

TEST REPORT

ACCORDING TO: FCC part 15 subpart C, §15.247 and subpart B

FOR:

NESS Ltd.

Transceiver

Trade mark: NESS L300

Model: stimulator (STM)

This report is in conformity with ISO/ IEC 17025. The A2LA logo endorsement applies only to the test methods and the standards that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested.
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1 Applicant information

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2 Equipment under test attributes

Product type: Transceiver
Trade mark: NESS L300
Model(s): Stimulator (STM)
Receipt date 2/26/2006

3 Manufacturer information

Manufacturer name: NESS Ltd.
Address: 19, Ha'haroshet street, Ra'anana 43654, Israel
Telephone: +972 9748 5738
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Contact name: Mr. Eyal Lasko




4 Test details

Project ID: 16891
Location: Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel
Test started: 2/26/2006
Test completed: 3/14/2006
Test specification(s): FCC part 15 subpart C, §15.247 (DTS) and subpart B
Test suite: FCC_15.247_DTS_without_RF_connector (5/3/2004 5:43:35 PM, modified)

5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.247(a)2, 6 dB bandwidth	Pass
Section 15.247(b)3, Peak output power	Pass
Section 15.247(b)5, RF exposure	Pass, refer to attached application documents
Section 15.247(c), Radiated spurious emissions	Pass
Section 15.247(d), Peak power density	Pass
Section 15.207(a), Conducted emission	Not required
Unintentional emissions	
Section 15.107, Conducted emission at AC power port	Not required
Section 15.109, Radiated emission	Pass

Testing was completed against all relevant requirements of the test standard. The 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	March 14, 2006	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	March 16, 2006	
Approved by:	Mr. M. Nikishin, EMC and Radio group leader	March 19, 2006	

6 EUT description

6.1 General information

The EUT is a transceiver, part of the Functional Electrical Stimulation (FES) device that is used to correct Foot Drop syndrome presented in subject with neurological injury. It is used to correct foot drop by applying electrical pulses to the paralyzed leg's dorsiflexors muscles through a pair of electrodes.

The EUT system consists of three internally powered units: Control unit (CU), Stimulator (STM) and Foot Sensor (FS). The Stimulator (STM) delivers Functional Electrical Stimulation (FES) pulses to the dorsiflexors muscles through a pair of electrodes in order to activate them. The stimulator is powered from 3.6 VDC rechargeable battery.

6.2 Operating frequencies

Source		Frequency, MHz
CU/STM CPU xtal	(clock)	7.3728
Digital portion	(clock)	26

6.3 Changes made in the EUT

No changes were implemented.

6.4 Transmitter characteristics

Type of equipment										
Stand-alone (Equipment with or without its own control provisions)										
X	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)									
Plug-in card (Equipment intended for a variety of host systems)										
Intended use					Condition of use					
fixed					Always at a distance more than 2 m from all people					
mobile					Always at a distance more than 20 cm from all people					
X	portable				May operate at a distance closer than 20 cm to human body					
Assigned frequency range					2400 – 2483.5 MHz					
Operating frequency					2401 – 2482 MHz					
RF channel spacing					1000 kHz					
Maximum rated output power					At transmitter 50 Ω RF output connector				NA	
					Effective radiated power (for equipment with no RF connector)				-1 65 dBm	
Is transmitter output power variable?					X	No				
					Yes	continuous variable				
						stepped variable with stepsize				dB
						minimum RF power				dBm
						maximum RF power				dBm
Antenna connection										
unique coupling			standard connector		X	integral		with temporary RF connector		
								X	without temporary RF connector	
Antenna/s technical characteristics										
Type		Manufacturer		Model number		Gain				
Chip		Fractus		FR05-S1-N-0-102		1.5 dBi				
Transmitter 99% power bandwidth				900 kHz						
Transmitter aggregate data rate/s				0.25 Mbps						
Transmitter aggregate symbol (baud) rate/s				0.25 Msymbols per second (MBaud)						
Type of modulation				FSK						
Maximum transmitter duty cycle in normal use				<27 %						
Transmitter duty cycle supplied for test				70 %		Tx ON time	243 msec	Period	343 msec	
Transmitter power source										
Battery		Nominal rated voltage		3.7 VDC		Battery type	Rechargeable LiIon, prismatic, 700 Mah			
Common power source for transmitter and receiver						X		yes	no	
Spread spectrum technique used				Digital transmission system (DTS)						

Test specification:		Section 15.247(a)2, 6 dB bandwidth	
Test procedure:		FR Vol.62, page 26243, Section 15.247(a)2	
Test mode:	Compliance	Verdict: PASS	
Date & Time:	3/14/2006 7:01:21 PM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

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

7.1 Minimum 6 dB bandwidth

7.1.1 General

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

Table 7.1.1 The 6 dB bandwidth limits

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

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

7.1.2 Test procedure

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

7.1.2.2 The EUT was set to transmit modulated carrier.

7.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in **Error! Reference source not found.** and associated plot.

Figure 7.1.1 The 6 dB bandwidth test setup



Test specification:		Section 15.247(a)2, 6 dB bandwidth	
Test procedure:		FR Vol.62, page 26243, Section 15.247(a)2	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/14/2006 7:01:21 PM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Table 7.1.2 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 2400 - 2483.5 MHz
 DETECTOR USED: Peak
 SWEEP MODE: Single
 SWEEP TIME: Auto
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 MODULATION ENVELOPE REFERENCE POINTS: 6.0 dBc
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 0.5 Mbps

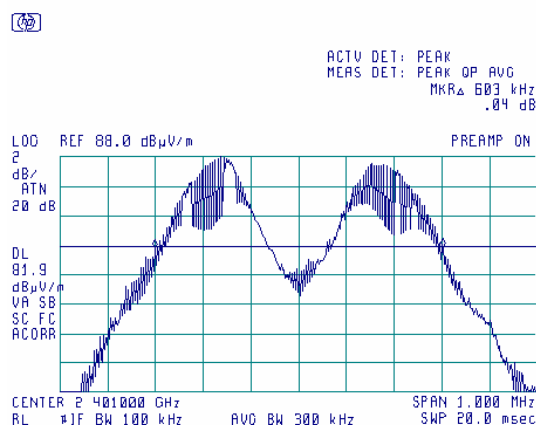
Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
Low frequency				
2401	603	500	103	Pass
Mid frequency				
2441	590	500	90	Pass
High frequency				
2482	605	500	105	Pass

Reference numbers of test equipment used

HL 1424								
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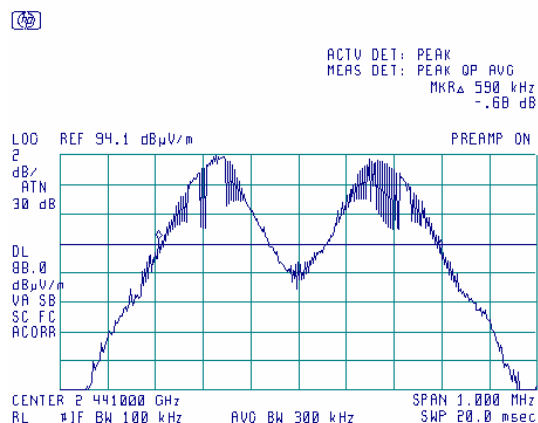
Full description is given in Appendix A.

Plot 7.1.1 The 6 dB bandwidth test result at low frequency

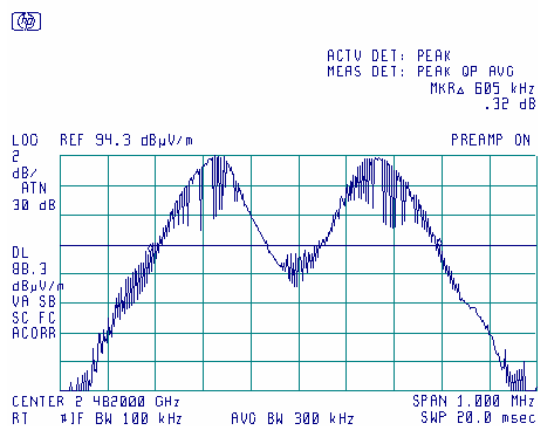


Test specification:		Section 15.247(a)2, 6 dB bandwidth	
Test procedure:		FR Vol.62, page 26243, Section 15.247(a)2	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/14/2006 7:01:21 PM	
Temperature: 21 °C		Air Pressure: 1010 hPa	Relative Humidity: 43 %
			Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.1.2 The 6 dB bandwidth test result at mid frequency



Plot 7.1.3 The 6 dB bandwidth test result at high frequency



Test specification:		Section 15.247(b)3, Peak output power	
Test procedure:		FR Vol.62, page 26243, Section 15.247(b)	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/14/2006 7:02:52 PM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

7.2 Peak output power

7.2.1 General

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

Table 7.2.1 Peak output power limits

Assigned frequency range, MHz	Maximum antenna gain, dBi	Peak output power*		Equivalent field strength limit @ 3m, dB(μV/m)**
		W	dBm	
902.0 – 928.0	6.0	1.0	30.0	131.2
2400.0 – 2483.5				
5725.0 – 5850.0				

*- The limit is provided in terms of conducted RF power at the antenna connector. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

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

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

7.2.2 Test procedure

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

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

7.2.2.3 The maximum field strength of the EUT carrier frequency was measured in 3 orthogonal positions of the device.

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

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

7.2.2.6 The maximum peak output power was calculated from the field strength of carrier as follows:

$$P = (E \times d)^2 / (30 \times G),$$

where P is the peak output power in W, E is the field strength in V/m, d is the test distance and G is the transmitter numeric antenna gain over an isotropic radiator.

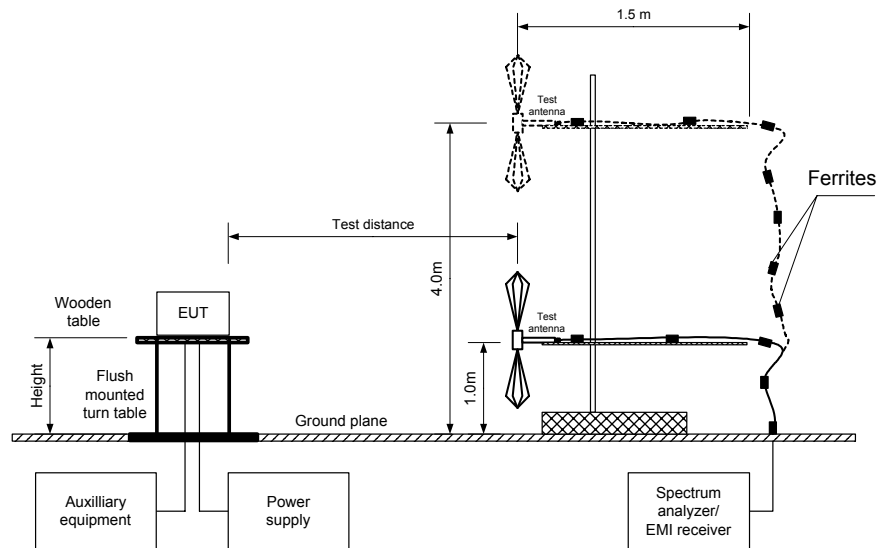
The above equation was converted in logarithmic units for 3 m test distance:

$$\text{Peak output power in dBm} = \text{Field strength in dB}(\mu\text{V/m}) - \text{Transmitter antenna gain in dBi} - 95.2 \text{ dB}$$

7.2.2.7 The worst test results (the lowest margins) were found in the EUT side position (Z-axis), recorded in Table 7.2.2 and shown in the associated plots.

Test specification: Section 15.247(b)3, Peak output power			
Test procedure: FR Vol.62, page 26243, Section 15.247(b)			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/14/2006 7:02:52 PM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Figure 7.2.1 Setup for carrier field strength measurements



Test specification:		Section 15.247(b)3, Peak output power	
Test procedure:		FR Vol.62, page 26243, Section 15.247(b)	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/14/2006 7:02:52 PM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 EUT position: 3 orthogonal
 TEST DISTANCE: 3 m
 TEST SITE: Semi anechoic chamber
 EUT HEIGHT: 0.8 m
 DETECTOR USED: Peak
 TEST ANTENNA TYPE: Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 0.5 Mbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 EUT 6 dB BANDWIDTH: 0.59 MHz
 RESOLUTION BANDWIDTH: 1 MHz
 VIDEO BANDWIDTH: 3 MHz

Frequency, MHz	Field strength, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	EUT antenna gain, dBi	Peak output power, dBm**	Limit, dBm	Margin, dB***	Verdict
2401	89.62	Vertical	1.5	304	1.5	-7.11	30.0	-37.11	Pass
2441	94.56	Vertical	1.4	210	1.5	-2.17	30.0	-32.17	Pass
2482	95.08	Vertical	1.5	299	1.5	-1.65	30.0	-31.65	Pass

The recorded test results were obtained in the EUT Z-axis position.

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

** - Peak output power was calculated from the field strength of carrier as follows: $P = (E \times d)^2 / (30 \times G)$, where P is the peak output power in W, E is the field strength in V/m, d is the test distance in meters and G is the transmitter numeric antenna gain over an isotropic radiator. The above equation was converted in logarithmic units for 3 m test distance: *Peak output power in dBm = Field strength in dB(μV/m) - Transmitter antenna gain in dBi – 95.2 dB*

*** - Margin = Peak output power – specification limit.

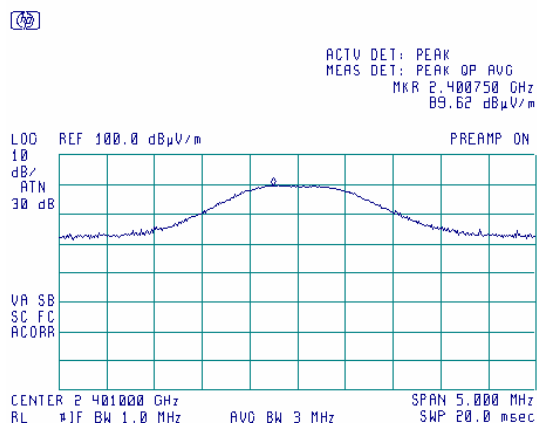
Reference numbers of test equipment used

HL 0521	HL 0589	HL 1947	HL 1984				
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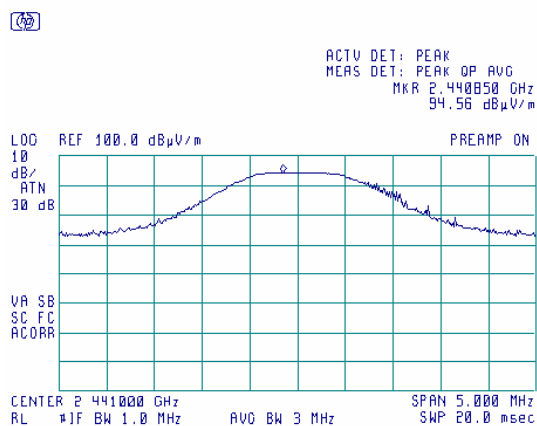
Full description is given in Appendix A.

Test specification:		Section 15.247(b)3, Peak output power	
Test procedure:		FR Vol.62, page 26243, Section 15.247(b)	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/14/2006 7:02:52 PM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.2.1 Field strength of carrier at low frequency

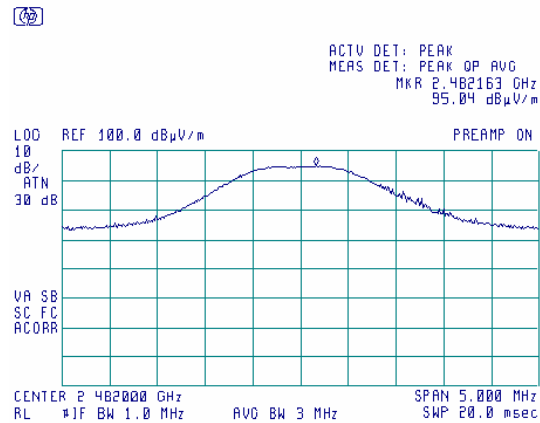


Plot 7.2.2 Field strength of carrier at mid frequency



Test specification:		Section 15.247(b)3, Peak output power	
Test procedure:		FR Vol.62, page 26243, Section 15.247(b)	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/14/2006 7:02:52 PM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.2.3 Field strength of carrier at high frequency



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

7.3 Field strength of spurious emissions

7.3.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Radiated spurious emissions limits

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

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

$$\text{Lim}_{S_2} = \text{Lim}_{S_1} + 40 \log(S_1/S_2),$$

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.

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

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and the performance check was conducted.

7.3.2.2 The field strength of the EUT spurious emission was measured in 3 orthogonal positions of the device.

7.3.2.3 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.

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

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

7.3.3.1 The EUT was set up as shown in Figure 7.3.2, energized and the performance check was conducted.

7.3.3.2 The field strength of the EUT spurious emission was measured in 3 orthogonal positions of the device.

7.3.3.3 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.

7.3.3.4 The worst test results (the lowest margins) were found in the EUT side position (Z-axis) as provided in Table 7.3.3 and shown in the associated plots.

