



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

MrHandsfree Blue Easy - Multi

Model: Blue Easy, Blue Multi

Brand: N/A

Test Report Number:

SZ120229B02-RP

Prepared for

TE-Group NV

Kapelse straat 61-2950 Kapellen-Belgium

Prepared by

COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.

**No.10-1, Mingkeda Logistics Park, No.18, Huanguan South Rd.,
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Issued Date: March 7, 2012



TESTING CERT #2861.01

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Revision History

Rev.	Issue No.	Revisions	Effect Page	Revised By
00	SZ120229B02-RP	Initial Issue	ALL	Nancy Fu



TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION	4
2. EUT DESCRIPTION.....	5
3. TEST METHODOLOGY	6
3.1. DESCRIPTION OF TEST MODES	6
4. FACILITIES AND ACCREDITATIONS	7
4.1. FACILITIES.....	7
4.2. ACCREDITATIONS	7
4.3. MEASUREMENT UNCERTAINTY	7
5. SETUP OF EQUIPMENT UNDER TEST	8
5.1. SETUP CONFIGURATION OF EUT	8
5.2. SUPPORT EQUIPMENT	8
6. FCC PART 15.247 REQUIREMENTS	9
6.1. 20DB BANDWIDTH	9
6.2. PEAK POWER.....	14
6.3. PEAK POWER SPECTRAL DENSITY	16
6.4. BAND EDGES MEASUREMENT	17
6.5. FREQUENCY SEPARATION	27
6.6. NUMBER OF HOPPING FREQUENCY	30
6.7. TIME OF OCCUPANCY (DWELL TIME)	33
6.8. SPURIOUS EMISSIONS	40
6.9. POWERLINE CONDUCTED EMISSIONS	58



1. TEST RESULT CERTIFICATION

Product: MrHandsfree Blue Easy - Multi
Model: Blue Easy, Blue Multi
Brand: N/A
Tested: February 29~ March 6, 2012
Applicant: **TE-Group NV**
Kapelse straat 61-2950 Kapellen-Belgium
Manufacturer: **TE-Group NV**
Kapelse straat 61-2950 Kapellen-Belgium

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	MrHandsfree Blue Easy - Multi
Model Number	Blue Easy, Blue Multi
Brand	N/A
Model Discrepancy	Only their appearance and model names are different for the marketing purpose.
Identify Number	SZ120229B02-RP
Power Supply	DC3.7V supplied by the lithium-ion battery or DC 5V supplied by the car charger
Car charger manufacturer/ model name	CS0105/ CU0105 AC input: 12-24V DC output: DC 5.0V 500mA
Received Date	February 29, 2012
Frequency Range	2402 ~ 2480 MHz
Transmit Power	GFSK: 5.77dBm 8DPSK: 4.90dBm
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 0dB gain(Max)
Temperature Range	-20°C ~ +70°C

Note: This submittal(s) (test report) is intended for FCC ID: TQGEASYMULTI 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	Not applicable since the EUT supplied by DC power.	<input type="checkbox"/>
Radiated Emission	Mode 1: Normal Link	<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.

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

Notes:

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

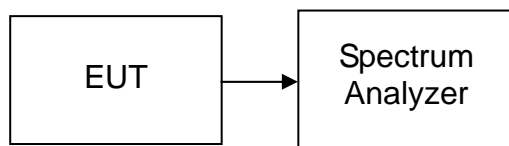
None; for reporting purpose only.

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

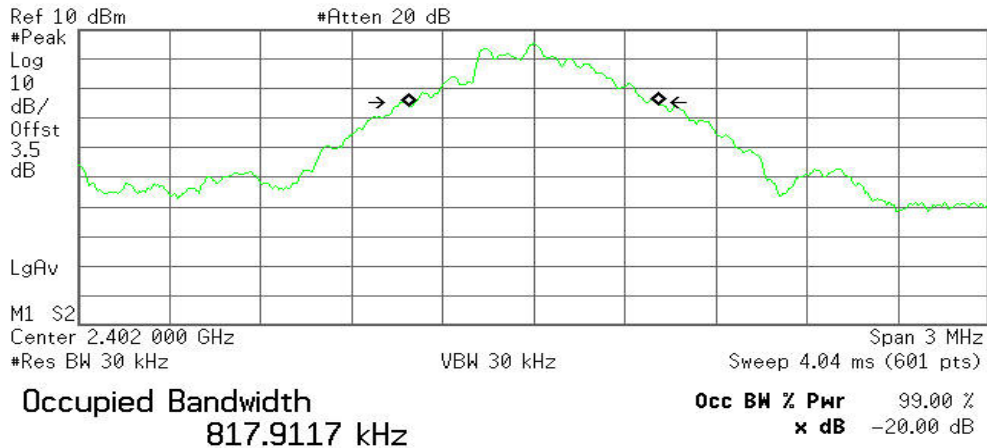


Test plot (GFSK)

20dB Bandwidth (CH Low)

Agilent 21:37:51 Feb 13, 2012

R T



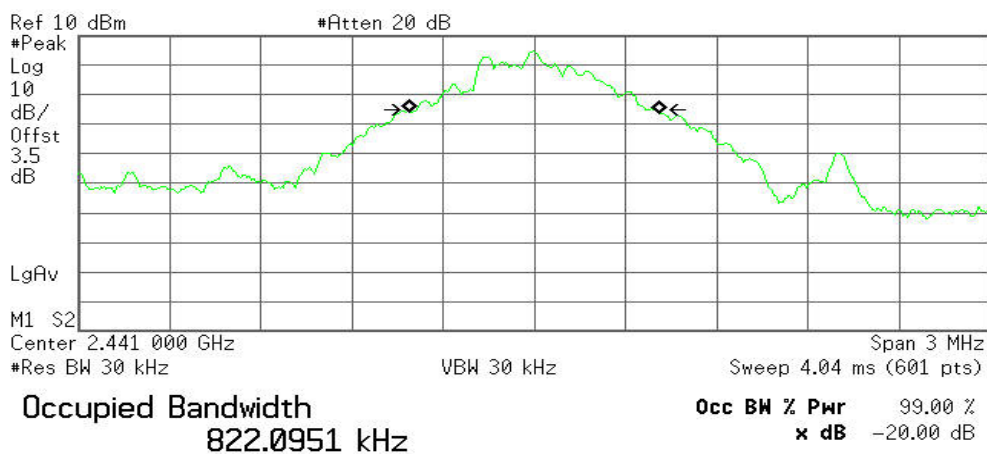
Transmit Freq Error 977.055 Hz

x dB Bandwidth 836.924 kHz

20dB Bandwidth (CH Mid)

Agilent 21:37:25 Feb 13, 2012

R T



Transmit Freq Error -758.723 Hz

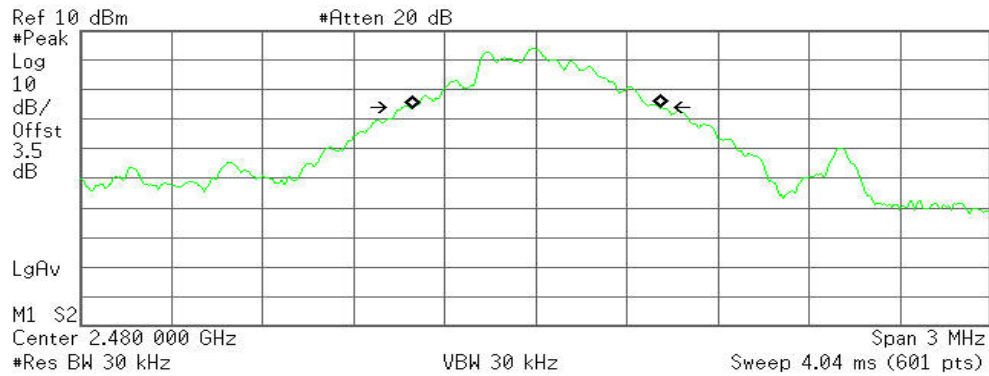
x dB Bandwidth 786.483 kHz



20dB Bandwidth (CH High)

Agilent 21:37:07 Feb 13, 2012

R T



Occupied Bandwidth
817.4333 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 1.398 kHz
x dB Bandwidth 842.643 kHz

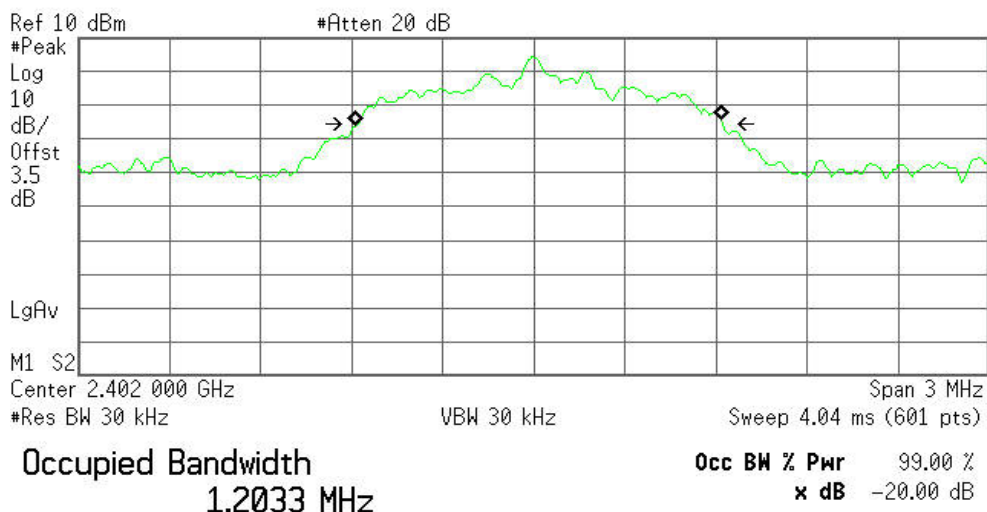


Test plot (8DPSK)

20dB Bandwidth (CH Low)

Agilent 21:35:39 Feb 13, 2012

R T

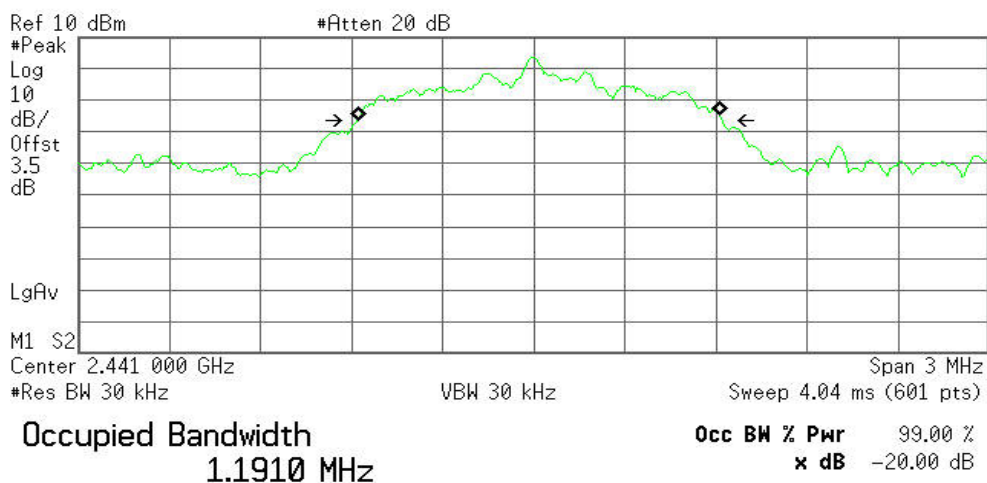


Transmit Freq Error 18.295 kHz
x dB Bandwidth 1.205 MHz

20dB Bandwidth (CH Mid)

Agilent 21:36:02 Feb 13, 2012

R T



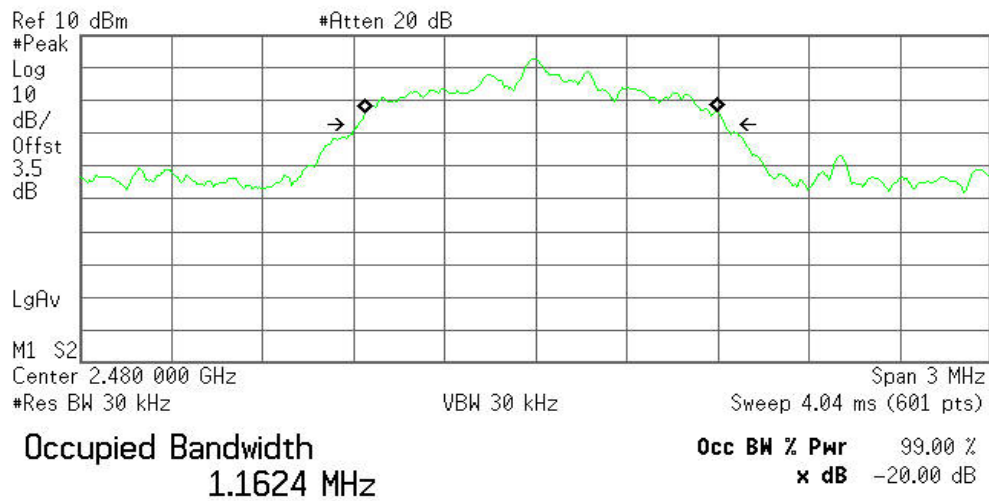
Transmit Freq Error 19.239 kHz
x dB Bandwidth 1.204 MHz



20dB Bandwidth (CH High)

Agilent 21:36:27 Feb 13, 2012

R T



Transmit Freq Error 20.382 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:

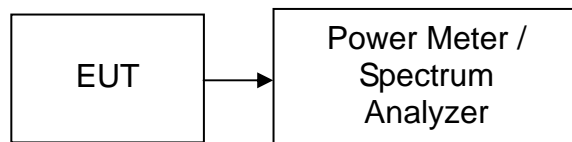
1. For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
2. Except as shown in paragraphs (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	2.27	3.50	5.77	0.00378	1000	PASS
Mid	2441	1.59	3.50	5.09	0.00323		PASS
High	2480	1.41	3.50	4.91	0.00310		PASS

8DPSK

Channel	Frequency (MHz)	Reading Power (dBm)	Factor (dB)	Output Power (dBm)	Output Power (W)	Limit (mW)	Result
Low	2402	1.40	3.50	4.90	0.00309	1000	PASS
Mid	2441	0.76	3.50	4.26	0.00267		PASS
High	2480	0.22	3.50	3.72	0.00236		PASS



6.3. PEAK POWER SPECTRAL DENSITY

LIMIT

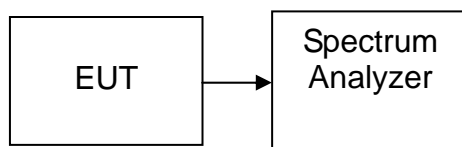
1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping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

