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IC LISTED REGISTRATION NUMBER IC 4621

CENTRO DE TECNOLOGÍA DE LAS COMUNICACIONES, S.A.
Parque Tecnológico de Andalucía,
c/Severo Ochoa nº 2
29590 Campanillas/ Málaga/ España
Tel. 952 61 91 00 - Fax 952 61 91 13
MÁLAGA, C.I.F. A29 507 456
Registro Mercantil Tomo 1169 Libro 82
Folio 133 Hoja MA3729

TEST REPORT

Report No.: 23079RET.101

TEST NAME: FCC PART 15.247 RADIATED TESTING FOR BLUETOOTH RADIO DEVICE

Product	:	Wireless NI cRIO™ carrier
Trade Mark	:	viBlue
Model/type Ref.	:	viBlueRIO
Manufacturer	:	ViTec Co., Ltd.
Requested by	:	ViTec Co., Ltd.
Other identification of the product	:	FCC ID: T60-VIBLUERIO Prototype
Standard(s)	:	USA FCC Part 15.247, 15.205, 15.209, 15.207

This test report includes 2 annexes and therefore the total number of pages is 60.

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INDEX

1. COMPETENCE AND GUARANTEES 3
2. GENERAL CONDITIONS 3
3. CHARACTERISTICS OF THE TEST 3
   3.1 TEST REQUESTED.....3
   3.2 REQUIREMENTS AND METHOD 3
4. IDENTIFICATION DATA SUPPLIED BY THE APPLICANT.....5
   4.1 APPLICANT.....5
   4.2 REPRESENTATIVE 5
   4.3 TEST SAMPLES SUPPLIER.....5
   4.4 IDENTIFICATION OF ITEM/ITEMS TESTED 5
5. USAGE OF SAMPLES, PERIOD OF TESTING AND ENVIRONMENTAL CONDITIONS 6
   5.1 USAGE OF SAMPLES 6
   5.2 PERIOD OF TESTING 6
   5.3 ENVIROMENTAL CONDITIONS.....6
6. TEST RESULTS 8
7. REMARKS AND COMMENTS.....8
8. SUMMARY.....8

ANNEXES
   ANNEX A. TEST RESULTS
   ANNEX B. MEASURING RESULTS FOR ELECTROMAGNETIC EMISSION
   ANNEX C. PHOTOGRAPHS

1. COMPETENCE AND GUARANTEES

Centro de Tecnología de las Comunicaciones (CETECOM), S.A. is a laboratory with a measurement facility in compliance with the requirements of Section 2.948 of the FCC rules and has been added to the list of facilities whose measurements data will be accepted in conjuction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Registration Number: 905266.

Centro de Tecnología de las Comunicaciones (CETECOM), S.A. is a laboratory with a measurement site in compliance with the requirements of RSS 212, Issue 1 (Provisional) and has been added to the list of filed sites of the Canadian Certification and Engineering Bureau. Reference File Number: IC 4621.

In order to assure the traceability to other national and international laboratories, CETECOM has a calibration and maintenance programme for its measuring equipment.

CETECOM guarantees the reliability of the data presented in this report, which is the result of measurements and tests performed to the item under test on the date and under the conditions stated on the report and is based on the knowledge and technical facilities available at CETECOM at the time of execution of the test.

CETECOM is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the item under test and the results of the test.

2. GENERAL CONDITIONS

1. This report only refers to the item that has undergone the test.
2. This report does not constitute or imply by its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without written approval of CETECOM.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of CETECOM and the Accreditation Bodies.

3. CHARACTERISTICS OF THE TEST

3.1 TEST REQUESTED

1. Measurements for frequency hopping spread spectrum equipment (Bluetooth) operating in the 2400 MHz -2483.5 MHz band and using, according to FCC Part 15.247.
2. Continuous conducted emission, power leads:

   Standard: FCC Rules and Regulations 47 CFR Part 15

   Limit: Class B

   Method: FCC Rules and Regulations 47 CFR Part 15, Subpart B y C

3.2 REQUIREMENTS AND METHOD

1. FCC parts 15.33, 15.35, 15.247, 15.207, 15.205, 15.209 and the document DA 00-705:"Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems".

The testing was performed according to the procedure in ANSI C63.4. Radiated testing was performed in Cetecom's semi-anechoic chamber. This site has been fully described in a report submitted to the FCC and was accepted in a letter dated July 25, 2002.

2. FCC Rules and Regulations 47 CFR Part 15, Subpart B: Limits and methods of measurements for radio frequency devices. Unintentional radiators.
3. FCC Rules and Regulations 47 CFR Part 15, Subpart C: Limits and methods of measurements for radio frequency devices. Intentional radiators.

The instrumentation used to perform the testing is listed below:

1. Semianechoic Absorber Lined Chamber IR 11. BS.
2. Control Chamber IR 12.BC.
3. Antenna mast EM 1072 NMT.
4. Rotating table EM 1084-4. ON.
5. Multi device controller ETS 2090.
6. Bluetooth test set Anritsu MT8852A.
7. Bilog antenna CHASE CBL6111.
8. Antenna tripod EMCO 11968C.
9. Double-ridge Guide Horn antenna 1-18 GHz HP 11966E.
10. Double-ridge Guide Horn antenna 18-40 GHz Agilent 119665J.
11. RF pre-amplifier Miteq JS4-12002600-30-5A.
12. Semianechoic Absorber Lined Chamber IR 11. BS.
13. RF pre-amplifier Miteq AFS5-04001300-15-10P-6.
14. Spectrum analyzer R&S ESIB 26.
15. Spectrum analyzer Agilent E4440A.
16. RF pre-amplifier Schaffner CPA 9231.
17. DC power supply R&S NGPE 40/40.
18. Transient limiter. HP 11947A.
19. Line Impedance Stabilization Network (L.I.S.N.) R&S. ESH2-Z5.

4. IDENTIFICATION DATA SUPPLIED BY THE APPLICANT

Identification data in this section has been supplied by the client.

4.1 APPLICANT

Name or Company: ViTec Co., Ltd.

V.A.T.: -----

Address: 170 Fontanka emb. **City:** St. Petersburg

Postal code: 198035 **Country:** Russia

Telephone: +7 8122510601 **Fax:** +7 8122599591

4.2 REPRESENTATIVE

Name: Mr. Maxim K. Soroka

4.3 TEST SAMPLES SUPPLIER

Name or Company: Same as indicated in point 4.1

Samples undergoing test have been selected by: **the client.**

4.4 IDENTIFICATION OF ITEM/ITEMS TESTED

Product: Wireless NI cRIO™ carrier

Trade mark: viBlue **Model:** viBlueRIO

Hardware version: 3.0.1 **Software version:** 2.1.1

Manufacturer: ViTec Co., Ltd.

Country of manufacture: Russia

Description: The carrier features the breakthrough BluetoothTM wireless technology that lets you create efficient communications between a laptop or desktop PC or PDA and National Instruments cRIOTM measurement devices using BluetoothTM wireless technology-without physical connectors or cables.

5. USAGE OF SAMPLES, PERIOD OF TESTING AND ENVIRONMENTAL CONDITIONS

5.1 USAGE OF SAMPLES

Sample M/01 is formed by the following elements:

Control No.	Description	Model	Serial No.	Date of reception
23079/04	Wireless NI cRIO™ carrier	viBlueRIO	Prototype	22/11/2005

Sample S/01 is composed of the following elements:

Control No.	Description	Model	Serial No.	Date of reception
23079/02	Wireless NI cRIO™ carrier	viBlueRIO	Prototype	22/11/05

During the tests were used next ancillary equipments:

Internal Control Nr.	Description	Model	Serial No.	Date of arrival
23079/01	iPAQ	iPAQ	X11-15454	22/11/05
---	Auxiliary PC, property of CETECOM	Toshiba SP6100	13123012G	---

1. Sample M/01 has undergone following test(s).

   All tests indicated in annex A.

2. Sample S/01 has undergone to the following test(s):

   Continuous conducted emission, power leads, in Annex B.

5.2 PERIOD OF TESTING

The performed test started on 2005-11-23 and finished on 2006-02-20.

The tests as detailed in this report have been performed at CETECOM.

5.3 ENVIROMENTAL CONDITIONS

In the control chamber the following limits were not exceeded during the test:

Temperature	Min. = 22 ºC Max. = 23 ºC
Relative humidity	Min. = 31 % Max. = 31 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

In the semianechoic chamber (21 meters x 11 meters x 8 meters) the following limits were no exceeded during the test.

Temperature	Min. = 23 ºC Max. = 24 ºC
Relative humidity	Min. = 36 % Max. = 36 %
Air pressure	Min. = 1010 mbar Max. = 1010 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogenousity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

In the chamber for conducted measurements the following limits were not exceeded during the test:

Temperature	Min. = 24 ºC Max. = 24 ºC
Relative humidity	Min. = 41 % Max. = 41 %
Air pressure	Min. = 1020 mbar Max. = 1020 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

6. TEST RESULTS

Abbreviations used in the VERDICT column of the following tables are:

P Pass

F Fail

NA not applicable

NM not measured

FCC PART 15 PARAGRAPH	VERDICT			
	NA	P	F	NM
15.247 Subclause (a) (1). 20 dB Bandwidth and Carrier frequency separation		P		
15.247 Subclause (a) (1) (iii). Number of hopping channels		P		
15.247 Subclause (a) (1) (iii). Time of occupancy (Dwell Time)		P		
15.247 Subclause (b). Maximum peak output power and antenna gain		P		
15.247 Subclause (c). Band-edge of conducted emissions (Transmitter)		P		
15.247 Subclause (c). Emission limitations conducted (Transmitter)		P		
15.247 Subclause (c). Emission limitations radiated (Transmitter)		P		
15.207. Conducted limits		P		

7. REMARKS AND COMMENTS

None

8. SUMMARY

Based on the results of the performed test, stated in annex A the item under test is **IN COMPLIANCE** with the specifications listed in section 3.1 “TEST REQUESTED”.

NOTE: The results presented in this Test Report apply only to the particular item under test declared in section 4.4 “IDENTIFICATION OF ITEM/ITEMS TESTED” of this document, as presented for test on the date(s) declared in section 5, “USAGE OF SAMPLES, PERIOD OF TESTING AND ENVIRONMENTAL CONDITIONS”.

ANNEX A

TEST RESULTS

Report No: 23079RET.101

INDEX

Page

TEST CONDITIONS 3

Section 15.247 Subclause (a) (1). 20 dB Bandwidth and Carrier frequency separation....4

Section 15.247 Subclause (a) (1) (iii). Number of hopping channels 7

Section 15.247 Subclause (a) (1) (iii). Time of occupancy (Dwell Time) 9

Section 15.247 Subclause (b). Maximum peak output power and antenna gain.....12

Section 15.247 Subclause (d). Band-edge of conducted emissions (Transmitter) 17

Section 15.247 Subclause (d). Emission limitations conducted (Transmitter).....20

Section 15.247 Subclause (d). Emission limitations radiated (Transmitter) 23

Section 15.109. Receiver spurious radiation 32

TEST CONDITIONS

Power supply (V):

$V_{nominal}$ = 2.5 Vdc

Type of power supply = Rechargeable battery

Type of antenna = External antenna with sma type connector

Maximum Declared Gain for antenna = 2.4 dBi

Operating Temperature Range (ºC):

T_n = 0 to + 50

TEST FREQUENCIES:

Lowest channel: 2402 MHz

Middle channel: 2441 MHz

Highest channel: 2480 MHz

The test set-up was made in accordance to the general provisions of ANSI C63.4.

CONDUCTED MEASUREMENTS

The equipment under test was set up in a shielded room and it is connected to a Bluetooth signalling unit (Bluetooth test set) and to the spectrum analyser using a 6 dB power. The reading in the spectrum analyser is corrected taking into account the power splitter loss.

RADIATED MEASUREMENTS

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m for the frequency range 30 MHz-1000 MHz (30 MHz-1000 MHz Bilog antenna) and at a distance of 1m for the frequency range 1 GHz-25 GHz (1 GHz-18 GHz Double ridge horn antenna and 18 GHz-40 GHz horn antenna).

For radiated emissions in the range 1 GHz-25 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive (wooden) platform one meter above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

An additional horn antenna is used to control the equipment under test with the Bluetooth signalling unit (Bluetooth test set).

Section 15.247 Subclause (a) (1). 20 dB Bandwidth and Carrier frequency separation

SPECIFICATION

Frequency hopping system shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

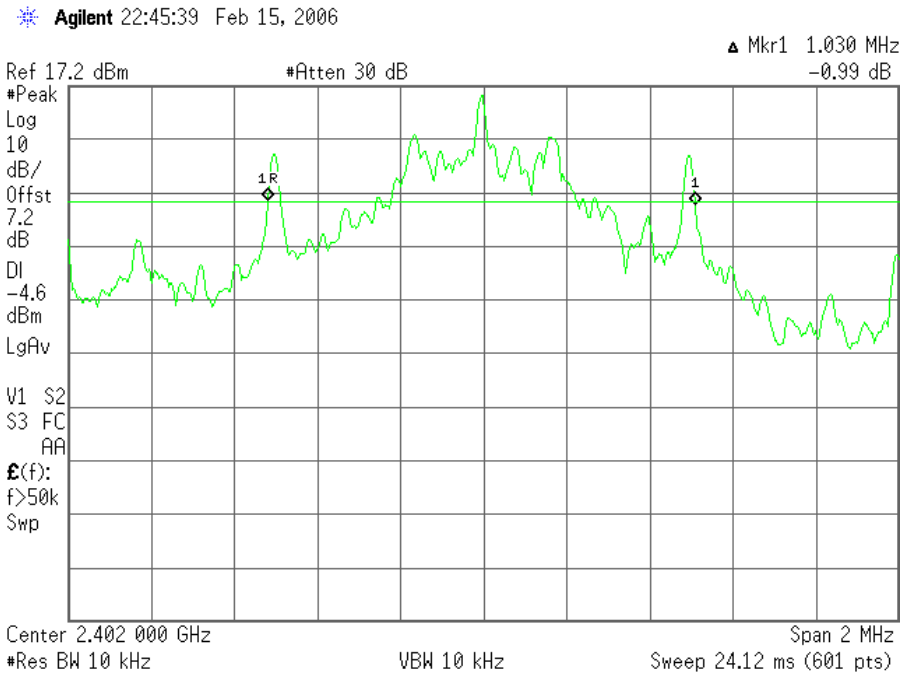
RESULTS

20 dB Bandwidth (see next 3 plots).

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
20 dB Spectrum bandwidth (kHz)	1030	1037	1030
Measurement uncertainty (kHz)	±11		

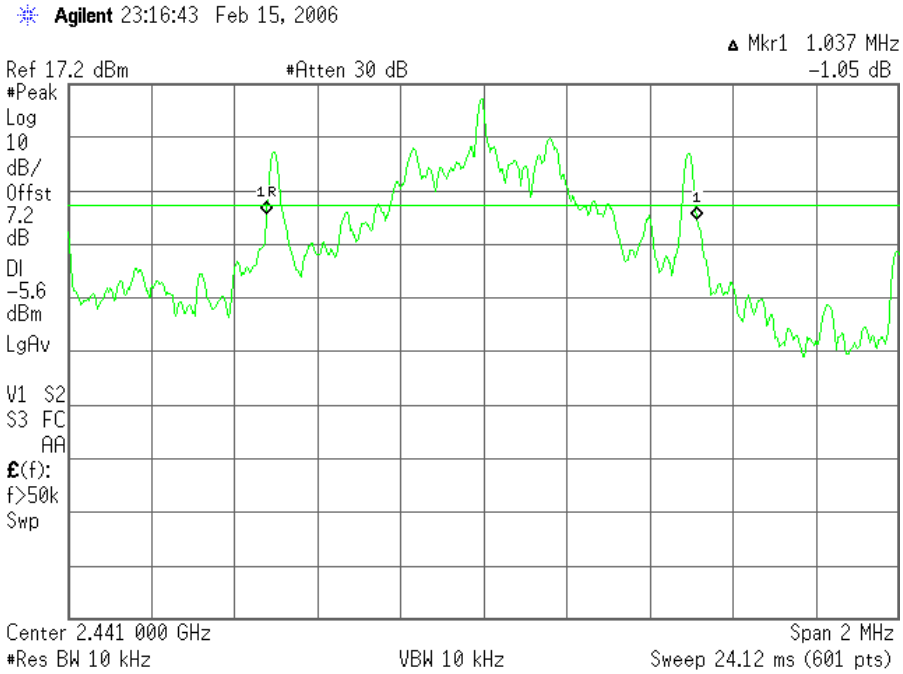
20 dB BANDWIDTH.

Lowest Channel: 2402 MHz.



