

TEST REPORT

ACCORDING TO: FCC part 15 subpart C, §15.247(b)(3), §15.247(d), §15.247(i) and subpart B

FOR:

Lipman Electronic Engineering Ltd.
Point of sale terminal
Model: Nurit 8010

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1 Applicant information

Client name: Lipman Electronic Engineering Ltd.
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Telephone: +972 3902 9730
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E-mail: adndrey@lipman.co.il
Contact name: Mr. Andrey Glemb

2 Equipment under test attributes

Product name: Point of sale terminal
Model(s): Nurit 8010
Serial number: 1002201653
Receipt date: 10/11/2005

3 Manufacturer information

Manufacturer name: Lipman Electronic Engineering Ltd.
Address: 11, Ha'amal street, Park Afeq, Rosh Ha'Ayin, 48092, Israel
Telephone: +972 3902 9730
Fax: +972 3902 9731
E-Mail: adndrey@lipman.co.il
Contact name: Mr. Andrey Glemb

4 Test details




Project ID: 16726
Location: Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel
Test started: 11/10/2005
Test completed: 1/27/2006
Test specification(s): FCC part 15 subpart C, §15.247(b)(3), §15.247(d), §15.247(i), and subpart B

5 Tests summary

Test	Status
Transmitter characteristics	
FCC section 15.247(a)2, 6 dB bandwidth	Not requested
FCC section 15.247(b)3, Peak output power	Pass
FCC section 15.247(i), RF exposure	Pass
FCC section 15.247(d), Radiated spurious emissions	Pass
FCC section 15.247(e), Peak power density	Not requested
FCC section 15.207(a), Conducted emission	Pass
Unintentional emissions	
FCC section 15.107, conducted emission at AC power port	Pass
FCC section 15.109, Radiated emission	Pass
FCC Part 15, Conducted emission at receiver antenna port	Not required

This test report replaces the previously issued test report identified by Doc ID:LIPRAD_FCC.16726.

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.

	Name and Title	Date	Signature
Tested by:	Mr. A. Adelberg, test engineer	January 27, 2006	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	January 29, 2006	
Approved by:	Mr. M. Nikishin, EMC and Radio group leader	January 30, 2006	

6 EUT description

6.1 General information

The EUT, NURIT 8010, is a point of sale terminal equipped with a transceiver that can access Wireless Local Area Networks (WLANs), used short-range wireless communications in home and office environments, retail stores, cafés, restaurants, and gasoline stations. They connect either directly to another WLAN terminal, or through an access point.

The NURIT 8010 terminals are designed to comply with the IEEE 802.11b standard. The EUT is powered by a rechargeable internal battery. Throughout the conducted emission testing in charging mode the EUT was powered by 120 VAC/8.4 VDC adapter manufactured by Lipman, model number TRF00067, serial number 0430. The EUT is unoperated during the charge.

6.2 Ports and lines

Port type	Port description	Connected		Connector type	Qty.	Cable type	Cable length	Indoor / outdoor
		From	To					
Power	8.4 VDC (charging mode)	EUT	AC/DC adapter	3-pin jack	1	Unshielded	2.2 m	Indoor
Power	AC power (charging mode)	AC/DC adapter	AC mains	Two-pole	1	NA	NA	Indoor

6.3 Operating frequencies

Source	Frequency, MHz					
Crystal	4.915	NA	NA	NA	NA	NA

6.4 Changes made in the EUT

A ferrite bead, P/N 28B0268000, manufactured by Steward, was installed at the antenna cable and the antenna cable was secured to plastic case.



6.5 Transmitter characteristics

Type of equipment					
	Stand-alone (Equipment with or without its own control provisions)				
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)				
X	Plug-in card (Equipment intended for a variety of host systems)				
Intended use		Condition of use			
	fixed	Always at a distance more than 2 m from all people			
X	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			
RF channel spacing		5 MHz			
Maximum rated output power		At transmitter 50 Ω RF output connector	16.1 dBm		
		Effective radiated power (for equipment with no RF connector)	17.1 dBm		
Is transmitter output power variable?		No			
		X	Yes	continuous variable	
				stepped variable with stepsize	dB
				minimum RF power	dBm
		maximum RF power	dBm		
Antenna connection					
	unique coupling	standard connector	X integral		
			X with temporary RF connector without temporary RF connector		
Antenna/s technical characteristics					
Type	Manufacturer	Model number	Gain		
Onmi directional	MARS Antenna&RF systems	MA-WE2458-L2	1.0 dBi		
Transmitter 99% power bandwidth		10 MHz			
Transmitter aggregate data rate/s		1.0, 2.0, 5.5 and 11.5 Mbps			
Type of modulation		DBSK (1 Mbps), DQPSK (2 Mbps), CCK (5.5 and 11.5 Mbps)			
Maximum transmitter duty cycle in normal use		100 %	Tx ON time Period		
Transmitter duty cycle supplied for test		100 %	Tx ON time msec Period msec		
Transmitter power source					
X	Battery	Nominal rated voltage	7.4 VDC Battery type Lithium		
X	DC (charging mode)	Nominal rated voltage	8.4 VDC		
Common power source for transmitter and receiver		X	yes no		
Spread spectrum parameters for transmitters tested per FCC 15.247 only					
DSSS	Chip sequence length	NA			
	Spectrum width	10 MHz			

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:	10/12/2005		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 52 %	Power Supply: 7.4 V battery
Remarks:			

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

7.1 Peak output power

7.1.1 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 7.1.1.

Table 7.1.1 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			

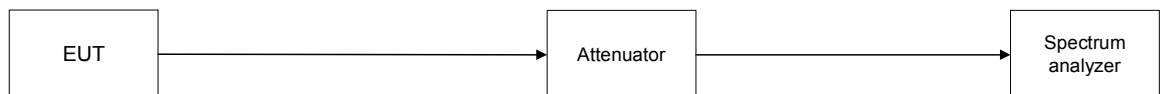
7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.

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

7.1.2.3 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 7.1.2 and associated plots.

Figure 7.1.1 Peak output power test setup



Photograph 7.1.1 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: 10/12/2005			
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 52 %	Power Supply: 7.4 V battery
Remarks:			

Table 7.1.2 Peak output power test results

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
 MODULATING SIGNAL: PRBS
 BIT RATE: 5.5 Mbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 1 MHz
 CARD NUMBER: 050822301193

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak output power, dBm	Limit, dBm	Margin*, dB	Verdict
Rate: 11 Mbps							
2412	15.9	Included	Included	15.9	30.0	-14.1	Pass
2437	16.1	Included	Included	16.1	30.0	-13.9	Pass
2462	15.1	Included	Included	15.1	30.0	-14.9	Pass

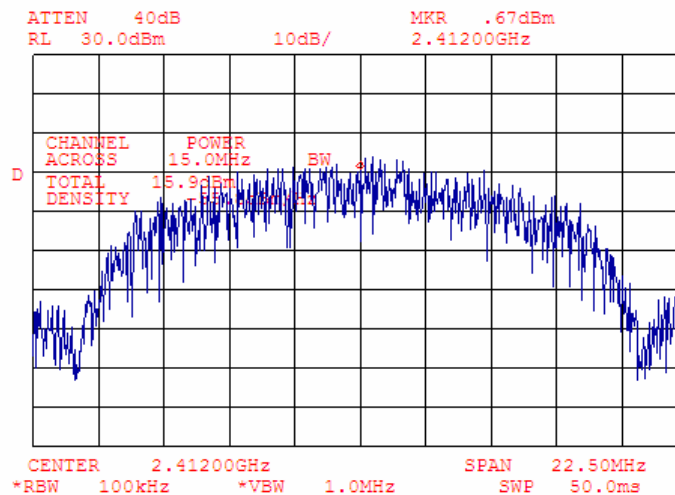
* - Margin = Peak output power – specification limit.

Reference numbers of test equipment used

HL 1424							
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Full description is given in Appendix A.

Plot 7.1.1 Peak output power at low frequency



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

7.2 Field strength of spurious emissions

7.2.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits given in Table 7.2.1.

Table 7.2.1 Radiated spurious emissions limits

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

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

$$\text{Lims}_2 = \text{Lims}_1 + 40 \log (S_1/S_2),$$

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.

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

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and the performance check was conducted. The testing was performed in 3 orthogonal positions.

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

7.2.2.3 The worst test results (the lowest margins) were found in X-axis position, recorded and shown in the associated plots.

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

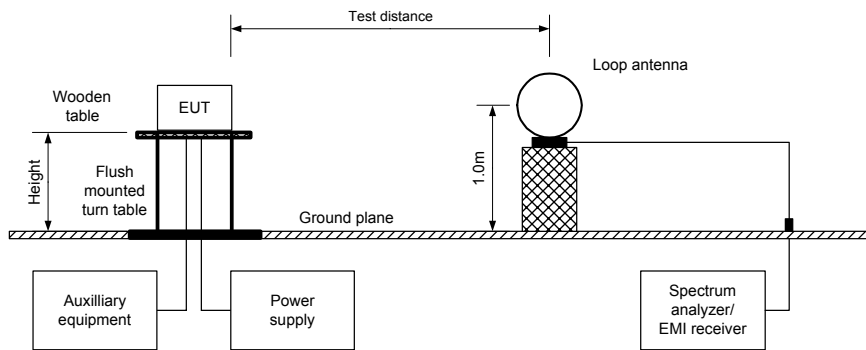
7.2.3.1 The EUT was set up as shown in Figure 7.2.2, energized and the performance check was conducted. The testing was performed in 3 orthogonal positions.

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

7.2.3.3 The worst test results (the lowest margins) were found in X-axis position, recorded and shown in the associated plots.

Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Figure 7.2.1 Setup for spurious emission field strength measurements below 30 MHz

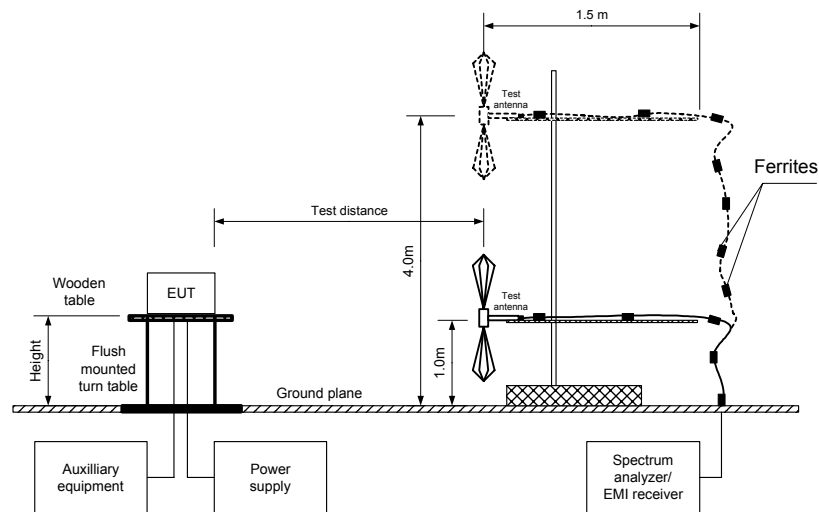


Photograph 7.2.1 Setup for spurious emission field strength measurements below 30 MHz



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Figure 7.2.2 Setup for spurious emission field strength measurements above 30 MHz



Photograph 7.2.2 Setup for spurious emission field strength measurements from 30 to 1000 MHz



Test specification:		FCC section 15.247(d), 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:	1/26/2006		
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Photograph 7.2.3 Setup for spurious emission field strength measurements from 1 to 6.5 GHz



Photograph 7.2.4 Setup for spurious emission field strength measurements, close view



Test specification:		FCC section 15.247(d), 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:	1/26/2006		
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Photograph 7.2.5 Setup for spurious emission field strength measurements from 14 to 18 GHz



Photograph 7.2.6 Setup for spurious emission field strength measurements from 18 to 25 GHz



Test specification: FCC section 15.247(d), 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: 1/26/2006	
Temperature: 21°C	Air Pressure: 1008 hPa
Relative Humidity: 48 %	
Power Supply: 7.4 V battery	
Remarks:	

Table 7.2.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: CCK
 MODULATING SIGNAL: 255
 BIT RATE: 5.5 Mbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 15.9 dBm at low carrier frequency
 16.1 dBm at mid carrier frequency
 15.1 dBm at high carrier frequency
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength of spurious, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(μV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
Low carrier frequency									
720.094	46.6	Horizontal	1.15	88	100.4	53.8	20.0	33.8	Pass
Mid carrier frequency									
720.088	46.5	Horizontal	1.15	90	100.3	53.8	20.0	33.8	Pass
High carrier frequency									
720.088	46.4	Horizontal	1.15	93	100.7	54.3	20.0	34.3	Pass

*- EUT front panel refers to 0 degrees position of turntable.

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

Test specification: FCC section 15.247(d), 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: 1/26/2006	
Temperature: 21°C	Air Pressure: 1008 hPa
Relative Humidity: 48 %	
Power Supply: 7.4 V battery	
Remarks:	

Table 7.2.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: CCK
 MODULATING SIGNAL: 255
 BIT RATE: 5.5 Mbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 15.9 dBm at low carrier frequency
 16.1 dBm at mid carrier frequency
 15.1 dBm at high carrier frequency
 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***	
Bit rate 1 Mbps											
Low carrier											
2375.1	H	1.0	93	55.8	74.0	-18.2	49.7	49.7	54.0	-6.3	Pass
High carrier											
2374.3	H	1.0	98	57.4	74.0	-16.6	47.9	47.9	54.0	-6.1	Pass
Bit rate 11 Mbps											
Low carrier											
2483.5	H	1.0	91	52.9	74.0	-21.1	47.1	47.1	54.0	-6.9	Pass
High carrier											
2499.3	H	1.0	94	52.8	74.0	-21.2	43.4	43.4	54.0	-10.6	Pass
Second harmonics											
Low carrier											
4.824.0	H	1.0	112	51.9	74.0	-22.1	51.9	51.9	54.0	-2.1	Pass
Mid carrier											
4874.1	H	1.0	109	52.2	74.0	-21.8	52.2	52.2	54.0	-1.8	Pass
High carrier											
4924.1	H	1.0	107	50.2	74.0	-23.8	50.2	50.2	54.0	-3.8	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 7.2.4 Average factor calculation

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

*- Average factor was calculated as follows

for pulse train shorter than 100 ms:

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

for pulse train longer than 100 ms:

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

Test specification: FCC section 15.247(d), 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: 1/26/2006	
Temperature: 21°C	Air Pressure: 1008 hPa
Relative Humidity: 48 %	
Power Supply: 7.4 V battery	
Remarks:	

Table 7.2.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: FSK / PSK / QAM
 MODULATING SIGNAL: 255
 BIT RATE: 5.5 Mbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 15.9 dBm at low carrier frequency
 16.1 dBm at mid carrier frequency
 15.1 dBm at high carrier frequency
 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*				
No spurious emissions were found								Pass

*- Margin = Measured emission - specification limit.