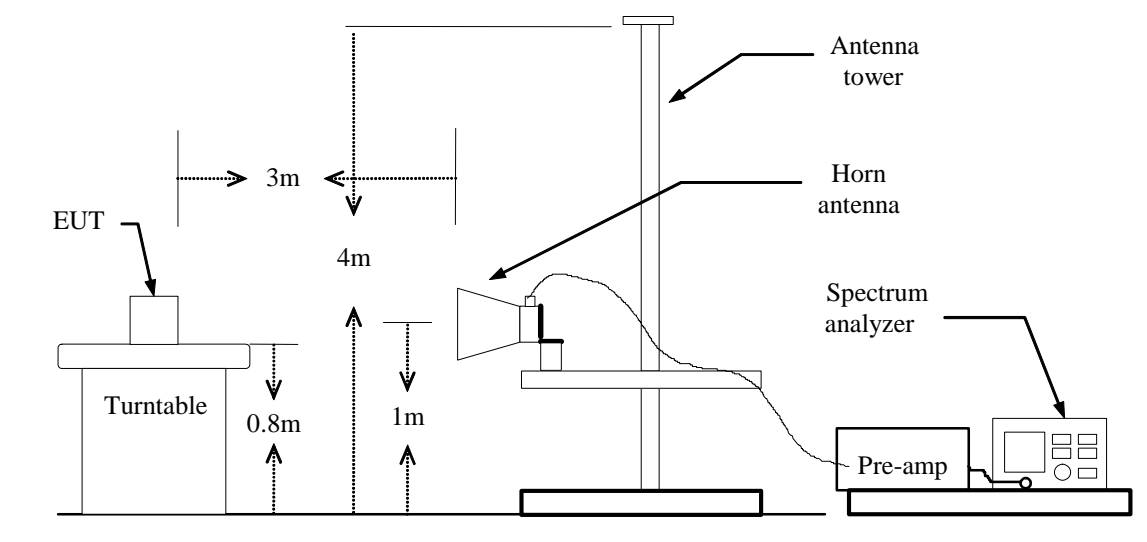
LIMIT

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)

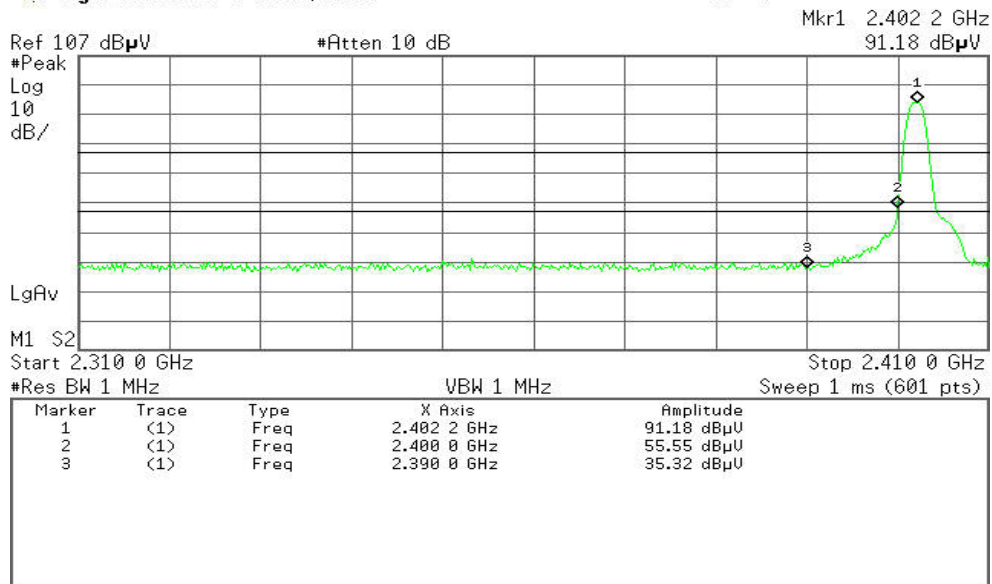
Band Edges (CH-Low)

Detector mode: Peak

Polarity: Vertical

Agilent 01:34:10 Feb 14, 2012

R T

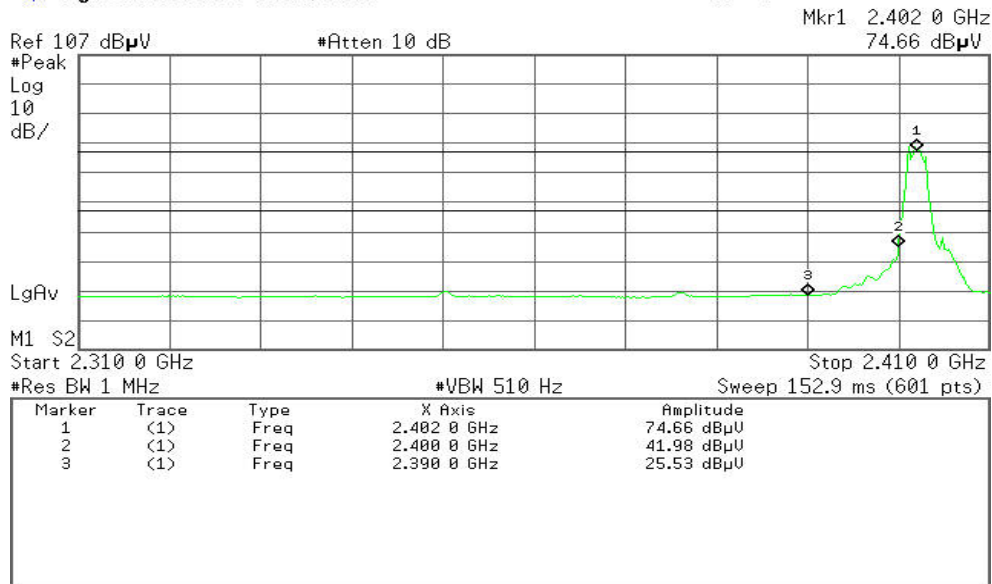


Detector mode: Average

Polarity: Vertical

Agilent 01:35:02 Feb 14, 2012

R T



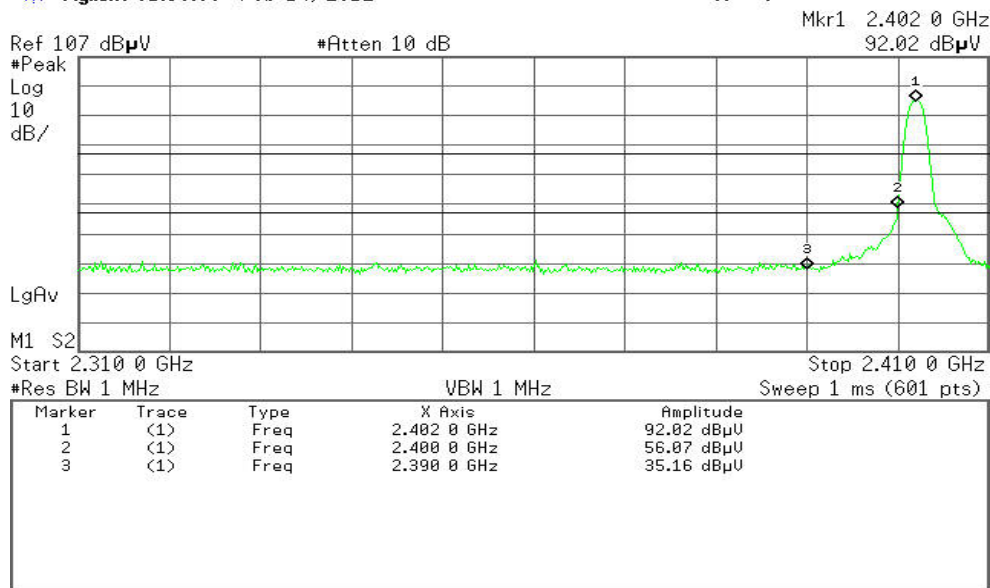


Detector mode: Peak

Polarity: Horizontal

Agilent 01:38:00 Feb 14, 2012

R T

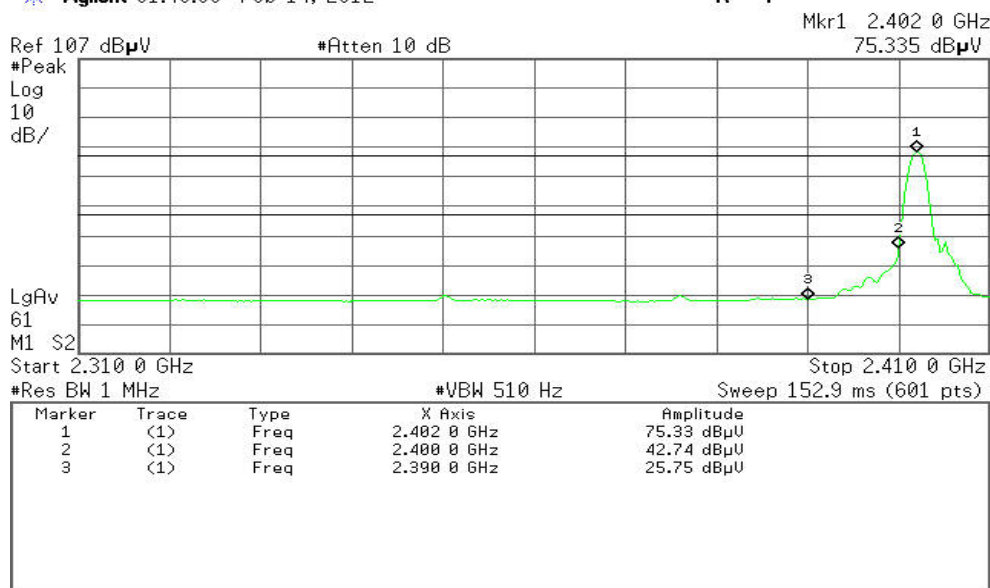


Detector mode: Average

Polarity: Horizontal

Agilent 01:40:08 Feb 14, 2012

R T





Band Edges (CH-High)

