



Hong Kong

## FCC / IC – Test report

Report Number : **60/790.13.035.01** Date of Issue: 21<sup>st</sup> January 2014

Model : **iD 678**

Product Type : **Waterproof Bluetooth Headset with Microphone**

Applicant : **DIFFANY Development Co. Ltd.**

Address : **G1, 13/F, World Tech Centre, 95 How Ming Street, Kwun Tong**

Production Facility : **DIFFANY Development Co. Ltd.**

Address : **G1, 13/F, World Tech Centre, 95 How Ming Street, Kwun Tong**

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : **62**

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Report Number: **60/790.13.035.01**

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Rev. no.: 2.1

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Hong Kong

## 2. Details about the Test Laboratory

### Details about the Test Laboratory

#### Test site 1

Company name: TÜV SÜD HONG KONG LTD.  
3/F, West Wing, Lakeside 2,  
10 Science Park West Avenue,  
Science Park, Shatin  
HK.

Telephone: 852 2776 1323

Fax: 852 2776 1372

#### Test site 2

Company name: Audix Technology(Shenzhen) Co., Ltd.  
No.6,Ke Feng Road,Block 52,Shenzhen Science & Industry  
Park,Nanshan,Shenzhen,Guangdong,China (518057)

### 3. Description of the Equipment Under Test

#### Description of the Equipment Under Test

Product:	Waterproof Bluetooth Headset with Microphone
Model no.:	iD 678
Serial number:	NIL
Options and accessories:	NIL
FCC ID:	2AABR-ID678
Rated Voltage:	3.7 VDC
Rated Current:	NIL
Rated Power:	NIL
Frequency:	2402-2480MHz
RF Transmission Frequency:	2402-2480MHz
Antenna gain:	0 dBi
No. of Operated Channel:	79
Modulation:	GFSK, $\pi/4$ -DQPSK, 8DPSK
Description of the EUT:	Battery operated – 1x 3.7V rechargeable battery

#### 4. Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C, Intentional Radiators, 10-1-12 Edition	PART 15 – RADIO FREQUENCY DEVICES Subpart C – Intentional Radiators

#### 5. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: GFSK Link Mode
Mode 2: $\pi/4$ -DQPSK Link Mode
Mode 3: 8DPSK Link Mode

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

## 6. Summary of Test Standards and Results

Emission Tests					
Test Condition	Pages	Test site	Test Result		
			Pass	Fail	N/A
Maximum Conducted Output Power	9	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emission Measurement	12	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Interference Measurement	16	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20dB RF Bandwidth	24	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carrier Frequency Separation	28	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Number of Hopping	30	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Time of Occupancy (Dwell Time)	32	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Out of Band Conducted Spurious Emission	41	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Band Edge Measurement	52	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antenna Requirement	62	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 7. General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: 2AABR-ID678 complies with the FCC Part 15, Subpart C Rules.

All the configurations of the product were tested and only the worst test results are listed in the report.

### SUMMARY:

All tests according to the regulations cited on page 7 were

■ - Performed

□ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: 06<sup>th</sup> January 2014

Testing Start Date: 07<sup>th</sup> January 2014

Testing End Date: 20<sup>th</sup> January 2014

- TÜV SÜD HONG KONG LTD. -

Reviewed by:

  
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Prepared by:

  
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Report Number: **60/790.13.035.01**

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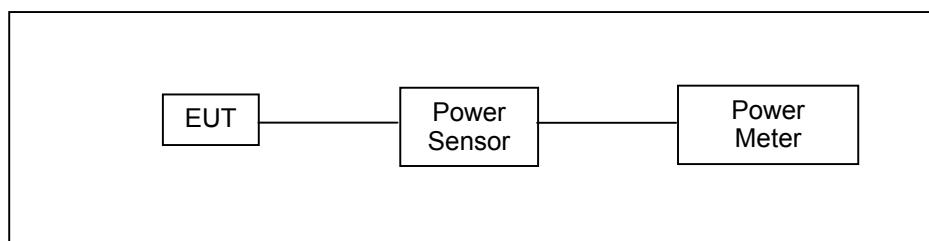


## 8. Test Results

### 7.1 Maximum Conducted Output Power Measurement Limit

For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels < 1 watt.

#### Test Setup



#### Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Single Channel PK Power Sensor	Agilent	N1911A	MY45101619	12/19/2012	(1)
Wideband Power Meter	Agilent	N1921A	MY45241957	12/19/2012	(1)
Test Site	ATL	TE02	TE02	N.C.R.	----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

#### Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

## Test Result

Model Number	iD 678			
Test Item	Maximum Conducted Output Power			
Test Mode	Mode 1: GFSK Link Mode			
Date of Test	01/09/2014			
Frequency (MHz)	Packet Type	Peak Power		Limit (mW)
		(dBm)	(mW)	
2402	DH1	8.166	6.56	< 1000
	DH3	8.202	6.61	
	DH5	8.205	6.61	
2441	DH1	8.881	7.73	
	DH3	8.796	7.58	
	DH5	8.913	7.79	
2480	DH1	10.613	11.52	
	DH3	10.618	11.53	
	DH5	10.622	11.54	

Model Number	iD 678			
Test Item	Maximum Conducted Output Power			
Test Mode	Mode 2: $\pi/4$ -DQPSK Mode			
Date of Test	01/09/2014			
Frequency (MHz)	Packet Type	Peak Power		Limit (mW)
		(dBm)	(mW)	
2402	DH1	6.425	4.39	< 1000
	DH3	6.431	4.40	
	DH5	6.438	4.40	
2441	DH1	8.121	6.49	
	DH3	8.127	6.50	
	DH5	8.131	6.50	
2480	DH1	9.878	9.72	
	DH3	9.884	9.74	
	DH5	9.886	9.74	

Model Number	iD 678			
Test Item	Maximum Conducted Output Power			
Test Mode	Mode 3: 8DPSK Link Mode			
Date of Test	01/09/2014			
Frequency (MHz)	Packet Type	Peak Power		Limit (mW)
		(dBm)	(mW)	
2402	DH1	6.417	4.38	< 1000
	DH3	6.421	4.39	
	DH5	6.425	4.39	
2441	DH1	8.071	6.41	
	DH3	8.072	6.42	
	DH5	8.079	6.43	
2480	DH1	9.847	9.65	
	DH3	9.845	9.65	
	DH5	9.953	9.89	

## 7.2 Conducted Emission Measurement

### Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

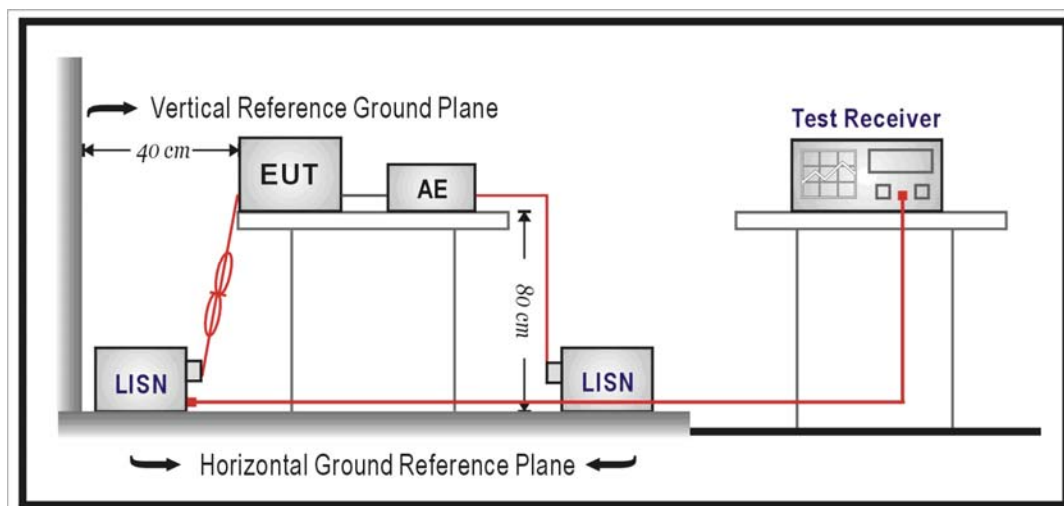
### Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/06/2013	(1)
LISN	R&S	ENV216	101040	03/04/2013	(1)
LISN	R&S	ENV216	101041	03/04/2013	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Setup



## Test Procedure

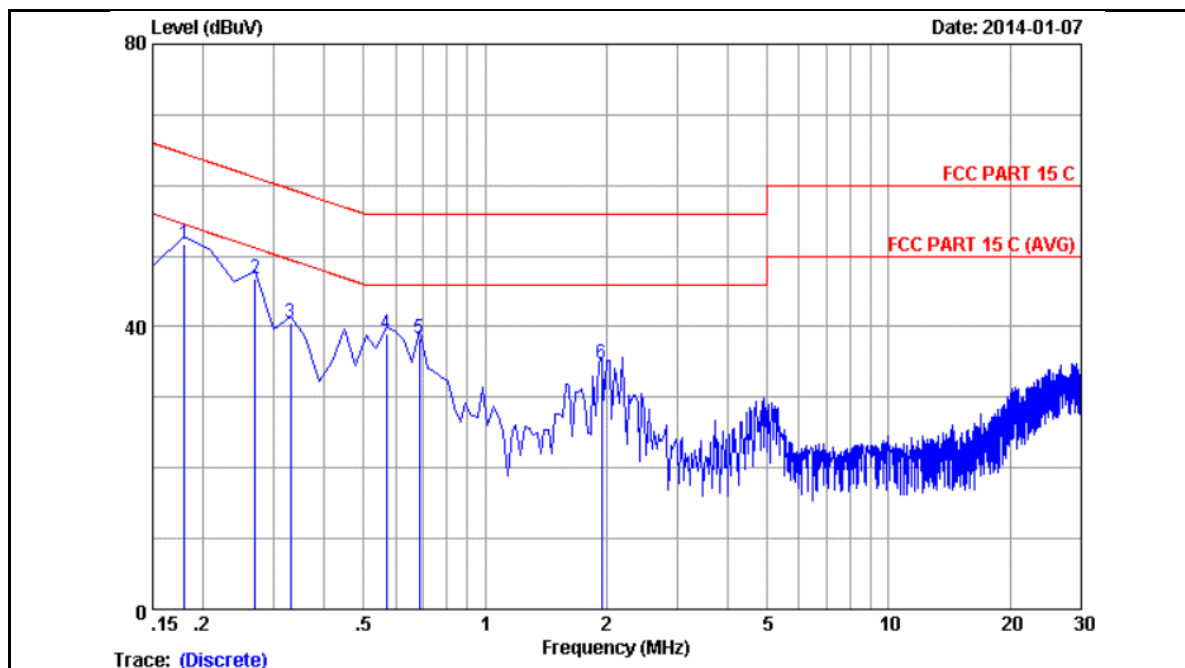
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

## Test Result

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26°C/60%RH
Mode:	Mode 1	Date:	01/09/2014
Description:		Test By:	

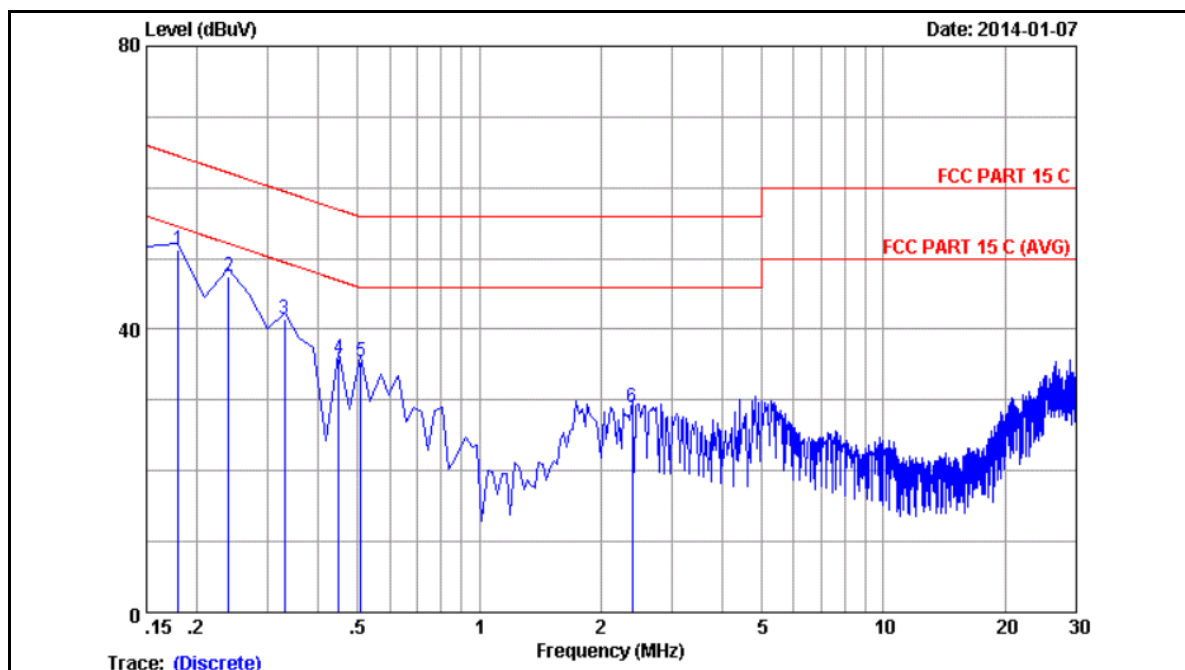


No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.17985	0.15	0.01	51.57	51.73	64.49	12.76	QP
2	0.26940	0.15	0.01	46.68	46.84	61.14	14.30	QP
3	0.32910	0.15	0.01	40.35	40.51	59.47	18.96	QP
4	0.56790	0.16	0.02	38.80	38.98	56.00	17.02	QP
5	0.68730	0.17	0.03	38.17	38.37	56.00	17.63	QP
6	1.941	0.22	0.04	34.40	34.66	56.00	21.34	QP

