

TEST REPORT

ACCORDING TO: FCC CFR 47 PART 15 subpart C, section 15.249 and subpart B

FOR:

Medingo Ltd.

Remote Control unit

Model: Solo Remote

This report is in conformity with ISO/ IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations 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

Client name: Medingo Ltd.
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Telephone: +972 73 713 1327
Fax: +972 73 713 1314
E-mail: amir@medingo.com
Contact name: Mr. Amir Baron

2 Equipment under test attributes

Product name: Remote Control unit
Product type: Transceiver
Model(s): Solo Remote
Serial number: 013
Hardware version: 0120-13-top PCB, 0120-16-middle PCB, 0120-19-bottom PCB
Software release: 0.9.62
Receipt date: 10/15/2009

3 Manufacturer information

Manufacturer name: Medingo Ltd.
Address: 7, Hacarmel street, P.O.B. 261, Yokneam 20692, Israel
Telephone: +972 73 713 1327
Fax: +972 73 713 1314
E-Mail: amir@medingo.com
Contact name: Mr. Amir Baron




4 Test details

Project ID: 20094
Location: Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started: 10/15/2009
Test completed: 11/25/2009
Test specification(s): FCC CFR47 Part 15, subpart C, §15.249 and subpart B

5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.249(a)(d), Field strength of emissions	Pass
Section 15.249(d), Band edge emissions	Pass
Section 15.207(a), Conducted emission	Not required
Section 15.203, Antenna requirement	Pass
Section 15.215(c), Occupied bandwidth	Pass
Unintentional emissions	
Section 15.107, Conducted emission at AC power port	Not required
Section 15.109, Radiated emission	Pass
Section 15.111, Conducted emission at receiver antenna port	Not required

The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

	Name and Title	Date	Signature
Tested by:	Mrs. E. Pitt, test engineer	November 25, 2009	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	November 29, 2009	
Approved by:	Mr. M. Nikishin, EMC and radio group manager	November 30, 2009	

6 EUT description

6.1 General information

The EUT, remote control, is a transceiver operating in 2400 – 2483.5 MHz range. It is a part of the Solo miniature, portable, programmable insulin dispenser which adheres to the user's skin. The Solo is intended for continuous delivery of insulin, at set and variable rates, for the management of diabetes mellitus in persons requiring insulin. Basal insulin doses are programmable and controlled by the remote control unit. The bidirectional radio frequency (RF) communication between the pump and the remote control enables programming and data acquisition

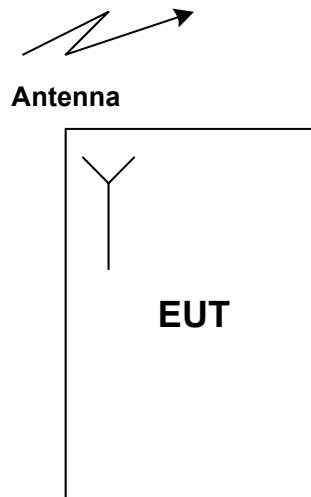
6.2 Changes made in the EUT

No changes were implemented.

6.3 Operating frequencies

Source	Frequency, MHz			
Clock	4	48	26	0.032

6.4 Test configuration





6.5 Transmitter characteristics

Type of equipment					
X	Stand-alone (Equipment with or without its own control provisions)				
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)				
	Plug-in card (Equipment intended for a variety of host systems)				
Intended use		Condition of use			
	fixed	Always at a distance more than 2 m from all people			
	mobile	Always at a distance more than 20 cm from all people			
X	portable	May operate at a distance closer than 20 cm to human body			
Assigned frequency range		2400 –2483.5 MHz			
Operating frequency range		2401.328 –2481.589 MHz			
Maximum rated output power		Effective radiated power (for equipment with no RF connector)		-10.9 dBm	
Is transmitter output power variable?		X	No		
			Yes	continuous variable	
				stepped variable with stepsize	
				minimum RF power	
				maximum RF power	
Antenna connection					
unique coupling		standard connector		X	integral
				X	with temporary RF connector
					without temporary RF connector
Antenna/s technical characteristics					
Type		Manufacturer		Model number	
SMD		Antenova		3030A6111-01	
Payload bit rate		250 kbps			
Type of modulation		MSK			
Transmitter duty cycle in normal use		4.5%	Tx ON time	4.5 msec	Period 1000 msec
Transmitter power source					
X	Battery	Nominal rated voltage	3 VDC	Battery type	
	DC	Nominal rated voltage	VDC		
	AC mains	Nominal rated voltage		Frequency	
Common power source for transmitter and receiver					
yes no					

Test specification:	Section 15.249(a)(d), Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/25/2009 10:02:08 AM		
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

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

7.1 Field strength of emissions

7.1.1 General

This test was performed to measure field strength of fundamental and spurious emissions from the EUT. Specification test limits are given in Table 7.1.1, Table 7.1.2 and Table 7.1.3.

Table 7.1.1 Radiated fundamental emission limits

Fundamental frequency, MHz	Field strength at 3 m, dB(μV/m)		
	Peak	Average	Quasi-Peak
2400 – 2483.5	114.0	94.0	NA

Table 7.1.2 Harmonics limits

Fundamental frequency, MHz	Field strength at 3 m, dB(μV/m)	
	Peak	Average
2400 – 2483.5	74.0	54.0

Table 7.1.3 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m, dB(μV/m)*			
	Peak	Quasi Peak	Average	Attenuation below carrier
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**	50 dBc (whichever is the less stringent)
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		
Above 1000	74.0	NA	54.0	

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

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

where S_1 and S_2 – standard defined and test distance respectively in meters.

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

Note: The above 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 but not exceeding 40 GHz for intentional radiators operated below 10 GHz and up to the fifth harmonic of the highest fundamental frequency but not exceeding 100 GHz for intentional radiators operated above 10 GHz.



Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

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

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and the performance check was conducted.

7.1.2.2 The measurements were performed in three EUT orthogonal positions.

7.1.2.3 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.

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

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

7.1.3.1 The EUT was set up as shown in Figure 7.1.2, energized and the performance check was conducted.

7.1.3.2 The measurements were performed in three EUT orthogonal positions.

7.1.3.3 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.

7.1.3.4 The worst test results (the lowest margins) were found in the EUT vertical (X-axis) position, recorded in the associated tables and shown in the associated plots

Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

Figure 7.1.1 Setup for spurious emission field strength measurements below 30 MHz

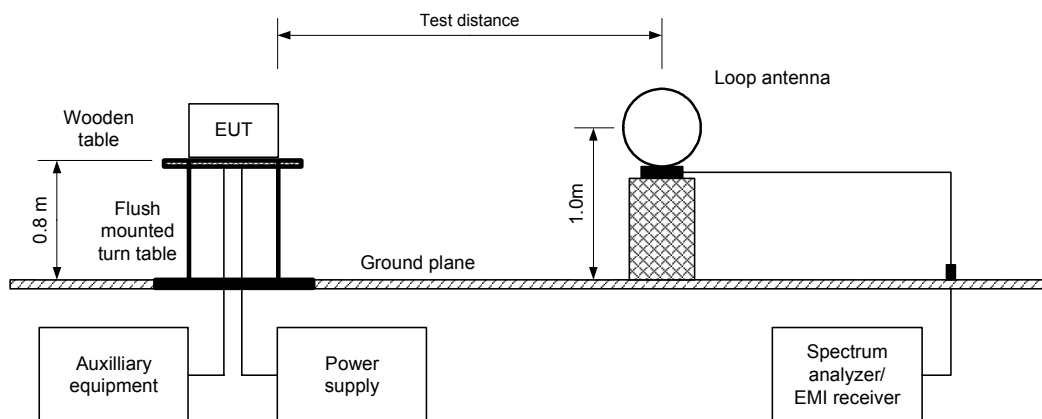
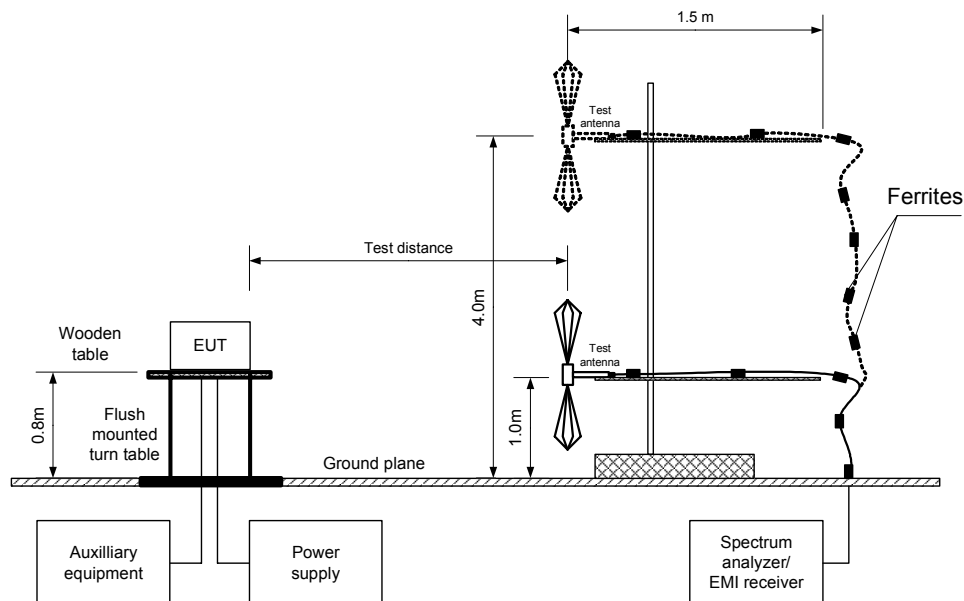


Figure 7.1.2 Setup for spurious emission field strength measurements above 30 MHz





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Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

Table 7.1.4 Field strength of fundamental emission, spurious emissions outside restricted bands and within restricted bands at frequencies above 1 GHz

TEST DISTANCE: 3 m
 EUT POSITION: 3 orthogonal (X / Y / Z-axis)
 MODULATION: MSK
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 INVESTIGATED FREQUENCY RANGE: 0.009 – 26500 MHz
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1.0 kHz (9 kHz – 150 kHz)
 9.0 kHz (150 kHz – 30 MHz)
 120 kHz (30 MHz – 1000 MHz)
 1.0 MHz (above 1000 MHz)
 VIDEO BANDWIDTH: ≥ Resolution bandwidth
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)

Fundamental emission

Frequency, MHz	Antenna		Azimuth, degrees*	Peak emission, dB(μV/m)	Average			Verdict
	Pol.	Height, m			Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
2401.328	H	1.7	175	81.81	NA	94	-12.19	Pass
2441.500	H	1.7	175	83.39	NA	94	-10.61	Pass
2481.589	H	1.7	175	84.30	NA	94	-9.70	Pass

Max value was obtained for the EUT in X-axis orthogonal position and at Unom voltage (1.5 V x 2) of new batteries.



Test specification:	Section 15.249(a)(d), Field strength of emissions			
Test procedure:	ANSI C63.4, Section 13.1.4			
Test mode:	Compliance	Verdict:		PASS
Date & Time:	11/25/2009 10:02:08 AM			
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery	
Remarks:				

Table 7.1.4 Field strength of fundamental emission, spurious emissions outside restricted bands and within restricted bands at frequencies above 1 GHz (continued)

Spurious emissions

F, MHz	Antenna		Azimuth, degrees*	Peak field strength			Avr factor, dB	Average field strength			Verdict
	Pol.	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
4802.644	H	1.2	175	44.32	74	-29.68	-11.944	32.376	54	-21.624	Pass
4883.137	H	1.2	175	45.89	74	-28.11	-11.944	33.946	54	-20.054	
4963.138	H	1.2	175	44.95	74	-29.05	-11.944	33.006	54	-20.994	

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

** - Margin = dB below (negative if above) specification limit.

Table 7.1.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
4.95	19.58	NA	NA	NA	-11.944

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

Reference numbers of test equipment used

HL 0446	HL 0521	HL 0604	HL 0768	HL 1833	HL 1984	HL 2909	HL 3121
HL 3206	HL 3343	HL 3531	HL 3535	HL 3616	HL 3632		

Full description is given in Appendix A.



