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TEST REPORT

ACCORDING TO: FCC part 15 subpart C, §15.247 and subpart B, parts 22, 24 ;
RSS-210 issue 6 Annex 8

FOR:

Motorola Israel Ltd.

HC700G Handheld Computer

Model: F3133A

FCC ID:AZ489FT7018

This report is in conformity with ISO/ IEC 17025. The A2LA logo endorsement applies only to the test methods and the standards that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested. This test report shall not be reproduced in any form except in full with the written approval of Hermon Laboratories Ltd.

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1 Applicant information

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Contact name:	Mr. Yaron Haim

2 Equipment under test attributes

Product name:	HC700G handheld computer
Model(s):	F3133A
Serial numbers:	629SFS0177 (radiated tests), 629SFS0204 (conducted tests)
Software release:	D00.00.08
Main board hardware version:	8489654V01
Receipt date	11/3/2005 2:41:00 PM

3 Manufacturer information

Manufacturer name:	Motorola Israel Ltd.
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Contact name:	Mr. Yaron Haim

4 Test details

Project ID:	16755
Location:	Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel
Test started:	11/3/2005
Test completed:	11/24/2005; 2/7/2006
Test specification(s):	FCC part 15, subpart C, §15.247(DTS), §15.247(FHSS) and subpart B; parts 22, 24; RSS-210 issue 6 Annex 8
Test suite:	FCC_15.247_FHSS_with_RF_connector (10/25/2004 4:50:32 PM, modified)

5 Tests summary

Test	Status
Transmitter characteristics according to §15.247 (DTS), RSS-210 Annex 8	
FCC section 15.247(a)2, RSS-210 section A8.2(1), 6 dB bandwidth	Pass
FCC section 15.247(b)3, RSS-210 section A8.4(4), Peak output power	Pass
FCC section 15.247(b)5, RSS-Gen, Section 5.5, RF exposure	Not required
FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	Pass
FCC section 15.247(d), RSS-210 section A8.2(2), Peak power density	Pass
FCC section 15.207(a), RSS-Gen, Section 7.2.2, Conducted emission	Not required
Transmitter characteristics according to §15.247 (FHSS), RSS-210 Annex 8	
Section 15.247(a)1, (g), (h), RSS-210 section A8.1(1), Frequency hopping requirements	Pass
Section 15.247(a)1, RSS-210 section A8.1(1), 20 dB bandwidth	Pass
Section 15.247(a)1, RSS-210 section A8.1(2), Frequency separation	Pass
Section 15.247(a)1, RSS-210 section A8.1(3), Number of hopping frequencies	Pass
Section 15.247(a)1, RSS-210 section A8.1(4), Average time of occupancy	Pass
Section 15.247(b), RSS-210 section A8.4(2), Peak output power	Pass
Section 15.247(b)5, RSS-Gen, Section 5.5, RF exposure	Not required
Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	Pass
Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	Pass
Section 15.203, RSS-Gen, Section 7.1.4, Antenna requirements	Pass
Section 15.207(a), RSS-Gen, Section 7.2.2, Conducted emission	Not required
Transmitter characteristics according to parts 22, 24	
Sections 22.913, 24.232, RF output power	Pass
Sections 24.238(b), 2.1049, Occupied bandwidth	Pass
Sections 22.917, 24.238, Radiated spurious emissions	Pass
Sections 22.917, 24.238, Emissions at band edges	Pass
Sections 22.355, 24.235, Frequency stability	Pass
Unintentional emissions	
FCC section 15.107, ICES-03, conducted emission at AC power port	Not required
FCC section 15.109, ICES-003, RSS-Gen, Section 7.2.3.2, Radiated emission	Pass
FCC Part 15, Section 111 / RSS-Gen, Section 7.2.3.1, Conducted emission at receiver antenna port	Not required

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested.
The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

This test report replaces the previously issued test report identified by Doc ID:MOTRAD_FCC.16755_rev3.

	Name and Title	Date	Signature
Tested by:	Mr. A. Adelberg, test engineer	November 24, 2005 February 7, 2006	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	February 8, 2006	
Approved by:	Mr. M. Nikishin, EMC and Radio group leader	February 8, 2006	

6 EUT description

6.1 General information

The HC700G is a rugged handheld computer designed for field applications where fast data acquisition and exchange is required.
The HC700G serves as a Personal Digital Assistant (PDA) that enables portable access to Microsoft® Windows Mobile applications. It contains a built-in imager (camera) for reading 1D and 2D barcode labels. The imager can also capture hand writing images such as signatures and correlate the signature to an adjacent barcode. Wireless communication enables access to the outside world through Global System for Mobile communication (GSM), General Packet Radio Service (GPRS) and 802.11b Wireless Local Area Network (WLAN). Short distance Bluetooth® radio is used to communicate with peripheral wireless equipment such as: printers and body-worn devices.
Only two radios can operate (transmit) simultaneously:
- The GPRS (GSM850/PCS1900) and WLAN will not work simultaneously when used in the present configuration;
- The GPRS (GSM850/PCS1900) and Bluetooth transmitters may work simultaneously when used in the present configuration;
- The WLAN and Bluetooth transmitters may work simultaneously.

6.2 Operating frequencies

Source	Frequency, MHz			
	WLAN	Bluetooth	GSM850	PCS1900
Digital portion	13	15.36	22	24.576
Processor	416	NA	NA	NA
SDRAM	104	NA	NA	NA
AC97	12.288	NA	NA	NA
Receiver	2412 - 2462	2402 - 2480	869 - 894	1930 – 1990
Transmitter	2412 - 2462	2402 - 2480	824.2 – 848.8	1850.2 – 1909.8
LO (GPRS) low band	695.36 – 715.04	NA	NA	NA
LO (GPRS) high band	772.08 -795.92	NA	NA	NA

6.3 Changes made in the EUT

No changes were implemented.

6.4 Transmitter characteristics

6.4.1 Bluetooth module characteristics (module BCM2035)

Type of equipment	
	Stand-alone (Equipment with or without its own control provisions)
X	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)
	Plug-in card (Equipment intended for a variety of host systems)

Intended use		**Condition of use**
	fixed	Always at a distance more than 2 m from all people
	mobile	Always at a distance more than 20 cm from all people
X	portable	May operate at a distance closer than 20 cm to human body

Assigned frequency range	2400 – 2483.5 MHz
Operating frequency range	2402 - 2480 MHz
RF channel spacing	1000 kHz
Maximum rated output power	At transmitter 50 Ω RF output connector: 2 mW
	Effective radiated power (for equipment with no RF connector): 2 mW

Is transmitter output power variable?				
	X	No		
		Yes		continuous variable
				stepped variable with stepsize: dB
			minimum RF power	0.251 mW
			maximum RF power	2 mW

Antenna connection				
unique coupling	standard connector	X	integral	with temporary RF connector
				X without temporary RF connector

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain
Inverted F 2.4-2.48 GHz λ/4	Motorola	8489654V01	0 dBi

Transmitter 99% power bandwidth	1000 kHz				
Transmitter aggregate data rate/s	1.0 Mbps				
Transmitter aggregate symbol (baud) rate/s	0.125 Msymbols per second (MBaud)				
Type of modulation	GFSK				
Type of multiplexing	TDD				
Modulating test signal (baseband)	PRBS				
Maximum transmitter duty cycle in normal use	35.8 %	**Tx ON time**	0.458 msec	**Period**	1.278 msec
Transmitter duty cycle supplied for test	100 %	**Tx ON time**		**Period**	

Transmitter power source					
X	Battery	**Nominal rated voltage**	7.2 VDC	Battery type	Lithium
		Nominal rated voltage			

Common power source for transmitter and receiver	X yes	no

Spread spectrum parameters for transmitters tested per FCC 15.247 only		
FHSS	total number of hops	79
	dwell time	0.458 msec
	bandwidth per hop	1.0 MHz
	max. separation of hops	1.0 MHz

6.4.2 Wireless LAN module characteristics (module Samsung 2350C)

Type of equipment	
	Stand-alone (Equipment with or without its own control provisions)
X	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)
	Plug-in card (Equipment intended for a variety of host systems)

Intended use		**Condition of use**
	fixed	Always at a distance more than 2 m from all people
	mobile	Always at a distance more than 20 cm from all people
X	portable	May operate at a distance closer than 20 cm to human body

Assigned frequency range	2400 – 2483.5 MHz
Operating frequency range	2412 - 2462 MHz
RF channel spacing	5 MHz
Maximum rated average output power	At transmitter 50 Ω RF output connector: 40 mW
	Effective radiated power (for equipment with no RF connector): 52.5 mW

Is transmitter output power variable?				
X	No			
	Yes		continuous variable	
			stepped variable with stepsize	dB
		minimum RF power		25 mW
		maximum RF power		40 mW

Antenna connection				
unique coupling	standard connector	X	integral	with temporary RF connector
				X without temporary RF connector

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain
Inverted F 2.4-2.48 GHz λ/4	Motorola	8489654V01	+1.2 dBi

Transmitter 99% power bandwidth	22 MHz				
Transmitter aggregate data rate/s	1.0, 2.0, 5.5 and 11 Mbps				
Transmitter aggregate symbol (baud) rate/s	0.125, 0.25, 06785 and 1.375 Msymbols per second (MBaud)				
Type of modulation	DSSS:1M – DBPSK, 2M – DQPSK and CCK: 5.5M – DQPSK, 11M - QPSK				
Type of multiplexing	TDD				
Modulating test signal (baseband)	PRBS				
Maximum transmitter duty cycle in normal use	1M – 99.9% 2M – 99.8% 5.5M – 99.6 % 11M – 99.3%	**Tx ON time**	18.8 msec 9.5 msec 3.6 msec 1.9 msec	**Period**	18.8126 msec 9.5126 msec 3.6126 msec 1.9126 msec
Transmitter duty cycle supplied for test	100 %	**Tx ON time**	msec	**Period**	msec

Transmitter power source					
X	Battery	**Nominal rated voltage**	7.2 VDC	Battery type	Lithium

Common power source for transmitter and receiver	X	yes	no

Spread spectrum parameters for transmitters tested per FCC 15.247 only		
DSSS	Chip sequence length	8 bits
	Spectrum width	22 MHz

6.4.3 G20 module F4007, GSM 850/PCS 1900 transmitter

Type of equipment	
	Stand-alone (Equipment with or without its own control provisions)
X	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)
	Plug-in card (Equipment intended for a variety of host systems)

Intended use		**Condition of use**
	fixed	Always at a distance more than 2 m from all people
	mobile	Always at a distance more than 20 cm from all people
X	portable	May operate at a distance closer than 20 cm to human body

Assigned frequency range	824 – 849 MHz/1850 – 1910 MHz
Operating frequency range	824.2 – 848.8 MHz/1850.2 – 1909.8 MHz
RF channel spacing	200 kHz

Maximum rated output power	At transmitter 50 Ω RF output connector	850 – 1.778 W 1900 – 0.891 W
	Effective radiated power (for equipment with no RF connector)	850 – 512.9 mW 1900 – 1415.8 mW

Is transmitter output power variable?		No			
	X	Yes		continuous variable	
			X	stepped variable with stepsize	2 dB
			minimum RF power		850 – 3.2 mW 1900 – 1 mW
			maximum RF power		850 – 1.778 W 1900 – 0.891 W

Antenna connection				
unique coupling	standard connector	X	integral	with temporary RF connector
				X without temporary RF connector

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain
Monopole, 850/900 λ/4 Monopole, 1800/1900 λ/2	Motorola	8589520V02	850/900: -5.5 dBi 1800/1900: +2 dBi

Transmitter 99% power bandwidth	245 kHz				
Transmitter aggregate data rate/s	21 kbps				
Transmitter aggregate symbol (baud) rate/s	21 ksymbols per second (kBaud)				
Type of modulation	GMSK				
Type of multiplexing	TDMA				
Modulating test signal (baseband)	GSM				
Maximum transmitter duty cycle in normal use	12.5 %	**Tx ON time**	0.576 msec	**Period**	4.7 msec
Transmitter duty cycle supplied for test	12.5 %	**Tx ON time**	0.576 msec	**Period**	4.7 msec

Transmitter power source					
X	Battery	**Nominal rated voltage**	7.2 VDC	Battery type	Lithium
		Nominal rated voltage			

Common power source for transmitter and receiver	X	yes	no

Test specification:	**Section 22.913, Section 24.232; Peak output power**		
Test procedure:	FCC part 22, Section 22.913; part 24, Section 24.232		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/5/2006 3:46:51 PM		
Temperature: 22ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 7.2 VDC battery
Remarks:			

7 Transmitter tests according to 47CFR part 22 and part 24 requirements

7.1 Peak output power (conducted)

7.1.1 General

This test was performed to measure the peak output power at RF antenna connector. Specification test limits are given in Table 7.1.1.

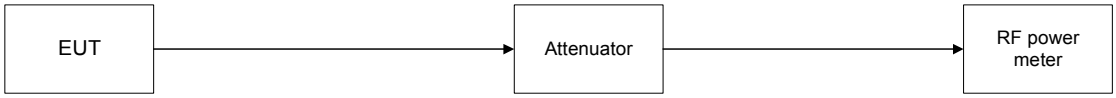
Table 7.1.1 Peak output power limits

Assigned frequency range, MHz	Maximum peak output power	
	W	dBm
824 – 849	7.0	38.45
1850 – 1910	2.0	33.00

7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.
7.1.2.2 The EUT was adjusted to produce maximum available to the end user RF output power.
7.1.2.3 The output power was measured with a thermocouple power meter and corrected for the duty cycle to obtain RMS values as provided in Table 7.1.2 and associated plots.

Figure 7.1.1 Peak output power test setup



Test specification:	**Section 22.913, Section 24.232; Peak output power**		
Test procedure:	FCC part 22, Section 22.913; part 24, Section 24.232		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/5/2006 3:46:51 PM		
Temperature: 22ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 7.2 VDC battery
Remarks:			

Table 7.1.2 Peak output power test results

OPERATING FREQUENCY RANGE: 824 - 849 MHz
MODULATION: GMSK
MODULATING SIGNAL: PRBS
BIT RATE: 270 kbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Carrier frequency, MHz	Power meter reading, dBm	External attenuation, dB	Correction factor*, dB	Cable loss, dB	RF output power**, dBm	Limit, dBm	Margin, dB	Verdict
824.4	3.15	20	9.2	0.25	32.60	38.45	-5.85	Pass
836.4	2.94	20	9.2	0.25	32.39	38.45	-6.06	Pass
848.8	3.03	20	9.2	0.25	32.48	38.45	-5.97	Pass

* - Duty cycle correction factor = 10*log (Pulse period / Pulse width) = 10*log 8.33 = 9.2
** - RF output power = Power meter reading + external attenuation + correction factor + cable loss

OPERATING FREQUENCY RANGE: 1850 – 1910 MHz
MODULATION: GMSK
MODULATING SIGNAL: PRBS
BIT RATE: 270 kbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Carrier frequency, MHz	Power meter reading, dBm	External attenuation, dB	Correction factor*, dB	Cable loss, dB	RF output power**, dBm	Limit, dBm	Margin, dB	Verdict
1850.2	-0.19	20	9.2	0.5	29.51	33.00	-3.49	Pass
1880.0	-0.35	20	9.2	0.5	29.35	33.00	-3.65	Pass
1909.8	-0.30	20	9.2	0.5	29.40	33.00	-3.60	Pass

* - Duty cycle correction factor = 10*log (Pulse period / Pulse width) = 10*log 8.33 = 9.2
** - RF output power = Power meter reading + external attenuation + correction factor + cable loss

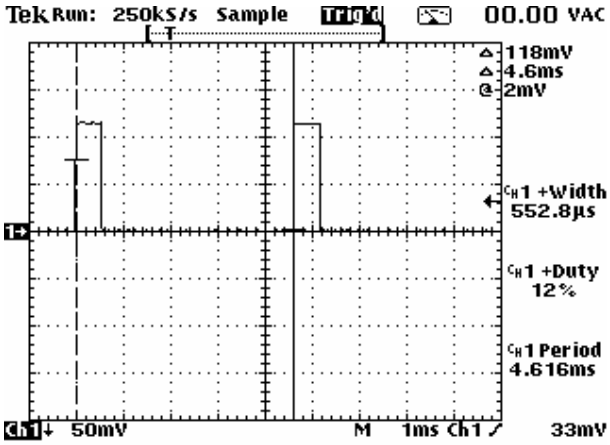
Reference numbers of test equipment used

HL 0190	HL 1650						

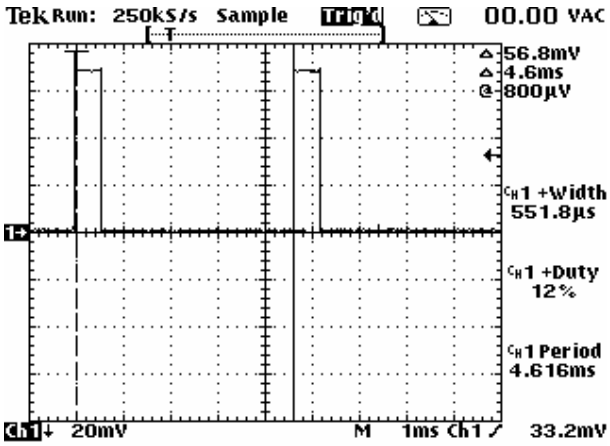
Full description is given in Appendix A.

Test specification:	Section 22.913, Section 24.232; Peak output power		
Test procedure:	FCC part 22, Section 22.913; part 24, Section 24.232		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/5/2006 3:46:51 PM		
Temperature: 22ºC	Air Pressure: 1012 hPa	Relative Humidity: 46 %	Power Supply: 7.2 VDC battery
Remarks:			

Plot 7.1.1 Duty cycle test results, G20 850



Plot 7.1.2 Duty cycle test results, G20 1900



Test specification:	Section 22.913, Section 24.232; Peak output power		
Test procedure:	FCC part 22, Section 22.913; part 24, Section 24.232		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/5/2006 3:46:51 PM		
Temperature: 21ºC	Air Pressure: 1012 hPa	Relative Humidity: 46 %	Power Supply: 7.2 VDC battery
Remarks:			

7.2 Peak output power (radiated)

7.2.1 General

This test was performed to measure the maximum peak output power radiated by transmitter. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Peak output power limits

Assigned frequency range, MHz	Peak output power		Equivalent field strength limit @ 3m, dB(μV/m)*
	W	dBm	
824 – 849	7.0	38.45	133.68
1850 – 1910	2.0	33.00	128.23

*- Equivalent field strength limit was calculated from the peak output power as follows: E=sqrt(30×P×G)/r, where P is peak output power in Watts, r is antenna to EUT distance in meters and G is transmitter antenna gain in dBi.

7.2.2 Test procedure for field strength measurements

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.

7.2.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

7.2.2.3 The resolution bandwidth of spectrum analyzer was set wider than 6 dB bandwidth of the EUT and the field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept in both vertical and horizontal polarizations.

7.2.2.4 The measurements were performed in 3 orthogonal positions of the EUT.

7.2.2.5 The maximum field strength of the EUT carrier frequency was measured as provided in Table 7.2.2 and associated plots.

7.2.3 Test procedure for substitution power measurements

7.2.3.1 The test equipment was set up as shown in Figure 7.2.2 and energized.

7.2.3.2 RF signal generator was set to the EUT carrier frequency and the RF output level was preliminary adjusted to produce the same field strength as it was measured from the EUT.

7.2.3.3 The test antenna height was swept to find maximum emission from substitution antenna and RF signal generator output was fine adjusted to produce the same field strength as it was measured from the EUT.

7.2.3.4 The maximum peak output power was calculated as a sum of signal generator output power in dBm and substitution antenna gain in dBi reduced by cable loss in dB.

7.2.3.5 The above procedure was performed in both horizontal and vertical polarizations of the substitution antenna.

7.2.3.6 The worst test results (the lowest margins) were recorded in Table 7.2.3 and shown in the associated plots.

Test specification:	**Section 22.913, Section 24.232; Peak output power**		
Test procedure:	FCC part 22, Section 22.913; part 24, Section 24.232		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/5/2006 3:46:51 PM		
Temperature: 21ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 7.2 VDC battery
Remarks:			

Figure 7.2.1 Setup for carrier field strength measurements

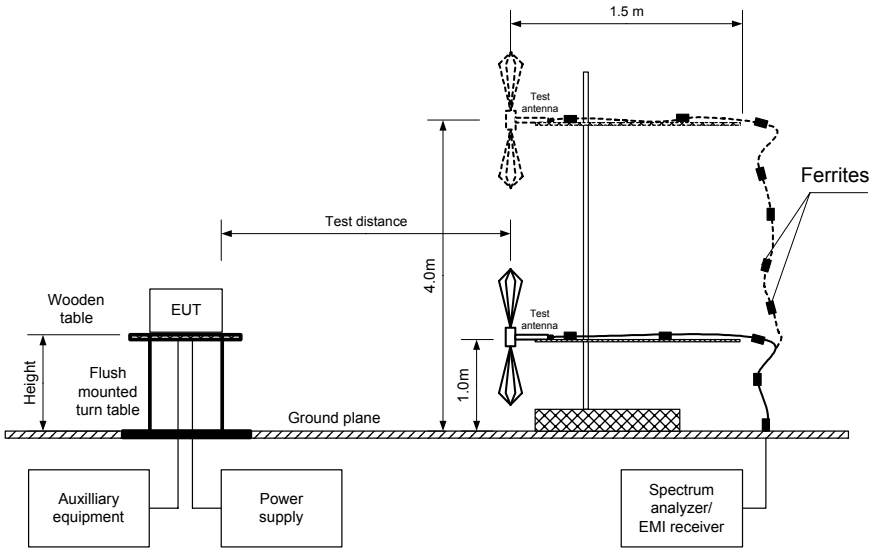
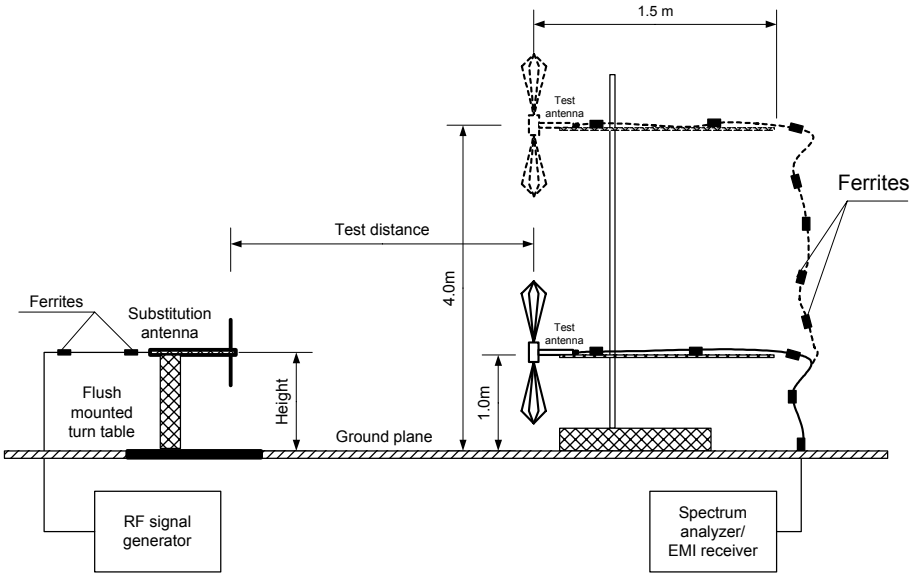


Figure 7.2.2 Setup for substitution peak output power measurements



Test specification:	**Section 22.913, Section 24.232; Peak output power**		
Test procedure:	FCC part 22, Section 22.913; part 24, Section 24.232		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/5/2006 3:46:51 PM		
Temperature: 21ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 7.2 VDC battery
Remarks:			

Table 7.2.2 Field strength measurement of peak output power

TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 0.8 m
EUT POSITION: 3 orthogonal axes
DETECTOR USED: Peak
TEST ANTENNA TYPE: Biconilog (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)
MODULATION: GMSK
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak

OPERATING FREQUENCY RANGE: 824 - 849 MHz

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	EUT position
824.20	125.70	133.68	-7.98	Horizontal	1.3	108	Y-axis
836.60	123.11	133.68	-10.57	Vertical	1.0	257	X-axis
848.80	124.02	133.68	-9.66	Vertical	1.0	292	X-axis

OPERATING FREQUENCY RANGE: 1850 - 1910 MHz

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	EUT position
1850.20	127.09	128.23	-1.14	Vertical	1.0	56	X-axis
1880.00	131.71	128.23	3.48	Vertical	1.0	62	Z-axis
1909.80	132.86	128.23	4.63	Vertical	1.0	73	X-axis

*- Margin = Field strength – calculated field strength limit.
**- EUT front panel refer to 0 degrees position of turntable.

Test specification:	**Section 22.913, Section 24.232; Peak output power**		
Test procedure:	FCC part 22, Section 22.913; part 24, Section 24.232		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/5/2006 3:46:51 PM		
Temperature: 21ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 7.2 VDC battery
Remarks:			

Table 7.2.3 Substitution measurement of peak output power

TEST DISTANCE: 3 m
SUBSTITUTION ANTENNA HEIGHT: 0.8 m
DETECTOR USED: Peak
SUBSTITUTION ANTENNA TYPE: Tunable dipole (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)

OPERATING FREQUENCY RANGE: 824 - 849 MHz

Frequency, MHz	Field strength, dB(µV/m)	Antenna polarization	RF generator output, dBm	Antenna gain, dBd	Cable loss, dB	Peak output power, ERP dBm	Limit, dBm	Margin, dB*	Verdict
824.20	125.70	h	25.03	-0.79	0.65	23.59	38.45	-14.86	Pass
836.60	123.11	v	23.90	-0.74	0.65	22.51	38.45	-15.94	Pass
848.80	124.02	v	25.81	-0.69	0.65	24.47	38.45	-13.98	Pass

*- Margin = Peak output power – specification limit.

OPERATING FREQUENCY RANGE: 1850 - 1910 MHz

Frequency, MHz	Field strength, dB(µV/m)	Antenna polarization	RF generator output, dBm	Antenna gain, dBi	Cable loss, dB	Peak output power,EiRP dBm	Limit, dBm	Margin, dB*	Verdict
1850.20	127.09	v	23.46	8.70	0.93	31.23	33.00	-1.77	Pass
1880.00	131.71	v	24.76	8.70	0.93	32.53	33.00	-0.47	Pass
1909.80	132.86	v	22.70	8.70	0.93	30.47	33.00	-2.53	Pass

Reference numbers of test equipment used

HL 0415	HL 0661	HL 0812	HL 1430	HL 1565	HL 1947	HL 1984	HL 2400
HL 2432							

Full description is given in Appendix A.

Test specification:	**Section 2.1049, Section 24.238(b); Occupied bandwidth**		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 40%	**Power Supply:** 7.2 VDC battery
Remarks:			

7.3 Occupied bandwidth test

7.3.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc
824 - 849	26
1850 - 1910	26

* - Modulation envelope reference points are provided in terms of attenuation below the unmodulated carrier.

7.3.2 Test procedure

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.
7.3.2.2 The EUT was set to transmit the unmodulated carrier and the reference peak power level was measured.
7.3.2.3 The EUT was set to transmit the normally modulated carrier.
7.3.2.4 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and the results provided in Table 7.3.2, Table 7.3.3 and the associated plots.

Figure 7.3.1 Occupied bandwidth test setup

Test specification:	**Section 2.1049, Section 24.238(b); Occupied bandwidth**		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 40%	**Power Supply:** 7.2 VDC battery
Remarks:			

Table 7.3.2 Occupied bandwidth test results

DETECTOR USED:	Peak hold
RESOLUTION BANDWIDTH:	3 kHz
VIDEO BANDWIDTH:	10 kHz
MODULATION ENVELOPE REFERENCE POINTS:	26 dBc
MODULATION:	GMSK
MODULATING SIGNAL:	PRBS
BIT RATE:	270 kbps

Carrier frequency, MHz	Lower reference point, MHz	Upper reference point, MHz	Occupied bandwidth, kHz
824.2	824.067	824.340	273
836.6	836.468	836.735	267
848.8	848.668	848.940	272

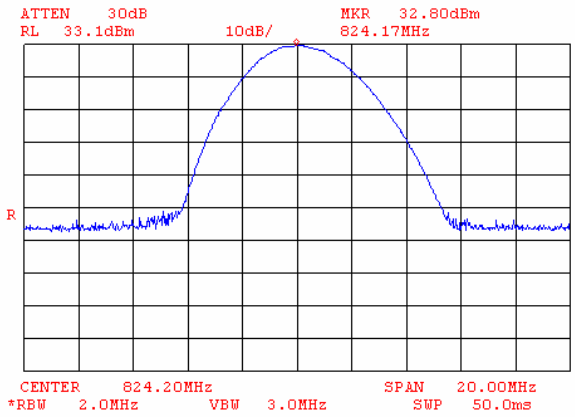
Reference numbers of test equipment used

HL 1424	HL 1650					

Full description is given in Appendix A.

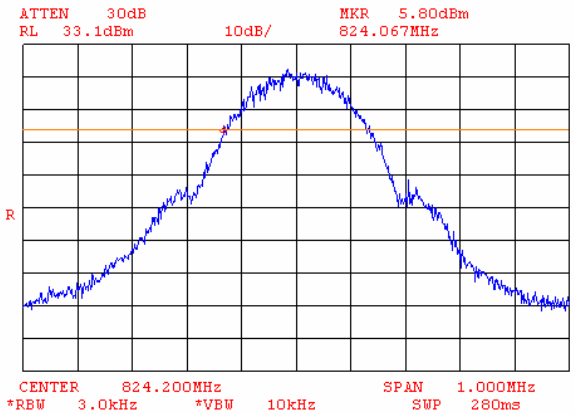
Test specification:	**Section 2.1049, Section 24.238(b); Occupied bandwidth**		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 40%	**Power Supply:** 7.2 VDC battery
Remarks:			

Plot 7.3.1 Occupied bandwidth test result at low frequency, reference level

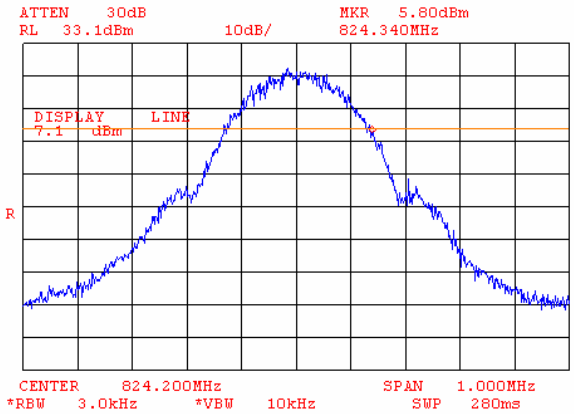


Test specification:	**Section 2.1049, Section 24.238(b); Occupied bandwidth**		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 40%	**Power Supply:** 7.2 VDC battery
Remarks:			

Plot 7.3.2 Occupied bandwidth test result at low frequency, lower reference point

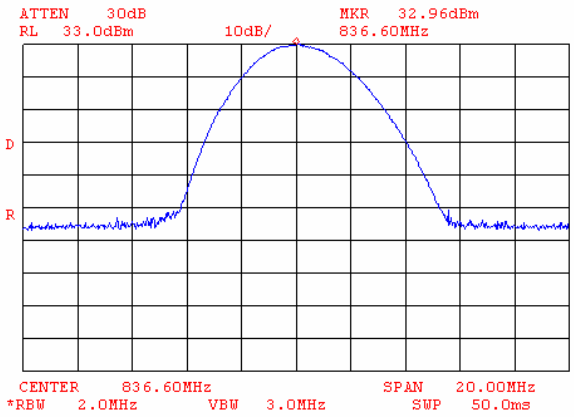


Plot 7.3.3 Occupied bandwidth test result at low frequency, higher reference point

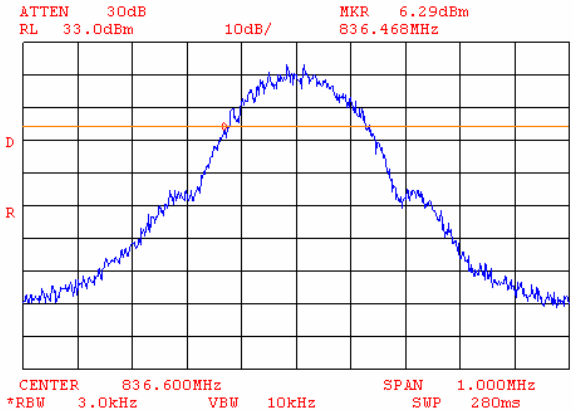


Test specification:	Section 2.1049, Section 24.238(b); Occupied bandwidth		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	Air Pressure: 1007 hPa	Relative Humidity: 40%	Power Supply: 7.2 VDC battery
Remarks:			

Plot 7.3.4 Occupied bandwidth test result at mid frequency, reference level

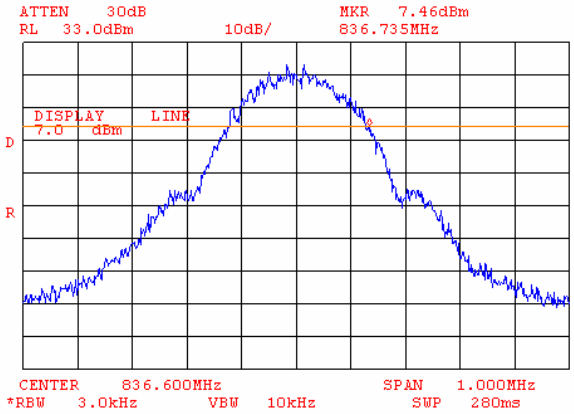


Plot 7.3.5 Occupied bandwidth test result at mid frequency, lower reference point

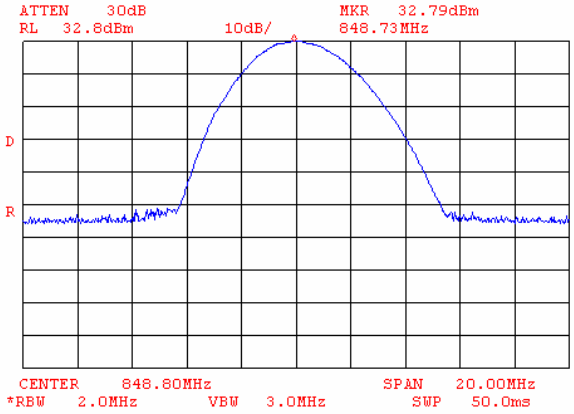


Test specification:	Section 2.1049, Section 24.238(b); Occupied bandwidth		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	Air Pressure: 1007 hPa	Relative Humidity: 40%	Power Supply: 7.2 VDC battery
Remarks:			

Plot 7.3.6 Occupied bandwidth test result at mid frequency, higher reference point

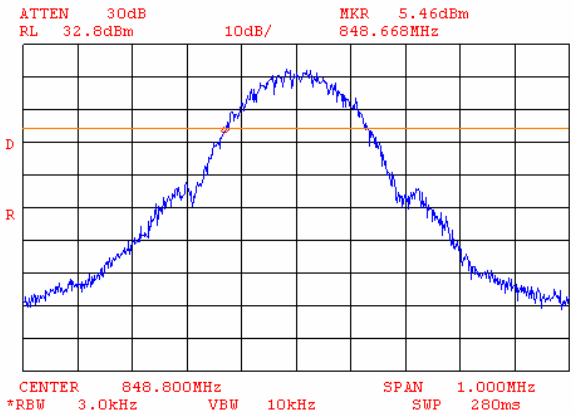


Plot 7.3.7 Occupied bandwidth test result at high frequency, reference level

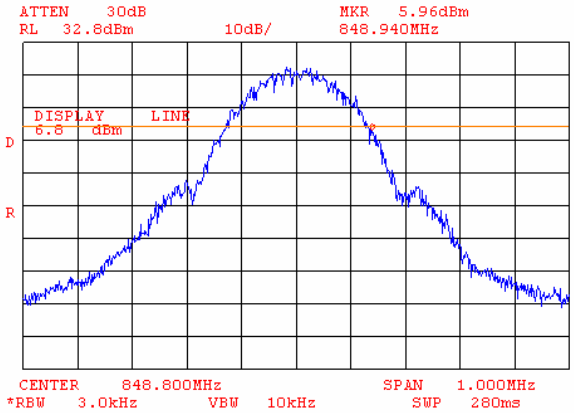


Test specification:	Section 2.1049, Section 24.238(b); Occupied bandwidth		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	Air Pressure: 1007 hPa	Relative Humidity: 40%	Power Supply: 7.2 VDC battery
Remarks:			

Plot 7.3.8 Occupied bandwidth test result at high frequency, lower reference point



Plot 7.3.9 Occupied bandwidth test result at high frequency, higher reference point



Test specification:	**Section 2.1049, Section 24.238(b); Occupied bandwidth**		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 40%	**Power Supply:** 7.2 VDC battery
Remarks:			

Table 7.3.3 Occupied bandwidth test results

DETECTOR USED:	Peak hold
RESOLUTION BANDWIDTH:	3 kHz
VIDEO BANDWIDTH:	10 kHz
MODULATION ENVELOPE REFERENCE POINTS:	26 dBc
MODULATION:	GMSK
MODULATING SIGNAL:	PRBS
BIT RATE:	270 kbps

Carrier frequency, MHz	Lower reference point, MHz	Upper reference point, MHz	Occupied bandwidth, kHz
1850.2	1850.067	1850.337	270
1880.0	1879.865	1880.142	277
1909.8	1909.663	1909.933	270

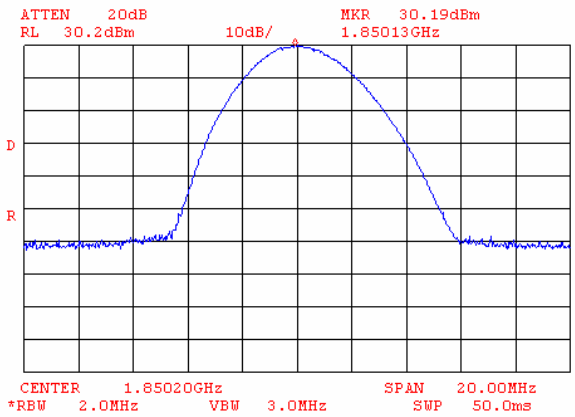
Reference numbers of test equipment used

HL 1424	HL 1650					

Full description is given in Appendix A.

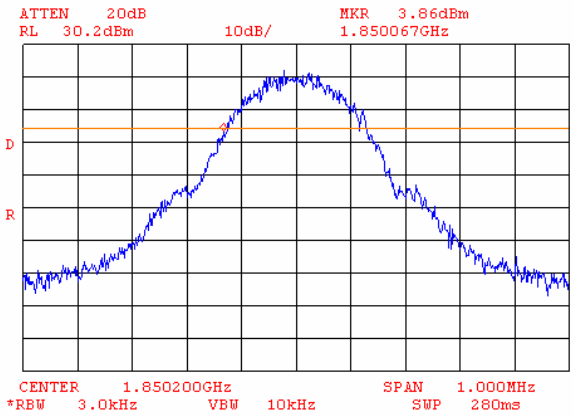
Test specification:	Section 2.1049, Section 24.238(b); Occupied bandwidth		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	Air Pressure: 1007 hPa	Relative Humidity: 40%	Power Supply: 7.2 VDC battery
Remarks:			

Plot 7.3.10 Occupied bandwidth test result at low frequency, reference level

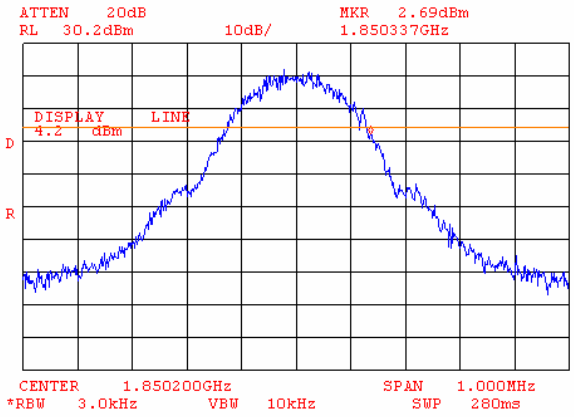


Test specification:	**Section 2.1049, Section 24.238(b); Occupied bandwidth**		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 40%	**Power Supply:** 7.2 VDC battery
Remarks:			

Plot 7.3.11 Occupied bandwidth test result at low frequency, lower reference point

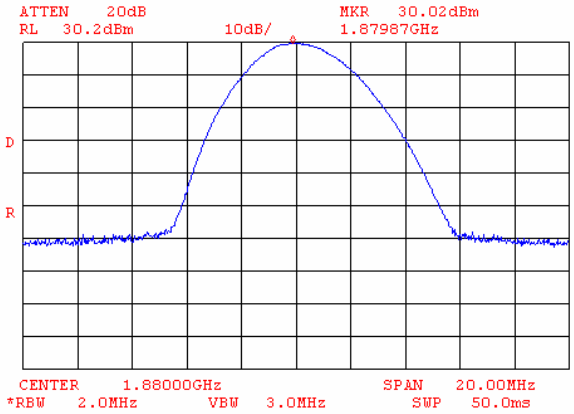


Plot 7.3.12 Occupied bandwidth test result at low frequency, higher reference point

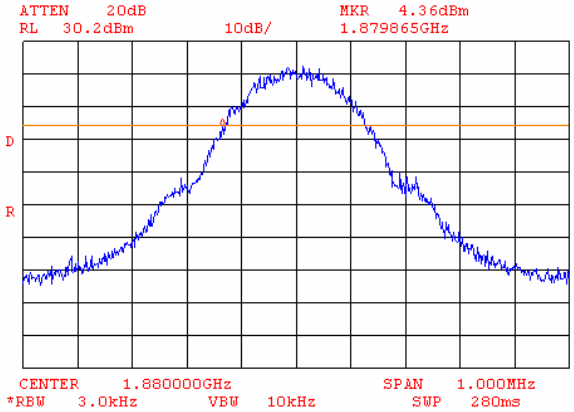


Test specification:	**Section 2.1049, Section 24.238(b); Occupied bandwidth**		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 40%	**Power Supply:** 7.2 VDC battery
Remarks:			

Plot 7.3.13 Occupied bandwidth test result at mid frequency, reference level

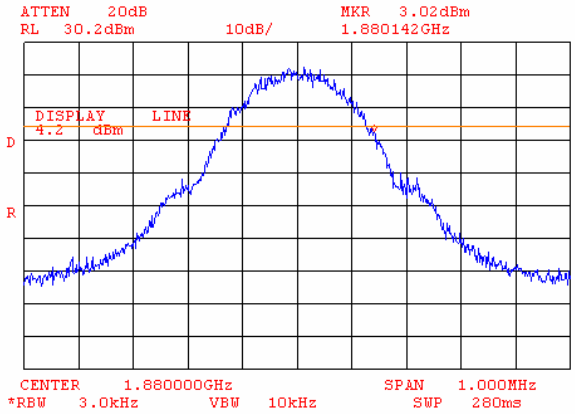


Plot 7.3.14 Occupied bandwidth test result at mid frequency, lower reference point

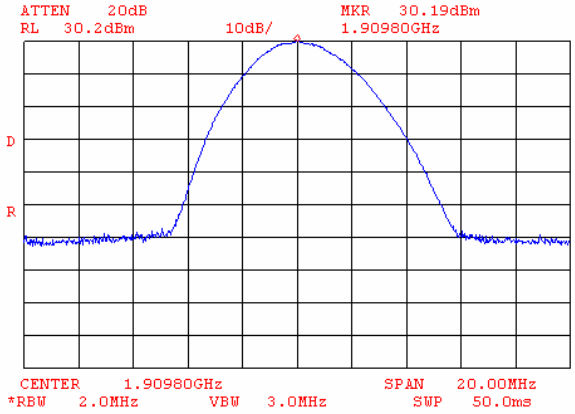


Test specification:	**Section 2.1049, Section 24.238(b); Occupied bandwidth**		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 40%	**Power Supply:** 7.2 VDC battery
Remarks:			

Plot 7.3.15 Occupied bandwidth test result at mid frequency, higher reference point

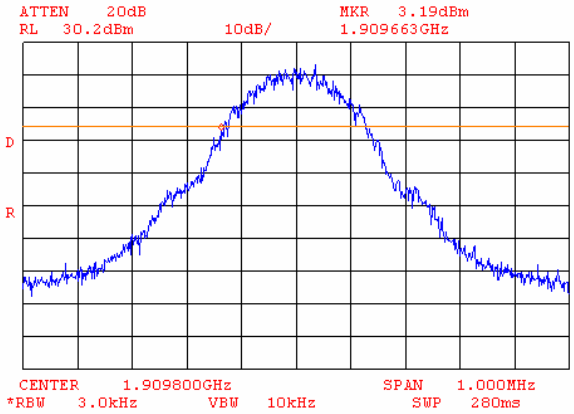


Plot 7.3.16 Occupied bandwidth test result at high frequency, reference level

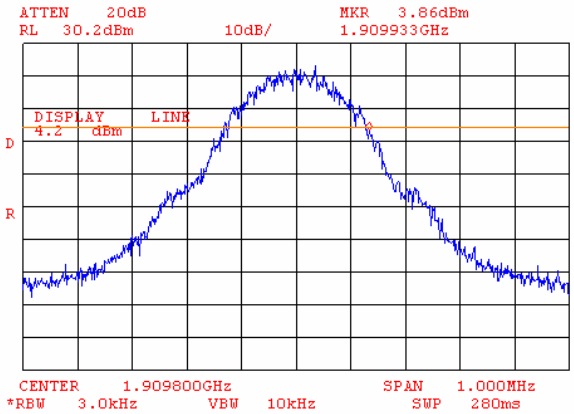


Test specification:	**Section 2.1049, Section 24.238(b); Occupied bandwidth**		
Test procedure:	FCC part 2, Section 2.1049; FCC part 24, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/7/2006 9:39:03 AM		
Temperature: 21ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 40%	**Power Supply:** 7.2 VDC battery
Remarks:			

Plot 7.3.17 Occupied bandwidth test result at high frequency, lower reference point



Plot 7.3.18 Occupied bandwidth test result at high frequency, higher reference point



Test specification:	**Section 22.355, Section 24.235, Frequency stability test**		
Test procedure:	FCC part 22, Section 22.355; part 24, Section 24.235; part 2 section 2.1055		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/3/2006 13:48:01 PM		
Temperature: 20ºC	**Air Pressure:** 1017 hPa	**Relative Humidity:** 45 %	**Power Supply:** 7.2 VDC battery
Remarks:			

7.4 Frequency stability test

7.4.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.4.1, Table 7.4.2.

Table 7.4.1 Frequency stability limits

Assigned frequency, MHz	Limit, ppm	Limits, Hz
824.2	2.5	2060
836.4		2091
848.8		2122

Table 7.4.2 Frequency stability limits

Assigned frequency, MHz	Limits
1850.2	26 dBc points including frequency tolerance shall remain within the authorized frequency block
1880.0	
1909.8	

7.4.2 Test procedure

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and its proper operation was checked.

7.4.2.2 The EUT power was turned off. Temperature within test chamber was set to +30˚C and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.

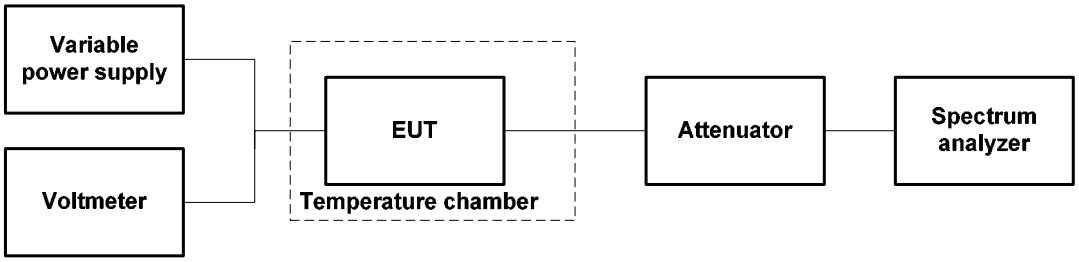
7.4.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.

7.4.2.4 The above procedure was repeated at 0˚C and at the lowest test temperature.

7.4.2.5 The EUT was powered on and carrier frequency was measured at start up moment and at the end of stabilization period at the rest of test temperatures and voltages. The EUT was powered off.

7.4.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.4.3.

Figure 7.4.1 Frequency stability test setup



Test specification:	**Section 22.355, Section 24.235, Frequency stability test**		
Test procedure:	FCC part 22, Section 22.355; part 24, Section 24.235; part 2 section 2.1055		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/3/2006 13:48:01 PM		
Temperature: 20ºC	**Air Pressure:** 1017 hPa	**Relative Humidity:** 45 %	**Power Supply:** 7.2 VDC battery
Remarks:			

Table 7.4.3 Frequency stability test results

OPERATING FREQUENCY: 824.2 – 848.8 MHz
NOMINAL POWER VOLTAGE: 7.2 VDC
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: Counter
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 100 kHz
MODULATION: GMSK

T, ºC	Voltage, V	Frequency, MHz							Max frequency drift, Hz		Limit, Hz	Margin, Hz	Verdict
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Positive	Negative			
Low frequency 824.2 MHz													
-30	nominal	824.201750	824.20150	824.20275	824.20225	824.20250	824.20125	824.20200	250	-1250	2060	-810	Pass
-20	nominal	824.202000	NA	NA	NA	NA	NA	824.20250	0	-500		-1560	Pass
-10	nominal	824.201500	NA	NA	NA	NA	NA	824.20200	0	-1000		-1060	Pass
0	nominal	824.201000	824.20150	824.20050	824.20125	824.20100	824.20075	824.20175	0	-2000		-60	Pass
10	nominal	824.201500	NA	NA	NA	NA	NA	824.20150	0	-1000		-1060	Pass
20	15%	824.202500	NA	NA	NA	NA	NA	824.20400	1500	0		-560	Pass
20	nominal	824.203500	NA	NA	NA	NA	NA	824.20250*	1000	0		-1060	Pass
20	-15%	824.203750	NA	NA	NA	NA	NA	824.20200	1250	-500		-810	Pass
30	nominal	824.202000	824.20150	824.20200	824.20100	824.20200	824.20200	824.20250	0	-1500		-560	Pass
40	nominal	824.201000	NA	NA	NA	NA	NA	824.20250	0	-1500		-560	Pass
50	nominal	824.200500	NA	NA	NA	NA	NA	824.20150	0	-2000		-60	Pass
Mid frequency 836.8 MHz													
-30	nominal	836.602000	836.60225	836.60100	836.60200	836.60200	836.60225	836.60200	0	-1500	2091	-591	Pass
-20	nominal	836.603000	NA	NA	NA	NA	NA	836.60300	500	0		-1591	Pass
-10	nominal	836.604250	NA	NA	NA	NA	NA	836.60200	1750	-500		-341	Pass
0	nominal	836.601750	836.60150	836.60175	836.60150	836.60200	836.60175	836.60100	0	-1500		-591	Pass
10	nominal	836.602500	NA	NA	NA	NA	NA	836.60125	0	-1250		-841	Pass
20	15%	836.603350	NA	NA	NA	NA	NA	836.60250	850	0		-1241	Pass
20	nominal	836.602500	NA	NA	NA	NA	NA	836.60250*	0	0		-2091	Pass
20	-15%	836.602000	NA	NA	NA	NA	NA	836.60250	0	-500		-1591	Pass
30	nominal	836.601500	836.60250	836.60150	836.60150	836.60200	836.60150	836.60150	0	-1000		-1091	Pass
40	nominal	836.602000	NA	NA	NA	NA	NA	836.60250	0	-500		-1591	Pass
50	nominal	836.601250	NA	NA	NA	NA	NA	836.60225	0	-1250		-841	Pass
High frequency 848.8 MHz													
-30	nominal	848.80200	848.80250	848.80250	848.80250	848.80250	848.80250	848.80250	0	-1000	2122	-1122	Pass
-20	nominal	848.802000	NA	NA	NA	NA	NA	848.80225	0	-1000		-1122	Pass
-10	nominal	848.801000	NA	NA	NA	NA	NA	848.80125	0	-2000		-122	Pass
0	nominal	848.801250	848.80175	848.80175	848.80150	848.80150	848.80125	848.80100	0	-2000		-122	Pass
10	nominal	848.801000	NA	NA	NA	NA	NA	848.80125	0	-2000		-122	Pass
20	15%	848.802000	NA	NA	NA	NA	NA	848.80200	0	-1000		-1122	Pass
20	nominal	848.802500	NA	NA	NA	NA	NA	848.80300*	0	-500		-1622	Pass
20	-15%	848.801000	NA	NA	NA	NA	NA	848.80200	0	-2000		-122	Pass
30	nominal	848.801500	848.80150	848.80200	848.80200	848.80200	848.80100	848.80100	0	-2000		-122	Pass
40	nominal	848.802000	NA	NA	NA	NA	NA	848.80200	0	-1000		-1122	Pass
50	nominal	848.801500	NA	NA	NA	NA	NA	848.80125	0	-1750		-372	Pass

* - Reference frequency

Test specification:	**Section 22.355, Section 24.235, Frequency stability test**		
Test procedure:	FCC part 22, Section 22.355; part 24, Section 24.235; part 2 section 2.1055		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/3/2006 13:48:01 PM		
Temperature: 20ºC	**Air Pressure:** 1017 hPa	**Relative Humidity:** 45 %	**Power Supply:** 7.2 VDC battery
Remarks:			

Table 7.4.4 Frequency stability test results

OPERATING FREQUENCY: 1850.2 – 1909.8 MHz
NOMINAL POWER VOLTAGE: 7.2 VDC
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: Counter
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 100 kHz
MODULATION: GMSK

T, ºC	Voltage, V	Frequency, MHz							Max frequency drift, Hz	
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Positive	Negative
Low frequency 1850.2 MHz										
-30	nominal	1850.202000	1850.202000	1850.200000	1850.199800	1850.201000	1850.200750	1850.201500	0	-2200
-20	nominal	1850.203000	NA	NA	NA	NA	NA	1850.202500	1000	0
-10	nominal	1850.201250	NA	NA	NA	NA	NA	1850.201500	0	-750
0	nominal	1850.201250	1850.201500	1850.200750	1850.201750	1850.201250	1850.199750	1850.200500	0	-2250
10	nominal	1850.201500	NA	NA	NA	NA	NA	1850.200750	0	-1250
20	15%	1850.201500	NA	NA	NA	NA	NA	1850.202000	0	-500
20	nominal	1850.202000	NA	NA	NA	NA	NA	1850.202000	0	0
20	-15%	1850.202000	NA	NA	NA	NA	NA	1850.202000	0	0
30	nominal	1850.201500	1850.200750	1850.202000	1850.202000	1850.202000	1850.201000	1850.200250	0	-1750
40	nominal	1850.202000	NA	NA	NA	NA	NA	1850.202000	0	0
50	nominal	1850.201500	NA	NA	NA	NA	NA	1850.201000	0	-1000
Mid frequency 1880.0 MHz										
-30	nominal	1880.001500	1880.002000	1880.001250	1880.001500	1880.002500	1880.001500	1880.001000	1500	0
-20	nominal	1880.002000	NA	NA	NA	NA	NA	1880.002500	1500	0
-10	nominal	1880.002500	NA	NA	NA	NA	NA	1880.001250	1500	0
0	nominal	1880.001750	1880.002250	1880.001500	1880.000750	1880.001250	1880.001250	1880.000250	1250	-750
10	nominal	1880.001250	NA	NA	NA	NA	NA	1880.001750	750	0
20	15%	1880.001500	NA	NA	NA	NA	NA	1880.001500	500	0
20	nominal	1880.002000	NA	NA	NA	NA	NA	1880.001000	1000	0
20	-15%	1880.001000	NA	NA	NA	NA	NA	1880.001000	0	0
30	nominal	1880.002000	1880.003000	1880.001500	1880.001000	1880.002500	1880.001000	1880.001500	2000	0
40	nominal	1880.002500	NA	NA	NA	NA	NA	1880.001500	1500	0
50	nominal	1880.001750	NA	NA	NA	NA	NA	1880.002500	1500	0
High frequency 1909.8 MHz										
-30	nominal	1909.801000	1909.801000	1909.802500	1909.801000	1909.802000	1909.801500	1909.802500	1500	0
-20	nominal	1909.802000	NA	NA	NA	NA	NA	1909.802500	1500	0
-10	nominal	1909.801750	NA	NA	NA	NA	NA	1909.799750	750	-1250
0	nominal	1909.801250	1909.800500	1909.801800	1909.801000	1909.802500	1909.801000	1909.801250	1500	-500
10	nominal	1909.801750	NA	NA	NA	NA	NA	1909.801000	750	0
20	15%	1909.802000	NA	NA	NA	NA	NA	1909.801500	1000	0
20	nominal	1909.802500	NA	NA	NA	NA	NA	1909.801000	1500	0
20	-15%	1909.801500	NA	NA	NA	NA	NA	1909.802000	1000	0
30	nominal	1909.800750	1909.801750	1909.801750	1909.801000	1909.801000	1909.801000	1909.802000	1000	-250
40	nominal	1909.801500	NA	NA	NA	NA	NA	1909.801500	500	0
50	nominal	1909.802000	NA	NA	NA	NA	NA	1909.801500	1000	0

* - Reference frequency

Test specification:	**Section 22.355, Section 24.235, Frequency stability test**		
Test procedure:	FCC part 22, Section 22.355; part 24, Section 24.235; part 2 section 2.1055		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	2/3/2006 13:48:01 PM		
Temperature: 20ºC	**Air Pressure:** 1017 hPa	**Relative Humidity:** 45 %	**Power Supply:** 7.2 VDC battery
Remarks:			

Table 7.4.5 Transmitter operating range including frequency drift

Carrier frequency, MHz	Lower reference point, MHz	Upper reference point, MHz	Maximum negative drift, Hz	Maximum positive drift, Hz	Frequency tolerance, MHz	Limit, MHz	Margin, kHz	Verdict
1850.2	1850.03700	1850.364000	2250	1000	1850.034750	1850	34.750	Pass
1880.0	1879.83900	1880.161000	750	2000	NA	NA	NA	NA
1909.8	1909.63700	1909.960000	1250	1500	1909.961500	1910	-38.500	Pass

Reference numbers of test equipment used

HL 0493	HL 0808	HL 1791	HL 2103	HL 2266	HL 2468	Customer test set

Full description is given in Appendix A.