Remarks: 1. Emission Level = LISN Factor + Cable Loss + Reading.  
2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 1	Date:	01/09/2014
		Test By:	

Description:



No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.17985	0.18	0.01	51.00	51.19	64.49	13.30	QP
2	0.23955	0.19	0.01	47.29	47.49	62.11	14.62	QP
3	0.32910	0.20	0.01	41.17	41.38	59.47	18.09	QP
4	0.44850	0.22	0.02	35.58	35.82	56.90	21.08	QP
5	0.50820	0.23	0.02	35.10	35.35	56.00	20.65	QP
6	2.389	0.27	0.04	28.73	29.04	56.00	26.96	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.

2.If the average limit is met when using a quasi-peak detector.  
the EUT shall be deemed to meet both limits and measurement  
with average detector is unnecessary.

### 7.3 Radiated Interference Measurement Limit

According to §15.209(a), 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 ( $\mu\text{V/m}$ at meter)	Measurement Distance (meters)
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

\*\* 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.

### Test Instruments

3 Meter Chamber (966-A)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/21/2013	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/21/2013	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2013	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2013	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/01/2013	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/10/2013	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/13/2013	(1)
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	08/14/2013	(3)
Test Site	ATL	TE01	888001	08/28/2013	(1)



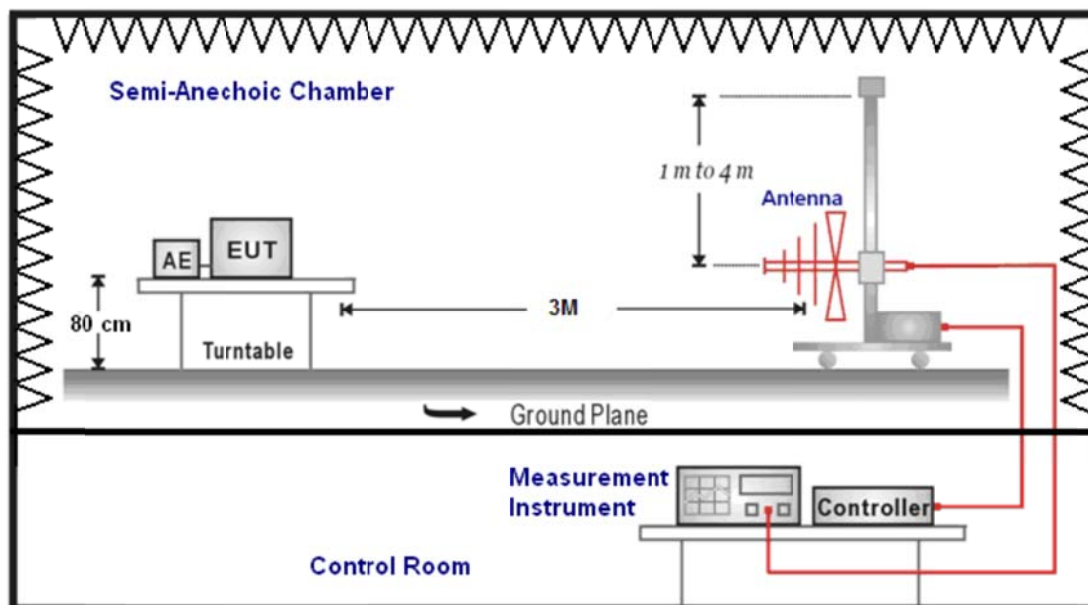
3 Meter Chamber (966-B)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2013	(1)
Amplifier	Mini-Circuits	ZKL-1R5+	072010	05/29/2013	(1)
Amplifier	Mini-Circuits	ZVA-213-S+	467900926	05/29/2013	(1)
RF Pre-selector	Agilent	N9039A	MY46520255	01/21/2013	(1)
Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00128055	08/24/2013	(1)
Trilog-Broadband Antenna	Schwarzbeck Mess-Elektronik	SB AC VULB	9168-419	05/10/2013	(1)
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	08/14/2013	(3)
Test Site	ATL	TE09	TE09	05/10/2013	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

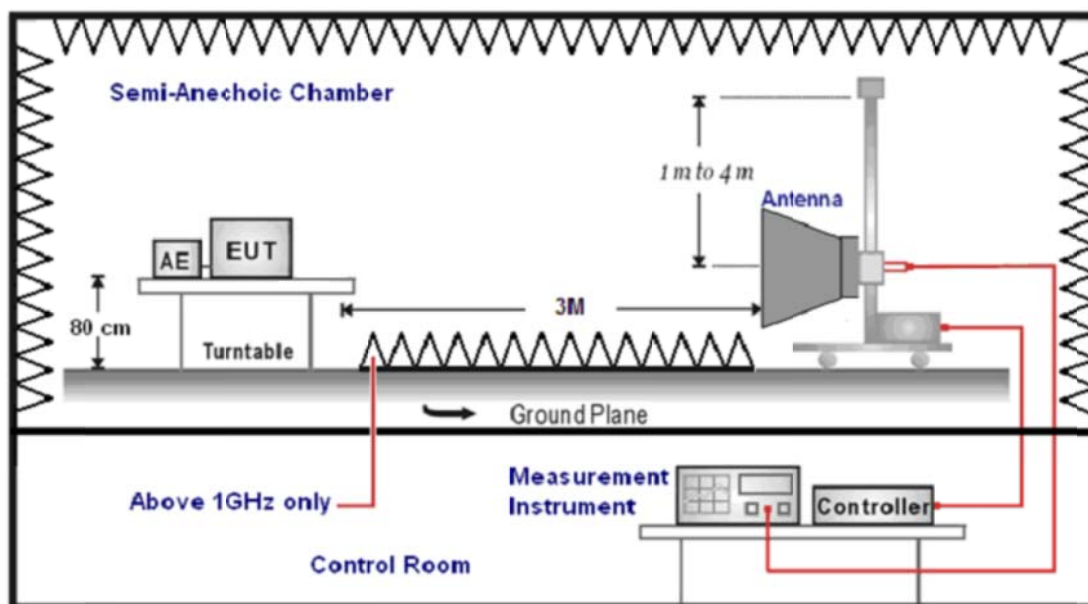
NOTE: N.C.R. = No Calibration Request.

## Setup

Below 1GHz



Above 1GHz



## Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (model VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts per meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

$$(1) \quad \text{Amplitude (dBuV/m)} = \text{FI (dBuV)} + \text{AF (dBuV)} + \text{CL (dBuV)} - \text{Gain (dB)}$$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

$$(2) \quad \text{Actual Amplitude (dBuV/m)} = \text{Amplitude (dBuV)} - \text{Dis(dB)}$$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark 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.

## Test Result

### Below 1GHz

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		iD 678		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 1		Date:		01/07/2014	
				Test By:			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dB)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
30.00	0.49	20.93	21.42	40.0	-18.58	QP	H
97.90	5.60	12.29	17.89	43.5	-25.61	QP	H
131.85	2.98	14.24	17.22	43.5	-26.28	QP	H
408.30	2.03	19.51	21.54	46.0	-24.46	QP	H
558.65	2.74	21.72	24.46	46.0	-21.54	QP	H
590.66	2.69	22.02	24.71	46.0	-21.29	QP	H
31.94	7.23	19.70	26.93	40.0	-13.07	QP	V
93.05	17.45	11.39	28.84	43.5	-14.66	QP	V
97.90	17.50	12.29	29.79	43.5	-13.71	QP	V
163.86	16.79	12.26	29.05	43.5	-14.45	QP	V
196.84	18.53	11.86	30.39	43.5	-13.11	QP	V
755.56	6.13	23.88	30.01	46.0	-15.99	QP	V

Note: No emission found between lowest internal used/generated frequencies to 30MHz (9 kHz~30MHz).

# Above 1GHz

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		iD 678		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 1		Date:		01/07/2014	
Frequency:		2402 MHz		Test By:			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4804	52.39	5.71	58.1	74.0	-15.9	peak	H
4804	43.91	5.71	49.62	54.0	-4.38	Average	H
7206	43.09	12.12	55.21	74.0	-18.79	peak	H
7206	30.06	12.12	42.18	54.0	-11.82	Average	H
4804	51.82	5.71	57.53	74.0	-16.47	peak	V
4804	40.54	5.71	46.25	54.0	-7.75	Average	V
7206	35.02	12.12	47.14	74.0	-26.86	peak	V
7206	31.1	12.12	43.22	54.0	-10.78	Average	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		iD 678		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 1		Date:		01/07/2014	
Frequency:		2441 MHz		Test By:			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4882	51.57	5.93	57.5	74.0	-16.5	peak	H
4882	42.22	5.93	48.15	54.0	-5.85	Average	H
7323	44.8	12.45	57.25	74.0	-16.75	peak	H
7323	32.37	12.45	44.82	54.0	-9.18	Average	H
4882	52.24	5.93	58.17	74.0	-15.83	peak	V
4882	41.39	5.93	47.32	54.0	-6.68	Average	V
7323	44.7	12.45	57.15	74.0	-16.85	peak	V
7323	33.26	12.45	45.71	54.0	-8.29	Average	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		iD 678		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 1		Date:		01/07/2014	
Frequency:		2480 MHz		Test By:			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4960	50.72	6.15	56.87	74.0	-17.13	peak	H
4960	42.02	6.15	48.17	54.0	-5.83	Average	H
7440	46.75	12.15	58.9	74.0	-15.1	peak	H
7440	33.37	12.15	45.52	54.0	-8.48	Average	H
4960	52.42	6.15	58.57	74.0	-15.43	peak	V
4960	43.51	6.15	49.66	54.0	-4.34	Average	V
7440	49.27	12.15	61.42	74.0	-12.58	peak	V
7440	36.61	12.15	48.76	54.0	-5.24	Average	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		iD 678		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 3		Date:		01/07/2014	
Frequency:		2402 MHz		Test By:			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4804	52.47	5.71	58.18	74.0	-15.82	peak	H
4804	44.04	5.71	49.75	54.0	-4.25	Average	H
7206	42.57	12.12	54.69	74.0	-19.31	peak	H
7206	29.83	12.12	41.95	54.0	-12.05	Average	H
4804	51.97	5.71	57.68	74.0	-16.32	peak	V
4804	42.94	5.71	48.65	54.0	-5.35	Average	V
7206	43.59	12.12	55.71	74.0	-18.29	peak	V
7206	31.4	12.12	43.52	54.0	-10.48	Average	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		iD 678		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 3		Date:		01/07/2014	
Frequency:		2441 MHz		Test By:			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4882	48.37	5.93	54.3	74.0	-19.7	peak	H
4882	42.18	5.93	48.11	54.0	-5.89	Average	H
7323	42.63	12.45	55.08	74.0	-18.92	peak	H
7323	29.84	12.45	42.29	54.0	-11.71	Average	H
4882	49.73	5.93	55.66	74.0	-18.34	peak	V
4882	41.82	5.93	47.75	54.0	-6.25	Average	V
7323	43.97	12.45	56.42	74.0	-17.58	peak	V
7323	30.72	12.45	43.17	54.0	-10.83	Average	V