** - EUT front panel refer to 0 degrees position of turntable.

Table 7.2.6 Restricted bands

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

Reference numbers of test equipment used

HL 0446	HL 0521	HL 0589	HL 0592	HL 0593	HL 0594	HL 0604	HL 0768
HL 1424	HL 1425	HL 1567	HL 1941	HL 1947	HL 1984	HL 2009	HL 2259
HL 2260							

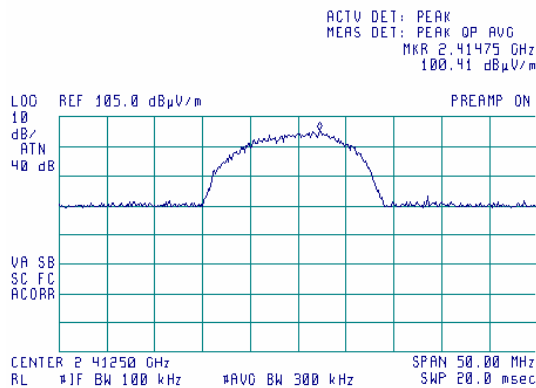
Full description is given in Appendix A.

Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.1 Radiated emission measurements at the low carrier frequency

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

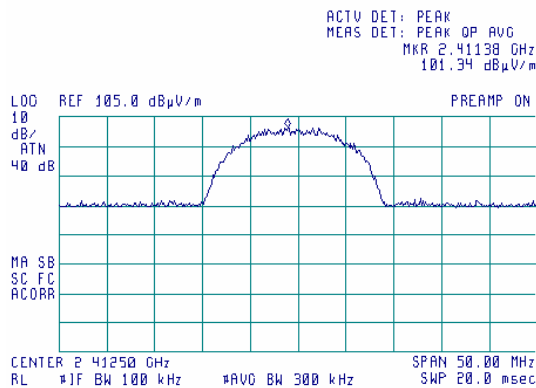
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Plot 7.2.2 Radiated emission measurements at the low carrier frequency

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

13:11:53 JAN 27, 2006

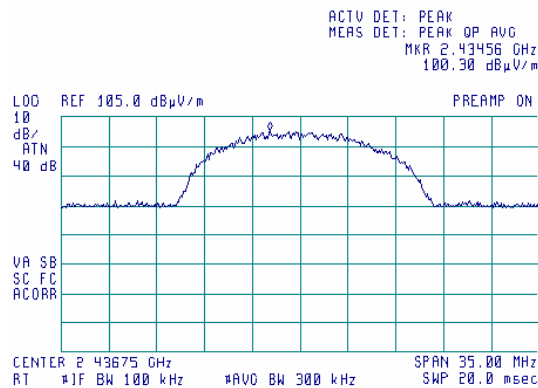


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.3 Radiated emission measurements at the mid carrier frequency

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

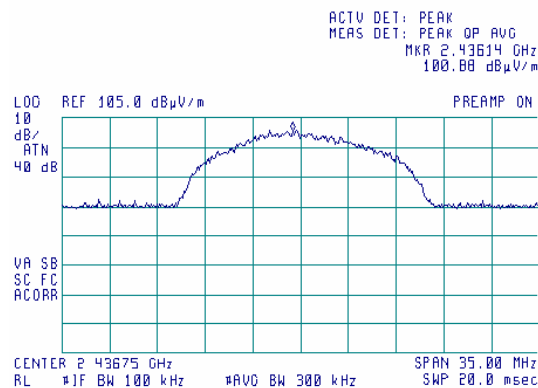
13:20:14 JAN 27, 2006



Plot 7.2.4 Radiated emission measurements at the mid carrier frequency

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

13:22:47 JAN 27, 2006

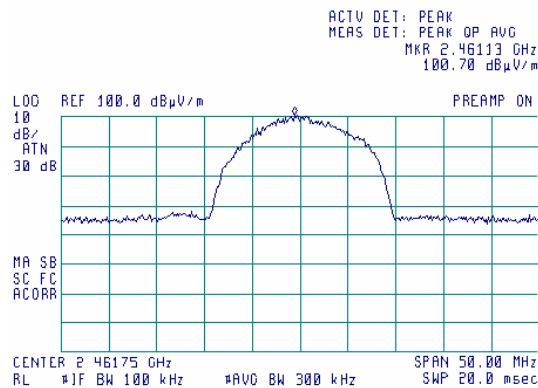


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.5 Radiated emission measurements at the high carrier frequency

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

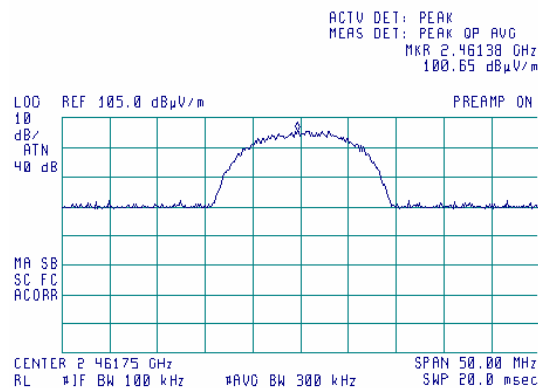
13:02:20 JAN 27, 2006



Plot 7.2.6 Radiated emission measurements at the high carrier frequency

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

13:05:00 JAN 27, 2006

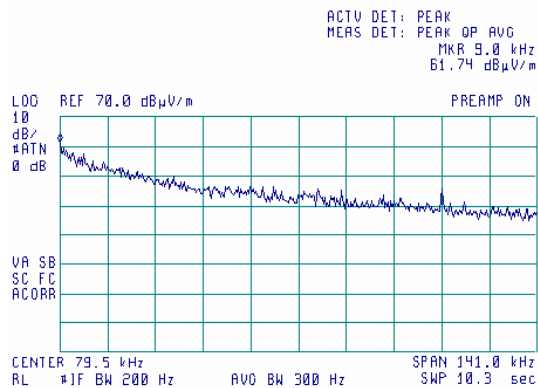


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.7 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

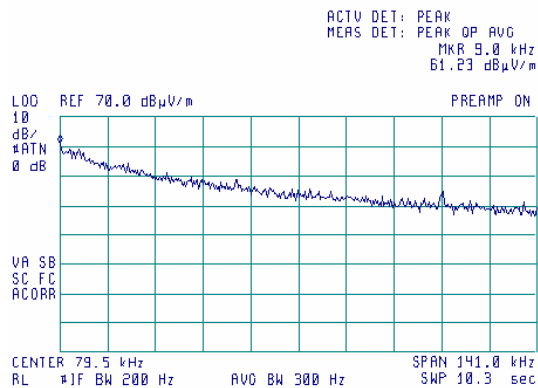
14:41:28 OCT 21, 2005



Plot 7.2.8 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

14:45:55 OCT 21, 2005

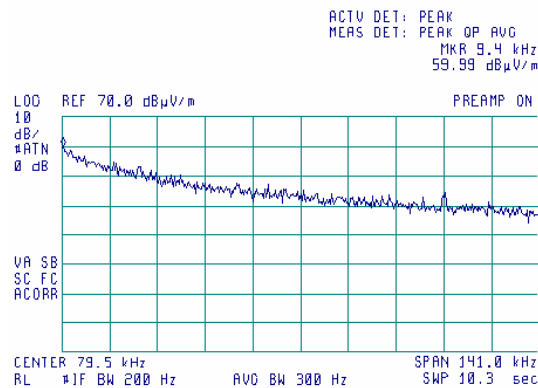


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.9 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

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

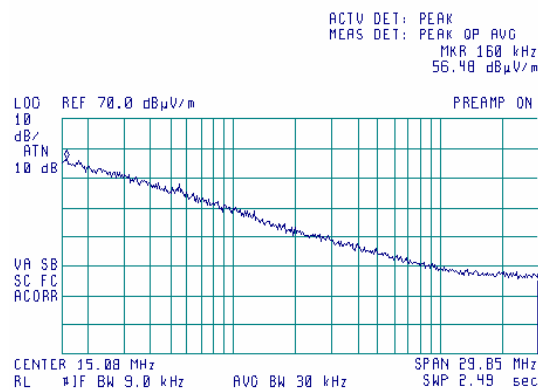
14:49:10 OCT 21, 2005



Plot 7.2.10 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

14:52:12 OCT 21, 2005

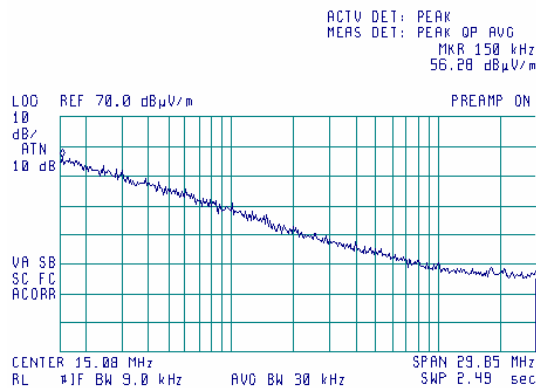


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.11 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

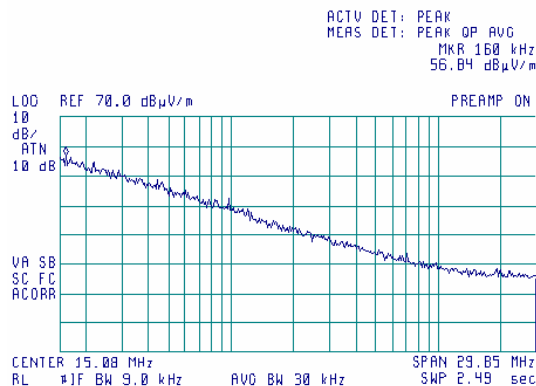
14:53:36 OCT 21, 2005



Plot 7.2.12 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

14:55:13 OCT 21, 2005

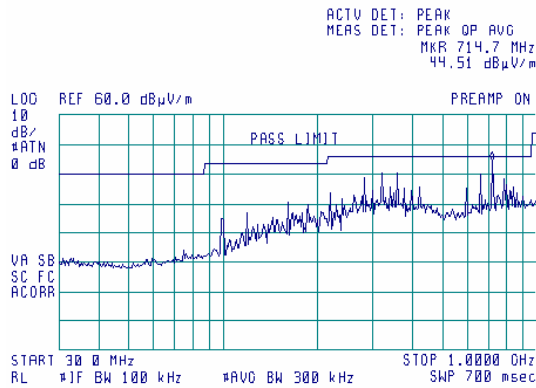


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.13 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

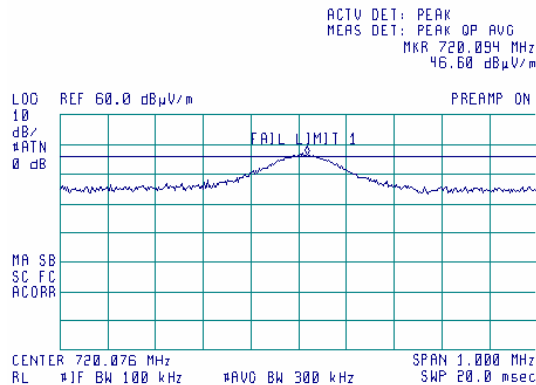
12:01:24 JAN 27, 2006



Plot 7.2.14 Radiated emission measurements at 720 MHz at the low carrier frequency

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

12:00:25 JAN 27, 2006

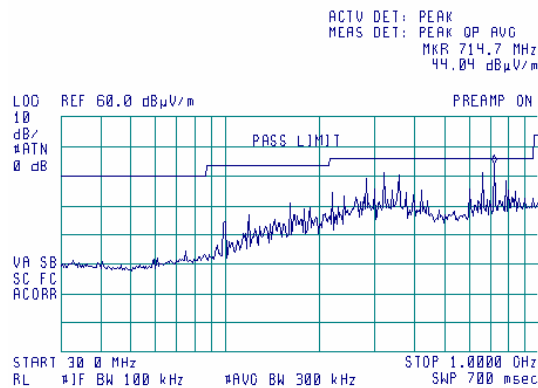


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.15 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

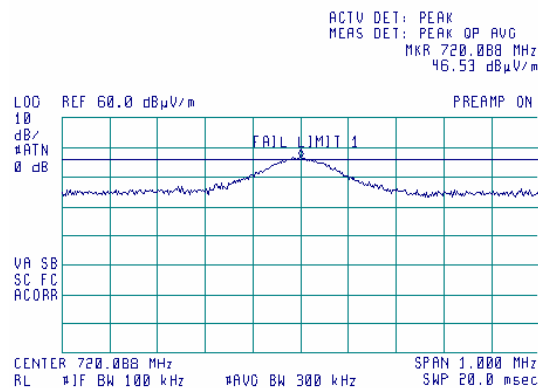
12:28:25 JAN 27, 2006



Plot 7.2.16 Radiated emission measurements at 720 MHz at the mid carrier frequency

