Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

7.9 Band edge spurious emission measurements with 14.5 dBi integral antenna, SISO mode

7.9.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.9.1, Table 7.9.2.

Table 7.9.1 Radiated spurious emission test limits

Assigned frequency range, MHz	EIRP of spurious, dBm/MHz	ıntenna assembl gain, dBi	Resolution ɔandwidth, kHz	Conducted spurious ımissions limit*, dBm/MH
5250 - 5350	-27	14.5	1000	-41.50

* - Conducted limit = EIRP limit – Antenna assembly gain

Table 7.9.2 Radiated spurious emissions limits within restricted bands

Frequency, MHz	Field strength at 3 m, dB(μV/m)***	
	Peak	Average
Above 1000	74.0	54.0

7.9.2 Conducted spurious emission test

7.9.2.1 This test was performed to measure conducted spurious emissions from the EUT near the band edges outside restricted bands and within the pass band of the dedicated EUT's antenna. Specification test limits are given in Table 7.9.1.

7.9.2.2 The EUT and measurement equipment were arranged as shown on Figure 7.9.1.

7.9.2.3 Test results are shown in the Table 7.9.3 and the associated plots.

7.9.3 Radiated spurious emission test

7.9.3.1 This test was performed to measure radiated spurious emission from the EUT near the band edge within the restricted bands. Specification test limits are given in Table 7.9.2.

7.9.3.2 The EUT and measurement equipment were arranged as shown on Figure 7.9.2.

7.9.3.3 Test results are shown in the Table 7.9.4 and the associated plots.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

Figure 7.9.1 Setup for conducted spurious emissions

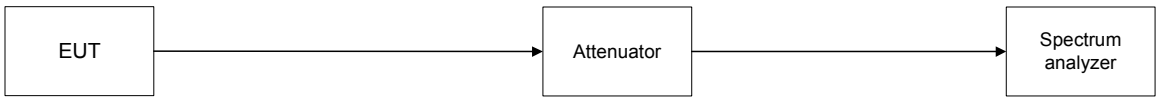
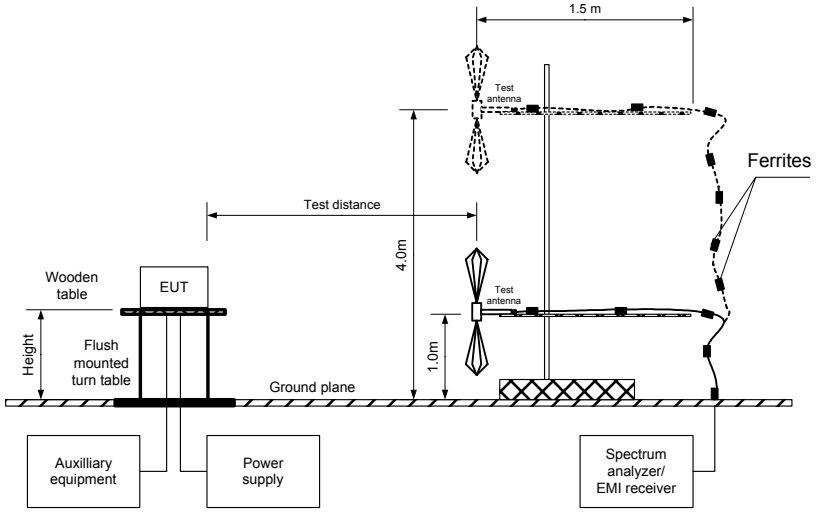


Figure 7.9.2 Setup for spurious emission field strength measurements above 1000 MHz



Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

Table 7.9.3 Conducted spurious emission test results at low edge

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	Detector	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain, dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5250.00	64QAM	Peak	5	-42.11	-27	14.5	-27.61	-0.61	Pass
5250.00	64QAM	Average	5	-56.51	-27	14.5	-42.01	-15.01	Pass
5250.00	64QAM	Peak	10	-45.47	-27	14.5	-30.97	-3.97	Pass

* - EIRP = SA reading (dBm) + Antenna assembly gain

**- Margin = EIRP – specified limit.

Reference numbers of test equipment used

HL 2780	HL 2883	HL 3176					

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

Table 7.9.4 Field strength of spurious emissions at high edge

ASSIGNED FREQUENCY RANGE:	5.25-5.35 GHz
TEST DISTANCE:	3 m
MODULATION:	64QAM
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	1000 kHz
TEST ANTENNA TYPE:	Double ridged guide

Frequency MHz	Antenna Polarization	Antenna Height m	Azimuth degrees*	Peak field strength(VBW=3 MHz Measured dB(µV/m)	Peak field strength(VBW=3 MHz Limit, dB(µV/m	Peak field strength(VBW=3 MHz Margin, dB**	Average field strength(VBW=10 Hz) Measured dB(µV/m)	Average field strength(VBW=10 Hz) Calculated dB(µV/m)	Average field strength(VBW=10 Hz) Limit, dB(µV/m	Average field strength(VBW=10 Hz) Margin dB***	Verdict
10 MHz EBW											
Low carrier frequency											
4951.800	Vertical	1.2	000	56.60	74.00	-17.40	45.75	41.32	54.00	-12.68	Pass
Mid carrier frequency											
4935.500	Vertical	1.2	010	55.69	74.00	-18.31	44.53	40.10	54.00	-13.90	Pass
5378.050	Horizontal	1.1	000	63.21	74.00	-10.79	49.26	44.83	54.00	-9.17	
High carrier frequency											
4935.500	Vertical	1.2	010	56.47	74.00	-17.53	44.53	40.10	54.00	-13.90	Pass
5350.000	Horizontal	1.1	020	67.23	74.00	-6.77	52.83	48.40	54.00	-5.60	
5 MHz EBW											
Mid carrier frequency											
5376.125	Vertical	1.2	010	57.39	74.00	-16.61	46.47	42.04	54.00	-11.96	Pass
High carrier frequency											
5021.000	Vertical	1.0	350	59.98	74.00	-14.02	46.13	41.70	54.00	-12.3	Pass
5351.100	Horizontal	1.2	000	61.25	74.00	-12.75	48.80	44.37	54.00	-9.63	
5417.375	Horizontal	1.1	000	62.43	74.00	-11.57	46.74	42.31	54.00	-11.69	

*- EUT front panel refers to 0 degrees position of turntable.
** - Margin, dB = Measured, dB(µV/m) – Limit, dB(µV/m)
*** - Margin, dB = Calculated, dB(µV/m) – Limit, dB(µV/m)

Table 7.9.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
3	5				-4.43

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Reference numbers of test equipment used

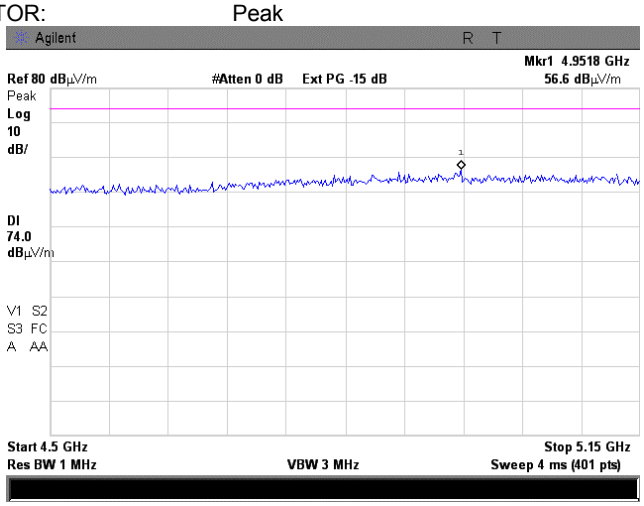
HL 0554	HL 1521	HL 1984	HL 3122	HL 3616			

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

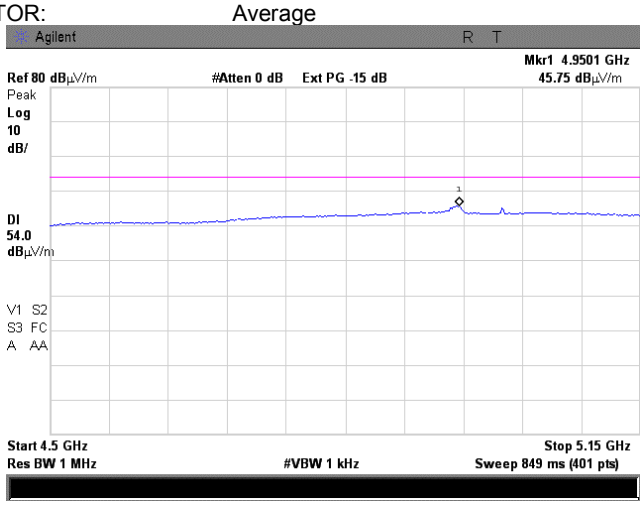
Plot 7.9.1 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at low carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.2 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at low carrier frequency, vertical antenna polarization

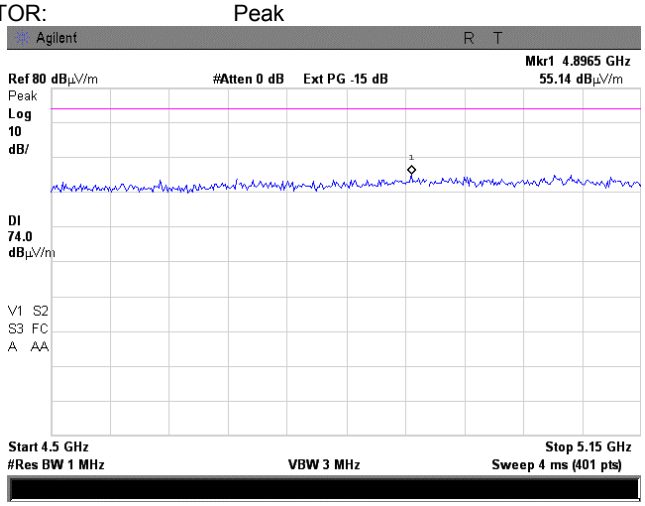
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

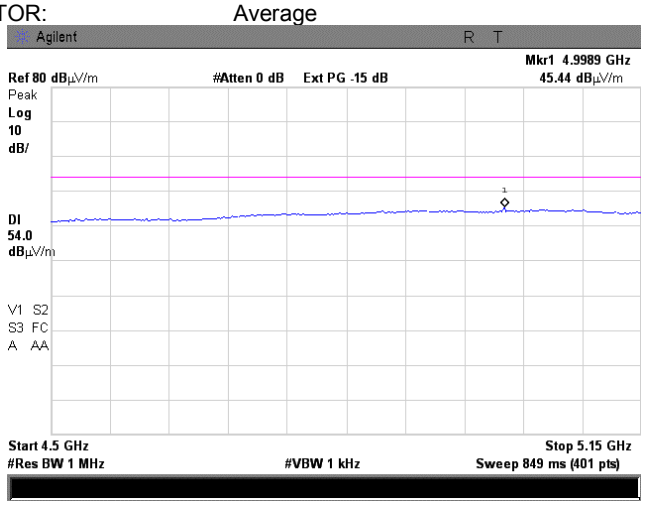
Plot 7.9.3 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at low carrier frequency, horizontal antenna polarization

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.4 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at low carrier frequency, horizontal antenna polarization

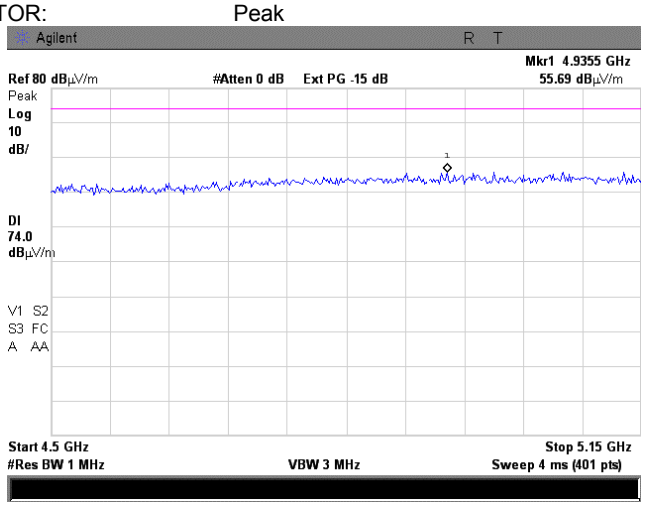
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

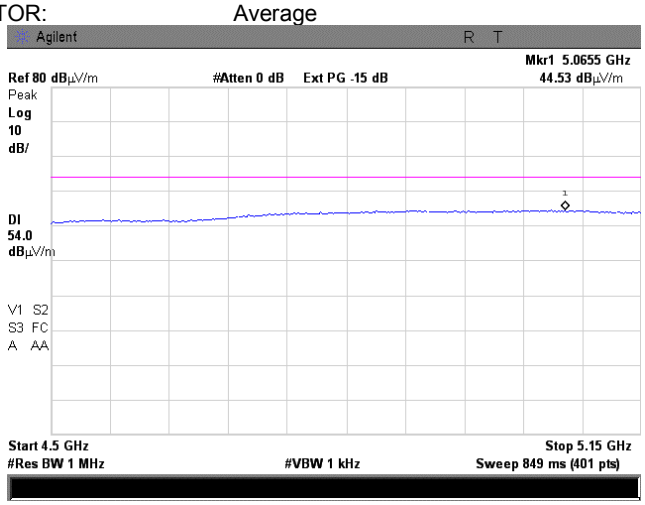
Plot 7.9.5 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.6 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

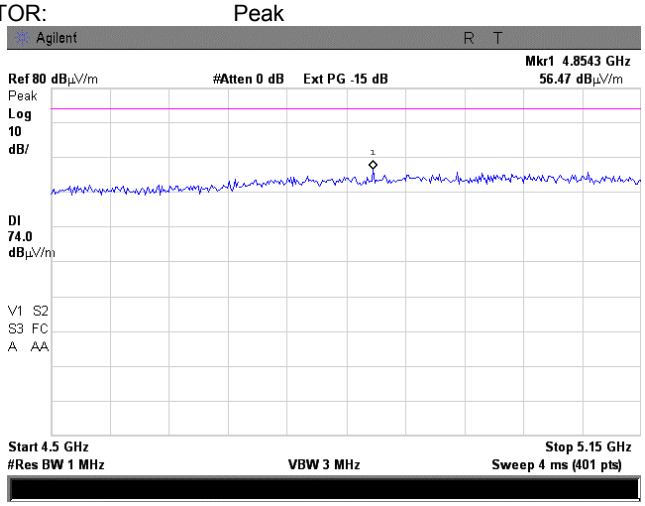
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

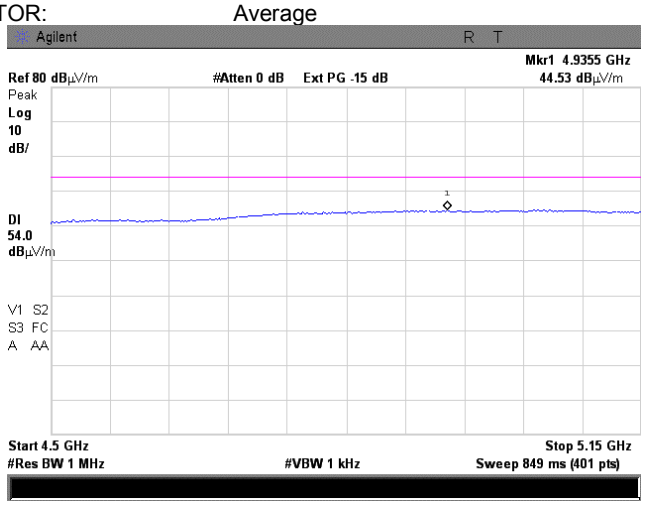
Plot 7.9.7 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at high carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.8 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at high carrier frequency, vertical & horizontal antenna polarization

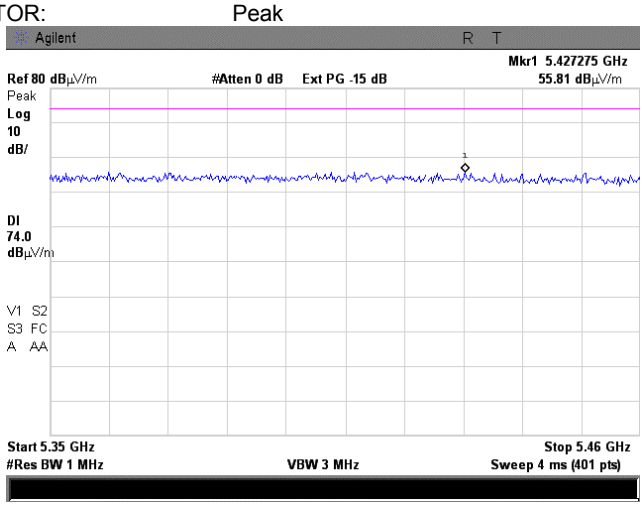
CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

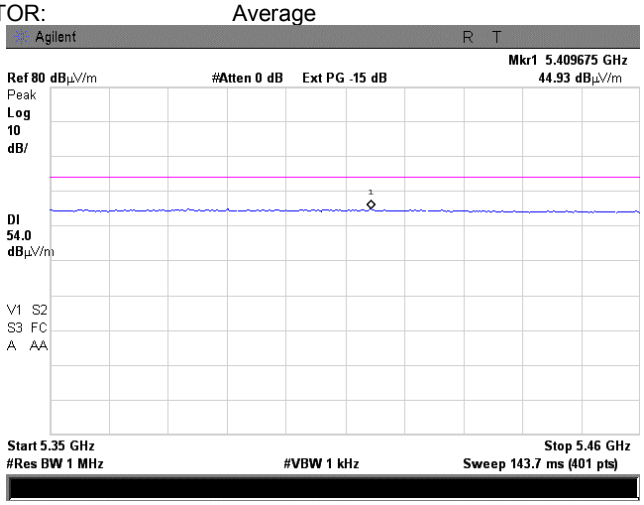
Plot 7.9.9 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at low carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.10 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at low carrier frequency, vertical antenna polarization

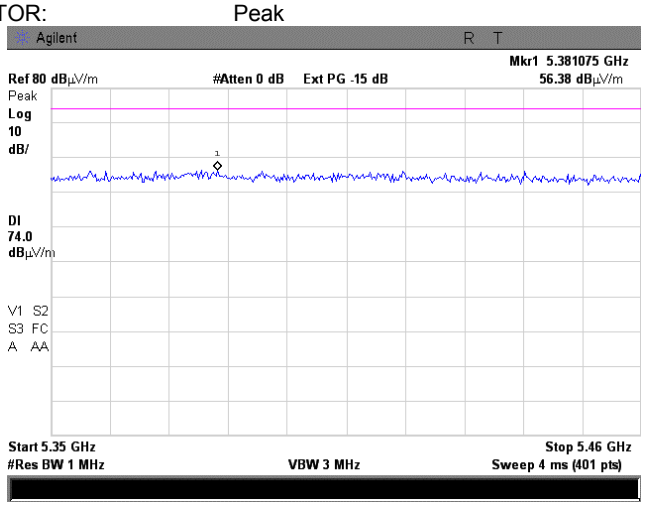
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

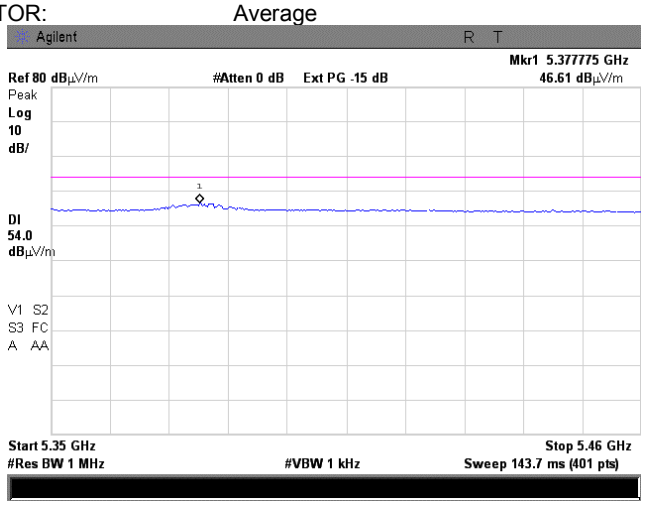
Plot 7.9.11 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at mid carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.12 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at mid carrier frequency, vertical antenna polarization

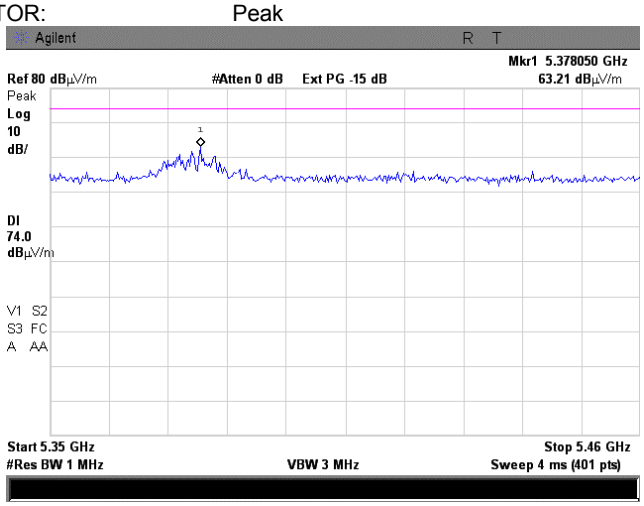
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

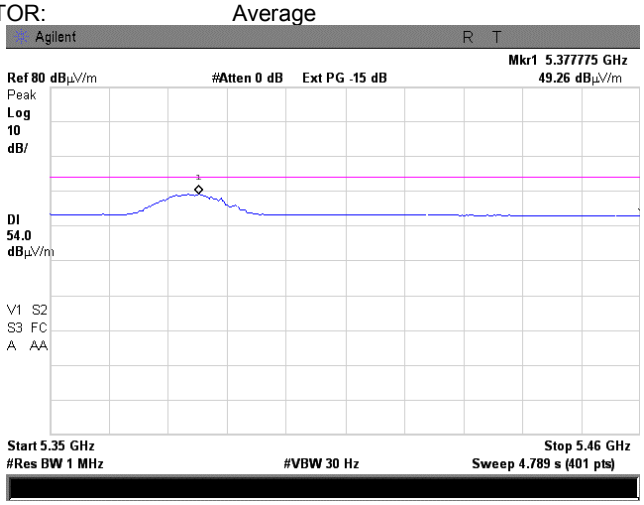
Plot 7.9.13 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at mid carrier frequency, horizontal antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.14 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at mid carrier frequency, horizontal antenna polarization

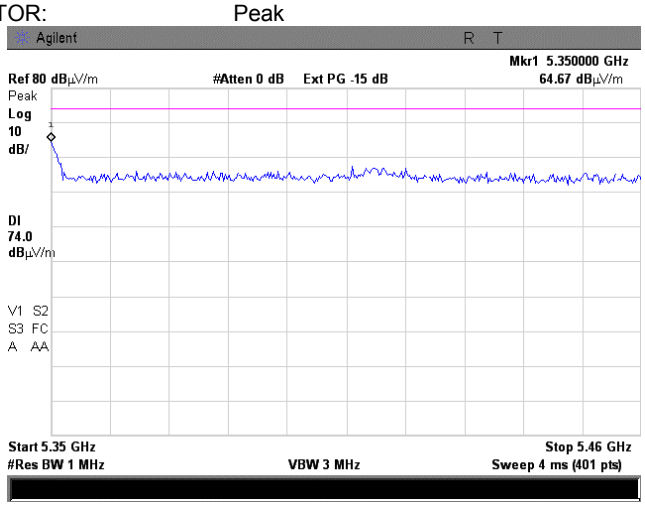
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

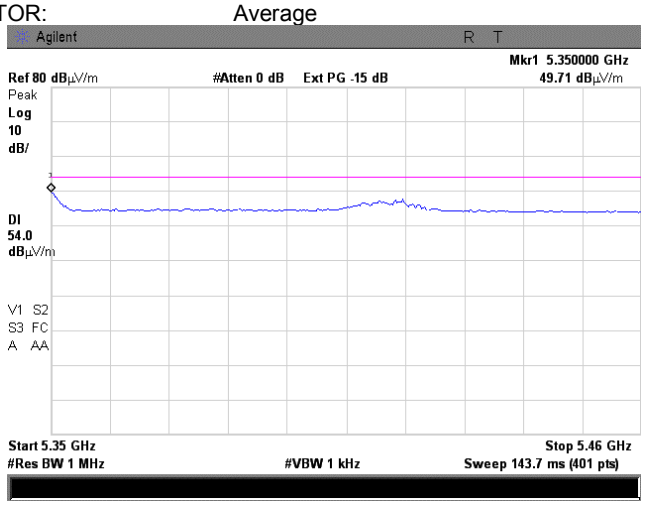
Plot 7.9.15 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.16 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical antenna polarization

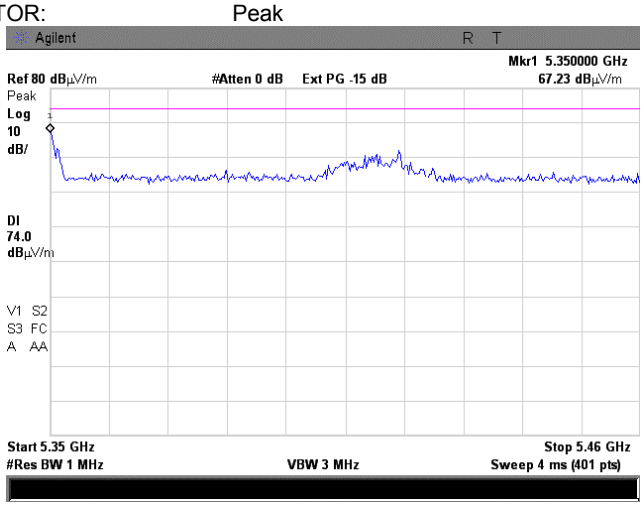
CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

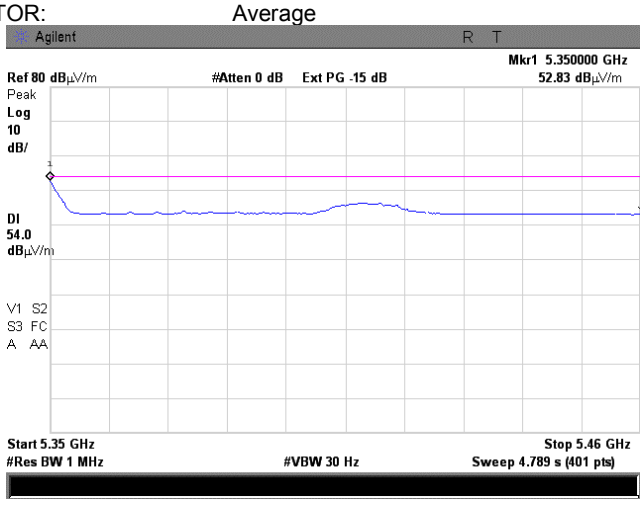
Plot 7.9.17 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, horizontal antenna polarization

CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.18 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, horizontal antenna polarization

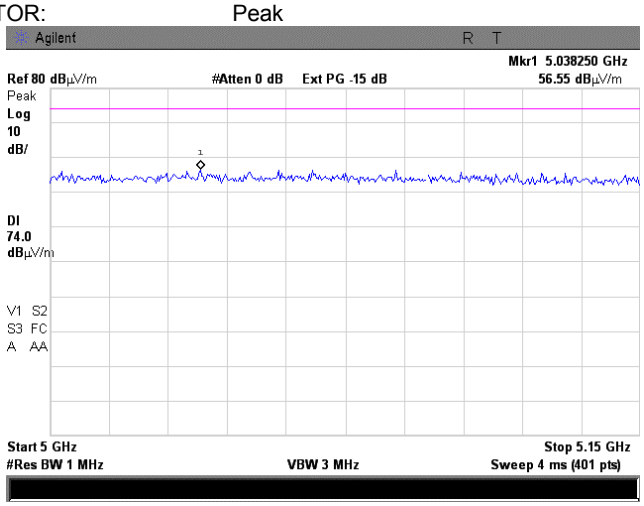
CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

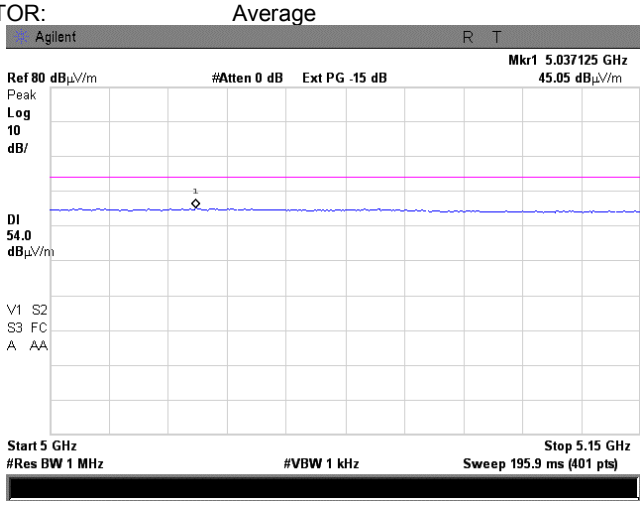
Plot 7.9.19 Radiated spurious emission measurements at the band edges in 5.0 –5.15 GHz range at low carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.20 Radiated spurious emission measurements at the band edges in 5.0 –5.15 GHz range at low carrier frequency, vertical antenna polarization

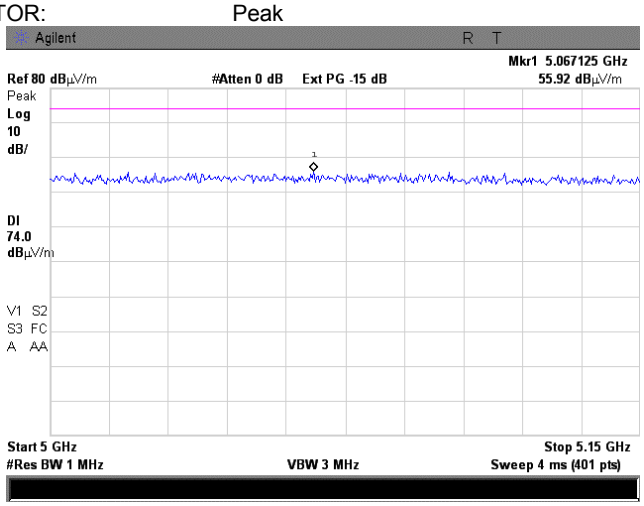
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

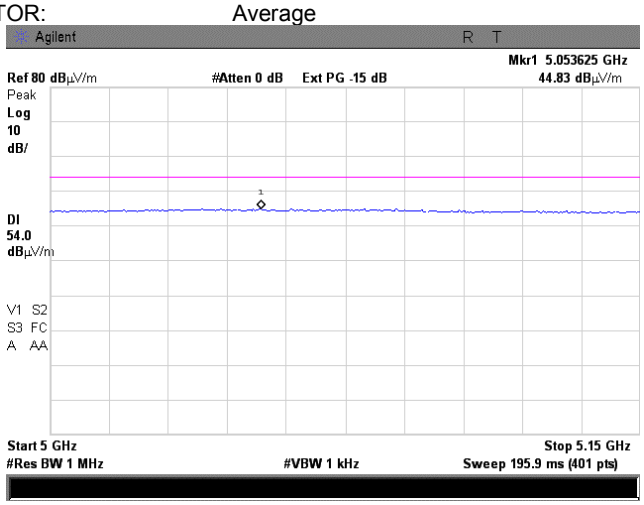
Plot 7.9.21 Radiated spurious emission measurements at the band edges in 5.0 –5.15 GHz range at low carrier frequency, horizontal antenna polarization

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.22 Radiated spurious emission measurements at the band edges in 5.0 –5.15 GHz range at low carrier frequency, horizontal antenna polarization

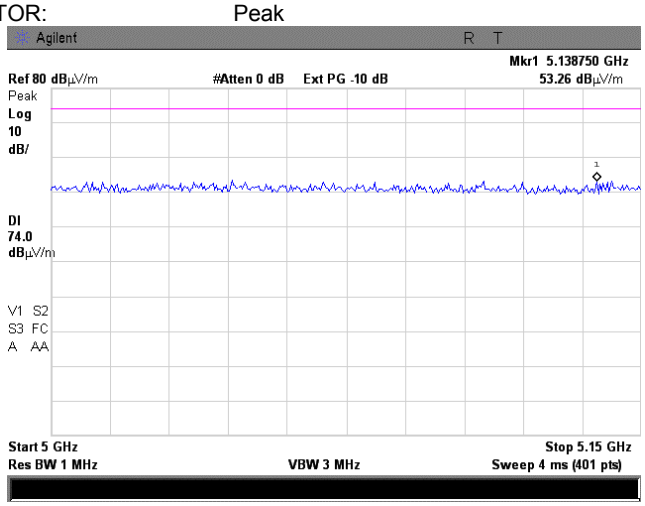
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

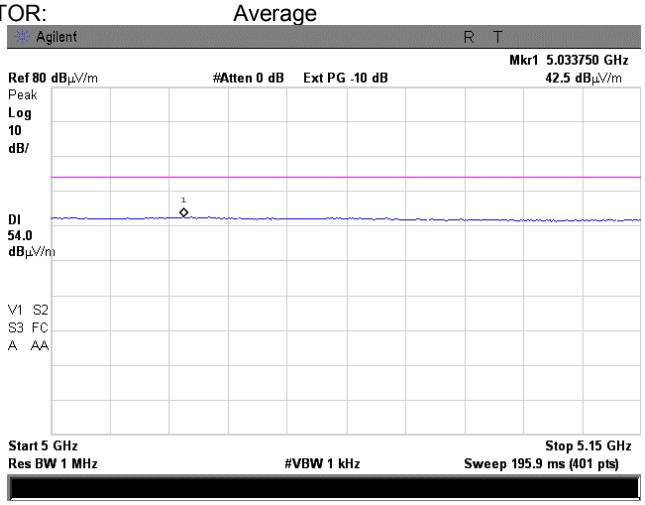
Plot 7.9.23 Radiated spurious emission measurements at the band edges in 5.0 –5.15 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.24 Radiated spurious emission measurements at the band edges in 5.0 –5.15 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

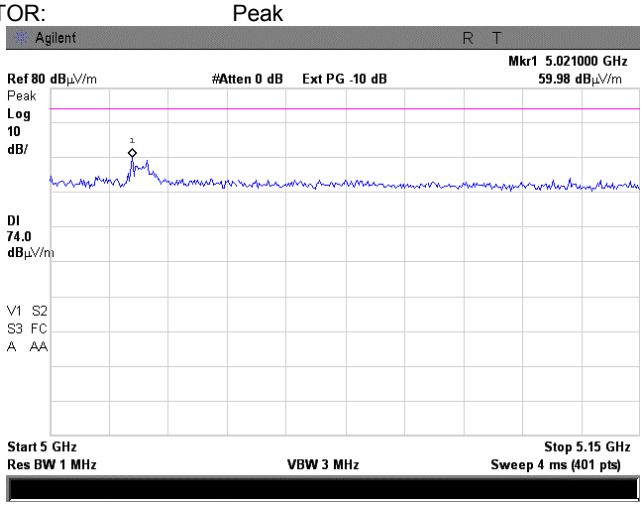
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

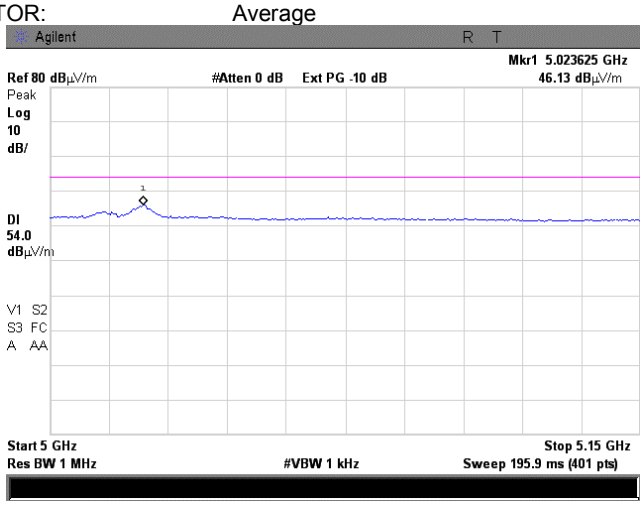
Plot 7.9.25 Radiated spurious emission measurements at the band edges in 5.0 –5.15 GHz range at high carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.26 Radiated spurious emission measurements at the band edges in 5.0 –5.15 GHz range at high carrier frequency, vertical & horizontal antenna polarization

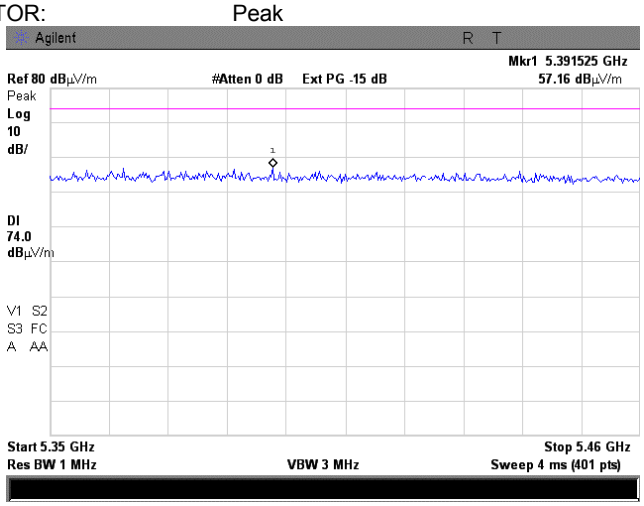
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