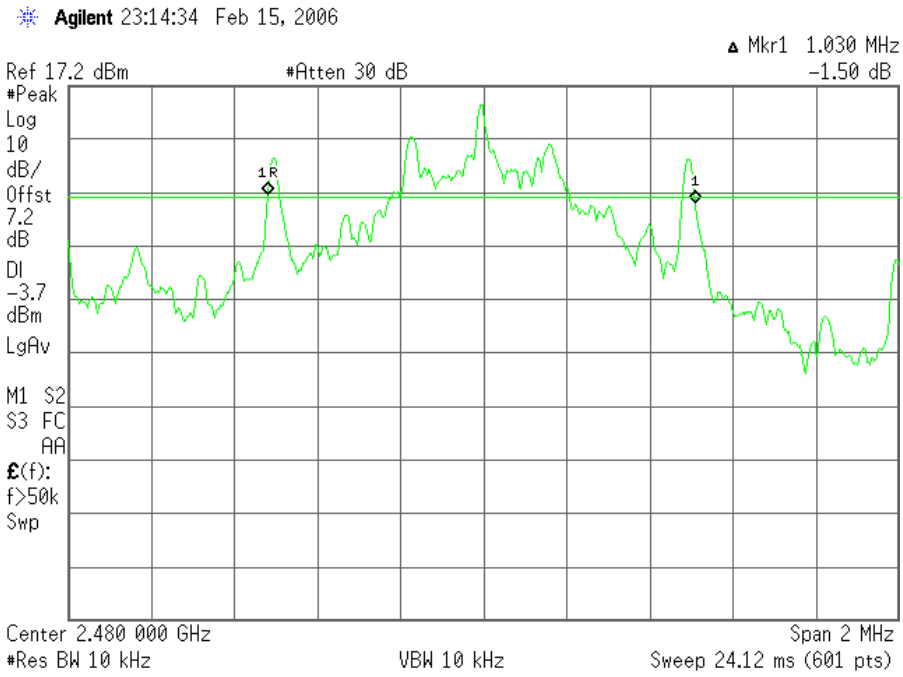
20 dB BANDWIDTH.

Middle Channel: 2441 MHz.

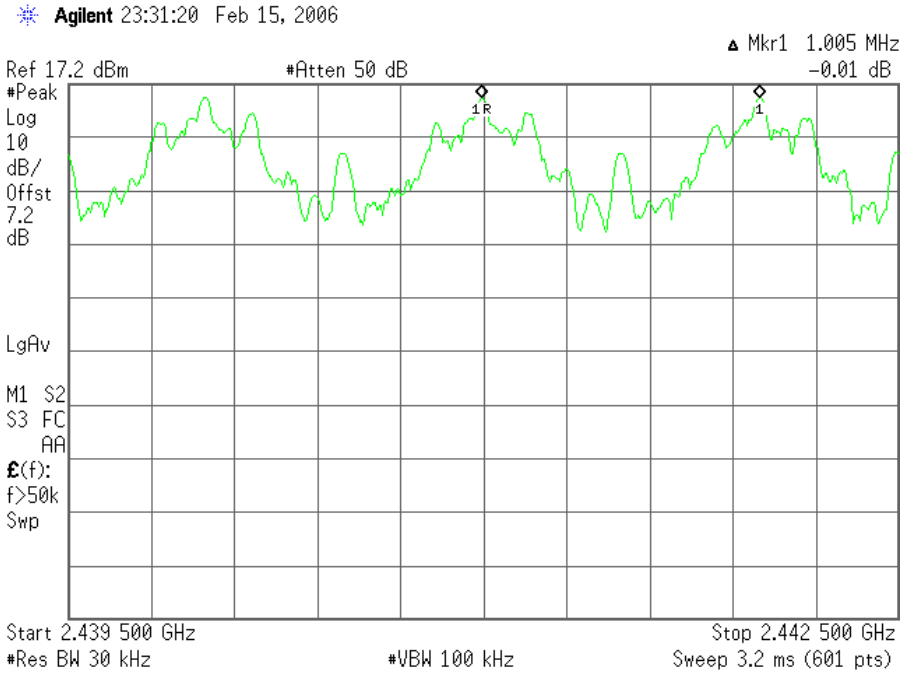


20 dB BANDWIDTH.

Highest Channel: 2480 MHz.



Carrier frequency separation (see next plot).



The hopping channel carrier frequencies are separated by a minimum of the 20 dB bandwidth of the hopping channel.

Verdict: PASS

Section 15.247 Subclause (a) (1) (iii). Number of hopping channels

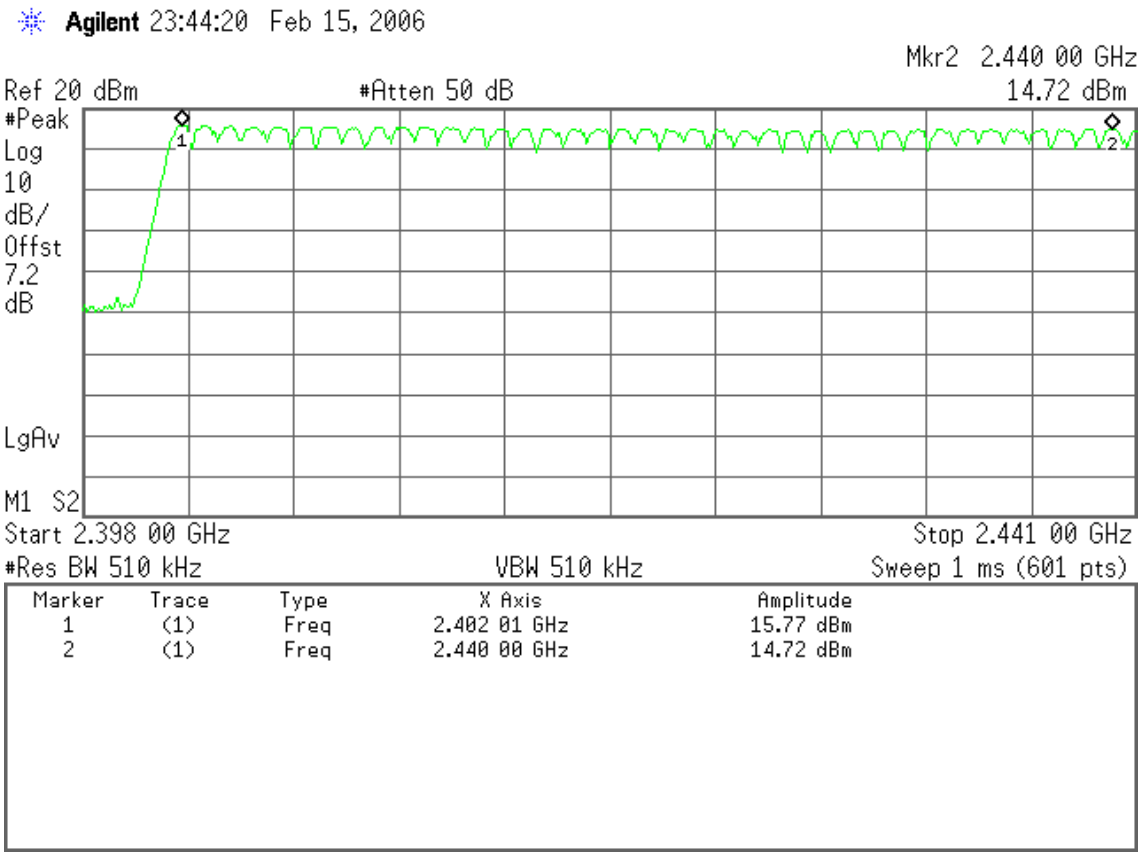
SPECIFICATION

Frequency hopping system in the 2400-2483.5 MHz band shall use at least 15 non-overlapping channels.

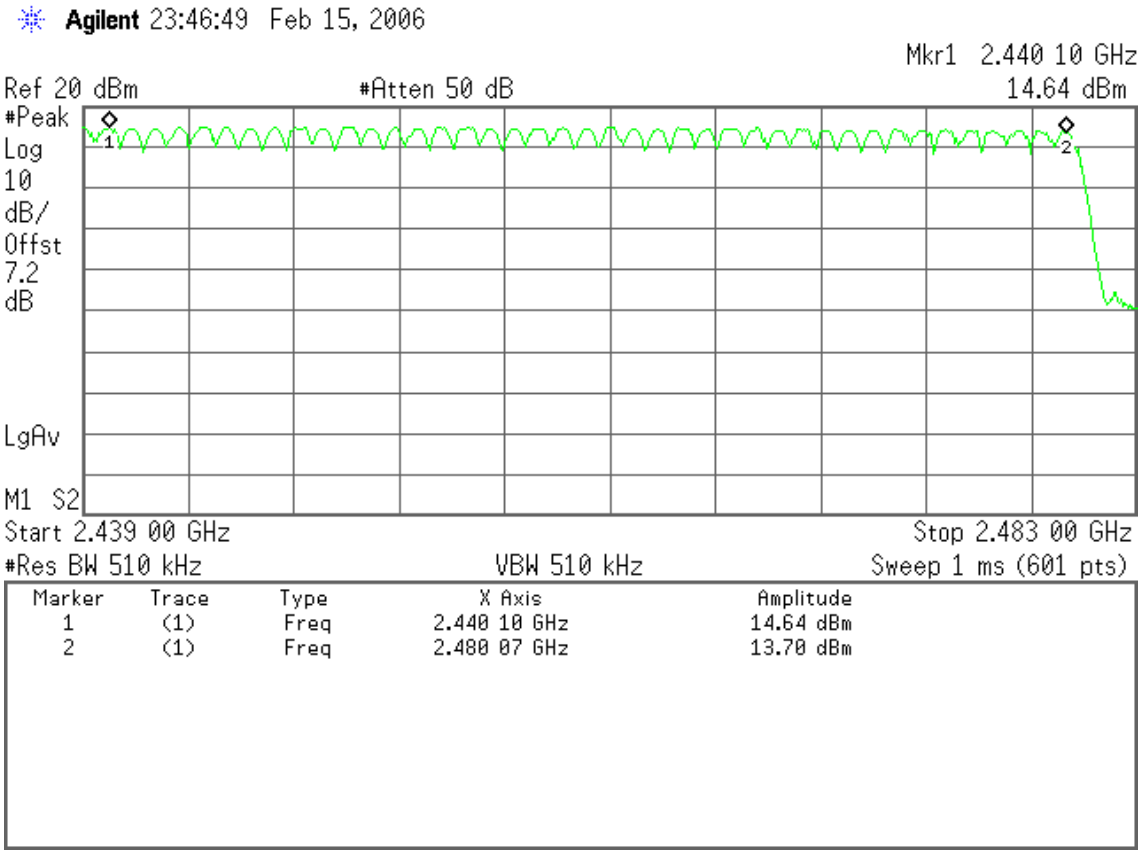
RESULTS

The number of hopping channels is 79 (see next two plots).

Number of hopping frequencies: 39



Number of hopping frequencies: 40



Total number of hopping frequencies: 79

Verdict: PASS

Section 15.247 Subclause (a) (1) (iii). Time of occupancy (Dwell Time)

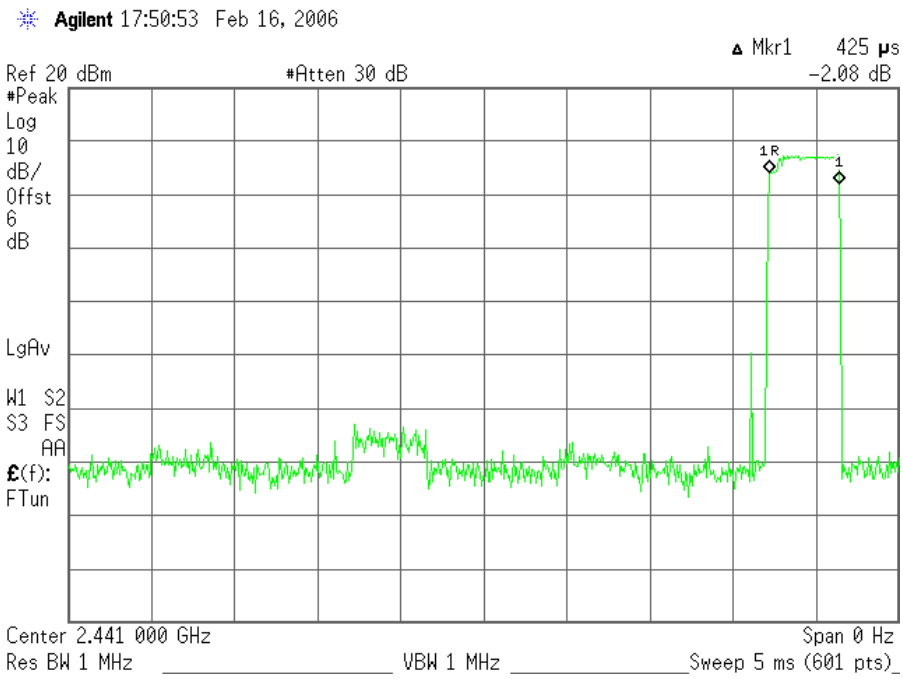
SPECIFICATION

The average time of occupancy on any channel shall not be greater than 0.4 seconds (400 ms) within a period of 0.4 seconds multiplied by the number of hopping channels employed = 0.4 x 79= 31.6 seconds.

RESULTS

TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH1.

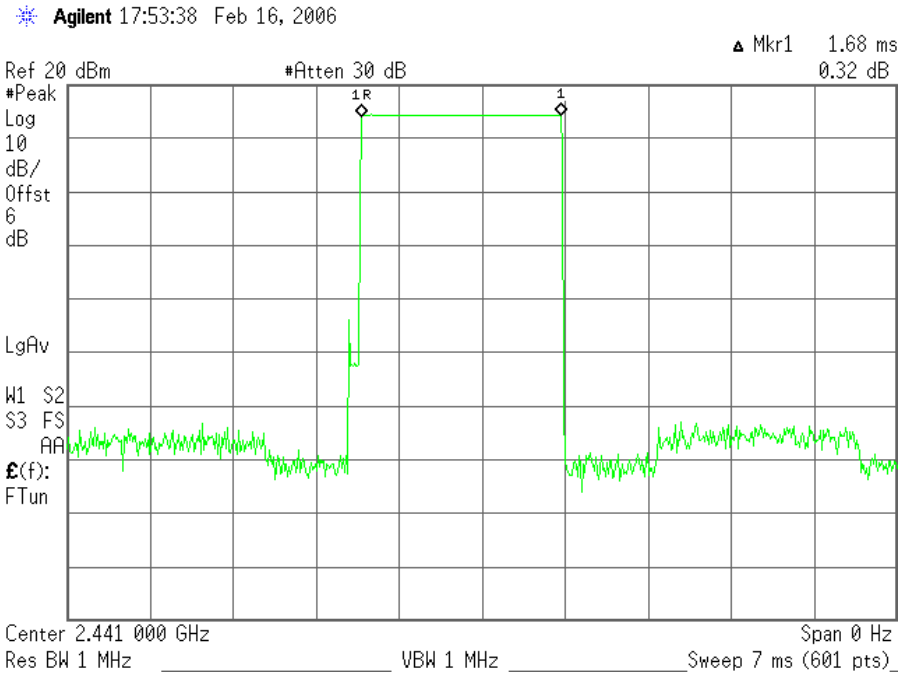
The system makes worst case 1600 hops per second or 1 time slot has a length of 625µs with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 1600/2 = 800 hops per second with 79 channels. So you have each channel 800/79 = 10.13 times per second and so for a period of 0.4 x 79 = 31.6 seconds you have 10.13 x 31.6 = 320.11 times of appearance.
Each Tx-time per appearance is 425.00 µs (see next plot).
So we have 320.11 x 425.00 µs =136.05 ms per 31.6 seconds.