Test specification: Section 15.247(c), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/16/2006 9:52:00 AM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Figure 7.3.1 Setup for spurious emission field strength measurements below 30 MHz

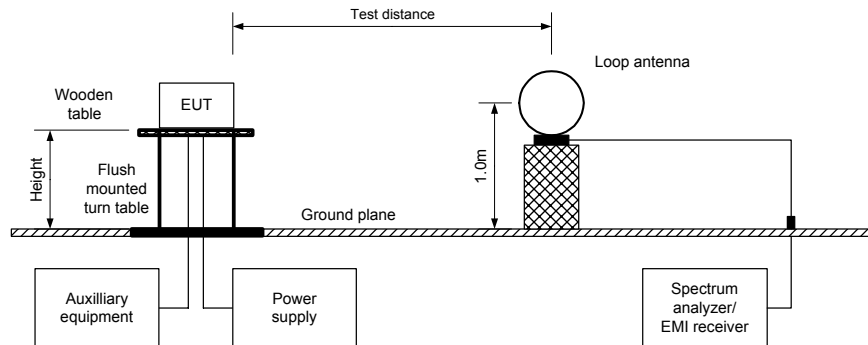
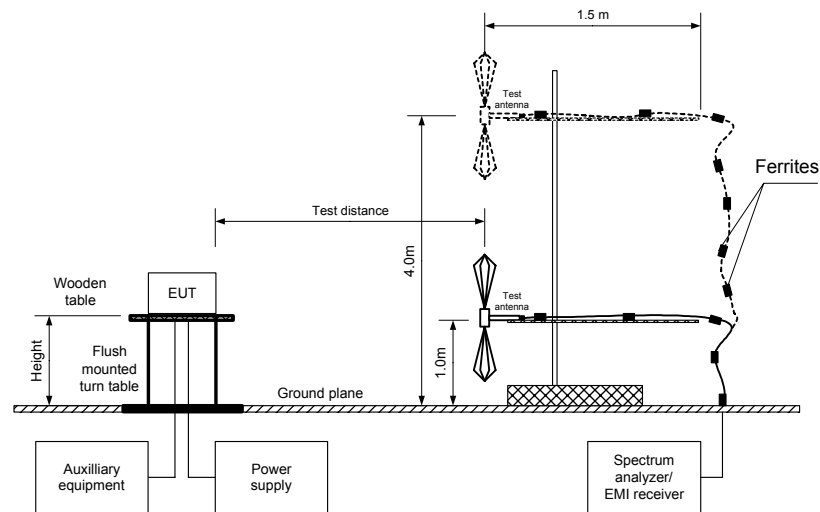


Figure 7.3.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Table 7.3.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY: 2400-2483.5 MHz
 EUT position: 3 orthogonal
 INVESTIGATED FREQUENCY RANGE: 0.009 - 30 MHz
 TEST DISTANCE: 3 m
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 0.5 Mbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: -7.11 dBm at low carrier frequency
 -2.17 dBm at mid carrier frequency
 -1.65 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)

Basic legal 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, 2401 MHz									
At least 20 dB below the limit									Pass
Mid carrier frequency, 2441 MHz									
At least 20 dB below the limit									Pass
High carrier frequency, 2482MHz									
At least 20 dB below the limit									Pass

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

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

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Table 7.3.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY: 2400-2483.5 MHz
 EUT position: 3 orthogonal
 INVESTIGATED FREQUENCY RANGE: 1000 - 26500 MHz
 TEST DISTANCE: 3 m
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 0.5 Mbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: -7.11 dBm at low carrier frequency
 -2.17 dBm at mid carrier frequency
 -1.65 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***	
Low carrier frequency, 2401 MHz											
4801.967	V	1.0	0	58.50	74.0	-15.50	55.33	44.33	54.00	-9.67	Pass
7202.975	V	1.0	0	60.17	74.0	-13.83	53.17	42.17	54.00	-11.83	
Mid carrier frequency, 2441 MHz											
4881.958	V	1.0	0	59.17	74.0	-14.83	55.83	44.83	54.00	-9.17	Pass
7322.883	V	1.0	0	54.67	74.0	-19.33	43.83	32.83	54.00	-21.17	
High carrier frequency, 2482 MHz											
4964.092	V	1.0	0	61.17	74.0	-12.83	58.17	47.17	54.00	-6.83	Pass
7445.967	V	1.0	0	54.50	74.0	-19.50	43.17	32.17	54.00	-21.83	

The recorded test results were obtained in the EUT Z-axis position.

*- 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 7.3.4 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
See manufacturer declaration					-11

*- Average factor was calculated as follows

for pulse train shorter than 100 ms:

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

for pulse train longer than 100 ms:

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

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Table 7.3.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 EUT position: 3 orthogonal
 INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz
 TEST DISTANCE: 3 m
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 0.5 Mbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: -7.11 dBm at low carrier frequency
 -2.17 dBm at mid carrier frequency
 -1.65 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*				
Low carrier frequency, 2401 MHz								
No spurious emissions were found								Pass
Mid carrier frequency, 2441 MHz								
No spurious emissions were found								Pass
High carrier frequency, , 2482 MHz								
No spurious emissions were found								Pass

*- Margin = Measured emission - specification limit.

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

Table 7.3.6 Restricted bands

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

Reference numbers of test equipment used

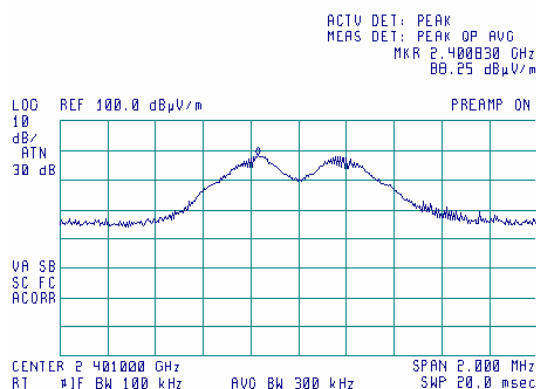
HL 0410	HL 0521	HL 0589	HL 0604	HL 0768	HL 0769	HL 1200	HL 1424
HL 1425	HL 1553	HL 1567	HL 1942	HL 1984	HL 2009	HL 2258	HL 2259
HL 2260	HL 2387	HL 2399	HL 2432	HL 2697			

Full description is given in Appendix A.

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

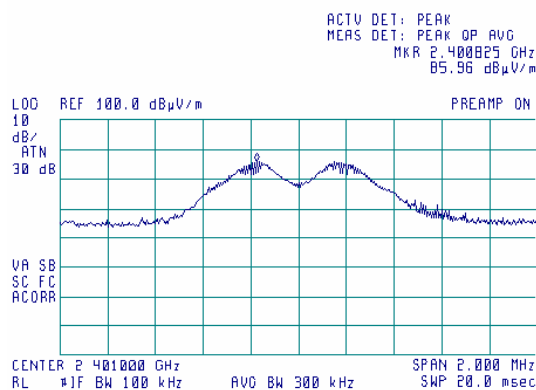
Plot 7.3.1 Radiated emission measurements at the low carrier frequency

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



Plot 7.3.2 Radiated emission measurements at the low carrier frequency

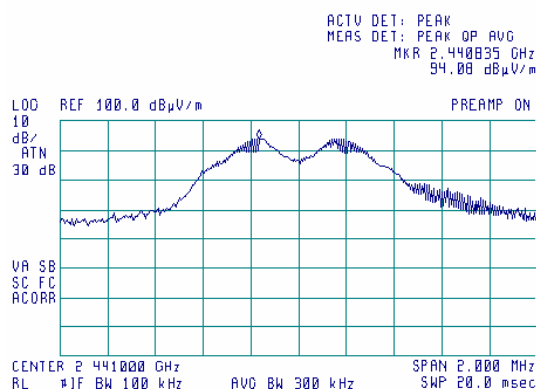
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

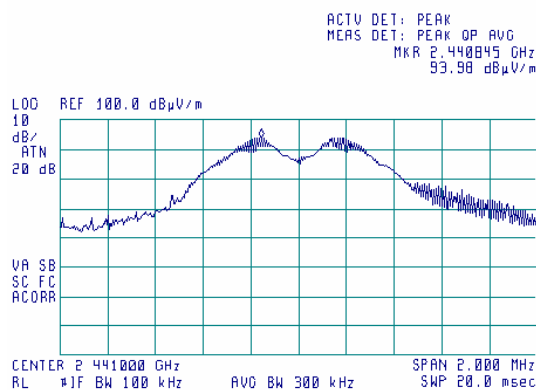
Plot 7.3.3 Radiated emission measurements at the mid carrier frequency

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



Plot 7.3.4 Radiated emission measurements at the mid carrier frequency

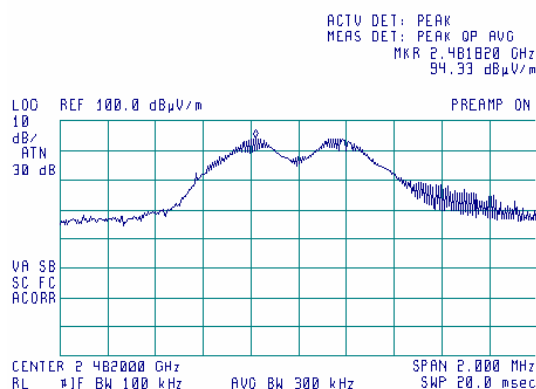
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

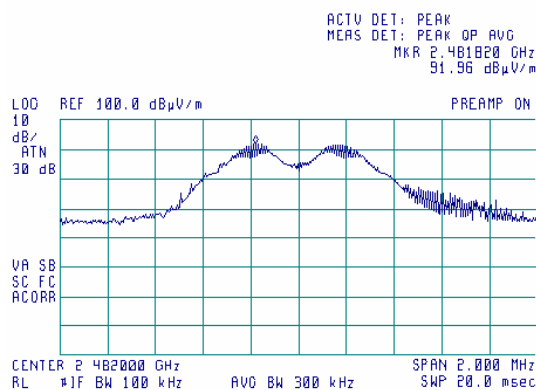
Plot 7.3.5 Radiated emission measurements at the high carrier frequency

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



Plot 7.3.6 Radiated emission measurements at the high carrier frequency

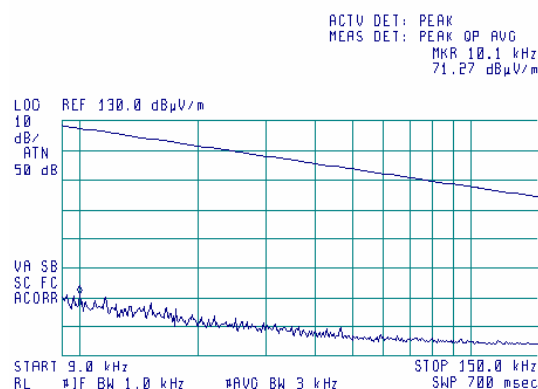
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

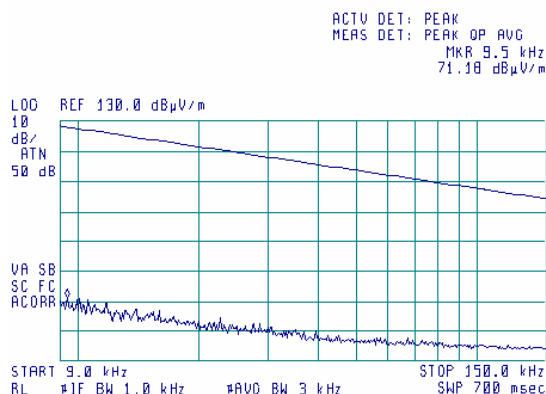
Plot 7.3.7 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

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



Plot 7.3.8 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

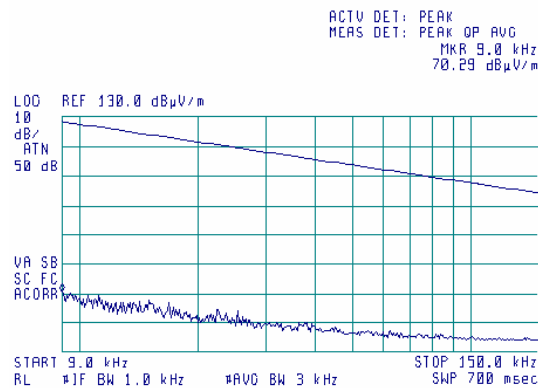
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

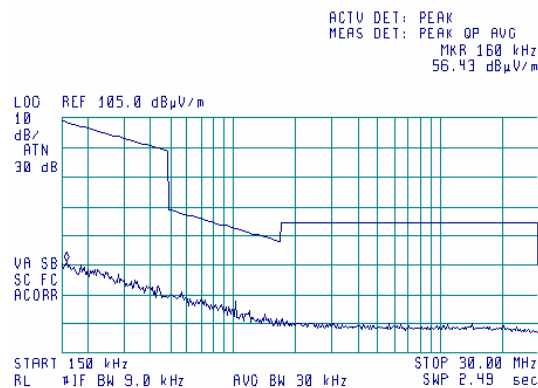
Plot 7.3.9 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

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



Plot 7.3.10 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

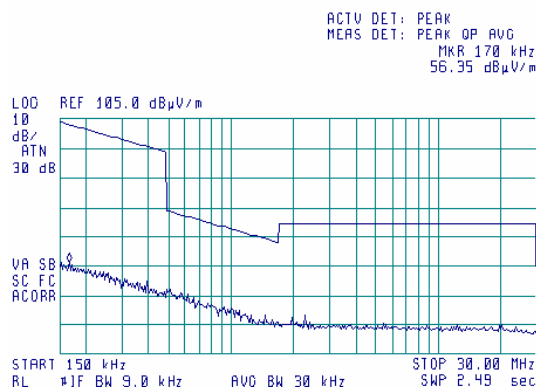
TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

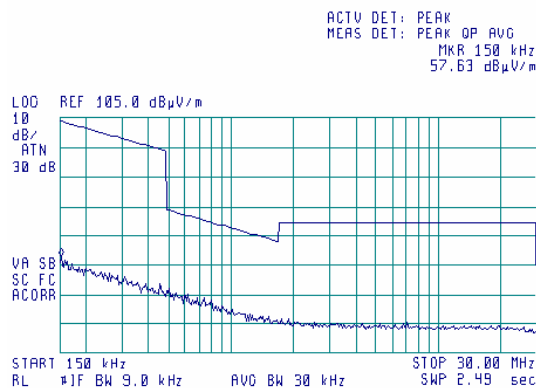
Plot 7.3.11 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

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



Plot 7.3.12 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

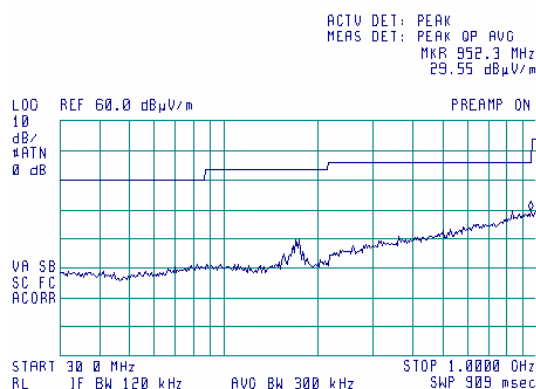
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict: PASS	
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

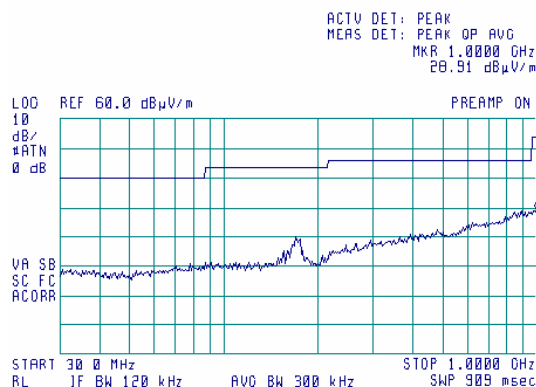
Plot 7.3.13 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

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



Plot 7.3.14 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

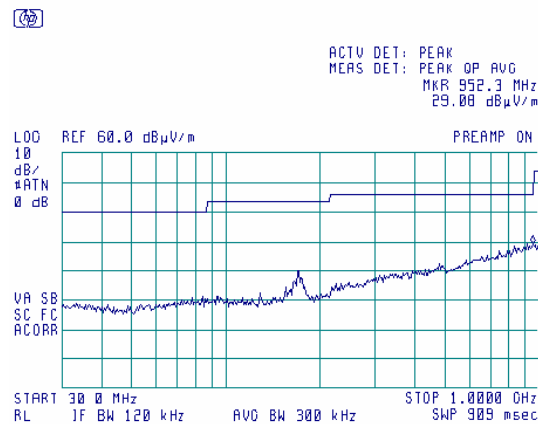
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

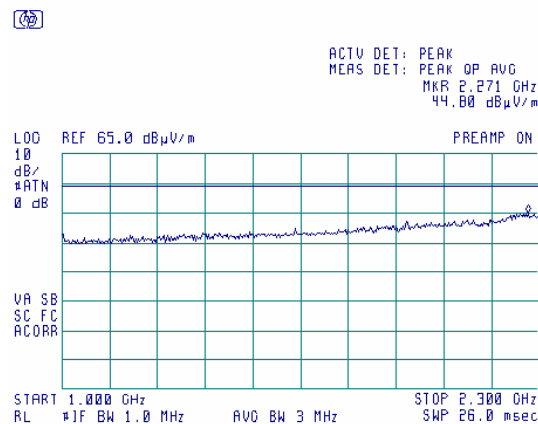
Plot 7.3.15 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

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



Plot 7.3.16 Radiated emission measurements from 1000 to 2300 MHz at the low carrier frequency

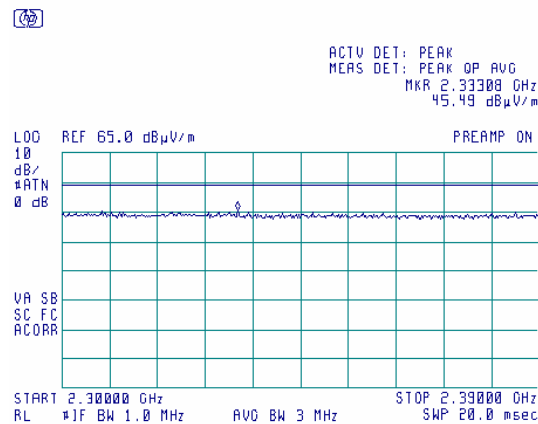
TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

