



**FCC 47 CFR PART 15 SUBPART C**

**TEST REPORT**

**For**

**912MHz+Bluetooth Wireless Outdoor Speaker**

**Model: AWS5B3**

**Brand: Acoustic Research**

**Test Report Number:**

**SZ111230B01-RP**

*Prepared for*

**Audiovox Accessories Corp.**

**701 Congressional Blvd. Ste200,Carmel, IN. 46032**

*Prepared by*

**COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.**

**No.10-1, Mingkeda Logistics Park, No.18, Huanguan South Rd.,  
Guan Lan Town, Baoan District, Shenzhen, China**

**TEL: 86-755-28055000**

**FAX: 86-755-28055221**

**Issued Date: January 12, 2012**



TESTING CERT #2861.01

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Revision History

Rev.	Issue No.	Revisions	Effect Page	Revised By
00	SZ111230B01-RP	Initial Issue	ALL	Bella Ge



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# 1. TEST RESULT CERTIFICATION

**Product:** 912MHz+Bluetooth Wireless Outdoor Speaker  
**Model:** AWS5B3  
**Brand:** Acoustic Research  
**Tested:** December 16, 2011~January 12, 2012  
**Applicant:** **Audiovox Accessories Corp.**  
701 Congressional Blvd. Ste200,Carmel, IN. 46032  
**Manufacturer:** **Uni-Art Precise Products Ltd**  
11-12/F, Yue Xiu Industrial Building, 87 Hung To Road, Kowloon, Hong Kong

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.207, 15.209 and 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

**Approved by:**

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**Tom Gan**  
Supervisor of EMC Dept.  
Compliance Certification Service Inc.

**Reviewed by:**

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**Aven Zhou**  
Supervisor of Report Dept.  
Compliance Certification Service Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	912MHz+Bluetooth Wireless Outdoor Speaker
<b>Model Number</b>	AWS5B3
<b>Brand</b>	Acoustic Research
<b>Model Discrepancy</b>	N/A
<b>Identify Number</b>	SZ111230B01-RP
<b>Power Supply</b>	DC12V powered by the adapter Adapter manufacturer/model name SIL / SSA-5W-12 US 120020F AC input: 100-240V,50/60Hz 0.2A DC output: DC12.0V 200mA DC output cable: Un-shielded, 1.80m
<b>Received Date</b>	December 16, 2011
<b>Frequency Range</b>	2402 ~ 2480 MHz
<b>Transmit Power</b>	GFSK :2.18dBm 8DPSK :3.51dBm
<b>Modulation Technique</b>	FHSS (GFSK for 1Mbps, $\pi/4$ -DQPSK for 2Mbps, 8DPSK for 3Mbps)
<b>Number of Channels</b>	79 Channels
<b>Antenna Specification</b>	2.4G ISM SMD Chip Antenna with 2dBi gain(Max)
<b>Temperature Range</b>	0°C ~ +55°C

**Note:** This submittal(s) (test report) is intended for FCC ID: VIXAUDAWS5B3RX filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



### 3. TEST METHODOLOGY

#### 3.1 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

The following test mode(s) were scanned during the preliminary test below 1G:

Test Item	Test mode	Worse mode
Conducted Emission	<b>Mode 1:</b> Bluetooth with adapter	<input checked="" type="checkbox"/>
Radiated Emission	<b>Mode 1:</b> Bluetooth with adapter	<input checked="" type="checkbox"/>

Above 1G, Channel Low (2402MHz) · Mid (2441MHz) and High (2480MHz) were chosen for full testing for GFSK.



## 4. FACILITIES AND ACCREDITATIONS

### 4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- No.10-1, Mingkeda Logistics Park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.4:2009, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 4.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

<b>USA</b>	<b>A2LA</b>
<b>China</b>	<b>CNAS</b>

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

<b>USA</b>	<b>FCC</b>
<b>Japan</b>	<b>VCCI(C-3478, R-3135, T-652)</b>
<b>Canada</b>	<b>INDUSTRY CANADA</b>
<b>Taiwan</b>	<b>BSMI</b>
<b>Norway</b>	<b>Nemko</b>

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>

### 4.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	+/- 3.18dB
Radiated emissions	30MHz ~ 200MHz	+/- 3.79dB
	200MHz ~1000MHz	+/- 3.62dB
	Above 1000MHz	+/- 5.04dB
Band Edges	+/-0.182 dB	

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.



## 5. SETUP OF EQUIPMENT UNDER TEST

### 5.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### 5.2 SUPPORT EQUIPMENT

No	Equipment	Model	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1.	IPOD	A1285	YM908BYU3QX	N/A	IPOD	Shielded 2.00m	N/A
2.	IPOD	A1285	YM913G7M3QS	N/A	IPOD	N/A	N/A

**Notes:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.





## 6. FCC PART 15.247 REQUIREMENTS

### 6.1 20DB BANDWIDTH

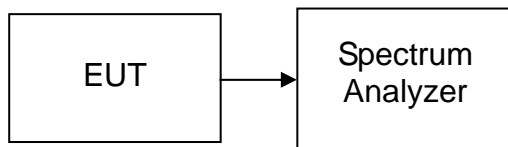
None; for reporting purpose only.

### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012

*Remark: Each piece of equipment is scheduled for calibration once a year.*

### TEST CONFIGURATION



### TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT, then connect a low loss RF cable from antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=30kHz, VBW=30kHz, Span=3MHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the test channels are investigated.

### TEST RESULTS

No non-compliance noted

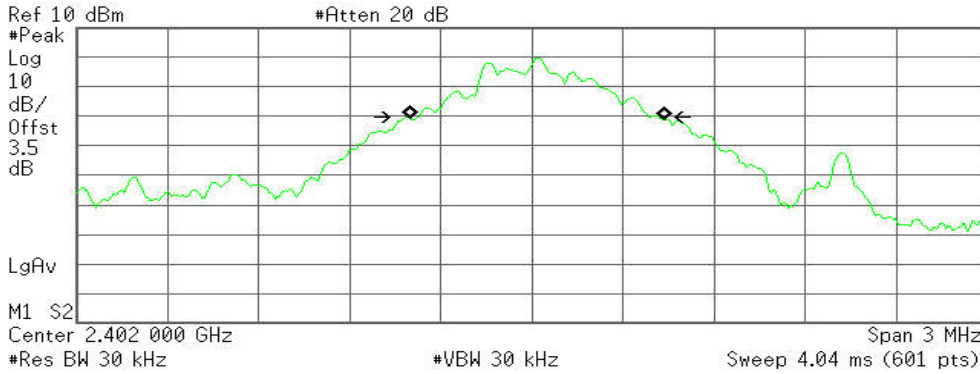


Test plot ( GFSK)

20dB Bandwidth (CH Low)

Agilent 04:46:26 Dec 17, 2011

R T



Occupied Bandwidth 833.4826 kHz

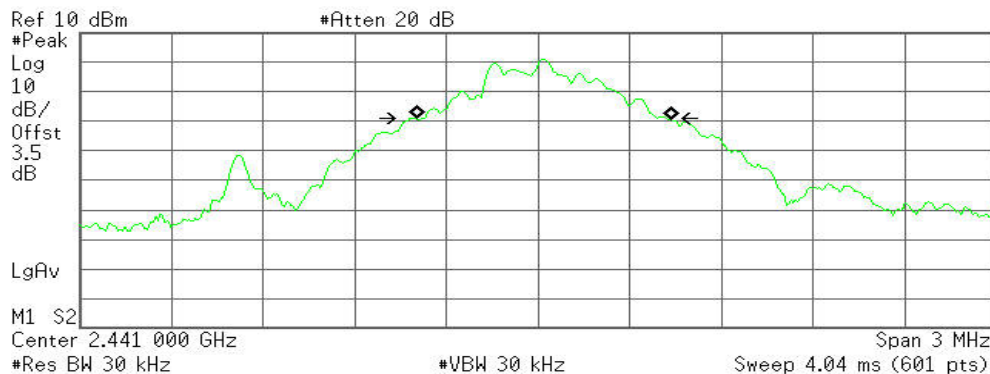
Occ BW % Pwr 99.00 %  
x dB -20.00 dB

Transmit Freq Error 19.180 kHz  
x dB Bandwidth 834.300 kHz

20dB Bandwidth (CH Mid)

Agilent 04:47:12 Dec 17, 2011

R T



Occupied Bandwidth 830.3084 kHz

Occ BW % Pwr 99.00 %  
x dB -20.00 dB

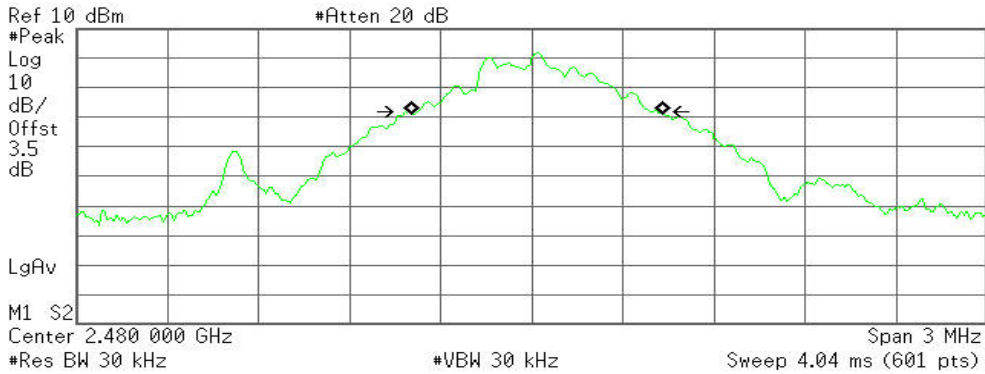
Transmit Freq Error 17.761 kHz  
x dB Bandwidth 835.348 kHz



### 20dB Bandwidth (CH High)

Agilent 04:47:46 Dec 17, 2011

R T



Occupied Bandwidth  
826.8932 kHz

Occ BW % Pwr 99.00 %  
x dB -20.00 dB

Transmit Freq Error 17.156 kHz  
x dB Bandwidth 820.786 kHz

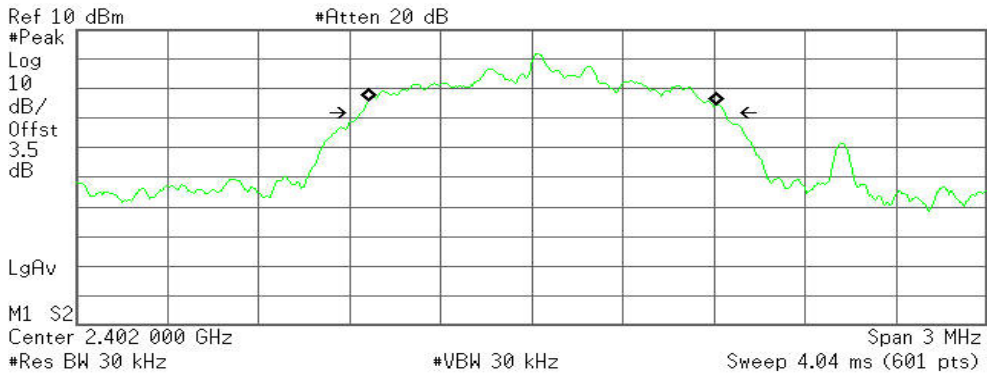


Test plot ( 8DPSK )

20dB Bandwidth (CH Low)

Agilent 04:49:26 Dec 17, 2011

R T



Occupied Bandwidth 1.1465 MHz

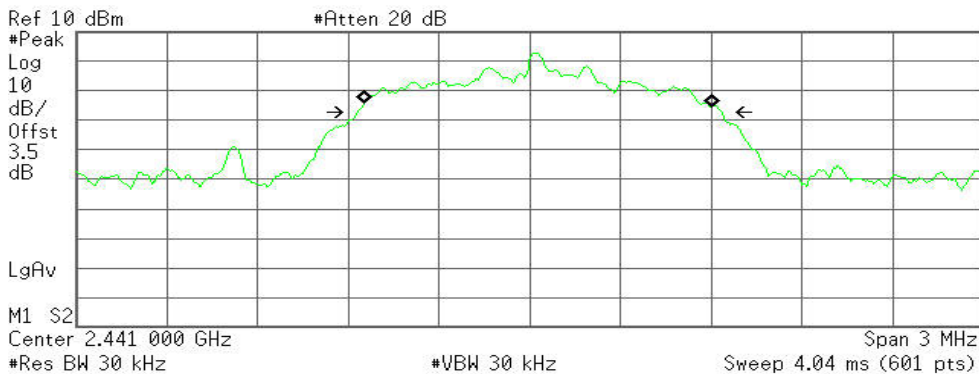
Occ BW % Pwr 99.00 %  
x dB -20.00 dB

Transmit Freq Error 35.817 kHz  
x dB Bandwidth 1.200 MHz

20dB Bandwidth (CH Mid)

Agilent 04:49:01 Dec 17, 2011

R T



Occupied Bandwidth 1.1500 MHz

Occ BW % Pwr 99.00 %  
x dB -20.00 dB

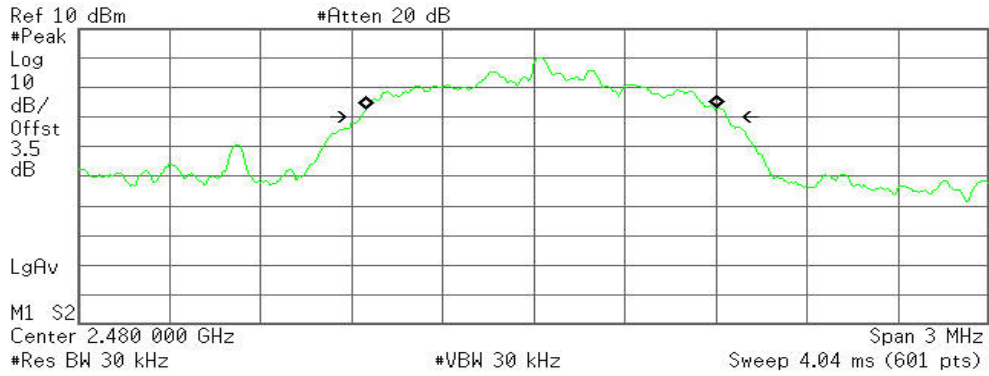
Transmit Freq Error 30.022 kHz  
x dB Bandwidth 1.203 MHz



### 20dB Bandwidth (CH High)

Agilent 04:48:20 Dec 17, 2011

R T



Occupied Bandwidth  
1.1554 MHz

Occ BW % Pwr 99.00 %  
x dB -20.00 dB

Transmit Freq Error 29.260 kHz  
x dB Bandwidth 1.205 MHz



## 6.2 PEAK POWER

### LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

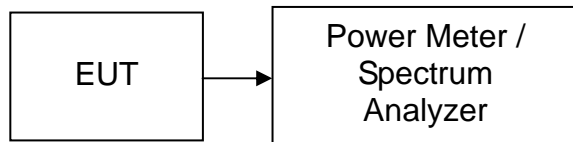
1. For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6dBi.
3. The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Power Meter	Anritsu	ML2487A	6K00001491	03/19/2011	03/19/2012
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012

*Remark: Each piece of equipment is scheduled for calibration once a year.*

### Test Configuration



### TEST PROCEDURE

The transmitter output is connected to the RF Power Meter. The RF Power Meter is set to the peak power detection.



