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Hermon Laboratories Ltd.
P.O.Box 23, Binyamina 30500, Israel
Tel. +972 4628 8001
Fax. +972 4628 8277
E-mail: mail@hermonlabs.com

TEST REPORT

ACCORDING TO: FCC part 15 subpart C §15.247

FOR:

Mobile Access Networks Ltd.
RF distribution amplifier
Model:MA 850 with Colubris AP

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

Client name:	Mobile Access Networks
Address:	Ofek One Center, Building 2, Nothern Industrial zone, Lod, Israel, 71293
Telephone:	+972 8918 3888
Fax:	+972 8918 3844
E-mail:	ShaiR@mobileaccess.com
Contact name:	Mr. Shai Rachamim

2 Equipment under test attributes

Product name:	RF distribution amplifier
Model(s):	MA 850 with Colubris AP
Receipt date	6/18/2006

3 Manufacturer information

Manufacturer name:	Mobile Access Networks
Address:	Ofek One Center, Building 2, Nothern Industrial zone, Lod, Israel, 71293
Telephone:	+972 8918 3888
Fax:	+972 8918 3844
E-Mail:	ShaiR@mobileaccess.com
Contact name:	Mr. Shai Rachamim

4 Test details

Project ID:	17196
Location:	Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel
Test started:	6/18/2006
Test completed:	10/12/2006; 11/9/2006
Test specification(s):	FCC part 15 subpart C, §15.247

5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.247(a)2, 6 dB bandwidth	Pass
Section 15.247(b)3, Peak output power	Pass
Section 15.247(b)5, RF exposure	Calculated
Section 15.247(c), Conducted spurious emissions	Pass
Section 15.247(c), Radiated spurious emissions	Pass
Section 15.247(d), Peak power density	Pass
Section 15.207(a), Conducted emission	Pass
Section 15.203, Antenna requirement	Professional installation is 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: MOBRAD_FCC.17196.

	Name and Title	Date	Signature
Tested by:	Mr. A. Adelberg, test engineer	November 9, 2006	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	November 23, 2006	
Approved by:	Mr. M. Nikishin, EMC and radio group leader	November 23, 2006	

6 EUT description

6.1 General information

The EUT, MobileAccess 850 provides secure and centralized connection for a number of 802.11b/g Collubris Access Points, significantly expands 802.11 coverage and enables distributing the data services over the same coax and antenna infrastructure used for distributing voice services through other MobileAccess products.

6.2 Ports and lines

Port type	Port description	Connected		Connector type	Qty.	Cable type	Cable length
		From	To				
Power	48 V DC	adapter	EUT	Power plug	1	unshielded	1.5 m
Power	AC power	mains	adapter	IEC 60320	1	unshielded	1.5 m
Signal	RS232	Open circuit	D-type	1	NA	NA	NA
Signal	Ethernet	Open circuit	RJ-45	1	NA	NA	NA
Signal	802.11b/g	EUT	Access point	TNC modified	4	coax	0.7 m
Signal	802.11a	EUT	50 Ω termination	TNC modified	4	NA	NA
RF	CELL/ PCS mobile services	EUT	50 Ω termination	SMA female	4	NA	NA
Conducted measurements							
RF	Antenna	EUT	50 Ω termination	n-type female	4	NA	NA
Radiated measurements							
RF	Antenna	EUT	antenna	n-type female	4	coax	0.7 m

6.3 Support and test equipment

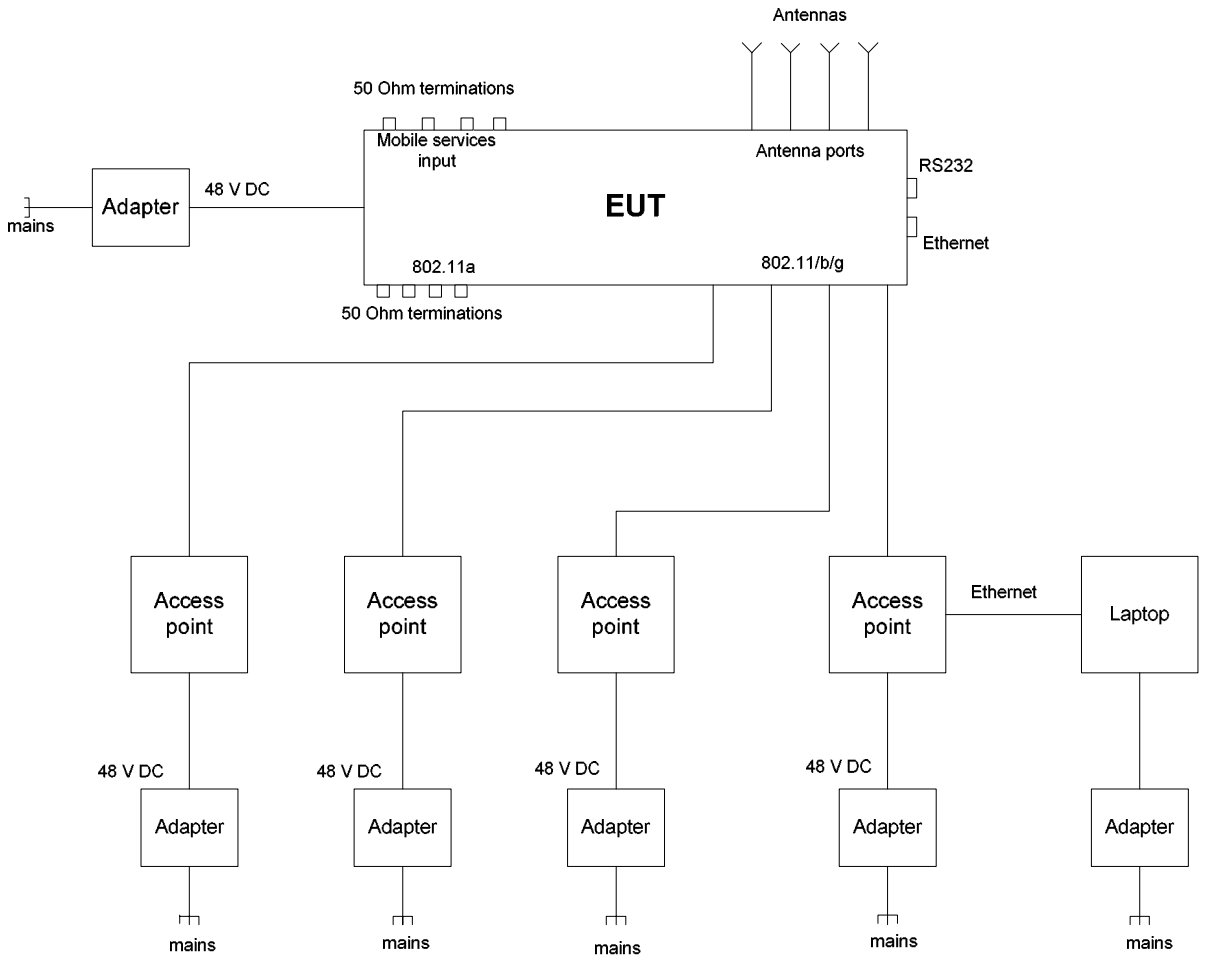
Description	Manufacturer	Model number	Serial number
MultiServer Access Point	Collubris	MAP-320	R038-00014
			R038-00005
			R038-00357
			R038-00745
Power supply for Access Point	FSP Group INC	FSP015-1AD201A	H00015056
			H00015097
			H00015379
			H00015220
4 Sencity®Art Ultra-broadband antennas	Huber+Suhner	SWA 0859/360/4/10/V	Art. No. 23040329
Adapter (EUT)	NA	SB-480A7F-11	006291
Laptop	IBM	2645-4A0	5515FL6
Adapter (laptop)	IBM	N79	02K6543

6.4 Changes made in the EUT

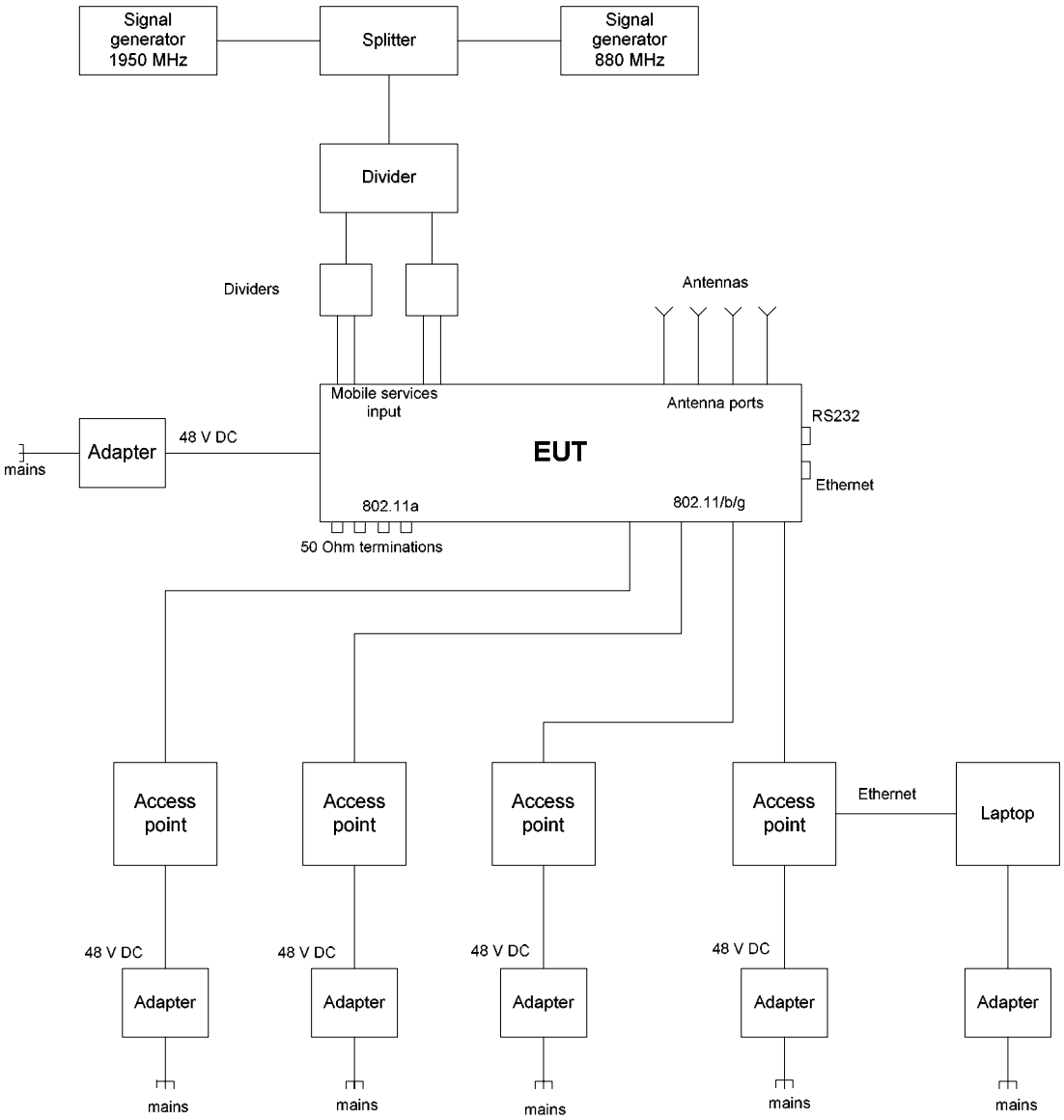
No changes were implemented.

6.5 Test configuration

6.5.1 802.11 b/g testing



6.5.2 802.11 b/g with licensed services testing



6.6 Transmitter characteristics

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**
X	fixed	Always at a distance more than 2 m from all people
	mobile	Always at a distance more than 20 cm from all people
	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

Maximum peak output power	At transmitter 50 Ω RF output connector	27 dBm (802.11 b/g)
	Effective radiated power (for equipment with no RF connector)	

Is transmitter output power variable?		No		
	X	Yes		continuous variable
				stepped variable with stepsize

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

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain
ultra-broadband antenna	HUBER+SUHNER	SWA 0859/360/4/10/V SENCITY-ART	7 dBi

Type of modulation	DSSS (DBPSK 1 Mbps, CCK 11 Mbps), OFDM (BPSK 6 Mbps, 64QAM 54 Mbps)
Type of multiplexing	TDMA

Transmitter power source					
	Battery	**Nominal rated voltage**		Battery type	
	DC	**Nominal rated voltage**			
X	AC mains	**Nominal rated voltage**	120 V AC	Frequency	60 Hz

Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 1:44:11 PM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

7 Transmitter tests according to 47CFR part 15 subpart C requirements

7.1 Minimum 6 dB bandwidth

7.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.1.1.

Table 7.1.1 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.

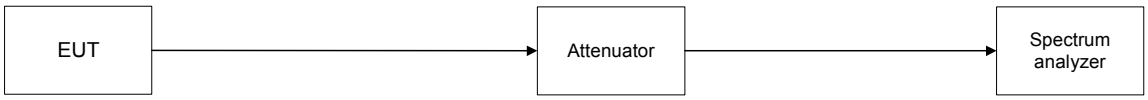
7.1.2 Test procedure

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 set to transmit modulated carrier.

7.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.1.2 and associated plot.

Figure 7.1.1 The 6 dB bandwidth test setup



Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 1:44:11 PM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Table 7.1.2 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND:	2400 – 2483.5 MHz
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
MODULATION ENVELOPE REFERENCE POINTS:	-6.0 dBc
MODULATION:	DSSS: (DBPSK) @ 1 Mbps, (CCK) @ 11 Mbps OFDM: BPSK @ 6 Mbps, 64QAM @ 54 Mbps
MODULATING SIGNAL:	PRBS
INPUTS:	802.11 b/g

Carrier frequency, MHz	6 dB bandwidth, MHz	Limit, kHz	Margin, kHz	Verdict
DSSS, 1 Mbps				
2412	12.0375	500	11537.5	Pass
2437	12.0375	500	11537.5	Pass
2462	12.5250	500	12025.0	Pass
DSSS, 11 Mbps				
2412	12.3000	500	11800.0	Pass
2437	12.2250	500	11725.0	Pass
2462	11.9625	500	11462.5	Pass
OFDM, 6 Mbps				
2412	16.6250	500	16125.0	Pass
2437	16.5625	500	16062.5	Pass
2462	16.5625	500	16062.5	Pass
OFDM, 54 Mbps				
2412	16.6250	500	16125.0	Pass
2437	16.6250	500	16125.0	Pass
2462	16.5625	500	16062.5	Pass

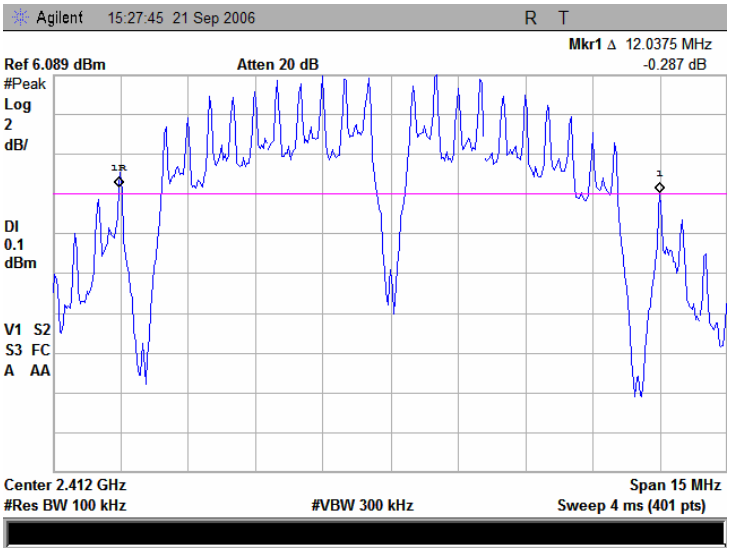
Reference numbers of test equipment used

HL 1650	HL 2780	HL 2869						

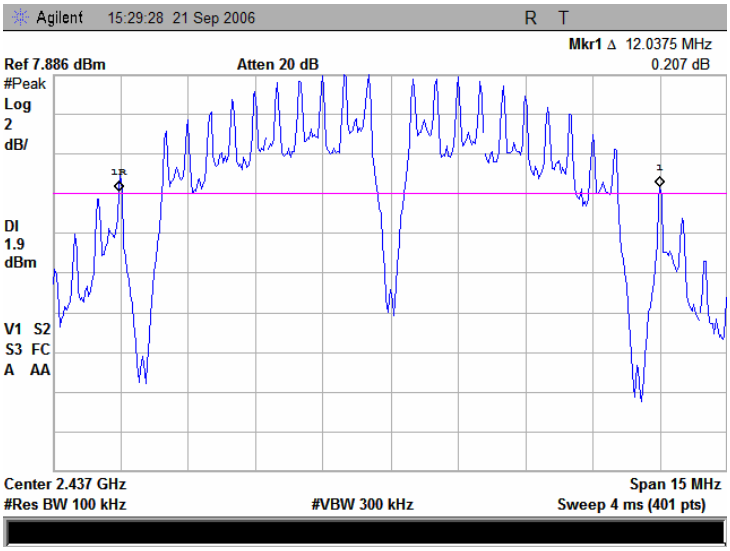
Full description is given in Appendix A.

Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 1:44:11 PM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.1.1 The 6 dB bandwidth test result at low frequency, DSSS, 1 Mbps

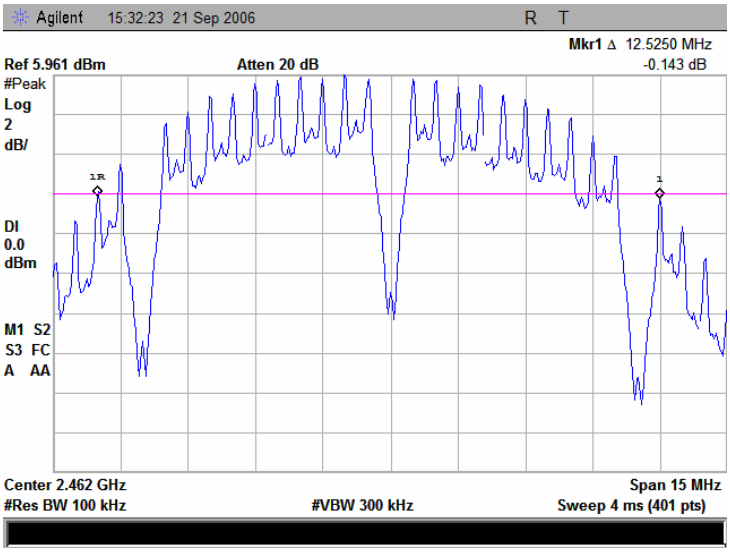


Plot 7.1.2 The 6 dB bandwidth test result at mid frequency, DSSS, 1 Mbps

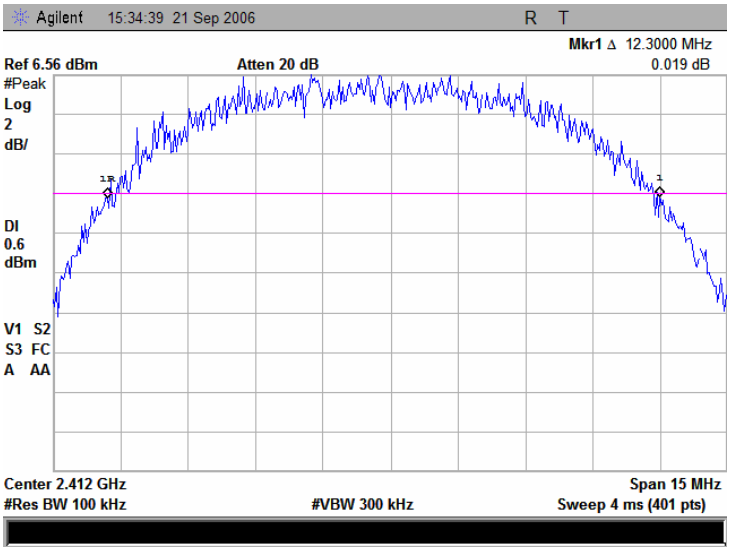


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 1:44:11 PM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.1.3 The 6 dB bandwidth test result at high frequency, DSSS, 1 Mbps

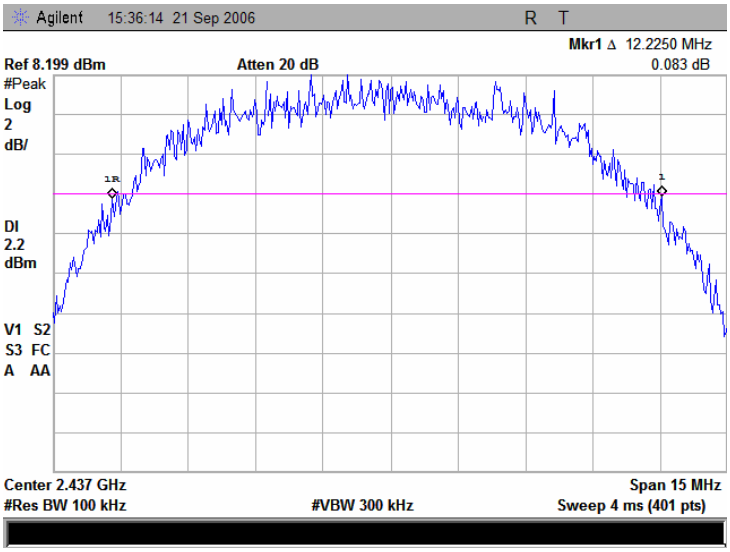


Plot 7.1.4 The 6 dB bandwidth test result at low frequency, DSSS, 11 Mbps

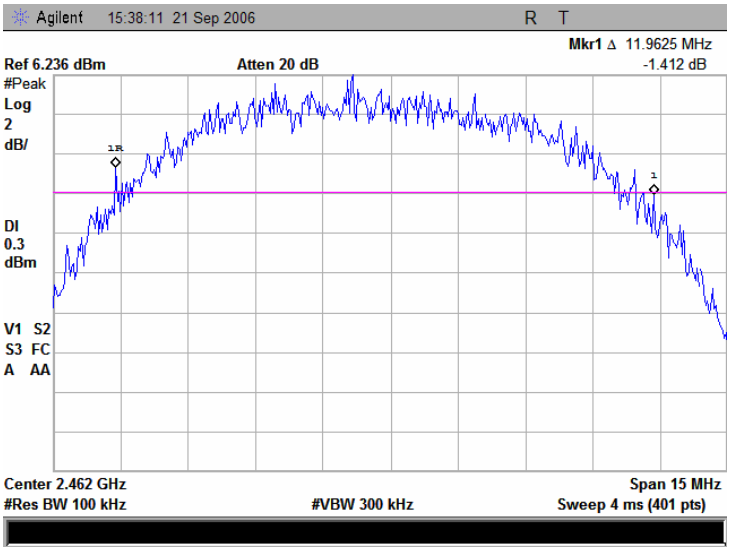


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 1:44:11 PM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.1.5 The 6 dB bandwidth test result at mid frequency, DSSS, 11 Mbps

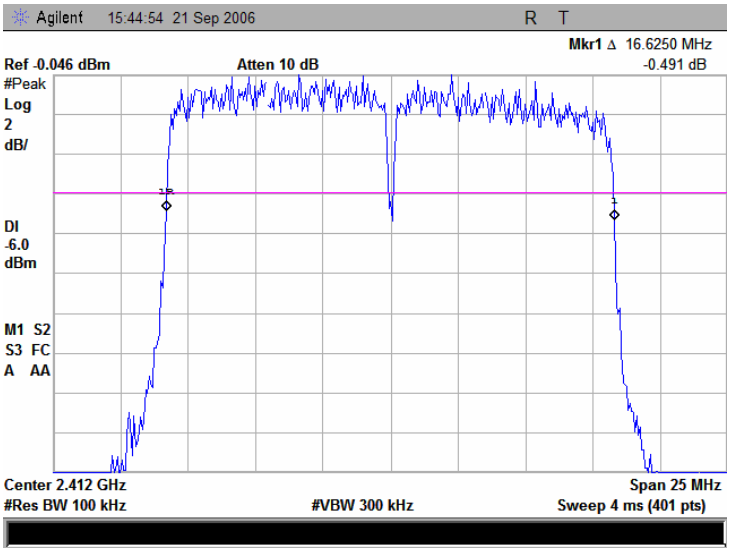


Plot 7.1.6 The 6 dB bandwidth test result at high frequency, DSSS, 11 Mbps

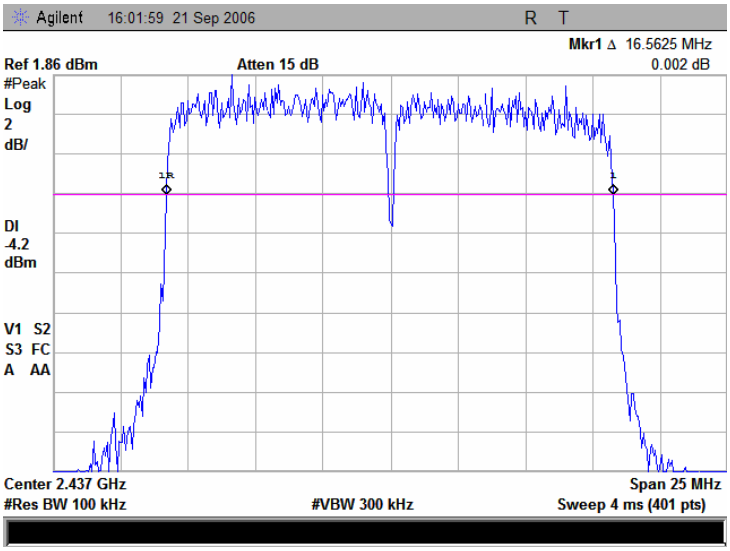


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 1:44:11 PM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.1.7 The 6 dB bandwidth test result at low frequency, OFDM, 6 Mbps

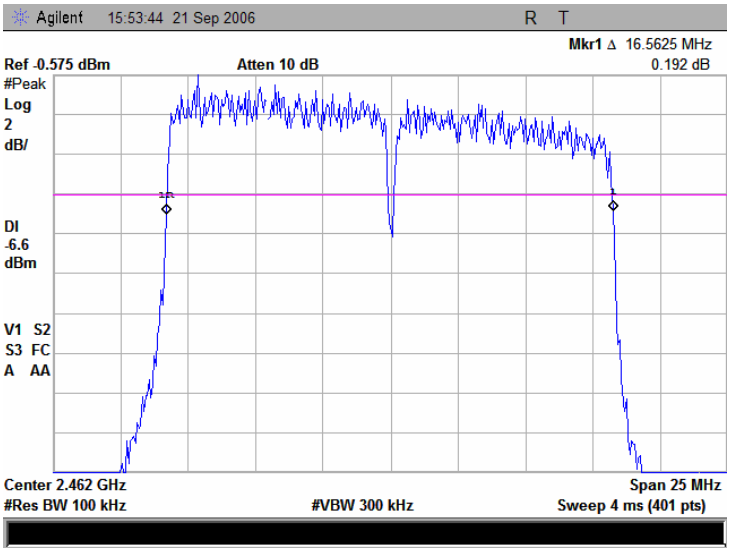


Plot 7.1.8 The 6 dB bandwidth test result at mid frequency, OFDM, 6 Mbps

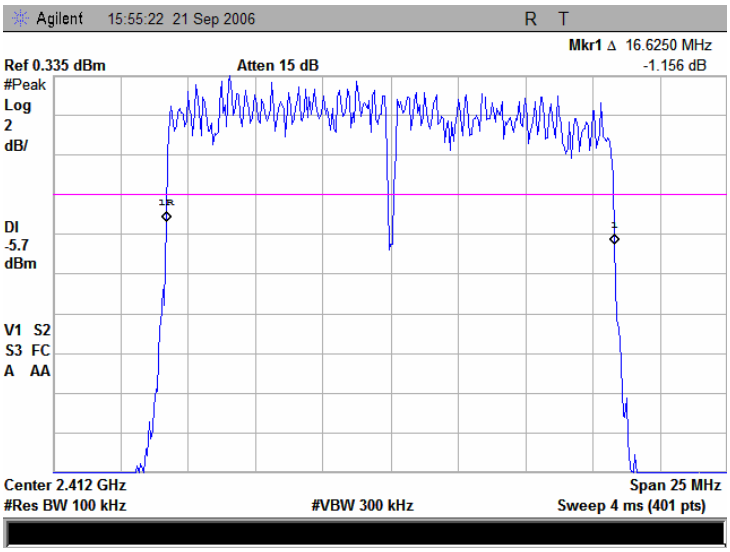


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 1:44:11 PM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.1.9 The 6 dB bandwidth test result at high frequency, OFDM, 6 Mbps

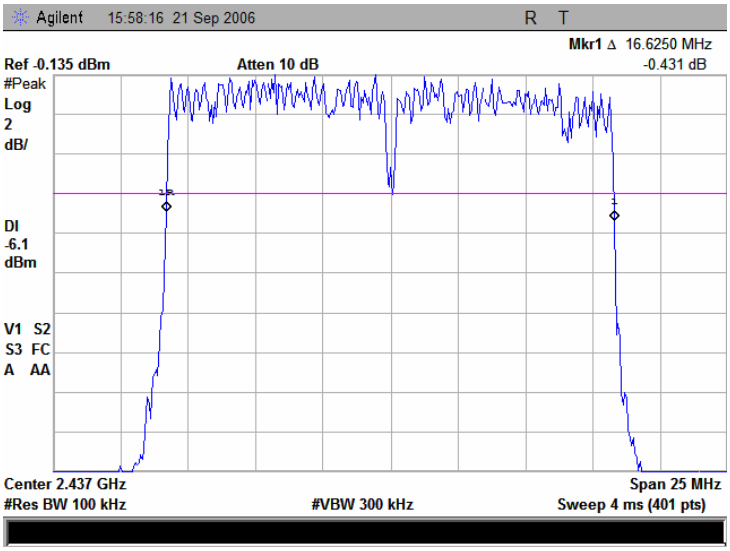


Plot 7.1.10 The 6 dB bandwidth test result at low frequency, OFDM, 54 Mbps

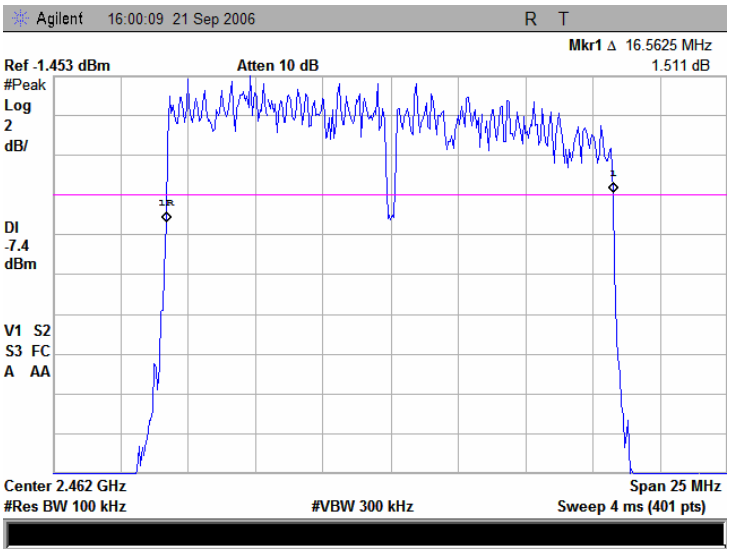


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 1:44:11 PM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.1.11 The 6 dB bandwidth test result at mid frequency, OFDM, 54 Mbps



Plot 7.1.12 The 6 dB bandwidth test result at high frequency, OFDM, 54 Mbps



Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

7.2 Peak output power

7.2.1 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 7.2.1.

Table 7.2.1 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.

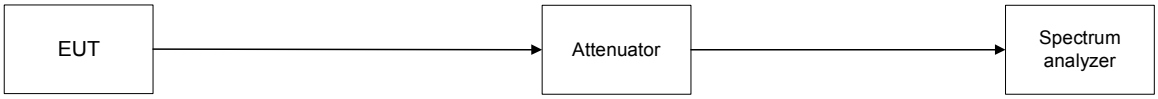
7.2.2 Test procedure

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 for 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 maximum peak output power was measured as provided in Table 7.2.2 and Table 7.2.3 and associated plots.

Figure 7.2.1 Peak output power test setup



Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Table 7.2.2 Output power test results

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
MODULATION: DBPSK, CCK, BPSK, 64QAM
MODULATING SIGNAL: PRBS
BIT RATE: 1, 11, 6, 54 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Sample
EUT 6 dB BANDWIDTH: 12.5 MHz (DSSS) / 16.3 MHz (OFDM)
RESOLUTION BANDWIDTH: 1 MHz
VIDEO BANDWIDTH: 3 MHz
INPUTS: 802.11 b/g

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Output power, dBm	Limit, dBm	Margin*, dB	Verdict
DSSS, 1 Mbps							
2412	16.68	Included	Included	16.68	30.0	-13.32	Pass
2437	17.73	Included	Included	17.73	30.0	-12.27	Pass
2462	16.41	Included	Included	16.41	30.0	-13.59	Pass
DSSS, 11 Mbps							
2412	15.67	Included	Included	15.67	30.0	-14.33	Pass
2437	16.47	Included	Included	16.47	30.0	-13.53	Pass
2462	15.53	Included	Included	15.53	30.0	-14.47	Pass
OFDM, 6 Mbps							
2412	11.70	Included	Included	11.70	30.0	-18.30	Pass
2437	11.31	Included	Included	11.31	30.0	-18.69	Pass
2462	10.26	Included	Included	10.26	30.0	-19.74	Pass
OFDM, 54 Mbps							
2412	8.94	Included	Included	8.94	30.0	-21.06	Pass
2437	10.90	Included	Included	10.90	30.0	-19.10	Pass
2462	7.55	Included	Included	7.55	30.0	-22.45	Pass

* - Margin = Peak output power – specification limit.

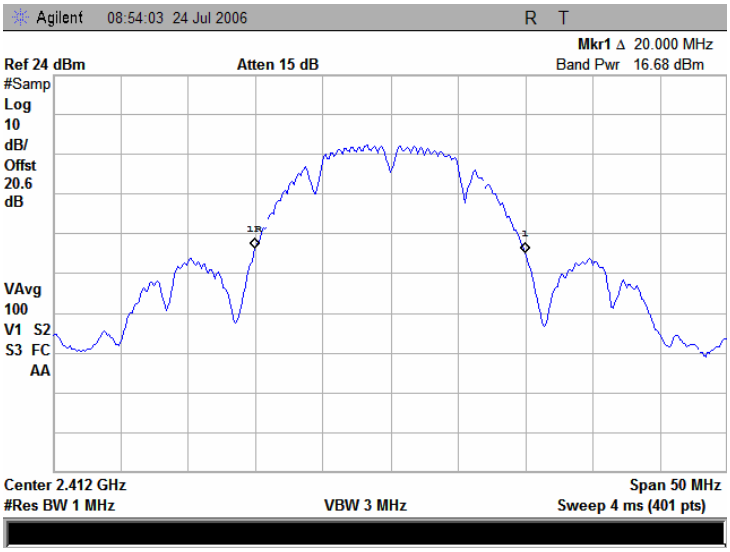
Reference numbers of test equipment used

HL 2254	HL 2780						

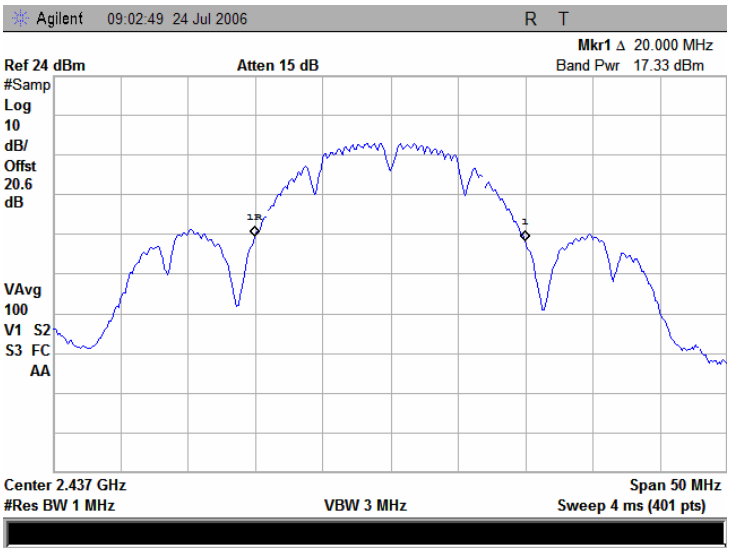
Full description is given in Appendix A.

Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.1 Output power at low frequency, DSSS, 1 Mbps

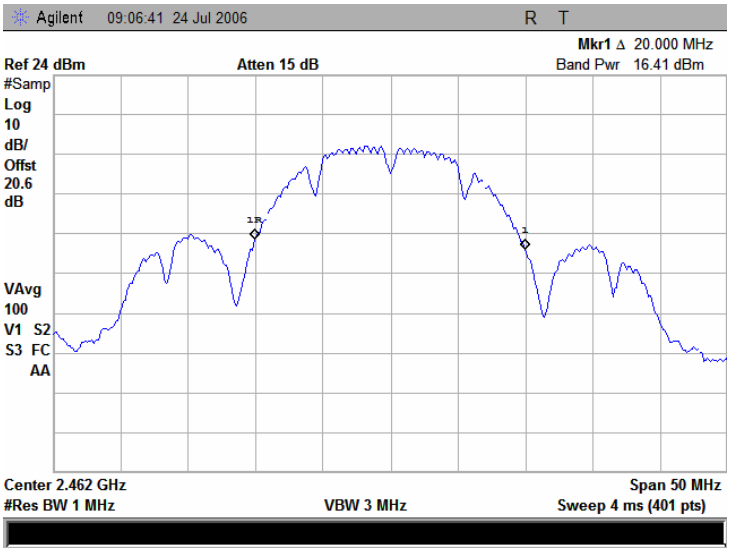


Plot 7.2.2 Output power at mid frequency, DSSS, 1 Mbps

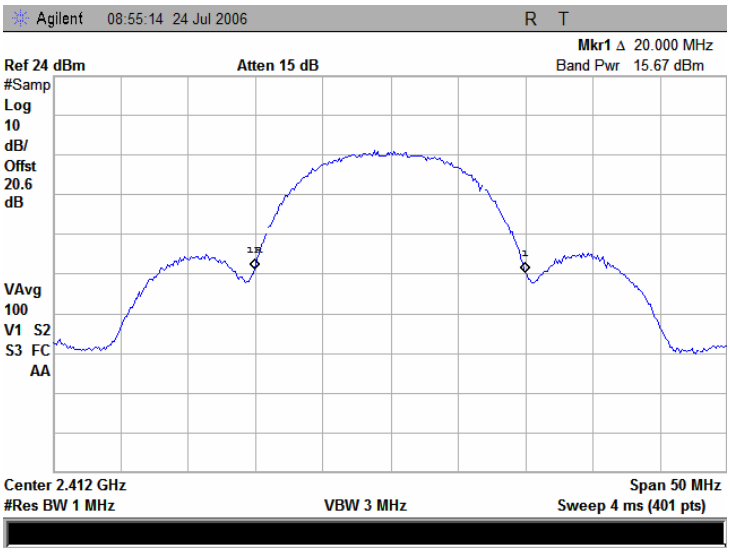


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.3 Output power at high frequency, DSSS, 1 Mbps

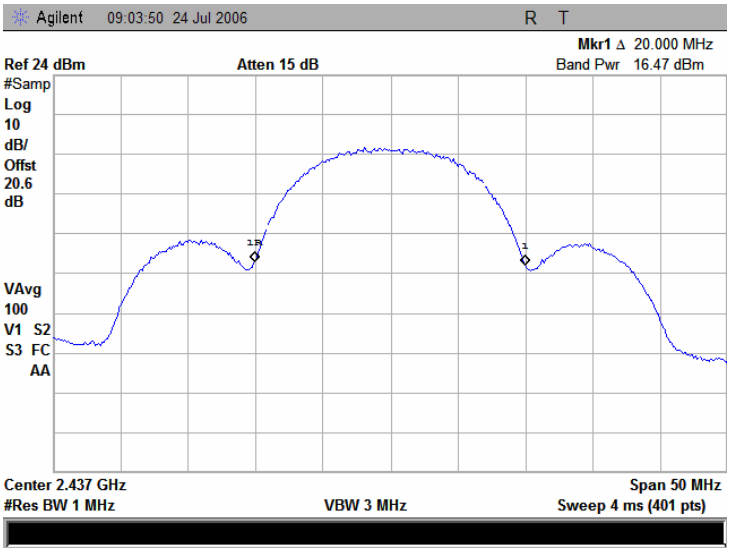


Plot 7.2.4 Output power at low frequency, DSSS, 11 Mbps

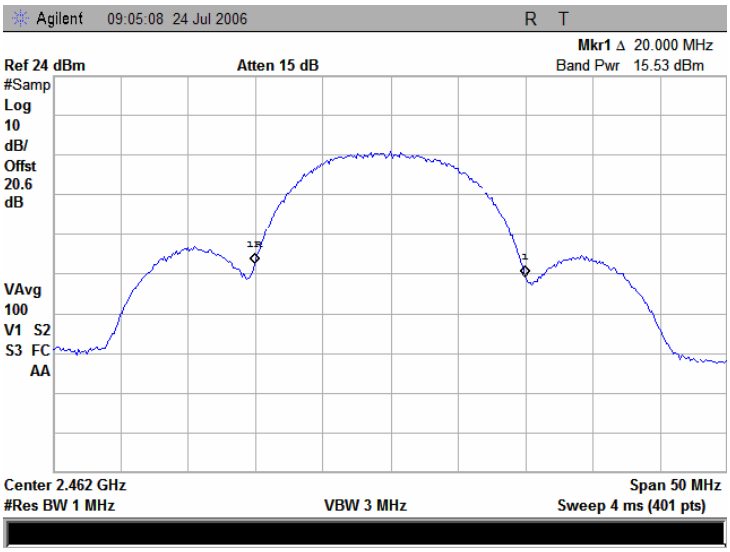


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.5 Output power at mid frequency, DSSS, 11 Mbps

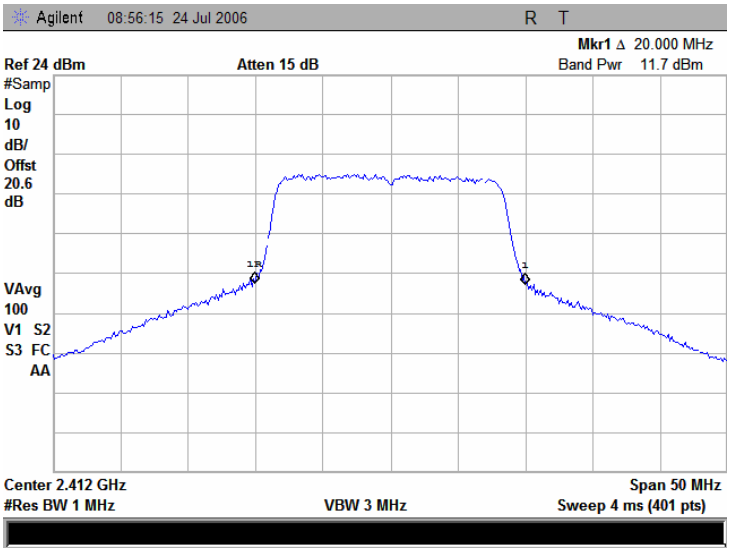


Plot 7.2.6 Output power at high frequency, DSSS, 11 Mbps

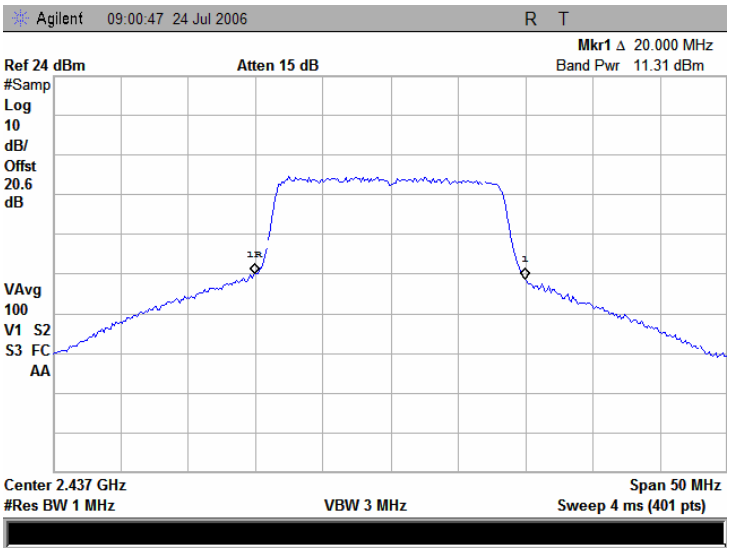


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.7 Output power at low frequency, OFDM, 6 Mbps

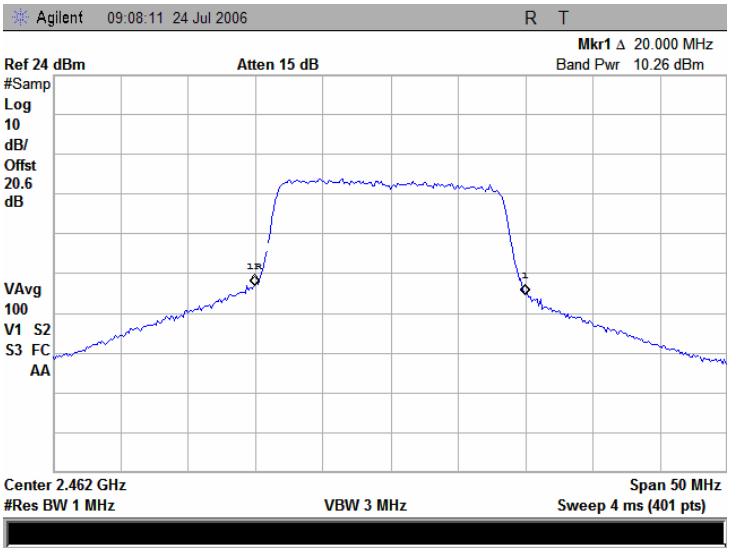


Plot 7.2.8 Output power at mid frequency, OFDM, 6 Mbps

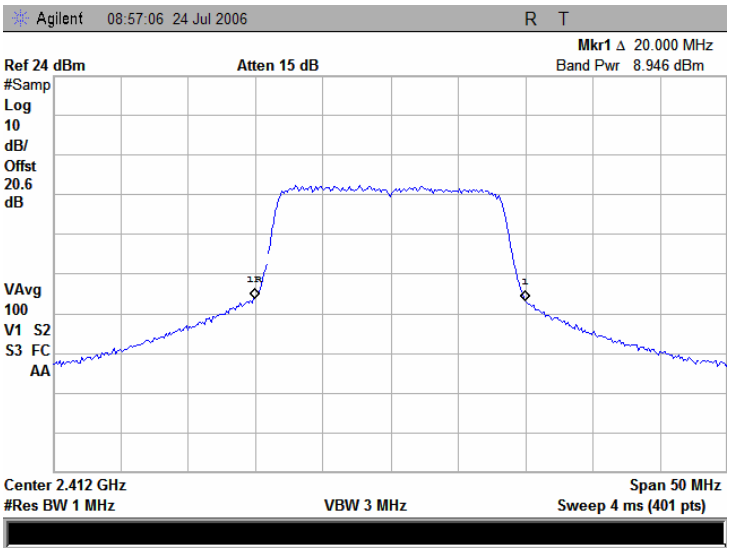


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.9 Output power at high frequency, OFDM, 6 Mbps

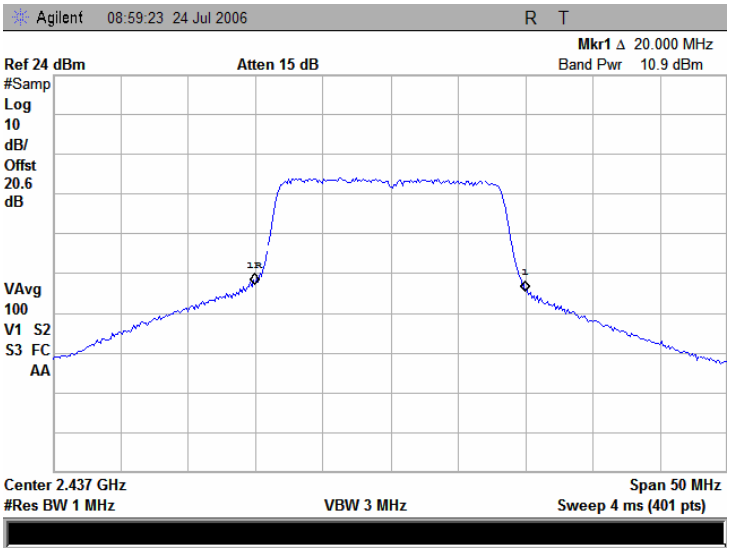


Plot 7.2.10 Output power at low frequency, OFDM, 54 Mbps

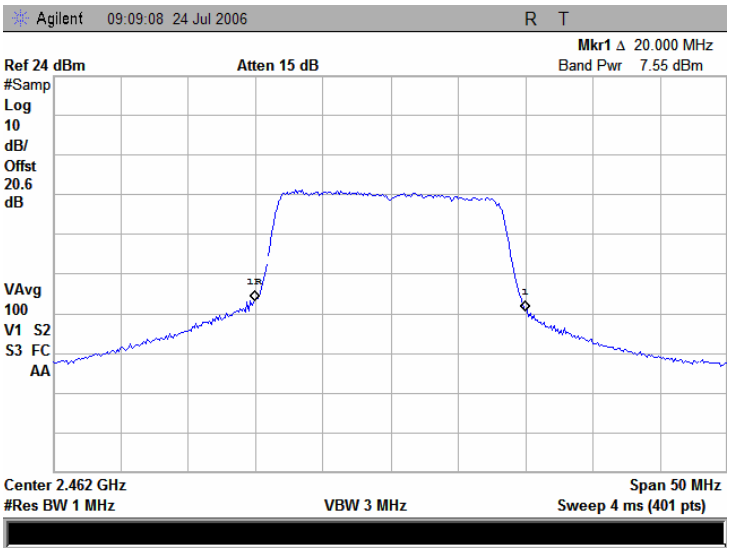


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.11 Output power at mid frequency, OFDM, 54 Mbps



Plot 7.2.12 Output power at high frequency, OFDM, 54 Mbps



Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Table 7.2.3 Peak output power test results

ASSIGNED FREQUENCY:	2400.0 – 2483.5 MHz
MODULATION:	DBPSK, CCK, BPSK, 64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	1, 11, 6, 54 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
EUT 6 dB BANDWIDTH:	12.5 MHz (DSSS) / 16.3 MHz (OFDM)
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
INPUTS:	802.11 b/g

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak output power, dBm	Limit, dBm	Margin*, dB	Verdict
DSSS, 1 Mbps							
2412	22.70	Included	Included	22.70	30.00	-7.30	Pass
2437	25.22	Included	Included	25.22	30.00	-4.78	Pass
2462	22.78	Included	Included	22.78	30.00	-7.22	Pass
DSSS, 11 Mbps							
2412	25.63	Included	Included	25.63	30.00	-4.37	Pass
2437	26.94	Included	Included	26.94	30.00	-3.06	Pass
2462	24.50	Included	Included	24.50	30.00	-5.50	Pass
OFDM, 6 Mbps							
2412	20.14	Included	Included	20.14	30.00	-9.86	Pass
2437	22.22	Included	Included	22.22	30.00	-7.78	Pass
2462	18.89	Included	Included	18.89	30.00	-11.11	Pass
OFDM, 54 Mbps							
2412	20.12	Included	Included	20.12	30.00	-9.88	Pass
2437	20.00	Included	Included	20.00	30.00	-10.00	Pass
2462	18.47	Included	Included	18.47	30.00	-11.53	Pass

* - Margin = Peak output power – specification limit.

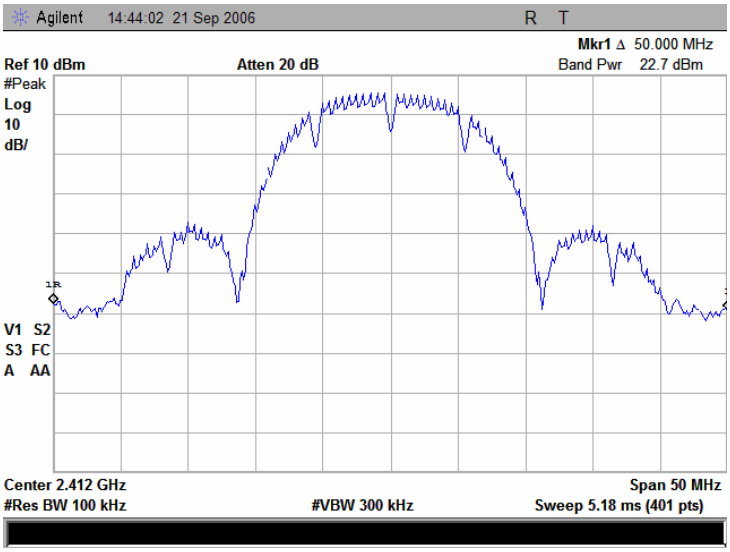
Reference numbers of test equipment used

HL 1650	HL 2780	HL 2869					

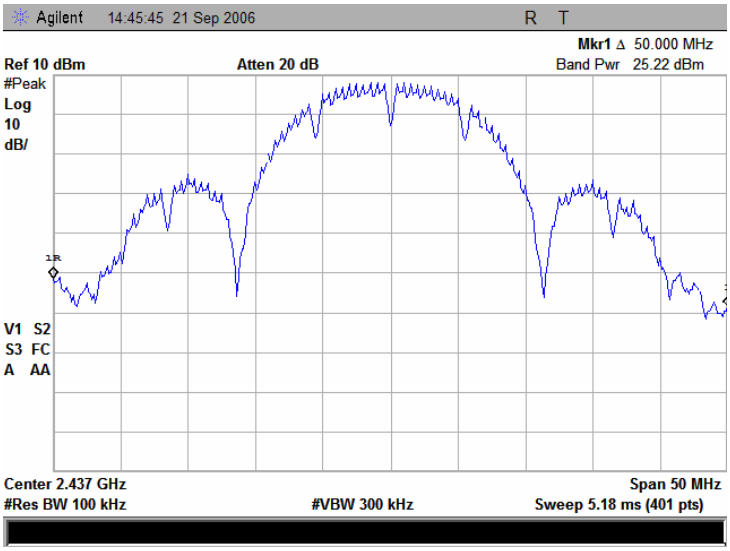
Full description is given in Appendix A.

Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.13 Peak output power at low frequency, DSSS, 1 Mbps

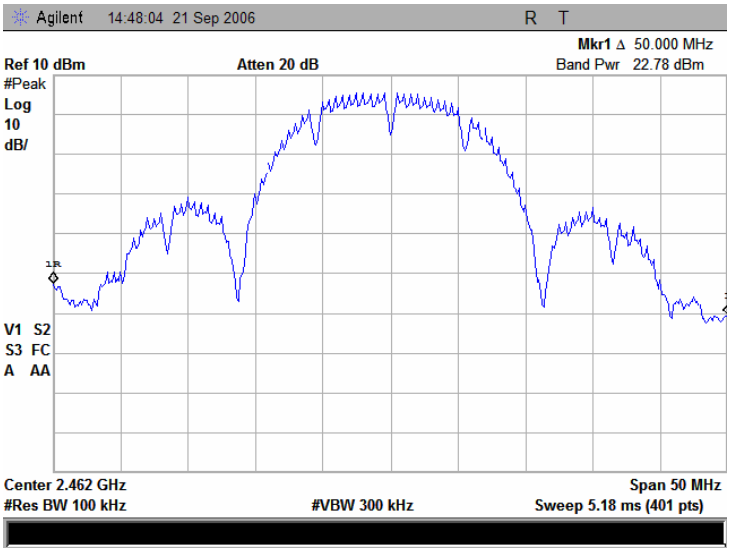


Plot 7.2.14 Peak output power at mid frequency, DSSS, 1 Mbps

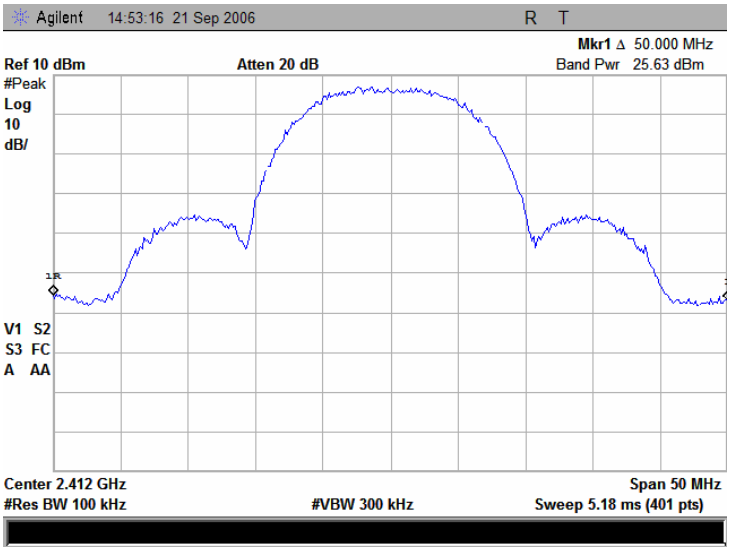


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.15 Peak output power at high frequency, DSSS, 1 Mbps

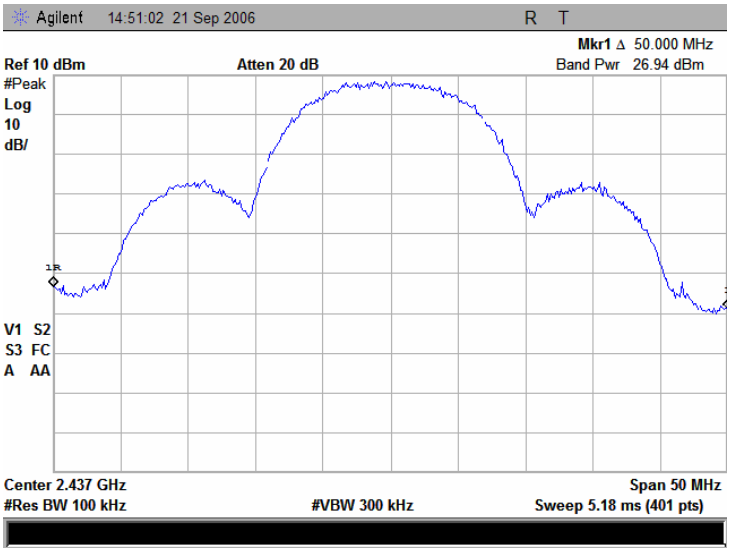


Plot 7.2.16 Peak output power at low frequency, DSSS, 11 Mbps

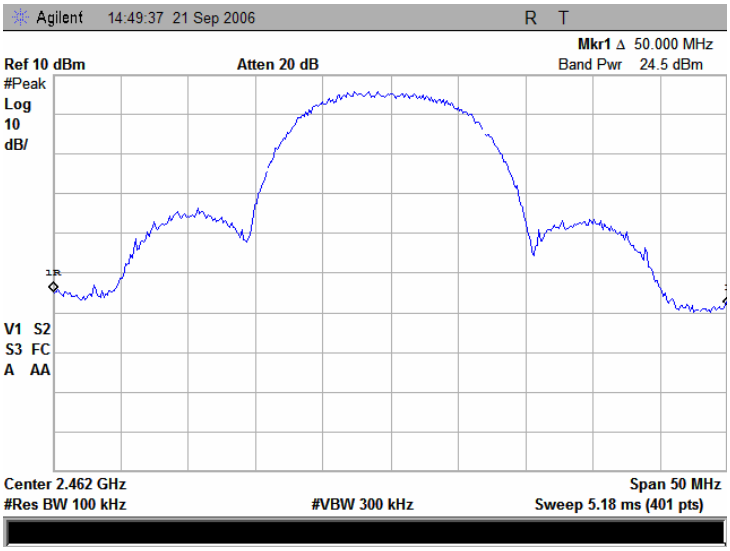


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.17 Peak output power at mid frequency, DSSS, 11 Mbps

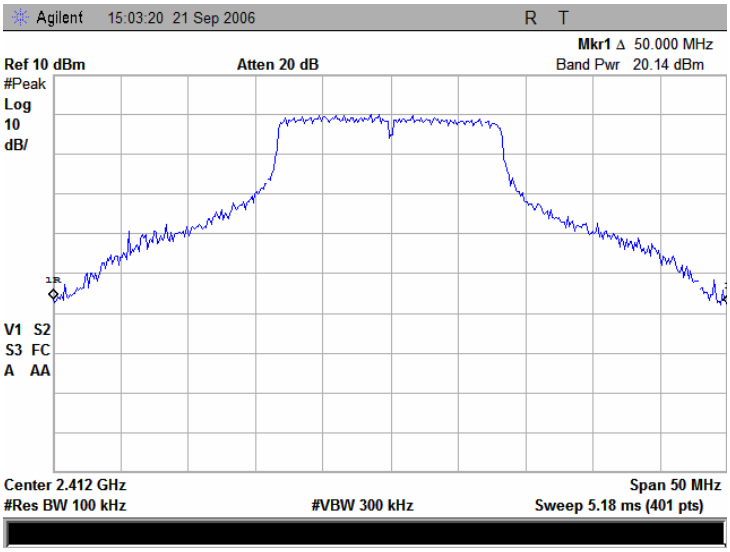


Plot 7.2.18 Peak output power at high frequency, DSSS, 11 Mbps

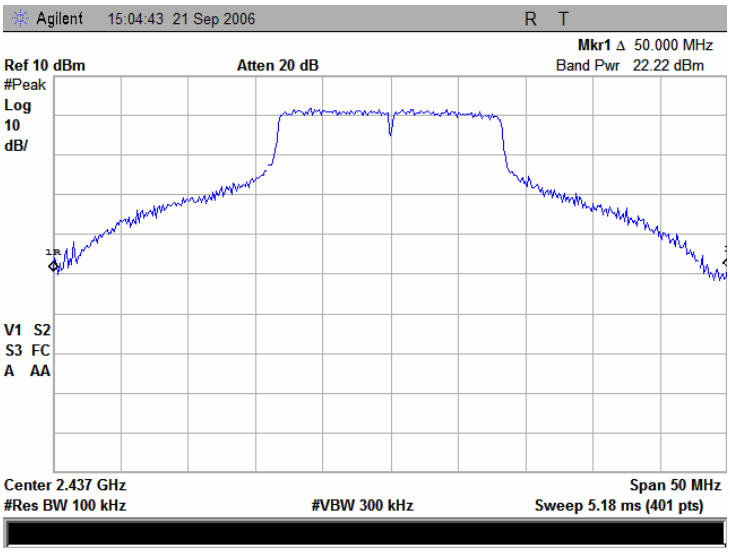


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.19 Peak output power at low frequency, OFDM, 6 Mbps

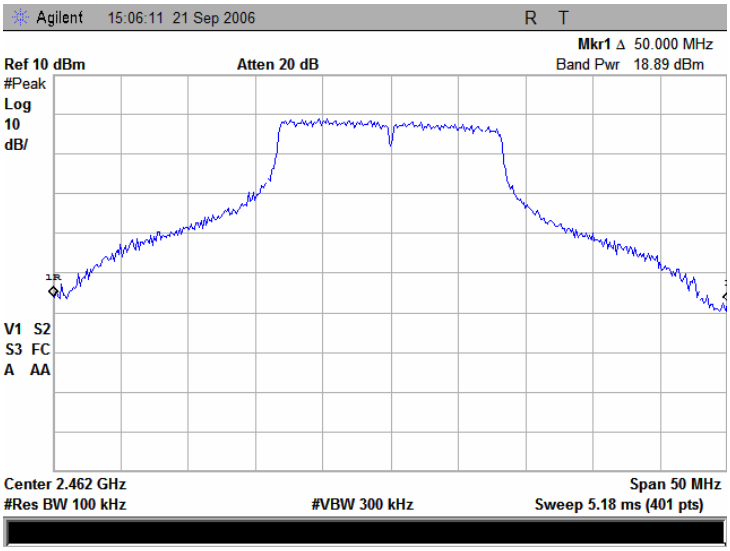


Plot 7.2.20 Peak output power at mid frequency, OFDM, 6 Mbps

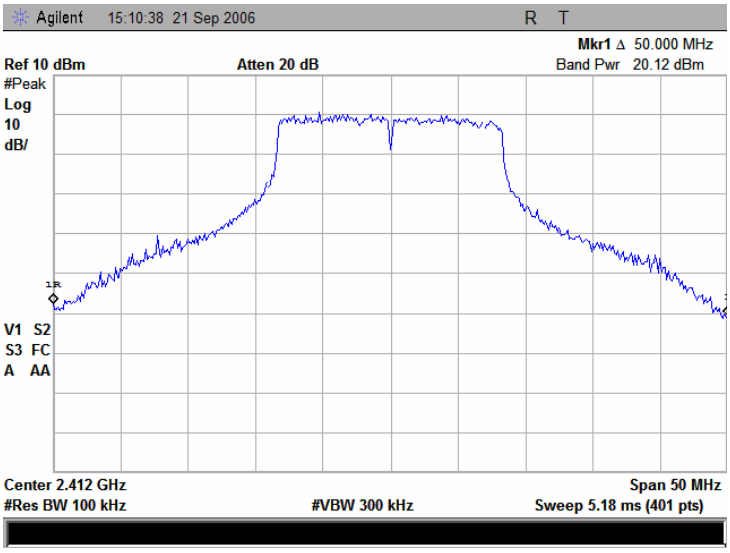


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.21 Peak output power at high frequency, OFDM, 6 Mbps

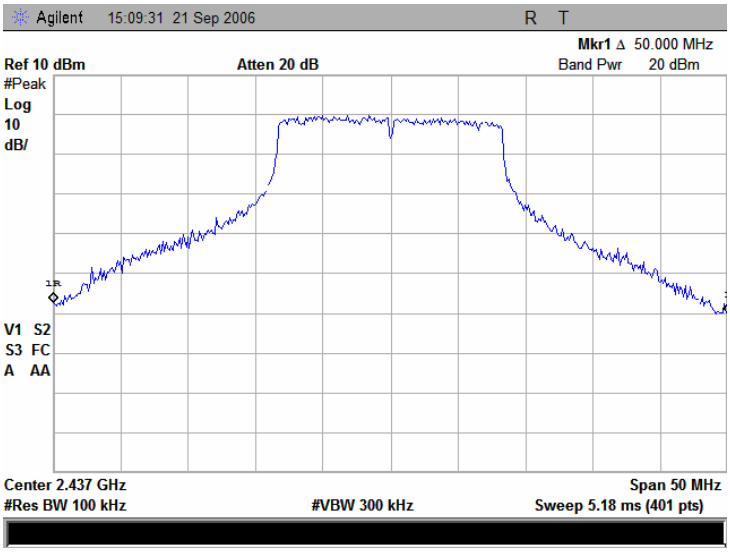


Plot 7.2.22 Peak output power at low frequency, OFDM, 54 Mbps

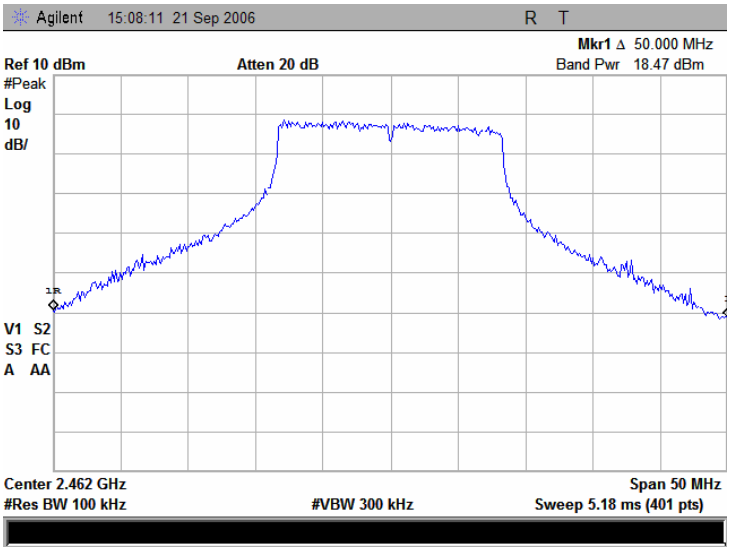


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	7/24/2006 9:06:31 AM		
Temperature: 24ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 50 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.2.23 Peak output power at mid frequency, OFDM, 54 Mbps



Plot 7.2.24 Peak output power at high frequency, OFDM, 54 Mbps



Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

7.3 Spurious emissions at RF antenna connector

7.3.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Spurious emission limits

Frequency*, MHz	Attenuation below carrier*, dBc
0.009 – 10th harmonic	30.0

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

7.3.2 Test procedure

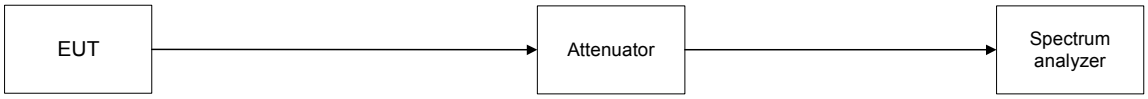
7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.

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

7.3.2.3 The highest emission level within the authorized band was measured.

7.3.2.4 The spurious emission was measured with spectrum analyzer as provided in Table 7.3.2 and associated plots and referenced to the highest emission level measured within the authorized band.

Figure 7.3.1 Spurious emission test setup



Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Table 7.3.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 2400-2483.5 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 26500 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 300 kHz
MODULATION: QAM
MODULATING SIGNAL: PRBS
BIT RATE: 1 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	Spurious emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
No spurious were found						Pass

*- Margin = Attenuation below carrier – specification limit.

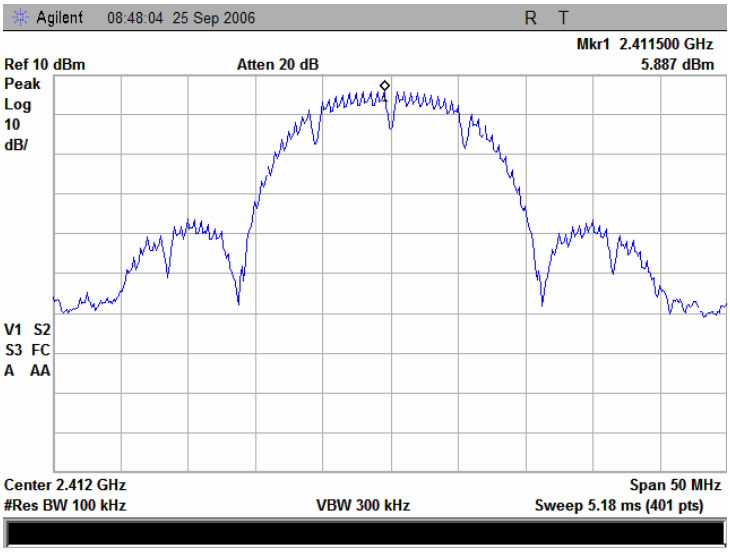
Reference numbers of test equipment used

HL 1650	HL 2254	HL 2780	HL 2869				

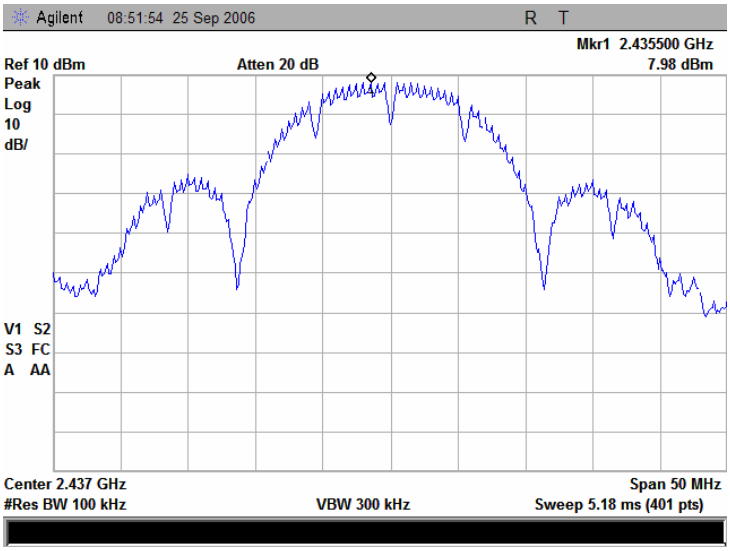
Full description is given in Appendix A.

Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Plot 7.3.1 The highest emission level within the assigned band at low carrier frequency

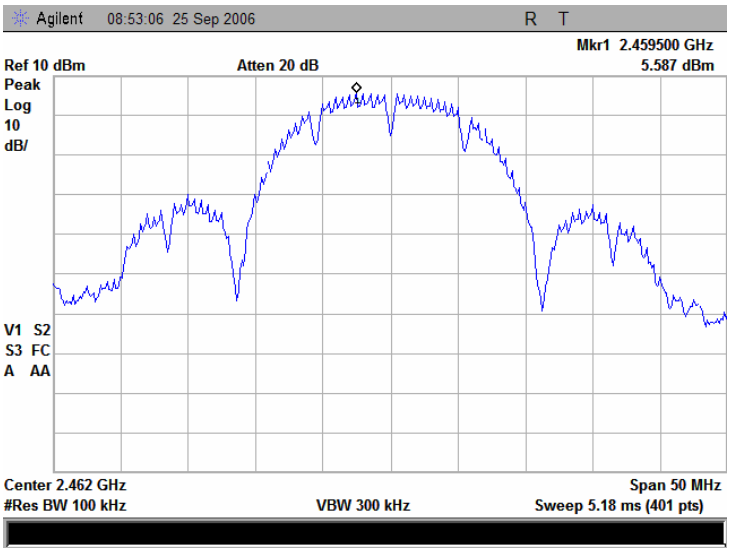


Plot 7.3.2 The highest emission level within the assigned band at mid carrier frequency

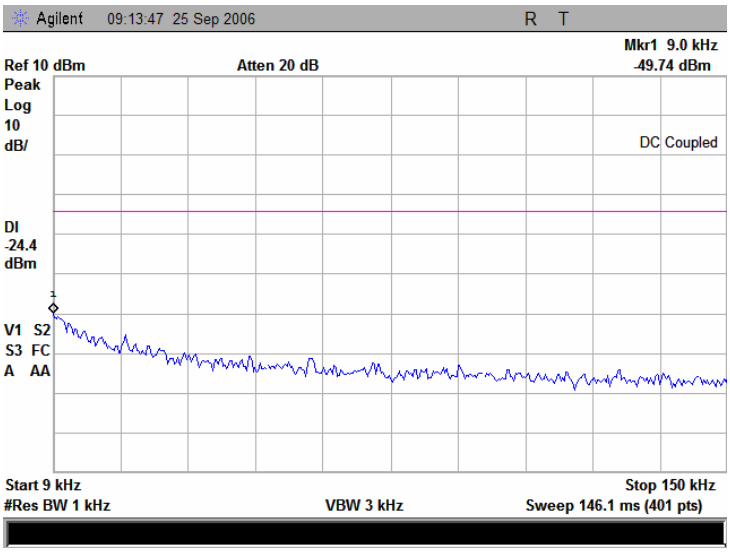


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Plot 7.3.3 The highest emission level within the assigned band at high carrier frequency

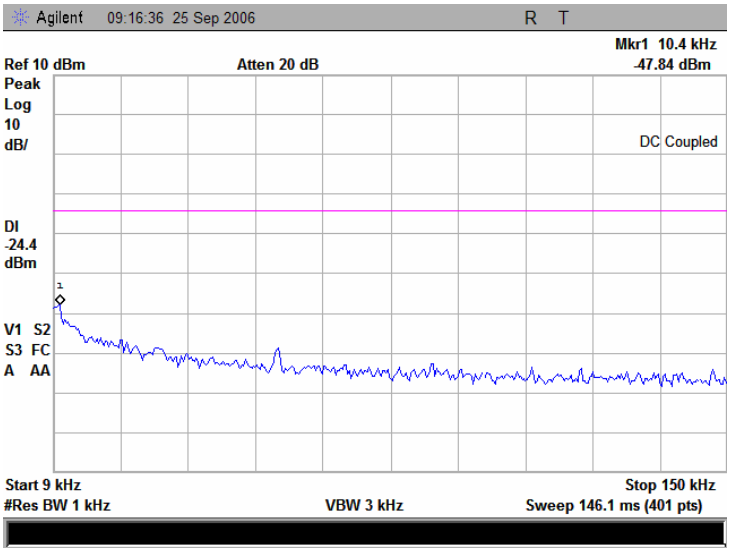


Plot 7.3.4 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency

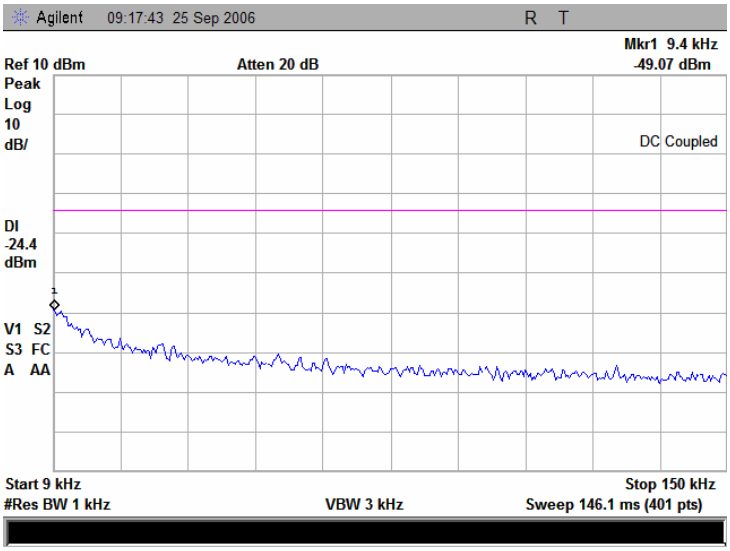


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Plot 7.3.5 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency

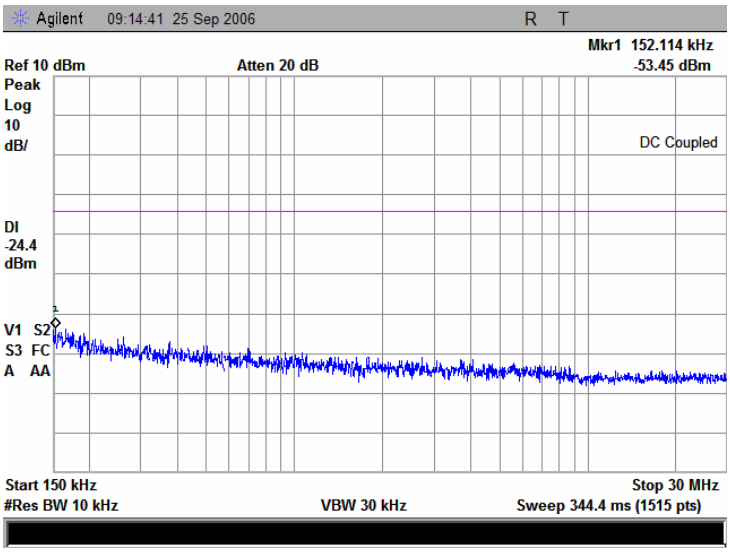


Plot 7.3.6 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

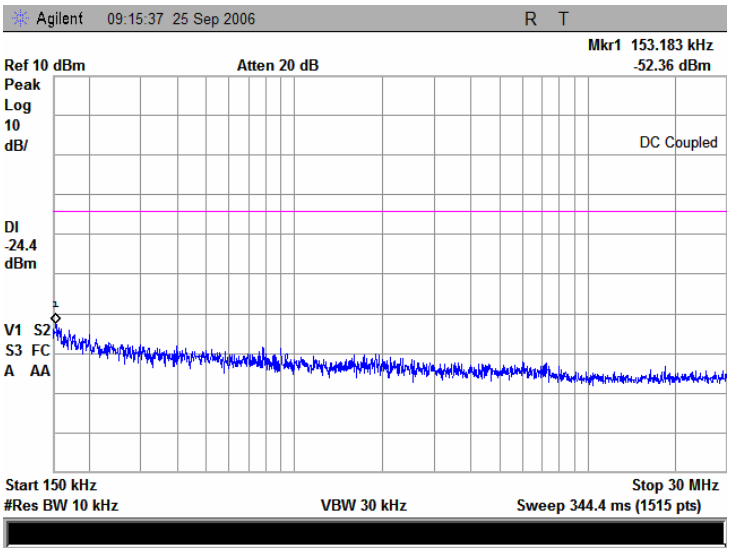


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Plot 7.3.7 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency

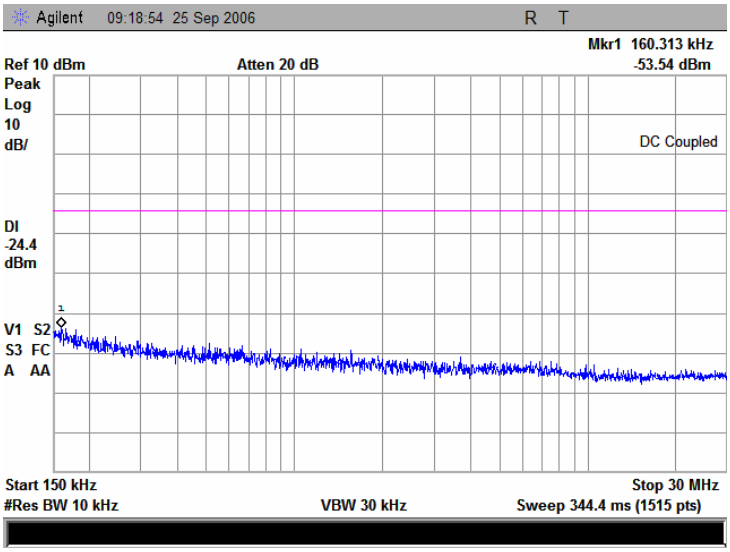


Plot 7.3.8 Spurious emission measurements in 0.15 - 30 MHz range at mid carrier frequency

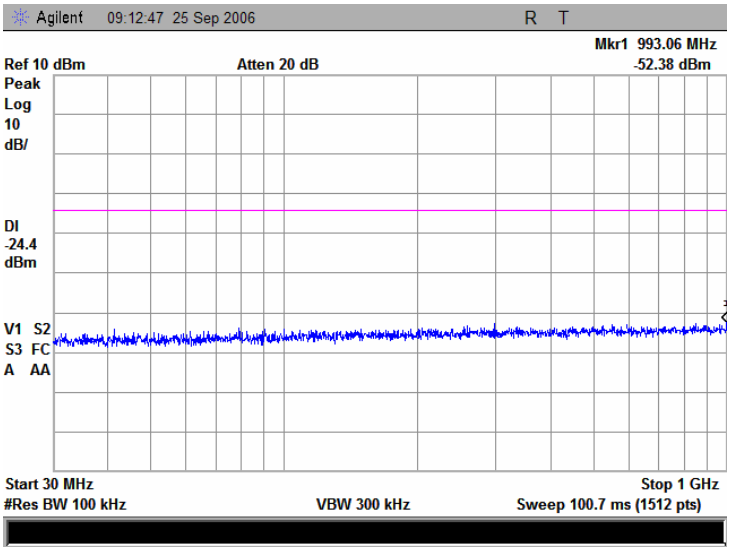


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Plot 7.3.9 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency

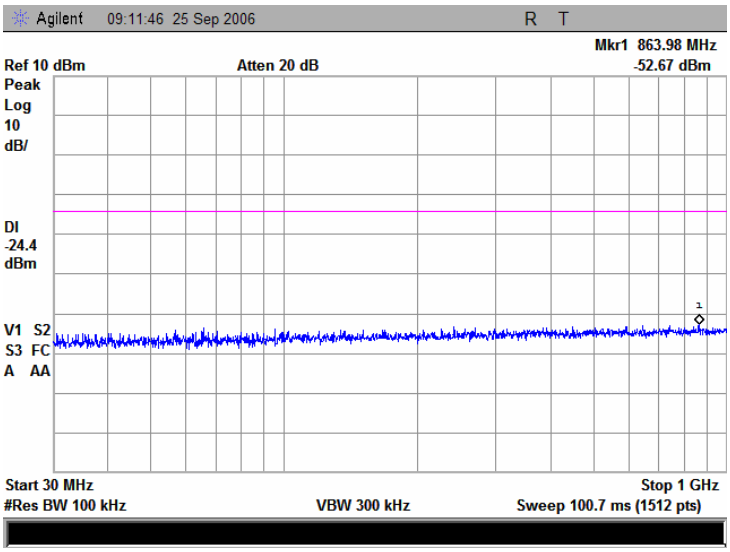


Plot 7.3.10 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency

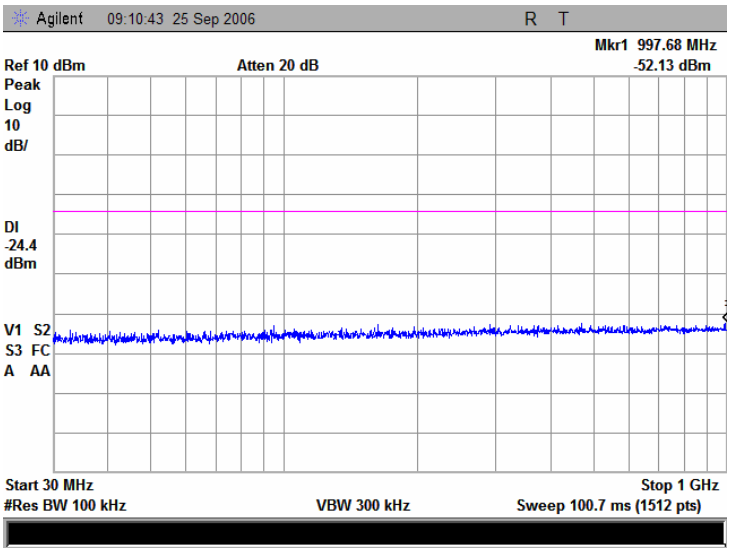


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Plot 7.3.11 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency

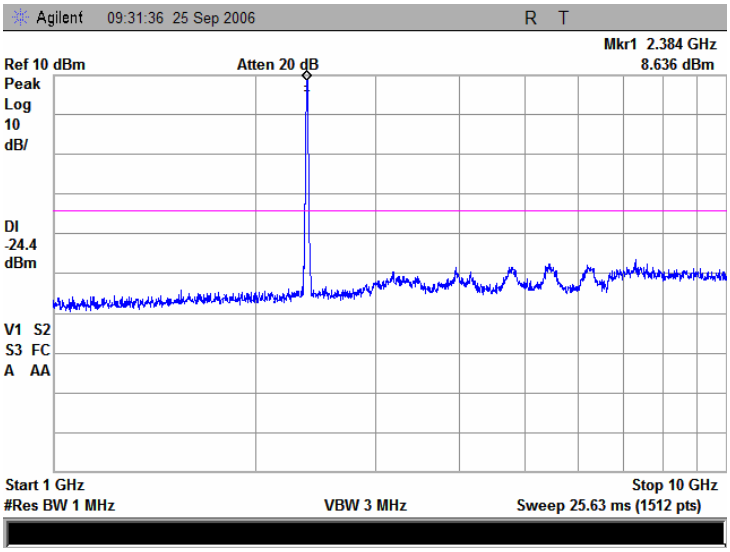


Plot 7.3.12 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency

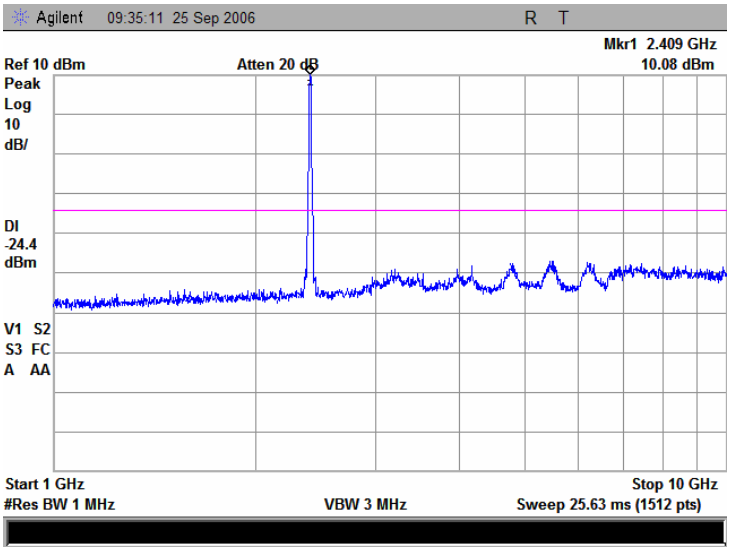


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Plot 7.3.13 Spurious emission measurements in 1000 – 10000 MHz range at low carrier frequency

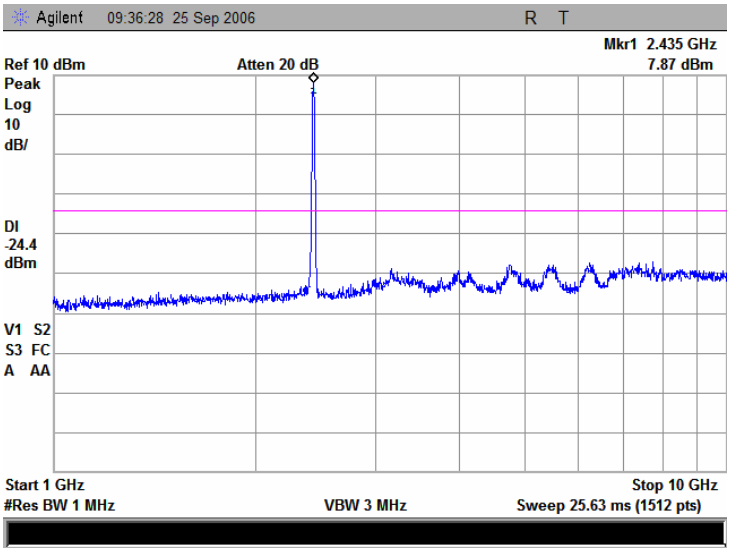


Plot 7.3.14 Spurious emission measurements in 1000 – 10000 MHz range at mid carrier frequency

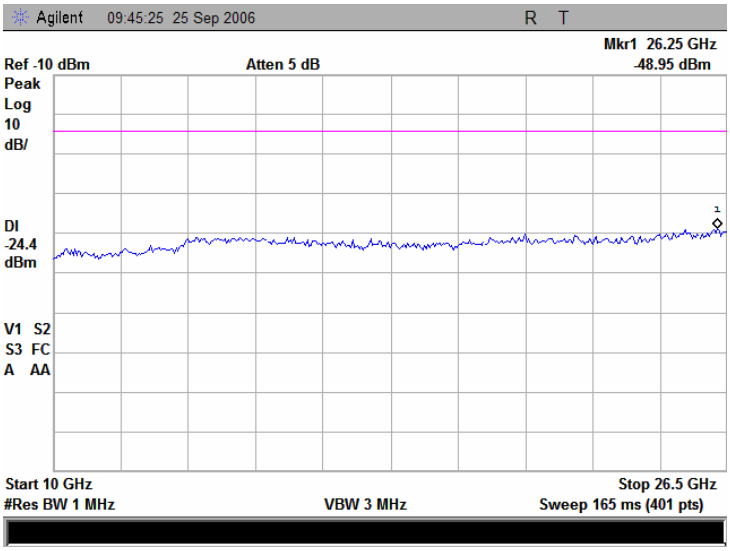


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Plot 7.3.15 Spurious emission measurements in 1000 – 10000 MHz range at high carrier frequency

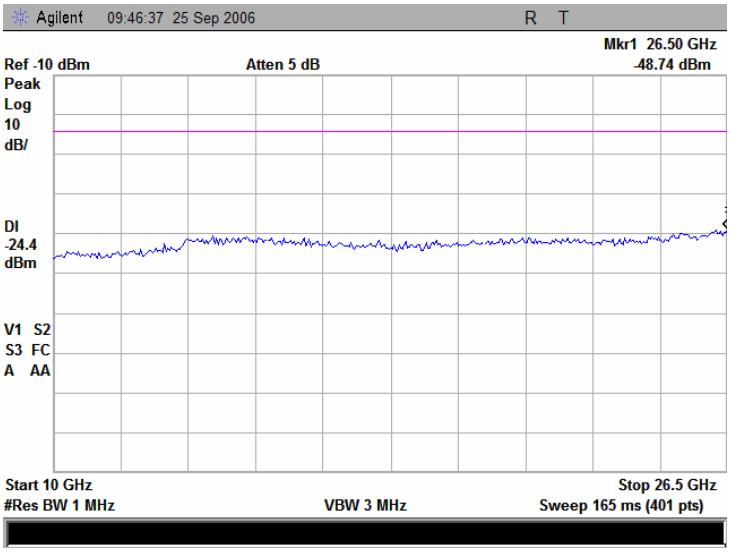


Plot 7.3.16 Spurious emission measurements in 10000 – 26500 MHz range at low carrier frequency

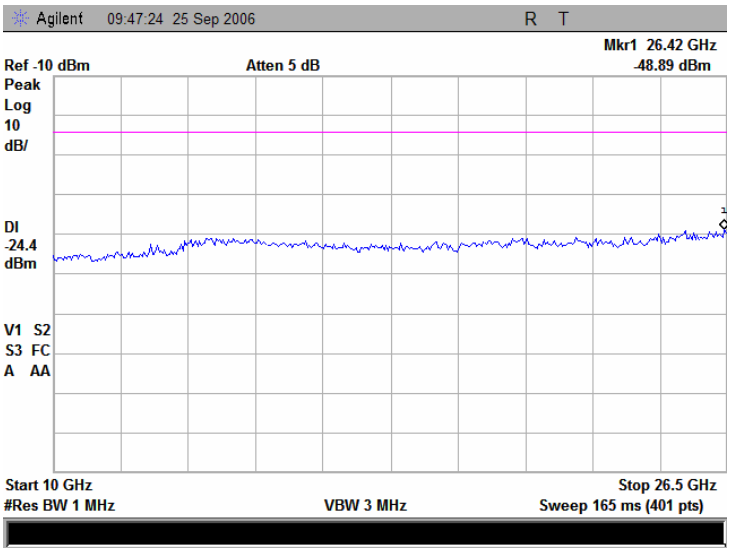


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/25/2006 10:18:07 AM		
Temperature: 24ºC	**Air Pressure:** 1012 hPa	**Relative Humidity:** 46 %	**Power Supply:** 120 V AC
Remarks: 802.11b/g			

Plot 7.3.17 Spurious emission measurements in 1000 – 26500 MHz range at mid carrier frequency



Plot 7.3.18 Spurious emission measurements in 1000 – 26500 MHz range at high carrier frequency



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

7.4 Field strength of spurious emissions

7.4.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.4.1.

Table 7.4.1 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.

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

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.

7.4.2.2 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.

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

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

7.4.3.1 The EUT was set up as shown in Figure 7.4.2, energized and the performance check was conducted.

7.4.3.2 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.

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

Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Figure 7.4.1 Setup for spurious emission field strength measurements below 30 MHz

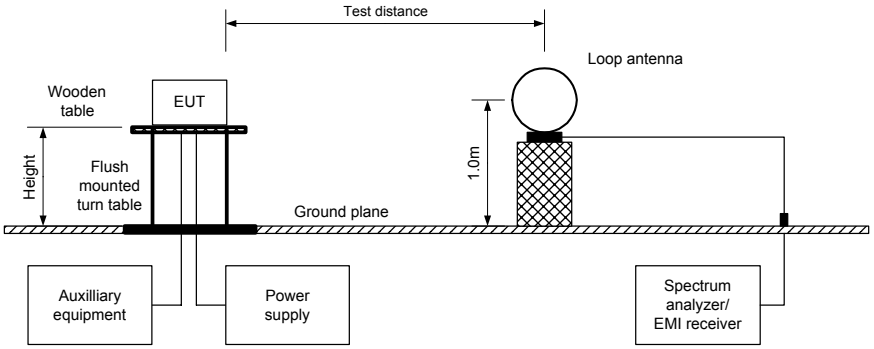
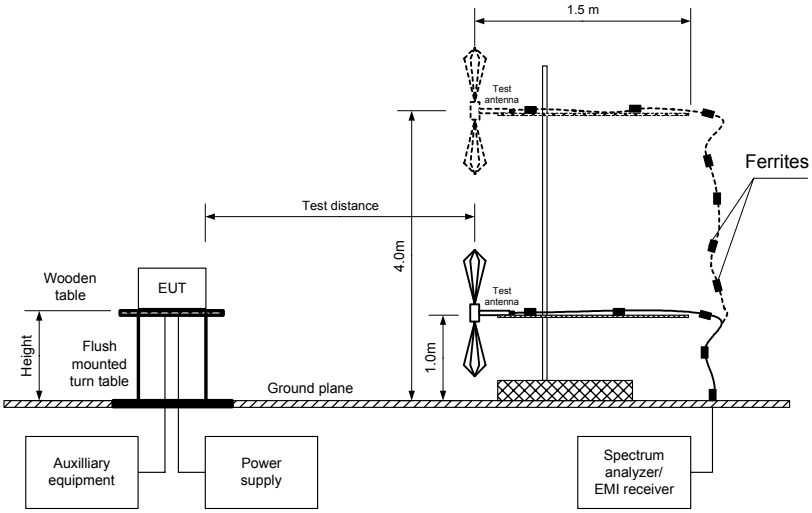


Figure 7.4.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Table 7.4.2 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY: 2400-2483.5 MHz
INVESTIGATED FREQUENCY RANGE: 1000 – 26500 MHz
TEST DISTANCE: 3 m
MODULATION: QAM
MODULATING SIGNAL: PRBS
BIT RATE: 1Mbps
DUTY CYCLE: 100 %
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
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***	
Low carrier frequency											
2386.00	V	1.2	187	56.10	74.00	-17.9	51.11	51.11	54.00	-2.89	Pass
Mid carrier frequency											
No spurious emissions were found											Pass
High carrier frequency											
2483.58	V	1.0	261	55.28	74.00	-18.72	48.32	48.32	54.00	-5.68	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 7.4.3 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
100% duty cycle					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:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Table 7.4.4 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:	QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	1Mbps
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*				
All frequencies								
37.554000	43.38	38.62	40.00	-1.38	V	1.0	273	Pass
73.97000	41.45	36.54	40.00	-3.46	V	1.0	94	
108.79700	42.27	38.08	43.50	-5.42	V	1.0	90	
130.50750	42.41	38.92	43.50	-4.58	V	1.0	264	
150.00372	42.03	39.12	43.50	-4.38	V	1.0	0	
333.12200	42.40	36.65	46.00	-9.35	H	1.0	82	
400.00100	44.59	39.09	46.00	-6.91	H	1.0	145	

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

Table 7.4.5 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 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

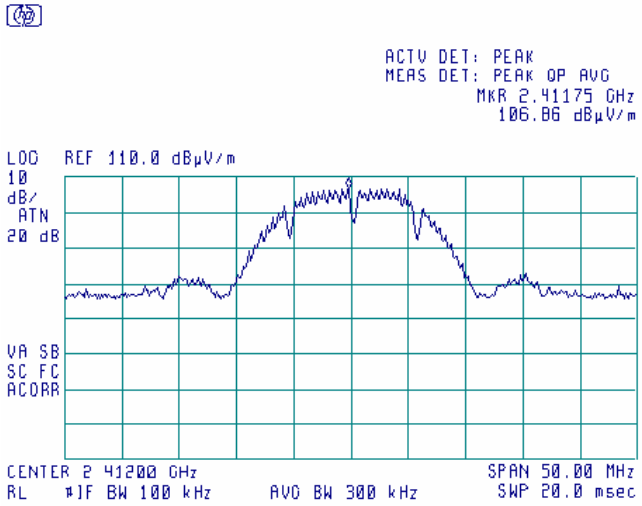
HL 0446	HL 0465	HL 0521	HL 0589	HL 0592	HL 0593	HL 0594	HL 0604
HL 1947	HL 1984	HL 2009					

Full description is given in Appendix A.

Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

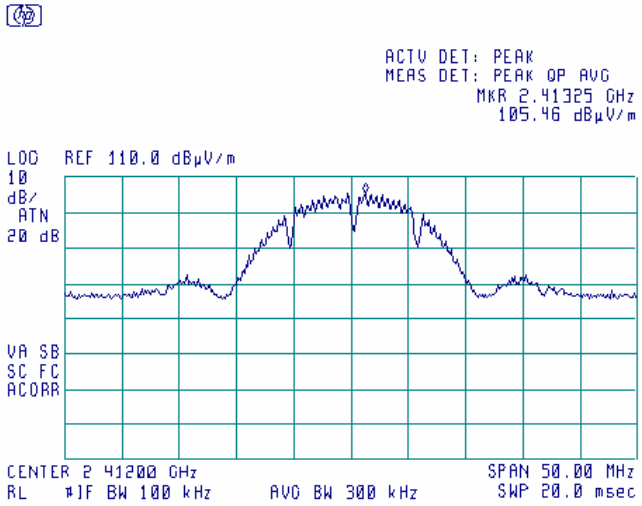
Plot 7.4.1 Radiated emission measurements at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 7.4.2 Radiated emission measurements at the low carrier frequency

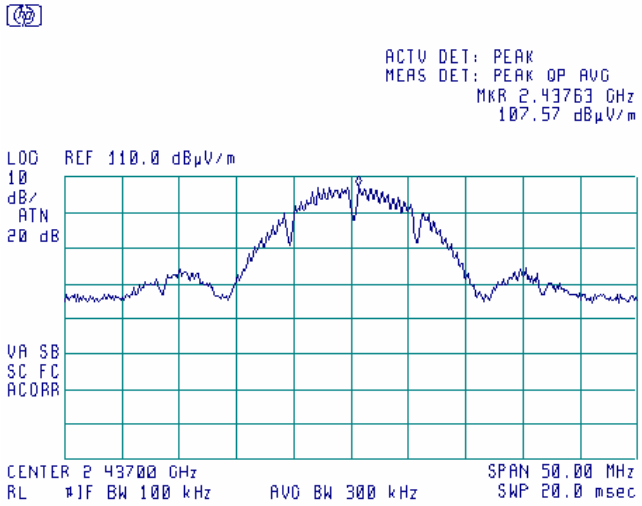
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

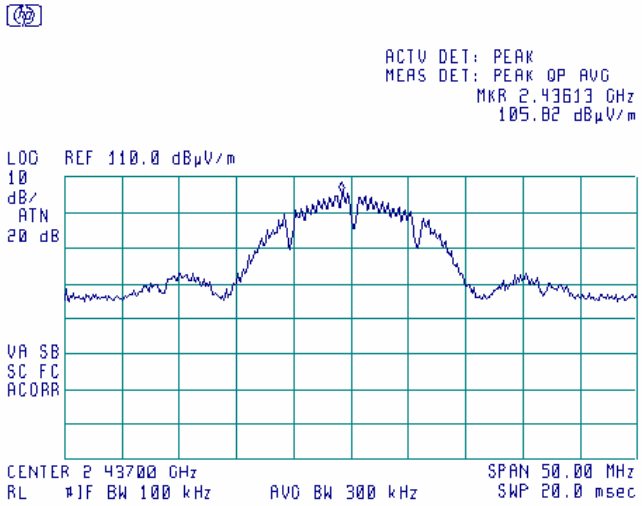
Plot 7.4.3 Radiated emission measurements at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 7.4.4 Radiated emission measurements at the mid carrier frequency

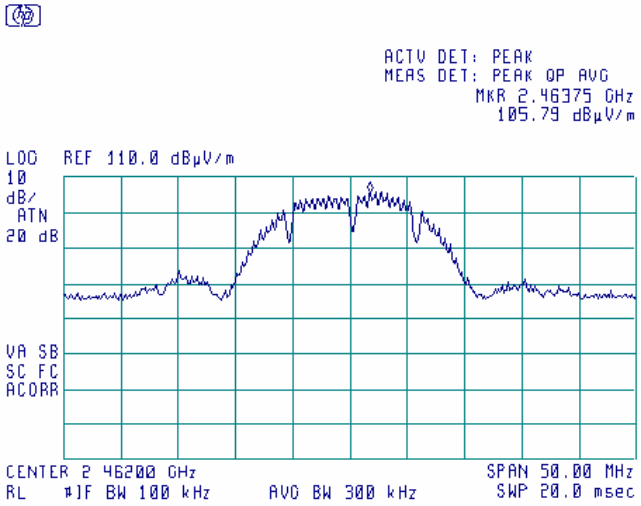
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

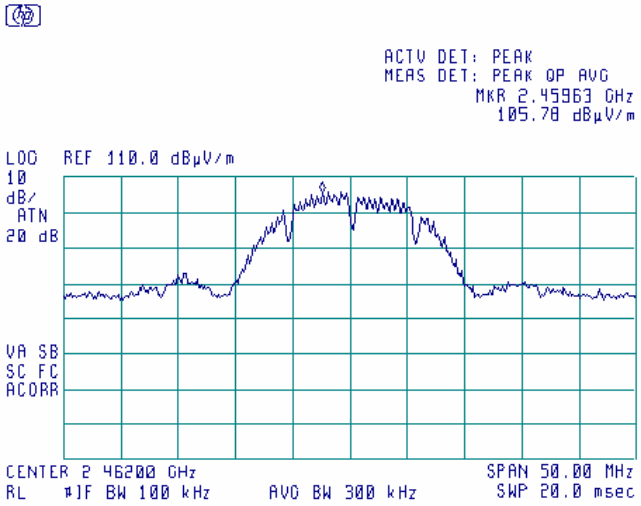
Plot 7.4.5 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 7.4.6 Radiated emission measurements at the high carrier frequency

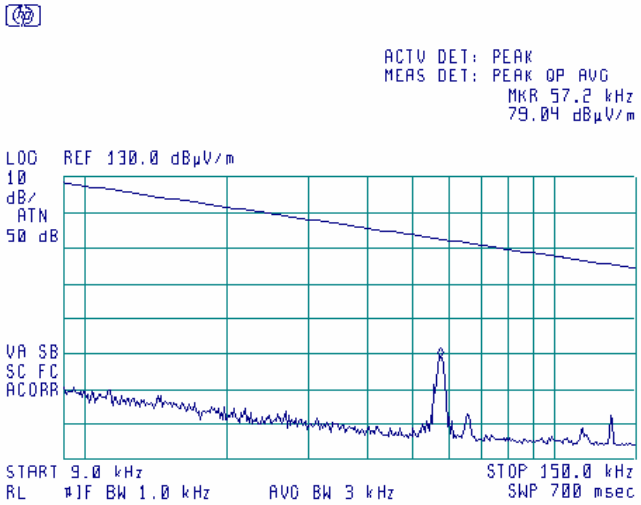
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

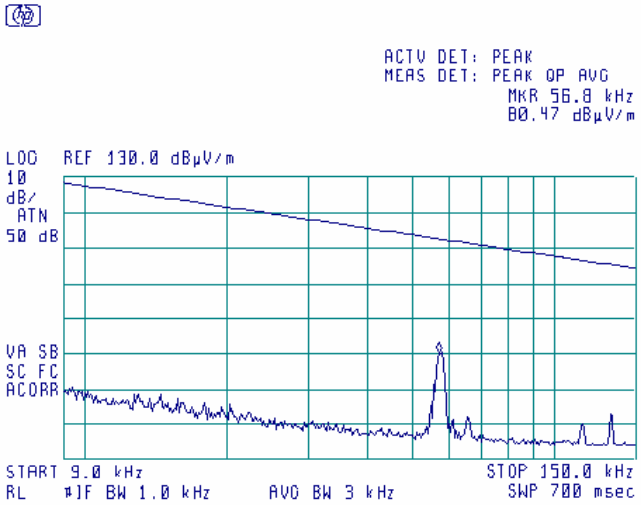
Plot 7.4.7 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
INPUTS: 802.11 b/g



Plot 7.4.8 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

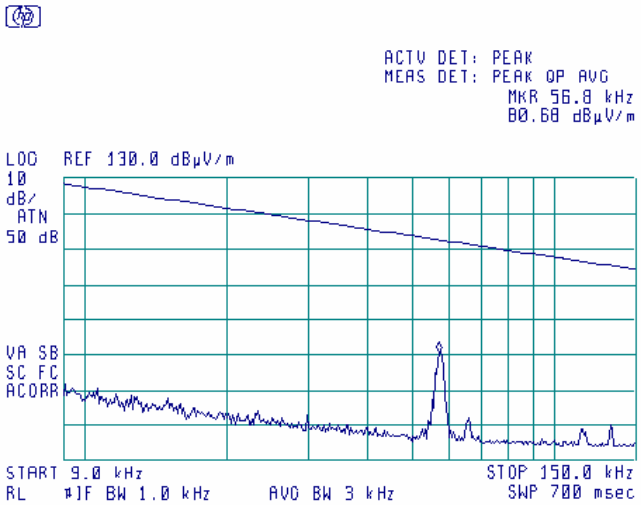
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

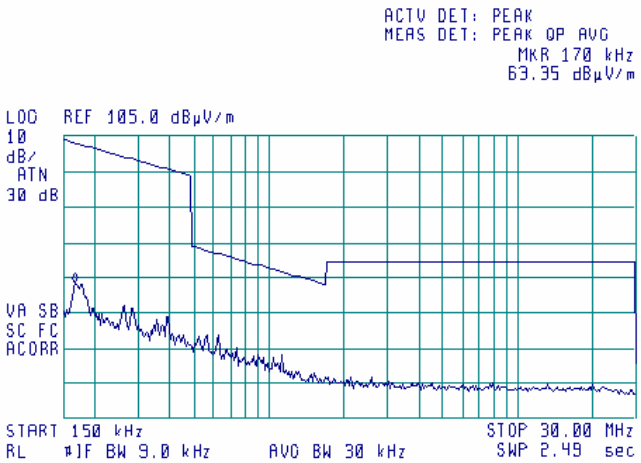
Plot 7.4.9 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 7.4.10 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