Test specification:	FCC part 22, section 22.917; part 24, section 24.238, Radiated spurious emissions		
Test procedure:	47 CFR Section 22.917, Section 24.238		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/27/2005 9:15:43 AM		
Temperature: 22 ºC	Air Pressure: 1022 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

7.5 Field strength of spurious emissions

7.5.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.5.1

Table 7.5.1 Radiated spurious emission test limits according to FCC parts 22 and 24

Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm	Equivalent field strength limit @ 3m, dB(μV/m)***
0.009 – 10th harmonic*	43+10logP**	-13	84.4

* - Excluding the in band emission within ± 250 % of the authorized bandwidth from the carrier
** - P is transmitter output power in Watts
*** - Equivalent field strength limit was calculated from maximum allowed ERP of spurious as follows: E=sqrt(30×P×1.64)/r, where P is ERP in Watts, 1.64 is numeric gain of ideal dipole and r is antenna to EUT distance in meters.

7.5.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and the performance check was conducted.

7.5.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

7.5.2.3 The measurements were performed in 3 orthogonal positions of the EUT. The worst test results (the lowest margins) were recorded and shown in the plots of section 8.8.

7.5.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.5.3.1 The EUT was set up as shown in Figure 7.5.2, energized and the performance check was conducted.

7.5.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.5.3.3 The measurements were performed in 3 orthogonal positions of the EUT. The worst test results (the lowest margins) were recorded and shown in the plots of section 8.8.

7.5.4 Test procedure for substitution ERP measurements of spurious

7.5.4.1 The test equipment was set up as shown in Figure 7.5.3 and energized.

7.5.4.2 RF signal generator was set to the frequency of investigated spurious emission and the RF output level was preliminary adjusted to produce the same field strength as it was measured from the EUT.

7.5.4.3 The test antenna height was swept from 1 to 4 m to find maximum emission from substitution antenna and RF signal generator output was fine adjusted to produce the same field strength as it was measured from the EUT.

7.5.4.4 The above procedure was performed in both, horizontal and vertical, polarizations of the test and substitution antennas.

7.5.4.5 The ERP of spurious emissions was calculated as a sum of signal generator output power in dBm and antenna gain in dBd reduced by cable loss in dB.

7.5.4.6 The above procedure was repeated at the rest of investigated frequencies.

7.5.4.7 The worst test results (the lowest margins) were recorded.

Test specification:	**FCC part 22, section 22.917; part 24, section 24.238, Radiated spurious emissions**		
Test procedure:	47 CFR Section 22.917, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/27/2005 9:15:43 AM		
Temperature: 22 ºC	**Air Pressure:** 1022 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Figure 7.5.1 Setup for spurious emission field strength measurements below 30 MHz

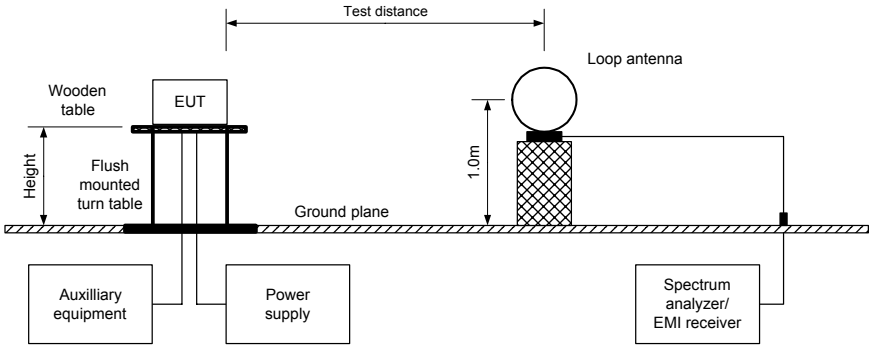
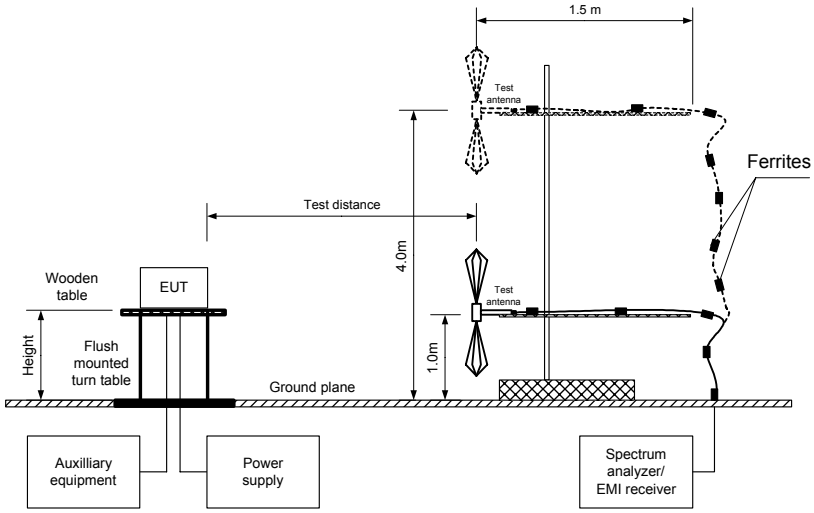
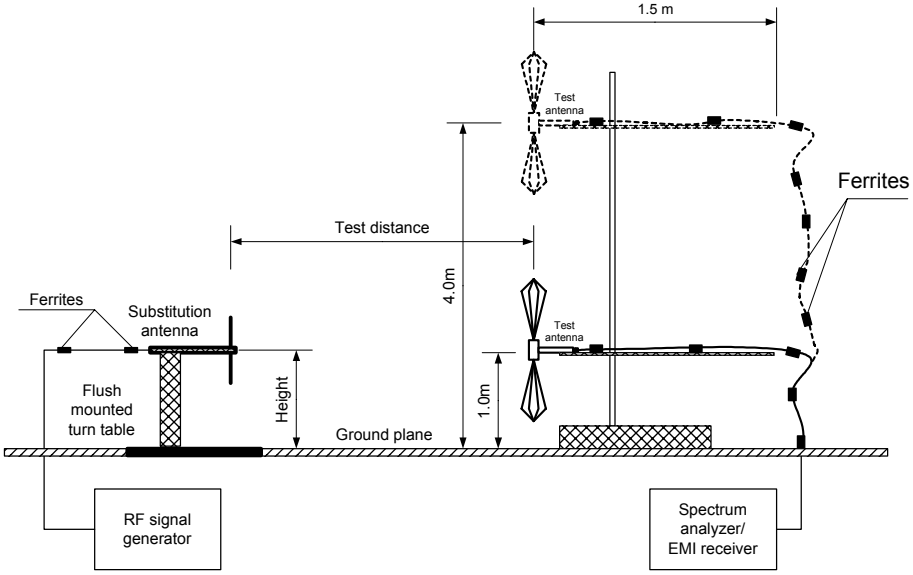


Figure 7.5.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**FCC part 22, section 22.917; part 24, section 24.238, Radiated spurious emissions**		
Test procedure:	47 CFR Section 22.917, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/27/2005 9:15:43 AM		
Temperature: 22 ºC	**Air Pressure:** 1022 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Figure 7.5.3 Setup for substitution ERP measurements of spurious



Test specification:	**FCC part 22, section 22.917; part 24, section 24.238, Radiated spurious emissions**		
Test procedure:	47 CFR Section 22.917, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/27/2005 9:15:43 AM		
Temperature: 22 ºC	**Air Pressure:** 1022 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 7.5.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE:	824 - 849 MHz
TEST DISTANCE:	3 m
TEST SITE:	Semi anechoic chamber / OATS
EUT HEIGHT:	0.8 m
INVESTIGATED FREQUENCY RANGE:	0.009 – 9000 MHz
DETECTOR USED:	Peak
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees
Low carrier frequency 824.4 MHz							
1648.4	58.91	84.4	-25.49	1000	H	1.1	144
2472.1	54.83	84.4	-29.57	1000	H	1.2	126
3296.7	53.17	84.4	-30.70	1000	H	1.1	187
Mid carrier frequency 836.4 MHz							
1673.2	56.68	84.4	-27.72	1000	H	1.1	146
2509.8	56.50	84.4	-27.90	1000	H	1.2	126
3346.4	51.83	84.4	-32.57	1000	H	1.1	187
High carrier frequency 848.8 MHz							
1697.6	52.99	84.4	-31.41	1000	V	1.3	216
2546.2	50.33	84.4	-34.07	1000	H	1.2	126
3394.9	53.83	84.4	-30.57	1000	H	1.1	187

*- Margin = Field strength of spurious – calculated field strength limit.
**- EUT front panel refers to 0 degrees position of turntable.

Test specification:	**FCC part 22, section 22.917; part 24, section 24.238, Radiated spurious emissions**		
Test procedure:	47 CFR Section 22.917, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/27/2005 9:15:43 AM		
Temperature: 22 ºC	**Air Pressure:** 1022 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 7.5.3 Substitution ERP of spurious test results

ASSIGNED FREQUENCY RANGE: 824 - 849 MHz
TRANSMITTER CARRIER ERP: 23.59 dBm at low frequency
22.51 dBm at mid frequency
24.47 dBm at high frequency
TEST SITE: Semi anechoic chamber / OATS
TEST DISTANCE: 3 m
SUBSTITUTION ANTENNA HEIGHT: 0.8 m
DETECTOR USED: Peak
VIDEO BANDWIDTH: > Resolution bandwidth
SUBSTITUTION ANTENNA TYPE: Tunable dipole (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength, dB(µV/m)	RBW, kHz	Antenna polarization	RF generator output, dBm	Ant gain, dBd	Cable loss, dB	ERP, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Low carrier frequency											
1648.4000	56.67	1000	H	-46.94	6.65	0.9	-41.19	41.19	96.59	-55.40	Pass
2472.1	54.83	1000	H	-48.34	4.48	1.03	-44.89	68.48	96.59	-28.11	Pass
3296.7	53.17	1000	H	-48.83	6.25	1.20	-43.78	67.37	96.59	-29.22	Pass
Mid carrier frequency											
1673.2000	56.68	1000	H	-49.09	6.65	0.9	-43.34	72.42	96.59	-24.17	Pass
2509.8	56.5	1000	H	-45.5	4.43	1.03	-42.10	64.61	95.51	-30.90	Pass
3346.4	51.83	1000	H	-50.5	6.37	1.20	-45.33	67.84	95.51	-27.67	Pass
High carrier frequency											
1697.6000	52.99	1000	V	-52.83	6.65	0.9	-47.08	47.08	96.59	-49.51	Pass
2546.2	50.33	1000	H	-52.5	4.52	1.03	-49.01	73.48	97.47	-23.99	Pass
3394.9	53.83	1000	H	-50.34	6.49	1.20	-45.05	69.52	97.47	-27.95	Pass

*- Margin = Spurious emission – specification limit.

Test specification:	**FCC part 22, section 22.917; part 24, section 24.238, Radiated spurious emissions**		
Test procedure:	47 CFR Section 22.917, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/27/2005 9:15:43 AM		
Temperature: 22 ºC	**Air Pressure:** 1022 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 7.5.4 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE:	1850 – 1910 MHz
TEST DISTANCE:	3 m
TEST SITE:	Semi anechoic chamber / OATS
EUT HEIGHT:	0.8 m
INVESTIGATED FREQUENCY RANGE:	0.009 – 9000 MHz
DETECTOR USED:	Peak
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

Frequency, MHz	Field strength, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees
Low carrier frequency 824.4 MHz							
3700.4000	61.83	84.4	-22.57	1000	H	1.1	108
5550.7	49.33	84.4	-35.07	1000	H	1.2	299
7400.6	64.33	84.4	-20.07	1000	V	1.1	67
Mid carrier frequency 836.4 MHz							
3760.0000	64.36	84.4	-20.04	1000	H	1.1	106
5640.1	50.33	84.4	-34.07	1000	H	1.2	300
7520.3	62.00	84.4	-22.40	1000	V	1.1	67
High carrier frequency 848.8 MHz							
3819.6000	69.68	84.4	-14.80	1000	H	1.2	112
5729.6	52.00	84.4	-32.40	1000	H	1.2	300
7638.8	56.00	84.4	-28.40	1000	V	1.1	67

*- Margin = Field strength of spurious – calculated field strength limit.
**- EUT front panel refers to 0 degrees position of turntable.

Test specification:	**FCC part 22, section 22.917; part 24, section 24.238, Radiated spurious emissions**		
Test procedure:	47 CFR Section 22.917, Section 24.238		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/27/2005 9:15:43 AM		
Temperature: 22 ºC	**Air Pressure:** 1022 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 7.5.5 Substitution ERP of spurious test results

ASSIGNED FREQUENCY RANGE: 1850 - 1910 MHz
TRANSMITTER CARRIER EIRP: 31.23 dBm at low frequency
32.53 dBm at mid frequency
30.47 dBm at high frequency
TEST SITE: Semi anechoic chamber / OATS
TEST DISTANCE: 3 m
SUBSTITUTION ANTENNA HEIGHT: 0.8 m
DETECTOR USED: Peak
VIDEO BANDWIDTH: > Resolution bandwidth
SUBSTITUTION ANTENNA TYPE: Tunable dipole (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength, dB(µV/m)	RBW, kHz	Antenna polarization	RF generator output, dBm	Ant gain, dBd	Cable loss, dB	ERP, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Low carrier frequency											
3700.4	49.33	1000	H	-33.54	6.85	1.26	-27.95	27.95	96.59	-68.64	Pass
5550.7	49.33	1000	H	-53.84	11.51	1.53	-43.86	67.45	96.59	-29.14	Pass
7400.6	64.33	1000	H	-37.67	13.27	1.77	-26.17	49.76	96.59	-46.83	Pass
Mid carrier frequency											
3760	50.33	1000	H	-31.38	6.85	1.26	-25.79	49.38	95.51	-46.13	Pass
5640.1	50.33	1000	H	-51.67	11.47	1.53	-41.73	64.24	95.51	-31.27	Pass
7520.3	62.00	1000	H	-40.33	13.40	1.77	-28.70	51.21	95.51	-44.30	Pass
High carrier frequency											
3819.6	52.00	1000	H	-24.79	6.85	1.26	-19.20	41.71	101.32	-59.61	Pass
5729.6	52.00	1000	H	-50.83	11.56	1.57	-40.84	65.31	101.32	-36.01	Pass
7638.8	56.00	1000	H	-48.17	13.53	1.78	-36.42	60.89	101.32	-40.43	Pass

*- Margin = Spurious emission – specification limit.

Reference numbers of test equipment used

HL 0410	HL 0521	HL 0589	HL 0592	HL 0593	HL 0594	HL 0604	HL 0768
HL 1200	HL 1424	HL 1942	HL 1947	HL 1984	HL 2009	HL 2259	HL 2260
HL 2399							

Full description is given in Appendix A.

Test specification:	**Section 15.247(a)1, (g), (h); RSS-210 section A8.1(1), Frequency hopping requirements**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/27/2005 9:15:43 AM		
Temperature: 22 ºC	**Air Pressure:** 1022 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

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8 Transmitter tests according to 47CFR part 15 subpart C and RSS-210 requirements (FHSS)

8.1 Frequency hopping requirements

The EUT was verified for compliance with frequency hopping requirements listed below:

- The EUT shall hop to channel frequencies that are selected from a pseudorandomly ordered list;
- Each hopping frequency shall be used equally on the average;
- The EUT receiver shall have input bandwidth that match the hopping channel bandwidth of the corresponding transmitter and shall shift frequencies in synchronization with the transmitted signals;
- The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

The rationale for compliance with the above requirements was either test results or supplier declaration. The summary of results is provided in Table 8.1.1.

Table 8.1.1 Frequency hopping requirements

Requirement	Rationale	Verdict
The EUT shall hop to channel frequencies that are selected from a pseudorandomly ordered list	Supplier declaration	Comply
Each hopping frequency shall be used equally on the average	Supplier declaration	Comply
The EUT receiver shall have input bandwidth that match the hopping channel bandwidth of the corresponding transmitter	Supplier declaration	Comply
The EUT receiver shall shift frequencies in synchronization with the transmitted signals	Supplier declaration	Comply
Each transmitter operates independently and there is no synchronization with other transmitters for purposes other than to avoid simultaneous channel occupancy	Supplier declaration	Comply

Test specification:	Section 15.247(a)1, RSS-210 section A8.1(1), 20 dB bandwidth		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/8/2005 12:30:02 PM		
Temperature: 21 ºC	Air Pressure: 1007hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

8.2 20 dB bandwidth

8.2.1 General

This test was performed to measure 20 dB bandwidth of the transmitter hopping channel. Specification test limits are given in Table 8.2.1.

Table 8.2.1 The 20 dB bandwidth limits

Assigned frequency, MHz	Minimum bandwidth, kHz	Modulation envelope reference points*, dBc
902.0 – 928.0	500	20
2400.0 – 2483.5	NA	
5725.0 – 5850.0	1000	

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

8.2.2 Test procedure

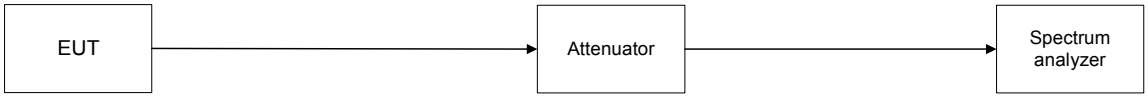
8.2.2.1 The EUT was set up as shown in Figure 8.2.1, energized and its proper operation was checked.

8.2.2.2 The EUT was set to transmit modulated carrier at maximum data rate.

8.2.2.3 The transmitter bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 8.2.2 and associated plot.

8.2.2.4 The test was repeated for each data rate and each modulation format.

Figure 8.2.1 The 20 dB bandwidth test setup



Test specification:	**Section 15.247(a)1, RSS-210 section A8.1(1), 20 dB bandwidth**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 12:30:02 PM		
Temperature: 21 ºC	**Air Pressure:** 1007hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 8.2.2 The 20 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: ≥ 1% of the 20 dB bandwidth
VIDEO BANDWIDTH: ≥ RBW
MODULATION ENVELOPE REFERENCE POINTS: 20.0 dBc
MODULATING SIGNAL: PRBS
FREQUENCY HOPPING: Disabled

Carrier frequency, MHz	Type of modulation	Data rate, Mbps	Symbol rate, Msymbols/s	20 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2402	GFSK	1.0	0.125	837	NA	NA	Pass
2440	GFSK	1.0	0.125	847	NA	NA	Pass
2480	GFSK	1.0	0.125	847	NA	NA	Pass

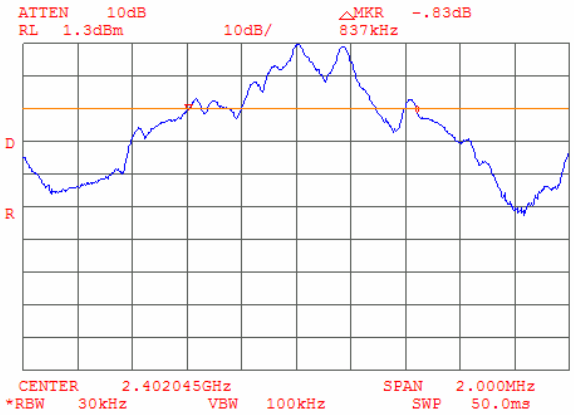
Reference numbers of test equipment used

HL 1424	HL 2425							

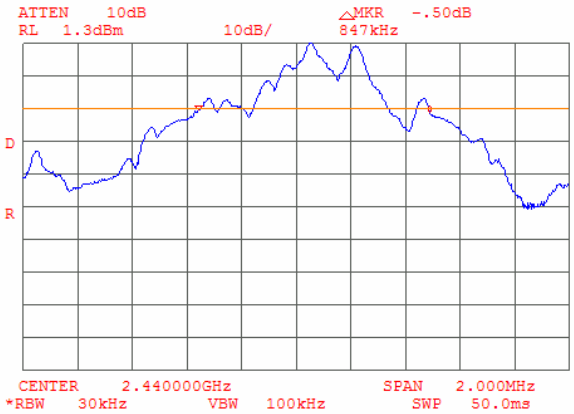
Full description is given in Appendix A.

Test specification:	**Section 15.247(a)1, RSS-210 section A8.1(1), 20 dB bandwidth**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 12:30:02 PM		
Temperature: 21 ºC	**Air Pressure:** 1007hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 8.2.1 The 20 dB bandwidth test result at low frequency



Plot 8.2.2 The 20 dB bandwidth test result at mid frequency



Test specification:	**Section 15.247(a)1, RSS-210 section A8.1(1), 20 dB bandwidth**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 12:30:02 PM		
Temperature: 21 ºC	**Air Pressure:** 1007hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 8.2.3 The 20 dB bandwidth test result at high frequency

Test specification:	Section 15.247(a)1, RSS-210 section A8.1(2), Frequency separation		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/8/2005 2:18:00 PM		
Temperature: 21 ºC	Air Pressure: 1007 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

8.3 Carrier frequency separation

8.3.1 General

This test was performed to measure frequency separation between the peaks of adjacent channels. Specification test limits are given in Table 8.3.1.

Table 8.3.1 Carrier frequency separation limits

Assigned frequency range, MHz	Carrier frequency separation
902.0 – 928.0	25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater
2400.0 – 2483.5	
5725.0 – 5850.0	

8.3.2 Test procedure

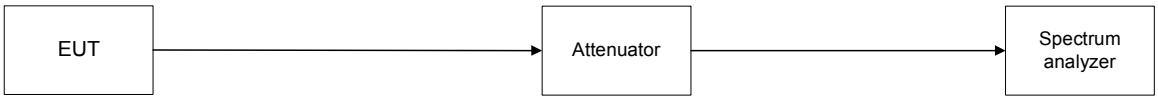
8.3.2.1 The EUT was set up as shown in Figure 8.3.1, energized with frequency hopping function enabled and its proper operation was checked.

8.3.2.2 The spectrum analyzer span was set to capture the carrier frequency and both of adjacent channels, the lower and the higher. The resolution bandwidth was set wider than 1 % of the frequency span.

8.3.2.3 The spectrum analyzer was set in max hold mode and allowed trace to stabilize.

8.3.2.4 The frequency separation between the peaks of adjacent channels was measured as provided in Table 8.3.2 and associated plots.

Figure 8.3.1 Carrier frequency separation test setup



Test specification:	**Section 15.247(a)1, RSS-210 section A8.1(2), Frequency separation**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 2:18:00 PM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 8.3.2 Carrier frequency separation test results

ASSIGNED FREQUENCY:	2400.0 – 2483.5 MHz
MODULATION:	GFSK
MODULATING SIGNAL:	PRBS
BIT RATE:	1 Mbps
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	≥ 1% of the span
VIDEO BANDWIDTH:	≥ RBW
FREQUENCY HOPPING:	Enabled
20 dB BANDWIDTH:	847 kHz

Carrier frequency separation, kHz	Limit, kHz	Margin*	Verdict
995	847	148	Pass

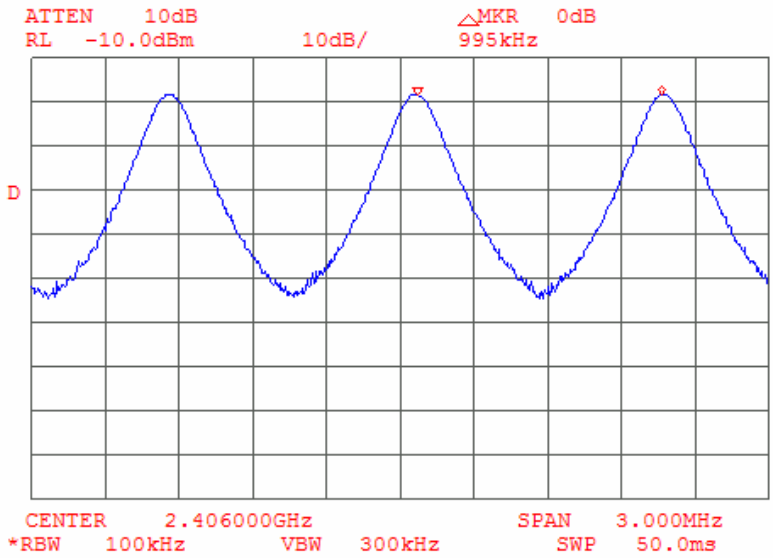
* - Margin = Carrier frequency separation – specification limit.

Reference numbers of test equipment used

HL 1424	HL 2425						

Full description is given in Appendix A.

Plot 8.3.1 Carrier frequency separation



Test specification:	Section 15.247(a)1, RSS-210 section A8.1(3), Number of hopping frequencies		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/8/2005 2:35:41 PM		
Temperature: 21 ºC	Air Pressure: 1007 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

8.4 Number of hopping frequencies

8.4.1 General

This test was performed to calculate the number of hopping frequencies used by the EUT. Specification test limits are given in Table 8.4.1.

Table 8.4.1 Minimum number of hopping frequencies

Assigned frequency range, MHz	Number of hopping frequencies
902.0 – 928.0	50 (if the 20 dB bandwidth is less than 250 kHz) 25 (if the 20 dB bandwidth is 250 kHz or greater)
2400.0 – 2483.5	**15**
5725.0 – 5850.0	75

8.4.2 Test procedure

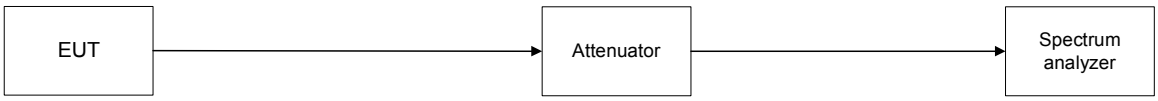
8.4.2.1 The EUT was set up as shown in Figure 8.4.1, energized with frequency hopping function enabled and its proper operation was checked.

8.4.2.2 Initially the spectrum analyzer span was set equal to frequency band of operation and the resolution bandwidth was set wider than 1 % of the frequency span. If the separate hopping channels were not clearly resolved the frequency band of operation was broken to sections and the resolution bandwidth was set wider than 1 % of the frequency span of each section.

8.4.2.3 The spectrum analyzer was set in max hold mode and allowed trace to stabilize.

8.4.2.4 The number of frequency hopping channels was calculated as provided in Table 8.4.2 and associated plots.

Figure 8.4.1 Hopping frequencies test setup



Test specification:	**Section 15.247(a)1, RSS-210 section A8.1(3), Number of hopping frequencies**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 2:35:41 PM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 8.4.2 Hopping frequencies test results

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
MODULATION: GFSK
MODULATING SIGNAL: PRBS
BIT RATE: 1 Mbps
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: ≥ 1% of the span
VIDEO BANDWIDTH: ≥ RBW
FREQUENCY HOPPING: Enabled

Number of hopping frequencies	Minimum number of hopping frequencies	Margin*	Verdict
79	15	64	Pass

* - Margin = Number of hopping frequencies – Minimum number of hopping frequencies.

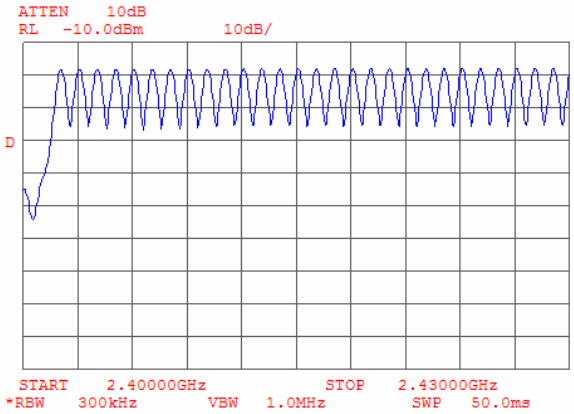
Reference numbers of test equipment used

HL 1424	HL 2425						

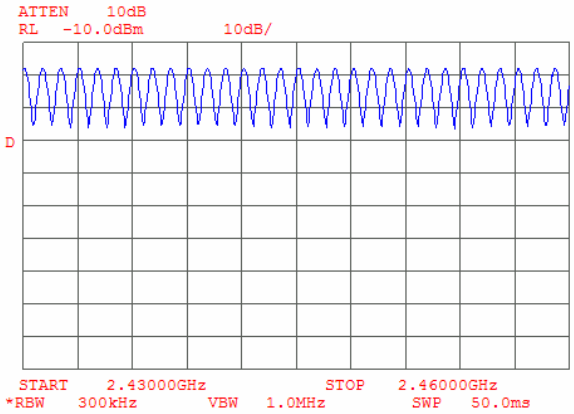
Full description is given in Appendix A.

Test specification:	**Section 15.247(a)1, RSS-210 section A8.1(3), Number of hopping frequencies**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 2:35:41 PM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 8.4.1 Number of hopping frequencies at 2400 – 2430 MHz range

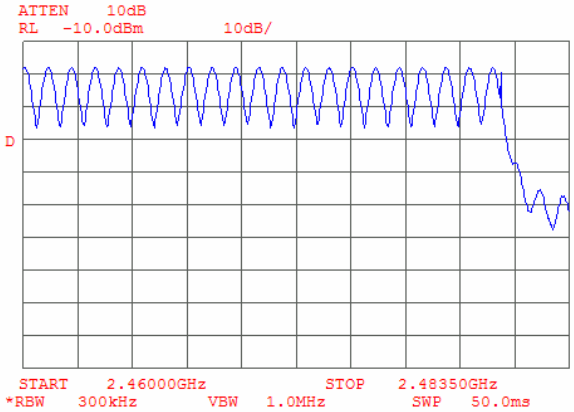


Plot 8.4.2 Number of hopping frequencies at 2430 – 2460 MHz range



Test specification:	**Section 15.247(a)1, RSS-210 section A8.1(3), Number of hopping frequencies**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 2:35:41 PM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 8.4.3 Number of hopping frequencies at 2460 – 2483.5 MHz range



Test specification:	Section 15.247(a)1, RSS-210 section A8.1(4), Average time of occupancy		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/8/2005 4:26:44 PM		
Temperature: 21 ºC	Air Pressure: 1007 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

8.5 Average time of occupancy

8.5.1 General

This test was performed to calculate the average time of occupancy (dwell time) on any frequency channel of the EUT. Specification test limits are given in Table 8.5.1.

Table 8.5.1 Average time of occupancy limits

Assigned frequency range, MHz	Maximum average time of occupancy, s	Investigated period, s	Number of hopping frequencies
902.0 – 928.0	0.4	20.0	≥ 50
902.0 – 928.0	0.4	10.0	< 50
2400.0 – 2483.5	**0.4**	**0.4 × N**	**N (≥ 15)**
5725.0 – 5850.0	0.4	30.0	≥ 75

8.5.2 Test procedure

8.5.2.1 The EUT was set up as shown in Figure 8.5.1 , energized with frequency hopping function enabled and its proper operation was checked.

8.5.2.2 The spectrum analyzer span was set to zero centered on a hopping channel.

8.5.2.3 The single transmission duration and period were measured with oscilloscope.

8.5.2.4 The average time of occupancy was calculated as the single transmission time multiplied by the investigated period and divided by the single transmission period.

8.5.2.5 The test was repeated at each data rate and modulation type as provided in Table 8.5.2 and associated plots.

Figure 8.5.1 Average time of occupancy test setup

Test specification:	**Section 15.247(a)1, RSS-210 section A8.1(4), Average time of occupancy**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 4:26:44 PM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 8.5.2 Average time of occupancy test results

ASSIGNED FREQUENCY:	2400-2483.5 MHz
MODULATION:	GFSK
MODULATING SIGNAL:	PRBS
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	1 MHz
VIDEO BANDWIDTH:	3 MHz
NUMBER OF HOPPING FREQUENCIES:	79
INVESTIGATED PERIOD:	31.6 s
FREQUENCY HOPPING:	Enabled

Carrier frequency, MHz	Single transmission duration, ms	Single transmission period, ms	Average time of occupancy*, s	Bit rate, Mbps	Symbol rate, Msymbol/s	Limit, s	Margin, s**	Verdict
2402-2480	0.454	1.274	0.143	1	1	0.4	0.257	Pass

* - Average time of occupancy = (Single transmission duration × Investigated period) / (Single transmission period × number of hopping channels).
** - Margin = Average time of occupancy – specification limit.

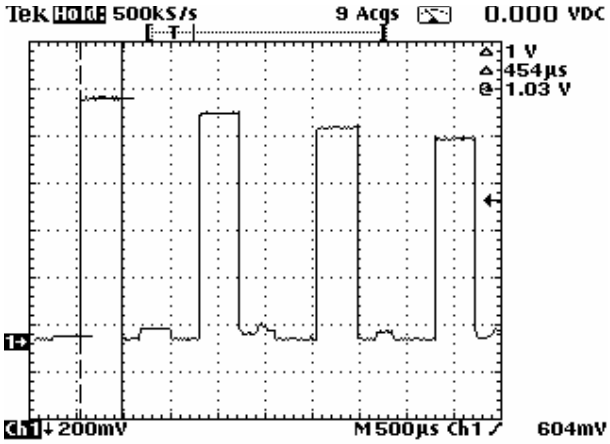
Reference numbers of test equipment used

HL 1562	HL 2258	HL 2483					

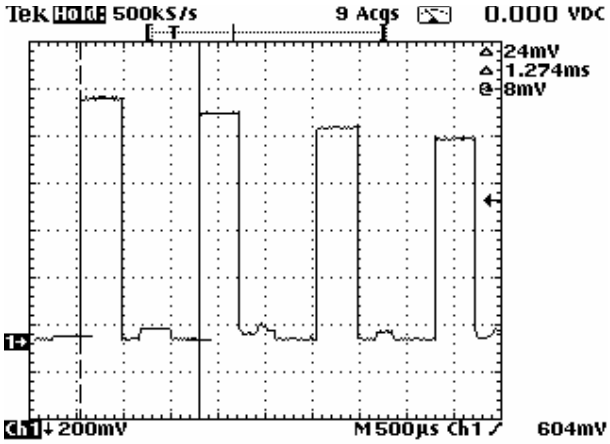
Full description is given in Appendix A.

Test specification:	Section 15.247(a)1, RSS-210 section A8.1(4), Average time of occupancy		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/8/2005 4:26:44 PM		
Temperature: 21 ºC	Air Pressure: 1007 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 8.5.1 Single transmission duration



Plot 8.5.2 Single transmission period



Test specification:	Section 15.247(b), RSS-210 section A8.4(2), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/8/2005 8:44:19 AM		
Temperature: 21 ºC	Air Pressure: 1007 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

8.6 Peak output power

8.6.1 General

This test was performed to measure the maximum peak output power at the transmitter RF antenna connector. Specification test limits are given in Table 8.6.1.

Table 8.6.1 Peak output power limits

Assigned frequency range, MHz	Peak output power*		Maximum antenna gain, dBi
	W	dBm	
902.0 – 928.0	0.125	21.0	6.0*
2400.0 – 2483.5	0.125 (<75 hopping channels) **1.0** (≥75 hopping channels)	21.0 (<75 hopping channels) **30.0** (≥75 hopping channels)	
5725.0 – 5850.0	1.0	30.0	

*- If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

- by 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;
- without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band;
- by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

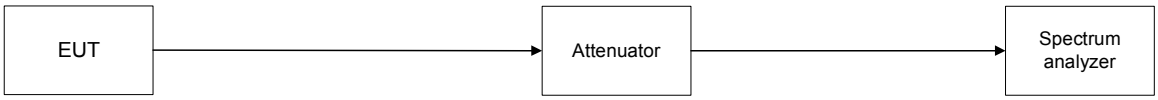
8.6.2 Test procedure

8.6.2.1 The EUT was set up as shown in Figure 8.6.1, energized and its proper operation was checked.

8.6.2.2 The EUT was adjusted to produce maximum available for end user RF output power.

8.6.2.3 The frequency span of spectrum analyzer was set approximately 5 times wider than 20 dB bandwidth of the EUT and the resolution bandwidth was set wider than 20 dB bandwidth of the EUT. The spectrum analyzer trace was allowed to stabilize and the maximum peak output power was measured as provided in Table 8.6.2 and associated plots.

Figure 8.6.1 Peak output power test setup



Test specification:	**Section 15.247(b), RSS-210 section A8.4(2), Peak output power**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 8:44:19 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 8.6.2 Peak output power test results

ASSIGNED FREQUENCY:	2400-2483.5 MHz
MODULATION:	GFSK
MODULATING SIGNAL:	PRBS
BIT RATE:	1 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
EUT 20 dB BANDWIDTH:	MHz
RESOLUTION BANDWIDTH:	1 MHz
VIDEO BANDWIDTH:	3 MHz
FREQUENCY HOPPING:	Disabled
NUMBER OF FREQUENCY HOPPING CHANNELS:	79

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak output power, dBm	Limit, dBm	Margin*, dB	Verdict
2402	1.33	Included	1.3	2.63	30.0	-27.37	Pass
2440	1.67	Included	1.3	2.97	30.0	-27.03	Pass
2480	1.33	Included	1.3	2.63	30.0	-27.37	Pass

* - Margin = Peak output power – specification limit.

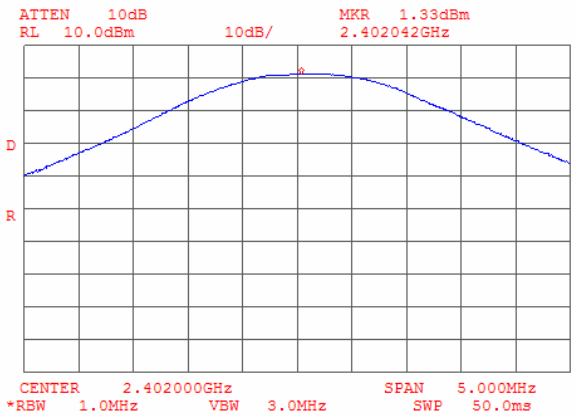
Reference numbers of test equipment used

HL 1424	HL 2524						

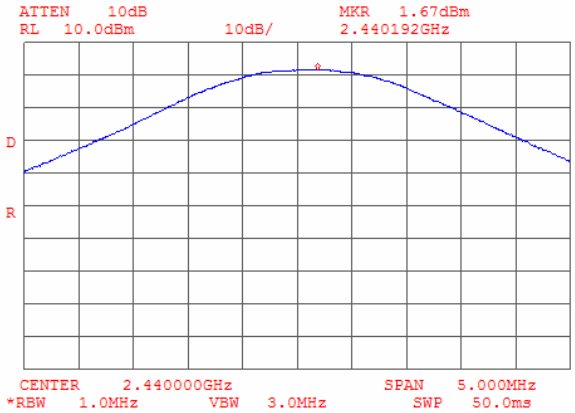
Full description is given in Appendix A.

Test specification:	**Section 15.247(b), RSS-210 section A8.4(2), Peak output power**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 8:44:19 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 8.6.1 Peak output power at low frequency

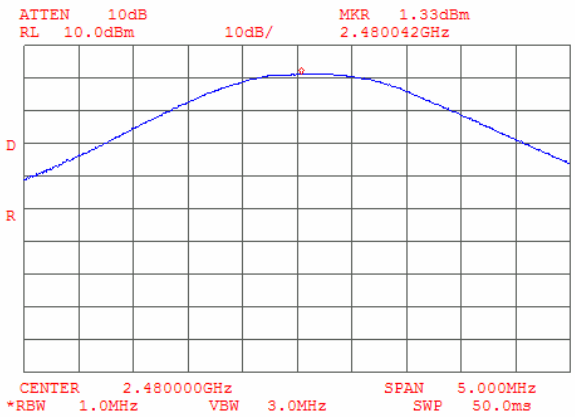


Plot 8.6.2 Peak output power at mid frequency



Test specification:	**Section 15.247(b), RSS-210 section A8.4(2), Peak output power**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 8:44:19 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 8.6.3 Peak output power at high frequency



Test specification:	Section 15.247(c), RSS-210 section A8.5, Emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 9:57:13 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks:			

8.7 Band edge emissions at RF antenna connector

8.7.1 General

This test was performed to measure band edge emissions at RF antenna connector. Specification test limits are given in Table 8.7.1.

Table 8.7.1 Band edge emission limits

Assigned frequency, MHz	Attenuation below carrier*, dBc
902.0 – 928.0	20.0
2400.0 – 2483.5	
5725.0 – 5850.0	

* - Band edge emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

8.7.2 Test procedure

8.7.2.1 The EUT was set up as shown in Figure 8.7.1, energized normally modulated at the maximum data rate with its hopping function disabled and its proper operation was checked.

8.7.2.2 The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.

8.7.2.3 The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set wider than 1 % of the frequency span.

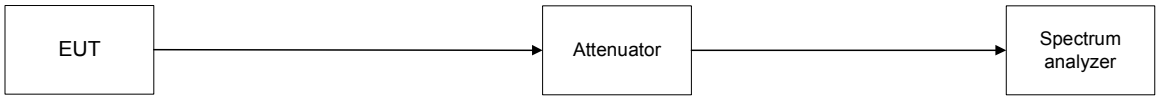
8.7.2.4 The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.

8.7.2.5 The maximum band edge emission and modulation product outside of the band were measured as provided in Table 8.7.2 and associated plots and referenced to the highest emission level measured within the authorized band.

8.7.2.6 The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the highest carrier frequency.

8.7.2.7 The above procedure was repeated with the frequency hopping function enabled.

Figure 8.7.1 Band edge emission test setup



Test specification:	**Section 15.247(c), RSS-210 section A8.5, Emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 9:57:13 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 8.7.2 Band edge emission test results

ASSIGNED FREQUENCY RANGE: 2400-2483.5MHz
DETECTOR USED: Peak
MODULATION: GFSK
MODULATING SIGNAL: PRBS
BIT RATE: 1 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
RESOLUTION BANDWIDTH: ≥ 1% of the span
VIDEO BANDWIDTH: ≥ RBW

Frequency, MHz	Band edge emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Frequency hopping disabled						
2399.98	-34.83	3.13	37.96	20	17.96	Pass
2484.11	-35.67		38.80		18.80	
Frequency hopping enabled						
2484.11	-36.50	3.30	39.80	20	19.80	Pass
2399.07	-40.33		43.63		23.63	

*- Margin = Attenuation below carrier – specification limit.

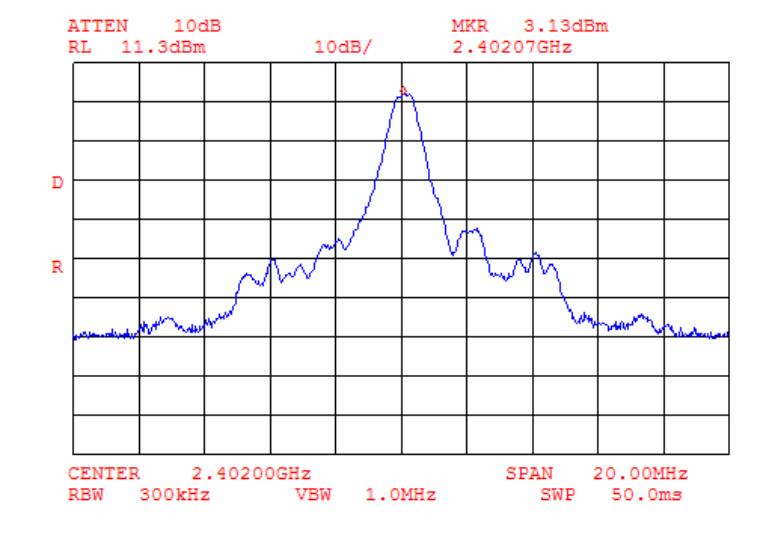
Reference numbers of test equipment used

HL 1424	HL 2524						

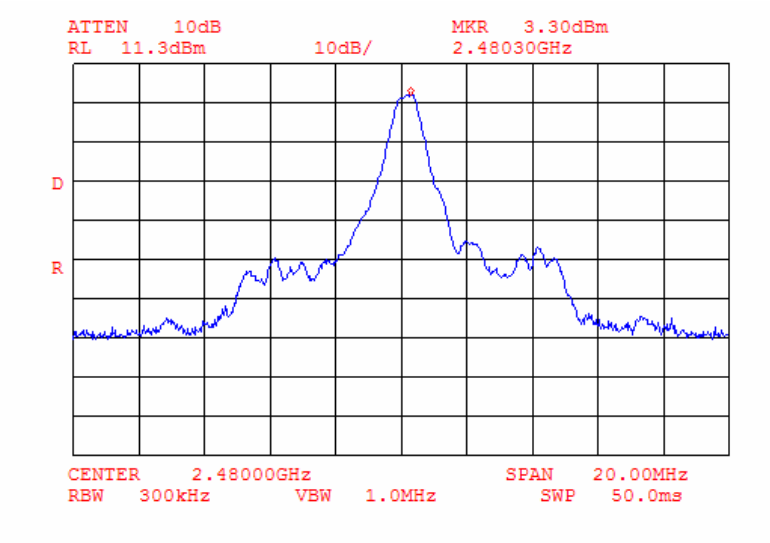
Full description is given in Appendix A.

Test specification:	**Section 15.247(c), RSS-210 section A8.5, Emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 9:57:13 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 8.7.1 The highest emission level within the assigned band at low carrier frequency

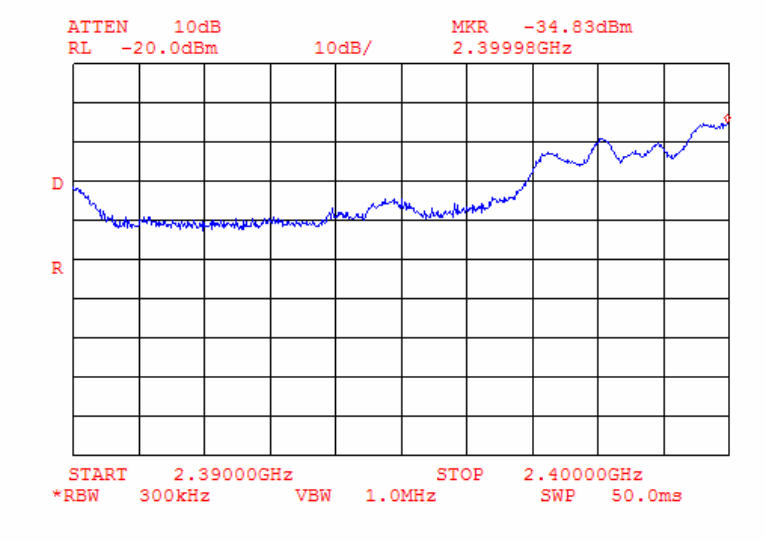


Plot 8.7.2 The highest emission level within the assigned band at high carrier frequency

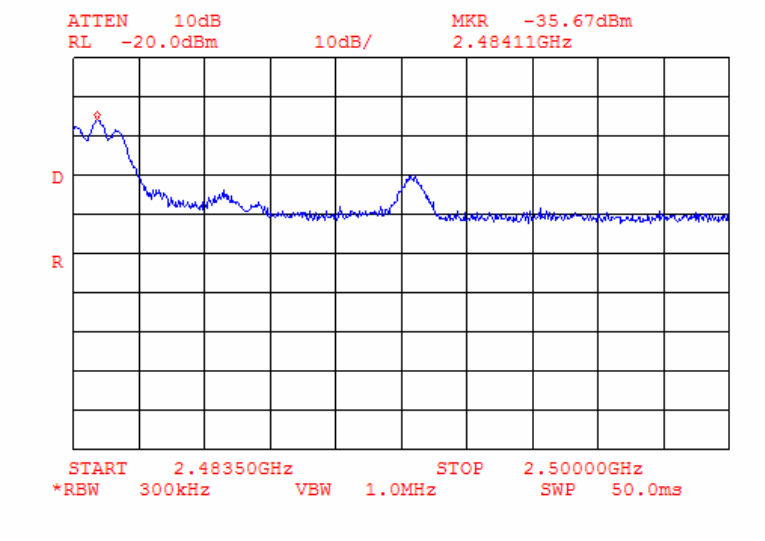


Test specification:	Section 15.247(c), RSS-210 section A8.5, Emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 9:57:13 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks:			

Plot 8.7.3 The highest band edge emission at low carrier frequency with hopping function disabled

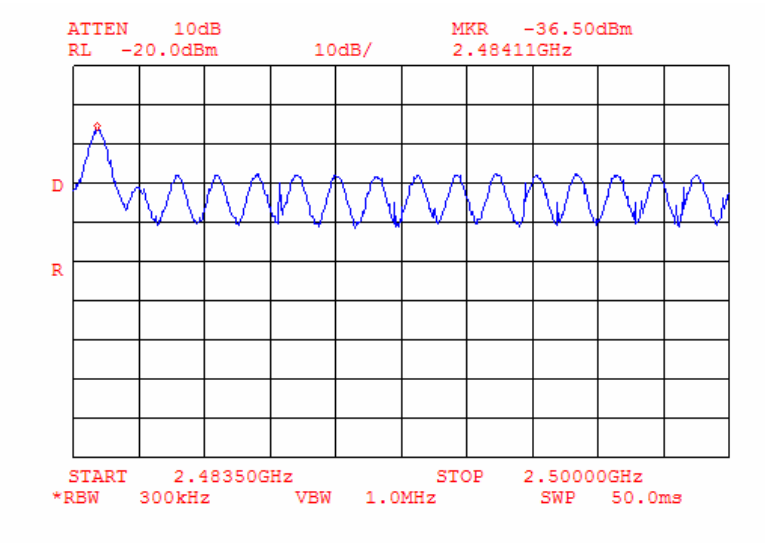


Plot 8.7.4 The highest band edge emission at high carrier frequency with hopping function disabled

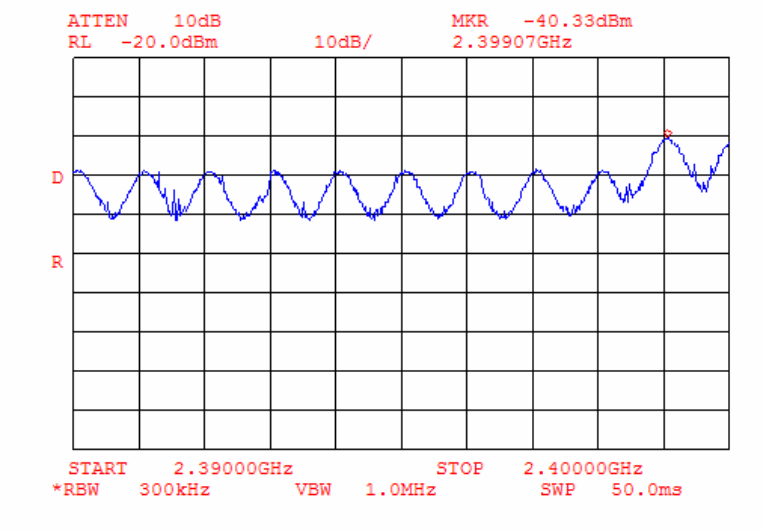


Test specification:	**Section 15.247(c), RSS-210 section A8.5, Emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 9:57:13 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 8.7.5 The higher band edge emissions with hopping function enabled



Plot 8.7.6 The lower band edge emission with hopping function enabled



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

8.8 Field strength of spurious emissions

8.8.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 8.8.1.