**TEST RESULTS**

No non-compliance noted

**Test Data**

**GFSK**

Channel	Frequency (MHz)	Reading Power (dBm)	Factor (dB)	Output Power (dBm)	Output Power (W)	Limit (mW)	Result
Low	2402	-341	350	0.09	0.00102	1000	PASS
Mid	2441	-204	350	1.46	0.00140		PASS
High	2480	-1.32	350	2.18	0.00165		PASS

**8DPSK**

Channel	Frequency (MHz)	Reading Power (dBm)	Factor (dB)	Output Power (dBm)	Output Power (W)	Limit (mW)	Result
Low	2402	-0.74	350	2.76	0.00189	1000	PASS
Mid	2441	0.01	350	3.51	0.00224		PASS
High	2480	-0.94	350	2.56	0.00180		PASS



### 6.3 PEAK POWER SPECTRAL DENSITY

#### LIMIT

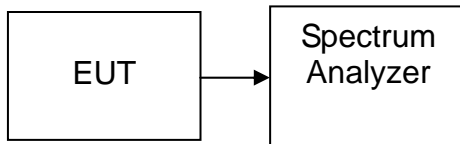
1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

#### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012

*Remark: Each piece of equipment is scheduled for calibration once a year.*

#### Test Configuration



#### TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5MHz, Sweep=500s
4. Record the max. reading.
5. Repeat the above procedure until the measurements for all frequencies are completed.

#### TEST RESULTS

*Not applicable. Since EUT is the Bluetooth device.*





### 6.4 BAND EDGES MEASUREMENT

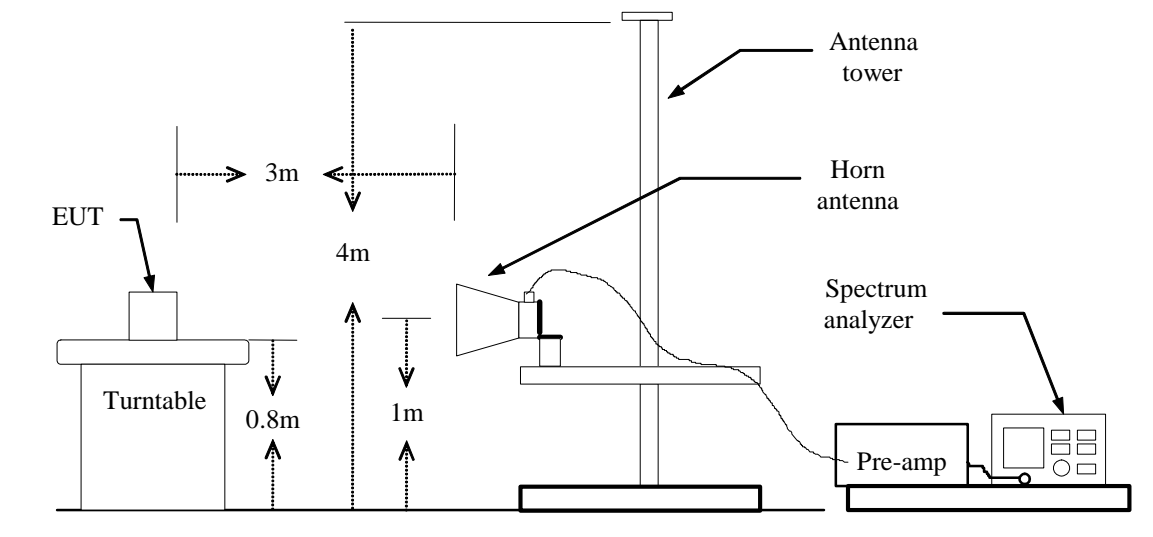
#### LIMIT

According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power. 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).

#### MEASUREMENT EQUIPMENT USED

Radiated Emission Test Site 966 (2)						
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration	
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012	
Amplifier	MITEQ	AM-1604-3000	1411843	03/18/2011	03/18/2012	
Turn Table	EMCO	2081-1.21	N/A	N.C.R	N.C.R	
Controller	CT	N/A	N/A	N.C.R	N.C.R	
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2011	03/18/2012	
Bilog Antenna	SCHAFFNER	CBL6143	5082	06/03/2011	06/03/2012	
Horn Antenna	SCHWARZBECK	BBHA9120D	D286	03/19/2011	03/19/2012	
Loop Antenna	A. R. A	PLA-1030/B	1029	03/19/2011	03/19/2012	
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/31/2011	03/31/2012	
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R	
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2				

#### Test Configuration





## **TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=510Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

## **TEST RESULTS**

Refer to attach spectrum analyzer data chart.



Test Data ( GFSK )

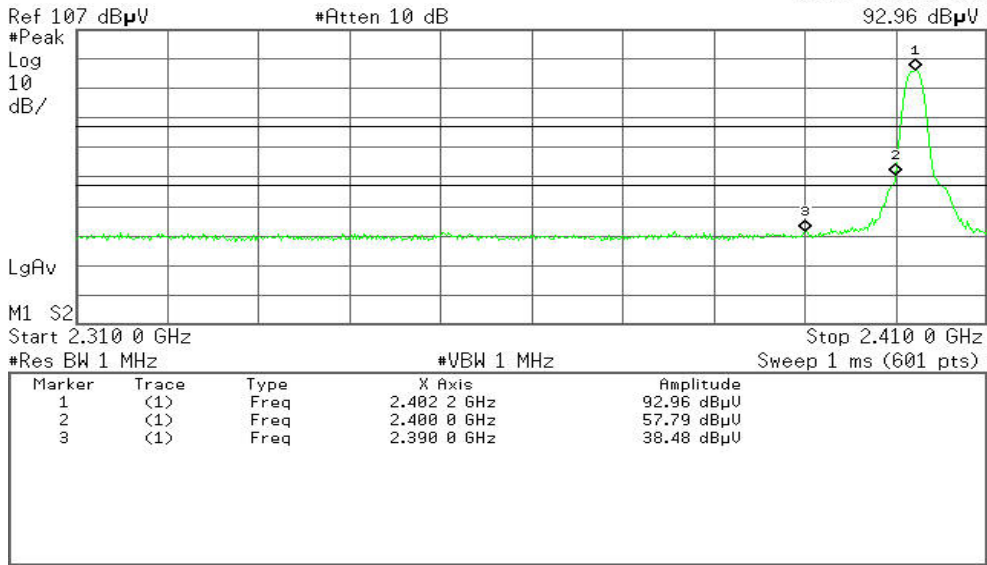
Band Edges (CH-Low)

Detector mode: Peak

Polarity: Vertical

Agilent 03:38:15 Dec 17, 2011

R T

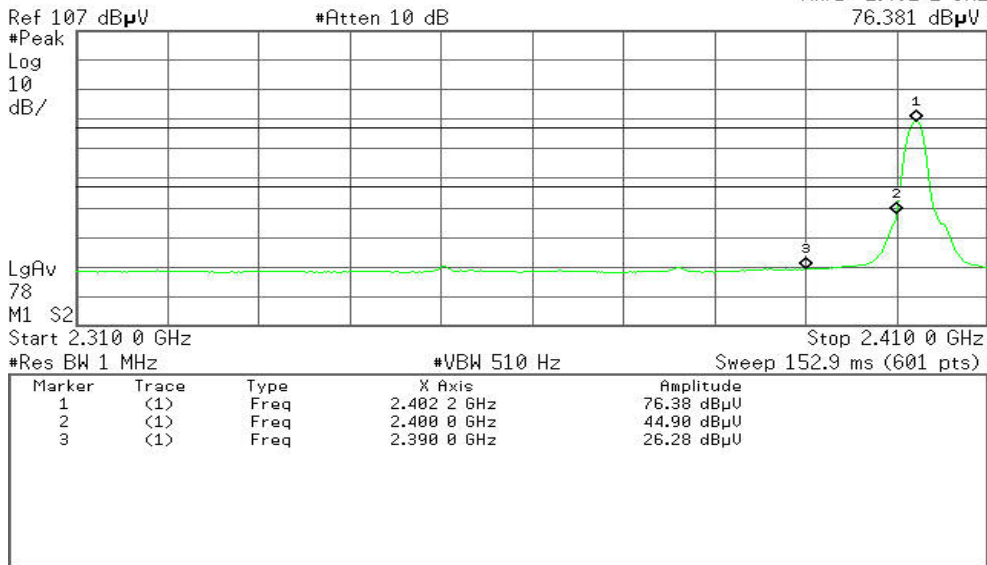


Detector mode: Average

Polarity: Vertical

Agilent 03:39:35 Dec 17, 2011

R T





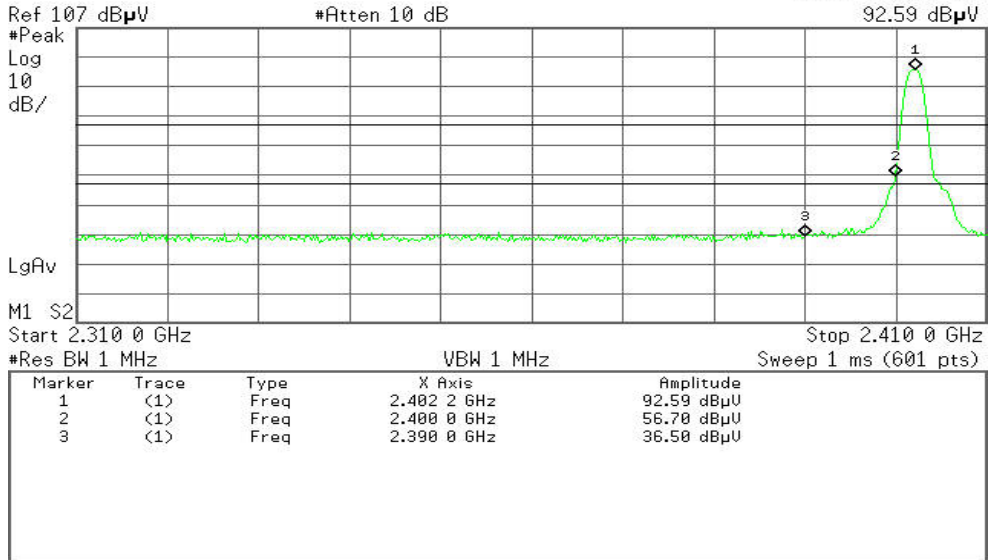
Detector mode: Peak

Polarity: Horizontal

Agilent 03:42:58 Dec 17, 2011

R T

Mkr1 2.402 2 GHz  
92.59 dBµV



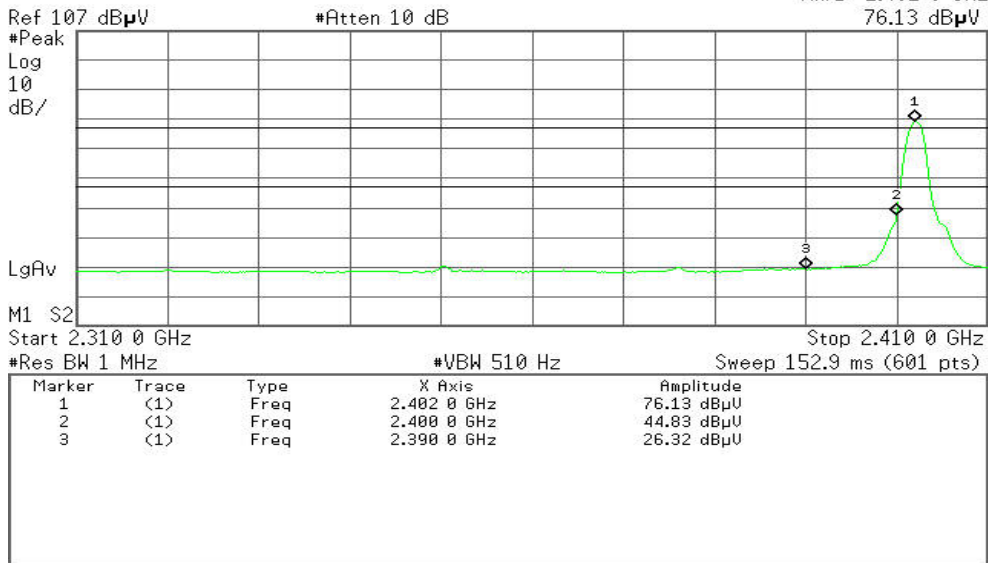
Detector mode: Average

Polarity: Horizontal

Agilent 03:44:12 Dec 17, 2011

R T

Mkr1 2.402 0 GHz  
76.13 dBµV





Band Edges (CH-High)

