



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

BLUETOOTH HEADSET

Model: PP-PRO


Brand: PROPOINT

Test Report Number:

SZ120331B06-RP

Prepared for

PROPOINT TRADING CO.,LTD.
NO. 218, WU-YIN ROAD, FENG-SHAN DISTRICT, KAOHSIUNG CITY,
TAIWAN

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
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Issued Date: July 9, 2012



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Revision History

Rev.	Issue No.	Revisions	Effect Page	Revised By
00	SZ120331B06-RP	Initial Issue	ALL	Amay Tang



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1. TEST RESULT CERTIFICATION

Product:	BLUETOOTH HEADSET
Model:	PP-PRO
Brand:	 PROPOINT
Tested:	March 31~July 6, 2012
Applicant:	PROPOINT TRADING CO.,LTD. NO. 218, WU-YIN ROAD, FENG-SHAN DISTRICT, KAOHSIUNG CITY, TAIWAN
Manufacturer:	DELLKING INDUSTRIAL CO.,LTD 904 DEQINGCHUANG BULDING, BULONG ROAD, BUJI TOWN, LONGGANG DISTRICT, SHENZHEN CITY, CHINA

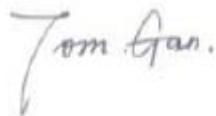
APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

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:



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

Reviewed by:



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



2. EUT DESCRIPTION

Product	BLUETOOTH HEADSET
Model Number	PP-PRO
Brand	 PROPOINT
Model Discrepancy	N/A
Identify Number	SZ120331B06-RP
Power Supply	DC5V supplied by the adapter or DC3.7V supplied by the battery
Adapter Manufacturer / Model No.	HON-KWANG/HK-X205-A05 AC Input:100~240V/50~60Hz 0.2A DC output:5V/1.0A
Received Date	March 31, 2012
Frequency Range	2402 ~ 2480 MHz
Transmit Power	GFSK : 2.00dBm 8DPSK :2.09dBm
Modulation Technique	FHSS (GFSK for 1Mbps, $\pi/4$ -DQPSK for 2Mbps, 8DPSK for 3Mbps)
Number of Channels	79 Channels
Antenna Specification	F type PCB Layout Antenna with 3.0dBi gain(Max)
Mini USB Cable	Unshielded 1.10m
Earphone Cable	Unshielded 0.90m
Temperature Range	0°C ~ +40°C

Note: This submittal(s) (test report) is intended for FCC ID: N26-PPVPPPRO 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	Mode 1: Normal Link	<input checked="" type="checkbox"/>
Radiated Emission	Mode 1: TX	<input checked="" type="checkbox"/>

Above 1G, Channel Low (2402MHz)、Mid (2441MHz) and High (2480MHz) were chosen for full testing for GFSK and 8DPSK.



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.

USA	A2LA
Taiwan	TAF

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

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

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 No.	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1.	Notebook 1#	992F2VG	62P7043	N/A	IBM	Shielded 1.50m	Unshielded 1.80m

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

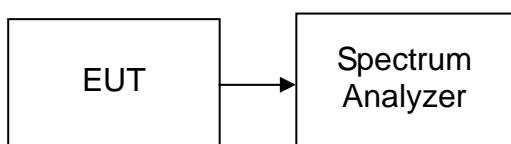
None; for reporting purpose only.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013

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.

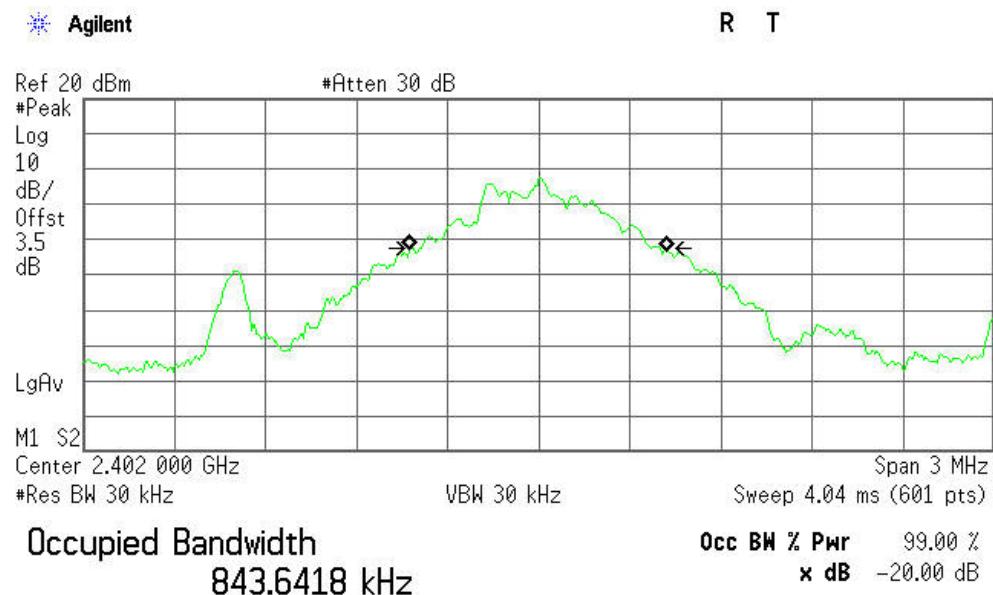
TEST RESULTS

No non-compliance noted



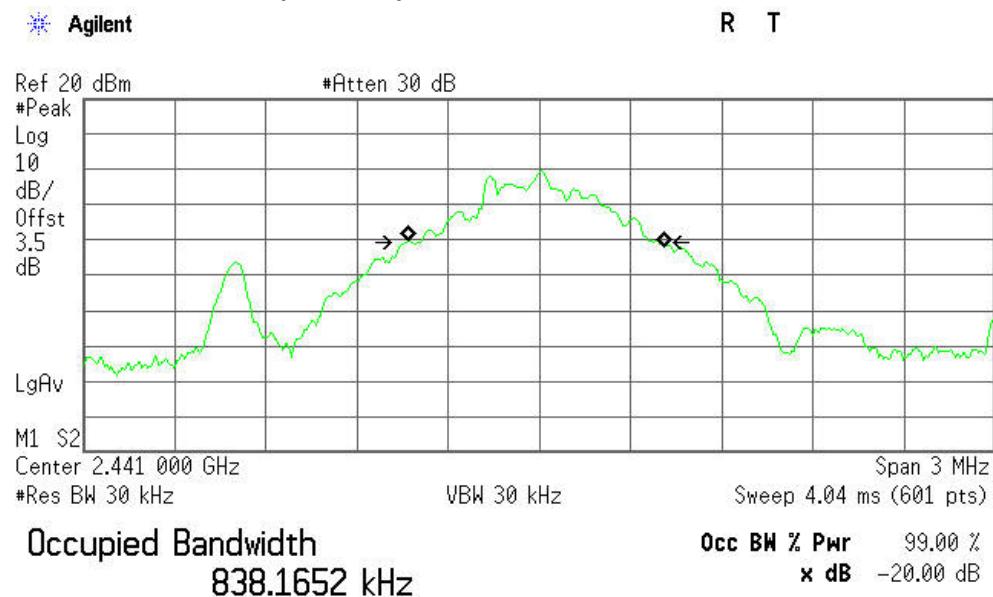
Test plot (GFSK)

20dB Bandwidth (CH Low)



Transmit Freq Error -1.756 kHz
x dB Bandwidth 791.590 kHz

20dB Bandwidth (CH Mid)

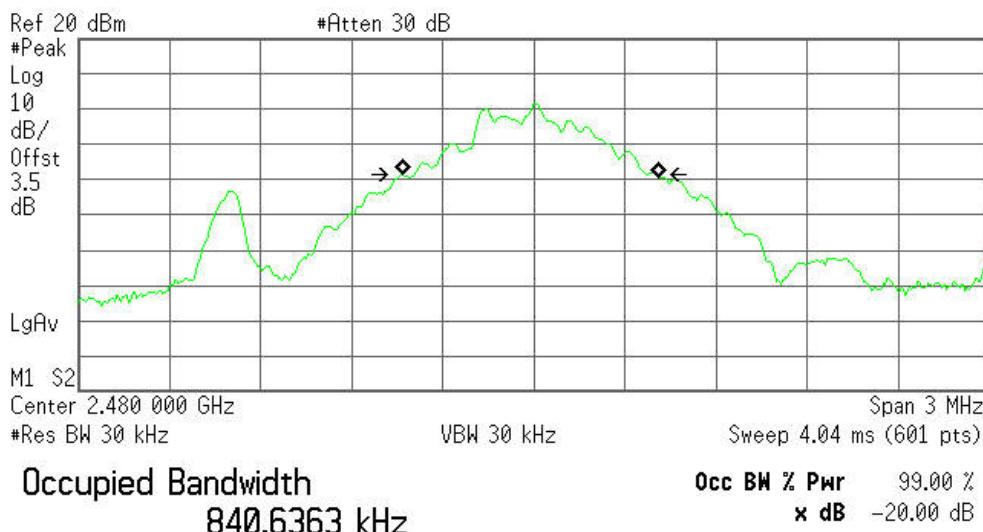


Transmit Freq Error -8.730 kHz
x dB Bandwidth 825.467 kHz

**20dB Bandwidth (CH High)**

Agilent

R T

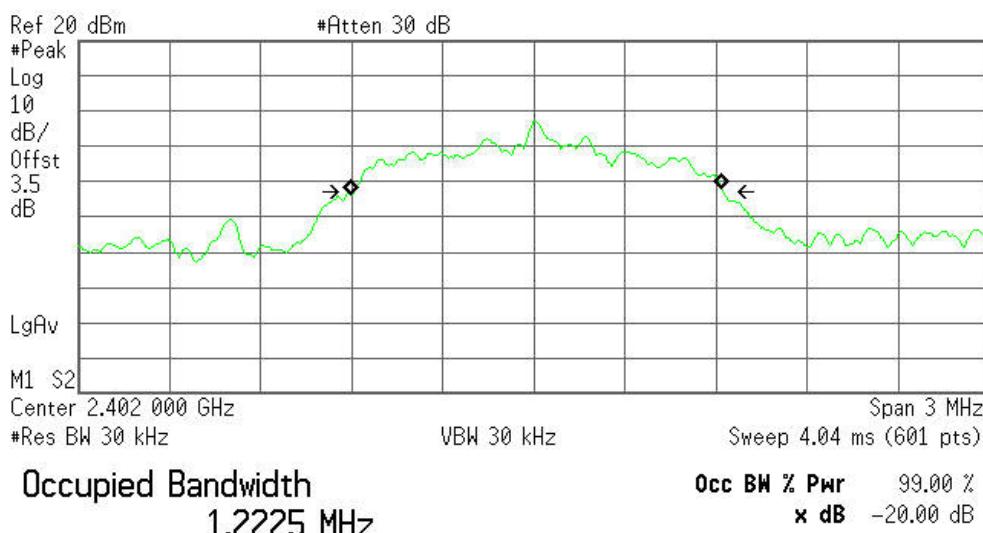


Transmit Freq Error -8.621 kHz
x dB Bandwidth 833.275 kHz

Test plot (8DPSK)**20dB Bandwidth (CH Low)**

Agilent

R T

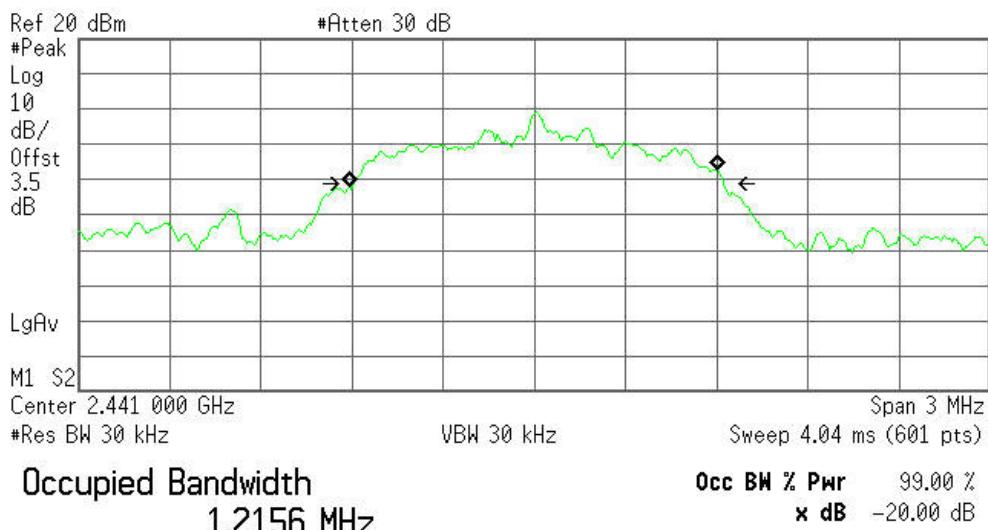


Transmit Freq Error 10.313 kHz
x dB Bandwidth 1.217 MHz

**20dB Bandwidth (CH Mid)**

Agilent

R T

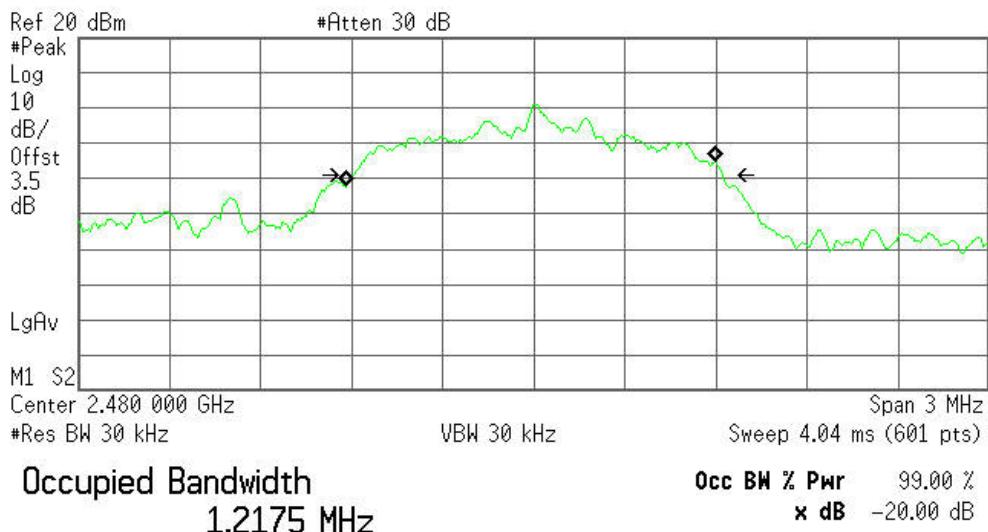


Transmit Freq Error -3.750 kHz
x dB Bandwidth 1.216 MHz

20dB Bandwidth (CH High)

Agilent

R T



Transmit Freq Error -10.588 kHz
x dB Bandwidth 1.212 MHz



6.2 PEAK POWER

LIMIT

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

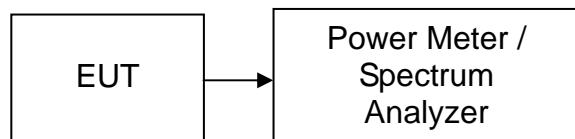
1. For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
2. Except as shown in paragraphs (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	03/19/2012	03/19/2013
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013

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 (W)	Result
Low	2402	-5.42	3.50	-1.92	0.00064	1	PASS
Mid	2441	-3.38	3.50	0.12	0.00103		PASS
High	2480	-1.50	3.50	2.00	0.00158		PASS

8DPSK

Channel	Frequency (MHz)	Reading Power (dBm)	Factor (dB)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2402	-5.00	3.50	-1.50	0.00071	1	PASS
Mid	2441	-3.19	3.50	0.31	0.00107		PASS
High	2480	-1.41	3.50	2.09	0.00162		PASS



6.3 PEAK POWER SPECTRAL DENSITY

LIMIT

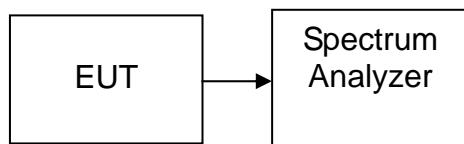
1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping 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	03/19/2012	03/19/2013

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 = 300kHz, Sweep=100s
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