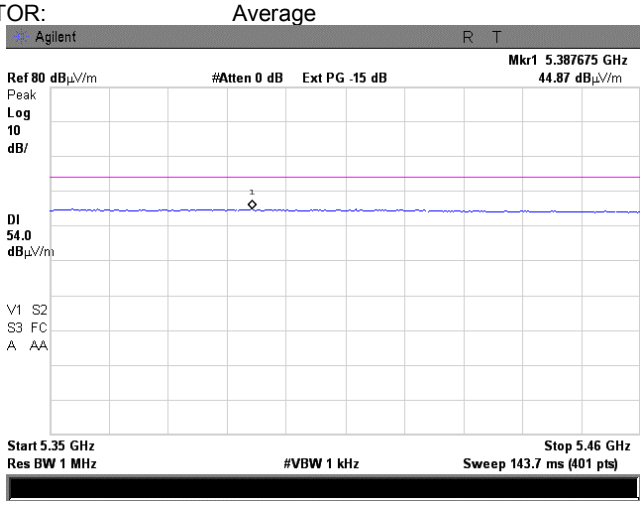
Plot 7.9.27 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.28 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at low carrier frequency, vertical & horizontal antenna polarization

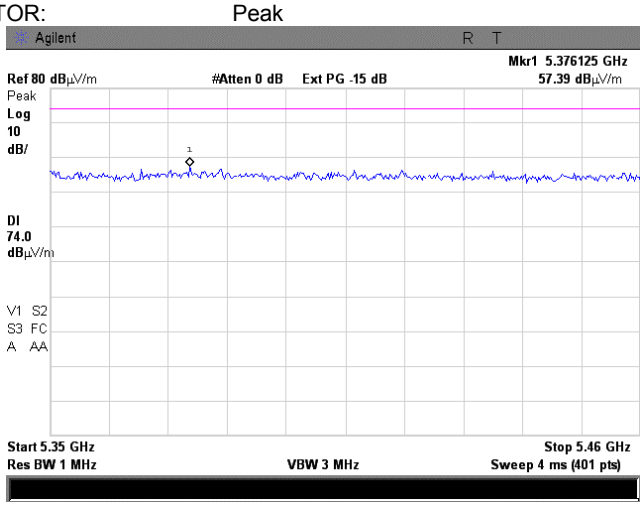
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

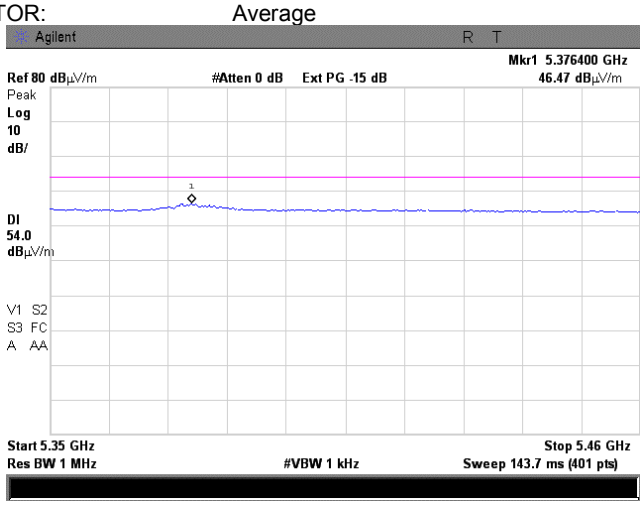
Plot 7.9.29 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at mid carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.30 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at mid carrier frequency, vertical antenna polarization

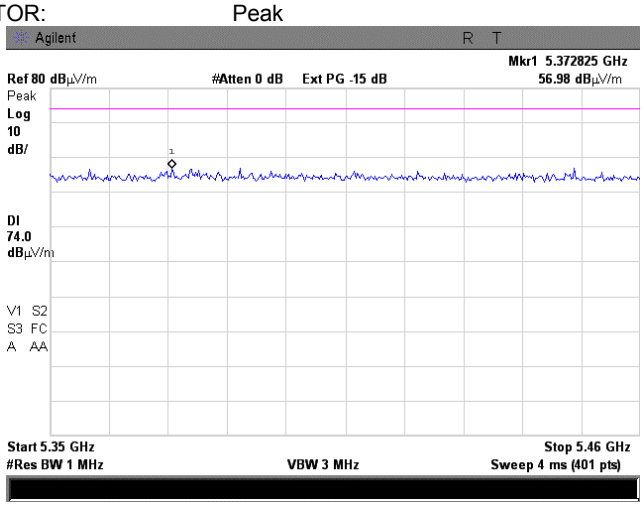
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

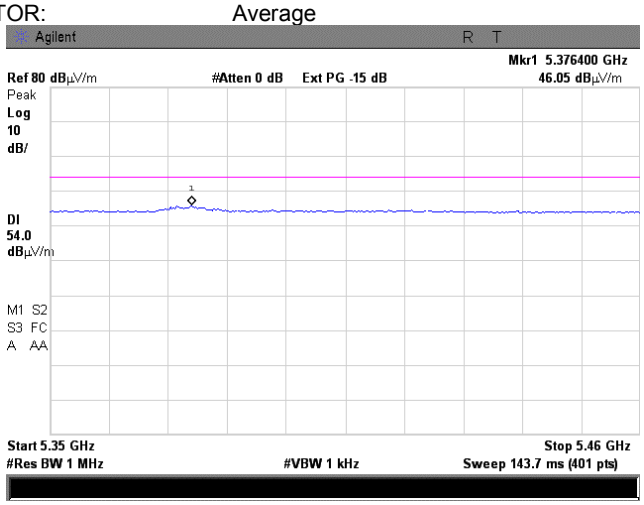
Plot 7.9.31 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at mid carrier frequency, horizontal antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.32 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at mid carrier frequency, horizontal antenna polarization

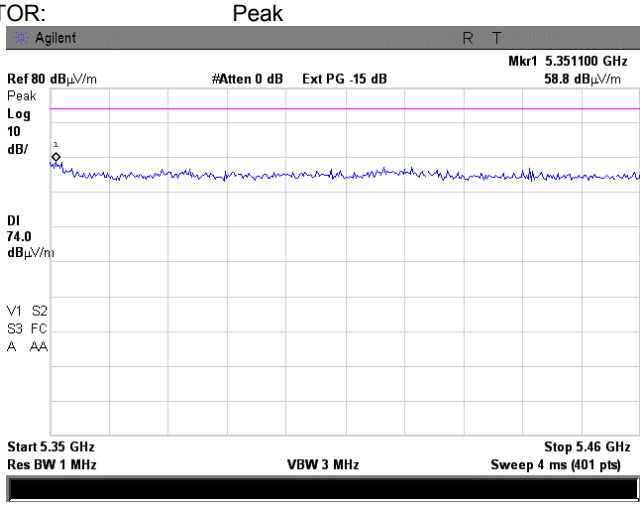
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

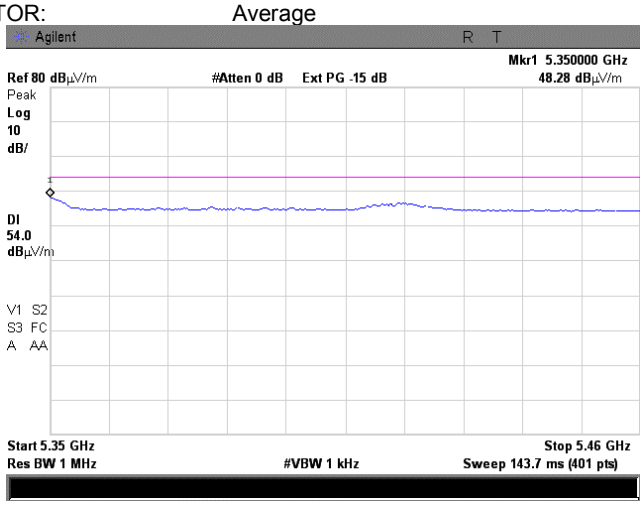
Plot 7.9.33 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.34 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, vertical antenna polarization

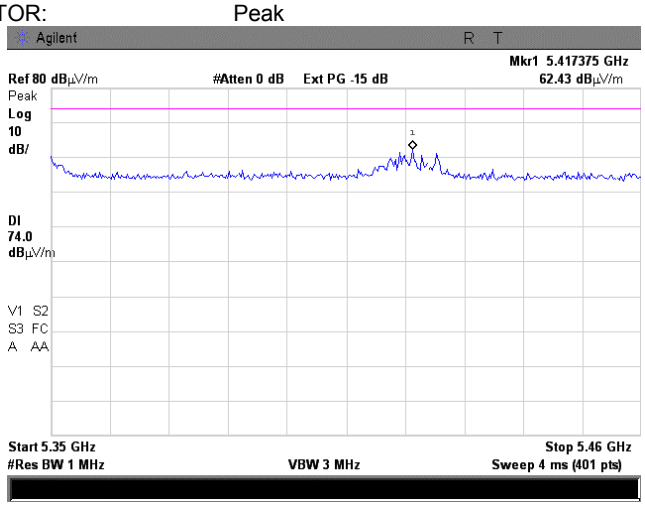
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

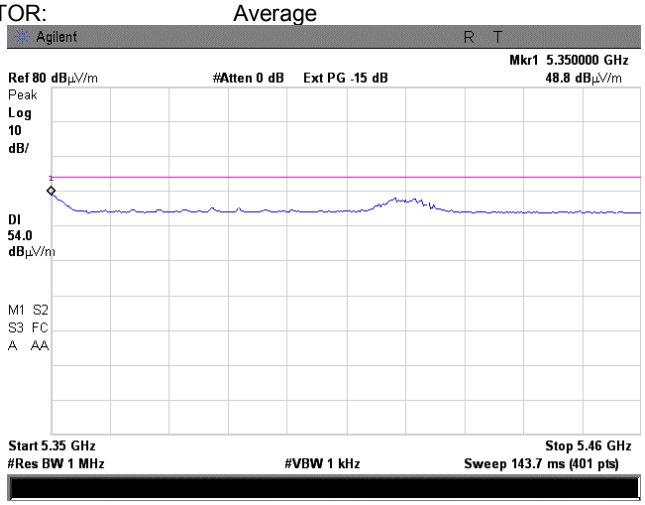
Plot 7.9.35 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, horizontal antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.36 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, horizontal antenna polarization

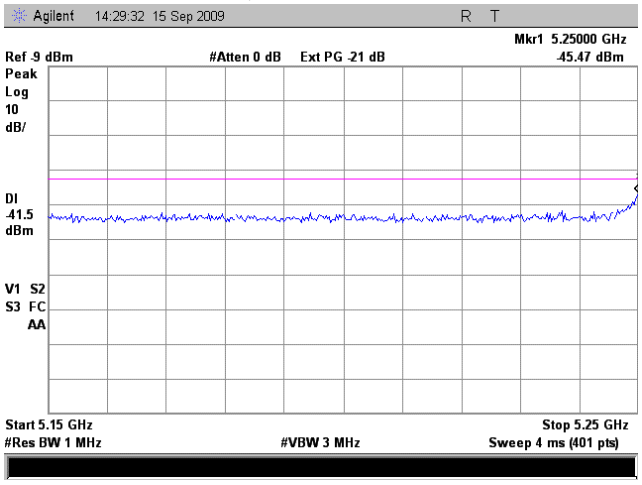
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

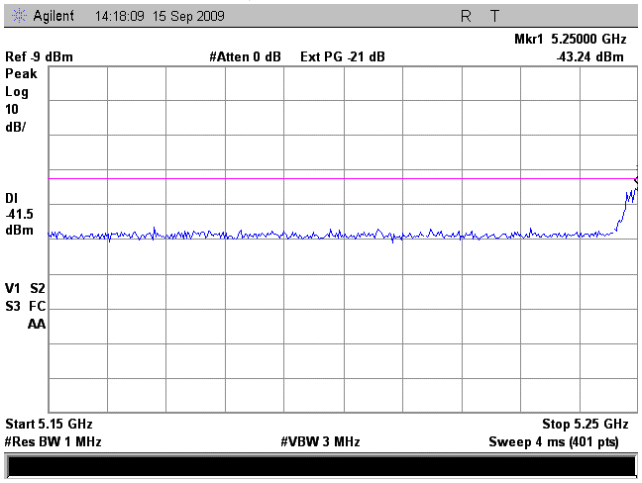
Plot 7.9.37 Conducted spurious emission measurements in 5150 – 5250 MHz range

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM



Plot 7.9.38 Conducted spurious emission measurements in 5150 – 5250 MHz range

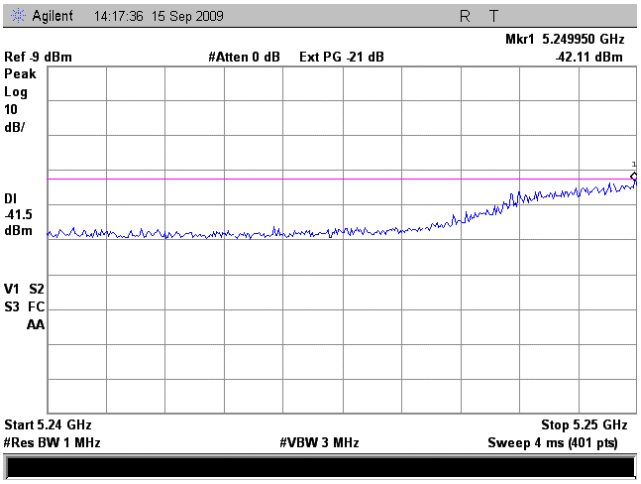
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:18:35 PM		
Temperature: 32 °C	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 14.5 dBi antenna			

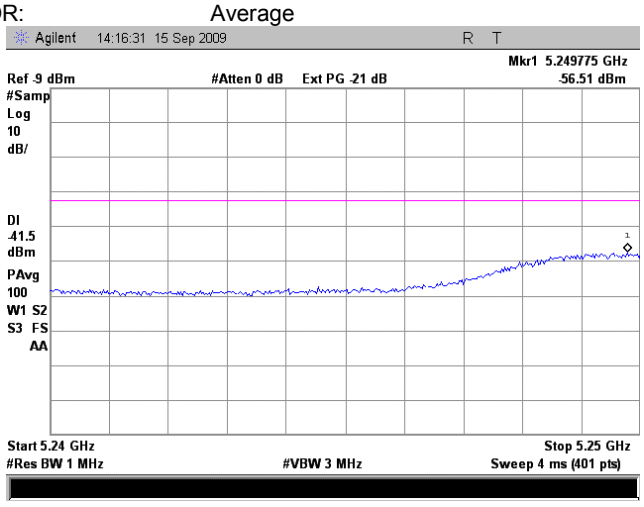
Plot 7.9.39 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.9.40 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

7.10 Band edge spurious emission measurements with 14.5 dBi integral antenna, MIMO mode

7.10.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.10.1, Table 7.10.2.

Table 7.10.1 Radiated spurious emission test limits

Assigned frequency range, MHz	EIRP of spurious, dBm/MHz	ıntenna assembl gain, dBi	Resolution ɔandwidth, kHz	Conducted spurious ımissions limit*, dBm/MH
5250 - 5350	-27	14.5	1000	-41.50

* - Conducted limit = EIRP limit – Antenna assembly gain

Table 7.10.2 Radiated spurious emissions limits within restricted bands

Frequency, MHz	Field strength at 3 m, dB(μV/m)***	
	Peak	Average
Above 1000	74.0	54.0

7.10.2 Conducted spurious emission test

7.10.2.1 This test was performed to measure conducted spurious emissions from the EUT near the band edges outside restricted bands and within the pass band of the dedicated EUT's antenna. Specification test limits are given in Table 7.10.1.

7.10.2.2 The EUT and measurement equipment were arranged as shown on Figure 7.10.1.

7.10.2.3 Test results are shown in the Table 7.10.3 and the associated plots.

7.10.3 Radiated spurious emission test

7.10.3.1 This test was performed to measure radiated spurious emission from the EUT near the band edge within the restricted bands. Specification test limits are given in Table 7.10.2.

7.10.3.2 The EUT and measurement equipment were arranged as shown on Figure 7.10.2.

7.10.3.3 Test results are shown in the Table 7.10.4 and the associated plots.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

Figure 7.10.1 Setup for conducted spurious emissions

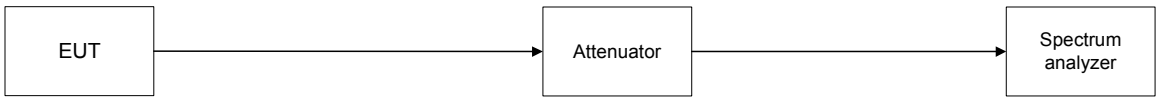
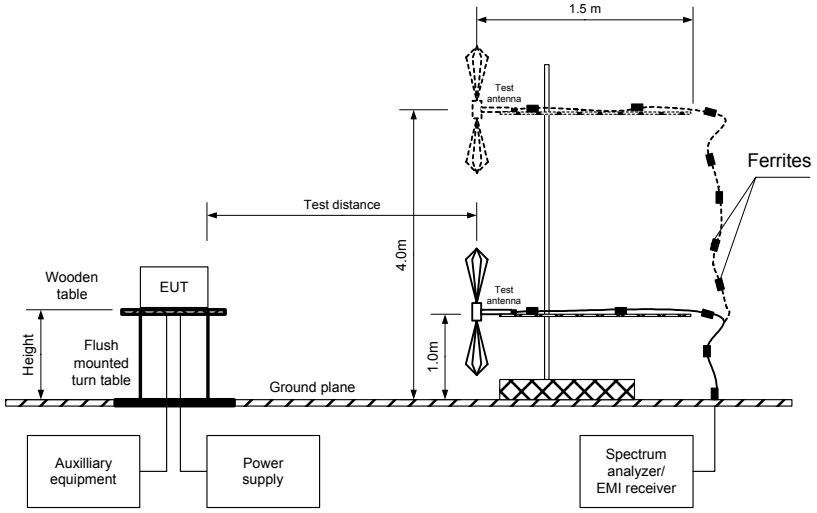


Figure 7.10.2 Setup for spurious emission field strength measurements above 1000 MHz



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

Table 7.10.3 Conducted spurious emission test results at low edge

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	Detector	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain, dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5249.450	64QAM	Peak	5	-43.13	-27	14.5	-28.63	-1.63	Pass
5249.225	64QAM	Average		-56.21	-27	14.5	-41.71	-14.71	Pass
5239.250	64QAM	Peak	10	-47.35	-27	14.5	-32.85	-5.85	Pass

* - EIRP = SA reading (dBm) + Antenna assembly gain
**- Margin = EIRP – specified limit.

Reference numbers of test equipment used

HL 2780	HL 2883	HL 3176					

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

Table 7.10.4 Field strength of spurious emissions at high edge

ASSIGNED FREQUENCY RANGE:	5.25-5.35 GHz
TEST DISTANCE:	3 m
MODULATION:	64QAM
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	1000 kHz
TEST ANTENNA TYPE:	Double ridged guide

Frequency MHz	Antenna Polarization	Antenna Height m	Azimuth degrees*	Peak field strength(VBW=3 MHz Measured dB(μV/m)	Peak field strength(VBW=3 MHz Limit, dB(μV/m	Peak field strength(VBW=3 MHz Margin, dB**	Average field strength(VBW=10 Hz) Measured dB(μV/m)	Average field strength(VBW=10 Hz) Calculated dB(μV/m)	Average field strength(VBW=10 Hz) Limit, dB(μV/m	Average field strength(VBW=10 Hz) Margin dB***	Verdict
10 MHz EBW											
Low carrier frequency											
4859.100	Vertical	1.2	010	56.65	74.00	-17.35	47.19	42.76	54.00	-11.24	Pass
5350.00	Vertical	1.1	000	57.02	74.00	-16.98	46.49	42.06	54.00	-11.94	
Mid carrier frequency											
4945.300	Vertical	1.1	000	56.65	74.00	-17.35	45.53	41.10	54.00	-12.90	Pass
5374.475	Horizontal	1.0	010	62.06	74.00	-11.94	48.55	44.12	54.00	-9.88	
High carrier frequency											
5039.500	Vertical	1.1	000	56.86	74.00	-17.14	45.18	40.75	54.00	-13.25	Pass
5350.00	Vertical	1.2	020	65.83	74.00	-8.17	50.11	45.68	54.00	-8.32	
5413.525	Horizontal	1.1	000	63.12	74.00	-10.88	49.91	45.48	54.00	-8.52	
5 MHz EBW											
Mid carrier frequency											
5376.950	Horizontal	1.0	000	63.33	74.00	-10.67	51.42	46.99	54.00	-7.01	Pass
High carrier frequency											
5350.00	Vertical	1.1	010	60.48	74.00	-13.52	46.91	42.48	54.00	-11.52	Pass
5415.450	Horizontal	1.1	000	62.92	74.00	-11.08	51.57	47.14	54.00	-6.86	

*- EUT front panel refers to 0 degrees position of turntable.
** - Margin, dB = Measured, dB(μV/m) – Limit, dB(μV/m)
*** - Margin, dB = Calculated, dB(μV/m) – Limit, dB(μV/m)

Table 7.10.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
3	5				-4.43

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Reference numbers of test equipment used

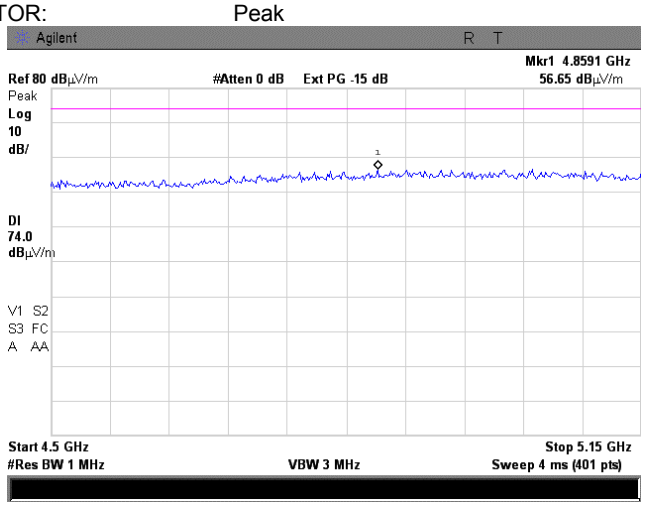
HL 0554	HL 1521	HL 1984	HL 3122	HL 3616			

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

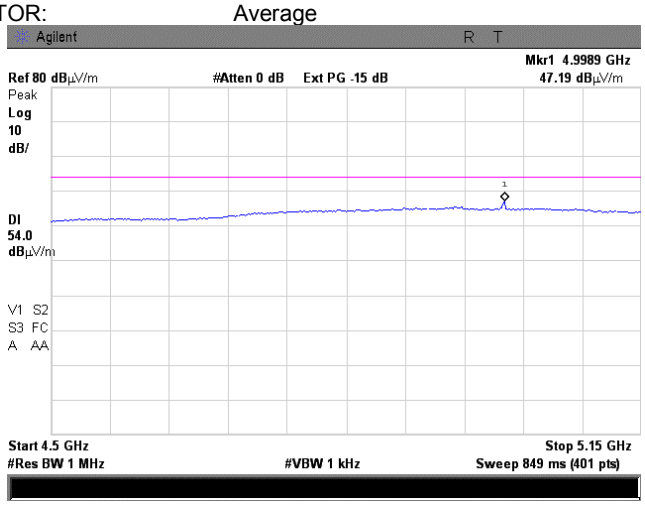
Plot 7.10.1 Radiated spurious emission measurements at the band edges in 4.5 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.2 Radiated spurious emission measurements at the band edges in 4.5 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

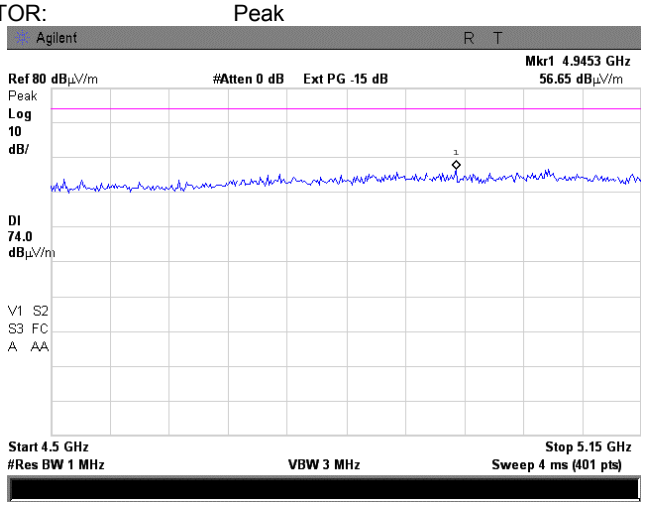
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

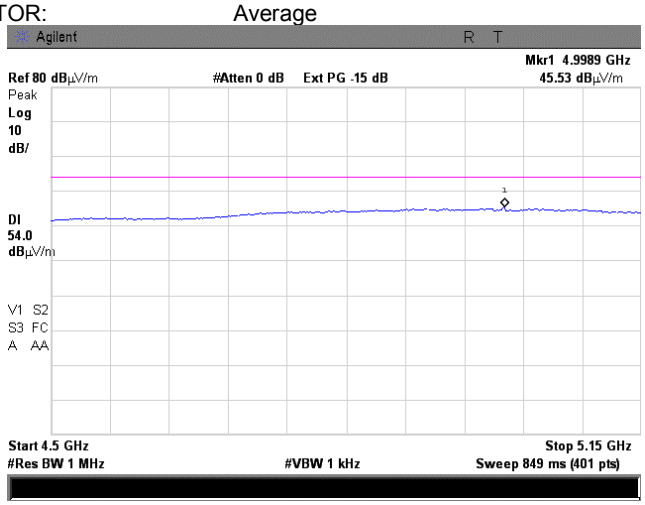
Plot 7.10.3 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.4 Radiated spurious emission measurements at the band edges in 4.5 –5.15 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

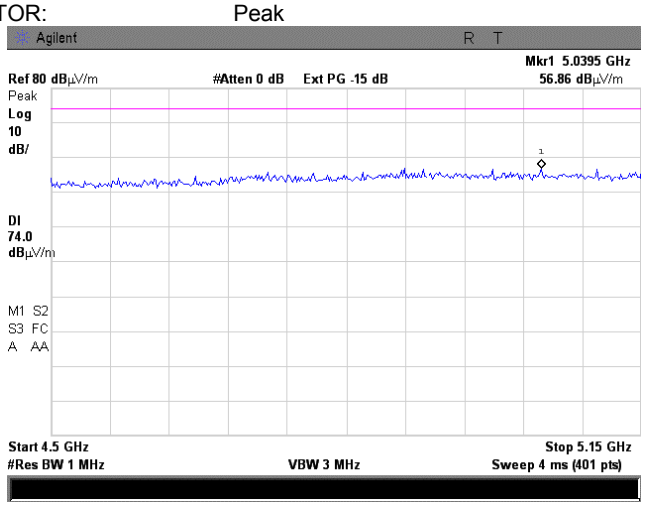
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

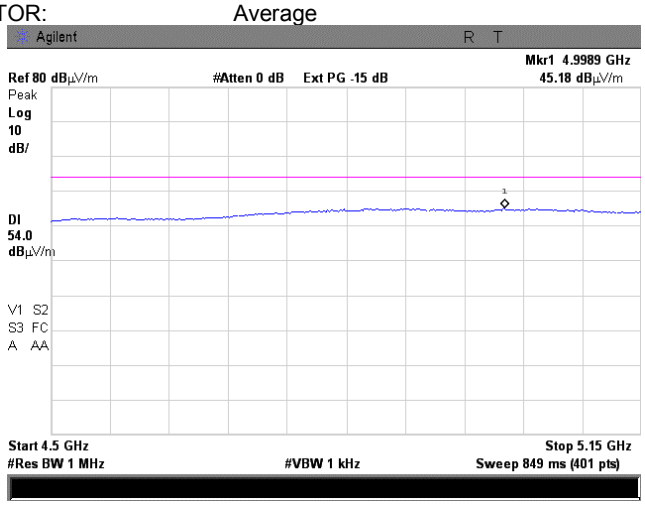
Plot 7.10.5 Radiated spurious emission measurements at the band edges in 4.5 – 5.15 GHz range at high carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.6 Radiated spurious emission measurements at the band edges in 4.5 – 5.15 GHz range at high carrier frequency, vertical & horizontal antenna polarization

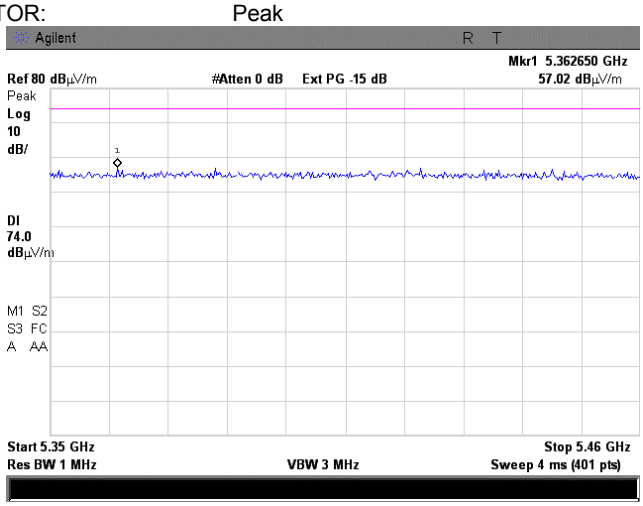
CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

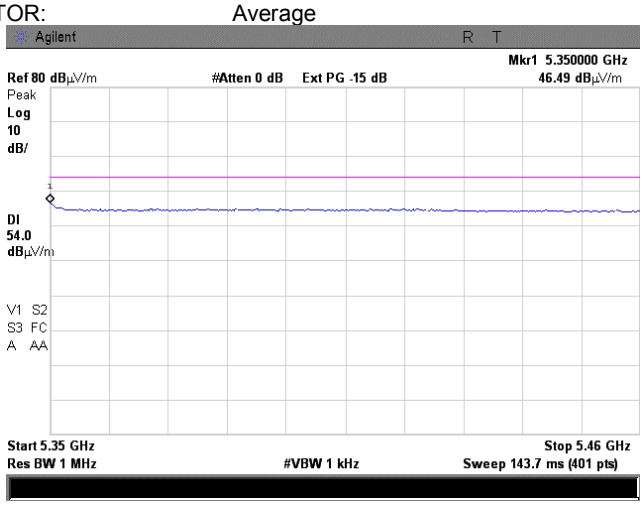
Plot 7.10.7 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.8 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at low carrier frequency, vertical & horizontal antenna polarization

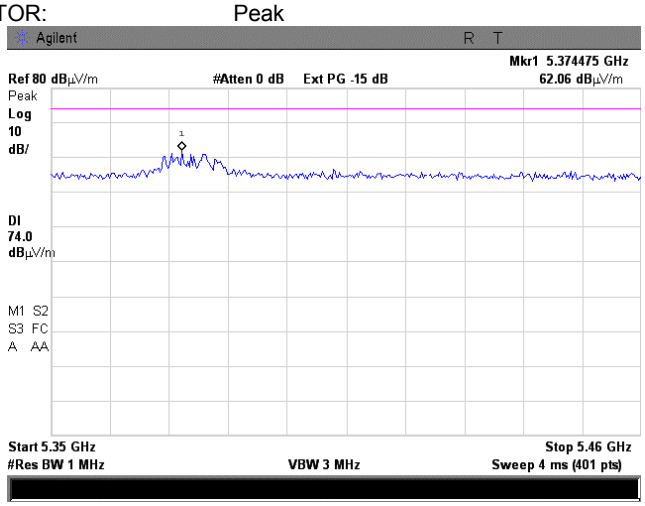
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

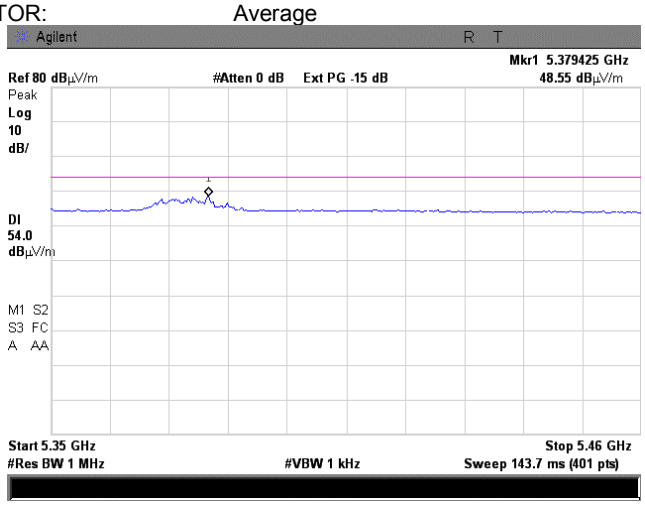
Plot 7.10.9 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.10 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

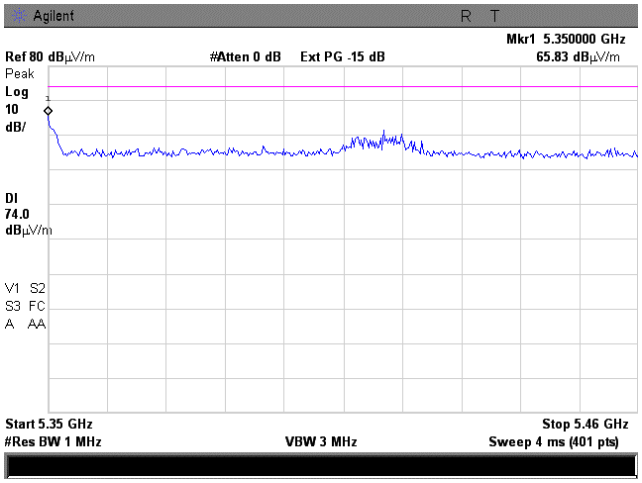
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

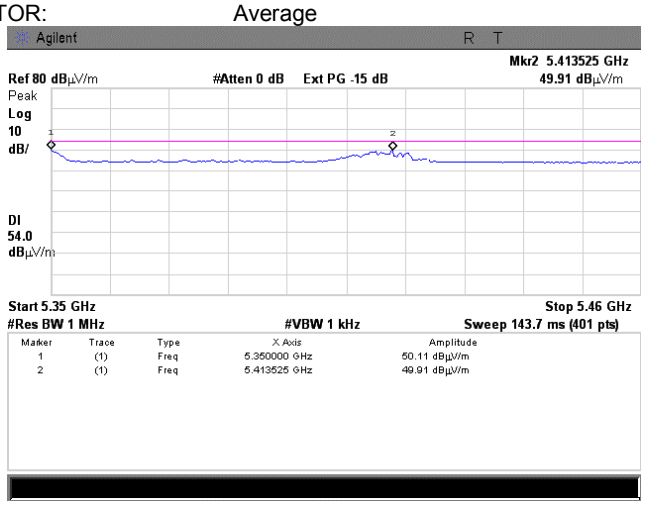
Plot 7.10.11 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency,
vertical & horizontal antenna polarization

CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.12 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency,
vertical & horizontal antenna polarization

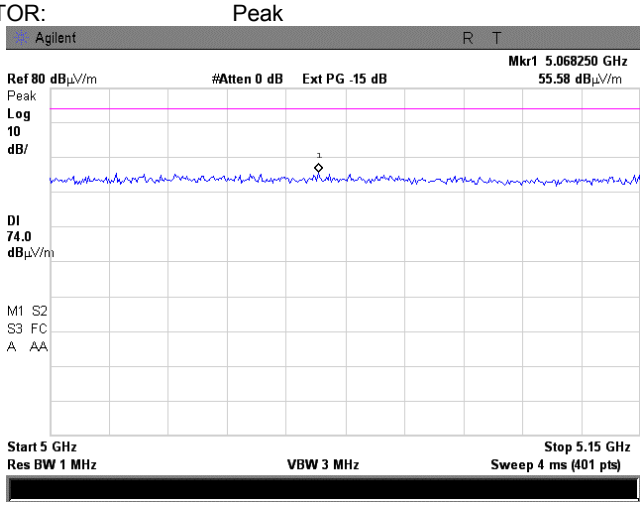
CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

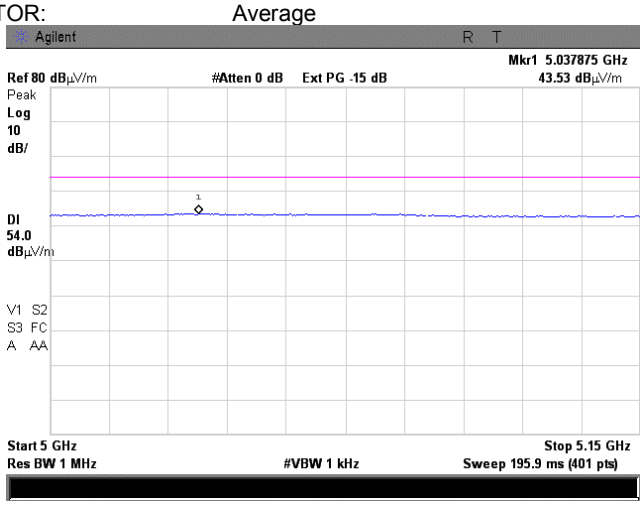
Plot 7.10.13 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.14 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

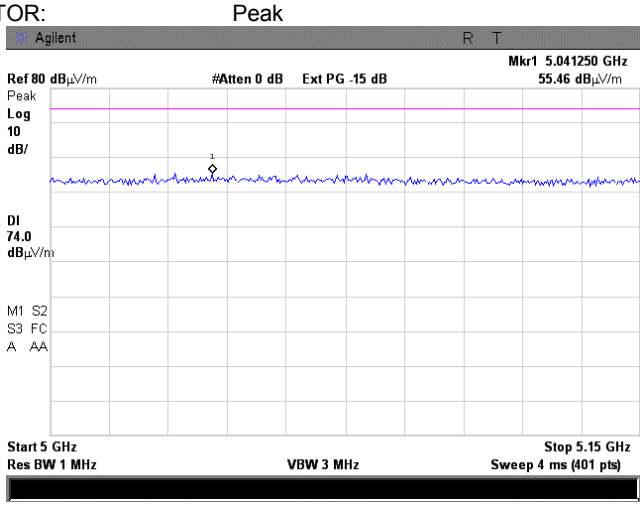
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