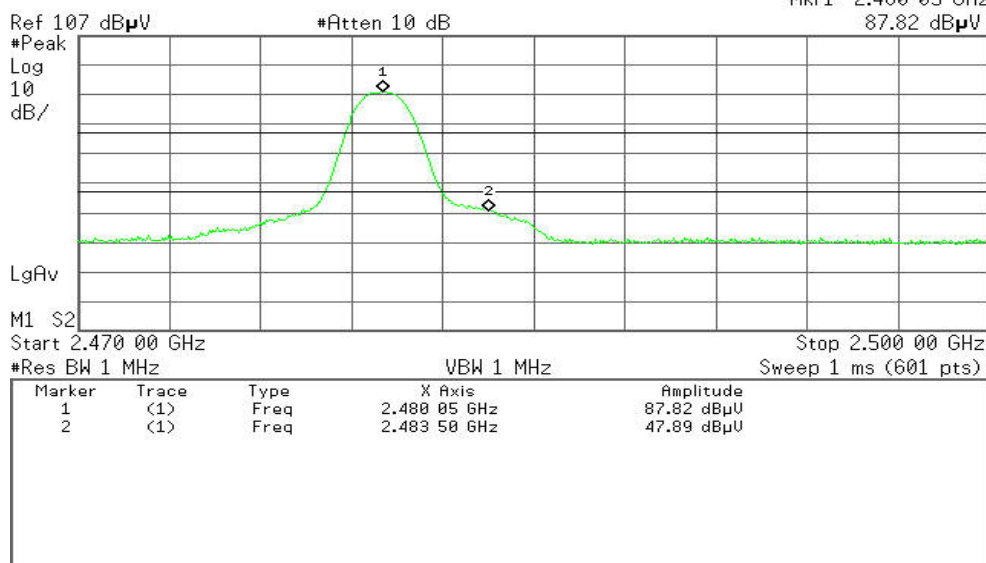
Detector mode: Peak

Polarity: Vertical

Agilent 01:27:32 Feb 14, 2012

R T

Mkr1 2.480 05 GHz
87.82 dBμV



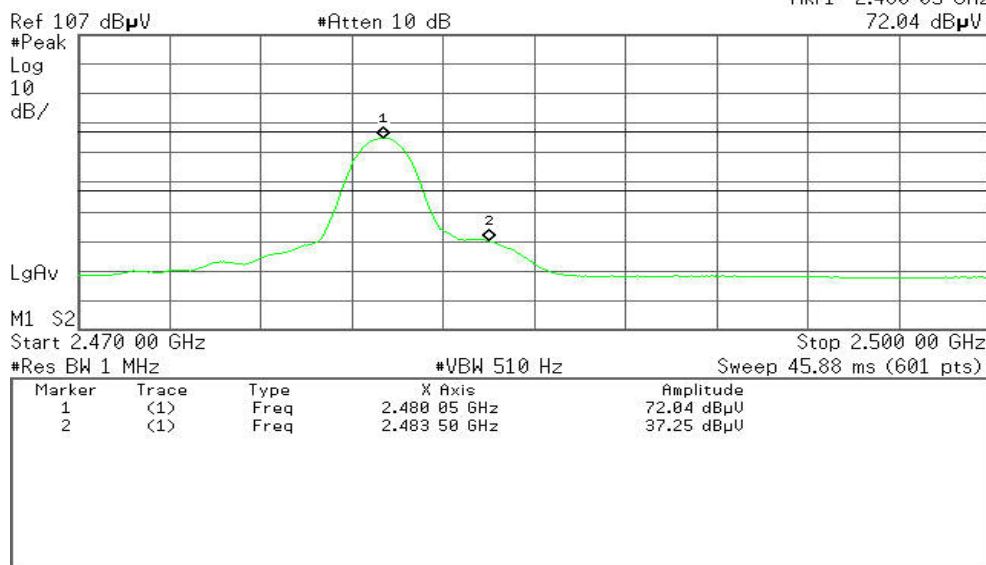
Detector mode: Average

Polarity: Vertical

Agilent 01:28:28 Feb 14, 2012

R T

Mkr1 2.480 05 GHz
72.04 dBμV





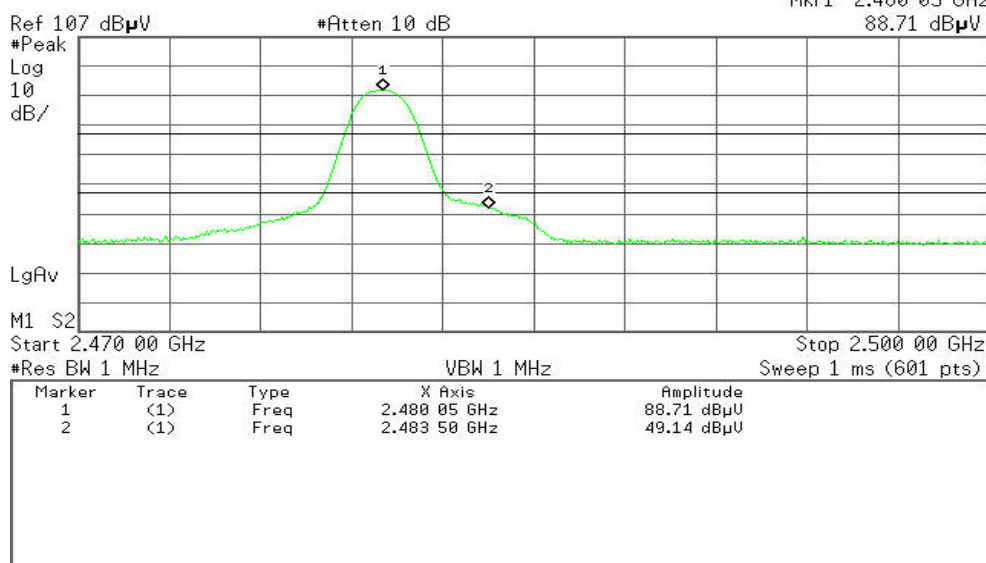
Detector mode: Peak

Polarity: Horizontal

Agilent 01:22:57 Feb 14, 2012

R T

Mkr1 2.480 05 GHz
88.71 dBμV



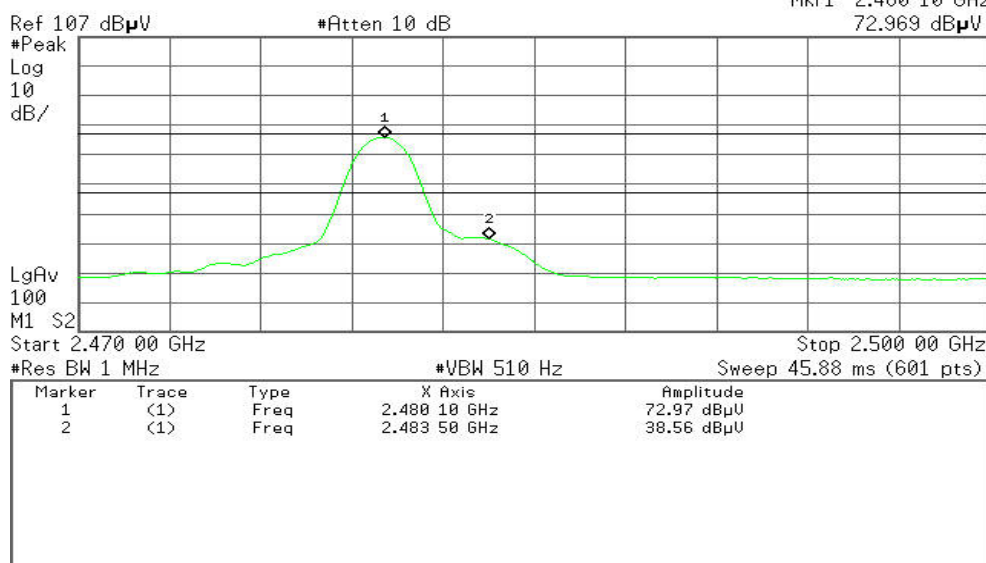
Detector mode: Average

Polarity: Horizontal

Agilent 01:23:44 Feb 14, 2012

R T

Mkr1 2.480 10 GHz
72.969 dBμV





Test Data (8DPSK)

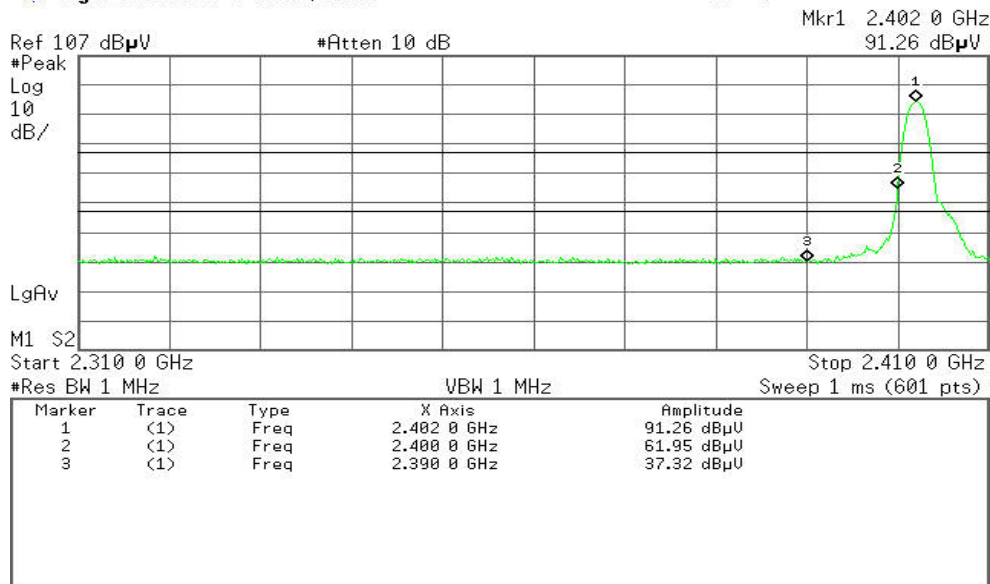
Band Edges (CH-Low)

Detector mode: Peak

Polarity: Vertical

Agilent 01:01:40 Feb 14, 2012

R T

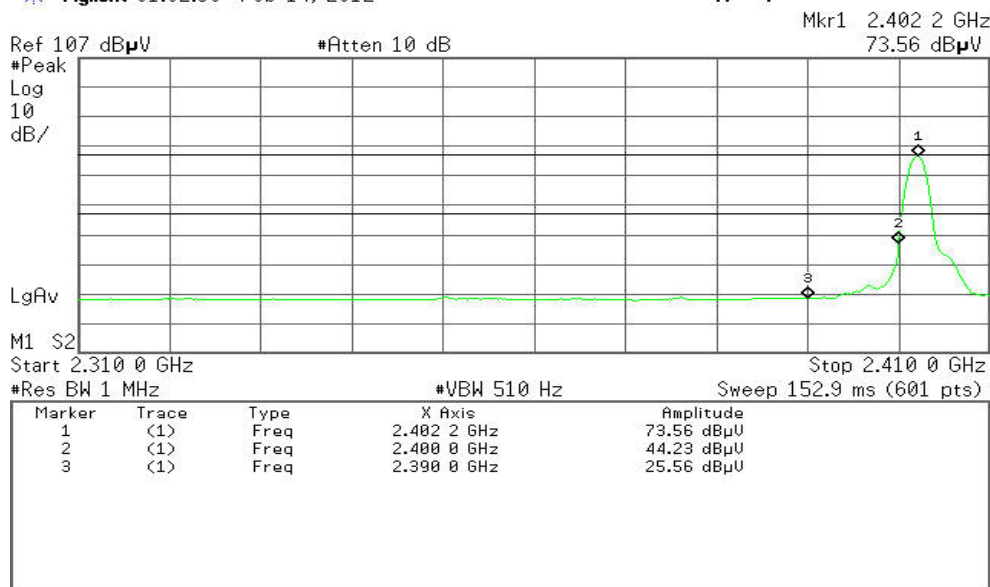


Detector mode: Average

Polarity: Vertical

Agilent 01:02:30 Feb 14, 2012

R T



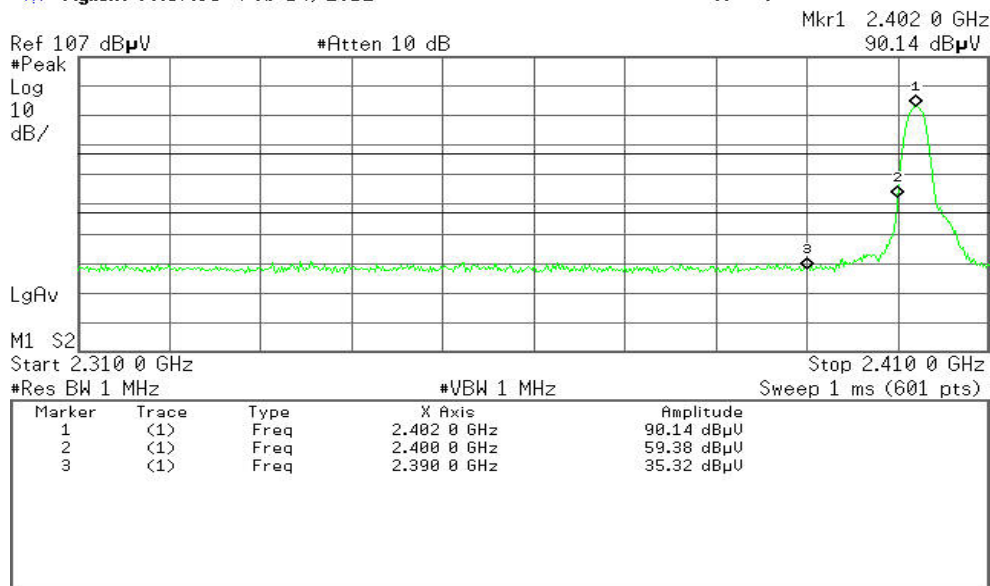


Detector mode: Peak

Polarity: Horizontal

Agilent 00:57:35 Feb 14, 2012

R T

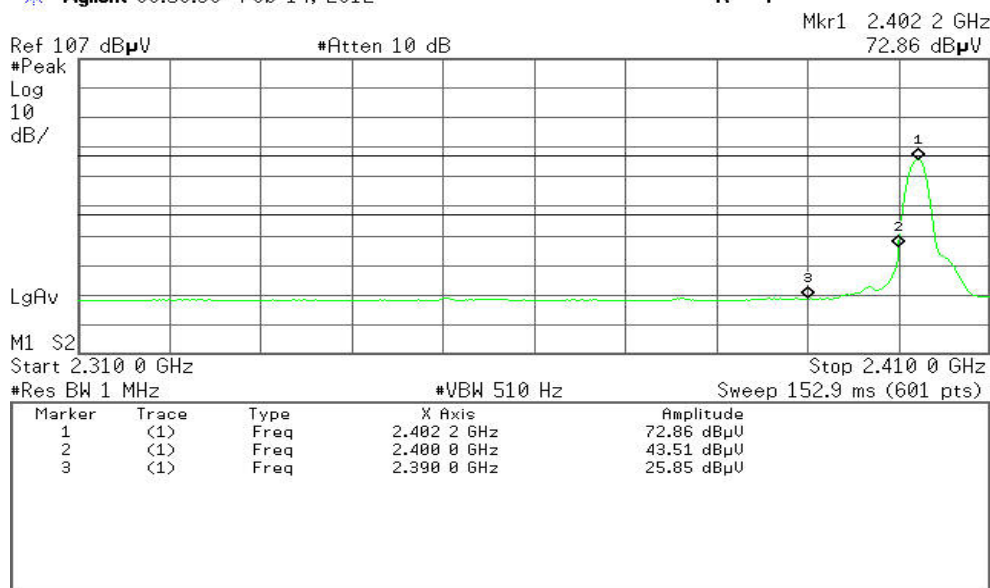


Detector mode: Average

Polarity: Horizontal

Agilent 00:58:39 Feb 14, 2012

R T





Band Edges (CH-High)