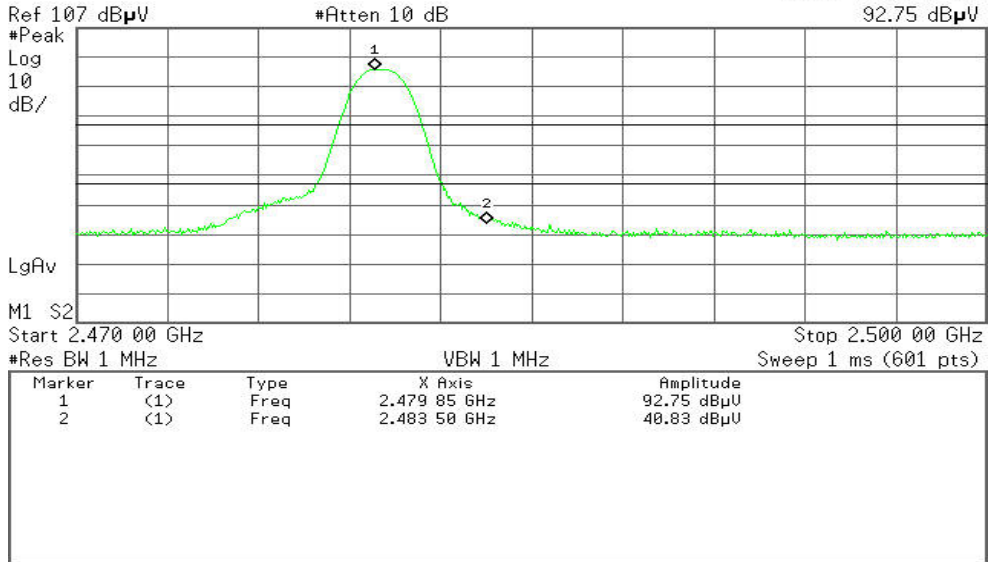
Detector mode: Peak

Polarity: Vertical

Agilent 04:11:02 Dec 17, 2011

R T

Mkr1 2.479 85 GHz  
92.75 dBµV



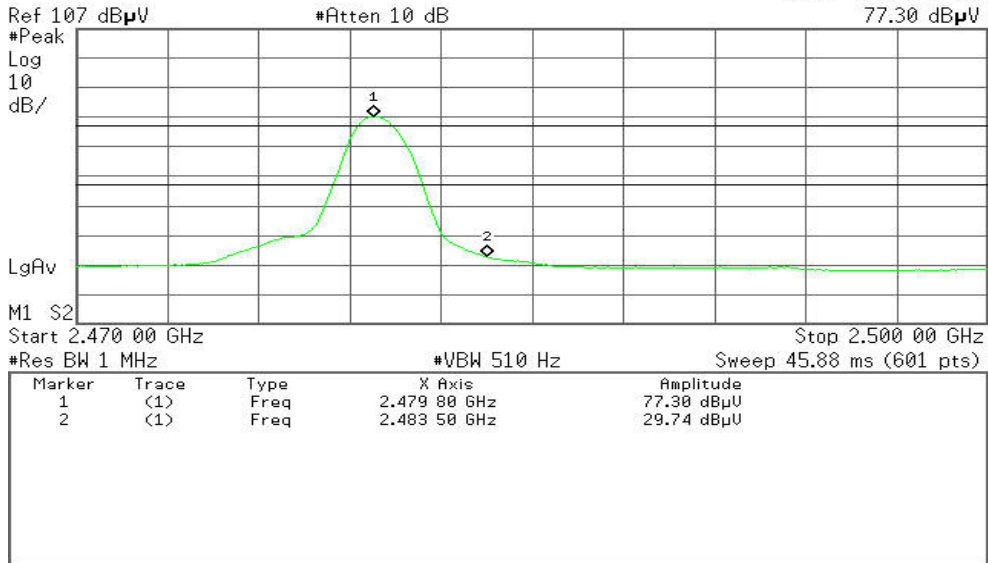
Detector mode: Average

Polarity: Vertical

Agilent 04:11:55 Dec 17, 2011

R T

Mkr1 2.479 80 GHz  
77.30 dBµV





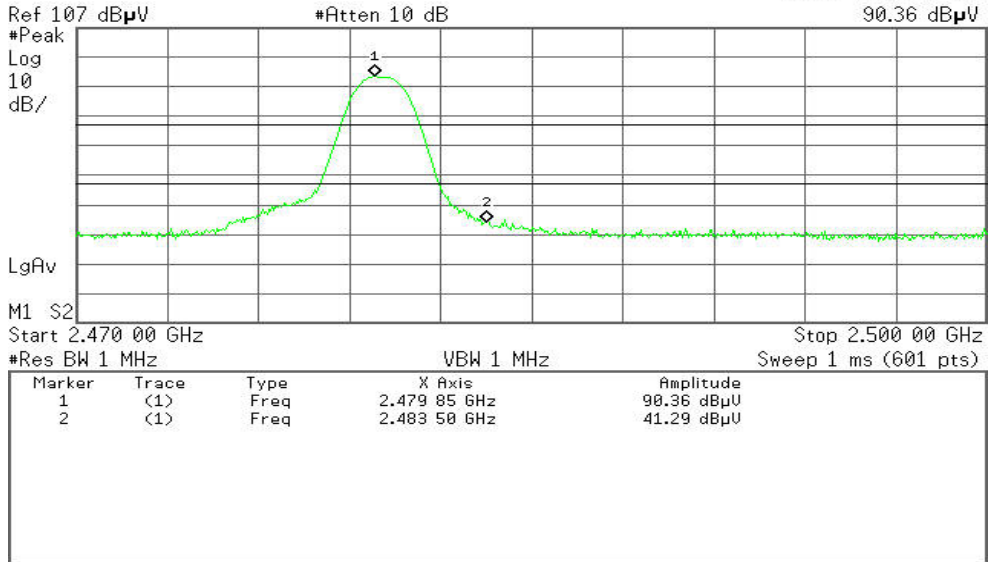
Detector mode: Peak

Polarity: Horizontal

Agilent 04:06:48 Dec 17, 2011

R T

Mkr1 2.479 85 GHz  
90.36 dBµV



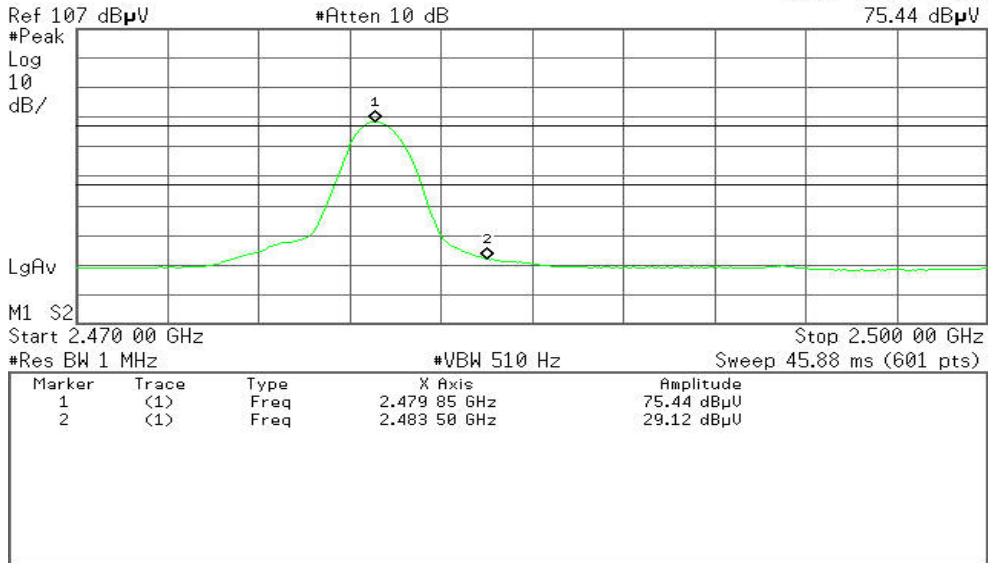
Detector mode: Average

Polarity: Horizontal

Agilent 04:07:36 Dec 17, 2011

R T

Mkr1 2.479 85 GHz  
75.44 dBµV





Test Data ( 8DPSK )

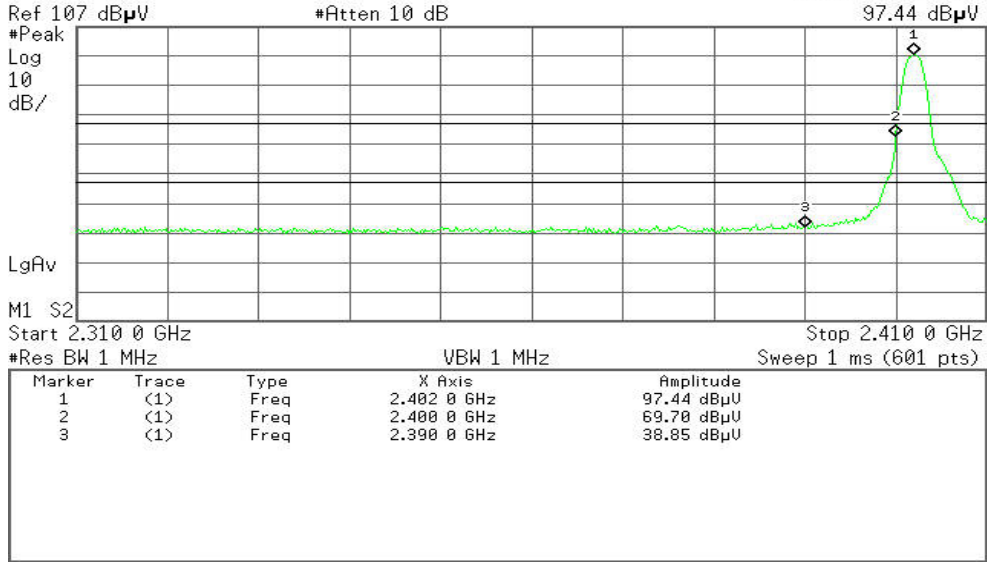
Band Edges (CH-Low)

Detector mode: Peak

Polarity: Vertical

Agilent 03:51:43 Dec 17, 2011

R T

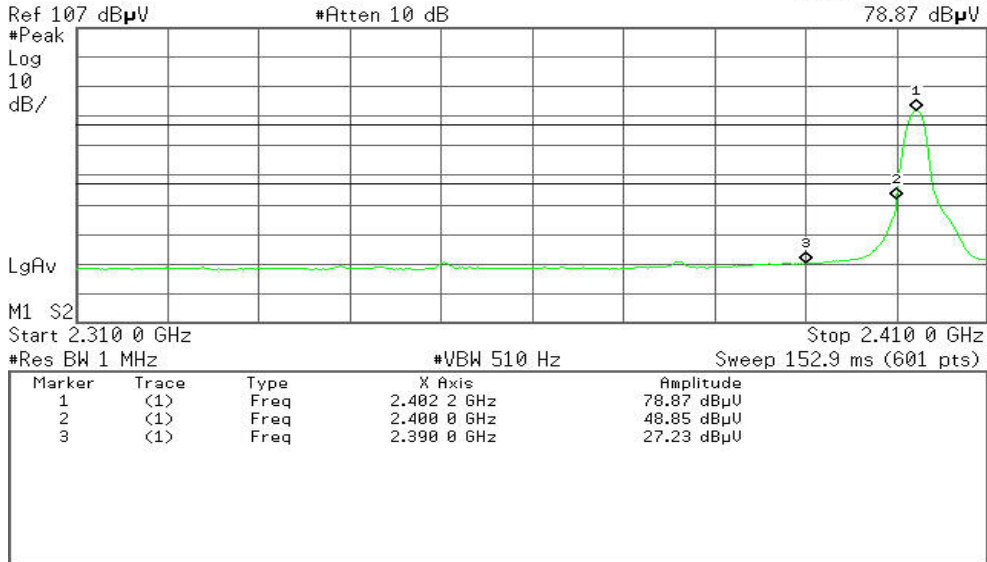


Detector mode: Average

Polarity: Vertical

Agilent 03:52:34 Dec 17, 2011

R T





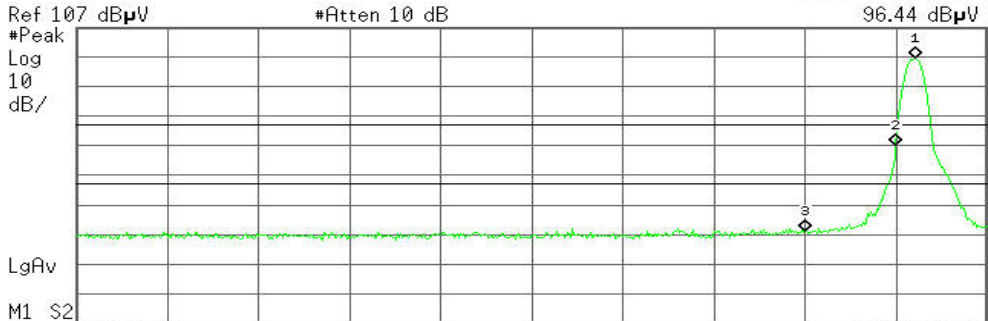
Detector mode: Peak

Polarity: Horizontal

Agilent 03:47:45 Dec 17, 2011

R T

Mkr1 2.402 2 GHz  
96.44 dBµV



Start 2.310 0 GHz Stop 2.410 0 GHz  
#Res BW 1 MHz #VBW 1 MHz Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.402 2 GHz	96.44 dBµU
2	(1)	Freq	2.400 0 GHz	66.99 dBµU
3	(1)	Freq	2.390 0 GHz	37.97 dBµU

Detector mode: Average

Polarity: Horizontal

Agilent 03:48:44 Dec 17, 2011

R T

Mkr1 2.402 0 GHz  
77.88 dBµV



Start 2.310 0 GHz Stop 2.410 0 GHz  
#Res BW 1 MHz #VBW 510 Hz Sweep 152.9 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.402 0 GHz	77.88 dBµU
2	(1)	Freq	2.400 0 GHz	48.42 dBµU
3	(1)	Freq	2.390 0 GHz	26.76 dBµU





Band Edges (CH-High)

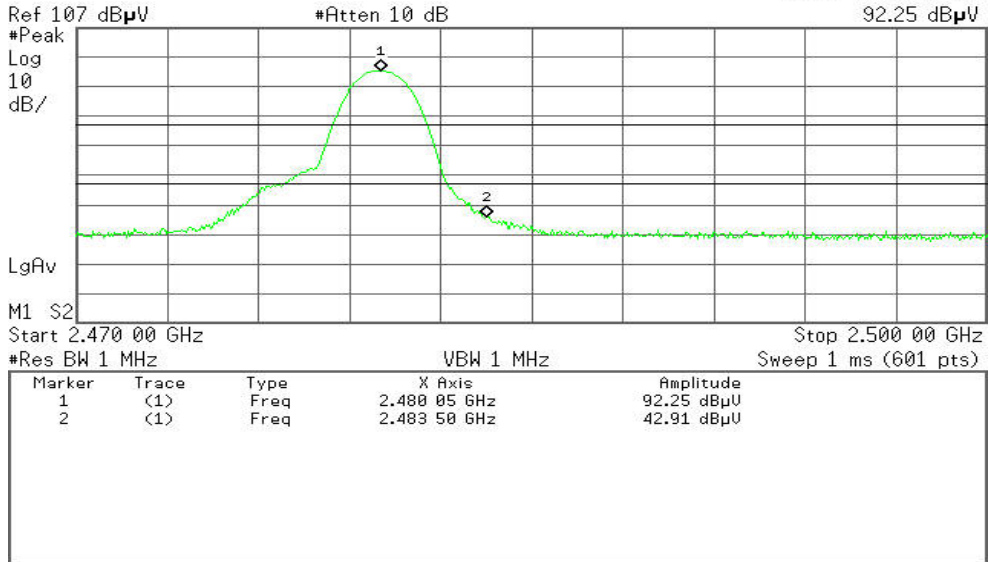
Detector mode: Peak

Polarity: Vertical

Agilent 03:58:23 Dec 17, 2011

R T

Mkr1 2.480 05 GHz  
92.25 dBµV



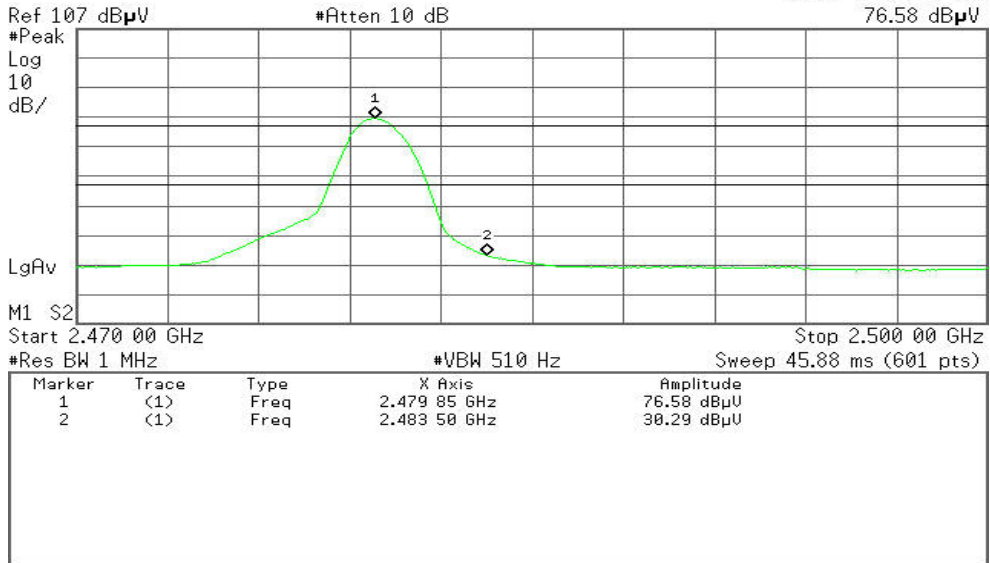
Detector mode: Average

Polarity: Vertical

Agilent 03:59:05 Dec 17, 2011

R T

Mkr1 2.479 85 GHz  
76.58 dBµV





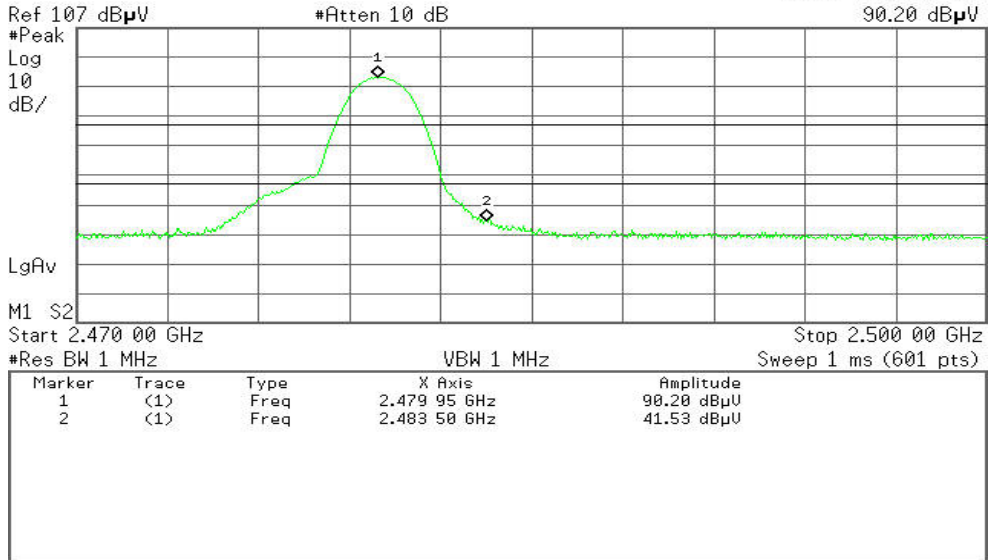
Detector mode: Peak

Polarity: Horizontal

Agilent 04:02:46 Dec 17, 2011

R T

Mkr1 2.479 95 GHz  
90.20 dBµV



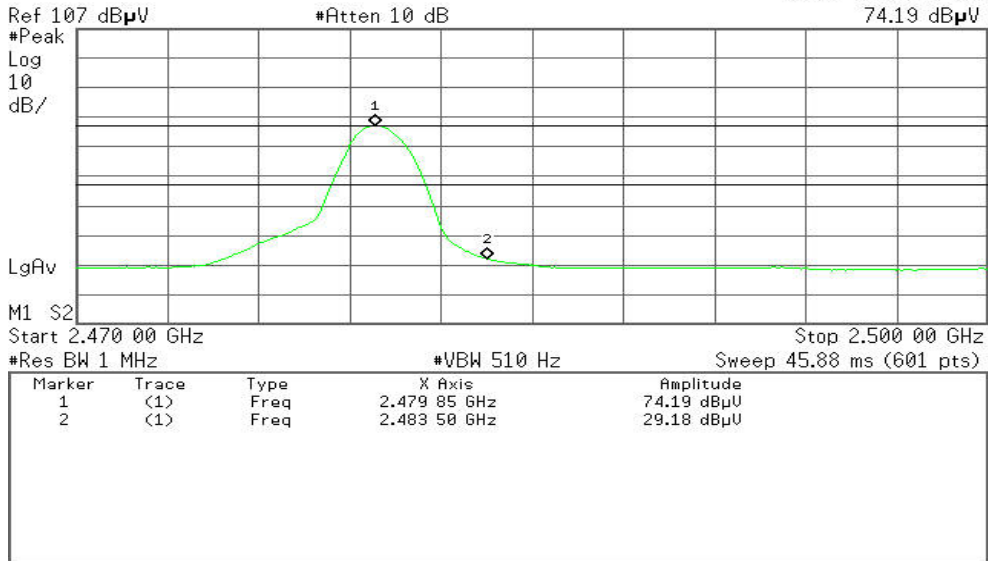
Detector mode: Average

Polarity: Horizontal

Agilent 04:03:29 Dec 17, 2011

R T

Mkr1 2.479 85 GHz  
74.19 dBµV





### 6.5 FREQUENCY SEPARATION

#### LIMIT

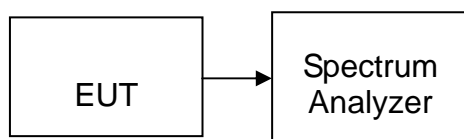
According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

#### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012
Spectrum Analyzer	R&S	FSP30	1093.4495.30	07/22/2011	07/22/2012

*Remark: Each piece of equipment is scheduled for calibration once a year.*

#### Test Configuration



#### TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = middle of hopping channel.
4. Set the spectrum analyzer as RBW=30kHz, VBW=30kHz, Adjust Span to 4 MHz, Sweep = auto.
5. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

#### TEST RESULTS

*No non-compliance noted*

#### Test Data

##### GFSK

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.000	556.899	> Two-thirds of the 20 dB Bandwidth	Pass

##### 8DPSK

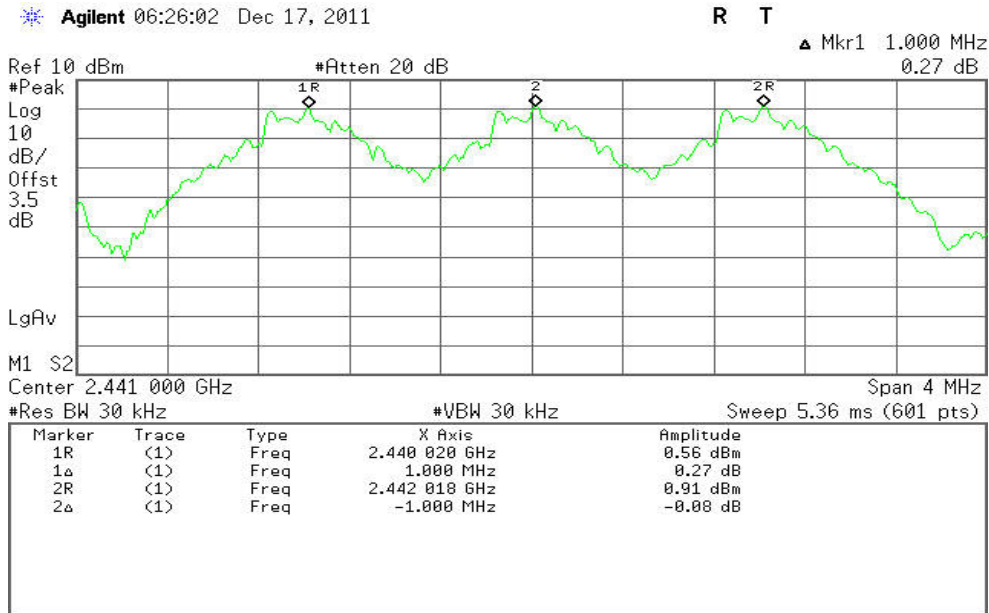
Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.000	803.333	> Two-thirds of the 20 dB Bandwidth	Pass



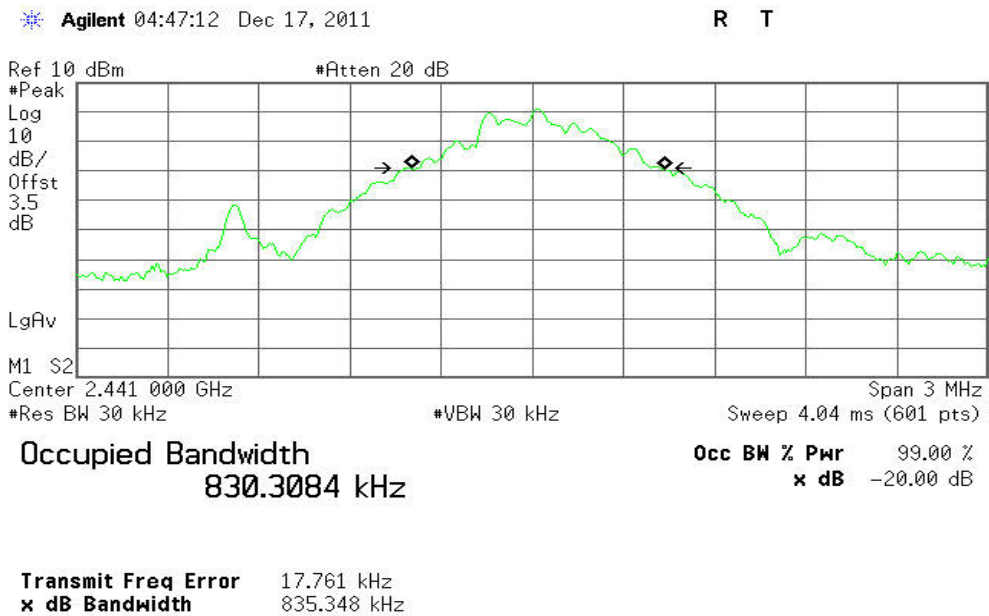
**GFSK**

**Test Plot**

**Measurement of Channel Separation**



**20 dB bandwidth(CH Mid)**

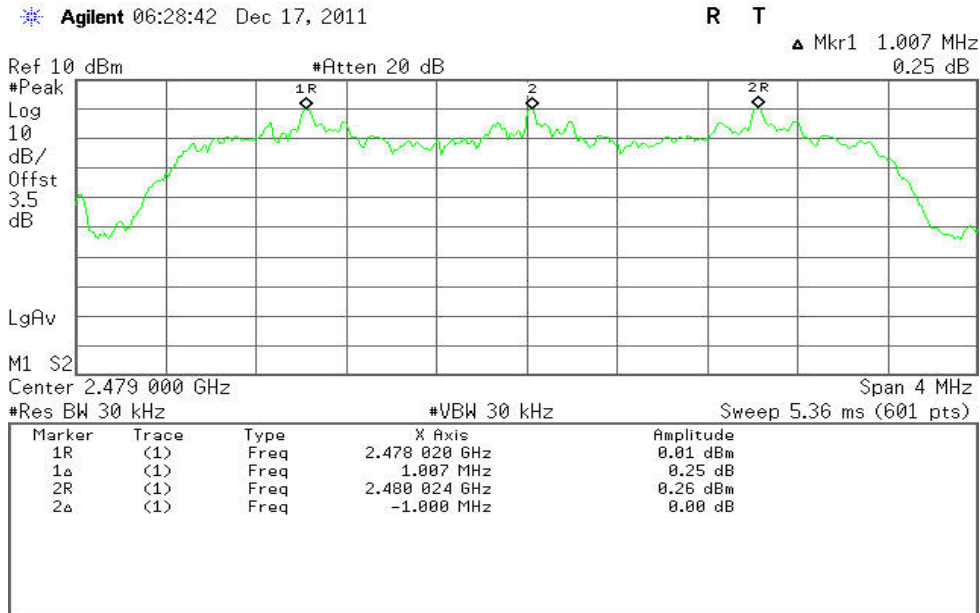




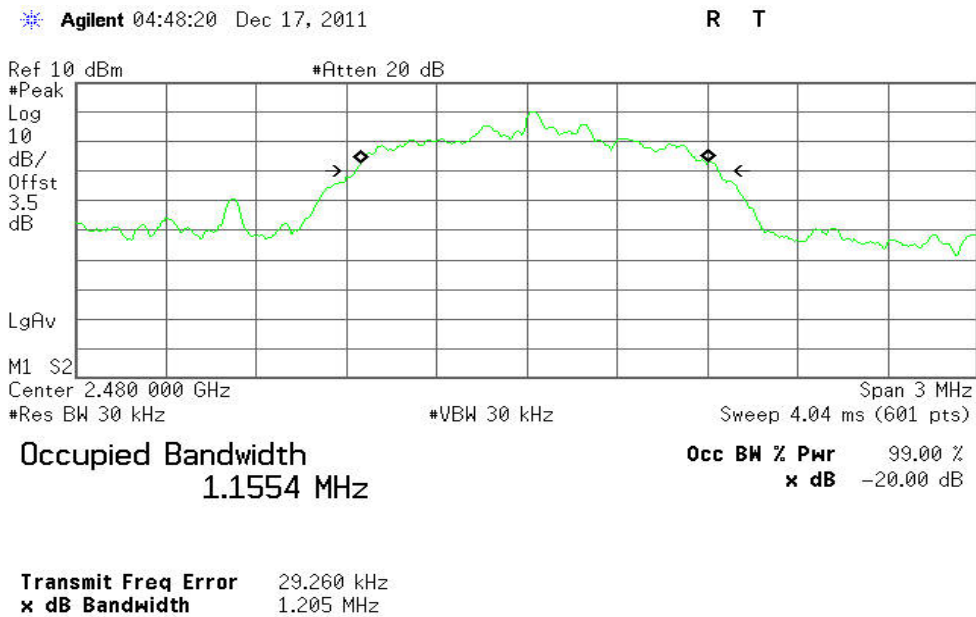
**8DPSK**

**Test Plot**

**Measurement of Channel Separation**



**20 dB bandwidth(CH High)**





### 6.6 NUMBER OF HOPPING FREQUENCY

#### LIMIT

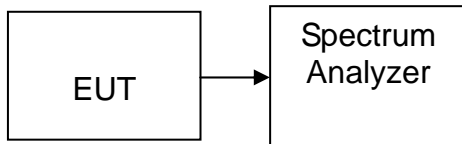
According to §15.247(a)(1)(ii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

#### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012

*Remark: Each piece of equipment is scheduled for calibration once a year.*

#### Test Configuration



#### TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set spectrum analyzer Start=2400MHz, Stop = 2441.5MHz, Sweep = 1ms and Start=2441.5MHz, Stop = 2483MHz, Sweep = 1ms.
4. Set the spectrum analyzer as RBW, VBW=300kHz,
5. Max hold, view and count how many channel in the band.

#### TEST RESULTS

*No non-compliance noted*

#### Test Data

Result (No. of CH)	Limit (No. of CH)	Result
79	>15	PASS



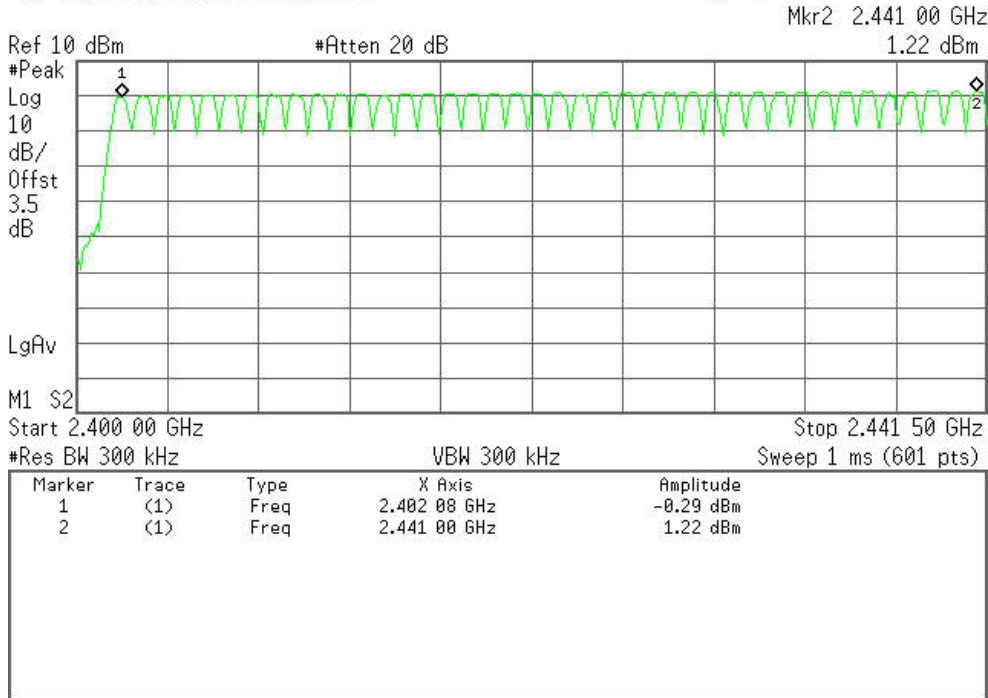
Test Plot ( GFSK )