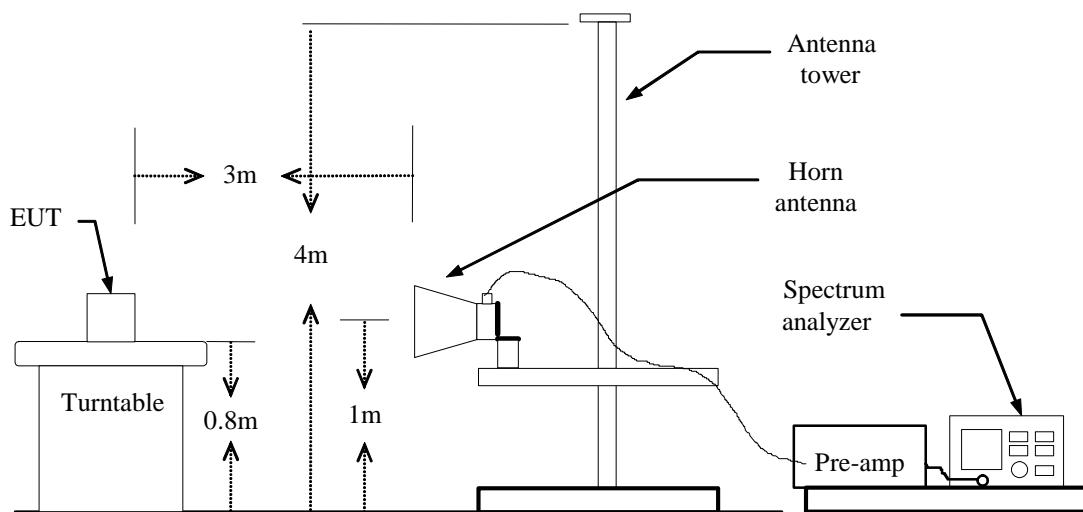
LIMIT

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	03/19/2012	03/19/2013
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2012	03/18/2013
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	03/18/2012	03/18/2013
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/17/2012	03/17/2013
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/17/2012	03/17/2013
Loop Antenna	A, R, A	PLA-1030/B	1029	03/23/2012	03/23/2013
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/19/2012	03/19/2013
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

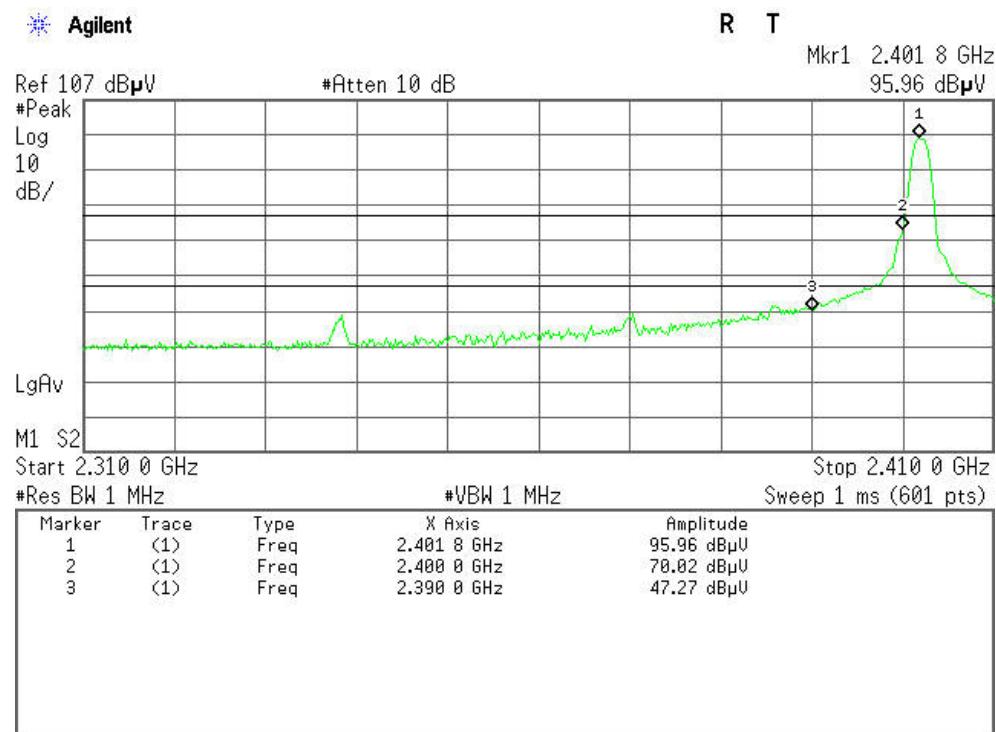
Refer to attach spectrum analyzer data chart.

Test Data (GFSK)

Band Edges (CH-Low)

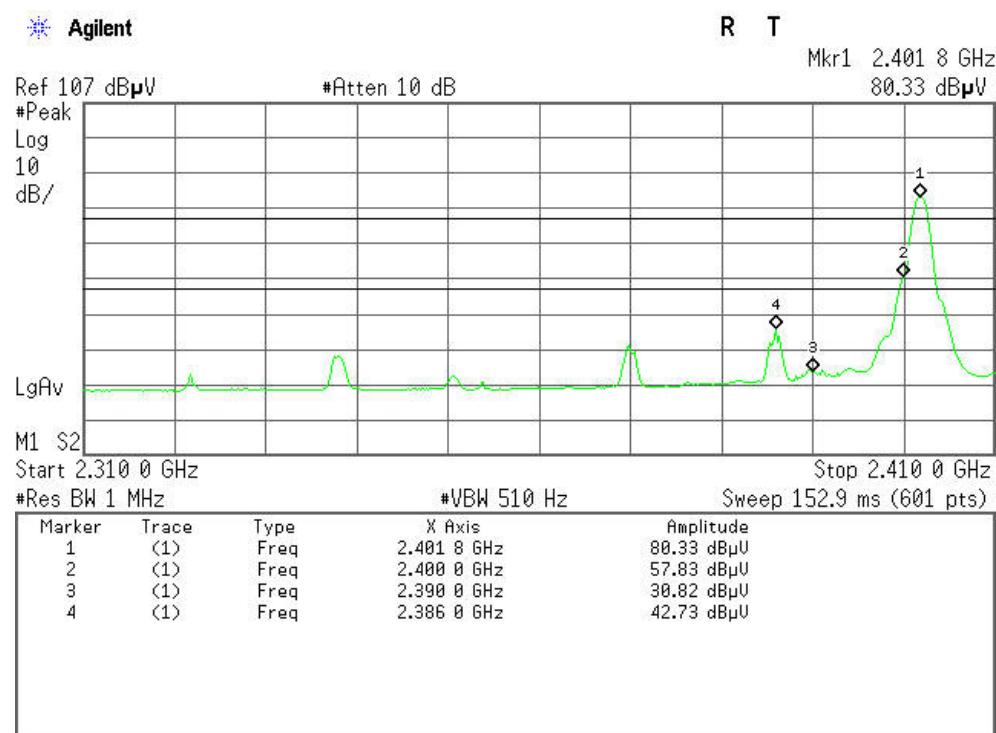
Detector mode: Peak

Polarity: Vertical



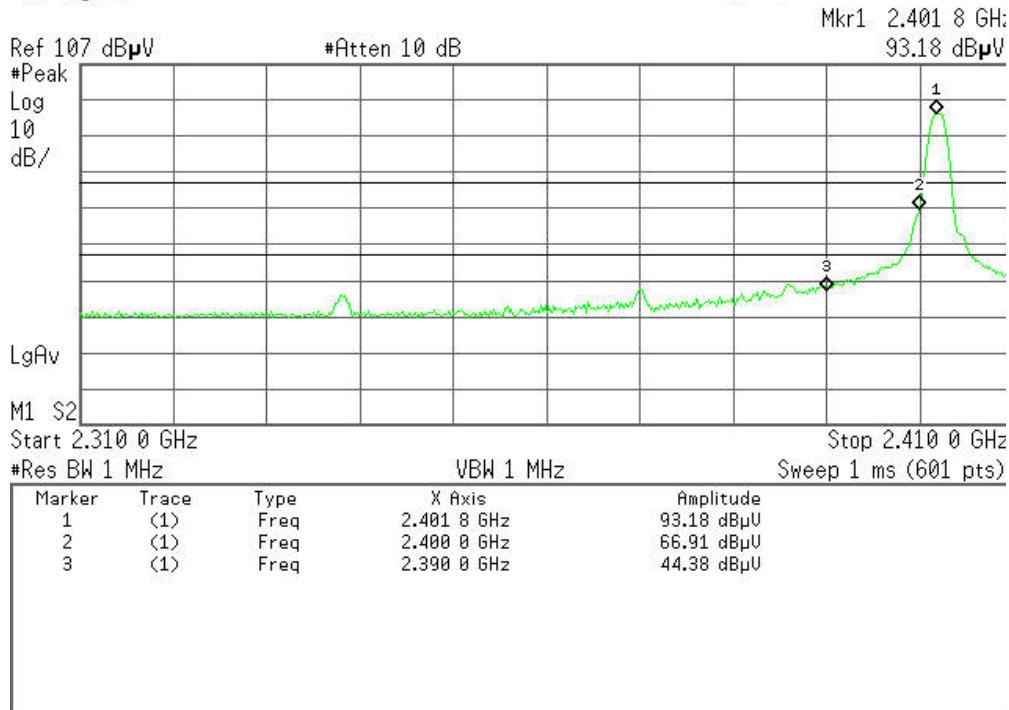
Detector mode: Average

Polarity: Vertical

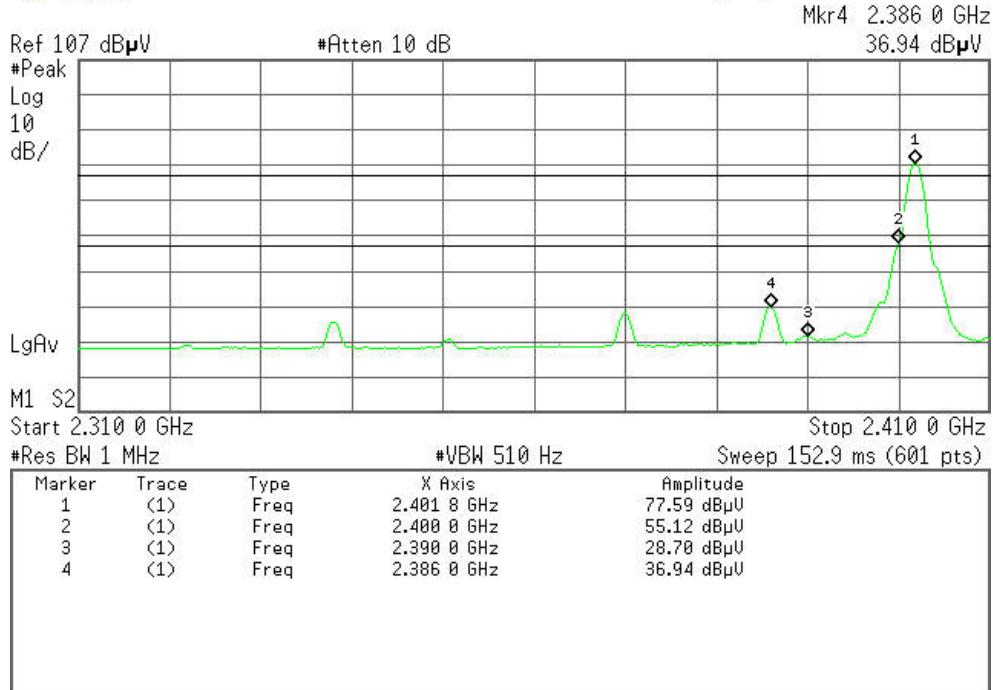


**Detector mode: Peak****Polarity: Horizontal**

Agilent

**Detector mode: Average****Polarity: Horizontal**

Agilent



**Band Edges (CH-High)****Detector mode: Peak****Polarity: Vertical**

Agilent 03:22:52 Apr 29, 2012

R T

Mkr1 2.479 85 GHz
100.12 dB μ VRef 107 dB μ V

#Atten 10 dB

#Peak Log 10 dB/

10

dB/

LgAv

M1 S2

Start 2,470 00 GHz

Stop 2,500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2,479 85 GHz	100.12 dB μ V
2	(1)	Freq	2,483 50 GHz	54.88 dB μ V

Detector mode: Average**Polarity: Vertical**

Agilent 03:24:45 Apr 29, 2012

R T

Mkr1 2.479 75 GHz
82.70 dB μ VRef 107 dB μ V

#Atten 10 dB

#Peak Log 10 dB/

10

dB/

LgAv

M1 S2

Start 2,470 00 GHz

Stop 2,500 00 GHz

#Res BW 1 MHz

#VBW 510 Hz

Sweep 45.88 ms (601 pts)

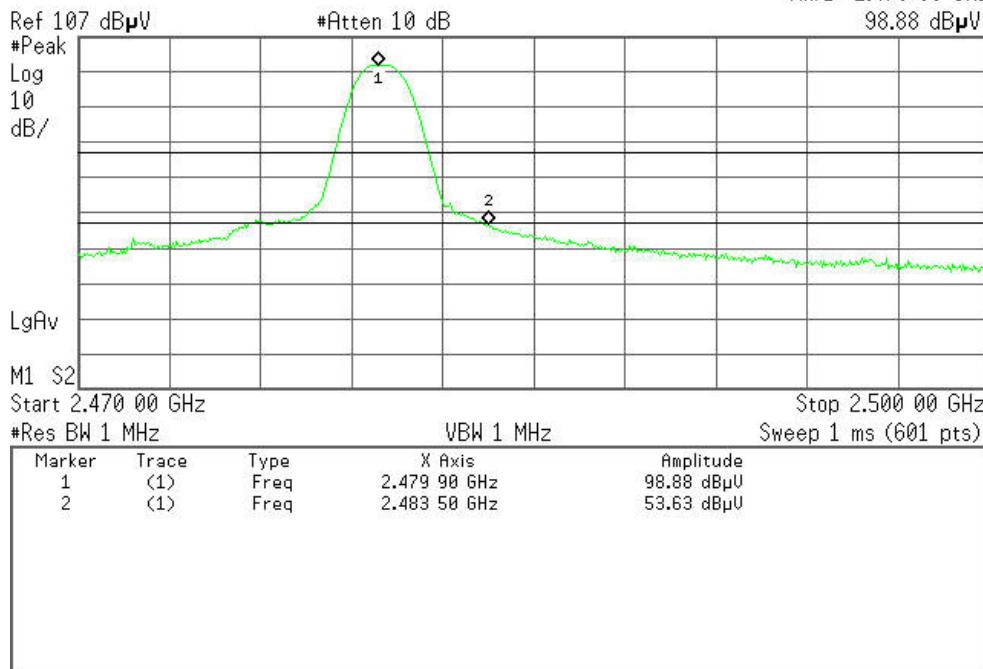
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2,479 75 GHz	82.70 dB μ V
2	(1)	Freq	2,483 50 GHz	36.15 dB μ V