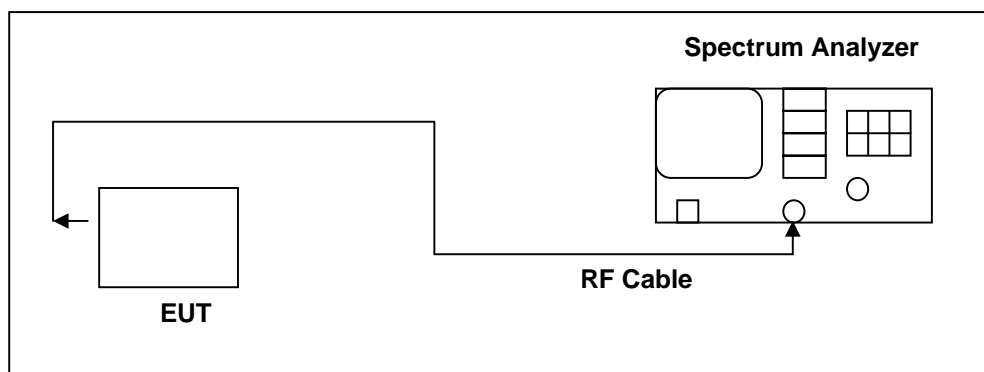
Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		iD 678		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 3		Date:		01/07/2014	
Frequency:		2480 MHz		Test By:			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4960	50.64	6.15	56.79	74.0	-17.21	peak	H
4960	42.00	6.15	48.15	54.0	-5.85	Average	H
7440	43.77	12.15	55.92	74.0	-18.08	peak	H
7440	32.50	12.15	44.65	54.0	-9.35	Average	H
4960	51.38	6.15	57.53	74.0	-16.47	peak	V
4960	43.13	6.15	49.28	54.0	-4.72	Average	V
7440	47.21	12.15	59.36	74.0	-14.64	peak	V
7440	34.02	12.15	46.17	54.0	-7.83	Average	V

## 7.4 20dB RF Bandwidth Measurement

### Limit

N/A

### Test Setup



### Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2013	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Procedure

#### 20dB RF Bandwidth

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = approx. 2 to 3 times the 20dB bandwidth, centered on a hopping frequency
2. RBW  $\geq$  1% of the 20dB span
3. VBW  $\geq$  RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 20dB down one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 20dB bandwidth of the emission.

Report Number: **60/790.13.035.01**

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## Test Result

Model Number	iD 678		
Test Item	20dB RF Bandwidth and 99 % Occupied Bandwidth		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	01/09/2014	Test Site	TE02
Frequency (MHz)	20dB RF Bandwidth (MHz)	Limit (MHz)	
2402	0.876	-----	
2441	0.871	-----	
2480	0.845	-----	

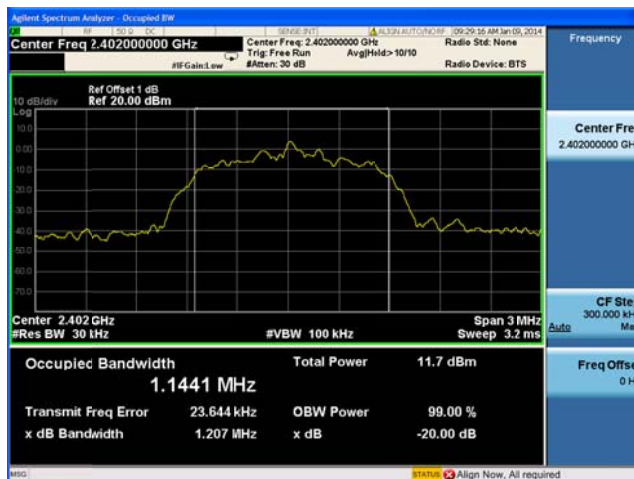
Model Number	iD 678		
Test Item	20dB RF Bandwidth and 99 % Occupied Bandwidth		
Test Mode	Mode 3: 8DPSK Link Mode		
Date of Test	01/09/2014	Test Site	TE02
Frequency (MHz)	20dB RF Bandwidth (MHz)	Limit (MHz)	
2402	1.207	-----	
2441	1.207	-----	
2480	1.210	-----	

## Test Graphs

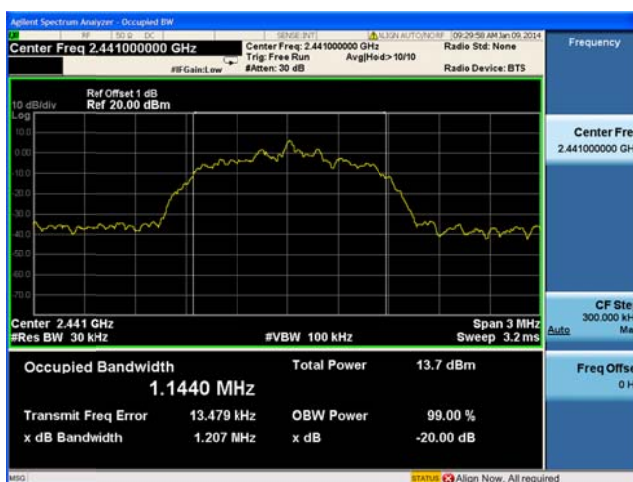
Mode 1: GFSK Link Mode	
2402	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.402000000 GHz</p> <p>Ref Offset 1 dB Ref 20.00 dBm</p> <p>Center 2.402 GHz #Res BW 30 kHz #VBW 100 kHz Span 3 MHz Sweep 3.2 ms</p> <p>Occupied Bandwidth 836.17 kHz</p> <p>Total Power 15.0 dBm</p> <p>Transmit Freq Error 14.925 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 875.8 kHz</p> <p>x dB -20.00 dB</p> <p>Frequency</p> <p>Center Freq 2.402000000 GHz</p> <p>CF Step 300.000 kHz</p> <p>Freq Offset 0 Hz</p> <p>Align Now, All required</p>
2441	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.441000000 GHz</p> <p>Ref Offset 1 dB Ref 20.00 dBm</p> <p>Center 2.441 GHz #Res BW 30 kHz #VBW 100 kHz Span 3 MHz Sweep 3.2 ms</p> <p>Occupied Bandwidth 833.29 kHz</p> <p>Total Power 16.0 dBm</p> <p>Transmit Freq Error 4.717 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 871.2 kHz</p> <p>x dB -20.00 dB</p> <p>Frequency</p> <p>Center Freq 2.441000000 GHz</p> <p>CF Step 300.000 kHz</p> <p>Freq Offset 0 Hz</p> <p>Align Now, All required</p>
2480	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.480000000 GHz</p> <p>Ref Offset 1 dB Ref 20.00 dBm</p> <p>Center 2.48 GHz #Res BW 30 kHz #VBW 100 kHz Span 3 MHz Sweep 3.2 ms</p> <p>Occupied Bandwidth 832.21 kHz</p> <p>Total Power 15.9 dBm</p> <p>Transmit Freq Error -1.565 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 844.9 kHz</p> <p>x dB -20.00 dB</p> <p>Frequency</p> <p>Center Freq 2.480000000 GHz</p> <p>CF Step 300.000 kHz</p> <p>Freq Offset 0 Hz</p> <p>Align Now, All required</p>

## Mode 3: 8DPSK Link Mode

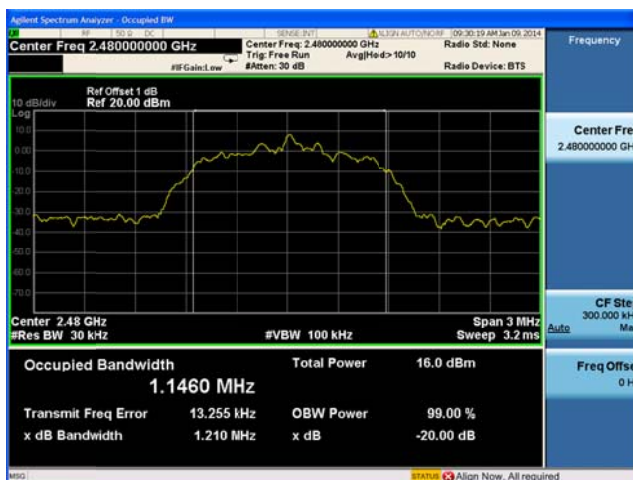
2402



2441



2480

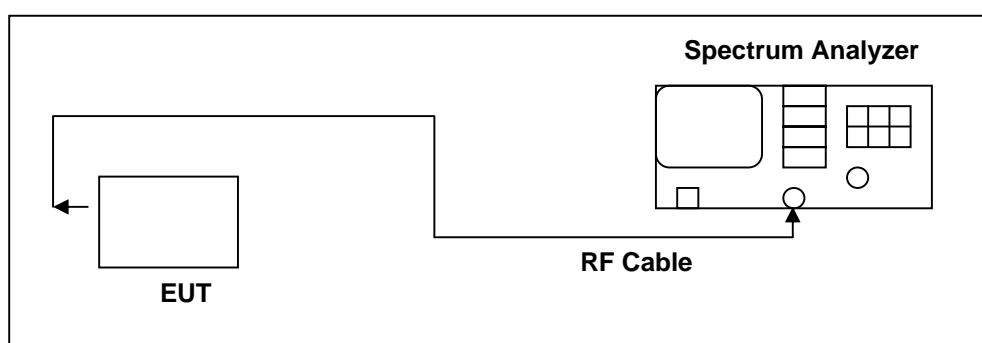


## 7.5 Carrier Frequency Separation Measurement

### Limit

Title 47 of the CFR, Part 15 Subpart (c) 15.247(a)(1)(i) requires the measurement of the bandwidth of the transmission between the -20 dB points on the transmitted spectrum. The results of this test determine the limits for channel spacing. The channel spacing shall be a minimum of 25 kHz or the 20 dB bandwidth.

### Test Setup



### Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2013	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth transmitter of the V6 had its hopping function enabled. The following spectrum analyzer settings were used:

1. Span = wide enough to capture the peaks of two adjacent channels
2. Resolution (or IF) Bandwidth (RBW)  $\geq 1\%$  of the span
3. Video (or Average) Bandwidth (VBW)  $\geq$  RBW
4. Sweep = auto

5. Detector function = peak

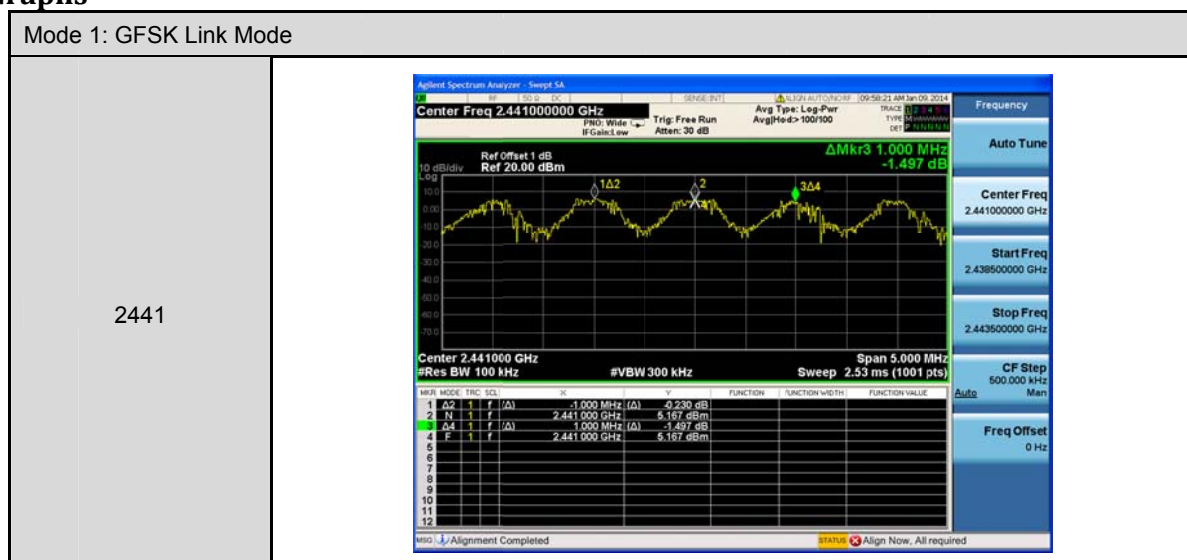
6. Trace = max hold

The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

## Test Result

Model Number	iD 678		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	01/09/2014	Test Site	TE02
Frequency (MHz)	Measurement (MHz)		Limit (MHz)
2441	1.000		> 0.581