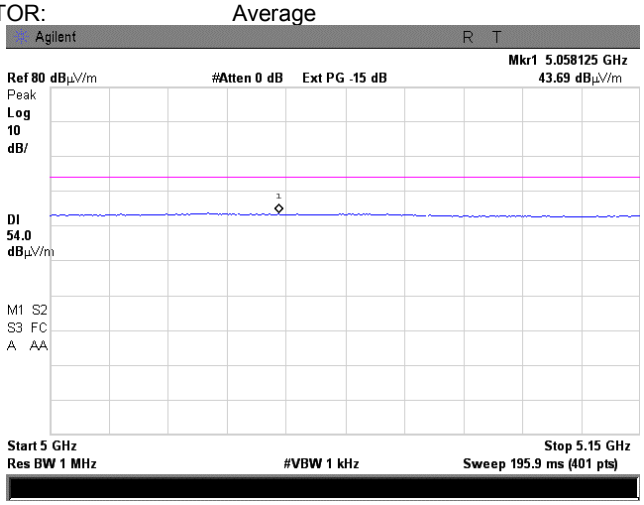
Plot 7.10.15 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.16 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

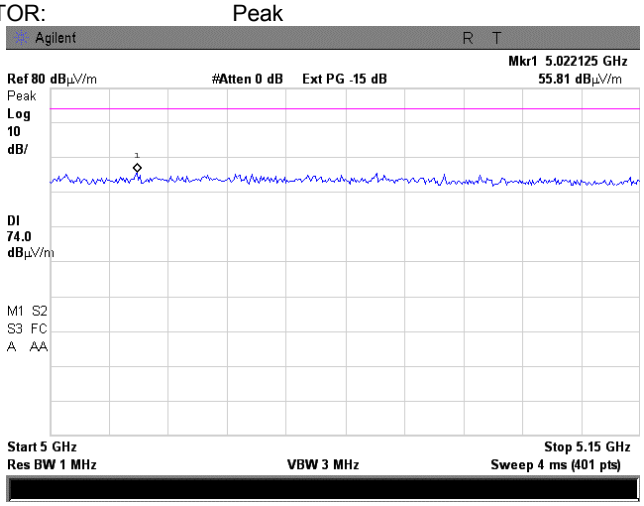
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

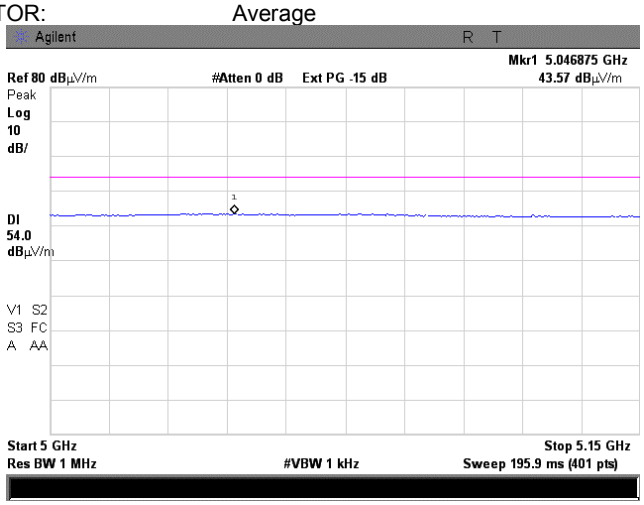
Plot 7.10.17 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at high carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.18 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at high carrier frequency, vertical & horizontal antenna polarization

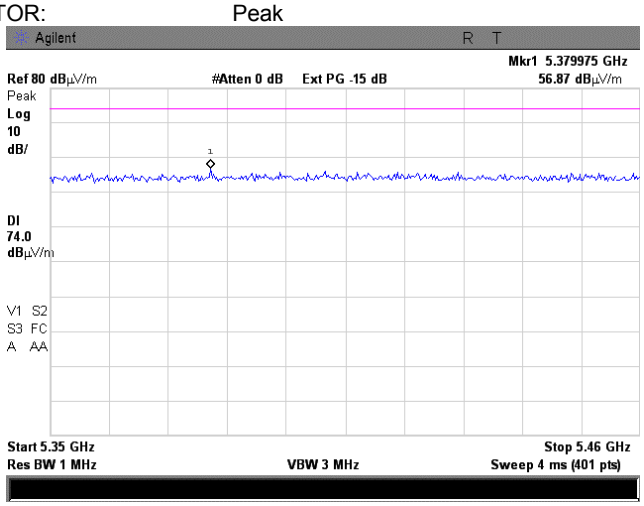
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

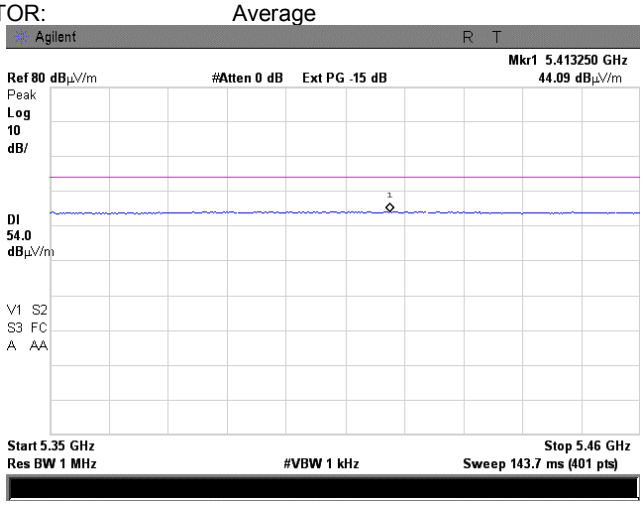
Plot 7.10.19 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.20 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at low carrier frequency, vertical & horizontal antenna polarization

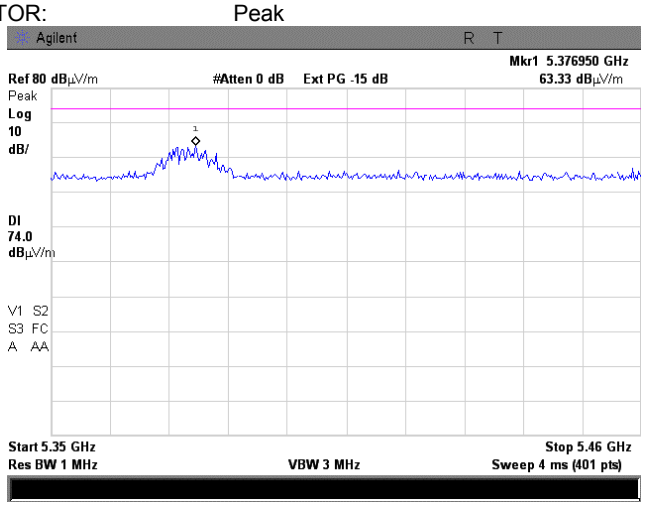
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

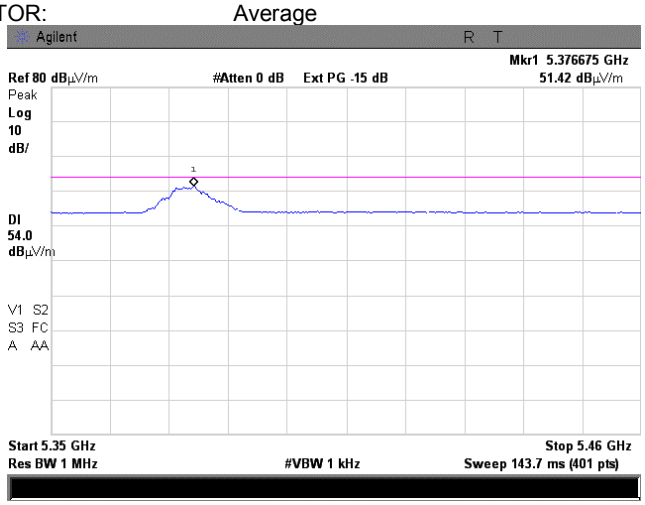
Plot 7.10.21 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.22 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at mid carrier frequency, vertical & horizontal antenna polarization

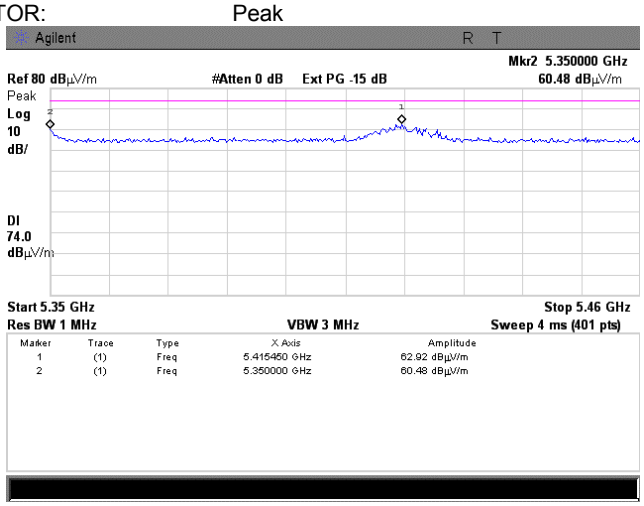
CARRIER FREQUENCY 5300 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

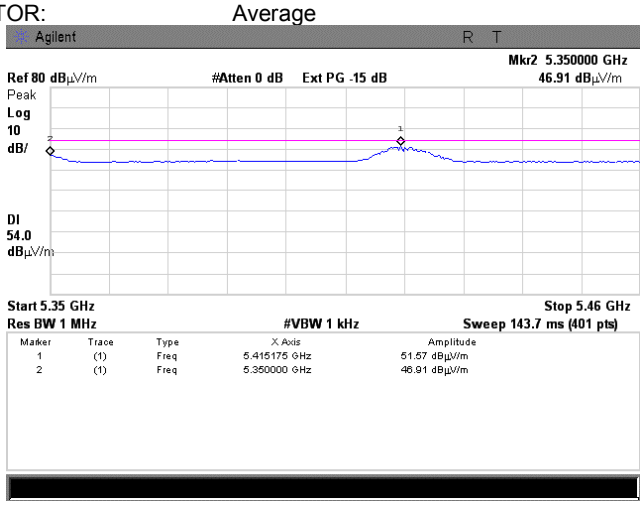
Plot 7.10.23 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.24 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, vertical & horizontal antenna polarization

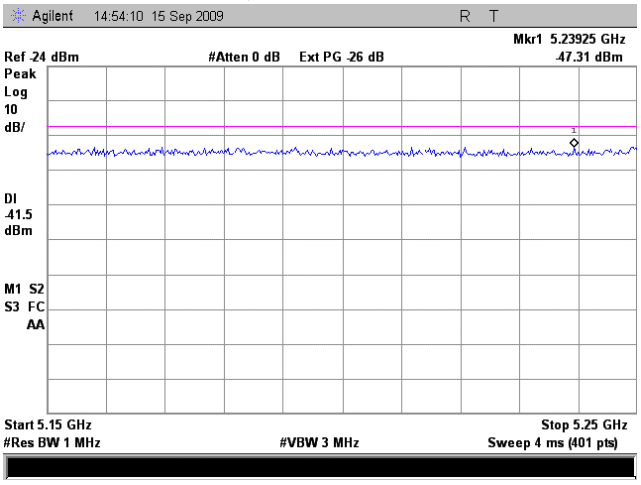
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

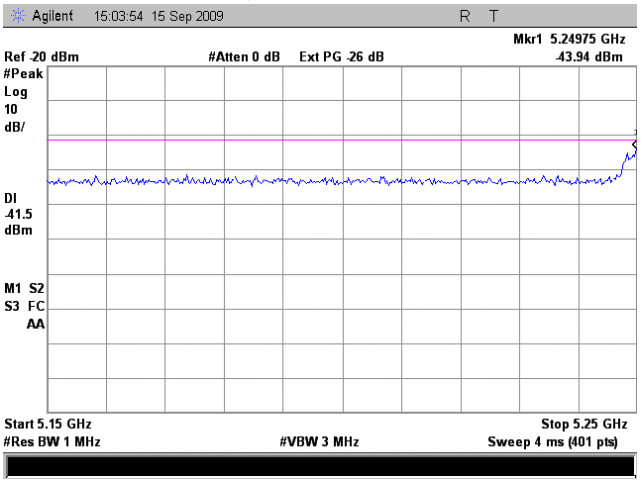
Plot 7.10.25 Conducted spurious emission measurements in 5150 – 5250 MHz range

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM



Plot 7.10.26 Conducted spurious emission measurements in 5150 – 5250 MHz range

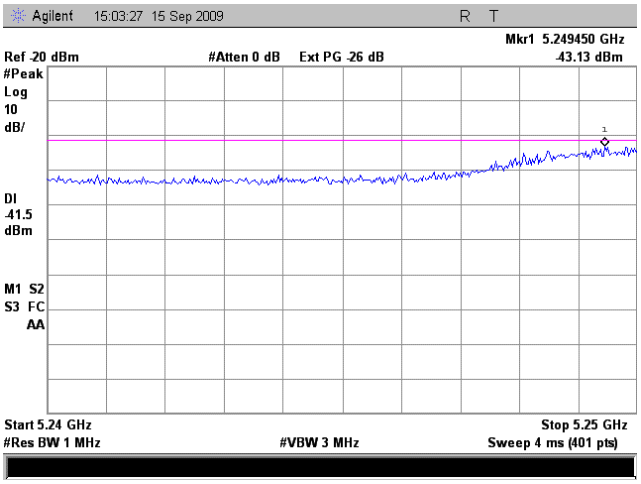
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:54 AM		
Temperature: 32 °C	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 14.5 dBi antenna			

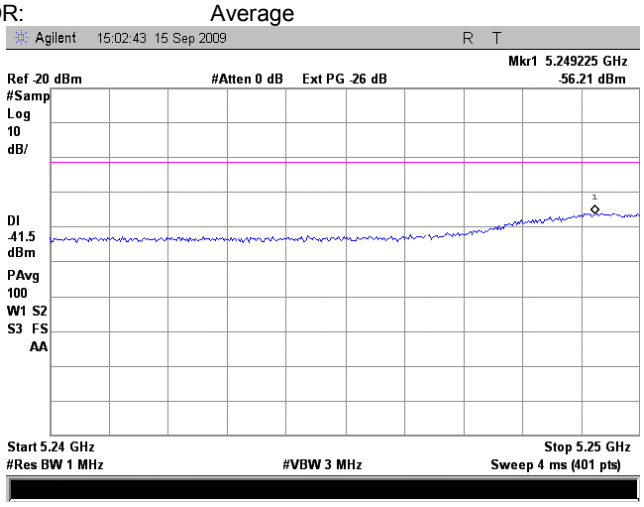
Plot 7.10.27 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.10.28 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

7.11 Band edge spurious emission measurements with 17 dBi external antenna, SISO mode

7.11.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.11.1, Table 7.11.2.

Table 7.11.1 Radiated spurious emission test limits

Assigned frequency range, MHz	EIRP of spurious, dBm/MHz	ıntenna assembl gain, dBi	Resolution ɔandwidth, kHz	Conducted spurious ımissions limit*, dBm/MH
5250 - 5350	-27	17.0	1000	-44.0

* - Conducted limit = EIRP limit – Antenna assembly gain

Table 7.11.2 Radiated spurious emissions limits within restricted bands

Frequency, MHz	Field strength at 3 m, dB(µV/m)***	
	Peak	Average
Above 1000	74.0	54.0

7.11.2 Conducted spurious emission test

7.11.2.1 This test was performed to measure conducted spurious emissions from the EUT near the band edges outside restricted bands and within the pass band of the dedicated EUT's antenna. Specification test limits are given in Table 7.11.1.

7.11.2.2 The EUT and measurement equipment were arranged as shown on Figure 7.11.1.

7.11.2.3 Test results are shown in the Table 7.11.3 and the associated plots.

7.11.3 Radiated spurious emission test

7.11.3.1 This test was performed to measure radiated spurious emission from the EUT near the band edge within the restricted bands. Specification test limits are given in Table 7.11.2.

7.11.3.2 The EUT and measurement equipment were arranged as shown on Figure 7.11.2.

7.11.3.3 Test results are shown in the Table 7.11.4 and the associated plots.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120 VAC
Remarks: SISO mode, 17 dBi antenna			

Figure 7.11.1 Setup for conducted spurious emissions

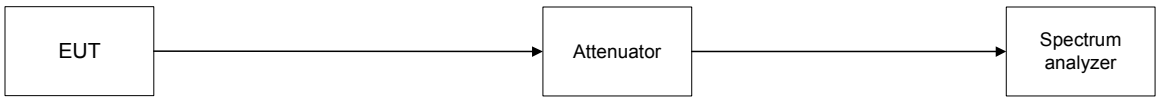
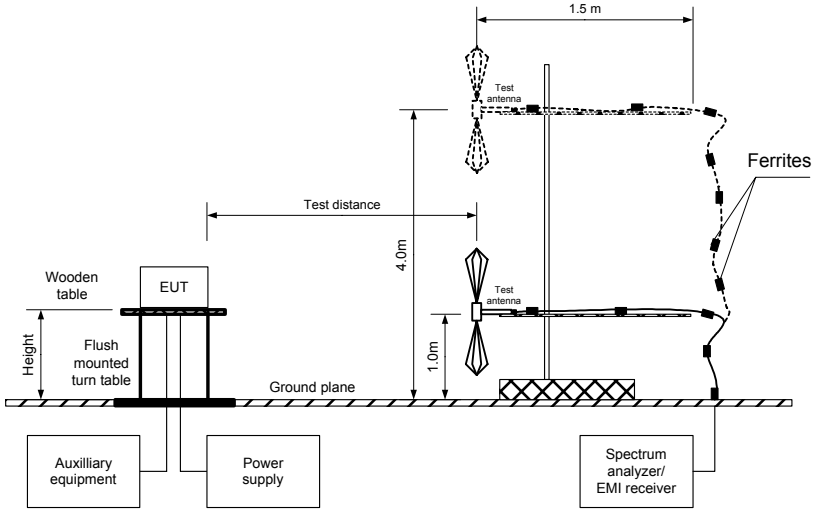


Figure 7.11.2 Setup for spurious emission field strength measurements above 1000 MHz



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

Table 7.11.3 Conducted spurious emission test results at low edge

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	Detector	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain, dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5249.925	64QAM	Peak	5	-44.32	-27	17.0	-27.32	-0.32	Pass
5249.375	64QAM	Average		-58.29	-27	17.0	-41.29	-14.29	Pass
5250.00	64QAM	Peak	10	-48.16	-27	17.0	-31.16	-4.16	Pass

* - EIRP = SA reading (dBm) + Antenna assembly gain
**- Margin = EIRP – specified limit.

Reference numbers of test equipment used

HL 2780	HL 2883	HL 3176					

Full description is given in Appendix A.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120 VAC
Remarks: SISO mode, 17 dBi antenna			

Table 7.11.4 Field strength of spurious emissions at high edge

ASSIGNED FREQUENCY RANGE: 5.25-5.35 GHz
TEST DISTANCE: 3 m
MODULATION: 64QAM
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1000 kHz
TEST ANTENNA TYPE: Double ridged guide

Frequency MHz	Antenna		Azimuth degrees	Peak field strength(VBW=3 MHz			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height m		Measured dB(μV/m)	Limit, dB(μV/m	Margin, dB**	Measured dB(μV/m)	Calculated dB(μV/m)	Limit, dB(μV/m	Margin dB***	
High carrier frequency 10 MHz EBW											
5350.000	Vertical	1.1	010	70.10	74.00	-3.90	51.35	46.92	54.00	-7.08	Pass
5413.800	Horizontal	1.0	000	68.33	74.00	-5.67	52.03	47.60	54.00	-6.40	
High carrier frequency 5 MHz EBW											
5350.066	Vertical	1.1	010	61.48	74.00	-12.52	47.97	43.54	54.00	-10.46	Pass
5419.850	Horizontal	1.0	000	65.08	74.00	-8.92	47.80	43.37	54.00	-10.63	

*- EUT front panel refers to 0 degrees position of turntable.
** - Margin, dB = Measured, dB(μV/m) – Limit, dB(μV/m)
*** - Margin, dB = Calculated, dB(μV/m) – Limit, dB(μV/m)

Table 7.11.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
3	5				-4.43

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Reference numbers of test equipment used

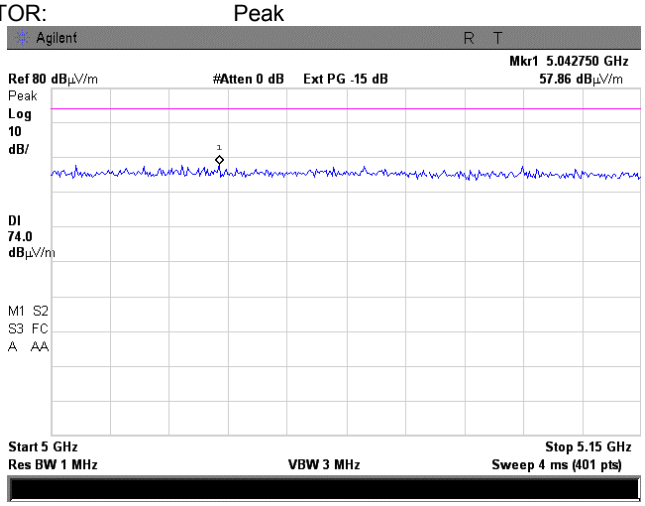
HL 0554	HL 1521	HL 1984	HL 3122	HL 3616			

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

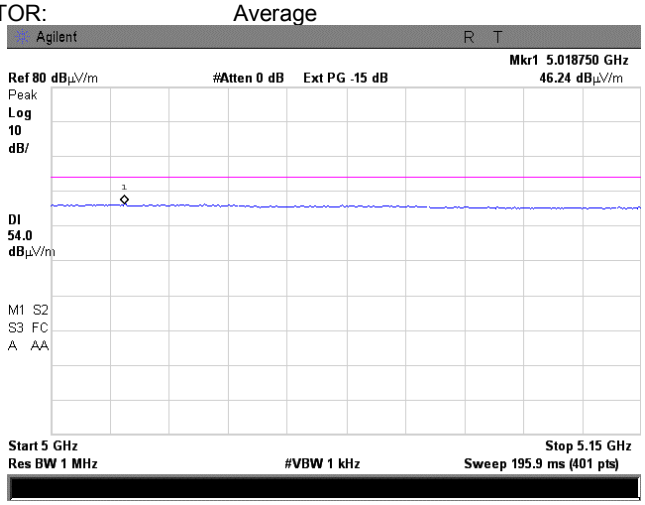
Plot 7.11.1 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.11.2 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical antenna polarization

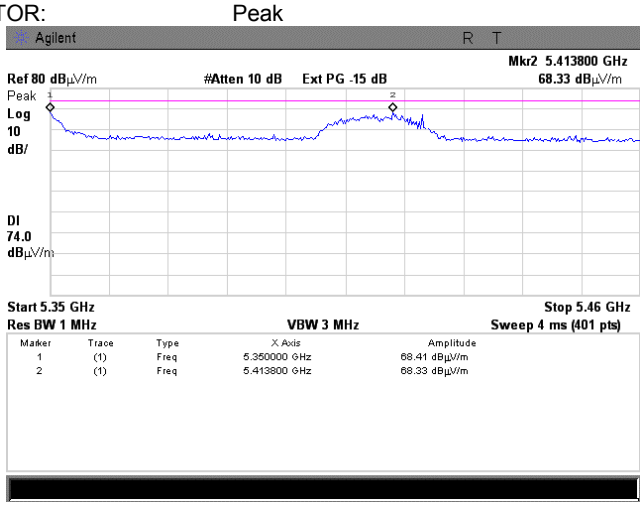
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

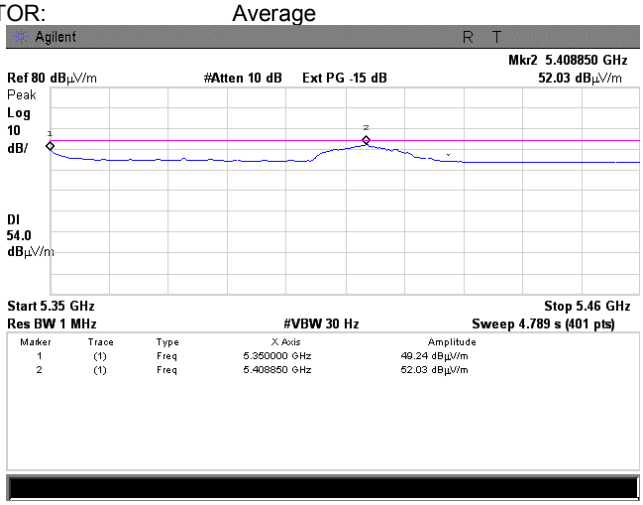
Plot 7.11.3 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.11.4 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical & horizontal antenna polarization

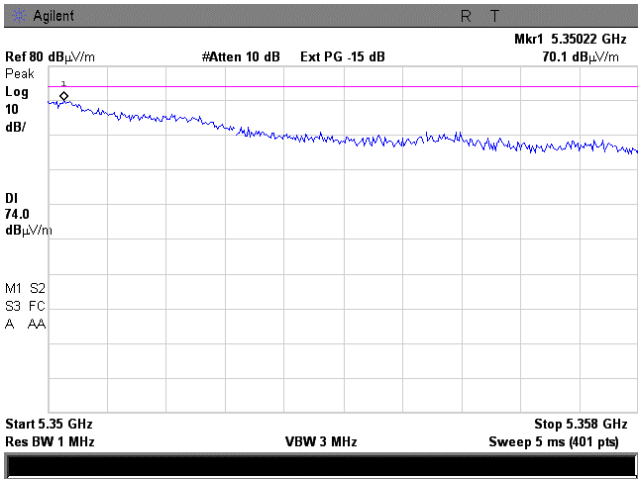
CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

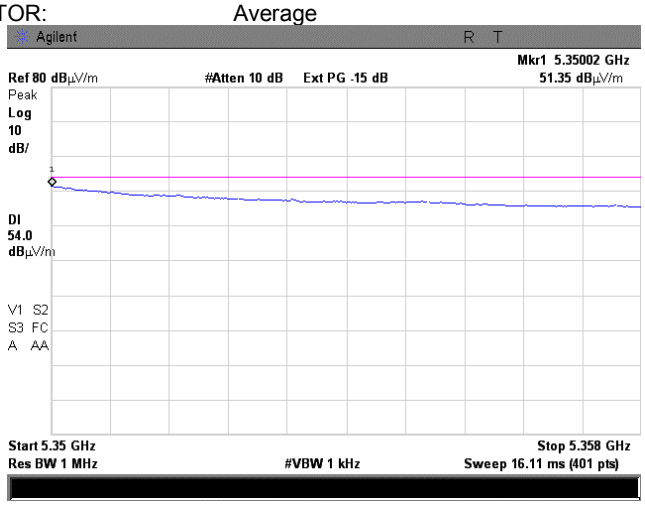
Plot 7.11.5 Radiated spurious emission measurements at the band edges in 5.35 – 5.358 GHz range at high carrier frequency,
vertical & horizontal antenna polarization

CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.11.6 Radiated spurious emission measurements at the band edges in 5.35 – 5.358 GHz range at high carrier frequency,
vertical & horizontal antenna polarization

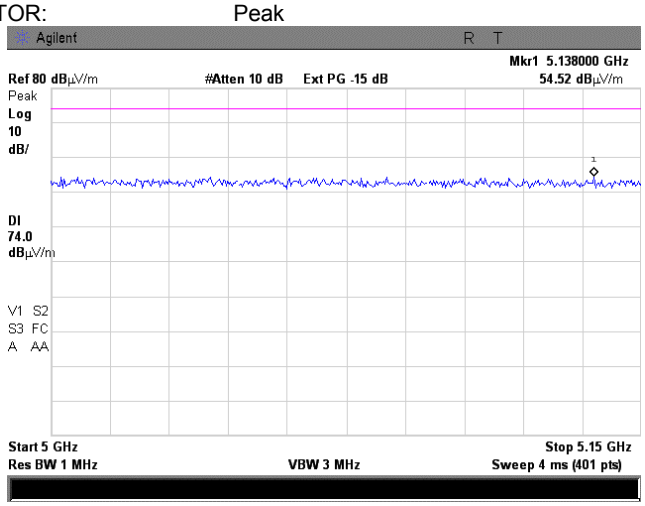
CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

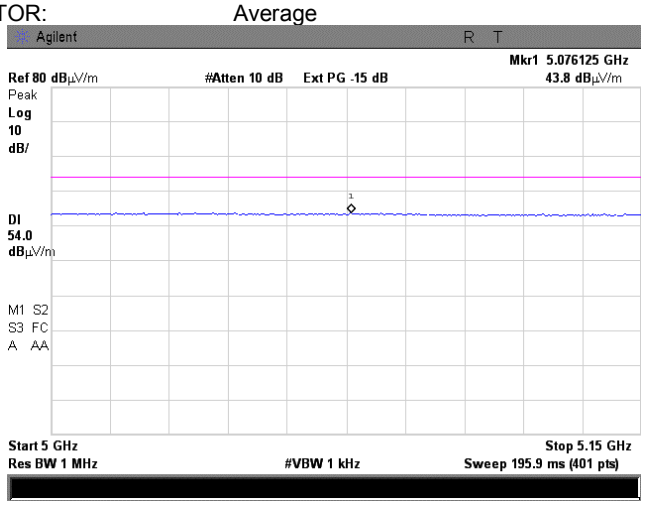
Plot 7.11.7 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.11.8 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

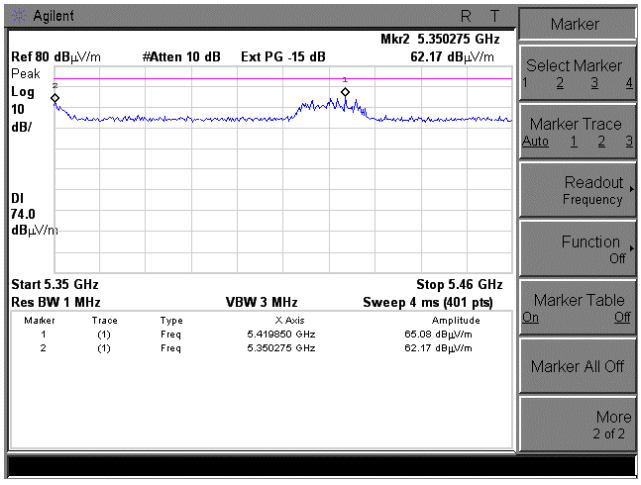
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

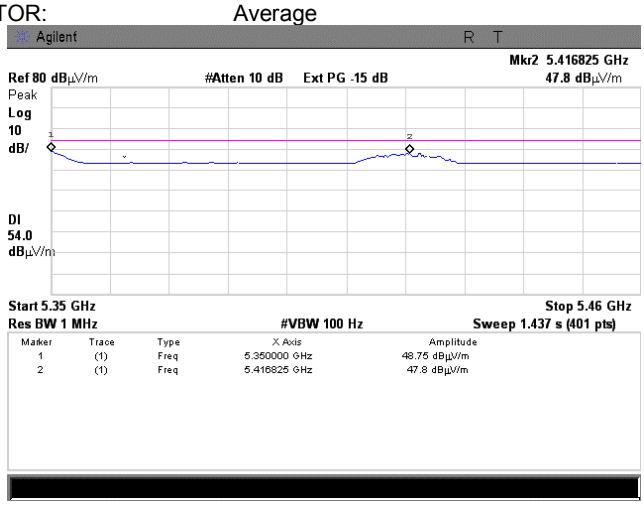
Plot 7.11.9 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency,
vertical & horizontal antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.11.10 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, vertical & horizontal antenna polarization

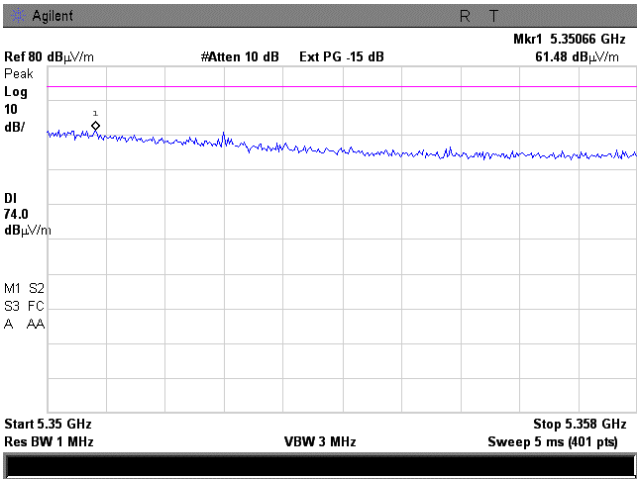
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 °C	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

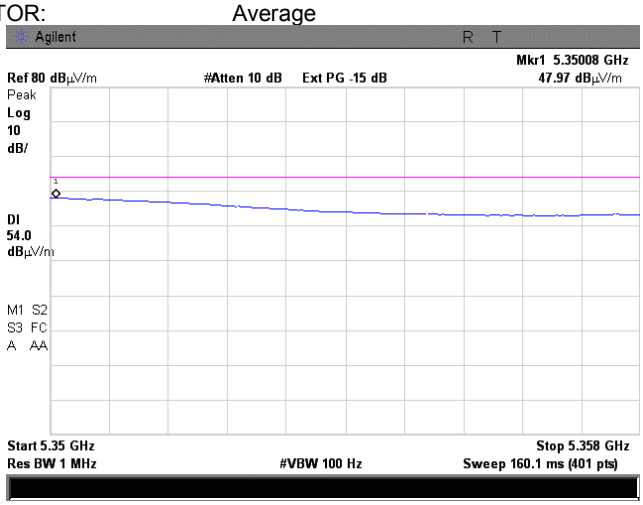
Plot 7.11.11 Radiated spurious emission measurements at the band edges in 5.35 –5.358 GHz range at high carrier frequency,
vertical antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.11.12 Radiated spurious emission measurements at the band edges in 5.35 –5.358 GHz range at high carrier frequency,
vertical antenna polarization

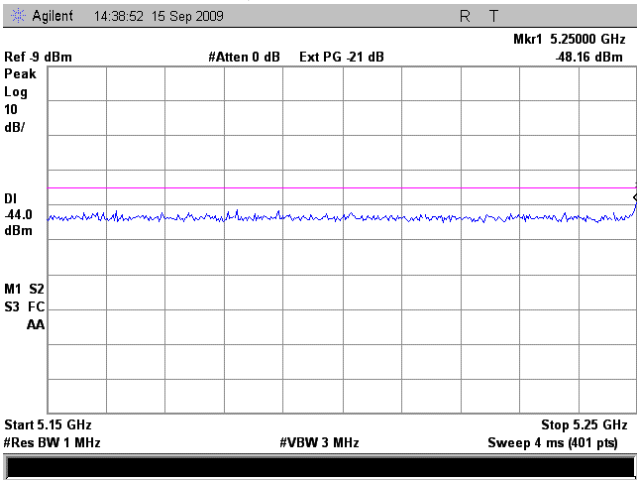
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

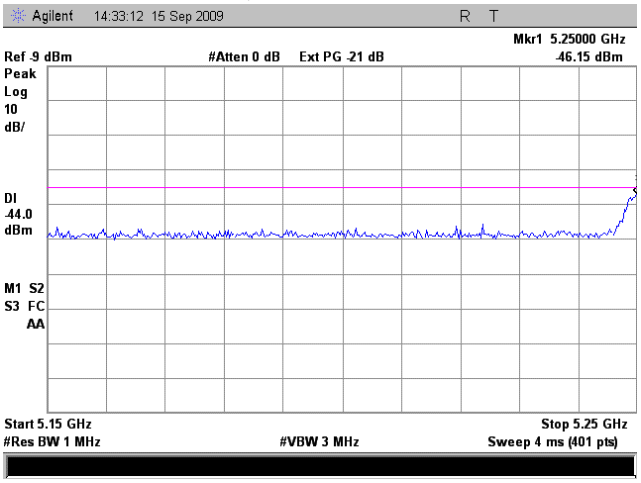
Plot 7.11.13 Conducted spurious emission measurements in 5150 – 5250 MHz range

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM



Plot 7.11.14 Conducted spurious emission measurements in 5150 – 5250 MHz range

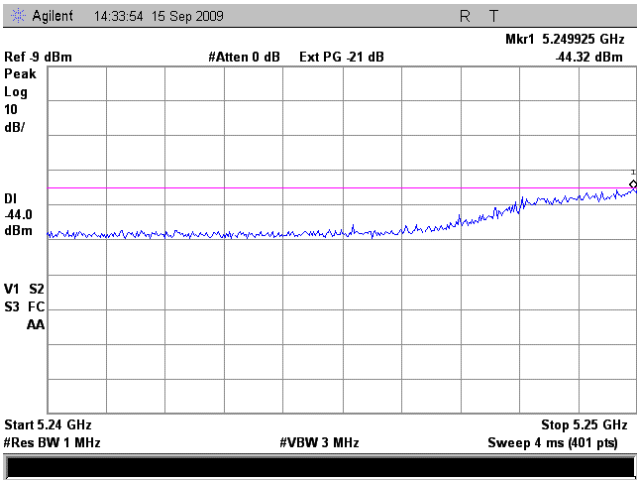
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 7:51:44 PM		
Temperature: 32 °C	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 17 dBi antenna			

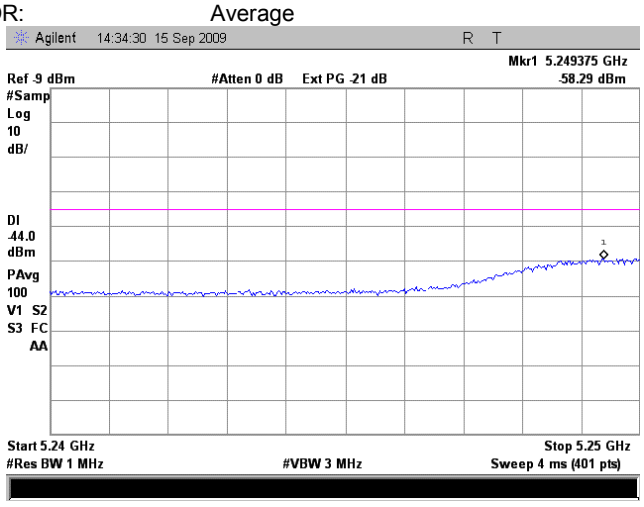
Plot 7.11.15 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.11.16 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

7.12 Band edge spurious emission measurements with 17 dBi external antenna, MIMO mode

7.12.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.12.1, Table 7.12.2.