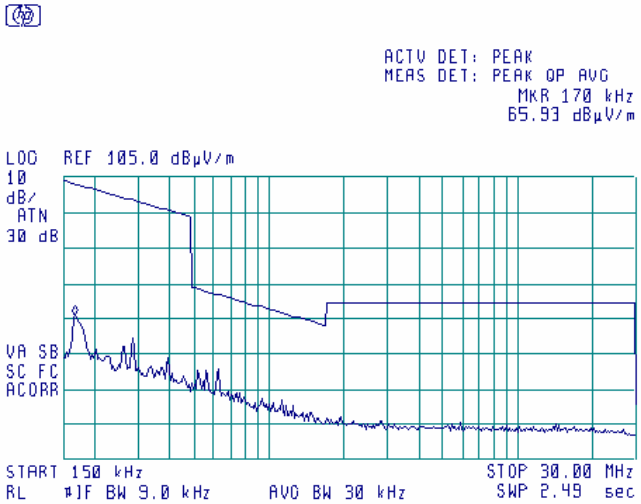
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

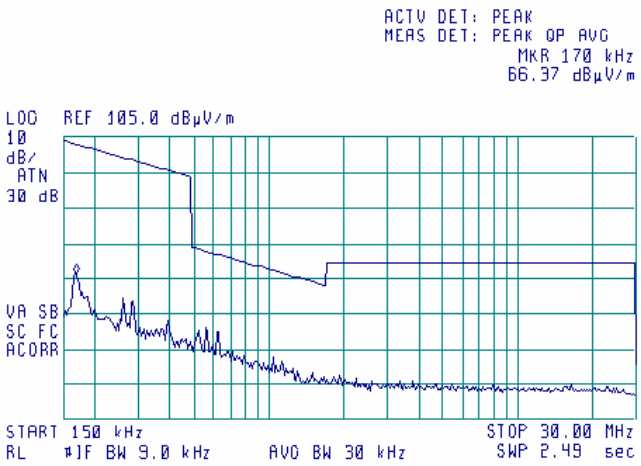
Plot 7.4.11 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 7.4.12 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

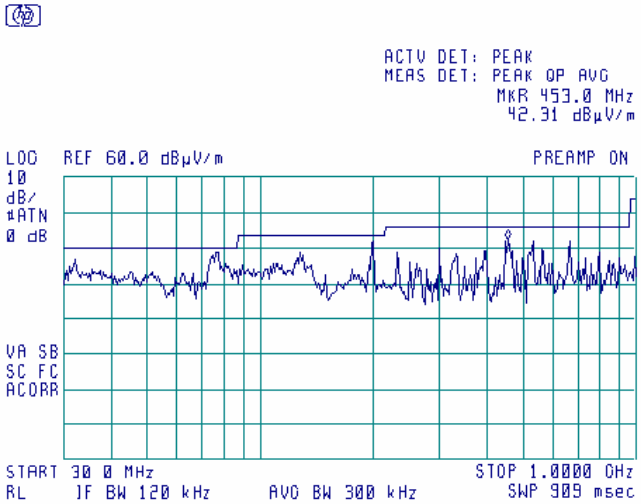
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

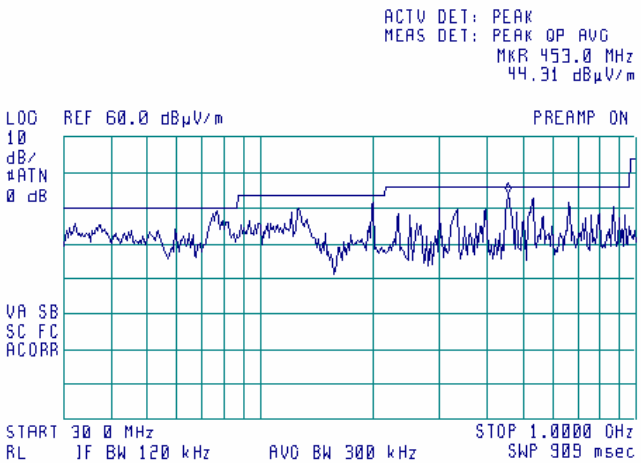
Plot 7.4.13 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.4.14 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

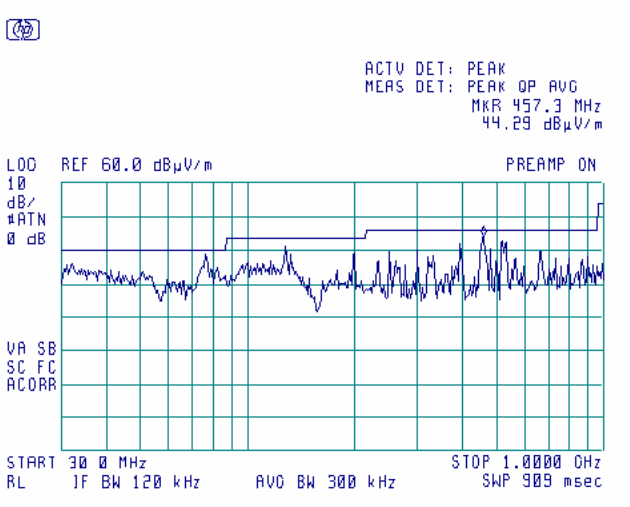
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.4.15 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

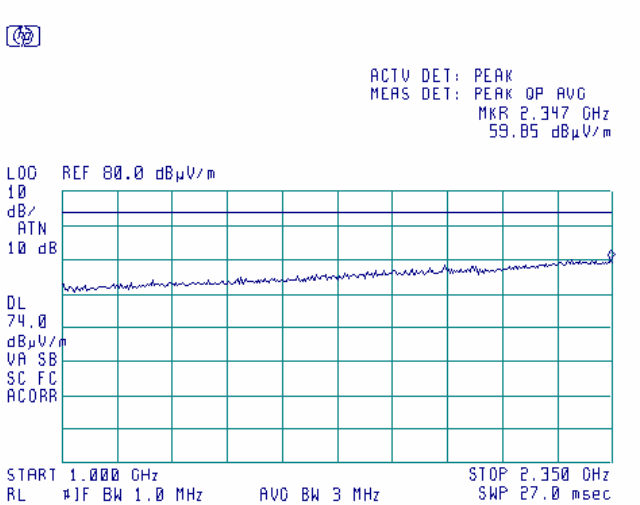
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

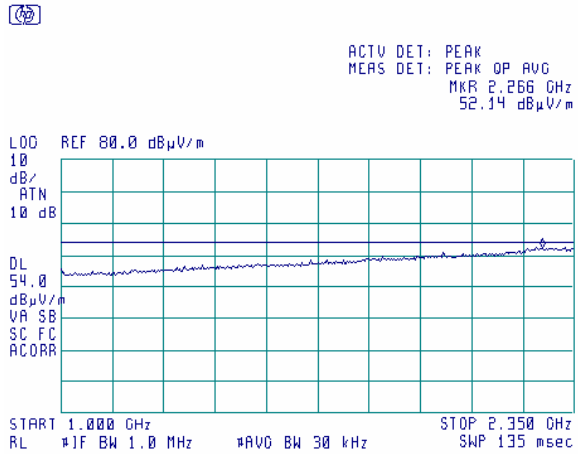
Plot 7.4.16 Radiated emission measurements from 1000 to 2350 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.17 Radiated emission measurements from 1000 to 2350 MHz at the low carrier frequency

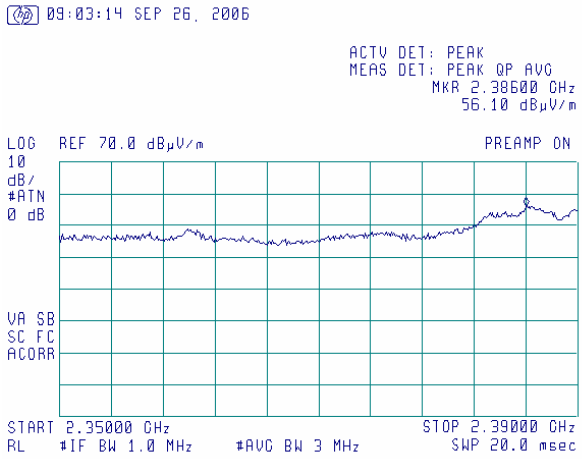
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

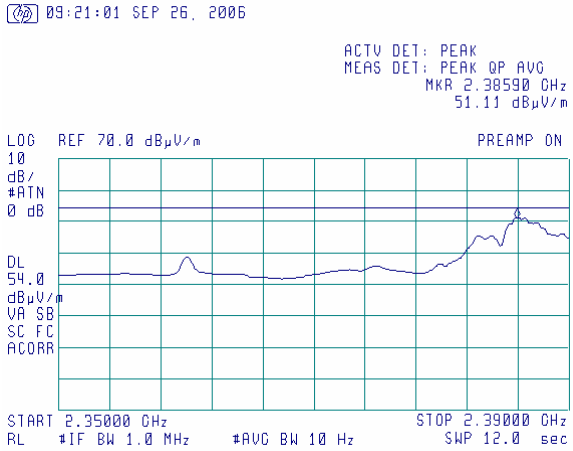
Plot 7.4.18 Radiated emission measurements from 2350 to 2390 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.19 Radiated emission measurements from 2350 to 2390 MHz at the low carrier frequency

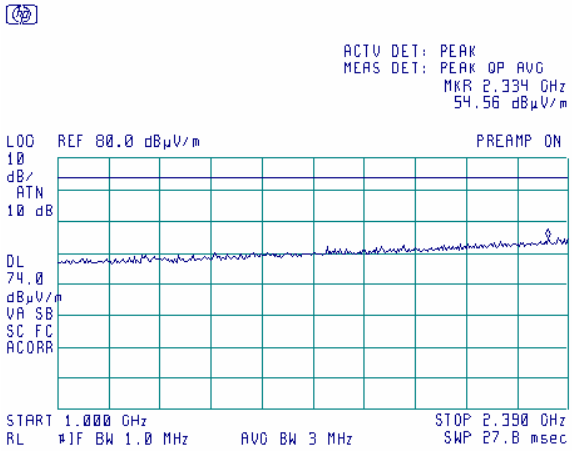
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

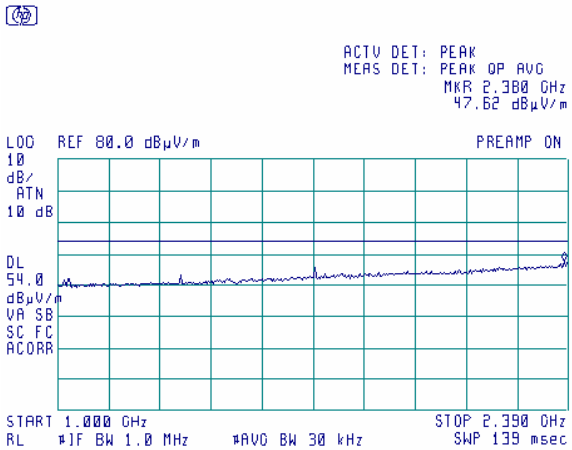
Plot 7.4.20 Radiated emission measurements from 1000 to 2390 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.21 Radiated emission measurements from 1000 to 2390 MHz at the mid carrier frequency

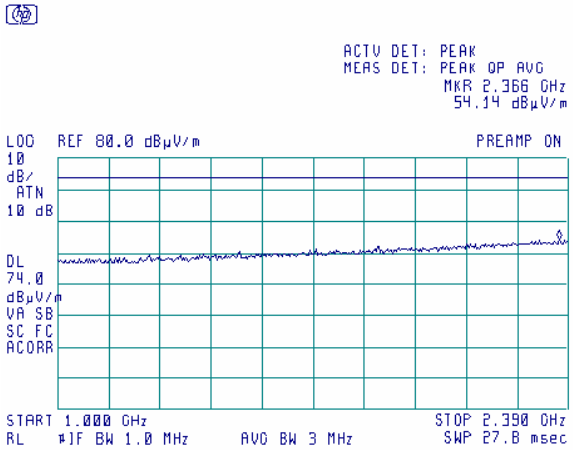
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

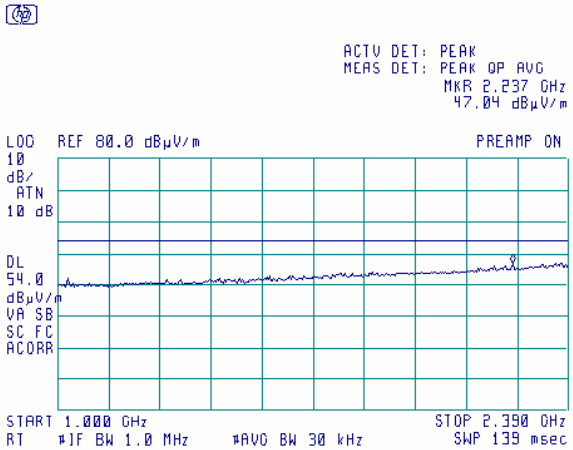
Plot 7.4.22 Radiated emission measurements from 1000 to 2390 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.23 Radiated emission measurements from 1000 to 2390 MHz at the high carrier frequency

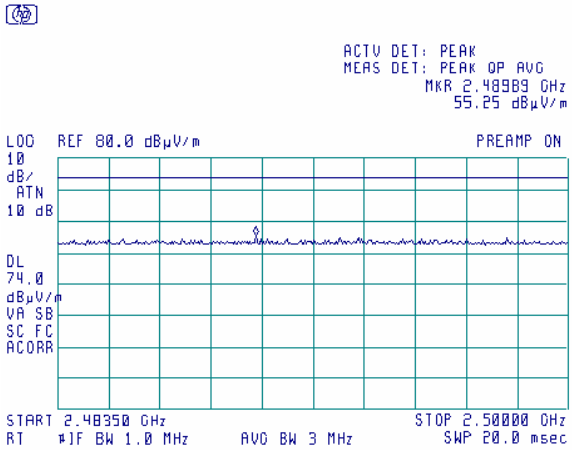
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

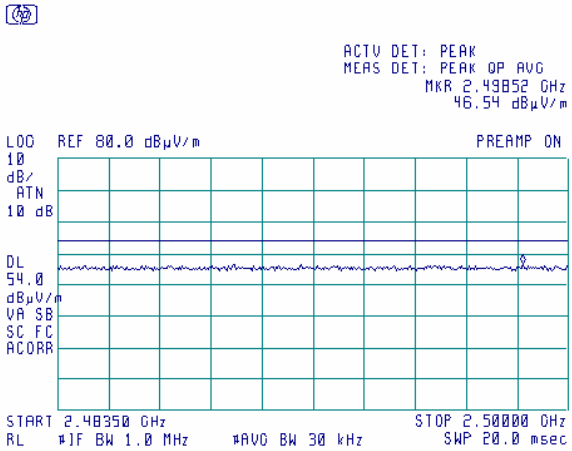
Plot 7.4.24 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.25 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

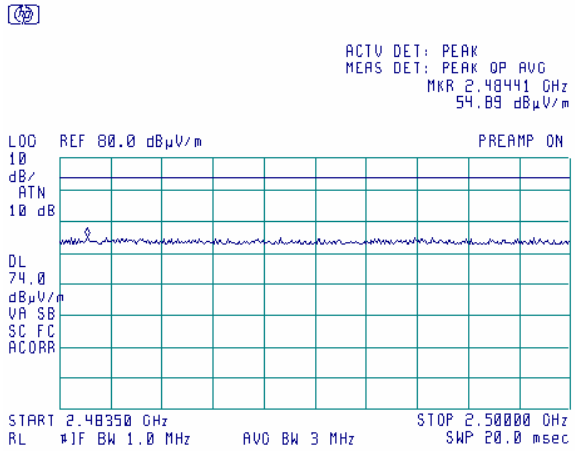
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

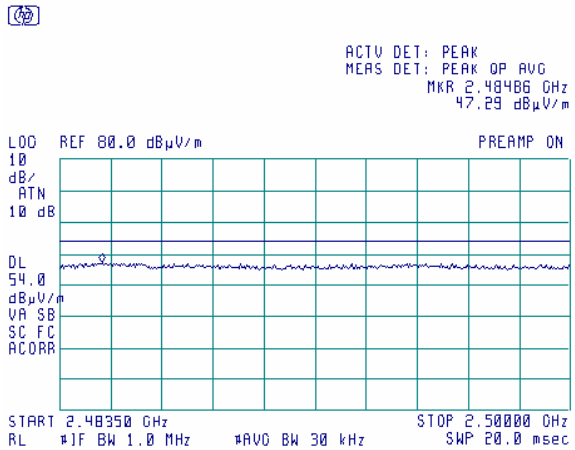
Plot 7.4.26 Radiated emission measurements from 2483.5 to 2500 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.27 Radiated emission measurements from 2483.5 to 2500 MHz at the mid carrier frequency

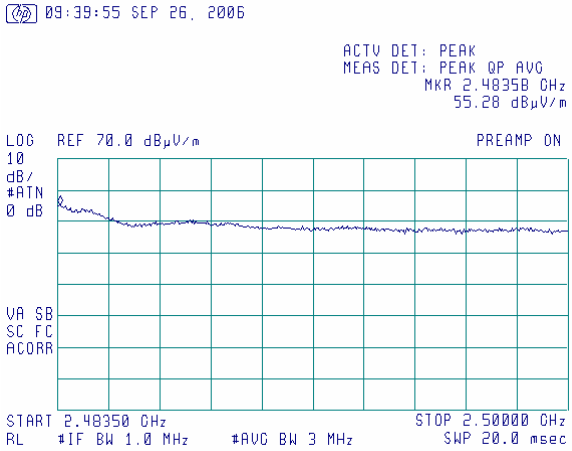
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

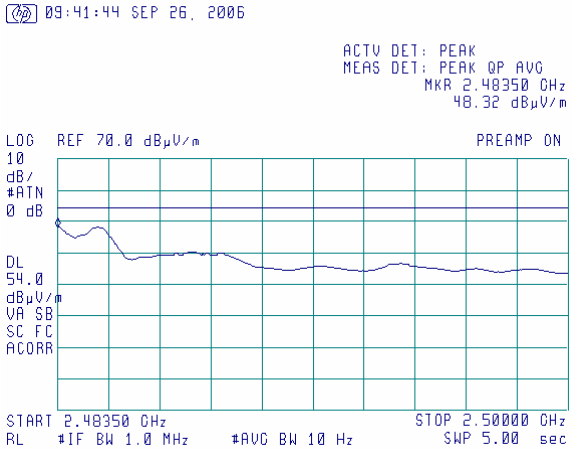
Plot 7.4.28 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical and Horizontal
INPUTS:	802.11 b/g
DETECTOR:	Peak



Plot 7.4.29 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

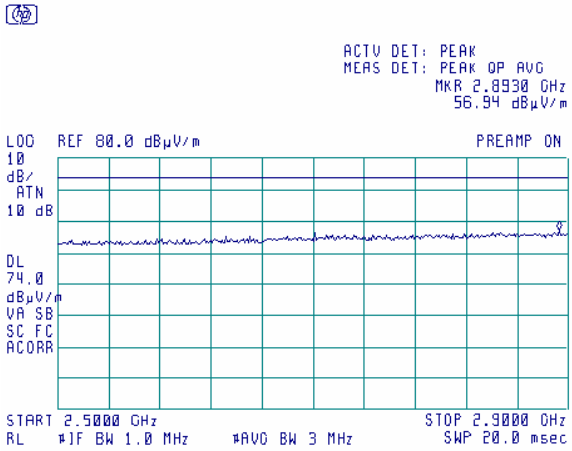
TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical and Horizontal
INPUTS:	802.11 b/g
DETECTOR:	Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

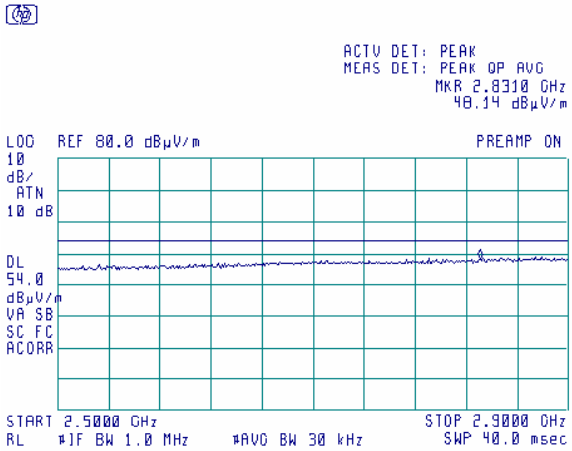
Plot 7.4.30 Radiated emission measurements from 2500 to 2900 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.31 Radiated emission measurements from 2500 to 2900 MHz at the low carrier frequency

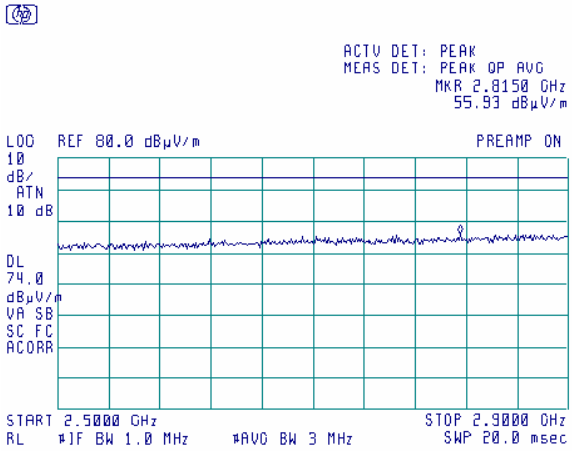
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

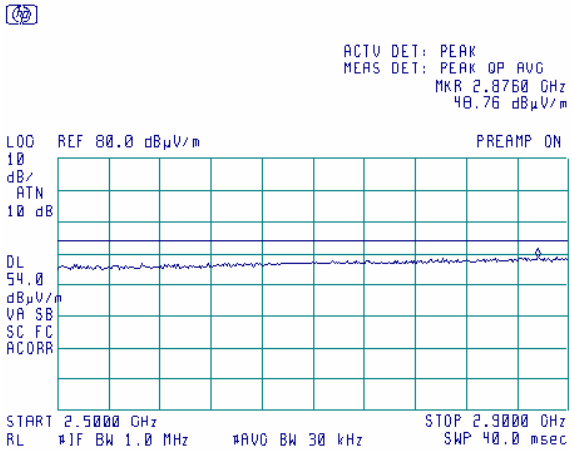
Plot 7.4.32 Radiated emission measurements from 2500 to 2900 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.33 Radiated emission measurements from 2500 to 2900 MHz at the mid carrier frequency

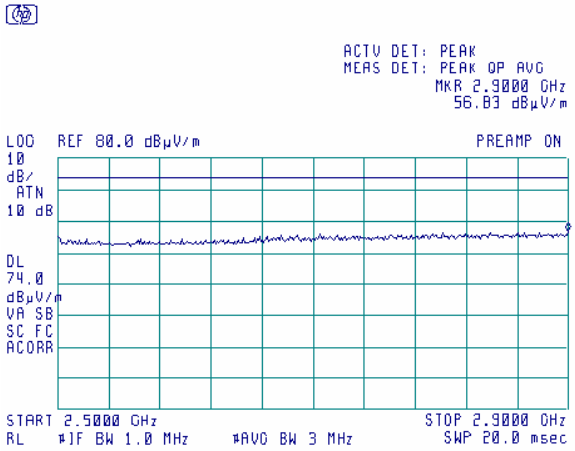
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

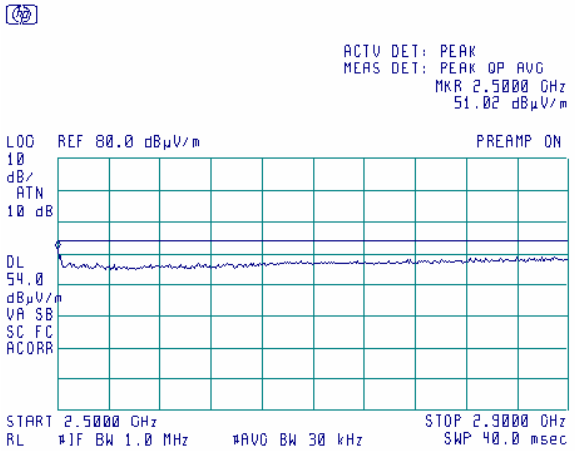
Plot 7.4.34 Radiated emission measurements from 2500 to 2900 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.35 Radiated emission measurements from 2500 to 2900 MHz at the high carrier frequency

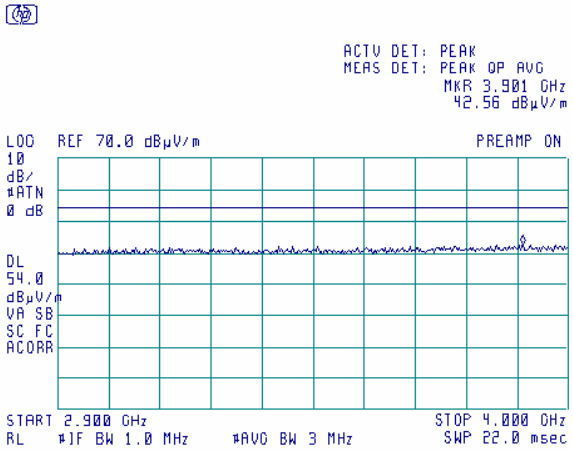
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

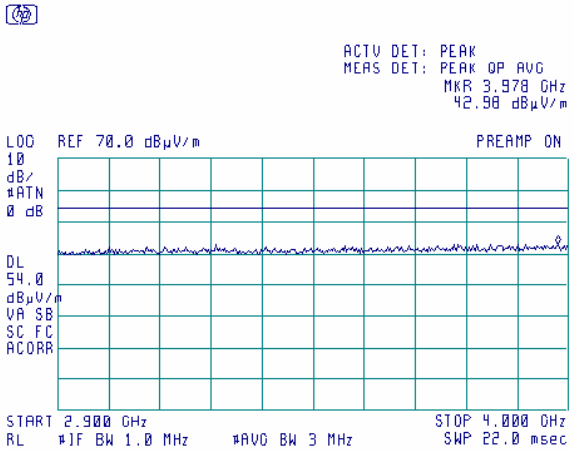
Plot 7.4.36 Radiated emission measurements from 2900 to 4000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.37 Radiated emission measurements from 2900 to 4000 MHz at the mid carrier frequency

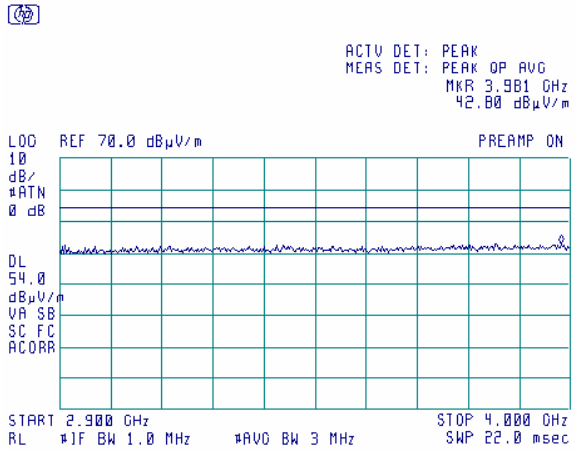
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.4.38 Radiated emission measurements from 2900 to 4000 MHz at the high carrier frequency

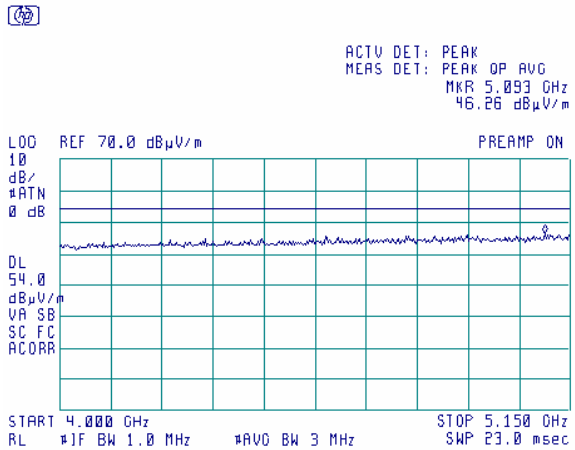
TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical and Horizontal
INPUTS:	802.11 b/g
DETECTOR:	Peak



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

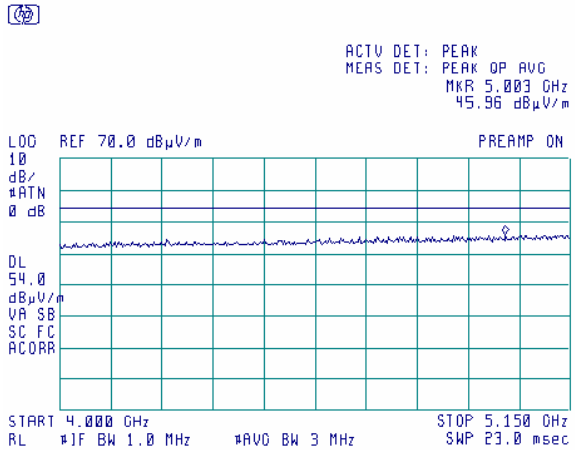
Plot 7.4.39 Radiated emission measurements from 4000 to 5150 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g



Plot 7.4.40 Radiated emission measurements from 4000 to 5150 MHz at the mid carrier frequency

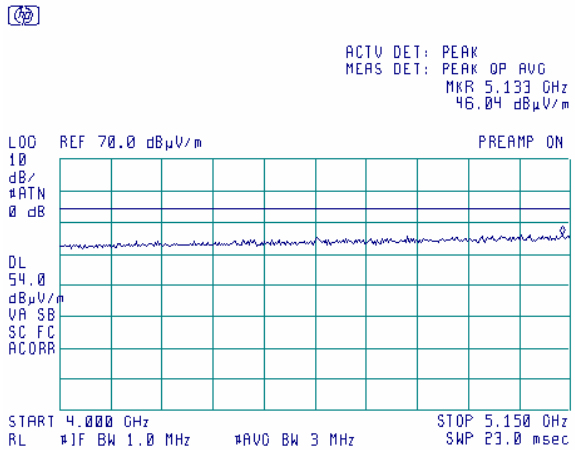
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

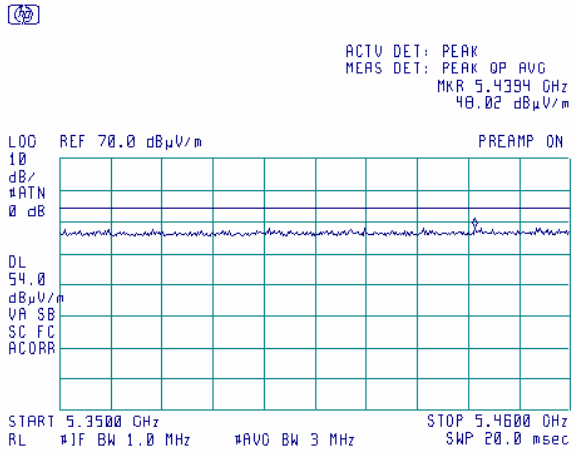
Plot 7.4.41 Radiated emission measurements from 4000 to 5150 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g



Plot 7.4.42 Radiated emission measurements from 5350 to 5460 MHz at the low carrier frequency

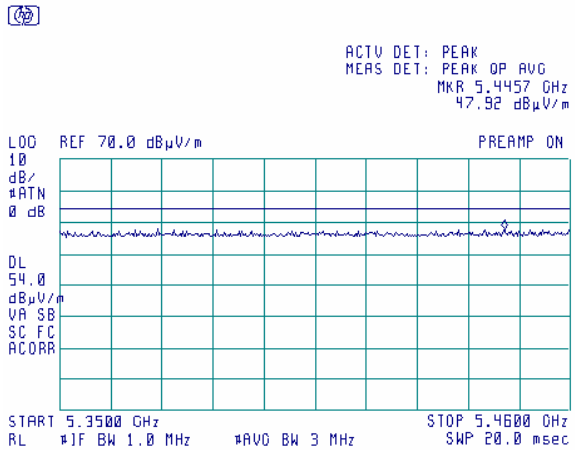
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

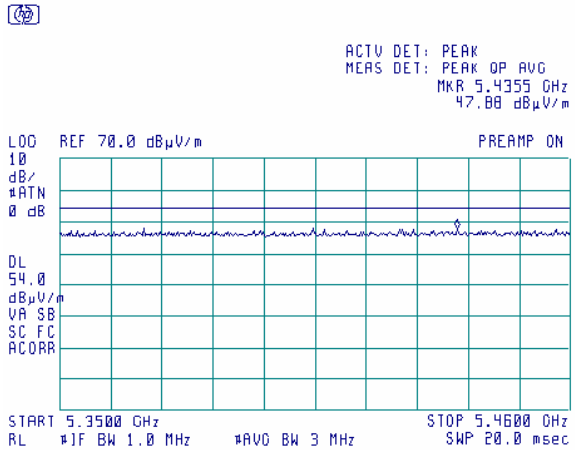
Plot 7.4.43 Radiated emission measurements from 5350 to 5460 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g



Plot 7.4.44 Radiated emission measurements from 5350 to 5460 MHz at the high carrier frequency

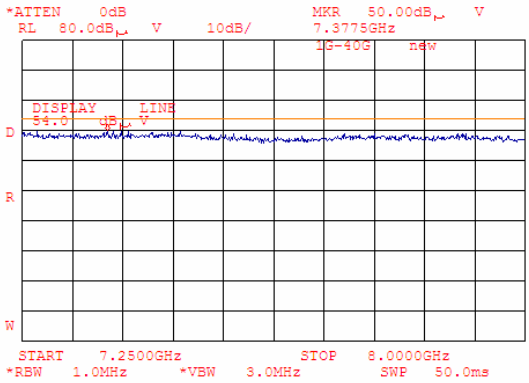
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

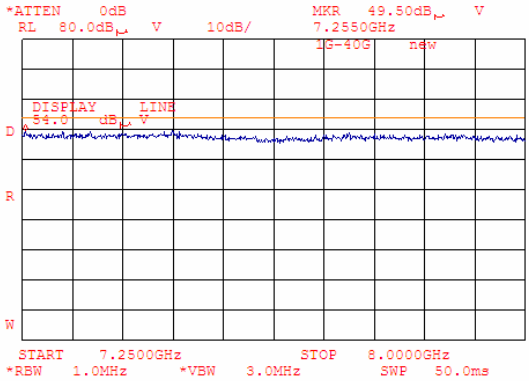
Plot 7.4.45 Radiated emission measurements from 7.25 to 8.0 GHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.46 Radiated emission measurements from 7.25 to 8.0 GHz at the mid carrier frequency

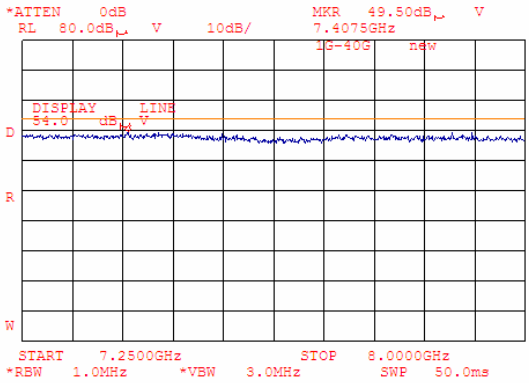
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

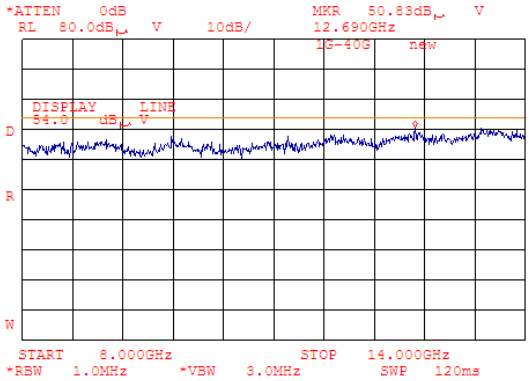
Plot 7.4.47 Radiated emission measurements from 7.25 to 8.0 GHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.48 Radiated emission measurements from 8.0 to 14.0 GHz at the low carrier frequency

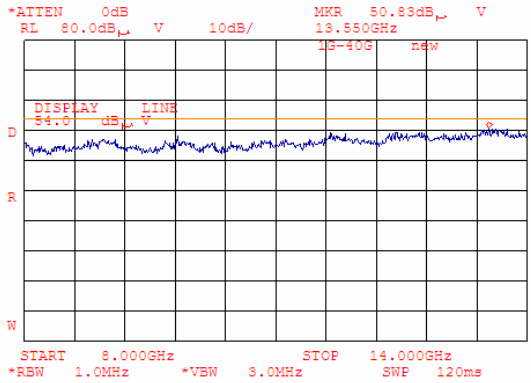
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

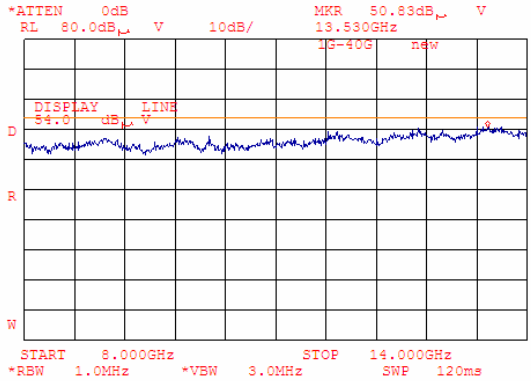
Plot 7.4.49 Radiated emission measurements from 8.0 to 14.0 GHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.50 Radiated emission measurements from 8.0 to 14.0 GHz at the high carrier frequency

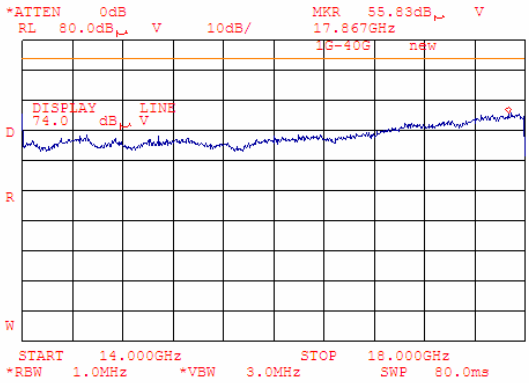
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

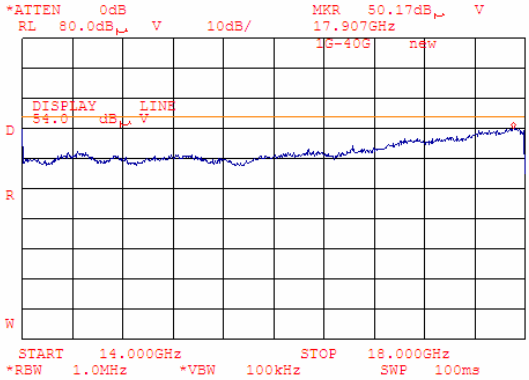
Plot 7.4.51 Radiated emission measurements from 14.0 to 18.0 GHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.52 Radiated emission measurements from 14.0 to 18.0 GHz at the low carrier frequency

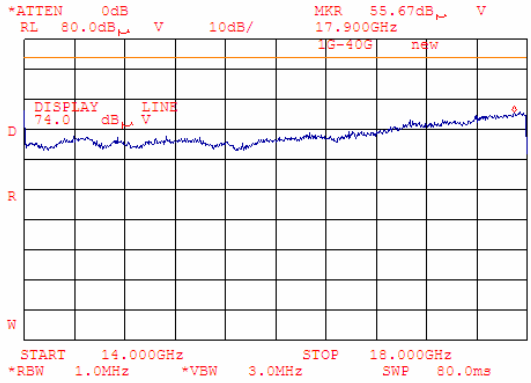
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

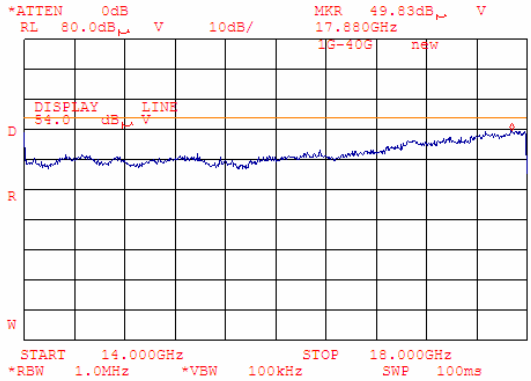
Plot 7.4.53 Radiated emission measurements from 14.0 to 18.0 GHz at the mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.54 Radiated emission measurements from 14.0 to 18.0 GHz at the mid carrier frequency

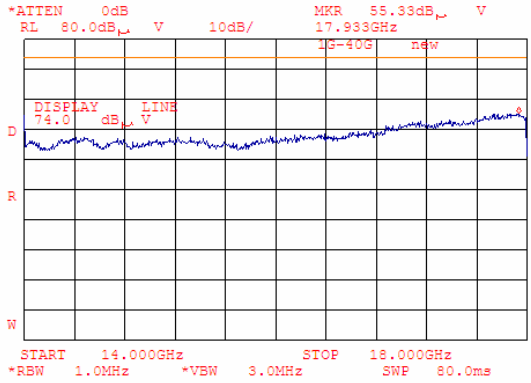
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

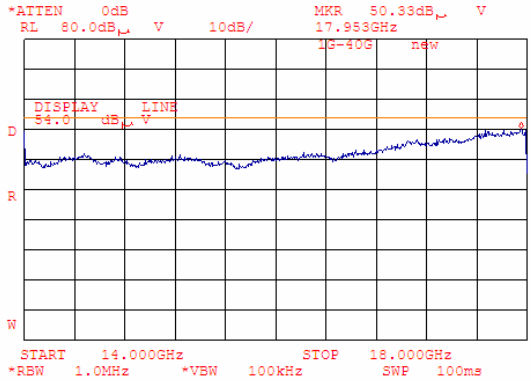
Plot 7.4.55 Radiated emission measurements from 14.0 to 18.0 GHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Plot 7.4.56 Radiated emission measurements from 14.0 to 18.0 GHz at the high carrier frequency

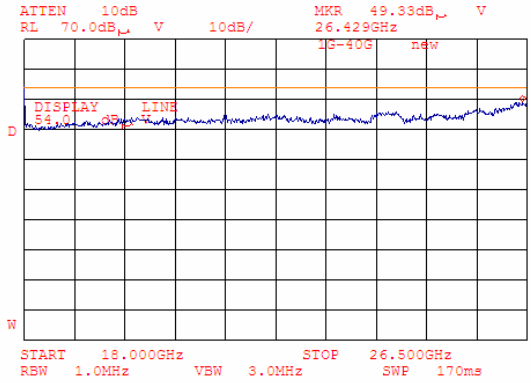
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: average



Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.4.57 Radiated emission measurements from 18.0 to 26.5 GHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



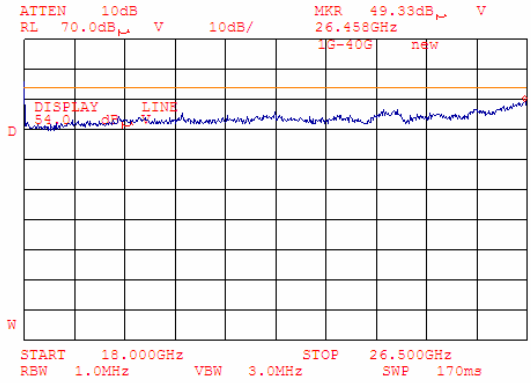
Plot 7.4.58 Radiated emission measurements from 18.0 to 26.5 GHz at the mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak

Test specification:	**Section 15.247(c), 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:	10/9/2006 2:04:51 PM		
Temperature: 23 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.4.59 Radiated emission measurements from 18.0 to 26.5 GHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g
DETECTOR: Peak



Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

7.5 Peak spectral power density

7.5.1 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 7.5.1.

Table 7.5.1 Peak spectral power density limits

Assigned frequency range, MHz	Measurement bandwidth, kHz	Peak spectral power density, dBm
2400-2483.5	3.0	8.0

7.5.2 Test procedure

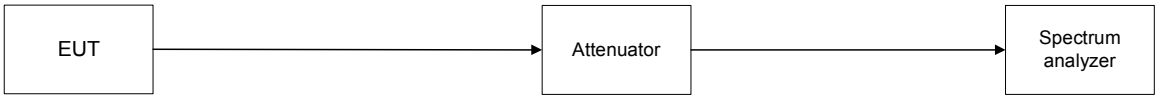
7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.

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

7.5.2.3 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.

7.5.2.4 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 7.5.2 and associated plots.

Figure 7.5.1 Peak spectral power density test setup



Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Table 7.5.2 Peak spectral power density test results

ASSIGNED FREQUENCY:	2400.0 – 2483.5 MHz
MODULATION:	DBPSK, CCK, BPSK, 64-QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	1, 11, 6, 54 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
EUT 6 dB BANDWIDTH:	12.5 MHz (DSSS) / 16.3 MHz (OFDM)
RESOLUTION BANDWIDTH:	3 kHz
VIDEO BANDWIDTH:	10 kHz
INPUTS:	802.11 b/g

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak power density, dB(mW/3 kHz)	Limit, dBm	Margin*, dB	Verdict
DSSS, 1 Mbps							
2412	-16.62	Included	Included	-16.62	8.00	-24.62	Pass
2437	-15.98	Included	Included	-15.98	8.00	-23.98	Pass
2462	-18.03	Included	Included	-18.03	8.00	-26.03	Pass
DSSS, 11 Mbps							
2412	-16.94	Included	Included	-16.94	8.00	-24.94	Pass
2437	-15.27	Included	Included	-15.27	8.00	-23.27	Pass
2462	-18.10	Included	Included	-18.10	8.00	-26.10	Pass
OFDM, 6 Mbps							
2412	-20.88	Included	Included	-20.88	8.00	-28.88	Pass
2437	-19.30	Included	Included	-19.30	8.00	-27.30	Pass
2462	-21.73	Included	Included	-21.73	8.00	-29.73	Pass
OFDM, 54 Mbps							
2412	-21.27	Included	Included	-21.27	8.00	-29.27	Pass
2437	21.34	Included	Included	21.34	8.00	13.34	Pass
2462	-23.42	Included	Included	-23.42	8.00	-31.42	Pass

*- Margin = Peak power density – specification limit.
Note: PSD option 2 was used for these measurements.

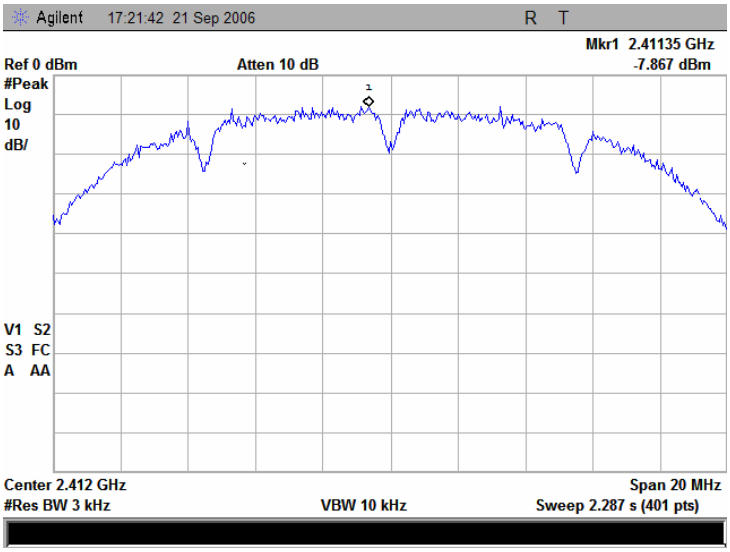
Reference numbers of test equipment used

HL 1650	HL 2524	HL 2867	HL 2909				

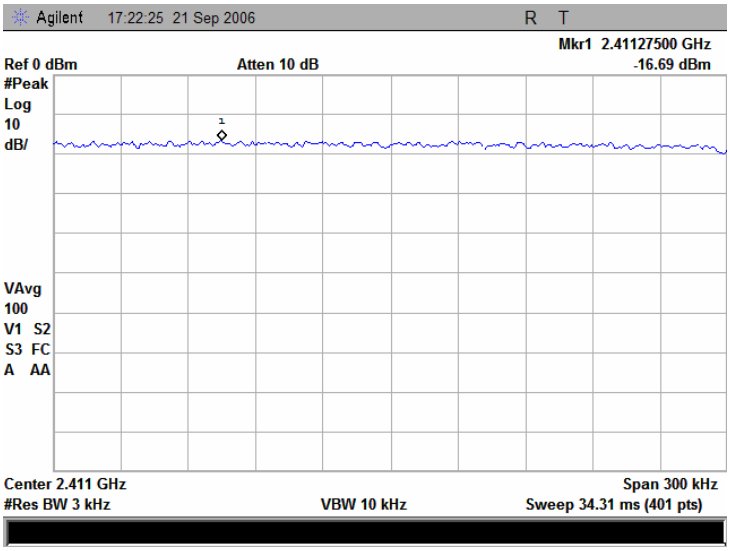
Full description is given in Appendix A.

Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.1 Peak spectral power density at low frequency within 6 dB band, data rate 1 Mbps

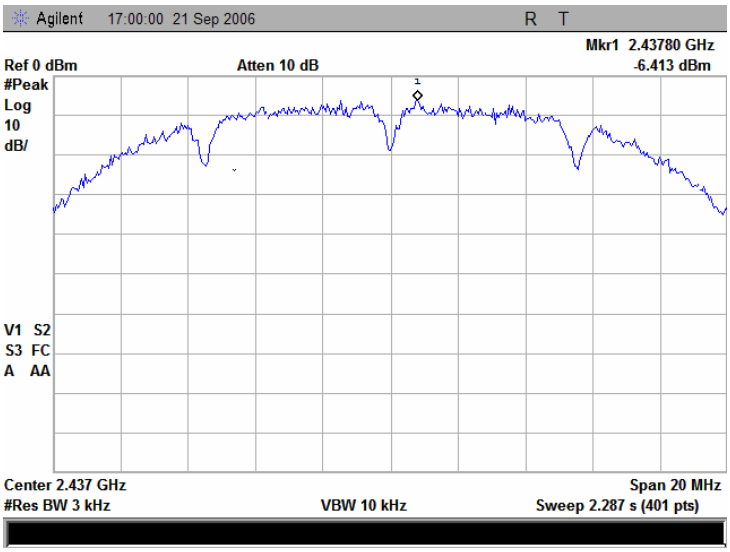


Plot 7.5.2 Peak spectral power density at low frequency zoomed at the peak, data rate 1 Mbps

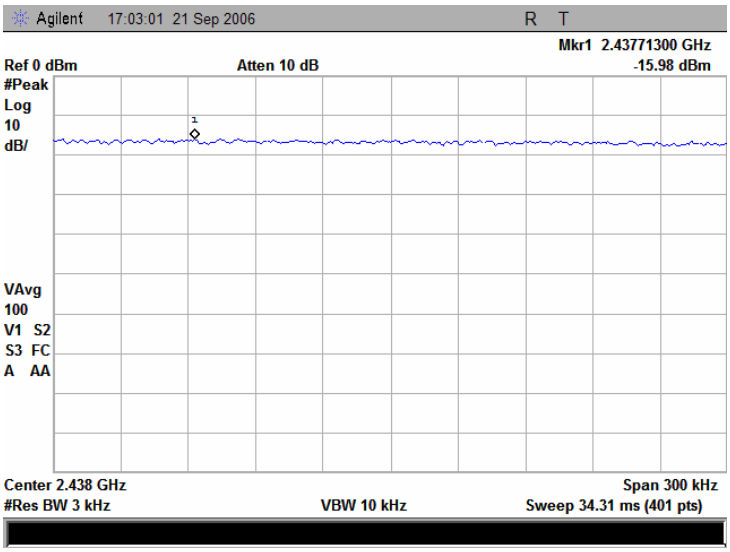


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.3 Peak spectral power density at mid frequency within 6 dB band, data rate 1 Mbps

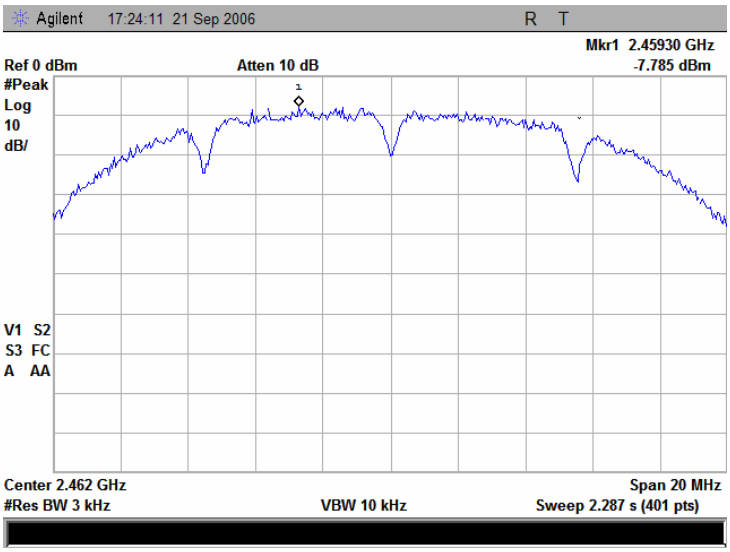


Plot 7.5.4 Peak spectral power density at mid frequency zoomed at the peak, data rate 1 Mbps

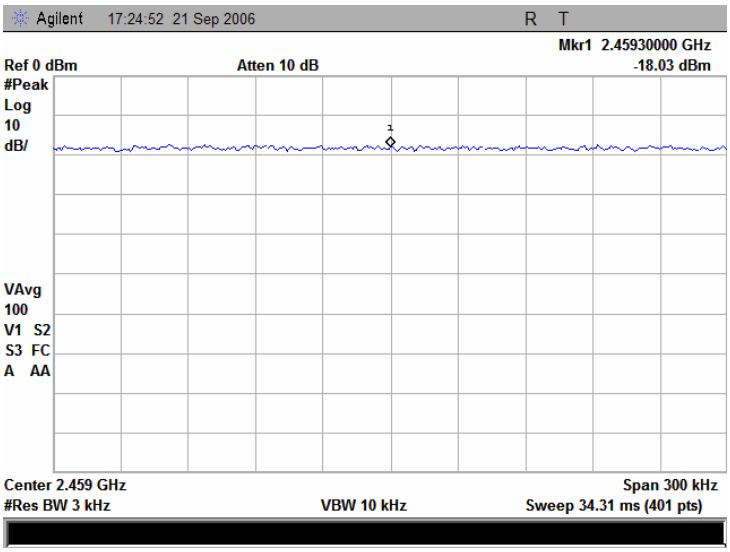


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.5 Peak spectral power density at high frequency within 6 dB band, data rate 1 Mbps

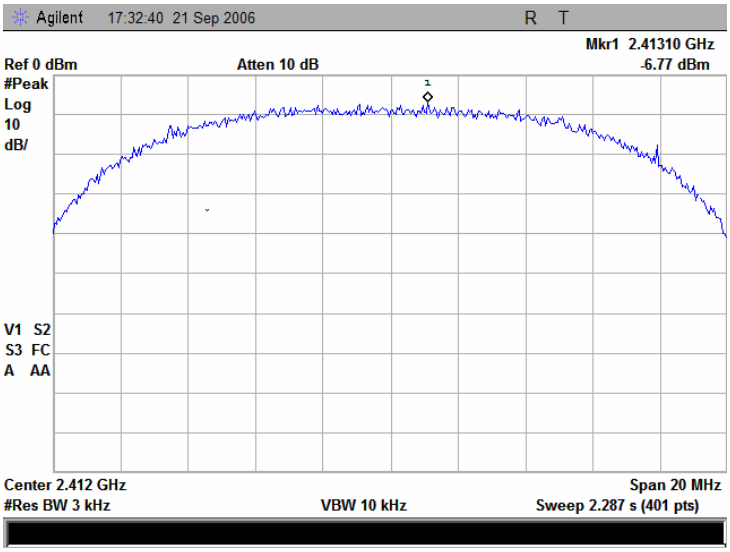


Plot 7.5.6 Peak spectral power density at high frequency zoomed at the peak, data rate 1 Mbps

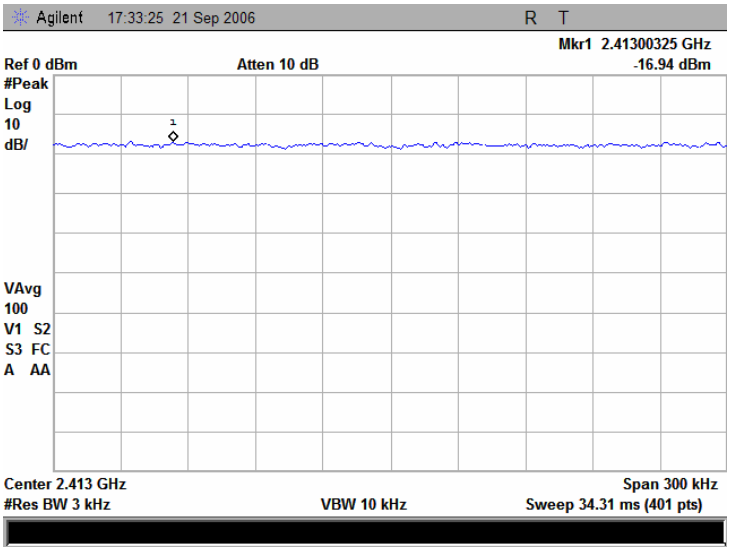


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.7 Peak spectral power density at low frequency within 6 dB band, data rate 11 Mbps

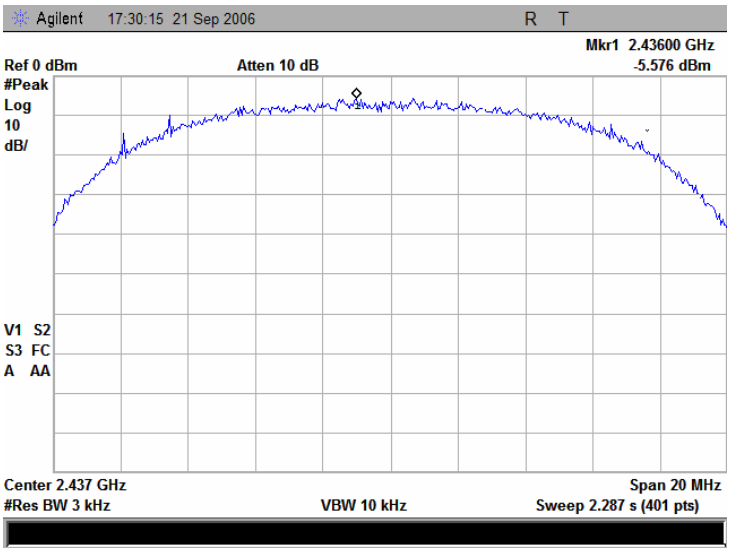


Plot 7.5.8 Peak spectral power density at low frequency zoomed at the peak, data rate 11 Mbps

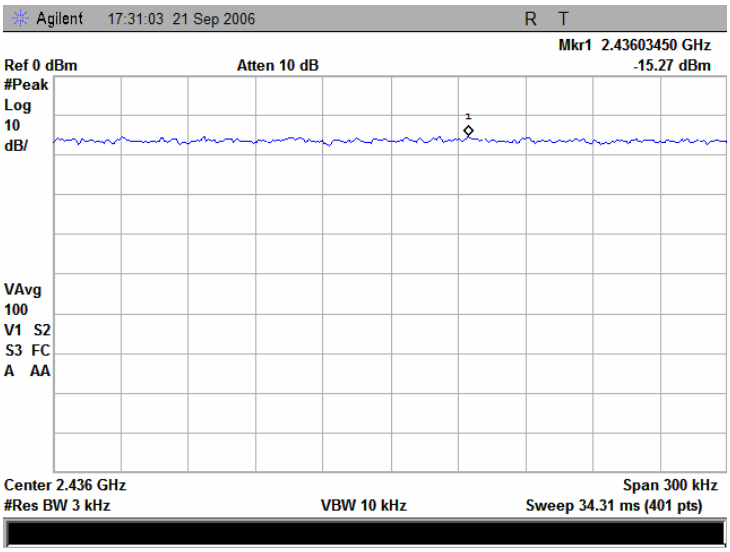


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.9 Peak spectral power density at mid frequency within 6 dB band, data rate 11 Mbps

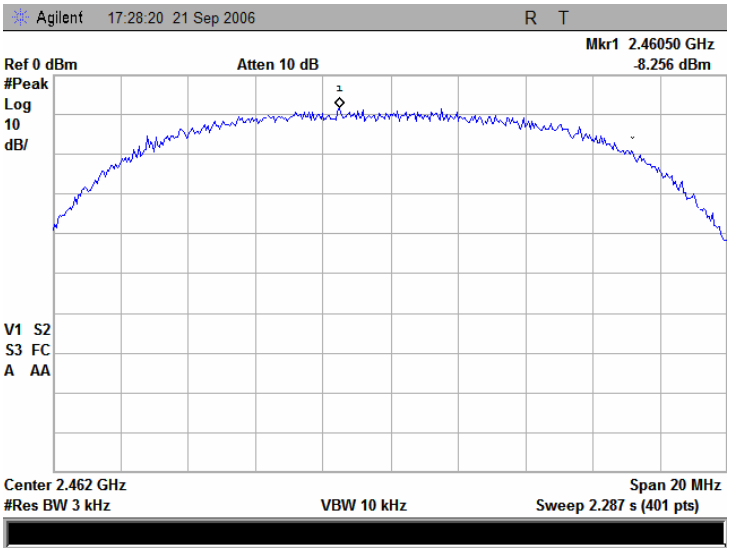


Plot 7.5.10 Peak spectral power density at mid frequency zoomed at the peak, data rate 11 Mbps

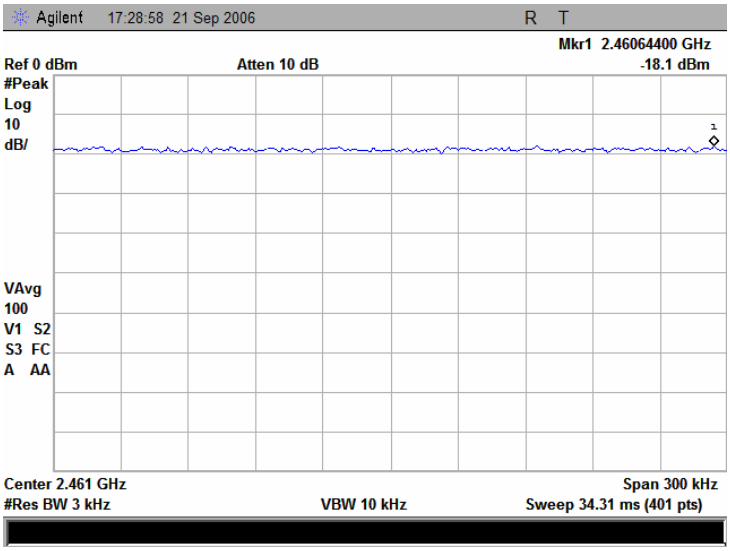


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.11 Peak spectral power density at high frequency within 6 dB band, data rate 11 Mbps

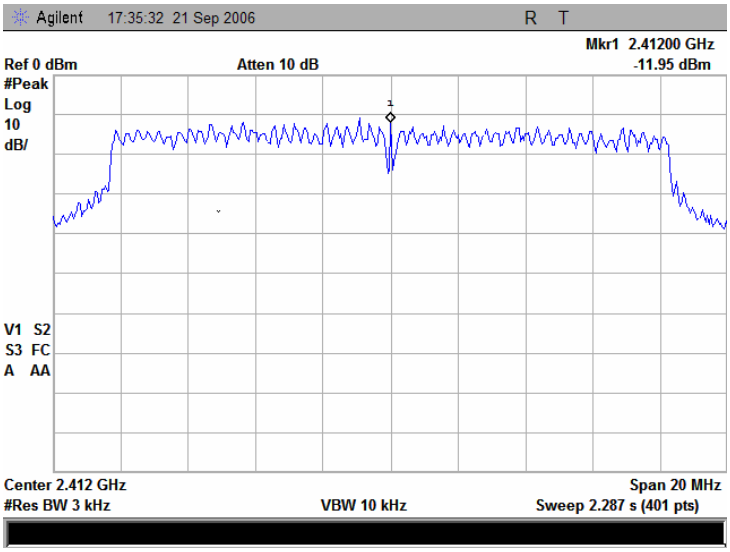


Plot 7.5.12 Peak spectral power density at high frequency zoomed at the peak, data rate 11 Mbps

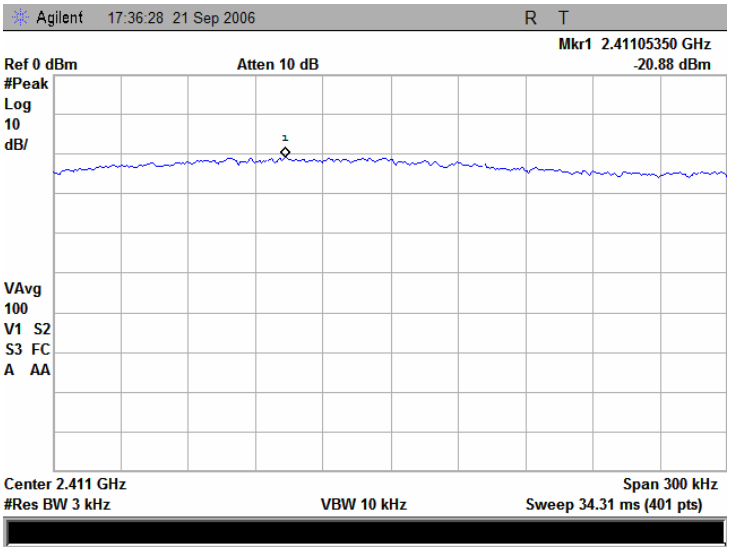


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.13 Peak spectral power density at low frequency within 6 dB band, data rate 6 Mbps

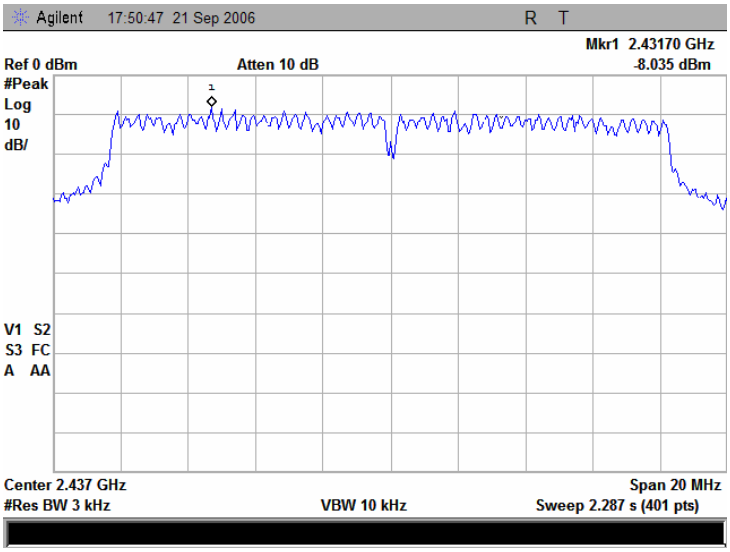


Plot 7.5.14 Peak spectral power density at low frequency zoomed at the peak, data rate 6 Mbps

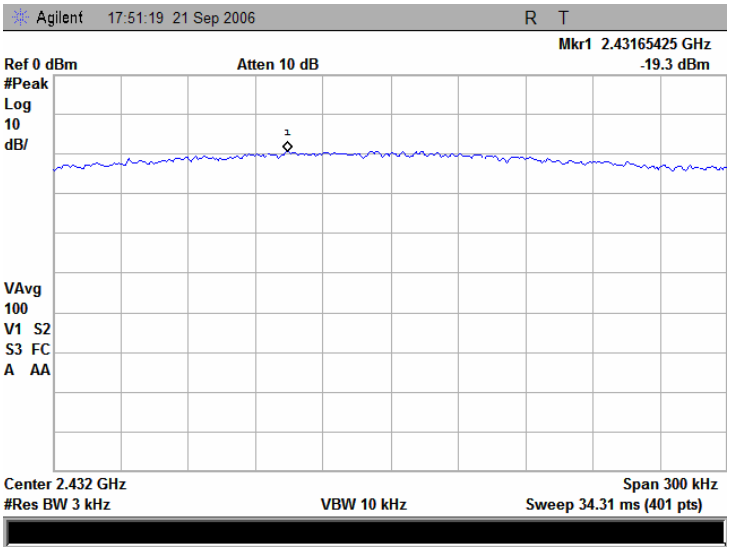


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.15 Peak spectral power density at mid frequency within 6 dB band, data rate 6 Mbps

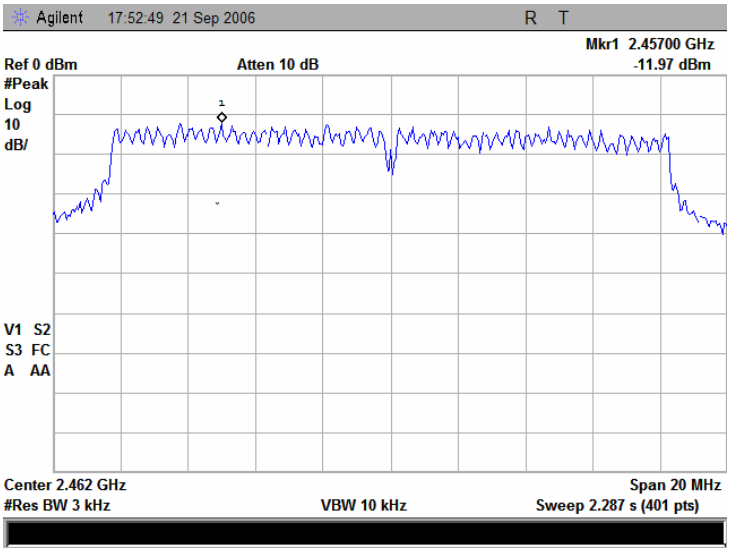


Plot 7.5.16 Peak spectral power density at mid frequency zoomed at the peak, data rate 6 Mbps

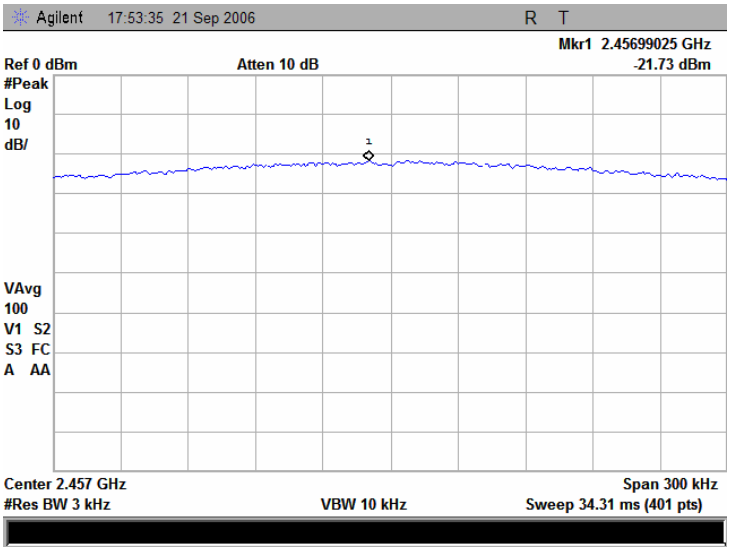


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.17 Peak spectral power density at high frequency within 6 dB band, data rate 6 Mbps

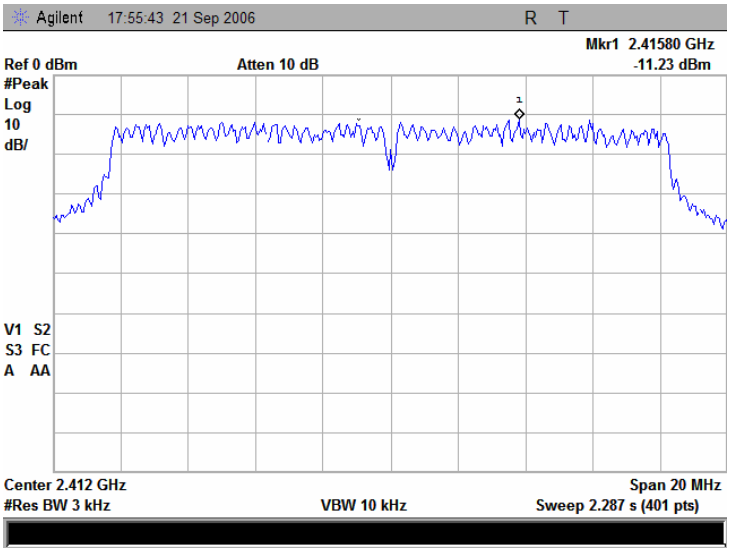


Plot 7.5.18 Peak spectral power density at high frequency zoomed at the peak, data rate 6 Mbps

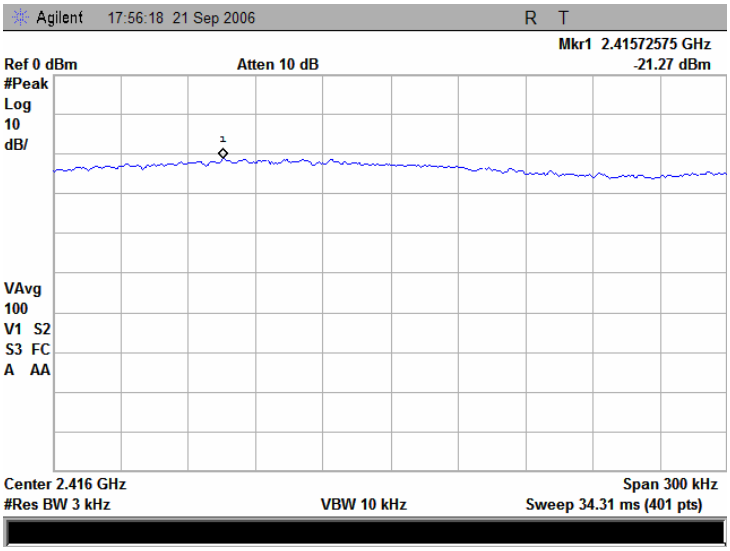


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.19 Peak spectral power density at low frequency within 6 dB band, data rate 54 Mbps

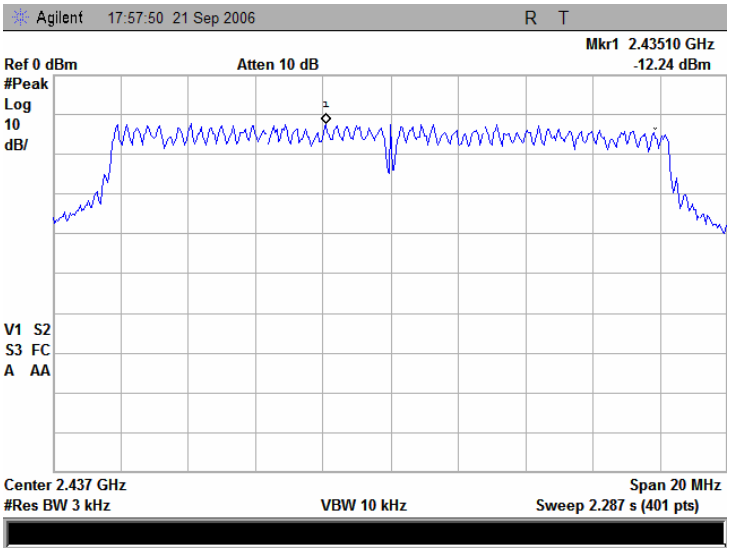


Plot 7.5.20 Peak spectral power density at low frequency zoomed at the peak, data rate 54 Mbps

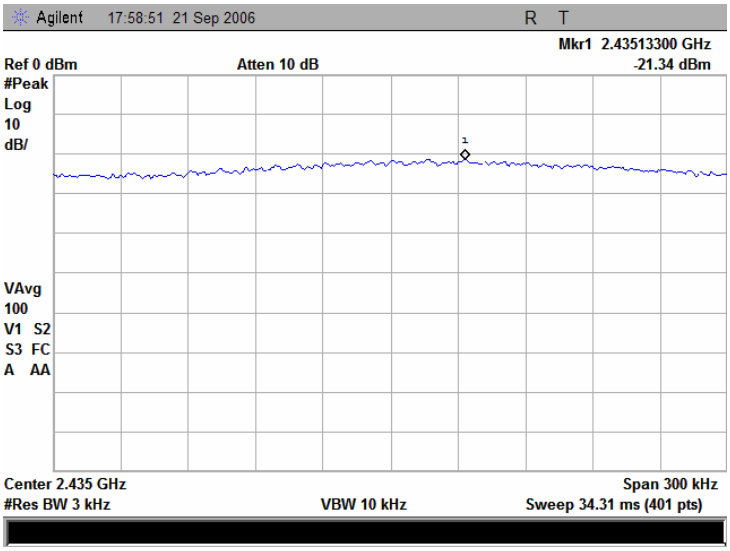


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.21 Peak spectral power density at mid frequency within 6 dB band, data rate 54 Mbps

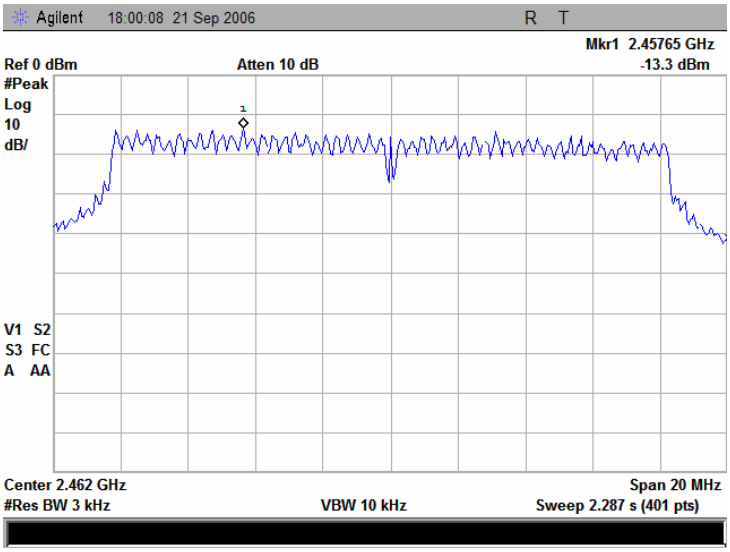


Plot 7.5.22 Peak spectral power density at mid frequency zoomed at the peak, data rate 54 Mbps

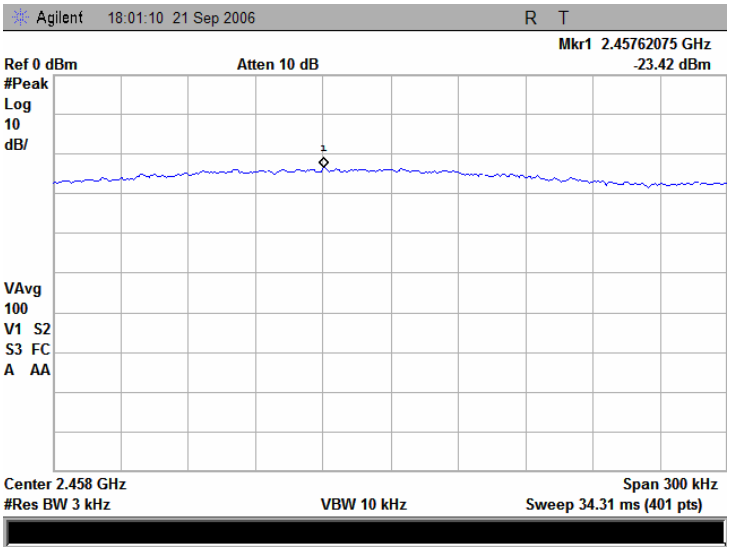


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2006 9:24:38 AM		
Temperature: 23ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 52 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Plot 7.5.23 Peak spectral power density at high frequency within 6 dB band, data rate 54 Mbps



Plot 7.5.24 Peak spectral power density at high frequency zoomed at the peak, data rate 54 Mbps



Test specification:	**Section 15.207(a), Conducted emission**		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	6/18/2006 2:21:41 PM		
Temperature: 24ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

7.6 Conducted emissions

7.6.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(µV)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5.0	56	46
5.0 - 30	60	50

* The limit decreases linearly with the logarithm of frequency.

7.6.2 Test procedure

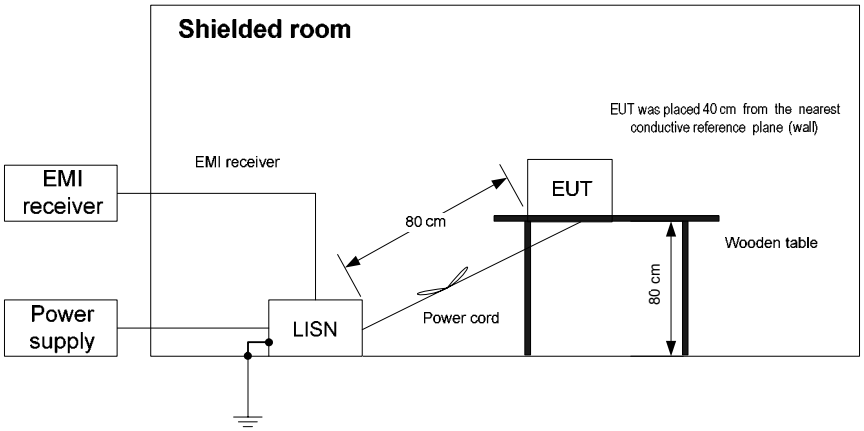
7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and the performance check was conducted.

7.6.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.6.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

7.6.2.3 The position of the device cables was varied to determine maximum emission level.

7.6.2.4 The worst test results (the lowest margins) were recorded in Table 7.6.2 and shown in the associated plots.

Figure 7.6.1 Setup for conducted emission measurements, table-top equipment



Test specification:	**Section 15.207(a), Conducted emission**		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	6/18/2006 2:21:41 PM		
Temperature: 24ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

Table 7.6.2 Conducted emission test results

LINE: **AC mains to MA850**
EUT OPERATING MODE: Transmit
EUT SET UP: TABLE-TOP
TEST SITE: SHIELDED ROOM
DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
FREQUENCY RANGE: 150 kHz - 30 MHz
RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(µV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*	Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*		
0.248686	47.60	45.50	61.83	-16.33	32.57	51.83	-19.26	L1	Pass
0.378577	46.16	43.06	58.34	-15.28	33.16	48.34	-15.18		
0.478175	44.06	41.34	56.41	-15.07	35.55	46.41	-10.86		
0.633901	41.04	38.27	56.00	-17.73	26.98	46.00	-19.02		
0.797057	52.94	49.84	56.00	-6.16	42.43	46.00	-3.57		
0.857861	46.94	44.42	56.00	-11.58	36.54	46.00	-9.46		
0.250041	49.34	47.41	61.79	-14.38	35.13	51.79	-16.66	L2	Pass
0.251117	49.63	47.72	61.75	-14.03	35.72	51.75	-16.03		
0.373717	47.10	45.34	58.46	-13.12	33.64	48.46	-14.82		
0.384185	47.28	45.37	58.21	-12.84	36.62	48.21	-11.59		
0.498513	44.89	40.57	56.03	-15.46	30.09	46.03	-15.94		
0.797933	54.81	49.67	56.00	-6.33	42.33	46.00	-3.67		

*****- Margin = Measured emission - specification limit.

LINE: **AC mains to Colubris AP**
EUT OPERATING MODE: Transmit
EUT SET UP: TABLE-TOP
TEST SITE: SHIELDED ROOM
DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
FREQUENCY RANGE: 150 kHz - 30 MHz
RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(µV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*	Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*		
0.215496	45.37	44.66	63.06	-18.40	39.90	53.06	-13.16	L1	Pass
0.323829	41.08	40.58	59.65	-19.07	38.31	49.65	-11.34		
9.123336	34.27	31.90	60.00	-28.10	26.15	50.00	-23.85		
0.162251	47.52	40.88	65.40	-24.52	34.20	55.40	-21.20	L2	Pass
0.215703	46.34	45.80	63.05	-17.25	40.37	53.05	-12.68		
21.058794	33.87	30.76	60.00	-29.24	23.27	50.00	-26.73		

*****- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

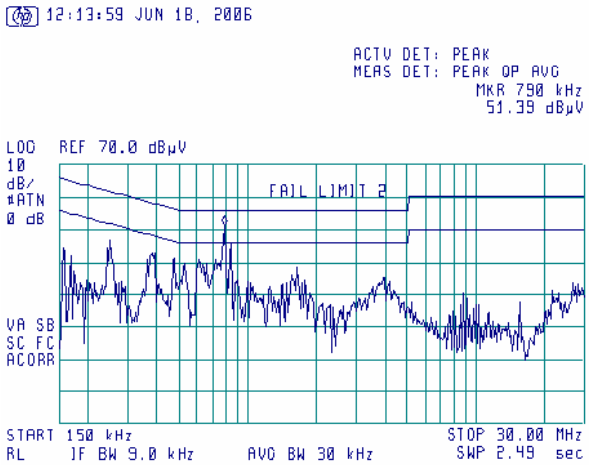
HL 0163	HL 0447	HL 0466	HL1206	HL 1430	HL 1502	HL 1510	

Full description is given in Appendix A.

Test specification:	**Section 15.207(a), Conducted emission**		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	6/18/2006 2:21:41 PM		
Temperature: 24ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

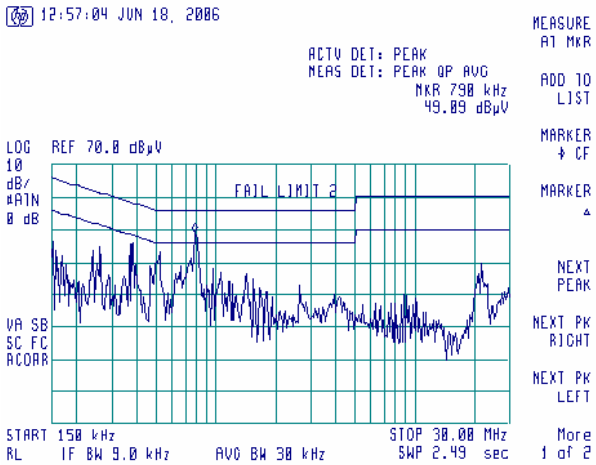
Plot 7.6.1 Conducted emission measurements at MA 850 power lines

LINE: L1
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Plot 7.6.2 Conducted emission measurements at MA 850 power lines

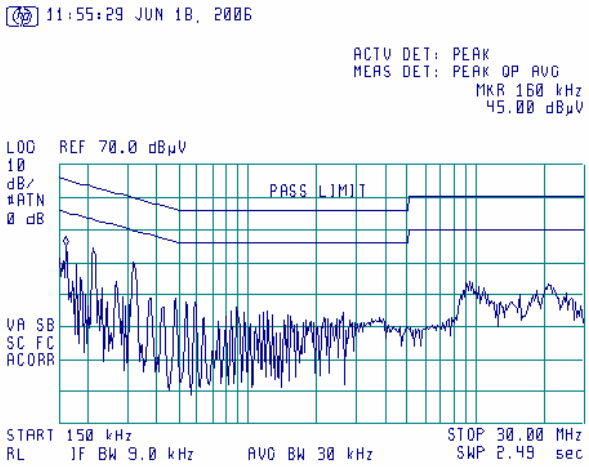
LINE: L2
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Test specification:	**Section 15.207(a), Conducted emission**		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	6/18/2006 2:21:41 PM		
Temperature: 24ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 38 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g			

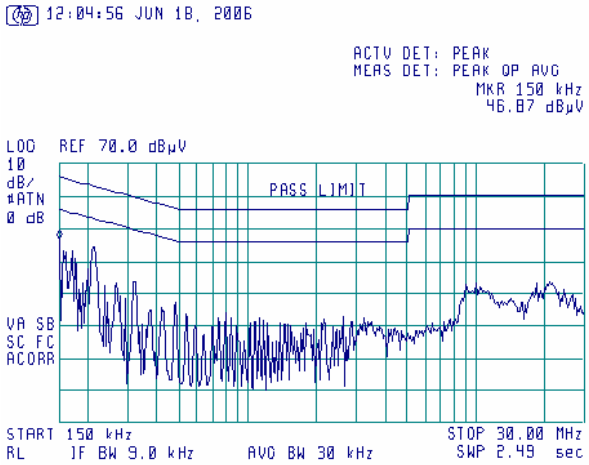
Plot 7.6.3 Conducted emission measurements at Collubris AP power lines

LINE: L1
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Plot 7.6.4 Conducted emission measurements at Collubris AP power lines

LINE: L2
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 8:52:36 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

8 Transmitter tests according to 47CFR part 15 subpart C with licensed services operated

8.1 Minimum 6 dB bandwidth

8.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. Specification test limits are given inTable 8.1.1.

Table 8.1.1 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.

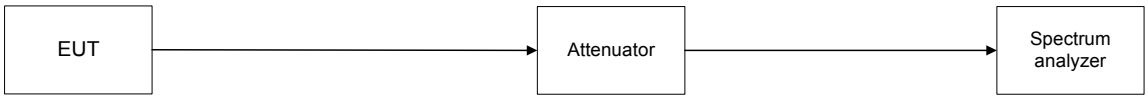
8.1.2 Test procedure

8.1.2.1 The EUT was set up as shown inFigure 8.1.1, energized and its proper operation was checked.

8.1.2.2 The EUT was set to transmit modulated carrier.

8.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 8.1.2 and associated plots.

Figure 8.1.1 The 6 dB bandwidth test setup



Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 8:52:36 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Table 8.1.2 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND:	2400 – 2483.5 MHz
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
MODULATION ENVELOPE REFERENCE POINTS:	-6.0 dBc
MODULATION:	DSSS: (DBPSK) @ 1 Mbps, (CCK) @ 11 Mbps OFDM: BPSK @ 6 Mbps, 64-QAM @ 54 Mbps
MODULATING SIGNAL:	PRBS
INPUTS:	802.11 b/g + licensed

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
DSSS, 1 Mbps				
2412	11062.5	500	10562.5	Pass
2437	12000.0	500	11500.0	Pass
2462	11550.0	500	11050.0	Pass
DSSS, 11 Mbps				
2412	11550.0	500	11050.0	Pass
2437	12225.0	500	11725.0	Pass
2462	12262.5	500	11762.5	Pass
OFDM, 6 Mbps				
2412	16500.0	500	16000.0	Pass
2437	16625.0	500	16125.0	Pass
2462	16562.5	500	16062.5	Pass
OFDM, 54 Mbps				
2412	16562.5	500	16062.5	Pass
2437	16562.5	500	16062.5	Pass
2462	16562.5	500	16062.5	Pass

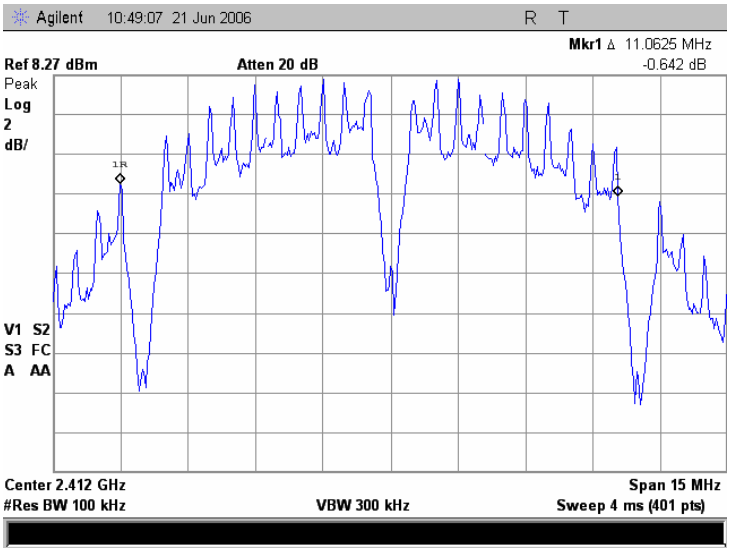
Reference numbers of test equipment used

HL 0661	HL 1441	HL 1488	HL 2400	HL 2524	HL 2866	HL 2867	HL 2909	

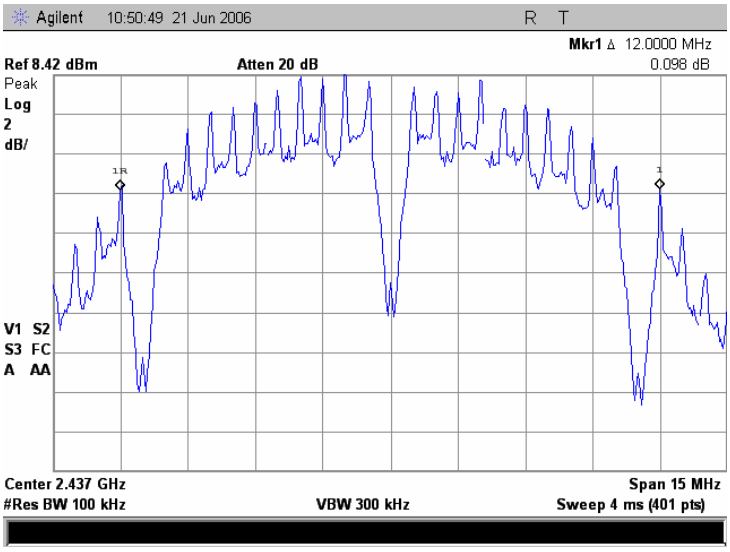
Full description is given in Appendix A.

Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 8:52:36 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.1.1 The 6 dB bandwidth test result at low frequency, DSSS, 1 Mbps

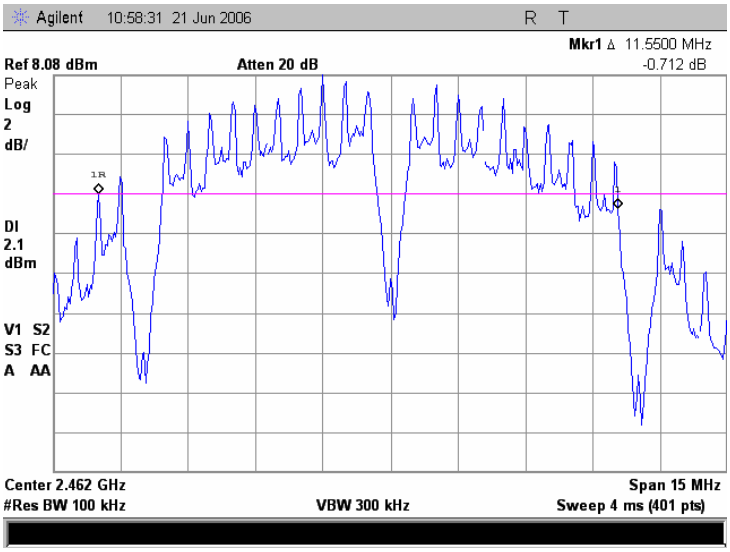


Plot 8.1.2 The 6 dB bandwidth test result at mid frequency, DSSS, 1 Mbps

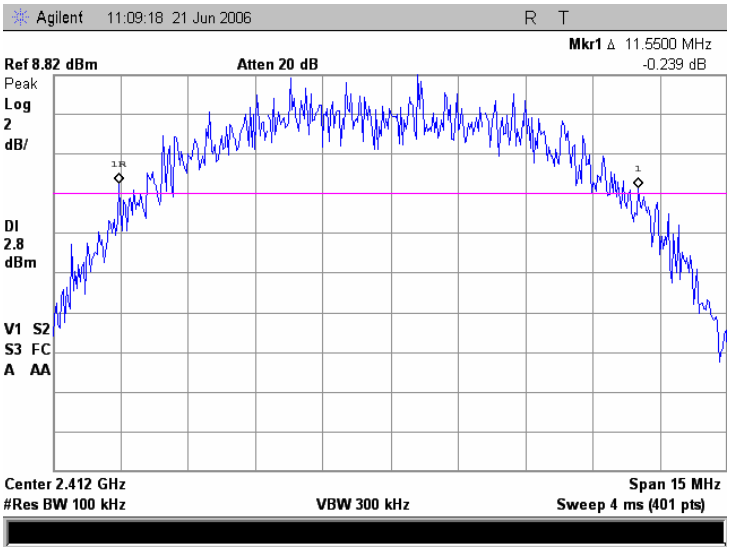


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 8:52:36 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.1.3 The 6 dB bandwidth test result at high frequency, DSSS, 1 Mbps

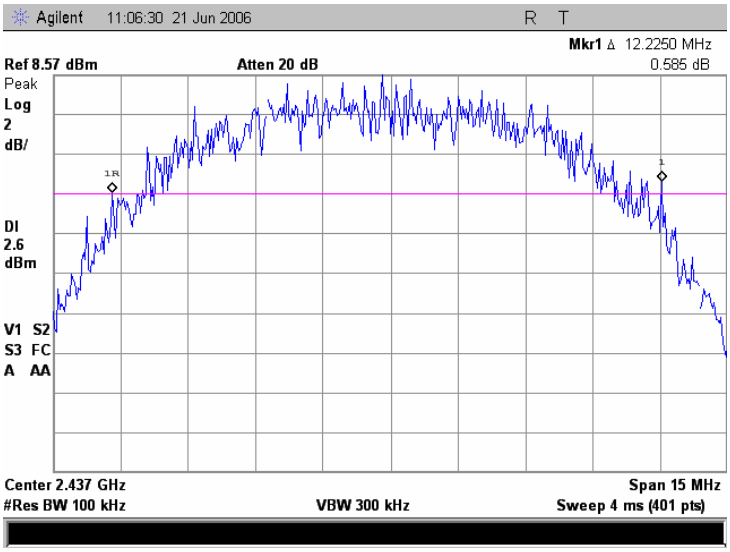


Plot 8.1.4 The 6 dB bandwidth test result at low frequency, DSSS, 11 Mbps

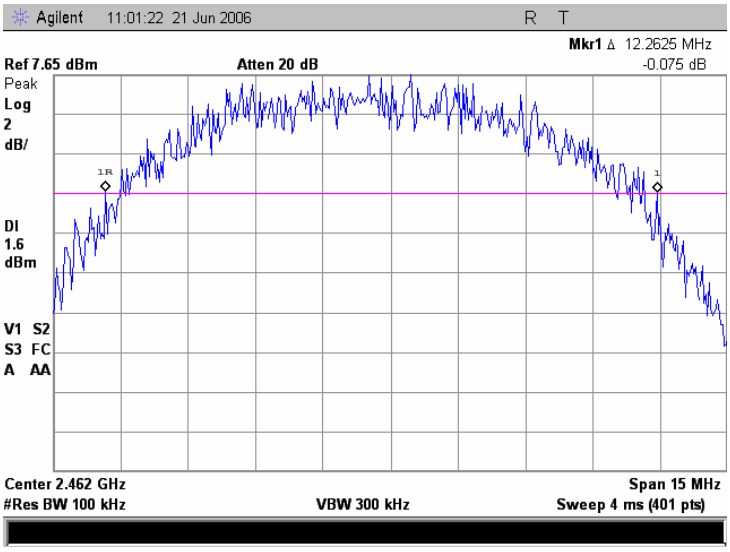


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 8:52:36 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.1.5 The 6 dB bandwidth test result at mid frequency, DSSS, 11 Mbps

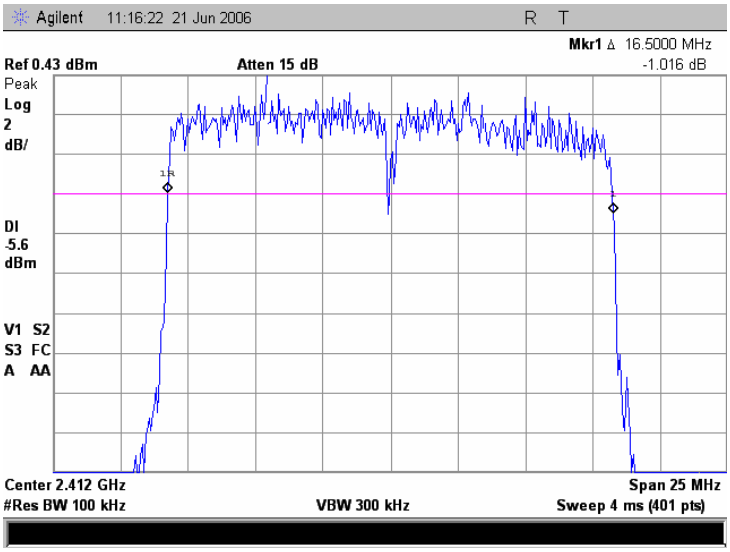


Plot 8.1.6 The 6 dB bandwidth test result at high frequency, DSSS, 11 Mbps

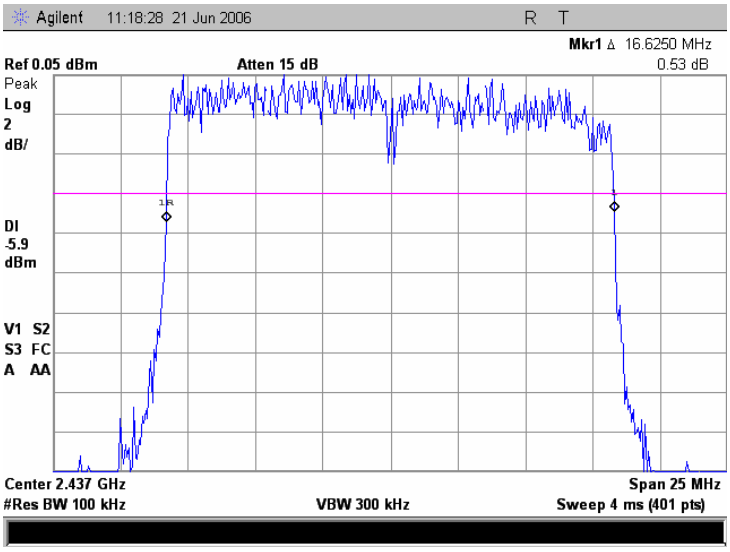


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 8:52:36 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.1.7 The 6 dB bandwidth test result at low frequency, OFDM, 6 Mbps

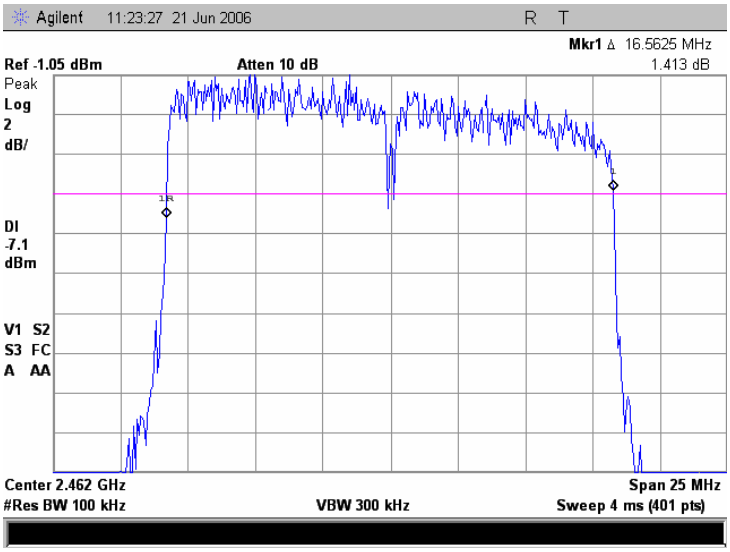


Plot 8.1.8 The 6 dB bandwidth test result at mid frequency, OFDM, 6 Mbps

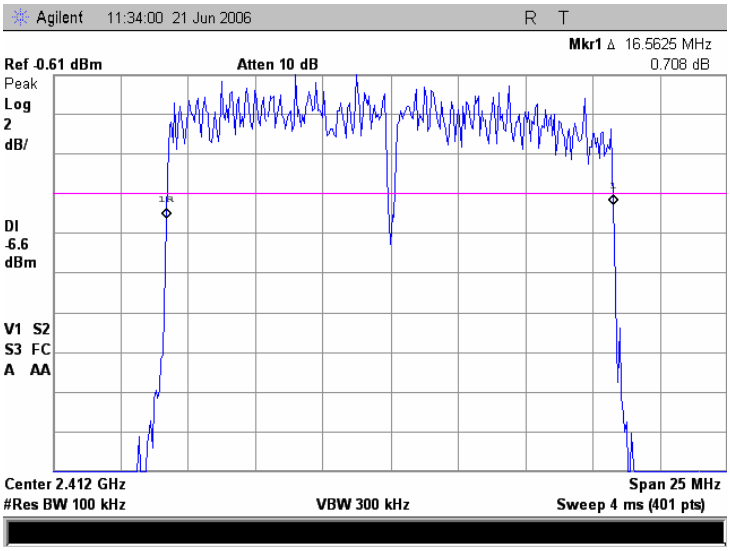


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 8:52:36 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.1.9 The 6 dB bandwidth test result at high frequency, OFDM, 6 Mbps

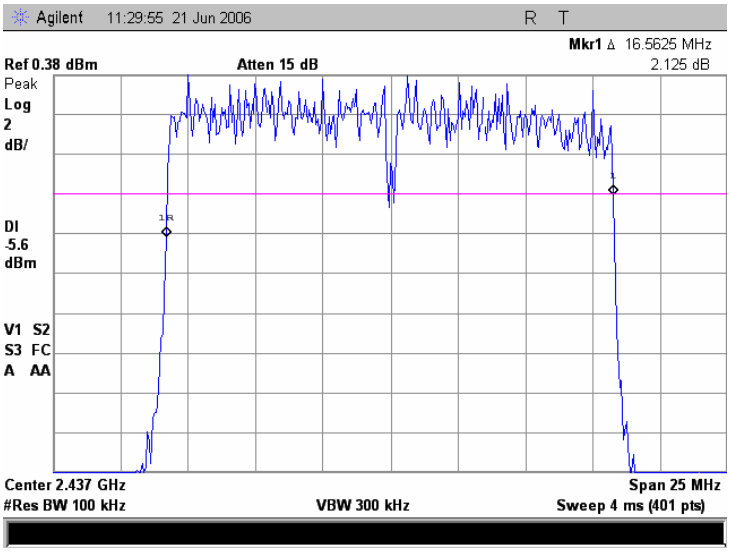


Plot 8.1.10 The 6 dB bandwidth test result at low frequency, OFDM, 54 Mbps

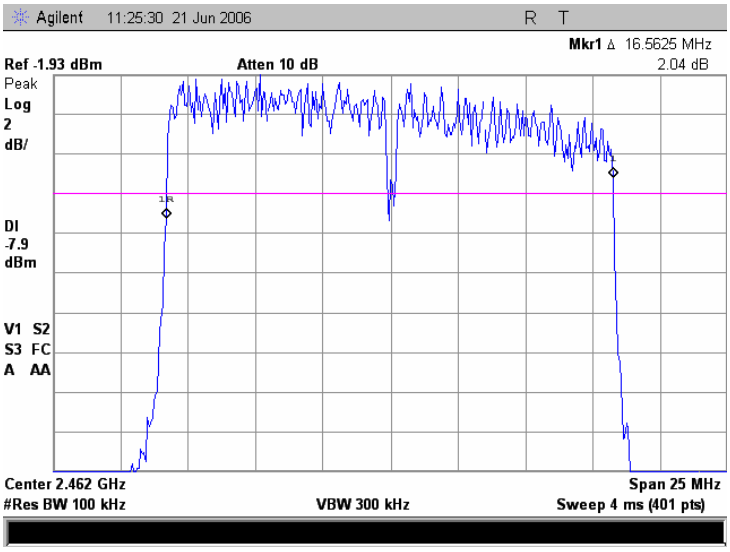


Test specification:	**Section 15.247(a)2, 6 dB bandwidth**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 8:52:36 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.1.11 The 6 dB bandwidth test result at mid frequency, OFDM, 54 Mbps



Plot 8.1.12 The 6 dB bandwidth test result at high frequency, OFDM, 54 Mbps



Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 10:17:31 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

8.2 Peak output power

8.2.1 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 8.2.1.

Table 8.2.1 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.

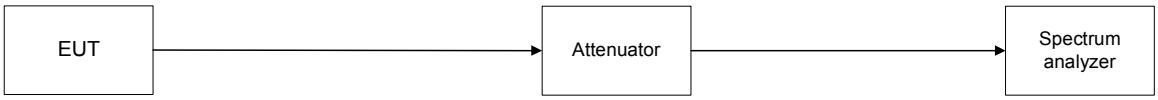
8.2.2 Test procedure

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

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

8.2.2.3 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 8.2.2 and associated plots.

Figure 8.2.1 Peak output power test setup



Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 10:17:31 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Table 8.2.2 Peak output power test results

ASSIGNED FREQUENCY:	2400.0 – 2483.5 MHz
MODULATION:	DBPSK, CCK, BPSK, 64-QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	1, 11, 6, 54 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
EUT 6 dB BANDWIDTH:	12.5 MHz (DSSS) / 16.3 MHz (OFDM)
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
INPUTS:	802.11 b/g and licensed

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak output power, dBm	Limit, dBm	Margin*, dB	Verdict
DSSS, 1 Mbps							
2412	23.48	Included	Included	23.48	30.00	-6.52	Pass
2437	24.66	Included	Included	24.66	30.00	-5.34	Pass
2462	22.26	Included	Included	22.26	30.00	-7.74	Pass
DSSS, 11 Mbps							
2412	25.36	Included	Included	25.36	30.00	-4.64	Pass
2437	26.57	Included	Included	26.57	30.00	-3.43	Pass
2462	24.61	Included	Included	24.61	30.00	-5.39	Pass
OFDM, 6 Mbps							
2412	19.63	Included	Included	19.63	30.00	-10.37	Pass
2437	22.01	Included	Included	22.01	30.00	-7.99	Pass
2462	18.57	Included	Included	18.57	30.00	-11.43	Pass
OFDM, 54 Mbps							
2412	19.88	Included	Included	19.88	30.00	-10.12	Pass
2437	19.60	Included	Included	19.60	30.00	-10.40	Pass
2462	18.01	Included	Included	18.01	30.00	-11.99	Pass

* - Margin = Peak output power – specification limit.

