Test specification:	Section 90.209 / RSS-197, Section 5.2, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 44 %	Power Supply: -48 VDC
Remarks:			

7.3 Occupied bandwidth test

7.3.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points	Maximum allowed bandwidth, MHz
3650.0 – 3700.0	99% power	NA

* - Modulation envelope reference points are provided in terms of attenuation below the total average power.

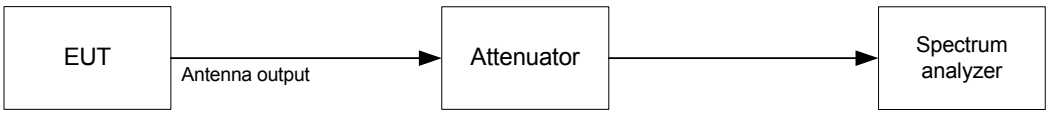
7.3.2 Test procedure

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

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

7.3.2.3 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.3.2 and the associated plots.

Figure 7.3.1 Occupied bandwidth test setup



Test specification:	Section 90.209 / RSS-197, Section 5.2, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 44 %	Power Supply: -48 VDC
Remarks:			

Table 7.3.2 Occupied bandwidth test results

DETECTOR USED: Average
RESOLUTION BANDWIDTH: 0.5-2% of the Emission bandwidth
VIDEO BANDWIDTH: 10 times RBW
MODULATING SIGNAL: PRBS

Carrier frequency, MHz	Measured with antenna assembly gain*	Modulation	99% occupied bandwidth, MHz	Emission bandwidth, MHz
3652.5	21 dBi	BPSK	4.6348	5.0
3663.0	21 dBi	BPSK	4.5083	5.0
3672.5	21 dBi	BPSK	4.5047	5.0
3652.5	13.5 dBi	64QAM	4.5854	5.0
3663.0	21 dBi	64QAM	4.5050	5.0
3672.5	24 dBi	64QAM	4.5148	5.0
3655.0	24 dBi	BPSK	9.0765	10.0
3663.0	13.5 dBi	BPSK	9.0449	10.0
3670.0	13.5 dBi	BPSK	9.0194	10.0
3655.0	24 dBi	64QAM	9.0260	10.0
3663.0	13.5 dBi	64QAM	9.0275	10.0
3669.0	13.5 dBi	64QAM	9.0144	10.0
3660.0	21 dBi	BPSK	17.9909	20.0
3663.0	13.5 dBi	BPSK	17.9039	20.0
3664.0	13.5 dBi	BPSK	17.8810	20.0
3660.0	17 dBi	64QAM	18.1500	20.0
3663.0	24 dBi	64QAM	18.6084	20.0
3669.0	13.5 dBi	64QAM	17.8643	20.0

* - Refer to Plots given in the test report section 7.1.
NOTE: Measured with no limit.

Reference numbers of test equipment used

HL 3440	HL 3474	HL 3779	HL 3784	HL 3818			

Full description is given in Appendix A.

Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 23.5 ºC	Air Pressure: 1009 hPa	Relative Humidity: 44 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

7.4 Emission mask test for 17 dBi gain

7.4.1 General

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

Table 7.4.1 Emission mask limits

Frequency displacement from carrier	Attenuation below carrier, dBc
Emission mask B (Emission bandwidth 5 MHz)	
0 – 2.5 MHz	0
2.5 – 5.0 MHz	25
5.0 – 12.5 MHz	35
More than* 12.5 MHz	43 + 10 log(P)
Emission mask B (Emission bandwidth 7 MHz)	
0 – 3.5 MHz	0
3.5 – 7.0 MHz	25
7.0 – 17.5 MHz	35
More than* 17.5 MHz	43 + 10 log(P)
Emission mask B (Emission bandwidth 10 MHz)	
0 – 5 MHz	0
5 – 10.0 MHz	25
10.0 – 25.0 MHz	35
More than* 25.0 MHz	43 + 10 log(P)

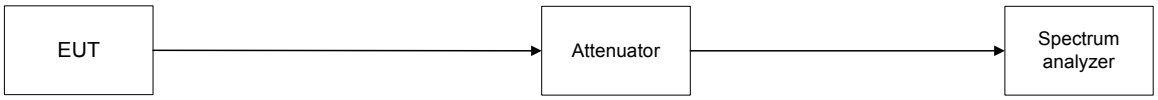
* - emission mask includes carrier modulation envelope within ± 250 % of the authorized bandwidth; the frequency range removed beyond ± 250 % of the authorized bandwidth from carrier was investigated as spurious emission

7.4.2 Test procedure

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and its proper operation was checked.

7.4.2.2 The emission mask was measured with spectrum analyzer as provided in the associated plots. The test results recorded in Table 7.4.2.

Figure 7.4.1 Emission mask test setup



Test specification:	**Section 90.210(b), Emission mask**		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	11/15/2010		
Temperature: 23.5 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 44 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Table 7.4.2 Emission mask test results

Carrier frequency, MHz	RBW, kHz (NOTE1)	Limit	Reference to Plot	Verdict
Channel bandwidth 5 MHz				
3652.5	100	Emission mask B	Plot 7.4.1	Pass
3663.0	100		Plot 7.4.2	
3672.5	100		Plot 7.4.3	
Channel bandwidth 10 MHz				
3655.0	100	Emission mask B	Plot 7.4.4	Pass
3663.0	100		Plot 7.4.5	
3670.0	100		Plot 7.4.6	
Channel bandwidth 20 MHz				
3660.0	1000	Emission mask B	Plot 7.4.7	Pass
3663.0	1000		Plot 7.4.8	
3665.0	1000		Plot 7.4.9	

NOTE1: Attenuation below carrier provided in terms of attenuation below total average power within occupied bandwidth. Measurement was performed with RBW set to 100 kHz for channel bandwidth 5MHz and 10MHz and the limit mask was reduced by 10 dB to compensate the lower RBW [10*log(1 MHz/ 100 kHz] = 10 dB;
NOTE2: Measurement was performed at BPSK modulation represented the worst case of power and power density.

Reference numbers of test equipment used

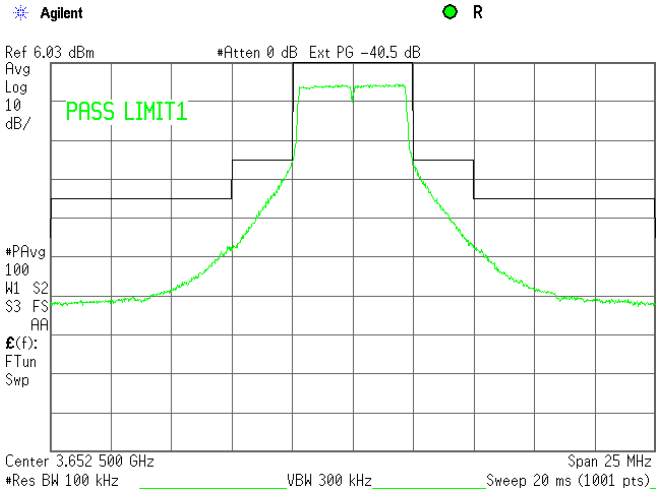
HL 3440	HL 3474	HL 3779	HL 3784	HL 3818			

Full description is given in Appendix A.

Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 23.5 ºC	Air Pressure: 1009 hPa	Relative Humidity: 44 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

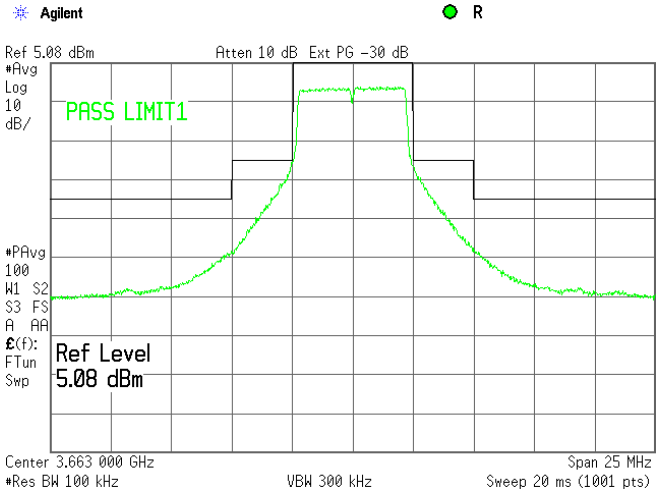
Plot 7.4.1 Emission mask test results at low carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	BPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	5 MHz
TRANSMITTER OUTPUT POWER:	16.03 dBm



Plot 7.4.2 Emission mask test results at mid carrier frequency

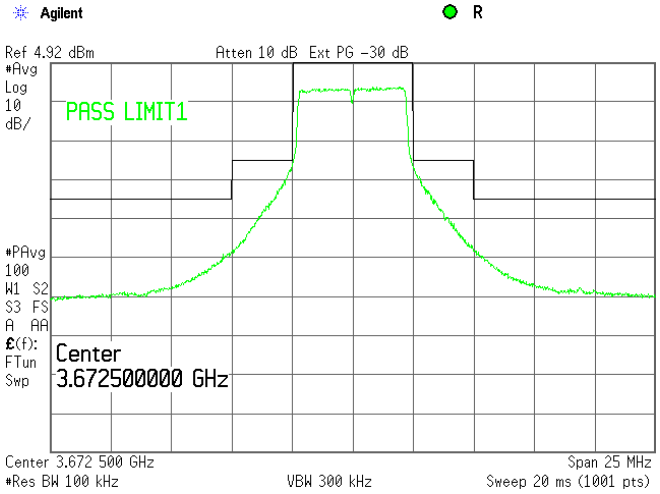
ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	5 MHz
TRANSMITTER OUTPUT POWER:	15.08 dBm



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 23.5 ºC	Air Pressure: 1009 hPa	Relative Humidity: 44 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

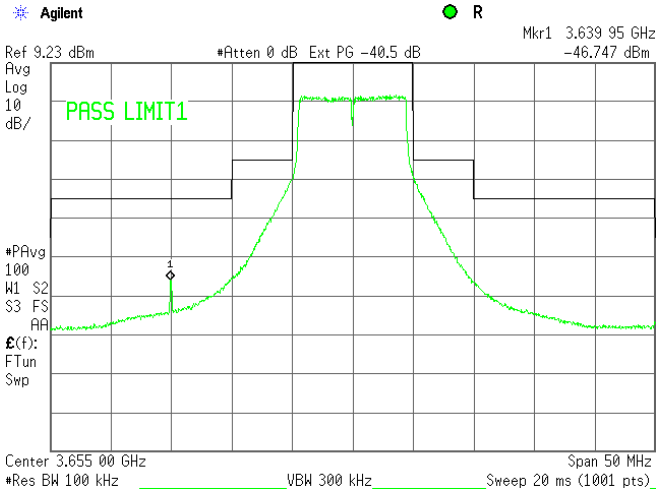
Plot 7.4.3 Emission mask test results at high carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	BPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	5 MHz
TRANSMITTER OUTPUT POWER:	14.92 dBm



Plot 7.4.4 Emission mask test results at low carrier frequency

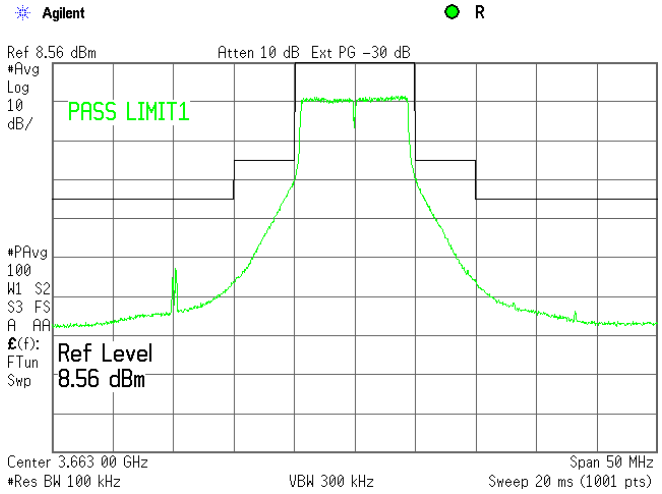
ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	BPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	10 MHz
TRANSMITTER OUTPUT POWER:	19.23 dBm



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 23.5 ºC	Air Pressure: 1009 hPa	Relative Humidity: 44 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

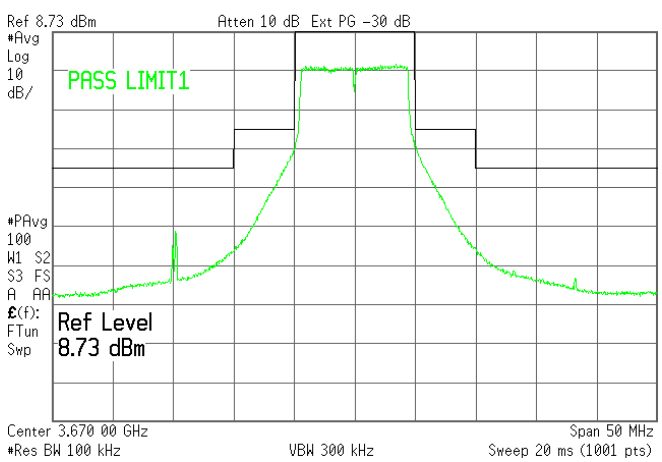
Plot 7.4.5 Emission mask test results at mid carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	BPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	10 MHz
TRANSMITTER OUTPUT POWER:	18.56 dBm



Plot 7.4.6 Emission mask test results at high carrier frequency

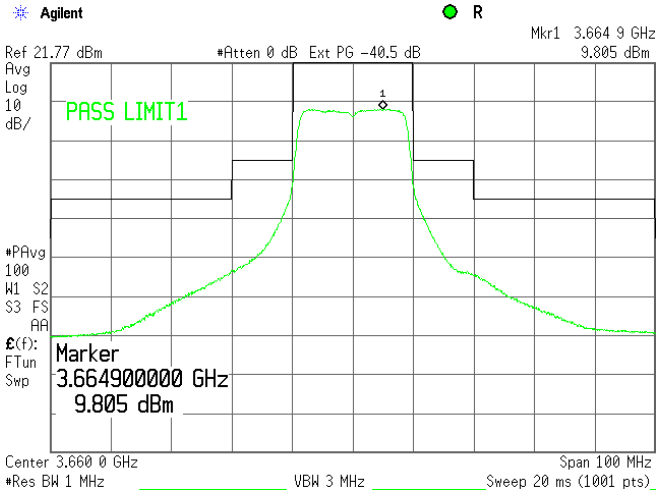
ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	BPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	10 MHz
TRANSMITTER OUTPUT POWER:	18.73 dBm



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 23.5 ºC	Air Pressure: 1009 hPa	Relative Humidity: 44 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

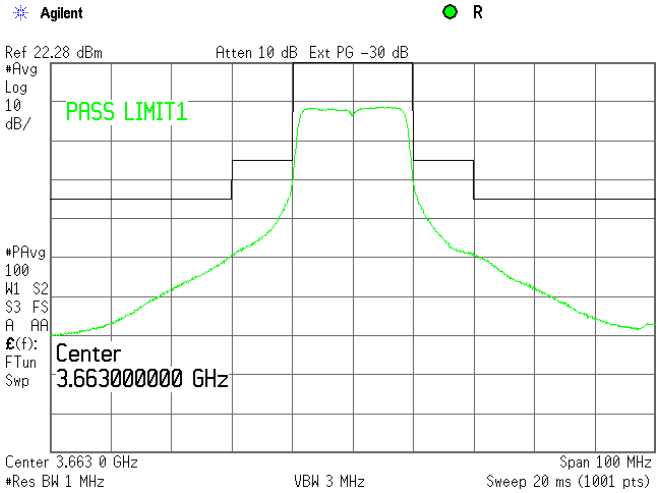
Plot 7.4.7 Emission mask test results at low carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	BPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	20 MHz
TRANSMITTER OUTPUT POWER:	21.77 dBm



Plot 7.4.8 Emission mask test results at mid carrier frequency

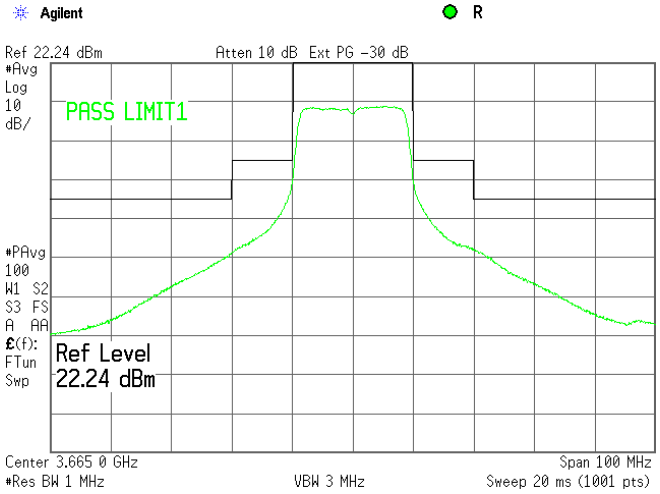
ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	20 MHz
TRANSMITTER OUTPUT POWER:	22.28 dBm



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 23.5 ºC	Air Pressure: 1009 hPa	Relative Humidity: 44 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.4.9 Emission mask test results at high carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	20 MHz
TRANSMITTER OUTPUT POWER:	22.24 dBm



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

7.5 Emission mask test for 13.5 dBi gain

7.5.1 General

This test was performed to measure emission mask at RF antenna connector. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Emission mask limits

Frequency displacement from carrier	Attenuation below carrier, dBc
Emission mask B (Emission bandwidth 5 MHz)	
0 – 2.5 MHz	0
2.5 – 5.0 MHz	25
5.0 – 12.5 MHz	35
More than* 12.5 MHz	43 + 10 log(P)
Emission mask B (Emission bandwidth 7 MHz)	
0 – 3.5 MHz	0
3.5 – 7.0 MHz	25
7.0 – 17.5 MHz	35
More than* 17.5 MHz	43 + 10 log(P)
Emission mask B (Emission bandwidth 10 MHz)	
0 – 5 MHz	0
5 – 10.0 MHz	25
10.0 – 25.0 MHz	35
More than* 25.0 MHz	43 + 10 log(P)

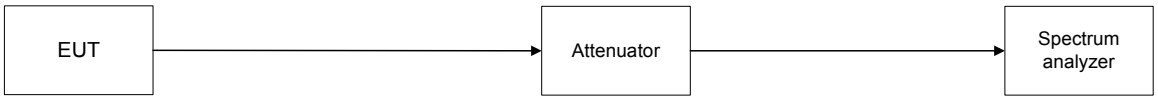
* - emission mask includes carrier modulation envelope within ± 250 % of the authorized bandwidth; the frequency range removed beyond ± 250 % of the authorized bandwidth from carrier was investigated as spurious emission

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 emission mask was measured with spectrum analyzer as provided in the associated plots. The test results recorded in Table 7.5.2.

Figure 7.5.1 Emission mask test setup



Test specification:	**Section 90.210(b), Emission mask**		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	11/15/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Table 7.5.2 Emission mask test results

Carrier frequency, MHz	RBW, kHz (NOTE1)	Limit	Reference to Plot	Verdict
5 MHz				
3652.5	100	Emission mask B	Plot 7.5.1	Pass
3663.0	100		Plot 7.5.2	
3672.5	100		Plot 7.5.3	
10 MHz				
3656.0	100	Emission mask B	Plot 7.5.4	Pass
3663.0	100		Plot 7.5.5	
3669.0	100		Plot 7.5.6	
20 MHz				
3661.0	1000	Emission mask B	Plot 7.5.7	Pass
3663.0	1000		Plot 7.5.8	
3664.0	1000		Plot 7.5.9	

NOTE1: Attenuation below carrier provided in terms of attenuation below total average power within occupied bandwidth. Measurement was performed with RBW set to 100 kHz for channel bandwidth 5MHz and 10MHz and the limit mask was reduced by 10 dB to compensate the lower RBW [10*log(1 MHz/ 100 kHz] = 10 dB;
NOTE2: Measurement was performed at BPSK modulation represented the worst case of power and power density.

Reference numbers of test equipment used

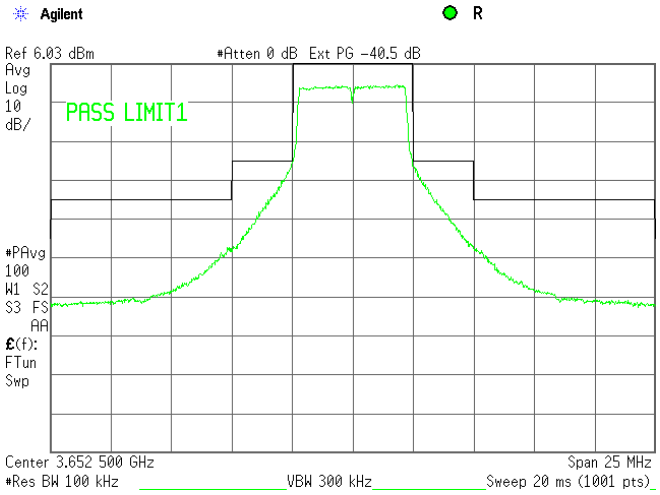
HL 3440	HL 3474	HL 3779	HL 3784	HL 3818			

Full description is given in Appendix A.

Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

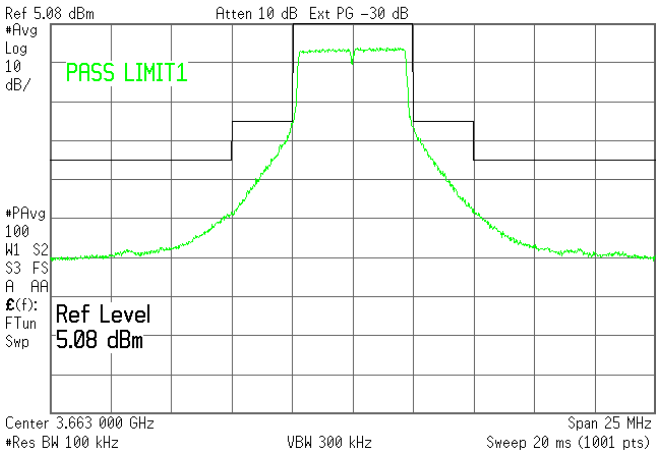
Plot 7.5.1 Emission mask test results at low carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	BPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	5 MHz
TRANSMITTER OUTPUT POWER:	16.03 dBm



Plot 7.5.2 Emission mask test results at mid carrier frequency

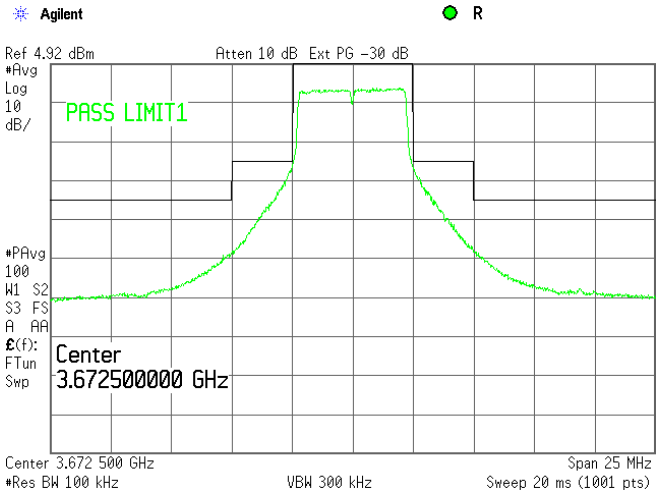
ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	5 MHz
TRANSMITTER OUTPUT POWER:	15.08 dBm



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

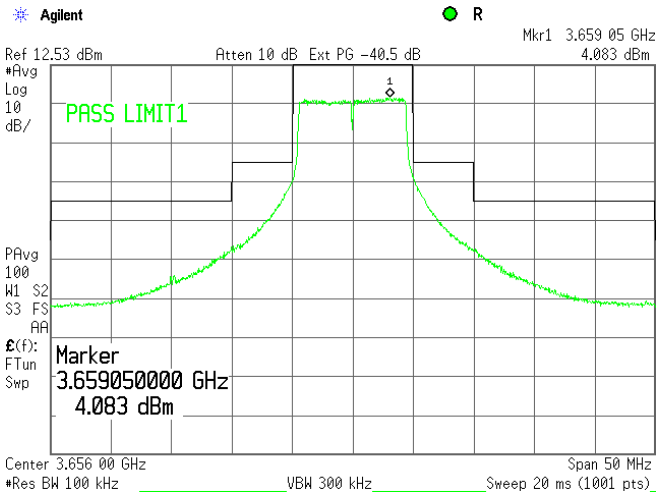
Plot 7.5.3 Emission mask test results at high carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	BPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	5 MHz
TRANSMITTER OUTPUT POWER:	14.92 dBm



Plot 7.5.4 Emission mask test results at low carrier frequency

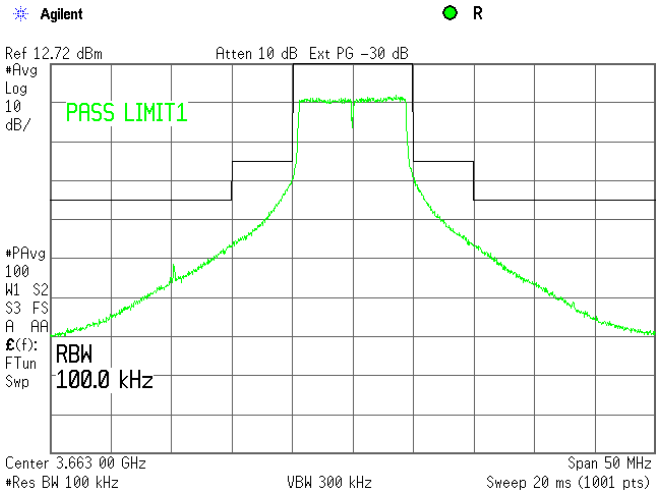
ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	10 MHz
TRANSMITTER OUTPUT POWER:	22.53 dBm



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

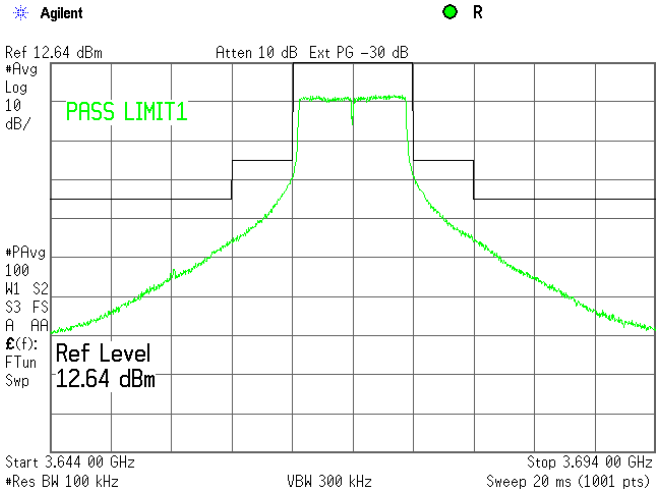
Plot 7.5.5 Emission mask test results at mid carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	10 MHz
TRANSMITTER OUTPUT POWER:	22.72 dBm



Plot 7.5.6 Emission mask test results at high carrier frequency

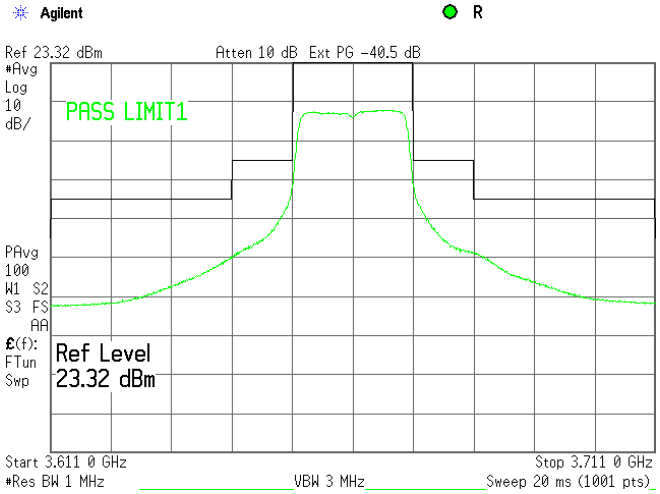
ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	BPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	10 MHz
TRANSMITTER OUTPUT POWER:	22.64 dBm



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

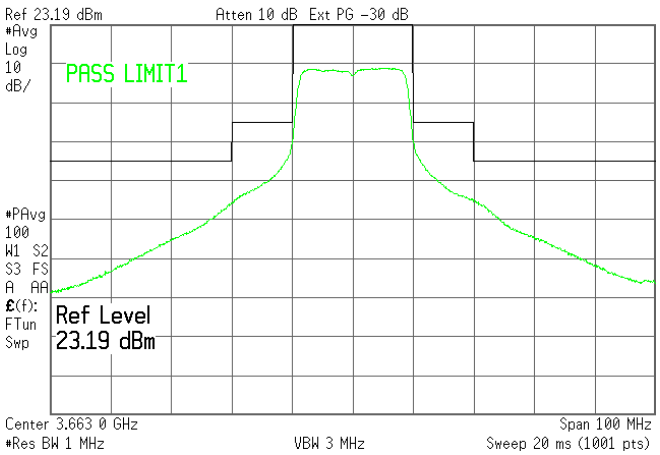
Plot 7.5.7 Emission mask test results at low carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	20 MHz
TRANSMITTER OUTPUT POWER:	23.32 dBm



Plot 7.5.8 Emission mask test results at mid carrier frequency

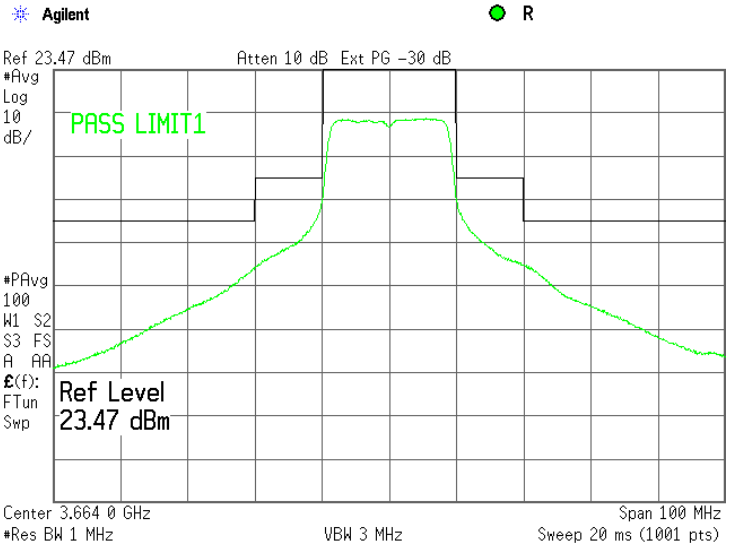
ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	20 MHz
TRANSMITTER OUTPUT POWER:	23.19 dBm



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	11/15/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.5.9 Emission mask test results at high carrier frequency

ASSIGNED FREQUENCY RANGE:	3650 – 3675 MHz
DETECTOR USED:	Average (RMS)
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
CHANNEL BANDWIDTH:	20 MHz
TRANSMITTER OUTPUT POWER:	23.47 dBm



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

7.6 Spurious emissions at RF antenna connector test for 17 dBi gain

7.6.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Spurious emission limits

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

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

7.6.2 Test procedure

7.6.2.1 The EUT was set up as shown in Figure 7.6.1, Figure 7.6.2, energized and its proper operation was checked.
7.6.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
7.6.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.6.2 and associated plots.

Figure 7.6.1 Spurious emission test setup for single antenna mode

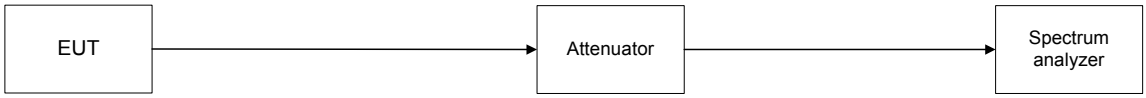
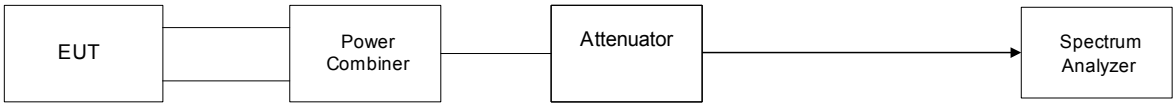


Figure 7.6.2 Spurious emission test setup for MIMO mode



Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Table 7.6.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 3650 – 3675 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 40000 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
EMISSION BANDWIDTH: 20 MHz
TRANSMITTER OUTPUT POWER: Maximum

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm	Limit, dBm	Margin, dB*	Verdict
Single RF output								
Low carrier frequency								
2845.000	-29.636	Included	Included	1000	-29.636	-13.000	-16.636	Pass
7320.000	-44.628	Included	Included	1000	-44.628	-13.000	-31.628	Pass
Mid carrier frequency								
2859.965	-32.148	Included	Included	1000	-32.148	-13.000	-19.148	Pass
7349.100	-42.814	Included	Included	1000	-42.814	-13.000	-29.814	Pass
High carrier frequency								
2875.000	-31.649	Included	Included	1000	-31.649	-13.000	-18.649	Pass
7381.800	-40.268	Included	Included	1000	-40.268	-13.000	-27.268	Pass
MIMO mode								
Low carrier frequency								
2849.980	-34.204	Included	Included	1000	-34.204	-13.000	-21.204	Pass
7320.000	-46.337	Included	Included	1000	-46.337	-13.000	-33.337	Pass
Mid carrier frequency								
2860.000	-28.623	Included	Included	1000	-28.623	-13.000	-15.623	Pass
7350.100	-44.467	Included	Included	1000	-44.467	-13.000	-31.467	Pass
High carrier frequency								
2875.000	-27.693	Included	Included	1000	-27.693	-13.000	-14.693	Pass
7379.700	-44.843	Included	Included	1000	--44.843	-13.000	-31.843	Pass

*****- Margin = Spurious emission – specification limit.

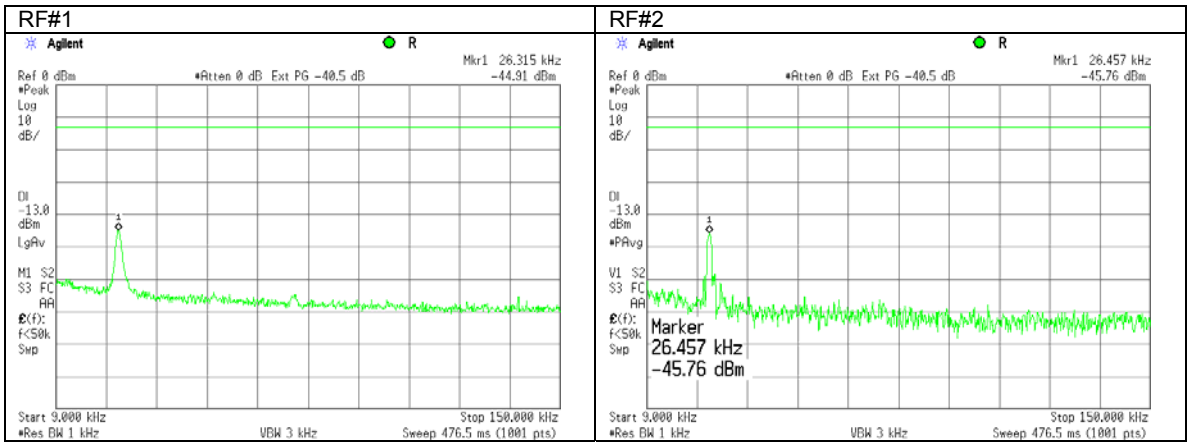
Reference numbers of test equipment used

HL 1906	HL 2953	HL 3440	HL 3455	HL 3472	HL 3474	HL 3779	HL 3784

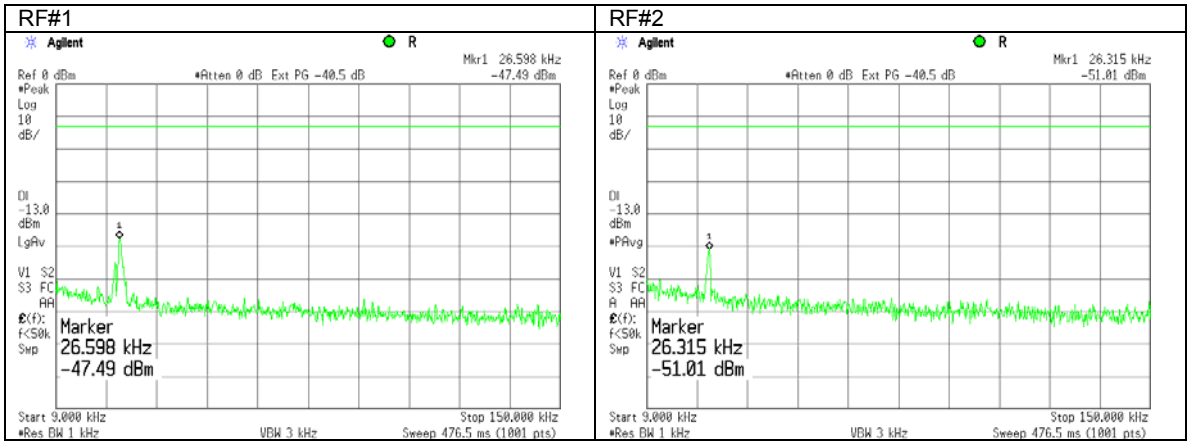
Full description is given in Appendix A.

Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.1 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency



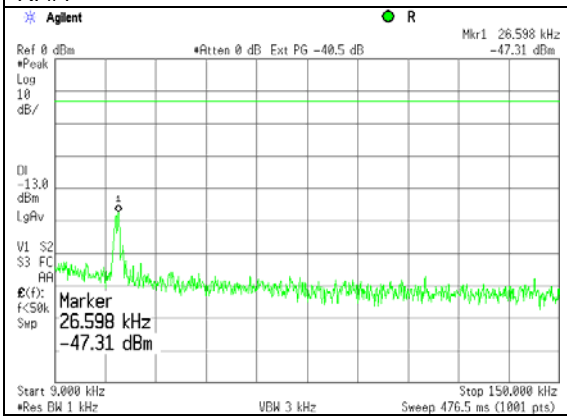
Plot 7.6.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency



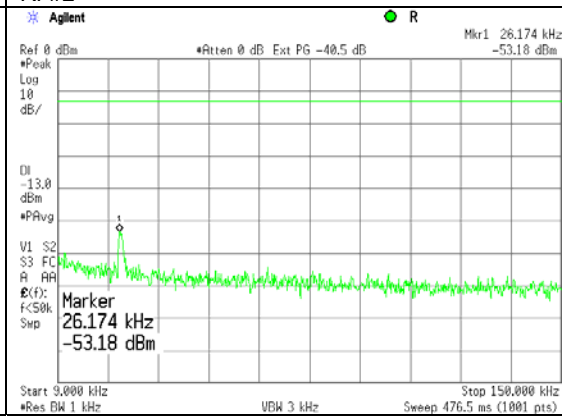
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

RF#1

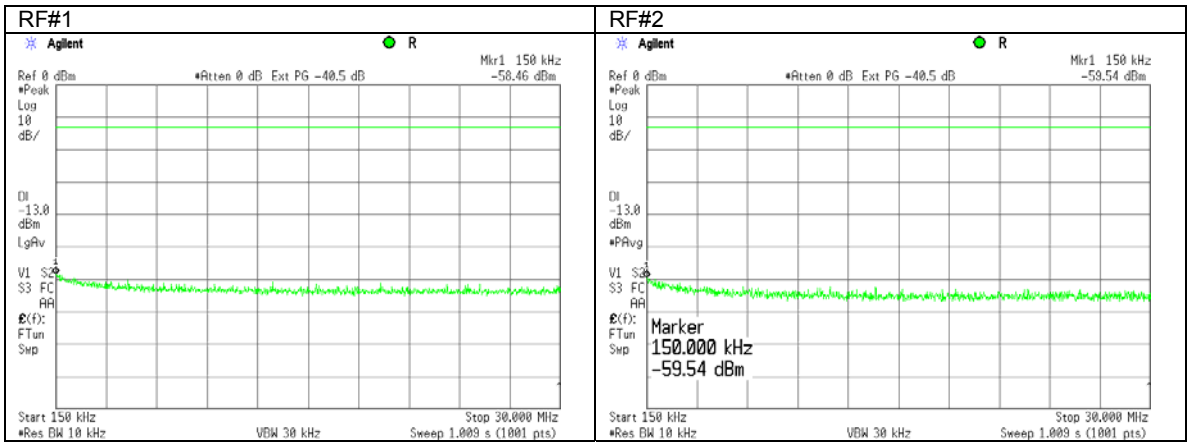


RF#2

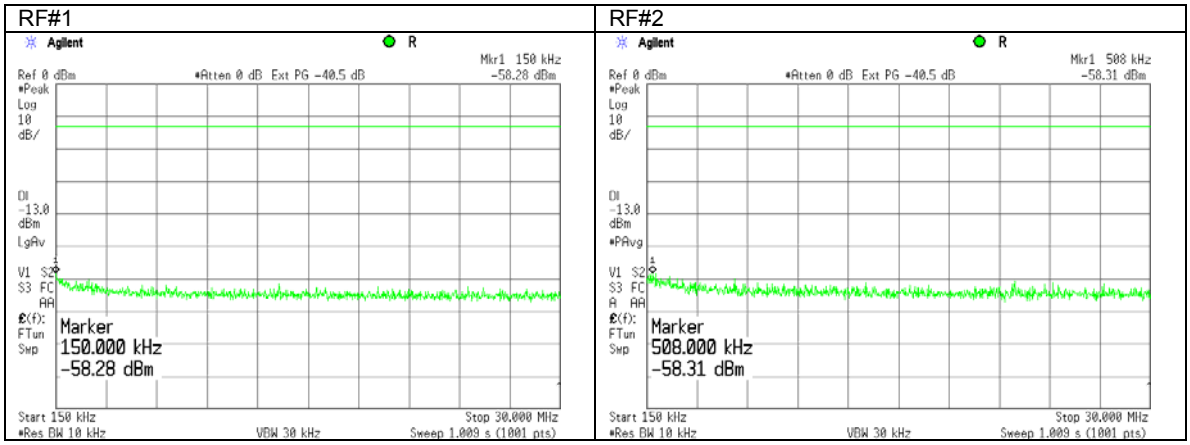


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.4 Spurious emission measurements in 0.15 - 30.0 MHz range at low carrier frequency



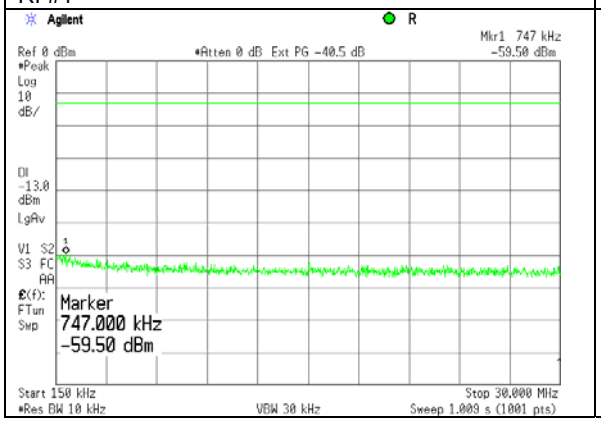
Plot 7.6.5 Spurious emission measurements in 0.15 - 30.0 MHz range at mid carrier frequency



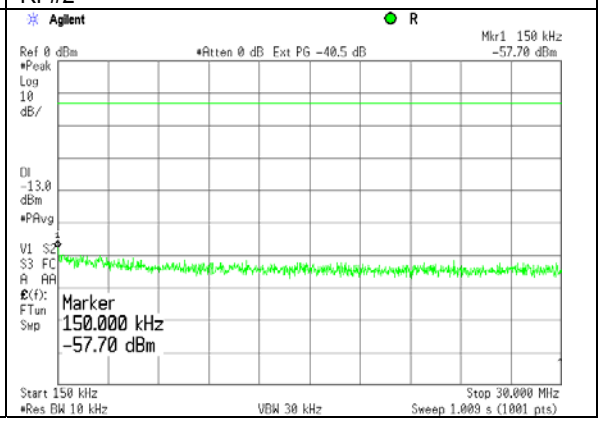
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.6 Spurious emission measurements in 0.15 – 30.0 MHz range at high carrier frequency

RF#1



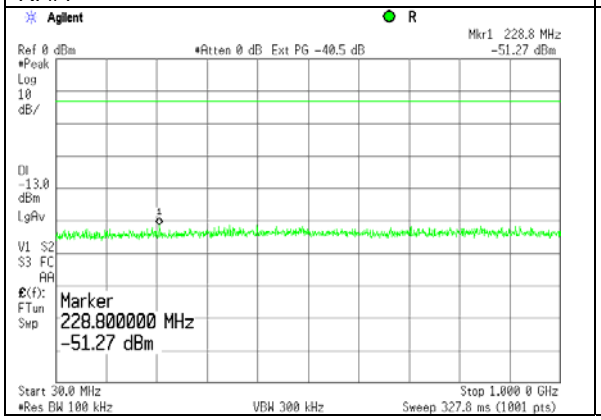
RF#2



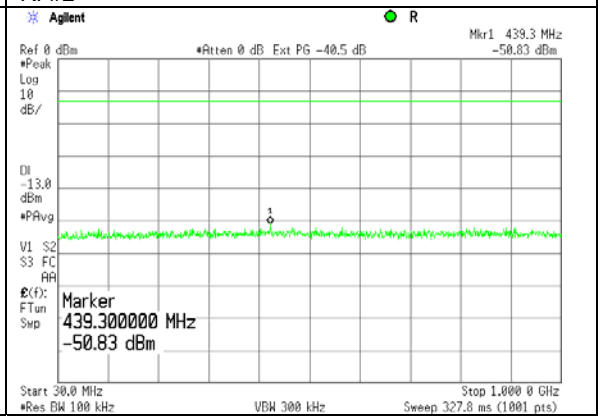
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.7 Spurious emission measurements in 30.0 - 1000 MHz range at low carrier frequency

RF#1

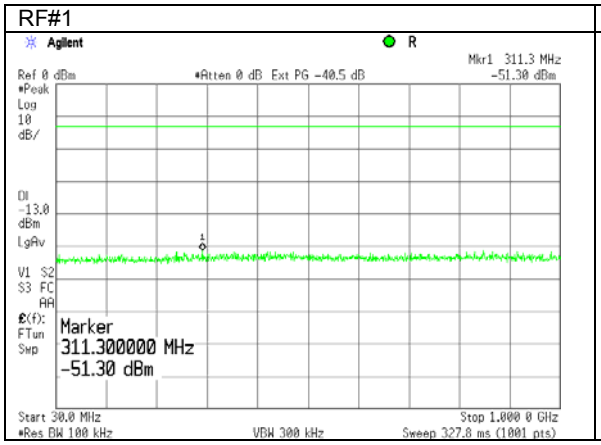


RF#2

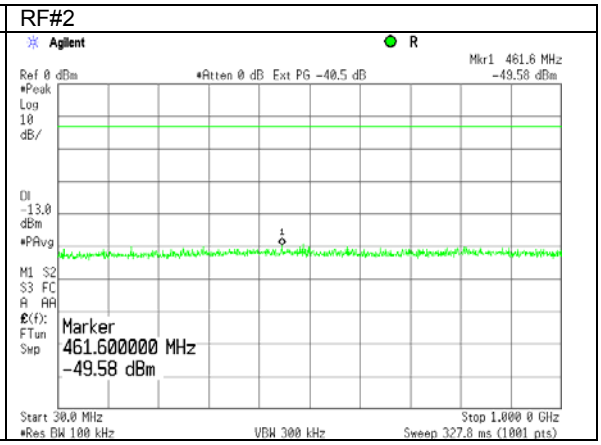


Plot 7.6.8 Spurious emission measurements in 30.0 - 1000 MHz range at mid carrier frequency

RF#1



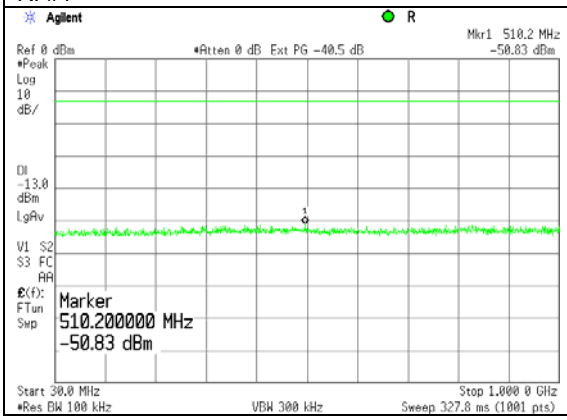
RF#2



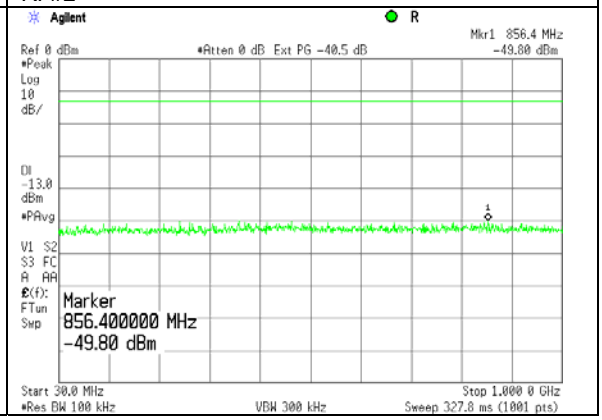
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.9 Spurious emission measurements in 30.0 - 1000 MHz range at high carrier frequency

RF#1



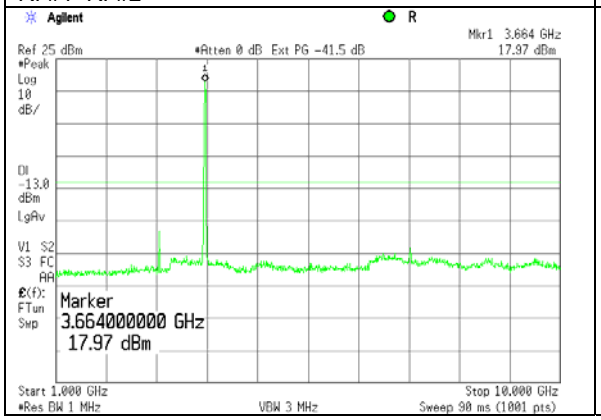
RF#2



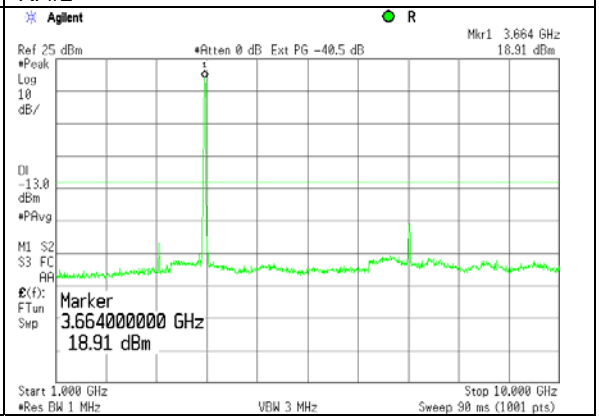
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.10 Spurious emission measurements in 1000 - 10000 MHz range at low carrier frequency

RF#1+RF#2

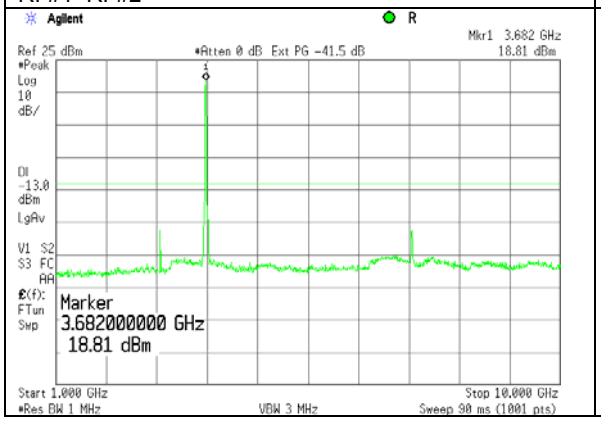


RF#2

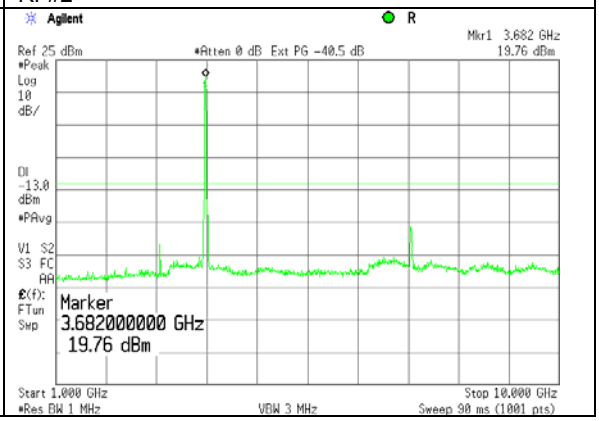


Plot 7.6.11 Spurious emission measurements in 1000 - 10000 MHz range at mid carrier frequency

RF#1+RF#2

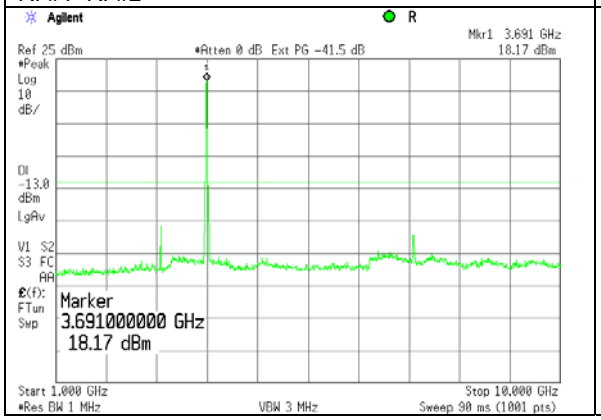
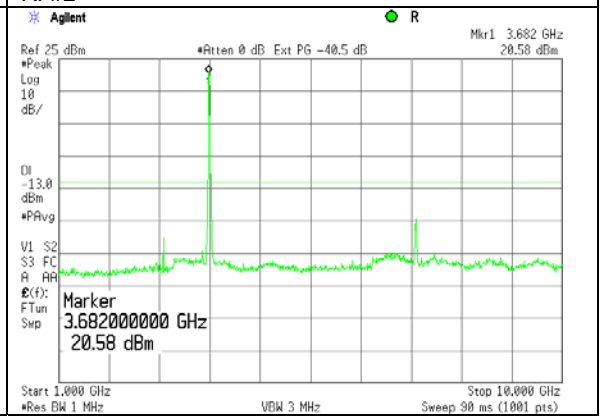


RF#2



Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

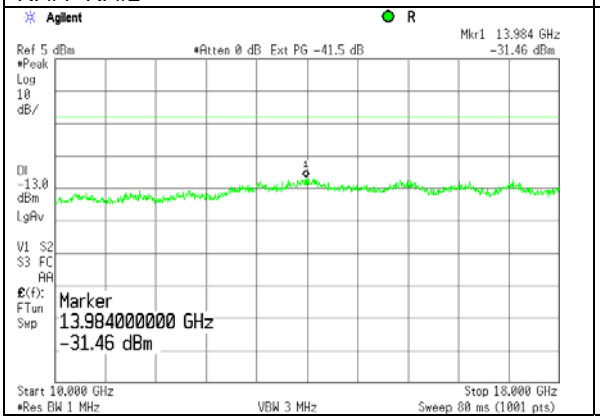
Plot 7.6.12 Spurious emission measurements in 1000 - 10000 MHz range at high carrier frequency

RF#1+RF#2	RF#2
	

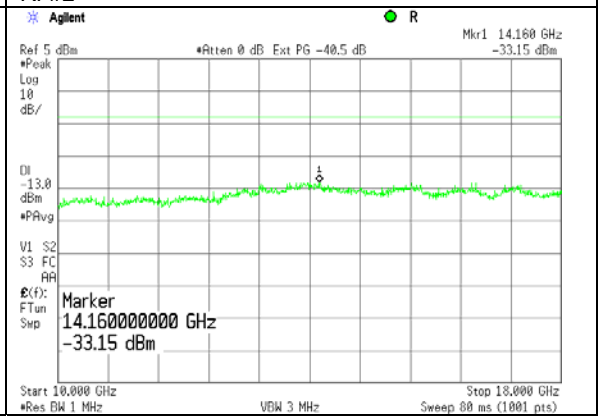
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.13 Spurious emission measurements in 10000 - 18000 MHz range at low carrier frequency

RF#1+RF#2

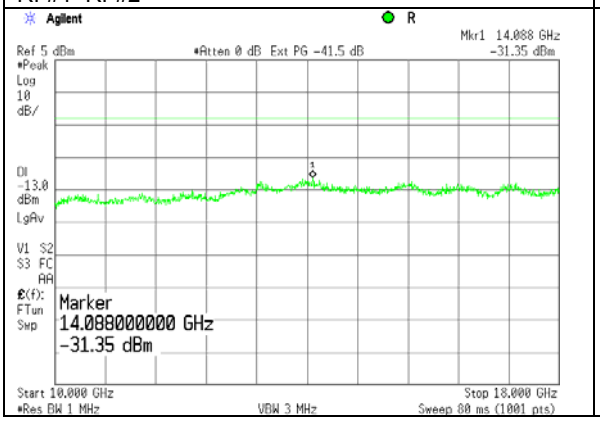


RF#2

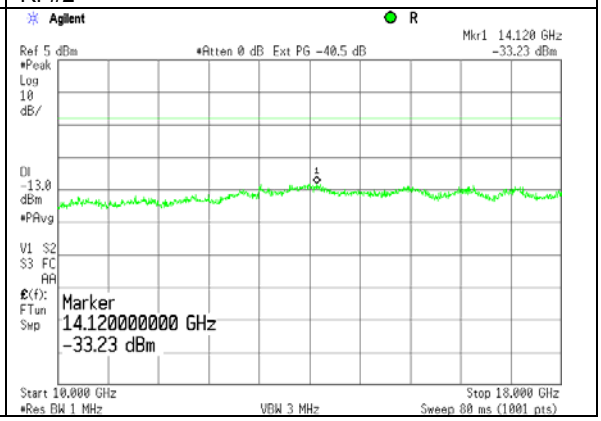


Plot 7.6.14 Spurious emission measurements in 10000 - 18000 MHz at mid carrier frequency

RF#1+RF#2



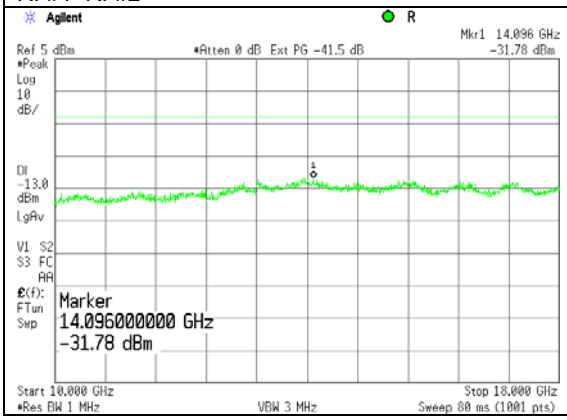
RF#2



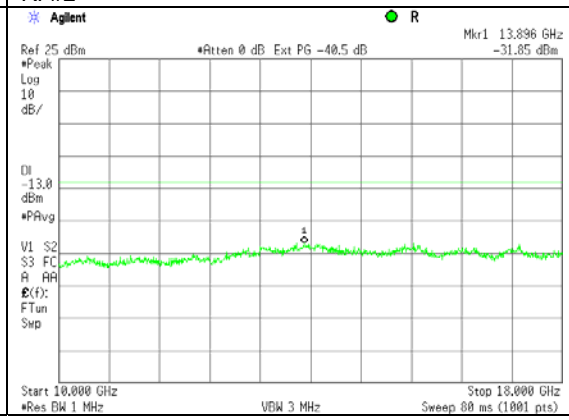
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.15 Spurious emission measurements in 10000 - 18000 MHz at high carrier frequency

RF#1+RF#2

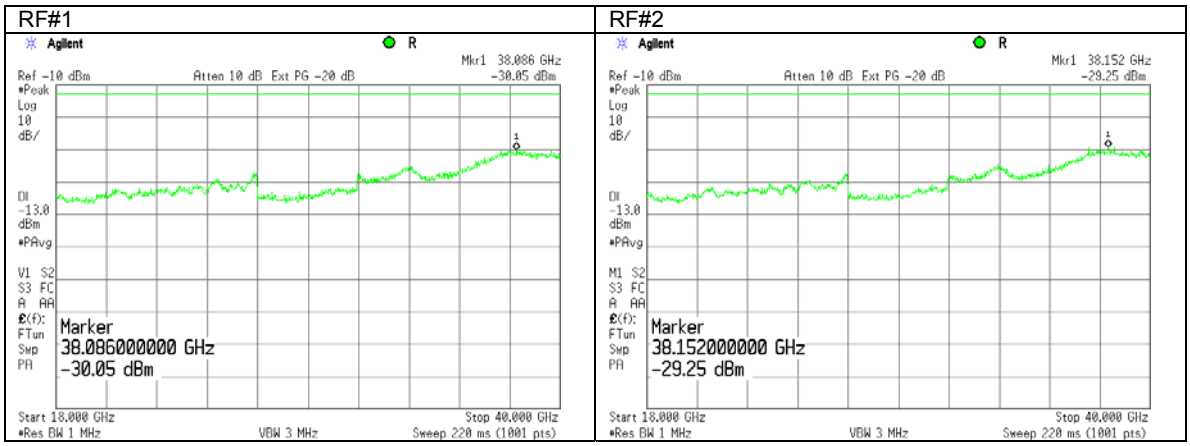


RF#2

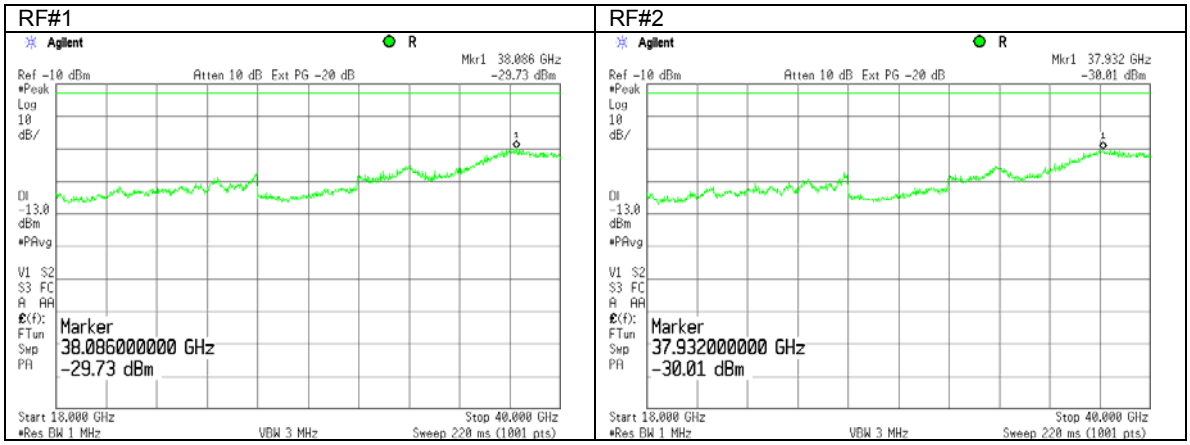


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.16 Spurious emission measurements in 18000 - 40000 MHz range at low carrier frequency



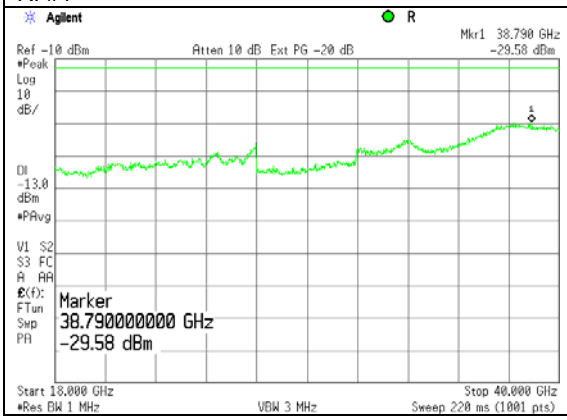
Plot 7.6.17 Spurious emission measurements in 18000 - 40000 MHz at mid carrier frequency



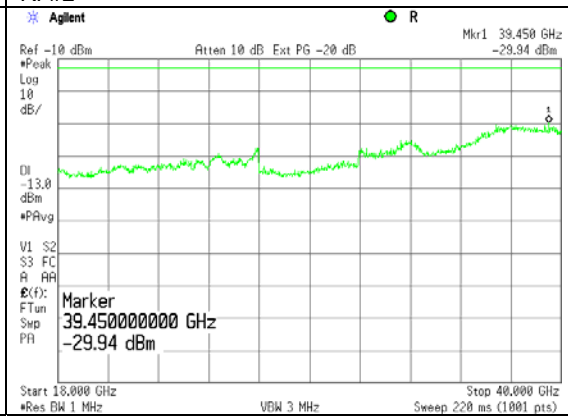
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.18 Spurious emission measurements in 18000 - 40000 MHz at high carrier frequency

RF#1

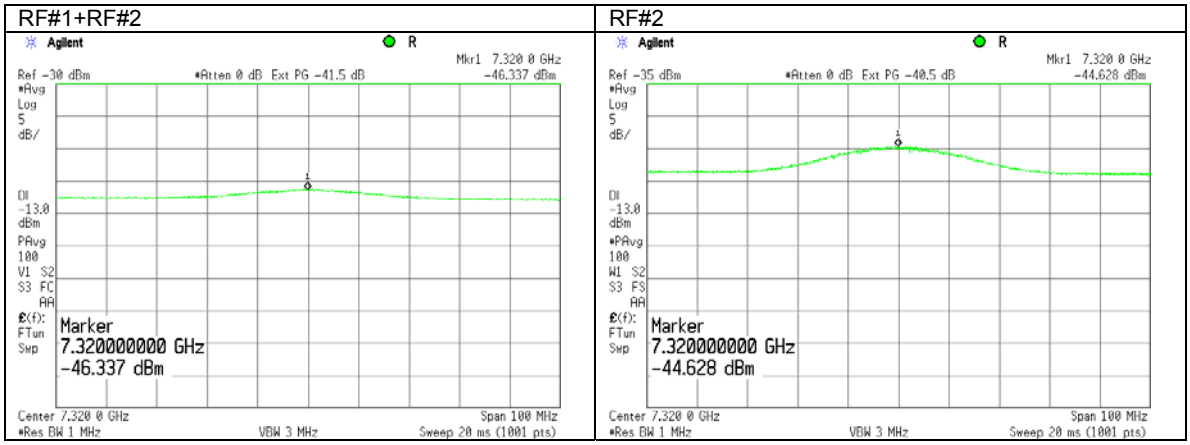


RF#2

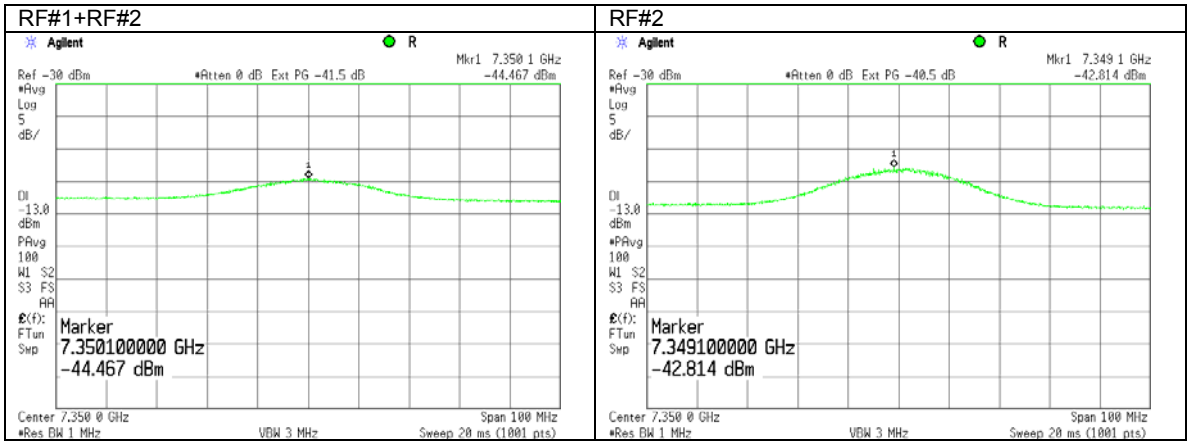


Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.19 Spurious emission measurements at the 2nd harmonic of low carrier frequency



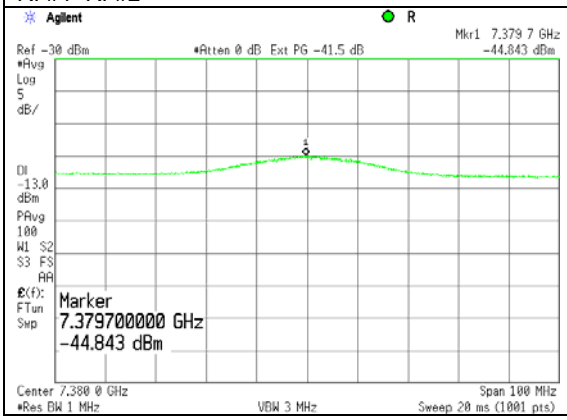
Plot 7.6.20 Spurious emission measurements at the 2nd harmonic of mid carrier frequency



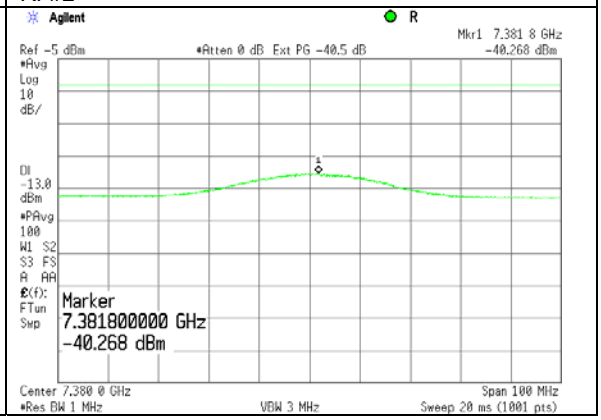
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.21 Spurious emission measurements at the 2nd harmonic of high carrier frequency

RF#1+RF#2

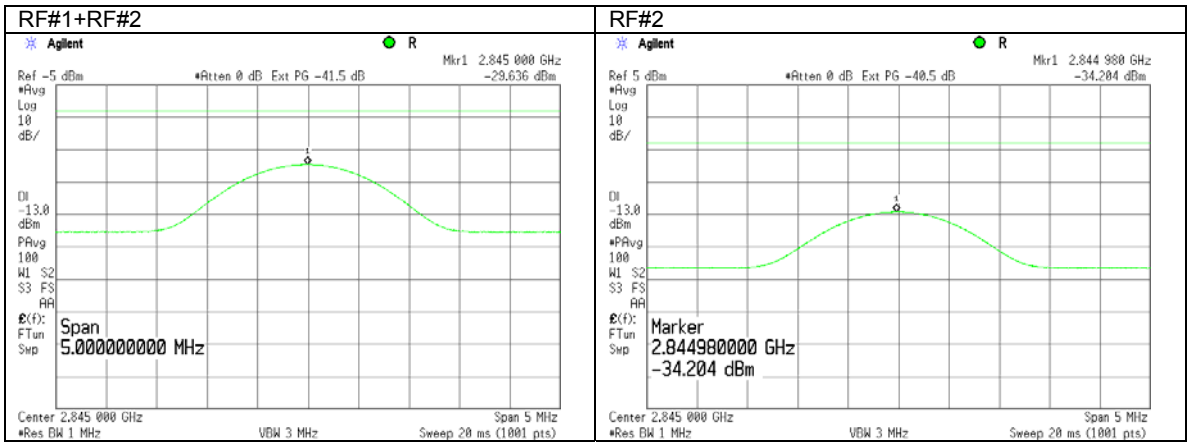


RF#2

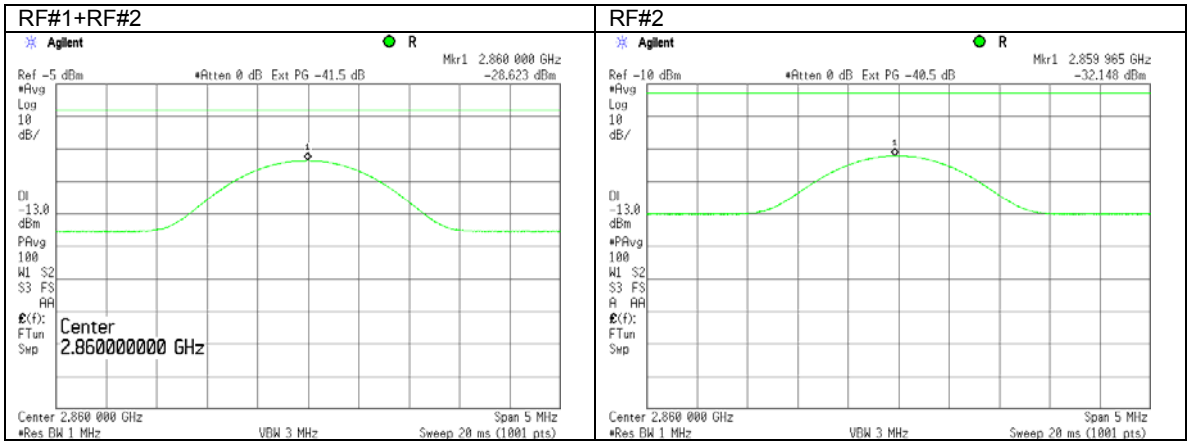


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.22 Spurious emission measurements at the 2845 MHz at low carrier frequency



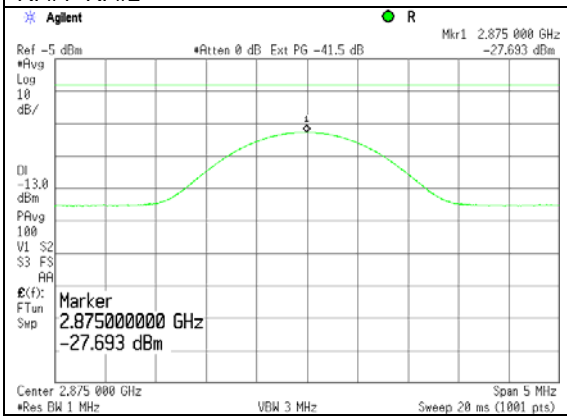
Plot 7.6.23 Spurious emission measurements at the 2860 MHz at mid carrier frequency



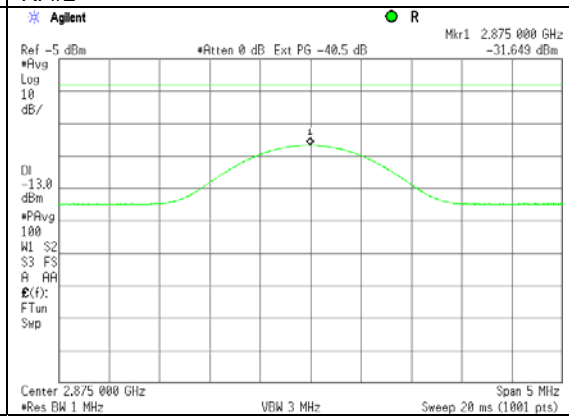
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.6.24 Spurious emission measurements at the 2875 MHz at high carrier frequency

RF#1+RF#2



RF#2



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

7.7 Spurious emissions near band edges at RF antenna connector test for 17 dBi gain

7.7.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.6.1.

Table 7.7.1 Spurious emission limits

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

* - P is transmitter output power in Watts

7.7.2 Test procedure

7.7.2.1 The EUT was set up as shown in Figure 7.6.1, Figure 7.6.2, energized and its proper operation was checked.
7.7.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
7.7.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.6.2 and associated plots.

Figure 7.7.1 Spurious emission test setup for single antenna mode

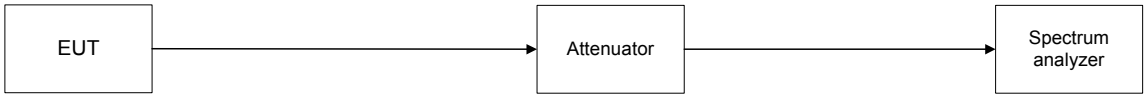
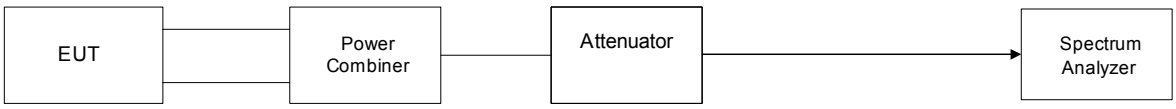


Figure 7.7.2 Spurious emission test setup for MIMO mode



Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Table 7.7.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 3650 – 3700 MHz
INVESTIGATED FREQUENCY RANGE: 3600 – 3750 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: PRBS
MODULATING SIGNAL: BPSK / 64QAM

Carrier frequency, MHz	Modulation	Bit rate, Mbps	RBW, kHz	Limit, dBm	Reference to Plot	Verdict
Channel bandwidth 5 MHz						
3652.5	BPSK	3.25	200	-13.0	Plot 7.7.1	Pass
3652.5	64QAM	32.5			Plot 7.7.2	
3697.5	BPSK	3.25			Plot 7.7.3	
3697.5	64QAM	32.5			Plot 7.7.4	
Channel bandwidth 10 MHz						
3655.0	BPSK	6.5	200	-13.0	Plot 7.7.5	Pass
3655.0	64QAM	65			Plot 7.7.6	
3695.0	BPSK	6.5			Plot 7.7.7	
3695.0	64QAM	65			Plot 7.7.8	
Channel bandwidth 20 MHz						
3660.0	BPSK	13	200	-13.0	Plot 7.7.9	Pass
3660.0	64QAM	130			Plot 7.7.10	
3690.0	BPSK	13			Plot 7.7.11	
3690.0	64QAM	130			Plot 7.7.12	

*****- Margin = Spurious emission – specification limit.

Reference numbers of test equipment used

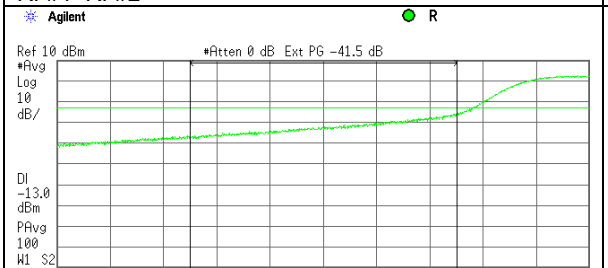
HL 1906	HL 2953	HL 3440	HL 3455	HL 3472	HL 3474	HL 3779	HL 3784
HL 3818							

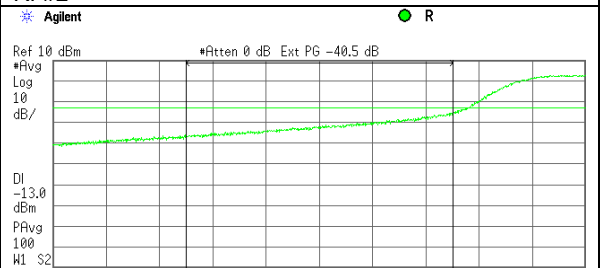
Full description is given in Appendix A.