Table 7.12.1 Radiated spurious emission test limits

Assigned frequency range, MHz	EIRP of spurious, dBm/MHz	ıntenna assembl gain, dBi	Resolution ɔandwidth, kHz	Conducted spurious ımissions limit*, dBm/MH
5250 - 5350	-27	17.0	1000	-44.0

* - Conducted limit = EIRP limit – Antenna assembly gain

Table 7.12.2 Radiated spurious emissions limits within restricted bands

Frequency, MHz	Field strength at 3 m, dB(μV/m)***	
	Peak	Average
Above 1000	74.0	54.0

7.12.2 Conducted spurious emission test

7.12.2.1 This test was performed to measure conducted spurious emissions from the EUT near the band edges outside restricted bands and within the pass band of the dedicated EUT's antenna. Specification test limits are given in Table 7.12.1.

7.12.2.2 The EUT and measurement equipment were arranged as shown on Figure 7.12.1.

7.12.2.3 Test results are shown in the Table 7.12.3 and the associated plots.

7.12.3 Radiated spurious emission test

7.12.3.1 This test was performed to measure radiated spurious emission from the EUT near the band edge within the restricted bands. Specification test limits are given in Table 7.12.2.

7.12.3.2 The EUT and measurement equipment were arranged as shown on Figure 7.12.2.

7.12.3.3 Test results are shown in the Table 7.12.4 and the associated plots.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

Figure 7.12.1 Setup for conducted spurious emissions

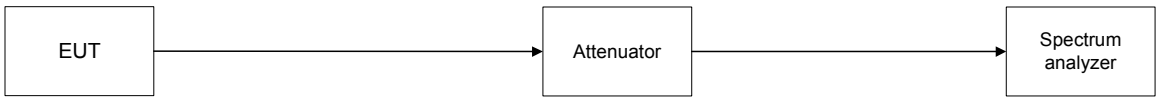
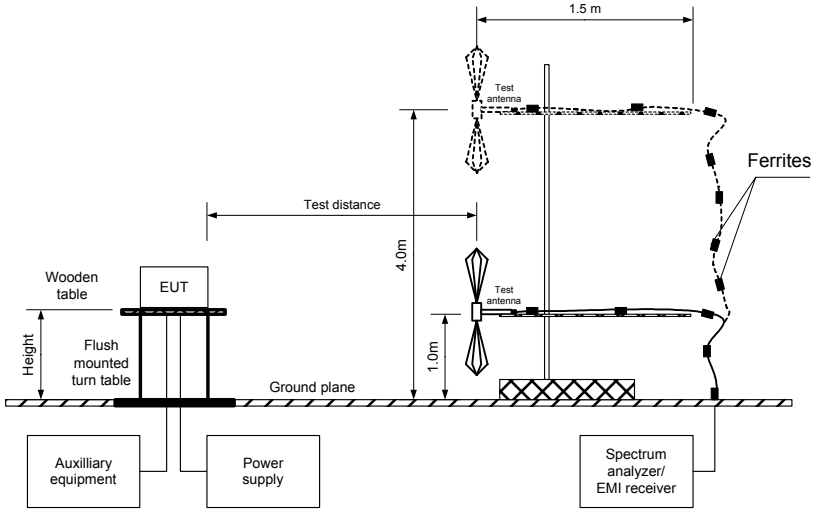


Figure 7.12.2 Setup for spurious emission field strength measurements above 1000 MHz



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

Table 7.12.3 Conducted spurious emission test results at low edge

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	Detector	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain, dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5249.925	64QAM	Peak	5	-44.99	-27	17.0	-27.99	-0.99	Pass
5249.375	64QAM	Average		-57.24	-27	17.0	-40.24	-13.24	Pass
5249.84	64QAM	Peak	10	-48.84	-27	17.0	-31.84	-4.84	Pass

* - EIRP = SA reading (dBm) + Antenna assembly gain
**- Margin = EIRP – specified limit.

Reference numbers of test equipment used

HL 2780	HL 2883	HL 3176					

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

Table 7.12.4 Field strength of spurious emissions at high edge

ASSIGNED FREQUENCY RANGE: 5.25-5.35 GHz
TEST DISTANCE: 3 m
MODULATION: 64QAM
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1000 kHz
TEST ANTENNA TYPE: Double ridged guide

Frequency MHz	Antenna Polarization	Antenna Height m	Azimuth degrees*	Peak field strength(VBW=3 MHz Measured dB(μV/m)	Peak field strength(VBW=3 MHz Limit, dB(μV/m	Peak field strength(VBW=3 MHz Margin, dB**	Average field strength(VBW=10 Hz) Measured dB(μV/m)	Average field strength(VBW=10 Hz) Calculated dB(μV/m)	Average field strength(VBW=10 Hz) Limit, dB(μV/m	Average field strength(VBW=10 Hz) Margin dB***	Verdict
High carrier frequency 10 MHz EBW											
5350.000	V	1.1	010	59.86	74.00	-14.14	44.98	40.55	54.00	-13.45	Pass
5414.350	H	1.0	000	66.96	74.00	-7.04	47.98	43.55	54.00	-10.45	
High carrier frequency 5 MHz EBW											
5350.066	V	1.1	010	64.35	74.00	-9.65	51.87	47.44	54.00	-6.56	Pass

*- EUT front panel refers to 0 degrees position of turntable.
** - Margin, dB = Measured, dB(μV/m) – Limit, dB(μV/m)
*** - Margin, dB = Calculated, dB(μV/m) – Limit, dB(μV/m)

Table 7.12.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
3	5				-4.43

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Reference numbers of test equipment used

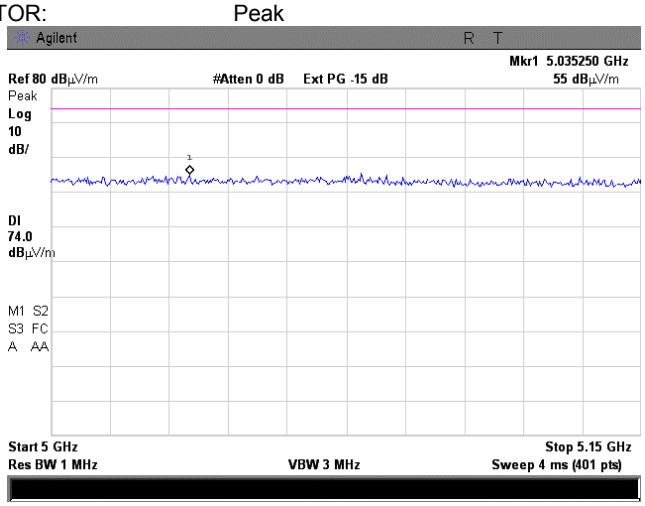
HL 0554	HL 1521	HL 1984	HL 3122	HL 3616			

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

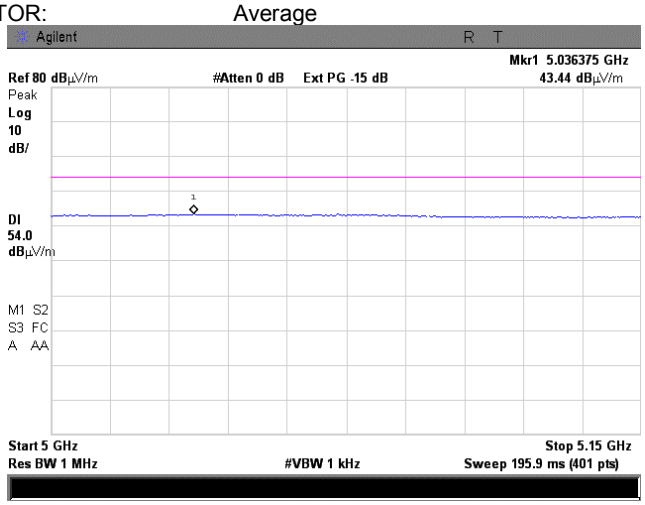
Plot 7.12.1 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.12.2 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

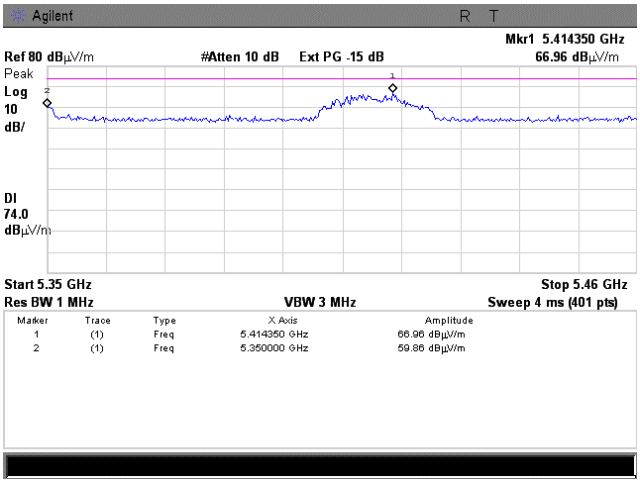
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

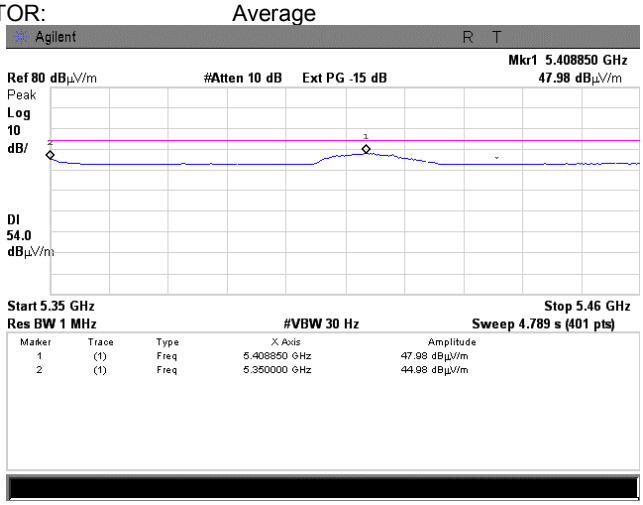
Plot 7.12.3 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency,
vertical & horizontal antenna polarization

CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.12.4 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency,
vertical & horizontal antenna polarization

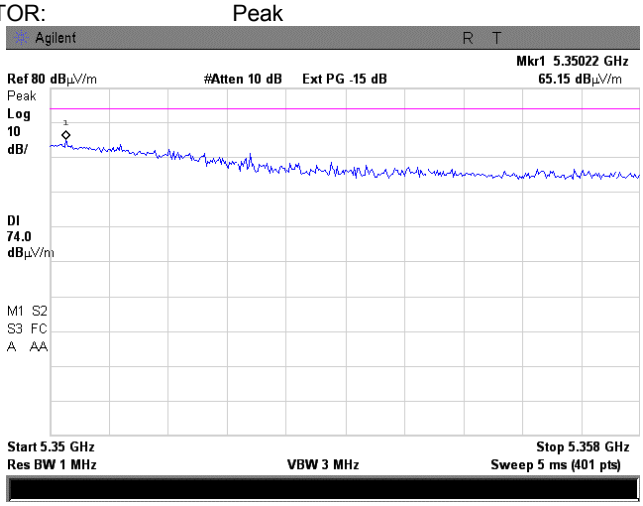
CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

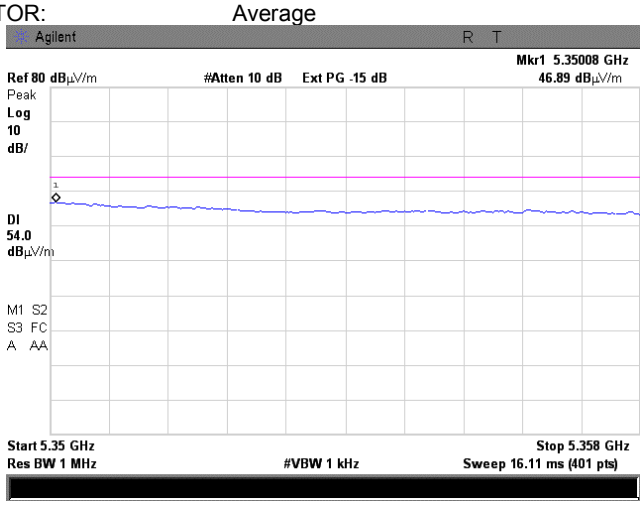
Plot 7.12.5 Radiated spurious emission measurements at the band edges in 5.35 –5.358 GHz range at high carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.12.6 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, vertical antenna polarization

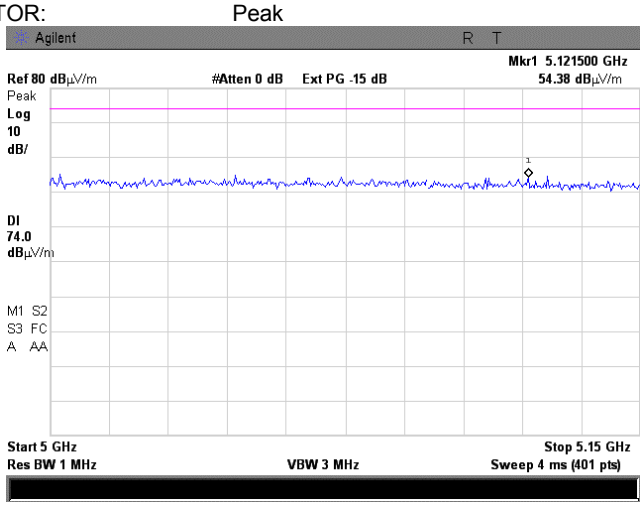
CARRIER FREQUENCY 5335 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

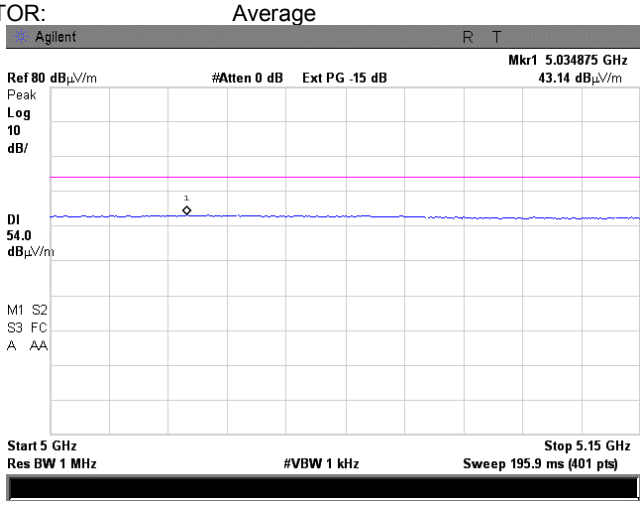
Plot 7.12.7 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.12.8 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical antenna polarization

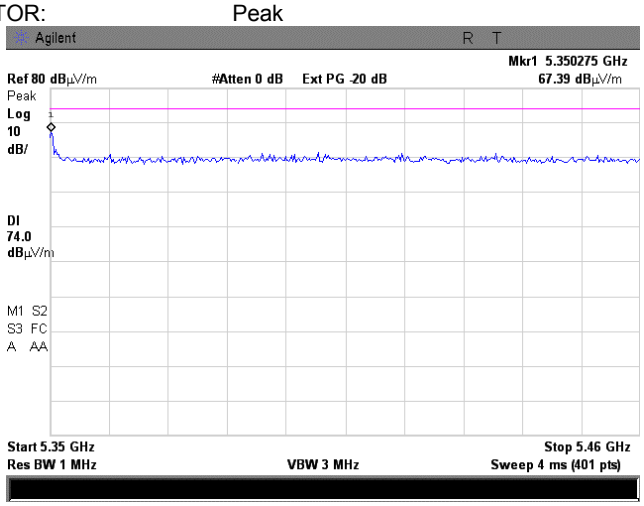
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

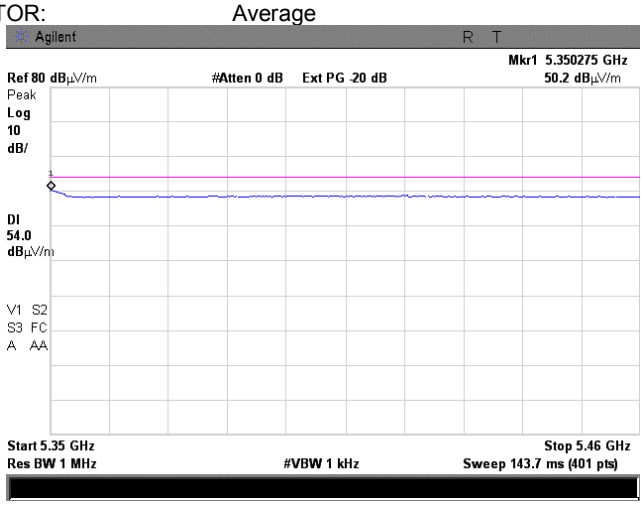
Plot 7.12.9 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.12.10 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical antenna polarization

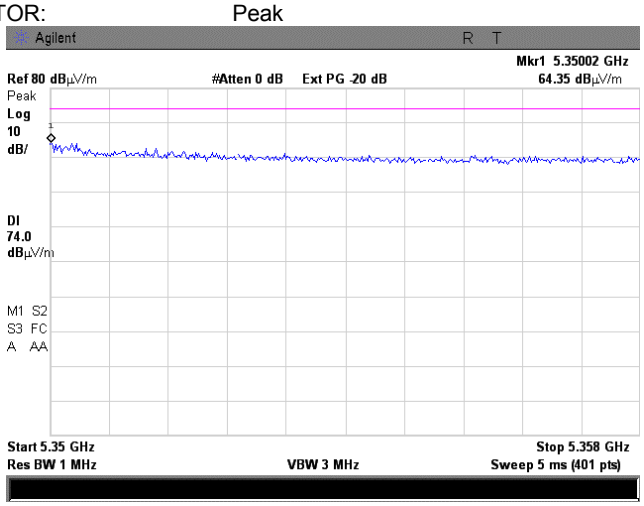
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

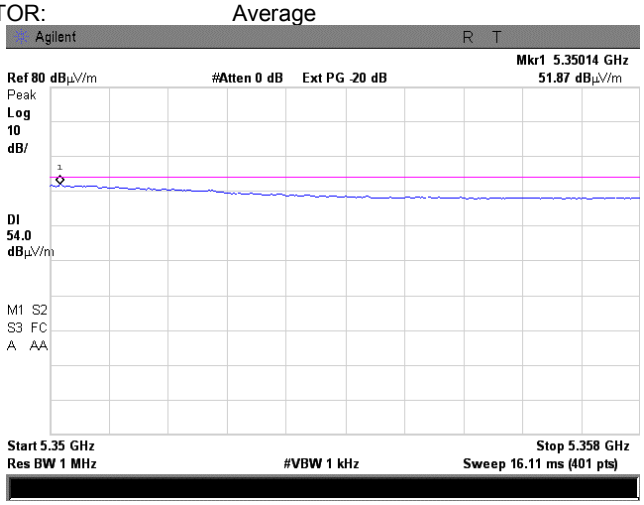
Plot 7.12.11 Radiated spurious emission measurements at the band edges in 5.35 – 5.358 GHz range at high carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.12.12 Radiated spurious emission measurements at the band edges in 5.35 – 5.358 GHz range at high carrier frequency, vertical antenna polarization

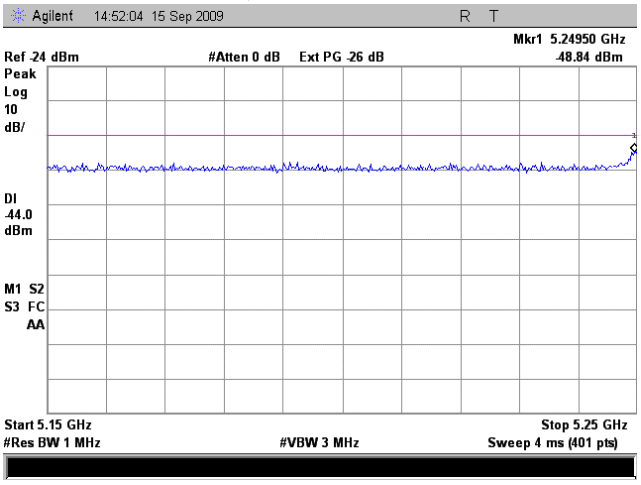
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

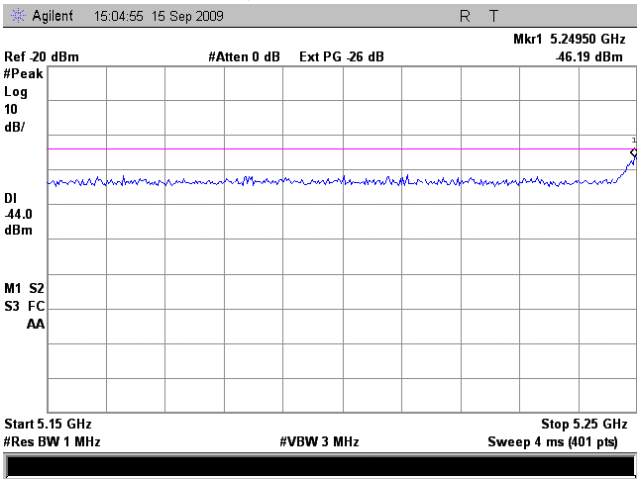
Plot 7.12.13 Conducted spurious emission measurements in 5150 – 5250 MHz range

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM



Plot 7.12.14 Conducted spurious emission measurements in 5150 – 5250 MHz range

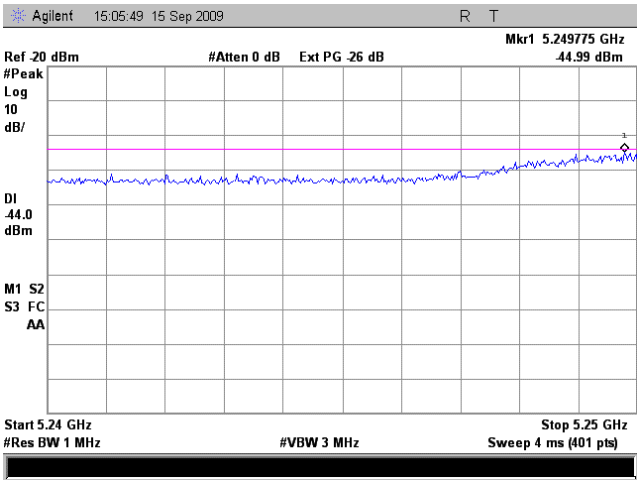
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/22/2009 8:02:07 PM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 17 dBi antenna			

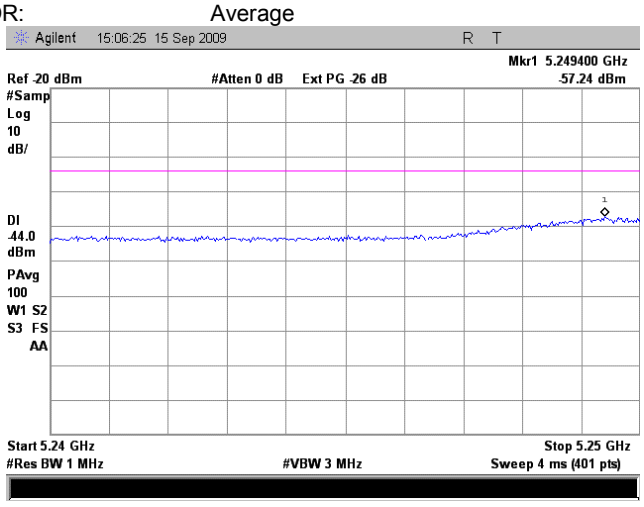
Plot 7.12.15 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.12.16 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

7.13 Band edge spurious emission measurements with 9.5 dBi external antenna, SISO mode

7.13.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.13.1, Table 7.13.2.

Table 7.13.1 Radiated spurious emission test limits

Assigned frequency range, MHz	EIRP of spurious, dBm/MHz	ıntenna assembl gain, dBi	Resolution ɔandwidth, kHz	Conducted spurious ımissions limit*, dBm/MH
5250 - 5350	-27	9.5	1000	-36.50

* - Conducted limit = EIRP limit – Antenna assembly gain

Table 7.13.2 Radiated spurious emissions limits within restricted bands

Frequency, MHz	Field strength at 3 m, dB(µV/m)***	
	Peak	Average
Above 1000	74.0	54.0

7.13.2 Conducted spurious emission test

7.13.2.1 This test was performed to measure conducted spurious emissions from the EUT near the band edges outside restricted bands and within the pass band of the dedicated EUT's antenna. Specification test limits are given in Table 7.13.1.

7.13.2.2 The EUT and measurement equipment were arranged as shown on Figure 7.13.1.

7.13.2.3 Test results are shown in the Table 7.13.3 and the associated plots.

7.13.3 Radiated spurious emission test

7.13.3.1 This test was performed to measure radiated spurious emission from the EUT near the band edge within the restricted bands. Specification test limits are given in Table 7.13.2.

7.13.3.2 The EUT and measurement equipment were arranged as shown on Figure 7.13.2.

7.13.3.3 Test results are shown in the Table 7.13.4 and the associated plots.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

Figure 7.13.1 Setup for conducted spurious emissions

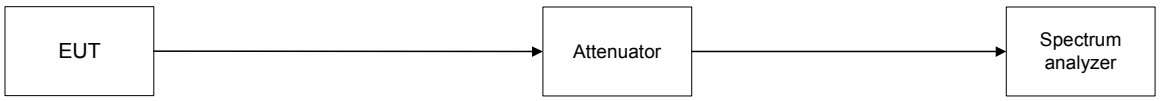
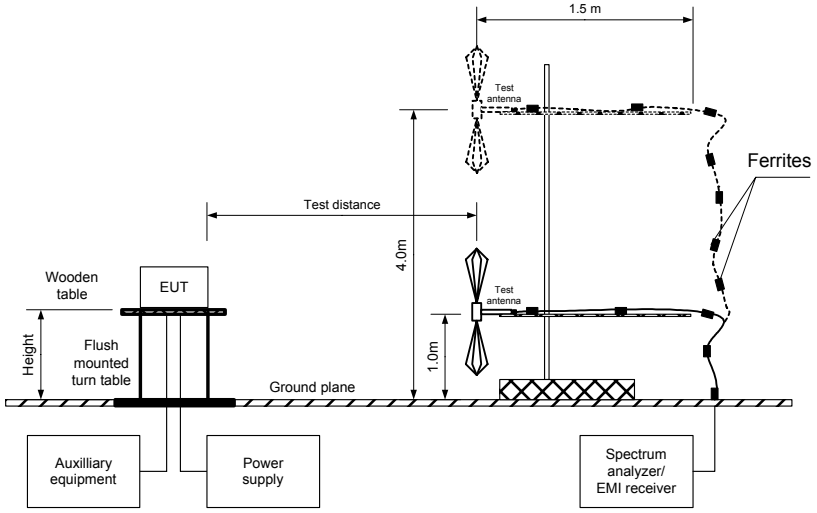


Figure 7.13.2 Setup for spurious emission field strength measurements above 1000 MHz



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

Table 7.13.3 Conducted spurious emission test results at low edge

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain, dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5250.00	64QAM	5	-37.70	-27	9.5	-28.20	-1.20	Pass
5249.75	64QAM	10	-45.35	-27	9.5	-35.85	-8.85	Pass

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Average
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain, dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5250.00	64QAM	5	-51.90	-27	9.5	-42.40	-15.40	Pass

* - EIRP = SA reading (dBm) + Antenna assembly gain
**- Margin = EIRP – specified limit.

Reference numbers of test equipment used

HL 2780	HL 2883	HL 3176					

Full description is given in Appendix A.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

Table 7.13.4 Field strength of spurious emissions at high edge

ASSIGNED FREQUENCY RANGE: 5.25-5.35 GHz
TEST DISTANCE: 3 m
MODULATION: QPSK/64QAM
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1000 kHz
TEST ANTENNA TYPE: Double ridged guide

Frequency MHz	Antenna		Azimuth degrees*	Peak field strength(VBW=3 MHz			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height m		Measured dB(μV/m)	Limit, dB(μV/m	Margin, dB**	Measured dB(μV/m)	Calculated dB(μV/m)	Limit, dB(μV/m	Margin dB***	
10 MHz EBW											
Low carrier frequency											
5060.750	Vertical	1.2	010	56.03	74.00	-17.97	44.51	40.08	54.00	-13.92	Pass
High carrier frequency											
5350.00	Vertical	1.2	010	71.09	74.00	-2.91	55.97	51.54	54.00	-2.46	Pass
5411.325	Horizontal	1.1	000	59.40	74.00	-14.60	48.45	44.02	54.00	-9.98	
5 MHz EBW											
Low carrier frequency											
5079.875	Vertical	1.2	010	56.13	74.00	-17.87	44.56	40.13	54.00	-13.87	Pass
High carrier frequency											
5350.000	Vertical	1.2	010	68.05	74.00	-5.95	52.52	48.09	54.00	-5.91	Pass
5414.900	Horizontal	1.1	000	61.15	74.00	-12.85	48.78	44.35	54.00	-9.65	

*- EUT front panel refers to 0 degrees position of turntable.
** - Margin, dB = Measured, dB(μV/m) – Limit, dB(μV/m)
*** - Margin, dB = Calculated, dB(μV/m) – Limit, dB(μV/m)

Table 7.13.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
3	5	-	-		-4.43

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Reference numbers of test equipment used

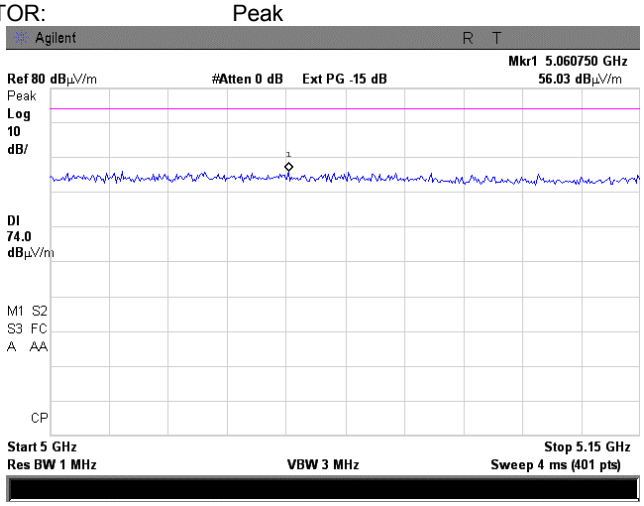
HL 0554	HL 1521	HL 1984	HL 3122	HL 3616			

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

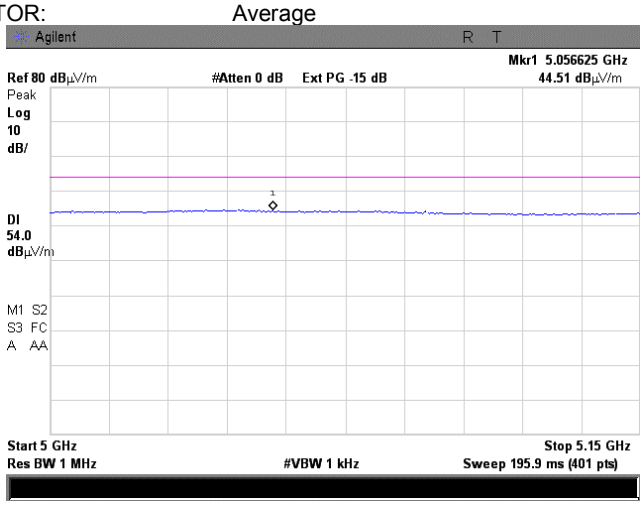
Plot 7.13.1 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.13.2 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical antenna polarization

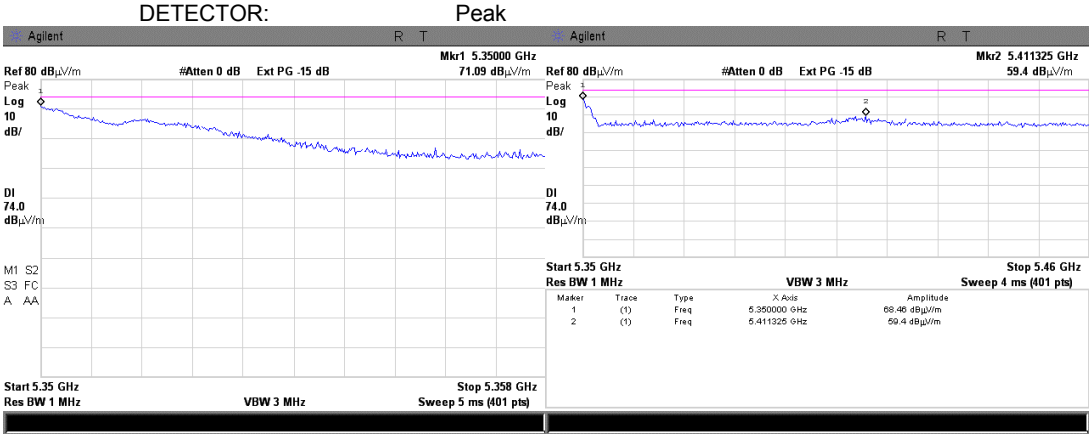
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

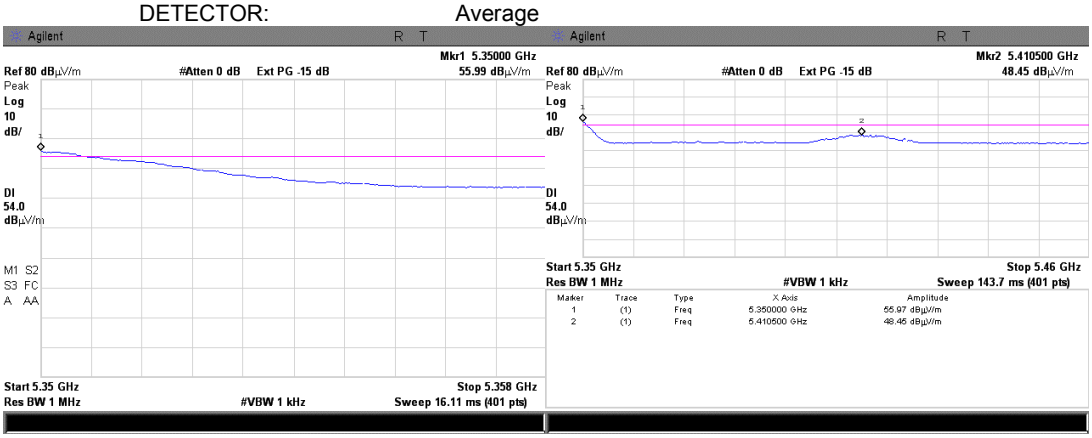
Plot 7.13.3 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical antenna polarization

CARRIER FREQUENCY	5335 MHz
CHANNEL BANDWIDTH	10 MHz
MODULATION:	64QAM
DETECTOR:	Peak



Plot 7.13.4 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical antenna polarization

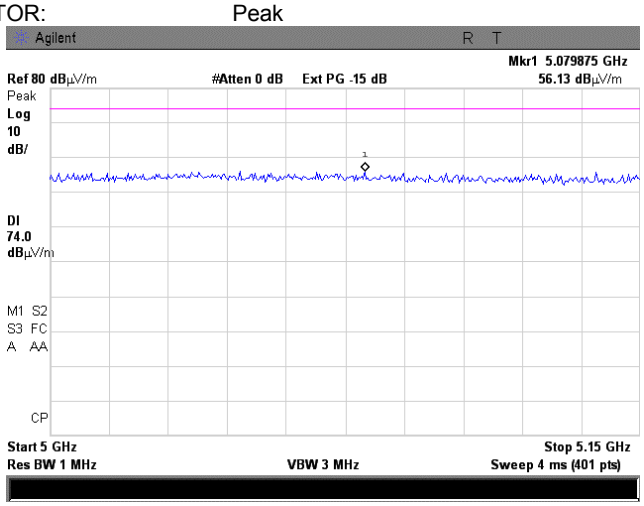
CARRIER FREQUENCY	5335 MHz
CHANNEL BANDWIDTH	10 MHz
MODULATION:	64QAM
DETECTOR:	Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

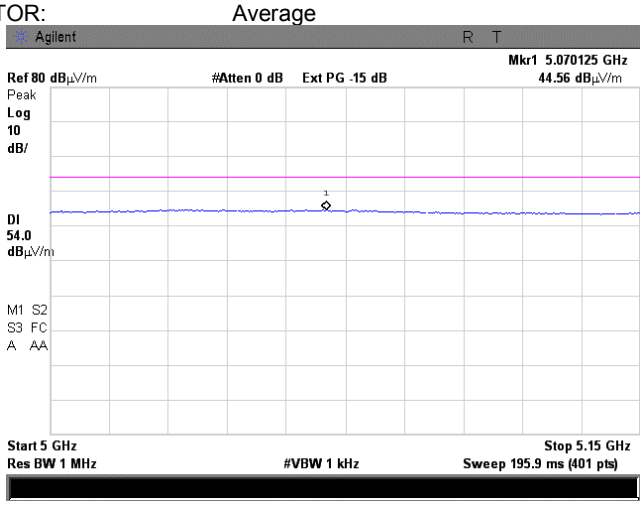
Plot 7.13.5 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.13.6 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