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Test specification:	Section 15.249(a)(d), Field strength of emissions			
Test procedure:	ANSI C63.4, Section 13.1.4			
Test mode:	Compliance	Verdict:		PASS
Date & Time:	11/25/2009 10:02:08 AM			
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery	
Remarks:				

Table 7.1.6 Field strength of emissions below 1 GHz within restricted bands

TEST DISTANCE: 3 m
 EUT POSITION: 3 orthogonal (X / Y / Z-axis)
 MODULATION: MSK
 TRANSMITTER OUTPUT POWER: Maximum
 INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1 kHz (9 kHz – 150 kHz)
 9.0 kHz (150 kHz – 30 MHz)
 120 kHz (30 MHz – 1000 MHz)
 VIDEO BANDWIDTH: ≥ Resolution bandwidth
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)

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

*- Margin = Measured emission – specification limit.

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

Table 7.1.7 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 – 0.11	8.37625 – 8.38675	73 – 74.6	399.9 – 410	2690 – 2900	10.6 – 12.7
0.495 – 0.505	8.41425 – 8.41475	74.8 – 75.2	608 – 614	3260 – 3267	13.25 – 13.4
2.1735 – 2.1905	12.29 – 12.293	108 – 121.94	960 – 1240	3332 – 3339	14.47 – 14.5
4.125 – 4.128	12.51975 – 12.52025	123 – 138	1300 – 1427	3345.8 – 3358	15.35 – 16.2
4.17725 – 4.17775	12.57675 – 12.57725	149.9 – 150.05	1435 – 1626.5	3600 – 4400	17.7 – 21.4
4.20725 – 4.20775	13.36 – 13.41	156.52475 – 156.52525	1645.5 – 1646.5	4500 – 5150	22.01 – 23.12
6.215 – 6.218	16.42 – 16.423	156.7 – 156.9	1660 – 1710	5350 – 5460	23.6 – 24
6.26775 – 6.26825	16.69475 – 16.69525	162.0125 – 167.17	1718.8 – 1722.2	7250 – 7750	31.2 – 31.8
6.31175 – 6.31225	16.80425 – 16.80475	167.72 – 173.2	2200 – 2300	8025 – 8500	36.43 – 36.5
8.291 – 8.294	25.5 – 25.67	240 – 285	2310 – 2390	9000 – 9200	Above 38.6
8.362 – 8.366	37.5 – 38.25	322 – 335.4	2483.5 – 2500	9300 – 9500	

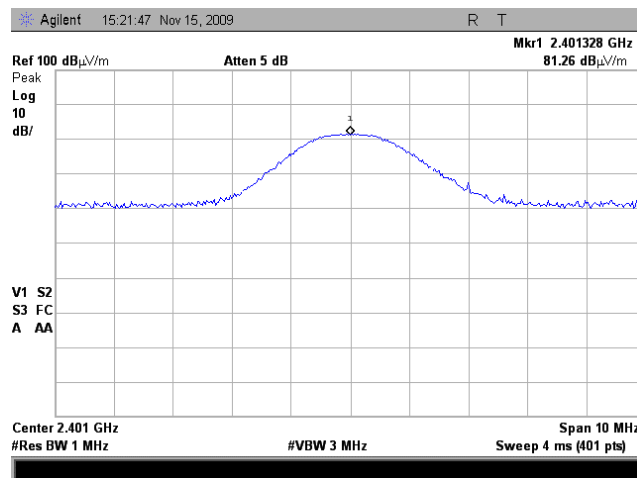


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Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

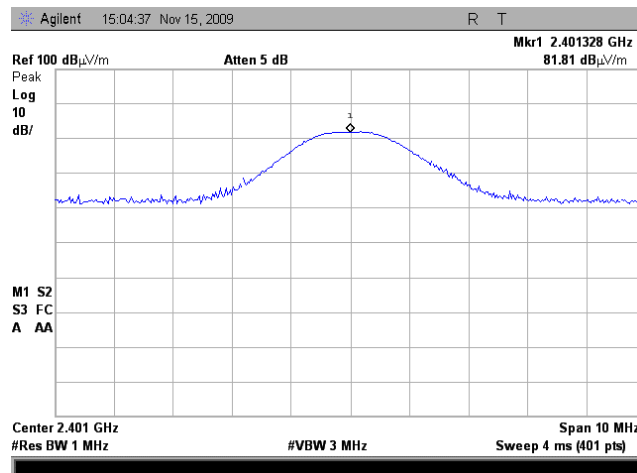
Plot 7.1.1 Radiated emission measurements at the fundamental frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: X-axis
FREQUENCY: Fmin=2401.328 MHz



Plot 7.1.2 Radiated emission measurements at the fundamental frequency

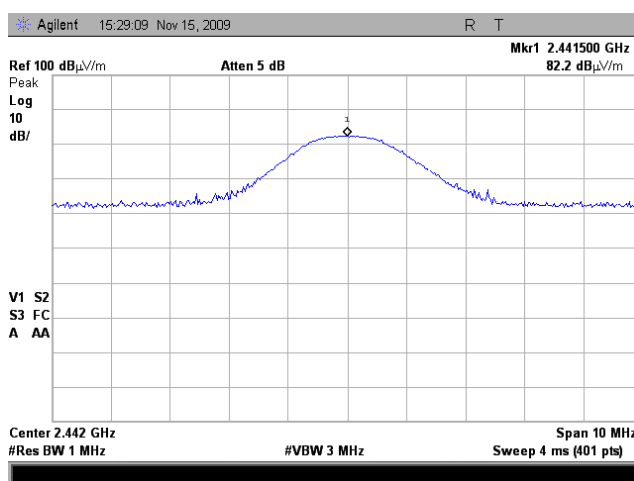
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
EUT POSITION: X-axis
FREQUENCY: Fmin=2401.328 MHz



Test specification:	Section 15.249(a)(d), Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/25/2009 10:02:08 AM		
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

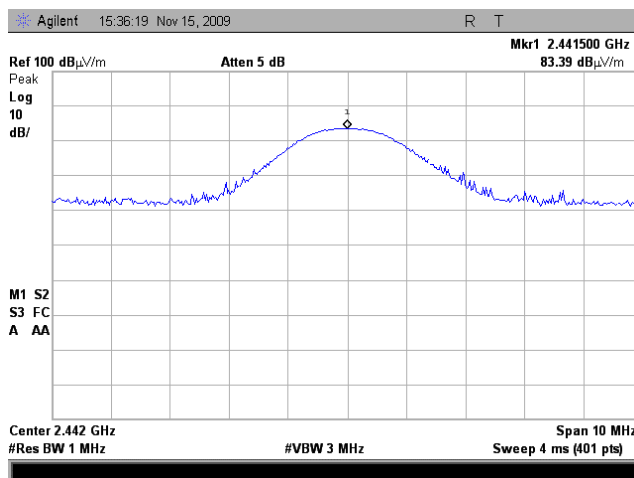
Plot 7.1.3 Radiated emission measurements at the fundamental frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: X-axis
FREQUENCY: Fmiddle=2441.500 MHz



Plot 7.1.4 Radiated emission measurements at the fundamental frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
EUT POSITION: X-axis
FREQUENCY: Fmiddle=2441.500 MHz



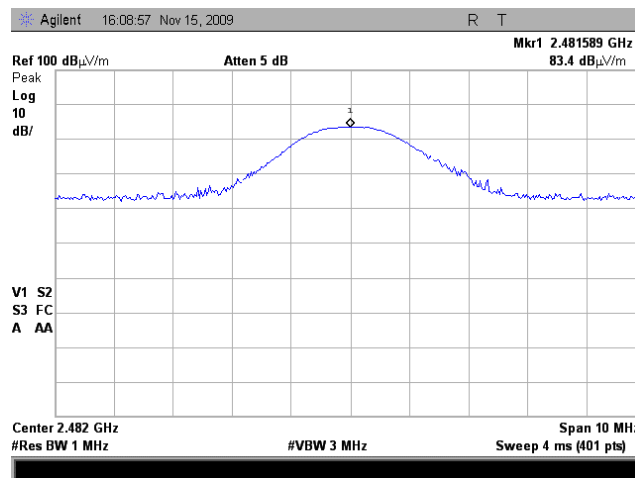


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Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

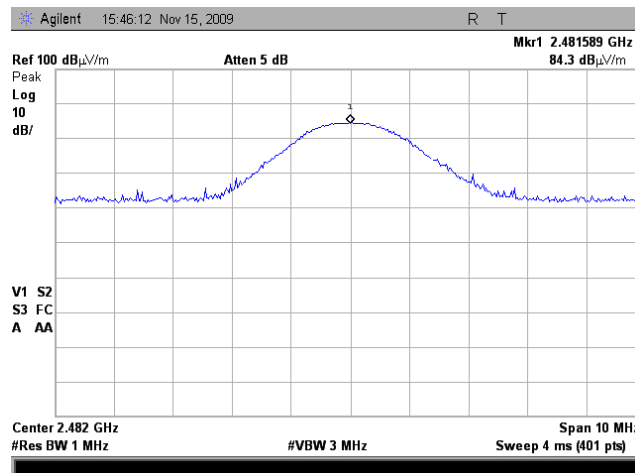
Plot 7.1.5 Radiated emission measurements at the fundamental frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: X-axis
Frequency: Fmax=2481.589 MHz



Plot 7.1.6 Radiated emission measurements at the fundamental frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
EUT POSITION: X-axis
Frequency: Fmax=2481.589 MHz





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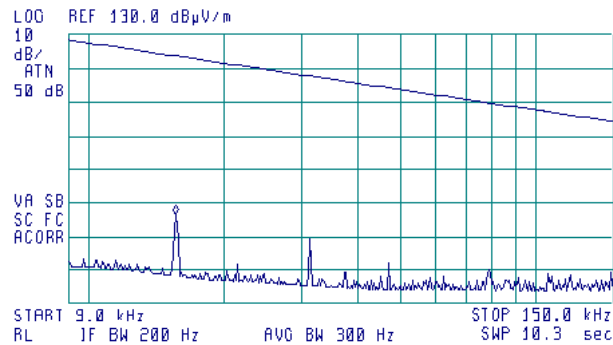
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Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

Plot 7.1.7 Radiated emission measurements from 9 to 150 kHz

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: X-axis

09:54:00 NOV 19, 2009

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 15.8 kHz
76.53 dBµV/m

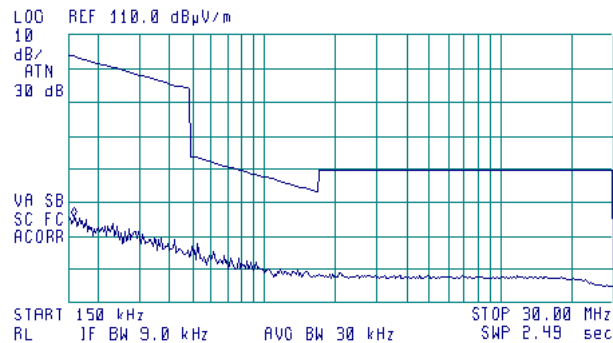


Plot 7.1.8 Radiated emission measurements from 0.15 to 30 MHz

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: X-axis

09:57:12 NOV 19, 2009

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 160 kHz
55.64 dBµV/m





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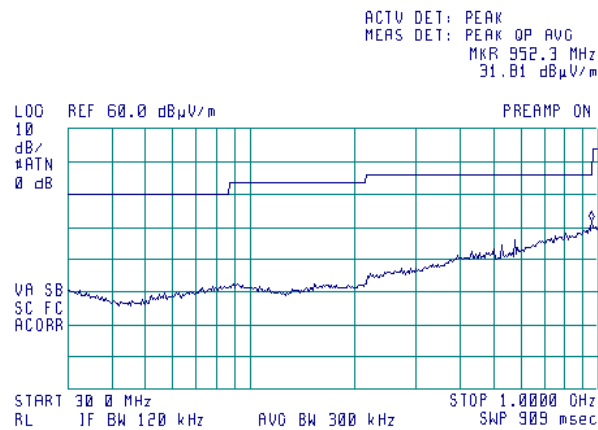
Date of Issue: 11/29/2009

