

TEST REPORT

**ACCORDING TO: FCC 47CFR part 15 subpart C § 15.247 (FHSS) and subpart B,
RSS-210, Issue 8, Annex 8, RSS-Gen issue 3,
ICES-003 Issue 5:2012**

FOR:

**Cardo Systems Inc.
Bluetooth headset
Model: SRCS
FCC ID:Q95ER18
IC:4668A-ER18**

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.
This test report shall not be reproduced in any form except in full with the written approval of Hermon Laboratories Ltd.



Table of contents

1	Applicant information	3
2	Equipment under test attributes	3
3	Manufacturer information	3
4	Test details	3
5	Tests summary	4
6	EUT description	5
6.1	General information	5
6.2	Test configuration	5
6.3	Changes made in the EUT	5
6.4	Transmitter characteristics	6
7	Transmitter tests according to 47CFR part 15 subpart C requirements	7
7.1	20 dB bandwidth	7
7.2	Carrier frequency separation	12
7.3	Number of hopping frequencies	15
7.4	Average time of occupancy	20
7.5	Peak output power	24
7.6	Band edge radiated emissions	33
7.7	Field strength of spurious emissions	44
7.8	Antenna requirements	99
7.9	Conducted emissions	100
8	Emission tests according to 47CFR part 15 subpart B requirements	103
8.1	Conducted emissions	103
8.2	Radiated emission measurements	107
9	APPENDIX A Test equipment and ancillaries used for tests	117
10	APPENDIX B Measurement uncertainties	119
11	APPENDIX C Test laboratory description	120
12	APPENDIX D Specification references	120
13	APPENDIX E Test equipment correction factors	121
14	APPENDIX F Abbreviations and acronyms	136



1 Applicant information

Client name: Cardo Systems Inc.
Address: 100 High Tower Blvd, Pittsburgh, PA 15205, USA
Telephone: 001 412-788-4533
Fax: 001 412 788-0270
E-mail: nir@cardosystems.com
Contact name: Mr. Nir Costa

2 Equipment under test attributes

Product name: Bluetooth headset
Product type: Transceiver
Model(s): SRCS
Serial number: R143R144
Hardware version: 1.0
Software release: 1.0
Receipt date 27-Jun-14

3 Manufacturer information

Manufacturer name: Cardo Systems Inc.
Address: 100 High Tower Blvd, Pittsburgh, PA 15205, USA
Telephone: 001 412-788-4533
Fax: 001 412 788-0270
E-Mail: nir@cardosystems.com
Contact name: Mr. Nir Costa

4 Test details

Project ID: 25827
Location: Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started: 27-Jun-14
Test completed: 24-Aug-14
Test specification(s): FCC Part 15, subpart C, §15.247 (FHSS) and subpart B;
RSS-210 Issue 8:2010, Annex 8; RSS-Gen issue 3, ICES-003 issue 5:2012



5 Tests summary

Test	Status
Transmitter characteristics	
FCC section 15.247(a)1 / RSS-210 section A8.1(a), The 20 dB bandwidth	Pass
FCC section 15.247(a)1 / RSS-210 section A8.1(b), Frequency separation	Pass
FCC section 15.247(a)1 / RSS-210 section A8.1(d), Number of hopping frequencies	Pass
FCC section 15.247(a)1 / RSS-210 section A8.1(d), Average time of occupancy	Pass
FCC section 15.247(b) / RSS-210 section A8.4(2), Peak output power	Pass
FCC section 15.247(i) / RSS-Gen, section 5.5, RF exposure	Exhibit provided in documentation for Application
FCC section 15.247(d) / RSS-210 section A8.5, Emissions at band edges	Pass
FCC section 15.247(d) / RSS-210 section A8.5, Radiated spurious emissions	Pass
FCC section 15.203 / RSS-Gen, section 7.1.2, Antenna requirements	Pass
FCC section 15.207(a) / RSS-Gen, section 7.2.4, Conducted emission	Pass
RSS-Gen, Section 4.6.1, 99% emission occupied bandwidth	Measured
Unintentional emissions	
FCC section 15.107 / ICES-003, Section 6.1 class B, Conducted emission at AC power port	Pass
FCC section 15.109 / RSS-Gen section 6.1, ICES-003, Section 6.2 class B, Radiated emission	Pass

Testing was completed against all relevant requirements of the test standard. The results obtained indicate that the product under test complies in full with the requirements tested.

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

	Name and Title	Date	Signature
Tested by:	Mr. S. Samokha, test engineer Mr. V. Einem, test engineer	August 24, 2014	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	September 17, 2014	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	October 2, 2014	

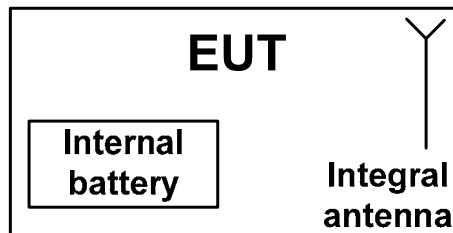


6 EUT description

6.1 General information

The EUT is a Bluetooth headset, technology compliant with Bluetooth™ Ver 3.0 + EDR class 1.

6.2 Test configuration



6.3 Changes made in the EUT

No changes were implemented in the EUT during testing.



6.4 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		2402 - 2480 MHz			
RF channel spacing		1 MHz			
Maximum rated output power		Peak output power		7.16 dBm	
Is transmitter output power variable?		X	No		
			Yes	continuous variable	
				stepped variable with stepsize	dB
				minimum RF power	dBm
				maximum RF power	dBm
Antenna connection					
unique coupling		standard connector		X	integral
				X	without temporary RF connector
Antenna/s technical characteristics					
Type		Manufacturer		Model number	
Printed		Cardo Systems, Inc.		NA	
Transmitter aggregate data rate/s		1 Mbps		2 Mbps	
Modulation		GFSK		DQPSK	
Modulating test signal (baseband)		PRBS			
Transmitter power source					
X	Battery	Nominal rated voltage	4.2 VDC	Battery type	Li Polymer
	DC	Nominal rated voltage	VDC		
	AC mains	Nominal rated voltage	VAC	Frequency	

Test specification:		Section 15.247(a)1, RSS-210 section A8.1(a), 20 dB bandwidth	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Jul-14	
Temperature: 23.2 °C	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

7 Transmitter tests according to 47CFR part 15 subpart C and RSS-210 requirements

7.1 20 dB bandwidth

7.1.1 General

This test was performed to measure the 20 dB bandwidth of the transmitter hopping channel. Specification test limits are given in Table 7.1.1.

Table 7.1.1 The 20 dB bandwidth limits

Assigned frequency, MHz	Maximum bandwidth, kHz	Modulation envelope reference points*, dBc
902.0 – 928.0	250	20
2400.0 – 2483.5	NA	
5725.0 – 5850.0	1000	

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

7.1.2 Test procedure

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

7.1.2.2 The EUT was set to transmit modulated carrier at maximum data rate.

7.1.2.3 The transmitter bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.1.2 and associated plot.

7.1.2.4 The test was repeated for each data rate and each modulation format.

Figure 7.1.1 The 20 dB bandwidth test setup



Test specification:	Section 15.247(a)1, RSS-210 section A8.1(a), 20 dB bandwidth		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Jul-14		
Temperature: 23.2 °C	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Table 7.1.2 The occupied bandwidth test results

ASSIGNED FREQUENCY BAND: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
SWEEP TIME: Auto
VIDEO BANDWIDTH: ≥ RBW
MODULATING SIGNAL: PRBS
FREQUENCY HOPPING: Disabled

Carrier frequency, MHz	Type of modulation	Data rate, Mbps	Symbol rate, Msymbols/s	20 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2402	GFSK	1.0	1.0	872.896	NA	NA	NA
2441	GFSK	1.0	1.0	835.554	NA	NA	NA
2480	GFSK	1.0	1.0	913.856	NA	NA	NA
2402	DQPSK	3.0	2.0	1315.00	NA	NA	NA
2441	DQPSK	3.0	2.0	1292.00	NA	NA	NA
2480	DQPSK	3.0	2.0	1283.00	NA	NA	NA

ASSIGNED FREQUENCY BAND: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
SWEEP TIME: Auto
VIDEO BANDWIDTH: ≥ RBW
MODULATING SIGNAL: PRBS
FREQUENCY HOPPING: Disabled

Carrier frequency, MHz	Type of modulation	Data rate, Mbps	Symbol rate, Msymbols/s	99% bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2402	GFSK	1.0	1.0	831.452	NA	NA	NA
2441	GFSK	1.0	1.0	848.796	NA	NA	NA
2480	GFSK	1.0	1.0	849.312	NA	NA	NA
2402	DQPSK	3.0	2.0	1264.10	NA	NA	NA
2441	DQPSK	3.0	2.0	1258.60	NA	NA	NA
2480	DQPSK	3.0	2.0	1250.50	NA	NA	NA

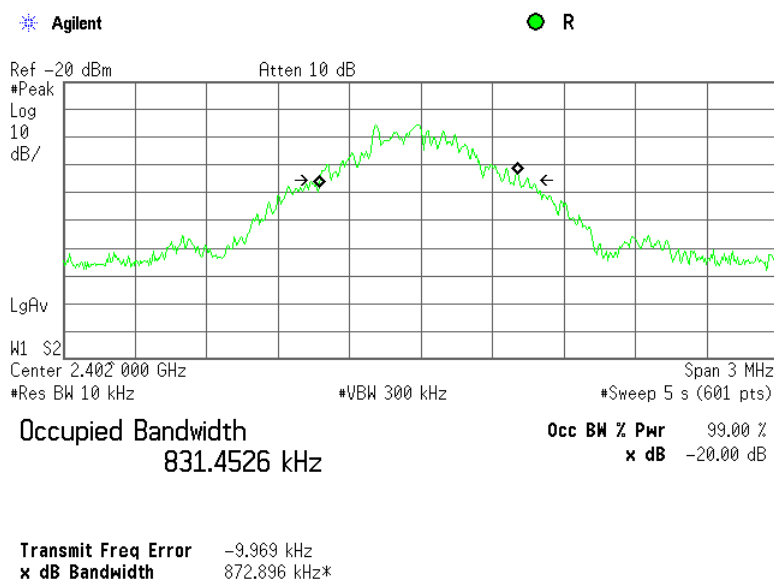
Reference numbers of test equipment used

HL 0337	HL 3818	HL 4274					
---------	---------	---------	--	--	--	--	--

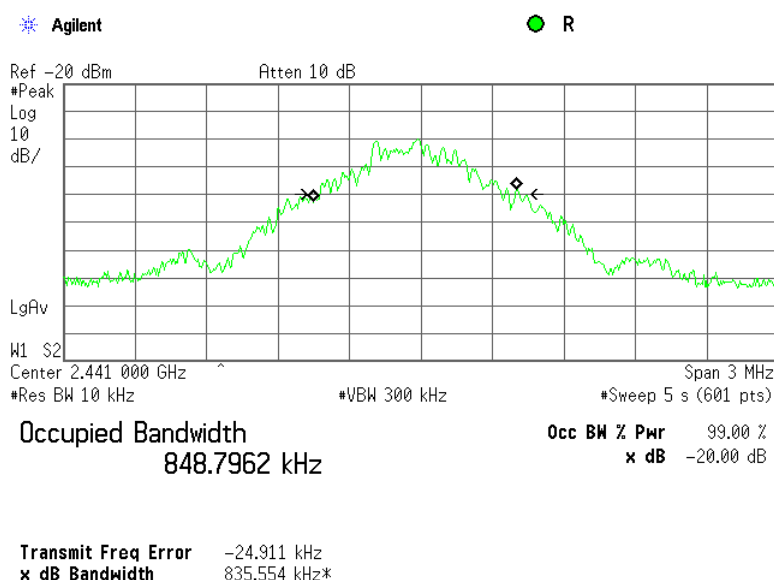
Full description is given in Appendix A.

Test specification:	Section 15.247(a)1, RSS-210 section A8.1(a), 20 dB bandwidth		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Jul-14		
Temperature: 23.2 °C	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Plot 7.1.1 The occupied bandwidth test result at low frequency, GFSK modulation

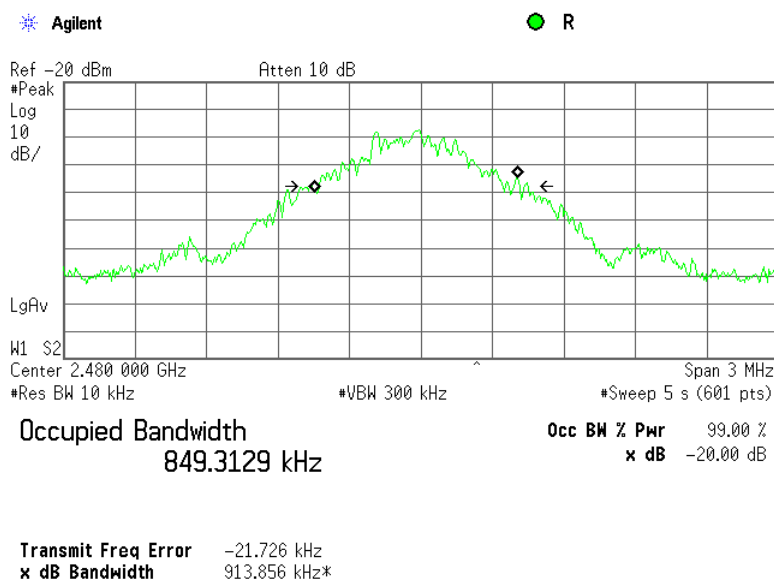


Plot 7.1.2 The occupied bandwidth test result at mid frequency, GFSK modulation

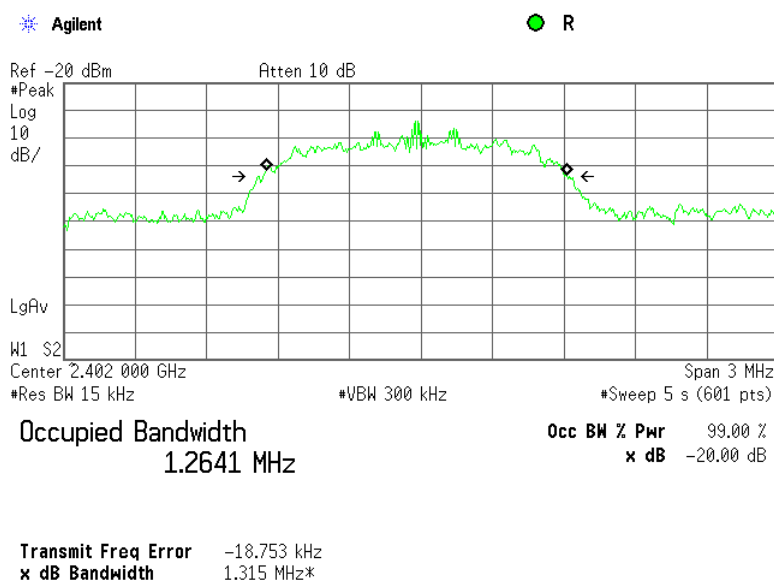


Test specification:	Section 15.247(a)1, RSS-210 section A8.1(a), 20 dB bandwidth		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Jul-14		
Temperature: 23.2 °C	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Plot 7.1.3 The occupied bandwidth test result at high frequency, GFSK modulation

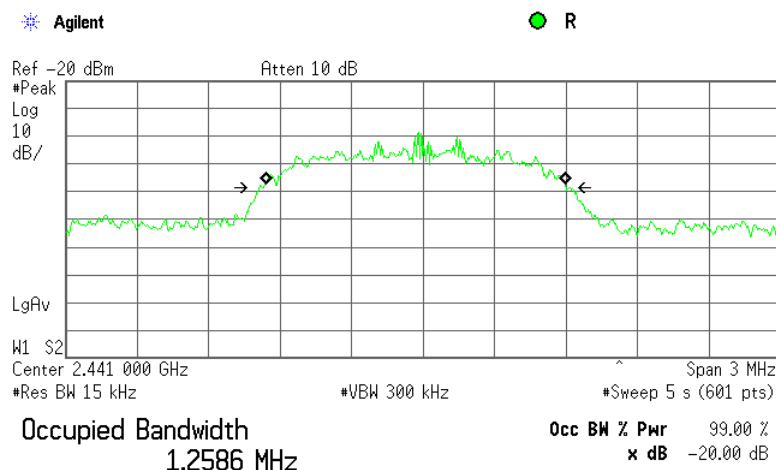


Plot 7.1.4 The occupied bandwidth test result at low frequency, DQPSK modulation



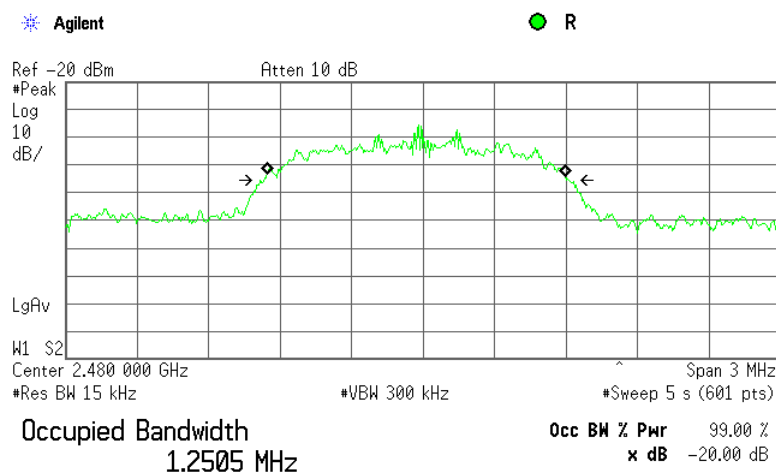
Test specification:		Section 15.247(a)1, RSS-210 section A8.1(a), 20 dB bandwidth	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Jul-14	
Temperature: 23.2 °C	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Plot 7.1.5 The occupied bandwidth test result at mid frequency, DQPSK modulation



Transmit Freq Error -32.457 kHz
Occupied Bandwidth 1.292 MHz*

Plot 7.1.6 The occupied bandwidth test result at high frequency, DQPSK modulation



Transmit Freq Error -31.492 kHz
Occupied Bandwidth 1.283 MHz*

Test specification:		Section 15.247(a)1, RSS-210 section A8.1(b), Frequency separation	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Jul-14	
Temperature: 23.2 °C	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

7.2 Carrier frequency separation

7.2.1 General

This test was performed to measure frequency separation between the peaks of adjacent channels. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Carrier frequency separation limits

Assigned frequency range, MHz	Carrier frequency separation	
	Output power 30 dBm	Output power 21 dBm
902.0 – 928.0	25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater	25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater
2400.0 – 2483.5		
5725.0 – 5850.0		

7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized with frequency hopping function enabled and its proper operation was checked.

7.2.2.2 The spectrum analyzer span was set to capture the carrier frequency and both of adjacent channels, the lower and the higher. The resolution bandwidth was set wider than 1 % of the frequency span.

7.2.2.3 The spectrum analyzer was set in max hold mode and allowed trace to stabilize.

7.2.2.4 The frequency separation between the peaks of adjacent channels was measured as provided in Table 7.2.2 and the associated plots.

Figure 7.2.1 Carrier frequency separation test setup



Test specification:	Section 15.247(a)1, RSS-210 section A8.1(b), Frequency separation		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Jul-14		
Temperature: 23.2 °C	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Table 7.2.2 Carrier frequency separation test results

ASSIGNED FREQUENCY BAND: 2400 -2483.5 MHz
 MODULATING SIGNAL: PRBS
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: $\geq 1\%$ of the span
 VIDEO BANDWIDTH: $\geq$ RBW
 FREQUENCY HOPPING: Enabled

MODULATION: GFSK

Carrier frequency separation, kHz	Limit, kHz	Margin*	Verdict
999.999	913.0	86.999	Pass

MODULATION: DQPSK

Carrier frequency separation, kHz	Limit**, kHz	Margin*	Verdict
1012.82	877.0	135.82	Pass

* - Margin = Carrier frequency separation – specification limit.

** - Limit (output power no greater than 125 mW) = $OBW \times 2/3 = 1315.0 \text{ kHz} \times 2/3 = 877.0 \text{ kHz}$.

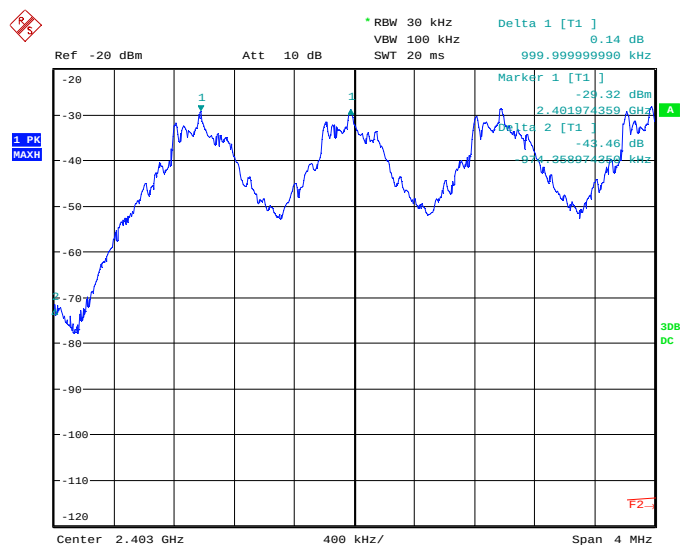
Reference numbers of test equipment used

HL 0337	HL 4274	HL 4360					
---------	---------	---------	--	--	--	--	--

Full description is given in Appendix A.

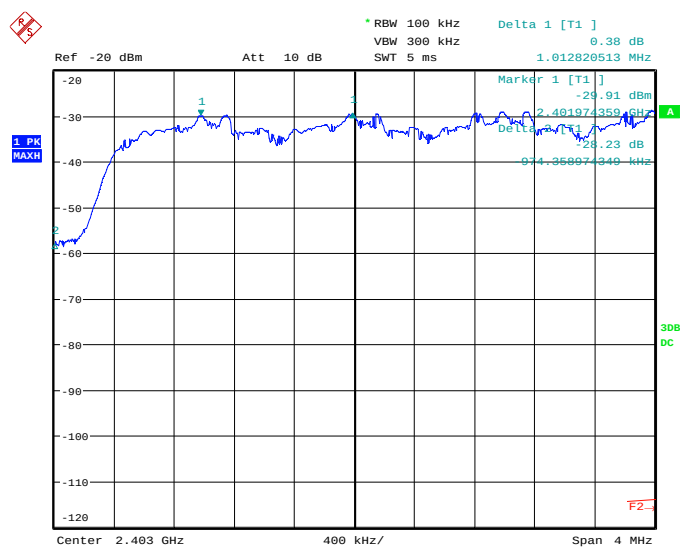
Test specification:	Section 15.247(a)1, RSS-210 section A8.1(b), Frequency separation		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Jul-14		
Temperature: 23.2 °C	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Plot 7.2.1 Carrier frequency separation, GFSK modulation



Date: 27.JUL.2014 11:20:37

Plot 7.2.2 Carrier frequency separation, DQPSK modulation



Date: 27.JUL.2014 13:00:16

Test specification: Section 15.247(a)1, RSS-210 section A8.1(c), Number of hopping frequencies			
Test procedure: Public notice DA 00-705			
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Aug-14		
Temperature: 25 °C	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: Battery
Remarks:			

7.3 Number of hopping frequencies

7.3.1 General

This test was performed to calculate the number of hopping frequencies used by the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Minimum number of hopping frequencies

Assigned frequency range, MHz	Number of hopping frequencies
902.0 – 928.0	50 (if the 20 dB bandwidth is less than 250 kHz) 25 (if the 20 dB bandwidth is 250 kHz or greater)
2400.0 – 2483.5	15
5725.0 – 5850.0	75

7.3.2 Test procedure

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized with frequency hopping function enabled and its proper operation was checked.

7.3.2.2 Initially the spectrum analyzer span was set equal to frequency band of operation and the resolution bandwidth was set wider than 1 % of the frequency span. If the separate hopping channels were not clearly resolved the frequency band of operation was broken to sections and the resolution bandwidth was set wider than 1 % of the frequency span of each section.

7.3.2.3 The spectrum analyzer was set in max hold mode and allowed trace to stabilize.

7.3.2.4 The number of frequency hopping channels was calculated as provided in Table 7.3.2 and associated plots.

Figure 7.3.1 Hopping frequencies test setup



Test specification:		Section 15.247(a)1, RSS-210 section A8.1(c), Number of hopping frequencies	
Test procedure:		Public notice DA 00-705	
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 25 °C	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: Battery
Remarks:			

Table 7.3.2 Hopping frequencies test results

ASSIGNED FREQUENCY BAND: 2400-2483.5 MHz
 MODULATING SIGNAL: PRBS
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: ≥ 1% of the span
 VIDEO BANDWIDTH: ≥ RBW
 FREQUENCY HOPPING: Enabled

MODULATION: GFSK
 BIT RATE: 1 Mbps

Number of hopping frequencies	Minimum number of hopping frequencies	Margin*	Verdict
79	15	-64	Pass

MODULATION: DQPSK
 BIT RATE: 2 Mbps

Number of hopping frequencies	Minimum number of hopping frequencies	Margin*	Verdict
79	15	-64	Pass

* - Margin = Number of hopping frequencies – Minimum number of hopping frequencies.

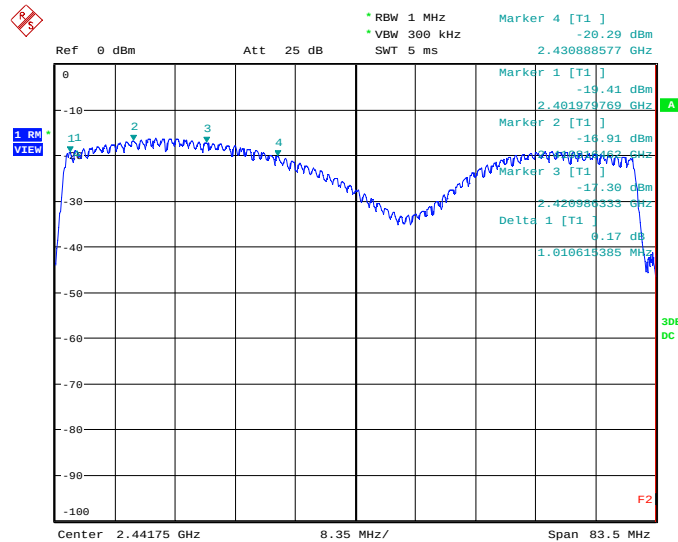
Reference numbers of test equipment used

HL 3818						
---------	--	--	--	--	--	--

Full description is given in Appendix A.

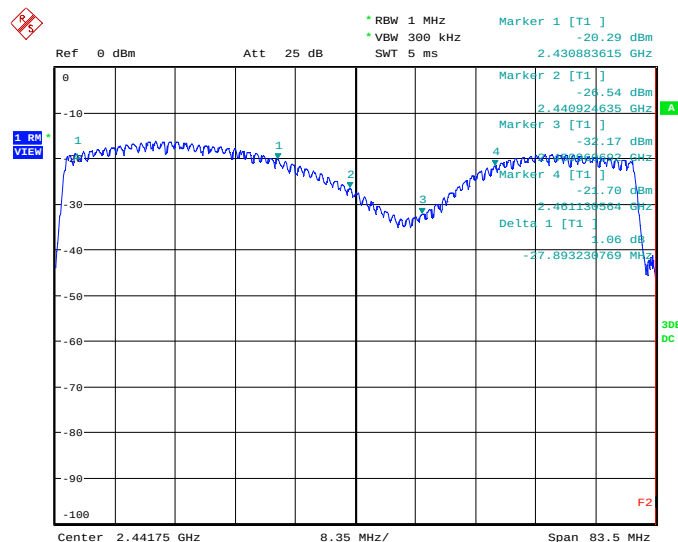
Test specification:	Section 15.247(a)1, RSS-210 section A8.1(c),Number of hopping frequencies			
Test procedure:	Public notice DA 00-705			
Test mode:	Compliance	Verdict: PASS		
Date(s):	20-Aug-14			
Temperature: 25 °C	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: Battery	
Remarks:				

Plot 7.3.1 Number of hopping frequencies, GFSK modulation, 30 channels



Date: 23.JUL.2014 14:09:53

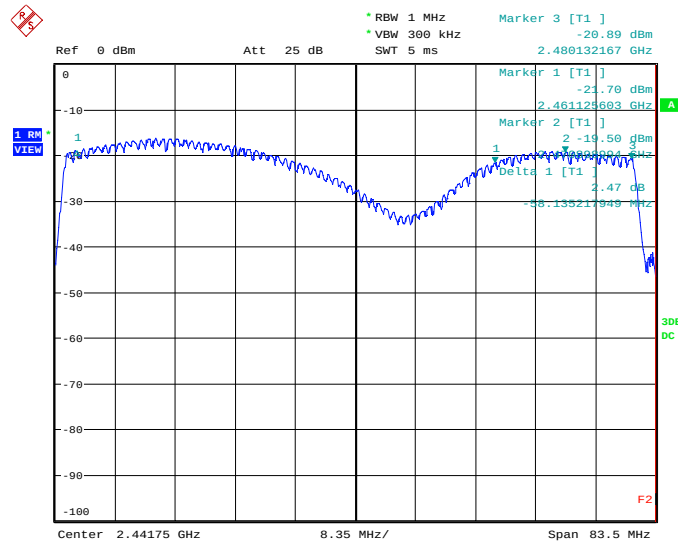
Plot 7.3.2 Number of hopping frequencies, GFSK modulation, 30 channels



Date: 23.JUL.2014 14:11:48

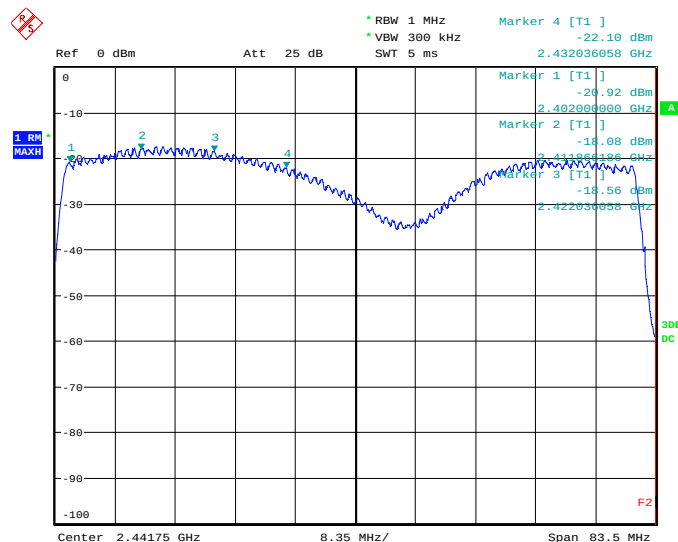
Test specification:	Section 15.247(a)1, RSS-210 section A8.1(c), Number of hopping frequencies		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 25 °C	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: Battery
Remarks:			

Plot 7.3.3 Number of hopping frequencies, GFSK modulation, 19 channels



Date: 23.JUL.2014 14:13:14

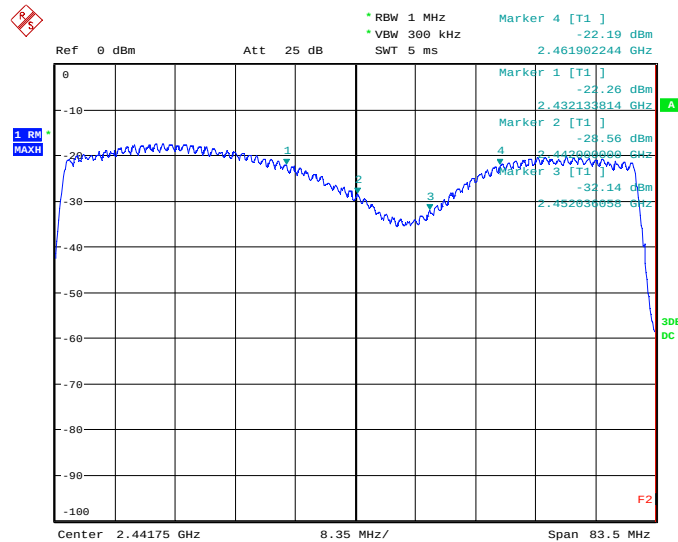
Plot 7.3.4 Number of hopping frequencies, DQPSK modulation, 30 channels



Date: 23.JUL.2014 14:21:26

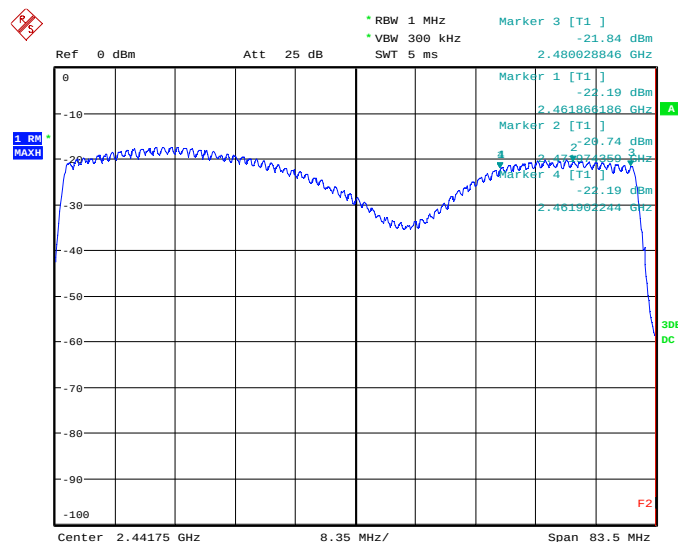
Test specification:		Section 15.247(a)1, RSS-210 section A8.1(c),Number of hopping frequencies			
Test procedure:		Public notice DA 00-705			
Test mode:		Compliance		Verdict: PASS	
Date(s):		20-Aug-14			
Temperature: 25 °C		Air Pressure: 1007 hPa		Relative Humidity: 45 %	
				Power Supply: Battery	
Remarks:					

Plot 7.3.5 Number of hopping frequencies, DQPSK modulation, 30 channels



Date: 23.JUL.2014 14:22:47

Plot 7.3.6 Number of hopping frequencies, DQPSK modulation, 19 channels



Date: 23.JUL.2014 14:25:01

Test specification:		Section 15.247(a)1, RSS-210 section A8.1(c), Average time of occupancy	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Aug-14	
Temperature: 25 °C	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: Battery
Remarks:			

7.4 Average time of occupancy

7.4.1 General

This test was performed to calculate the average time of occupancy (dwell time) on any frequency channel of the EUT. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Average time of occupancy limits

Assigned frequency range, MHz	Maximum average time of occupancy, s	Investigated period, s	Number of hopping frequencies
902.0 – 928.0	0.4	20.0	≥ 50
902.0 – 928.0	0.4	10.0	< 50
2400.0 – 2483.5	0.4	$0.4 \times N$	$N (\geq 15)$
5725.0 – 5850.0	0.4	30.0	≥ 75

7.4.2 Test procedure

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized with frequency hopping function enabled and its proper operation was checked.

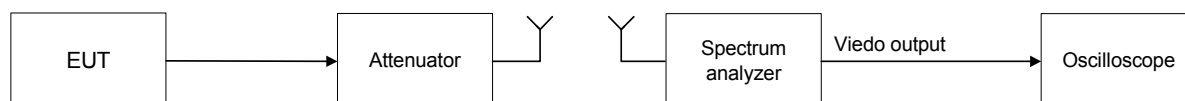
7.4.2.2 The spectrum analyzer span was set to zero centered on a hopping channel.

7.4.2.3 The single transmission duration and period were measured with oscilloscope.

7.4.2.4 The average time of occupancy was calculated as the single transmission time multiplied by the investigated period and divided by the single transmission period.

7.4.2.5 The test was repeated at each data rate and modulation type as provided in Table 7.4.2 and associated plots.

Figure 7.4.1 Average time of occupancy test setup



Test specification:		Section 15.247(a)1, RSS-210 section A8.1(c), Average time of occupancy	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Aug-14	
Temperature: 25 °C	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: Battery
Remarks:			

Table 7.4.2 Average time of occupancy test results

ASSIGNED FREQUENCY BAND: 2400 – 2483.5 MHz
 MODULATING SIGNAL: PRBS
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1 MHz
 VIDEO BANDWIDTH: 3 MHz
 FREQUENCY HOPPING: Enabled

MODULATION: GFSK
 NUMBER OF HOPPING FREQUENCIES: 79
 INVESTIGATED PERIOD: 31.6 s

Carrier frequency, MHz	Single transmission duration, ms	Single transmission period, ms	Average time of occupancy*, s	Bit rate, Mbps	Symbol rate, Msymbol/s	Limit, s	Margin, s**	Verdict
2403.0	0.4	99.07	0.1275	1.0	1.0	0.4	-0.2725	Pass

MODULATION: DQPSK
 NUMBER OF HOPPING FREQUENCIES: 79
 INVESTIGATED PERIOD: 31.6 s

Carrier frequency, MHz	Single transmission duration, ms	Single transmission period, ms	Average time of occupancy*, s	Bit rate, Mbps	Symbol rate, Msymbol/s	Limit, s	Margin, s**	Verdict
2403.0	2.92	989.6	0.0921	3.0	3	0.4	-0.3079	Pass

* - Average time of occupancy = (Single transmission duration × Investigated period) / Single transmission period

** - Margin = Average time of occupancy – specification limit.

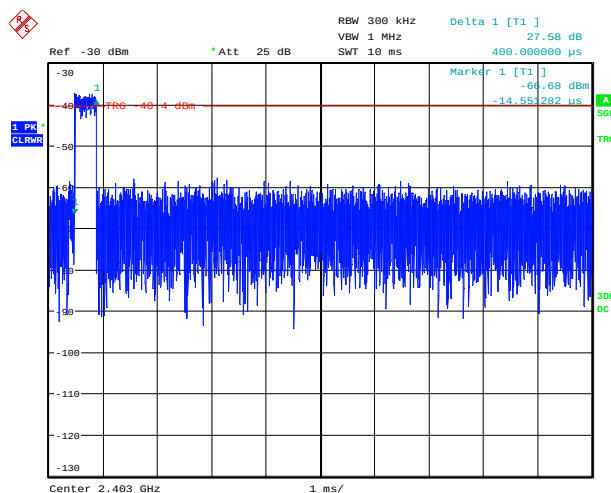
Reference numbers of test equipment used

HL 0337	HL 4274	HL 4360					
---------	---------	---------	--	--	--	--	--

Full description is given in Appendix A.

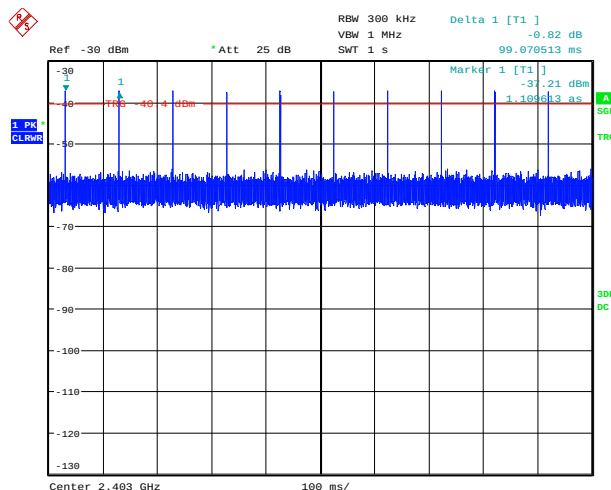
Test specification:	Section 15.247(a)1, RSS-210 section A8.1(c), Average time of occupancy		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 25 °C	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: Battery
Remarks:			

Plot 7.4.1 Single transmission duration, GFSK modulation



Date: 28.JUL.2014 09:52:33

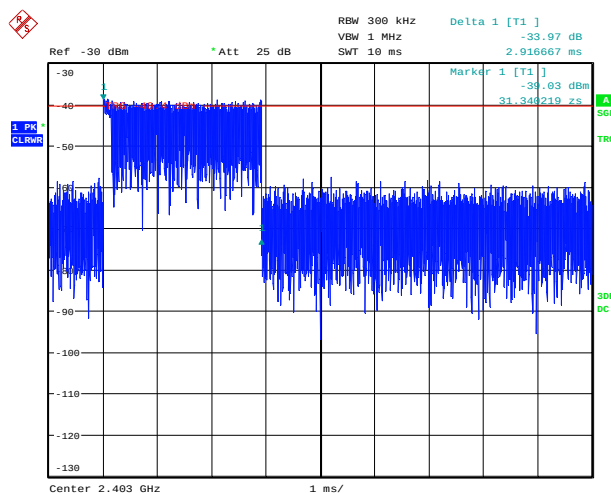
Plot 7.4.2 Single transmission period, GFSK modulation



Date: 28.JUL.2014 10:09:34

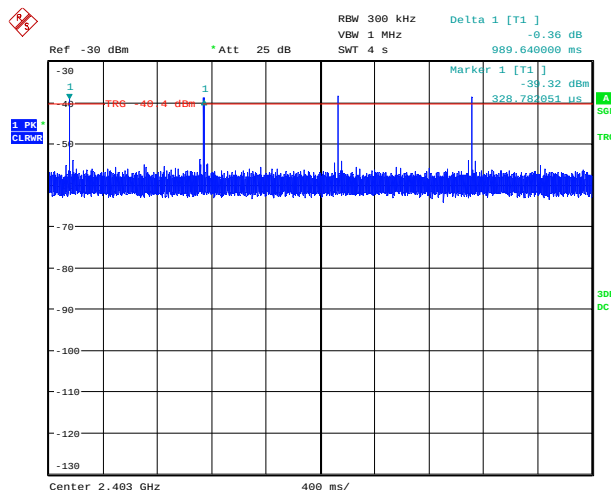


Plot 7.4.3 Single transmission duration, DQPSK modulation



Date: 28.JUL.2014 09:57:40

Plot 7.4.4 Single transmission period, DQPSK modulation



Date: 28.JUL.2014 09:56:33



Test specification:		Section 15.247(b), RSS-210 section A8.4(1), Peak output power	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 20-Aug-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 49 %	Power Supply: Battery
Remarks:			

7.5 Peak output power

7.5.1 General

This test was performed to measure the maximum peak output power radiated by transmitter. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Peak output power limits

Assigned frequency range, MHz	Peak output power*		Equivalent field strength limit @ 3m, dB(μV/m)*	Maximum antenna gain, dBi	
	W	dBm			
902.0 – 928.0	0.25 (<50 hopping channels)	24.0(<50 hopping channels)	125.2 (<50 hopping channels)	6.0*	
	1.0 (≥50 hopping channels)	30.0 (≥50 hopping channels)	131.2 (≥50 hopping channels)		
2400.0 – 2483.5	0.125 (<75 hopping channels)	21.0(<75 hopping channels)	122.2 (<75 hopping channels)		
	1.0 (≥75 hopping channels)	30.0 (≥75 hopping channels)	131.2 (≥75 hopping channels)		
5725.0 – 5850.0	1.0	30.0	131.2		

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

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

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

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

7.5.2.3 The frequency span of spectrum analyzer was set approximately 5 times wider than 20 dB bandwidth of the EUT and the resolution bandwidth was set wider than 20 dB bandwidth of the EUT. To find maximum radiation the turntable was rotated 360° and the measuring antenna height was swept in both vertical and horizontal polarizations.

7.5.2.4 The maximum field strength of the EUT carrier frequency was measured as provided in Table 7.5.2 and associated plots.