**Detector mode: Peak****Polarity: Horizontal**

Agilent 03:27:20 Apr 29, 2012

R T

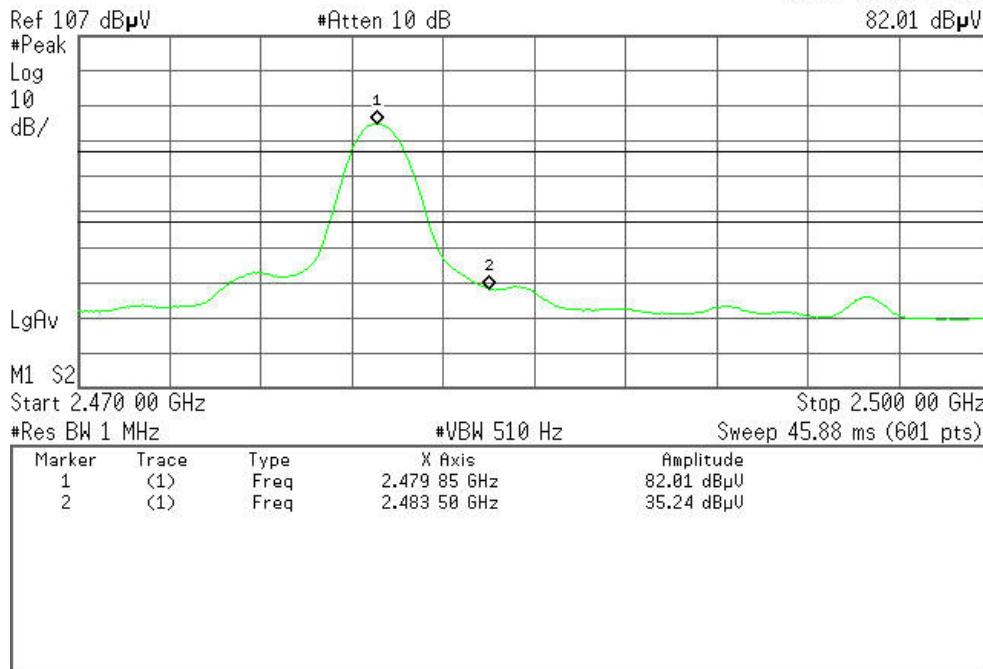
Mkr1 2.479 90 GHz

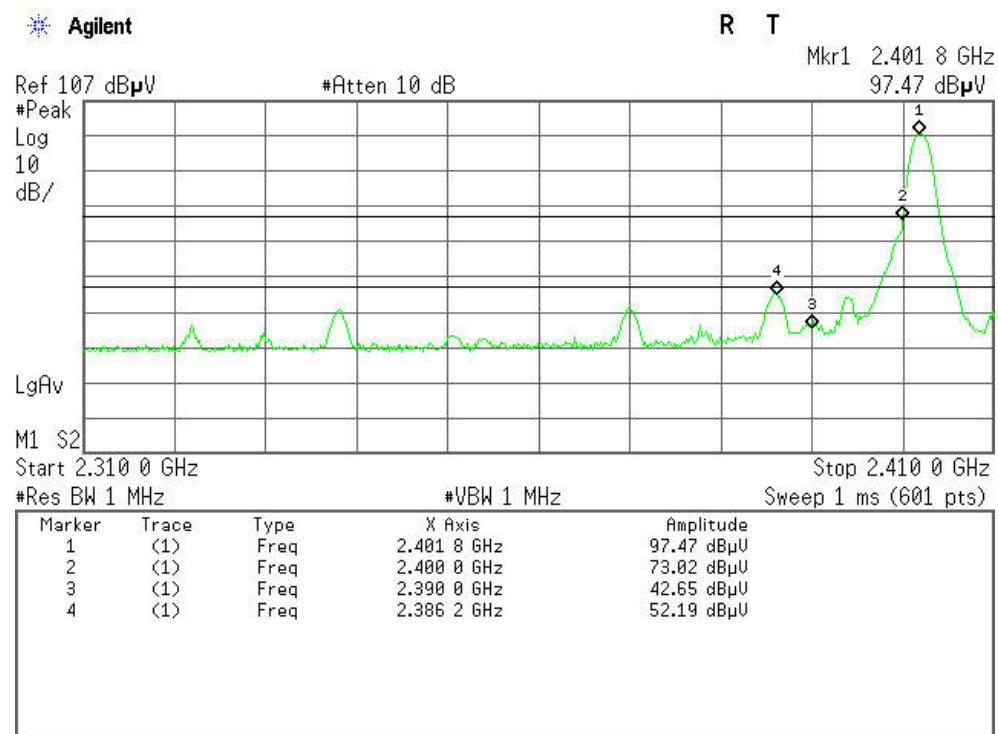
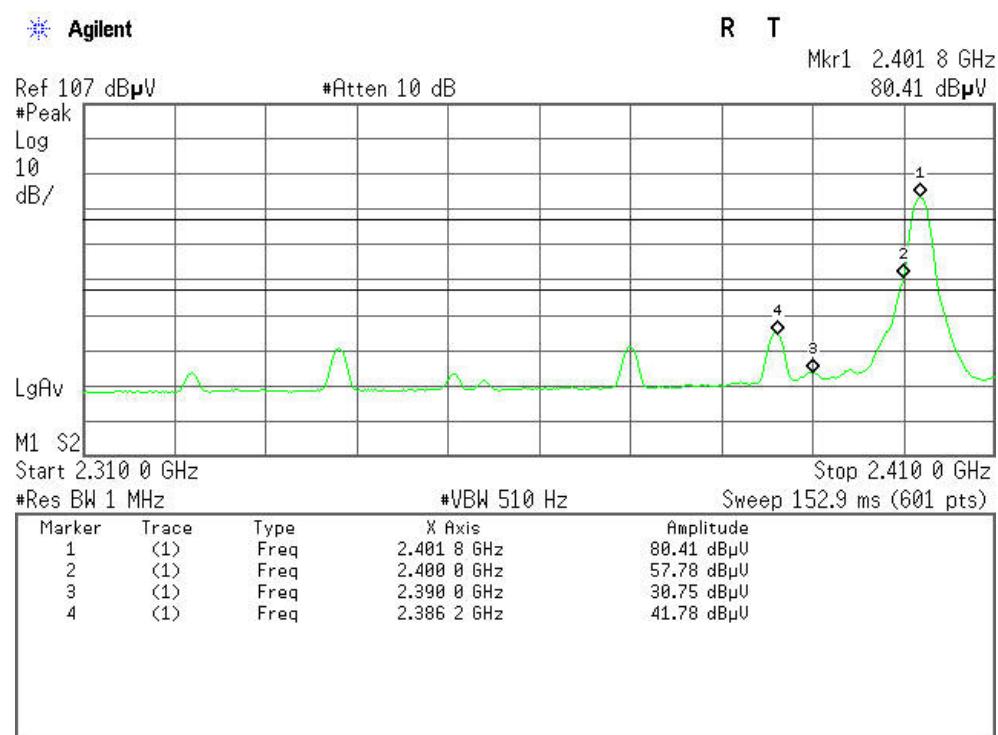
98.88 dB μ V**Detector mode: Average****Polarity: Horizontal**

Agilent 03:27:56 Apr 29, 2012

R T

Mkr1 2.479 85 GHz

82.01 dB μ V

**Test Data (8DPSK)****Band Edges (CH-Low)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

**Detector mode: Peak****Polarity: Horizontal****Agilent**Ref 107 dB μ V

#Atten 10 dB

R T
Mkr1 2.401 8 GHz
93.98 dB μ V#Peak
Log
10
dB/LgAv
M1 S2

Start 2.310 0 GHz

VBW 1 MHz

Stop 2.410 0 GHz

#Res BW 1 MHz

Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.401 8 GHz	93.98 dB μ V
2	(1)	Freq	2.400 0 GHz	69.85 dB μ V
3	(1)	Freq	2.390 0 GHz	41.81 dB μ V
4	(1)	Freq	2.385 8 GHz	49.17 dB μ V

Detector mode: Average**Polarity: Horizontal****Agilent**Ref 107 dB μ V

#Atten 10 dB

R T
Mkr1 2.401 8 GHz
77.02 dB μ V#Peak
Log
10
dB/LgAv
M1 S2

Start 2.310 0 GHz

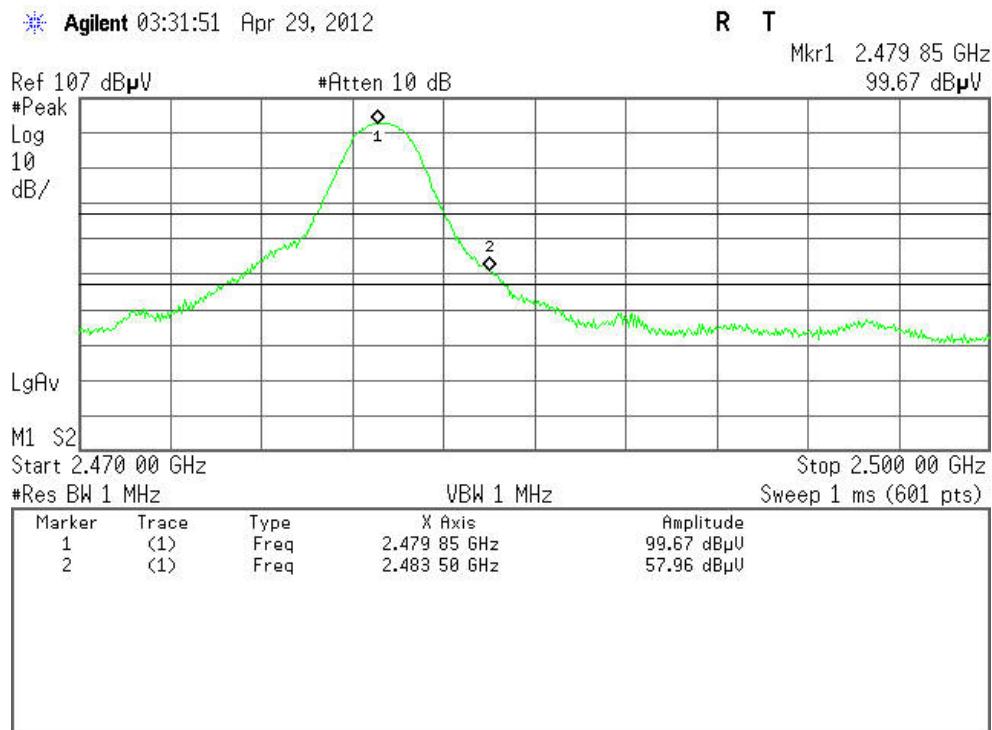
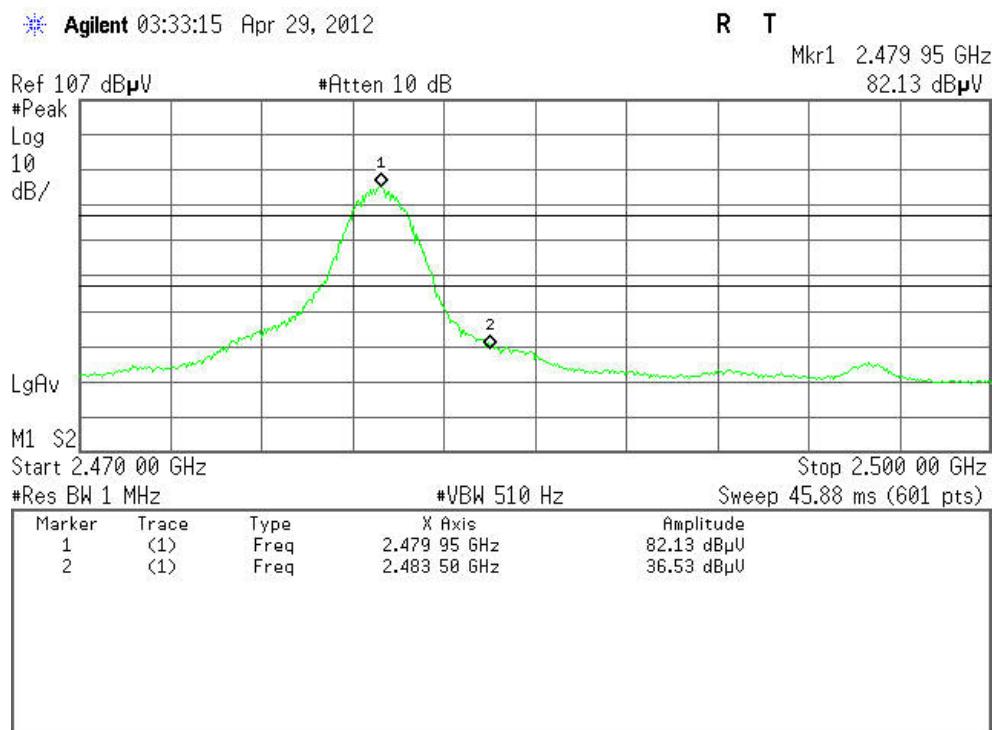
#VBW 510 Hz

Stop 2.410 0 GHz

#Res BW 1 MHz

Sweep 152.9 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.401 8 GHz	77.02 dB μ V
2	(1)	Freq	2.400 0 GHz	54.29 dB μ V
3	(1)	Freq	2.390 0 GHz	28.47 dB μ V
4	(1)	Freq	2.385 8 GHz	39.08 dB μ V

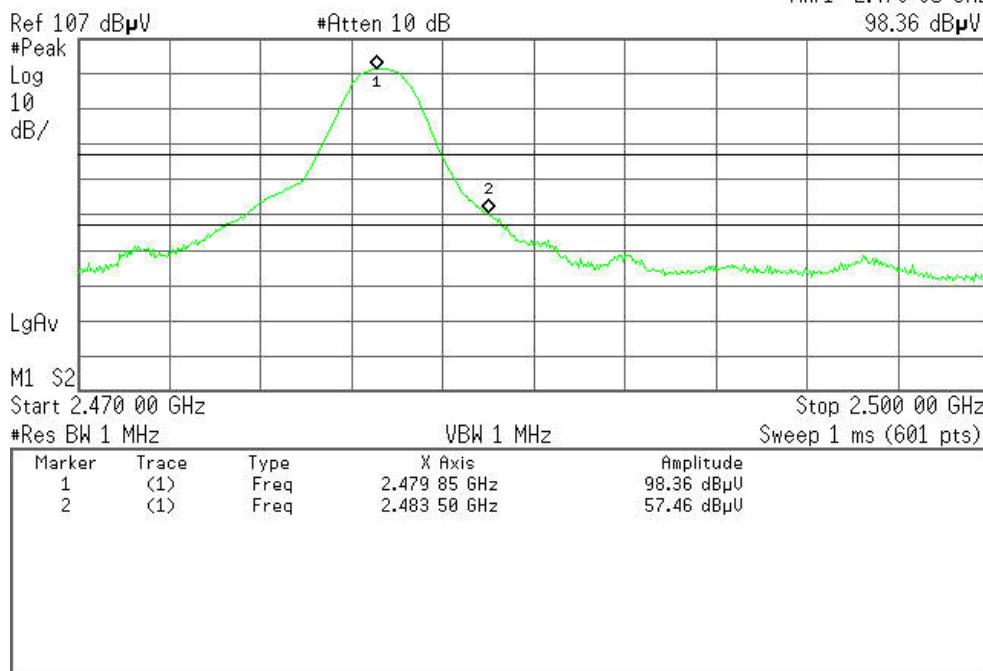
**Band Edges (CH-High)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

**Detector mode: Peak****Polarity: Horizontal**

Agilent 03:29:33 Apr 29, 2012

R T

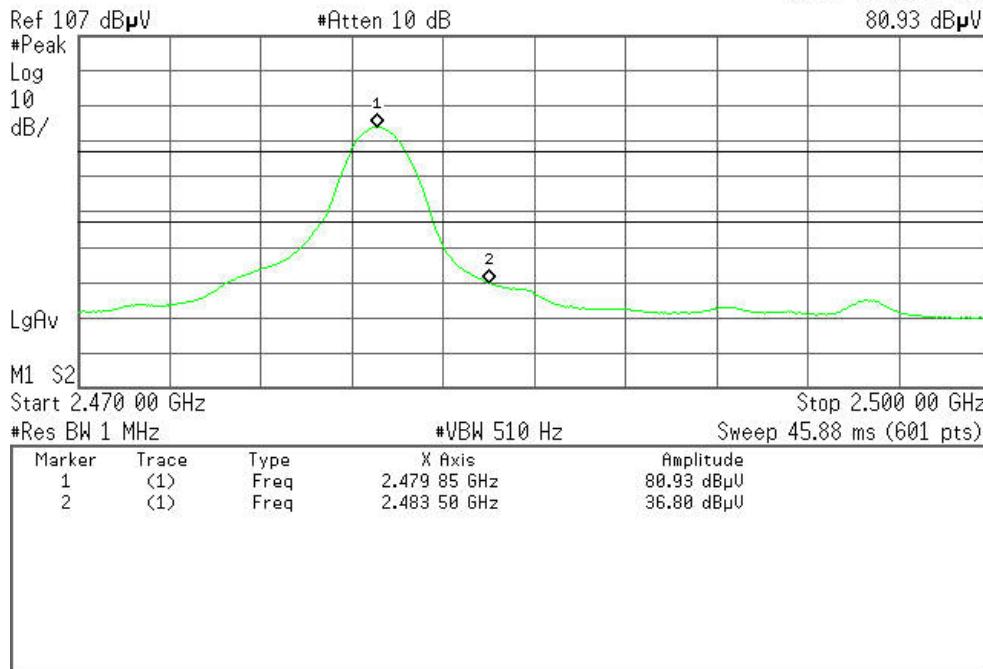
Mkr1 2.479 85 GHz

98.36 dB μ V**Detector mode: Average****Polarity: Horizontal**

Agilent 03:30:14 Apr 29, 2012

R T

Mkr1 2.479 85 GHz

80.93 dB μ V



6.5 FREQUENCY SEPARATION

LIMIT

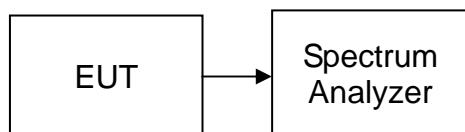
According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel 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	03/19/2012	03/19/2013