Verdict: PASS

2. TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH3.

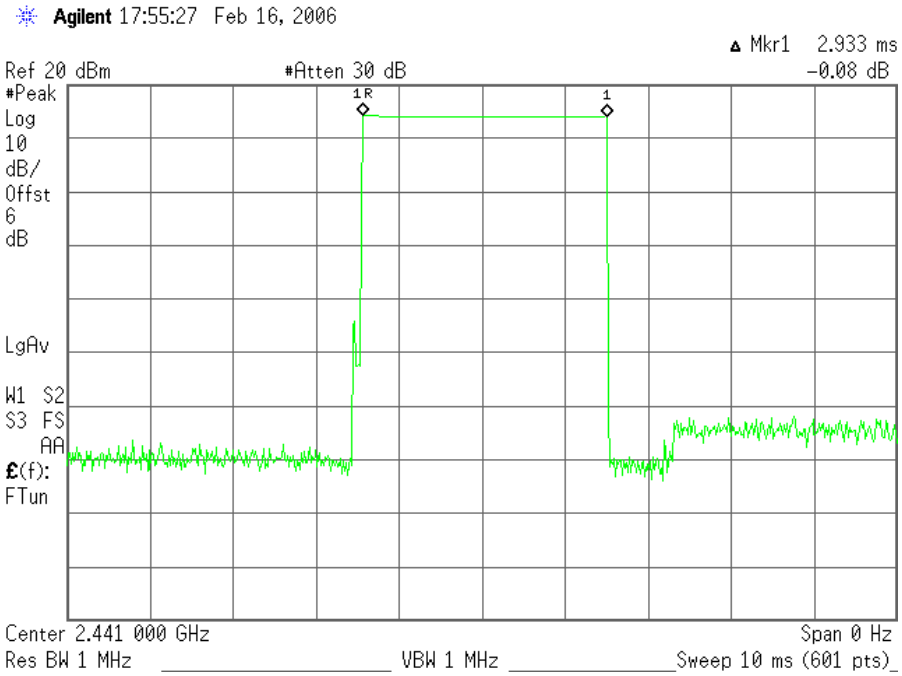
A DH3 Packet need 3 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case 1600/4 = 400 hops per second with 79 channels. So you have each channel 400/79 = 5.1 times per second and so for a period of 0.4 x 79 = 31.6 seconds you have 5.1 x 31.6 = 161.16 times of appearance.
Each Tx-time per appearance is 1.68 ms (see next plot).
So we have 161.16 x 1.68 ms = 270.75 ms per 31.6 seconds.



Verdict: PASS

3. TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH5.

A DH5 Packet need 5 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case 1600/6 = 266.67 hops per second with 79 channels. So you have each channel 266.67/79 = 3.37 times per second and so for a period of 0.4 x 79 = 31.6 seconds you have 3.37 x 31.6 = 106.49 times of appearance.
Each Tx-time per appearance is 2.933 ms (see next plot).
So we have 106.49 x 2.933 ms = 312.33 ms per 31.6 seconds.



Verdict: PASS

Section 15.247 Subclause (b). Maximum peak output power and antenna gain

SPECIFICATION

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels: 1 watt (30 dBm).

RESULTS

MAXIMUM PEAK OUTPUT POWER (CONDUCTED). See next plots.

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Maximum peak power (dBm)	15.61	14.60	14.05
Measurement uncertainty (dB)	±1.5		

The maximum declared antenna gain for this device is 2.4 dBi, therefore the maximum theoretical peak radiated power (EIRP) in the three measurement channels for this device is 18.01 dBm or 63.24 mW.

The actual peak radiated power (EIRP) was measured for the lowest, middle and highest frequency (see next plots):

MAXIMUM PEAK OUTPUT POWER (RADIATED).

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Correction Factor (dB)	34.96	35.10	35.24
Maximum EIRP peak power (dBm)	17.49	16.43	15.97
Measurement uncertainty (dB)	+1.98 / -1.75		

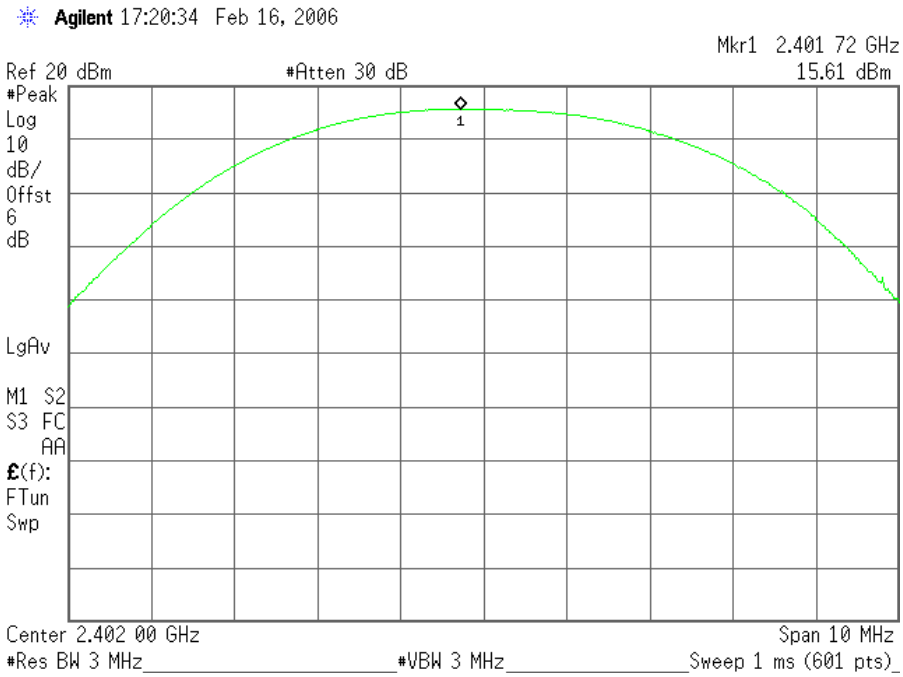
Declared peak gain: 2.4 dBi

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Verdict: PASS

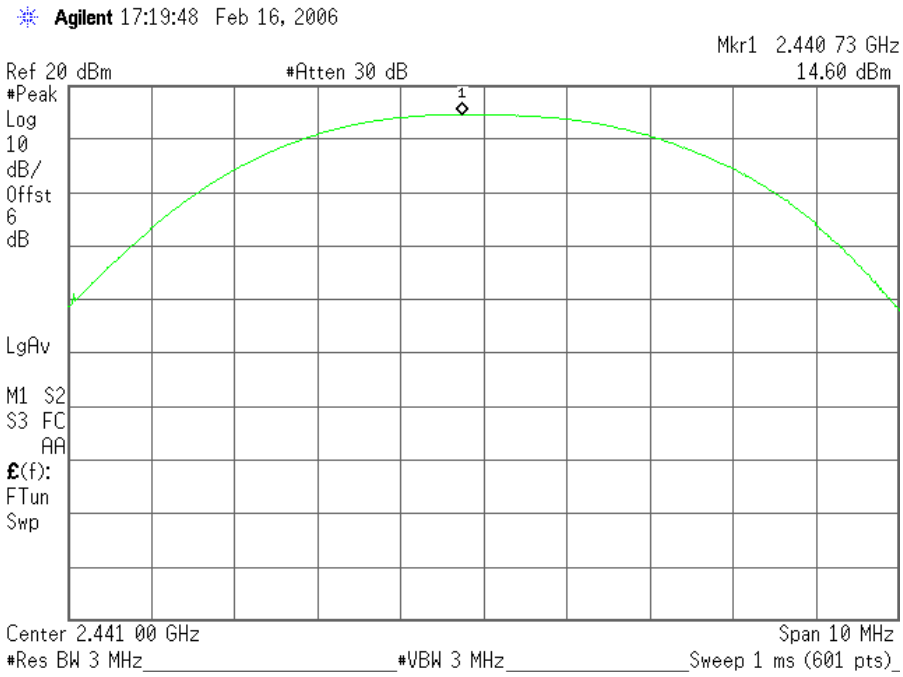
PEAK OUTPUT POWER (CONDUCTED).

Lowest Channel: 2402 MHz.



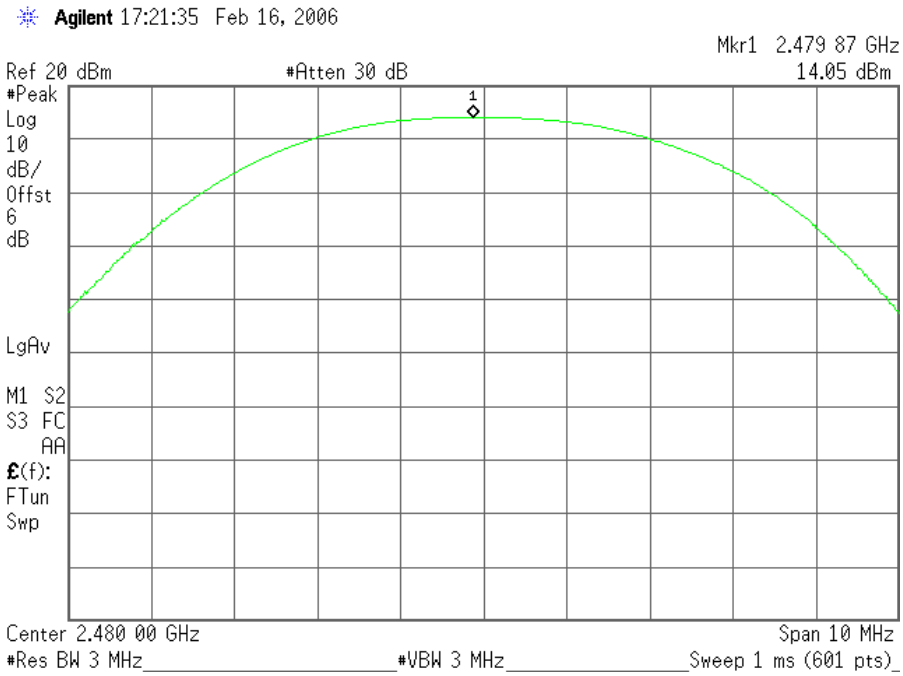
PEAK OUTPUT POWER (CONDUCTED).

Middle Channel: 2441 MHz.



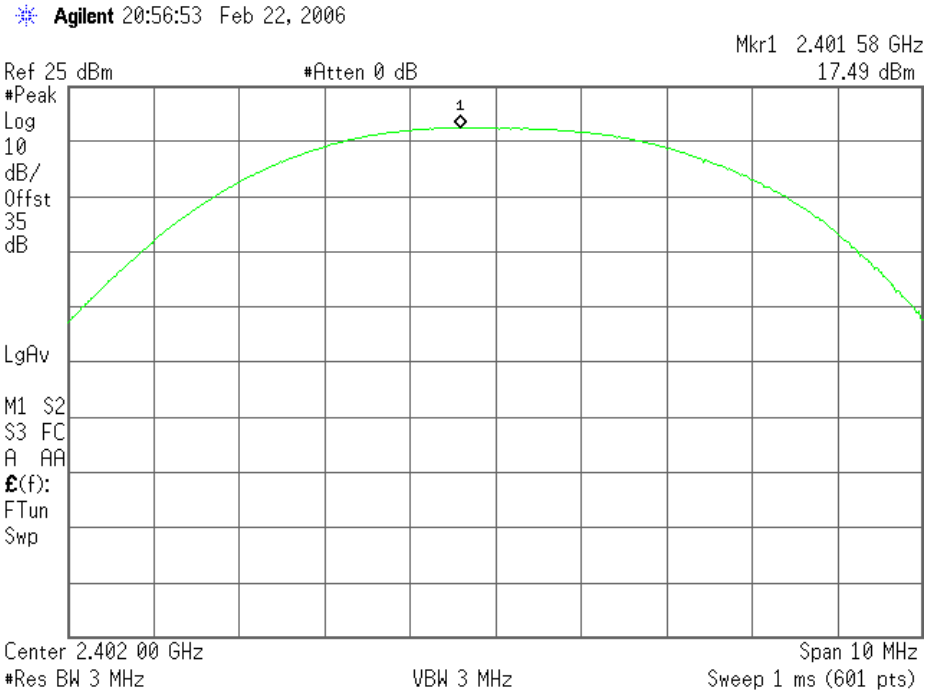
PEAK OUTPUT POWER (CONDUCTED).

Highest Channel: 2480 MHz.



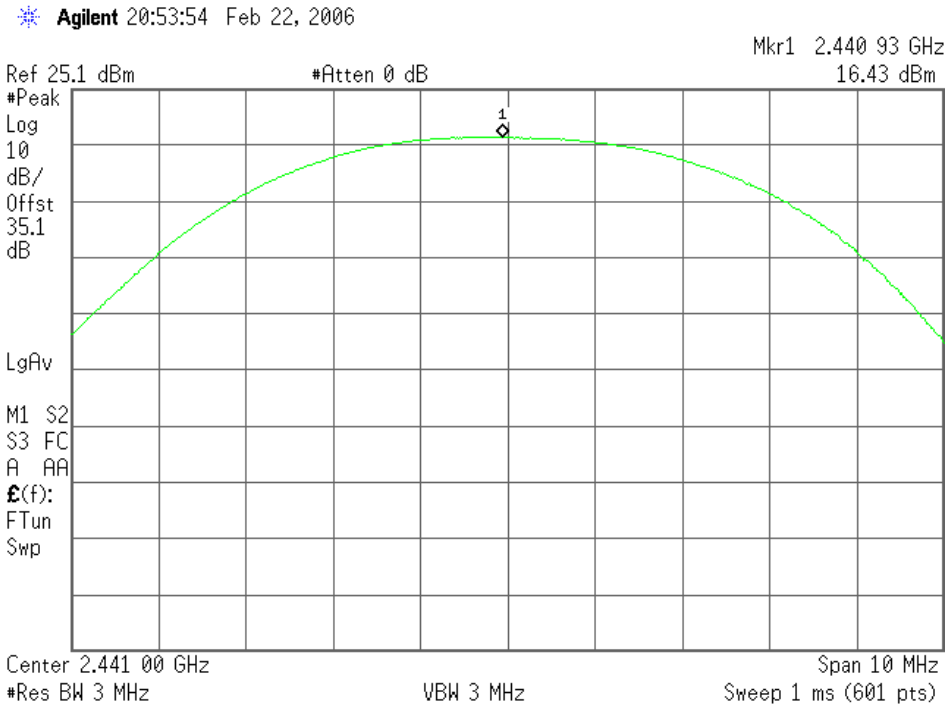
PEAK OUTPUT POWER (RADIATED).

Lowest Channel: 2402 MHz.



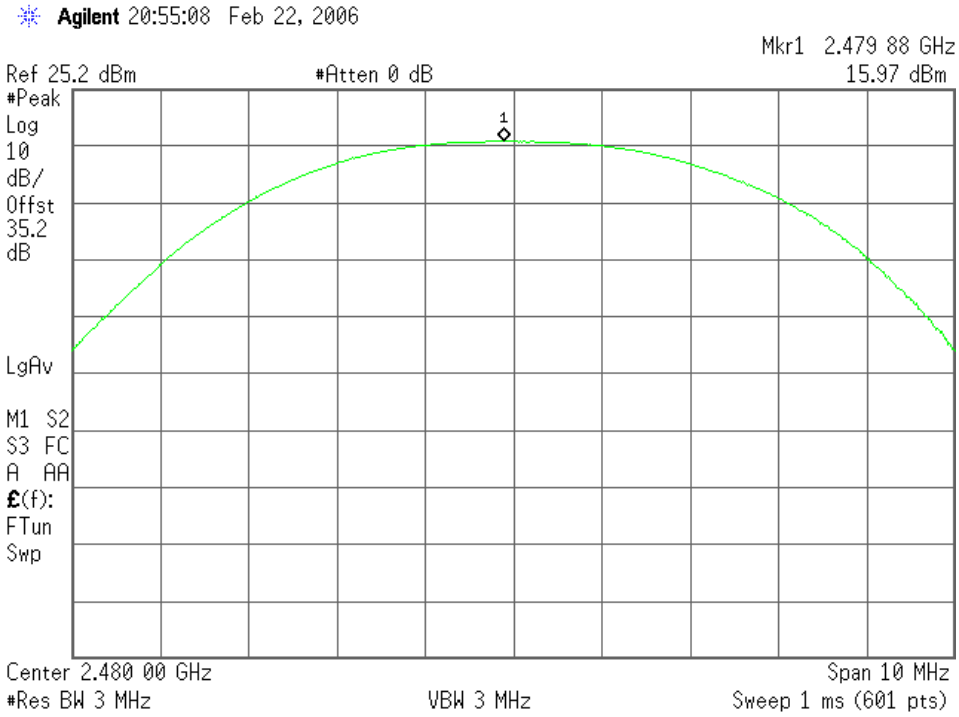
PEAK OUTPUT POWER (RADIATED).

Middle Channel: 2441 MHz.



PEAK OUTPUT POWER (RADIATED).

Highest Channel: 2480 MHz.