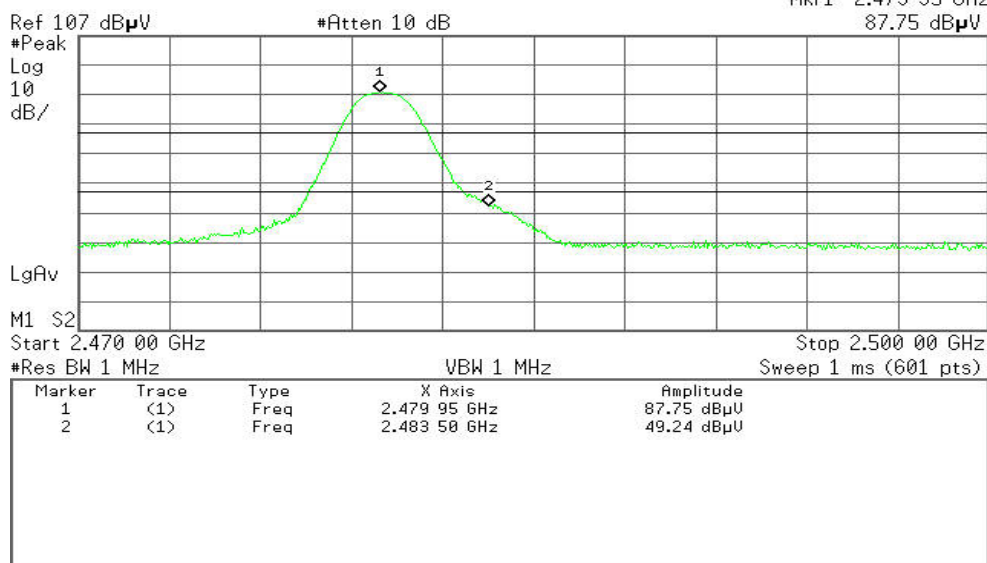
Detector mode: Peak

Polarity: Vertical

Agilent 01:07:22 Feb 14, 2012

R T

Mkr1 2.479 95 GHz
87.75 dBμV



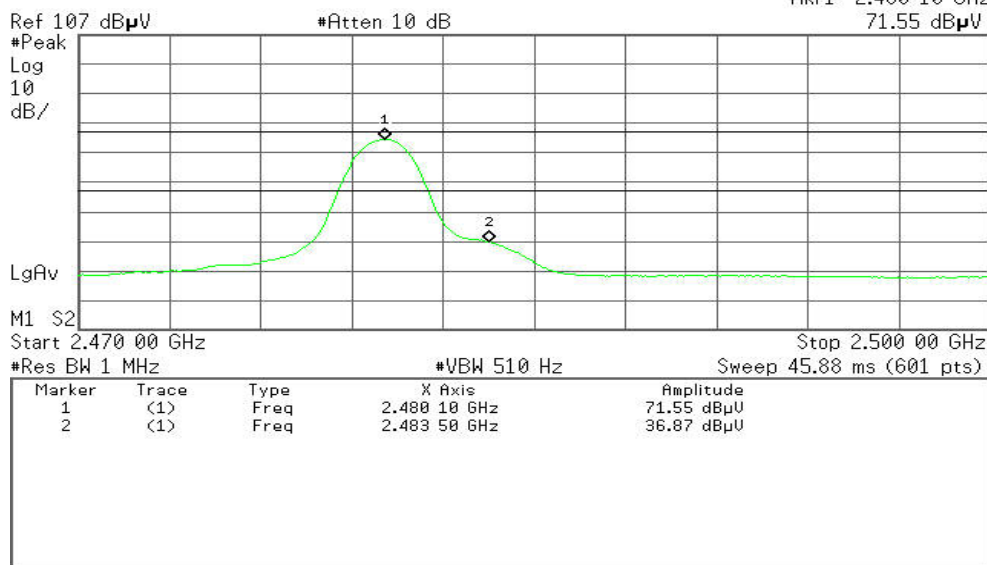
Detector mode: Average

Polarity: Vertical

Agilent 01:08:05 Feb 14, 2012

R T

Mkr1 2.480 10 GHz
71.55 dBμV





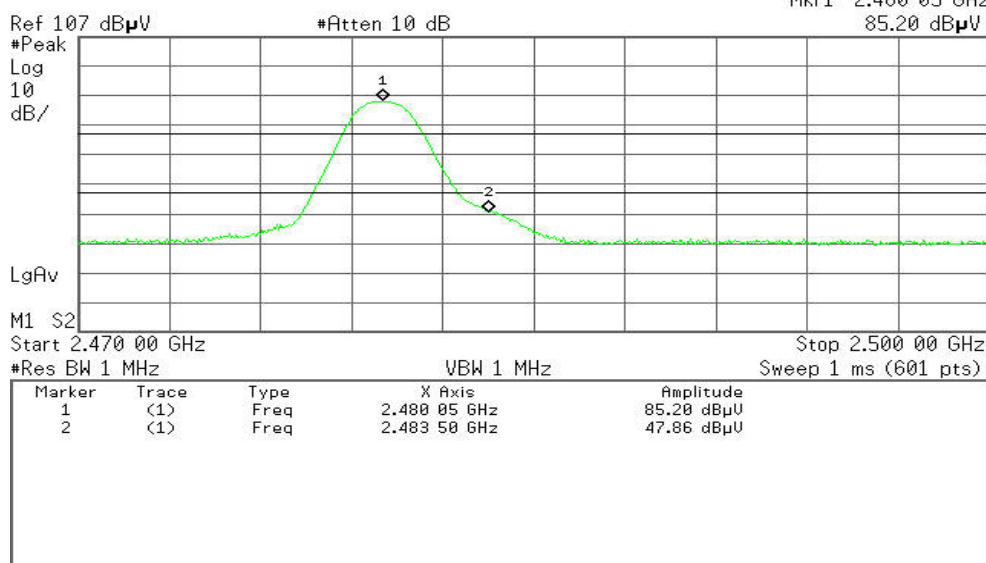
Detector mode: Peak

Polarity: Horizontal

Agilent 01:10:57 Feb 14, 2012

R T

Mkr1 2.480 05 GHz
85.20 dBμV



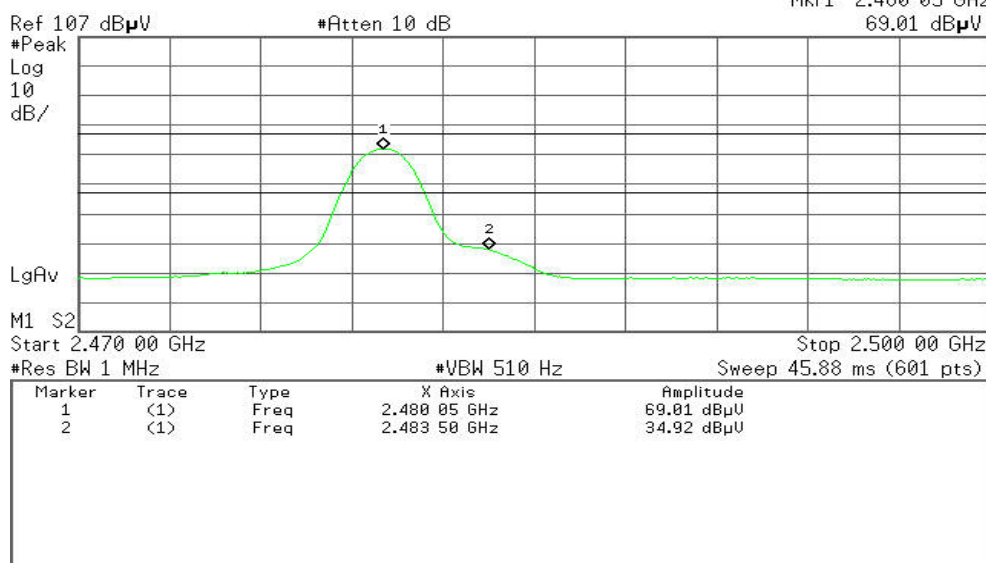
Detector mode: Average

Polarity: Horizontal

Agilent 01:11:51 Feb 14, 2012

R T

Mkr1 2.480 05 GHz
69.01 dBμV





6.5. FREQUENCY SEPARATION

LIMIT

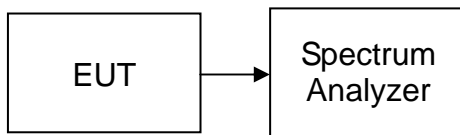
According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel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

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	561.762	> 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

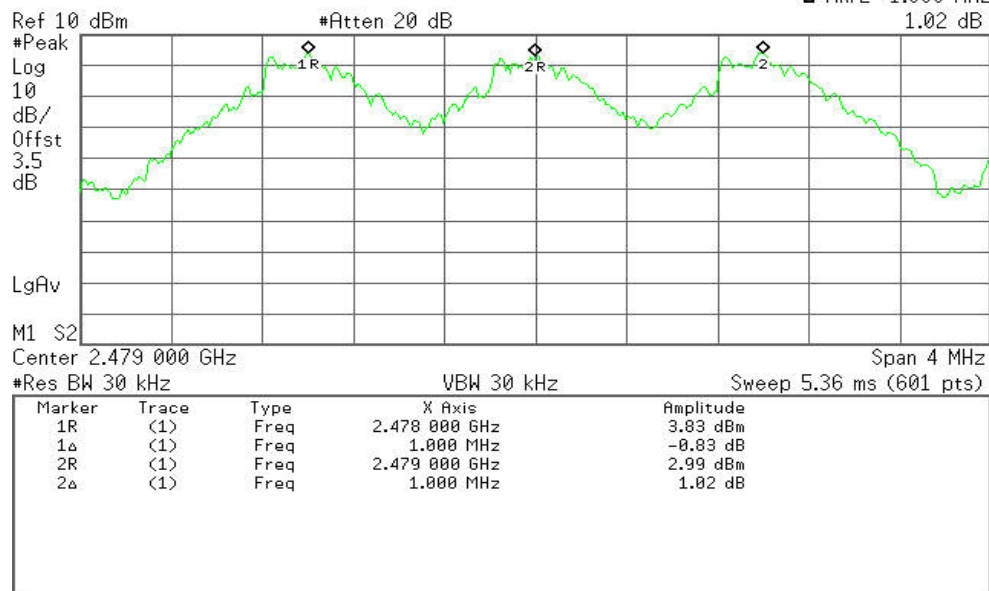
Measurement of Channel Separation

Agilent 21:59:43 Feb 13, 2012

R T

▲ Mkr2 1.000 MHz

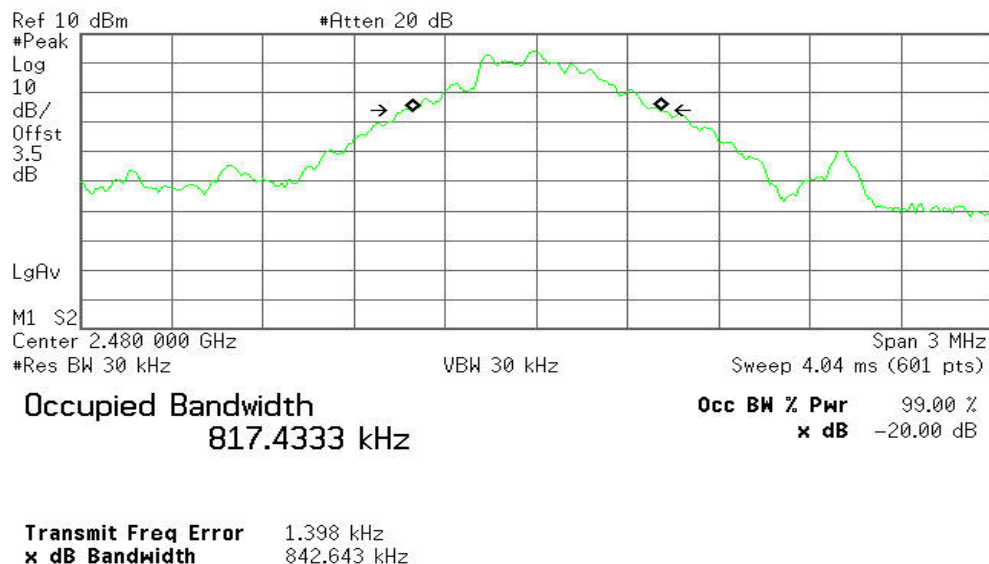
1.02 dB



20 dB bandwidth(CH High)

Agilent 21:37:07 Feb 13, 2012

R T

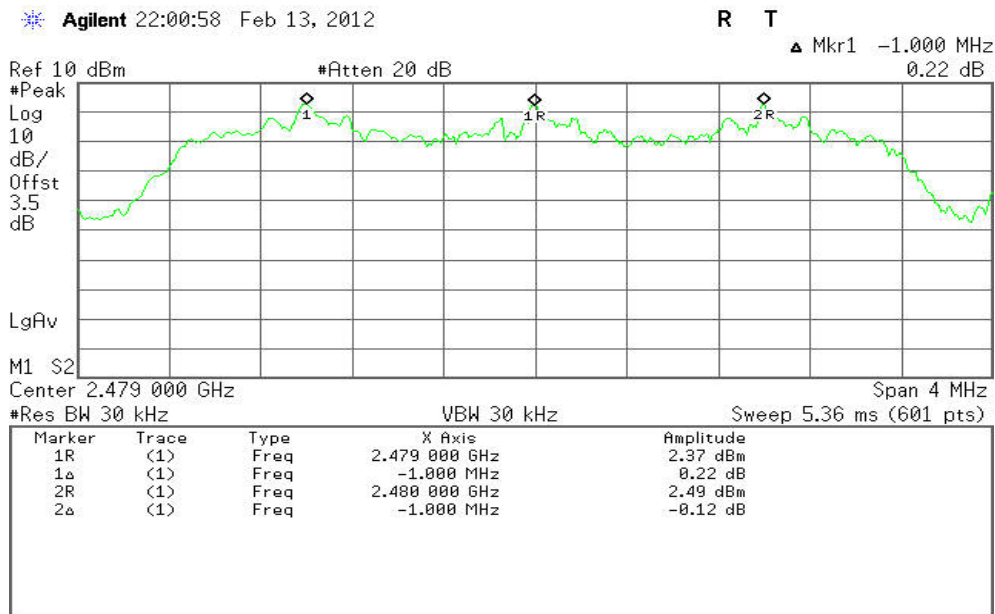




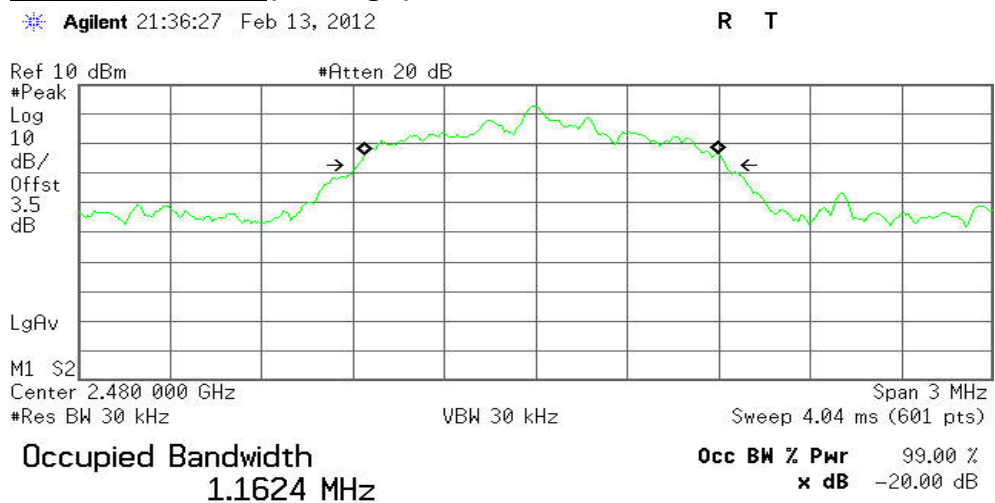
8DPSK

Test Plot

Measurement of Channel Separation



20 dB bandwidth(CH High)



Transmit Freq Error 20.382 kHz
x dB Bandwidth 1.205 MHz



6.6. NUMBER OF HOPPING FREQUENCY

LIMIT

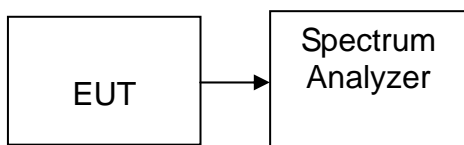
According to §15.247(a)(1)(ii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

MEASUREMENT EQUIPMENT USED

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



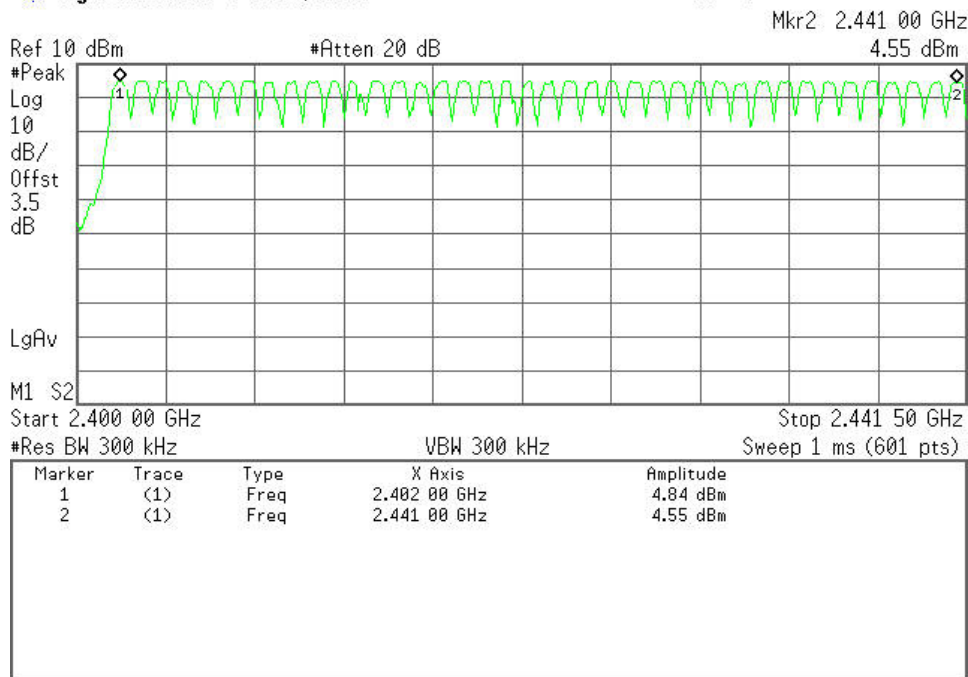
Test Plot (GFSK)

