

## FCC PART 15.247

### TEST REPORT

For

### Acomdata Technology, INC.

12F.-1, No.99, Sec. 1, Nankan Rd., Luzhu Township, Taoyuan County 338, Taiwan (R.O.C.)

**FCC ID: SYO-POWERBOOM**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Wireless Speaker
<b>Test Engineer:</b> Allen Qiao	<i>Allen Qiao</i>
<b>Report Number:</b> RDG140716001-00A	
<b>Report Date:</b> 2014-08-05	
<b>Reviewed By:</b> Jerry Zhang EMC Manager	<i>Jerry Zhang</i>
<b>Test Laboratory:</b>	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>

**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan). This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

## **TABLE OF CONTENTS**

<b>GENERAL INFORMATION.....</b>	<b>4</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	4
OBJECTIVE .....	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY .....	4
TEST FACILITY .....	5
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>6</b>
DESCRIPTION OF TEST CONFIGURATION .....	6
EUT EXERCISE SOFTWARE .....	6
EQUIPMENT MODIFICATIONS .....	6
SUPPORT EQUIPMENT LIST AND DETAILS .....	6
EXTERNAL CABLE.....	6
BLOCK DIAGRAM OF TEST SETUP .....	7
<b>SUMMARY OF TEST RESULTS .....</b>	<b>8</b>
<b>FCC §15.247 (i) &amp; §1.1310 &amp; §2.1093- RF EXPOSURE .....</b>	<b>9</b>
APPLICABLE STANDARD .....	9
<b>FCC §15.203 - ANTENNA REQUIREMENT.....</b>	<b>10</b>
APPLICABLE STANDARD .....	10
ANTENNA CONNECTOR CONSTRUCTION .....	10
<b>FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS .....</b>	<b>11</b>
APPLICABLE STANDARD .....	11
MEASUREMENT UNCERTAINTY.....	11
EUT SETUP .....	11
EMI TEST RECEIVER SETUP.....	12
TEST PROCEDURE .....	12
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	12
TEST EQUIPMENT LIST AND DETAILS.....	13
TEST RESULTS SUMMARY .....	13
TEST DATA .....	13
<b>FCC §15.209, §15.205 &amp; §15.247(d) - SPURIOUS EMISSIONS.....</b>	<b>16</b>
APPLICABLE STANDARD .....	16
MEASUREMENT UNCERTAINTY.....	16
EUT SETUP .....	16
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP .....	17
TEST PROCEDURE .....	17
TEST EQUIPMENT LIST AND DETAILS.....	18
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	18
TEST RESULTS SUMMARY .....	18
TEST DATA .....	18
<b>FCC §15.247(a) (1) - CHANNEL SEPARATION TEST .....</b>	<b>27</b>
APPLICABLE STANDARD .....	27
TEST EQUIPMENT LIST AND DETAILS.....	27
TEST PROCEDURE .....	27
TEST DATA .....	27
<b>FCC §15.247(a) (1) – 20 dB BANDWIDTH TESTING .....</b>	<b>33</b>

APPLICABLE STANDARD .....	33
TEST PROCEDURE .....	33
TEST EQUIPMENT LIST AND DETAILS.....	33
TEST DATA .....	33
<b>FCC §15.247(a) (1) (iii) - QUANTITY OF HOPPING CHANNEL TEST .....</b>	<b>39</b>
APPLICABLE STANDARD .....	39
TEST PROCEDURE .....	39
TEST EQUIPMENT LIST AND DETAILS.....	39
TEST DATA .....	39
<b>FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME).....</b>	<b>43</b>
APPLICABLE STANDARD .....	43
TEST PROCEDURE .....	43
TEST EQUIPMENT LIST AND DETAILS.....	43
TEST DATA .....	43
<b>FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT .....</b>	<b>59</b>
APPLICABLE STANDARD .....	59
TEST PROCEDURE .....	59
TEST EQUIPMENT LIST AND DETAILS.....	59
TEST DATA .....	59
<b>FCC §15.247(d) - BAND EDGES TESTING .....</b>	<b>65</b>
APPLICABLE STANDARD .....	65
TEST PROCEDURE .....	65
TEST EQUIPMENT LIST AND DETAILS.....	65
TEST DATA .....	65
<b>DECLARATION OF SIMILARITY .....</b>	<b>69</b>

## GENERAL INFORMATION

---

### Product Description for Equipment under Test (EUT)

The Acomdata Technology, INC.'s product, model number: *PowerBoom mobile150* (FCC ID: *SYO-POWERBOOM*) (the "EUT") in this report was a *Wireless Speaker*, which was measured approximately: 15.0 cm (L) x 5.5 cm (W) x 6.3 cm (H), rated input voltage: DC 3.7V from rechargeable Li-ion battery or DC 5V from adapter.

Adapter information:

Model: PA1005-050SUB100

Input: 100-240Vac, 50-60Hz, 0.3A

Output: DC 5V, 1.0A 5W Max

Manufacture: Powertron Electronics Corp

*Note: The series product, model PowerBoom 5A, PowerBoom mobile150, PowerBoom\_150, PowerBoom, SportsBuddy, MB-20-5, MB-20-5-A, MB-20-5-B, MB-20-5-C, MB-20-5-D, MB-20-5-E, MB-20-5-F are electrically identical, the differences between them are the model name and color of appearance, we selected PowerBoom mobile150 for fully testing, the details was explained in the attached declaration letter.*

*All measurement and test data in this report was gathered from production sample serial number: 140716001 (Assigned by BACL, Dongguan). The EUT was received on 2014-07-17.*

### Objective

This report is prepared on behalf of *Acomdata Technology, INC.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communications Commission's rules

The tests were performed in order to determine the Bluetooth BDR and EDR mode of EUT compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

### Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: *SYO-POWERBOOM* for Bluetooth LE mode.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

**Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxihu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

FINAL

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in an engineering mode, which was entrance by the software provided by manufacturer. And the engineering mode was controlled by the Bluetooth Tester.

### EUT Exercise Software

The software “CSR Bluesuite 2.5.0” was used for testing, which was provided by manufacturer. The worst condition (maximum power) was setting by the software as following table:

Test Software Version		CSR Bluesuite 2.5.0		
Test Frequency		2402MHz	2441MHz	2480MHz
Power Level Setting	GFSK	63	63	63
	$\pi/4$ DQPSK	100	100	100
	8DPSK	100	100	100

### Equipment Modifications

No modification was made to the EUT.