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

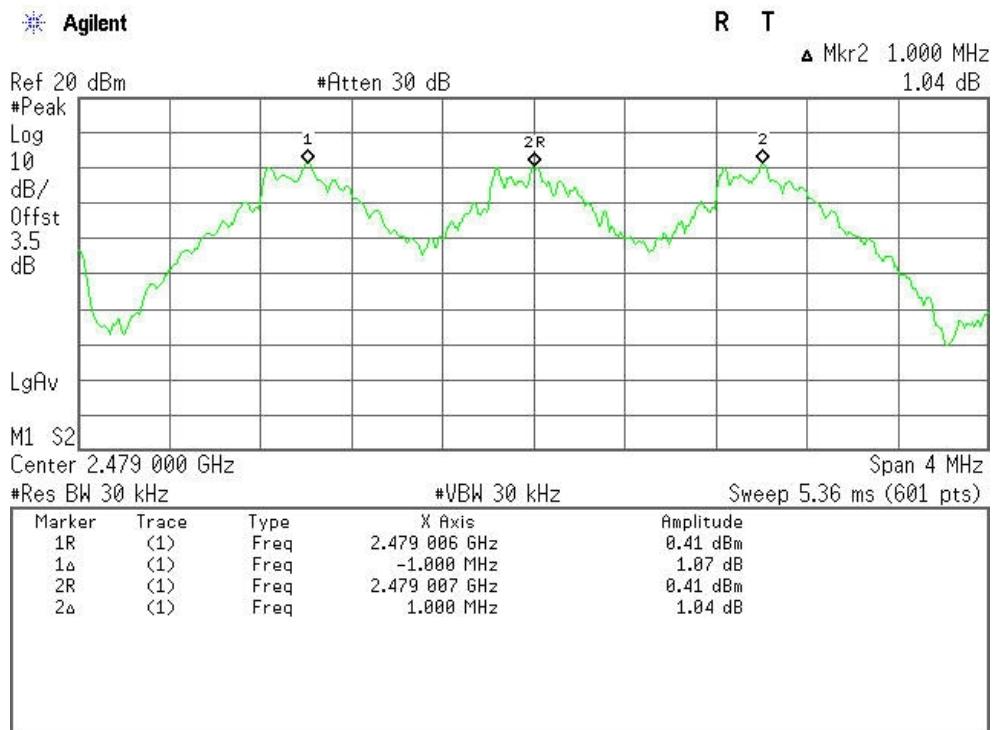
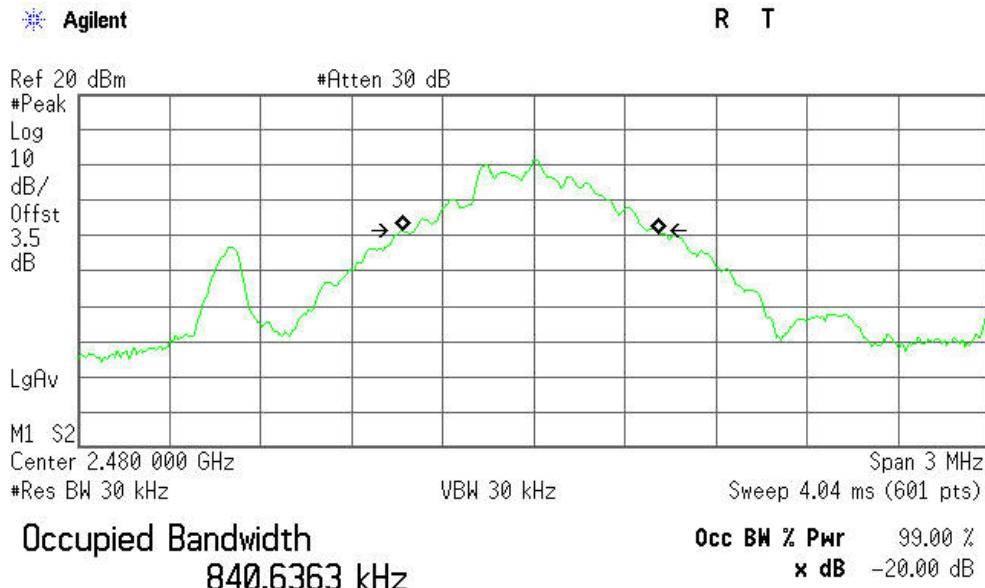
Test Data

GFSK

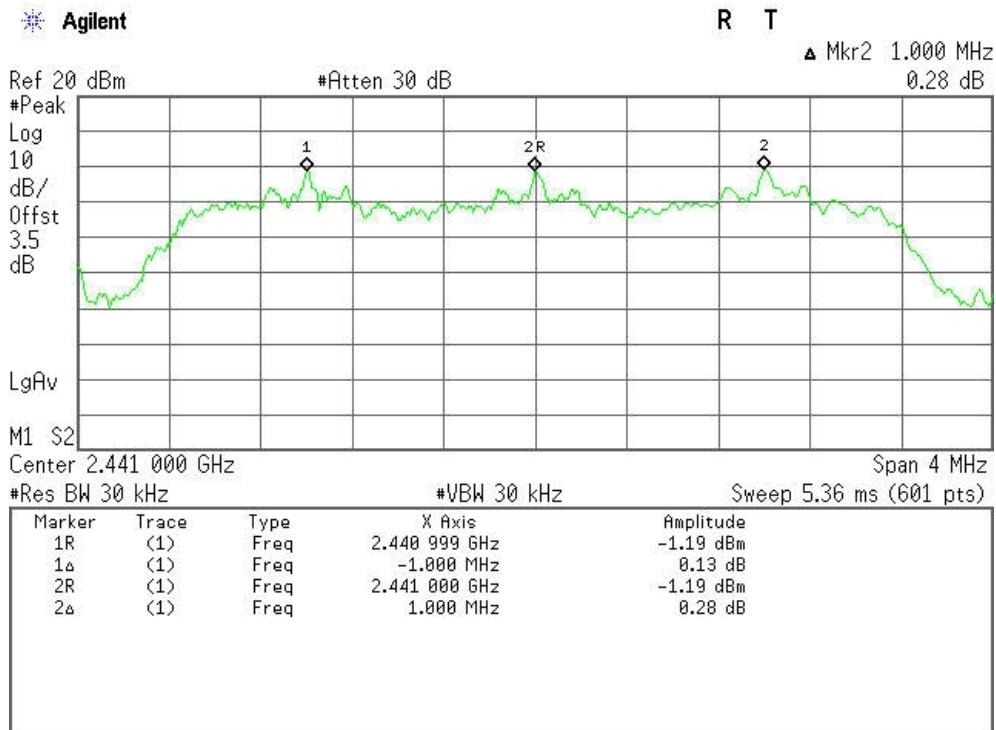
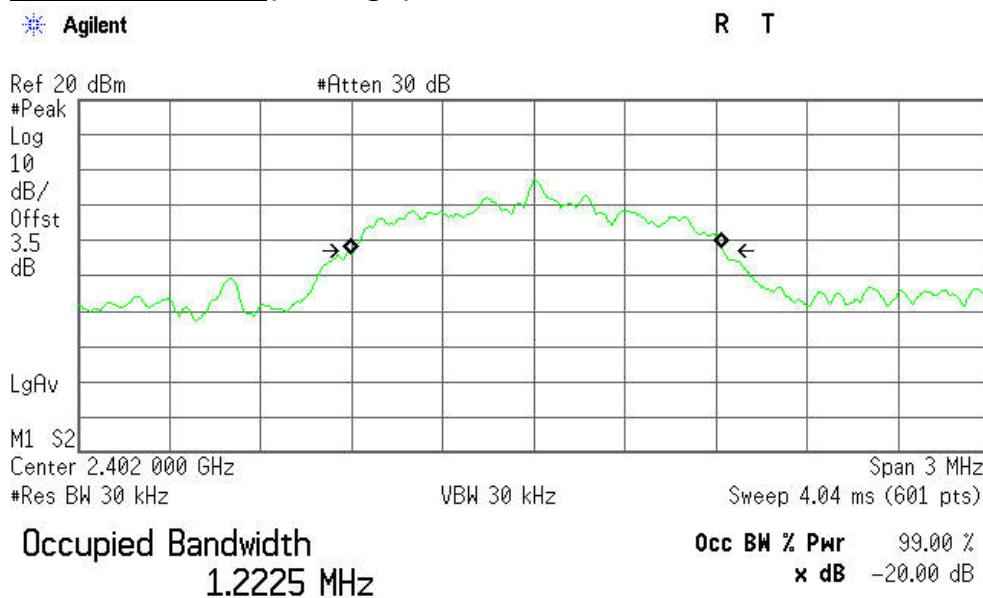
Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.000	555.516	> Two-thirds of the 20 dB Bandwidth	Pass

8DPSK

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.000	811.333	> Two-thirds of the 20 dB Bandwidth	Pass

GFSKTest PlotMeasurement of Channel Separation20 dB bandwidth(CH High)

Transmit Freq Error -8.621 kHz
x dB Bandwidth 833.275 kHz

**8DPSK****Test Plot****Measurement of Channel Separation****20 dB bandwidth(CH High)**

Transmit Freq Error 10.313 kHz
x dB Bandwidth 1.217 MHz



6.6 NUMBER OF HOPPING FREQUENCY

LIMIT

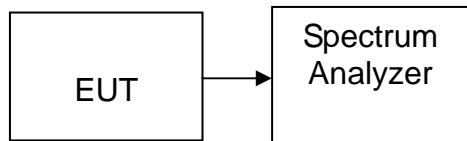
According to §15.247(a)(1)(ii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013

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

Test Configuration



TEST PROCEDURE

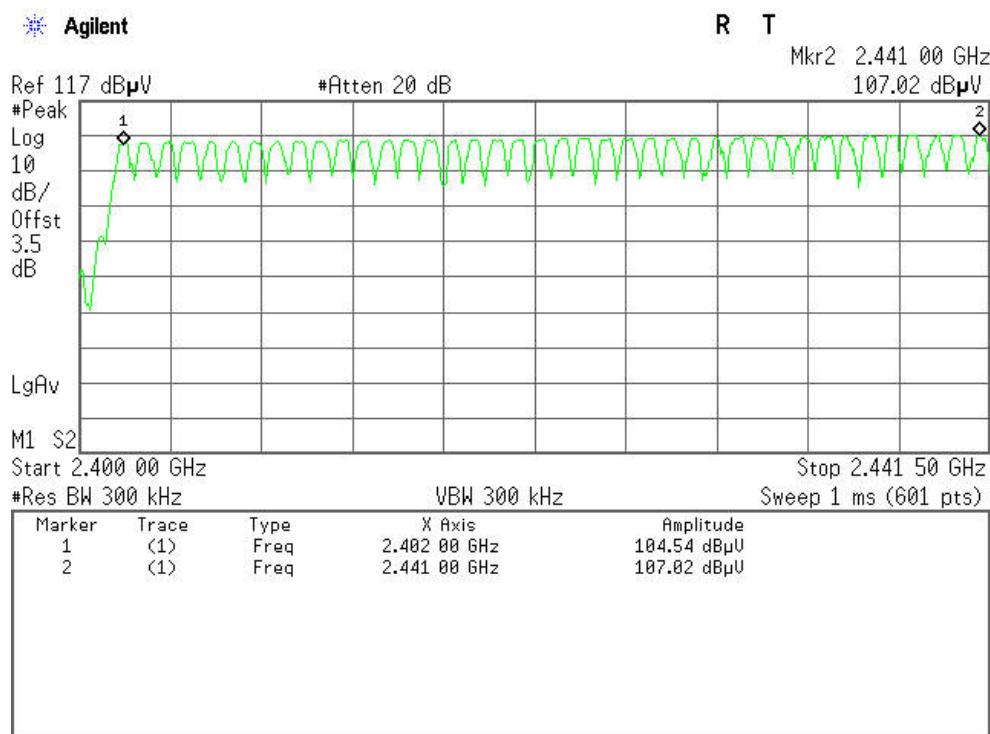
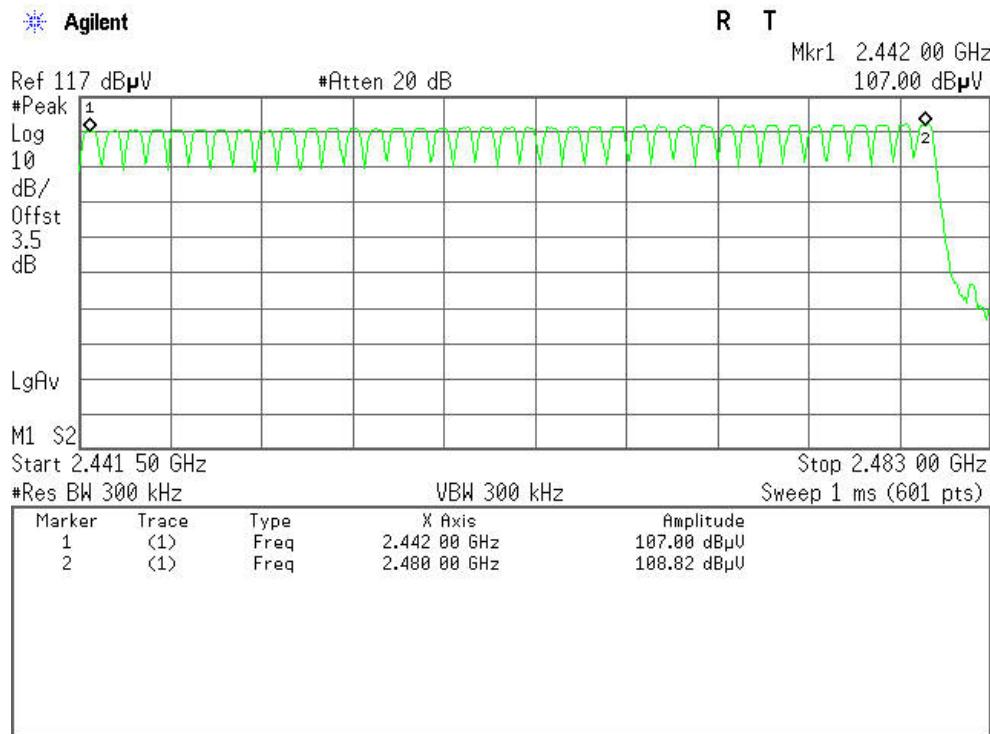
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set spectrum analyzer Start=2402MHz, Stop = 2441MHz, Sweep = 1ms and Start=2441MHz, Stop = 2483.5MHz, Sweep = 1ms.
4. Set the spectrum analyzer as RBW, VBW=300kHz,
5. Max hold, view and count how many channel in the band.