Section 15.247 Subclause (d). Band-edge of conducted emissions (Transmitter)

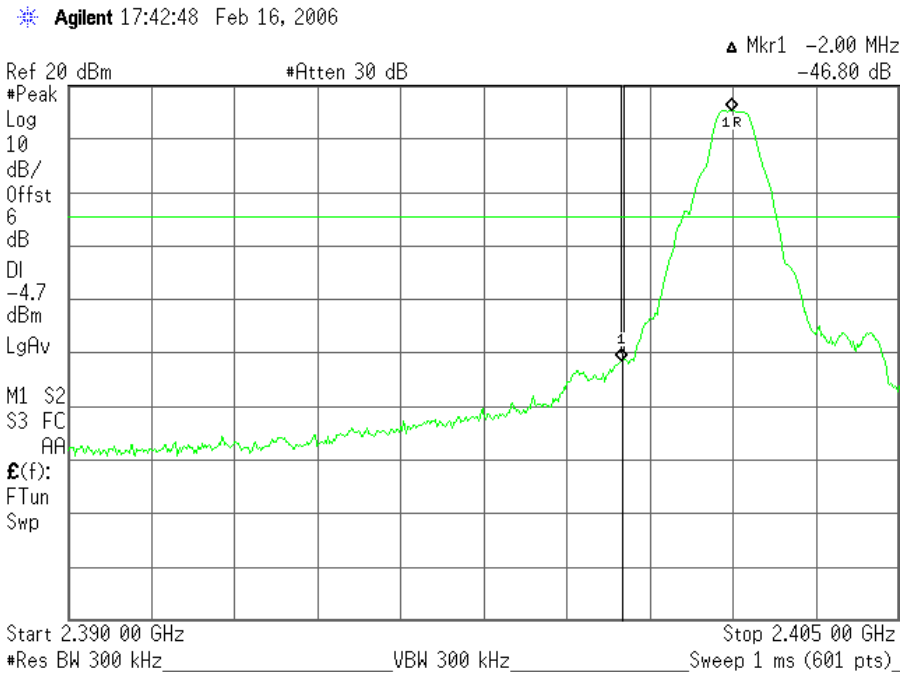
SPECIFICATION

Emissions outside the frequency band in which the intentional radiator is operating shall be at least 20dB below the highest level of the desired power.

RESULTS:

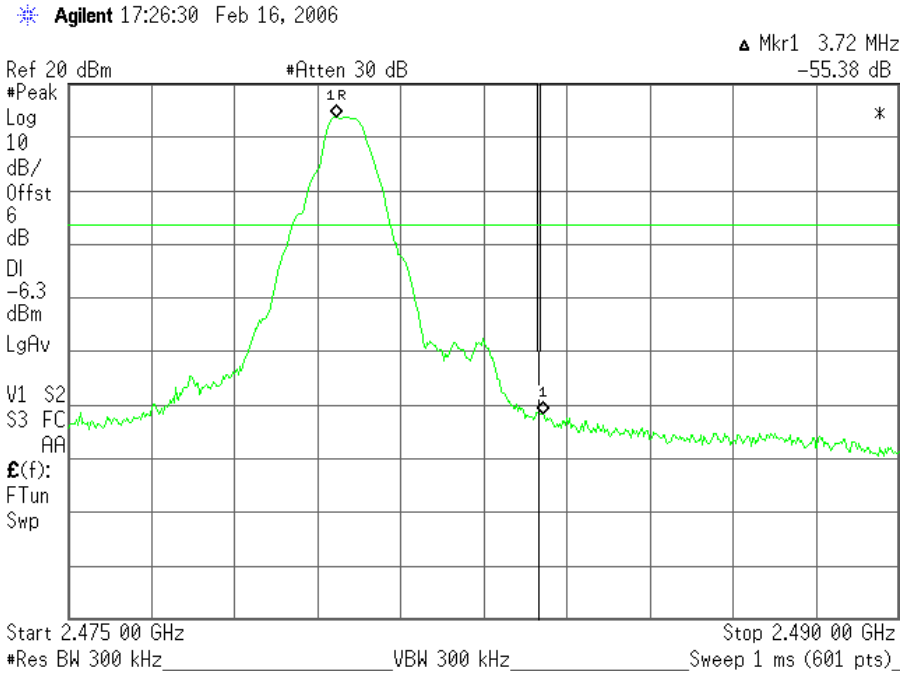
See next plots

1. LOW FREQUENCY SECTION 2402 MHz (HOPPING OFF). CONDUCTED



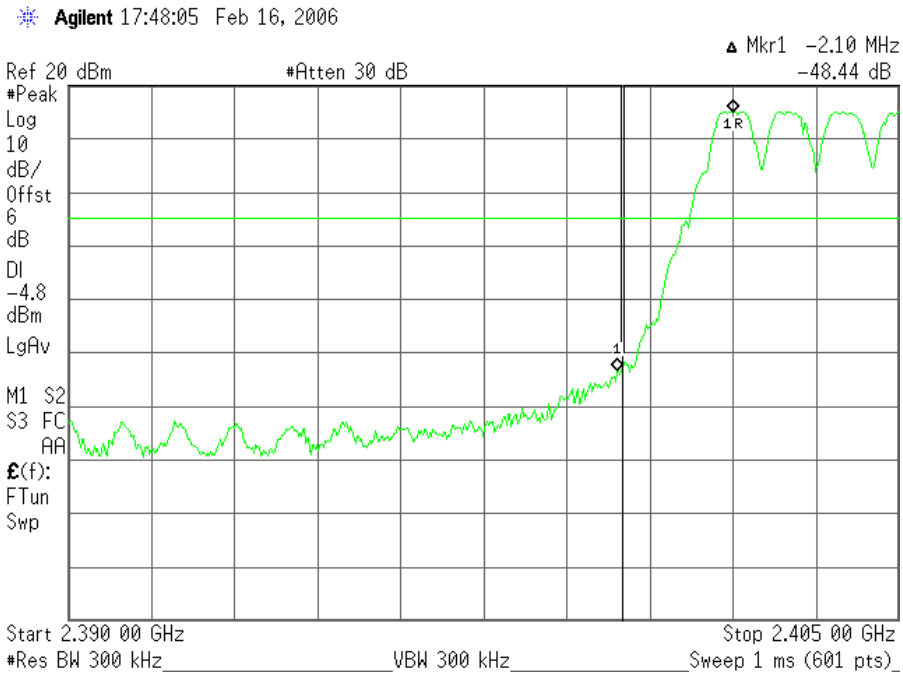
Verdict: PASS

2. HIGH FREQUENCY SECTION 2480 MHz (HOPPING OFF). CONDUCTED



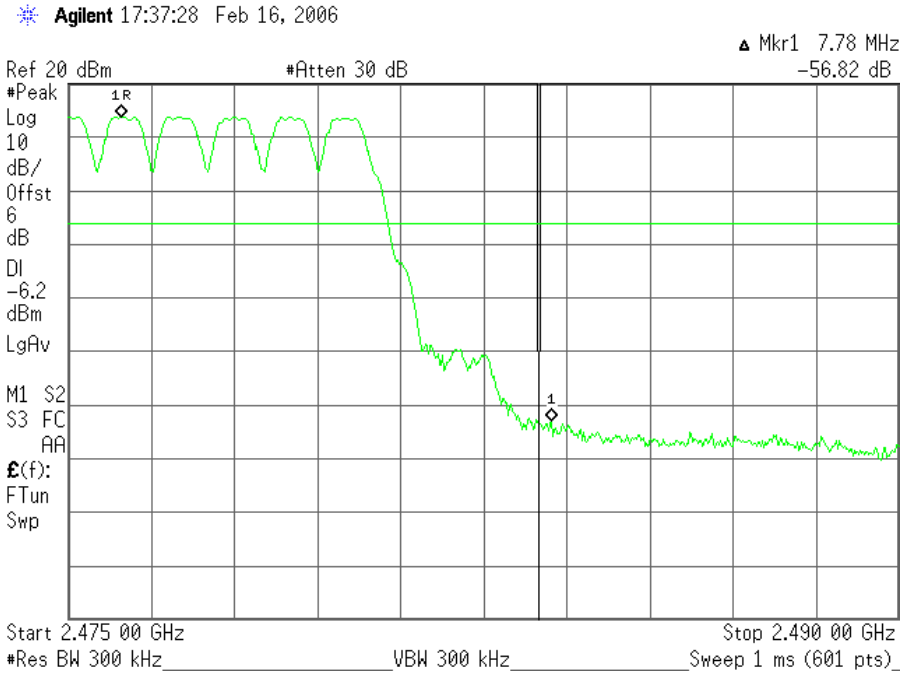
Verdict: PASS

3. LOW FREQUENCY SECTION (HOPPING ON). CONDUCTED



Verdict: PASS

4. HIGH FREQUENCY SECTION (HOPPING ON). CONDUCTED



Verdict: PASS

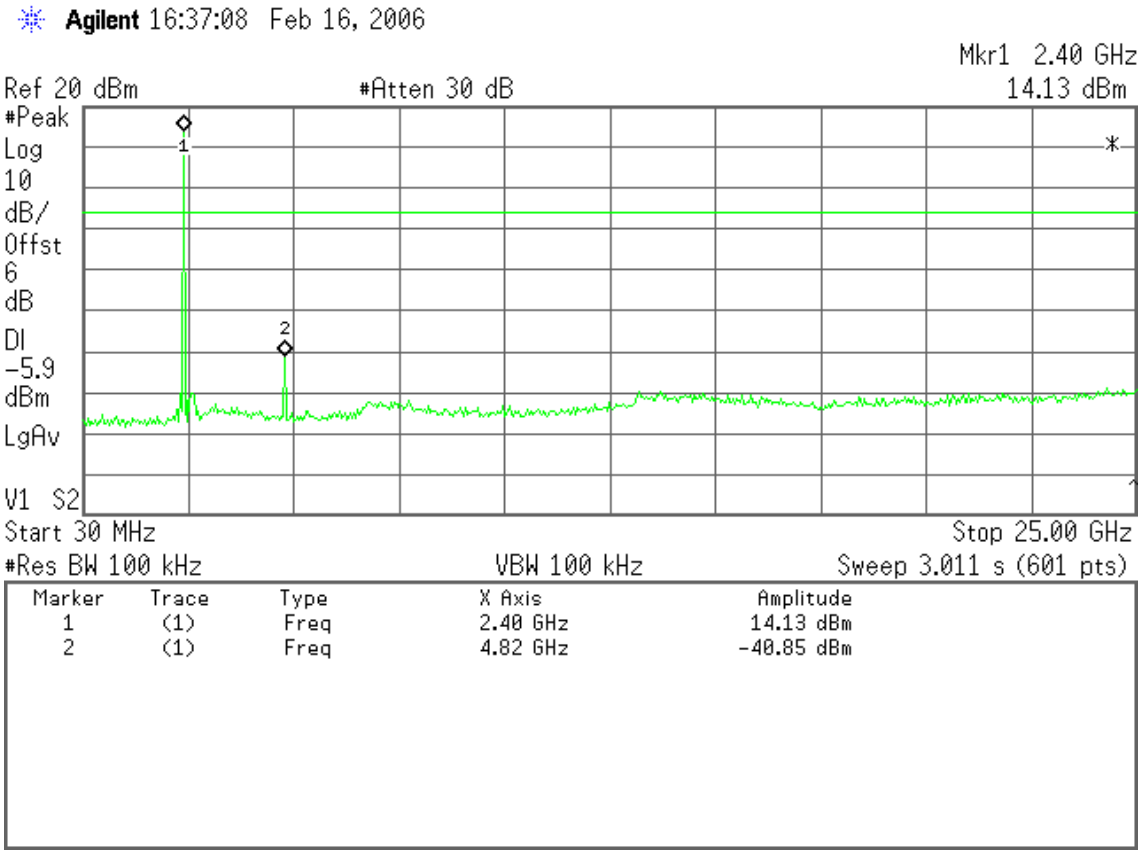
Section 15.247 Subclause (d). Emission limitations conducted (Transmitter)

SPECIFICATION

In any 100 kHz bandwidths outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

RESULTS:

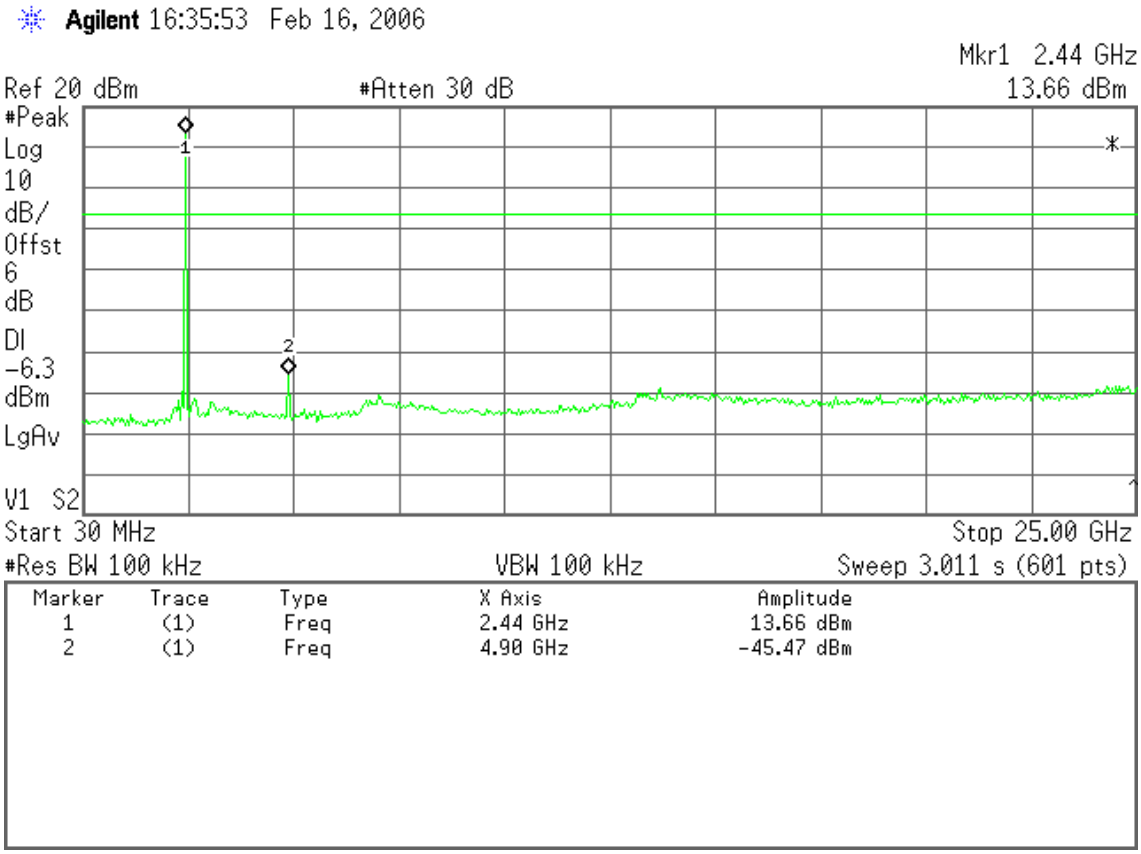
1. LOWEST CHANNEL (2402 MHz): 30 MHz-25 GHz (see next plot).



Note: The peak above the limit is the carrier frequency.

Verdict: PASS

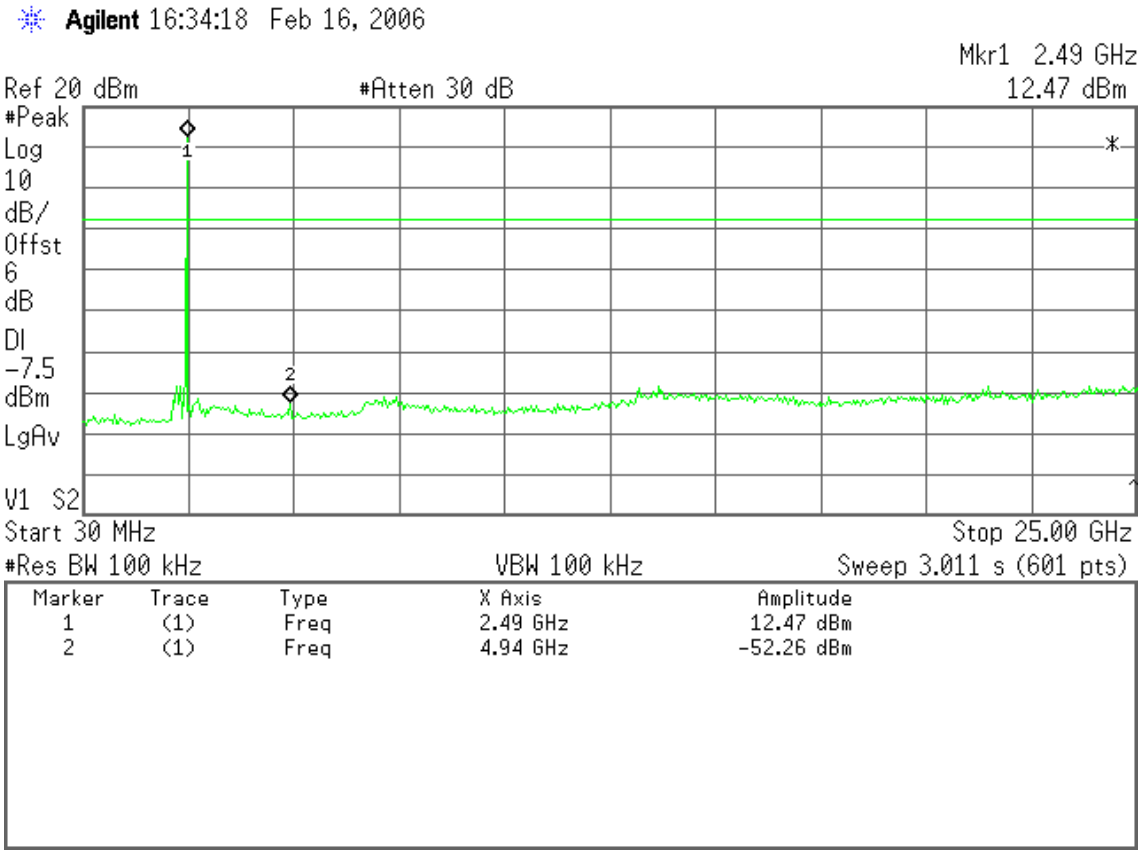
2. MIDDLE CHANNEL (2441 MHz): 30 MHz-25 GHz (see next plot).