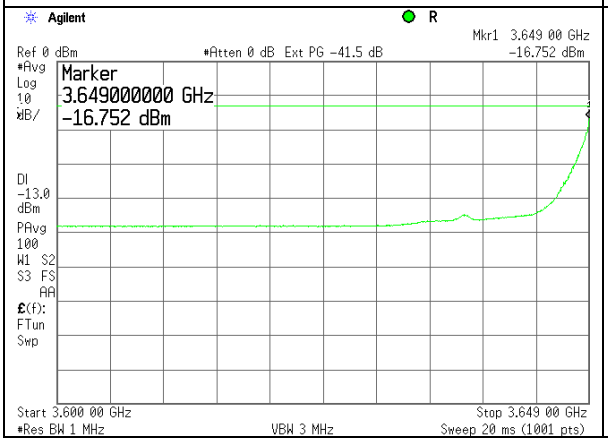
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

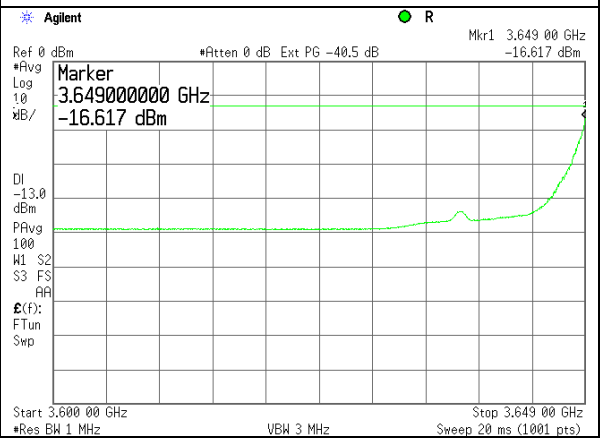
Plot 7.7.1 Spurious emission near low band edge at low carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2





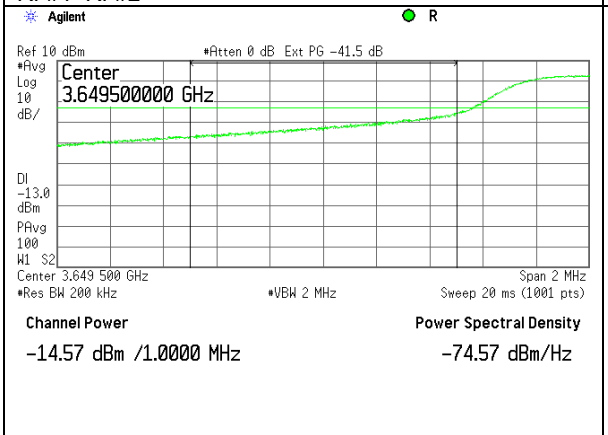


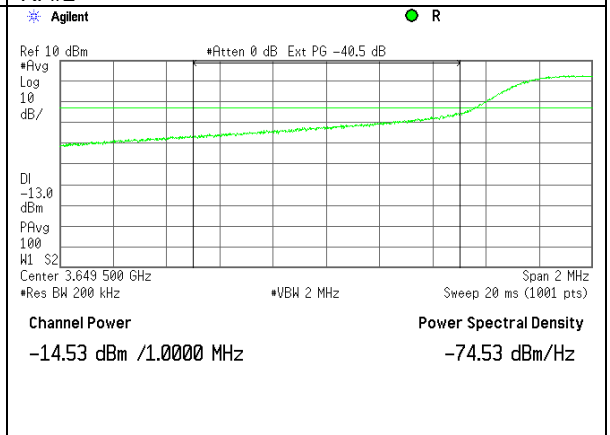


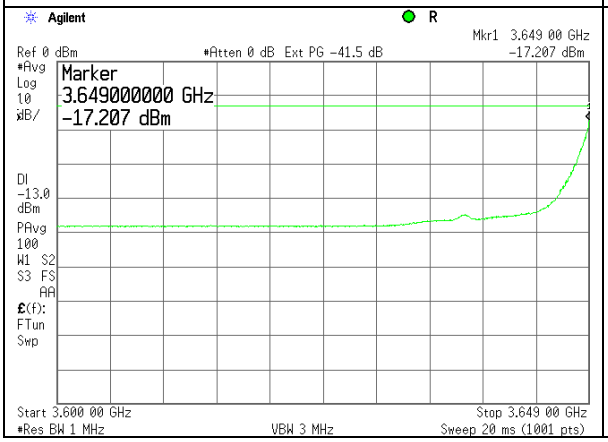
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

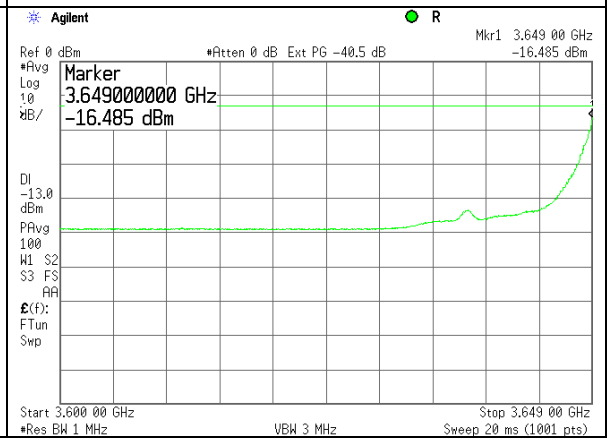
Plot 7.7.2 Spurious emission near low band edge at low carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2





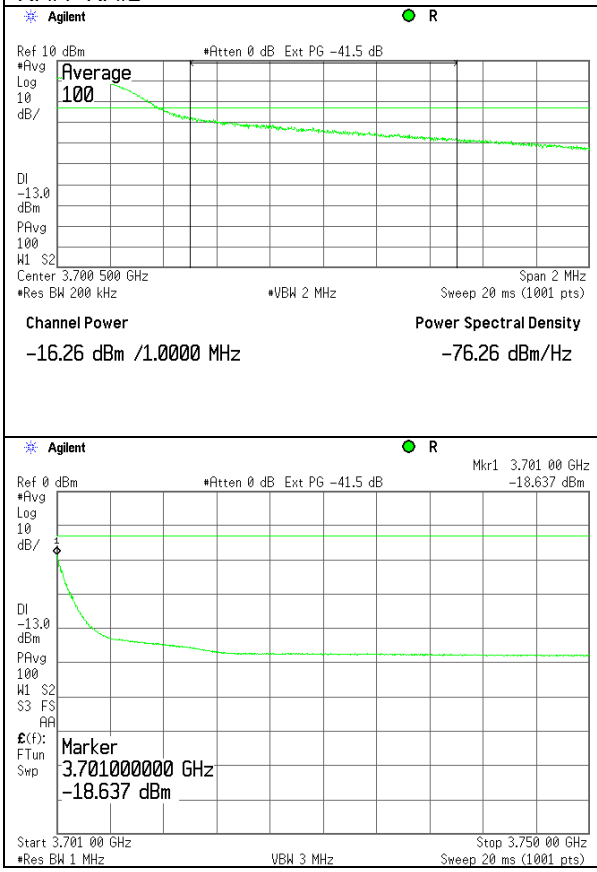


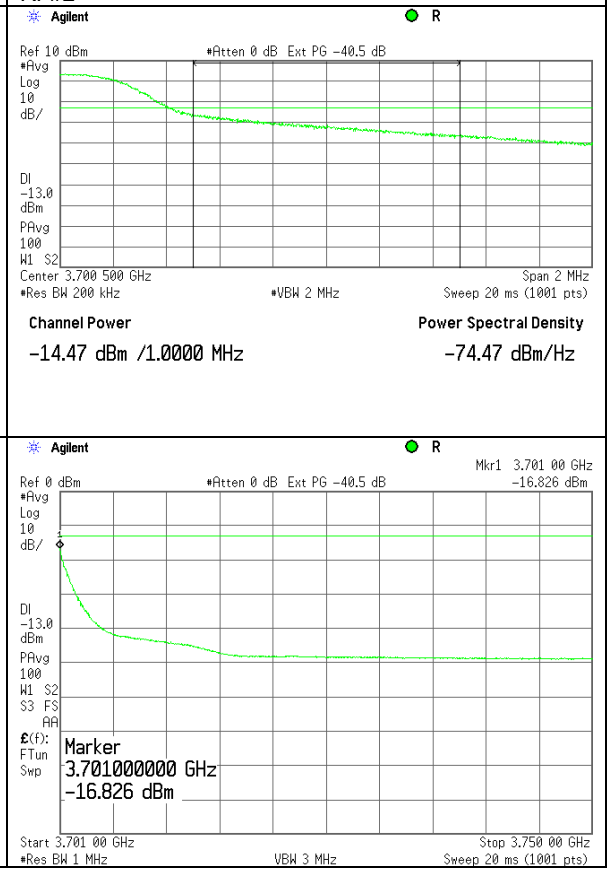


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.7.3 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2

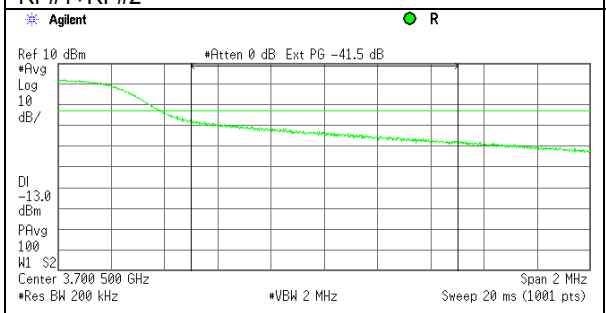


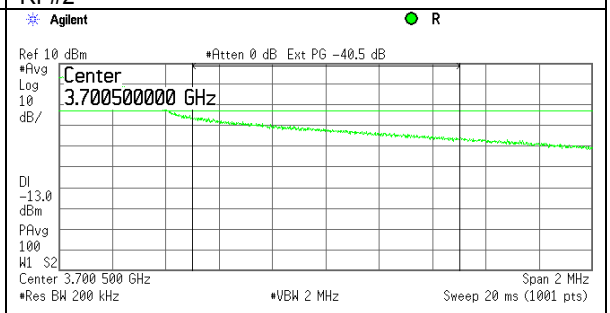


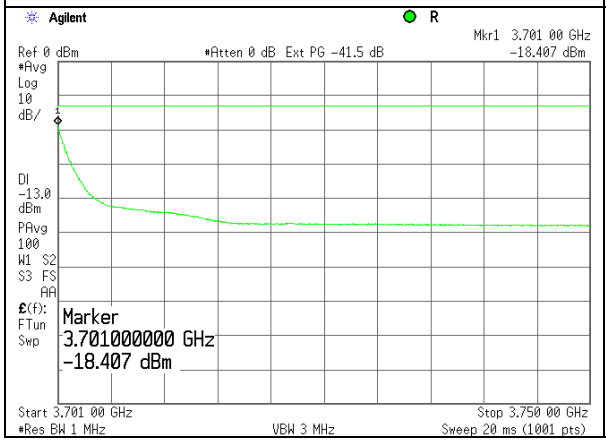
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

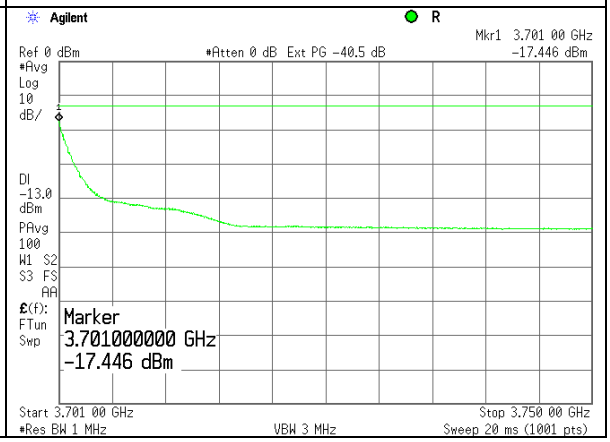
Plot 7.7.4 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2





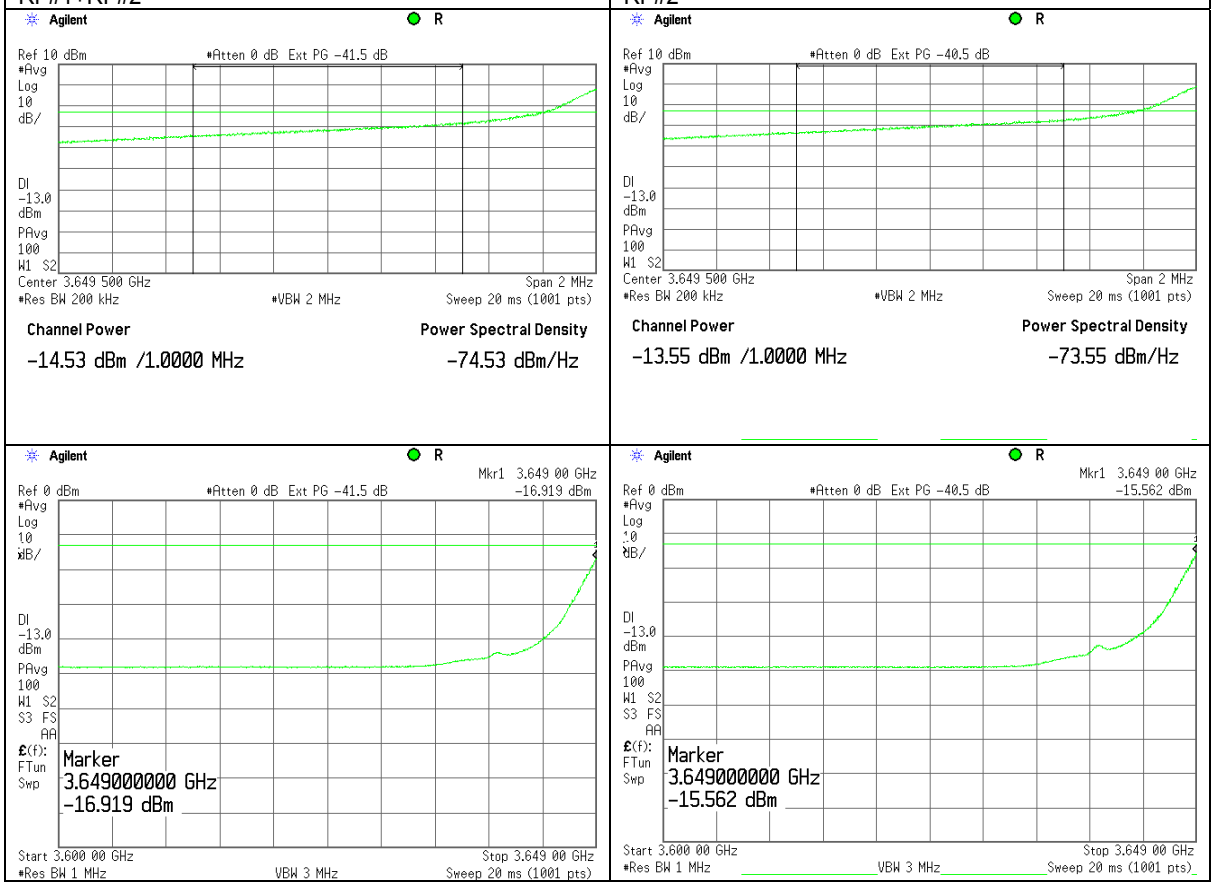




Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.7.5 Spurious emission near low band edge at low carrier frequency

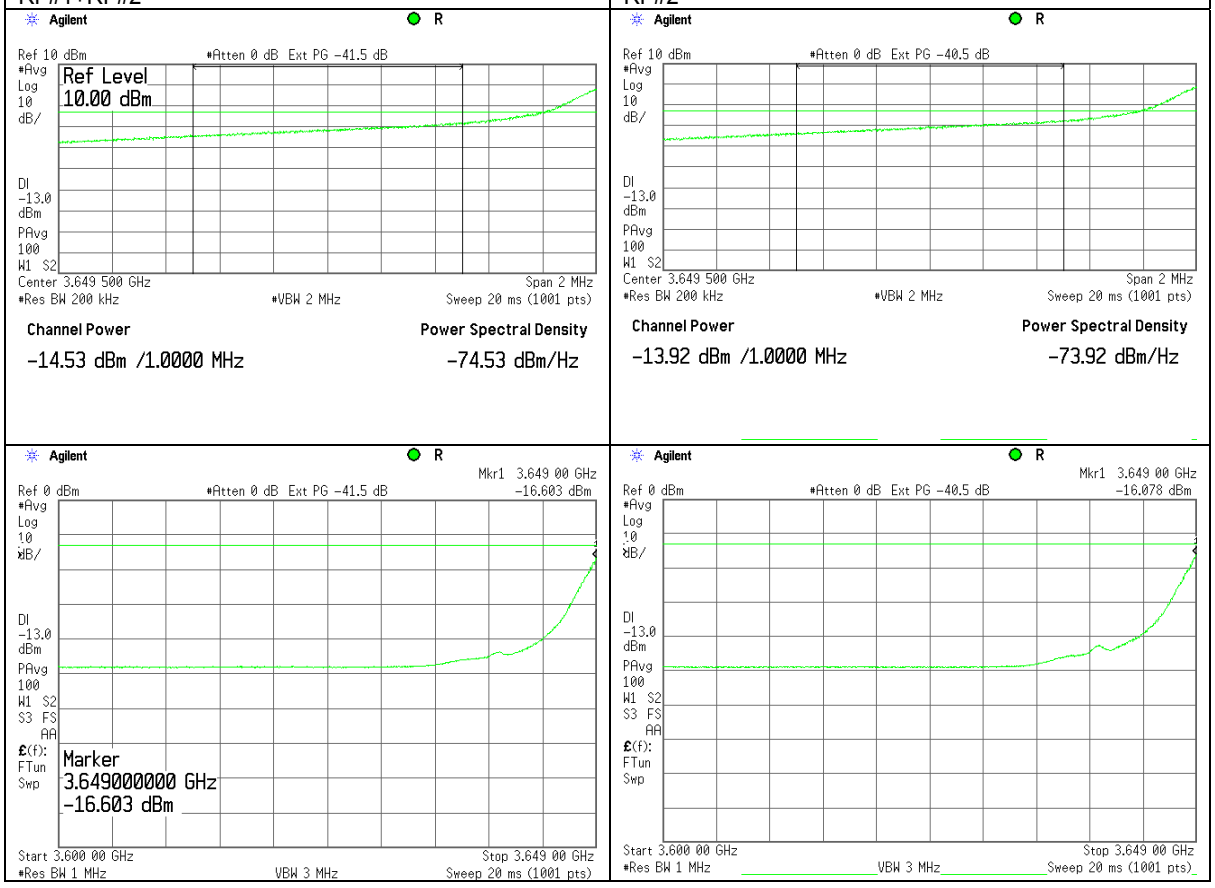
CHANNEL BANDWIDTH:	10MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.7.6 Spurious emission near low band edge at low carrier frequency

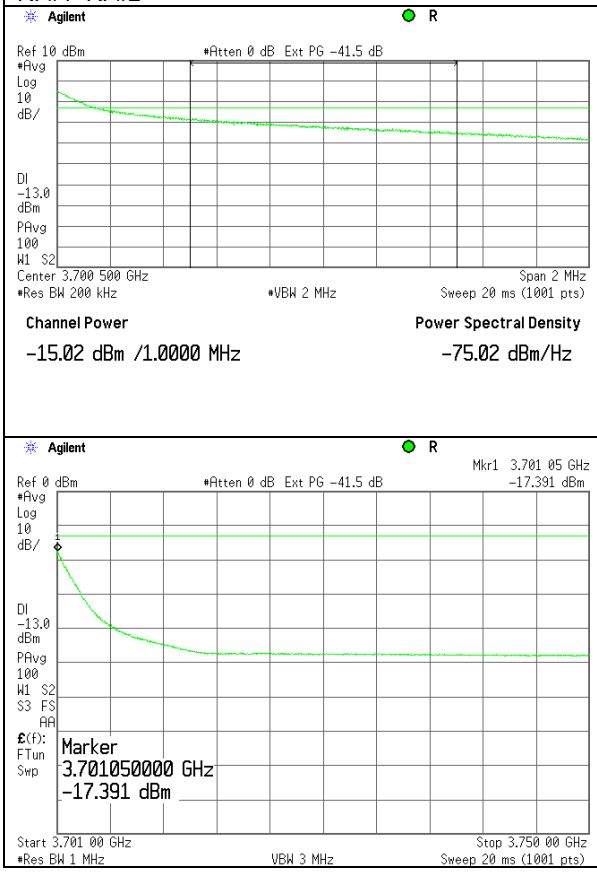
CHANNEL BANDWIDTH:	10MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2

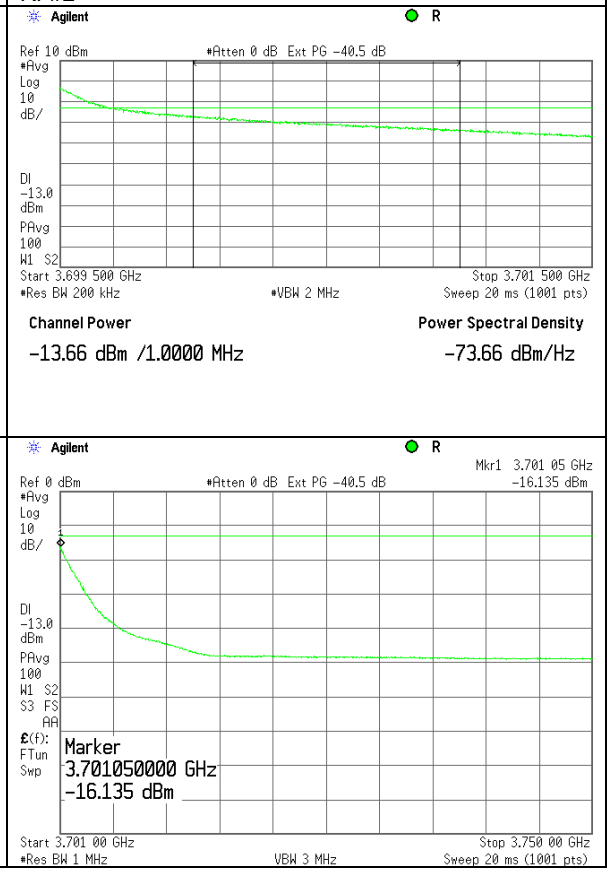


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.7.7 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	10MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2

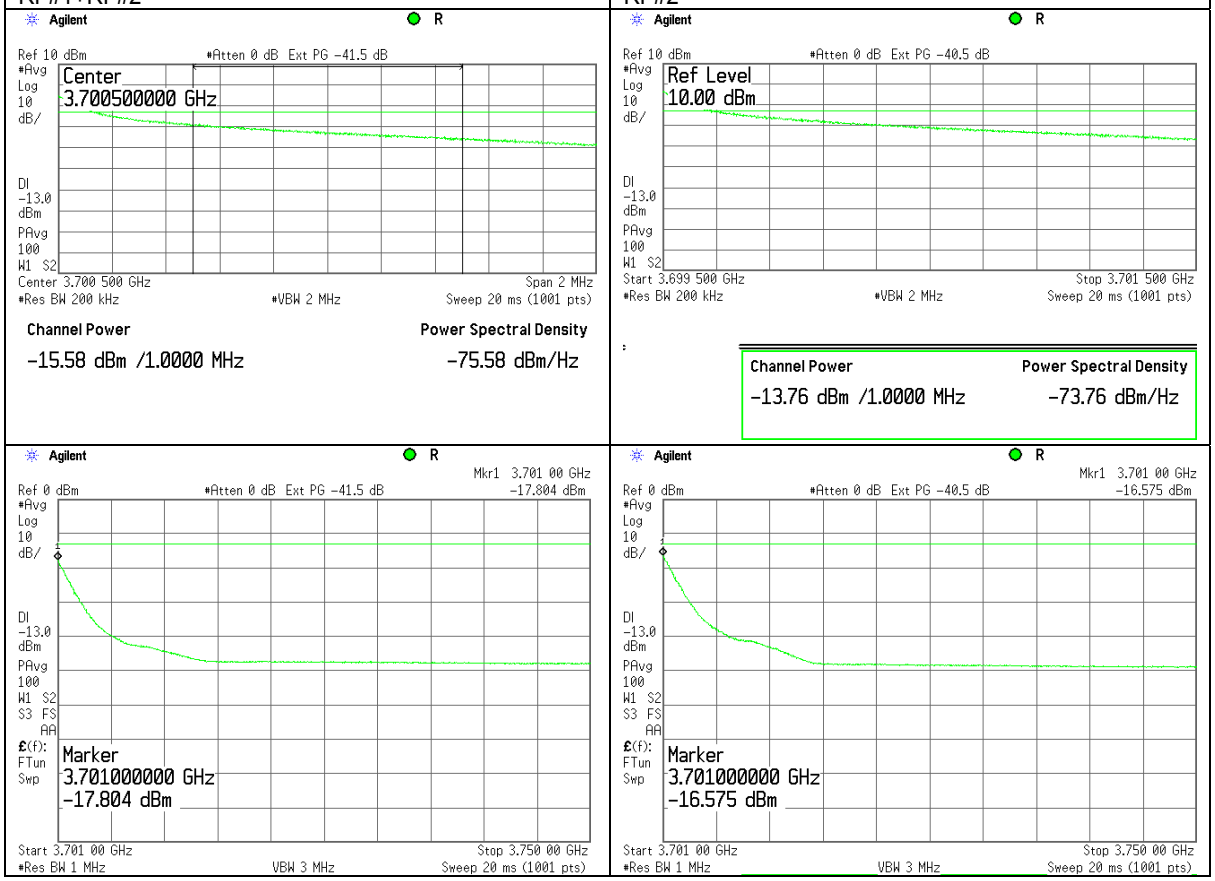




Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.7.8 Spurious emission near high band edge at high carrier frequency

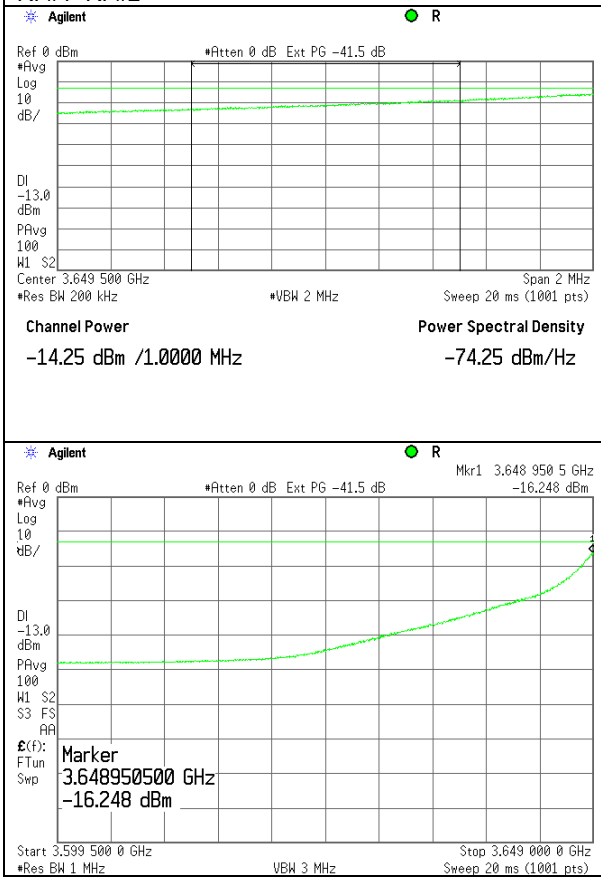
CHANNEL BANDWIDTH:	10MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2

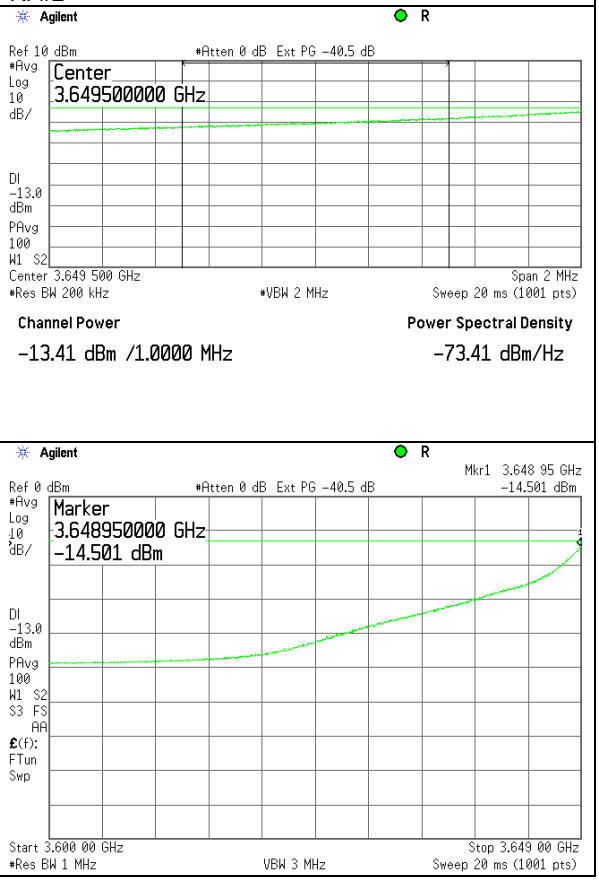


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.7.9 Spurious emission near low band edge at low carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2

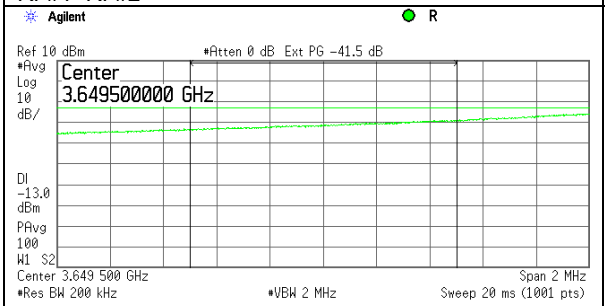


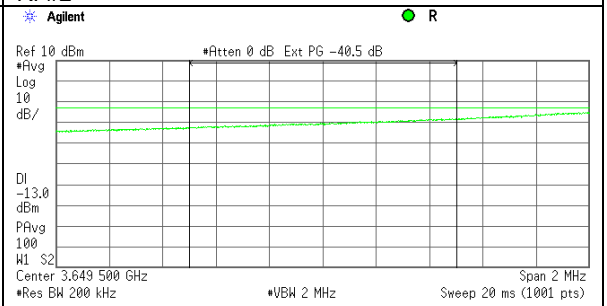


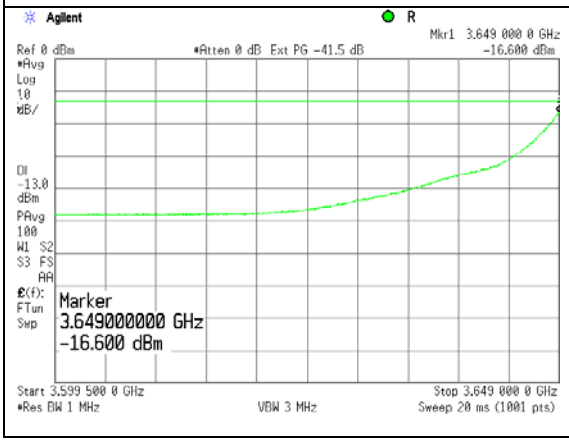
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	6/06/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks: with 17dBi gain antenna assembly			

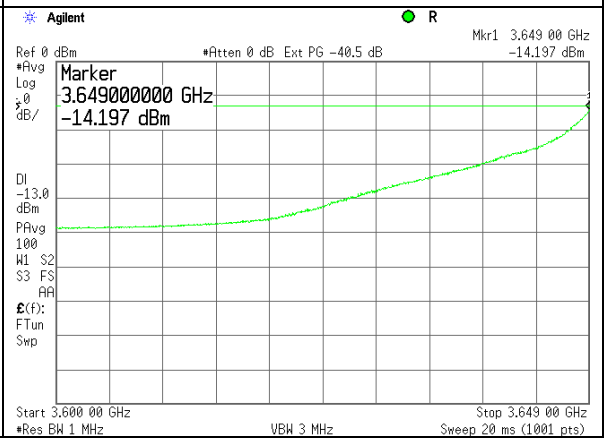
Plot 7.7.10 Spurious emission near low band edge at low carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2



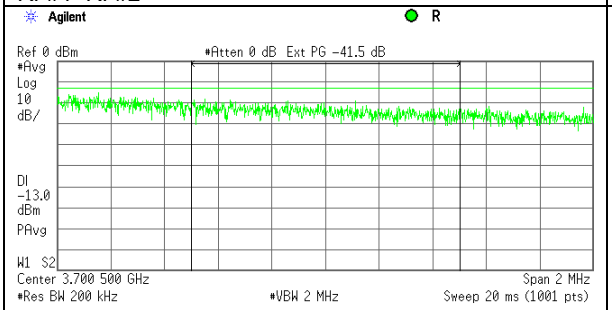
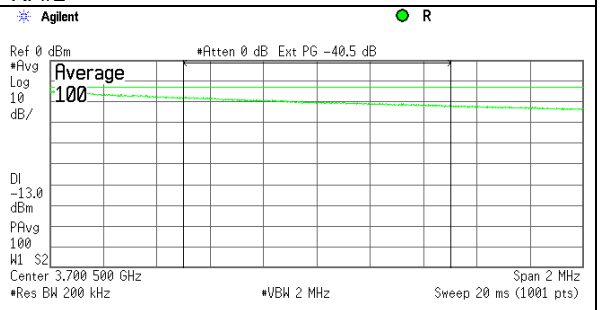
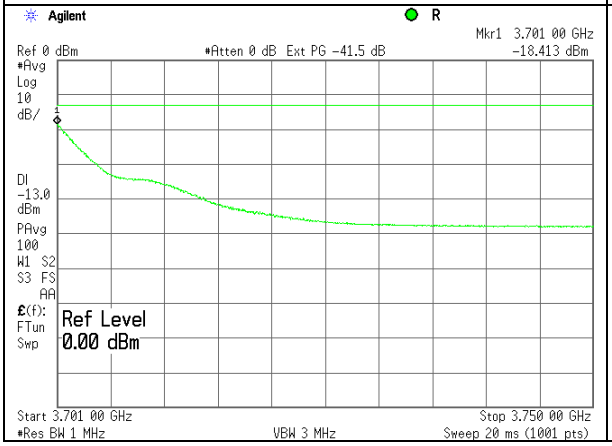
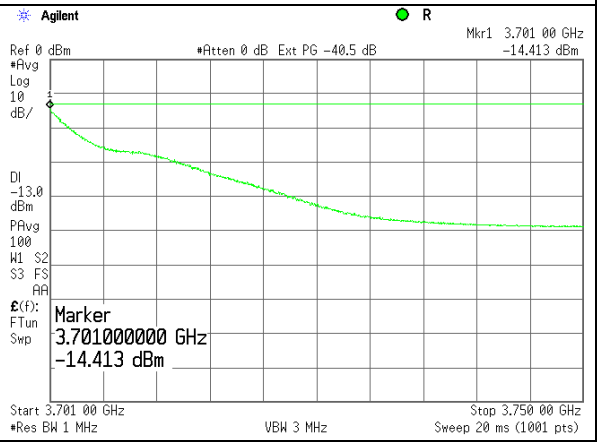






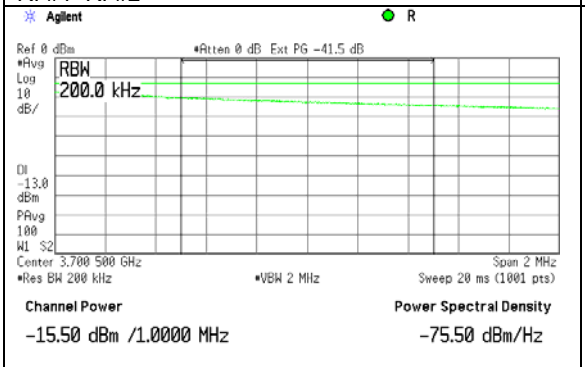
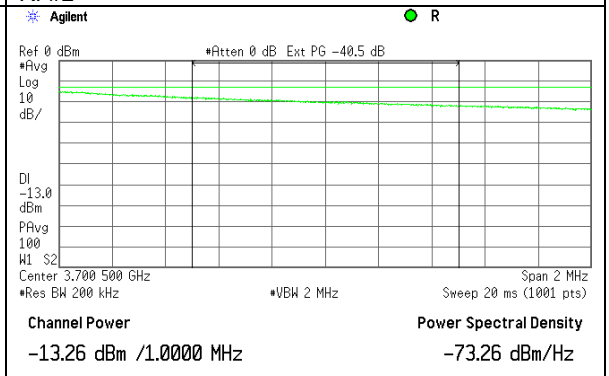
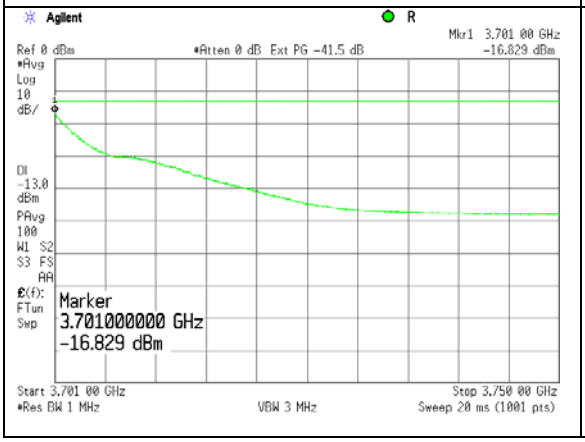
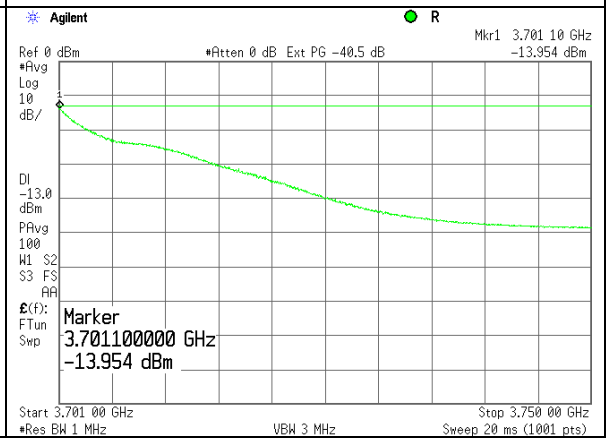
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.7.11 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2
	
	

Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/06/2010		
Temperature: 25 ºC	**Air Pressure:** 1009 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks: with 17dBi gain antenna assembly			

Plot 7.7.12 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2
	
	

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

7.8 Spurious emissions near band edges at RF antenna connector test for 13.5 dBi gain

7.8.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.8.1.