Channel Number

2.400 GHz – 2.4415 GHz

Agilent 21:46:53 Feb 13, 2012

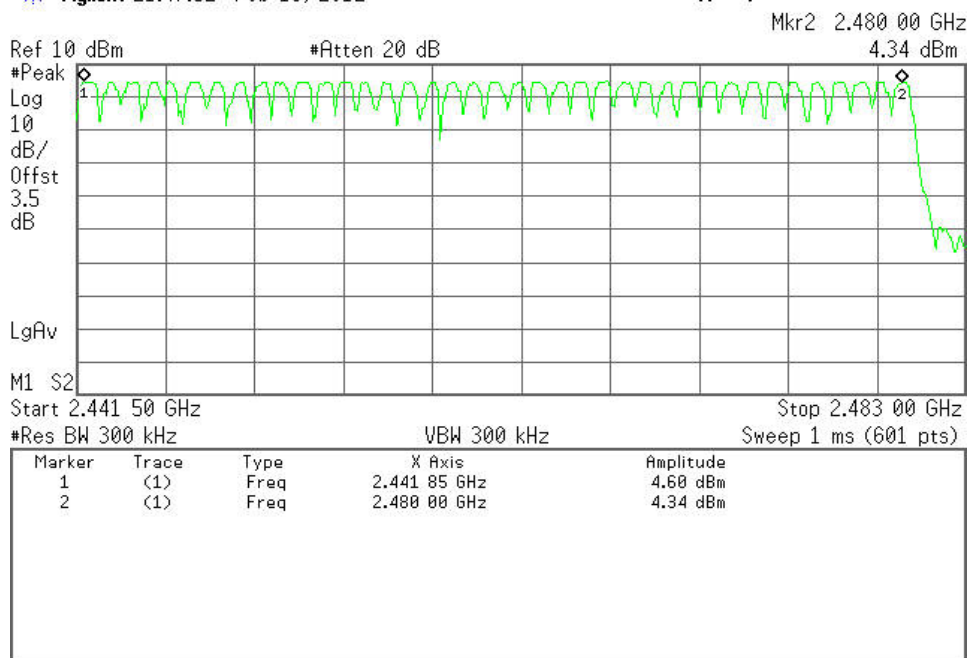
R T



2.4415 GHz – 2.483 GHz

Agilent 21:47:52 Feb 13, 2012

R T





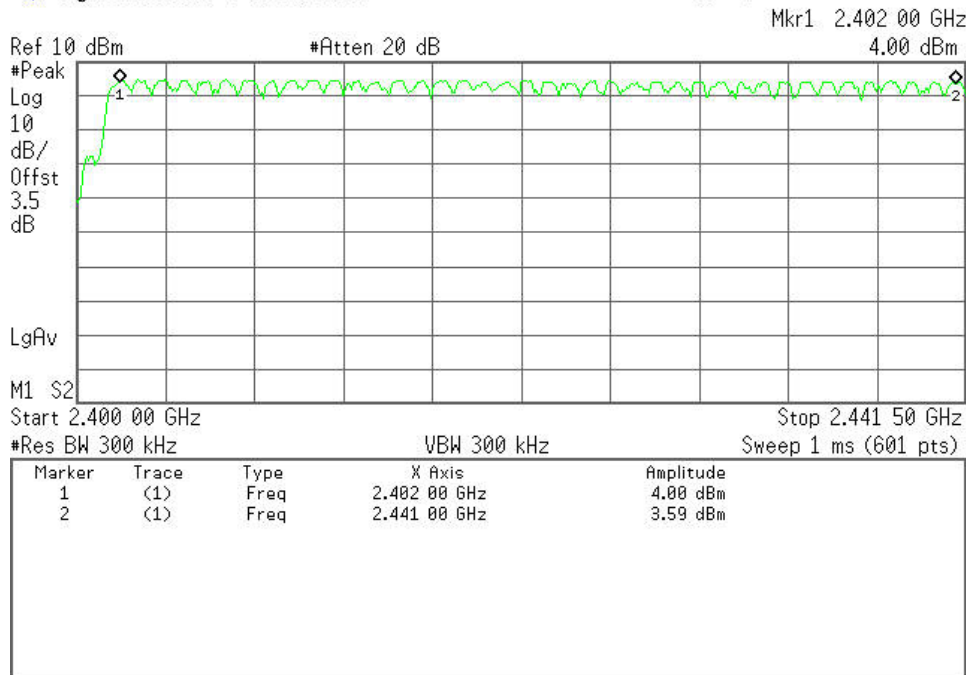
Test Plot (8DPSK)

Channel Number

2.400 GHz – 2.4415 GHz

Agilent 21:52:38 Feb 13, 2012

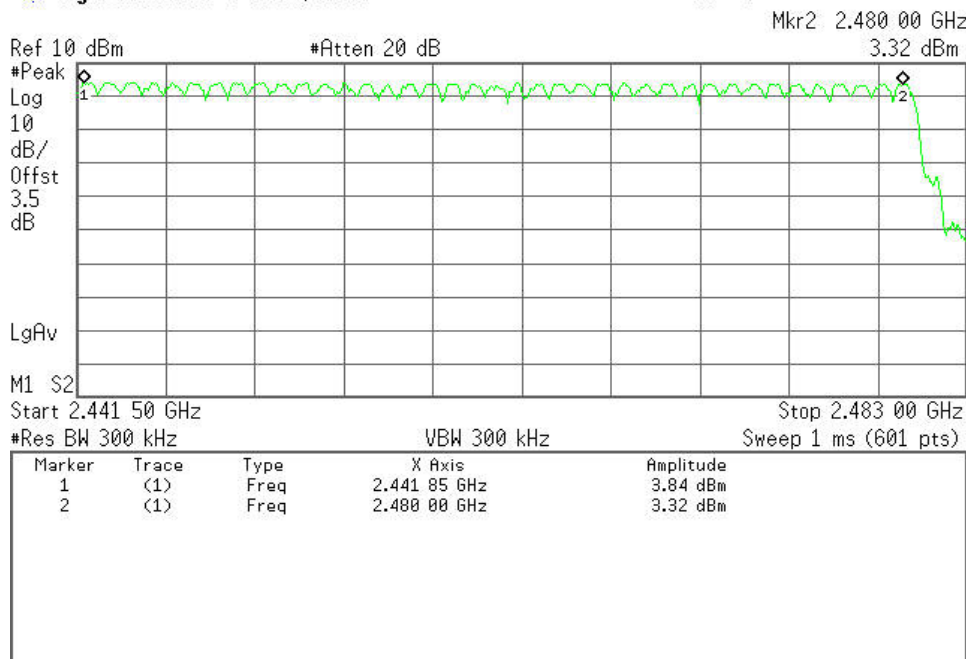
R T



2.4415 GHz –2.483 GHz

Agilent 21:50:15 Feb 13, 2012

R T





6.7. TIME OF OCCUPANCY (DWELL TIME)

LIMIT

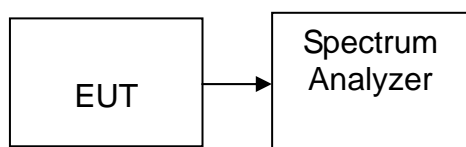
According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

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: $0.513 * (1600/2)/79 * 31.6 = 164.160$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Mid	0.513	164.160	31.60	400.00	PASS

DH 3CH Mid: $1.765 * (1600/4)/79 * 31.6 = 282.400$ (ms)

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

DH 5CH 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: $0.525 * (1600/2)/79 * 31.6 = 168.000$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Mid	0.525	168.000	31.60	400.00	PASS

DH 3

CH Mid: $1.775 * (1600/4)/79 * 31.6 = 284.000$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Mid	1.775	284.000	31.60	400.00	PASS

DH 5

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

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



Test Plot

GFSK

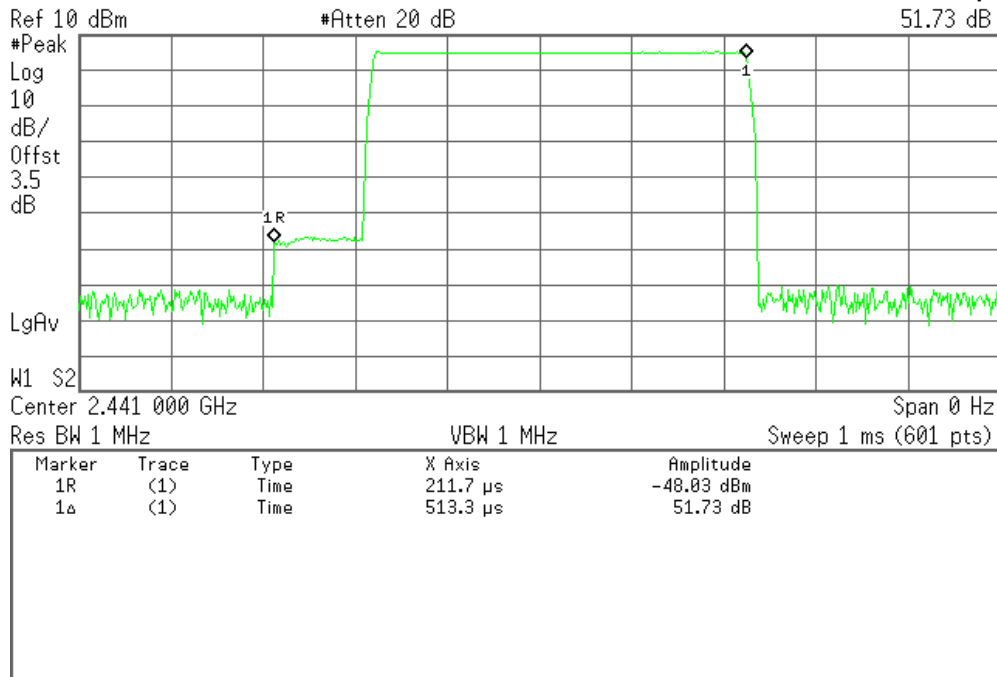
DH 1

(CH Mid)

Agilent 21:40:47 Feb 13, 2012

R T

Δ Mkr1 513.3 μs
51.73 dB



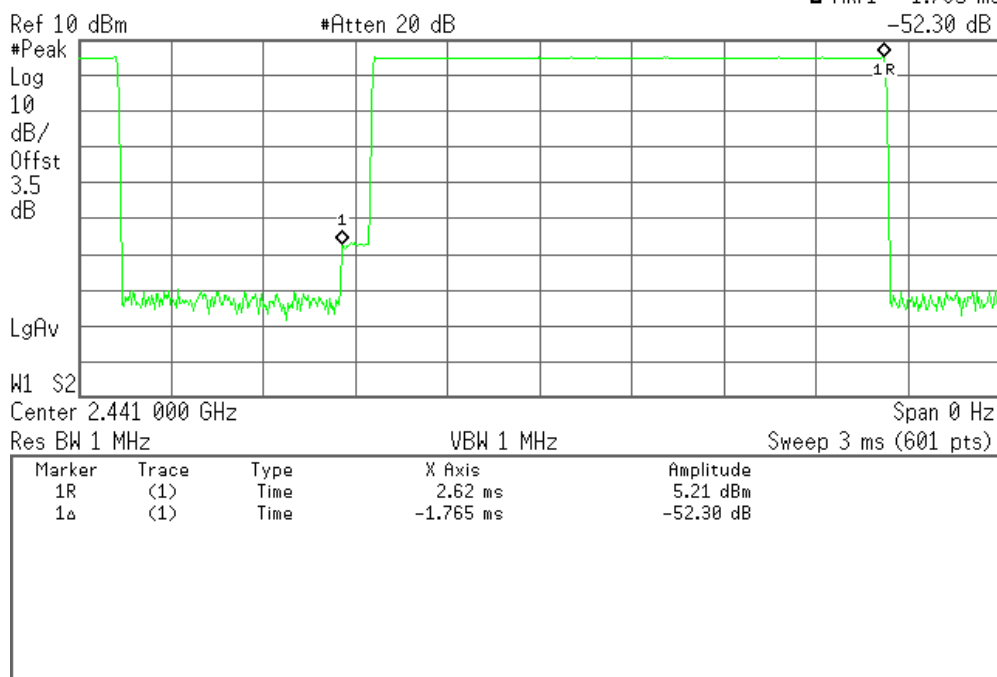
DH 3

(CH Mid)

Agilent 21:41:31 Feb 13, 2012

R T

Δ Mkr1 -1.765 ms
-52.30 dB





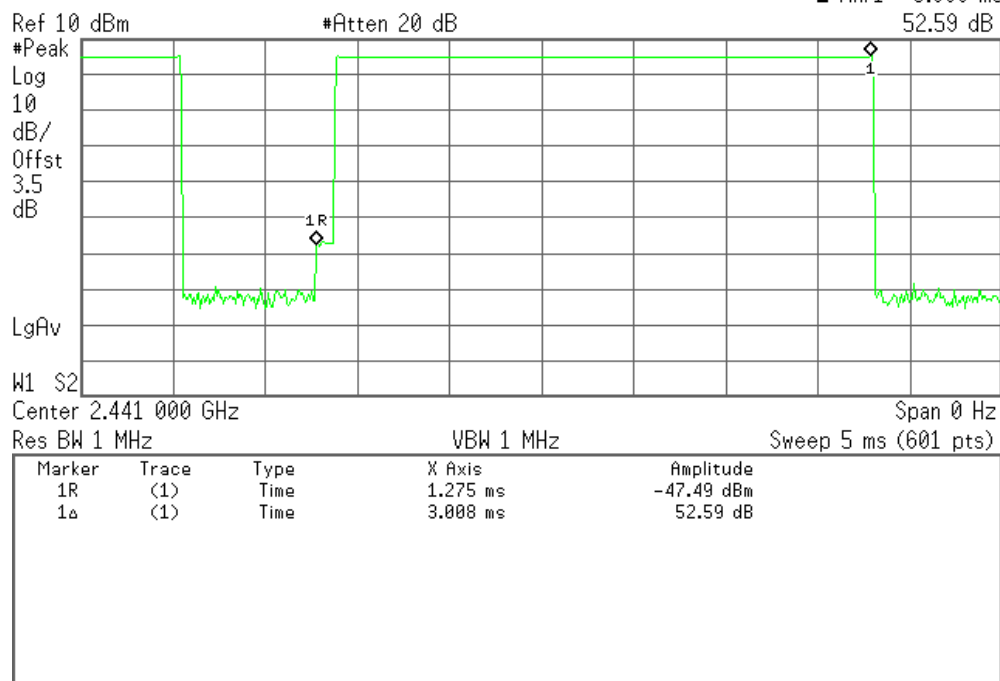
DH 5

(CH Mid)