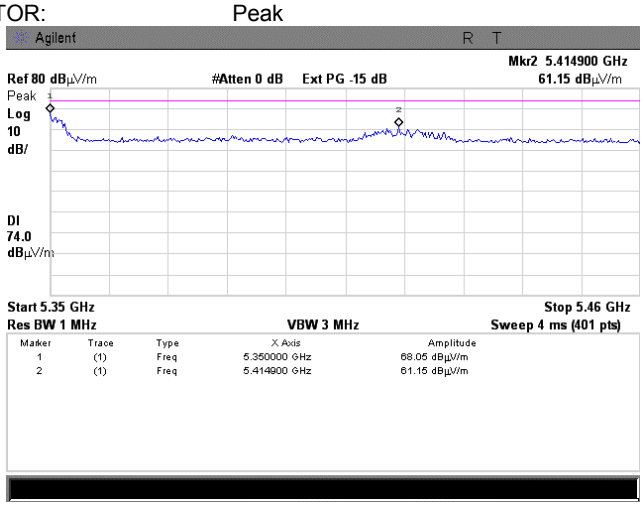
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

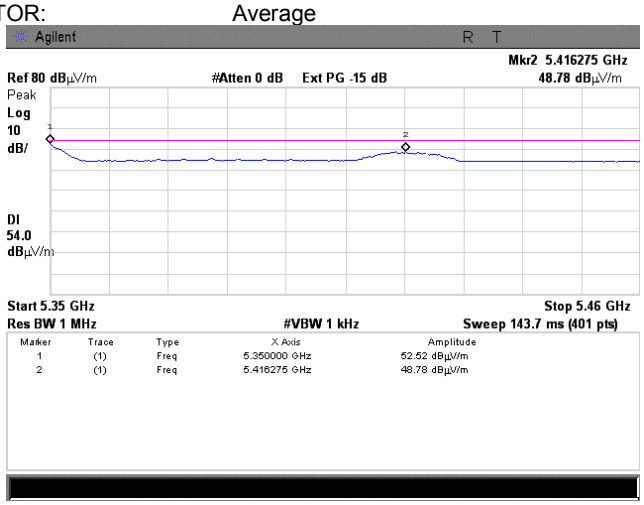
Plot 7.13.7 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, vertical antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.13.8 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, vertical antenna polarization

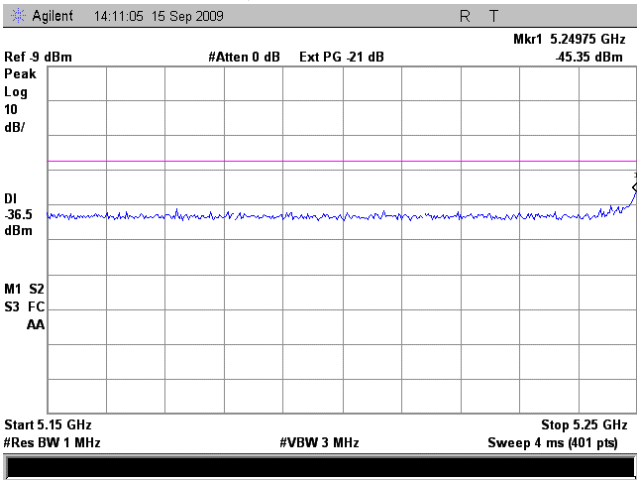
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

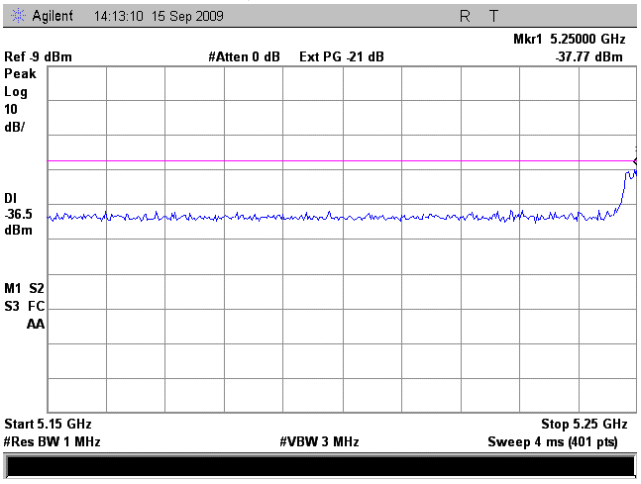
Plot 7.13.9 Conducted spurious emission measurements in 5150 – 5250 MHz range

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM



Plot 7.13.10 Conducted spurious emission measurements in 5150 – 5250 MHz range

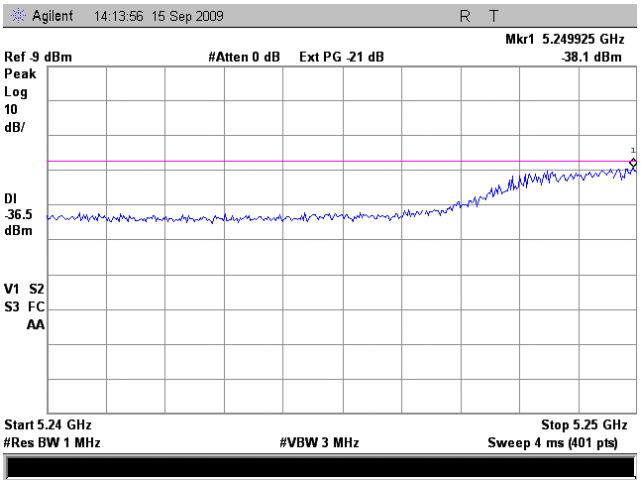
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:09:06 AM		
Temperature: 32 °C	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: SISO mode, 9.5 dBi antenna			

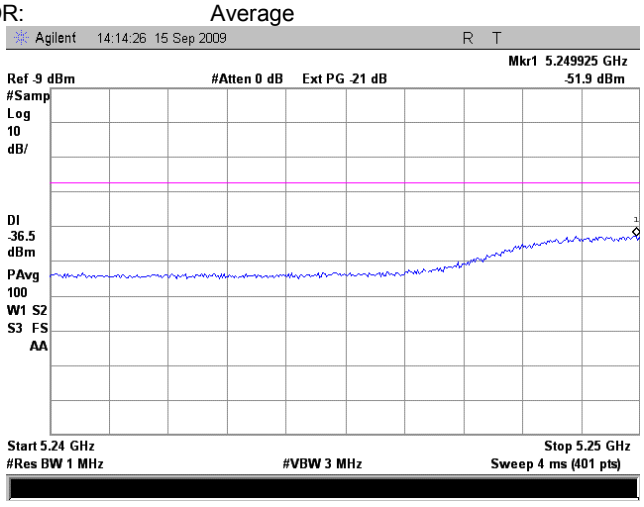
Plot 7.13.11 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.13.12 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

7.14 Band edge spurious emission measurements with 9.5 dBi external antenna, MIMO mode

7.14.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.14.1, Table 7.14.2.

Table 7.14.1 Radiated spurious emission test limits

Assigned frequency range, MHz	EIRP of spurious, dBm/MHz	ıntenna assembl gain, dBi	Resolution ɔandwidth, kHz	Conducted spurious ımissions limit*, dBm/MH
5250 - 5350	-27	9.5	1000	-36.50

* - Conducted limit = EIRP limit – Antenna assembly gain

Table 7.14.2 Radiated spurious emissions limits within restricted bands

Frequency, MHz	Field strength at 3 m, dB(μV/m)***	
	Peak	Average
Above 1000	74.0	54.0

7.14.2 Conducted spurious emission test

7.14.2.1 This test was performed to measure conducted spurious emissions from the EUT near the band edges outside restricted bands and within the pass band of the dedicated EUT's antenna. Specification test limits are given in Table 7.14.1.

7.14.2.2 The EUT and measurement equipment were arranged as shown on Figure 7.14.1.

7.14.2.3 Test results are shown in the Table 7.14.3 and the associated plots.

7.14.3 Radiated spurious emission test

7.14.3.1 This test was performed to measure radiated spurious emission from the EUT near the band edge within the restricted bands. Specification test limits are given in Table 7.14.2.

7.14.3.2 The EUT and measurement equipment were arranged as shown on Figure 7.14.2.

7.14.3.3 Test results are shown in the Table 7.14.4 and the associated plots.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

Figure 7.14.1 Setup for conducted spurious emissions

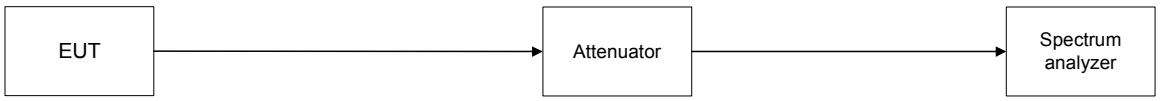
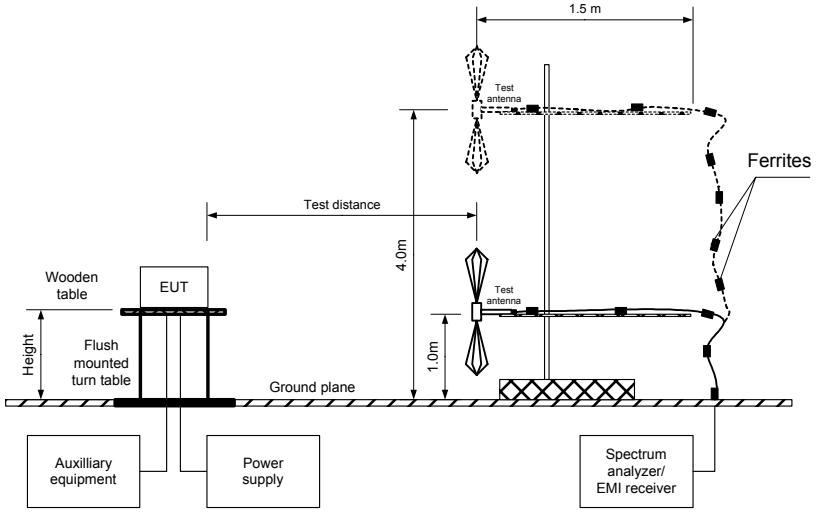


Figure 7.14.2 Setup for spurious emission field strength measurements above 1000 MHz



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

Table 7.14.3 Conducted spurious emission test results at low edge

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain, dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5250.00	64QAM	5	-44.4	-27	9.5	-34.9	-7.9	Pass
5250.00	64QAM	10	-38.35	-27	9.5	-28.85	-1.85	Pass

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Average
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain, dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5250.00	64QAM	10	-50.71	-27	9.5	-41.21	-14.21	Pass

* - EIRP = SA reading (dBm) + Antenna assembly gain
**- Margin = EIRP – specified limit.

Reference numbers of test equipment used

HL 2780	HL 2883	HL 3176					

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

Table 7.14.4 Field strength of spurious emissions at high edge

ASSIGNED FREQUENCY RANGE: 5.25-5.35 GHz
TEST DISTANCE: 3 m
MODULATION: 64QAM
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1000 kHz
TEST ANTENNA TYPE: Double ridged guide

Frequency MHz	Antenna Polarization	Antenna Height m	Azimuth degrees*	Peak field strength(VBW=3 MHz Measured dB(μV/m)	Peak field strength(VBW=3 MHz Limit, dB(μV/m	Peak field strength(VBW=3 MHz Margin, dB**	Average field strength(VBW=10 Hz) Measured dB(μV/m)	Average field strength(VBW=10 Hz) Calculated dB(μV/m)	Average field strength(VBW=10 Hz) Limit, dB(μV/m	Average field strength(VBW=10 Hz) Margin dB***	Verdict
High carrier frequency 10 MHz EBW											
5350.000	Vertical	1.2	000	70.28	74.00	-3.72	55.20	50.77	54.00	-3.23	Pass
5409.950	Horizontal	1.0	120	59.65	74.00	-14.35	47.87	43.44	54.00	-10.56	
High carrier frequency 5 MHz EBW											
5350.000	Vertical	1.2	000	64.56	74.00	-9.44	49.26	44.83	54.00	-9.17	Pass
5414.900	Horizontal	1.0	120	60.70	74.00	-13.30	49.27	44.84	54.00	-9.16	

*- EUT front panel refers to 0 degrees position of turntable.
** - Margin, dB = Measured, dB(μV/m) – Limit, dB(μV/m)
*** - Margin, dB = Calculated, dB(μV/m) – Limit, dB(μV/m)

Table 7.14.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
3	5				-4.43

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Reference numbers of test equipment used

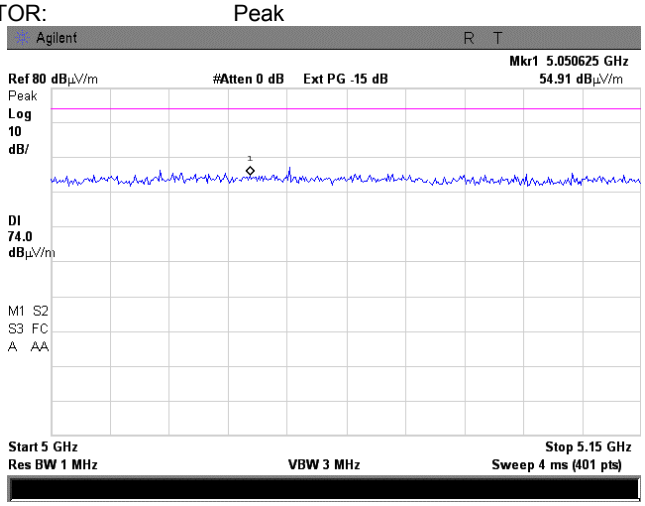
HL 0554	HL 1521	HL 1984	HL 3122	HL 3616			

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

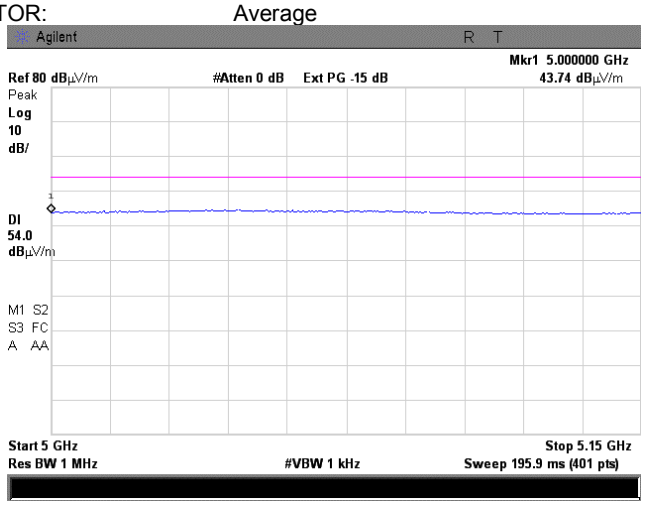
Plot 7.14.1 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.14.2 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

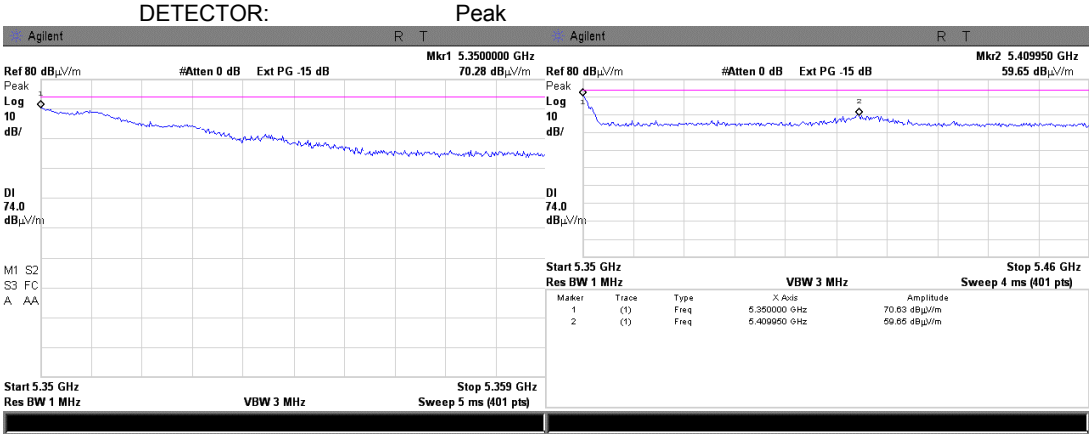
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

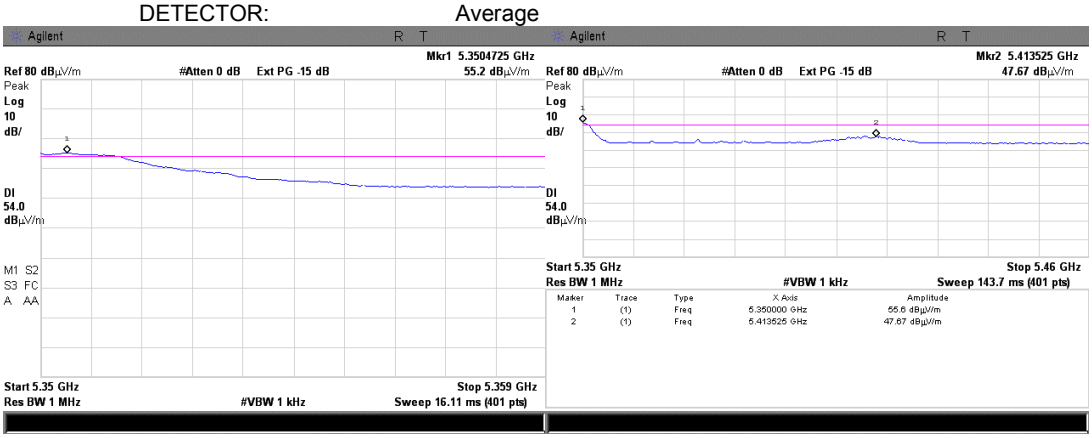
Plot 7.14.3 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical antenna polarization

CARRIER FREQUENCY	5335 MHz
CHANNEL BANDWIDTH	10 MHz
MODULATION:	64QAM
DETECTOR:	Peak



Plot 7.14.4 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency, vertical antenna polarization

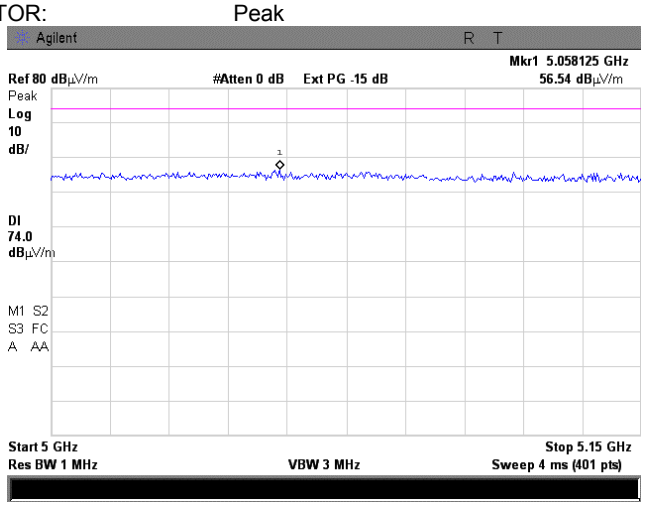
CARRIER FREQUENCY	5335 MHz
CHANNEL BANDWIDTH	10 MHz
MODULATION:	64QAM
DETECTOR:	Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

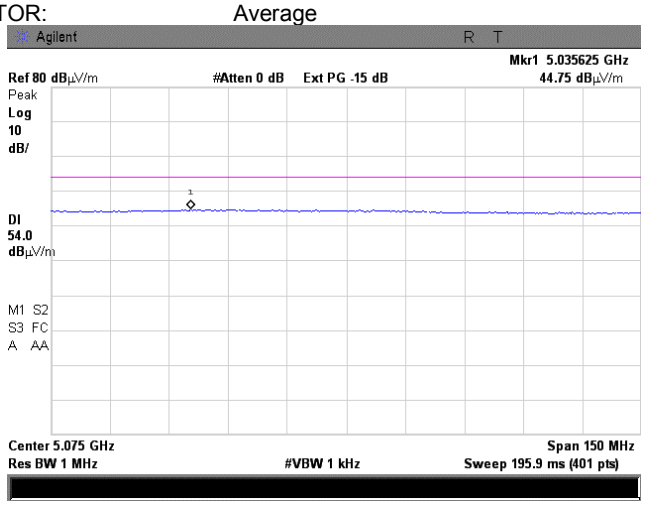
Plot 7.14.5 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.14.6 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency, vertical & horizontal antenna polarization

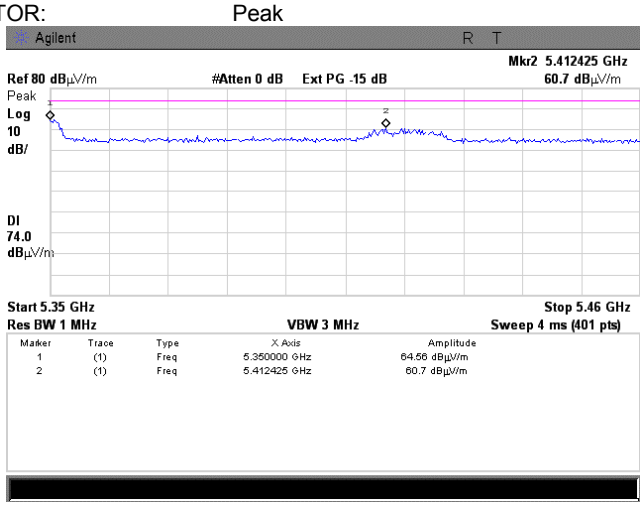
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

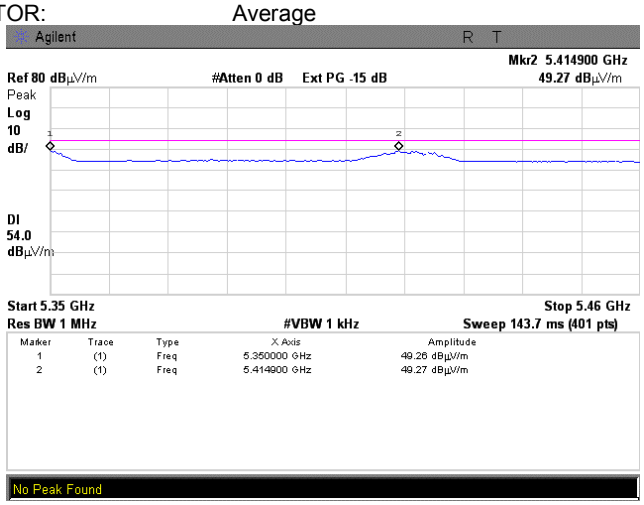
Plot 7.14.7 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency, vertical & horizontal antenna polarization

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.14.8 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier , vertical & horizontal antenna polarization

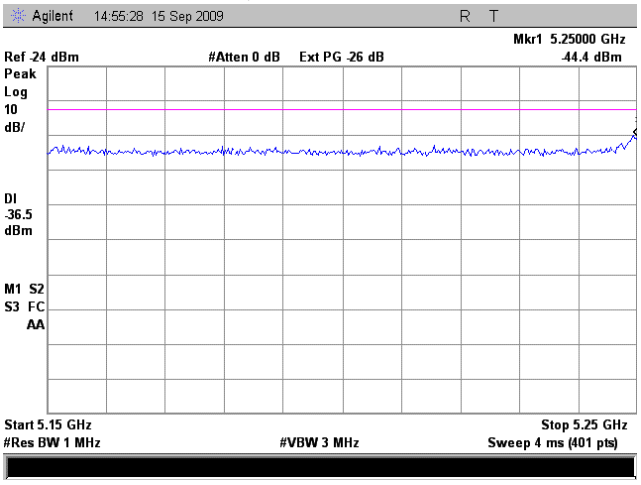
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 ºC	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

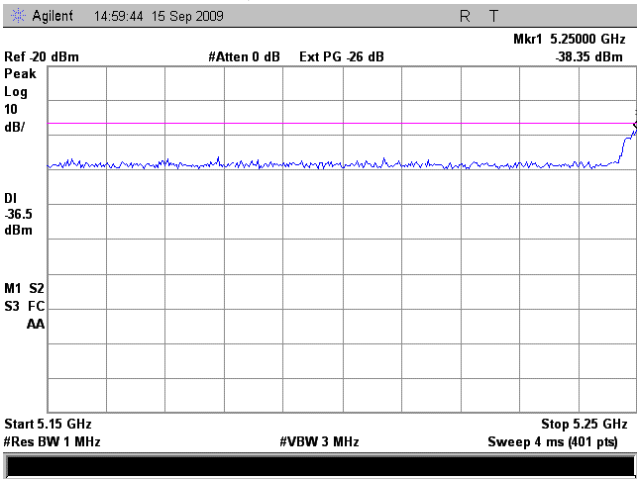
Plot 7.14.9 Conducted spurious emission measurements in 5150 – 5250 MHz range

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM



Plot 7.14.10 Conducted spurious emission measurements in 5150 – 5250 MHz range

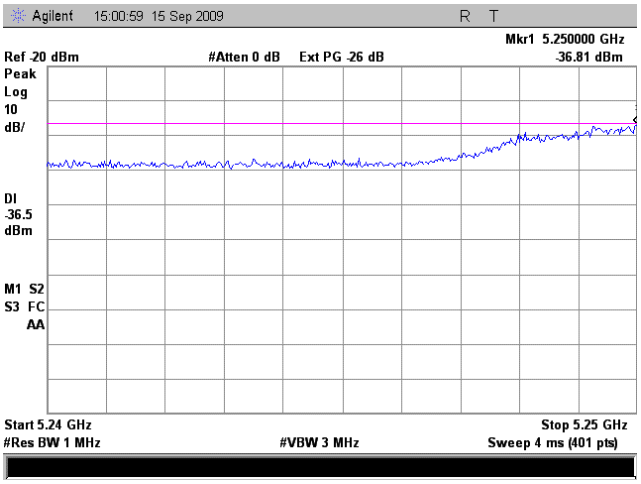
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/23/2009 9:08:59 AM		
Temperature: 32 °C	Air Pressure: 1013 hPa	Relative Humidity: 45 %	Power Supply: 120 VAC
Remarks: MIMO mode, 9.5 dBi antenna			

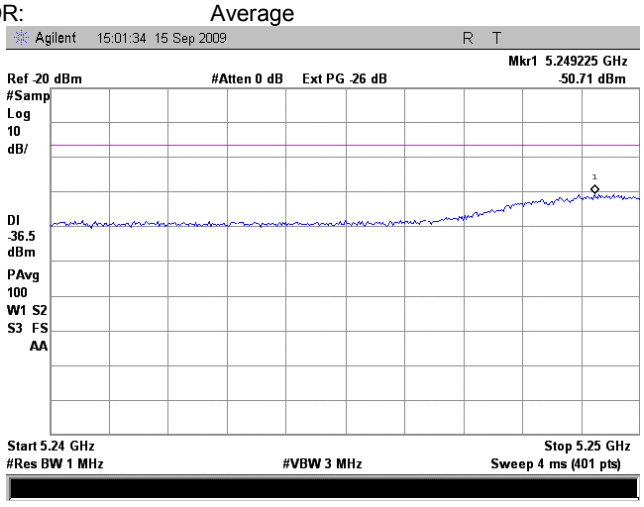
Plot 7.14.11 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Peak



Plot 7.14.12 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR: Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

7.15 Band edge spurious emission measurements with 6.5 dBi external antenna, MIMO mode

7.15.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.15.1, Table 7.15.2.

Table 7.15.1 Radiated spurious emission test limits

Assigned frequency range, MHz	EIRP of spurious, dBm/MHz	ıntenna assembl gain, dBi	Resolution ɔandwidth, kHz	Conducted spurious ımissions limit*, dBm/MH
5250 - 5350	-27	5.8	1000	-32.8

* - Conducted limit = EIRP limit – Antenna assembly gain

Table 7.15.2 Radiated spurious emissions limits within restricted bands

Frequency, MHz	Field strength at 3 m, dB(µV/m)***	
	Peak	Average
Above 1000	74.0	54.0

7.15.2 Conducted spurious emission test

7.15.2.1 This test was performed to measure conducted spurious emissions from the EUT near the band edges outside restricted bands and within the pass band of the dedicated EUT's antenna. Specification test limits are given in Table 7.15.1.

7.15.2.2 The EUT and measurement equipment were arranged as shown on Figure 7.15.1.

7.15.2.3 Test results are shown in the Table 7.15.3 and the associated plots.

7.15.3 Radiated spurious emission test

7.15.3.1 This test was performed to measure radiated spurious emission from the EUT near the band edge within the restricted bands. Specification test limits are given in Table 7.15.2.

7.15.3.2 The EUT and measurement equipment were arranged as shown on Figure 7.15.2.

7.15.3.3 Test results are shown in the Table 7.15.4 and the associated plots.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 59 %	**Power Supply:** 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

Figure 7.15.1 Setup for conducted spurious emissions

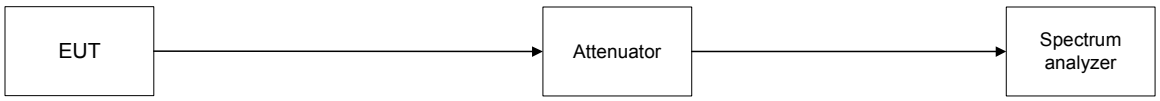
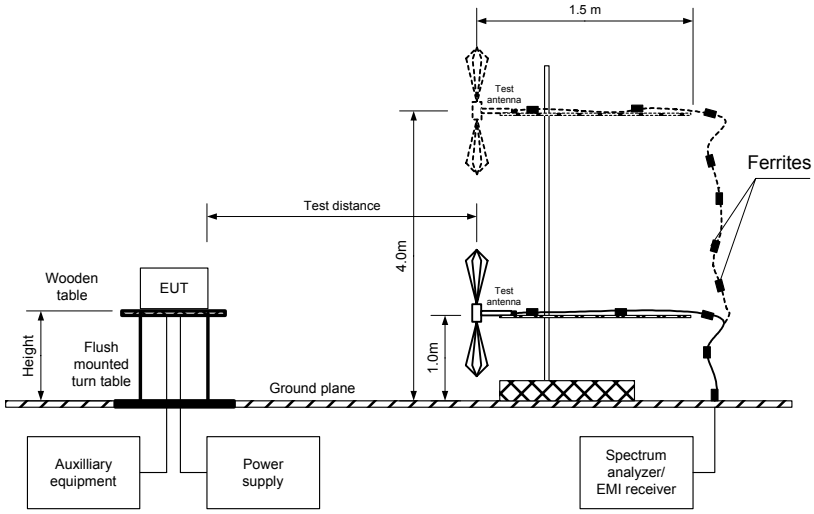


Figure 7.15.2 Setup for spurious emission field strength measurements above 1000 MHz



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

Table 7.15.3 Conducted spurious emission test results at low edge

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain. dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5250.00	64QAM	5	-33.50	-27	5.8	-27.70	-0.30	Pass
5250.00	64QAM	10	-35.79	-27	5.8	-29.99	-2.99	Pass

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Average
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain. dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5250.00	64QAM	10	-45.25	-27	5.8	-39.45	-12.45	Pass

* - EIRP = SA reading (dBm) + Antenna assembly gain

**- Margin = EIRP – specified limit.

Reference numbers of test equipment used

HL 2909	HL 2952	HL 3439	HL 3440				

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

Table 7.15.4 Field strength of spurious emissions at high edge

ASSIGNED FREQUENCY: 5.25-5.35 GHz
TEST DISTANCE: 3 m
MODULATION: 64QAM
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1000 kHz
TEST ANTENNA TYPE: Double ridged guide

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=1 kHz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
High carrier frequency 10 MHz EBW											
5350.000	V	1.2	000	72.02	74.00	-1.98	56.55	52.12	54.00	-1.88	Pass
High carrier frequency 5 MHz EBW											
5350.000	V	1.2	000	69.42	74.00	-4.58	55.38	50.95	54.00	-3.05	Pass

Note: All plots provided for test antenna vertical polarization as represented the worst case of emissions.
*- EUT front panel refers to 0 degrees position of turntable.
** - Margin, dB = Measured, dB(μV/m) – Limit, dB(μV/m)
*** - Margin, dB = Calculated, dB(μV/m) – Limit, dB(μV/m)

Table 7.15.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
3	5				-4.43

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Reference numbers of test equipment used

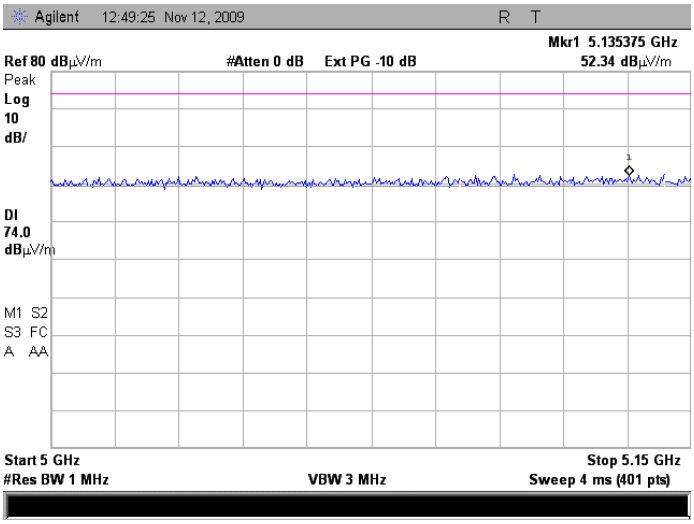
HL 2016	HL 2017	HL 2432	HL 2883	HL 2909	HL 3531		

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

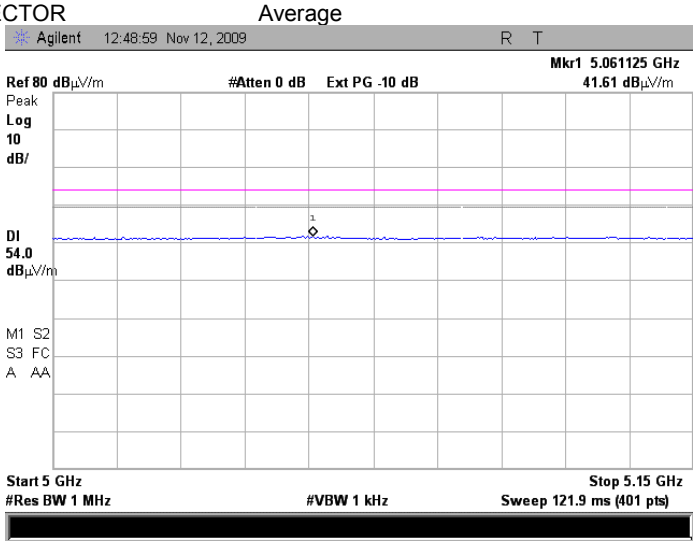
Plot 7.15.1 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR Peak



Plot 7.15.2 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency

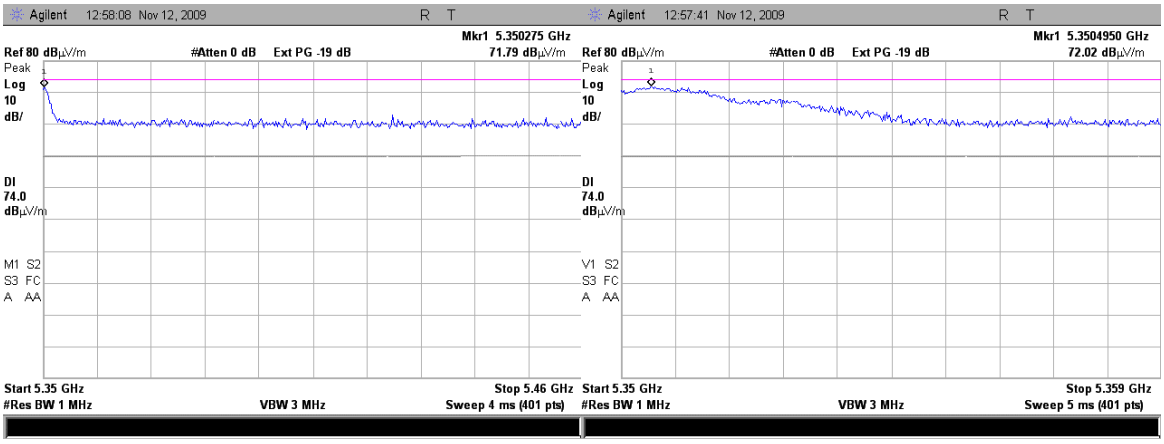
CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM
DETECTOR Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

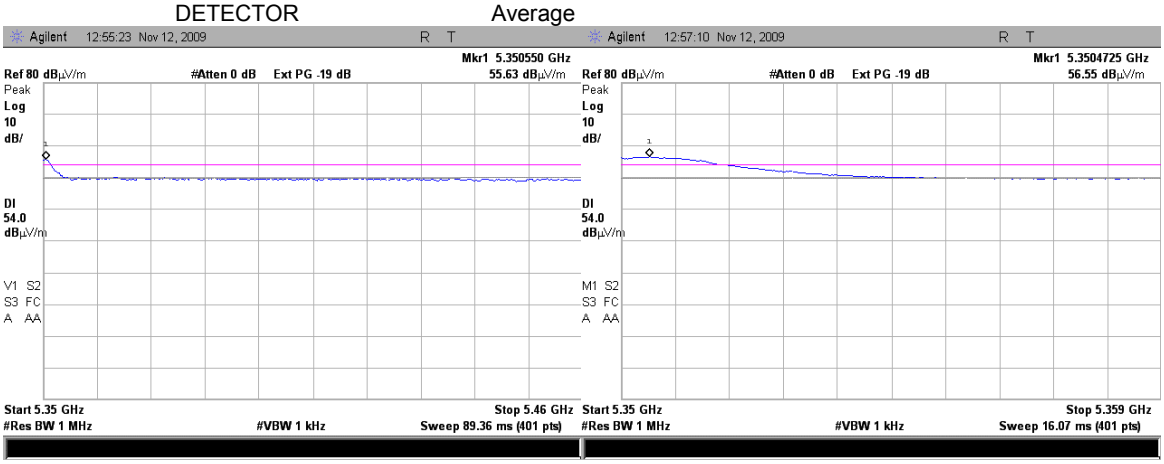
Plot 7.15.3 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency

CARRIER FREQUENCY	5335 MHz
CHANNEL BANDWIDTH	10 MHz
MODULATION:	64QAM
DETECTOR	Peak



Plot 7.15.4 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency

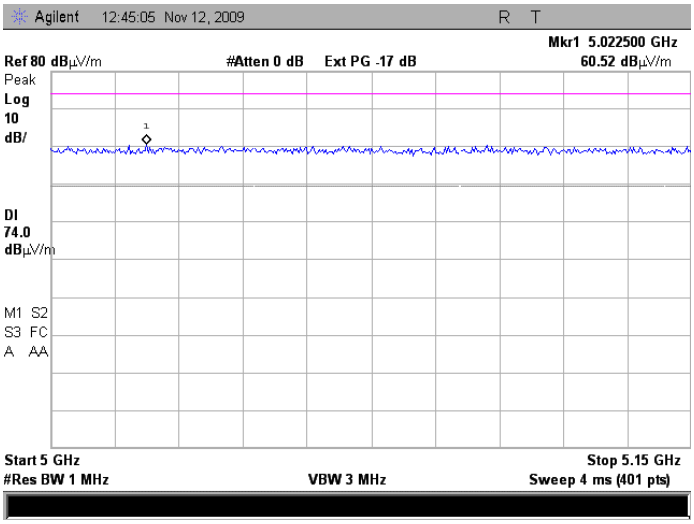
CARRIER FREQUENCY	5335 MHz
CHANNEL BANDWIDTH	10 MHz
MODULATION:	64QAM
DETECTOR	Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

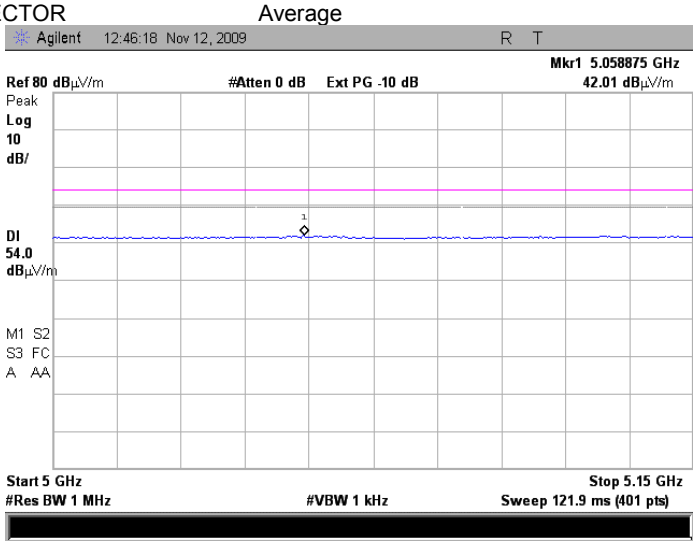
Plot 7.15.5 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR Peak



Plot 7.15.6 Radiated spurious emission measurements at the band edges in 5.0 – 5.15 GHz range at low carrier frequency

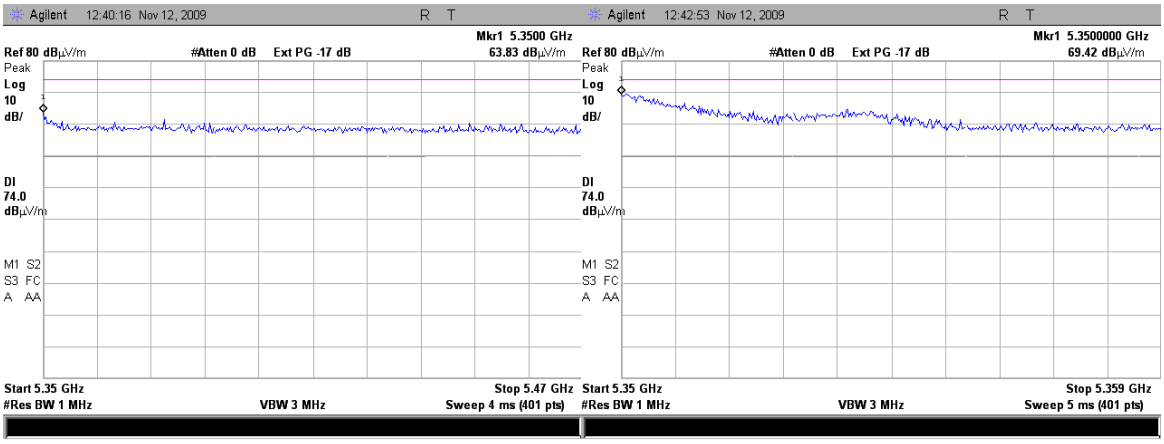
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

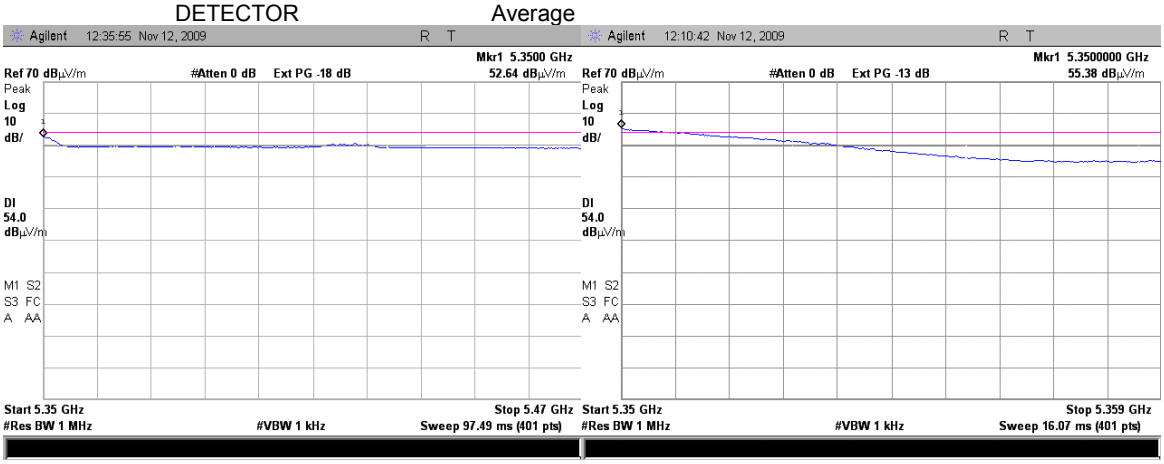
Plot 7.15.7 Radiated spurious emission measurements at the band edges in 5.35 –5.47 GHz range at high carrier frequency

CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR Peak



Plot 7.15.8 Radiated spurious emission measurements at the band edges in 5.35 –5.47 GHz range at high carrier frequency

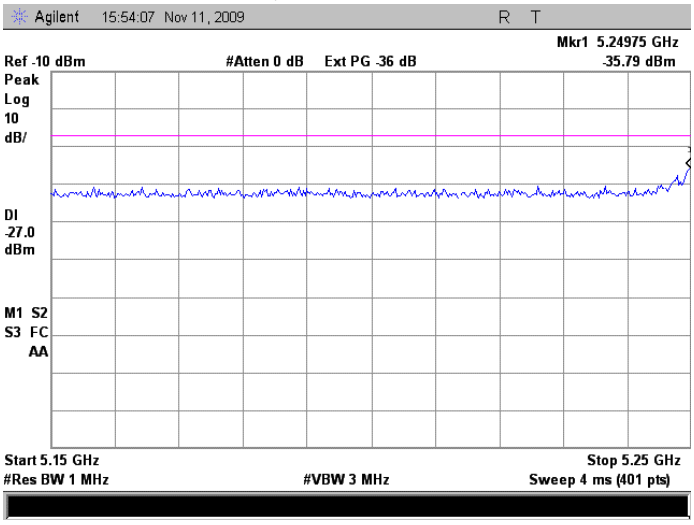
CARRIER FREQUENCY 5340 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM
DETECTOR Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

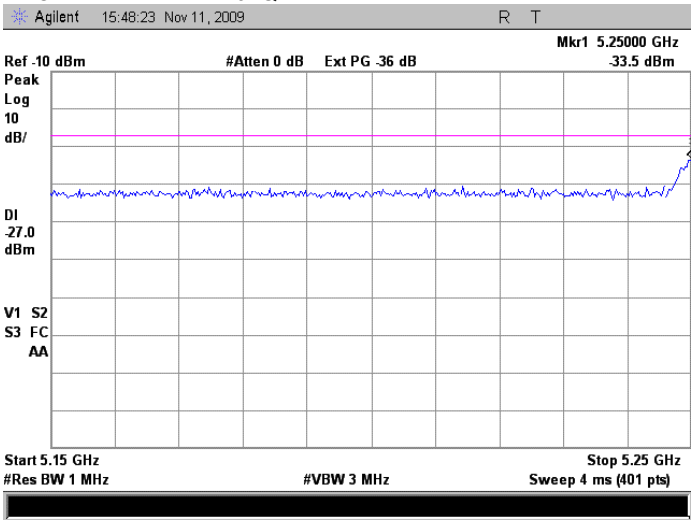
Plot 7.15.9 Conducted spurious emission measurements in 5150 – 5250 MHz range

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM



Plot 7.15.10 Conducted spurious emission measurements in 5150 – 5250 MHz range

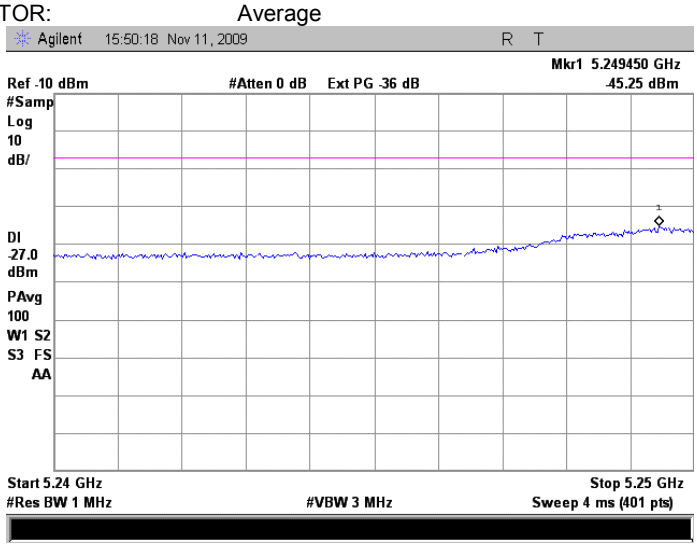
CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: MIMO mode, 6.5 dBi antenna			

Plot 7.15.11 Conducted spurious emission measurements in 5240 – 5250 MHz range

CARRIER FREQUENCY	5260 MHz
CHANNEL BANDWIDTH	5 MHz
MODULATION:	64QAM
DETECTOR:	Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: SISO mode, 6.5 dBi antenna			

7.16 Band edge spurious emission measurements with 6.5 dBi external antenna, SISO mode

7.16.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.16.1, Table 7.16.2.

Table 7.16.1 Radiated spurious emission test limits

Assigned frequency range, MHz	EIRP of spurious, dBm/MHz	ıntenna assembl gain, dBi	Resolution ɔandwidth, kHz	Conducted spurious ımissions limit*, dBm/MH
5250 - 5350	-27	5.8	1000	-32.8

* - Conducted limit = EIRP limit – Antenna assembly gain

Table 7.16.2 Radiated spurious emissions limits within restricted bands

Frequency, MHz	Field strength at 3 m, dB(µV/m)***	
	Peak	Average
Above 1000	74.0	54.0

7.16.2 Conducted spurious emission test

7.16.2.1 This test was performed to measure conducted spurious emissions from the EUT near the band edges outside restricted bands and within the pass band of the dedicated EUT's antenna. Specification test limits are given in Table 7.16.1.

7.16.2.2 The EUT and measurement equipment were arranged as shown on Figure 7.16.1.

7.16.2.3 Test results are shown in the Table 7.16.3 and the associated plots.

7.16.3 Radiated spurious emission test

7.16.3.1 This test was performed to measure radiated spurious emission from the EUT near the band edge within the restricted bands. Specification test limits are given in Table 7.16.2.

7.16.3.2 The EUT and measurement equipment were arranged as shown on Figure 7.16.2.

7.16.3.3 Test results are shown in the Table 7.16.4 and the associated plots.

Test specification:	**FCC section 15.407(b), Spurious emissions at band edges**		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 59 %	**Power Supply:** 120 VAC
Remarks: SISO mode, 6.5 dBi antenna			

Figure 7.16.1 Setup for conducted spurious emissions

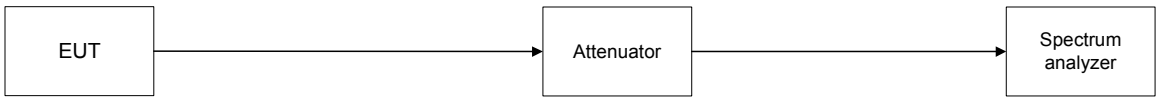
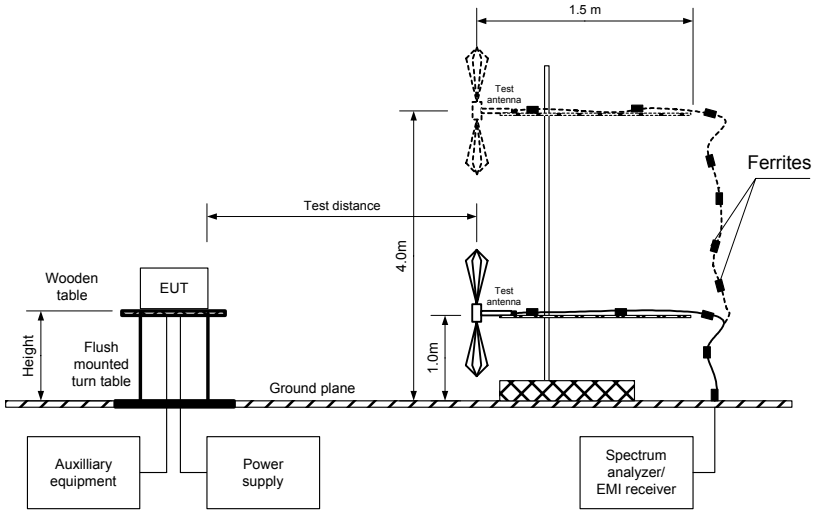


Figure 7.16.2 Setup for spurious emission field strength measurements above 1000 MHz



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: SISO mode, 6.5 dBi antenna			

Table 7.16.3 Conducted spurious emission test results at low edge

ASSIGNED FREQUENCY RANGE: 5250 – 5350 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz
VIDEO BANDWIDTH: 3000 kHz
MODULATING SIGNAL: OFDM

Frequency, MHz	Modulation	CBW, MHz	SA reading, dBm	Limit, dBm/MHz	Antenna assembly gain, dBi	EIRP*, dBm/MHz	Margin**, dB	Verdict
5250.00	64QAM	5	-35.11	-27.00	5.8	-29.31	-2.31	Pass
5249.75	64QAM	10	-40.63	-27.00	5.8	-34.83	-7.83	Pass

* - EIRP = SA reading (dBm) + Antenna assembly gain

**- Margin = EIRP, dBm – specified limit.

Reference numbers of test equipment used

HL 2909	HL 2952	HL 3439	HL 3440				

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: SISO mode, 6.5 dBi antenna			

Table 7.16.4 Field strength of spurious emissions at high edge

ASSIGNED FREQUENCY: 5.25-5.35 GHz
TEST DISTANCE: 3 m
MODULATION: QPSK/64QAM
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1000 kHz
TEST ANTENNA TYPE: Double ridged guide

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=1 kHz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
10 MHz EBW											
High carrier frequency											
5350.00	V	1.2	010	72.06	74.00	-1.94	55.96	51.53	54.00	-2.47	Pass
5 MHz EBW											
High carrier frequency											
5350.000	V	1.2	010	68.64	74.00	-5.36	54.11	49.68	54.00	-4.32	Pass

Note: All plots provided for test antenna vertical polarization as represented the worst case of emissions.
*- EUT front panel refers to 0 degrees position of turntable.
** - Margin, dB = Measured, dB(μV/m) – Limit, dB(μV/m)
*** - Margin, dB = Calculated, dB(μV/m) – Limit, dB(μV/m)

Table 7.16.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
3.0	5.0	-	-	-	-4.43

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Reference numbers of test equipment used

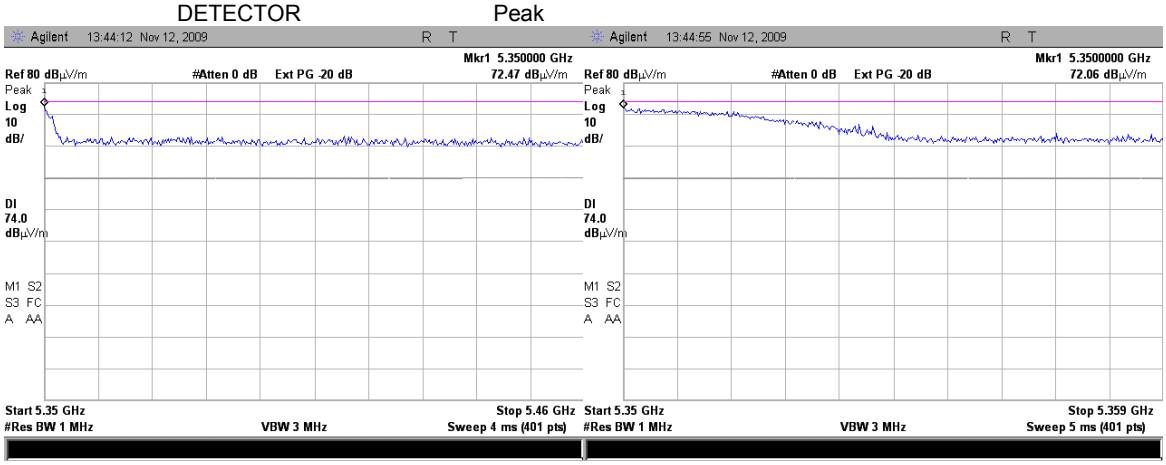
HL 2016	HL 2017	HL 2432	HL 2883	HL 3531			

Full description is given in Appendix A.

Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: SISO mode, 6.5 dBi antenna			

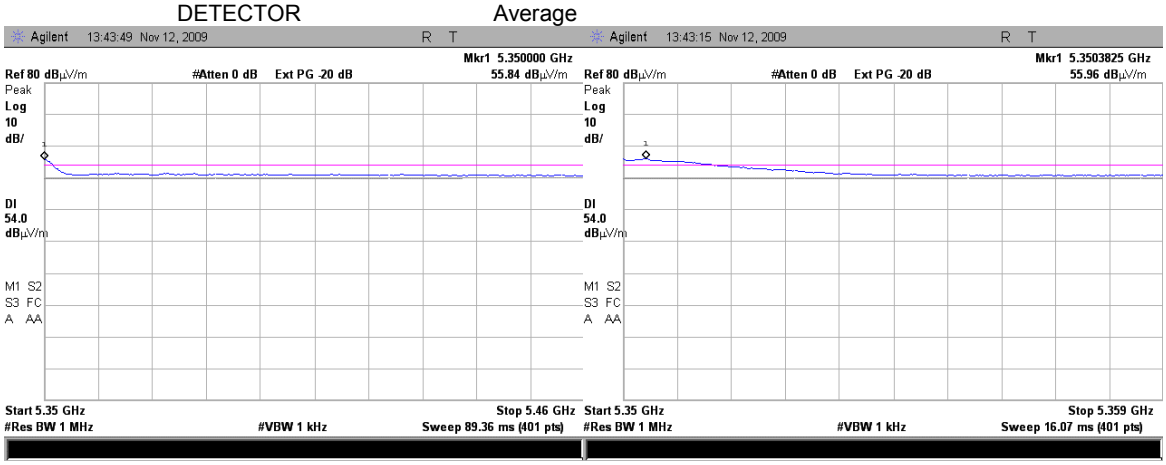
Plot 7.16.1 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency

CARRIER FREQUENCY	5335 MHz
CHANNEL BANDWIDTH	10 MHz
MODULATION:	64QAM
DETECTOR	Peak



Plot 7.16.2 Radiated spurious emission measurements at the band edges in 5.35 – 5.46 GHz range at high carrier frequency

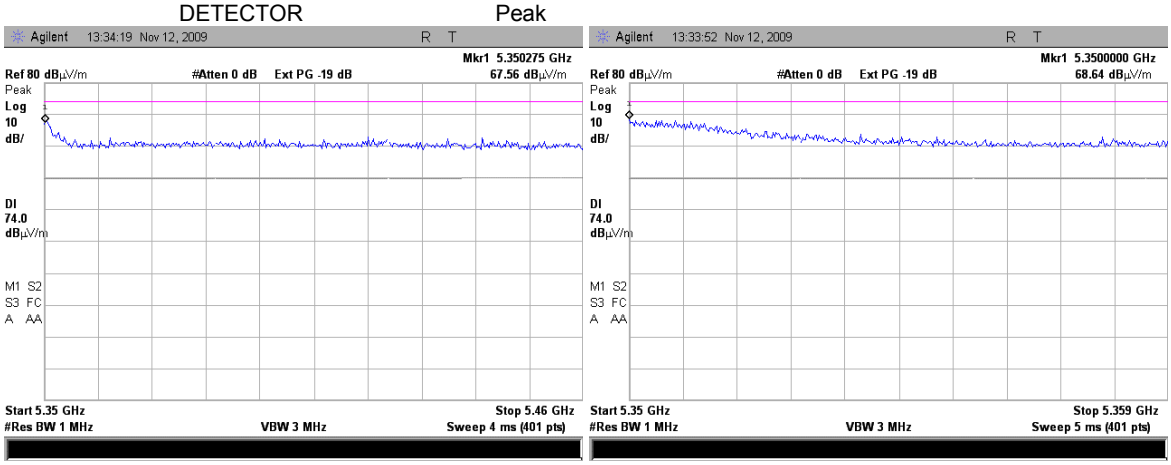
CARRIER FREQUENCY	5335 MHz
CHANNEL BANDWIDTH	10 MHz
MODULATION:	64QAM
DETECTOR	Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: SISO mode, 6.5 dBi antenna			

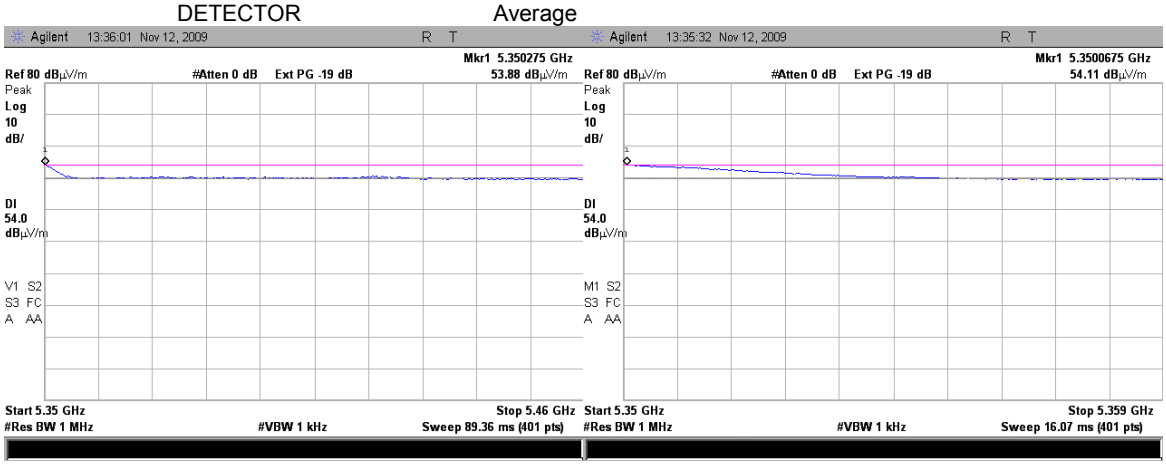
Plot 7.16.3 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency

CARRIER FREQUENCY	5340 MHz
CHANNEL BANDWIDTH	5 MHz
MODULATION:	64QAM
DETECTOR	Peak



Plot 7.16.4 Radiated spurious emission measurements at the band edges in 5.35 –5.46 GHz range at high carrier frequency

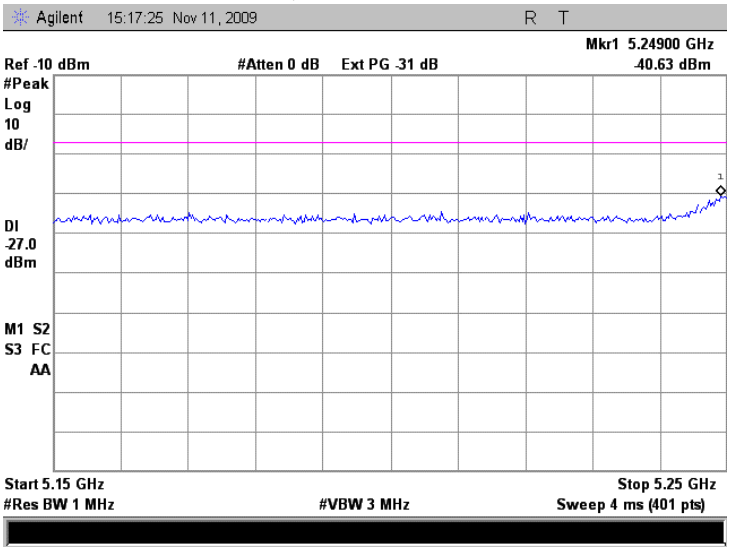
CARRIER FREQUENCY	5340 MHz
CHANNEL BANDWIDTH	5 MHz
MODULATION:	64QAM
DETECTOR	Average



Test specification:	FCC section 15.407(b), Spurious emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2009 12:24:57 PM		
Temperature: 26.0 ºC	Air Pressure: 1013 hPa	Relative Humidity: 59 %	Power Supply: 120 VAC
Remarks: SISO mode, 6.5 dBi antenna			

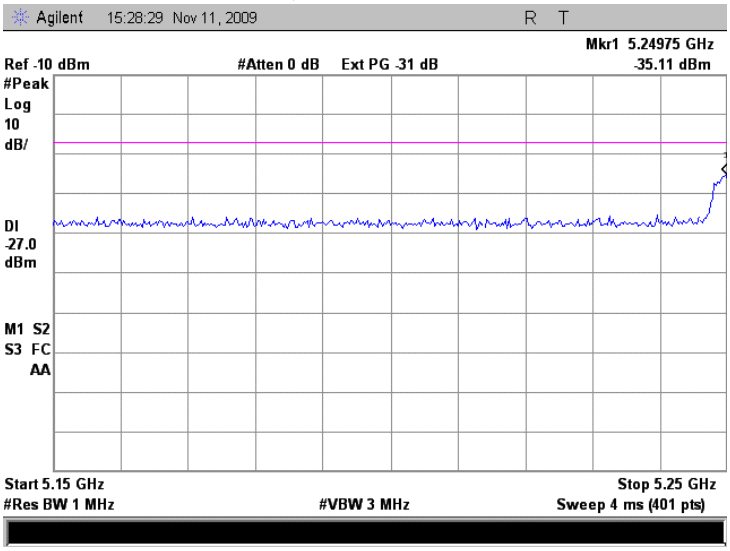
Plot 7.16.5 Conducted spurious emission measurements in 5150 – 5250 MHz range

CARRIER FREQUENCY 5265 MHz
CHANNEL BANDWIDTH 10 MHz
MODULATION: 64QAM



Plot 7.16.6 Conducted spurious emission measurements in 5150 – 5250 MHz range

CARRIER FREQUENCY 5260 MHz
CHANNEL BANDWIDTH 5 MHz
MODULATION: 64QAM



Test specification:	FCC section 15.407(g), Frequency stability		
Test procedure:	47 CFR, Section 2.1055		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 4:03:41 PM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC or 48 VDC
Remarks:			

7.17 Frequency stability test

7.17.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.17.1.

Table 7.17.1 Frequency stability limits

Assigned frequency band, MHz	Maximum allowed frequency displacement
5250 - 5350	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual

7.17.2 Test procedure

7.17.2.1 The EUT was set up as shown in Figure 7.17.1, energized and its proper operation was checked.

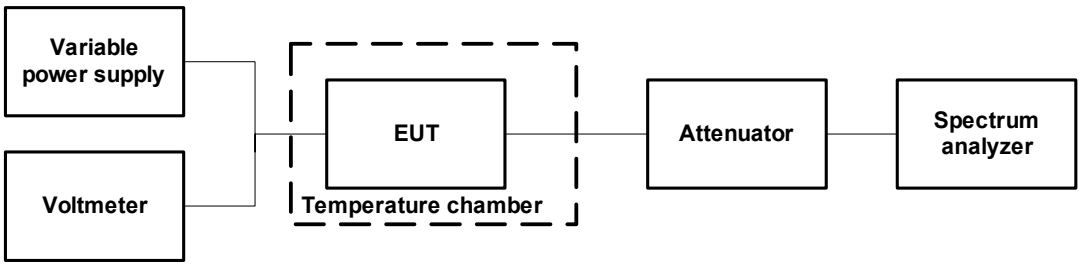
7.17.2.2 The EUT power was turned off. Temperature within test chamber was set to the required one and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.

7.17.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then after 2, 5 and 10 minutes. The EUT was powered off.

7.17.2.4 The above procedure was repeated at the rest of the test temperatures and voltages as provided in Table 7.17.2.

7.17.2.5 Frequency displacement was calculated and compared with the limit as provided in Table 7.17.2.

Figure 7.17.1 Frequency stability test setup



Test specification:	FCC section 15.407(g), Frequency stability		
Test procedure:	47 CFR, Section 2.1055		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 4:03:41 PM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC or 48 VDC
Remarks:			

Table 7.17.2 Frequency stability test results

ASSIGNID FREQUENCY BAND: 5250 - 5350 MHz
NOMINAL POWER VOLTAGE: 120 VAC
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: Frequency counter
RESOLUTION BANDWIDTH: 1 kHz
VIDEO BANDWIDTH: 3 kHz

Temperature ºC	Voltage, V	Frequency, MHz				Max frequency drift, Hz		Verdict
		Start up	2nd min	5th min	10th min	Positive	Negative	
Low frequency:								
-40	Nominal	5260.004930	5260.004490	5260.004493	5260.003893	5468.00	0.00	
20	Nominal +15%	5259.999462	5259.999452	5259.999435	5259.999415	0.00	-47.00	
20	Nominal	5259.999562	5259.999497	5259.999474	5259.999462	100.00	0.00	Pass
20	Nominal -15%	5259.999338	5259.999318	5259.999292	5259.999261	0.00	-201.00	
60	Nominal	5259.993771	5259.993738	5259.993724	5259.993714	0.00	-5748.00	
High frequency:								
-40	Nominal	5340.004678	5340.003575	5340.003174	5340.003236	5210.00	0.00	
20	Nominal +15%	5339.999403	5339.999390	5339.999375	5339.999324	0.00	-144.00	
20	Nominal	5339.999688	5339.999672	5339.999635	5339.999468	220.00	0.00	Pass
20	Nominal -15%	5339.999239	5339.999227	5339.999209	5339.999181	0.00	-287.00	
60	Nominal	5339.994475	5339.994220	5339.993983	5339.993654	0.00	-5814.00	

NOMINAL POWER VOLTAGE: 48 VDC

Temperature ºC	Voltage, V	Frequency, MHz				Max frequency drift, Hz		Verdict
		Start up	2nd min	5th min	10th min	Positive	Negative	
Low frequency:								
20	Nominal +15%	5260.000443	5260.000434	5260.000419	5260.000347	0.00	-113.00	
20	Nominal	5260.000486	5260.000479	5260.000472	5260.000460	26.00	0.00	
20	Nominal -15%	5260.000314	5260.000271	5260.000172	5260.000055	0.00	-405.00	
High frequency:								
20	Nominal +15%	5340.000402	5340.000392	5340.000390	5340.000340	0.00	-188.00	
20	Nominal	5340.000158	5340.000425	5340.000513	5340.000528	0.00	-370.00	
20	Nominal -15%	5340.000326	5340.000270	5340.000178	5340.000043	0.00	-485.00	

Lower measured* band edge, MHz (Low Channel)	Upper measured* band edge, MHz (High Channel)	Lower specified band edge, MHz (Low Channel)	Upper specified band edge, MHz (High Channel)	Lower Margin**, MHz	Upper Margin**, MHz
5 MHz EBW, 5260.0 MHz					
64QAM					
5257.555	5342.460	5250.0	5350.0	-7.555	-7.54
10 MHz EBW, 5265.0 MHz					
64QAM					
5260.260	5339.770	5250.0	5350.0	-10.26	-10.23

* - Measured under normal test conditions at 26 dBc points
** - Margin = band edge – specified band edge

Note: The lowest frequency margin to the assigned band edges is 7540.0 kHz. Obtained maximum frequency drift is – 5.748 kHz for low channel and 5.210 kHz for high channel and are more than sufficient to guarantee that the intentional emission will remain in the band over the entire operating range of the EUT.

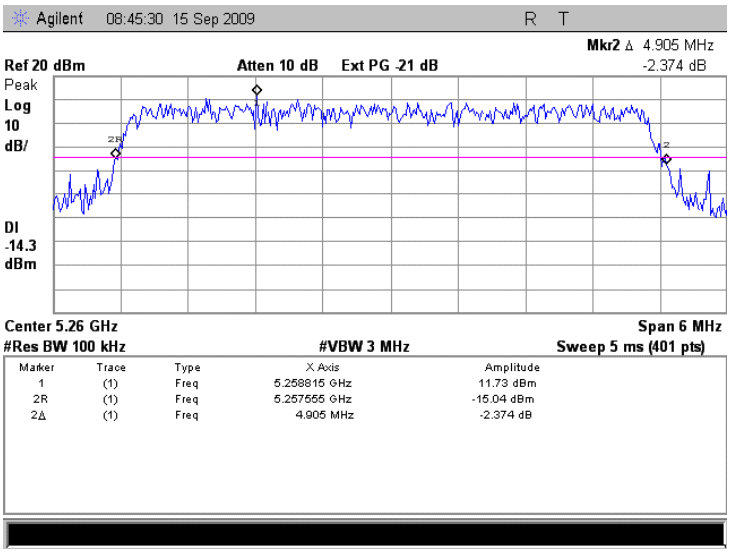
Reference numbers of test equipment used

HL 2909	HL 3286						

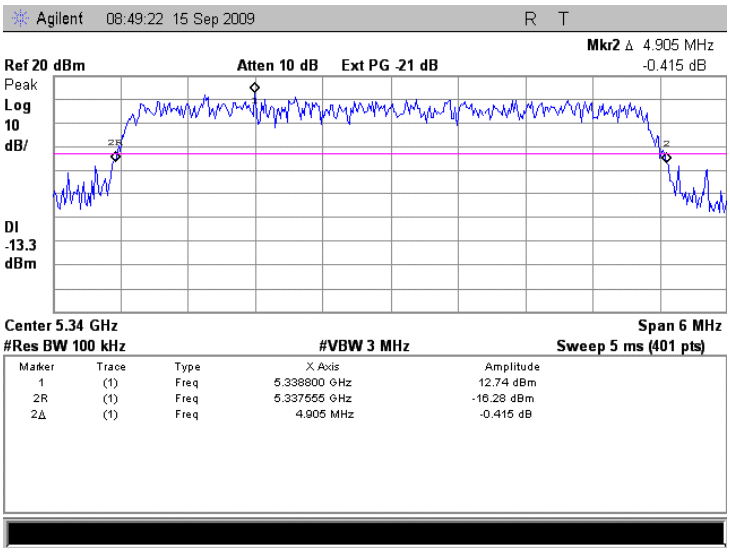
Full description is given in Appendix A.

Test specification:	FCC section 15.407(g), Frequency stability		
Test procedure:	47 CFR, Section 2.1055		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 4:03:41 PM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC or 48 VDC
Remarks:			

Plot 7.17.1 The 26 dB bandwidth test result at low frequency, 64QAM modulation, 5 MHz EBW

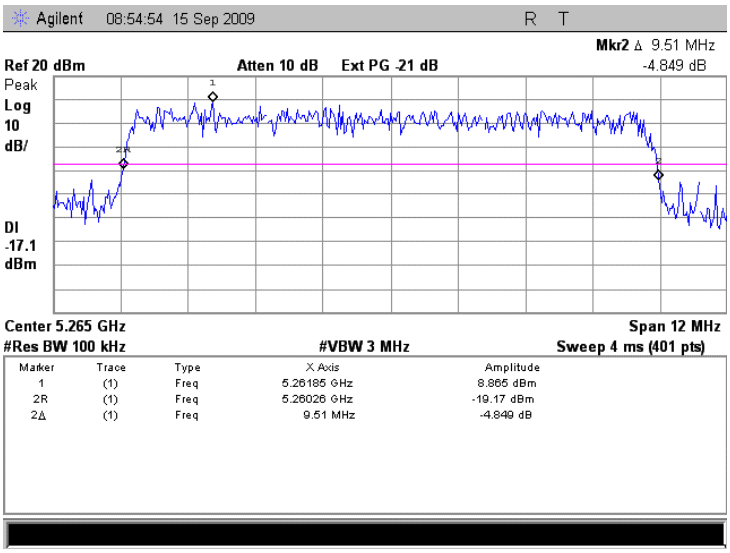


Plot 7.17.2 The 26 dB bandwidth test result at high frequency, 64QAM modulation, 5 MHz EBW

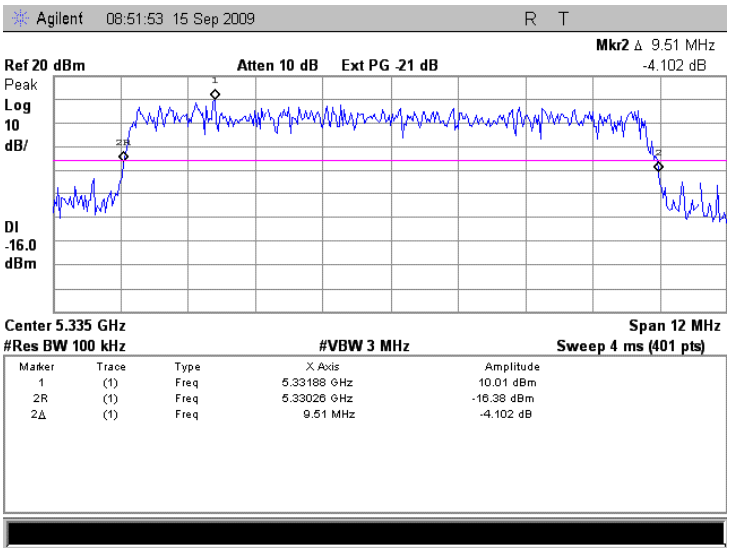


Test specification:	FCC section 15.407(g), Frequency stability		
Test procedure:	47 CFR, Section 2.1055		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 4:03:41 PM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC or 48 VDC
Remarks:			

Plot 7.17.3 The 26 dB bandwidth test result at low frequency 64QAM modulation, 10 MHz EBW



Plot 7.17.4 The 26 dB bandwidth test result at high frequency, 64QAM modulation, 10 MHz EBW



Test specification:	FCC sections 15. 407(b)(6), 15.207(a), Conducted emission		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 4:58:34 PM		
Temperature: 25ºC	Air Pressure: 1011 hPa	Relative Humidity: 45 %	Power Supply: 120VAC
Remarks:			

7.18 Conducted emissions

7.18.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 7.18.1.