Table 8.8.1 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m within restricted bands, dB(µV/m)***			Attenuation of field strength of spurious versus carrier outside restricted bands, dBc***
	Peak	Quasi Peak	Average	
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**	20.0
0.090 – 0.110	NA	108.5 – 106.8**	NA	
0.110 – 0.490	126.8 – 113.8	NA	106.8 – 93.8**	
0.490 – 1.705	NA	73.8 – 63.0**	NA	
1.705 – 30.0*		69.5**		
30 – 88		40.0		
88 – 216		43.5		
216 – 960		46.0		
960 - 1000		54.0		
1000 – 10th harmonic	74.0	NA	54.0	

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$Lim_{S2} = Lim_{S1} + 40 \log (S_1/S_2),$$

where S_1 and S_2 – standard defined and test distance respectively in meters.
**- The limit decreases linearly with the logarithm of frequency.
*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

8.8.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

8.8.2.1 The EUT was set up as shown in Figure 8.8.1, energized and the performance check was conducted.

8.8.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

8.8.2.3 The measurements were performed in 3 orthogonal positions of the EUT. The worst test results (the lowest margins) were recorded and shown in the associated plots.

8.8.3 Test procedure for spurious emission field strength measurements above 30 MHz

8.8.3.1 The EUT was set up as shown in Figure 8.8.2, energized and the performance check was conducted.

8.8.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

8.8.3.3 The measurements were performed in 3 orthogonal positions of the EUT. The worst test results (the lowest margins) were recorded and shown in the associated plots.

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Figure 8.8.1 Setup for spurious emission field strength measurements below 30 MHz

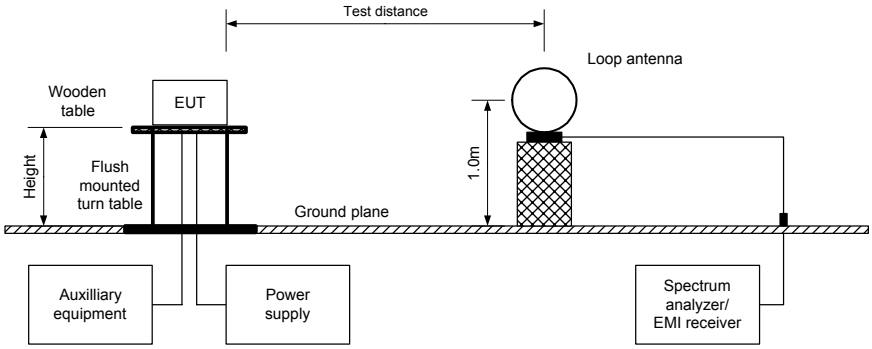
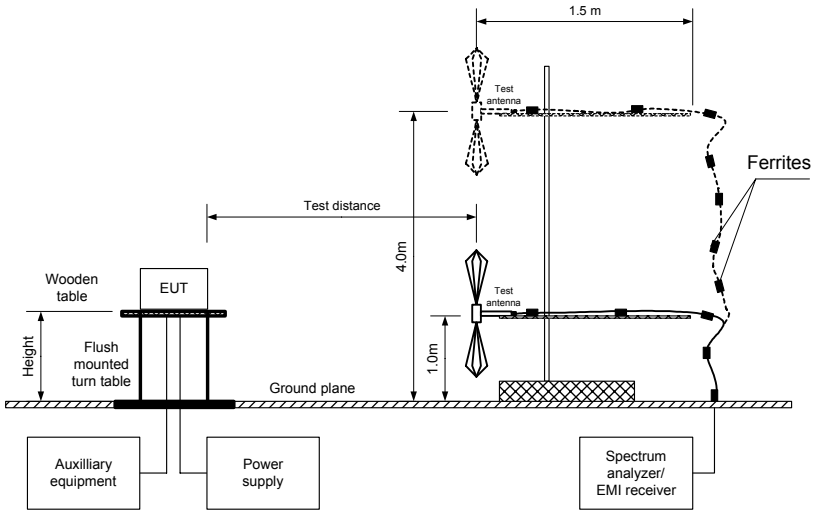


Figure 8.8.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Table 8.8.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY:	2400 – 2483.5 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 - 25000 MHz
TEST DISTANCE:	3 m
MODULATION:	FSK
MODULATING SIGNAL:	PRBS
BIT RATE:	1.0 Mbps
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)
FREQUENCY HOPPING:	Disabled

Frequency, MHz	Field strength of spurious, dB(µV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(µV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB	Verdict
No spurious emissions were found									Pass

*- EUT front panel refers to 0 degrees position of turntable.
**- Margin = Attenuation below carrier – specification limit.

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Table 8.8.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY:	2400 – 2483.5 MHz
INVESTIGATED FREQUENCY RANGE:	1 - 25000 MHz
TEST DISTANCE:	3 m
MODULATION:	FSK
MODULATING SIGNAL:	PRBS
BIT RATE:	1.0 Mbps
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	1000 kHz
TEST ANTENNA TYPE:	Double ridged guide
FREQUENCY HOPPING:	Disabled

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
Low carrier frequency											
2137.30	V	1.0	100	47.16	74.00	-26.84	31.40	31.40	54.00	-22.60	Pass
2484.04	V	1.1	288	57.90	74.00	-16.10	38.64	38.64	54.00	-15.36	
Mid carrier frequency											
No spurious emissions were found											Pass
High carrier frequency											
No spurious emissions were found											Pass

*- EUT front panel refers to 0 degrees position of turntable.
**- Margin = Measured field strength - specification limit.
***- Margin = Calculated field strength - specification limit,
where Calculated field strength = Measured field strength + average factor.

Table 8.8.4 Average factor calculation

Transmission pulse		Average factor, dB
Duration, ms	Period, ms	
91.8%		0

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Table 8.8.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY:	2400 – 2483.5 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 1000 MHz
TEST DISTANCE:	3 m
MODULATION:	FSK
MODULATING SIGNAL:	PRBS
BIT RATE:	1.0 Mbps
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
RESOLUTION BANDWIDTH:	0.2 kHz (9 kHz – 150 kHz) 9.0 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH:	> Resolution bandwidth
FREQUENCY HOPPING:	Disabled

Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
Low carrier frequency								
No spurious emissions were found								Pass
Mid carrier frequency								
No spurious emissions were found								Pass
High carrier frequency								
No spurious emissions were found								Pass

*- Margin = Measured emission - specification limit.
**- EUT front panel refer to 0 degrees position of turntable.

Table 8.8.6 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2655 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 – 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 – 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	

Reference numbers of test equipment used

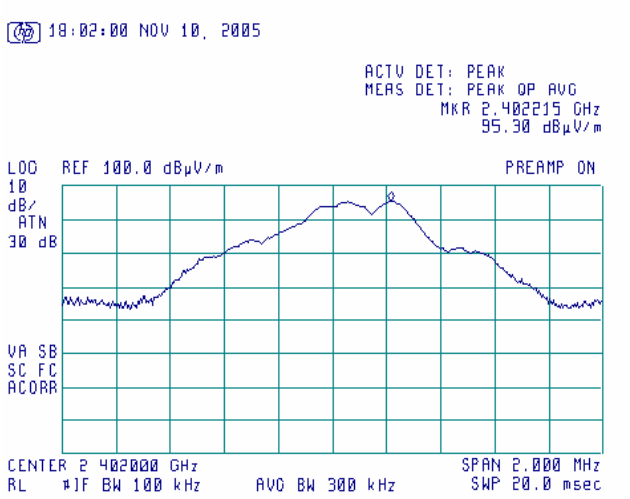
HL 0410	HL 0521	HL 0589	HL 0592	HL 0593	HL 0594	HL 0604	HL 0768
HL 1200	HL 1424	HL 1942	HL 1947	HL 1984	HL 2009	HL 2259	HL 2260
HL 2399							

Full description is given in Appendix A.

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

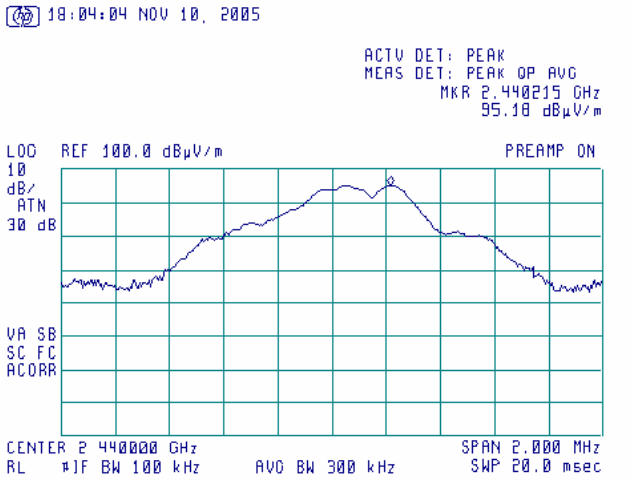
Plot 8.8.1 Radiated emission measurements at the low carrier frequency

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Plot 8.8.2 Radiated emission measurements at the mid carrier frequency

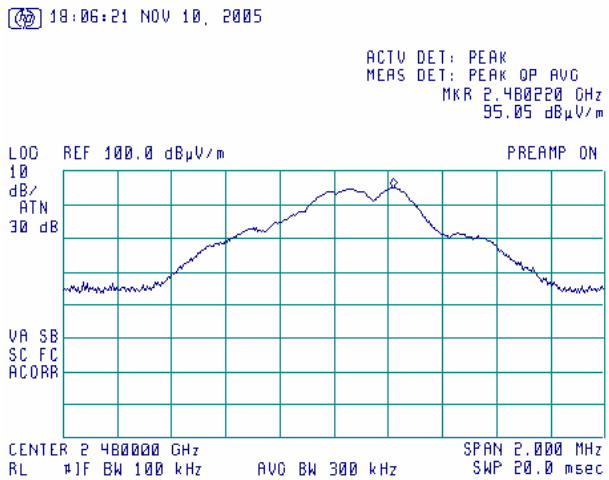
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

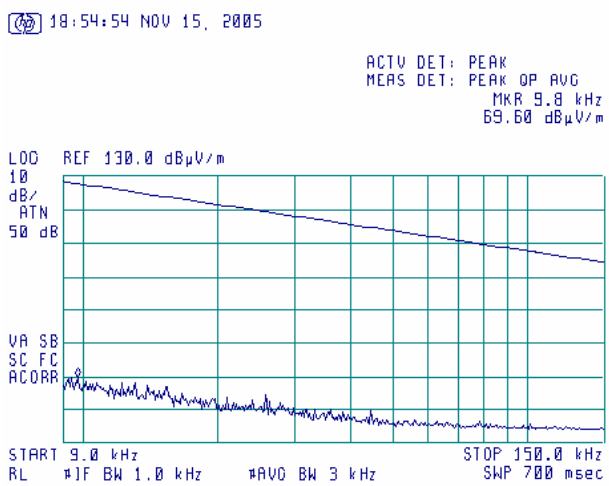
Plot 8.8.3 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Plot 8.8.4 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency (BT+G20-850)

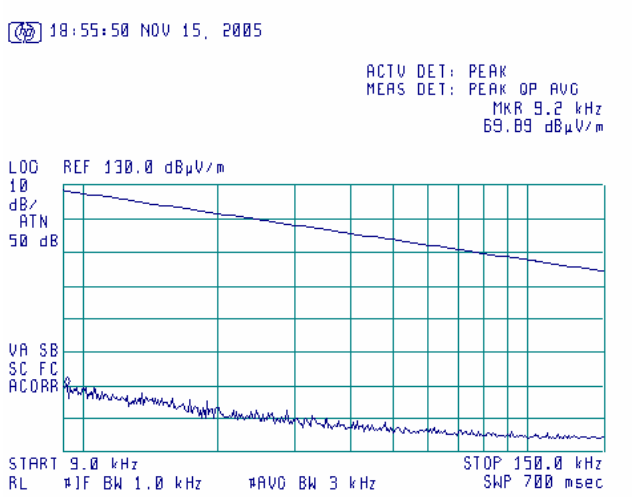
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

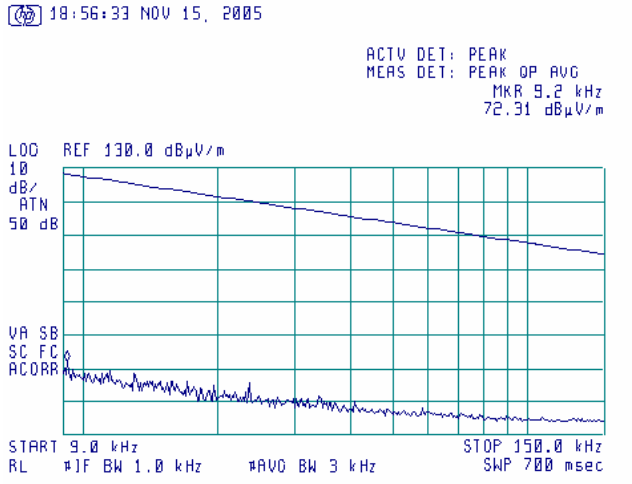
Plot 8.8.5 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency (BT+G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 8.8.6 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency (BT+G20-850)

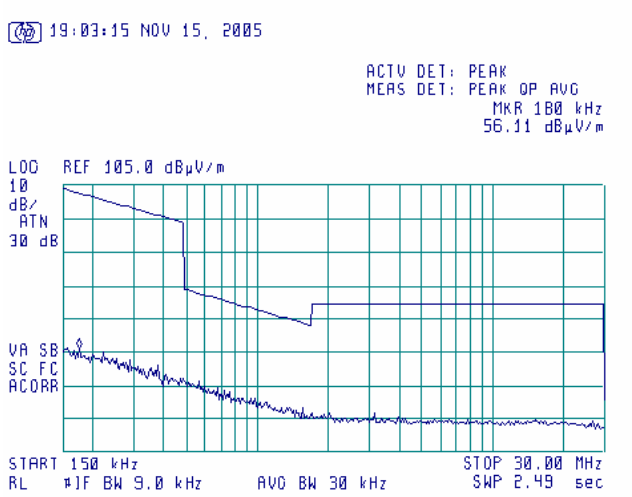
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

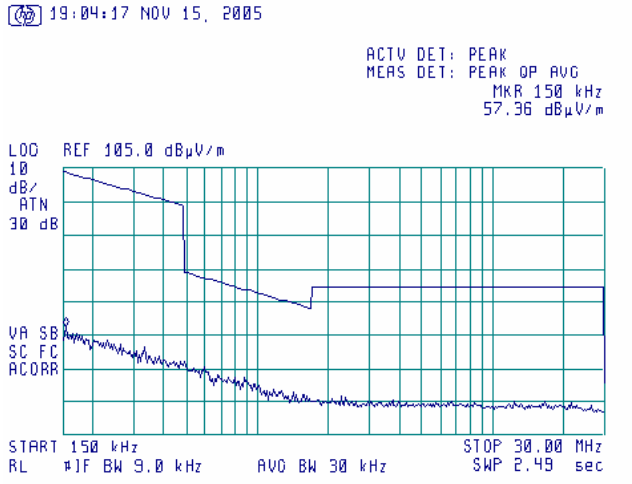
Plot 8.8.7 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency (BT+G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 8.8.8 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency (BT+G20-850)

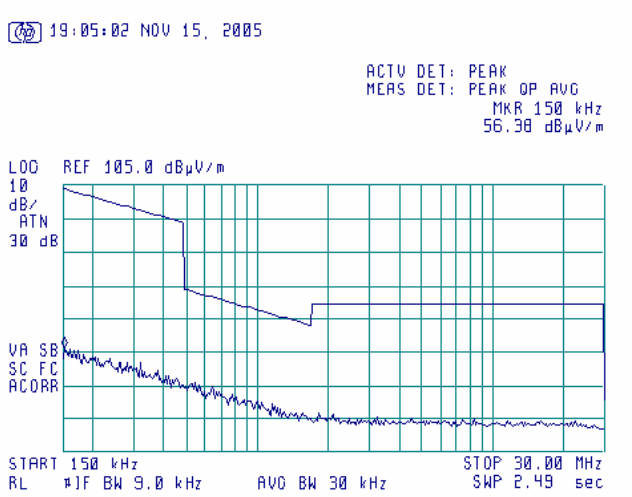
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

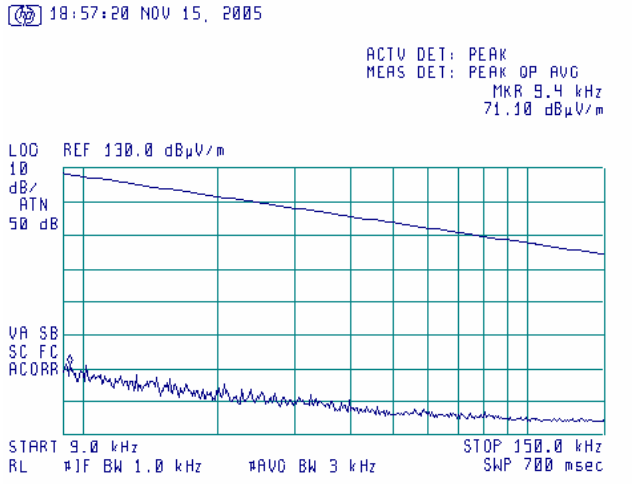
Plot 8.8.9 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency (BT+G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 8.8.10 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency (BT+G20-1900)

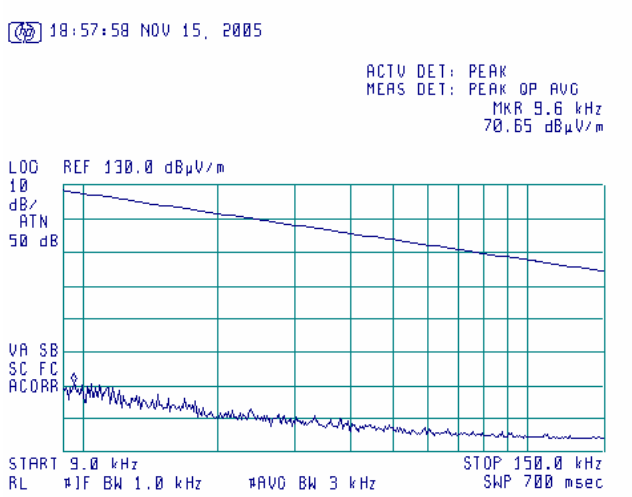
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

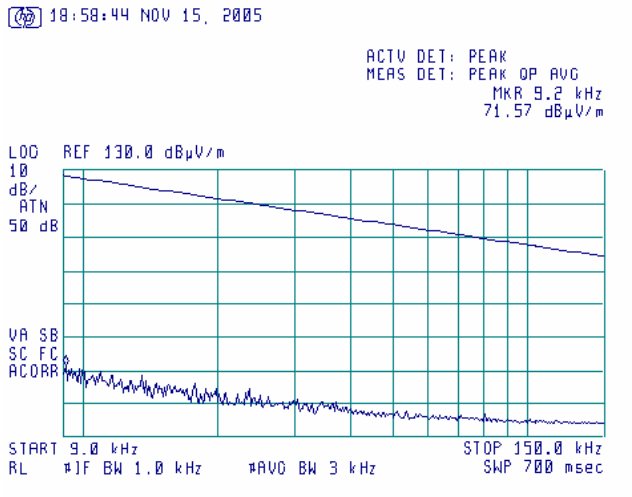
Plot 8.8.11 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency (BT+G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 8.8.12 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency (BT+G20-1900)

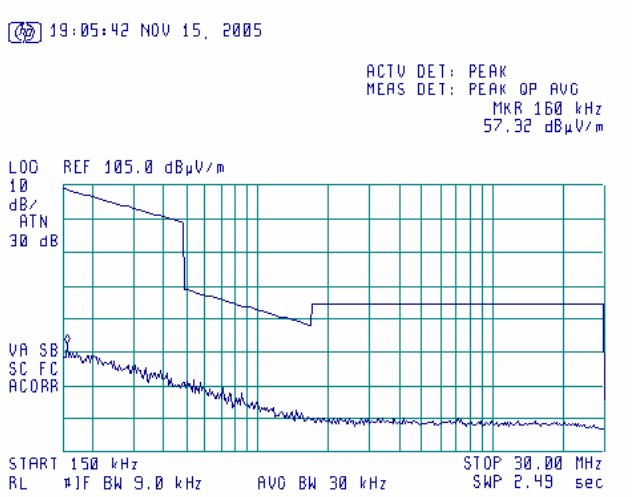
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

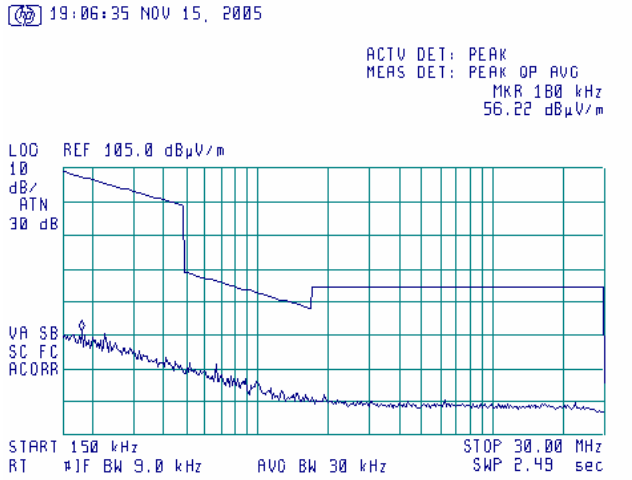
Plot 8.8.13 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency (BT+G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 8.8.14 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency (BT+G20-1900)

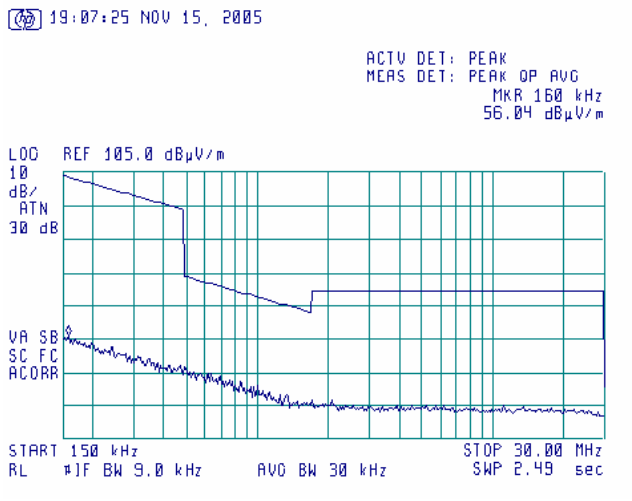
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

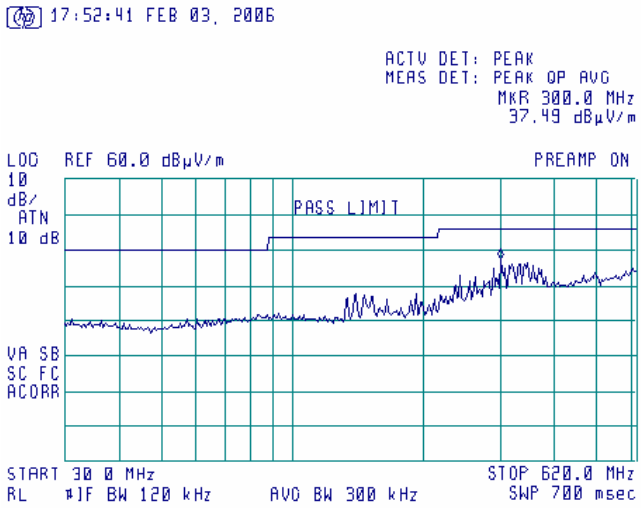
Plot 8.8.15 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency (BT+G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 8.8.16 Radiated emission measurements from 30 to 620 MHz at the low carrier frequency (BT+G20-850)

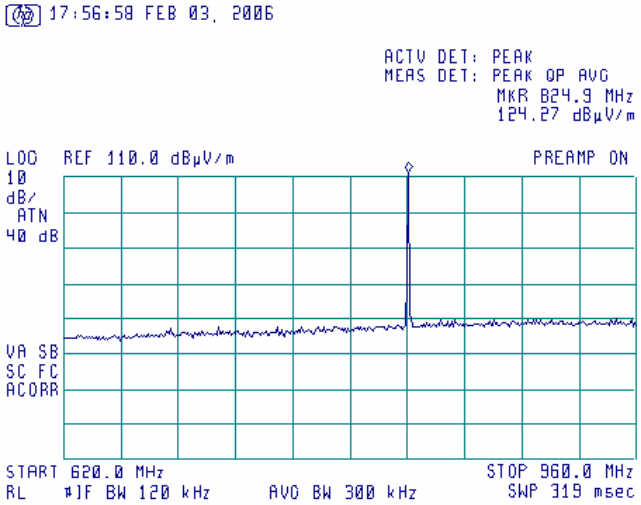
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

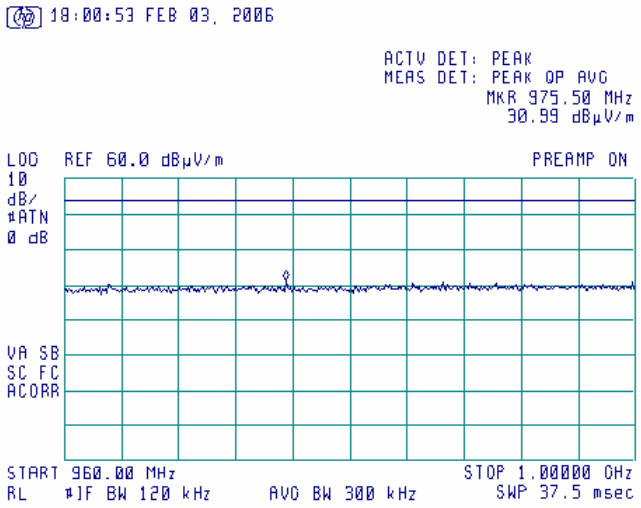
Plot 8.8.17 Radiated emission measurements from 620 to 960 MHz at the low carrier frequency (BT+G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.18 Radiated emission measurements from 960 to 1000 MHz at the low carrier frequency (BT+G20-850)

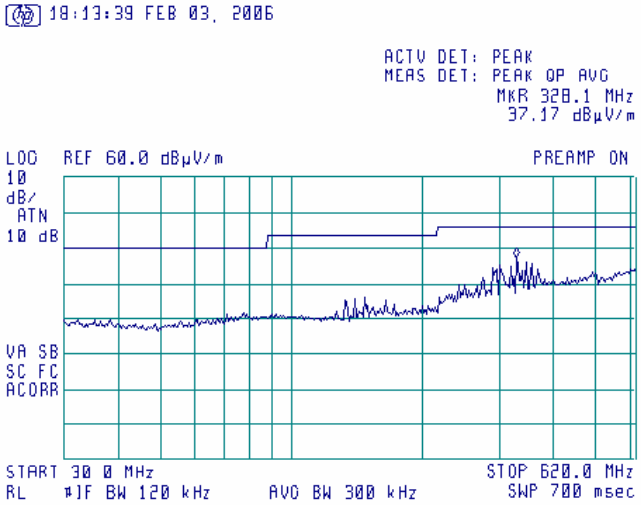
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

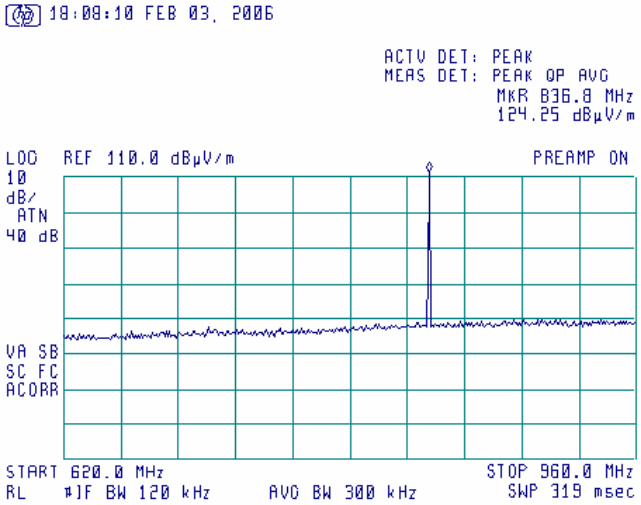
Plot 8.8.19 Radiated emission measurements from 30 to 620 MHz at the mid carrier frequency (BT+G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.20 Radiated emission measurements from 620 to 960 MHz at the mid carrier frequency (BT+G20-850)

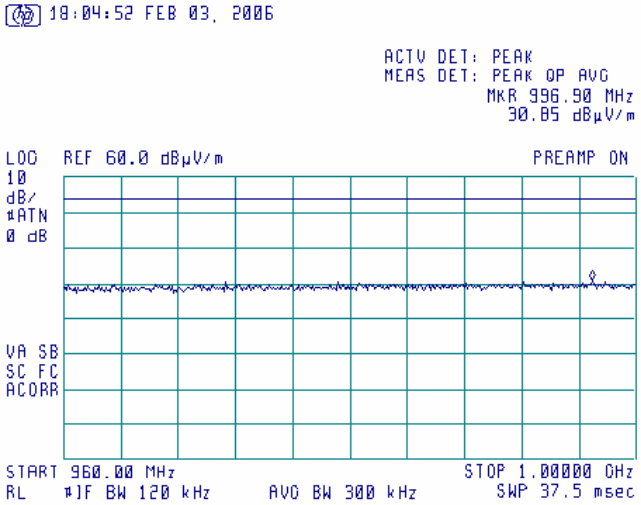
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

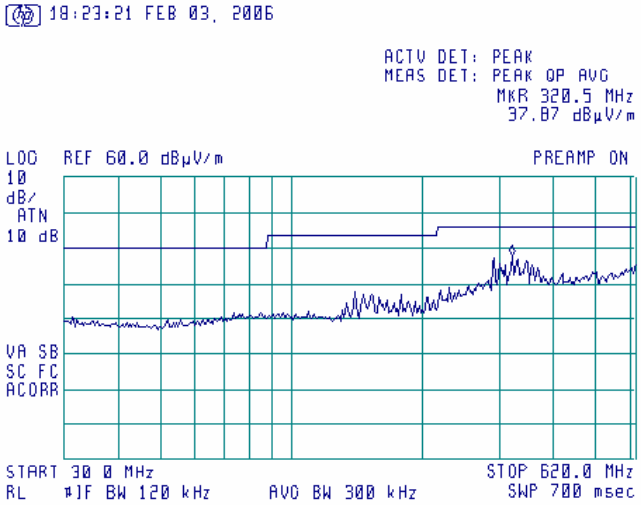
Plot 8.8.21 Radiated emission measurements from 960 to 1000 MHz at the mid carrier frequency (BT+G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.22 Radiated emission measurements from 30 to 620 MHz at the high carrier frequency (BT+G20-850)

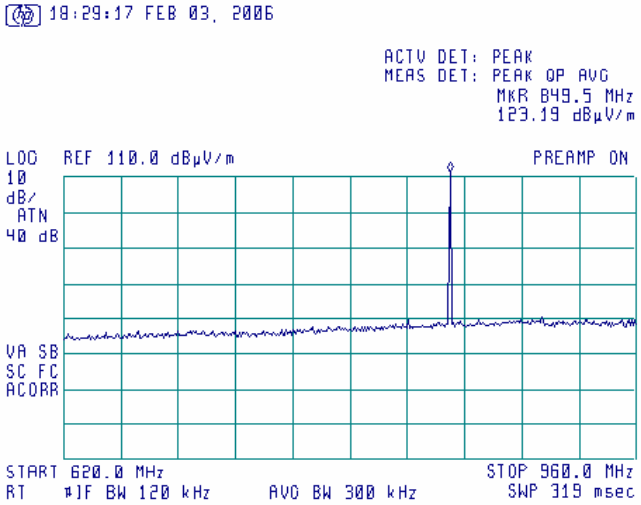
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

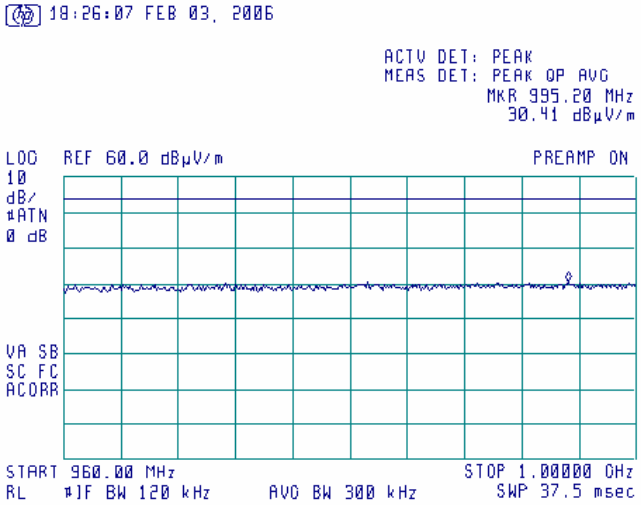
Plot 8.8.23 Radiated emission measurements from 620 to 960 MHz at the high carrier frequency (BT+G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.24 Radiated emission measurements from 960 to 1000 MHz at the high carrier frequency (BT+G20-850)

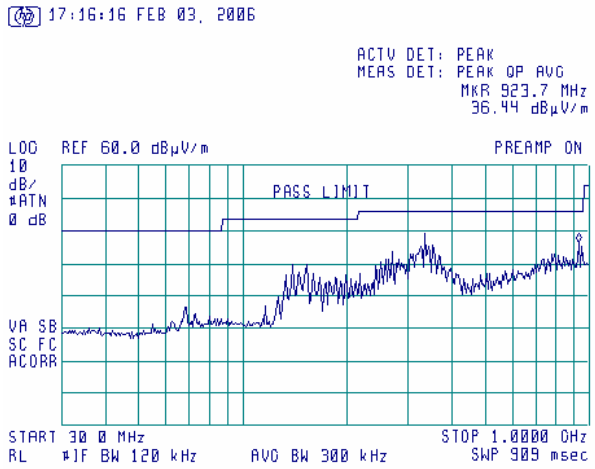
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.25 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency (BT+G20-1900)

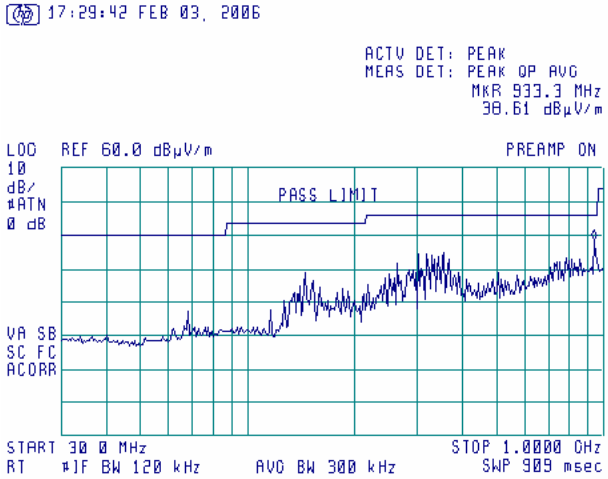
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



925.1 = 1850.2 / 2 – not restricted band, not digital part

Plot 8.8.26 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency (BT+G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

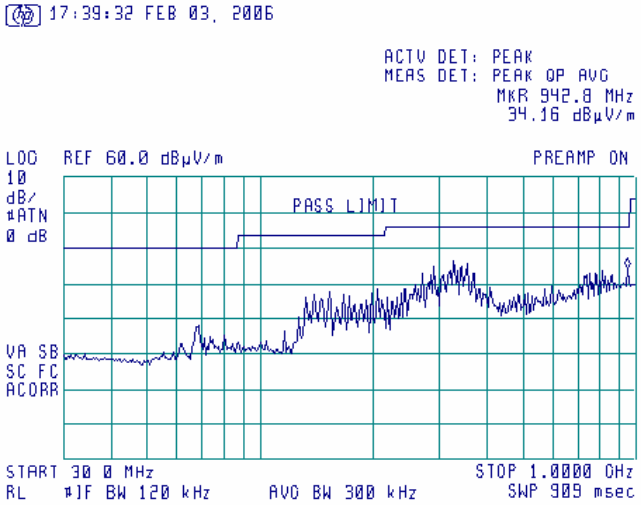


940 = 1880 / 2 – not restricted band, not digital part

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.27 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency (BT+G20-1900)

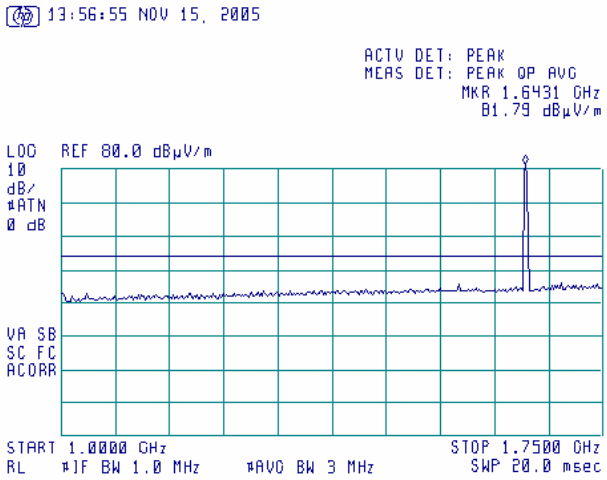
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



954.9 = 1909.8 / 2 - not restricted band, not digital part

Plot 8.8.28 Radiated emission measurements from 1000 to 1750 MHz at the low carrier frequency (BT and G20-850)

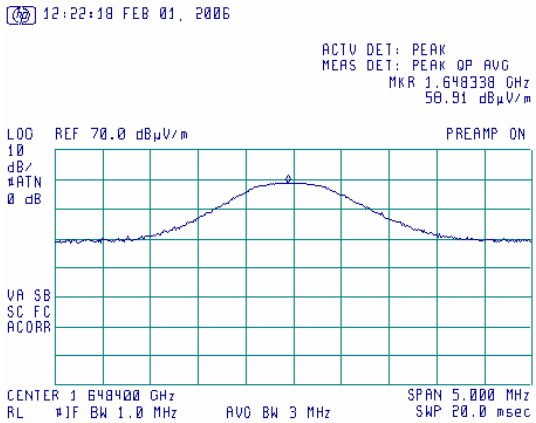
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.29 Radiated emission measurements at 1648 MHz at the low carrier frequency (BT and G20-850)

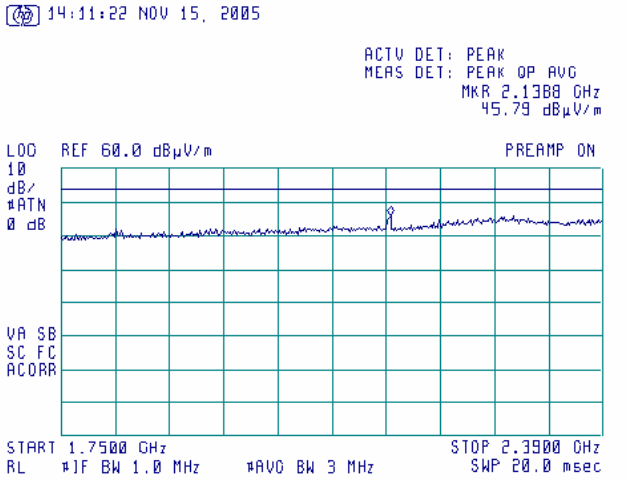
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



1648 MHz – 2-nd harmonic of G20-850 low carrier frequency (824.2 MHz) limit 84.4 dBµV/m

Plot 8.8.30 Radiated emission measurements from 1750 to 2390 MHz at the low carrier frequency (BT and G20-850)

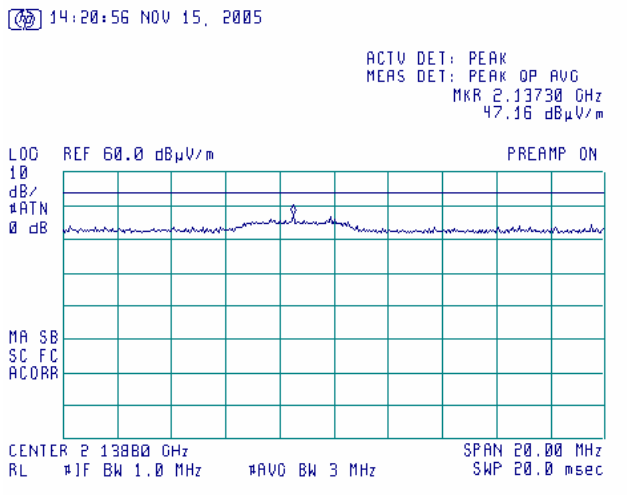
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

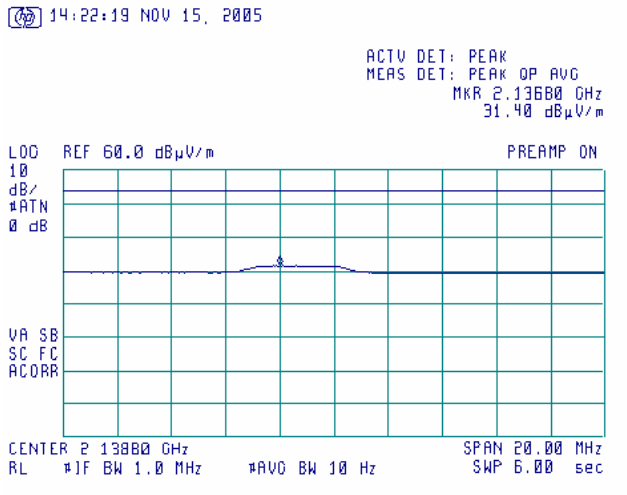
Plot 8.8.31 Radiated emission measurements at 2137 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.32 Radiated emission measurements at 2137 MHz at the low carrier frequency (BT and G20-850)

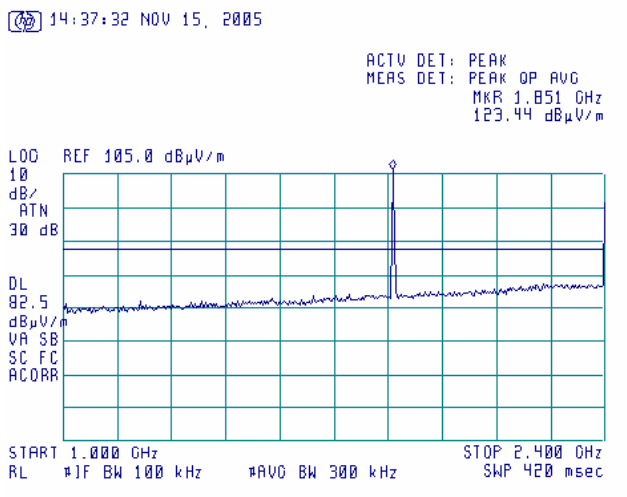
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.33 Radiated emission measurements from 1000 to 2400 MHz at the low carrier frequency (BT and G20-1900)

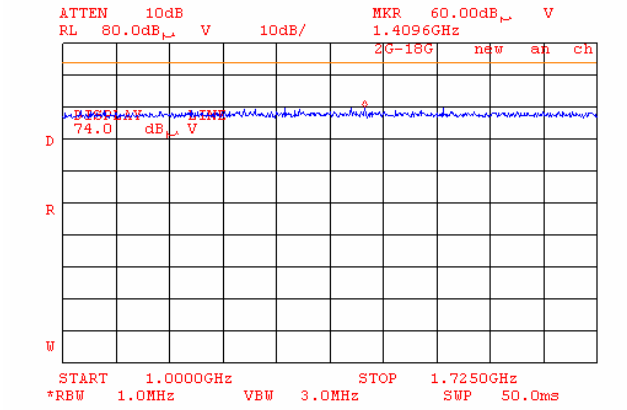
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Intended emission of GPRS module

Plot 8.8.34 Radiated emission measurements from 1000 to 1725 MHz at the low carrier frequency (BT and G20-1900)

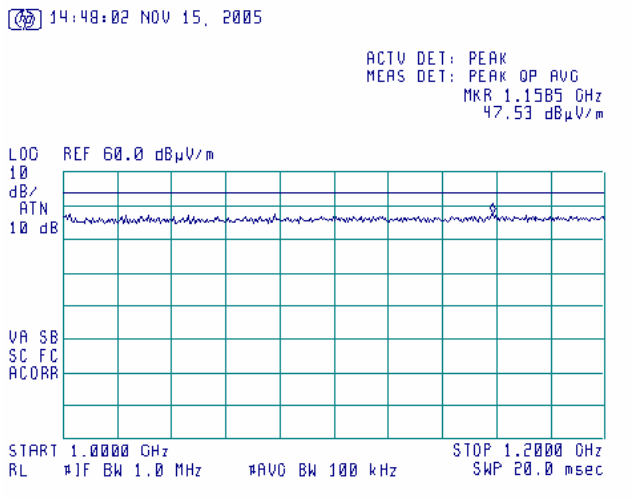
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

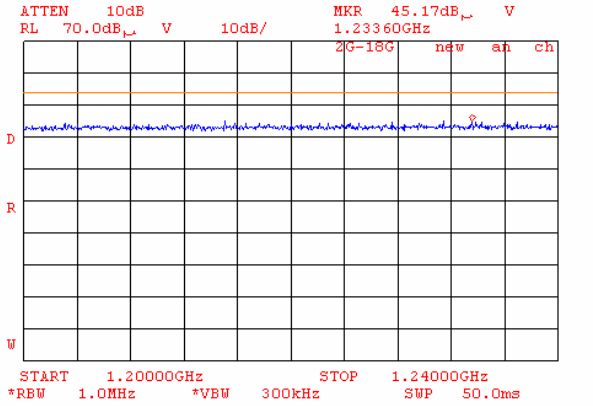
Plot 8.8.35 Radiated emission measurements from 1000 to 1240 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.36 Radiated emission measurements from 1200 to 1240 MHz at the low carrier frequency (BT and G20-1900)

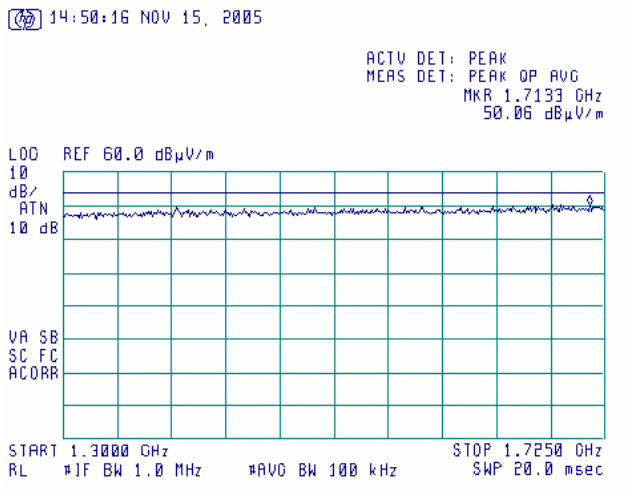
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

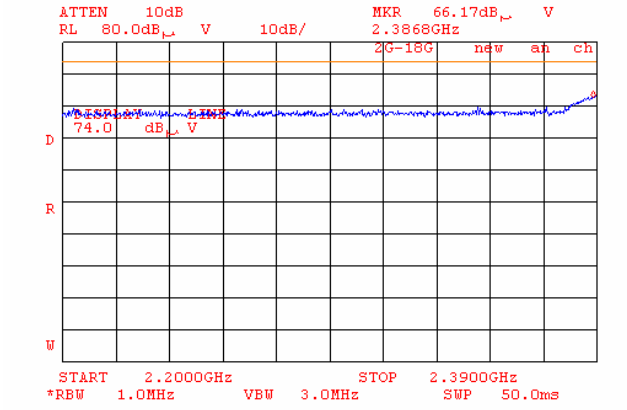
Plot 8.8.37 Radiated emission measurements from 1300 to 1725 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.38 Radiated emission measurements from 2200 to 2390 MHz at the low carrier frequency (BT and G20-1900)

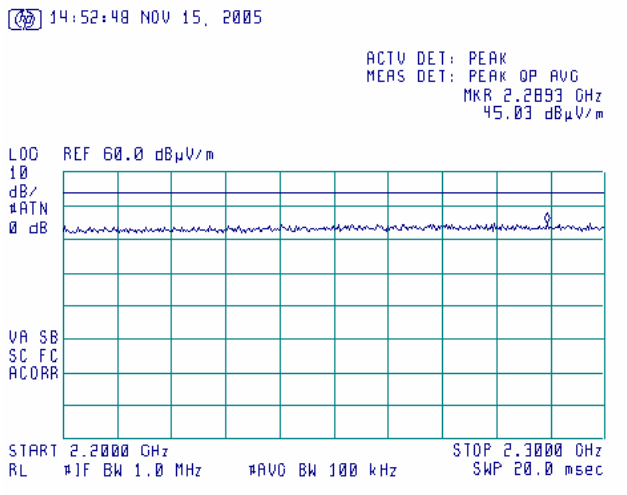
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

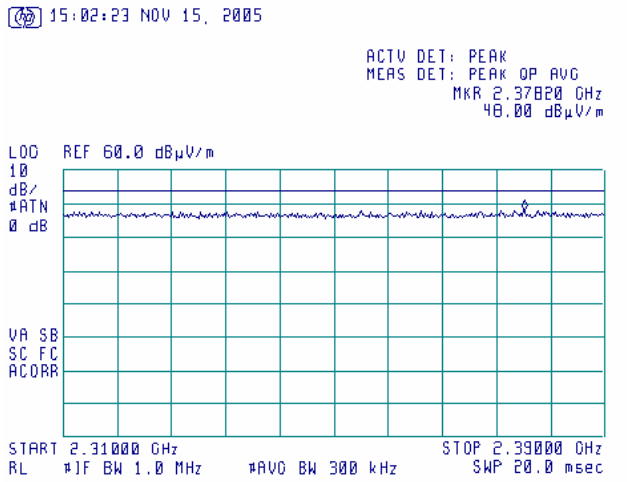
Plot 8.8.39 Radiated emission measurements from 2200 to 2300 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.40 Radiated emission measurements from 2310 to 2390 MHz at the low carrier frequency (BT and G20-1900)

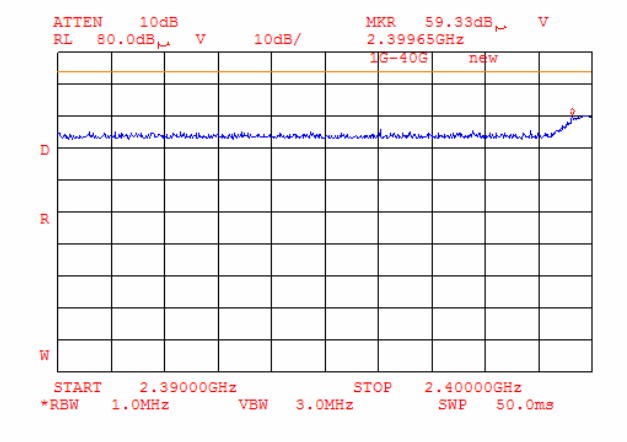
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

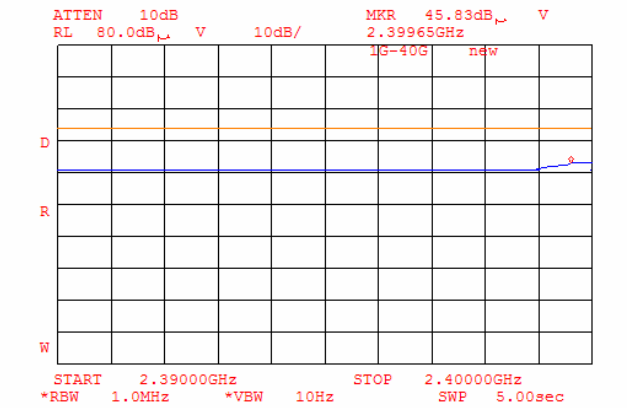
Plot 8.8.41 Radiated emission measurements from 2390 to 2400 MHz at the low carrier frequency (BT and G20-1900 / BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.42 Radiated emission measurements from 2390 to 2400 MHz at the low carrier frequency (BT and G20-1900 / BT and G20-850)

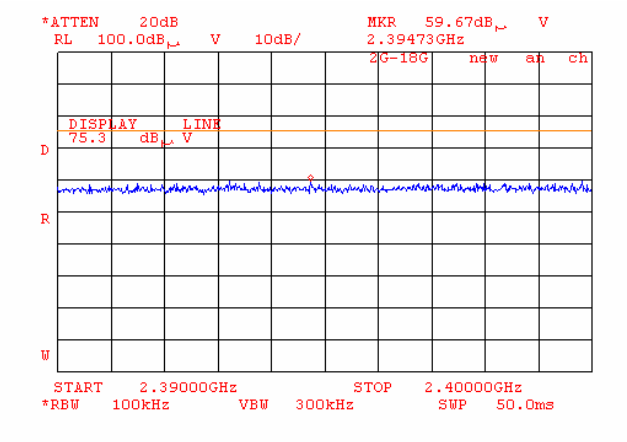
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

