HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

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TEST REPORT

ACCORDING TO: FCC part 27

FOR:

Airspan Networks Inc.

Terminal station

Model:SSRM 1.4GHz

FCC ID:PIDASMAX1400

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1 Applicant information

Client name:	Airspan Networks Inc.
Address:	777 Yamato, Road Suite 310 Boca Raton, FL 33431, USA
Telephone:	+1 561 893 8670
Fax:	+1 561 893 8671
E-mail:	zlevi@airspan.com
Contact name:	Mr. Zion Levi

2 Equipment under test attributes

Product name:	Terminal station
Product type:	Transceiver
Model(s):	SSRM 1.4GHz
Serial number:	A20FC5D20DD8
Hardware version:	Ver.C1
Software release:	10.3.1.23
Receipt date	7/02/2012

3 Manufacturer information

Manufacturer name:	Airspan Networks Inc.
Address:	777 Yamato, Road Suite 310 Boca Raton, FL 33431, USA
Telephone:	+1 561 893 8670
Fax:	+1 561 893 8671
E-Mail:	zlevi@airspan.com
Contact name:	Mr. Zion Levi

4 Test details

Project ID:	23473
Location:	Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started:	7/02/2012
Test completed:	7/04/2012
Test specification(s):	FCC 47CFR part 27

5 Tests summary

Test	Status
Transmitter characteristics	
Section 27.50(e)(1), (2), Peak output power at RF antenna connector	Pass
Section 2.1049, Occupied bandwidth	Pass
Section 2.1091, 27.52, RF safety	Pass, exhibit provided in Application for certification
Section 27.53(j), Spurious emissions at RF antenna connector	Pass
Section 27.53(j), Band edge emissions at RF antenna connector	Pass
Section 27.53(j), Radiated spurious emissions	Pass
Section 27.54, Frequency stability	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. S. Samokha, test engineer	July 4, 2012	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	July 19, 2012	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	July 25, 2012	

6 EUT description

6.1 General information

A subscriber premises radio, SSRM 1400 MHz TDD is part of a WiMAX broadband fixed cellular wireless access system. The system provides a radio link between an end-user (a subscriber) and a network to give high-speed data access. The SSRM's transceiver/receiver (Up to 64 QAM modulation, data rate up to 4.2Mbps) uses OFDMA and operating in TDD duplexing mode, equipped with a 10 dBi external antenna.

6.2 Ports and lines

Port type	Port description	Connected from	Connected to	Qty.	Cable type	Cable length, m
Power	DC Power	Power Supply	PC MCI Extender	1	Unshielded	1.5
Signal	Power/Data	PCI Extender	EUT	1	Flat cable 2x26	0.15
RF	Antenna	EUT	Open circuit	2	NA	NA

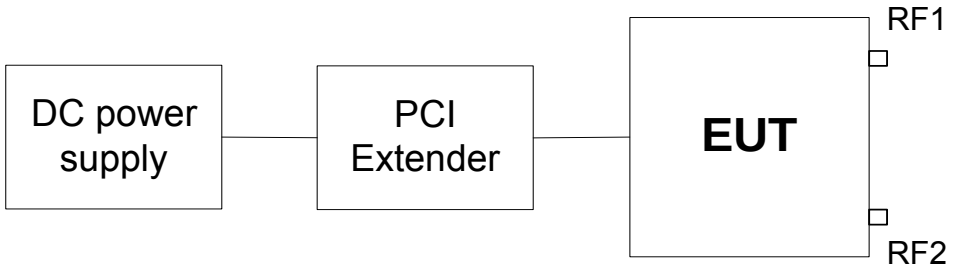
6.3 Support and test equipment

Description	Manufacturer	Model number	Serial number
5.5 VDC power supply	Fuhua	UE15WCP	0000298
Mini PCI Express Male to Female Extender	Orbit Micro	DRU-149-81772	NA
Laptop	IBM	ThinkPad T43	L3-AFKW5 05/09
AC/DC Adapter	IBM	08K8202	Z1ZAPW5940EL

6.4 Changes made in EUT

No changes were implemented in the EUT during testing.

6.5 Test configuration



6.6 Transmitter characteristics

Type of equipment	
V	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
V	fixed	Always at a distance more than 2 m from all people
	mobile	Always at a distance more than 20 cm from all people
	portable	May operate at a distance closer than 20 cm to human body

Assigned frequency range	1390 – 1395 MHz;				
Operating frequency	1392.5 MHz				
Maximum rated output power	Aggregate conducted power of both RF chains				26.18 dBm
Is transmitter output power variable?		No			
	V	Yes		continuous variable	
			V	stepped variable with stepsize	0.5 dB
				minimum RF power	0 dBm
				maximum RF power at transmitter 50 Ω RF output connector	23.18 dBm

Antenna connection					
unique coupling	**V**	standard connector	Integral	**V**	with temporary RF connector
					without temporary RF connector

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain (maximum)
External	MTI Wireless Edge Ltd.	MT – 282025/CD	10 dBi

Transmitter 99% power bandwidth	Transmitter aggregate data rate/s, MBps	Type of modulation
3.5 MHz	1	QPSK
	2.52	16QAM
	4.2	64QAM

Type of multiplexing	OFDM				
Modulating test signal (baseband)	PRBS				
Maximum transmitter duty cycle in normal use	38%				
Transmitter power source					
		Nominal rated voltage		Battery type	
V	DC	**Nominal rated voltage**	5.5 VDC via PC MCI		
	AC mains	**Nominal rated voltage**	NA	NA	NA

Common power source for transmitter and receiver	**V**	yes	no

Test specification:	Section 27.50(e)(1), (2), Peak output power		
Test procedure:	47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/2/2012		
Temperature: 24.2 ºC	Air Pressure: 1004 hPa	Relative Humidity: 40 %	Power Supply: 5.5 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 27 requirements

7.1 Peak output power test

7.1.1 General

This test was performed to measure the peak output power at RF antenna connector. Specification test limits are given in Table 7.1.1.

Table 7.1.1 EIRP peak power limits for Fixed Base Station

Assigned frequency range, MHz	Maximum peak output power, EIRP	
	W	dBm
1390.0 – 1395.0	100	50.0

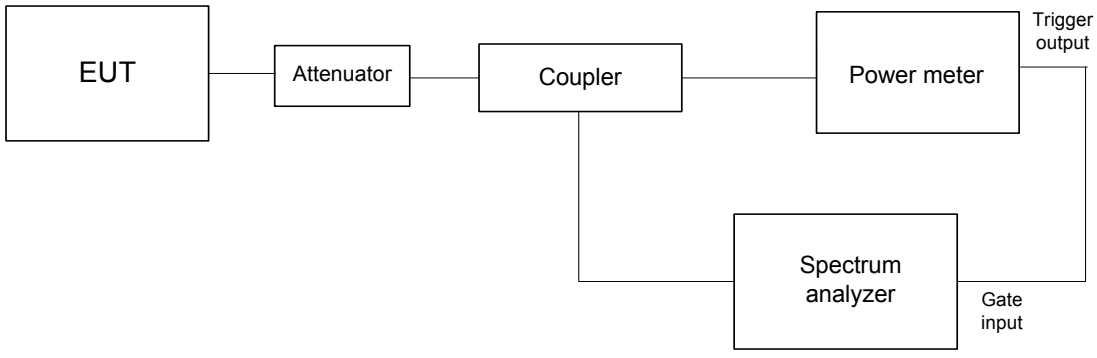
7.1.2 Test procedure

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

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

7.1.2.3 The peak output power was measured with spectrum analyzer as provided in Table 7.1.2.

Figure 7.1.1 Peak output power test setup



Test specification:	**Section 27.50(e)(1), (2), Peak output power**		
Test procedure:	47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	7/2/2012		
Temperature: 24.2 ºC	**Air Pressure:** 1004 hPa	**Relative Humidity:** 40 %	**Power Supply:** 5.5 VDC
Remarks:			