Channel Number

2.4000 GHz – 2.4415 GHz

Agilent 06:14:22 Dec 17, 2011

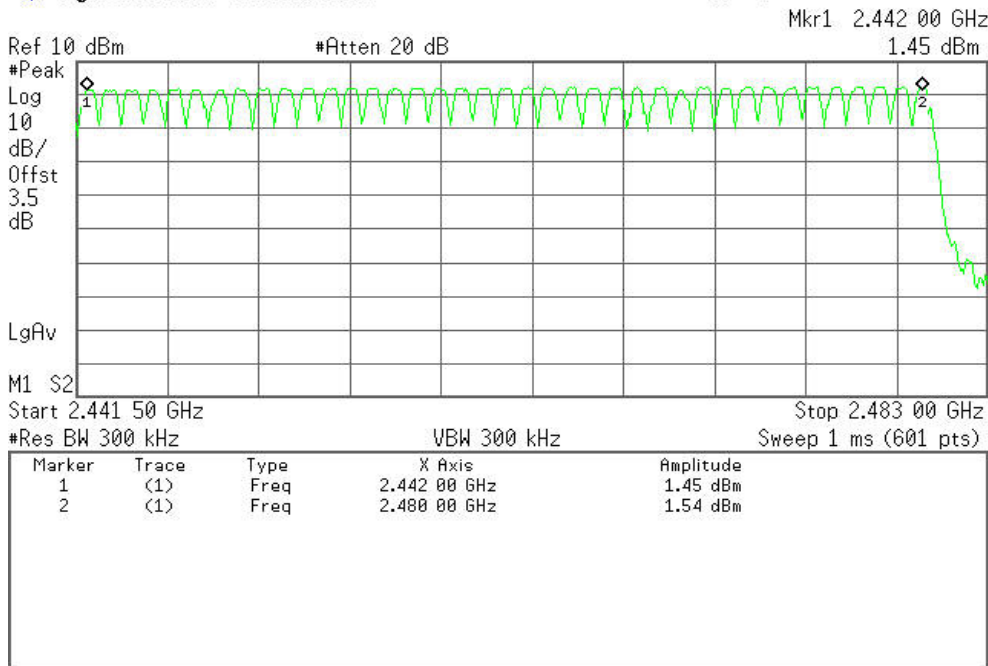
R T



2.4415 GHz –2.4830 GHz

Agilent 06:20:23 Dec 17, 2011

R T







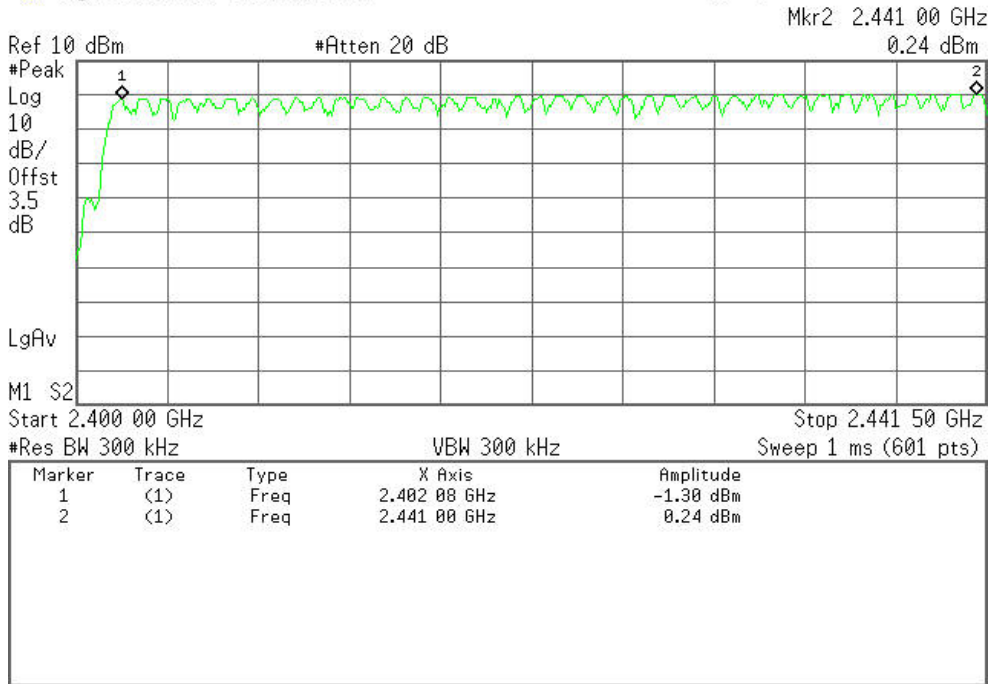
Test Plot (8DPSK )

Channel Number

2.4000 GHz – 2.4415 GHz

Agilent 06:16:10 Dec 17, 2011

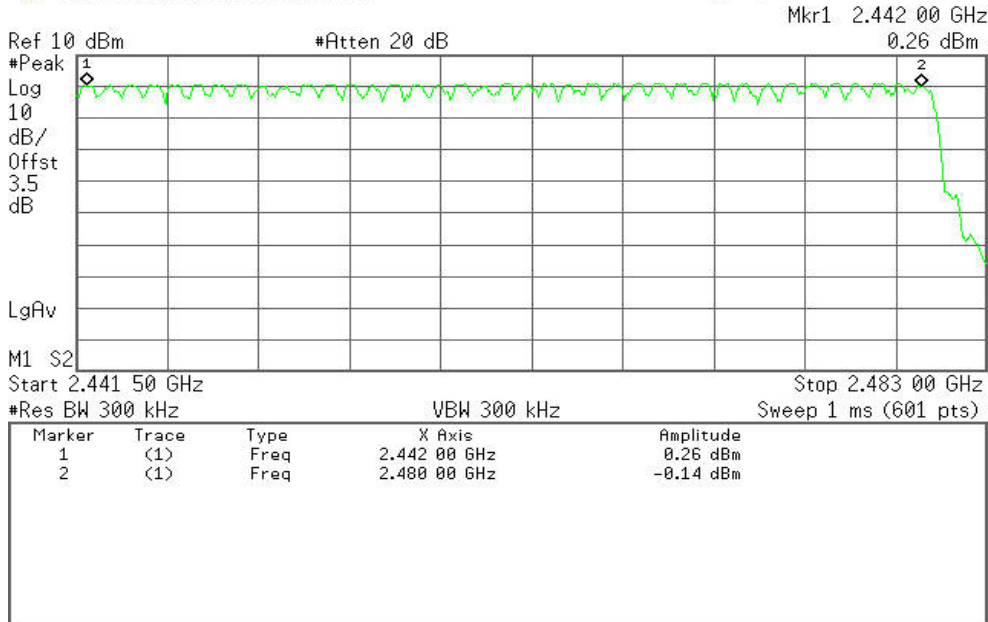
R T



2.4415 GHz –2.4830 GHz

Agilent 06:19:12 Dec 17, 2011

R T







## 6.7 TIME OF OCCUPANCY (DWELL TIME)

### LIMIT

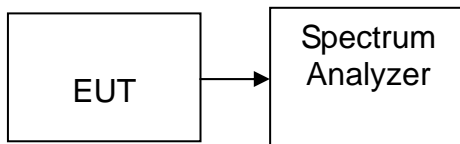
According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012

*Remark: Each piece of equipment is scheduled for calibration once a year.*

### Test Configuration



### TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.
5. Repeat above procedures until all frequency measured were complete.



**TEST RESULTS**

*No non-compliance noted*

**Test Data**

**GFSK**

**DH 1**

CH Mid:  $0.505 * (1600/2)/79 * 31.6 = 161.600$  (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Mid	0.505	161.600	31.60	400.00	PASS

**DH 3**

CH Mid:  $1.755 * (1600/4)/79 * 31.6 = 280.800$  (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Mid	1.755	280.800	31.60	400.00	PASS

**DH 5**

CH Mid:  $3.008 * (1600/6)/79 * 31.6 = 320.853$  (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Mid	3.008	320.853	31.60	400.00	PASS



**Test Data**

**8DPSK**

**DH 1**

CH Mid:  $0.517 * (1600/2)/79 * 31.6 = 165.440$  (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Mid	0.517	165.440	31.60	400.00	PASS

**DH 3**

CH Mid:  $1.770 * (1600/4)/79 * 31.6 = 283.200$  (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Mid	1.770	283.200	31.60	400.00	PASS

**DH 5**

CH Mid:  $3.000 * (1600/6)/79 * 31.6 = 320.000$  (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Mid	3.000	320.000	31.60	400.00	PASS



**Test Plot**

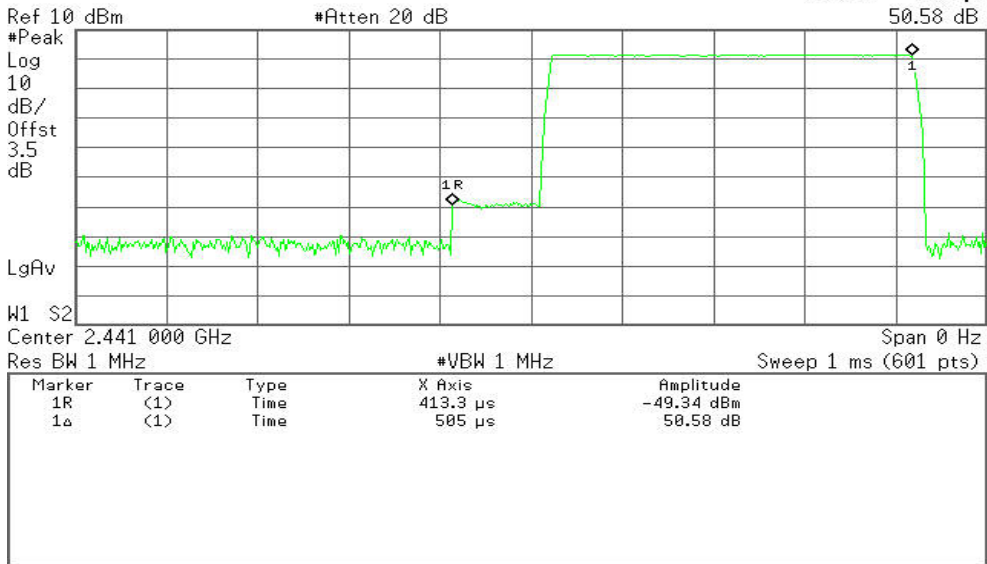
**GFSK**

**DH 1**

**(CH Mid)**

Agilent 06:07:09 Dec 17, 2011

R T

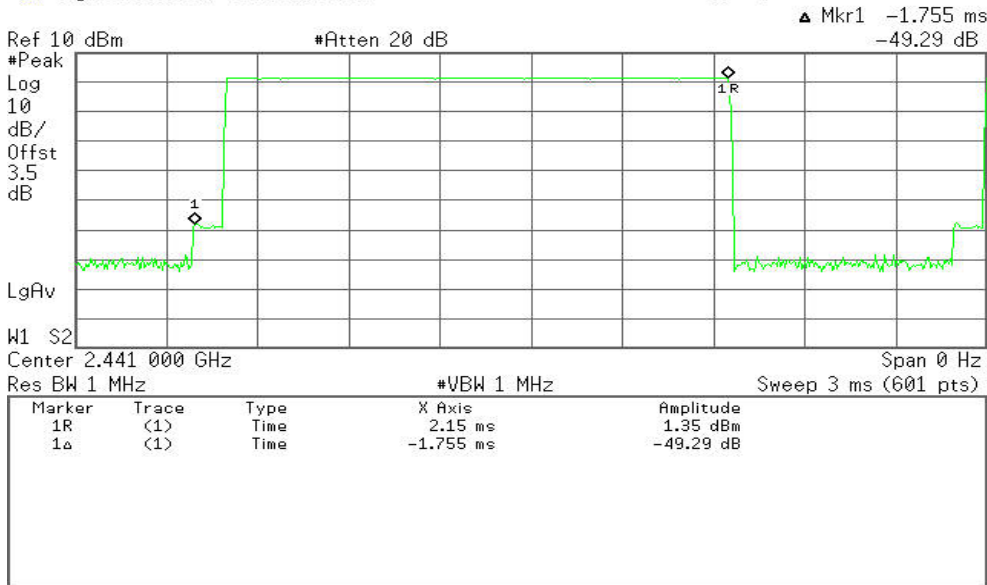


**DH 3**

**(CH Mid)**

Agilent 06:08:07 Dec 17, 2011

R T





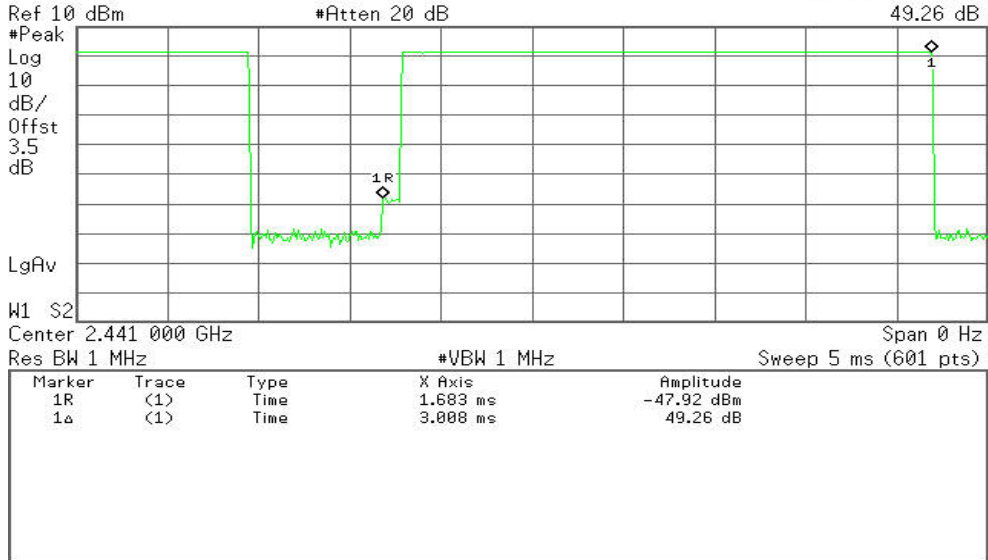
DH 5

(CH Mid)

Agilent 06:08:59 Dec 17, 2011

R T

Mkr1 3.008 ms 49.26 dB





8DPSK Test Plot

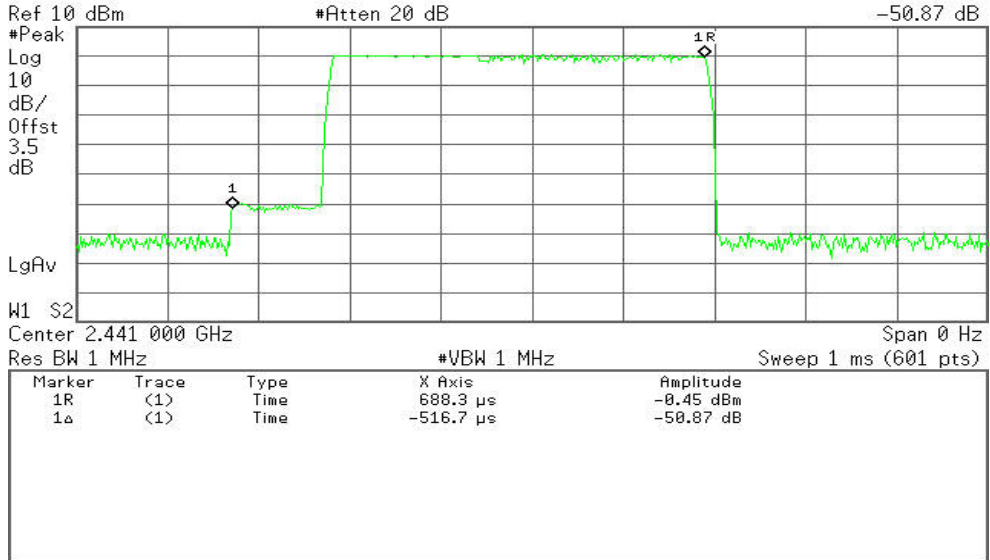
DH 1

(CH Mid)

Agilent 06:10:24 Dec 17, 2011

R T

Mkr1 -516.7 μs -50.87 dB



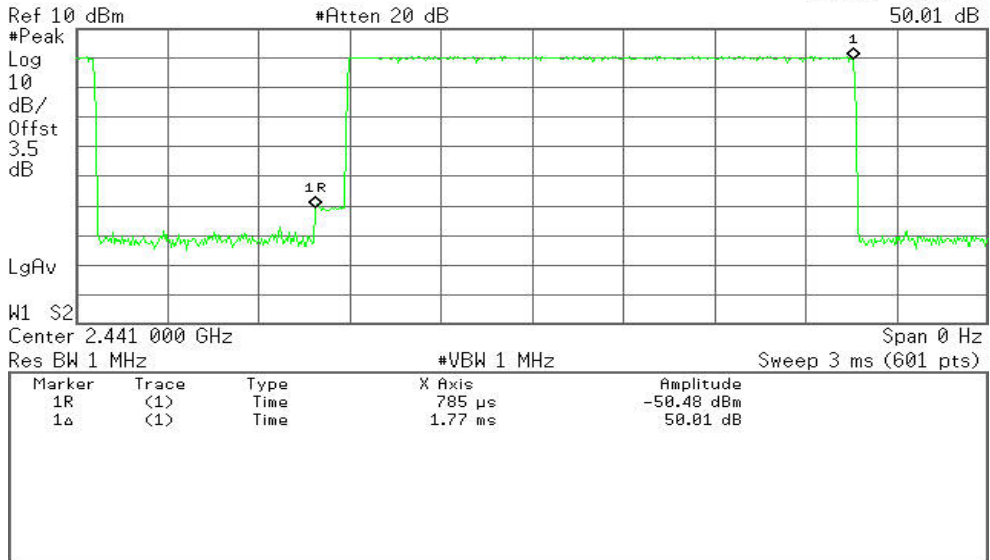
DH 3

(CH Mid)