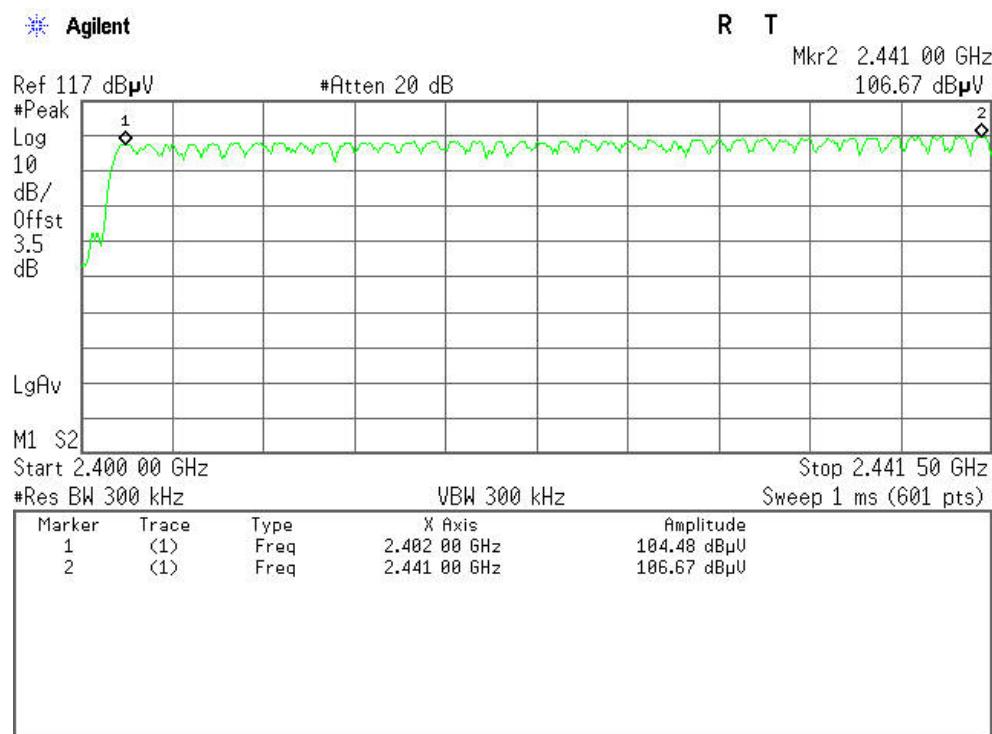
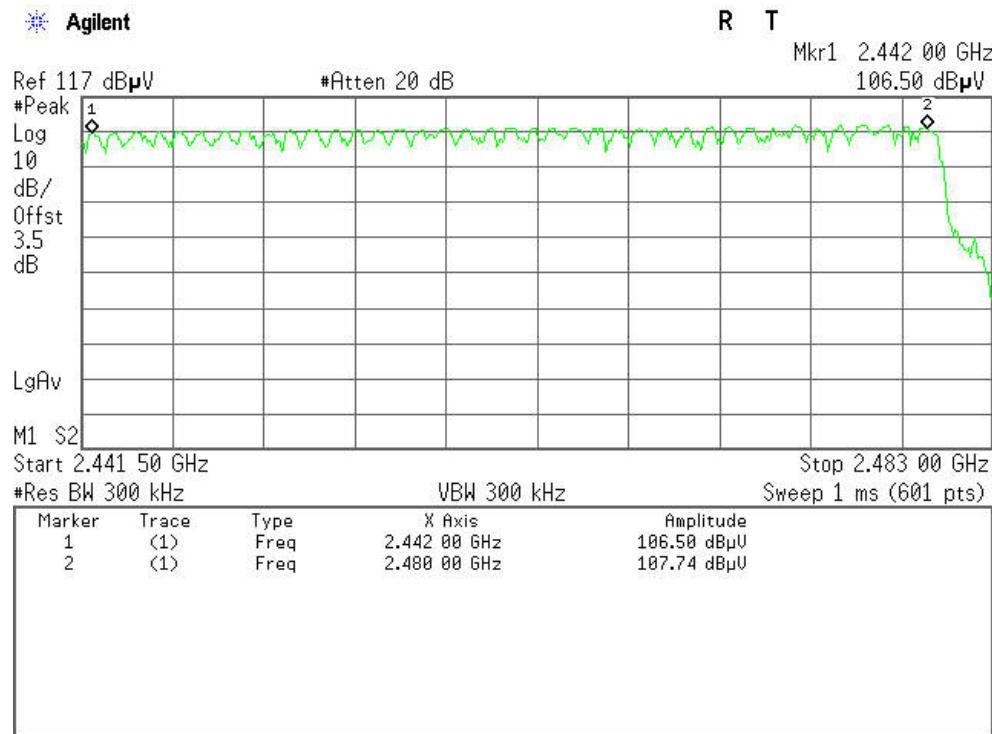
TEST RESULTS

No non-compliance noted

Test Data

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

Test Plot (GFSK)Channel Number**2.400 GHz – 2.4415 GHz****2.4415 GHz –2.483GHz**

Test Plot (8DPSK)Channel Number**2.400 GHz – 2.4415 GHz****2.4415 GHz –2.483 GHz**



6.7 TIME OF OCCUPANCY (DWELL TIME)

LIMIT

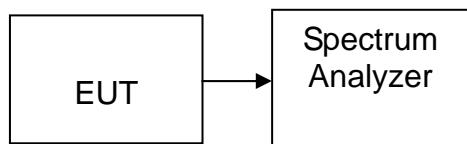
According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013

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 Low: $0.510^* (1600/2)/79 * 31.6 = 163.200$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	0.510	163.200	31.60	400.00	PASS

DH 3

CH Low: $1.765^* (1600/4)/79 * 31.6 = 282.400$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	1.765	282.400	31.60	400.00	PASS

DH 5

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

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

**Test Data****8DPSK****DH 1**

CH Low: $0.521^* (1600/2)/79 * 31.6 = 166.720$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	0.521	166.720	31.60	400.00	PASS

DH 3

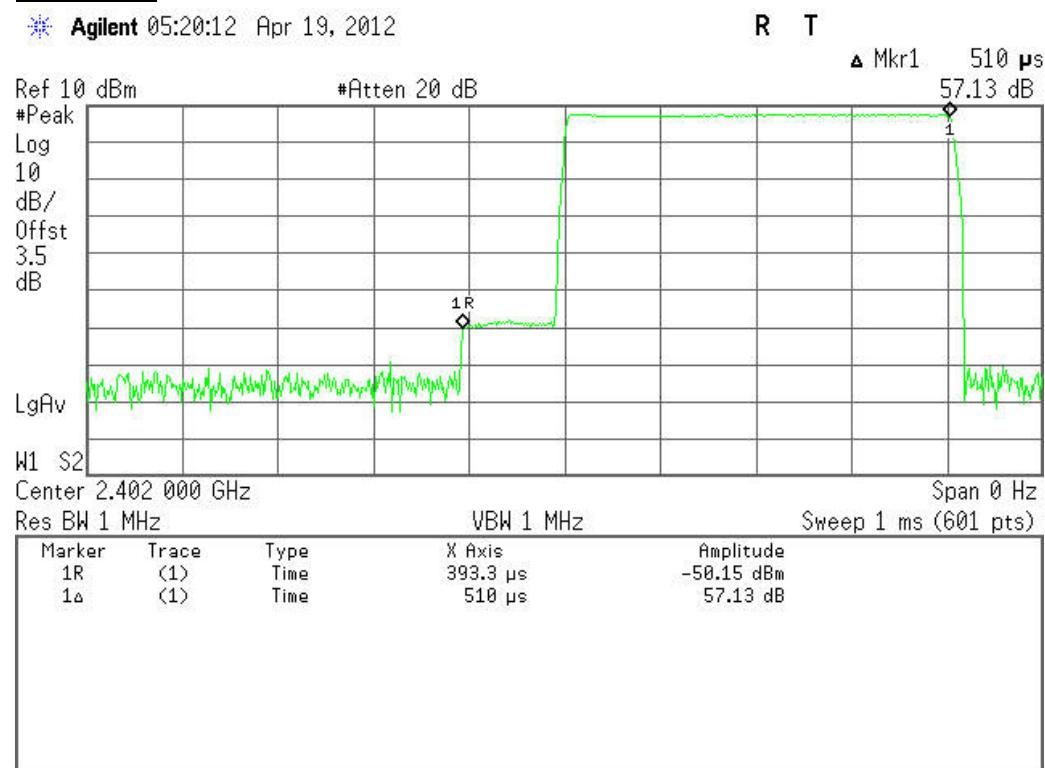
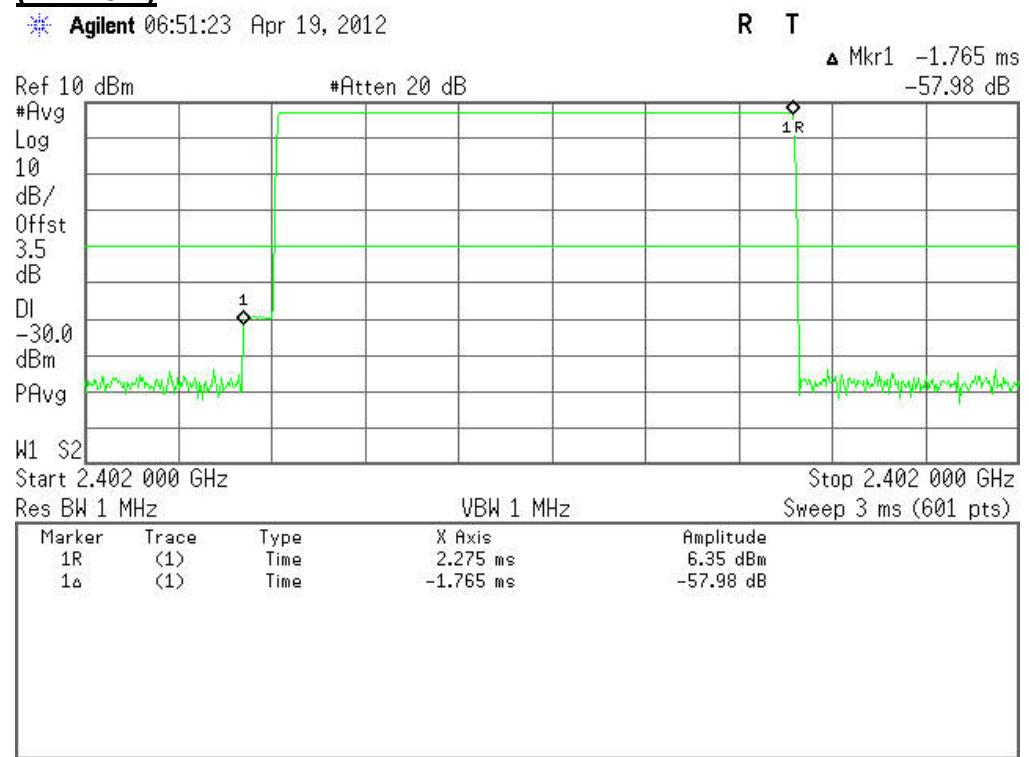
CH Low: $1.715^* (1600/4)/79 * 31.6 = 274.400$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	1.715	274.400	31.60	400.00	PASS

DH 5

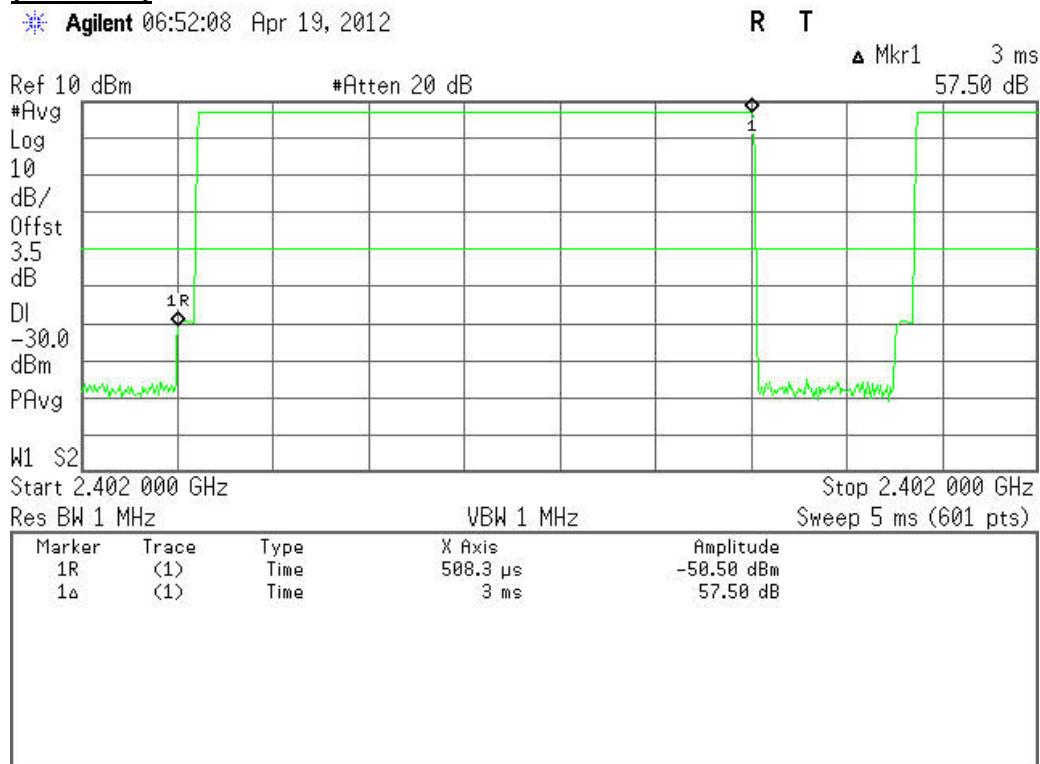
CH Low: $3.017^* (1600/6)/79 * 31.6 = 321.813$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	3.017	321.813	31.60	400.00	PASS

Test PlotGFSKDH 1(CH Low)DH 3(CH Low)