Table 7.8.1 Spurious emission limits

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

* - P is transmitter output power in Watts

7.8.2 Test procedure

7.8.2.1 The EUT was set up as shown in Figure 7.8.1, Figure 7.8.2, energized and its proper operation was checked.
7.8.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
7.8.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.8.2 and the associated plots.

Figure 7.8.1 Spurious emission test setup for single antenna mode

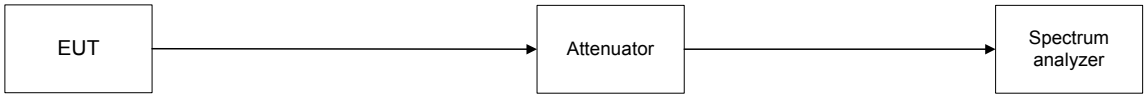
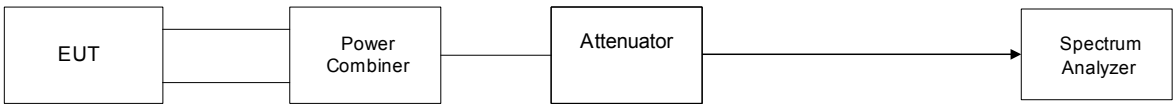


Figure 7.8.2 Spurious emission test setup for MIMO mode



Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/12/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Table 7.8.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 3650 - 3700MHz
INVESTIGATED FREQUENCY RANGE: 3600 - 3750MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: PRBS
MODULATING SIGNAL: BPSK / 64QAM

Carrier frequency, MHz	Modulation	Bit rate, Mbps	RBW, kHz	Limit, dBm	Reference to Plot	Verdict
Channel bandwidth 5 MHz						
3652.5	BPSK	3.25	200	-13.0	Plot 7.8.1	Pass
3652.5	64QAM	32.5			Plot 7.8.2	
3697.5	BPSK	3.25			Plot 7.8.3	
3697.5	64QAM	32.5			Plot 7.8.4	
Channel bandwidth 10 MHz						
3656.0	BPSK	6.5	200	-13.0	Plot 7.8.5	Pass
3656.0	64QAM	65			Plot 7.8.6	
3694.0	BPSK	6.5			Plot 7.8.7	
3694.0	64QAM	65			Plot 7.8.8	
Channel bandwidth 20 MHz						
3661.0	BPSK	13	200	-13.0	Plot 7.8.9	Pass
3661.0	64QAM	130			Plot 7.8.10	
3689.0	BPSK	13			Plot 7.8.11	
3689.0	64QAM	130			Plot 7.8.12	

*****- Margin = Spurious emission – specification limit.

Reference numbers of test equipment used

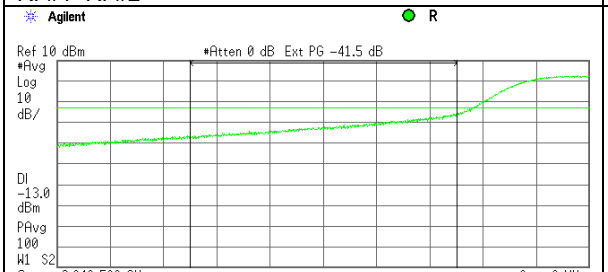
HL 1906	HL 2953	HL 3440	HL 3455	HL 3472	HL 3474	HL 3779	HL 3784
HL 3818							

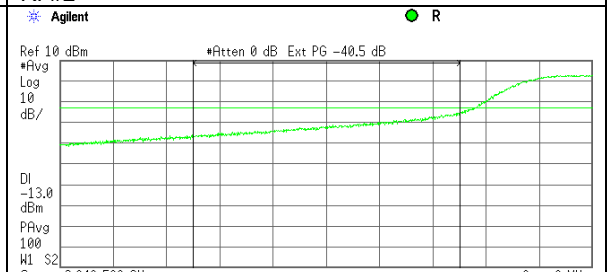
Full description is given in Appendix A.

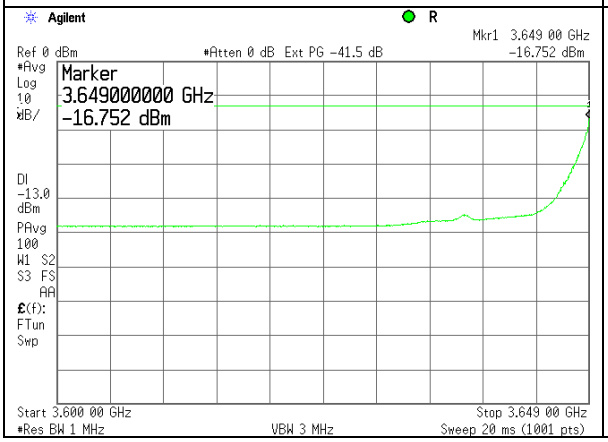
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

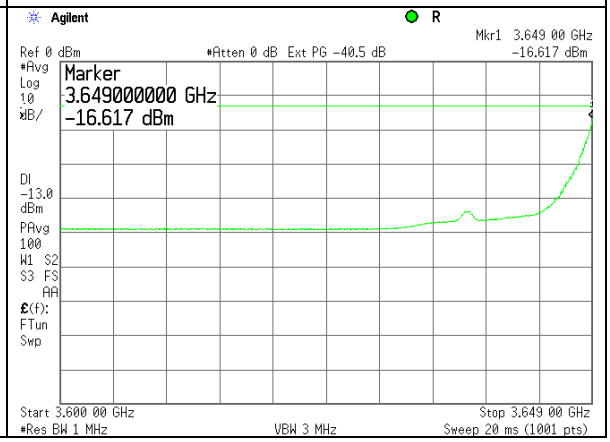
Plot 7.8.1 Spurious emission near low band edge at low carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2





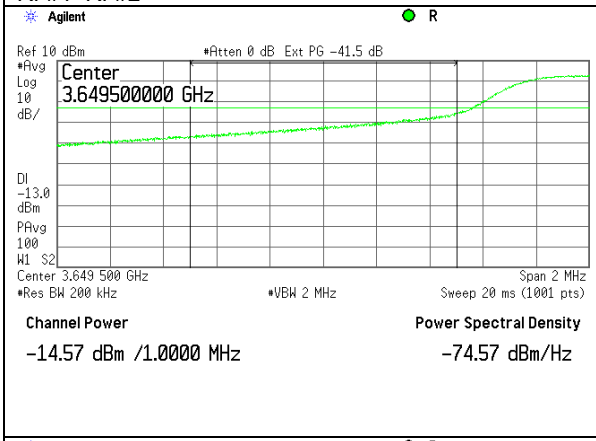


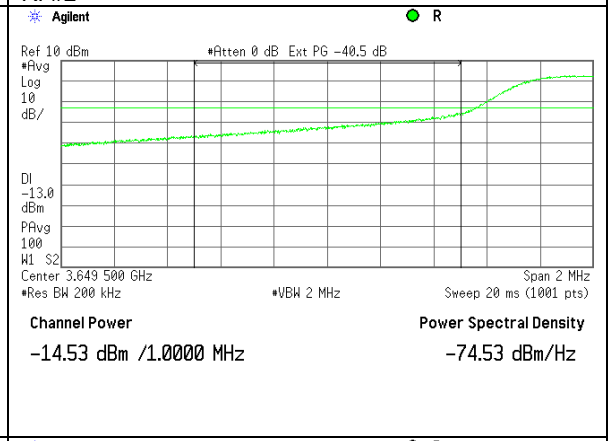


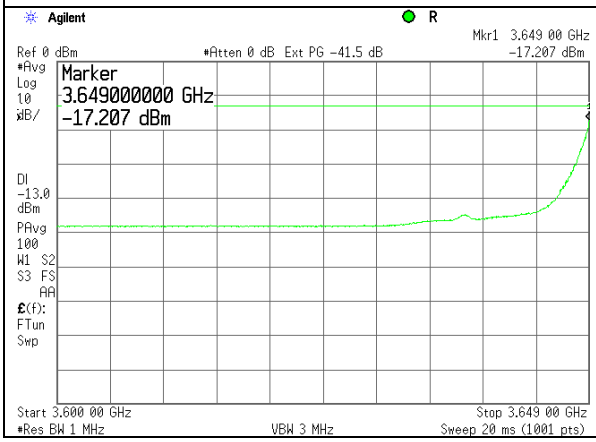
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

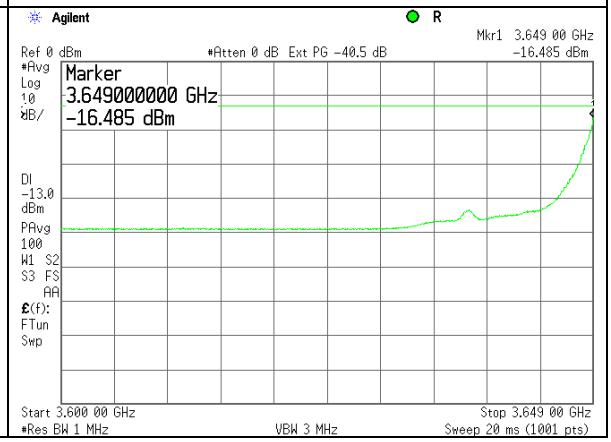
Plot 7.8.2 Spurious emission near low band edge at low carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2





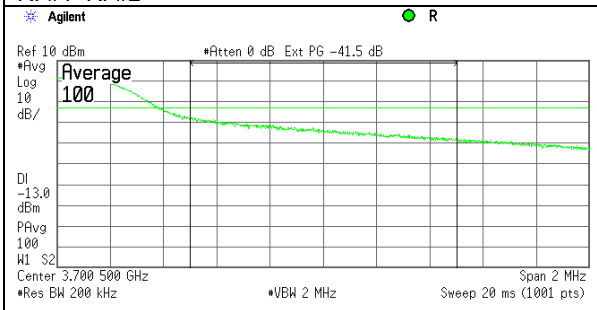


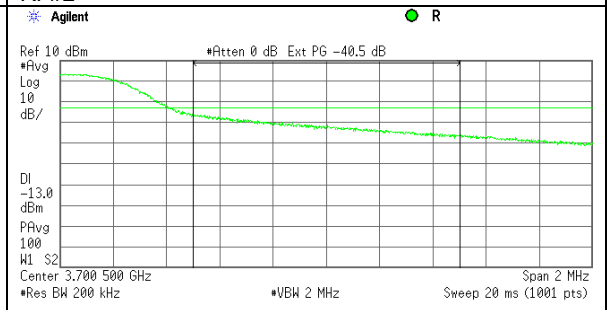


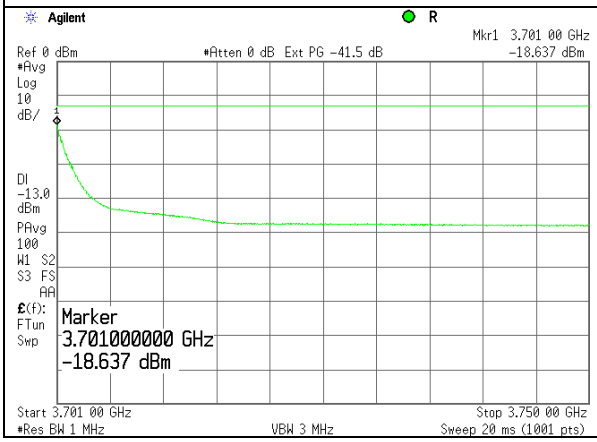
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

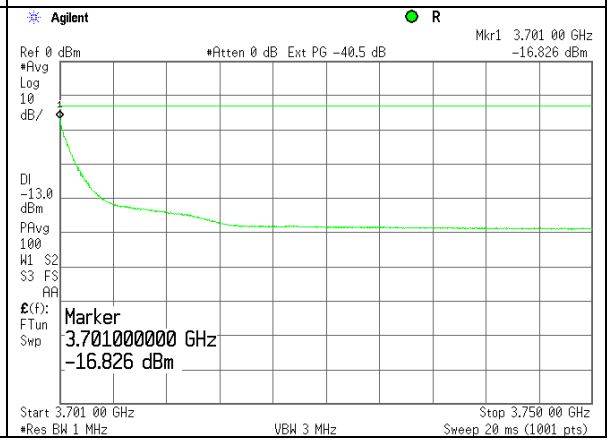
Plot 7.8.3 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2





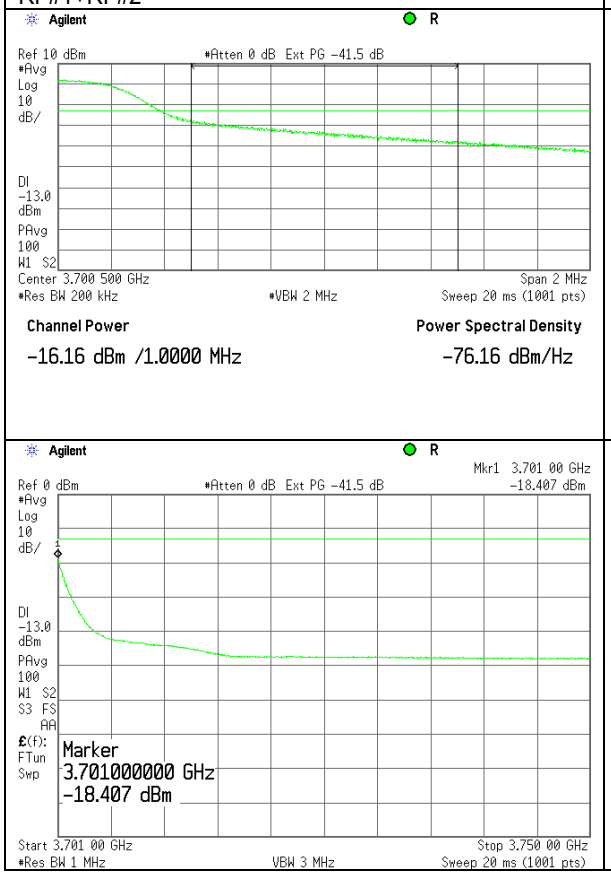


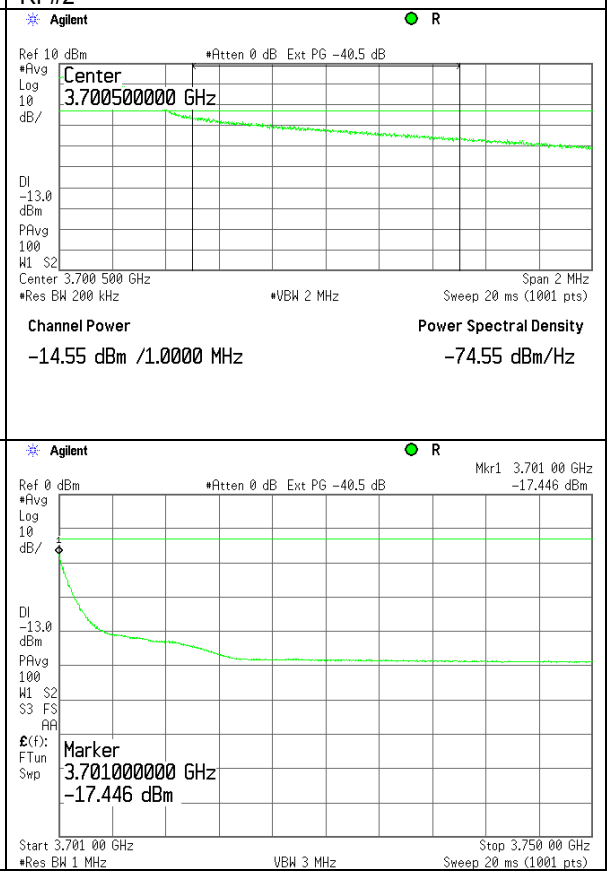


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.8.4 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2

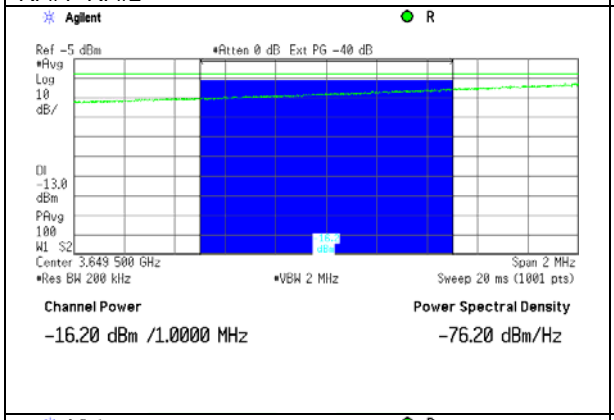


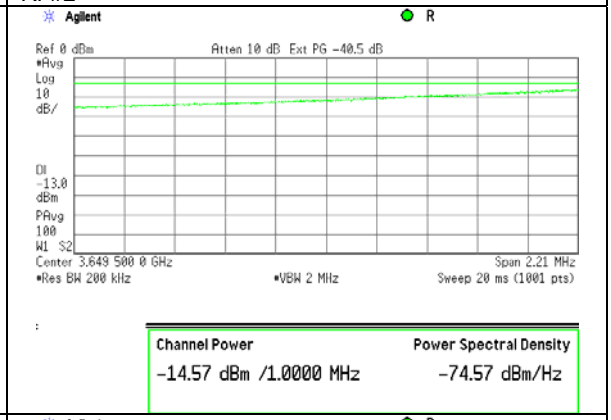


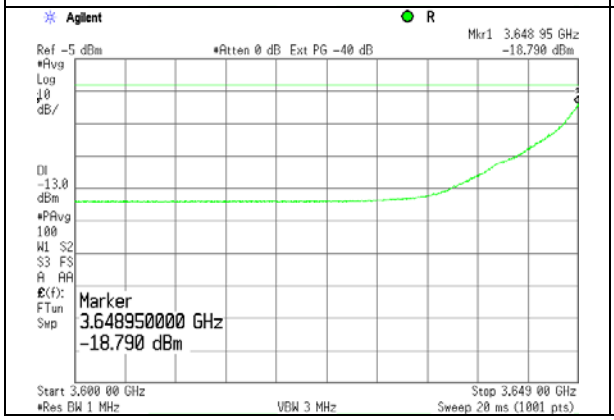
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

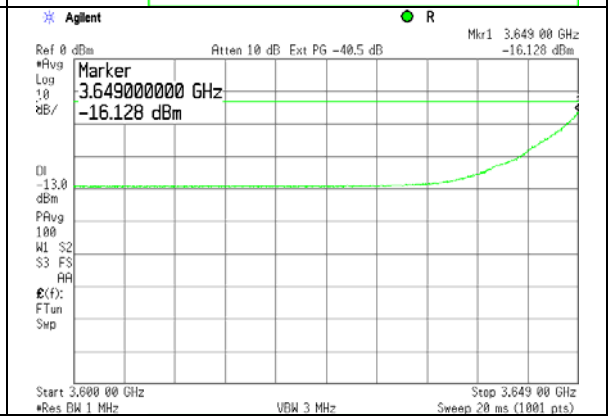
Plot 7.8.5 Spurious emission near low band edge at low carrier frequency

CHANNEL BANDWIDTH:	10MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2





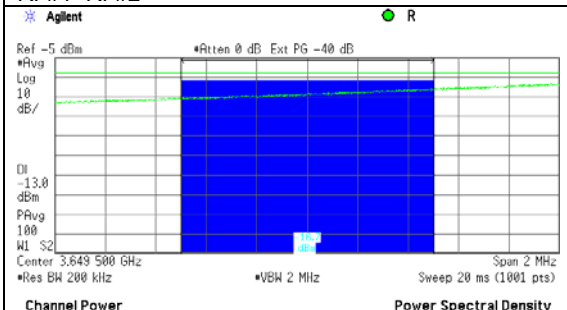


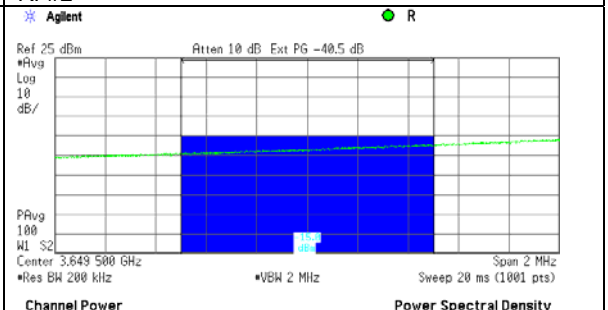


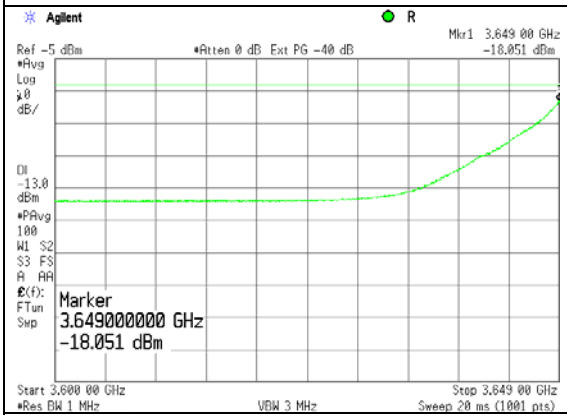
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

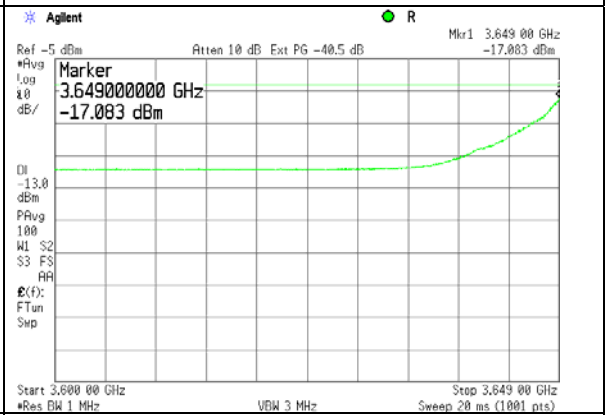
Plot 7.8.6 Spurious emission near low band edge at low carrier frequency

CHANNEL BANDWIDTH:	10MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2



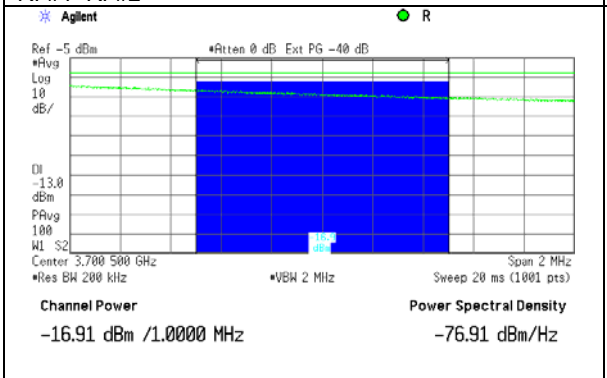
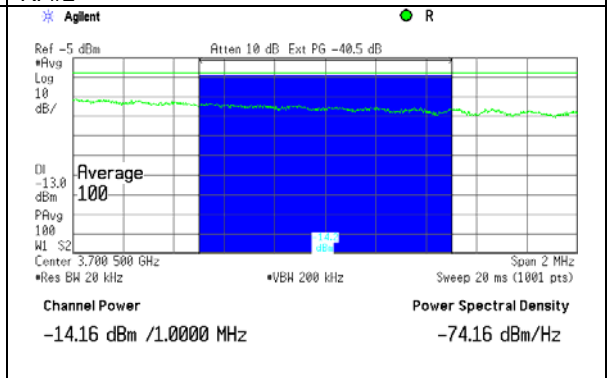
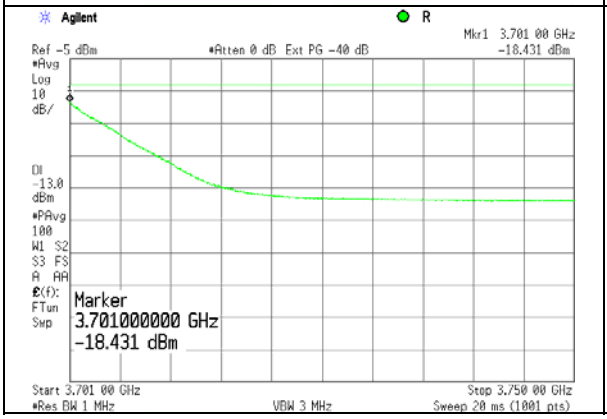
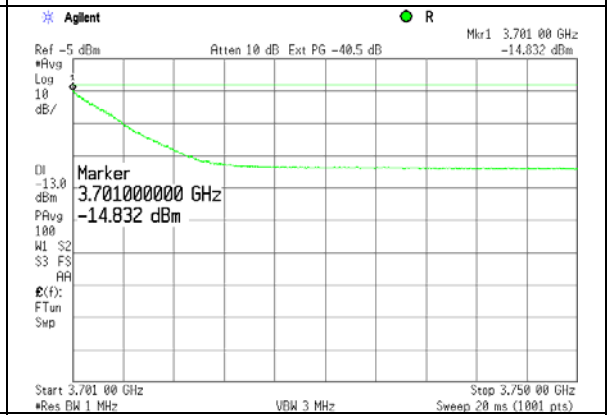






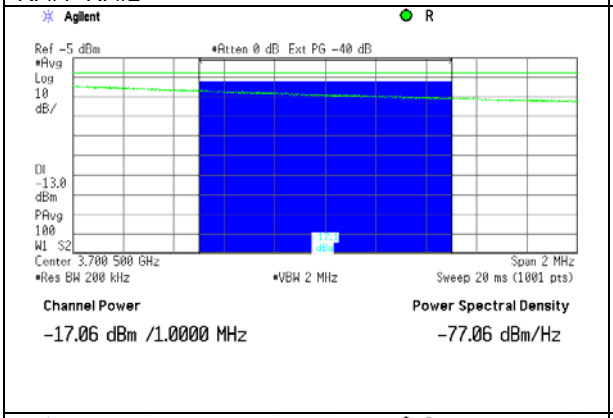
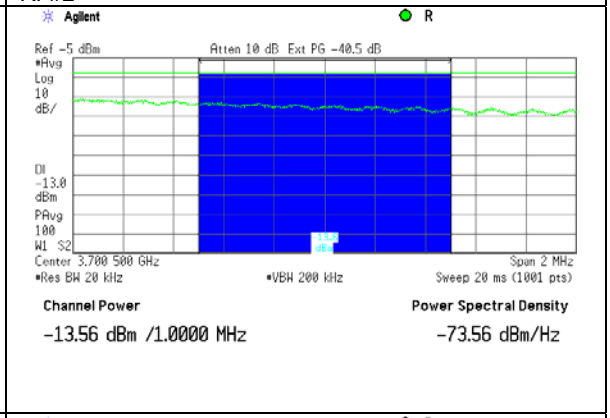
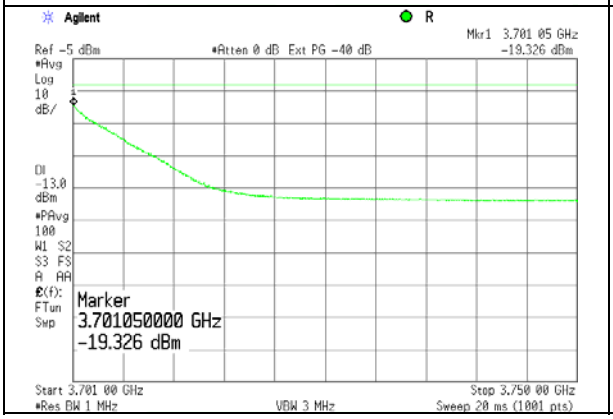
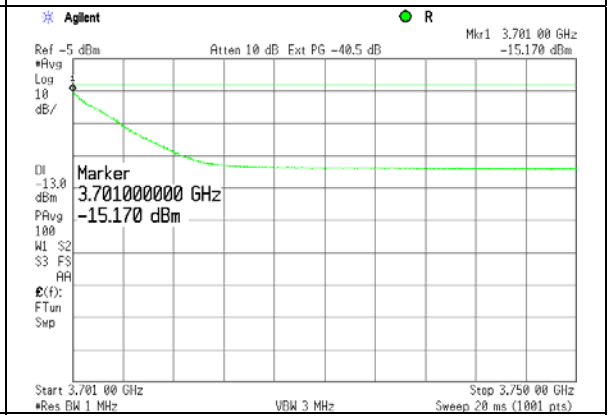
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.8.7 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	10MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2
	
	

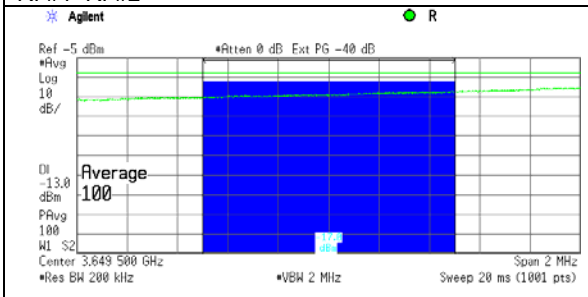
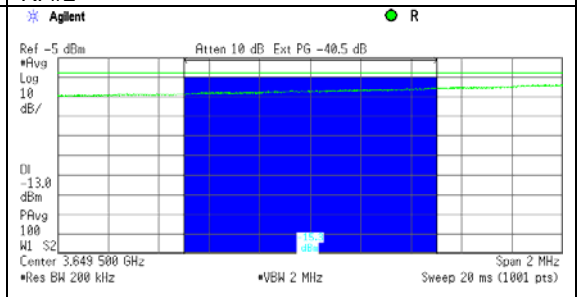
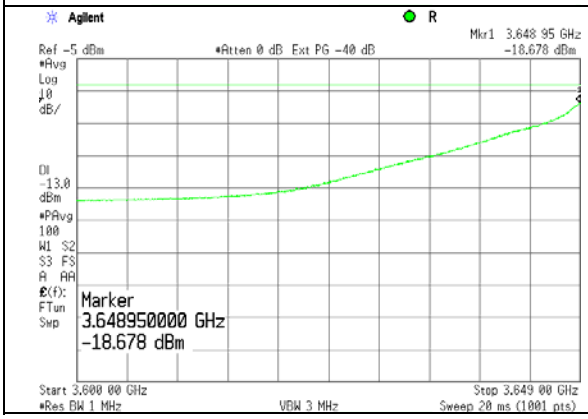
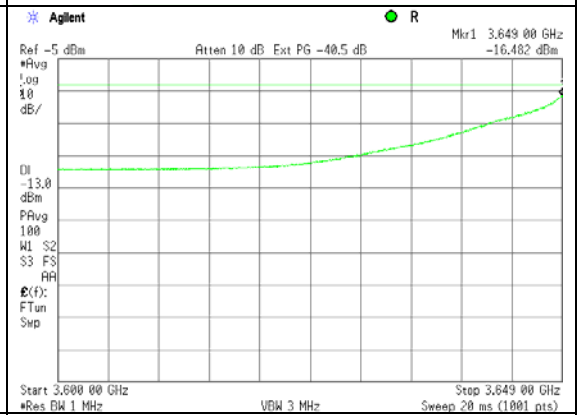
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.8.8 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	10MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2
	
	

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

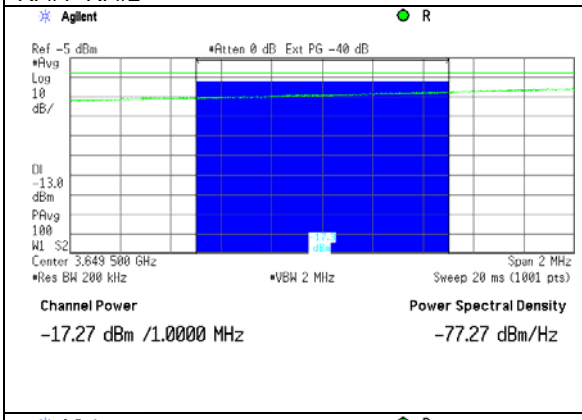
Plot 7.8.9 Spurious emission near low band edge at low carrier frequency

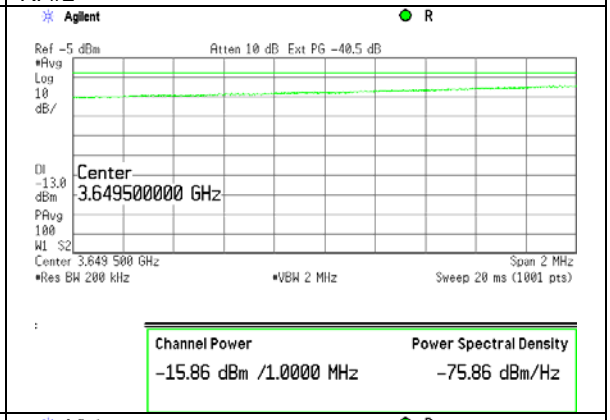
CHANNEL BANDWIDTH:	20MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2
	
	

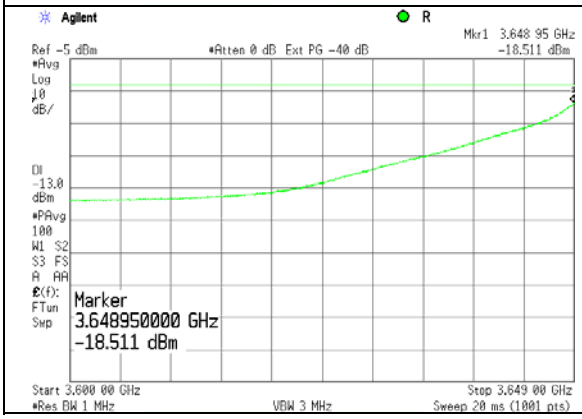
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

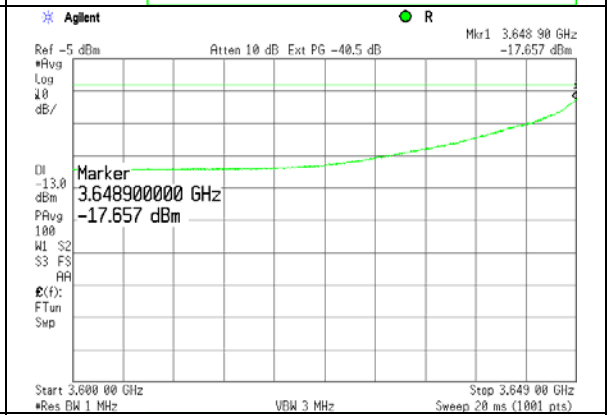
Plot 7.8.10 Spurious emission near low band edge at low carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2



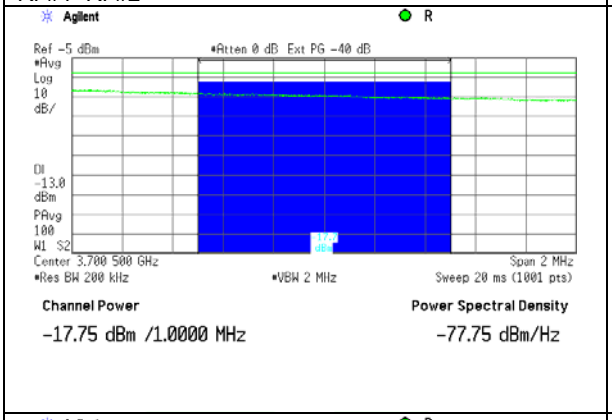
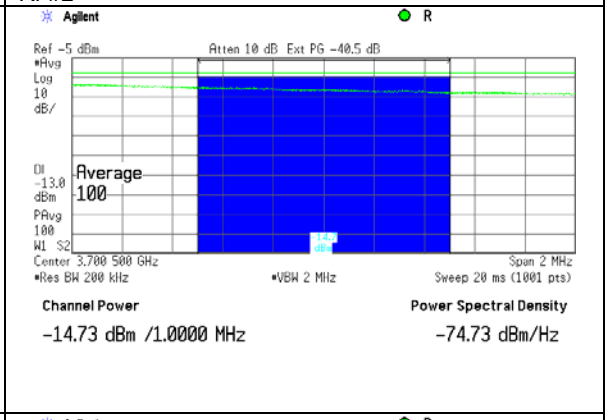
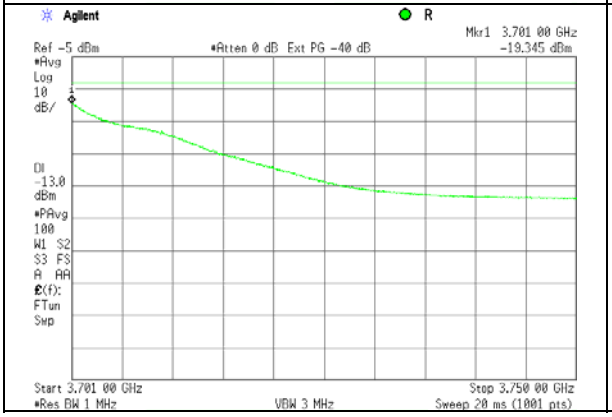
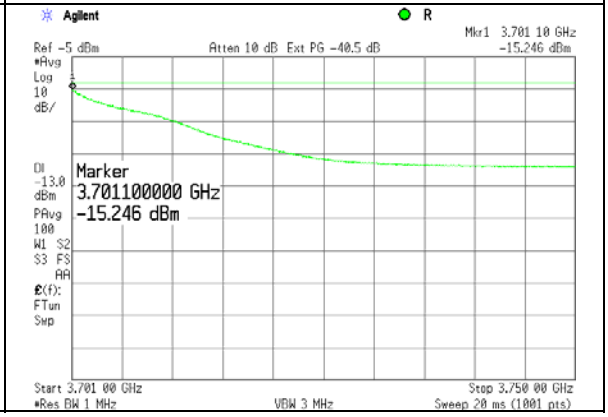






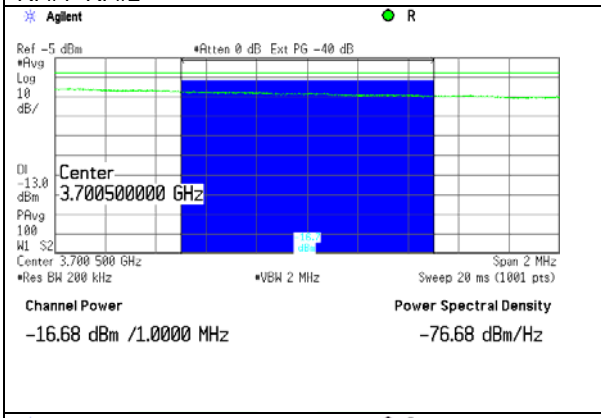
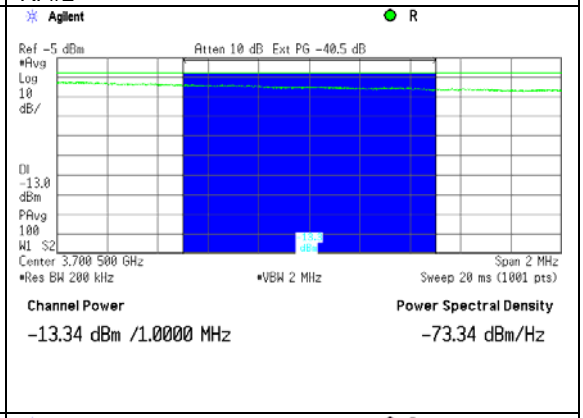
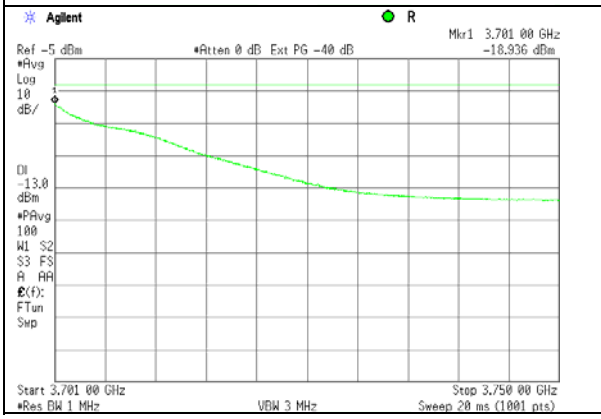
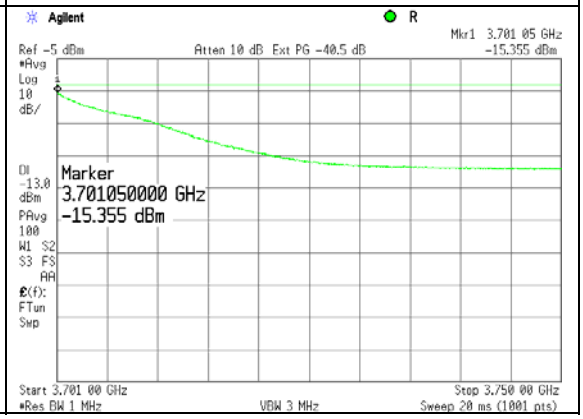
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.8.11 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2
	
	

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.8.12 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2
	
	

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

7.9 Spurious emissions at RF antenna connector test for 13.5 dBi gain

7.9.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.9.1.