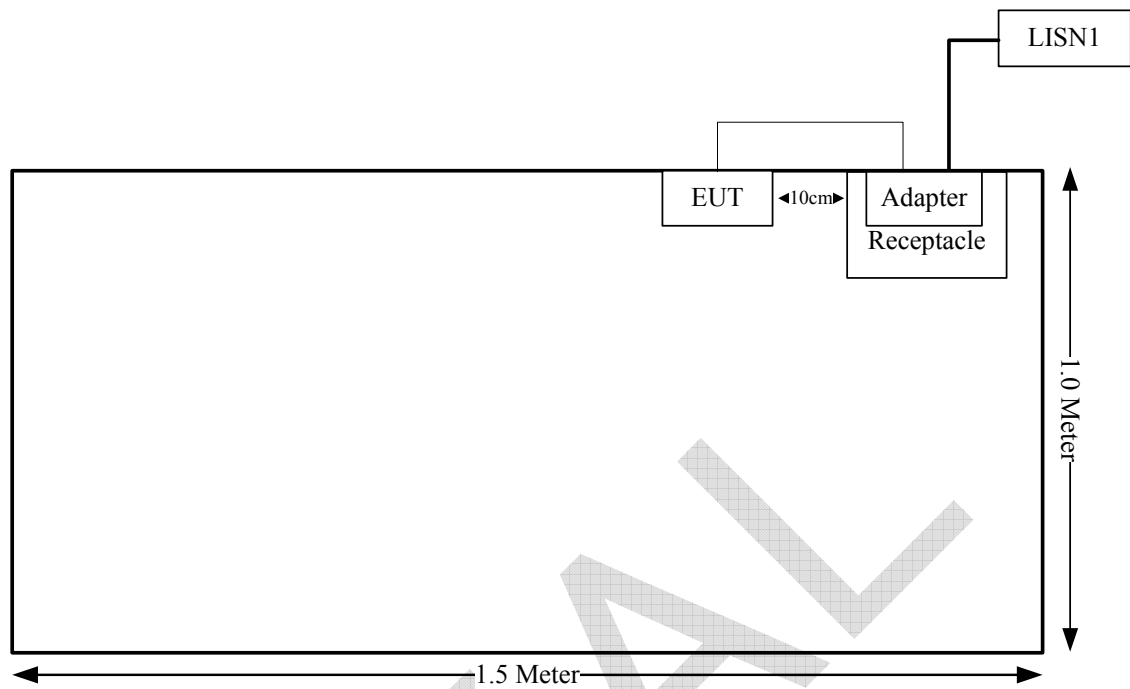
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

### External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	1	USB Port of Adapter	EUT

## Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(1)	20 dB Bandwidth	Compliance
§15.247(a)(1)	Channel Separation Test	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliance
§15.247(b)(1)	Peak Output Power Measurement	Compliance
§15.247(d)	Band Edges	Compliance



## **FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE**

### **Applicable Standard**

According to §15.247(i) and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v05r02:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

### **Measurement Result**

The maximum conducted output power= 5.79 dBm (3.79 mW) at 2402 MHz  
 $[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$   
 $= 3.79/5 \cdot (\sqrt{2.402}) = 1.176 < 3.0$

**So the stand-alone SAR evaluation is not necessary.**

## **FCC §15.203 - ANTENNA REQUIREMENT**

---

### **Applicable Standard**

According to FCC § 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

### **Antenna Connector Construction**

The EUT has one integral antenna arrangement, which was soldered on the main board and the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliance.

## FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

FCC§15.207

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cisp}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cisp}$  of Table 1, then:

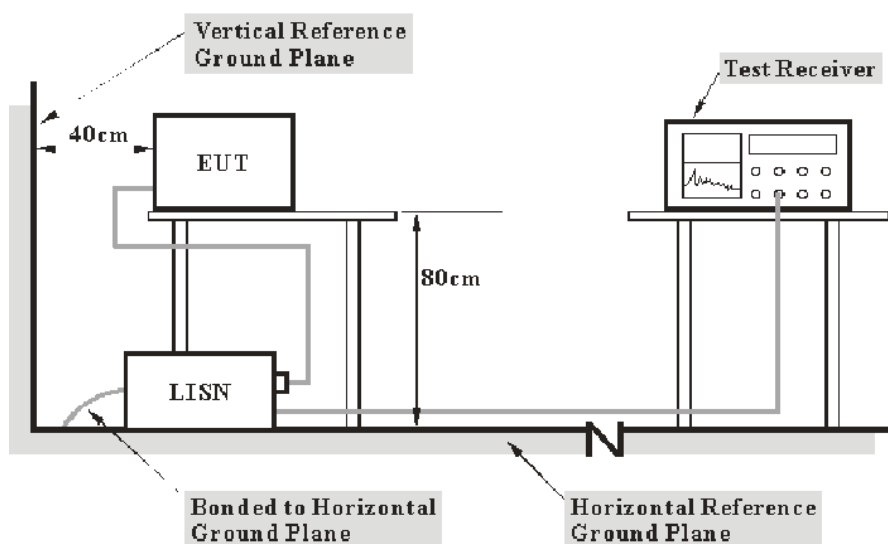
- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cisp})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cisp})$ , exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of  $U_{cisp}$

Measurement	$U_{cisp}$
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

### EUT Setup



Note: 1. Support units were connected to second LISN.  
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

### Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

$V_C$ : corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_C$ : attenuation caused by cable loss

$VDF$ : voltage division factor of AMN or ISN

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2013-11-20	2014-11-20
R&S	L.I.S.N	ESH3-Z5	843331/015	2013-09-25	2014-09-25
R&S	Two-line V-network	ENV 216	3560.6550.12	2014-01-22	2015-01-22
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Results Summary**

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

**15.1 dB at 0.393383 MHz** in the **Neutral** conducted mode

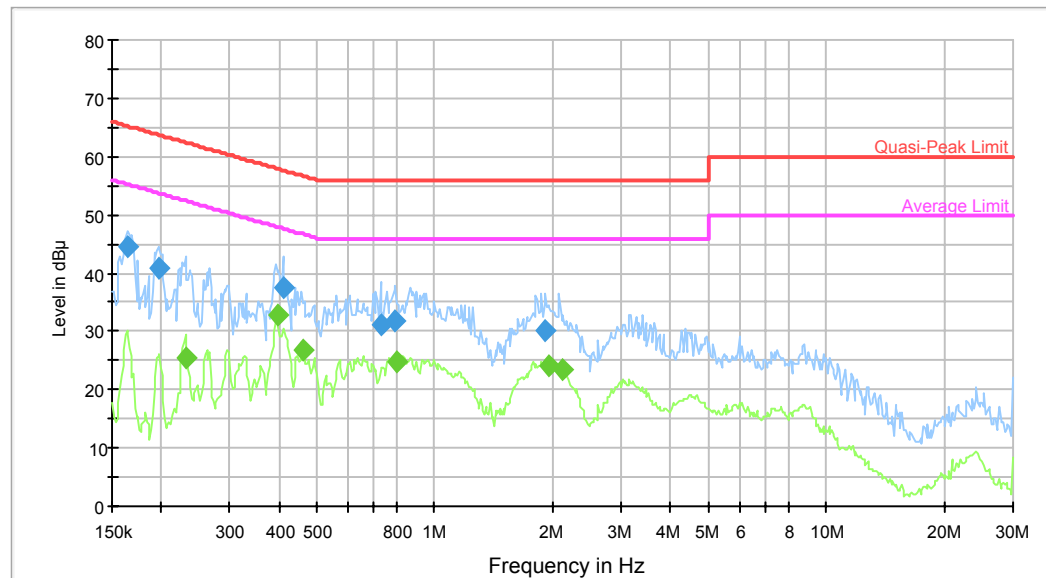
**Test Data****Environmental Conditions**

<b>Temperature:</b>	27.5 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	100 kPa