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

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

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

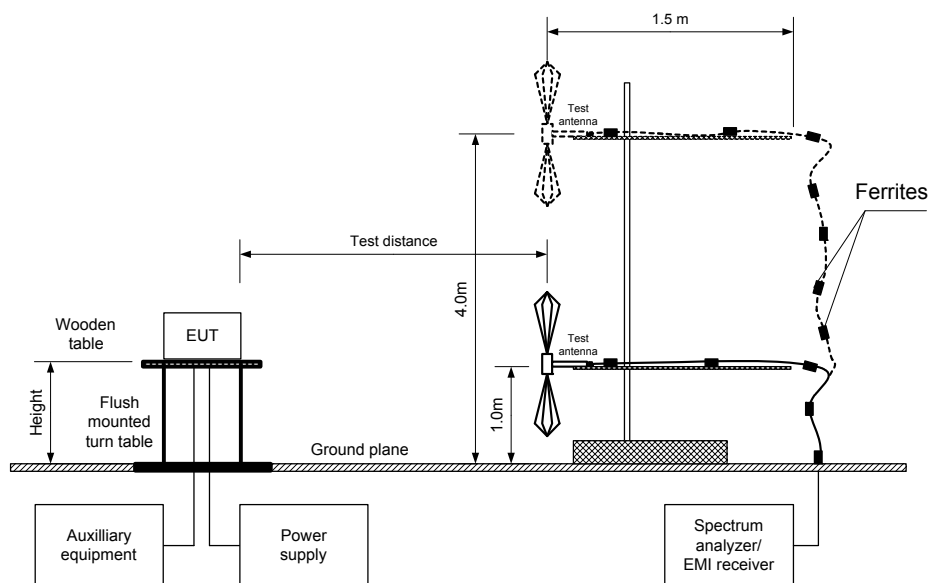
The above equation was converted in logarithmic units for 3 m test distance:

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

7.5.2.6 The worst test results (the lowest margins) were recorded in Table 7.5.2.

Test specification:		Section 15.247(b), RSS-210 section A8.4(1), Peak output power	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 20-Aug-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 49 %	Power Supply: Battery
Remarks:			

Figure 7.5.1 Setup for carrier field strength measurements



Test specification:	Section 15.247(b), RSS-210 section A8.4(1), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 20-Aug-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 49 %	Power Supply: Battery
Remarks:			

Table 7.5.2 Peak output power test results

ASSIGNED FREQUENCY BAND: 2400 – 2483.5 MHz
 TEST DISTANCE: 3 m
 TEST SITE: Semi anechoic chamber
 EUT HEIGHT: 0.8 m
 DETECTOR USED: Peak
 TEST ANTENNA TYPE: Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)
 MODULATING SIGNAL: PRBS
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 EUT 20 dB BANDWIDTH: 0.913 MHz
 RESOLUTION BANDWIDTH: 1 MHz
 VIDEO BANDWIDTH: 3 MHz
 FREQUENCY HOPPING: Disabled

NUMBER OF FREQUENCY HOPPING CHANNELS: 79
 BT Mode: GFSK
 BIT RATE: 1 Mbps

Frequency, MHz	Field strength, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	EUT antenna gain, dBi	Peak output power, dBm**	Limit, dBm	Margin, dB***	Verdict
2402.115	102.36	Vertical	1.5	272	0	7.16	30.0	-22.84	Pass
2441.00	102.26	Horizontal	2.0	224	0	7.06	30.0	-22.94	Pass
2479.865	100.42	Vertical	1.4	267	0	5.22	30.0	-24.78	Pass

NUMBER OF FREQUENCY HOPPING CHANNELS: 79
 BT Mode: DQPSK
 BIT RATE: 2 Mbps

Frequency, MHz	Field strength, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	EUT antenna gain, dBi	Peak output power, dBm**	Limit, dBm	Margin, dB***	Verdict
2402.035	101.13	Horizontal	1.7	238	0	5.93	21.0	-15.07	Pass
2440.965	100.42	Vertical	1.6	261	0	5.22	21.0	-15.78	Pass
2479.980	101.11	Vertical	1.4	262	0	5.91	21.0	-15.09	Pass

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

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

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

Reference numbers of test equipment used

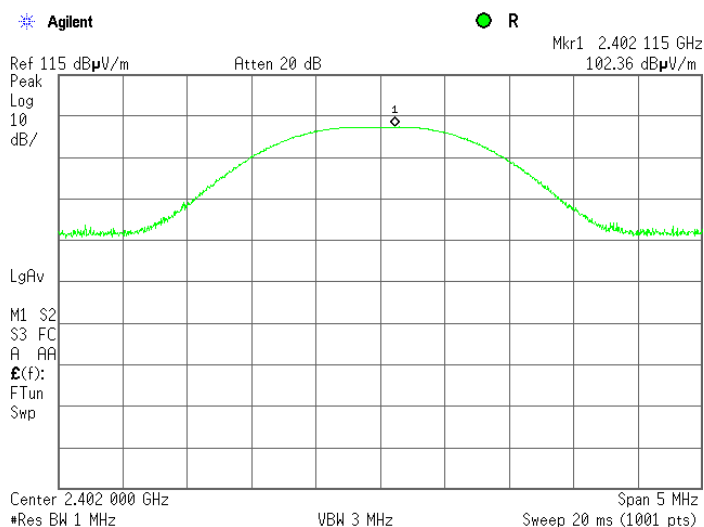
HL 1984	HL 3818	HL 4353	HL 4352				
---------	---------	---------	---------	--	--	--	--

Full description is given in Appendix A.

Test specification:	Section 15.247(b), RSS-210 section A8.4(1), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 20-Aug-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 49 %	Power Supply: Battery
Remarks:			

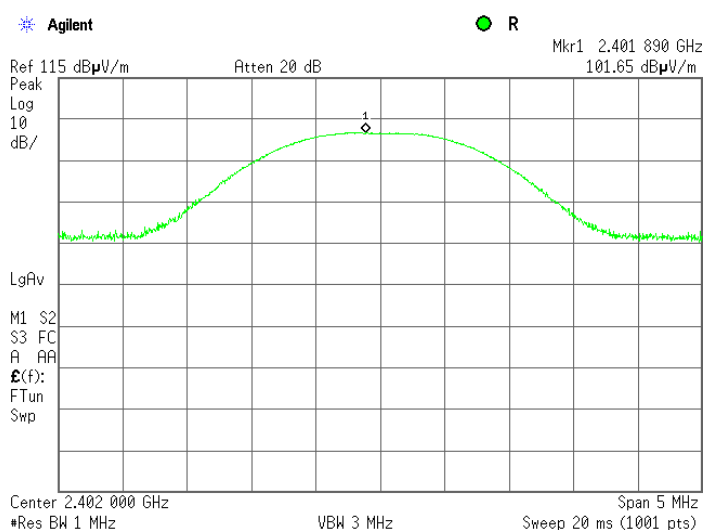
Plot 7.5.1 Field strength of carrier at low frequency

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



Plot 7.5.2 Field strength of carrier at low frequency

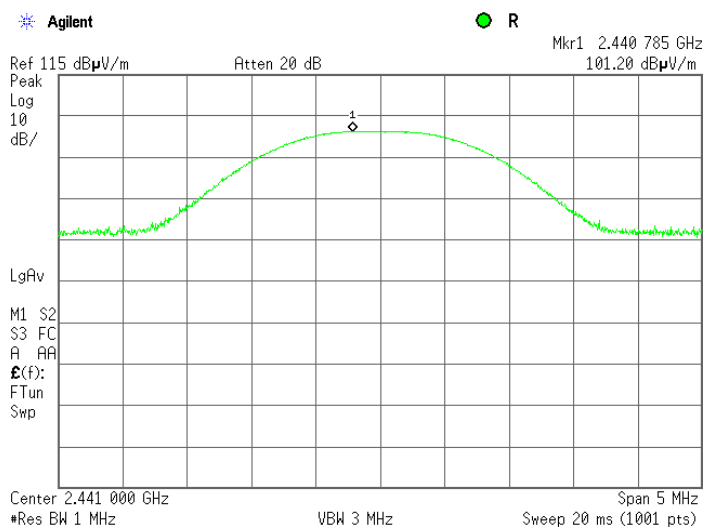
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: GFSK



Test specification:	Section 15.247(b), RSS-210 section A8.4(1), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 20-Aug-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 49 %	Power Supply: Battery
Remarks:			

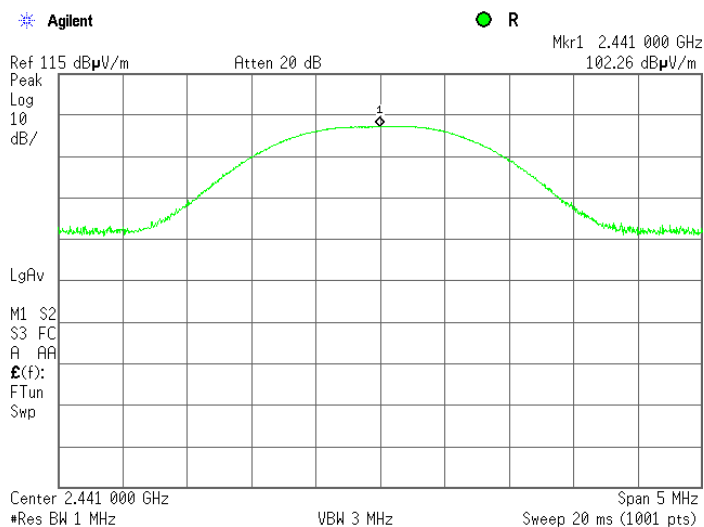
Plot 7.5.3 Field strength of carrier at mid frequency

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



Plot 7.5.4 Field strength of carrier at mid frequency

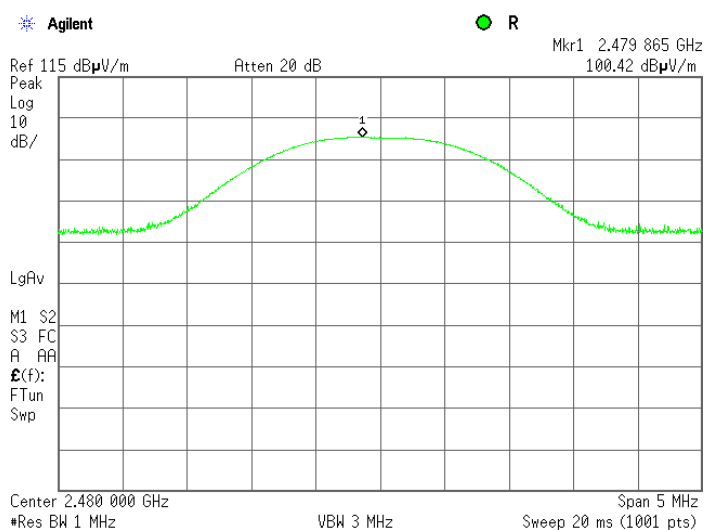
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: GFSK



Test specification:	Section 15.247(b), RSS-210 section A8.4(1), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 20-Aug-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 49 %	Power Supply: Battery
Remarks:			

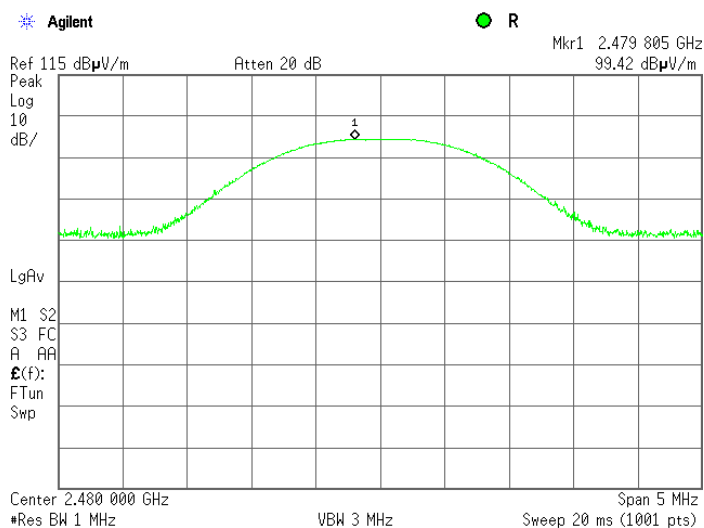
Plot 7.5.5 Field strength of carrier at high frequency

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



Plot 7.5.6 Field strength of carrier at high frequency

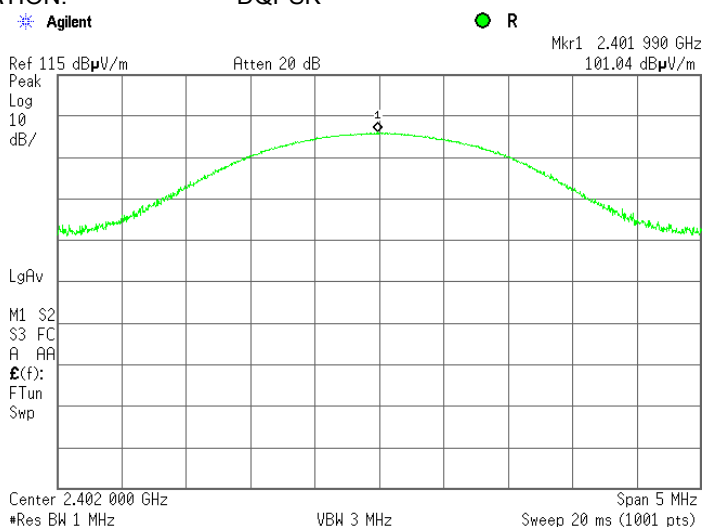
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: GFSK



Test specification:	Section 15.247(b), RSS-210 section A8.4(1), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 20-Aug-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 49 %	Power Supply: Battery
Remarks:			

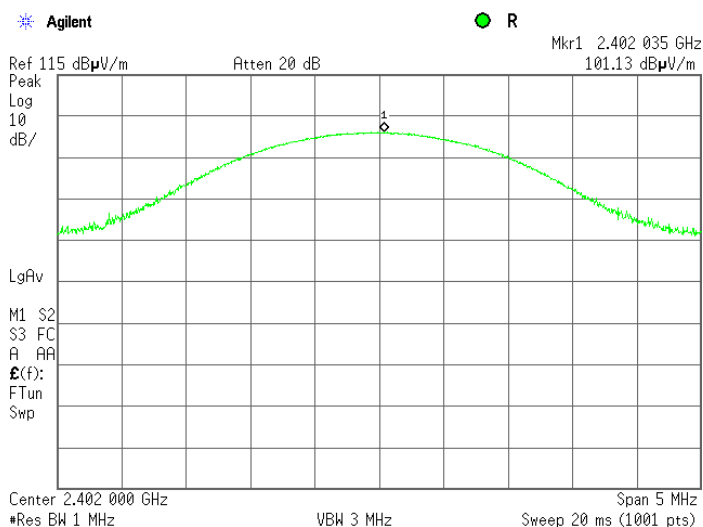
Plot 7.5.7 Field strength of carrier at low frequency

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



Plot 7.5.8 Field strength of carrier at low frequency

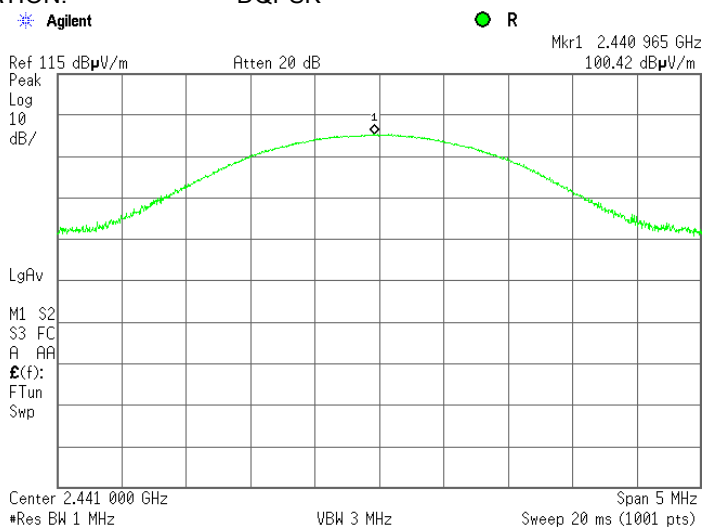
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: DQPSK



Test specification:		Section 15.247(b), RSS-210 section A8.4(1), Peak output power	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 20-Aug-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 49 %	Power Supply: Battery
Remarks:			

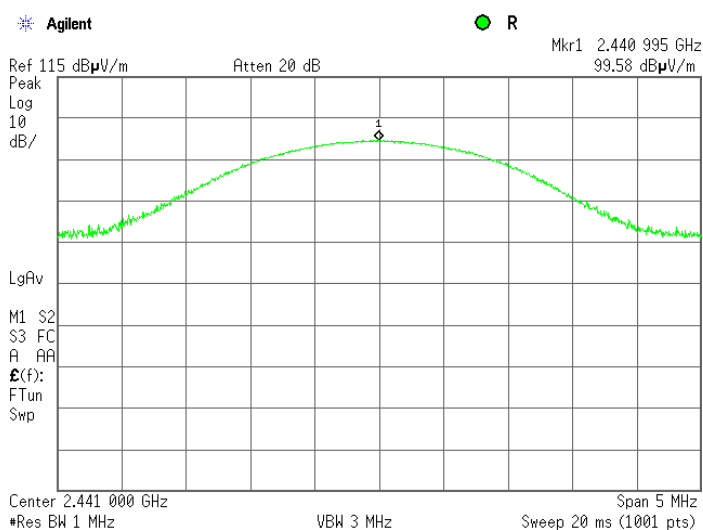
Plot 7.5.9 Field strength of carrier at mid frequency

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



Plot 7.5.10 Field strength of carrier at mid frequency

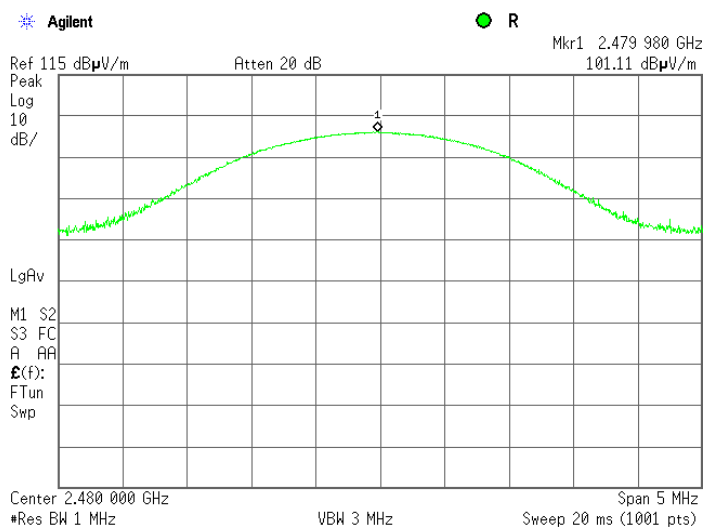
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: DQPSK



Test specification:		Section 15.247(b), RSS-210 section A8.4(1), Peak output power	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 20-Aug-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 49 %	Power Supply: Battery
Remarks:			

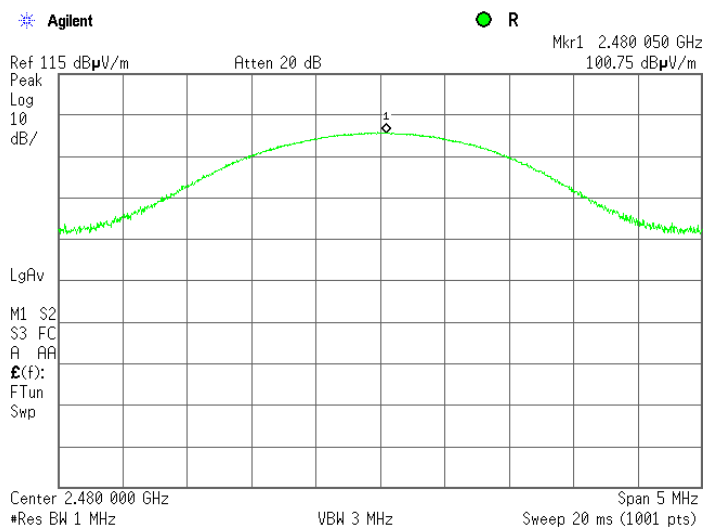
Plot 7.5.11 Field strength of carrier at high frequency

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



Plot 7.5.12 Field strength of carrier at high frequency

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



Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

7.6 Band edge radiated emissions

7.6.1 General

This test was performed to measure emissions, radiated from the EUT at the assigned frequency band edges. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Band edge emission limits

Assigned frequency, MHz	Attenuation below carrier*, dBc	Field strength at 3 m within restricted bands, dB(μV/m)	
		Peak	Average
902.0 – 928.0	20.0	74.0	54.0
2400.0 – 2483.5			
5725.0 – 5850.0			

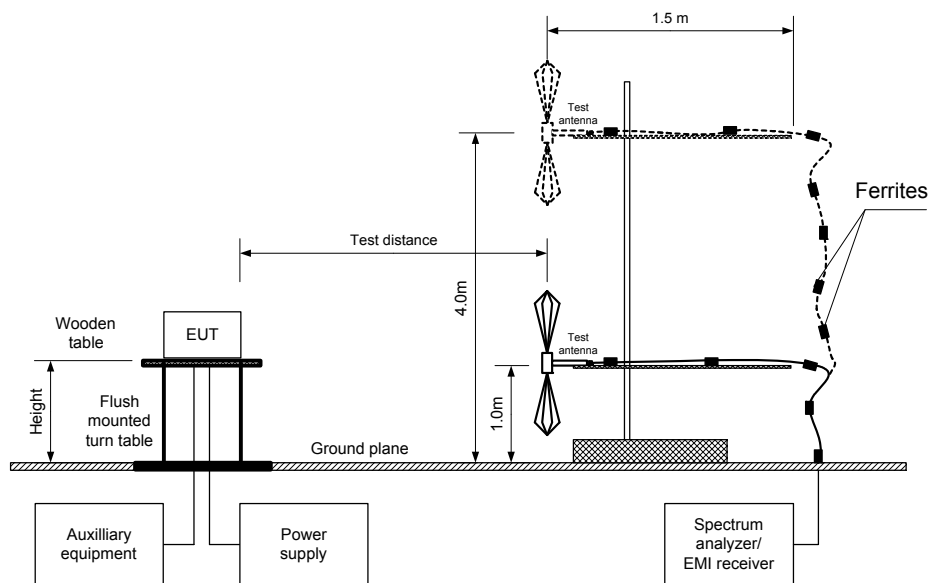
* - Band edge emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

7.6.2 Test procedure

- 7.6.2.1** The EUT was set up as shown in Figure 7.6.1, energized normally modulated at the maximum data rate with its hopping function disabled and its proper operation was checked.
- 7.6.2.2** The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.
- 7.6.2.3** The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set wider than 1 % of the frequency span.
- 7.6.2.4** The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.
- 7.6.2.5** The maximum band edge emission and modulation product outside of the band were measured as provided in Table 7.6.2 and associated plots and referenced to the highest emission level measured within the authorized band.
- 7.6.2.6** The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the highest carrier frequency.
- 7.6.2.7** The above procedure was repeated with the frequency hopping function enabled.

Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

Figure 7.6.1 Band edge emission test setup



Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

Table 7.6.2 Band edge emission test results, GFSK modulation

ASSIGNED FREQUENCY BAND: 2400 – 2483.5 MHz
DETECTOR USED: Peak
MODULATION: GFSK
MODULATING SIGNAL: PRBS
BIT RATE: 1 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
RESOLUTION BANDWIDTH: $\geq 1\%$ of the span
VIDEO BANDWIDTH: $\geq$ RBW

Frequency, MHz	Band edge emission, dB(μ V/m)	Emission at carrier, dB(μ V/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Frequency hopping disabled						
2400	78.80	103.28	-24.48	20	-4.48	Pass
Frequency hopping enabled						
2400	74.05	103.28	-29.23	20	-9.23	Pass

*- Margin = Attenuation below carrier – specification limit.

RESTRICTED BANDS: 2483.5 – 2500 MHz

RESTRICTED BANDS:				2100-2300 MHz							
Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=3 kHz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
Frequency hopping disabled											
2483.500	Vertical	1.0	238	64.46	74	-9.54	46.14	36.25	54	-17.75	Pass
Frequency hopping enabled											
2483.500	Vertical	1.1	240	64.51	74	-9.49	48.67	38.78	54	-15.22	Pass

Average factor calculation: $20 \log (0.4 \text{ ms}/1.25 \text{ ms}) = -9.89 \text{ dB}$

$\text{VBW} \geq 1/T_{\text{on}} = 0.4 \text{ ms} \geq 2.5 \text{ kHz}$, 3 kHz was used.

Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

Table 7.6.3 Band edge emission test results, DQPSK modulation

ASSIGNED FREQUENCY BAND: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
MODULATION: DQPSK
MODULATING SIGNAL: PRBS
BIT RATE: 2 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
VIDEO BANDWIDTH: ≥ RBW
OUTSIDE RESTRICTED BAND: 2390 – 2400 MHz

Frequency, MHz	Band edge emission, dB(μV/m)	Emission at carrier, dB(μV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Frequency hopping disabled						
2400	74.80	101.38	-26.58	20	-6.58	Pass
Frequency hopping enabled						
2400	74.93	101.38	-26.45	20	-6.45	Pass

*- Margin = Attenuation below carrier – specification limit.

RESTRICTED BANDS: 2483.5 – 2500 MHz

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=3 kHz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
Frequency hopping disabled											
2483.5	Vertical	1.1	236	64.08	74	-9.92	47.87	35.47	54	-18.53	Pass
Frequency hopping enabled											
2483.5	Vertical	1.0	232	63.60	74	-10.4	48.21	35.81	54	-18.19	Pass

Average factor calculation: $20 \log(3 \text{ ms}/12.55 \text{ ms}) = -12.4 \text{ dB}$

$VBW \geq 1/T_{on} = 1/3 \text{ ms} \geq 333 \text{ Hz}$, 3 kHz was used.

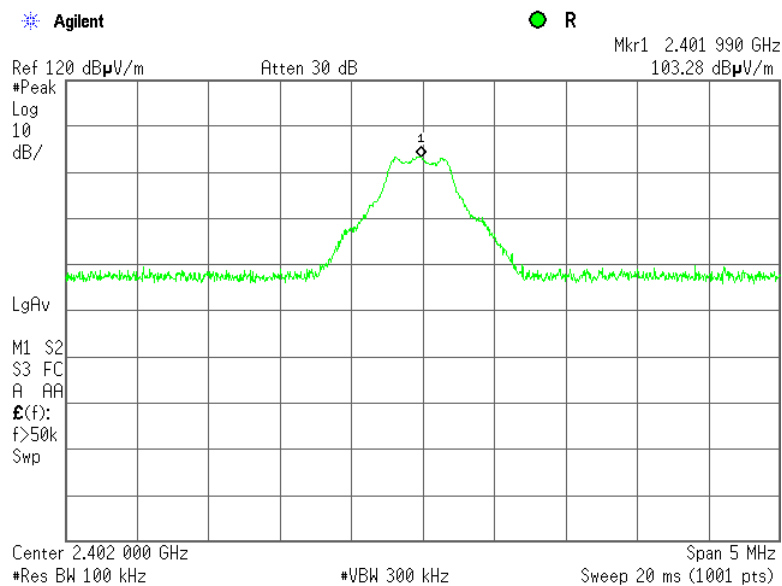
Reference numbers of test equipment used

HL 3818	HL 3903	HL 4114	HL 4150				
---------	---------	---------	---------	--	--	--	--

Full description is given in Appendix A.

Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

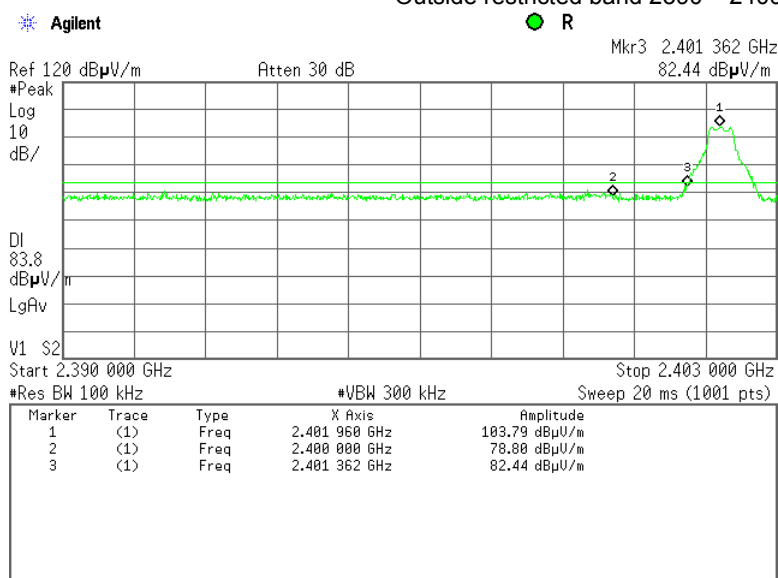
Plot 7.6.1 The highest emission level within the assigned band at low carrier frequency, GFSK modulation



Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

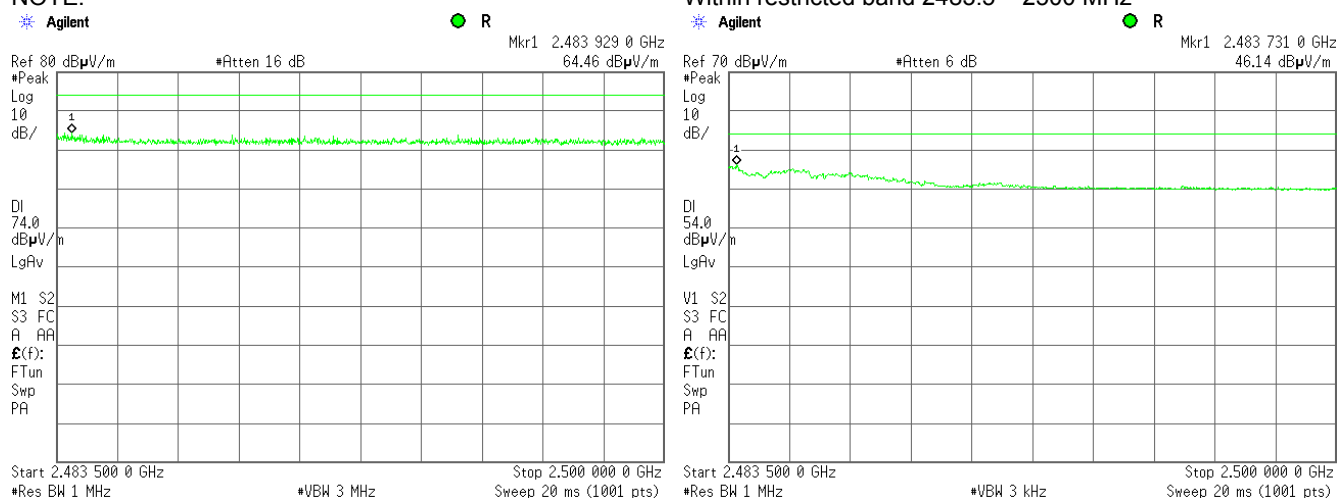
Plot 7.6.2 The highest band edge emission at low carrier frequency with hopping function disabled, GFSK modulation

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
NOTE: Outside restricted band 2390 – 2400 MHz



Plot 7.6.3 The highest band edge emission at high carrier frequency with hopping function disabled, GFSK modulation

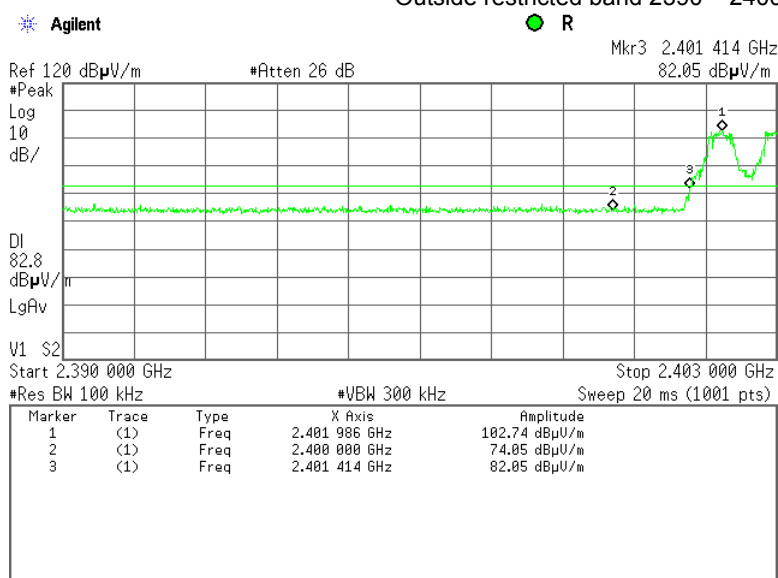
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
RBW=1MHz; VBW=3 MHz
NOTE: Within restricted band 2483.5 – 2500 MHz



Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

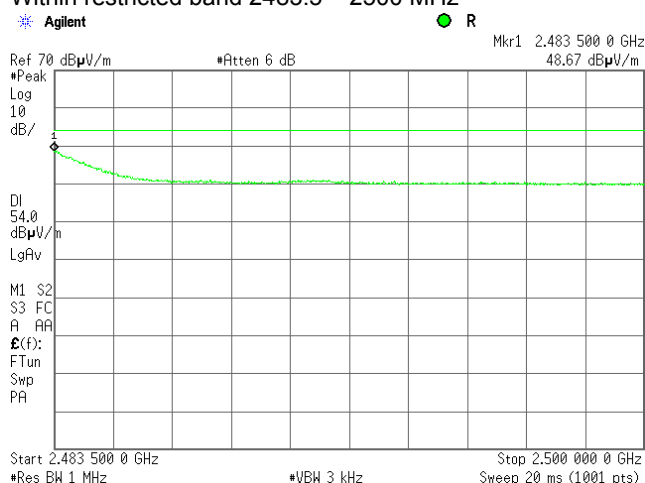
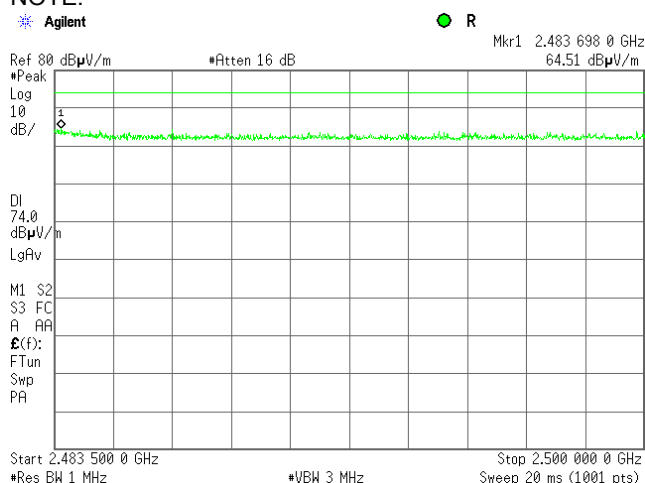
Plot 7.6.4 The highest band edge emission at low carrier frequency with hopping function enabled, GFSK modulation

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
NOTE: Outside restricted band 2390 – 2400 MHz



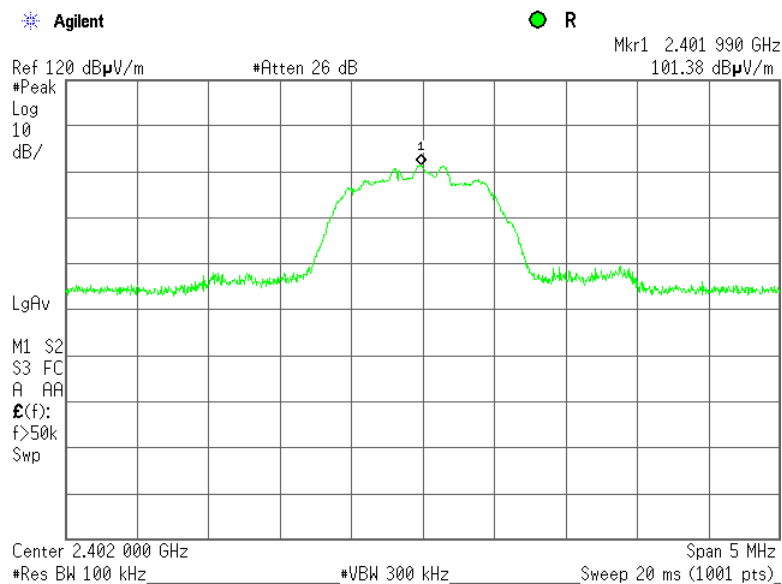
Plot 7.6.5 The highest band edge emission at high carrier frequency with hopping function enabled, GFSK modulation

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
RBW=1MHz; VBW=3 MHz
NOTE: Within restricted band 2483.5 – 2500 MHz



Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

Plot 7.6.6 The highest emission level within the assigned band at low carrier frequency, DQPSK modulation

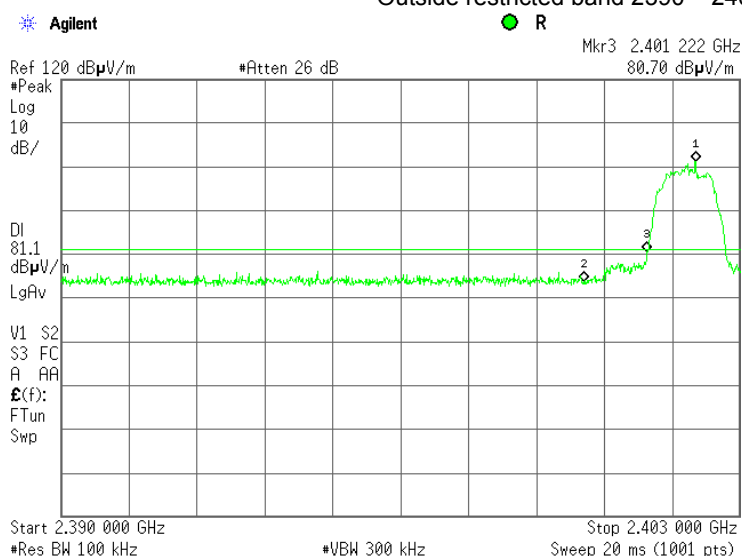


Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

Plot 7.6.7 The highest band edge emission at low carrier frequency with hopping function disabled, DQPSK modulation

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
NOTE:

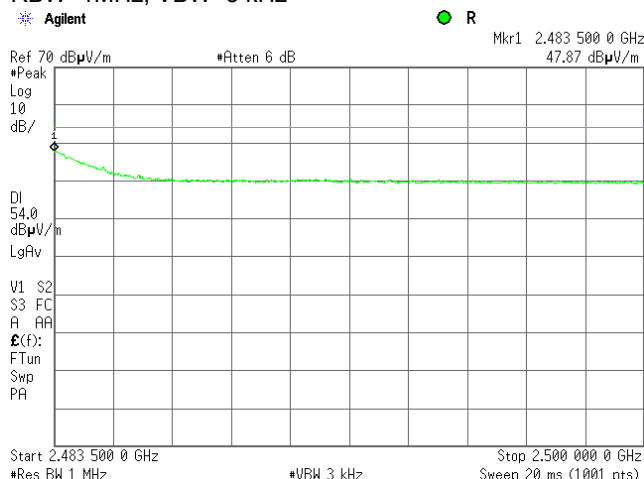
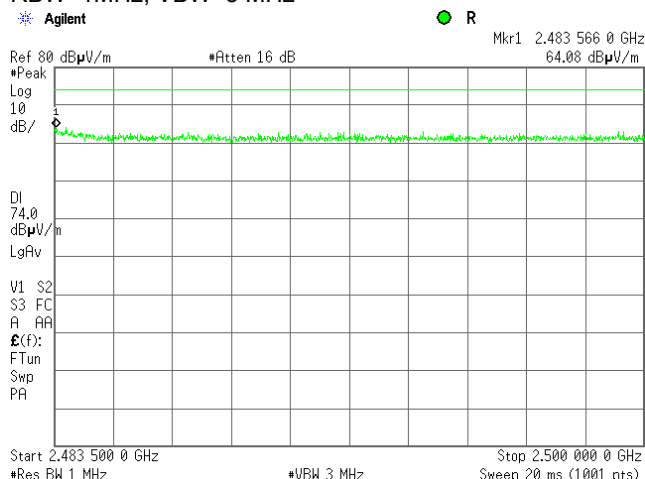
OATS
3 m
Vertical and Horizontal
Outside restricted band 2390 – 2400 MHz



Plot 7.6.8 The highest band edge emission at high carrier frequency with hopping function disabled, DQPSK modulation

TEST SITE:
TEST DISTANCE:
NOTE:
RBW=1MHz; VBW=3 MHz

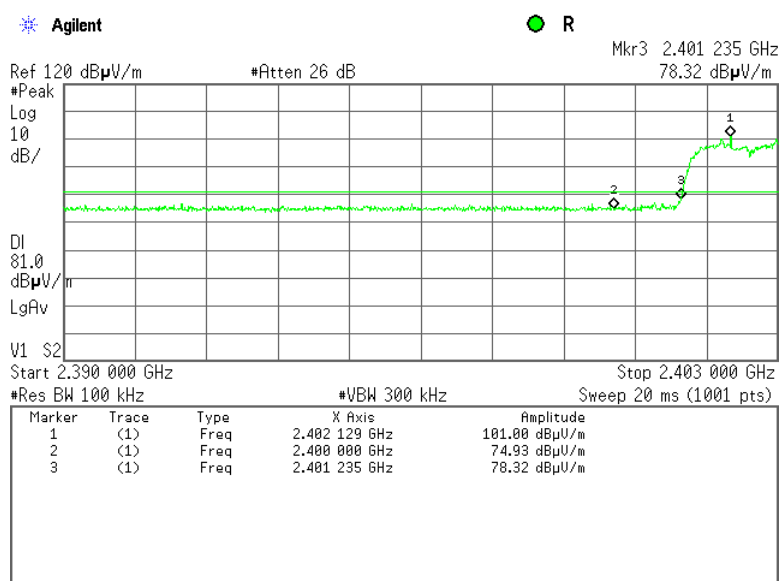
OATS
3 m
Within restricted band 2483.5 – 2500 MHz
RBW=1MHz; VBW=3 kHz



Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

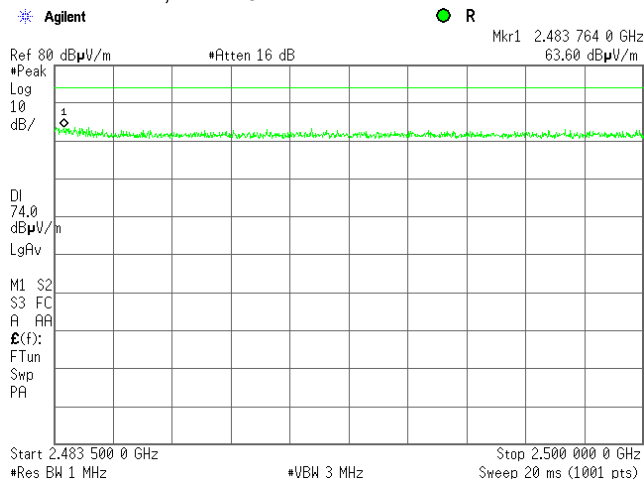
**Plot 7.6.9 The highest band edge emission at low carrier frequency with hopping function enabled
DQPSK modulation**

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
NOTE: Outside restricted band 2390 – 2400 MHz

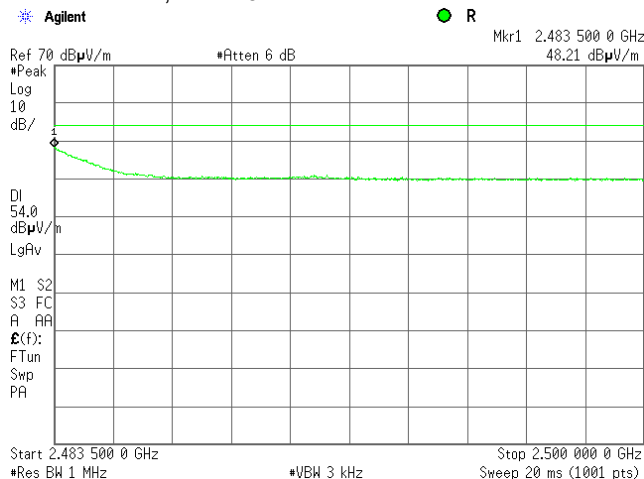


**Plot 7.6.10 The highest band edge emission at high carrier frequency with hopping function enabled
DQPSK modulation**

TEST SITE: OATS
TEST DISTANCE: 3 m
NOTE: Within restricted band 2483.5 – 2500 MHz
RBW=1 MHz; VBW=3 MHz

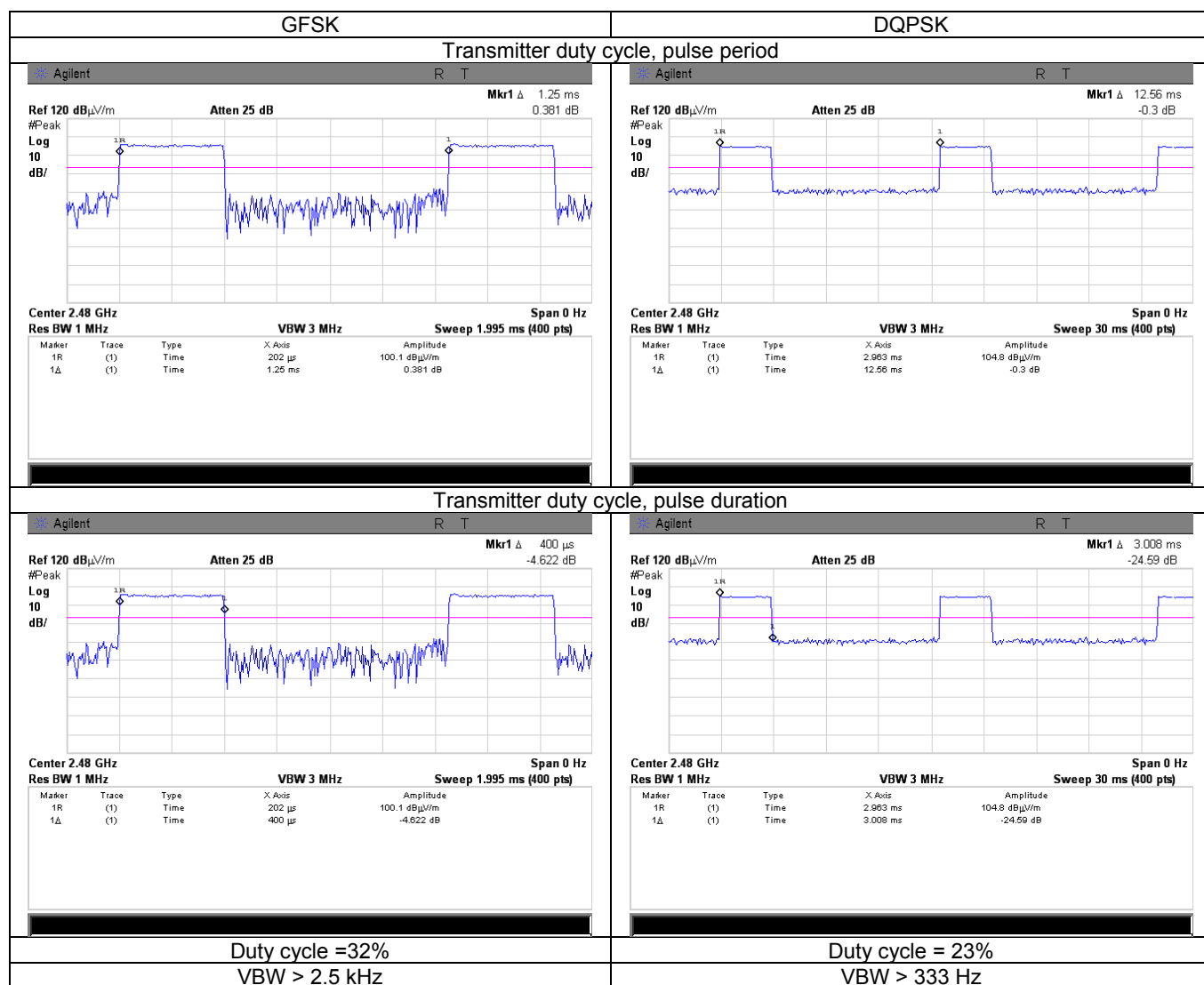


TEST SITE: OATS
TEST DISTANCE: 3 m
NOTE: Within restricted band 2483.5 – 2500 MHz
RBW=1 MHz; VBW=3 MHz



Test specification:		Section 15.247(c), RSS-210 section A8.5, Emissions at band edges	
Test procedure:		Public notice DA 00-705	
Test mode:		Compliance	Verdict: PASS
Date(s):		02-Jul-14	
Temperature: 30 °C	Air Pressure: 1010 hPa	Relative Humidity: 64 %	Power Supply: Battery
Remarks:			

Plot 7.6.11 Transmitter duty cycle



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

7.7 Field strength of spurious emissions

7.7.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.7.1.