Agilent 21:42:05 Feb 13, 2012

R T

▲ Mkr1 3.008 ms
52.59 dB





Test Plot
8DPSK

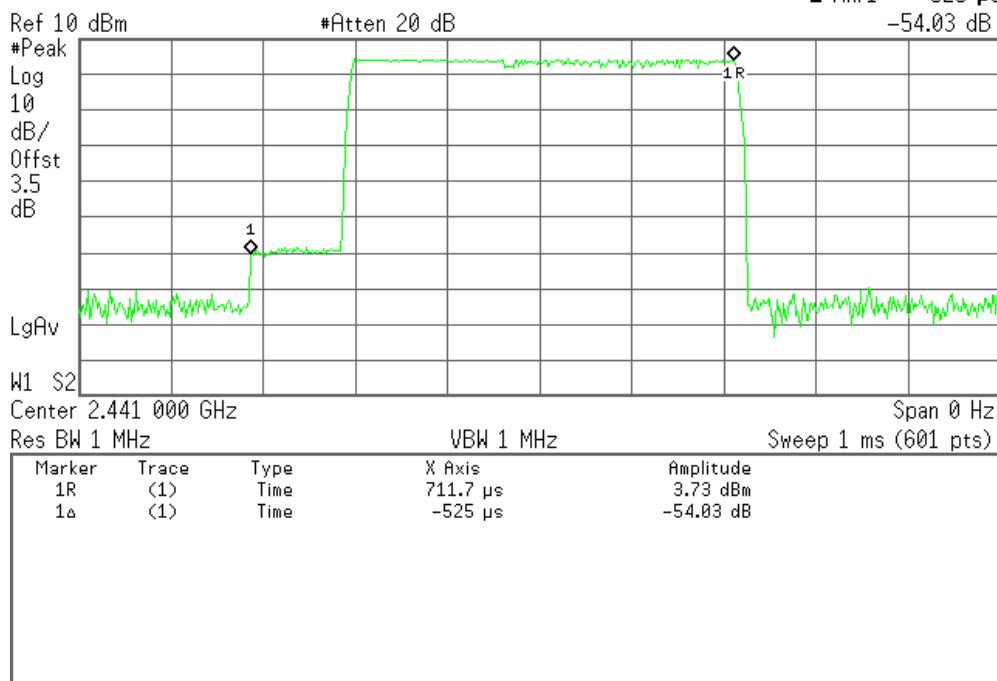
DH 1

(CH Mid)

Agilent 21:44:29 Feb 13, 2012

R T

Δ Mkr1 -525 μs
-54.03 dB



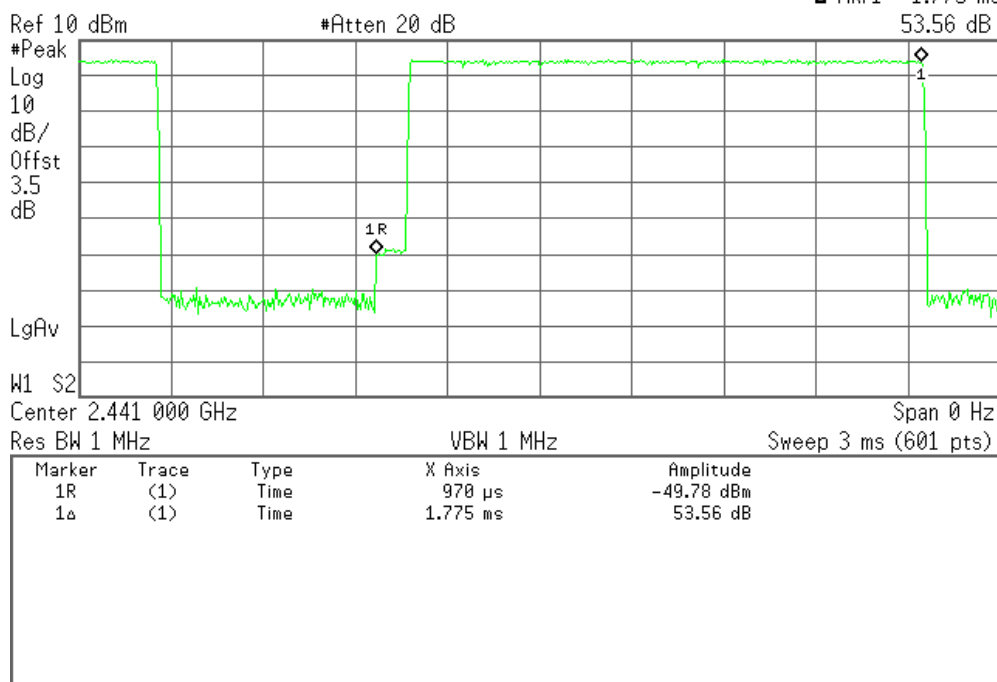
DH 3

(CH Mid)

Agilent 21:43:50 Feb 13, 2012

R T

Δ Mkr1 1.775 ms
53.56 dB





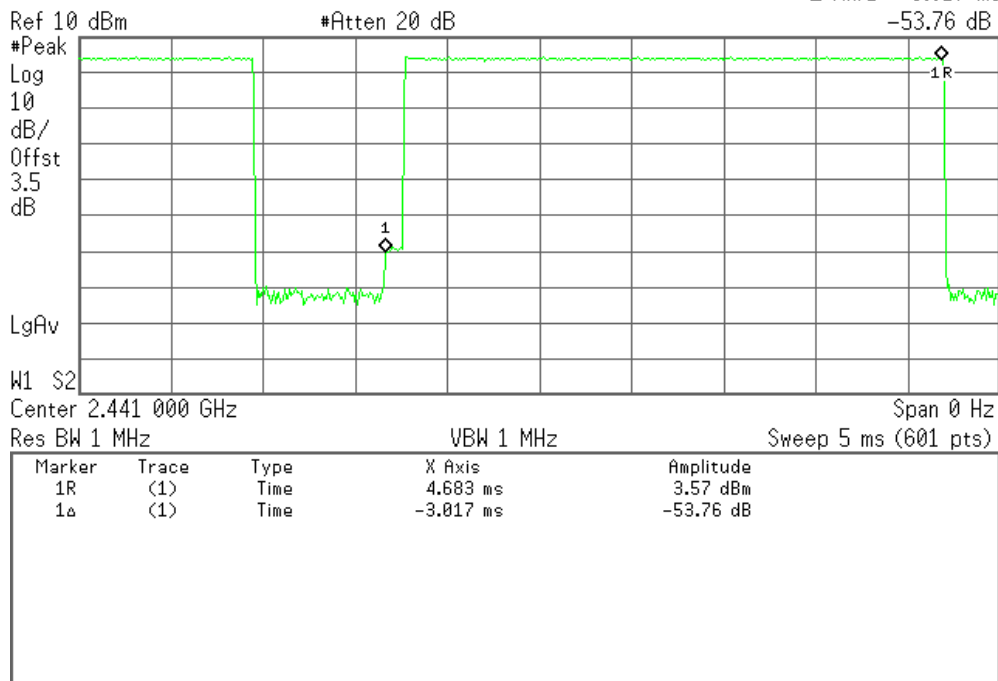
DH 5

(CH Mid)

Agilent 21:43:01 Feb 13, 2012

R T

▲ Mkr1 -3.017 ms
-53.76 dB





6.8. SPURIOUS EMISSIONS

6.8.1. Conducted Measurement

LIMIT

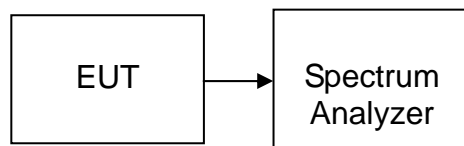
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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



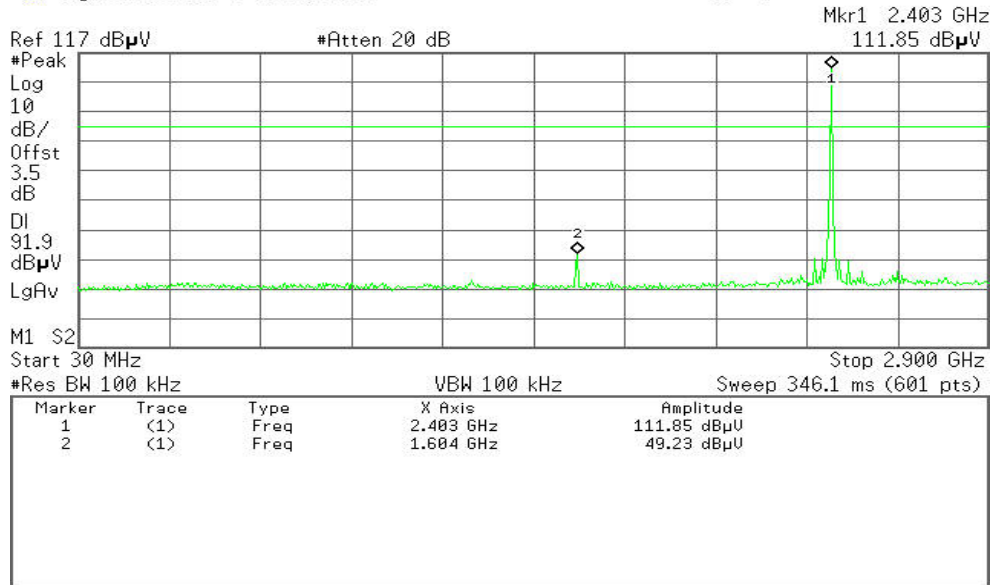
Test Plot (GFSK)