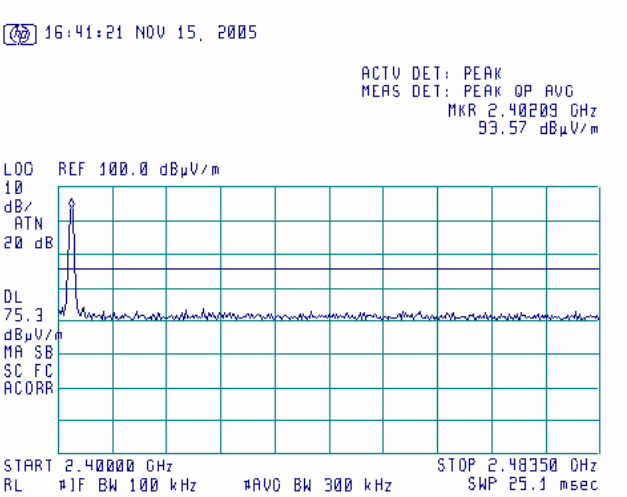
Plot 8.8.43 Radiated emission measurements from 2390 to 2400 MHz at the low carrier frequency (BT and G20-1900 / BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.44 Radiated emission measurements from 2400 to 2483.5 MHz at the low carrier frequency (BT and G20-1900 / BT and G20-850)

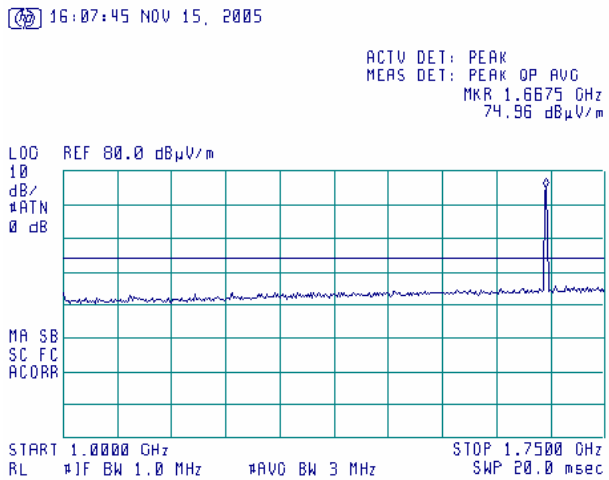
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

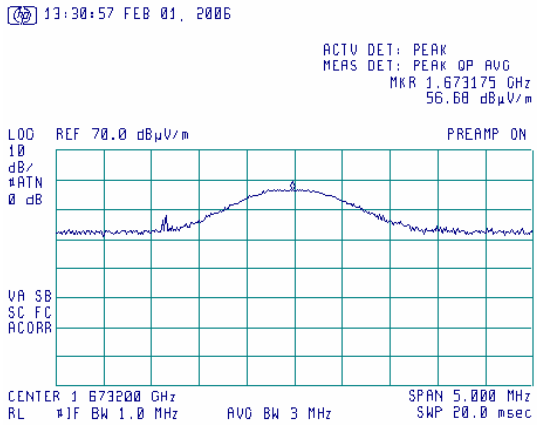
Plot 8.8.45 Radiated emission measurements from 1000 to 1750 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.46 Radiated emission measurements at 1673 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

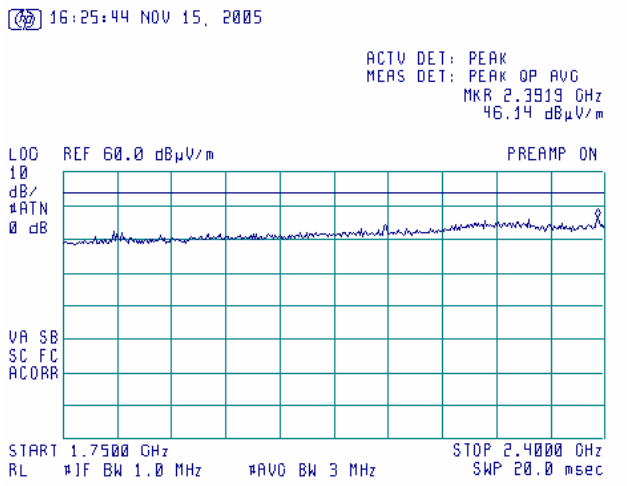


1673 MHz – 2-nd harmonic of G20-850 mid carrier frequency (836.6 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

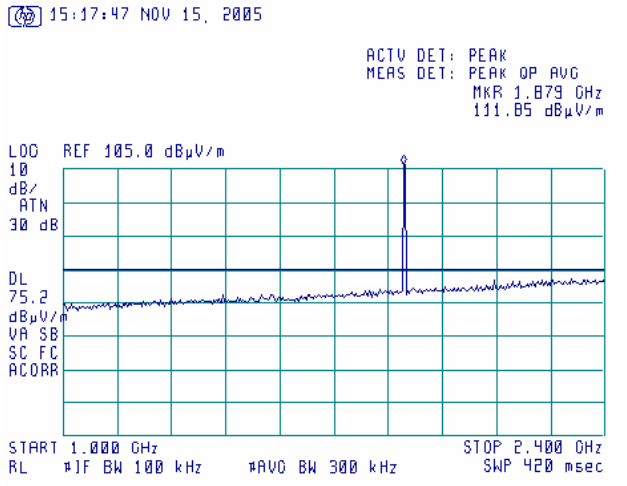
Plot 8.8.47 Radiated emission measurements from 1750 to 2400 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.48 Radiated emission measurements from 1000 to 2400 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

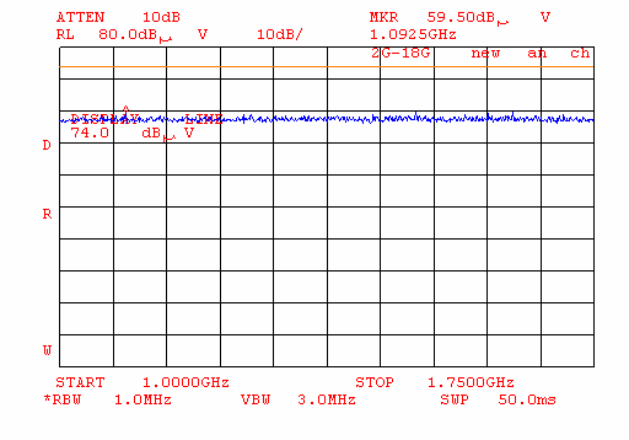


Intended emission of GPRS module

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

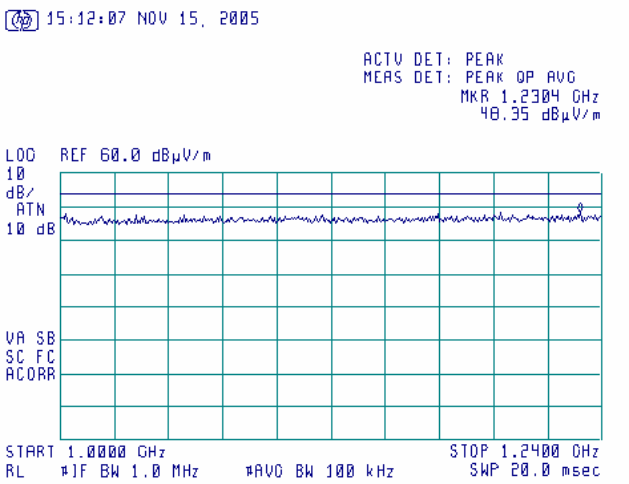
Plot 8.8.49 Radiated emission measurements from 1000 to 1750 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.50 Radiated emission measurements from 1000 to 1240 MHz at the mid carrier frequency (BT and G20-1900)

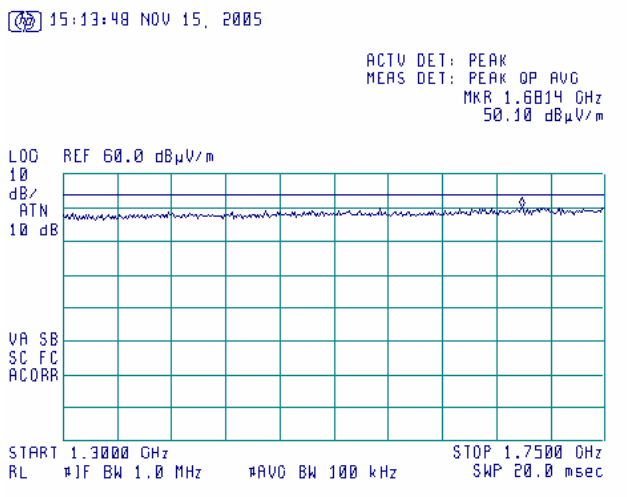
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

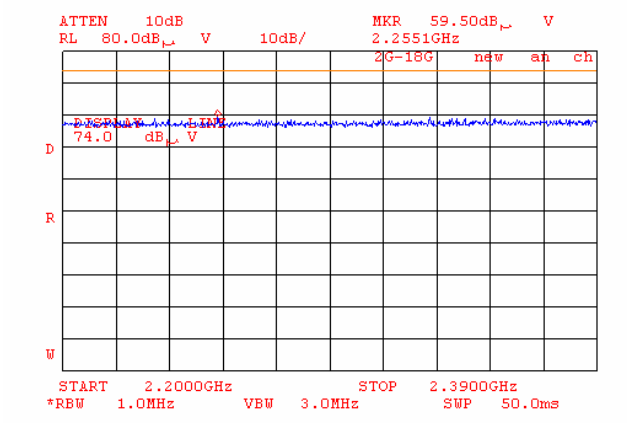
Plot 8.8.51 Radiated emission measurements from 1300 to 1750 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.52 Radiated emission measurements from 2200 to 2390 MHz at the mid carrier frequency (BT and G20-1900)

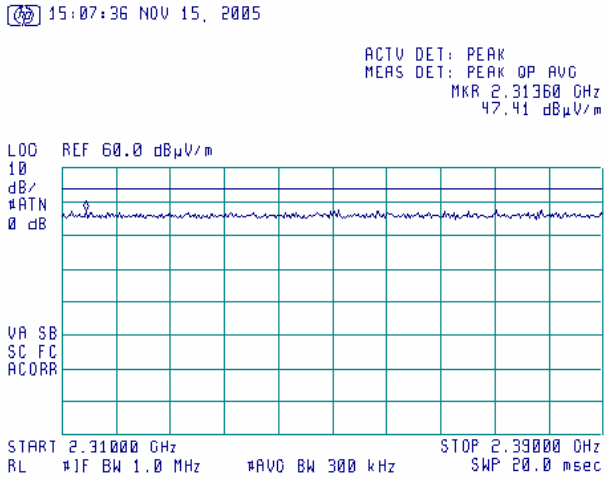
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

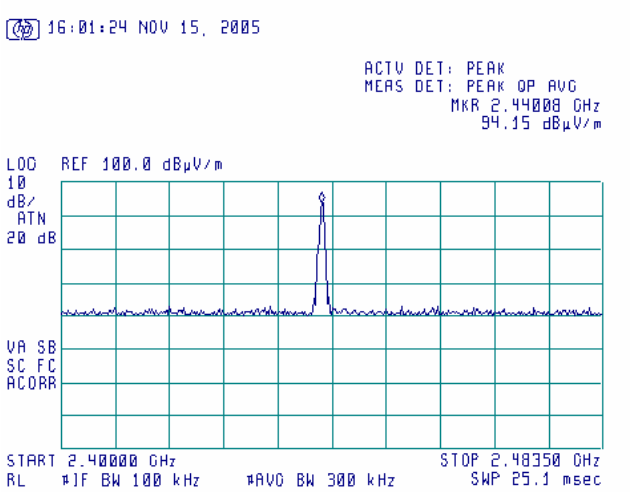
Plot 8.8.53 Radiated emission measurements from 2200 to 2390 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.54 Radiated emission measurements from 2400 to 2483.5 MHz at the mid carrier frequency (BT and G20-1900 / BT and G20-850)

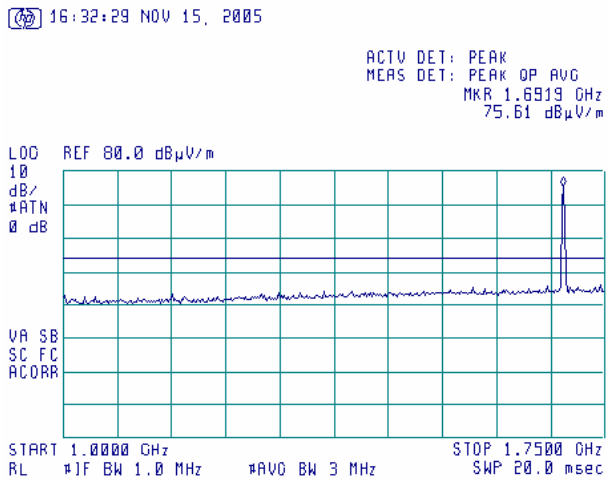
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

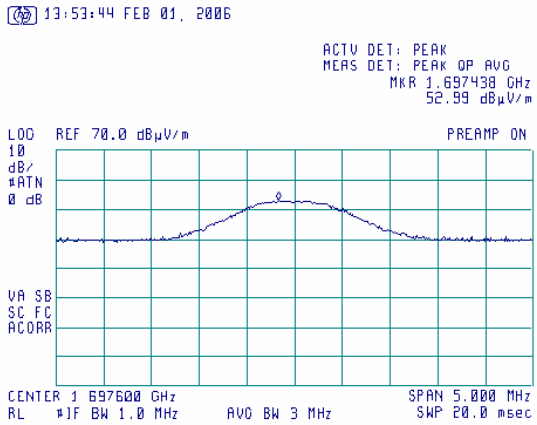
Plot 8.8.55 Radiated emission measurements from 1000 to 1750 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.56 Radiated emission measurements at 1697 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

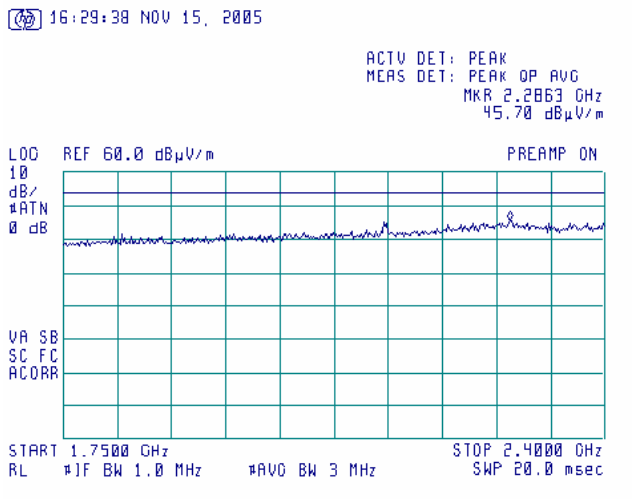


1697 MHz – 2-nd harmonic of G20-850 high carrier frequency (848.8 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

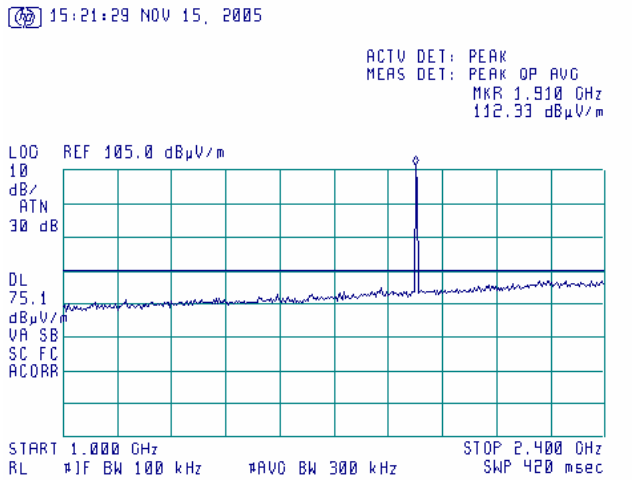
Plot 8.8.57 Radiated emission measurements from 1750 to 2400 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.58 Radiated emission measurements from 1000 to 2400 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

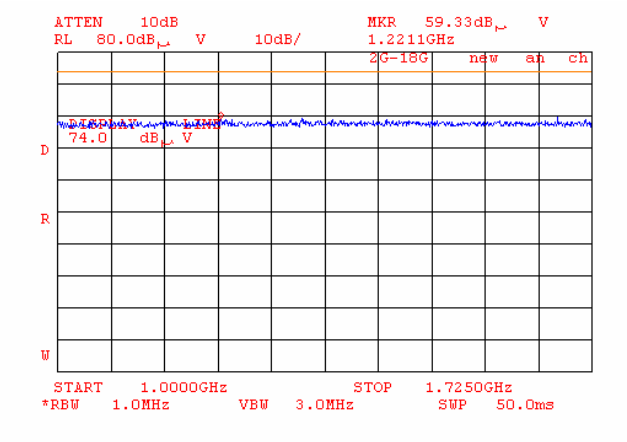


Intended emission of GPRS module

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

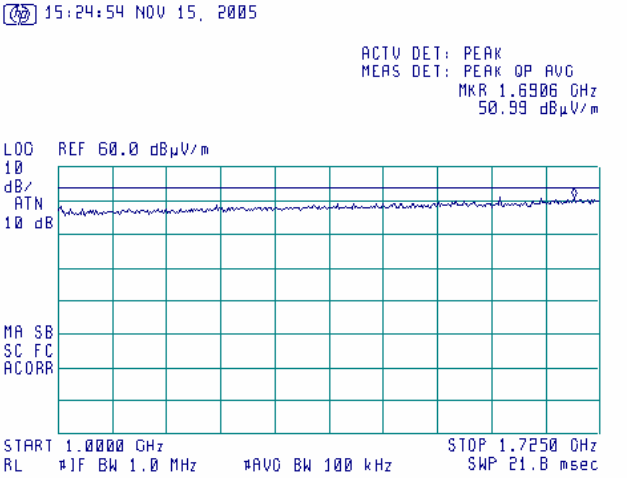
Plot 8.8.59 Radiated emission measurements from 1000 to 1725 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.60 Radiated emission measurements from 1000 to 1725 MHz at the high carrier frequency (BT and G20-1900)

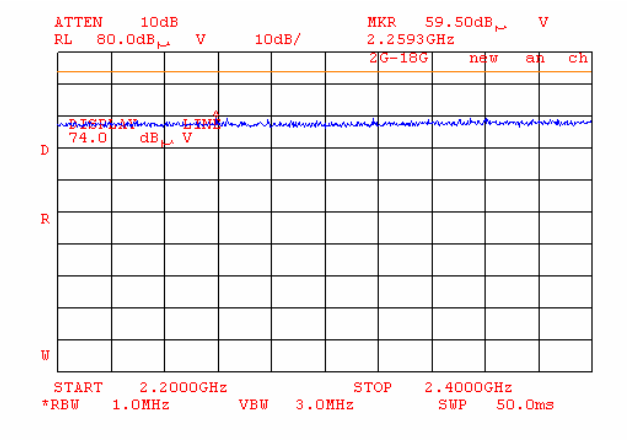
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

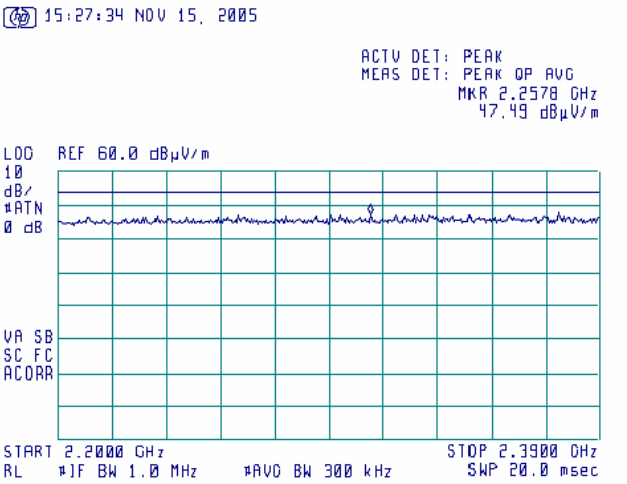
Plot 8.8.61 Radiated emission measurements from 2200 to 2400 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.62 Radiated emission measurements from 2200 to 2390 MHz at the high carrier frequency (BT and G20-1900)

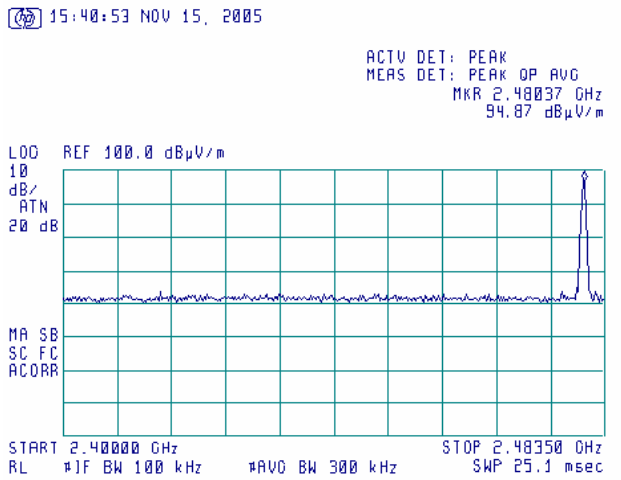
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

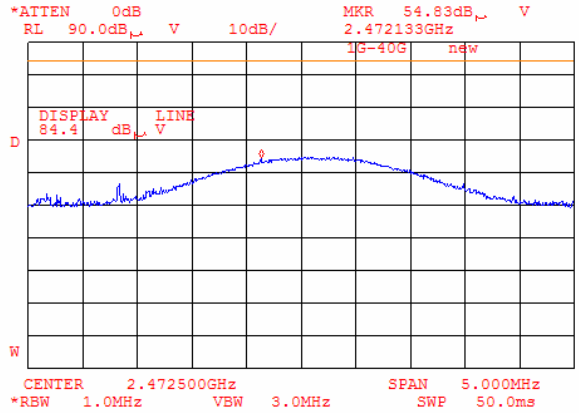
Plot 8.8.63 Radiated emission measurements from 2400 to 2483.5 MHz at the high carrier frequency (BT and G20-1900 / BT and G20-850)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.64 Radiated emission measurements at 2472 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

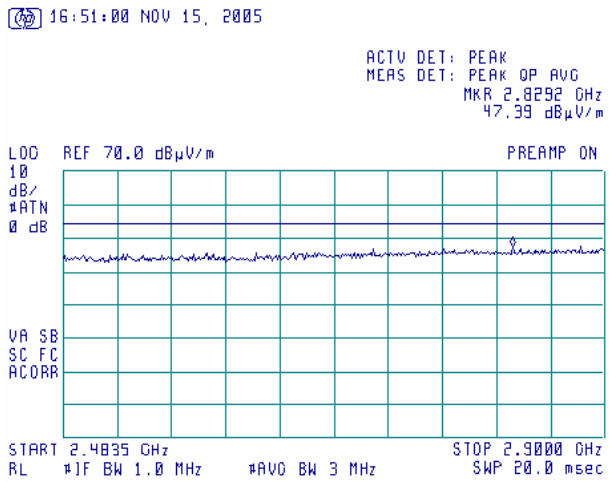


2472.6 MHz – 3-rd harmonic of G20-850 low carrier frequency (824.2 MHz) limit 84.4 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.65 Radiated emission measurements from 2483.5 to 2900 MHz at the low carrier frequency (BT and G20-850)

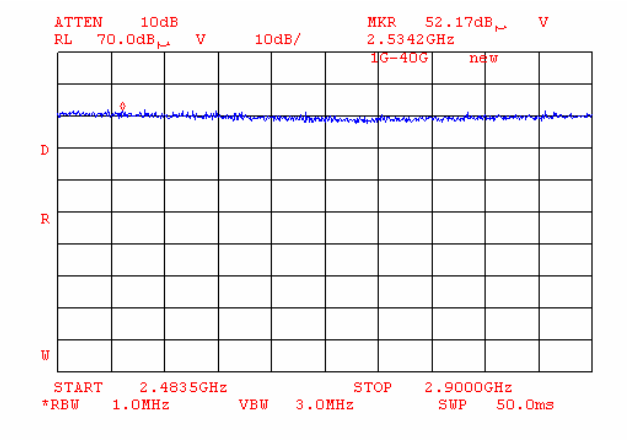
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

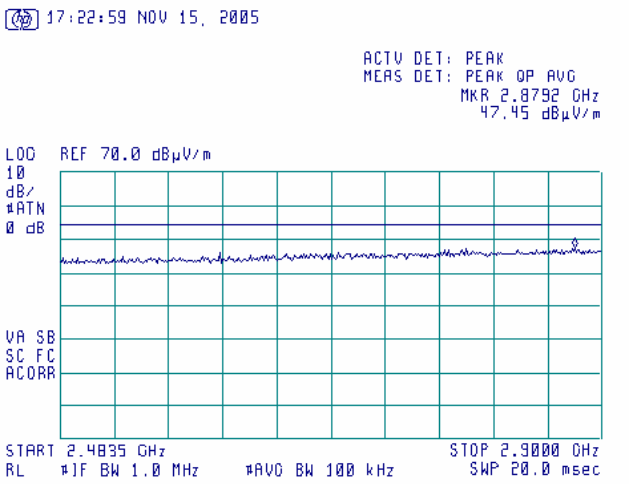
Plot 8.8.66 Radiated emission measurements from 2483.5 to 2900 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.67 Radiated emission measurements from 2483.5 to 2900 MHz at the low carrier frequency (BT and G20-1900)

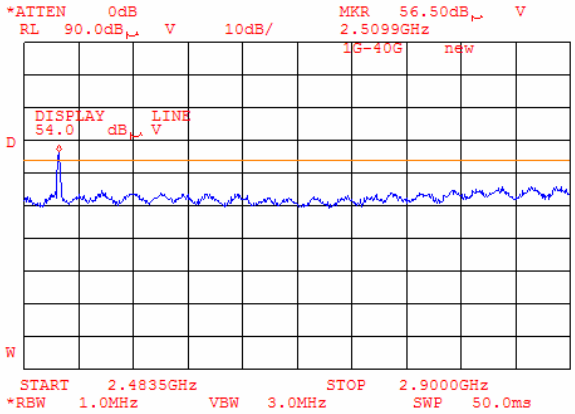
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

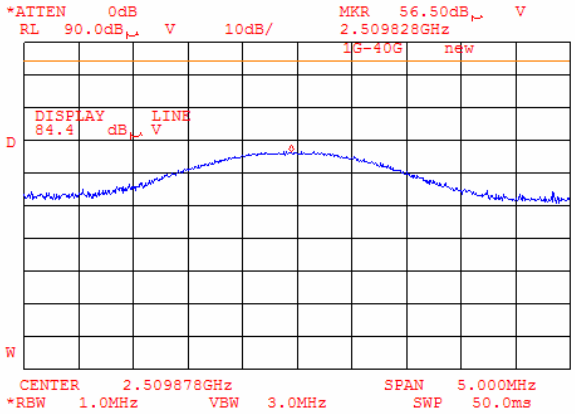
Plot 8.8.68 Radiated emission measurements from 2483.5 to 2900 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.69 Radiated emission measurements at 2509 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

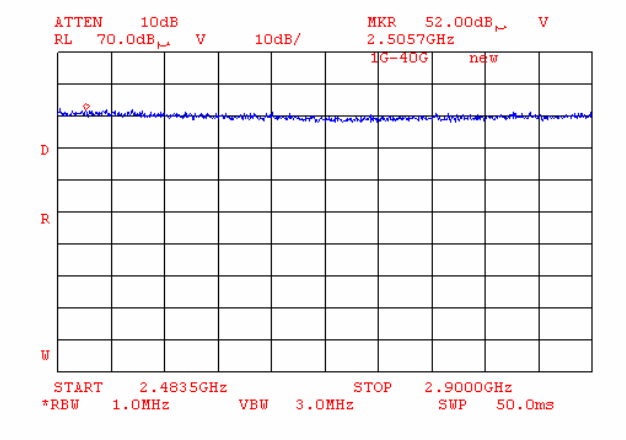


2509.2 MHz – 3-rd harmonic of G20-850 mid carrier frequency (836.6 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

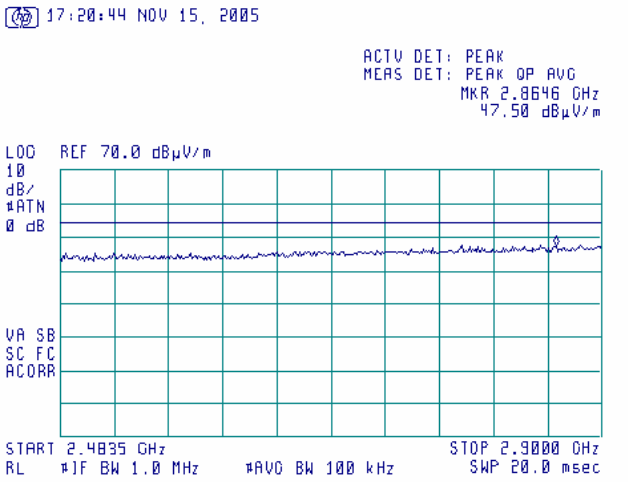
Plot 8.8.70 Radiated emission measurements from 2483.5 to 2900 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.71 Radiated emission measurements from 2483.5 to 2900 MHz at the mid carrier frequency (BT and G20-1900)

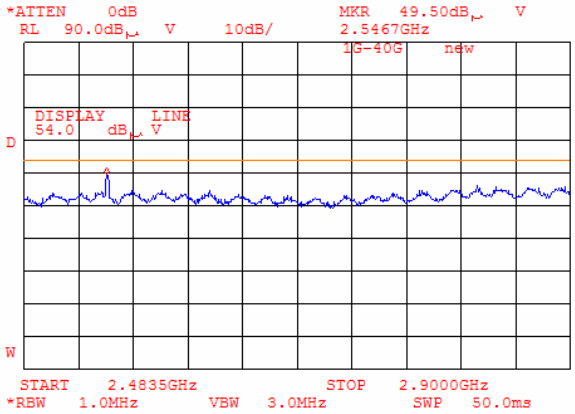
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

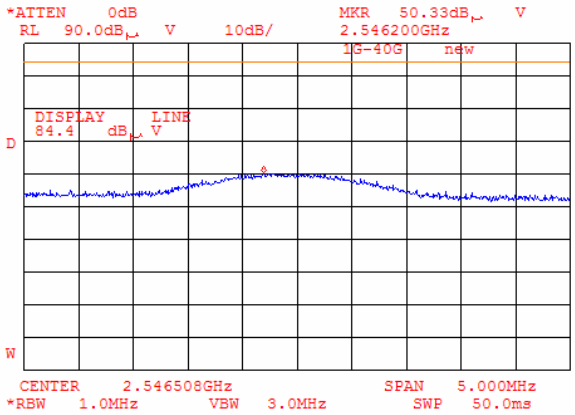
Plot 8.8.72 Radiated emission measurements from 2483.5 to 2900 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.73 Radiated emission measurements at 2546 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

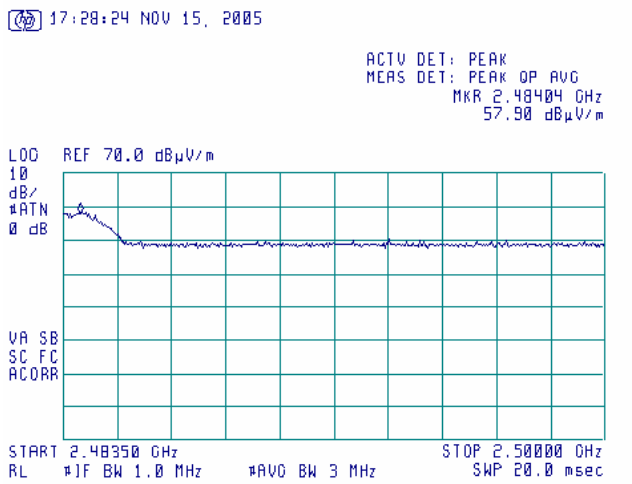


2546 MHz – 3-rd harmonic of G20-850 high carrier frequency (848.8 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

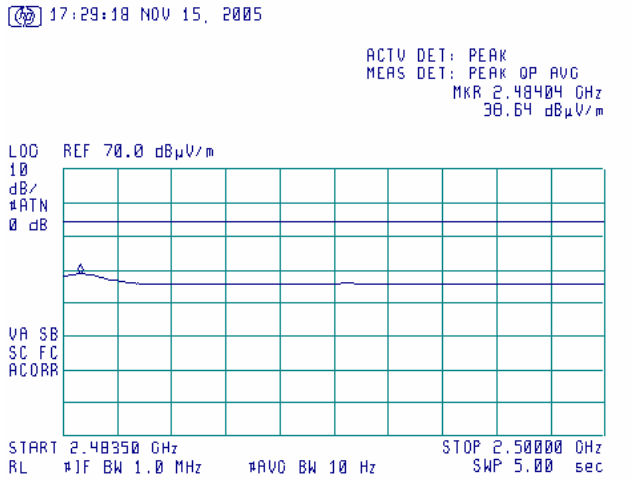
Plot 8.8.74 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.75 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency (BT and G20-1900)

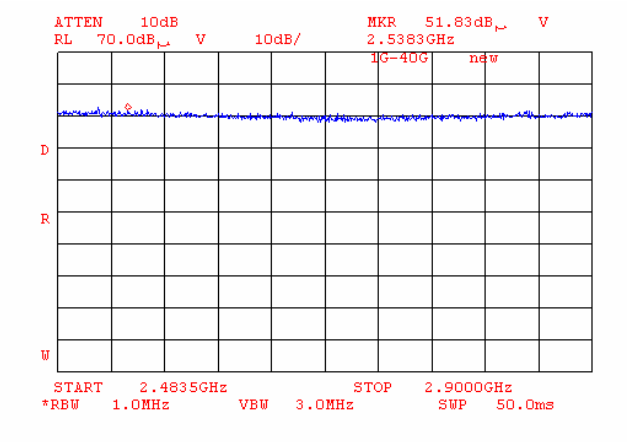
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

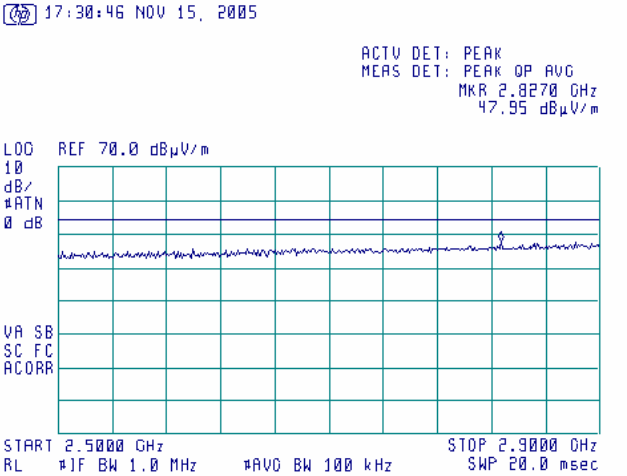
Plot 8.8.76 Radiated emission measurements from 2483.5 to 2900 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.77 Radiated emission measurements from 2500 to 2900 MHz at the high carrier frequency (BT and G20-1900)

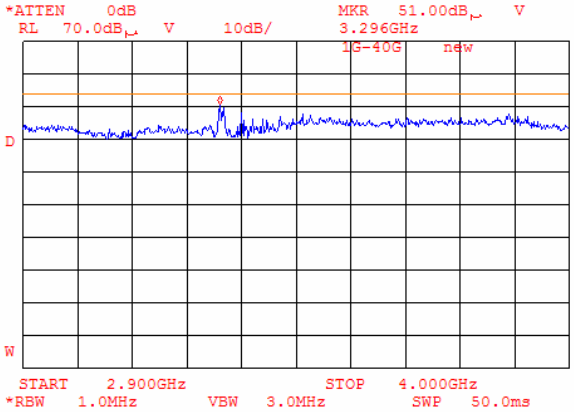
TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

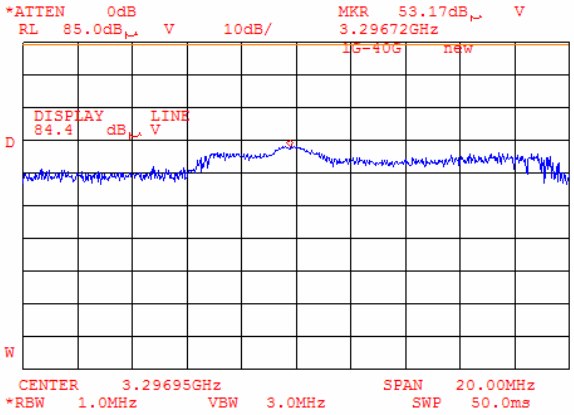
Plot 8.8.78 Radiated emission measurements from 2900 to 4000 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.79 Radiated emission measurements at 3296 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

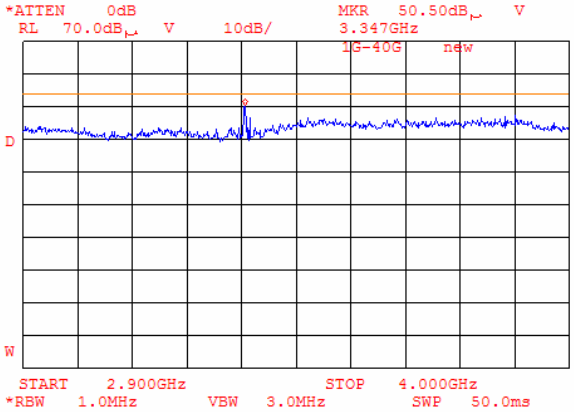


3296 MHz – 4-th harmonic of G20-850 low carrier frequency (824.2 MHz) limit 84.4 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

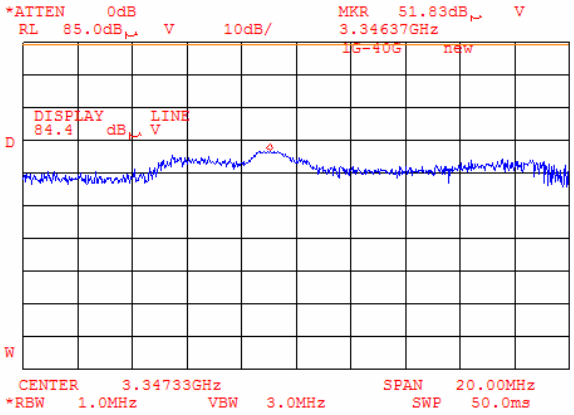
Plot 8.8.80 Radiated emission measurements from 2900 to 4000 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.81 Radiated emission measurements at 3346 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

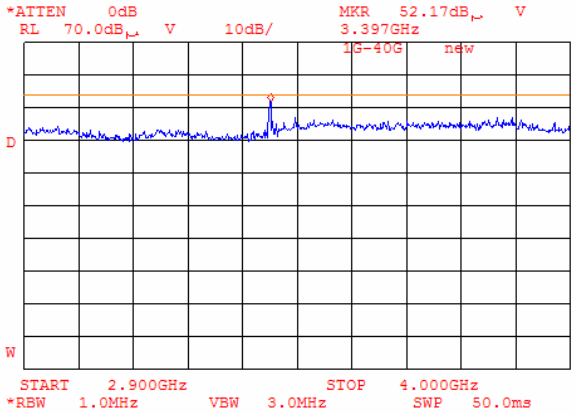


3346MHz – 4-th harmonic of G20-850 mid carrier frequency (836.4 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

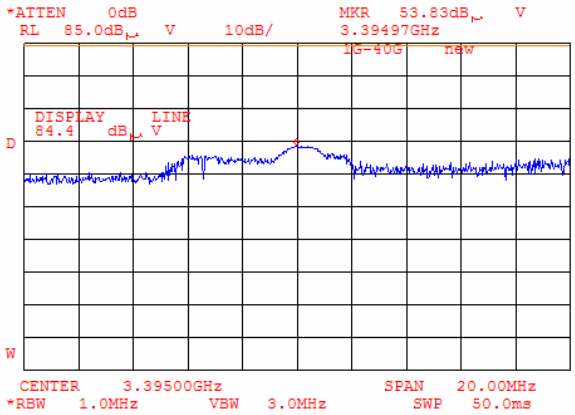
Plot 8.8.82 Radiated emission measurements from 2900 to 4000 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.83 Radiated emission measurements at 3395 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

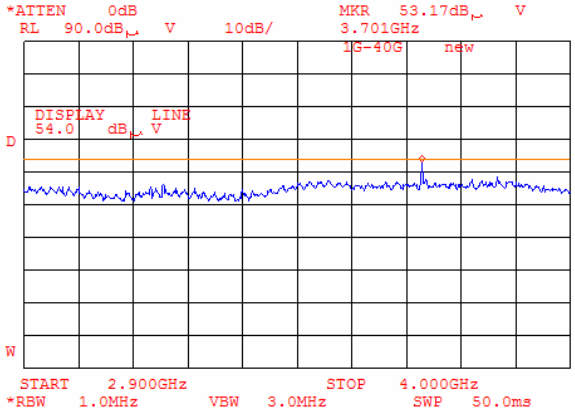


3395 MHz – 4-th harmonic of G20-850 high carrier frequency (848.8 MHz) limit 84.4 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

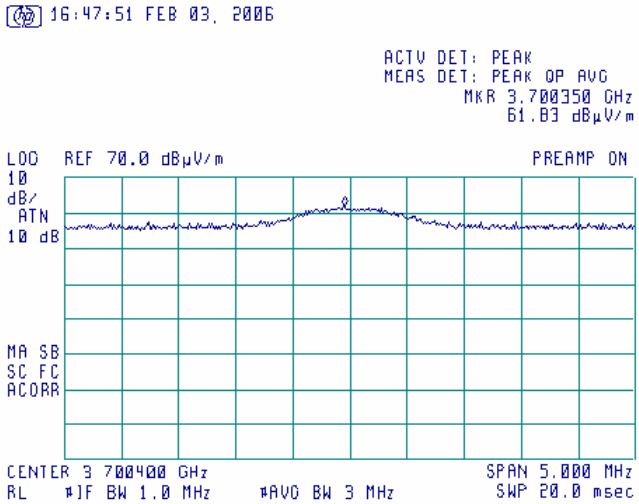
Plot 8.8.84 Radiated emission measurements from 2900 to 4000 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.85 Radiated emission measurements at 3760 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

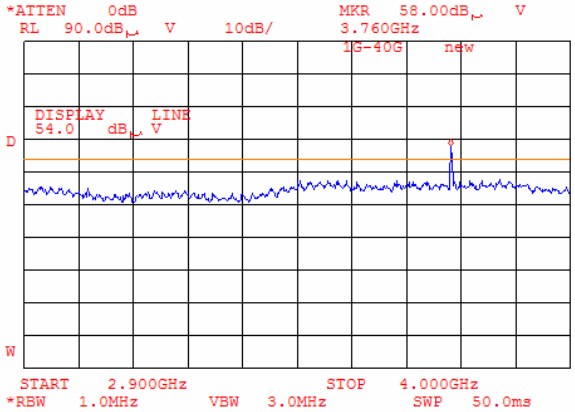


3700 MHz – 2-nd harmonic of G20-1900 low carrier frequency (1850.2 MHz) limit 84.4 dBμV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

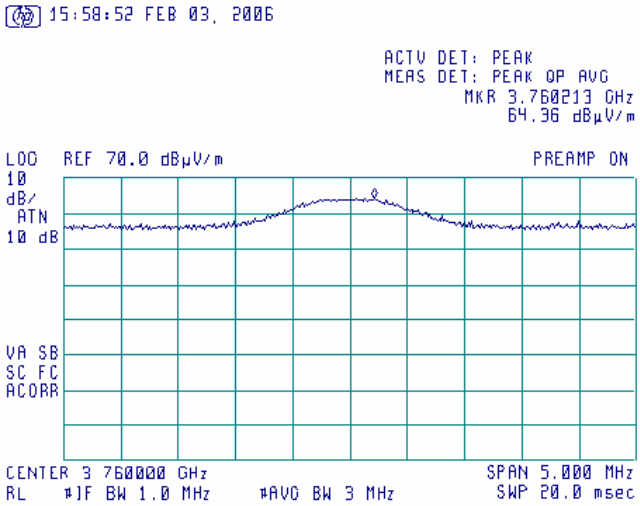
Plot 8.8.86 Radiated emission measurements from 2900 to 4000 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.87 Radiated emission measurements at 3760 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

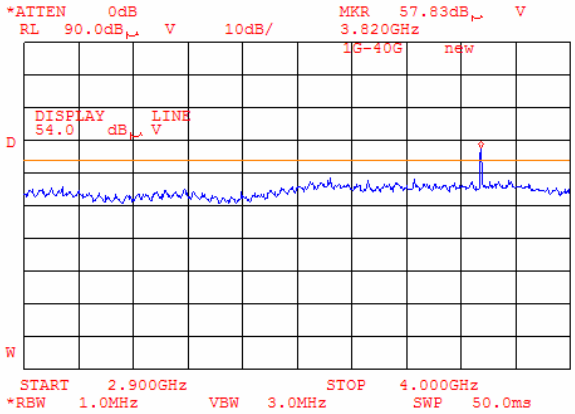


3760 MHz – 2-nd harmonic of G20-1900 mid carrier frequency (1880 MHz) limit 84.4 dBμV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

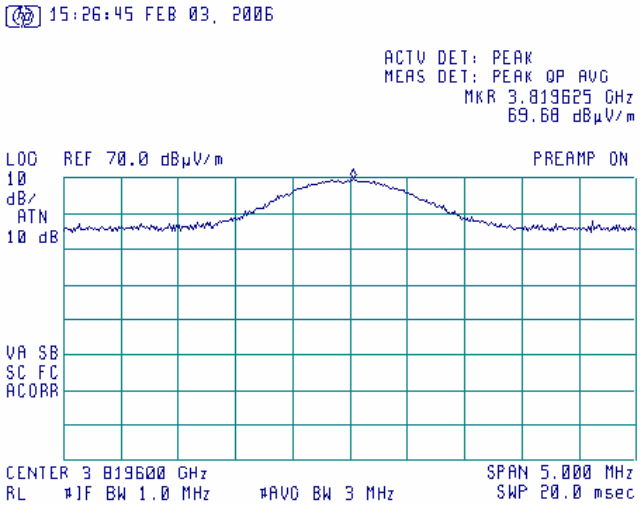
Plot 8.8.88 Radiated emission measurements from 2900 to 4000 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.89 Radiated emission measurements at 3819 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: Semi Anechoic Chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

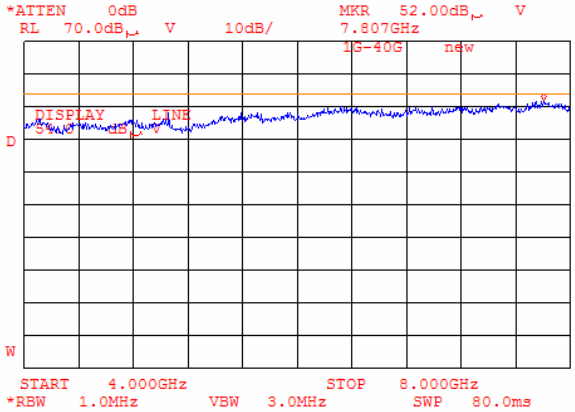


3819 MHz – 2-nd harmonic of G20-1900 high carrier frequency (1909.8 MHz) limit 84.4 dBμV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

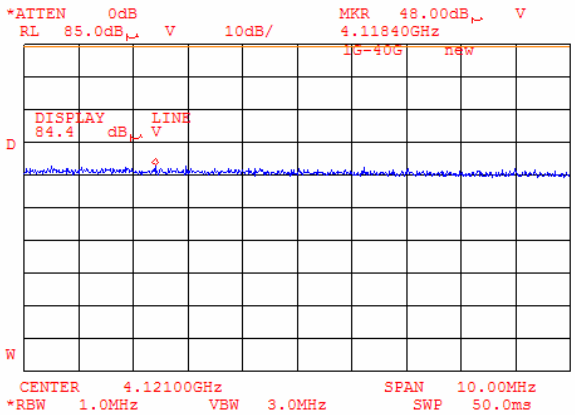
Plot 8.8.90 Radiated emission measurements from 4000 to 8000 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.91 Radiated emission measurements at 4121 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

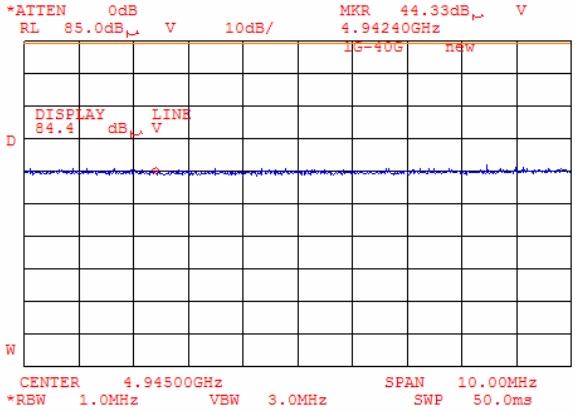


4121 MHz – 5-th harmonic of G20-850 low carrier frequency (824.2.8 MHz) limit 84.4 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.92 Radiated emission measurements at 4945 MHz at the low carrier frequency (BT and G20-850)

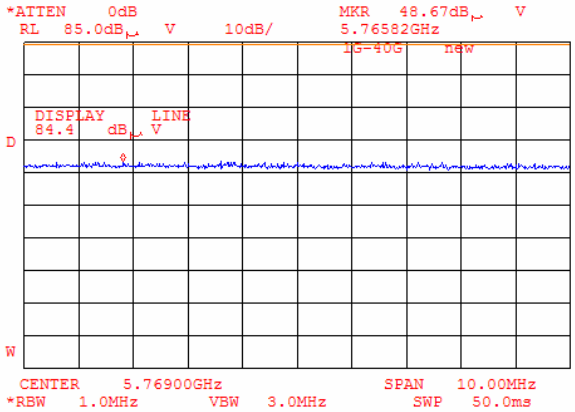
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



4945 MHz – 6-th harmonic of G20-850 low carrier frequency (824.2.8 MHz) limit 84.4 dBµV/m

Plot 8.8.93 Radiated emission measurements at 5769 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

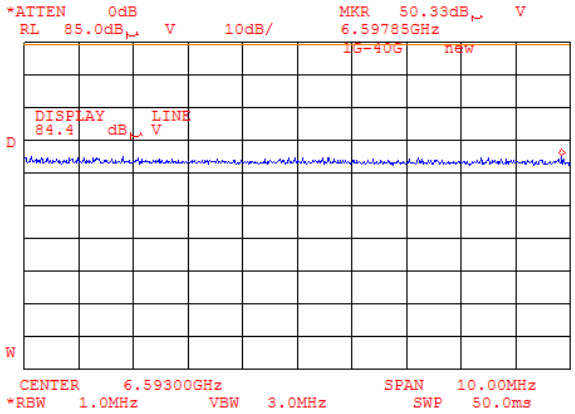


5769 MHz – 7-th harmonic of G20-850 low carrier frequency (824.2.8 MHz) limit 84.4 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.94 Radiated emission measurements at 6593 MHz at the low carrier frequency (BT and G20-850)

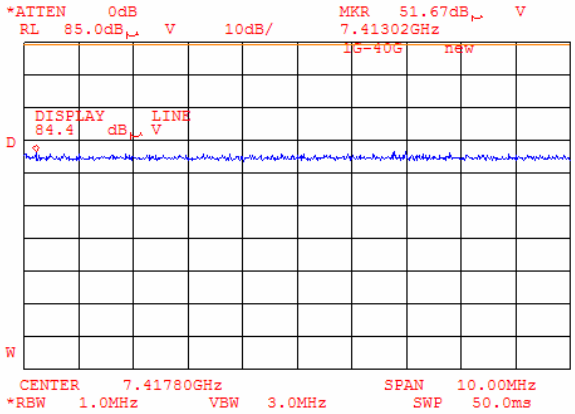
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



6593 MHz – 8-th harmonic of G20-850 low carrier frequency (824.2 MHz) limit 84.4 dBμV/m

Plot 8.8.95 Radiated emission measurements at 7417 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

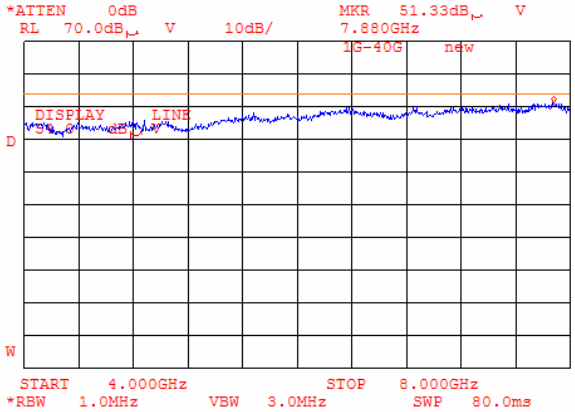


7417 MHz – 9-th harmonic of G20-850 low carrier frequency (824.2 MHz) limit 84.4 dBμV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

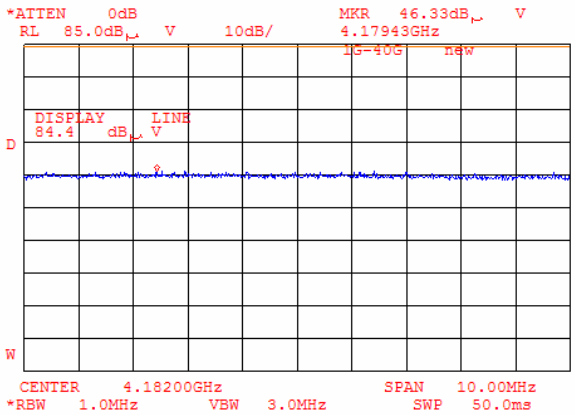
Plot 8.8.96 Radiated emission measurements from 4000 to 8000 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.97 Radiated emission measurements at 4182 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