Table 7.9.1 Spurious emission limits

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

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

7.9.2 Test procedure

7.9.2.1 The EUT was set up as shown in Figure 7.9.1, Figure 7.9.2, energized and its proper operation was checked.
7.9.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
7.9.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.9.2 and the associated plots.

Figure 7.9.1 Spurious emission test setup for single antenna mode

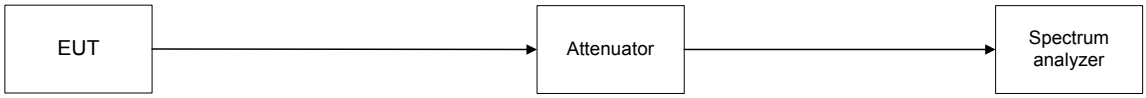
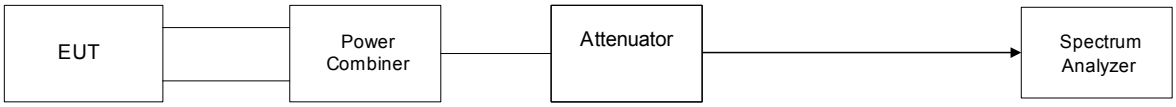


Figure 7.9.2 Spurious emission test setup for MIMO mode



Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/12/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Table 7.9.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 3650 – 3700 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 40000 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: BPSK
MODULATING SIGNAL: PRBS
EMISSION BANDWIDTH: 20 MHz
TRANSMITTER OUTPUT POWER: Maximum

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm	Limit, dBm	Margin, dB*	Verdict
Single RF output								
Low carrier frequency								
2845.000	-29.636	Included	Included	1000	-29.636	-13.000	-16.636	Pass
7322.240	-35.922	Included	Included	1000	-35.922	-13.000	-22.922	Pass
Mid carrier frequency								
2859.965	-32.148	Included	Included	1000	-32.148	-13.000	-19.148	Pass
7350.880	-34.606	Included	Included	1000	-34.606	-13.000	-21.606	Pass
High carrier frequency								
2875.000	-31.649	Included	Included	1000	-31.649	-13.000	-18.649	Pass
7381.800	-38.206	Included	Included	1000	-38.206	-13.000	-25.206	Pass
MIMO mode								
Low carrier frequency								
2849.98	-34.204	Included	Included	1000	-34.204	-13.000	-21.204	Pass
7322.00	-41.473	Included	Included	1000	-41.473	-13.000	-28.473	Pass
Mid carrier frequency								
2860.00	-28.623	Included	Included	1000	-28.623	-13.000	-15.623	Pass
7350.10	-41.087	Included	Included	1000	-41.087	-13.000	-28.087	Pass
High carrier frequency								
2875.000	-27.693	Included	Included	1000	-27.693	-13.000	-14.693	Pass
7379.700	-40.102	Included	Included	1000	-40.102	-13.000	-27.102	Pass

*****- Margin = Spurious emission – specification limit.

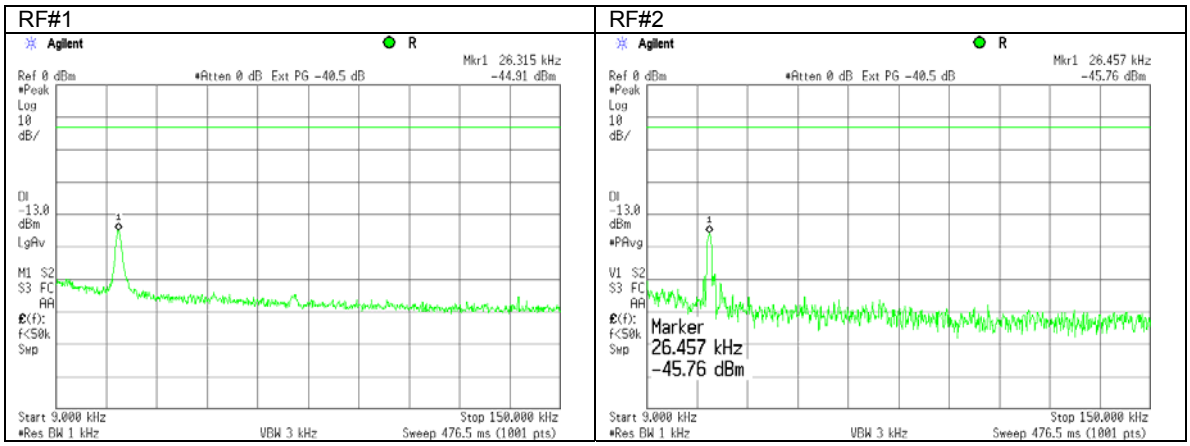
Reference numbers of test equipment used

HL 1906	HL 2953	HL 3440	HL 3455	HL 3472	HL 3474	HL 3779	HL 3784

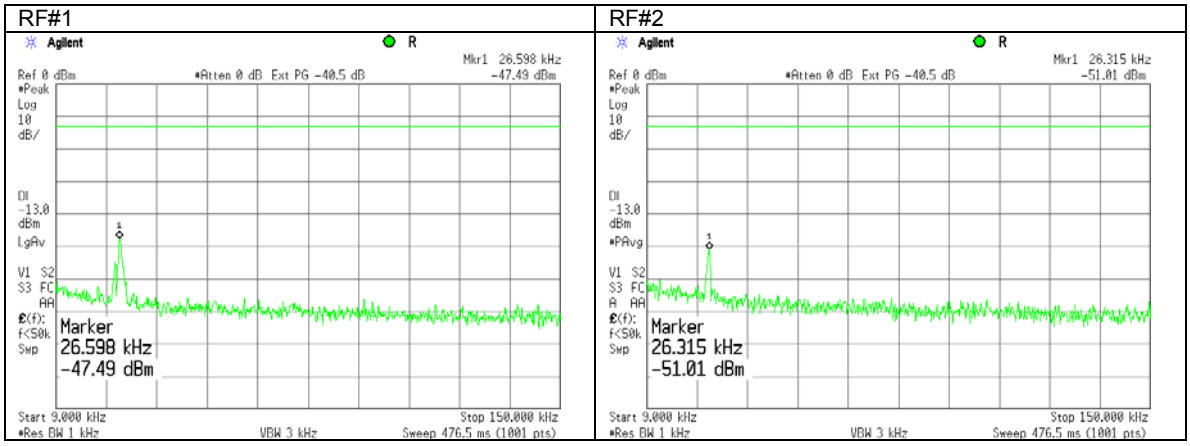
Full description is given in Appendix A.

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.1 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency



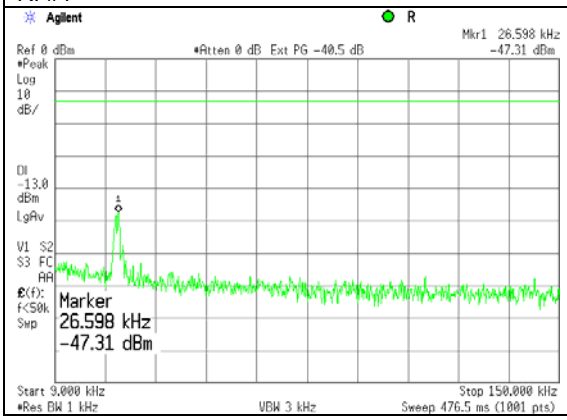
Plot 7.9.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency



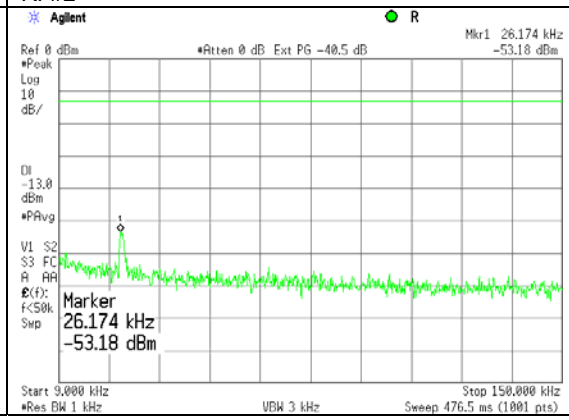
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/12/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

RF#1

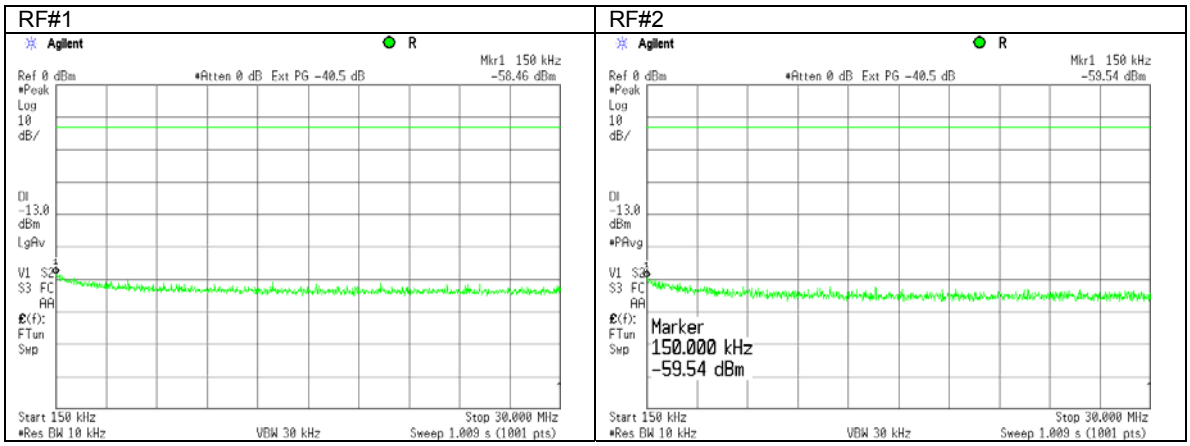


RF#2

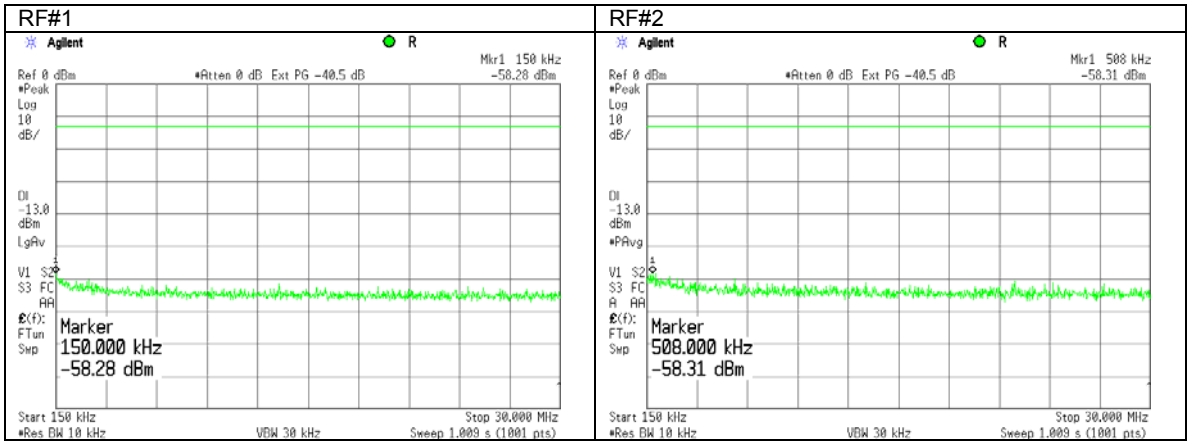


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.4 Spurious emission measurements in 0.15 - 30.0 MHz range at low carrier frequency



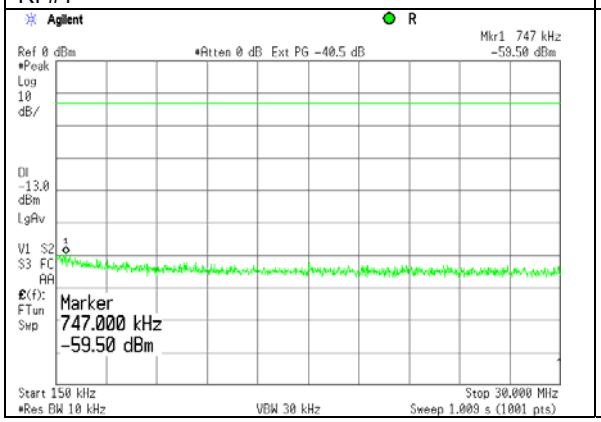
Plot 7.9.5 Spurious emission measurements in 0.15 - 30.0 MHz range at mid carrier frequency



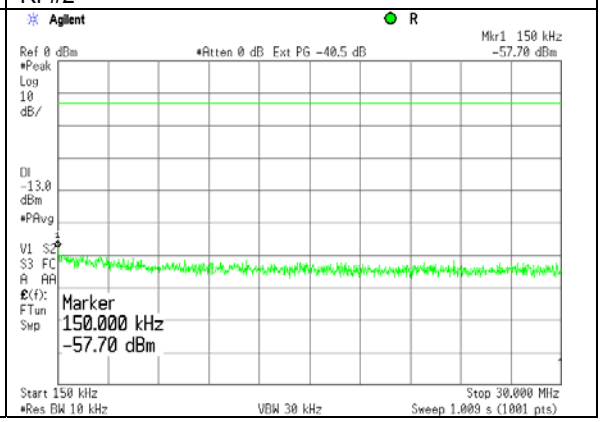
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.6 Spurious emission measurements in 0.15 – 30.0 MHz range at high carrier frequency

RF#1



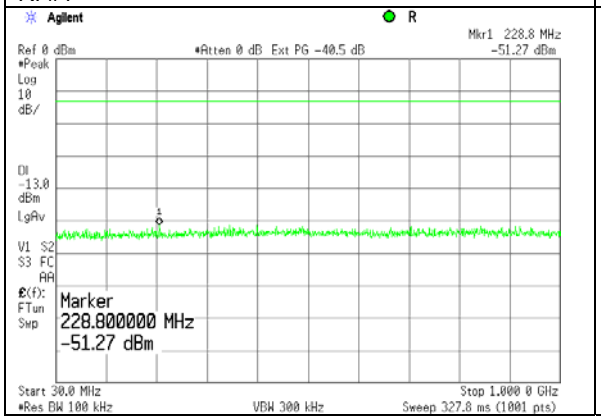
RF#2



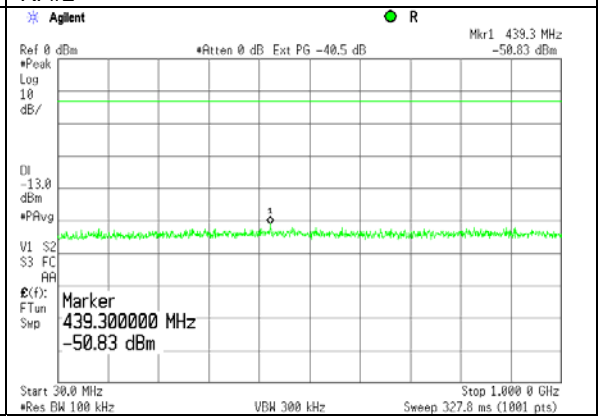
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/12/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.7 Spurious emission measurements in 30.0 - 1000 MHz range at low carrier frequency

RF#1

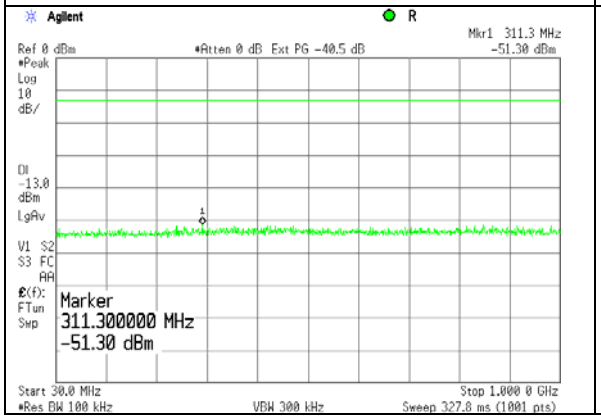


RF#2

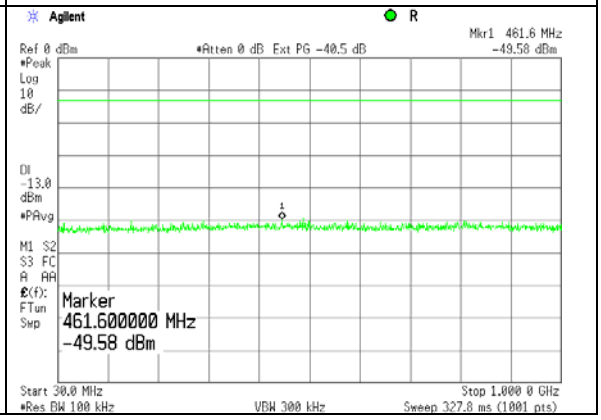


Plot 7.9.8 Spurious emission measurements in 30.0 - 1000 MHz range at mid carrier frequency

RF#1



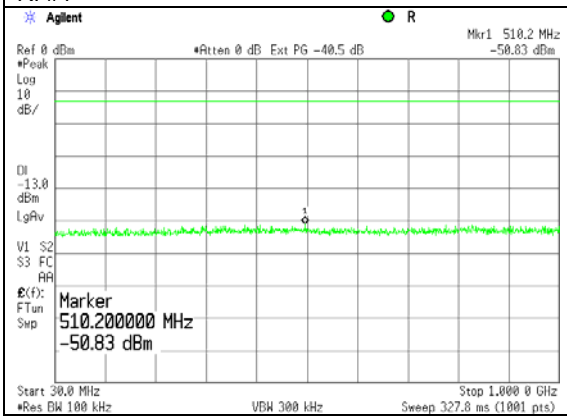
RF#2



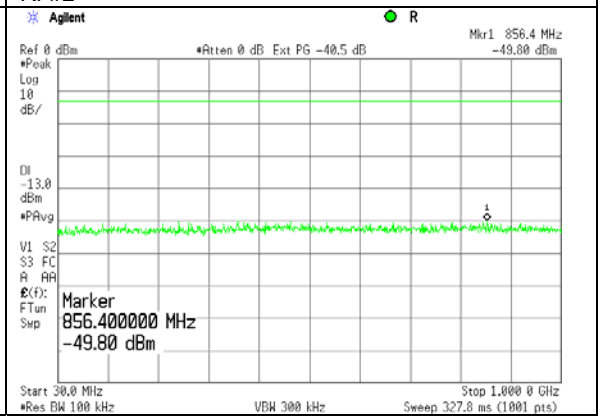
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.9 Spurious emission measurements in 30.0 - 1000 MHz range at high carrier frequency

RF#1



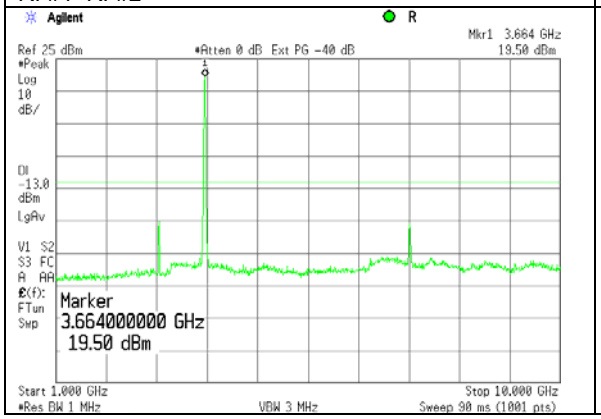
RF#2



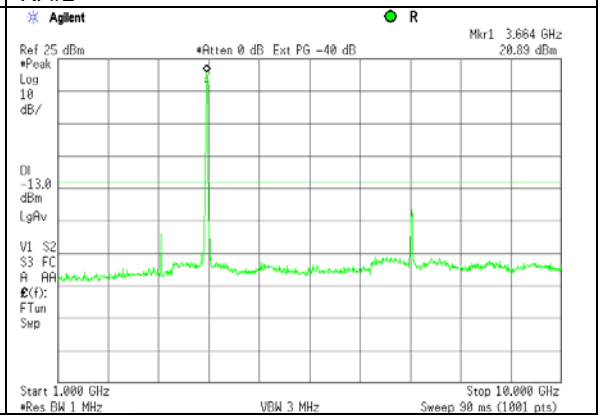
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.10 Spurious emission measurements in 1000 - 10000 MHz range at low carrier frequency

RF#1+RF#2

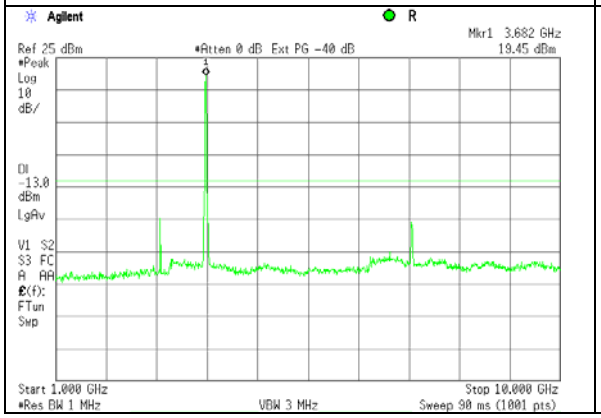


RF#2

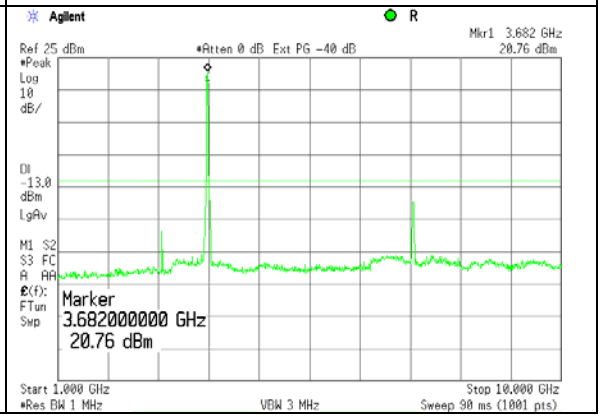


Plot 7.9.11 Spurious emission measurements in 1000 - 10000 MHz range at mid carrier frequency

RF#1+RF#2



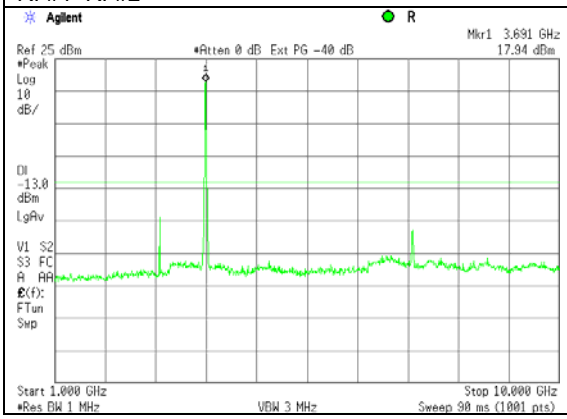
RF#2



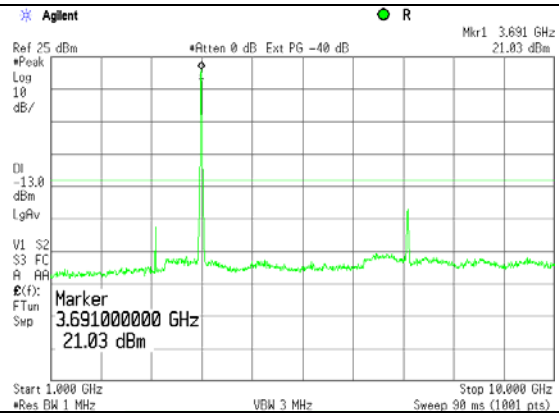
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.12 Spurious emission measurements in 1000 - 10000 MHz range at high carrier frequency

RF#1+RF#2



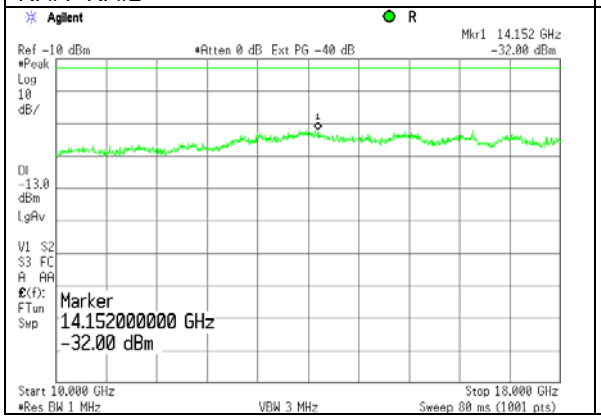
RF#2



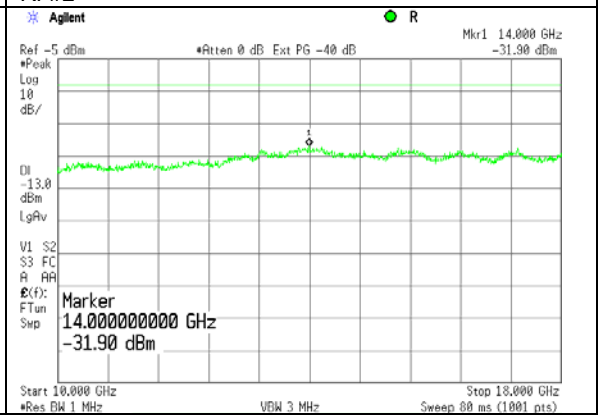
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/12/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.13 Spurious emission measurements in 10000 - 18000 MHz range at low carrier frequency

RF#1+RF#2

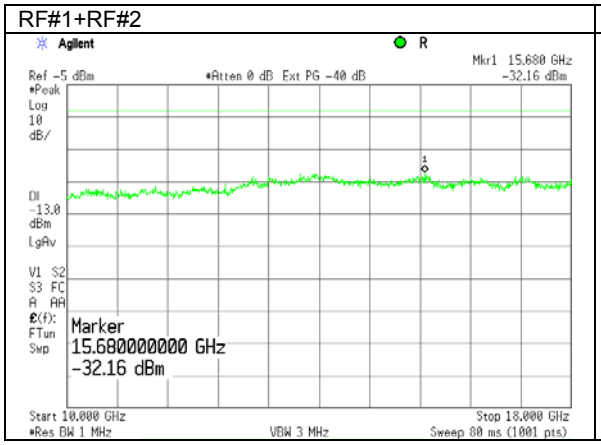


RF#2

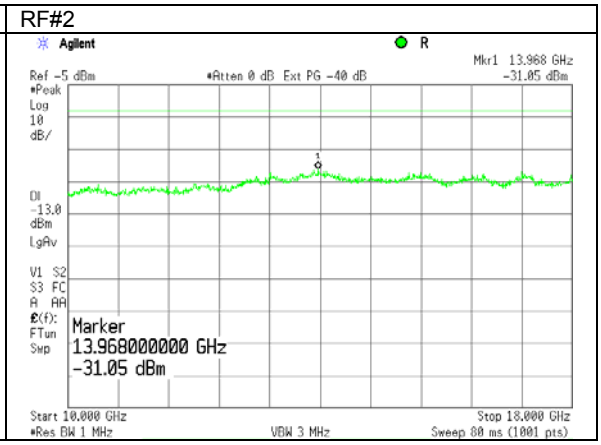


Plot 7.9.14 Spurious emission measurements in 10000 - 18000 MHz at mid carrier frequency

RF#1+RF#2

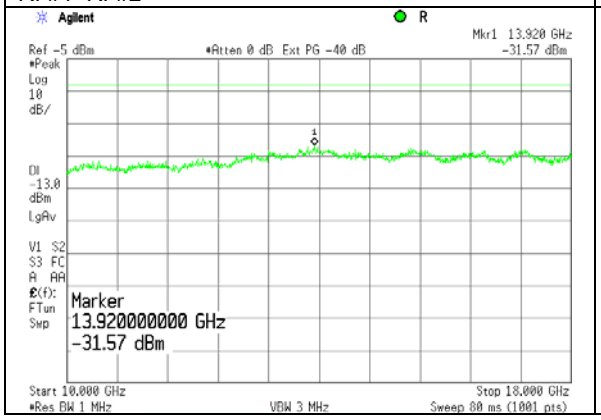
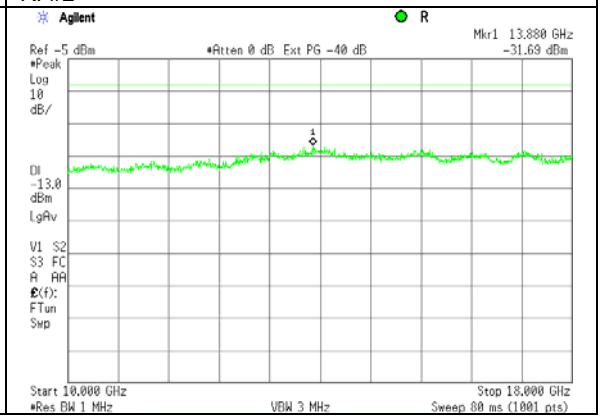


RF#2



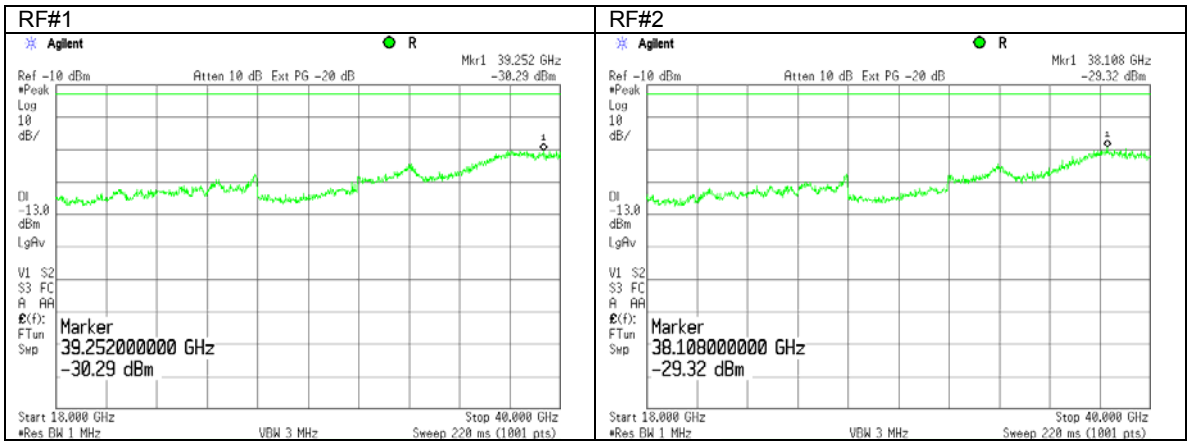
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/12/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.15 Spurious emission measurements in 10000 - 18000 MHz at high carrier frequency

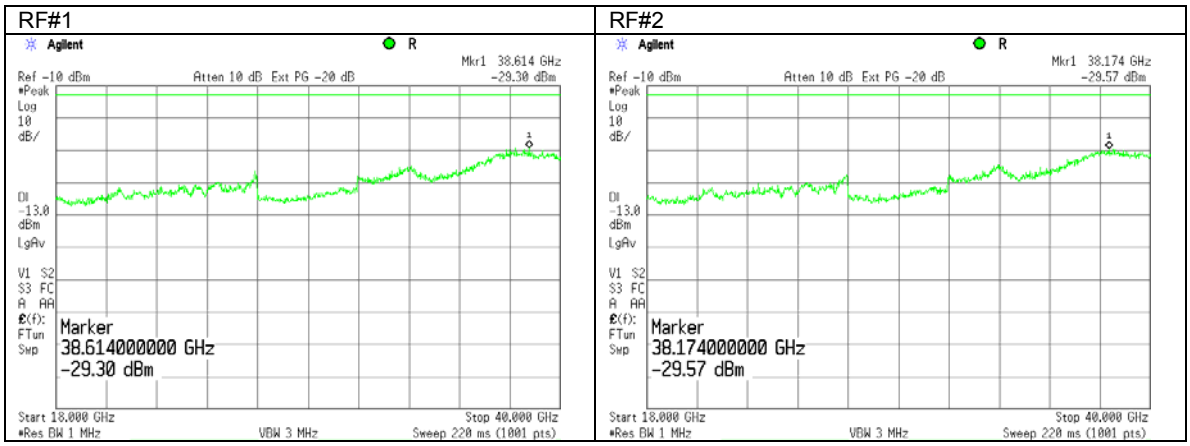
RF#1+RF#2	RF#2
	

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.16 Spurious emission measurements in 18000 - 40000 MHz range at low carrier frequency



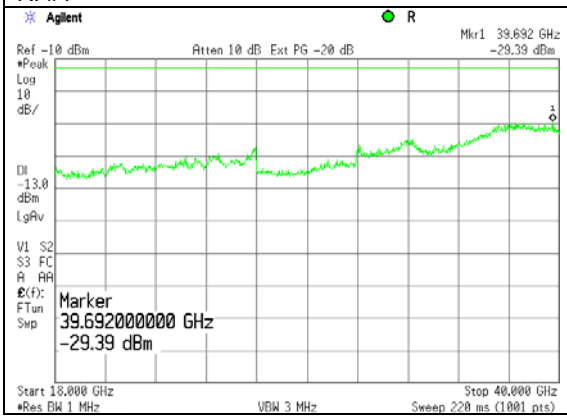
Plot 7.9.17 Spurious emission measurements in 18000 - 40000 MHz at mid carrier frequency



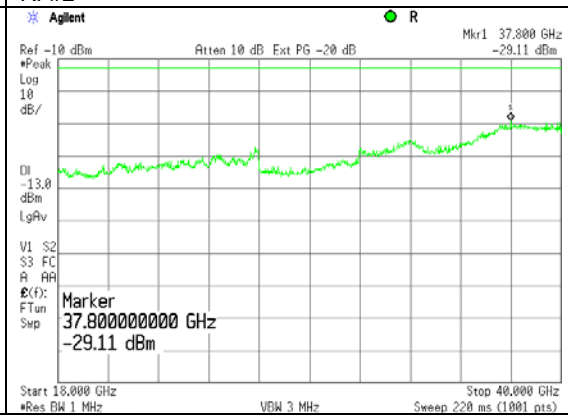
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/12/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.18 Spurious emission measurements in 18000 - 40000 MHz at high carrier frequency

RF#1

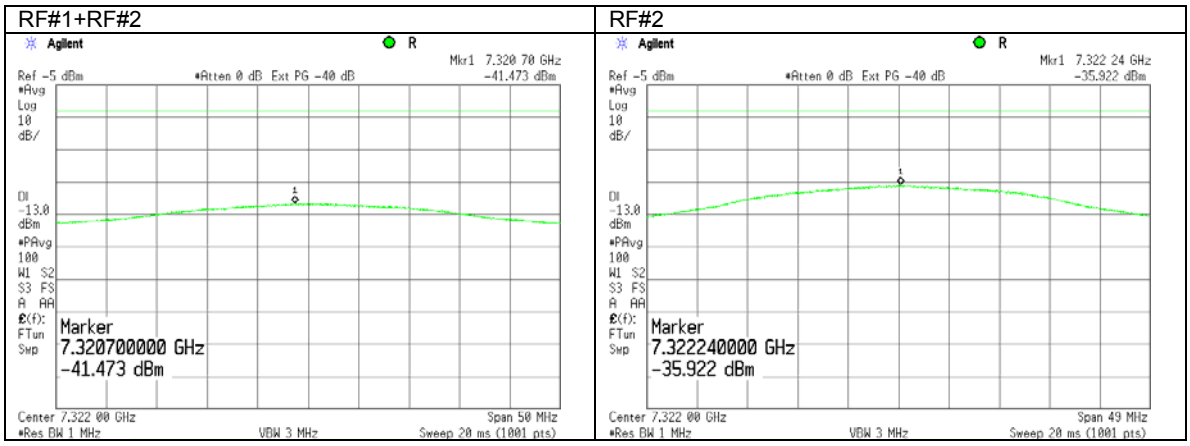


RF#2

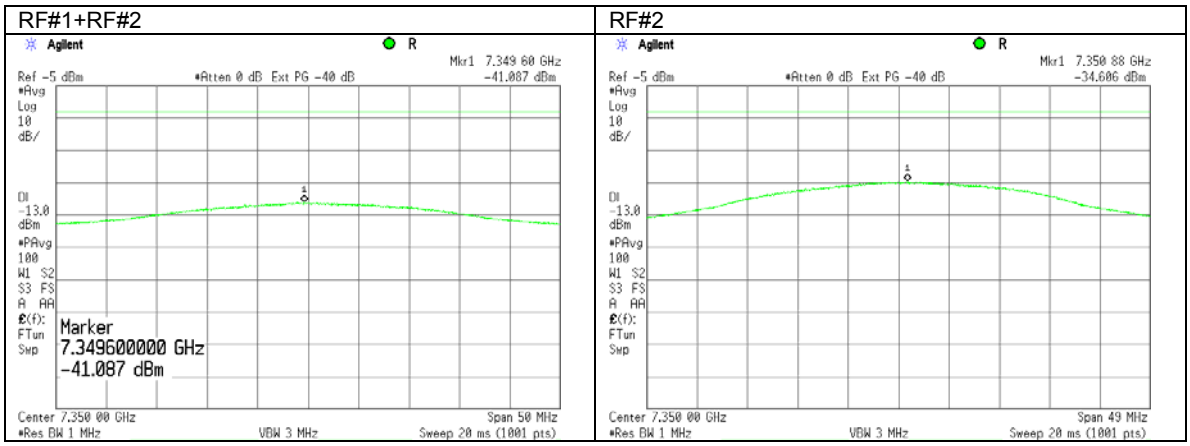


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.19 Spurious emission measurements at the 2nd harmonic of low carrier frequency