Agilent 06:11:04 Dec 17, 2011

R T

Mkr1 1.77 ms 50.01 dB





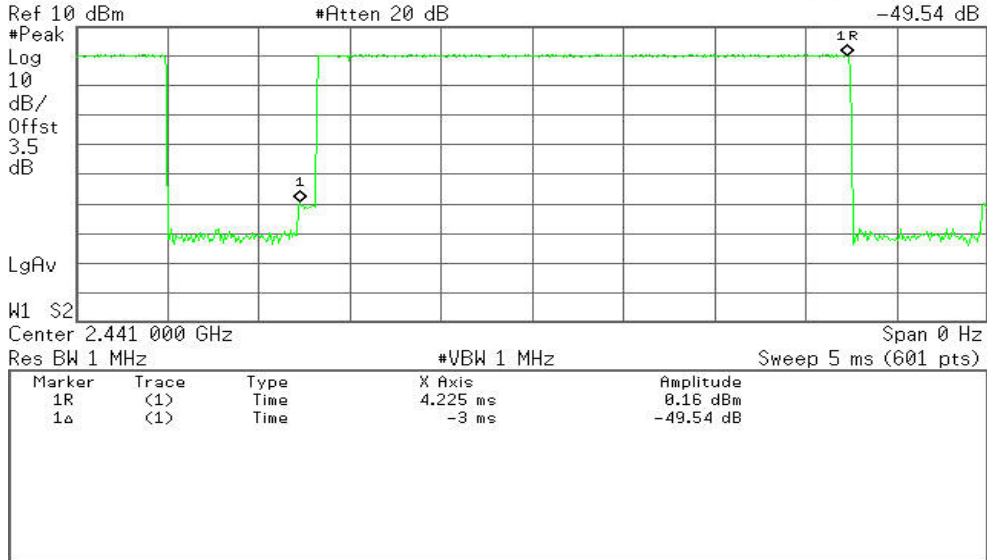
DH 5

(CH Mid)

Agilent 06:11:42 Dec 17, 2011

R T

Mkr1 -3 ms  
-49.54 dB





## 6.8 SPURIOUS EMISSIONS

### 6.8.1. Conducted Measurement

#### LIMIT

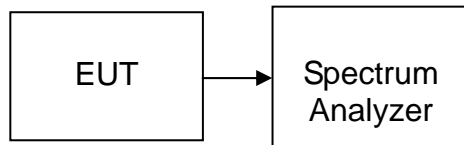
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. 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)).

#### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012

*Remark: Each piece of equipment is scheduled for calibration once a year.*

#### Test Configuration



#### TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

#### TEST RESULTS

*No non-compliance noted*





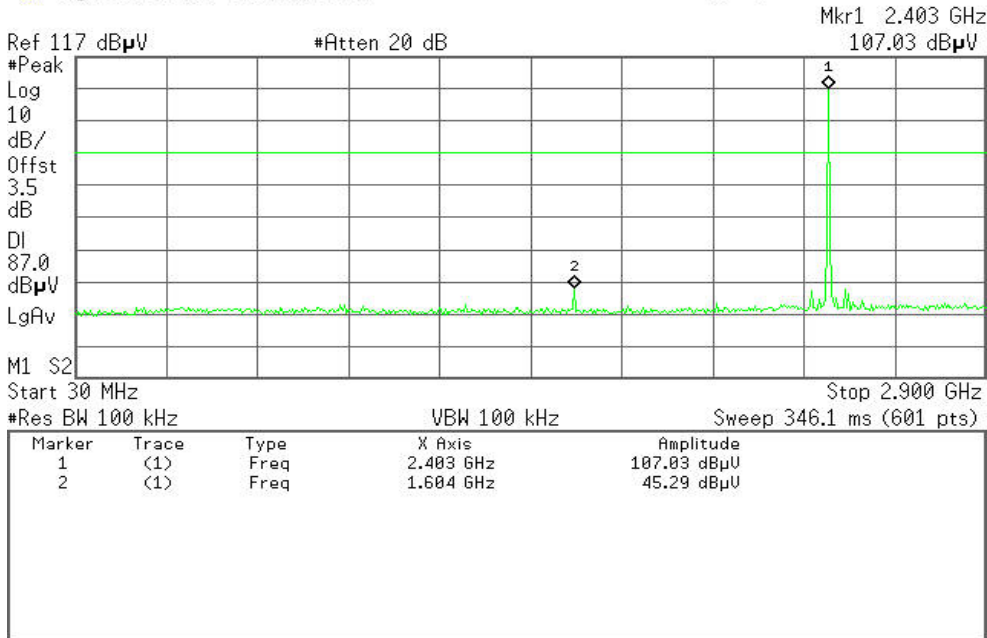
Test Plot ( GFSK )