Table 7.7.1 Radiated spurious emissions limits

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

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

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

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

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

*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

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

7.7.2.1 The EUT was set up as shown in Figure 7.7.1, energized and the performance check was conducted.

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

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

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

7.7.3.1 The EUT was set up as shown in Figure 7.7.2, energized and the performance check was conducted.

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

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

Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Figure 7.7.1 Setup for spurious emission field strength measurements below 30 MHz

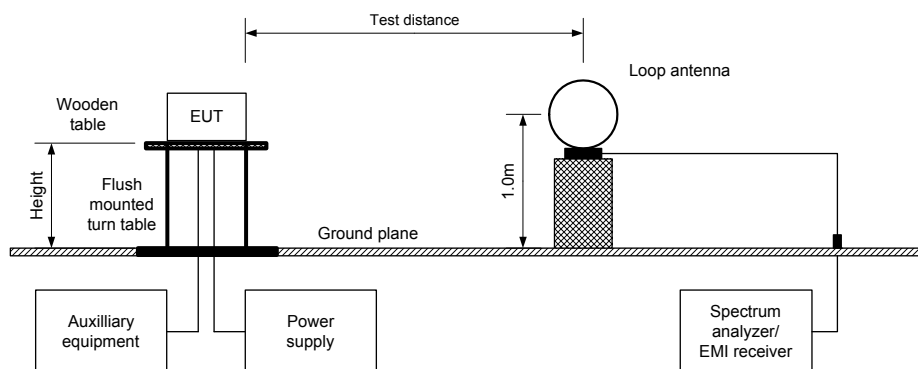
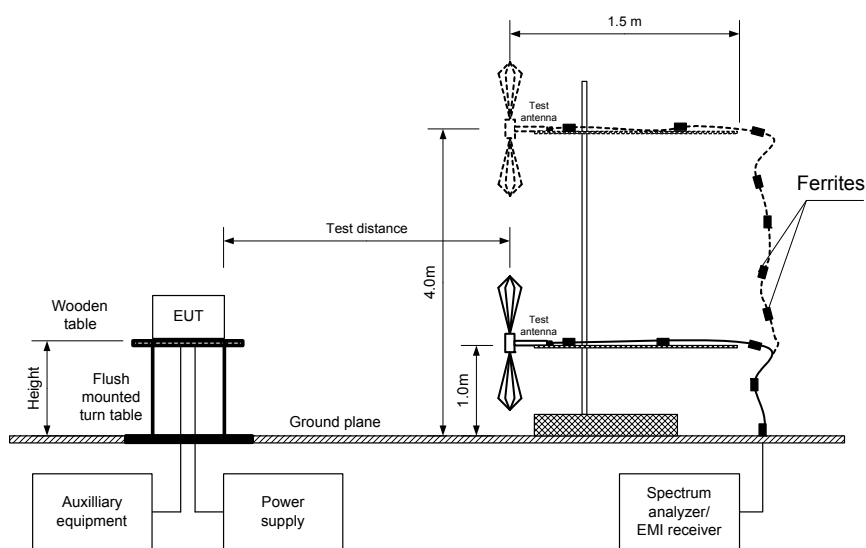


Figure 7.7.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Table 7.7.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY BAND: 2400 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 - 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: GFSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 1 Mbps
 DUTY CYCLE: 32%
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)
 FREQUENCY HOPPING: Disabled

Frequency, MHz	Field strength of spurious, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(μV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
Low carrier frequency									
368.012	39.60	Horizontal	180	1.0	101.97	62.37	20.0	82.37	Pass
447.998	45.10	Horizontal	180	1.0		56.87		56.87	
570.137	34.30	Horizontal	212	1.0		67.67		67.67	
Mid carrier frequency									
373.3348	37.27	Horizontal	170	1.0	101.86	64.59	20.0	44.59	Pass
432.0033	44.80	Horizontal	180	1.0		57.06		37.06	
566.0028	34.30	Horizontal	215	1.0		67.56		47.56	
1627.3207	50.87	Horizontal	230	1.0		50.99		30.99	
High carrier frequency									
367.9958	37.90	Horizontal	170	1.0	99.85	61.95	20.0	41.95	Pass
475.7989	41.60	Horizontal	190	1.0		58.25		38.25	
571.2511	34.00	Horizontal	170	1.0		65.85		45.85	
1653.317	53.18	Horizontal	235	1.1		46.67		26.67	

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

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

Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Table 7.7.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY BAND: 2400 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 – 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: GFSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 1 Mbps
 DUTY CYCLE: 32%
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1000 kHz
 TEST ANTENNA TYPE: Double ridged guide
 FREQUENCY HOPPING: Disabled

Antenna			Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=3/10 kHz)				Verdict
Frequency, MHz	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
Low carrier frequency											
1601.318	Vertical	1.0	61	53.37	74	-20.63	49.42	39.52	54	-14.48	Pass
4803.745	Vertical	1.6	160	62.20	74	-11.8	60.63	50.73	54	-3.27	
7205.665	Horizontal	1.5	310	58.22	74	-15.78	55.05	45.15	54	-8.85	
9607.334	Vertical	1.4	110	63.95	74	-10.05	59.17	49.27	54	-4.73	
Mid carrier frequency											
4882.125	Vertical	1.5	355	64.09	74	-9.91	61.83	51.93	54	-2.07	Pass
7322.525	Horizontal	1.8	306	60.21	74	-13.79	56.55	46.65	54	-7.35	
9764.536	Vertical	1.3	126	64.39	74	-9.61	59.61	49.71	54	-4.29	
High carrier frequency											
49590.58	Vertical	1.5	359	63.35	74	-10.65	61.14	51.24	54	-2.76	Pass
7440.345	Horizontal	1.6	267	64.27	74	-9.73	61.07	51.17	54	-2.83	
9919.294	Horizontal	1.5	83	65.51	74	-8.49	60.75	50.85	54	-3.15	

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

** - Margin = Measured field strength - specification limit.

*** - Margin = Calculated field strength - specification limit,

where Calculated field strength = Measured field strength + average factor.

Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Table 7.7.4 Average factor calculation

MODULATION				GFSK	
Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
0.4	1.25	NA	NA	NA	9.9

MODULATION				DQPSK	
Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
3.008	12.56	NA	NA	NA	12.4

*- Average factor was calculated as follows

for pulse train shorter than 100 ms:

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

for pulse train longer than 100 ms:

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

Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Table 7.7.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY BAND: 2400 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 1000.0 MHz
 TEST DISTANCE: 3 m
 MODULATION: GFSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 1 Mbps
 DUTY CYCLE: 32%
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 7.16 dBm at low carrier frequency
 7.06 dBm at mid carrier frequency
 5.22 dBm at high carrier frequency
 RESOLUTION BANDWIDTH: 1.0 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 HOPPING: Disabled

Frequency, MHz		Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*					
Low carrier frequency									
164.004	39.10	37.10	43.5	-6.4	Vertical	330	1.0	Pass	
368.012	39.60	33.44	46.0	-12.56	Horizontal	180	1.0		
447.998	45.10	39.53	46.0	-6.47	Horizontal	200	1.0		
570.137	34.30	29.13	46.0	-16.87	Horizontal	212	1.0		
Mid carrier frequency									
166.0065	37.00	35.20	43.5	-8.3	Vertical	335	1.0	Pass	
373.3348	37.27	30.51	46.0	-15.49	Horizontal	170	1.0		
432.0033	44.80	40.11	46.0	-5.89	Horizontal	180	1.0		
566.0028	34.30	28.90	46.0	-17.1	Horizontal	215	1.0		
High carrier frequency									
163.9935	39.60	37.02	43.5	-6.48	Vertical	340	1.0	Pass	
367.9958	37.90	33.31	46.0	-12.69	Horizontal	170	1.0		
475.7989	41.60	37.02	46.0	-8.98	Horizontal	190	1.0		
571.2511	34.00	28.53	46.0	-17.47	Horizontal	170	1.0		

*- Margin = Measured emission - specification limit.

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

Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Table 7.7.6 Restricted bands according to FCC section 15.205

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	

Table 7.7.7 Restricted bands according to RSS-Gen

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.291 - 8.294	16.80425 - 16.80475	399.9 - 410	3260 - 3267	10.6 - 12.7
2.1735 - 2.1905	8.362 - 8.366	25.5 - 25.67	608 - 614	3332 - 3339	13.25 - 13.4
3.020 - 3.026	8.37625 - 8.38675	37.5 - 38.25	960 - 1427	3345.8 - 3358	14.47 - 14.5
4.125 - 4.128	8.41425 - 8.41475	73 - 74.6	1435 - 1626.5	3500 - 4400	15.35 - 16.2
4.17725 - 4.17775	12.29 - 12.293	74.8 - 75.2	1645.5 - 1646.5	4500 - 5150	17.7 - 21.4
4.20725 - 4.20775	12.51975 - 12.52025	108 - 138	1660 - 1710	5350 - 5460	22.01 - 23.12
5.677 - 5.683	12.57675 - 12.57725	156.52475 - 156.52525	1718.8 - 1722.2	7250 - 7750	23.6 - 24
6.215 - 6.218	13.36 - 13.41	156.7 - 156.9	2200 - 2300	8025 - 8500	31.2 - 31.8
6.26775 - 6.26825	16.42 - 16.423	240 - 285	2310 - 2390	9000 - 9200	36.43 - 36.5
6.31175 - 6.31225	16.69475 - 16.69525	322 - 335.4	2655 - 2900	9300 - 9500	Above 38.6

Reference numbers of test equipment used

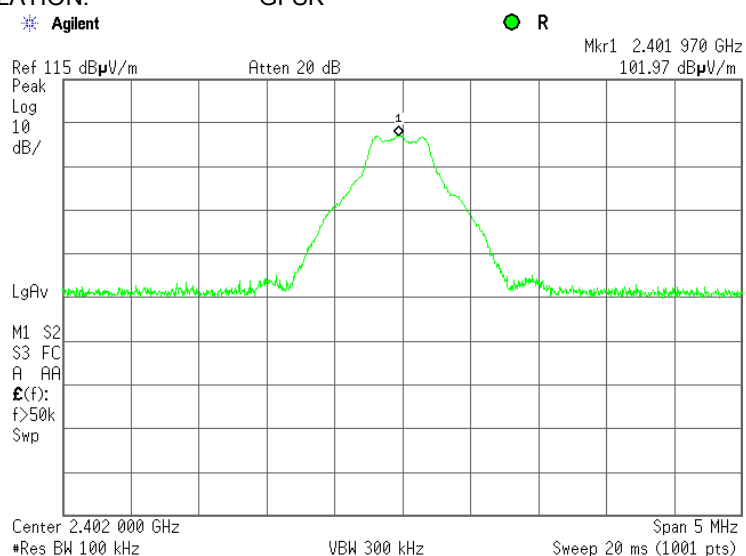
HL 0446	HL 0521	HL 0604	HL 0768	HL 1984	HL 3535	HL 3818	HL 3903
HL 4114	HL 4164	HL 4275	HL 4352	HL 4353			

Full description is given in Appendix A.

Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

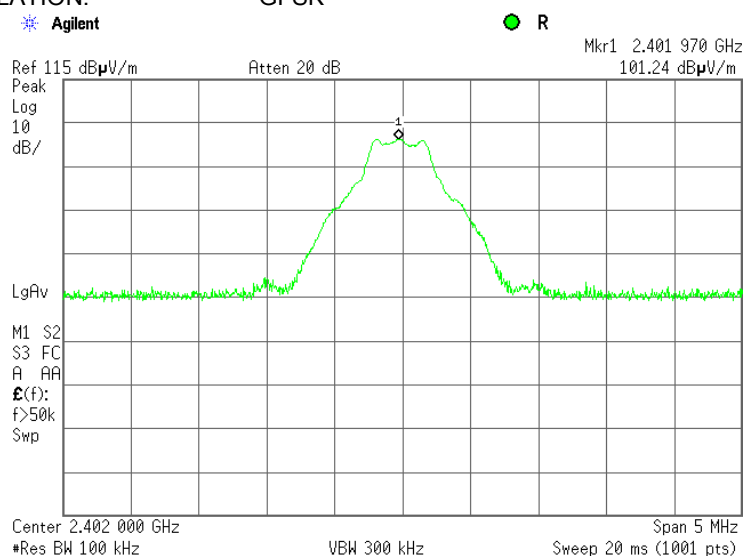
Plot 7.7.1 Radiated emission measurements at the low carrier frequency

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



Plot 7.7.2 Radiated emission measurements at the low carrier frequency

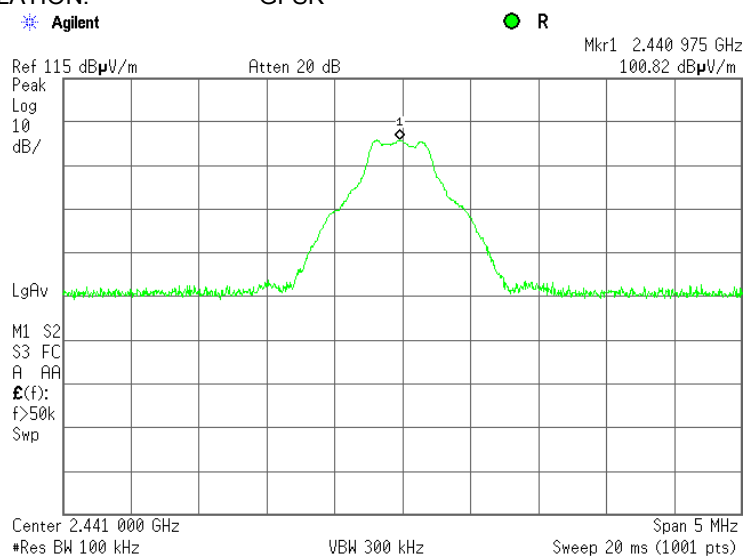
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: GFSK



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

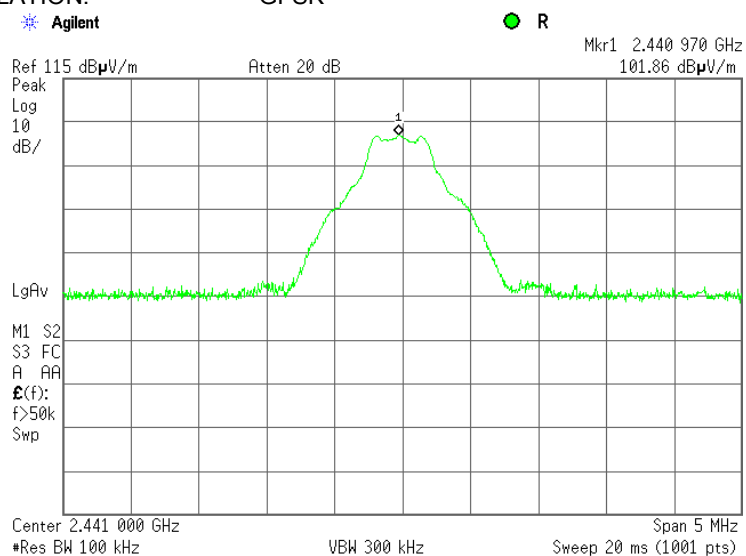
Plot 7.7.3 Radiated emission measurements at the mid carrier frequency

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



Plot 7.7.4 Radiated emission measurements at the mid carrier frequency

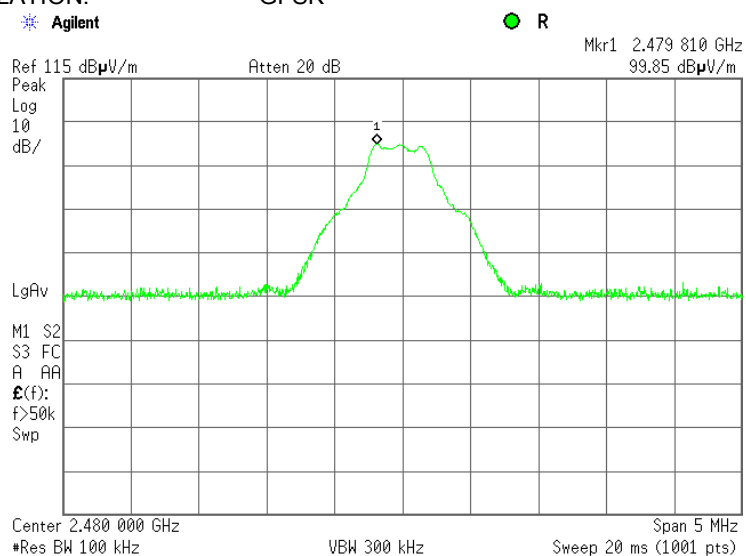
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: GFSK



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

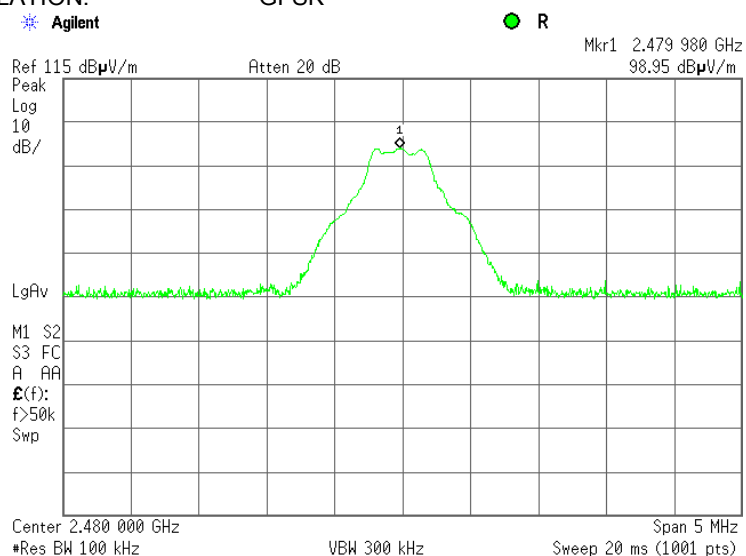
Plot 7.7.5 Radiated emission measurements at the high carrier frequency

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



Plot 7.7.6 Radiated emission measurements at the high carrier frequency

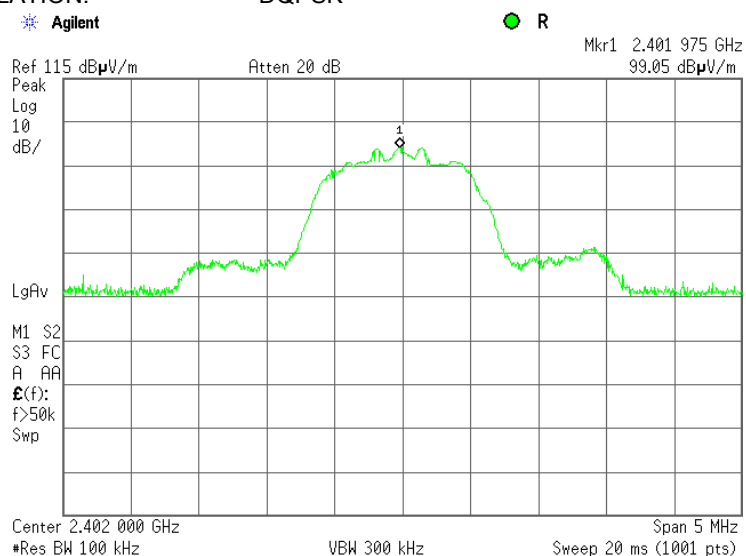
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: GFSK



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

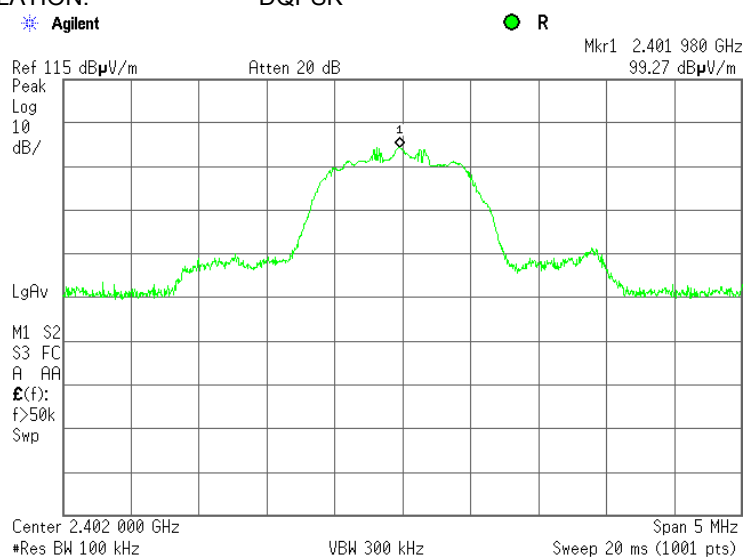
Plot 7.7.7 Radiated emission measurements at the low carrier frequency

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



Plot 7.7.8 Radiated emission measurements at the low carrier frequency

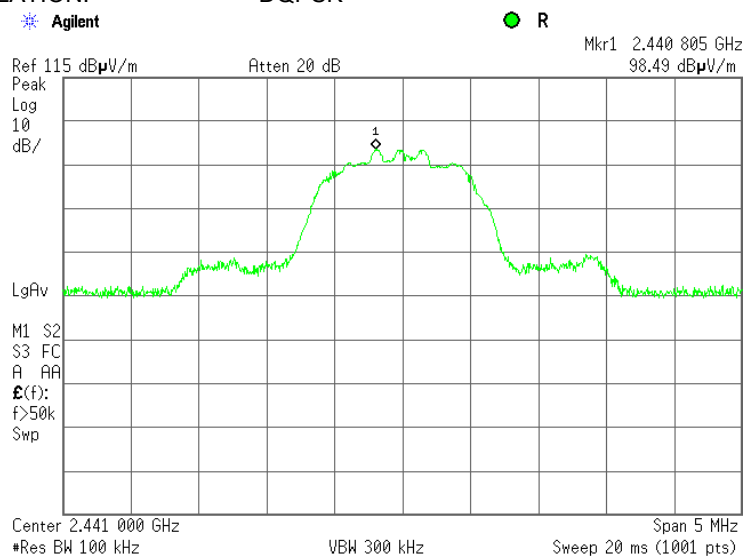
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: DQPSK



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

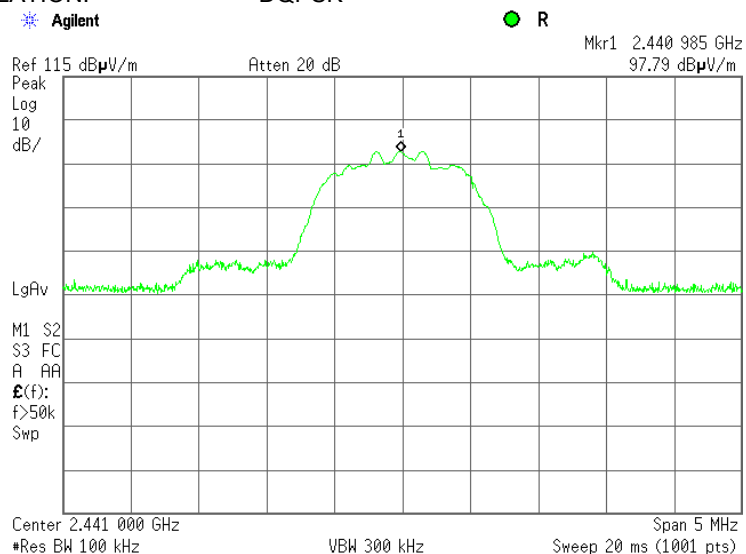
Plot 7.7.9 Radiated emission measurements at the mid carrier frequency

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



Plot 7.7.10 Radiated emission measurements at the mid carrier frequency

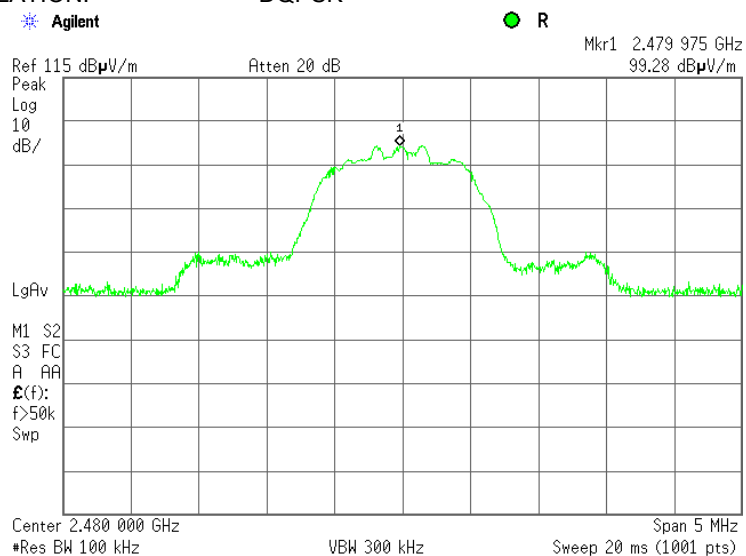
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: DQPSK



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

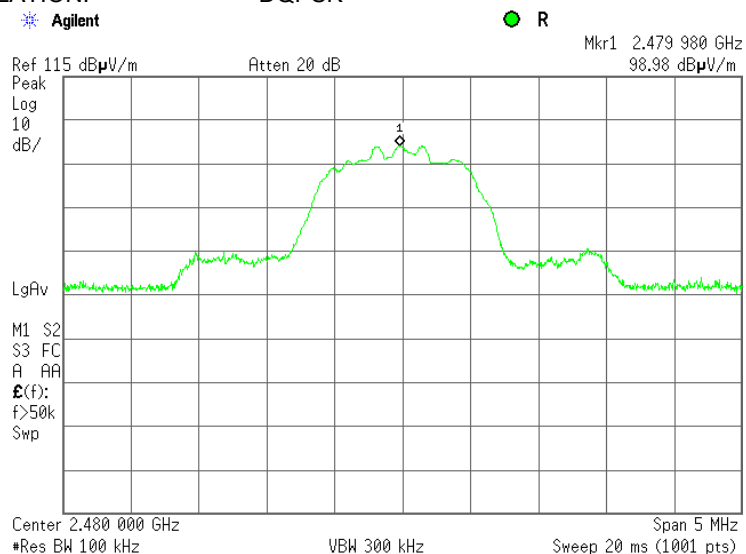
Plot 7.7.11 Radiated emission measurements at the high carrier frequency

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



Plot 7.7.12 Radiated emission measurements at the high carrier frequency

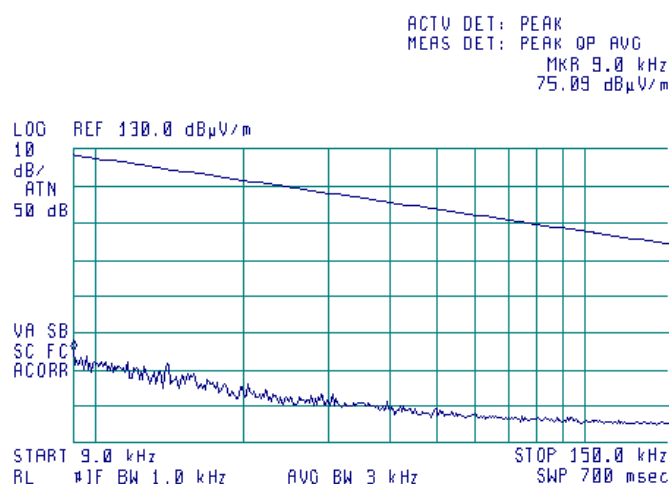
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: DQPSK



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

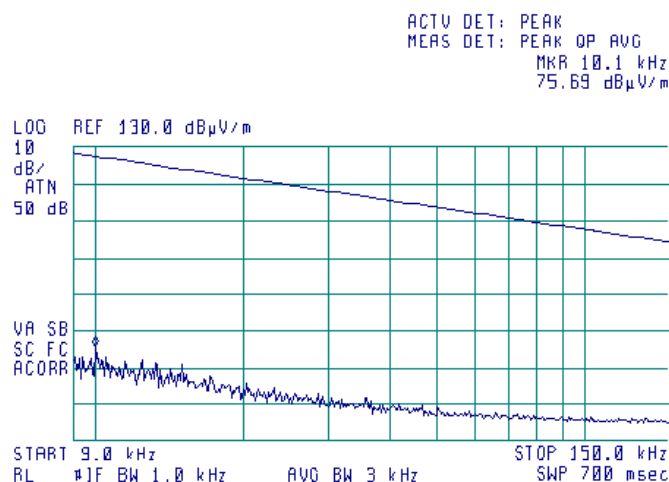
Plot 7.7.13 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

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



Plot 7.7.14 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

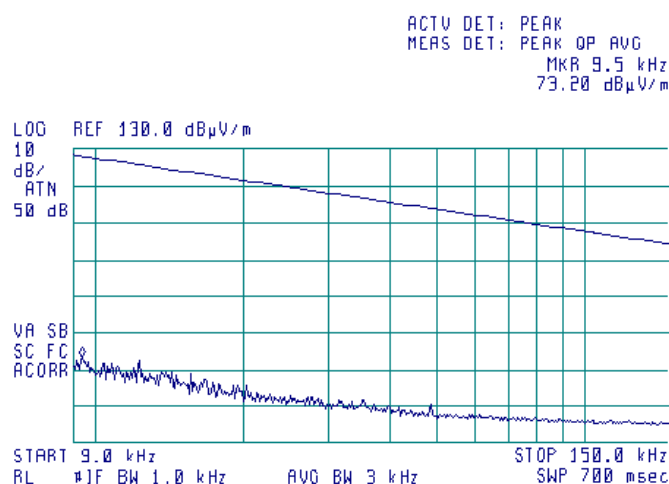
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

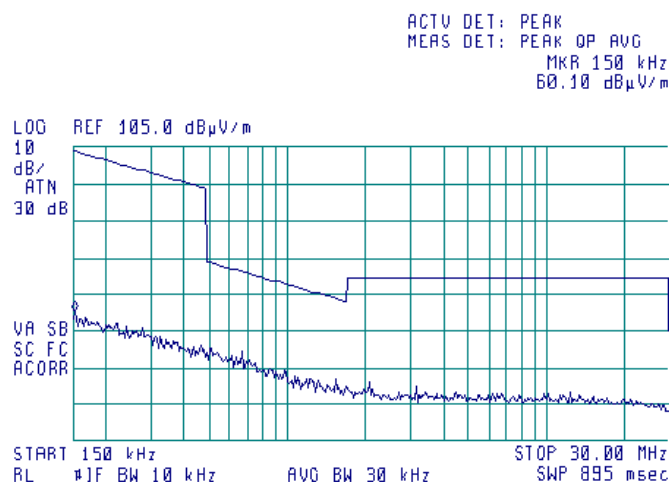
Plot 7.7.15 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

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



Plot 7.7.16 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

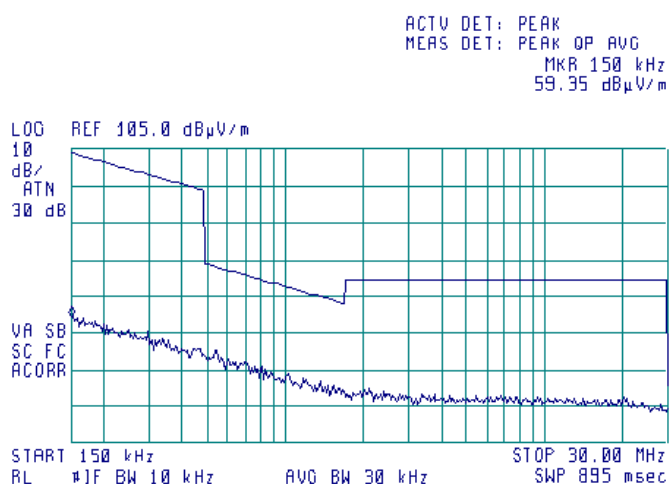
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

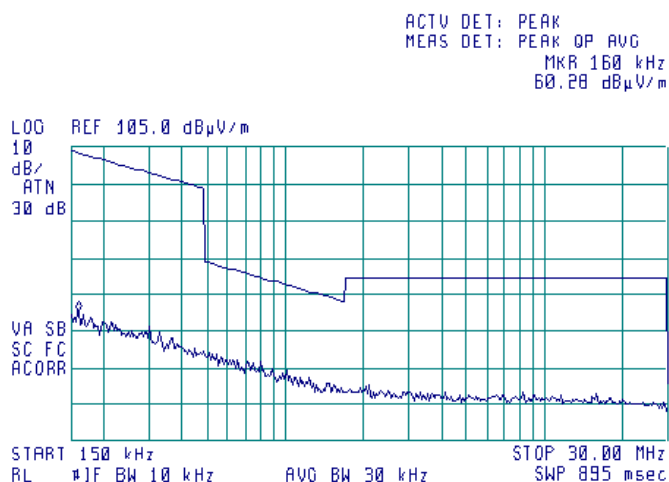
Plot 7.7.17 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

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



Plot 7.7.18 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

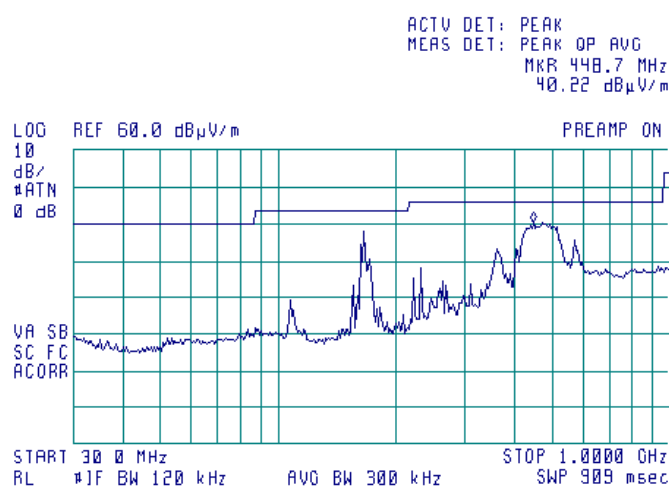
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

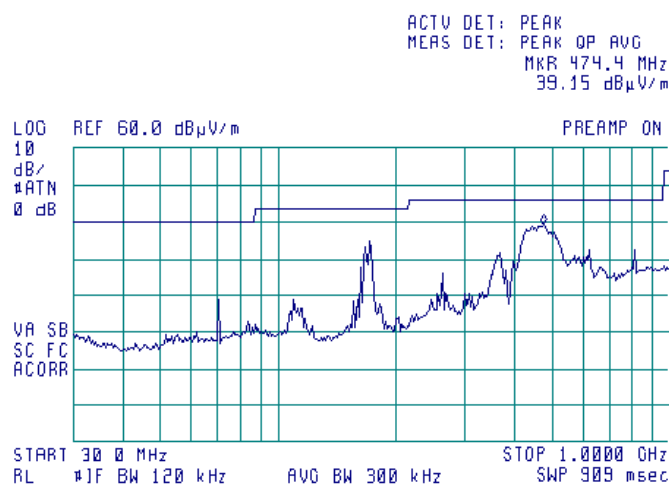
Plot 7.7.19 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

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



Plot 7.7.20 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

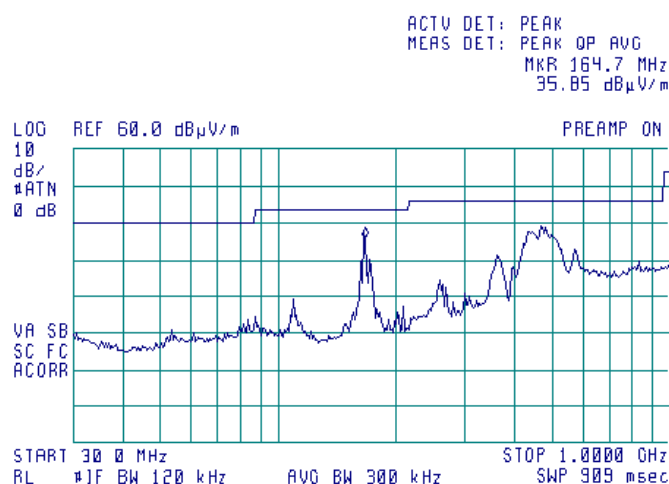
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

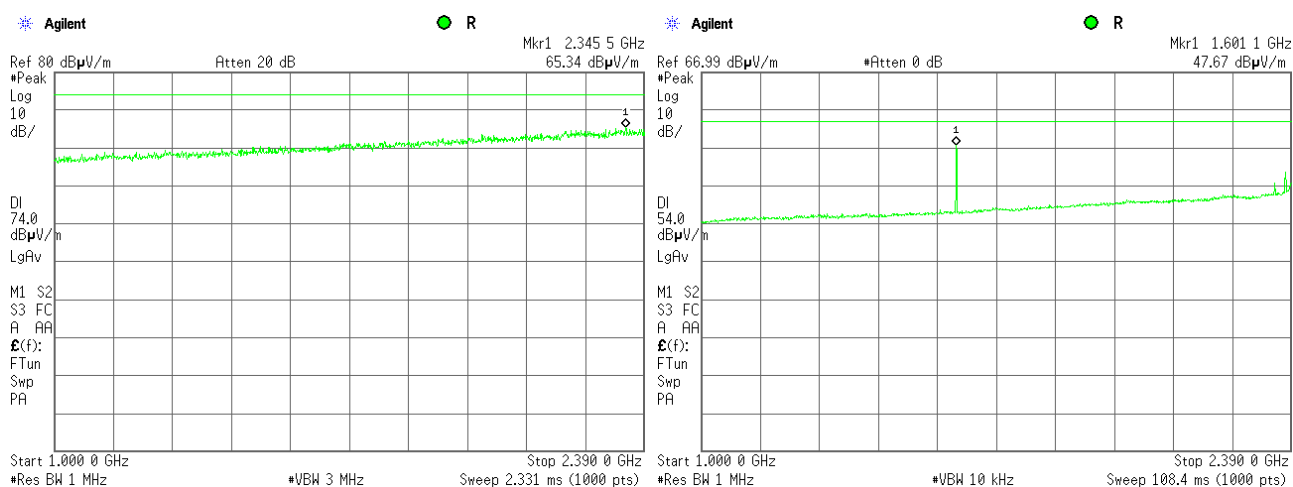
Plot 7.7.21 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

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



Plot 7.7.22 Radiated emission measurements from 1000 to 2400 MHz at the low carrier frequency