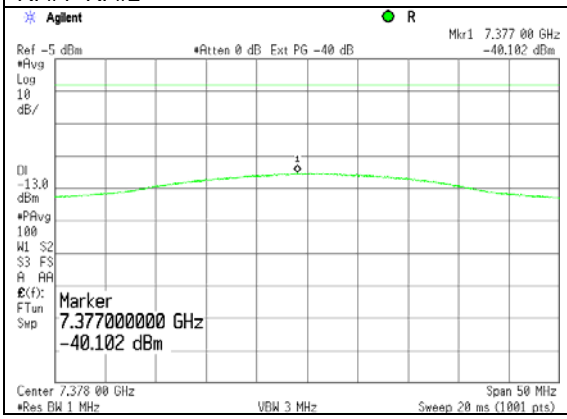
Plot 7.9.20 Spurious emission measurements at the 2nd harmonic of mid carrier frequency



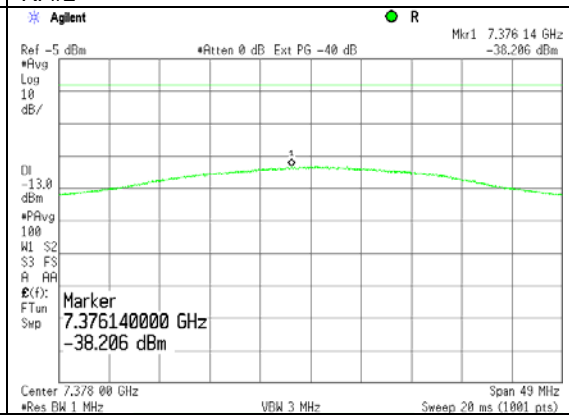
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/12/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.21 Spurious emission measurements at the 2nd harmonic of high carrier frequency

RF#1+RF#2

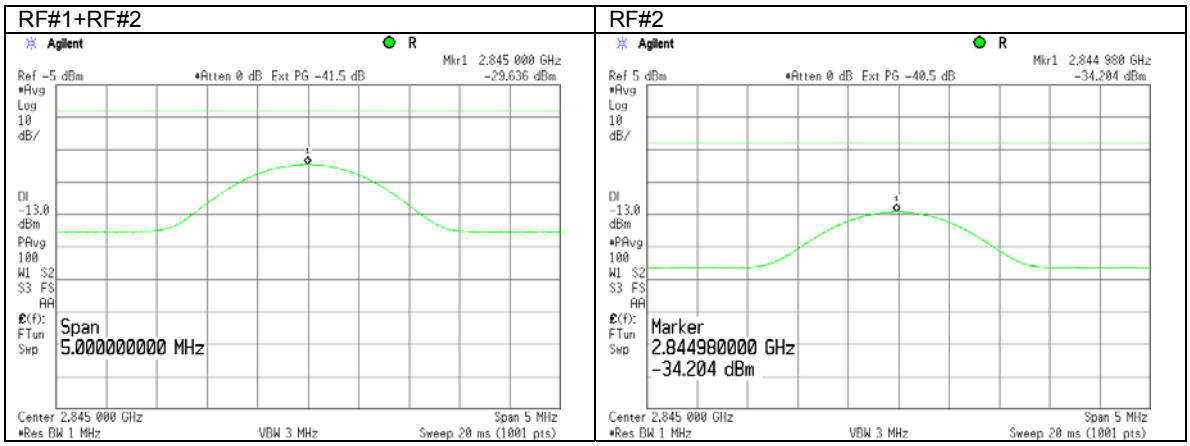


RF#2

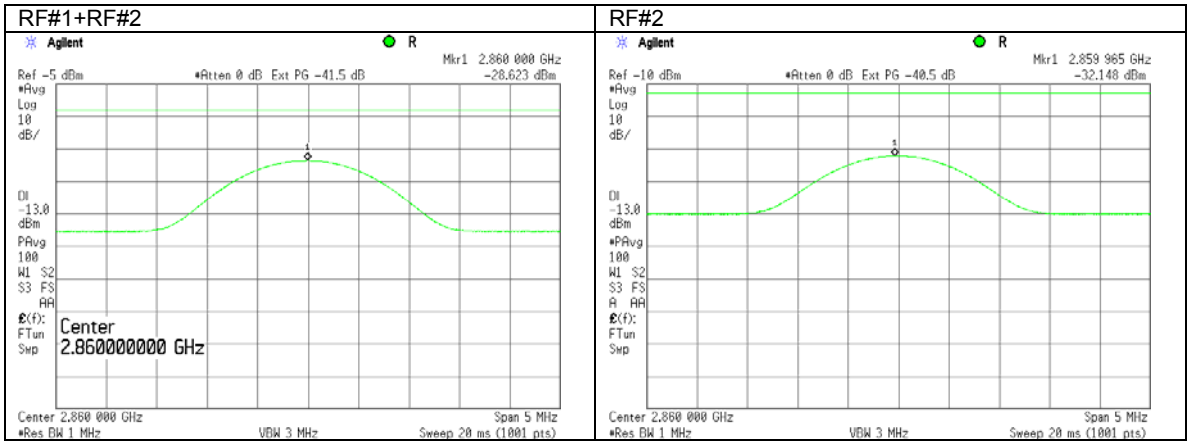


Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.22 Spurious emission measurements at the 2845 MHz at low carrier frequency

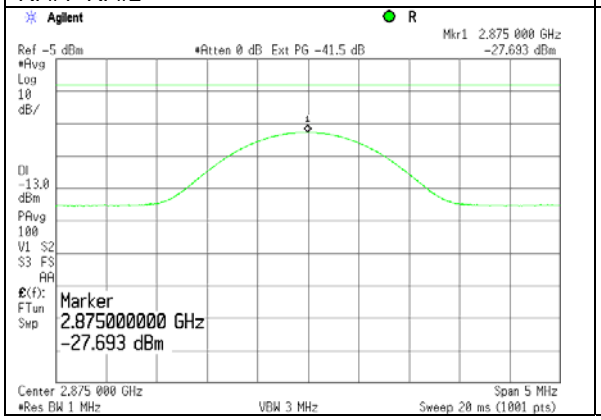
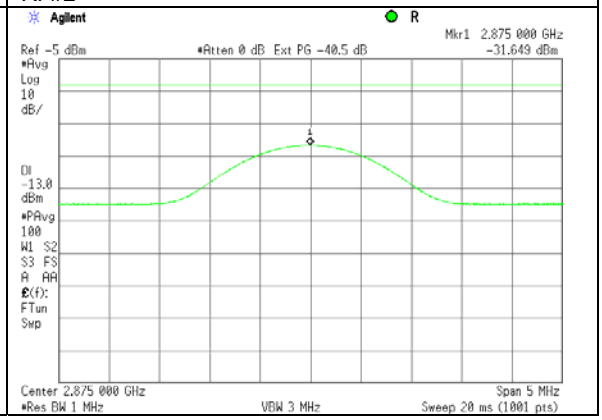


Plot 7.9.23 Spurious emission measurements at the 2860 MHz at mid carrier frequency



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	8/12/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: with 13.5 dBi gain antenna assembly			

Plot 7.9.24 Spurious emission measurements at the 2875 MHz at high carrier frequency

RF#1+RF#2	RF#2
	

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	10/27/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: Investigated range 3650-3675 MHz			

7.10 Spurious emissions test at RF antenna connector near band edges in 3650-3675 MHz range

7.10.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.10.1.

Table 7.10.1 Spurious emission limits

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

* - P is transmitter output power in Watts

7.10.2 Test procedure

7.10.2.1 The EUT was set up as shown in Figure 7.10.1, Figure 7.10.2, energized and its proper operation was checked.
7.10.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
7.10.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.10.2 and the associated plots.

Figure 7.10.1 Spurious emission test setup for single antenna mode

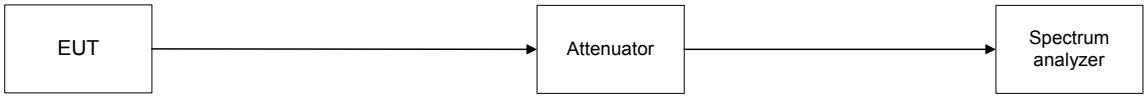
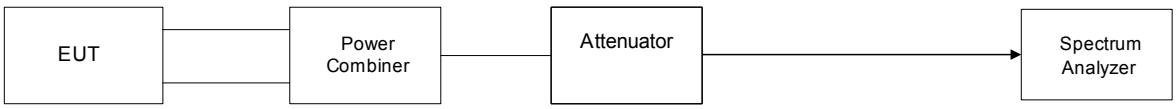


Figure 7.10.2 Spurious emission test setup for MIMO mode



Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	10/27/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: Investigated range 3650-3675 MHz			

Table 7.10.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 3650 – 3700 MHz
INVESTIGATED FREQUENCY RANGE: 3650 – 3675 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: PRBS
MODULATING SIGNAL: BPSK / 64QAM

Carrier frequency, MHz	Modulation	Bit rate, Mbps	RBW, kHz	Limit	Reference to Plot	Verdict
Channel bandwidth 5 MHz						
3672.5	BPSK	3.25	200	-13.0dBm	Plot 7.10.1	Pass
3672.5	64QAM	32.5			Plot 7.10.2	
Channel bandwidth 10 MHz, 13.5dBi antenna assembly gain						
3669.0	BPSK	6.5	200	-13.0dBm	Plot 7.10.3	Pass
3669.0	64QAM	65			Plot 7.10.5	
Channel bandwidth 10 MHz, 17dBi antenna assembly gain						
3670.0	BPSK	6.5	200	-13.0dBm	Plot 7.10.4	Pass
3670.0	64QAM	65			Plot 7.10.6	
Channel bandwidth 20 MHz, 13.5 dBi antenna assembly gain						
3664.0	BPSK	13	200	-13.0dBm	Plot 7.10.7	Pass
3664.0	64QAM	130			Plot 7.10.9	
Channel bandwidth 20 MHz, 17 dBi antenna assembly gain						
3665.0	BPSK	13	200	-13.0dBm	Plot 7.10.8	Pass
3665.0	64QAM	130			Plot 7.10.10	

*****- Margin = Spurious emission – specification limit.

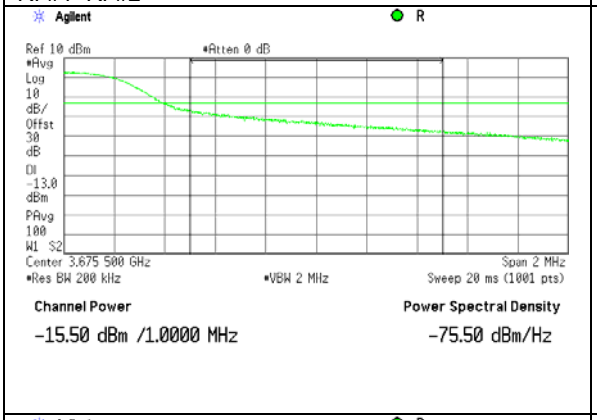
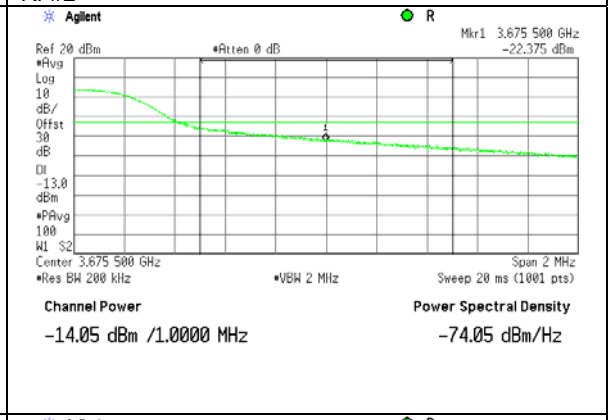
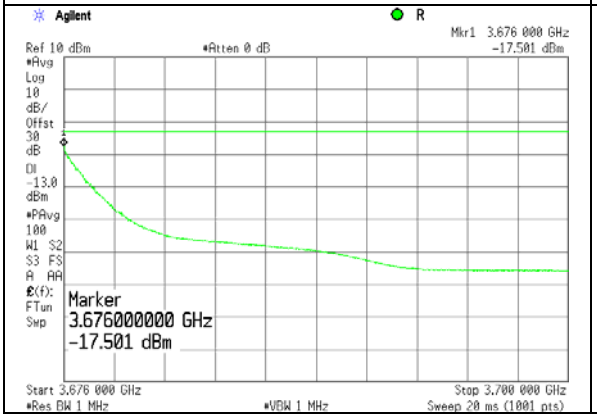
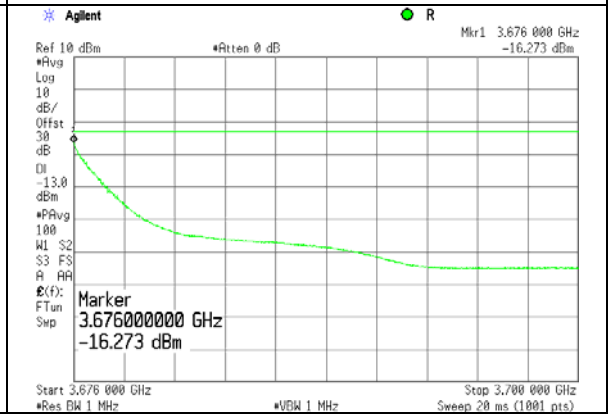
Reference numbers of test equipment used

HL 1906	HL 2953	HL 3440	HL 3455	HL 3472	HL 3474	HL 3779	HL 3784
HL 3818							

Full description is given in Appendix A.

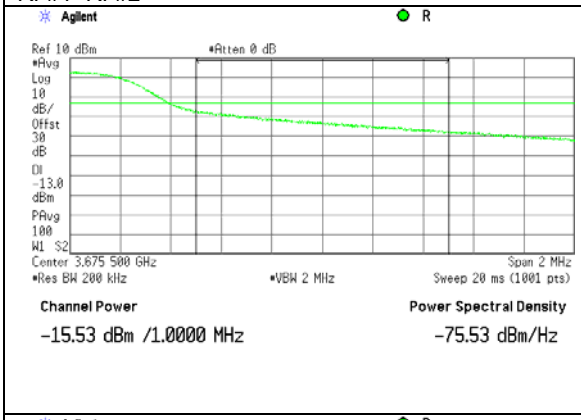
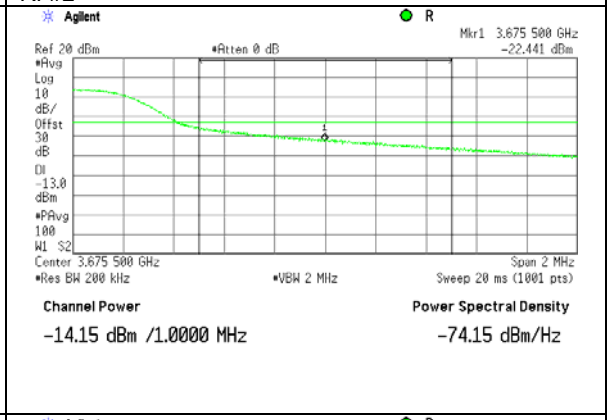
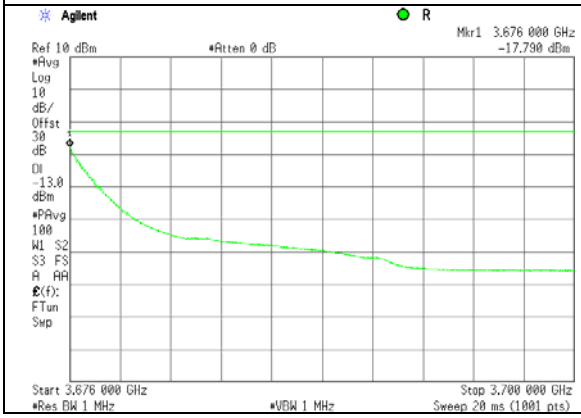
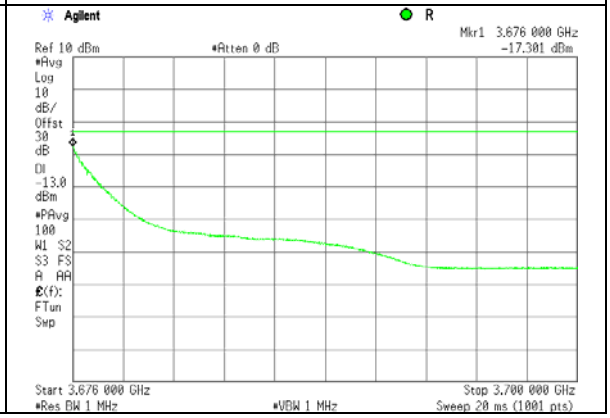
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	10/27/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: Investigated range 3650-3675 MHz			

Plot 7.10.1 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	BPSK
RF#1+RF#2	RF#2
	
	

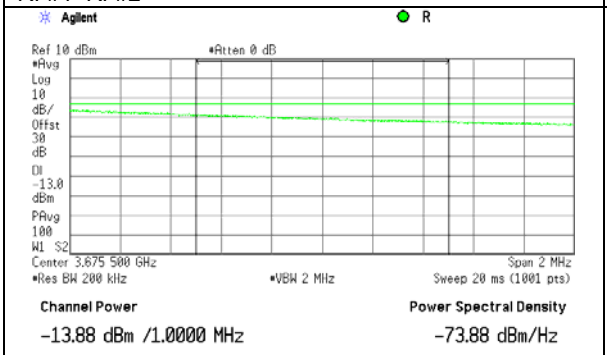
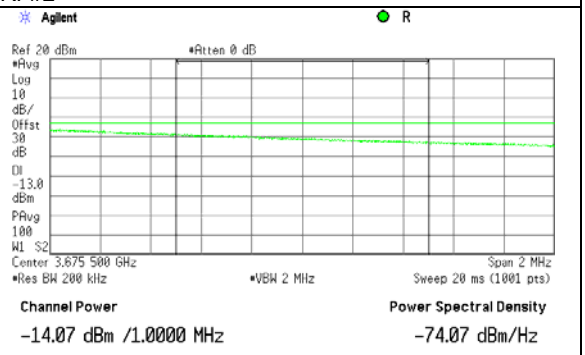
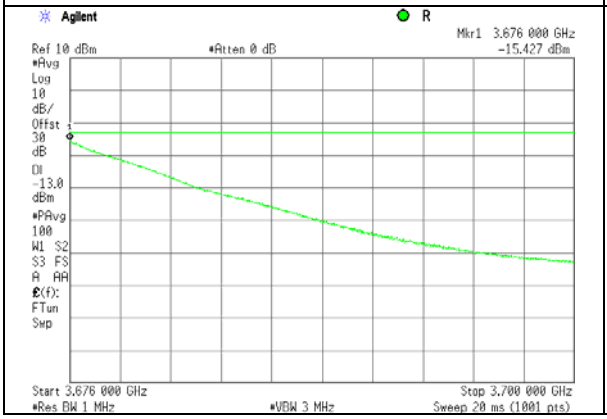
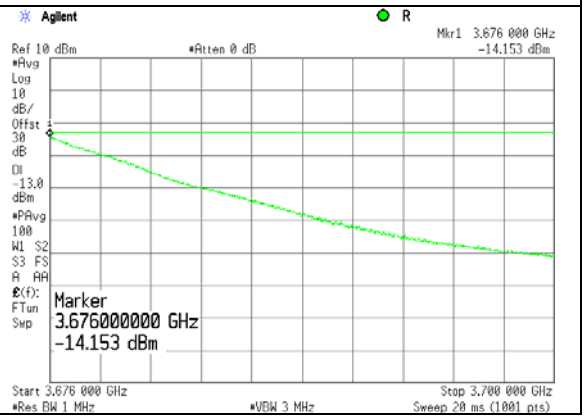
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	10/27/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: Investigated range 3650-3675 MHz			

Plot 7.10.2 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	5MHz
MODULATION:	64QAM
RF#1+RF#2	RF#2
	
	

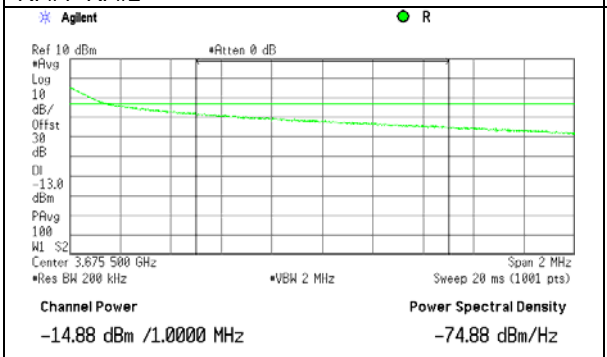
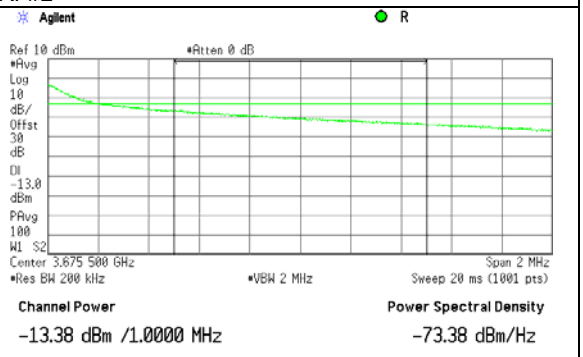
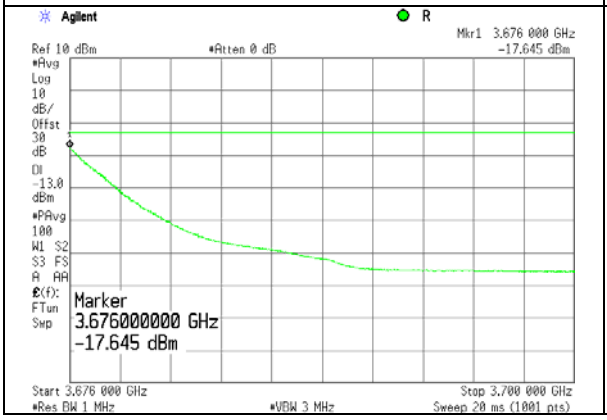
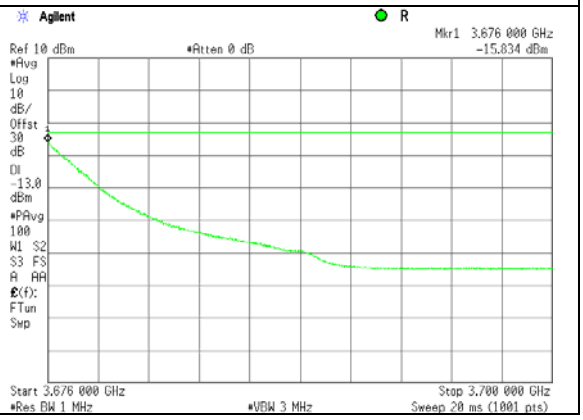
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	10/27/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: Investigated range 3650-3675 MHz			

Plot 7.10.3 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	10MHz
MODULATION:	BPSK
ANTENNA ASSEMBLY GAIN:	13.5 dBi
RF#1+RF#2	RF#2
	
	

Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	10/27/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: Investigated range 3650-3675 MHz			

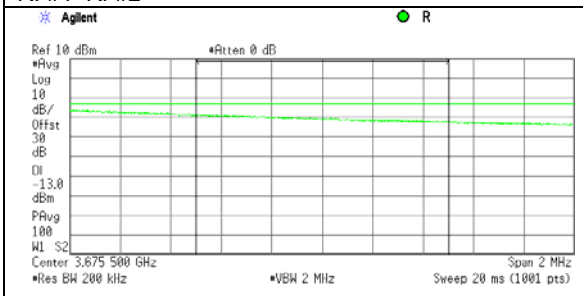
Plot 7.10.4 Spurious emission near high band edge at high carrier frequency

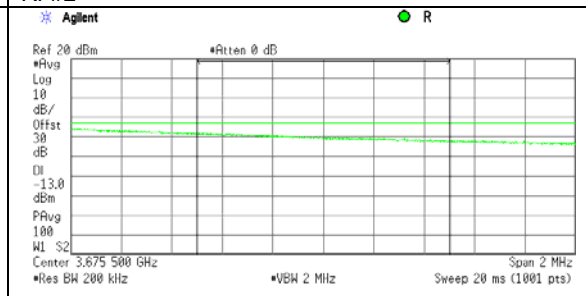
CHANNEL BANDWIDTH:	10MHz
MODULATION:	BPSK
ANTENNA ASSEMBLY GAIN:	17 dBi
RF#1+RF#2	RF#2
	
	

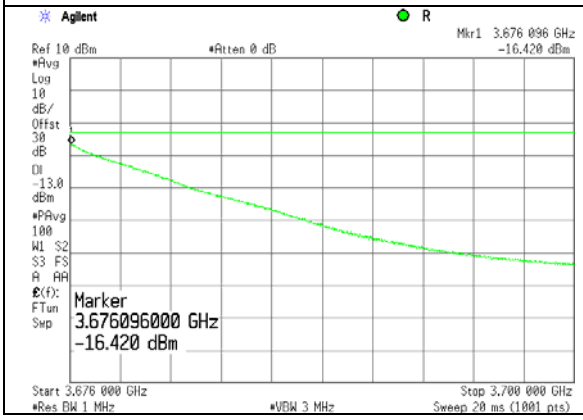
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	10/27/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: Investigated range 3650-3675 MHz			

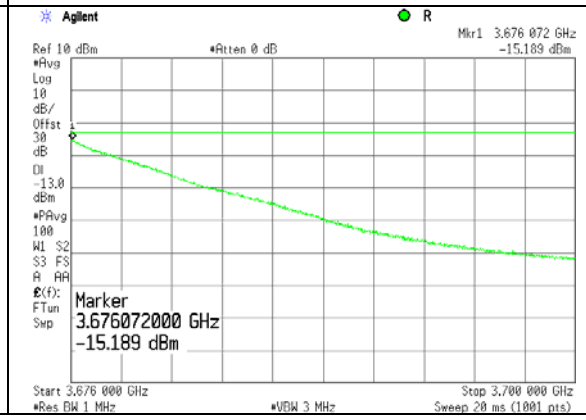
Plot 7.10.5 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	10MHz
MODULATION:	64QAM
ANTENNA ASSEMBLY GAIN:	13.5 dBi
RF#1+RF#2	RF#2





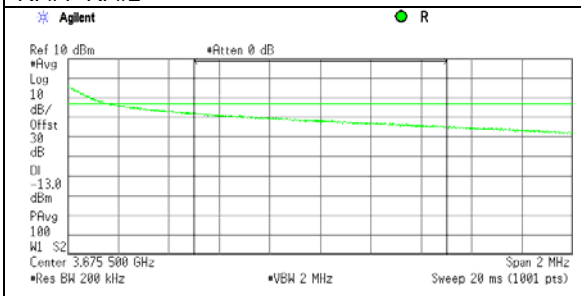


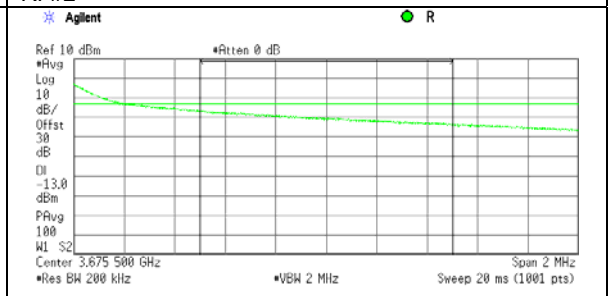


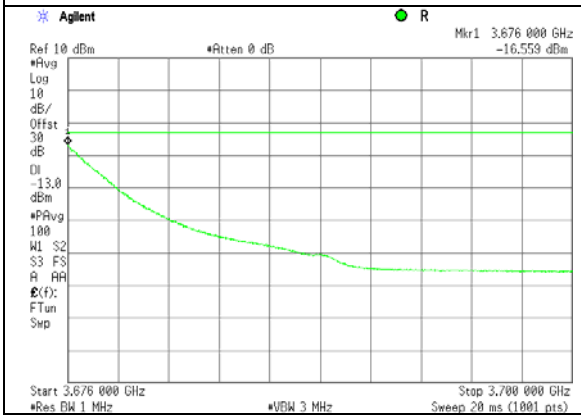
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	10/27/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: Investigated range 3650-3675 MHz			

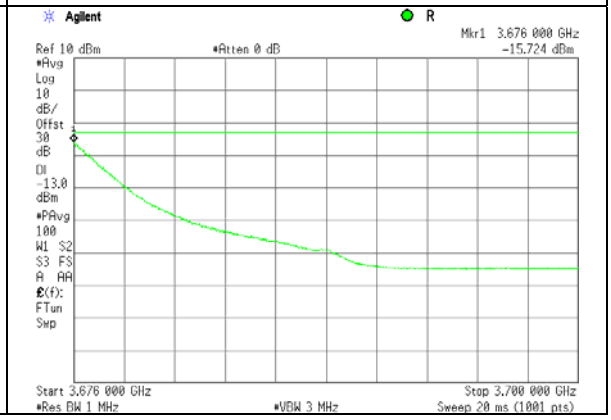
Plot 7.10.6 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	10MHz
MODULATION:	64QAM
ANTENNA ASSEMBLY GAIN:	17dBi
RF#1+RF#2	RF#2





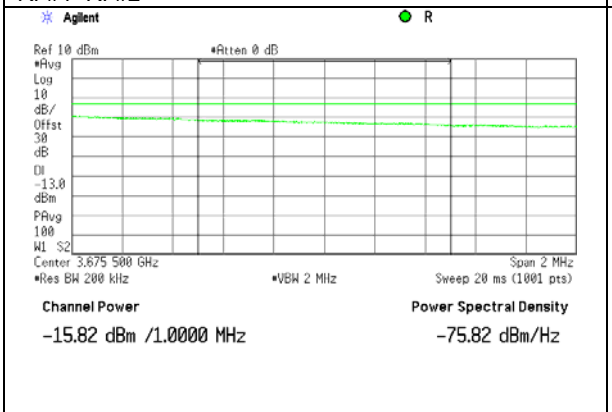


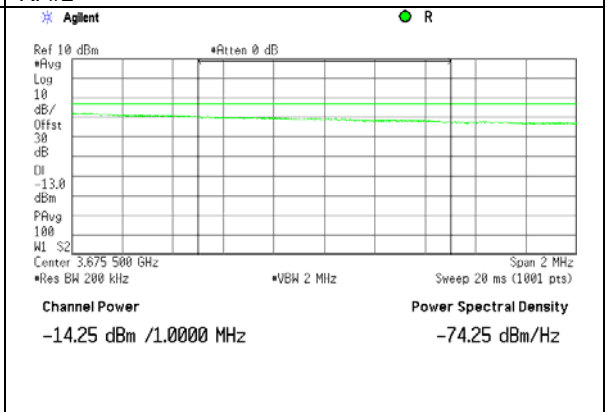


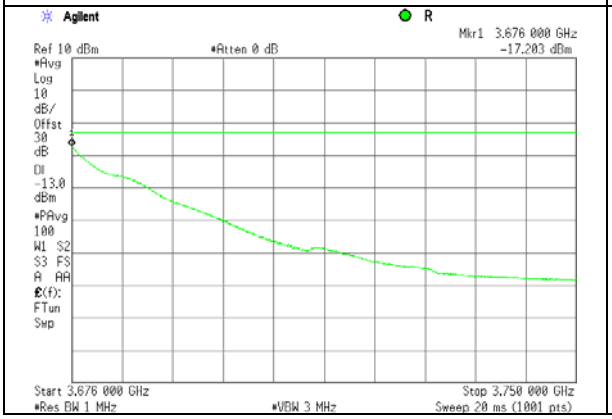
Test specification:	**Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector**		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	10/27/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** -48 VDC
Remarks: Investigated range 3650-3675 MHz			

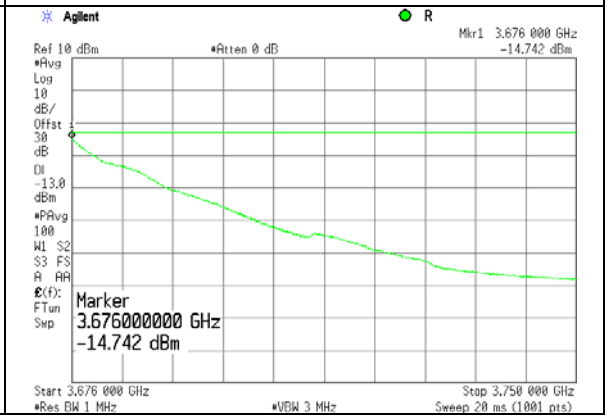
Plot 7.10.7 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	BPSK
ANTENNA ASSEMBLY GAIN:	13.5dBi
RF#1+RF#2	RF#2





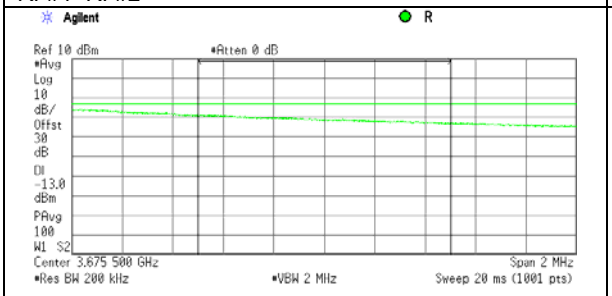


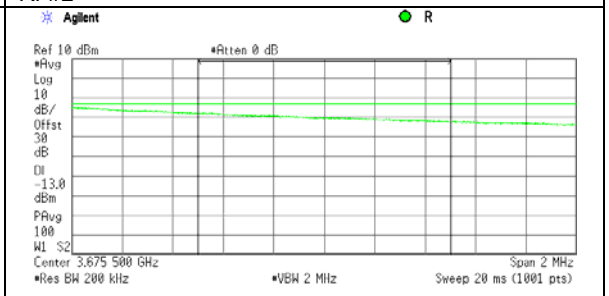


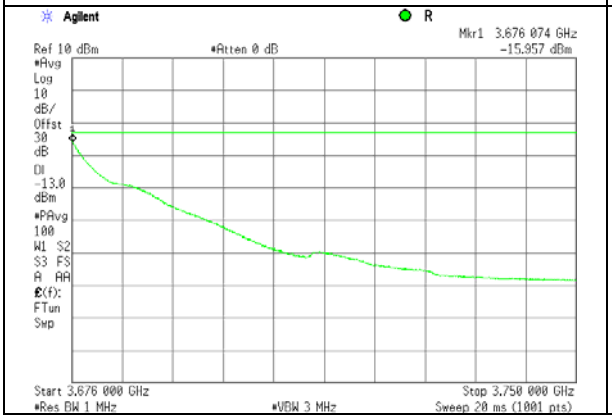
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	10/27/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: Investigated range 3650-3675 MHz			

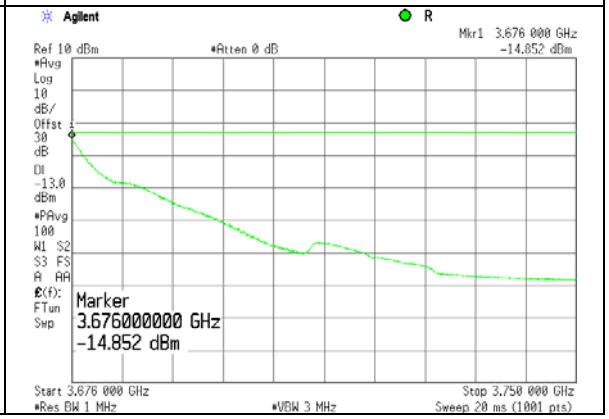
Plot 7.10.8 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	BPSK
ANTENNA ASSEMBLY GAIN:	17dBi
RF#1+RF#2	RF#2





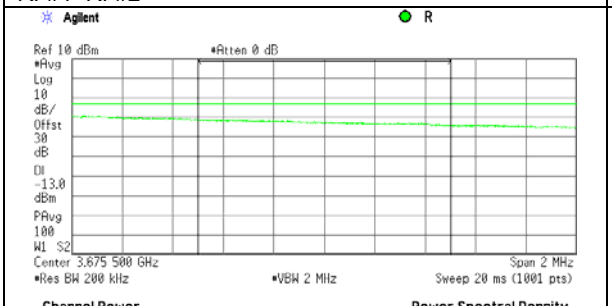


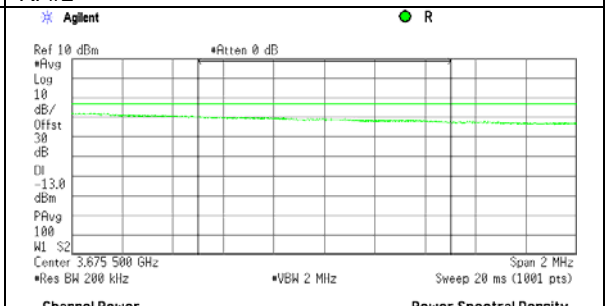


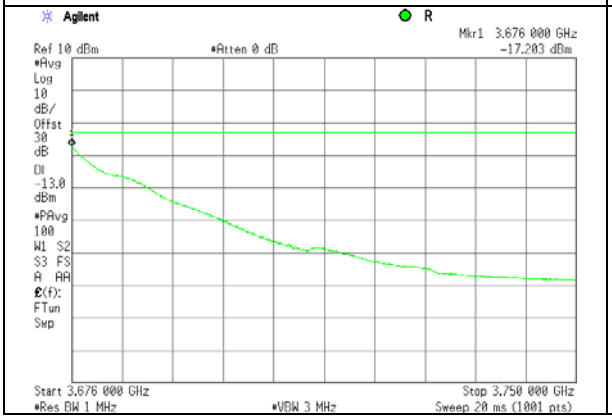
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	10/27/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: Investigated range 3650-3675 MHz			

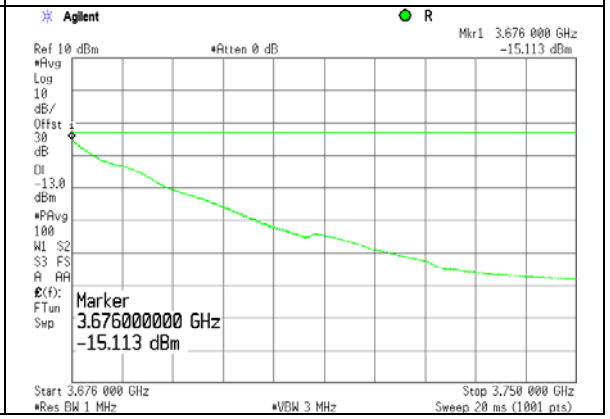
Plot 7.10.9 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	64QAM
ANTENNA ASSEMBLY GAIN:	13.5dBi
RF#1+RF#2	RF#2





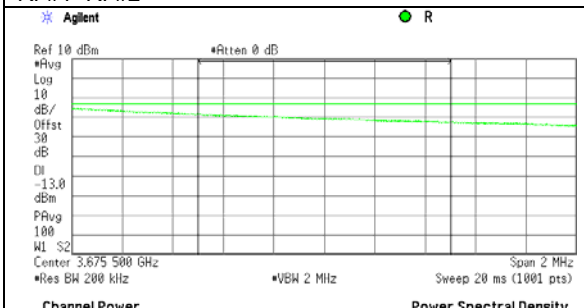


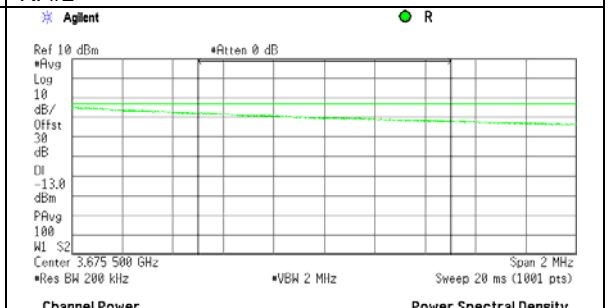


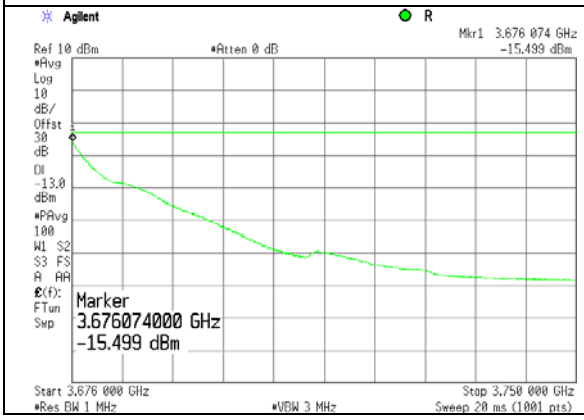
Test specification:	Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 90.1323; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	10/27/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: -48 VDC
Remarks: Investigated range 3650-3675 MHz			

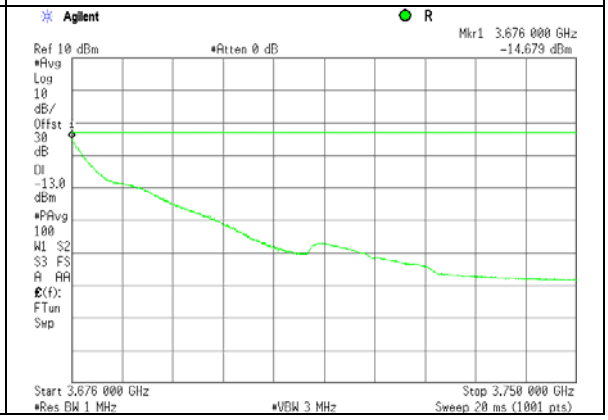
Plot 7.10.10 Spurious emission near high band edge at high carrier frequency

CHANNEL BANDWIDTH:	20MHz
MODULATION:	64QAM
ANTENNA ASSEMBLY GAIN:	17dBi
RF#1+RF#2	RF#2









Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

7.11 Radiated spurious emission measurements

7.11.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.11.1.