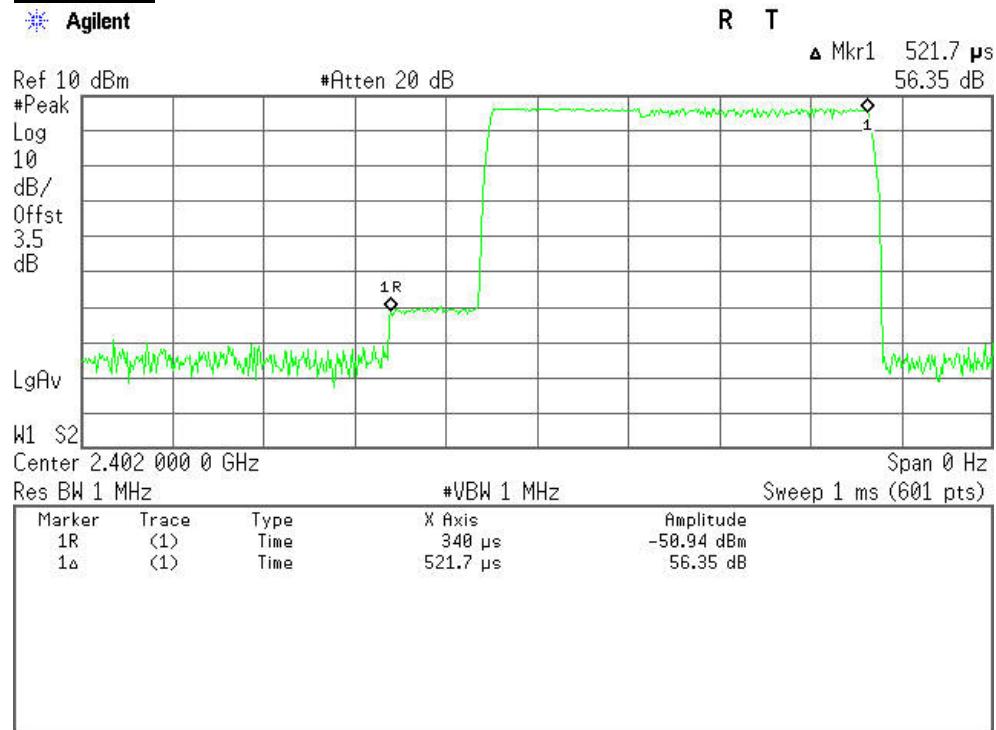
**DH 5****(CH Low)**

Agilent 06:52:08 Apr 19, 2012

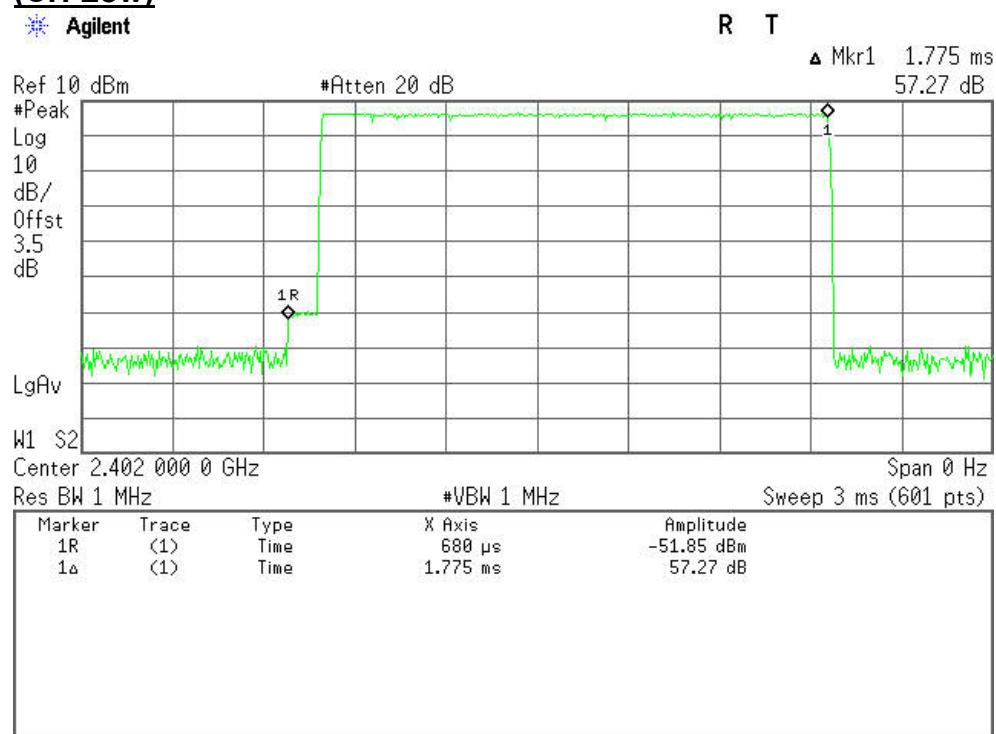


**Test Plot**
8DPSK**DH 1****(CH Low)**

Agilent

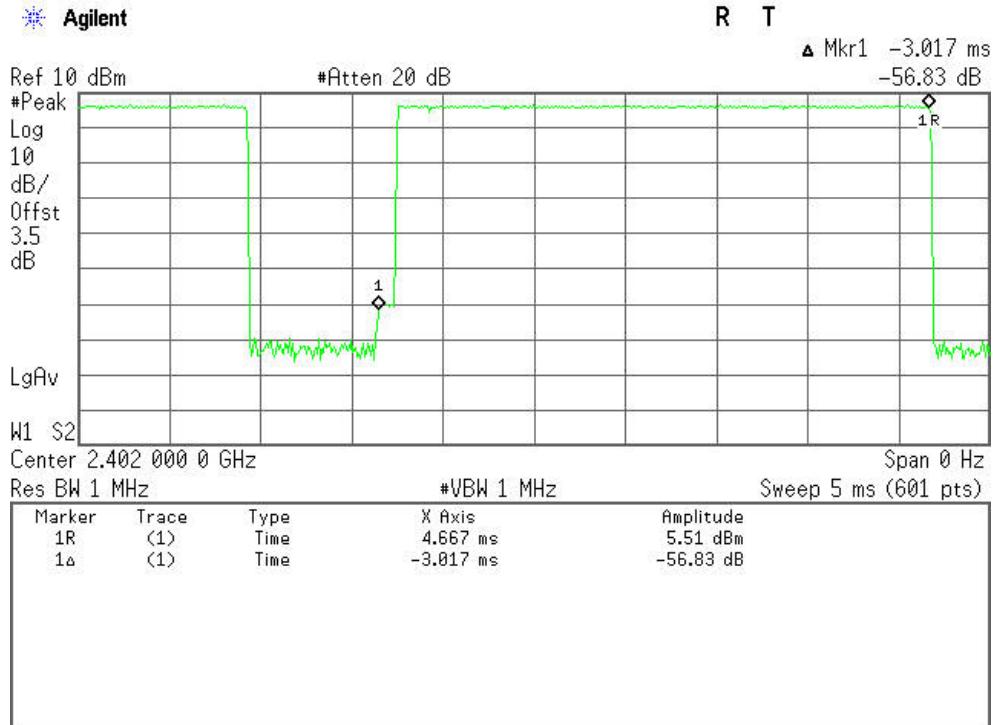
**DH 3****(CH Low)**

Agilent



**DH 5****(CH Low)**

Agilent





6.8 SPURIOUS EMISSIONS

6.8.1. Conducted Measurement

LIMIT

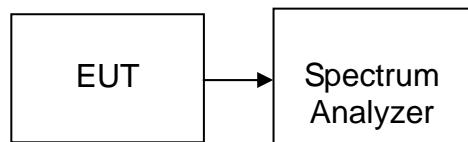
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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	03/19/2012	03/19/2013

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

Test Configuration



TEST PROCEDURE

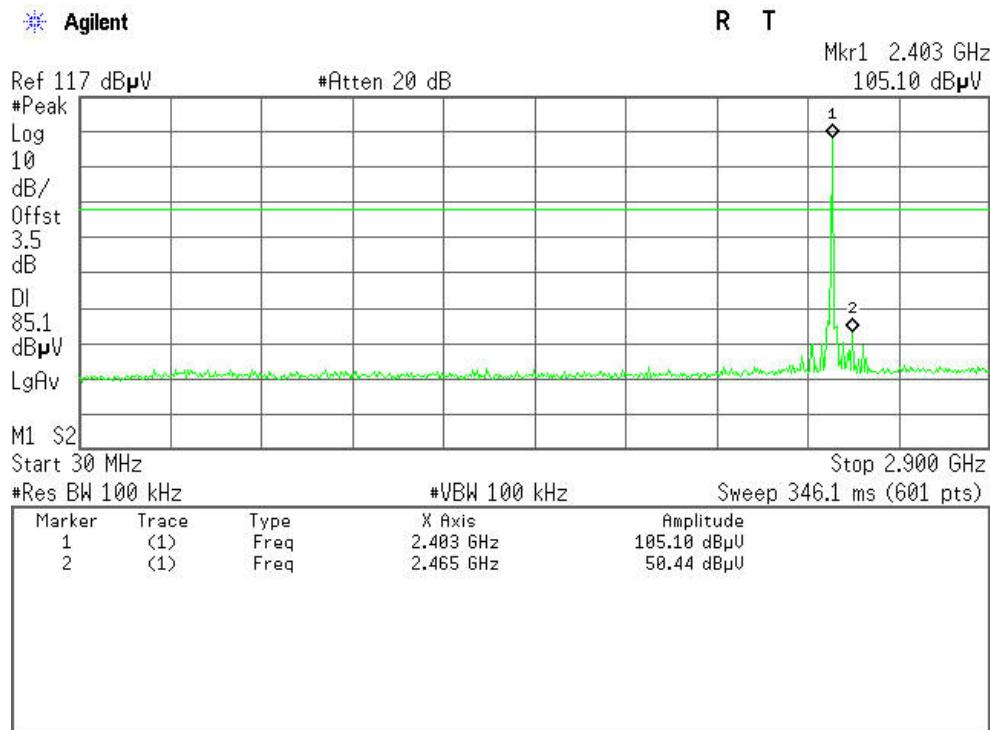
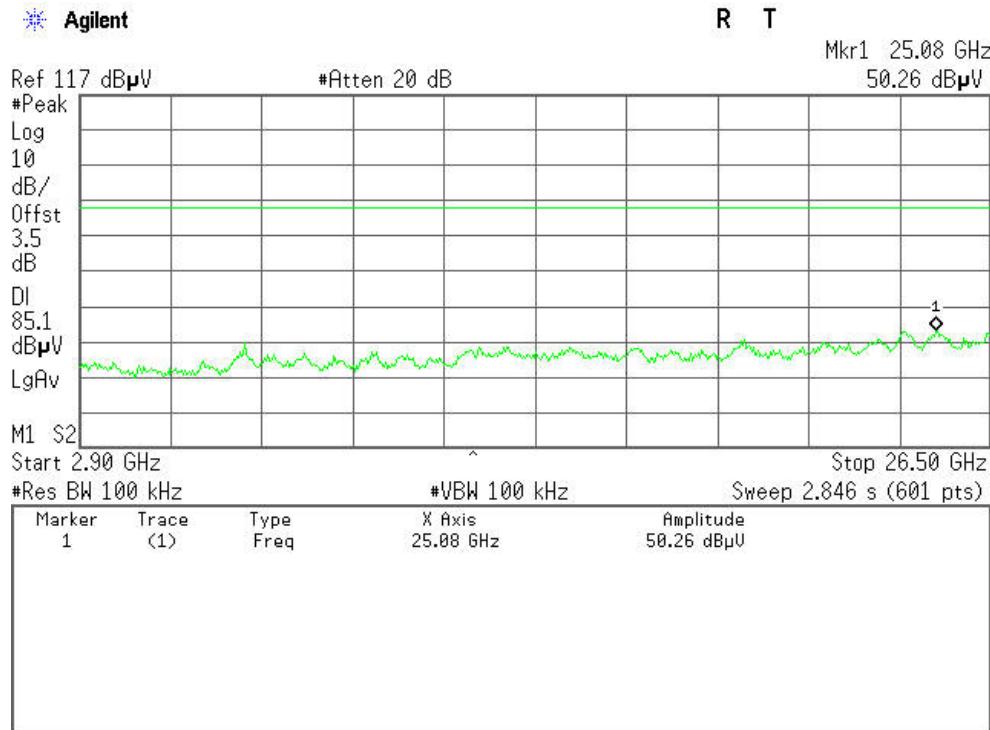
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

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.

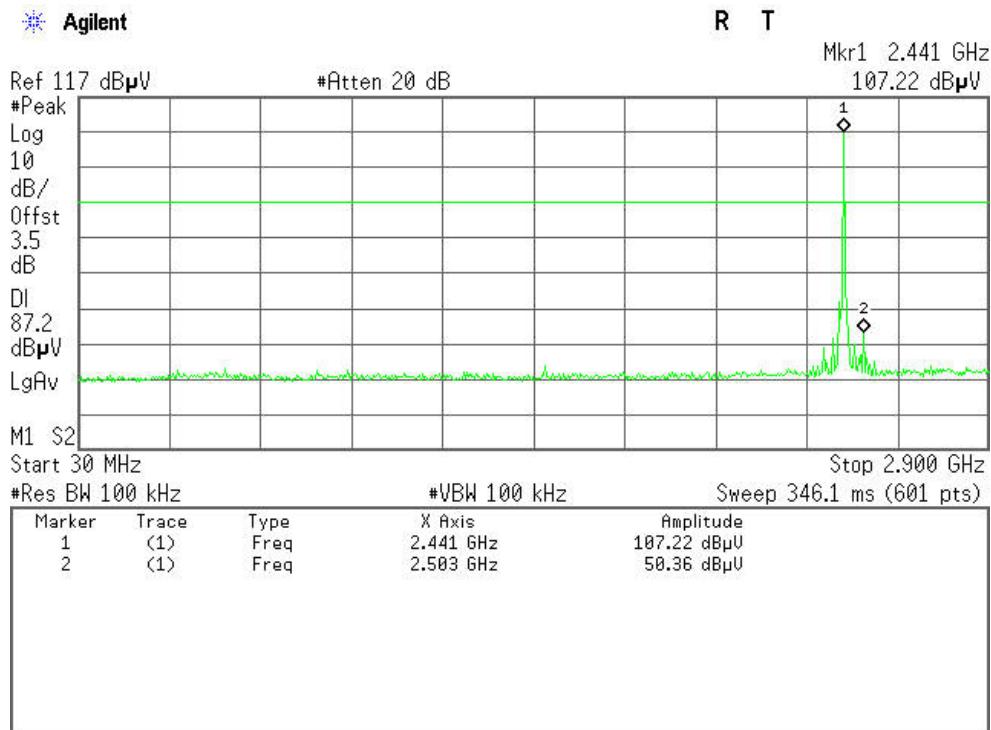
TEST RESULTS

No non-compliance noted

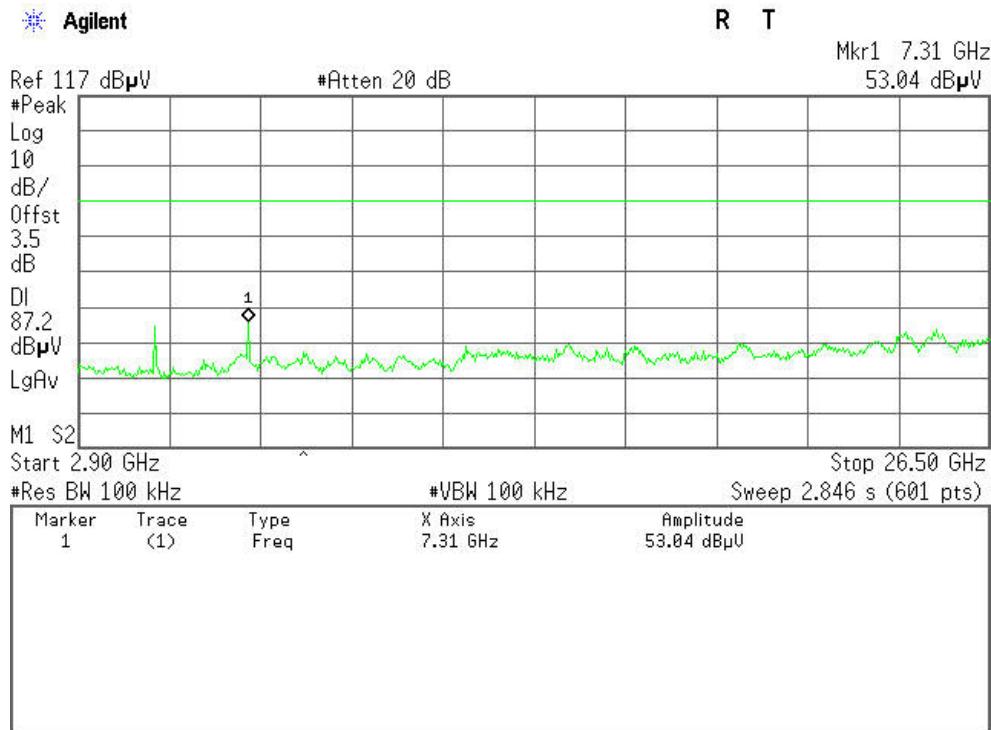
Test Plot (GFSK)**CH Low****30MHz ~2.9GHz****2.9MHz ~26.5GHz**