CH Low

30MHz ~2.9GHz

Agilent 04:23:10 Dec 17, 2011

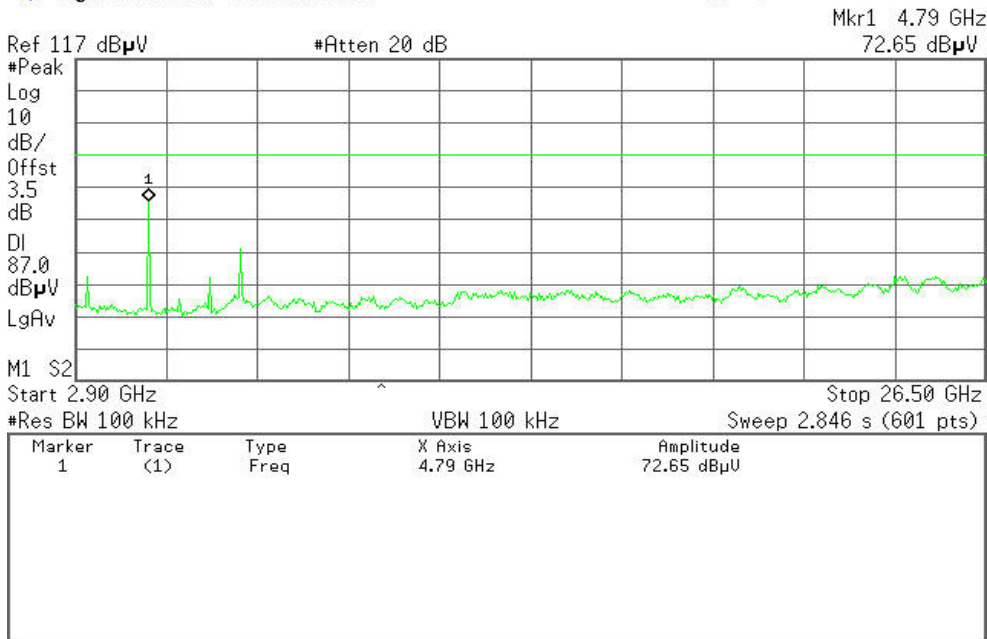
R T



2.9MHz ~26.5GHz

Agilent 04:23:57 Dec 17, 2011

R T



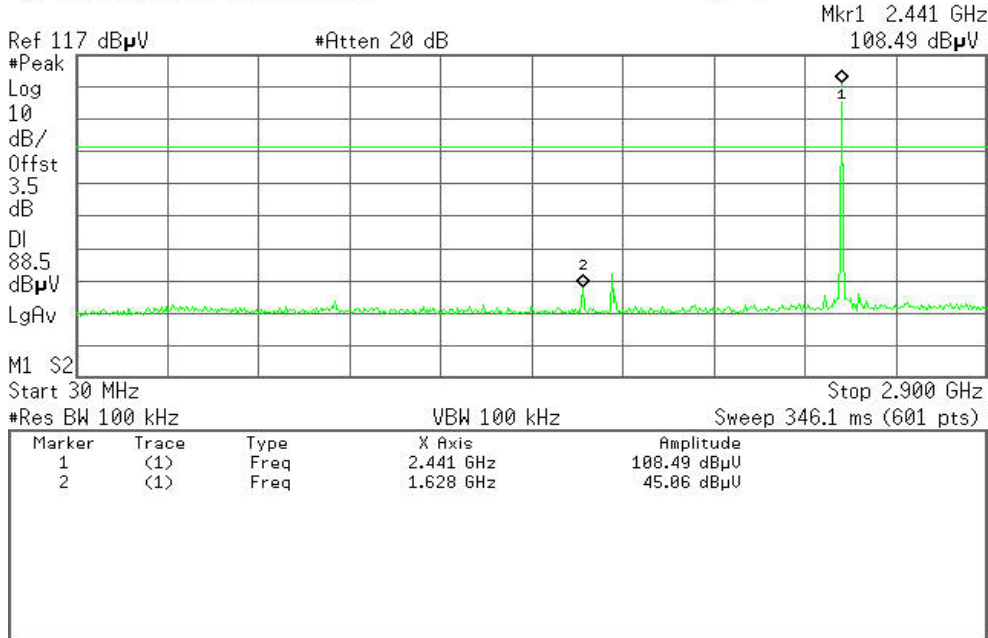


**CH Mid**

**30MHz ~ 2.9GHz**

Agilent 04:31:45 Dec 17, 2011

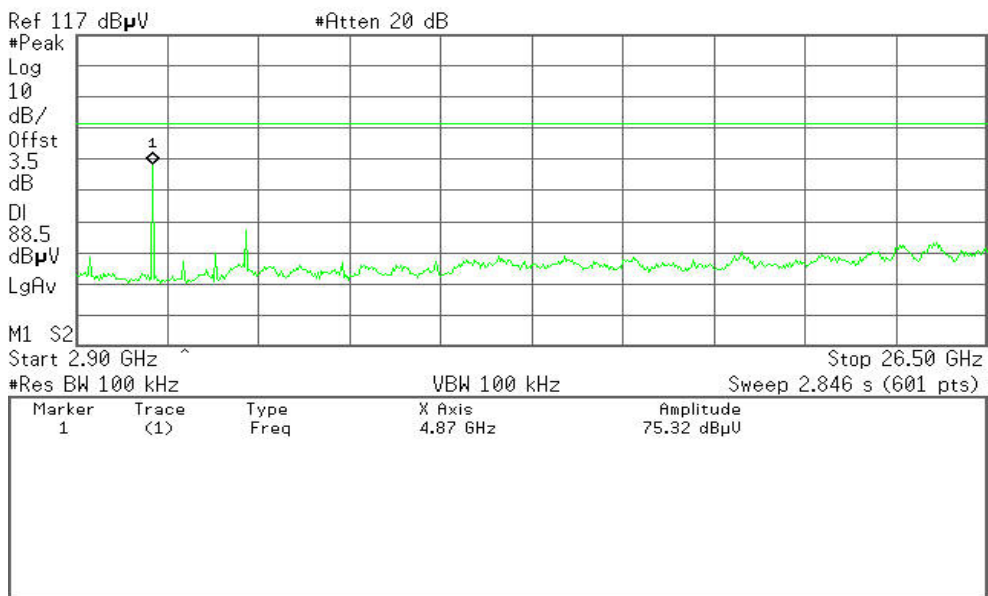
R T



**2.9GHz ~ 26.5GHz**

Agilent 04:32:24 Dec 17, 2011

R T



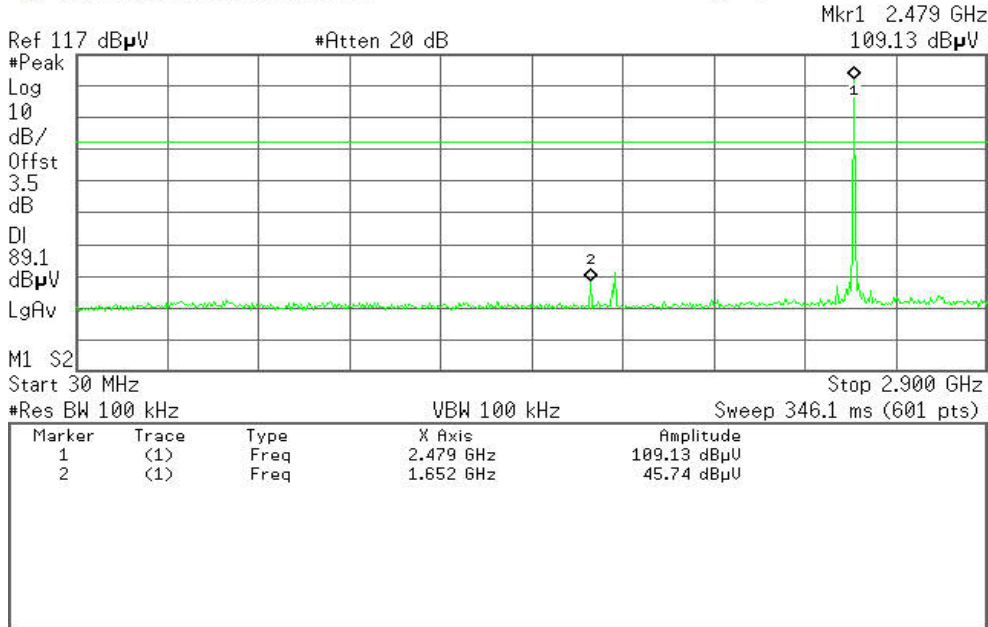


**CH High**

**30MHz ~ 2.9GHz**

Agilent 04:33:32 Dec 17, 2011

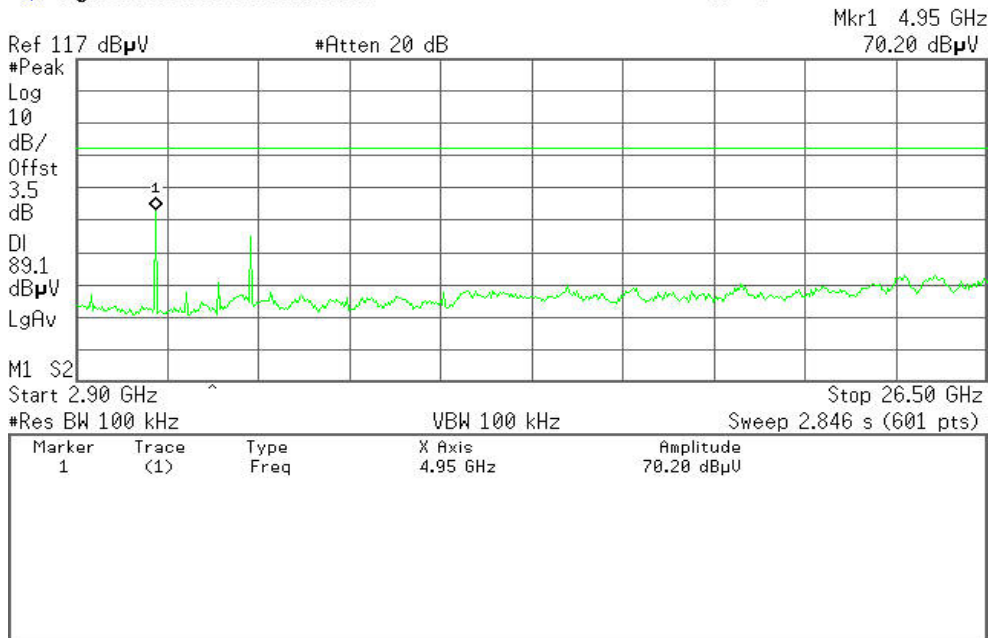
R T



**2.9GHz ~ 26.5GHz**

Agilent 04:34:42 Dec 17, 2011

R T





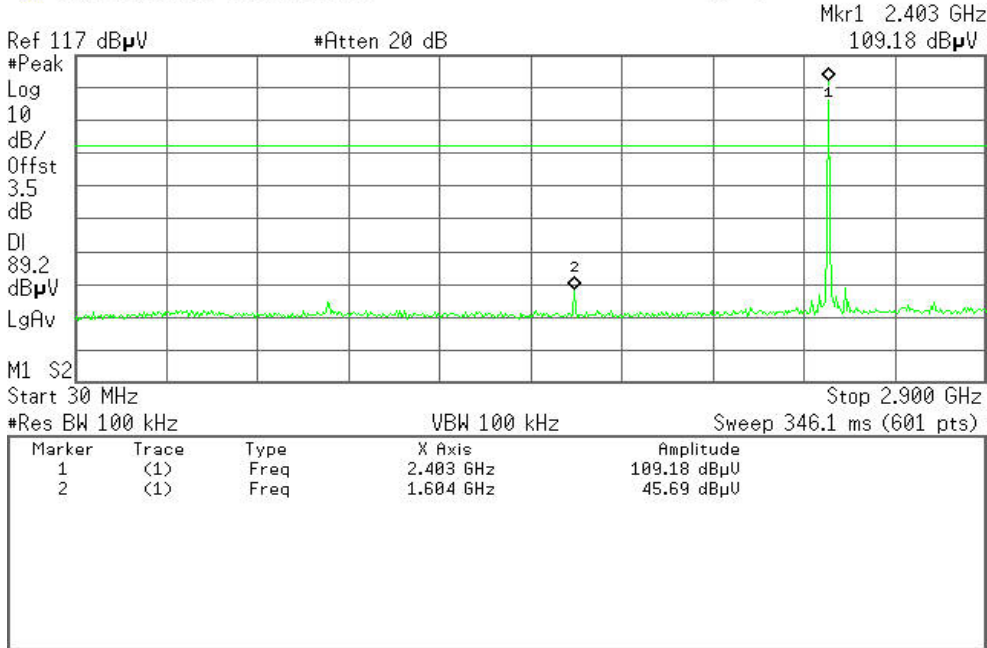
**Test Plot (8DPSK )**

**CH Low**

**30MHz ~2.9GHz**

Agilent 04:39:17 Dec 17, 2011

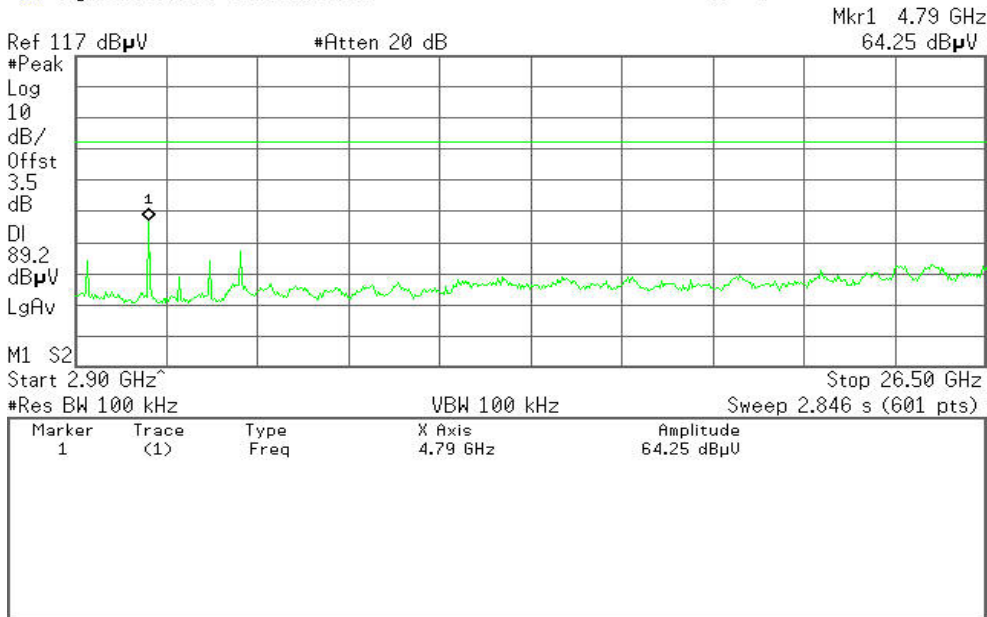
R T



**2.9MHz ~26.5GHz**

Agilent 04:40:10 Dec 17, 2011

R T



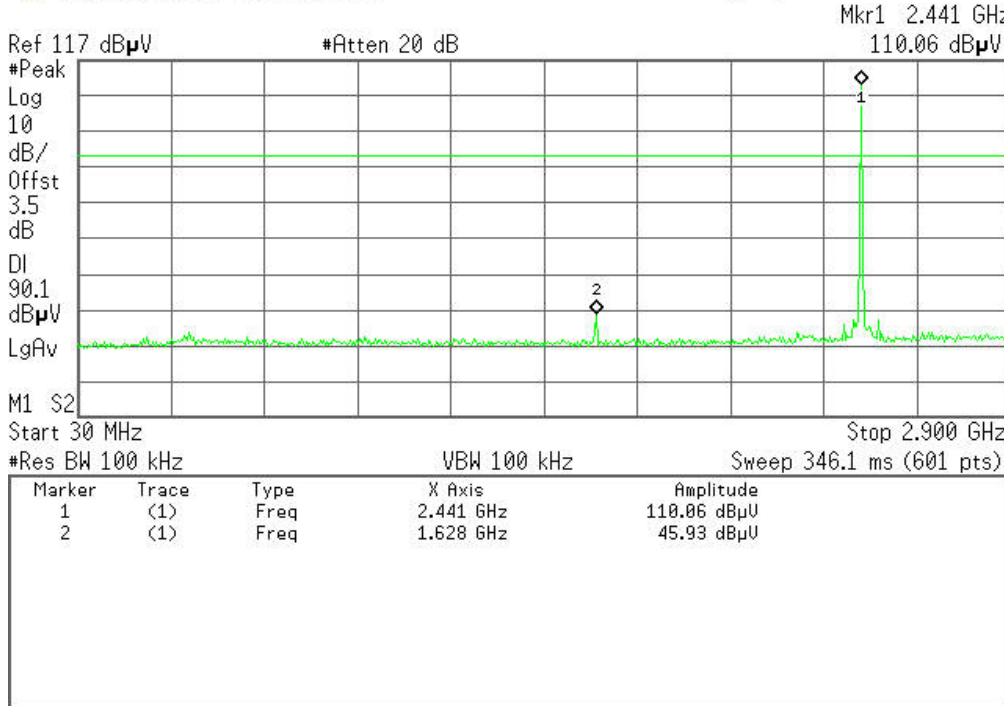


**CH Mid**

**30MHz ~ 2.9GHz**

Agilent 04:41:26 Dec 17, 2011

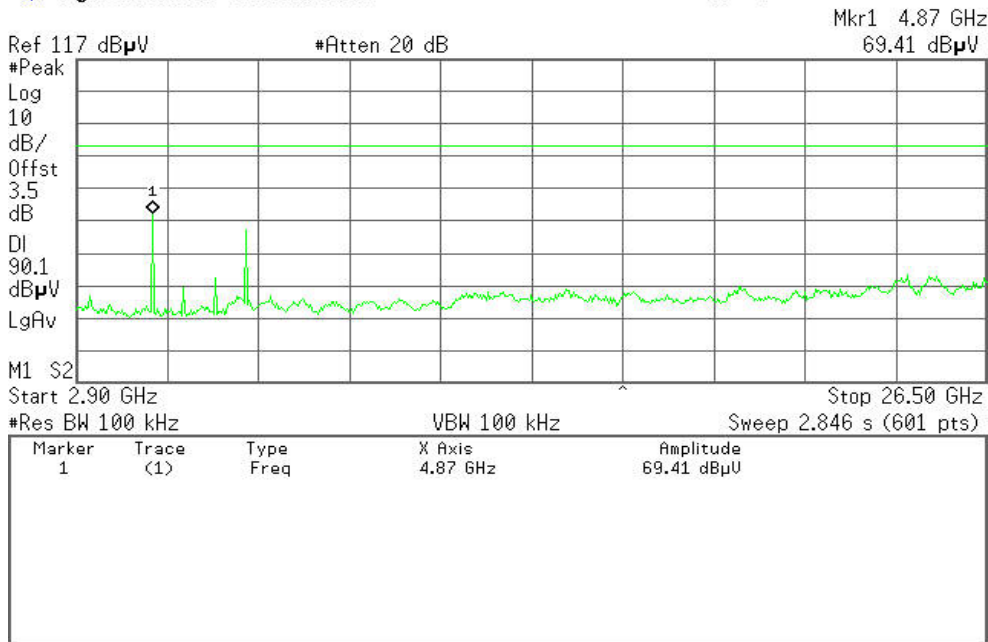
R T



**2.9GHz ~ 26.5GHz**

Agilent 04:42:03 Dec 17, 2011

R T



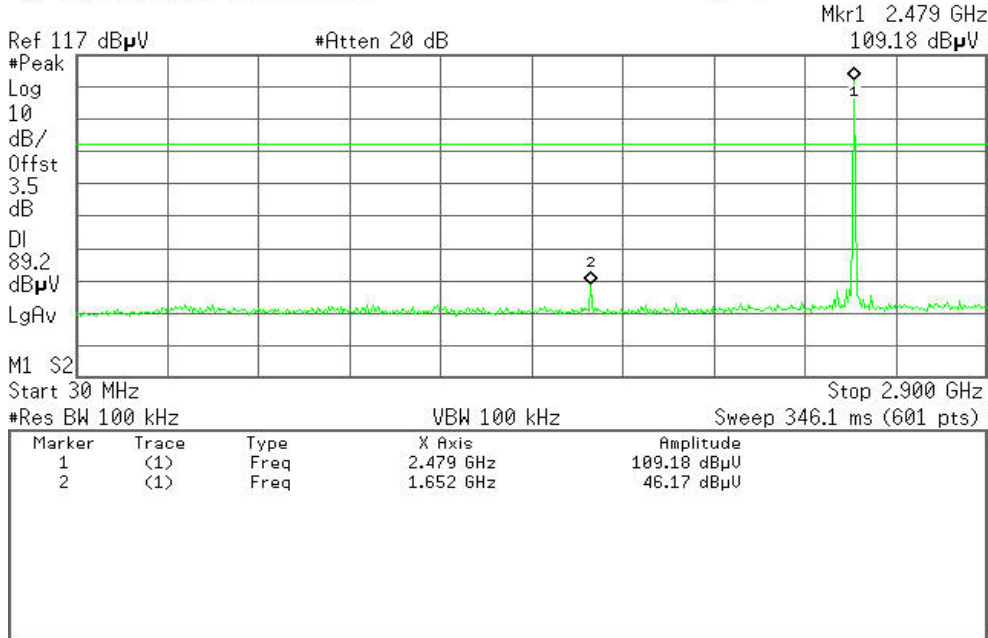


CH High

30MHz ~ 2.9GHz

Agilent 04:42:57 Dec 17, 2011

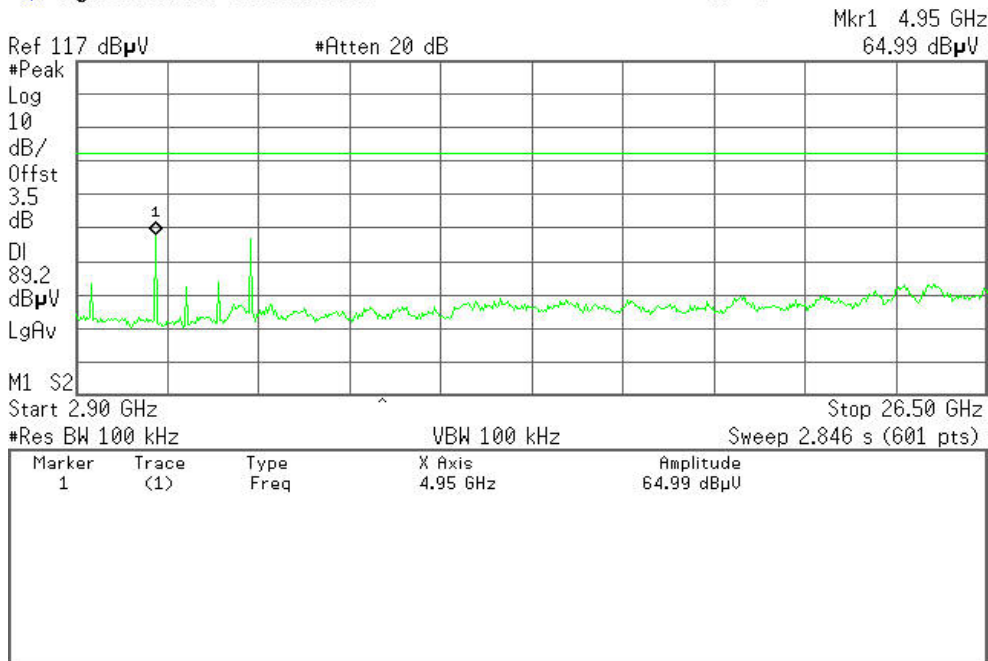
R T



2.9GHz ~ 26.5GHz

Agilent 04:43:50 Dec 17, 2011

R T





### 6.8.2. Radiated Emissions

#### LIMIT

1. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

**Note:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

2. In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength ( $\mu$ V/m at 3-meter)	Field Strength (dB $\mu$ V/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54



**MEASUREMENT EQUIPMENT USED**

Radiated Emission Test Site 966 (2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012
Amplifier	MITEQ	AM-1604-3000	1411843	03/18/2011	03/18/2012
Turn Table	EMCO	2081-1.21	N/A	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2011	03/18/2012
Bilog Antenna	SCHAFFNER	CBL6143	5082	06/03/2011	06/03/2012
Horn Antenna	SCHWARZBECK	BBHA9120D	D286	03/19/2011	03/19/2012
Loop Antenna	A、R、A	PLA-1030/B	1029	03/19/2011	03/19/2012
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/31/2011	03/31/2012
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

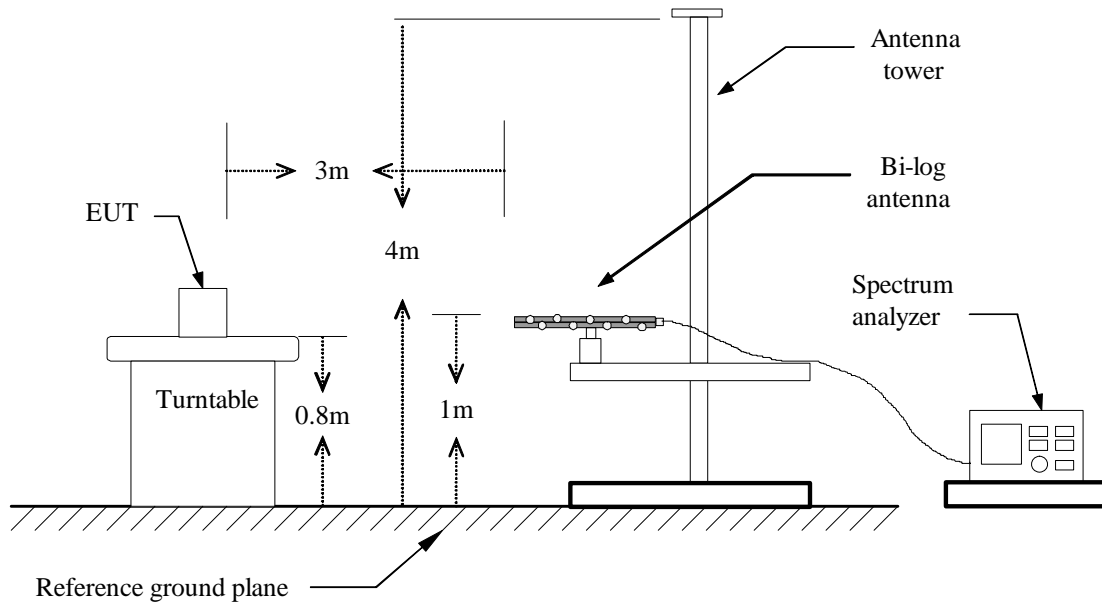
**Remark:** Each piece of equipment is scheduled for calibration once a year.