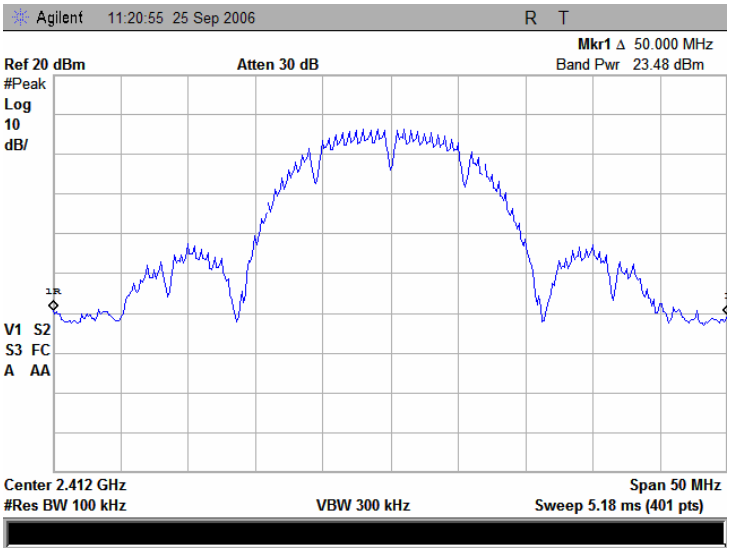
Reference numbers of test equipment used

HL 1650	HL 2254	HL 2780					

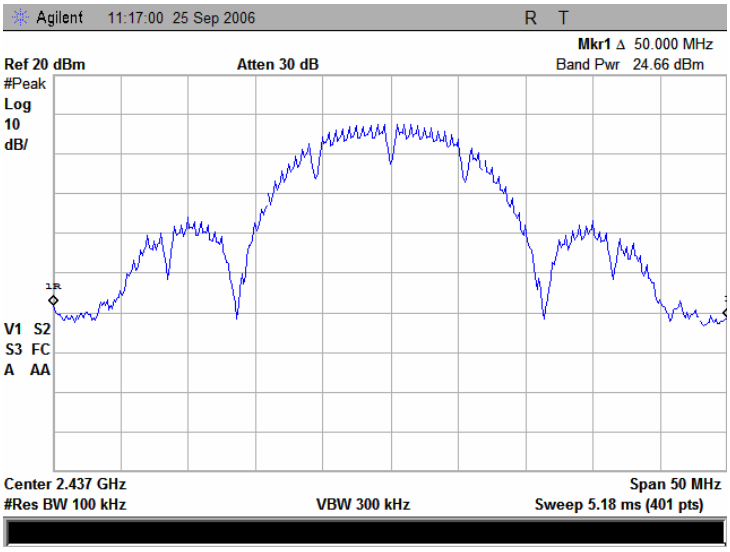
Full description is given in Appendix A.

Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 10:17:31 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.2.1 Peak output power at low frequency, DSSS, 1 Mbps

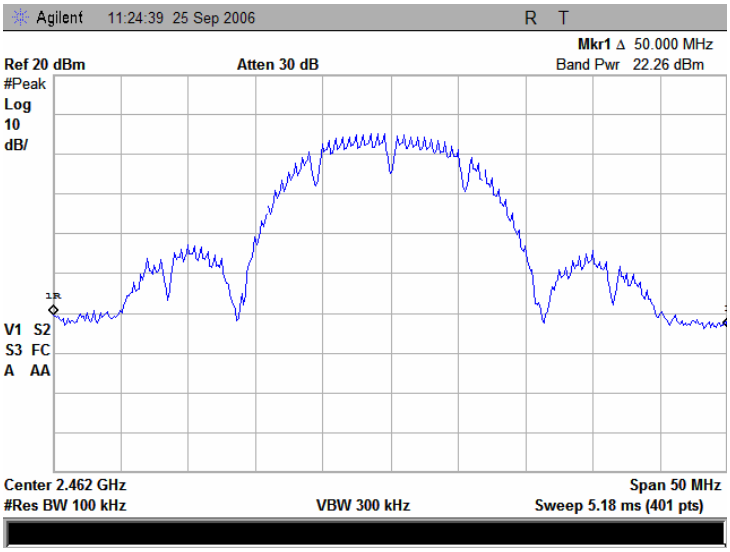


Plot 8.2.2 Peak output power at mid frequency, DSSS, 1 Mbps

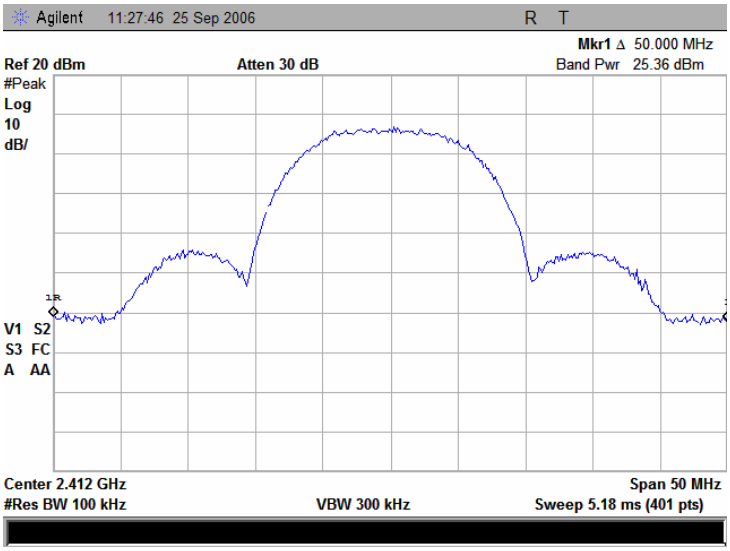


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 10:17:31 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.2.3 Peak output power at high frequency, DSSS, 1 Mbps

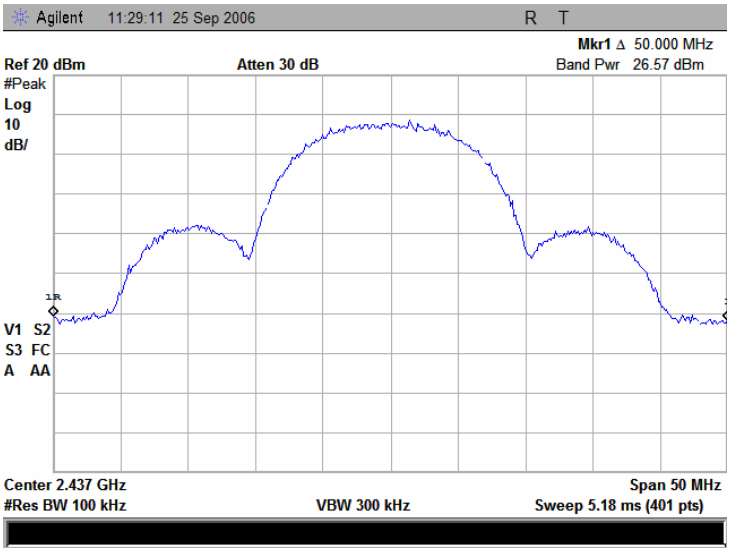


Plot 8.2.4 Peak output power at low frequency, DSSS, 11 Mbps

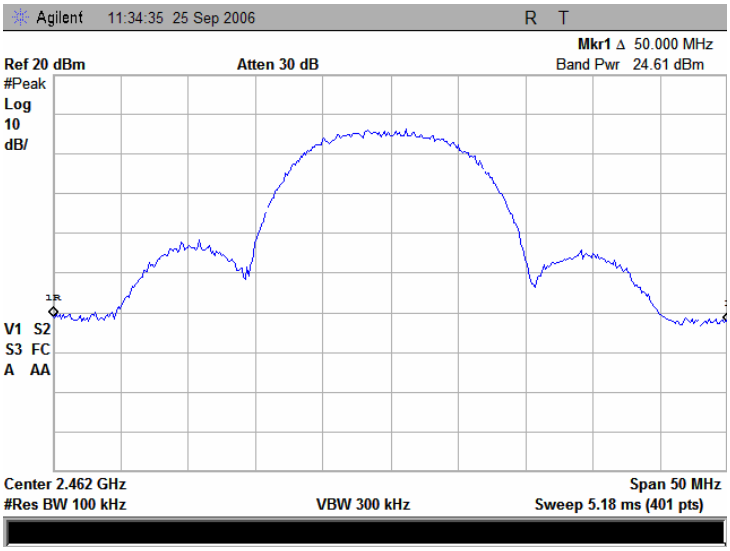


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 10:17:31 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.2.5 Peak output power at mid frequency, DSSS, 11 Mbps

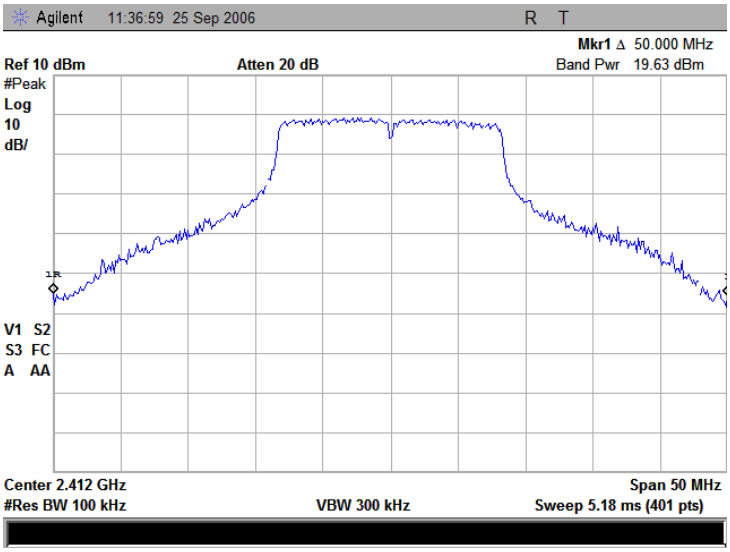


Plot 8.2.6 Peak output power at high frequency, DSSS, 11 Mbps

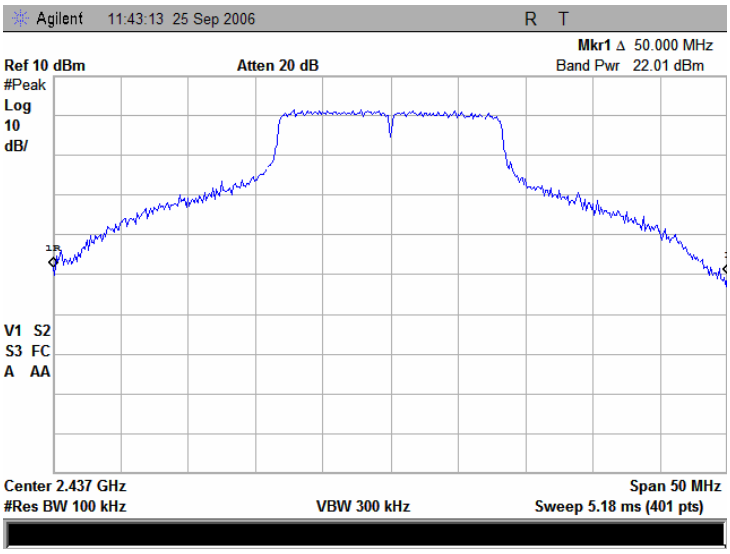


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 10:17:31 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.2.7 Peak output power at low frequency, OFDM, 6 Mbps

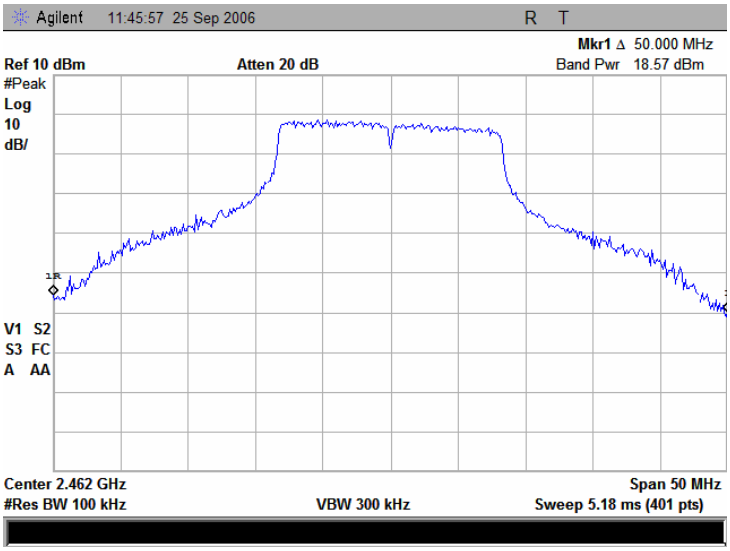


Plot 8.2.8 Peak output power at mid frequency, OFDM, 6 Mbps

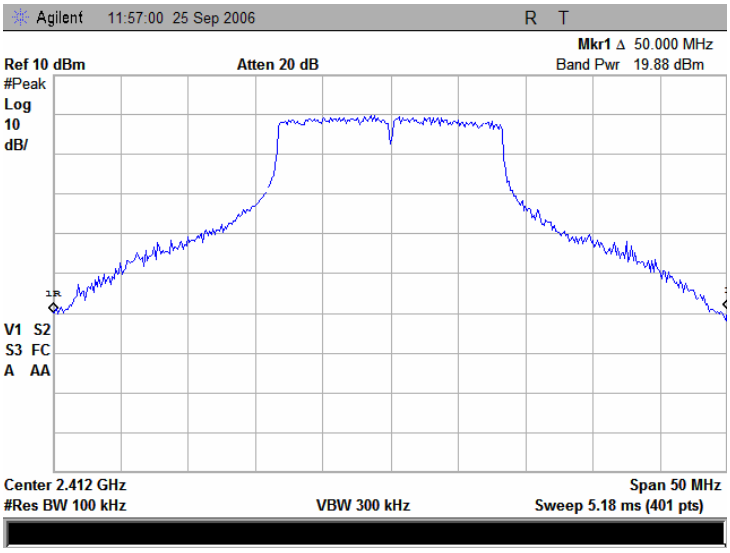


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 10:17:31 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.2.9 Peak output power at high frequency, OFDM, 6 Mbps

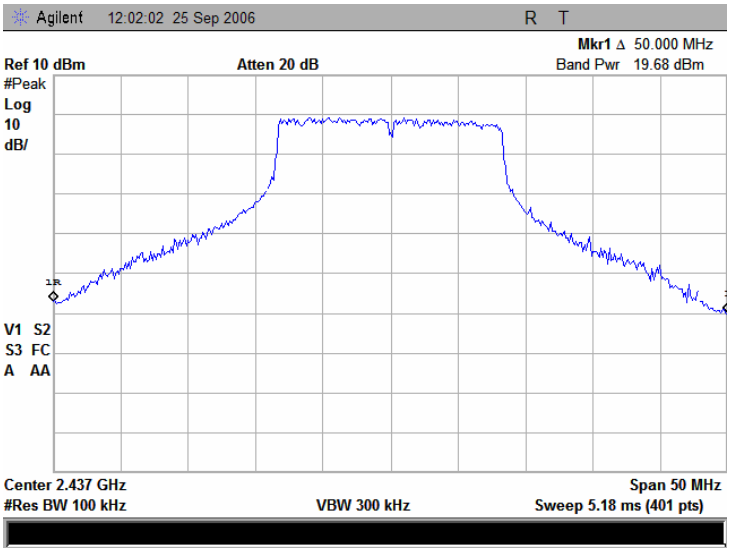


Plot 8.2.10 Peak output power at low frequency, OFDM, 54 Mbps

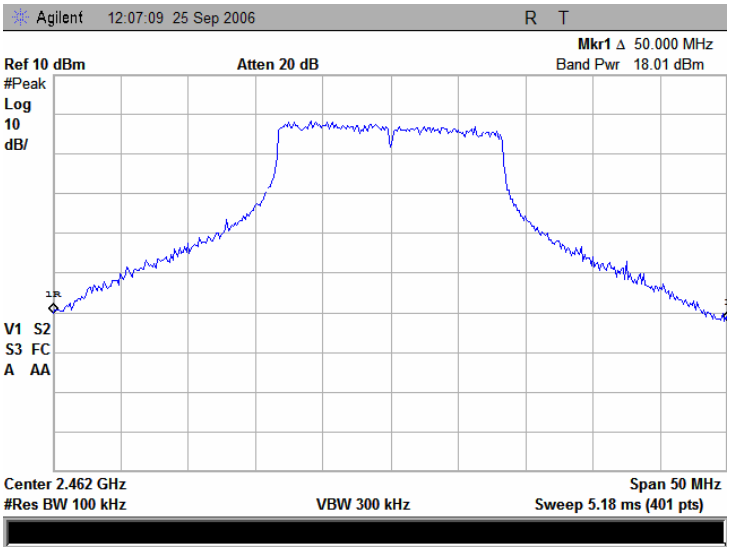


Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 10:17:31 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licensed			

Plot 8.2.11 Peak output power at mid frequency, OFDM, 54 Mbps



Plot 8.2.12 Peak output power at high frequency, OFDM, 54 Mbps



Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

8.3 Spurious emissions at RF antenna connector

8.3.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 8.3.1.

Table 8.3.1 Spurious emission limits

Frequency*, MHz	Attenuation below carrier*, dBc
0.009 – 10th harmonic	20.0

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

8.3.2 Test procedure

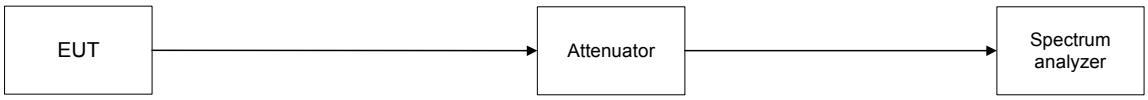
8.3.2.1 The EUT was set up as shown inFigure 8.3.1, energized and its proper operation was checked.

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

8.3.2.3 The highest emission level within the authorized band was measured.

8.3.2.4 The spurious emission was measured with spectrum analyzer as provided in Table 8.3.2 and associated plots and referenced to the highest emission level measured within the authorized band.

Figure 8.3.1 Spurious emission test setup



Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Table 8.3.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 2400-2483.5 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 26500 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 300 kHz
MODULATION: QAM
MODULATING SIGNAL: PRBS
BIT RATE: 1 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	Spurious emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
No spurious emissions were found						Pass

*- Margin = Attenuation below carrier – specification limit.

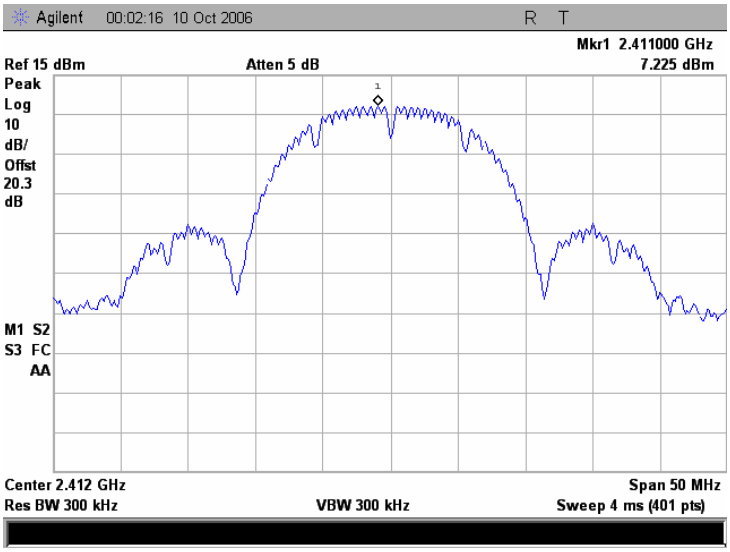
Reference numbers of test equipment used

HL 2254	HL 2780						

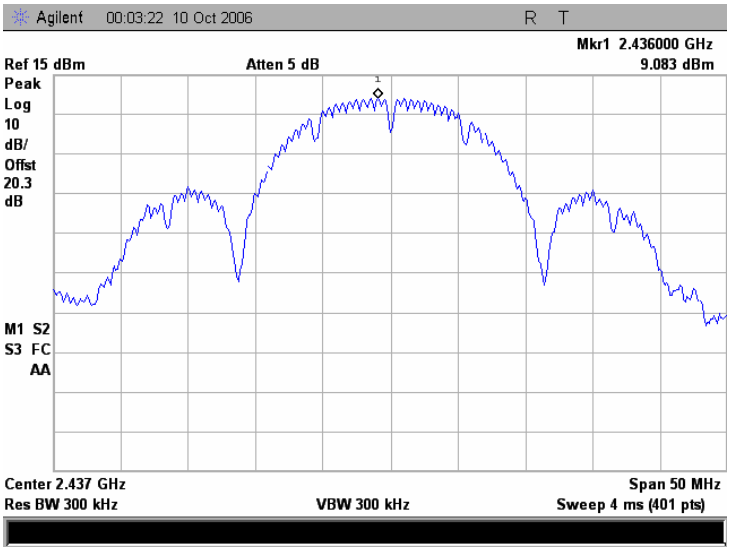
Full description is given in Appendix A.

Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.1 The highest emission level within the assigned band at low carrier frequency

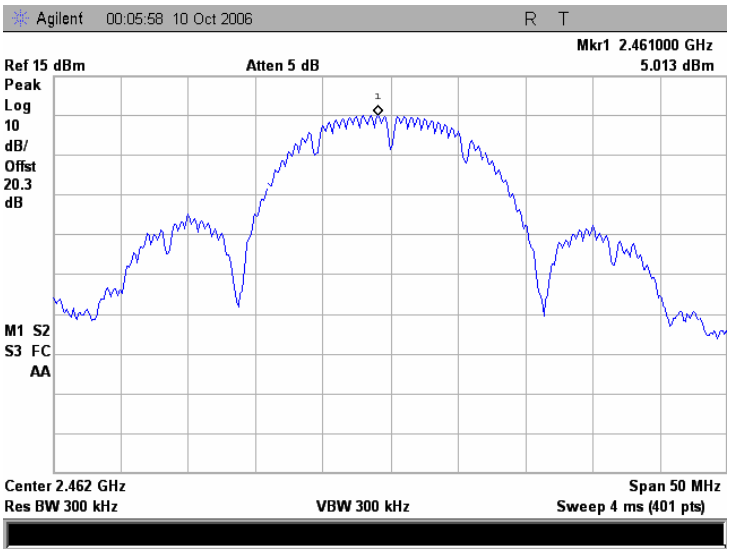


Plot 8.3.2 The highest emission level within the assigned band at mid carrier frequency

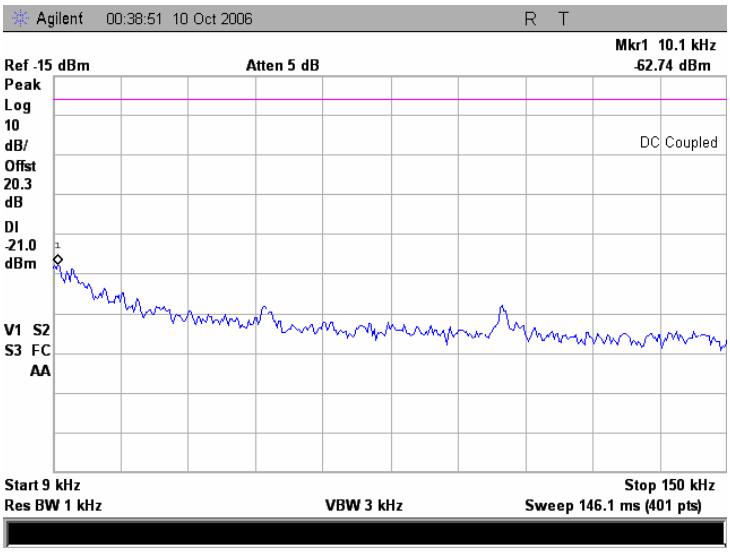


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.3 The highest emission level within the assigned band at high carrier frequency

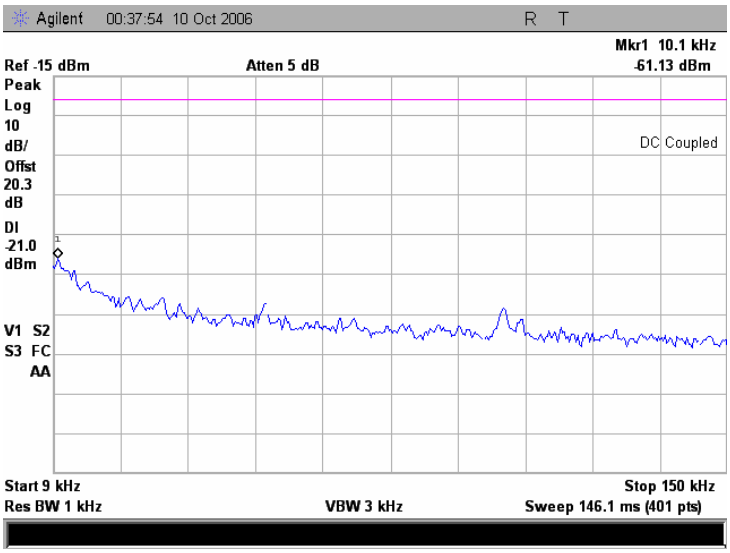


Plot 8.3.4 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency

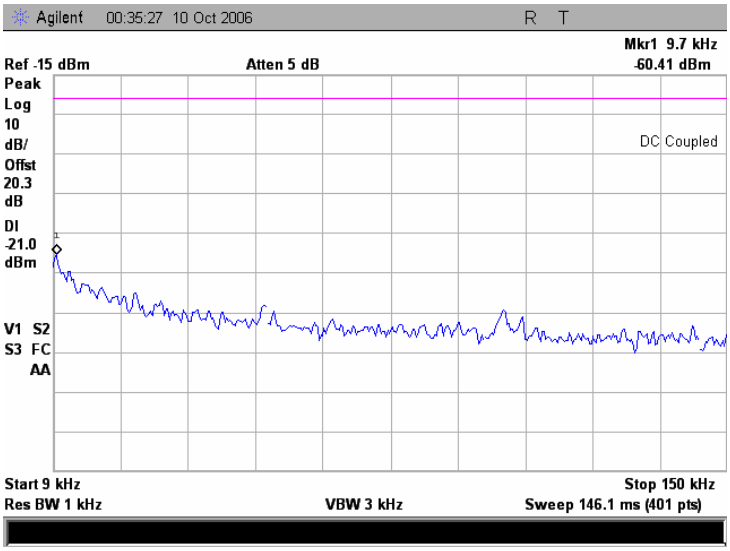


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.5 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency

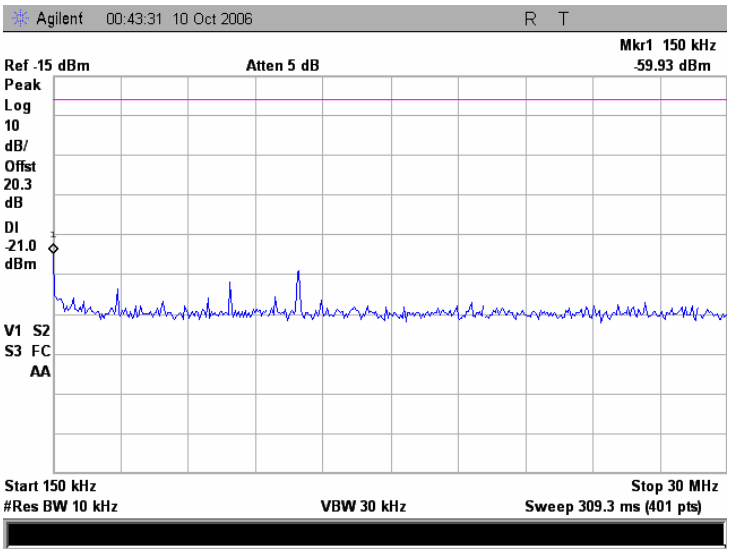


Plot 8.3.6 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

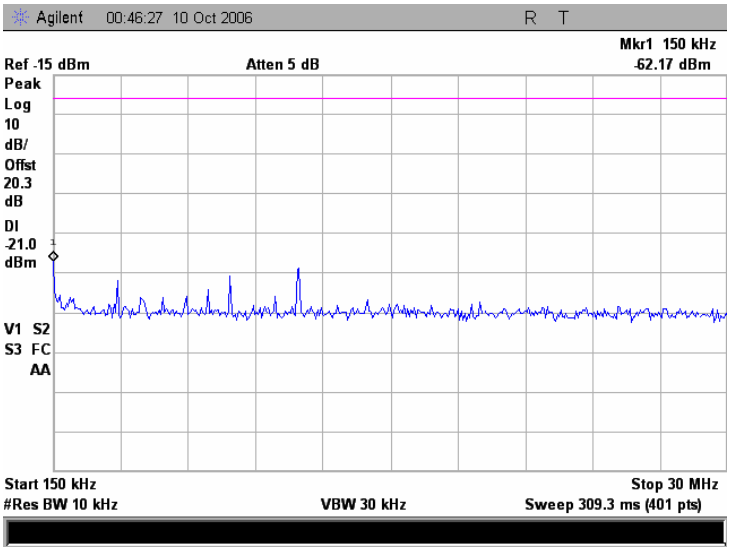


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.7 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency

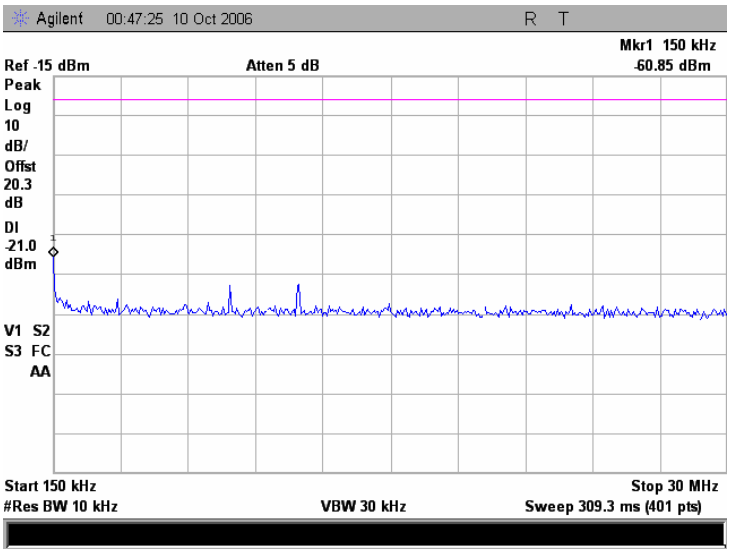


Plot 8.3.8 Spurious emission measurements in 0.15 - 30 MHz range at mid carrier frequency

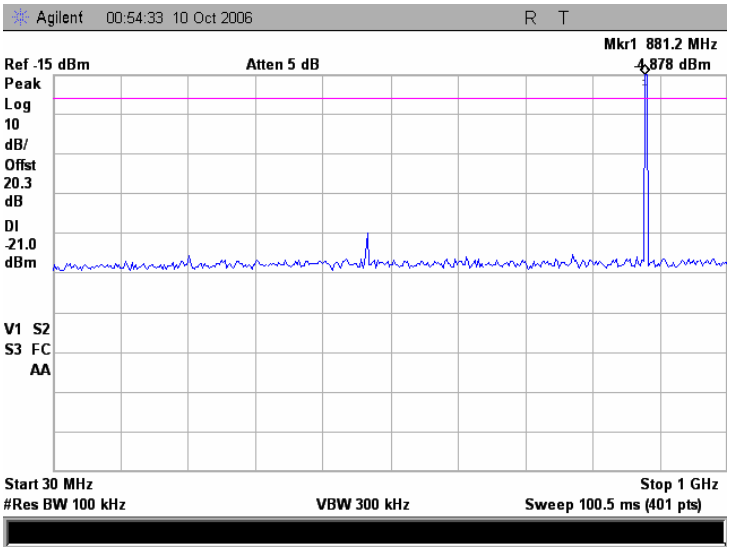


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.9 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency

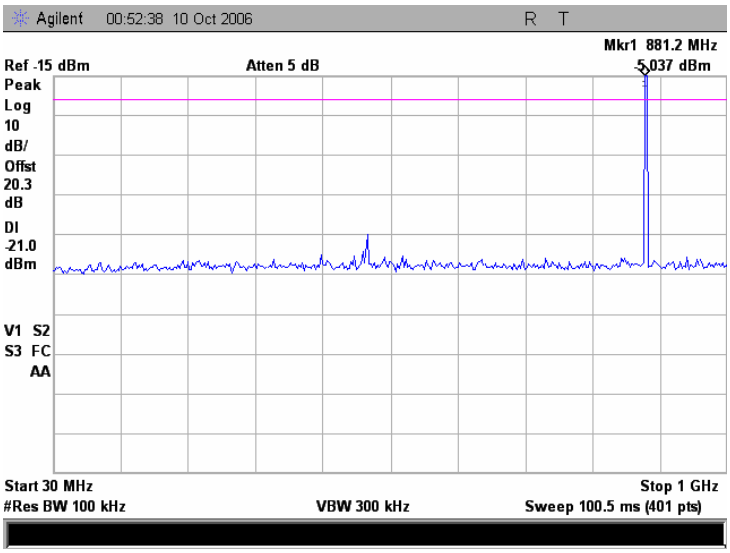


Plot 8.3.10 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency

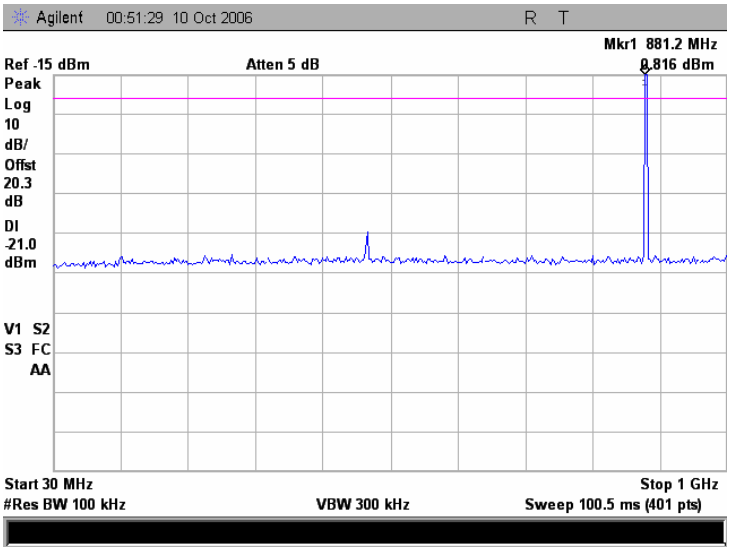


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.11 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency

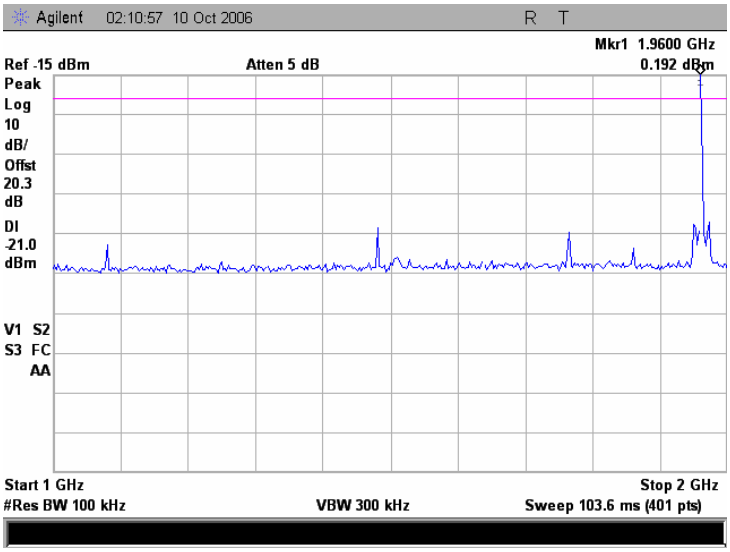


Plot 8.3.12 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency

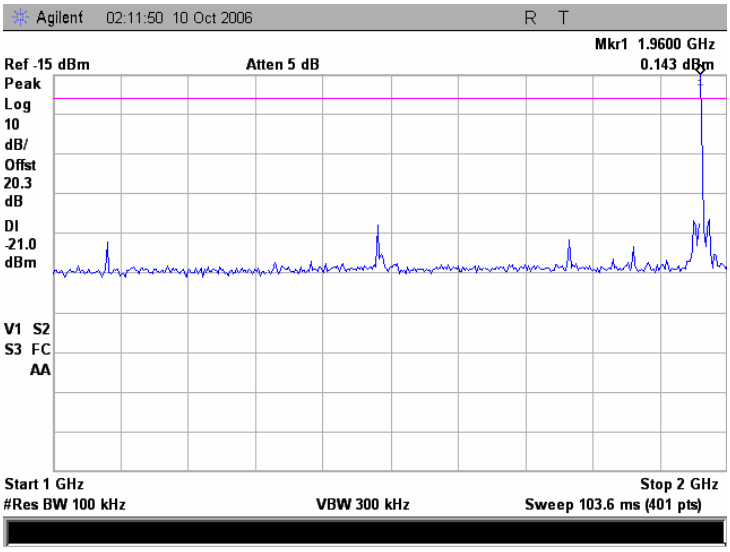


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.13 Spurious emission measurements in 1000 - 2000MHz range at low carrier frequency

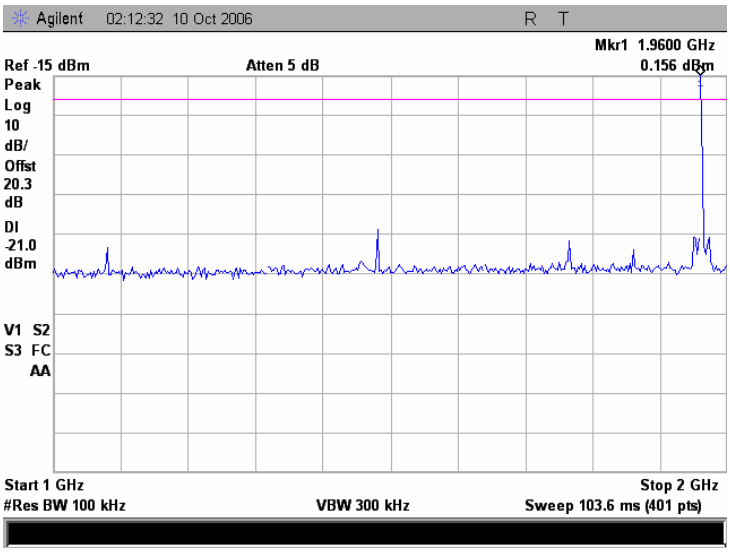


Plot 8.3.14 Spurious emission measurements in 1000 - 2000MHz range at mid carrier frequency



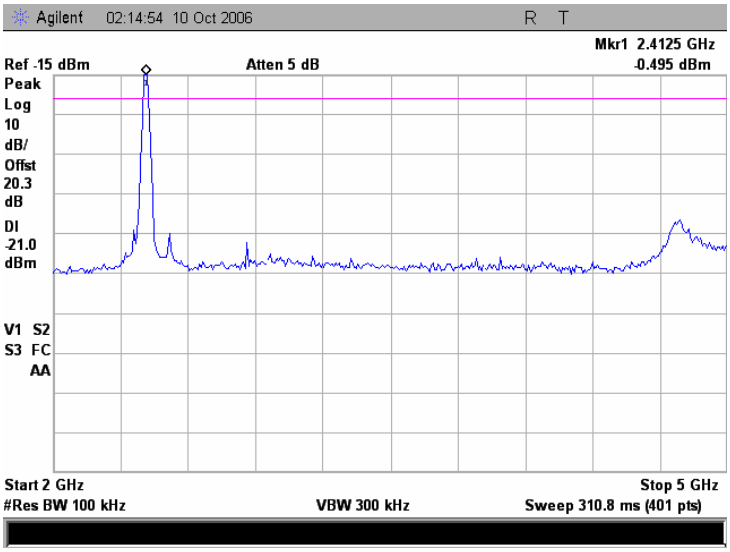
Plot 8.3.15 Spurious emission measurements in 1000 -2000 MHz range at high carrier frequency

Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

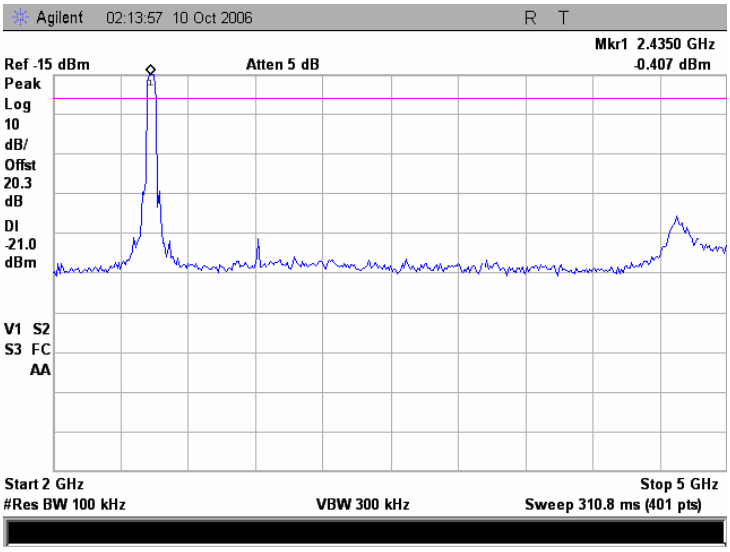


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.16 Spurious emission measurements in 2000 - 5000MHz range at low carrier frequency

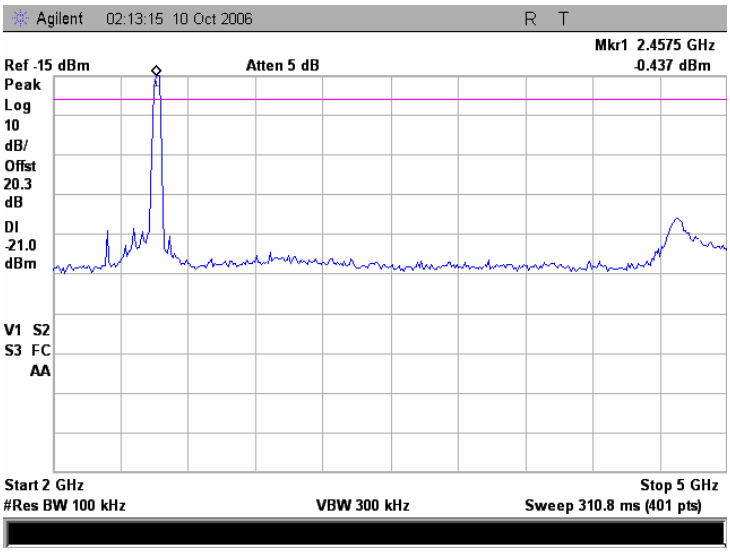


Plot 8.3.17 Spurious emission measurements in 2000 - 5000MHz range at mid carrier frequency



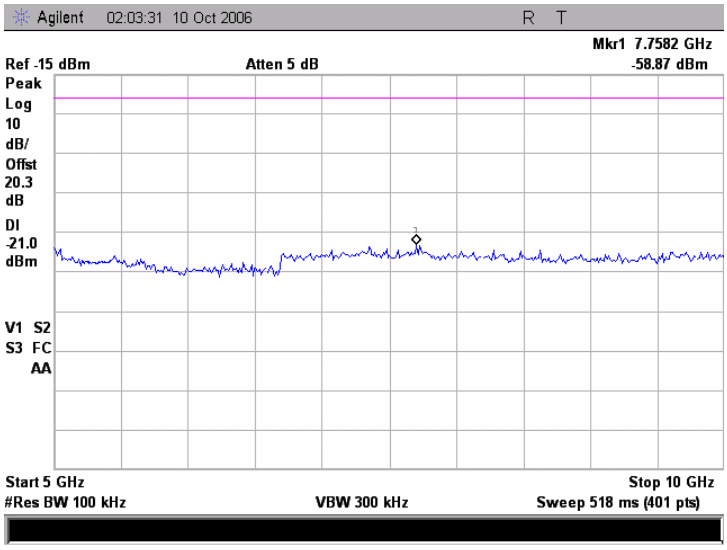
Plot 8.3.18 Spurious emission measurements in 2000 -5000 MHz range at high carrier frequency

Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

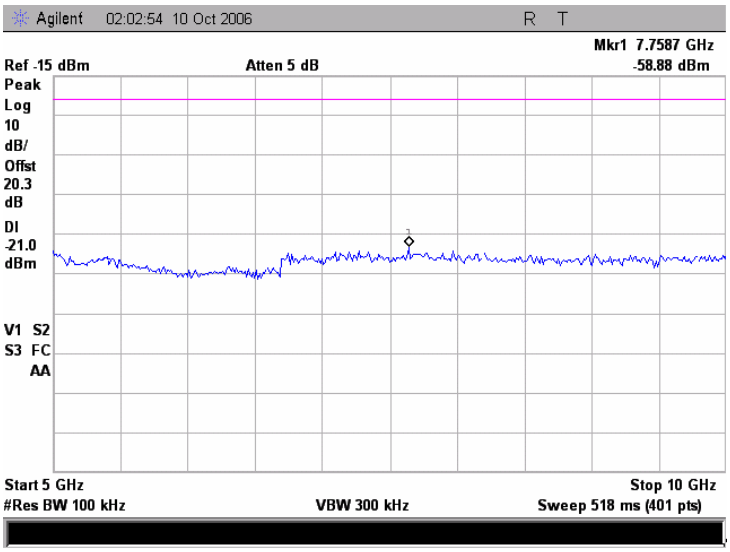


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.19 Spurious emission measurements in 5000 - 10000MHz range at low carrier frequency

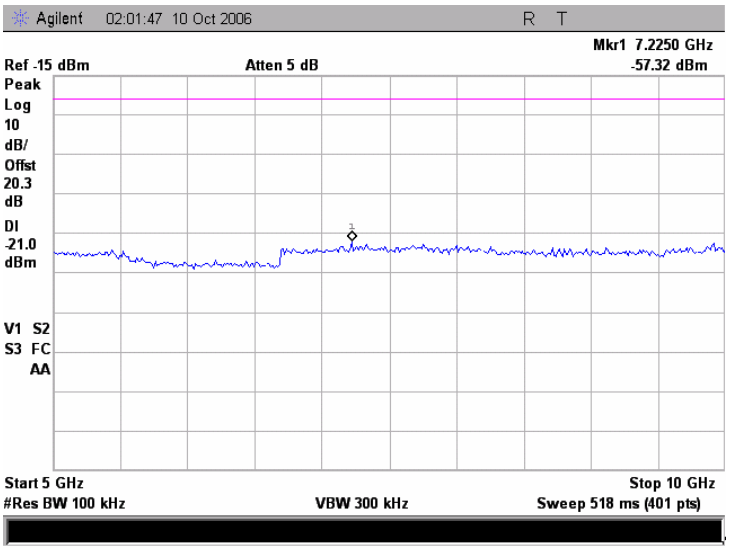


Plot 8.3.20 Spurious emission measurements in 5000 - 10000MHz range at mid carrier frequency



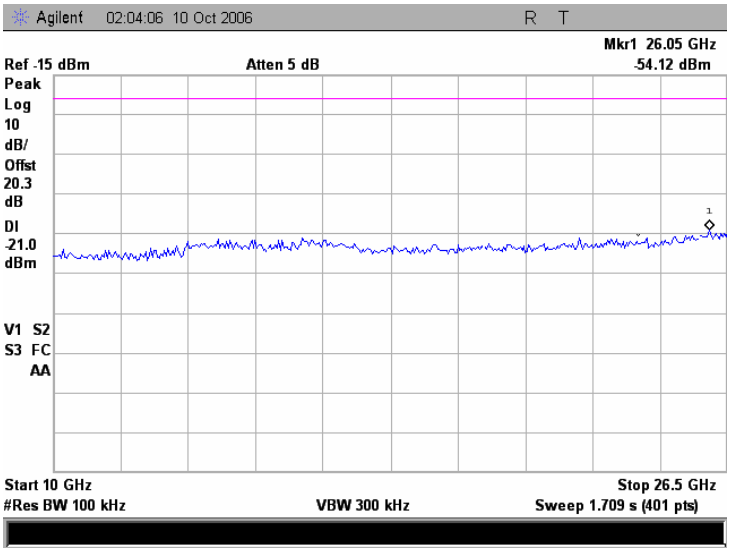
Plot 8.3.21 Spurious emission measurements in 5000 -10000 MHz range at high carrier frequency

Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

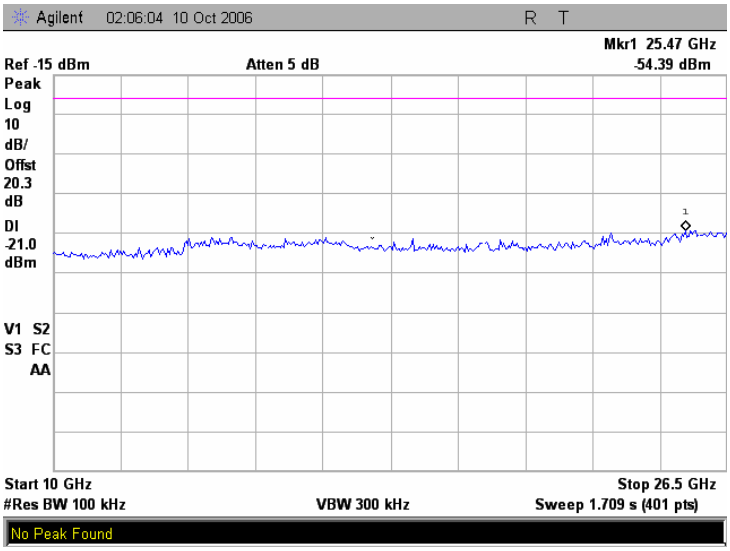


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.22 Spurious emission measurements in 10000 - 26500MHz range at low carrier frequency

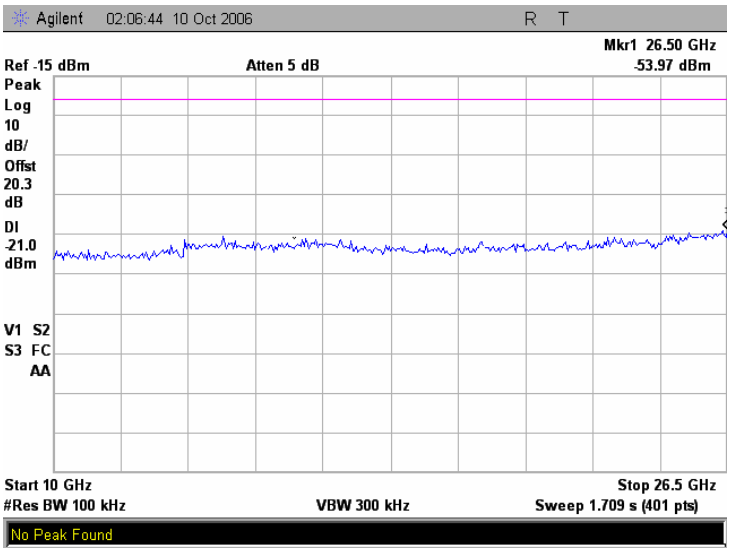


Plot 8.3.23 Spurious emission measurements in 10000 - 26500MHz range at mid carrier frequency



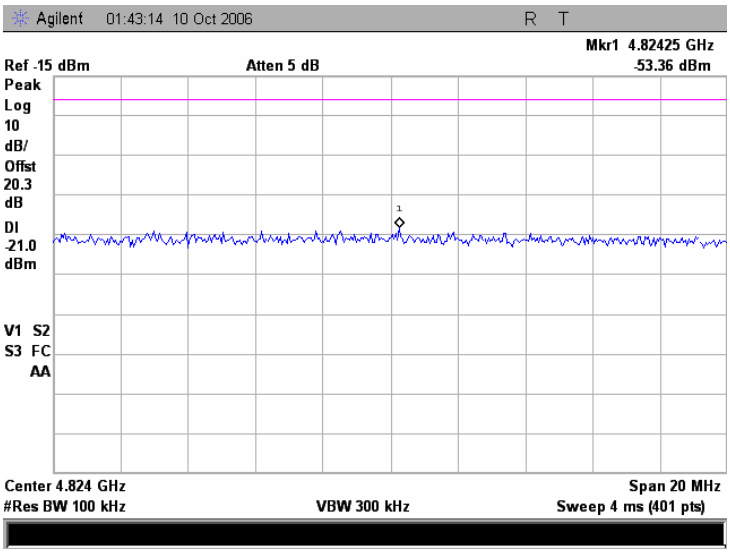
Plot 8.3.24 Spurious emission measurements in 100000 -26500 MHz range at high carrier frequency

Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

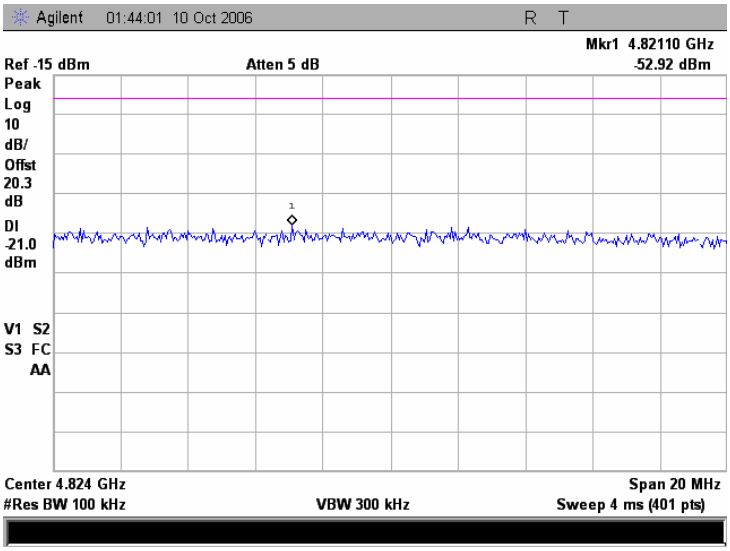


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.25 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequency

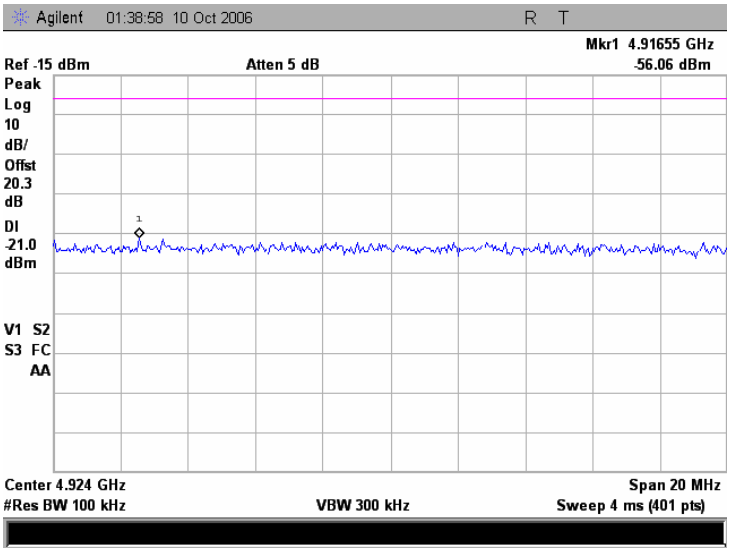


Plot 8.3.26 Conducted spurious emission measurements at the 2nd harmonic of mid carrier frequency

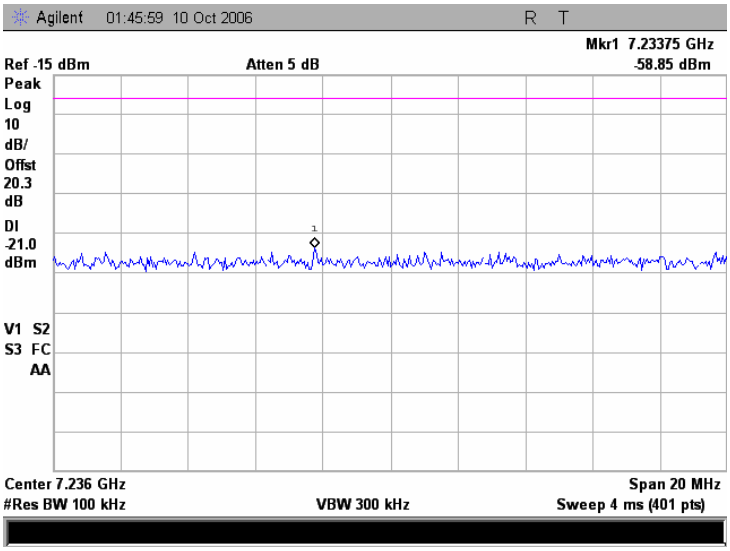


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.27 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequency

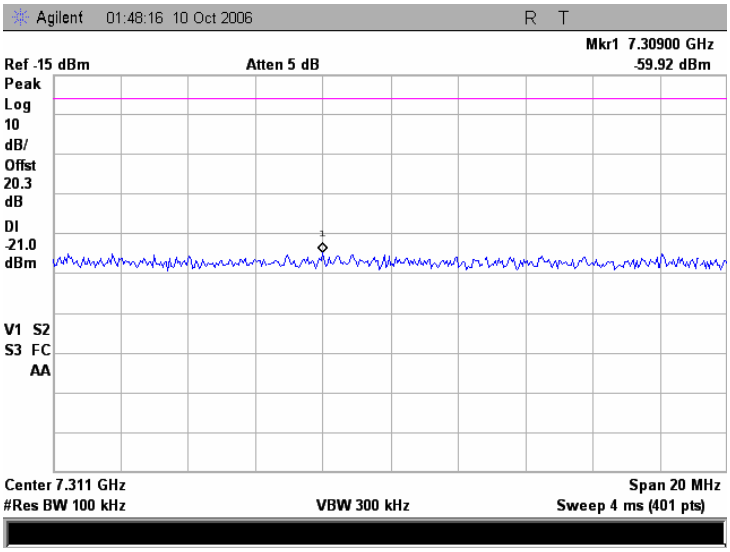


Plot 8.3.28 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency

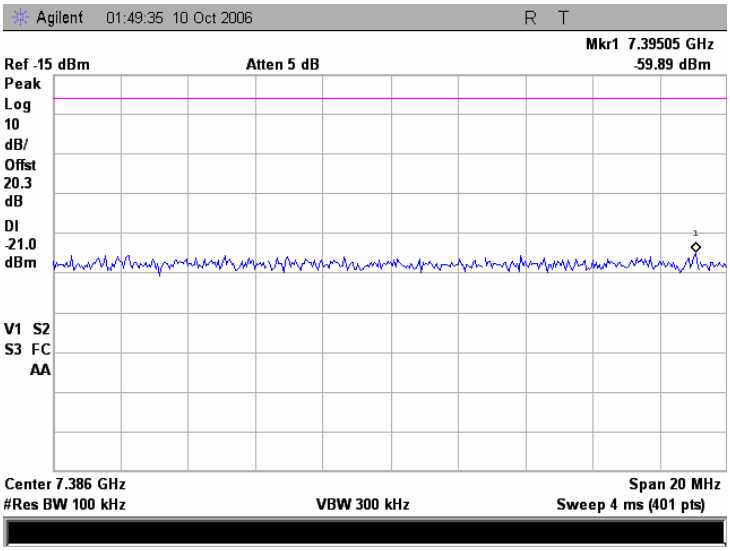


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:33:15 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11b/g + licenced			

Plot 8.3.29 Conducted spurious emission measurements at the 3rd harmonic of mid carrier frequency



Plot 8.3.30 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency



Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

8.4 Spurious emissions at RF antenna connector

8.4.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 8.4.1.