*The testing was performed by Allen Qiao on 2014-07-21.*

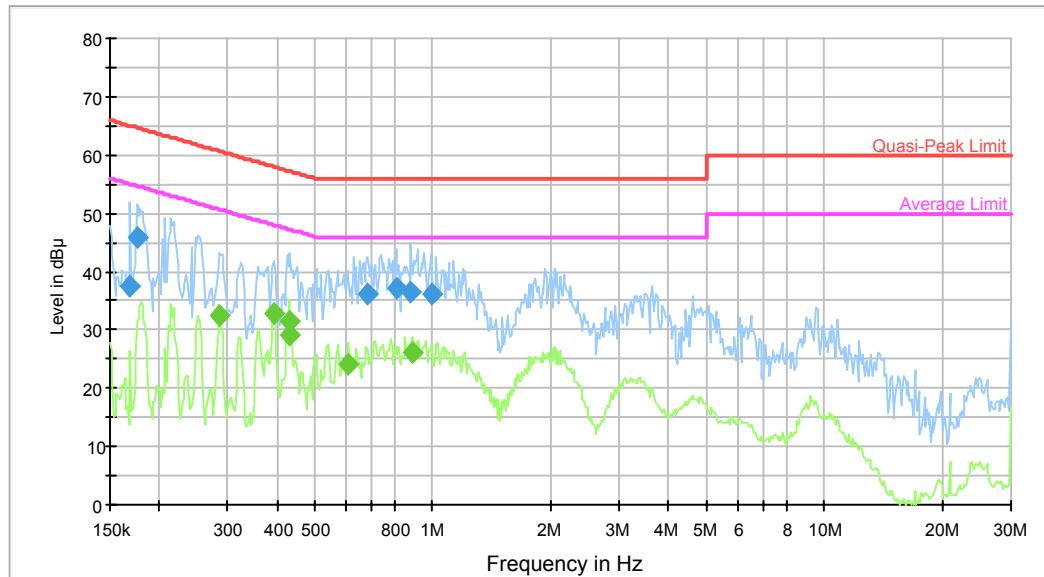
Test Mode: Charging&Transmitting

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.163741	44.4	9.000	L1	10.2	20.9	65.3	Compliance
0.196675	40.7	9.000	L1	10.7	23.0	63.7	Compliance
0.409372	37.3	9.000	L1	10.6	20.3	57.7	Compliance
0.726569	31.1	9.000	L1	10.6	24.9	56.0	Compliance
0.793127	31.7	9.000	L1	10.5	24.3	56.0	Compliance
1.920710	30.3	9.000	L1	10.5	25.7	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.230654	25.4	9.000	L1	10.7	27.0	52.4	Compliance
0.396530	32.7	9.000	L1	10.6	15.2	47.9	Compliance
0.461346	26.7	9.000	L1	10.5	19.9	46.7	Compliance
0.799472	24.6	9.000	L1	10.5	21.4	46.0	Compliance
1.967177	24.2	9.000	L1	10.5	21.8	46.0	Compliance
2.130339	23.4	9.000	L1	10.5	22.6	46.0	Compliance

**AC120 V, 60 Hz, Neutral:**

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.169044	37.6	9.000	N	10.6	27.4	65.0	Compliance
0.175915	45.8	9.000	N	10.8	18.9	64.7	Compliance
0.681699	36.2	9.000	N	10.6	19.8	56.0	Compliance
0.805868	37.1	9.000	N	10.5	18.9	56.0	Compliance
0.879690	36.4	9.000	N	10.6	19.6	56.0	Compliance
0.991374	36.2	9.000	N	10.5	19.8	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.286019	32.4	9.000	N	11.2	18.2	50.6	Compliance
0.393383	32.9	9.000	N	10.8	15.1	48.0	Compliance
0.429420	29.0	9.000	N	10.7	18.3	47.3	Compliance
0.432855	31.3	9.000	N	10.7	15.9	47.2	Compliance
0.609741	24.2	9.000	N	10.5	21.8	46.0	Compliance
0.886728	26.3	9.000	N	10.6	19.7	46.0	Compliance

## FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

### Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cisp}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cisp}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cisp})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cisp})$ , exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:

30M~200MHz: 5.0 dB

200M~1GHz: 6.2 dB

1G~6GHz: 4.45 dB

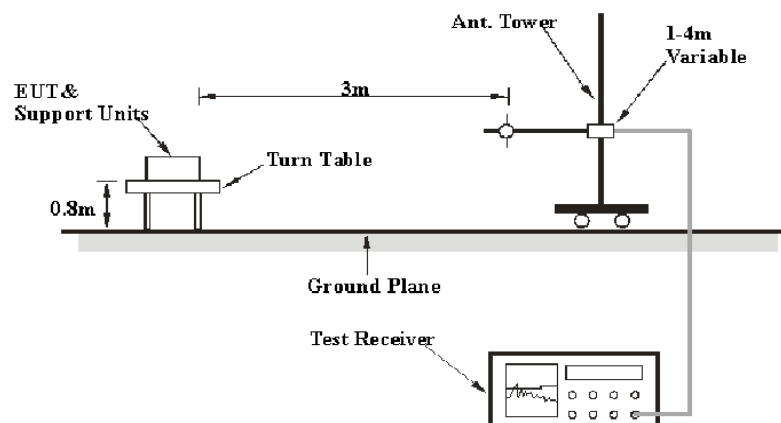
6G~18GHz: 5.23 dB

Table 1 – Values of  $U_{cisp}$

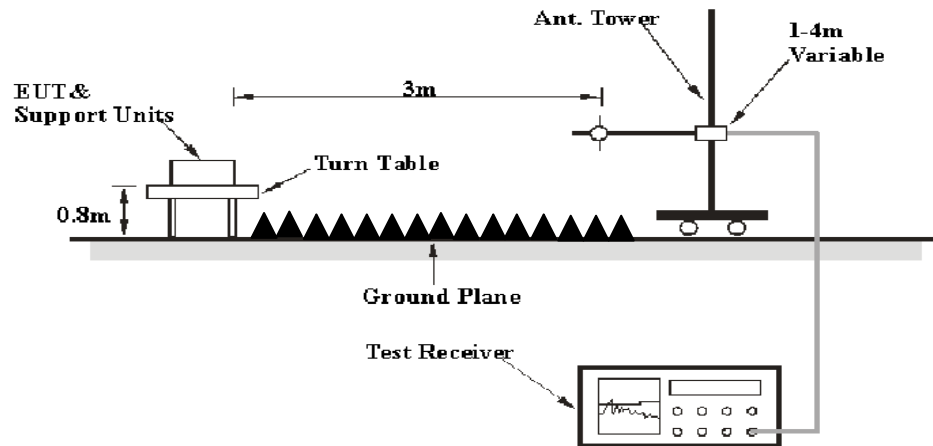
Measurement	$U_{cisp}$
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

### EUT Setup

Below 1GHz:





**Above 1GHz:**

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209, and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

**EMI Test Receiver & Spectrum Analyzer Setup**

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

**Test Procedure**

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz - 1 GHz, peak and Average detection modes for frequencies above 1 GHz.

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2014-05-09	2015-05-09
Sunol Sciences	Antenna	JB3	A060611-1	2011-09-06	2014-09-05
HP	Amplifier	8447E	2434A02181	2013-09-06	2014-09-06
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09
ETS-Lindgren	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2013-09-06	2014-09-06

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Corrected Amplitude & Margin Calculation**

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

**Test Results Summary**

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, and section 15.205, 15.209 and 15.247, with the worst margin reading of:

**9.62 dB at 4960 MHz** in the **Horizontal** polarization of EDR Mode (8-DPSK)

**Test Data****Environmental Conditions**

<b>Temperature:</b>	27.1~27.8 °C
<b>Relative Humidity:</b>	53~55 %
<b>ATM Pressure:</b>	99.1~100 kPa