Table 7.1.2 EIRP peak power test results

ASSIGNED FREQUENCY RANGE: 1390.0 – 1395.0 MHz
DETECTOR USED: Power meter
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
ANTENNA GAIN: 10 dBi
EMISSION BANDWIDTH 3.5 MHz
NUMBER OF OUTPUTS: N = 2

Carrier frequency, MHz	Power meter reading, dBm	External attenuation, dB	Cable loss, dB	Total output power, dBm*	EIRP, dBm**	Limit, dBm	Margin, dB***	Verdict
Modulation QPSK 1 Mbps								
1392.5	23.18	Included	Included	26.18	36.18	50.0	-13.82	Pass
Modulation 64QAM 4.2 Mbps								
1392.5	22.91	Included	Included	25.91	35.91	50.0	-14.09	Pass

* - Total output power, dBm = Power meter reading + 10*log(N) = Power meter reading + 3 dB

** - EIRP, dBm = Total output power, dBm + Antenna gain, dBi

*** - Margin, dB = EIRP – Specification limit

Reference numbers of test equipment used

HL 3301	HL 3302						

Full description is given in Appendix A.

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/2/2012		
Temperature: 24.2 ºC	Air Pressure: 1004 hPa	Relative Humidity: 40 %	Power Supply: 5.5 VDC
Remarks:			

7.2 Occupied bandwidth test

7.2.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Maximum allowed bandwidth, kHz
1390.0 – 1395.0	26	NA

* - Modulation envelope reference points are provided in terms of attenuation below the unmodulated carrier.

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 set to transmit the unmodulated carrier and the reference peak power level was measured.

7.2.2.3 The EUT was set to transmit the normally modulated carrier.

7.2.2.4 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.2.2 and the associated plot.

Figure 7.2.1 Occupied bandwidth test setup

Test specification:	**Section 2.1049, Occupied bandwidth**		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	7/2/2012		
Temperature: 24.2 ºC	**Air Pressure:** 1004 hPa	**Relative Humidity:** 40 %	**Power Supply:** 5.5 VDC
Remarks:			

Table 7.2.2 Occupied bandwidth test results

DETECTOR USED:	Peak hold
RESOLUTION BANDWIDTH:	36 kHz
VIDEO BANDWIDTH:	680 kHz
MODULATION ENVELOPE REFERENCE POINTS:	26 dBc
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	4.2 Mbps

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
1392.5	3179.8	NA	NA	NA

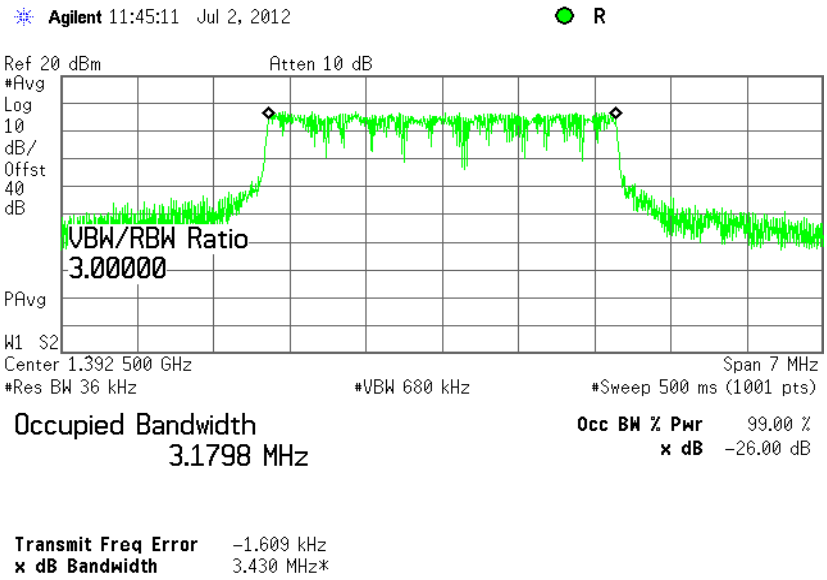
Reference numbers of test equipment used

HL 0337	HL 3787	HL 3818	HL 3903				

Full description is given in Appendix A.

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/2/2012		
Temperature: 24.2 °C	Air Pressure: 1004 hPa	Relative Humidity: 40 %	Power Supply: 5.5 VDC
Remarks:			

Plot 7.2.1 Occupied bandwidth test result at carrier frequency



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/4/2012		
Temperature: 21.8 ºC	Air Pressure: 1004 hPa	Relative Humidity: 54 %	Power Supply: 5.5VDC
Remarks:			

7.3 Radiated spurious emission measurements

7.3.1 General

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

Table 7.3.1 Radiated spurious emission test limits

Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm	Equivalent field strength limit @ 3m, dB(μV/m)***
0.009 – 10th harmonic*	43+10logP**	-13	84.4

* - Excluding the in band emission within ± 250 % of the authorized bandwidth from the carrier
** - P is transmitter output power in Watts
*** - Equivalent field strength limit was calculated from maximum allowed ERP of spurious as follows: E=sqrt(30×P×1.64)/r, where P is ERP in Watts, 1.64 is numeric gain of ideal dipole and r is antenna to EUT distance in meters

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 specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

7.3.2.3 The worst test results (the lowest margins) were recorded in Table 7.3.2 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 specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.

7.3.3.3 The worst test results (the lowest margins) were recorded in Table 7.3.2 and shown in the associated plots.

Test specification:	**Section 27.53(j), Radiated spurious emissions**		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	7/4/2012		
Temperature: 21.8 ºC	**Air Pressure:** 1004 hPa	**Relative Humidity:** 54 %	**Power Supply:** 5.5VDC
Remarks:			