CH Low

30MHz ~2.9GHz

Agilent 22:13:13 Feb 13, 2012

R T



2.9MHz ~26.5GHz

Agilent 22:18:10 Feb 13, 2012

R T



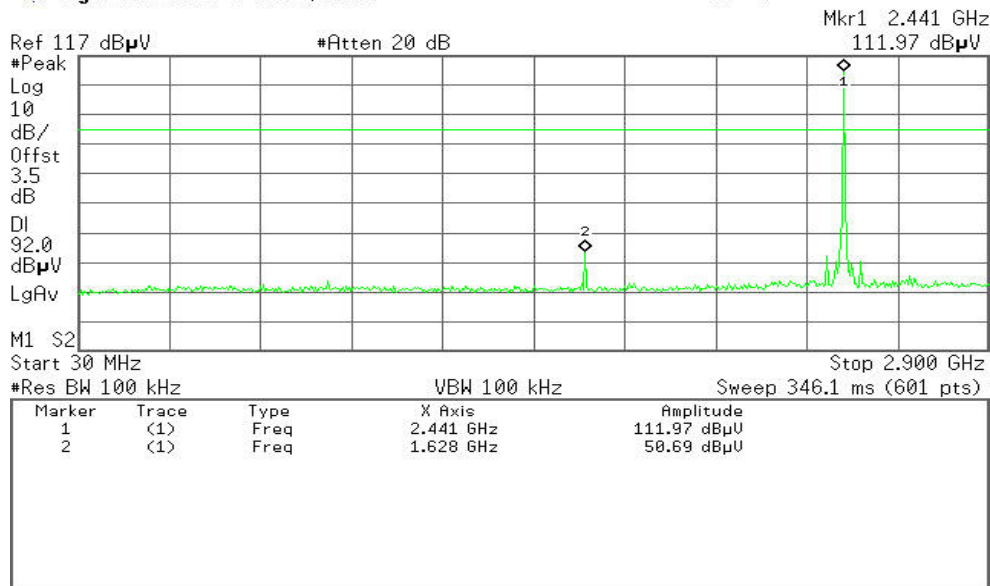


CH Mid

30MHz ~ 2.9GHz

Agilent 22:11:19 Feb 13, 2012

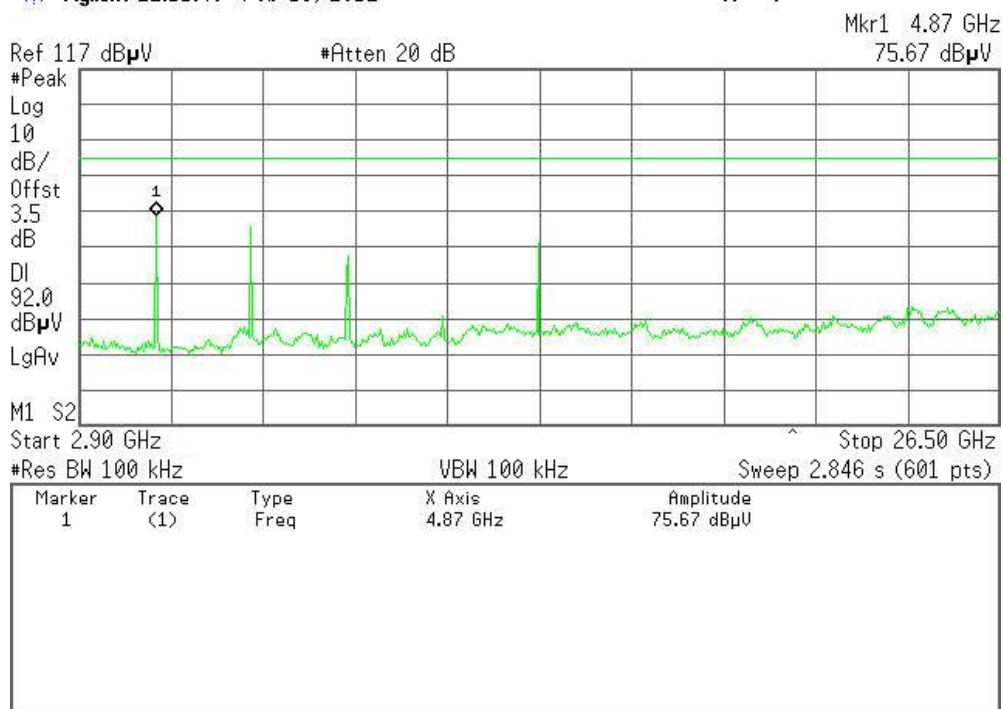
R T



2.9GHz ~ 26.5GHz

Agilent 22:11:49 Feb 13, 2012

R T



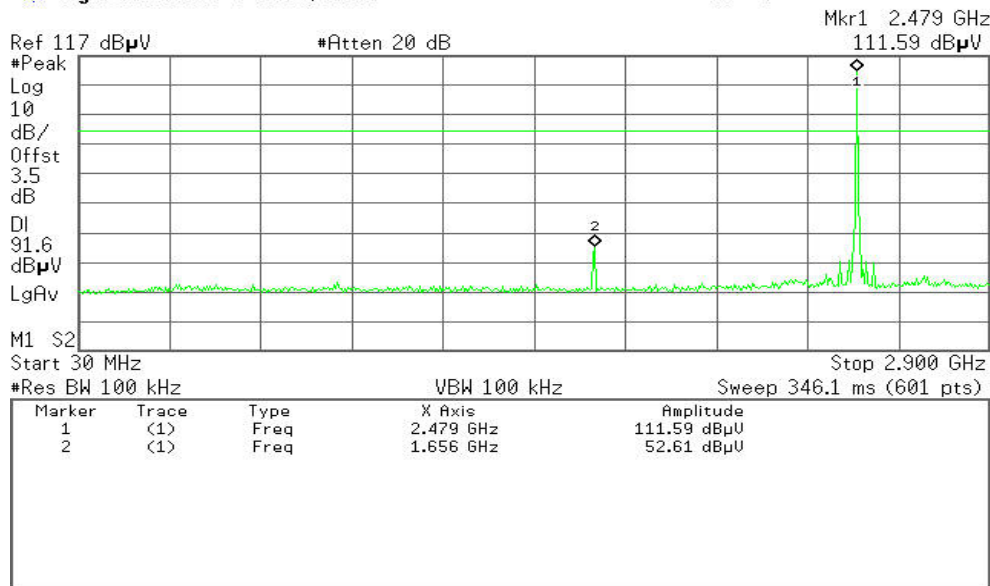


CH High

30MHz ~ 2.9GHz

Agilent 22:09:44 Feb 13, 2012

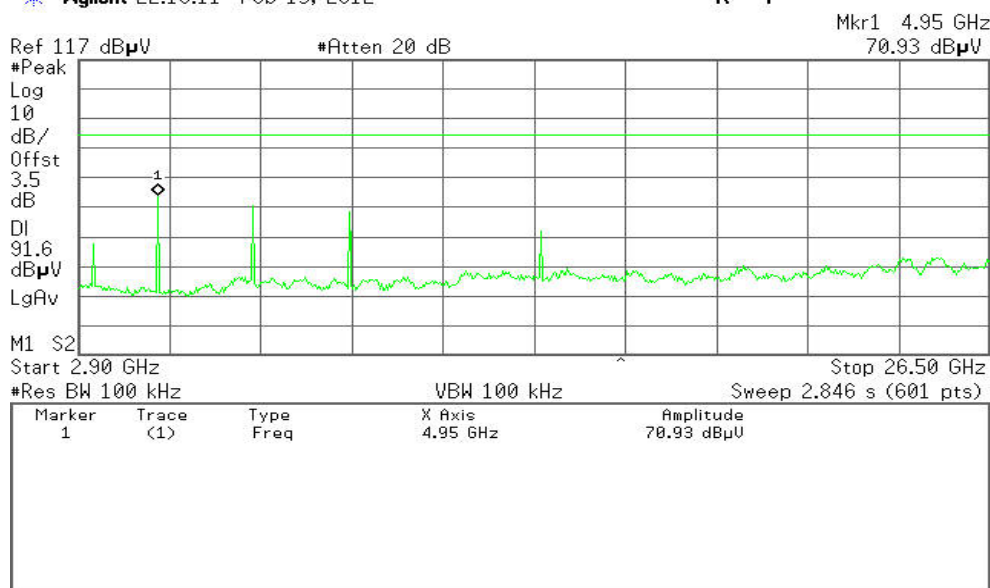
R T



2.9GHz ~ 26.5GHz

Agilent 22:10:11 Feb 13, 2012

R T





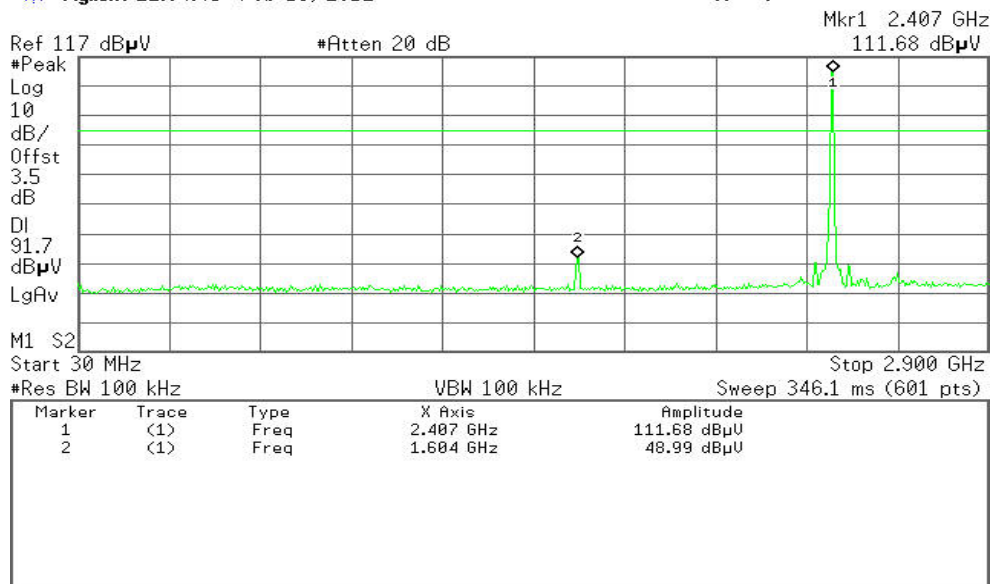
Test Plot (8DPSK)

CH Low

30MHz ~2.9GHz

Agilent 22:04:45 Feb 13, 2012

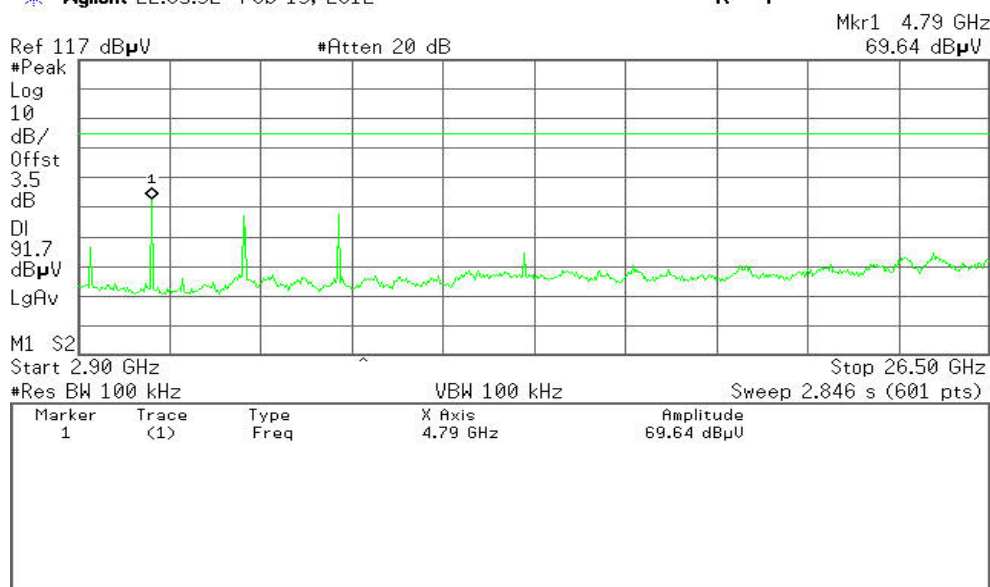
R T



2.9MHz ~26.5GHz

Agilent 22:05:32 Feb 13, 2012

R T



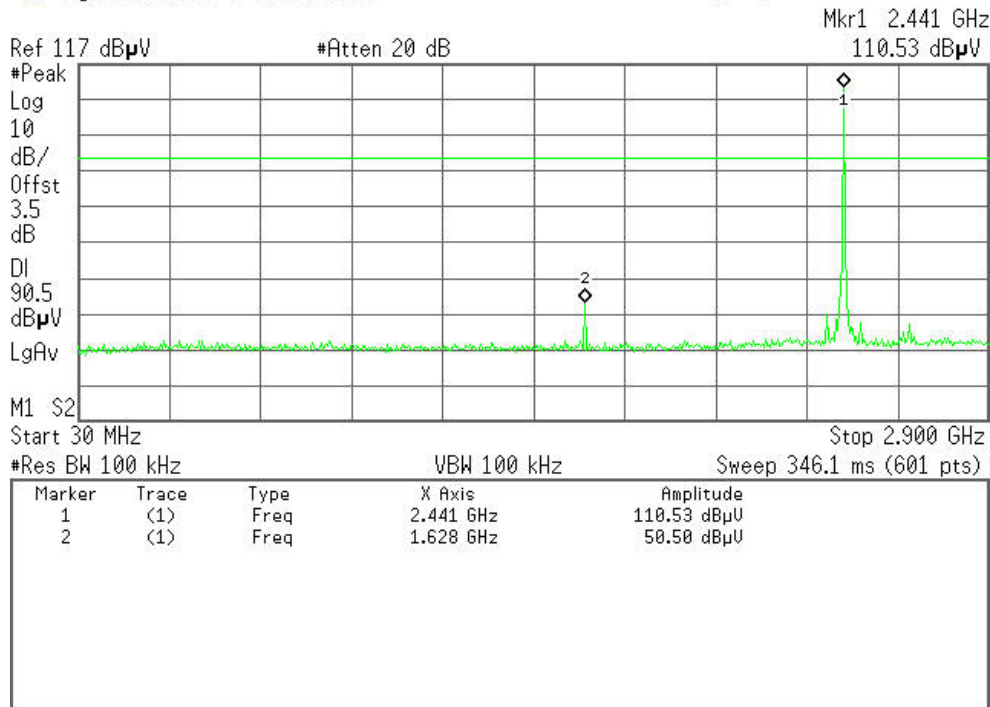


CH Mid

30MHz ~ 2.9GHz

Agilent 22:06:34 Feb 13, 2012

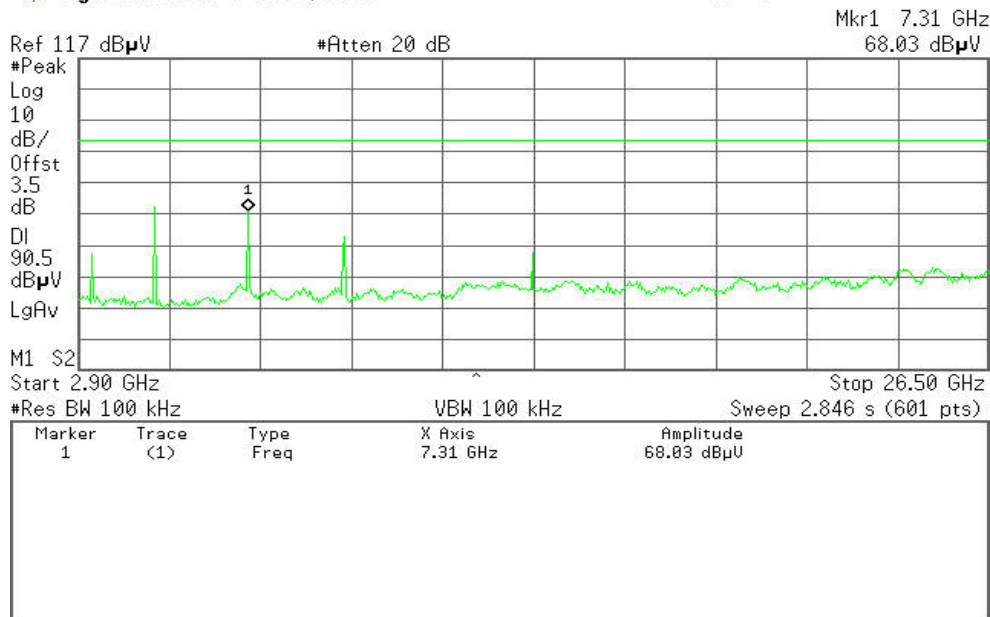
R T



2.9GHz ~ 26.5GHz

Agilent 22:07:00 Feb 13, 2012

R T



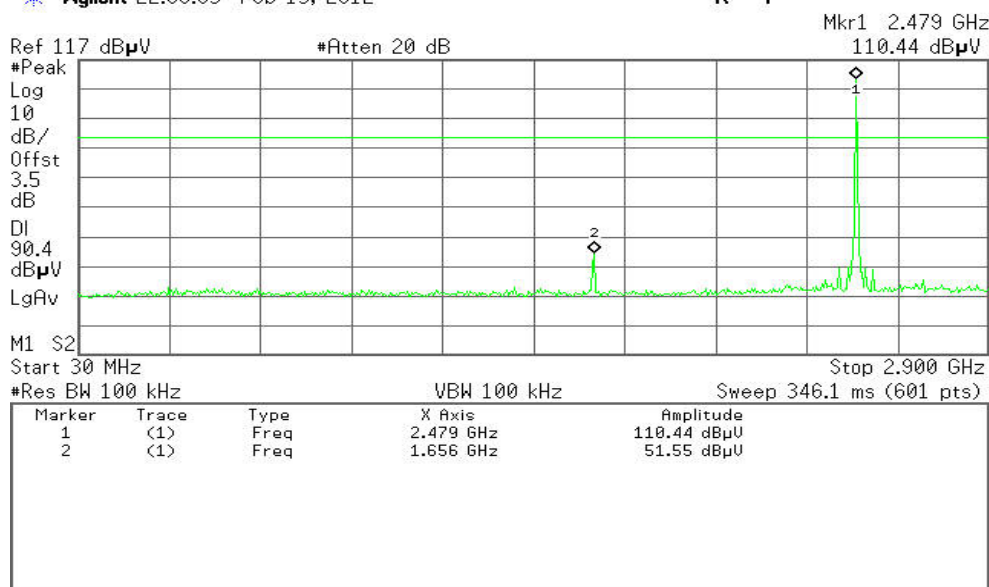


CH High

30MHz ~ 2.9GHz

Agilent 22:08:03 Feb 13, 2012

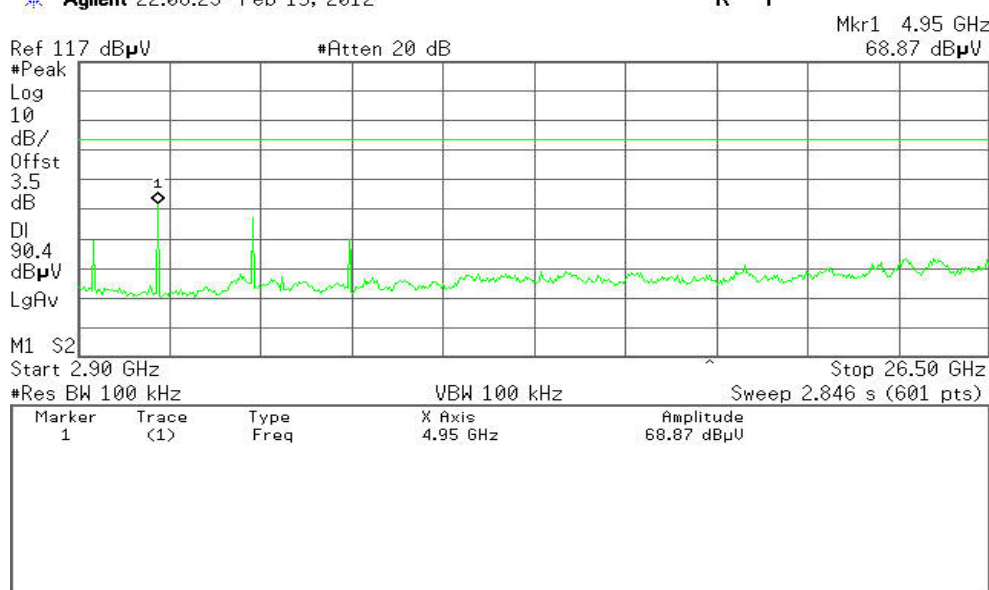
R T



2.9GHz ~ 26.5GHz

Agilent 22:08:29 Feb 13, 2012

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 (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**

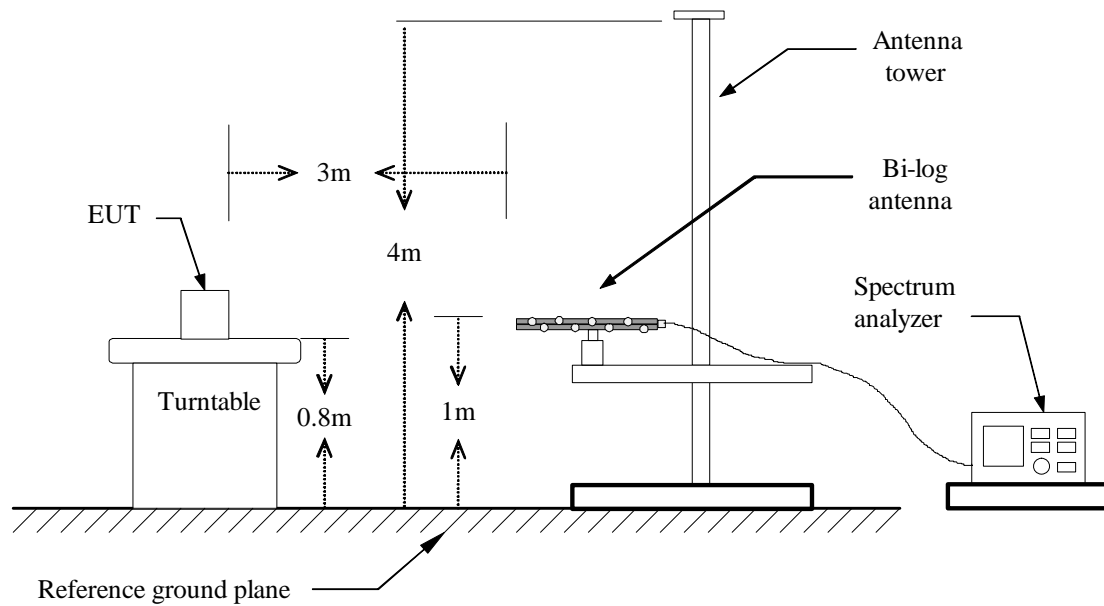
Radiated Emission Test Site 966(2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2011	03/19/2012
Amplifier	MITEQ	AM-1604-3000	1411843	03/18/2011	03/18/2012
Turn Table	EMCO	2081-1.21	N/A	N.C.R	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.