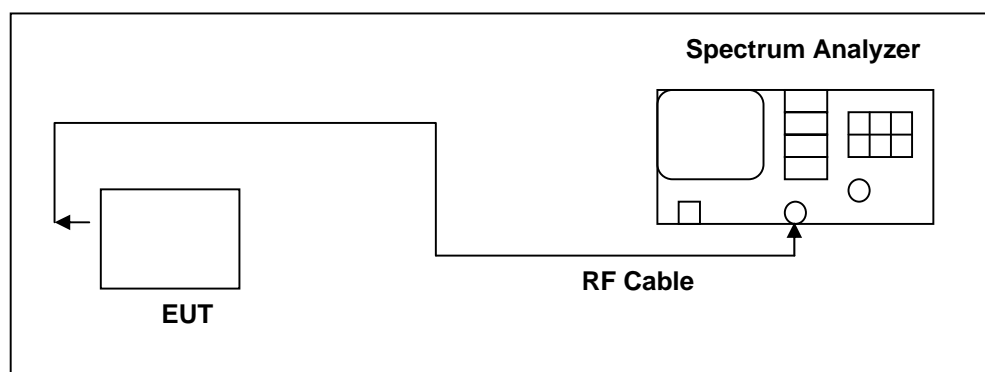
## Test Graphs



## 7.6 Number of Hopping Measurement Limit

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

### Test Setup



### Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2013	(1)
Test Site	ATL	TE02	TE02	N.C.R.	----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = the frequency band of operation
2. RBW  $\geq$  1% of the span
3. VBW  $\geq$  RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

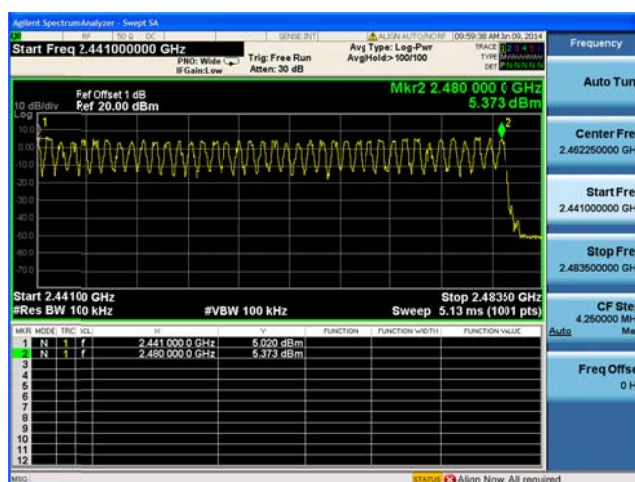
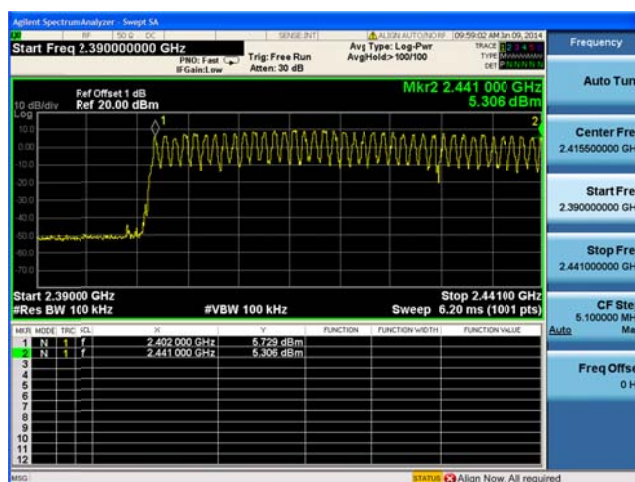
The trace was allowed to stabilize.

## Test Result

Model Number	iD 678		
Test Item	Number of Hopping		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	01/09/2014	Test Site	TE02
Frequency Range (MHz)	Measurement (ch)	Limit (ch)	
2402 - 2480	79	> 15	

## Test Graphs

Mode 1: GFSK Link Mode

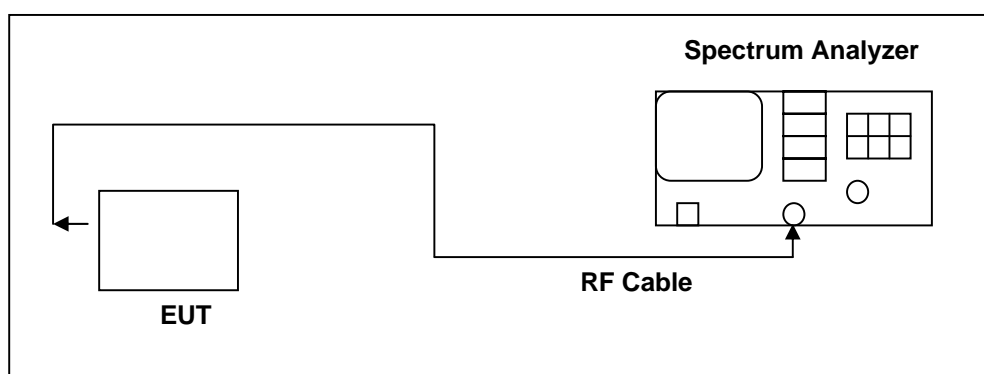


## 7.7 Time of Occupancy (Dwell Time) Measurement

### Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

### Test Setup



### Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2013	(1)
Test Site	ATL	TE02	TE02	N.C.R.	----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

1. Span = zero span, centered on a hopping channel
2. RBW = 1 MHz
3. VBW  $\geq$  RBW
4. Sweep = as necessary to capture the entire dwell time per hopping channel
5. Detector function = peak
6. Trace = max hold

The marker-delta function was used to determine the dwell time.



## Test Result

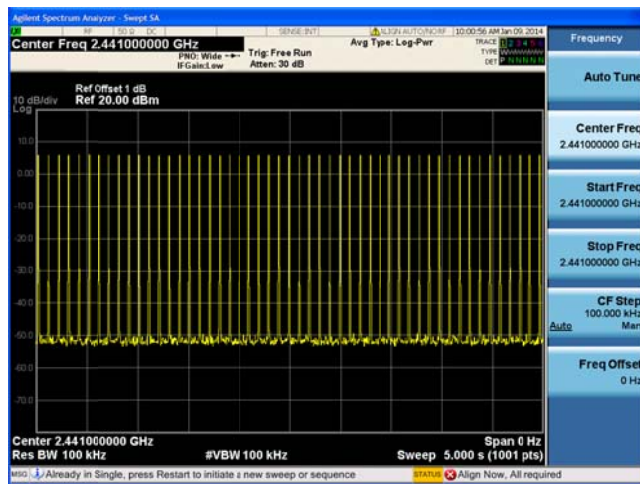
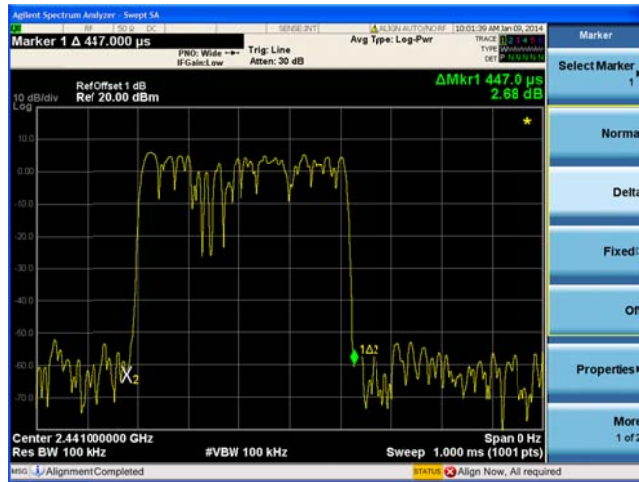
Model Number	iD 678		
Test Item	Time of Occupancy (Dwell Time)		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	01/09/2014	Test Site	TE02
DH1			
Length of per burst(ms)	0.447 ms		
Number of burst in 5 seconds	51		
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
Dwell Times	31.6/5*51*0.447 =144.077		
LIMIT(msec)	< = 400		
DH3			
Length of per burst(ms)	1.704		
Number of burst in 5 seconds	25		
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
Dwell Times	31.6/5*25*1.704 =269.232		
LIMIT(msec)	< = 400		
DH5			
Length of per burst(ms)	2.940		
Number of burst in 5 seconds	17		
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
Dwell Times	31.6/5*17*2.940 =315.874		
LIMIT(msec)	< = 400		

Model Number	iD 678		
Test Item	Time of Occupancy (Dwell Time)		
Test Mode	Mode 3: 8DPSK Link Mode		
Date of Test	01/09/2014	Test Site	TE02
DH1			
Length of per burst(ms)	0.468		
Number of burst in 5 seconds	50		
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
Dwell Times	31.6/5*50*0.468 =147.888		
LIMIT(msec)	< = 400		
DH3			
Length of per burst(ms)	1.719		
Number of burst in 5 seconds	25		
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
Dwell Times	31.6/5*25*1.719 =271.602		
LIMIT(msec)	< = 400		
DH5			
Length of per burst(ms)	2.960		
Number of burst in 5 seconds	17		
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
Dwell Times	31.6/5*17*2.960 =318.022		
LIMIT(msec)	< = 400		

## Test Graphs

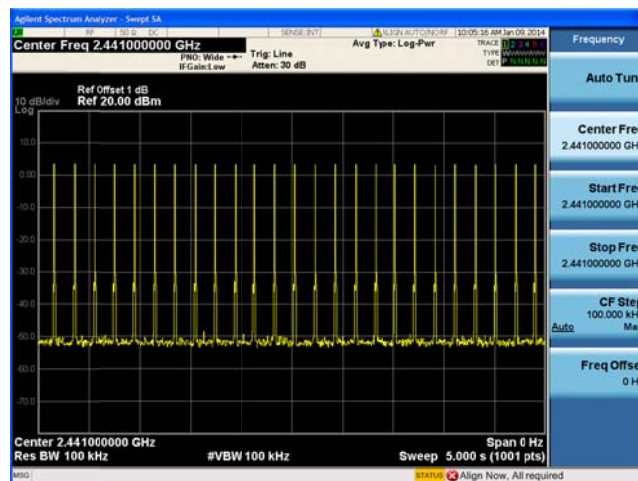
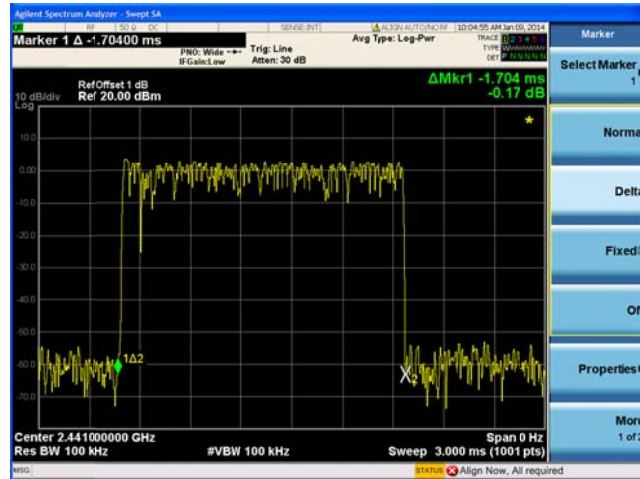
Mode 1: GFSK Link Mode

DH1



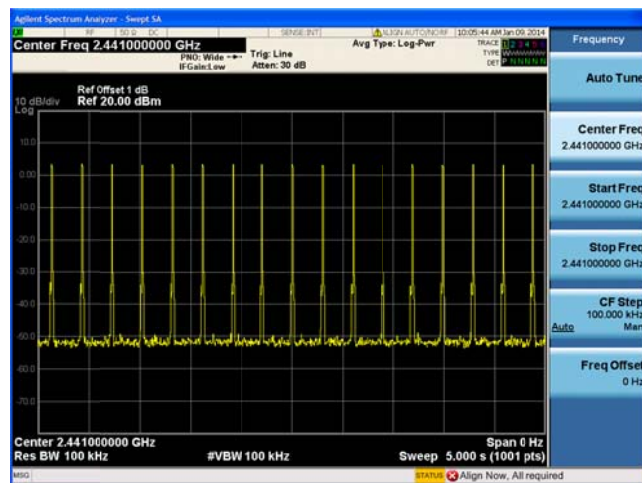
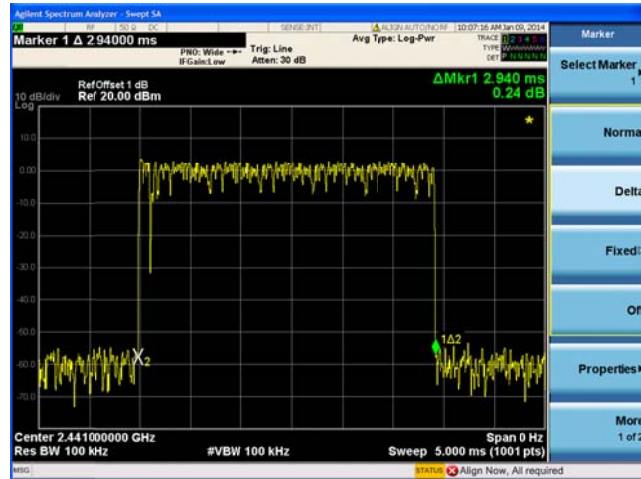
Mode 1: GFSK Link Mode