*The testing was performed by Allen Qiao from 2014-07-30 to 2014-08-01.*

*Mode: Transmitting*

## BDR Mode (GFSK):

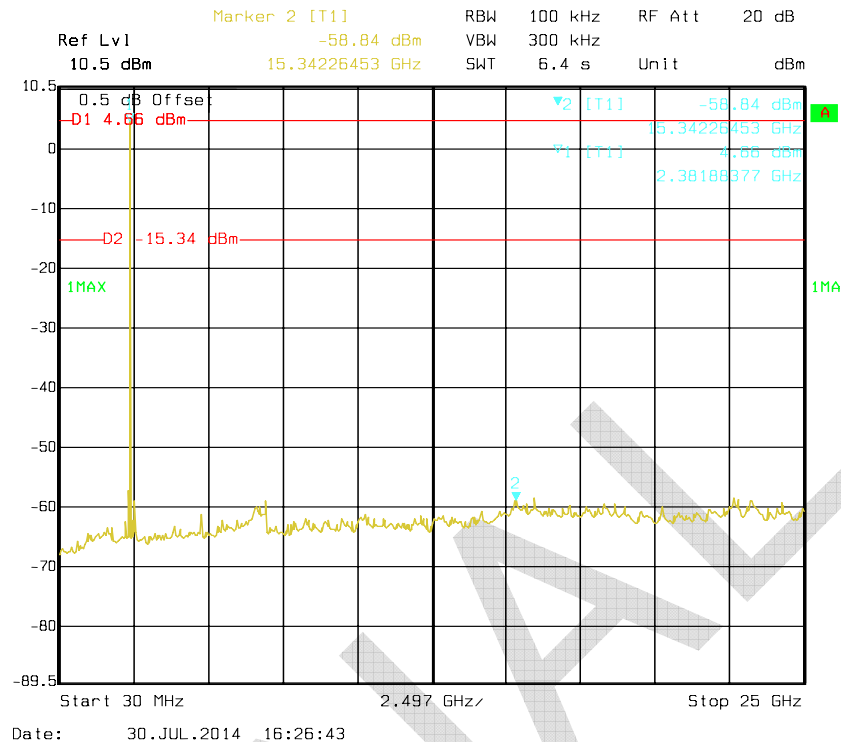
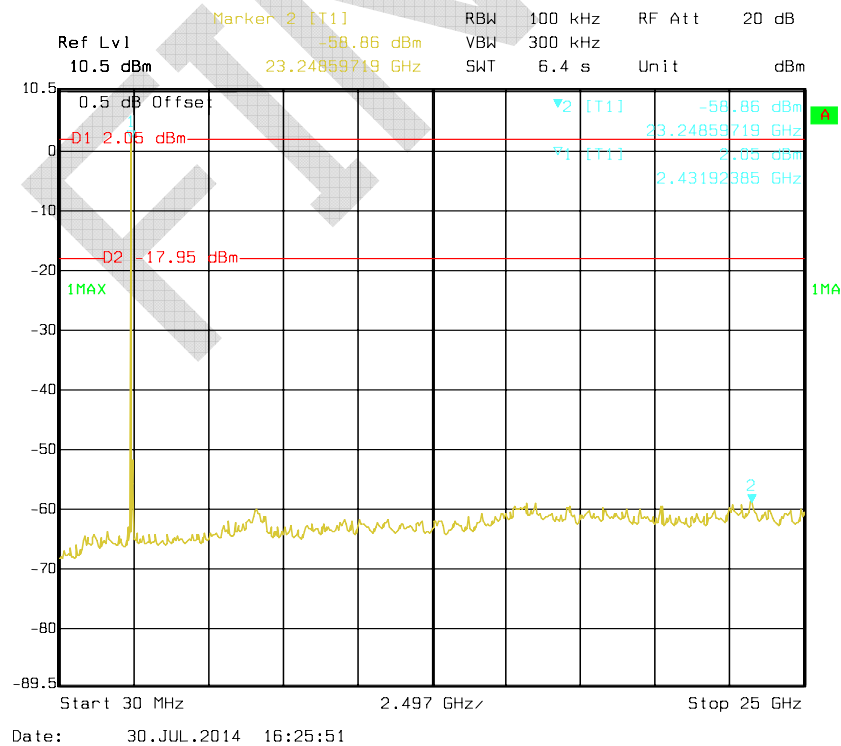
Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	FCC 15.247	
(MHz)	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBµV/m)	Margin (dB)
Low Channel: 2402 MHz									
2402	68.32	PK	H	25.65	4.42	0.00	98.39	N/A	N/A
2402	57.96	AV	H	25.65	4.42	0.00	88.03	N/A	N/A
2402	72.53	PK	V	25.65	4.42	0.00	102.60	N/A	N/A
2402	61.85	AV	V	25.65	4.42	0.00	91.92	N/A	N/A
2390	38.62	PK	H	25.61	4.39	27.32	41.30	74.00	32.70
2390	22.12	AV	H	25.61	4.39	27.32	24.80	54.00	29.20
4804	44.63	PK	H	30.59	5.98	27.41	53.79	74.00	20.21
4804	33.71	AV	H	30.59	5.98	27.41	42.87	54.00	11.13
7206	34.16	PK	H	34.09	7.45	25.91	49.79	74.00	24.21
7206	22.36	AV	H	34.09	7.45	25.91	37.99	54.00	16.01
9608	29.14	PK	H	35.96	8.80	27.55	46.35	74.00	27.65
9608	17.21	AV	H	35.96	8.80	27.55	34.42	54.00	19.58
2347	45.21	PK	H	25.50	4.28	27.31	47.68	74.00	26.32
2347	30.14	AV	H	25.50	4.28	27.31	32.61	54.00	21.39
277.4	33.95	QP	H	13.76	2.01	21.51	28.21	46.00	17.79
Middle Channel: 2441 MHz									
2441	69.74	PK	H	25.75	4.40	0.00	99.89	N/A	N/A
2441	59.66	AV	H	25.75	4.40	0.00	89.81	N/A	N/A
2441	72.67	PK	V	25.75	4.40	0.00	102.82	N/A	N/A
2441	62.76	AV	V	25.75	4.40	0.00	92.91	N/A	N/A
4882	45.41	PK	H	30.79	6.08	27.42	54.86	74.00	19.14
4882	32.56	AV	H	30.79	6.08	27.42	42.01	54.00	11.99
7323	34.18	PK	H	34.38	7.51	25.88	50.19	74.00	23.81
7323	22.36	AV	H	34.38	7.51	25.88	38.37	54.00	15.63
9764	30.14	PK	H	36.33	8.83	27.20	48.10	74.00	25.90
9764	18.92	AV	H	36.33	8.83	27.20	36.88	54.00	17.12
7621	32.28	PK	H	34.90	7.59	26.48	48.29	74.00	25.71
7621	20.19	AV	H	34.90	7.59	26.48	36.20	54.00	17.80
2388	45.69	PK	H	25.61	4.39	27.32	48.37	74.00	25.63
2388	32.14	AV	H	25.61	4.39	27.32	34.82	54.00	19.18
277.4	34.06	QP	H	13.76	2.01	21.51	28.32	46.00	17.68
High Channel: 2480 MHz									
2480	69.27	PK	H	25.85	4.48	0.00	99.60	N/A	N/A
2480	59.19	AV	H	25.85	4.48	0.00	89.52	N/A	N/A
2480	72.38	PK	V	25.85	4.48	0.00	102.71	N/A	N/A
2480	62.46	AV	V	25.85	4.48	0.00	92.79	N/A	N/A
2483.5	37.36	PK	H	25.86	4.49	27.36	40.35	74.00	33.65
2483.5	23.29	AV	H	25.86	4.49	27.36	26.28	54.00	27.72
4960	45.17	PK	H	31.00	5.90	27.43	54.64	74.00	19.36
4960	32.19	AV	H	31.00	5.90	27.43	41.66	54.00	12.34
7440	34.15	PK	H	34.66	7.58	25.97	50.42	74.00	23.58
7440	22.41	AV	H	34.66	7.58	25.97	38.68	54.00	15.32
9920	30.14	PK	H	36.71	8.87	26.66	49.06	74.00	24.94
9920	19.68	AV	H	36.71	8.87	26.66	38.60	54.00	15.40
2126	44.12	PK	H	24.93	4.03	27.36	45.72	74.00	28.28
2126	25.03	AV	H	24.93	4.03	27.36	26.63	54.00	27.37
277.4	34.12	QP	H	13.76	2.01	21.51	28.38	46.00	17.62