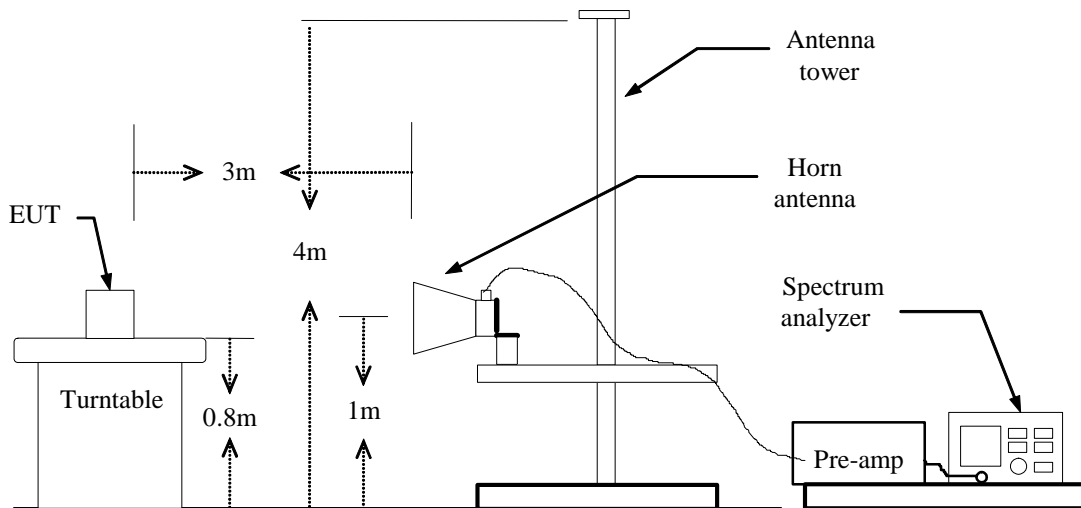


Test Configuration

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:** Normal Link**Test Date:** March 6, 2012**Temperature:** 24°C**Tested by:** Sunday Hu**Humidity:** 52% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
99.5167	44.90	-23.10	21.80	43.50	-21.70	V	QP
122.1500	40.73	-20.42	20.31	43.50	-23.19	V	QP
227.2333	35.26	-20.56	14.70	46.00	-31.30	V	QP
367.8833	36.76	-16.54	20.22	46.00	-25.78	V	QP
825.4000	49.80	-9.75	40.05	46.00	-5.95	V	QP
961.2000	34.14	-8.63	25.51	54.00	-28.49	V	QP
99.5167	44.34	-23.10	21.24	43.50	-22.26	H	QP
363.0333	40.29	-16.63	23.66	46.00	-22.34	H	QP
768.8167	38.71	-10.64	28.07	46.00	-17.93	H	QP
831.8667	41.86	-9.70	32.16	46.00	-13.84	H	QP
904.6167	37.78	-9.11	28.67	46.00	-17.33	H	QP
991.9167	37.15	-7.96	29.19	54.00	-24.81	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 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: March 6, 2012

Temperature: 24°C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1750.0000	50.76	-10.19	40.57	74.00	-33.43	V	peak
2965.0000	47.68	-6.20	41.48	74.00	-32.52	V	peak
3460.0000	47.03	-4.69	42.34	74.00	-31.66	V	peak
4300.0000	46.66	-2.59	44.07	74.00	-29.93	V	peak
4810.0000	49.54	-0.62	48.92	74.00	-25.08	V	peak
6265.0000	46.51	3.77	50.28	74.00	-23.72	V	peak
2035.0000	48.06	-9.27	38.79	74.00	-35.21	H	peak
2935.0000	47.77	-6.40	41.37	74.00	-32.63	H	peak
3700.0000	46.51	-3.84	42.67	74.00	-31.33	H	peak
4930.0000	46.29	-0.23	46.06	74.00	-27.94	H	peak
5215.0000	45.91	0.62	46.53	74.00	-27.47	H	peak
6250.0000	45.36	3.79	49.15	74.00	-24.85	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 (dBμV/m) = Uncorrected Analyzer / Receiver Reading
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain
 Limit (dBμV/m) = Limit stated in standard
 Margin (dB) = Result (dBμV/m) - Limit (dBμV/m)
 Pk = Peak Reading
 AV = Average Reading
 Remark = Mark Peak Reading or Average Reading



Operation Mode: TX(CH Mid)

Test Date: March 6, 2012

Temperature: 24°C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1525.0000	48.84	-10.31	38.53	74.00	-35.47	V	peak
3265.0000	46.97	-5.35	41.62	74.00	-32.38	V	peak
3625.0000	46.95	-3.81	43.14	74.00	-30.86	V	peak
4885.0000	53.69	-0.38	53.31	74.00	-20.69	V	peak
6745.0000	45.79	4.27	50.06	74.00	-23.94	V	peak
7330.0000	47.86	5.29	53.15	74.00	-20.85	V	peak
1840.0000	48.52	-9.98	38.54	74.00	-35.46	H	peak
2965.0000	48.05	-6.20	41.85	74.00	-32.15	H	peak
4675.0000	44.74	-1.34	43.40	74.00	-30.60	H	peak
4885.0000	52.29	-0.38	51.91	74.00	-22.09	H	peak
5230.0000	46.26	0.65	46.91	74.00	-27.09	H	peak
7315.0000	47.93	5.26	53.19	74.00	-20.81	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 (dBμV/m) = Uncorrected Analyzer / Receiver Reading
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain
 Limit (dBμV/m) = Limit stated in standard
 Margin (dB) = Result (dBμV/m)- Limit (dBμV/m)
 Pk = Peak Reading
 AV = Average Reading
 Remark = Mark Peak Reading or Average Reading



Operation Mode: TX(CH High)

Test Date: March 6, 2012

Temperature: 24 °C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1615.0000	48.65	-10.30	38.35	74.00	-35.65	V	peak
1930.0000	48.20	-9.57	38.63	74.00	-35.37	V	peak
3040.0000	47.36	-5.87	41.49	74.00	-32.51	V	peak
3640.0000	46.07	-3.82	42.25	74.00	-31.75	V	peak
4960.0000	58.03	-0.14	57.89	74.00	-16.11	V	peak
4960.0000	58.03	-0.14	57.89	74.00	-16.11	V	peak
4960.0000	40.89	-0.14	40.75	54.00	-13.25	V	AVG
7435.0000	49.21	5.53	54.74	74.00	-19.26	V	peak
7435.0000	30.88	5.53	36.41	54.00	-17.59	V	AVG
1090.0000	49.87	-11.71	38.16	74.00	-35.84	H	peak
2080.0000	48.55	-9.26	39.29	74.00	-34.71	H	peak
3550.0000	47.03	-4.12	42.91	74.00	-31.09	H	peak
4165.0000	47.03	-3.04	43.99	74.00	-30.01	H	peak
4960.0000	58.19	-0.14	58.05	74.00	-15.95	H	peak
4960.0000	40.64	-0.14	40.50	54.00	-13.50	H	AVG
7435.0000	50.56	5.53	56.09	74.00	-17.91	H	peak
7435.0000	33.71	5.53	39.24	54.00	-14.76	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 (dBμV/m) =Uncorrected Analyzer / Receiver Reading
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain
 Limit (dBμV/m) = Limit stated in standard
 Margin (dB) = Result (dBμV/m)- Limit (dBμV/m)
 Pk = Peak Reading
 AV = Average Reading
 Remark = Mark Peak Reading or Average Reading

**8DPSK****Operation Mode:** TX(CH Low)**Test Date:** March 6, 2012**Temperature:** 24°C**Tested by:** Sunday Hu**Humidity:** 52% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3400.0000	47.20	-5.07	42.13	74.00	-31.87	V	peak
3955.0000	46.98	-3.64	43.34	74.00	-30.66	V	peak
4510.0000	46.02	-1.98	44.04	74.00	-29.96	V	peak
5245.0000	45.14	0.68	45.82	74.00	-28.18	V	peak
6250.0000	44.73	3.79	48.52	74.00	-25.48	V	peak
6940.0000	45.25	4.37	49.62	74.00	-24.38	V	peak
1330.0000	48.37	-10.70	37.67	74.00	-36.33	H	peak
2080.0000	47.84	-9.26	38.58	74.00	-35.42	H	peak
2725.0000	48.22	-7.80	40.42	74.00	-33.58	H	peak
3580.0000	46.24	-3.93	42.31	74.00	-31.69	H	peak
4180.0000	46.42	-2.99	43.43	74.00	-30.57	H	peak
5125.0000	45.01	0.36	45.37	74.00	-28.63	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 (dBμV/m) = Uncorrected Analyzer / Receiver Reading
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain
 Limit (dBμV/m) = Limit stated in standard
 Margin (dB) = Result (dBμV/m)- Limit (dBμV/m) ss
 Pk = Peak Reading
 AV. = Average Reading
 Remark = Mark Peak Reading or Average Reading



Operation Mode: TX(CH Mid)

Test Date: March 6, 2012

Temperature: 24°C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1435.0000	48.23	-10.27	37.96	74.00	-36.04	V	peak
2395.0000	48.54	-9.70	38.84	74.00	-35.16	V	peak
3580.0000	46.26	-3.93	42.33	74.00	-31.67	V	peak
4885.0000	48.30	-0.38	47.92	74.00	-26.08	V	peak
6220.0000	45.17	3.81	48.98	74.00	-25.02	V	peak
7330.0000	45.00	5.29	50.29	74.00	-23.71	V	peak
3700.0000	45.59	-3.84	41.75	74.00	-32.25	H	peak
4375.0000	45.37	-2.34	43.03	74.00	-30.97	H	peak
4885.0000	48.95	-0.38	48.57	74.00	-25.43	H	peak
5710.0000	46.07	2.10	48.17	74.00	-25.83	H	peak
6175.0000	45.46	3.71	49.17	74.00	-24.83	H	peak
7330.0000	46.37	5.29	51.66	74.00	-22.34	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 (dBμV/m) = Uncorrected Analyzer / Receiver Reading
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain
 Limit (dBμV/m) = Limit stated in standard
 Margin (dB) = Result (dBμV/m)- Limit (dBμV/m)
 Pk = Peak Reading
 AV = Average Reading
 Remark = Mark Peak Reading or Average Reading



Operation Mode: TX(CH High)

Test Date: March 6, 2012

Temperature: 24 °C

Tested by: Sunday Hu

Humidity: 52% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1540.0000	48.38	-10.31	38.07	74.00	-35.93	V	peak
2035.0000	47.48	-9.27	38.21	74.00	-35.79	V	peak
2935.0000	47.47	-6.40	41.07	74.00	-32.93	V	peak
4585.0000	45.47	-1.80	43.67	74.00	-30.33	V	peak
4960.0000	52.00	-0.14	51.86	74.00	-22.14	V	peak
7435.0000	45.69	5.53	51.22	74.00	-22.78	V	peak
1270.0000	49.27	-11.05	38.22	74.00	-35.78	H	peak
2995.0000	46.69	-5.99	40.70	74.00	-33.30	H	peak
3685.0000	46.72	-3.83	42.89	74.00	-31.11	H	peak
3955.0000	46.54	-3.64	42.90	74.00	-31.10	H	peak
4960.0000	50.12	-0.14	49.98	74.00	-24.02	H	peak
7435.0000	47.71	5.53	53.24	74.00	-20.76	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 (dBμV/m) = Uncorrected Analyzer / Receiver Reading
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain
 Limit (dBμV/m) = Limit stated in standard
 Margin (dB) = Result (dBμV/m)- Limit (dBμV/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 (dB μ V)	
	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.

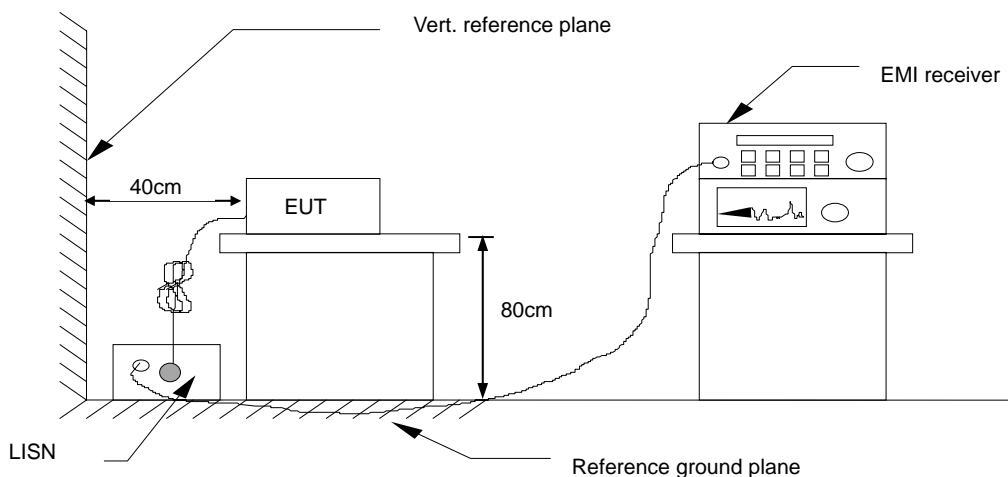
MEASUREMENT EQUIPMENT USED

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

Not applicable since the EUT supplied by the DC power.