DH3



Mode 1: GFSK Link Mode

DH5

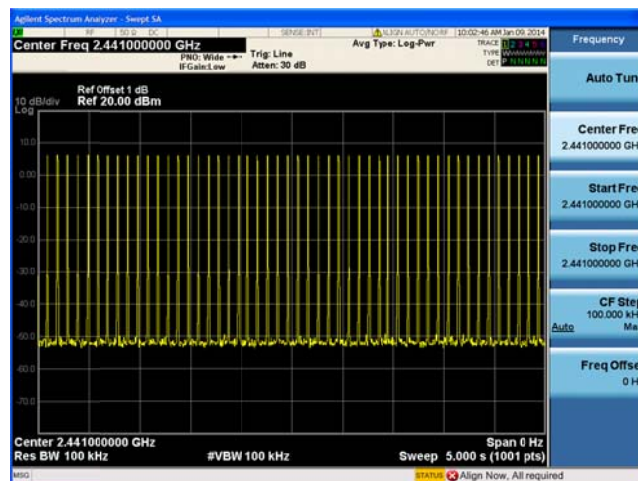


Mode 3: 8DPSK Link Mode

3DH1

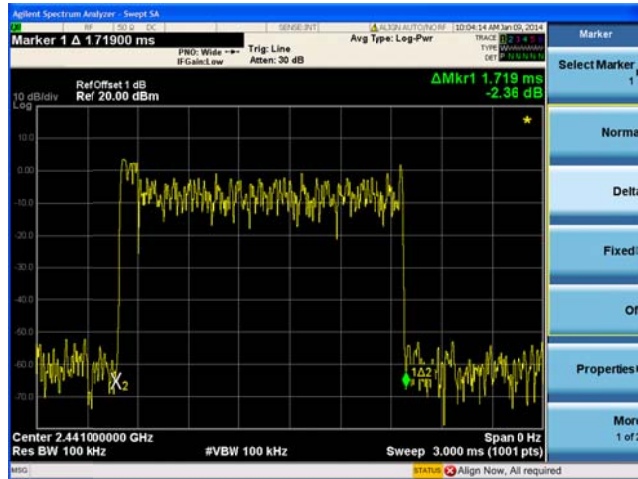


3DH1

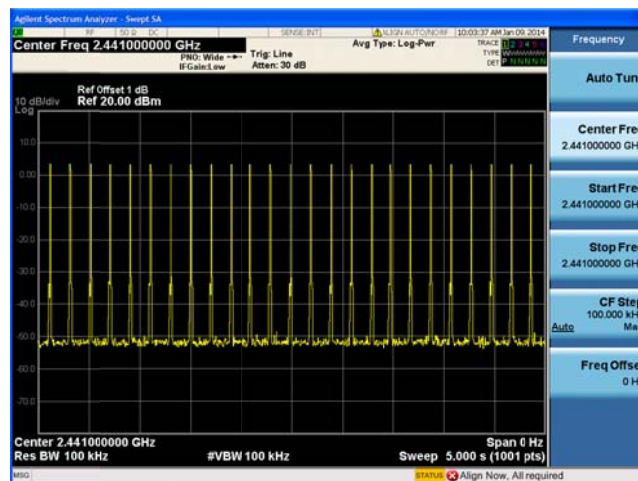


Mode 3: 8DPSK Link Mode

3DH3

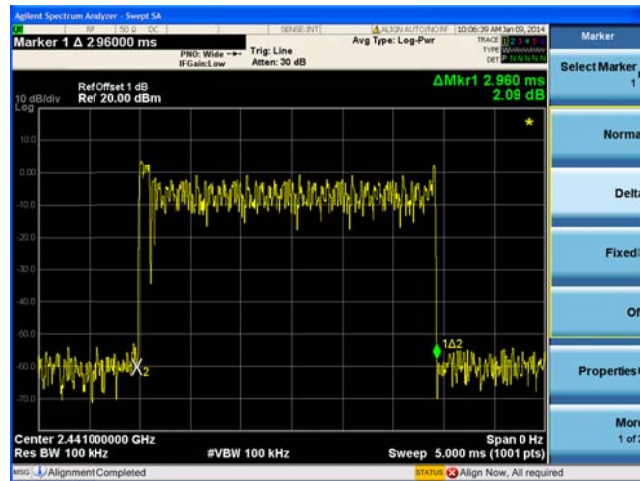


3DH3

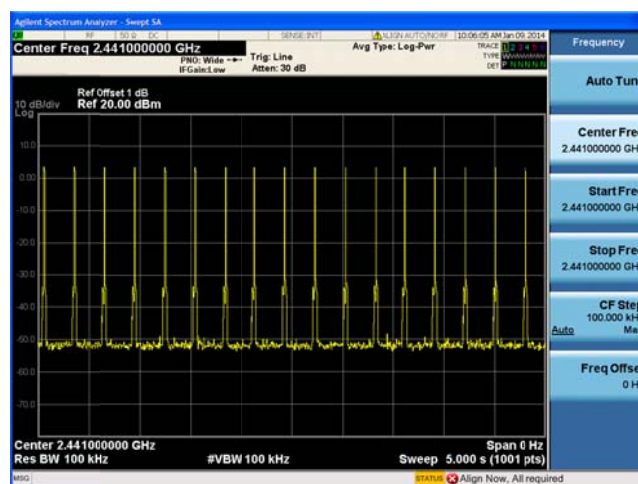


Mode 3: 8DPSK Link Mode

3DH3



3DH3



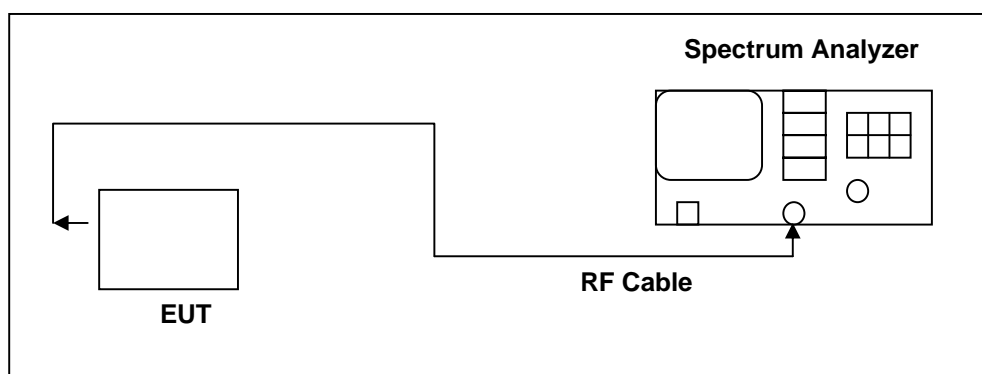


## 7.8 Out of Band Conducted Emissions Measurement

### 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

### Test Setup



### Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2013	(1)
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/09/2013	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Procedure

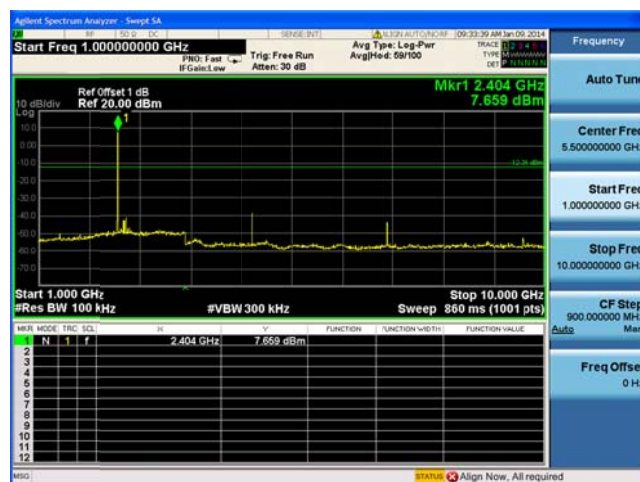
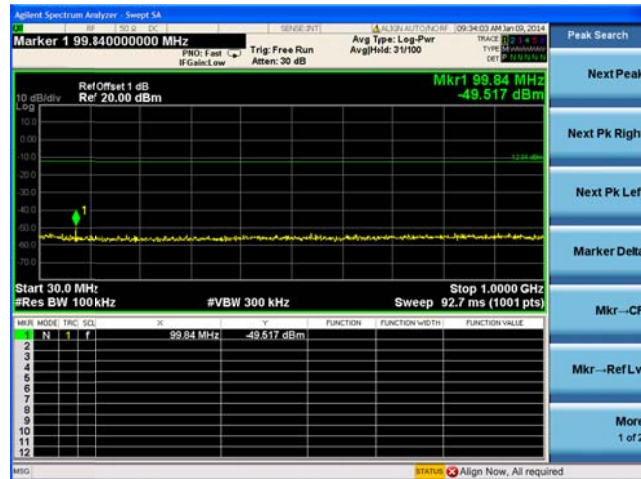
Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 0, 39, 78)

## Test Graphs

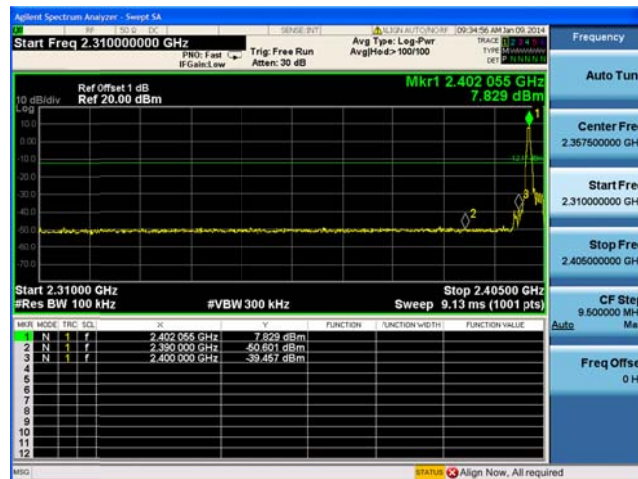
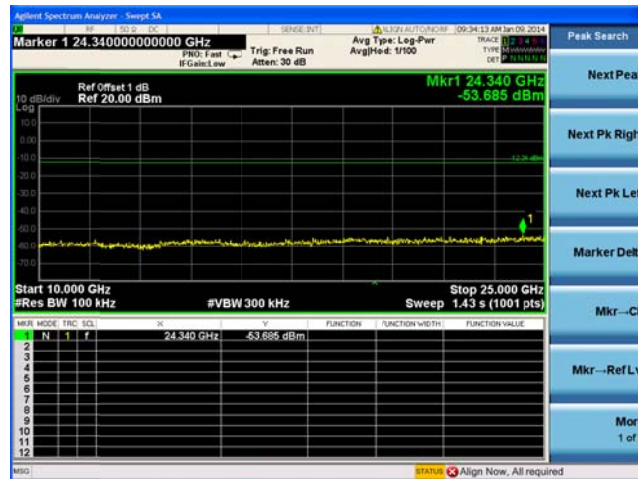
Mode 1: GFSK Link Mode