EDR Mode ( $\pi/4$ -DQPSK):

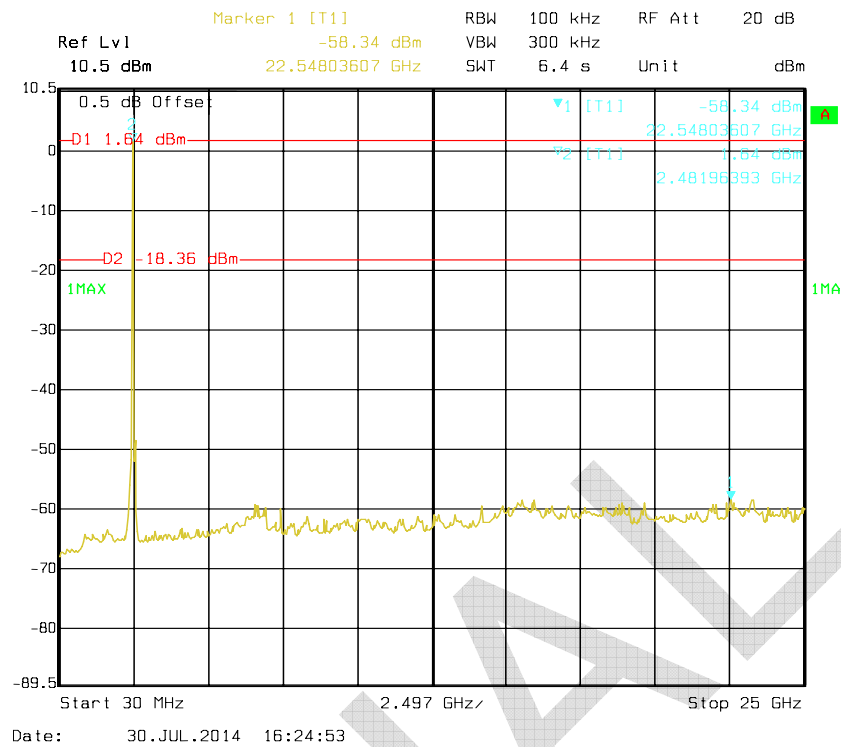
Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402 MHz									
2402	67.06	PK	H	25.65	4.42	0.00	97.13	N/A	N/A
2402	55.16	AV	H	25.65	4.42	0.00	85.23	N/A	N/A
2402	72.21	PK	V	25.65	4.42	0.00	102.28	N/A	N/A
2402	59.96	AV	V	25.65	4.42	0.00	90.03	N/A	N/A
2390	37.39	PK	H	25.61	4.39	27.32	40.07	74.00	33.93
2390	26.11	AV	H	25.61	4.39	27.32	28.79	54.00	25.21
4804	42.52	PK	H	30.59	5.98	27.41	51.68	74.00	22.32
4804	29.12	AV	H	30.59	5.98	27.41	38.28	54.00	15.72
7206	34.28	PK	H	34.09	7.45	25.91	49.91	74.00	24.09
7206	22.56	AV	H	34.09	7.45	25.91	38.19	54.00	15.81
9608	30.04	PK	H	35.96	8.80	27.55	47.25	74.00	26.75
9608	19.12	AV	H	35.96	8.80	27.55	36.33	54.00	17.67
2507	46.85	PK	H	25.92	4.55	27.37	49.95	74.00	24.05
2507	27.32	AV	H	25.92	4.55	27.37	30.42	54.00	23.58
355.5	33.99	QP	H	15.43	2.29	21.66	30.05	46.00	15.95
Middle Channel: 2441 MHz									
2441	68.55	PK	H	25.75	4.40	0.00	98.70	N/A	N/A
2441	57.19	AV	H	25.75	4.40	0.00	87.34	N/A	N/A
2441	71.82	PK	V	25.75	4.40	0.00	101.97	N/A	N/A
2441	60.59	AV	V	25.75	4.40	0.00	90.74	N/A	N/A
4882	45.44	PK	H	30.79	6.08	27.42	54.89	74.00	19.11
4882	32.13	AV	H	30.79	6.08	27.42	41.58	54.00	12.42
7323	34.67	PK	H	34.38	7.51	25.88	50.68	74.00	23.32
7323	23.65	AV	H	34.38	7.51	25.88	39.66	54.00	14.34
9764	30.61	PK	H	36.33	8.83	27.20	48.57	74.00	25.43
9764	19.14	AV	H	36.33	8.83	27.20	37.10	54.00	16.90
7621	32.31	PK	H	34.90	7.59	26.48	48.32	74.00	25.68
7621	20.24	AV	H	34.90	7.59	26.48	36.25	54.00	17.75
2545	46.23	PK	H	26.02	4.63	27.39	49.49	74.00	24.51
2545	32.02	AV	H	26.02	4.63	27.39	35.28	54.00	18.72
355.5	34.22	QP	H	15.43	2.29	21.66	30.28	46.00	15.72
High Channel: 2480 MHz									
2480	68.79	PK	H	25.85	4.48	0.00	99.12	N/A	N/A
2480	57.28	AV	H	25.85	4.48	0.00	87.61	N/A	N/A
2480	72.44	PK	V	25.85	4.48	0.00	102.77	N/A	N/A
2480	61.57	AV	V	25.85	4.48	0.00	91.90	N/A	N/A
2483.5	44.23	PK	H	25.86	4.49	27.36	47.22	74.00	26.78
2483.5	30.37	AV	H	25.86	4.49	27.36	33.36	54.00	20.64
4960	45.11	PK	H	31.00	5.90	27.43	54.58	74.00	19.42
4960	32.47	AV	H	31.00	5.90	27.43	41.94	54.00	12.06
7440	35.39	PK	H	34.66	7.58	25.97	51.66	74.00	22.34
7440	23.37	AV	H	34.66	7.58	25.97	39.64	54.00	14.36
9920	30.29	PK	H	36.71	8.87	26.66	49.21	74.00	24.79
9920	19.36	AV	H	36.71	8.87	26.66	38.28	54.00	15.72
2533	44.74	PK	H	25.99	4.60	27.39	47.94	74.00	26.06
2533	30.69	AV	H	25.99	4.60	27.39	33.89	54.00	20.11
355.5	34.08	QP	H	15.43	2.29	21.66	30.14	46.00	15.86