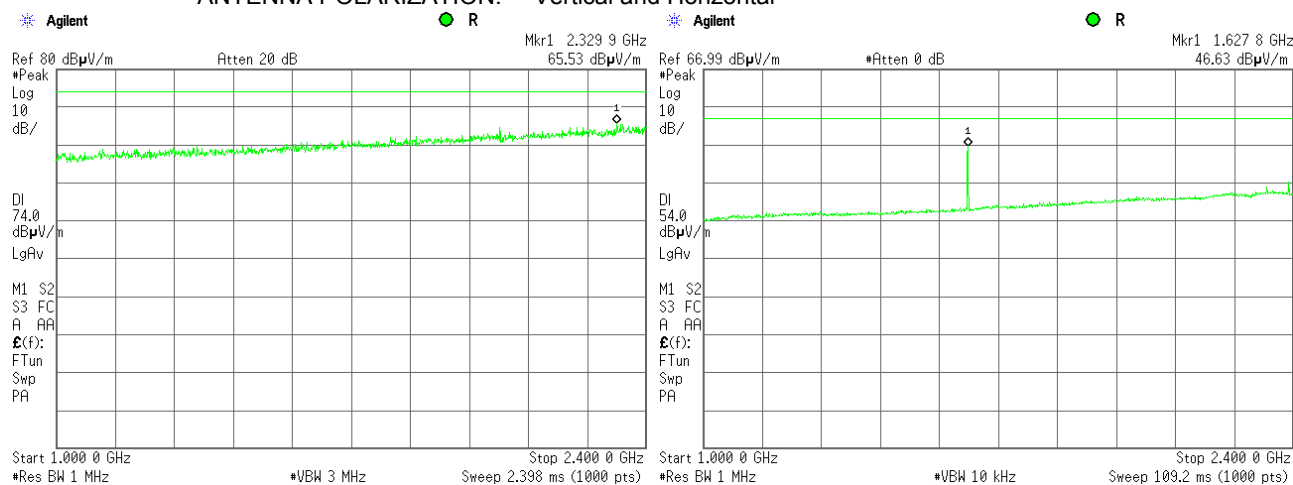
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

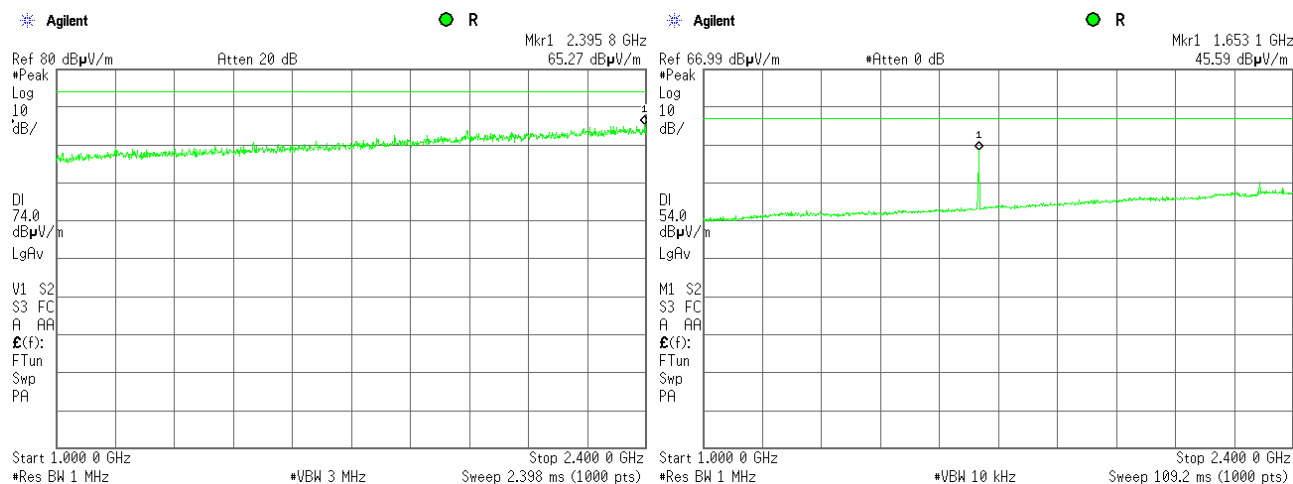
Plot 7.7.23 Radiated emission measurements from 1000 to 2400 MHz at the mid carrier frequency

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



Plot 7.7.24 Radiated emission measurements from 1000 to 2400 MHz at the high carrier frequency

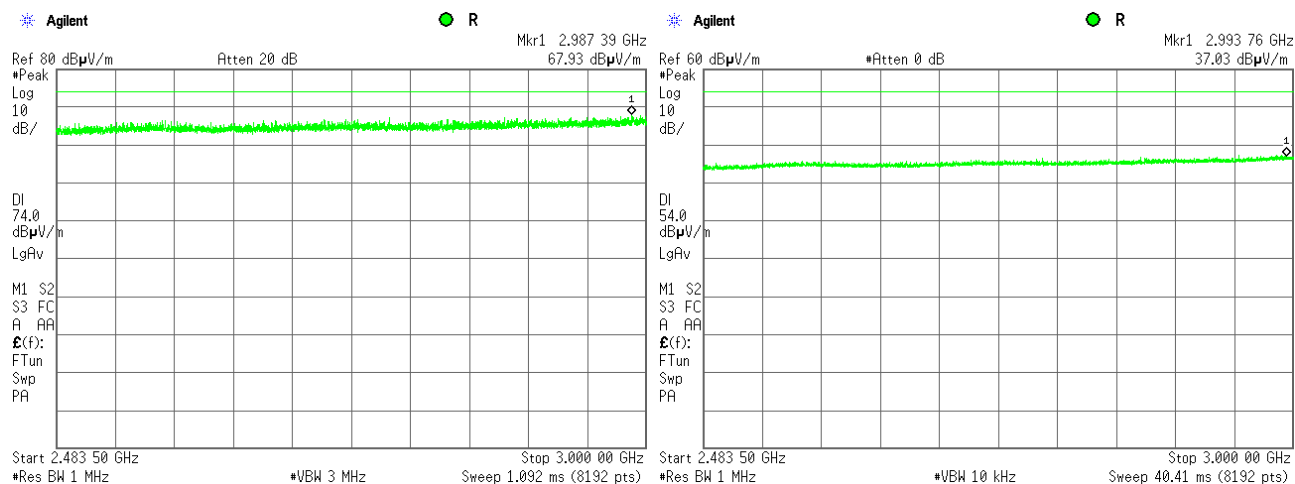
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

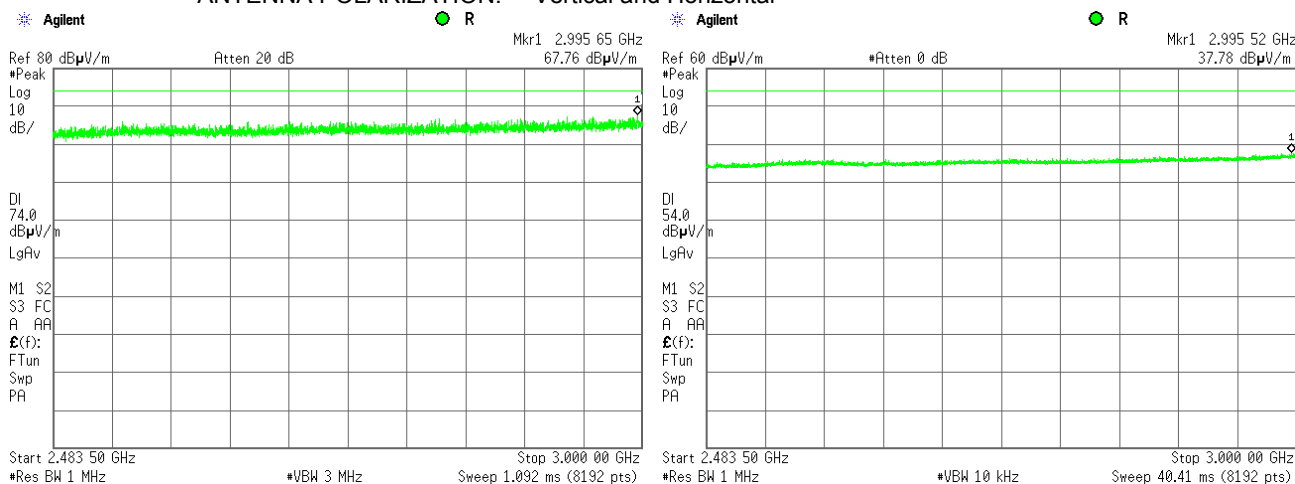
Plot 7.7.25 Radiated emission measurements from 2483.5 to 3000 MHz at the low carrier frequency

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



Plot 7.7.26 Radiated emission measurements from 2483.5 to 3000 MHz at the mid carrier frequency

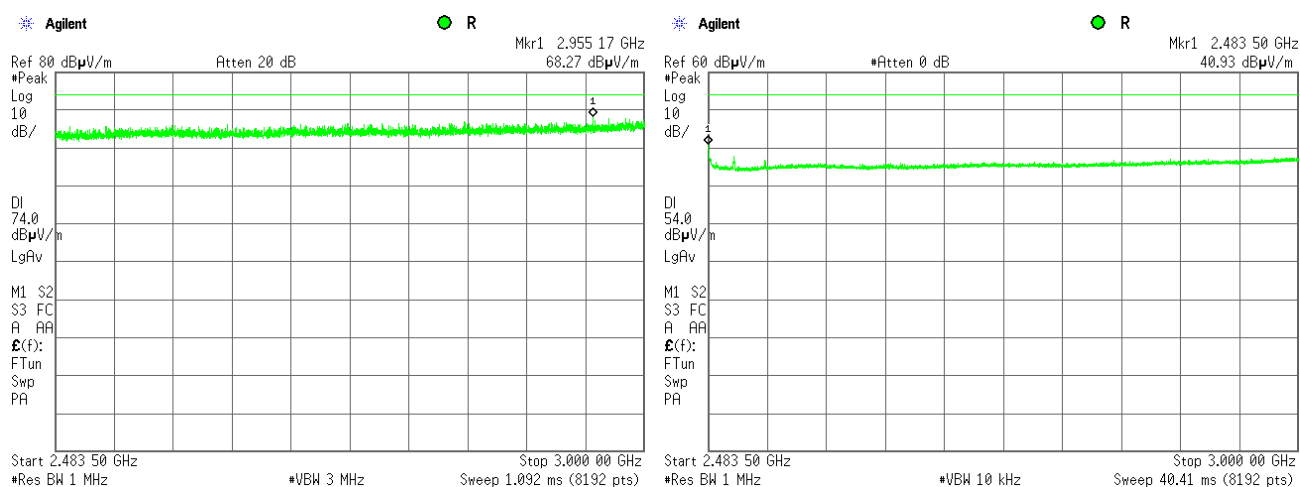
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

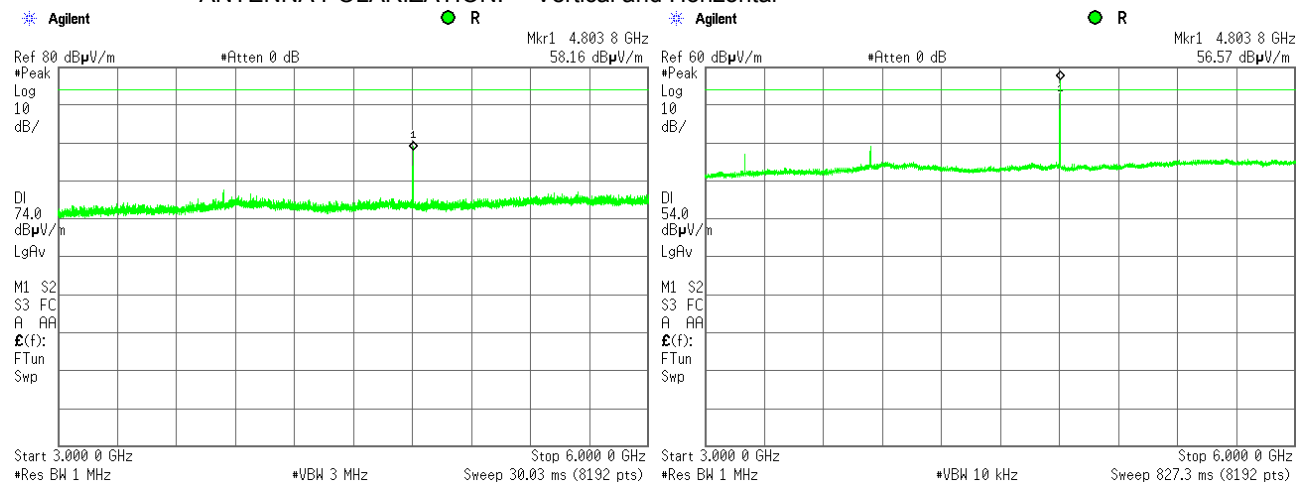
Plot 7.7.27 Radiated emission measurements from 2483.5 to 3000 MHz at the high carrier frequency

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



Plot 7.7.28 Radiated emission measurements from 3000 to 6000 MHz at the low carrier frequency

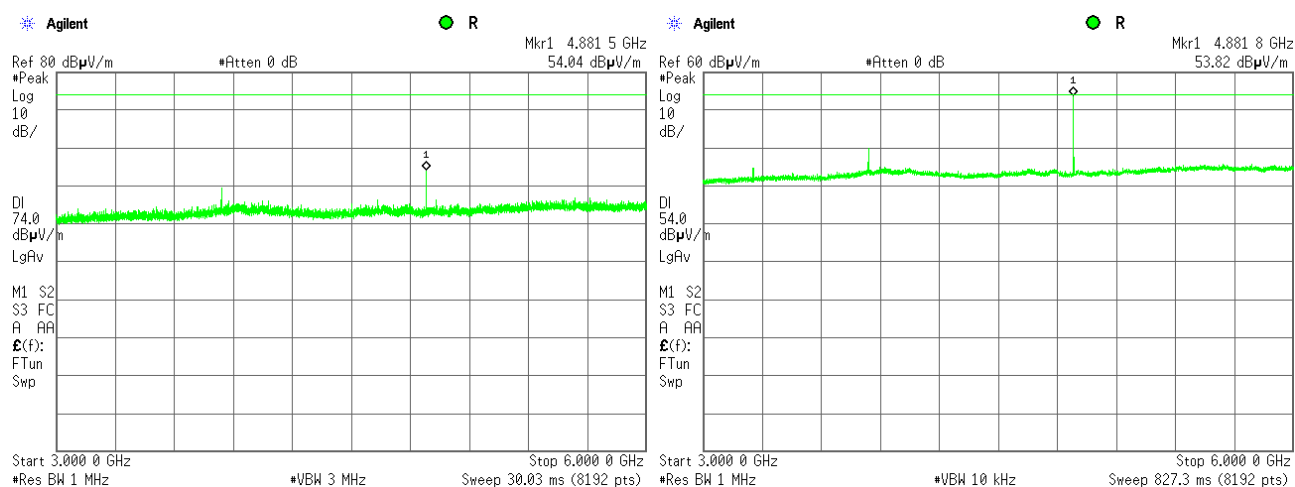
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

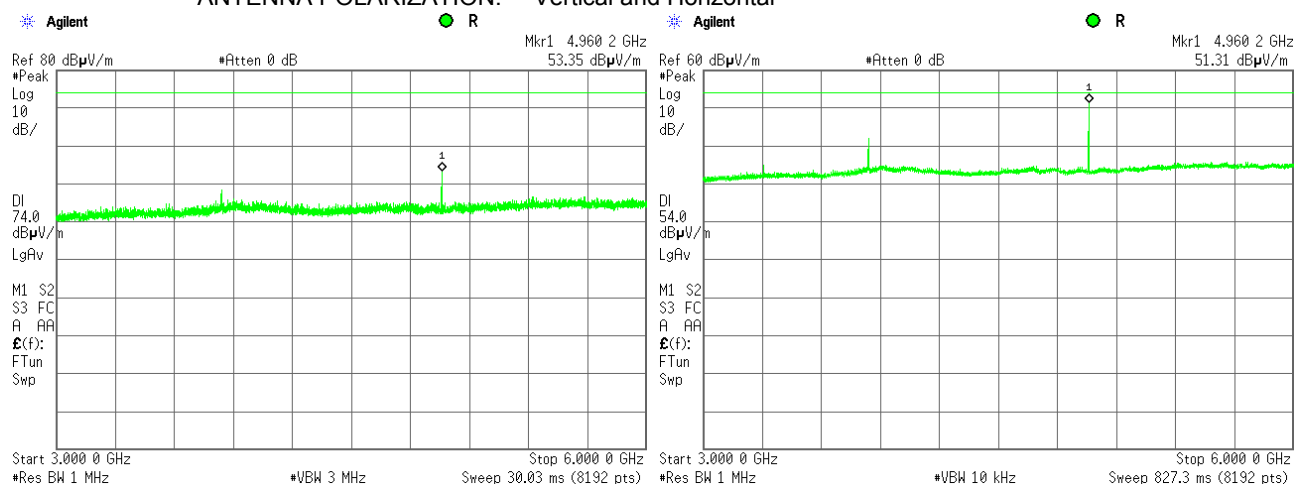
Plot 7.7.29 Radiated emission measurements from 3000 to 6000 MHz at the mid carrier frequency

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



Plot 7.7.30 Radiated emission measurements from 3000 to 6000 MHz at the high carrier frequency

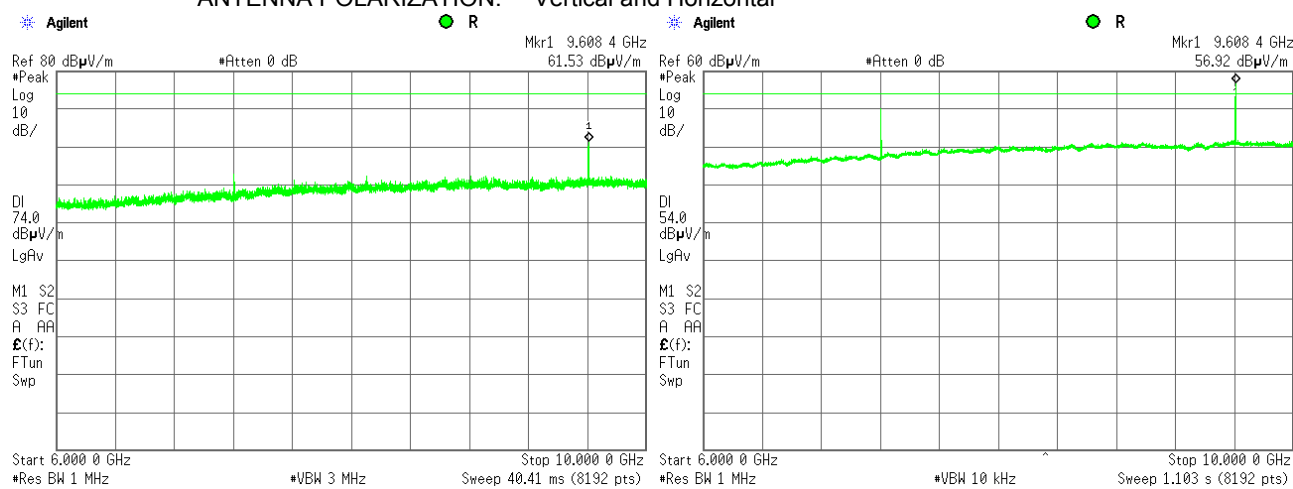
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

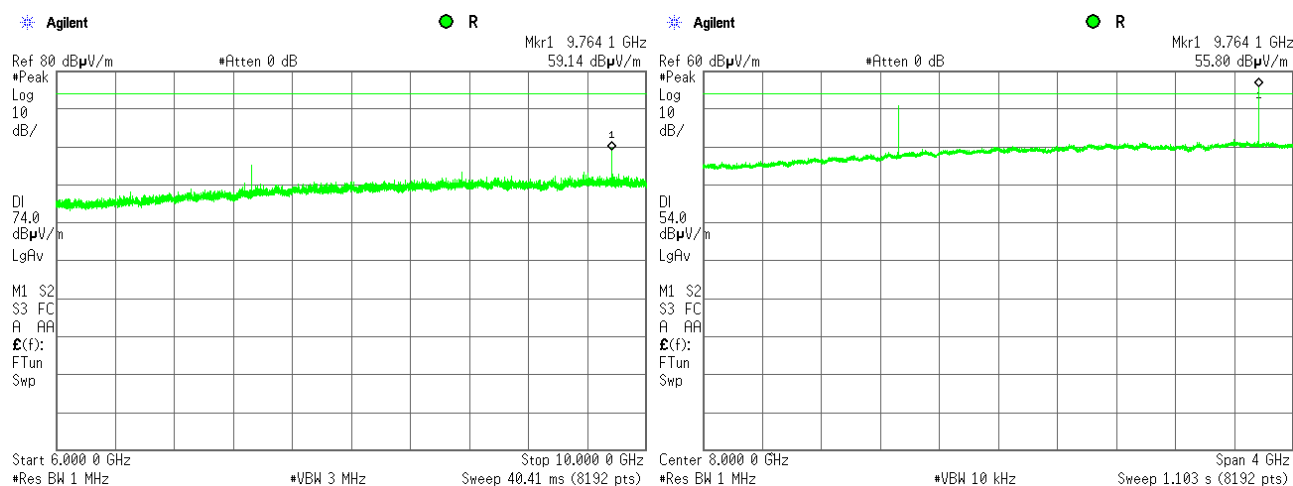
Plot 7.7.31 Radiated emission measurements from 6000to 10000 MHz at the low carrier frequency

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



Plot 7.7.32 Radiated emission measurements from 6000 to 10000 MHz at the mid carrier frequency

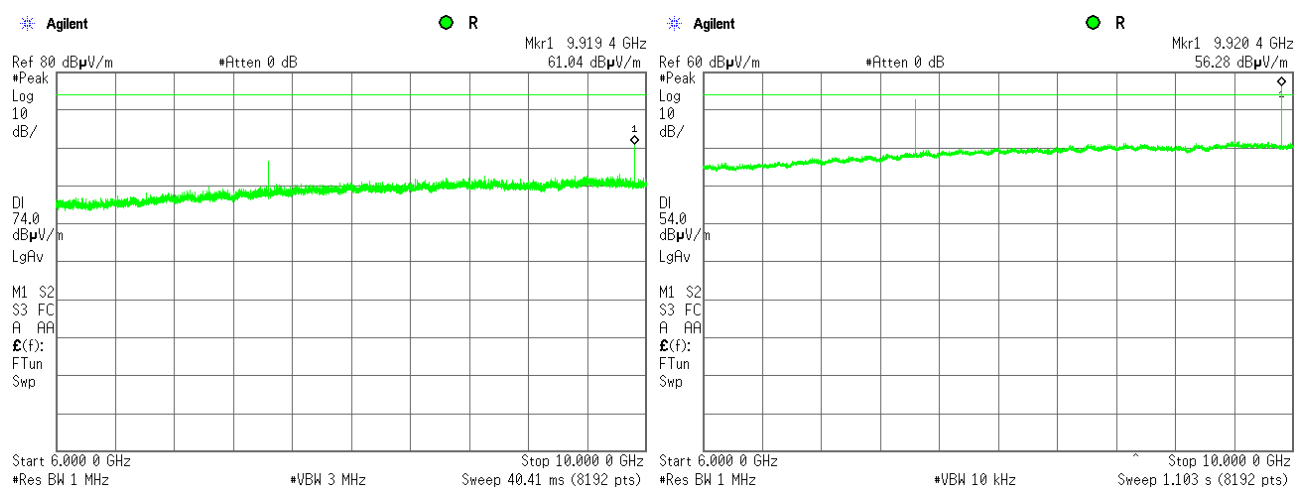
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.7.33 Radiated emission measurements from 6000 to 10000 MHz at the high carrier frequency

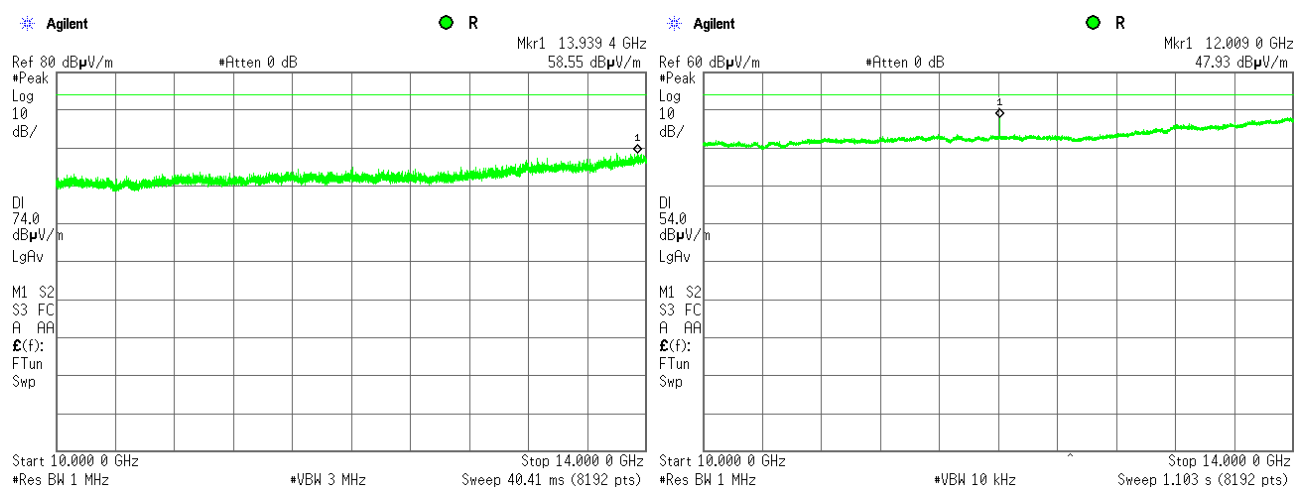
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

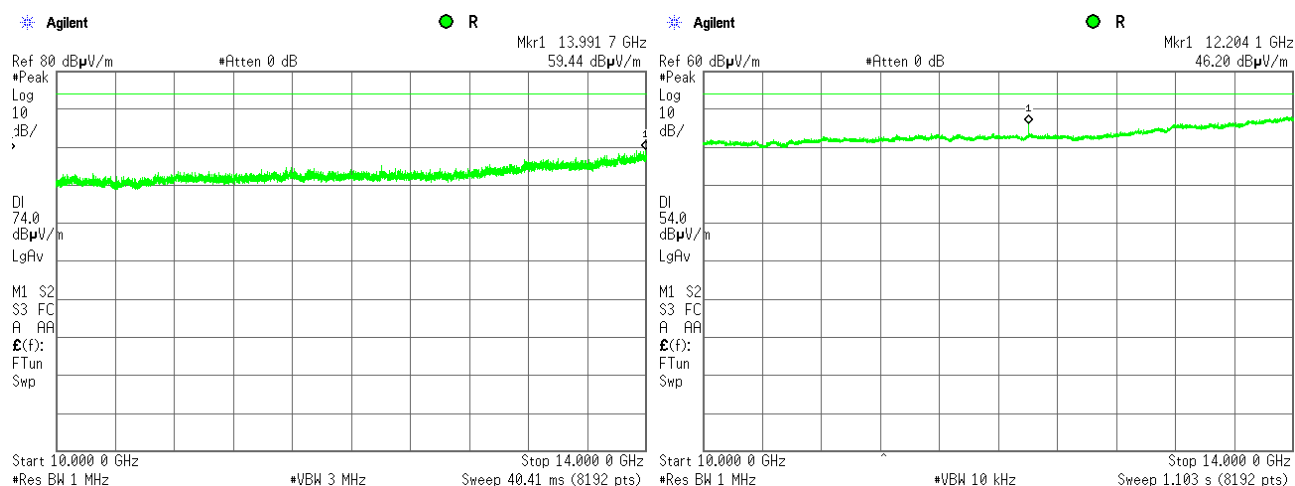
Plot 7.7.34 Radiated emission measurements from 10000 to 14000 MHz at the low carrier frequency

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



Plot 7.7.35 Radiated emission measurements from 10000 to 14000 MHz at the mid carrier frequency

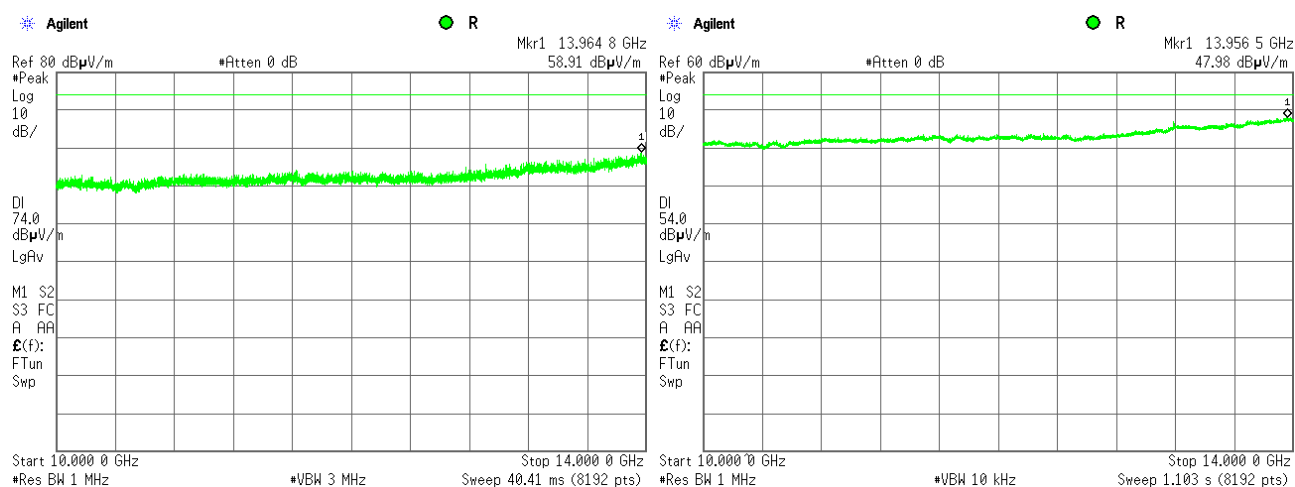
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

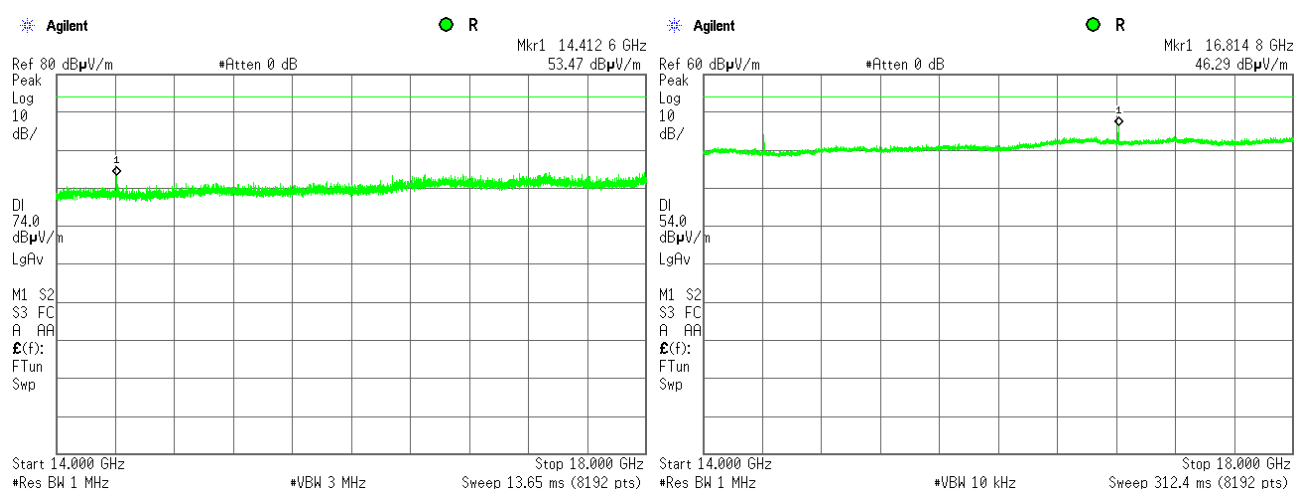
Plot 7.7.36 Radiated emission measurements from 10000 to 14000 MHz at the high carrier frequency

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



Plot 7.7.37 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency

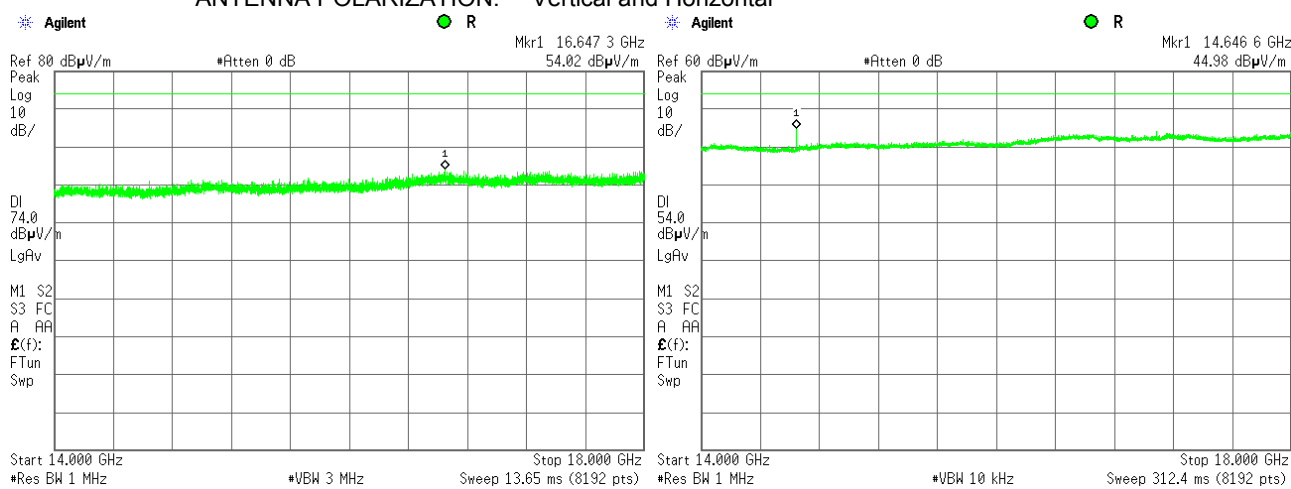
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

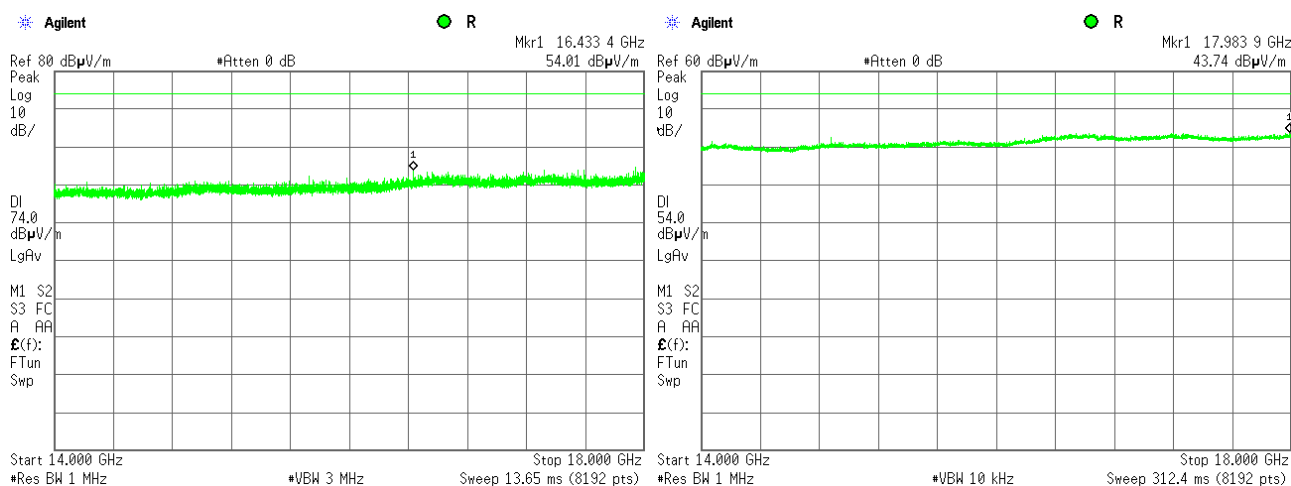
Plot 7.7.38 Radiated emission measurements from 14000 to 18000 MHz at the mid carrier frequency

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



Plot 7.7.39 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency

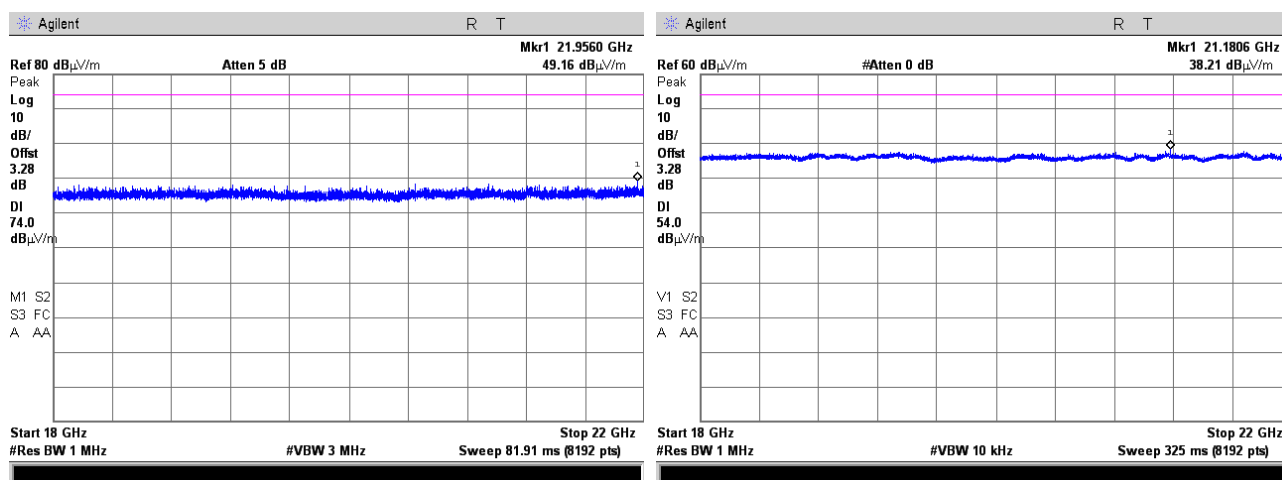
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

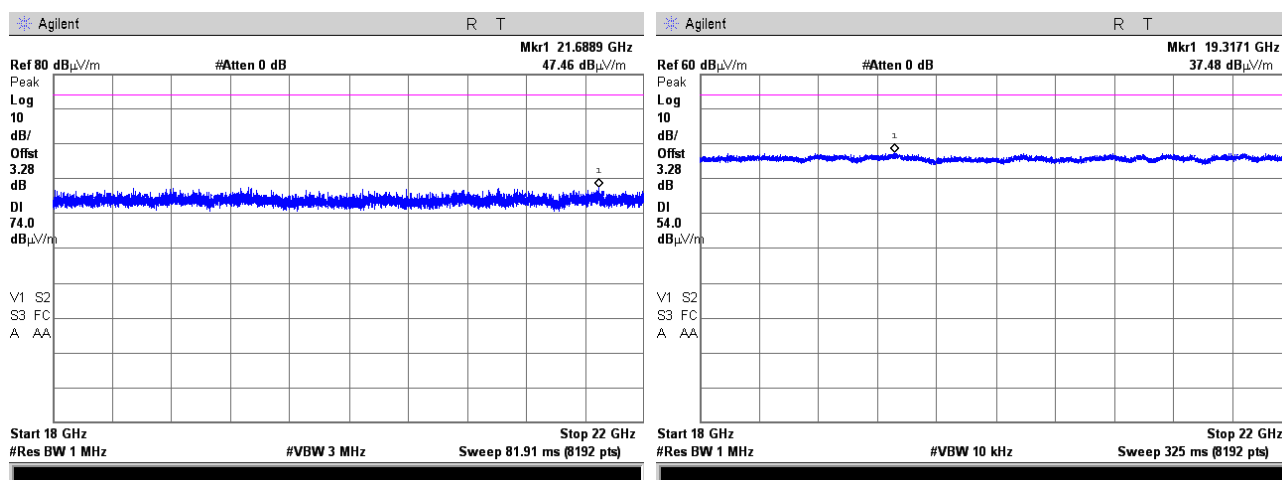
Plot 7.7.40 Radiated emission measurements from 18000to 22000 MHz at the low carrier frequency

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



Plot 7.7.41 Radiated emission measurements from 18000 to 22000 MHz at the mid carrier frequency

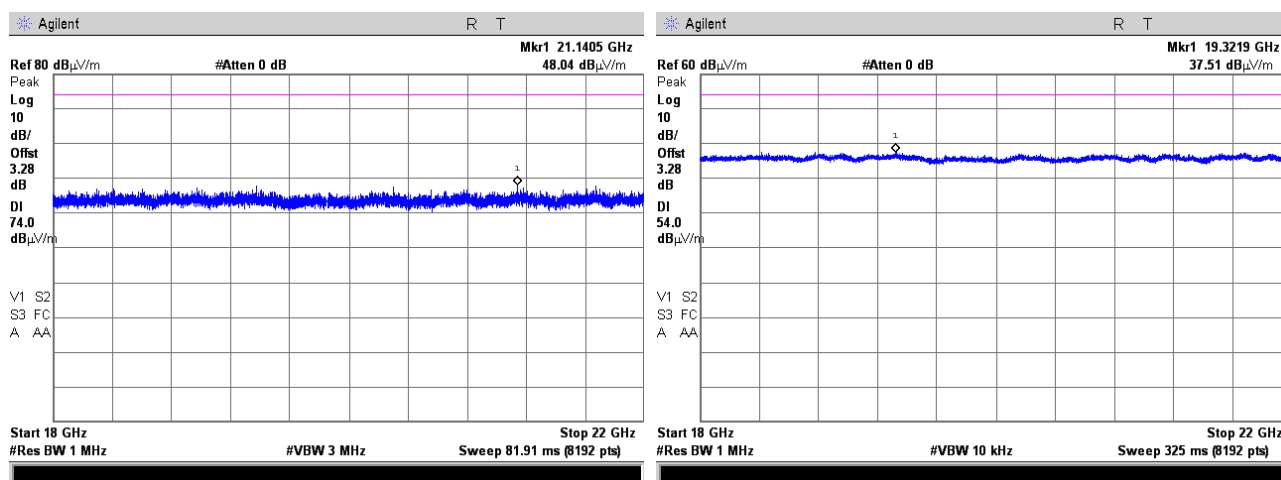
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

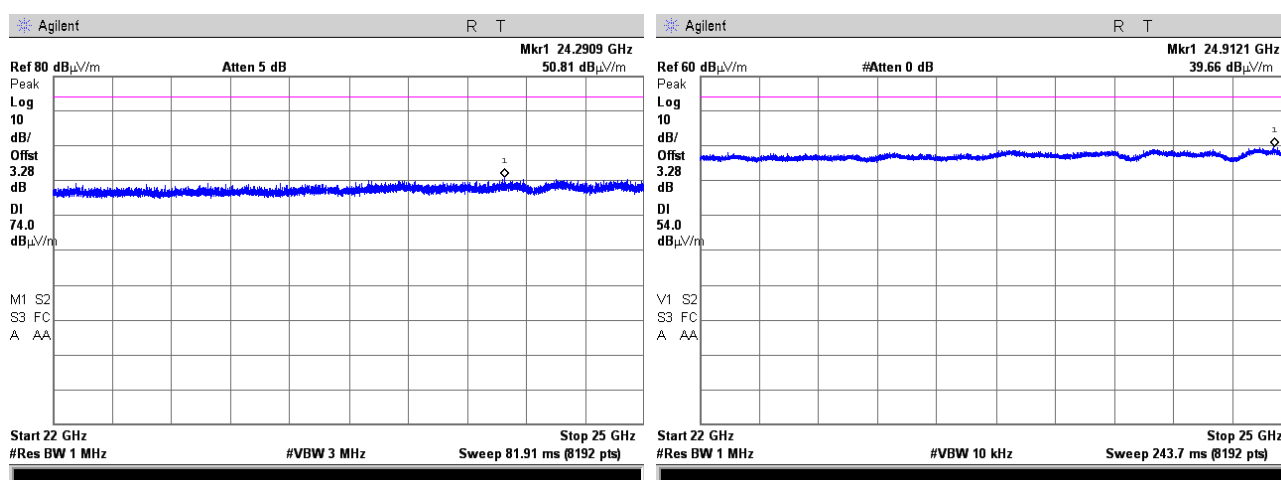
Plot 7.7.42 Radiated emission measurements from 18000 to 22000 MHz at the high carrier frequency

