



Electromagnetic Compatibility Test Report

Test Report No: MOT 100407

Issued on: April 10, 2007

Product Name

HC700G

Model: F4705A

FCC ID: AZ489FT7030

IC: 109U-89FT7030

Tested According to

FCC 47 CFR, Part 15, Subparts B & C

FCC 47 CFR, Part 22 & Part 24

Industry Canada ICES-003 & RSS-210

Tests Performed for

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1633.01

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1633.01

Test Report details:

Issued on: 10.04.2007

Assessment information:

This report contains an assessment of the EUT against Electromagnetic Compatibility based upon tests carried out on the samples submitted. The results contained in this report relate only to the items tested. Manufactured products will not necessarily give identical results due to production and measurement tolerances. QualiTech, EMC Lab does not assume responsibility for any conclusion and generalization drawn from the test results with regards to other specimens or samples of type of the equipment represented by test item.

The EUT was set up and exercised using the configuration, modes of operation and arrangements defined in this report only.

Modifications:

Modifications made to the EUT

None.

Modifications made to the Test Standard

None.

Summary of Compliance Status

Bluetooth: FCC 47 CFR, Part 15, Subparts B & C, RSS 210 Annex.8 Issue 6

Test Spec. Clause	Test Case	Remarks
§15.247 (a) (1) & RSS-210 section A8.1 (2)	Carrier Frequency Separation	Pass
§15.247 (a) (1)(iii) & RSS-210 section A8.1 (3)	Number of Hopping Channels	Pass
§15.247 (a) (1)(iii) & RSS-210 section A8.1 (4)	Time Occupancy (Dwell Time)	Pass
§15.247 (a) (1) (ii) & RSS-210 section A8.1 (1)	Spectrum Bandwidth of a FHSS system/ Maximum 20dB BW	Pass
§15.247 (b) (1) & RSS-210 section A8.4 (2)	Maximum Peak Output Power	Pass
§15.247 (d) & RSS-210 section A8.5	Band-Edge compliance of RF Conducted Emission	Pass
§15.205& RSS-210 section A8.5	Radiated Emission, Restricted Bands	Pass
§15.247 (d) & RSS-210 section A8.5	Spurious Emission Conducted	Pass
§15.247 (d) & RSS-210 section A8.5	Spurious Emission Radiated	Pass
§15.109 & ICES-003, RSS-GEN, Section 7.2.3.2	Radiated Emission (receiver)	Pass
§15.203 & RSS-Gen, Section 7.1.4	Antenna Connector requirement	Pass

WLAN: 802.11b/g: FCC 47 CFR Part 15, Subparts B & C, RSS 210 Annex.8 Issue 6

Test Spec. Clause	Test Case	Remarks
§15.247 (a) (2) & RSS-210 section A8.2 (1)	6 dB Bandwidth	Pass
§15.247 (b) (3) & RSS-210 section A8.4 (4)	Maximum Peak Output Power	Pass
§15.247 (e) & RSS-210 Section A8.2 (2)	Peak Power Spectral Density	Pass
§15.247 (d) & RSS-210 Section A8.5	Conducted Spurious Emissions	Pass
§15.247 (d) & §15.205	Radiated Spurious Emissions, Restricted Bands (2310-2390MHz, 2483.5-2500MHz)	Pass
§15.247 (d) & §15.205 & RSS-210 section A8.5	Radiated Emissions, Restricted Bands	Pass
§15.209& RSS-210 section A8.5	Radiated Emissions (Receive mode)	Pass
§15.203 & RSS-Gen.Section 7.1.4	Antenna Connector requirement	Pass

FCC 47 CFR, Part 24

Test Spec. Clause	Test Case	Remarks
§24.232 (c)	EIRP Peak Power	Pass
§24.235 & §2.1055	Frequency Stability	Pass
§24.238 & §2.1049	Occupied Bandwidth	Pass
§24.238	Out of Band Emissions - radiated	Pass
§24.238	Out of Band Emissions - conducted	Pass
§24.238	Block Edge Emissions - conducted	Pass
§15.109	Radiated Emissions	Pass

FCC 47 CFR, Part 22

Test Spec. Clause	Test Case	Remarks
§22.913(a)(2)	EIRP Peak Power	Pass
§22.355 & §2.1055	Frequency Stability	Pass
§22.917(b) & §2.1049	Occupied Bandwidth	Pass
§22.917(a)	Out of Band Emissions - radiated	Pass
§22.917(b)	Out of Band Emissions - conducted	Pass
§22.917(b)	Block Edge Emissions - conducted	Pass
§15.109	Radiated Emissions	Pass

Emission Tests w/Cradle configuration

Test type	Test Method	Class applied	Frequency Range	Test results
Radiated Emission	ANSI C63.4	B	30MHz÷1GHz	Comply
Power line Emission, 110 VAC	ANSI C63.4	B	150kHz÷30MHz	Comply



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1. General Description

1.1. Description of the EUT system/test Item:

Product name: HC700G

FCC ID: AZ489FT7030

IC: 109U-89FT7030

EUT Description

The HC700-G is a portable data terminal based on Intel PXA270 CPU and the industry standard Microsoft pocket pc Phone Edition Operating system. The display is a 64K color QVGA 3.5 inch transfective TFT LCD with backlight and touch screen. Serial (RS-232, and USB) interfaces and Bluetooth wireless communications are standard. Mobile communication (GSM/GPRS) is available via Motorola Quad-band G24 radio; Ethernet LAN communications is also available via the Communications and charging cradles. Standard features also include a 1D/2D imager based barcode scanner with signature capture and an alphanumeric keypad with backlight

Only two radios can operate (transmit) simultaneously:

- The GPRS (GSM850/PCS 1900) and WLAN will not work simultaneously when used in the present configuration;
- The GPRS (GSM850/PCS 1900) and Bluetooth transmitters may work simultaneously when used in the present configuration;
- The WLAN and Bluetooth transmitters may work simultaneously.

WLAN:

The WLAN transmitter was tested and investigated with maximum transmitted power. All data rates were investigated and worst-case rates were selected and plotted. PRBS data was transmitted during testing. The transmitter was operated during testing at 100% duty cycle.

Type of Multiplexing: TDD

Data Rates for 802.11b/g:

Protocol	OFDM, 802.11g	CCK, 802.11b
Rate [Mbps]	6, 9,12, 18, 24,36,48, 54	1, 2, 5.5, 11

Bluetooth:

The Bluetooth transmitter was tested and investigated with maximum transmitted power. All data rates were investigated and worst-case rates were selected and plotted. PRBS data was transmitted during testing. The transmitter was operated during testing at 100% duty cycle.

Type of Modulation: GFSK

Type of Multiplexing: TDD

GSM 850/PCS 1900:

The **GSM 850/PCS 1900** transmitter was tested and investigated with maximum transmitted power. All data rates were investigated and worst-case rates were selected and plotted. PRBS data was transmitted during testing. The transmitter was operated during testing at 12.5% duty cycle.

Type of Modulation: GMSK and 8PSK

Type of Multiplexing: TDMA

2. Method of Measurements

2.1. Conducted Measurements:

The RF output of the transmitter under test was directly connected to the input of the Spectrum analyzer through a specialized antenna connector provided by the manufacturer, and an attenuator as specified. The external attenuator and cable loss were added to the reading. Worst-case results of in the various modulation modes (where applicable) were reported.

For carrier frequency separation, number of hopping frequencies, time of occupancy, 20dB BW, peak output power, band edge emissions, and spurious emissions were measured according the guidelines in DA 00-705.

For PSD, emission peak was zoomed within the pass band with spectrum analyzer's settings as reported (Sweep time=Span/3kHz).

For Maximum Conducted Output Power per §15.247(b)(3), the spectrum analyzer was set for video trigger, and 100 traces were averaged in power averaging mode. The power was integrated across a bandwidth of the 26dB EBW of the signal, using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges.

2.2. Radiated Emissions Measurements in the restricted bands:

For radiated emissions, which fall in the restricted bands the spectrum from 1MHz to 25GHz was investigated following the guidelines in ANSI C63.4-2003, with the transmitter set to the lowest, middle and highest channel frequencies. Measurements were performed with peak detector and repeated averaged with VBW=10Hz.

2.3. Radiated Peak Output Power Measurements:

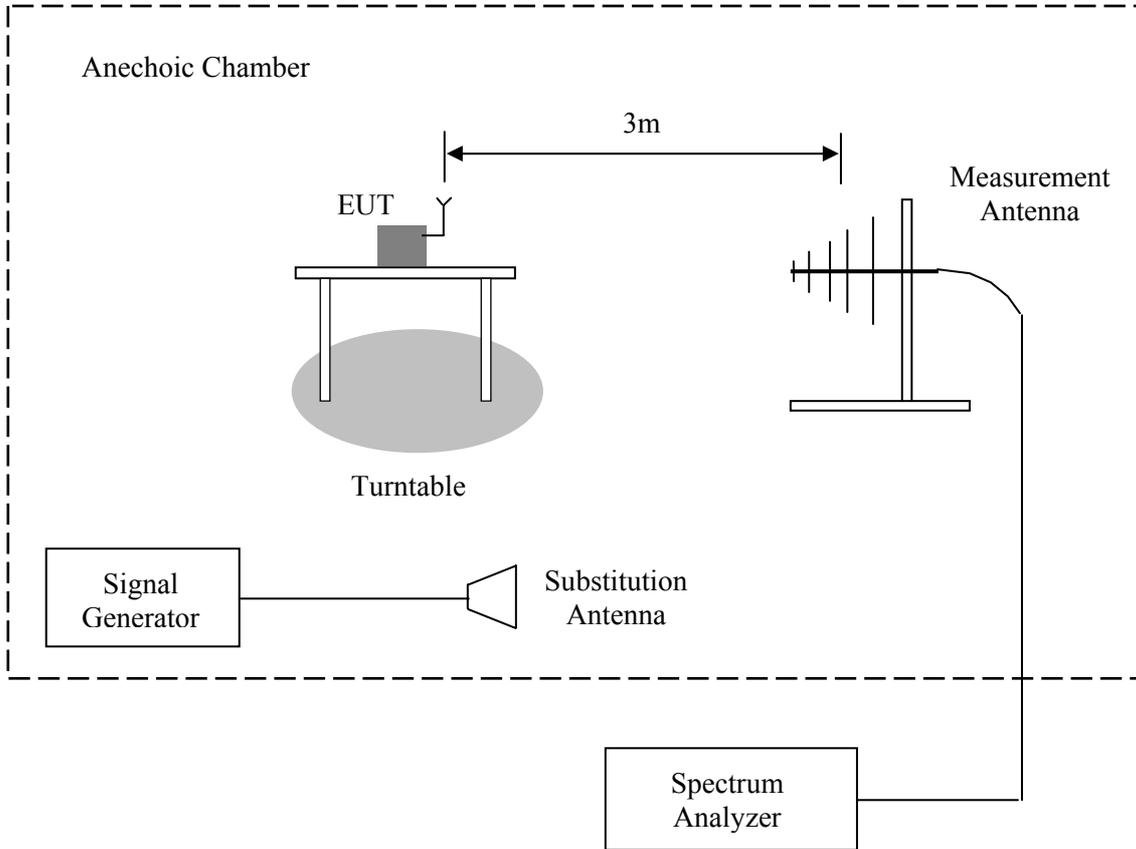
During the testing process, the EUT was controlled via dedicated software. The EUT was operated at maximum power, continuous transmission and PRBS data modulation.

The EUT was placed in an anechoic chamber, on a non-metallic table/support, 0.8m above the turntable, at 3 meter from the receive antenna, and its position where the maximum antenna gain occurs was identified. See test Setup # 1.

The peak emission was measured and recorded.

Using the Substitution Method in accordance to TIA/EIA 603, an antenna with a known gain substituted the EUT, and an RF signal source was connected to the antenna input by means of coaxial cable with known loss. The signal source level was adjusted until the previously recorded maximum reading was obtained. The power source reading was corrected for the cable loss, and the antenna gain was added to obtain the EIRP/ERP peak power. EIRP/ERP measurements were made at the upper, center, and lower carrier frequencies (1850.2MHz, 1879.8MHz, 1909.8 MHz or 824.2MHz, 836.6MHz, 848.8MHz).

Test Setup # 1



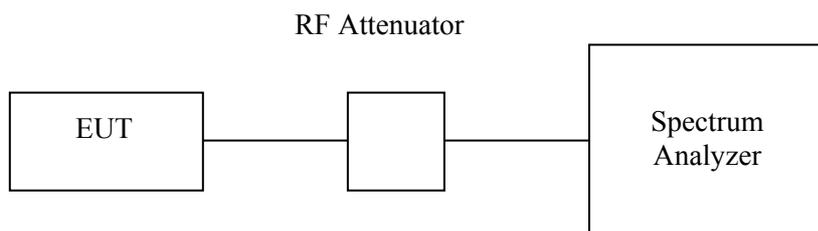
2.4. Conducted Peak Output Power Measurements:

During the testing process, the EUT was controlled via dedicated software. The EUT was operated at maximum power, continuous transmission and PRBS data modulation.

The transmitter output was connected to the Spectrum Analyzer via an RF attenuator, and peak output power was measured with an Impulse Bandwidth of 5MHz, in video trigger mode. See test Setup # 2.

Average output Power was also measured using a Power Meter instead of the Spectrum Analyzer.

Test Setup # 2



2.5. Radiated Out of Band Emissions Measurements:

During the testing process, the EUT was controlled via dedicated software. The EUT was operated at maximum power, continuous transmission and PRBS data modulation.

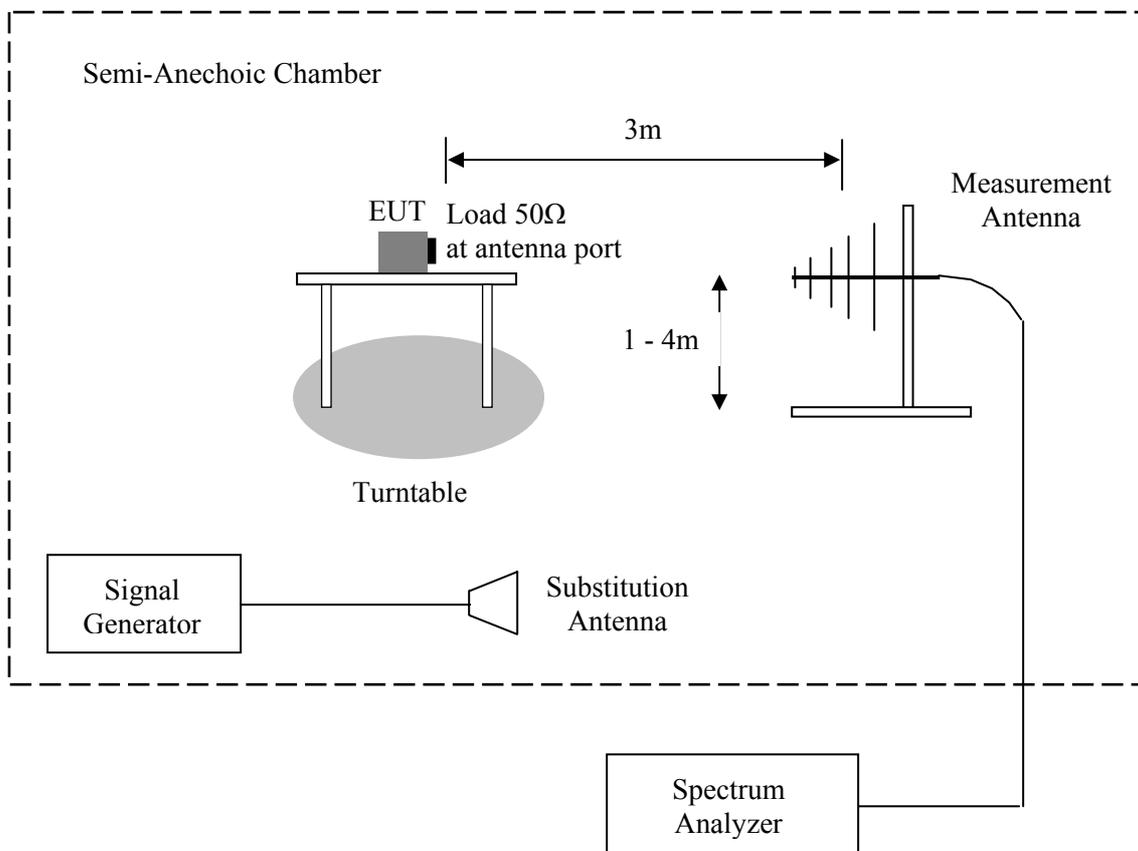
The antenna output was terminated with 50 Ω load.

The spectrum was scanned from 30MHz to the 10th harmonic of the highest frequency generated within the EUT, which is the transmitted carrier that can be as high as 1910MHz. For each spurious frequency, the antenna mast was raised and lowered from 1 to 4 meters and the turntable was rotated 360degrees to obtain a maximum reading on the spectrum analyzer. The maximum readings were recorded.

Radiated emissions measurements were made at the upper, center, and lower carrier frequencies of the 850/1900 bands (1850.2MHz, 1879.8MHz, 1909.8 MHz and 824.2MHz, 836.6MHz, 848.8MHz).

After all spurious emissions were recorded; the EUT was replaced with a substitution antenna in accordance to TIA/EIA 603, with a known gain fed by a signal generator. With the signal generator tuned to a particular spurious frequency, the antenna mast was raised and lowered from 1 to 4 meters to obtain a maximum reading on the spectrum analyzer. The signal source level was adjusted until a reading at the spectrum analyzer identical to the previously recorded spurious readings was obtained. The power readings in dBm was corrected for the cable loss, and compared to the §24.238 limits.

Test Setup # 3



2.6. Conducted Out of Band Emissions Measurements:

During the testing process, the EUT was controlled via dedicated software. The EUT was operated at maximum power, continuous transmission and PRBS data modulation.

The transmitter output was connected to the input of the Spectrum analyzer through a specialized antenna connector provided by the manufacturer, and an attenuator as specified. The external attenuators and cable loss were added to the reading. See test Setup # 4.

For spurious emissions measurement, the spectrum from 10MHz to 20GHz was investigated with the transmitter set to the lowest, middle and highest channel frequencies.

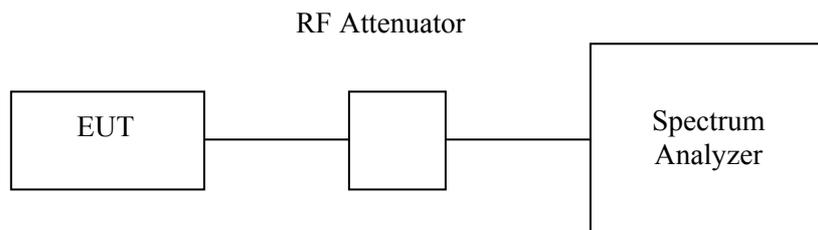
For Block Edge measurements, in 1MHz bands immediately outside and adjacent to the frequency block, conducted emissions were measured using a RBW of 1% of the occupied BW.

2.7. Occupied BW Measurements:

The transmitter output was connected to the input of the Spectrum analyzer through a specialized antenna connector provided by the manufacturer, and an attenuator as specified.

The RBW was set approximately 1% of the emission BW. Peak detector was used, and the view button was used to capture the emission. The maximum width of the emission, that is 26dB down from the peak of the emission was measured. This was compared with the analyzer, and RBW was readjusted and measurement repeated until the RBW/EBW ratio was approximately 1%.

Test Setup # 4



2.8. Radiated Emission measurements:

During the testing process, the EUT was controlled via dedicated software. The EUT was operated at in receive mode.

Measurements were performed at a 3-meter measurement distance in the semi-anechoic chamber in order to evaluate the radiated electromagnetic interference characteristics of the EUT. The EUT was placed on a non-metallic table/support, 0.8m above the turntable, was configured, arranged and operated in a manner consistent with typical application and load conditions.

An appropriate antenna depending upon the frequency range, per ANSI C63.4-2003 clause 4.1.5 was used. While the turntable was being rotated, the height of the antenna was varied from 1 to 4m for the frequency range of 9kHz to 25GHz. The highest radiated emission was detected by manipulating the system cables to the worst-case position. This process was repeated for both antenna polarizations.

The amplitudes of worst-case emission were measured with the detector modes and resolution bandwidths over various frequency ranges according to the requirements of ANSI C63.4-2003 clause 4.2.

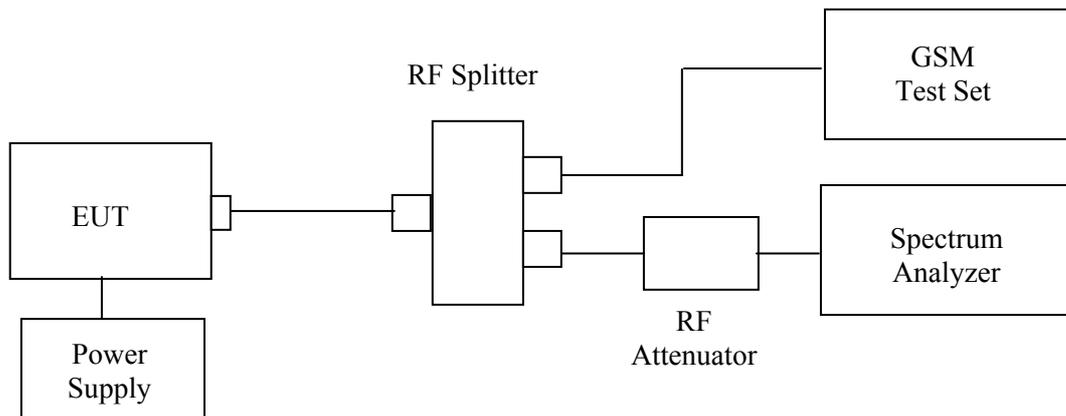
2.9. Frequency stability measurements:

During the process of testing, the EUT was controlled via Willtek 4202S GSM test set in “BS Call” mode on center channel, 836.6/1880MHz, under AFC lock, with settings to operate at maximum power transmission and proper modulation. See Setup # 5.

With the EUT powered with 7.2 V, the carrier frequency was measured at room temperature. Carrier frequency measurement was repeated at 10°C increments from -30°C to +50°C. At least 1 hour was allowed at each temperature un-powered, before measurement was made. The measurements were made within 2 minutes of powering up the EUT, to prevent significant self-warming.

With the EUT powered with 7.2 V, the carrier frequency was re-measured at room temperature. Supply voltage was varied from 7.2 V to 8.2 V in steps of 0.2V, re-measuring carrier frequency at each voltage.

Test Setup # 5



2.10. Power line Emission measurements:

The EUT was placed on a non-conductive table/support 80 cm above the reference ground plane. The EUT was configured in accordance with ANSI C63.4-2003 using a 50µH/50 ohm LISN.

Compliance with the provisions was based on the measurements of the radio frequency voltage between each line and the ground at the power terminal.

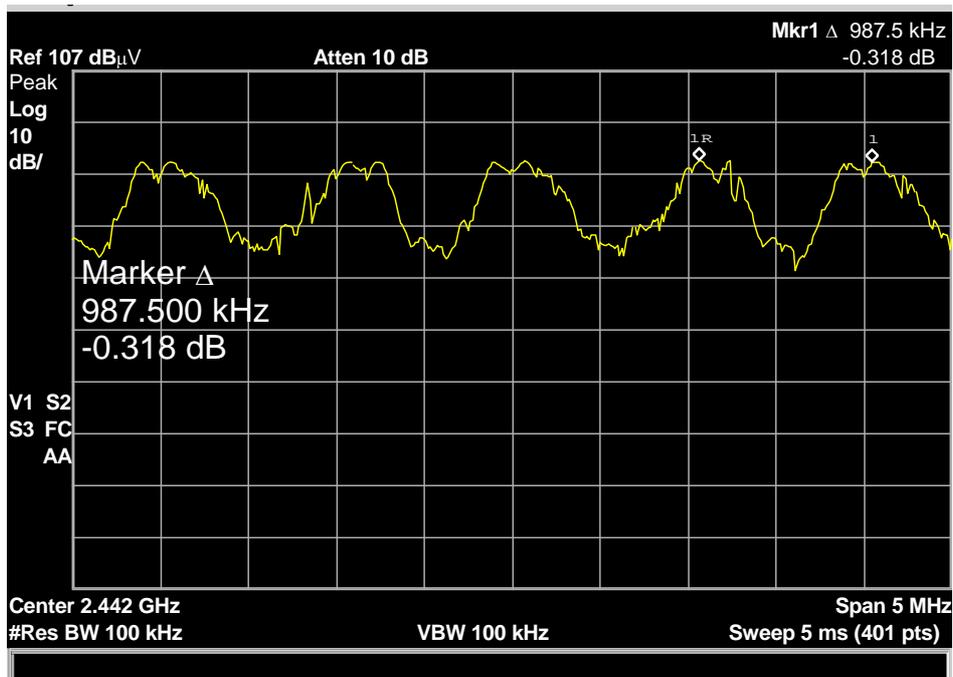
3. Bluetooth: Report of Measurements and examinations

3.1. Carrier Frequency Separation

Reference document:	47 CFR §15.247 (a) (1) & DA 00-705		
Test Requirements:	Hopping channels carrier frequencies separated by a minimum of 25kHz or 20dB Bandwidth of the hopping channel, whichever is greater.		
Test setup:	See Sec. 2.1	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Conducted		
S.A. Settings:	RBW: 100kHz, VBW: 100kHz		
Hopping function:	Enabled		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	Plot 3.1	

20dB BW [kHz]	Carrier separation [kHz]	Result
861	988	Pass

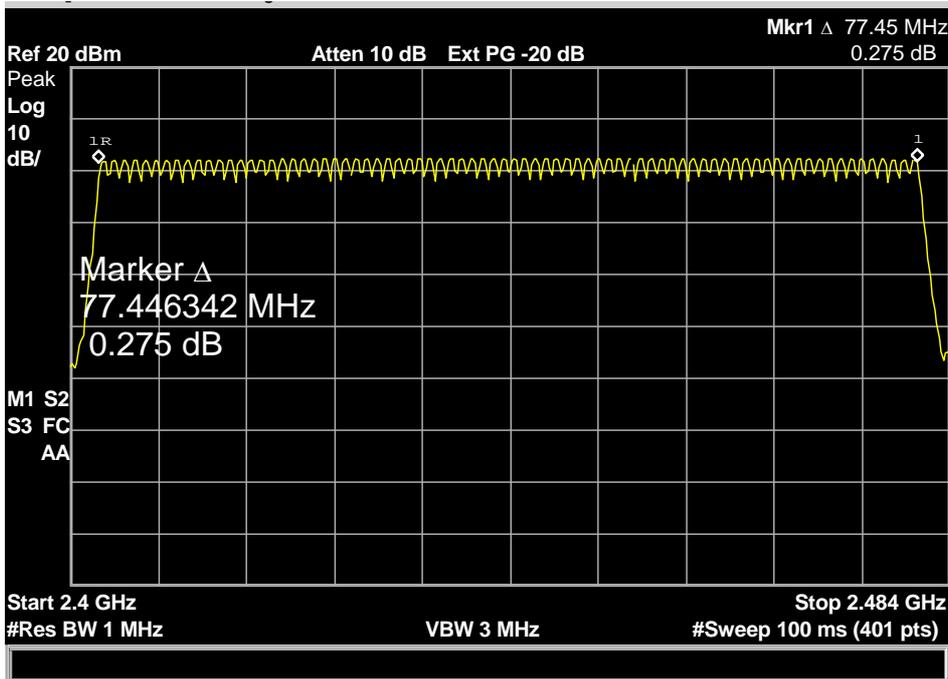
Plot 3.1



3.2. Number of Hopping Channels

Reference document:	47 CFR §15.247 (a) (1)(iii) & DA 00-705		
Test Requirements:	Hopping system shall use at least 15 non-overlapping channels.		
Test setup:	See Sec. 2.1	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Conducted		
S.A. Settings:	RBW: 1MHz, VBW: 3MHz		
Hopping function:	Enabled		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	79 hopping channels	Plot 3.2	

Plot 3.2



3.3. Average Time of Occupancy (Dwell Time)

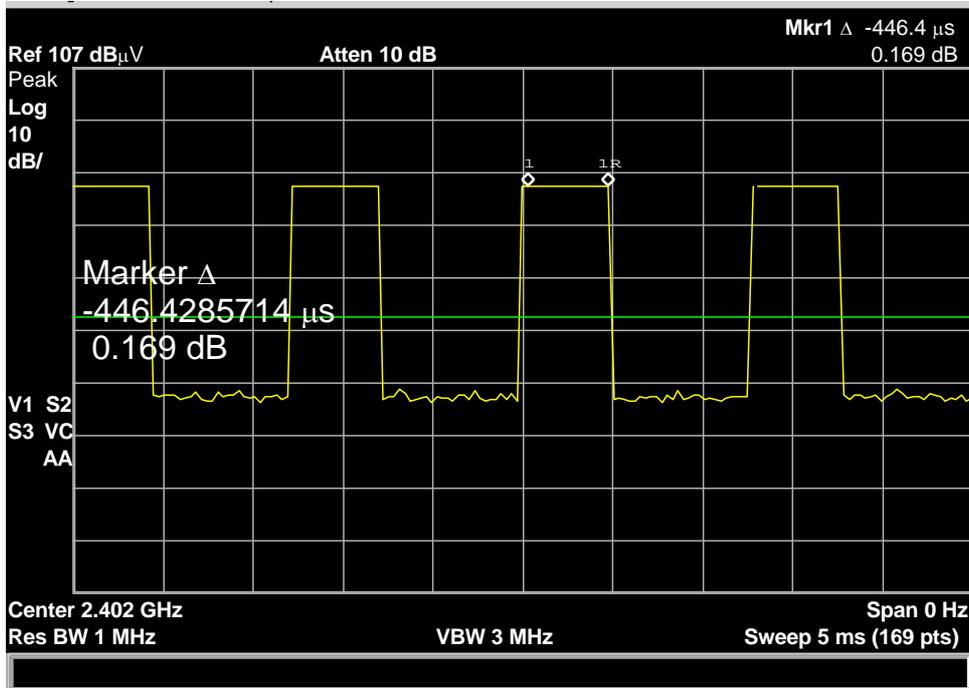
Reference document:	47 CFR §15.247 (a) (1) (iii) & DA 00-705		
Test Requirements:	The average time of occupancy on any channel shall not be greater than 0.4seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.		
Test setup:	See Sec. 2.1	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Conducted		
S.A. Settings:	RBW: 1MHz, VBW: 3MHz, Span:0 centered on hopping channel		
Hopping function:	Disabled		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.3.1– Plot 3.3.3	

Test results:

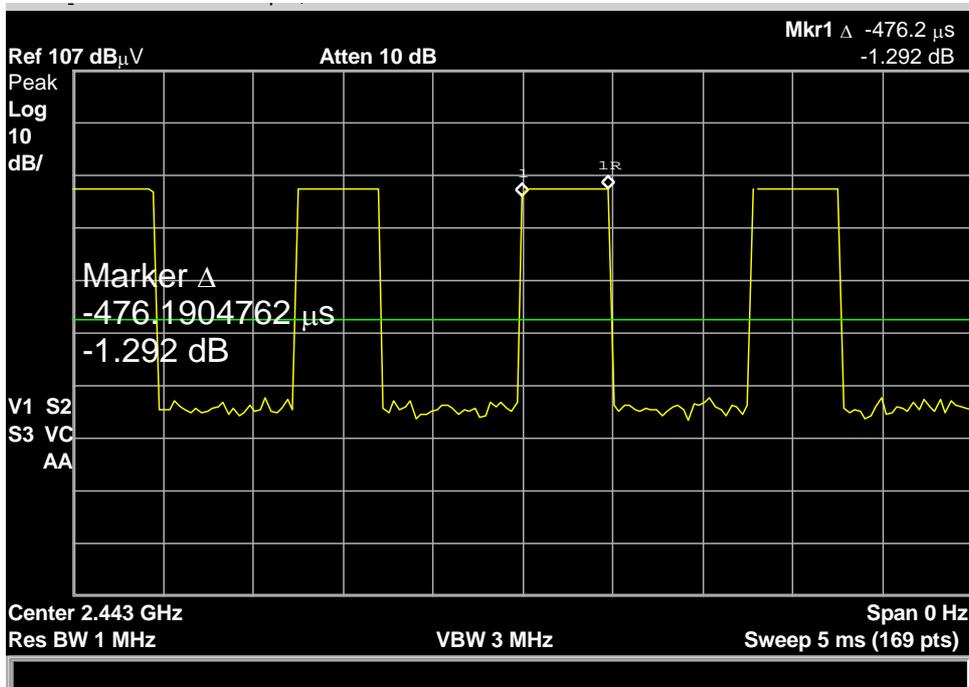
Frequency [GHz]	Time slot length [msec]	Reference	Dwell time [Sec]	Limit [Sec]	Result
2.402	0.4464	Plot 3.3.1	0.286	0.4	Pass
2.443	0.4762	Plot 3.3.2	0.305	0.4	Pass
2.480	0.4762	Plot 3.3.3	0.305	0.4	Pass

Dwell Time = Time Slot Length * Hop Rate/Number of Hopping Channels* Period Time
 Period Time= 0.4sec * 79, Hop Rate =1600 1/s

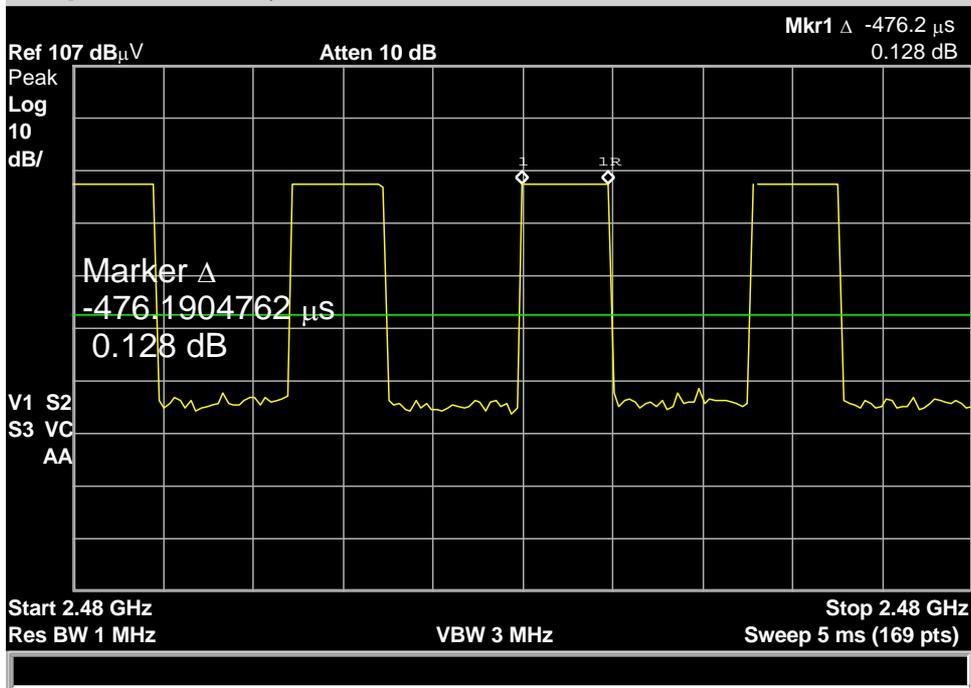
Plot 3.3.1



Plot 3.3.2



Plot 3.3.3



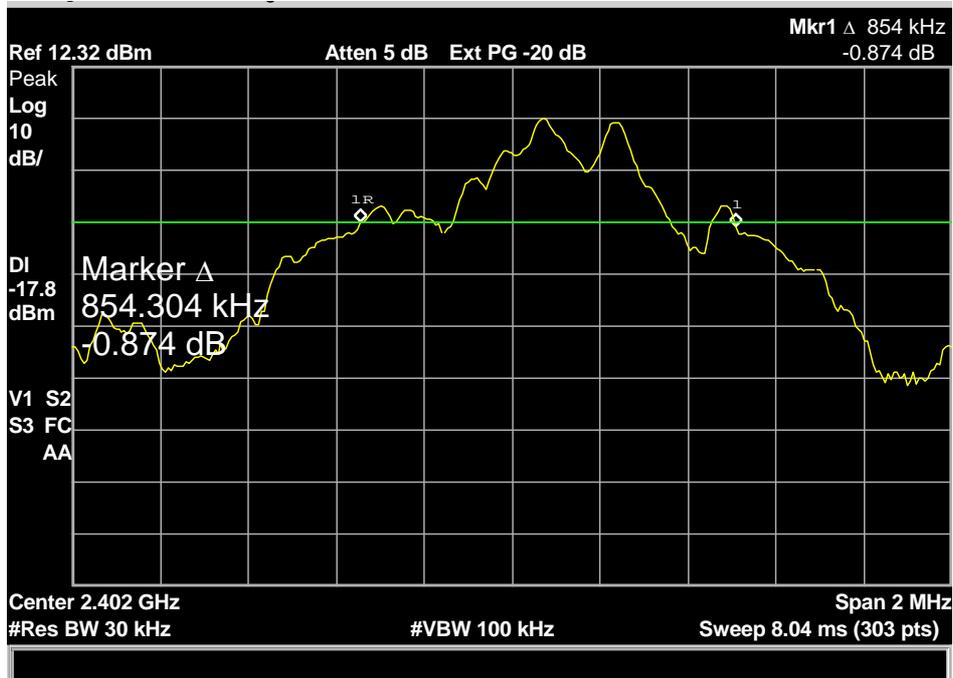
3.4. 20dB Bandwidth

Reference document:	47 CFR §15.247 (a) (1)(iii) & DA 00-705		
Test Requirements:	Hopping channels carrier frequencies separated by a minimum of 25kHz or 20dB Bandwidth of the hopping channel, whichever is greater.		
Test setup:	See Sec. 2.1	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Conducted		
S.A. Settings:	RBW: 30kHz, VBW: 100kHz, Span: 2MHz		
Hopping function:	Disabled		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.4.1 – Plot 3.4.3	

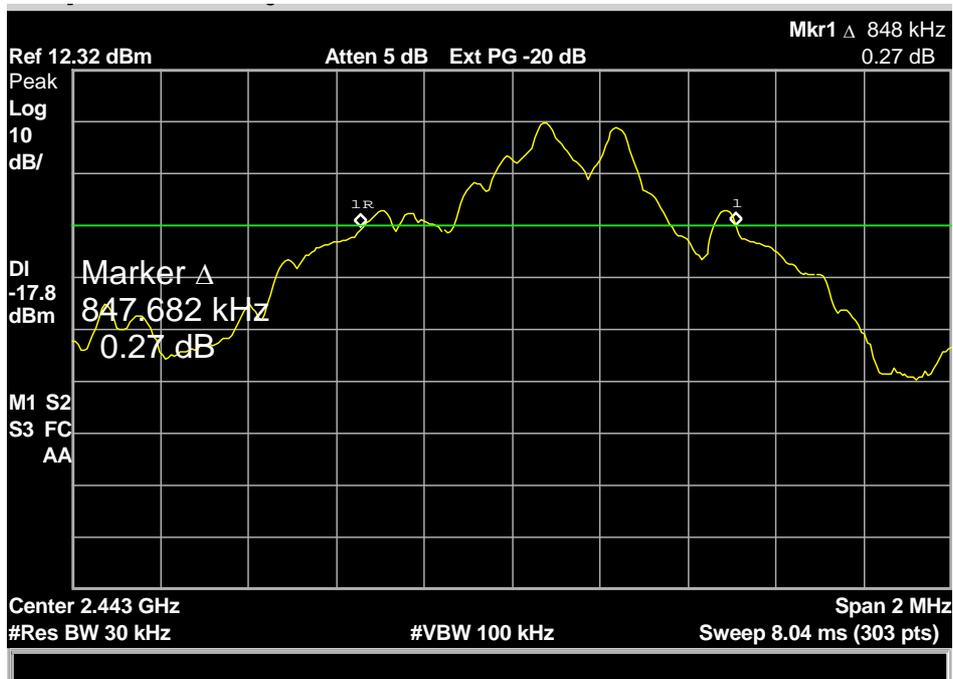
Test results:

Frequency [GHz]	20dB BW [kHz]	Reference
2.402	854	Plot 3.4.1
2.443	848	Plot 3.4.2
2.480	861	Plot 3.4.3

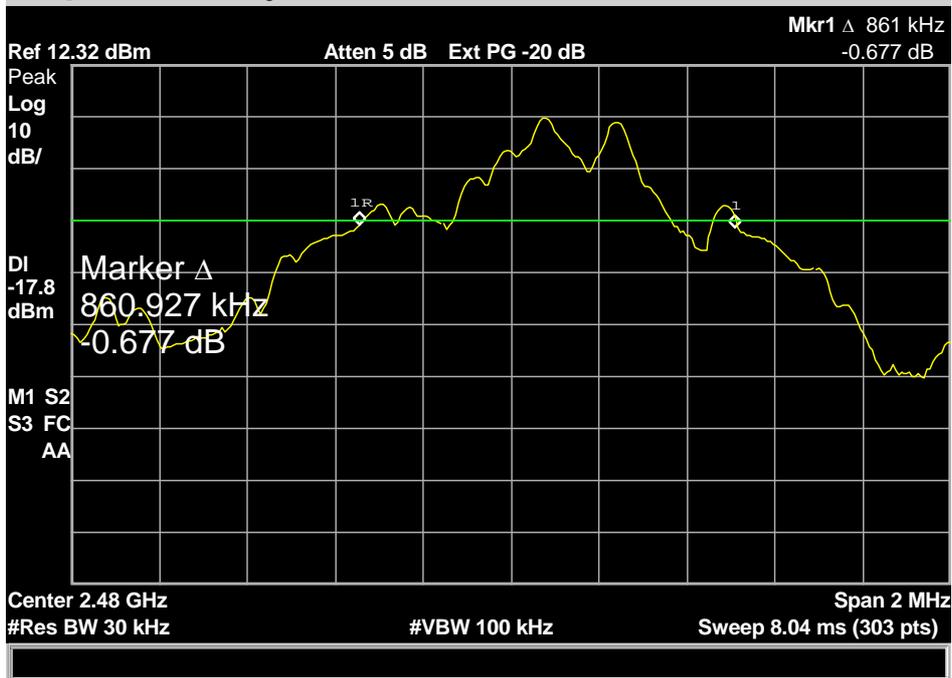
Plot 3.4.1



Plot 3.4.2



Plot 3.4.3



3.5. Maximum Peak Output Power

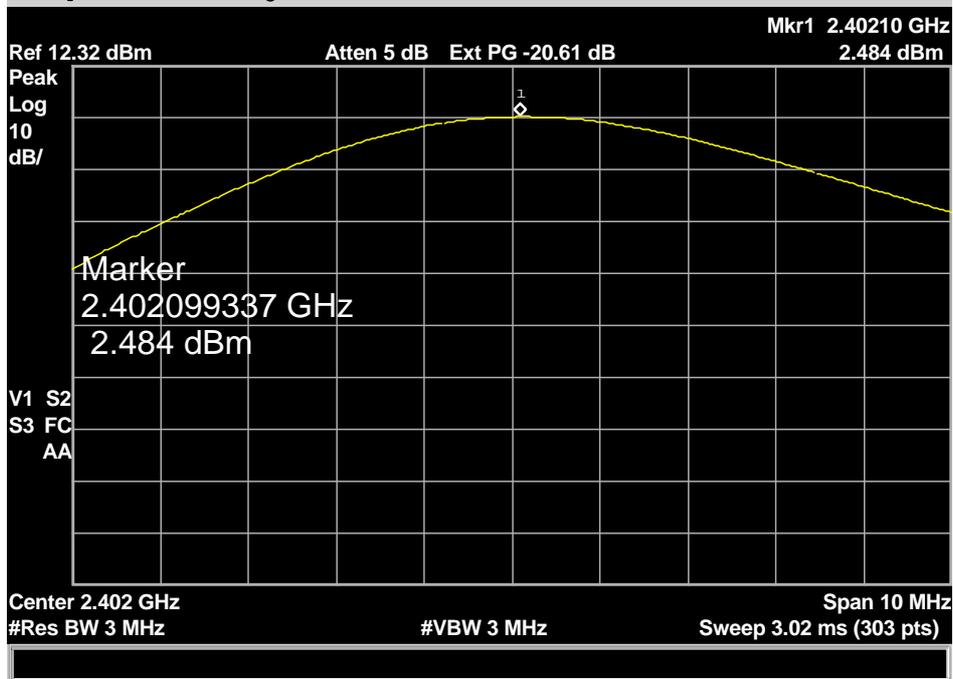
Reference document:	47 CFR §15.247 (b) (1) & DA 00-705		
Test Requirements:	The maximum peak output power shall not exceed 1Watt (30dBm)		
Test setup:	See Sec. 2.1	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Conducted		
S.A. Settings:	RBW: 3MHz, VBW: 3MHz,		
Hopping function:	Disabled		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.5.1 – Plot 3.5.3	

Test results:

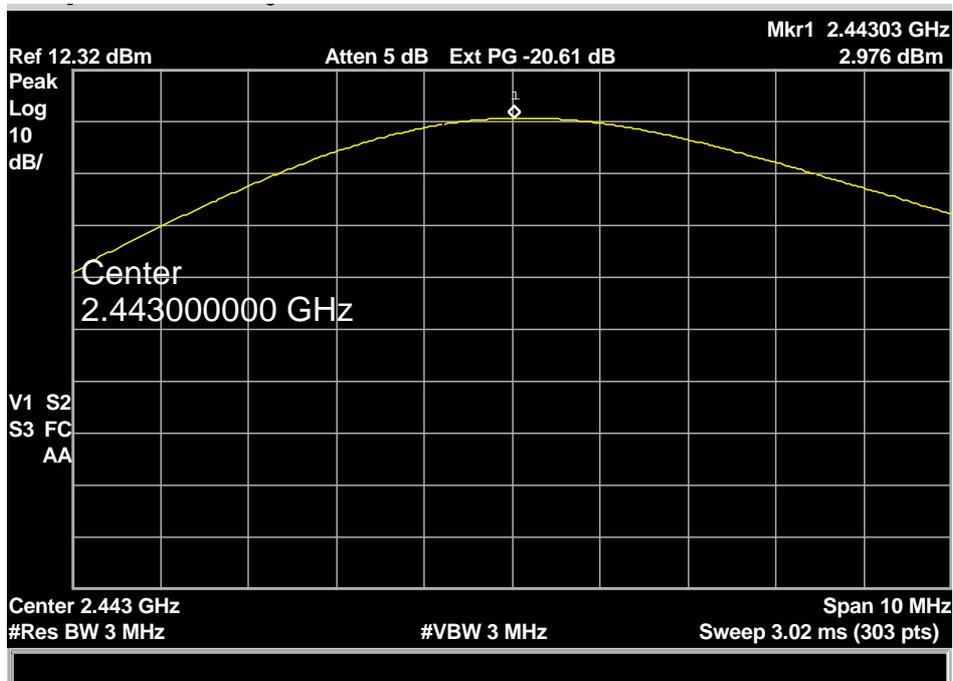
Frequency [GHz]	Cable Loss [dB]	Max. Peak Output power* [dBm]	Max. Peak Output power* [mW]	Reference	Result
2.402	0.45	2.484	1.772	Plot 3.5.1	Pass
2.443	0.45	2.976	1.984	Plot 3.5.2	Pass
2.480	0.45	2.775	1.895	Plot 3.5.3	Pass

*Corrected for external attenuations

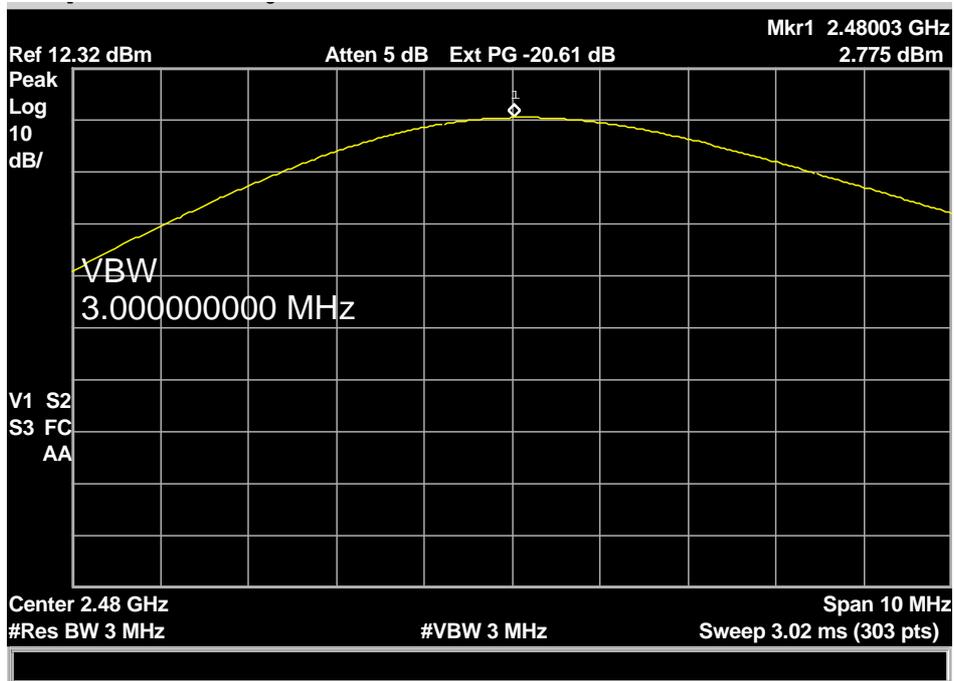
Plot 3.5.1



Plot 3.5.2



Plot 3.5.3



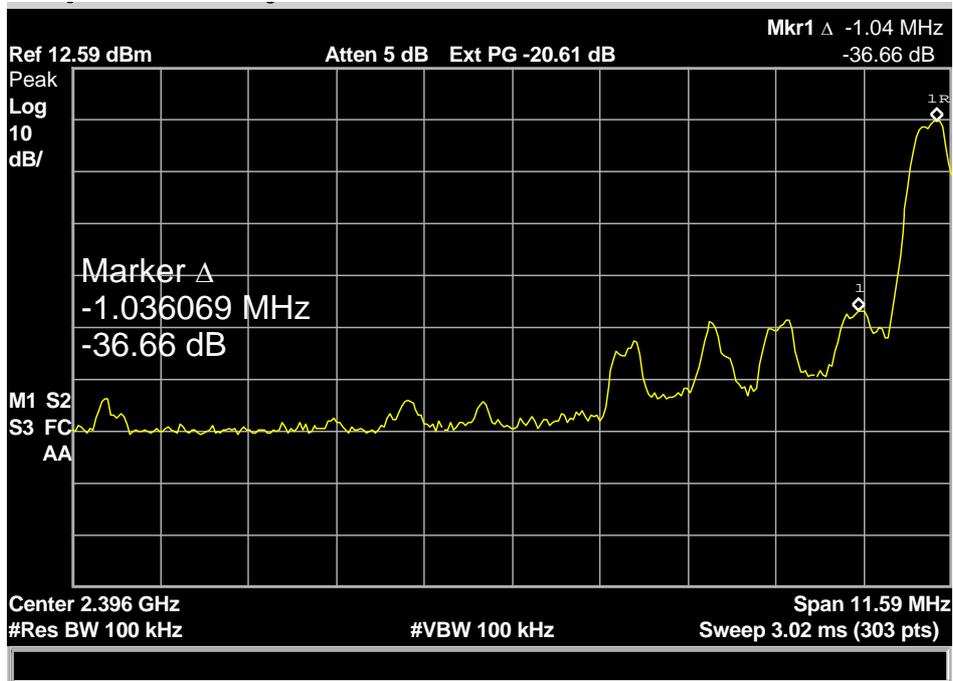
3.6. Band-edge compliance of RF Conducted Emission

Reference document:	47 CFR §15.247 (d) & DA 00-705		
Test Requirements and limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).		
Test setup:	See Sec. 2.1	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Conducted		
S.A. Settings:	RBW: 100kHz, VBW: 100kHz		
Hopping function:	Disabled/Enabled		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.6.1 – Plot 3.6.4	

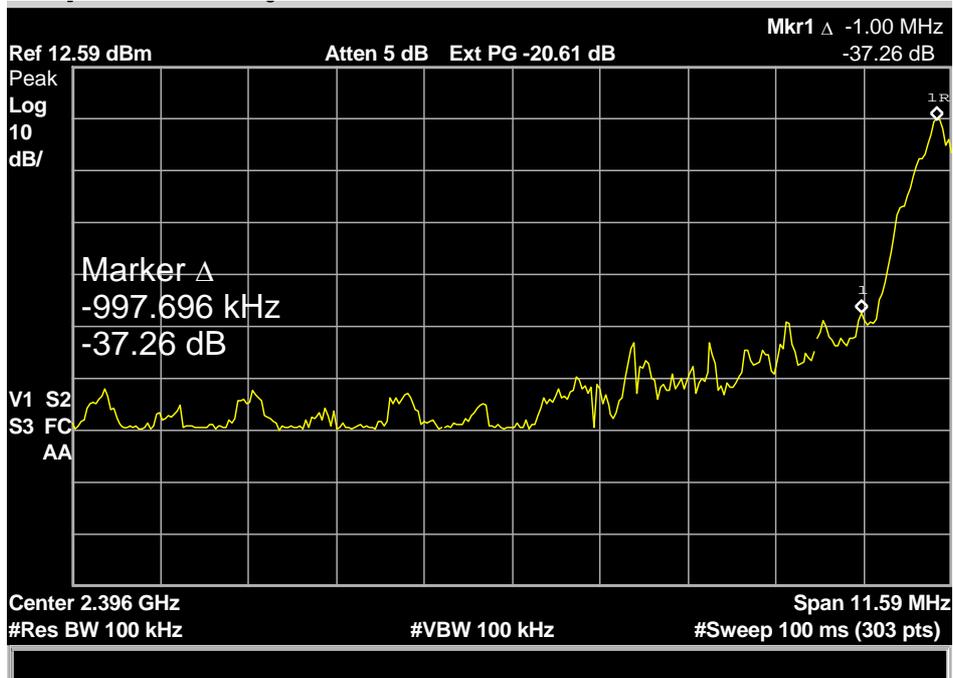
Test results of

Activity	Measured emission [dBc]	Limit [dBc]	Reference	Result
Hopping off, lowest frequency	-36.66	-20	Plot 3.6.1	Pass
Hopping on, lowest frequency	-37.26	-20	Plot 3.6.2	Pass
Hopping off, highest frequency	-31.21	-20	Plot 3.6.3	Pass
Hopping on, highest frequency	-30.89	-20	Plot 3.6.4	Pass