2402



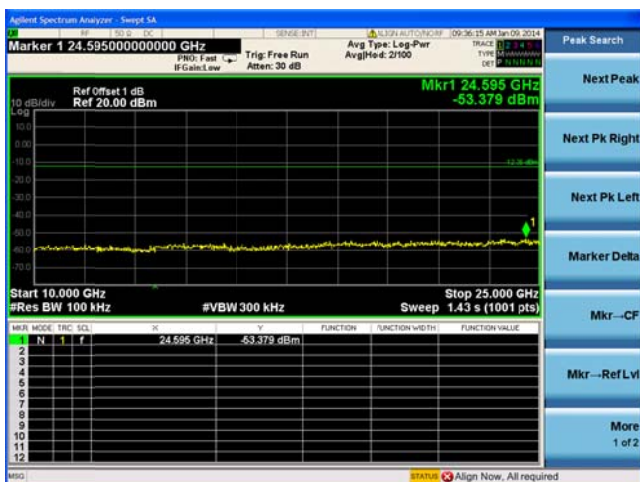
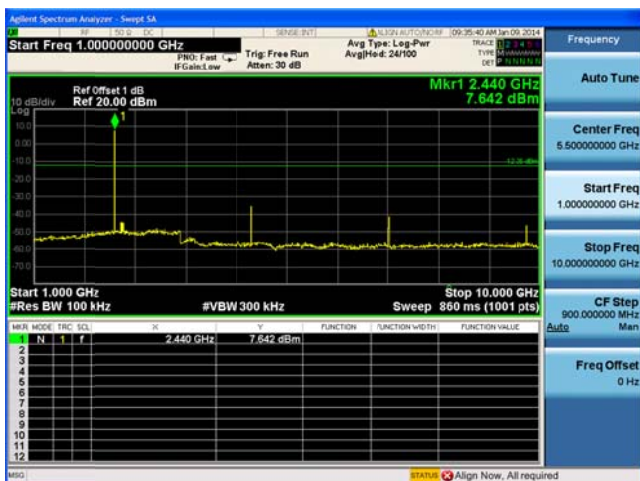
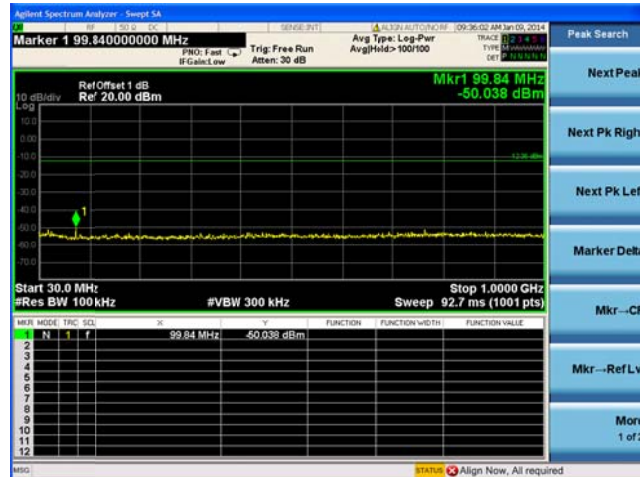
Mode 1: GFSK Link Mode(continuous)

2402



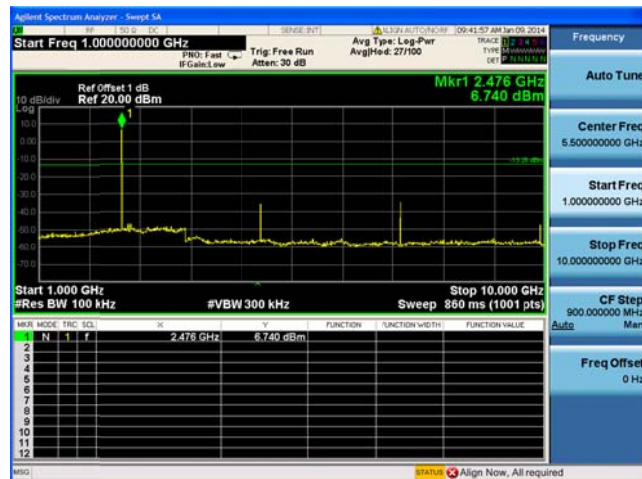
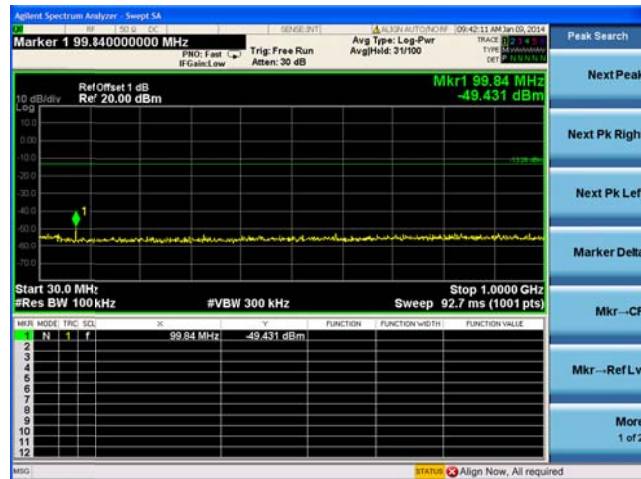
Mode 1: GFSK Link Mode

2441



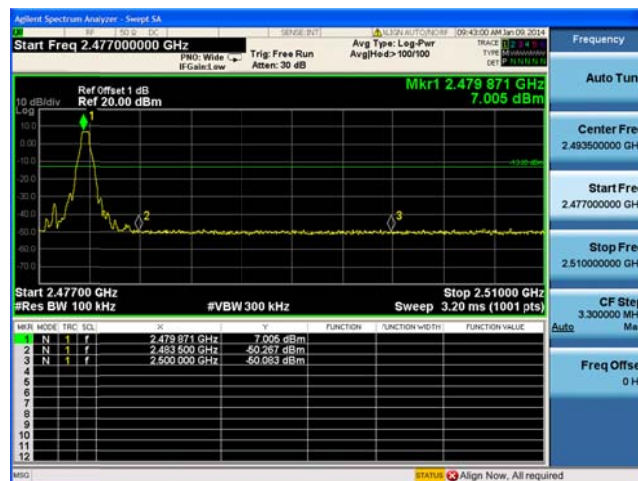
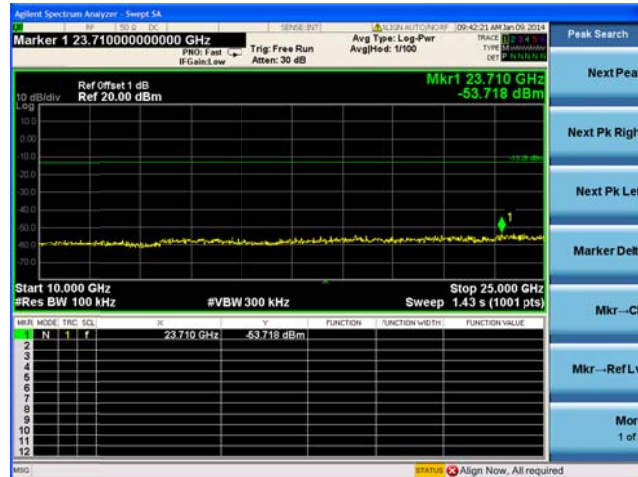
Mode 1: GFSK Link Mode

2480



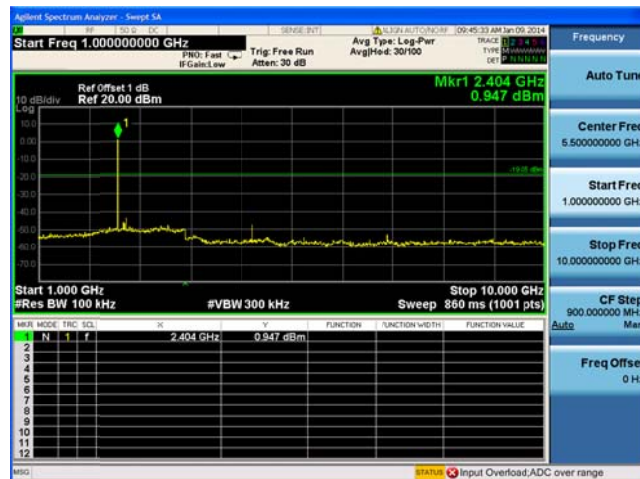
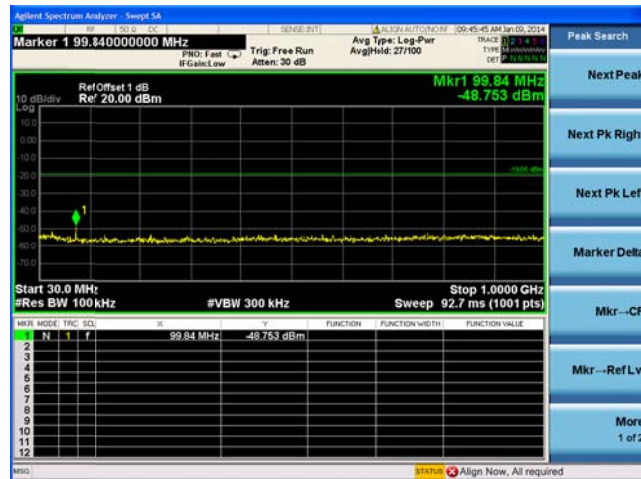
Mode 1: GFSK Link Mode (continuous)

2480



Mode 3: 8DPSK Link Mode

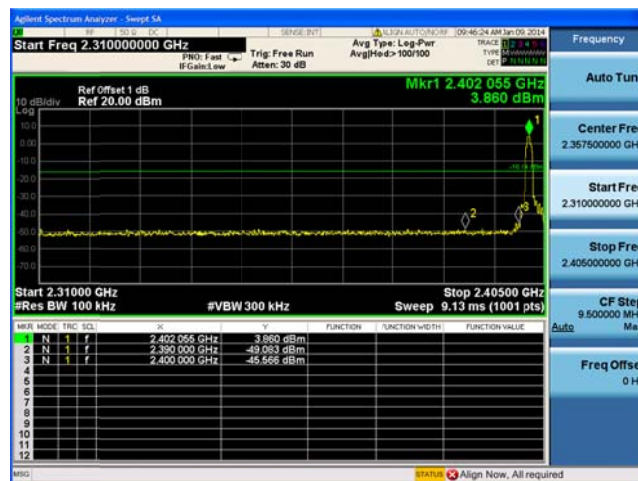
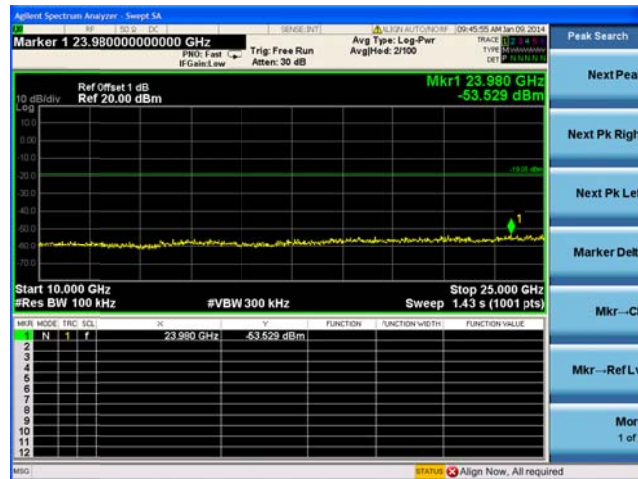
2402





Mode 3: 8DPSK Link Mode (continuous)

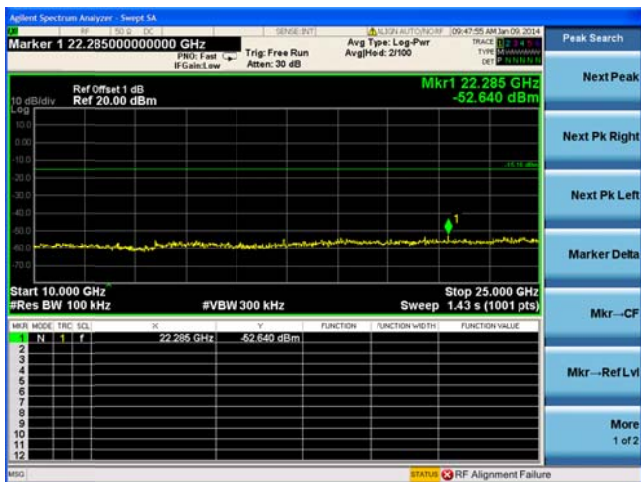
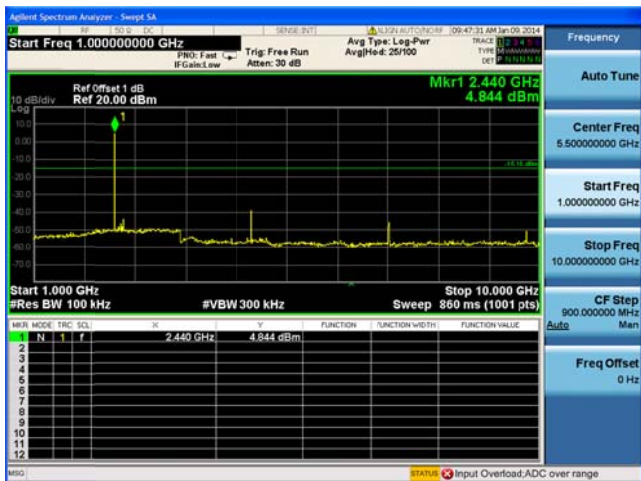
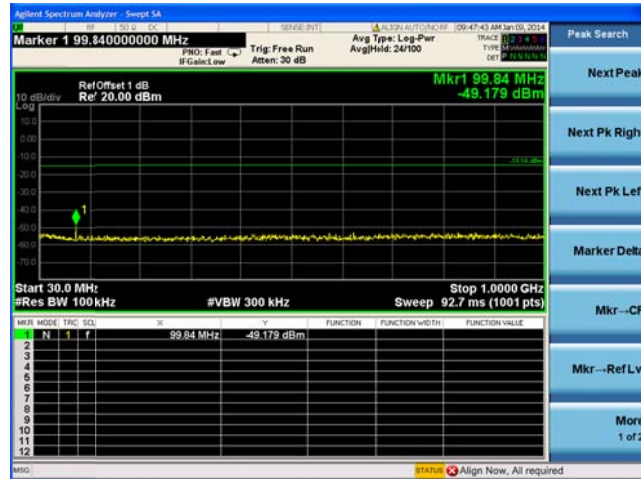
2402