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



Plot 7.7.43 Radiated emission measurements from 22000to 25000 MHz at the low carrier frequency

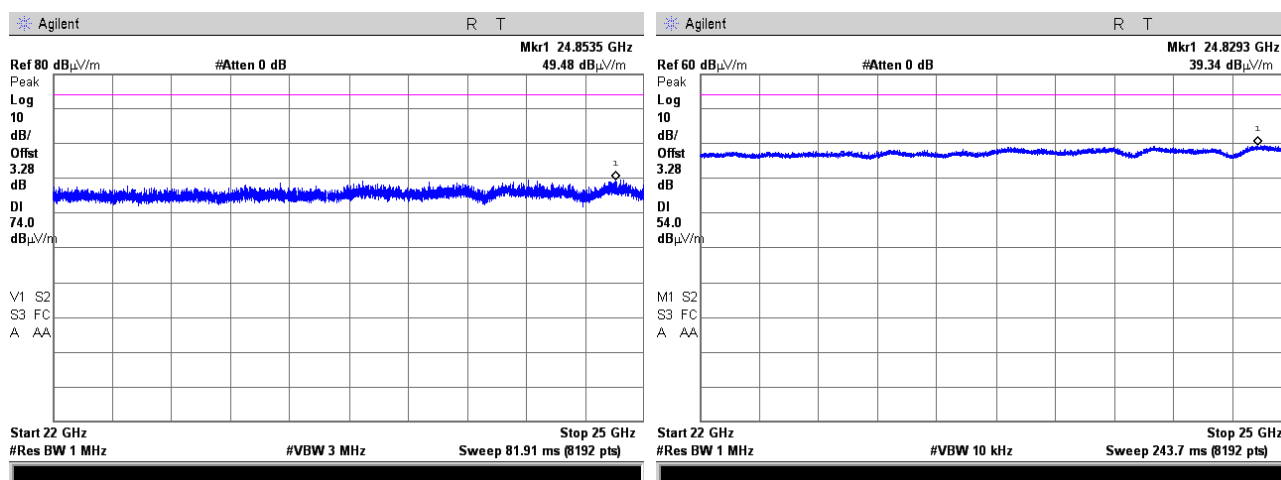
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

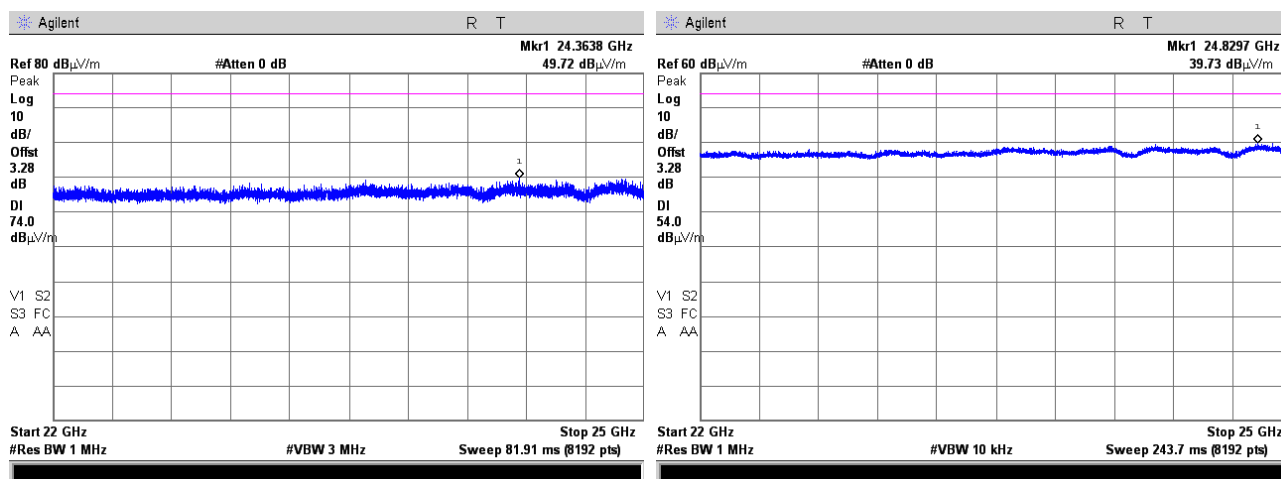
Plot 7.7.44 Radiated emission measurements from 22000 to 25000 MHz at the mid carrier frequency

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



Plot 7.7.45 Radiated emission measurements from 22000 to 25000 MHz at the high carrier frequency

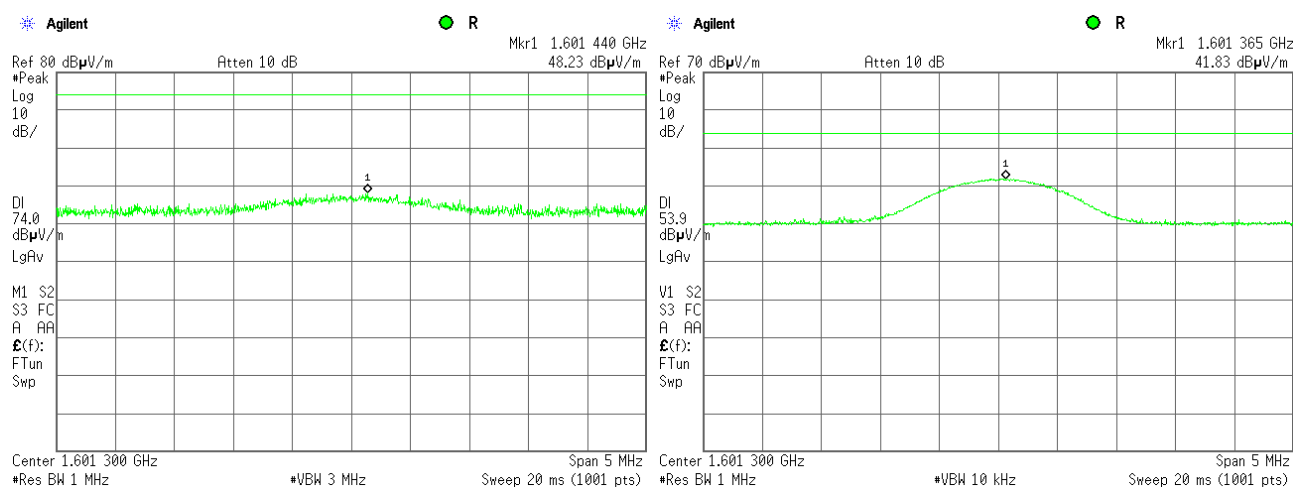
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

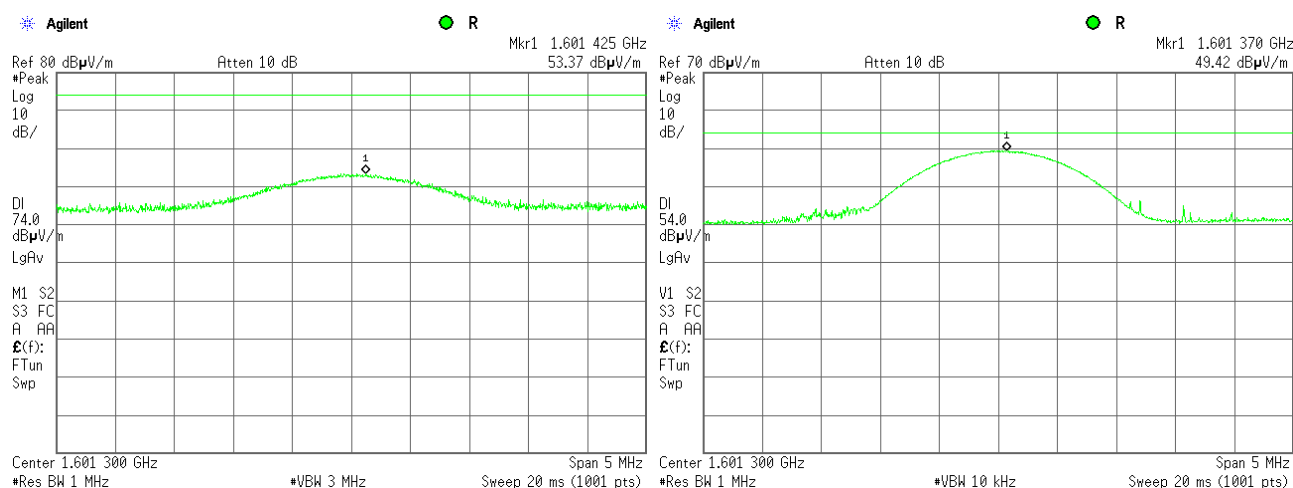
Plot 7.7.46 Radiated emission measurements at the 1.6 GHz at low carrier frequency

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



Plot 7.7.47 Radiated emission measurements at the 1.6 GHz at low carrier frequency

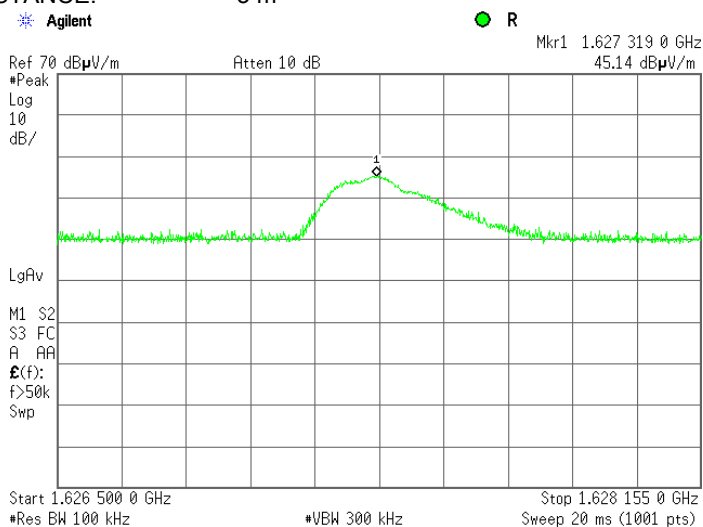
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

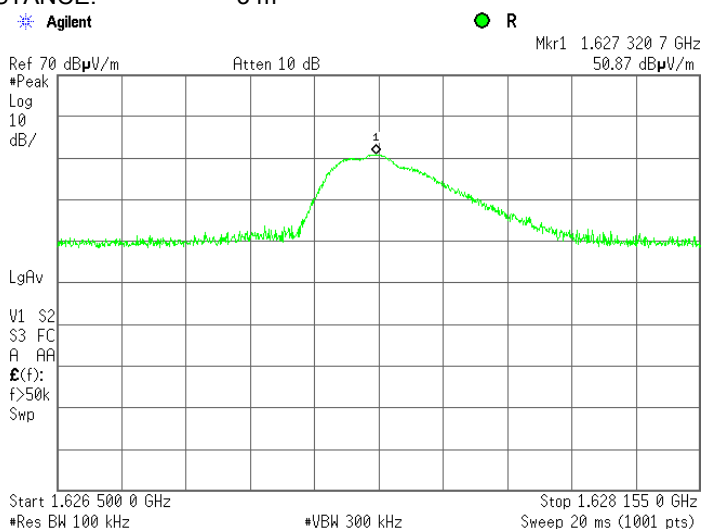
Plot 7.7.48 Radiated emission measurements at the 1.6 GHz at mid carrier frequency

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



Plot 7.7.49 Radiated emission measurements at the 1.6 GHz at mid carrier frequency

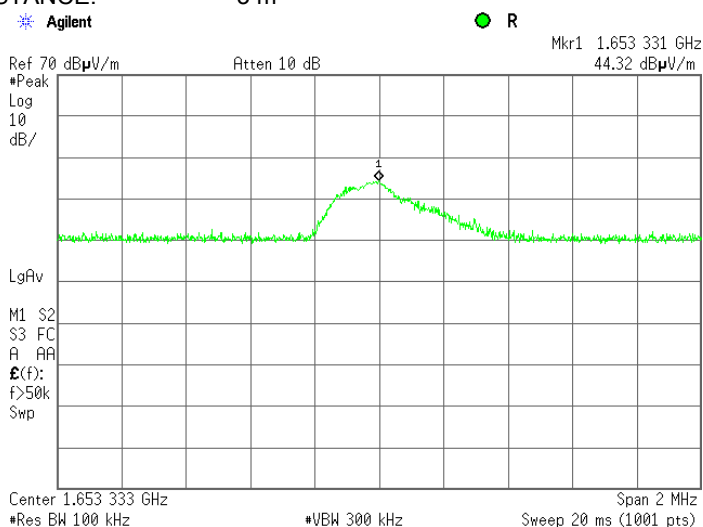
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

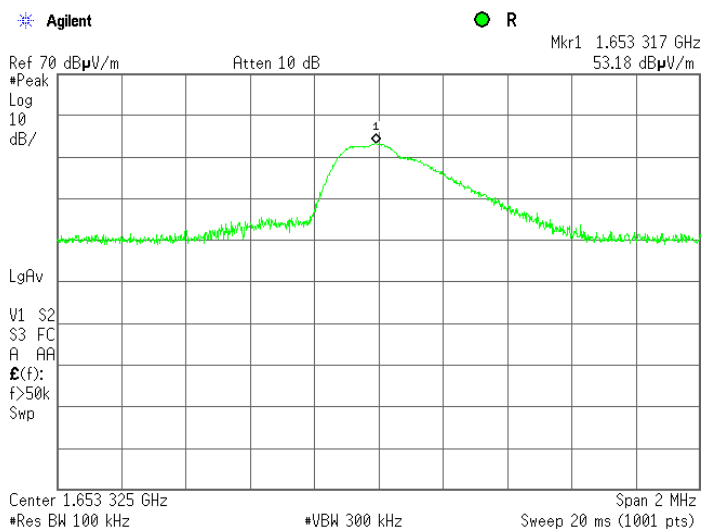
Plot 7.7.50 Radiated emission measurements at the 1.6 GHz at high carrier frequency

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



Plot 7.7.51 Radiated emission measurements at the 1.6 GHz at high carrier frequency

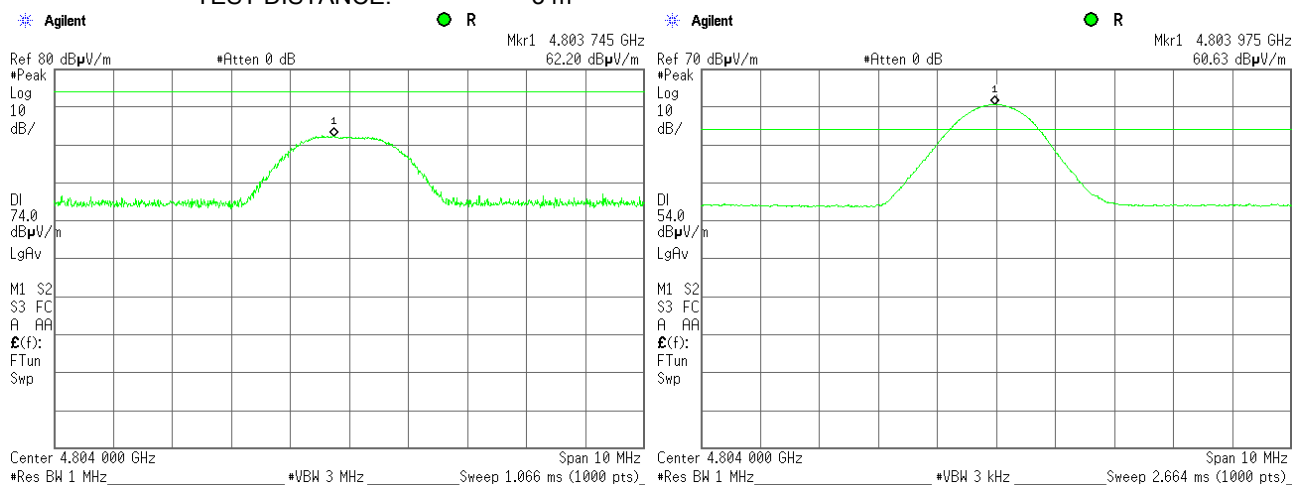
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

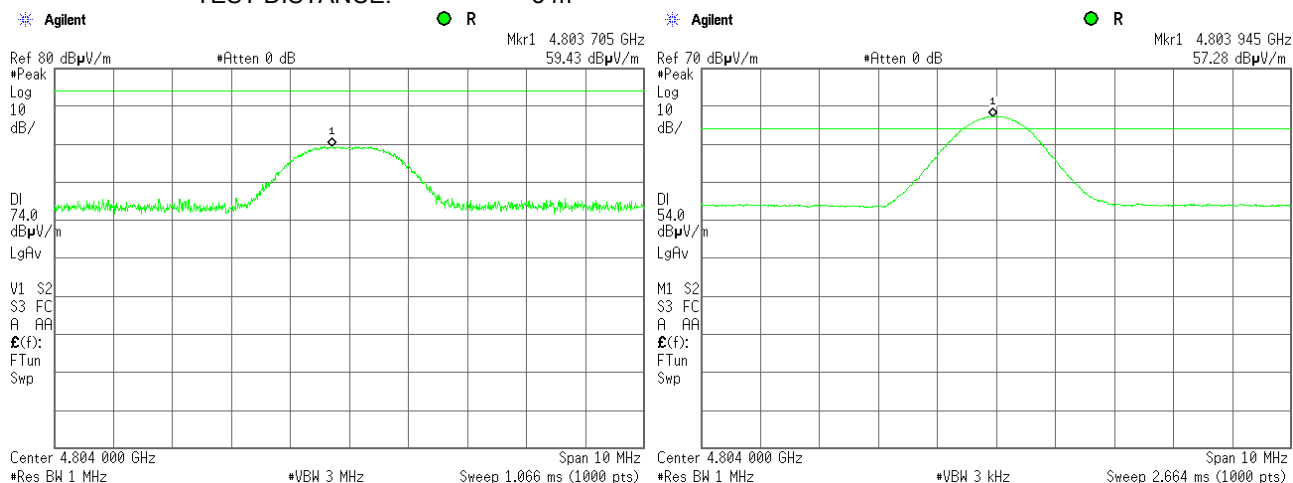
Plot 7.7.52 Radiated emission measurements at the second harmonic of low carrier frequency

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



Plot 7.7.53 Radiated emission measurements at the second harmonic of low carrier frequency

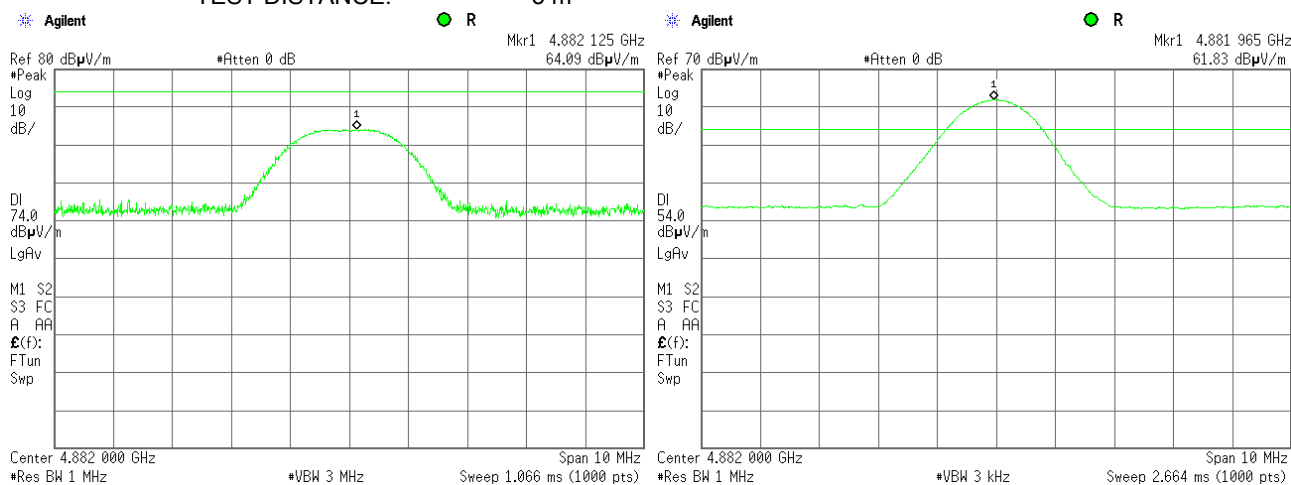
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

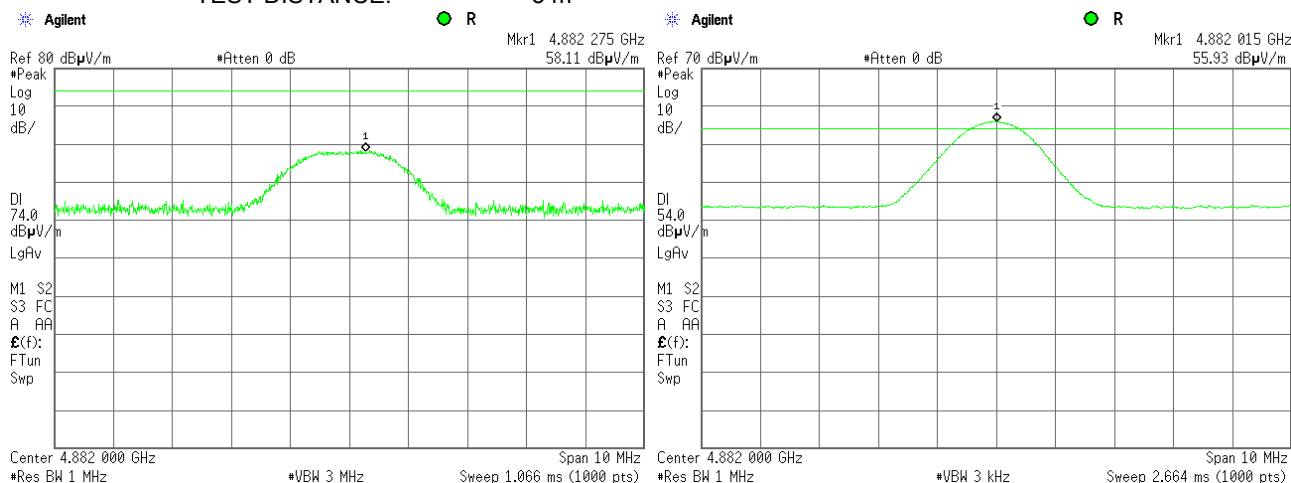
Plot 7.7.54 Radiated emission measurements at the second harmonic of mid carrier frequency

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



Plot 7.7.55 Radiated emission measurements at the second harmonic of mid carrier frequency

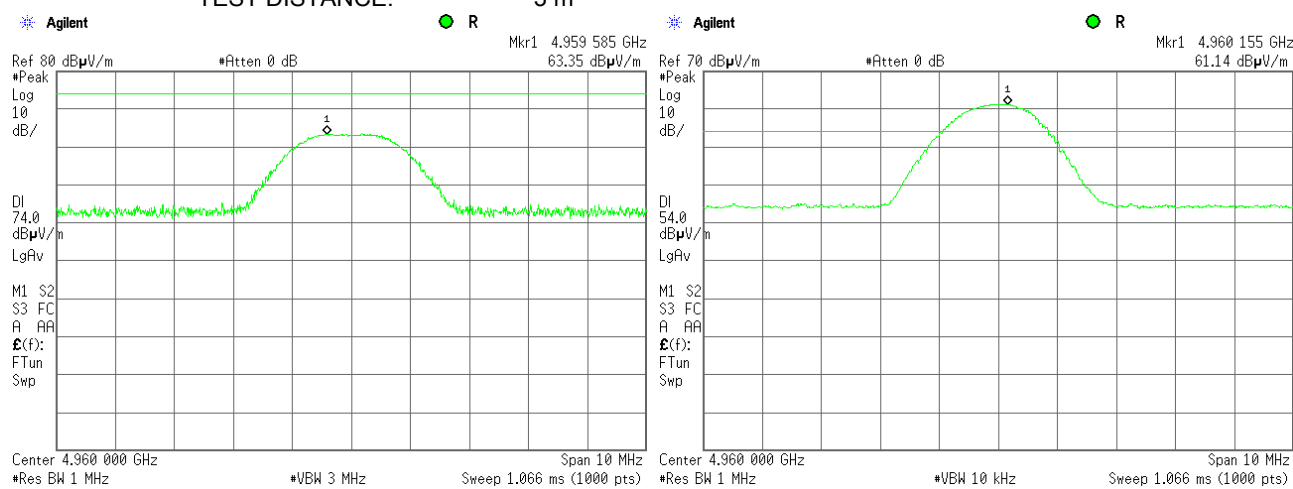
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

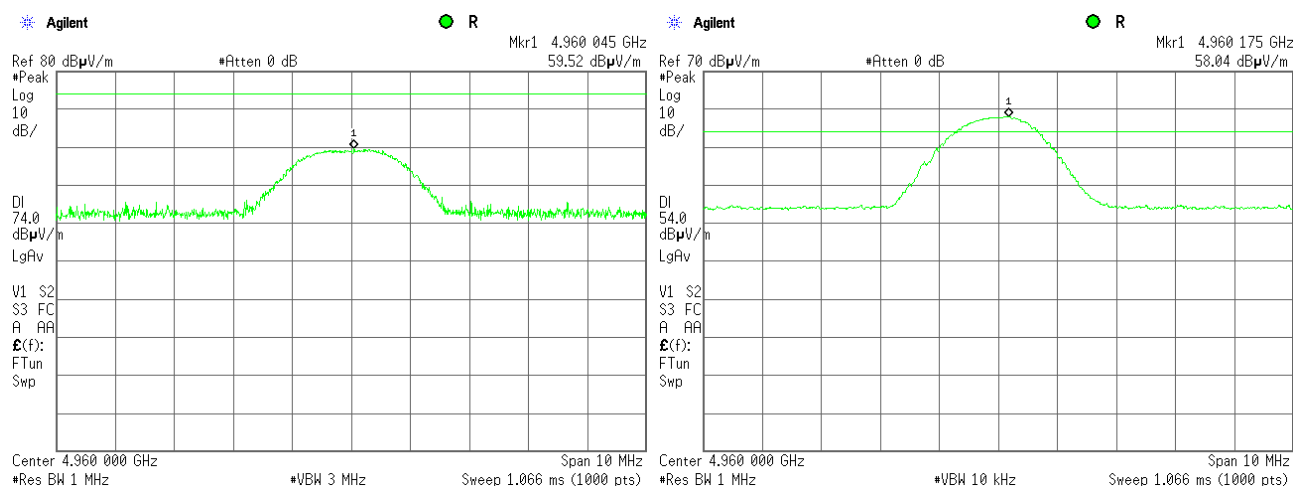
Plot 7.7.56 Radiated emission measurements at the second harmonic of high carrier frequency

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



Plot 7.7.57 Radiated emission measurements at the second harmonic of high carrier frequency

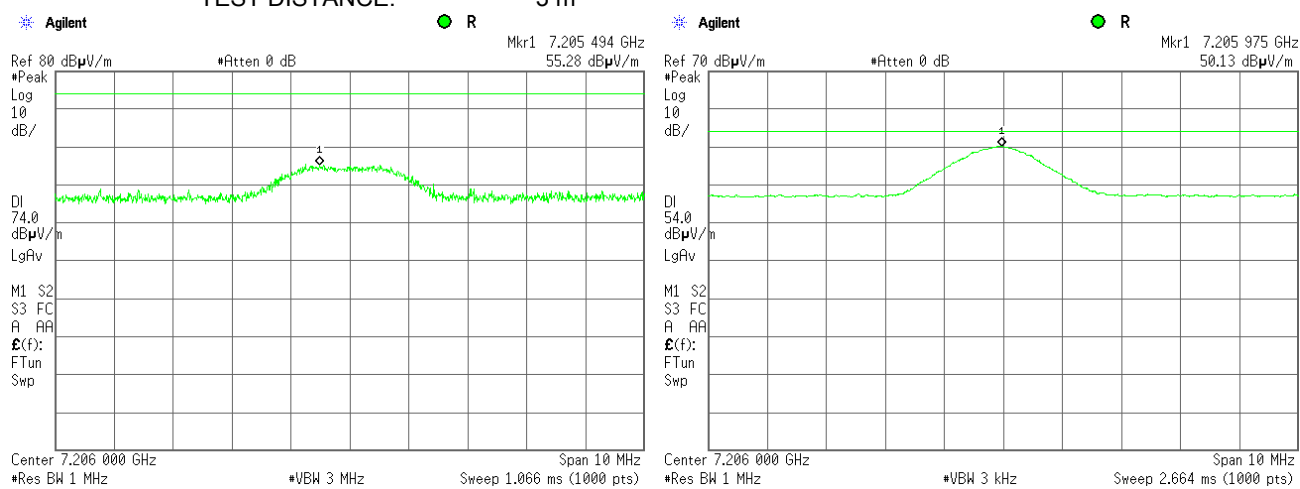
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

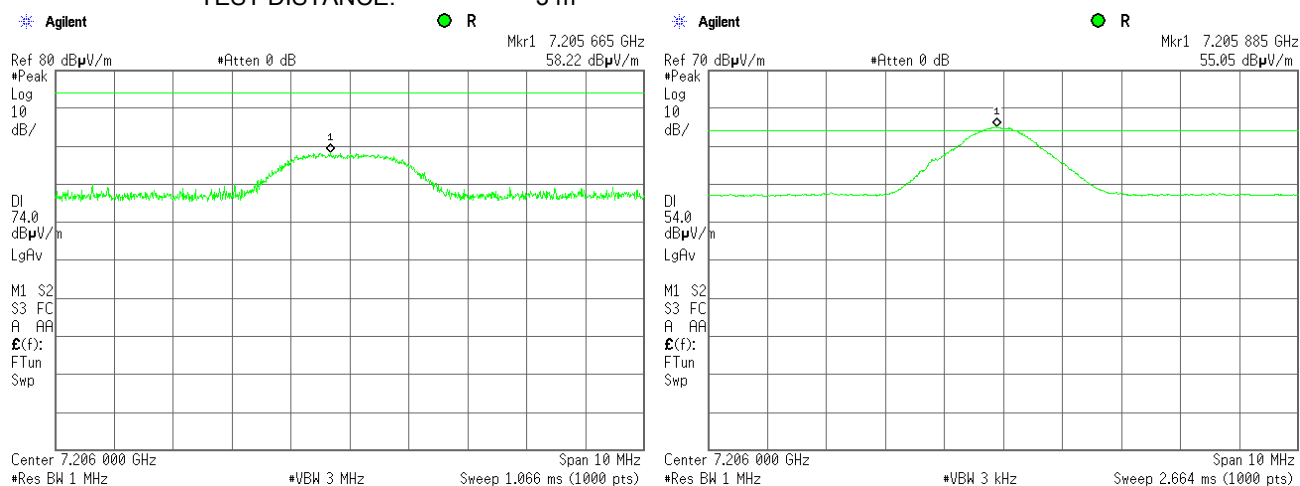
Plot 7.7.58 Radiated emission measurements at the third harmonic of low carrier frequency

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



Plot 7.7.59 Radiated emission measurements at the third harmonic of low carrier frequency

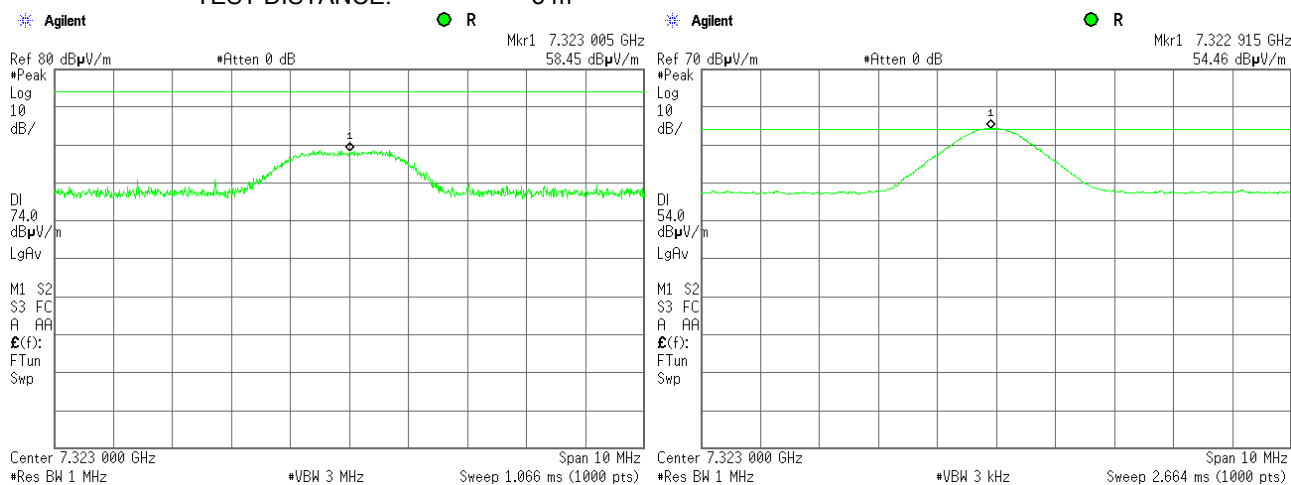
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

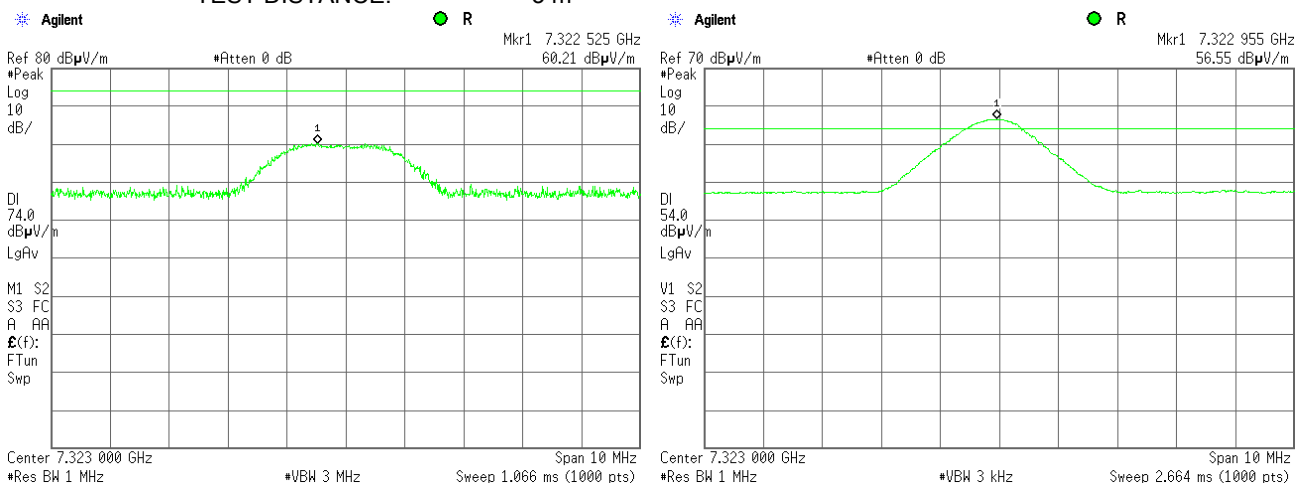
Plot 7.7.60 Radiated emission measurements at the third harmonic of mid carrier frequency

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



Plot 7.7.61 Radiated emission measurements at the third harmonic of mid carrier frequency

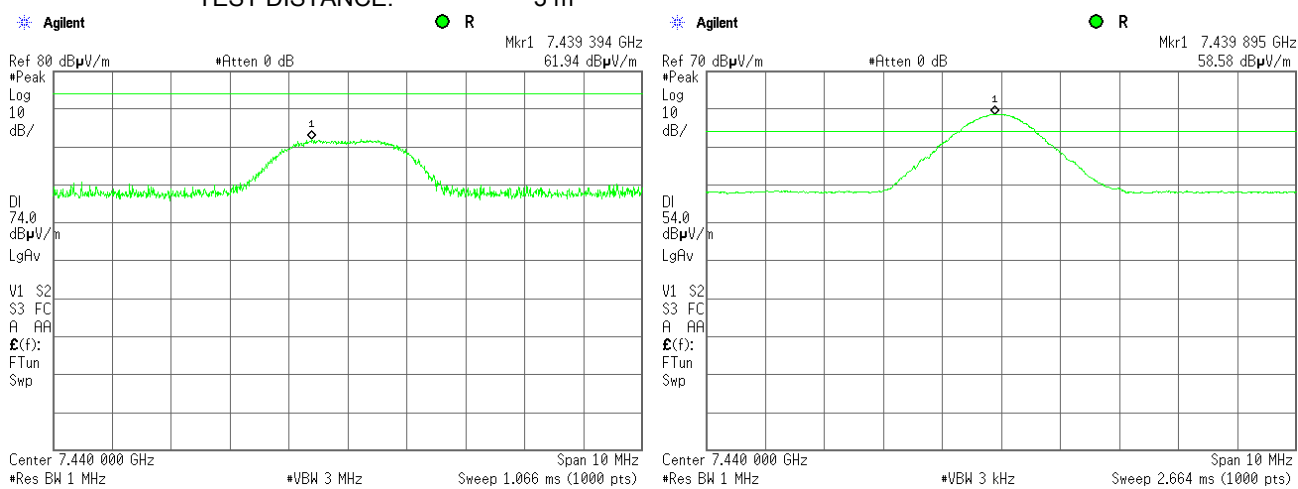
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

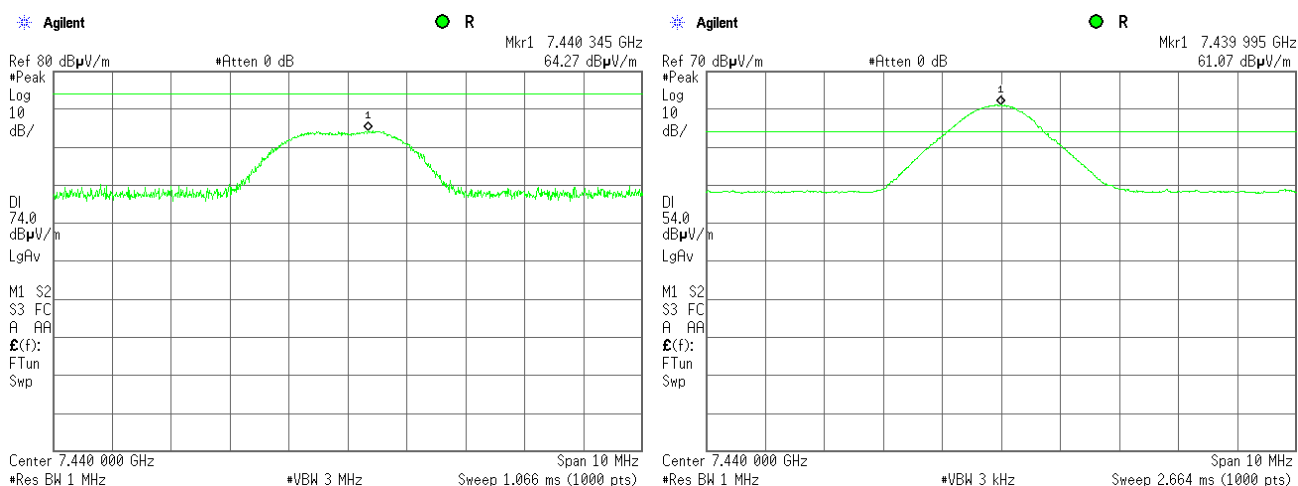
Plot 7.7.62 Radiated emission measurements at the third harmonic of high carrier frequency

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



Plot 7.7.63 Radiated emission measurements at the third harmonic of high carrier frequency

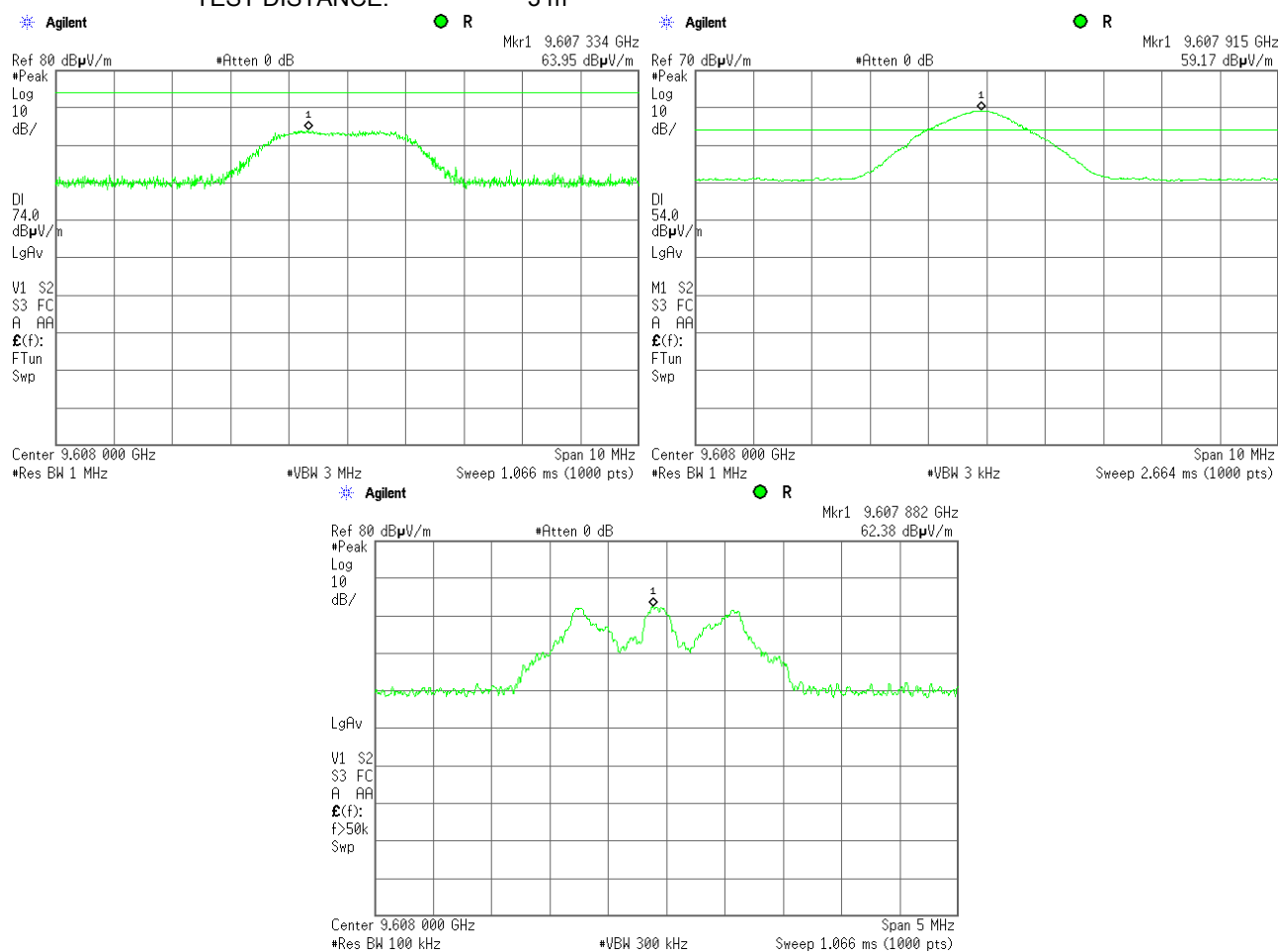
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.7.64 Radiated emission measurements at the fourth harmonic of low carrier frequency