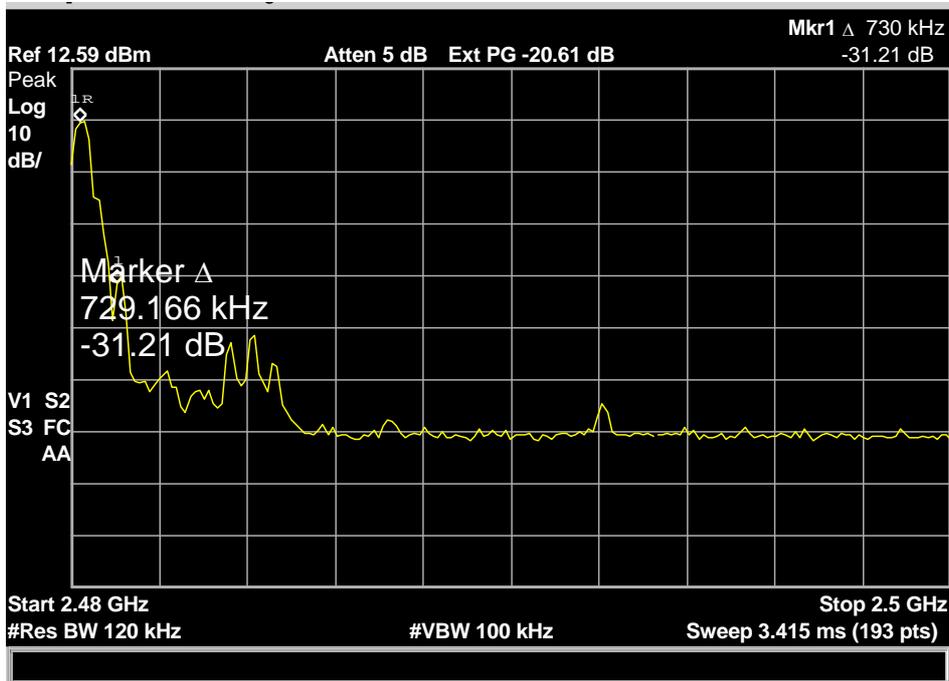
Plot 3.6.1



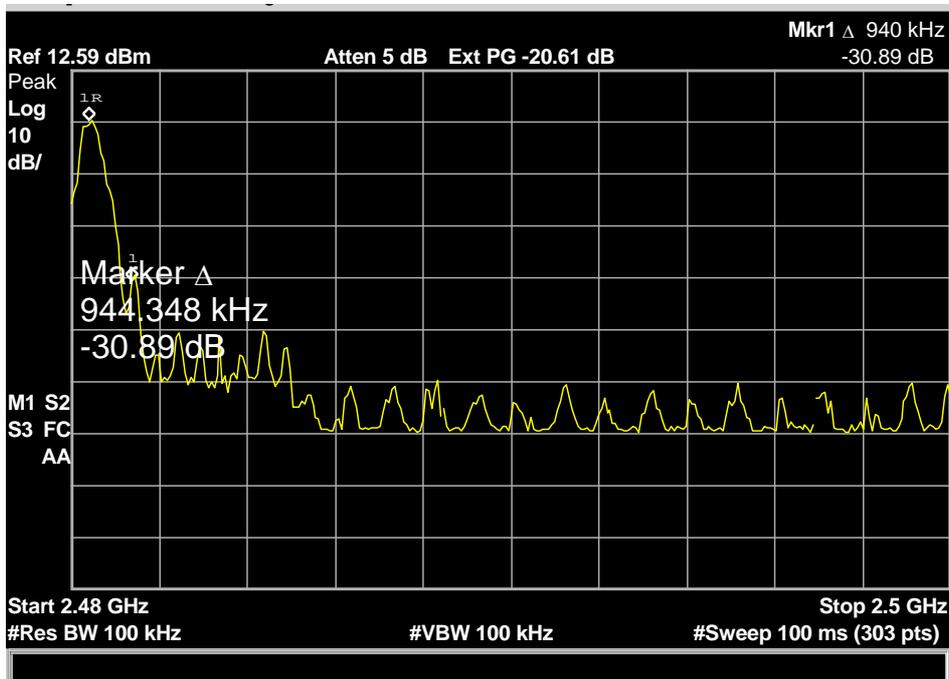
Plot 3.6.2



Plot 3.6.3



Plot 3.6.4



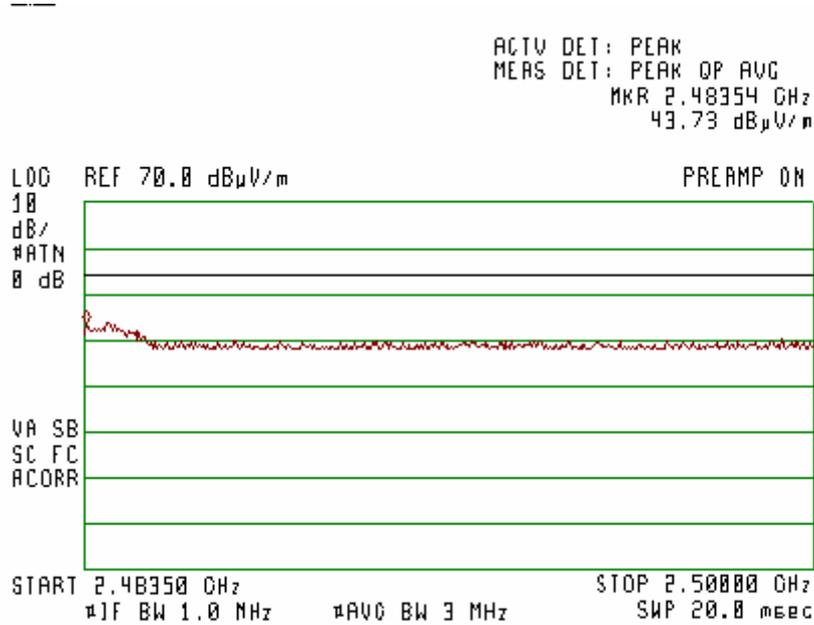
3.7. Radiated Spurious Emissions, Restricted Bands (2310-2390MHz, 2483.5-2500MHz)

Reference document:	47 CFR §15.205 & DA 00-705		
Test Requirements:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).		
Test setup:	See Sec. 2.2	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Radiated		
S.A. Settings:	RBW: 1MHz, VBW: 3MHz, 10Hz		
Hopping function:	Disabled/Enabled		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.7.1 – Plot 3.7.16	

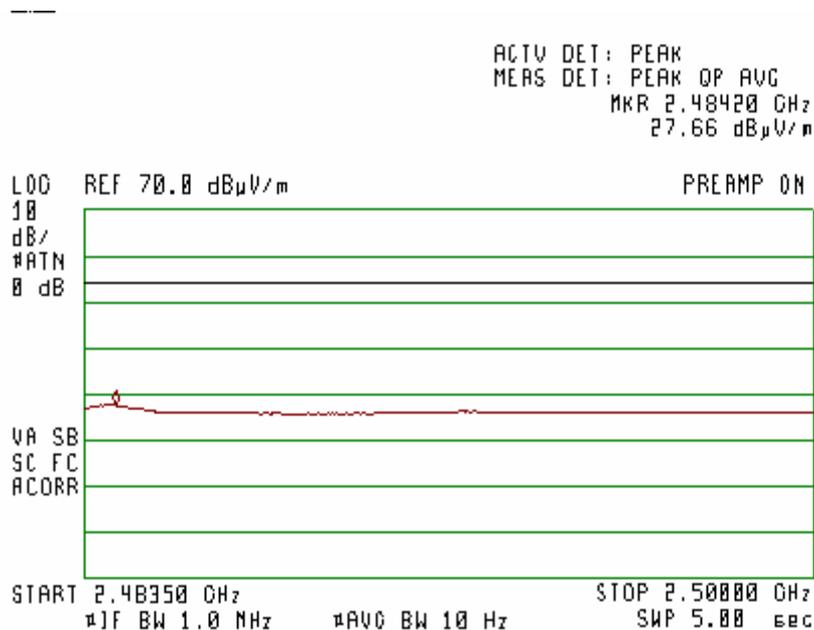
Test results:

Channel	Detector type	Max. Measured in restricted band at 3m [dBµV/m]	Limit [dBµV/m]	Reference	Result
Hopping off, highest frequency	Average	28.92	54	Plot 3.7.1 – Plot 3.7.8	Pass
	Peak	49.68	74		Pass
Hopping on, highest frequency	Average	25.82	54		Pass
	Peak	39.44	74		Pass
Hopping off, lowest frequency	Average	25.89	54	Plot 3.7.9 – Plot 3.7.16	Pass
	Peak	40.05	74		Pass
Hopping on, lowest frequency	Average	20.58	54		Pass
	Peak	33.71	74		Pass

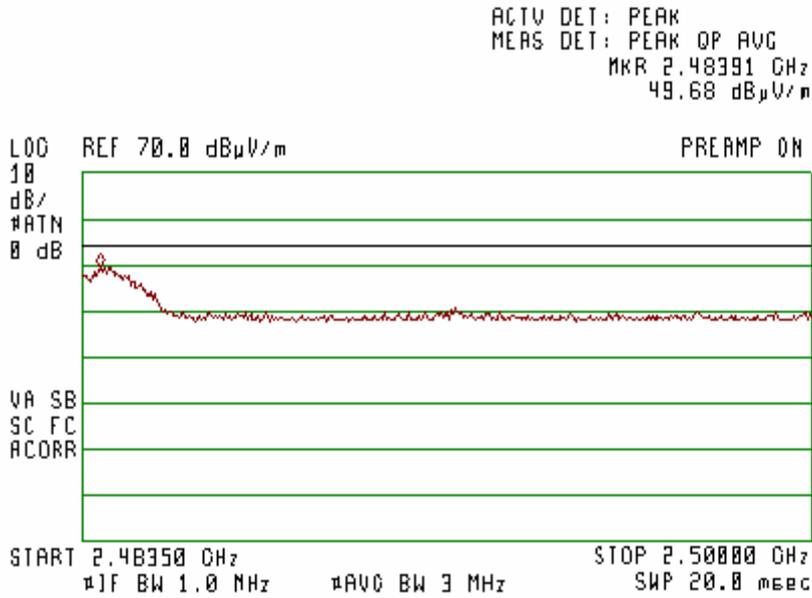
**Single mode Highest Frequency
Vertical Polarization
Peak
Plot 3.7.1**



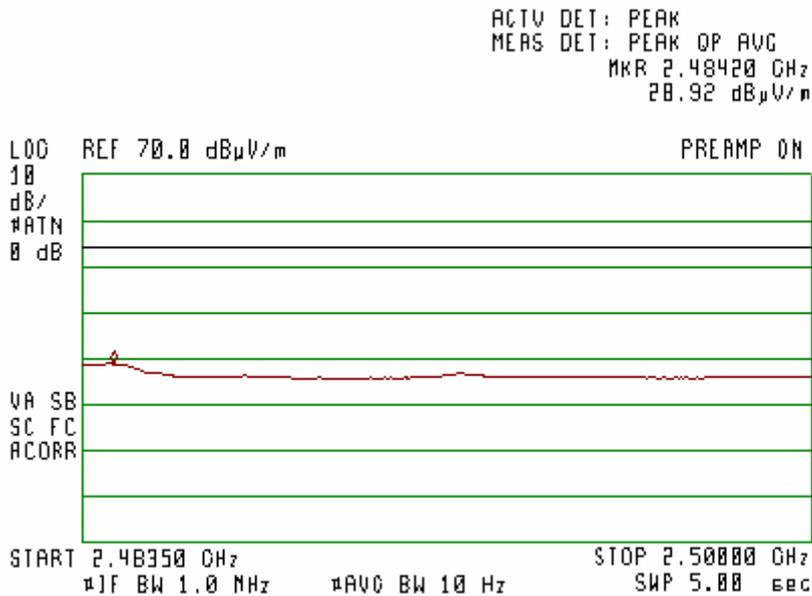
**Average
Plot 3.7.2**



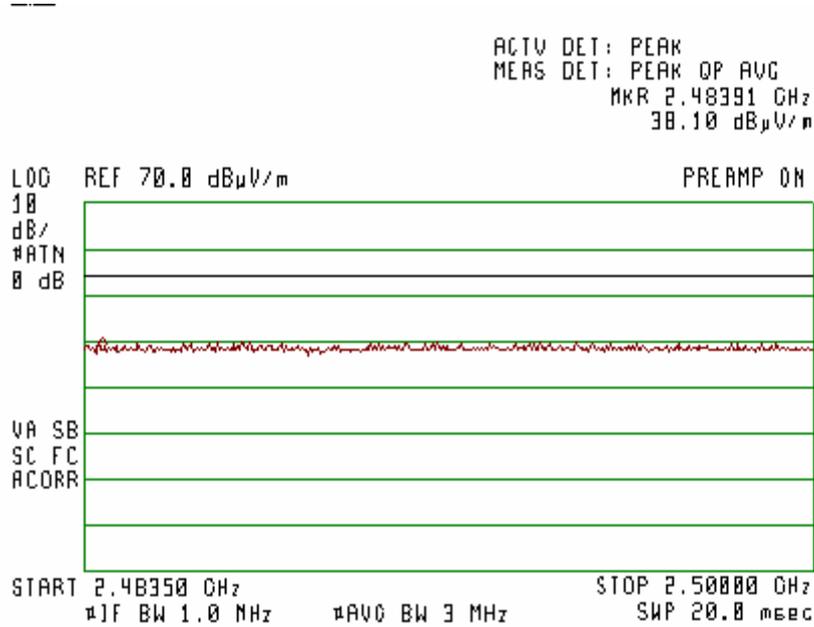
**Single mode Highest Frequency
Horizontal Polarization
Peak
Plot 3.7.3**



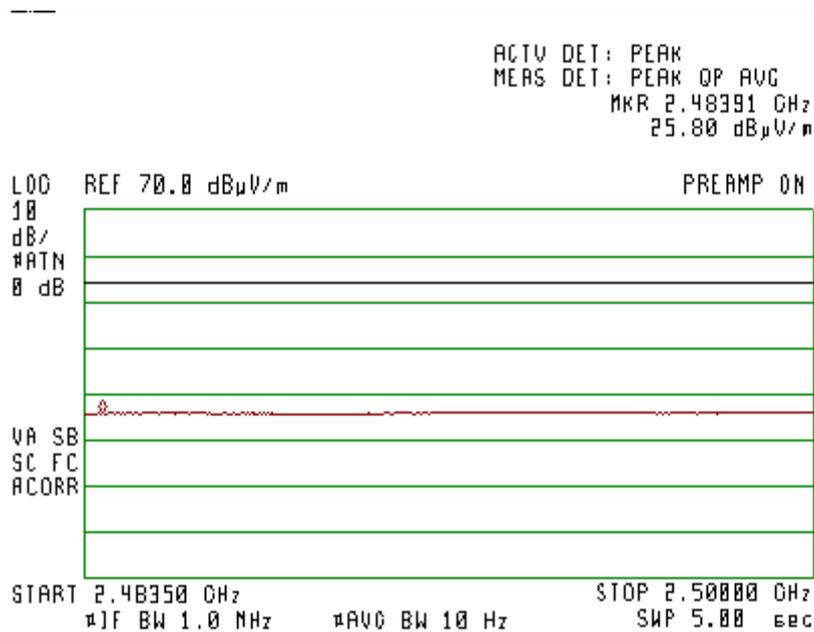
**Average
Plot 3.7.4**



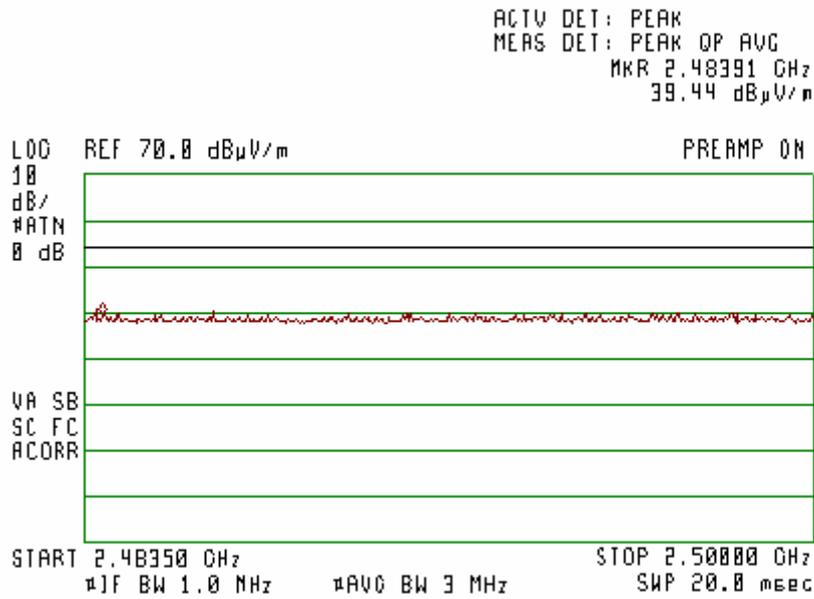
**Hopping mode highest Frequency
Vertical Polarization
Peak
Plot 3.7.5**



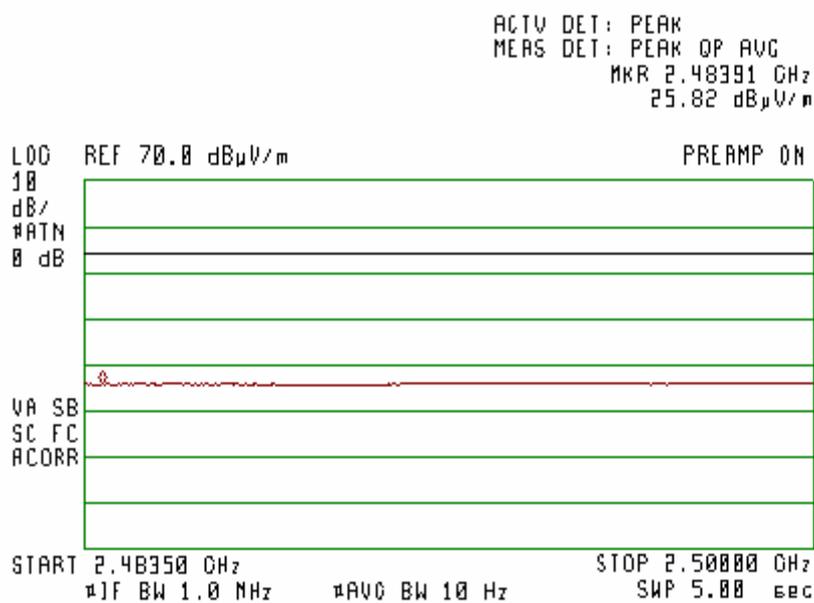
**Average
Plot 3.7.6**



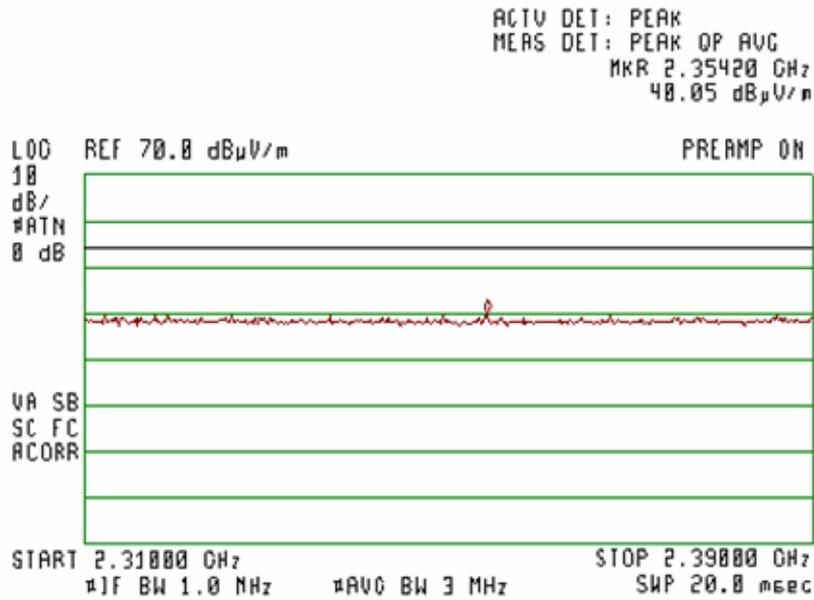
**Hopping mode highest Frequency
Horizontal Polarization
Peak
Plot 3.7.7**



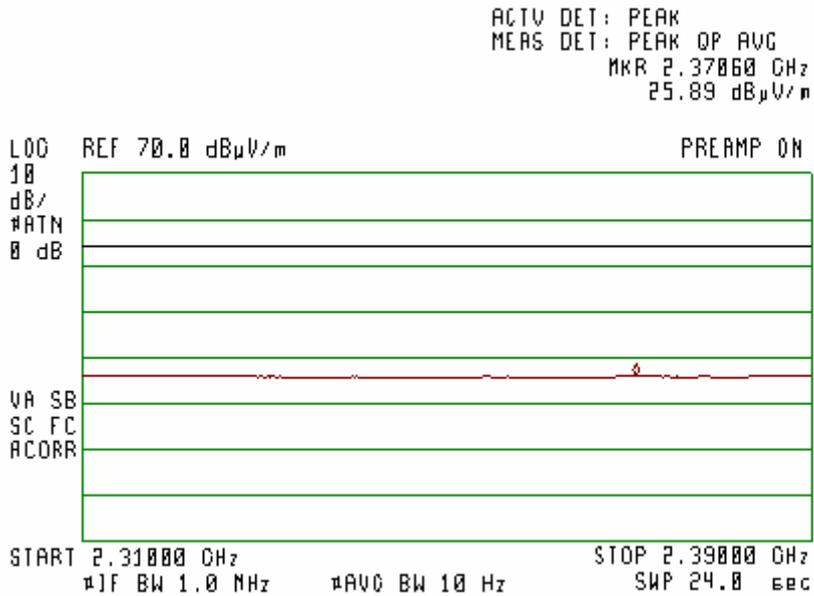
**Average
Plot 3.7.8**



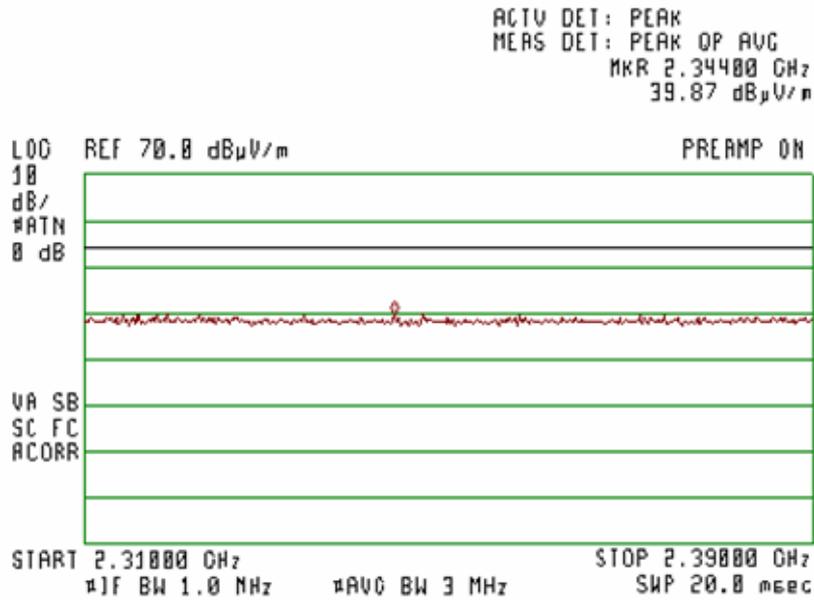
**Single mode Lowest Frequency
Vertical Polarization
Peak
Plot 3.7.9**



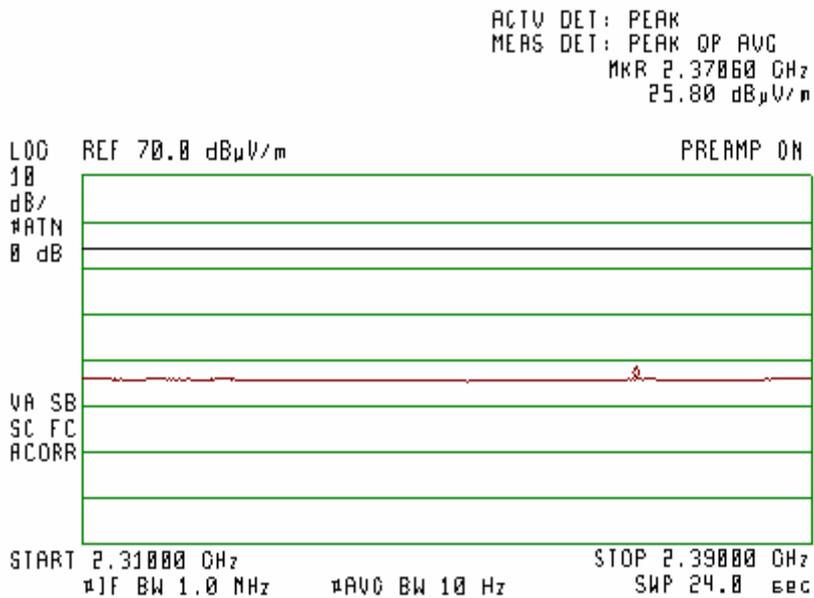
**Average
Plot 3.7.10**



**Single mode Lowest Frequency
Horizontal Polarization
Peak
Plot 3.7.11**

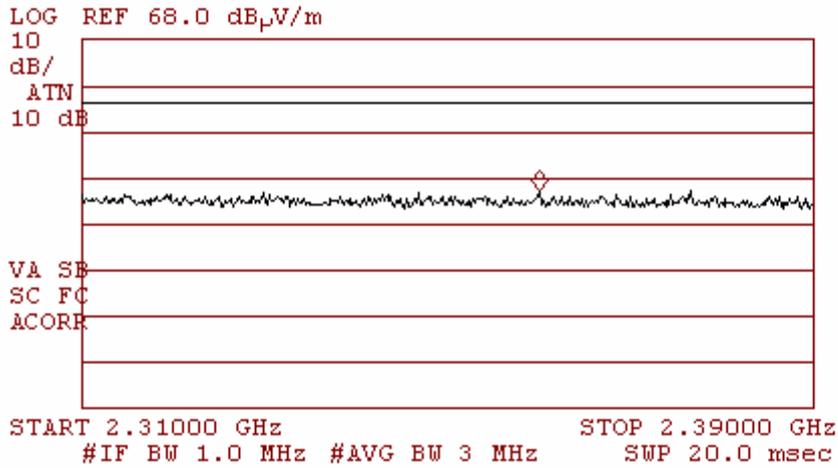


**Average
Plot 3.7.12**



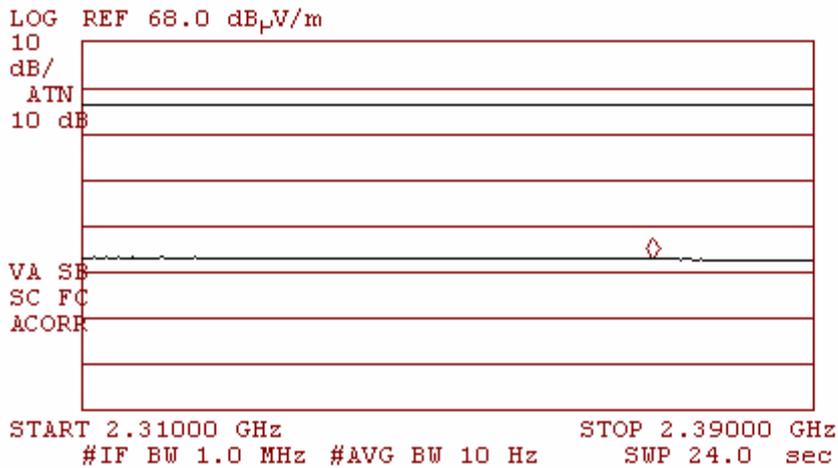
**Hopping mode Lowest Frequency
Vertical Polarization
Peak
Plot 3.7.13**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.36000 GHz
34.95 dB μ V/m



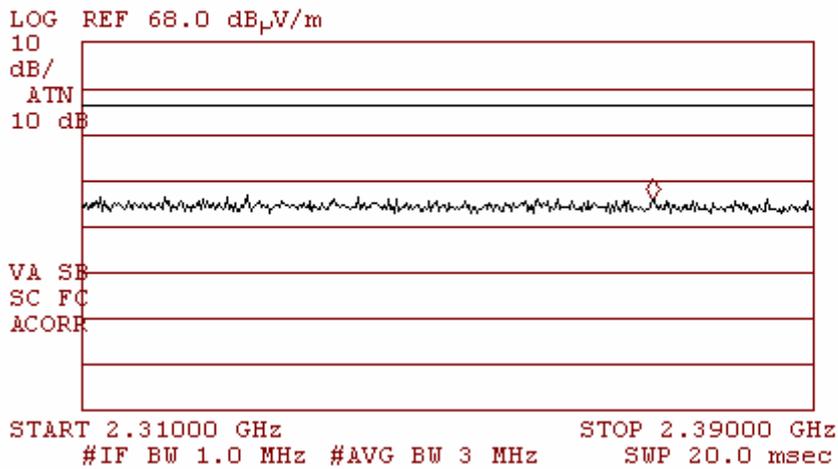
**Average
Plot 3.7.14**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.37240 GHz
20.52 dB μ V/m



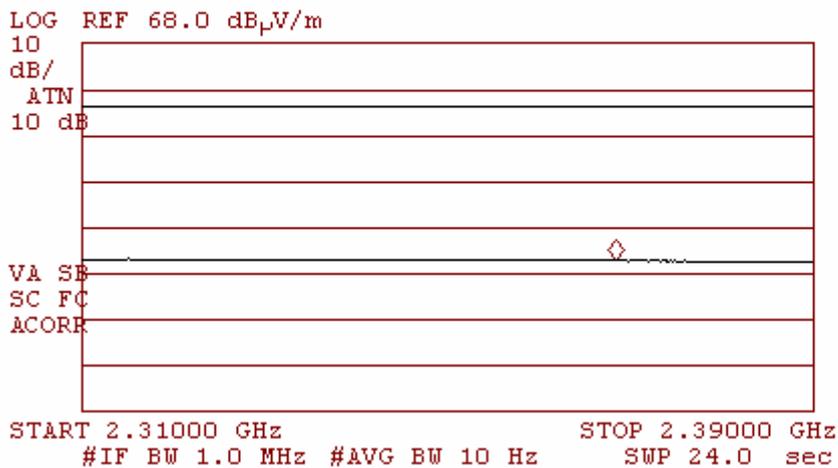
**Hopping mode Lowest Frequency
Horizontal Polarization
Peak
Plot 3.7.15**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.37240 GHz
33.71 dB μ V/m



**Average
Plot 3.7.16**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.36840 GHz
20.58 dB μ V/m



3.8. Radiated Spurious Emissions, Restricted Bands

Reference document:	47 CFR §15.247 (d) & §15.209(a) & DA 00-705		
Test Requirements:	The emissions from an intentional radiator shall not exceed the field strength levels specified in §15.209(a).		
Test setup:	See Sec. 2.8	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Radiated		
S.A. Settings:	f < 1GHz: RBW: 120kHz, VBW: 1MHz f > 1GHz: RBW: 1MHz, VBW: 3MHz		
Hopping function:	Disabled (lowest, middle, and highest)		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	Appendix A	

Test result

All measurements were done in horizontal and vertical polarizations; the results show the worst case

Lowest channel, 2.402					
Frequency [MHz]	Detector	Spurious level [dBµV/m]	Limit [dBµV/m]	Reference Plot	Result
4804	Avg	30.6	54	Plot 2	Pass

Middle channel, 2.443					
Frequency [MHz]	Detector	Spurious level [dBµV/m]	Limit [dBµV/m]	Reference Plot	Result
4886	Avg	27.0	54	Plot 6	Pass

Highest channel, 2.48					
Frequency [MHz]	Detector	Spurious level [dBµV/m]	Limit [dBµV/m]	Reference Plot	Result
4960	Avg	25.6	54	Plot 10	Pass

3.9. Spurious Emission- Conducted

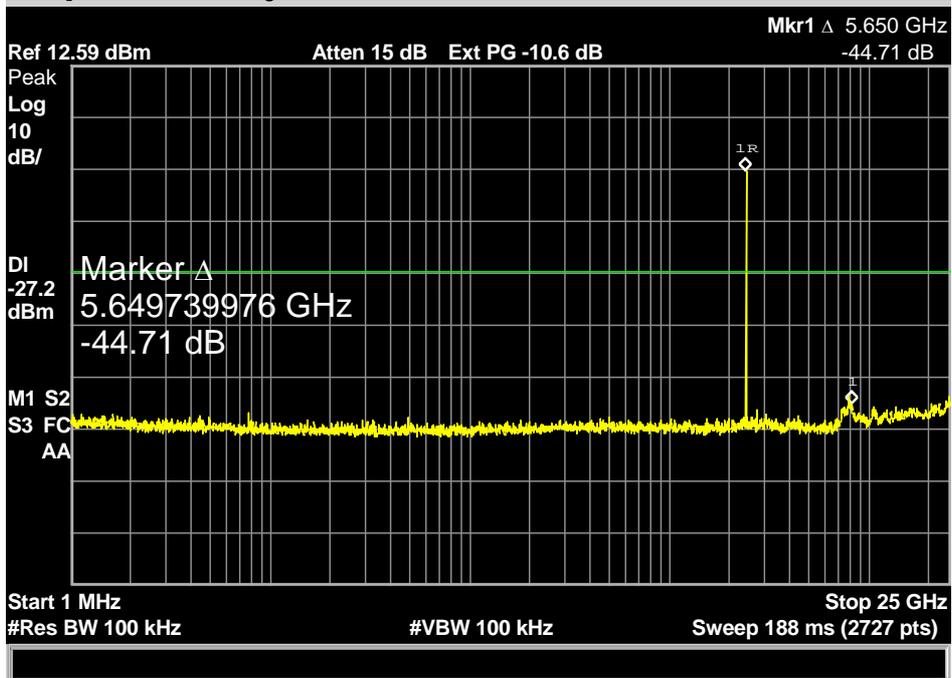
Reference document:	47 CFR §15.247 (d) & DA 00-705		
Test Requirements:	In any 100 kHz bandwidth outside the frequency band at least 20 dB below the highest level of the desired power.		
Test setup:	See Sec. 2.1	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Conducted		
S.A. Settings:	RBW: 100kHz, VBW: 100kHz,		
Hopping function:	Disabled (lowest, middle, and highest)		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.9.1 – Plot 3.9.3	

Test results:

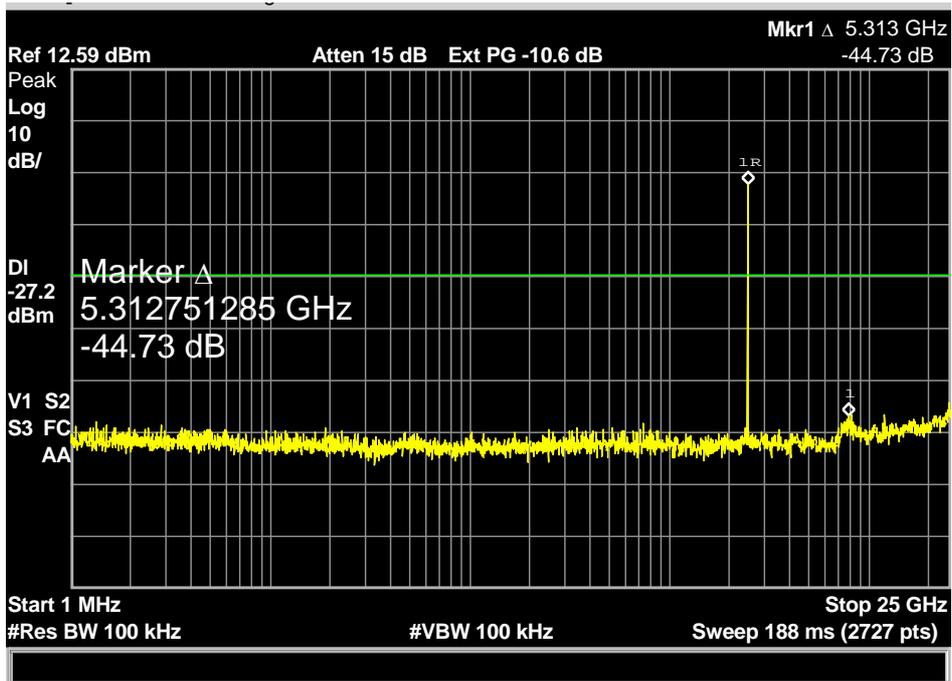
Frequency [GHz]	Spurious Frequency [GHz]	Emissions limit	Reference	Result
2.402	All readings At least -40dBc	-20dBc	Plot 3.9.1	Pass
2.443	All readings At least -40dBc		Plot 3.9.2	Pass
2.480	All readings At least -40dBc		Plot 3.9.3	Pass

Spurious Emission- Conducted

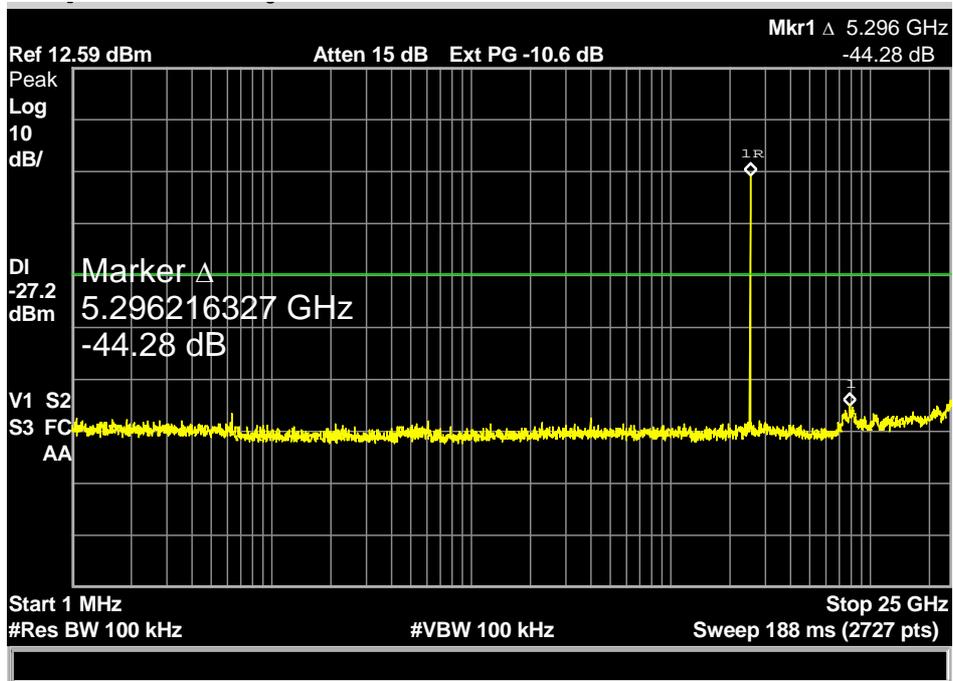
**Low frequency
Plot 3.9.1**



**Middle frequency
Plot 3.9.2**



High frequency
Plot 3.9.3



3.10. Radiated Emission- (Receive mode)

Reference document:	47 CFR §15.109		
Test Requirements:	Emission Level shall not exceed §15.109 limits		
Test setup:	See Sec. 2.8	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Radiated		
S.A. Settings:	F <1GHz: RBW: 120kHz,VBW: 1MHz F >1GHz: RBW: 1MHz, VBW: 3MHz		
Mode of operation:	Receive		
Environment conditions:	Ambient Temperature: 22°c	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	All readings were at least 10 db below the limit	Appendix B	

3.11. Antenna Connector Requirements

Reference document:	47 CFR §15.203	
Test Requirements:	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with provisions of this section.	
Test Result:	The HC700G employs a unique connector type UFL connector.	Pass

4. WLAN 802.11b/g: Report of Measurements and examinations

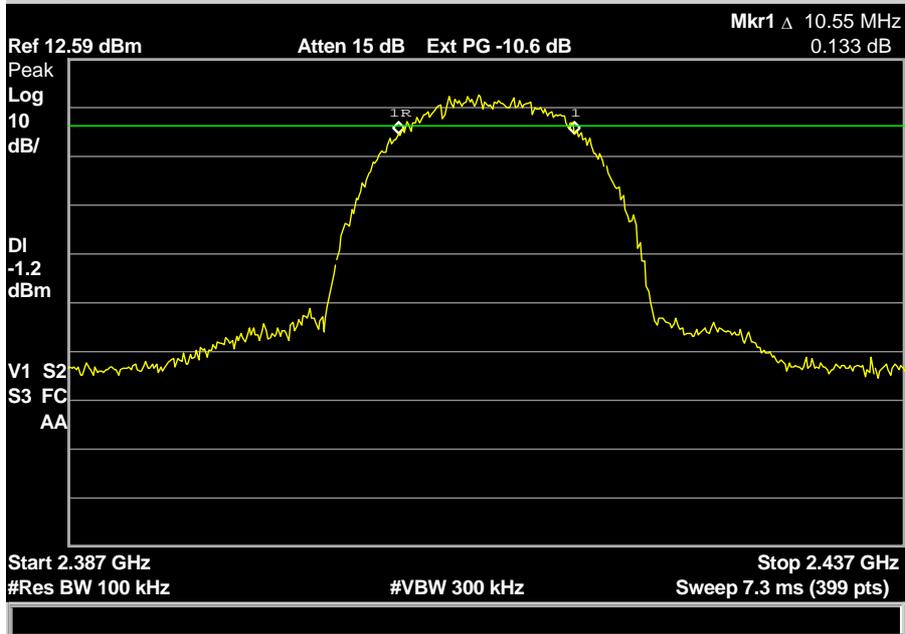
4.1. 6 dB Bandwidth

Reference document:	47 CFR §15.247 (a) (2)		
Test Requirements:	Systems using digital modulation techniques may operate in 2400-2483.5 MHz band. The minimum 6dB bandwidth shall be at least 500 kHz.		
Test setup:	See Sec. 2.1	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 100kHz, VBW: 300kHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 4.1.1 - Plot 4.1.6	

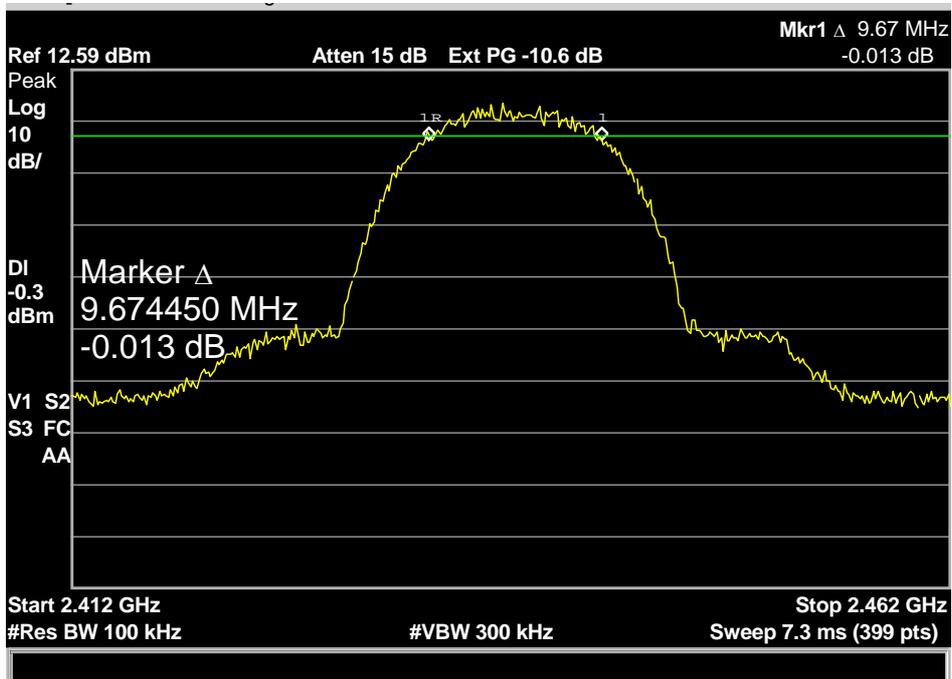
Test results

Frequency [MHz]	Data Rate [Mbps]	6 dB Bandwidth [kHz]	Limit [kHz]	Test Result	Reference
802.11b Mode					
2412	11	10550	>500	Pass	Plot 4.1.1
2437	11	9670	>500	Pass	Plot 4.1.2
2462	11	10180	>500	Pass	Plot 4.1.3
802.11g Mode					
2412	54	16460	>500	Pass	Plot 4.1.4
2437	54	16580	>500	Pass	Plot 4.1.5
2462	54	16330	>500	Pass	Plot 4.1.6

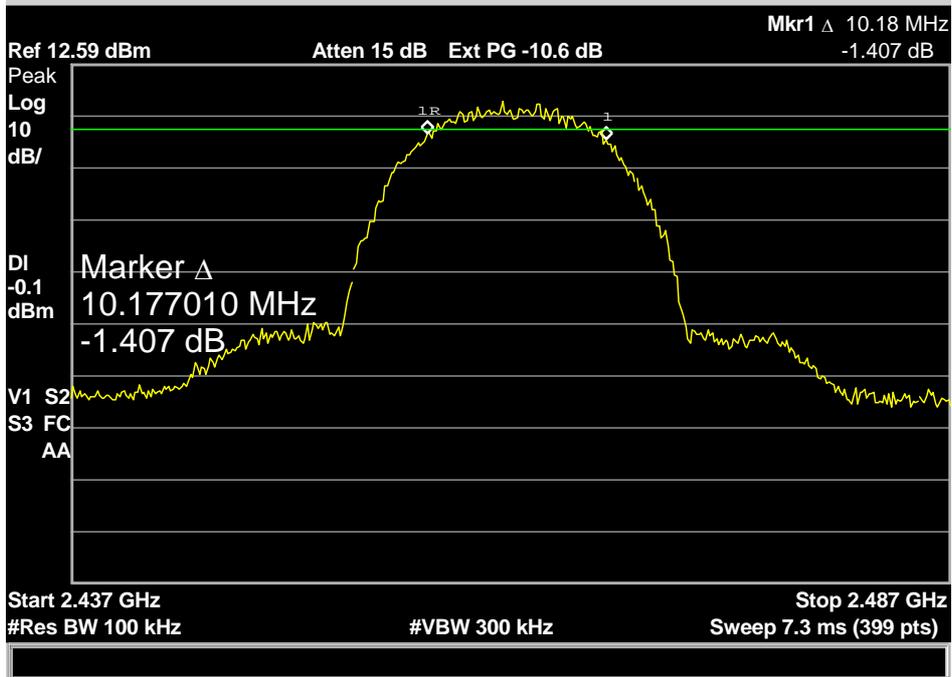
802.11b Mode
Plot 4.1.1



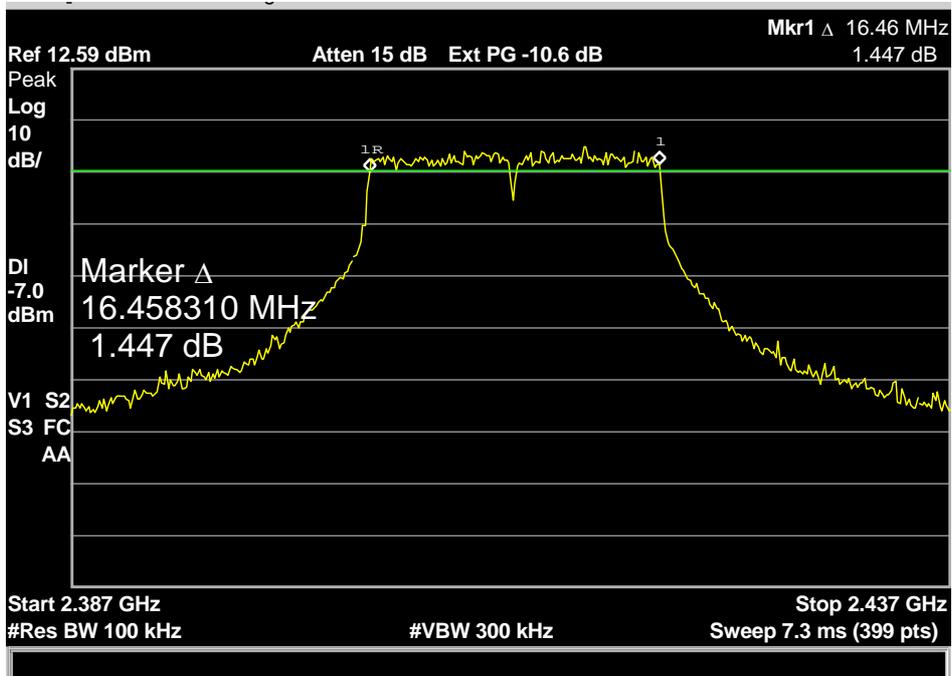
Plot 4.1.2



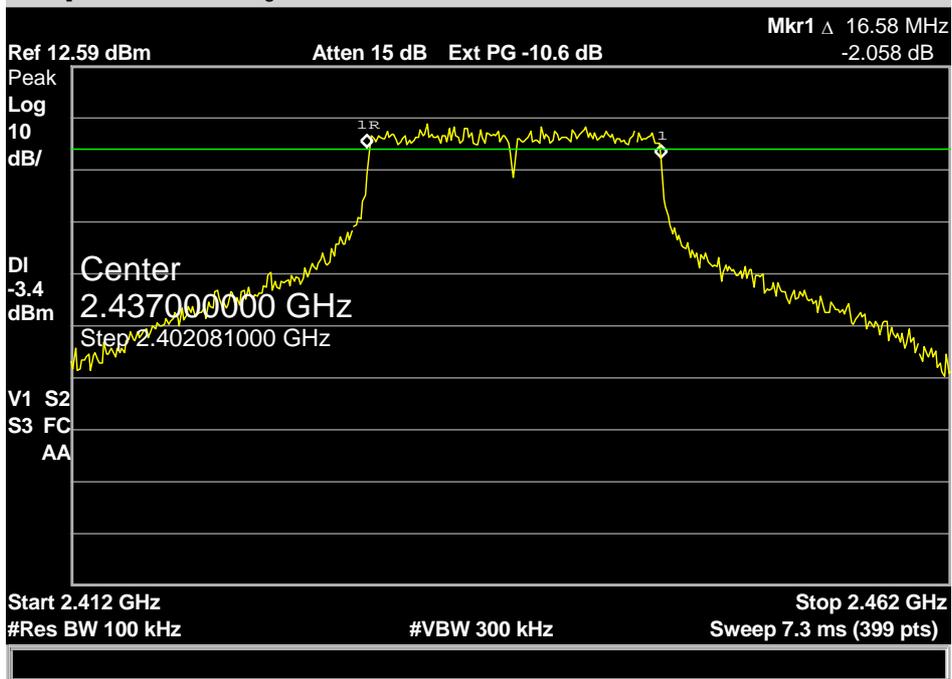
Plot 4.1.3



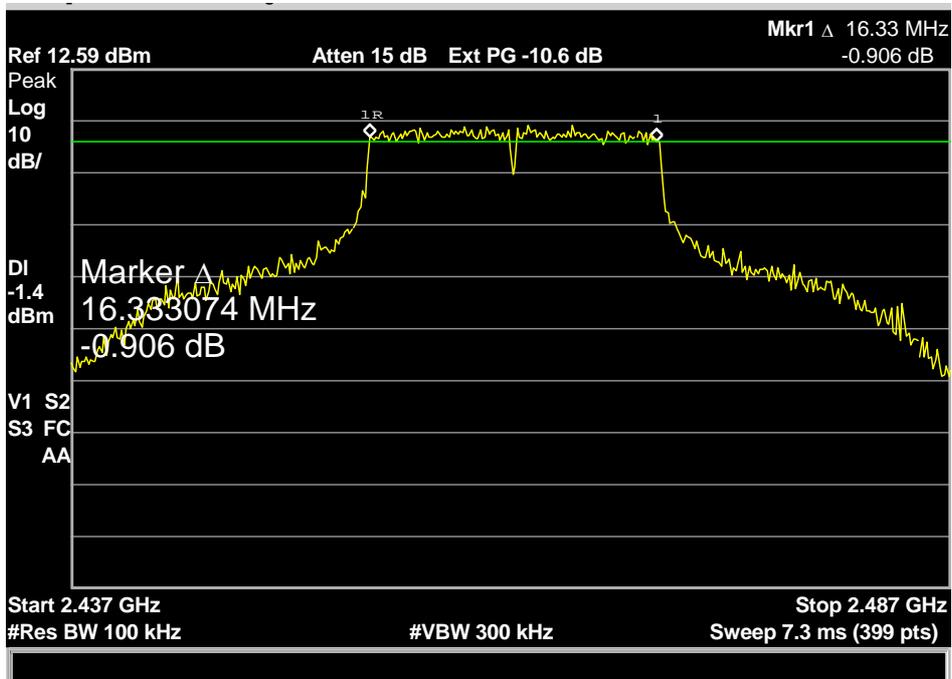
802.11g Mode
Plot 4.1.4



Plot 4.1.5



Plot 4.1.6



4.2. Maximum Conducted Output Power

Reference document:	47 CFR §15.247 (b) (3)		
Test Requirements:	The maximum peak conducted output power of the intentional radiator for systems using digital modulation in the 2400-2483.5 MHz band shall not exceed 1 Watt.		
Test setup:	See Sec. 2.1	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 1MHz, VBW: 3MHz, Average: 100 traces,		
Environment conditions:	Ambient Temperature: 22°c	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 4.2.1 - Plot 4.2.12	

Test Results:

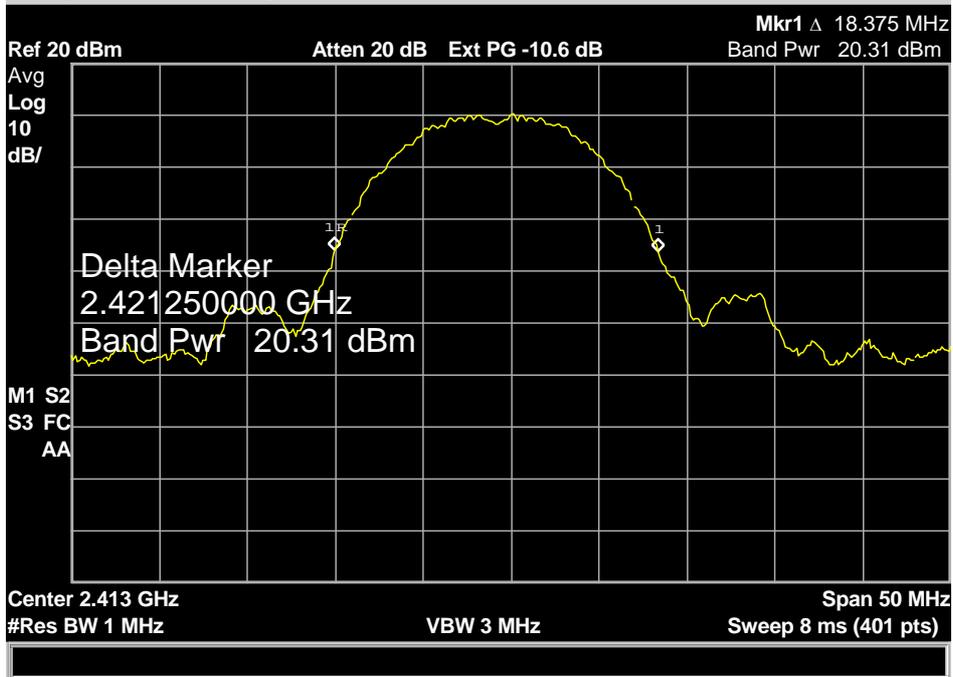
Frequency [MHz]	Data Rate [Mbps]	Max. Peak Cond. Output Power* [dBm]	Max. Peak Cond. Output Power* [mW]	Average** Output power [dBm]	Limit [dBm]	Margin [dB]	Reference
802.11b Mode							
2412	1	20.31	107.40	15.98	30	-9.69	Plot 4.2.1
2432	1	18.71	74.30	15.87	30	-11.29	Plot 4.2.2
2462	1	19.11	81.47	15.75	30	-10.89	Plot 4.2.3
2412	11	21.33	135.83	15.23	30	-8.67	Plot 4.2.4
2432	11	21.56	143.22	15.17	30	-8.44	Plot 4.2.5
2462	11	21.88	154.17	15.20	30	-8.12	Plot 4.2.6
802.11g Mode							
2412	6	21.19	131.52	14.82	30	-8.81	Plot 4.2.7
2432	6	22.31	170.22	14.92	30	-7.69	Plot 4.2.8
2462	6	22.22	166.72	14.95	30	-7.78	Plot 4.2.9
2412	54	20.74	118.58	14.75	30	-9.26	Plot 4.2.10
2432	54	22.85	192.75	14.81	30	-7.15	Plot 4.2.11
2462	54	22.67	184.93	14.85	30	-7.33	Plot 4.2.12

* Corrected for external attenuations

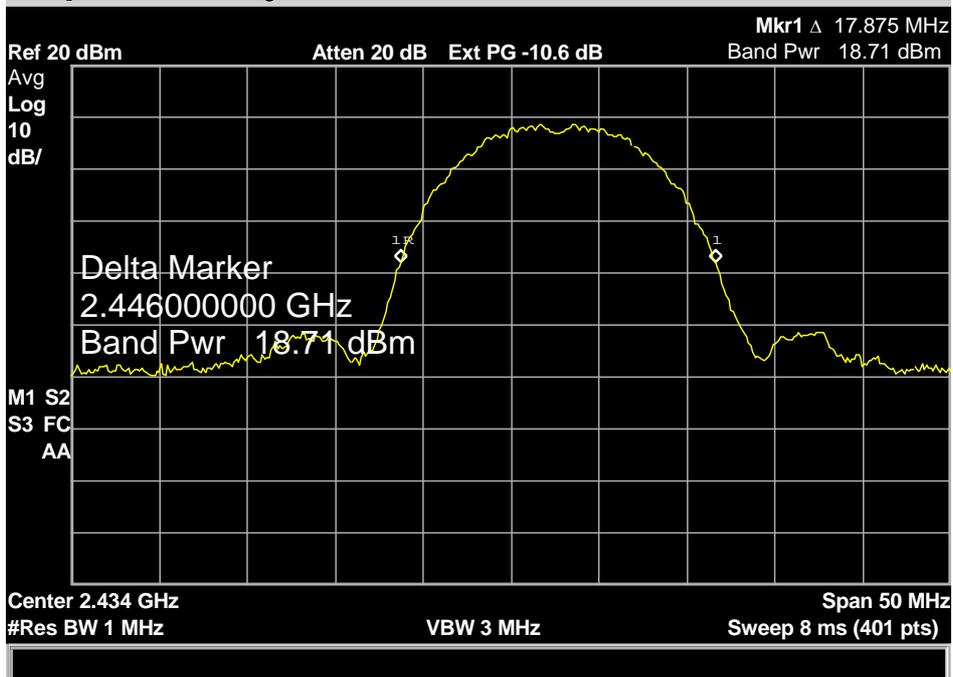
** Maximum Conducted Peak Output Power is not a factor to determine the final Average Output Power. Please refer to Average Output Power.