Figure 7.3.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band

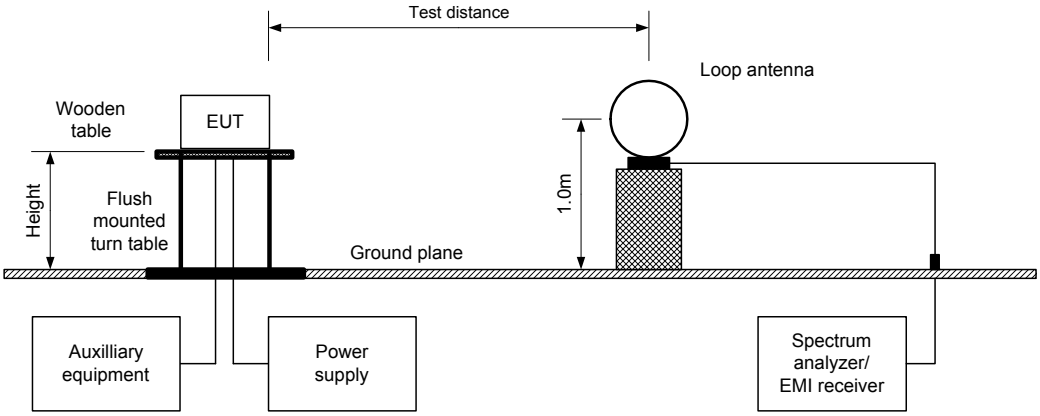
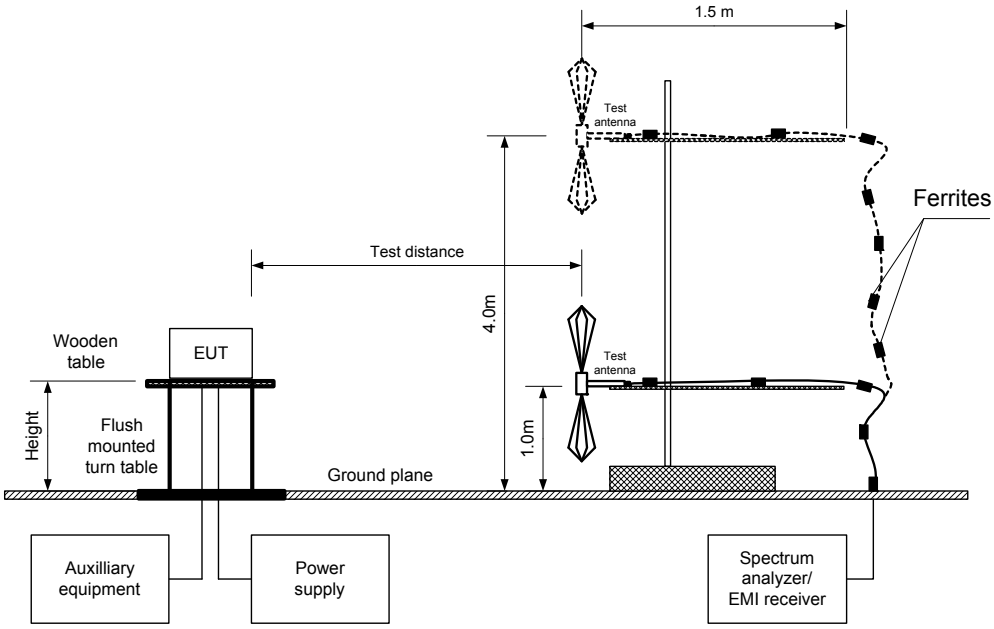


Figure 7.3.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 27.53(j), Radiated spurious emissions**		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	7/4/2012		
Temperature: 21.8 ºC	**Air Pressure:** 1004 hPa	**Relative Humidity:** 54 %	**Power Supply:** 5.5VDC
Remarks:			

Table 7.3.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE:	1390.0 – 1395.0 MHz
TEST DISTANCE:	3 m
TEST SITE:	Semi anechoic chamber
EUT HEIGHT:	0.8 m
INVESTIGATED FREQUENCY RANGE:	0.009 – 14000 MHz
DETECTOR USED:	Peak
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	4.2 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position, degrees	Verdict
No emissions were found								Pass

*****- Margin = Field strength of spurious – calculated field strength limit.
******- EUT front panel refers to 0 degrees position of turntable.

NOTE: Radiated spurious emissions were tested with EUT configured to transmit at 64QAM modulation assuming that this configuration produces maximum RF power.

Reference numbers of test equipment used

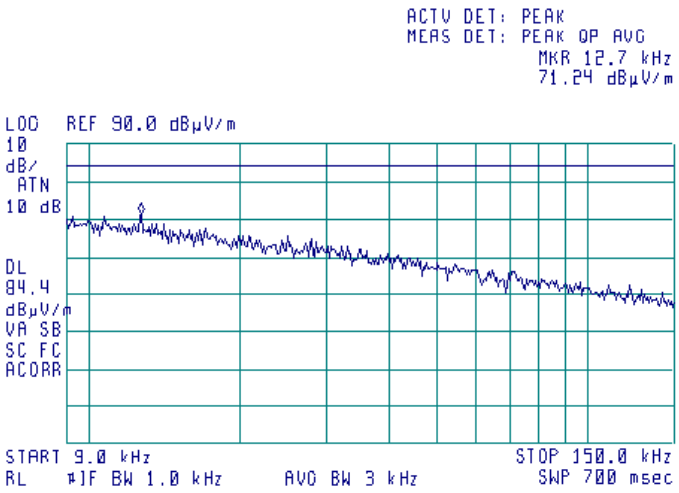
HL 0446	HL 0521	HL 0604	HL 2871	HL 2909	HL 3533	HL 3901	HL 4114
HL 4278							

Full description is given in Appendix A.

Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/4/2012		
Temperature: 21.8 ºC	Air Pressure: 1004 hPa	Relative Humidity: 54 %	Power Supply: 5.5VDC
Remarks:			

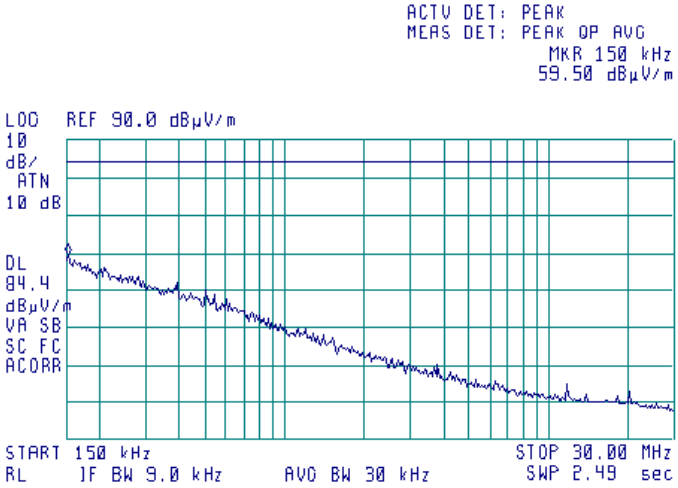
Plot 7.3.1 Radiated emission measurements in 9 - 150 kHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	1392.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.2 Radiated emission measurements in 0.15 - 30 MHz range

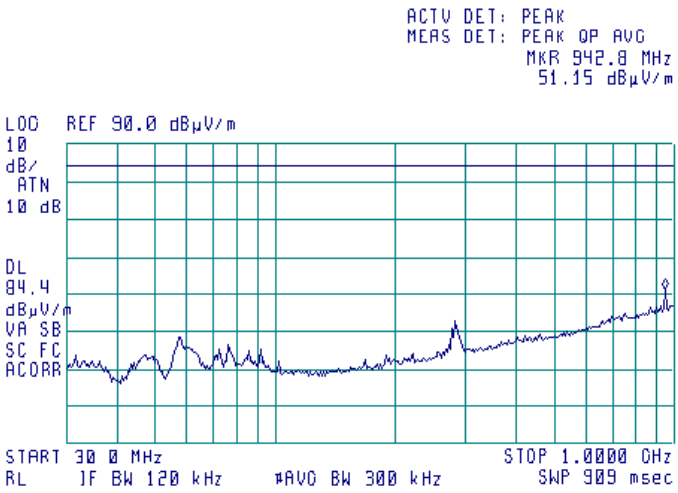
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	1392.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/4/2012		
Temperature: 21.8 ºC	Air Pressure: 1004 hPa	Relative Humidity: 54 %	Power Supply: 5.5VDC
Remarks:			