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

12:33:22 JAN 27, 2006

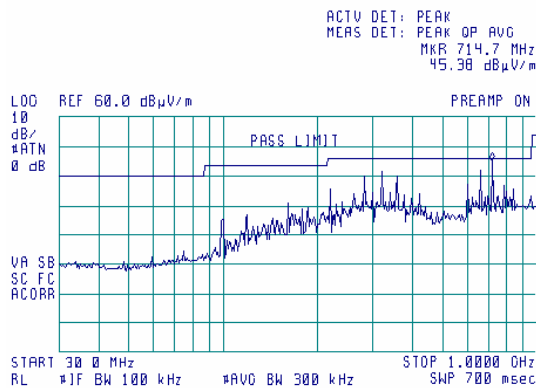


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance			Verdict: PASS
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.17 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

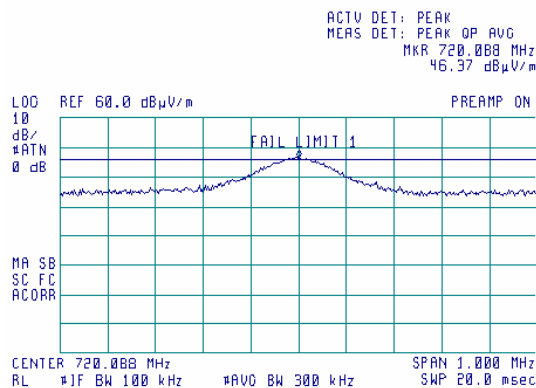
12:40:38 JAN 27, 2006



Plot 7.2.18 Radiated emission measurements at 720 MHz at the high carrier frequency

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

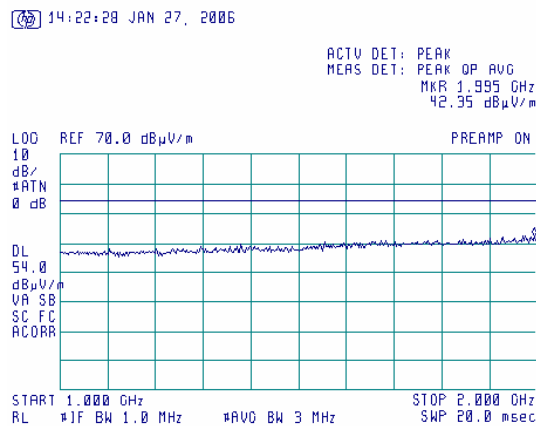
12:36:22 JAN 27, 2006



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

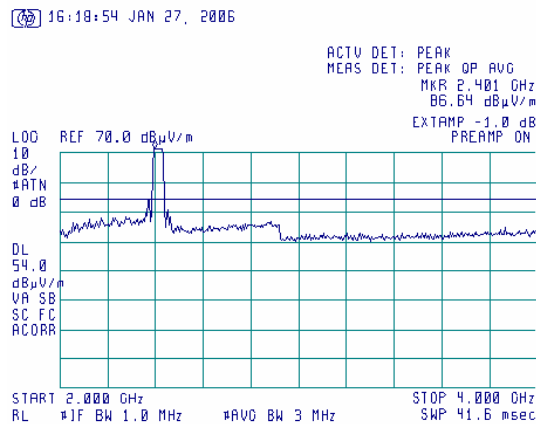
Plot 7.2.19 Radiated emission measurements from 1000 to 2000 MHz at the low carrier frequency

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



Plot 7.2.20 Radiated emission measurements from 2000 to 4000 MHz at the low carrier frequency

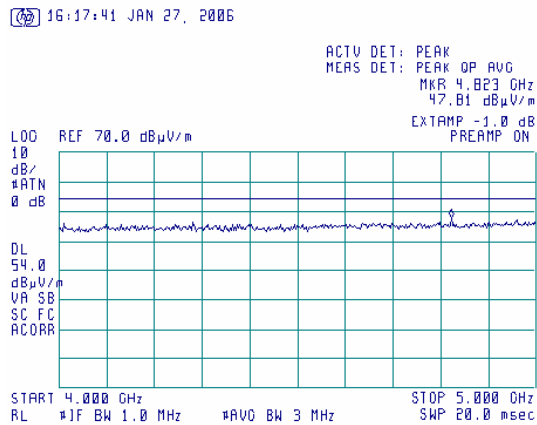
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

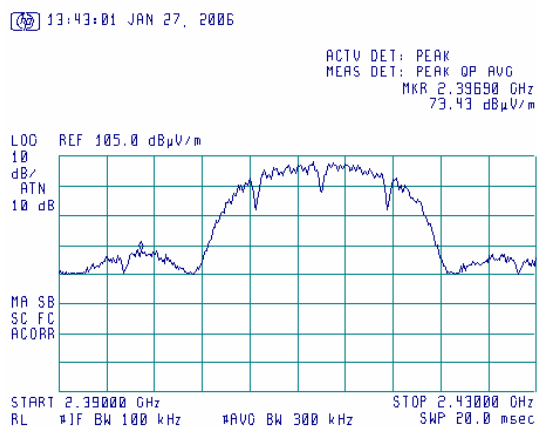
Plot 7.2.21 Radiated emission measurements from 4000 to 5000 MHz at the low carrier frequency

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



Plot 7.2.22 Radiated emission measurements at band edge at the low carrier frequency, bitrate 1 MBit/s

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

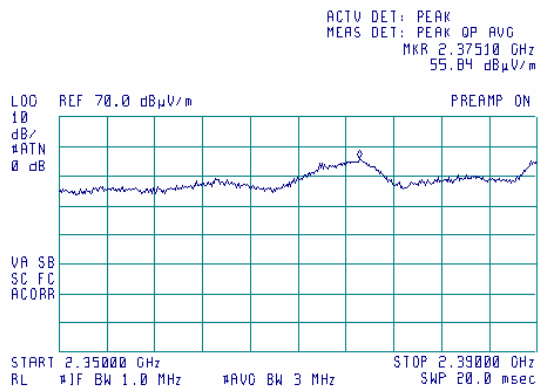


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.23 Radiated emission measurements at band edge at the low carrier frequency, bitrate 1 MBit/s

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

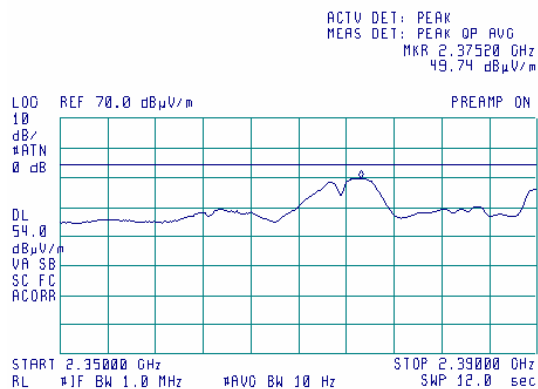
13:58:08 JAN 27, 2006



Plot 7.2.24 Radiated emission measurements at band edge at the low carrier frequency, bitrate 1 MBit/s

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

14:00:25 JAN 27, 2006

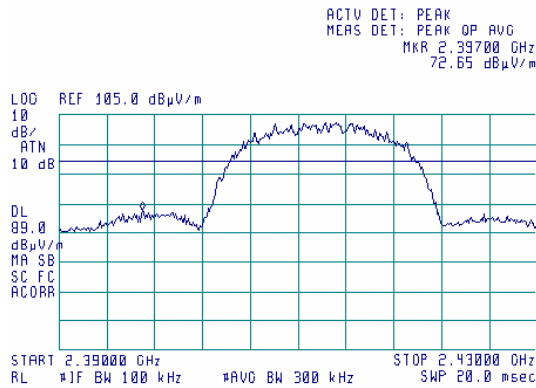


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.25 Radiated emission measurements at band edge at the low carrier frequency, bitrate 11 MBit/s

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

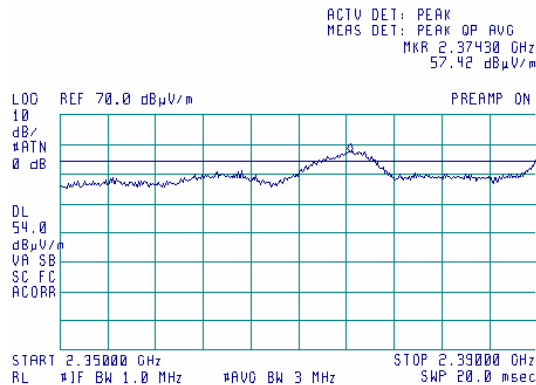
14:41:58 JAN 27, 2006



Plot 7.2.26 Radiated emission measurements at band edge at the low carrier frequency, bitrate 11 MBit/s

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

14:46:54 JAN 27, 2006

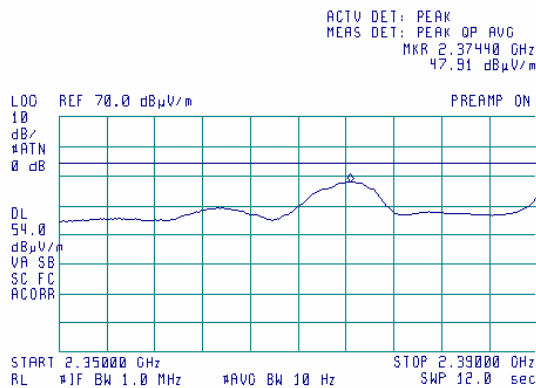


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance			Verdict: PASS
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.27 Radiated emission measurements at band edge at the low carrier frequency, bitrate 11 MBit/s

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

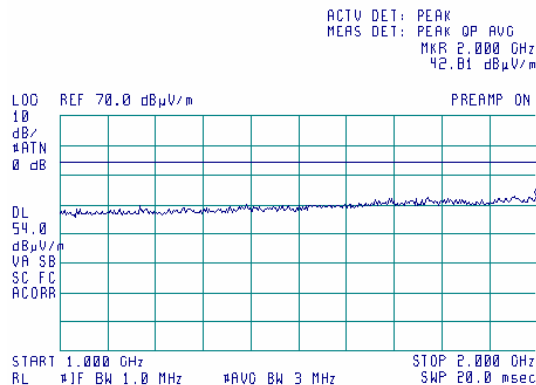
14:48:20 JAN 27, 2006



Plot 7.2.28 Radiated emission measurements from 1000 to 2000 MHz at the mid carrier frequency

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

14:52:36 JAN 27, 2006

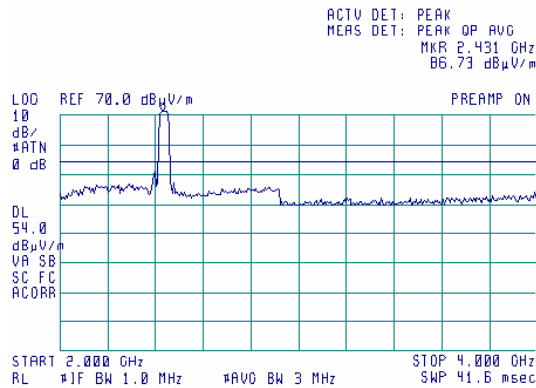


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.29 Radiated emission measurements from 2000 to 4000 MHz at the mid carrier frequency

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

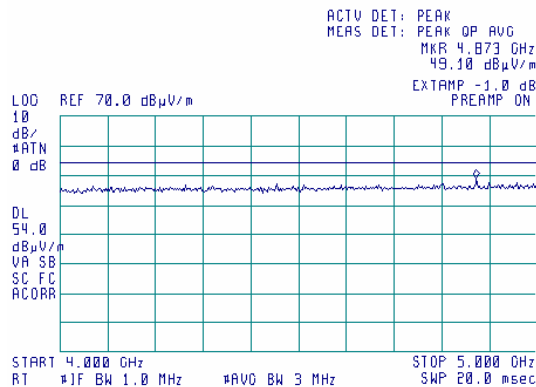
16:09:18 JAN 27, 2006



Plot 7.2.30 Radiated emission measurements from 4000 to 5000 MHz at the mid carrier frequency

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

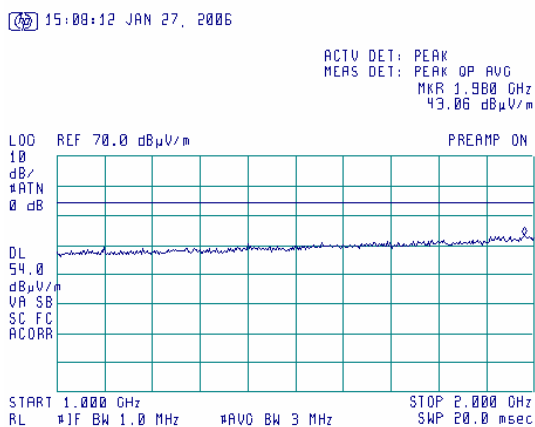
16:06:54 JAN 27, 2006



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

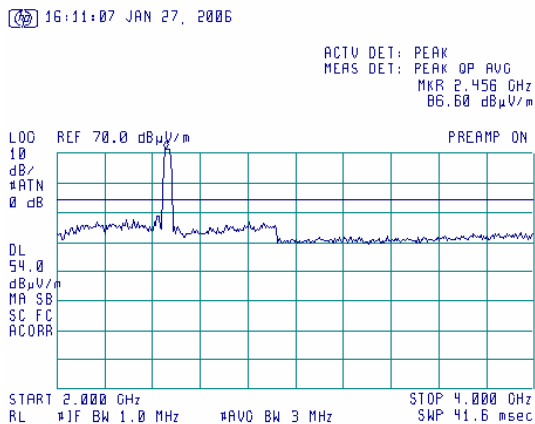
Plot 7.2.31 Radiated emission measurements from 1000 to 2000 MHz at the high carrier frequency

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



Plot 7.2.32 Radiated emission measurements from 2000 to 4000 MHz at the high carrier frequency

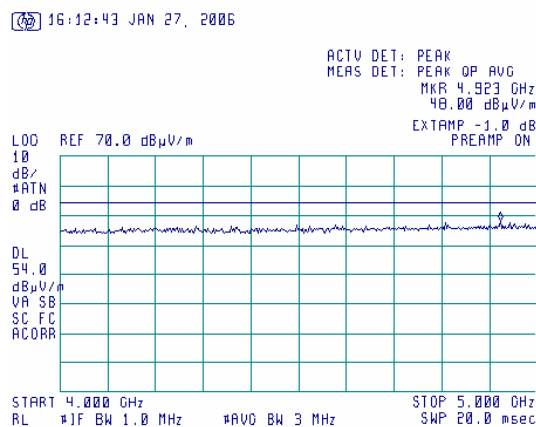
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