802.11b Mode

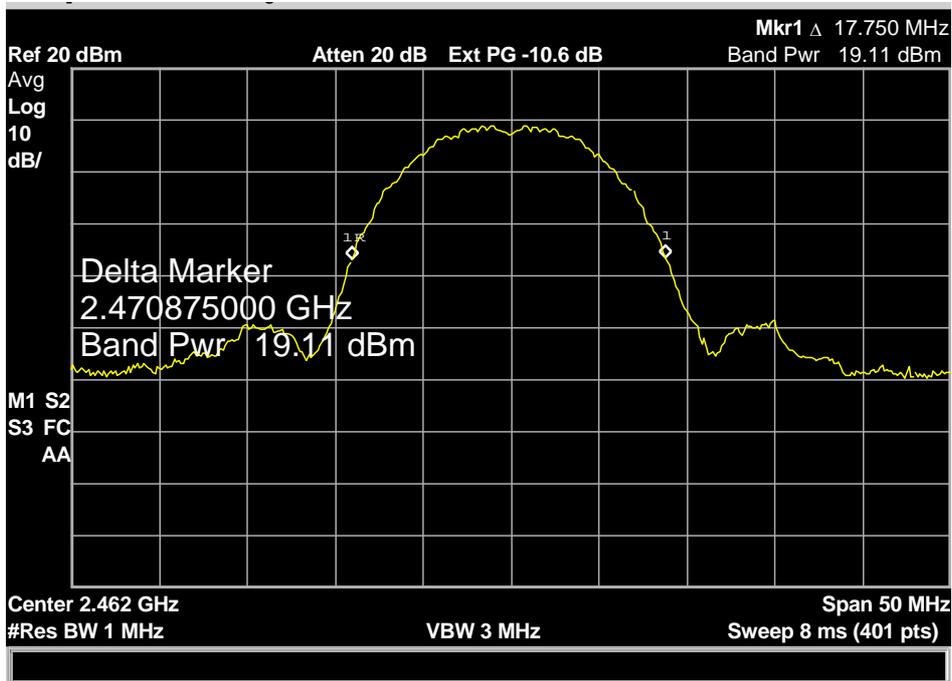
Plot 4.2.1



Plot 4.2.2

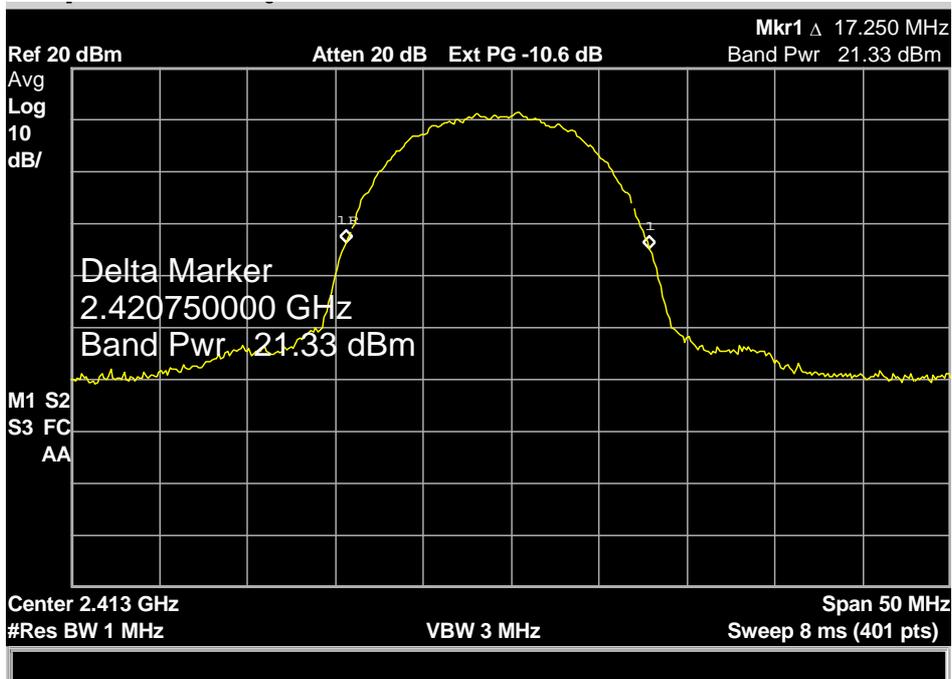


Plot 4.2.3

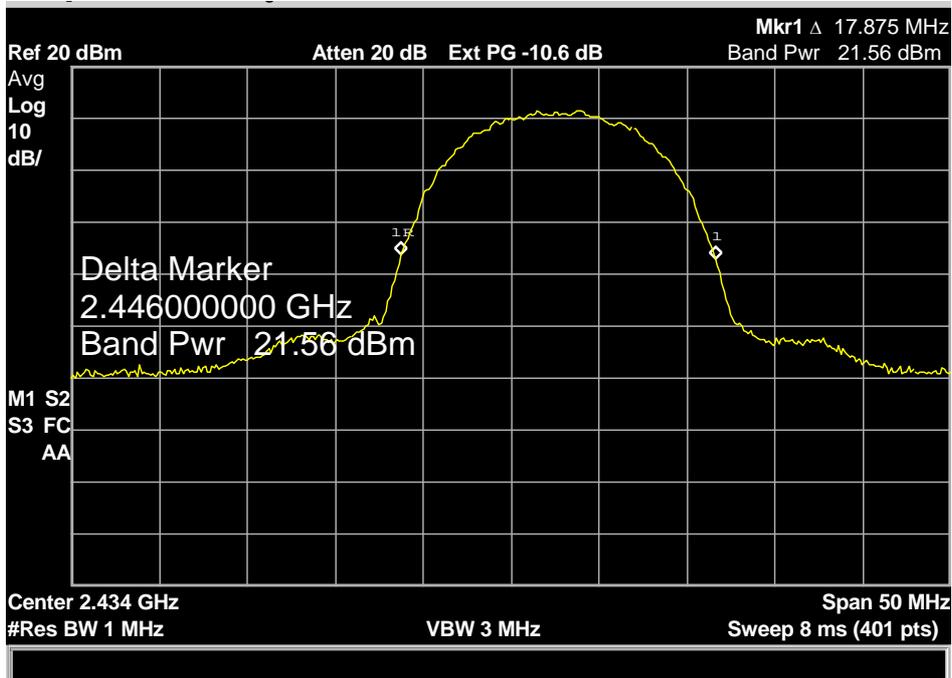


802.11g Mode

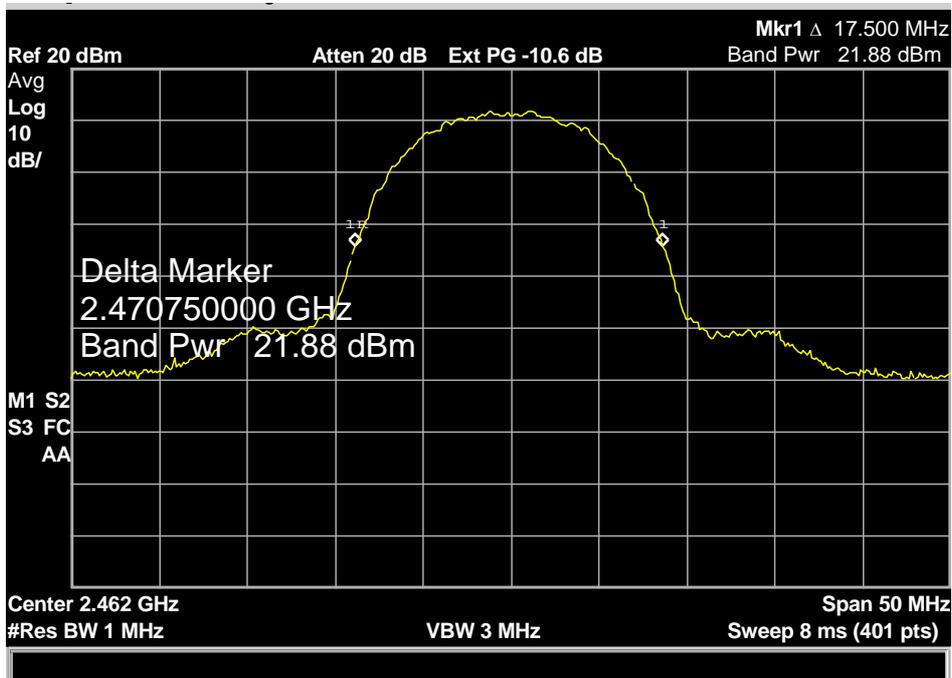
Plot 4.2.4



Plot 4.2.5

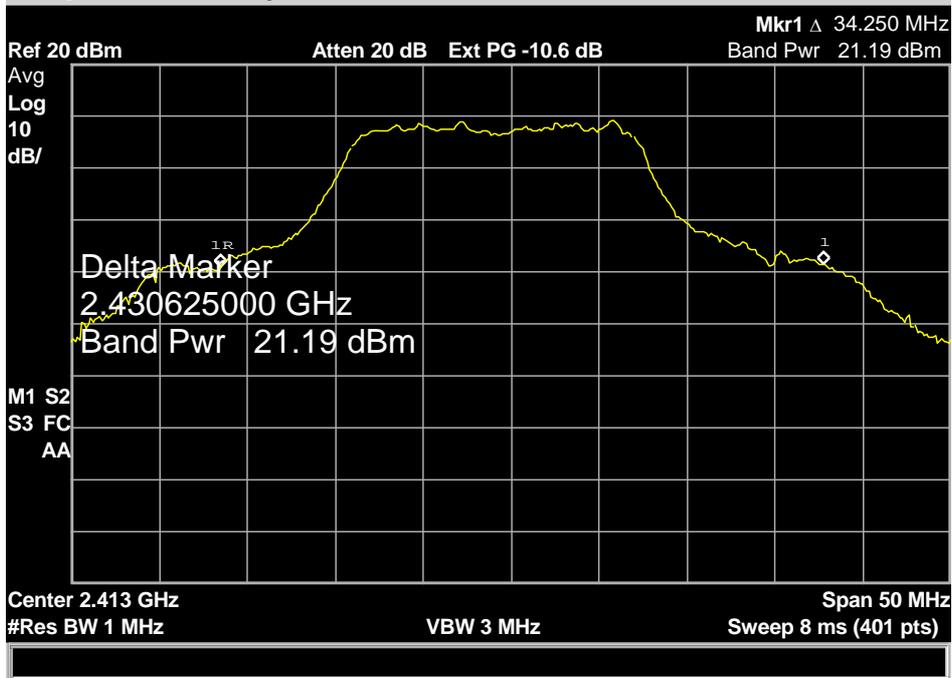


Plot 4.2.6

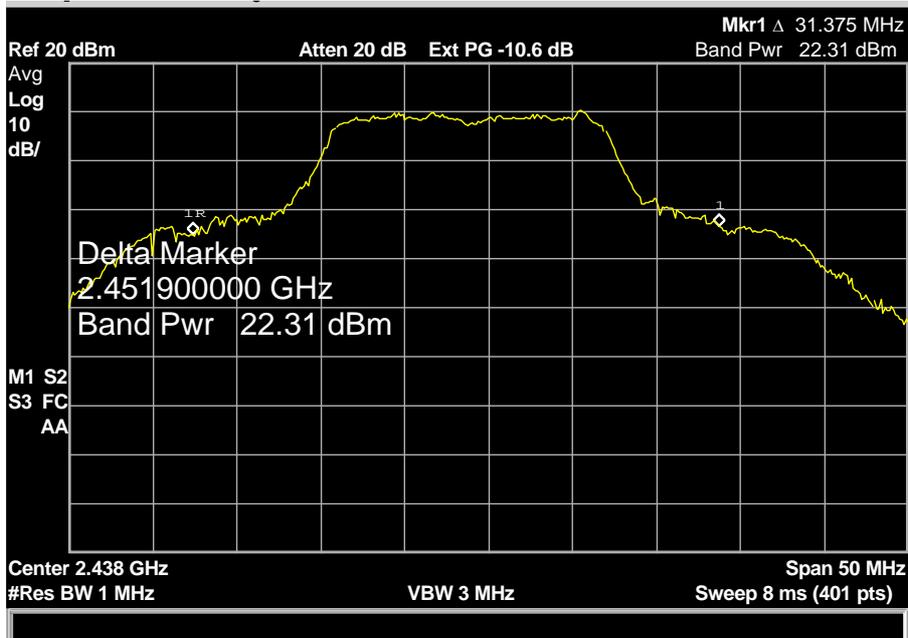


802.11g Mode

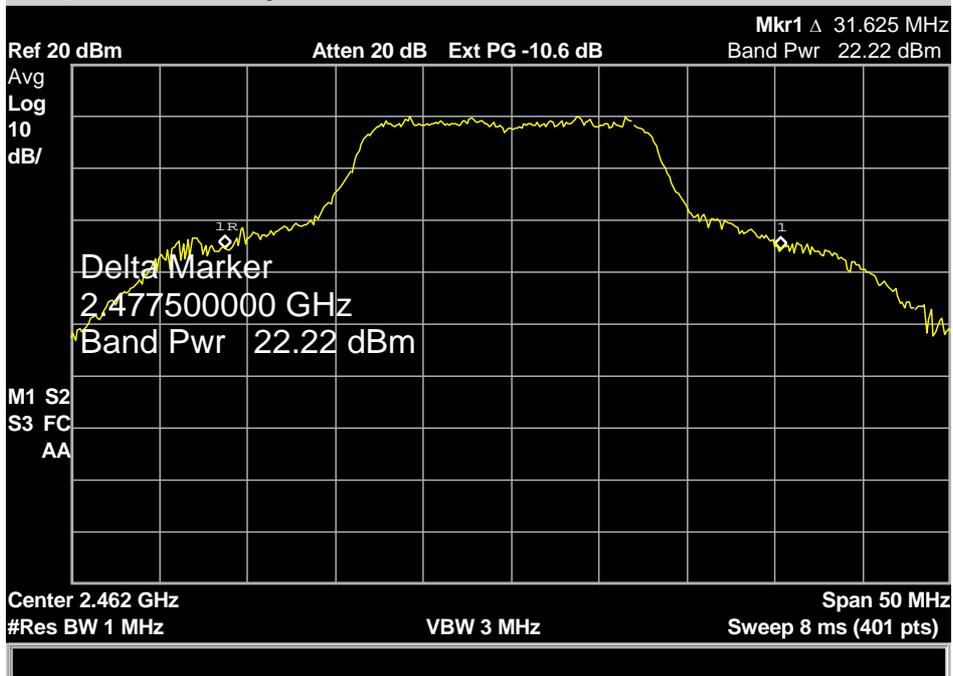
Plot 4.2.7



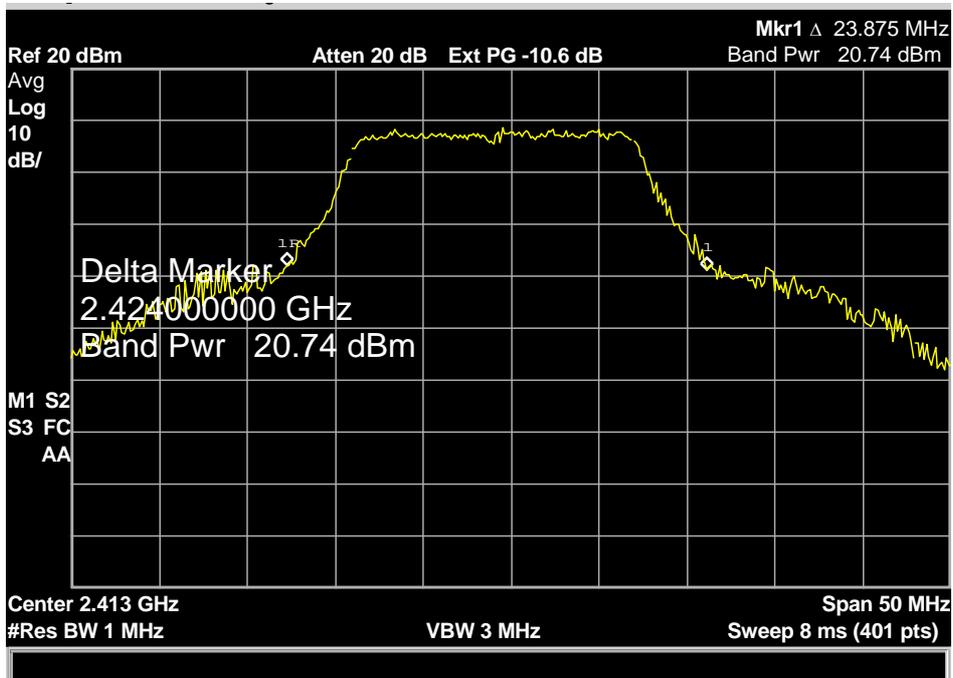
Plot 4.2.8



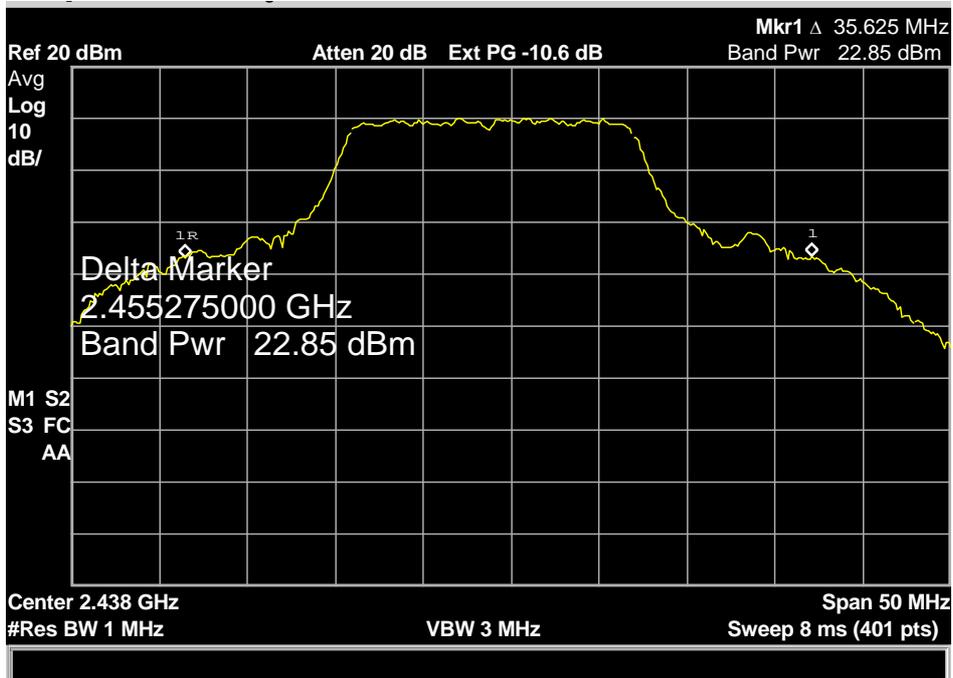
Plot 4.2.9



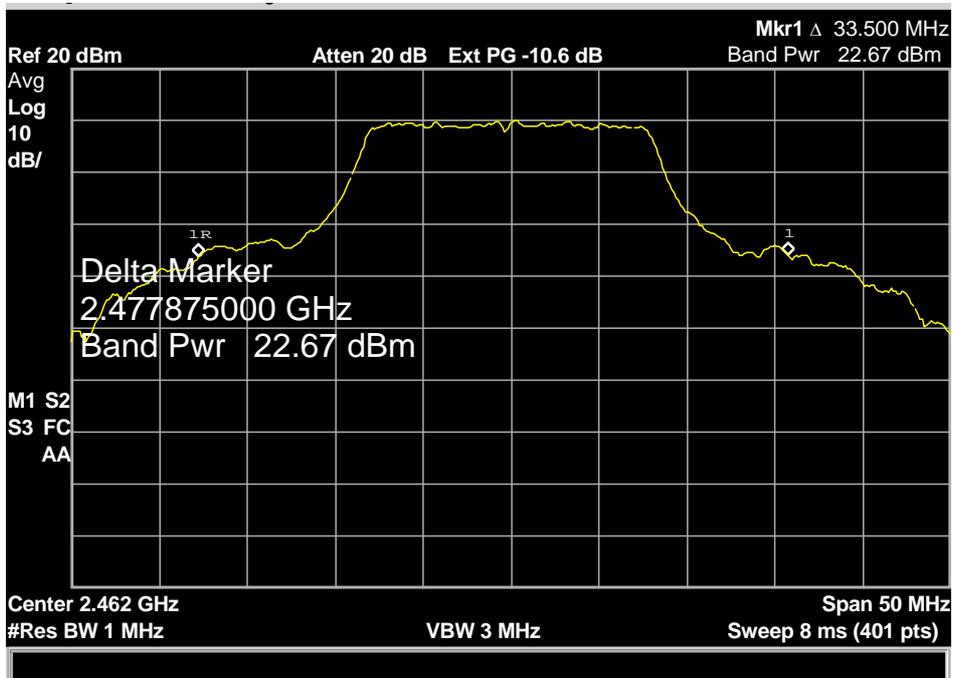
Plot 4.2.10



Plot 4.2.11



Plot 4.2.12



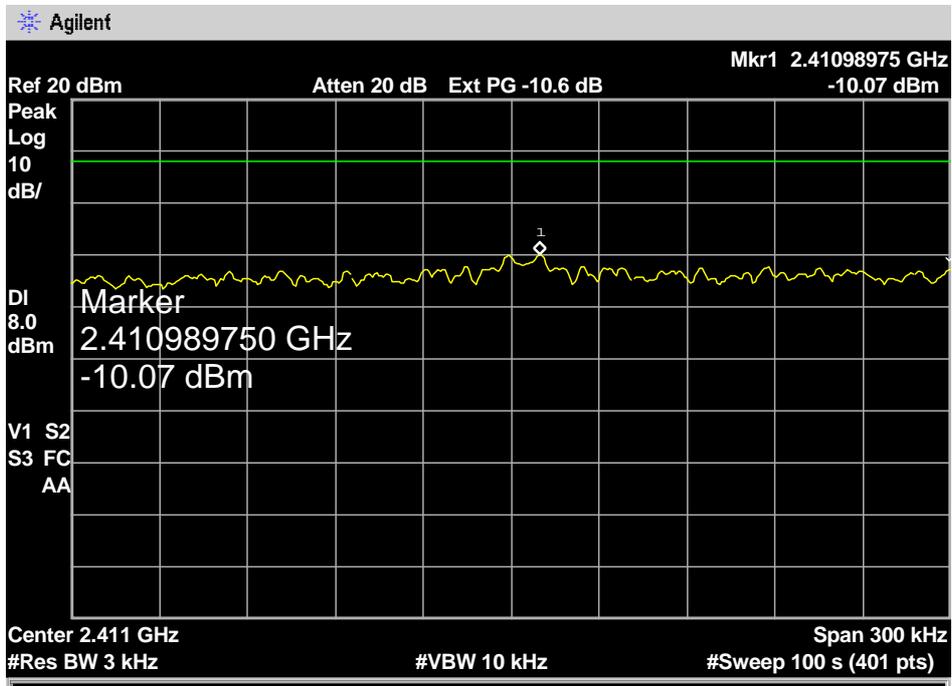
4.3. Peak Power Spectral Density

Reference document:	47 CFR §15.247 (e)		
Test Requirements:	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.		
Test setup:	See sec 2.1	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 3 kHz, VBW: 10 kHz, Span=300kHz, Sweep Time: 100s		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 4.3.1 - 4.3.12	

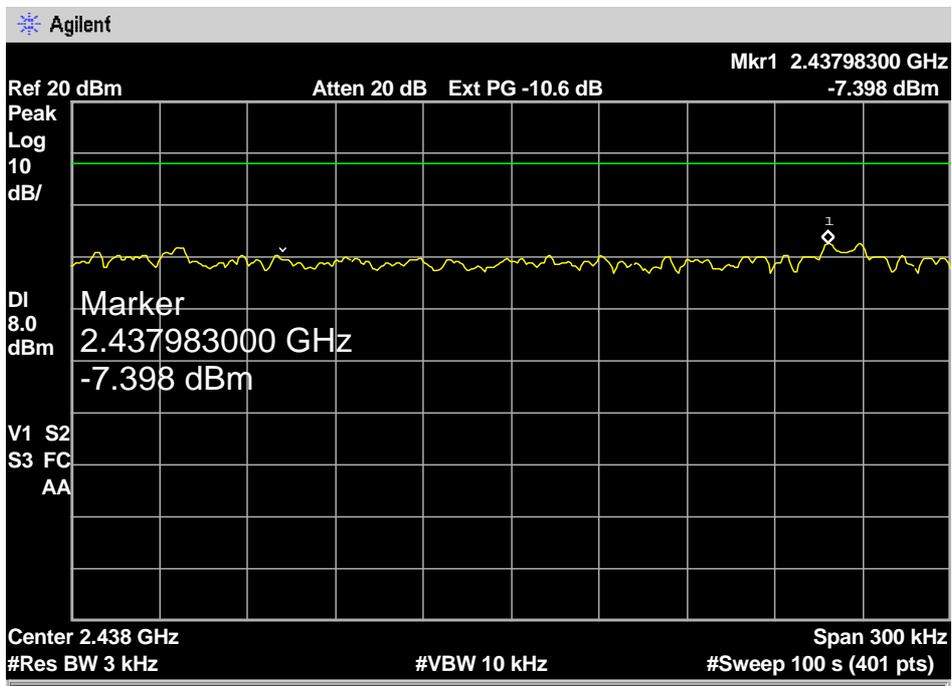
Test results:

Frequency [MHz]	Data Rate [Mbps]	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Margin [dB]	Reference
802.11b Mode					
2412	1	-10.07	8	-18.07	Plot 4.3.1
2437	1	-7.398	8	-15.398	Plot 4.3.2
2462	1	-6.897	8	-14.897	Plot 4.3.3
2412	11	-10.45	8	-18.45	Plot 4.3.4
2437	11	-8.708	8	-16.708	Plot 4.3.5
2462	11	-9.368	8	-17.368	Plot 4.3.6
802.11g Mode					
2412	6	-11.95	8	-19.95	Plot 4.3.7
2437	6	-12.03	8	-20.03	Plot 4.3.8
2462	6	-11.36	8	-19.36	Plot 4.3.9
2412	54	-10.62	8	-18.62	Plot 4.3.10
2437	54	-11.1	8	-19.1	Plot 4.3.11
2462	54	-11.79	8	-19.79	Plot 4.3.12

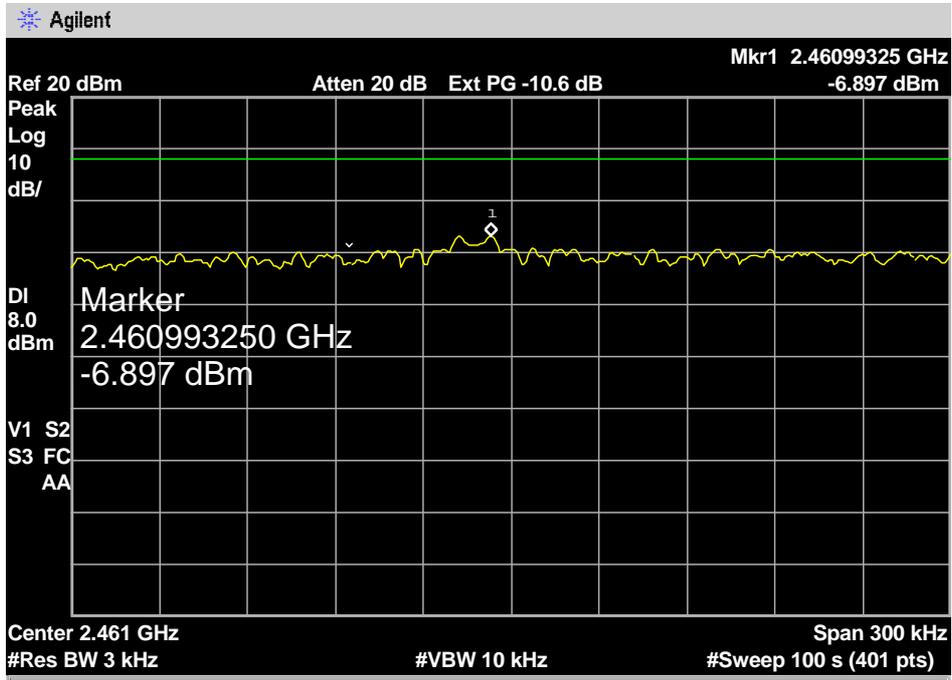
802.11b Mode
Plot 4.3.1



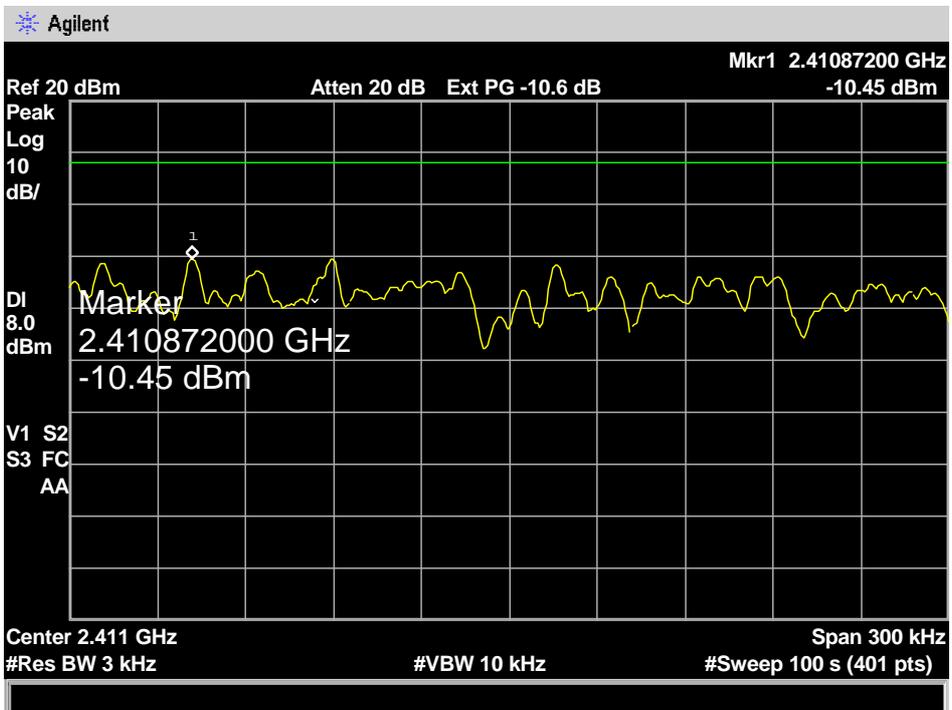
Plot 4.3.2



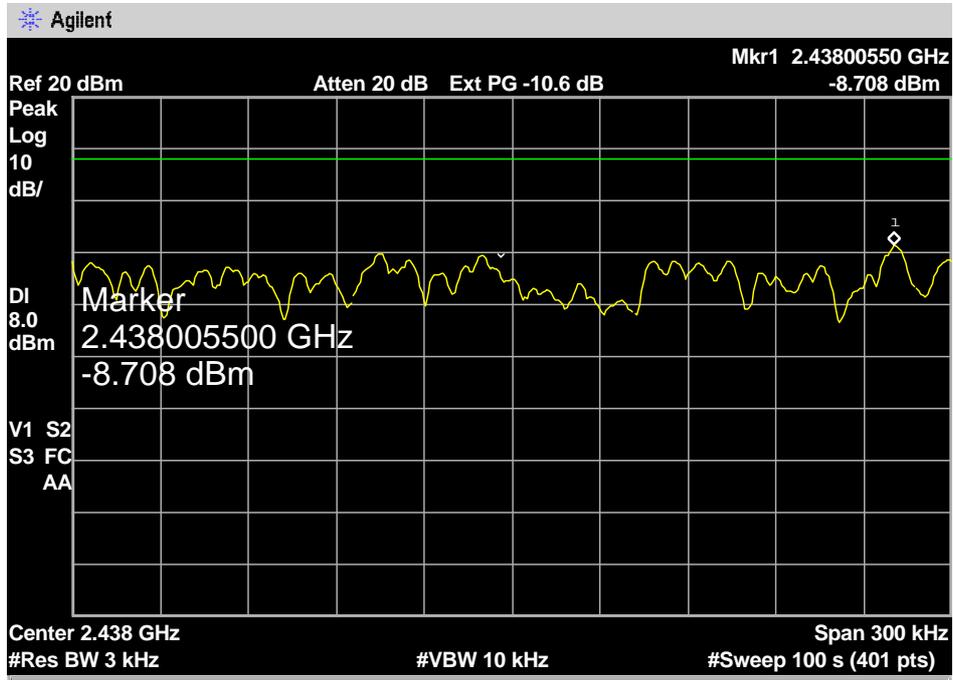
Plot 4.3.3



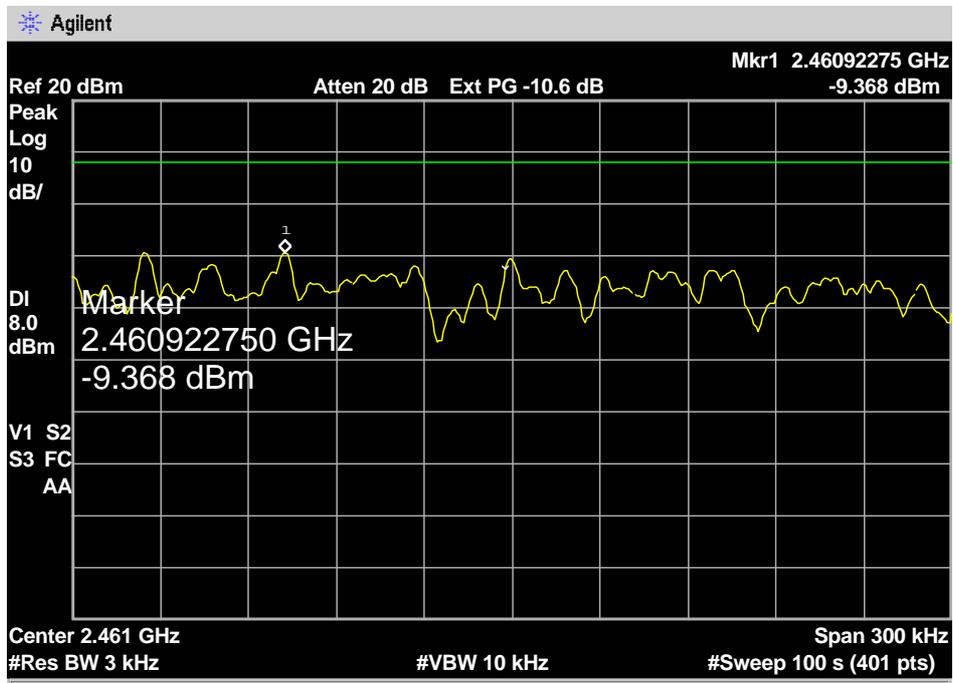
Plot 4.3.4



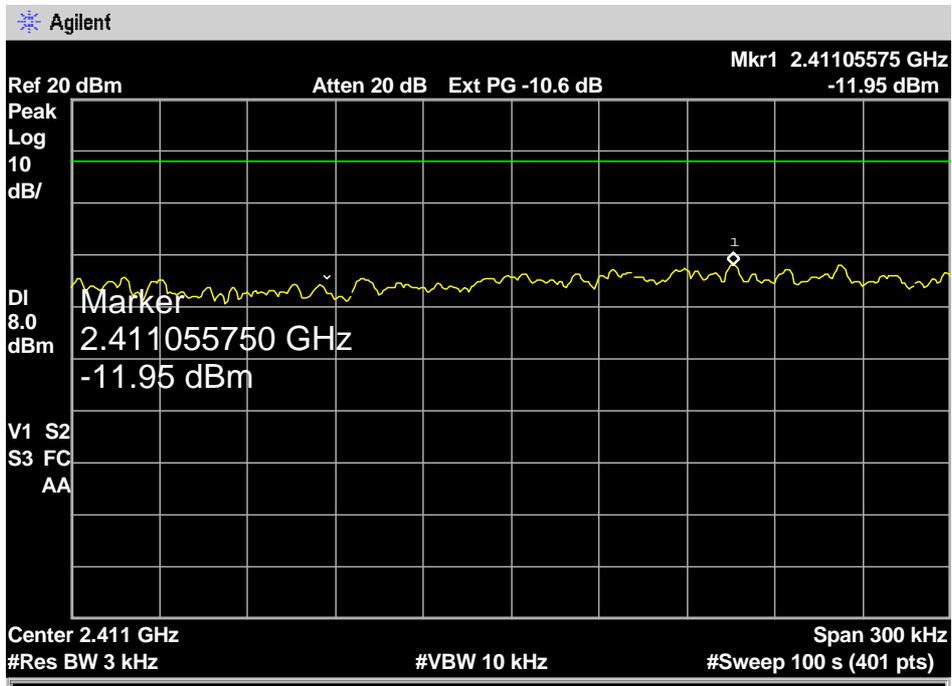
Plot 4.3.5



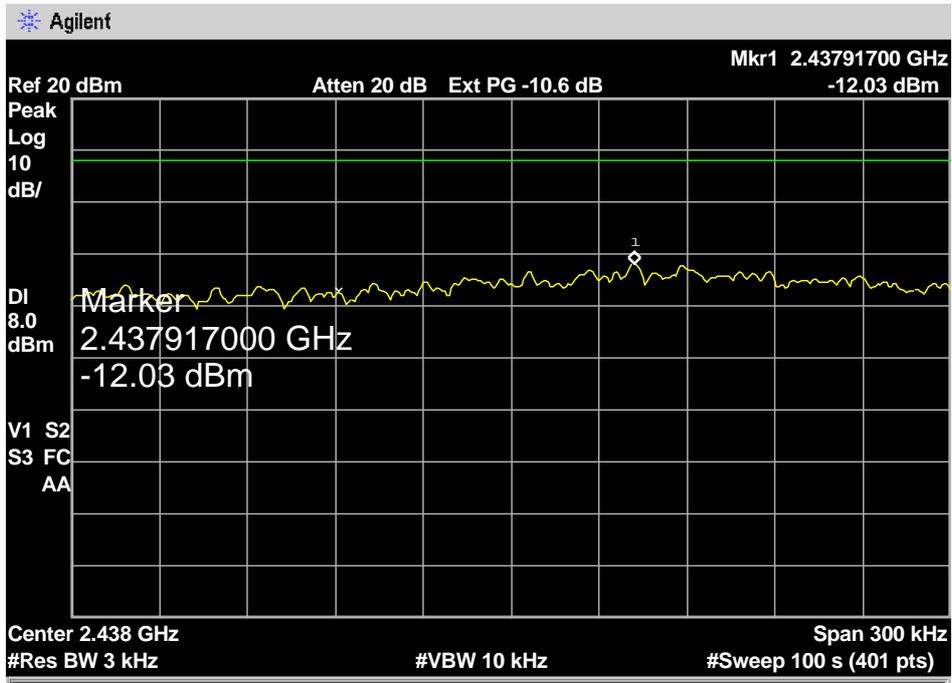
Plot 4.3.6



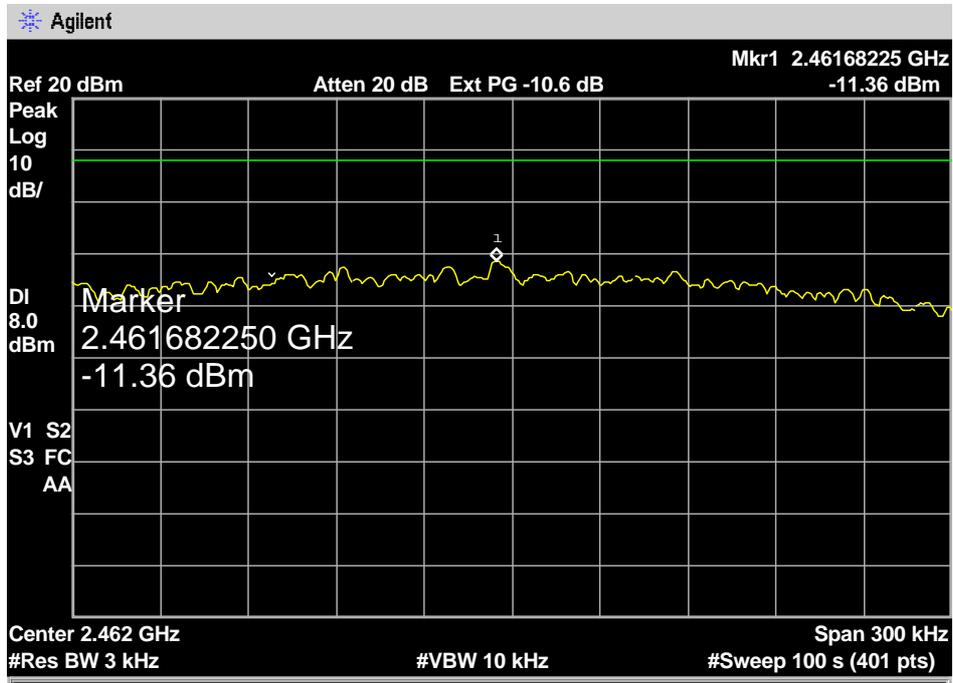
802.11g Mode
Plot 4.3.7



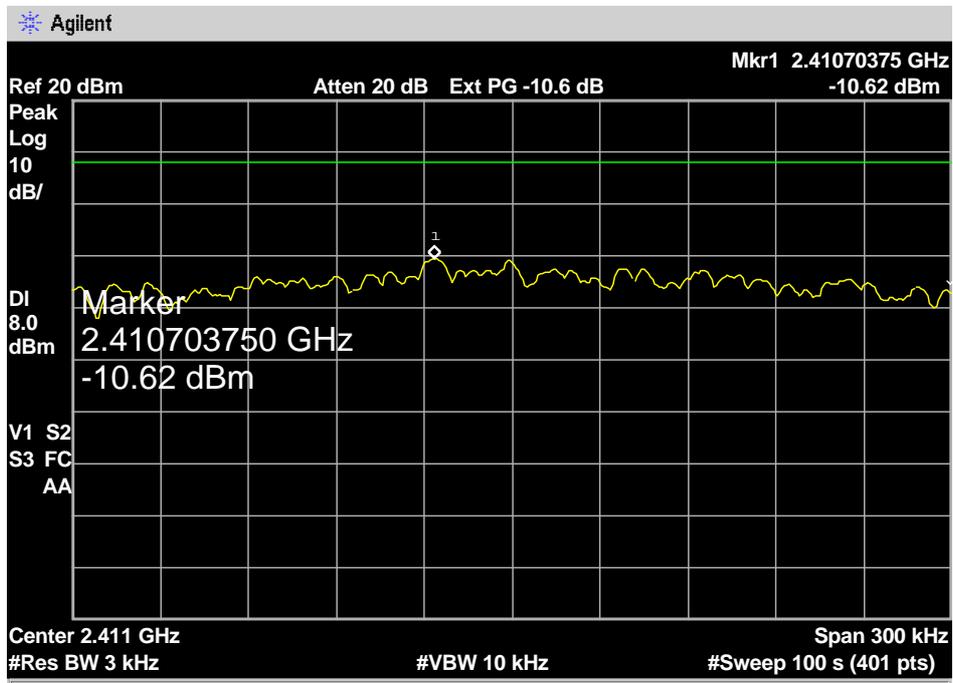
Plot 4.3.8



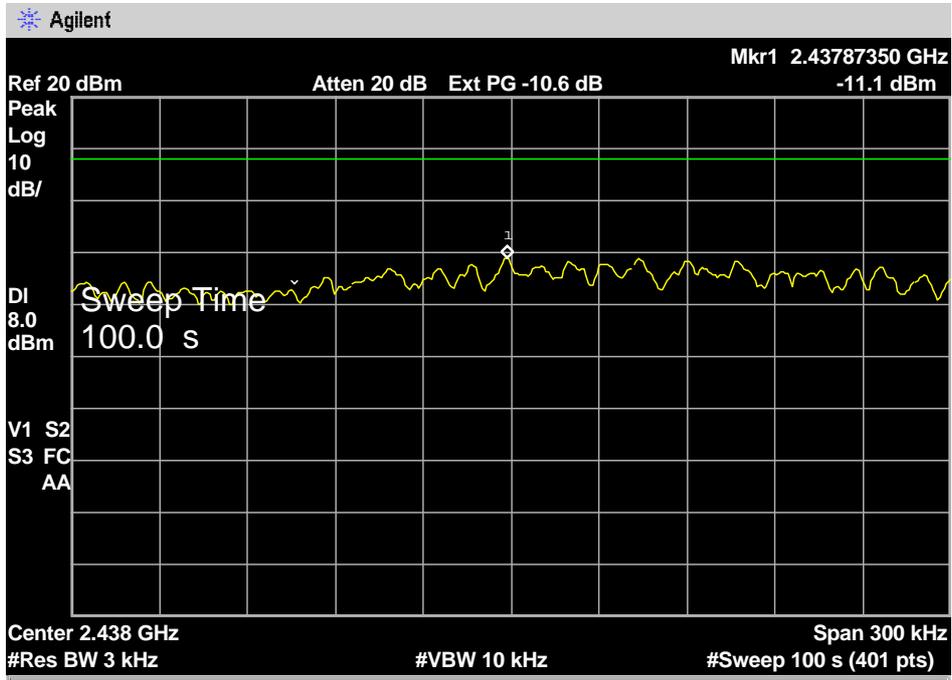
Plot 4.3.9



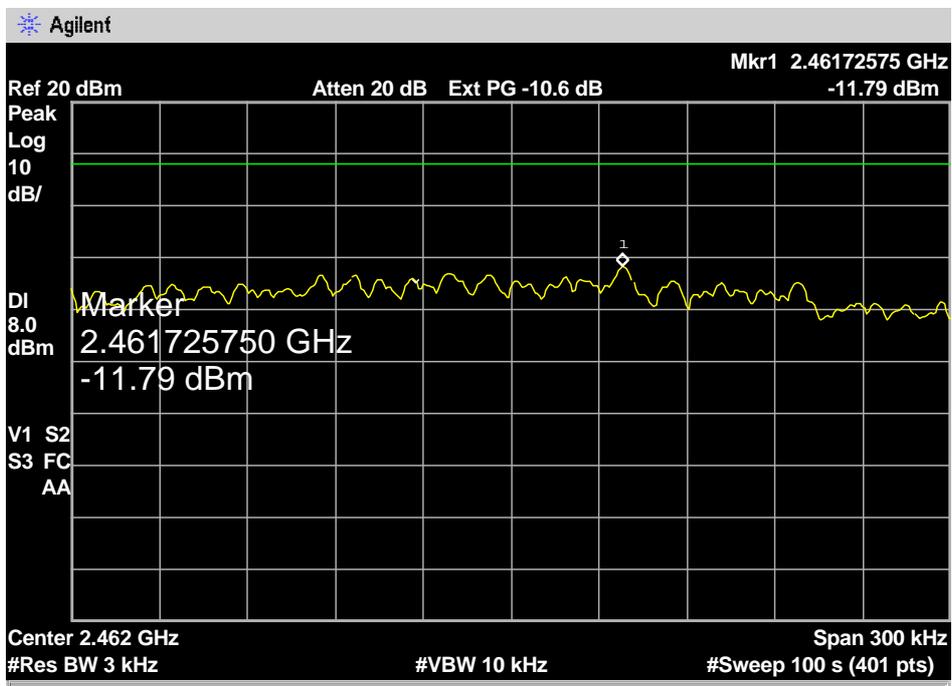
Plot 4.3.10



Plot 4.3.11



Plot 4.3.12



4.4. Conducted Spurious Emissions

Reference document:	47 CFR §15.247 (d)		
Test Requirements:	In any 100 kHz bandwidth outside the frequency band in which the digitally modulated radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB. Attenuation below the general limits specified in Section §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (See §15.205(c).		
Test setup:	See Sec. 2.1	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 100kHz, VBW: 300kHz		
Environment conditions:	Ambient Temperature: 22°c	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 4.4.1 - 4.4.10	

Test results:

Spurious

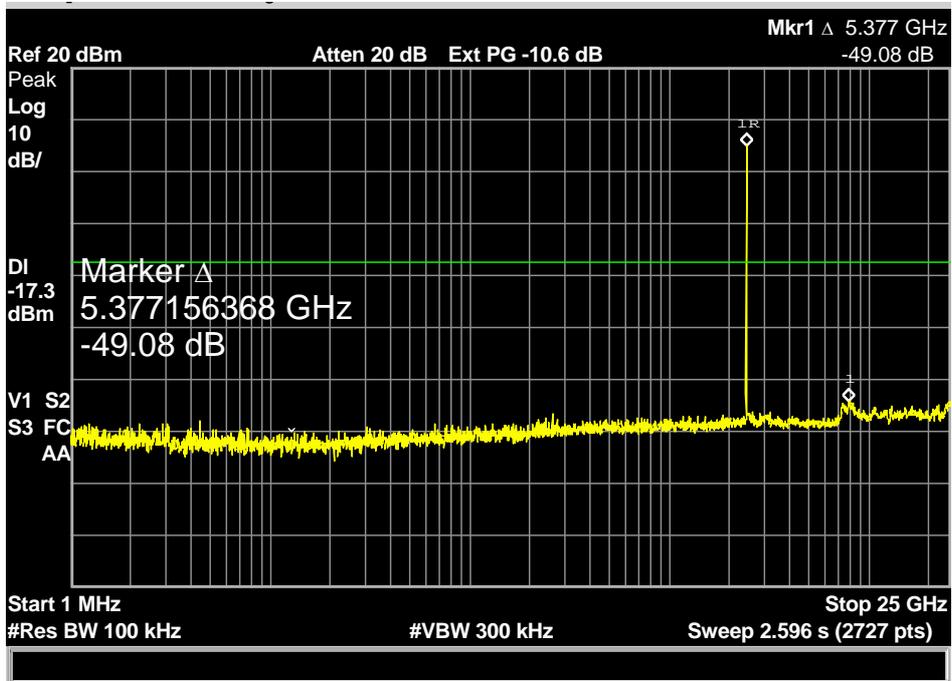
Frequency [MHz]	Data Rate [Mbps]	Measured Emission [dBc]	Limit [dBc]	Reference	Result
802.11b Mode					
2412	11	*	-20	Plot 4.4.1	Pass
2437	11	*	-20	Plot 4.4.2	Pass
2462	11	*	-20	Plot 4.4.3	Pass
802.11g Mode					
2412	54	*	-20	Plot 4.4.4	Pass
2437	54	*	-20	Plot 4.4.5	Pass
2462	54	*	-20	Plot 4.4.6	Pass

Band edge

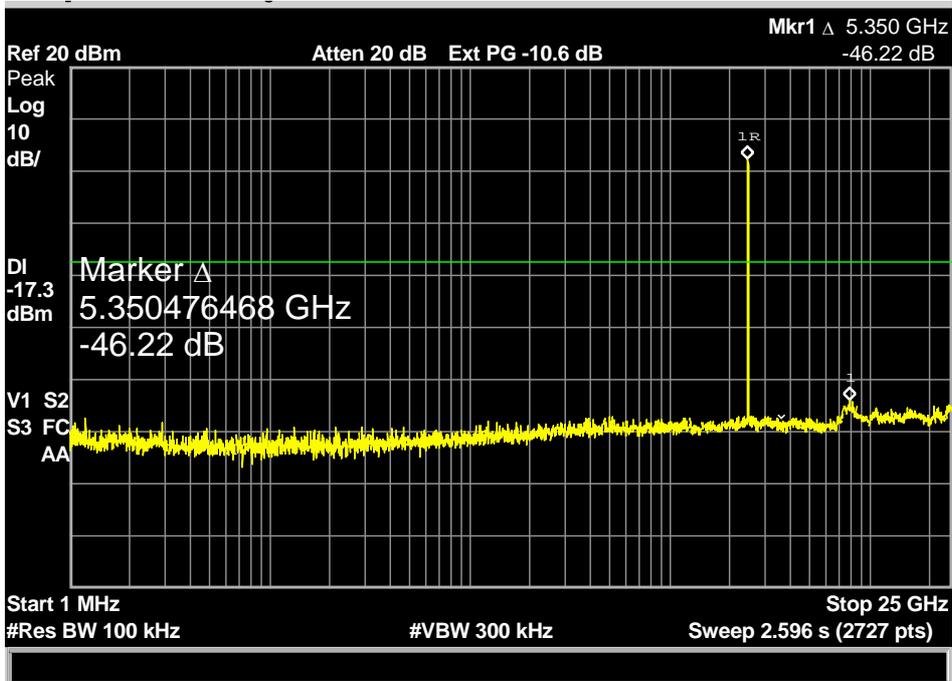
Frequency [MHz]	Data Rate [Mbps]	Measured Emission [dBc]	Limit [dBc]	Reference	Result
802.11b Mode					
2412	11	*	-20	Plot 4.4.7	Pass
2462	11	*	-20	Plot 4.4.8	Pass
802.11g Mode					
2412	54	*	-20	Plot 4.4.9	Pass
2462	54	*	-20	Plot 4.4.10	Pass

*All emission at least 20 dB below the limit (-40 dBc)