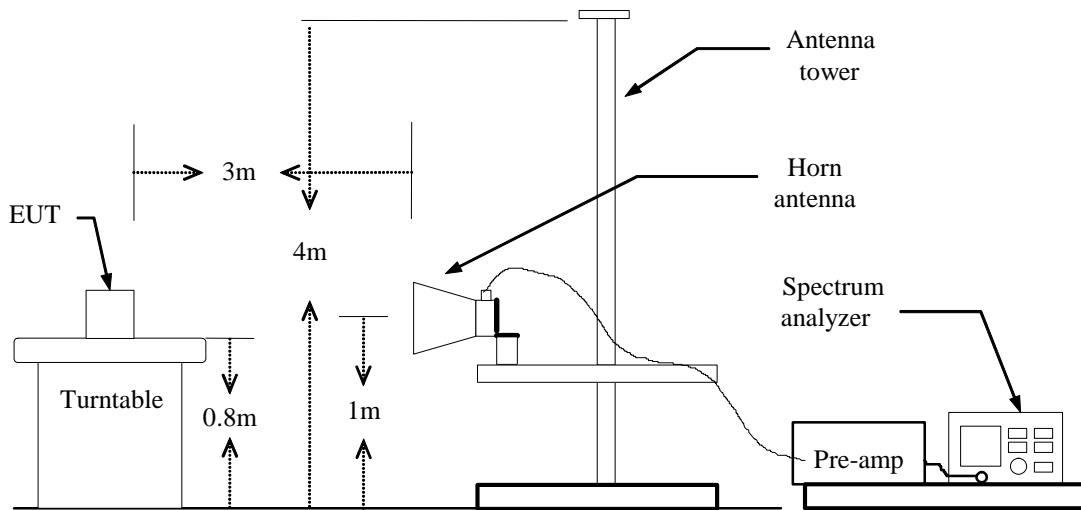


**Test Configuration**

**Below 1 GHz**



**Above 1 GHz**





## **TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.



TEST RESULTS

Below 1 GHz

Operation Mode: TX

Test Date: January 6, 2012

Temperature: 24°C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Table with 8 columns: Frequency (MHz), Reading (dBµV), Correction Factor (dB/m), Result (dBµV/m), Limit (dBµV/m), Margin (dB), Antenna Pole (V/H), Remark. It contains 15 rows of test data.

\*\*Remark: No emission found between lowest internal used/generated frequency to 30MHz.

Notes:

- 1. Measuring frequencies from 9kHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30MHz to 1GHz were made with an instrument using Peak/Quasi-peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.
5. Frequency (MHz) = Emission frequency in MHz
Reading (dBUV) = Receiver reading
Correction Factor(dB/m) = Antenna factor + Cable loss - Amplifier gain
Actual FS (dBUV/m) = Reading (dBUV) + Corr. Factor (dB/m)
Limit (dBUV/m) = Limit stated in standard
Margin(dB) = Measured (dBUV/m) - Limits (dBUV/m)
Antenna Pole(V/H) = Current carrying line of reading



**Above 1 GHz**

**GFSK**

**Operation Mode:**

TX(CH Low)

**Test Date:** January 5, 2012

**Temperature:** 24°C

**Tested by:** Sunday Hu

**Humidity:** 52% RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1058.3333	52.36	-11.79	40.57	74.00	-33.43	V	Peak
1198.3333	53.56	-11.42	42.14	74.00	-31.86	V	Peak
1466.6667	50.79	-10.29	40.50	74.00	-33.50	V	Peak
1606.6667	51.19	-10.30	40.89	74.00	-33.11	V	Peak
4243.3333	46.02	-2.78	43.24	74.00	-30.76	V	Peak
4803.3333	65.96	-0.64	65.32	74.00	-8.68	V	Peak
4803.3333	46.82	-0.64	46.18	54.00	-7.82	V	AVG
1105.0000	51.63	-11.68	39.95	74.00	-34.05	H	Peak
1595.0000	50.31	-10.31	40.00	74.00	-34.00	H	Peak
3461.6667	45.90	-4.68	41.22	74.00	-32.78	H	Peak
4080.0000	46.33	-3.31	43.02	74.00	-30.98	H	Peak
4803.3333	71.03	-0.64	70.39	74.00	-3.61	H	Peak
4803.3333	50.29	-0.64	49.65	54.00	-4.35	H	AVG
7230.0000	45.50	5.04	50.54	74.00	-23.46	H	Peak

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.
5. Frequency (MHz) = Emission frequency in MHz  
 Reading (dBuV/m) =Uncorrected Analyzer / Receiver Reading  
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain  
 Limit (dBuV/m) = Limit stated in standard  
 Margin (dB) = Result (dBuV/m)- Limit (dBuV/m)  
 Pk = Peak Reading  
 AV. = Average Reading  
 Remark = Mark Peak Reading or Average Reading



Operation Mode: TX(CH Mid)

Test Date: January 5, 2012

Temperature: 24°C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1198.3333	53.05	-11.42	41.63	74.00	-32.37	V	Peak
1466.6667	50.09	-10.29	39.80	74.00	-34.20	V	Peak
1595.0000	50.56	-10.31	40.25	74.00	-33.75	V	Peak
2960.0000	47.26	-6.23	41.03	74.00	-32.97	V	Peak
3613.3333	46.18	-3.81	42.37	74.00	-31.63	V	Peak
4885.0000	63.24	-0.38	62.86	74.00	-11.14	V	Peak
4885.0000	41.40	-0.38	41.02	54.00	-12.98	V	AVG
1198.3333	50.99	-11.42	39.57	74.00	-34.43	H	Peak
1350.0000	48.87	-10.57	38.30	74.00	-35.70	H	Peak
2715.0000	48.21	-7.87	40.34	74.00	-33.66	H	Peak
3473.3333	46.12	-4.60	41.52	74.00	-32.48	H	Peak
4185.0000	46.50	-2.98	43.52	74.00	-30.48	H	Peak
4885.0000	65.80	-0.38	65.42	74.00	-8.58	H	Peak
4885.0000	46.97	-0.38	46.59	54.00	-7.41	H	AVG

Notes:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- Spectrum setting:
  - Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.
- Frequency (MHz) = Emission frequency in MHz  
 Reading (dBuV/m) =Uncorrected Analyzer / Receiver Reading  
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain  
 Limit (dBuV/m) = Limit stated in standard  
 Margin (dB) = Result (dBuV/m)- Limit (dBuV/m)  
 Pk = Peak Reading  
 AV. = Average Reading  
 Remark = Mark Peak Reading or Average Reading



Operation Mode: TX(CH High)

Test Date: January 5, 2012

Temperature: 24 °C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1198.3333	52.49	-11.42	41.07	74.00	-32.93	V	Peak
1595.0000	51.31	-10.31	41.00	74.00	-33.00	V	Peak
3018.3333	47.05	-5.92	41.13	74.00	-32.87	V	Peak
3648.3333	46.50	-3.82	42.68	74.00	-31.32	V	Peak
4593.3333	46.57	-1.78	44.79	74.00	-29.21	V	Peak
4955.0000	68.30	-0.15	68.15	74.00	-5.85	V	Peak
4955.0000	47.44	-0.15	47.29	54.00	-6.71	V	AVG
1093.3333	53.67	-11.71	41.96	74.00	-32.04	H	Peak
1653.3333	50.75	-10.26	40.49	74.00	-33.51	H	Peak
2715.0000	48.93	-7.87	41.06	74.00	-32.94	H	Peak
3578.3333	45.98	-3.94	42.04	74.00	-31.96	H	Peak
4476.6667	45.50	-2.07	43.43	74.00	-30.57	H	Peak
4955.0000	63.06	-0.15	62.91	74.00	-11.09	H	Peak
4955.0000	41.21	-0.15	41.06	54.00	-12.94	H	AVG

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.
5. Frequency (MHz) = Emission frequency in MHz  
 Reading (dBuV/m) =Uncorrected Analyzer / Receiver Reading  
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain  
 Limit (dBuV/m) = Limit stated in standard  
 Margin (dB) = Result (dBuV/m)- Limit (dBuV/m)  
 Pk = Peak Reading  
 AV = Average Reading  
 Remark = Mark Peak Reading or Average Reading



8DPSK

Operation Mode:

TX(CH Low)

Test Date: January 6, 2012

Temperature: 24°C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Table with 8 columns: Frequency (MHz), Reading (dBuV), Correction Factor (dB/m), Result (dBuV/m), Limit (dBuV/m), Margin (dB), Antenna Pole (V/H), Remark. It contains two groups of data rows, each with 8 rows.

Notes:

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.
5. Frequency (MHz) = Emission frequency in MHz
Reading (dBuV/m) =Uncorrected Analyzer / Receiver Reading
Correction Factor (dB) = Antenna factor + Cable loss - Amplifier gain
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m)- Limit (dBuV/m)
Pk = Peak Reading
AV. = Average Reading
Remark = Mark Peak Reading or Average Reading



Operation Mode: TX(CH Mid)

Test Date: January 6, 2012

Temperature: 24°C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1058.3333	57.44	-11.79	45.65	74.00	-28.35	V	Peak
1198.3333	53.80	-11.42	42.38	74.00	-31.62	V	Peak
2960.0000	48.72	-6.23	42.49	74.00	-31.51	V	Peak
4885.0000	65.19	-0.38	64.81	74.00	-9.19	V	Peak
4885.0000	45.75	-0.38	45.37	54.00	-8.63	V	AVG
5760.0000	46.84	2.37	49.21	74.00	-24.79	V	Peak
6285.0000	46.14	3.76	49.90	74.00	-24.10	V	Peak
1198.3333	49.44	-11.42	38.02	74.00	-35.98	H	Peak
1630.0000	49.72	-10.28	39.44	74.00	-34.56	H	Peak
2983.3333	47.33	-6.07	41.26	74.00	-32.74	H	Peak
3263.3333	47.23	-5.36	41.87	74.00	-32.13	H	Peak
3543.3333	46.64	-4.16	42.48	74.00	-31.52	H	Peak
4885.0000	65.06	-0.38	64.68	74.00	-9.32	H	Peak
4885.0000	45.53	-0.38	45.15	54.00	-8.85	H	AVG

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.
5. Frequency (MHz) = Emission frequency in MHz  
 Reading (dBuV/m) =Uncorrected Analyzer / Receiver Reading  
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain  
 Limit (dBuV/m) = Limit stated in standard  
 Margin (dB) = Result (dBuV/m)- Limit (dBuV/m)  
 Pk = Peak Reading  
 AV. = Average Reading  
 Remark = Mark Peak Reading or Average Reading





Operation Mode: TX(CH High)

Test Date: January 6, 2012

Temperature: 24 °C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1198.3333	51.20	-11.42	39.78	74.00	-34.22	V	Peak
1910.0000	48.46	-9.65	38.81	74.00	-35.19	V	Peak
2411.6667	49.45	-9.72	39.73	74.00	-34.27	V	Peak
2995.0000	47.48	-5.99	41.49	74.00	-32.51	V	Peak
4955.0000	58.59	-0.15	58.44	74.00	-15.56	V	Peak
4955.0000	39.73	-0.15	39.58	54.00	-14.42	V	AVG
6588.3333	45.82	4.16	49.98	74.00	-24.02	V	Peak
1105.0000	51.23	-11.68	39.55	74.00	-34.45	H	Peak
1653.3333	50.61	-10.26	40.35	74.00	-33.65	H	Peak
2901.6667	48.90	-6.63	42.27	74.00	-31.73	H	Peak
3601.6667	46.31	-3.80	42.51	74.00	-31.49	H	Peak
4955.0000	54.11	-0.15	53.96	74.00	-20.04	H	Peak
4955.0000	33.35	-0.15	33.20	54.00	-20.80	H	AVG
6973.3333	46.14	4.39	50.53	74.00	-23.47	H	Peak

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.
5. Frequency (MHz) = Emission frequency in MHz  
 Reading (dBuV/m) =Uncorrected Analyzer / Receiver Reading  
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain  
 Limit (dBuV/m) = Limit stated in standard  
 Margin (dB) = Result (dBuV/m)- Limit (dBuV/m)  
 Pk = Peak Reading  
 AV. = Average Reading  
 Remark = Mark Peak Reading or Average Reading



### 6.9 POWERLINE CONDUCTED EMISSIONS

#### LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

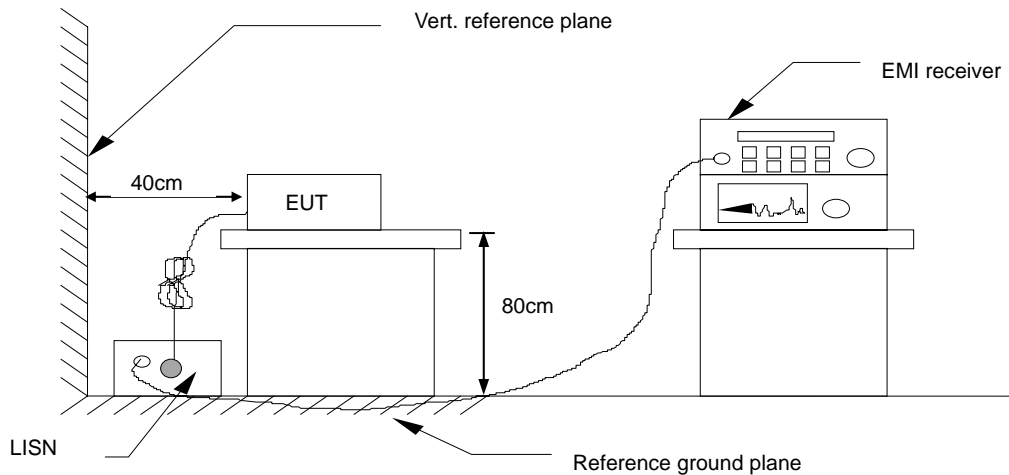
#### MEASUREMENT EQUIPMENT USED

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
ESCI EMI TEST RECEIVE.ESCI	ROHDE&SCHWARZ	ESCI	100783	03/19/2011	03/19/2012
LISN	SCHAFFNER	NNB42	2001/001	05/26/2011	05/26/2012
LISN	EMCO	3825/2	8901-1459	03/19/2011	03/19/2012
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/31/2011	03/31/2012
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

**Remark:** Each piece of equipment is scheduled for calibration once a year.



## Test Configuration



See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

## TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

## TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.



Test Data

<b>Model No.</b>	AWS5B3	<b>RBW,VBW</b>	9 kHz
<b>Environmental Conditions</b>	26°C, 60% RH	<b>Test Mode</b>	Mode 1
<b>Tested by</b>	Leevin Li		

(The chart below shows the highest readings taken from the final data.)

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Line (L1/L2!)
0.1700	24.82	8.87	11.52	36.34	20.39	64.96	54.96	-28.62	-34.57	L1
0.2620	20.10	6.85	11.52	31.62	18.37	61.36	51.37	-29.74	-33.00	L1
0.2909	21.89	8.56	11.52	33.41	20.08	60.50	50.50	-27.09	-30.42	L1
0.4220	15.07	2.99	11.51	26.58	14.50	57.41	47.41	-30.83	-32.91	L1
18.6500	19.37	0.20	12.38	31.75	12.58	60.00	50.00	-28.25	-37.42	L1
27.6660	12.26	1.00	12.85	25.11	13.85	60.00	50.00	-34.89	-36.15	L1
0.1740	24.54	7.40	11.52	36.06	18.92	64.76	54.77	-28.70	-35.85	L2
0.3100	19.62	5.16	11.52	31.14	16.68	59.97	49.97	-28.83	-33.29	L2
1.0380	14.22	0.04	11.52	25.74	11.56	56.00	46.00	-30.26	-34.44	L2
18.1299	21.64	2.59	12.38	34.02	14.97	60.00	50.00	-25.98	-35.03	L2
19.7420	20.65	0.54	12.37	33.02	12.91	60.00	50.00	-26.98	-37.09	L2
27.8100	12.34	1.10	12.85	25.19	13.95	60.00	50.00	-34.81	-36.05	L2

- NOTE:** 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).  
2. Those frequencies only show peak emission level because that was below the Average limit, so no need to check average anymore.