Note: The peak above the limit is the carrier frequency.

Verdict: PASS

3. HIGH CHANNEL (2480 MHz): 30 MHz-25 GHz (see next plot).



Note: The peak above the limit is the carrier frequency.

Verdict: PASS

Section 15.247 Subclause (d). Emission limitations radiated (Transmitter)

SPECIFICATION

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	300
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RESULTS:

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

All tests were performed in a semi-anechoic chamber at a distance of 3 m for the frequency range 30 MHz-1000 MHz and at distance of 1m for the frequency range 1 GHz-25 GHz.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyser. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

The equipment transmits continuously in the selected channel so it is not necessary a duty cycle correction factor.

1. CHANNEL: LOWEST (2402 MHz).

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-25 GHz.

Spurious frequency (MHz)	Polarization	Detector	Emission Level (dBµV/m)	Measurement Uncertainty (dB)
4803.670	V	Peak	43.88	± 4.0
4803.670	V	Average	40.74	± 4.0

Additionally, no spurious signals were found inside the restricted bands 2310-2390 MHz and 2483.5-2500 MHz.

2. CHANNEL: MIDDLE (2441 MHz).

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-25 GHz.

Spurious frequency (MHz)	Polarization	Detector	Emission Level (dBµV/m)	Measurement Uncertainty (dB)
4882.150	V	Peak	44.73	± 4.0
4882.150	V	Average	39.08	± 4.0
7322.080	V	Peak	47.66	± 4.0
7322.080	V	Average	39.29	± 4.0

Additionally, no spurious signals were found inside the restricted bands 2310-2390 MHz and 2483.5-2500 MHz.

3. CHANNEL: HIGHEST (2480 MHz).

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

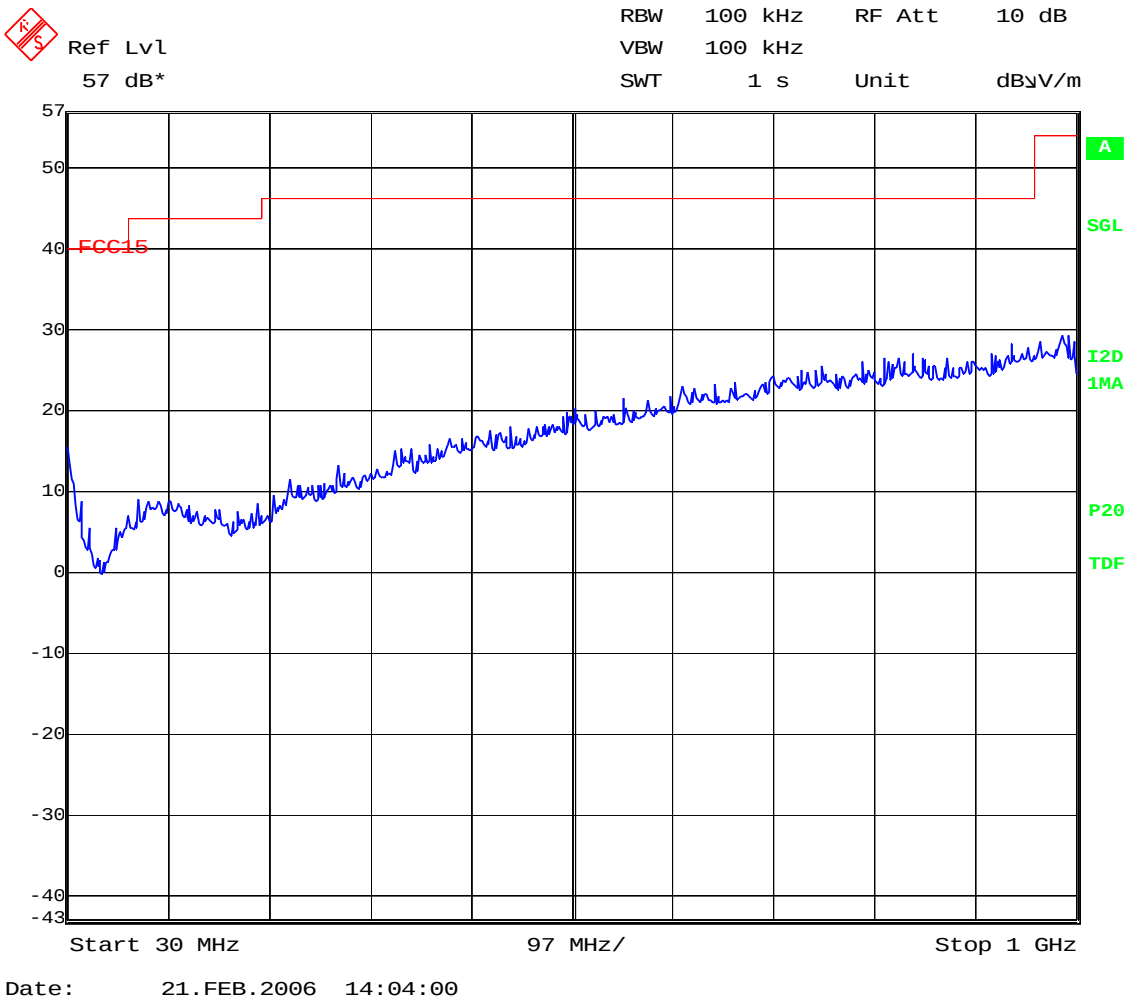
Frequency range 1 GHz-25 GHz.

Spurious frequency (MHz)	Polarization	Detector	Emission Level (dBµV/m)	Measurement Uncertainty (dB)
4959.880	V	Peak	55.21	± 4.0
4959.880	V	Average	40.81	± 4.0
7440.620	V	Peak	50.58	± 4.0
7440.620	V	Average	37.38	± 4.0

Additionally, no spurious signals were found inside the restricted bands 2310-2390 MHz and 2483.5-2500 MHz.

Verdict: PASS

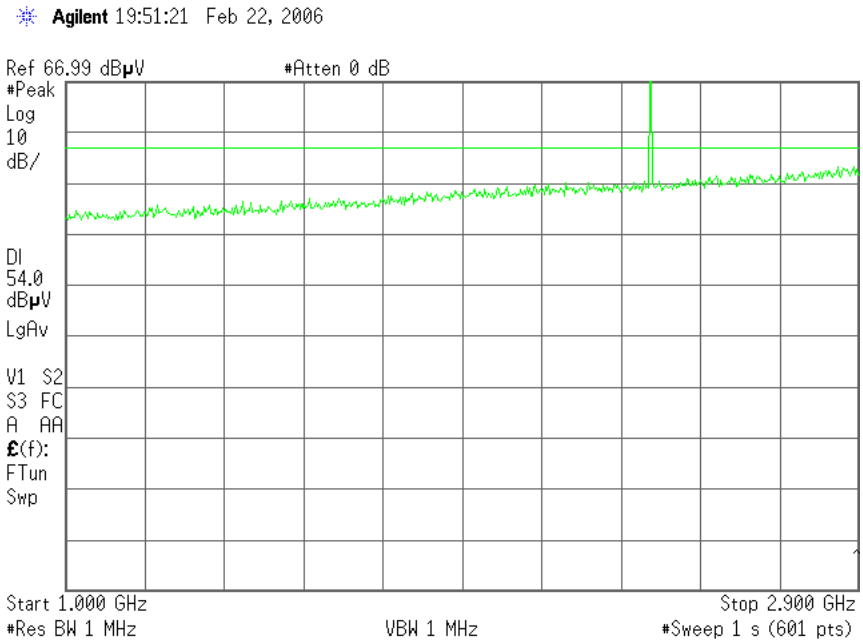
FREQUENCY RANGE 30 MHz-1000 MHz.



(This plot is valid for all three channels).

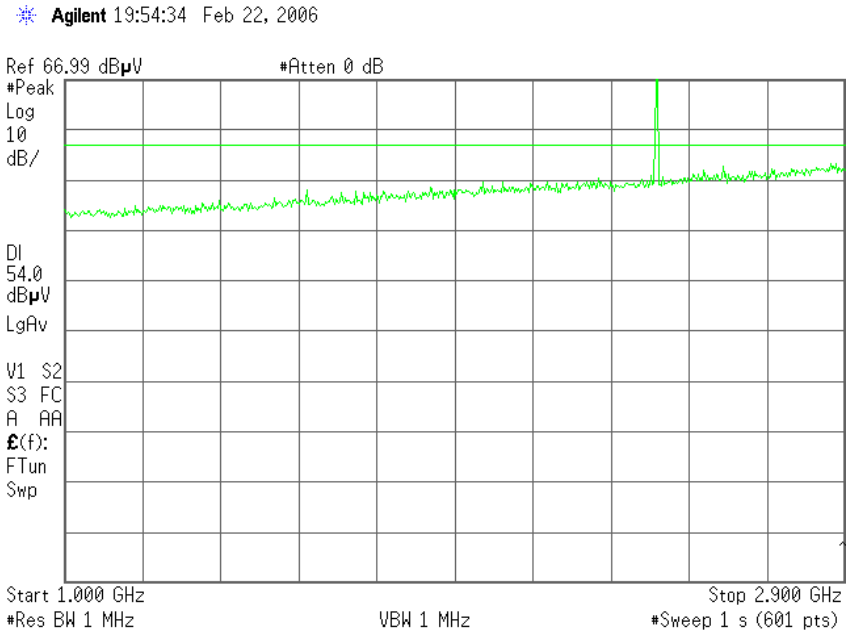
FREQUENCY RANGE 1 GHz to 2.9 GHz.

CHANNEL: Lowest (2402 MHz).



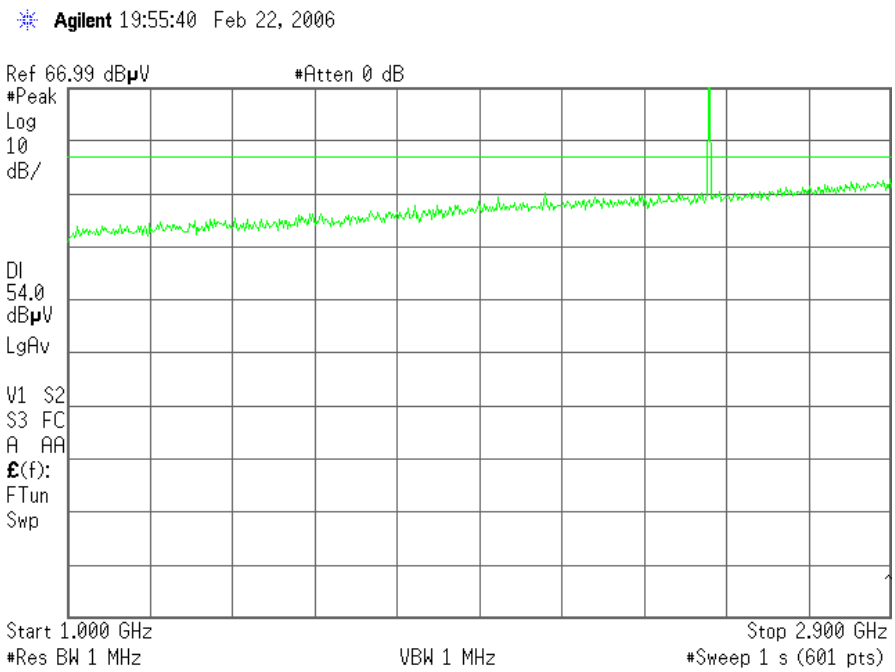
Note: The peak above the limit is the carrier frequency.

CHANNEL: Middle (2441 MHz).



Note: The peak above the limit is the carrier frequency.

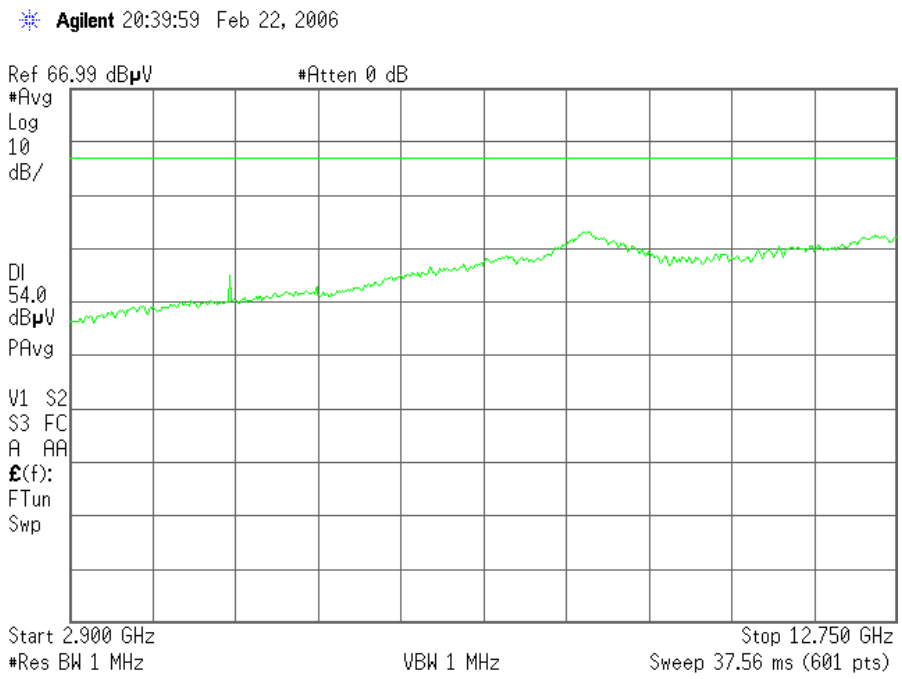
CHANNEL: Highest (2480 MHz).



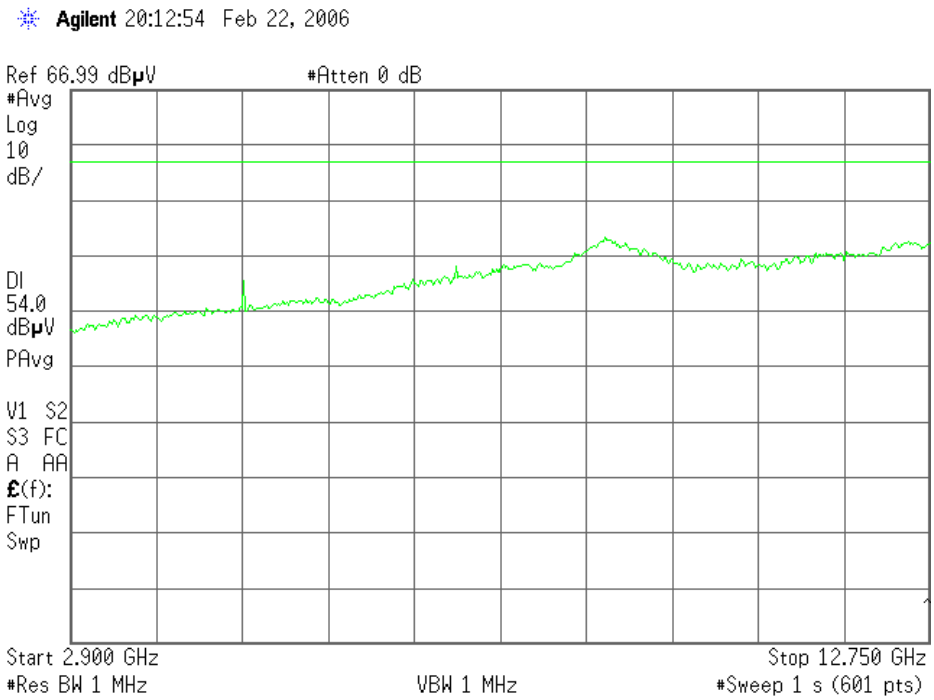
Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 2.9 GHz to 12.75 GHz.