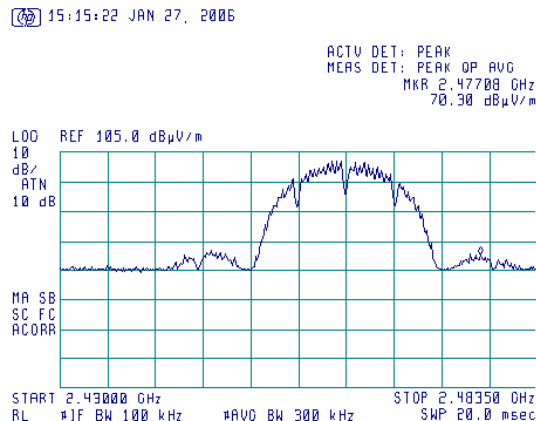
Plot 7.2.33 Radiated emission measurements from 4000 to 5000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.34 Radiated emission measurements at band edge at the high carrier frequency, bitrate 1 MBit/s

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

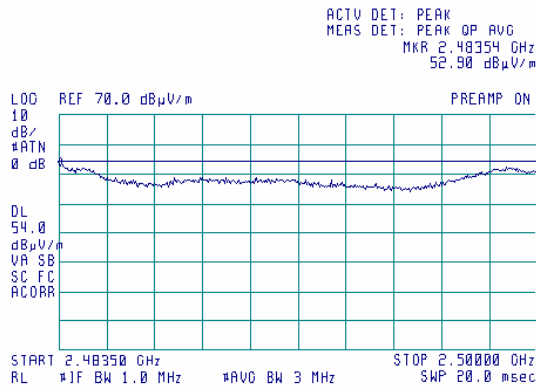


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.35 Radiated emission measurements at band edge at the high carrier frequency, bitrate 1 MBit/s

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

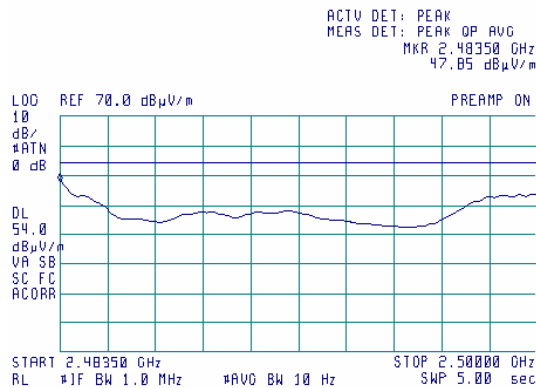
15:19:46 JAN 27, 2006



Plot 7.2.36 Radiated emission measurements at band edge at the high carrier frequency, bitrate 1 MBit/s

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

15:22:49 JAN 27, 2006



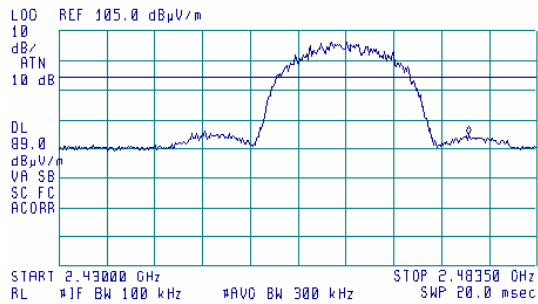
Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.37 Radiated emission measurements at band edge at the high carrier frequency, bitrate 11 MBit/s

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

15:33:12 JAN 27, 2006

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.47500 GHz
69.60 dBµV/m

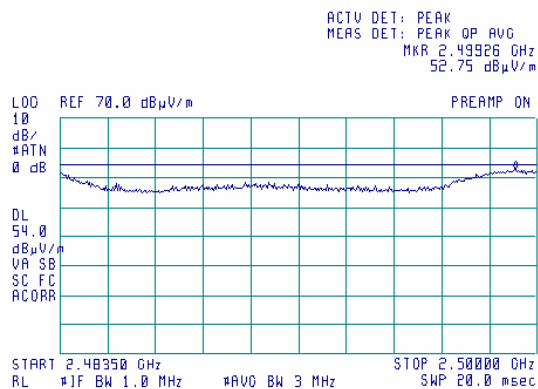


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.38 Radiated emission measurements at band edge at the high carrier frequency, bitrate 11 MBit/s

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

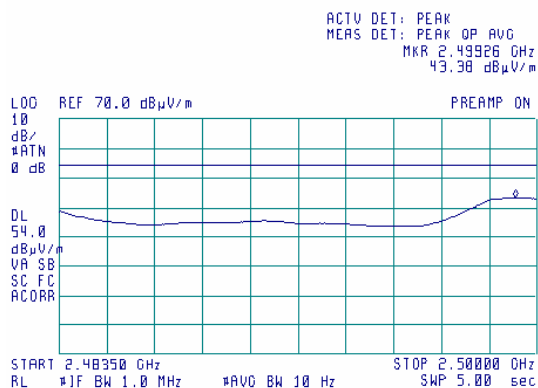
15:29:24 JAN 27, 2006



Plot 7.2.39 Radiated emission measurements at band edge at the high carrier frequency, bitrate 11 MBit/s

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

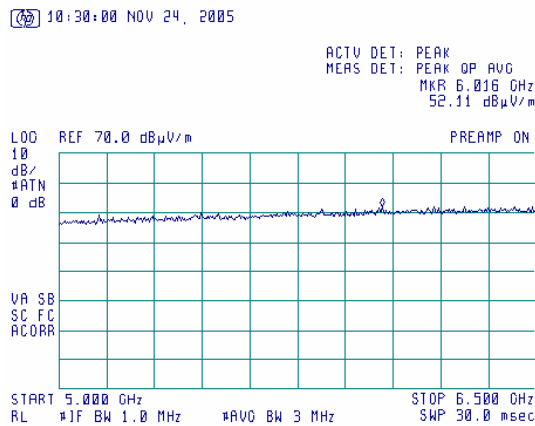
15:27:02 JAN 27, 2006



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.40 Radiated emission measurements from 5000 to 6500 MHz at the low carrier frequency

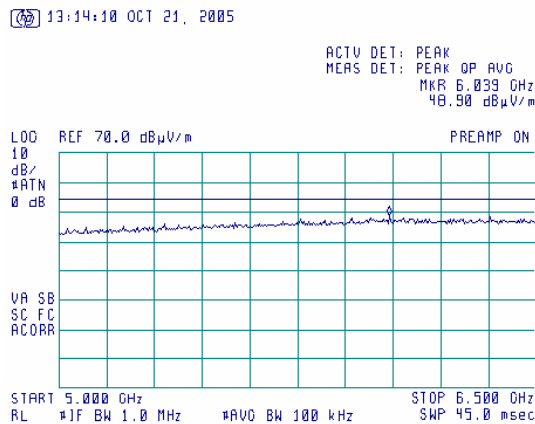
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Peak Limit 74 dBμV/m

Plot 7.2.41 Radiated emission measurements from 5000 to 6500 MHz at the low carrier frequency

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

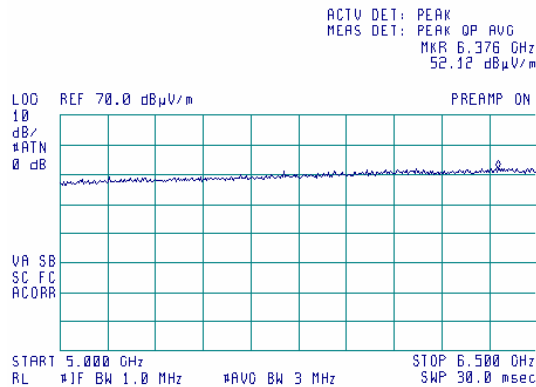


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.42 Radiated emission measurements from 5000 to 6500 MHz at the mid carrier frequency

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

10:31:29 NOV 24, 2005

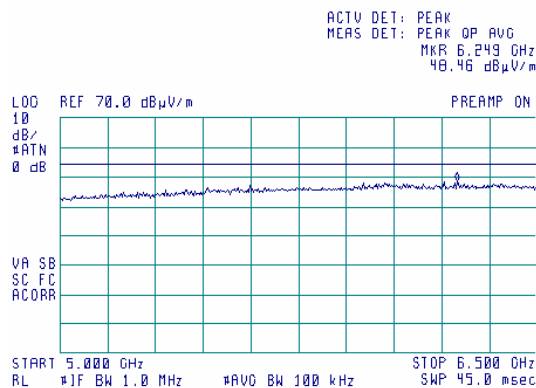


Peak Limit 74 dBμV/m

Plot 7.2.43 Radiated emission measurements from 5000 to 6500 MHz at the mid carrier frequency

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

13:53:26 OCT 21, 2005

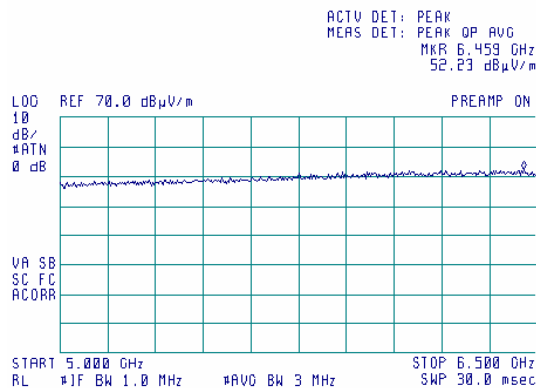


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.44 Radiated emission measurements from 5000 to 6500 MHz at the high carrier frequency

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

10:32:53 NOV 24, 2005

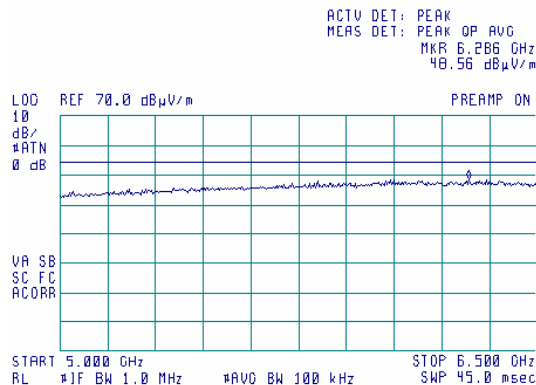


Peak Limit 74 dB μ V/m

Plot 7.2.45 Radiated emission measurements from 5000 to 6500 MHz at the high carrier frequency

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

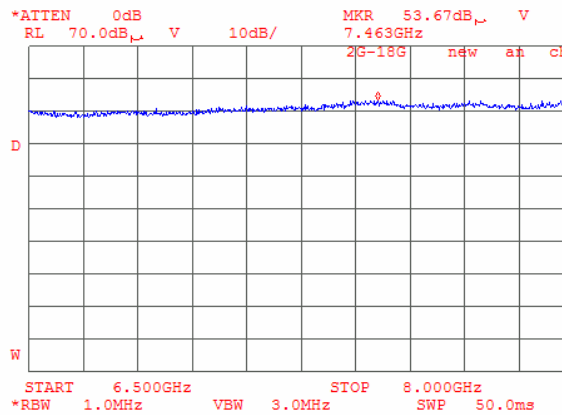
13:11:16 OCT 21, 2005



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.46 Radiated emission measurements from 6.5 to 8.0 GHz at the low carrier frequency

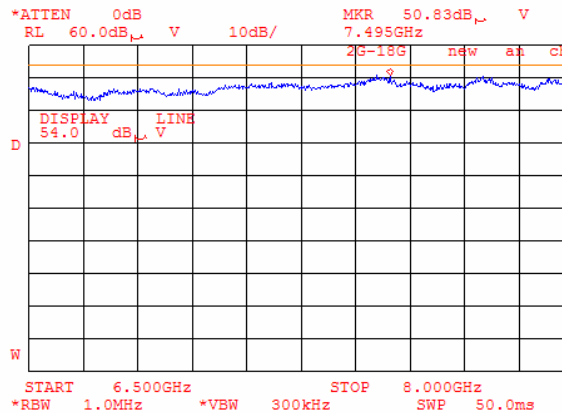
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Peak Limit 74 dBμV/m

Plot 7.2.47 Radiated emission measurements from 6.5 to 8.0 GHz at the low carrier frequency

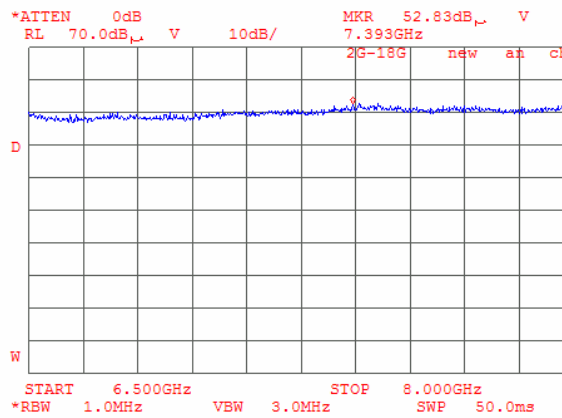
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.48 Radiated emission measurements from 6.5 to 8.0 GHz at the mid carrier frequency

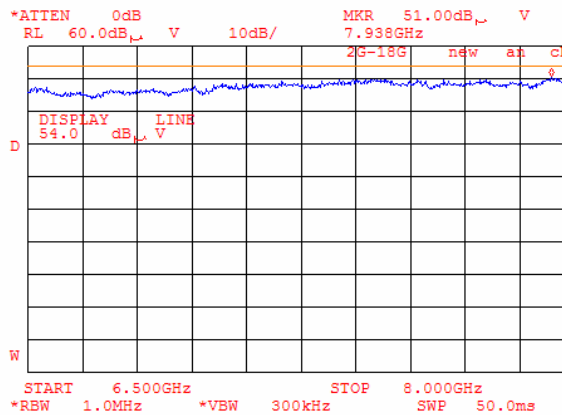
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Peak Limit 74 dBμV/m