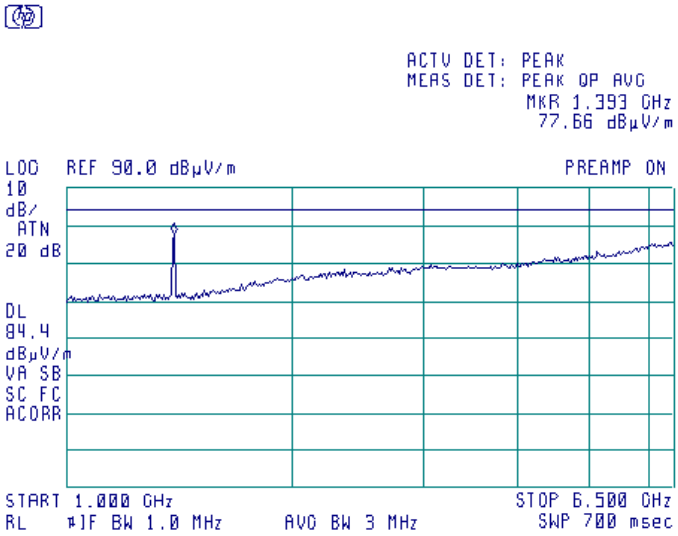
Plot 7.3.3 Radiated emission measurements in 30 - 1000 MHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	1392.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.4 Radiated emission measurements in 1000 – 6000 MHz range

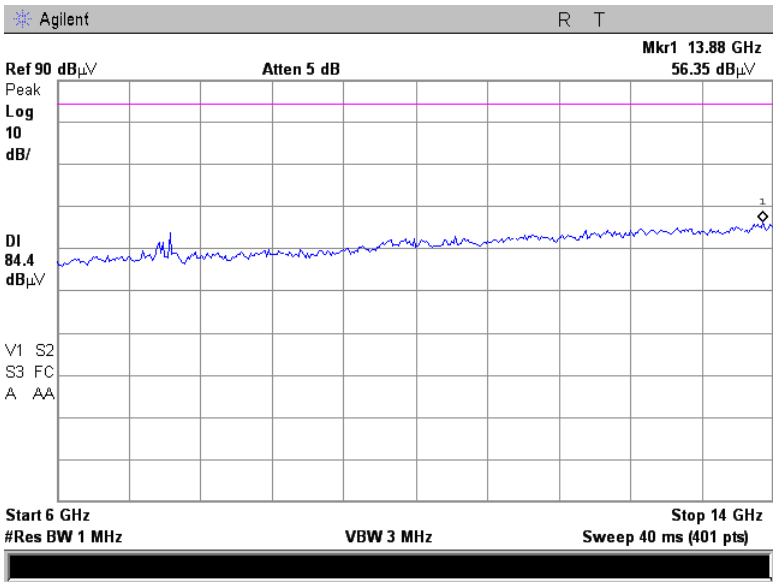
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	1392.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/4/2012		
Temperature: 21.8 ºC	Air Pressure: 1004 hPa	Relative Humidity: 54 %	Power Supply: 5.5VDC
Remarks:			

Plot 7.3.5 Radiated emission measurements in 6000 – 14000 MHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	1392.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/2/2012		
Temperature: 24.2 ºC	Air Pressure: 1004 hPa	Relative Humidity: 40 %	Power Supply: 5.5 VDC
Remarks:			

7.4 Spurious emissions at RF antenna connector test

7.4.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Spurious emission limits

Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm
0.009 – 10th harmonic*	43+10logP**	-13.0

* - spurious emission limits do not apply to the in band emission within ± 250 % of the authorized bandwidth from the carrier; investigated in course of emission mask testing
** - P is transmitter output power in Watts

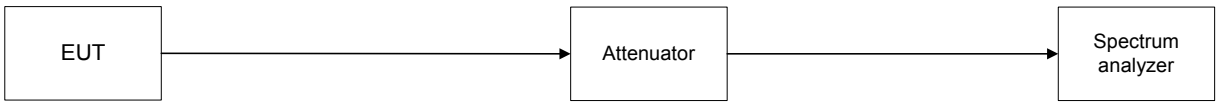
7.4.2 Test procedure

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 for end user RF output power.

7.4.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.4.2 and the associated plots.

Figure 7.4.1 Spurious emission test setup



Test specification:	**Section 27.53(j), Conducted spurious emissions**		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	7/2/2012		
Temperature: 24.2 ºC	**Air Pressure:** 1004 hPa	**Relative Humidity:** 40 %	**Power Supply:** 5.5 VDC
Remarks:			

Table 7.4.2 Spurious emission test results

OPERATING FREQUENCY: 1392.5 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 14000 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1 MHz
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
BIT RATE: 4.2 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
NUMBER OF OUTPUTS: N = 2

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm*	Limit, dBm	Margin, dB**	Verdict
281.110	-33.16	Included	Included	1000	-30.16	-13.0	-17.16	Pass
1109.987	-17.54	Included	Included	1000	-14.54	-13.0	-1.54	Pass
1412.637	-20.58	Included	Included	1000	-17.58	-13.0	-4.58	Pass
8350.706	-26.20	Included	Included	1000	-23.20	-13.0	-10.2	Pass

*****- Spurious emission = SA Reading + 10*log(N)
******- Margin = Spurious emission – specification limit.

Table 7.4.3 Band edge spurious emission test results

ASSIGNED FREQUENCY RANGE: 1390.0 - 1395.0 MHz
INVESTIGATED FREQUENCY RANGE: Below 1390MHz, above 1395MHz
DETECTOR USED: Average
RESOLUTION BANDWIDTH: 100 kHz with integration over 1 MHz
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
BIT RATE: 4.2 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
NUMBER OF OUTPUTS: N = 2

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	Spurious emission, dBm	Limit, dBm	Margin, dB*	Verdict
Modulation QPSK Mbps							
1390.0	-20.31	Included	Included	-17.31	-13.0	-4.31	Pass
1395.0	-21.25	Included	Included	-18.25	-13.0	-5.25	Pass
Modulation 64QAM Mbps							
1390.0	-19.65	Included	Included	-16.65	-13.0	-3.65	Pass
1395.0	-20.09	Included	Included	-17.09	-13.0	-4.09	Pass

*****- Spurious emission = SA Reading + 10*log(N)
******- Margin = Spurious emission – specification limit.

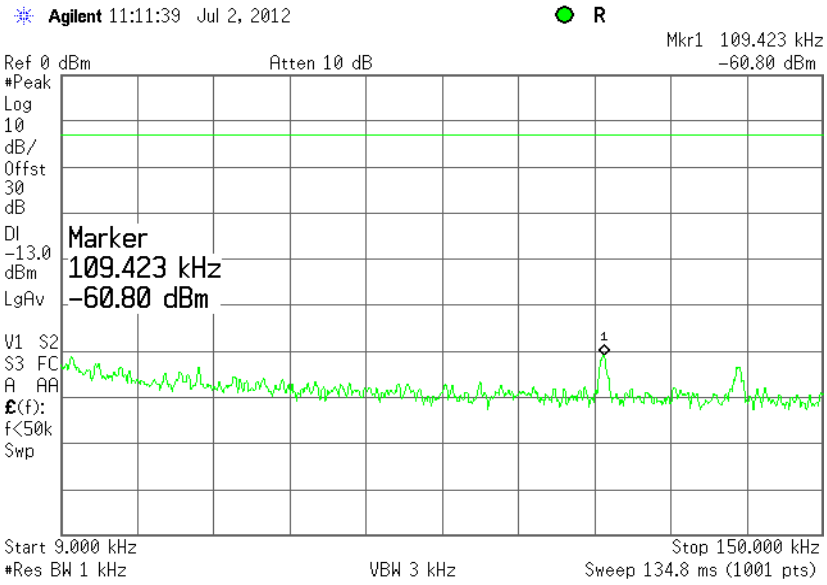
Reference numbers of test equipment used