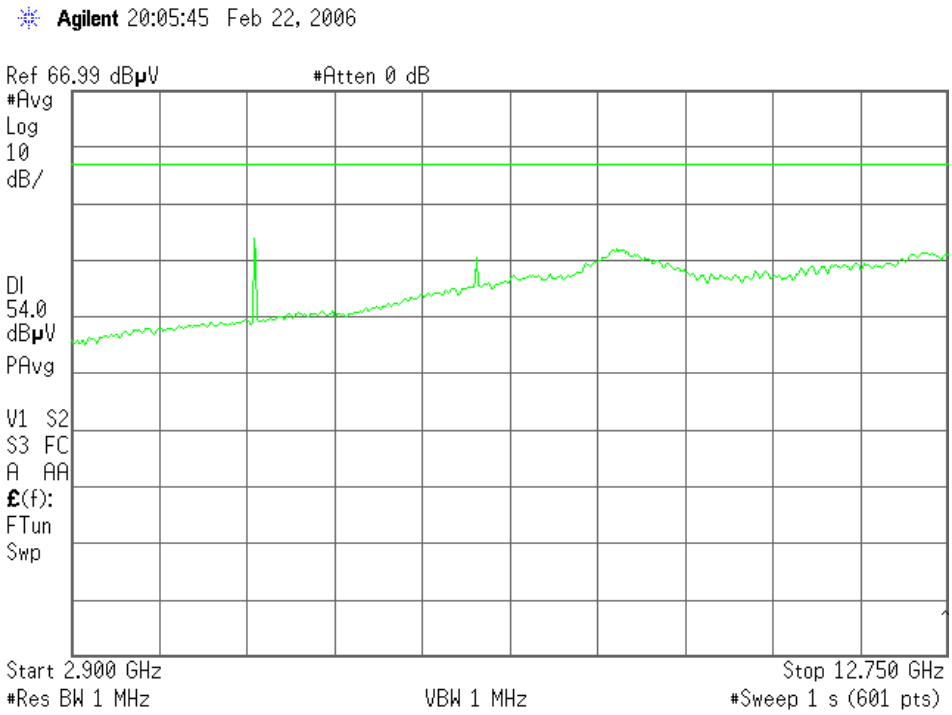
CHANNEL: Lowest (2402 MHz).



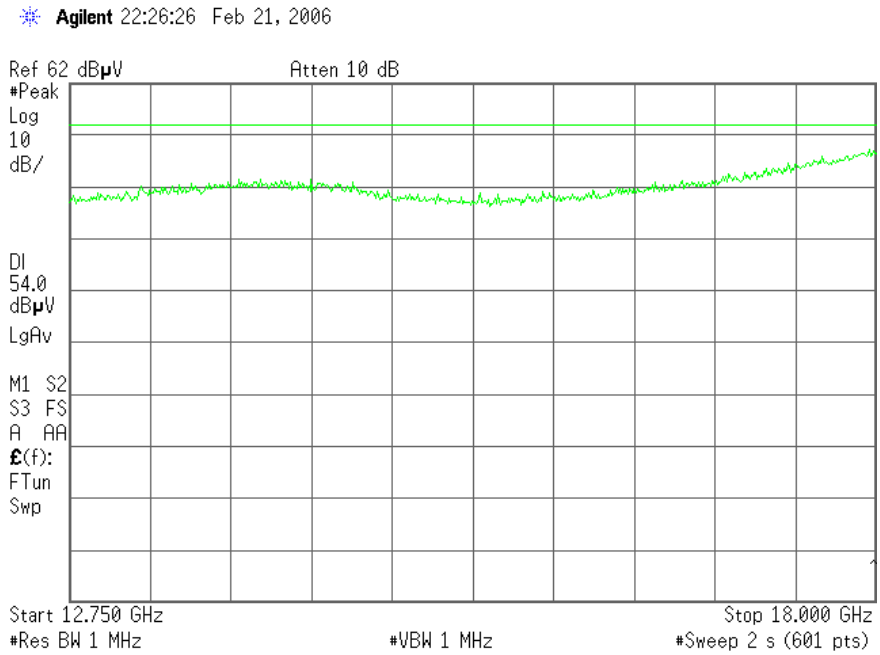
CHANNEL: Middle (2441 MHz).



CHANNEL: Highest (2480 MHz).

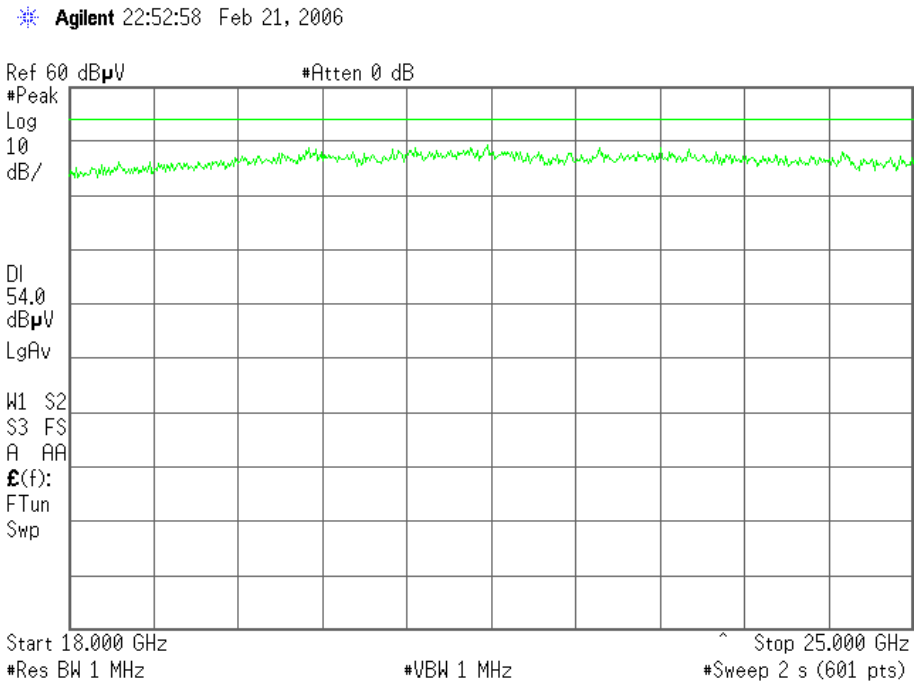


FREQUENCY RANGE 12.75 GHz to 18 GHz.



(This plot is valid for all three channels).

FREQUENCY RANGE 18 GHz to 25 GHz.



(This plot is valid for all three channels).

Section 15.109. Receiver spurious radiation

SPECIFICATION

The field strength shall not exceed the following values:

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	300
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RESULTS:

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

All tests were performed in a semi-anechoic chamber at a distance of 3 m for the frequency range 30 MHz-1000 MHz and at distance of 1m for the frequency range 1 GHz-25 GHz.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyser. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

It is not possible to select individual receiving channels in the equipment under test. The equipment under test is set in inquiry scan mode with the receiver open and scanning through receiving channels.

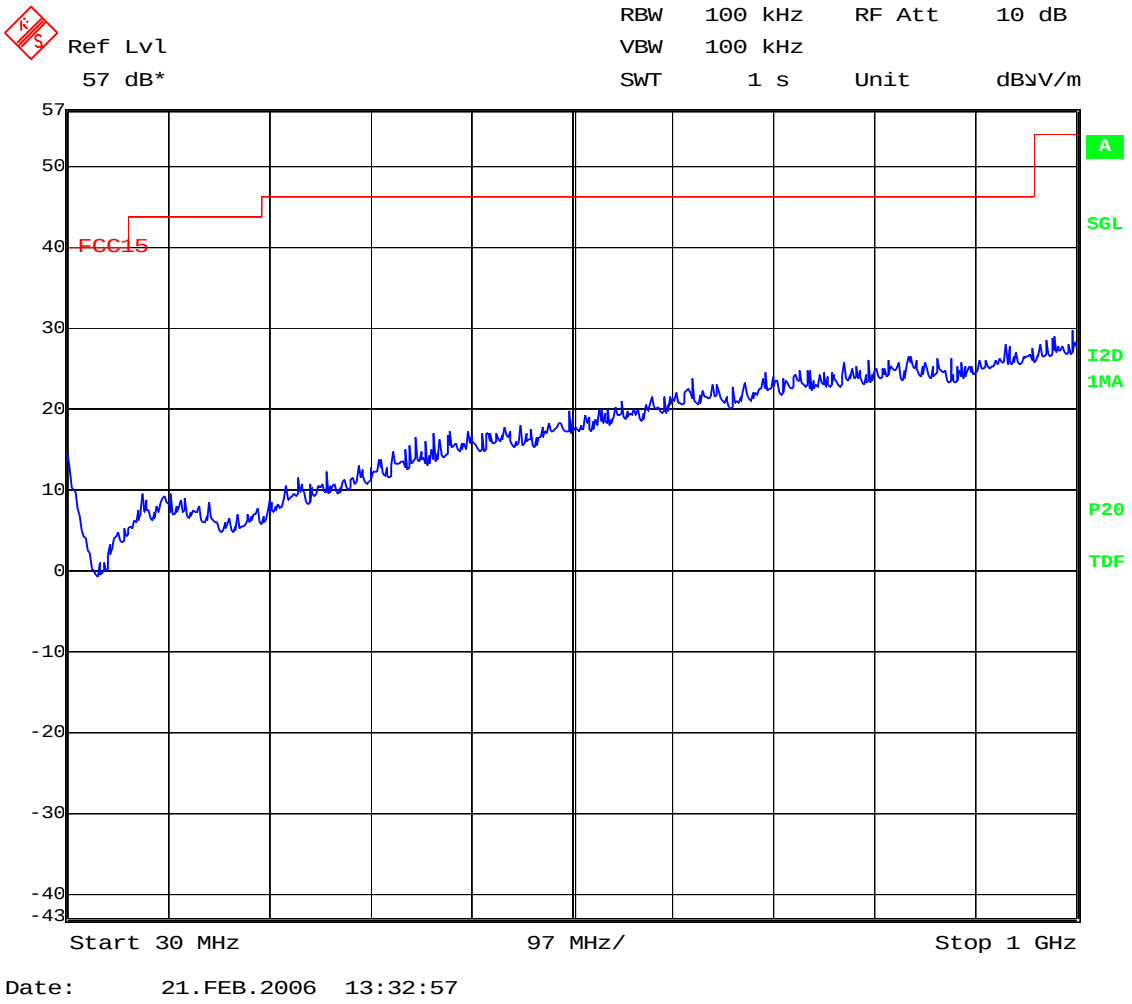
Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range

Frequency range 1 GHz-25 GHz.
No spurious signals were found in all the range

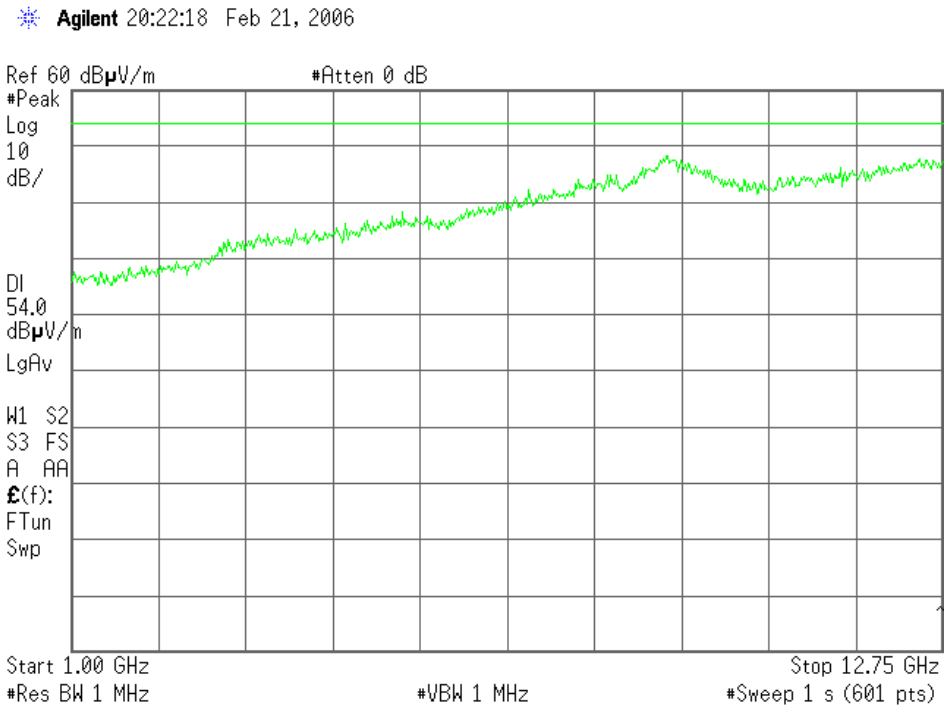
Additionally, no spurious signals were found inside the restricted bands 2310-2390 MHz and 2483.5-2500 MHz.

Verdict: PASS.

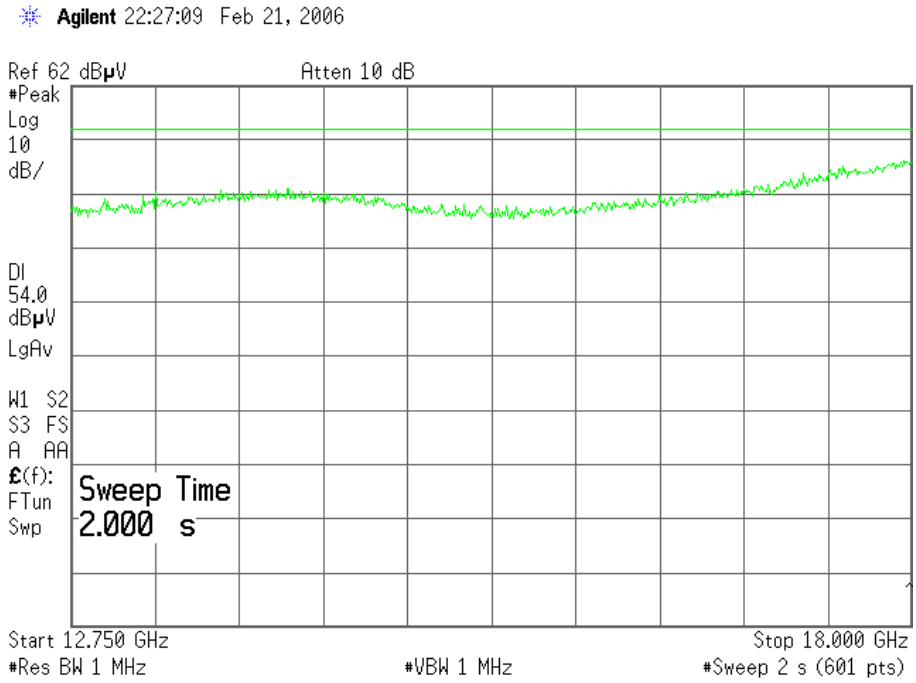
FREQUENCY RANGE 30 MHz-1000 MHz.



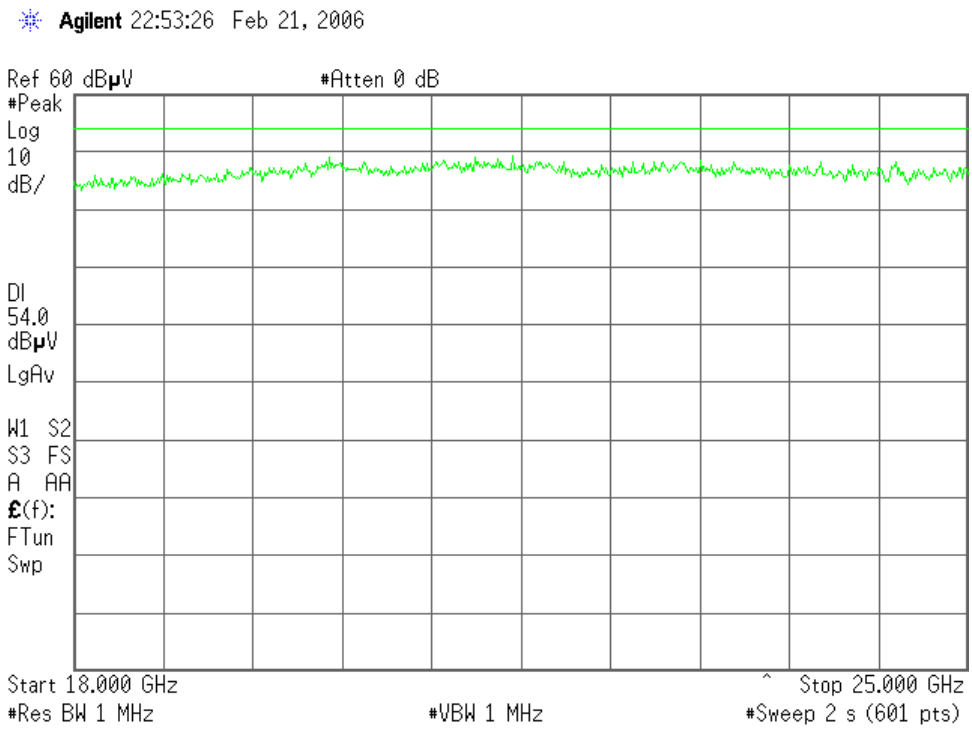
FREQUENCY RANGE 1 GHz-12.75 GHz.