**CH Mid****30MHz ~ 2.9GHz**

Agilent

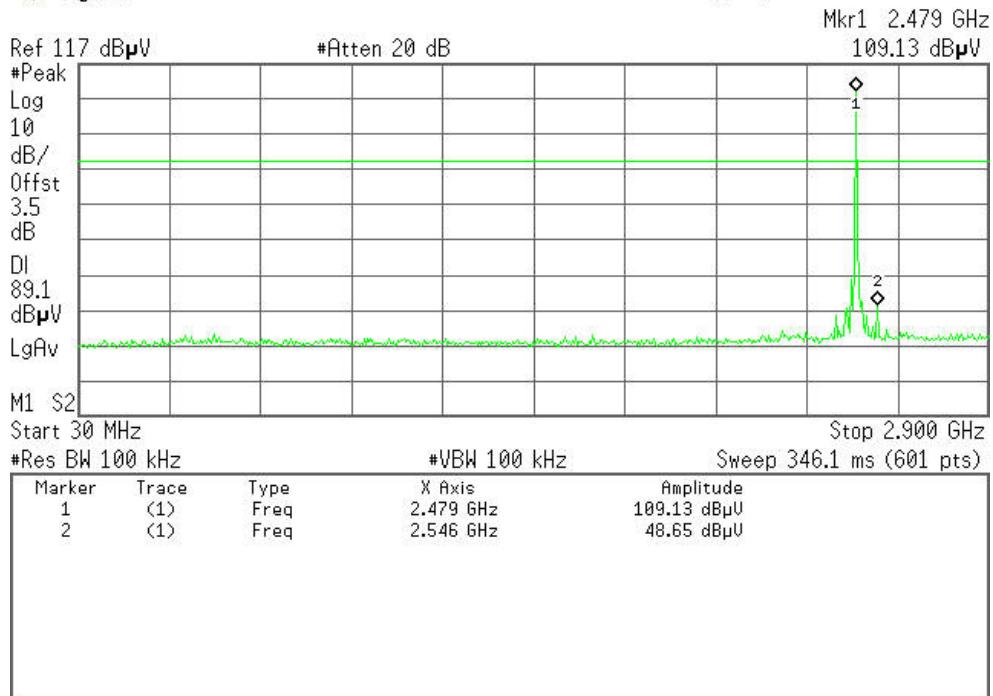
**2.9GHz ~ 26.5GHz**

Agilent

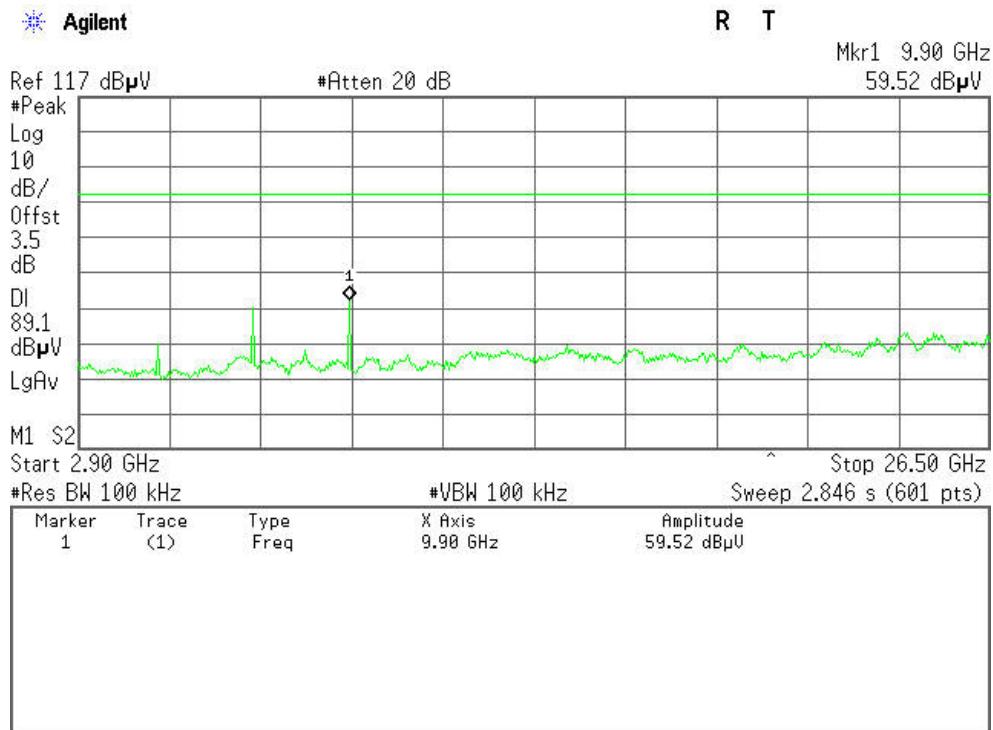


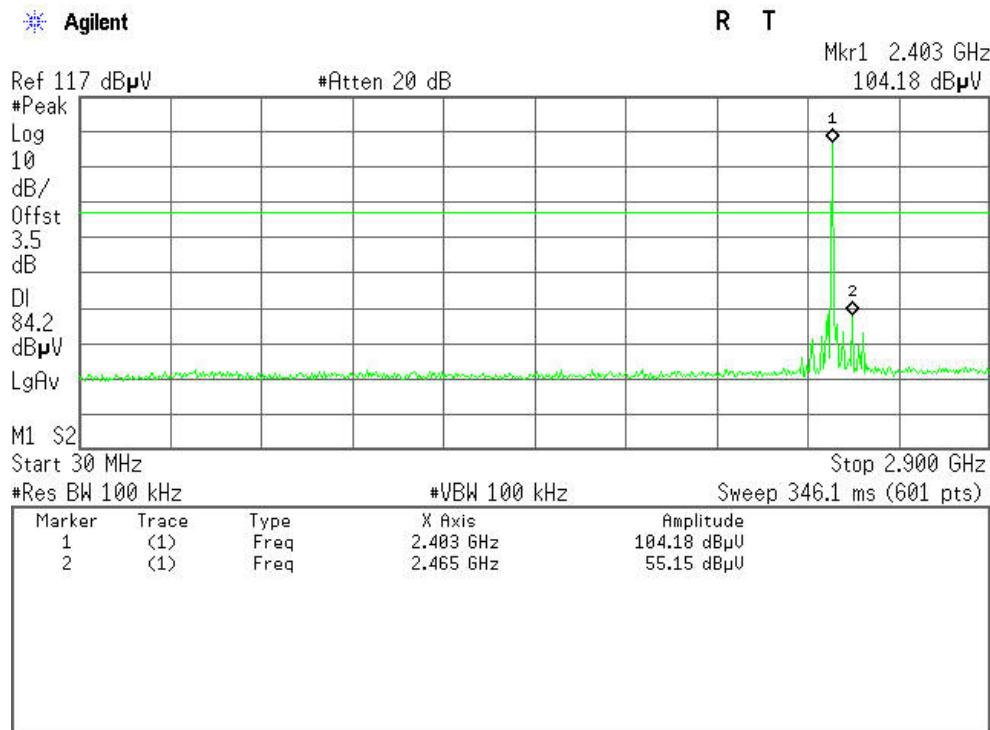
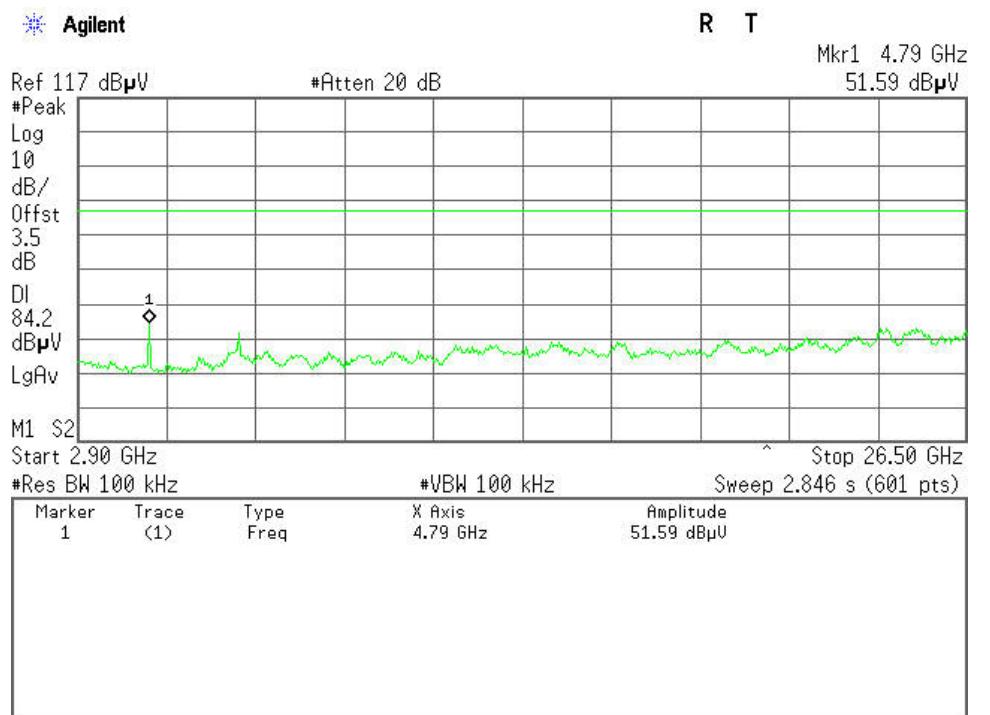
**CH High****30MHz ~ 2.9GHz**

Agilent

**2.9GHz ~ 26.5GHz**

Agilent



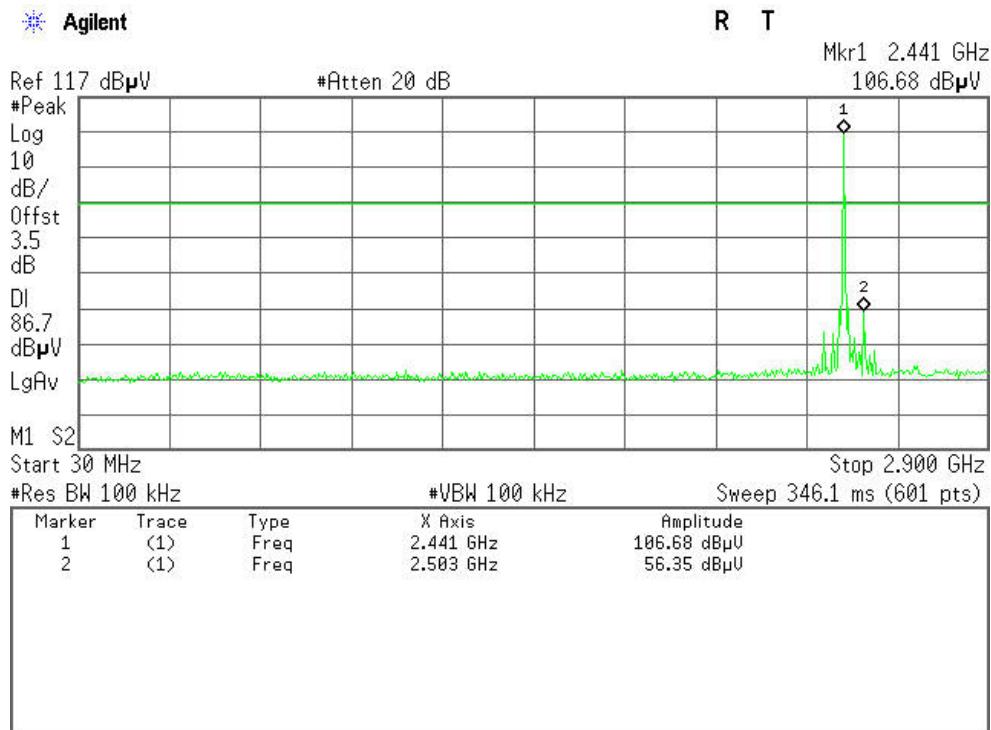
Test Plot (8DPSK)**CH Low****30MHz ~2.9GHz****2.9MHz ~26.5GHz**



CH Mid

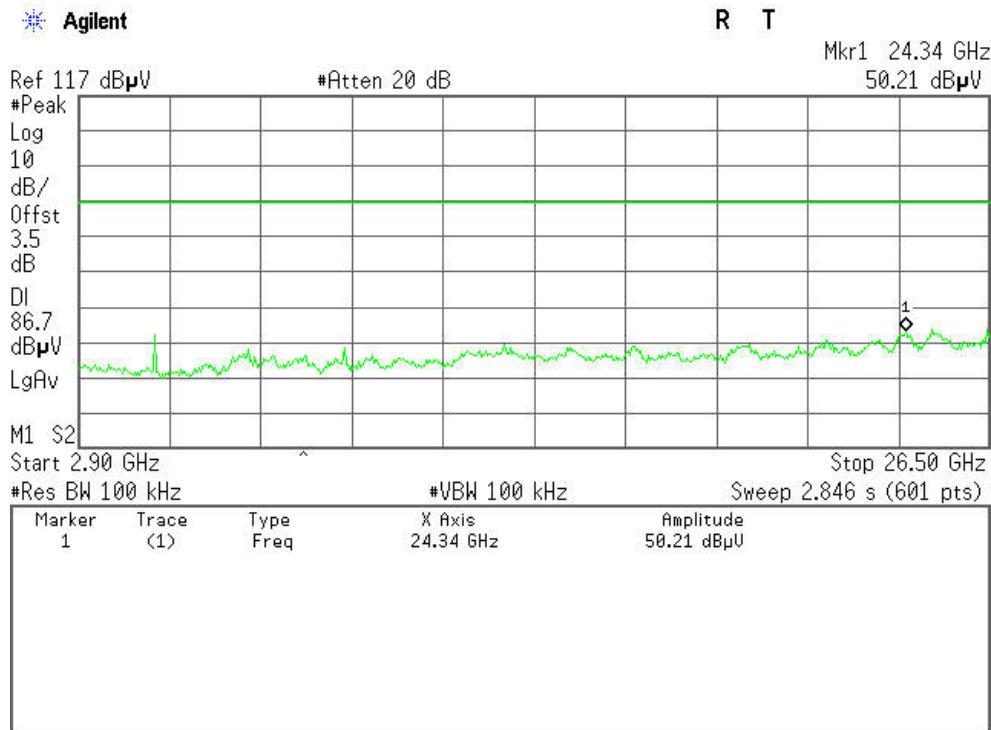
30MHz ~ 2.9GHz

Agilent



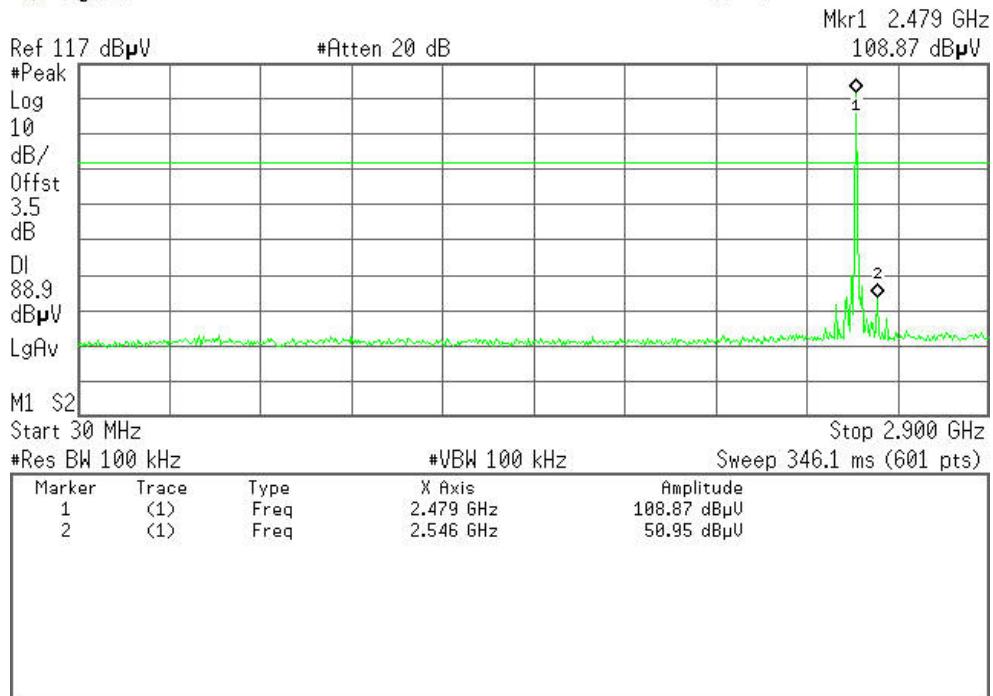
2.9GHz ~ 26.5GHz

Agilent

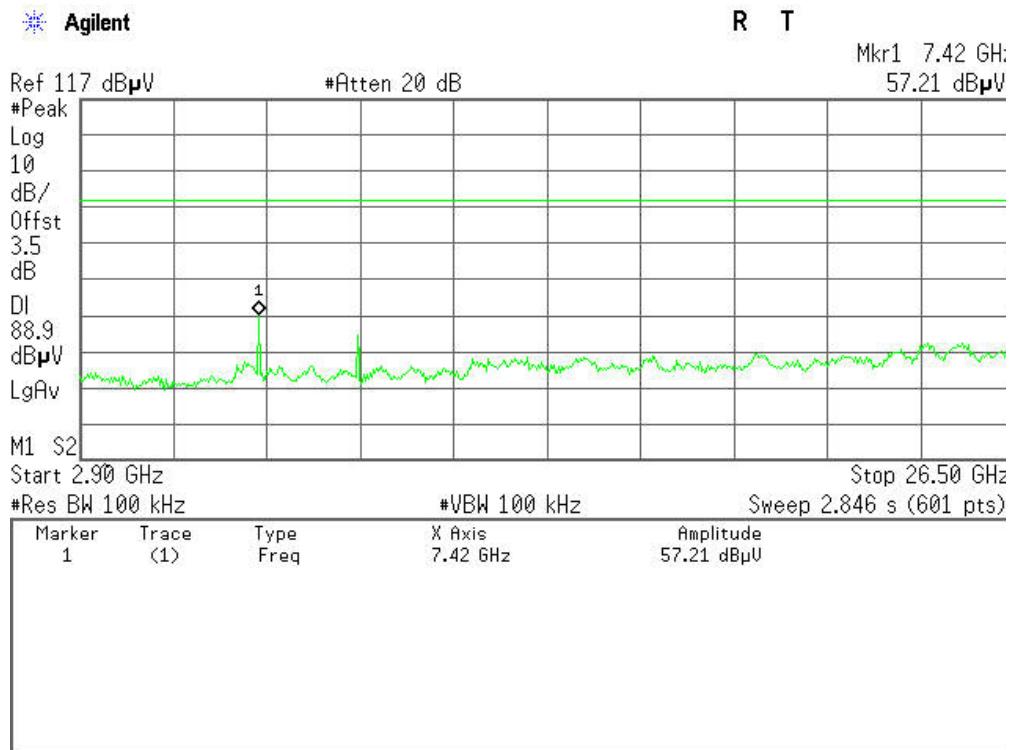


**CH High****30MHz ~ 2.9GHz**

Agilent

**2.9GHz ~ 26.5GHz**

Agilent





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

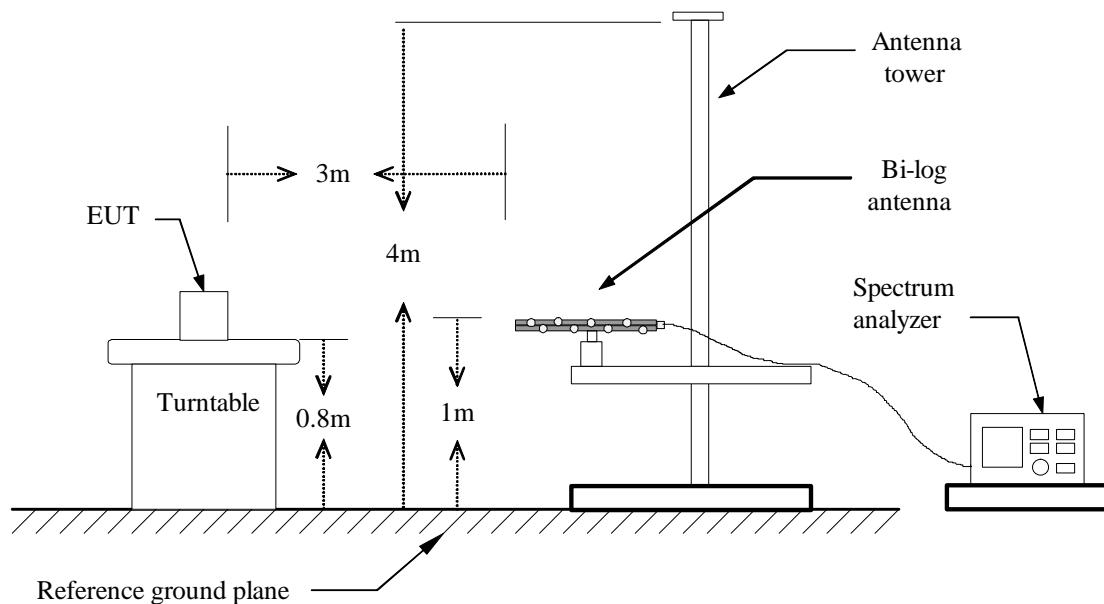
**MEASUREMENT EQUIPMENT USED**

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	03/19/2012	03/19/2013
ESCI EMI TEST RECEIVE.ESCI	ROHDE&SCHWARZ	ESCI	100783	03/17/2012	03/17/2013
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2012	03/18/2013
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	03/18/2012	03/18/2013
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/17/2012	03/17/2013
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/17/2012	03/17/2013
Loop Antenna	A, R, A	PLA-1030/B	1029	03/23/2012	03/23/2013
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/19/2012	03/19/2013
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD		LZ-RF / CCS-SZ-3A2		