HL 3301	HL 3302	HL 3903	HL 4366				

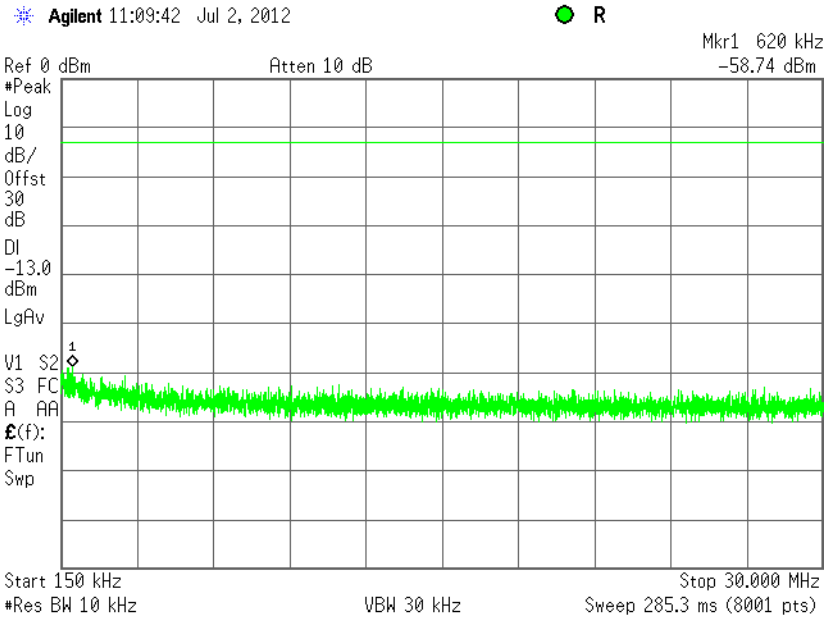
Full description is given in Appendix A.

Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/2/2012		
Temperature: 24.2 °C	Air Pressure: 1004 hPa	Relative Humidity: 40 %	Power Supply: 5.5 VDC
Remarks:			

Plot 7.4.1 Spurious emission measurements in 9 - 100 kHz range at low carrier frequency

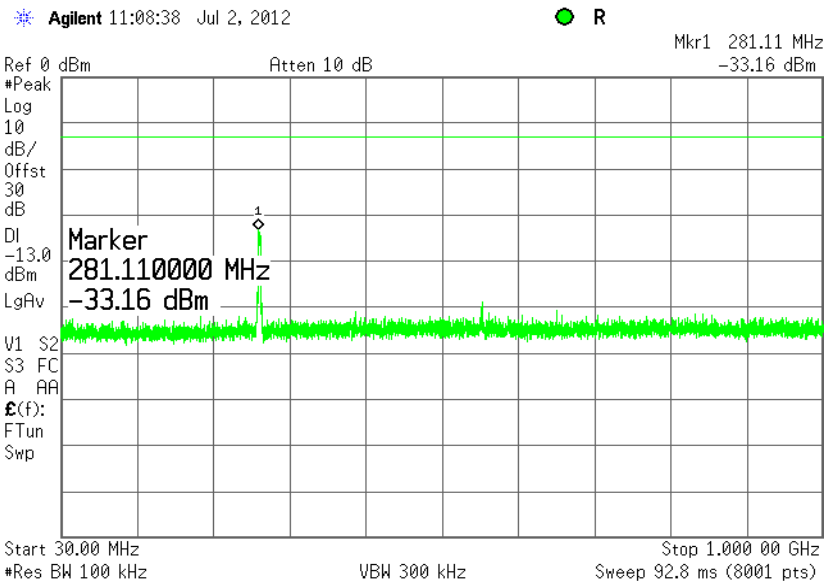


Plot 7.4.2 Spurious emission measurements in 0.15 - 30.0 MHz range at low carrier frequency



Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/2/2012		
Temperature: 24.2 °C	Air Pressure: 1004 hPa	Relative Humidity: 40 %	Power Supply: 5.5 VDC
Remarks:			

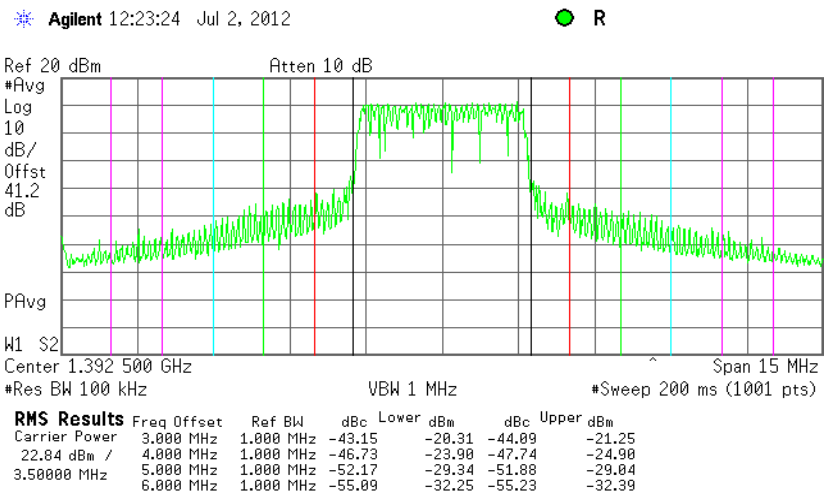
Plot 7.4.3 Spurious emission measurements in 30 - 1000 MHz range at carrier frequency



Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/2/2012		
Temperature: 24.2 °C	Air Pressure: 1004 hPa	Relative Humidity: 40 %	Power Supply: 5.5 VDC
Remarks:			

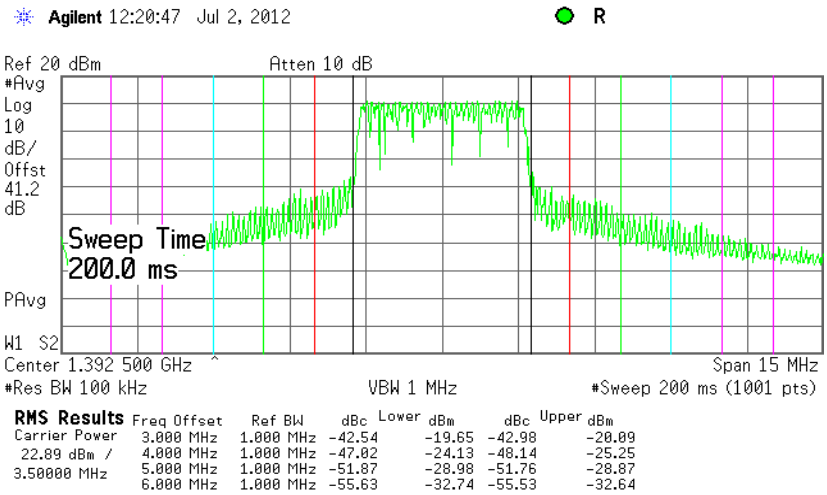
Plot 7.4.4 Band edge spurious emission measurements at carrier frequency