FREQUENCY RANGE 12.75 GHz-18 GHz.



FREQUENCY RANGE 18 GHz-25 GHz.



ANNEX B

MEASURING RESULTS FOR

ELECTROMAGNETIC EMISSION

Report No: 23079RET.101

For the sample under test, named S/01, and that was formed by the elements described in the clause "Identification of the tested item/items" of this test report.

INDEX:

1. - CONTINUOUS CONDUCTED EMISSION, POWER LEADS ON THE SAMPLE S/01 3

2. - GRAPH RESULTS 4

* * *

1. - CONTINUOUS CONDUCTED EMISSION, POWER LEADS ON THE SAMPLE S/01

LIMITS OF INTERFERENCE

The applied limit for continuous conducted emissions in power leads, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range (MHz)	Limit (dBµV)	
	Quasi-peak	Average
0,15 to 0,5	66-56	56-46
0,5 to 5	56	46
5 to 30	60	50

TEST METHOD

According to Part 15, Subpart B of FCC Rules.

OPERATING MODES OF EUT

Different tested operating modes (OM)

- OM#01: EUT ON. Stand by mode. Linked with auxiliary PC to charger batteries.
- OM#02: EUT ON. Bluetooth mode. Linked with auxiliary mobile phone.

TEST RESULTS

CCmmnnxx: CC, Conduction condition°; mm: sample number; nn: operation mode; xx: wire.

- OM#01.

CDmmnnxx	Description	Result
CC01010N	Interference voltage on Neutral wire	PASS
CC0101L1	Interference voltage on phase wire	PASS

- OM#02.

CDmmnnxx	Description	Result
CC01020N	Interference voltage on Neutral wire	PASS
CC0102L1	Interference voltage on phase wire	PASS

2. - GRAPH RESULTS

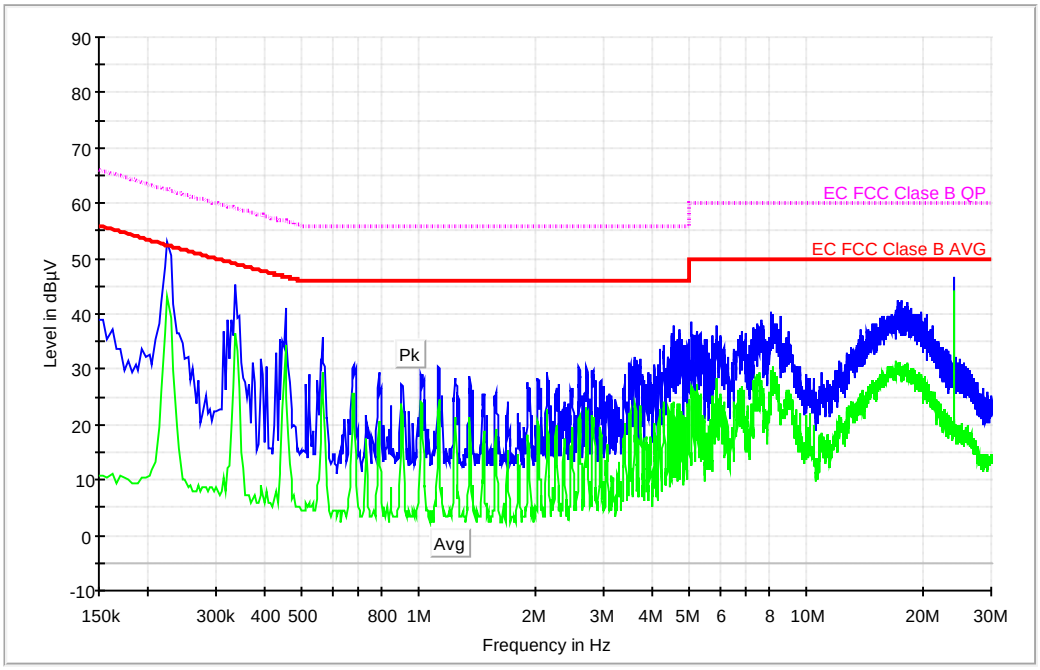
Continuous conducted emission: CC01010N (Peak and Average)

EMC32 Report

Test Information

Proyecto:	23079iem.002
Empresa:	VITEC
Muestra:	M/01
Modo operacion:	MO#01
Fecha:	2005-11-24 08:39
Setup:	EMI conducted
Mode:	EUT ON. Stand by mode.
Description	Neutral noise.

EC FCC Clase B ESIB26 CC



Acceptance Analysis

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.226000	53.0	43.1
0.338000	45.4	36.3
0.454000	41.1	34.4
4.534000	38.0	23.2
4.722000	37.1	23.7
8.102000	40.2	29.0
8.226000	40.0	30.2
17.522000	42.6	30.4
20.486000	40.2	27.2
24.010000	46.7	44.2

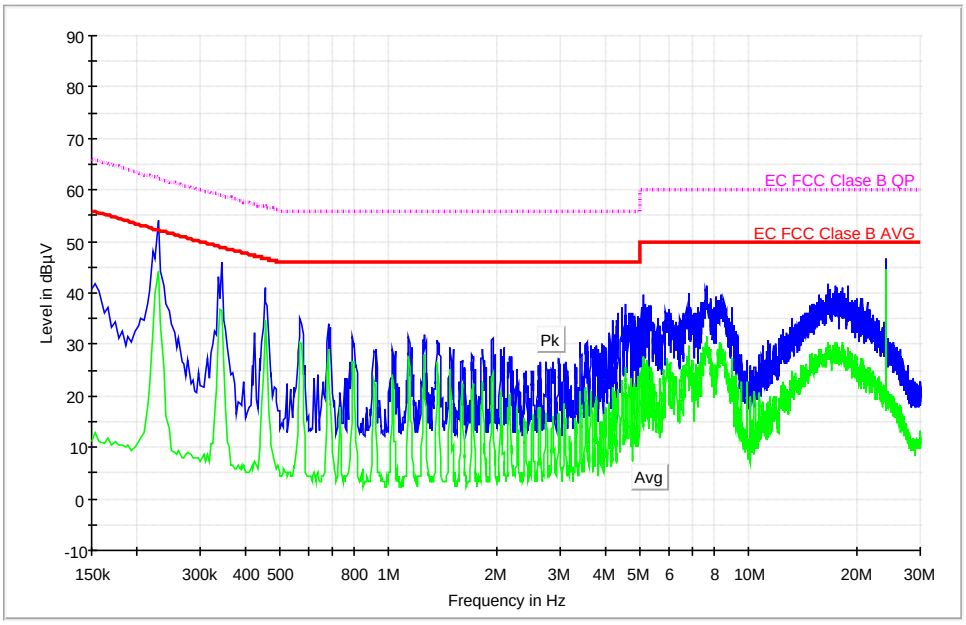
Continuous conducted emission: CC0101L1 (Peak and Average)

EMC32 Report

Test Information

Proyecto:	23079iem.002
Empresa:	VITEC
Muestra:	M/01
Modo operacion:	MO#01
Fecha:	2005-11-24 08:35
Setup:	EMI conducted
Mode:	EUT ON. Stand by mode.
Description	Phase noise.

EC FCC Clase B ESIB26 CC



Acceptance Analysis

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.230000	54.1	44.1
0.346000	46.0	36.6
0.454000	41.2	33.4
4.434000	36.8	19.7
4.462000	37.2	22.1
4.546000	37.9	22.7
4.690000	36.1	23.4
6.842000	40.0	28.5
7.638000	41.3	31.4
16.590000	41.9	30.3
17.482000	41.4	29.0
18.174000	41.2	30.0
18.974000	41.3	29.3
24.010000	46.7	44.6

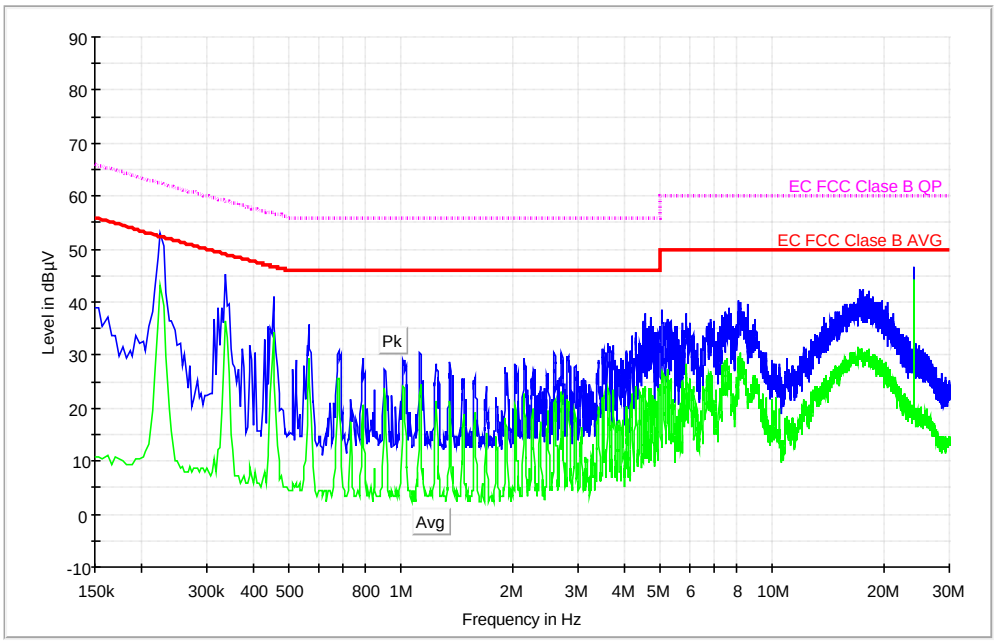
Continuous conducted emission: CC01020N (Peak and Average)

EMC32 Report

Test Information

Proyecto:	23079iem.002
Empresa:	VITEC
Muestra:	M/01
Modo operacion:	MO#02
Fecha:	2005-11-24 08:39
Setup:	EMI conducted
Mode:	EUT ON. Tx / Rx mode.
Description	Neutral noise.

EC FCC Clase B ESIB26 CC



Acceptance Analysis

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.226000	53.0	43.1
0.338000	45.4	36.3
0.454000	41.1	34.4
4.534000	38.0	23.2
4.722000	37.1	23.7
8.102000	40.2	29.0
8.226000	40.0	30.2
17.522000	42.6	30.4
20.486000	40.2	27.2
24.010000	46.7	44.2

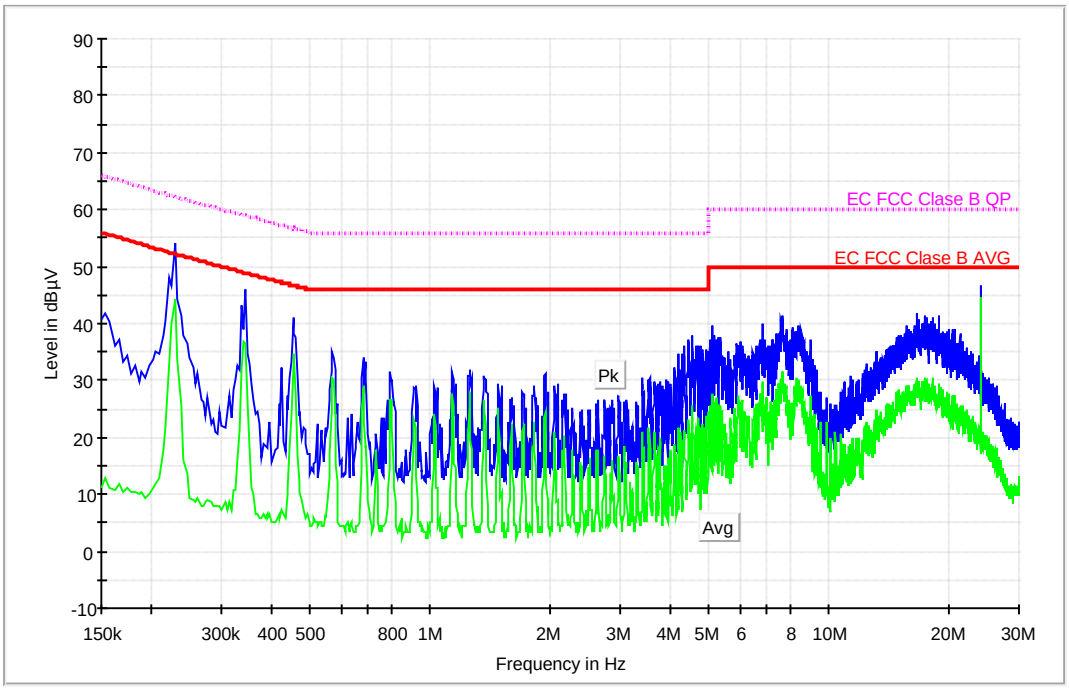
Continuous conducted emission: CC0102L1 (Peak and Average)

EMC32 Report

Test Information

Proyecto:	23079iem.002
Empresa:	VITEC
Muestra:	M/01
Modo operacion:	MO#02
Fecha:	2005-11-24 08:35
Setup:	EMI conducted
Mode:	EUT ON. Tx / Rx mode.
Description	Phase noise.

EC FCC Clase B ESIB26 CC



Acceptance Analysis

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.230000	54.1	44.1
0.346000	46.0	36.6
0.454000	41.2	33.4
4.434000	36.8	19.7
4.462000	37.2	22.1
4.546000	37.9	22.7
4.690000	36.1	23.4
6.842000	40.0	28.5
7.638000	41.3	31.4
16.590000	41.9	30.3
17.482000	41.4	29.0
18.174000	41.2	30.0
18.974000	41.3	29.3
24.010000	46.7	44.6

ANNEX C

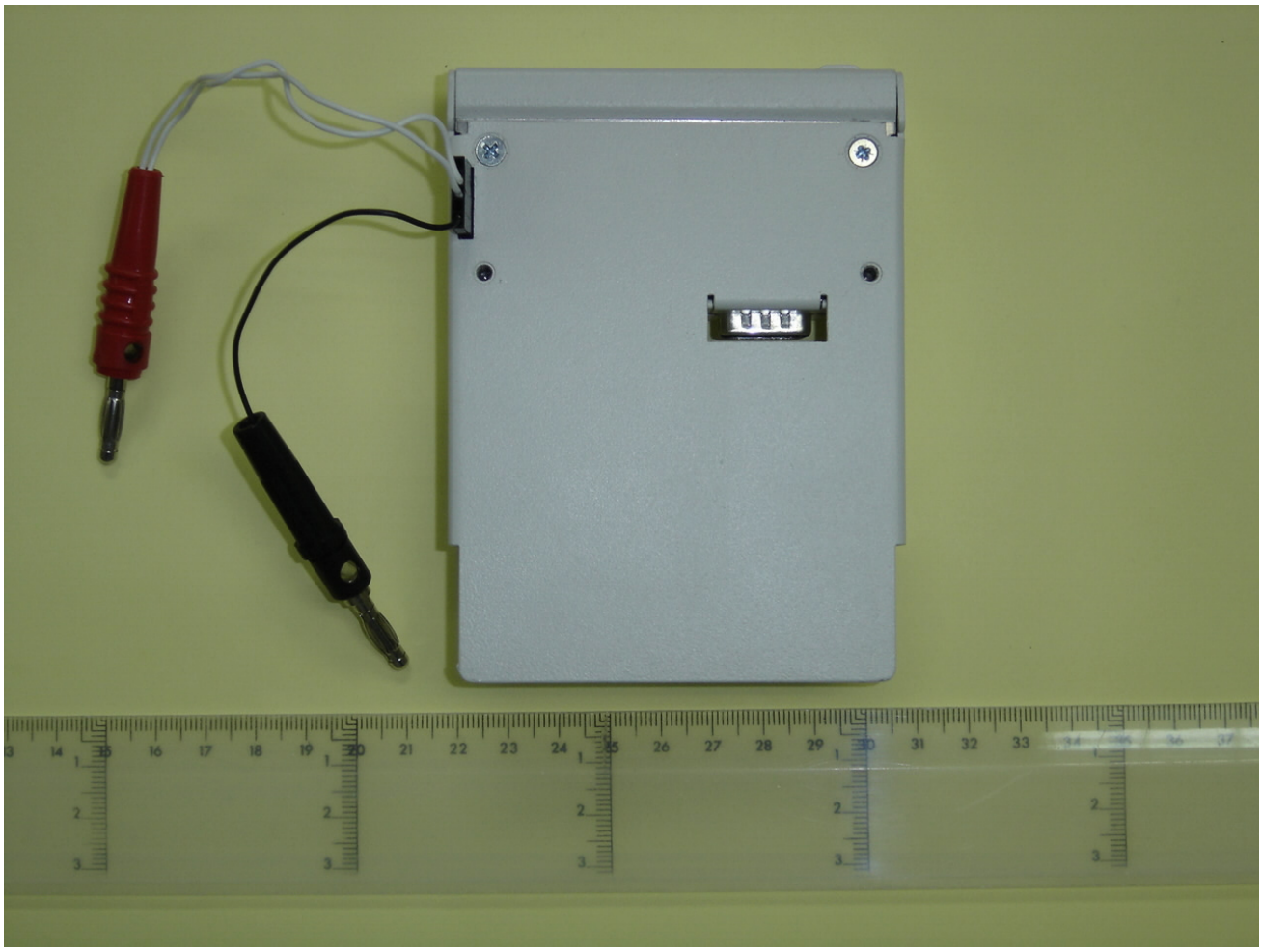
PHOTOGRAPHS
(Number of photographs: 7)