Plot 7.2.49 Radiated emission measurements from 6.5 to 8.0 GHz at the mid carrier frequency

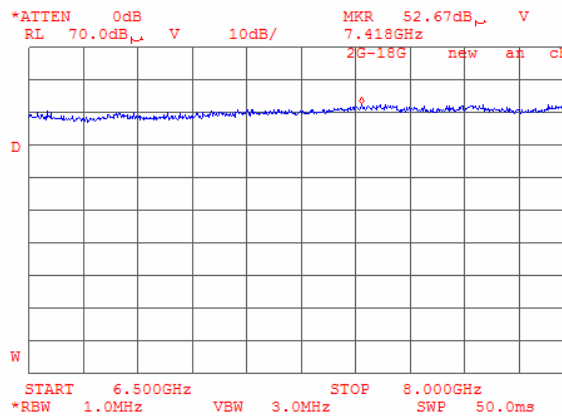
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.50 Radiated emission measurements from 6.5 to 8.0 GHz at the high carrier frequency

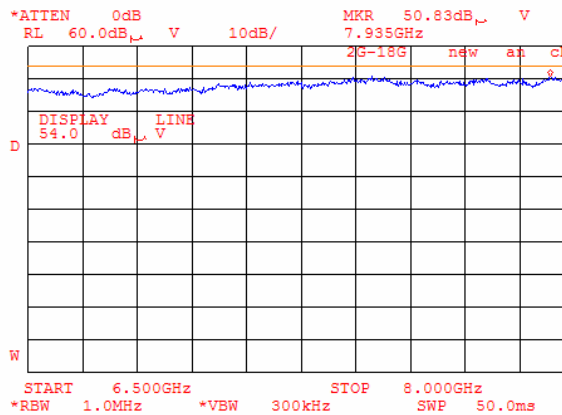
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Peak Limit 74 dBμV/m

Plot 7.2.51 Radiated emission measurements from 6.5 to 8.0 GHz at the high carrier frequency

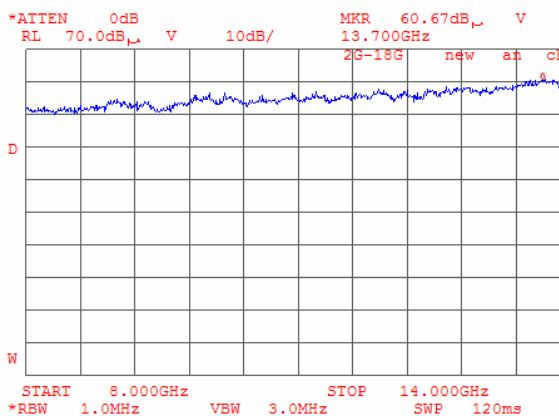
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.52 Radiated emission measurements from 8 to 14 GHz at the low carrier frequency

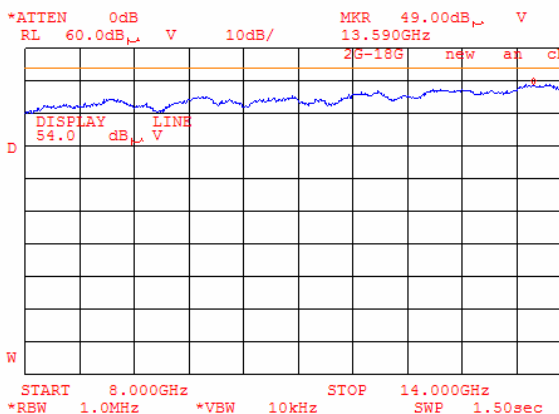
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Peak Limit 74 dBμV/m

Plot 7.2.53 Radiated emission measurements from 8 to 14 GHz at the low carrier frequency

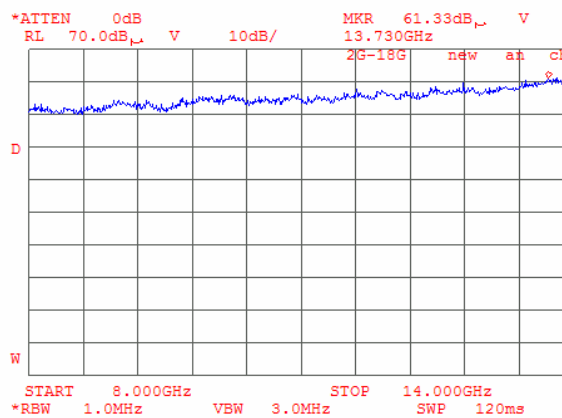
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.54 Radiated emission measurements from 8 to 14 GHz at the mid carrier frequency

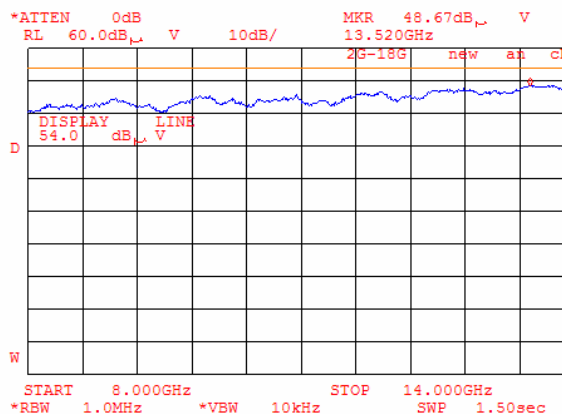
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Peak Limit 74 dBμV/m

Plot 7.2.55 Radiated emission measurements from 8 to 14 GHz at the mid carrier frequency

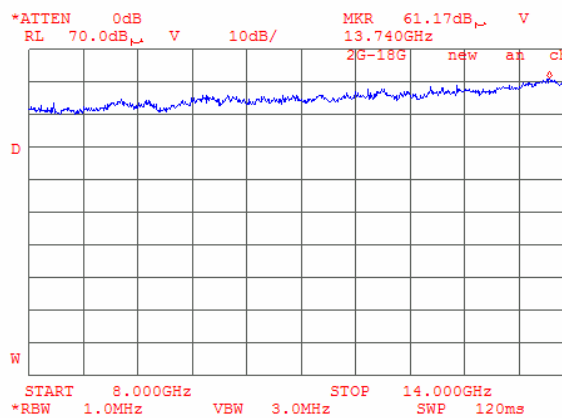
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.56 Radiated emission measurements from 8 to 14 GHz at the high carrier frequency

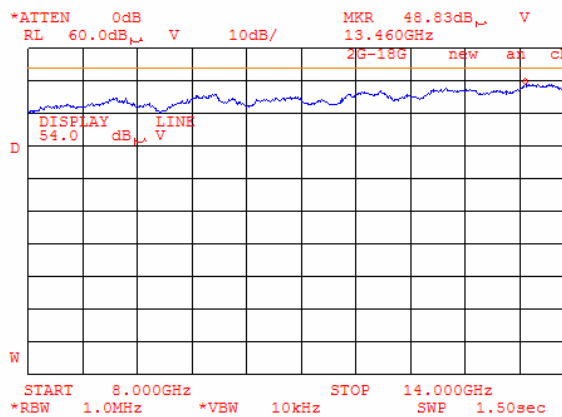
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Peak Limit 74 dBμV/m

Plot 7.2.57 Radiated emission measurements from 8 to 14 GHz at the high carrier frequency

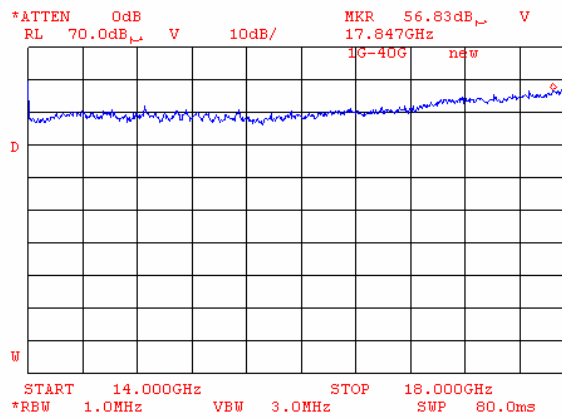
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

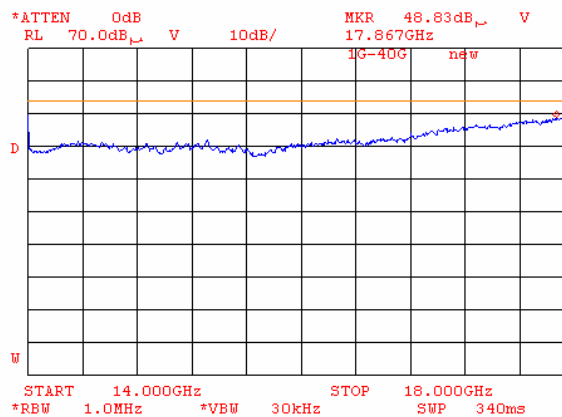
Plot 7.2.58 Radiated emission measurements from 14 to 18 GHz at the low carrier frequency

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



Plot 7.2.59 Radiated emission measurements from 14 to 18 GHz at the low carrier frequency

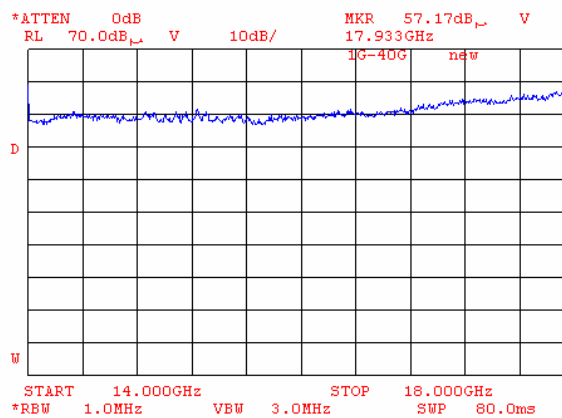
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

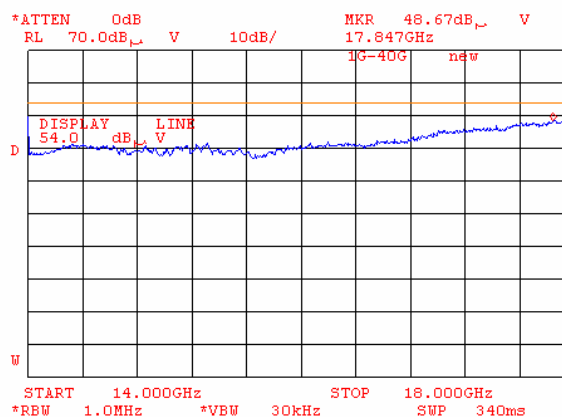
Plot 7.2.60 Radiated emission measurements from 14 to 18 GHz at the mid carrier frequency

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



Plot 7.2.61 Radiated emission measurements from 14 to 18 GHz at the mid carrier frequency

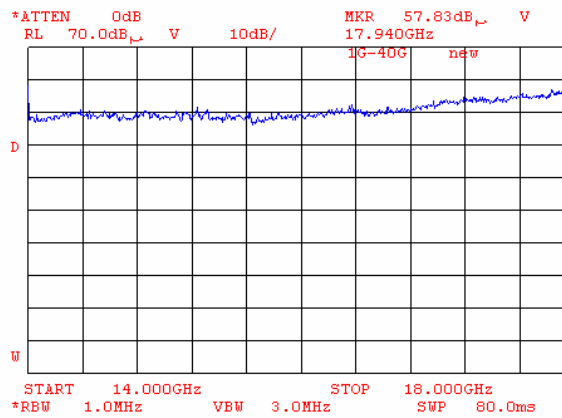
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

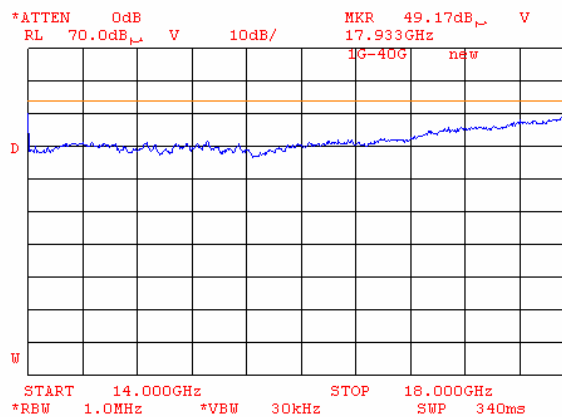
Plot 7.2.62 Radiated emission measurements from 14 to 18 GHz at the high carrier frequency

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



Plot 7.2.63 Radiated emission measurements from 14 to 18 GHz at the high carrier frequency

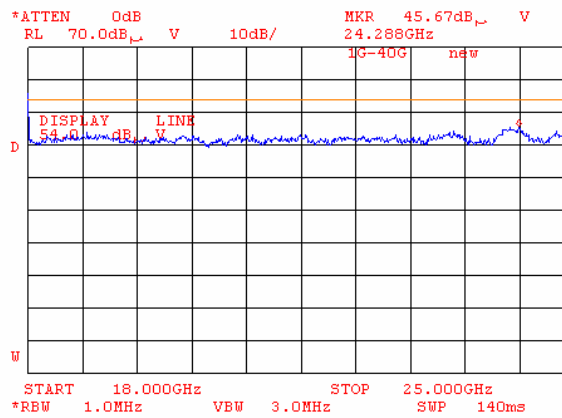
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

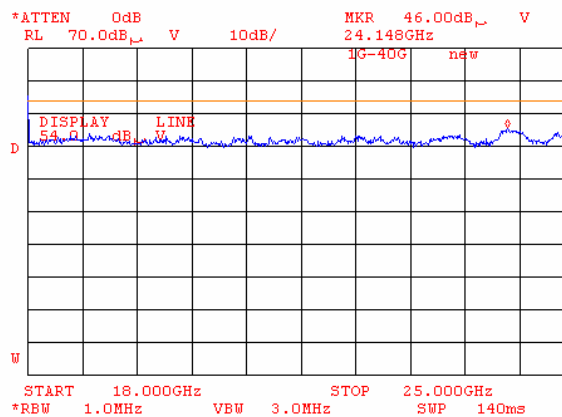
Plot 7.2.64 Radiated emission measurements from 18 to 25 GHz at the low carrier frequency