## EDR Mode (8-DPSK):

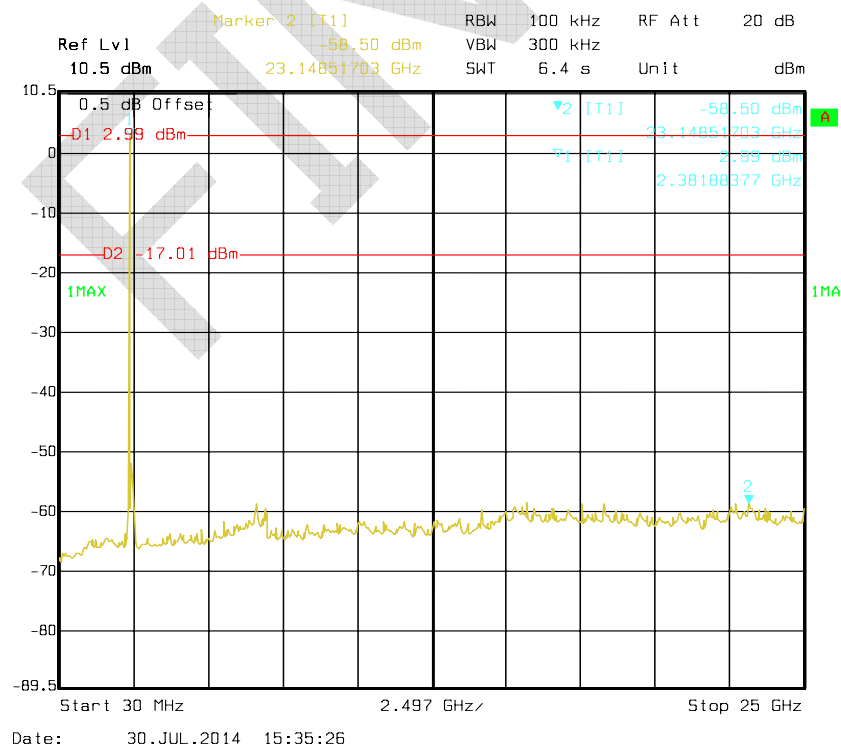
Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402 MHz									
2402	66.59	PK	H	25.65	4.42	0.00	96.66	N/A	N/A
2402	55.16	AV	H	25.65	4.42	0.00	85.23	N/A	N/A
2402	72.09	PK	V	25.65	4.42	0.00	102.16	N/A	N/A
2402	60.77	AV	V	25.65	4.42	0.00	90.84	N/A	N/A
2390	38.21	PK	H	25.61	4.39	27.32	40.89	74.00	33.11
2390	26.22	AV	H	25.61	4.39	27.32	28.90	54.00	25.10
4804	43.08	PK	H	30.59	5.98	27.41	52.24	74.00	21.76
4804	29.08	AV	H	30.59	5.98	27.41	38.24	54.00	15.76
7206	33.98	PK	H	34.09	7.45	25.91	49.61	74.00	24.39
7206	22.41	AV	H	34.09	7.45	25.91	38.04	54.00	15.96
9608	30.56	PK	H	35.96	8.80	27.55	47.77	74.00	26.23
9608	20.12	AV	H	35.96	8.80	27.55	37.33	54.00	16.67
2507	46.22	PK	H	25.92	4.55	27.37	49.32	74.00	24.68
2507	31.24	AV	H	25.92	4.55	27.37	34.34	54.00	19.66
355.7	33.52	QP	H	15.44	2.29	21.66	29.59	46.00	16.41
Middle Channel: 2441 MHz									
2441	68.38	PK	H	25.75	4.40	0.00	98.53	N/A	N/A
2441	57.34	AV	H	25.75	4.40	0.00	87.49	N/A	N/A
2441	72.03	PK	V	25.75	4.40	0.00	102.18	N/A	N/A
2441	61.3	AV	V	25.75	4.40	0.00	91.45	N/A	N/A
4882	46.11	PK	H	30.79	6.08	27.42	55.56	74.00	18.44
4882	32.35	AV	H	30.79	6.08	27.42	41.80	54.00	12.20
7323	34.68	PK	H	34.38	7.51	25.88	50.69	74.00	23.31
7323	22.74	AV	H	34.38	7.51	25.88	38.75	54.00	15.25
9764	30.56	PK	H	36.33	8.83	27.20	48.52	74.00	25.48
9764	20.11	AV	H	36.33	8.83	27.20	38.07	54.00	15.93
7620	31.74	PK	H	34.90	7.59	26.48	47.75	74.00	26.25
7620	20.62	AV	H	34.90	7.59	26.48	36.63	54.00	17.37
2545	45.28	PK	H	26.02	4.63	27.39	48.54	74.00	25.46
2545	33.65	AV	H	26.02	4.63	27.39	36.91	54.00	17.09
335.7	34.25	QP	H	14.75	2.18	21.61	29.57	46.00	16.43
High Channel: 2480 MHz									
2480	68.77	PK	H	25.85	4.48	0.00	99.10	N/A	N/A
2480	57.84	AV	H	25.85	4.48	0.00	88.17	N/A	N/A
2480	72.98	PK	V	25.85	4.48	0.00	103.31	N/A	N/A
2480	45.26	AV	V	25.85	4.48	0.00	75.59	N/A	N/A
2483.5	44.95	PK	H	25.86	4.49	27.36	47.94	74.00	26.06
2483.5	33.09	AV	H	25.86	4.49	27.36	36.08	54.00	17.92
4960	43.55	PK	H	31.00	5.90	27.43	39.72	74.00	34.28
4960	30.25	AV	H	31.00	5.90	27.43	44.38	54.00	9.62
7440	34.91	PK	H	34.66	7.58	25.97	51.18	74.00	22.82
7440	23.07	AV	H	34.66	7.58	25.97	39.34	54.00	14.66
9920	30.33	PK	H	36.71	8.87	26.66	49.25	74.00	24.75
9920	20.22	AV	H	36.71	8.87	26.66	39.14	54.00	14.86
2531	44.39	PK	H	25.98	4.60	27.39	47.58	74.00	26.42
2531	32.08	AV	H	25.98	4.60	27.39	35.27	54.00	18.73

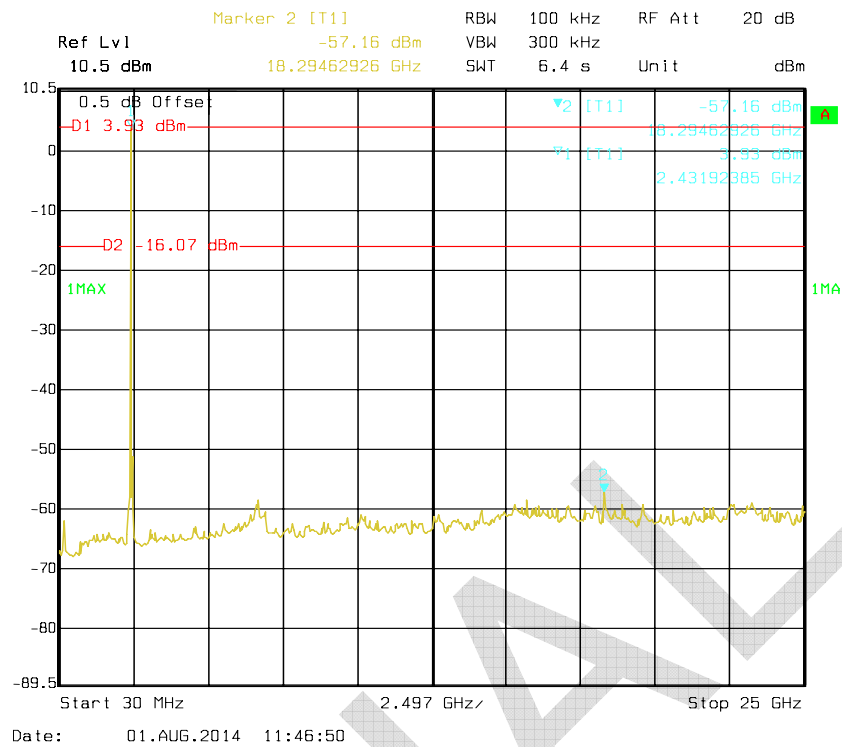
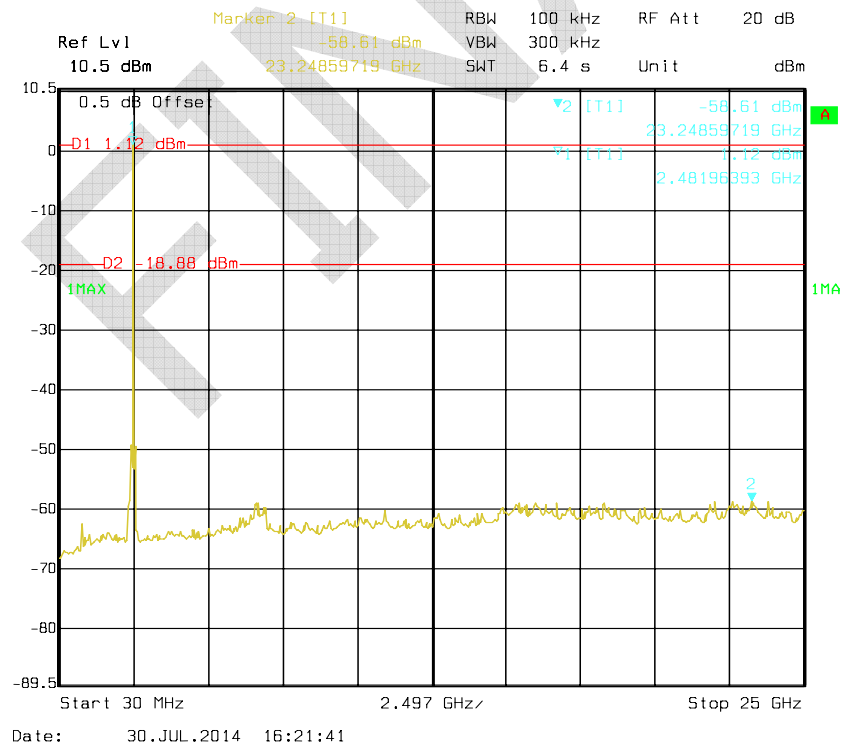
**Conducted Spurious Emissions at Antenna Port***BDR Mode (GFSK):***Low Channel****Middle Channel**