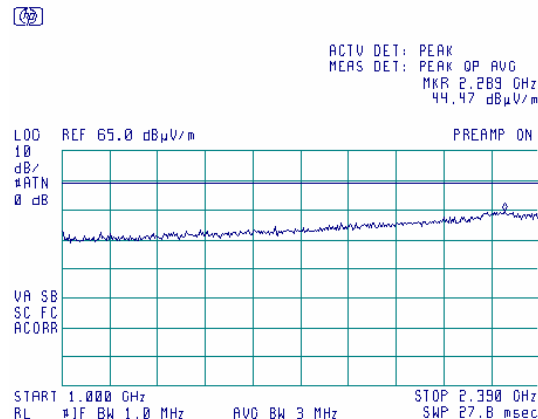
Plot 7.3.17 Radiated emission measurements from 2300 to 2390 MHz at the low carrier frequency

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



Plot 7.3.18 Radiated emission measurements from 1000 to 2390 MHz at the mid carrier frequency

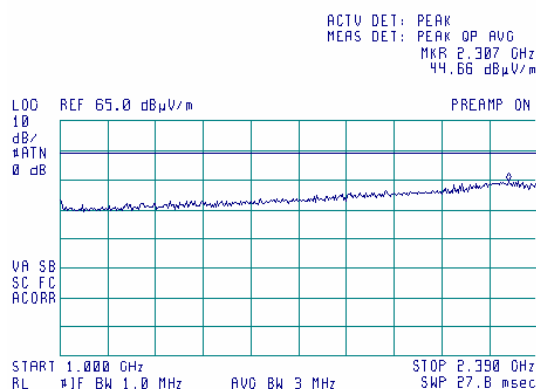
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

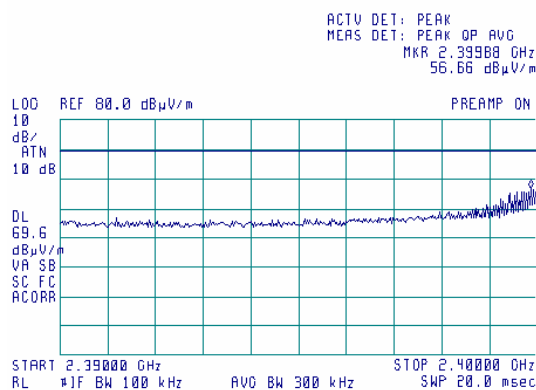
Plot 7.3.19 Radiated emission measurements from 1000 to 2390 MHz at the high carrier frequency

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



Plot 7.3.20 Radiated emission measurements from 2390 to 2400 MHz at the low carrier frequency

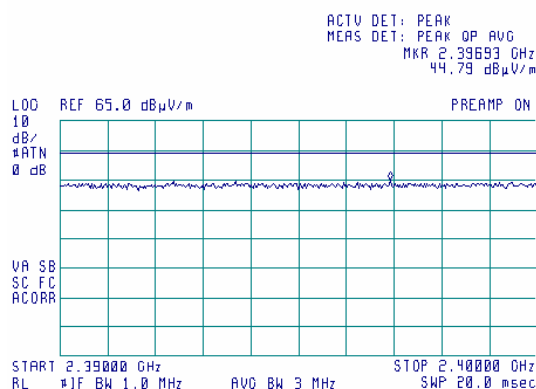
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

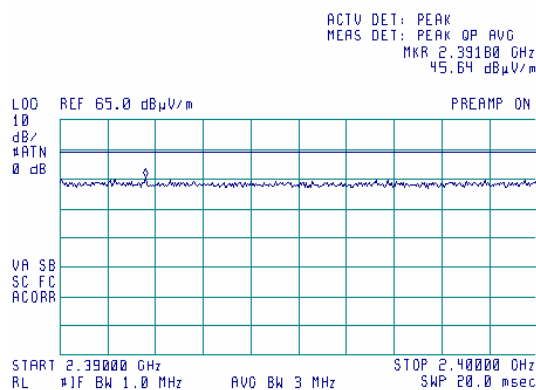
Plot 7.3.21 Radiated emission measurements from 2390 to 2400 MHz at the mid carrier frequency

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



Plot 7.3.22 Radiated emission measurements from 2390 to 2400 MHz at the high carrier frequency

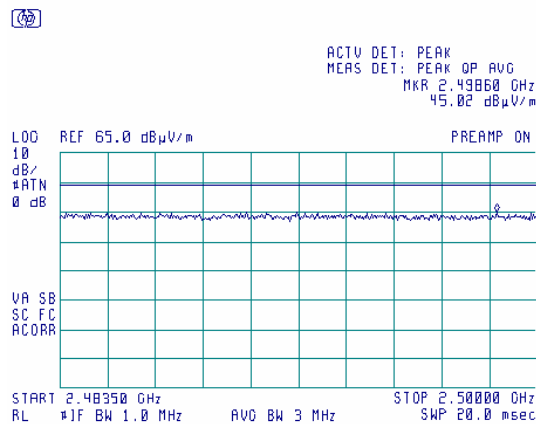
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

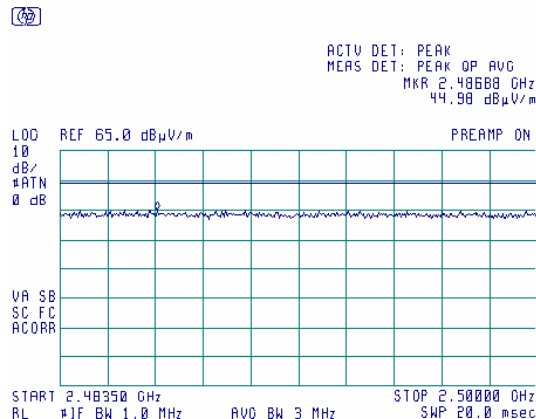
Plot 7.3.23 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

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



Plot 7.3.24 Radiated emission measurements from 2483.5 to 2500 MHz at the mid carrier frequency

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

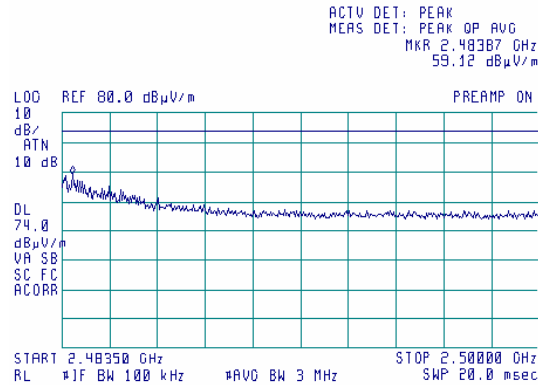


Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.25 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

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

62

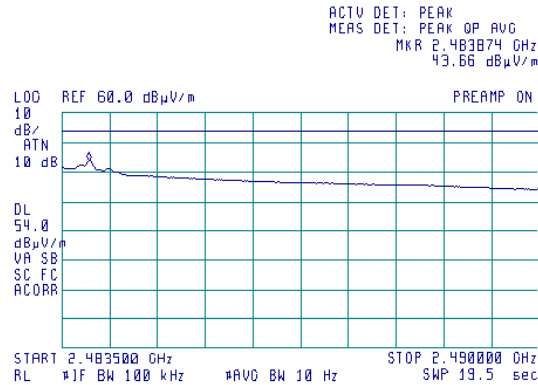


Note: SA reading + 10 log(1 MHz/100 kHz) = 59.12 + 10 dB = 69.12 dBμV/m

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Verdict: PASS	
Date & Time:			
Temperature: 21 °C		Relative Humidity: 43 %	Power Supply: 3.7 V battery
Air Pressure: 1010 hPa			
Remarks: Stimulator (STM)			

Plot 7.3.26 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

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

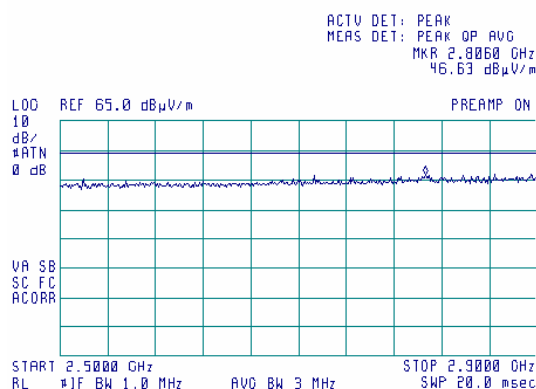


Note: SA reading + 10 log(1 MHz/100 kHz) = 43.66 + 10 dB = 53.66 dBμV/m

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

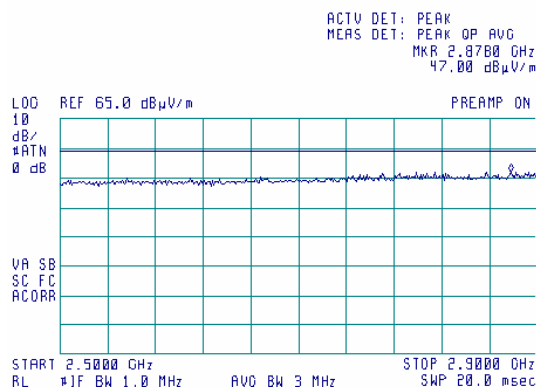
Plot 7.3.27 Radiated emission measurements from 2500 to 2900 MHz at the low carrier frequency

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



Plot 7.3.28 Radiated emission measurements from 2500 to 2900 MHz at the mid carrier frequency

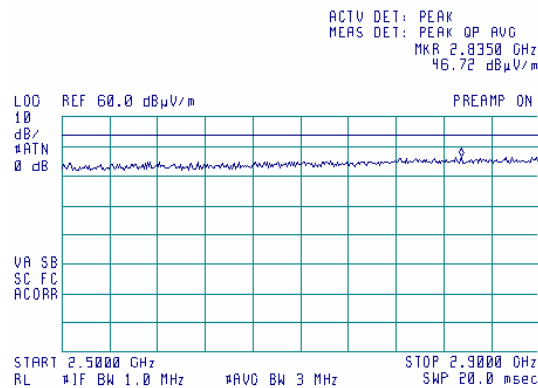
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

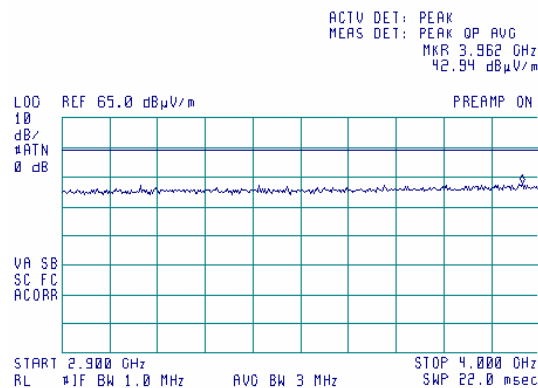
Plot 7.3.29 Radiated emission measurements from 2500 to 2900 MHz at the high carrier frequency

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



Plot 7.3.30 Radiated emission measurements from 2900 to 4000 MHz at the low carrier frequency

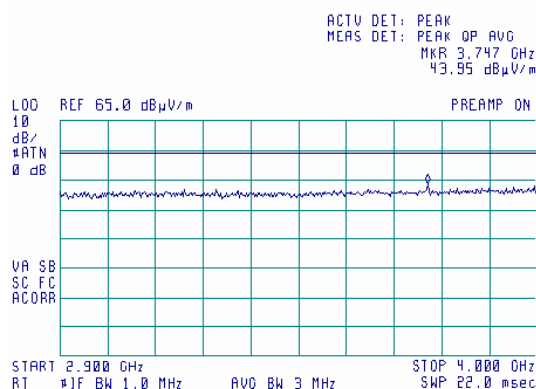
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

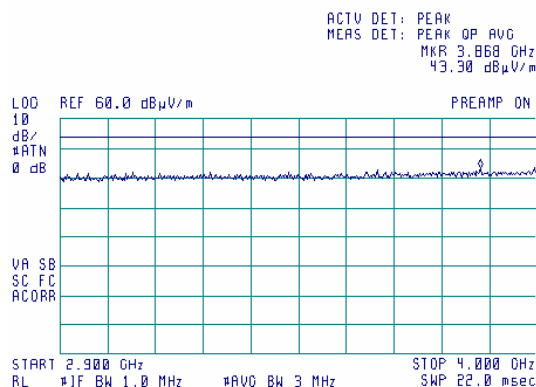
Plot 7.3.31 Radiated emission measurements from 2900 to 4000 at the mid carrier frequency

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



Plot 7.3.32 Radiated emission measurements from 2900 to 4000 MHz at the high carrier frequency

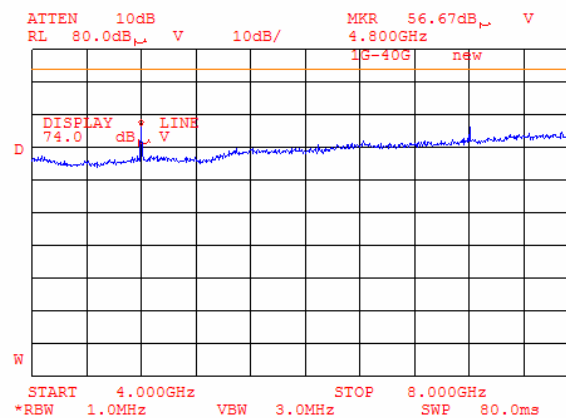
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.33 Radiated emission measurements from 4000 to 8000 MHz at the low carrier frequency

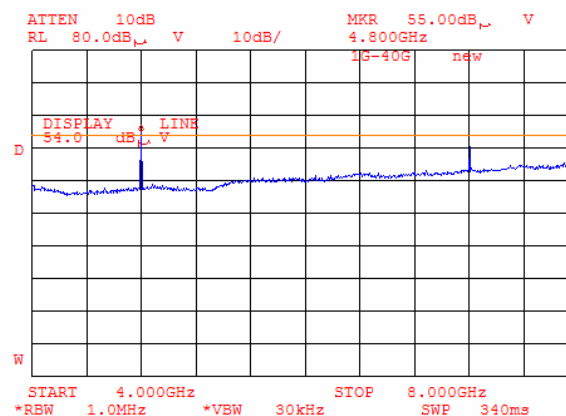
TEST SITE: OATS
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: PEAK



Note: 4802 MHz – second harmonic of RF module, 7203 MHz – third harmonic of RF module.

Plot 7.3.34 Radiated emission measurements from 4000 to 8000 MHz at the low carrier frequency

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

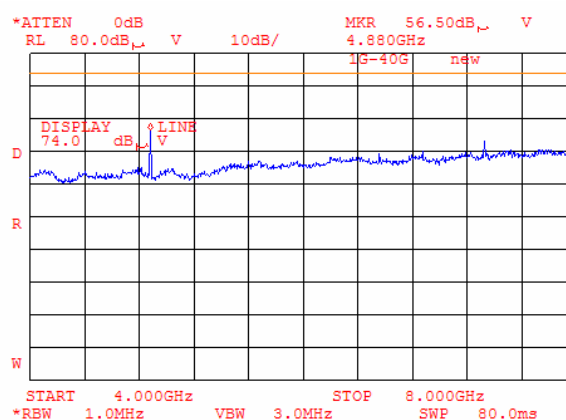


Note: 4802 MHz – second harmonic of RF module, 7203 MHz – third harmonic of RF module.

Test specification: Section 15.247(c), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/16/2006 9:52:00 AM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.35 Radiated emission measurements from 4000 to 8000 at the mid carrier frequency

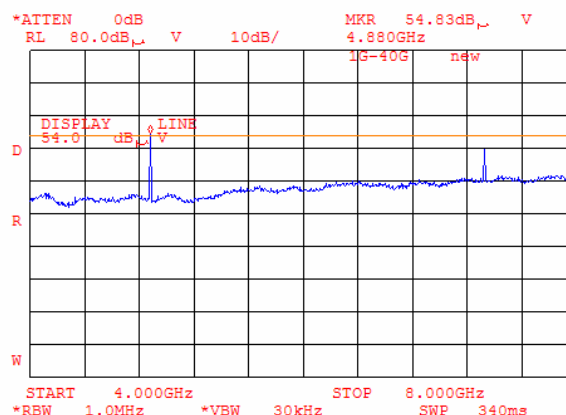
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Note: 4882 MHz – second harmonic of RF module, 7323 MHz – third harmonic of RF module.

Plot 7.3.36 Radiated emission measurements from 4000 to 8000 at the mid carrier frequency

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

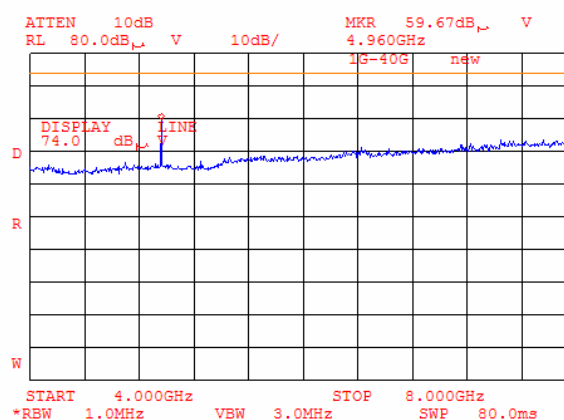


Note: 4882 MHz – second harmonic of RF module, 7323 MHz – third harmonic of RF module.