Table 8.4.1 Spurious emission limits

Frequency*, MHz	Attenuation below carrier*, dBc
0.009 – 10th harmonic	43+10logP

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

8.4.2 Test procedure

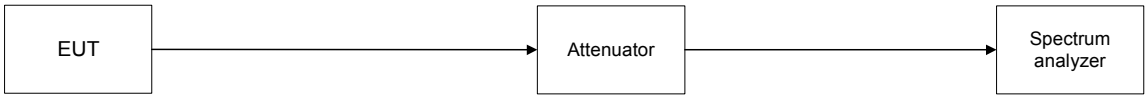
8.4.2.1 The EUT was set up as shown in Figure 8.4.1, energized and its proper operation was checked.

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

8.4.2.3 The highest emission level within the authorized band was measured.

8.4.2.4 The spurious emission was measured with spectrum analyzer as provided in Table 8.4.2 and associated plots and referenced to the highest emission level measured within the authorized band.

Figure 8.4.1 Spurious emission test setup



Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Table 8.4.2 Spurious emission test results

INVESTIGATED FREQUENCY RANGE: 0.009 – 26500 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: DSSS/OFDM
MODULATING SIGNAL: PRBS
BIT RATE: 1 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Low carrier frequency									
1728.375	-29.07	Included	Included	1000	-29.07	66.07	50.00	-16.07	Pass
Mid carrier frequency									
1763.025	-29.93	Included	Included	1000	-29.93	66.93	50.00	-16.93	Pass
High carrier frequency									
1787.625	-31.11	Included	Included	1000	-31.11	68.11	50.00	-18.11	Pass

*****- Margin = Attenuation below carrier – specification limit.

Note: intentional radiators at 800MHz & 1900MHz band range, and at 2.4GHz.

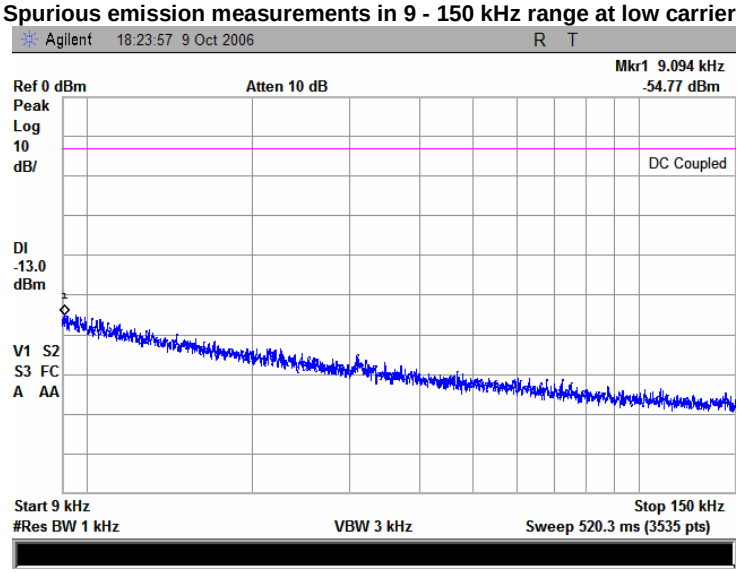
Reference numbers of test equipment used

HL 1441	HL 1906	HL 2667	HL 2909				

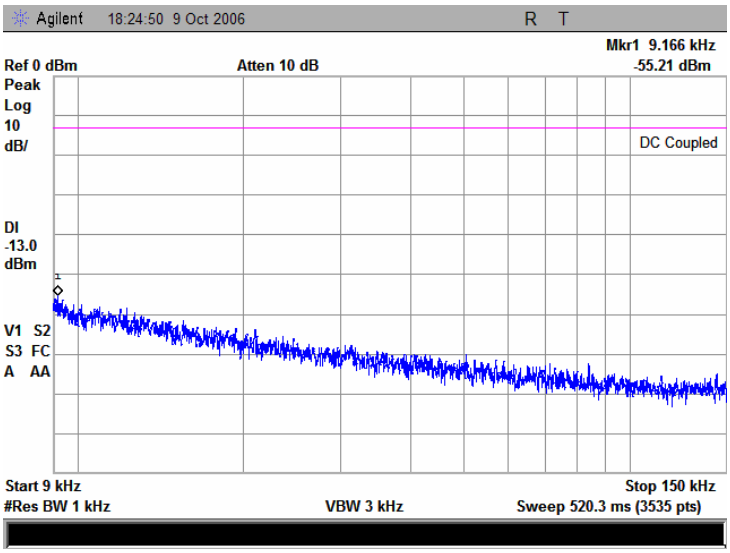
Full description is given in Appendix A.

Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.1 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency

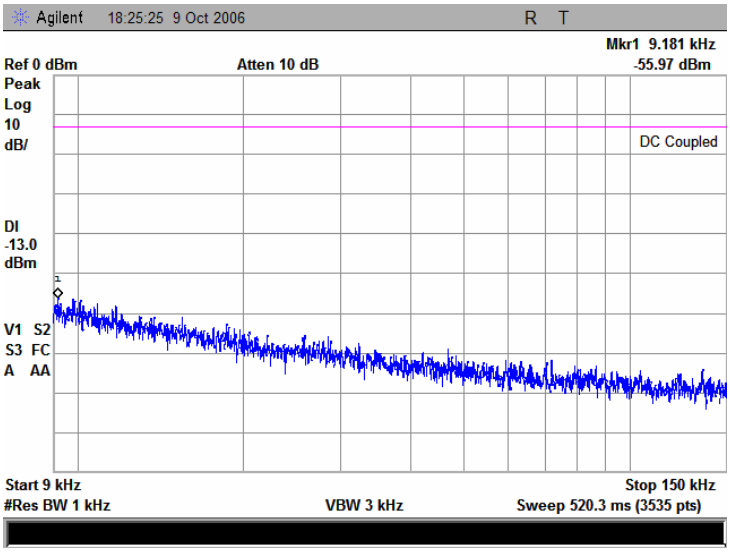


Plot 8.4.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency

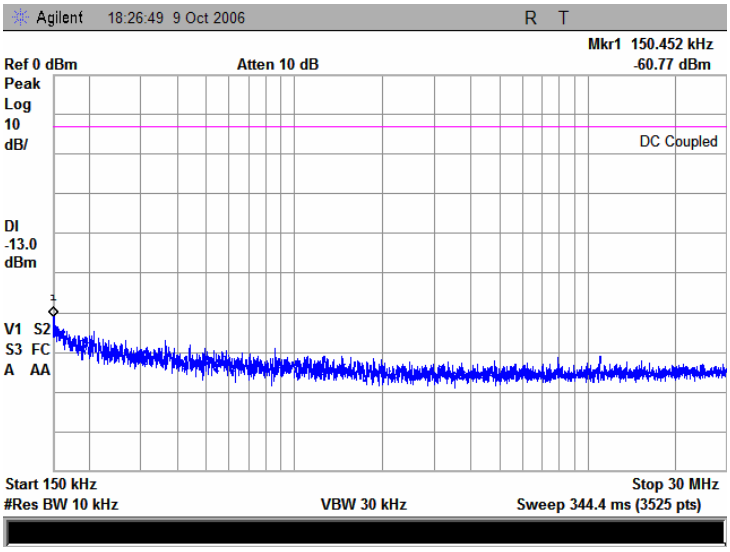


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

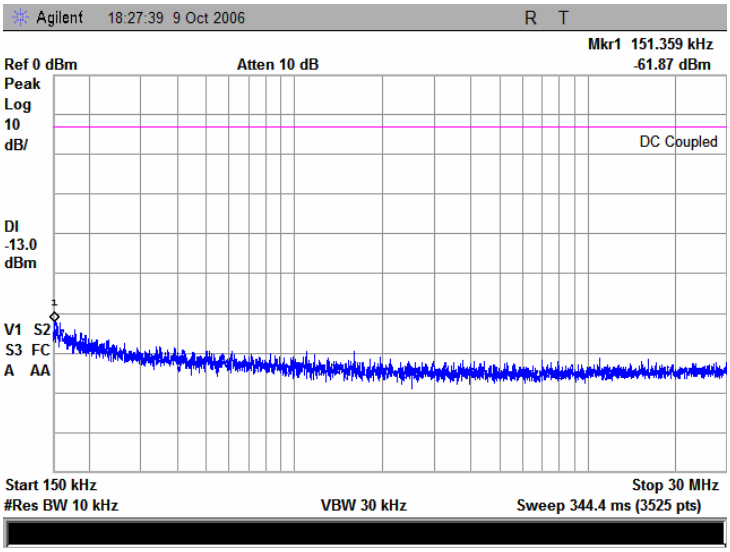


Plot 8.4.4 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency

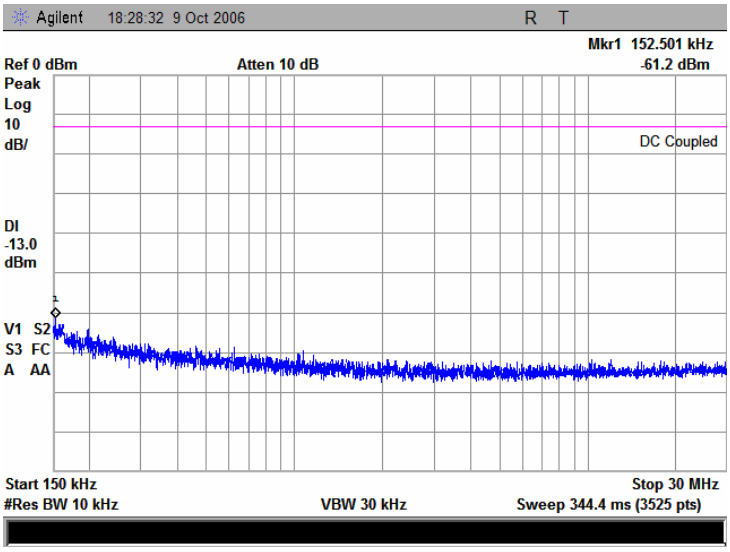


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.5 Spurious emission measurements in 0.15 - 30 MHz range at mid carrier frequency

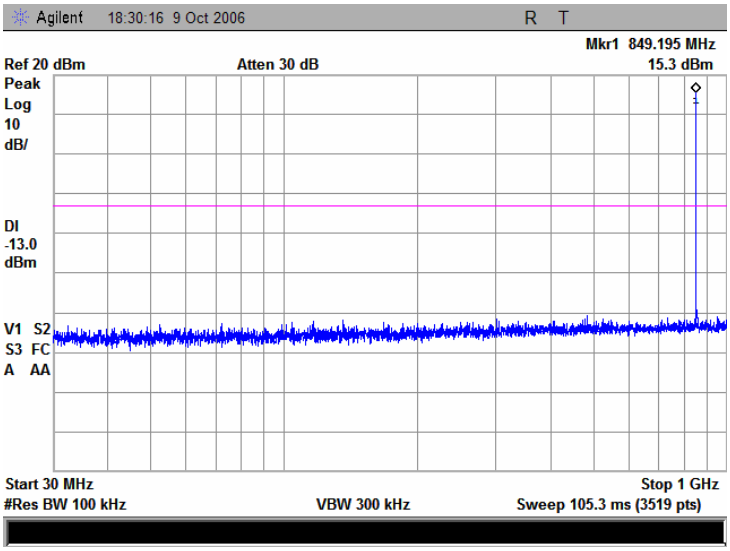


Plot 8.4.6 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency

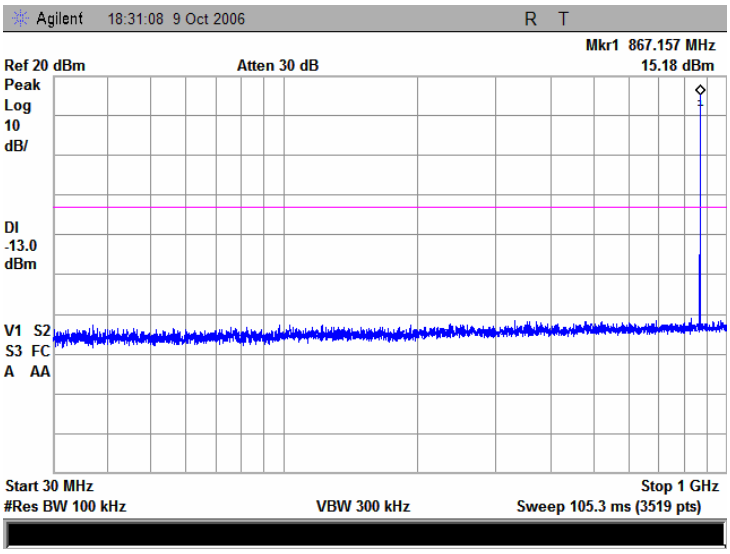


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.7 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency

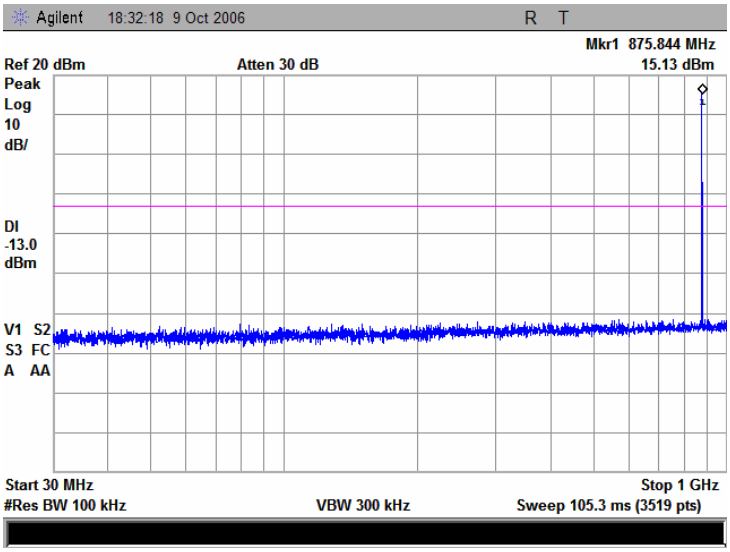


Plot 8.4.8 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency

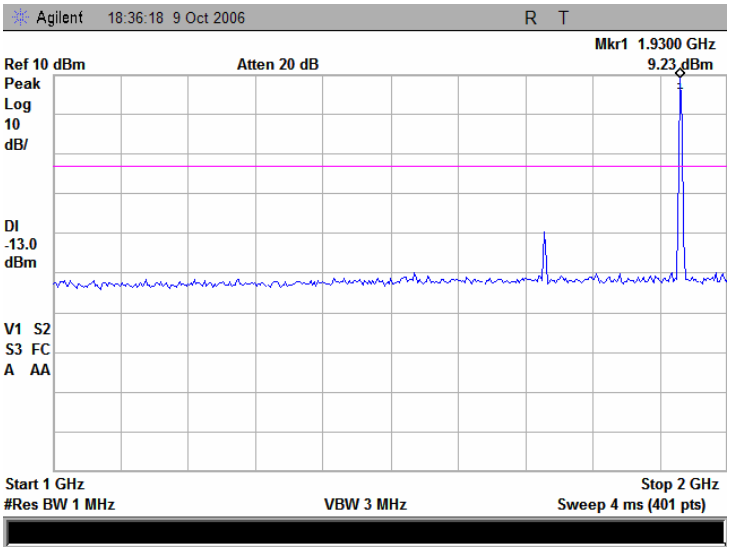


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.9 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency

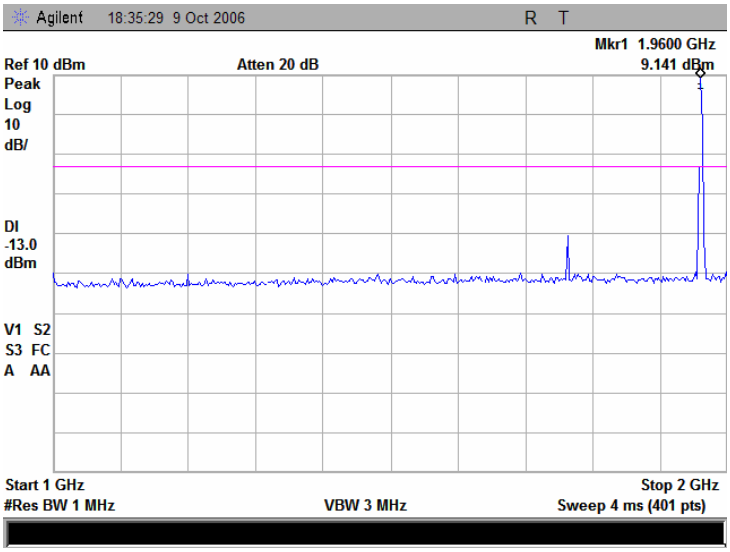


Plot 8.4.10 Spurious emission measurements in 1000 - 2000MHz range at low carrier frequency

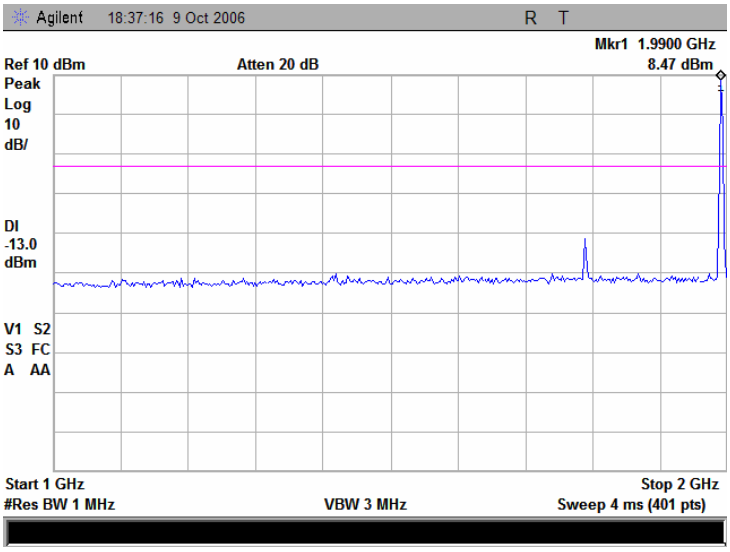


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.11 Spurious emission measurements in 1000 - 2000MHz range at mid carrier frequency

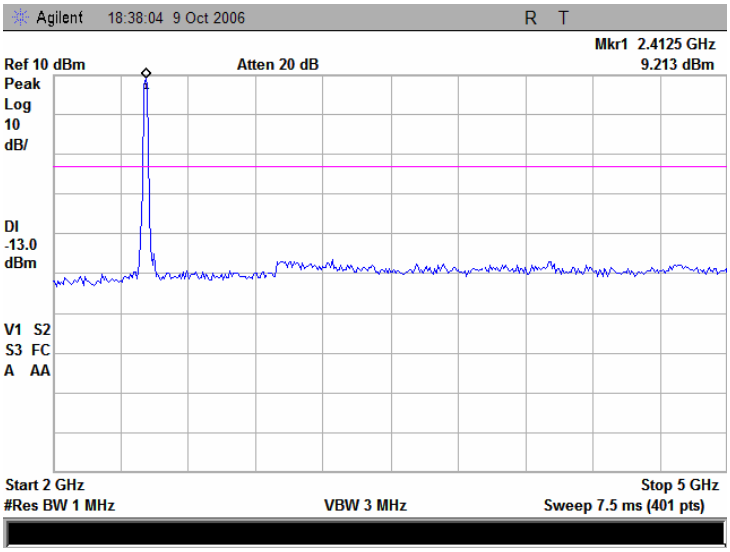


Plot 8.4.12 Spurious emission measurements in 1000 -2000 MHz range at high carrier frequency

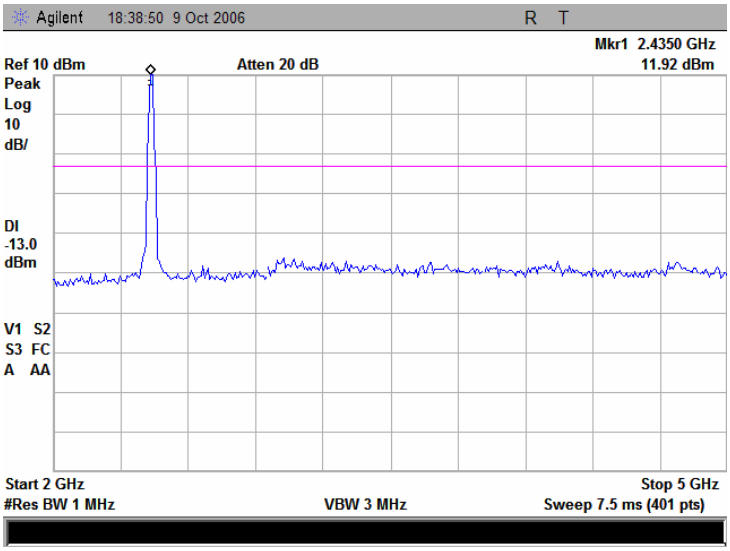


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.13 Spurious emission measurements in 2000 - 5000MHz range at low carrier frequency

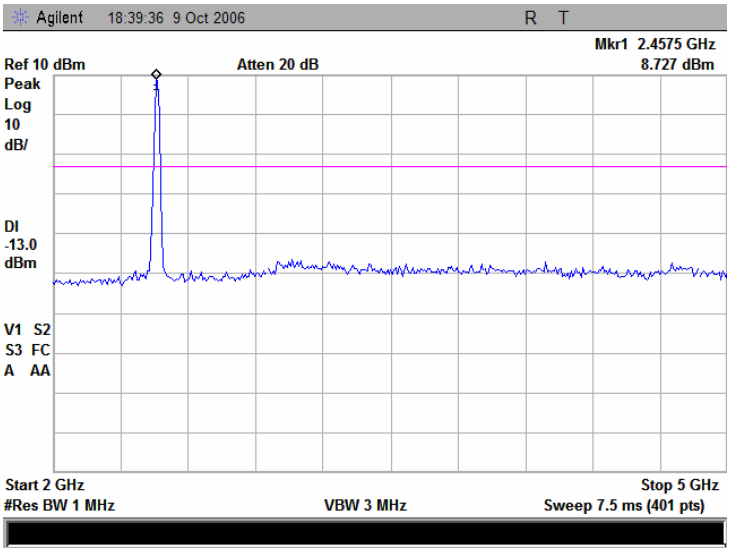


Plot 8.4.14 Spurious emission measurements in 2000 - 5000MHz range at mid carrier frequency

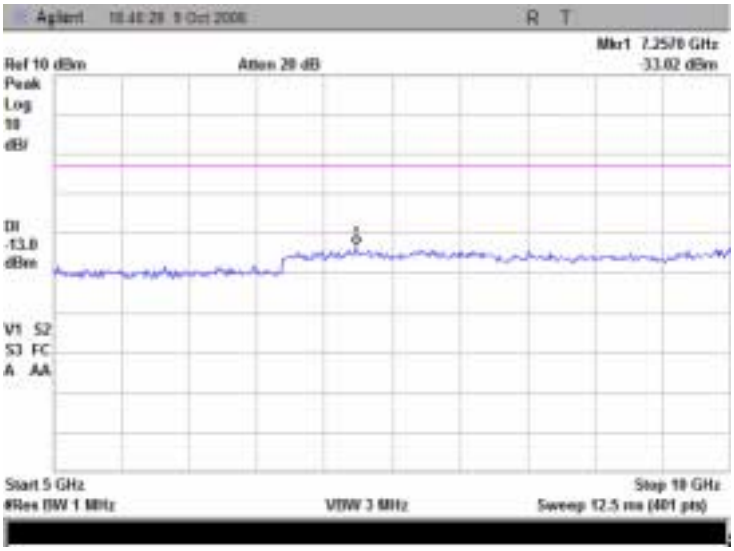


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.15 Spurious emission measurements in 2000 -5000 MHz range at high carrier frequency

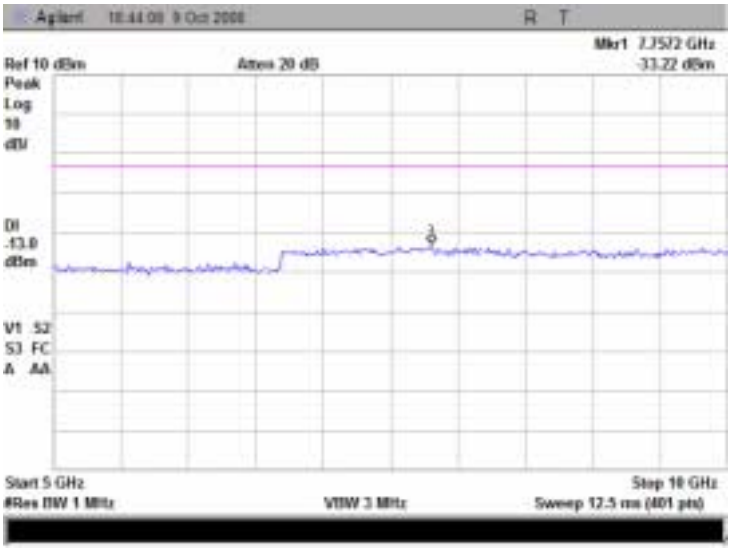


Plot 8.4.16 Spurious emission measurements in 5000 - 10000MHz range at low carrier frequency

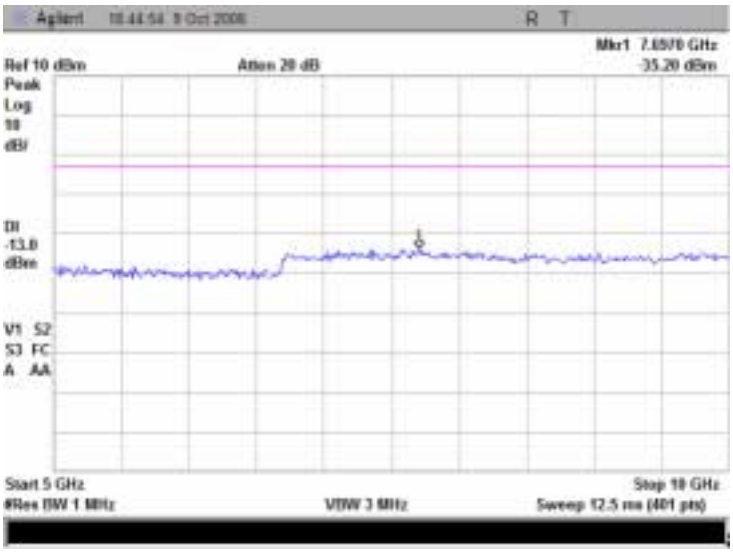


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.17 Spurious emission measurements in 5000 - 10000MHz range at mid carrier frequency

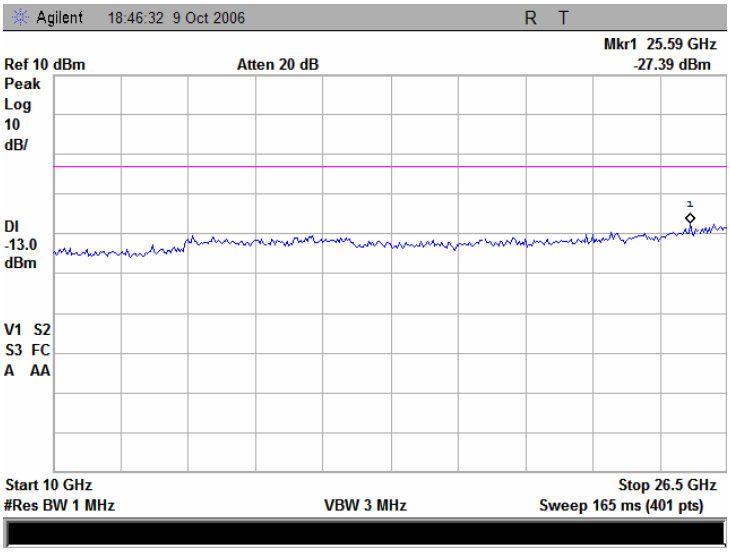


Plot 8.4.18 Spurious emission measurements in 5000 -10000 MHz range at high carrier frequency

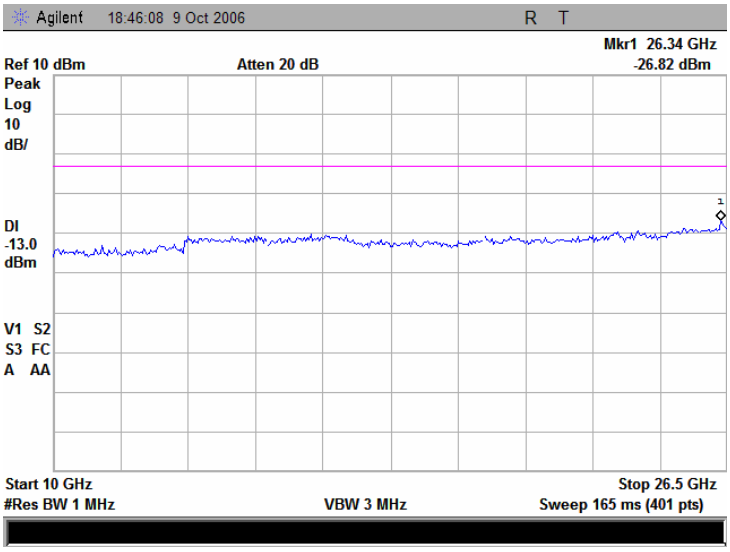


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.19 Spurious emission measurements in 10000 - 26500MHz range at low carrier frequency

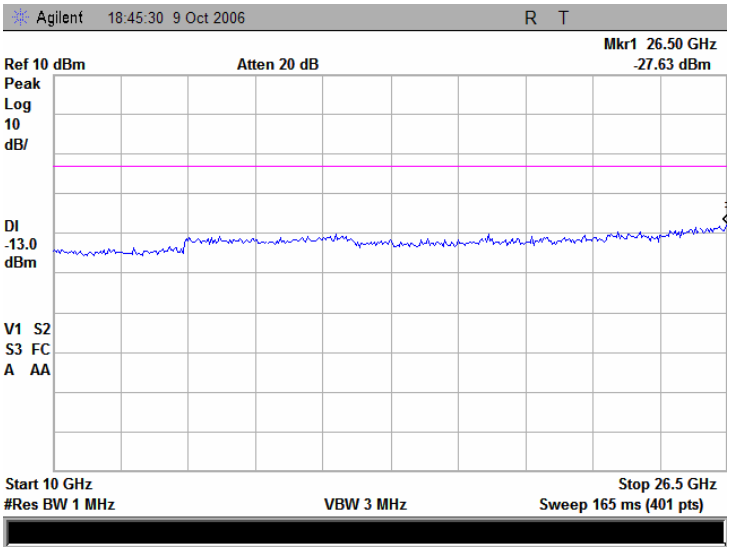


Plot 8.4.20 Spurious emission measurements in 10000 - 26500MHz range at mid carrier frequency



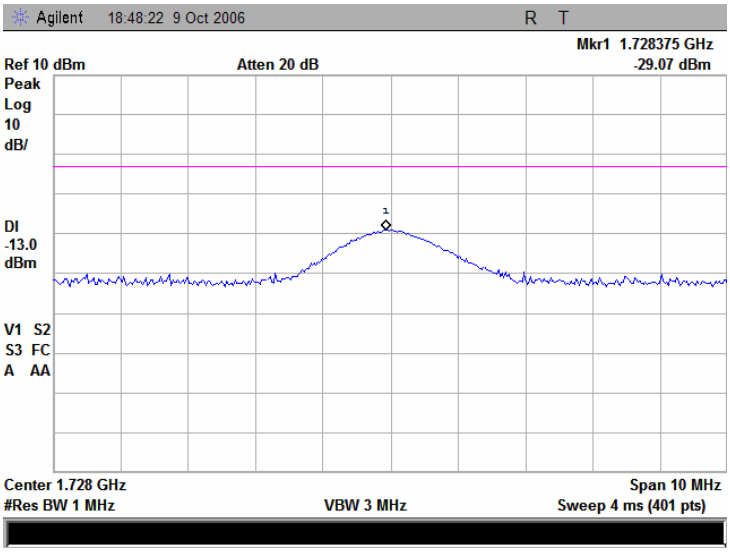
Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.21 Spurious emission measurements in 100000 -26500 MHz range at high carrier frequency

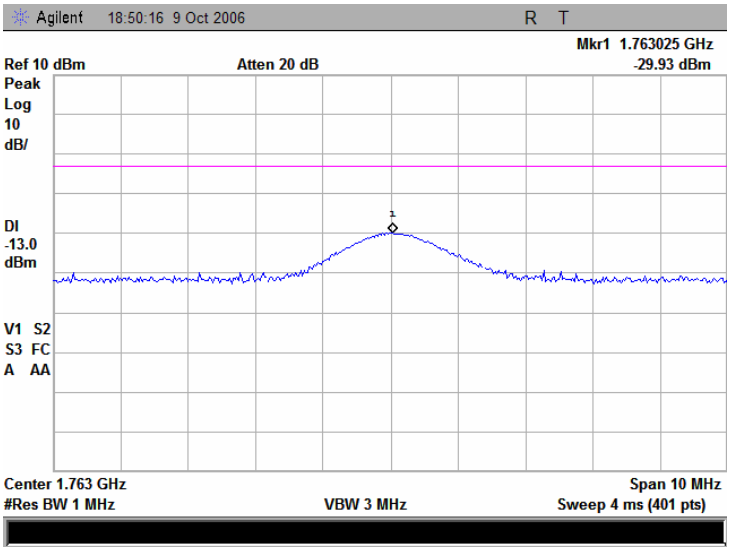


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.22 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequency 800 band

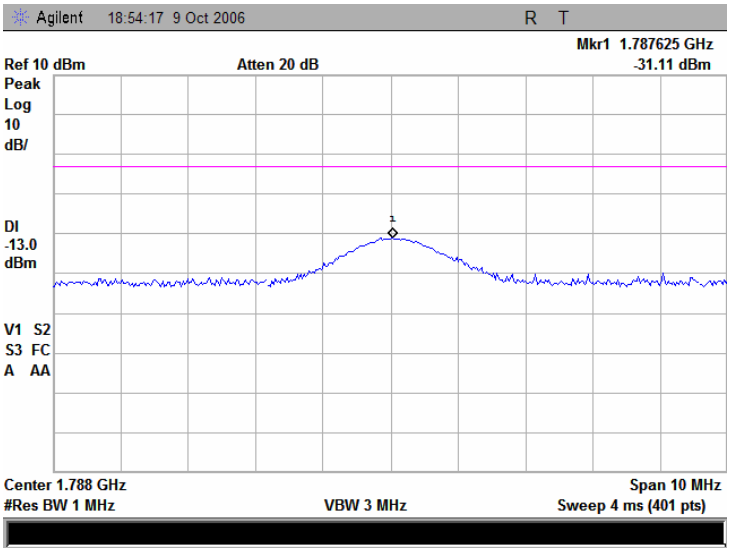


Plot 8.4.23 Conducted spurious emission measurements at the 2nd harmonic of mid carrier frequency 800 band

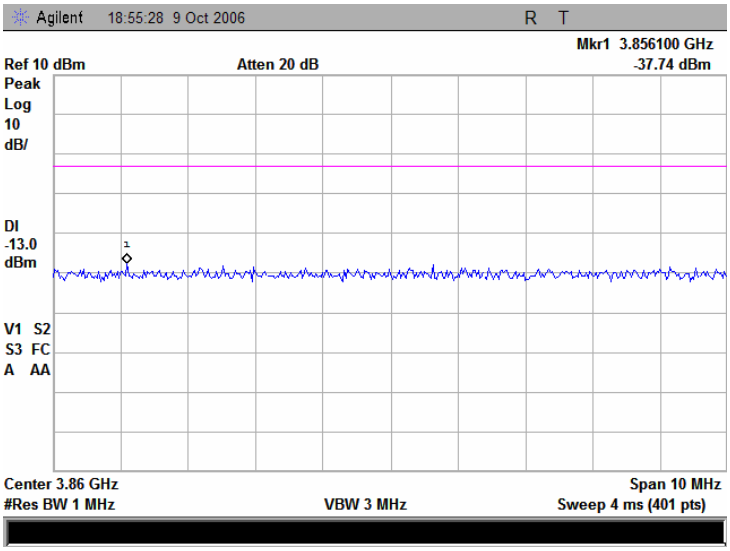


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.24 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequency 800 band

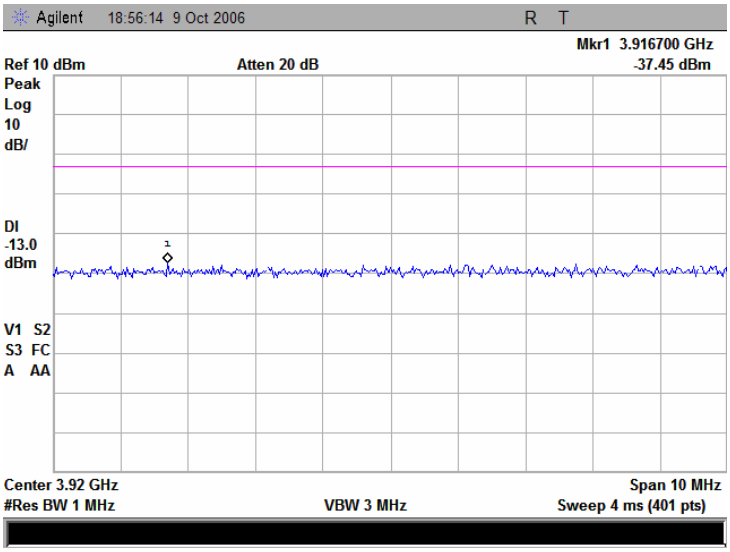


Plot 8.4.25 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequency 1900 band

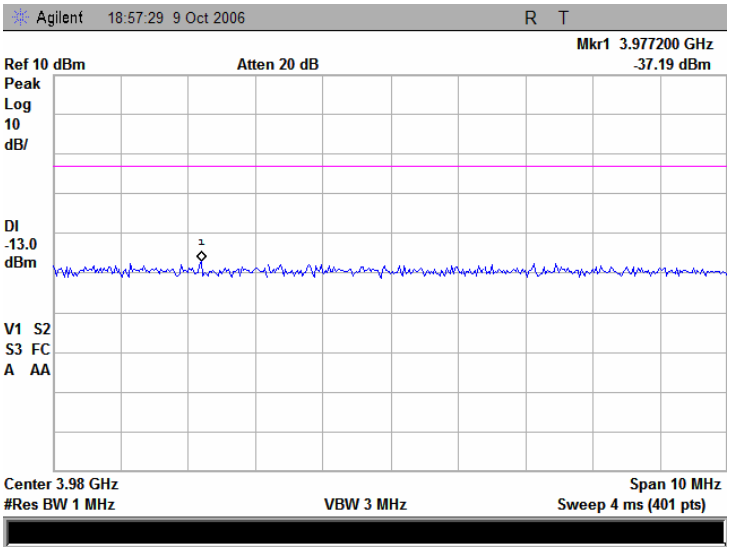


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.26 Conducted spurious emission measurements at the 2nd harmonic of mid carrier frequency 1900 band

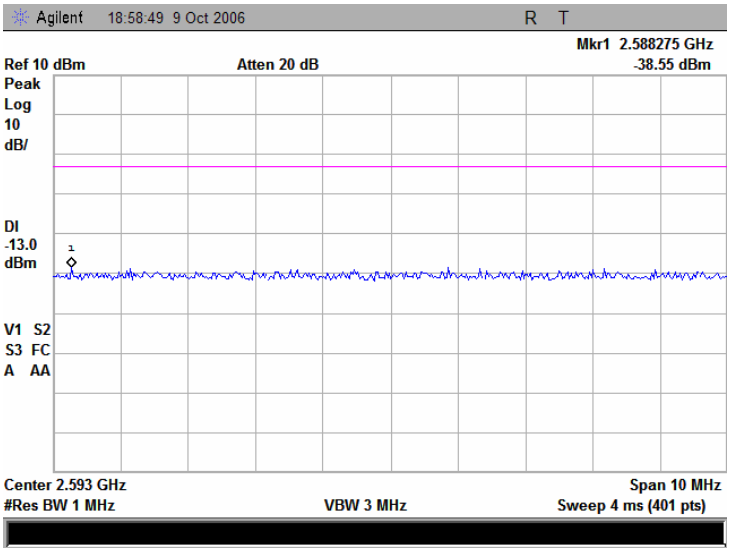


Plot 8.4.27 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequency 1900 band

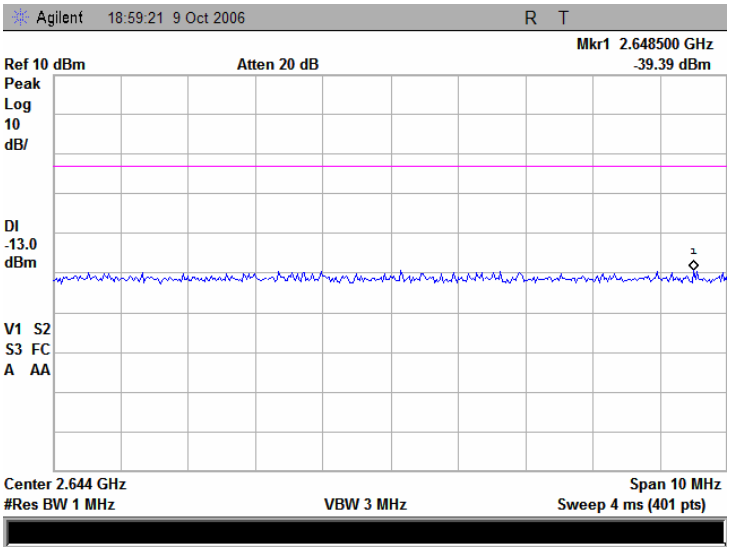


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.28 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency 800 band

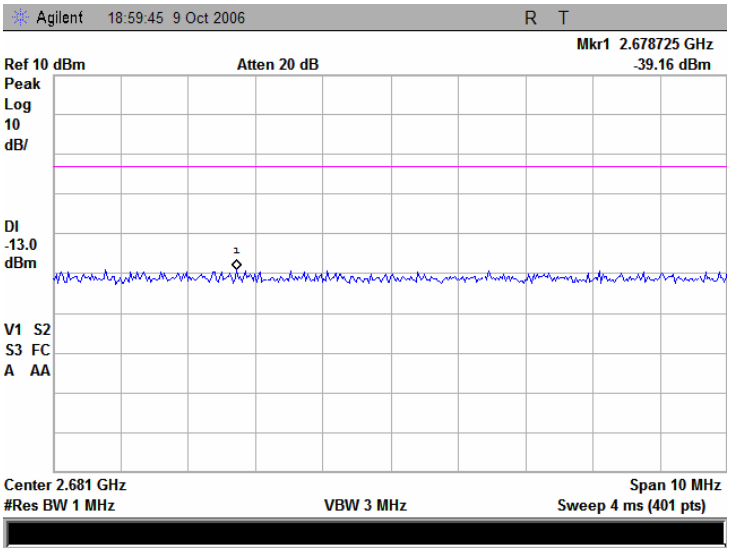


Plot 8.4.29 Conducted spurious emission measurements at the 3rd harmonic of mid carrier frequency 800 band

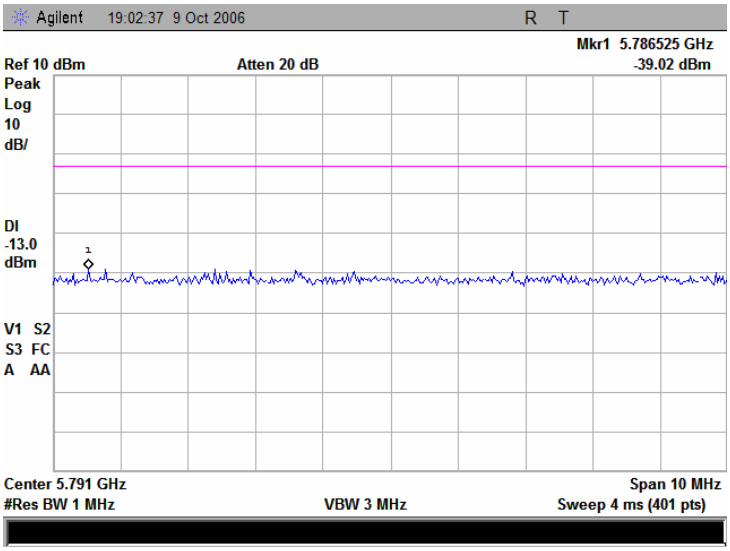


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.30 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency 800 band

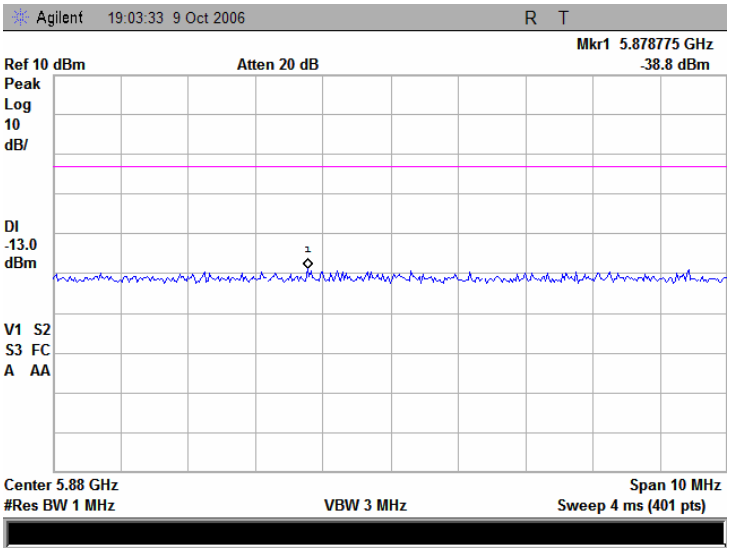


Plot 8.4.31 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency 1900 band

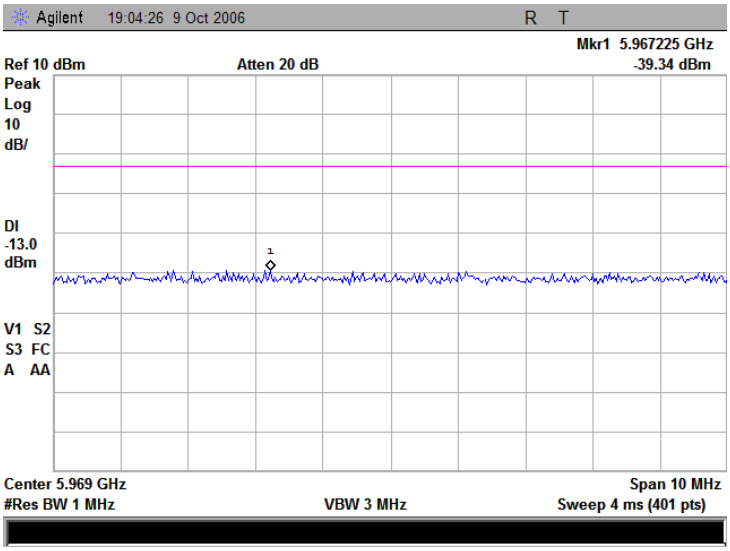


Test specification:	**Section 15.247(c), Conducted spurious emissions**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 2:07:26 PM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: according to part 22/24			

Plot 8.4.32 Conducted spurious emission measurements at the 3rd harmonic of mid carrier frequency 1900 band



Plot 8.4.33 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency 1900 band



HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

8.5 Field strength of spurious emissions

8.5.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given inTable 8.5.1.

Table 8.5.1 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:
LimS2 = LimS1 + 40 log (S1/S2),
where S1 and S2 – 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.

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

8.5.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.

8.5.2.2 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.

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

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

8.5.3.1 The EUT was set up as shown in Figure 7.4.2, energized and the performance check was conducted.

8.5.3.2 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.

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

HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Figure 8.5.1 Setup for spurious emission field strength measurements below 30 MHz

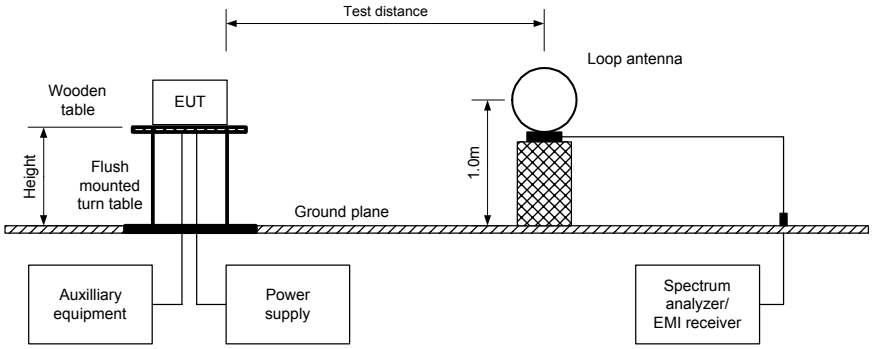
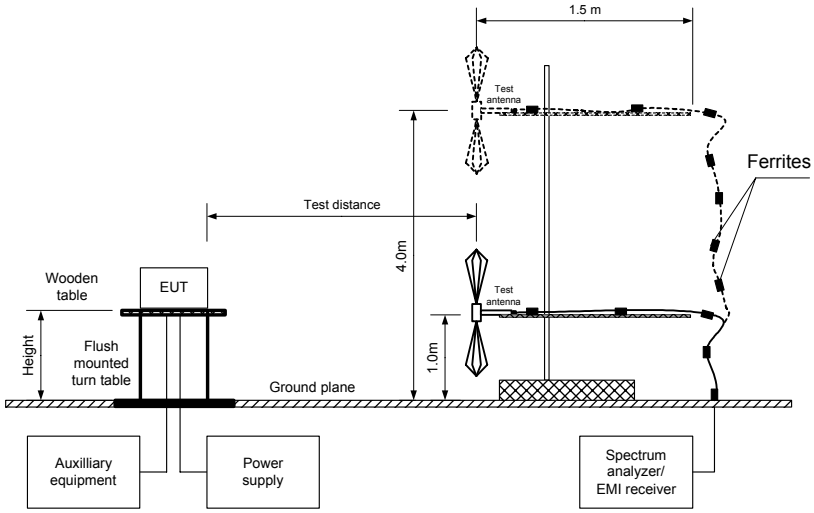


Figure 8.5.2 Setup for spurious emission field strength measurements above 30 MHz



HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Table 8.5.2 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY:	2400 – 2483.5 MHz
INVESTIGATED FREQUENCY RANGE:	1000 – 25000 MHz
TEST DISTANCE:	3 m
MODULATION:	QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	1 Mbps
DUTY CYCLE:	99 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
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***	
Low carrier frequency											
2386.20	V	1.0	198	56.33	74.00	-6.73	48.35	48.35	54.00	-5.65	Pass
Mid carrier frequency											
No spurious emissions were found											Pass
High carrier frequency											
2483.50	V	1.0	170	55.88	74.00	-18.12	48.46	48.46	54.00	-5.54	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 8.5.3 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
100% duty cycle					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:

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

HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Table 8.5.4 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:	QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	1 Mbps
DUTY CYCLE:	99 %
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*				
All frequencies								
37.554000	43.38	38.62	40.00	-1.38	V	1.0	273	
73.97000	41.45	36.54	40.00	-3.46	V	1.0	94	
108.79700	42.27	38.08	43.50	-5.42	V	1.0	90	
130.50750	42.41	38.92	43.50	-4.58	V	1.0	264	
150.00372	42.03	39.12	43.50	-4.38	V	1.0	0	
333.12200	42.40	36.65	46.00	-9.35	H	1.0	82	
400.00100	44.59	39.09	46.00	-6.91	H	1.0	145	

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

Table 8.5.5 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 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 0446	HL 0465	HL 0521	HL 0589	HL 0592	HL 0593	HL 0594	HL 0604
HL 1947	HL 1984	HL 2009					

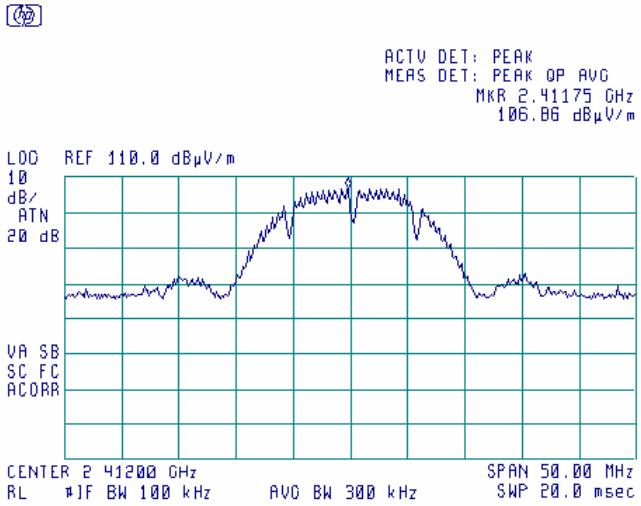
Full description is given in Appendix A.

HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

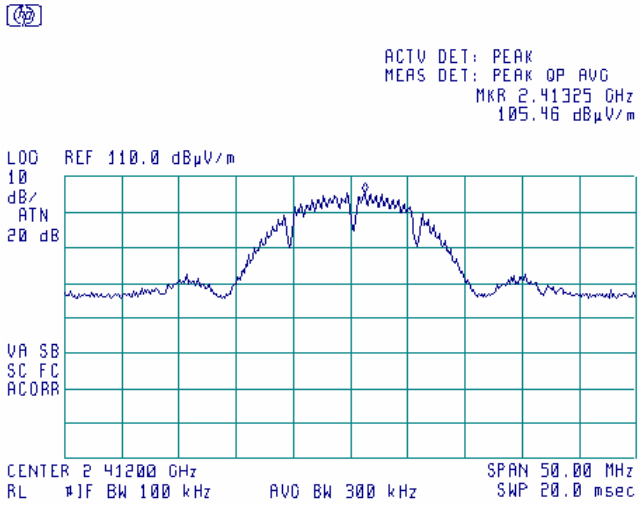
Plot 8.5.1 Radiated emission measurements at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 8.5.2 Radiated emission measurements at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal

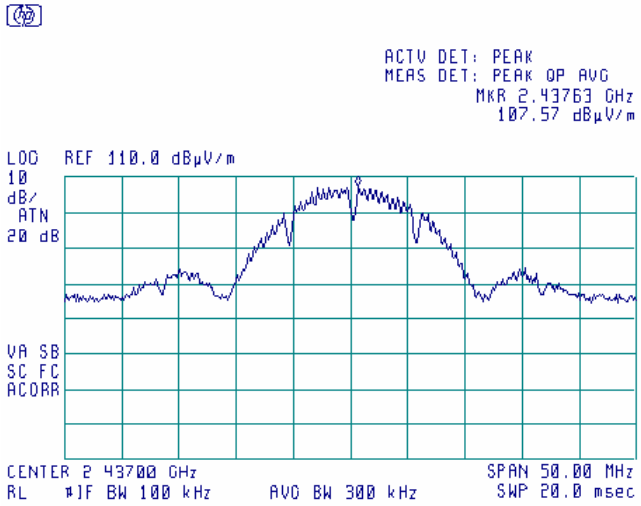


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

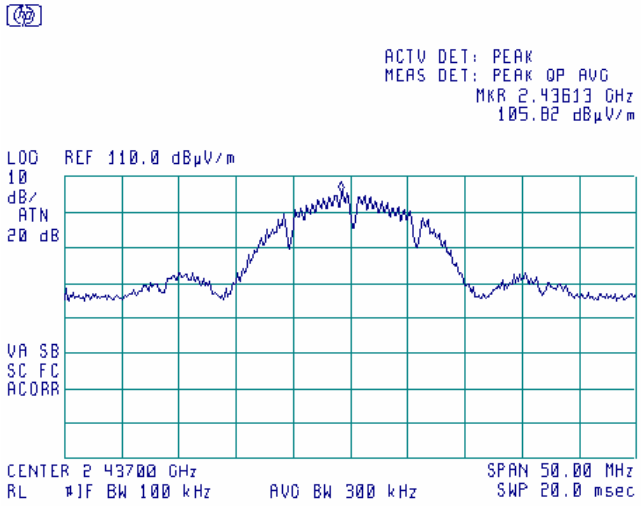
Plot 8.5.3 Radiated emission measurements at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 8.5.4 Radiated emission measurements at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal

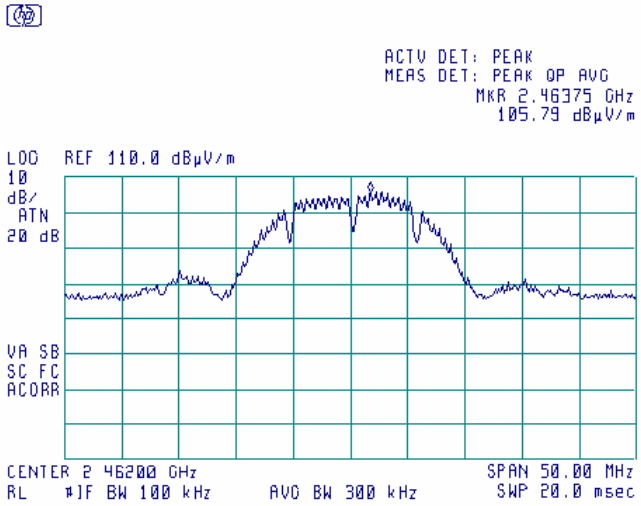


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

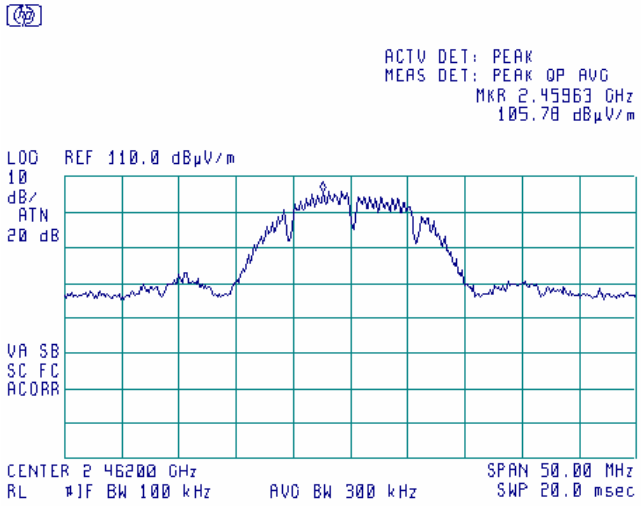
Plot 8.5.5 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 8.5.6 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal

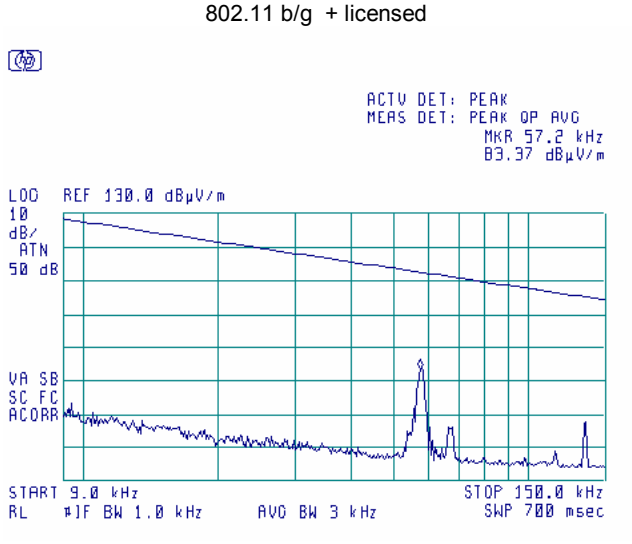


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

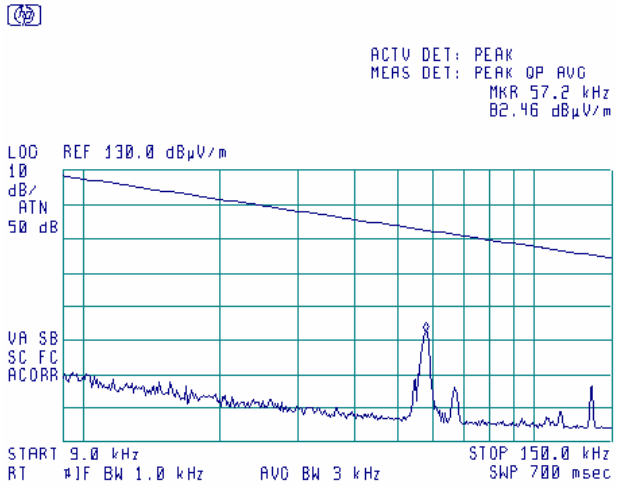
Plot 8.5.7 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
INPUTS: 802.11 b/g + licensed



Plot 8.5.8 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
INPUTS: 802.11 b/g + licensed

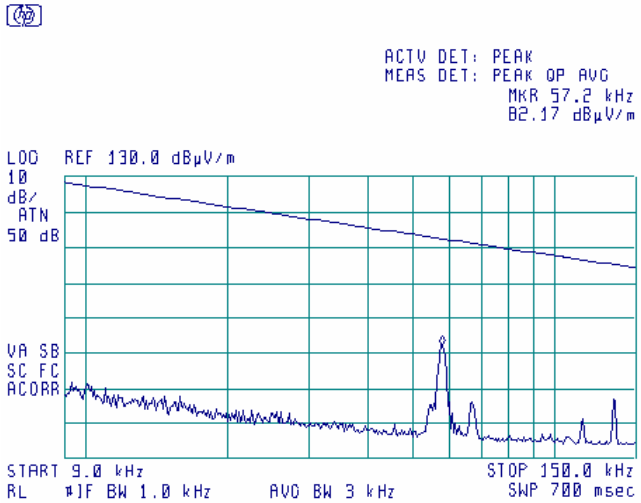


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

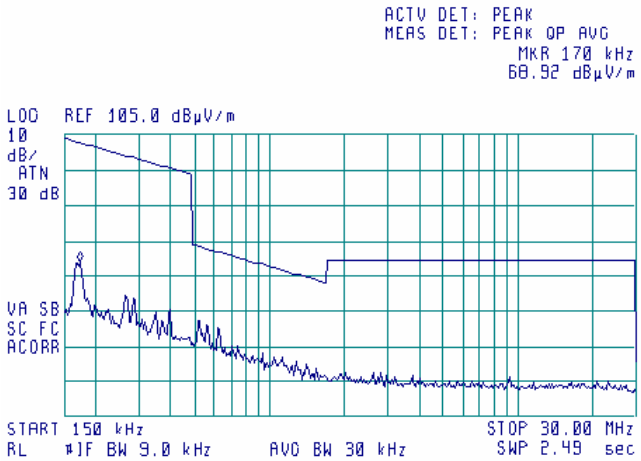
Plot 8.5.9 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
INPUTS: 802.11 b/g + licensed



Plot 8.5.10 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
INPUTS: 802.11 b/g + licensed

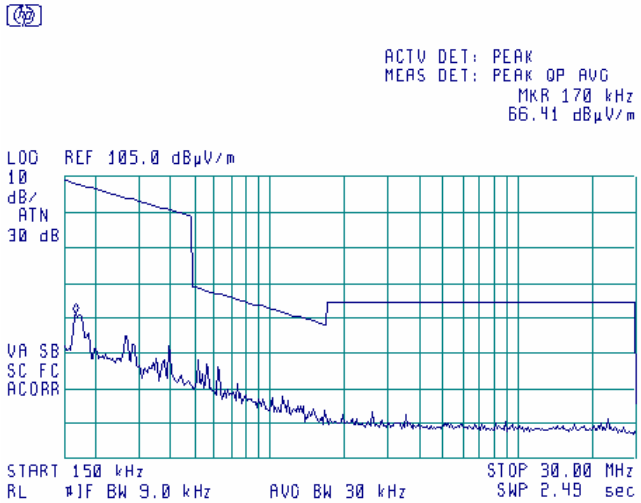


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

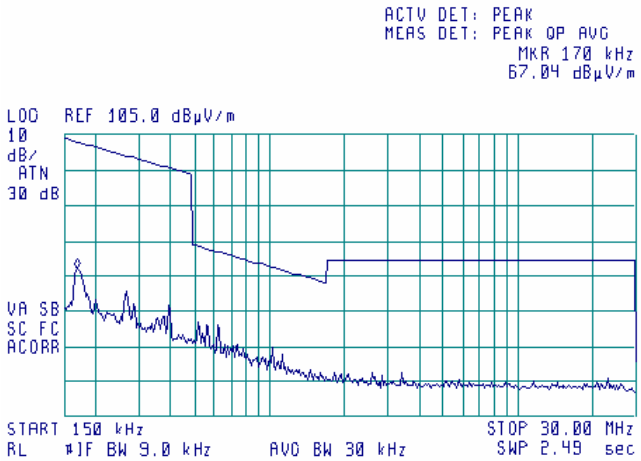
Plot 8.5.11 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
INPUTS: 802.11 b/g + licensed



Plot 8.5.12 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
INPUTS: 802.11 b/g + licensed

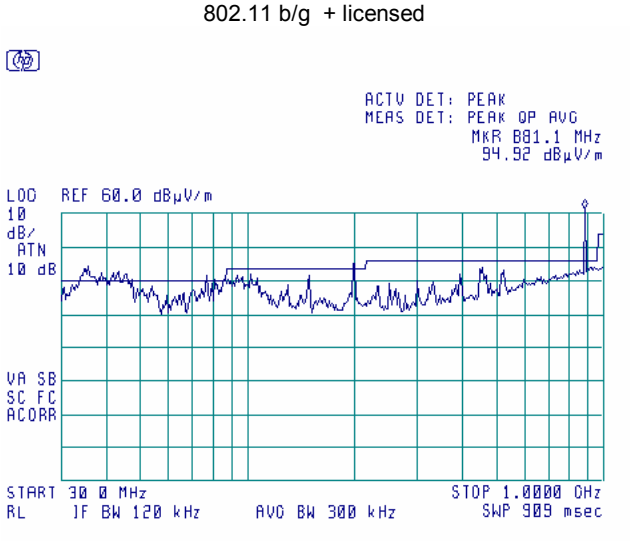


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.5.13 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

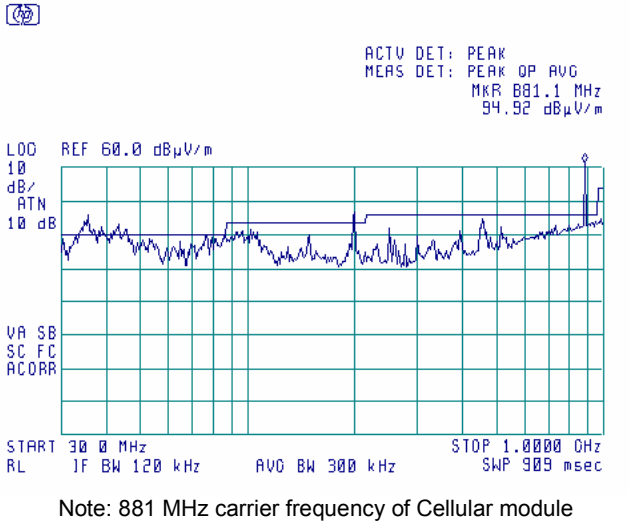
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed



Note: 881 MHz carrier frequency of Cellular module

Plot 8.5.14 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
INPUTS: 802.11 b/g + licensed



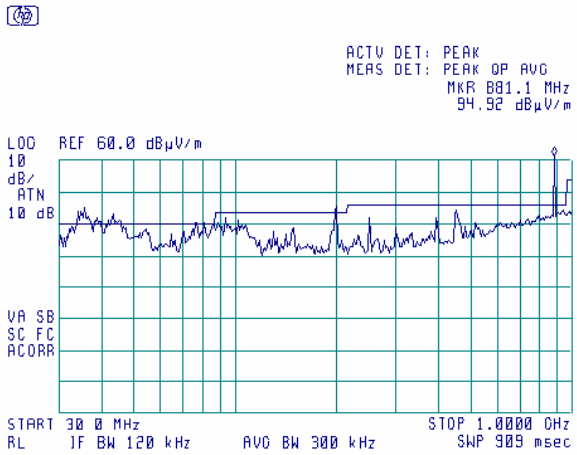
Note: 881 MHz carrier frequency of Cellular module

HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.5.15 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

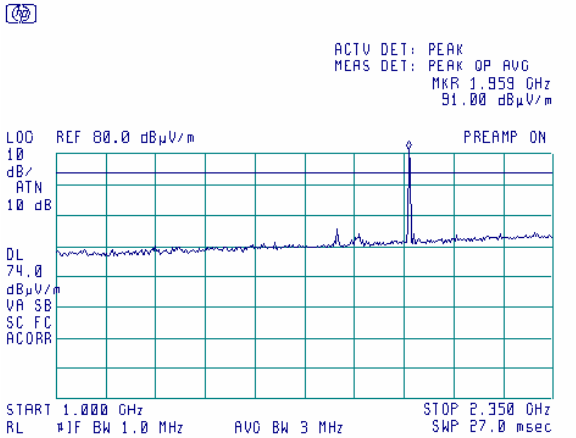
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed



Note: 881 MHz carrier frequency of Cellular module

Plot 8.5.16 Radiated emission measurements from 1000 to 2350 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



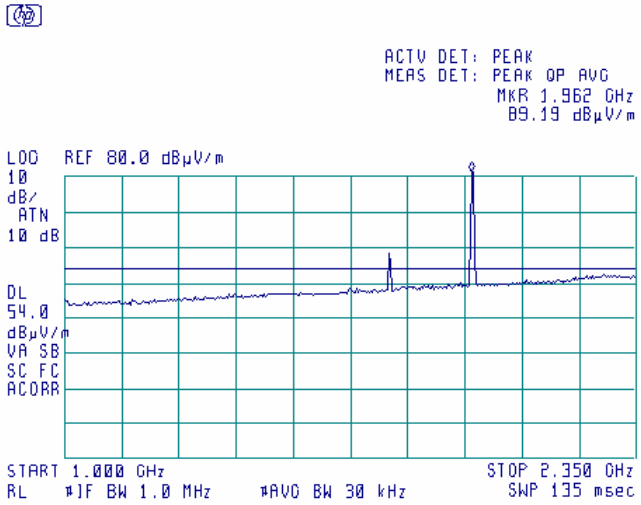
Note: 1960 MHz – intended emission of PCS module, 1763 MHz – second harmonic of CELL module

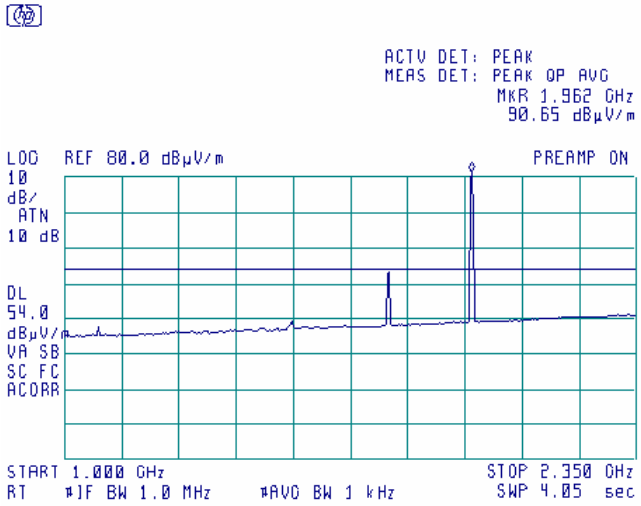
HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.5.17 Radiated emission measurements from 1000 to 2350 MHz at the low carrier frequency

TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical and Horizontal
INPUTS:	802.11 b/g + licensed
DETECTOR:	Average





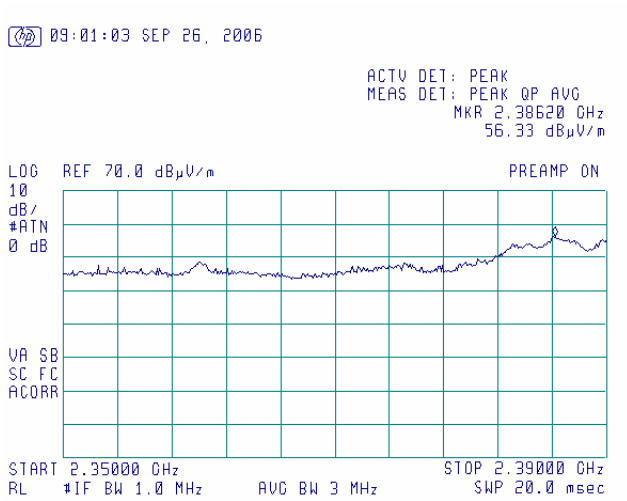
Note: 1960 MHz – intended emission of PCS module, 1763 MHz – second harmonic of CELL module

HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

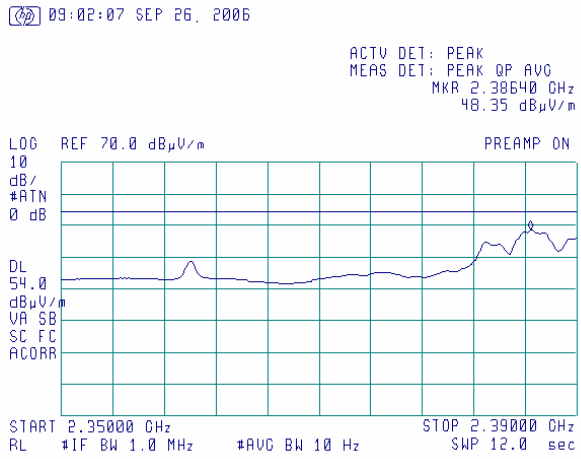
Plot 8.5.18 Radiated emission measurements from 2350 to 2390 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.19 Radiated emission measurements from 2350 to 2390 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

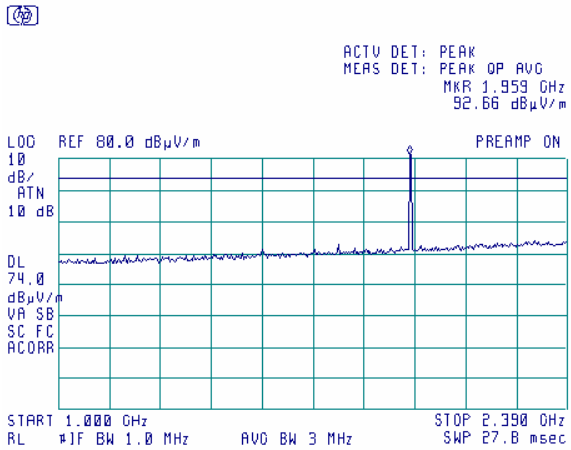


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.5.20 Radiated emission measurements from 1000 to 2390 MHz at the mid carrier frequency

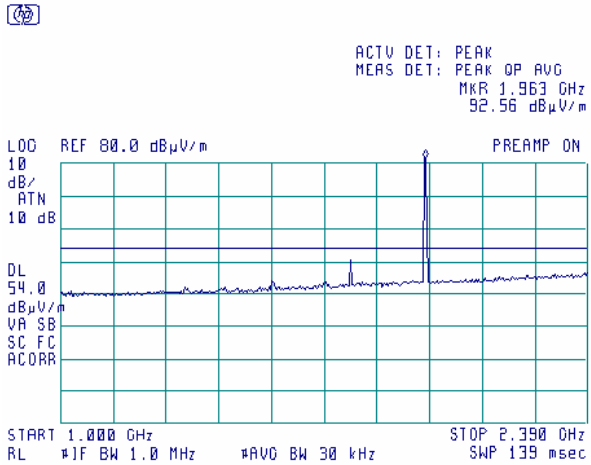
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Note: 1960 MHz – intended emission of PCS module, 1763 MHz – second harmonic of CELL module

Plot 8.5.21 Radiated emission measurements from 1000 to 2390 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Average



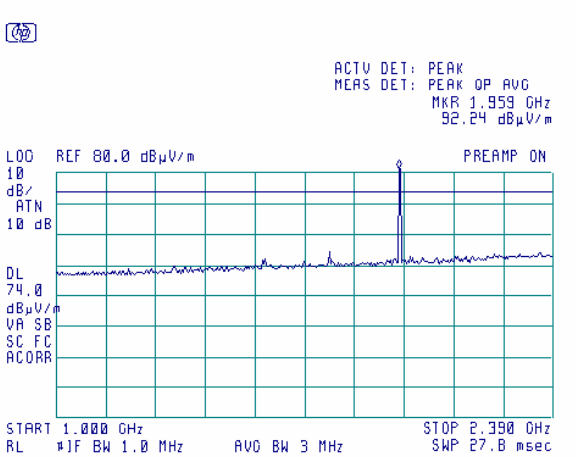
Note: 1960 MHz – intended emission of PCS module, 1763 MHz – second harmonic of CELL module

HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.5.22 Radiated emission measurements from 1000 to 2390 MHz at the high carrier frequency

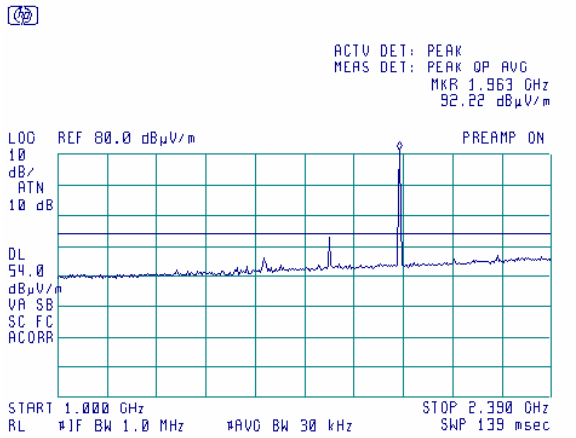
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Note: 1960 MHz – intended emission of PCS module, 1763 MHz – second harmonic of CELL module

Plot 8.5.23 Radiated emission measurements from 1000 to 2390 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Average



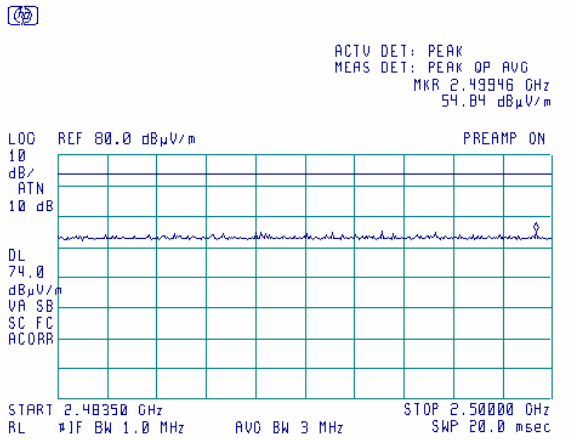
Note: 1960 MHz – intended emission of PCS module, 1763 MHz – second harmonic of CELL module

HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

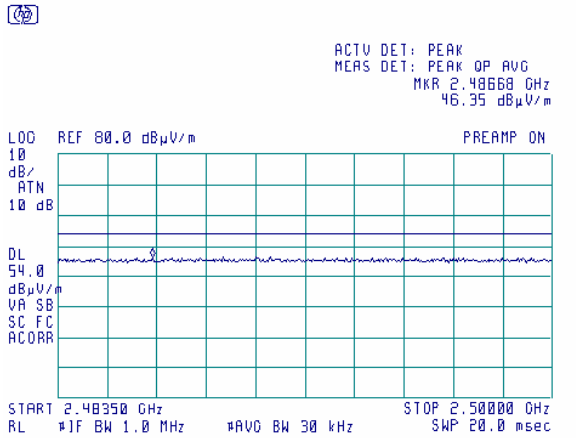
Plot 8.5.24 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.25 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
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

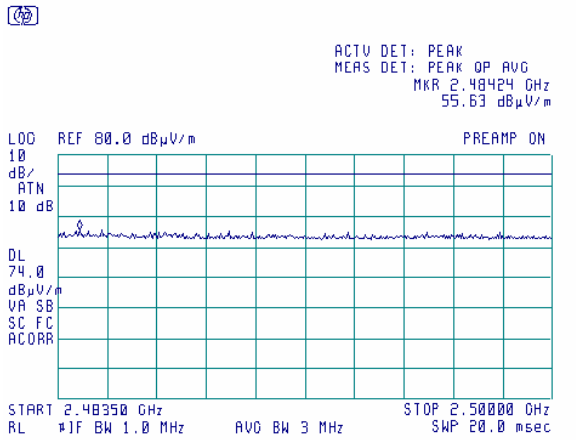


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

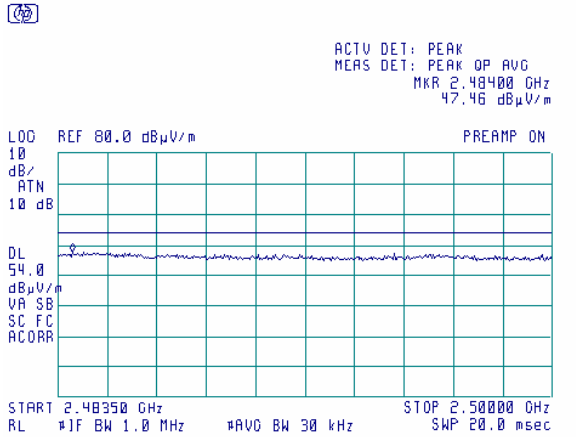
Plot 8.5.26 Radiated emission measurements from 2483.5 to 2500 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.27 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
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

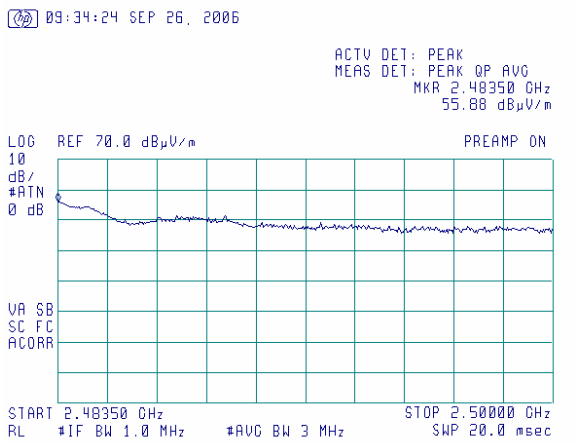


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

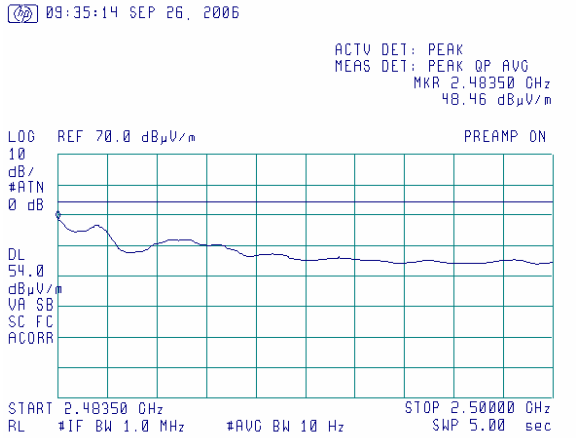
Plot 8.5.28 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.29 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

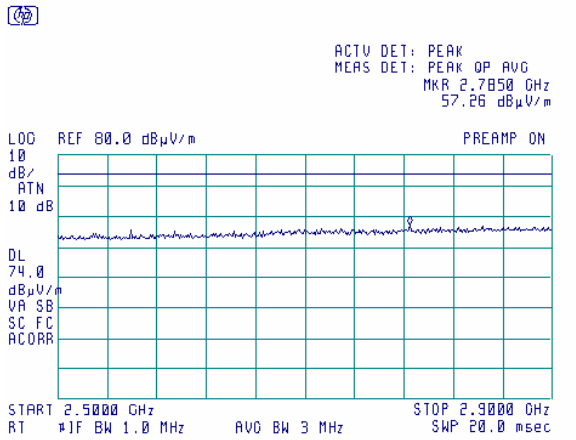


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

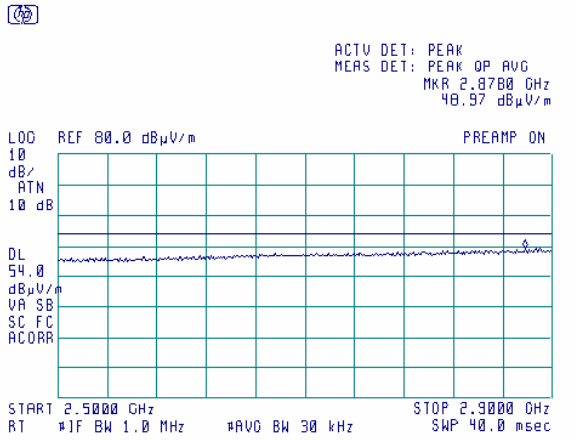
Plot 8.5.30 Radiated emission measurements from 2500 to 2900 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.31 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
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

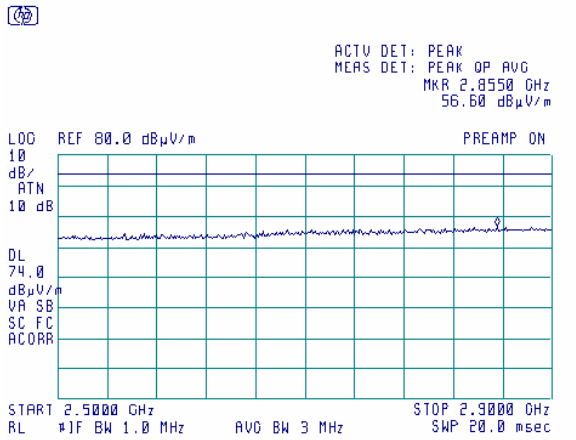


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

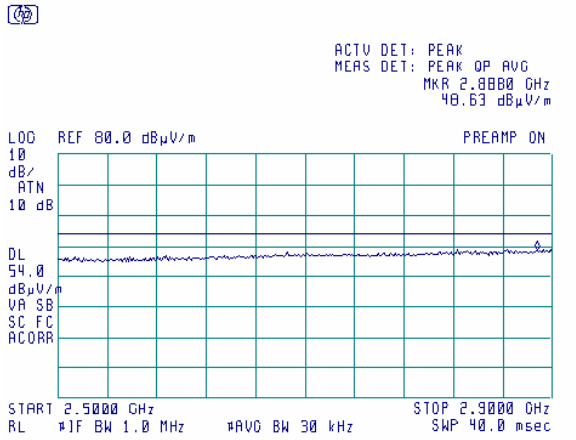
Plot 8.5.32 Radiated emission measurements from 2500 to 2900 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.33 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
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

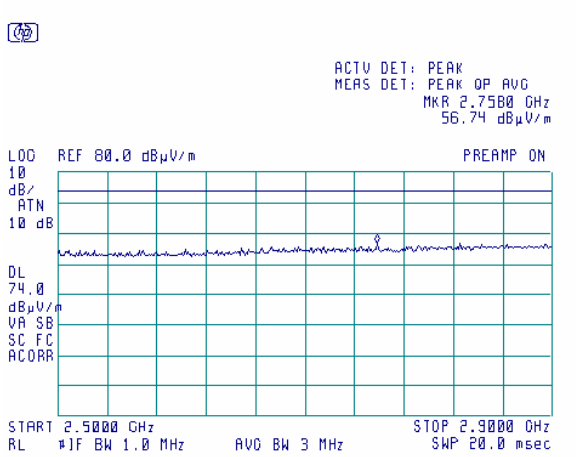


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

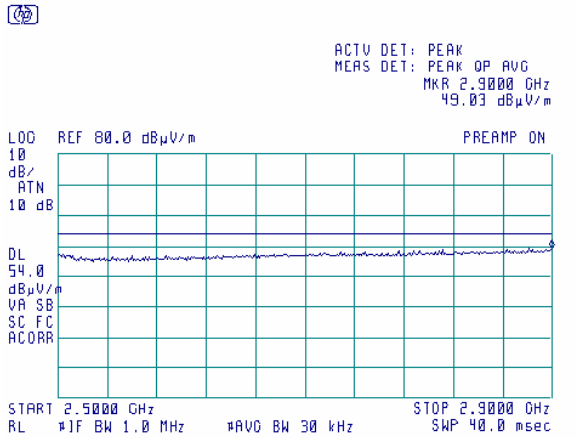
Plot 8.5.34 Radiated emission measurements from 2500 to 2900 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.35 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
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

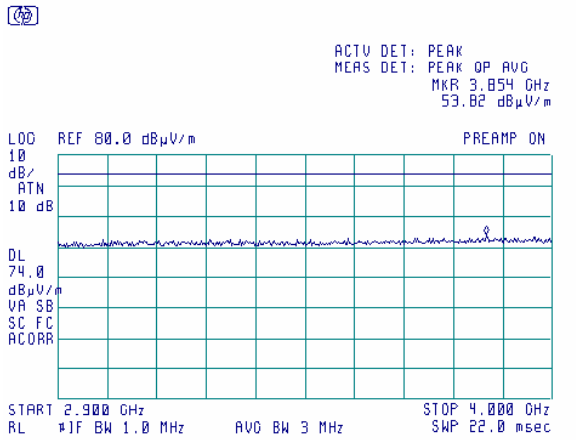


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

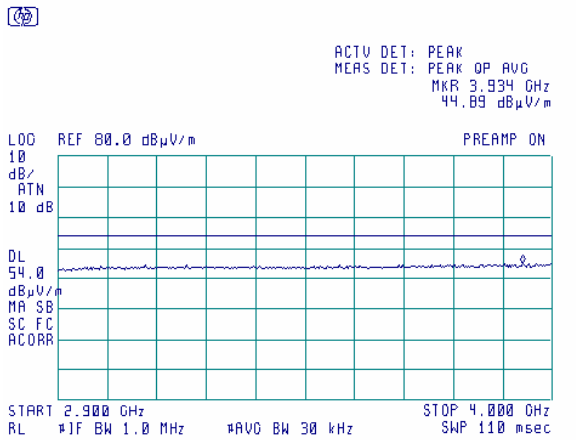
Plot 8.5.36 Radiated emission measurements from 2900 to 4000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.37 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
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

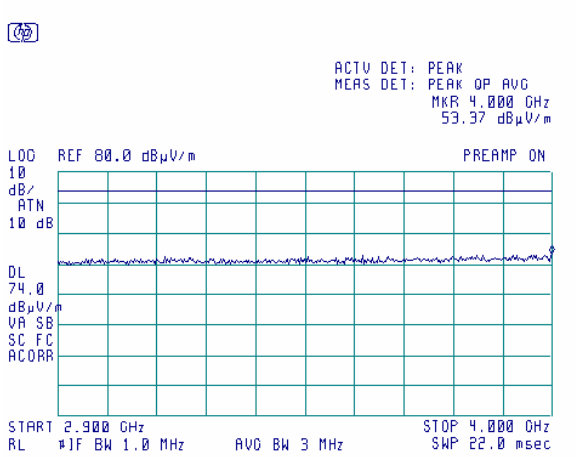


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

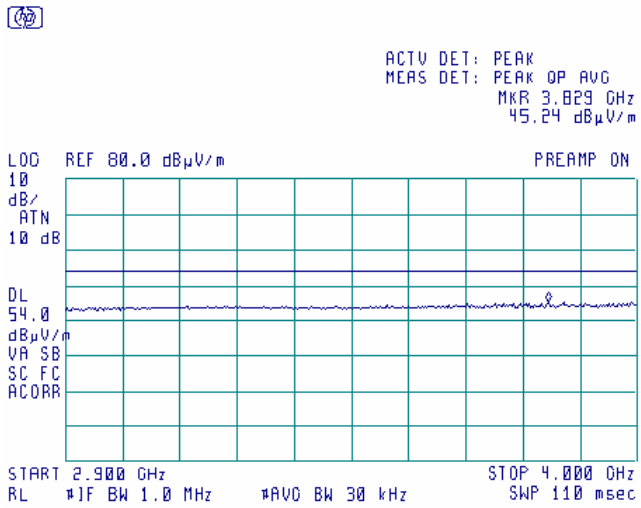
Plot 8.5.38 Radiated emission measurements from 2900 to 4000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.39 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
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

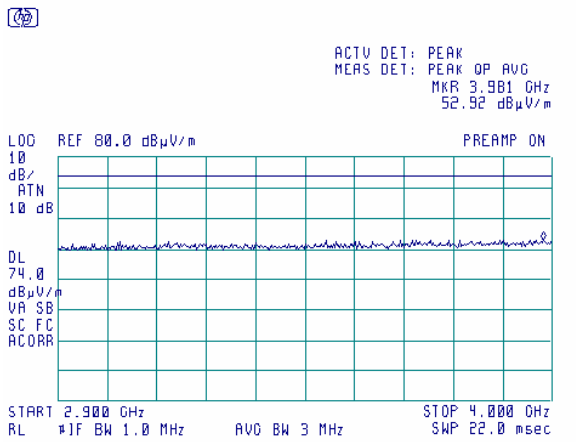


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

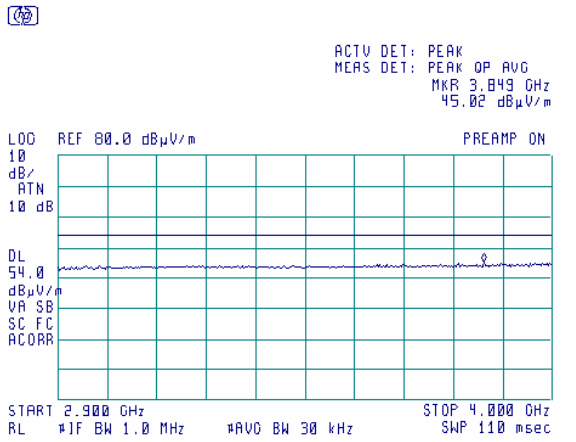
Plot 8.5.40 Radiated emission measurements from 2900 to 4000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.41 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
INPUTS: 802.11 b/g + licensed
DETECTOR: Average

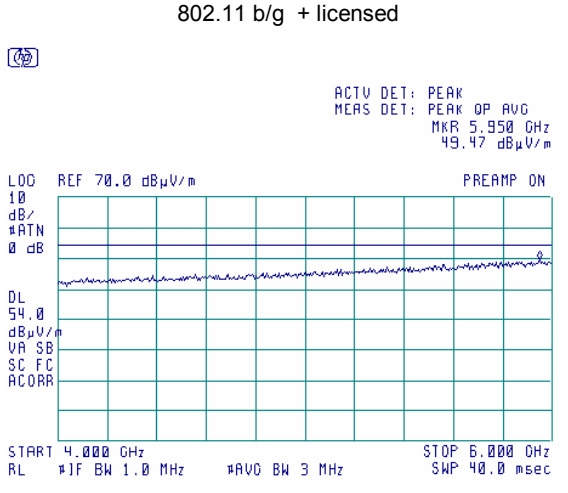


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

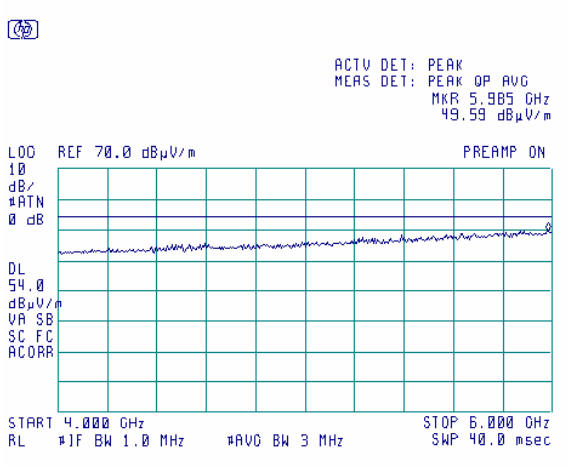
Plot 8.5.42 Radiated emission measurements from 4000 to 6000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed



Plot 8.5.43 Radiated emission measurements from 4000 to 6000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed

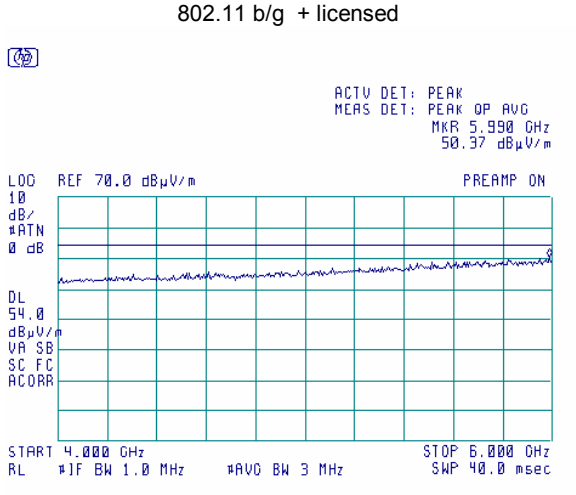


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.5.44 Radiated emission measurements from 4000 to 6000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed



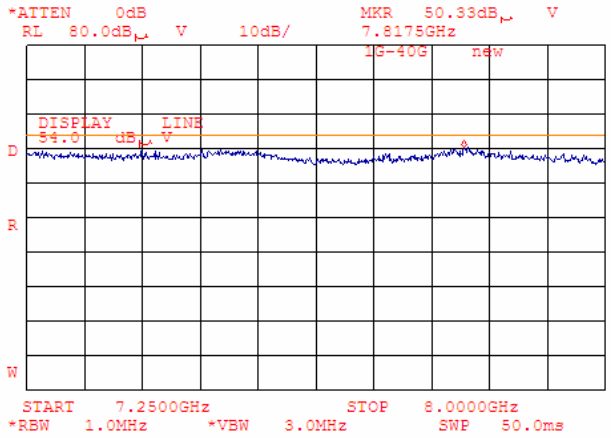
Note: 6000 – 7250 MHz range is out of restricted bands, hence not tested radiated.

HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

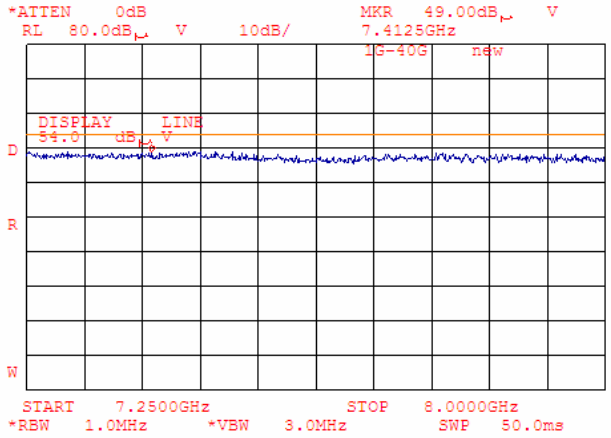
Plot 8.5.45 Radiated emission measurements from 7.25 to 8.0 GHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.46 Radiated emission measurements from 7.25 to 8.0 GHz at the mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak

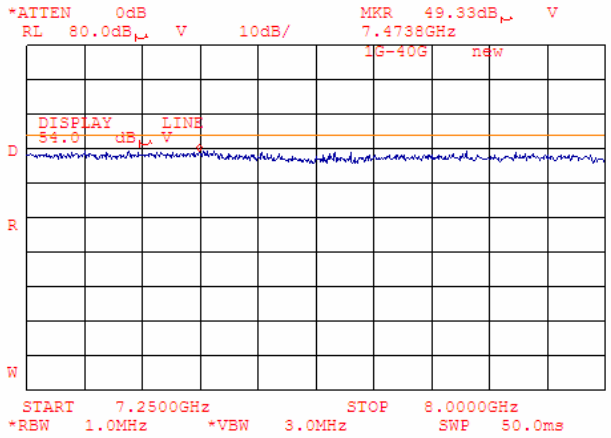


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

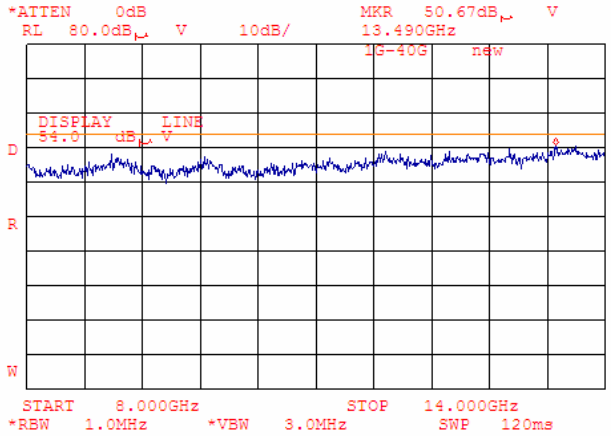
Plot 8.5.47 Radiated emission measurements from 7.25 to 8.0 GHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.48 Radiated emission measurements from 8.0 to 14.0 GHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak

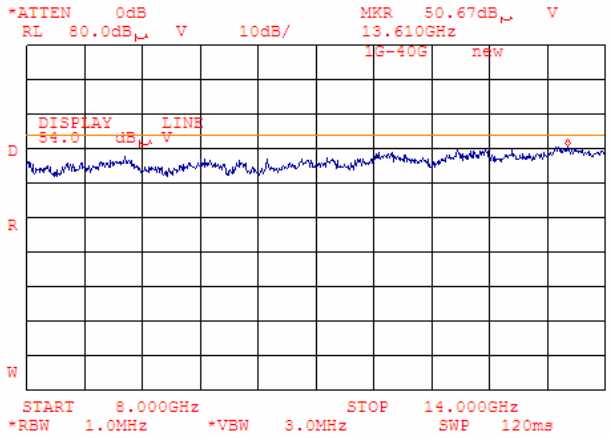


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

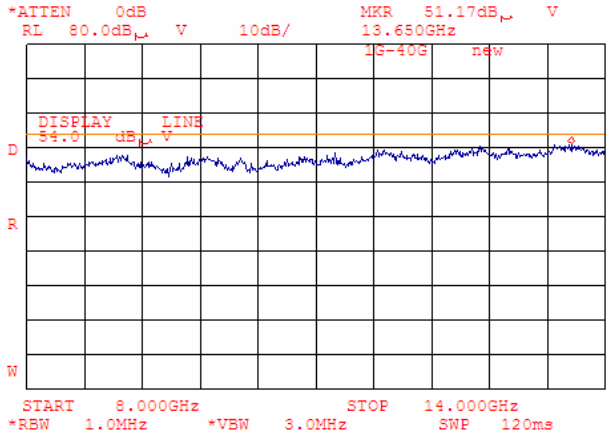
Plot 8.5.49 Radiated emission measurements from 8.0 to 14.0 GHz at the mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.50 Radiated emission measurements from 8.0 to 14.0 GHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak

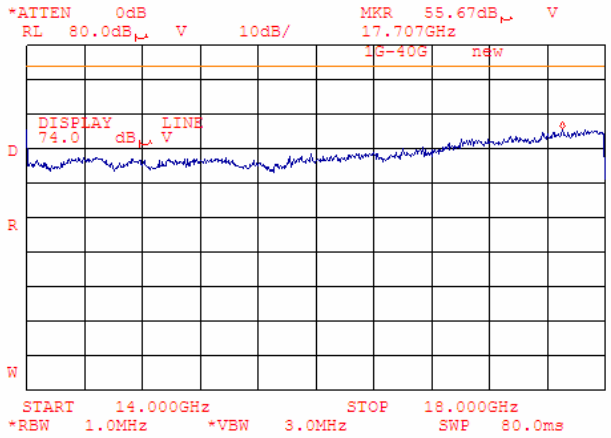


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

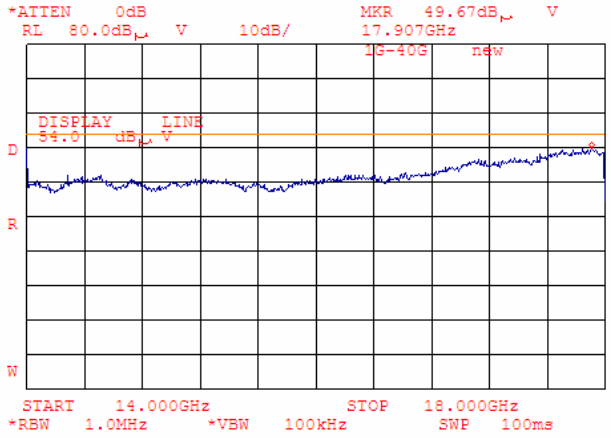
Plot 8.5.51 Radiated emission measurements from 14.0 to 18.0 GHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.52 Radiated emission measurements from 14.0 to 18.0 GHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: average

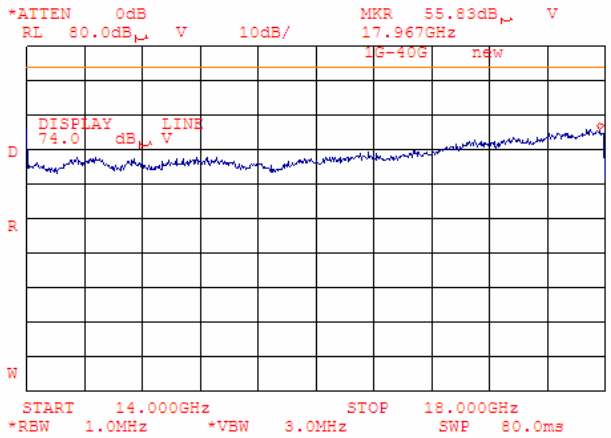


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

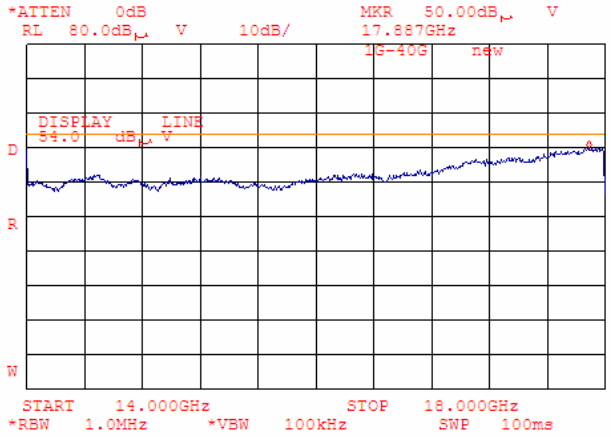
Plot 8.5.53 Radiated emission measurements from 14.0 to 18.0 GHz at the mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.54 Radiated emission measurements from 14.0 to 18.0 GHz at the mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: average

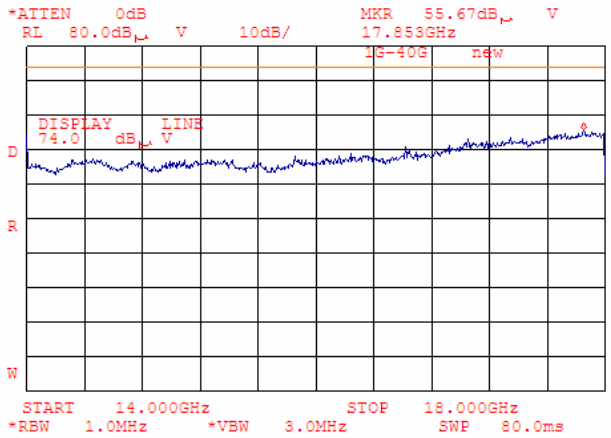


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

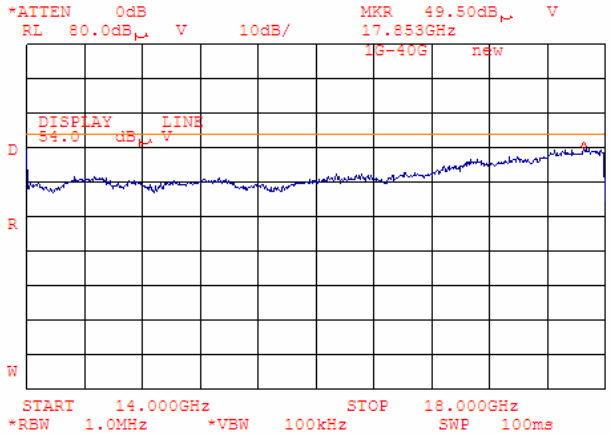
Plot 8.5.55 Radiated emission measurements from 14.0 to 18.0 GHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.56 Radiated emission measurements from 14.0 to 18.0 GHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: average

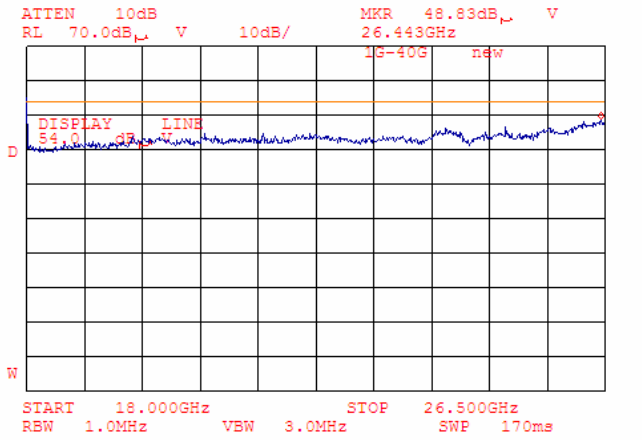


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

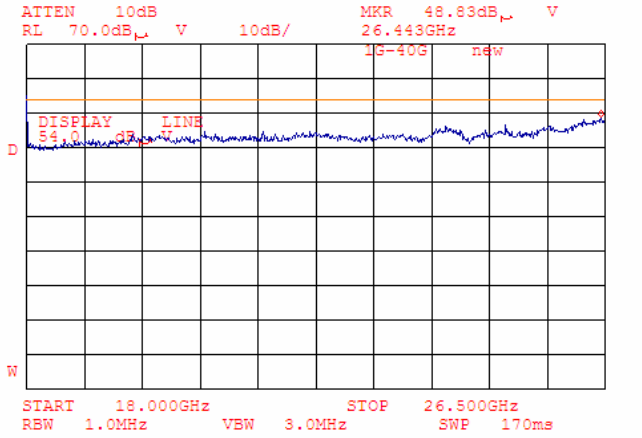
Plot 8.5.57 Radiated emission measurements from 18.0 to 26.5 GHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Plot 8.5.58 Radiated emission measurements from 18.0 to 26.5 GHz at the mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak

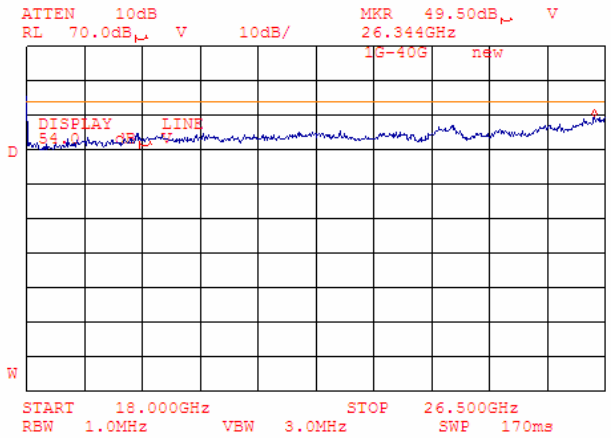


HERMON LABORATORIES

Test specification:	**Section 15.247(c), 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:	11/9/2006 10:52:13 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.5.59 Radiated emission measurements from 18.0 to 26.5 GHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
INPUTS: 802.11 b/g + licensed
DETECTOR: Peak



Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

8.6 Peak spectral power density

8.6.1 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 8.6.1.