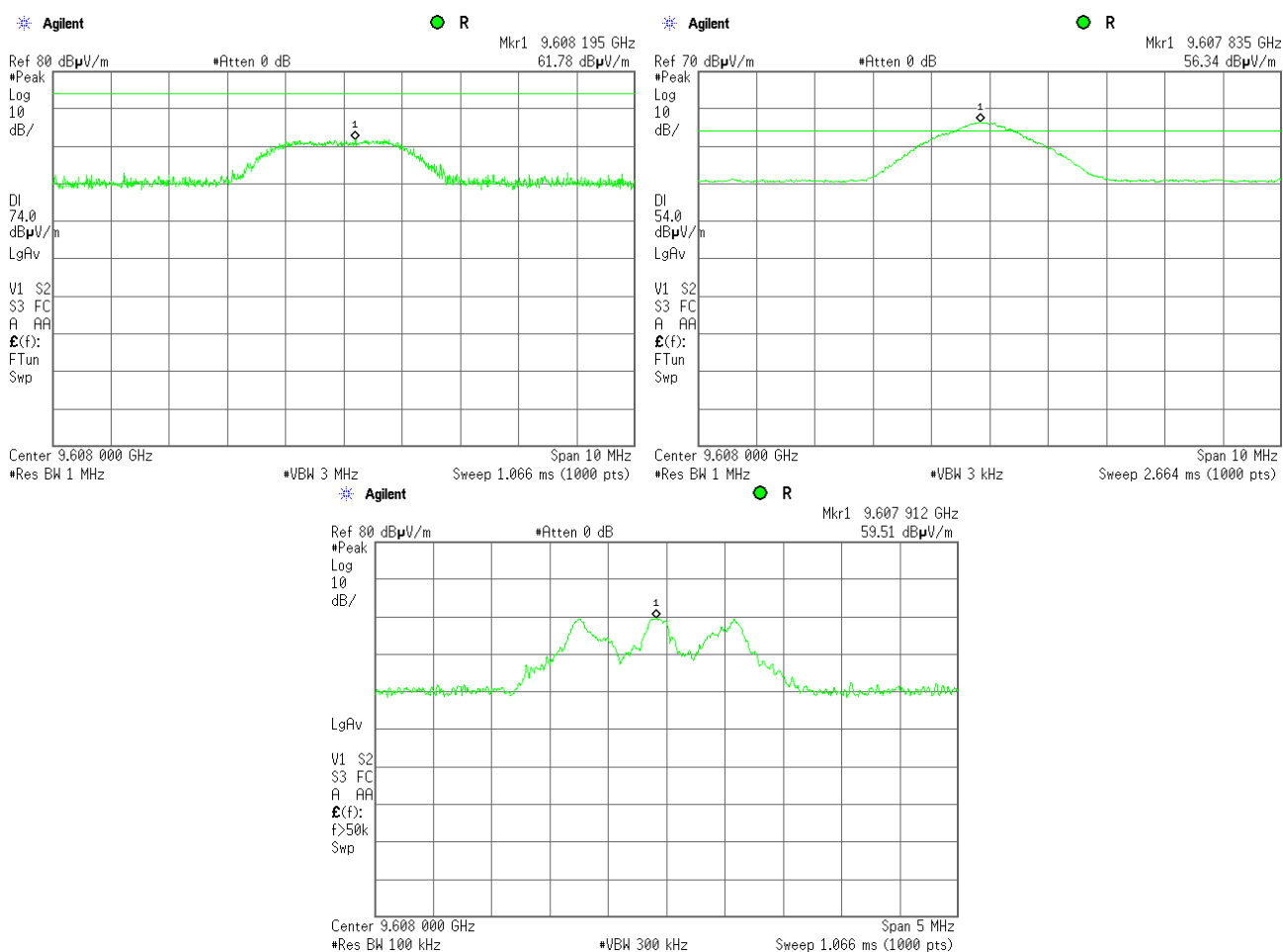
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.7.65 Radiated emission measurements at the fourth harmonic of low carrier frequency

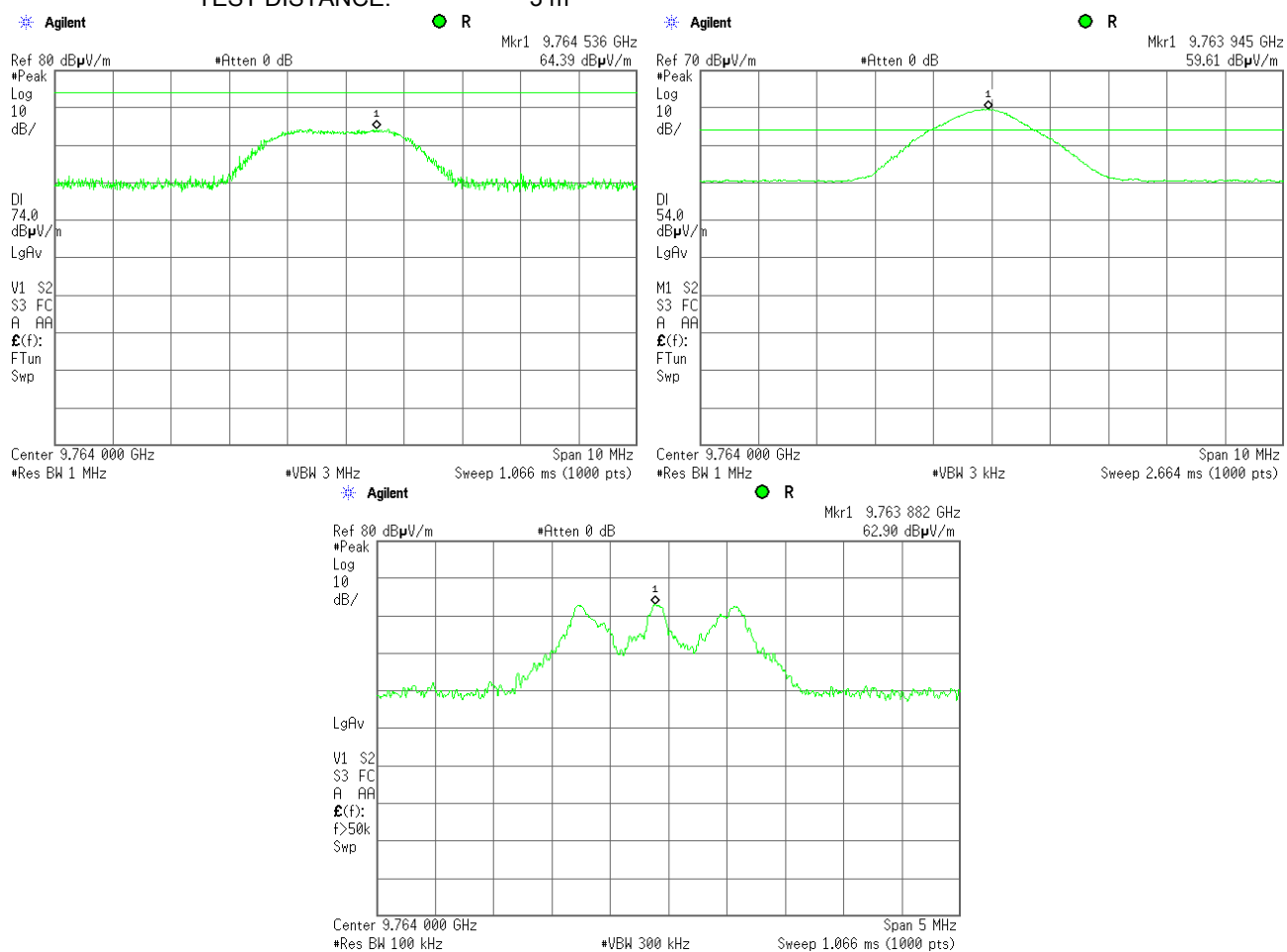
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.7.66 Radiated emission measurements at the fourth harmonic of mid carrier frequency

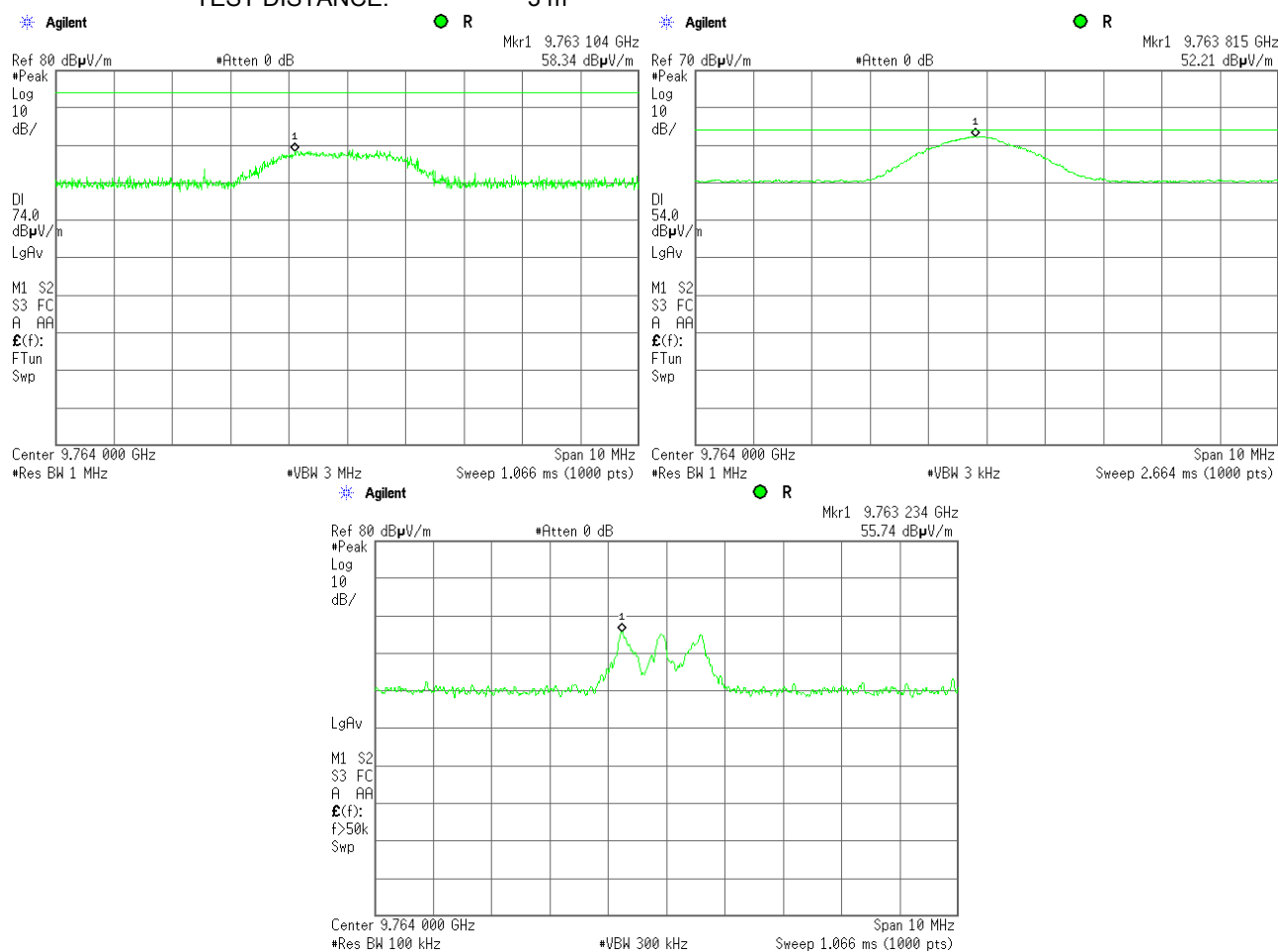
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.7.67 Radiated emission measurements at the fourth harmonic of mid carrier frequency

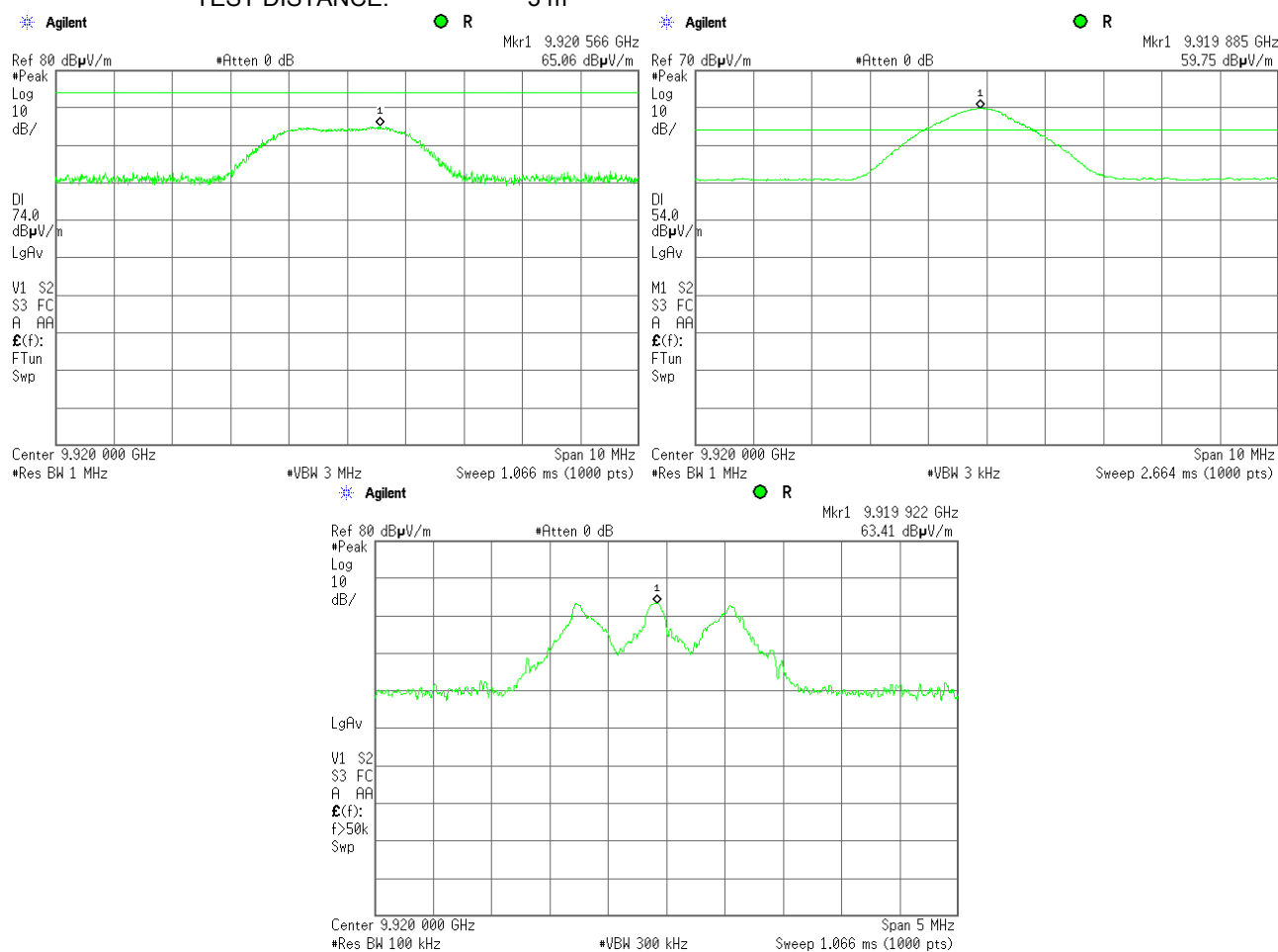
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.7.68 Radiated emission measurements at the fourth harmonic of high carrier frequency

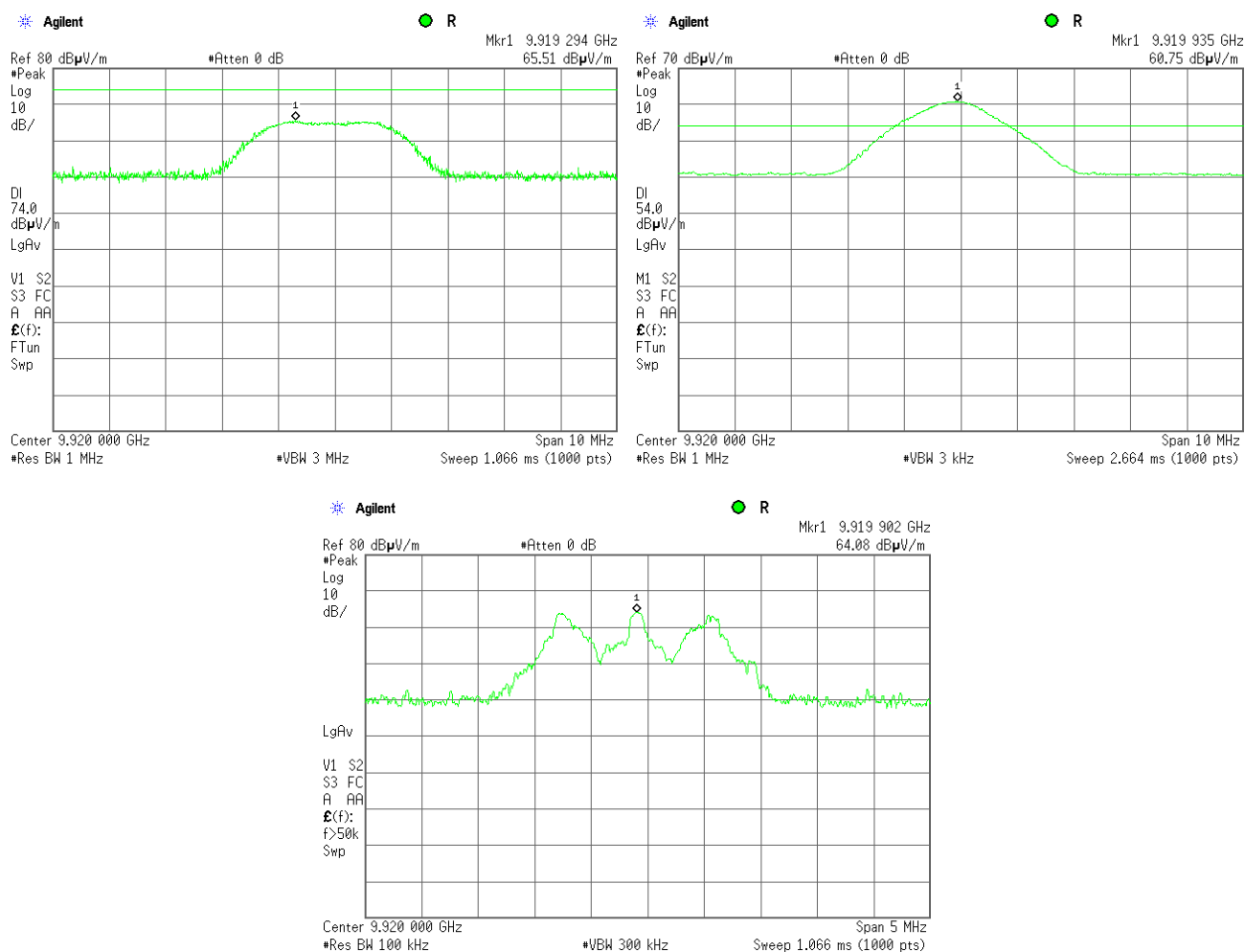
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Vertical
TEST DISTANCE: 3 m



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.7.69 Radiated emission measurements at the fourth harmonic of high carrier frequency

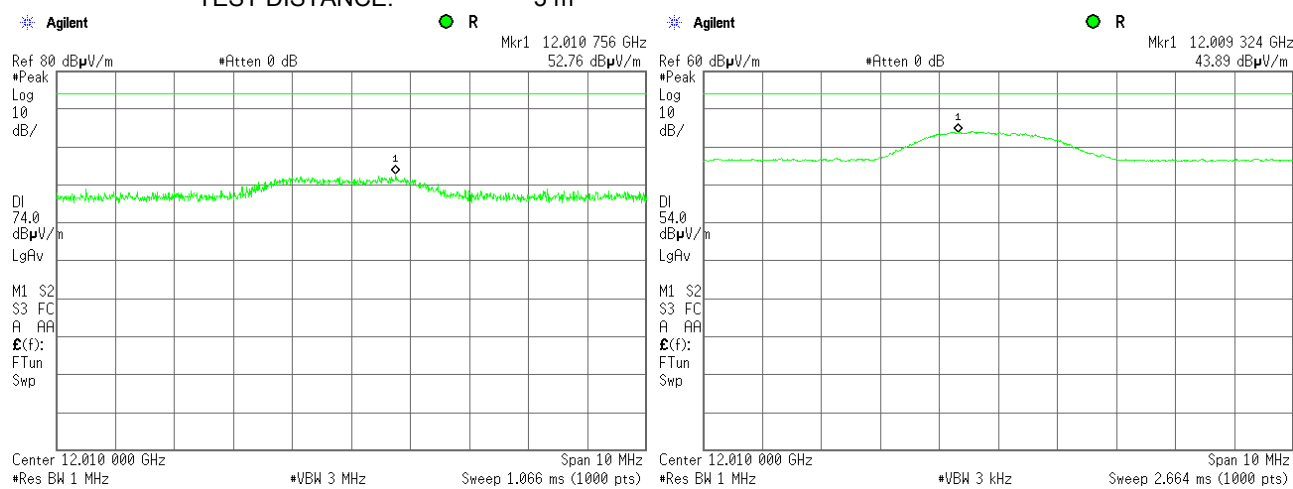
TEST SITE: Semi anechoic chamber
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

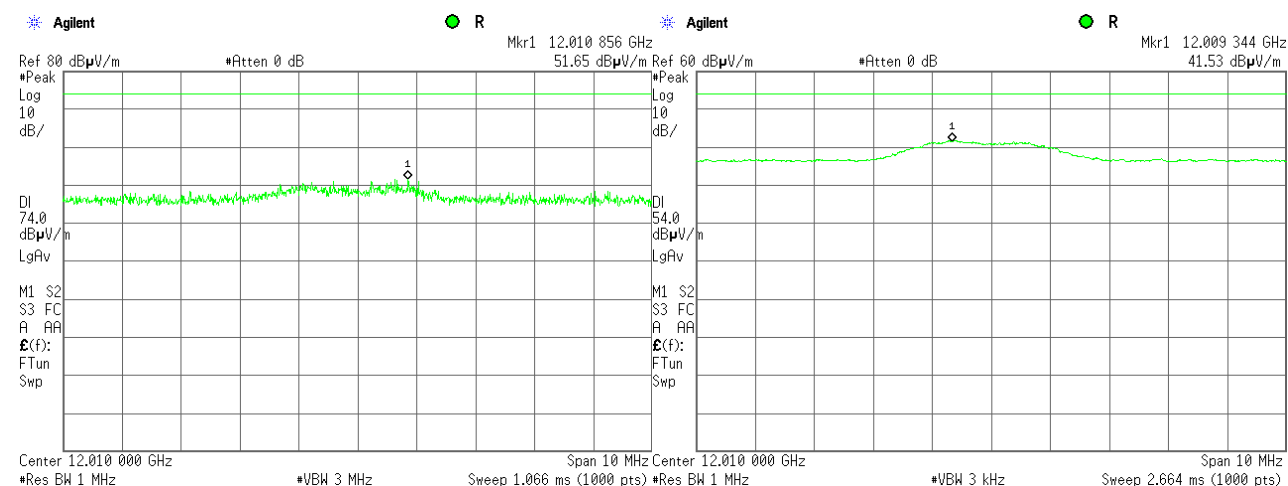
Plot 7.7.70 Radiated emission measurements at the fifth harmonic of low carrier frequency

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



Plot 7.7.71 Radiated emission measurements at the fifth harmonic of low carrier frequency

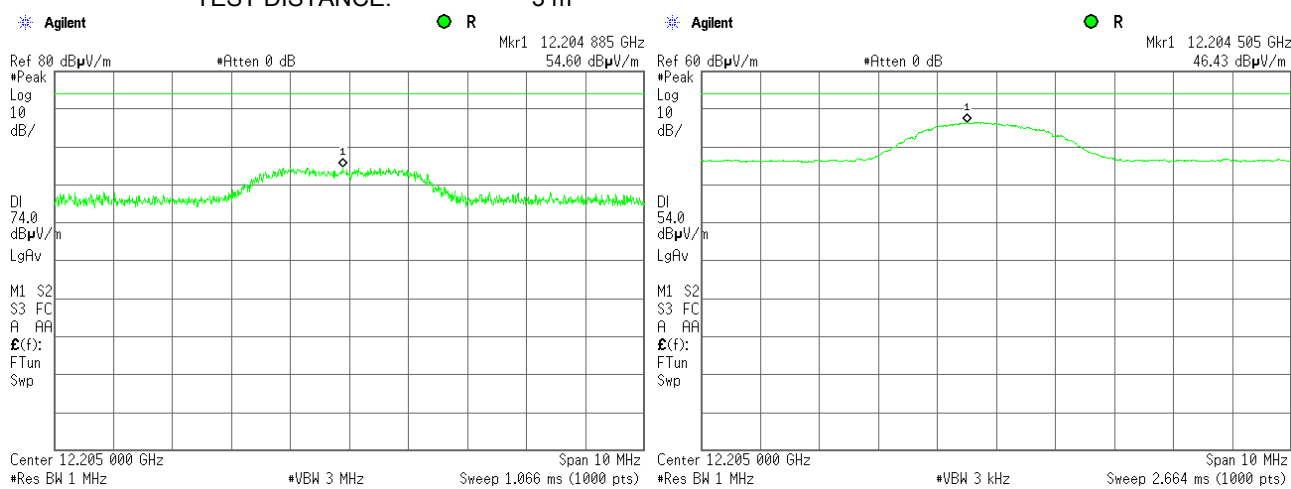
TEST SITE: OATS
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

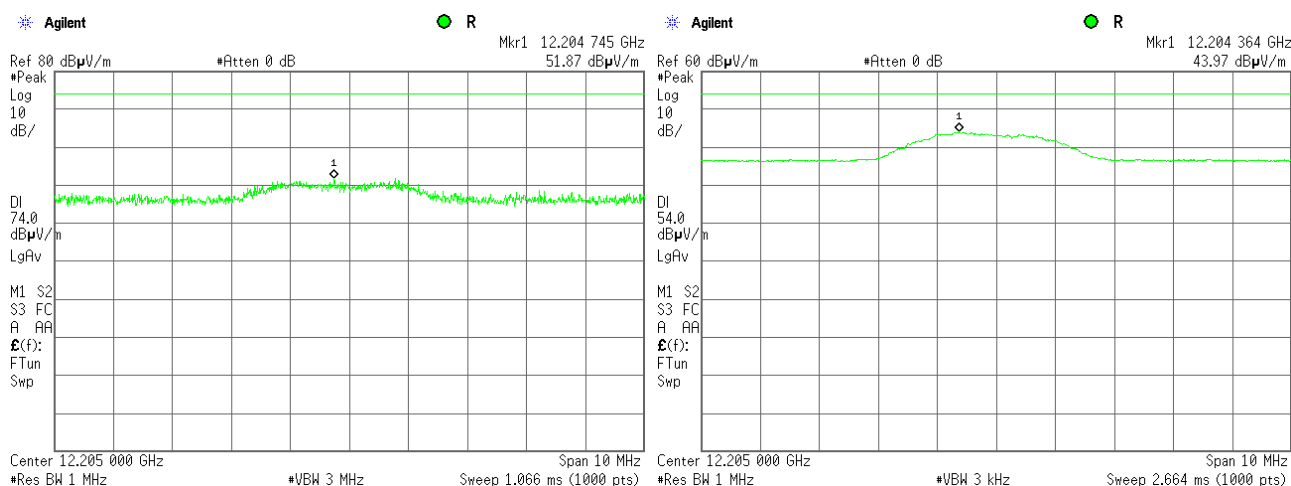
Plot 7.7.72 Radiated emission measurements at the fifth harmonic of mid carrier frequency

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



Plot 7.7.73 Radiated emission measurements at the fifth harmonic of mid carrier frequency

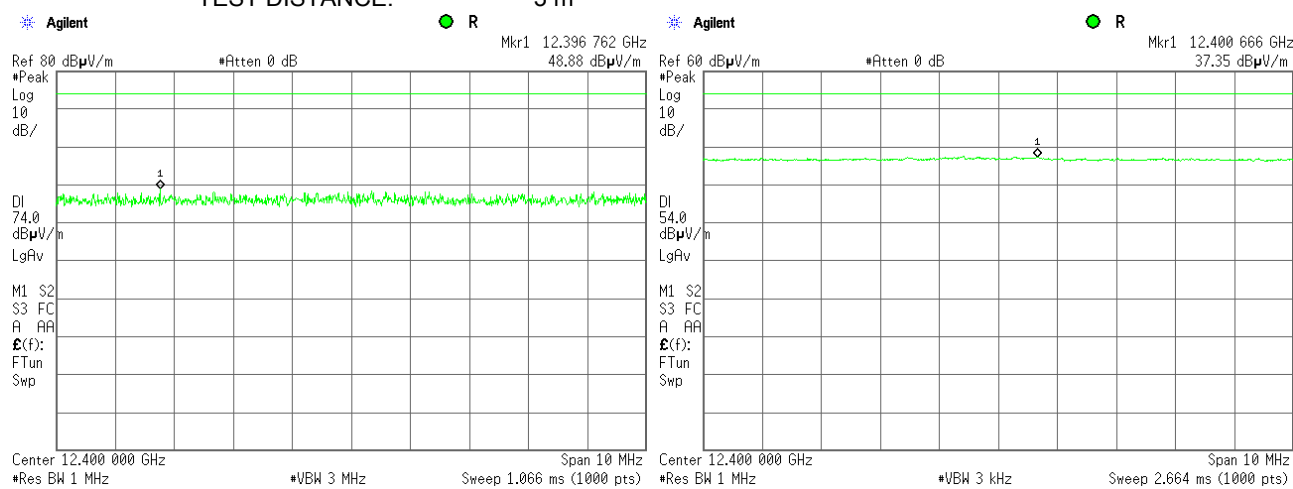
TEST SITE: OATS
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

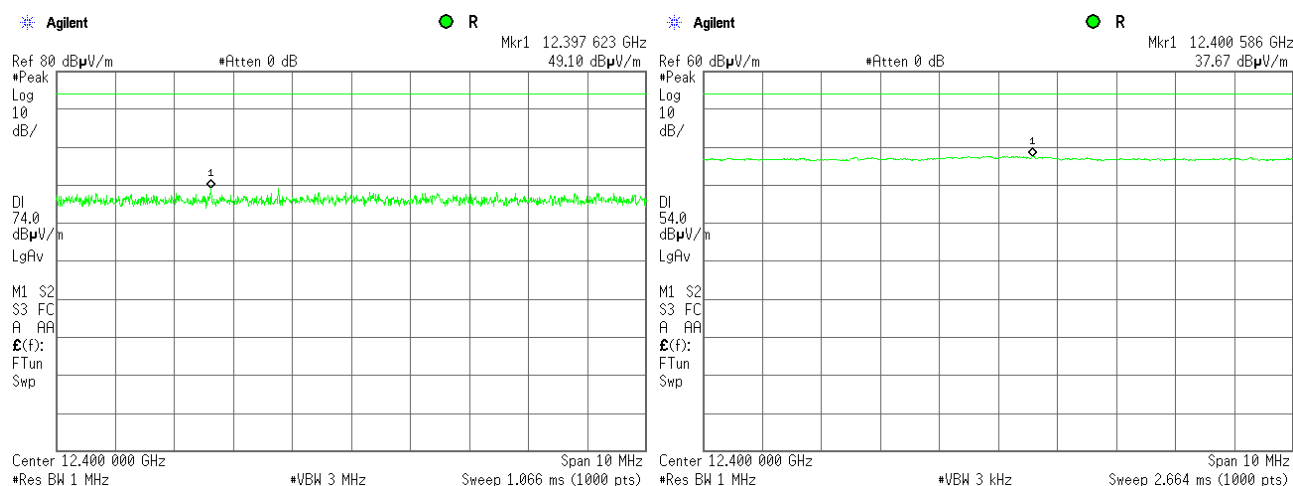
Plot 7.7.74 Radiated emission measurements at the fifth harmonic of high carrier frequency

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



Plot 7.7.75 Radiated emission measurements at the fifth harmonic of high carrier frequency

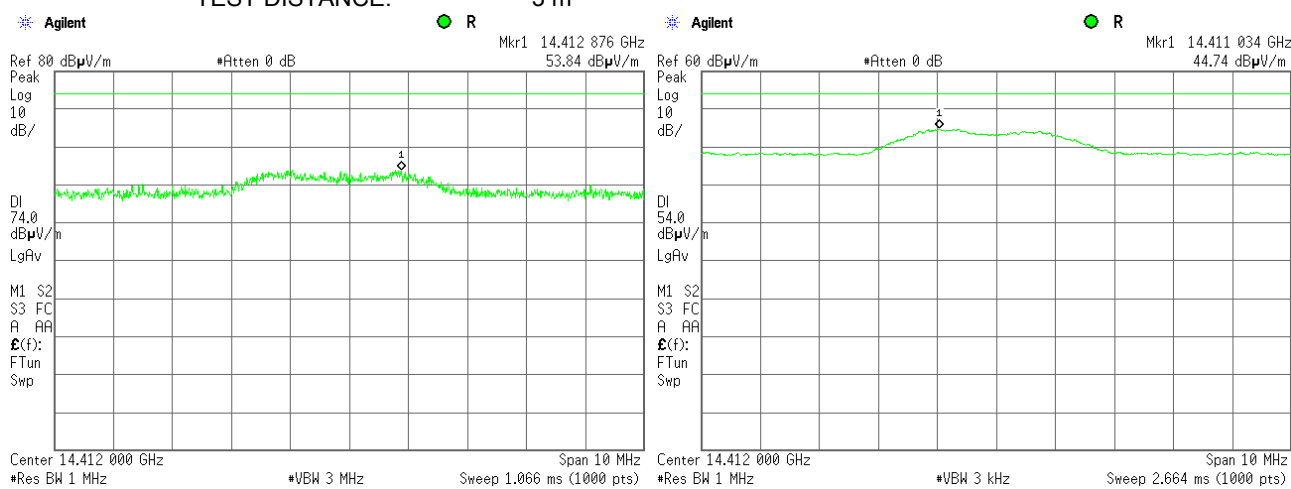
TEST SITE: OATS
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

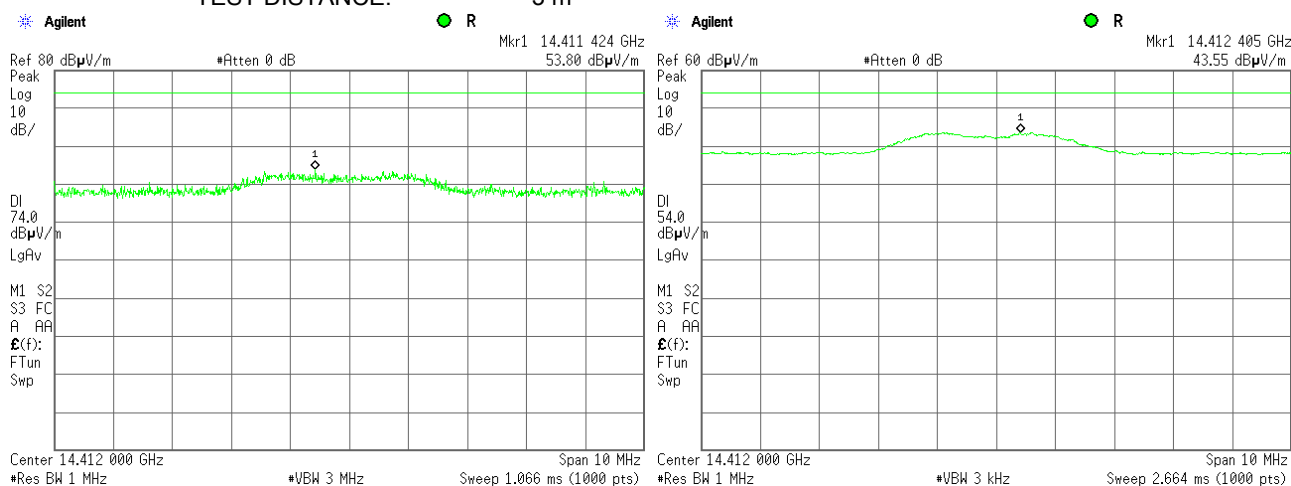
Plot 7.7.76 Radiated emission measurements at the sixth harmonic of low carrier frequency

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



Plot 7.7.77 Radiated emission measurements at the sixth harmonic of low carrier frequency

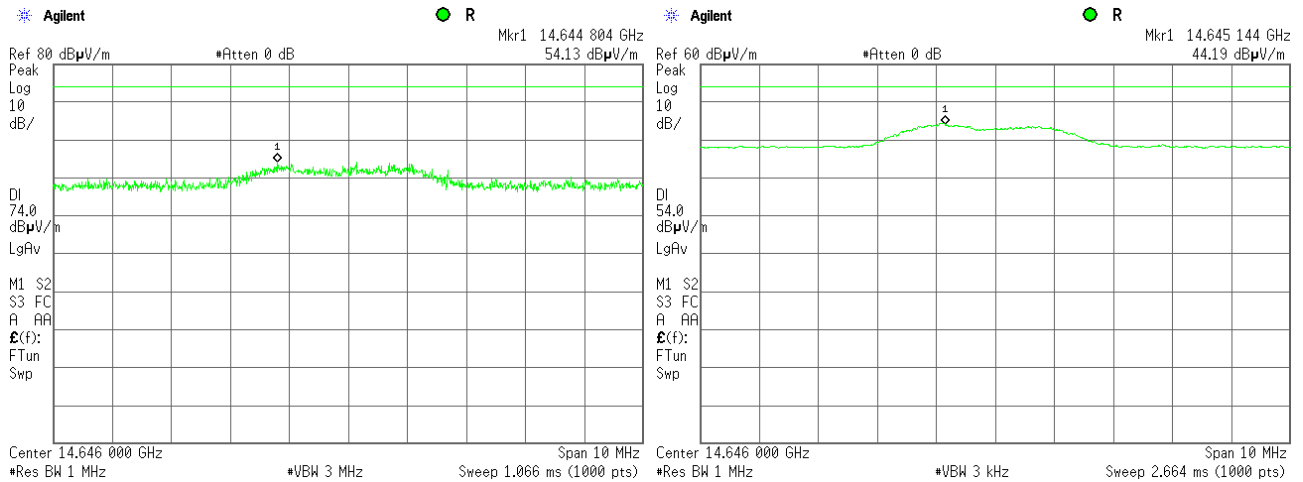
TEST SITE: OATS
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

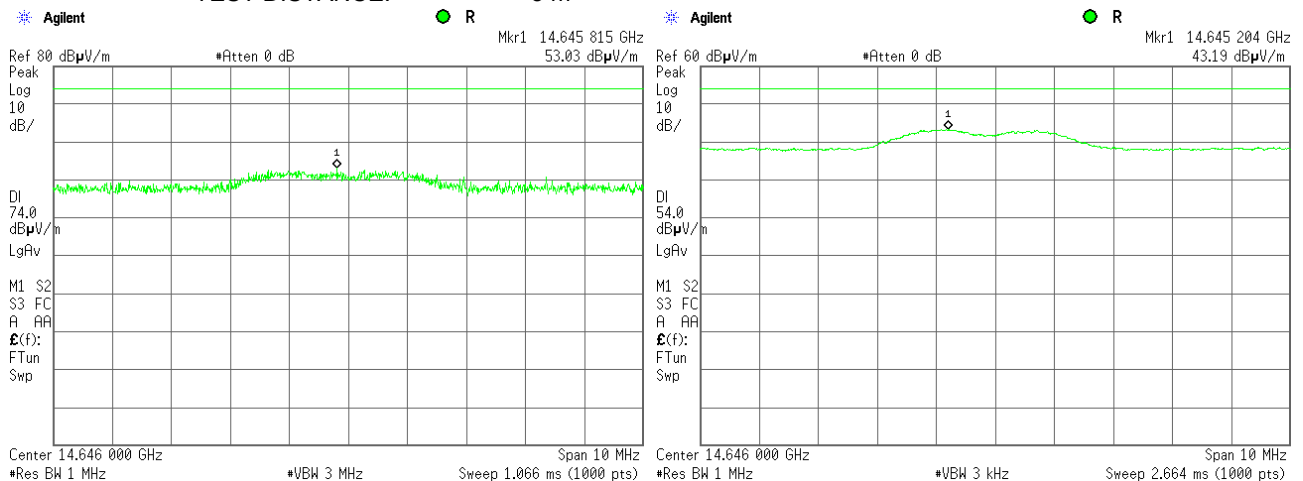
Plot 7.7.78 Radiated emission measurements at the sixth harmonic of mid carrier frequency

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



Plot 7.7.79 Radiated emission measurements at the sixth harmonic of mid carrier frequency

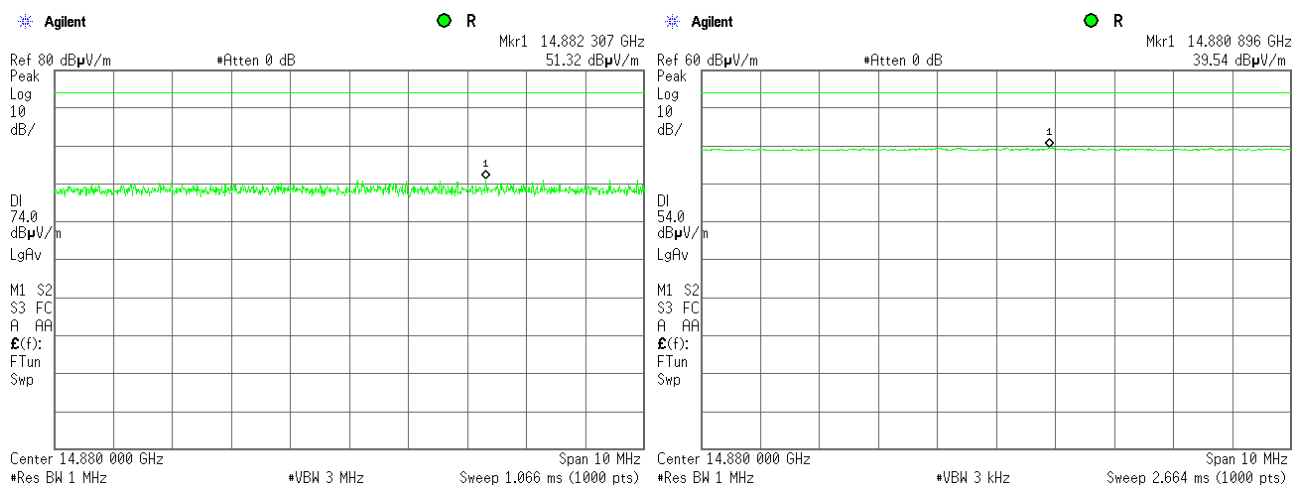
TEST SITE: OATS
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