Test specification: Section 15.247(c), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/16/2006 9:52:00 AM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.37 Radiated emission measurements from 4000 to 8000 MHz at the high carrier frequency

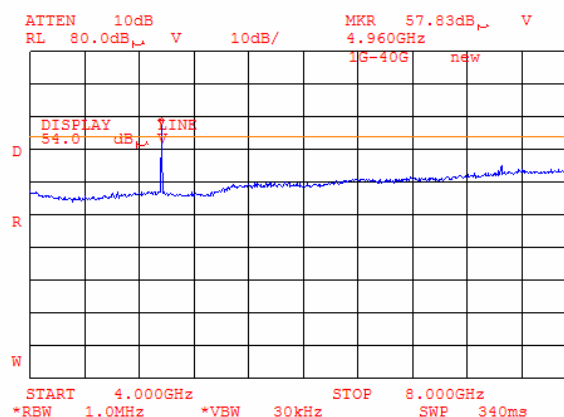
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Note: 4964 MHz – second harmonic of RF module, 7446 MHz – third harmonic of RF module.

Plot 7.3.38 Radiated emission measurements from 4000 to 8000 MHz at the high carrier frequency

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

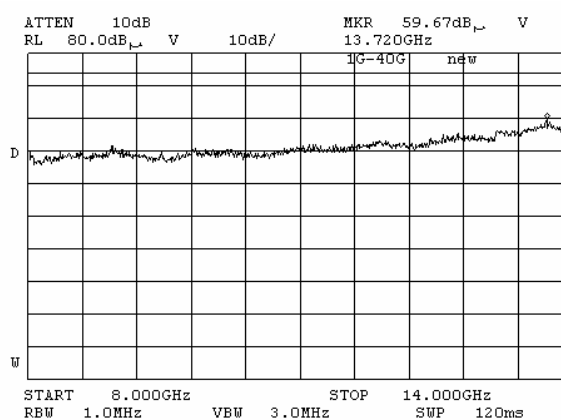


Note: 4964 MHz – second harmonic of RF module, 7446 MHz – third harmonic of RF module.

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.39 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency

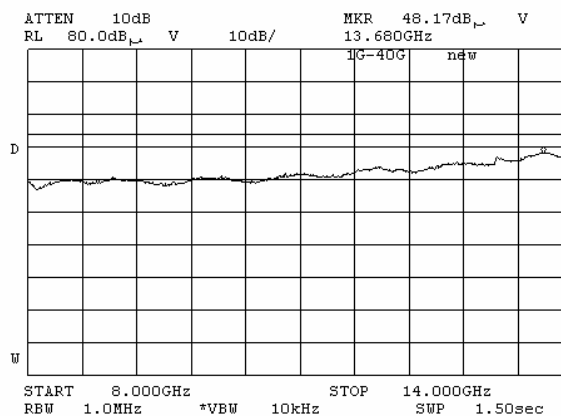
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Note: 9604 MHz – forth harmonic of RF module, 12005 MHz – fifth harmonic of RF module.

Plot 7.3.40 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency

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

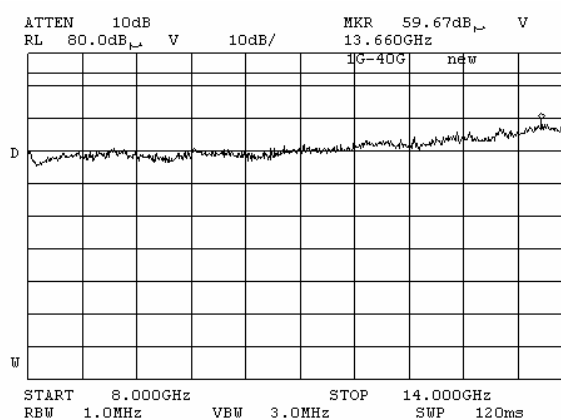


Note: 9604 MHz – forth harmonic of RF module, 12005 MHz – fifth harmonic of RF module

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.41 Radiated emission measurements from 8000 to 14000 at the mid carrier frequency

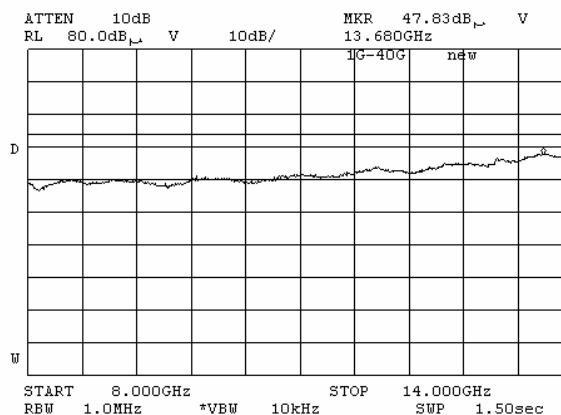
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Note: 9764 MHz – forth harmonic of RF module, 12205 MHz – fifth harmonic of RF module.

Plot 7.3.42 Radiated emission measurements from 8000 to 14000 at the mid carrier frequency

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

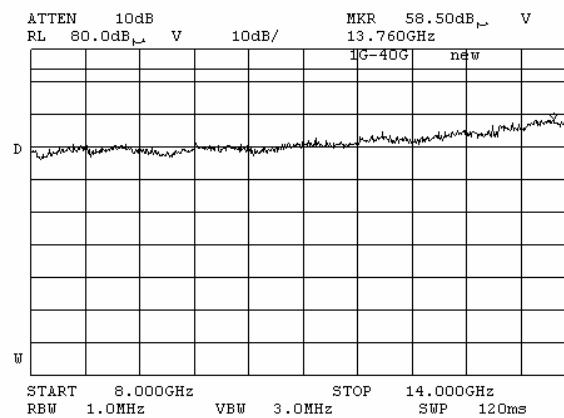


Note: 9764 MHz – forth harmonic of RF module, 12205 MHz – fifth harmonic of RF module.

Test specification: Section 15.247(c), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/16/2006 9:52:00 AM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.43 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency

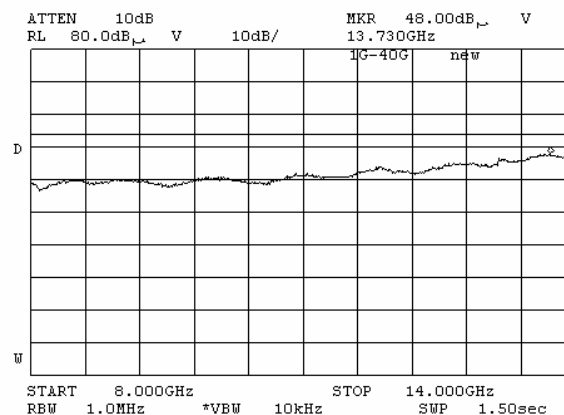
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Note: 9928 MHz – forth harmonic of RF module, 12410 MHz – fifth harmonic of RF module.

Plot 7.3.44 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency

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

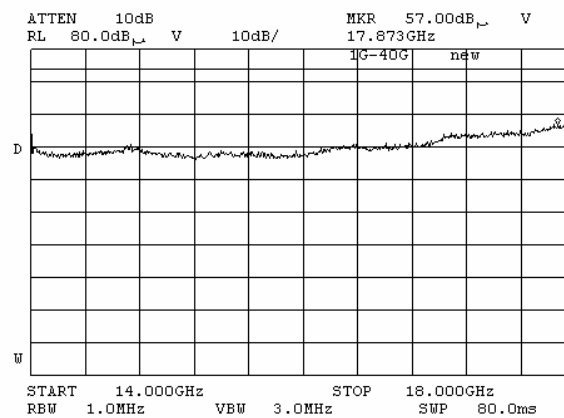


Note: 9928 MHz – forth harmonic of RF module, 12410 MHz – fifth harmonic of RF module.

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.45 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency

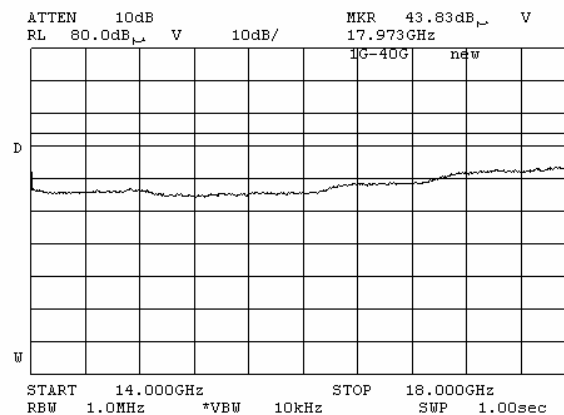
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Note: 14406 MHz – sixth harmonic of RF module, 16807 MHz – seventh harmonic of RF module.

Plot 7.3.46 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency

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

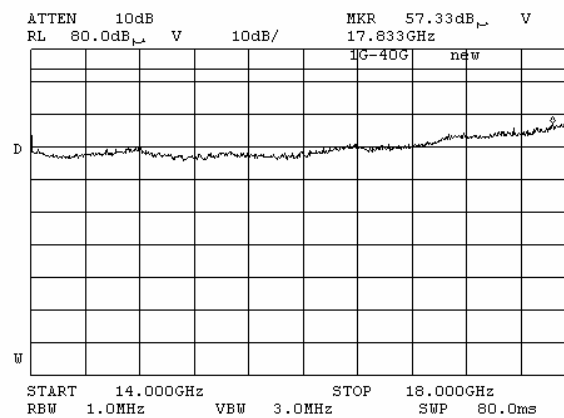


Note: 14406 MHz – sixth harmonic of RF module, 16807 MHz – seventh harmonic of RF module.

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.47 Radiated emission measurements from 14000 to 18000 at the mid carrier frequency

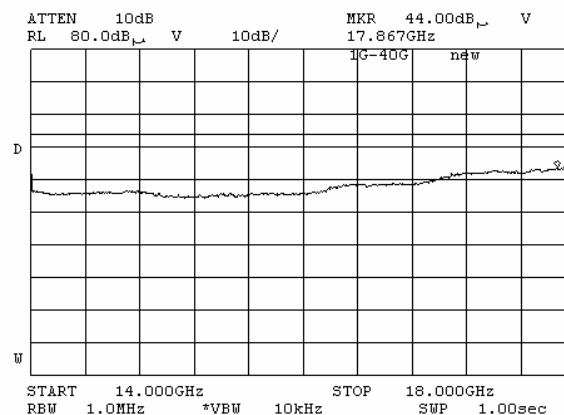
TEST SITE: OATS
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: PEAK



Note: 14646 MHz – sixth harmonic of RF module, 17087 MHz – seventh harmonic of RF module.

Plot 7.3.48 Radiated emission measurements from 14000 to 18000 at the mid carrier frequency

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

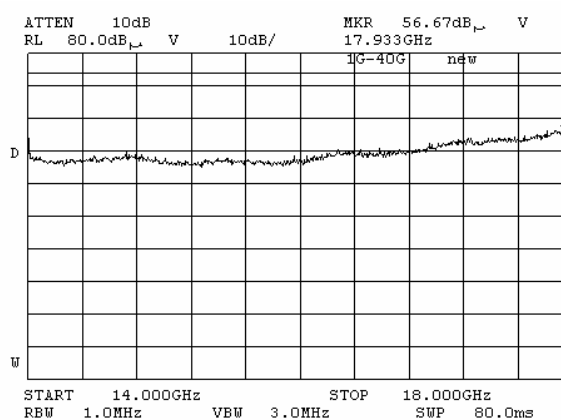


Note: 14646 MHz – sixth harmonic of RF module, 17087 MHz – seventh harmonic of RF module.

Test specification: Section 15.247(c), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/16/2006 9:52:00 AM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.49 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency

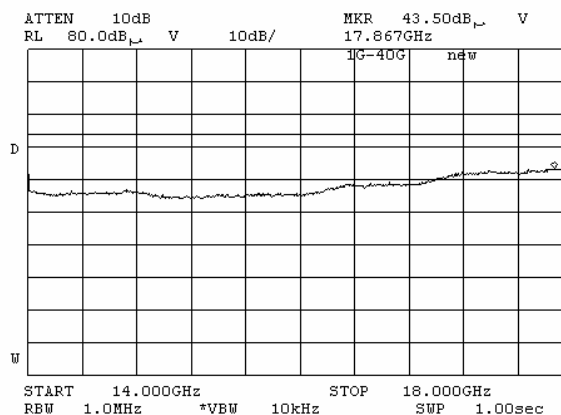
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Note: 14892 MHz – sixth harmonic of RF module, 17274 MHz – seventh harmonic of RF module.

Plot 7.3.50 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency

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

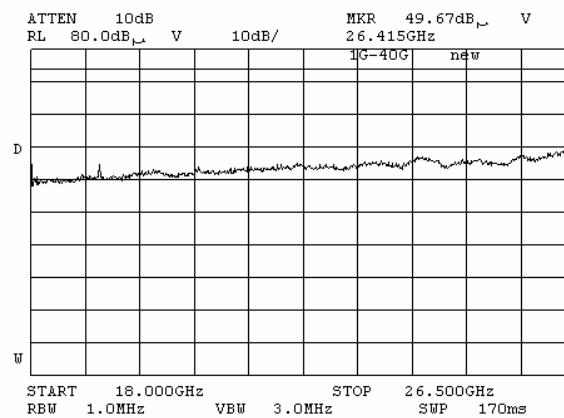


Note: 14892 MHz – sixth harmonic of RF module, 17274 MHz – seventh harmonic of RF module.

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.51 Radiated emission measurements from 18000 to 26500 MHz at the low carrier frequency

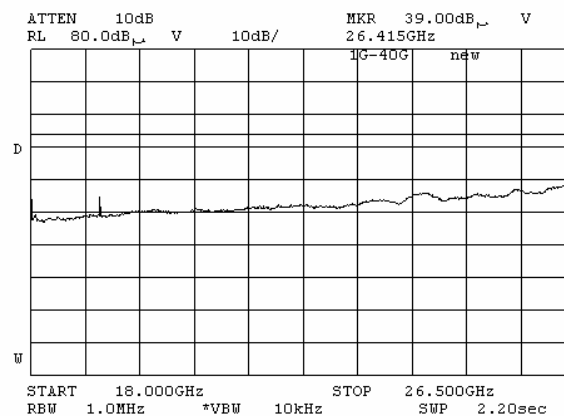
TEST SITE: OATS
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: PEAK



Note: 19208 MHz – eighth harmonic of RF module, 21609 MHz – ninth harmonic of RF module, 24010 MHz – tenth harmonic of RF module.

Plot 7.3.52 Radiated emission measurements from 18000 to 26500 MHz at the low carrier frequency

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

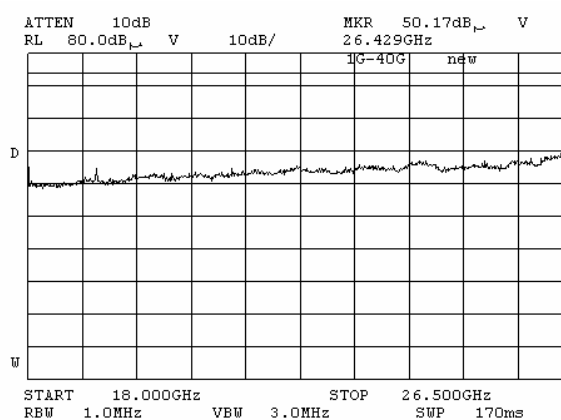


Note: 19208 MHz – eighth harmonic of RF module, 21609 MHz – ninth harmonic of RF module, 24010 MHz – tenth harmonic of RF module.

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.53 Radiated emission measurements from 18000 to 26500 at the mid carrier frequency

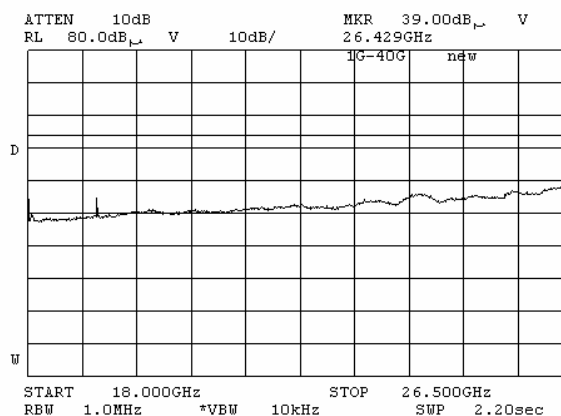
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Note: 19208 MHz – eighth harmonic of RF module, 21609 MHz – ninth harmonic of RF module, 24010 MHz – tenth harmonic of RF module.

Plot 7.3.54 Radiated emission measurements from 18000 to 26500 at the mid carrier frequency

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

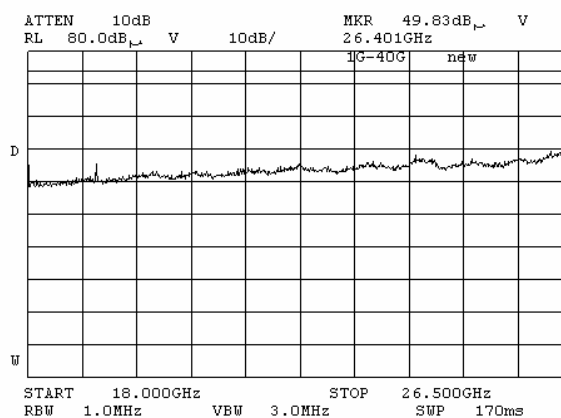


Note: 19208 MHz – eighth harmonic of RF module, 21609 MHz – ninth harmonic of RF module, 24010 MHz – tenth harmonic of RF module.