Table 7.11.1 Radiated spurious emission test limits

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

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

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

7.11.2.1 The EUT was set up as shown in Figure 7.11.1, energized and the performance check was conducted.
7.11.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.
7.11.2.3 The worst test results (the lowest margins) were recorded in Table 7.11.2 and shown in the associated plots.

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

7.11.3.1 The EUT was set up as shown in Figure 7.11.2, energized and the performance check was conducted.
7.11.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.
7.11.3.3 The worst test results (the lowest margins) were recorded in Table 7.11.2 and shown in the associated plots.

7.11.4 Test procedure for substitution ERP measurements of spurious

7.11.4.1 The test equipment was set up as shown in Figure 7.11.3 and energized.
7.11.4.2 RF signal generator was set to the frequency of investigated spurious emission and the RF output level was preliminary adjusted to produce the same field strength as it was measured from the EUT.
7.11.4.3 The test antenna height was swept from 1 to 4 m to find maximum emission from substitution antenna and RF signal generator output was fine adjusted to produce the same field strength as it was measured from the EUT.
7.11.4.4 The above procedure was performed in both, horizontal and vertical, polarizations of the test and substitution antennas.
7.11.4.5 The ERP of spurious emissions was calculated as a sum of signal generator output power in dBm and antenna gain in dBd reduced by cable loss in dB.
7.11.4.6 The above procedure was repeated at the rest of investigated frequencies.
7.11.4.7 The worst test results (the lowest margins) were recorded in Table 7.11.3 and shown in the associated plots.

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

Figure 7.11.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band

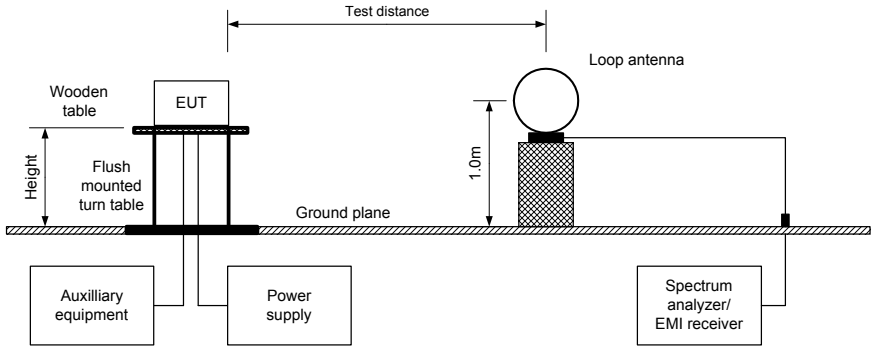
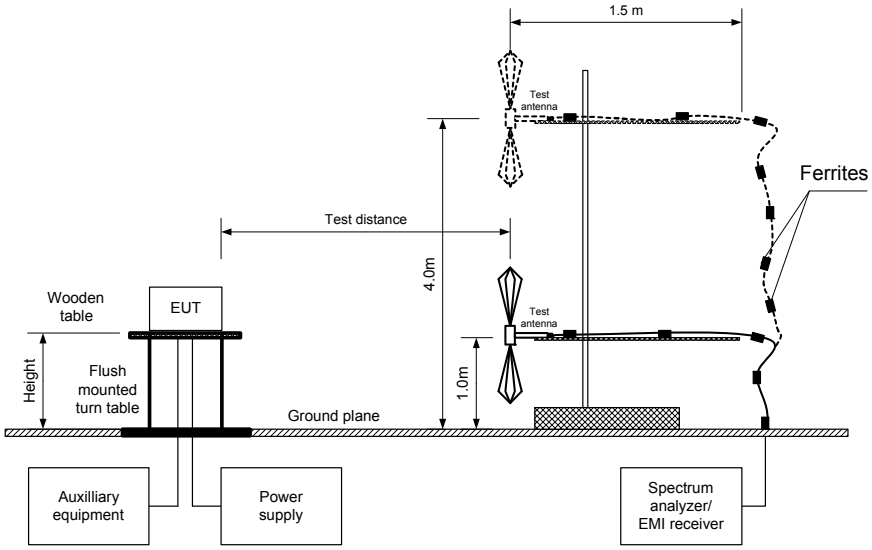
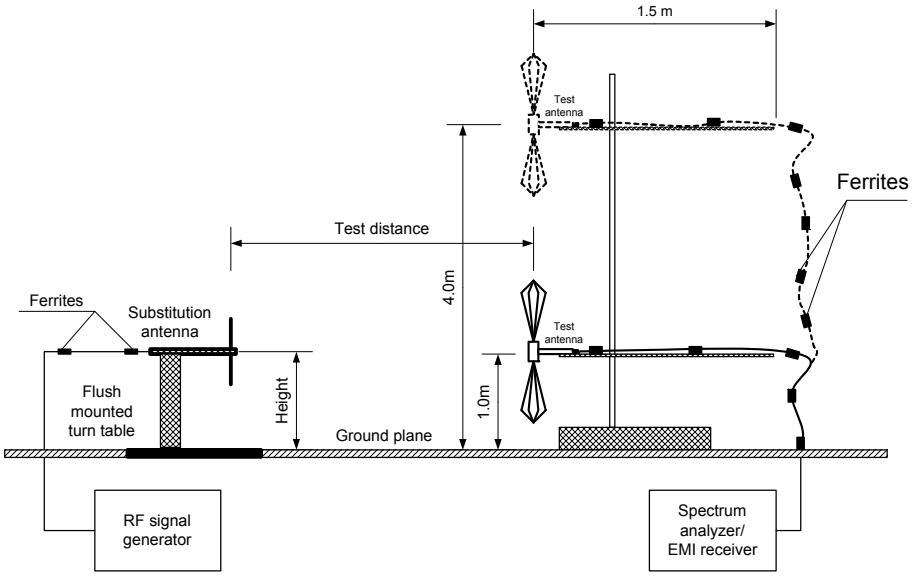


Figure 7.11.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

Figure 7.11.3 Setup for substitution ERP measurements of spurious



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

Table 7.11.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE:	3650 – 3700 MHz
TEST DISTANCE:	3 m
TEST SITE:	Semi anechoic chamber / OATS
EUT HEIGHT:	0.8 m
INVESTIGATED FREQUENCY RANGE:	0.009 – 40000 MHz
DETECTOR USED:	Peak
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
EMISSION BANDWIDTH:	20 MHz
BIT RATE:	130 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	RBW, kHz	Antenna polariz.	Antenna height, m	Turn-table position**, degrees
Low carrier frequency							
2845.0000	64.9	84.4	-19.5	1000	Vertical	1.0	90
Mid carrier frequency							
2860.0000	65.7	84.4	-18.7	1000	Vertical	1.0	90
High carrier frequency							
2875.0000	64.8	84.4	-19.6	1000	Vertical	1.0	180
Not depended on transmitter							
13154.9625	61.0	84.4	-23.4	1000	Horizontal	1.0	0

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

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

Table 7.11.3 Substitution ERP of spurious test results

ASSIGNED FREQUENCY RANGE: 3650 – 3700 MHz
TRANSMITTER CARRIER ERP: 23.91 dBm at low frequency
23.81 dBm at mid frequency
23.64 dBm at high frequency
TEST SITE: Semi anechoic chamber / OATS
TEST DISTANCE: 3 m
SUBSTITUTION ANTENNA HEIGHT: 0.8 m
DETECTOR USED: Peak
VIDEO BANDWIDTH: > Resolution bandwidth
SUBSTITUTION ANTENNA TYPE: Tunable dipole (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength, dB(μV/m)	RBW, kHz	Antenna polarization	RF generator out, dBm	Ant gain, dBd	Cable loss, dB	ERP, dBm	Limit, dBm	Margin, dB*	Verdict
Low carrier frequency										
2845.0	64.9	1000	Vertical	-40.15	9.8	3.1	-33.43	-13.00	-20.43	Pass
Mid carrier frequency										
2860.0	65.7	1000	Vertical	-39.40	9.8	3.1	-32.69	-13.00	-19.69	Pass
High carrier frequency										
2875.0	64.8	1000	Vertical	40.00	9.8	3.1	-33.29	-13.00	-20.29	Pass
Not depended on transmitter										
13154.9625	61.0	1000	Horizontal	-44.4	12.6	6.14	-37.95	-13.00	-24.95	Pass

*- Margin = Spurious emission – specification limit.

Reference numbers of test equipment used

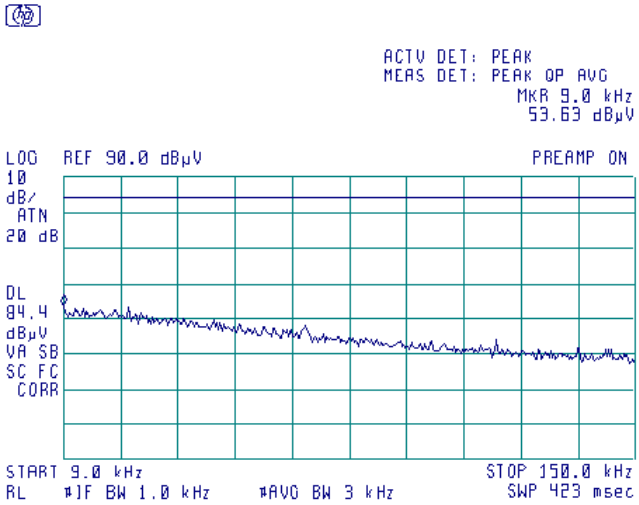
HL 0446	HL 0521	HL 0604	HL 0611	HL 0614	HL 0768	HL 0769	HL 1984
HL 2432	HL 2780	HL 2870	HL 2871	HL 3119	HL 3385	HL 3386	HL 3616
HL 3818	HL 3883	HL 3902					

Full description is given in Appendix A.

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

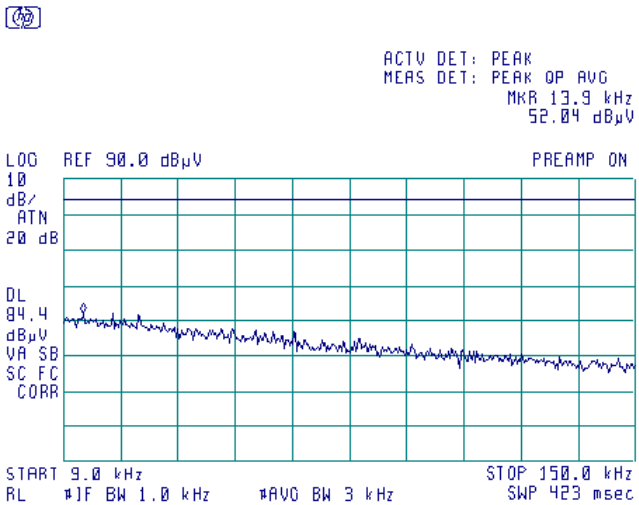
Plot 7.11.1 Radiated emission measurements in 9 - 150 kHz range

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



Plot 7.11.2 Radiated emission measurements in 9 - 150 kHz range

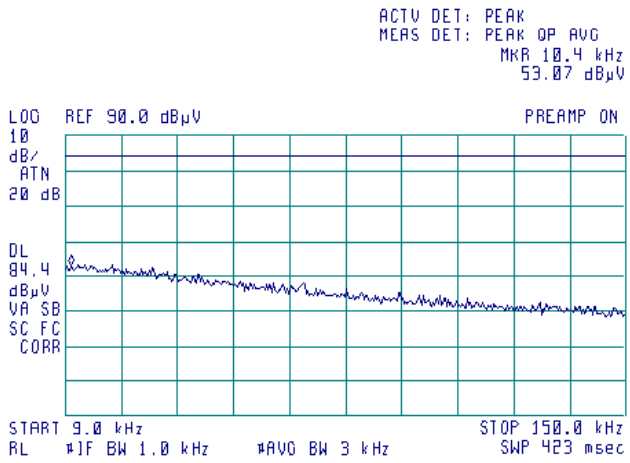
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Mid
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

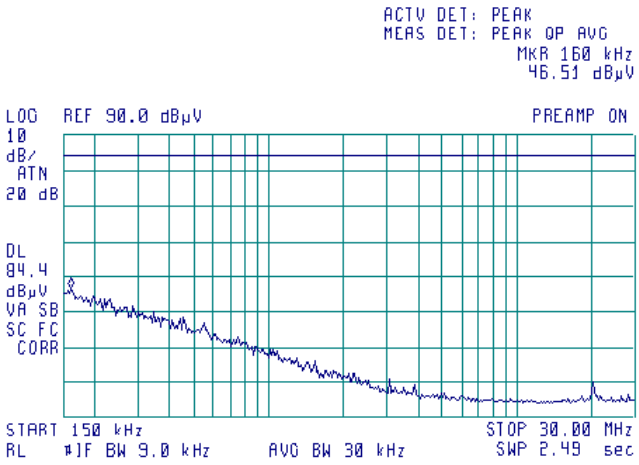
Plot 7.11.3 Radiated emission measurements in 9 - 150 kHz range

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



Plot 7.11.4 Radiated emission measurements in 0.15 - 30 MHz range

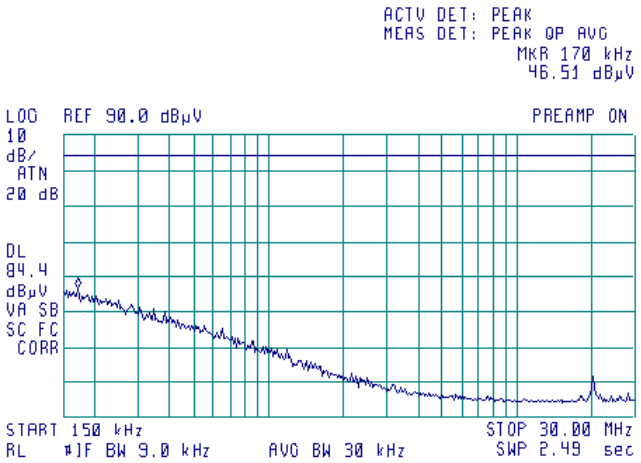
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

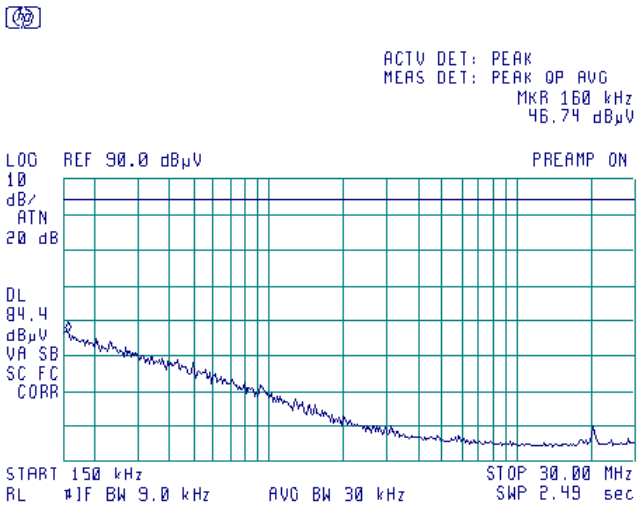
Plot 7.11.5 Radiated emission measurements in 0.15 - 30 MHz range

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



Plot 7.11.6 Radiated emission measurements in 0.15 - 30 MHz range

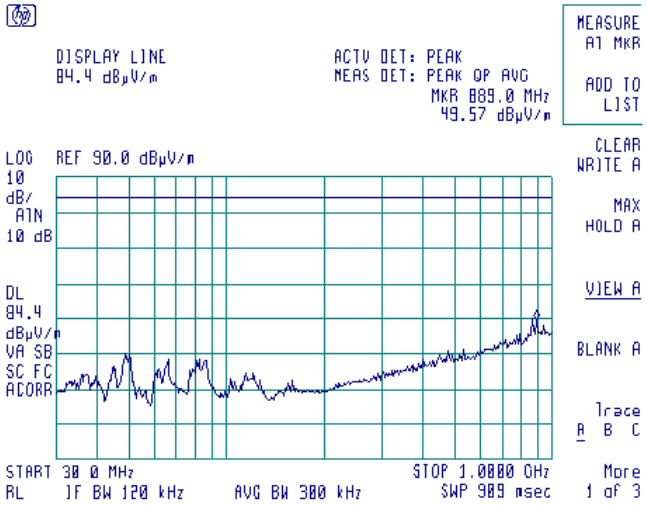
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

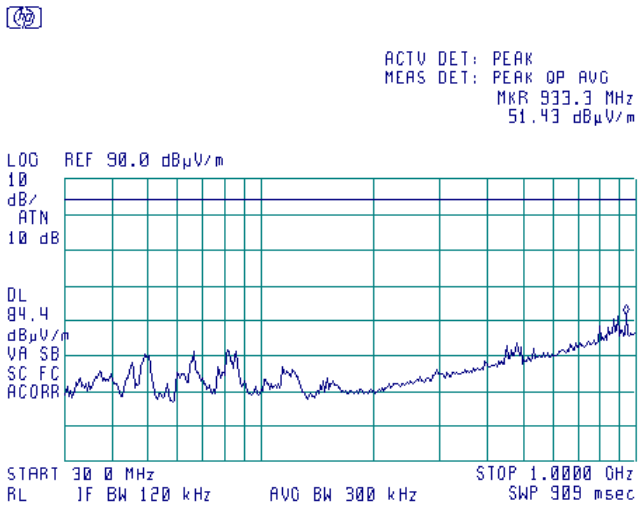
Plot 7.11.7 Radiated emission measurements in 30 - 1000 MHz range

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



Plot 7.11.8 Radiated emission measurements in 30 - 1000 MHz range

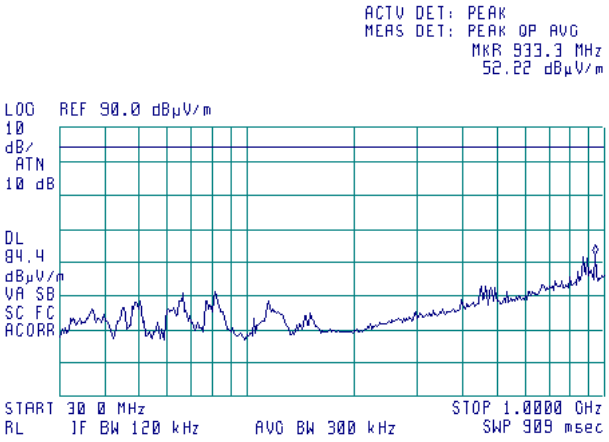
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

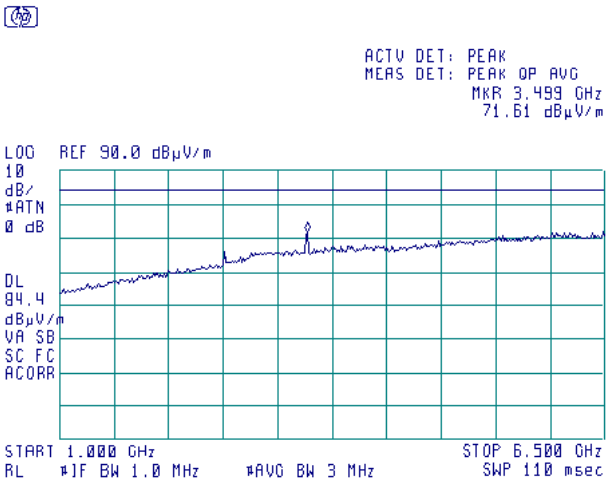
Plot 7.11.9 Radiated emission measurements in 30 - 1000 MHz range

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



Plot 7.11.10 Radiated emission measurements in 1000 – 6500 MHz range

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

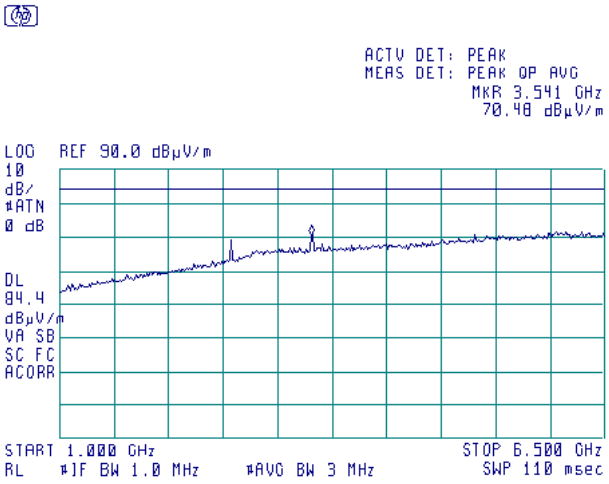


3485 MHz is the Tx on the low channel

Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

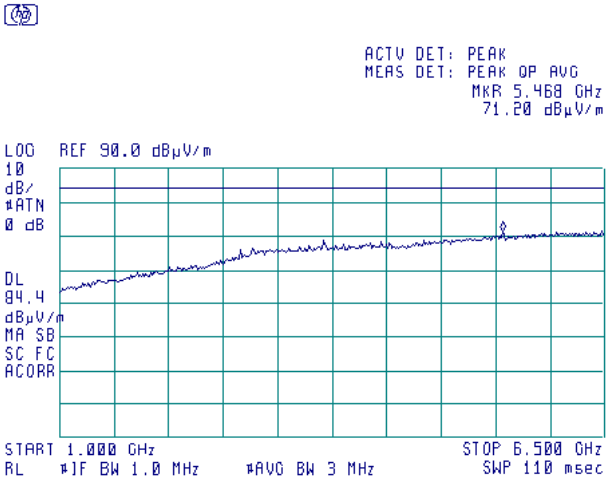
Plot 7.11.11 Radiated emission measurements in 1000 – 6500 MHz range

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



Plot 7.11.12 Radiated emission measurements in 1000 – 6500 MHz range

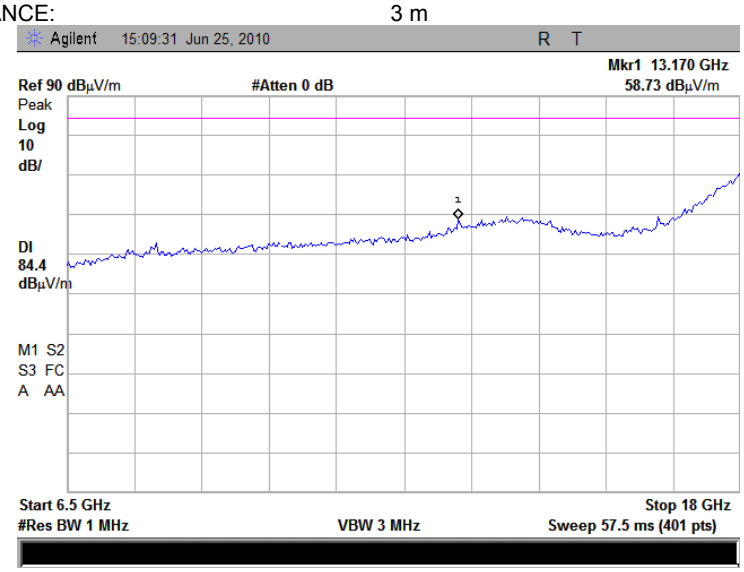
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

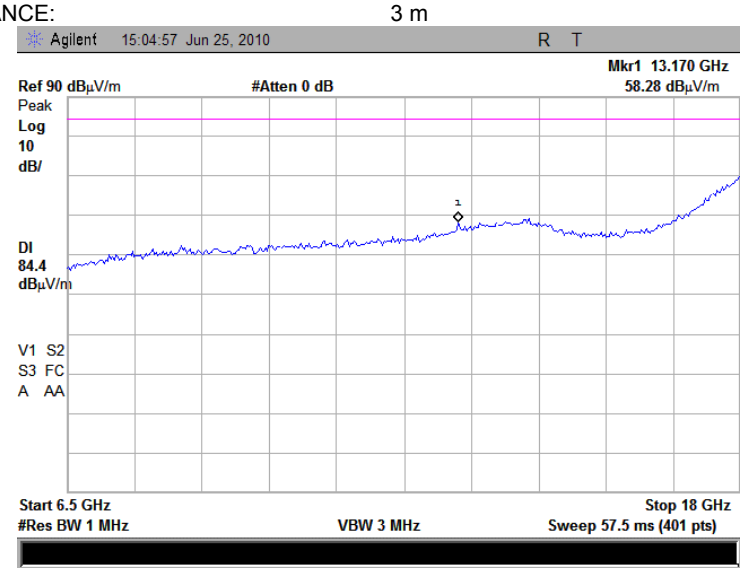
Plot 7.11.13 Radiated emission measurements in 6500 – 18000 MHz range

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



Plot 7.11.14 Radiated emission measurements in 6500 – 18000 MHz range

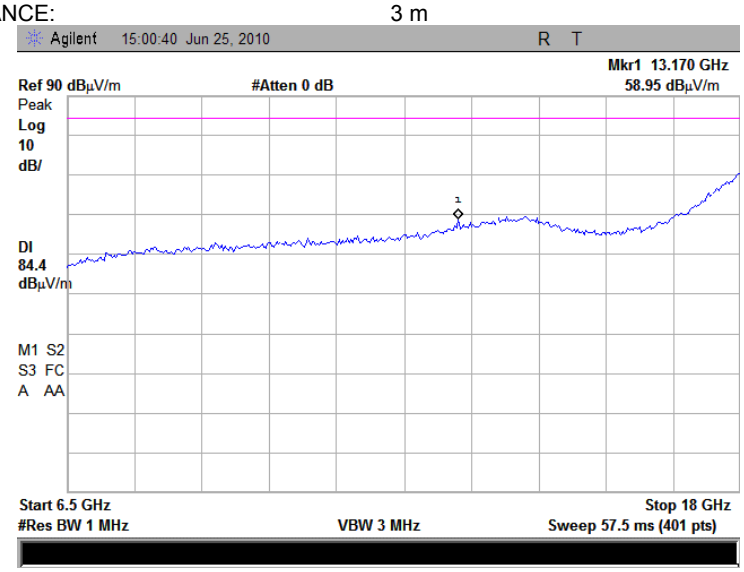
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Mid
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

Plot 7.11.15 Radiated emission measurements in 6500 – 18000 MHz range

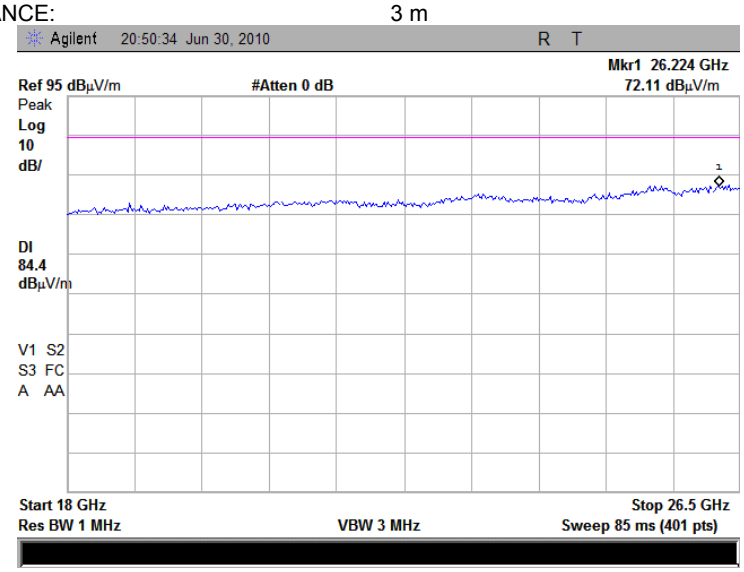
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

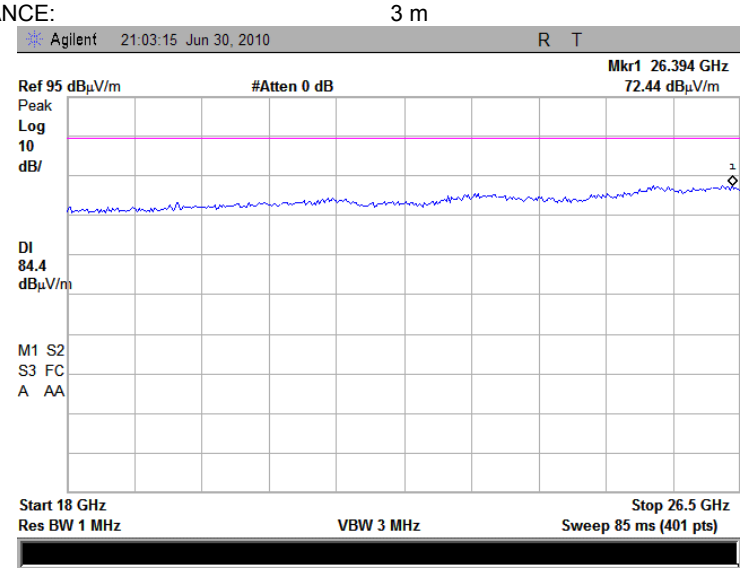
Plot 7.11.16 Radiated emission measurements in 18000 – 26500 MHz range

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



Plot 7.11.17 Radiated emission measurements in 18000 – 26500 MHz range

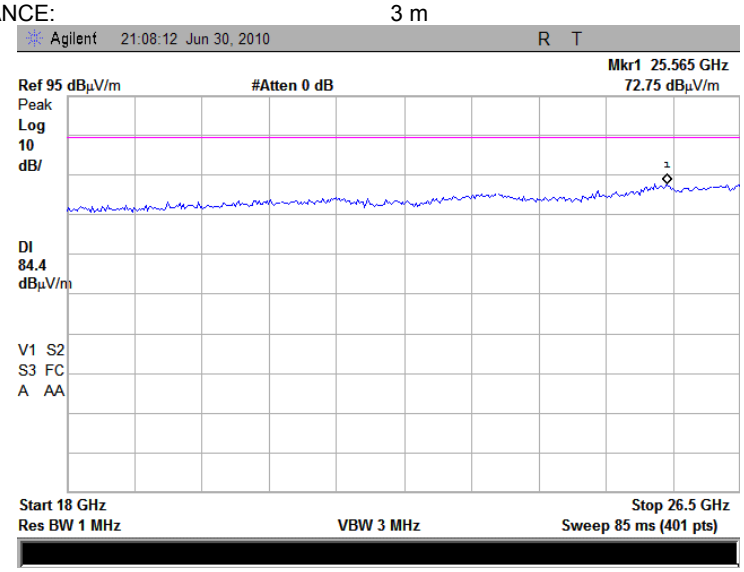
TEST SITE: OATS
CARRIER FREQUENCY: Mid
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

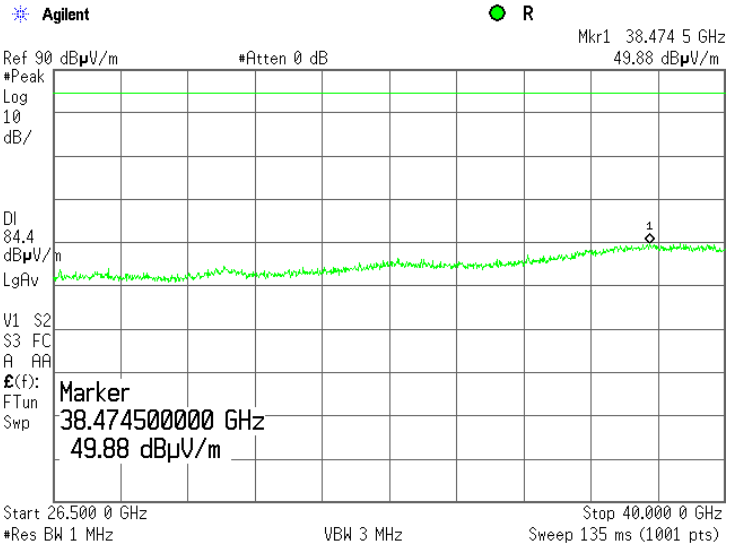
Plot 7.11.18 Radiated emission measurements in 18000 – 26500 MHz range

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



Plot 7.11.19 Radiated emission measurements in 26500 – 40000 MHz range

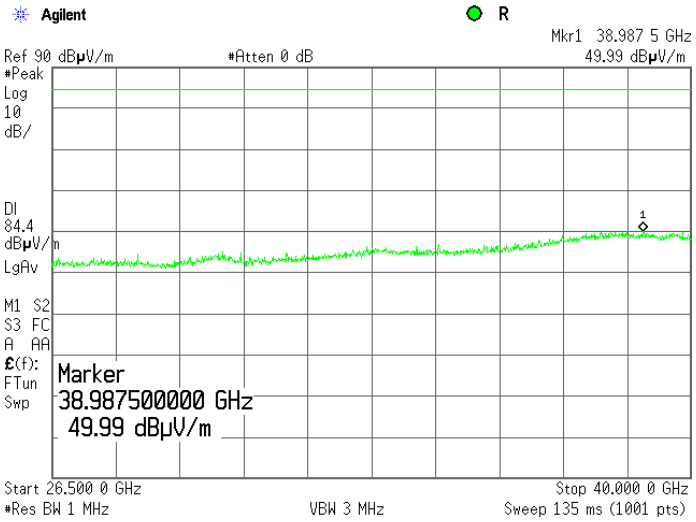
TEST SITE: OATS
CARRIER FREQUENCY: Low
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053, 90.1323; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	7/1/2010		
Temperature: 25 ºC	Air Pressure: 1009 hPa	Relative Humidity: 53 %	Power Supply: 120 VAC
Remarks:			

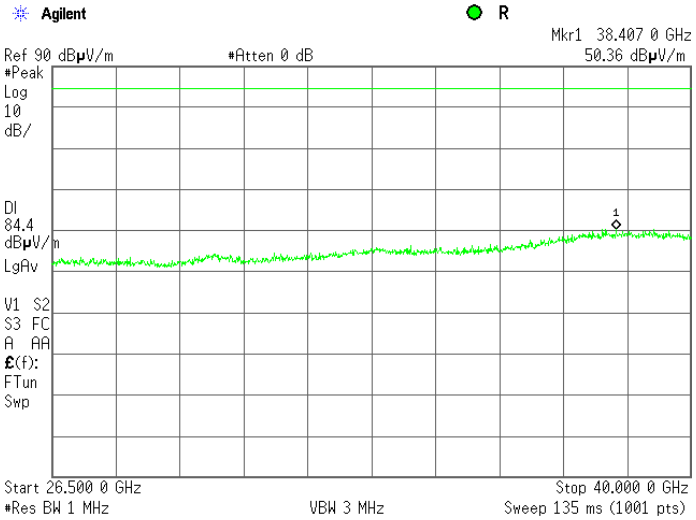
Plot 7.11.20 Radiated emission measurements in 26500 – 40000 MHz range

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



Plot 7.11.21 Radiated emission measurements in 26500 – 40000 MHz range

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



Test specification:	Section 90.213 / RSS-197, Section 5.7, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date:	6/24/2010		
Temperature: 25 ºC	Air Pressure: 1007 hPa	Relative Humidity: 42 %	Power Supply: 120 VAC
Remarks:			

7.12 Frequency stability test

7.12.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.12.1.

Table 7.12.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement	
	ppm	Hz
3650.0 – 3700.0	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation	

7.12.2 Test procedure

7.12.2.1 The EUT was set up as shown in Figure 7.12.1, energized and its proper operation was checked.

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

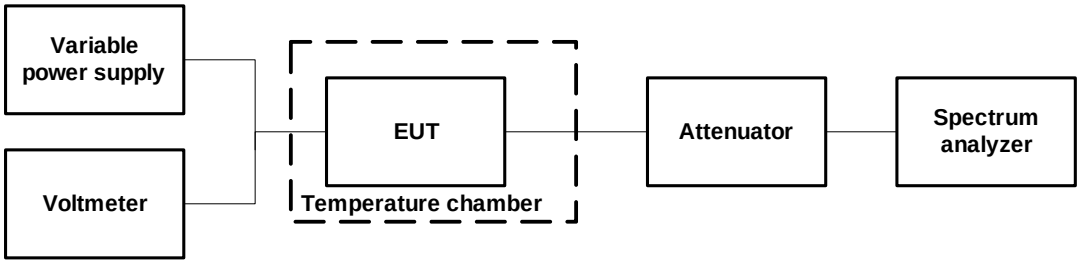
7.12.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.

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

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

7.12.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.12.2.