Report No.: 23079RET.101

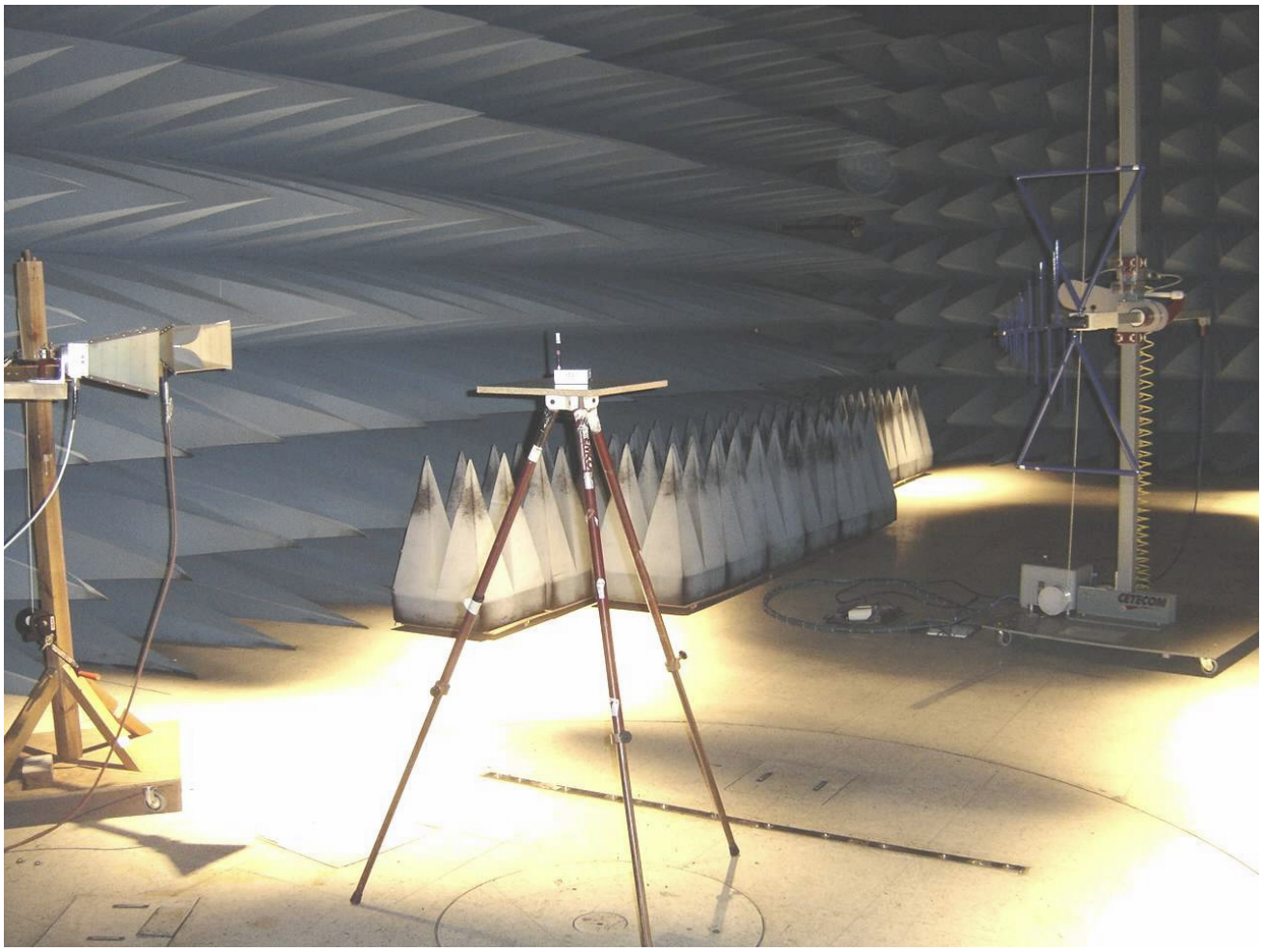
1. Equipment (front view).

2. Equipment (back view).

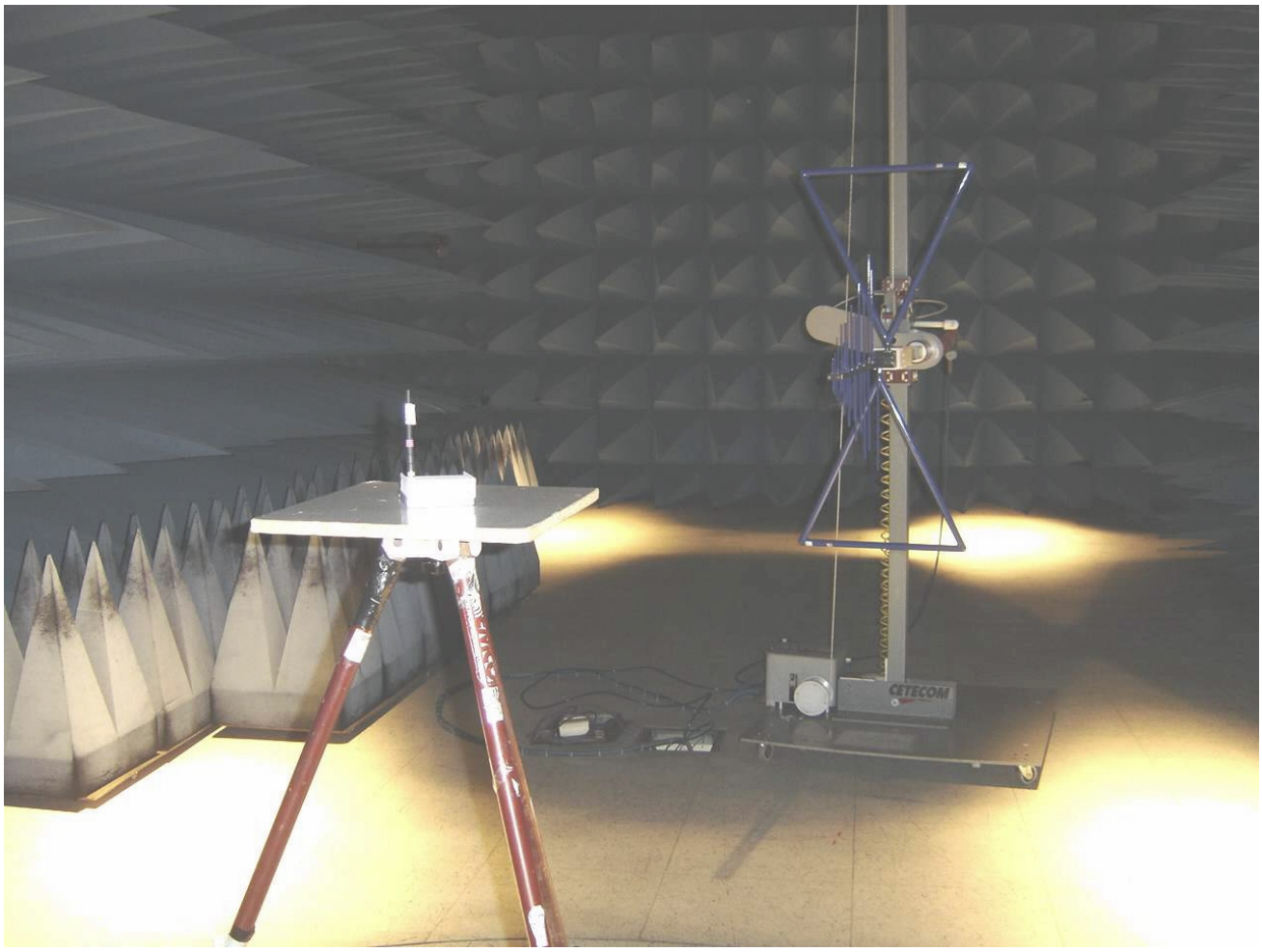
3. Equipment for conducted measurements.



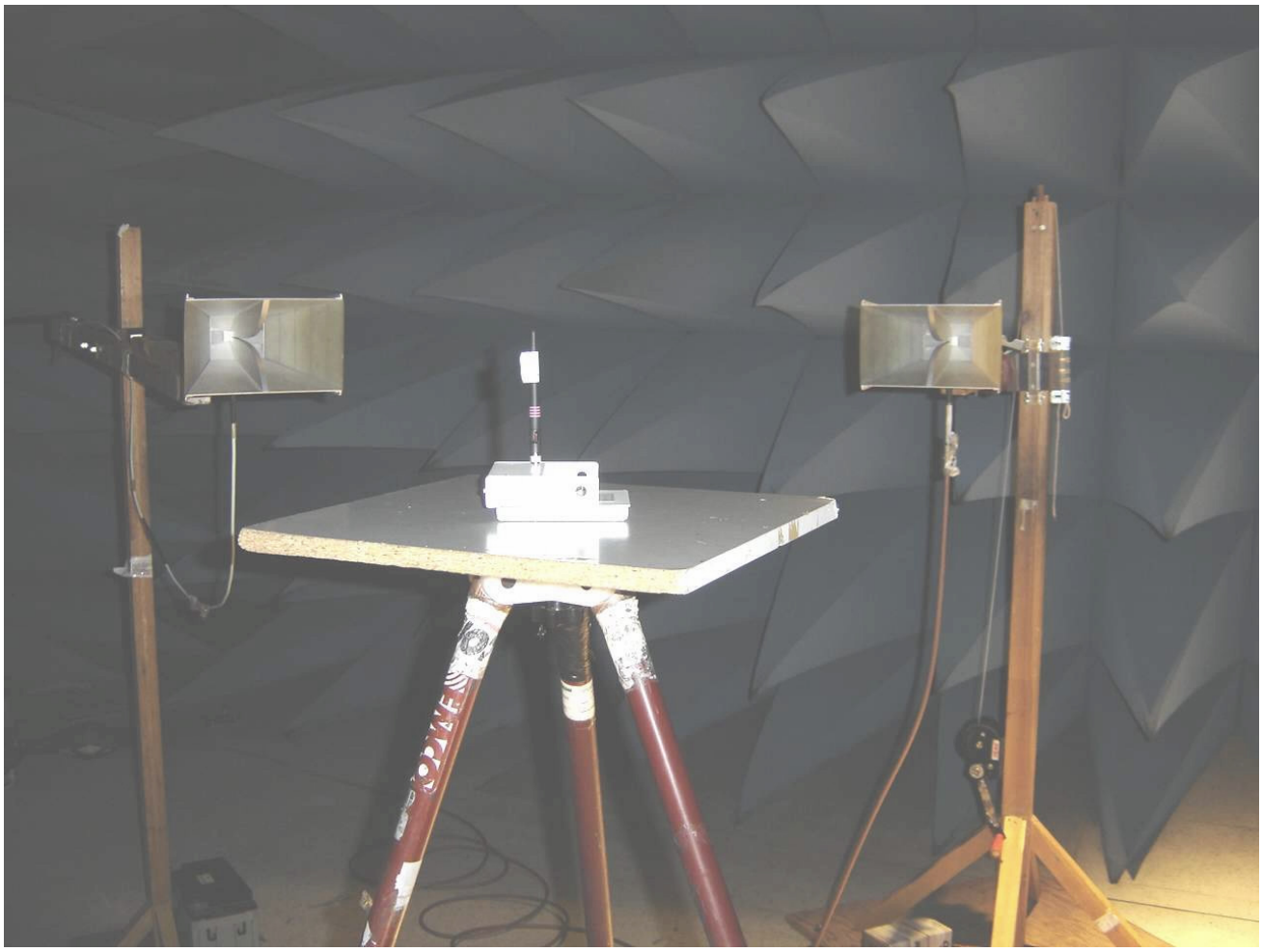
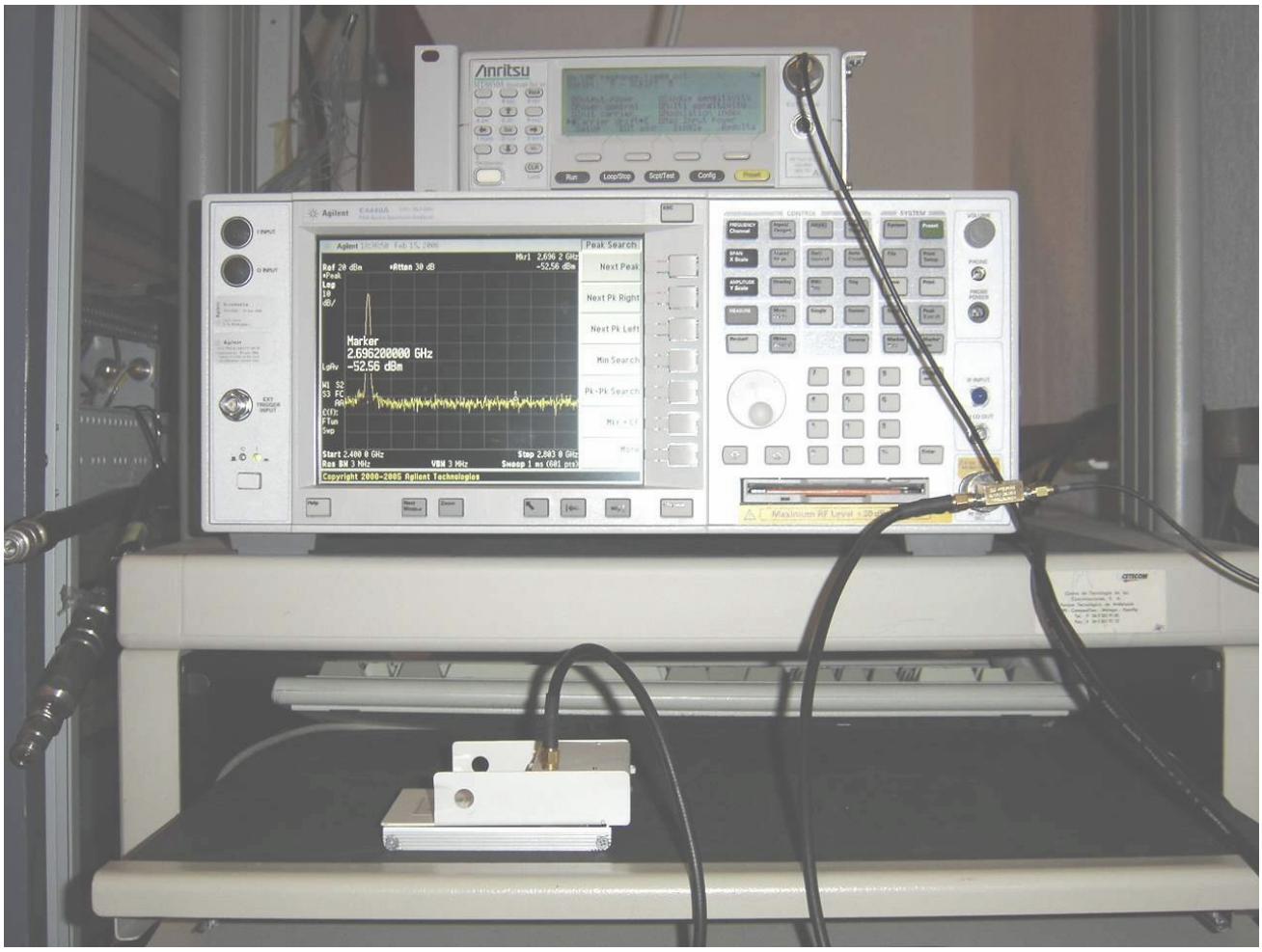
4. General test set-up for radiated measurements.



5. Test set-up for radiated measurements below 1 GHz.



6. Test set-up for radiated measurements above 1 GHz.



7. Test set-up for conducted measurements.