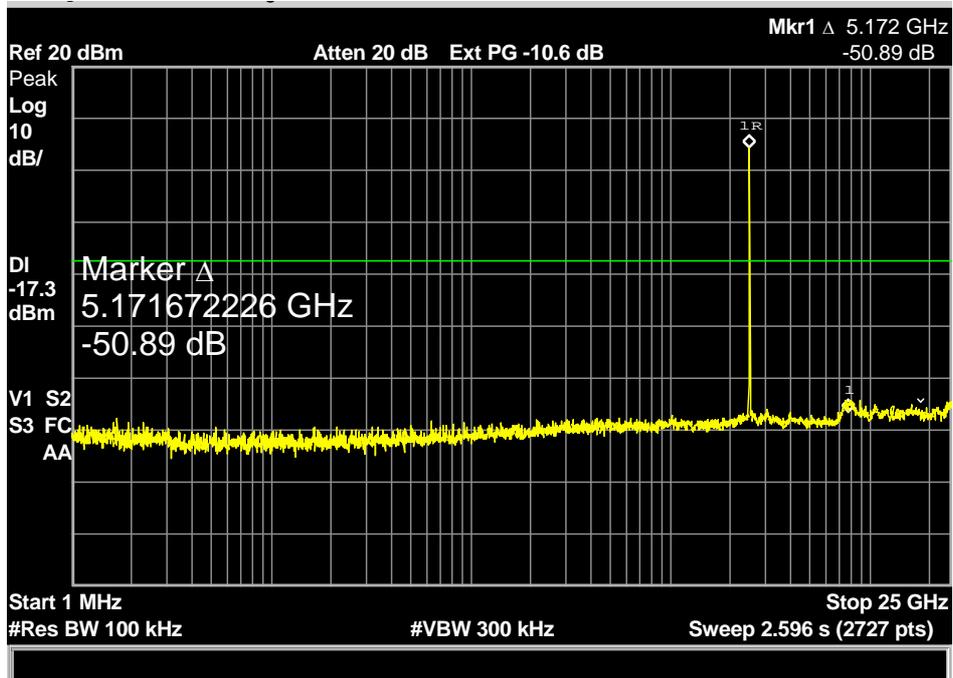
Spurious: 802.11b Mode
Plot 4.4.1



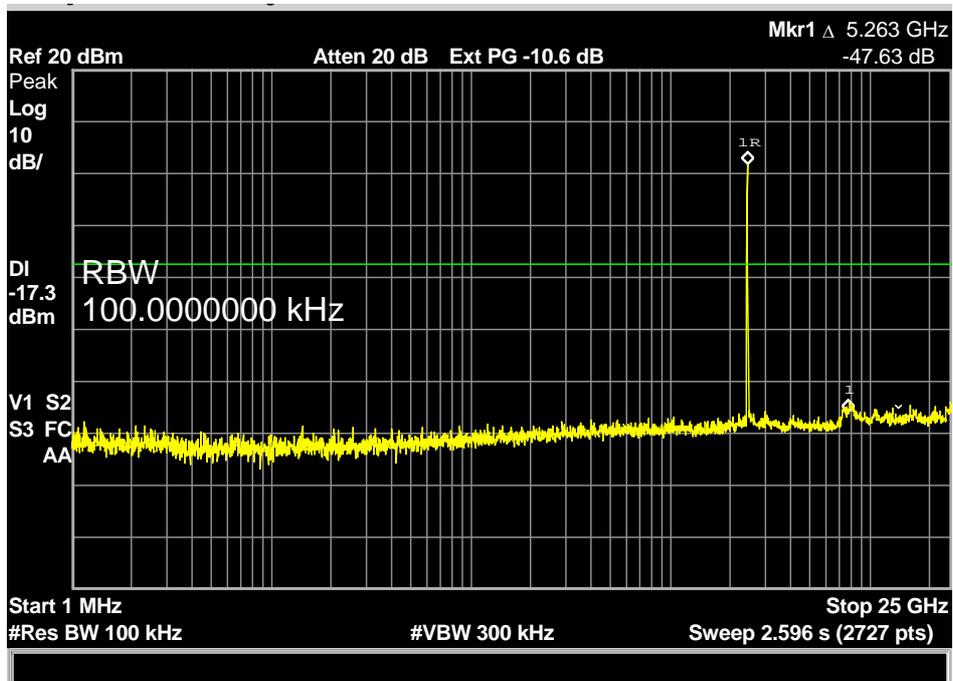
Plot 4.4.2



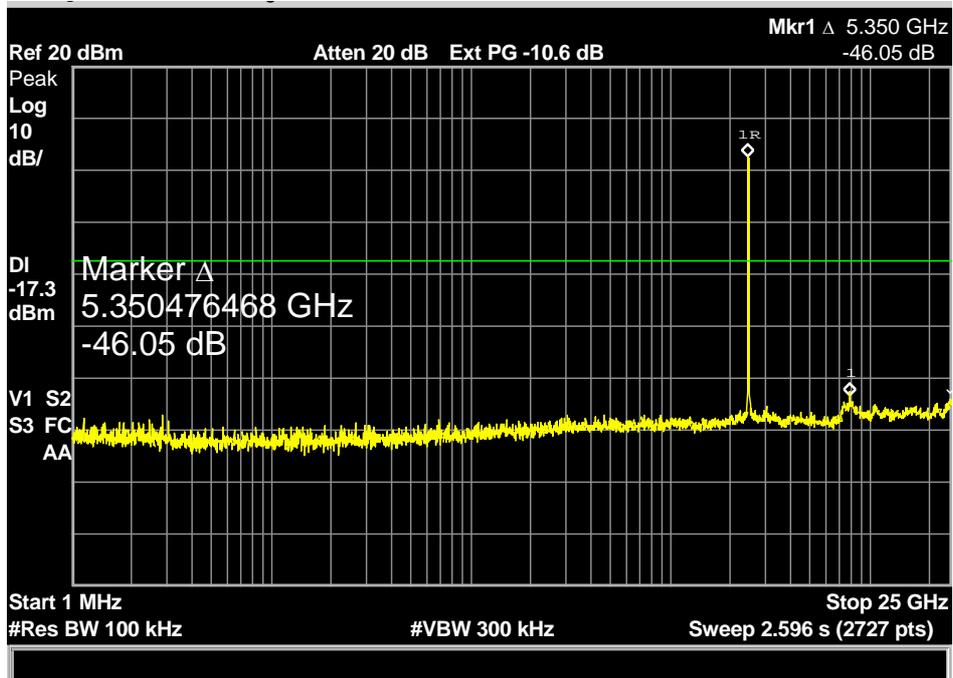
Plot 4.4.3



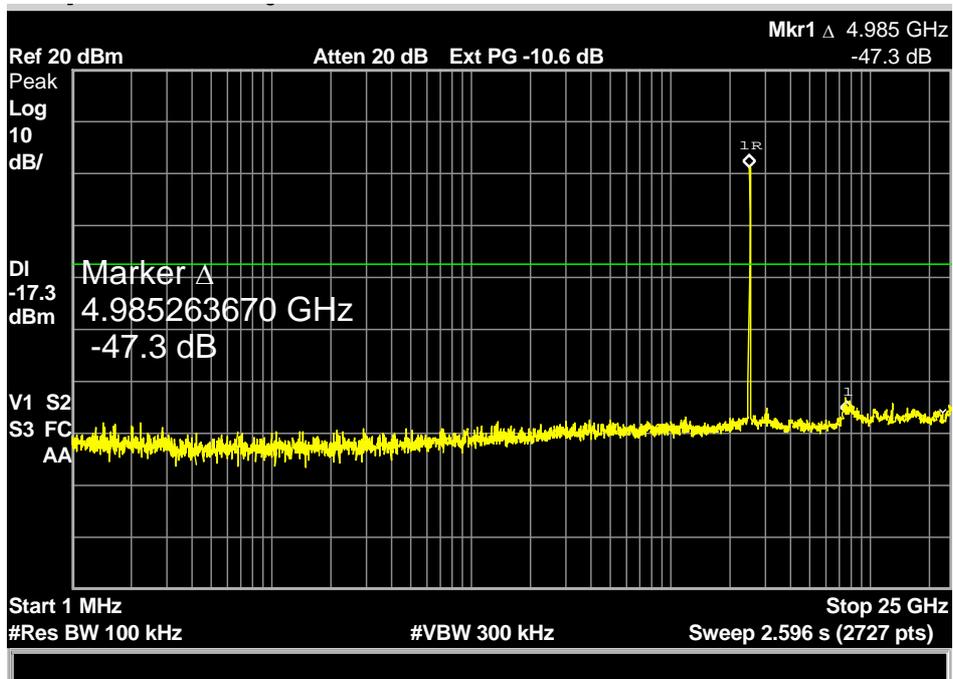
Spurious: 802.11g Mode
Plot 4.4.4



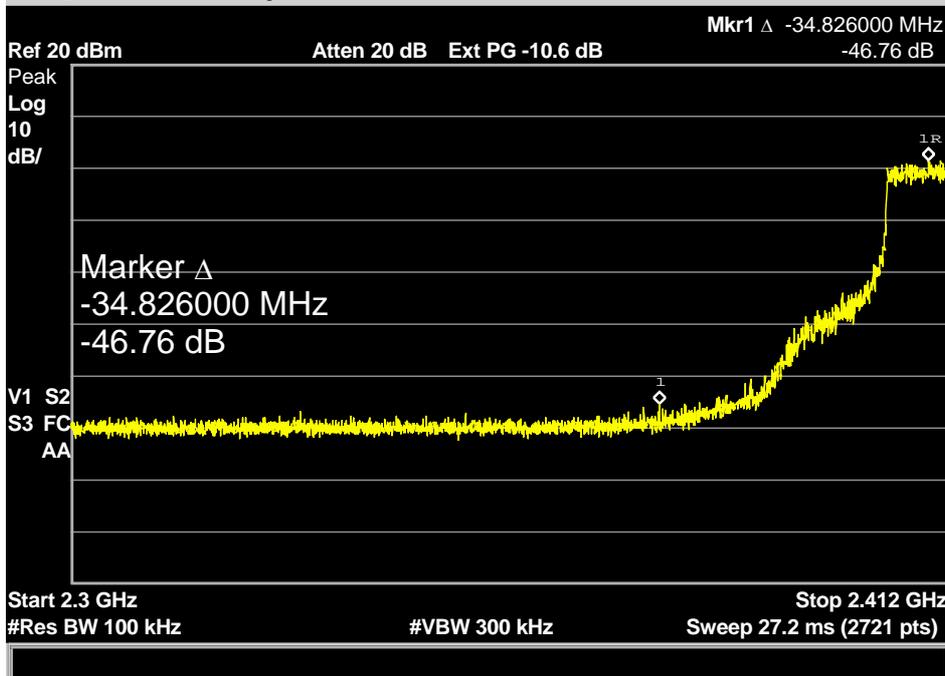
Plot 4.4.5



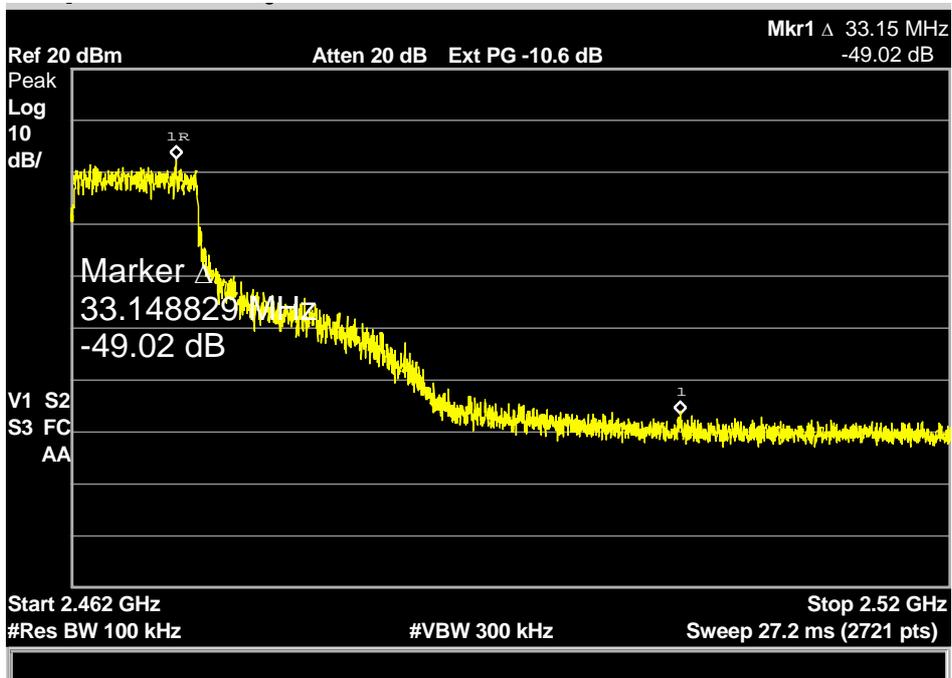
Plot 4.4.6



Band Edge: 802.11g Mode
Plot 4.4.9



Plot 4.4.10



4.5. Radiated Spurious Emissions, Restricted Bands (2310-2390MHz, 2483.5-2500MHz)

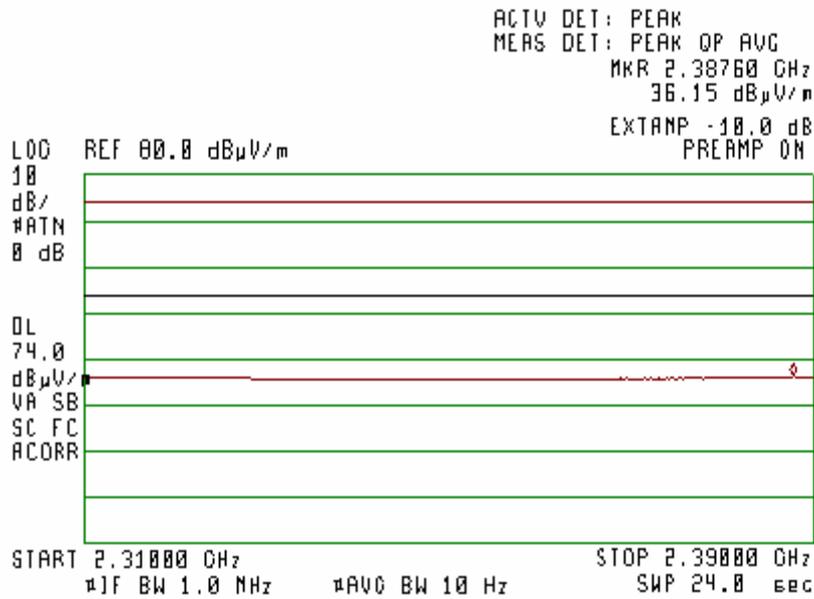
Reference document:	47 CFR §15.247 (d) & §15.205		
Test Requirements:	Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).		
Test setup:	See Sec. 2.2	Pass	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 1MHz, VBW: 3MHz, Average: VBW: 10Hz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 4.5.1 - 4.5.16	

Test results:

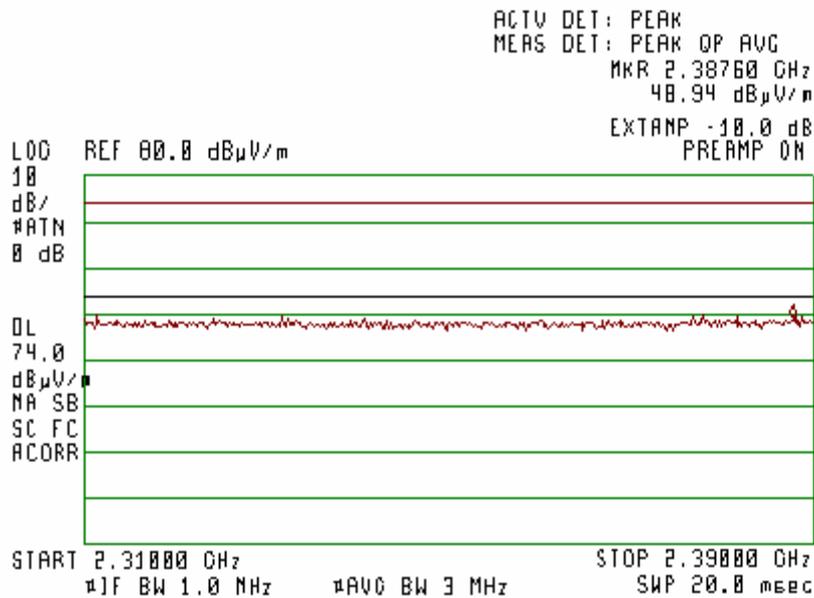
Frequency [MHz]	Data Rate [Mbps]	Emission Frequency [MHz]	Detector Type	Pol. V/H	Emission Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
802.11b Mode							
2412	11	2387.60	Average	H	36.20	54	-17.8
2412	11	2387.60	Peak	V	48.94	74	-25.06
2462	11	2487.71	Average	H	36.13	54	-17.87
2462	11	2487.71	Peak	H	51.05	74	-22.95
802.11g Mode							
2412	54	2390.00	Average	H	45.00	54	-9
2412	54	2390.00	Peak	H	59.80	74	-14.2
2462	54	2483.91	Average	H	45.5	54	-8.5
2462	54	2483.91	Peak	H	60.54	74	-13.46
All other emission at least 20 dB below the limit							

Note: Spurious Emission [dBµV/m] = measured [dBµV] + Correction-factor [dB (1/m)]
Correction Factor = Antenna factor + Cable Loss

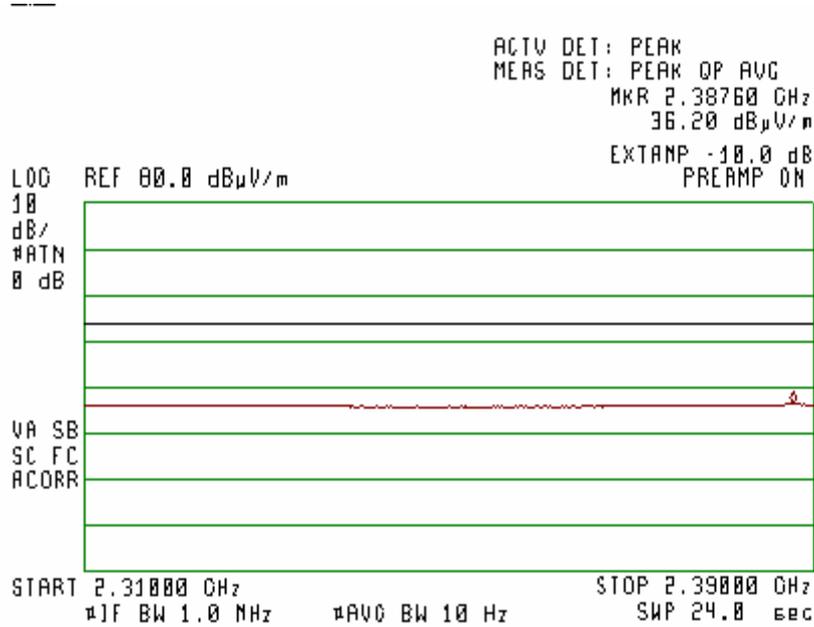
**802.11b: 11 Mbps
Lowest Frequency
Vertical Polarization
Average
Plot 4.5.1**



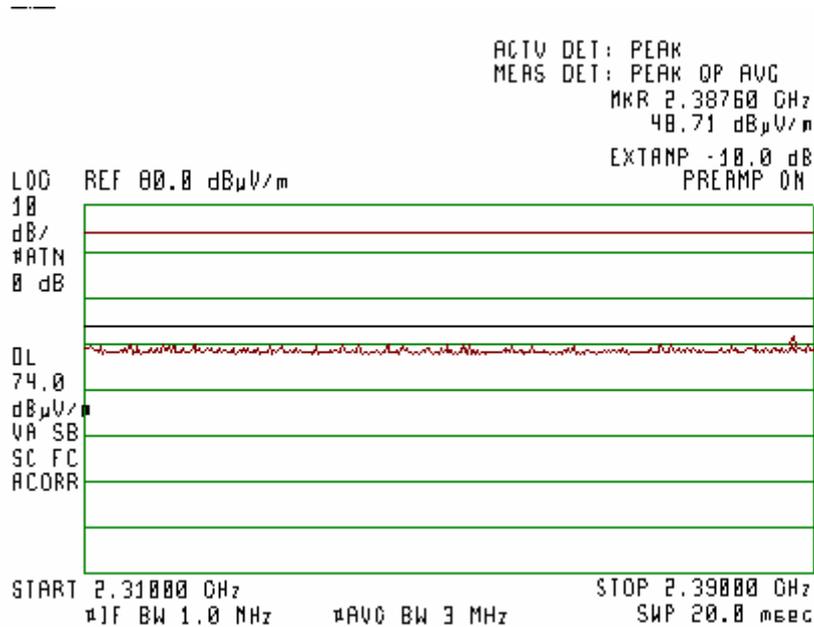
**Peak
Plot 4.5.2**



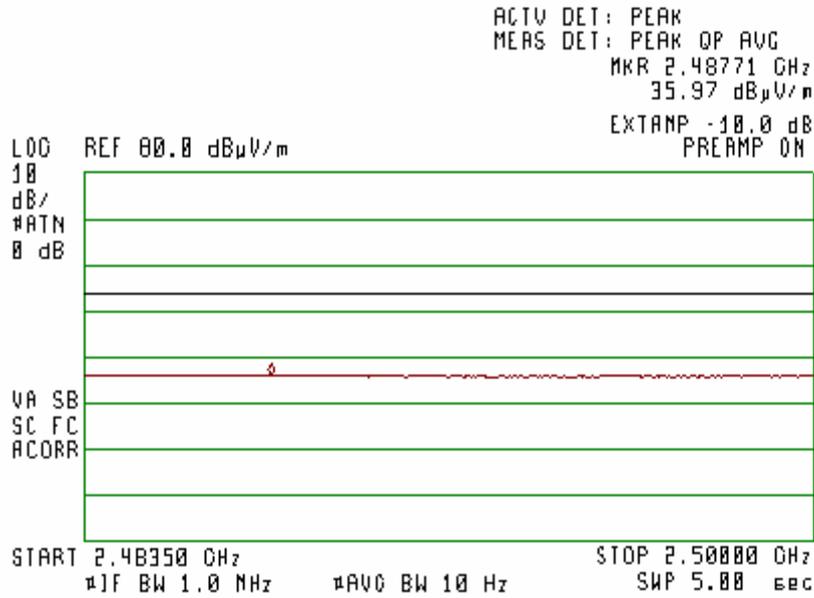
Horizontal Polarization
Average
Plot 4.5.3



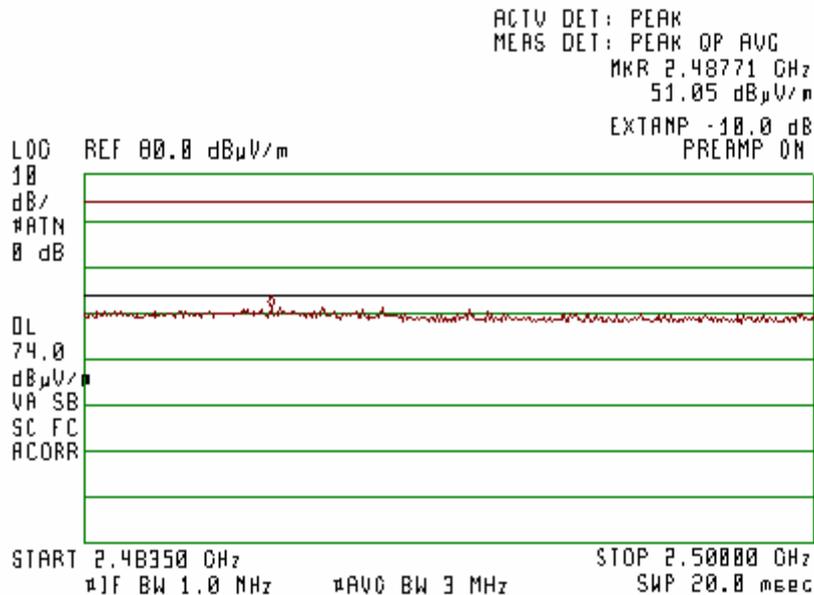
Peak
Plot 4.5.4



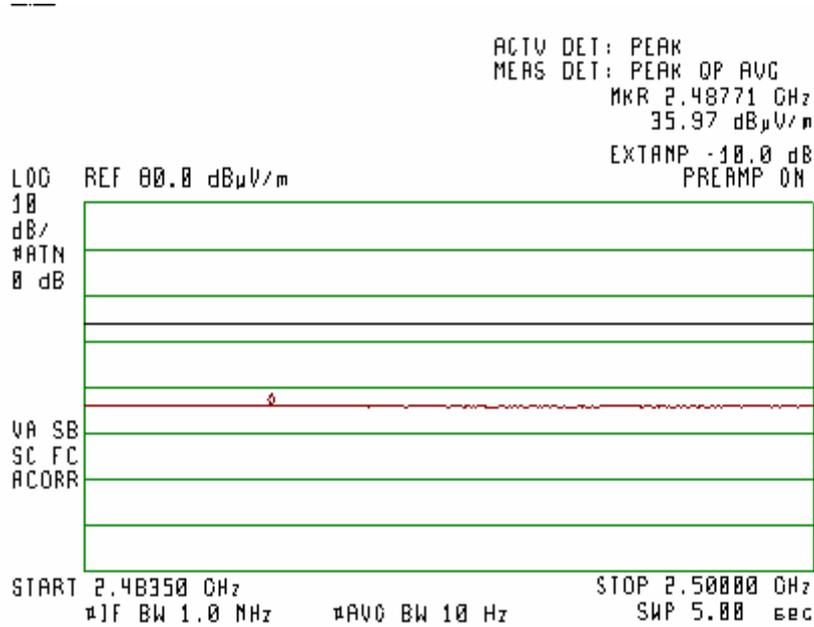
**802.11b: 11 Mbps
Highest Frequency
Vertical Polarization
Average
Plot 4.5.5**



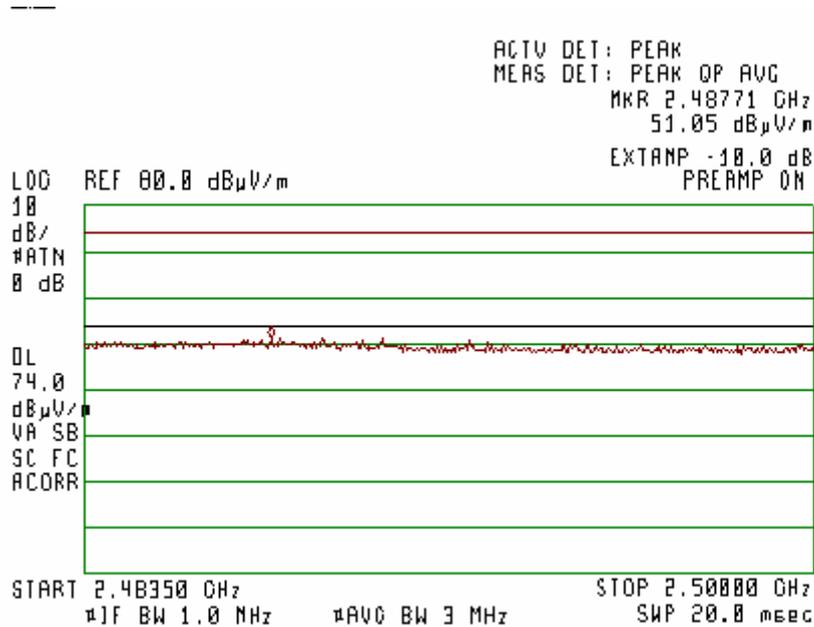
**Peak
Plot 4.5.6**



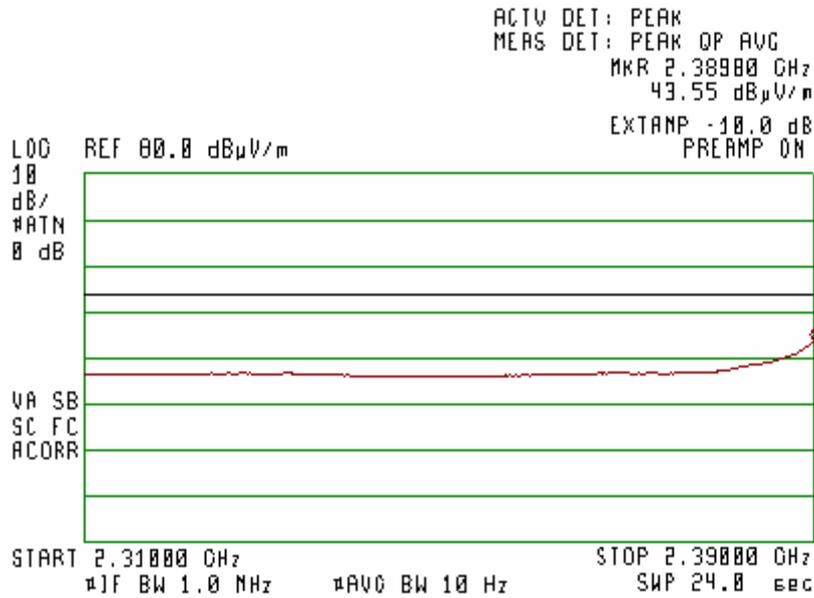
Horizontal Polarization
Average
Plot 4.5.7



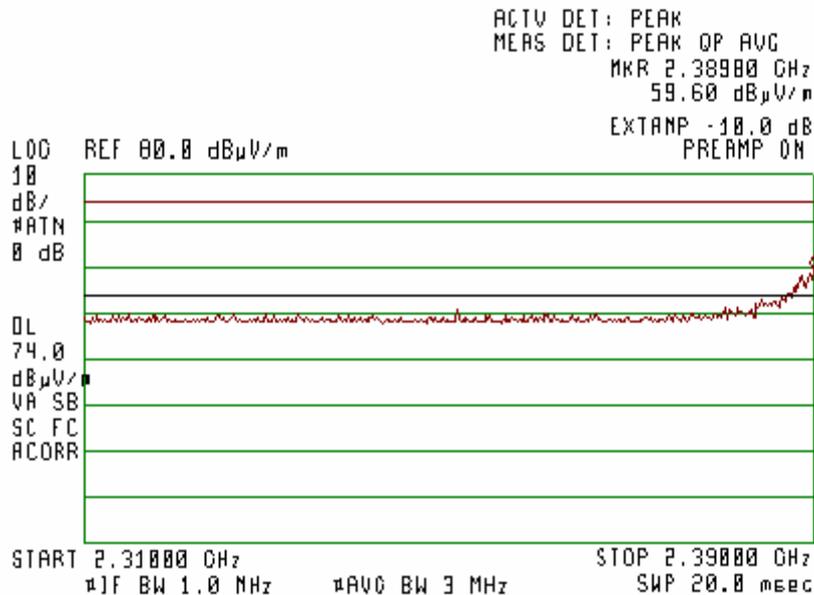
Peak
Plot 4.5.8



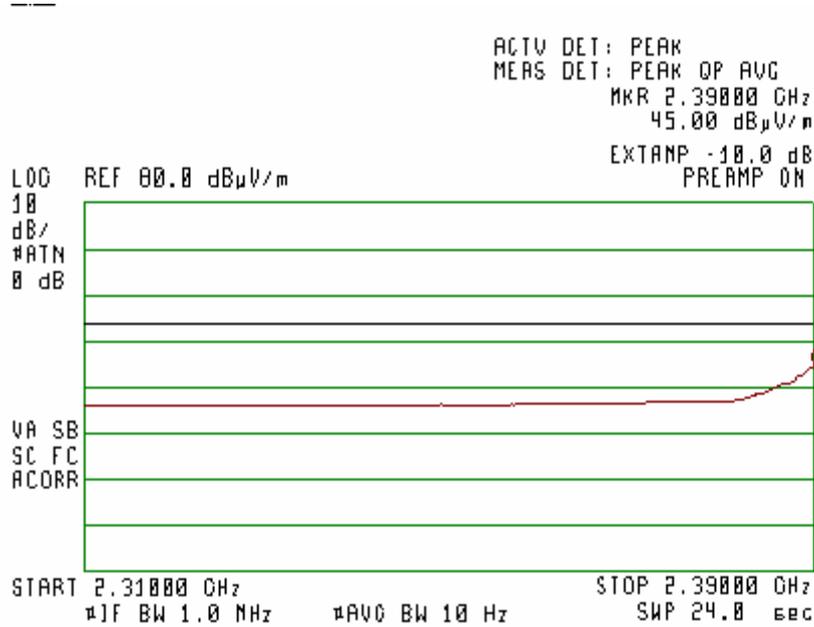
802.11g: 54 Mbps
Lowest Frequency
Vertical Polarization
Average
Plot 4.5.9



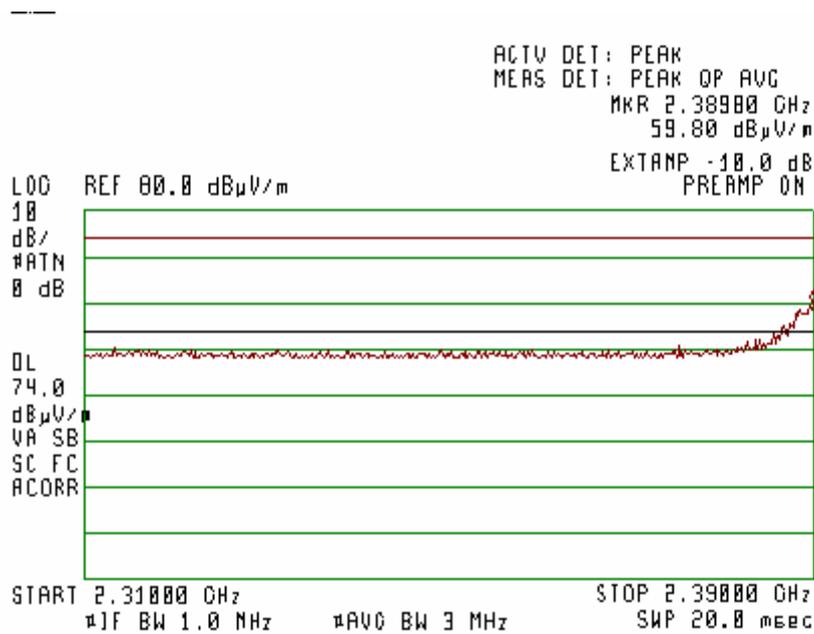
Peak
Plot 4.5.10



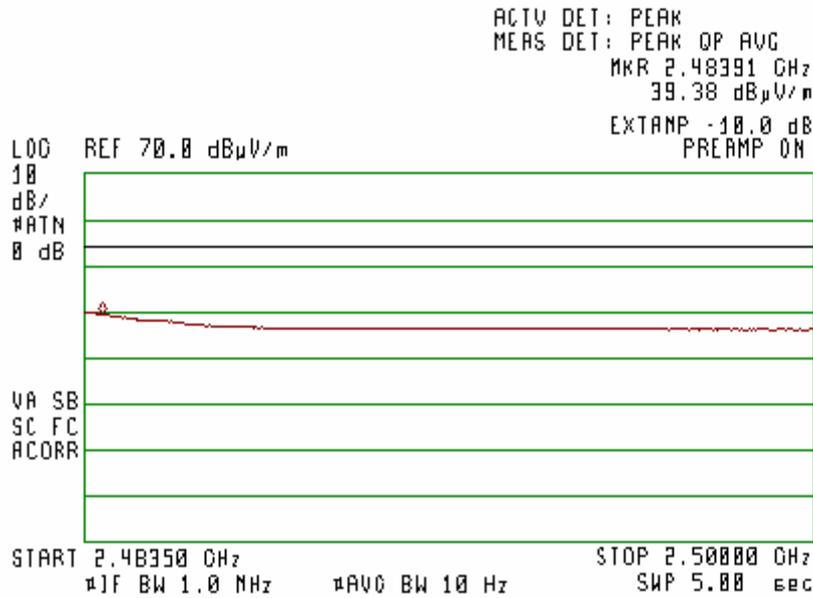
Horizontal Polarization
Average
Plot 4.5.11



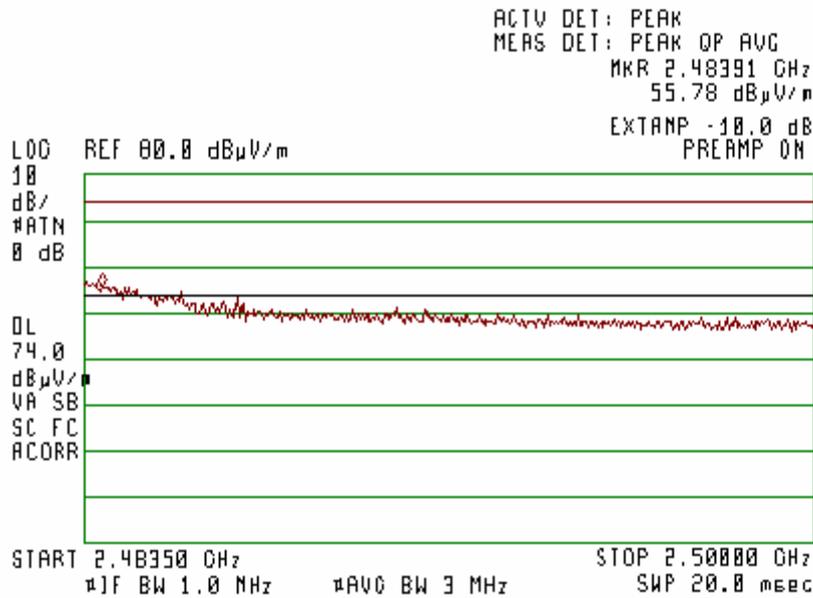
Peak
Plot 4.5.12



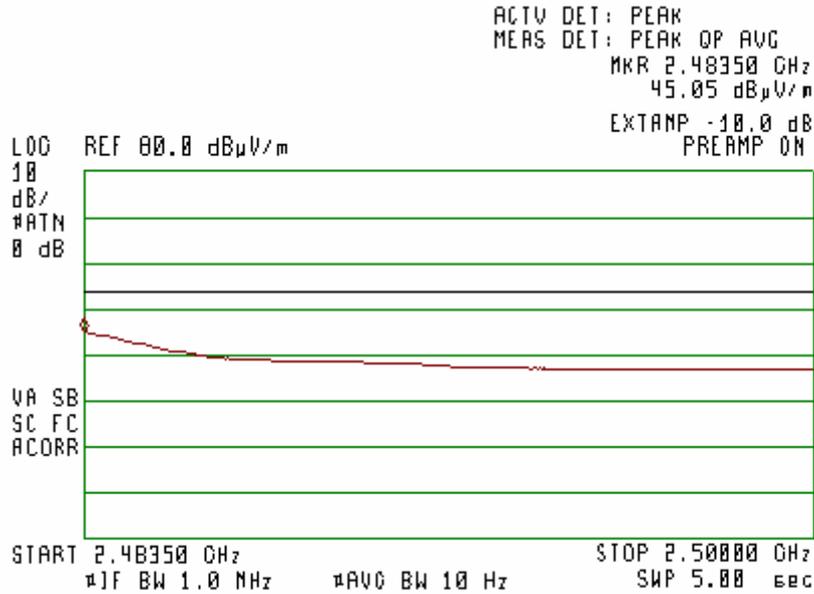
**802.11g: 54 Mbps
Highest Frequency
Vertical Polarization
Average
Plot 4.5.13**



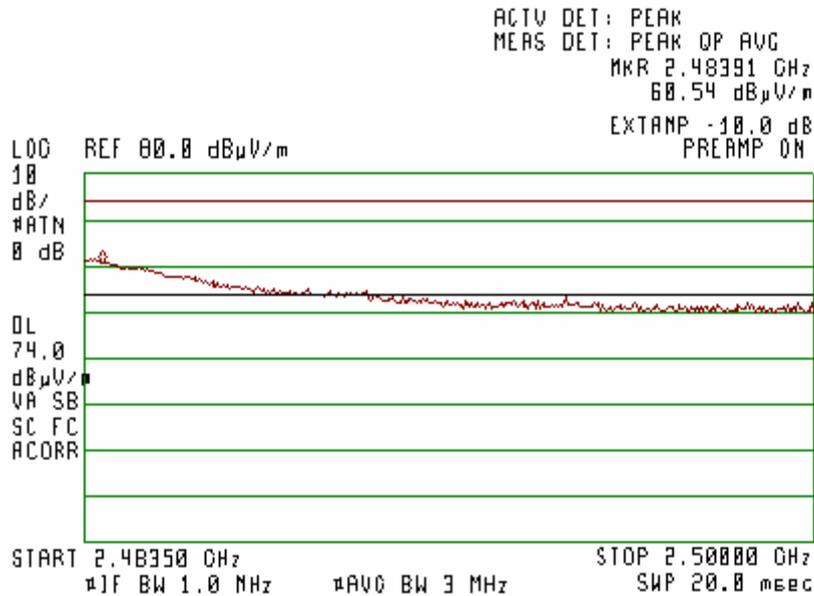
**Peak
Plot 4.5.14**



Horizontal Polarization
Average
Plot 4.5.15



Peak
Plot 4.5.16



4.6. Radiated Spurious Emission, Restricted Bands

Reference document:	47 CFR §15.247 (d) & §15.209(a)		
Test Requirements:	The emissions from an intentional radiator shall not exceed the field strength levels specified in §15.209(a).		
Test setup:	See Sec. 2.8	Pass	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	f < 1GHz: RBW: 120kHz, VBW: 1MHz f > 1GHz: RBW: 1MHz, VBW: 3MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	Appendix A	

Test result

All measurements were done in horizontal and vertical polarizations; the results show the worst case.

Frequency [MHz]	Data Rate [Mbps]	Antenna Gain	Spurious frequency [MHz]	Detector Type	Pol. V/H	Spurious Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
802.11b Mode								
2412	11	All emission at least 20 dB below the limit					54	>20dB
2433	11						54	>20dB
2462	11						54	>20dB
802.11g Mode								
2412	54	All emission at least 20 dB below the limit					54	>20dB
2433	54						54	>20dB
2462	54						54	>20dB

Note: Spurious Emission [dBµV/m] = measured [dBµV] + Correction-factor [dB (1/m)]
 Correction Factor = Antenna factor + Cable Loss + Filter I/L.

4.7. Radiated Emission (Receive mode)

Reference document:	47 CFR §15.109		
Test Requirements:	Emission Level shall not exceed §15.109(a) limits		
Test setup:	See Sec. 2.8	Pass	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 120kHz, VBW: 300kHz		
Mode of operation:	Receive		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	All peak reading at least 20 dB blow the limit	Appendix B	

Note: Emission Level [dBµV/m] = measured [dBµV] + Correction-factor [dB (1/m)]
 Correction Factor = Antenna factor + Cable Loss

4.8. Antenna Connector Requirements

Reference document:	47 CFR §15.203	
Test Requirements:	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with provisions of this section.	
Result:	The HC700G employs an integral antenna without any connector.	Pass

5. FCC 47 CFR, Part 24 & Part 15 Subpart B: Report of Measurements and examinations

5.1. Conducted Peak Output Power

Reference document:	47 CFR §24.232 (c)		
Test Requirements:	Mobile/portable stations are limited to 2 watts EIRP peak power		
Test setup:	See sec 2.4	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: Impulse BW 5MHz, VBW: 3MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 5.1.1 - Plot 5.1.6	

Test results

Modulation: GMSK

Frequency [MHz]	Peak Output Power* [dBm]	Antenna Gain [dBi]	Calculated EIRP [dBm]	Limit EIRP [dBm]	Margin [dB]	Reference
1850.2	29.87	2.8	32.67	33	-0.33	Plot 5.1.1
1880.0	29.65	2.8	32.45	33	-0.55	Plot 5.1.2
1909.8	29.89	2.8	32.69	33	-0.31	Plot 5.1.3

*Corrected for attenuations and cables loss

Modulation: 8PSK

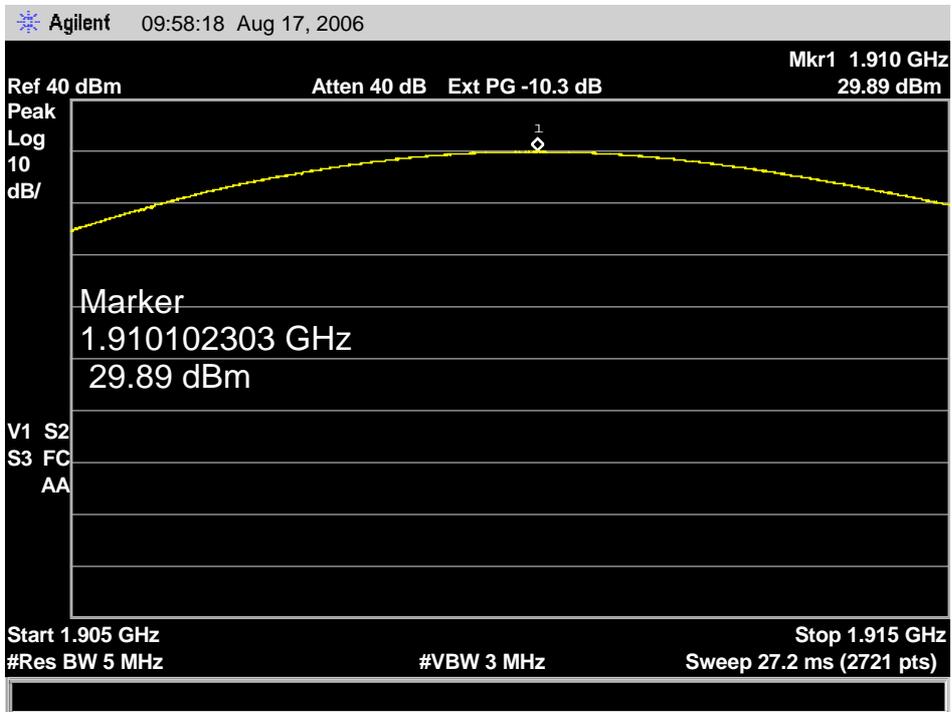
Frequency [MHz]	Burst Peak Output Power* [dBm]	Antenna Gain [dBi]	Calculated EIRP [dBm]	Limit EIRP [dBm]	Margin [dB]	Ref. Plots
1850.2	29.83	2.8	32.63	33	-0.37	Plot 5.1.4
1880.0	29.96	2.8	32.76	33	-0.24	Plot 5.1.5
1909.8	29.70	2.8	32.50	33	-0.50	Plot 5.1.6

*Corrected for attenuations and cables loss

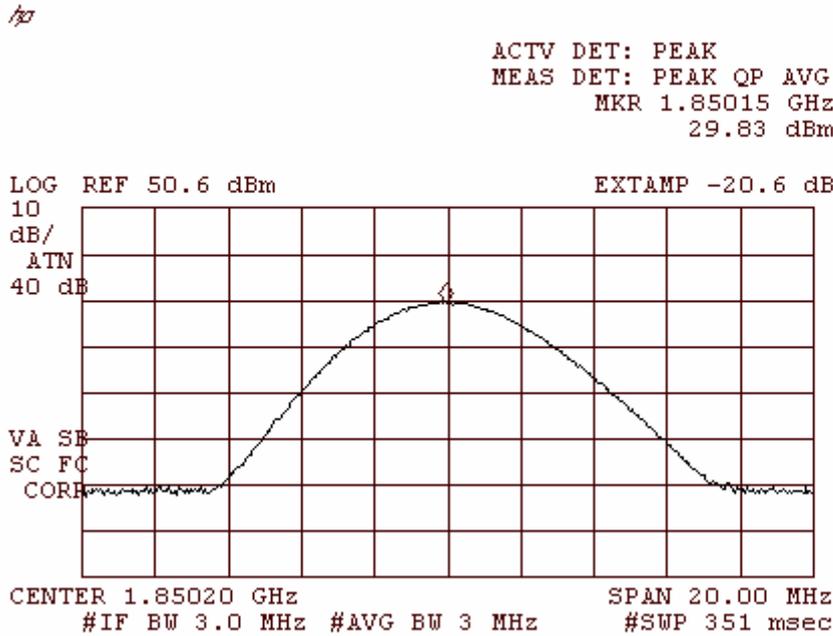
Frequency [MHz]	Average in Burst Output Power* [dBm]	Antenna Gain [dBi]	Calculated Average in Burst EIRP [dBm]
1850.2	25.71	2.8	28.51
1880.0	25.94	2.8	28.74
1909.8	25.72	2.8	28.52

*Corrected for attenuations and cables loss

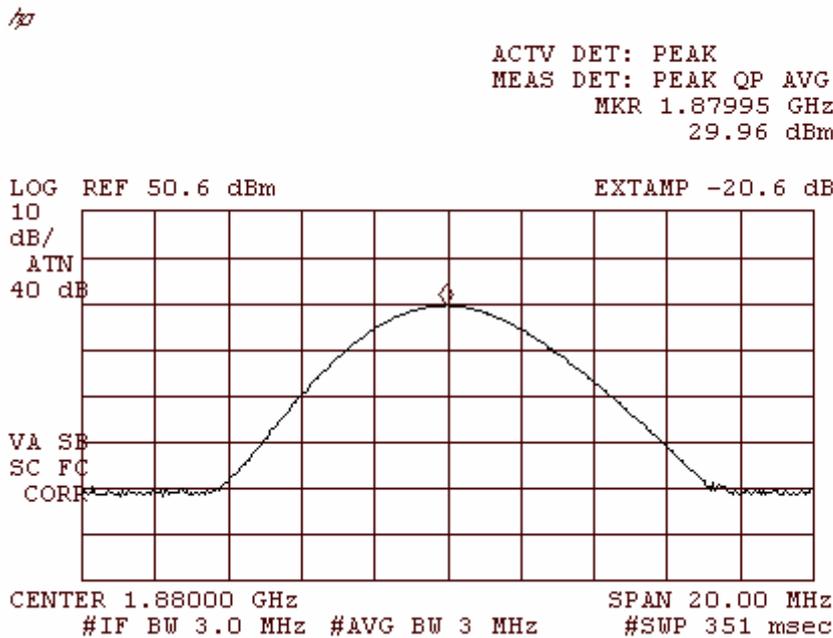
Frequency 1909.8 MHz
Plot 5.1.3



**Modulation: 8PSK
Frequency 1850.2 MHz
Plot 5.1.4**



**Frequency 1880.0 MHz
Plot 5.1.5**



5.2. Frequency stability

Reference document:	47 CFR §24.235 & §2.1055		
Test Requirements:	The frequency stability shall be to ensure that the fundamental emissions stay within the authorized frequency block.		
Test setup:	See Sec. 2.9	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	-	

Test results

AFC Frequency error vs. Voltage

Voltage [Vdc]	Frequency Error [Hz]	Frequency Error [%]	Frequency Error [ppm]	Limit [ppm]	Test Result
Carrier frequency at 22°C (7.2VDC): 1880MHz					
7.2-8.3	No Frequency Error observed				Pass

AFC Frequency error vs. Temperature

Temperature [°C]	Frequency Error [Hz]	Frequency Error [%]	Frequency Error [ppm]	Limit [ppm]	Margin [ppm]
Carrier frequency at 22°C (7.2VDC): 1880MHz					
-30	19	0.0000010106	0.010106383	0.1	Pass
-20	17	0.0000009043	0.009042553	0.1	Pass
-10	15	0.0000007979	0.007978723	0.1	Pass
0	12	0.0000006383	0.006382979	0.1	Pass
10	7	0.0000003723	0.003723404	0.1	Pass
20	3	0.0000001596	0.001595745	0.1	Pass
30	-5	-0.0000002660	-0.002659574	0.1	Pass
40	-9	-0.0000004787	-0.004787234	0.1	Pass
50	-14	-0.0000007447	-0.007446809	0.1	Pass

5.3. Occupied Bandwidth

Reference document:	47 CFR §24.238 & §2.1049		
Test Requirements:	The occupied bandwidth that is the frequency bandwidth outside of which all emission are attenuated at least 26 dB below the transmitter power.		
Test setup:	See sec 2.7	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 3kHz, VBW: 3kHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 5.3.1 to plot 5.3.12	

Test results:

Modulation: GMSK

Frequency [MHz]	99% Occupied Bandwidth*	-26dBc Occupied Bandwidth	Reference
1850.2	280	308	Plot 5.3.1 & 5.3.2
1880.0	248	315	Plot 5.3.3 & 5.3.4
1909.8	275	320	Plot 5.3.5 & 5.3.6

*§24.38(b) requires a measurement bandwidth of at least 1% of the -26dBc Occupied Bandwidth. From these results, a resolution BW of 3kHz was used.

Modulation: 8PSK

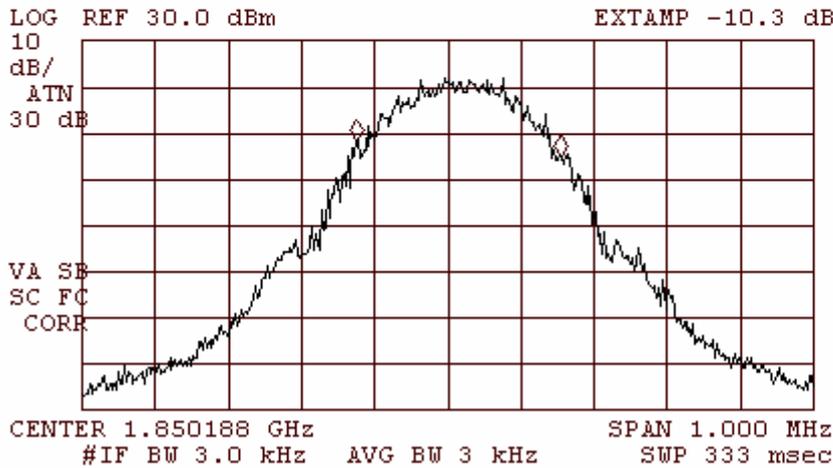
Frequency [MHz]	99% Occupied Bandwidth*	-26dBc Occupied Bandwidth	Reference
1850.2	245	300	Plot 5.3.7 & 5.3.8
1880.0	248	293	Plot 5.3.9 & 5.3.10
1909.8	238	310	Plot 5.3.11 & 5.3.12

*§24.238(b) requires a measurement bandwidth of at least 1% of the -26dBc Occupied Bandwidth. From these results, a resolution BW of 3kHz was used.