Test specification:	Section 15.249(a)(d), Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/25/2009 10:02:08 AM		
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

Plot 7.1.9 Radiated emission measurements from 30 to 1000 MHz

TEST SITE: Semi anechoic chamber
FREQUENCY: F min, F middle, F max
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis

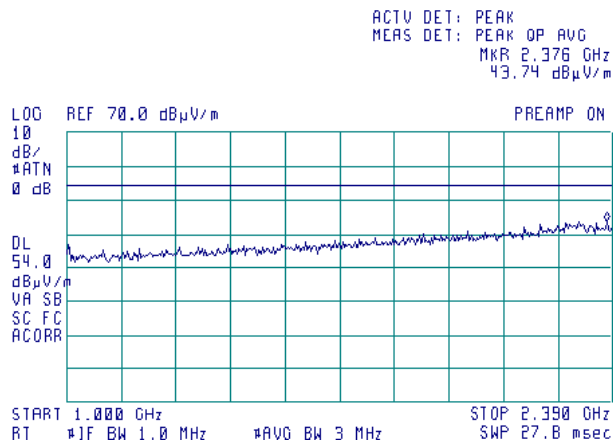
09:25:10 NOV 19, 2009



Plot 7.1.10 Radiated emission measurements from 1.0 to 2.39 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F min=2401.328 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis

09:17:57 DEC 08, 2009





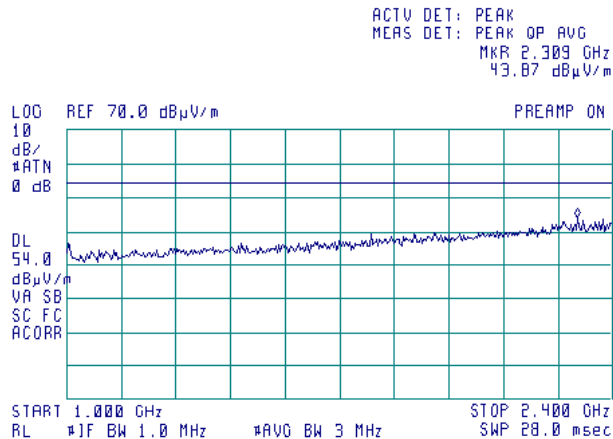
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Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

Plot 7.1.11 Radiated emission measurements from 1.0 to 2.4 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F middle=2441.500 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis

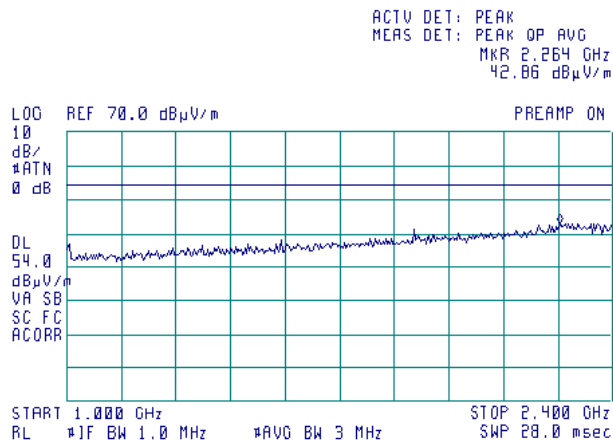
09:15:40 DEC 08, 2009



Plot 7.1.12 Radiated emission measurements from 1.0 to 2.4 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F max=2481.589 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis

09:16:38 DEC 08, 2009





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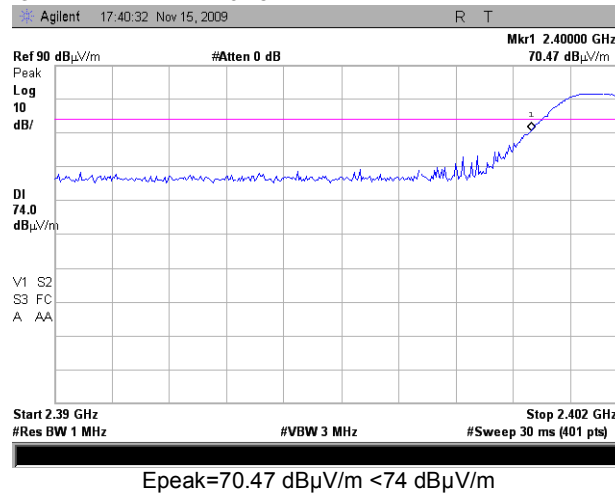
Report ID: MEDRAD_FCC.20094.doc

Date of Issue: 11/29/2009

Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

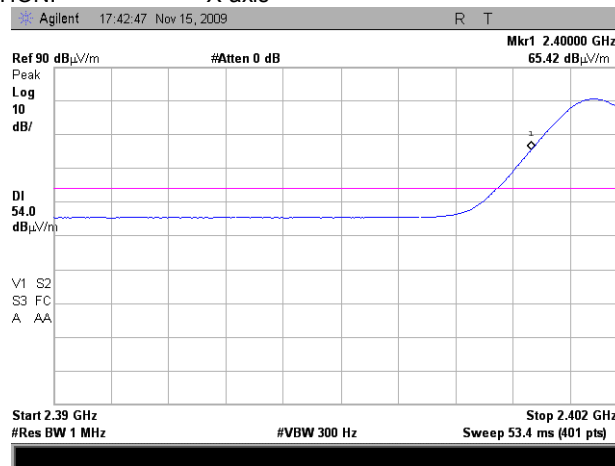
Plot 7.1.13 Radiated emission measurements from 2.39 to 2.4 GHz

TEST SITE: Anechoic chamber
 FREQUENCY: F min=2401.328 MHz
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 EUT POSITION: X-axis



Plot 7.1.14 Radiated emission measurements from 2.39 to 2.4 GHz

TEST SITE: Anechoic chamber
 FREQUENCY: F min=2401.328 MHz
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 EUT POSITION: X-axis



E avr=65.42 dBμV/m + Average Factor=65.42 dBμV/m -11.944 dB=53.476 dBμV/m <54 dBμV/m



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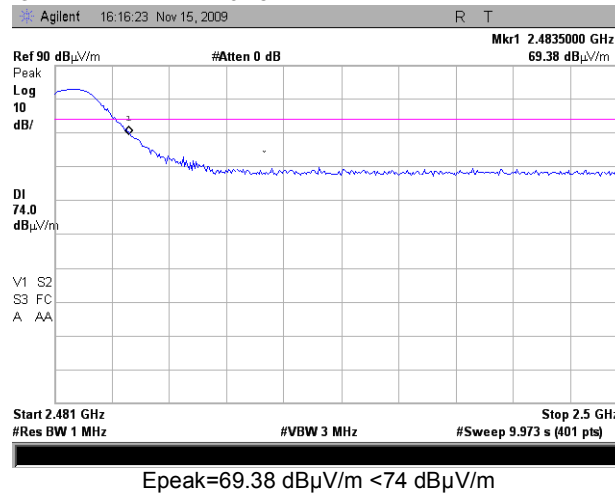
Report ID: MEDRAD_FCC.20094.doc

Date of Issue: 11/29/2009

Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

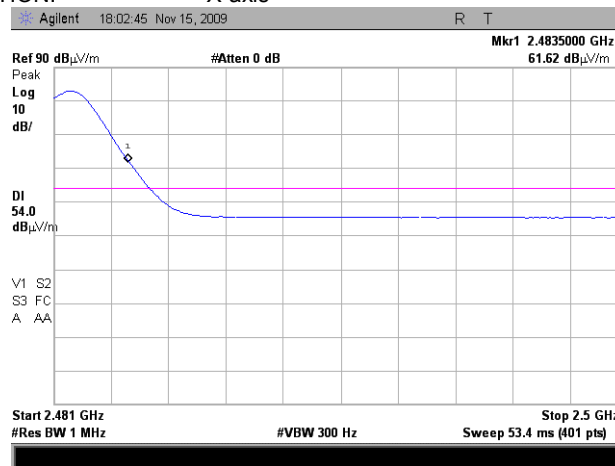
Plot 7.1.15 Radiated emission measurements from 2.481 to 2.5 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F max=2481.589 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis



Plot 7.1.16 Radiated emission measurements from 2.481 to 2.5 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F max=2481.589 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis



E avr=61.62 dBμV/m + Average Factor=61.62 dBμV/m -11.944 dB=49.676 dBμV/m < 54 dBμV/m



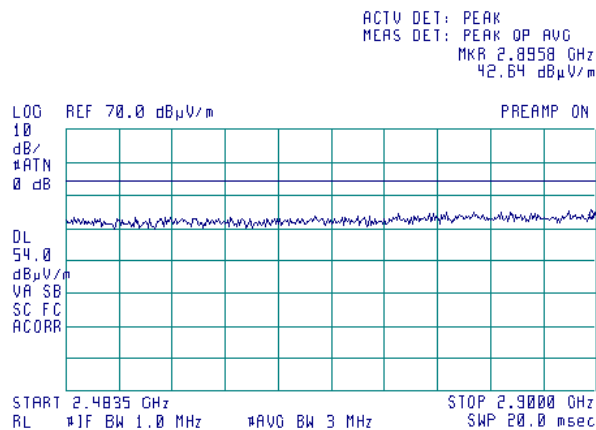
HERMON LABORATORIES

Test specification:	Section 15.249(a)(d), Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/25/2009 10:02:08 AM		
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

Plot 7.1.17 Radiated emission measurements from 2.4835 to 2.9 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F min=2401.328 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis

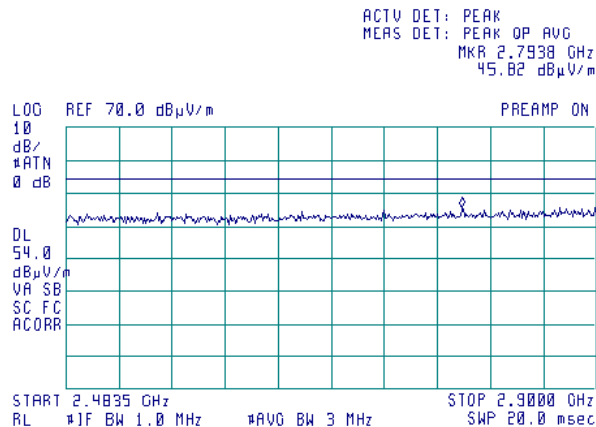
09:19:34 DEC 08, 2009



Plot 7.1.18 Radiated emission measurements from 2.4835 to 2.9 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F middle=2441.500 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis

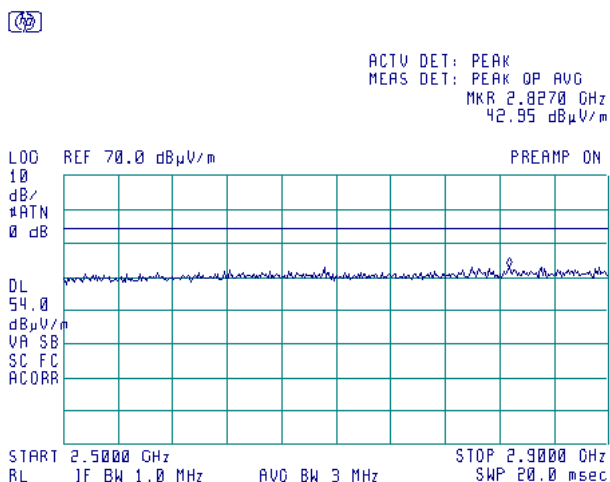
09:20:35 DEC 08, 2009



Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

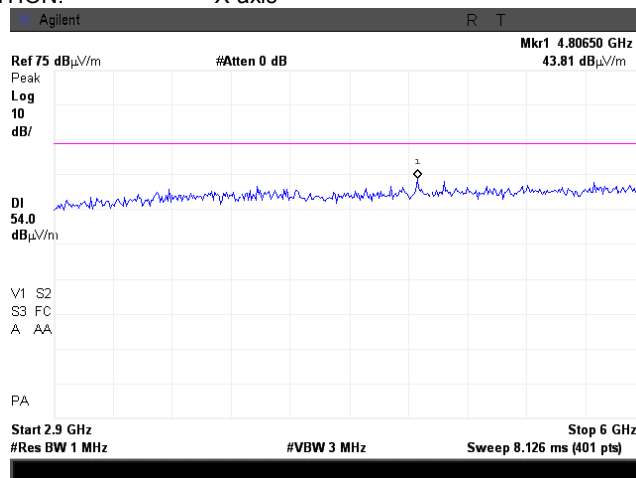
Plot 7.1.19 Radiated emission measurements from 2.5 to 2.9 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F max=2481.589 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis



Plot 7.1.20 Radiated emission measurements from 2.9 to 6.0 GHz

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
FREQUENCY: F min=2401.328 MHz
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis



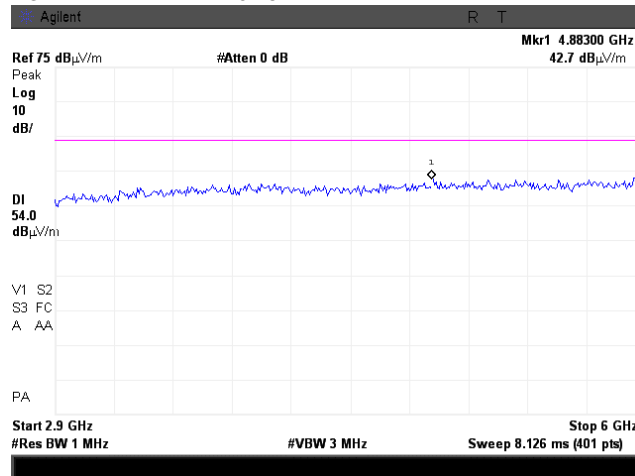


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Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

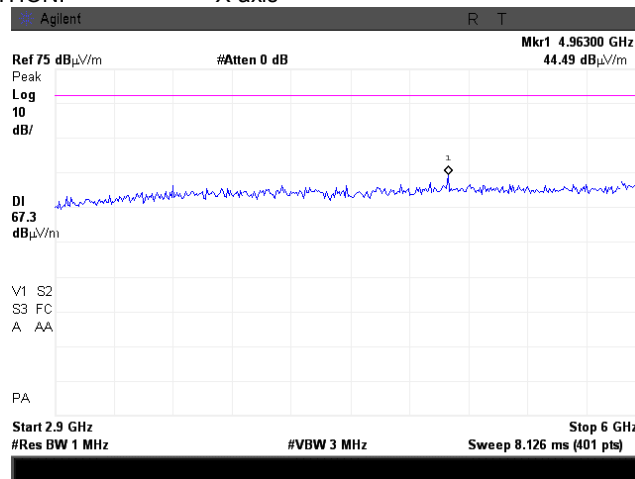
Plot 7.1.21 Radiated emission measurements from 2.9 to 6.0 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F middle=2441.500 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis



Plot 7.1.22 Radiated emission measurements from 2.9 to 6.0 GHz

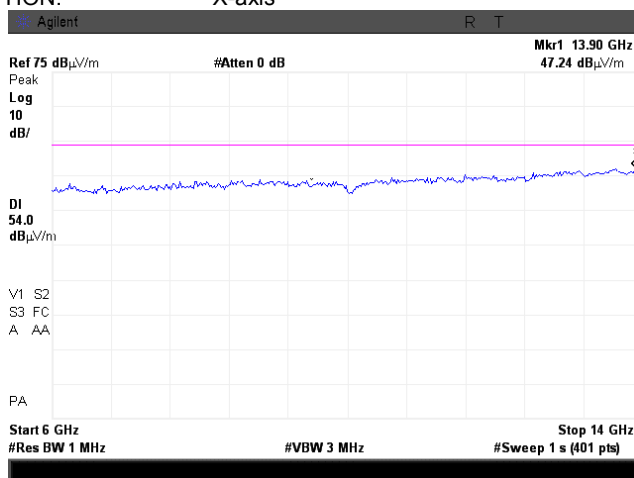
TEST SITE: Anechoic chamber
FREQUENCY: F max=2481.589 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis



Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

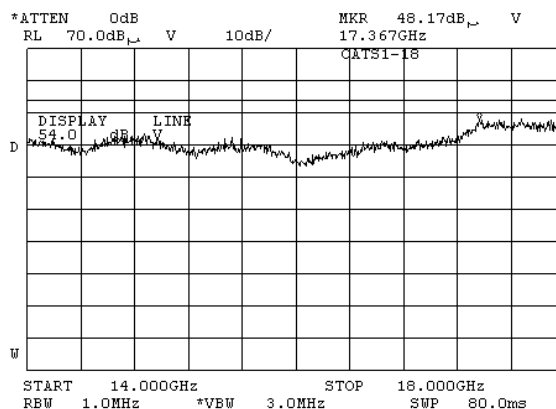
Plot 7.1.23 Radiated emission measurements from 6.0 to 14.0 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F min, F middle, F max
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis



Plot 7.1.24 Radiated emission measurements from 14.0 to 18.0 GHz

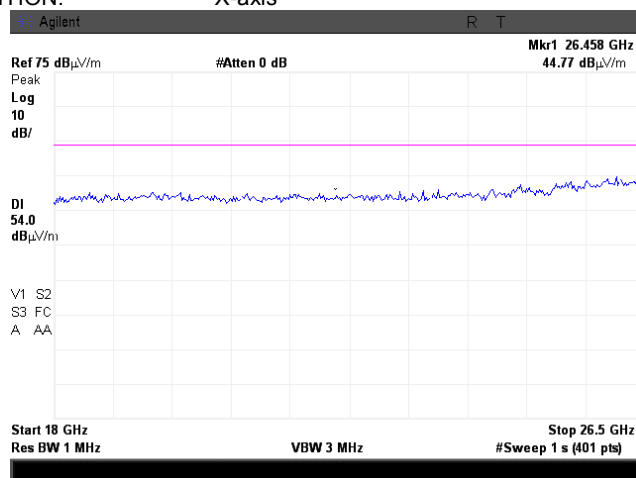
TEST SITE: Anechoic chamber
FREQUENCY: F min, F middle, F max
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis



Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

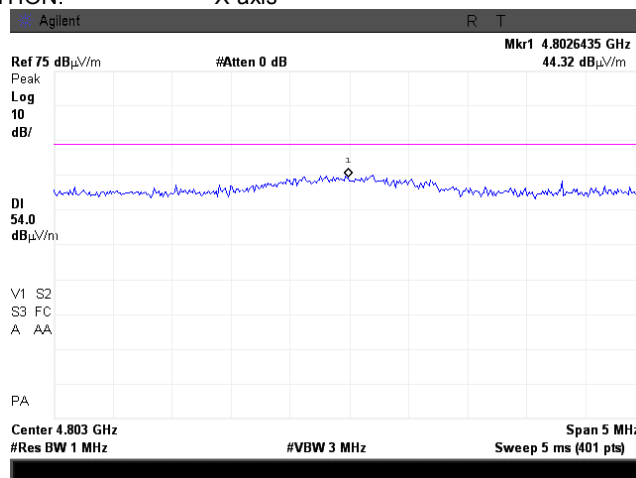
Plot 7.1.25 Radiated emission measurements from 18.0 to 26.5 GHz

TEST SITE: Anechoic chamber
FREQUENCY: F min, F middle, F max
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: X-axis



Plot 7.1.26 Radiated emission measurements at the second harmonic frequency

TEST SITE: Anechoic chamber
FREQUENCY: F min=2401.328 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical, Horizontal
EUT POSITION: X-axis



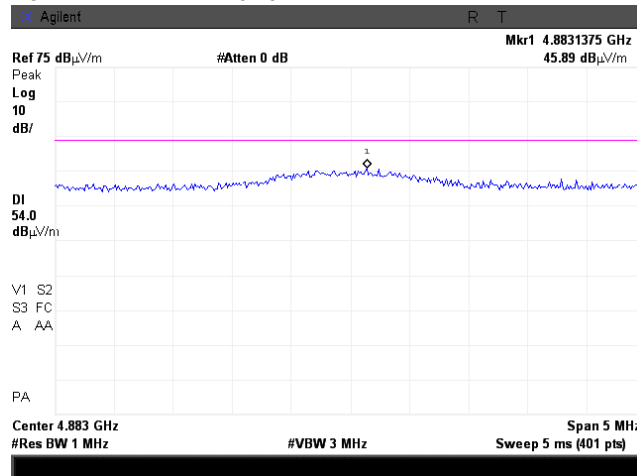


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Test specification:		Section 15.249(a)(d), Field strength of emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:02:08 AM	
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

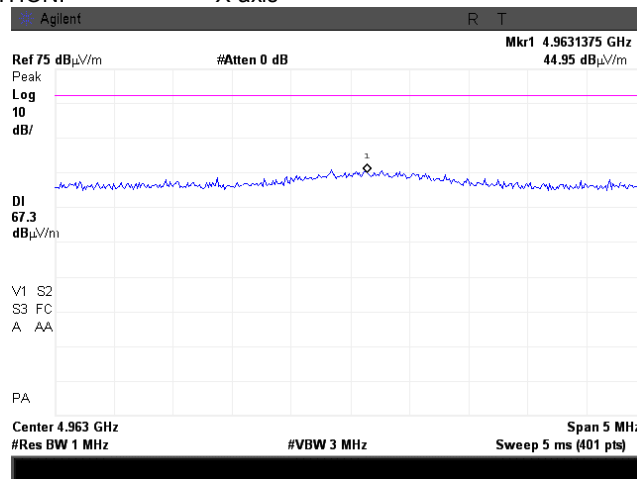
Plot 7.1.27 Radiated emission measurements at the second harmonic frequency

TEST SITE: Anechoic chamber
FREQUENCY: F middle=2441.500 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical, Horizontal
EUT POSITION: X-axis



Plot 7.1.28 Radiated emission measurements at the second harmonic frequency

TEST SITE: Anechoic chamber
FREQUENCY: F max=2481.589 MHz
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical, Horizontal
EUT POSITION: X-axis





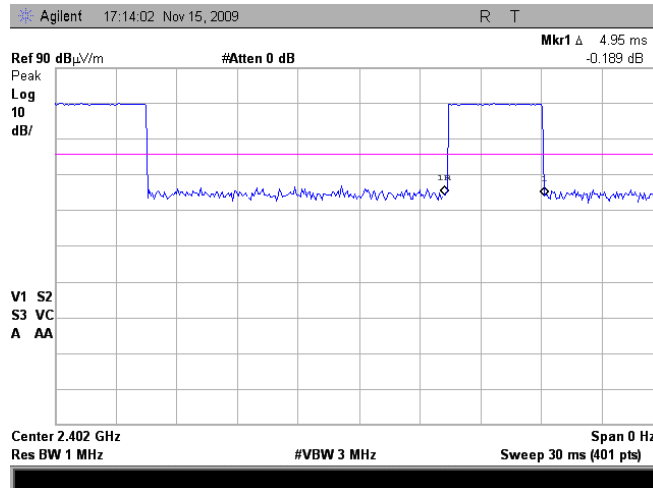
HERMON LABORATORIES

Report ID: MEDRAD_FCC.20094.doc

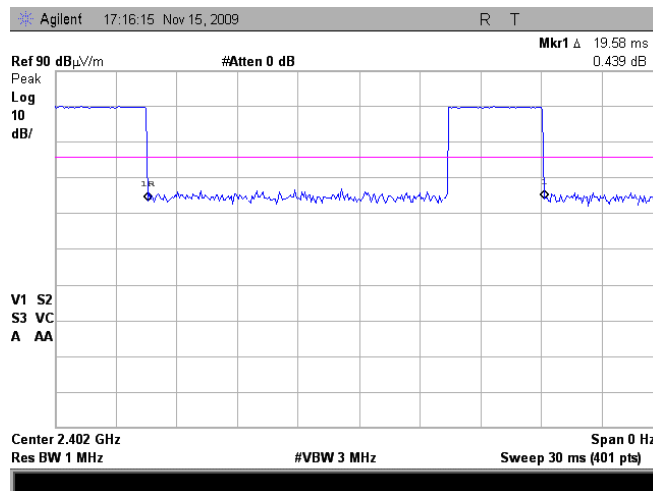
Date of Issue: 11/29/2009

Test specification:	Section 15.249(a)(d), Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/25/2009 10:02:08 AM		
Temperature: 23.3 °C	Air Pressure: 1017 hPa	Relative Humidity: 46 %	Power Supply: Battery
Remarks:			