Test specification: Section 15.247(c), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/16/2006 9:52:00 AM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.55 Radiated emission measurements from 18000 to 26500 MHz at the high carrier frequency

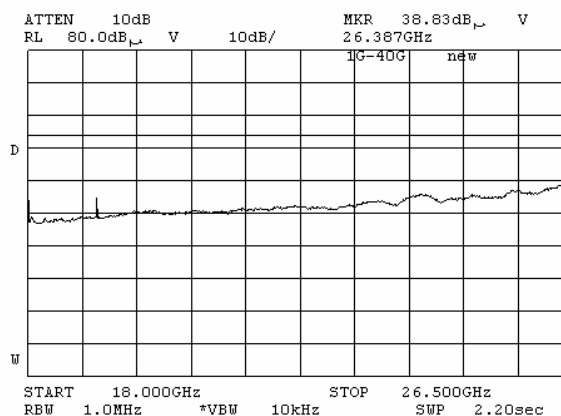
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Note: 19208 MHz – eighth harmonic of RF module, 21609 MHz – ninth harmonic of RF module,
Note: 24010 MHz – tenth harmonic of RF module.

Plot 7.3.56 Radiated emission measurements from 18000 to 26500 MHz at the high carrier frequency

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

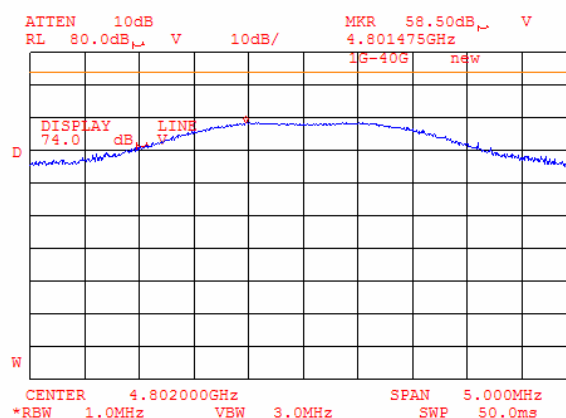


Note: 19208 MHz – eighth harmonic of RF module, 21609 MHz – ninth harmonic of RF module,
24010 MHz – tenth harmonic of RF module.

Test specification: Section 15.247(c), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/16/2006 9:52:00 AM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

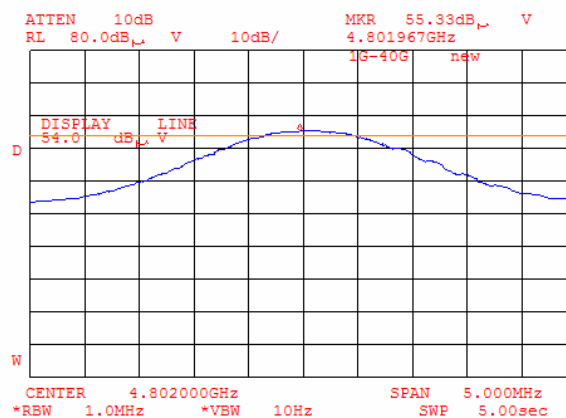
Plot 7.3.57 Radiated emission measurements at the second harmonic of low carrier frequency

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



Plot 7.3.58 Radiated emission measurements at the second harmonic of low carrier frequency

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

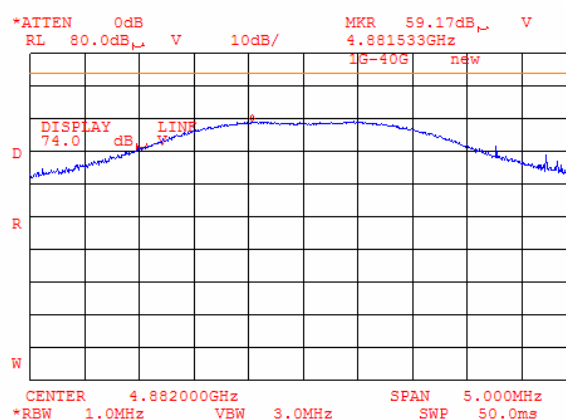


Note: Field strength = SA reading + average factor = 55.33 + (-11 dB) = 44.33 dBμV/m

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

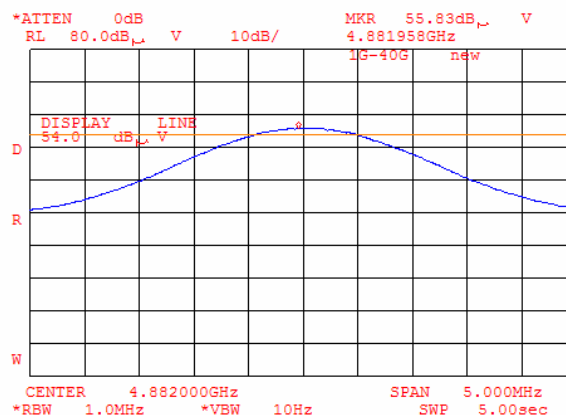
Plot 7.3.59 Radiated emission measurements at the second harmonic of mid carrier frequency

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



Plot 7.3.60 Radiated emission measurements at the second harmonic of mid carrier frequency

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

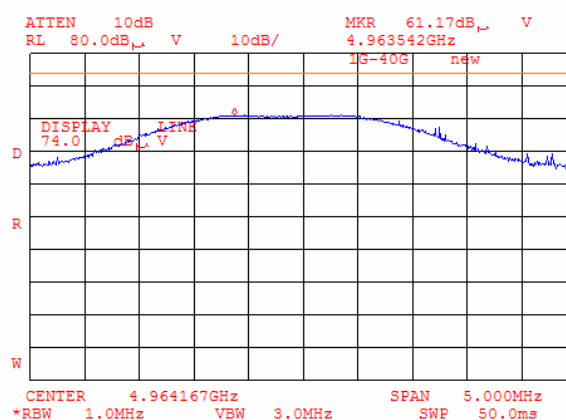


Note: Field strength = SA reading + average factor = 55.83 + (-11 dB) = 44.83 dBμV/m

Test specification: Section 15.247(c), Radiated spurious emissions			
Test procedure: FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/16/2006 9:52:00 AM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

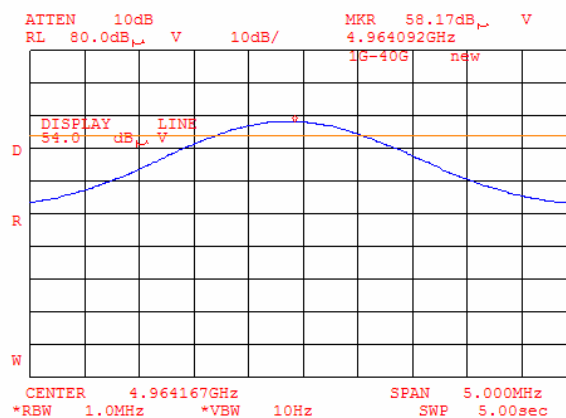
Plot 7.3.61 Radiated emission measurements at the second harmonic of high carrier frequency

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



Plot 7.3.62 Radiated emission measurements at the second harmonic of high carrier frequency

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

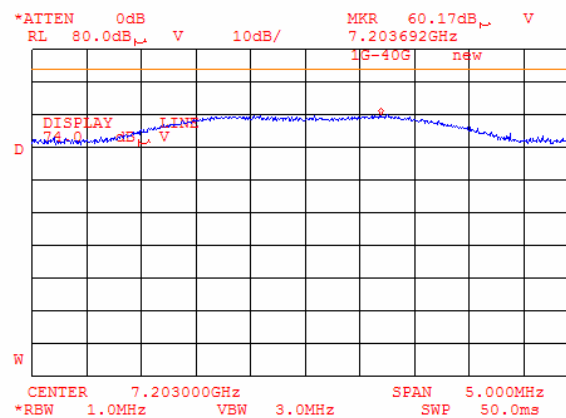


Note: Field strength = SA reading + average factor = 58.17 + (-11 dB) = 47.17 dBµV/m

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

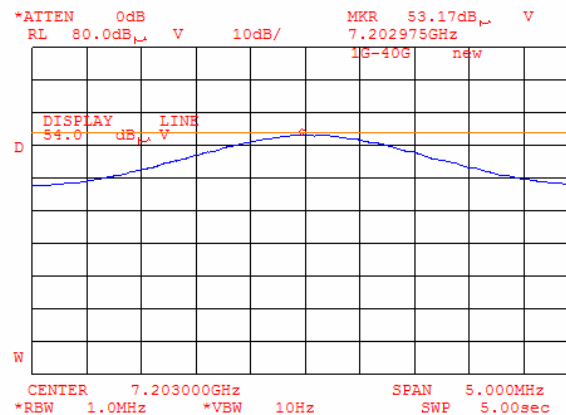
Plot 7.3.63 Radiated emission measurements at the third harmonic of low carrier frequency

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



Plot 7.3.64 Radiated emission measurements at the third harmonic of low carrier frequency

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

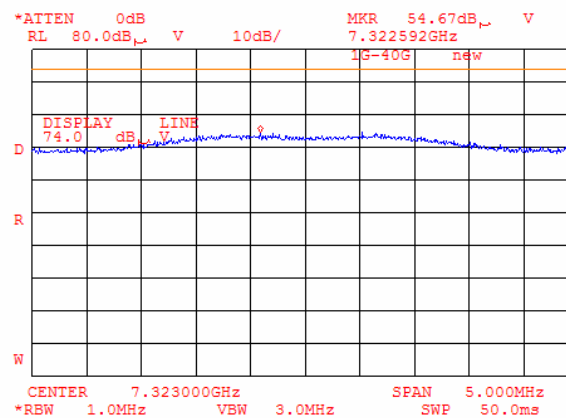


Note: Field strength = SA reading + average factor = 53.17 + (-11 dB) = 42.17 dBμV/m

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

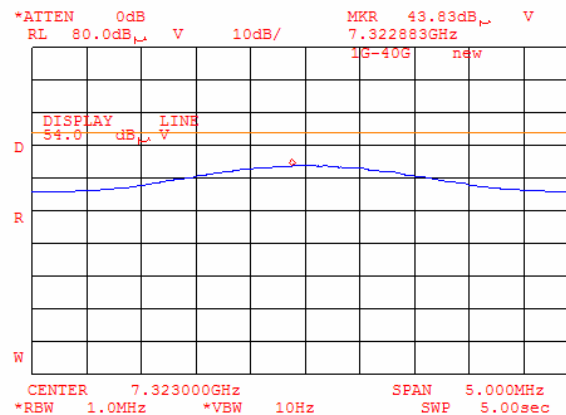
Plot 7.3.65 Radiated emission measurements at the third harmonic of mid carrier frequency

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



Plot 7.3.66 Radiated emission measurements at the third harmonic of mid carrier frequency

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

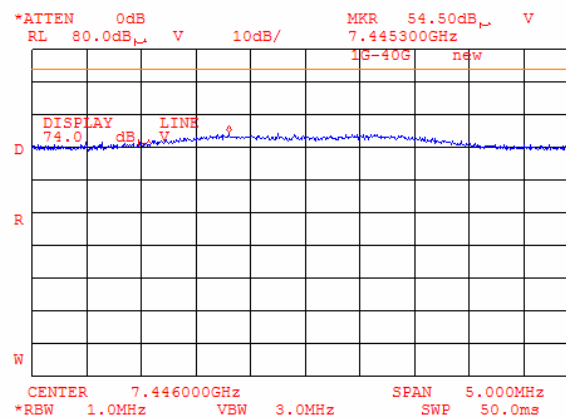


Note: Field strength = SA reading + average factor = 43.83 + (-11 dB) = 32.83 dBμV/m

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

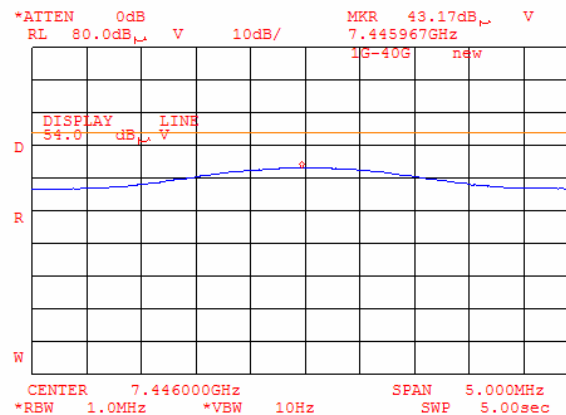
Plot 7.3.67 Radiated emission measurements at the third harmonic of high carrier frequency

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



Plot 7.3.68 Radiated emission measurements at the third harmonic of high carrier frequency

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

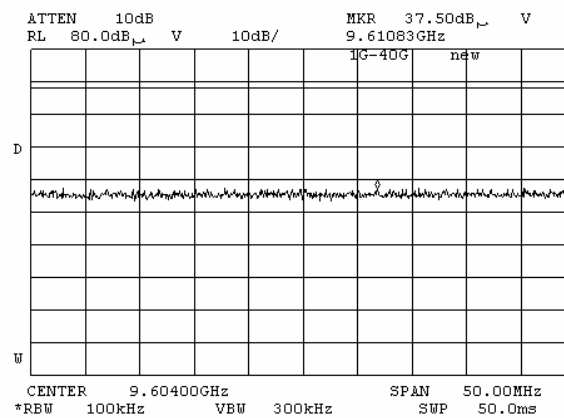


Note: Field strength = SA reading + average factor = 43.17 + (-11 dB) = 32.17 dBμV/m

Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

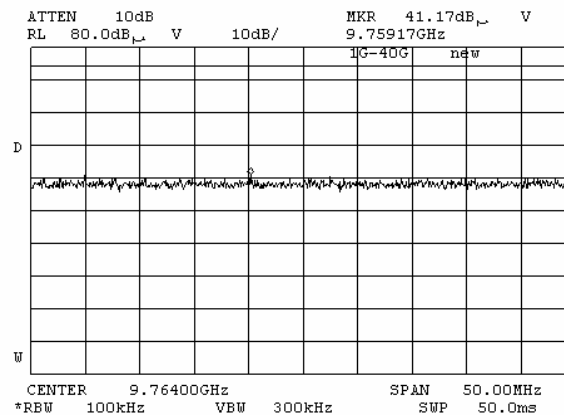
Plot 7.3.69 Radiated emission measurements at the forth harmonic of low carrier frequency

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



Plot 7.3.70 Radiated emission measurements at the forth harmonic of mid carrier frequency

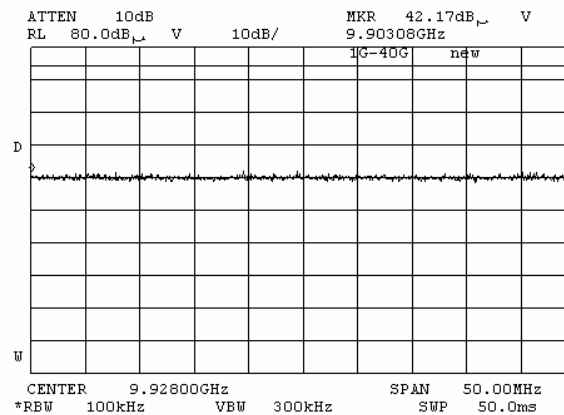
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2006 9:52:00 AM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.3.71 Radiated emission measurements at the forth harmonic of high carrier frequency

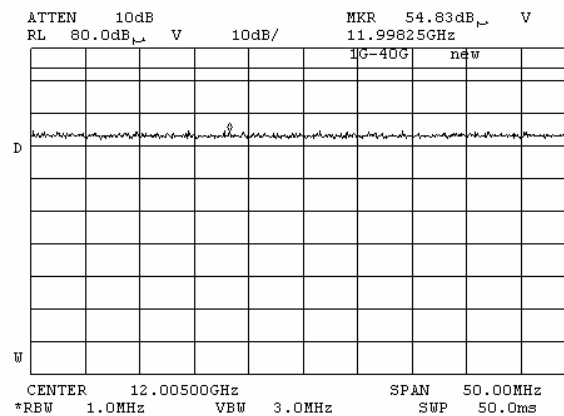
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

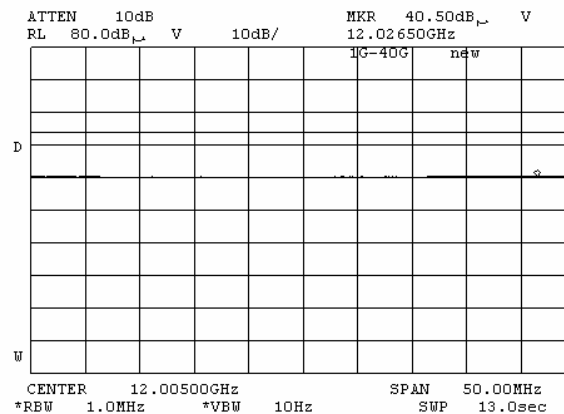
Plot 7.3.72 Radiated emission measurements at the fifth harmonic of low carrier frequency

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



Plot 7.3.73 Radiated emission measurements at the fifth harmonic of low carrier frequency

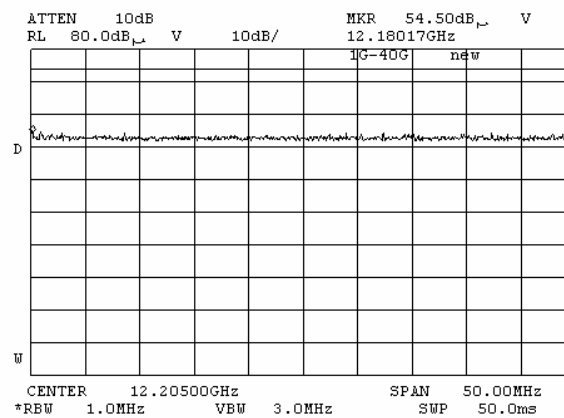
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: AVERAGE