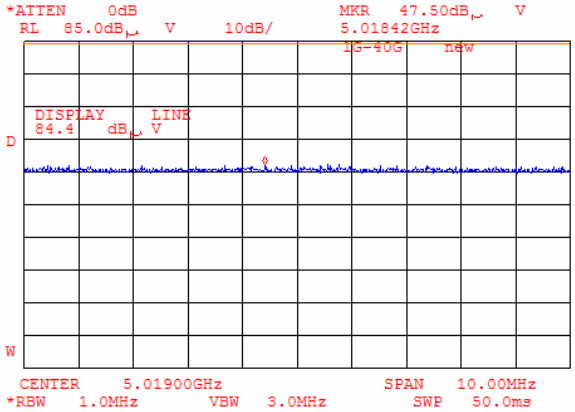


4182 MHz – 5-th harmonic of G20-850 mid carrier frequency (836.6 MHz) limit 84.4 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.98 Radiated emission measurements at 5019 MHz at the mid carrier frequency (BT and G20-850)

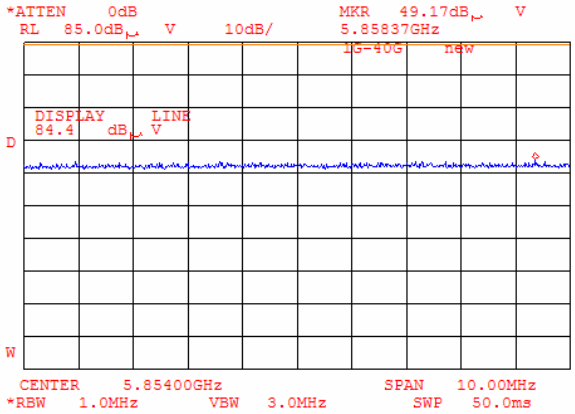
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



5019 MHz – 6-th harmonic of G20-850 mid carrier frequency (836.6 MHz) limit 84.4 dBµV/m

Plot 8.8.99 Radiated emission measurements at 5854 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

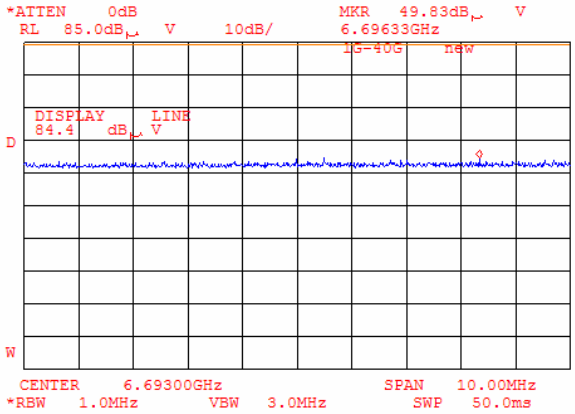


5854 MHz – 7-th harmonic of G20-850 mid carrier frequency (836.6 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.100 Radiated emission measurements at 6695 MHz at the mid carrier frequency (BT and G20-850)

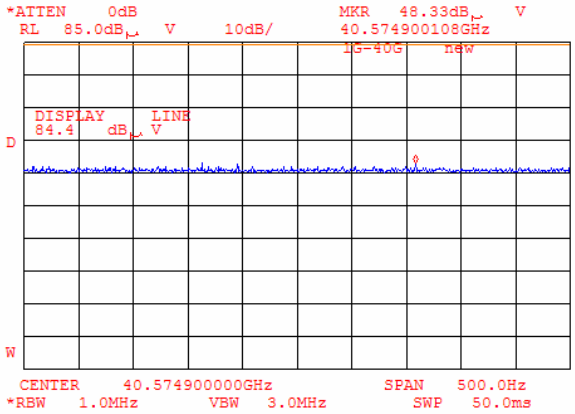
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



6693 MHz – 8-th harmonic of G20-850 mid carrier frequency (836.4 MHz) limit 84.4 dBµV/m

Plot 8.8.101 Radiated emission measurements at 7529 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

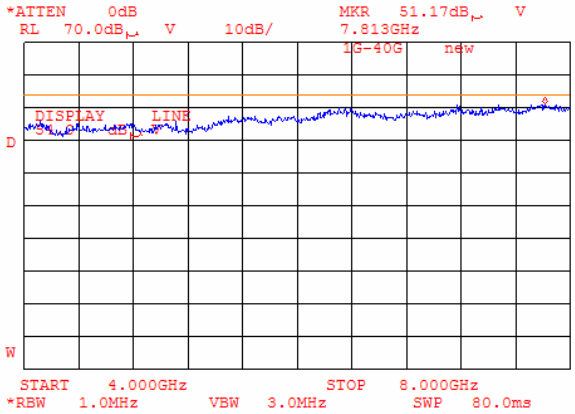


7529 MHz – 9-th harmonic of G20-850 mid carrier frequency (836.4 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

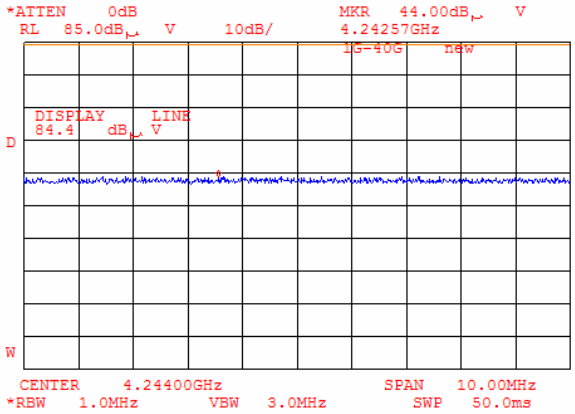
Plot 8.8.102 Radiated emission measurements from 4000 to 8000 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.103 Radiated emission measurements at 4244 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

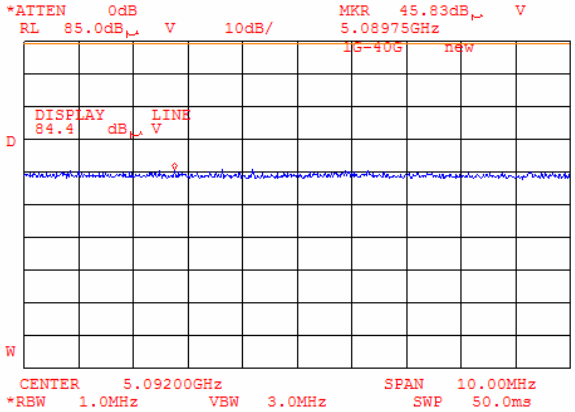


4244 MHz – 5-th harmonic of G20-850 high carrier frequency (848.8 MHz) limit 84.4 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.104 Radiated emission measurements at 5092 MHz at the high carrier frequency (BT and G20-850)

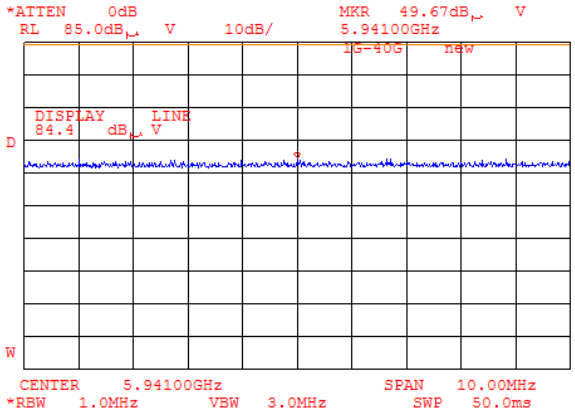
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



5092 MHz – 6-th harmonic of G20-850 high carrier frequency (848.8 MHz) limit 84.4 dBµV/m

Plot 8.8.105 Radiated emission measurements at 5941 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

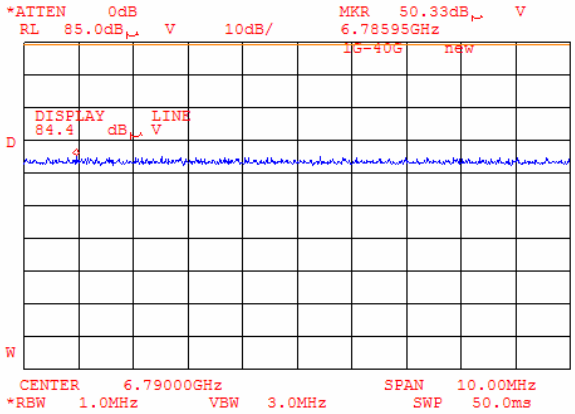


5941 MHz – 7-th harmonic of G20-850 high carrier frequency (848.8 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.106 Radiated emission measurements at 6790 MHz at the high carrier frequency (BT and G20-850)

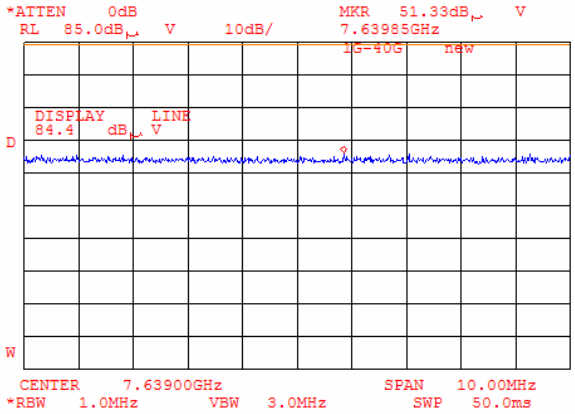
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



6790 MHz – 8-th harmonic of G20-850 high carrier frequency (848.8 MHz) limit 84.4 dBµV/m

Plot 8.8.107 Radiated emission measurements at 7639 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

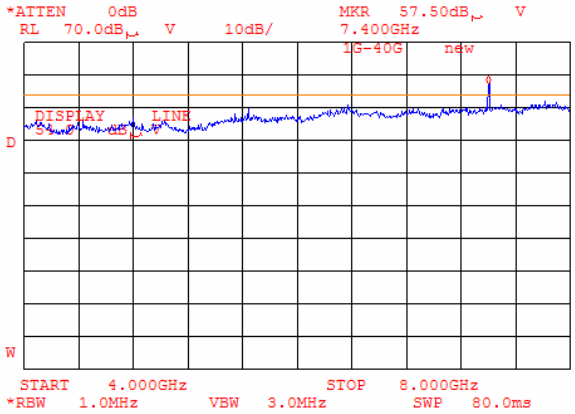


7639 MHz – 9-th harmonic of G20-850 high carrier frequency (848.8 MHz) limit 84.4 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

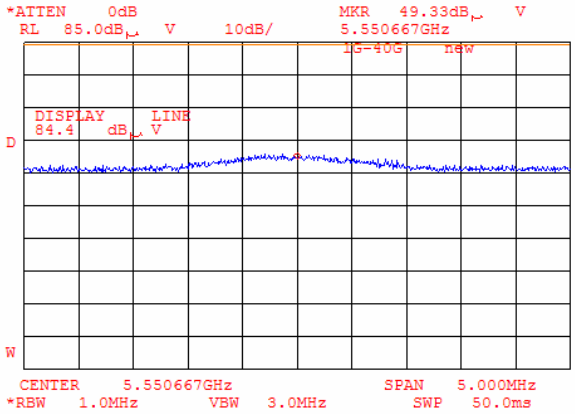
Plot 8.8.108 Radiated emission measurements from 4000 to 8000 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.109 Radiated emission measurements at 5550 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

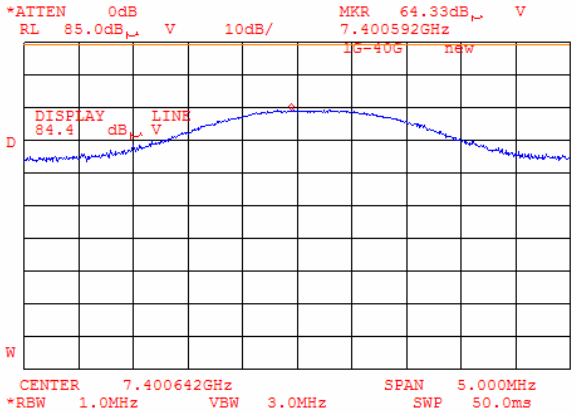


5550 MHz – 3-rd harmonic of G20-1900 low carrier frequency (1850.2 MHz) limit 84.4 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.110 Radiated emission measurements at 7400 MHz at the low carrier frequency (BT and G20-1900)

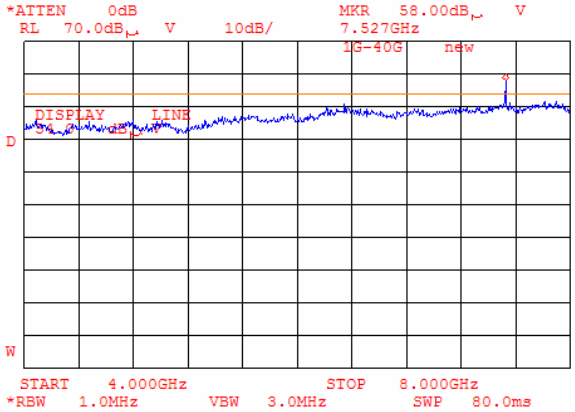
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



7400 MHz – 4-th harmonic of G20-1900 low carrier frequency (1850.2 MHz) limit 84.4 dBµV/m

Plot 8.8.111 Radiated emission measurements from 4000 to 8000 MHz at the mid carrier frequency (BT and G20-1900)

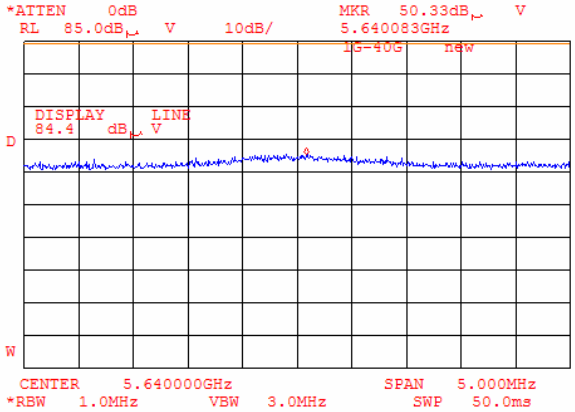
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.112 Radiated emission measurements at 5640 MHz at the mid carrier frequency (BT and G20-1900)

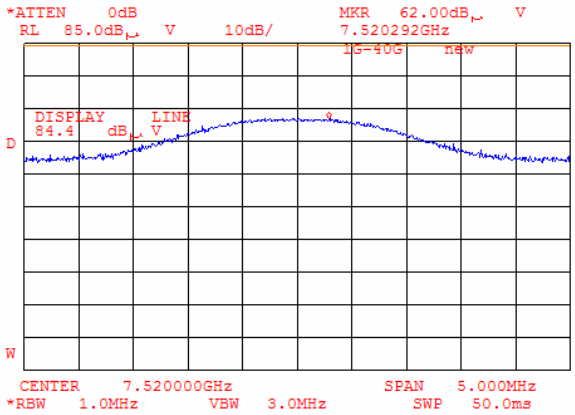
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



5640 MHz – 3-rd harmonic of G20-1900 mid carrier frequency (1880 MHz) limit 84.4 dBµV/m

Plot 8.8.113 Radiated emission measurements at 7520 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

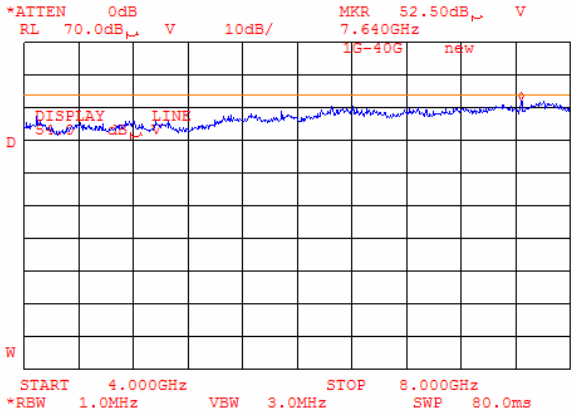


7520 MHz – 4-th harmonic of G20-1900 mid carrier frequency (1880 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

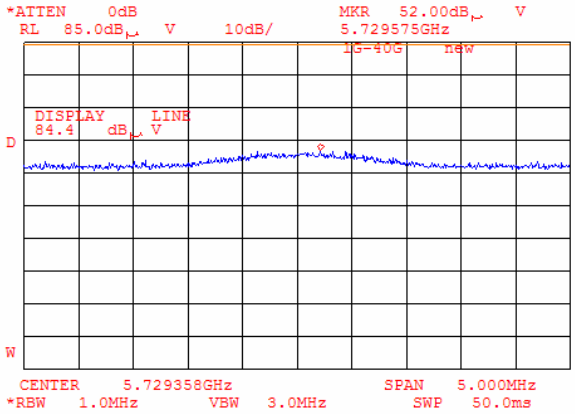
Plot 8.8.114 Radiated emission measurements from 4000 to 8000 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.115 Radiated emission measurements at 5729 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

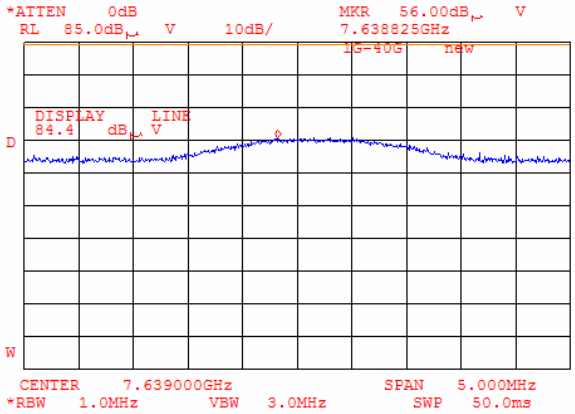


5729 MHz – 3-rd harmonic of G20-1900 high carrier frequency (1909.8 MHz) limit 84.4 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

Plot 8.8.116 Radiated emission measurements at 7639 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

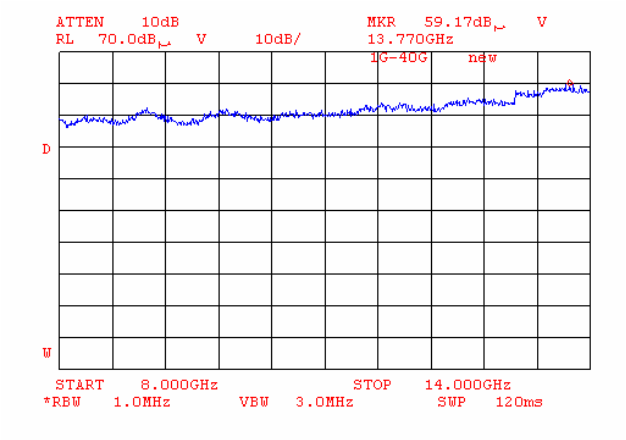


7639 MHz – 4-th harmonic of G20-1900 high carrier frequency (1909.8 MHz) limit 84.4 dBμV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

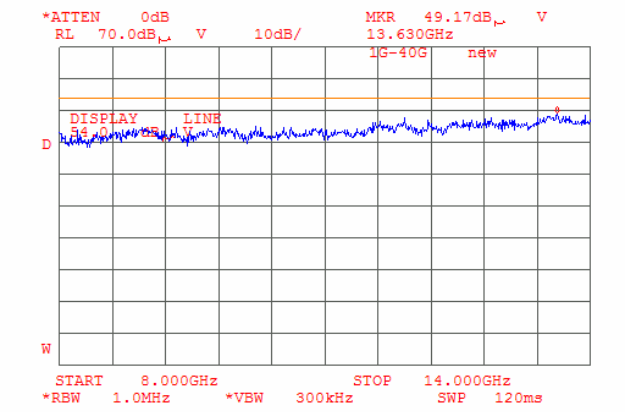
Plot 8.8.117 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.118 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency (BT and G20-850)

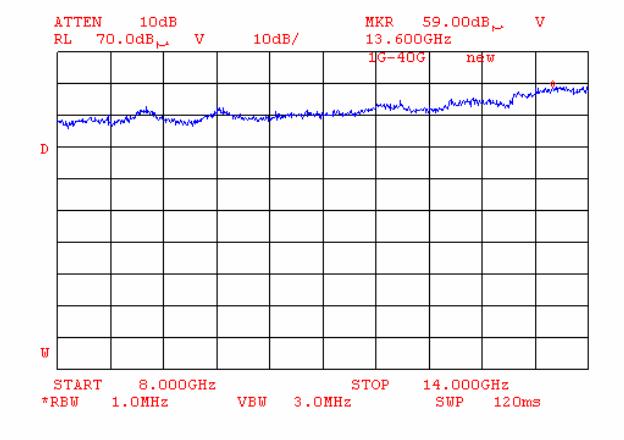
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

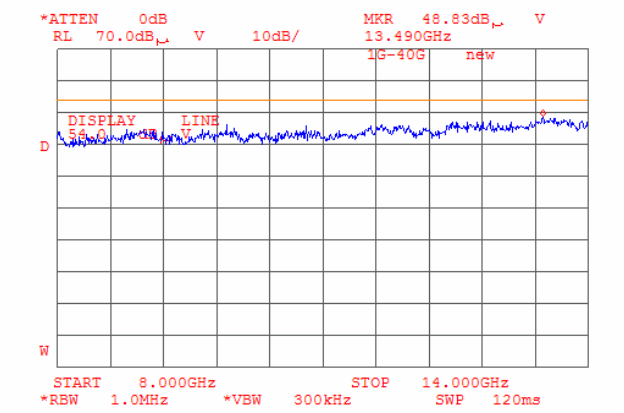
Plot 8.8.119 Radiated emission measurements from 8000 to 14000 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.120 Radiated emission measurements from 8000 to 14000 MHz at the mid carrier frequency (BT and G20-850)

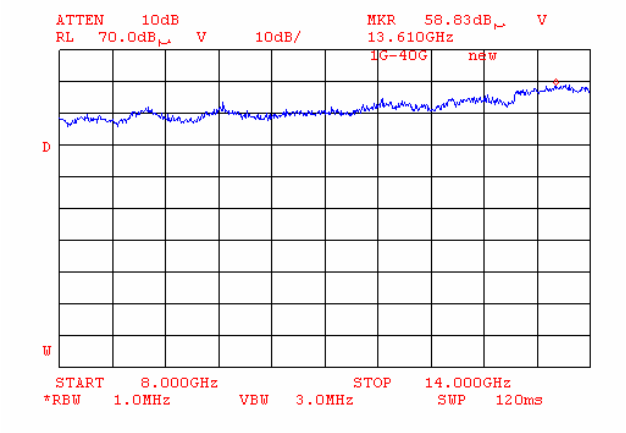
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

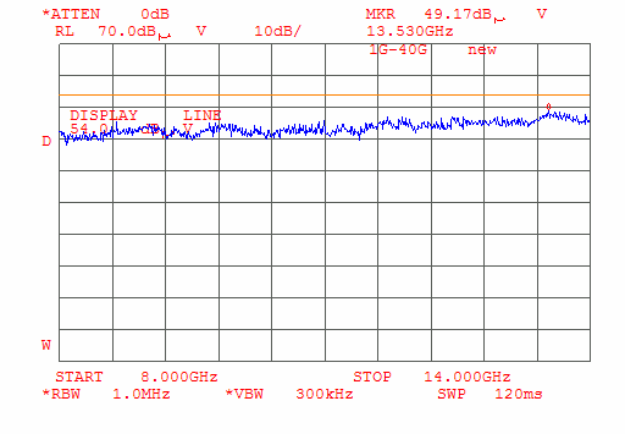
Plot 8.8.121 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.122 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency (BT and G20-850)

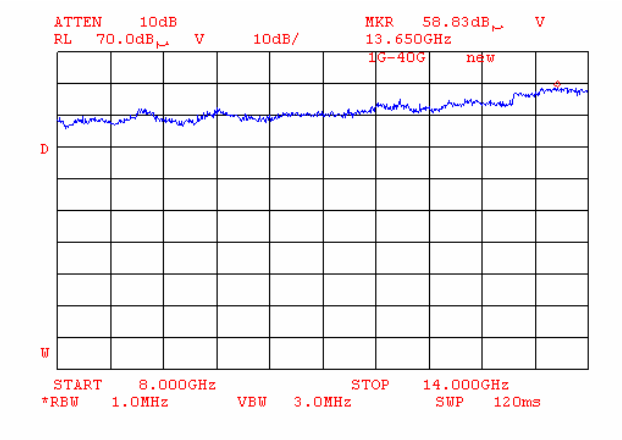
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

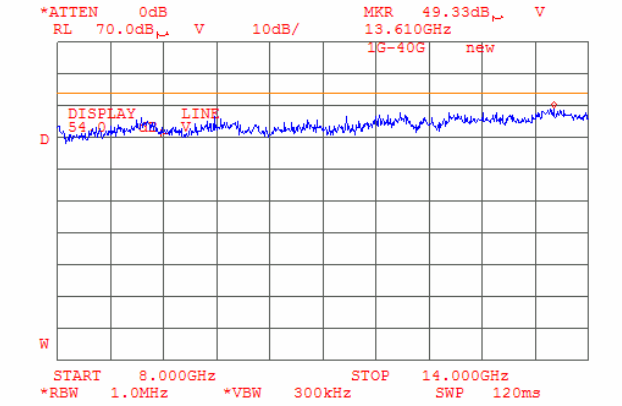
Plot 8.8.123 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.124 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency (BT and G20-1900)

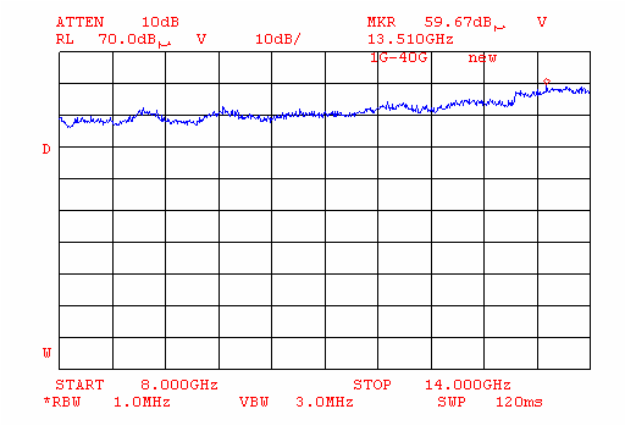
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

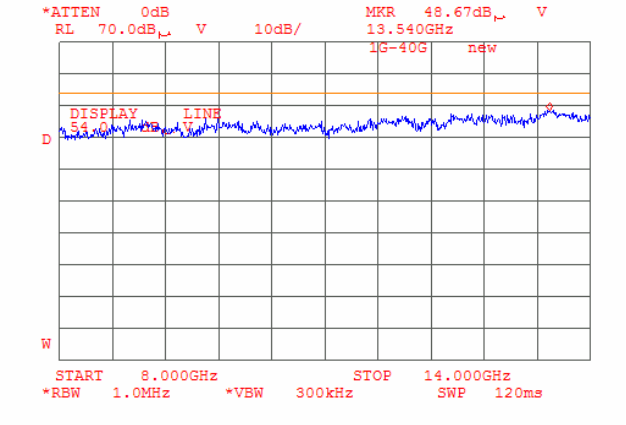
Plot 8.8.125 Radiated emission measurements from 8000 to 14000 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.126 Radiated emission measurements from 8000 to 14000 MHz at the mid carrier frequency (BT and G20-1900)

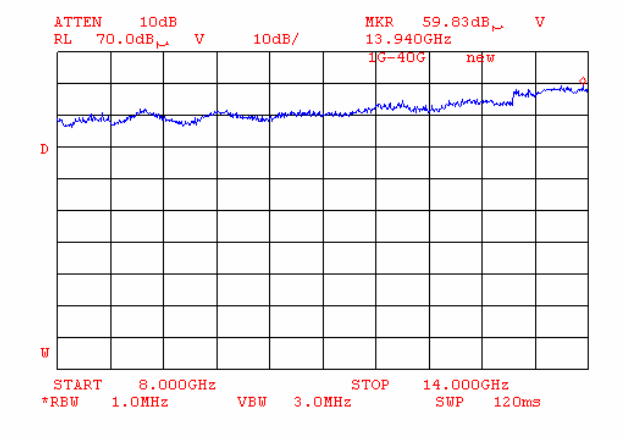
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

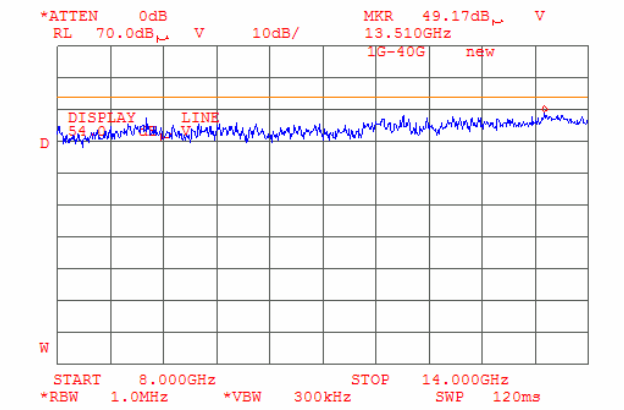
Plot 8.8.127 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.128 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency (BT and G20-1900)

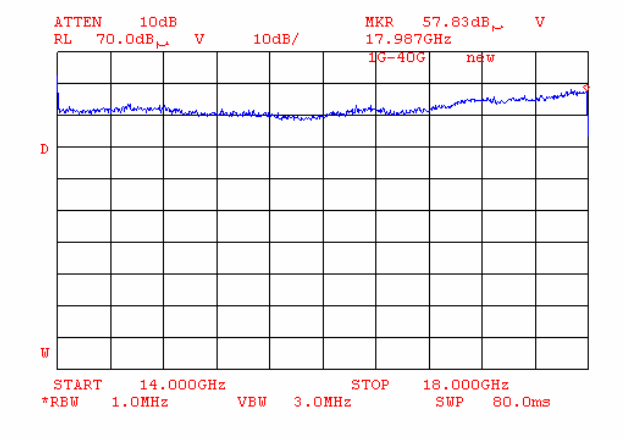
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

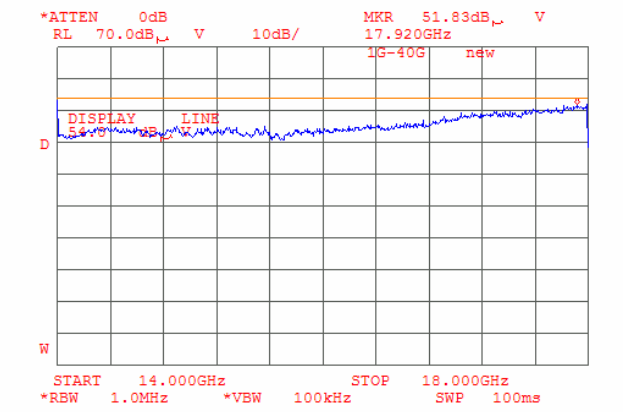
Plot 8.8.129 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.130 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency (BT and G20-850)

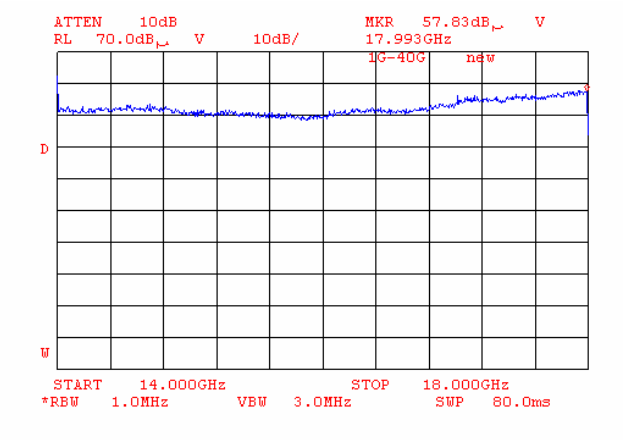
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

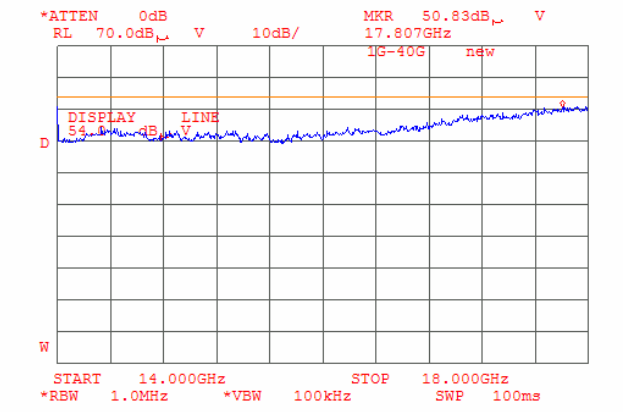
Plot 8.8.131 Radiated emission measurements from 14000 to 18000 MHz at the mid carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.132 Radiated emission measurements from 14000 to 18000 MHz at the mid carrier frequency (BT and G20-850)

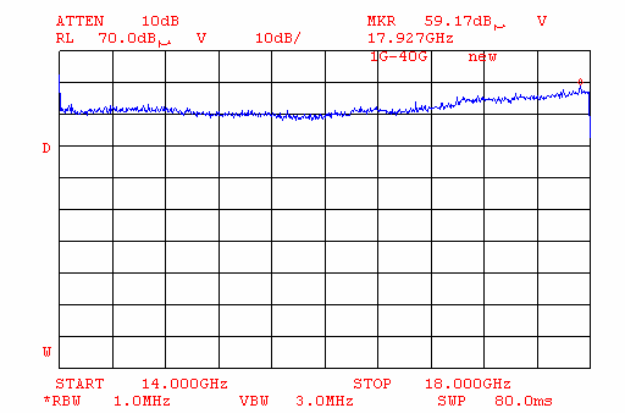
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

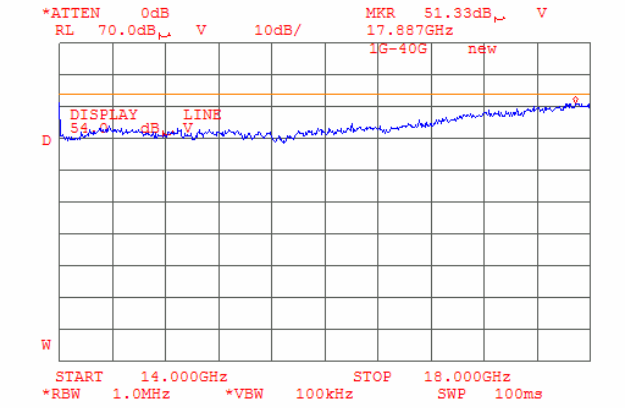
Plot 8.8.133 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.134 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency (BT and G20-850)

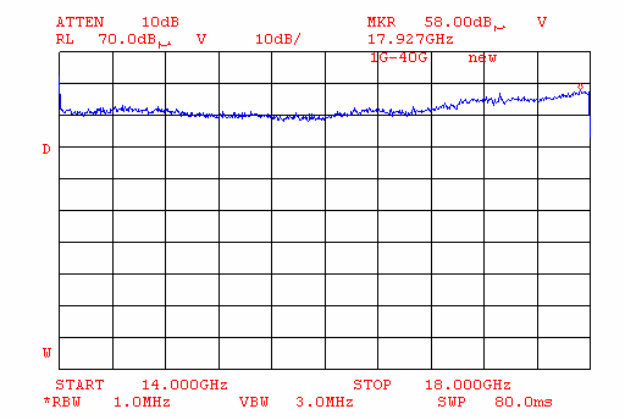
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

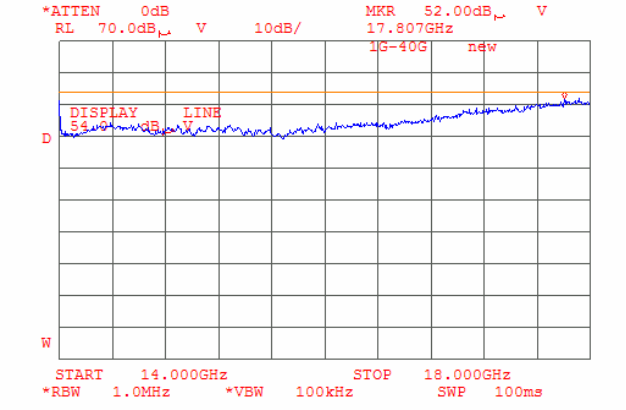
Plot 8.8.135 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.136 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency (BT and G20-1900)

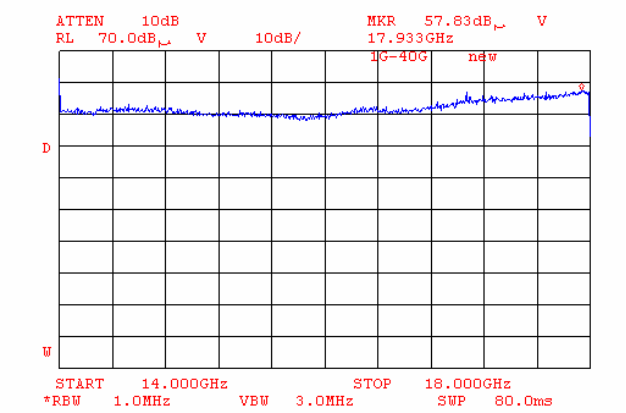
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

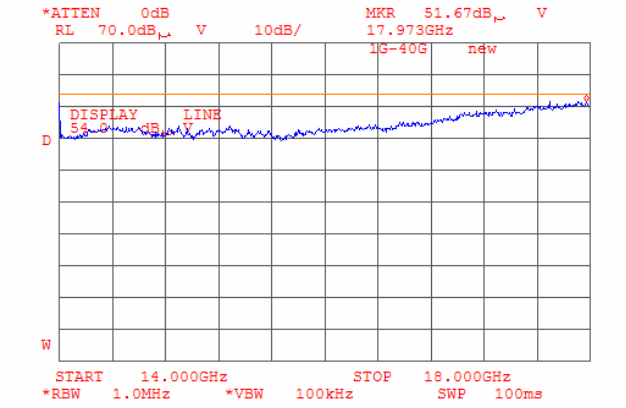
Plot 8.8.137 Radiated emission measurements from 14000 to 18000 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.138 Radiated emission measurements from 14000 to 18000 MHz at the mid carrier frequency (BT and G20-1900)

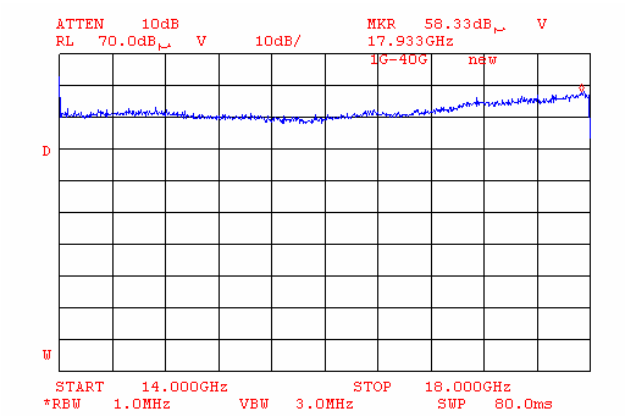
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

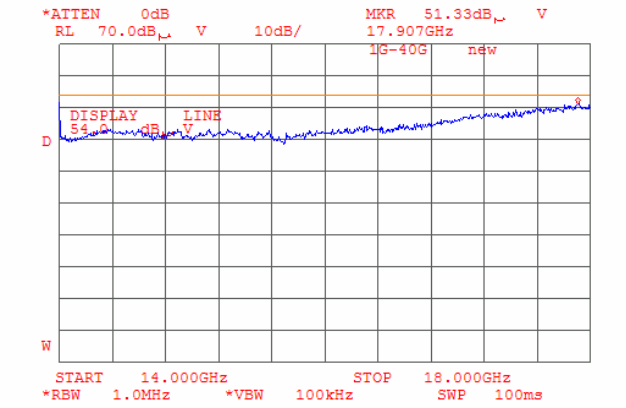
Plot 8.8.139 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.140 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency (BT and G20-1900)

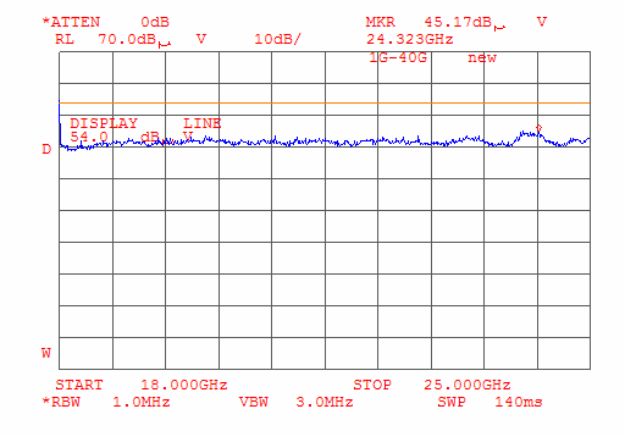
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

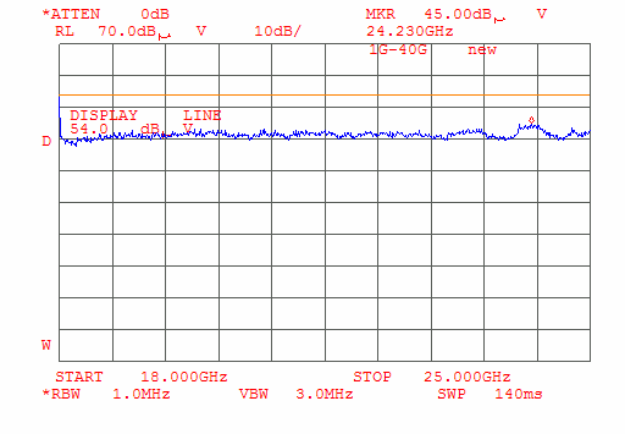
Plot 8.8.141 Radiated emission measurements from 18000 to 25000 MHz at the low carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.142 Radiated emission measurements from 18000 to 25000 MHz at the mid carrier frequency (BT and G20-850)

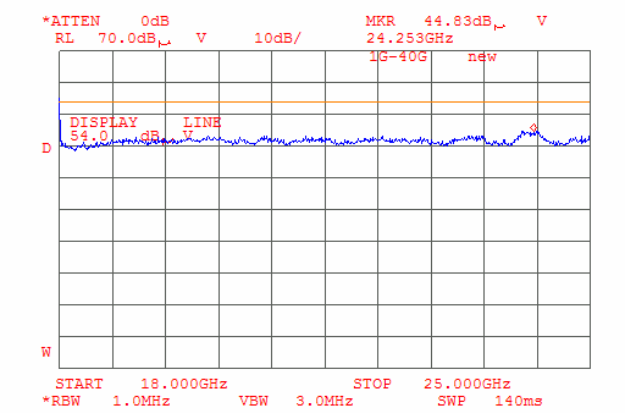
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: G20 + BT			

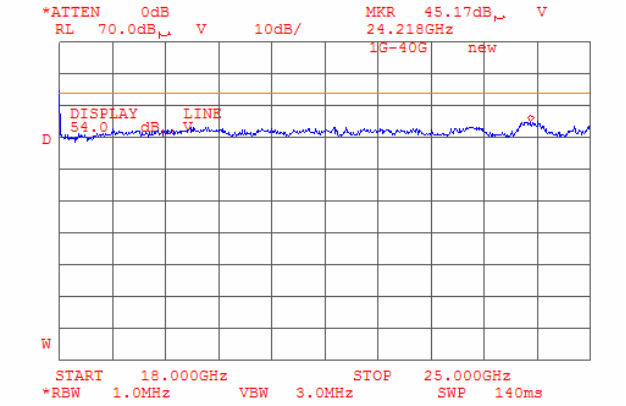
Plot 8.8.143 Radiated emission measurements from 18000 to 25000 MHz at the high carrier frequency (BT and G20-850)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.144 Radiated emission measurements from 18000 to 25000 MHz at the low carrier frequency (BT and G20-1900)

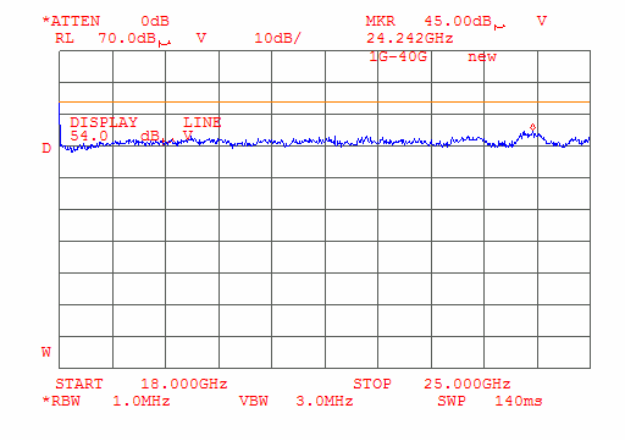
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:51:23 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: G20 + BT			

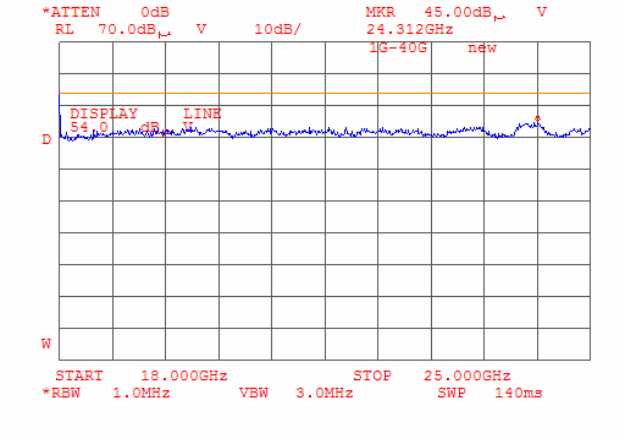
Plot 8.8.145 Radiated emission measurements from 18000 to 25000 MHz at the mid carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 8.8.146 Radiated emission measurements from 18000 to 25000 MHz at the high carrier frequency (BT and G20-1900)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**Section 15.203, RSS-Gen section 7.1.4, Antenna requirements**		
Test procedure:	Visual inspection		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/27/2005 9:19:04 AM		
Temperature: 23 ºC	**Air Pressure:** 1016 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks:			

8.9 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.
The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 8.9.1.

Table 8.9.1 Antenna requirements

Requirement	Rationale	Verdict
The transmitter antenna is permanently attached	Visual inspection	Comply
The transmitter employs a unique antenna connector	NA	
The transmitter requires professional installation	NA	

Test specification:	Section 15.247(a)2, RSS-210 section A8.2(1), 6 dB bandwidth		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/8/2005 9:07:24 AM		
Temperature: 21 ºC	Air Pressure: 1007 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

9 Transmitter tests according to 47CFR part 15 subpart C and RSS-210 requirements (DTS)

9.1 Minimum 6 dB bandwidth

9.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. Specification test limits are given in Table 9.1.1.

Table 9.1.1 The 6 dB bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Minimum bandwidth, kHz
902.0 – 928.0	6.0	500.0
2400.0 – 2483.5		
5725.0 – 5850.0		

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

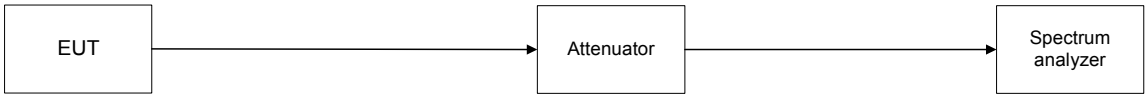
9.1.2 Test procedure

9.1.2.1 The EUT was set up as shown in Figure 9.1.1, energized and its proper operation was checked.

9.1.2.2 The EUT was set to transmit modulated carrier.

9.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 9.1.2 and associated plot.

Figure 9.1.1 The 6 dB bandwidth test setup



Test specification:	**Section 15.247(a)2, RSS-210 section A8.2(1), 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 9:07:24 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 9.1.2 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND:	2400.0 – 2483.5 MHz
DETECTOR USED:	Peak
SWEEP TIME:	Auto
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
MODULATION ENVELOPE REFERENCE POINTS:	6.0 dBc
MODULATION:	DBPSK / DPSK / DQPSK / QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	1 / 2 / 5.5 / 11 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
Bit Rate 1 Mbps				
2412	13030	500	12530	Pass
2437	13030		12530	Pass
2462	12600		12100	Pass
Bit Rate 2 Mbps				
2412	12770	500	12270	Pass
2437	12530		12030	Pass
2462	12770		12270	Pass
Bit Rate 5.5 Mbps				
2412	12370	500	11870	Pass
2437	12200		11700	Pass
2462	12770		12270	Pass
Bit Rate 11 Mbps				
2412	12930	500	12430	Pass
2437	12400		11900	Pass
2462	12630		12130	Pass

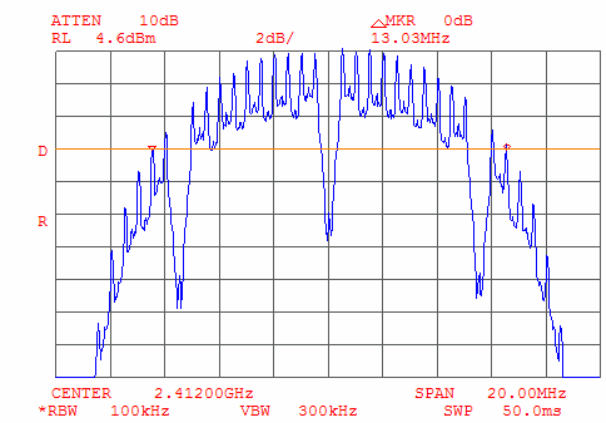
Reference numbers of test equipment used

HL 1424	HL 2425							

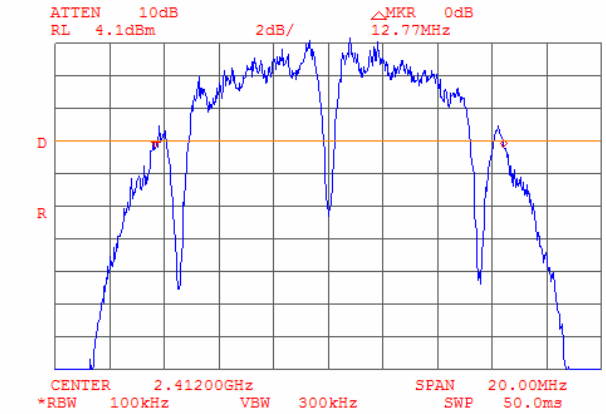
Full description is given in Appendix A.