Plot 7.1.29 Transmission pulse duration



Plot 7.1.30 Transmission pulse period



Average factor = $20\text{Log}(\text{Ton}/\text{Tperiod}) = 20\text{Log}(4.95\text{ms}/19.58\text{ms}) = -11.944 \text{ dB}$



Test specification:		Section 15.249(d), Band edge emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		12/08/2009 10:03:31 AM	
Temperature: 22 °C	Air Pressure: 1012 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

7.2 Band edge emission

7.2.1 General

This test was performed to verify the EUT band edge emission including all associated side bands and was attenuated at least 50 dB below the unmodulated carrier level or below the general spurious emission limit. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Band edge emission limits

Frequency band, MHz	Field strength limit at 3 m, dB μ V/m		Attenuation below carrier, dBc
	Peak	Average	
2400-2483.5	74.0	54.0	50

7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and the performance check was conducted.

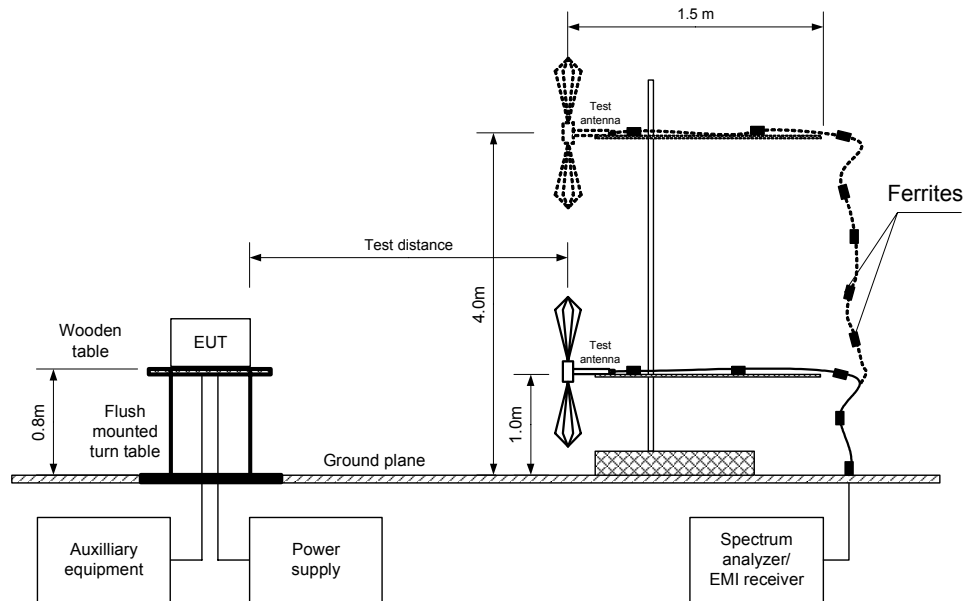
7.2.2.2 The spectrum analyzer frequency span was set to capture all major modulation sidebands of emission and sweep time was set sufficiently slow to ensure peak measurements. Spectrum analyzer was set in peak hold mode and time sufficient for trace stabilization was allowed.

7.2.2.3 The frequency of modulation envelope points beyond which power level drops below the band edge emission limit was measured.

7.2.2.4 The test results were recorded in Table 7.2.2 and shown in the associated plots.

Test specification:		Section 15.249(d), Band edge emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		12/08/2009 10:03:31 AM	
Temperature: 22 °C	Air Pressure: 1012 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Figure 7.2.1 Band edge emission measurement set up





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Test specification:		Section 15.249(d), Band edge emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		12/08/2009 10:03:31 AM	
Temperature: 22 °C	Air Pressure: 1012 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Table 7.2.2 Band edge emission test results

ASSIGNED FREQUENCY RANGE: 2400.0-2483.5 MHz
 DETECTOR USED: Peak hold
 RESOLUTION BANDWIDTH: 1000 kHz
 VIDEO BANDWIDTH: 3000/300 kHz
 MODULATION: MSK
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Modulation envelope		Band edge limit, MHz	Margin, kHz***	Verdict
Edge	Frequency, MHz*			
Low	2400.233	2400.00	233	Pass
High	2483.04	2483.50	460	Pass

* - Measured frequency beyond which the emission dropped 50 dB below the carrier emission or below the field strength limit whichever was a less stringent

** - Margin = Band edge limit – Band edge frequency

Reference numbers of test equipment used

HL 0521	HL 1984	HL 3121	HL 3123				
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Full description is given in Appendix A.



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Report ID: MEDRAD_FCC.20094.doc

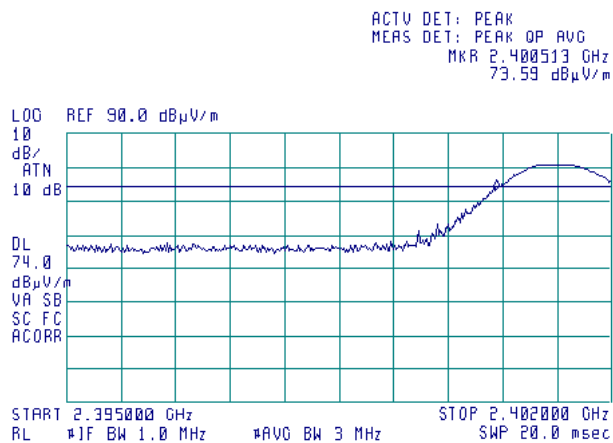
Date of Issue: 11/29/2009

Test specification:		Section 15.249(d), Band edge emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		12/08/2009 10:03:31 AM	
Temperature: 22 °C	Air Pressure: 1012 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Plot 7.2.1 Low band edge emission test result, VBW=3 MHz

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

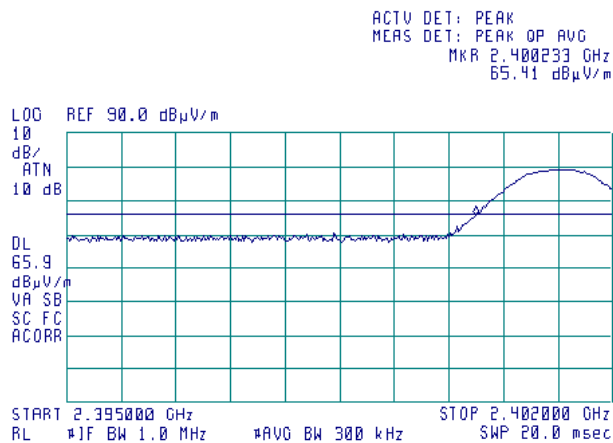
13:34:03 NOV 19, 2009



Plot 7.2.2 Low band edge emission test result, VBW=300 kHz

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

09:09:25 DEC 08, 2009



Limit AVR=54 dBμV/m +Average Factor = 54 dBμV/m +11.944 dB = 65.944 dBμV/m
VBW>1/Tx on=1/5 ms>200 Hz



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Report ID: MEDRAD_FCC.20094.doc

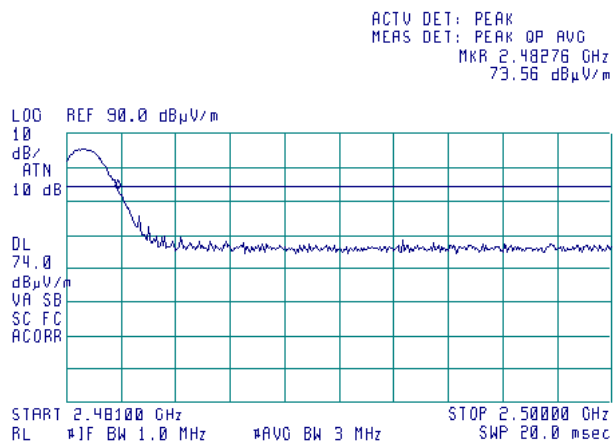
Date of Issue: 11/29/2009

Test specification:		Section 15.249(d), Band edge emissions	
Test procedure:		ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		12/08/2009 10:03:31 AM	
Temperature: 22 °C	Air Pressure: 1012 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Plot 7.2.3 High band edge emission test result, VBW=3 MHz

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

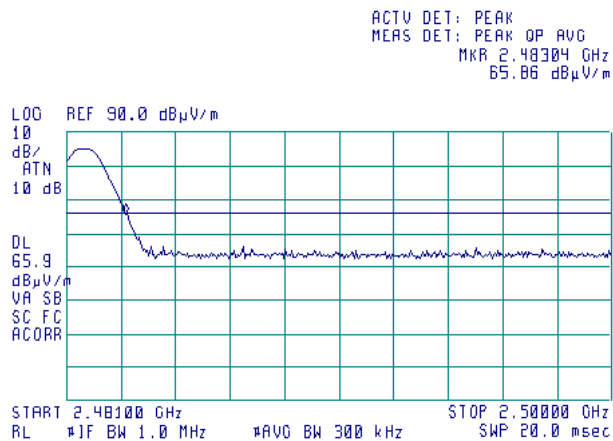
13:54:45 NOV 19, 2009



Plot 7.2.4 High band edge emission test result, VBW=300 kHz

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

13:56:47 NOV 19, 2009



Limit AVR=54 dBμV/m +Average Factor=54 dBμV/m +11.944 dB=65.944 dBμV/m
VBW>1/Tx on=1/5ms>200 Hz

Test specification:		Section 15.215(c), Occupied bandwidth	
Test procedure:		ANSI C63.4, Section 13.1.7	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/19/2009 2:04:10 PM	
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

7.3 Occupied bandwidth test

7.3.1 General

This test was performed to verify that the 20 dB bandwidth of the emissions was contained within the standard specified frequency band according to FCC §15.215 requirements. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc
2400 – 2483.5	20.0

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

7.3.2 Test procedure

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

7.3.2.2 The spectrum analyzer sweep time and bandwidth were set to capture all major modulation sidebands of emission and sweep time was set sufficiently slow to ensure peak measurements. Spectrum analyzer was set in peak hold mode and time sufficient for trace stabilization was allowed.

7.3.2.3 The peak of emission was measured. The transmitter occupied bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.3.2 and associated plot.

Figure 7.3.1 Occupied bandwidth test setup





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Report ID: MEDRAD_FCC.20094.doc

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Test specification:		Section 15.215(c), Occupied bandwidth			
Test procedure:		ANSI C63.4, Section 13.1.7			
Test mode:		Compliance		Verdict: PASS	
Date & Time:		11/19/2009 2:04:10 PM			
Temperature: 21.1 °C		Air Pressure: 1019 hPa		Relative Humidity: 39 %	Power Supply: Battery
Remarks:					

Table 7.3.2 Occupied bandwidth test results

ASSIGNED FREQUENCY BAND 2400-2483.5 MHz
 DETECTOR USED: Peak hold
 RESOLUTION BANDWIDTH: 10 kHz
 VIDEO BANDWIDTH: 30 kHz
 MODULATION ENVELOPE REFERENCE POINTS: 20 dBc
 MODULATING SIGNAL: enable

Band edge	Cross point frequency, MHz	Frequency drift, kHz		Modulation band edge, MHz	Assigned band edge, MHz	Verdict
		Negative	Positive			
Low	2400.813	NA	NA	2400.813	2400.0	Pass
High	2481.964	NA	NA	2481.964	2483.5	Pass

Reference numbers of test equipment used

HL 0521	HL 1984	HL 3121	HL 3123					
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Full description is given in Appendix A.