Table 7.18.1 Limits for conducted emissions

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

* The limit decreases linearly with the logarithm of frequency.

7.18.2 Test procedure

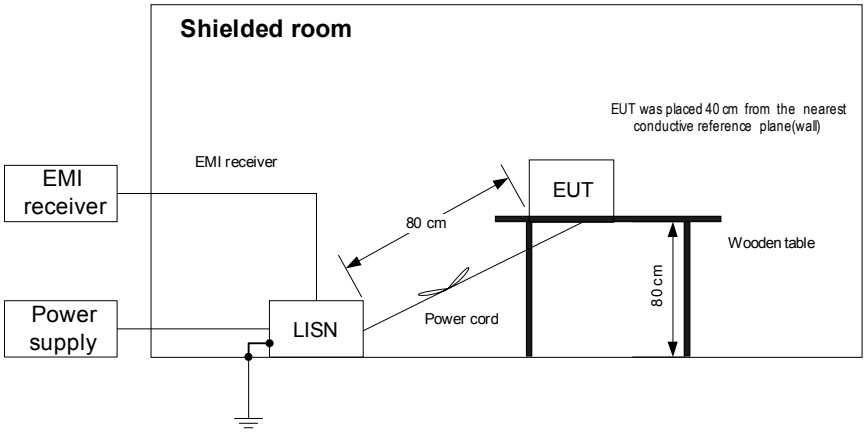
7.18.2.1 The EUT was set up as shown in Figure 7.18.1, energized and the performance check was conducted.

7.18.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.18.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

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

7.18.2.4 The worst test results (the lowest margins) were recorded in Table 7.18.2 and shown in the associated plots.

Figure 7.18.1 Setup for conducted emission measurements, table-top equipment



Test specification:	**FCC sections 15. 407(b)(6), 15.207(a), Conducted emission**		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2009 4:58:34 PM		
Temperature: 25ºC	**Air Pressure:** 1011 hPa	**Relative Humidity:** 45 %	**Power Supply:** 120VAC
Remarks:			

Table 7.18.2 Conducted emission test results

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

Frequency, MHz	Peak emission, dB(µV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*	Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*		
0.187412	50.47	49.45	64.18	-14.73	38.74	54.18	-15.44	L1	Pass
0.250612	49.48	48.58	61.77	-13.19	46.06	51.77	-5.71		
0.319528	44.71	42.81	59.75	-16.94	38.64	49.75	-11.11		
4.992990	44.01	40.22	56.00	-15.78	22.13	46.00	-23.87		
7.088725	48.15	45.38	60.00	-14.62	31.09	50.00	-18.91		
26.488541	48.94	45.54	60.00	-14.46	40.97	50.00	-9.03		
0.187238	50.61	49.51	64.18	-14.67	40.78	54.18	-13.40	L2	Pass
0.250760	50.54	49.71	61.76	-12.05	47.66	51.76	-4.10		
0.311680	49.22	47.76	59.94	-12.18	43.42	49.94	-6.52		
0.441465	44.08	43.24	57.09	-13.85	41.51	47.09	-5.58		
0.500340	43.59	42.61	56.00	-13.39	39.03	46.00	-6.97		
11.647500	46.16	40.75	60.00	-19.25	32.44	50.00	-17.56		
26.610375	49.24	46.23	60.00	-13.77	42.09	50.00	-7.91		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

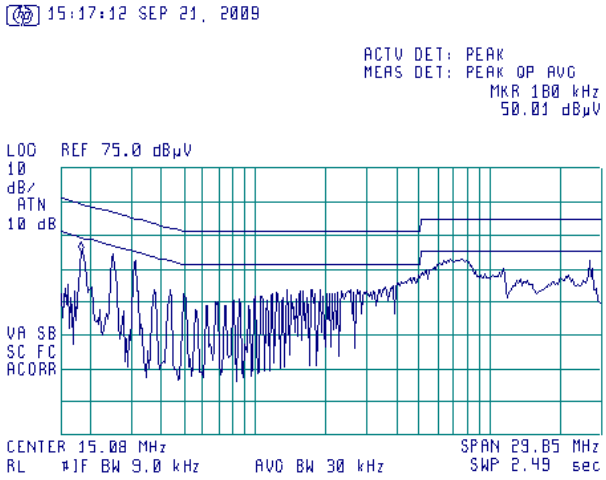
HL 0447	HL 0787	HL 1430	HL 1511	HL 3612			

Full description is given in Appendix A.

Test specification:	FCC sections 15. 407(b)(6), 15.207(a), Conducted emission		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 4:58:34 PM		
Temperature: 25ºC	Air Pressure: 1011 hPa	Relative Humidity: 45 %	Power Supply: 120VAC
Remarks:			

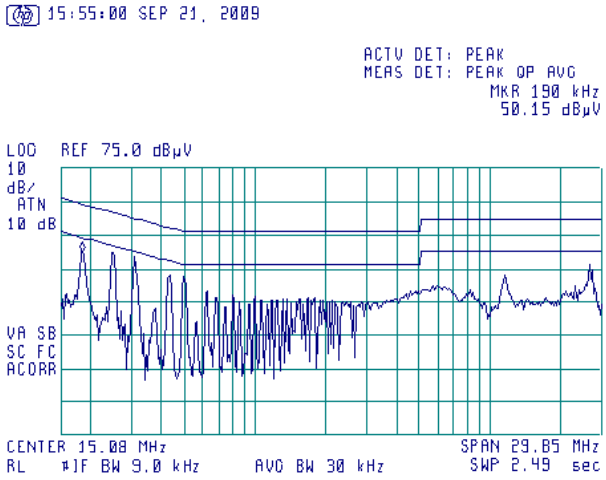
Plot 7.18.1 Conducted emission measurements

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



Plot 7.18.2 Conducted emission measurements

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



Test specification:	Section 15.203, Antenna requirement		
Test procedure:	Visual inspection		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 4:59:49 PM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks:			

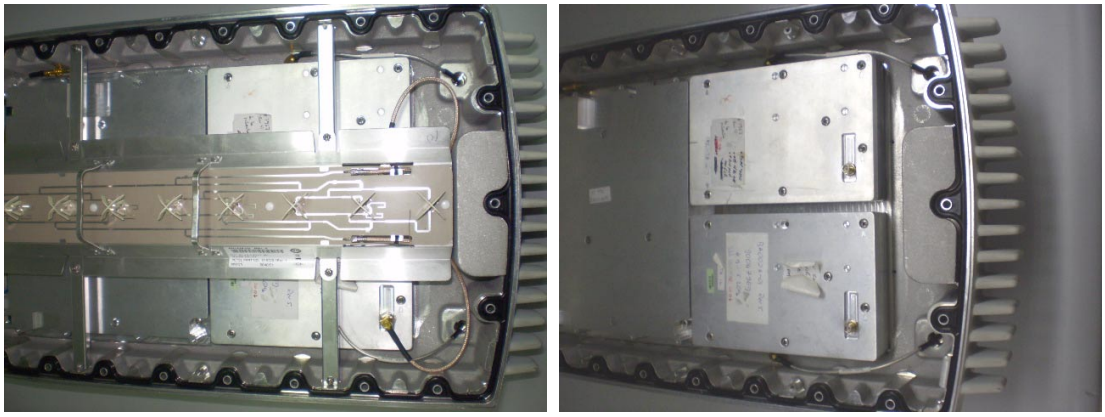
7.19 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.
The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.19.1.

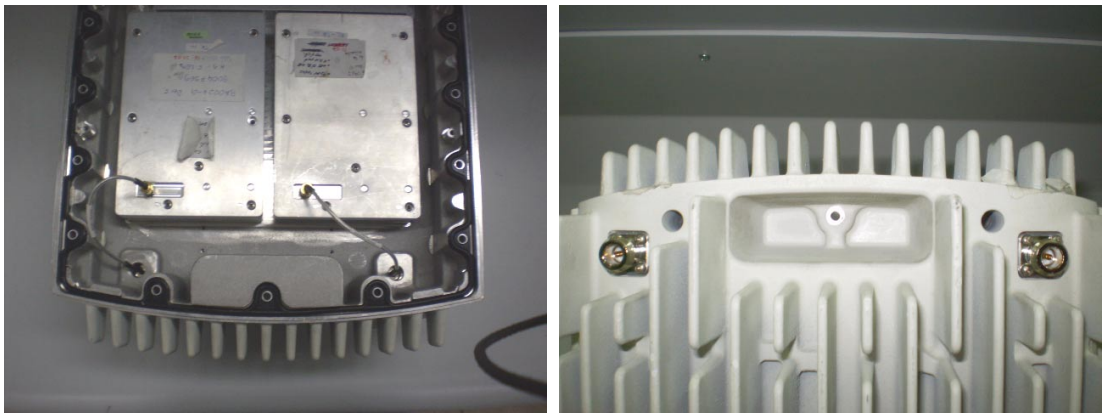
Table 7.19.1 Antenna requirements

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

Photograph 7.19.1 Antenna assembly internal antenna



Photograph 7.19.2 Antenna connectors for external antennas assembly



Test specification:	Section 15.107, Conducted emission at AC power port		
Test procedure:	ANSI C63.4, Sections 11.5 and 12.1.3		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 5:52:51 PM		
Temperature: 24.5ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks:			

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

8.1 Conducted emissions

8.1.1 General

This test was performed to measure common mode conducted emissions at the mains power port.
Specification test limits are given in Table 8.1.1. The worst test results (the lowest margins) were recorded in Table 8.1.2 and shown in the associated plots.

Table 8.1.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(μV)		Class A limit, dB(μV)	
	QP	AVRG	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*	79	66
0.5 - 5.0	56	46	73	60
5.0 - 30	60	50	73	60

* The limit decreases linearly with the logarithm of frequency.

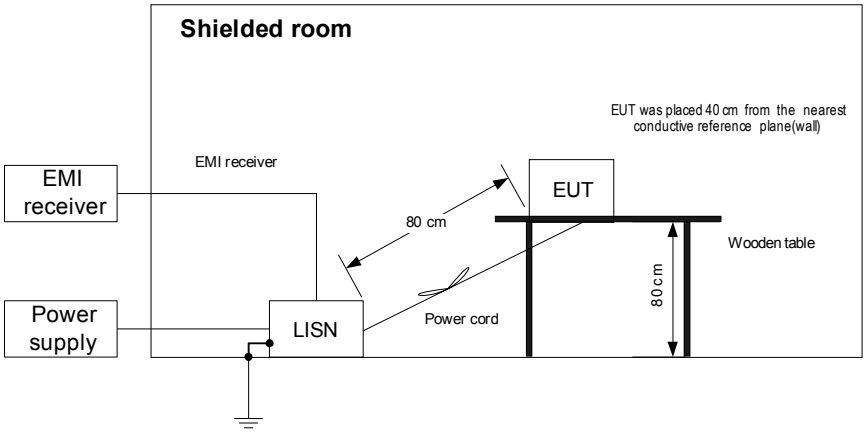
8.1.2 Test procedure

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

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

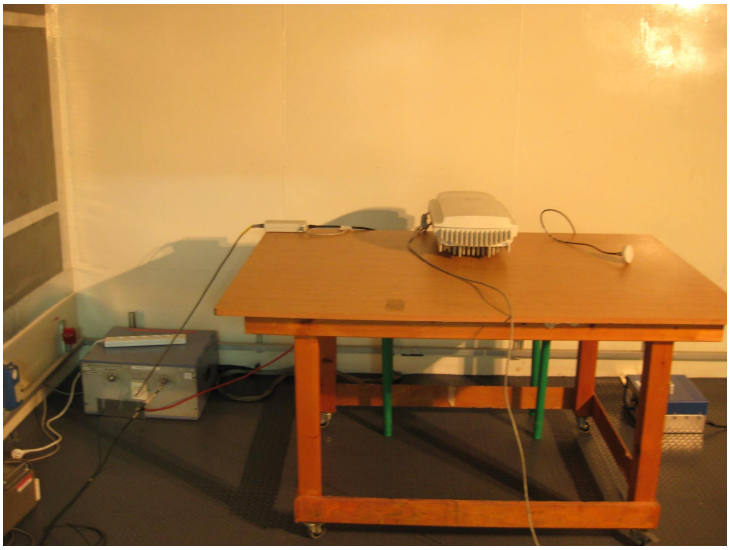
8.1.2.3 The position of the device cables was varied to determine maximum emission level.

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

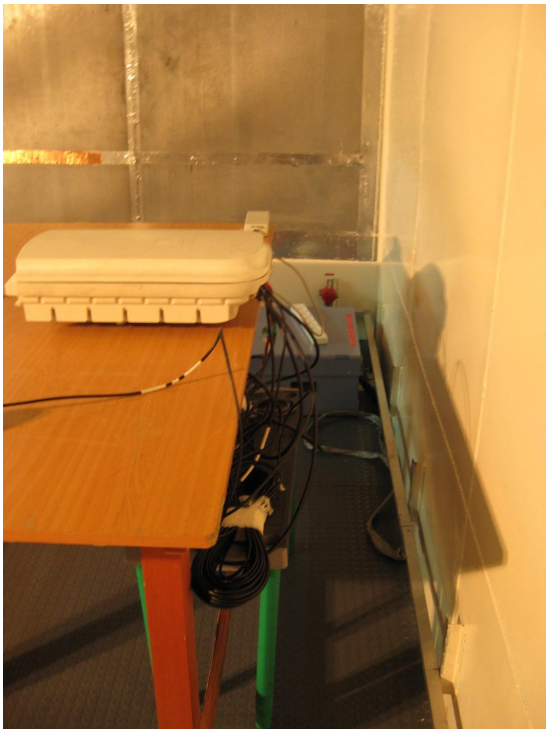


Test specification:	Section 15.107, Conducted emission at AC power port		
Test procedure:	ANSI C63.4, Sections 11.5 and 12.1.3		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 5:52:51 PM		
Temperature: 24.5ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks:			

Photograph 8.1.1 Setup for conducted emission measurements



Photograph 8.1.2 Setup for conducted emission measurements



Test specification:	**Section 15.107, Conducted emission at AC power port**		
Test procedure:	ANSI C63.4, Sections 11.5 and 12.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2009 5:52:51 PM		
Temperature: 24.5ºC	**Air Pressure:** 1015 hPa	**Relative Humidity:** 40 %	**Power Supply:** 120 VAC
Remarks:			

Table 8.1.2 Conducted emission test results

LINE: AC mains
LIMIT: Class B
EUT OPERATING MODE: Receive / Stand-by
EUT SET UP: TABLE-TOP
TEST SITE: SHIELDED ROOM
DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
FREQUENCY RANGE: 150 kHz - 30 MHz
RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(µV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*	Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*		
0.172855	59.26	58.24	64.89	-6.65	48.17	54.89	-6.72	L1	Pass
0.232620	51.74	50.67	62.40	-11.73	42.44	52.40	-9.96		
0.293305	47.68	45.27	60.48	-15.21	36.66	50.48	-13.82		
0.345760	47.46	45.41	59.12	-13.71	38.40	49.12	-10.72		
20.260060	42.77	41.14	60.00	-18.86	38.17	50.00	-11.83		
28.443940	40.72	38.70	60.00	-21.30	37.11	50.00	-12.89		
0.172910	57.94	57.00	64.88	-7.88	45.82	54.88	-9.06	L2	Pass
0.232825	50.59	49.36	62.39	-13.03	40.36	52.39	-12.03		
0.290748	45.84	44.41	60.55	-16.14	36.58	50.55	-13.97		
8.087838	44.15	39.42	60.00	-20.58	28.73	50.00	-21.27		
20.257500	43.33	40.87	60.00	-19.13	37.07	50.00	-12.93		
28.687760	45.33	44.14	60.00	-15.86	43.19	50.00	-6.81		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

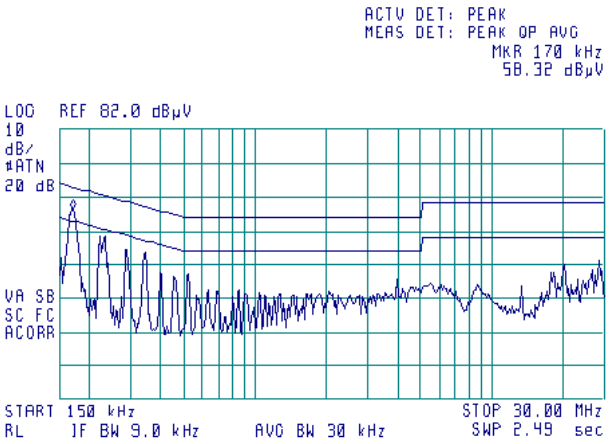
HL 0447	HL 0787	HL 1513	HL 3612				

Full description is given in Appendix A.

Test specification:	Section 15.107, Conducted emission at AC power port		
Test procedure:	ANSI C63.4, Sections 11.5 and 12.1.3		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 5:52:51 PM		
Temperature: 24.5ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks:			

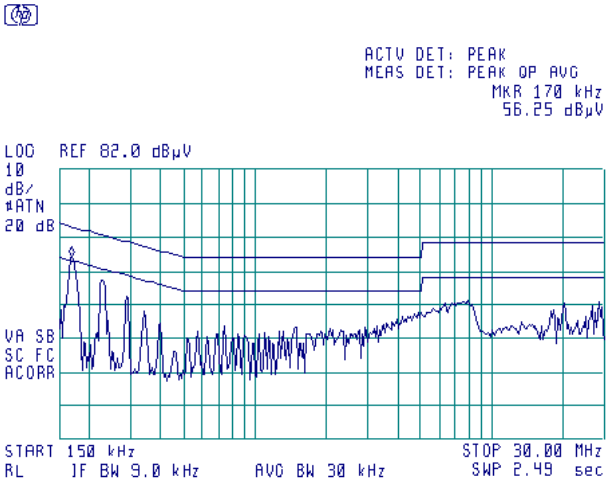
Plot 8.1.1 Conducted emission measurements

LINE:	L1
LIMIT:	Class B
EUT OPERATING MODE:	Receive / Stand-by
LIMIT:	QUASI-PEAK, AVERAGE
DETECTOR:	PEAK



Plot 8.1.2 Conducted emission measurements

LINE:	L2
LIMIT:	Class B
EUT OPERATING MODE:	Receive / Stand-by
LIMIT:	QUASI-PEAK, AVERAGE
DETECTOR:	PEAK



Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

8.2 Radiated emission measurements

8.2.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.2.1.

Table 8.2.1 Radiated emission test limits

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

* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$,
where S_1 and S_2 – standard defined and test distance respectively in meters.

8.2.2 Test procedure

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

8.2.2.2 The measurements were performed in the anechoic chamber at 3 m test distance. The specified frequency range was investigated with biconical and log periodic antennas connected to EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

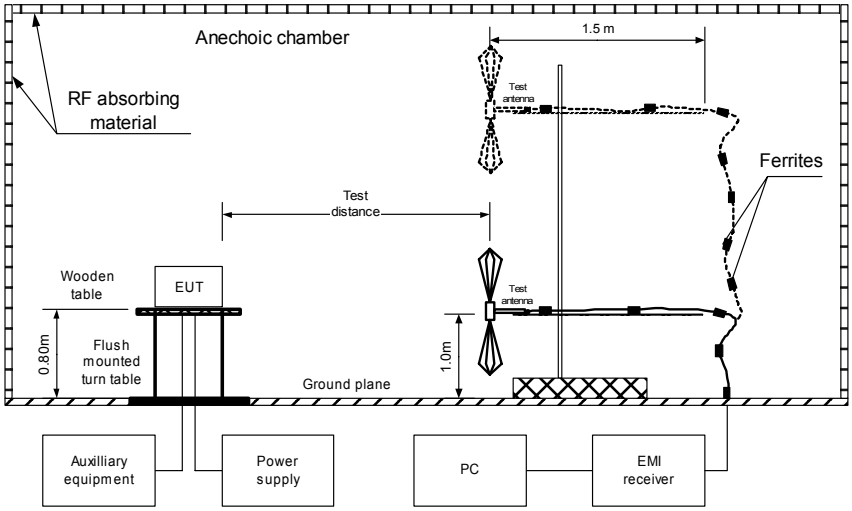
8.2.2.3 The EUT was set up as shown in Figure 8.2.2, energized and the performance check was conducted.

8.2.2.4 Final measurements were performed at the open area test site at 3 m test distance. The EUT wires and cables were arranged to produce maximum emission as it was found during preliminary measurements. The frequencies yield the worst test results (the lowest margins) during preliminary testing were investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m and its polarization was changed from vertical to horizontal. At frequencies where high ambient noise was encountered, the final measurements were taken in the anechoic chamber at 3 m distance.

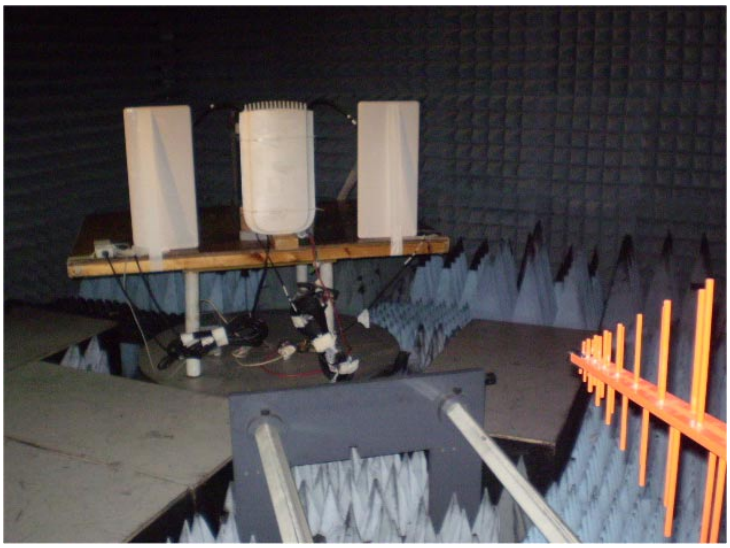
8.2.2.5 The worst test results (the lowest margins) were recorded in Table 8.2.2 and shown in the associated plots.

Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

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

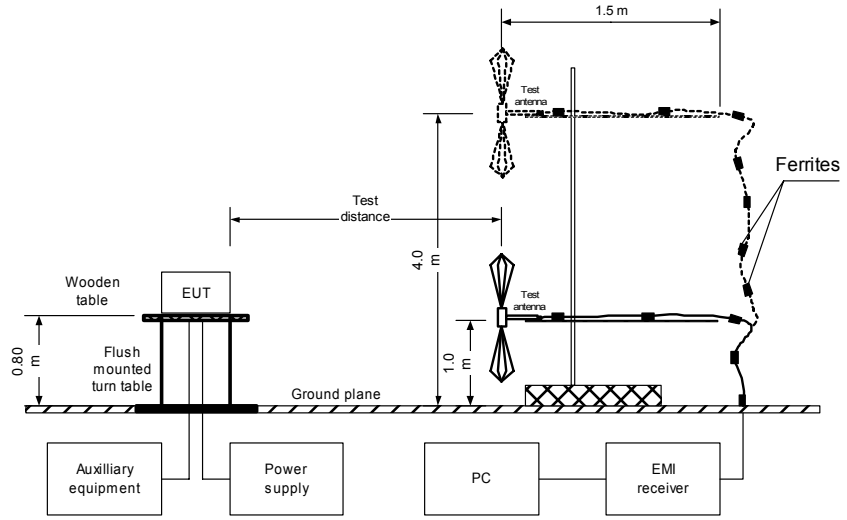


Photograph 8.2.1 Setup for radiated emission measurements in anechoic chamber



Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

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



Photograph 8.2.2 Setup for radiated emission measurements at OATS, general view

Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

Photograph 8.2.3 Setup for radiated emission measurements, EUT cabling

Test specification:	**Section 15.109, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	**Air Pressure:** 1015 hPa	**Relative Humidity:** 40 %	**Power Supply:** 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

Table 8.2.2 Radiated emission test results

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Receive / Stand-by
TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / QUASI-PEAK
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 120 kHz

Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
58.700000	31.80	26.85	40.00	-13.15	Horizontal	3.1	0	Pass
94.416400	35.54	33.27	43.50	-10.23	Horizontal	2.1	65	
111.597500	32.32	27.62	43.50	-15.88	Horizontal	1.6	0	
560.011000	39.98	39.04	46.00	-6.96	Vertical	1.5	10	
640.010100	40.33	39.21	46.00	-6.79	Vertical	1.4	340	
720.007700	41.35	40.23	46.00	-5.77	Vertical	1.2	20	
880.003750	43.26	42.18	46.00	-3.82	Horizontal	1.1	350	

TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 MHz – 14000 MHz
RESOLUTION BANDWIDTH: 1000 kHz

Frequency, MHz	Peak			Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
1200.000	46.90	74.00	-27.10	39.60	54.00	-14.40	Horizontal	1.7	020	Pass
1280.007	48.40	74.00	-25.60	42.90	54.00	-11.10	Horizontal	1.0	000	
1360.000	48.50	74.00	-25.50	42.70	54.00	-11.30	Horizontal	1.0	020	
1439.944	50.40	74.00	-23.60	46.10	54.00	-7.90	Horizontal	1.0	350	
1936.000	51.63	74.00	-22.34	41.87	54.00	12.13	Horizontal	1.0	350	
2320.000	51.80	74.00	-22.20	40.70	54.00	-13.30	Horizontal	1.1	340	
2400.000	53.20	74.00	-20.80	42.30	54.00	-11.70	Horizontal	1.0	000	
2640.000	54.10	74.00	-19.90	44.40	54.00	-9.60	Vertical	1.2	340	

*- Margin = Measured emission - specification limit.
**- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

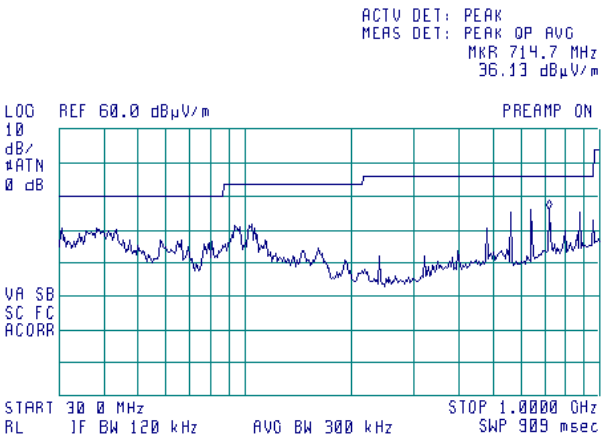
HL 0521	HL 0604	HL 1425	HL 2432	HL 2697	HL 2882	HL 2883	HL 3123
HL 3614	HL 3616						

Full description is given in Appendix A.

Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

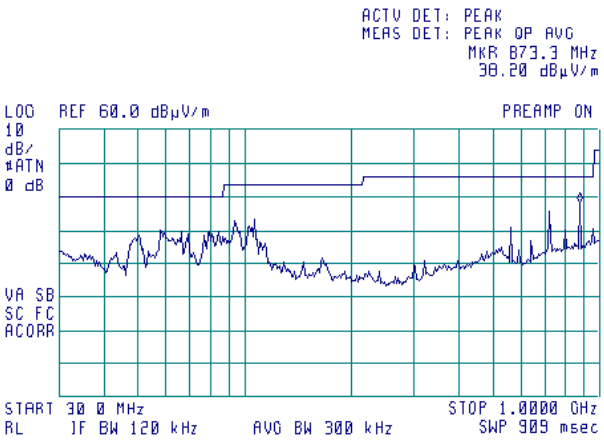
Plot 8.2.1 Radiated emission measurements in 30 - 1000 MHz range, vertical antenna polarization

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



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

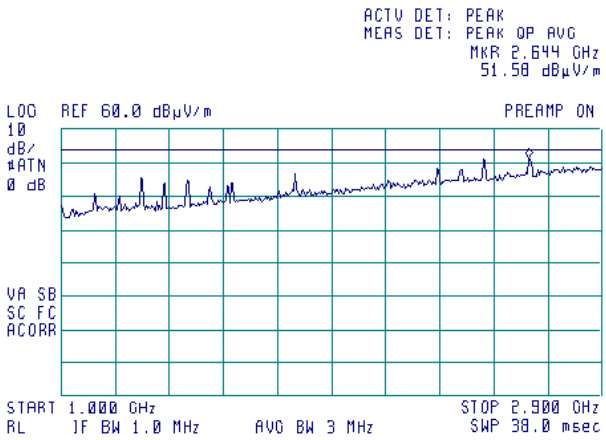
TEST SITE: Anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

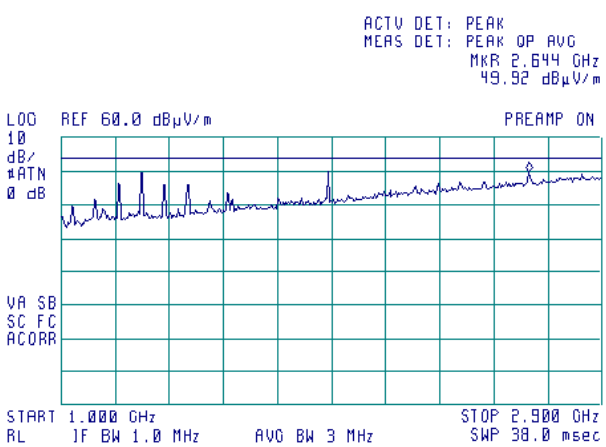
Plot 8.2.3 Radiated emission measurements from 1000 to 2900 MHz, vertical antenna polarization

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



Plot 8.2.4 Radiated emission measurements from 1000 to 2900 MHz, horizontal antenna polarization

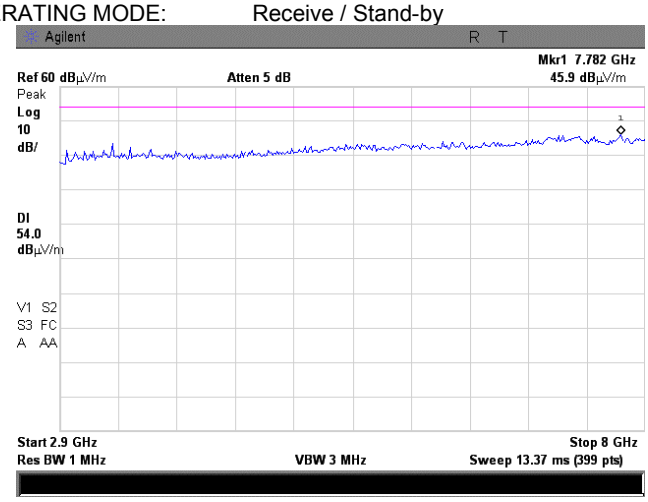
TEST SITE:	Anechoic chamber
LIMIT:	Class B
TEST DISTANCE:	3 m
EUT OPERATING MODE:	Receive / Stand-by



Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

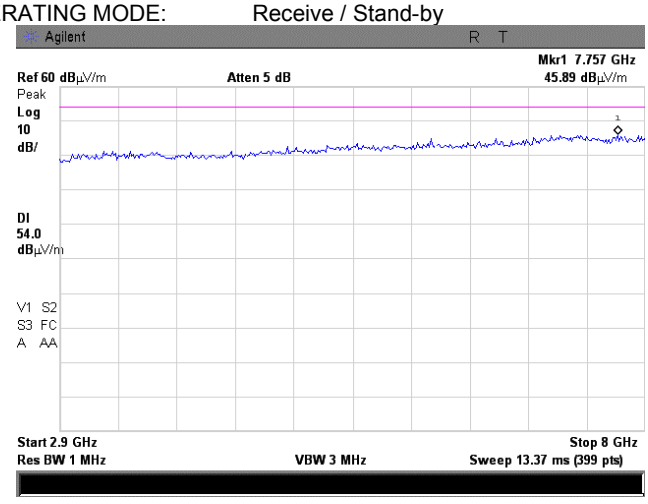
Plot 8.2.5 Radiated emission measurements from 2900 to 8000 MHz, vertical antenna polarization

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



Plot 8.2.6 Radiated emission measurements from 2900 to 8000 MHz, horizontal antenna polarization

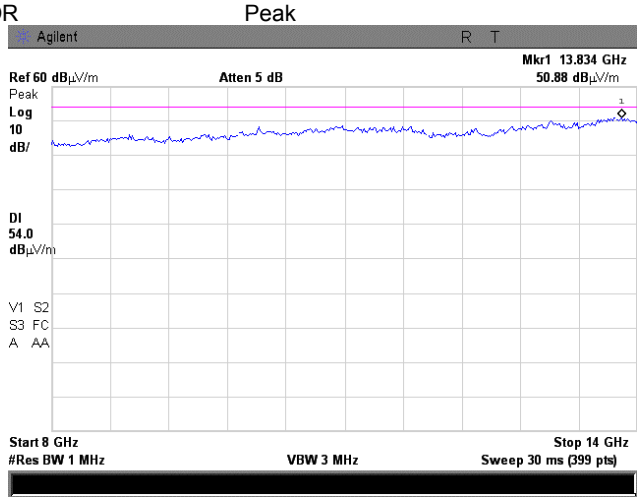
TEST SITE: Anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

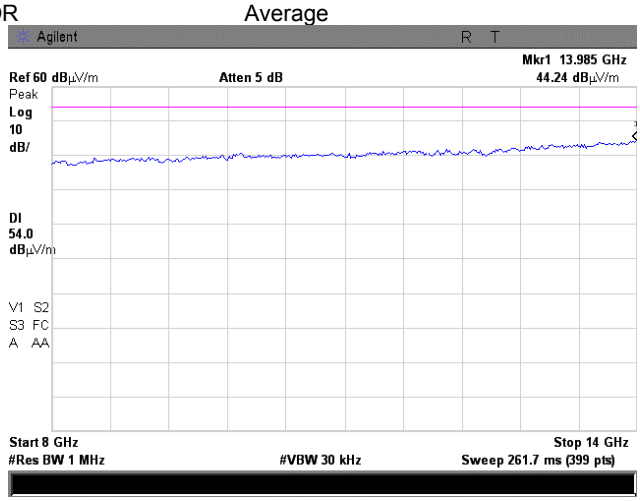
Plot 8.2.7 Radiated emission measurements from 8000 to 14000 MHz, vertical antenna polarization

TEST SITE:	Anechoic chamber
LIMIT:	Class B
TEST DISTANCE:	3 m
EUT OPERATING MODE:	Receive / Stand-by
DETECTOR	Peak



Plot 8.2.8 Radiated emission measurements from 8000 to 14000 MHz, vertical antenna polarization

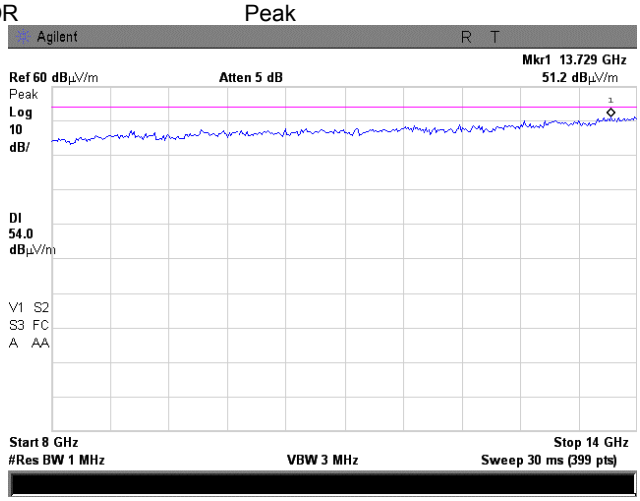
TEST SITE:	Anechoic chamber
LIMIT:	Class B
TEST DISTANCE:	3 m
EUT OPERATING MODE:	Receive / Stand-by
DETECTOR	Average



Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	9/21/2009 10:10:38 AM		
Temperature: 25ºC	Air Pressure: 1015 hPa	Relative Humidity: 40 %	Power Supply: 120VAC
Remarks: Test performed with 17 dBi extermal antenna			