Modulation: GMSK
Frequency 1850.2MHz, 99 %
Plot 5.3.1

09:30:04 21 AUG 2006
/p

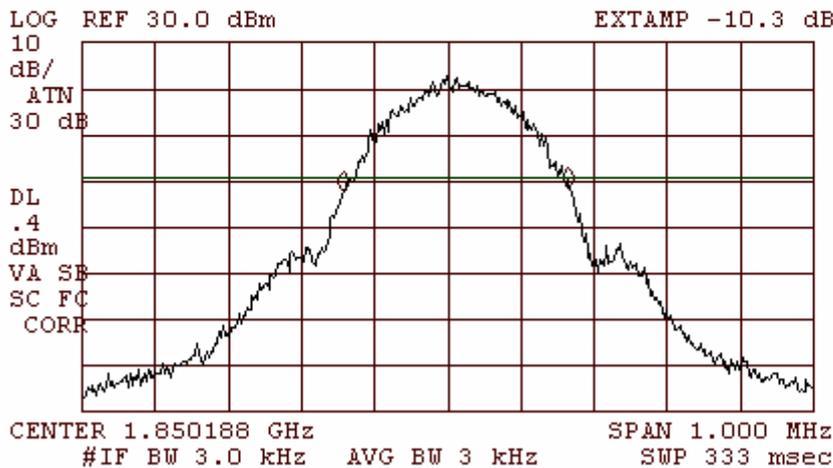
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 280 kHz
-3.16 dB



Frequency 1850.2MHz, -26dBc
Plot 5.3.2

09:39:02 21 AUG 2006
/p

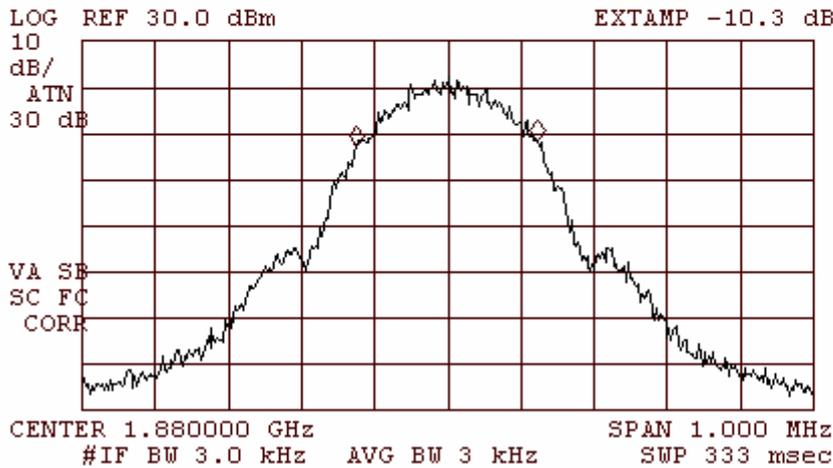
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 308 kHz
.66 dB



Frequency 1880 MHz, 99%
Plot 5.3.3

09:42:35 21 AUG 2006
/p

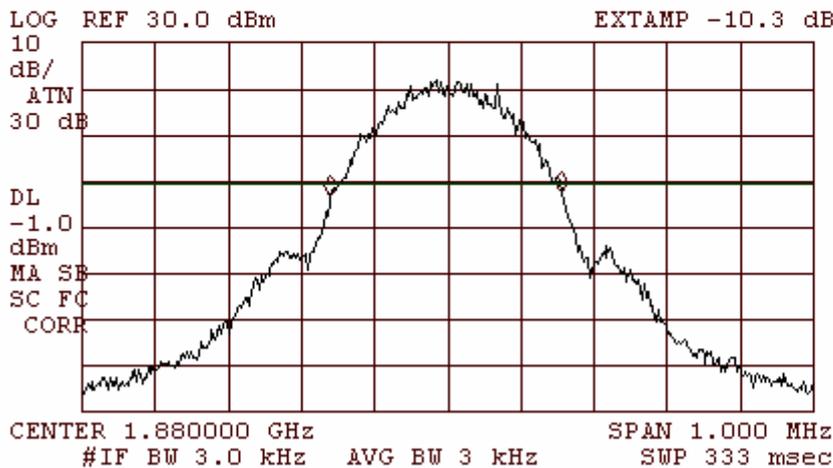
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 248 kHz
.98 dB



Frequency 1880MHz, -26dBc
Plot 5.3.4

09:46:48 21 AUG 2006
/p

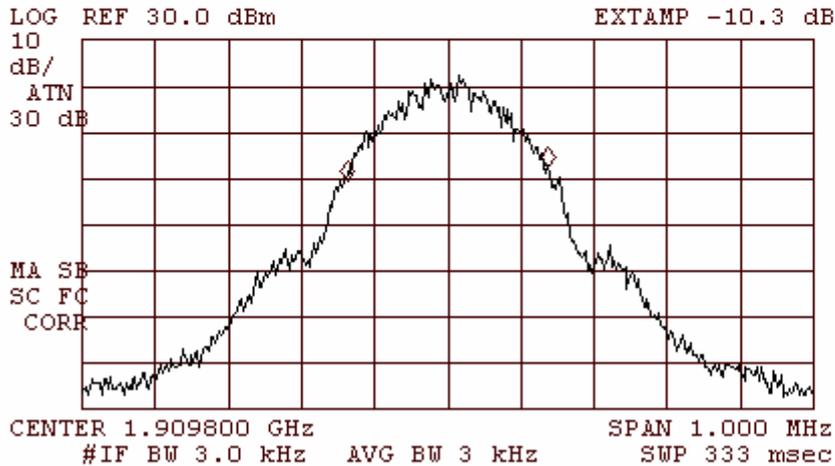
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 315 kHz
.95 dB



Frequency 1909.8MHz, 99%
Plot 5.3.5

09:51:14 21 AUG 2006
/p

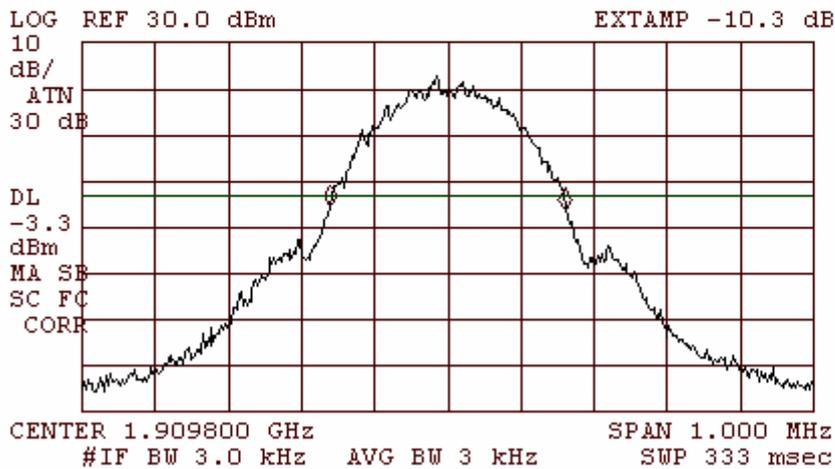
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 275 kHz
3.21 dB



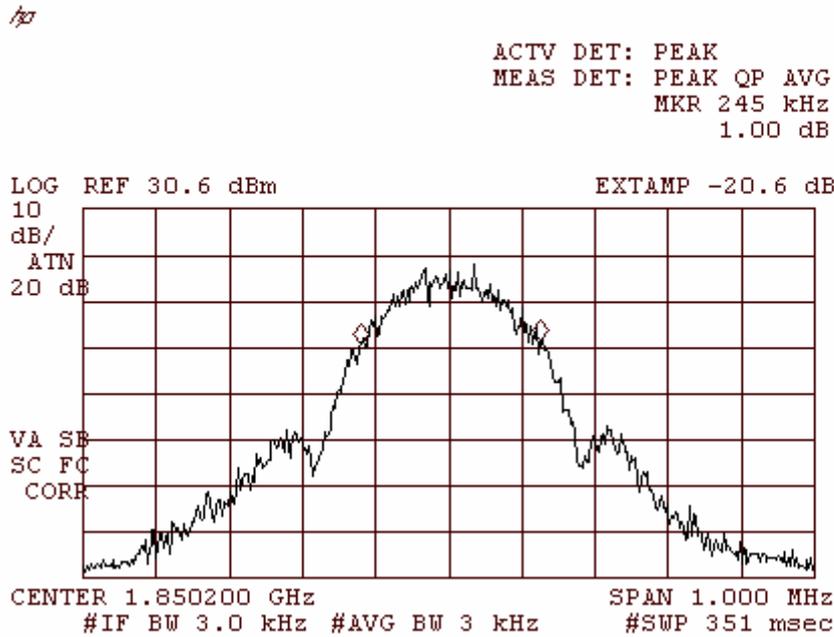
Frequency 1909.8MHz, -26dBc
Plot 5.3.6

09:49:22 21 AUG 2006
/p

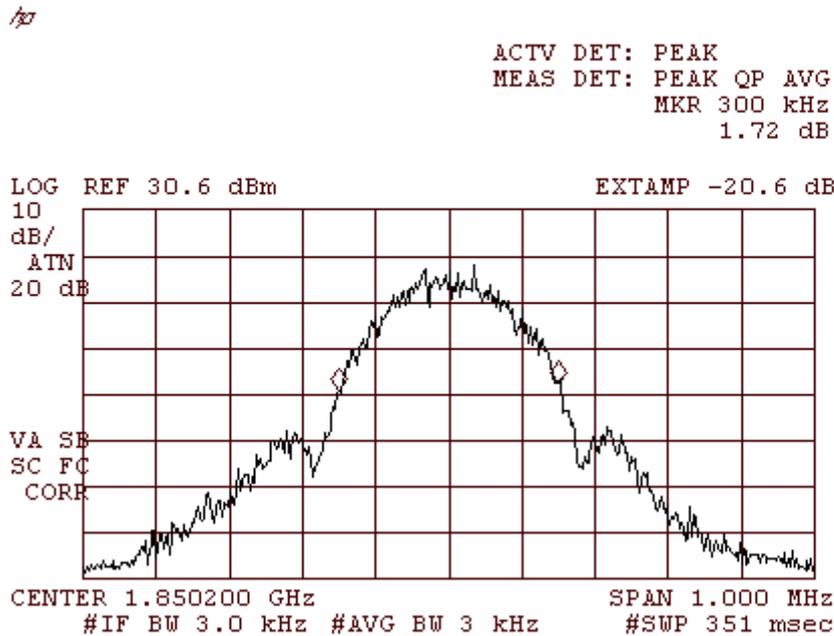
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 320 kHz
-.76 dB



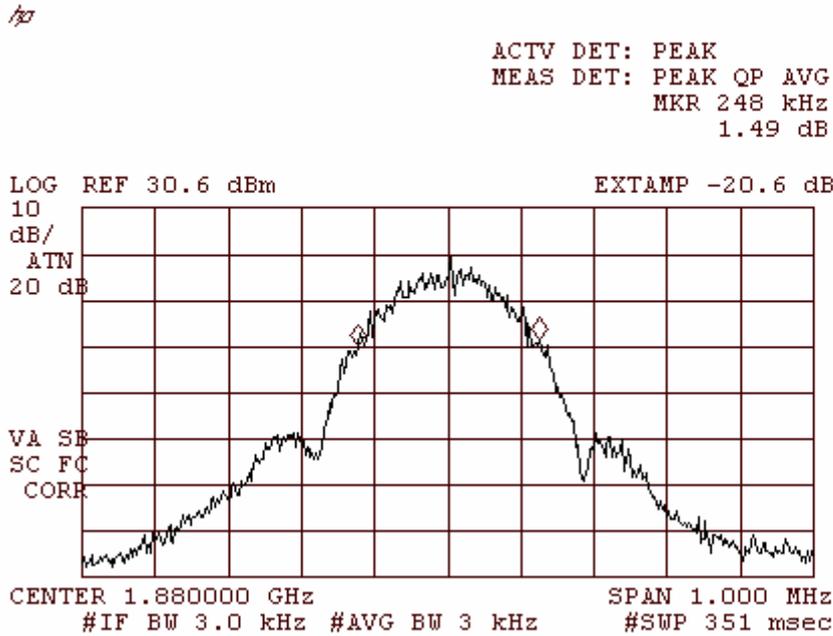
Modulation: 8PSK
Frequency 1850.2MHz, 99 %
Plot 5.3.7



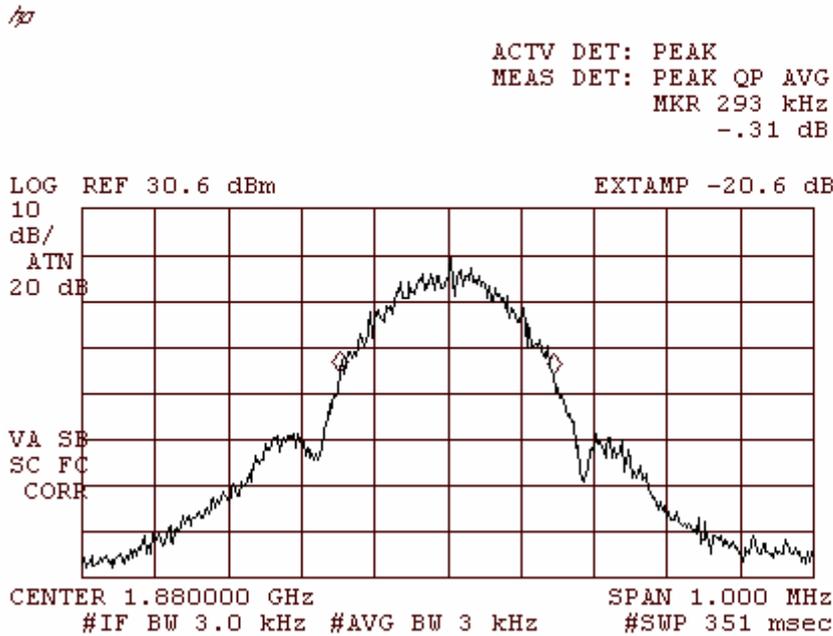
Frequency 1850.2MHz, -26dBc
Plot 5.3.8



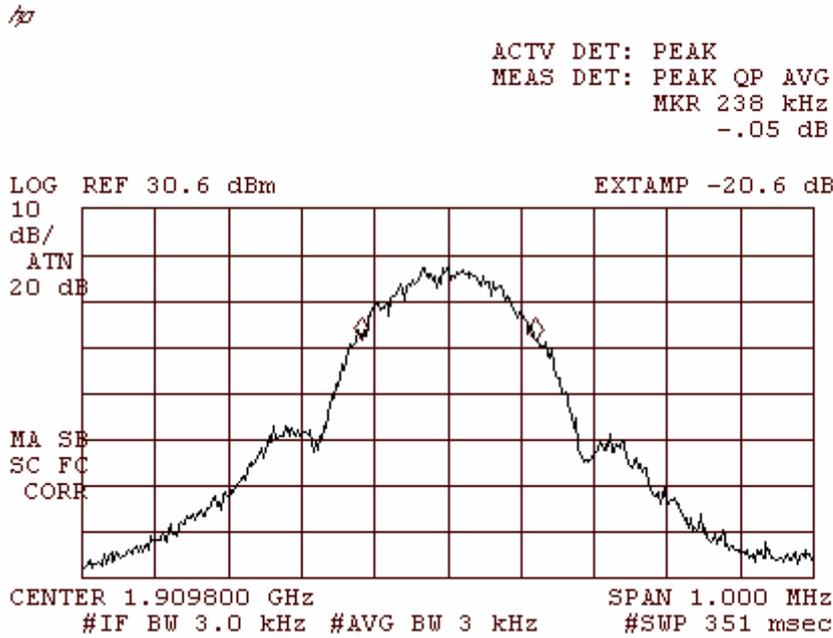
Frequency 1880 MHz, 99%
Plot 5.3.9



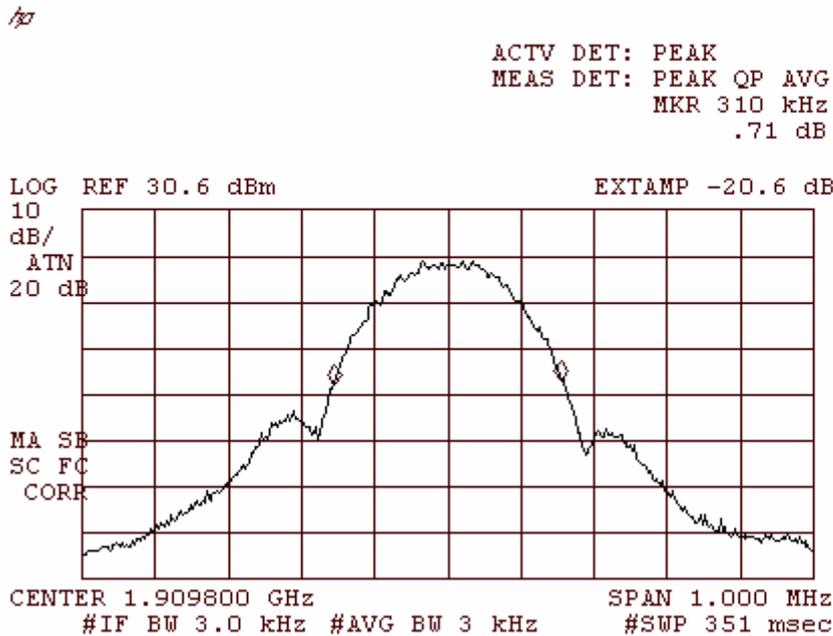
Frequency 1880MHz, -26dBc
Plot 5.3.10



Frequency 1909.8MHz, 99%
Plot 5.3.11



Frequency 1909.8MHz, -26dBc
Plot 5.3.12



5.4. Out of Band Emissions - Radiated

Reference document:	47 CFR §24.238		
Test Requirements:	The power of any emission outside of the authorized operating frequency block shall be attenuated below the transmitting power (P, in Watts) by a factor of at least 43+10log(P) dB*.		
Test setup:	See Sec. 2.5	Pass	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	f <1GHz: RBW: 120kHz, VBW: 1MHz f >1GHz: RBW: 1MHz, VBW: 3MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	Plots, see Appendix A	

*It translates to a limit of -13dBm

Test results:

Frequency [MHz]	Radiated Emission Level [dBμV/m]	Spurious Emission Level* ERP [dBm]	Limit [dBm]	Margin [dB]	Reference	Result
1850.2	126.63	30.0	Carrier			
3700.4	39.8	-48.5	-13.0	-35.5	Plot 30	Pass
9251	61.26	-17.47	-13.0	-4.47	Plot 31	Pass
11101.2	56.22	-21.18	-13.0	-8.18	Plot 31	Pass
1880.0	124.01	30.7	Carrier			
3760	40.48	-49.1	-13.0	-36.1	Plot 34	Pass
9400	57.82	-20.97	-13.0	-7.97	Plot 35	Pass
11280	53.68	-24.68	-13.0	-11.68	Plot 35	Pass
15040	50.69	-27.56	-13.0	-14.56	Plot 35	Pass
1909.8	122.05	28.2	Carrier			
3819.6	39.65	-48.7	-13.0	-35.7	Plot 38	Pass
9549	57.04	-20.07	-13.0	-7.07	Plot 39	Pass
11458.81	58.91	-18.98	-13.0	-5.98	Plot 39	Pass

* Spurious Emission [dBm] = Measured [dBm] - Cable Loss [dB] + Substitution Antenna Gain [dBd]

5.5. Out of Band Emissions - Conducted

Reference document:	47 CFR §24.238		
Test Requirements:	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10log (P) dB.		
Test setup:	See sec 2.6	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW:1 MHz, VBW: 1 MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 5.5.1- Plot 5.5.18	

Test results:

Modulation: GMSK

Frequency [MHz]	Spurious Emission Level* [dBm]	Limit [dBm]	Reference	Actual Attenuation [dBc]	Margin [dB]	Result
1850.2	29.87					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 5.5.1- Plot 5.5.3	-	>15dBc	Pass
1880.0	29.65					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 5.5.4- Plot 5.5.6	-	>15dBc	Pass
1909.8	29.89					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 5.5.7- Plot 5.5.9	-	>15dBc	Pass

* Spurious Emission [dBm] = Measured [dBm] - Attenuations [dB]

Modulation: 8PSK

Frequency [MHz]	Spurious Emission Level* [dBm]	Limit [dBm]	Ref plot	Actual Attenuation [dBc]	Margin [dB]	Result
1850.2	29.83					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 5.5.10- Plot 5.5.12	-	>15dBc	Pass
1880.0	29.96					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 5.5.13- Plot 5.5.15	-	>15dBc	Pass
1909.8	29.70					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 5.5.16- Plot 5.5.18	-	>15dBc	Pass

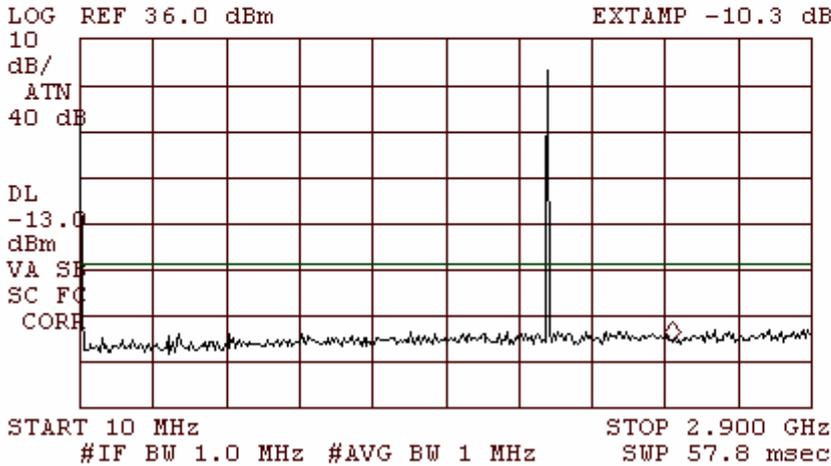
* Spurious Emission [dBm] = Measured [dBm] - Attenuations [dB]

Modulation: GMSK
Frequency 1850.2 MHz
Plot 5.5.1

13:24:52 21 AUG 2006

1/20

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.351 GHz
-29.79 dBm

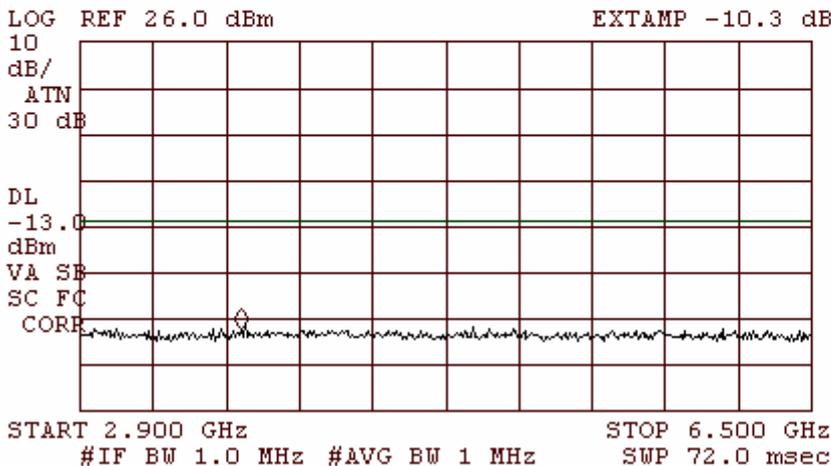


Plot 5.5.2

13:32:08 21 AUG 2006

1/20

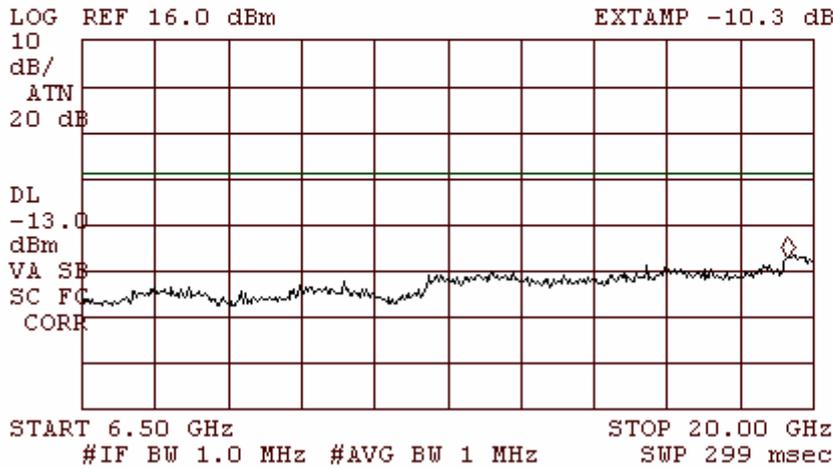
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 3.692 GHz
-36.58 dBm



Plot 5.5.3

14:50:36 21 AUG 2006
/P

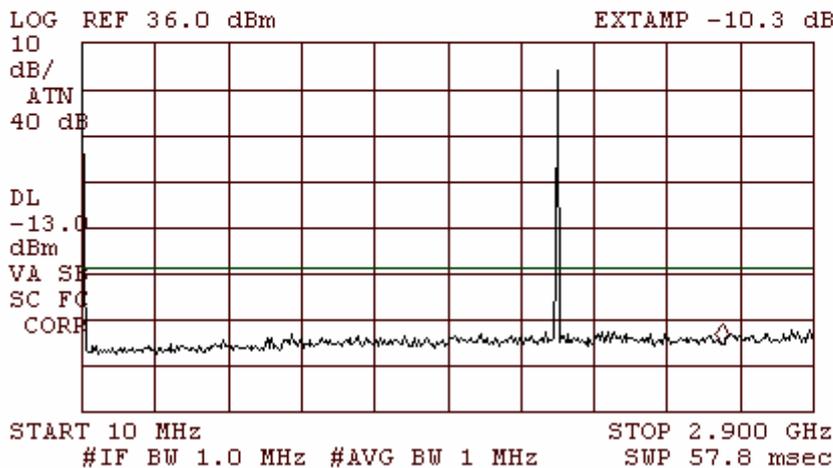
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 19.53 GHz
-31.20 dBm



Frequency 1880 MHz
Plot 5.5.4

13:27:17 21 AUG 2006
/P

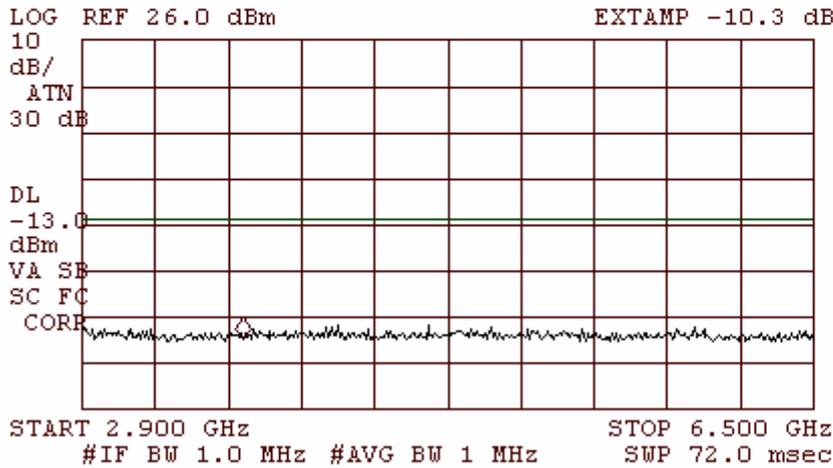
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.539 GHz
-29.36 dBm



Plot 5.5.5

13:33:20 21 AUG 2006
/P

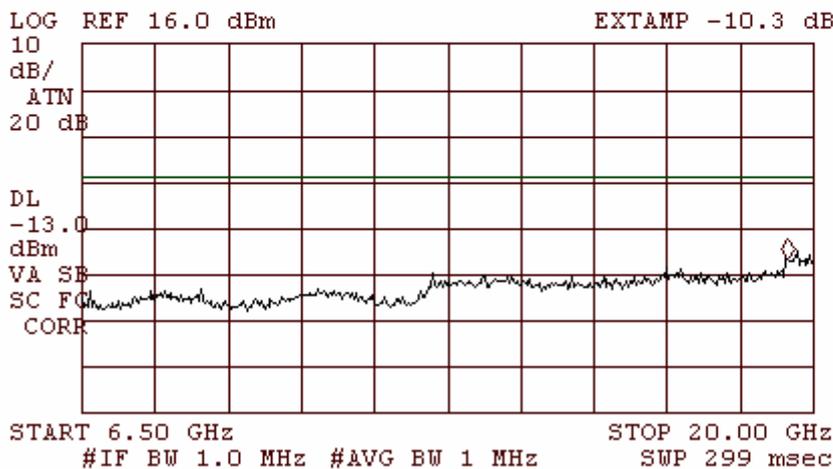
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 3.692 GHz
-38.87 dBm



Plot 5.5.6

14:48:09 21 AUG 2006
/P

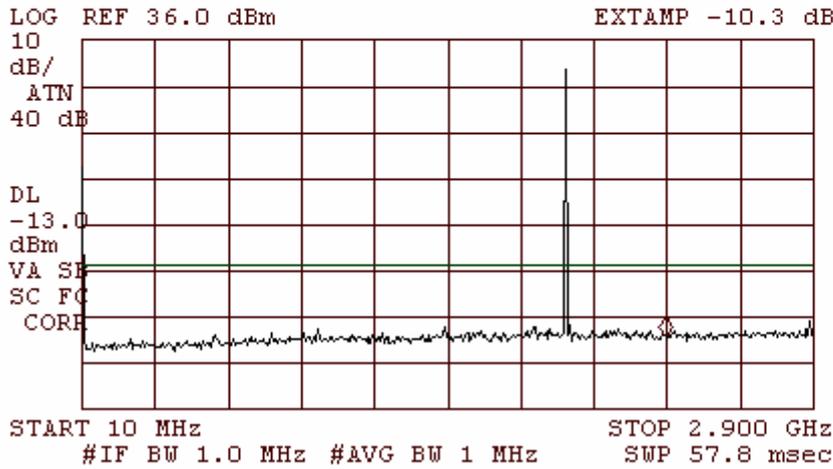
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 19.53 GHz
-30.89 dBm



Frequency 1909.8 MHz
Plot 5.5.7

13:29:12 21 AUG 2006
/30

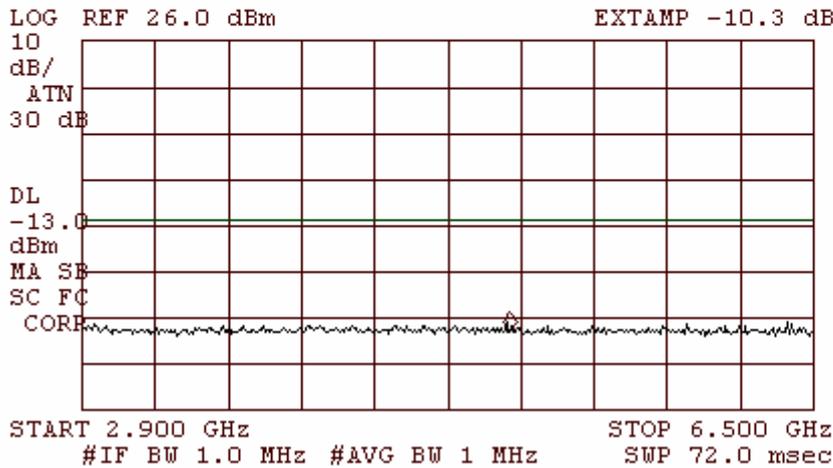
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.315 GHz
-28.71 dBm



Plot 5.5.8

13:34:41 21 AUG 2006
/30

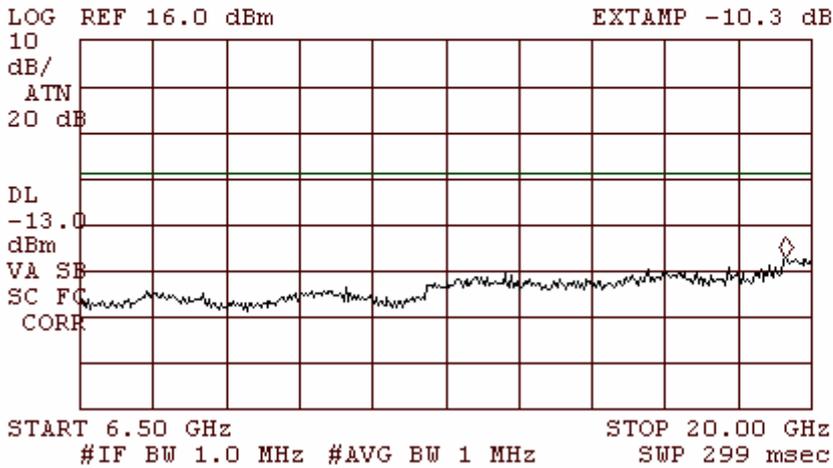
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 5.006 GHz
-37.26 dBm



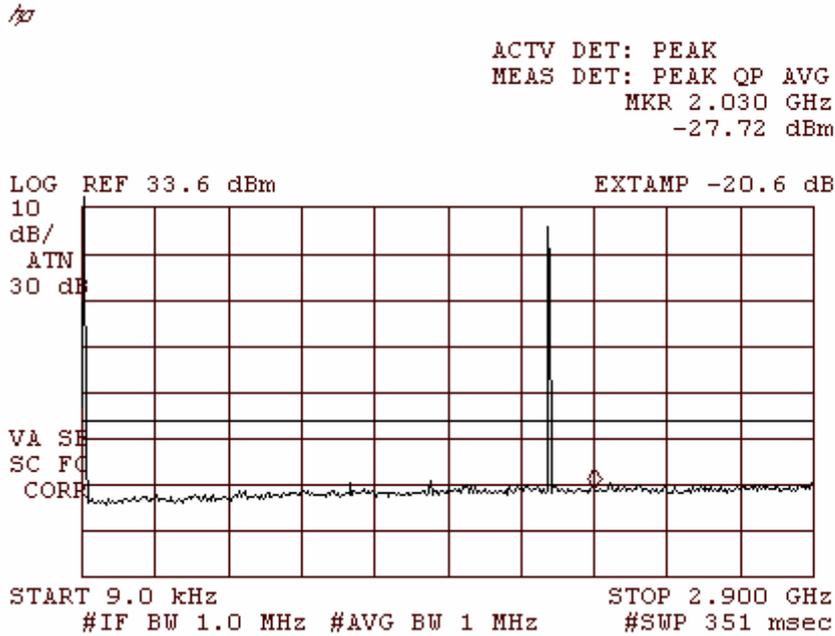
Plot 5.5.9

14:47:22 21 AUG 2006
/30

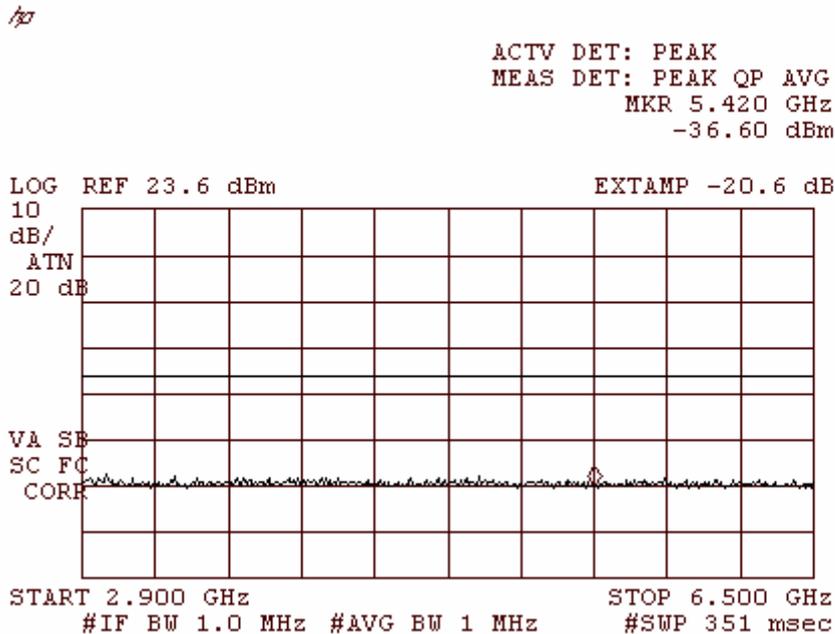
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 19.53 GHz
-31.34 dBm



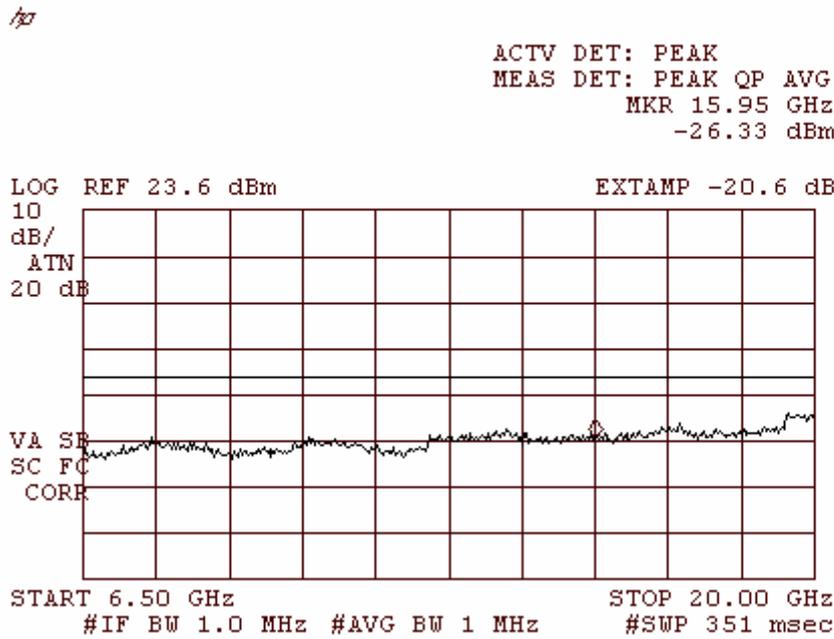
Modulation: 8PSK
Frequency 1850.2 MHz
Plot 5.5.10



Plot 5.5.11

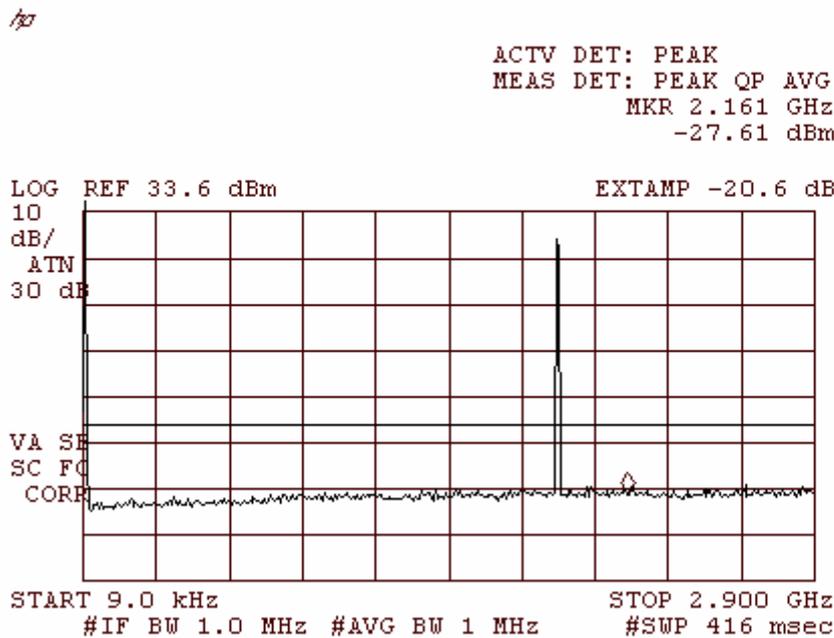


Plot 5.5.12

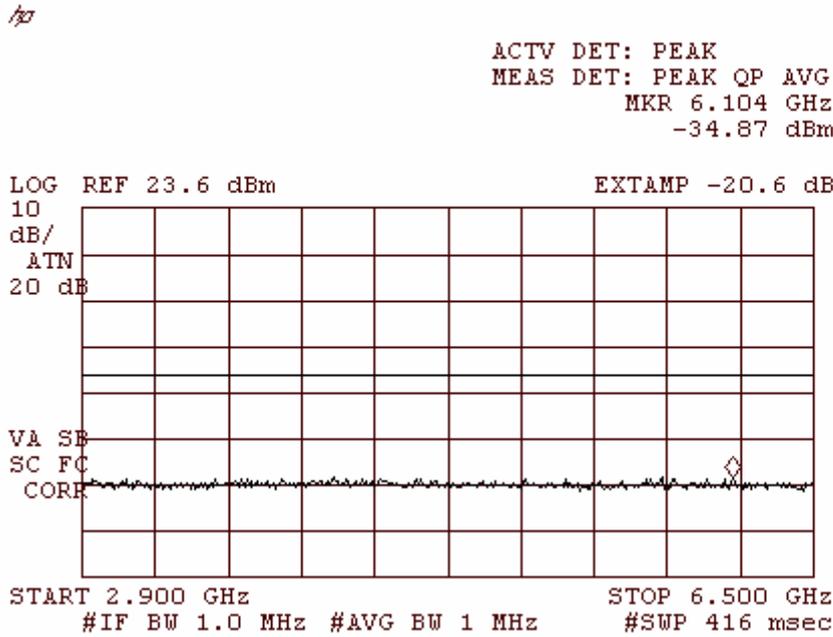


Frequency 1880 MHz

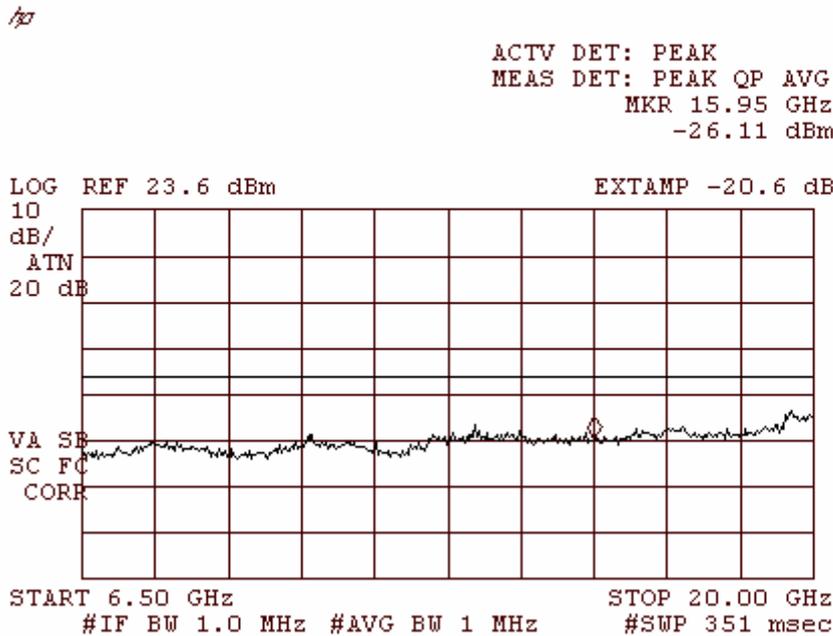
Plot 5.5.13



Plot 5.5.14

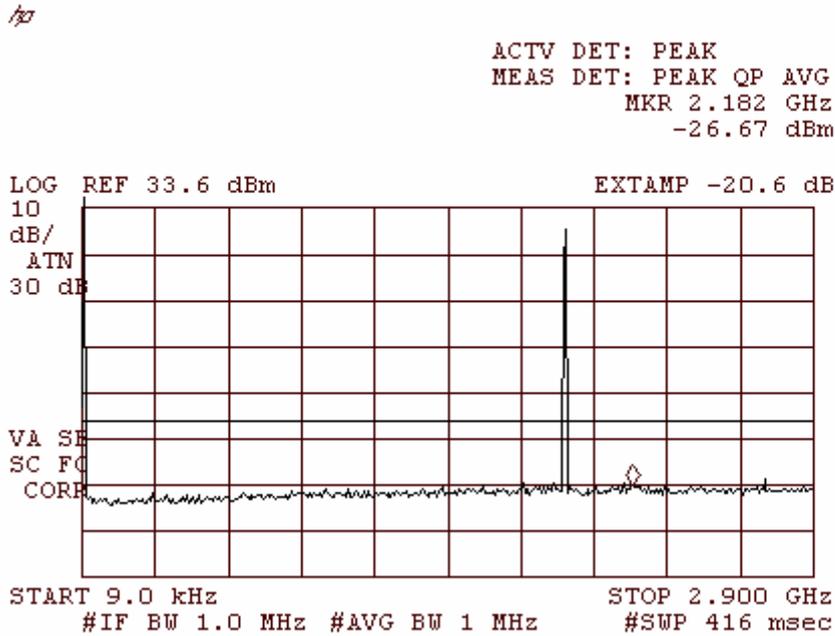


Plot 5.5.15

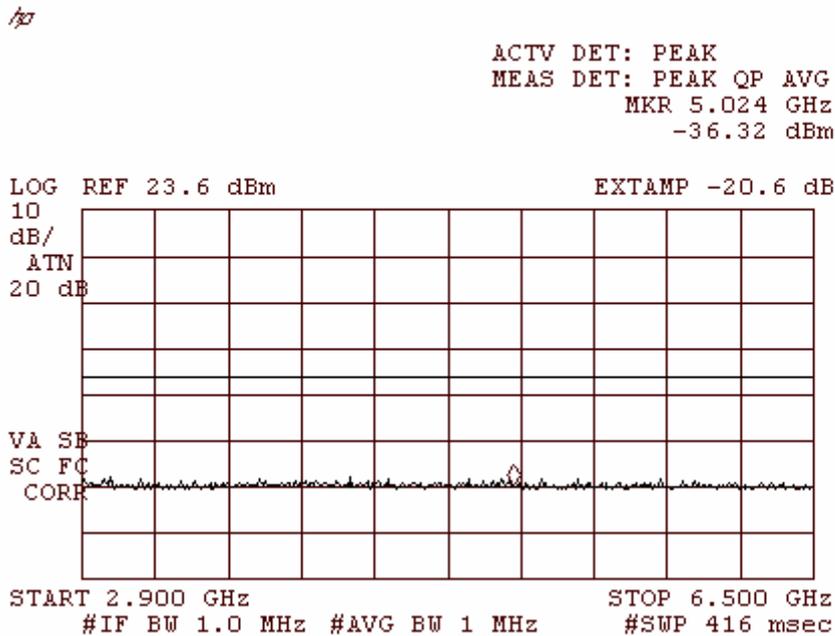


Frequency 1909.8 MHz

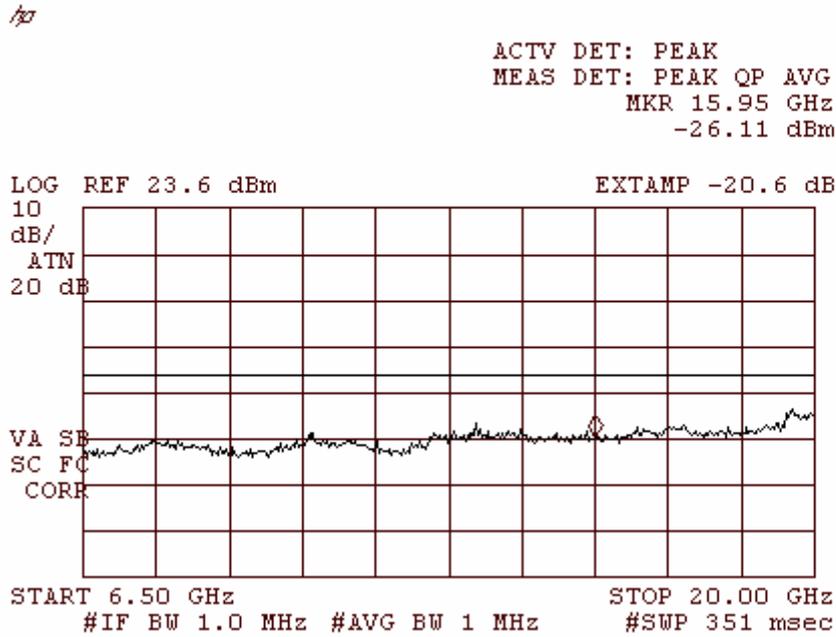
Plot 5.5.16



Plot 5.5.17



Plot 5.5.18



5.6. Block Edge Emissions - conducted

Reference document:	47 CFR §24.238		
Test Requirements:	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10log (P) dB. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 1% of the EBW may be employed.		
Test setup:	See sec 2.6	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 3kHz, VBW: 3kHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 5.6.1 - Plot 5.6.4	

Test results:

Modulation: GMSK

Frequency [MHz]	Spurious Emission Level* [dBm]	Limit [dBm]	Actual Attenuation below frequency of operation [dBc]	Reference	Margin [dB]	Result
1850.2	29.87					Carrier
1849.985	-16.41	-13.0	-46.28	Plot 5.6.1	-3.41	Pass
1909.8	29.89					Carrier
1910.02	-16.79	-13.0	-46.68	Plot 5.6.2	-3.79	Pass

* Spurious Emission [dBm] = Measured [dBm] – Attenuations [dB]

Modulation: 8PSK

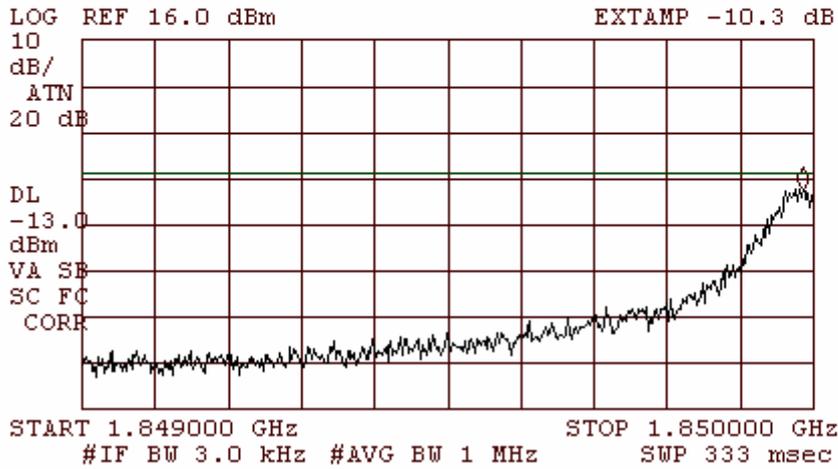
Frequency [MHz]	Spurious Emission Level* [dBm]	Limit [dBm]	Actual Attenuation below frequency of operation [dBc]	Ref plot	Margin [dB]	Result
1850.2	29.83					Carrier
1849.985	-17.80	-13.0	-47.63	Plot 5.6.3	-4.8	Pass
1909.8	29.70					Carrier
1910.02	-19.60	-13.0	-49.3	Plot 5.6.4	-6.6	Pass

* Spurious Emission [dBm] = Measured [dBm] – Attenuations [dB]

Modulation: GMSK
Plot 5.6.1

14:52:33 21 AUG 2006
/30

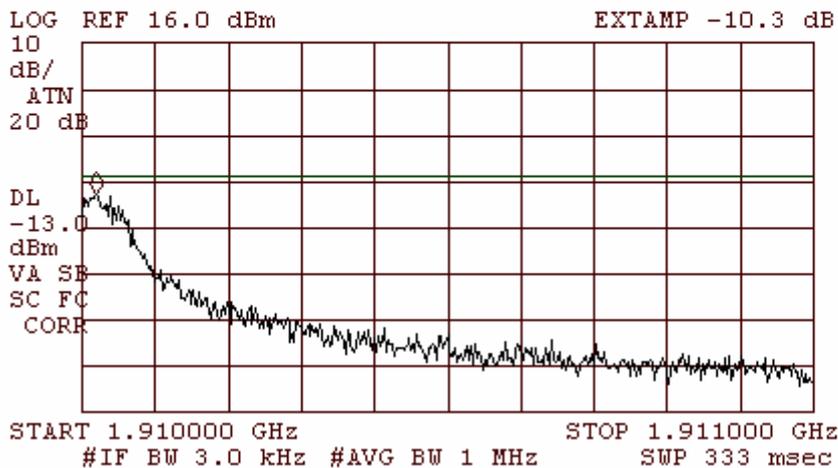
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 1.849985 GHz
-16.41 dBm



Plot 5.6.2

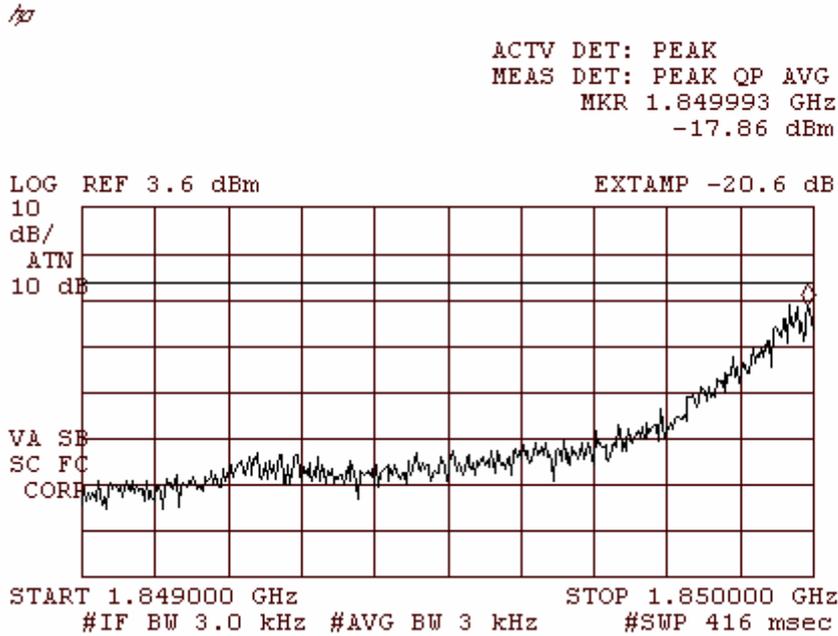
15:00:32 21 AUG 2006
/30

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 1.910020 GHz
-16.79 dBm

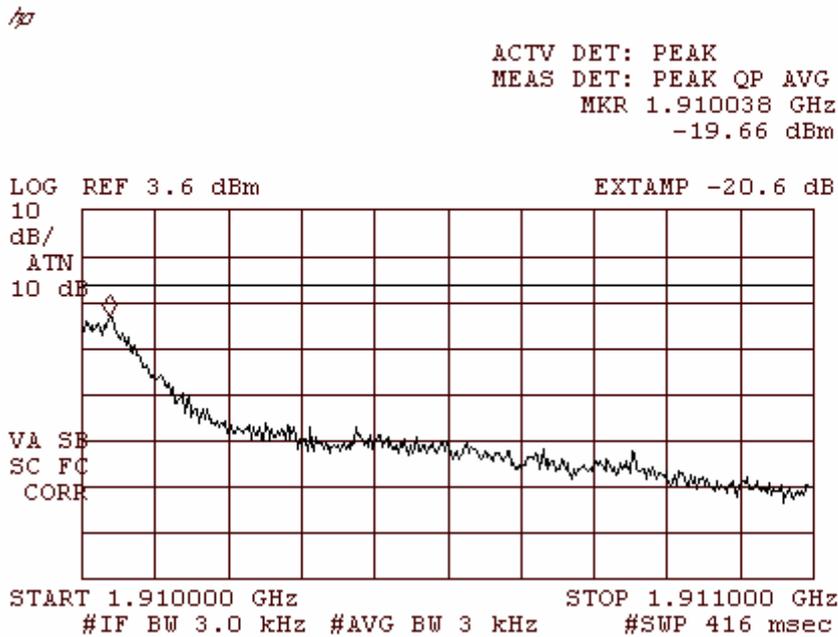


Modulation: 8PSK

Plot 5.6.3



Plot 5.6.4



5.7. Radiated Emissions

Reference document:	47 CFR §15.109		
Test Requirements:	Emission Level shall not exceed §15.109 limits		
Test setup:	See Sec. 2.8	Pass	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 120kHz,VBW: 300kHz		
Mode of operation:	Receive		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	All peak readings were at least 20 dB below the limit.	Plots, see Appendix B	

6. FCC 47 CFR, Part 22 & Part 15 Subpart B: Report of Measurements and examinations

6.1. Conducted Peak Output Power

Reference document:	47 CFR §22.913 (a) (2)		
Test Requirements:	Mobile stations are limited to 7 watts EIRP peak power		
Test setup:	See sec 2.4	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: BW 3MHz, VBW: 3MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 6.1.1 - Plot 6.1.6	

Test results

Modulation: GMSK

Frequency [MHz]	Peak Output Power* [dBm]	Antenna Gain [dBd]	Calculated ERP [dBm]	Limit [dBm]	Margin [dB]	Reference
824.2	33.13	-4.14	28.99	38	-9.01	Plot 6.1.1
836.6	33.08	-4.14	28.94	38	-9.06	Plot 6.1.2
848.8	32.94	-4.14	28.8	38	-9.2	Plot 6.1.3

*Corrected for attenuations and cables loss

Modulation: 8PSK

Frequency [MHz]	Burst Peak Output Power* [dBm]	Antenna Gain [dBd]	Calculated ERP [dBm]	Limit [dBm]	Margin [dB]	Plot Ref
824.2	30.87	-4.14	26.73	38.45	-11.72	Plot 6.1.4
836.6	31.06	-4.14	26.92	38.45	-11.53	Plot 6.1.5
848.8	31.02	-4.14	26.88	38.45	-11.57	Plot 6.1.6

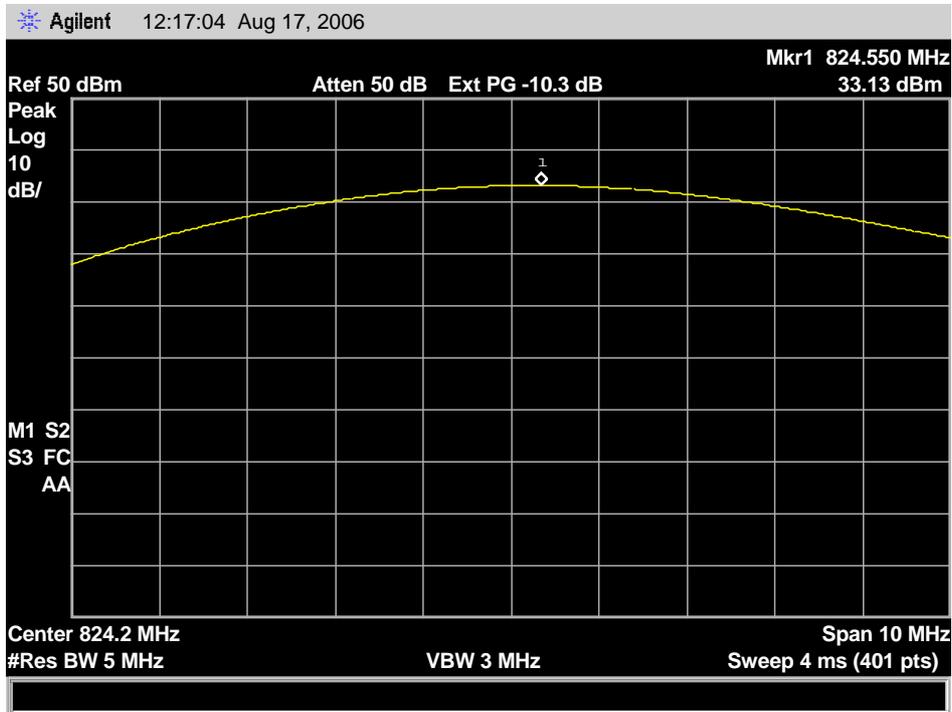
*Corrected for attenuations and cables loss

Frequency [MHz]	Average in Burst Output Power* [dBm]	Antenna Gain [dBi]	Calculated Average in Burst EIRP [dBm]
824.2	26.75	-4.14	22.61
836.6	27.1	-4.14	22.96
848.8	26.85	-4.14	22.71

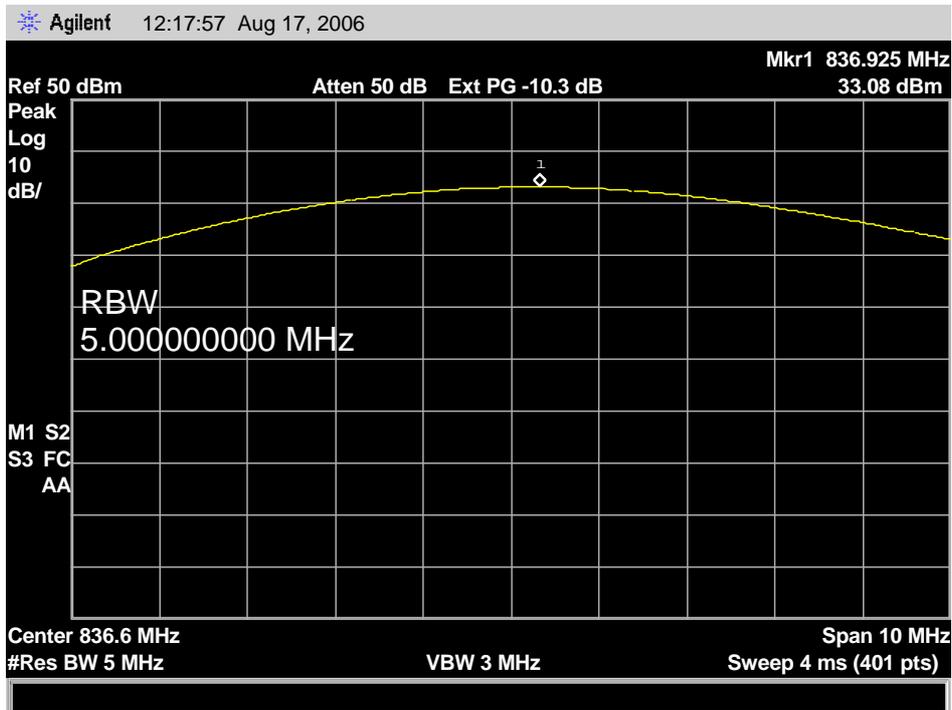
*Corrected for attenuations and cables loss

Modulation: GMSK

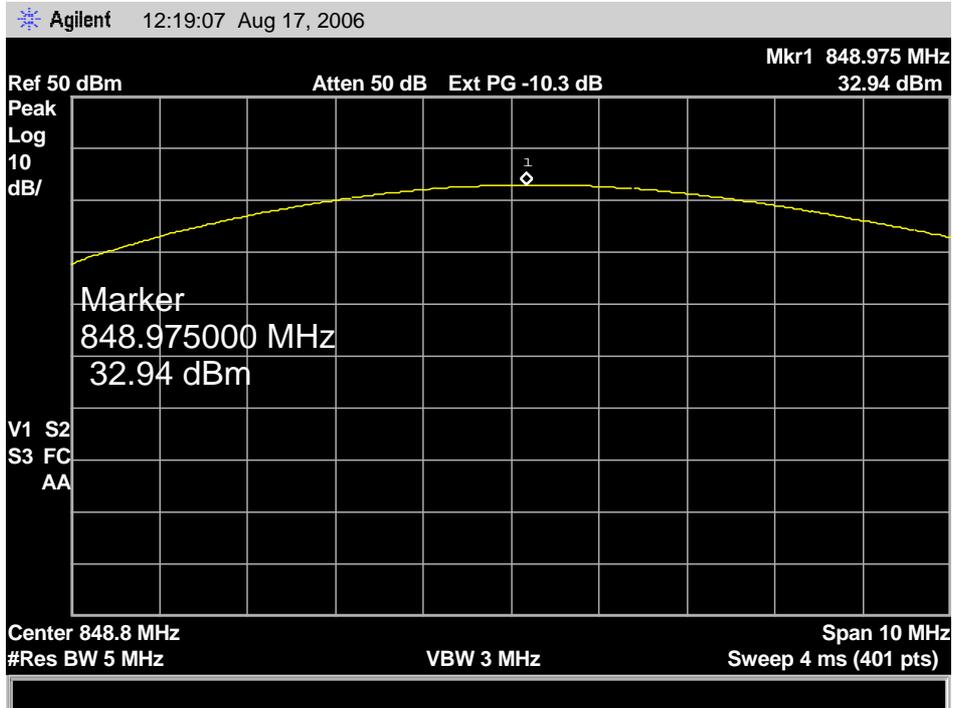
Plot 6.1.1



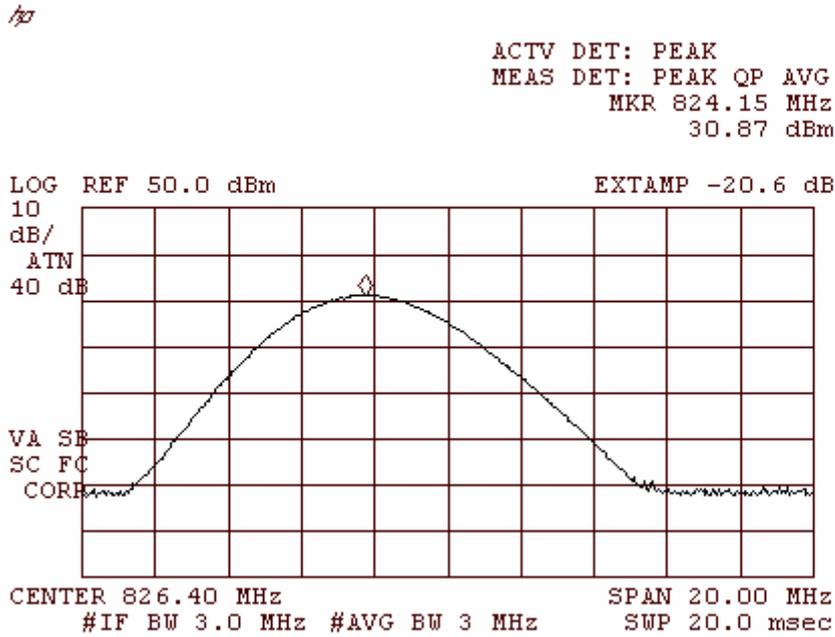
Plot 6.1.2



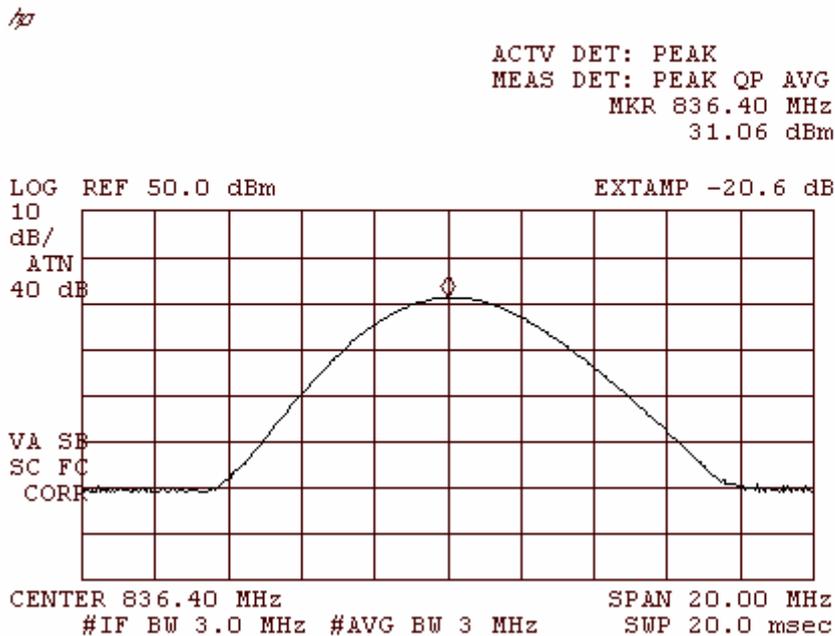
Plot 6.1.3



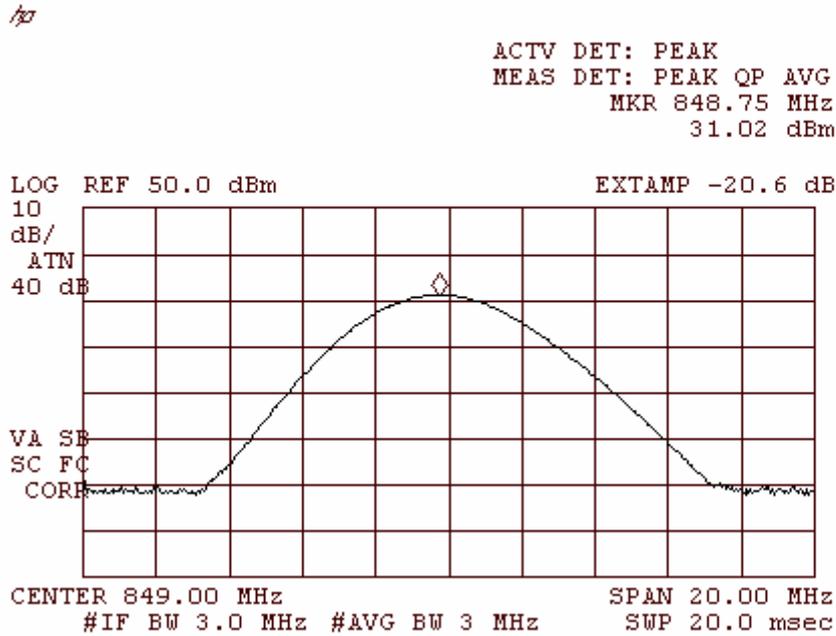
Modulation: 8PSK
Plot 6.1.4



Plot 6.1.5



Plot 6.1.6



6.2. Frequency stability

Reference document:	47 CFR §22.355 & §2.1055		
Test Requirements:	The frequency stability shall be less than 2.5 ppm .		
Test setup:	See Sec. 2.9	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	-	

Test results

AFC Frequency error vs. Voltage

Voltage [V]	Frequency Error [Hz]	Frequency Error [%]	Frequency Error [ppm]	Limit [ppm]	Test Result
Carrier frequency at 22°C (7.2VDC): 836.6MHz					
7.2-8.3	No Frequency Error observed				Pass

AFC Frequency error vs. Temperature

Temperature [°C]	Frequency Error [Hz]	Frequency Error [%]	Frequency Error [ppm]	Limit [ppm]	Margin [ppm]
Carrier frequency at 22°C (7.2VDC): 836.6MHz					
-30	23	0.0000012234	0.012234043	2.5	Pass
-20	21	0.0000011170	0.011170213	2.5	Pass
-10	20	0.0000010638	0.010638298	2.5	Pass
0	19	0.0000010106	0.010106383	2.5	Pass
10	17	0.0000009043	0.009042553	2.5	Pass
20	17	0.0000009043	0.009042553	2.5	Pass
30	15	0.0000007979	0.007978723	2.5	Pass
40	14	0.0000007447	0.007446809	2.5	Pass
50	12	0.0000006383	0.006382979	2.5	Pass

6.3. Occupied Bandwidth

Reference document:	47 CFR §22.917 & §2.1049		
Test Requirements:	The occupied bandwidth, that is the frequency bandwidth outside of which all emission are attenuated at least 26 dB below the transmitter power.		
Test setup:	See sec 2.7	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 3kHz, VBW: 3kHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 6.3.1 - Plot 6.3.12	

Test results:

Modulation: GMSK

Frequency [MHz]	99% Occupied Bandwidth*	-26dBc Occupied Bandwidth	Reference
824.2	250	320	Plot 6.3.1 & 6.3.2
836.6	253	325	Plot 6.3.3 & 6.3.4
848.8	248	318	Plot 6.3.5 & 6.3.6

*§22.917 (b) requires a measurement bandwidth of at least 1% of the -26dBc Occupied Bandwidth. From these results, a resolution BW of 3kHz was used.