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



Plot 7.2.65 Radiated emission measurements from 18 to 25 GHz at the mid carrier frequency

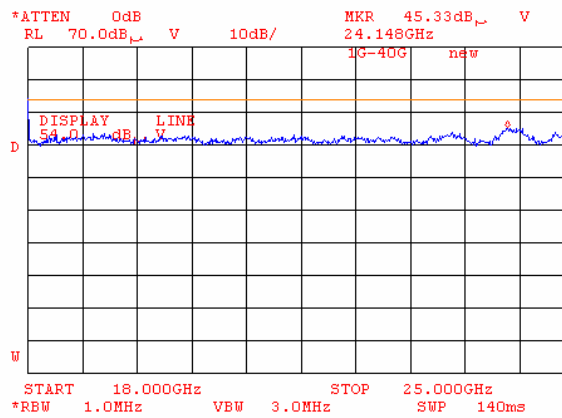
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.66 Radiated emission measurements from 18 to 25 GHz at the high carrier frequency

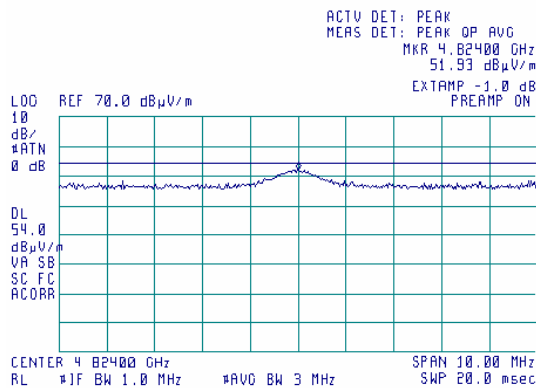
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.2.67 Radiated emission measurements at the second harmonic of low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m

16:01:34 JAN 27, 2006

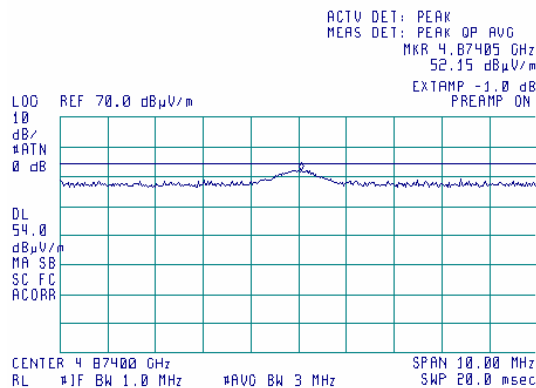


Test specification: FCC section 15.247(d), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

Plot 7.2.68 Radiated emission measurements at the second harmonic of mid carrier frequency

TEST SITE: anechoic chamber
TEST DISTANCE: 3 m

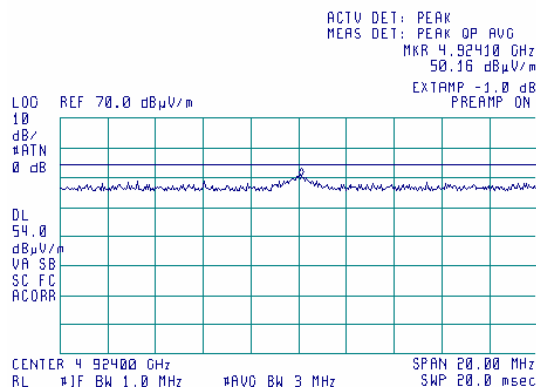
16:05:32 JAN 27, 2006



Plot 7.2.69 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m

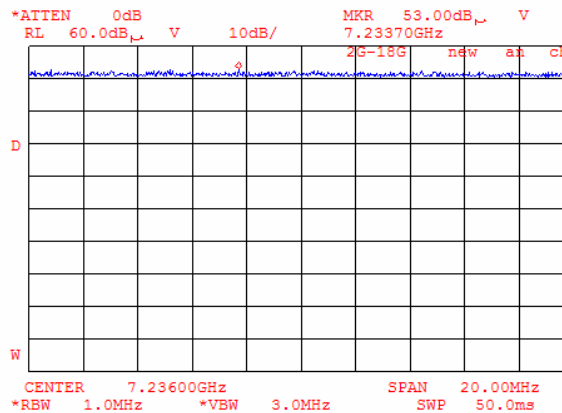
16:15:00 JAN 27, 2006



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

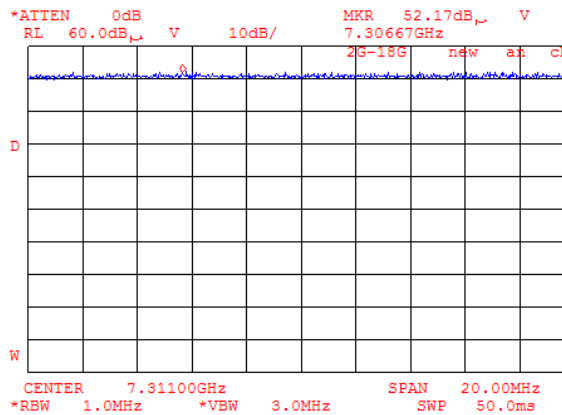
Plot 7.2.70 Radiated emission measurements at the third harmonic of low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.71 Radiated emission measurements at the third harmonic of mid carrier frequency

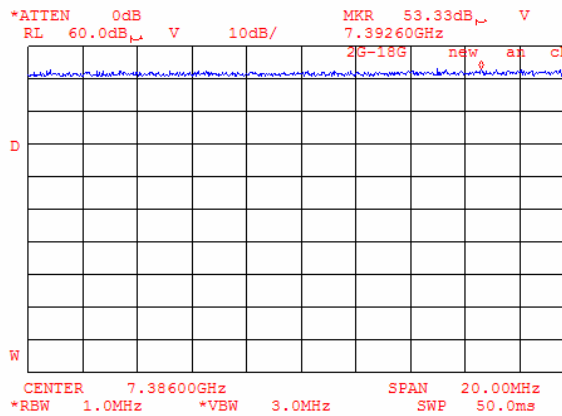
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

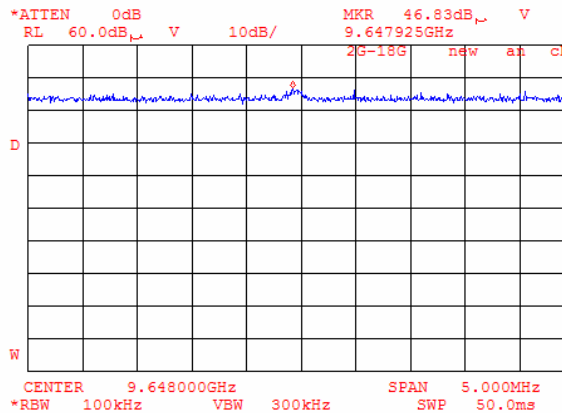
Plot 7.2.72 Radiated emission measurements at the third harmonic of high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.73 Radiated emission measurements at the fourth harmonic of low carrier frequency

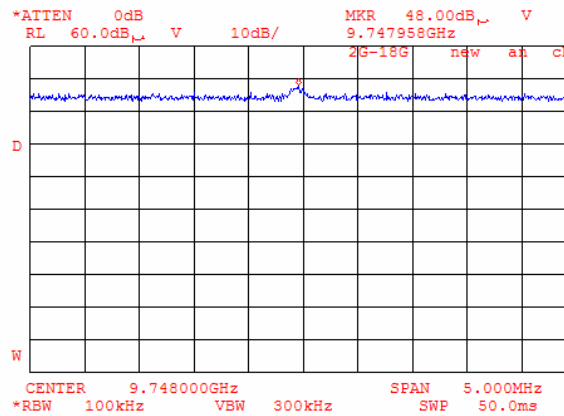
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

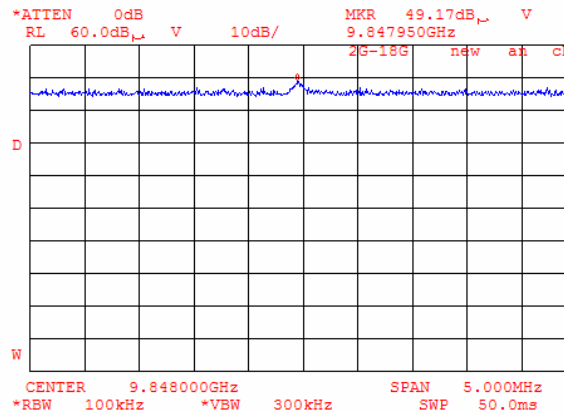
Plot 7.2.74 Radiated emission measurements at the fourth harmonic of mid carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.75 Radiated emission measurements at the fourth harmonic of high carrier frequency

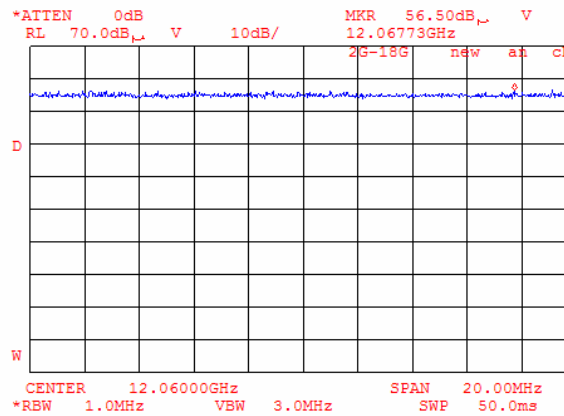
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

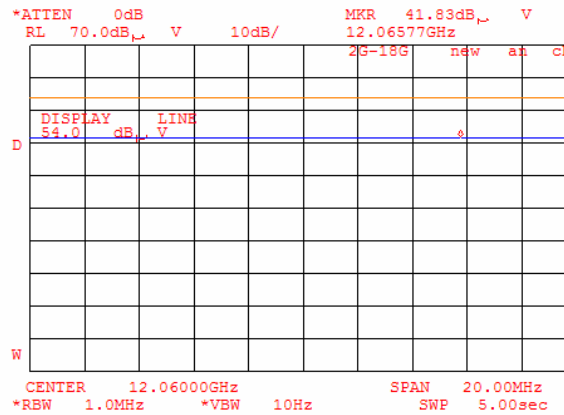
Plot 7.2.76 Radiated emission measurements at the fifth harmonic of low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.77 Radiated emission measurements at the fifth harmonic of low carrier frequency

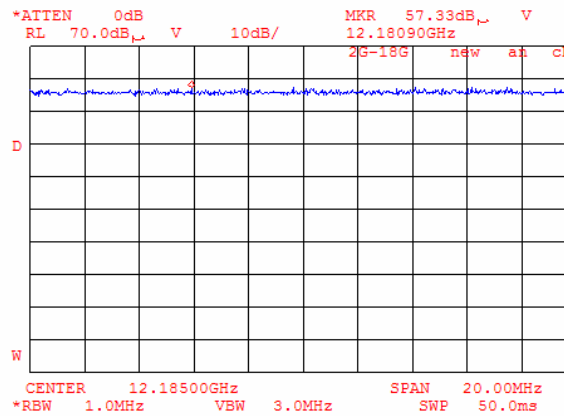
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

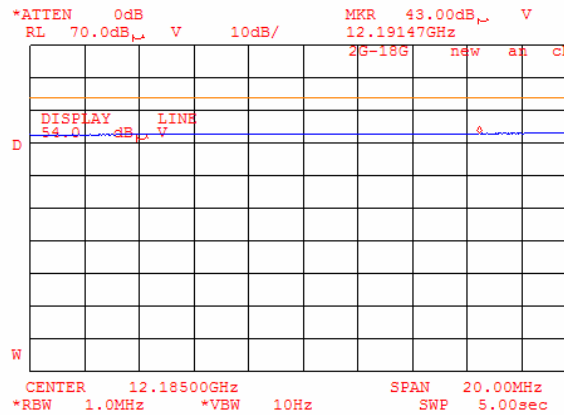
Plot 7.2.78 Radiated emission measurements at the fifth harmonic of mid carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.79 Radiated emission measurements at the fifth harmonic of mid carrier frequency

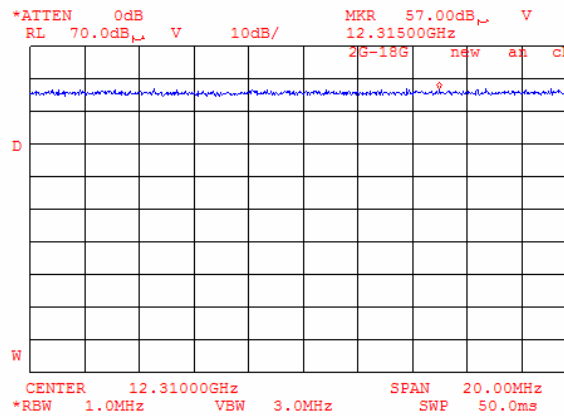
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Test specification: FCC section 15.247(d), 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: 1/26/2006			
Temperature: 21°C	Air Pressure: 1008 hPa	Relative Humidity: 48 %	Power Supply: 7.4 V battery
Remarks:			

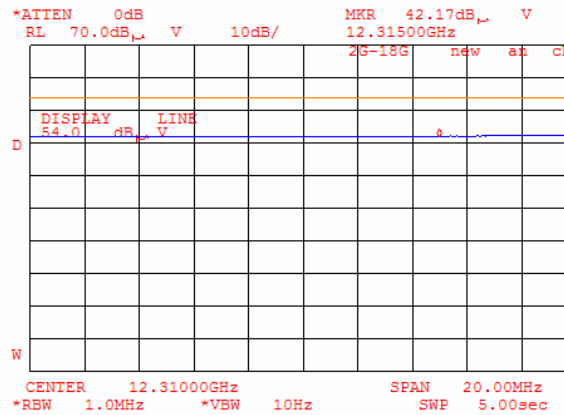
Plot 7.2.80 Radiated emission measurements at the fifth harmonic of high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.81 Radiated emission measurements at the fifth harmonic of high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Test specification: Section 15.247(i), RF exposure			
Test procedure: FR Vol. 62, page 26243, Section 15.247(d)			
Test mode: Compliance			Verdict: PASS
Date: 10/30/2005			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.4 V battery
Remarks:			

7.3 RF exposure

7.3.1 General

This test was performed to determine the minimum safe distance between the transmitter antenna and human to avoid public exposure in excess of limits for general population (uncontrolled exposure). Specification test limits are given in Table 7.3.1.