Figure 7.12.1 Frequency stability test setup



Test specification:	**Section 90.213 / RSS-197, Section 5.7, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	**Verdict:**	PASS
Date:	6/24/2010		
Temperature: 25 ºC	**Air Pressure:** 1007 hPa	**Relative Humidity:** 42 %	**Power Supply:** 120 VAC
Remarks:			

Table 7.12.2 Frequency stability test results

ASSIGNED FREQUENCY RANGE: 3650.0 – 3700.0 MHz
NOMINAL POWER VOLTAGE: 120VAC
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: Counter
RESOLUTION BANDWIDTH: 30Hz
VIDEO BANDWIDTH: 100Hz
MODULATION: Unmodulated

T, ºC	Voltage, VAC	Frequency, MHz							Max frequency drift, Hz		Max frequency drift, ppm	
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Positive	Negative	Positive	Negative
Low channel 3562.5MHz												
-30	Nominal	3652.504958	3652.504900	3652.504950	3652.504965	3652.504975	3652.504975	3652.504975	24315.00	0.00	6.66	0.00
-20	Nominal	3652.504585	NA	NA	NA	NA	NA	3652.504130	23925.00	0.00	6.55	0.00
-10	Nominal	3652.499895	NA	NA	NA	NA	NA	3652.491750	19235.00	0.00	5.27	0.00
0	Nominal	3652.496500	3652.495938	3652.495520	3652.495280	3652.495070	3652.494920	3652.494500	15840.00	0.00	4.34	0.00
10	Nominal	3652.486875	NA	NA	NA	NA	NA	3652.485006	6215.00	0.00	1.70	0.00
20	138.0	3652.480060	NA	NA	NA	NA	NA	3652.480660	0.00	-600.00	0.00	-0.16
20	Nominal	3652.480060	NA	NA	NA	NA	NA	3652.480660	0.00	-600.00	0.00	-0.16
20	102.0	3652.480060	NA	NA	NA	NA	NA	3652.480980	320.00	-600.00	0.09	-0.16
30	Nominal	3652.479220	3652.479100	3652.479180	3652.479070	3652.479060	3652.479060	3652.479060	0.00	-1600.00	0.00	-0.44
40	Nominal	3652.479980	NA	NA	NA	NA	NA	3652.483170	2510.00	-680.00	0.69	-0.19
50	Nominal	3652.479980	3652.485400	3652.487200	3652.488000	3652.488500	3652.488850	3652.494200	13540.00	-680.00	3.71	-0.19
Mid channel MHz												
-30	Nominal	3650.004958	3650.004900	3650.004950	3650.004965	3650.004975	3650.004975	3650.004975	24315.00	0.00	6.66	0.00
-20	Nominal	3650.004585	NA	NA	NA	NA	NA	3650.004130	23925.00	0.00	6.55	0.00
-10	Nominal	3649.999895	NA	NA	NA	NA	NA	3649.991750	19235.00	0.00	5.27	0.00
0	Nominal	3649.996500	3649.995938	3649.995520	3649.995280	3649.995070	3649.99492	3649.9945	15840.00	0.00	4.34	0.00
10	Nominal	3649.986875	NA	NA	NA	NA	NA	3649.985006	6215.00	0.00	1.70	0.00
20	138.0	3649.980060	NA	NA	NA	NA	NA	3649.980660	0.00	-600.00	0.00	-0.16
20	Nominal	3649.980060	NA	NA	NA	NA	NA	3649.980660	0.00	-600.00	0.00	-0.16
20	102.0	3649.980060	NA	NA	NA	NA	NA	3649.980980	320.00	-600.00	0.09	-0.16
30	Nominal	3649.979220	3649.979100	3649.979180	3649.979070	3649.979060	3649.979060	3649.979060	0.00	-1600.00	0.00	-0.44
40	Nominal	3649.979980	NA	NA	NA	NA	NA	3649.983170	2510.00	-680.00	0.69	-0.19
50	Nominal	3649.979980	3649.985400	3649.987200	3649.988000	3649.988500	3649.988850	3649.994200	13540.00	-680.00	3.71	-0.19
High channel MHz												
-30	Nominal	3697.505047	3697.505035	3697.505080	3697.505090	3697.505095	3697.505095	3697.505095	24735.00	0.00	6.69	0.00
-20	Nominal	3697.505000	NA	NA	NA	NA	NA	3697.504130	24640.00	0.00	6.66	0.00
-10	Nominal	3697.501670	NA	NA	NA	NA	NA	3697.499875	21310.00	0.00	5.76	0.00
0	Nominal	3697.494800	3697.494709	3697.494488	3697.494350	3697.494232	3697.494136	3697.493760	14440.00	0.00	3.91	0.00
10	Nominal	3697.486300	NA	NA	NA	NA	NA	3697.485190	5940.00	0.00	1.61	0.00
20	+15%	3697.479980	NA	NA	NA	NA	NA	3697.480420	60.00	-380.00	0.02	-0.10
20	Nominal	3697.479930	NA	NA	NA	NA	NA	3697.480360	0.00	-430.00	0.00	-0.12
20	-15%	3697.479920	NA	NA	NA	NA	NA	3697.480415	55.00	-440.00	0.01	-0.12
30	Nominal	3697.480170	3697.479855	3697.479515	3697.479375	3697.479230	3697.479140	3697.478900	0.00	-1460.00	0.00	-0.39
40	Nominal	3697.480900	NA	NA	NA	NA	NA	3697.483120	2760.00	0.00	0.75	0.00
50	Nominal	3697.488200	3697.489200	3697.490200	3697.490860	3697.491090	3697.491450	3697.492500	12140.00	0.00	3.28	0.00

* - Reference frequency
Note1: As no limit is specified by the standard for 3650.0 – 3700.0 MHz band the worst case test results are given for information purpose only.

Reference numbers of test equipment used

HL 1215	HL 2953	HL 3233	HL 3286	HL 3818			

Full description is given in Appendix A.

Test specification:	RSS-197, Section 5.8, Receiver spurious emissions		
Test procedure:	ANSI C63.4, Sections 12.1.4, 12.1.5		
Test mode:	Compliance	Verdict:	PASS
Date:	7/29/2010		
Temperature: 23 ºC	Air Pressure: 1004 hPa	Relative Humidity: 45 %	Power Supply: -48 VDC
Remarks:			

7.13 Receiver spurious emissions

7.13.1 General

This test was performed to measure spurious emissions at RF antenna connector of receiver or a receiver which was tested for compliance with radiated emission limits with the antenna port connected to resistive termination. Specification test limits at antenna connector measurement are given in Table 7.13.1 (RSS-Gen section 7.3.2.1).

Table 7.13.1 Antenna conducted measurement spurious emission limits

Frequency range, MHz	Power of spurious		Measurement bandwidth, (min) kHz
	nW	dBm	
30 – 1000	2	-57	4
1000 – 3rd harmonic	5	-53	4

* - harmonic of the highest frequency the EUT generates, uses, operates or tunes to (without exceeding 40 GHz).

7.13.2 Test procedure for conducted measurement

7.13.2.1 The EUT was set up as shown in Figure 7.13.1, energized and its proper operation was checked.
7.13.2.2 The spurious emission was measured with spectrum analyzer as provided in Table 7.13.2 and the associated plots.

Figure 7.13.1 Spurious emission test setup for single antenna mode

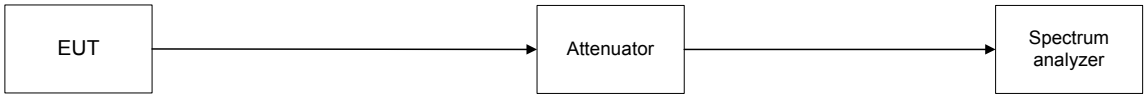
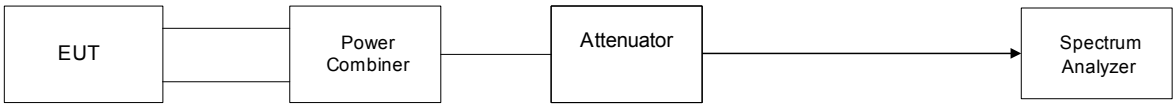


Figure 7.13.2 Spurious emission test setup for MIMO mode



Test specification:	**RSS-197, Section 5.8, Receiver spurious emissions**		
Test procedure:	ANSI C63.4, Sections 12.1.4, 12.1.5		
Test mode:	Compliance	**Verdict:**	PASS
Date:	7/29/2010		
Temperature: 23 ºC	**Air Pressure:** 1004 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks:			

Table 7.13.2 Spurious emission test results according to RSS-Gen, Section 7.2.3.1

INVESTIGATED FREQUENCY RANGE:	30 – 11000 MHz
RECEIVER OPERATING FREQUENCY RANGE:	3652.5 – 3697.5 MHz
EUT OPERATING MODE:	Receive at 3675.0 MHz (mid frequency)
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz (below 1000 MHz) 1000 kHz (above 1000 MHz)
VIDEO BANDWIDTH:	300 kHz (below 1000 MHz) 3000 kHz (above 1000 MHz)

Frequency, MHz	Spurious emission, dBm	Limit, dBm	Margin, dB	Verdict
RF#1+RF#2				
2860.000	-58.50	-53.00	-5.50	Pass
4385.000	-66.00	-53.00	-13.00	Pass
RF#1				
2860.000	-58.50	-53.00	-5.50	Pass
4385.000	-66.33	-53.00	-13.33	Pass
RF#2				
2860.000	-64.17	-53.00	-11.17	Pass
4385.000	-66.33	-53.00	-13.33	Pass

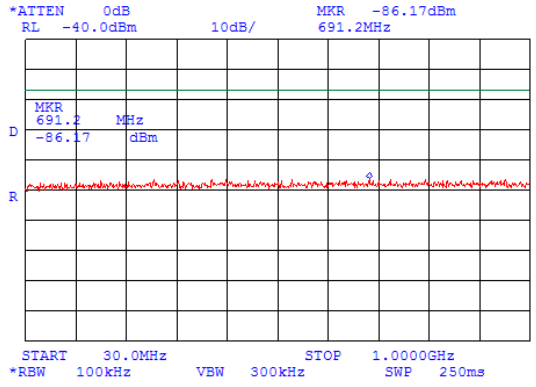
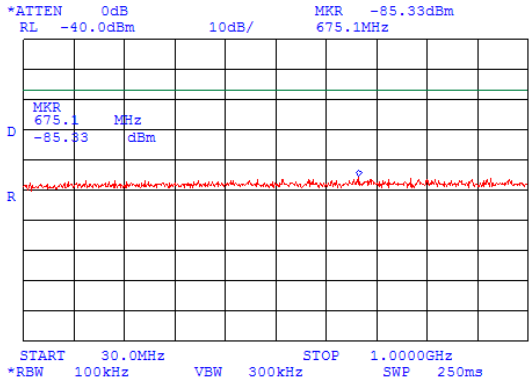
Reference numbers of test equipment used

HL 1424	HL 2015	HL 3206	HL 3472	HL 3473			

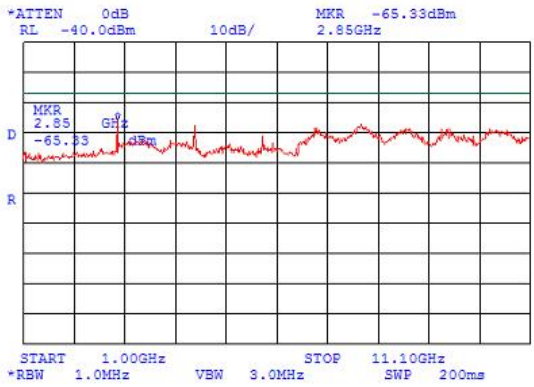
Full description is given in Appendix A.

Test specification:	**RSS-197, Section 5.8, Receiver spurious emissions**		
Test procedure:	ANSI C63.4, Sections 12.1.4, 12.1.5		
Test mode:	Compliance	**Verdict:**	PASS
Date:	7/29/2010		
Temperature: 23 ºC	**Air Pressure:** 1004 hPa	**Relative Humidity:** 45 %	**Power Supply:** -48 VDC
Remarks:			

Plot 7.13.1 Spurious emission test results

RF#1	RF#2
	

Plot 7.13.2 Spurious emission test results

RF#1+RF2	RF#2
	

8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	29-Jun-10	29-Jun-11
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	25-Aug-10	25-Aug-11
0611	Mount thermistor for the 432A, 0.01 - 10 GHz, 200 Ohm	Hewlett Packard Co	478 A	78692	30-Dec-09	30-Dec-10
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	11-Jan-10	11-Jan-11
0614	Antenna, Dipole, Tunable, 200 - 500 MHz	Electro-Metrics	TDS-30-1	334	31-Jan-10	31-Jan-11
0768	Antenna Standard Gain Horn,18-26.5 GHz, WR-42, 25 dB gain	Quinstar Technology	QWH-4200-BA	110	23-Dec-08	23-Dec-11
0769	Antenna Standard Gain Horn, 26.5-40 GHz, WR28, 25 dB gain	Quinstar Technology	QWH-2800-BA	112	23-Dec-08	23-Dec-11
1215	Gertsch ratio transformer, 350V	Singer, Alfred, Eaton	RT-60	1077	30-Dec-09	30-Dec-10
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies	8564EC	3946A002 19	28-Aug-10	28-Aug-11
1906	Power Divider, 0.5-18.0 GHz, 80 W	Omni Spectra	2090-6204-00	1906	01-Dec-08	01-Dec-10
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W	EMC Test Systems	3115	9911-5964	11-Jun-10	11-Jun-11
2015	Power Divider, 0.5-18.0 GHz, 80 W	Omni Spectra	2090-6204-00	2015	01-Dec-08	01-Dec-10
2432	Antenna, Double-Ridged Waveguide Horn 1-18 GHz	EMC Test Systems	3115	00027177	11-Jun-10	11-Jun-11
2780	EMC analyzer, 100 Hz to 26.5 GHz	Agilent Technologies	E7405A	MY451024 62	07-Jul-10	07-Jul-11
2870	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	2870	04-Aug-10	04-Aug-11
2871	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-8155-00	2871	15-Sep-10	15-Sep-11
2953	Cable, RF, 18 GHz, 1.2 m, SMA-SMA	Gore	10020014	NA	05-Oct-10	05-Oct-11
3119	Cable, 18 GHz N-type, M-F, 3 m	Bird	TC-MNFN-3.0	211539004	29-Nov-09	29-Nov-10
3206	Cable 40 GHz, 0.6 m	Gore	GOR245	05118336	13-Jun-10	13-Jun-11
3233	Multimeter	Fluke	115C	93771523	05-Jul-10	05-Jul-11
3286	Temperature Chamber, (-40 to +170) °C	Thermotron	EL-8-CH-1-1-CO2	21-9048	09-Sep-10	09-Sep-11
3385	Microwave Cable Assembly, 18.0 GHz, 1.0 m, N type/N type	Suhner Sucoflex	104EA	3385	30-Dec-09	30-Dec-10
3386	Microwave Cable Assembly, 26.5 GHz, 1.0 m, N type/N type	Suhner Sucoflex	104EA	3386	25-Feb-10	25-Feb-11
3440	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	07-Mar-10	07-Mar-11

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
3455	Medium Power Fixed Coaxial Attenuator DC to 40 GHz, 20 dB, 5 W	Aeroflex / Weinschel	75A-20-12	1182	25-Mar-10	25-Mar-11
3472	Cable, Coax, Microwave, DC-18 GHz, SMA-SMA, 1.0 m	Gore	GORE 65474	1003478	09-May-10	09-May-11
3473	Cable, Coax, Microwave, DC-18 GHz, SMA-SMA, 0.6 m	Gore	GORE 65474	1003478	09-May-10	09-May-11
3474	Cable, Coax, Microwave, DC-18 GHz, SMA-SMA, 0.6 m	Gore	GORE 65475	1640102	09-May-10	09-May-11
3616	Cable RF, 6.5 m, N type-N type, DC-6.5 GHz	Suhner Switzerland	Rg 214/U	NA	27-May-10	27-May-11
3779	Attenuator, N-type, 10 dB, DC to 18 GHz, 5 W	Mini-Circuits	BW-N10W5+	NA	31-Aug-10	31-Aug-11
3784	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	07-Dec-09	07-Dec-10
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY48250288	25-Sep-10	25-Sep-11
3883	Preamplifier, 0.1 to 18 GHz, Gain 25 dB, N-type (f) in, N-type (m) out.	Agilent Technologies	87405C	MY47010406	13-Jan-10	13-Jan-11
3902	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1227/2A	07-Feb-10	07-Feb-11

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Transmitter tests	
Carrier power conducted at antenna connector	± 1.7 dB
Carrier power radiated (substitution method)	± 4.5 dB
Occupied bandwidth	±8%
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB
Spurious emissions radiated 30 MHz – 40 GHz (substitution method)	± 4.5 dB
Frequency error	30 – 300 MHz: ± 50.5 Hz (1.68 ppm) 300 – 1000 MHz: ± 168 Hz (0.56 ppm)
Transient frequency behaviour	187 Hz ± 13.9 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %

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

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

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

10 APPENDIX C Test facility description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility.
Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47), 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).

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11 APPENDIX D Specification references

FCC 47CFR part 90: 2009	Private land mobile radio services
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.
ANSI/TIA/EIA-603-C:2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
RSS-197 Issue 1:2010	Wireless Broadband Access Equipment Operating in the Band 3650-3700 MHz
SRSP-303.65 Issue 1:2010	Technical Requirements for Wireless Broadband Services (WBS) in the Band 3650-3700 MHz
RSS-Gen Issue 2, September 2007	General Requirements and Information for the certification of Radiocommunication Equipment

12 APPENDIX E Test equipment correction factors

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

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

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

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

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

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

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

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

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

Antenna factor
Double-ridged wave guide horn antenna
Model 3115, S/N 9911-5964, HL 1984

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

Antenna factor
Double-ridged guide horn antenna
Model 3115, serial number: 00027177, HL 2432

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

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

Cable loss
Cable coaxial, Huber-Suhner, 18 GHz, 6.4 m, SMA - SMA, model 198-9155-00, HL 2870

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.09	5750	2.49	12000	3.71
30	0.17	6000	2.53	12250	3.81
100	0.32	6250	2.58	12500	3.84
250	0.49	6500	2.64	12750	3.88
500	0.70	6750	2.69	13000	3.92
750	0.86	7000	2.75	13250	3.96
1000	1.00	7250	2.80	13500	3.98
1250	1.11	7500	2.87	13750	4.01
1500	1.23	7750	2.93	14000	4.03
1750	1.34	8000	2.94	14250	4.09
2000	1.41	8250	3.00	14500	4.08
2250	1.51	8500	3.04	14750	4.10
2500	1.59	8750	3.08	15000	4.15
2750	1.68	9000	3.14	15250	4.22
3000	1.76	9250	3.16	15500	4.31
3250	1.83	9500	3.22	15750	4.42
3500	1.91	9750	3.26	16000	4.48
3750	1.97	10000	3.36	16250	4.54
4000	2.05	10250	3.41	16500	4.56
4250	2.11	10500	3.46	16750	4.57
4500	2.18	10750	3.50	17000	4.59
4750	2.24	11000	3.54	17250	4.66
5000	2.30	11250	3.58	17500	4.70
5250	2.36	11500	3.63	17750	4.76
5500	2.43	11750	3.66	18000	4.72

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

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

Cable loss
Cable coaxial, Gore, 25.5 GHz, 1.2 m, SMA-SMA, S/N 10020014
HL 2953

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.06	8750	1.28	18000	1.84
30	0.06	9000	1.30	18250	1.91
100	0.12	9250	1.35	18500	1.94
250	0.19	9500	1.34	18750	1.92
500	0.27	9750	1.36	19000	1.95
750	0.34	10000	1.33	19250	2.00
1000	0.40	10250	1.38	19500	1.96
1250	0.45	10500	1.39	19750	2.02
1500	0.50	10750	1.39	20000	1.92
1750	0.54	11000	1.43	20250	2.04
2000	0.57	11250	1.42	20500	2.00
2250	0.60	11500	1.48	20750	2.09
2500	0.64	11750	1.49	21000	2.01
2750	0.67	12000	1.59	21250	2.07
3000	0.70	12250	1.50	21500	2.20
3250	0.74	12500	1.55	21750	2.10
3500	0.76	12750	1.55	22000	2.24
3750	0.80	13000	1.61	22250	2.25
4000	0.83	13250	1.62	22500	2.12
4250	0.85	13500	1.56	22750	2.05
4500	0.87	13750	1.61	23000	2.10
4750	0.91	14000	1.57	23250	2.03
5000	0.92	14250	1.66	23500	2.08
5250	0.96	14500	1.58	23750	2.14
5500	0.99	14750	1.69	24000	2.16
5750	0.99	15000	1.71	24250	2.25
6000	1.03	15250	1.74	24500	2.17
6250	1.05	15500	1.75	24750	2.32
6500	1.07	15750	1.72	25000	2.32
6750	1.08	16000	1.89	25250	2.32
7000	1.12	16250	1.79	25500	2.41
7250	1.13	16500	1.84	25750	2.31
7500	1.15	16750	1.82	26000	2.28
7750	1.20	17000	1.79	26250	2.32
8000	1.20	17250	1.78	26500	2.29
8250	1.23	17500	1.85		
8500	1.27	17750	1.83		

Cable loss
Cable 18 GHz, N-type, M-F, 3 m, Bird Electronic Corp., model TC-MNFN-3.0, S/N 211539004
HL 3119

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.06	3600	1.34	7400	2.00	11200	2.48	15100	2.90
30	0.09	3700	1.36	7500	2.01	11300	2.45	15200	2.89
50	0.11	3800	1.37	7600	2.03	11400	2.51	15300	2.91
100	0.23	3900	1.39	7700	2.05	11500	2.45	15400	2.85
200	0.30	4000	1.39	7800	2.07	11600	2.49	15500	2.83
300	0.42	4100	1.42	7900	2.06	11700	2.51	15600	2.89
400	0.39	4200	1.45	8000	2.06	11800	2.50	15700	2.85
500	0.47	4300	1.47	8100	2.09	11900	2.52	15800	2.87
600	0.49	4400	1.49	8200	2.10	12000	2.48	15900	2.91
700	0.63	4500	1.51	8300	2.11	12100	2.53	16000	2.90
800	0.62	4600	1.53	8400	2.15	12200	2.54	16100	2.94
900	0.70	4700	1.55	8500	2.15	12300	2.56	16200	2.91
1000	0.70	4800	1.54	8600	2.17	12400	2.57	16300	2.96
1100	0.77	4900	1.57	8700	2.19	12500	2.57	16400	3.01
1200	0.78	5000	1.60	8800	2.20	12600	2.55	16500	3.01
1300	0.83	5100	1.60	8900	2.21	12700	2.50	16600	2.98
1400	0.86	5200	1.62	9000	2.22	12800	2.57	16700	3.00
1500	0.85	5300	1.65	9100	2.23	12900	2.57	16800	3.01
1600	0.94	5400	1.66	9200	2.25	13000	2.55	16900	3.06
1700	0.90	5500	1.69	9300	2.24	13100	2.62	17000	3.07
1800	0.90	5600	1.70	9400	2.28	13200	2.60	17100	3.09
1900	0.95	5700	1.72	9500	2.28	13300	2.67	17200	3.10
2000	0.97	5800	1.74	9600	2.27	13400	2.66	17300	3.11
2100	1.00	5900	1.75	9700	2.30	13500	2.71	17400	3.16
2200	1.02	6000	1.77	9800	2.30	13600	2.73	17500	3.15
2300	1.05	6100	1.79	9900	2.34	13700	2.73	17600	3.21
2400	1.08	6200	1.82	10000	2.32	13800	2.85	17700	3.21
2500	1.10	6300	1.83	10100	2.31	13900	2.83	17800	3.18
2600	1.13	6400	1.83	10200	2.31	14000	2.83	17900	3.25
2700	1.15	6500	1.87	10300	2.26	14100	2.83	18000	3.14
2800	1.17	6600	1.88	10400	2.32	14200	2.84		
2900	1.21	6700	1.90	10500	2.26	14300	2.90		
3000	1.22	6800	1.93	10600	2.26	14400	2.84		
3100	1.25	6900	1.92	10700	2.31	14600	2.88		
3200	1.27	7000	1.95	10800	2.24	14700	2.85		
3300	1.29	7100	1.96	10900	2.39	14800	2.92		
3400	1.28	7200	1.99	11000	2.41	14900	2.93		
3500	1.31	7300	2.00	11100	2.46	15000	2.83		

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

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

Cable loss
Cable coaxial, Microwave Cable Assembly, 104EA, 18 GHz, 1.0 m
Suhner Sucoflex, HL 3385

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.04	5000	0.89	10200	1.16	15500	1.54
30	0.07	5100	0.88	10300	1.17	15600	1.50
50	0.07	5200	0.88	10400	1.14	15700	1.49
100	0.11	5300	0.90	10500	1.17	15800	1.51
200	0.15	5400	0.90	10600	1.18	15900	1.49
300	0.20	5500	0.91	10700	1.30	16000	1.58
400	0.23	5600	0.96	10800	1.20	16100	1.58
500	0.25	5700	0.97	10900	1.21	16200	1.57
600	0.28	5800	0.97	11000	1.27	16300	1.55
700	0.30	5900	1.01	11100	1.23	16400	1.61
800	0.32	6000	1.05	11200	1.24	16500	1.66
900	0.34	6100	1.05	11300	1.24	16600	1.66
1000	0.36	6200	1.06	11400	1.27	16700	1.70
1100	0.38	6300	1.09	11500	1.26	16800	1.70
1200	0.40	6400	1.09	11600	1.26	16900	1.61
1300	0.40	6500	1.09	11700	1.21	17000	1.63
1400	0.43	6600	1.15	11800	1.24	17100	1.64
1500	0.44	6700	1.16	11900	1.30	17200	1.65
1600	0.46	6800	1.17	12000	1.28	17300	1.65
1700	0.49	6900	1.18	12100	1.26	17400	1.65
1800	0.51	7000	1.21	12200	1.30	17500	1.65
1900	0.53	7100	1.20	12300	1.31	17600	1.63
2000	0.52	7200	1.24	12400	1.30	17700	1.63
2100	0.53	7300	1.24	12500	1.31	17800	1.61
2200	0.55	7400	1.25	12600	1.32	17900	1.62
2300	0.57	7500	1.25	12700	1.35	18000	1.60
2400	0.58	7600	1.26	12800	1.39		
2500	0.59	7700	1.27	12900	1.36		
2600	0.63	7800	1.30	13000	1.39		
2700	0.63	7900	1.29	13100	1.41		
2800	0.64	8000	1.31	13200	1.38		
2900	0.64	8100	1.30	13300	1.40		
3000	0.66	8200	1.29	13400	1.44		
3100	0.66	8300	1.28	13500	1.43		
3200	0.68	8400	1.22	13600	1.45		
3300	0.69	8500	1.22	13700	1.45		
3400	0.72	8600	1.23	13800	1.52		
3500	0.72	8700	1.24	13900	1.53		
3600	0.72	8800	1.26	14000	1.53		
3700	0.74	8900	1.20	14100	1.51		
3800	0.75	9000	1.21	14200	1.50		
3900	0.78	9100	1.19	14300	1.46		
4000	0.77	9200	1.17	14400	1.47		
4100	0.78	9300	1.17	14600	1.51		
4200	0.81	9400	1.13	14700	1.47		
4300	0.80	9500	1.14	14800	1.45		
4400	0.81	9600	1.17	14900	1.45		
4500	0.82	9700	1.17	15000	1.40		
4600	0.85	9800	1.18	15100	1.44		
4700	0.85	9900	1.14	15200	1.44		
4800	0.91	10000	1.16	15300	1.49		
4900	0.89	10100	1.16	15400	1.54		

Cable loss
Cable coaxial, Microwave Cable Assembly, 104EA, 18 GHz, 1.0 m
Suhner Sucoflex, HL 3386

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.05	5750	1.01	12000	1.29
30	0.07	6000	1.02	12250	1.33
100	0.12	6250	1.02	12500	1.36
250	0.18	6500	0.95	12750	1.35
500	0.26	6750	0.96	13000	1.36
750	0.32	7000	1.01	13250	1.39
1000	0.35	7250	1.04	13500	1.37
1250	0.41	7500	1.09	13750	1.43
1500	0.45	7750	1.12	14000	1.46
1750	0.50	8000	1.13	14250	1.39
2000	0.54	8250	1.15	14500	1.36
2250	0.57	8500	1.15	14750	1.47
2500	0.61	8750	1.15	15000	1.47
2750	0.64	9000	1.16	15250	1.41
3000	0.67	9250	1.14	15500	1.52
3250	0.70	9500	1.14	15750	1.54
3500	0.71	9750	1.19	16000	1.49
3750	0.74	10000	1.20	16250	1.48
4000	0.77	10250	1.22	16500	1.52
4250	0.80	10500	1.23	16750	1.56
4500	0.84	10750	1.22	17000	1.57
4750	0.85	11000	1.21	17250	1.53
5000	0.84	11250	1.24	17500	1.55
5250	0.85	11500	1.26	17750	1.55
5500	0.92	11750	1.28	18000	1.54

Cable loss
Cable coaxial, Microwave, SMA-SMA, 18 GHz, 1.0 m
Gore, HL 3472

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.01	5000	0.47	10200	0.72	15500	0.75
30	0.03	5100	0.47	10300	0.67	15600	0.89
50	0.04	5200	0.47	10400	0.77	15700	0.82
100	0.04	5300	0.47	10500	0.67	15800	0.89
200	0.08	5400	0.49	10600	0.74	15900	0.89
300	0.11	5500	0.48	10700	0.81	16000	0.93
400	0.11	5600	0.49	10800	0.77	16100	0.90
500	0.12	5700	0.49	10900	0.82	16200	0.92
600	0.14	5800	0.51	11000	0.86	16300	0.90
700	0.15	5900	0.50	11100	0.78	16400	0.94
800	0.16	6000	0.51	11200	0.82	16500	0.93
900	0.18	6100	0.53	11300	0.77	16600	0.95
1000	0.17	6200	0.52	11400	0.84	16700	0.98
1100	0.19	6300	0.53	11500	0.74	16800	1.00
1200	0.22	6400	0.54	11600	0.81	16900	0.94
1300	0.21	6500	0.55	11700	0.73	17000	1.00
1400	0.22	6600	0.54	11800	0.75	17100	0.93
1500	0.23	6700	0.57	11900	0.73	17200	1.00
1600	0.24	6800	0.54	12000	0.75	17300	0.93
1700	0.24	6900	0.58	12100	0.66	17400	0.93
1800	0.25	7000	0.58	12200	0.66	17500	0.96
1900	0.26	7100	0.58	12300	0.72	17600	0.94
2000	0.28	7200	0.61	12400	0.64	17700	0.99
2100	0.27	7300	0.59	12500	0.75	17800	0.97
2200	0.29	7400	0.55	12600	0.67	17900	0.90
2300	0.29	7500	0.63	12700	0.75	18000	0.78
2400	0.30	7600	0.60	12800	0.66		
2500	0.30	7700	0.61	12900	0.81		
2600	0.32	7800	0.64	13000	0.75		
2700	0.32	7900	0.60	13100	0.80		
2800	0.33	8000	0.58	13200	0.80		
2900	0.34	8100	0.61	13300	0.81		
3000	0.34	8200	0.62	13400	0.88		
3100	0.35	8300	0.62	13500	0.82		
3200	0.35	8400	0.68	13600	1.00		
3300	0.36	8500	0.63	13700	0.93		
3400	0.37	8600	0.61	13800	0.86		
3500	0.38	8700	0.63	13900	0.84		
3600	0.38	8800	0.62	14000	1.00		
3700	0.40	8900	0.64	14100	0.86		
3800	0.40	9000	0.62	14200	0.98		
3900	0.40	9100	0.64	14300	0.99		
4000	0.40	9200	0.62	14400	0.82		
4100	0.43	9300	0.62	14600	0.89		
4200	0.43	9400	0.62	14700	0.84		
4300	0.43	9500	0.63	14800	0.90		
4400	0.44	9600	0.64	14900	0.89		
4500	0.45	9700	0.60	15000	0.89		
4600	0.45	9800	0.65	15100	0.86		
4700	0.46	9900	0.60	15200	0.87		
4800	0.46	10000	0.67	15300	0.86		
4900	0.46	10100	0.69	15400	0.87		

Cable loss
Cable coaxial, Microwave, SMA-SMA, 18 GHz, 0.6 m
Gore, HL 3473

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.01	5000	0.48	10200	0.72	15500	0.85
30	0.03	5100	0.48	10300	0.70	15600	0.93
50	0.04	5200	0.48	10400	0.75	15700	0.87
100	0.04	5300	0.48	10500	0.68	15800	0.88
200	0.08	5400	0.50	10600	0.77	15900	0.94
300	0.11	5500	0.48	10700	0.80	16000	0.94
400	0.12	5600	0.50	10800	0.77	16100	0.99
500	0.13	5700	0.50	10900	0.85	16200	0.96
600	0.15	5800	0.52	11000	0.83	16300	0.96
700	0.15	5900	0.51	11100	0.79	16400	0.94
800	0.17	6000	0.52	11200	0.82	16500	0.94
900	0.19	6100	0.54	11300	0.79	16600	1.03
1000	0.18	6200	0.53	11400	0.81	16700	1.04
1100	0.20	6300	0.54	11500	0.76	16800	1.07
1200	0.22	6400	0.55	11600	0.78	16900	0.94
1300	0.22	6500	0.56	11700	0.74	17000	1.05
1400	0.23	6600	0.56	11800	0.76	17100	0.96
1500	0.24	6700	0.60	11900	0.79	17200	1.07
1600	0.25	6800	0.55	12000	0.74	17300	0.98
1700	0.25	6900	0.60	12100	0.69	17400	1.16
1800	0.26	7000	0.59	12200	0.69	17500	1.05
1900	0.27	7100	0.60	12300	0.75	17600	1.13
2000	0.29	7200	0.61	12400	0.66	17700	1.05
2100	0.28	7300	0.60	12500	0.76	17800	1.22
2200	0.30	7400	0.57	12600	0.70	17900	1.02
2300	0.30	7500	0.63	12700	0.77	18000	1.04
2400	0.31	7600	0.60	12800	0.69		
2500	0.31	7700	0.63	12900	0.79		
2600	0.33	7800	0.66	13000	0.81		
2700	0.33	7900	0.61	13100	0.83		
2800	0.35	8000	0.58	13200	0.80		
2900	0.35	8100	0.62	13300	0.82		
3000	0.35	8200	0.62	13400	0.90		
3100	0.35	8300	0.63	13500	0.85		
3200	0.36	8400	0.67	13600	1.04		
3300	0.38	8500	0.63	13700	0.93		
3400	0.38	8600	0.61	13800	0.91		
3500	0.40	8700	0.64	13900	0.89		
3600	0.40	8800	0.62	14000	0.96		
3700	0.40	8900	0.64	14100	0.88		
3800	0.41	9000	0.64	14200	1.01		
3900	0.41	9100	0.64	14300	0.99		
4000	0.41	9200	0.63	14400	0.83		
4100	0.45	9300	0.63	14600	0.88		
4200	0.43	9400	0.63	14700	0.91		
4300	0.46	9500	0.64	14800	0.91		
4400	0.44	9600	0.65	14900	0.88		
4500	0.47	9700	0.62	15000	0.89		
4600	0.46	9800	0.66	15100	0.91		
4700	0.47	9900	0.61	15200	0.88		
4800	0.47	10000	0.70	15300	0.94		
4900	0.48	10100	0.70	15400	0.91		

Cable loss
Cable coaxial, Microwave, SMA-SMA, 18 GHz, 0.6 m
Gore, HL 3474

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.00	5000	0.44	10200	0.72	15500	0.84
30	0.02	5100	0.44	10300	0.68	15600	0.95
50	0.03	5200	0.44	10400	0.75	15700	0.82
100	0.03	5300	0.44	10500	0.64	15800	0.94
200	0.07	5400	0.46	10600	0.75	15900	0.91
300	0.10	5500	0.45	10700	0.80	16000	0.91
400	0.11	5600	0.46	10800	0.77	16100	0.86
500	0.12	5700	0.47	10900	0.80	16200	0.86
600	0.14	5800	0.48	11000	0.79	16300	0.86
700	0.14	5900	0.48	11100	0.70	16400	0.84
800	0.15	6000	0.49	11200	0.76	16500	0.83
900	0.18	6100	0.51	11300	0.70	16600	0.87
1000	0.17	6200	0.50	11400	0.73	16700	0.90
1100	0.18	6300	0.50	11500	0.67	16800	0.91
1200	0.21	6400	0.51	11600	0.74	16900	0.90
1300	0.20	6500	0.51	11700	0.64	17000	0.97
1400	0.21	6600	0.52	11800	0.68	17100	0.94
1500	0.22	6700	0.54	11900	0.67	17200	1.01
1600	0.23	6800	0.51	12000	0.71	17300	0.97
1700	0.23	6900	0.55	12100	0.64	17400	1.02
1800	0.24	7000	0.54	12200	0.64	17500	1.06
1900	0.25	7100	0.55	12300	0.71	17600	1.01
2000	0.27	7200	0.55	12400	0.62	17700	1.10
2100	0.26	7300	0.54	12500	0.80	17800	1.16
2200	0.28	7400	0.52	12600	0.69	17900	1.12
2300	0.28	7500	0.58	12700	0.85	18000	1.00
2400	0.28	7600	0.56	12800	0.67		
2500	0.29	7700	0.57	12900	0.84		
2600	0.30	7800	0.62	13000	0.76		
2700	0.31	7900	0.57	13100	0.85		
2800	0.32	8000	0.55	13200	0.77		
2900	0.32	8100	0.59	13300	0.82		
3000	0.32	8200	0.59	13400	0.79		
3100	0.33	8300	0.60	13500	0.82		
3200	0.33	8400	0.66	13600	0.91		
3300	0.35	8500	0.60	13700	0.81		
3400	0.35	8600	0.59	13800	0.76		
3500	0.36	8700	0.59	13900	0.75		
3600	0.36	8800	0.58	14000	0.81		
3700	0.37	8900	0.60	14100	0.77		
3800	0.38	9000	0.60	14200	0.89		
3900	0.38	9100	0.60	14300	0.92		
4000	0.38	9200	0.57	14400	0.78		
4100	0.41	9300	0.57	14600	0.85		
4200	0.40	9400	0.58	14700	0.83		
4300	0.41	9500	0.60	14800	0.95		
4400	0.42	9600	0.62	14900	0.89		
4500	0.43	9700	0.58	15000	0.96		
4600	0.42	9800	0.63	15100	0.90		
4700	0.44	9900	0.58	15200	0.96		
4800	0.43	10000	0.67	15300	0.90		
4900	0.44	10100	0.69	15400	0.95		

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

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

Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 1.5 m, SMA-SMA, S/N 1227/2A
HL 3902

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	-0.02	9500	1.84	21000	2.93
100	0.15	10000	1.86	22000	3.04
500	0.38	10500	1.93	23000	3.08
1000	0.56	11000	1.99	24000	3.18
1500	0.69	11500	2.04	25000	3.23
2000	0.82	12000	2.10	26000	3.34
2500	0.90	12500	2.15	27000	3.39
3000	0.98	13000	2.21	28000	3.49
3500	1.06	13500	2.25	29000	3.55
4000	1.11	14000	2.29	30000	3.64
4500	1.17	14500	2.34	31000	3.68
5000	1.24	15000	2.36	32000	3.77
5500	1.32	15500	2.40	33000	3.87
6000	1.40	16000	2.45	34000	3.93
6500	1.50	16500	2.48	35000	3.89
7000	1.56	17000	2.56	36000	4.00
7500	1.62	17500	2.58	37000	4.15
8000	1.68	18000	2.60	38000	4.20
8500	1.74	19000	2.80	39000	4.25
9000	1.78	20000	2.85	40000	4.32

13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
AM	amplitude modulation
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μV)	decibel referred to one microvolt
dB(μV/m)	decibel referred to one microvolt per meter
DC	direct current
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
H	height
HL	Hermon Laboratories
Hz	hertz
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μs	microsecond
NA	not applicable
OATS	open area test site
Ω	Ohm
QP	quasi-peak
PS	power supply
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
VA	volt-ampere

END OF DOCUMENT