Modulation: 8PSK

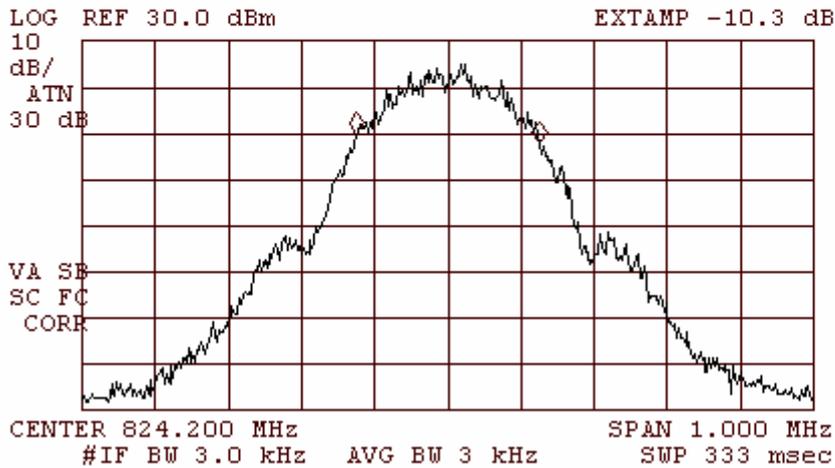
Frequency [MHz]	99% Occupied Bandwidth*	-26dBc Occupied Bandwidth	Reference
824.2	248	318	Plot 6.3.7 & 6.3.8
836.6	250	305	Plot 6.3.9 & 6.3.10
848.8	243	313	Plot 6.3.11 & 6.3.12

*§22.917 (b) requires a measurement bandwidth of at least 1% of the -26dBc Occupied Bandwidth. From these results, a resolution BW of 3kHz was used.

Modulation: GMSK
Frequency 824.2 MHz, 99 %
Plot 6.3.1

09:59:13 21 AUG 2006
for

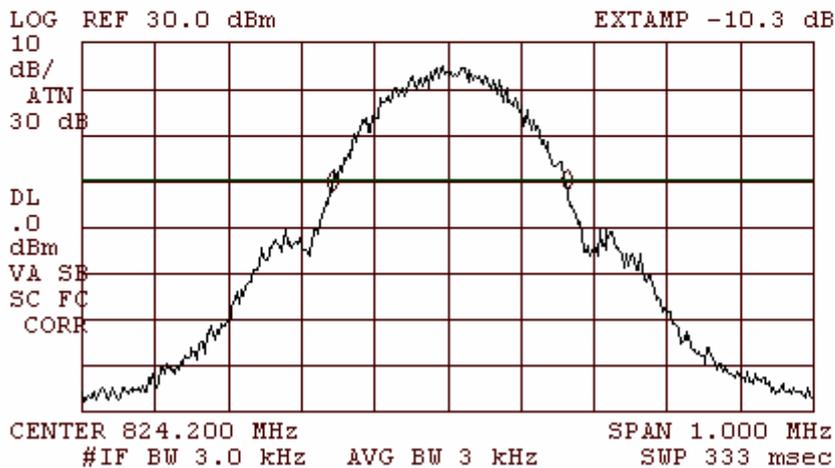
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 250 kHz
-2.14 dB



Frequency 824.2, -26dBc
Plot 6.3.2

10:01:04 21 AUG 2006
for

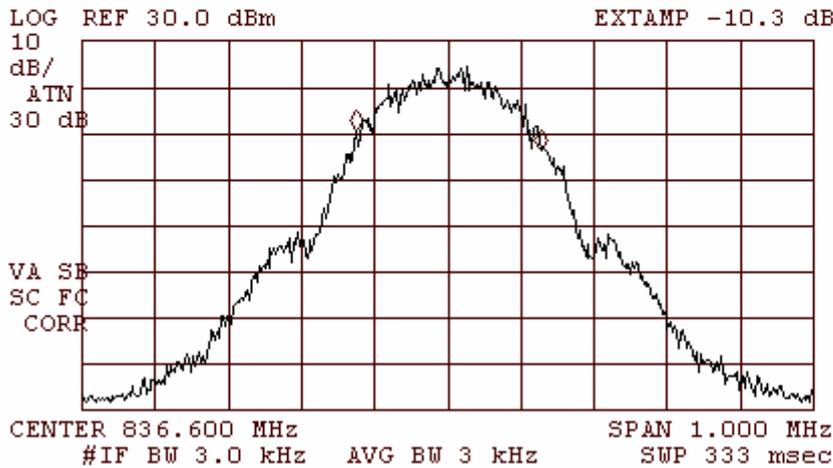
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 320 kHz
.35 dB



Frequency 836.6MHz, 99%
Plot 6.3.3

10:06:14 21 AUG 2006
for

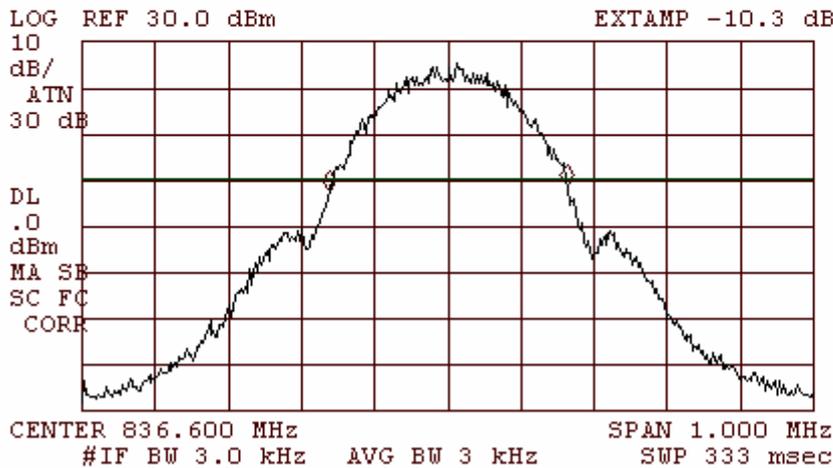
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 253 kHz
-4.40 dB



Frequency 836.6, -26dBc
Plot 6.3.4

10:03:28 21 AUG 2006
for

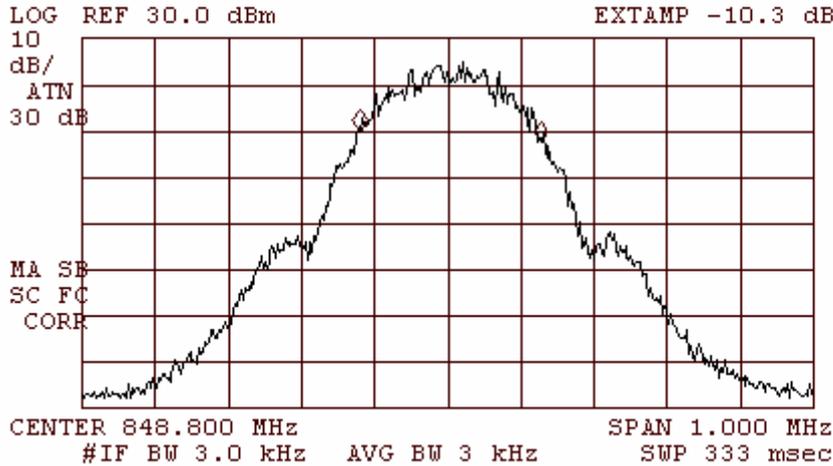
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 325 kHz
1.27 dB



Frequency 848.8, 99%
Plot 6.3.5

10:11:06 21 AUG 2006
/P

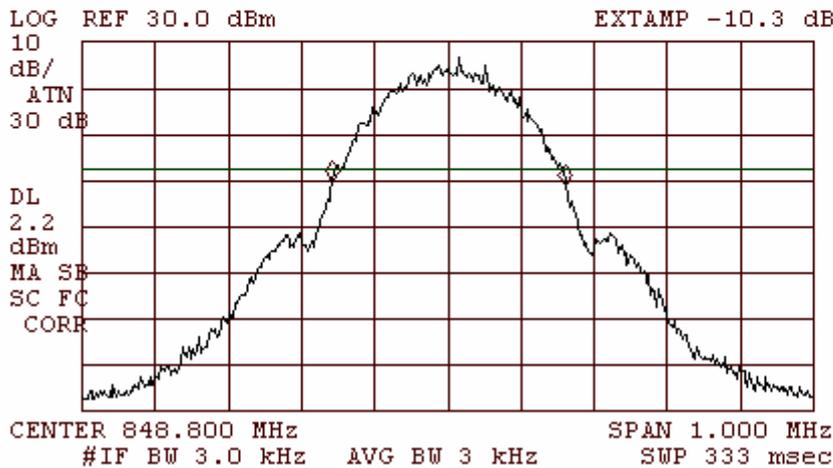
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 248 kHz
-2.49 dB



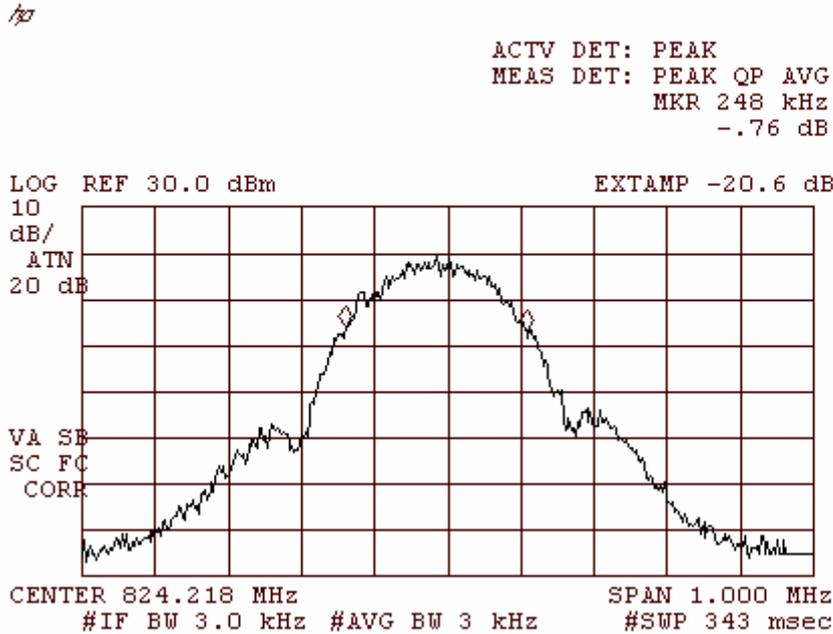
Frequency 848.8, -26dBc
Plot 6.3.6

10:09:23 21 AUG 2006
/P

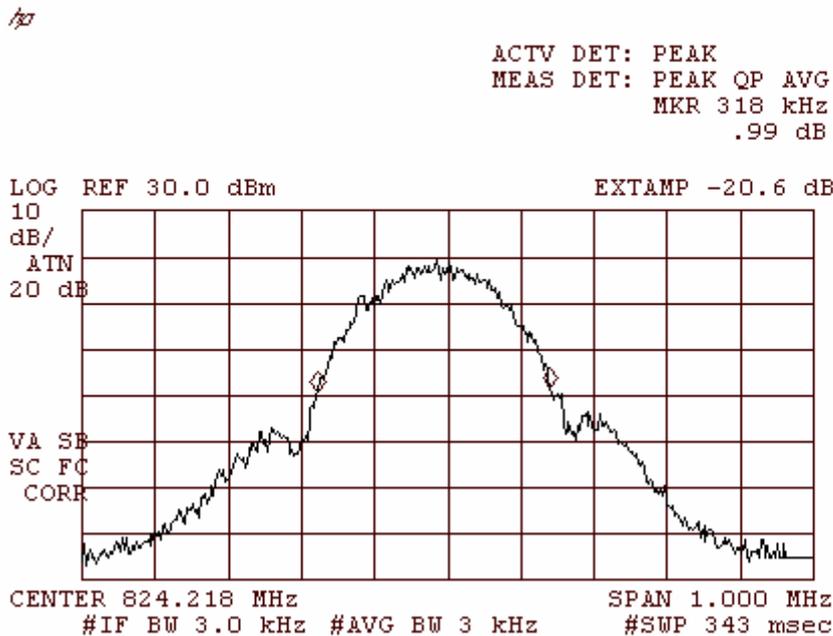
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 318 kHz
-.68 dB



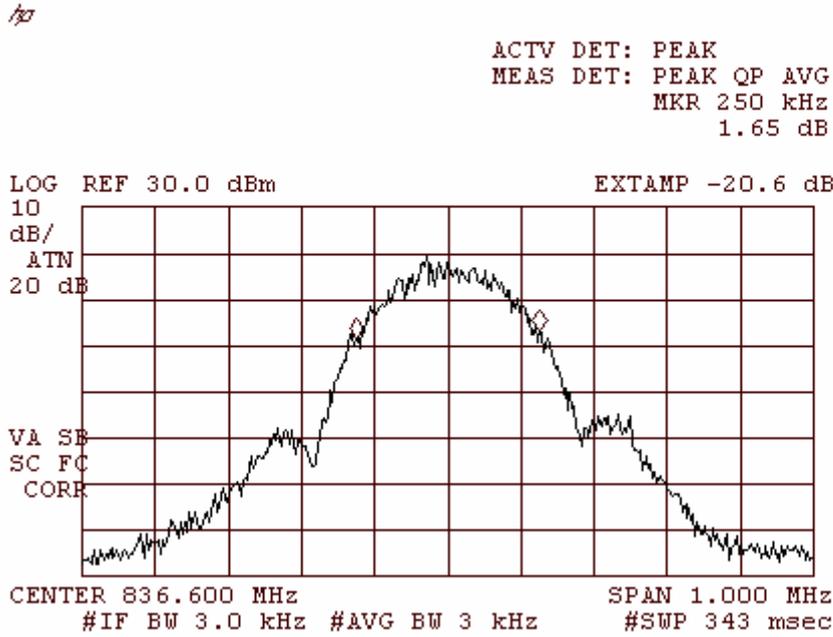
Modulation: 8PSK
Frequency 824.2 MHz, 99 %
Plot 6.3.7



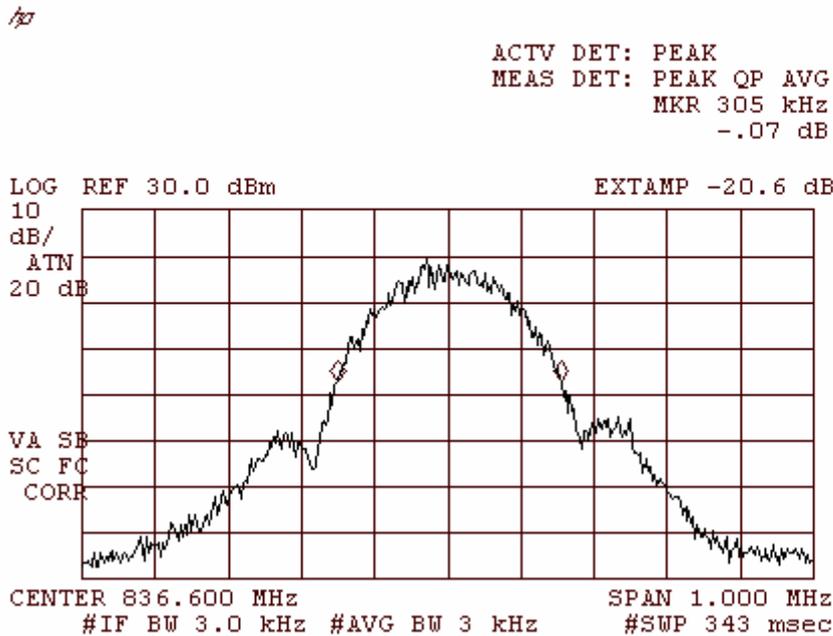
Frequency 824.2, -26dBc
Plot 6.3.8



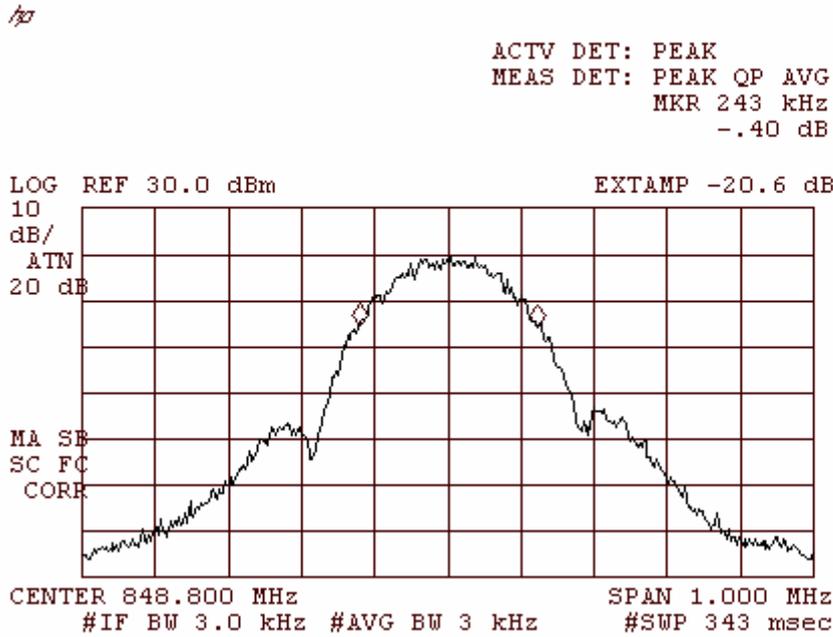
Frequency 836.6MHz, 99%
Plot 6.3.9



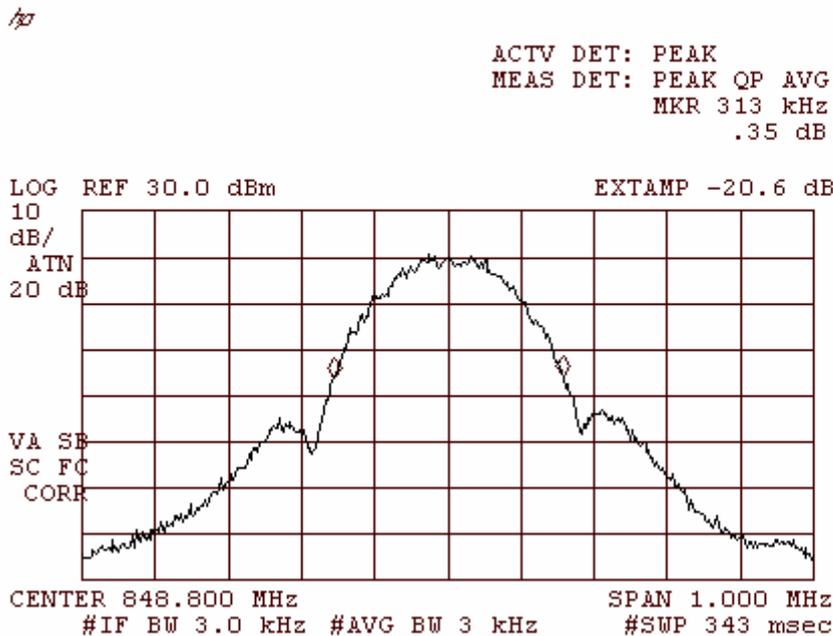
Frequency 836.6, -26dBc
Plot 6.3.10



Frequency 848.8, 99%
Plot 6.3.11



Frequency 848.8, -26dBc
Plot 6.3.12



6.4. Out of Band Emissions - Radiated

Reference document:	47 CFR §22.917(a)		
Test Requirements:	The power of any emission outside of the authorized operating frequency shall be attenuated below the transmitting power (P, in Watts) by a factor of at least 43+10log(P) dB*.		
Test setup:	See Sec. 2.5	Pass	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	f <1GHz: RBW: 120kHz, VBW: 1MHz f >1GHz: RBW: 1MHz, VBW: 3MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	Plots, see Appendix A	

*It translates to a limit of -13dBm

Test results:

Frequency [MHz]	Radiated Emission Level [dBμV/m]	Spurious Emission Level* ERP [dBm]	Limit [dBm]	Margin [dB]	Reference	Result
824.2	127.53	29.01	Carrier			
1648	41.35	-53.29	-13.0	-40.29	Plot 41	Pass
836.6	128.3	29.91	Carrier			
1673.2	39.69	-54.79	-13.0	-41.79	Plot 45	Pass
848.6	128.24	29.61	Carrier			
1697.6	46.24	-50.79	-13.0	-37.79	Plot 49	Pass

- Spurious Emission [dBm] = Measured [dBm] - Cable Loss [dB] + Substitution Antenna Gain [dBd]

6.5. Out of Band Emissions - Conducted

Reference document:	§22.917(b)		
Test Requirements:	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10log(P) dB.		
Test setup:	See sec 2.6	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 1MHz, VBW: 3 MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 6.5.1- Plot 6.5.18	

Test results:

Modulation: GMSK

Frequency [MHz]	Spurious Emission Level* [dBm]	Limit [dBm]	Ref plot	Actual Attenuation [dBc]	Margin [dB]	Result
824.2	33.13					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 6.5.1- Plot 6.5.3	-	>15dBc	Pass
836.6	33.08					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 6.5.4- Plot 6.5.6	-	>15dBc	Pass
848.8	32.94					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 6.5.7- Plot 6.5.9	-	>15dBc	Pass

* Spurious Emission [dBm] = Measured [dBm] – Attenuations [dB]

Modulation: 8PSK

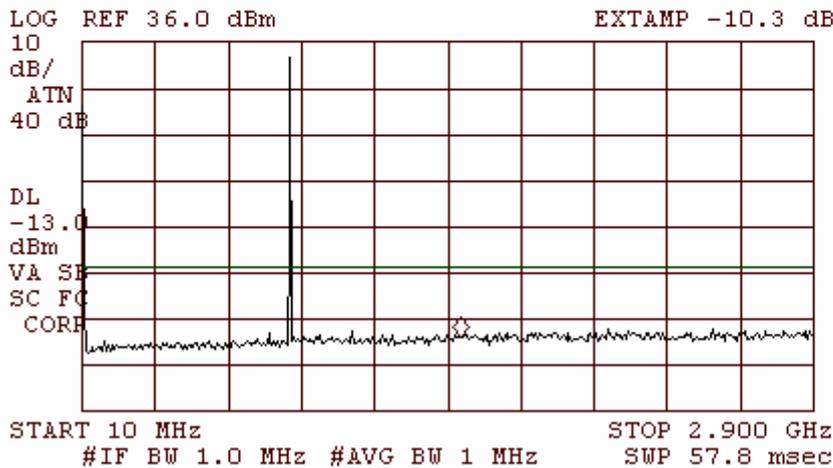
Frequency [MHz]	Spurious Emission Level* [dBm]	Limit [dBm]	Ref plot	Actual Attenuation [dBc]	Margin [dB]	Result
824.2	30.87					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 6.5.10- Plot 6.5.12	-	>15dBc	Pass
836.6	31.06					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 6.5.13- Plot 6.5.15	-	>15dBc	Pass
848.8	31.02					Carrier
All Spurious at least 15 dB blow the limit		-13.0	Plot 6.5.16- Plot 6.5.18	-	>15dBc	Pass

* Spurious Emission [dBm] = Measured [dBm] – Attenuations [dB]

Modulation: GMSK
Frequency 824.2 MHz
Plot 6.5.1

13:16:24 21 AUG 2006
/30

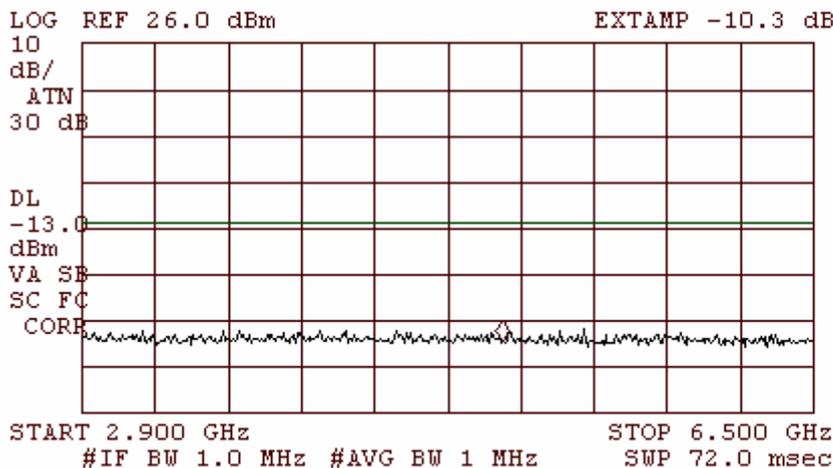
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 1.506 GHz
-28.25 dBm



Plot 6.5.2

11:52:26 21 AUG 2006
/30

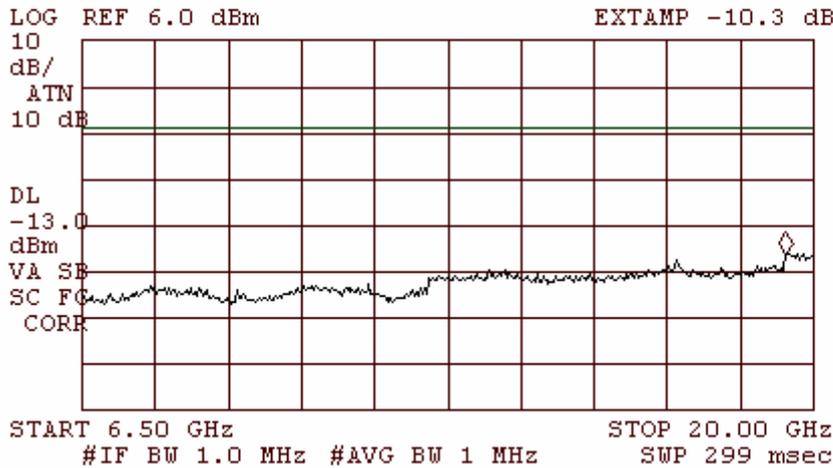
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.970 GHz
-38.54 dBm



Plot 6.5.3

12:07:51 21 AUG 2006
/30

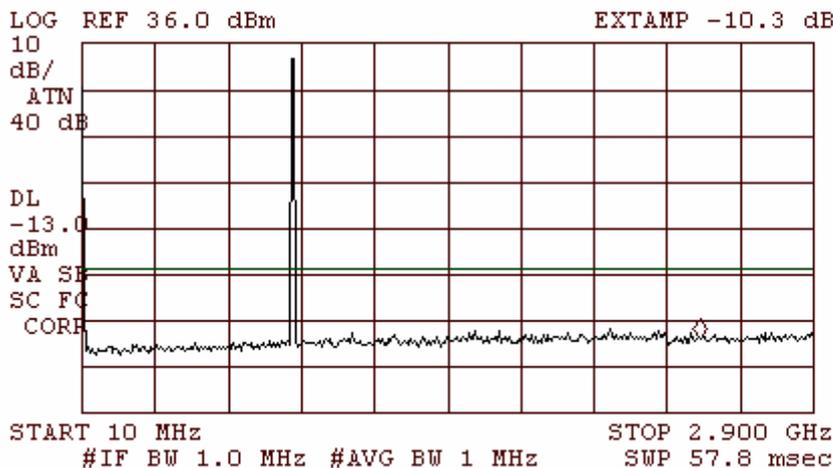
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 19.49 GHz
-40.30 dBm



Frequency 836.6 MHz
Plot 6.5.4

13:14:43 21 AUG 2006
/30

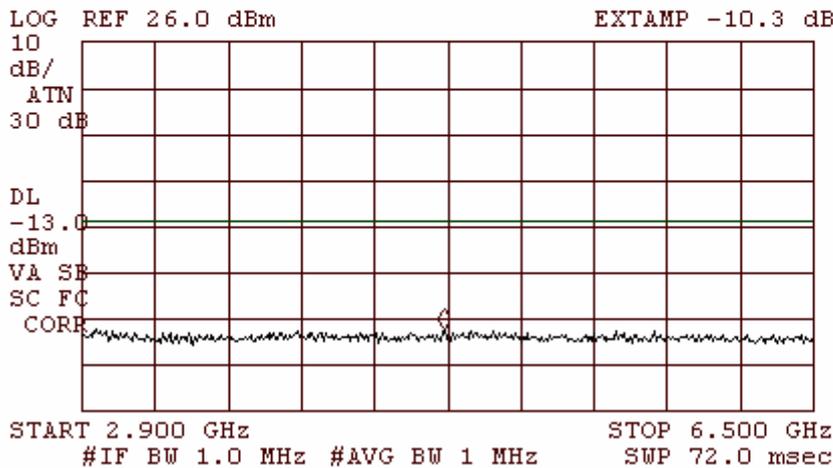
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.452 GHz
-28.09 dBm



Plot 6.5.5

11:54:46 21 AUG 2006
/30

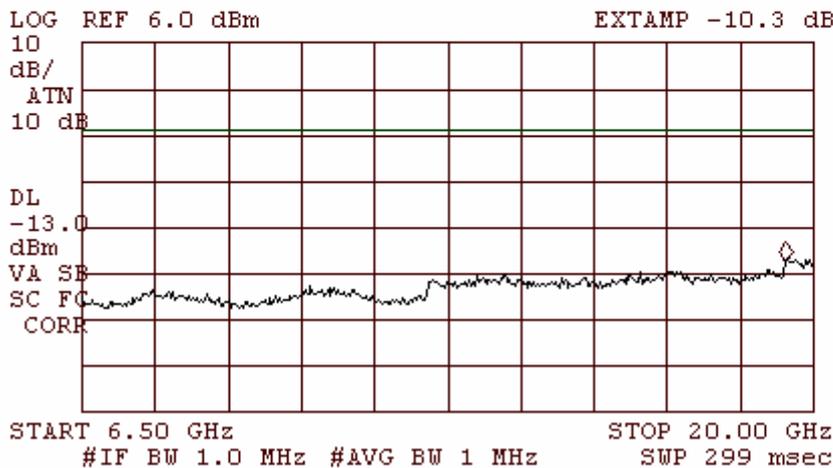
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.682 GHz
-36.62 dBm



Plot 6.5.6

13:02:52 21 AUG 2006
/30

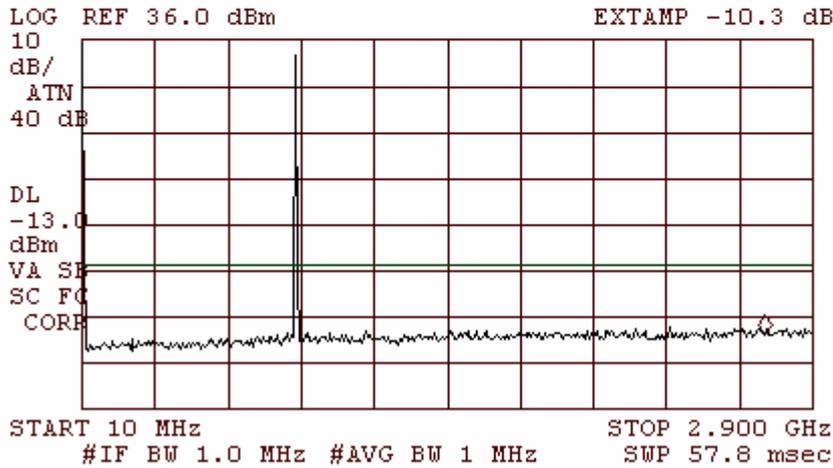
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 19.49 GHz
-41.65 dBm



**Frequency 848.8 MHz
Plot 6.5.7**

13:13:35 21 AUG 2006
/p/

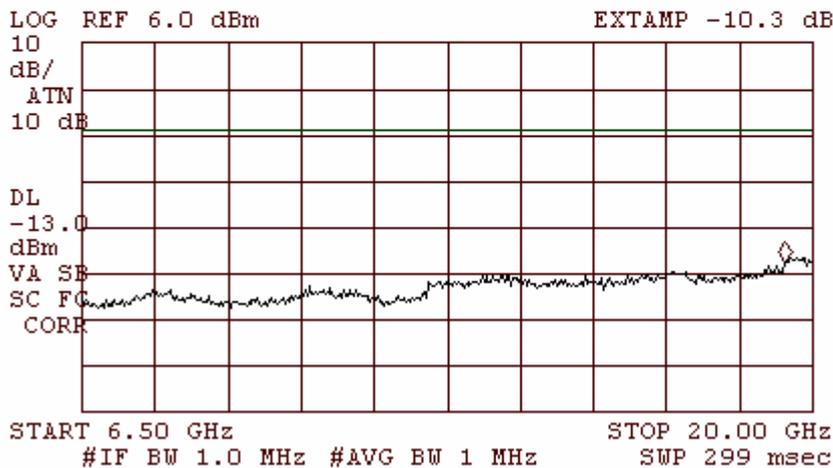
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.712 GHz
-28.08 dBm



Plot 6.5.8

13:04:23 21 AUG 2006
/p/

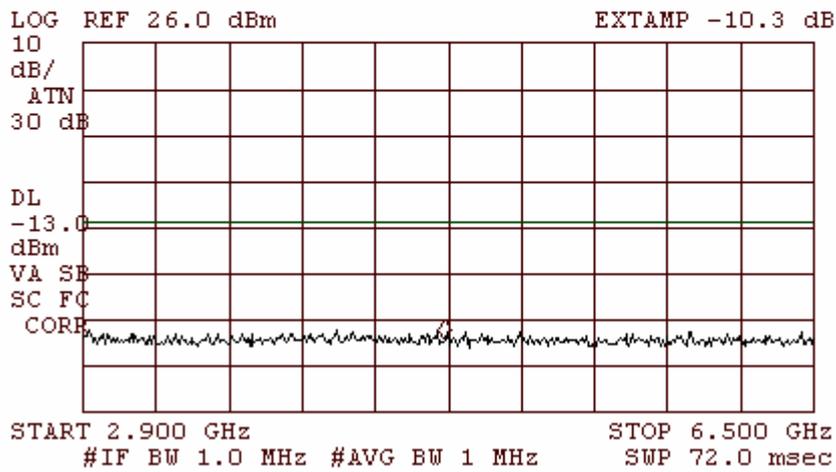
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 19.49 GHz
-41.63 dBm



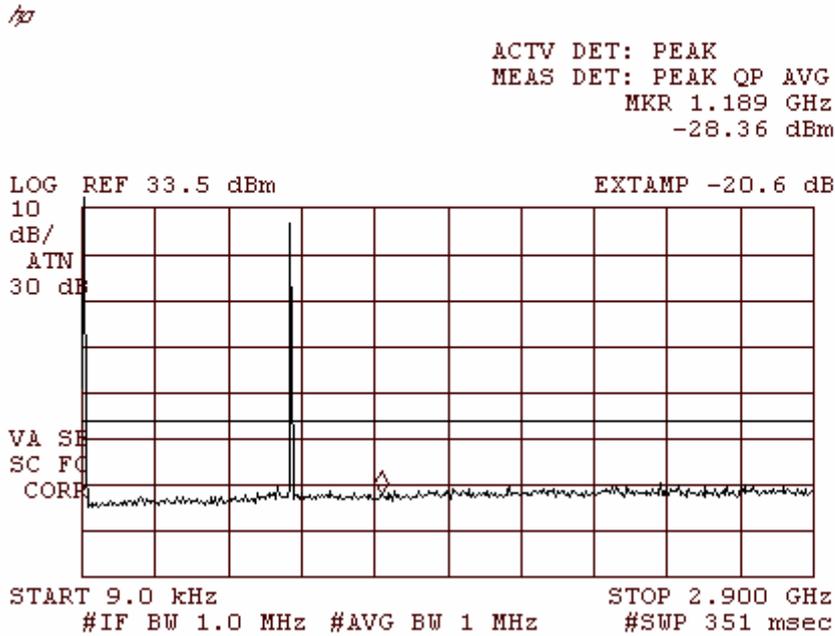
Plot 6.5.9

12:04:12 21 AUG 2006
/37

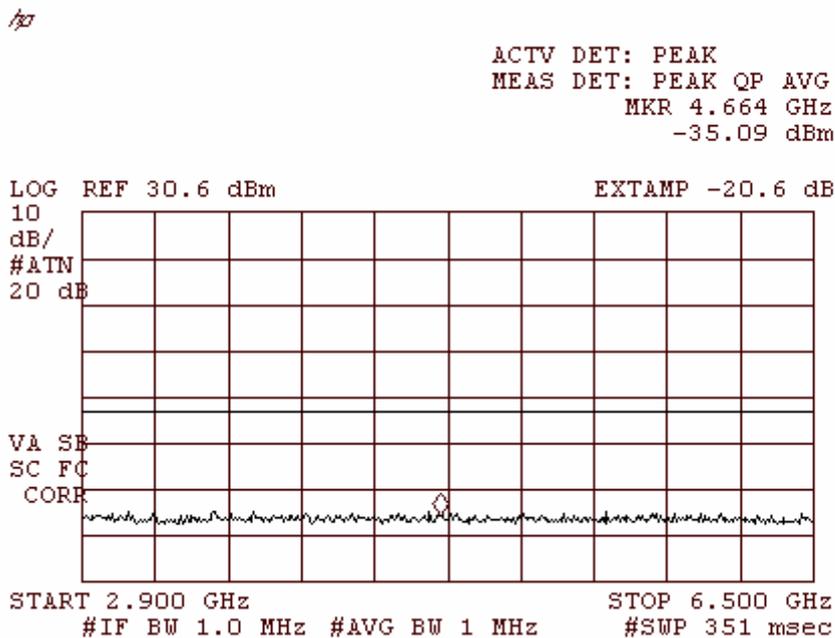
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.682 GHz
-38.82 dBm



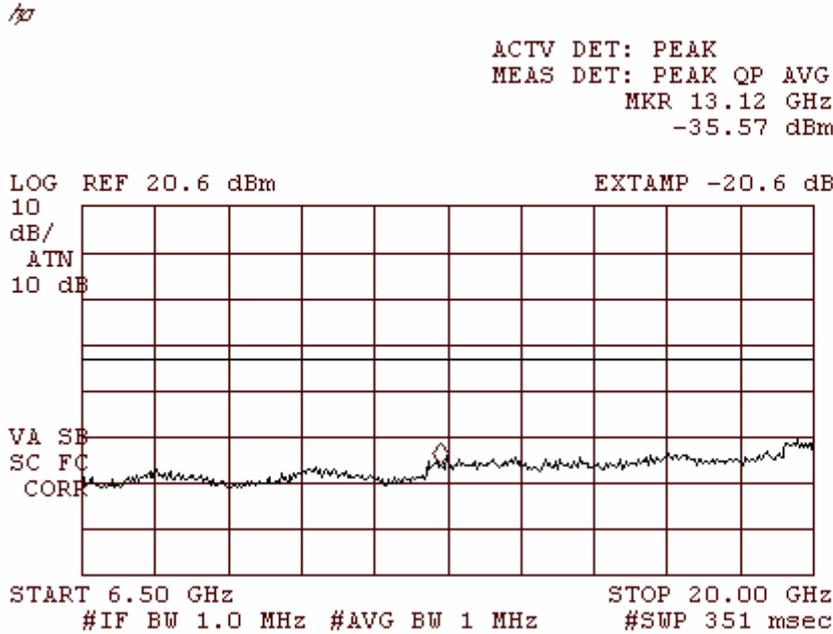
**Modulation: 8PSK
Frequency 824.2 MHz
Plot 6.5.10**



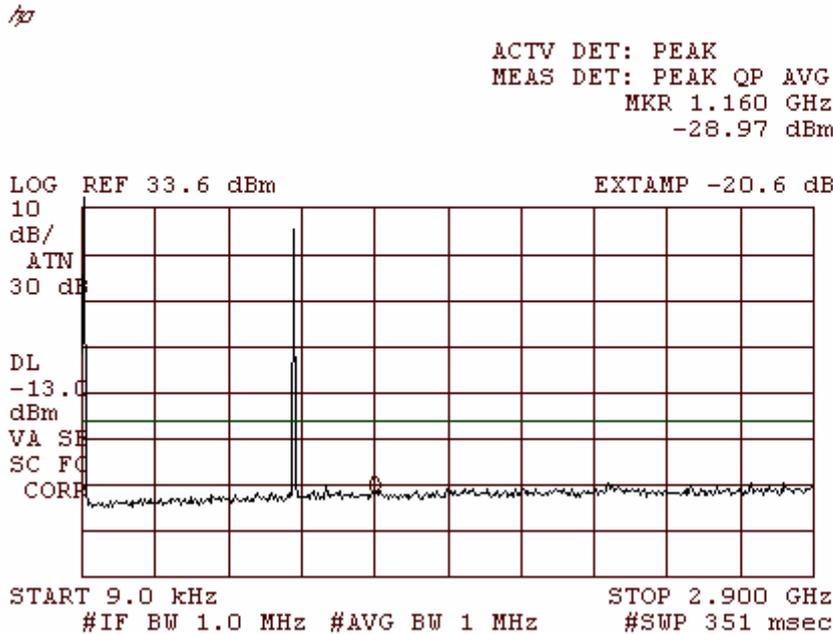
Plot 6.5.11



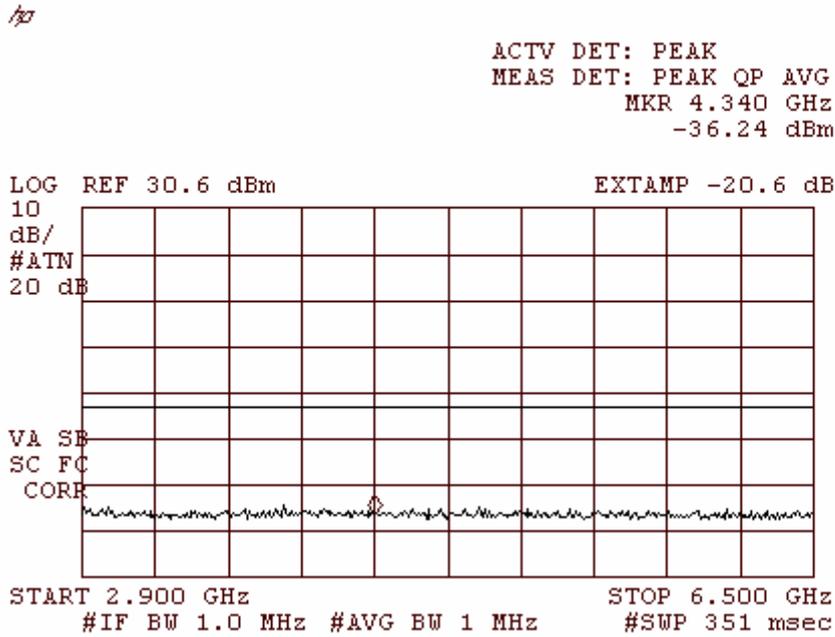
Plot 6.5.12



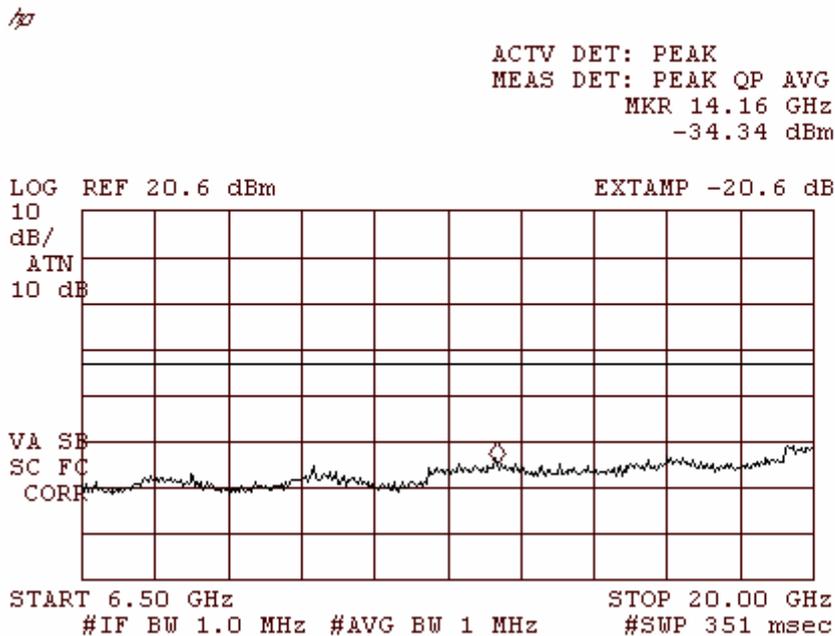
Frequency 836.6 MHz
Plot 6.5.13



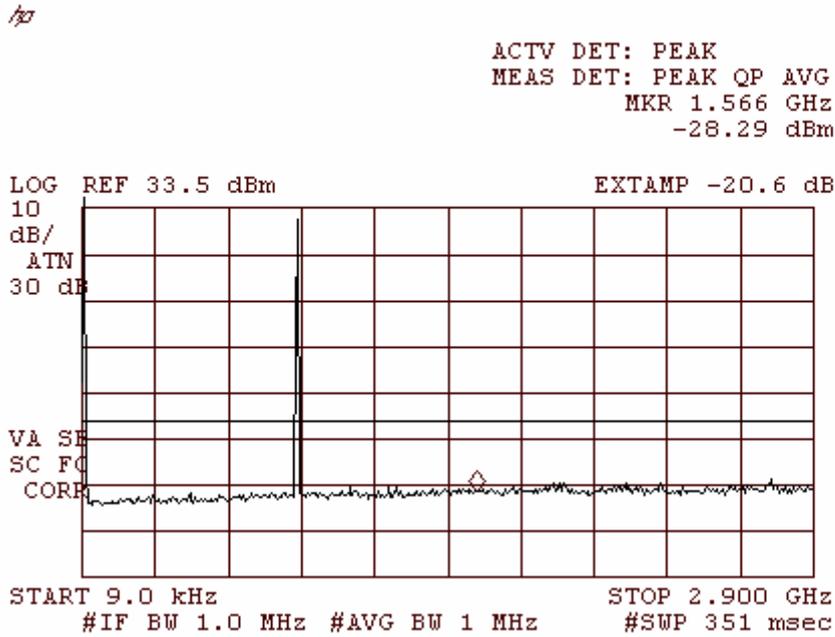
Plot 6.5.14



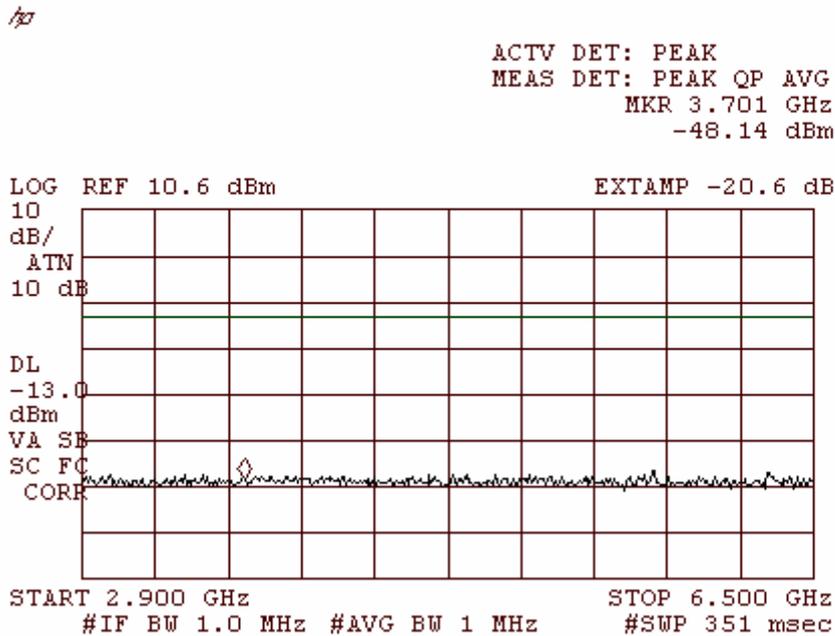
Plot 6.5.15



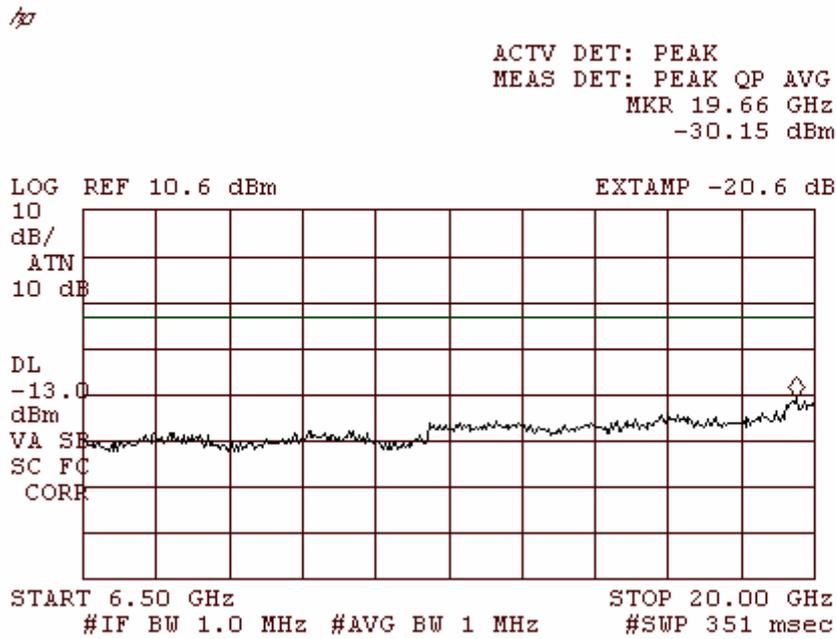
**Frequency 848.8 MHz
Plot 6.5.16**



Plot 6.5.17



Plot 6.5.18



6.6. Block Edge Emissions - conducted

Reference document:	§22.917(b)		
Test Requirements:	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43+10\log(P)$ dB. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 1% of the EBW may be employed.		
Test setup:	See sec 2.6	Pass	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 3kHz, VBW: 3kHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 6.6.1 -Plot 6.6.4	

Test results:

Modulation: GMSK

Frequency [MHz]	Spurious Emission Level* [dBm]	Limit [dBm]	Actual Attenuation below frequency of operation [dBc]	Margin [dB]	Result
824.2	33.13				Carrier
823.983	-14.71	-13.0	-47.84	-1.71	Pass
848.8	32.94				Carrier
849.015	-14.46	-13.0	-47.8	-1.46	Pass

* Spurious Emission [dBm] = Measured [dBm] – Attenuations [dB]