## High Channel

EDR Mode ( $\pi/4$ -DQPSK):

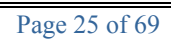
## Low Channel



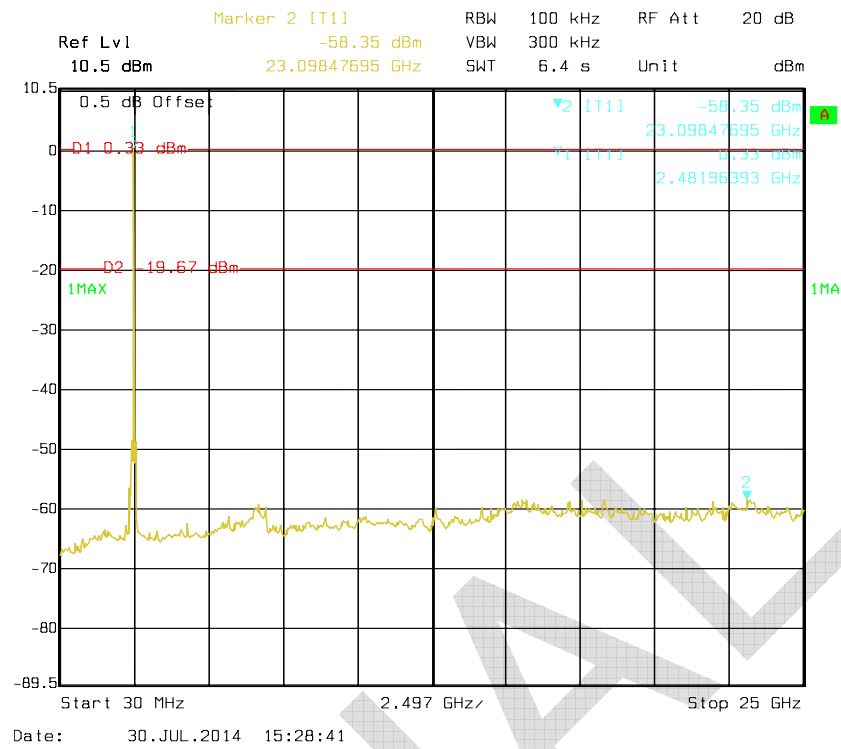
**Middle Channel****High Channel**



## Low Channel



# High Channel



## FCC §15.247(a) (1) - CHANNEL SEPARATION TEST

### Applicable Standard

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.50 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Procedure

1. Set the EUT in transmitting mode, spectrum Bandwidth was set at 30 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another truce
3. Measure the channel separation.

### Test Data

#### Environmental Conditions

Temperature:	31.1 °C
Relative Humidity:	61 %
ATM Pressure:	100 kPa

\* The testing was performed by Allen Qiao on 2014-07-30

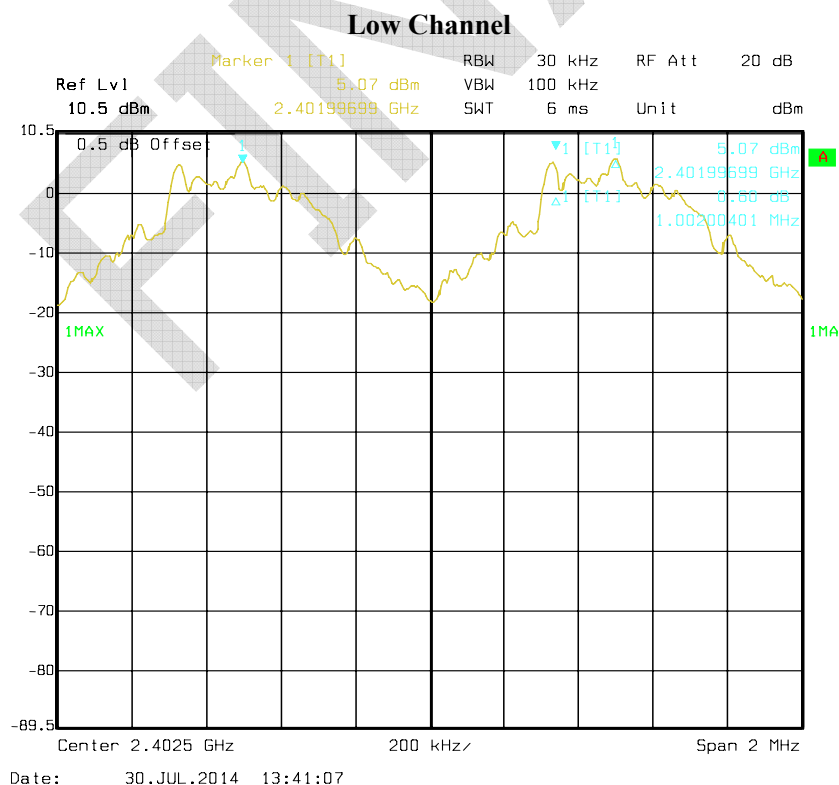
**Test Result:** Compliance.