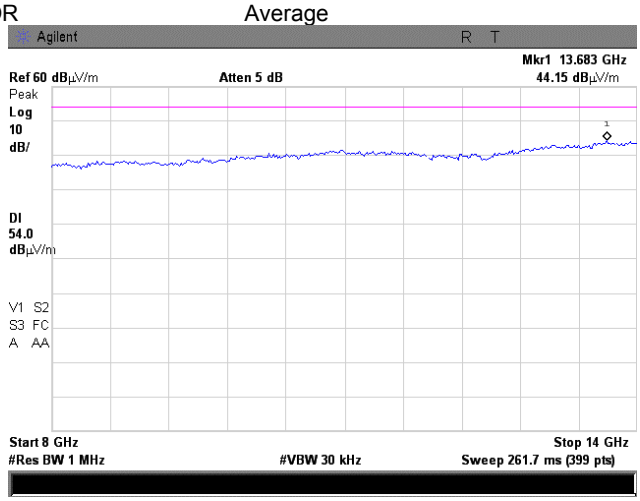
Plot 8.2.9 Radiated emission measurements from 8000 to 14000 MHz, horizontal antenna polarization

TEST SITE:	Anechoic chamber
LIMIT:	Class B
TEST DISTANCE:	3 m
EUT OPERATING MODE:	Receive / Stand-by
DETECTOR	Peak



Plot 8.2.10 Radiated emission measurements from 8000 to 14000 MHz, horizontal antenna polarization

TEST SITE:	Anechoic chamber
LIMIT:	Class B
TEST DISTANCE:	3 m
EUT OPERATING MODE:	Receive / Stand-by
DETECTOR	Average



9 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	29-Jun-09	29-Jun-10
0447	LISN, 16/2, 300V RMS, 50 Ohm/50 uH + 5 Ohm, STD CISPR 16-1	Hermon Laboratories	LISN 16 - 1	066	05-Nov-09	05-Nov-10
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	27-Aug-09	27-Aug-10
0554	Amplifier, 2-18 GHz RF	Miteq	AFD4	104300	01-Jan-09	01-Jan-10
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	11-Jan-09	11-Jan-10
0768	Antenna Standard Gain Horn,18-26.5 GHz, WR-42, 25 dB gain	Quinstar Technology	QWH-4200-BA	110	23-Dec-08	23-Dec-11
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
0787	Transient Limiter 9 kHz-200 MHz	Hewlett Packard	11947A	3107A018 77	18-Oct-09	18-Oct-10
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies	8564EC	3946A002 19	28-Aug-09	28-Aug-10
1425	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1426, HL1427	Agilent Technologies	8542E	3710A002 22, 3705A002 04	28-Aug-09	28-Aug-10
1430	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL1432	Agilent Technologies	8542E	3807A002 62,3705A0 0217	31-Aug-09	31-Aug-10
1511	Cable RF, 8 m, BNC/BNC	Belden	M17/167 MIL-C-17	1511	01-Jan-09	01-Jan-10
1513	Cable RF, 8 m, BNC/BNC	Belden	M17/167 MIL-C-17	1513	01-Sep-09	01-Sep-10
1521	Cable RF, 1.0 m, BNC/BNC	Telequis	MIL-C-17F-RG 058 CU	1521	01-Sep-09	01-Sep-10
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W	EMC Test Systems	3115	9911-5964	24-Aug-09	24-Aug-10
2016	Attenuator, Manual Step, 0-9/1 dB, 0-8 GHz, 2 W	Midwest Microwave	1072	1315	18-Jan-09	18-Jan-10
2017	Attenuator, Manual Step, 0-60/10 dB, 0-8.0 GHz	Midwest Microwave	1071	2017	18-Jan-09	18-Jan-10
2254	Cable 40 GHz, 0.8 m, blue	Rhophase Microwave Limited	KPS-1503A-800-KPS	W4907	11-Jun-09	11-Jun-10
2387	Filter Bandpass, 8-14 GHz	Hermon Laboratories	FBP8-14	2387	05-Oct-09	05-Oct-11
2432	Antenna, Double-Ridged Waveguide Horn 1-18 GHz	EMC Test Systems	3115	00027177	24-Aug-09	24-Aug-10
2697	Antenna, 30 MHz - 3.0 GHz	Sunol Sciences. Corp. Pleasanton, California USA	JB3	A022805	11-Jan-09	11-Jan-10
2780	EMC analyzer, 100 Hz to 26.5 GHz	Agilent Technologies	E7405A	MY451024 6	05-Jul-09	05-Jul-10
2882	Cable, 18 GHz N-type, M-F, 3 m	Bird	TC-MNFN-3.0	211539 001	01-Jan-09	01-Jan-10
2883	Cable, 18 GHz N-type, M-F, 3 m	Bird	TC-MNFN-3.0	211539 003	07-Dec-08	07-Dec-09
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY414447 62	07-May-09	07-May-10

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
2952	Cable, RF, 18 GHz, 1.2 m, SMA-SMA	Gore	10020014	NA	05-Oct-09	05-Oct-10
3122	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	3122	01-Jan-09	01-Jan-10
3123	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	3123	01-Jan-09	01-Jan-10
3176	Attenuator, N-type, 10 dB, DC to 18 GHz, 5 W	Mini-Circuits	BW-N10W5+	NA	07-May-09	07-May-10
3286	Temperature Chamber, (-40 to +170) °C	Thermotron	EL-8-CH-1-1-CO2	21-9048	09-Sep-09	09-Sep-10
3351	Low Pass Filter, 50 Ohm, DC to 400 MHz.	Mini-Circuits	NLP-450+	NA	05-Oct-09	05-Oct-10
3352	Low Pass Filter, 50 Ohm, DC to 580 MHz.	Mini-Circuits	NLP-600+	NA	05-Oct-09	05-Oct-10
3439	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	08-Mar-09	08-Mar-10
3440	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	08-Mar-09	08-Mar-10
3531	Amplifier, low noise, 2 to 8 GHz	Quinstar Technology	QLJ-02084040-J0	11159002002	07-Dec-08	07-Dec-09
3612	Cable RF, 17.5 m, N type-N type	Teldor	RG-214/U	NA	17-Dec-08	17-Dec-09
3614	Coupling Network per. STD ITU-T K.54 (12/2004)	Hermon Laboratories	CN-1	NA	01-Dec-08	01-Dec-09
3616	Cable RF, 6.5 m, N type-N type, DC-6.5 GHz	Suhner Switzerland	Rg 214/U	NA	07-Dec-08	07-Dec-09

10 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

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

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

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

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

11 APPENDIX C Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility.
Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47), Registration Numbers 90624 for OATS and 90623 for the anechoic chamber; by Industry Canada for electromagnetic emissions (file numbers IC 2186A-1 for OATS and IC 2186A-2 for anechoic chamber), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site), has a status of a Telefication - Listed Testing Laboratory, Certificate No. L138/00. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01).

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

Person for contact: Mr. Alex Usoskin, CEO.

12 APPENDIX D Specification references

FCC 47CFR part 15: 2008	Radio Frequency Devices.
FCC Public Notice DA 02-2138 August 30, 2002	Measurement procedure updated for peak transmit power in U-NII bands
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

13 APPENDIX E Test equipment correction factors

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

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

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

Antenna Factor
Active Loop Antenna
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, serial number 1011, HL 0604

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

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

Antenna factor
Double-ridged wave guide horn antenna
EMC Test Systems, model 3115, serial no: 9911-5964, HL 1984

Frequency, MHz	Antenna gain, dBi	Antenna factor. dB(1/m)
1000.0	5.8	24.5
1500.0	9.0	24.8
2000.0	8.6	27.7
2500.0	9.5	28.7
3000.0	8.9	30.8
3500.0	8.2	32.9
4000.0	9.6	32.7
4500.0	11.2	32.1
5000.0	10.6	33.6
5500.0	9.8	35.3
6000.0	10.1	35.7
6500.0	10.7	35.8
7000.0	10.9	36.2
7500.0	10.5	37.2
8000.0	11.1	37.2
8500.0	10.8	38.1
9000.0	10.7	38.6
9500.0	11.5	38.3
10000.0	11.8	38.4
10500.0	12.3	38.3
11000.0	12.3	38.8
11500.0	11.5	39.9
12000.0	12.2	39.6
12500.0	12.6	39.5
13000.0	12.0	40.5
13500.0	11.7	41.1
14000.0	11.7	41.5
14500.0	12.7	40.8
15000.0	14.2	39.5
15500.0	16.0	38.1
16000.0	16.2	38.1
16500.0	14.5	40.1
17000.0	12.2	42.6
17500.0	9.7	45.4
18000.0	6.6	48.7

Antenna factor is to be added to receiver meter reading in dB(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).

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

Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain
30	22.2	-22.5	0.01	620	19.7	6.3	4.27	1215	24.9	7.0	5.05	1810	28.3	7.1	5.08	2405	30.9	6.9	4.93
35	18.5	-17.4	0.02	625	19.7	6.5	4.42	1220	24.9	7.0	4.99	1815	28.5	6.9	4.91	2410	30.9	6.9	4.89
40	14.7	-12.5	0.06	630	19.6	6.6	4.57	1225	25.1	6.9	4.91	1820	28.6	6.8	4.74	2415	31.0	6.9	4.85
45	11.3	-8.1	0.16	635	19.7	6.5	4.48	1230	25.2	6.8	4.82	1825	28.7	6.8	4.75	2420	31.0	6.8	4.82
45	11.3	-8.1	0.16	640	19.9	6.4	4.40	1235	25.1	7.0	4.96	1830	28.7	6.8	4.76	2425	31.1	6.8	4.81
50	8.9	-4.7	0.34	645	19.9	6.5	4.45	1240	25.0	7.1	5.09	1835	28.7	6.7	4.72	2430	31.0	6.9	4.87
55	7.9	-2.8	0.52	650	19.9	6.5	4.51	1245	25.0	7.1	5.12	1840	28.8	6.7	4.69	2435	31.0	6.9	4.88
60	7.8	-2.1	0.62	655	19.9	6.6	4.60	1250	25.0	7.1	5.15	1845	28.6	6.9	4.90	2440	31.2	6.8	4.74
65	8.5	-2.0	0.63	660	19.9	6.7	4.69	1255	25.0	7.2	5.25	1850	28.4	7.1	5.12	2445	31.1	6.9	4.91
70	9.0	-1.9	0.64	665	19.9	6.7	4.70	1260	24.9	7.3	5.36	1855	28.5	7.0	5.07	2450	31.0	7.0	4.96
75	8.8	-1.1	0.78	670	20.0	6.7	4.71	1265	25.0	7.3	5.31	1860	28.6	7.0	5.01	2455	31.0	7.0	5.01
80	8.4	-0.2	0.97	675	20.1	6.7	4.71	1270	25.1	7.2	5.26	1865	28.5	7.1	5.17	2460	30.9	7.2	5.19
85	8.0	0.8	1.20	680	20.1	6.7	4.71	1275	25.3	7.0	5.05	1870	28.4	7.3	5.33	2465	31.1	6.9	4.95
90	8.2	1.1	1.29	685	20.1	6.8	4.79	1280	25.5	6.8	4.84	1875	28.4	7.2	5.28	2470	31.3	6.8	4.76
95	9.2	0.5	1.13	690	20.1	6.9	4.88	1285	25.4	7.0	4.97	1880	28.5	7.2	5.22	2475	31.4	6.7	4.69
100	10.6	-0.4	0.92	695	20.2	6.8	4.82	1290	25.3	7.1	5.10	1885	28.5	7.2	5.22	2480	31.3	6.8	4.79
110	12.6	-1.6	0.70	705	20.4	6.8	4.75	1300	25.2	7.3	5.33	1895	28.6	7.2	5.24	2490	31.1	7.0	4.99
120	13.9	-2.1	0.62	715	20.5	6.8	4.80	1310	25.5	7.1	5.09	1905	28.5	7.3	5.36	2500	30.9	7.2	5.27
125	14.2	-2.0	0.63	720	20.5	6.9	4.85	1315	25.4	7.2	5.23	1910	28.5	7.4	5.45	2505	31.1	7.1	5.15
130	14.2	-1.7	0.68	725	20.6	6.8	4.81	1320	25.3	7.3	5.36	1915	28.5	7.3	5.38	2510	31.0	7.2	5.22
140	13.4	-0.3	0.94	735	20.9	6.7	4.65	1330	25.6	7.0	5.06	1925	28.6	7.3	5.35	2520	31.2	7.0	5.05
150	12.9	0.8	1.21	745	21.0	6.6	4.59	1340	25.7	7.1	5.09	1935	28.5	7.4	5.54	2530	31.0	7.3	5.37
160	12.7	1.6	1.44	755	21.0	6.8	4.74	1350	25.7	7.1	5.17	1945	28.5	7.5	5.59	2540	31.2	7.1	5.09
165	12.5	2.0	1.59	760	21.0	6.8	4.83	1355	25.8	7.0	5.06	1950	28.6	7.4	5.48	2545	31.0	7.3	5.43
170	12.2	2.6	1.83	765	21.1	6.8	4.73	1360	25.9	6.9	4.95	1955	28.6	7.5	5.57	2550	31.0	7.3	5.39
175	11.8	3.3	2.13	770	21.3	6.7	4.64	1365	26.0	6.9	4.95	1960	28.6	7.5	5.65	2555	31.1	7.2	5.30
180	11.6	3.7	2.36	775	21.3	6.7	4.68	1370	26.0	7.0	4.96	1965	28.7	7.4	5.47	2560	31.0	7.4	5.47
185	11.5	4.0	2.54	780	21.3	6.7	4.72	1375	26.0	7.0	5.01	1970	28.9	7.2	5.29	2565	30.8	7.6	5.70
190	11.6	4.2	2.61	785	21.3	6.8	4.77	1380	26.0	7.0	5.06	1975	28.9	7.2	5.22	2570	31.1	7.3	5.37
200	13.1	3.2	2.07	795	21.4	6.8	4.79	1390	26.1	6.9	4.92	1985	29.1	7.1	5.11	2580	31.6	6.9	4.87
205	12.0	4.4	2.76	800	21.5	6.8	4.77	1395	26.2	6.9	4.94	1990	29.1	7.0	5.06	2585	31.6	6.8	4.79
210	11.0	5.6	3.66	805	21.6	6.7	4.71	1400	26.2	7.0	4.96	1995	29.1	7.1	5.09	2590	31.6	6.9	4.88
215	11.3	5.6	3.59	810	21.7	6.7	4.65	1405	26.1	7.0	5.02	2000	29.1	7.1	5.11	2595	31.5	7.0	4.97
220	11.6	5.5	3.52	815	21.7	6.7	4.72	1410	26.1	7.1	5.09	2005	29.1	7.1	5.16	2600	31.6	6.9	4.86
225	11.7	5.5	3.55	820	21.7	6.8	4.80	1415	26.2	7.0	5.02	2010	29.1	7.1	5.15	2605	31.3	7.2	5.30
230	11.9	5.5	3.57	825	21.7	6.8	4.82	1420	26.3	7.0	4.96	2015	29.2	7.1	5.13	2610	31.4	7.1	5.15
235	12.1	5.5	3.56	830	21.7	6.9	4.85	1425	26.2	7.1	5.10	2020	29.2	7.1	5.18	2615	31.7	6.9	4.88
240	12.3	5.5	3.54	835	21.8	6.8	4.82	1430	26.1	7.2	5.25	2025	29.3	7.1	5.08	2620	31.6	7.0	4.97
245	12.3	5.7	3.71	840	21.9	6.8	4.80	1435	26.1	7.2	5.24	2030	29.3	7.0	5.05	2625	31.4	7.1	5.17
250	12.3	5.9	3.88	845	21.9	6.8	4.83	1440	26.2	7.2	5.24	2035	29.3	7.1	5.07	2630	31.6	7.0	5.00
255	12.5	5.9	3.85	850	21.9	6.9	4.86	1445	26.3	1	5.11	2040	29.3	7.1	5.13	2635	31.8	6.8	4.82
260	12.7	5.8	3.83	855	22.0	6.8	4.80	1450	26.5	7.0	4.98	2045	29.2	7.2	5.23	2640	31.7	7.0	4.98
265	13.2	5.5	3.54	860	22.1	6.8	4.74	1455	26.4	7.1	5.07	2050	29.2	7.2	5.27	2645	31.7	6.9	4.93
270	13.7	5.2	3.27	865	22.0	6.9	4.92	1460	26.4	7.1	5.17	2055	29.3	7.2	5.21	2650	31.8	6.9	4.85
275	13.7	5.3	3.39	870	21.9	7.1	5.11	1465	26.4	7.2	5.19	2060	29.5	7.0	5.02	2655	31.8	6.9	4.85
280	13.7	5.4	3.50	875	22.0	7.1	5.08	1470	26.4	7.2	5.22	2065	29.4	7.1	5.08	2660	31.7	7.0	5.02
285	13.7	5.6	3.61	880	22.1	7.0	5.05	1475	26.4	7.1	5.17	2070	29.4	7.1	5.10	2665	32.0	6.7	4.71
290	13.7	5.7	3.72	885	22.1	7.0	5.06	1480	26.5	7.1	5.12	2075	29.5	7.0	5.01	2670	32.0	6.7	4.67
295	13.8	5.8	3.77	890	22.1	7.0	5.06	1485	26.5	7.1	5.14	2080	29.8	6.8	4.76	2675	31.9	6.8	4.81
300	13.9	5.8	3.81	895	22.2	7.1	5.09	1490	26.5	7.1	5.17	2085	29.7	6.9	4.89	2680	31.7	7.0	5.04
305	14.0	5.9	3.85	900	22.2	7.1	5.12	1495	26.5	7.2	5.24	2090	29.7	6.9	4.86	2685	31.9	6.8	4.83
310	14.1	5.9	3.88	905	22.3	7.1	5.09	1500	26.5	7.2	5.31	2095	29.8	6.8	4.78	2690	32.1	6.7	4.72
315	14.3	5.9	3.89	910	22.3	7.0	5.05	1505	26.5	7.2	5.27	2100	29.9	6.8	4.75	2695	32.1	6.7	4.71
320	14.4	5.9	3.90	915	22.4	7.0	4.99	1510	26.6	7.2	5.23	2105	29.8	6.8	4.81	2700	32.0	6.8	4.81
325	14.5	5.9	3.92	920	22.6	6.9	4.92	1515	26.6	7.2	5.30	2110	29.9	6.8	4.78	2705	32.0	6.8	4.80
330	14.6	5.9	3.93	925	22.7	6.9	4.85	1520	26.5	7.3	5.38	2115	29.9	6.8	4.76	2710	32.1	6.8	4.79
335	14.7	6.0	4.02	930	22.8	6.8	4.77	1525	26.6	7.3	5.37	2120	29.9	6.8	4.84	2715	32.1	6.7	4.71
340	14.7	6.2	4.12	935	22.8	6.8	4.83	1530	26.6	7.3	5.36	2125	29.9	6.9	4.89	2720	32.4	6.5	4.47
345	14.9	6.1	4.06	940	22.8	6.9	4.89	1535	26.6	7.4	5.44	2130	29.9	6.9	4.90	2725	32.2	6.7	4.63
350	15.1	6.0	3.99	945	22.8	6.9	4.87	1540	26.5	7.4	5.53	2135	29.8	6.9	4.94	2730	31.9	7.0	5.05
355	15.3	5.9	3.88	950	22.9	6.9	4.85	1545	26.5	7.5	5.58	2140	29.8	7.1	5.08	2735	31.6	7.4	5.44
360	15.6	5.8	3.78	955	23.0	6.8	4.81	1550	26.5	7.5	5.63	2145	29.9	6.9	4.92	2740	31.6	7.1	5.46
365	15.5	5.9	3.89	960	23.1	6.8	4.77	1555	26.7	7.3	5.39	2150	29.9	7.0	4.98	2745	31.9	7.0	5.06
370	15.5	6.0	4.01	965	23.1	6.7	4.73	1560	26.9	7.1	5.16	2155	29.8	7.1	5.10	2750	32.0	6.9	4.94
375	15.6	6.1	4.03	970	23.2	6.7	4.69	1565	26.9	7.2	5.23	2160	29.8	7.1	5.09	2755	32.0	7.0	4.98
380	15.7	6.1	4.05	975	23.3	6.6	4.62	1570	26.9	7.2	5.30	2165	29.9	7.0	5.00	2760	32.0	7.0	5.06
385	15.7	6.2	4.15	980	23.5	6.6	4.54	1575	27.0	7.2	5.23	2170	29.9	7.1	5.07	2765	32.2	6.8	4.80
390	15.7	6.3	4.25	985	23.5	6.6	4.52	1580	27.0	7.1	5.17	2175	29.8	7.2	5.20	2770	32.3	6.8	4.73
395	15.9	6.3	4.22	990	23.6	6.5	4.50	1585	27.0	7.2	5.20	2180	29.8	7.2	5.27	2775	32.3	6.8	4.77
400	16.0	6.2	4.18	995	23.6	6.5	4.48	1590	27.0	7.2	5.22	2185	29.8	7.2	5.27	2780	32.3	6.8	4.82
405	16.3	6.1	4.07	1000	23.7	6.5	4.46	1595	27.0	7.2	5.29	2190	29.8	7.2	5.28	2785	32.7	6.4	4.41
410	16.5	6.0	3.96	1005	23.7	6.5	4.51	1600	27.0	7.3	5.36	2195	29.8	7.2	5.30	2790	32.8	6.3	4.25
415	16.5	6.0	4.00	1010	23.7	6.6	4.57	1605	27.0	7.3	5.38	2200	29.7	7.3	5.38	2795	32.8	6.4	4.33
420	16.6	6.1	4.03	1015	23.7	6.6	4.55	1610	27.0	7.3	5.41	2205	29.7	7.3	5.41	2800	32.5	6.7	4.66
425	16.6	6.1	4.10	1020	23.8	6.6	4.54	1615	27.1	7.3	5.33	2210	29.7	7.4	5.47	2805	32.5	6.6	4.62
430	16.7	6.2	4.16	1025	23.8	6.6	4.62	1620	27.2	7.2	5.27	2215	29.7	7.4	5.54	2810	32.5	6.7	4.70
435	16.9	6.1	4.05	1030	23.7	6.7	4.70	1625	27.2	7.2	5.30	2220	29.7	7.5	5.57	2815	32.3	6.9	4.85
440	17.1	5.9	3.93	1035	23.7	6.8	4.81	1630	27.2	7.3	5.33	2225	29.8	7.3	5.43	2820	32.2	7.0	5.01
445	17.2	6.0	3.97	1040	23.6	6.9	4.92	1635	27.2	7.3	5.35	2230	29.8	7.4	5.45	2825	32.3	7.0	4.96
450	17.2	6.0	4.00	1045	23.7	6.9	4.91	1640	27.2	7.3	5.36	2235	29.7	7.5	5.61	2830	32.4	6.8	4.80
455	17.3	6.1	4.04	1050	23.7	6.9	4.91	1645	27.3	7.2	5.22	2240	29.5	7.7	5.86	2835	32.5	6.7	4.68
460	17.4	6.1	4.07	1055	23.7	7.0	5.01	1650	27.5	7.1	5.09	2245	29.8	7.4	5.53	2840	32.5	6.8	4.78
465	17.5	6.1	4.05	1060	23.6	7.1	5.11	1655	27.5	7.1	5.11	2250	30.0	7.3	5.35	2845	32.6	6.6	4.62
470	17.6	6.1	4.04	1065	23.7	7.0	5.06	1660	27.5	7.1	5.13	2255	30.0	7.2	5.28	2850	32.6	6.7	4.70
475	17.7	6.0	3.99	1070	23.8	7.0	5.01	1665	27.6	7.0	5.06	2260	30.1	7.2	5.24	2855	32.4	6.9	4.88
480	17.9	5.9	3.93	1075	23.8	7.0	5.01	1670	27.7	7.0	4.99	2265	30.1	7.2	5.20	2860	32.4	7.0	4.98
485	18.0	5.9	3.88	1080	23.9	7.0	5.01	1675	27.7	7.0	5.02	2270	30.2	7.1	5.12	2865	32.8	6.5	4.52
490	18.2	5.8	3.82	1085	24.0	7.0	4.96	1680	27.7	7.0	5.05	2275	30.3	7.0	5.05	2870	33.0	6.3	4.30
495	18.0	6.0	4.02	1090	24.0	6.9	4.91	1685	27.7	7.0	5.01	2280	30.0	7.0	5.06	2875	33.0	6.4	4.38
500	17.9	6.3	4.23	1095	24.1	6.9	4.86	1690	27.8	7.0	4.98	2285	30.3	7.0	5.05	2880	32.5	6.9	4.87
505	17.9	6.3	4.29	1100	24.2	6.8	4.82	1695	27.8	7.0	5.01	2290	30.3	7.1	5.07	2885	33.0	6.4	4.40
510	18.0	6.4	4.36	1105	24.3	6.8	4.80	1700	27.8	7.0	5.03	2295	30.3	7.1	5.13	2890	33.1	6.3	4.28
515	18.1	6.4	4.34	1110	24.3	6.8	4.78	1705	27.8	7.1	5.09	2300	30.2	7.2	5.23	2895	33.1	6.4	4.34
520	18.2	6.4	4.32	1115	24.3	6.8	4.79	1710	27.7	7.1	5.16	2305	30.3	7.2	5.20	2900	33.0	6.4	4.41
525	18.2	6.4	4.36	1120	24.4	6.8	4.80	1715	27.8	7.1	5.08	2310	30.2	7.3	5.35	2905	32.9	6.6	4.58
530	18.3	6.4	4.39	1125	24.3	6.9	4.90	1720	27.9	7.0	5.00	2315	30.1	7.4	5.45	2910	32.9	6.5	4.51
535	18.3	6.4	4.41	1130	24.3	7.0	5.00	1725	28.0	7.0	4.99	2320	30.3	7.2	5.27	2915	33.1	6.4	4.33
540	18.4	6.4	4.41	1135	24.4	6.9	4.90	1730	28.0	7.0	4.98	2325	304	7.2	5.22	2920	33.3	6.2	4.16
545	18.4	6.5	4.47	1140	24.5	6.8	4.81	1735	28.0	7.0	5.02	2330	30.4	7.1	5.13	2925	33.0	6.5	4.45
550	18.4	6.6	4.53	1145	24.6	6.8	4.76	1740	28.0	7.1	5.07	2335	30.5	7.0	5.07	2930	33.0	6.5	4.51
555	18.6	6.5	4.45	1150	24.7	6.7	4.71	1745	28.0	7.0	5.04	2340	30.5	7.1	5.11	2935	33.0	6.5	4.48
560	18.8	6.4	4.37	1155	24.7	6.8	4.76	1750	28.1	7.0	5.01	2345	30.6	7.0	5.07	2940	33.0	6.5	4.52
565	18.9	6.4	4.33	1160	24.7	6.8	4.80	1755	27.9	7.1	5.17	2350	30.5	7.1	5.12	2945	33.1	6.5	4.42
570	19.0	6.3	4.28	1165	24.7	6.8	4.81	1760	27.8	7.3	5.34	2355	30.6	7.1	5.08	2950	33.2	6.4	4.32
575	19.1	6.3	4.31	1170	24.7	6.8	4.81	1765	27.9	7.3	5.31	2360	30.9	6.8	4.79	2955	33.3	6.3	4.27
580	19.1	6.4	4.33	1175	24.8	6.8	4.84	1770	27.9	7.2	5.28	2365	31.0	6.7	4.66	2960	33.3	6.3	4.30
590	19.1	6.6	4.52	1185	24.8	6.9	4.92	1780	27.9	7.3	5.35	2375	31.1	6.6	4.60	2970	33.3	6.4	4.36
595	19.0	6.6	4.62	1190	24.7	7.0	4.99	1785	28.1	7.2	5.21	2380	31.1	6.6	4.61	2975	33.0	6.6	4.60
600	19.0	6.7	4.72	1195	24.7	7.0	5.02	1790	28.2	7.0	5.07	2385	31.1	6.7	4.62	2980	32.9	6.8	4.74
610	19.1	6.8	4.76	1205	24.08	7.1	5.08	1800	28.3	7.0	5.06	2395	31.2	6.6	4.60	2990	32.9	6.8	4.82
615	19.4	6.5	4.51	1210	24.8	7.1	5.11	1805	28.3	7.1	5.07	2400	30.9	6.9	4.93	3000	33.4	6.4	4.33

Cable loss
Cable 40 GHz, 0.8 m, blue, model: KPS-1503A-800-KPS, S/N W4907, HL 2254

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
0.03	0.04	5.10	0.80	15.00	1.49
0.05	0.07	5.30	0.83	15.50	1.49
0.10	0.09	5.50	0.83	16.00	1.46
0.20	0.15	5.70	0.84	16.50	1.47
0.30	0.19	5.90	0.87	17.00	1.50
0.40	0.25	6.10	0.86	17.50	1.57
0.50	0.29	6.30	0.89	18.00	1.63
0.60	0.33	6.50	0.90	18.50	1.57
0.70	0.37	6.70	0.89	19.00	1.63
0.80	0.41	6.90	0.93	19.50	1.65
0.90	0.44	7.10	0.92	20.00	1.64
1.00	0.45	7.30	0.95	20.50	1.75
1.10	0.48	7.50	0.96	21.00	1.72
1.20	0.51	7.70	0.97	21.50	1.78
1.30	0.53	7.90	1.01	22.00	1.76
1.40	0.54	8.10	1.00	22.50	1.72
1.50	0.57	8.30	1.05	23.00	1.83
1.60	0.59	8.50	1.04	23.50	1.80
1.70	0.04	8.70	1.07	24.00	1.90
1.80	0.07	8.90	1.11	24.50	1.81
1.90	0.09	9.10	1.09	25.00	1.98
2.00	0.15	9.30	1.14	25.50	1.91
2.10	0.19	9.50	1.12	26.00	2.02
2.20	0.25	9.70	1.15	26.50	1.92
2.30	0.29	9.90	1.16	27.00	1.97
2.40	0.33	10.10	1.16	28.00	2.02
2.50	0.37	10.30	1.19	29.00	1.95
2.60	0.41	10.50	1.14	30.00	1.94
2.70	0.44	10.70	1.19	31.00	2.11
2.80	0.45	10.90	1.17	32.00	2.17
2.90	0.48	11.10	1.13	33.00	2.27
3.10	0.61	11.30	1.20	34.00	2.27
3.30	0.64	11.50	1.13	35.00	2.29
3.50	0.65	11.70	1.20	36.00	2.35
3.70	0.68	11.90	1.18	37.00	2.37
3.90	0.69	12.10	1.14	38.00	2.40
4.10	0.71	12.40	1.19	39.00	2.57
4.30	0.73	13.00	1.34	40.00	2.36
4.50	0.75	13.50	1.33		
4.70	0.77	14.00	1.48		
4.90	0.79	14.50	1.45		

Cable loss
Cable coaxial, Bird, 18 GHz, N-type, M-F, model TC-MNFN-3.0, S/N 211539 001
HL 2882

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.08	5750	1.78	12000	2.57
30	0.12	6000	1.84	12250	2.62
100	0.22	6250	1.87	12500	2.66
250	0.35	6500	1.92	12750	2.68
500	0.49	6750	1.96	13000	2.67
750	0.60	7000	2.01	13250	2.75
1000	0.68	7250	2.08	13500	2.77
1250	0.78	7500	2.12	13750	2.90
1500	0.85	7750	2.19	14000	3.00
1750	0.92	8000	2.22	14250	3.12
2000	0.98	8250	2.28	14500	2.98
2250	1.06	8500	2.29	14750	3.03
2500	1.11	8750	2.27	15000	2.99
2750	1.19	9000	2.28	15250	2.99
3000	1.25	9250	2.26	15500	2.98
3250	1.30	9500	2.29	15750	2.98
3500	1.34	9750	2.33	16000	2.99
3750	1.40	10000	2.34	16250	3.05
4000	1.45	10250	2.41	16500	3.11
4250	1.51	10500	2.46	16750	3.18
4500	1.54	10750	2.48	17000	3.23
4750	1.59	11000	2.48	17250	3.21
5000	1.63	11250	2.52	17500	3.22
5250	1.68	11500	2.53	17750	3.22
5500	1.72	11750	2.56	18000	3.25

Cable loss
Cable coaxial, Bird, 18 GHz, N-type, M-F, model TC-MNFN-3.0, S/N 211539 003
HL 2883

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.06	5750	1.70	12000	2.46
30	0.12	6000	1.75	12250	2.48
100	0.21	6250	1.80	12500	2.52
250	0.34	6500	1.81	12750	2.50
500	0.47	6750	1.86	13000	2.54
750	0.59	7000	1.86	13250	2.48
1000	0.67	7250	1.92	13500	2.63
1250	0.76	7500	1.96	13750	2.65
1500	0.84	7750	1.98	14000	2.72
1750	0.92	8000	2.02	14250	2.67
2000	0.98	8250	2.03	14500	2.70
2250	1.05	8500	2.05	14750	2.72
2500	1.12	8750	2.11	15000	2.79
2750	1.17	9000	2.17	15250	2.80
3000	1.22	9250	2.17	15500	2.83
3250	1.27	9500	2.20	15750	2.75
3500	1.33	9750	2.19	16000	2.82
3750	1.38	10000	2.22	16250	2.85
4000	1.42	10250	2.25	16500	2.90
4250	1.46	10500	2.30	16750	2.89
4500	1.51	10750	2.28	17000	2.88
4750	1.54	11000	2.32	17250	2.85
5000	1.59	11250	2.34	17500	2.96
5250	1.62	11500	2.39	17750	3.04
5500	1.65	11750	2.42	18000	3.04

Cable loss
Cable coaxial, Gore, 18 GHz, 1.2 m, SMA-SMA, S/N 10020014
HL 2952

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.03	5750	0.97	12000	1.50
30	0.05	6000	1.01	12250	1.45
100	0.11	6250	1.03	12500	1.48
250	0.19	6500	1.06	12750	1.57
500	0.26	6750	1.08	13000	1.51
750	0.32	7000	1.10	13250	1.64
1000	0.38	7250	1.13	13500	1.60
1250	0.43	7500	1.13	13750	1.63
1500	0.47	7750	1.21	14000	1.59
1750	0.53	8000	1.20	14250	1.66
2000	0.55	8250	1.24	14500	1.60
2250	0.59	8500	1.29	14750	1.65
2500	0.63	8750	1.23	15000	1.72
2750	0.66	9000	1.27	15250	1.68
3000	0.69	9250	1.27	15500	1.73
3250	0.72	9500	1.29	15750	1.70
3500	0.75	9750	1.30	16000	1.82
3750	0.78	10000	1.38	16250	1.79
4000	0.82	10250	1.44	16500	1.81
4250	0.84	10500	1.47	16750	1.91
4500	0.86	10750	1.45	17000	1.92
4750	0.90	11000	1.50	17250	1.98
5000	0.91	11250	1.46	17500	2.05
5250	0.94	11500	1.47	17750	2.04
5500	0.96	11750	1.44	18000	2.05

Cable loss
Microwave Cable Assembly, 18 GHz, 6.4 m, SMA – SMA, Huber-Suhner, model 198-9155-00
HL 3122

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.11	3600	2.08	7400	3.07	11200	3.92	15100	4.61
30	0.17	3700	2.12	7500	3.09	11300	3.95	15200	4.58
50	0.23	3800	2.15	7600	3.14	11400	3.93	15300	4.62
100	0.32	3900	2.18	7700	3.15	11500	3.93	15400	4.62
200	0.47	4000	2.21	7800	3.19	11600	3.94	15500	4.65
300	0.58	4100	2.24	7900	3.22	11700	3.97	15600	4.66
400	0.66	4200	2.27	8000	3.20	11800	3.98	15700	4.66
500	0.74	4300	2.31	8100	3.21	11900	4.08	15800	4.72
600	0.81	4400	2.31	8200	3.24	12000	4.03	15900	4.78
700	0.88	4500	2.36	8300	3.27	12100	4.06	16000	4.89
800	0.95	4600	2.37	8400	3.32	12200	4.05	16100	4.95
900	1.00	4700	2.40	8500	3.35	12300	4.16	16200	4.92
1000	1.06	4800	2.43	8600	3.35	12400	4.18	16300	4.95
1100	1.11	4900	2.45	8700	3.33	12500	4.20	16400	5.02
1200	1.16	5000	2.50	8800	3.37	12600	4.22	16500	5.04
1300	1.21	5100	2.51	8900	3.39	12700	4.23	16600	5.06
1400	1.26	5200	2.55	9000	3.45	12800	4.28	16700	5.17
1500	1.31	5300	2.56	9100	3.46	12900	4.26	16800	5.16
1600	1.35	5400	2.59	9200	3.47	13000	4.28	16900	5.19
1700	1.39	5500	2.62	9300	3.46	13100	4.28	17000	5.23
1800	1.44	5600	2.65	9400	3.50	13200	4.28	17100	5.30
1900	1.47	5700	2.67	9500	3.50	13300	4.29	17200	5.26
2000	1.52	5800	2.71	9600	3.53	13400	4.34	17300	5.30
2100	1.55	5900	2.72	9700	3.52	13500	4.31	17400	5.30
2200	1.60	6000	2.73	9800	3.54	13600	4.35	17500	5.36
2300	1.63	6100	2.76	9900	3.56	13700	4.36	17600	5.40
2400	1.67	6200	2.78	10000	3.57	13800	4.37	17700	5.47
2500	1.70	6300	2.81	10100	3.60	13900	4.41	17800	5.56
2600	1.74	6400	2.85	10200	3.69	14000	4.42	17900	5.45
2700	1.78	6500	2.87	10300	3.69	14100	4.45	18000	5.47
2800	1.83	6600	2.87	10400	3.67	14200	4.49		
2900	1.85	6700	2.90	10500	3.70	14300	4.55		
3000	1.89	6800	2.91	10600	3.70	14400	4.62		
3100	1.92	6900	2.96	10700	3.76	14600	4.54		
3200	1.96	7000	2.99	10800	3.88	14700	4.58		
3300	1.99	7100	3.01	10900	3.88	14800	4.57		
3400	2.03	7200	3.04	11000	3.85	14900	4.65		
3500	2.06	7300	3.08	11100	3.85	15000	4.64		

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

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

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

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

Cable loss
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		

14 APPENDIX F Abbreviations and acronyms

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

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