Modulation: 8PSK

Frequency [MHz]	Spurious Emission Level* [dBm]	Limit [dBm]	Actual Attenuation below frequency of operation [dBc]	Margin [dB]	Result
824.2	30.87				Carrier
823.983	-16.83	-13.0	-47.7	-3.83	Pass
848.8	31.02				Carrier
849.015	-16.04	-13.0	-47.06	-3.04	Pass

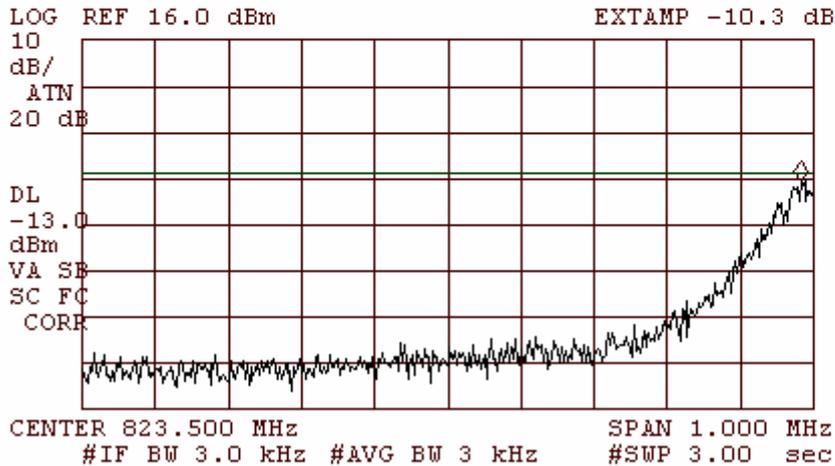
* Spurious Emission [dBm] = Measured [dBm] – Attenuations [dB]

Modulation: GMSK

Plot 6.6.1

16:49:02 21 AUG 2006
/30

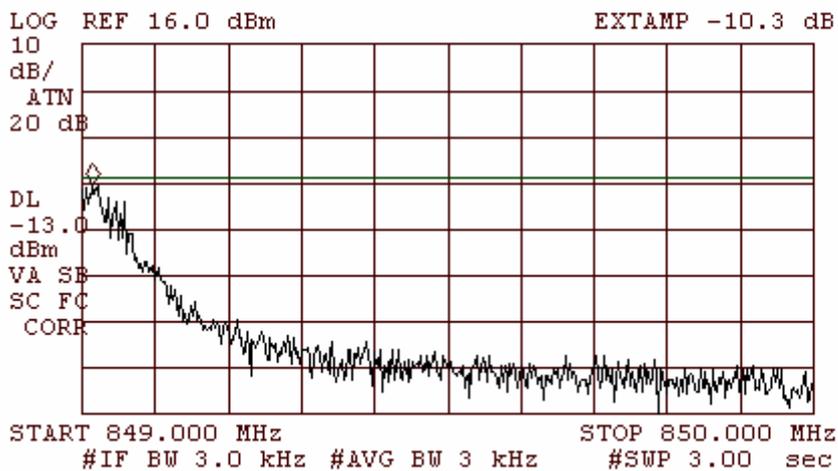
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 823.983 MHz
-14.71 dBm



Plot 6.6.2

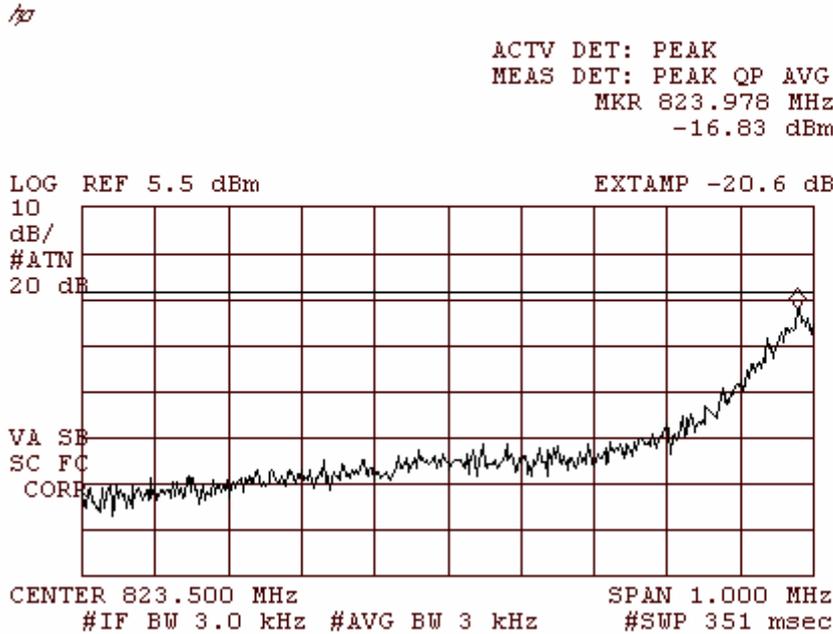
16:50:47 21 AUG 2006
/30

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 849.015 MHz
-14.46 dBm

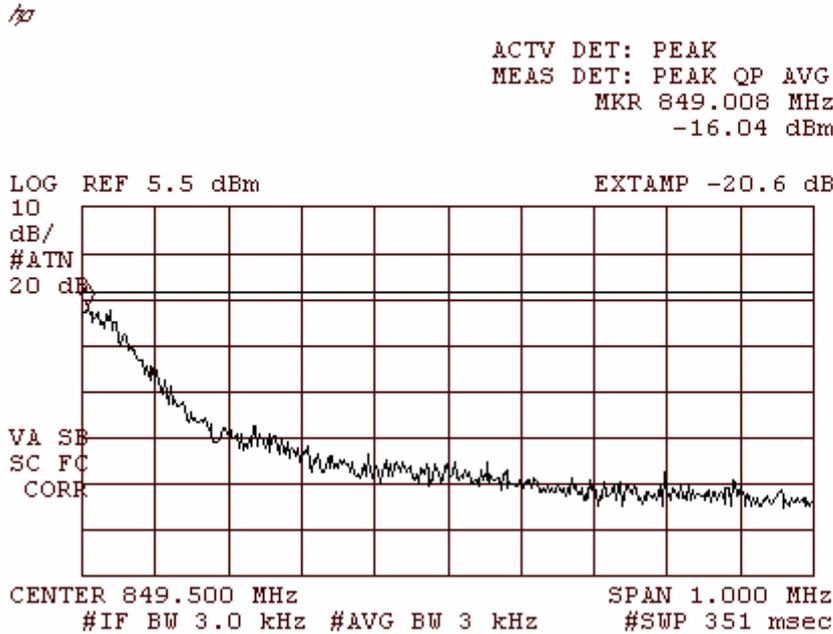


Modulation: 8PSK

Plot 6.6.3



Plot 6.6.4



6.7. Radiated Emissions (Receive mode)

Reference document:	47 CFR §15.109		
Test Requirements:	Emission Level shall not exceed §15.109 limits		
Test setup:	See Sec. 2.8	Pass	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 120kHz,VBW: 300kHz		
Mode of operation:	Receive		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	All peak readings were at least 20 dB below the limit.	Plots, see Appendix B	

7. HC700G Terminal docking into Cradle configuration

7.1. Radiated Emission measurements

Reference document:	47 CFR §15.109		
Test Requirements:	The field strength of radiated emissions from an unintentional radiator shall not exceed the levels specified in §15.109		
Test setup:	See Sec. 2.8	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Radiated		
S.A. Settings:	f < 1GHz; RBW: 120kHz, VBW: 1MHz		
Radio device:	Idle		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 53%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See plots 7.1.1-7.1.4	

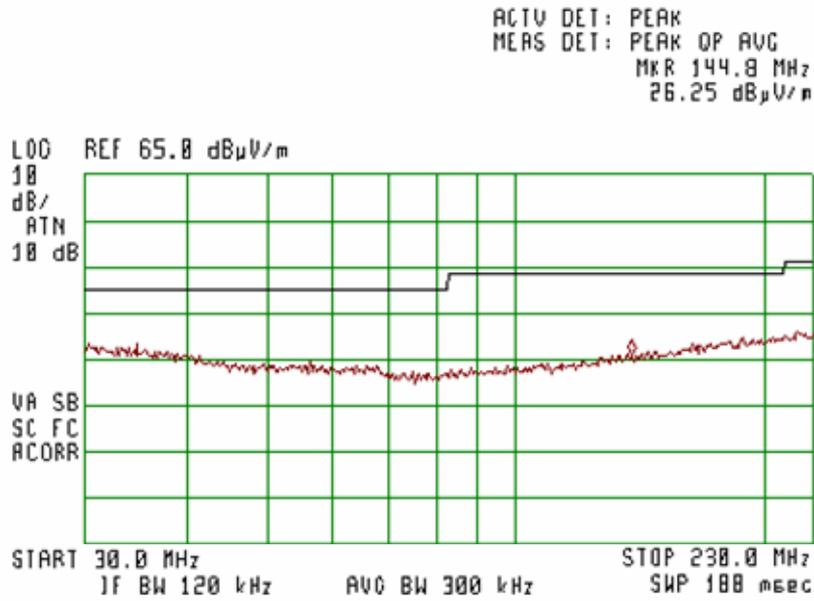
Test Results:

Frequency [MHz]	Ant. Type	Ant. Pol.	Ant. Pos. [cm]	Turn-table Azimuth [°]	Radiated Emission dB(μV/m)	Class B Limit at 3m dB(μV/m)	Margin [dB]	Pass/Fail
144.792182	Biconical	V	100	0	24.6	43.5	-18.9	Pass
170.352955	Biconical	V	110	189	22.0	43.5	-21.5	Pass
246.995768	Log-periodic	V	120	130	26.8	46	-19.2	Pass

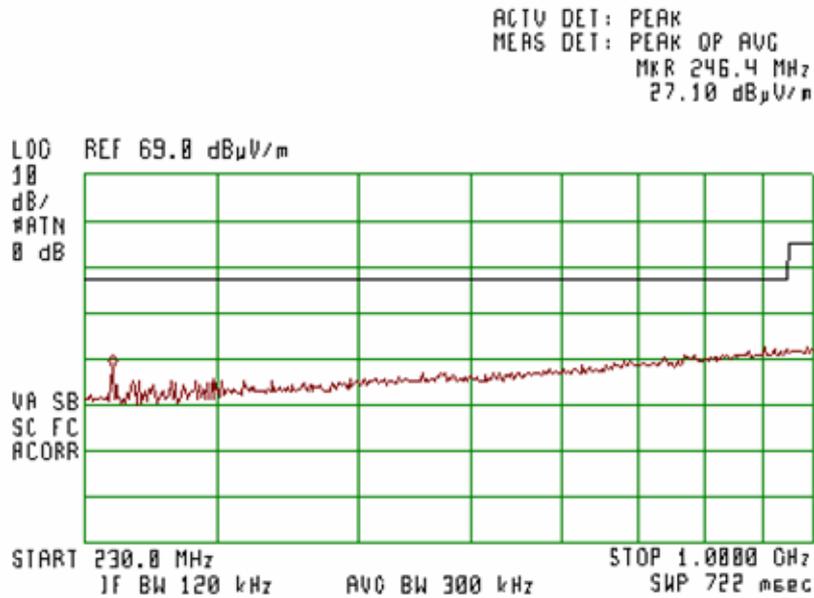
Note: Radiated Emission [dBμV/m] = measured [dBμV] + Correction-factor [dB(1/m)]
Correction Factor = Antenna factor + Cable Loss

Upper frequency measurement: 1GHz (highest frequency used in the device < 108MHz).

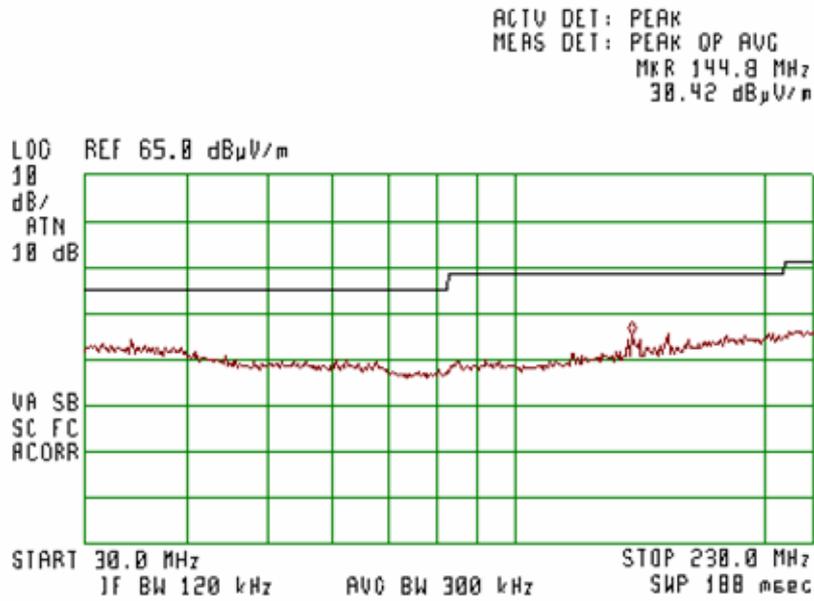
Plot 7.1.1
Horizontal Polarization
30MHz-230MHz



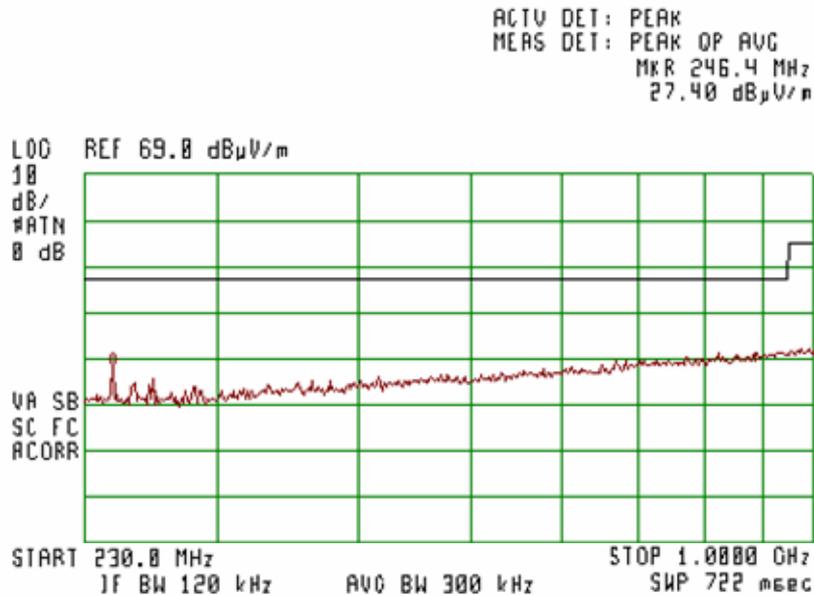
Plot 7.1.2
Horizontal Polarization
230MHz-1GHz



Plot 7.1.3
Vertical Polarization
30MHz-230MHz



Plot 7.1.4
Vertical Polarization
230MHz-1GHz



7.2. Conducted Emission measurements

Reference document:	47 CFR §15.107		
Test Requirements:	The radio frequency voltage that is conducted back onto the AC power line shall not exceed the limits specified in §15.107		
Test setup:	See Sec. 2.10	Pass	
Operating conditions:	Under normal test conditions		
Method of testing:	Radiated		
S.A. Settings:	f <30MHz: RBW: 9kHz, VBW:30kHz		
Radio device:	Idle		
Environment conditions:	Ambient Temperature: 21°C	Relative Humidity: 54%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plots 7.2.1 to 7.2.2	

Test Results:

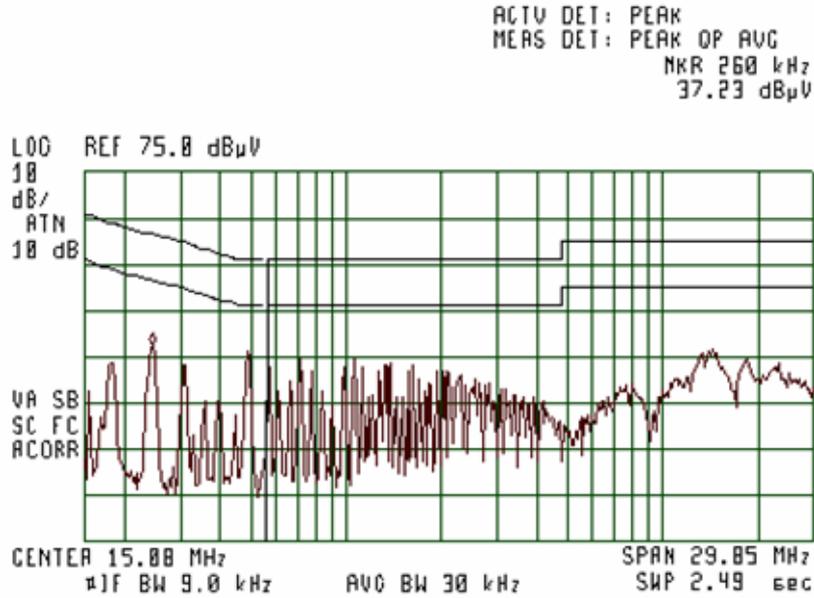
“Phase” Lead, 110 VAC

Frequency [MHz]	Measured Result [dBμV]		Class B Limits [dBμV]		Margin [dB]		Pass/Fail
	QP	AVR	QP	AVR	QP	AVR	
0.254431	38.3	32.3	61.61	51.61	-23.31	-19.31	Pass
0.316667	30.9	26.7	59.79	49.79	-28.89	-23.09	Pass
0.508488	37.3	36.9	56.00	46.00	-18.70	-9.10	Pass
0.762913	34.6	34.3	56.00	46.00	-21.40	-11.70	Pass
1.398419	33.7	33.2	56.00	46.00	-22.30	-12.80	Pass

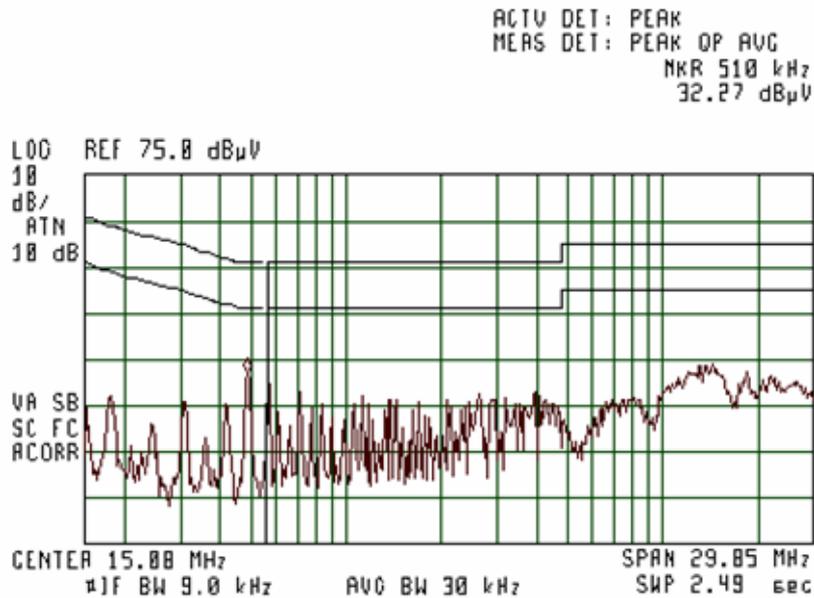
“Neutral” Lead, 110 VAC

Frequency [MHz]	Measured Result [dBμV]		Class B Limits [dBμV]		Margin [dB]		Pass/Fail
	QP	AVR	QP	AVR	QP	AVR	
0.190462	45	35.9	64.02	54.02	-19.02	-18.12	Pass
0.317194	31.5	25.1	59.78	49.78	-28.28	-24.68	Pass
0.507974	32.8	32.2	56.00	46.00	-23.20	-13.80	Pass
0.572574	33.4	32.7	56.00	46.00	-22.60	-13.30	Pass
1.079888	27.7	25.8	56.00	46.00	-28.30	-20.20	Pass

Plot 7.2.1
Power Supply ports
150kHz – 30MHz
“Phase” Lead



Plot 7.2.2
Power Supply ports
150kHz – 30MHz
“Neutral” Lead

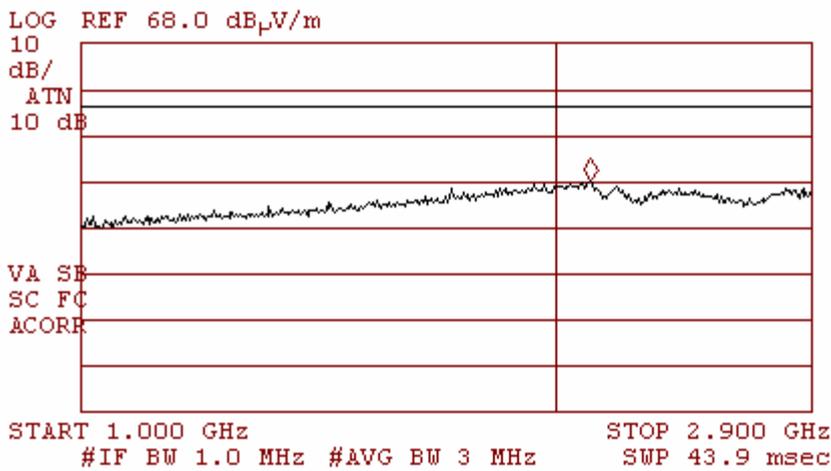


8. Appendix

Appendix A: Spurious emissions test plots

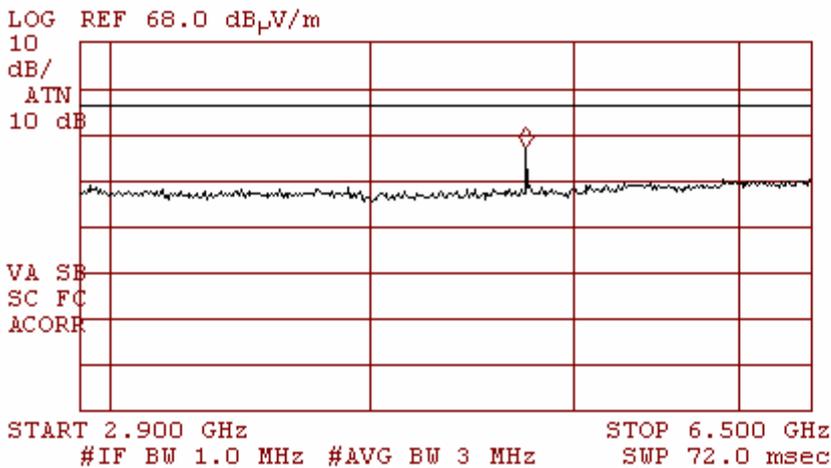
Simultaneously Operated: Bluetooth & 802.11g 54 Mbs
Lowest frequency
Horizontal & Vertical Polarization
Plot 1

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.173 GHz
38.18 dB μ V/m



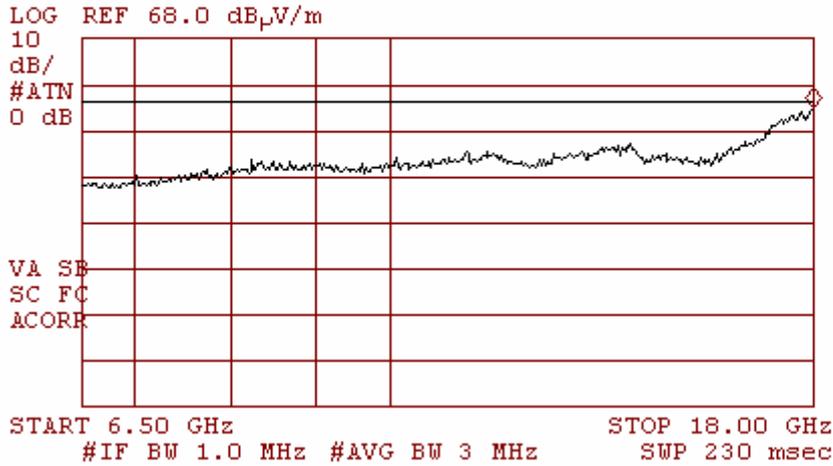
Horizontal & Vertical Polarization
Plot 2

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.811 GHz
44.77 dB μ V/m

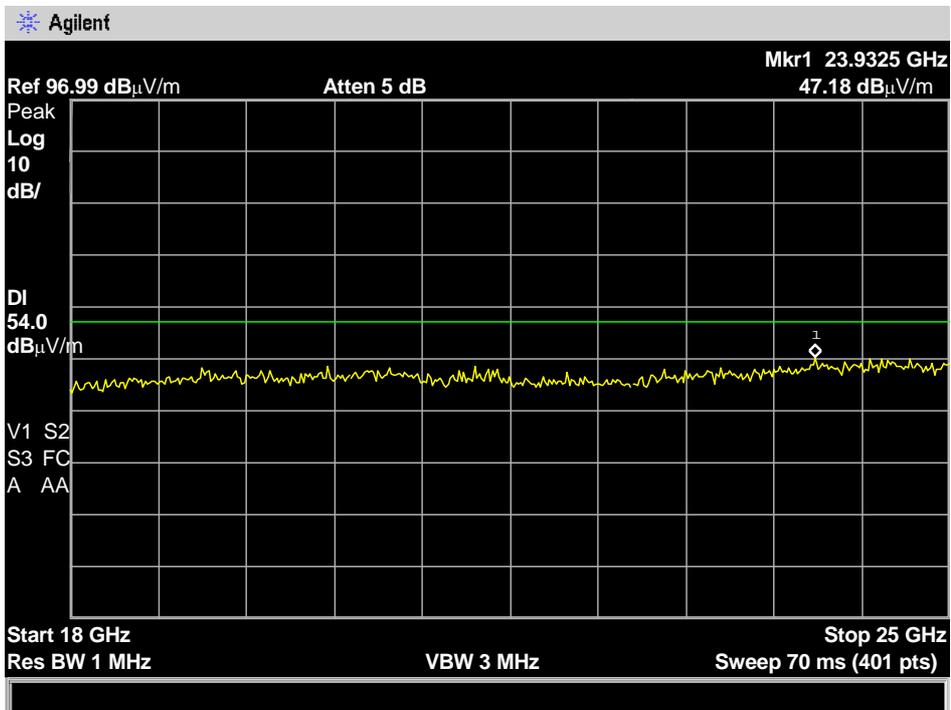


**Horizontal & Vertical Polarization
Plot 3**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 18.00 GHz
52.73 dB μ V/m

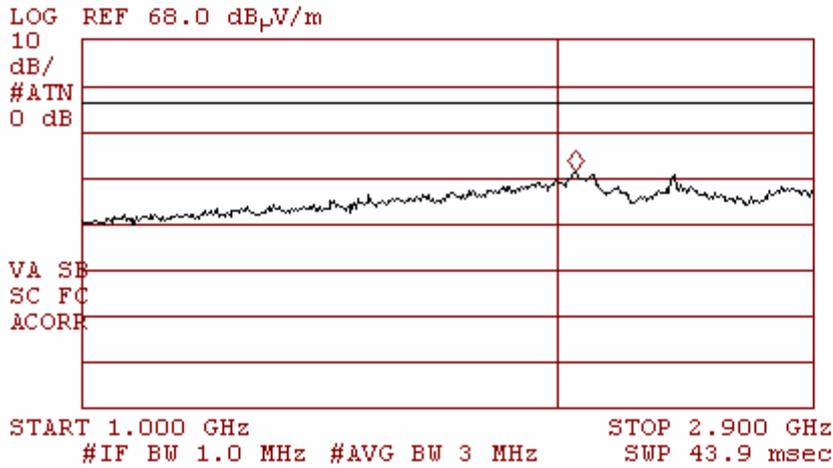


**Horizontal & Vertical Polarization
Plot 4**



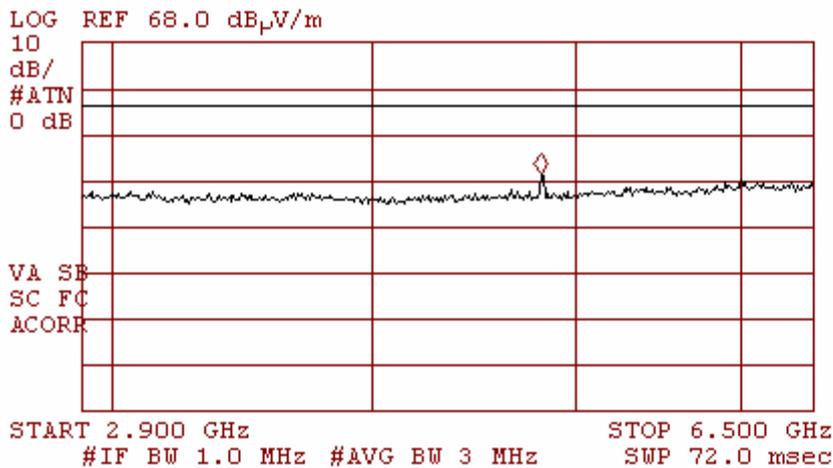
**Middle frequency
Horizontal & Vertical Polarization
Plot 5**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.119 GHz
39.25 dB μ V/m



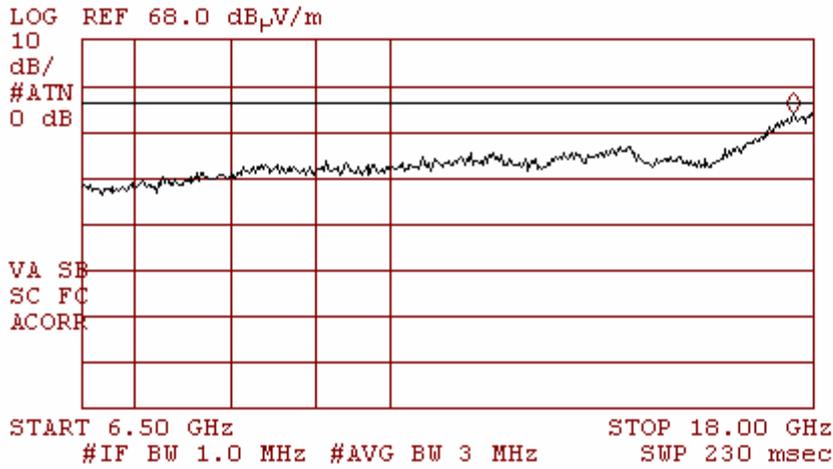
**Horizontal & Vertical Polarization
Plot 6**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.887 GHz
39.33 dB μ V/m

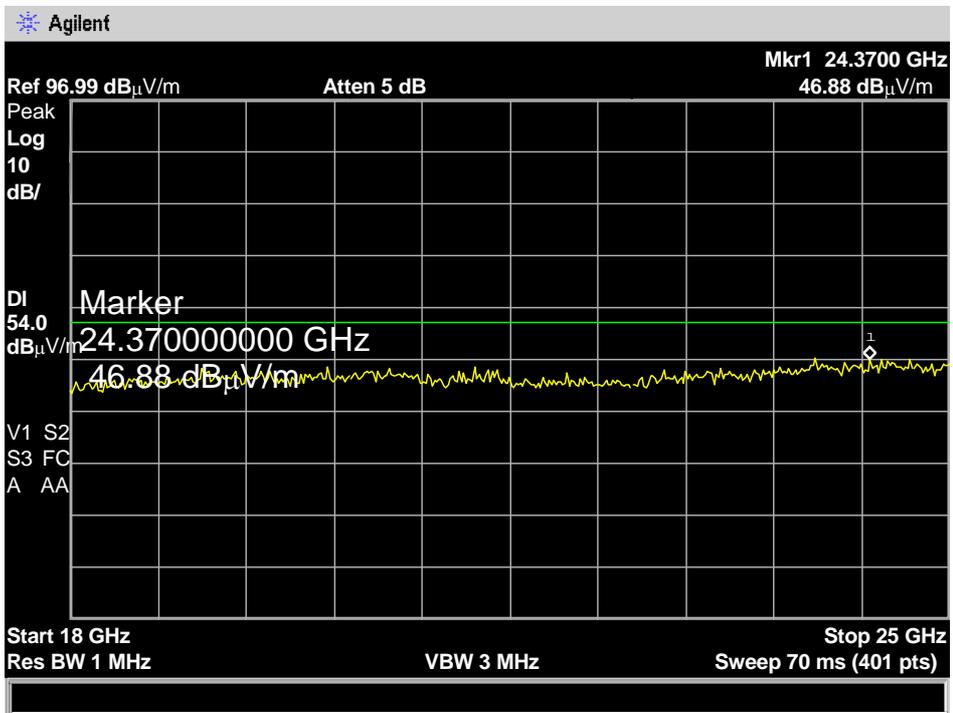


**Horizontal & Vertical Polarization
Plot 7**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 17.60 GHz
51.89 dB μ V/m

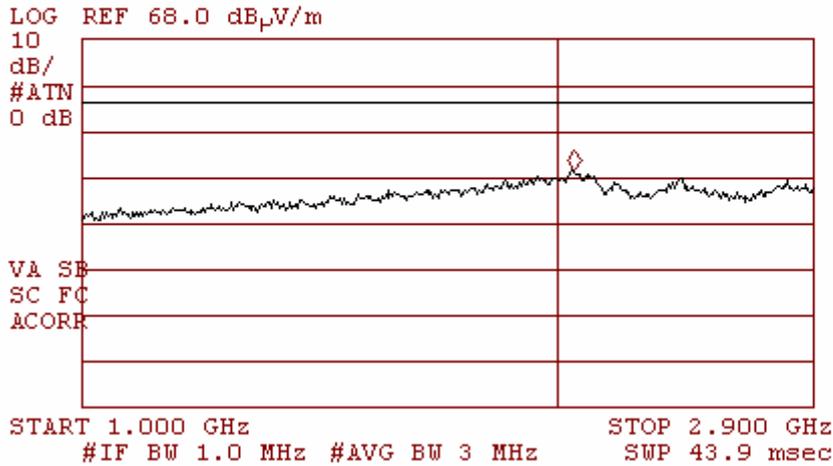


**Horizontal & Vertical Polarization
Plot 8**



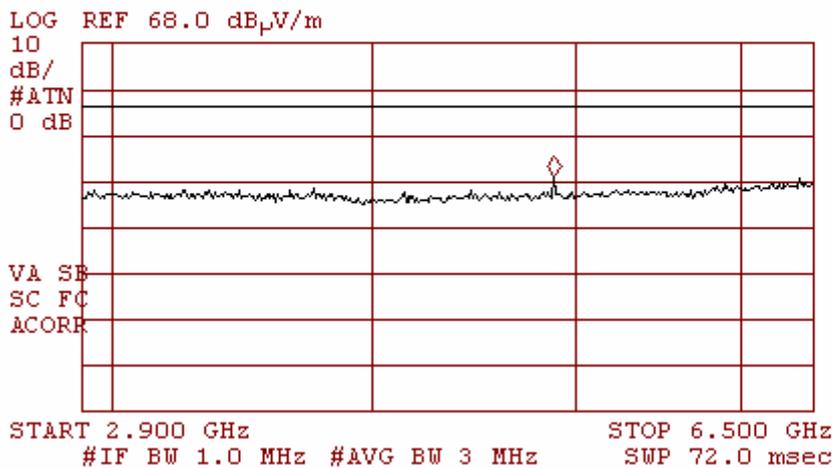
**Highest frequency
Horizontal & Vertical Polarization
Plot 9**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.113 GHz
39.37 dB μ V/m



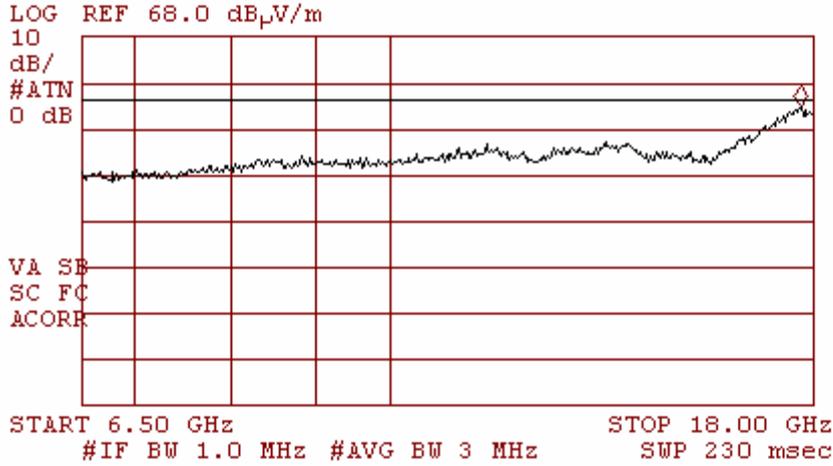
**Horizontal & Vertical Polarization
Plot 10**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.963 GHz
38.98 dB μ V/m

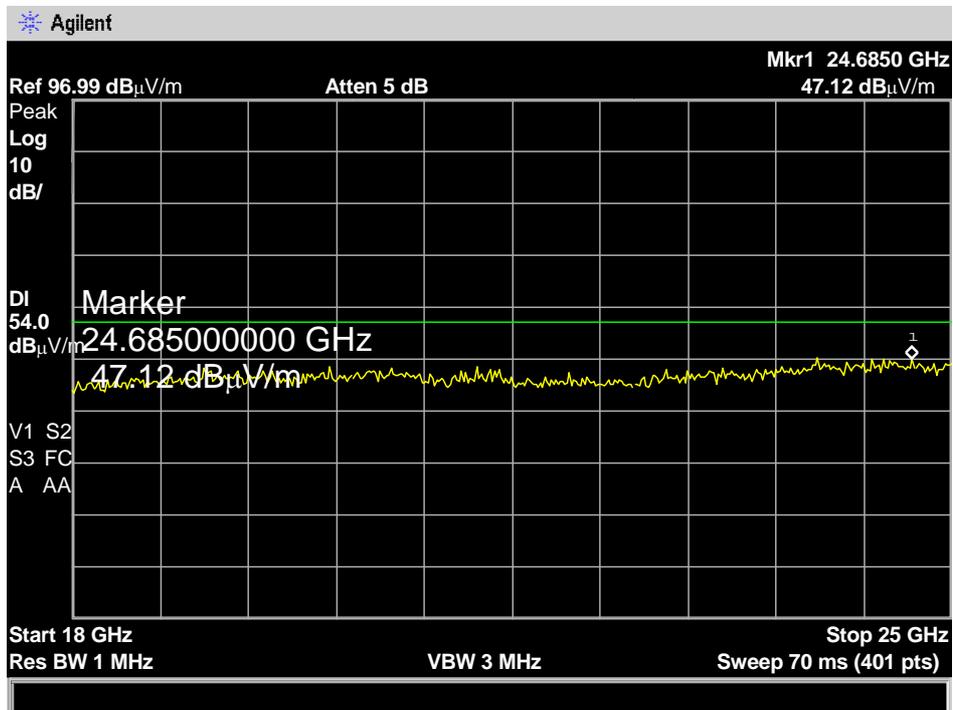


**Horizontal & Vertical Polarization
Plot 11**

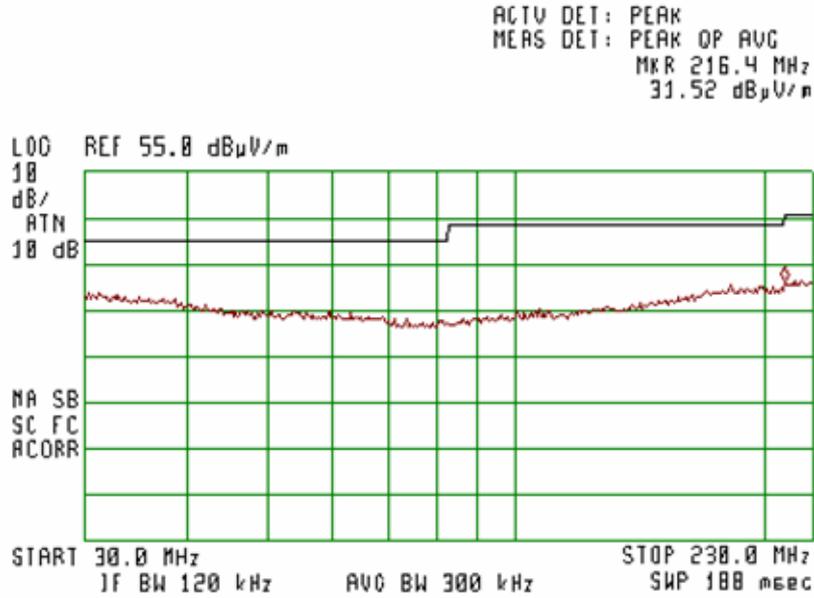
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 17.75 GHz
52.58 dB μ V/m



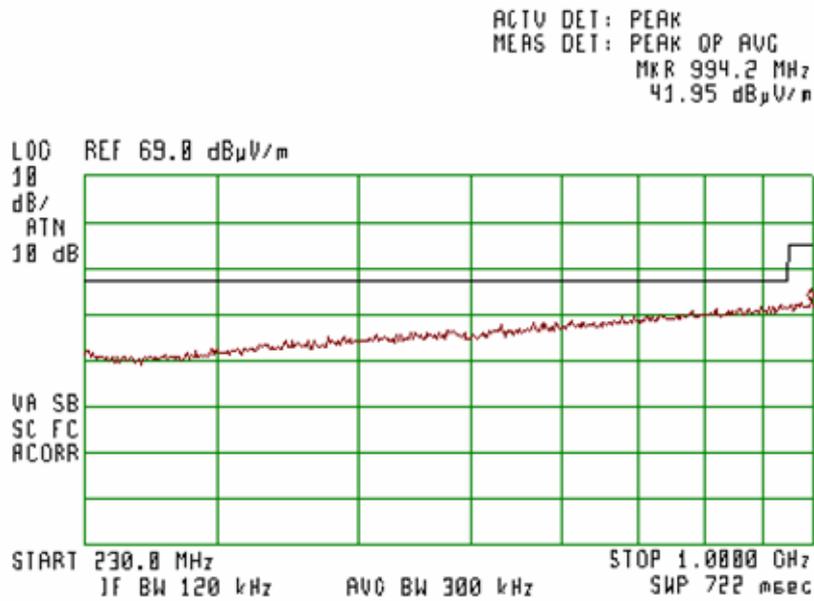
**Horizontal & Vertical Polarization
Plot 12**



**Horizontal & Vertical Polarization
Plot 13**



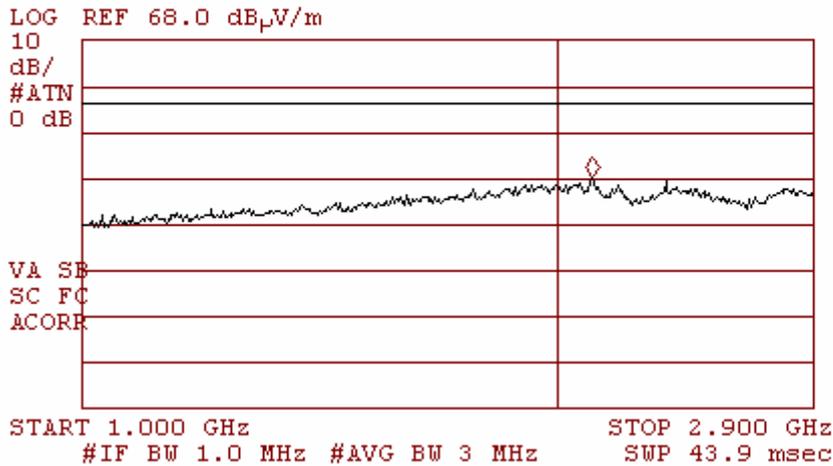
**Horizontal & Vertical Polarization
Plot 14**



Simultaneously Operated: Bluetooth & 802.11b 11 Mbs

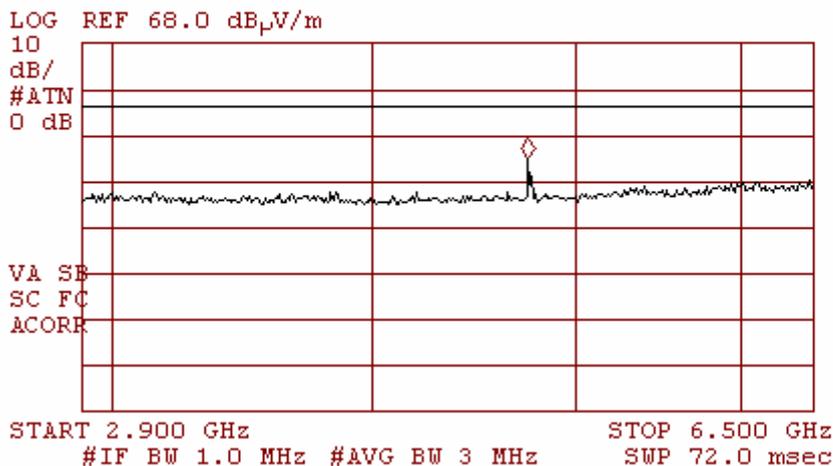
**Lowest frequency
Horizontal & Vertical Polarization
Plot 15**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.173 GHz
37.91 dB μ V/m



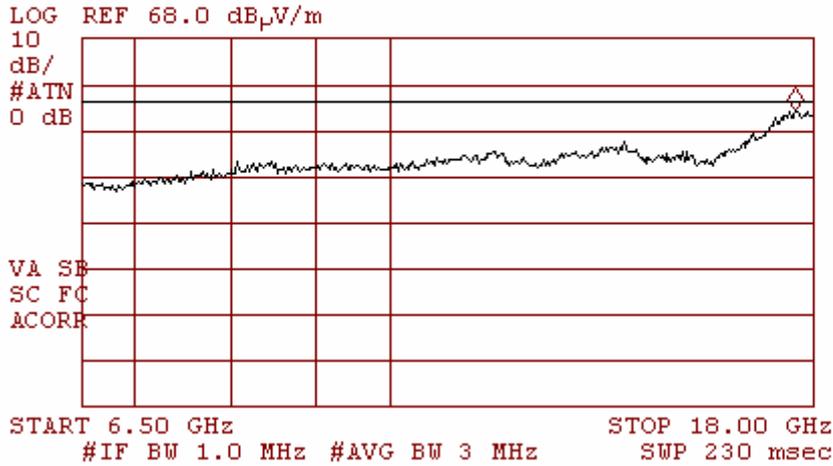
**Horizontal & Vertical Polarization
Plot 16**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.811 GHz
42.81 dB μ V/m

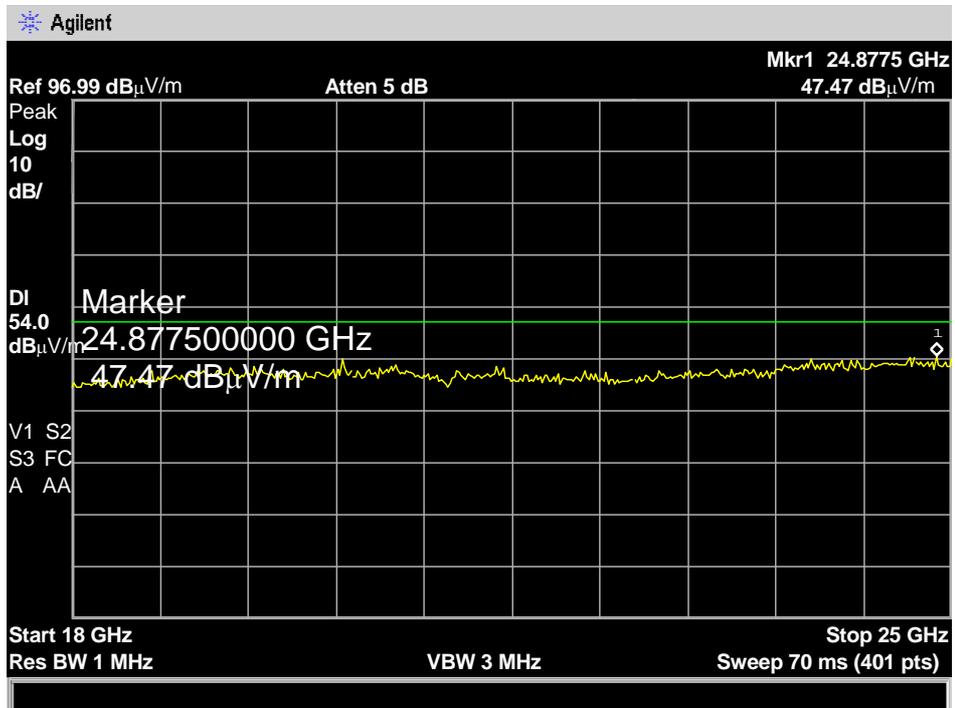


**Horizontal & Vertical Polarization
Plot 17**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 17.64 GHz
52.49 dB μ V/m

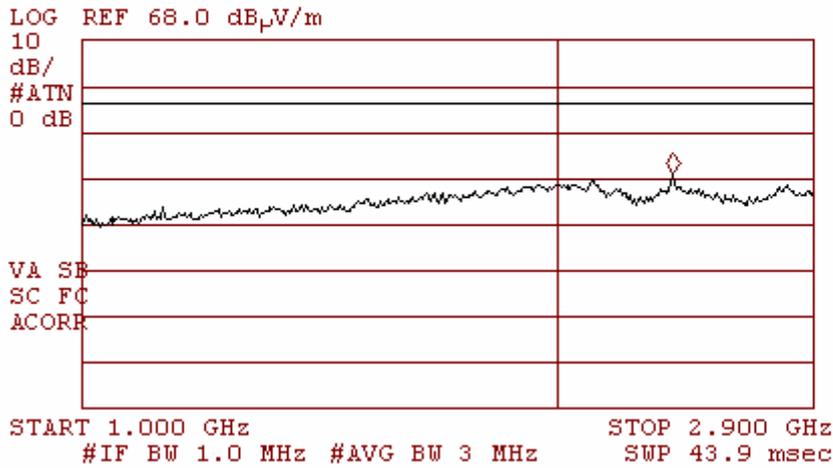


**Horizontal & Vertical Polarization
Plot 18**



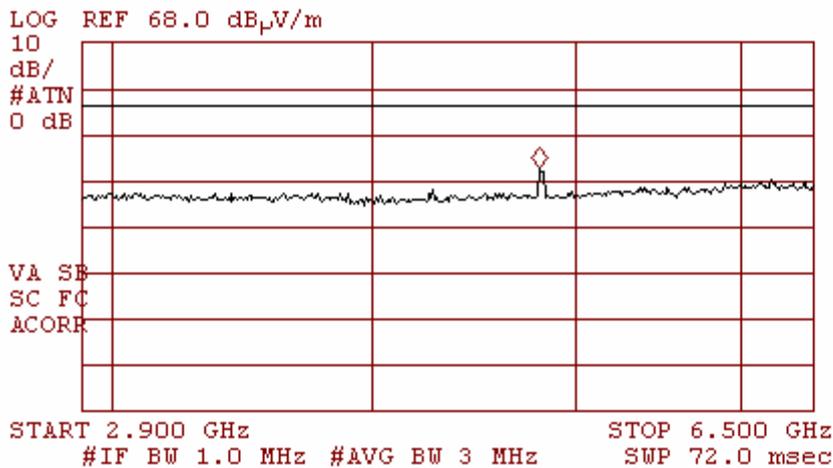
**Middle frequency
Horizontal & Vertical Polarization
Plot 19**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.438 GHz
38.70 dB μ V/m

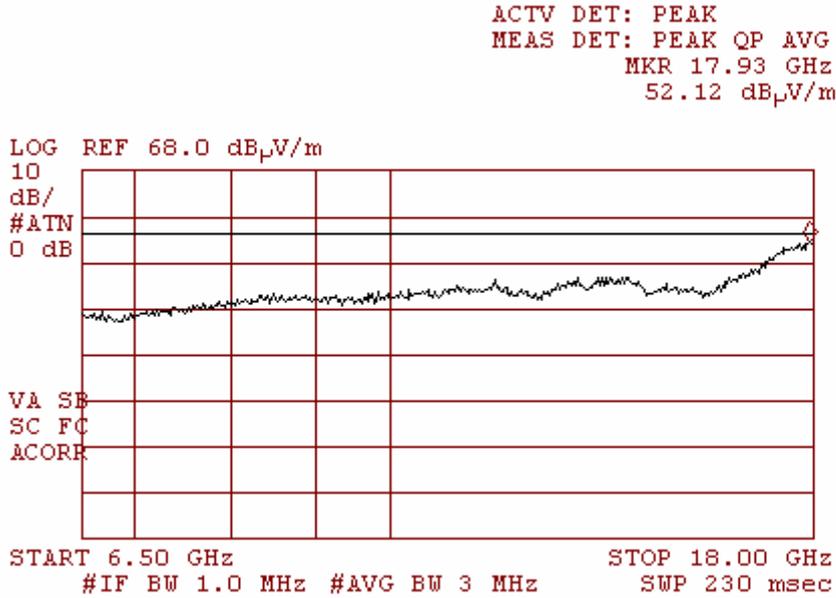


**Horizontal & Vertical Polarization
Plot 20**

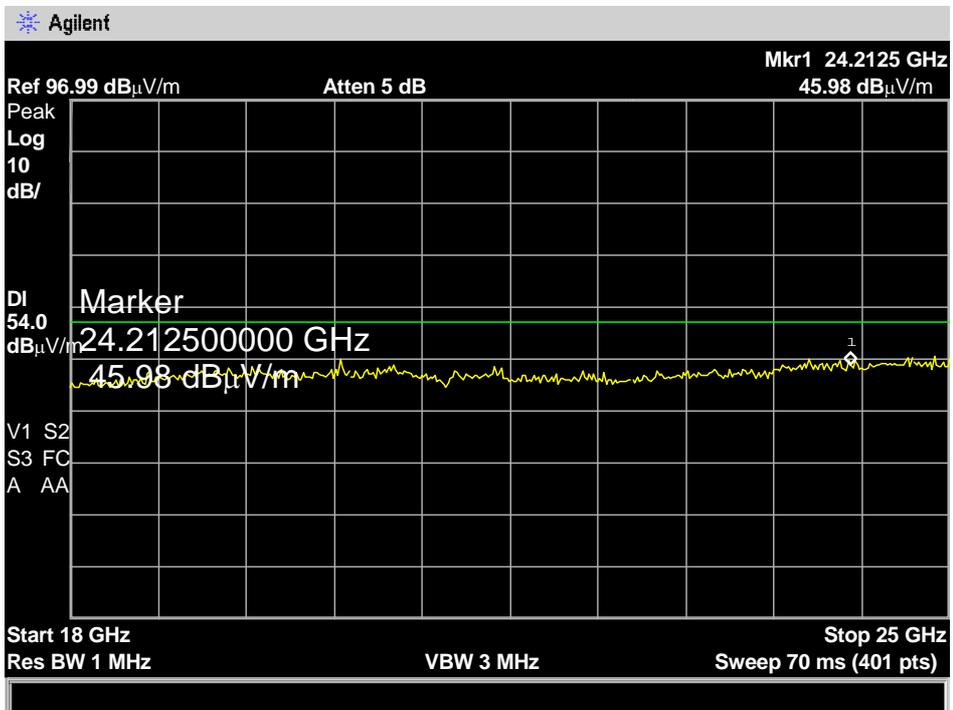
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.876 GHz
40.50 dB μ V/m



**Horizontal & Vertical Polarization
Plot 21**

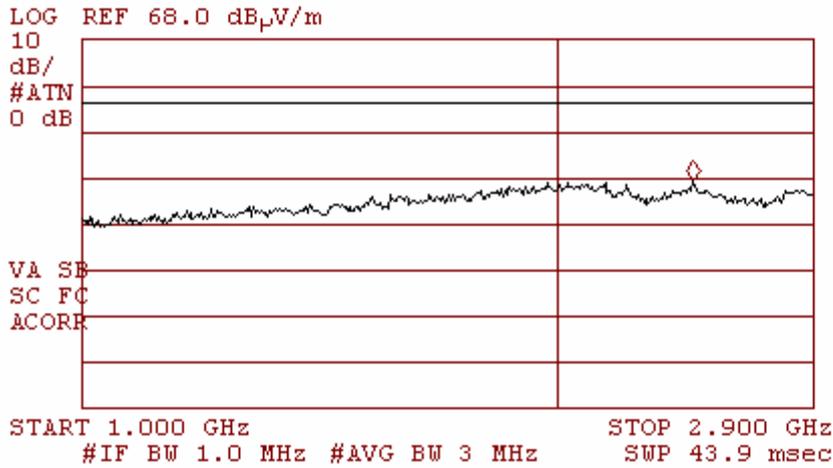


**Horizontal & Vertical Polarization
Plot 22**



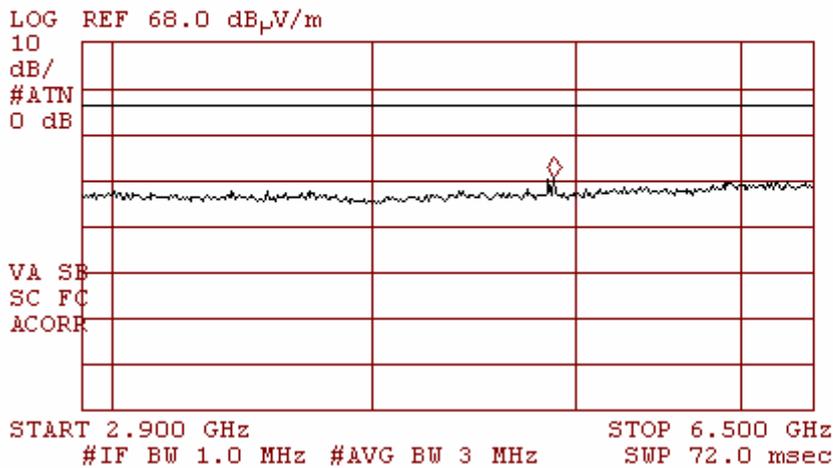
**Highest frequency
Horizontal & Vertical Polarization
Plot 23**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.504 GHz
37.11 dB μ V/m