Test specification:	**Section 15.247(a)2, RSS-210 section A8.2(1), 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 9:07:24 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.1.1 The 6 dB bandwidth test result at low frequency, Bit Rate 1 Mbps

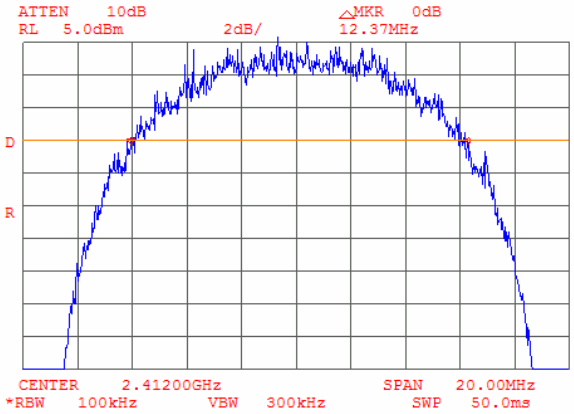


Plot 9.1.2 The 6 dB bandwidth test result at low frequency, Bit Rate 2 Mbps

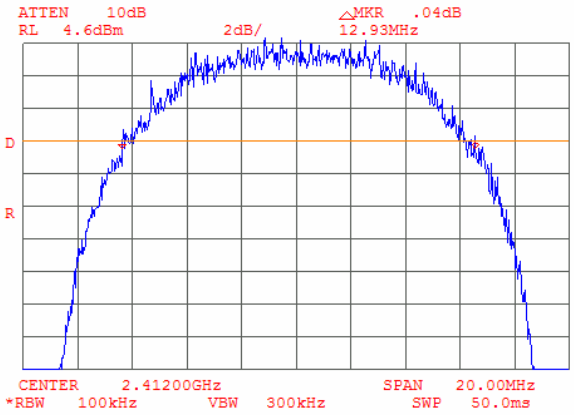


Test specification:	**Section 15.247(a)2, RSS-210 section A8.2(1), 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 9:07:24 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.1.3 The 6 dB bandwidth test result at low frequency, Bit Rate 5.5 Mbps

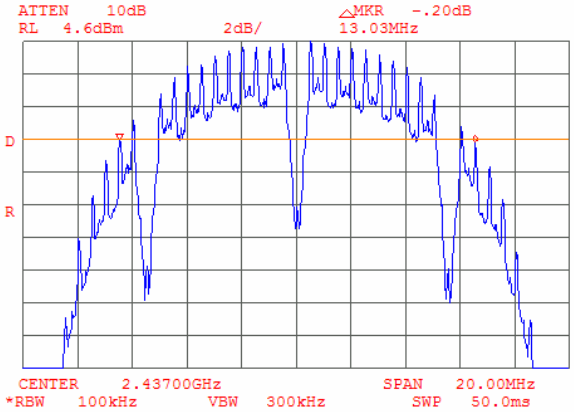


Plot 9.1.4 The 6 dB bandwidth test result at low frequency, Bit Rate 11 Mbps

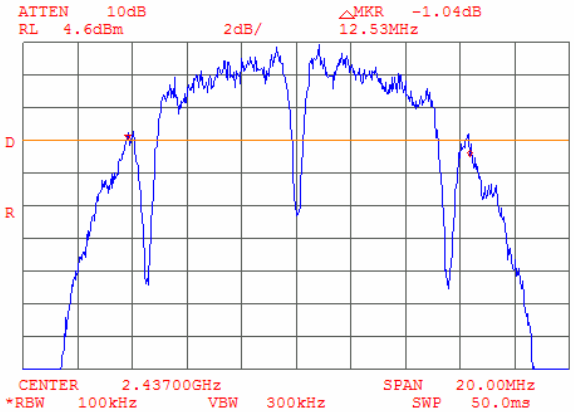


Test specification:	**Section 15.247(a)2, RSS-210 section A8.2(1), 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 9:07:24 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.1.5 The 6 dB bandwidth test result at mid frequency, Bit Rate 1 Mbps

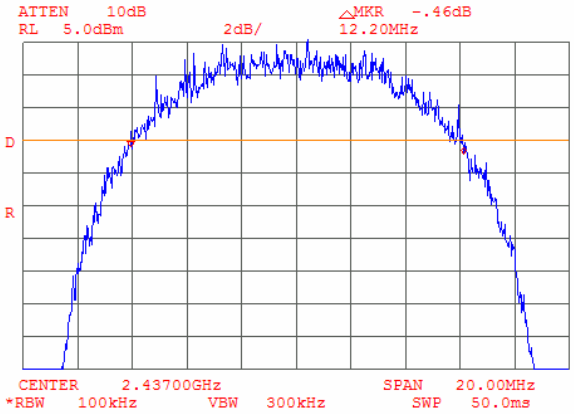


Plot 9.1.6 The 6 dB bandwidth test result at mid frequency, Bit Rate 2 Mbps

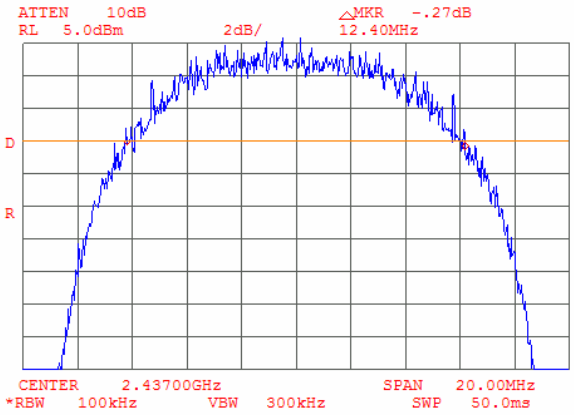


Test specification:	**Section 15.247(a)2, RSS-210 section A8.2(1), 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 9:07:24 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.1.7 The 6 dB bandwidth test result at mid frequency, Bit Rate 5.5 Mbps

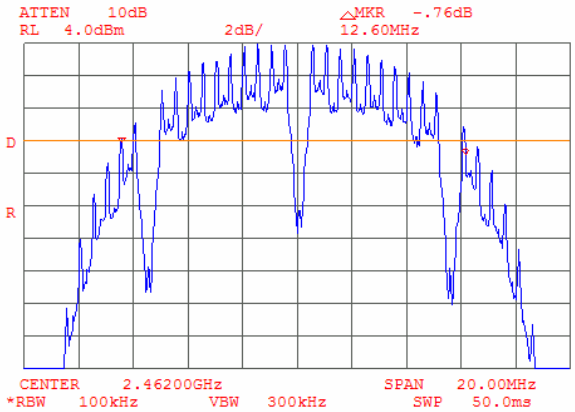


Plot 9.1.8 The 6 dB bandwidth test result at mid frequency, Bit Rate 11 Mbps

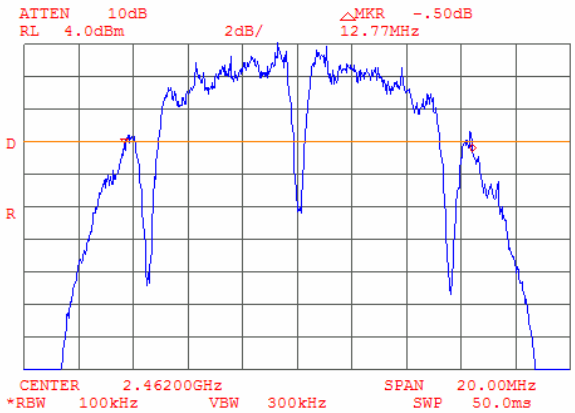


Test specification:	**Section 15.247(a)2, RSS-210 section A8.2(1), 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 9:07:24 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.1.9 The 6 dB bandwidth test result at high frequency, Bit Rate 1 Mbps

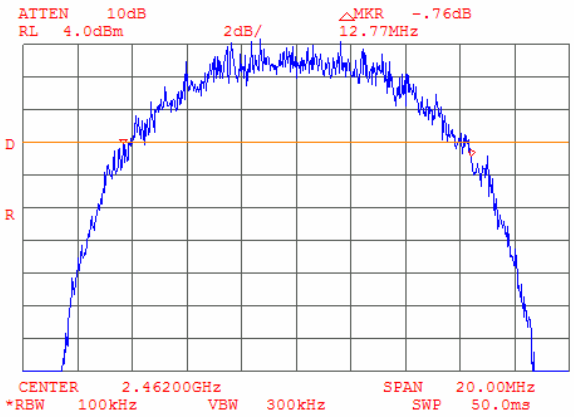


Plot 9.1.10 The 6 dB bandwidth test result at high frequency, Bit Rate 2 Mbps

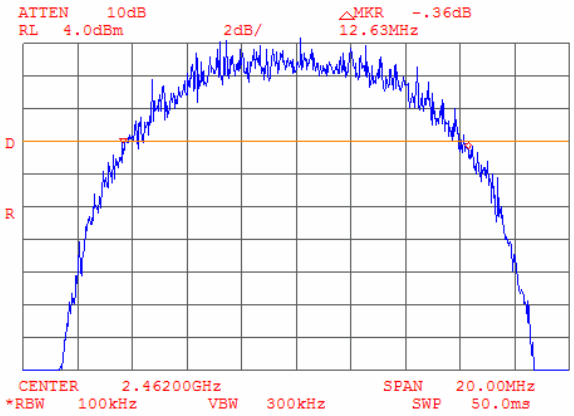


Test specification:	**Section 15.247(a)2, RSS-210 section A8.2(1), 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/8/2005 9:07:24 AM		
Temperature: 21 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.1.11 The 6 dB bandwidth test result at high frequency, Bit Rate 5.5 Mbps



Plot 9.1.12 The 6 dB bandwidth test result at high frequency, Bit Rate 11 Mbps



Test specification:	Section 15.247(b)3, RSS-210 section A8.4(4), Peak output power		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:55 AM		
Temperature: 22 ºC	Air Pressure: 1010 hPa	Relative Humidity: 52 %	Power Supply: 7.2 V battery
Remarks:			

9.2 Peak output power

9.2.1 General

This test was performed to measure the maximum peak output power at the transmitter RF antenna connector. Specification test limits are given in Table 9.2.1.

Table 9.2.1 Peak output power limits

Assigned frequency range, MHz	Maximum antenna gain, dBi	Peak output power*	
		W	dBm
902.0 – 928.0	6.0	1.0	30.0
2400.0 – 2483.5			
5725.0 – 5850.0			

*- If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

by 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;

without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band;

by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

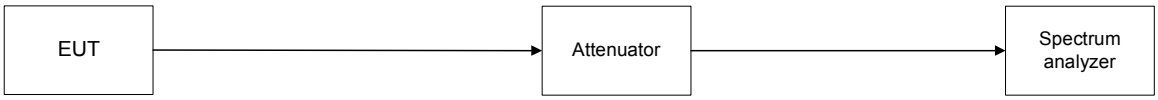
9.2.2 Test procedure

9.2.2.1 The EUT was set up as shown in Figure 9.2.1, energized and its proper operation was checked.

9.2.2.2 The EUT was adjusted to produce maximum available for end user RF output power.

9.2.2.3 The resolution bandwidth of spectrum analyzer was set wider than 6 dB bandwidth of the EUT and the maximum peak output power was measured as provided in Table 9.2.2 and associated plots.

Figure 9.2.1 Peak output power test setup



Test specification:	**Section 15.247(b)3, RSS-210 section A8.4(4), Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:55 AM		
Temperature: 22 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 9.2.2 Peak output power test results

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
MODULATION: DBPSK / DPSK / DQPSK / QPSK
MODULATING SIGNAL: PRBS
BIT RATE: 1 / 2 / 5.5 / 11 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
EUT 6 dB BANDWIDTH: 13 MHz
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 300 kHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak output power, dBm	Limit, dBm	Margin*, dB	Verdict
Bit Rate 1 Mbps							
2412	19.8	Included	1.3	21.1	30.0	-8.9	Pass
2437	19.6	Included	1.3	20.9	30.0	-9.1	Pass
2462	18.8	Included	1.3	20.1	30.0	-9.9	Pass
Bit Rate 2 Mbps							
2412	19.8	Included	1.3	21.1	30.0	-8.9	Pass
2437	19.8	Included	1.3	21.1	30.0	-8.9	Pass
2462	19.0	Included	1.3	20.3	30.0	-9.7	Pass
Bit Rate 5.5 Mbps							
2412	20.3	Included	1.3	21.6	30.0	-8.4	Pass
2437	20.2	Included	1.3	21.5	30.0	-8.5	Pass
2462	19.4	Included	1.3	20.7	30.0	-9.3	Pass
Bit Rate 11 Mbps							
2412	20.1	Included	1.3	21.4	30.0	-8.6	Pass
2437	20.3	Included	1.3	21.6	30.0	-8.4	Pass
2462	19.3	Included	1.3	20.6	30.0	-9.4	Pass

* - Margin = Peak output power – specification limit.

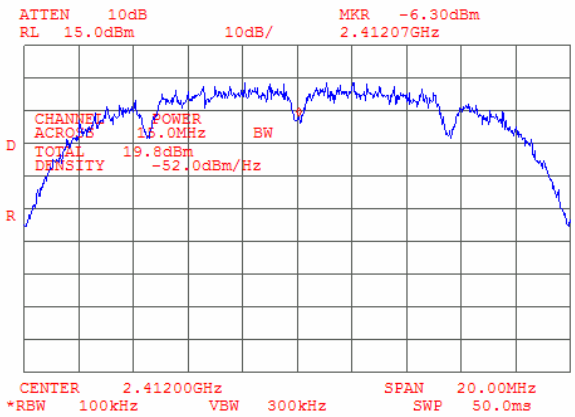
Reference numbers of test equipment used

HL 1424	HL 2524						

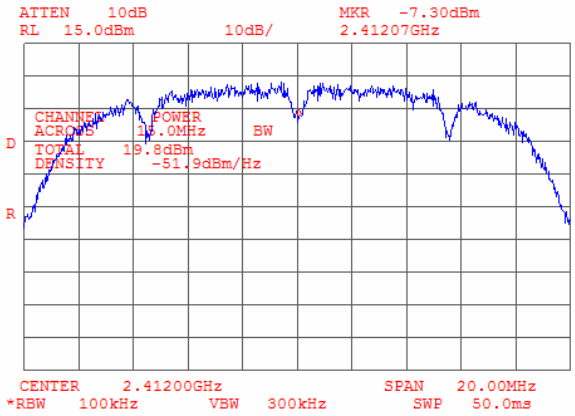
Full description is given in Appendix A.

Test specification:	**Section 15.247(b)3, RSS-210 section A8.4(4), Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:55 AM		
Temperature: 22 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.2.1 Peak output power at low frequency, Bit Rate 1 Mbps

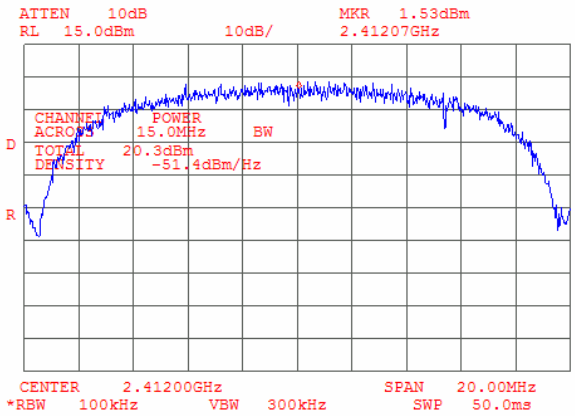


Plot 9.2.2 Peak output power at low frequency, Bit Rate 2 Mbps

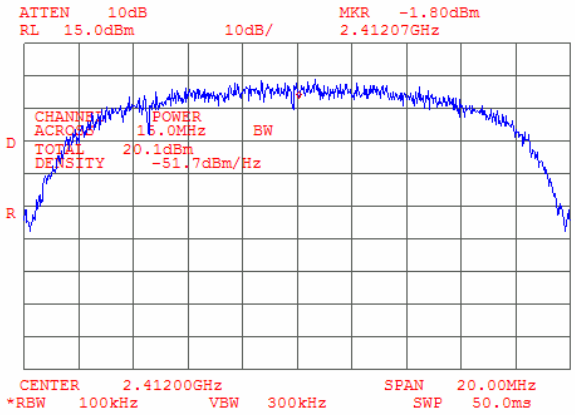


Test specification:	**Section 15.247(b)3, RSS-210 section A8.4(4), Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:55 AM		
Temperature: 22 °C	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.2.3 Peak output power at low frequency, Bit Rate 5.5 Mbps

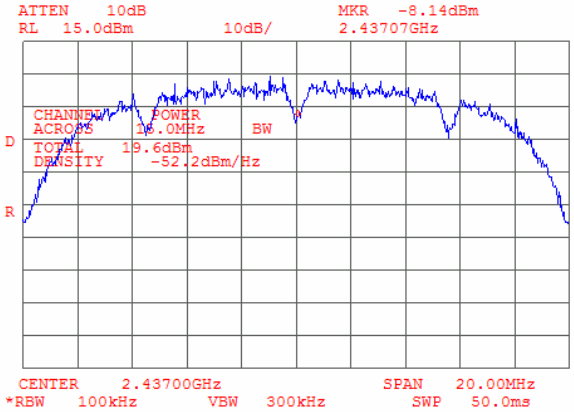


Plot 9.2.4 Peak output power at low frequency, Bit Rate 11 Mbps

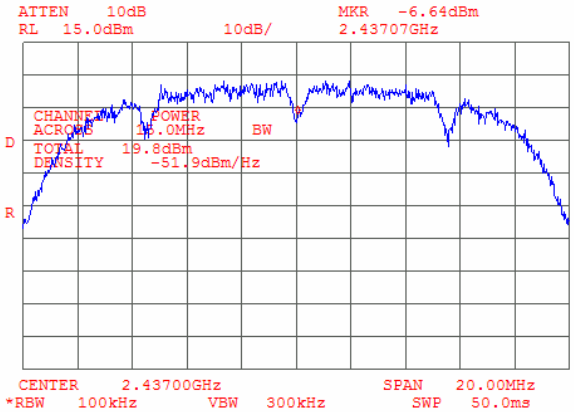


Test specification:	**Section 15.247(b)3, RSS-210 section A8.4(4), Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:55 AM		
Temperature: 22 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.2.5 Peak output power at mid frequency, Bit Rate 1 Mbps

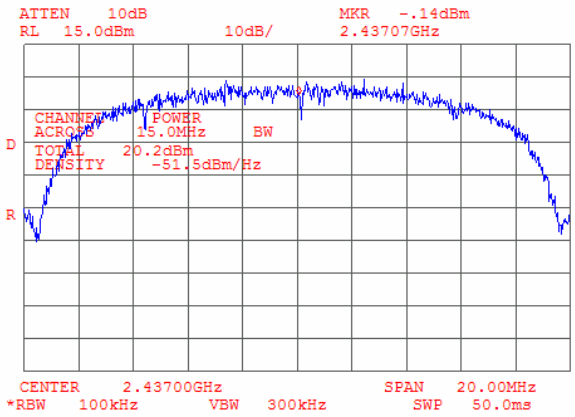


Plot 9.2.6 Peak output power at mid frequency, Bit Rate 2 Mbps

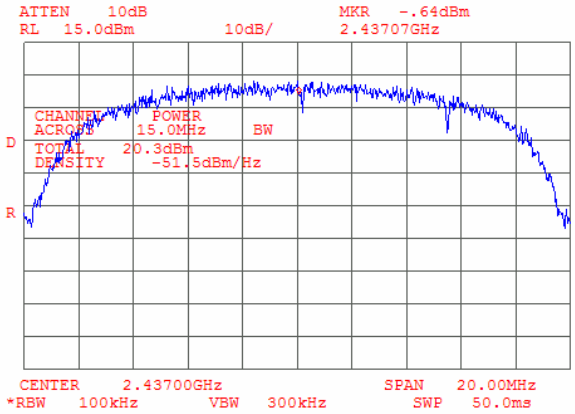


Test specification:	**Section 15.247(b)3, RSS-210 section A8.4(4), Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:55 AM		
Temperature: 22 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.2.7 Peak output power at mid frequency, Bit Rate 5.5 Mbps

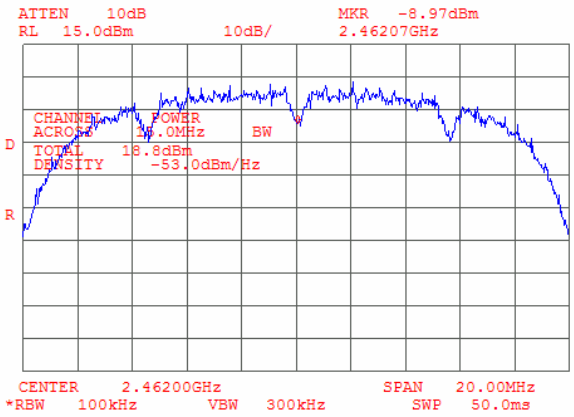


Plot 9.2.8 Peak output power at mid frequency, Bit Rate 11 Mbps

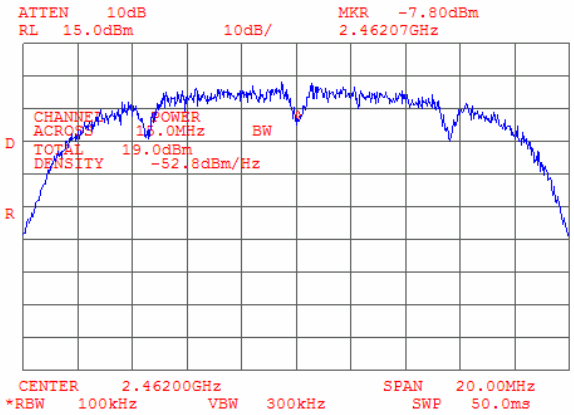


Test specification:	**Section 15.247(b)3, RSS-210 section A8.4(4), Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:55 AM		
Temperature: 22 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.2.9 Peak output power at high frequency, Bit Rate 1 Mbps

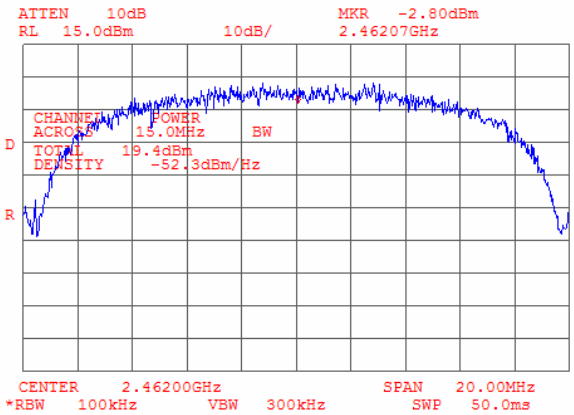


Plot 9.2.10 Peak output power at high frequency, Bit Rate 2 Mbps

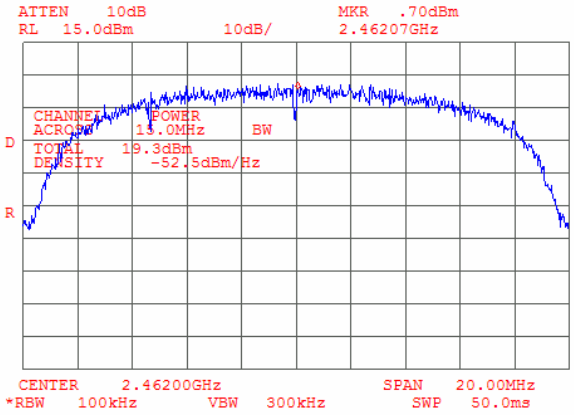


Test specification:	**Section 15.247(b)3, RSS-210 section A8.4(4), Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:55 AM		
Temperature: 22 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.2.11 Peak output power at high frequency, Bit Rate 5.5 Mbps



Plot 9.2.12 Peak output power at high frequency, Bit Rate 11 Mbps



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

9.3 Field strength of spurious emissions

9.3.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits according to FCC part 15 section 15.247(c) and RSS-210 section A8.5 are given in Table 9.3.1.

Table 9.3.1 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m within restricted bands, dB(µV/m)***			Attenuation of field strength of spurious versus carrier outside restricted bands, dBc***
	Peak	Quasi Peak	Average	
0.009 – 0.490*	NA	128.5 – 93.8**	NA	20.0
0.490 – 1.705*		73.8 – 63.0**		
1.705 – 30.0*		69.5**		
30 – 88		40.0		
88 – 216		43.5		
216 – 960		46.0		
960 - 1000		54.0		
Above 1000	74.0	NA	54.0	

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$Lim_{S2} = Lim_{S1} + 40 \log (S_1/S_2),$$

where S_1 and S_2 – standard defined and test distance respectively in meters.
**- The limit decreases linearly with the logarithm of frequency.
*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

9.3.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

9.3.2.1 The EUT was set up as shown in Figure 9.3.1, energized and the performance check was conducted.

9.3.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

9.3.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

9.3.3 Test procedure for spurious emission field strength measurements above 30 MHz

9.3.3.1 The EUT was set up as shown in Figure 9.3.2, energized and the performance check was conducted.

9.3.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

9.3.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: WLAN + BT			

Figure 9.3.1 Setup for spurious emission field strength measurements below 30 MHz

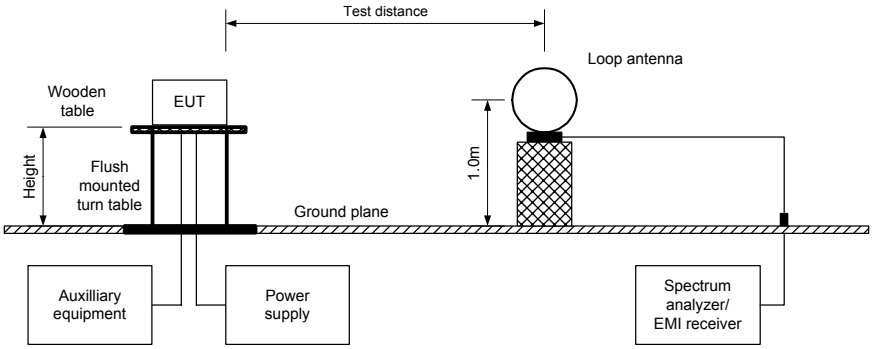
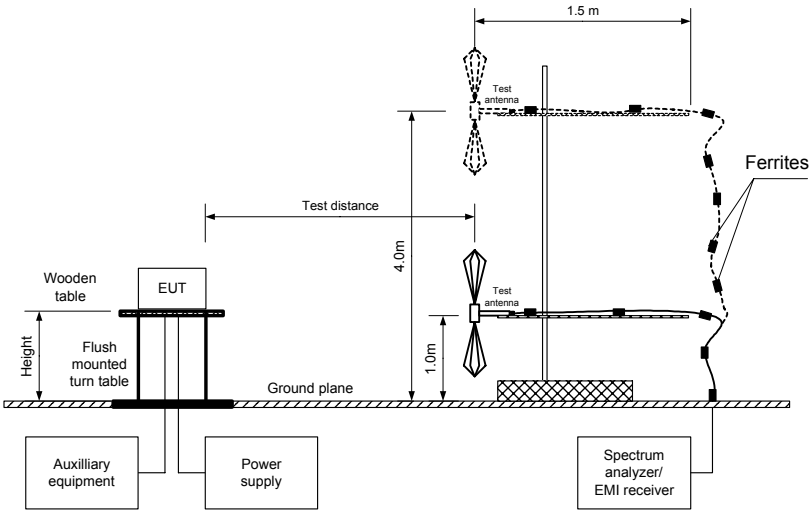


Figure 9.3.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: WLAN + BT			

Table 9.3.2 Field strength of emissions outside restricted bands

OPERATING FREQUENCY BAND:	2412 - 2462 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 - 25000 MHz
TEST DISTANCE:	3 m
MODULATION:	BT: CW, WLAN:DBPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	1 Mbps
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength of spurious, dB(µV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(µV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
Low carrier frequency									
No spurious emissions were found									Pass
Mid carrier frequency									
No spurious emissions were found									Pass
High carrier frequency									
No spurious emissions were found									Pass

*- EUT front panel refers to 0 degrees position of turntable.
**- Margin = Attenuation below carrier – specification limit.

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: WLAN + BT			

Table 9.3.3 Field strength of spurious emissions above 1 GHz within restricted bands

OPERATING FREQUENCY BAND:	2412-2462 MHz MHz
INVESTIGATED FREQUENCY RANGE:	1 - 25 GHz
TEST DISTANCE:	3 m
MODULATION:	BT: CW, WLAN:DBPSK
MODULATING SIGNAL:	PRBS
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak, average
RESOLUTION BANDWIDTH:	1000 kHz
TEST ANTENNA TYPE:	Double ridged guide

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
Bit Rate 1 Mbps											
Low carrier frequency											
2386.10	H	1.1	178	50.46	74.00	-23.54	40.16	40.16	54.00	-13.84	Pass
High carrier frequency											
2484.24	V	1.0	236	49.82	74.00	-24.18	39.72	39.72	54.00	-14.28	Pass
Bit Rate 11 Mbps											
Low carrier frequency											
2384.90	H	1.1	178	50.52	74.00	-23.48	37.42	37.42	54.00	-16.58	Pass
4824.00	V	1.0	115	58.13	74.00	-15.87	42.73	42.73	54.00	-11.27	
Mid carrier frequency											
4873.88	H	1.1	261	58.61	74.00	-15.39	43.98	43.98	54.00	-10.02	Pass
High carrier frequency											
2483.95	V	1.0	236	57.46	74.00	-16.54	38.82	38.82	54.00	-15.18	Pass
4923.98	H	1.1	211	56.26	74.00	-17.74	41.23	41.23	54.00	-12.77	

*- EUT front panel refers to 0 degrees position of turntable.
**- Margin = Measured field strength - specification limit.
***- Margin = Calculated field strength - specification limit,
where Calculated field strength = Measured field strength + average factor.

Table 9.3.4 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
100%					0

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

Table 9.3.5 Field strength of spurious emissions below 1 GHz within restricted bands

OPERATING FREQUENCY BAND:	2412-2462 MHz MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 1000 MHz
TEST DISTANCE:	3 m
MODULATION:	BT: CW, WLAN:DBPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	1 Mbps
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
RESOLUTION BANDWIDTH:	0.2 kHz (9 kHz – 150 kHz) 9.0 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz)

Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
Low carrier frequency								
No spurious emissions were found								Pass
Mid carrier frequency								
No spurious emissions were found								Pass
High carrier frequency								
No spurious emissions were found								Pass

*- Margin = Measured emission - specification limit.
**- EUT front panel refer to 0 degrees position of turntable.

Table 9.3.6 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2655 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 – 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 – 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	

Reference numbers of test equipment used

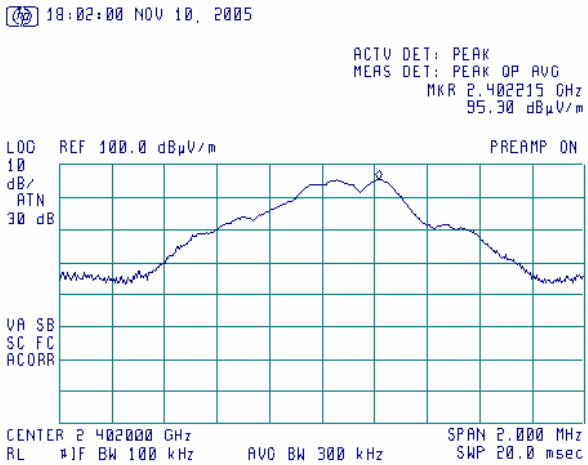
HL 0410	HL 0521	HL 0589	HL 0592	HL 0593	HL 0594	HL 0604	HL 0768
HL 1200	HL 1424	HL 1942	HL 1947	HL 1984	HL 2009	HL 2259	HL 2260
HL 2399							

Full description is given in Appendix A.

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

Plot 9.3.1 Radiated emission measurements at the low carrier frequency

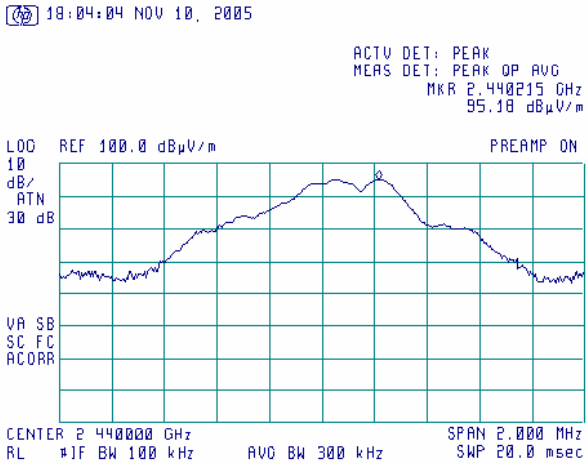
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and horizontal



The Bluetooth transmitter was measured to calculate the limit of spurious emissions because its power is less than the power of WLAN transmitter.

Plot 9.3.2 Radiated emission measurements at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

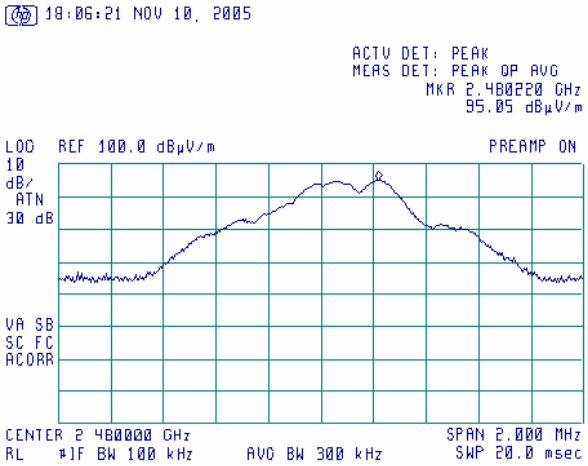


The Bluetooth transmitter was measured to calculate the limit of spurious emissions because its power is less than the power of WLAN transmitter.

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

Plot 9.3.3 Radiated emission measurements at the high carrier frequency

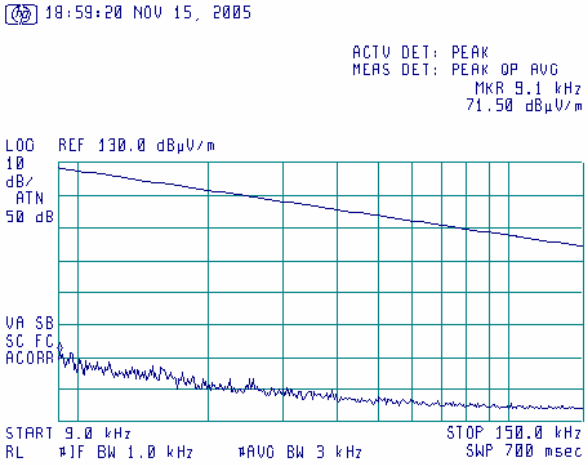
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



The Bluetooth transmitter was measured to calculate the limit of spurious emissions because its power is less than the power of WLAN transmitter.

Plot 9.3.4 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

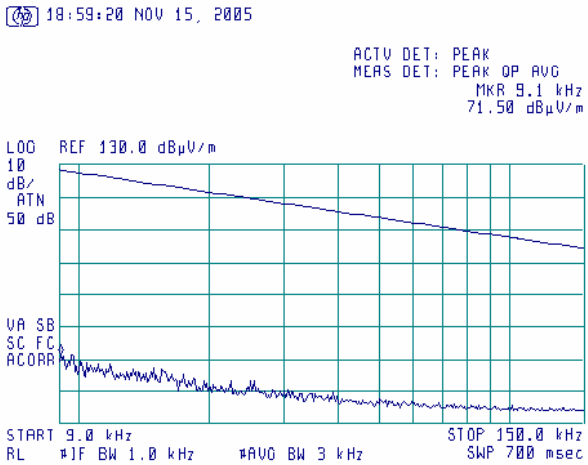
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

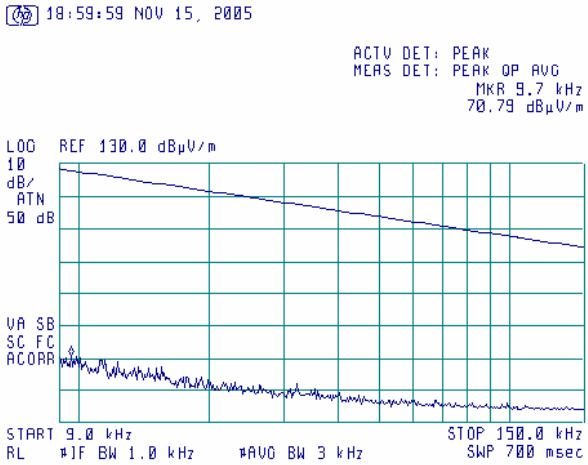
Plot 9.3.5 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 9.3.6 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

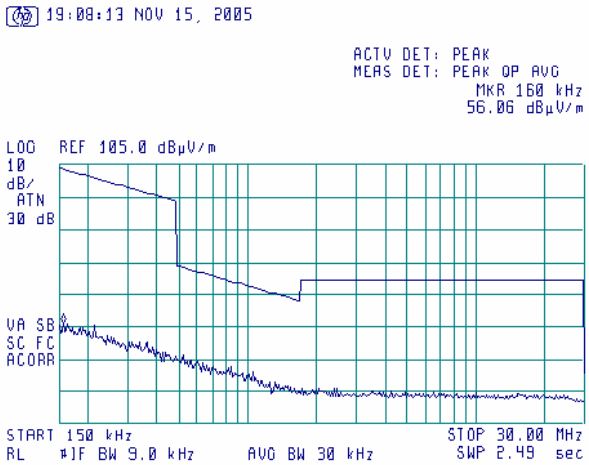
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

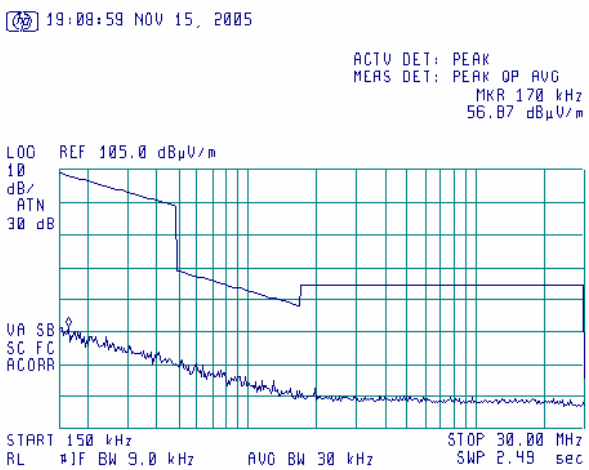
Plot 9.3.7 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 9.3.8 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

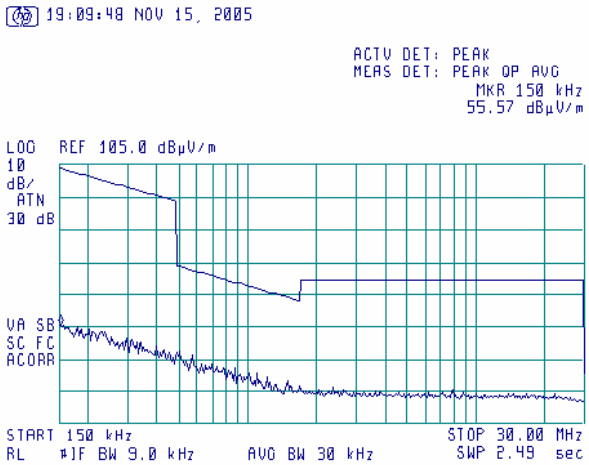
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: WLAN + BT			

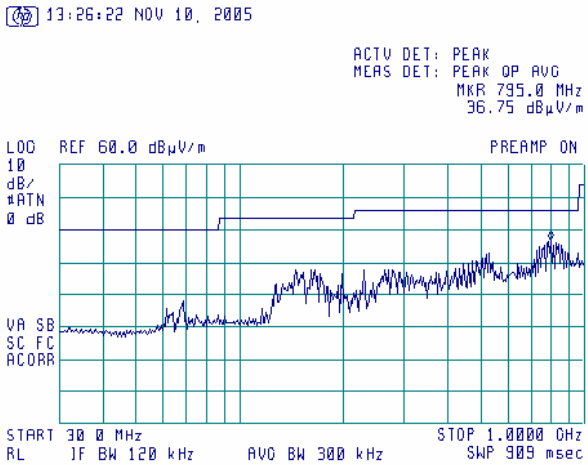
Plot 9.3.9 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 9.3.10 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

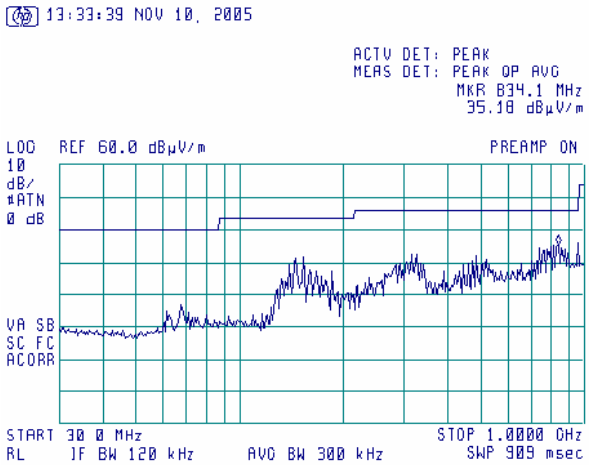
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

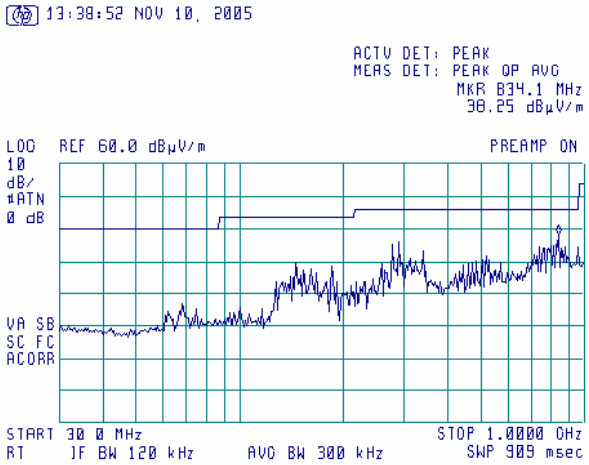
Plot 9.3.11 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.12 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

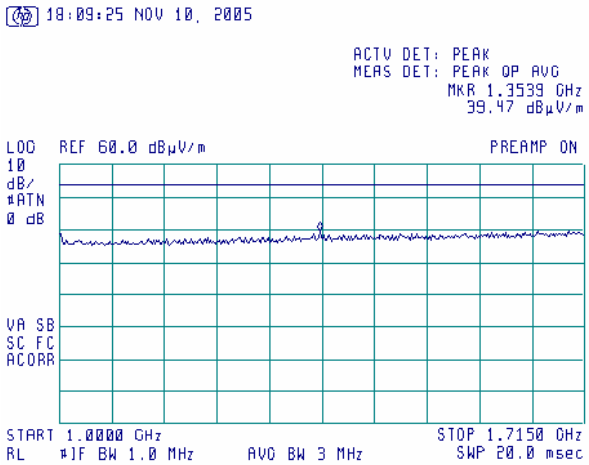
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

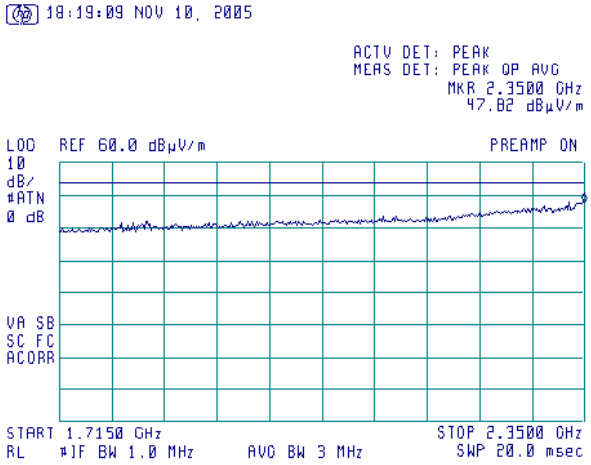
Plot 9.3.13 Radiated emission measurements from 1000 to 1715 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.14 Radiated emission measurements from 1715 to 2350 MHz at the low carrier frequency

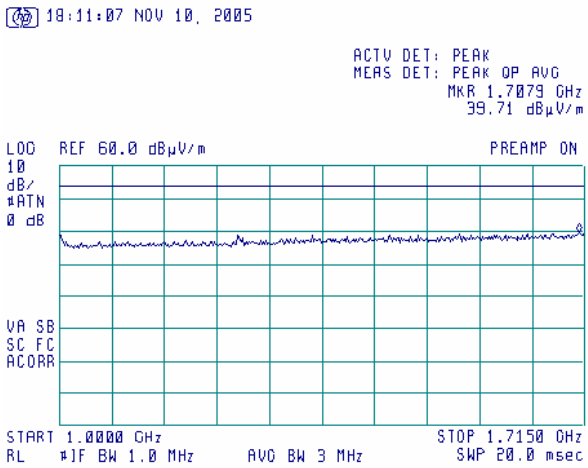
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

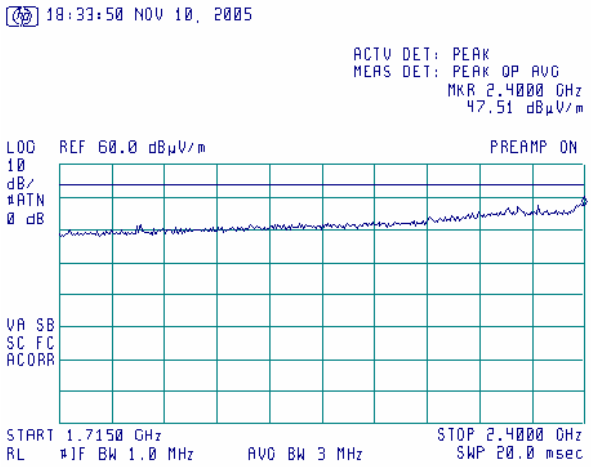
Plot 9.3.15 Radiated emission measurements from 1000 to 1715 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.16 Radiated emission measurements from 1715 to 2400 MHz at the mid carrier frequency

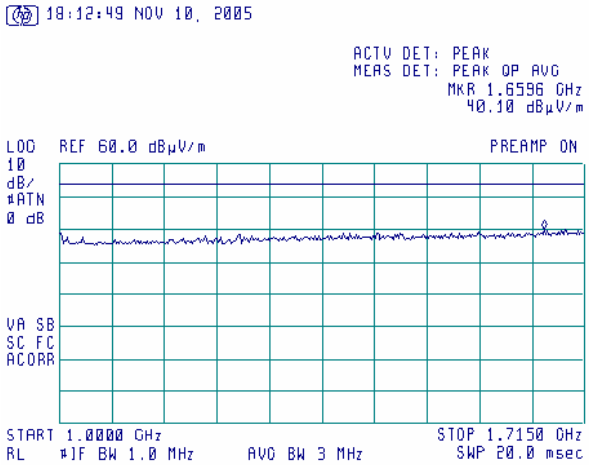
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

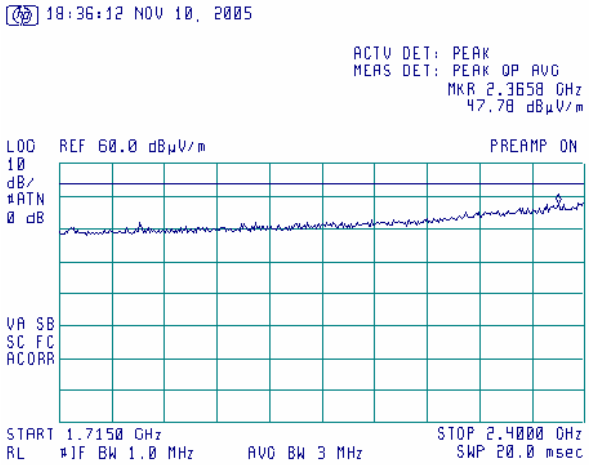
Plot 9.3.17 Radiated emission measurements from 1000 to 1715 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.18 Radiated emission measurements from 1715 to 2400 MHz at the high carrier frequency

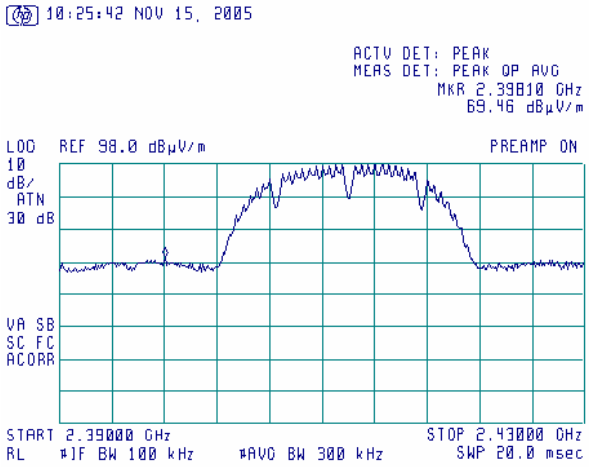
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

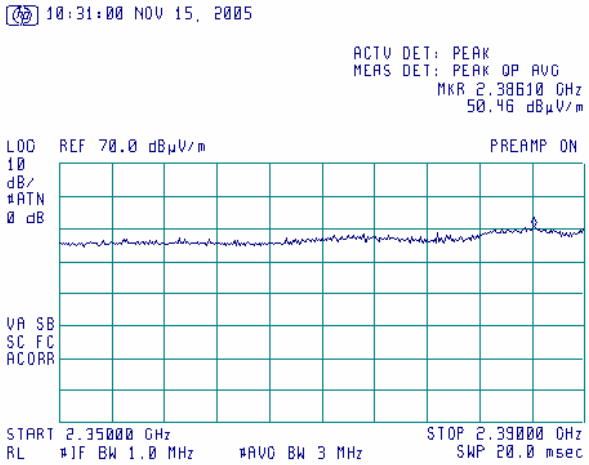
Plot 9.3.19 Radiated emission measurements at band edge at the low carrier frequency, bit rate 1 Mbps

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.20 Radiated emission measurements at band edge at the low carrier frequency, bit rate 1 Mbps

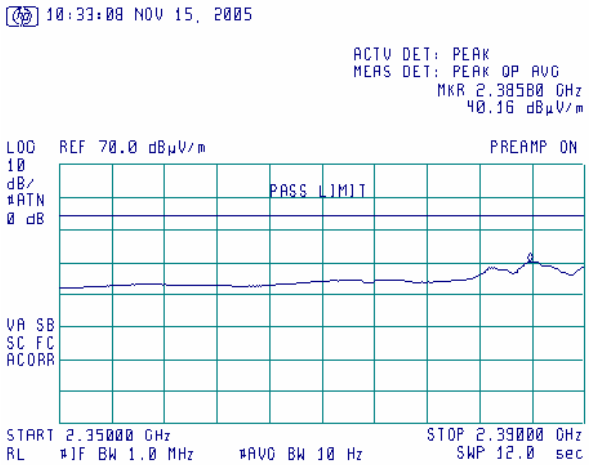
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: WLAN + BT			

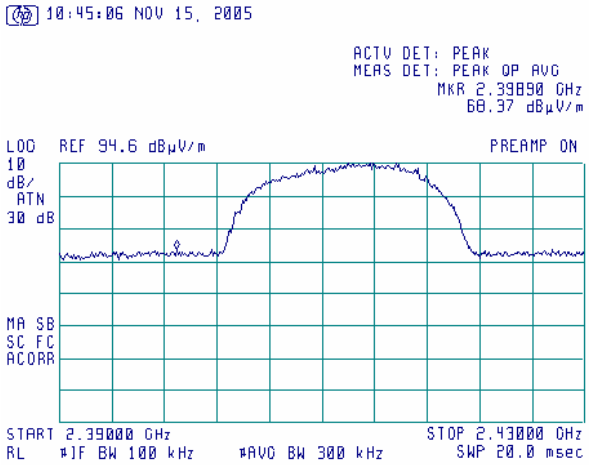
Plot 9.3.21 Radiated emission measurements at band edge at the low carrier frequency, bit rate 1 Mbps

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.22 Radiated emission measurements at band edge at the low carrier frequency, bit rate 11 Mbps

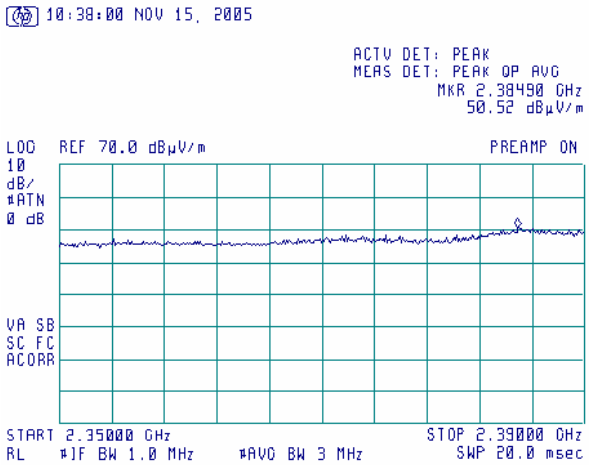
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

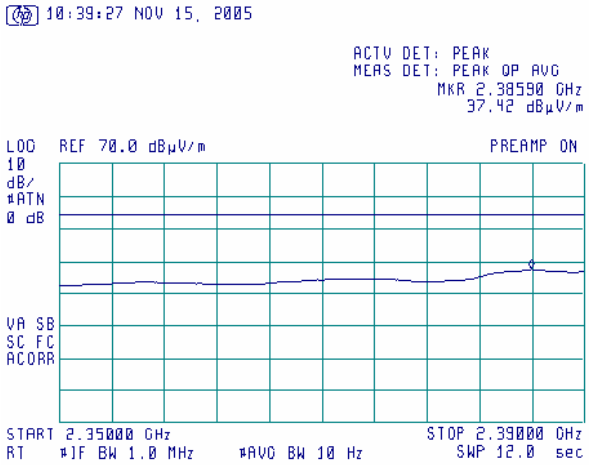
Plot 9.3.23 Radiated emission measurements at band edge at the low carrier frequency, bit rate 11 Mbps

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.24 Radiated emission measurements at band edge at the low carrier frequency, bit rate 11 Mbps

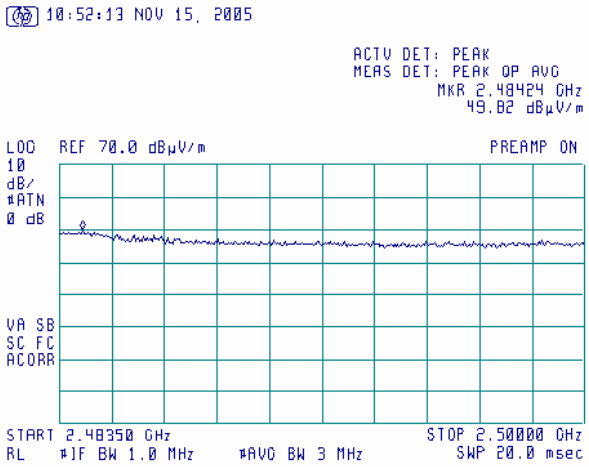
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

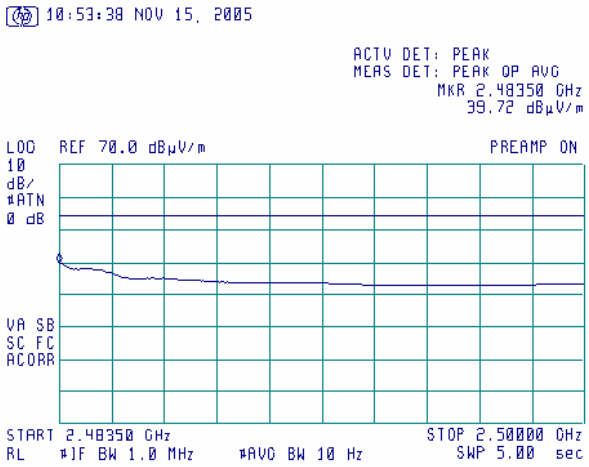
Plot 9.3.25 Radiated emission measurements at band edge at the high carrier frequency, bit rate 1 Mbps

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.26 Radiated emission measurements at band edge at the high carrier frequency, bit rate 1 Mbps

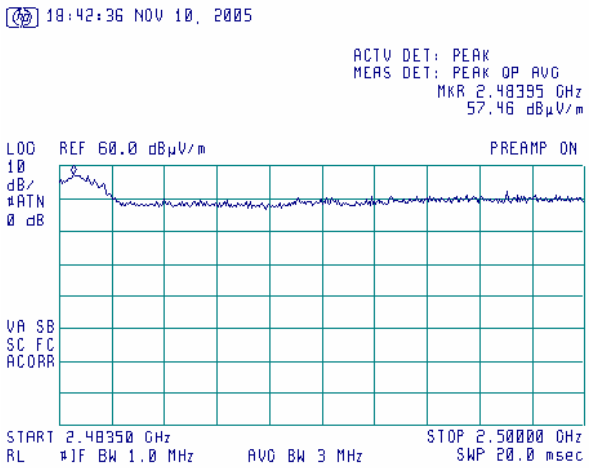
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