Plot 7.3.1 Occupied bandwidth test result

11:25:20 NOV 19, 2009

ACTV DET: PEAK
 MEAS DET: PEAK OP AVG
 MKR Δ 895 kHz
 - .30 dB

L00 REF 90.0 dB μ V/m

10
 dB/
 #ATN
 10 dB

VA SB
 SC FC
 ACORR

CENTER 2 441500 GHz

RL #1F BW 10 kHz

#AVG BW 30 kHz

SPAN 2.000 MHz

SWP 60.0 msec



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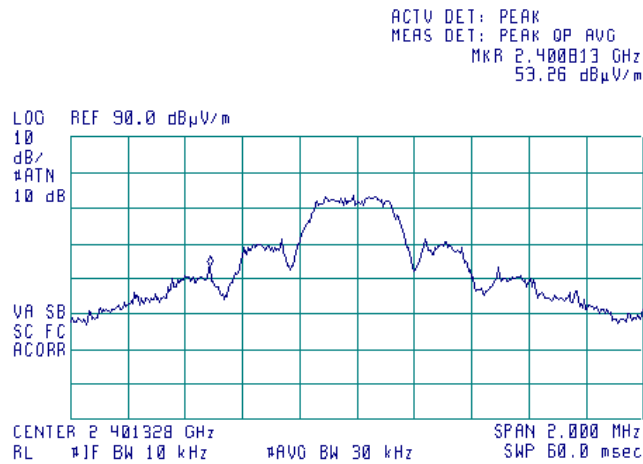
Report ID: MEDRAD_FCC.20094.doc

Date of Issue: 11/29/2009

Test specification:	Section 15.215(c), Occupied bandwidth		
Test procedure:	ANSI C63.4, Section 13.1.7		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/19/2009 2:04:10 PM		
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

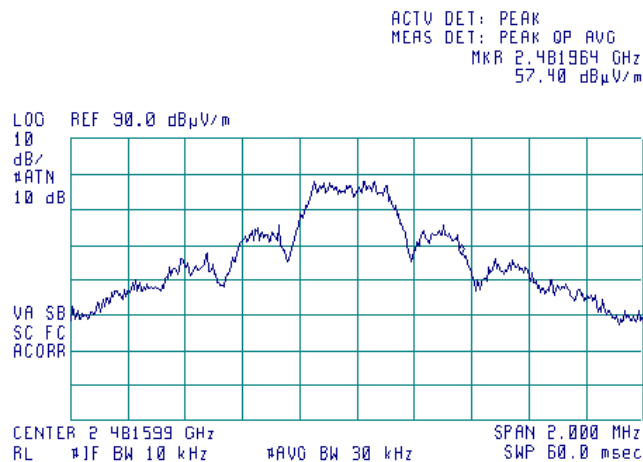
Plot 7.3.2 Occupied bandwidth test result, modulation bandwidth

11:36:33 NOV 19, 2009



Plot 7.3.3 Occupied bandwidth test result, modulation bandwidth

11:40:33 NOV 19, 2009





Test specification:	Section 15.203, Antenna requirement		
Test procedure:	Visual inspection / supplier declaration		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/25/2009 10:07:38 AM		
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

7.4 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.

The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.4.1.

Table 7.4.1 Antenna requirements

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



Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:07:38 AM	
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

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

8.1 Radiated emission measurements

8.1.1 General

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

Table 8.1.1 Radiated emission test limits according to FCC Part 15, Section 109

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

8.1.2 Test procedure

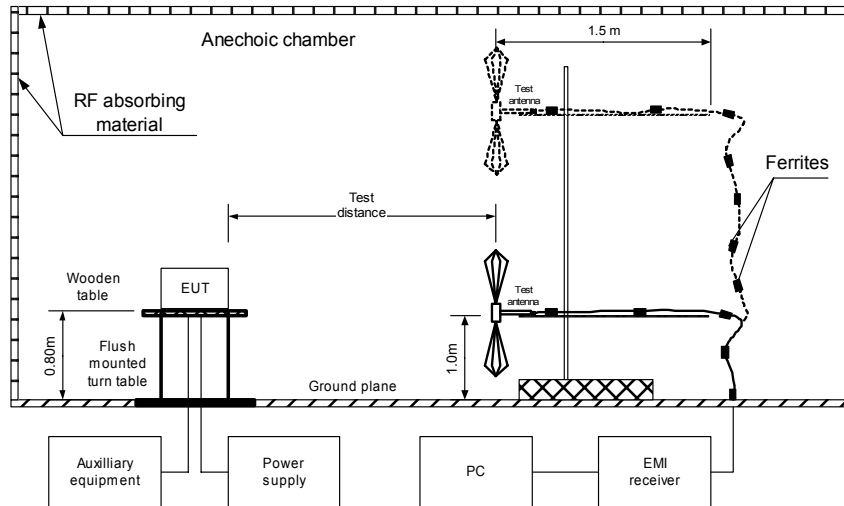
8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photograph/s, energized and the performance check was conducted.

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

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

Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		11/25/2009 10:07:38 AM	
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

Figure 8.1.1 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:		11/25/2009 10:07:38 AM	
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

Photograph 8.1.1 Setup for radiated emission measurements in 30-1000 MHz



Photograph 8.1.2 Setup for radiated emission measurements above 1000 MHz





HERMON LABORATORIES

Report ID: MEDRAD_FCC.20094.doc

Date of Issue: 11/29/2009

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:	11/25/2009 10:07:38 AM		
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

Table 8.1.2 Radiated emission test results

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Receive
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*				
No emissions were found								Pass

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 MHz – 26000 MHz
RESOLUTION BANDWIDTH: 1000 kHz

Frequency, MHz	Peak			Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
No emissions were found										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 0604	HL 1984	HL 3121	HL 3123			
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Full description is given in Appendix A.



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Report ID: MEDRAD_FCC.20094.doc

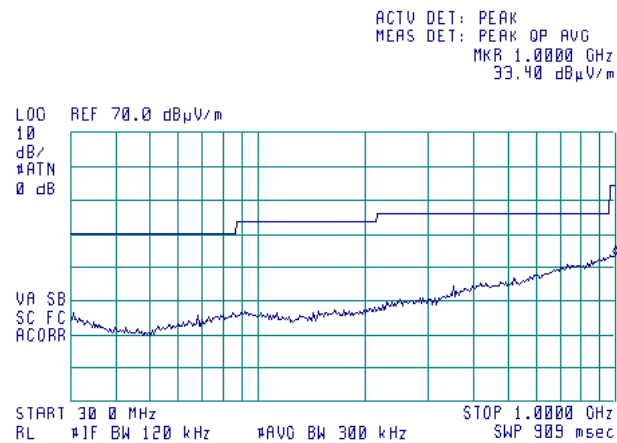
Date of Issue: 11/29/2009

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:		11/25/2009 10:07:38 AM	
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical & Horizontal
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by

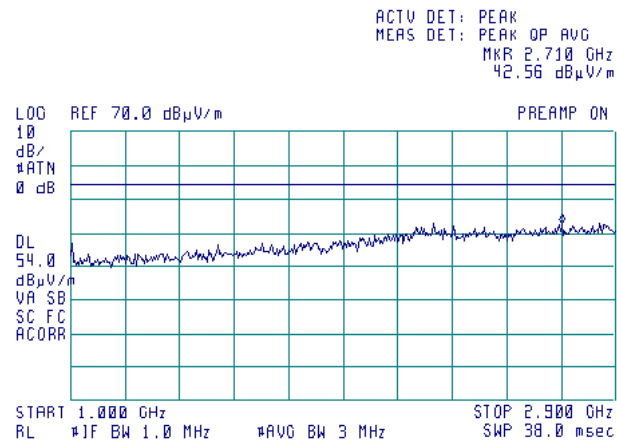
16:48:13 NOV 19, 2009



Plot 8.1.2 Radiated emission measurements in 1000-2900 MHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical & Horizontal
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by

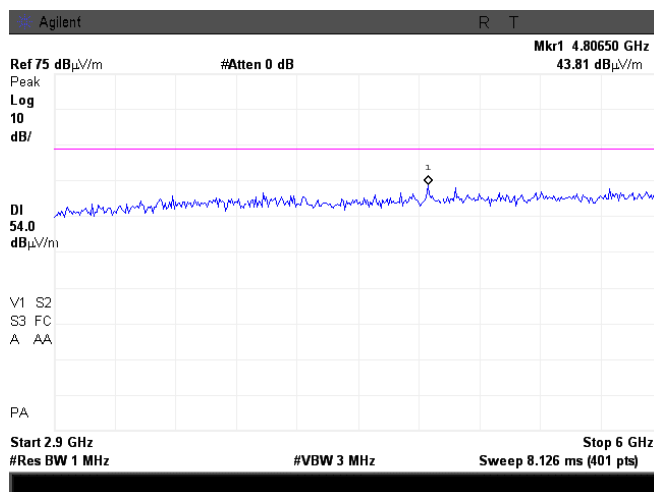
15:05:00 NOV 19, 2009



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:		11/25/2009 10:07:38 AM	
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

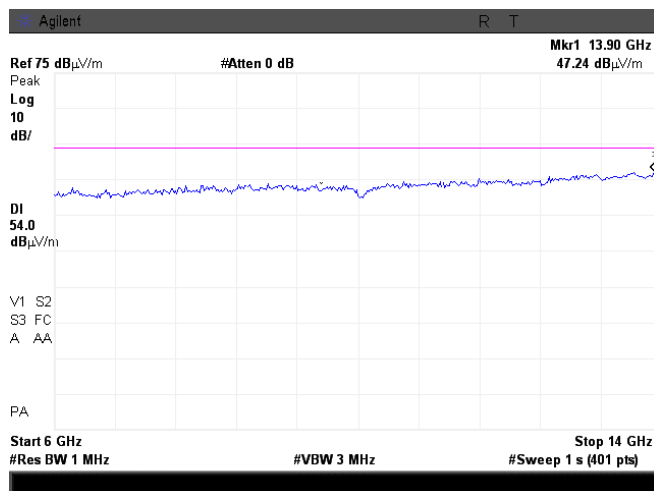
Plot 8.1.3 Radiated emission measurements in 2900 - 6000 MHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical & Horizontal
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



Plot 8.1.4 Radiated emission measurements in 6 - 14 GHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical & Horizontal
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by





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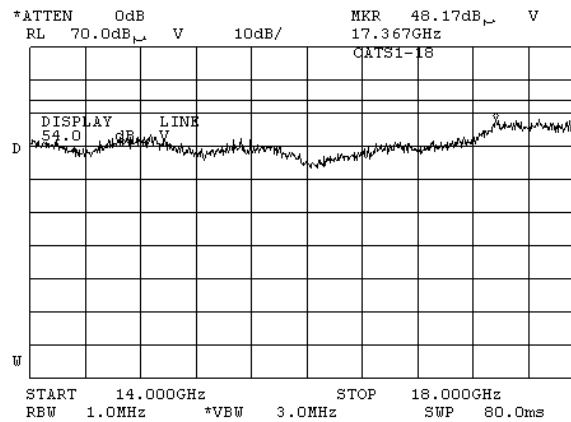
Report ID: MEDRAD_FCC.20094.doc

Date of Issue: 11/29/2009

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:	11/25/2009 10:07:38 AM		
Temperature: 21.1 °C	Air Pressure: 1019 hPa	Relative Humidity: 39 %	Power Supply: Battery
Remarks:			