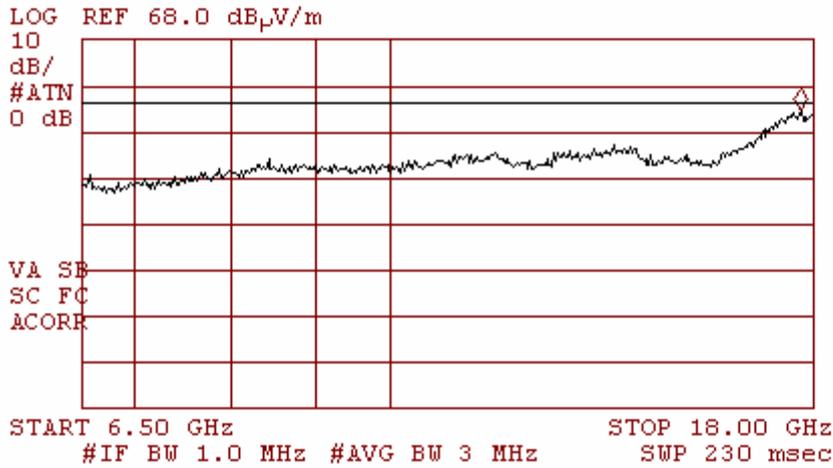
**Plot 24
Horizontal & Vertical Polarization**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.963 GHz
38.55 dB μ V/m

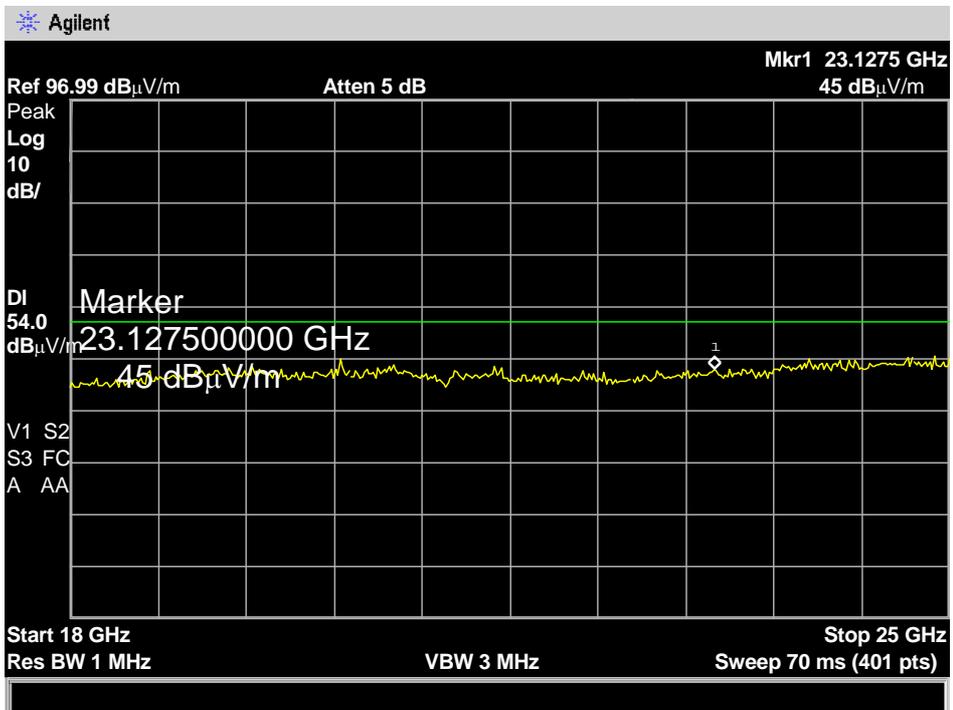


Plot 25
Horizontal & Vertical Polarization

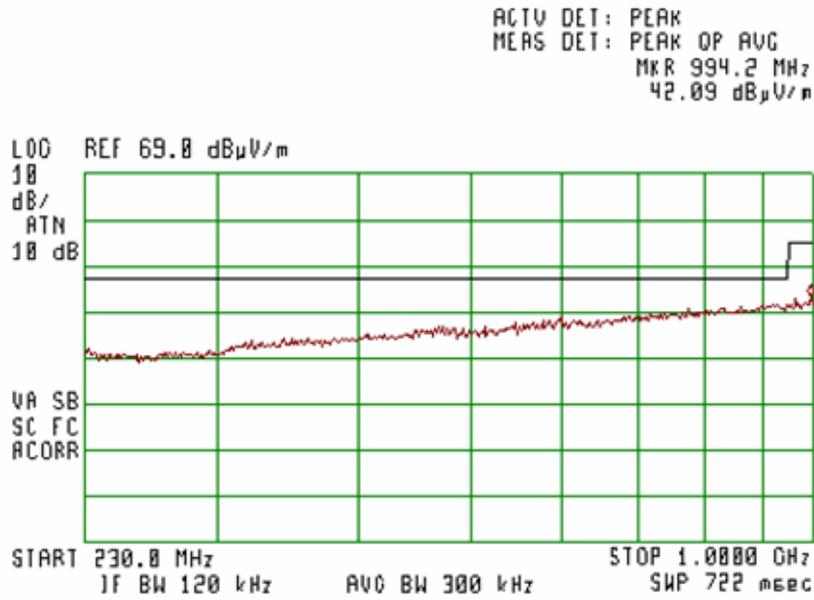
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 17.75 GHz
52.53 dB μ V/m



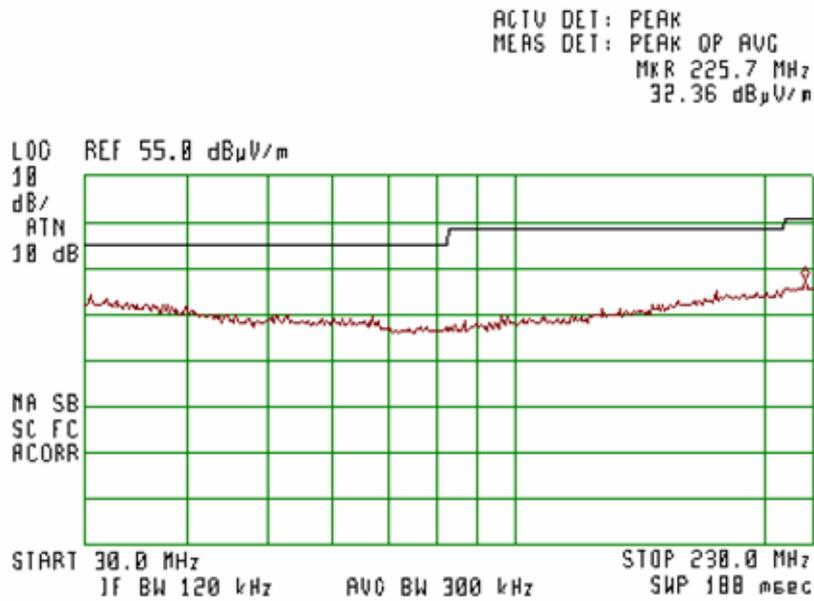
Plot 26
Horizontal & Vertical Polarization



**Horizontal & Vertical Polarization
Plot 27**

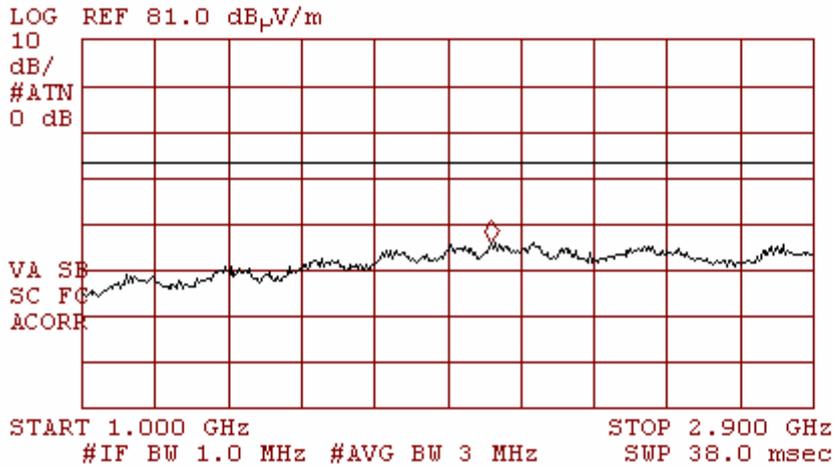


**Horizontal & Vertical Polarization
Plot 28**



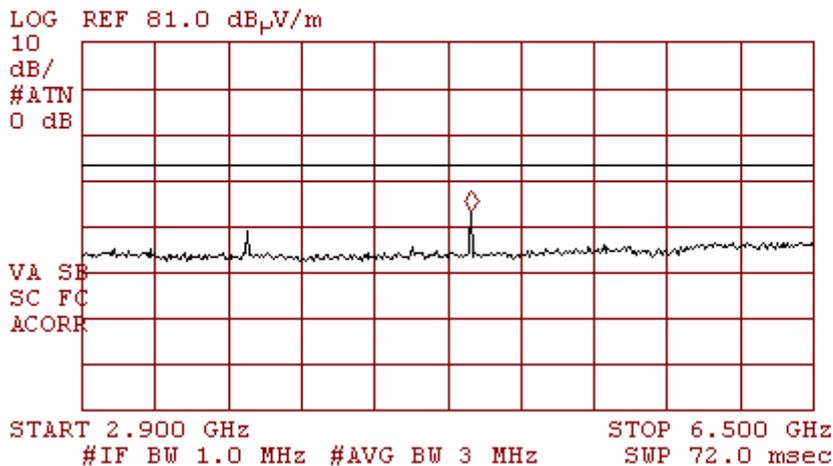
Simultaneously Operated: Bluetooth & G24 (PCS 1900)
Lowest frequency
Horizontal & Vertical Polarization
Plot 29

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.064 GHz
36.92 dB μ V/m



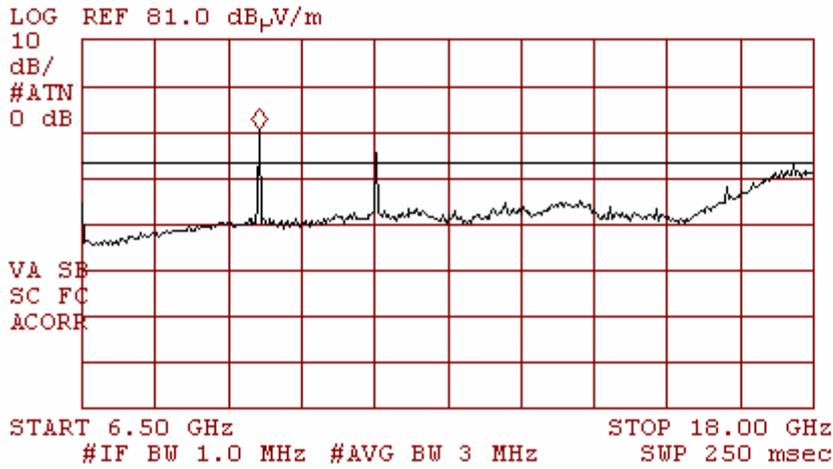
Horizontal & Vertical Polarization
Plot 30

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.817 GHz
43.98 dB μ V/m

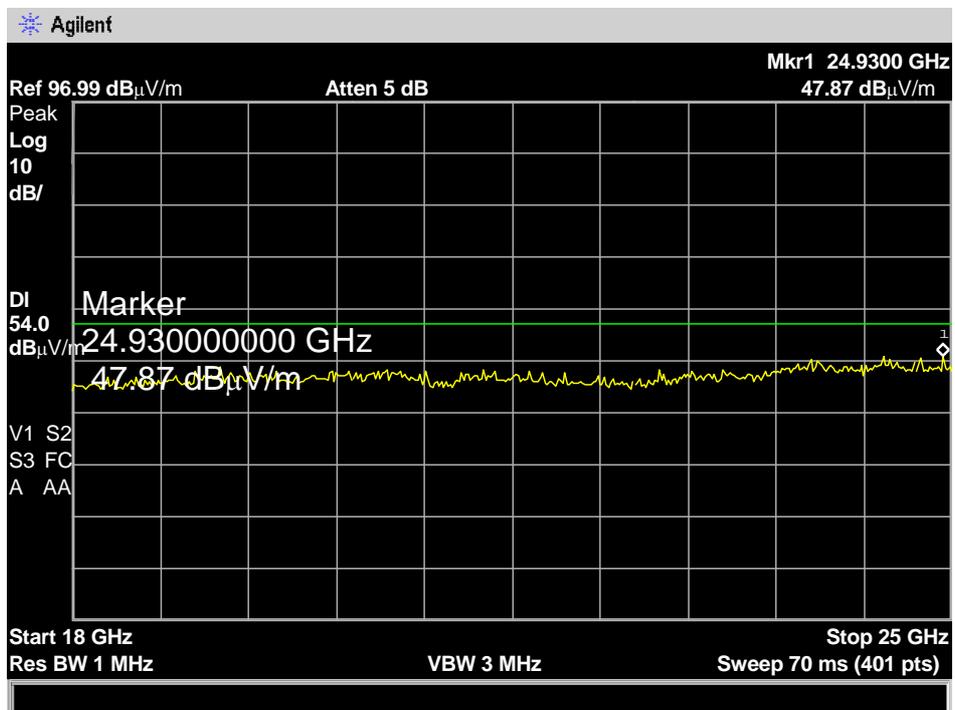


**Horizontal & Vertical Polarization
Plot 31**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 9.29 GHz
61.26 dB μ V/m

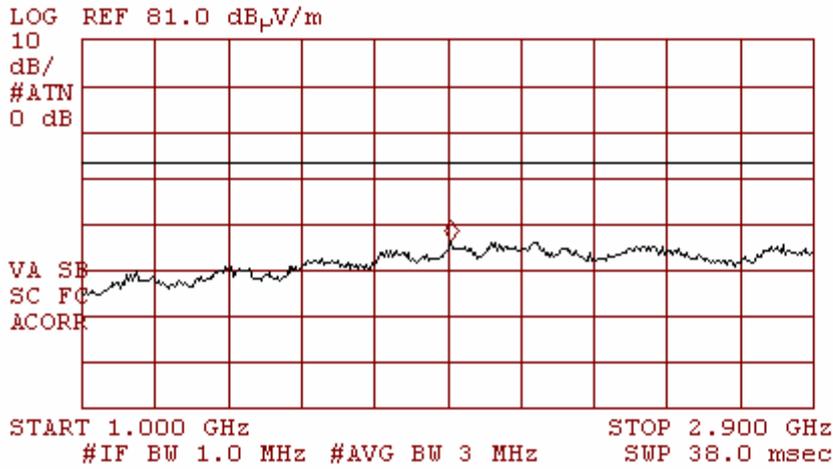


**Horizontal & Vertical Polarization
Plot 32**



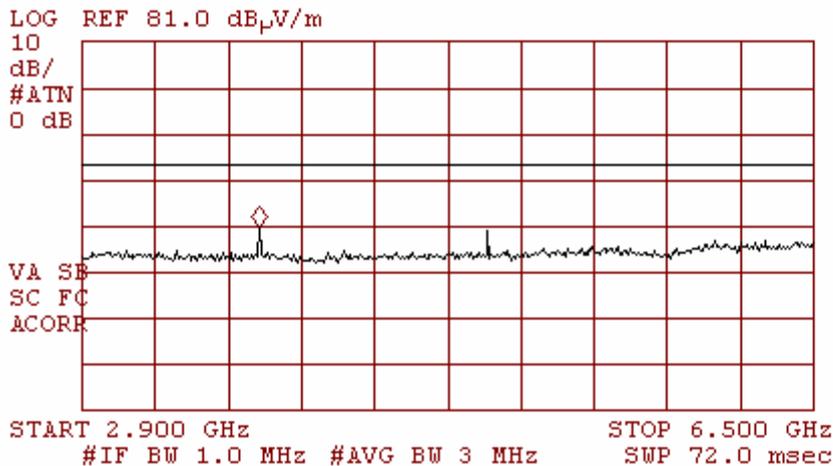
**Middle frequency
Horizontal & Vertical Polarization
Plot 33**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 1.960 GHz
37.14 dB μ V/m



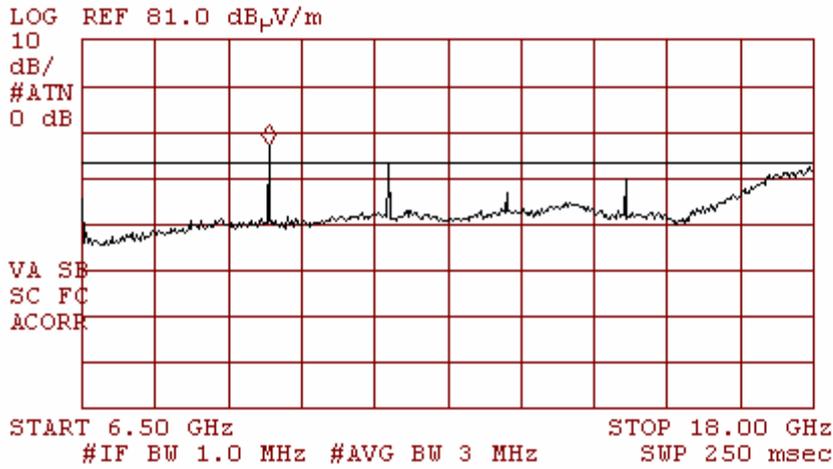
**Horizontal & Vertical Polarization
Plot 34**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 3.773 GHz
40.48 dB μ V/m

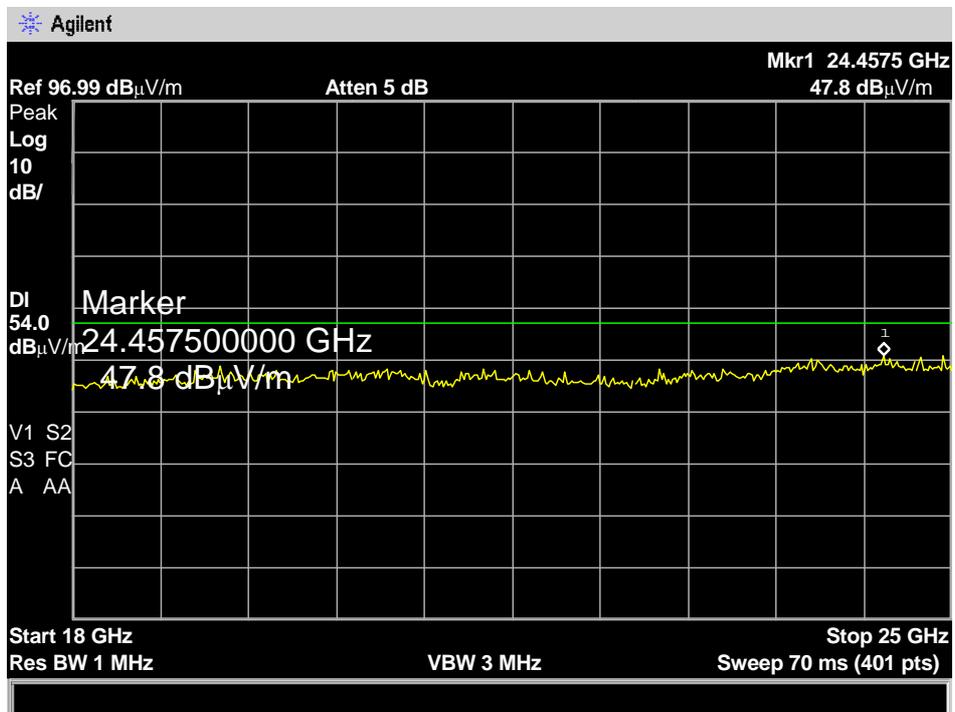


**Horizontal & Vertical Polarization
Plot 35**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 9.43 GHz
57.82 dB μ V/m

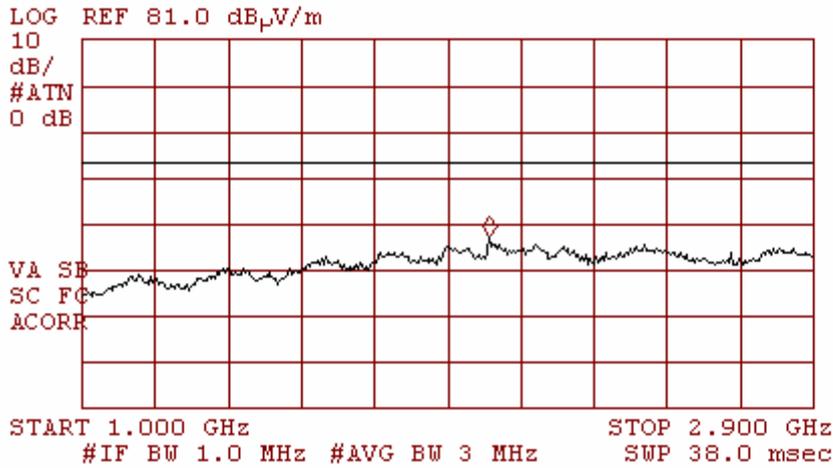


**Horizontal & Vertical Polarization
Plot 36**



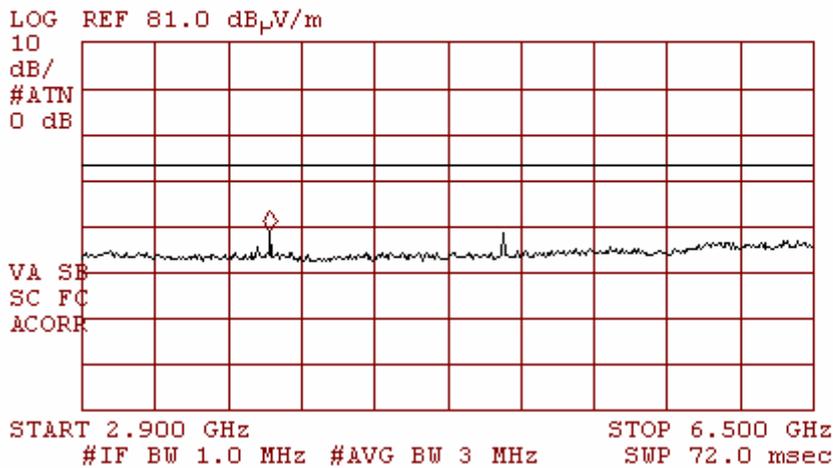
**Highest frequency
Horizontal & Vertical Polarization
Plot 37**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.059 GHz
37.96 dB μ V/m



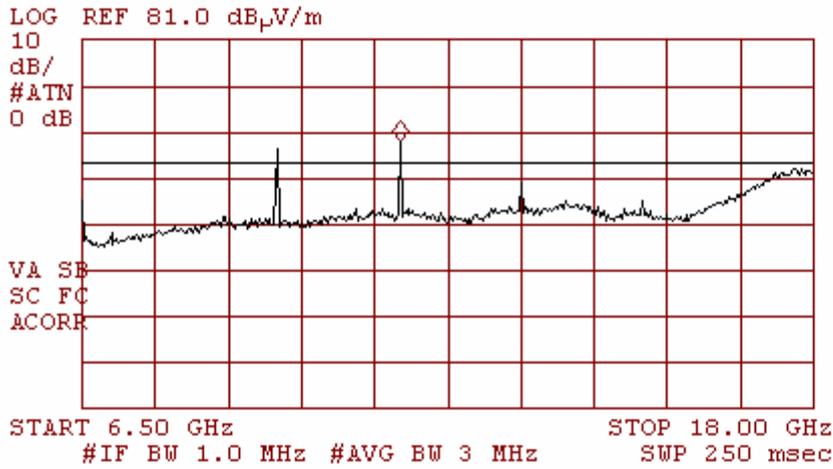
**Horizontal & Vertical Polarization
Plot 38**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 3.827 GHz
39.65 dB μ V/m

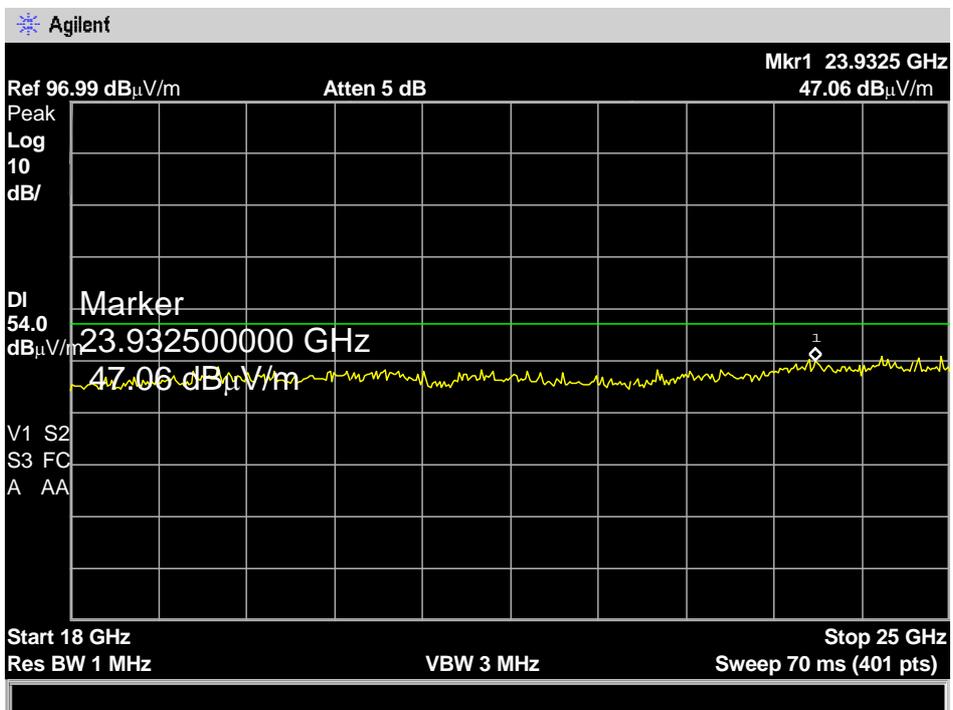


**Horizontal & Vertical Polarization
Plot 39**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 11.50 GHz
58.91 dB μ V/m

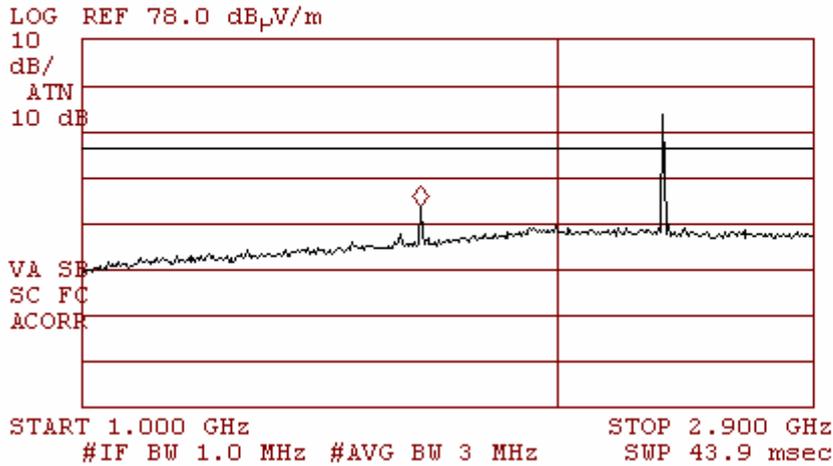


**Horizontal & Vertical Polarization
Plot 40**



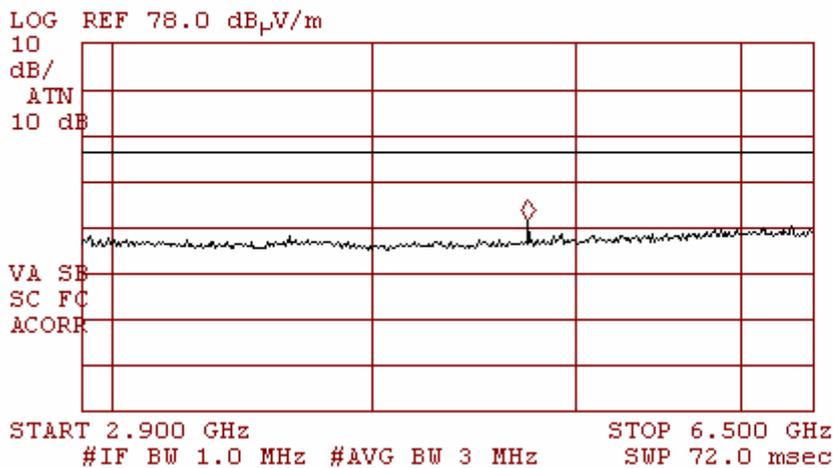
Simultaneously Operated: Bluetooth & G24 (GSM 850)
Lowest frequency
Horizontal & Vertical Polarization
Plot 41

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 1.649 GHz
41.35 dB μ V/m



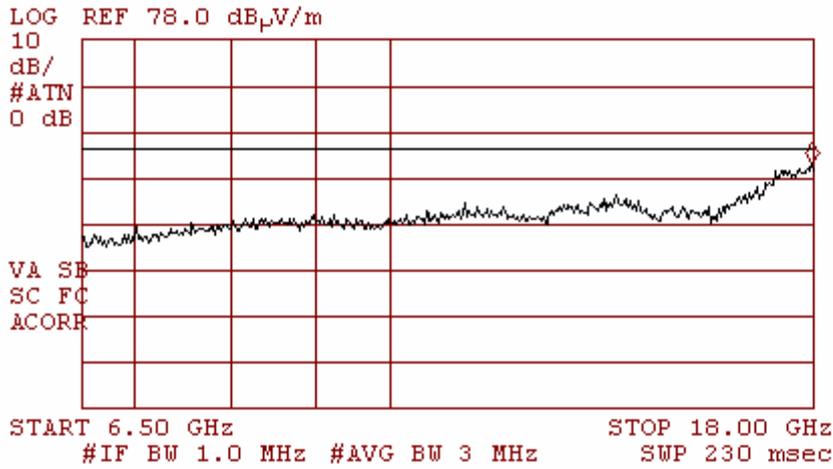
Horizontal & Vertical Polarization
Plot 42

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.811 GHz
39.16 dB μ V/m

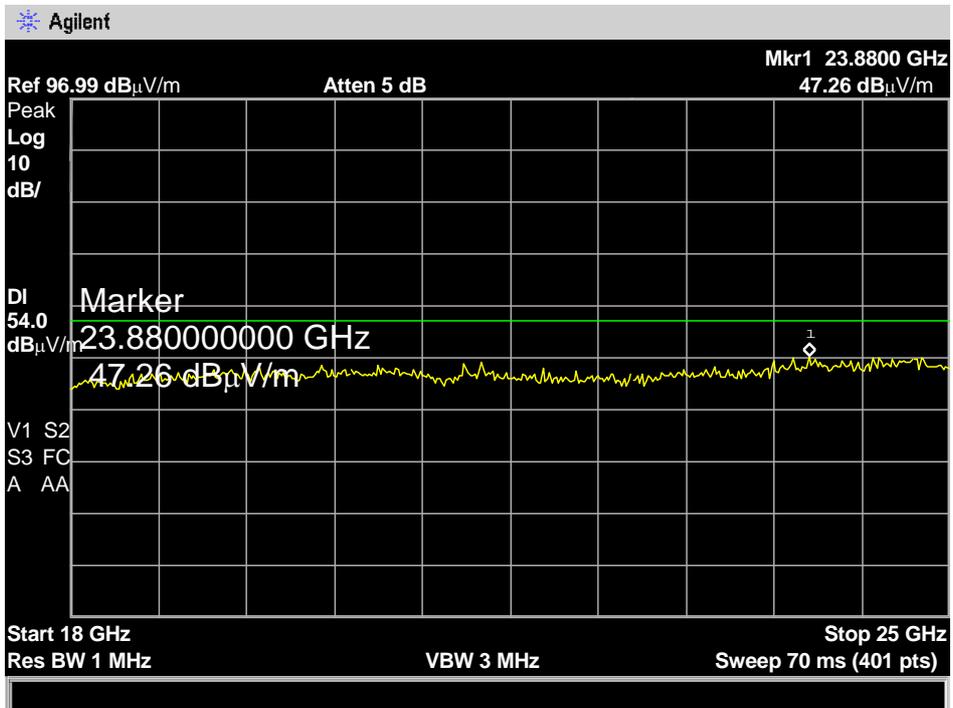


**Horizontal & Vertical Polarization
Plot 43**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 17.96 GHz
51.03 dB μ V/m

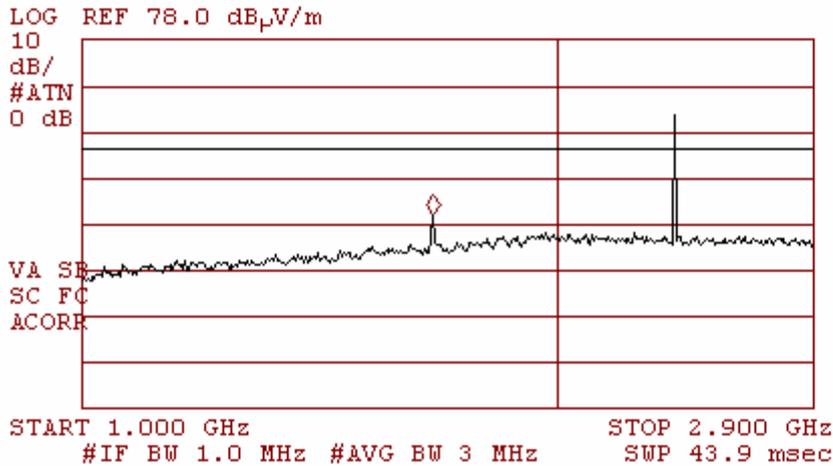


**Horizontal & Vertical Polarization
Plot 44**



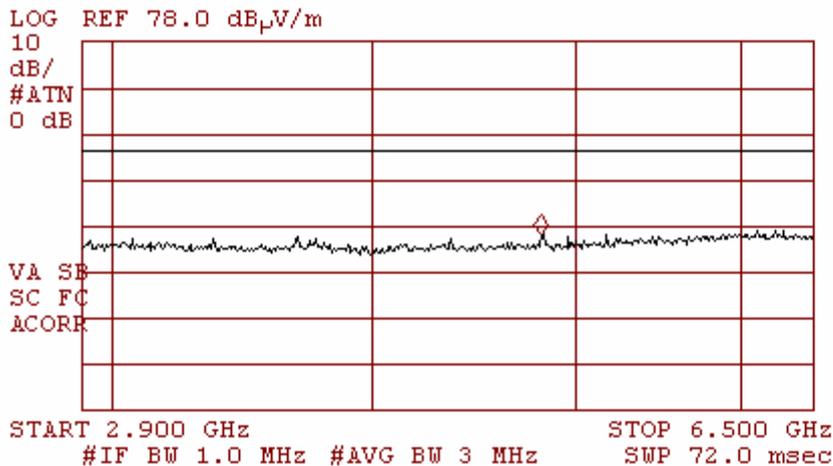
**Middle frequency
Horizontal & Vertical Polarization
Plot 45**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 1.674 GHz
39.69 dB μ V/m



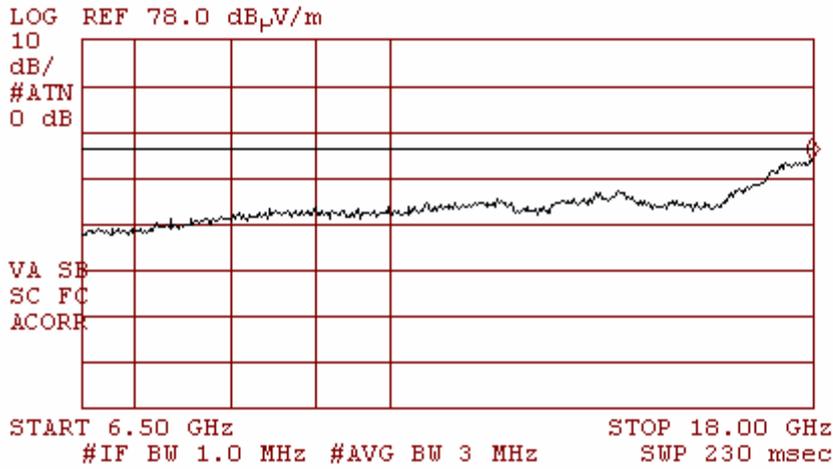
**Horizontal & Vertical Polarization
Plot 46**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.887 GHz
35.82 dB μ V/m

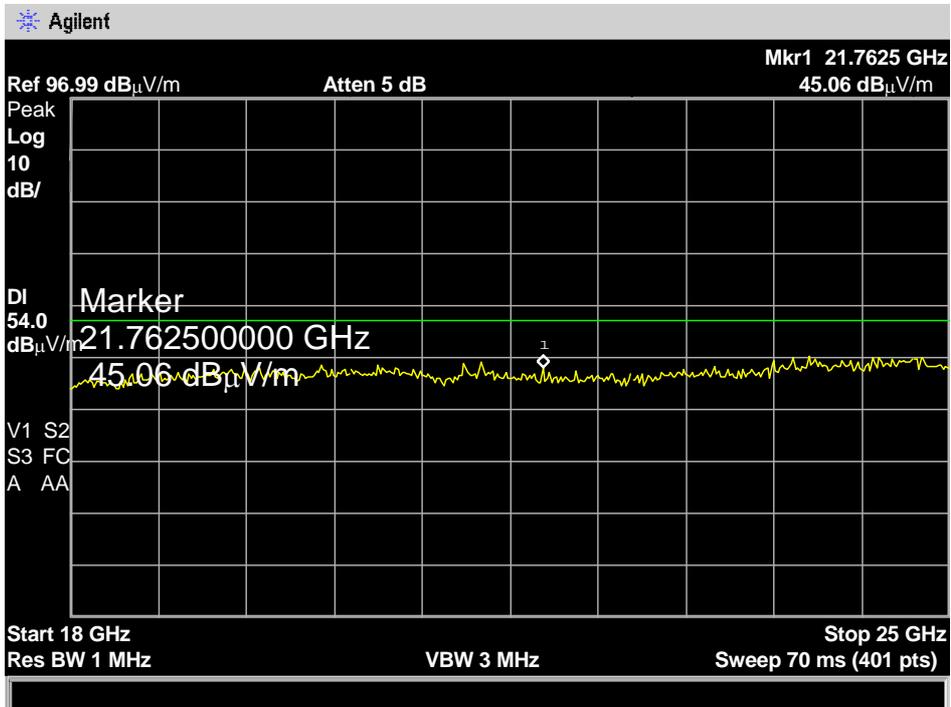


**Horizontal & Vertical Polarization
Plot 47**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 17.96 GHz
51.74 dB μ V/m

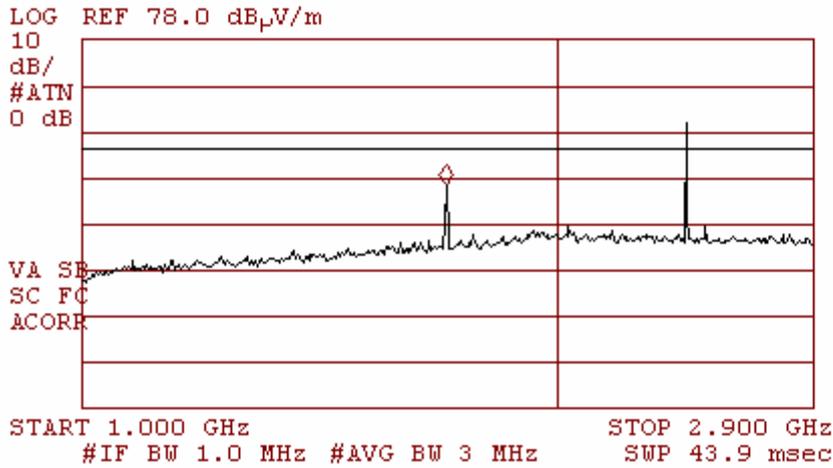


**Horizontal & Vertical Polarization
Plot 48**



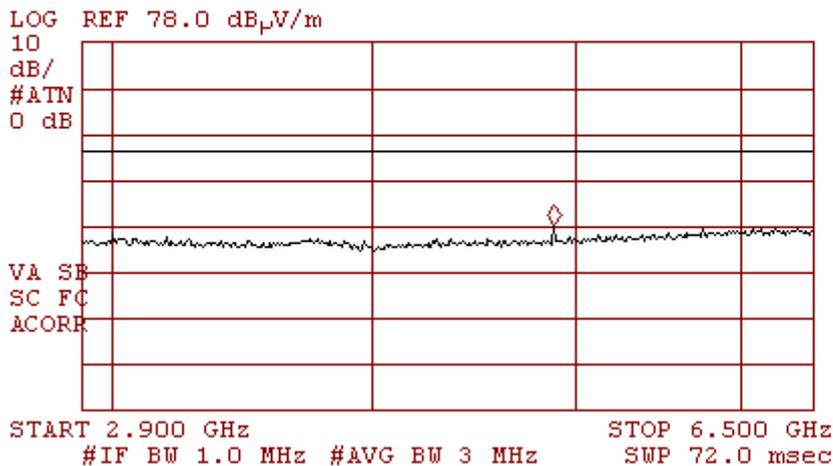
**Highest frequency
Horizontal & Vertical Polarization
Plot 49**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 1.698 GHz
46.24 dB μ V/m



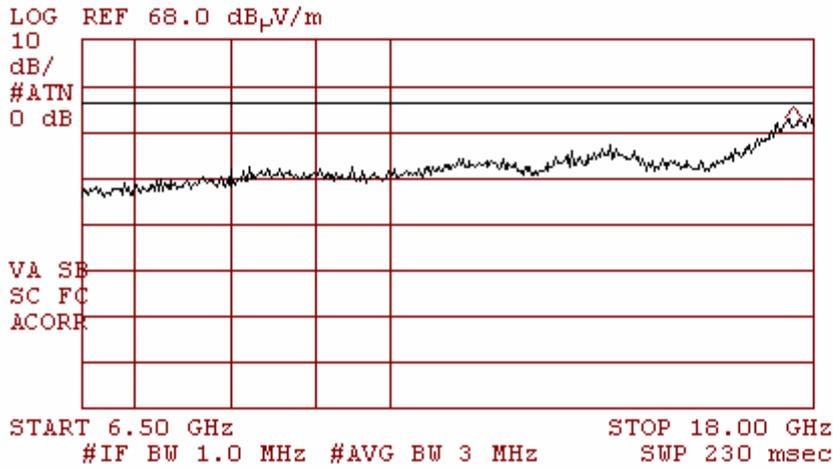
**Horizontal & Vertical Polarization
Plot 50**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 4.963 GHz
37.90 dB μ V/m

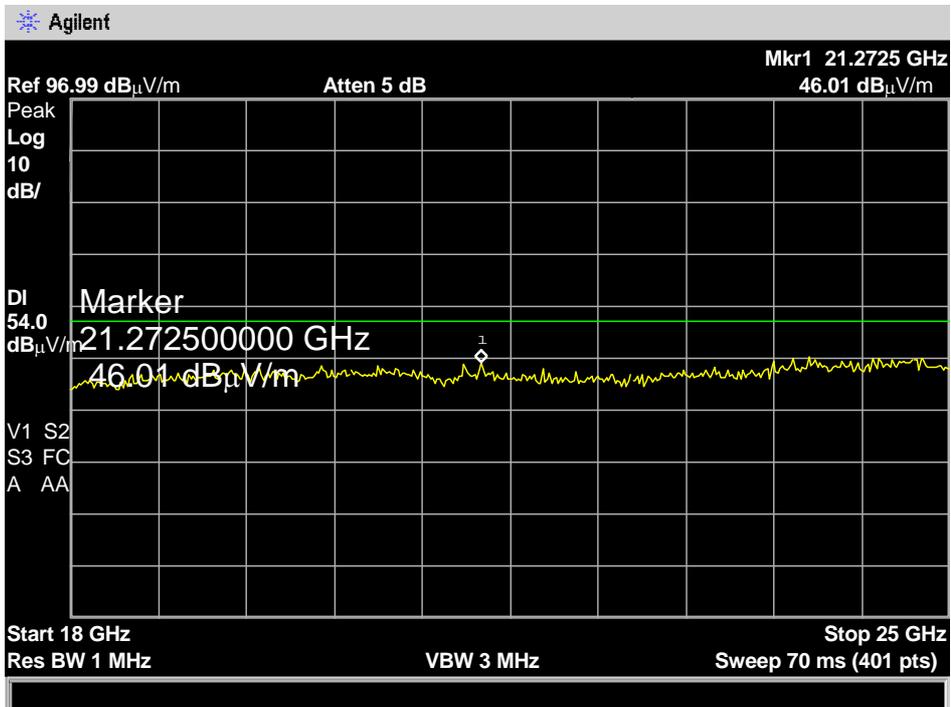


**Horizontal & Vertical Polarization
Plot 51**

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 17.60 GHz
48.73 dB μ V/m



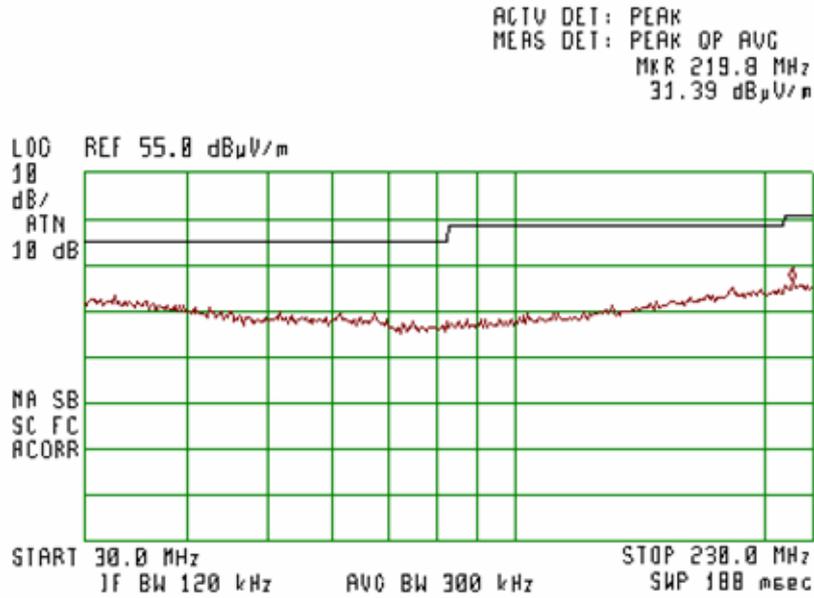
**Horizontal & Vertical Polarization
Plot 52**



Appendix B: Receive Mode test plots

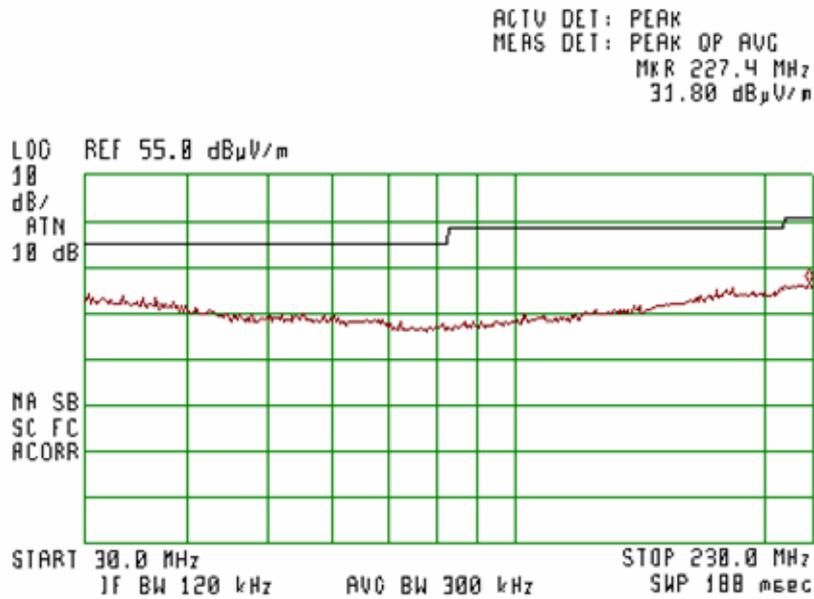
Horizontal Polarization

Plot 1

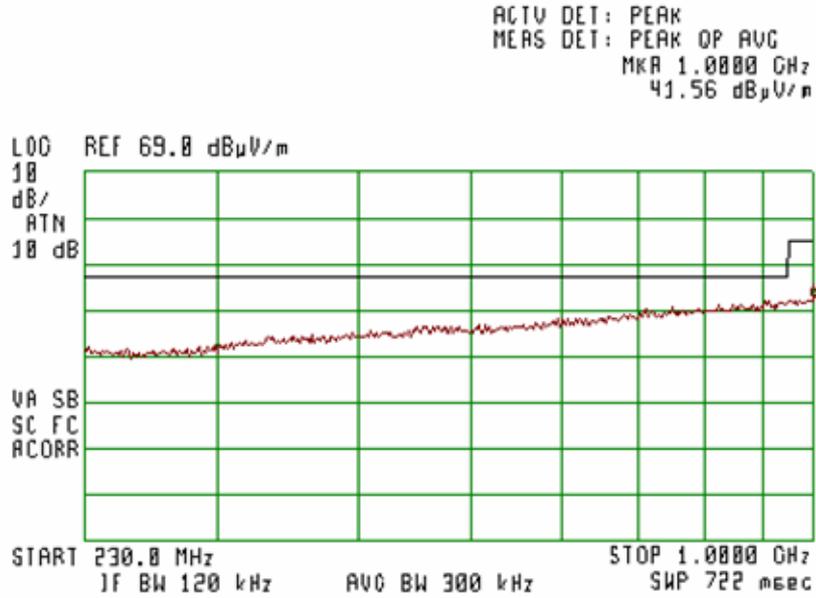


Vertical Polarization

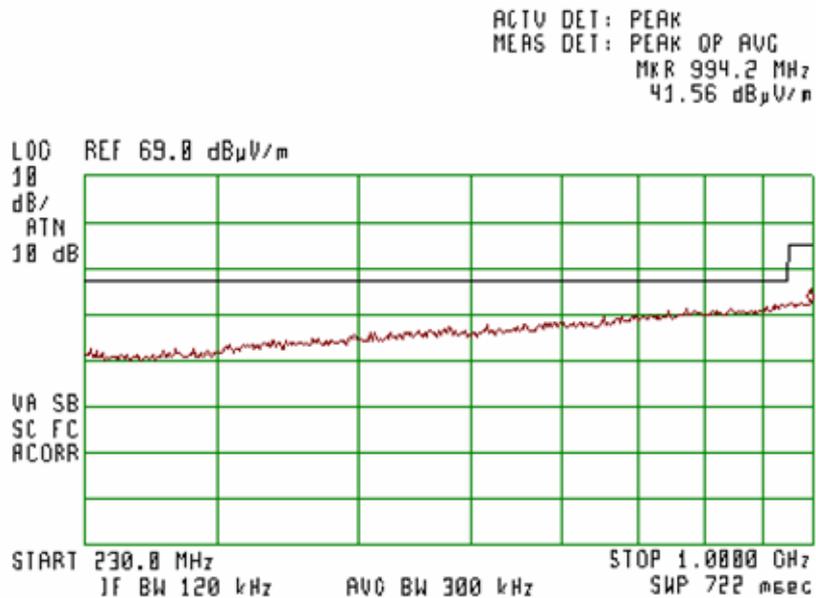
Plot 2



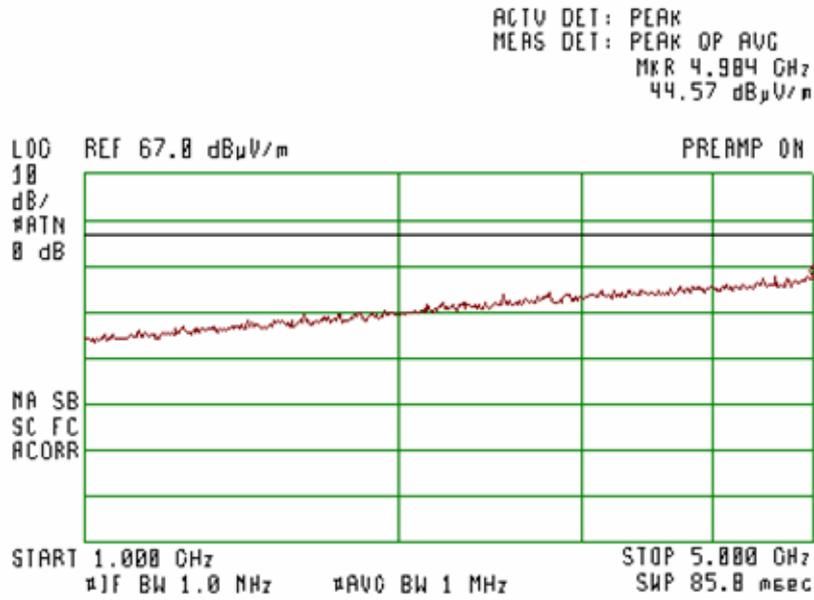
**Horizontal Polarization
Plot 3**



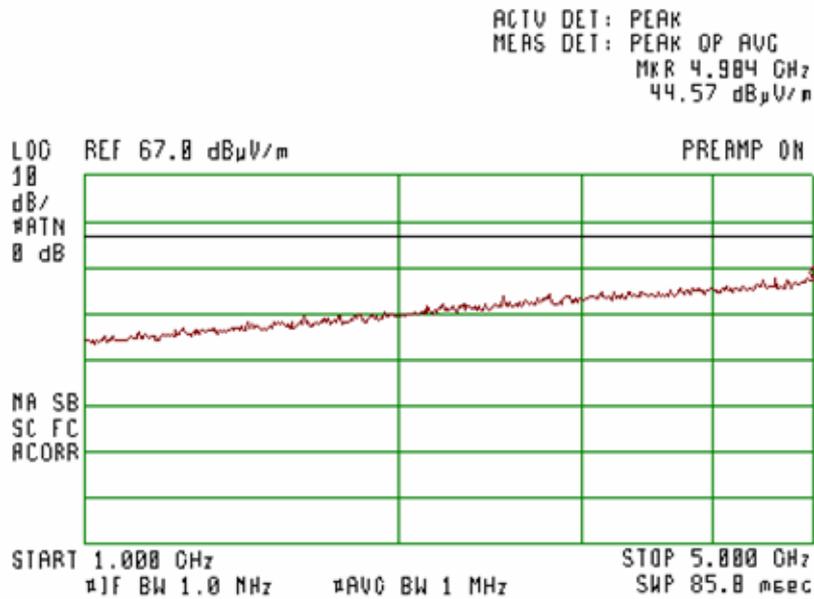
**Vertical Polarization
Plot 4**



**Horizontal Polarization
Plot 5**



**Vertical Polarization
Plot 6**



Appendix C: List of Measuring Equipment used:

Equipment	Manufacturer/ Model	Serial Number	Due date
CISPR16 EMI Receiver	HP8546A	3710A00392	30.06.2007
Spectrum Analyzer 9kHz ÷ 22 GHz	HP 8593EM	3536A00131	30.06.2007
Spectrum Analyzer 100 Hz ÷ 26.5 GHz	Agilent E7405A	US41160436	30.06.2007
LNA Amplifier 1 GHz ÷ 18 GHz	AMP – 5D-010180-30-10P-GW	618653	01.01.2008
Dual Ridged Guide Ant.1-18 GHz	EMCO 3115	9602-4677	01.01.2008
Antenna 18 GHz ÷ 26.5 GHz	Alpha Industry 861A/599	505	01.01.2008
Turn table	HD100	100/693	-
Antenna Mast	HD 100	100/693	-
Biconical 20 –200 MHz	Schwarzbeck VHBB9124	9124/0255	30.06.2007
Log-Periodic 200 – 1000 MHz	Schwarzbeck VUSLP9111	VUSLP9111184	30.06.2007
Pre-Amplifier	MiTeq, AMF-5F-18002650-30-10P	945372	01.01.2008
LISN	Fischer 50/250-25-2	-	30.06.2007
Transient Limiter	HP11947A	-	30.06.2007
Notch Filter	Micro-Tronics BRM50702-05	0001	01.01.2008
Antenna 15G-40 GHz	Schwarzbeck BBHA 9170	BBHA9170214	01.01.2008
High pass Filter	Wainwright WHK 1.2/15G-10EF	3	30.06.2007
High pass Filter	Wainwright WHK2.4/18G-10EF	1	30.06.2007
Oven	Tenneg Ten	10.158-5	30.06.2007
LISN	Fischer 50/250-25-2	-	30.06.2007
Transient Limiter	HP11947A	-	30.06.2007

End of the Test Report