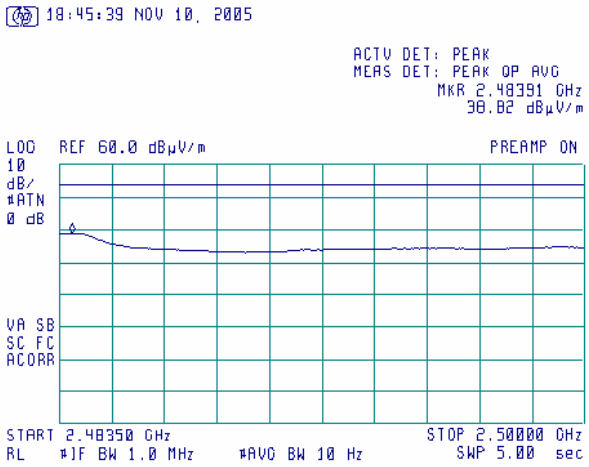
Plot 9.3.27 Radiated emission measurements at band edge at the high carrier frequency, bit rate 11 Mbps

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.28 Radiated emission measurements at band edge at the high carrier frequency, bit rate 11 Mbps

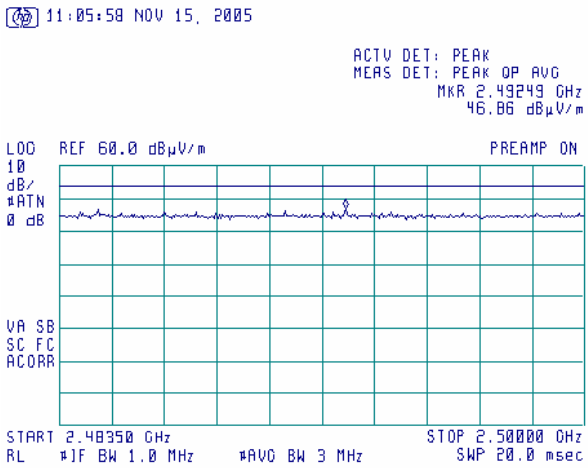
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

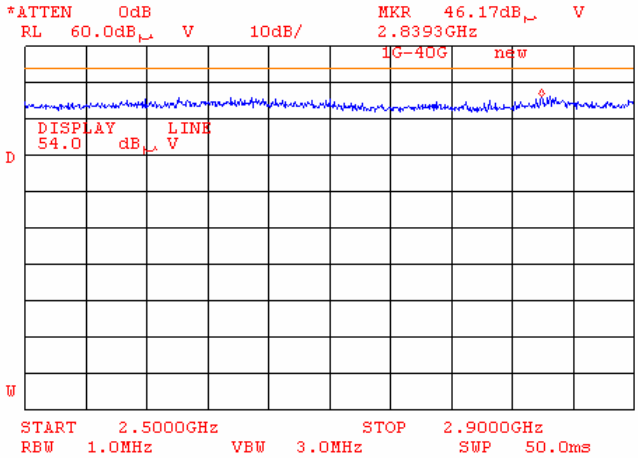
Plot 9.3.29 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.30 Radiated emission measurements from 2500 to 2900 MHz at the low carrier frequency

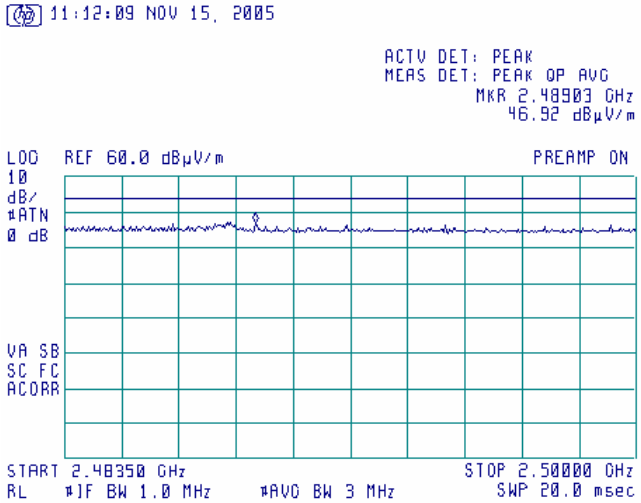
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

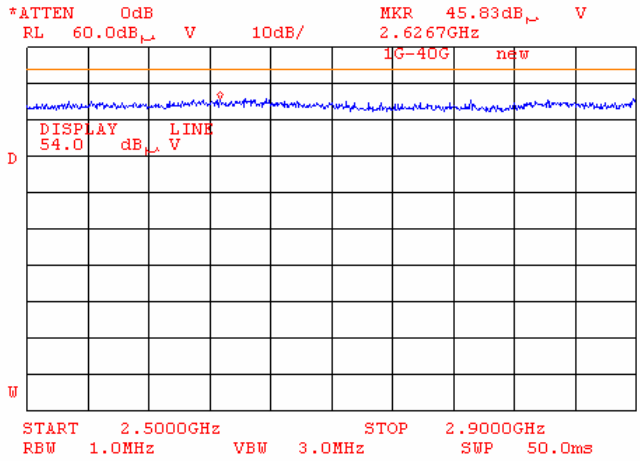
Plot 9.3.31 Radiated emission measurements from 2483.5 to 2500 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.32 Radiated emission measurements from 2500 to 2900 MHz at the mid carrier frequency

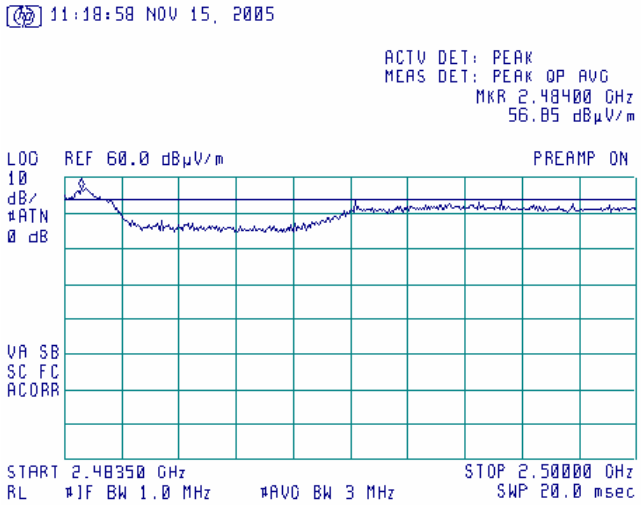
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: WLAN + BT			

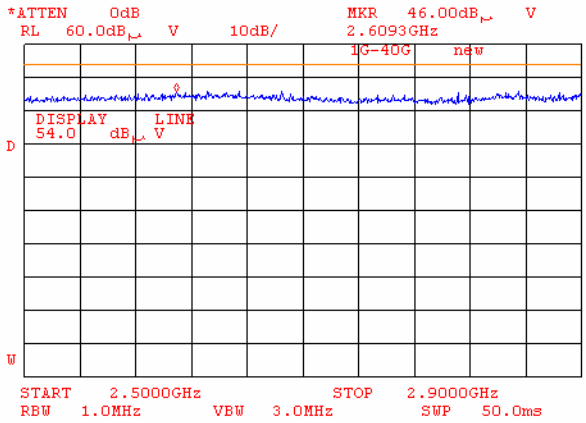
Plot 9.3.33 Radiated emission measurements from 24835 to 2500 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.34 Radiated emission measurements from 2500 to 2900 MHz at the high carrier frequency

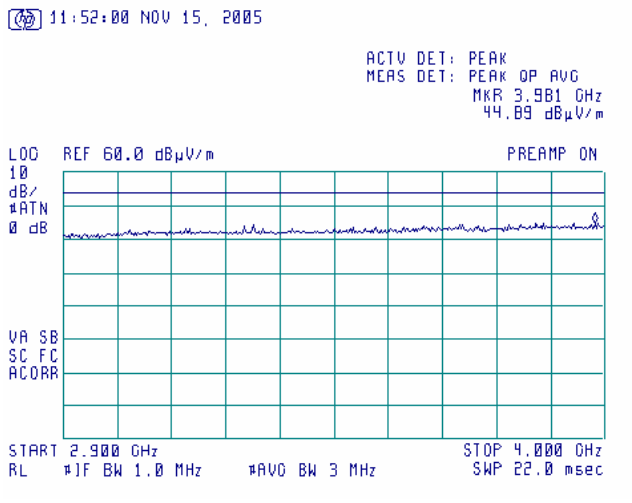
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

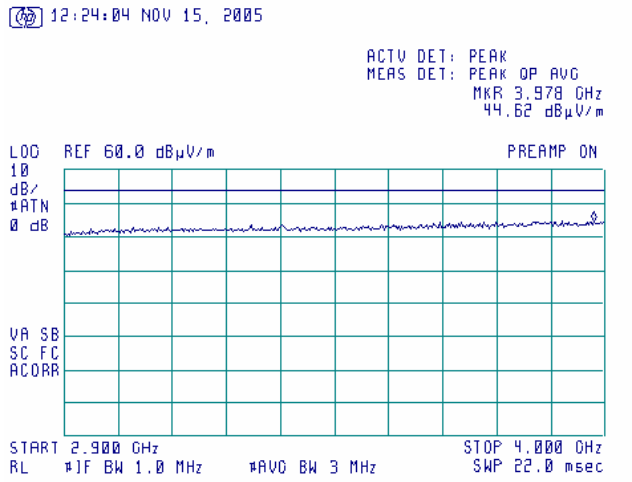
Plot 9.3.35 Radiated emission measurements from 2900 to 4000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.36 Radiated emission measurements from 2900 to 4000 MHz at the mid carrier frequency

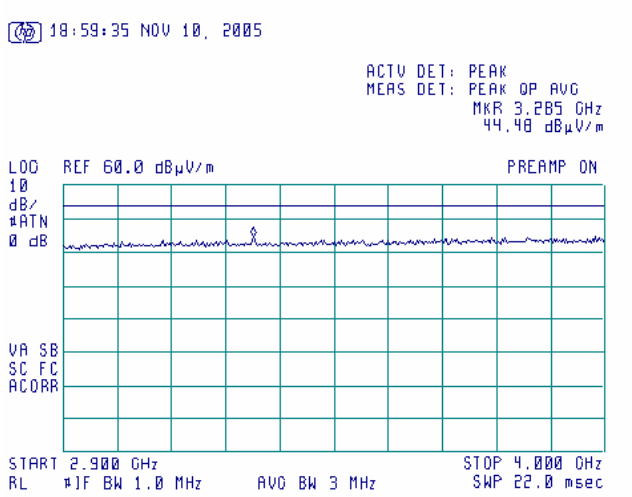
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

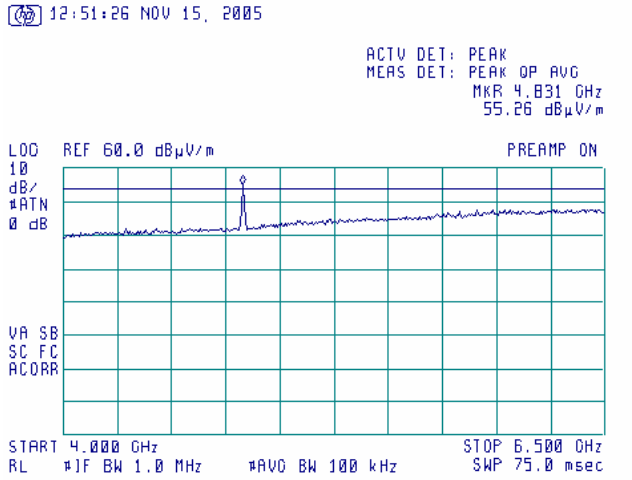
Plot 9.3.37 Radiated emission measurements from 2900 to 4000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.38 Radiated emission measurements from 4000 to 6500 MHz at the low carrier frequency

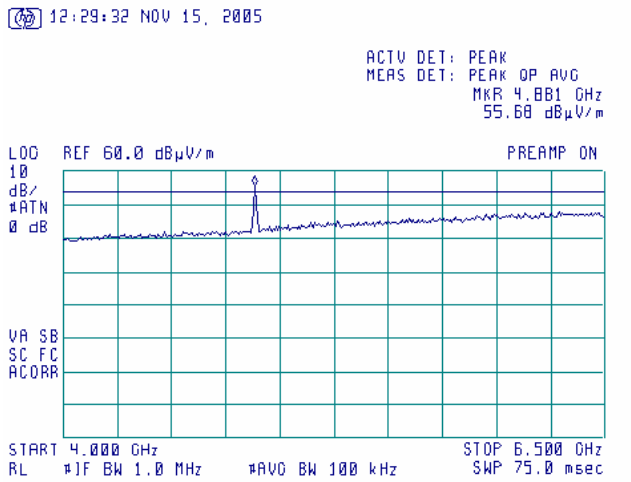
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

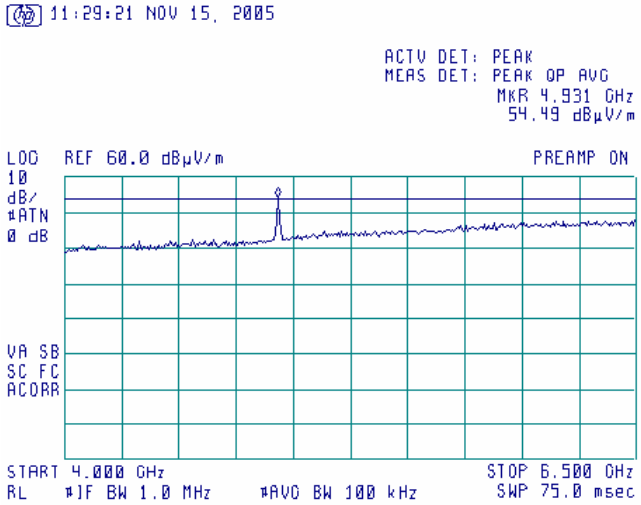
Plot 9.3.39 Radiated emission measurements from 4000 to 6500 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.40 Radiated emission measurements from 4000 to 6500 MHz at the high carrier frequency

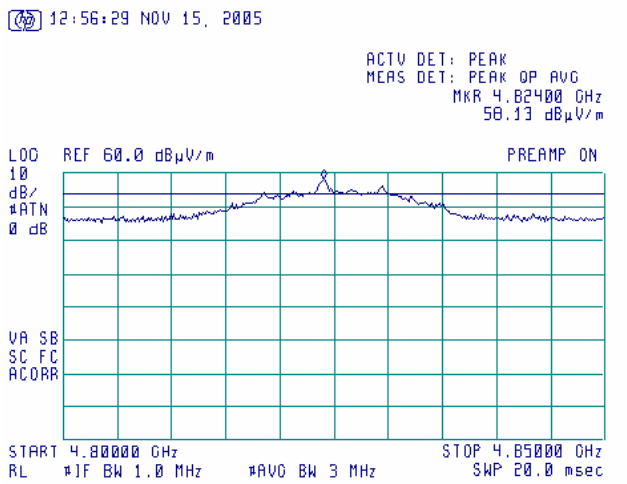
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

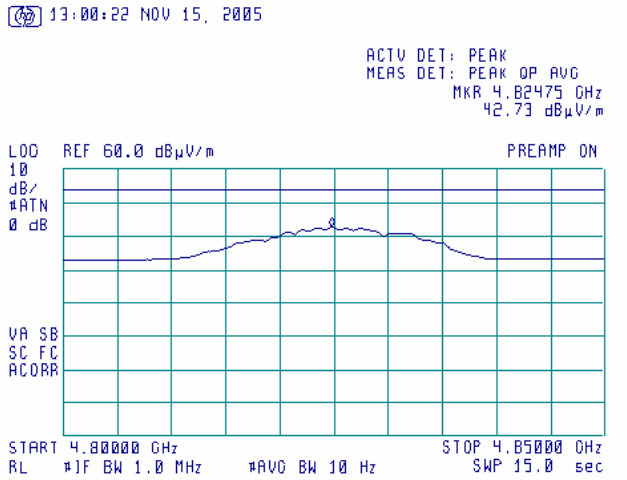
Plot 9.3.41 Radiated emission measurements from 4800 to 4850 MHz at the low carrier frequency (WLAN second harmonic)

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 9.3.42 Radiated emission measurements from 4800 to 4850 MHz at the low carrier frequency (WLAN second harmonic)

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

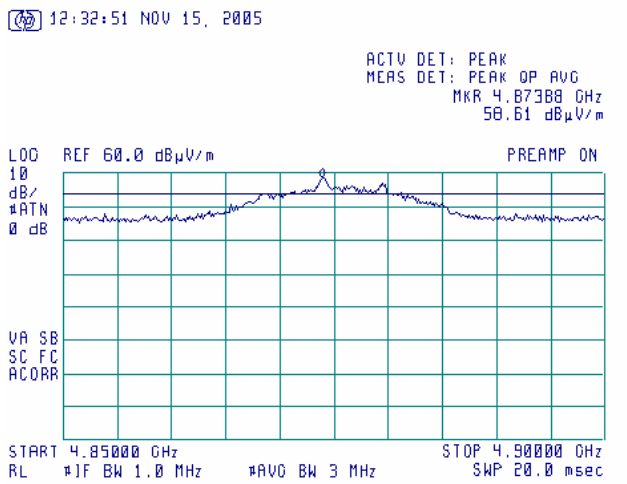


WLAN: 4824 MHz 42.73 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

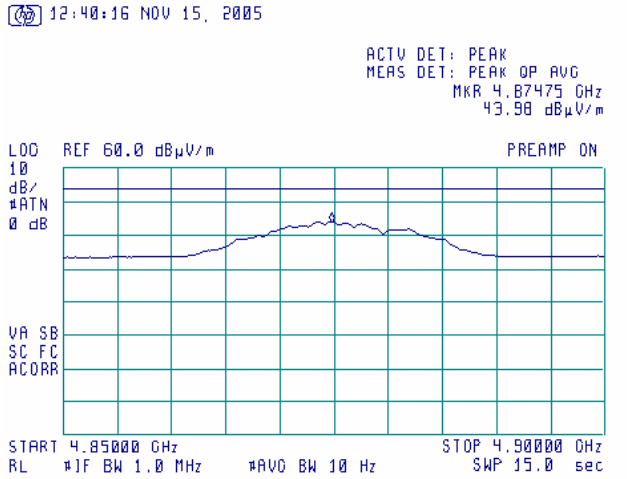
Plot 9.3.43 Radiated emission measurements from 4850 to 4900 MHz at the mid carrier frequency (WLAN second harmonic)

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Plot 9.3.44 Radiated emission measurements from 4850 to 4900 MHz at the mid carrier frequency (WLAN and BT second harmonic)

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal

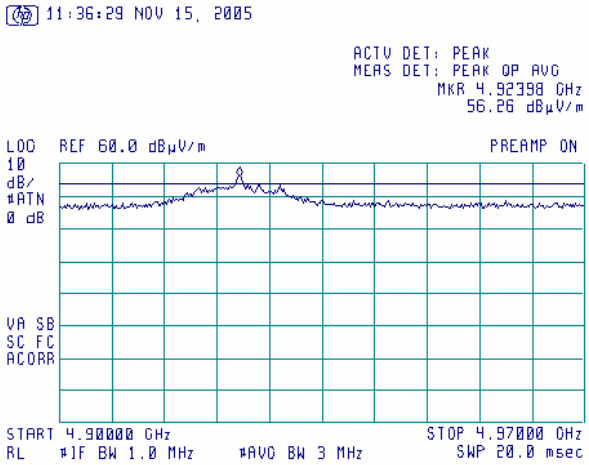


WLAN: 4874 MHz 43.98 dBµV/m

Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

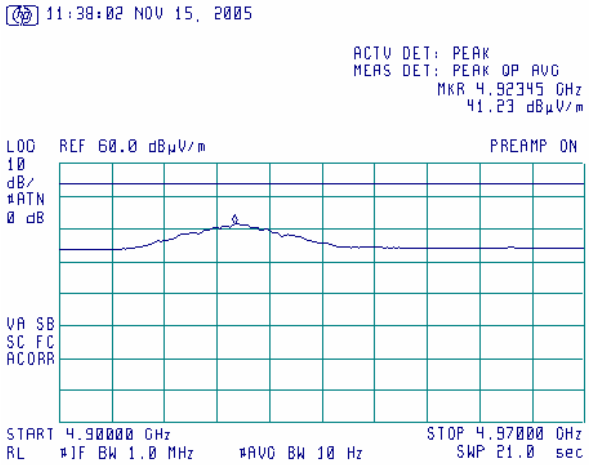
Plot 9.3.45 Radiated emission measurements from 4900 to 4970 MHz at the high carrier frequency (WLAN and BT second harmonic)

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Plot 9.3.46 Radiated emission measurements from 4900 to 4970 MHz at the high carrier frequency (WLAN and BT second harmonic)

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal

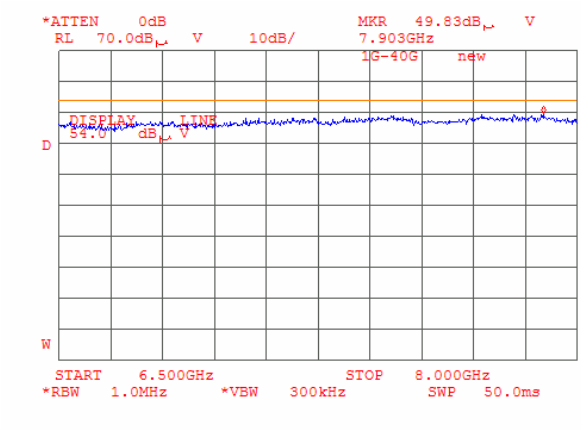


WLAN: 4924 MHz 41.23 dBµV/m

Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: WLAN + BT			

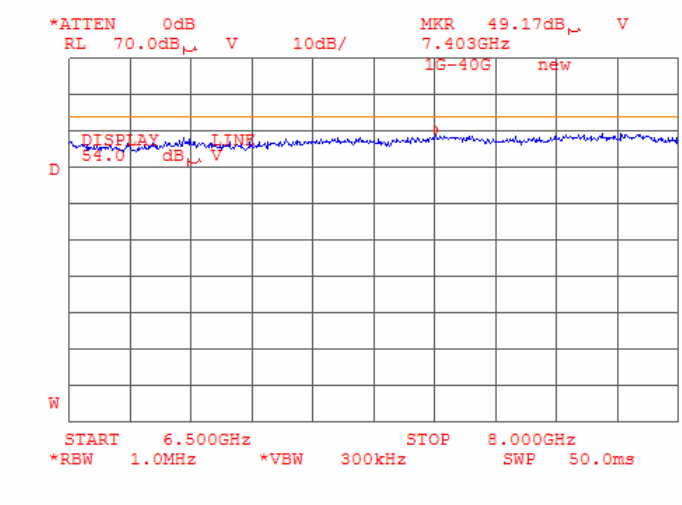
Plot 9.3.47 Radiated emission measurements from 6500 to 8000 MHz at the low carrier frequency (WLAN + BT)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.48 Radiated emission measurements from 6500 to 8000 MHz at the mid carrier frequency (WLAN + BT)

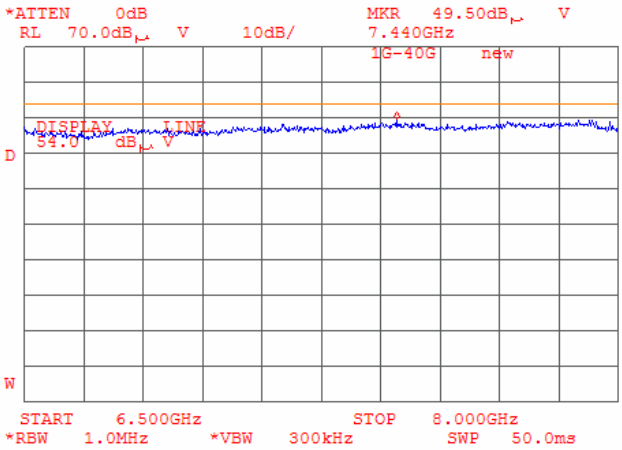
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: WLAN + BT			

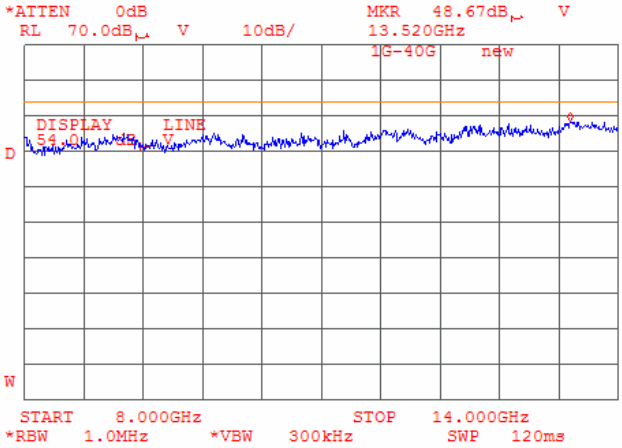
Plot 9.3.49 Radiated emission measurements from 6500 to 8000 MHz at the high carrier frequency (WLAN + BT)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.50 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency (WLAN + BT)

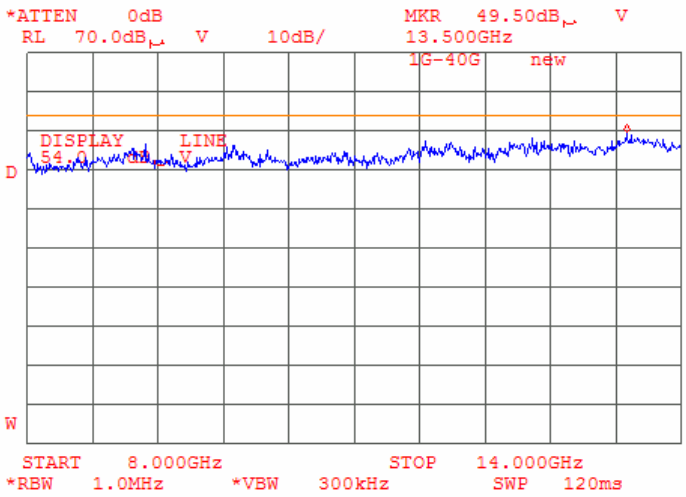
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

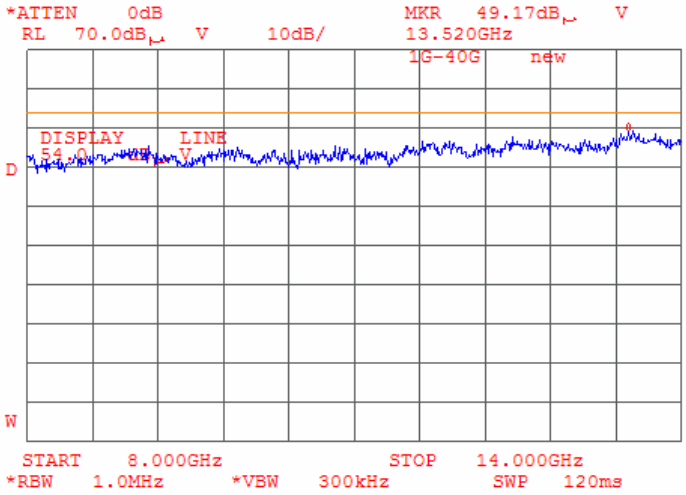
Plot 9.3.51 Radiated emission measurements from 8000 to 14000 MHz at the mid carrier frequency (WLAN + BT)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.52 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency (WLAN + BT)

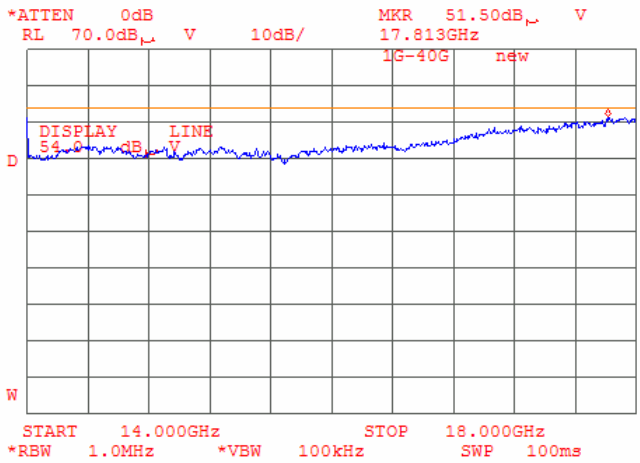
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

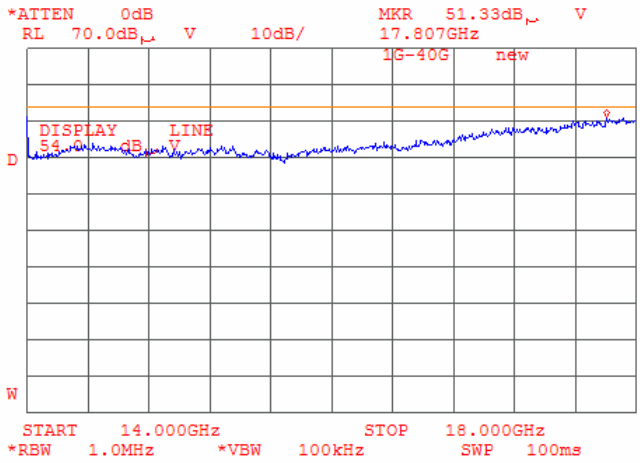
Plot 9.3.53 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency (WLAN + BT)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.54 Radiated emission measurements from 14000 to 18000 MHz at the mid carrier frequency (WLAN + BT)

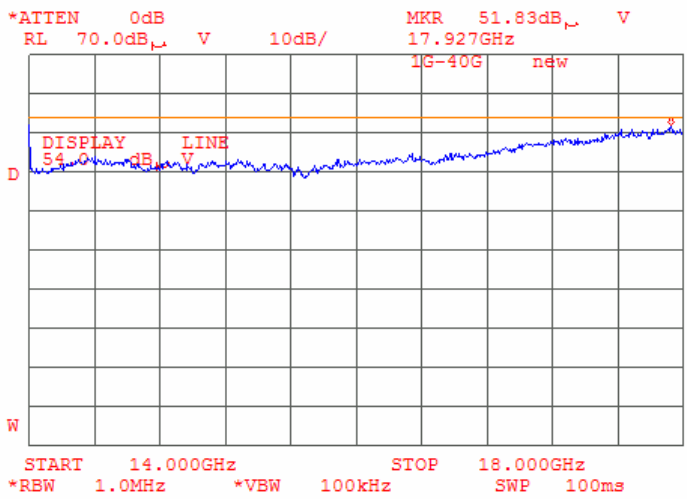
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks: WLAN + BT			

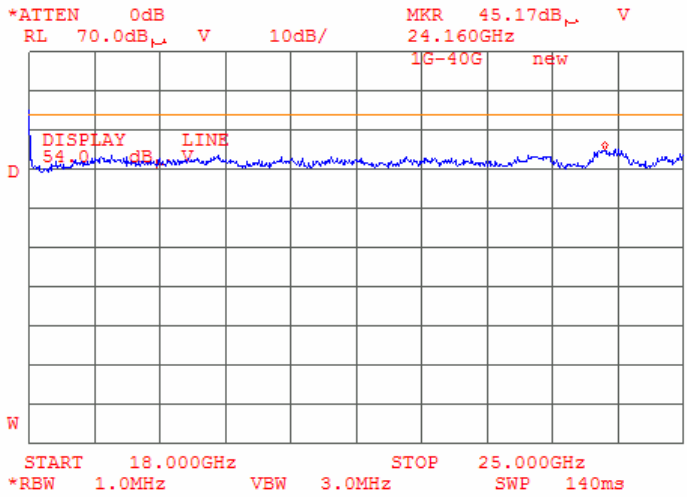
Plot 9.3.55 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency (WLAN + BT)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.56 Radiated emission measurements from 18000 to 25000 MHz at the low carrier frequency (WLAN + BT)

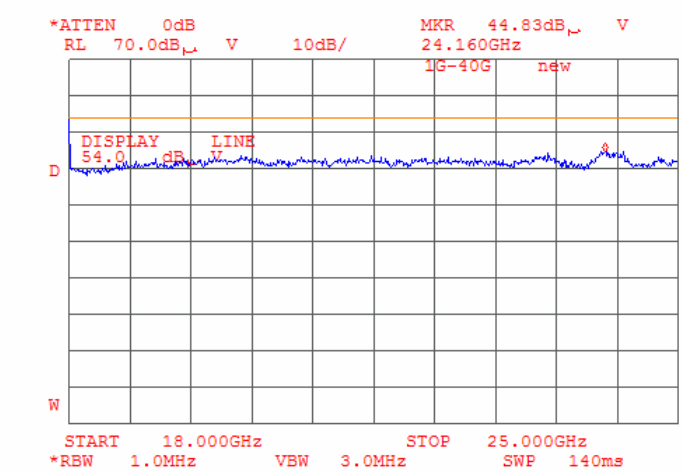
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**FCC section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 11:28:21 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks: WLAN + BT			

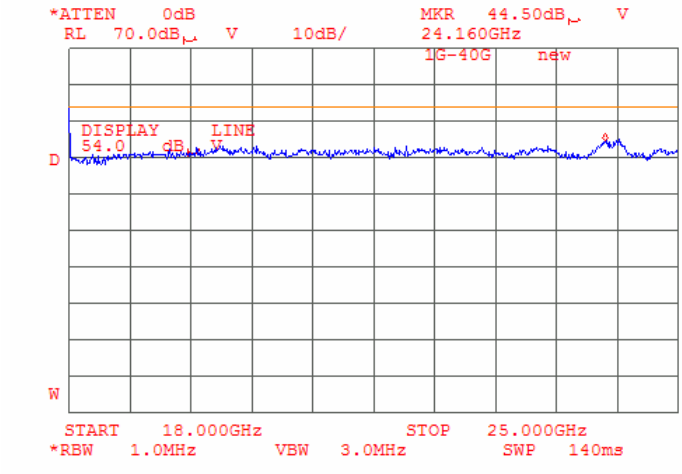
Plot 9.3.57 Radiated emission measurements from 18000 to 25000 MHz at the mid carrier frequency (WLAN + BT)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 9.3.58 Radiated emission measurements from 18000 to 25000 MHz at the high carrier frequency (WLAN + BT)

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

9.4 Peak spectral power density

9.4.1 General

This test was performed to measure the peak spectral power density at the transmitter RF antenna connector. Specification test limits are given in Table 9.4.1.

Table 9.4.1 Peak spectral power density limits

Assigned frequency range, MHz	Measurement bandwidth, kHz	Peak spectral power density, dBm
2400.0 – 2483.5	3.0	8.0

9.4.2 Test procedure

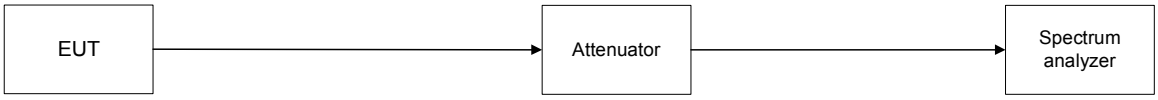
9.4.2.1 The EUT was set up as shown in Figure 9.4.1, energized and its proper operation was checked.

9.4.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

9.4.2.3 The frequency span of spectrum analyzer was set to capture the entire 6 dB band of the transmitter, in peak hold mode with resolution bandwidth set to 3.0 kHz, video bandwidth wider than resolution bandwidth, auto sweep time and sufficient number of sweeps was allowed for trace stabilization. The spectrum lines spacing was verified to be wider than 3 kHz. Otherwise the resolution bandwidth was reduced until individual spectrum lines were resolved and the power of individual spectrum lines was integrated over 3 kHz band.

9.4.2.4 The peak of emission was zoomed with span set just wide enough to capture the emission peak area and sweep time was set equal to span width divided by resolution bandwidth. Spectrum analyzer was set in peak hold mode, sufficient number of sweeps was allowed for trace stabilization and peak spectral power density was measured as provided in Table 9.4.2 and associated plots.

Figure 9.4.1 Peak spectral power density test setup



Test specification:	**Section 15.247(d), RSS-210 section A8.2(2), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 9.4.2 Peak spectral power density test results

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
MODULATION: DBPSK / DPSK / DQPSK / QPSK
MODULATING SIGNAL: PRBS
BIT RATE: 1 / 2 / 5.5 / 11 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
TRANSMITTER OUTPUT POWER: 21.1 dBm at low carrier frequency
21.1 dBm at mid carrier frequency
21.6 dBm at high carrier frequency
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 3 kHz
VIDEO BANDWIDTH: 10 kHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm/Hz	External attenuation, dB	Cable loss, dB	Peak power density, dB(mW/3 kHz)	Limit, dBm	Margin**, dB	Verdict
Bit Rate 1 Mbps							
2412	-47.60	Included	1.3	-11.53	8.0	-19.53	Pass
2437	-47.44	Included	1.3	-11.37	8.0	-19.37	Pass
2462	-49.94	Included	1.3	-13.87	8.0	-21.87	Pass
Bit Rate 2 Mbps							
2412	-46.77	Included	1.3	-10.70	8.0	-18.70	Pass
2437	-49.94	Included	1.3	-13.87	8.0	-21.87	Pass
2462	-47.60	Included	1.3	-11.53	8.0	-19.53	Pass
Bit Rate 5.5 Mbps							
2412	-47.60	Included	1.3	-11.53	8.0	-19.53	Pass
2437	-47.60	Included	1.3	-11.53	8.0	-19.53	Pass
2462	-49.27	Included	1.3	-13.20	8.0	-21.20	Pass
Bit Rate 11 Mbps							
2412	-47.27	Included	1.3	-11.20	8.0	-19.20	Pass
2437	-48.94	Included	1.3	-12.87	8.0	-20.87	Pass
2462	-48.44	Included	1.3	-12.37	8.0	-20.37	Pass

* - Peak power density = SA reading + cable loss + 10 log(3000Hz/1Hz) = SA reading + cable loss + 34.8 dB
** - Margin = Peak power density – specification limit.

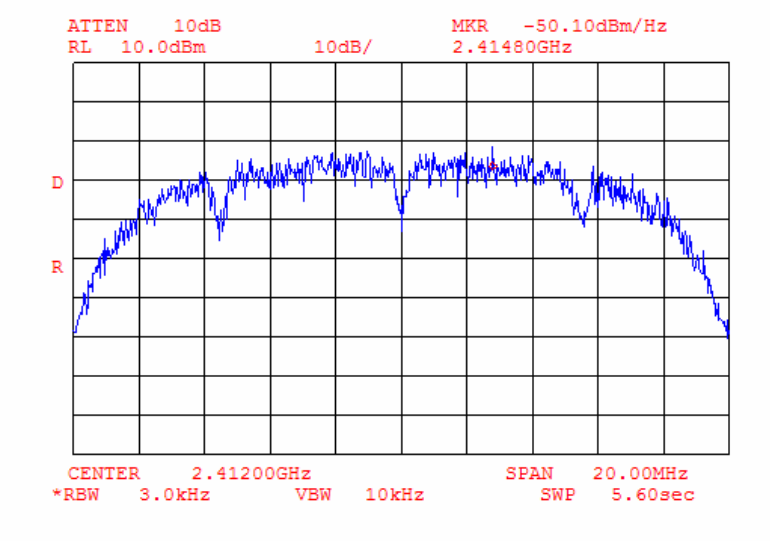
Reference numbers of test equipment used

HL 1424	HL 2425						

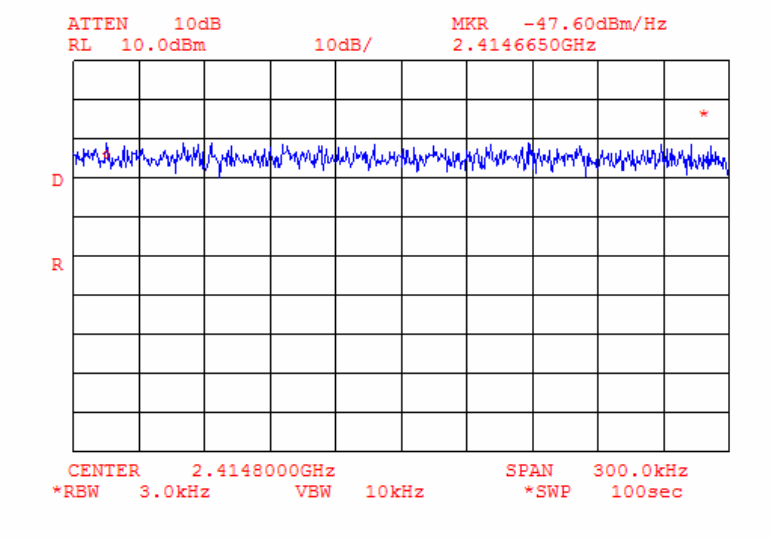
Full description is given in Appendix A.

Test specification:	**Section 15.247(d), RSS-210 section A8.2(2), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.4.1 Peak spectral power density at low frequency within 6 dB band, bit rate 1 Mbps

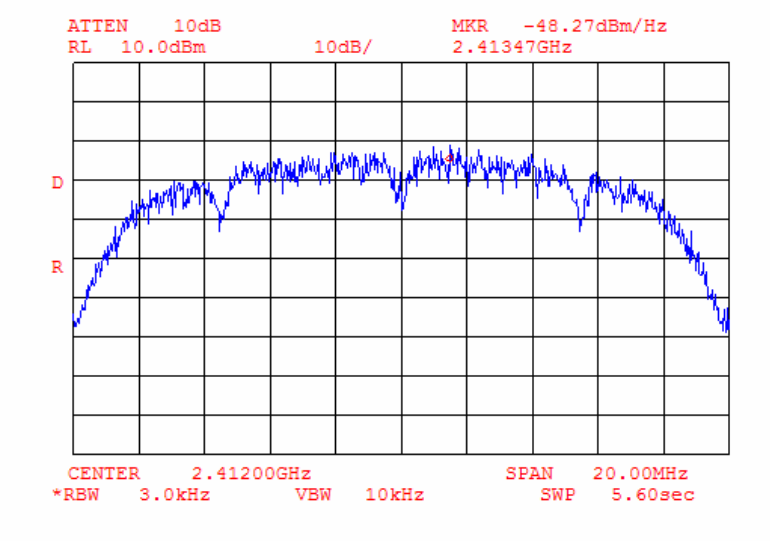


Plot 9.4.2 Peak spectral power density at low frequency zoomed at the peak, bit rate 1 Mbps

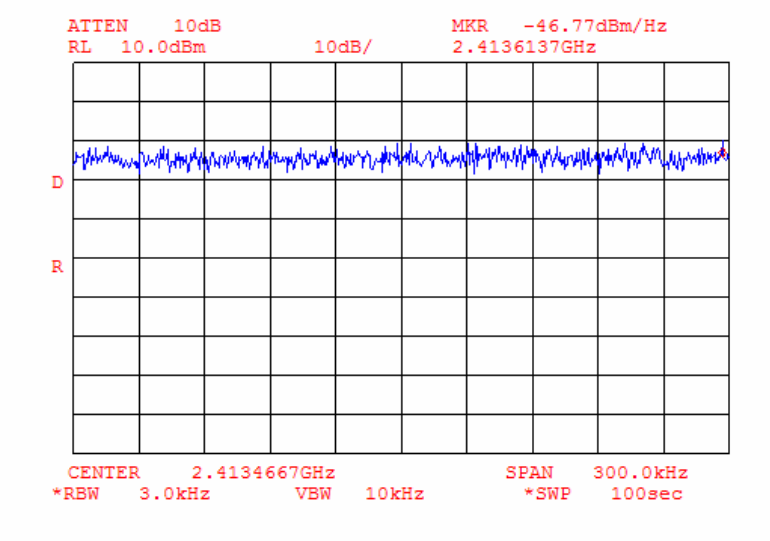


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.3 Peak spectral power density at low frequency within 6 dB band, bit rate 2 Mbps

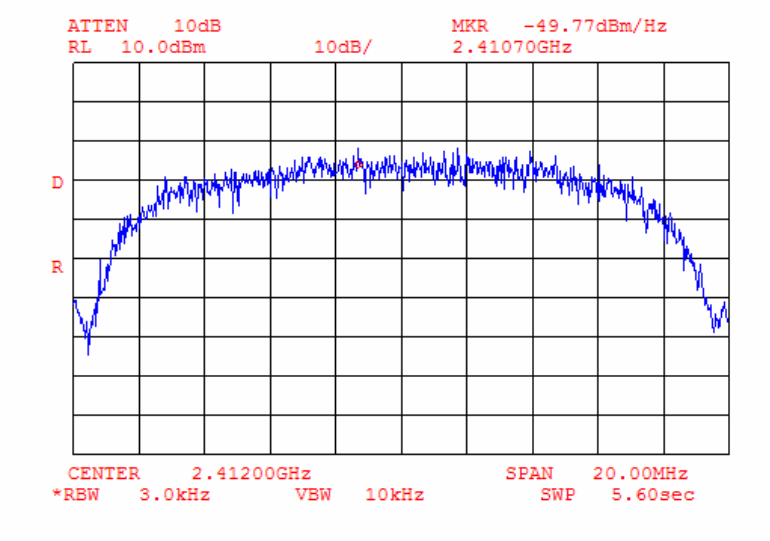


Plot 9.4.4 Peak spectral power density at low frequency zoomed at the peak, bit rate 2 Mbps

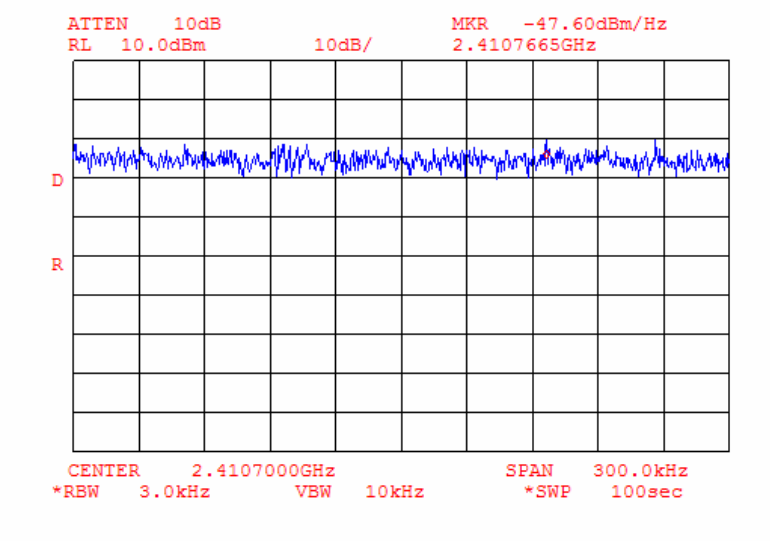


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.5 Peak spectral power density at low frequency within 6 dB band, bit rate 5.5 Mbps

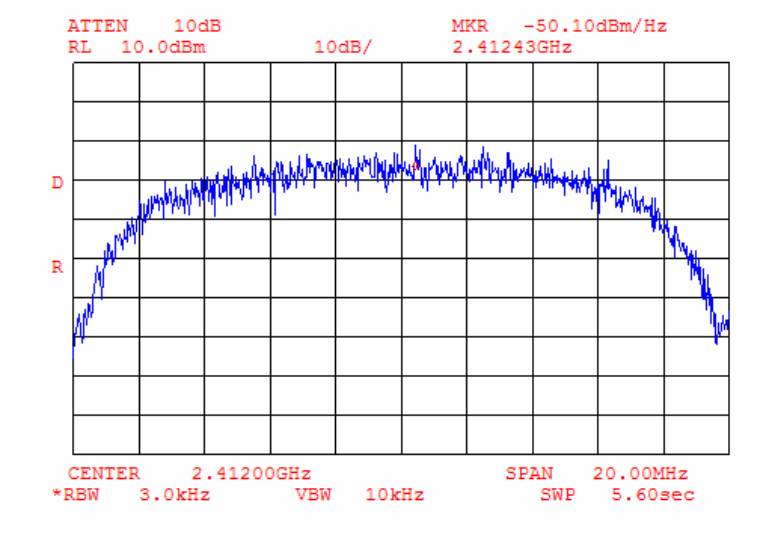


Plot 9.4.6 Peak spectral power density at low frequency zoomed at the peak, bit rate 5.5 Mbps

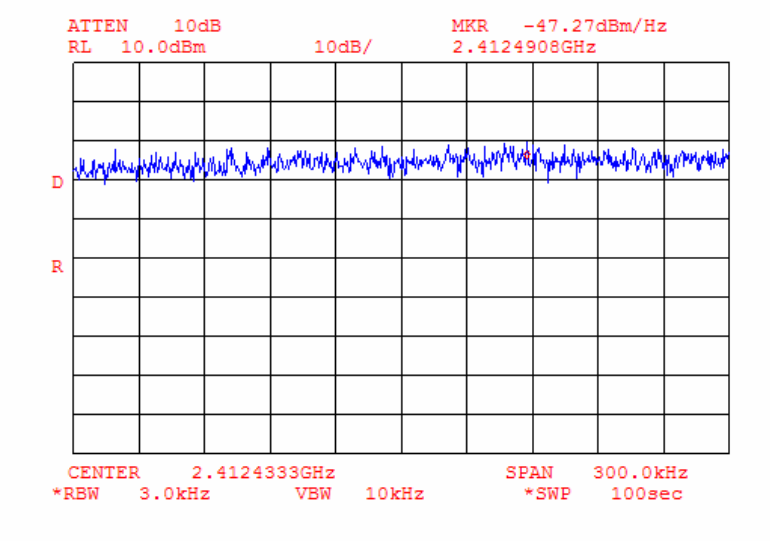


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.7 Peak spectral power density at low frequency within 6 dB band, bit rate 11 Mbps

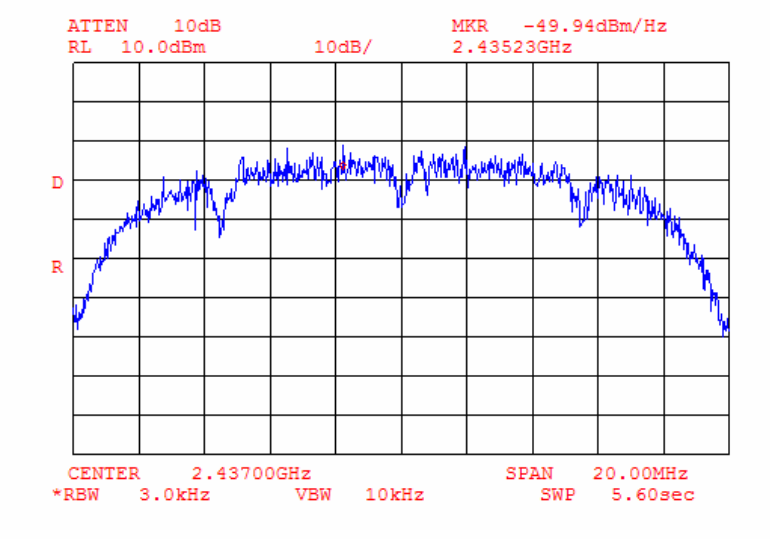


Plot 9.4.8 Peak spectral power density at low frequency zoomed at the peak, bit rate 11 Mbps

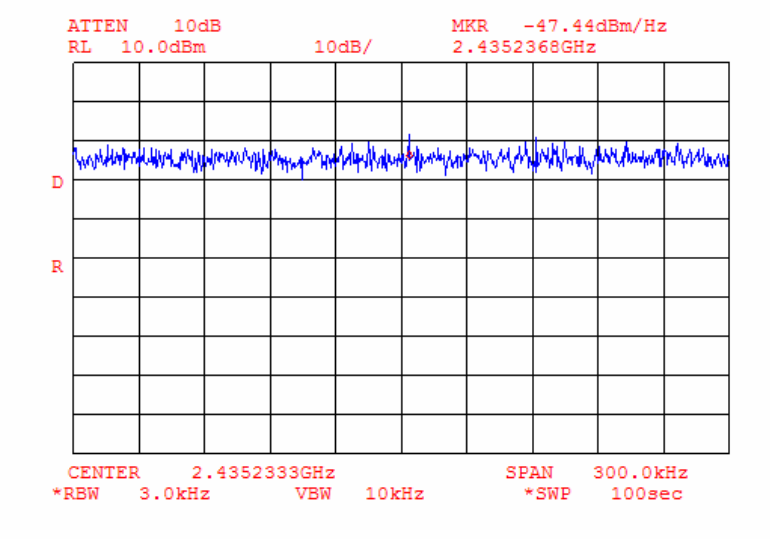


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.9 Peak spectral power density at mid frequency within 6 dB band, bit rate 1 Mbps

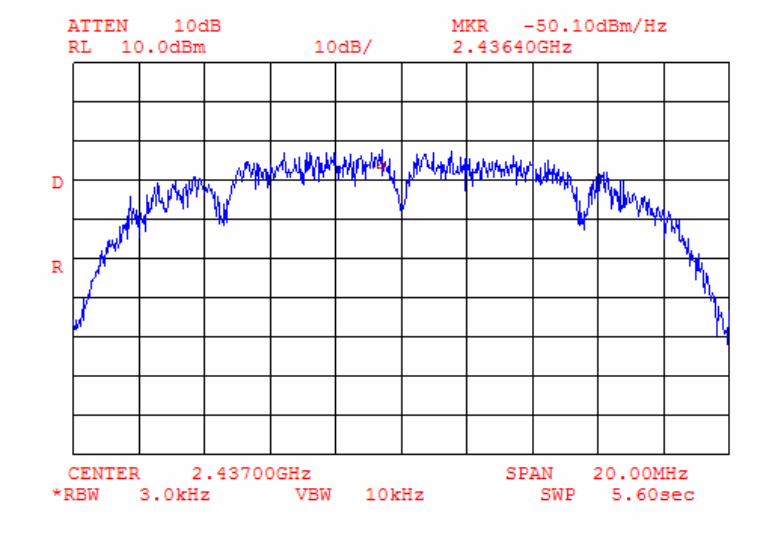


Plot 9.4.10 Peak spectral power density at mid frequency zoomed at the peak, bit rate 1 Mbps