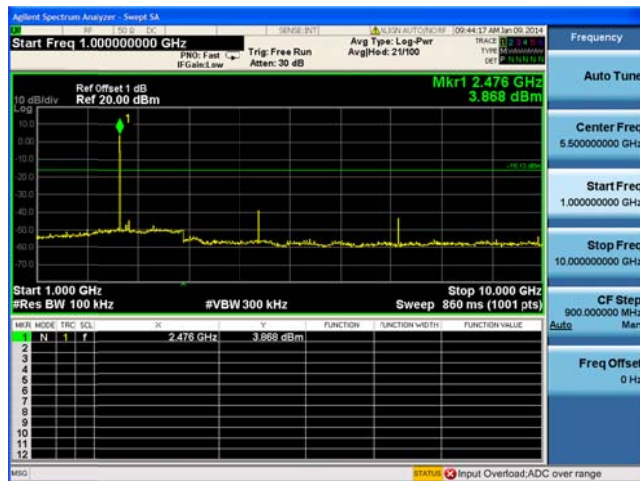
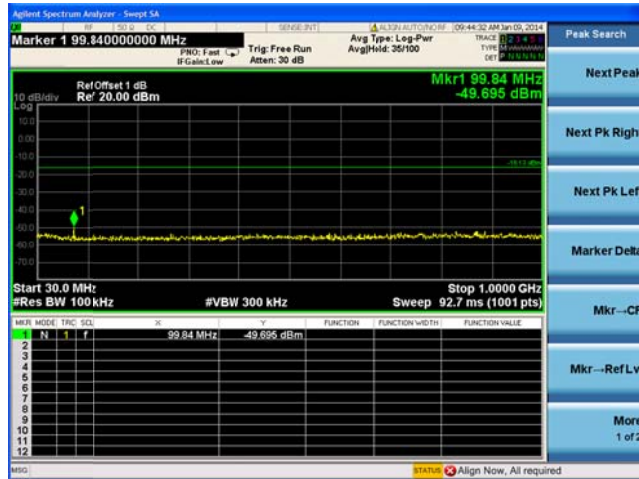
Mode 3: 8DPSK Link Mode

2441



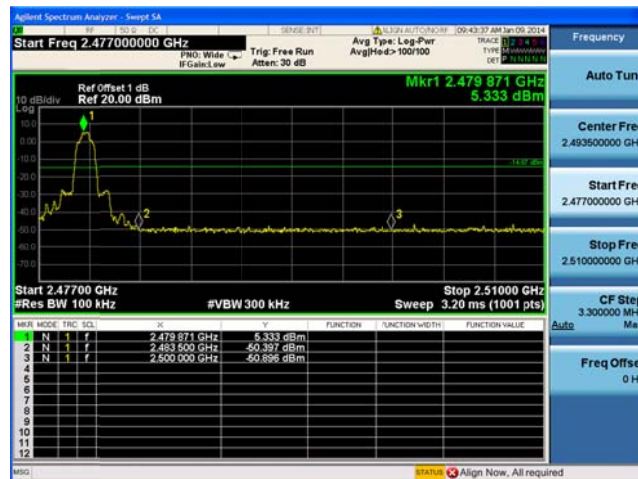
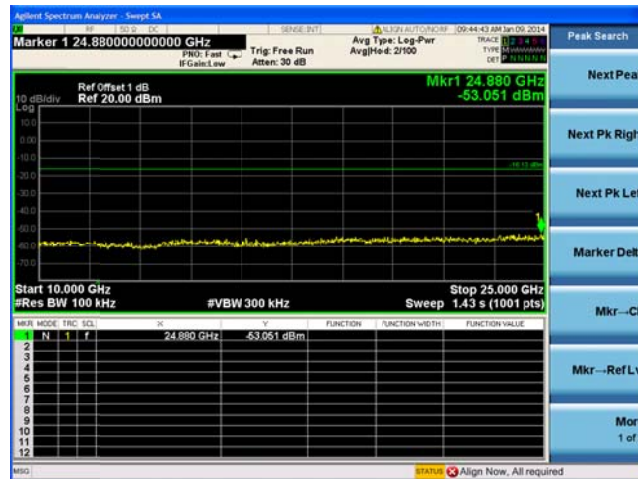
### Mode 3: 8DPSK Link Mode

2480



Mode 3: 8DPSK Link Mode(continuous)

2480

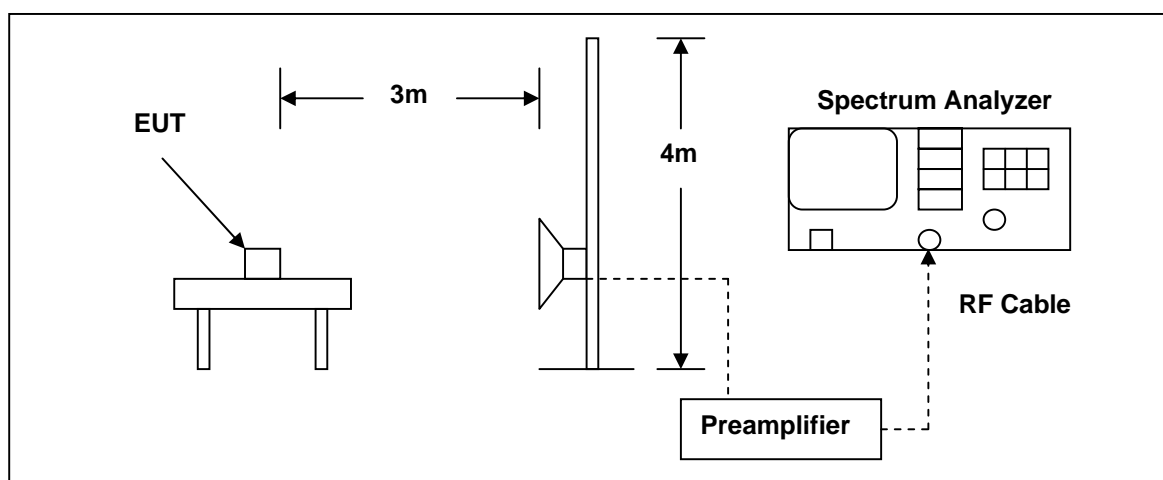


## 7.9 Band Edges Measurement

### 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

### Test Setup



### Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/09/2013	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2013	(1)
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	9120D	9120D-550	06/15/2013	(1)
Test Site	ATL	TE01	888001	08/28/2013	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

## Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

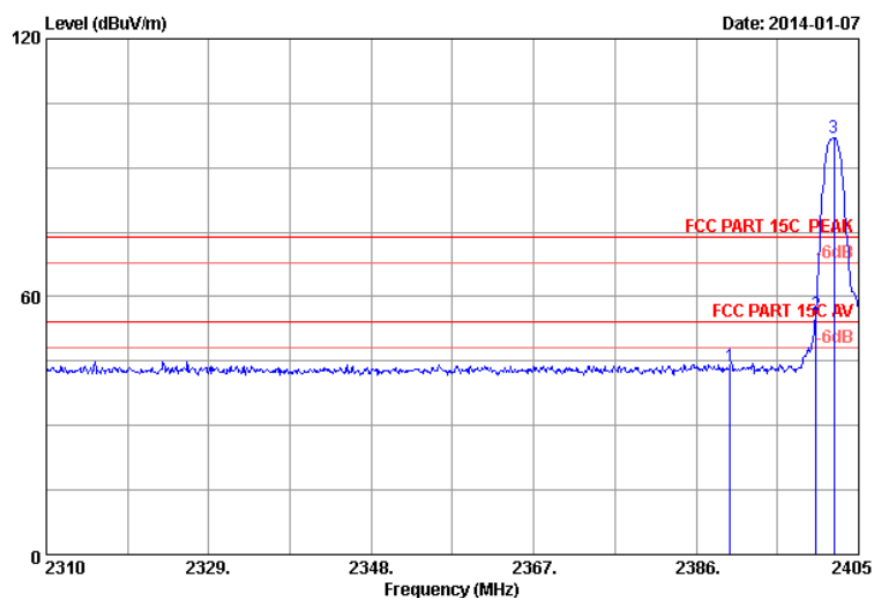
The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

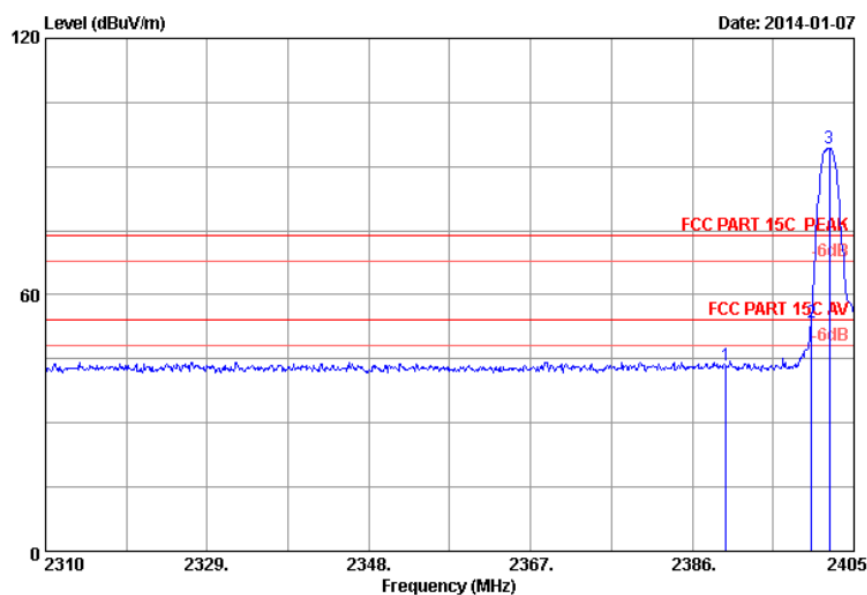
## Test Result

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	01/07/2014
Frequency:	2402 MHz	Test By:	
Ant.Polar.:	Horizontal		



Frequency (MHz)	Correct Factor (dB/m)	Reading (dBuV)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	1.72	45.61	43.85	74.0	30.61	Peak
2400.000	1.72	57.46	55.74	74.0	18.26	Peak
2400.000	1.72	47.32	44.40	54.0	8.60	AV
2402.150	1.72	98.63	96.91	74.0	-22.91	Peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	01/07/2014
Frequency:	2402 MHz	Test By:	
Ant.Polar.:	Vertical		