CARRIER FREQUENCY: 1392.5 MHz
MODULATION: QPSK



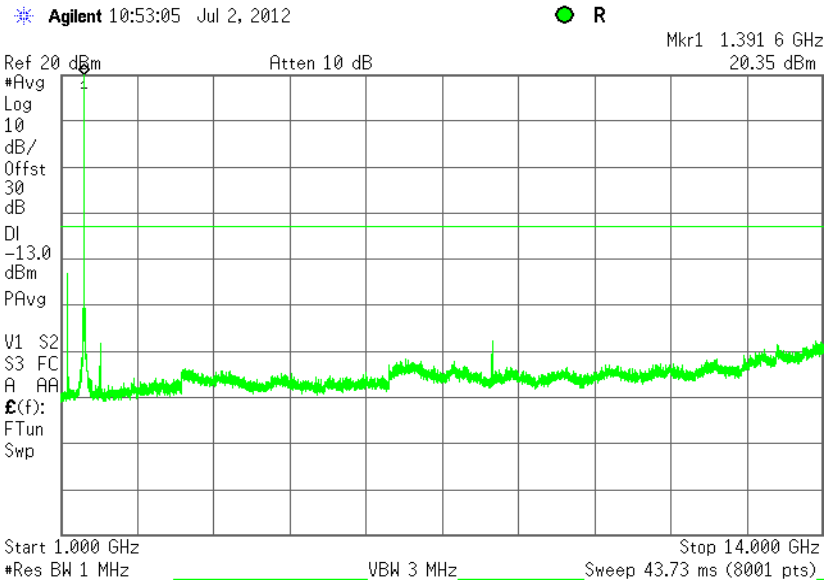
Plot 7.4.5 Band edge spurious emission measurements at carrier frequency

CARRIER FREQUENCY: 1392.5 MHz
MODULATION: 64QAM

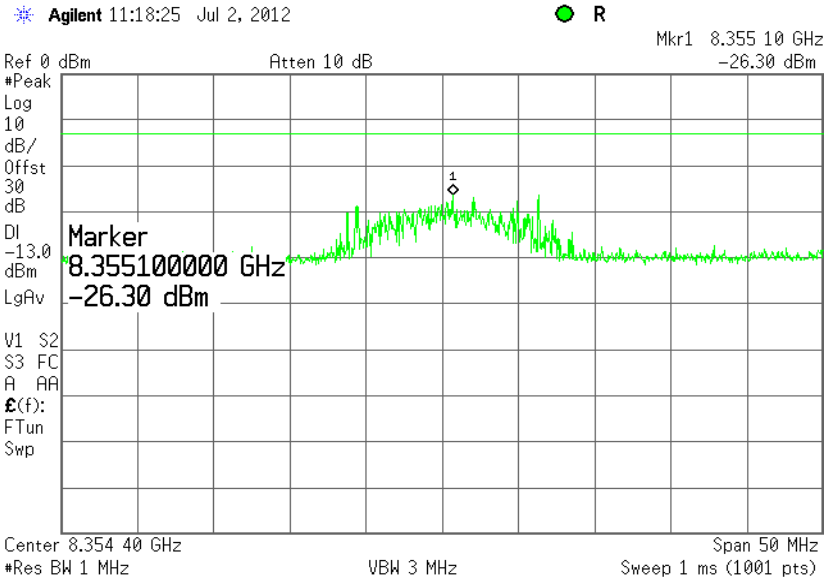


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/2/2012		
Temperature: 24.2 °C	Air Pressure: 1004 hPa	Relative Humidity: 40 %	Power Supply: 5.5 VDC
Remarks:			

Plot 7.4.6 Spurious emission measurements in 1000 - 14000 MHz range at carrier frequency



Plot 7.4.7 Conducted spurious emission measurements at the 6th harmonic of carrier frequency



Test specification:	Section 27.54, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	7/2/2012 - 7/3/2012		
Temperature: 24.2 ºC	Air Pressure: 1004 hPa	Relative Humidity: 37 %	Power Supply: 5.5 VDC
Remarks:			

7.5 Frequency stability test

7.5.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement	
	ppm	Hz
1390.0 – 1395.0	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation	

7.5.2 Test procedure

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

7.5.2.2 The EUT power was turned off. Temperature within test chamber was set to +30˚C and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.

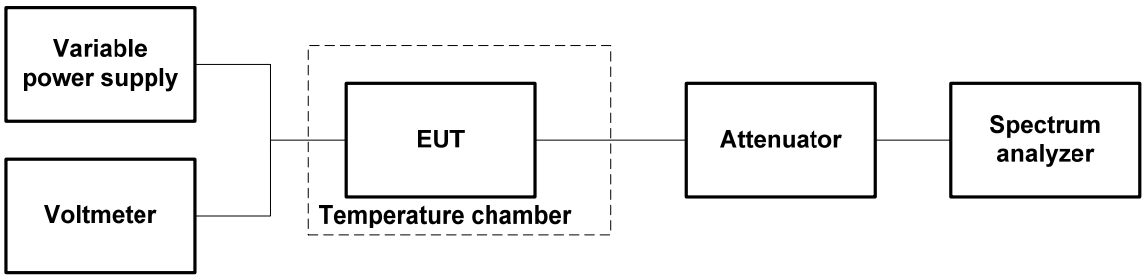
7.5.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.

7.5.2.4 The above procedure was repeated at 0˚C and at the lowest test temperature.

7.5.2.5 The EUT was powered on and carrier frequency was measured at start up moment and at the end of stabilization period at the rest of test temperatures and voltages. The EUT was powered off.

7.5.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.5.2.

Figure 7.5.1 Frequency stability test setup



Test specification:	**Section 27.54, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	7/2/2012 - 7/3/2012		
Temperature: 24.2 ºC	**Air Pressure:** 1004 hPa	**Relative Humidity:** 37 %	**Power Supply:** 5.5 VDC
Remarks:			

Table 7.5.2 Frequency stability test results

ASSIGNED FREQUENCY RANGE: 1390.0 – 1395.0 MHz
NOMINAL POWER VOLTAGE: 5.5 V
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: ACP (Adjacent Channel Power)
RESOLUTION BANDWIDTH: 100 kHz with integration over 1 MHz
VIDEO BANDWIDTH: 1000 kHz
MODULATION: 64QAM

T, ºC	Voltage, V	Spurious Radiated Emission, dBm								Total SRE, dBm*	Limit, dBm	Margin, dB**	Verdict
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Max				
Low band edge of operation 1390.0 MHz													
-30	nominal	-18.40	-17.97	-17.83	-18.01	-17.46	-17.58	-17.53	-17.46	-14.45		-1.45	Pass
-20	nominal	-17.78	NA	NA	NA	NA	NA	-17.74	-17.74	-14.73		-1.73	Pass
-10	nominal	-18.32	NA	NA	NA	NA	NA	-18.31	-18.31	-15.30		-2.30	Pass
0	nominal	-19.14	-19.26	-19.43	-19.44	-19.36	-19.43	-19.43	-19.14	-16.13		-3.13	Pass
10	nominal	-19.27	NA	NA	NA	NA	NA	-18.91	-18.91	-15.90		-2.90	Pass
20	+15%	-19.52	NA	NA	NA	NA	NA	-21.04	-19.52	-16.51	-13.0	-3.51	Pass
20	nominal	-20.17	NA	NA	NA	NA	NA	-20.52	-20.17	-17.16		-4.16	Pass
20	-15%	-21.44	NA	NA	NA	NA	NA	-20.38	-20.38	-17.37		-4.37	Pass
30	nominal	-17.31	-18.32	-18.53	-18.75	-18.91	-19.22	-19.20	-17.31	-14.30		-1.30	Pass
40	nominal	-20.10	NA	NA	NA	NA	NA	-21.36	-20.10	-17.09		-4.09	Pass
50	nominal	-21.67	NA	NA	NA	NA	NA	-22.23	-21.67	-18.66		-5.66	Pass
High band edge of operation 1395.0 MHz													
-30	nominal	-18.59	-18.52	-18.93	-18.50	-18.59	-18.58	-18.52	-18.50	-15.49		-2.49	Pass
-20	nominal	-18.89	NA	NA	NA	NA	NA	-18.64	-18.64	-15.63		-2.63	Pass
-10	nominal	-19.35	NA	NA	NA	NA	NA	-19.38	-19.35	-16.34		-3.34	Pass
0	nominal	-20.17	-20.49	-20.38	-20.27	-20.31	-20.33	-20.33	-20.17	-17.16		-4.16	Pass
10	nominal	-19.84	NA	NA	NA	NA	NA	-19.77	-19.77	-16.76		-3.76	Pass
20	+15%	-20.48	NA	NA	NA	NA	NA	-21.79	-20.48	-17.47	-13.0	-4.47	Pass
20	nominal	-20.89	NA	NA	NA	NA	NA	-21.19	-20.89	-17.88		-4.88	Pass
20	-15%	-22.03	NA	NA	NA	NA	NA	-21.34	-21.34	-18.33		-5.33	Pass
30	nominal	-18.97	-19.66	-19.67	-19.84	-19.89	-20.04	-20.11	-18.97	-15.96		-2.96	Pass
40	nominal	-20.90	NA	NA	NA	NA	NA	-21.93	-20.90	-17.89		-4.89	Pass
50	nominal	-22.29	NA	NA	NA	NA	NA	-22.77	-22.29	-19.28		-6.28	Pass