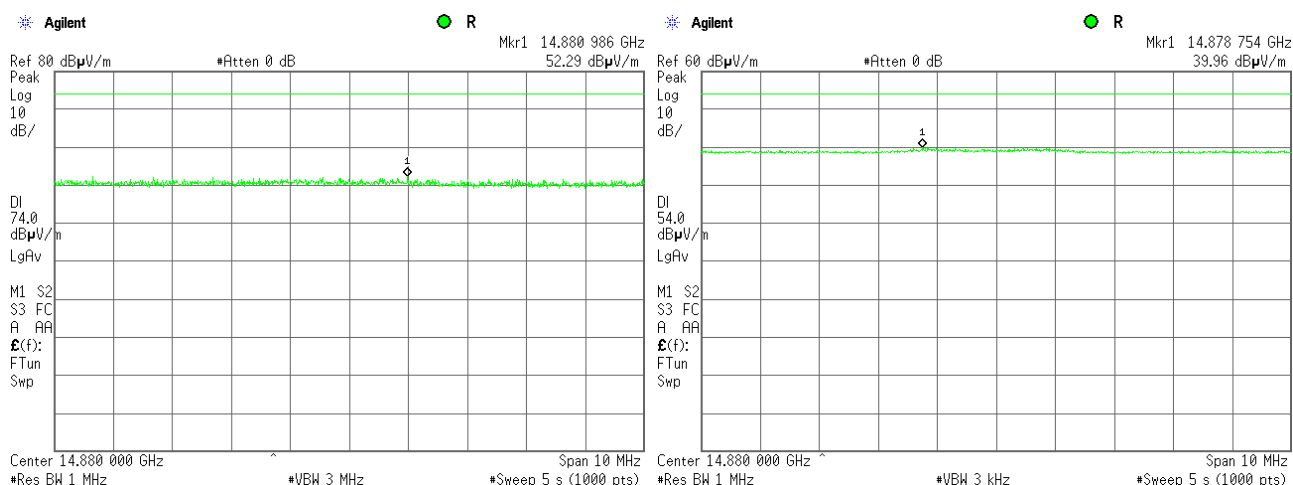
Plot 7.7.80 Radiated emission measurements at the sixth harmonic of high carrier frequency

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



Plot 7.7.81 Radiated emission measurements at the sixth harmonic of high carrier frequency

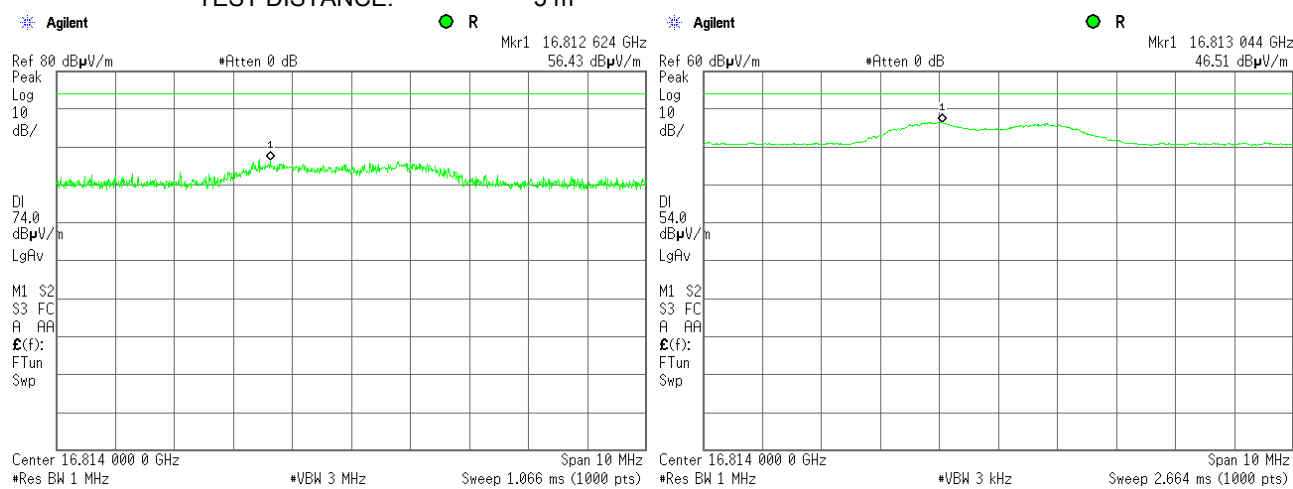
TEST SITE: OATS
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

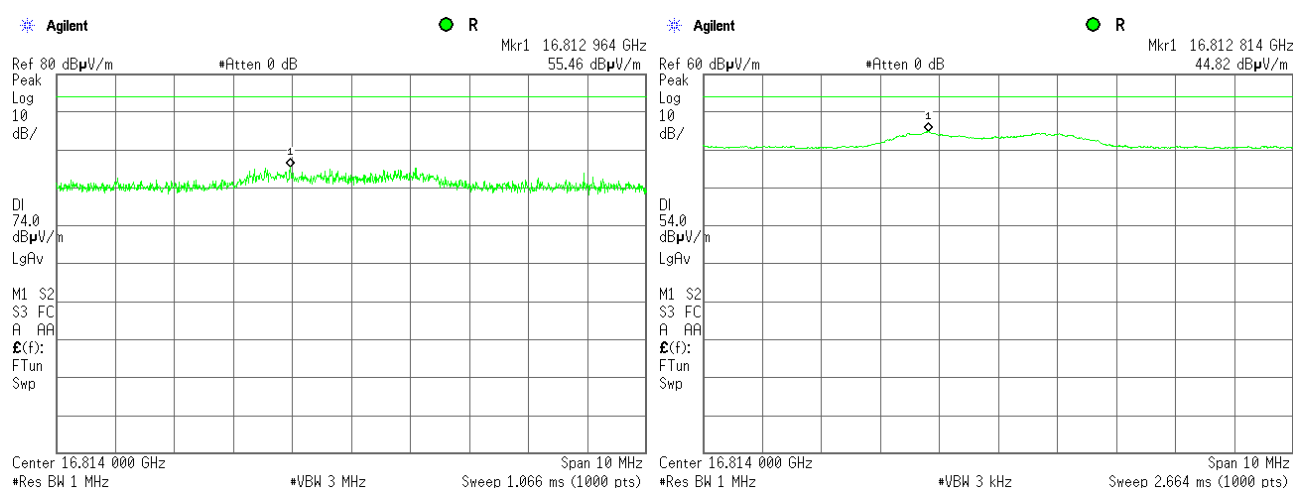
Plot 7.7.82 Radiated emission measurements at the seventh harmonic of low carrier frequency

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



Plot 7.7.83 Radiated emission measurements at the seventh harmonic of low carrier frequency

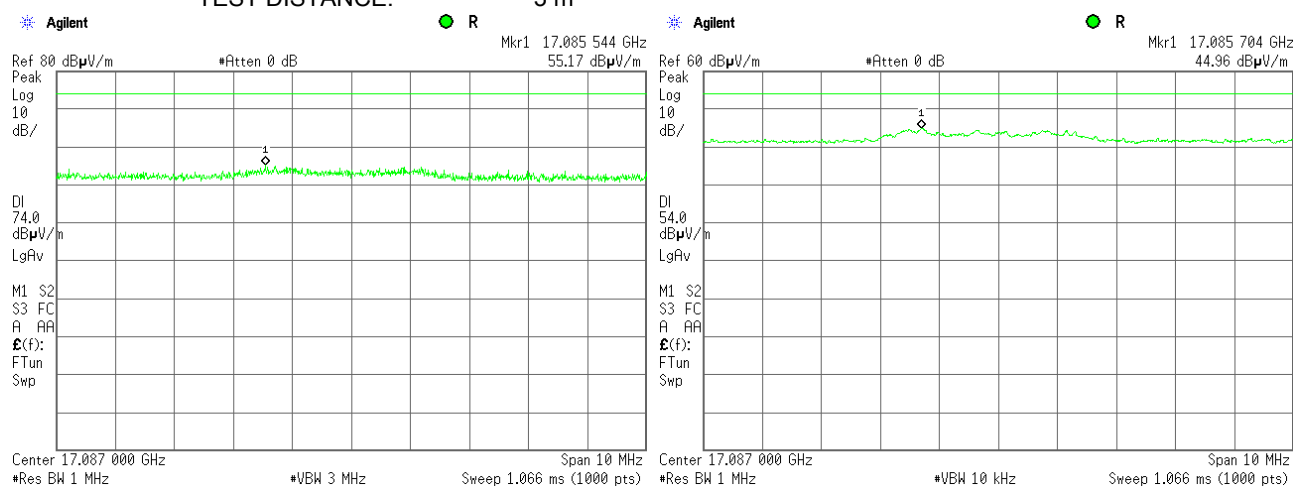
TEST SITE: OATS
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

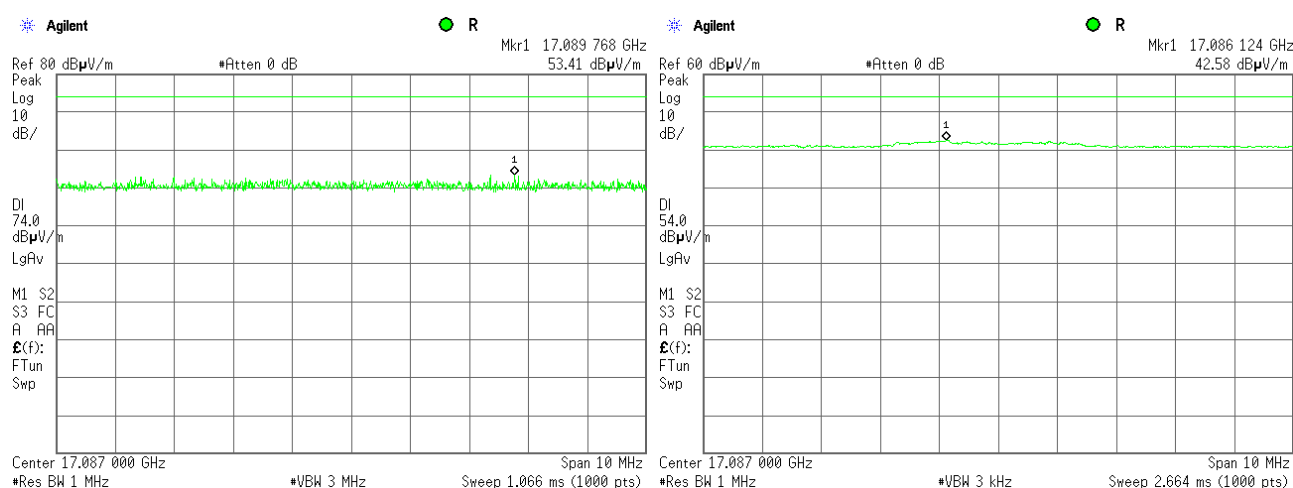
Plot 7.7.84 Radiated emission measurements at the seventh harmonic of mid carrier frequency

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



Plot 7.7.85 Radiated emission measurements at the seventh harmonic of mid carrier frequency

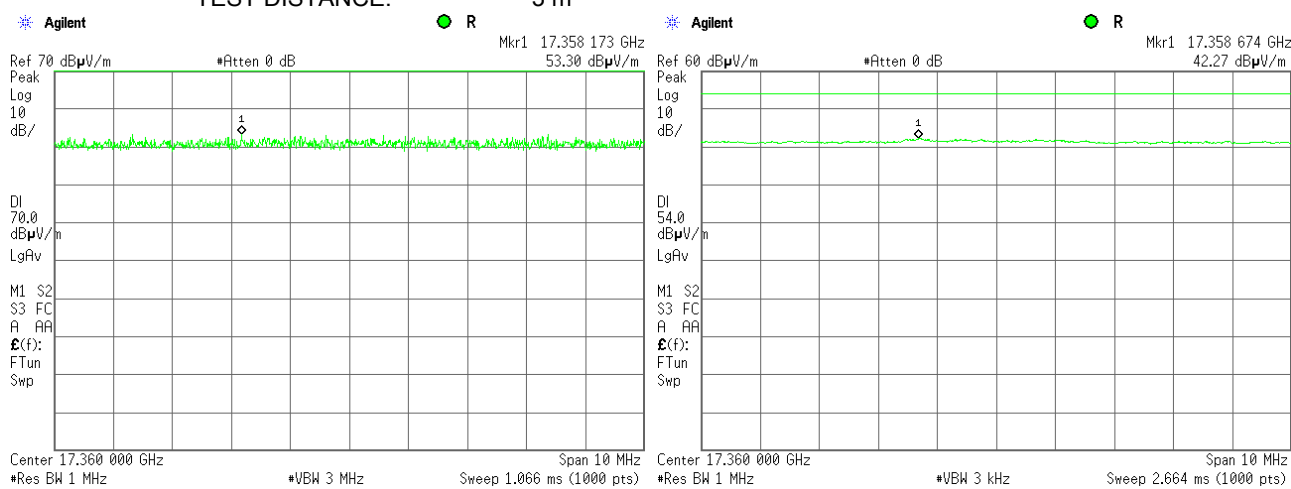
TEST SITE: OATS
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:		Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions	
Test procedure:		Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jun-14 - 06-Jul-14	
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

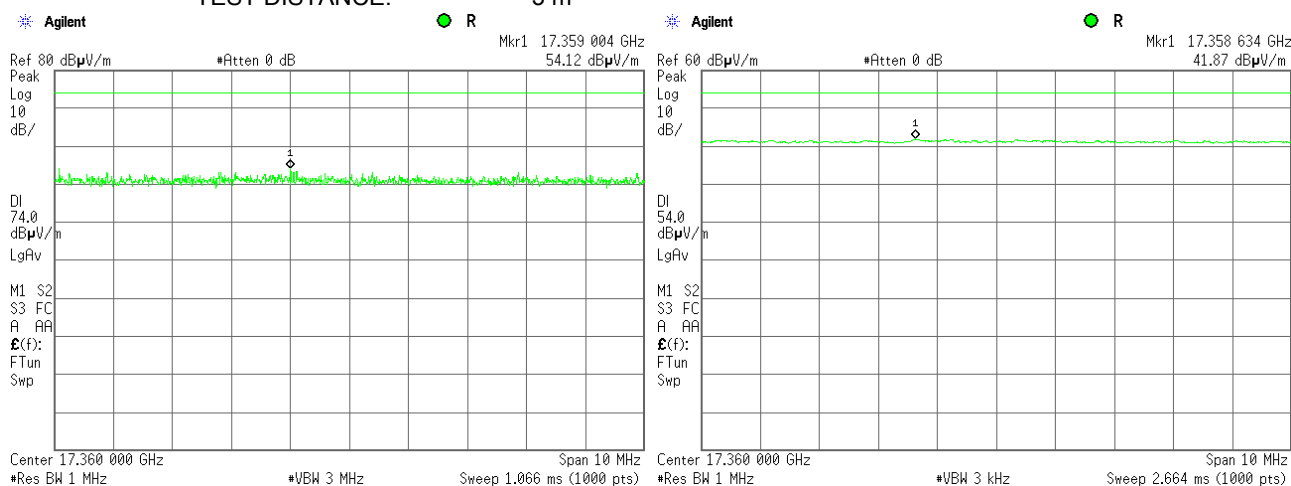
Plot 7.7.86 Radiated emission measurements at the seventh harmonic of high carrier frequency

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



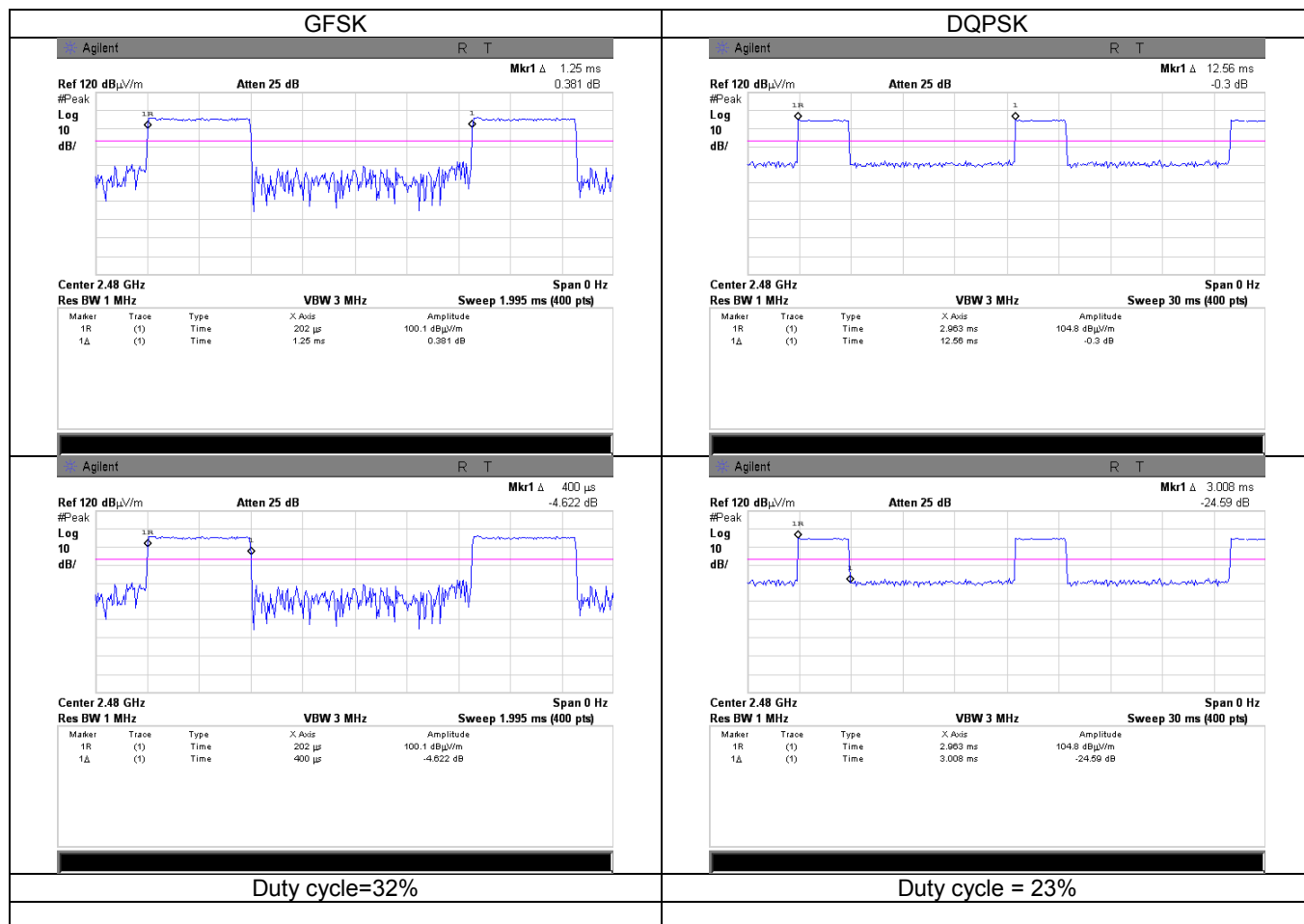
Plot 7.7.87 Radiated emission measurements at the seventh harmonic of high carrier frequency

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



Test specification:	Section 15.247(c), RSS-210 section A8.5, Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-14 - 06-Jul-14		
Temperature: 24 °C	Air Pressure: 1006 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.7.88 Transmission pulse duration and period



Test specification:		Section 15.203, RSS-Gen section 7.1.2, Antenna requirements	
Test procedure:		Public notice DA 00-705	
Test mode:	Compliance	Verdict:	PASS
Date(s):	24-Aug-14		
Temperature: 25 °C	Air Pressure: 1005 hPa	Relative Humidity: 45 %	Power Supply: Battery
Remarks:			

7.8 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 7.8.1.

Table 7.8.1 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	

Photograph 7.8.1 Antenna assembly



Test specification:		Section 15.207(a), RSS-Gen section 7.2.4, Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Aug-14	
Temperature: 25 °C	Air Pressure: 1012 hPa	Relative Humidity: 47 %	Power Supply: Battery
Remarks:			

7.9 Conducted emissions

7.9.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 7.9.1.

Table 7.9.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(μ V)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5.0	56	46
5.0 - 30	60	50

* The limit decreases linearly with the logarithm of frequency.

7.9.2 Test procedure

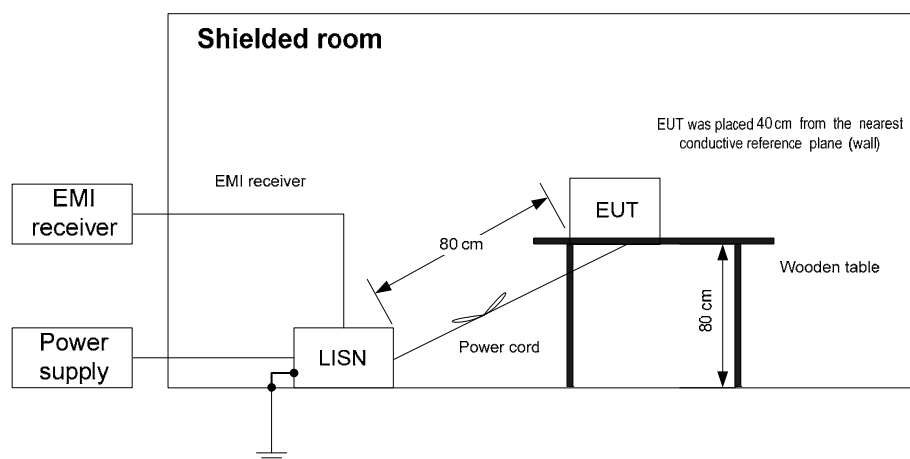
7.9.2.1 The EUT was set up as shown in Figure 7.9.1 and associated photographs, energized and the performance check was conducted.

7.9.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.9.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

7.9.2.3 The position of the device cables was varied to determine maximum emission level.

7.9.2.4 The worst test results (the lowest margins) were recorded in Table 7.9.2 and shown in the associated plots.

Figure 7.9.1 Setup for conducted emission measurements, table-top equipment



Test specification:		Section 15.207(a), RSS-Gen section 7.2.4, Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Aug-14	
Temperature: 25 °C	Air Pressure: 1012 hPa	Relative Humidity: 47 %	Power Supply: Battery
Remarks:			

Table 7.9.2 Conducted emission test results

LINE: AC mains input
EUT SET UP: TABLE-TOP
TEST SITE: SHIELDED ROOM
DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
FREQUENCY RANGE: 150 kHz - 30 MHz
RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(μV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*	Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*		
0.305708	38.39	32.83	60.10	-27.27	18.35	50.10	-31.75	L1	Pass
1.368540	31.97	25.60	56.00	-30.40	11.55	46.00	-34.45		
0.303190	34.15	29.33	60.18	-30.85	15.70	50.18	-34.48	L2	Pass
0.511275	30.01	24.15	56.00	-31.85	12.12	46.00	-33.88		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

HL 0447	HL 0787	HL 1513	HL 3612	HL 4778			
---------	---------	---------	---------	---------	--	--	--

Full description is given in Appendix A.

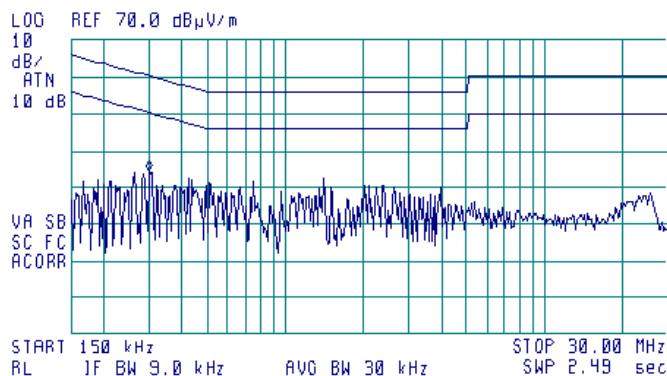
Test specification:		Section 15.207(a), RSS-Gen section 7.2.4, Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Aug-14	
Temperature: 25 °C	Air Pressure: 1012 hPa	Relative Humidity: 47 %	Power Supply: Battery
Remarks:			

Plot 7.9.1 Conducted emission measurements

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



ACTU DET: PEAK
MEAS DET: PEAK OP AVG
MKR 300 kHz
34.37 dBμV/m

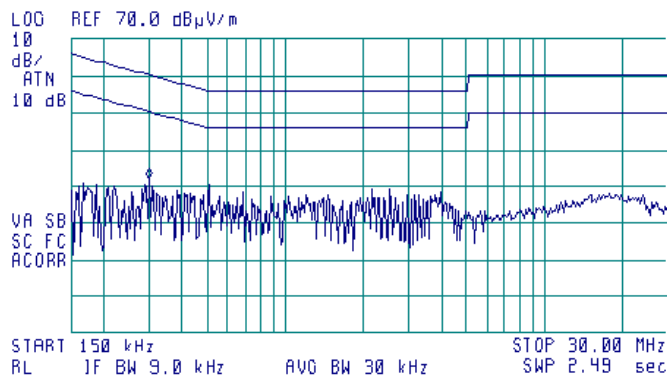


Plot 7.9.2 Conducted emission measurements

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



ACTU DET: PEAK
MEAS DET: PEAK OP AVG
MKR 300 kHz
32.11 dBμV/m



Test specification:		Section 5.107 Class B / ICES-003, Section 6.1, Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Aug-14	
Temperature: 25 °C	Air Pressure: 1012 hPa	Relative Humidity: 47 %	Power Supply: Battery
Remarks:			

8 Unintentional emission tests

8.1 Conducted emissions

8.1.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 8.1.1.

Table 8.1.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(μ V)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5.0	56	46
5.0 - 30	60	50

* The limit decreases linearly with the logarithm of frequency.

8.1.2 Test procedure

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

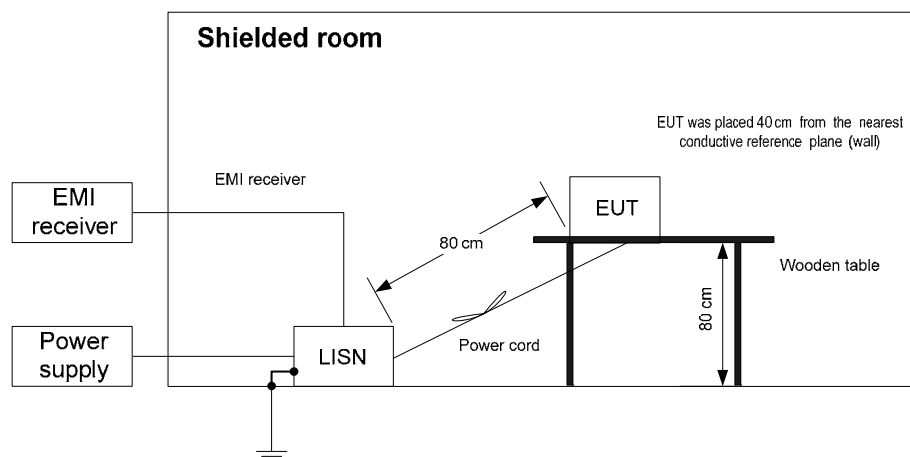
8.1.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 8.1.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

8.1.2.3 The position of the device cables was varied to determine maximum emission level.

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

Test specification:		Section 5.107 Class B / ICES-003, Section 6.1, Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Aug-14	
Temperature: 25 °C	Air Pressure: 1012 hPa	Relative Humidity: 47 %	Power Supply: Battery
Remarks:			

Figure 8.1.1 Setup for conducted emission measurements, table-top equipment



Photograph 8.1.1 Setup for conducted emission measurements



Test specification:		Section 5.107 Class B / ICES-003, Section 6.1, Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Aug-14	
Temperature: 25 °C	Air Pressure: 1012 hPa	Relative Humidity: 47 %	Power Supply: Battery
Remarks:			

Table 8.1.2 Conducted emission test results

LINE: AC mains input
 EUT SET UP: TABLE-TOP
 TEST SITE: SHIELDED ROOM
 DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
 FREQUENCY RANGE: 150 kHz - 30 MHz
 RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(μV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*	Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*		
0.305708	38.39	32.83	60.10	-27.27	18.35	50.10	-31.75	L1	Pass
1.368540	31.97	25.60	56.00	-30.40	11.55	46.00	-34.45		
0.303190	34.15	29.33	60.18	-30.85	15.70	50.18	-34.48	L2	Pass
0.511275	30.01	24.15	56.00	-31.85	12.12	46.00	-33.88		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

HL 0447	HL 0787	HL 1513	HL 3612	HL 4778			
---------	---------	---------	---------	---------	--	--	--

Full description is given in Appendix A.

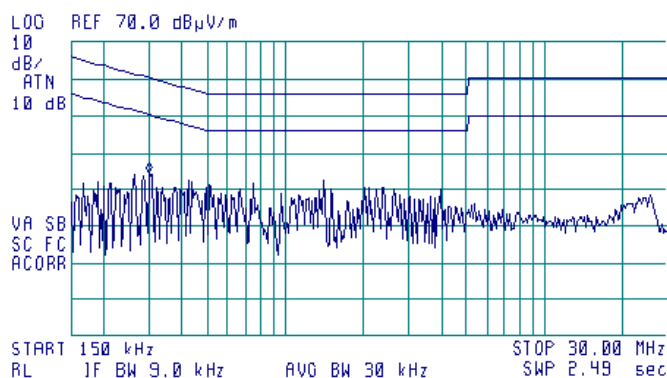
Test specification:		Section 5.107 Class B / ICES-003, Section 6.1, Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date(s):		20-Aug-14	
Temperature: 25 °C	Air Pressure: 1012 hPa	Relative Humidity: 47 %	Power Supply: Battery
Remarks:			

Plot 8.1.1 Conducted emission measurements

LINE: L1
EUT OPERATING MODE: Receive / Standby
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 300 kHz
34.37 dB μ V/m

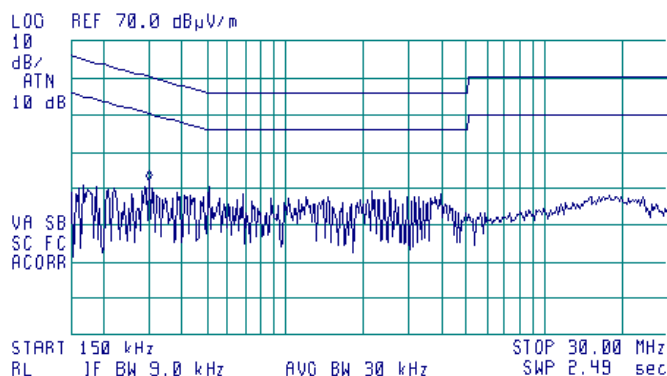


Plot 8.1.2 Conducted emission measurements

LINE: L2
EUT OPERATING MODE: Receive / Standby
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 300 kHz
32.11 dB μ V/m



Test specification:		Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

8.2 Radiated emission measurements

8.2.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.2.1, Table 8.2.2. **Error! Reference source not found..**

Table 8.2.1 Radiated emission limits according to FCC Part 15, Section 109

Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
960 - 5 th harmonic**	43.5*	54.0	49.5	60.0*

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

Table 8.2.2 Radiated emission limits according to RSS-Gen, Section 6.1

Frequency, MHz	Field strength limit at 3 m test distance, dB(μV/m)
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
960 - 3 rd harmonic**	54.0

** - harmonic of the highest frequency the EUT generates, uses, operates or tunes to.

8.2.2 Test procedure

8.2.2.1 The EUT was set up as shown in Figure 8.2.1 and associated photographs, energized and the performance check was conducted.

8.2.2.2 Preliminary measurements were performed in the anechoic chamber at 3 m test distance. The specified frequency range was investigated with biconical and log periodic antennas connected to EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

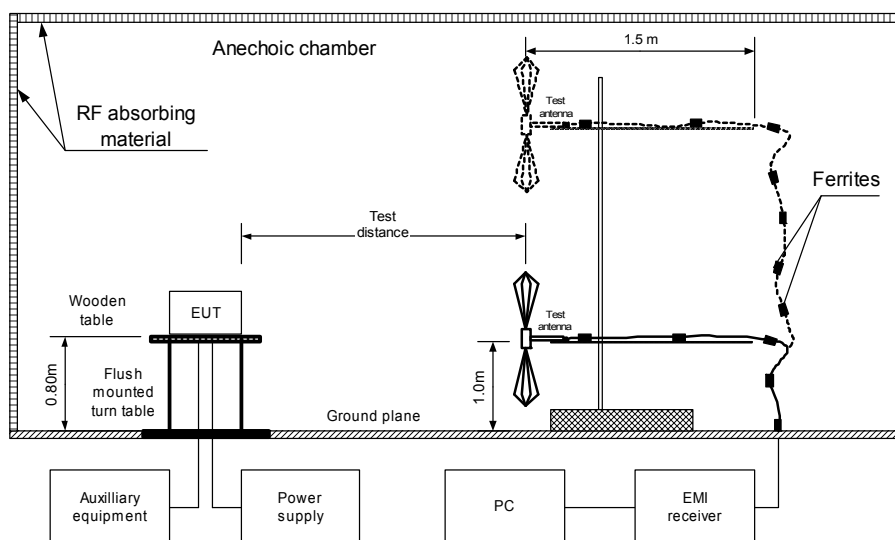
8.2.2.3 The EUT was set up as shown in Figure 8.2.2, energized and the performance check was conducted.

8.2.2.4 Final measurements were performed at the open area test site at 3 m test distance. The EUT wires and cables were arranged to produce maximum emission as it was found during preliminary measurements. The frequencies yield the worst test results (the lowest margins) during preliminary testing were 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 and its polarization was changed from vertical to horizontal.

8.2.2.5 The worst test results (the lowest margins) were recorded in Table 8.2.3 and shown in the associated plots.

Test specification:	Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

Figure 8.2.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment

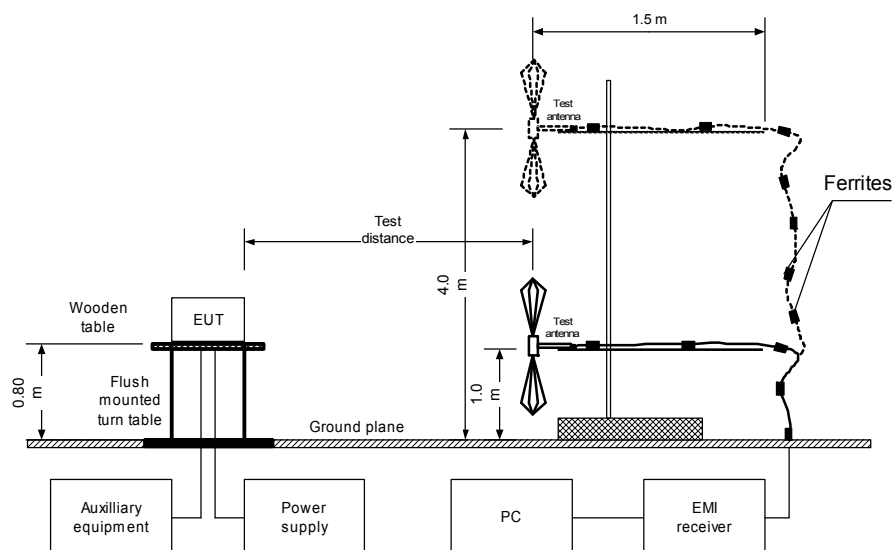


Photograph 8.2.1 Setup for radiated emission measurements



Test specification:		Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

Figure 8.2.2 Setup for radiated emission measurements at OATS, table-top equipment



Test specification:	Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

Photograph 8.2.2 Setup for radiated emission measurements, general view



Photograph 8.2.3 Setup for final radiated emission measurements, EUT cabling



Test specification:	Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

Table 8.2.3 Radiated emission test results

EUT SET UP: TABLE-TOP
TEST SITE: FULL ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / QUASI-PEAK
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 120 kHz

Resolution bandwidth:					120 kHz			
Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
All emission below limit at least at 20 dB								Pass

TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 MHz – 12500 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*				
1584.5000	52.86	74.00	-21.16	33.01	54.00	-20.99	Horizontal	1.0	330	Pass
1743.0000	62.22	74.00	-11.78	46.30	54.00	-7.70	Vertical	1.0	0	
5533.0000	48.57	74.00	-23.43	34.59	54.00	-19.41	Horizontal	1.0	30	

*- Margin = Measured emission - specification limit.

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

Reference numbers of test equipment used

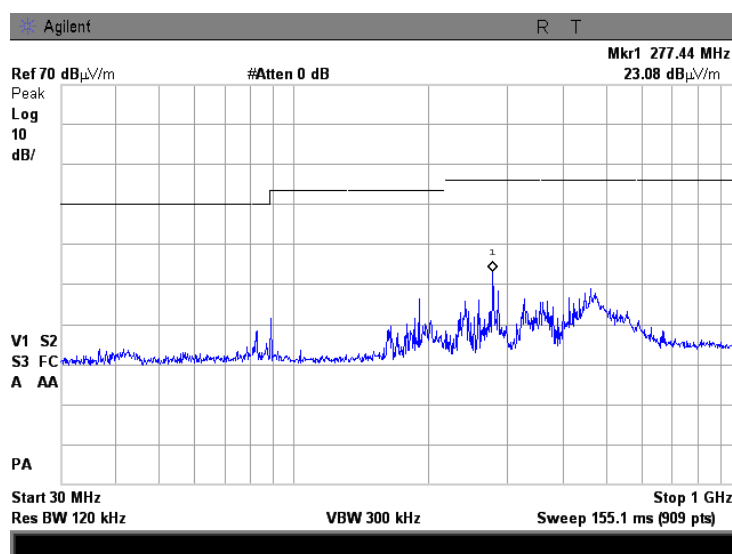
HL 0415	HL 2697	HL 2780	HL 4114	HL 4160	HL 4276	HL 4278	
---------	---------	---------	---------	---------	---------	---------	--

Full description is given in Appendix A.