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

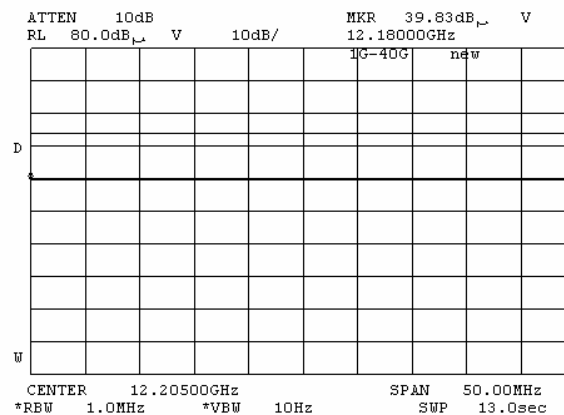
Plot 7.3.74 Radiated emission measurements at the fifth harmonic of mid carrier frequency

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



Plot 7.3.75 Radiated emission measurements at the fifth harmonic of mid carrier frequency

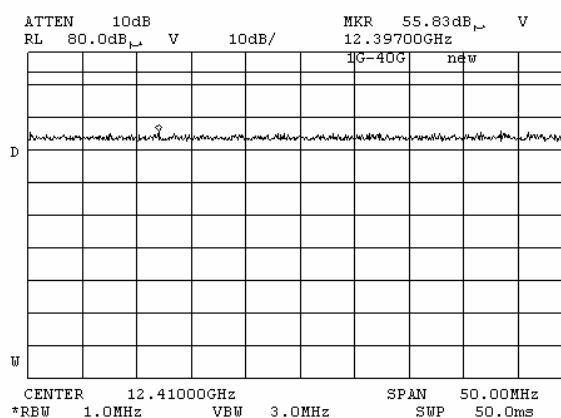
TEST SITE: OATS
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: AVERAGE



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

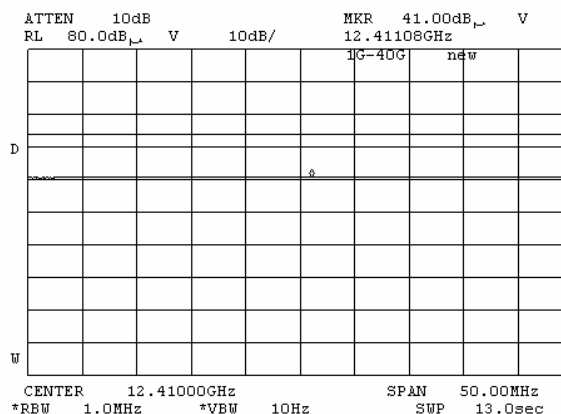
Plot 7.3.76 Radiated emission measurements at the fifth harmonic of high carrier frequency

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



Plot 7.3.77 Radiated emission measurements at the fifth harmonic of high carrier frequency

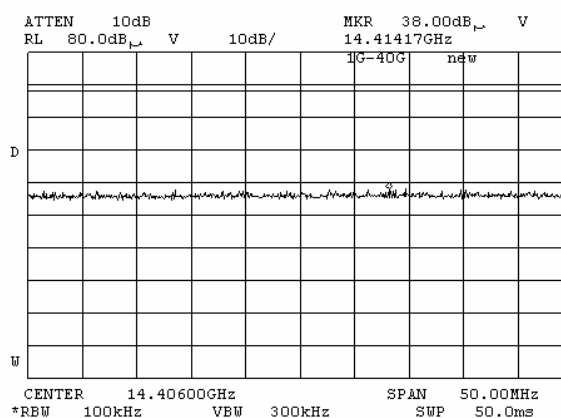
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: AVERAGE



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

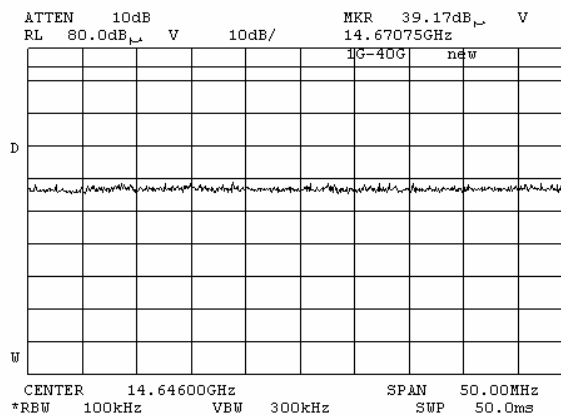
Plot 7.3.78 Radiated emission measurements at the sixth harmonic of low carrier frequency

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



Plot 7.3.79 Radiated emission measurements at the sixth harmonic of mid carrier frequency

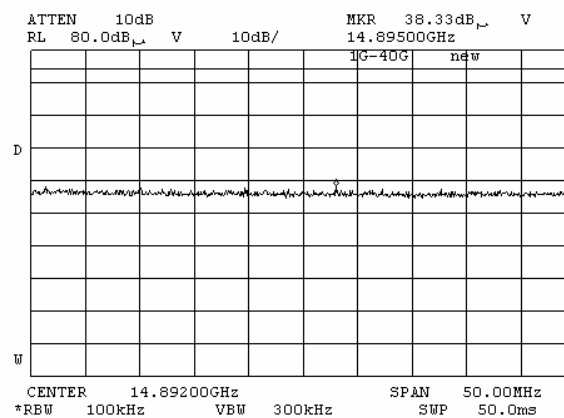
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: PEAK



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

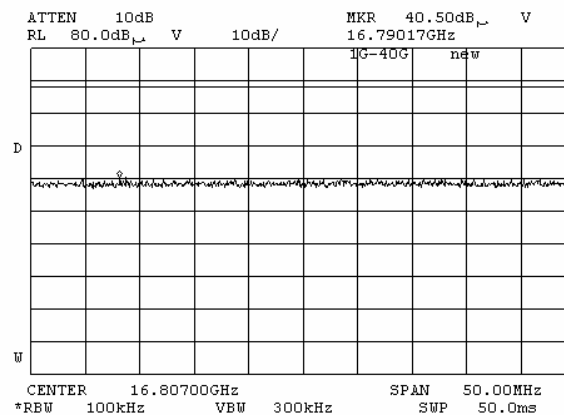
Plot 7.3.80 Radiated emission measurements at the sixth harmonic of high carrier frequency

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



Plot 7.3.81 Radiated emission measurements at the seventh harmonic of low carrier frequency

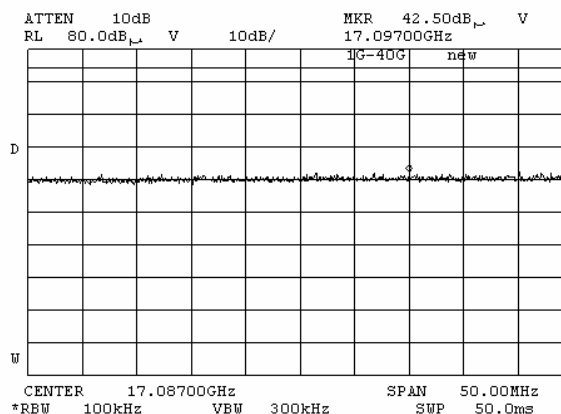
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2006 9:52:00 AM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

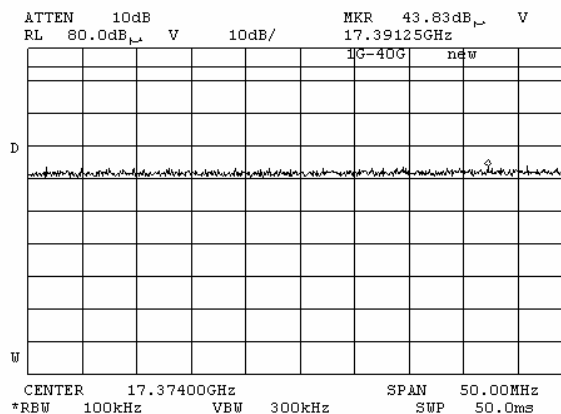
Plot 7.3.82 Radiated emission measurements at the seventh harmonic of mid carrier frequency

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



Plot 7.3.83 Radiated emission measurements at the seventh harmonic of high carrier frequency

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



Test specification: Section 15.247(d), Peak power density			
Test procedure: FR Vol. 62, page 26243, Section 15.247(d)			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/14/2006 7:12:10 PM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

7.4 Peak spectral power density

7.4.1 General

This test was performed to measure the peak spectral power density radiated by the transmitter RF antenna. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Peak spectral power density limits

Assigned frequency range, MHz	Measurement bandwidth, kHz	Peak spectral power density, dBm	Equivalent field strength limit @ 3m, dB(μV/m)*
902.0 – 928.0	3.0	8.0	103.2
2400.0 – 2483.5			
5725.0 – 5850.0			

* - Equivalent field strength limit was calculated from the peak spectral power density as follows: $E = \sqrt{30 \times P} / r$, where P is peak spectral power density and r is antenna to EUT distance in meters.

7.4.2 Test procedure for field strength measurements

- 7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and its proper operation was checked.
- 7.4.2.2 The EUT was adjusted to produce maximum available to end user RF output power.
- 7.4.2.3 The field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna height was swept in both vertical and horizontal polarizations.
- 7.4.2.4 The frequency span of spectrum analyzer was set to capture the entire 6 dB band of the transmitter, in peak hold mode with resolution bandwidth set to 3.0 kHz, video bandwidth wider than resolution bandwidth, auto sweep time and sufficient number of sweeps was allowed for trace stabilization. The spectrum lines spacing was verified to be wider than 3 kHz. Otherwise the resolution bandwidth was reduced until individual spectrum lines were resolved and the power of individual spectrum lines was integrated over 3 kHz band.
- 7.4.2.5 The peak of emission was zoomed with span set just wide enough to capture the emission peak area and sweep time was set equal to span width divided by resolution bandwidth. Spectrum analyzer was set in peak hold mode, sufficient number of sweeps was allowed for trace stabilization and peak spectral power density was measured as provided in Table 7.4.2 and associated plots.

7.4.3 Test procedure for substitution power density measurements

- 7.4.3.1 The test equipment was set up as shown in Figure 7.4.2 and energized.
- 7.4.3.2 RF signal generator was set to the EUT carrier frequency and the RF output level was preliminary adjusted to produce the same field strength as it was measured from the EUT.
- 7.4.3.3 The test antenna height was swept to find maximum emission from substitution antenna and RF signal generator output was fine adjusted to produce the same field strength as it was measured from the EUT.
- 7.4.3.4 The peak spectral power density was calculated as a sum of signal generator output power in dBm and substitution antenna gain in dBi reduced by cable loss in dB and the transmitter antenna gain in dBi.
- 7.4.3.5 The above procedure was performed in both horizontal and vertical polarizations of the substitution antenna.
- 7.4.3.6 The worst test results (the lowest margins) were recorded in Table 7.4.3 and shown in the associated plots.

Test specification: Section 15.247(d), Peak power density			
Test procedure: FR Vol. 62, page 26243, Section 15.247(d)			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/14/2006 7:12:10 PM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Figure 7.4.1 Setup for carrier field strength measurements

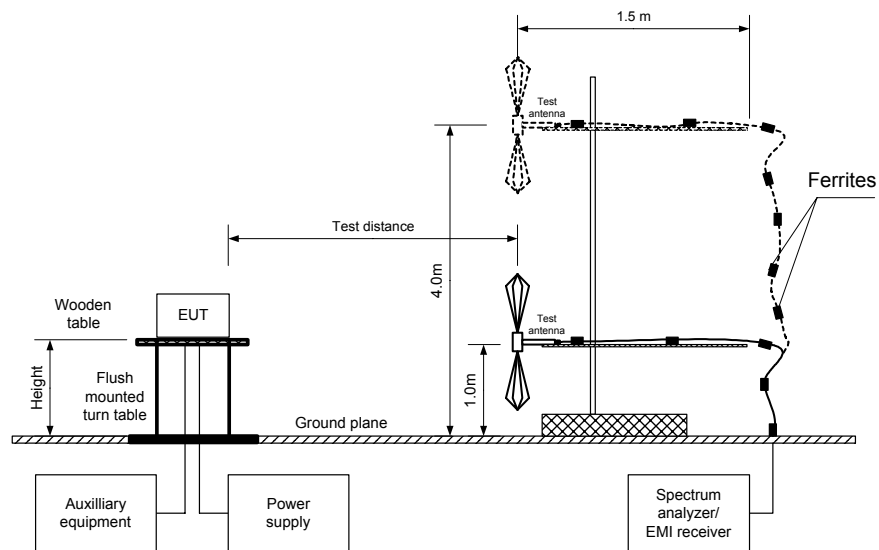
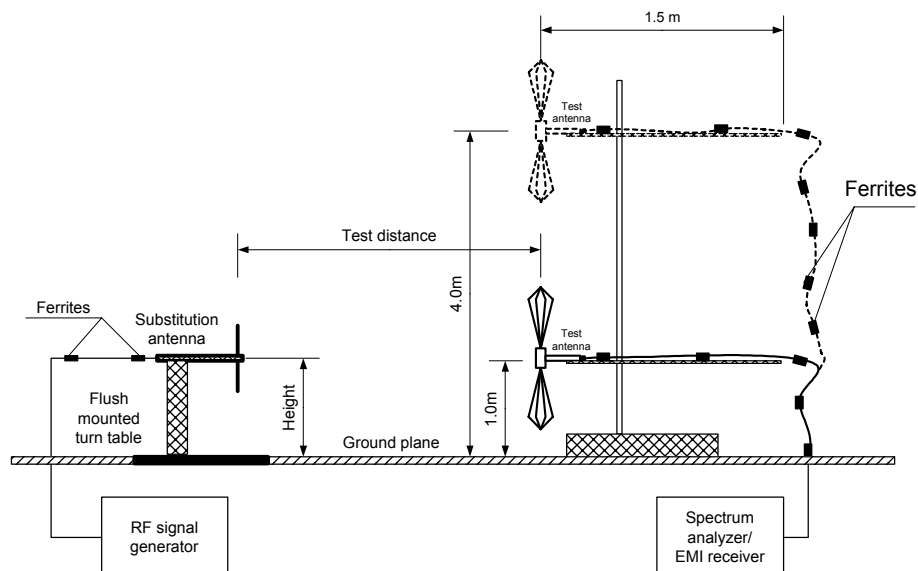


Figure 7.4.2 Setup for substitution power density measurements



Test specification:		Section 15.247(d), Peak power density	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(d)	
Test mode:	Compliance	Verdict: PASS	
Date & Time:	3/14/2006 7:12:10 PM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Table 7.4.2 Field strength measurement of peak spectral power density

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 TEST DISTANCE: 3 m
 TEST SITE: OATS
 EUT HEIGHT: 0.8 m
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 3 kHz
 VIDEO BANDWIDTH: 10 kHz
 TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 0.25 Mbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: -7.11 dBm at low carrier frequency
 -2.17 dBm at mid carrier frequency
 -1.65 dBm at high carrier frequency

Frequency, MHz	Field strength, dB(μV/m)	EUT antenna gain, dBi	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees
2400.8778	89.17	1.5	103.2	-15.53	Vertical	1.0	95
2440.8750	91.67	1.5	103.2	-13.03	Vertical	1.0	90
2481.8693	92.67	1.5	103.2	-12.03	Vertical	1.0	91

*- Margin = Field strength - EUT antenna gain - calculated field strength limit.

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

Table 7.4.3 Substitution measurement of peak spectral power density

ASSIGNED FREQUENCY RANGE: 2400 – 2483.5 MHz
 TEST DISTANCE: 3 m
 SUBSTITUTION ANTENNA HEIGHT: 0.8 m
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 3 kHz
 VIDEO BANDWIDTH: 10 kHz
 SUBSTITUTION ANTENNA TYPE: Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength, dB(μV/m)	Antenna polarization	RF generator output, dBm	Antenna gain, dBi	Cable loss, dB	EUT ant. gain, dBi	Peak power density*, dB(mW/3 kHz)	Limit, dBm	Margin, dB**	Verdict
2400.8778	89.17	Vertical	-14.67	9.02	1.34	1.5	-8.49	8.0	-16.49	Pass
2440.875	91.67	Vertical	-12.17	9.02	1.34	1.5	-5.99	8.0	-13.99	Pass
2481.8693	92.67	Vertical	-11.17	9.02	1.34	1.5	-4.99	8.0	-12.99	Pass

*- Peak power density provided in terms of conducted power density at antenna connector and was calculated as follows:

Peak power density = RF generator output in dBm – Cable loss in dB + Substitution antenna gain in dBi - Transmitter antenna gain in dBi

** - Margin = Peak power density - EUT antenna gain - specification limit.

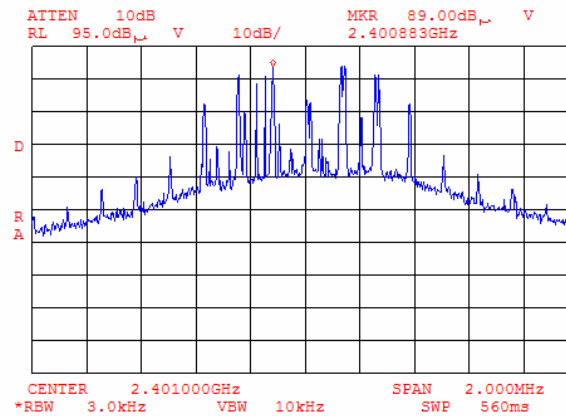
Reference numbers of test equipment used

HL 1424	HL 1984	HL 2259	HL 2868				
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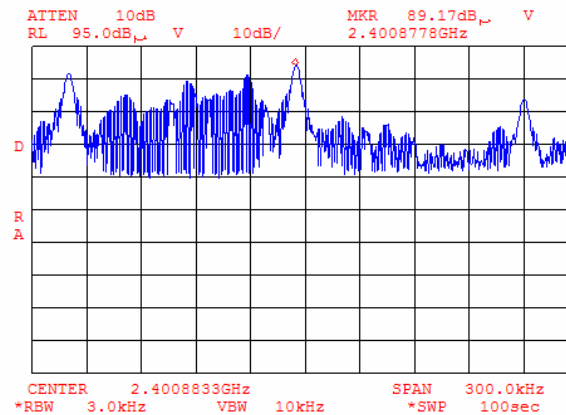
Full description is given in Appendix A.