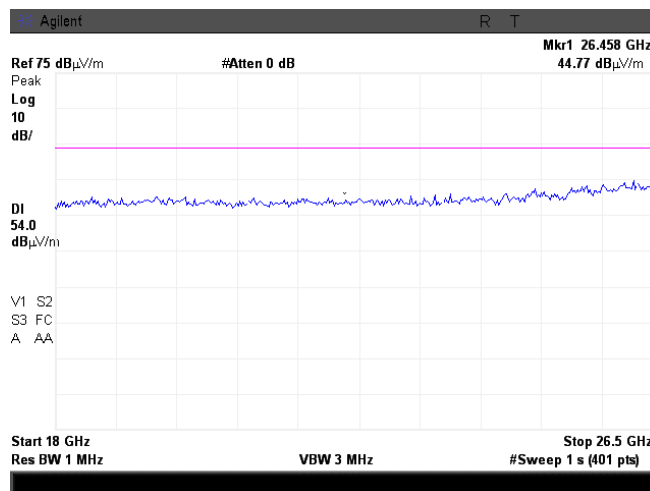
Plot 8.1.5 Radiated emission measurements in 14 - 18 GHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical & Horizontal
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



Plot 8.1.6 Radiated emission measurements in 18 - 26.5 GHz range

TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical & Horizontal
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



9 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	29-Jun-09	29-Jun-10
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	27-Aug-09	27-Aug-10
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	11-Jan-09	11-Jan-10
0768	Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, 25 dB gain	Quinstar Technology	QWH-4200-BA	110	23-Dec-08	23-Dec-11
1833	Cable RF, 1 m, blue, 26.5 GHz	Huber-Suhner	Sucoflex 104	146602/2	11-Jun-09	11-Jun-10
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W	EMC Test Systems	3115	9911-5964	24-Aug-09	24-Aug-10
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY414447 62	07-May-09	07-May-10
3121	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	3121	07-Dec-08	07-Dec-09
3123	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	3123	01-Jan-09	01-Jan-10
3206	Cable 40 GHz, 0.6 m	Gore	GOR245	05118336	11-Jun-09	11-Jun-10
3343	High Pass Filter, 50 Ohm, 2650 to 6500 MHz	Mini-Circuits	VHF-2700+	NA	05-Oct-09	05-Oct-10
3531	Amplifier, low noise, 2 to 8 GHz	Quinstar Technology	QLJ-02084040-J0	111590020 02	07-Dec-08	07-Dec-09
3535	Amplifier, low noise, 18 to 40 GHz	Quinstar Technology	QLJ-18404537-J0	111590030 01	07-Dec-08	07-Dec-09
3616	Cable RF, 6.5 m, N type-N type, DC-6.5 GHz	Suhner Switzerland	Rg 214/U	NA	07-Dec-08	07-Dec-09
3632	Cable RF, 5.4 m, N type-N type, DC-6.5 GHz	Alpha Wire	RG 214/U	NA	17-Dec-08	17-Dec-09

10 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Radiated emissions at 10 m measuring distance Horizontal polarization Vertical polarization	Biconilog antenna: ± 5.0 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.1 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 5.5 dB Biconical antenna: ± 5.5 dB Log periodic antenna: ± 5.6 dB Double ridged horn antenna: ± 5.8 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
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
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Occupied bandwidth	± 8.0 %

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

11 APPENDIX C Test laboratory 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), Registration Numbers 90624 for OATS and 90623 for the anechoic chamber; by Industry Canada for electromagnetic emissions (file numbers IC 2186A-1 for OATS and IC 2186A-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), has a status of a Telefication - Listed Testing Laboratory, Certificate No. L138/00. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01).

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Person for contact: Mr. Alex Usoskin, CEO.

12 APPENDIX D Specification references

47CFR part 15: 2008	Radio Frequency Devices.
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

13 APPENDIX E Test equipment correction factors

Antenna Factor
Active Loop Antenna
EMC Test Systems, model 6502, S/N 2857, HL 0446

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

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

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

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

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

Antenna factor
Biconilog antenna EMCO Model 3141
Ser.No.1011, HL 0604

Frequency, MHz	Antenna Factor, dB(1/m)	Frequency, MHz	Antenna Factor, dB(1/m)
26	7.8	940	24.0
28	7.8	960	24.1
30	7.8	980	24.5
40	7.2	1000	24.9
60	7.1	1020	25.0
70	8.5	1040	25.2
80	9.4	1060	25.4
90	9.8	1080	25.6
100	9.7	1100	25.7
110	9.3	1120	26.0
120	8.8	1140	26.4
130	8.7	1160	27.0
140	9.2	1180	27.0
150	9.8	1200	26.7
160	10.2	1220	26.5
170	10.4	1240	26.5
180	10.4	1260	26.5
190	10.3	1280	26.6
200	10.6	1300	27.0
220	11.6	1320	27.8
240	12.4	1340	28.3
260	12.8	1360	28.2
280	13.7	1380	27.9
300	14.7	1400	27.9
320	15.2	1420	27.9
340	15.4	1440	27.8
360	16.1	1460	27.8
380	16.4	1480	28.0
400	16.6	1500	28.5
420	16.7	1520	28.9
440	17.0	1540	29.6
460	17.7	1560	29.8
480	18.1	1580	29.6
500	18.5	1600	29.5
520	19.1	1620	29.3
540	19.5	1640	29.2
560	19.8	1660	29.4
580	20.6	1680	29.6
600	21.3	1700	29.8
620	21.5	1720	30.3
640	21.2	1740	30.8
660	21.4	1760	31.1
680	21.9	1780	31.0
700	22.2	1800	30.9
720	22.2	1820	30.7
740	22.1	1840	30.6
760	22.3	1860	30.6
780	22.6	1880	30.6
800	22.7	1900	30.6
820	22.9	1920	30.7
840	23.1	1940	30.9
860	23.4	1960	31.2
880	23.8	1980	31.6
900	24.1	2000	32.0
920	24.1		

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 factor
Double-ridged wave guide horn antenna
Model 3115, S/N 9911-5964, HL1984

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

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

Cable loss
Microwave Cable Assembly, 18 GHz, 6.4 m, SMA – SMA, Huber-Suhner, model 198-9155-00
HL 3121

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.08	3600	2.10	7400	3.08	11200	3.85	15100	4.58
30	0.18	3700	2.14	7500	3.11	11300	3.85	15200	4.60
50	0.26	3800	2.18	7600	3.14	11400	3.86	15300	4.63
100	0.34	3900	2.19	7700	3.16	11500	3.86	15400	4.65
200	0.47	4000	2.25	7800	3.18	11600	3.87	15500	4.71
300	0.59	4100	2.25	7900	3.20	11700	3.85	15600	4.70
400	0.66	4200	2.28	8000	3.22	11800	3.96	15700	4.69
500	0.75	4300	2.35	8100	3.26	11900	3.92	15800	4.71
600	0.83	4400	2.35	8200	3.27	12000	3.92	15900	4.74
700	0.90	4500	2.38	8300	3.29	12100	3.94	16000	4.69
800	0.96	4600	2.43	8400	3.30	12200	3.94	16100	4.72
900	1.02	4700	2.43	8500	3.31	12300	3.99	16200	4.71
1000	1.07	4800	2.45	8600	3.33	12400	4.02	16300	4.74
1100	1.12	4900	2.48	8700	3.35	12500	4.10	16400	4.74
1200	1.15	5000	2.55	8800	3.36	12600	4.09	16500	4.75
1300	1.22	5100	2.54	8900	3.38	12700	4.15	16600	4.78
1400	1.28	5200	2.56	9000	3.40	12800	4.15	16700	4.86
1500	1.29	5300	2.58	9100	3.41	12900	4.08	16800	4.84
1600	1.36	5400	2.61	9200	3.45	13000	4.21	16900	4.83
1700	1.40	5500	2.64	9300	3.48	13100	4.19	17000	4.86
1800	1.45	5600	2.69	9400	3.52	13200	4.29	17100	4.83
1900	1.51	5700	2.67	9500	3.54	13300	4.24	17200	4.90
2000	1.50	5800	2.71	9600	3.59	13400	4.26	17300	4.91
2100	1.56	5900	2.73	9700	3.59	13500	4.26	17400	4.94
2200	1.59	6000	2.75	9800	3.62	13600	4.29	17500	4.93
2300	1.63	6100	2.81	9900	3.70	13700	4.35	17600	4.93
2400	1.73	6200	2.80	10000	3.70	13800	4.31	17700	5.00
2500	1.73	6300	2.82	10100	3.72	13900	4.29	17800	5.01
2600	1.78	6400	2.85	10200	3.73	14000	4.32	17900	5.00
2700	1.84	6500	2.87	10300	3.75	14100	4.33	18000	5.00
2800	1.84	6600	2.90	10400	3.76	14200	4.34		
2900	1.91	6700	2.91	10500	3.77	14300	4.36		
3000	1.91	6800	2.94	10600	3.79	14400	4.38		
3100	1.97	6900	2.96	10700	3.80	14600	4.42		
3200	1.98	7000	2.98	10800	3.81	14700	4.42		
3300	2.04	7100	3.01	10900	3.81	14800	4.55		
3400	2.04	7200	3.02	11000	3.83	14900	4.55		
3500	2.10	7300	3.04	11100	3.84	15000	4.55		

Cable loss
Microwave Cable Assembly, 18 GHz, 6.4 m, SMA – SMA, Huber-Suhner, model 198-9155-00
HL 3123

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.11	3600	1.97	7400	3.12	11200	3.90	15100	4.74
30	0.17	3700	1.97	7500	3.13	11300	3.93	15200	4.70
50	0.25	3800	2.03	7600	3.16	11400	3.88	15300	4.73
100	0.32	3900	2.04	7700	3.18	11500	3.87	15400	4.78
200	0.46	4000	2.10	7800	3.20	11600	3.90	15500	4.75
300	0.58	4100	1.97	7900	3.23	11700	3.86	15600	4.76
400	0.65	4200	1.97	8000	3.25	11800	3.88	15700	4.75
500	0.74	4300	2.03	8100	3.26	11900	3.86	15800	4.78
600	0.82	4400	2.04	8200	3.28	12000	3.89	15900	4.79
700	0.89	4500	2.10	8300	3.31	12100	3.94	16000	4.73
800	0.95	4600	1.97	8400	3.31	12200	3.92	16100	4.78
900	1.01	4700	1.97	8500	3.32	12300	3.96	16200	4.84
1000	1.07	4800	2.03	8600	3.34	12400	4.01	16300	4.90
1100	1.11	4900	2.04	8700	3.35	12500	4.07	16400	4.87
1200	1.17	5000	2.10	8800	3.37	12600	4.08	16500	4.90
1300	1.22	5100	2.53	8900	3.39	12700	4.17	16600	4.98
1400	1.27	5200	2.55	9000	3.42	12800	4.26	16700	5.05
1500	1.29	5300	2.60	9100	3.43	12900	4.16	16800	5.04
1600	1.35	5400	2.61	9200	3.51	13000	4.21	16900	5.02
1700	1.40	5500	2.64	9300	3.52	13100	4.24	17000	5.09
1800	1.44	5600	2.70	9400	3.54	13200	4.27	17100	5.07
1900	1.51	5700	2.67	9500	3.63	13300	4.31	17200	5.10
2000	1.49	5800	2.71	9600	3.61	13400	4.33	17300	5.13
2100	1.55	5900	2.74	9700	3.71	13500	4.25	17400	5.23
2200	1.58	6000	2.80	9800	3.66	13600	4.27	17500	5.21
2300	1.62	6100	2.79	9900	3.77	13700	4.33	17600	5.22
2400	1.72	6200	2.81	10000	3.75	13800	4.33	17700	5.36
2500	1.76	6300	2.83	10100	3.77	13900	4.31	17800	5.35
2600	1.78	6400	2.86	10200	3.80	14000	4.30	17900	5.45
2700	1.80	6500	2.88	10300	3.79	14100	4.30	18000	5.43
2800	1.86	6600	2.90	10400	3.87	14200	4.31		
2900	1.90	6700	2.92	10500	3.83	14300	4.37		
3000	1.90	6800	2.98	10600	3.88	14400	4.35		
3100	1.97	6900	2.98	10700	3.86	14600	4.53		
3200	1.97	7000	3.00	10800	3.87	14700	4.50		
3300	2.03	7100	3.02	10900	3.90	14800	4.62		
3400	2.04	7200	3.04	11000	3.84	14900	4.65		
3500	2.10	7300	3.06	11100	3.88	15000	4.79		