Test specification:	Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

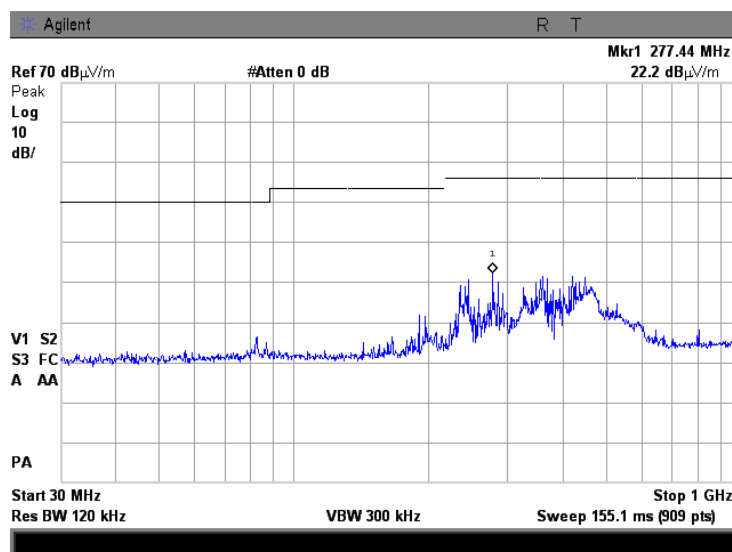
Plot 8.2.1 Radiated emission measurements in 30 - 1000 MHz range, vertical antenna polarization

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 8.2.2 Radiated emission measurements in 30 - 1000 MHz range, horizontal antenna polarization

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m

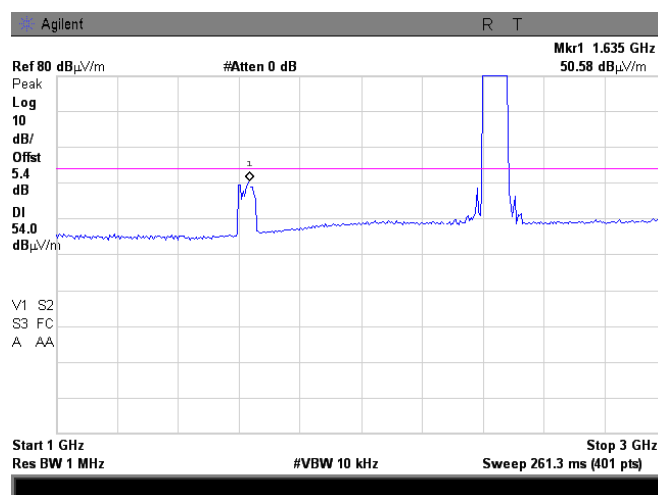
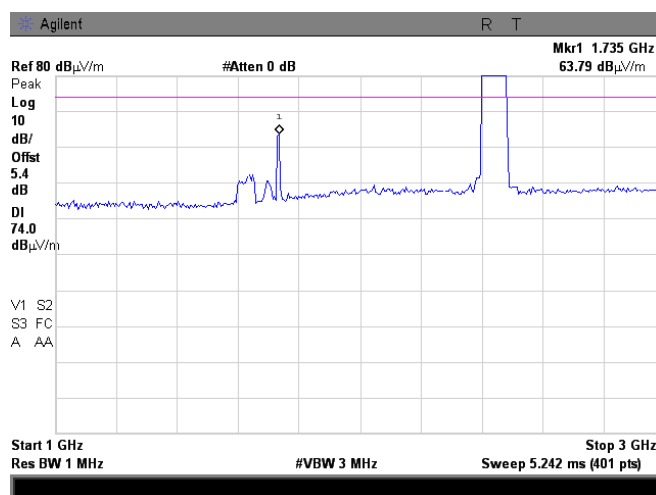


Test specification:	Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

Plot 8.2.3 Radiated emission measurements 1000 3000 MHz, vertical antenna polarization

TEST SITE:
TEST DISTANCE:

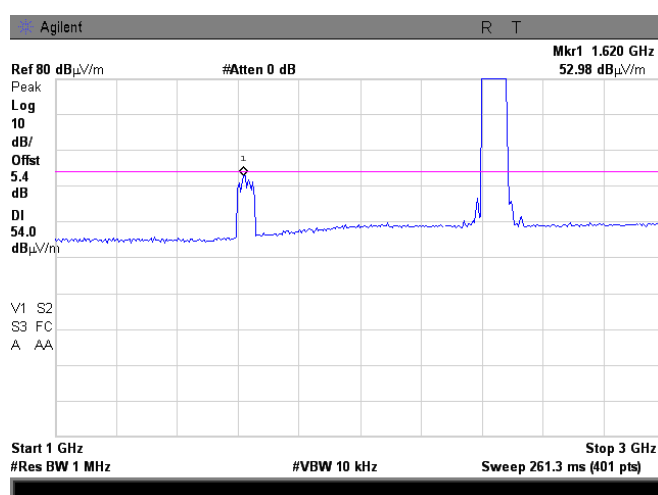
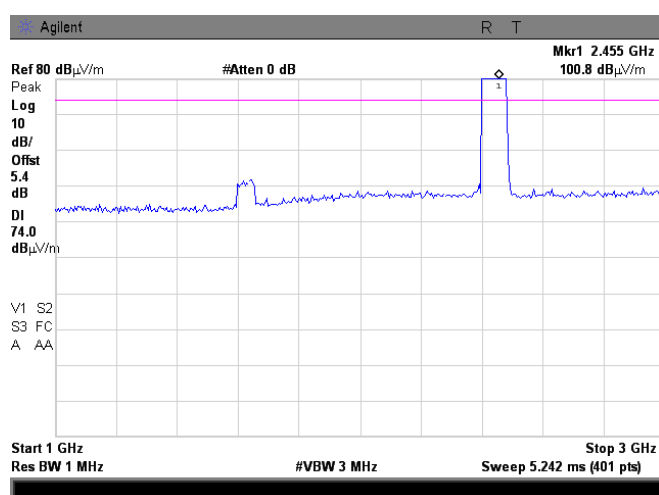
Anechoic chamber
3 m



Plot 8.2.4 Radiated emission measurements 1000 3000 MHz, horizontal antenna polarization

TEST SITE:
TEST DISTANCE:

Anechoic chamber
3 m



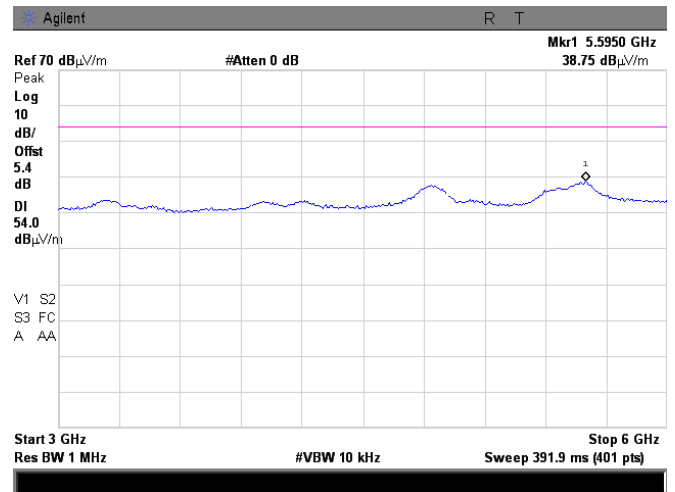
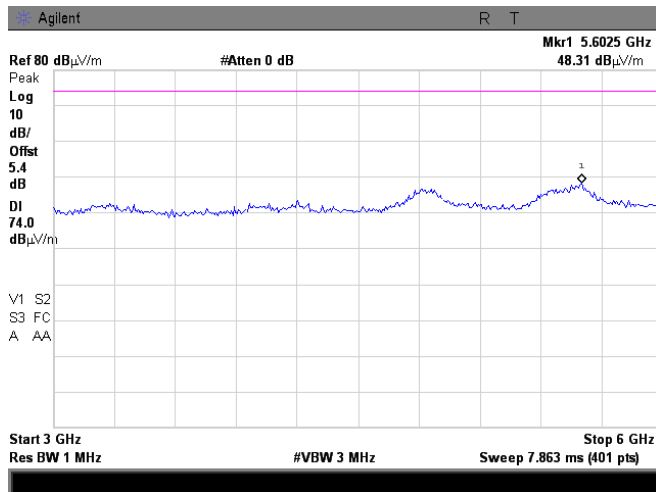
Frequency 2.455 GHz - carrier

Test specification:	Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

Plot 8.2.5 Radiated emission measurements 3000 6000 MHz, vertical antenna polarization

TEST SITE:
TEST DISTANCE:

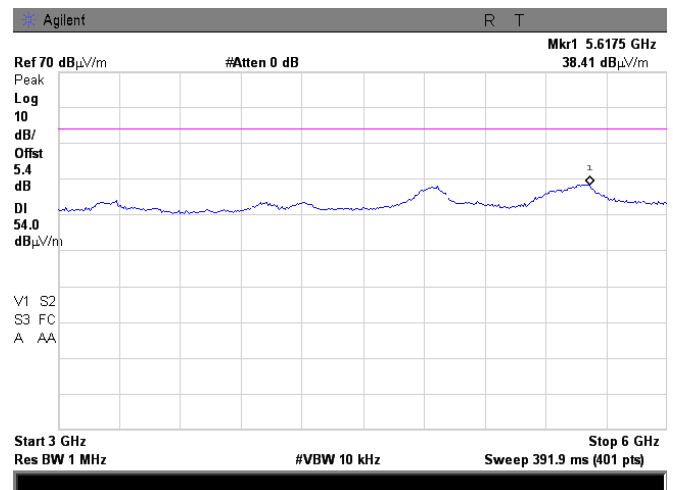
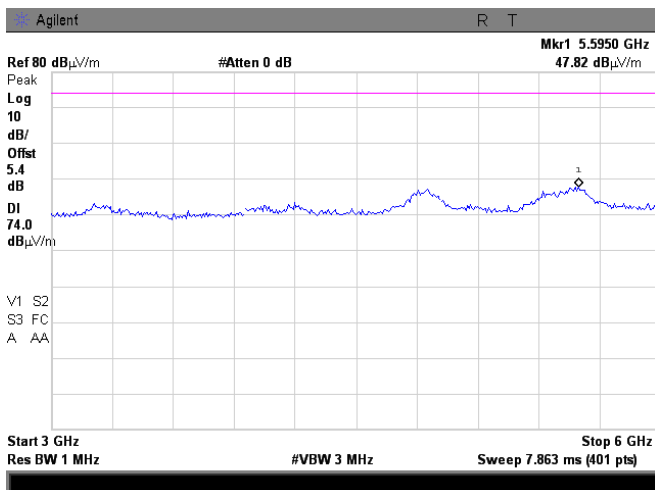
Anechoic chamber
3 m



Plot 8.2.6 Radiated emission measurements 3000 6000 MHz, horizontal antenna polarization

TEST SITE:
TEST DISTANCE:

Anechoic chamber
3 m

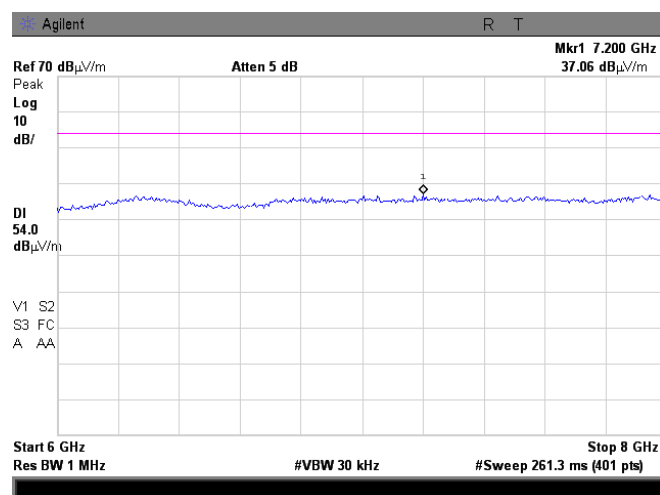
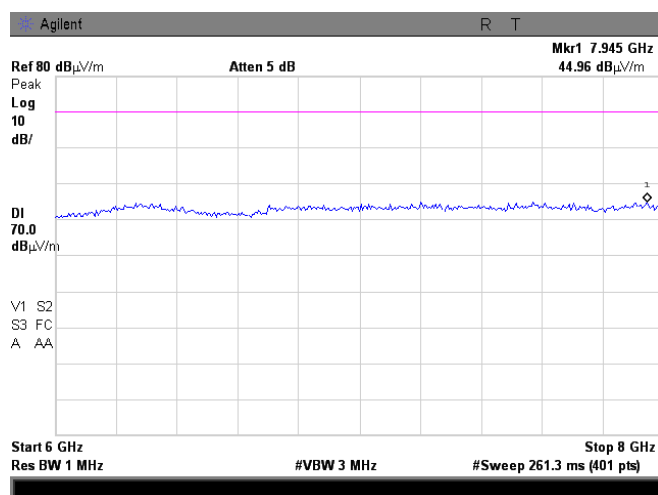


Test specification:	Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

Plot 8.2.7 Radiated emission measurements 6000 8000 MHz, vertical antenna polarization

TEST SITE:
TEST DISTANCE:

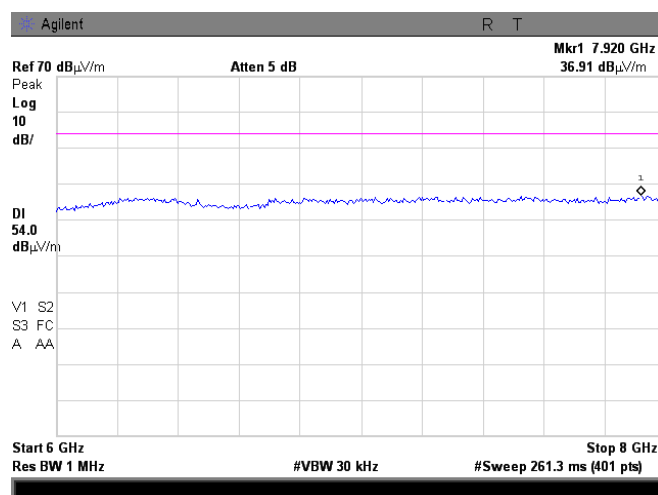
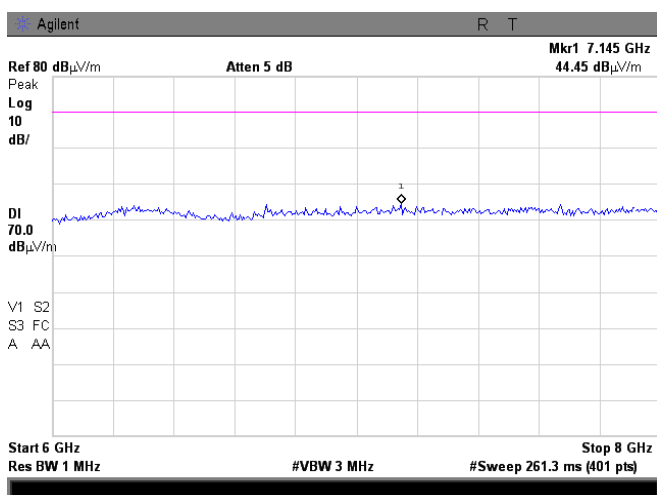
Anechoic chamber
3 m



Plot 8.2.8 Radiated emission measurements 6000 8000 MHz, horizontal antenna polarization

TEST SITE:
TEST DISTANCE:

Anechoic chamber
3 m

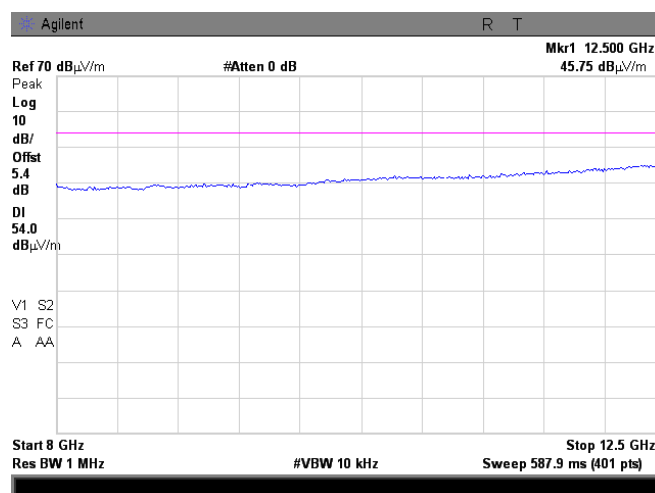
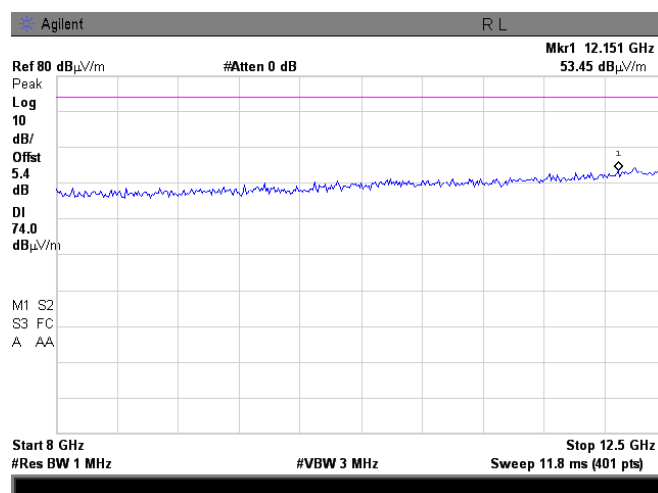


Test specification:	Section 15.109 /RSS-Gen section 6.1/ICES-003, Section 6.2, Class B Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 °C	Air Pressure: 1007 hPa	Relative Humidity: 61 %	Power Supply: 120 VAC
Remarks:			

Plot 8.2.9 Radiated emission measurements 8000 12500 MHz, vertical antenna polarization

TEST SITE:
TEST DISTANCE:

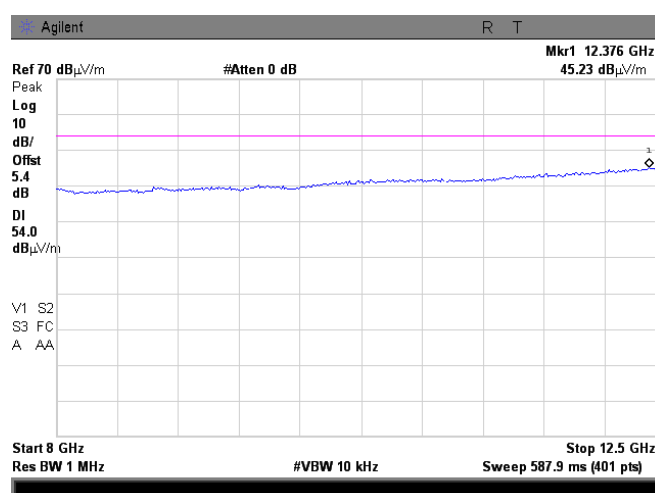
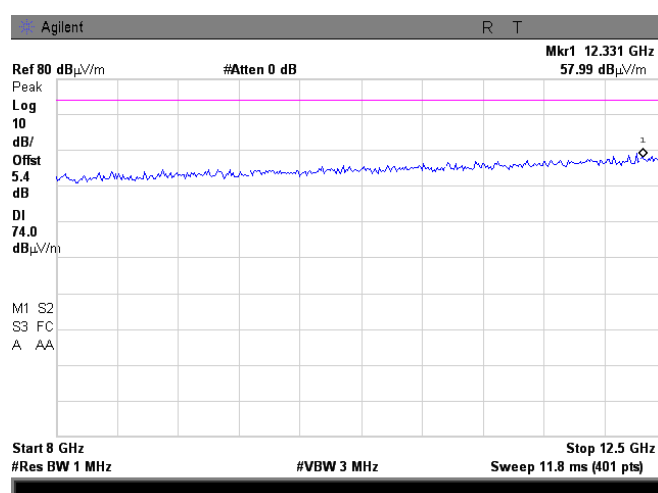
Anechoic chamber
3 m



Plot 8.2.10 Radiated emission measurements 8000 12500 MHz, horizontal antenna polarization

TEST SITE:
TEST DISTANCE:

Anechoic chamber
3 m



9 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	10-Jun-14	10-Jun-15
0415	Cable, Coax, RF, RG-214, 12.3 m	Hermon Laboratories	CC-3	056	05-Dec-13	05-Dec-14
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	21-Jan-14	21-Jan-15
0447	LISN, 16/2, 300V RMS, 50 Ohm/50 uH + 5 Ohm, STD CISPR 16-1	Hermon Laboratories	LISN 16 - 1	066	23-Oct-13	23-Oct-14
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	28-Oct-13	28-Oct-14
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	22-May-14	22-May-15
0768	Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, 25 dB gain	Quinstar Technology	QWH-4200-BA	110	12-Dec-12	12-Dec-15
0787	Transient Limiter 9 kHz-200 MHz	Hewlett Packard	11947A	3107A018 77	13-Oct-13	13-Oct-14
1513	Cable RF, 8 m, BNC/BNC	Belden	M17/167 MIL-C-17	1513	09-Sep-14	09-Sep-15
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W	EMC Test Systems	3115	9911-5964	03-Jan-14	03-Jan-15
2697	Antenna, 30 MHz - 3.0 GHz	Sunol Sciences. Corp. Pleasanton, California USA	JB3	A022805	22-May-14	22-May-15
2780	EMC analyzer, 100 Hz to 26.5 GHz	Agilent Technologies	E7405A	MY451024 62	02-Sep-14	02-Sep-15
3535	Amplifier, low noise, 18 to 40 GHz	Quinstar Technology	QLJ-18404537-J0	111590030 01	08-Oct-13	08-Oct-14
3612	Cable RF, 17.5 m, N type-N type	Teldor	RG-214/U	NA	05-Dec-13	05-Dec-14
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY482502 88	20-May-14	20-May-15
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLE X 102A	1226/2A	06-Feb-14	06-Feb-15
4114	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz	ETS Lindgren	3117	00123515	27-Dec-13	27-Dec-14
4150	Preamplifier, 0.1 to 18 GHz, Gain 25 dB, N-type(f) in, N-type(m) out.	Agilent Technologies	87405C	MY470105 91	12-Aug-14	12-Aug-15
4160	Preamplifier, 0.1 to 18 GHz, Gain 25 dB, N-type(f) in, N-type(m) out.	Agilent Technologies	87405C	MY470105 94	12-Aug-14	12-Aug-15
4164	DC Power Supply, 60V, 5A	Standig	605D	NA	15-Jan-14	15-Jan-15
4274	Test Cable , DC-18 GHz, 1.8 m, SMA/M - N/M	Mini-Circuits	CBL-6FT-SMNM+	70047	27-Nov-13	27-Nov-14
4275	Test Cable , DC-18 GHz, 1.8 m, SMA/M - N/M	Mini-Circuits	CBL-6FT-SMNM+	70050	27-Nov-13	27-Nov-14
4276	Test Cable , DC-18 GHz, 3.05 m, N/M - N/M	Mini-Circuits	APC-10FT-NMNM+	0747A	27-Nov-13	27-Nov-14
4278	Test Cable , DC-18 GHz, 4.6 m, N/M - N/M	Mini-Circuits	APC-15FT-NMNM+	0755A	27-Nov-13	27-Nov-14
4352	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	12025101 002	01-Jan-14	01-Jan-15

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
4353	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	12025101003	16-Mar-14	16-Mar-15
4360	EMI Test Receiver, 20 Hz to 40 GHz.	Rohde & Schwarz	ESU40	100322	01-Jan-14	01-Jan-15
4778	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL4777	Hewlett Packard	8542E	30807A00262, 3427A00123	06-Nov-13	06-Nov-14

10 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted carrier power at RF antenna connector	Below 12.4 GHz: ± 1.7 dB 12.4 GHz to 40 GHz: ± 2.3 dB
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB
Occupied bandwidth	± 8.0 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB

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, 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.

Address: P.O. Box 23, Binyamina 30500, Israel.
Telephone: +972 4628 8001
Fax: +972 4628 8277
e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

Person for contact: Mr. Alex Usoskin, CEO.

12 APPENDIX D Specification references

FCC 47CFR part 15: 2013	Radio Frequency Devices
Public notice DA 00- 705: 2000	Filing and measurement guidelines for frequency hopping spread spectrum systems.
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
RSS-210 Issue 8: 2010	Low Power Licence- Exempt Radiocommunication Devices
RSS-Gen Issue 3: 2010	General Requirements and Information for the Certification of Radiocommunication Equipment

13 APPENDIX E Test equipment correction factors

Correction factor
Line impedance stabilization network
Model LISN 16 - 1
Hermon Laboratories, HL 0447

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

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

Antenna factor
Active loop antenna
Model 6502, S/N 2857, HL 0446

Frequency, MHz	Magnetic antenna factor, dB	Electric antenna factor, dB
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	9.8
0.750	-41.9	9.7
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.2
4.000	-41.4	10.1
5.000	-41.5	10.1
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(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).

Antenna factor
Standard gain horn antenna
Quinstar Technology
Model QWH
Ser.No.112, HL 0768, 0769, 0770, 0771, 0772

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 strength 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)	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(μ V) to convert it into field strength 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).

Antenna calibration
Sunol Sciences Inc., model JB3, serial number A022805, HL 2697

Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain
30	22.2	-22.5	0.01	620	19.7	6.3	4.27	1215	24.9	7.0	5.05	1810	28.3	7.1	5.08	2405	30.9	6.9	4.93
35	18.5	-17.4	0.02	625	19.7	6.5	4.42	1220	24.9	7.0	4.99	1815	28.5	6.9	4.91	2410	30.9	6.9	4.89
40	14.7	-12.5	0.06	630	19.6	6.6	4.57	1225	25.1	6.9	4.91	1820	28.6	6.8	4.74	2415	31.0	6.9	4.85
45	11.3	-8.1	0.16	635	19.7	6.5	4.48	1230	25.2	6.8	4.82	1825	28.7	6.8	4.75	2420	31.0	6.8	4.82
45	11.3	-8.1	0.16	640	19.9	6.4	4.40	1235	25.1	7.0	4.96	1830	28.7	6.8	4.76	2425	31.1	6.8	4.81
50	8.9	-4.7	0.34	645	19.9	6.5	4.45	1240	25.0	7.1	5.09	1835	28.7	6.7	4.72	2430	31.0	6.9	4.87
55	7.9	-2.8	0.52	650	19.9	6.5	4.51	1245	25.0	7.1	5.12	1840	28.8	6.7	4.69	2435	31.0	6.9	4.86
60	7.5	-2.1	0.62	655	19.9	6.6	4.50	1250	25.0	7.1	5.15	1845	28.6	6.9	4.90	2440	31.2	6.8	4.74
65	8.5	-2.0	0.63	660	19.9	6.7	4.69	1255	25.0	7.2	5.25	1850	28.4	7.1	5.12	2445	31.1	6.9	4.91
70	9.0	-1.9	0.64	665	19.9	6.7	4.70	1260	24.9	7.3	5.36	1855	28.5	7.0	5.07	2450	31.0	7.0	4.96
75	8.8	-1.1	0.78	670	20.0	6.7	4.71	1265	25.0	7.3	5.31	1860	28.6	7.0	5.01	2455	31.0	7.0	5.01
80	8.4	-0.2	0.97	675	20.1	6.7	4.71	1270	25.1	7.2	5.26	1865	28.5	7.1	5.17	2460	30.9	7.2	5.19
85	8.0	0.6	1.20	680	20.1	6.7	4.71	1275	25.3	7.0	5.05	1870	28.4	7.3	5.33	2465	31.1	6.9	4.95
90	8.2	1.1	1.29	685	20.1	6.8	4.79	1280	25.5	6.8	4.94	1875	28.4	7.2	5.28	2470	31.3	6.8	4.76
95	9.2	0.5	1.13	690	20.1	6.9	4.88	1285	25.4	7.0	4.97	1880	28.5	7.2	5.22	2475	31.4	6.7	4.69
100	10.6	-0.4	0.92	695	20.2	6.8	4.82	1290	25.3	7.1	5.10	1885	28.5	7.2	5.22	2480	31.3	6.8	4.79
110	12.6	-1.6	0.70	705	20.4	6.8	4.75	1300	25.2	7.3	5.33	1895	28.6	7.2	5.24	2490	31.1	7.0	4.99
120	13.9	-2.1	0.62	715	20.5	6.8	4.80	1310	25.5	7.1	5.09	1905	28.5	7.3	5.36	2500	30.9	7.2	5.27
125	14.2	-2.0	0.63	720	20.5	6.9	4.85	1315	25.4	7.2	5.23	1910	28.5	7.4	5.45	2505	31.1	7.1	5.15
130	14.2	-1.7	0.68	725	20.6	6.8	4.81	1320	25.3	7.3	5.36	1915	28.5	7.3	5.38	2510	31.0	7.2	5.22
140	13.4	0.3	0.94	735	20.9	6.7	4.55	1330	25.6	7.0	5.06	1925	28.6	7.3	5.39	2520	31.2	7.0	5.05
150	12.9	0.8	1.21	745	21.0	6.6	4.59	1340	25.7	7.1	5.09	1935	28.5	7.4	5.54	2530	31.0	7.3	5.37
160	12.7	1.6	1.44	755	21.0	6.8	4.74	1350	25.7	7.1	5.17	1945	28.5	7.5	5.59	2540	31.2	7.1	5.09
165	12.5	2.0	1.59	760	21.0	6.8	4.83	1355	25.8	7.0	5.06	1950	28.6	7.4	5.48	2545	31.0	7.3	5.43
170	12.2	2.6	1.83	765	21.1	6.8	4.73	1360	25.9	6.9	4.95	1955	28.6	7.5	5.57	2550	31.0	7.3	5.39
175	11.8	3.3	2.13	770	21.3	6.7	4.64	1365	26.0	6.9	4.95	1960	28.6	7.5	5.65	2555	31.1	7.2	5.30
180	11.6	3.7	2.36	775	21.3	6.7	4.68	1370	26.0	7.0	4.98	1965	28.7	7.4	5.47	2560	31.0	7.4	5.47
185	11.5	4.0	2.54	780	21.3	6.7	4.72	1375	26.0	7.0	5.01	1970	28.5	7.2	5.29	2565	30.8	7.6	5.70
190	11.6	4.2	2.61	785	21.3	6.8	4.77	1380	26.0	7.0	5.06	1975	28.9	7.2	5.22	2570	31.1	7.3	5.37
200	13.1	3.2	2.07	795	21.4	6.8	4.79	1390	26.1	6.9	4.92	1985	29.1	7.1	5.11	2580	31.6	6.9	4.87
205	12.0	4.4	2.76	800	21.5	6.8	4.77	1395	26.2	6.9	4.94	1990	29.1	7.0	5.06	2585	31.6	6.8	4.79
210	11.0	5.6	3.66	805	21.6	6.7	4.71	1400	26.2	7.0	4.96	1995	29.1	7.1	5.09	2590	31.6	6.9	4.88
215	11.3	5.6	3.59	810	21.7	6.7	4.65	1405	26.1	7.0	5.02	2000	29.1	7.1	5.11	2595	31.5	7.0	4.97
220	11.6	5.5	3.52	815	21.7	6.7	4.72	1410	26.1	7.1	5.09	2005	29.1	7.1	5.16	2600	31.6	6.9	4.86
225	11.7	5.5	3.45	820	21.7	6.8	4.80	1415	26.2	7.0	5.02	2010	29.1	7.1	5.15	2605	31.3	7.2	5.30
230	11.9	5.5	3.57	825	21.7	6.8	4.82	1420	26.3	7.0	5.06	2015	29.2	7.1	5.13	2610	31.4	7.1	5.15
235	12.1	5.5	3.56	830	21.7	6.9	4.85	1425	26.2	7.1	5.10	2020	29.2	7.1	5.18	2615	31.7	6.9	4.88
240	12.3	5.5	3.54	835	21.8	6.8	4.82	1430	26.1	7.2	5.25	2025	29.3	7.1	5.08	2620	31.6	7.0	4.97
245	12.3	5.7	3.71	840	21.9	6.8	4.80	1435	26.1	7.2	5.24	2030	29.3	7.0	5.05	2625	31.4	7.1	5.17
250	12.3	5.9	3.88	845	21.9	6.8	4.83	1440	26.2	7.2	5.24	2035	29.3	7.1	5.07	2630	31.6	7.0	5.00
255	12.5	5.9	3.85	850	21.9	6.9	4.86	1445	26.3	1	5.11	2040	29.3	7.1	5.13	2635	31.8	6.8	4.82
260	12.7	5.8	3.83	855	22.0	6.8	4.80	1450	26.5	7.0	4.98	2045	29.2	7.2	5.23	2640	31.7	7.0	4.98
265	13.2	5.5	3.54	860	22.1	6.8	4.74	1455	26.4	7.1	5.07	2050	29.2	7.2	5.27	2645	31.7	6.9	4.93
270	13.7	5.2	3.27	865	22.1	6.9	4.82	1460	26.4	7.1	5.17	2055	29.3	7.2	5.21	2650	31.8	6.9	4.85
275	13.7	5.3	3.39	870	21.9	7.1	5.11	1465	26.4	7.2	5.19	2060	29.5	7.0	5.02	2655	31.8	6.9	4.85
280	13.7	5.4	3.50	875	22.0	7.1	5.08	1470	26.4	7.2	5.22	2065	29.4	7.1	5.08	2660	31.7	7.0	5.02
285	13.7	5.6	3.61	880	22.1	7.0	5.05	1475	26.4	7.1	5.17	2070	29.4	7.1	5.01	2665	32.0	6.7	4.71
290	13.7	5.7	3.72	885	22.1	7.0	5.06	1480	26.5	7.1	5.12	2075	29.5	7.0	5.01	2670	32.0	6.7	4.67
295	13.8	5.8	3.77	890	22.1	7.0	5.06	1485	26.5	7.1	5.14	2080	29.8	6.8	4.76	2675	31.9	6.8	4.81
300	13.9	5.8	3.81	895	22.2	7.1	5.09	1490	26.5	7.1	5.17	2085	29.7	6.9	4.89	2680	31.7	7.0	5.04
305	14.0	5.9	3.85	900	22.2	7.1	5.12	1495	26.5	7.2	5.24	2090	29.7	6.9	4.86	2685	31.9	6.8	4.83
310	14.1	5.9	3.88	905	22.3	7.1	5.09	1500	26.5	7.2	5.31	2095	29.8	6.8	4.78	2690	32.1	6.7	4.72
315	14.3	5.8	3.88	910	22.3	7.0	5.05	1505	26.5	7.2	5.27	2100	29.8	6.8	4.75	2695	32.1	6.7	4.71
320	14.4	5.9	3.90	915	22.4	7.0	5.05	1510	26.5	7.2	5.27	2105	29.8	6.8	4.81	2700	32.0	6.8	4.81
325	14.5	5.9	3.92	920	22.6	6.9	4.92	1515	26.6	7.2	5.30	2110	29.9	6.8	4.78	2705	32.0	6.8	4.80
330	14.6	5.9	3.93	925	22.7	6.9	4.85	1520	26.5	7.3	5.38	2115	29.9	6.8	4.76	2710	32.1	6.8	4.79
335	14.7	6.0	4.02	930	22.8	6.8	4.77	1525	26.6	7.3	5.37	2120	29.9	6.8	4.84	2715	32.1	6.7	4.71
340	14.7	6.2	4.12	935	22.8	6.8	4.83	1530	26.6	7.3	5.36	2125	29.9	6.9	4.89	2720	32.4	6.5	4.47
345	14.9	6.1	4.06	940	22.8	6.9	4.89	1535	26.6	7.4	5.44	2130	29.9	6.9	4.90	2725	32.2	6.7	4.63
350	15.1	6.0	3.99	945	22.8	6.9	4.87	1540	26.5	7.4	5.53	2135	29.8	6.9	4.94	2730	31.9	7.0	5.05
355	15.3	5.9	3.88	950	22.9	6.9	4.85	1545	26.5	7.5	5.58	2140	29.8	7.1	5.08	2735	31.6	7.4	5.44
360	15.8	5.8	3.78	955	23.0	6.8	4.81	1550	26.6	7.5	5.63	2145	29.8	6.9	4.92	2740	31.8	7.1	5.40
365	15.5	5.9	3.89	960	23.1	6.8	4.77	1555	26.7	7.3	5.59	2150	29.9	7.0	4.98	2745	31.9	7.0	5.06
370	15.5	6.0	4.01	965	23.1	6.7	4.73	1560	26.9	7.1	5.18	2155	29.8	7.1	5.10	2750	32.0	6.9	4.94
375	15.6	6.1	4.03	970	23.2	6.7	4.69	1565	26.9	7.2	5.23	2160	29.8	7.1	5.09	2755	32.0	7.0	4.98
380	15.7	6.1	4.05	975	23.3	6.6	4.62	1570	26.9	7.2	5.30	2165	29.9	7.0	5.00	2760	32.0	7.0	5.06
385	15.7	6.2	4.15	980	23.5	6.6	4.54	1575	27.0	7.2	5.23	2170	29.9	7.1	5.07	2765	32.2	6.8	4.80
390	15.7	6.3	4.25	985	23.5	6.6	4.52	1580	27.0	7.1	5.17	2175	29.8	7.2	5.20	2770	32.3	6.8	4.73

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(μ V) to convert to field strength in dB(μ V/meter)

Cable loss
Cable coax, RG-214, 12.3 m, s/n 056, HL 0415

No.	Frequency, MHz	Cable loss, dB	Measured uncertainty, dB
1	10	0.23	±0.12
2	30	0.44	±0.12
3	50	0.60	±0.12
4	100	0.89	±0.12
5	150	1.11	±0.13
6	200	1.30	±0.13
7	250	1.45	±0.13
8	300	1.61	±0.13
9	400	1.94	±0.13
10	500	2.18	±0.13
11	600	2.45	±0.14
12	700	2.67	±0.14
13	800	2.94	±0.14
14	900	3.16	±0.14
15	1000	3.38	±0.14

Cable loss
Cable coaxial, RG-214/U, N type-N type, 17 m
Teldor, HL 3612

Frequency, MHz	Cable loss, dB
0.1	0.05
0.5	0.07
1	0.10
3	0.22
5	0.29
10	0.39
30	0.68
50	0.90
100	1.27
150	1.58
200	1.80
250	2.12
300	2.36
350	2.60
400	2.82
450	2.99
500	3.23
550	3.40
600	3.56
650	3.71
700	3.90
750	4.04
800	4.23
850	4.39
900	4.55
950	4.65
1000	4.79

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 70047, 18 GHz, 1.8 m, SMA/M - N/M
CBL-6FT-SMNM+, HL 4274

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.07	4800	1.69	9800	2.62	14800	3.42
30	0.11	4900	1.70	9900	2.63	14900	3.39
50	0.14	5000	1.72	10000	2.64	15000	3.38
100	0.21	5100	1.75	10100	2.64	15100	3.40
200	0.26	5200	1.76	10200	2.66	15200	3.41
300	0.30	5300	1.77	10300	2.67	15300	3.40
400	0.37	5400	1.79	10400	2.68	15400	3.39
500	0.44	5500	1.82	10500	2.68	15500	3.41
600	0.49	5600	1.85	10600	2.70	15600	3.44
700	0.54	5700	1.86	10700	2.71	15700	3.46
800	0.58	5800	1.87	10800	2.73	15800	3.45
900	0.63	5900	1.91	10900	2.74	15900	3.47
1000	0.67	6000	1.94	11000	2.76	16000	3.51
1100	0.71	6100	1.97	11100	2.77	16100	3.56
1200	0.75	6200	1.98	11200	2.78	16200	3.55
1300	0.78	6300	1.99	11300	2.79	16300	3.54
1400	0.81	6400	2.02	11400	2.80	16400	3.57
1500	0.85	6500	2.05	11500	2.82	16500	3.62
1600	0.88	6600	2.06	11600	2.83	16600	3.61
1700	0.91	6700	2.06	11700	2.84	16700	3.60
1800	0.94	6800	2.08	11800	2.85	16800	3.62
1900	0.97	6900	2.10	11900	2.87	16900	3.68
2000	1.00	7000	2.12	12000	2.88	17000	3.70
2100	1.03	7100	2.12	12100	2.89	17100	3.68
2200	1.06	7200	2.13	12200	2.90	17200	3.70
2300	1.08	7300	2.16	12300	2.92	17300	3.80
2400	1.11	7400	2.19	12400	2.94	17400	3.84
2500	1.14	7500	2.22	12500	2.95	17500	3.83
2600	1.16	7600	2.23	12600	2.96	17600	3.83
2700	1.19	7700	2.26	12700	2.98	17700	3.86
2800	1.21	7800	2.30	12800	3.00	17800	3.86
2900	1.27	7900	2.33	12900	3.02	17900	3.80
3000	1.29	8000	2.35	13000	3.03	18000	3.79
3100	1.32	8100	2.37	13100	3.06		
3200	1.35	8200	2.41	13200	3.08		
3300	1.37	8300	2.44	13300	3.09		
3400	1.38	8400	2.47	13400	3.10		
3500	1.41	8500	2.48	13500	3.13		
3600	1.43	8600	2.51	13600	3.17		
3700	1.46	8700	2.53	13700	3.17		
3800	1.47	8800	2.55	13800	3.18		
3900	1.49	8900	2.56	13900	3.22		
4000	1.52	9000	2.57	14000	3.26		
4100	1.55	9100	2.58	14100	3.28		
4200	1.56	9200	2.59	14200	3.30		
4300	1.58	9300	2.59	14300	3.35		
4400	1.60	9400	2.60	14400	3.39		
4500	1.63	9500	2.60	14500	3.39		
4600	1.65	9600	2.61	14600	3.39		
4700	1.67	9700	2.61	14700	3.41		

Cable loss
Test cable, Mini-Circuits, S/N 70050, 18 GHz, 1.8 m, SMA/M - N/M
CBL-6FT-SMNM+, HL 4275

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.08	5000	1.71	10200	2.64	15400	3.46
30	0.11	5100	1.73	10300	2.65	15500	3.47
50	0.14	5200	1.75	10400	2.66	15600	3.52
100	0.21	5300	1.76	10500	2.67	15700	3.55
200	0.30	5400	1.77	10600	2.70	15800	3.55
300	0.37	5500	1.82	10700	2.71	15900	3.55
400	0.43	5600	1.84	10800	2.72	16000	3.61
500	0.49	5700	1.86	10900	2.73	16100	3.62
600	0.54	5800	1.86	11000	2.75	16200	3.63
700	0.58	5900	1.89	11100	2.77	16300	3.62
800	0.62	6000	1.94	11200	2.78	16400	3.66
900	0.66	6100	1.95	11300	2.80	16500	3.71
1000	0.70	6200	1.96	11400	2.82	16600	3.71
1100	0.74	6300	1.97	11500	2.83	16700	3.67
1200	0.78	6400	2.01	11600	2.84	16800	3.69
1300	0.81	6500	2.03	11700	2.86	16900	3.74
1400	0.84	6600	2.02	11800	2.88	17000	3.73
1500	0.88	6700	2.02	11900	2.89	17100	3.71
1600	0.91	6800	2.05	12000	2.90	17200	3.73
1700	0.94	6900	2.06	12100	2.92	17300	3.77
1800	0.97	7000	2.07	12200	2.93	17400	3.77
1900	1.00	7100	2.07	12300	2.94	17500	3.76
2000	1.02	7200	2.08	12400	2.96	17600	3.76
2100	1.05	7300	2.11	12500	2.98	17700	3.78
2200	1.07	7400	2.13	12600	2.99	17800	3.80
2300	1.10	7500	2.15	12700	3.01	17900	3.79
2400	1.13	7600	2.16	12800	3.03	18000	3.78
2500	1.15	7700	2.18	12900	3.05		
2600	1.18	7800	2.21	13000	3.07		
2700	1.20	7900	2.24	13100	3.09		
2800	1.24	8000	2.25	13200	3.12		
2900	1.26	8100	2.26	13300	3.13		
3000	1.28	8200	2.29	13400	3.14		
3100	1.30	8300	2.31	13500	3.16		
3200	1.33	8400	2.33	13600	3.18		
3300	1.36	8500	2.33	13700	3.19		
3400	1.37	8600	2.34	13800	3.21		
3500	1.39	8700	2.36	13900	3.23		
3600	1.42	8800	2.38	14000	3.25		
3700	1.45	8900	2.39	14100	3.26		
3800	1.46	9000	2.40	14200	3.27		
3900	1.48	9100	2.42	14300	3.30		
4000	1.50	9200	2.45	14400	3.32		
4100	1.53	9300	2.46	14500	3.33		
4200	1.55	9400	2.48	14600	3.34		
4300	1.57	9500	2.50	14700	3.36		
4400	1.59	9600	2.52	14800	3.39		
4500	1.61	9700	2.54	14900	3.40		
4600	1.64	9800	2.56	15000	3.41		
4700	1.66	9900	2.58	15100	3.41		
4800	1.67	10000	2.60	15200	3.44		
4900	1.69	10100	2.61	15300	3.46		

Cable loss
Test cable, Mini-Circuits, S/N 0747A, 18 GHz, 3.05 m, N/M - N/M
APC-10FT-NMNM+, HL 4276

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.11	4500	2.81	9300	4.30	14100	5.59
30	0.19	4600	2.85	9400	4.33	14200	5.61
50	0.25	4700	2.88	9500	4.36	14300	5.63
100	0.36	4800	2.92	9600	4.39	14400	5.66
150	0.44	4900	2.95	9700	4.42	14500	5.68
200	0.52	5000	3.00	9800	4.46	14600	5.70
300	0.64	5100	3.03	9900	4.49	14700	5.72
400	0.75	5200	3.08	10000	4.53	14800	5.75
500	0.84	5300	3.11	10100	4.56	14900	5.77
600	0.93	5400	3.13	10200	4.60	15000	5.80
700	1.01	5500	3.16	10300	4.64	15100	5.82
800	1.08	5600	3.20	10400	4.66	15200	5.85
900	1.15	5700	3.22	10500	4.68	15300	5.88
1000	1.22	5800	3.26	10600	4.70	15400	5.91
1100	1.28	5900	3.30	10700	4.73	15500	5.93
1200	1.34	6000	3.34	10800	4.75	15600	5.97
1300	1.40	6100	3.39	10900	4.77	15700	5.99
1400	1.46	6200	3.42	11000	4.80	15800	6.02
1500	1.51	6300	3.47	11100	4.83	15900	6.07
1600	1.57	6400	3.50	11200	4.86	16000	6.08
1700	1.62	6500	3.52	11300	4.88	16100	6.11
1800	1.68	6600	3.55	11400	4.90	16200	6.12
1900	1.72	6700	3.58	11500	4.92	16300	6.14
2000	1.77	6800	3.60	11600	4.94	16400	6.17
2100	1.82	6900	3.62	11700	4.96	16500	6.19
2200	1.87	7000	3.64	11800	4.98	16600	6.21
2300	1.92	7100	3.66	11900	5.01	16700	6.22
2400	1.96	7200	3.68	12000	5.03	16800	6.24
2500	2.01	7300	3.71	12100	5.06	16900	6.26
2600	2.05	7400	3.74	12200	5.09	17000	6.28
2700	2.10	7500	3.78	12300	5.12	17100	6.31
2800	2.14	7600	3.81	12400	5.15	17200	6.33
2900	2.18	7700	3.84	12500	5.17	17300	6.36
3000	2.23	7800	3.87	12600	5.20	17400	6.39
3100	2.27	7900	3.90	12700	5.22	17500	6.42
3200	2.31	8000	3.93	12800	5.25	17600	6.45
3300	2.35	8100	3.96	12900	5.28	17700	6.48
3400	2.39	8200	4.00	13000	5.32	17800	6.50
3500	2.42	8300	4.03	13100	5.35	17900	6.52
3600	2.46	8400	4.06	13200	5.38	18000	6.55
3700	2.50	8500	4.08	13300	5.40		
3800	2.54	8600	4.11	13400	5.42		
3900	2.58	8700	4.13	13500	5.44		
4000	2.61	8800	4.16	13600	5.46		
4100	2.65	8900	4.18	13700	5.48		
4200	2.69	9000	4.21	13800	5.51		
4300	2.73	9100	4.24	13900	5.53		
4400	2.77	9200	4.27	14000	5.56		

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

Cable loss
Low Loss Armored Test Cable, MegaPhase, 18 GHz, 6.2 m, N type-M/N type-M,
NC29-N1N1-244S/N 12025101 002,
HL 4352

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
50	0.20	9000	2.81
100	0.28	9500	2.89
300	0.49	10000	3.00
500	0.63	10500	3.07
1000	0.90	11000	3.15
1500	1.10	11500	3.23
2000	1.28	12000	3.30
2500	1.44	12500	3.38
3000	1.57	13000	3.47
3500	1.71	13500	3.55
4000	1.85	14000	3.61
4500	1.95	14500	3.68
5000	2.05	15000	3.76
5500	2.14	15500	3.86
6000	2.27	16000	3.92
6500	2.38	16500	3.97
7000	2.47	17000	4.03
7500	2.58	17500	4.10
8000	2.65	18000	4.18
8500	2.74		

Cable loss
Low Loss Armored Test Cable, MegaPhase, 18 GHz, 6.2 m, N type-M/N type-M,
NC29-N1N1-244S/N 12025101 003,
HL 4353

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
50	0.20	9000	2.71
100	0.27	9500	2.81
300	0.47	10000	2.90
500	0.61	10500	2.97
1000	0.87	11000	3.06
1500	1.07	11500	3.13
2000	1.24	12000	3.20
2500	1.39	12500	3.26
3000	1.53	13000	3.34
3500	1.65	13500	3.39
4000	1.77	14000	3.47
4500	1.89	14500	3.54
5000	1.99	15000	3.62
5500	2.07	15500	3.69
6000	2.20	16000	3.76
6500	2.30	16500	3.83
7000	2.39	17000	3.86
7500	2.51	17500	3.94
8000	2.58	18000	4.02
8500	2.65		

14 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
dB(μ A)	decibel referred to one microampere
DC	direct current
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
μ s	microsecond
NA	not applicable
OATS	open area test site
Ω	Ohm
PS	power supply
ppm	part per million (10^{-6})
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt

END OF DOCUMENT