* - Total SRE = Max SRE result + 10*log(N)

** - Margin = Total SRE – Specification Limit

Reference numbers of test equipment used

HL 0337	HL 1464	HL 3301	HL 3302	HL 3818	HL 3903		

Full description is given in Appendix A.

8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
0337	Probe Set, Hand held, 5 probes	Electro-Metrics	EHFP-30	238	06-Jun-12	06-Jun-13
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	03-Jul-12	03-Jul-13
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	29-Aug-11	29-Sep-12
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	20-May-12	20-May-14
1464	Cable, 0.5 m, N-Type/N-Type	Harbour Industries	MIL 17/60-RG142	1464	01-Sep-11	01-Sep-12
2871	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-8155-00	2871	15-Jan-12	15-Jan-13
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY414447 62	08-May-12	08-May-13
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY451010 57	14-Dec-11	14-Dec-12
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY452405 86	14-Dec-11	14-Dec-12
3533	Amplifier, low noise, 6 to 18 GHz	Quinstar Technology	QLJ-06184040 -J0	111590010 01	25-Dec-11	25-Dec-12
3787	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	19-Dec-11	19-Dec-12
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY482502 88	16-Feb-12	16-Feb-13
3901	Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA	Huber-Suhner	SUCOFLE X 102A	1225/2A	08-Feb-12	08-Feb-13
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLE X 102A	1226/2A	08-Feb-12	08-Feb-13
4114	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz	ETS Lindgren	3117	00123515	23-Jan-12	23-Jan-13
4278	Test Cable , DC-18 GHz, 4.6 m, N/M - N/M	Mini-Circuits	APC-15FT-NMNM+	0755A	23-Nov-11	23-Nov-12
4366	Directional coupler, 1 GHz to 18 GHz, 10 dB, SMA Female	Tiger Micro-Electronics Institute	TGD-A1101-10	01e-JSDE805-007	17-Apr-12	17-Apr-14

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Transmitter tests	
Carrier power conducted at antenna connector	± 1.7 dB
Carrier power radiated (substitution method)	± 4.5 dB
Occupied bandwidth	±8%
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
Spurious emissions radiated 30 MHz – 40 GHz (substitution method)	± 4.5 dB
Frequency error	30 – 300 MHz: ± 50.5 Hz (1.68 ppm) 300 – 1000 MHz: ± 168 Hz (0.56 ppm)
Transient frequency behaviour	187 Hz ± 13.9 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %

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.

10 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, IC 2186A-2 for anechoic chamber, IC 2186A-3 for full-anechoic chamber for RE measurements above 1 GHz), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, G-27 for full-anechoic chamber for RE measurements above 1 GHz, C-845 for conducted emissions site, T-1606 for conducted emissions at telecommunication ports), 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). The FCC Designation Number is US1003.

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website: www.hermonlabs.com

Person for contact: Mr. Alex Usoskin, CEO.

11 APPENDIX D Specification references

FCC 47CFR part 27: 2011	Miscellaneous wireless communications services
FCC 47CFR part 2: 2011	Frequency allocations and radio treaty matters; general rules and regulations
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 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(μV) to convert it into field intensity in dB(μA/m).
Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μV/m).

Antenna factor
Biconilog antenna EMCO Model 3141
Ser.No.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	580	20.6	1320	27.8
28	7.8	600	21.3	1340	28.3
30	7.8	620	21.5	1360	28.2
40	7.2	640	21.2	1380	27.9
60	7.1	660	21.4	1400	27.9
70	8.5	680	21.9	1420	27.9
80	9.4	700	22.2	1440	27.8
90	9.8	720	22.2	1460	27.8
100	9.7	740	22.1	1480	28.0
110	9.3	760	22.3	1500	28.5
120	8.8	780	22.6	1520	28.9
130	8.7	800	22.7	1540	29.6
140	9.2	820	22.9	1560	29.8
150	9.8	840	23.1	1580	29.6
160	10.2	860	23.4	1600	29.5
170	10.4	880	23.8	1620	29.3
180	10.4	900	24.1	1640	29.2
190	10.3	920	24.1	1660	29.4
200	10.6	940	24.0	1680	29.6
220	11.6	960	24.1	1700	29.8
240	12.4	980	24.5	1720	30.3
260	12.8	1000	24.9	1740	30.8
280	13.7	1020	25.0	1760	31.1
300	14.7	1040	25.2	1780	31.0
320	15.2	1060	25.4	1800	30.9
340	15.4	1080	25.6	1820	30.7
360	16.1	1100	25.7	1840	30.6
380	16.4	1120	26.0	1860	30.6
400	16.6	1140	26.4	1880	30.6
420	16.7	1160	27.0	1900	30.6
440	17.0	1180	27.0	1920	30.7
460	17.7	1200	26.7	1940	30.9
480	18.1	1220	26.5	1960	31.2
500	18.5	1240	26.5	1980	31.6
520	19.1	1260	26.5	2000	32.0
540	19.5	1280	26.6		
560	19.8	1300	27.0		

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

Antenna factor
Double-ridged waveguide horn antenna
ETS Lindgren, Model 3117, serial number: 00123515, HL 4114

Frequency, MHz	Antenna factor, dB/m		
	Measured	Manufacturer	Deviation
1000	28.0	28.4	-0.4
1500	28.0	27.4	0.6
2000	31.2	30.9	0.3
2500	32.5	33.4	-0.9
3000	32.9	32.6	0.3
3500	32.7	32.8	-0.1
4000	33.1	33.4	-0.3
4500	33.8	33.9	-0.1
5000	33.8	34.1	-0.3
5500	34.4	34.5	-0.1
6000	35.0	35.2	-0.2
6500	35.4	35.5	-0.1
7000	35.7	35.7	0.0
7500	35.9	35.7	0.2
8000	35.8	35.8	0.0
8500	35.9	35.8	0.1
9000	36.3	36.2	0.1
9500	36.6	36.6	0.0
10000	37.1	37.1	0.0
10500	37.6	37.5	0.1
11000	37.9	37.7	0.2
11500	38.5	38.1	0.4
12000	39.2	38.7	0.5
12500	39.0	38.9	0.1
13000	39.1	39.1	0.0
13500	38.9	38.8	0.1
14000	39.0	38.8	0.2
14500	39.6	39.9	-0.3
15000	39.9	39.7	0.2
15500	39.9	40.1	-0.2
16000	40.7	40.8	-0.1
16500	41.3	41.8	-0.5
17000	42.5	42.1	0.4
17500	41.3	41.2	0.1
18000	41.4	40.9	0.5