Test specification: Section 15.247(d), Peak power density			
Test procedure: FR Vol. 62, page 26243, Section 15.247(d)			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/14/2006 7:12:10 PM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.4.1 Peak spectral power density at low frequency within 6 dB band

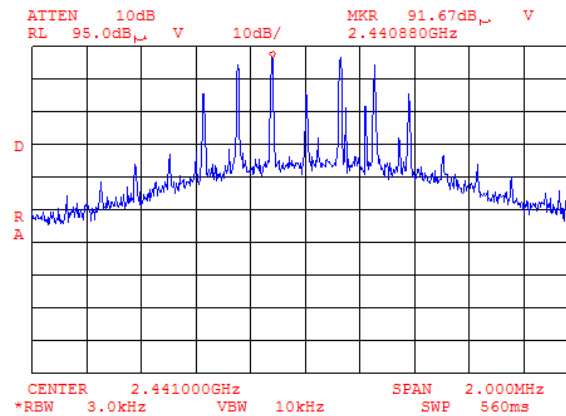


Plot 7.4.2 Peak spectral power density at low frequency zoomed at the peak

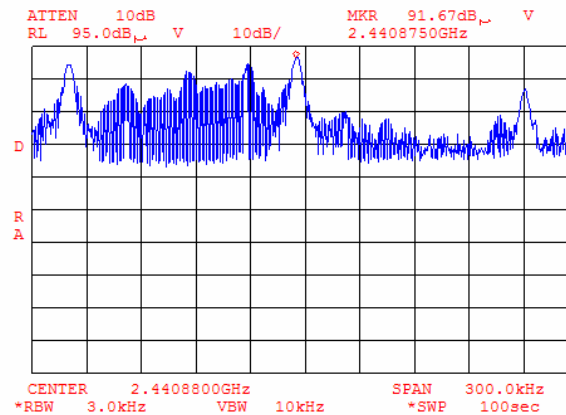


Test specification: Section 15.247(d), Peak power density			
Test procedure: FR Vol. 62, page 26243, Section 15.247(d)			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/14/2006 7:12:10 PM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.4.3 Peak spectral power density at mid frequency within 6 dB band

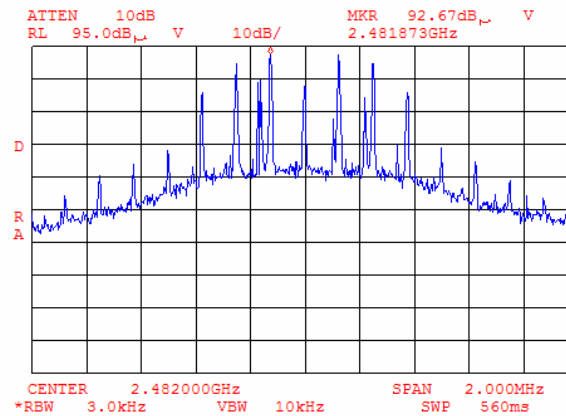


Plot 7.4.4 Peak spectral power density at mid frequency zoomed at the peak

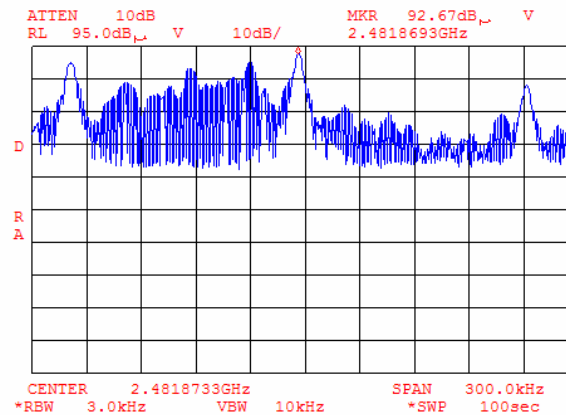


Test specification: Section 15.247(d), Peak power density			
Test procedure: FR Vol. 62, page 26243, Section 15.247(d)			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/14/2006 7:12:10 PM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.4.5 Peak spectral power density at high frequency within 6 dB band



Plot 7.4.6 Peak spectral power density at high frequency zoomed at the peak



Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/14/2006 7:16:39 PM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

7.5 Radiated emission measurements

7.5.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Radiated emission test limits

Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
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: $\text{Lim}_{S_2} = \text{Lim}_{S_1} + 20 \log(S_1/S_2)$, where S_1 and S_2 – standard defined and test distance respectively in meters.

7.5.2 Test procedure for measurements in semi-anechoic chamber

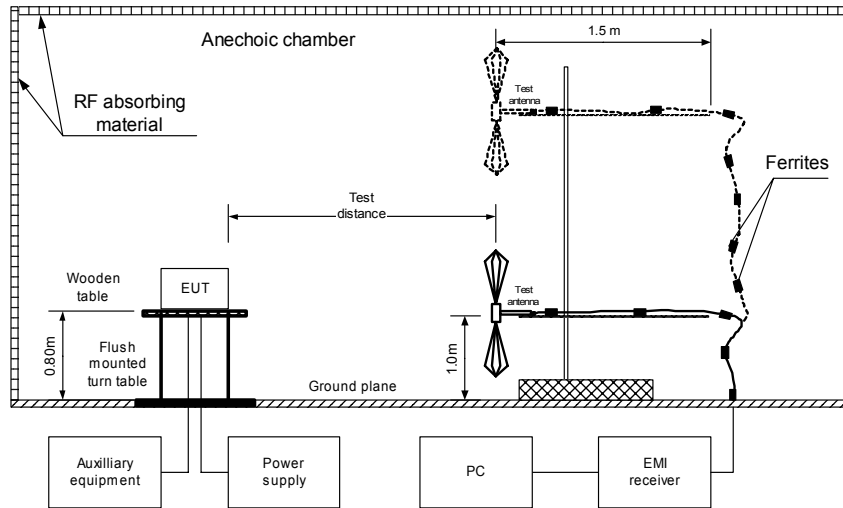
7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and the performance check was conducted.

7.5.2.2 The specified frequency range was investigated with 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.

7.5.2.3 The worst test results (the lowest margins) were recorded in Table 7.5.2 and shown in the associated plots.

Test specification: Section 15.109, Radiated emission			
Test procedure: ANSI C63.4, Sections 11.6 and 12.1.4			
Test mode: Compliance		Verdict: PASS	
Date & Time: 3/14/2006 7:16:39 PM			
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Figure 7.5.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment



Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/14/2006 7:16:39 PM		
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Table 7.5.2 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*				
All emissions found were more than 20 dB below the limit								Pass

*- Margin = Measured emission - specification limit.

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

Reference numbers of test equipment used

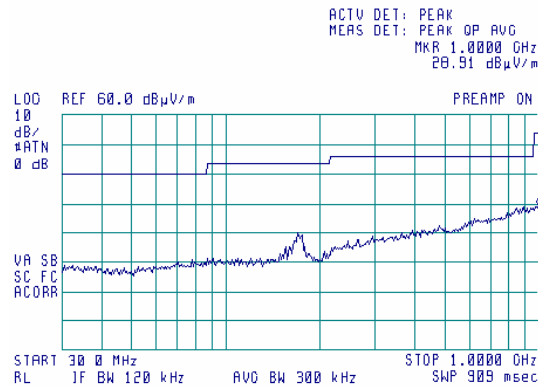
HL 0521	HL 0589	HL 0604	HL 2009				
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Full description is given in Appendix A.

Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/14/2006 7:16:39 PM	
Temperature: 21 °C	Air Pressure: 1010 hPa	Relative Humidity: 43 %	Power Supply: 3.7 V battery
Remarks: Stimulator (STM)			

Plot 7.5.1 Radiated emission measurements in 30 - 1000 MHz range, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0410	Cable, Coax, Microwave, DC-18 GHz, N-N, 1 m	Gore	PFP01P0 1039.4	9338767	17-Oct-05	17-Oct-06
0446	Antenna, Loop active, 10kHz-30MHz	EMCO	6502	2857	28-Jun-05	28-Jun-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	26-Sep-05	26-Sep-06
0589	Cable Coaxial, GORE A2P01POL118, 2.3 m	HL	GORE-3	176	02-Dec-05	02-Dec-06
0592	Position Controller	HL	L2-SR3000 (HL CRL-3)	100	18-May-05	18-May-06
0593	Antenna Mast, 1-4 m Pneumatic	Madgesh	AM-F1	101	03-Feb-06	03-Feb-07
0594	Turn Table FOR ANECHOIC CHAMBER flush mount d=1.2 m Pneumatic	HL	TT-WDC1	102	27-Jan-06	27-Jan-07
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE 26 - 2000 MHz	EMCO	3141	9611-1011	27-Jan-06	27-Jan-07
0661	Generator Swept Signal, 10 MHz to 40 GHz, + 10 dBm	Hewlett Packard	83640B	3614A002 66	27-Jan-06	27-Jan-07
0663	Wooden plate 540x277x45	HL	PW	126	27-Jan-06	27-Jan-07
0768	Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, K-band, Gain - 25 dB	Quinstar Technology	QWH-4200-BA	110	14-Sep-05	14-Sep-06
0769	Antenna Standard Gain Horn, 26.5-40 GHz, WR28, Ka band, Gain 25 dB	Quinstar Technology	QWH-2800-BA	112	14-Sep-05	14-Sep-06
1200	Quadruplexer 1-12 GHz (1-2 GHz; 2-4 GHz; 4-8 GHz; 8-12GHz)	Elettronica S.p.A. - Roma	UE 84	D/00240	10-Feb-06	10-Feb-07
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
1553	Cable RF, 3.5 m	Alpha Wire	RG-214	1553	02-Dec-05	02-Dec-06
1567	Cable RF, 2 m	Huber-Suhner	Sucoflex 104PE	13095/4PE	02-Dec-05	02-Dec-06
1942	Cable 18GHz, 4 m, blue	Rhophase Microwave Limited	SPS-1803A-4000-NPS	T4658	02-Dec-05	02-Dec-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
2258	Amplifier Low Noise 2-20 GHz	Sophia Wireless	LNA0220-C	0222	05-Nov-05	05-Nov-06
2259	Amplifier Low Noise 2-20 GHz	Sophia Wireless	LNA0220-C	0223	05-Nov-05	05-Nov-06

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
2260	Amplifier Low Noise 14-33 GHz	Sophia Wireless	LNA28-B	0233	05-Nov-05	05-Nov-06
2387	Filter Bandpass, 8-14 GHz	HL	FBP8-14	2387	05-Jun-05	05-Jun-06
2399	Cable 40GHz, 1.5 m, blue	Rhophase Microwave Limited	KPS-1503A-1500-KPS	X2945	24-Jun-05	24-Jun-06
2400	Cable 40GHz, 1.5 m, green	Rhophase Microwave Limited	KPS-1503A-1500-KPS	X2946	24-Jun-05	24-Jun-06
2432	Antenna, Double-Ridged Waveguide Horn 1-18 GHz	EMC Test Systems	3115	00027177	22-Mar-05	22-Mar-06
2697	Antenna, 30 MHz - 3.0 GHz,	Sunol Sciences. Corp. Pleasanton, California USA	JB3	A022805	10-Mar-06	10-Mar-07
2868	Cable, 18 GHz, 1.1 m, SMA - SMA	Gore	Right Angle	91P72071	16-Febr-06	16-Febr-07

9 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.

10 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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11 APPENDIX D Specification references

47CFR part 15: 2005	Radio Frequency Devices.
FR Vol.62	Federal Register, Volume 62, May 13, 1997
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

12 APPENDIX E Abbreviations and acronyms

A	ampere
AC	alternating current
AM	amplitude modulation
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
dB(μ A)	decibel referred to one microampere
DC	direct current
DTS	digital transmission system
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
k	kilo
kHz	kilohertz
LISN	line impedance stabilization network
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μ s	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

13 APPENDIX F Test equipment correction factors

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.112, HL 0768, 0769

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).

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
Double-ridged guide horn antenna
Model 3115, serial number: 00027177, HL2432

Frequency, MHz	Antenna factor. dB(1/m)
1000.0	24.7
1500.0	25.7
2000.0	27.8
2500.0	28.9
3000.0	30.7
3500.0	31.8
4000.0	33.0
4500.0	32.8
5000.0	34.2
5500.0	34.9
6000.0	35.2
6500.0	35.4
7000.0	36.3
7500.0	37.3
8000.0	37.5
8500.0	38.0
9000.0	38.3
9500.0	38.3
10000.0	38.7
10500.0	38.7
11000.0	38.9
11500.0	39.5
12000.0	39.5
12500.0	39.4
13000.0	40.5
13500.0	40.8
14000.0	41.5
14500.0	41.3
15000.0	40.2
15500.0	38.7
16000.0	38.5
16500.0	39.8
17000.0	41.9
17500.0	45.8
18000.0	49.1