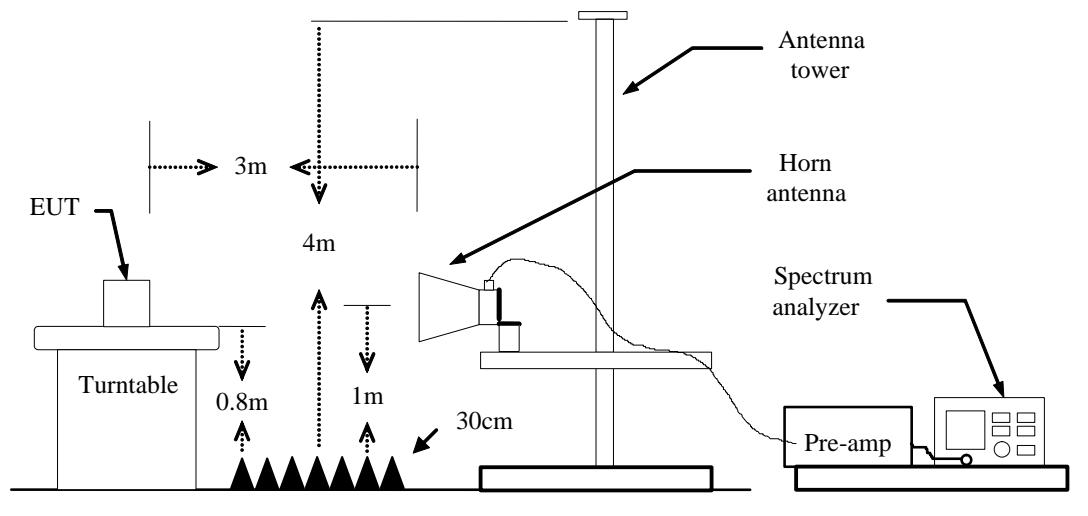
Remark: Each piece of equipment is scheduled for calibration once a year.

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: May 3, 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
112.4500	42.96	-20.83	22.13	43.50	-21.37	V	QP
337.1666	33.37	-17.62	15.75	46.00	-30.25	V	QP
503.6833	32.79	-13.79	19.00	46.00	-27.00	V	QP
519.8500	35.26	-13.15	22.11	46.00	-23.89	V	QP
610.3832	33.35	-12.26	21.09	46.00	-24.91	V	QP
793.0667	33.68	-10.31	23.37	46.00	-22.63	V	QP
<hr/>							
115.6833	41.09	-20.66	20.43	43.50	-23.07	H	QP
416.3833	39.00	-15.36	23.64	46.00	-22.36	H	QP
639.4833	34.99	-12.13	22.86	46.00	-23.14	H	QP
799.5333	38.04	-10.38	27.66	46.00	-18.34	H	QP
864.2000	39.43	-9.34	30.09	46.00	-15.91	H	QP
896.5333	40.07	-9.17	30.90	46.00	-15.10	H	QP

****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 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 120kHz.
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:** May 3, 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	53.21	-11.42	41.79	74.00	-32.21	V	peak
1595.0000	52.97	-10.31	42.66	74.00	-31.34	V	peak
4796.6667	56.07	-0.67	55.40	74.00	-18.60	V	peak
4796.6667	42.05	-0.67	41.38	54.00	-12.62	V	AVG
6298.3333	44.34	3.75	48.09	74.00	-25.91	V	peak
7205.0000	50.56	4.98	55.54	74.00	-18.46	V	peak
7205.0000	35.27	4.98	40.25	54.00	-13.75	V	AVG
9613.3333	49.69	8.42	58.11	74.00	-15.89	V	peak
9613.3333	34.84	8.42	43.26	54.00	-10.74	V	AVG
<hr/>							
1198.3333	51.32	-11.42	39.90	74.00	-34.10	H	peak
2133.3333	48.26	-9.31	38.95	74.00	-35.05	H	peak
3805.0000	45.64	-3.87	41.77	74.00	-32.23	H	peak
4796.6667	54.97	-0.67	54.30	74.00	-19.70	H	peak
4796.6667	40.25	-0.67	39.58	54.00	-14.42	H	AVG
7205.0000	56.83	4.98	61.81	74.00	-12.19	H	peak
7205.0000	41.60	4.98	46.58	54.00	-7.42	H	AVG
9613.3333	49.38	8.42	57.80	74.00	-16.20	H	peak
9613.3333	34.84	8.42	43.26	54.00	-10.74	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 1GHz - 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:** May 3, 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
1595.0000	53.41	-10.31	43.10	74.00	-30.90	V	peak
2161.6667	47.96	-9.36	38.60	74.00	-35.40	V	peak
3748.3333	45.27	-3.86	41.41	74.00	-32.59	V	peak
4286.6667	45.11	-2.64	42.47	74.00	-31.53	V	peak
4881.6667	60.20	-0.39	59.81	74.00	-14.19	V	peak
4881.6667	41.59	-0.39	41.20	54.00	-12.80	V	AVG
9755.0000	51.26	8.64	59.90	74.00	-14.10	V	peak
9755.0000	36.16	8.64	44.80	54.00	-9.20	V	AVG
<hr/>							
1198.3333	51.58	-11.42	40.16	74.00	-33.84	H	peak
2870.0000	47.29	-6.84	40.45	74.00	-33.55	H	peak
3805.0000	45.73	-3.87	41.86	74.00	-32.14	H	peak
4881.6667	58.34	-0.39	57.95	74.00	-16.05	H	peak
4881.6667	42.74	-0.39	42.35	54.00	-11.65	H	AVG
6185.0000	43.60	3.75	47.35	74.00	-26.65	H	peak
7318.3333	51.52	5.27	56.79	74.00	-17.21	H	peak
7318.3333	37.11	5.27	42.38	54.00	-11.62	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 1GHz - 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:** May 3, 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
1595.0000	52.34	-10.31	42.03	74.00	-31.97	V	peak
3153.3333	45.47	-5.60	39.87	74.00	-34.13	V	peak
4145.0000	45.12	-3.11	42.01	74.00	-31.99	V	peak
4966.6667	56.47	-0.12	56.35	74.00	-17.65	V	peak
4966.6667	42.27	-0.12	42.15	54.00	-11.85	V	AVG
6496.6667	44.14	3.93	48.07	74.00	-25.93	V	peak
7998.3333	44.95	7.41	52.36	74.00	-21.64	V	peak
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1198.3333	51.13	-11.42	39.71	74.00	-34.29	H	Peak
1595.0000	49.02	-10.31	38.71	74.00	-35.29	H	Peak
2558.3333	47.50	-9.11	38.39	74.00	-35.61	H	Peak
3181.6667	45.55	-5.53	40.02	74.00	-33.98	H	Peak
3805.0000	45.68	-3.87	41.81	74.00	-32.19	H	Peak
4966.6667	52.10	-0.12	51.98	74.00	-22.02	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

**8DPSK****Operation Mode:**

TX(CH Low)

Test Date: May 3, 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	52.48	-11.42	41.06	74.00	-32.94	V	peak
1595.0000	53.30	-10.31	42.99	74.00	-31.01	V	peak
4400.0000	45.51	-2.26	43.25	74.00	-30.75	V	peak
4796.6667	58.59	-0.67	57.92	74.00	-16.08	V	peak
4796.6667	43.02	-0.67	42.35	54.00	-11.65	V	AVG
7205.0000	49.80	4.98	54.78	74.00	-19.22	V	peak
7205.0000	35.27	4.98	40.25	54.00	-13.75	V	AVG
9613.3333	48.75	8.42	57.17	74.00	-16.83	V	peak
9613.3333	34.84	8.42	43.26	54.00	-10.74	V	AVG
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1198.3333	51.11	-11.42	39.69	74.00	-34.31	H	peak
1595.0000	50.27	-10.31	39.96	74.00	-34.04	H	peak
3181.6667	46.31	-5.53	40.78	74.00	-33.22	H	peak
4796.6667	55.76	-0.67	55.09	74.00	-18.91	H	peak
4796.6667	40.82	-0.67	40.15	54.00	-13.85	H	AVG
6241.6667	45.05	3.79	48.84	74.00	-25.16	H	peak
7205.0000	54.30	4.98	59.28	74.00	-14.72	H	peak
7205.0000	40.28	4.98	45.26	54.00	-8.74	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 Mid)**Test Date:** May 3, 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
1595.0000	53.40	-10.31	43.09	74.00	-30.91	V	peak
2558.3333	49.17	-9.11	40.06	74.00	-33.94	V	peak
3975.0000	45.53	-3.61	41.92	74.00	-32.08	V	peak
4881.6667	59.47	-0.39	59.08	74.00	-14.92	V	peak
4881.6667	45.65	-0.39	45.26	54.00	-8.74	V	AVG
7318.3333	45.98	5.27	51.25	74.00	-22.75	V	peak
9755.0000	49.29	8.64	57.93	74.00	-16.07	V	peak
9755.0000	34.65	8.64	43.29	54.00	-10.71	V	AVG
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1198.3333	51.58	-11.42	40.16	74.00	-33.84	H	peak
1623.3333	48.72	-10.29	38.43	74.00	-35.57	H	peak
3238.3333	46.95	-5.41	41.54	74.00	-32.46	H	peak
4145.0000	45.16	-3.11	42.05	74.00	-31.95	H	peak
4881.6667	57.60	-0.39	57.21	74.00	-16.79	H	peak
4881.6667	42.77	-0.39	42.38	54.00	-11.62	H	AVG
7318.3333	51.33	5.27	56.60	74.00	-17.40	H	peak
7318.3333	35.98	5.27	41.25	54.00	-12.75	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 1GHz - 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:** May 3, 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
1595.0000	53.00	-10.31	42.69	74.00	-31.31	V	peak
3238.3332	46.64	-5.41	41.23	74.00	-32.77	V	peak
4966.6667	54.65	-0.12	54.53	74.00	-19.47	V	peak
4966.6667	40.27	-0.12	40.15	54.00	-13.85	V	AVG
6071.6667	45.58	3.25	48.83	74.00	-25.17	V	peak
6893.3333	45.92	4.35	50.27	74.00	-23.73	V	peak
9925.0000	51.53	8.51	60.04	74.00	-13.96	V	peak
9925.0000	36.15	8.51	44.66	54.00	-9.34	V	AVG
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1198.3333	51.12	-11.42	39.70	74.00	-34.30	H	peak
3153.3333	47.00	-5.60	41.40	74.00	-32.60	H	peak
4258.3333	46.56	-2.73	43.83	74.00	-30.17	H	peak
4796.6667	45.18	-0.67	44.51	74.00	-29.49	H	peak
4966.6667	55.20	-0.12	55.08	74.00	-18.92	H	peak
4966.6667	40.47	-0.12	40.35	54.00	-13.65	H	AVG
7431.6667	44.72	5.52	50.24	74.00	-23.76	H	peak
1198.3333	51.12	-11.42	39.70	74.00	-34.30	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 1GHz - 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 (dBuV)	
	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

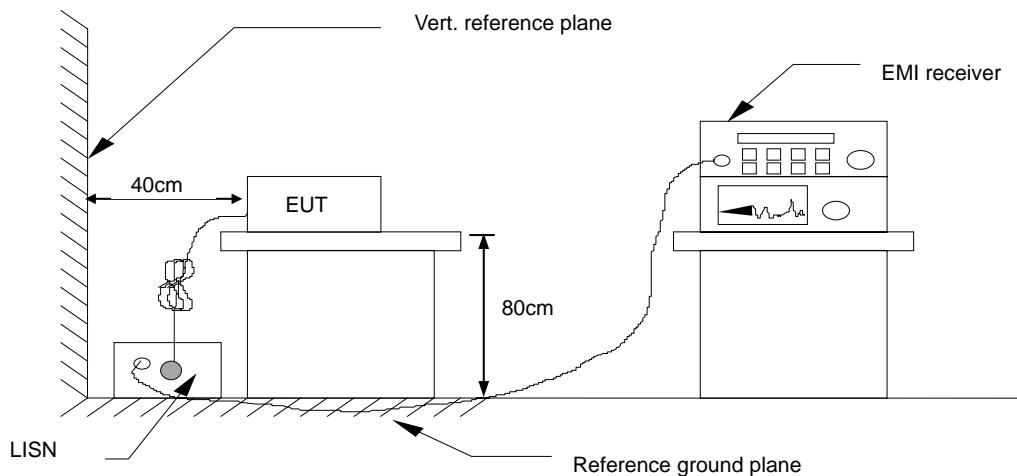
Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

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	03/17/2012	03/17/2013
LISN(EUT)	SCHAFFNER	NNB42	2001/001	03/19/2012	03/19/2013
LISN	EMCO	3825/2	8901-1459	03/19/2012	03/19/2013
Temp. / Humidity Meter	VICTOR	HTC-1	2	03/20/2012	03/20/2013
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****Operation Mode:** Normal Link **Test Date:** June 29, 2012**Temperature:** 22°C **Humidity:** 45% RH**Tested by:** Sunday Hu

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	37.38	9.63	10.20	47.58	19.83	64.96	54.96	-17.38	-35.13	L1
0.2540	33.18	6.10	10.21	43.39	16.31	61.62	51.63	-18.23	-35.32	L1
0.4540	28.22	2.48	10.23	38.45	12.71	56.80	46.80	-18.35	-34.09	L1
1.4260	18.50	0.04	10.38	28.88	10.42	56.00	46.00	-27.12	-35.58	L1
7.3940	27.41	3.87	10.38	37.79	14.25	60.00	50.00	-22.21	-35.75	L1
8.5500	26.25	2.22	10.38	36.63	12.60	60.00	50.00	-23.37	-37.40	L1
0.1700	35.56	6.85	10.17	45.73	17.02	64.96	54.96	-19.23	-37.94	L2
0.2500	28.84	2.21	10.21	39.05	12.42	61.75	51.76	-22.70	-39.34	L2
0.3580	25.75	0.18	10.22	35.97	10.40	58.77	48.77	-22.80	-38.37	L2
1.9900	18.70	0.85	10.41	29.11	11.26	56.00	46.00	-26.89	-34.74	L2
4.7819	22.68	0.58	10.38	33.06	10.96	56.00	46.00	-22.94	-35.04	L2
7.3820	26.20	2.02	10.38	36.58	12.40	60.00	50.00	-23.42	-37.60	L2

Note:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Peak detector, Quasi-peak detector and average detector.
3. “--” denotes the emission level was or more than 2dB below the Average limit.
4. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
5. L1= Line One (Live Line)/ L2= Line Two (Neutral Line)