Antenna factor is to be added to receiver meter reading in dB(μV) to convert to field strength in dB(μV/meter)

Cable loss
Cable coaxial, Huber-Suhner, 18 GHz, 6.4 m, SMA - SMA, model 198-8155-00, HL 2871

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.12	5750	2.34	12000	3.55
30	0.14	6000	2.39	12250	3.61
100	0.27	6250	2.46	12500	3.67
250	0.45	6500	2.52	12750	3.74
500	0.63	6750	2.58	13000	3.79
750	0.76	7000	2.64	13250	3.82
1000	0.89	7250	2.68	13500	3.83
1250	1.01	7500	2.73	13750	3.83
1500	1.12	7750	2.78	14000	3.88
1750	1.23	8000	2.83	14250	3.93
2000	1.32	8250	2.88	14500	3.96
2250	1.41	8500	2.94	14750	4.01
2500	1.49	8750	2.97	15000	4.00
2750	1.58	9000	3.02	15250	4.01
3000	1.66	9250	3.07	15500	4.00
3250	1.73	9500	3.13	15750	4.13
3500	1.80	9750	3.18	16000	4.22
3750	1.87	10000	3.21	16250	4.29
4000	1.93	10250	3.26	16500	4.29
4250	2.01	10500	3.30	16750	4.32
4500	2.06	10750	3.36	17000	4.37
4750	2.12	11000	3.39	17250	4.45
5000	2.17	11250	3.44	17500	4.49
5250	2.24	11500	3.48	17750	4.53
5500	2.29	11750	3.52	18000	4.55

Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 3.5 m, SMA-SMA, S/N 1225/2A
HL 3901

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.09	9500	4.29	21000	6.67
100	0.41	10000	4.40	22000	6.92
500	0.93	10500	4.52	23000	7.00
1000	1.33	11000	4.64	24000	7.18
1500	1.63	11500	4.76	25000	7.29
2000	1.90	12000	4.87	26000	7.55
2500	2.12	12500	4.99	27000	7.70
3000	2.33	13000	5.11	28000	7.88
3500	2.50	13500	5.20	29000	8.02
4000	2.67	14000	5.31	30000	8.15
4500	2.82	14500	5.42	31000	8.35
5000	2.99	15000	5.51	32000	8.40
5500	3.16	15500	5.58	33000	8.62
6000	3.32	16000	5.68	34000	8.73
6500	3.51	16500	5.78	35000	8.78
7000	3.65	17000	5.91	36000	8.94
7500	3.79	17500	5.99	37000	9.21
8000	3.92	18000	6.07	38000	9.37
8500	4.04	19000	6.36	39000	9.45
9000	4.18	20000	6.49	40000	9.52

Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 1.5 m, SMA-SMA, S/N 1226/2A
HL 3903

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	-0.02	9500	1.84	21000	2.98
100	0.15	10000	1.86	22000	3.07
500	0.38	10500	1.93	23000	3.13
1000	0.56	11000	1.99	24000	3.21
1500	0.69	11500	2.04	25000	3.26
2000	0.82	12000	2.10	26000	3.48
2500	0.90	12500	2.15	27000	3.44
3000	0.98	13000	2.21	28000	3.53
3500	1.06	13500	2.25	29000	3.59
4000	1.11	14000	2.29	30000	3.66
4500	1.17	14500	2.34	31000	3.70
5000	1.24	15000	2.36	32000	3.79
5500	1.32	15500	2.40	33000	3.88
6000	1.40	16000	2.45	34000	3.94
6500	1.50	16500	2.48	35000	3.91
7000	1.56	17000	2.56	36000	4.05
7500	1.62	17500	2.58	37000	4.22
8000	1.68	18000	2.60	38000	4.25
8500	1.74	19000	2.84	39000	4.27
9000	1.78	20000	2.88	40000	4.33

Cable loss
Test cable, Mini-Circuits, S/N 0755A, 18 GHz, 4.6 m, N/M - N/M
APC-15FT-NMNM+, HL 4278

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.24	5000	4.25	10200	6.52	15400	8.40
30	0.26	5100	4.29	10300	6.57	15500	8.42
50	0.34	5200	4.32	10400	6.59	15600	8.46
100	0.50	5300	4.38	10500	6.61	15700	8.50
200	0.72	5400	4.41	10600	6.64	15800	8.52
300	0.90	5500	4.46	10700	6.64	15900	8.56
400	1.06	5600	4.51	10800	6.65	16000	8.61
500	1.20	5700	4.56	10900	6.68	16100	8.64
600	1.32	5800	4.59	11000	6.68	16200	8.66
700	1.44	5900	4.64	11100	6.69	16300	8.70
800	1.54	6000	4.69	11200	6.70	16400	8.73
900	1.64	6100	4.72	11300	6.74	16500	8.74
1000	1.74	6200	4.77	11400	6.78	16600	8.75
1100	1.83	6300	4.80	11500	6.81	16700	8.78
1200	1.92	6400	4.83	11600	6.84	16800	8.79
1300	2.01	6500	4.89	11700	6.87	16900	8.81
1400	2.09	6600	4.90	11800	6.92	17000	8.85
1500	2.18	6700	4.95	11900	6.98	17100	8.90
1600	2.25	6800	5.01	12000	7.02	17200	8.95
1700	2.33	6900	4.99	12100	7.08	17300	8.99
1800	2.39	7000	5.04	12200	7.15	17400	9.03
1900	2.47	7100	5.11	12300	7.20	17500	9.07
2000	2.53	7200	5.14	12400	7.26	17600	9.11
2100	2.60	7300	5.21	12500	7.31	17700	9.15
2200	2.67	7400	5.29	12600	7.36	17800	9.19
2300	2.73	7500	5.33	12700	7.41	17900	9.24
2400	2.80	7600	5.38	12800	7.46	18000	9.28
2500	2.87	7700	5.46	12900	7.51		
2600	2.93	7800	5.52	13000	7.55		
2700	3.00	7900	5.58	13100	7.59		
2800	3.06	8000	5.64	13200	7.65		
2900	3.12	8100	5.69	13300	7.69		
3000	3.18	8200	5.75	13400	7.72		
3100	3.24	8300	5.80	13500	7.78		
3200	3.30	8400	5.84	13600	7.82		
3300	3.35	8500	5.90	13700	7.86		
3400	3.42	8600	5.97	13800	7.91		
3500	3.46	8700	5.99	13900	7.96		
3600	3.52	8800	6.04	14000	8.01		
3700	3.57	8900	6.10	14100	8.06		
3800	3.61	9000	6.13	14200	8.10		
3900	3.67	9100	6.17	14300	8.13		
4000	3.71	9200	6.23	14400	8.16		
4100	3.77	9300	6.27	14500	8.19		
4200	3.83	9400	6.30	14600	8.21		
4300	3.89	9500	6.35	14700	8.23		
4400	3.94	9600	6.37	14800	8.26		
4500	4.00	9700	6.40	14900	8.28		
4600	4.05	9800	6.44	15000	8.30		
4700	4.10	9900	6.45	15100	8.33		
4800	4.16	10000	6.47	15200	8.35		
4900	4.19	10100	6.50	15300	8.37		

13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
CBW	channel bandwidth
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μV)	decibel referred to one microvolt
dB(μV/m)	decibel referred to one microvolt per meter
dB(μA)	decibel referred to one microampere
DC	direct current
EBW	emission bandwidth
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
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μs	microsecond
NA	not applicable
NB	narrow band
OATS	open area test site
Ω	Ohm
QP	quasi-peak
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

END OF DOCUMENT