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

Antenna calibration
Sunol Sciences Inc., model JB3, serial number A022805

Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain
30	22.2	-22.5	0.01	520	19.7	6.3	4.27	1215	24.9	7.0	5.05	1810	28.3	7.1	5.08	2405	30.9	6.9	4.93
35	18.5	-17.4	0.02	625	19.7	6.5	4.42	1220	24.9	7.0	4.99	1815	28.5	6.9	4.91	2410	30.9	6.9	4.89
40	14.7	-12.5	0.06	630	19.6	6.6	4.57	1225	25.1	6.9	4.91	1820	28.6	6.8	4.74	2415	31.0	6.9	4.85
45	11.3	-8.1	0.16	635	19.7	6.5	4.48	1230	25.2	6.8	4.92	1825	28.7	6.8	4.76	2420	31.0	6.8	4.82
45	11.3	-8.1	0.16	640	19.9	6.4	4.40	1235	25.1	7.0	4.96	1830	28.7	6.8	4.76	2425	31.1	6.8	4.81
50	8.9	-4.7	0.34	645	19.9	6.5	4.45	1240	25.0	7.1	5.09	1835	28.7	6.7	4.72	2430	31.0	6.9	4.87
55	7.9	-2.8	0.52	650	19.9	6.5	4.51	1245	25.0	7.1	5.12	1840	28.8	6.7	4.69	2435	31.0	6.9	4.88
60	7.8	-2.1	0.62	655	19.9	6.6	4.60	1250	25.0	7.1	5.15	1845	28.6	6.9	4.90	2440	31.2	6.8	4.74
65	8.5	-2.0	0.63	660	19.9	6.7	4.69	1255	25.0	7.2	5.25	1850	28.4	7.1	5.12	2445	31.1	6.9	4.91
70	9.0	-1.9	0.64	665	19.9	6.7	4.70	1260	24.9	7.3	5.36	1855	28.5	7.0	5.07	2450	31.0	7.0	4.96
75	8.8	-1.1	0.78	670	20.0	6.7	4.71	1265	25.0	7.3	5.31	1860	28.6	7.0	5.01	2455	31.0	7.0	5.01
80	8.4	-0.2	0.97	675	20.1	6.7	4.71	1270	25.1	7.2	5.26	1865	28.5	7.1	5.17	2460	30.9	7.2	5.19
85	8.0	0.8	1.20	680	20.1	6.7	4.71	1275	25.3	7.0	5.05	1870	28.4	7.3	5.33	2465	31.1	6.9	4.95
90	8.2	1.1	1.22	685	20.1	6.8	4.79	1280	25.5	6.8	4.94	1875	28.5	7.2	5.28	2470	31.3	6.8	4.76
95	9.2	0.5	1.13	690	20.1	6.9	4.88	1285	25.4	7.0	4.97	1880	28.5	7.2	5.22	2475	31.4	6.7	4.69
100	10.6	-0.4	0.92	695	20.2	6.8	4.82	1290	25.3	7.1	5.10	1885	28.5	7.2	5.22	2480	31.3	6.8	4.79
105	11.7	-1.1	0.78	700	20.3	6.8	4.76	1295	25.3	7.2	5.22	1890	28.6	7.2	5.21	2485	31.1	7.0	5.00
110	12.6	-1.6	0.70	705	20.4	6.8	4.75	1300	25.2	7.3	5.33	1895	28.6	7.2	5.24	2490	31.1	7.0	4.99
115	13.3	-1.9	0.85	710	20.5	6.8	4.75	1305	25.6	7.0	5.21	1900	28.6	7.2	5.27	2495	31.2	7.0	4.99
120	13.9	-2.1	0.62	715	20.5	6.8	4.80	1310	25.5	7.1	5.09	1905	28.5	7.3	5.36	2500	30.9	7.2	5.27
125	14.2	-2.0	0.63	720	20.5	6.9	4.85	1315	25.4	7.2	5.23	1910	28.5	7.4	5.45	2505	31.1	7.1	5.15
130	14.2	-1.7	0.68	725	20.6	6.8	4.81	1320	25.3	7.3	5.36	1915	28.5	7.3	5.38	2510	31.0	7.2	5.22
135	13.8	-1.0	0.79	730	20.7	6.8	4.77	1325	25.5	7.2	5.21	1920	28.6	7.3	5.31	2515	31.0	7.2	5.26
140	13.4	0.3	0.94	735	20.9	6.7	4.65	1330	25.6	7.0	5.08	1925	28.6	7.3	5.36	2520	31.2	7.0	5.05
145	13.1	0.3	1.08	740	21.0	6.8	4.83	1335	25.7	7.1	5.07	1930	28.6	7.3	5.39	2525	30.8	7.4	5.54
150	12.9	0.8	1.21	745	21.0	6.8	4.59	1340	25.7	7.1	5.09	1935	28.5	7.4	5.54	2530	31.0	7.3	5.37
155	12.7	1.3	1.34	750	21.0	6.7	4.64	1345	25.7	7.1	5.13	1940	28.4	7.6	5.70	2535	31.2	7.0	5.08
160	12.7	1.6	1.44	755	21.0	6.8	4.74	1350	25.7	7.1	5.17	1945	28.5	7.5	5.69	2540	31.2	7.1	5.09
165	12.5	2.0	1.59	760	21.0	6.8	4.63	1355	25.8	7.0	5.12	1950	28.5	7.5	5.48	2545	31.0	7.3	4.43
170	12.2	2.6	1.83	765	21.1	6.8	4.73	1360	25.9	6.9	4.95	1955	28.6	7.5	5.57	2550	31.0	7.3	5.39
175	11.8	3.3	2.13	770	21.3	6.7	4.64	1365	26.0	6.9	4.95	1960	28.6	7.5	5.65	2555	31.1	7.2	5.30
180	11.6	3.7	2.36	775	21.3	6.7	4.68	1370	26.0	7.0	4.96	1965	28.7	7.4	5.47	2560	31.0	7.4	5.47
185	11.5	4.0	2.54	780	21.3	6.7	4.72	1375	26.0	7.0	5.01	1970	28.9	7.2	5.29	2565	30.8	7.6	5.70
190	11.6	4.2	2.61	785	21.3	6.7	4.75	1380	26.0	7.2	5.08	1975	28.9	7.2	5.27	2570	31.1	7.3	5.37
195	12.1	3.9	2.47	790	21.3	6.8	4.82	1385	26.0	7.0	4.99	1980	29.0	7.1	5.16	2575	31.5	7.0	4.96
200	13.1	3.2	2.07	795	21.4	6.8	4.79	1390	26.1	6.9	4.92	1985	29.1	7.1	5.11	2580	31.6	6.9	4.87
205	12.0	4.4	2.76	800	21.5	6.8	4.77	1395	26.2	6.9	4.94	1990	29.1	7.0	5.06	2585	31.6	6.8	4.79
210	11.0	5.6	3.66	805	21.6	6.7	4.71	1400	26.2	7.0	4.96	1995	29.1	7.1	5.09	2590	31.6	6.9	4.88
215	11.3	5.8	3.59	810	21.7	6.7	4.65	1405	26.1	7.0	5.02	2000	29.1	7.1	5.11	2595	31.5	7.0	4.97
220	11.6	5.5	3.82	815	21.7	6.7	4.72	1410	26.1	7.1	5.09	2005	29.1	7.1	5.16	2600	31.6	6.9	4.86
225	11.7	5.5	3.55	820	21.7	6.8	4.80	1415	26.2	7.0	5.02	2010	29.1	7.1	5.15	2605	31.3	7.2	5.30
230	11.9	5.5	3.67	825	21.7	6.8	4.82	1420	26.3	7.0	4.96	2015	29.2	7.1	5.13	2610	31.4	7.1	5.15
235	12.1	5.5	3.66	830	21.7	6.9	4.85	1425	26.2	7.1	5.10	2020	29.2	7.1	5.18	2615	31.7	6.9	4.88
240	12.3	5.5	3.64	835	21.8	6.8	4.82	1430	26.1	7.2	5.25	2025	29.3	7.1	5.08	2620	31.6	7.0	4.97
245	12.3	5.7	3.71	840	21.9	6.8	4.86	1435	26.1	7.2	5.24	2030	29.3	7.0	5.05	2625	30.9	7.1	5.17
250	12.3	5.9	3.88	845	21.9	6.8	4.83	1440	26.2	7.2	5.24	2035	29.3	7.1	5.07	2630	31.6	7.0	5.00
255	12.7	5.8	3.83	850	22.0	6.8	4.80	1450	26.5	7.0	4.98	2045	29.2	7.2	5.23	2640	31.7	7.0	4.98
260	13.7	5.2	3.27	855	22.0	6.9	4.92	1460	26.4	7.1	5.17	2055	29.3	7.2	5.21	2650	31.8	6.9	4.85
275	13.7	5.3	3.39	870	21.9	7.1	5.11	1465	26.4	7.2	5.19	2060	29.5	7.0	5.02	2655	31.8	6.9	4.85
280	13.7	5.4	3.50	875	22.0	7.1	5.08	1470	26.4	7.2	5.22	2065	29.4	7.1	5.08	2660	31.7	7.0	5.02
285	13.7	5.6	3.61	880	22.1	7.0	5.05	1475	26.4	7.1	5.17	2070	29.4	7.1	5.10	2665	32.0	6.7	4.71
290	13.7	5.7	3.72	885	22.1	7.0	5.06	1480	26.5	7.1	5.12	2075	29.5	7.0	5.01	2670	32.0	6.7	4.67
295	13.8	5.8	3.77	890	22.1	7.0	5.06	1485	26.5	7.1	5.14	2080	29.8	6.8	4.76	2675	31.9	6.8	4.81
300	13.9	5.8	3.81	895	22.2	7.1	5.09	1490	26.5	7.1	5.17	2085	29.7	6.9	4.89	2680	31.7	7.0	5.04
305	14.0	5.9	3.85	900	22.2	7.1	5.12	1495	26.5	7.2	5.24	2090	29.7	6.9	4.86	2685	31.9	6.8	4.83
310	14.1	5.9	3.88	905	22.3	7.1	5.09	1500	26.5	7.2	5.31	2095	29.8	6.8	4.78	2690	32.1	6.7	4.72
315	14.3	5.9	3.89	910	22.3	7.0	5.05	1505	26.5	7.2	5.27	2100	29.9	6.8	4.75	2695	32.1	6.7	4.71
320	14.4	5.9	3.90	915	22.4	7.0	4.99	1510	26.6	7.2	5.23	2105	29.8	6.8	4.81	2700	32.0	6.8	4.81
325	14.5	5.9	3.92	920	22.6	6.9	4.92	1515	26.6	7.2	5.30	2110	29.9	6.8	4.78	2705	32.0	6.8	4.80
330	14.6	5.9	3.93	925	22.7	6.9	4.85	1520	26.5	7.3	5.38	2115	29.9	6.8	4.76	2710	32.1	6.8	4.79
335	14.7	6.0	4.02	930	22.8	6.8	4.77	1525	26.6	7.3	5.37	2120	29.9	6.8	4.84	2715	32.1	6.7	4.71
340	14.7	6.2	4.12	935	22.8	6.8	4.83	1530	26.6	7.3	5.36	2125	29.9	6.9	4.89	2720	32.4	6.5	4.47
345	14.9	6.1	4.06	940	22.8	6.9	4.89	1535	26.6	7.4	5.44	2130	29.9	6.9	4.90	2725	32.2	6.7	4.63
350	15.1	6.0	3.98	945	22.8	6.9	4.87	1540	26.5	7.3	5.33	2135	29.8	6.9	4.94	2730	31.9	7.0	5.05
355	15.6	5.8	3.78	950	23.0	6.8	4.81	1550	26.5	7.5	5.63	2145	29.9	6.9	4.92	2740	31.6	7.1	5.46
365	15.5	5.9	3.89	960	23.1	6.8	4.77	1555	26.7	7.3	5.39	2150	29.9	7.0	4.98	2745	31.9	7.0	5.06
370	15.5	6.0	4.01	965	23.1	6.7	4.73	1560	26.9	7.1	5.16	2155	29.8	7.1	5.10	2750	32.0	6.9	4.94
375	15.6	6.1	4.03	970	23.2	6.7	4.69	1565	26.9	7.2	5.23	2160	29.8	7.1	5.09	2755	32.0	7.0	5.08

Cable loss
Cable GORE, HL 0410

No.	Frequency, GHz	Cable loss, dB
1	0.5	0.16
2	1	0.28
3	2	0.38
4	4	0.55
5	6	0.85
6	8	0.90
7	10	1.07
8	12	1.11
9	14	1.29
10	16	1.41
11	18	1.73

Cable loss
Cable coaxial, GORE A2P01POL118, 2.3 m, model GORE-3, serial number 176, HL 0589
+ Cable coaxial, ANDREW PSWJ4, 6 m, model: ANDREW-6, serial number 163, 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	≤ 6.5	±0.12
16	2800	3.21		
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		
24	5100	4.62		
25	5400	4.78		
26	5700	5.16		
27	6000	5.67		
28	6500	5.99		±0.17

Cable loss
RF cable 3.5 m, Alpha Wire, model RG-214, S/N 149, HL 1553

No.	Frequency, MHz	Cable loss, dB	Measurement uncertainty, dB
1	1	0.01	±0.05
2	10	0.07	
3	30	0.12	
4	50	0.22	
5	100	0.26	
6	200	0.40	
7	300	0.52	
8	400	0.60	
9	500	0.70	
10	600	0.77	
11	700	0.84	
12	800	1.00	
13	900	1.00	
14	1000	1.05	
15	2000	1.70	

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, blue, model SPS-1803A-4000-NPS, serial number T4658, HL 1942

Frequency, GHz	Cable loss, dB
0.03	0.21
0.05	0.26
0.10	0.36
0.20	0.50
0.30	0.61
0.40	0.70
0.50	0.78
0.60	0.85
0.70	0.93
0.80	0.99
0.90	1.04
1.00	1.10
1.10	1.16
1.20	1.22
1.30	1.26
1.40	1.31
1.50	1.35
1.60	1.41
1.70	1.45
1.80	1.49
1.90	1.53
2.00	1.57
2.10	1.61
2.20	1.65
2.30	1.69
2.40	1.72
2.50	1.76
2.60	1.79
2.70	1.83
2.80	1.87
2.90	1.90
3.10	1.97
3.30	2.04
3.50	2.11
3.70	2.18
3.90	2.24
4.10	2.31
4.30	2.38
4.50	2.43
4.70	2.53
4.90	2.53
5.10	2.63
5.30	2.65
5.50	2.72
5.70	2.76
5.90	2.79

Frequency, GHz	Cable loss, dB
6.10	2.88
6.30	2.90
6.50	2.97
6.70	3.02
6.90	3.04
7.10	3.07
7.30	3.12
7.50	3.13
7.70	3.19
7.90	3.24
8.10	3.30
8.30	3.36
8.50	3.45
8.70	3.41
8.90	3.45
9.10	3.42
9.30	3.55
9.50	3.48
9.70	3.58
9.90	3.61
10.10	3.66
10.30	3.68
10.50	3.70
10.70	3.70
10.90	3.75
11.10	3.78
11.30	3.86
11.50	3.98
11.70	4.10
11.90	4.12
12.10	4.09
12.40	4.13
13.00	4.23
13.50	4.35
14.00	4.40
14.50	4.44
15.00	4.57
15.50	4.66
16.00	4.64
16.50	4.66
17.00	4.75
17.50	4.85
18.00	4.93

Cable loss

Cable 18 GHz, 6.5 m, blue, model NPS-1803A-6500-NPS, serial number T4974, HL 1947

Frequency, GHz	Insertion 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	Insertion 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, serial number C-56, HL 2009

No.	Frequency, MHz	Cable loss, dB	Tolerance (Specification), dB	Measurement uncertainty, dB
1	1	0.10	NA	±0.12
2	10	0.14		
3	30	0.25		
4	50	0.34		
5	100	0.53		
6	300	0.99		
7	500	1.31		
8	800	1.73		
9	1000	1.98		
10	1100	2.11		
11	1200	2.21		
12	1300	2.35		
13	1400	2.46		
14	1500	2.55		
15	1600	2.68		
16	1700	2.78		
17	1800	2.88		
18	1900	2.98		
19	2000	3.09		

Cable loss

Cable coaxial, 40GHz, 1.5 m, Blue, Rhopase Microwave Limited, model: KPS-1503A-1500-KPS, HL 2399

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
0.03	0.07	6.5	1.57	15.50	2.50
0.05	0.10	6.7	1.60	16.00	2.51
0.1	0.16	6.9	1.55	16.50	2.58
0.2	0.26	7.1	1.65	17.00	2.65
0.3	0.33	7.3	1.65	17.50	2.73
0.5	0.38	7.5	1.70	18.00	2.74
0.7	0.41	7.7	1.71	18.50	2.67
0.9	0.58	7.9	1.73	19.00	2.67
1.1	0.64	8.1	1.79	19.50	2.74
1.3	0.70	8.3	1.81	20.00	2.69
1.5	0.75	8.5	1.84	20.50	2.80
1.7	0.79	8.7	1.85	21.00	2.82
1.9	0.83	8.9	1.90	21.50	2.87
2.1	0.88	9.1	1.95	22.00	2.87
2.3	0.93	9.3	1.93	22.50	2.92
2.5	0.97	9.5	1.98	23.50	3.04
2.7	1.01	9.7	1.96	24.00	3.05
2.9	1.04	9.9	2.03	24.50	3.03
3.1	1.08	10.1	1.99	25.00	3.11
3.3	1.14	10.30	2.02	25.50	3.10
3.5	1.17	10.50	2.02	26.00	3.17
3.7	1.21	10.70	2.02	26.50	3.11
3.9	1.24	10.90	2.08	27.00	3.16
4.1	1.26	11.10	2.02	28.00	3.19
4.3	1.26	11.30	2.09	29.00	3.19
4.5	1.29	11.50	2.05	30.00	3.30
4.7	1.34	11.70	2.11	31.00	3.31
4.9	1.34	11.90	2.11	32.00	3.35
5.1	1.40	12.10	2.12	33.00	3.46
5.3	1.43	12.40	2.17	34.00	3.45
5.5	1.45	13.00	2.29	35.00	3.49
5.7	1.47	13.50	2.31	36.00	3.54
5.9	1.40	14.00	2.43	37.00	3.62
6.1	1.53	14.50	2.43	39.00	3.69
6.3	1.55	15.00	2.46	40.00	3.75

Cable loss

Cable coaxial, 40GHz, 1.5 m, green, Rhopase Microwave Limited, model: KPS-1503A-1500-KPS, HL 2400

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
0.03	0.06	6.5	1.46	15.50	2.34
0.05	0.08	6.7	1.49	16.00	2.34
0.1	0.15	6.9	1.50	16.50	2.40
0.2	0.23	7.1	1.51	17.00	2.46
0.3	0.29	7.3	1.55	17.50	2.54
0.5	0.37	7.5	1.56	18.00	2.61
0.7	0.46	7.7	1.58	18.50	2.59
0.9	0.53	7.9	1.60	19.00	2.59
1.1	0.58	8.1	1.61	19.50	2.67
1.3	0.65	8.3	1.68	20.00	2.62
1.5	0.66	8.5	1.68	20.50	2.73
1.7	0.72	8.7	1.75	21.00	2.71
1.9	0.76	8.9	1.74	21.50	2.78
2.1	0.79	9.1	1.81	22.00	2.83
2.3	0.85	9.3	1.79	22.50	2.81
2.5	0.90	9.5	1.86	23.50	2.91
2.7	0.91	9.7	1.85	24.00	2.97
2.9	0.97	9.9	1.87	24.50	2.98
3.1	0.97	10.1	1.88	25.00	2.97
3.3	1.03	10.30	1.82	25.50	3.03
3.5	1.06	10.50	1.92	26.00	3.04
3.7	1.10	10.70	1.86	26.50	3.11
3.9	1.13	10.90	1.96	27.00	2.97
4.1	1.16	11.10	1.90	28.00	3.15
4.3	1.18	11.30	1.99	29.00	3.07
4.5	1.21	11.50	1.95	30.00	3.13
4.7	1.23	11.70	2.00	31.00	3.13
4.9	1.26	11.90	2.01	32.00	3.18
5.1	1.28	12.10	1.99	33.00	3.31
5.3	1.31	12.40	2.06	34.00	3.32
5.5	1.32	13.00	2.11	35.00	3.37
5.7	1.36	13.50	2.17	36.00	3.36
5.9	1.37	14.00	2.36	37.00	3.46
6.1	1.38	14.50	2.32	39.00	3.49
6.3	1.44	15.00	2.30	40.00	3.52

Cable loss
Cable coaxial, Gore, 18 GHz, 1.1 m, SMA - SMA, model Right Angle,
HL 2868

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
10	0.06	5750	0.82	12000	1.27
30	0.06	6000	0.84	12250	1.28
100	0.09	6250	0.85	12500	1.30
250	0.17	6500	0.89	12750	1.32
500	0.22	6750	0.90	13000	1.36
750	0.27	7000	0.96	13250	1.35
1000	0.30	7250	0.95	13500	1.36
1250	0.35	7500	0.97	13750	1.35
1500	0.37	7750	0.98	14000	1.39
1750	0.43	8000	0.98	14250	1.40
2000	0.46	8250	1.01	14500	1.36
2250	0.49	8500	1.03	14750	1.43
2500	0.52	8750	1.03	15000	1.35
2750	0.56	9000	1.06	15250	1.42
3000	0.59	9250	1.09	15500	1.34
3250	0.61	9500	1.09	15750	1.48
3500	0.64	9750	1.12	16000	1.52
3750	0.66	10000	1.14	16250	1.55
4000	0.67	10250	1.15	16500	1.61
4250	0.71	10500	1.17	16750	1.58
4500	0.73	10750	1.18	17000	1.71
4750	0.74	11000	1.20	17250	1.68
5000	0.75	11250	1.21	17500	1.76
5250	0.78	11500	1.23	17750	1.74
5500	0.80	11750	1.24	18000	1.76