Table 7.3.1 RF exposure limits

Frequency range, MHz	Power density*		Electric field strength**, V/m
	mW/cm ²	W/m ²	
150.0 – 170.0	0.2	2.0	27.5
450.0 – 470.0	0.3 – 0.31	3.0 – 3.1	33.6 – 34.2
700.0	0.47	4.7	42.1
902.0 – 928.0	0.60 – 0.62	6.0 – 6.2	47.6 – 48.3
2400.0 – 2483.5	1.00	10.0	61.4
5725.0 – 5850.0	1.00	10.0	61.4

* - Power density limit within 300 - 1500 MHz was calculated according to the following equation: $S = F / 1500$, where S is power density in mW/cm² and F is frequency in MHz

** - Electric field strength limit was calculated from power density as follows: $E = \sqrt{S \times 120 \times \pi}$, where E is electric field strength in V/m and S is power density in W/m²

7.3.2 Test procedure for E-field strength measurements

- 7.3.2.1 The EUT, connected to the antenna providing the maximum directional gain, was set up as shown in Figure 7.3.1.
- 7.3.2.2 The E-field probe was pointed to the EUT antenna zero azimuth at a 3 m distance, the maximum field strength reading was recorded in Table 7.3.2.
- 7.3.2.3 The E-field probe was slowly moved toward the EUT until E-field equivalent to the maximum permitted power density was measured.
- 7.3.2.4 The obtained antenna to probe distance was recorded in Table 7.3.2 as a minimum separation distance.
- 7.3.2.5 The test was repeated at the rest of test distances according to Table 7.3.2.

Table 7.3.2 Maximum permissible exposure (MPE) measurement

Test distance, m	Field strength, V/m	Equivalent power density, mW/cm ²	Limit, mW/cm ²	Margin, mW/cm ²	Verdict
3.0	0.5	6.63e-05	1	-0.99	Pass
2.5	1.2	3.81e-04	1	-0.99	Pass
2.0	1.3	4.48e-04	1	-0.99	Pass
1.5	1.4	5.19e-04	1	-0.99	Pass
1.0	1.9	9.57e-04	1	-0.99	Pass
0.5	2.3	1.40e-04	1	-0.99	Pass
0.3	2.7	1.93e-03	1	-0.99	Pass
0.2	3.0	2.38e-03	1	-0.99	Pass
0.1	3.2	2.71e-03	1	-0.99	Pass
0.05	3.2	2.71e-03	1	-0.99	Pass

* - Equivalent power density was calculated from electric field strength as follows: $S = 0.1 \times E^2 / (120 \times \pi)$, where E is electric field strength in V/m and S is power density in mW/cm²

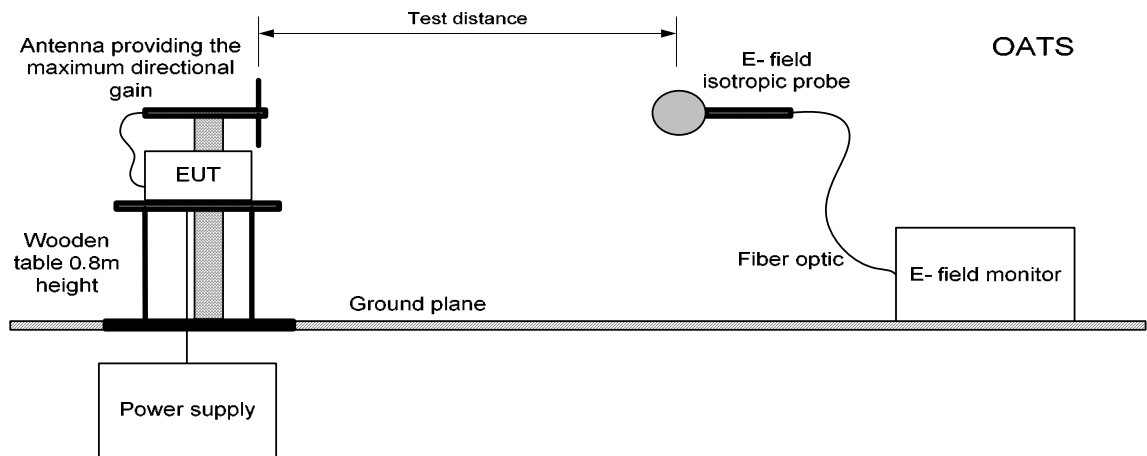
Reference numbers of test equipment used

HL 0174	HL 2078				
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Full description is given in Appendix A.

Test specification: Section 15.247(i), RF exposure			
Test procedure: FR Vol. 62, page 26243, Section 15.247(d)			
Test mode: Compliance		Verdict: PASS	
Date: 10/30/2005			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 7.4 V battery
Remarks:			

Figure 7.3.1 Maximum permissible exposure (MPE) measurement set up



Photograph 7.3.1 Maximum permissible exposure (MPE) measurement set up



Test specification: Part 15 Section 109 Class B, Radiated emissions			
Test procedure: ANSI C63.4, Sections 11.6 and 12.1.4			
Test mode: Compliance			Verdict: PASS
Date: 1/27/2006			
Temperature: 21°C	Air Pressure: 1010 hPa	Relative Humidity: 52%	Power Supply: 7.4 V battery
Remarks:			

8 Emission tests according to 47CFR part 15 subpart B requirements

8.1 Radiated emission measurements

8.1.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.1.1.

Table 8.1.1 Radiated emission test limits

Frequency, MHz	Class B limit, dB(μ V/m)		Class A limit, dB(μ V/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
Above 960	43.5*	54.0	49.5	60.0*

* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $Lim_{S_2} = Lim_{S_1} + 20 \log(S_1/S_2)$, where S_1 and S_2 – standard defined and test distance respectively in meters.

8.1.2 Test procedure for measurements in semi-anechoic chamber

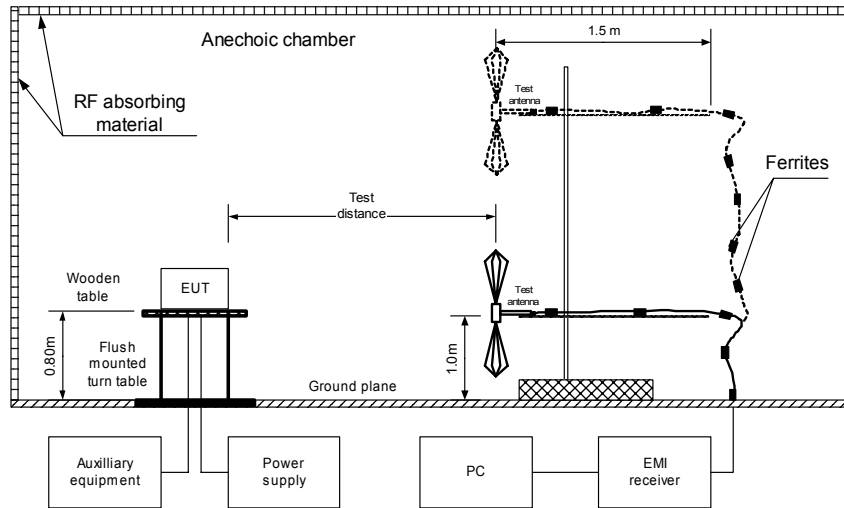
8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photograph, energized and the performance check was conducted.

8.1.2.2 The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360° , the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

8.1.2.3 The worst test results (the lowest margins) were recorded in Table 8.1.2 and shown in the associated plots.

Test specification: Part 15 Section 109 Class B, Radiated emissions			
Test procedure: ANSI C63.4, Sections 11.6 and 12.1.4			
Test mode: Compliance		Verdict: PASS	
Date: 1/27/2006			
Temperature: 21°C	Air Pressure: 1010 hPa	Relative Humidity: 52%	Power Supply: 7.4 V battery
Remarks:			

Figure 8.1.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment



Photograph 8.1.1 Setup for radiated emission measurements



Test specification: Part 15 Section 109 Class B, Radiated emissions			
Test procedure: ANSI C63.4, Sections 11.6 and 12.1.4			
Test mode: Compliance	Verdict: PASS		
Date: 1/27/2006			
Temperature: 21°C	Air Pressure: 1010 hPa	Relative Humidity: 52%	Power Supply: 7.4 V battery
Remarks:			

Table 8.1.2 Radiated emission test results

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Receive / Stand-by
TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / QUASI-PEAK
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 120 kHz

Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
660.075000	44.01	42.74	46.00	-3.26	Horizontal	1.20	93	Pass
720.088000	46.52	45.36	46.00	-0.64	Horizontal	1.10	88	
780.095700	39.21	37.34	46.00	-8.66	Horizontal	1.00	66	
800.091950	37.19	34.77	46.00	-11.23	Horizontal	1.00	69	
840.104800	39.03	36.83	46.00	-9.17	Horizontal	1.00	60	
951.200000	36.06	31.50	46.00	-14.50	Horizontal	1.00	248	

*- Margin = Measured emission - specification limit.

** - EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

HL 0521	HL 0589	HL 0592	HL 0593	HL 0594	HL 0604	HL 2009
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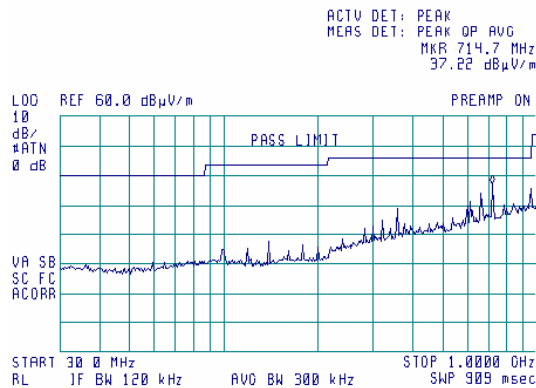
Full description is given in Appendix A.

Test specification: Part 15 Section 109 Class B, Radiated emissions			
Test procedure: ANSI C63.4, Sections 11.6 and 12.1.4			
Test mode: Compliance			Verdict: PASS
Date: 1/27/2006			
Temperature: 21°C	Air Pressure: 1010 hPa	Relative Humidity: 52%	Power Supply: 7.4 V battery
Remarks:			

Plot 8.1.1 Radiated emission measurements in 30- 1000 MHz range, vertical antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by
EUT CONFIGURATION: Without charger

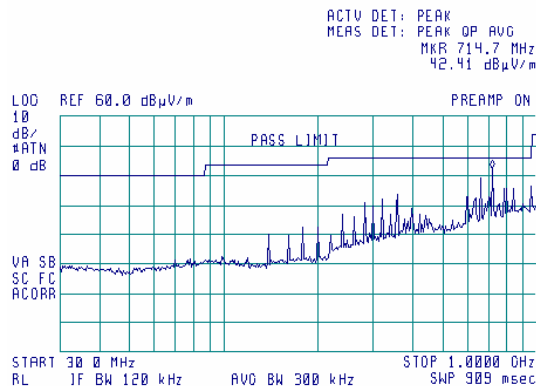
10:32:00 JAN 27, 2006



Plot 8.1.2 Radiated emission measurements in 30- 1000 MHz range, horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by
EUT CONFIGURATION: Without charger

10:35:13 JAN 27, 2006



Test specification:	Section 15.207, Section 15.107 Class B, AC power lines conducted emissions		
Test procedure:	ANSI C63.4, Section 11.5		
Test mode:	Compliance	Verdict:	PASS
Date:	12/8/2005		
Temperature: 21 °C	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 120 V AC
Remarks:			

8.2 Conducted emissions

8.2.1 General

This test was performed to measure the common mode conducted emissions at the EUT power port. The specification test limits are given in Table 8.2.1.

Table 8.2.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(μV)		Class A limit, dB(μV)	
	QP	AVRG	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*	79	66
0.5 - 5.0	56	46	73	60
5.0 - 30	60	50	73	60

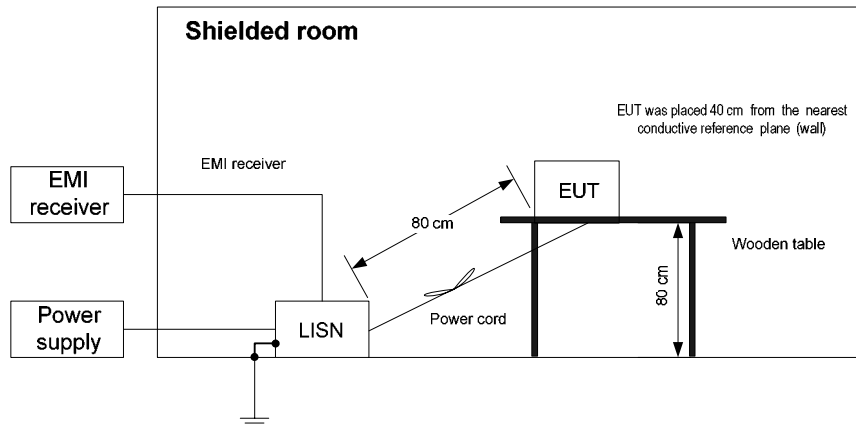
* - The limit decreases linearly with the logarithm of frequency.

8.2.2 Test procedure

- 8.2.2.1 The EUT was set up as shown in Figure 8.2.1 and the associated photograph, energized and the EUT performance was checked.
- 8.2.2.2 The measurements were performed at the EUT power terminals with the LISN connected to the EMI receiver in the frequency range referred to in Table 8.2.2. The unused coaxial connector of the LISN was terminated with 50 Ohm.
- 8.2.2.3 The position of the EUT cables was varied to find the highest emission.
- 8.2.2.4 The worst test results with respect to the limits were recorded in Table 8.2.2 and shown in the associated plots.