Table 8.6.1 Peak spectral power density limits

Assigned frequency range, MHz	Measurement bandwidth, kHz	Peak spectral power density, dBm
2400-2483.5	3.0	8.0

8.6.2 Test procedure

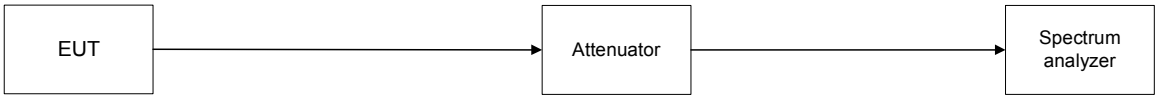
8.6.2.1 The EUT was set up as shown in Figure 8.6.1, energized and its proper operation was checked.

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

8.6.2.3 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.

8.6.2.4 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 8.6.2 and associated plots.

Figure 8.6.1 Peak spectral power density test setup



Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Table 8.6.2 Peak spectral power density test results

ASSIGNED FREQUENCY:	2400.0 – 2483.5 MHz
MODULATION:	DBPSK, CCK, BPSK, 64-QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	1, 11, 6, 54 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
EUT 6 dB BANDWIDTH:	12.5 MHz (DSSS) / 16.3 MHz (OFDM)
RESOLUTION BANDWIDTH:	3 kHz
VIDEO BANDWIDTH:	10 kHz
INPUTS:	802.11 b/g and licensed

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak power density, dB(mW/3 kHz)	Limit, dBm	Margin*, dB	Verdict
DSSS, 1 Mbps							
2412	-16.80	Included	Included	-16.80	8.00	-24.80	Pass
2437	-15.53	Included	Included	-15.53	8.00	-23.53	Pass
2462	-18.36	Included	Included	-18.36	8.00	-26.36	Pass
DSSS, 11 Mbps							
2412	-17.05	Included	Included	-17.05	8.00	-25.05	Pass
2437	-16.19	Included	Included	-16.19	8.00	-24.19	Pass
2462	-19.19	Included	Included	-19.19	8.00	-27.19	Pass
OFDM, 6 Mbps							
2412	-22.28	Included	Included	-22.28	8.00	-30.28	Pass
2437	-19.33	Included	Included	-19.33	8.00	-27.33	Pass
2462	-22.66	Included	Included	-22.66	8.00	-30.66	Pass
OFDM, 54 Mbps							
2412	-22.56	Included	Included	-22.56	8.00	-30.56	Pass
2437	-22.01	Included	Included	-22.01	8.00	-30.01	Pass
2462	-23.80	Included	Included	-23.80	8.00	-31.80	Pass

*- Margin = Peak power density – specification limit.
Note: PSD option 2 was used for these measurements.

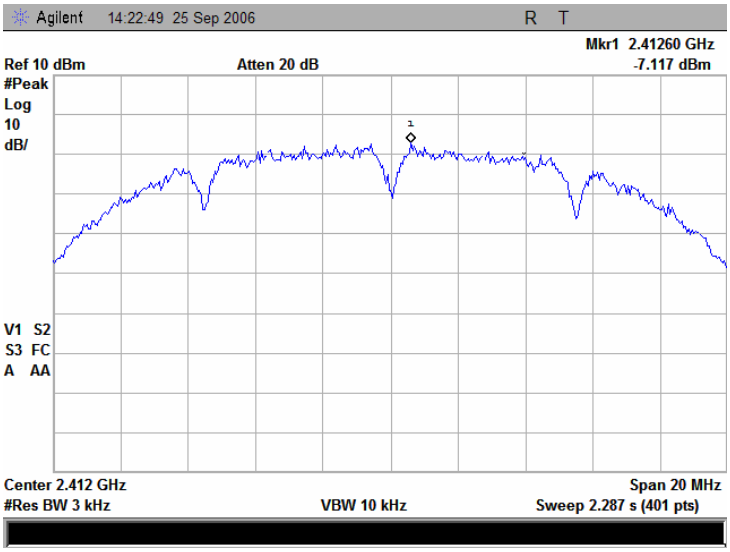
Reference numbers of test equipment used

HL 1650	HL 2524	HL 2867	HL 2909				

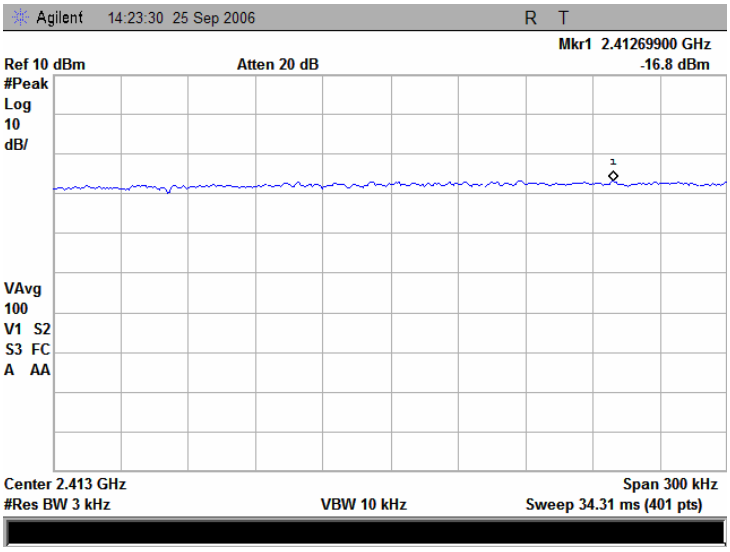
Full description is given in Appendix A.

Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.1 Peak spectral power density at low frequency within 6 dB band, data rate 1 Mbps

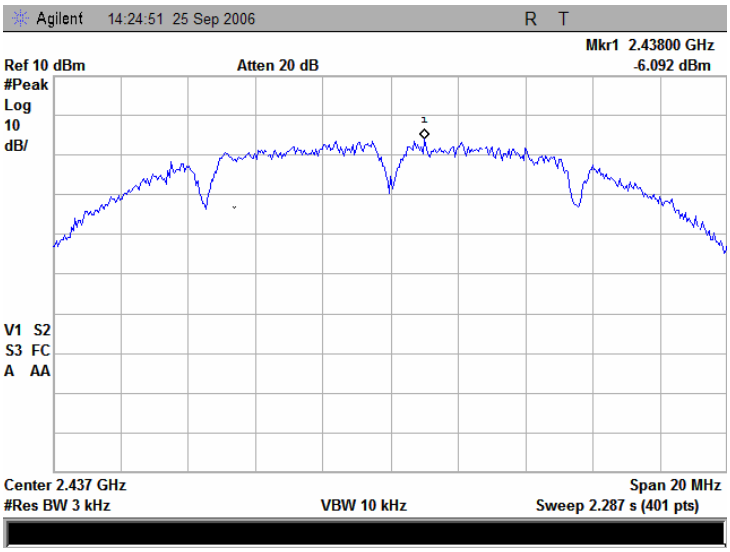


Plot 8.6.2 Peak spectral power density at low frequency zoomed at the peak, data rate 1 Mbps

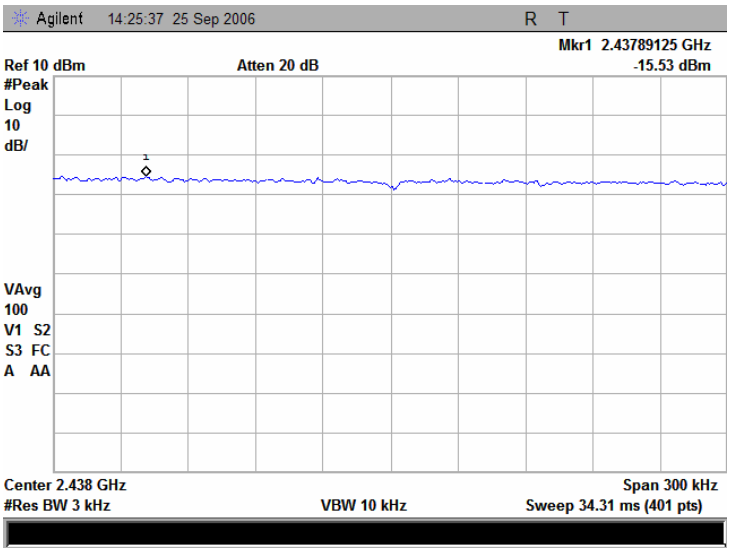


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.3 Peak spectral power density at mid frequency within 6 dB band, data rate 1 Mbps

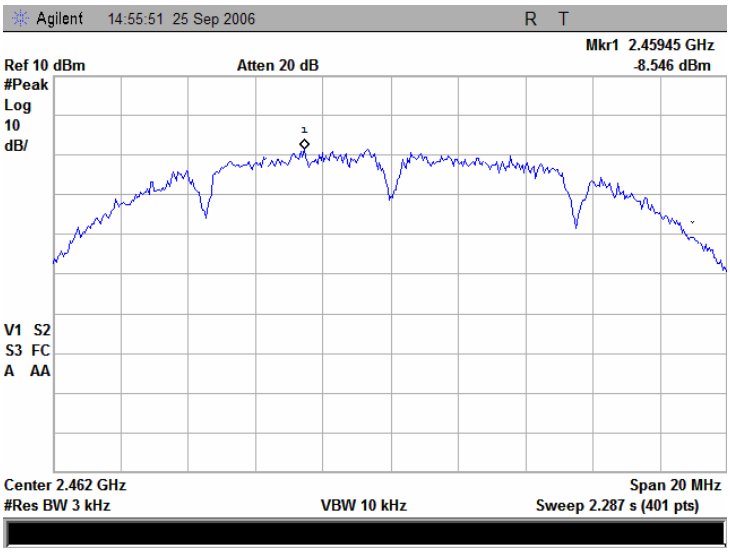


Plot 8.6.4 Peak spectral power density at mid frequency zoomed at the peak, data rate 1 Mbps

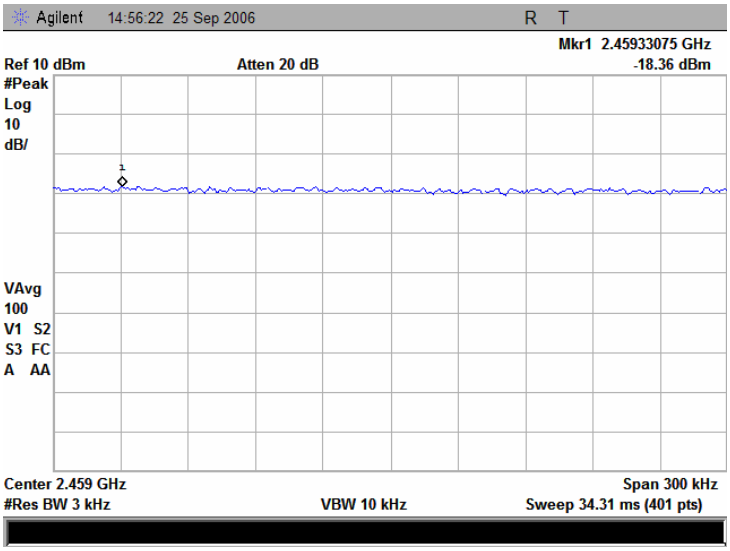


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.5 Peak spectral power density at high frequency within 6 dB band, data rate 1 Mbps

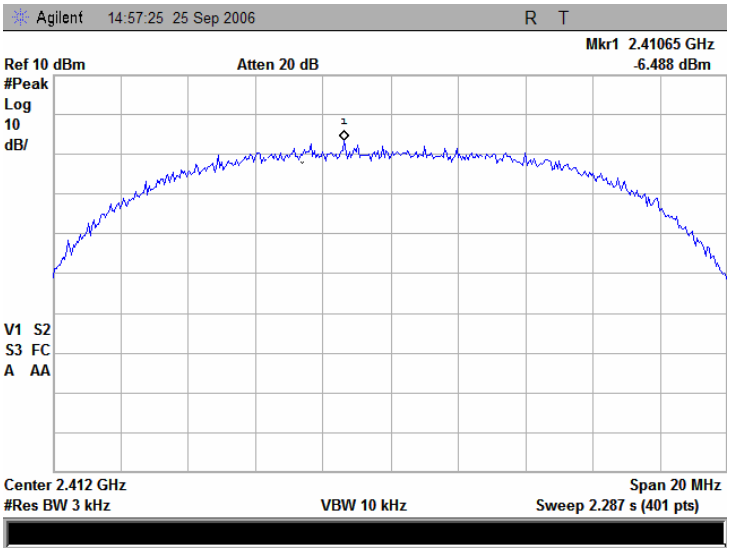


Plot 8.6.6 Peak spectral power density at high frequency zoomed at the peak, data rate 1 Mbps

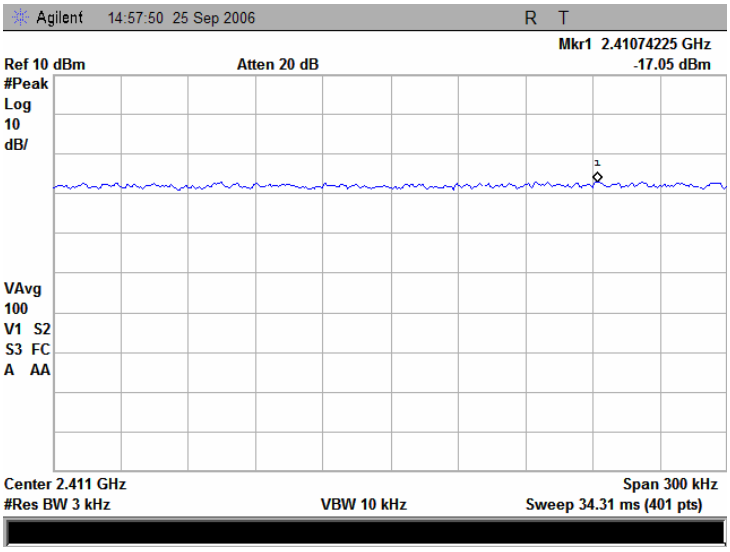


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.7 Peak spectral power density at low frequency within 6 dB band, data rate 11 Mbps

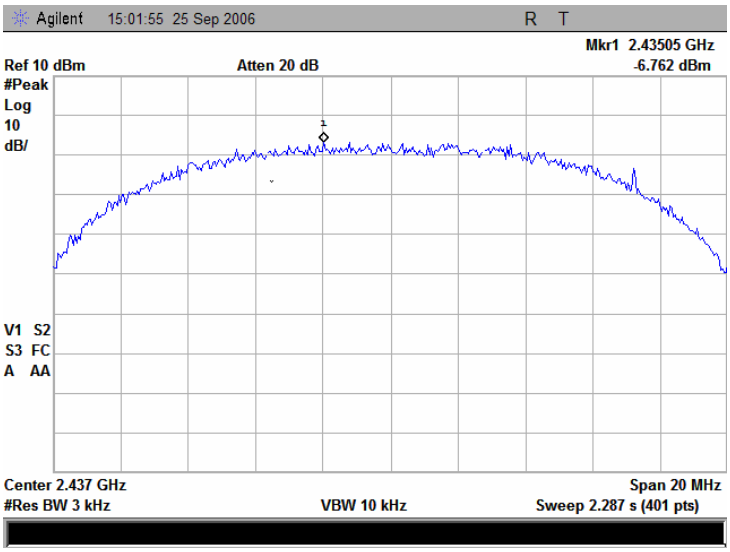


Plot 8.6.8 Peak spectral power density at low frequency zoomed at the peak, data rate 11 Mbps

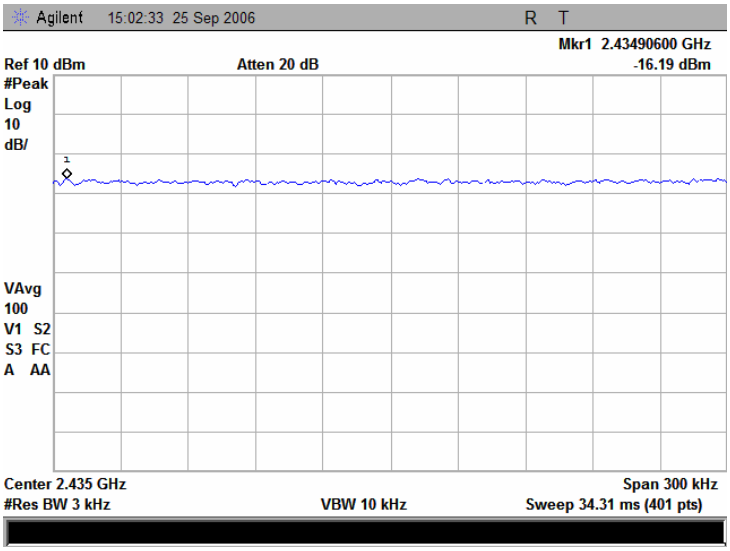


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.9 Peak spectral power density at mid frequency within 6 dB band, data rate 11 Mbps

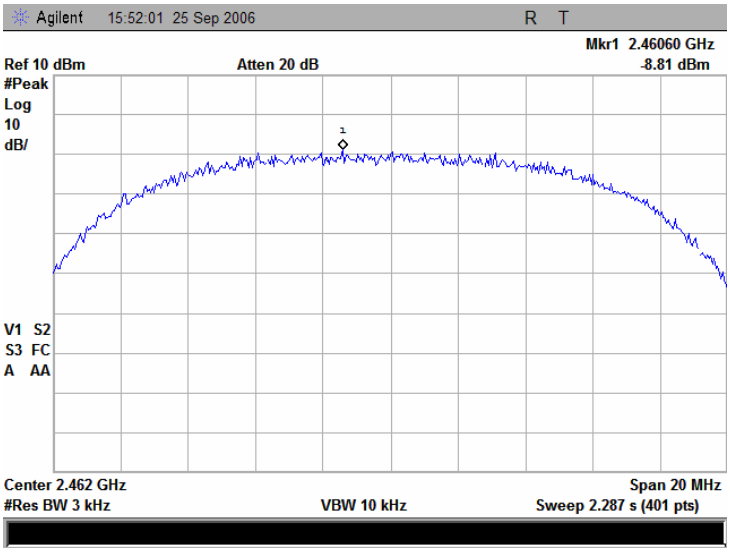


Plot 8.6.10 Peak spectral power density at mid frequency zoomed at the peak, data rate 11 Mbps

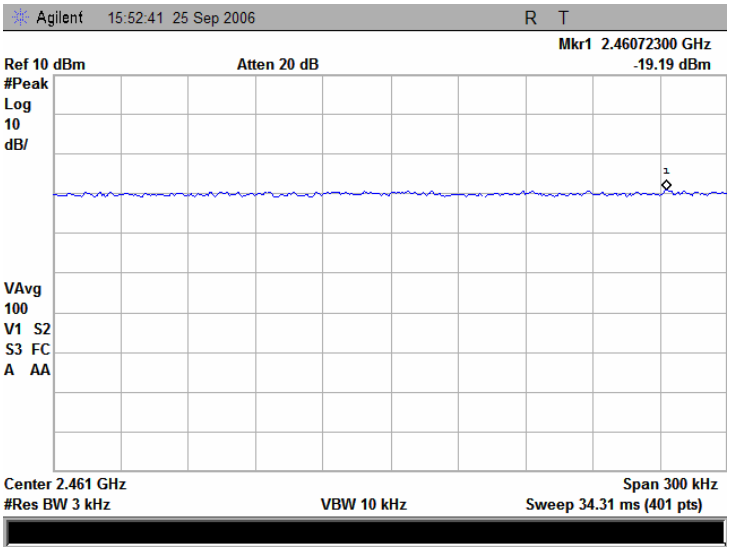


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.11 Peak spectral power density at high frequency within 6 dB band, data rate 11 Mbps

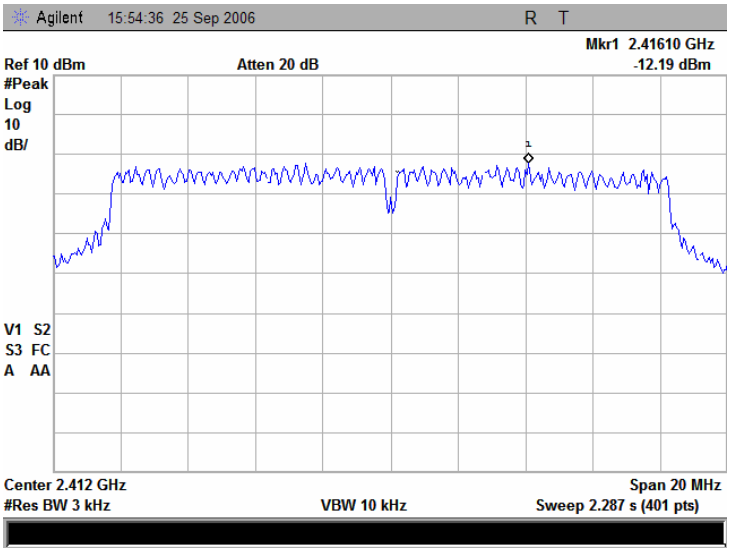


Plot 8.6.12 Peak spectral power density at high frequency zoomed at the peak, data rate 11 Mbps

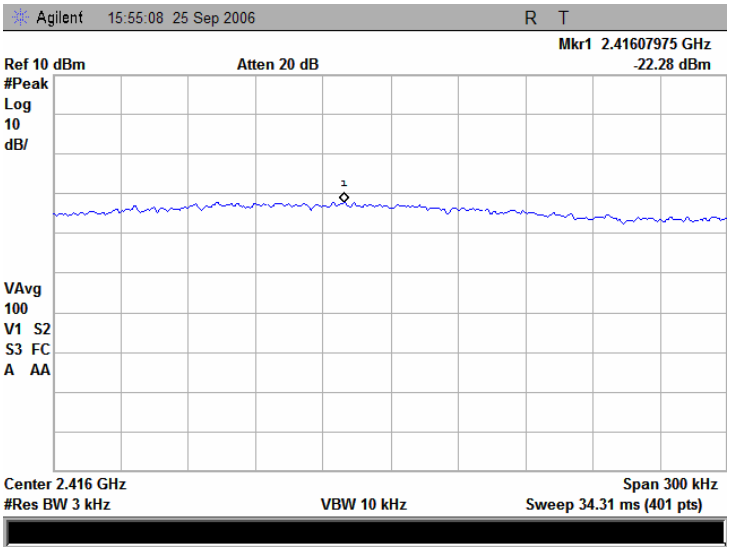


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.13 Peak spectral power density at low frequency within 6 dB band, data rate 6 Mbps

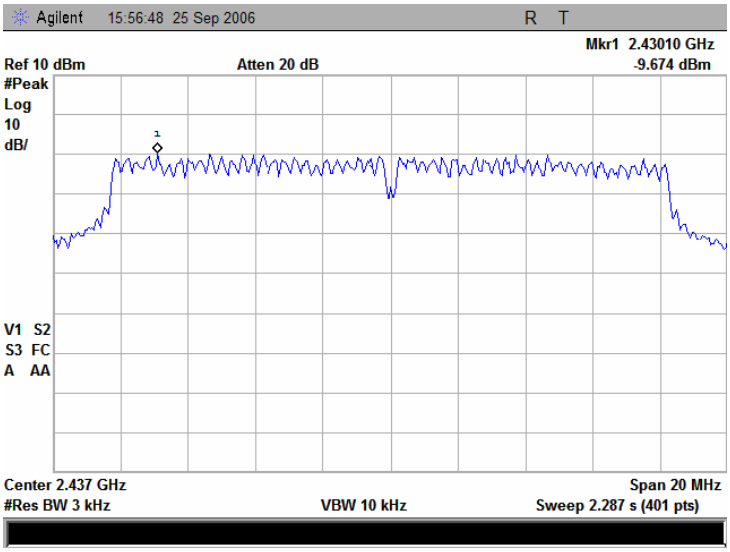


Plot 8.6.14 Peak spectral power density at low frequency zoomed at the peak, data rate 6 Mbps

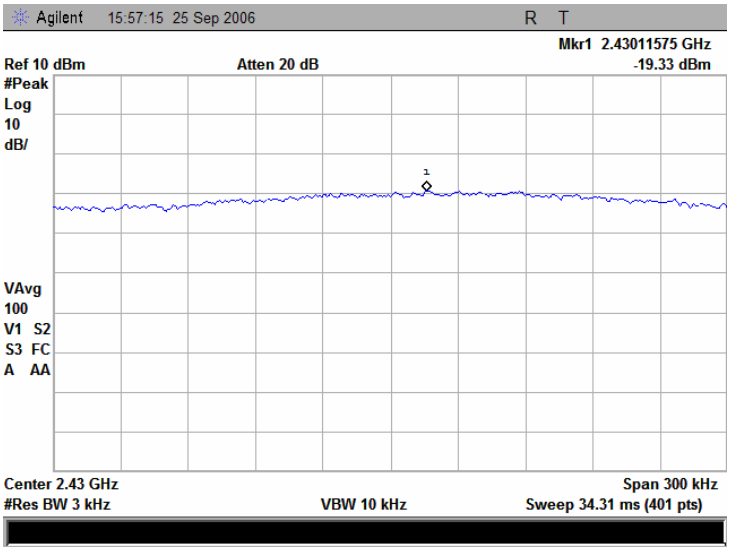


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.15 Peak spectral power density at mid frequency within 6 dB band, data rate 6 Mbps

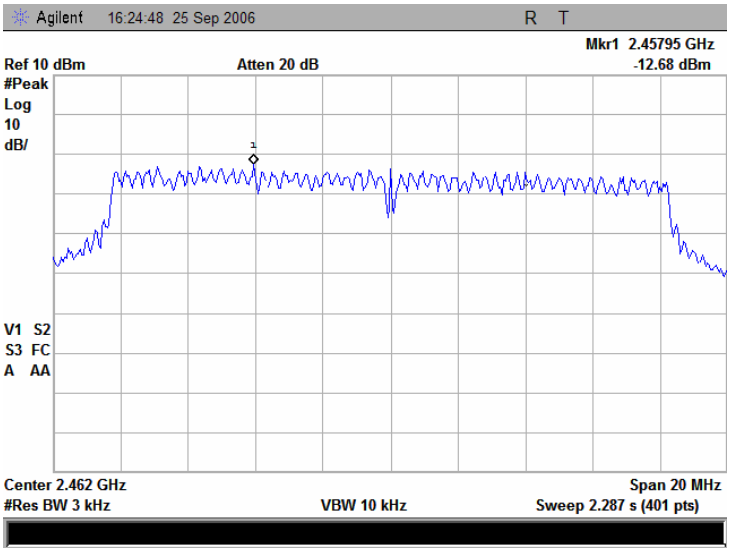


Plot 8.6.16 Peak spectral power density at mid frequency zoomed at the peak, data rate 6 Mbps

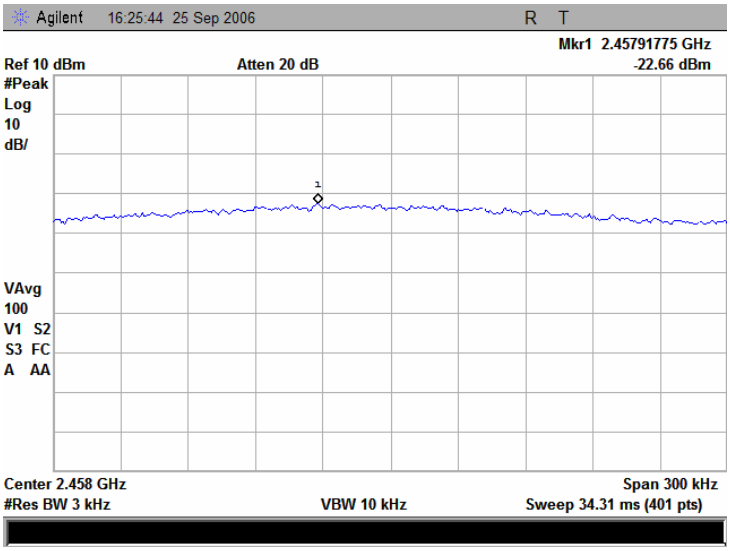


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.17 Peak spectral power density at high frequency within 6 dB band, data rate 6 Mbps

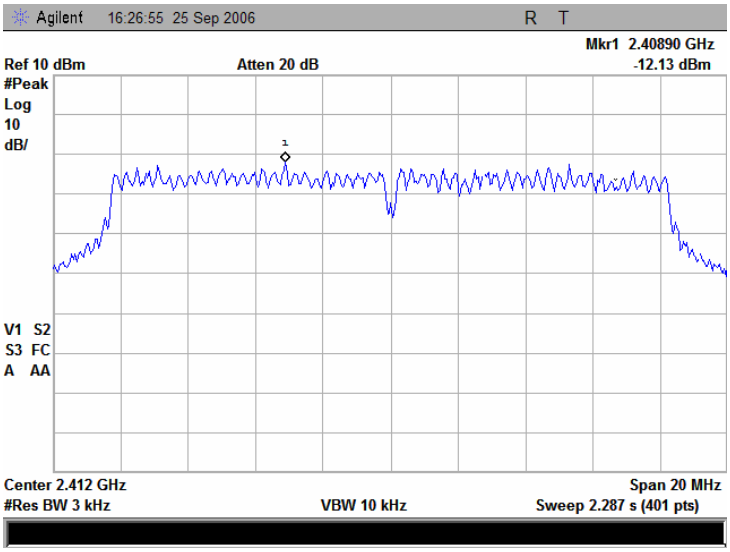


Plot 8.6.18 Peak spectral power density at high frequency zoomed at the peak, data rate 6 Mbps

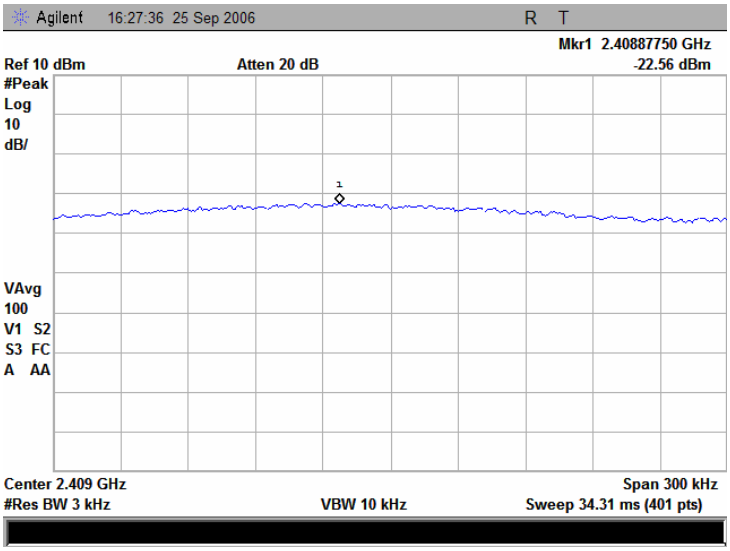


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.19 Peak spectral power density at low frequency within 6 dB band, data rate 54 Mbps

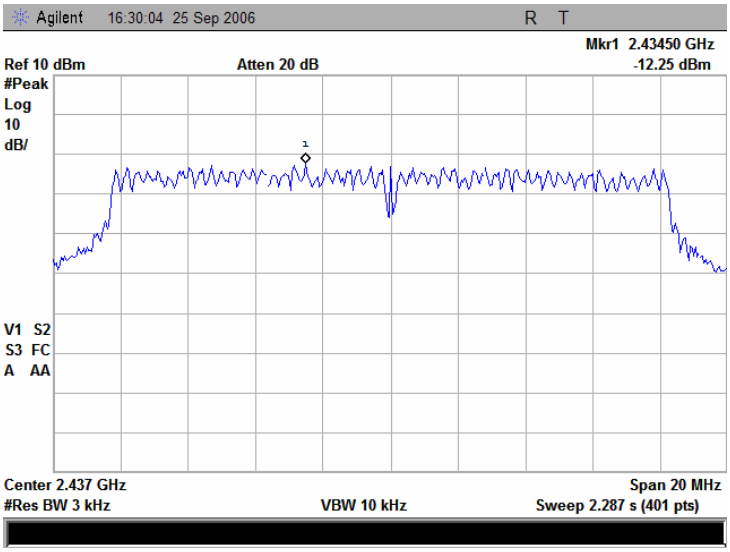


Plot 8.6.20 Peak spectral power density at low frequency zoomed at the peak, data rate 54 Mbps

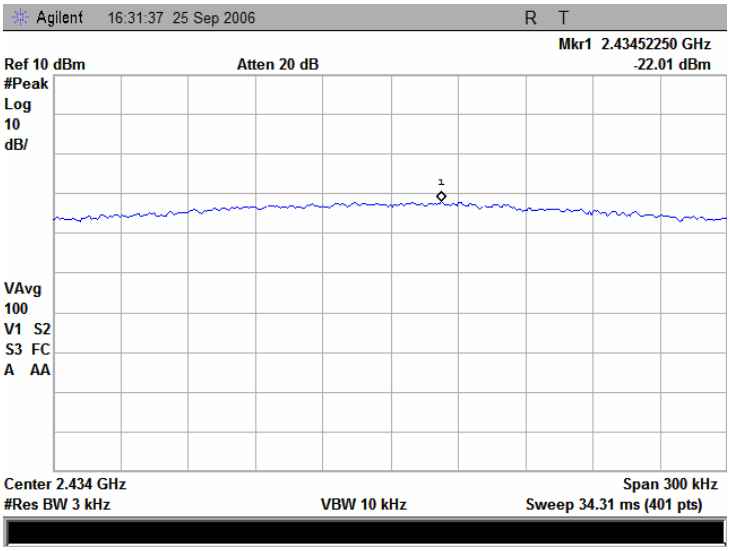


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.21 Peak spectral power density at mid frequency within 6 dB band, data rate 54 Mbps

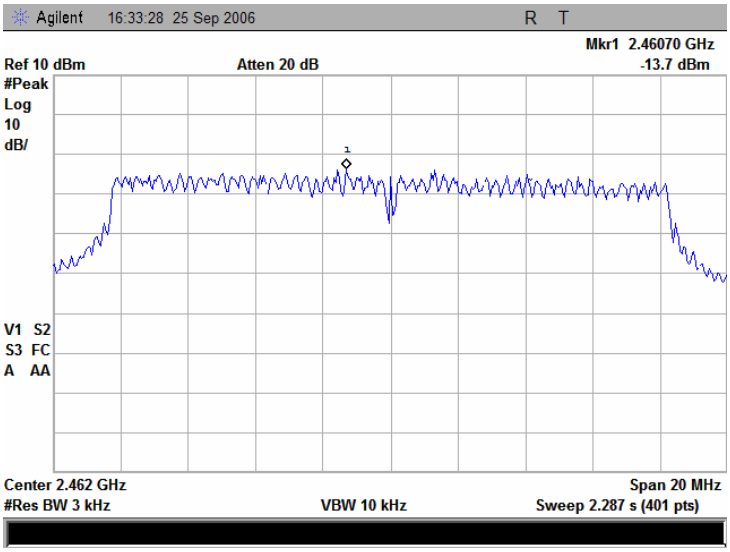


Plot 8.6.22 Peak spectral power density at mid frequency zoomed at the peak, data rate 54 Mbps

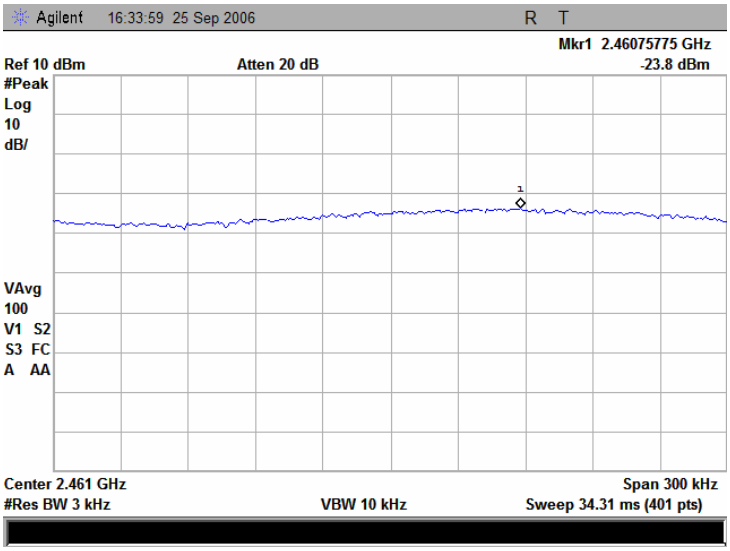


Test specification:	**Section 15.247(d), Peak power density**		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/9/2006 9:24:38 AM		
Temperature: 22ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 48 %	**Power Supply:** 120 VAC
Remarks: 802.11 b/g +licensed			

Plot 8.6.23 Peak spectral power density at high frequency within 6 dB band, data rate 54 Mbps



Plot 8.6.24 Peak spectral power density at high frequency zoomed at the peak, data rate 54 Mbps



9 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0163	LISN FCC/VDE/50 Ohm/50 uH + 5 Ohm, MIL-STD-461E, CISPR 16-1	Electro-Metrics	ANS 25/2	1314	01-Oct-06	01-Oct-07
0446	Antenna, Loop active, 10kHz-30MHz	EMCO	6502	2857	28-Jun-06	28-Jun-07
0447	LISN, 16/2, 300V RMS, 50 Ohm/50 uH + 5 Ohm, STD CISPR 16-1	HL	LISN 16 - 1	066	03-Nov-06	03-Nov-07
0465	Anechoic Chamber 9(L) x 6.5(W) x 5.5(H) m	HL	AC - 1	023	11-Nov-05	11-Nov-06
0466	Shielded Room 3(L) x 3(W) x 2,4(H) m	HL	SR - 1	024	11-Nov-05	11-Nov-06
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	26-Sep-06	26-Sep-07
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-06	18-May-07
0593	Antenna Mast, 1-4 m Pneumatic	Madgesh	AM-F1	101	02-Feb-06	02-Feb-07
0594	Turn Table FOR ANECHOIC CHAMBER flush mount d=1.2 m Pneumatic	HL	TT-WDC1	102	26-Jan-06	26-Jan-07
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE 26 - 2000 MHz	EMCO	3141	9611-1011	10-Jan-06	10-Jan-07
0661	Generator Swept Signal, 10 MHz to 40 GHz, + 10 dBm	Hewlett Packard	83640B	3614A002 66	14-Sep-06	14-Sep-07
1206	One phase voltage regulator, 2kVA, 0-250V	HL	TDGC-2	142	04-Jun-06	04-Jun-07
1430	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL1432	Agilent Technologies	8542E	3807A002 62,3705A0 0217	01-Sep-06	01-Sep-07
1441	Synthesized RF Signal Generator 10 kHz - 1050 MHz	Fluke	6060B	4190210	16-Oct-06	16-Oct-07
1488	Power Divider 0.5 - 18 GHz	Omni Spectra	2090-6204-00		05-Dec-05	05-Dec-06
1502	Cable RF, 6 m	Belden	M17/167 MIL-C-17	1502	02-Dec-05	02-Dec-06
1510	Cable RF, 8 m	Belden	M17/167 MIL-C-17	1510	02-Dec-05	02-Dec-06
1650	Attenuators Set (2, 3, 5, 20 dB), DC-18 GHz	M/A-COM	2082	1650	03-Jan-06	03-Jan-07
1906	Power Divider, 0.5-18.0 GHz, 80 W	Omni Spectra	2090-6204-00	1906	05-Dec-05	05-Dec-06
1947	Cable 18GHz, 6.5 m, blue	Rhophase Microwave Limited	NPS-1803A-6500-NPS	T4974	17-Oct-06	17-Oct-07
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W, N-type	EMC Test Systems	3115	9911-5964	03-Mar-06	03-Mar-07
2009	Cable RF, 8 m	Alpha Wire	RG-214	C-56	02-Dec-05	02-Dec-06
2254	Cable 40GHz, 0.8 m, blue	Rhophase Microwave Limited	KPS-1503A-800-KPS	W4907	21-Jun-06	21-Jun-07
2400	Cable 40GHz, 1.5 m, green	Rhophase Microwave Limited	KPS-1503A-1500-KPS	X2946	21-Jun-06	21-Jun-07

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
2524	Attenuator, 10 dB, DC-18 GHz	Midwest Microwave	263-10	2524	03-Jan-06	03-Jan-07
2667	Signal generator, 9 kHz - 3.3 GHz	Rohde & Schwarz	SML03	101909	24-Sep-04	24-Sep-07
2780	EMC analyzer, 100 Hz to 26.5 GHz	Agilent Technologies	E7405A	MY4510246	11-Jun-06	11-Jun-07
2866	Cable, 18 GHz, 0.6 m, SMA - SMA	Gore	NA	91P67960	16-Feb-06	16-Feb-07
2867	Cable, 18 GHz, 0.9 m, SMA - SMA, Right Angle	Gore	NA	91P72076	16-Feb-06	16-Feb-07
2869	Cable, 18 GHz, 1.2 m, SMA - SMA, Right Angle	Gore	NA	91P72073	16-Feb-06	16-Feb-07
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY41444762	10-Apr-06	10-Apr-07

10 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.

11 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).

Address: P.O. Box 23, Binyamina 30500, Israel.
Telephone: +972 4628 8001
Fax: +972 4628 8277
e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

Person for contact: Mr. Alex Usoskin, CEO.

12 APPENDIX D Specification references

47CFR part 15: 2006	Radio Frequency Devices.
FR Vol.62	Federal Register, Volume 62, May 13, 1997
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.

13 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

14 APPENDIX F Test equipment correction factors

Correction factor
Line impedance stabilization network
Model ANS-25/2
Electro-Metrics

Frequency, MHz	Correction factor, dB	Frequency, MHz	Correction factor, dB
0.01	4.7	3.0	0.1
0.02	2.1	4.0	0.1
0.03	1.1	5.0	0.1
0.04	0.7	6.0	0.1
0.05	0.5	10.0	0.1
0.1	0.2	12.0	0.1
0.2	0.1	16.0	0.1
0.4	0.1	18.0	0.1
0.6	0.1	20.0	0.1
0.8	0.1	25.0	0.1
1.0	0.1	28.0	0.1
2.0	0.1	30.0	0.1

The correction factor in dB is to be added to meter readings of an interference analyzer or a spectrum analyzer.

Correction factor
Line impedance stabilization network
Model LISN 16 - 1
Hermon Laboratories

Frequency, MHz	Correction factor, dB	Frequency, MHz	Correction factor, dB
0.01	5.0	3.0	0.1
0.02	2.2	4.0	0.1
0.03	1.1	5.0	0.1
0.04	0.7	6.0	0.2
0.05	0.5	10.0	0.3
0.1	0.2	12.0	0.4
0.2	0.1	16.0	0.5
0.4	0.1	18.0	0.6
0.6	0.1	20.0	0.7
0.8	0.1	25.0	0.9
1.0	0.1	28.0	1.2
2.0	0.1	30.0	1.3

The correction factor in dB is to be added to meter readings of an interference analyzer or a spectrum analyzer.

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

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
Model 3115, S/N 9911-5964, HL1984

Frequency, MHz	Antenna factor, dB(1/m)
1000.0	24.7
1500.0	25.7
2000.0	27.6
2500.0	28.9
3000.0	31.2
3500.0	32.0
4000.0	32.5
4500.0	32.7
5000.0	33.6
5500.0	35.1
6000.0	35.4
6500.0	34.9
7000.0	36.1
7500.0	37.8
8000.0	38.0
8500.0	38.1
9000.0	39.1
9500.0	38.3
10000.0	38.6
10500.0	38.2
11000.0	38.7
11500.0	39.5
12000.0	40.0
12500.0	40.4
13000.0	40.5
13500.0	41.1
14000.0	41.6
14500.0	41.7
15000.0	38.7
15500.0	38.2
16000.0	38.8
16500.0	40.5
17000.0	42.5
17500.0	45.9
18000.0	49.4

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 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 coaxial, 6 m, model: M17/167 MIL-C-17, HL 1502

Frequency, MHz	Cable loss, dB
0.1	0.02
1	0.07
3	0.15
5	0.17
10	0.26
30	0.43
50	0.57
80	0.72
100	0.81
300	1.48
500	2.00
800	2.70
1000	3.09

Cable loss
Cable M17/167 MIL-C-17, HL 1510

No.	Frequency, MHz	Cable loss, dB
1	0.1	0.05
2	1	0.09
3	3	0.16
4	5	0.18
5	10	0.27
6	30	0.44
7	50	0.58
8	80	0.69
9	100	0.82
10	300	1.48
11	500	2.01
12	800	2.65
13	1000	3.12

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 40 GHz, 0.8 m, blue, model: KPS-1503A-800-KPS, S/N W4907, HL 2254

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
0.03	0.04	5.10	0.80	15.00	1.49
0.05	0.07	5.30	0.83	15.50	1.49
0.10	0.09	5.50	0.83	16.00	1.46
0.20	0.15	5.70	0.84	16.50	1.47
0.30	0.19	5.90	0.87	17.00	1.50
0.40	0.25	6.10	0.86	17.50	1.57
0.50	0.29	6.30	0.89	18.00	1.63
0.60	0.33	6.50	0.90	18.50	1.57
0.70	0.37	6.70	0.89	19.00	1.63
0.80	0.41	6.90	0.93	19.50	1.65
0.90	0.44	7.10	0.92	20.00	1.64
1.00	0.45	7.30	0.95	20.50	1.75
1.10	0.48	7.50	0.96	21.00	1.72
1.20	0.51	7.70	0.97	21.50	1.78
1.30	0.53	7.90	1.01	22.00	1.76
1.40	0.54	8.10	1.00	22.50	1.72
1.50	0.57	8.30	1.05	23.00	1.83
1.60	0.59	8.50	1.04	23.50	1.80
1.70	0.04	8.70	1.07	24.00	1.90
1.80	0.07	8.90	1.11	24.50	1.81
1.90	0.09	9.10	1.09	25.00	1.98
2.00	0.15	9.30	1.14	25.50	1.91
2.10	0.19	9.50	1.12	26.00	2.02
2.20	0.25	9.70	1.15	26.50	1.92
2.30	0.29	9.90	1.16	27.00	1.97
2.40	0.33	10.10	1.16	28.00	2.02
2.50	0.37	10.30	1.19	29.00	1.95
2.60	0.41	10.50	1.14	30.00	1.94
2.70	0.44	10.70	1.19	31.00	2.11
2.80	0.45	10.90	1.17	32.00	2.17
2.90	0.48	11.10	1.13	33.00	2.27
3.10	0.61	11.30	1.20	34.00	2.27
3.30	0.64	11.50	1.13	35.00	2.29
3.50	0.65	11.70	1.20	36.00	2.35
3.70	0.68	11.90	1.18	37.00	2.37
3.90	0.69	12.10	1.14	38.00	2.40
4.10	0.71	12.40	1.19	39.00	2.57
4.30	0.73	13.00	1.34	40.00	2.36
4.50	0.75	13.50	1.33		
4.70	0.77	14.00	1.48		
4.90	0.79	14.50	1.45		

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

Cable loss
Cable coaxial, Gore, 18 GHz, 0.9 m, SMA - SMA, model Right Angle, HL 2867

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
10	0.06	5750	0.68	12000	1.06
30	0.04	6000	0.69	12250	1.07
100	0.07	6250	0.70	12500	1.09
250	0.14	6500	0.73	12750	1.09
500	0.19	6750	0.74	13000	1.15
750	0.22	7000	0.78	13250	1.17
1000	0.26	7250	0.77	13500	1.16
1250	0.27	7500	0.79	13750	1.17
1500	0.31	7750	0.81	14000	1.14
1750	0.35	8000	0.86	14250	1.13
2000	0.38	8250	0.86	14500	1.06
2250	0.41	8500	0.87	14750	1.12
2500	0.43	8750	0.87	15000	1.16
2750	0.46	9000	0.88	15250	1.11
3000	0.48	9250	0.89	15500	1.06
3250	0.51	9500	0.90	15750	1.12
3500	0.53	9750	0.94	16000	1.20
3750	0.55	10000	1.00	16250	1.25
4000	0.56	10250	1.01	16500	1.24
4250	0.58	10500	1.02	16750	1.34
4500	0.60	10750	1.01	17000	1.35
4750	0.62	11000	1.01	17250	1.35
5000	0.64	11250	1.01	17500	1.36
5250	0.67	11500	1.01	17750	1.40
5500	0.68	11750	1.05	18000	1.51

Cable loss
Cable coaxial, Gore, 18 GHz, 1.1 m, SMA - SMA, model Right Angle, S/N 91P72071
HL 2869

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
10	0.06	5750	0.87	12000	1.30
30	0.06	6000	0.87	12250	1.33
100	0.10	6250	0.89	12500	1.35
250	0.18	6500	0.92	12750	1.36
500	0.25	6750	0.94	13000	1.38
750	0.27	7000	0.98	13250	1.41
1000	0.34	7250	0.99	13500	1.39
1250	0.35	7500	1.02	13750	1.41
1500	0.42	7750	1.03	14000	1.42
1750	0.44	8000	1.04	14250	1.46
2000	0.49	8250	1.04	14500	1.39
2250	0.52	8500	1.08	14750	1.46
2500	0.55	8750	1.08	15000	1.40
2750	0.59	9000	1.12	15250	1.47
3000	0.61	9250	1.12	15500	1.36
3250	0.64	9500	1.15	15750	1.49
3500	0.67	9750	1.14	16000	1.51
3750	0.69	10000	1.19	16250	1.60
4000	0.70	10250	1.20	16500	1.56
4250	0.74	10500	1.23	16750	1.66
4500	0.76	10750	1.24	17000	1.71
4750	0.77	11000	1.24	17250	1.78
5000	0.79	11250	1.25	17500	1.75
5250	0.82	11500	1.28	17750	1.77
5500	0.84	11750	1.29	18000	1.86