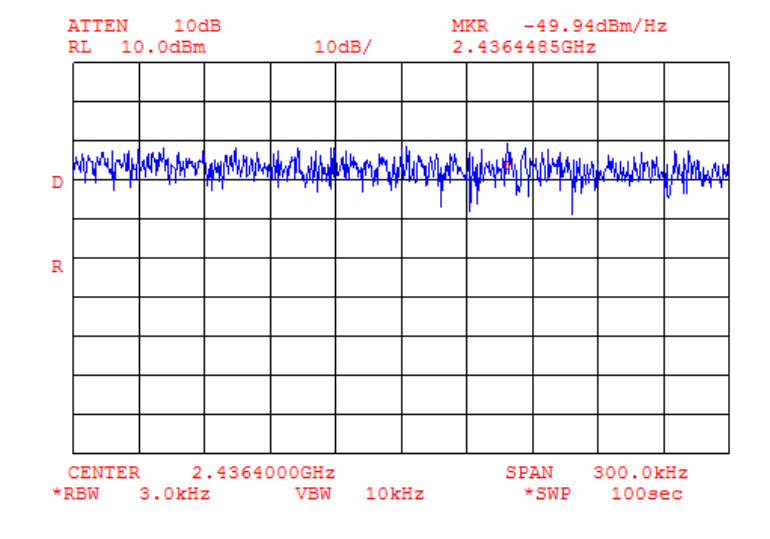


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.11 Peak spectral power density at mid frequency within 6 dB band, bit rate 2 Mbps

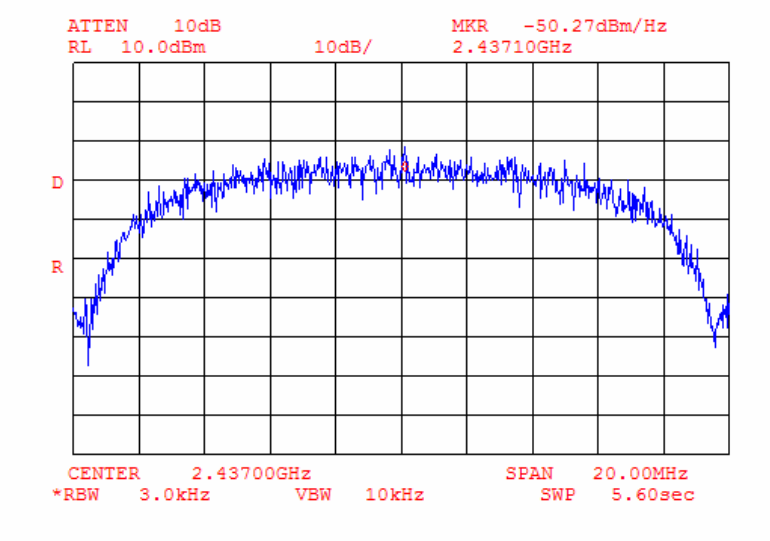


Plot 9.4.12 Peak spectral power density at mid frequency zoomed at the peak, bit rate 2 Mbps

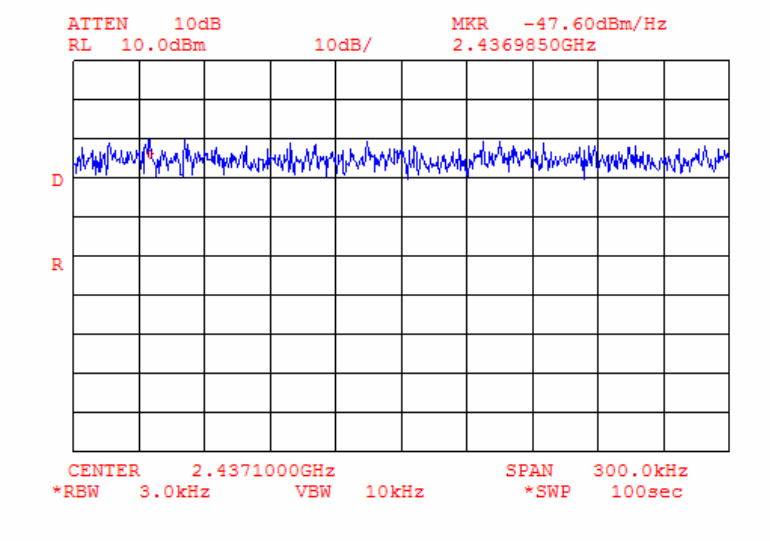


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.13 Peak spectral power density at mid frequency within 6 dB band, bit rate 5.5 Mbps

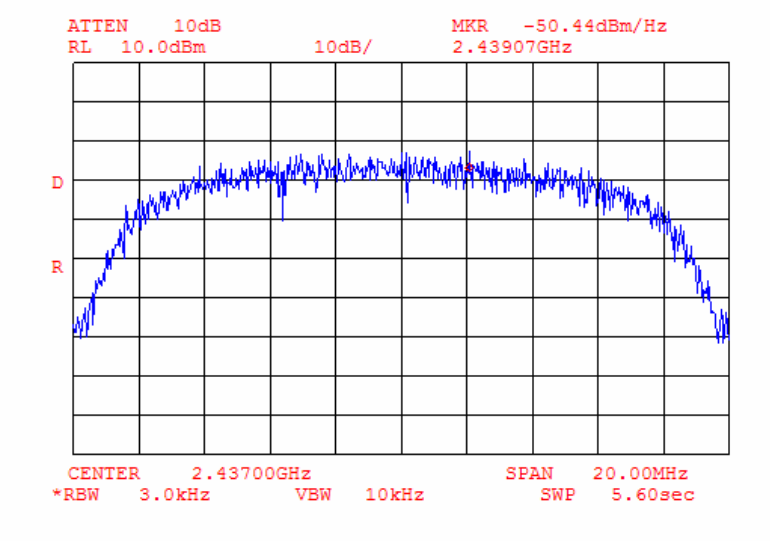


Plot 9.4.14 Peak spectral power density at mid frequency zoomed at the peak, bit rate 5.5 Mbps

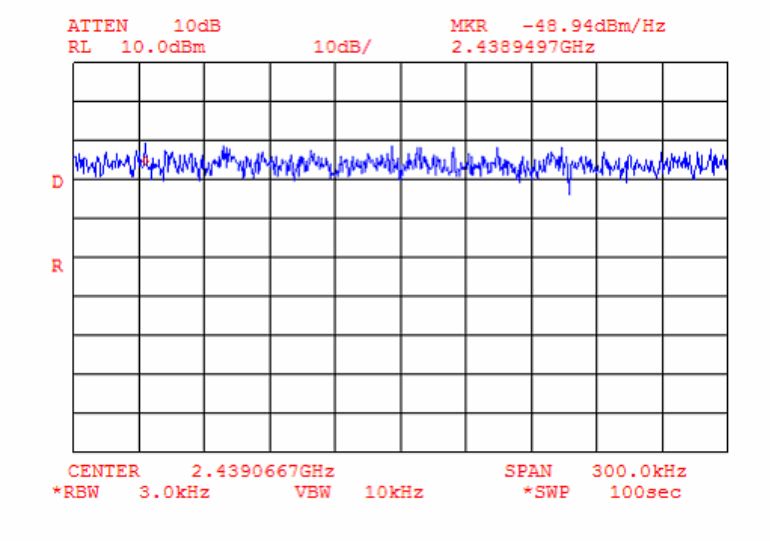


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.15 Peak spectral power density at mid frequency within 6 dB band, bit rate 11 Mbps

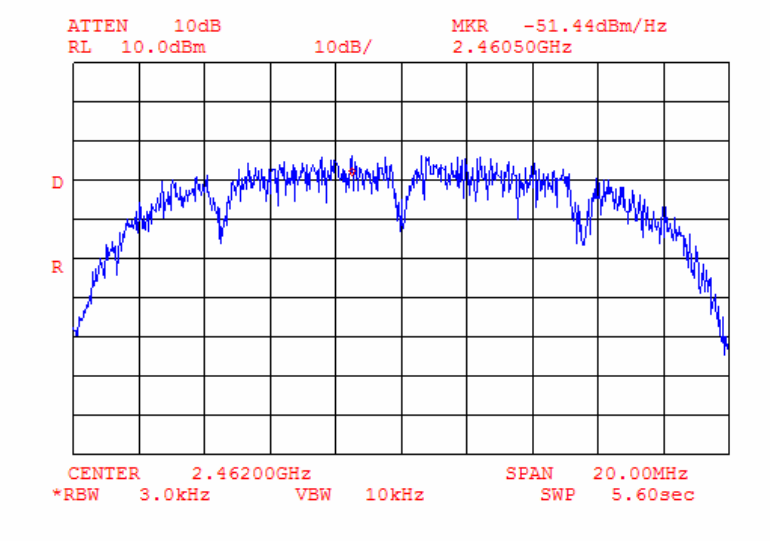


Plot 9.4.16 Peak spectral power density at mid frequency zoomed at the peak, bit rate 11 Mbps

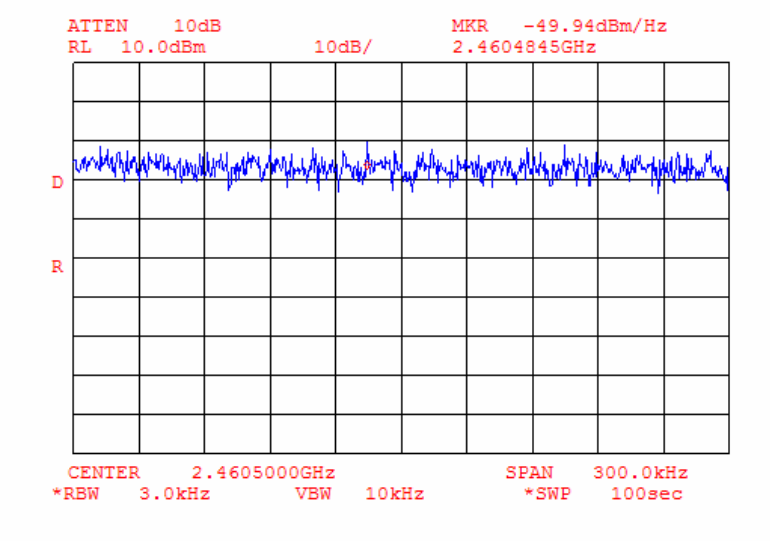


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.17 Peak spectral power density at high frequency within 6 dB band, bit rate 1 Mbps

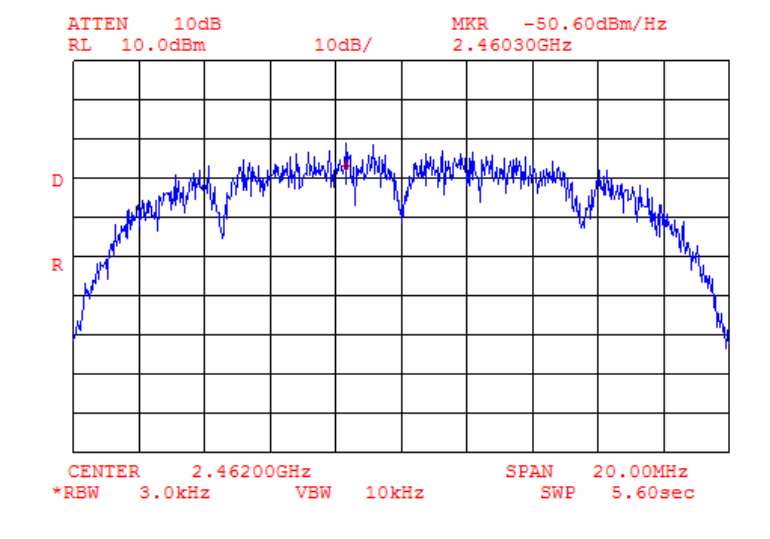


Plot 9.4.18 Peak spectral power density at high frequency zoomed at the peak, bit rate 1 Mbps

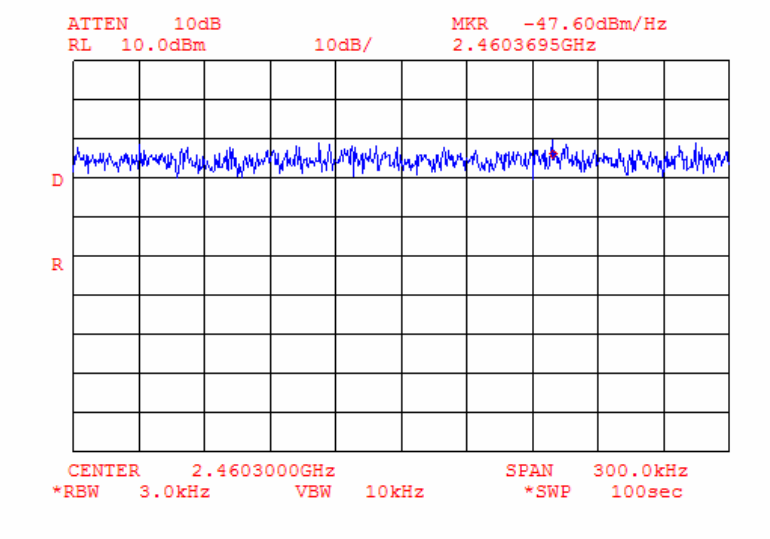


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.19 Peak spectral power density at high frequency within 6 dB band, bit rate 2 Mbps

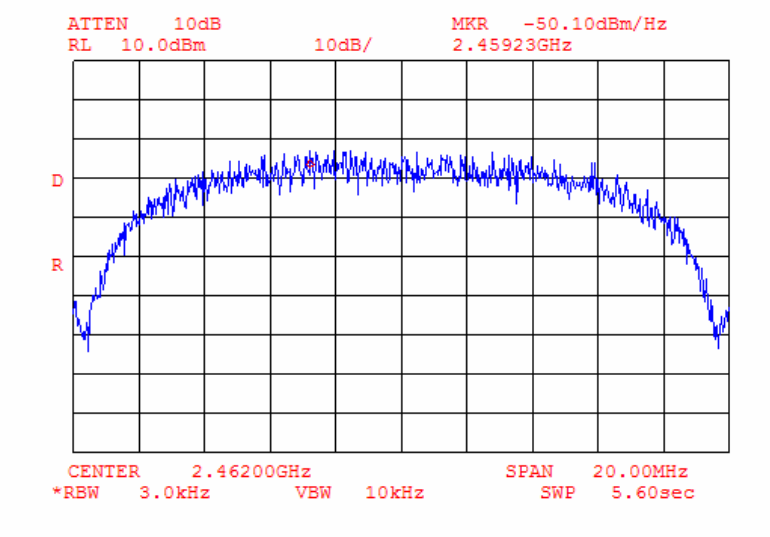


Plot 9.4.20 Peak spectral power density at high frequency zoomed at the peak, bit rate 2 Mbps

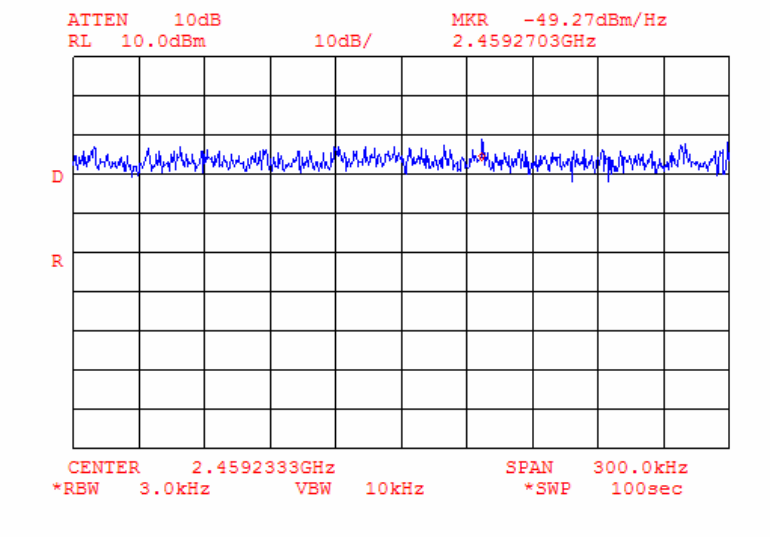


Test specification:	**Section 15.247(d), RSS-210 section A8.2(2), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 43 %	**Power Supply:** 7.2 V battery
Remarks:			

Plot 9.4.21 Peak spectral power density at high frequency within 6 dB band, bit rate 5.5 Mbps

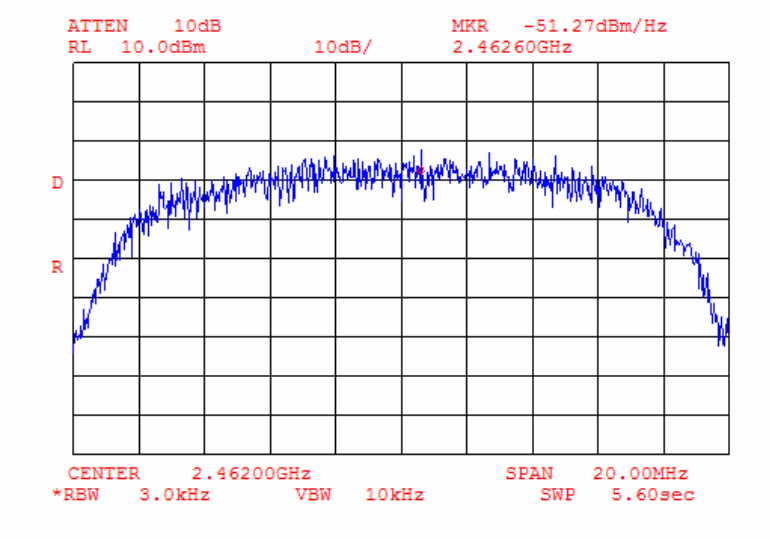


Plot 9.4.22 Peak spectral power density at high frequency zoomed at the peak, bit rate 5.5 Mbps

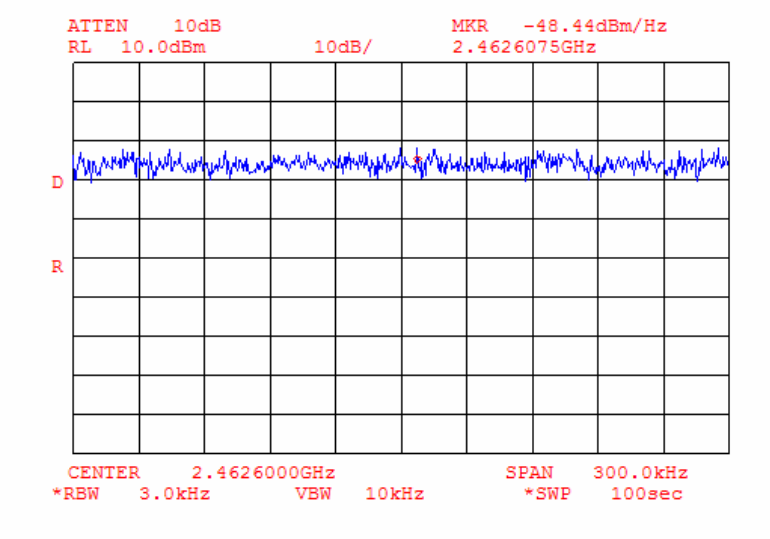


Test specification:	Section 15.247(d), RSS-210 section A8.2(2), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/10/2005 10:08:15 AM		
Temperature: 21 ºC	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.2 V battery
Remarks:			

Plot 9.4.23 Peak spectral power density at high frequency within 6 dB band, bit rate 11 Mbps



Plot 9.4.24 Peak spectral power density at high frequency zoomed at the peak, bit rate 11 Mbps



Test specification:	FCC Part 15, Section 109 / RSS-Gen, Section 7.2.3.2 / ICES-003, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4 / RSS-212, Section 3.0 / CISPR 22		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2005 10:41:47 AM		
Temperature: 21 ºC	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 7.2 V battery
Remarks:			

10 Emission tests according to 47CFR part 15 subpart B and ICES-003 requirements

10.1 Radiated emission measurements

10.1.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits according to FCC Part 15, Section 109 are given in Table 10.1.1, according to ICES-003, Section 5 in Table 10.1.2 and according to RSS-Gen, Section 7.2.3.2 in Table 10.1.3.

Table 10.1.1 Radiated emission limits according to FCC Part 15, Section 109

Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
960 - 5th harmonic**	43.5*	54.0	49.5	60.0*

Table 10.1.2 Radiated emission limits according to ICES-003, Section 5

Frequency, MHz	Class B limit, dB(μV/m)	
	10 m distance	3 m distance
30 - 230	30	40.5*
230 - 1000	37	47.5*

* - The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$,
where S_1 and S_2 – standard defined and test distance respectively in meters.

Table 10.1.3 Radiated emission limits according to RSS-Gen, Section 7.2.3.2

Frequency, MHz	Field strength limit at 3 m test distance, dB(μV/m)
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
960 - 1610	54.0
1610 - 3rd harmonic**	60.0

** - harmonic of the highest frequency the EUT generates, uses, operates or tunes to.

10.1.2 Test procedure for measurements in semi-anechoic chamber

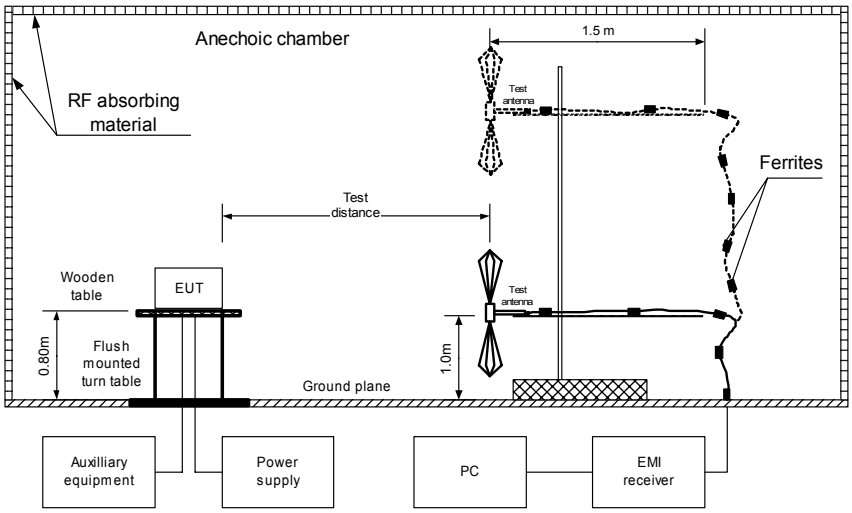
10.1.2.1 The EUT was set up as shown in Figure 10.1.1 and associated photograph/s, energized and the performance check was conducted.

10.1.2.2 The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

10.1.2.3 The worst test results (the lowest margins) were provided in the associated tables and plots.

Test specification:	**FCC Part 15, Section 109 / RSS-Gen, Section 7.2.3.2 / ICES-003, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4 / RSS-212, Section 3.0 / CISPR 22		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 10:41:47 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks:			

Figure 10.1.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment



Test specification:	**FCC Part 15, Section 109 / RSS-Gen, Section 7.2.3.2 / ICES-003, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4 / RSS-212, Section 3.0 / CISPR 22		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 10:41:47 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 10.1.4 Radiated emission test results according to FCC Part 15, Section 109; RSS-Gen, Section 7.2.3.2

EUT SET UP:	TABLE-TOP
LIMIT:	Class B
EUT OPERATING MODE:	Stand-by and Receive
TEST SITE:	SEMI ANECHOIC CHAMBER
TEST DISTANCE:	3 m
FREQUENCY RANGE:	30 MHz – 1000 MHz
RESOLUTION BANDWIDTH:	120 kHz

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
139.747450	32.64	26.78	43.50	-16.72	Horizontal	1.2	76	Pass
146.247500	32.88	26.01	43.50	-17.49	Horizontal	1.1	75	
152.750000	33.19	27.26	43.50	-16.24	Horizontal	1.2	79	
165.748950	32.94	27.18	43.50	-16.32	Horizontal	1.2	75	
461.495200	33.55	31.23	46.00	-14.77	Vertical	1.0	360	
474.502000	33.58	31.22	46.00	-14.78	Vertical	1.1	360	
487.496400	33.38	31.09	46.00	-14.91	Vertical	1.1	359	
760.493836	40.80	38.35	46.00	-7.65	Vertical	1.0	2	
773.500000	40.64	37.53	46.00	-8.47	Vertical	1.1	358	
786.487500	40.04	37.50	46.00	-8.50	Vertical	1.0	360	
825.503950	38.36	35.70	46.00	-10.30	Vertical	1.0	354	

Test specification:	**FCC Part 15, Section 109 / RSS-Gen, Section 7.2.3.2 / ICES-003, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4 / RSS-212, Section 3.0 / CISPR 22		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 10:41:47 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks:			

Table 10.1.5 Radiated emission test results according to ICES-003, Section 5

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Stand-by
TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 120 kHz

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
139.747450	32.64	26.78	40.50	-13.72	Horizontal	1.2	76	Pass
146.247500	32.88	26.01	40.50	-14.49	Horizontal	1.1	75	
152.750000	33.19	27.26	40.50	-13.24	Horizontal	1.2	79	
165.748950	32.94	27.18	40.50	-13.32	Horizontal	1.2	75	
461.495200	33.55	31.23	47.50	-16.27	Vertical	1.0	360	
474.502000	33.58	31.22	47.50	-16.28	Vertical	1.1	360	
487.496400	33.38	31.09	47.50	-16.41	Vertical	1.1	359	
760.493836	40.80	38.35	47.50	-9.15	Vertical	1.0	2	
773.500000	40.64	37.53	47.50	-9.97	Vertical	1.1	358	
786.487500	40.04	37.50	47.50	-10.00	Vertical	1.0	360	
825.503950	38.36	35.70	47.50	-11.80	Vertical	1.0	354	

*- Margin = Measured emission - specification limit.
**- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

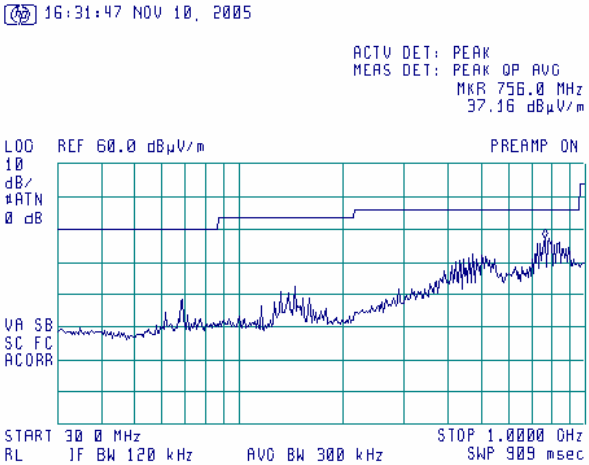
HL 0521	HL 0589	HL 0604	HL 1947	HL 1984	HL 2009		

Full description is given in Appendix A.

Test specification:	**FCC Part 15, Section 109 / RSS-Gen, Section 7.2.3.2 / ICES-003, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4 / RSS-212, Section 3.0 / CISPR 22		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 10:41:47 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks:			

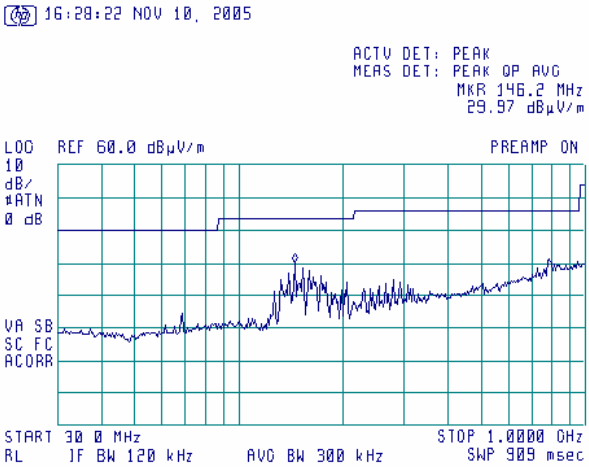
Plot 10.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



Plot 10.1.2 Radiated emission measurements in 30 - 1000 MHz range, horizontal antenna polarization

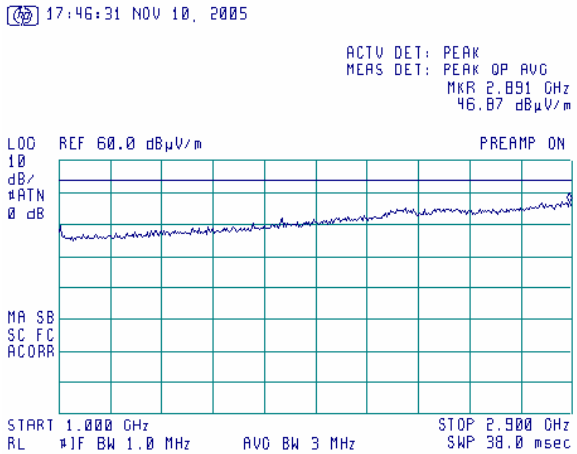
TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



Test specification:	**FCC Part 15, Section 109 / RSS-Gen, Section 7.2.3.2 / ICES-003, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4 / RSS-212, Section 3.0 / CISPR 22		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2005 10:41:47 AM		
Temperature: 21 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 7.2 V battery
Remarks:			

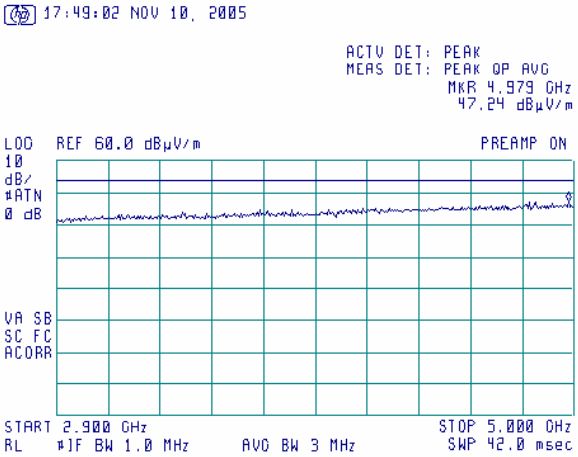
Plot 10.1.3 Radiated emission measurements above 1000 MHz, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



Plot 10.1.4 Radiated emission measurements above 1000 MHz, horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



11 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0190	Power Meter, RF, -20 +10 dBm, 10 MHz - 10 GHz	Hewlett Packard	432A	1507A14742	17-Feb-05	17-Feb-06
0410	Cable, Coax, Microwave, DC-18 GHz, N-N, 1 m	Gore	PFP01P01039.4	9338767	17-Oct-05	17-Oct-06
0415	Cable, Coax, RF, RG-214	HL	CC-3	056	02-Dec-05	02-Dec-06
0446	Active Loop Antenna 10 kHz-30 MHz	Electro-Mechanics	6502	2857	14-Sep-05	14-Sep-06
0493	Oven temperature -45…175 deg C	Thermotron	S-1.2 Mini-Max	14016	23-Sep-05	23-Sep-06
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A00319, 3448A00253	26-Sep-05	26-Sep-06
0589	Cable Coaxial, GORE A2P01POL118, 2.3 m	HL	GORE-3	176	02-Dec-05	02-Dec-06
0592	Position Controller	HL	L2-SR3000 (HL CRL-3)	100	18-May-05	18-May-06
0593	Antenna Mast, 1-4 m Pneumatic	Madgesh	AM-F1	101	03-Feb-05	03-Feb-06
0594	Turn Table FOR ANECHOIC CHAMBER flush mount d=1.2 m Pneumatic	HL	TT-WDC1	102	27-Jan-05	27-Jan-06
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE 26 - 2000 MHz	EMCO	3141	9611-1011	27-Jan-05	27-Jan-06
0661	Generator Swept Signal, 10 MHz to 40 GHz, + 10 dBm	Hewlett Packard	83640B	3614A00266	27-Jan-05	27-Jan-06
0768	Antenna Standard Gain Horn,18-26.5 GHz, WR-42, K-band, Gain - 25 dB	Quinstar Technology	QWH-4200-BA	110	14-Sep-05	14-Sep-06
0808	Analyzer Spectrum 100 Hz to 2.2 GHz	Anritsu	MS2601B	M178731	27-Mar-05	27-Mar-06
0812	Cable Coax, RG-214, 11.5 m, N-type connectors	HL	C214-11	148	02-Dec-05	02-Dec-06
1200	Quadruplexer 1-12 GHz (1-2 GHz; 2-4GHz;4-8 GHz; 8-12GHz)	Elettronica S.p.A. - Roma	UE 84	D/00240	10-Feb-05	10-Feb-06
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies (HP)	8564EC	3946A00219	30-Aug-05	30-Aug-06
1430	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL1432	Agilent Technologies (HP)	8542E	3807A00262,3705A00217	01-Sep-05	01-Sep-06
1562	Oscilloscope 100 MHz, DMM	Tektronix	THS720A	B039444	20-Sep-05	20-Sep-06
1565	Antenna, Dipole, Tunable 500 - 1000 MHz	Electro-Metrics	TDS-30-2	334	29-Jan-05	29-Jan-06
1650	Attenuators Set (2, 3, 5, 20 dB), DC-18 GHz	M/A-COM	2082	1650	03-Jan-05	03-Jan-06
1791	Laboratory DC Power Supply, Dual Tracking Output	RACOM	PS-404	8800692	03-Jan-05	03-Jan-06
1942	Cable 18GHz, 4 m, blue	Rhophase Microwave Limited	SPS-1803A-4000-NPS	T4658	03-Jan-05	03-Jan-06
1947	Cable 18GHz, 6.5 m, blue	Rhophase Microwave Limited	NPS-1803A-6500-NPS	T4974	17-Oct-05	17-Oct-06
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W, N-type	EMC Test Systems	3115	9911-5964	22-Mar-05	22-Mar-06

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
2009	Cable RF, 8 m	Alpha Wire	RG-214	C-56	02-Dec-05	02-Dec-06
2258	Amplifier Low Noise 2-20 GHz	Sophia Wireless	LNA0220-C	0222	05-Nov-05	05-Nov-06
2259	Amplifier Low Noise 2-20 GHz	Sophia Wireless	LNA0220-C	0223	05-Nov-05	05-Nov-06
2260	Amplifier Low Noise 14-33 GHz	Sophia Wireless	LNA28-B	0233	05-Nov-05	05-Nov-06
2266	Cable 2m SMA/SMA	HL	MIL17/84-RG223	2266	11-Sep-05	11-Sep-06
2399	Cable 40GHz, 1.5 m, blue	Rhophase Microwave Limited	KPS-1503A-1500-KPS	X2945	11-Sep-05	11-Sep-06
2400	Cable 40GHz, 1.5 m, green	Rhophase Microwave Limited	KPS-1503A-1500-KPS	X2946	11-Sep-05	11-Sep-06
2432	Antenna, Double-Ridged Waveguide Horn 1-18 GHz	EMC Test Systems	3115	00027177	11-Sep-05	11-Sep-06
2468	Cable RF, 3.4 m	Coleman	M17/84-RG223		11-Sep-05	11-Sep-06
2483	Detector 0.001-12 GHz	HP	36-51	2483	22-Mar-05	22-Mar-06
2524	Attenuator, 10 dB, DC-18 GHz	Midwest Microwave	263-10	2524	03-Jan-05	03-Jan-06

11.1 Customer test equipment used for tests

Description	Manufacturer	Model number	Serial number	Last Cal.	Due Cal.
Wireless Communication Test Set	Agilent Technologies	8960 Series 10 E5515C	GB43461131	30-Jun-05	30-Jun-06

12 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted carrier power at RF antenna connector	Below 12.4 GHz: ± 1.7 dB 12.4 GHz to 40 GHz: ± 2.3 dB
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB
Occupied bandwidth	± 8.0 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB

The test equipment has been calibrated according to its recommended procedures and is within the manufacturer's published limit of error. The standards and instruments used in the calibration system conform to the present requirements of ISO/IEC 17025 (or alternately ANSI/NCSL Z540-1).
The laboratory calibrates its measurement standards by a third party (traceable to NIST, USA) on a regular basis according to equipment manufacturer requirements. The Hermon Labs EMC measurements uncertainty is given in the table above.

13 APPENDIX C Test facility description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility. Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47) and by Industry Canada for electromagnetic emissions (file numbers IC 2186-1 for OATS and IC 2186-2 for anechoic chamber), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site), assessed by TNO Certification EP&S (Netherlands) for a number of EMC, telecommunications, environmental, safety standards, and by AMTAC (UK) for safety of medical devices. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01).

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Person for contact: Mr. Alex Usoskin, CEO.

14 APPENDIX D Specification references

47CFR part 15: 2005	Radio Frequency Devices.
47CFR part 22:2005	Public Mobile Services
47CFR part 24: 2005	Personal Communications Services
Public notice DA 00- 705: 2000	Filing and measurement guidelines for frequency hopping spread spectrum systems.
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
RSS-210 Issue 6: 2005	Low Power Licence- Exempt Radiocommunication Devices (All frequency bands), Category I Equipment
RSS-Gen Issue 1:2005	General Requirements and Information for the Certification of Radiocommunication Equipment
ICES-003 Issue 4: 2004	Digital Apparatus
CAN/CSA-CEI/IEC CISPR 22: 02	Information Technology Equipment- Radio Disturbance Characteristics- Limits and Methods of measurement

15 APPENDIX E Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μV)	decibel referred to one microvolt
dB(μV/m)	decibel referred to one microvolt per meter
dB(μA)	decibel referred to one microampere
dBΩ	decibel referred to one Ohm
DC	direct current
DTS	digital transmission system
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
FHSS	frequency hopping spread spectrum
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
ITE	information technology equipment
k	kilo
kHz	kilohertz
LISN	line impedance stabilization network
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μs	microsecond
NA	not applicable
NT	not tested
OATS	open area test site
Ω	Ohm
PCB	printed circuit board
PM	pulse modulation
PS	power supply
ppm	part per million (10^{-6})
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
VA	volt-ampere

16 APPENDIX F Test equipment correction factors

Antenna factor

Biconilog antenna EMCO, model 3141, serial number 1011, HL 0604

Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)
26	7.8	560	19.8	1300	27.0
28	7.8	580	20.6	1320	27.8
30	7.8	600	21.3	1340	28.3
40	7.2	620	21.5	1360	28.2
60	7.1	640	21.2	1380	27.9
70	8.5	660	21.4	1400	27.9
80	9.4	680	21.9	1420	27.9
90	9.8	700	22.2	1440	27.8
100	9.7	720	22.2	1460	27.8
110	9.3	740	22.1	1480	28.0
120	8.8	760	22.3	1500	28.5
130	8.7	780	22.6	1520	28.9
140	9.2	800	22.7	1540	29.6
150	9.8	820	22.9	1560	29.8
160	10.2	840	23.1	1580	29.6
170	10.4	860	23.4	1600	29.5
180	10.4	880	23.8	1620	29.3
190	10.3	900	24.1	1640	29.2
200	10.6	920	24.1	1660	29.4
220	11.6	940	24.0	1680	29.6
240	12.4	960	24.1	1700	29.8
260	12.8	980	24.5	1720	30.3
280	13.7	1000	24.9	1740	30.8
300	14.7	1020	25.0	1760	31.1
320	15.2	1040	25.2	1780	31.0
340	15.4	1060	25.4	1800	30.9
360	16.1	1080	25.6	1820	30.7
380	16.4	1100	25.7	1840	30.6
400	16.6	1120	26.0	1860	30.6
420	16.7	1140	26.4	1880	30.6
440	17.0	1160	27.0	1900	30.6
460	17.7	1180	27.0	1920	30.7
480	18.1	1200	26.7	1940	30.9
500	18.5	1220	26.5	1960	31.2
520	19.1	1240	26.5	1980	31.6
540	19.5	1260	26.5	2000	32.0
		1280	26.6		

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μV/m).

Antenna factor
Double-ridged wave guide horn antenna
EMC Test Systems, model 3115, serial no: 9911-5964, HL 1984

Frequency, MHz	Antenna gain, dBi	Antenna factor. dB(1/m)
1000.0	5.8	24.5
1500.0	9.0	24.8
2000.0	8.6	27.7
2500.0	9.5	28.7
3000.0	8.9	30.8
3500.0	8.2	32.9
4000.0	9.6	32.7
4500.0	11.2	32.1
5000.0	10.6	33.6
5500.0	9.8	35.3
6000.0	10.1	35.7
6500.0	10.7	35.8
7000.0	10.9	36.2
7500.0	10.5	37.2
8000.0	11.1	37.2
8500.0	10.8	38.1
9000.0	10.7	38.6
9500.0	11.5	38.3
10000.0	11.8	38.4
10500.0	12.3	38.3
11000.0	12.3	38.8
11500.0	11.5	39.9
12000.0	12.2	39.6
12500.0	12.6	39.5
13000.0	12.0	40.5
13500.0	11.7	41.1
14000.0	11.7	41.5
14500.0	12.7	40.8
15000.0	14.2	39.5
15500.0	16.0	38.1
16000.0	16.2	38.1
16500.0	14.5	40.1
17000.0	12.2	42.6
17500.0	9.7	45.4
18000.0	6.6	48.7

Antenna factor is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μV/m).

Antenna Factor
Active Loop Antenna
EMC Test Systems, model 6502, serial number 2857, HL 0446

Frequency, MHz	Magnetic Antenna Factor, dB(S/m)	Electric Antenna Factor, dB(1/m)
0.009	-32.8	18.7
0.010	-33.8	17.7
0.020	-38.3	13.2
0.050	-41.1	10.4
0.075	-41.3	10.2
0.100	-41.6	9.9
0.150	-41.7	9.8
0.250	-41.6	9.9
0.500	-41.8	9.7
0.750	-41.9	9.6
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.1
4.000	-41.4	10.1
5.000	-41.5	10.0
10.000	-41.9	9.6
15.000	-41.9	9.6
20.000	-42.2	9.3
25.000	-42.8	8.7
30.000	-44.0	7.5

Antenna factor in dB(S/m) is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μA/m).
Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μV/m).

Antenna factor
Standard gain horn antenna
Quinstar Technology
Model QWH
Ser.No.110, HL 0768

Frequency min, GHz	Frequency max, GHz	Antenna factor, dB(1/m)
18.000	26.500	32.01
26.500	40.000	35.48
40.000	60.000	39.03
60.000	90.000	42.55
90.000	140.000	46.23
140.000	220.000	50.11

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μV/m).

Antenna factor
Double-ridged guide horn antenna
Model 3115, serial number: 00027177, HL2432

Frequency, MHz	Antenna factor. dB(1/m)
1000.0	24.7
1500.0	25.7
2000.0	27.8
2500.0	28.9
3000.0	30.7
3500.0	31.8
4000.0	33.0
4500.0	32.8
5000.0	34.2
5500.0	34.9
6000.0	35.2
6500.0	35.4
7000.0	36.3
7500.0	37.3
8000.0	37.5
8500.0	38.0
9000.0	38.3
9500.0	38.3
10000.0	38.7
10500.0	38.7
11000.0	38.9
11500.0	39.5
12000.0	39.5
12500.0	39.4
13000.0	40.5
13500.0	40.8
14000.0	41.5
14500.0	41.3
15000.0	40.2
15500.0	38.7
16000.0	38.5
16500.0	39.8
17000.0	41.9
17500.0	45.8
18000.0	49.1

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μV/m).

Cable loss
Cable GORE, HL 0410

No.	Frequency, GHz	Cable loss, dB
1	0.5	0.16
2	1	0.28
3	2	0.38
4	4	0.55
5	6	0.85
6	8	0.90
7	10	1.07
8	12	1.11
9	14	1.29
10	16	1.41
11	18	1.73

Cable loss
Cable Coaxial, RG-58/RG-214, s/n 056, HL 0415
+ Cable Coaxial, RG-214, 11.5m, s/n 148, HL 0812

No.	Frequency, MHz	Cable loss, dB	Measured uncertainty, dB
1	20	0.73	±0.12
2	30	0.91	
3	50	1.2	
4	80	1.56	
5	100	1.76	
6	200	2.59	
7	300	3.26	
8	400	3.93	
9	500	4.42	
10	600	4.92	
11	700	5.36	
12	800	5.88	
13	900	6.41	
14	1000	6.71	
15	1500	8.63	
16	2000	10.39	

Cable loss
Cable Coaxial, GORE A2P01POL118, 2.3 m, model:GORE-3, HL 0589
+ Cable Coaxial, ANDREW PSWJ4, 6m, model: ANDREW-6, HL 1004

No.	Frequency, MHz	Cable loss, dB	Tolerance (Specification), dB	Measurement uncertainty, dB
1	30	0.33	≤ 6.5	±0.12
2	50	0.40		
3	100	0.57		
4	300	0.97		
5	500	1.25		
6	800	1.59		
7	1000	1.81		
8	1200	1.97		
9	1400	2.15		
10	1600	2.28		
11	1800	2.43		
12	2000	2.61		
13	2200	2.75		
14	2400	2.89		
15	2600	2.97		
16	2800	3.21	≤ 6.5	±0.12
17	3000	3.32		
18	3300	3.47		
19	3600	3.62		
20	3900	3.84		
21	4200	3.92		±0.17
22	4500	4.07		
23	4800	4.36		
24	5100	4.62		
25	5400	4.78		
26	5700	5.16		
27	6000	5.67		
28	6500	5.99		

Cable loss
Cable 18 GHz, 4 m, blue, model: SPS-1803A-4000-NPS, S/N T4658, HL 1942

Frequency, GHz	Cable loss, dB
0.03	0.21
0.05	0.26
0.10	0.36
0.20	0.50
0.30	0.61
0.40	0.70
0.50	0.78
0.60	0.85
0.70	0.93
0.80	0.99
0.90	1.04
1.00	1.10
1.10	1.16
1.20	1.22
1.30	1.26
1.40	1.31
1.50	1.35
1.60	1.41
1.70	1.45
1.80	1.49
1.90	1.53
2.00	1.57
2.10	1.61
2.20	1.65
2.30	1.69
2.40	1.72
2.50	1.76
2.60	1.79
2.70	1.83
2.80	1.87
2.90	1.90
3.10	1.97
3.30	2.04
3.50	2.11
3.70	2.18
3.90	2.24
4.10	2.31
4.30	2.38
4.50	2.43
4.70	2.53
4.90	2.53
5.10	2.63
5.30	2.65
5.50	2.72
5.70	2.76
5.90	2.79

Frequency, GHz	Cable loss, dB
6.10	2.88
6.30	2.90
6.50	2.97
6.70	3.02
6.90	3.04
7.10	3.07
7.30	3.12
7.50	3.13
7.70	3.19
7.90	3.24
8.10	3.30
8.30	3.36
8.50	3.45
8.70	3.41
8.90	3.45
9.10	3.42
9.30	3.55
9.50	3.48
9.70	3.58
9.90	3.61
10.10	3.66
10.30	3.68
10.50	3.70
10.70	3.70
10.90	3.75
11.10	3.78
11.30	3.86
11.50	3.98
11.70	4.10
11.90	4.12
12.10	4.09
12.40	4.13
13.00	4.23
13.50	4.35
14.00	4.40
14.50	4.44
15.00	4.57
15.50	4.66
16.00	4.64
16.50	4.66
17.00	4.75
17.50	4.85
18.00	4.93

Cable loss
Cable 18 GHz, 6.5 m, blue, model: NPS-1803A-6500-NPS, S/N T4974, HL 1947

Frequency, GHz	Cable loss, dB
0.03	0.30
0.05	0.38
0.10	0.53
0.20	0.74
0.30	0.91
0.40	1.05
0.50	1.18
0.60	1.29
0.70	1.40
0.80	1.50
0.90	1.59
1.00	1.68
1.10	1.77
1.20	1.86
1.30	1.94
1.40	2.01
1.50	2.08
1.60	2.16
1.70	2.22
1.80	2.29
1.90	2.36
2.00	2.42
2.10	2.48
2.20	2.54
2.30	2.60
2.40	2.66
2.50	2.71
2.60	2.77
2.70	2.83
2.80	2.89
2.90	2.95
3.10	3.06
3.30	3.17
3.50	3.28
3.70	3.39
3.90	3.51
4.10	3.62
4.30	3.76
4.50	3.87
4.70	4.01
4.90	4.10
5.10	4.21
5.30	4.31
5.50	4.43
5.70	4.56
5.90	4.71

Frequency, GHz	Cable loss, dB
6.10	4.87
6.30	4.95
6.50	4.94
6.70	4.88
6.90	4.87
7.10	4.83
7.30	4.85
7.50	4.86
7.70	4.91
7.90	4.96
8.10	5.03
8.30	5.08
8.50	5.13
8.70	5.21
8.90	5.22
9.10	5.34
9.30	5.35
9.50	5.52
9.70	5.51
9.90	5.66
10.10	5.70
10.30	5.78
10.50	5.79
10.70	5.82
10.90	5.86
11.10	5.94
11.30	6.06
11.50	6.21
11.70	6.44
11.90	6.61
12.10	6.76
12.40	6.68
13.00	6.66
13.50	6.81
14.00	6.90
14.50	6.90
15.00	6.97
15.50	7.17
16.00	7.28
16.50	7.27
17.00	7.38
17.50	7.68
18.00	7.92

Cable loss
RF cable 8 m, model RG-214, HL 2009

No.	Frequency, MHz	Cable loss, dB	Tolerance (Specification), dB	Measurement uncertainty, dB
1	1	0.10	NA	±0.12
2	10	0.14		
3	30	0.25		
4	50	0.34		
5	100	0.53		
6	300	0.99		
7	500	1.31		
8	800	1.73		
9	1000	1.98		
10	1100	2.11		
11	1200	2.21		
12	1300	2.35		
13	1400	2.46		
14	1500	2.55		
15	1600	2.68		
16	1700	2.78		
17	1800	2.88		
18	1900	2.98		
19	2000	3.09		

Cable loss
Cable coaxial, 40GHz, 1.5 m, Blue, Rhophase Microwave Limited, model: KPS-1503A-1500-KPS, HL 2399

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
0.03	0.07	6.5	1.57	15.50	2.50
0.05	0.10	6.7	1.60	16.00	2.51
0.1	0.16	6.9	1.55	16.50	2.58
0.2	0.26	7.1	1.65	17.00	2.65
0.3	0.33	7.3	1.65	17.50	2.73
0.5	0.38	7.5	1.70	18.00	2.74
0.7	0.41	7.7	1.71	18.50	2.67
0.9	0.58	7.9	1.73	19.00	2.67
1.1	0.64	8.1	1.79	19.50	2.74
1.3	0.70	8.3	1.81	20.00	2.69
1.5	0.75	8.5	1.84	20.50	2.80
1.7	0.79	8.7	1.85	21.00	2.82
1.9	0.83	8.9	1.90	21.50	2.87
2.1	0.88	9.1	1.95	22.00	2.87
2.3	0.93	9.3	1.93	22.50	2.92
2.5	0.97	9.5	1.98	23.50	3.04
2.7	1.01	9.7	1.96	24.00	3.05
2.9	1.04	9.9	2.03	24.50	3.03
3.1	1.08	10.1	1.99	25.00	3.11
3.3	1.14	10.30	2.02	25.50	3.10
3.5	1.17	10.50	2.02	26.00	3.17
3.7	1.21	10.70	2.02	26.50	3.11
3.9	1.24	10.90	2.08	27.00	3.16
4.1	1.26	11.10	2.02	28.00	3.19
4.3	1.26	11.30	2.09	29.00	3.19
4.5	1.29	11.50	2.05	30.00	3.30
4.7	1.34	11.70	2.11	31.00	3.31
4.9	1.34	11.90	2.11	32.00	3.35
5.1	1.40	12.10	2.12	33.00	3.46
5.3	1.43	12.40	2.17	34.00	3.45
5.5	1.45	13.00	2.29	35.00	3.49
5.7	1.47	13.50	2.31	36.00	3.54
5.9	1.40	14.00	2.43	37.00	3.62
6.1	1.53	14.50	2.43	39.00	3.69
6.3	1.55	15.00	2.46	40.00	3.75

Cable loss
Cable coaxial, 40GHz, 1.5 m, green, Rhophase Microwave Limited, model: KPS-1503A-1500-KPS, HL 2400

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
0.03	0.06	6.5	1.46	15.50	2.34
0.05	0.08	6.7	1.49	16.00	2.34
0.1	0.15	6.9	1.50	16.50	2.40
0.2	0.23	7.1	1.51	17.00	2.46
0.3	0.29	7.3	1.55	17.50	2.54
0.5	0.37	7.5	1.56	18.00	2.61
0.7	0.46	7.7	1.58	18.50	2.59
0.9	0.53	7.9	1.60	19.00	2.59
1.1	0.58	8.1	1.61	19.50	2.67
1.3	0.65	8.3	1.68	20.00	2.62
1.5	0.66	8.5	1.68	20.50	2.73
1.7	0.72	8.7	1.75	21.00	2.71
1.9	0.76	8.9	1.74	21.50	2.78
2.1	0.79	9.1	1.81	22.00	2.83
2.3	0.85	9.3	1.79	22.50	2.81
2.5	0.90	9.5	1.86	23.50	2.91
2.7	0.91	9.7	1.85	24.00	2.97
2.9	0.97	9.9	1.87	24.50	2.98
3.1	0.97	10.1	1.88	25.00	2.97
3.3	1.03	10.30	1.82	25.50	3.03
3.5	1.06	10.50	1.92	26.00	3.04
3.7	1.10	10.70	1.86	26.50	3.11
3.9	1.13	10.90	1.96	27.00	2.97
4.1	1.16	11.10	1.90	28.00	3.15
4.3	1.18	11.30	1.99	29.00	3.07
4.5	1.21	11.50	1.95	30.00	3.13
4.7	1.23	11.70	2.00	31.00	3.13
4.9	1.26	11.90	2.01	32.00	3.18
5.1	1.28	12.10	1.99	33.00	3.31
5.3	1.31	12.40	2.06	34.00	3.32
5.5	1.32	13.00	2.11	35.00	3.37
5.7	1.36	13.50	2.17	36.00	3.36
5.9	1.37	14.00	2.36	37.00	3.46
6.1	1.38	14.50	2.32	39.00	3.49
6.3	1.44	15.00	2.30	40.00	3.52