Cable loss
Cable coaxial, GORE-TEX, GOR245, 40 GHz, 0.6 m, SMA-SMA, S/N 05118336
HL 3206

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.09	4900	0.85	10000	1.20	15200	1.51	29500	1.94
30	0.09	5000	0.85	10100	1.23	15300	1.56	30000	2.11
50	0.10	5100	0.86	10200	1.24	15400	1.54	30500	2.25
100	0.14	5200	0.87	10300	1.25	15500	1.55	31000	2.23
200	0.18	5300	0.88	10400	1.24	15600	1.50	31500	2.24
300	0.22	5400	0.89	10500	1.20	15700	1.56	32000	2.21
400	0.26	5500	0.90	10600	1.23	15800	1.50	32500	2.19
500	0.29	5600	0.92	10700	1.25	15900	1.58	33000	2.24
600	0.31	5700	0.93	10800	1.28	16000	1.56	33500	2.26
700	0.33	5800	0.93	10900	1.35	16100	1.59	34000	2.25
800	0.35	5900	0.95	11000	1.30	16200	1.57	34500	2.28
900	0.38	6000	0.93	11100	1.31	16300	1.59	35000	2.27
1000	0.39	6100	0.97	11200	1.31	16400	1.57	35500	2.31
1100	0.41	6200	0.95	11300	1.35	16500	1.60	36000	2.36
1200	0.42	6300	0.99	11400	1.32	16600	1.60	36500	2.39
1300	0.45	6400	0.98	11500	1.38	16700	1.63	37000	2.39
1400	0.46	6500	0.99	11600	1.33	16800	1.66	37500	2.41
1500	0.48	6600	0.99	11700	1.37	16900	1.64	38000	2.40
1600	0.49	6700	0.99	11800	1.36	17000	1.66	38500	2.40
1700	0.50	6800	0.99	11900	1.42	17100	1.65	39000	2.54
1800	0.52	6900	1.02	12000	1.34	17200	1.67	39500	2.39
1900	0.53	7000	1.02	12100	1.41	17300	1.66	40000	2.48
2000	0.53	7100	1.06	12200	1.36	17400	1.69		
2100	0.54	7200	1.05	12300	1.40	17500	1.66		
2200	0.55	7300	1.02	12400	1.34	17600	1.69		
2300	0.56	7400	1.03	12500	1.39	17700	1.70		
2400	0.57	7500	1.04	12600	1.40	17800	1.74		
2500	0.59	7600	1.05	12700	1.42	17900	1.67		
2600	0.60	7700	1.10	12800	1.37	18000	1.72		
2700	0.62	7800	1.11	12900	1.39	18500	1.72		
2800	0.62	7900	1.10	13000	1.40	19000	1.78		
2900	0.65	8000	1.10	13100	1.42	19500	1.77		
3000	0.65	8100	1.10	13200	1.41	20000	1.82		
3100	0.66	8200	1.10	13300	1.43	20500	1.82		
3200	0.67	8300	1.16	13400	1.45	21000	1.94		
3300	0.69	8400	1.15	13500	1.45	21500	1.92		
3400	0.70	8500	1.20	13600	1.54	22000	2.07		
3500	0.71	8600	1.19	13700	1.54	22500	1.90		
3600	0.71	8700	1.15	13800	1.49	23000	1.96		
3700	0.73	8800	1.16	13900	1.50	23500	1.88		
3800	0.74	8900	1.19	14000	1.50	24000	1.96		
3900	0.75	9000	1.18	14100	1.52	24500	1.96		
4000	0.76	9100	1.23	14200	1.60	25000	2.10		
4100	0.76	9200	1.20	14300	1.57	25500	2.05		
4200	0.78	9300	1.20	14400	1.57	26000	2.05		
4300	0.79	9400	1.19	14600	1.50	26500	2.05		
4400	0.80	9500	1.23	14700	1.54	27000	1.97		
4500	0.80	9600	1.21	14800	1.51	27500	2.09		
4600	0.82	9700	1.22	14900	1.54	28000	2.10		
4700	0.82	9800	1.20	15000	1.57	28500	2.05		
4800	0.83	9900	1.18	15100	1.56	29000	2.08		

Cable loss
Cable coaxial, RG-214/U, N type-N type, 6.5 m
Suhner Switzerland, HL 3616

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.13	1750	2.66	3550	4.44	5350	6.08
30	0.25	1800	2.72	3600	4.46	5400	6.12
50	0.32	1850	2.78	3650	4.59	5450	6.17
100	0.48	1900	2.81	3700	4.60	5500	6.25
150	0.60	1950	2.86	3750	4.72	5550	6.31
200	0.71	2000	2.94	3800	4.72	5600	6.35
250	0.81	2050	2.97	3850	4.86	5650	6.41
300	0.91	2100	3.01	3900	4.85	5700	6.50
350	1.00	2150	3.06	3950	4.99	5750	6.52
400	1.07	2200	3.11	4000	4.90	5800	6.57
450	1.14	2250	3.16	4050	5.04	5850	6.61
500	1.23	2300	3.21	4100	5.01	5900	6.71
550	1.30	2350	3.26	4150	5.10	5950	6.70
600	1.37	2400	3.31	4200	5.08	6000	6.75
650	1.44	2450	3.35	4250	5.18	6050	6.74
700	1.50	2500	3.39	4300	5.14	6100	6.84
750	1.58	2550	3.46	4350	5.22	6150	6.87
800	1.64	2600	3.48	4400	5.21	6200	6.93
850	1.69	2650	3.55	4450	5.29	6250	6.96
900	1.77	2700	3.59	4500	5.31	6300	7.02
950	1.79	2750	3.66	4550	5.39	6350	7.04
1000	1.87	2800	3.68	4600	5.41	6400	7.10
1050	1.92	2850	3.75	4650	5.49	6450	7.11
1100	1.98	2900	3.79	4700	5.52	6500	7.19
1150	2.05	2950	3.86	4750	5.60		
1200	2.09	3000	3.89	4800	5.64		
1250	2.15	3050	3.94	4850	5.73		
1300	2.21	3100	3.98	4900	5.70		
1350	2.27	3150	4.03	4950	5.73		
1400	2.33	3200	4.06	5000	5.75		
1450	2.38	3250	4.12	5050	5.83		
1500	2.44	3300	4.14	5100	5.82		
1550	2.48	3350	4.22	5150	5.91		
1600	2.52	3400	4.24	5200	5.92		
1650	2.56	3450	4.31	5250	5.98		
1700	2.62	3500	4.35	5300	6.01		

Cable loss
Cable coaxial, RG-214/U, N type-N type, 5.4 m
Alpha Wire, HL 3632

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.06	1750	2.12	3550	3.45	5350	4.75
30	0.17	1800	2.15	3600	3.48	5400	4.76
50	0.24	1850	2.16	3650	3.53	5450	4.80
100	0.35	1900	2.23	3700	3.57	5500	4.82
150	0.45	1950	2.25	3750	3.60	5550	4.88
200	0.54	2000	2.34	3800	3.64	5600	4.90
250	0.64	2050	2.36	3850	3.67	5650	4.94
300	0.69	2100	2.41	3900	3.73	5700	4.98
350	0.76	2150	2.46	3950	3.81	5750	5.01
400	0.83	2200	2.51	4000	3.81	5800	5.07
450	0.90	2250	2.52	4050	3.81	5850	5.13
500	0.95	2300	2.56	4100	3.90	5900	5.15
550	1.02	2350	2.57	4150	3.88	5950	5.20
600	1.07	2400	2.61	4200	3.92	6000	5.26
650	1.14	2450	2.68	4250	3.99	6050	5.28
700	1.18	2500	2.68	4300	4.01	6100	5.30
750	1.24	2550	2.72	4350	4.04	6150	5.37
800	1.31	2600	2.75	4400	4.05	6200	5.39
850	1.33	2650	2.79	4450	4.09	6250	5.45
900	1.38	2700	2.83	4500	4.18	6300	5.48
950	1.41	2750	2.89	4550	4.18	6350	5.52
1000	1.51	2800	2.91	4600	4.19	6400	5.56
1050	1.52	2850	2.96	4650	4.22	6450	5.61
1100	1.55	2900	2.97	4700	4.29	6500	5.62
1150	1.62	2950	3.00	4750	4.30		
1200	1.66	3000	3.04	4800	4.32		
1250	1.68	3050	3.08	4850	4.37		
1300	1.76	3100	3.12	4900	4.39		
1350	1.78	3150	3.18	4950	4.47		
1400	1.80	3200	3.20	5000	4.51		
1450	1.86	3250	3.24	5050	4.50		
1500	1.92	3300	3.27	5100	4.53		
1550	1.95	3350	3.32	5150	4.59		
1600	1.97	3400	3.35	5200	4.63		
1650	2.04	3450	3.41	5250	4.64		
1700	2.07	3500	3.42	5300	4.66		

Cable loss
Cable coaxial, RG-214/U, N type-N type, 5.5 m
Alpha Wire, HL 3634

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.05	1750	2.12	3550	3.43	5350	4.66
30	0.18	1800	2.16	3600	3.50	5400	4.70
50	0.24	1850	2.17	3650	3.53	5450	4.76
100	0.36	1900	2.23	3700	3.55	5500	4.80
150	0.47	1950	2.25	3750	3.57	5550	4.86
200	0.55	2000	2.33	3800	3.63	5600	4.87
250	0.64	2050	2.34	3850	3.67	5650	4.91
300	0.70	2100	2.41	3900	3.73	5700	4.97
350	0.77	2150	2.44	3950	3.73	5750	5.02
400	0.83	2200	2.49	4000	3.78	5800	5.07
450	0.91	2250	2.52	4050	3.79	5850	5.07
500	0.95	2300	2.55	4100	3.90	5900	5.15
550	1.02	2350	2.56	4150	3.88	5950	5.20
600	1.08	2400	2.60	4200	3.88	6000	5.25
650	1.15	2450	2.68	4250	3.98	6050	5.26
700	1.19	2500	2.67	4300	4.00	6100	5.30
750	1.25	2550	2.73	4350	4.02	6150	5.37
800	1.31	2600	2.74	4400	4.03	6200	5.40
850	1.35	2650	2.77	4450	4.06	6250	5.45
900	1.39	2700	2.84	4500	4.14	6300	5.47
950	1.45	2750	2.85	4550	4.16	6350	5.50
1000	1.49	2800	2.89	4600	4.17	6400	5.57
1050	1.56	2850	2.91	4650	4.19	6450	5.62
1100	1.57	2900	2.99	4700	4.21	6500	5.61
1150	1.64	2950	3.00	4750	4.26		
1200	1.66	3000	3.03	4800	4.29		
1250	1.71	3050	3.06	4850	4.30		
1300	1.73	3100	3.14	4900	4.33		
1350	1.80	3150	3.20	4950	4.36		
1400	1.81	3200	3.20	5000	4.45		
1450	1.87	3250	3.22	5050	4.44		
1500	1.94	3300	3.24	5100	4.49		
1550	1.96	3350	3.33	5150	4.53		
1600	1.97	3400	3.35	5200	4.62		
1650	2.03	3450	3.38	5250	4.63		
1700	2.05	3500	3.39	5300	4.64		

14 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
BB	broadband
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
dB Ω	decibel referred to one Ohm
DC	direct current
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
ITE	information technology equipment
k	kilo
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μ s	microsecond
NA	not applicable
NB	narrowband
OATS	open area test site
Ω	Ohm
QP	quasi-peak
PCB	printed circuit board
PM	pulse modulation
PS	power supply
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
VA	volt-ampere

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