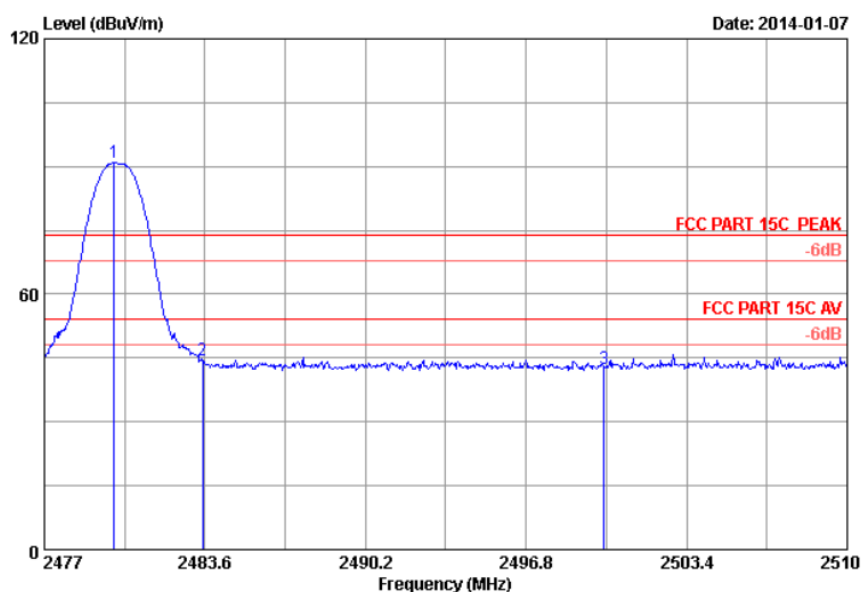


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.16	5.78	35.70	45.08	43.32	74.00	30.68	Peak
2	2400.000	28.18	5.80	35.70	55.33	53.61	74.00	20.39	Peak
3	2402.150	28.18	5.80	35.70	96.07	94.35	74.00	-20.35	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	01/07/2014
Frequency:	2480 MHz	Test By:	
Ant.Polar.:	Horizontal		



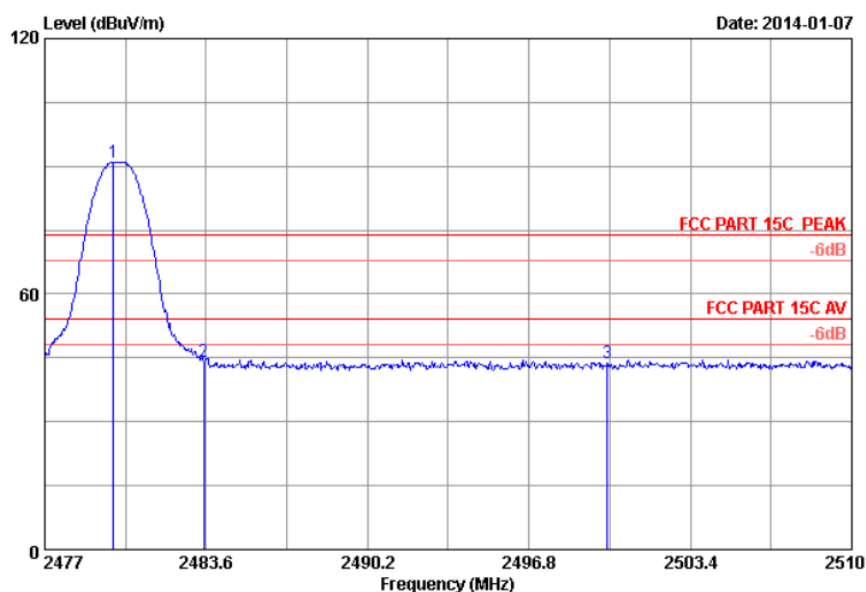
	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.871	28.36	5.91	35.70	92.24	90.81	74.00	-16.81	Peak
2	2483.500	28.36	5.92	35.70	45.95	44.53	74.00	29.47	Peak
3	2500.000	28.40	5.94	35.70	43.96	42.60	74.00	31.40	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	01/07/2014
Frequency:	2480 MHz	Test By:	
Ant.Polar.:	Vertical		

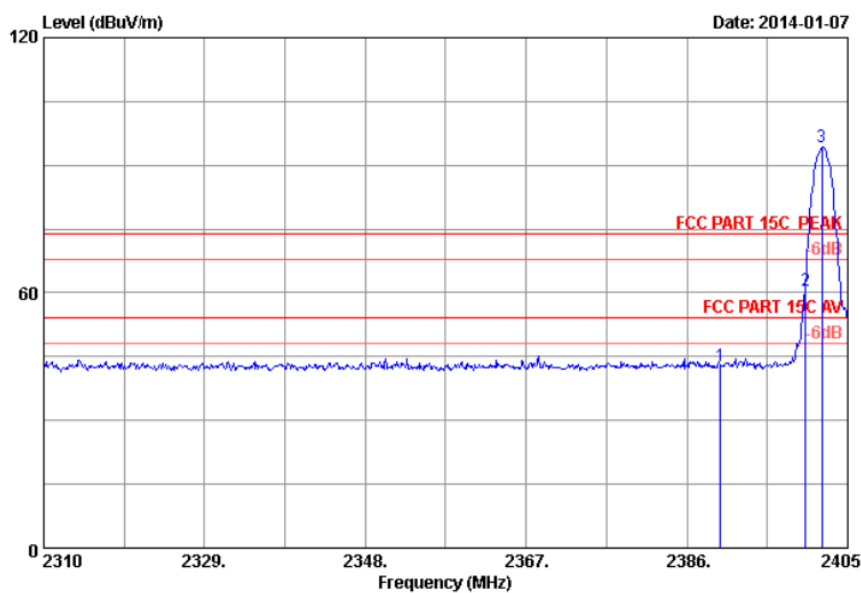


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.805	28.36	5.91	35.70	92.50	91.07	74.00	-17.07	Peak
2	2483.500	28.36	5.92	35.70	45.66	44.24	74.00	29.76	Peak
3	2500.000	28.40	5.94	35.70	45.00	43.64	74.00	30.36	Peak

#### Remarks:

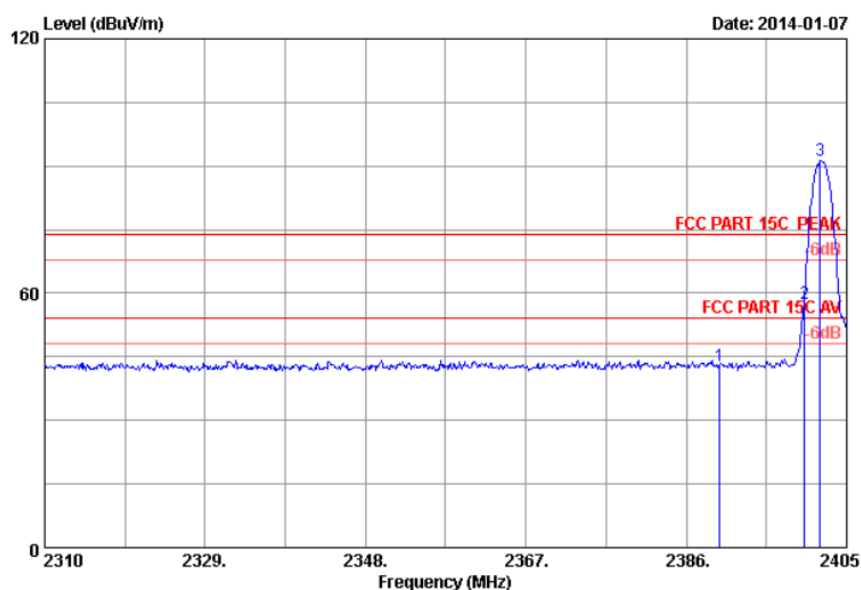
1. Emission Level= Antenna Factor + Cable Loss -amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	01/07/2014
Frequency:	2402 MHz	Test By:	
Ant.Polar.:	Horizontal		



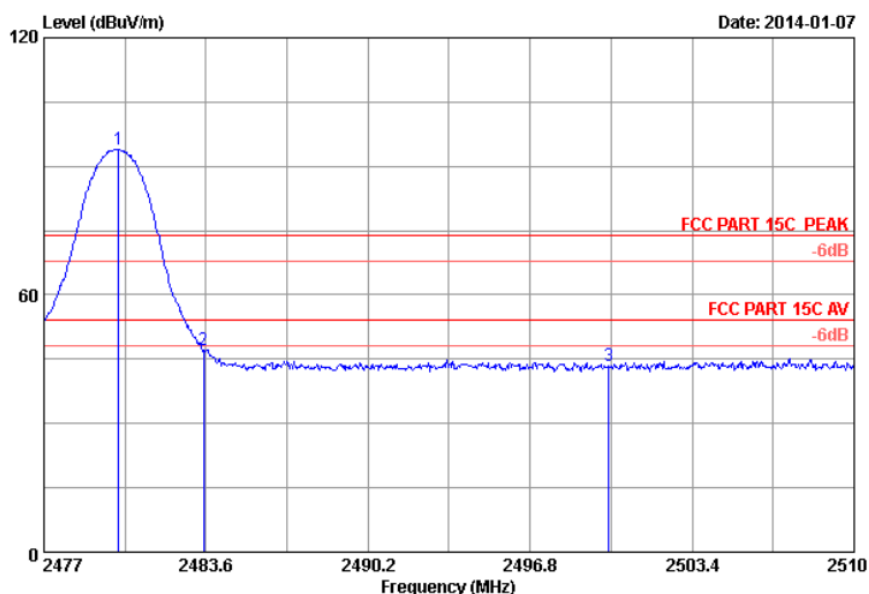
Frequency (MHz)	Correct Factor (dB/m)	Reading (dBuV)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	1.72	44.49	42.73	74.0	31.27	Peak
2400.000	1.72	62.25	60.53	74.0	13.47	Peak
2400.000	1.72	52.19	50.47	54.0	3.53	AV
2401.960	1.72	98.63	96.91	74.0	-22.91	Peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	01/07/2014
Frequency:	2402 MHz	Test By:	
Ant.Polar.:	Vertical		



Frequency (MHz)	Correct Factor (dB/m)	Reading (dBuV)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	1.72	44.67	42.91	74.0	31.09	Peak
2400.000	1.72	59.35	57.63	74.0	16.37	Peak
2400.000	1.72	50.13	48.41	54.0	5.59	AV
2401.865	1.72	93.12	91.40	74.0	-17.40	Peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	01/07/2014
Frequency:	2480 MHz	Test By:	
Ant.Polar.:	Horizontal		

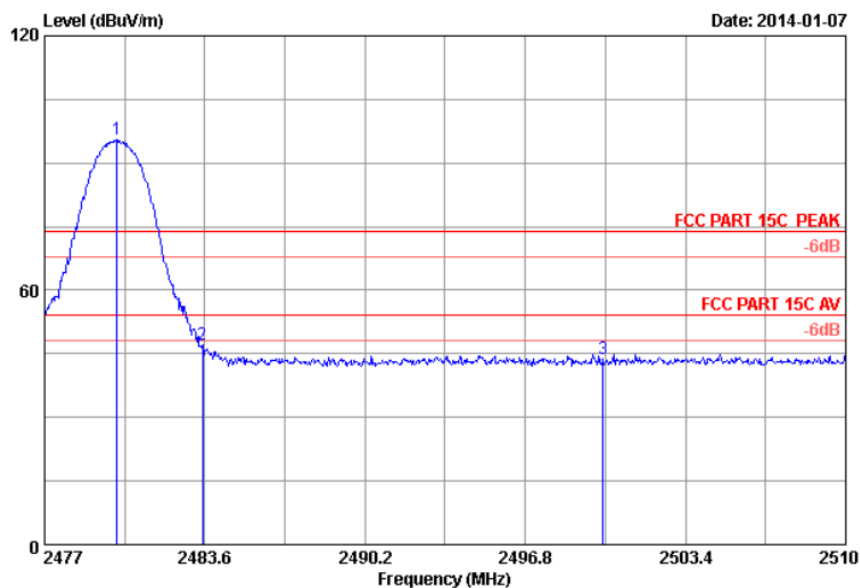


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.036	28.36	5.91	35.70	95.50	94.07	74.00	-20.07	Peak
2	2483.500	28.36	5.92	35.70	48.50	47.08	74.00	26.92	Peak
3	2500.000	28.40	5.94	35.70	44.85	43.49	74.00	30.51	Peak

#### Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	iD 678	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	01/07/2014
Frequency:	2480 MHz	Test By:	
Ant.Polar.:	Vertical		



	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.970	28.36	5.91	35.70	96.92	95.49	74.00	-21.49	Peak
2	2483.500	28.36	5.92	35.70	48.49	47.07	74.00	26.93	Peak
3	2500.000	28.40	5.94	35.70	45.27	43.91	74.00	30.09	Peak

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

## 7.10 Antenna Measurement Limit

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

## Antenna Connector Construction

The antenna used in this product is Internal monopolar antenna. And the maximum Gain of this antenna is 0.0 dBi.