Test specification:	Section 15.207, Section 15.107 Class B, AC power lines conducted emissions		
Test procedure:	ANSI C63.4, Section 11.5		
Test mode:	Compliance	Verdict:	PASS
Date:	12/8/2005		
Temperature: 21 °C	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 120 V AC
Remarks:			

Figure 8.2.1 Setup for conducted emission measurements, table-top EUT



Photograph 8.2.1 Setup for conducted emission measurements



Test specification:	Section 15.207, Section 15.107 Class B, AC power lines conducted emissions		
Test procedure:	ANSI C63.4, Section 11.5		
Test mode:	Compliance	Verdict: PASS	
Date:	12/8/2005		
Temperature: 21 °C	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 120 V AC
Remarks:			

Table 8.2.2 Conducted emission test results

LINE: AC mains
 EUT SET UP: TABLE-TOP
 EUT MODE: Charging
 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*		
0.187537	62.05	57.06	64.17	-7.11	48.78	54.17	-5.39	L1	Pass
0.247969	54.25	45.73	61.85	-16.12	35.48	51.85	-16.37		
0.312381	50.08	44.27	59.92	-15.65	39.61	49.92	-10.31		
0.437630	46.84	41.82	57.17	-15.35	38.65	47.17	-8.52		
0.559836	43.08	37.75	56.00	-18.25	33.98	46.00	-12.02		
0.685479	41.84	39.38	56.00	-16.62	37.08	46.00	-8.92		
0.187283	62.71	56.58	64.18	-7.60	48.40	54.18	-5.78	L2	Pass
0.432775	48.59	43.10	57.26	-14.16	39.44	47.26	-7.82		
0.494554	46.64	41.58	56.10	-14.52	37.05	46.10	-9.05		
0.685788	45.46	42.65	56.00	-13.35	38.85	46.00	-7.15		
0.930149	43.72	42.57	56.00	-13.43	38.06	46.00	-7.94		
2.105596	42.19	39.57	56.00	-16.43	23.64	46.00	-22.36		

*- Margin = Measured emission – specification limit.

Reference numbers of test equipment used

HL 0447	HL 0672	HL 0787	HL 1430	HL 1502	HL 1510		
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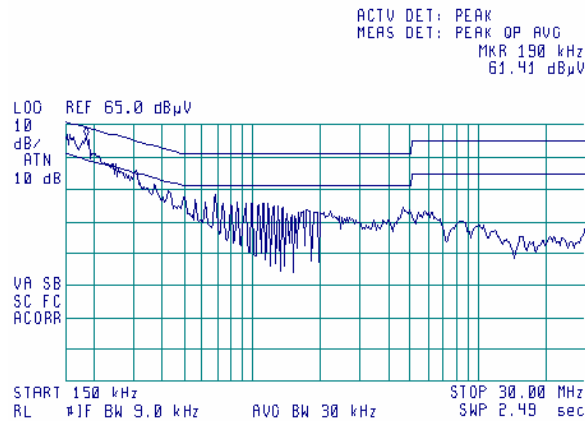
Full description is given in Appendix A.

Test specification:	Section 15.207, Section 15.107 Class B, AC power lines conducted emissions		
Test procedure:	ANSI C63.4, Section 11.5		
Test mode:	Compliance	Verdict:	PASS
Date:	12/8/2005		
Temperature: 21 °C	Air Pressure: 1013 hPa	Relative Humidity: 48 %	Power Supply: 120 V AC
Remarks:			

Plot 8.2.1 Conducted emission measurements

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

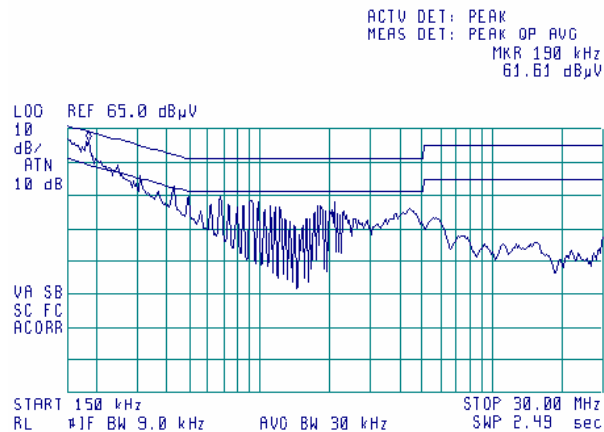
08:58:43 DEC 07, 2005



Plot 8.2.2 Conducted emission measurements

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

09:09:54 DEC 07, 2005



9 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0174	Monitor, Field, 10kHz-1GHz, 1-300 V/m, w/fiberoptic	Amplifier Research	FM1000	60525	13-Feb-05	13-Feb-06
0446	Antenna, Loop active, 10kHz-30MHz	EMCO	6502	2857	28-Jun-05	28-Jun-06
0447	LISN, 16/2, 300 V RMS	Hermon Labs	LISN 16-1	447	3-Nov-05	3-Nov-06
0465	Anechoic Chamber 9(L) x 6.5(W) x 5.5(H) m	HL	AC - 1	023	10-Oct-05	10-Oct-06
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	11-Oct-05	11-Oct-06
0589	Cable Coaxial, GORE A2P01POL118, 2.3 m	HL	GORE-3	176	02-Dec-05	02-Dec-06
0592	Position Controller	HL	L2-SR3000 (HL CRL-3)	100	18-May-05	18-May-06
0593	Antenna Mast, 1-4 m Pneumatic	Madgesh	AM-F1	101	03-Feb-05	03-Feb-06
0594	Turn Table FOR ANECHOIC CHAMBER flush mount d=1.2 m Pneumatic	HL	TT-WDC1	102	27-Jan-05	27-Jan-06
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE 26 - 2000 MHz	EMCO	3141	9611-1011	27-Jan-05	27-Jan-06
0672	Shielded Room 4,6(L) x 4,2(W) x 2,4(H) m	HL	SR - 3	027	10-Jan-05	10-Jan-06
0768	Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, K-band, Gain - 25 dB	Quinstar Technology	QWH-4200-BA	110	10-Jan-05	10-Jan-06
0787	Transient Limiter	Hewlett Packard	11947A	3107A018 77	21-Nov-05	21-Nov-06
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies (HP)	8564EC	3946A002 19	30-Aug-05	30-Aug-06
1425	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1426, HL1427	Agilent Technologies (HP)	8542E	3710A002 22, 3705A002 04	01-Sep-05	01-Sep-06
1430	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL1432	Agilent Technologies (HP)	8542E	3807A002 62,3705A0 0217	01-Sep-05	01-Sep-06
1502	Cable RF, 6 m	Belden	M17/167 MIL-C-17	1502	12-Feb-05	12-Feb-06
1510	Cable RF, 8 m	Belden	M17/167 MIL-C-17	1510	02-Dec-05	02-Dec-06
1567	Cable RF, 2 m	Huber-Suhner	Sucoflex 104PE	13095/4PE	02-Dec-05	02-Dec-06
1941	Cable 18GHz, 4 m, green	Rhophase Microwave Limited	SPS-1803A-4000-NPS	T4657	17-Oct-05	17-Oct-06
1947	Cable 18GHz, 6.5 m, blue	Rhophase Microwave Limited	NPS-1803A-6500-NPS	T4974	17-Oct-05	17-Oct-06
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W, N-type	EMC Test Systems	3115	9911-5964	22-Mar-05	22-Mar-06
2009	Cable RF, 8 m	Alpha Wire	RG-214	C-56	02-Dec-05	02-Dec-06

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
2078	Isotropic Field Probe 80 MHz - 40 GHz	Amplifier Research	FP2080	302541	08-Dec-05	08-Dec-06
2259	Amplifier Low Noise 2-20 GHz	Sophia Wireless	LNA0220-C	0223	05-Nov-05	05-Nov-06
2260	Amplifier Low Noise 14-33 GHz	Sophia Wireless	LNA28-B	0233	05-Nov-05	05-Nov-06

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).

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Person for contact: Mr. Alex Usoskin, CEO.

12 APPENDIX D Specification references

47CFR part 15: 2005	Radio Frequency Devices.
Public notice DA 00- 705: 2000	Filing and measurement guidelines for frequency hopping spread spectrum systems.
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

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 LISN 16 - 1
Hermon Laboratories, HL 0447

Frequency, kHz	Correction factor, dB
10	4.9
15	2.86
20	1.83
25	1.25
30	0.91
35	0.69
40	0.53
50	0.35
60	0.25
70	0.18
80	0.14
90	0.11
100	0.09
125	0.06
150	0.04

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

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(μ V) to convert it into field intensity in dB(μ V/m).

Antenna factor
Double-ridged wave guide horn antenna
EMC Test Systems, model 3115, serial no: 9911-5964, HL 1984

Frequency, MHz	Antenna gain, dBi	Antenna factor. dB(1/m)
1000.0	5.8	24.5
1500.0	9.0	24.8
2000.0	8.6	27.7
2500.0	9.5	28.7
3000.0	8.9	30.8
3500.0	8.2	32.9
4000.0	9.6	32.7
4500.0	11.2	32.1
5000.0	10.6	33.6
5500.0	9.8	35.3
6000.0	10.1	35.7
6500.0	10.7	35.8
7000.0	10.9	36.2
7500.0	10.5	37.2
8000.0	11.1	37.2
8500.0	10.8	38.1
9000.0	10.7	38.6
9500.0	11.5	38.3
10000.0	11.8	38.4
10500.0	12.3	38.3
11000.0	12.3	38.8
11500.0	11.5	39.9
12000.0	12.2	39.6
12500.0	12.6	39.5
13000.0	12.0	40.5
13500.0	11.7	41.1
14000.0	11.7	41.5
14500.0	12.7	40.8
15000.0	14.2	39.5
15500.0	16.0	38.1
16000.0	16.2	38.1
16500.0	14.5	40.1
17000.0	12.2	42.6
17500.0	9.7	45.4
18000.0	6.6	48.7

Antenna factor is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).

Antenna Factor
Active Loop Antenna
EMC Test Systems, model 6502, serial number 2857, HL 0446

Frequency, MHz	Magnetic Antenna Factor, dB(S/m)	Electric Antenna Factor, dB(1/m)
0.009	-32.8	18.7
0.010	-33.8	17.7
0.020	-38.3	13.2
0.050	-41.1	10.4
0.075	-41.3	10.2
0.100	-41.6	9.9
0.150	-41.7	9.8
0.250	-41.6	9.9
0.500	-41.8	9.7
0.750	-41.9	9.6
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.1
4.000	-41.4	10.1
5.000	-41.5	10.0
10.000	-41.9	9.6
15.000	-41.9	9.6
20.000	-42.2	9.3
25.000	-42.8	8.7
30.000	-44.0	7.5

Antenna factor in dB(S/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ A/m).
Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).

Antenna factor
Standard gain horn antenna
Quinstar Technology
Model QWH
Ser.No.110, HL 0768

Frequency min, GHz	Frequency max, GHz	Antenna factor, dB(1/m)
18.000	26.500	32.01
26.500	40.000	35.48
40.000	60.000	39.03
60.000	90.000	42.55
90.000	140.000	46.23
140.000	220.000	50.11

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/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		
22	4500	4.07		
23	4800	4.36		±0.17
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 RF, 2 m, model: Sucoflex 104PE, s/n 13095/4PE, HL 1567

No.	Frequency, MHz	Cable loss, dB
1	30	0.09
2	50	0.15
3	100	0.23
4	300	0.31
5	500	0.46
6	800	0.63
7	1000	0.67
8	1500	0.89
9	2000	1.05
10	2500	1.18
11	300	1.26
12	5300	1.51
13	4000	1.66
14	4500	1.61
15	5000	1.67
16	5500	1.91
17	6000	1.98
18	6500	1.91
19	7000	2.04
20	7500	2.36
21	8000	2.36
22	8500	2.61
23	9000	2.69
24	9500	2.62
25	10000	2.73
26	10500	2.83
27	11000	2.84
28	11500	3.22
29	12000	3.17
30	12500	3.17
31	13000	3.18
32	13500	3.49
33	14000	3.43
34	14500	3.57
35	15000	3.76
36	15500	4.20
37	16000	4.10
38	16500	4.49
39	17000	4.53
40	17500	4.46
41	18000	4.47

Cable loss
Cable 18 GHz, 4 m, green, model: SPS-1803A-4000-NPS, S/N T4657, HL 1941

Frequency, GHz	Cable loss, dB
0.03	0.39
0.05	0.49
0.1	0.68
0.2	0.95
0.3	1.30
0.5	1.58
0.7	1.84
0.9	2.08
1.1	2.28
1.3	2.56
1.5	2.91
1.7	2.95
1.9	3.17
2.1	3.22
2.3	3.25
2.5	3.39
2.7	3.51
2.9	3.67
3.1	3.81
3.3	3.92
3.5	4.05
3.7	4.14
3.9	4.30
4.1	4.44
4.3	4.55
4.5	4.68
4.7	4.75
4.9	4.84
5.1	4.86
5.3	4.89
5.5	5.00
5.7	5.05
5.9	5.19
6.1	5.28
7.7	5.58

Frequency, GHz	Cable loss, dB
7.9	5.63
8.1	5.67
8.3	5.70
8.5	5.74
8.7	5.78
8.9	5.84
9.1	5.89
9.3	5.94
9.5	6.02
9.7	6.10
9.9	6.12
10.1	6.09
10.3	6.03
10.5	6.01
10.7	6.05
10.9	6.08
11.1	6.10
11.3	6.18
11.5	6.23
11.7	6.20
11.9	6.16
12.1	6.18
12.4	6.33
13.0	6.51
13.5	6.51
14.0	6.75
14.5	6.82
15.0	6.93
15.5	7.16
16.0	7.10
16.5	7.18
17.0	7.67
17.5	7.71
18.0	7.61

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		