Please refer to following tables and plots

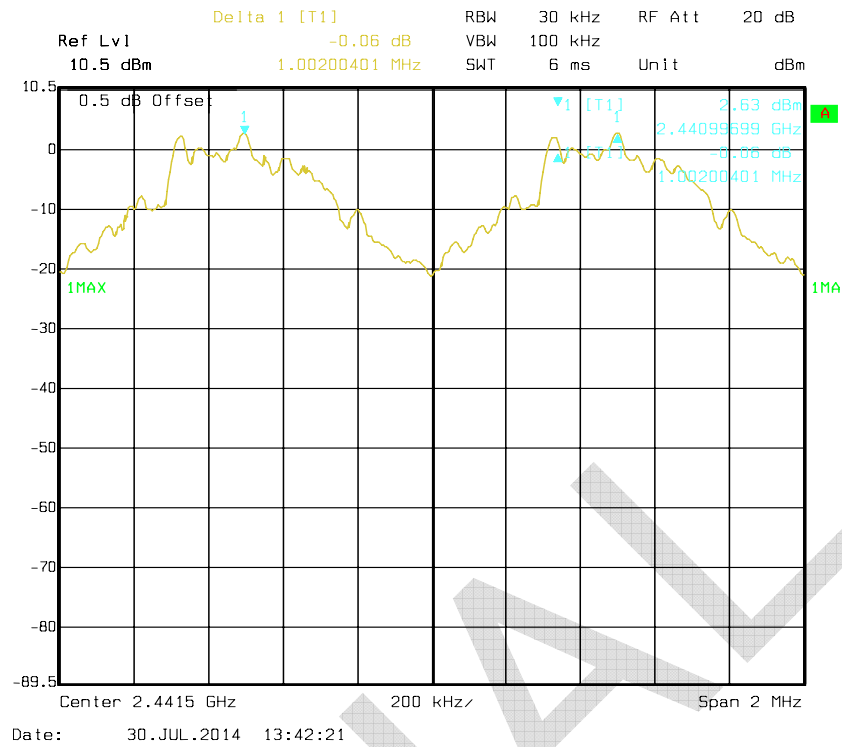
Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
BDR Mode (GFSK)	Low	2402	1.002	0.599	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.599	Pass
	Adjacent	2440			
	High	2480	1.002	0.599	Pass
	Adjacent	2479			
EDR Mode ( $\pi/4$ -DQPSK):	Low	2402	1.002	0.850	Pass
	Adjacent	2403			
	Middle	2441	1.006	0.850	Pass
	Adjacent	2440			
	High	2480	1.002	0.850	Pass
	Adjacent	2479			
EDR Mode (8-DPSK):	Low	2402	1.002	0.817	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.817	Pass
	Adjacent	2440			
	High	2480	1.002	0.817	Pass
	Adjacent	2479			

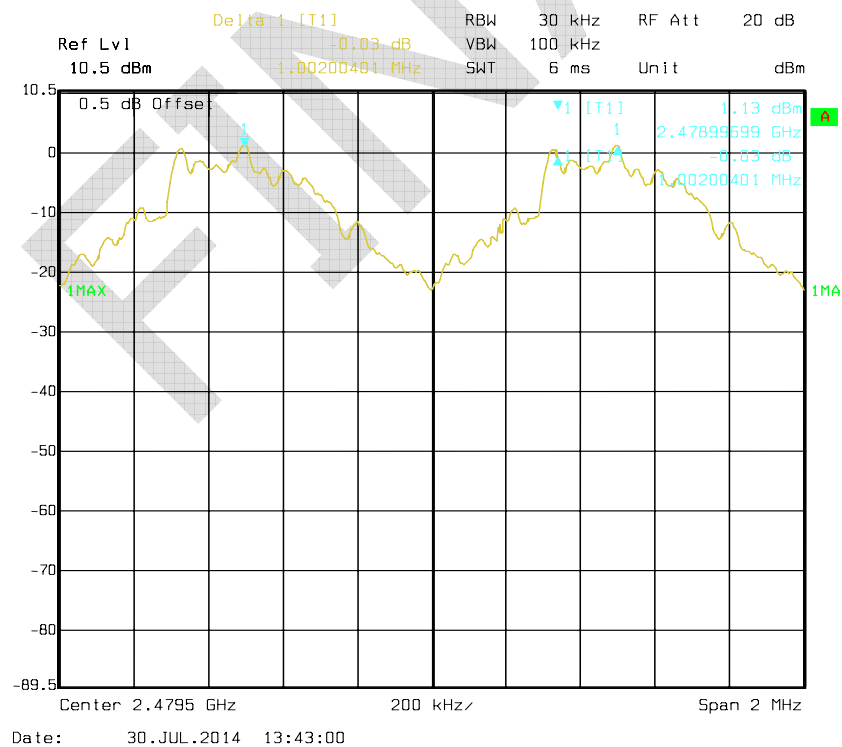
BDR Mode (GFSK):

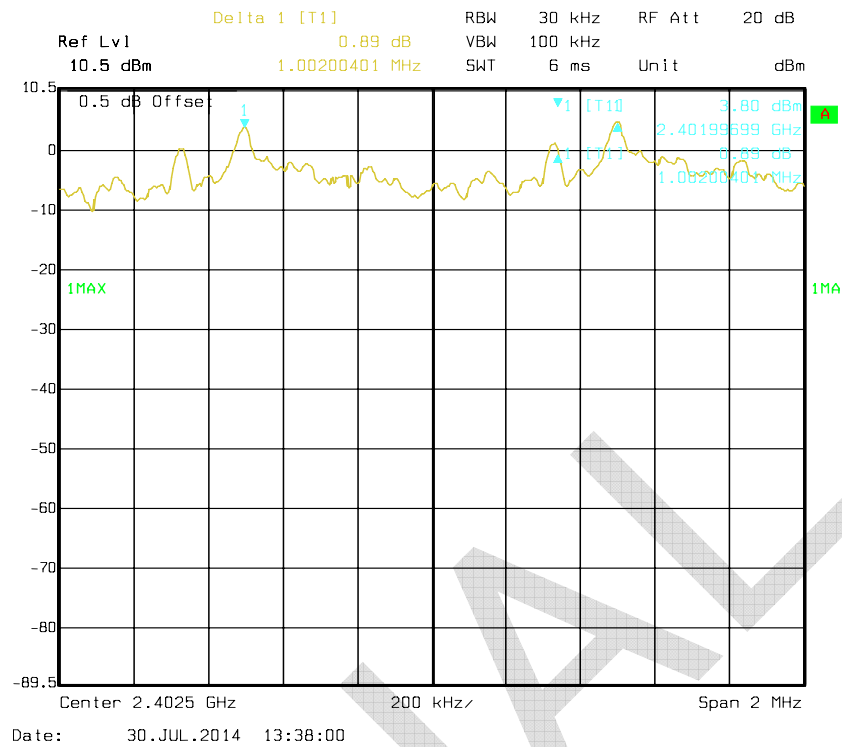
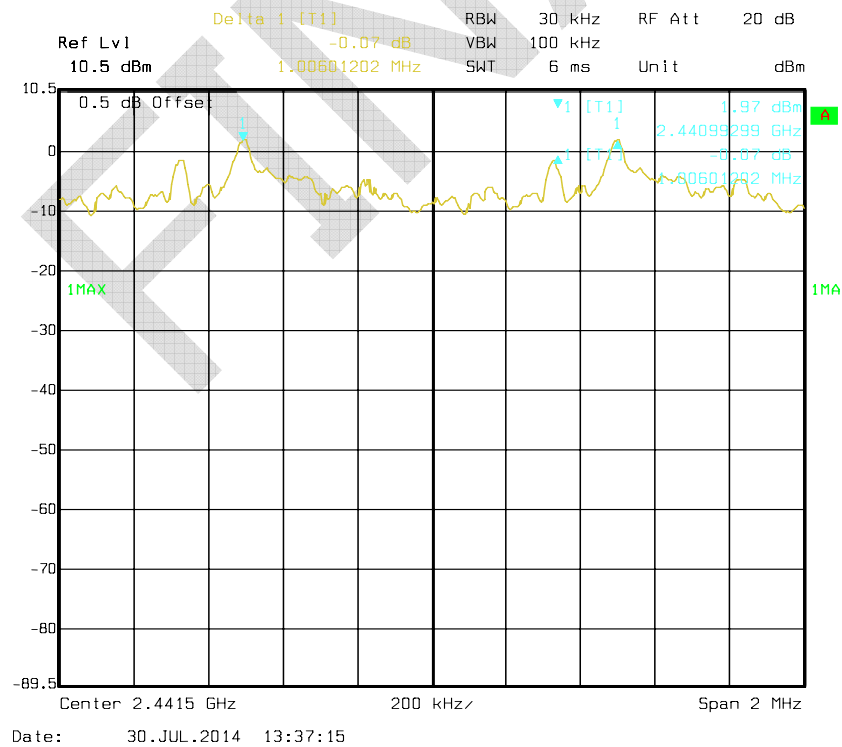


### Middle Channel

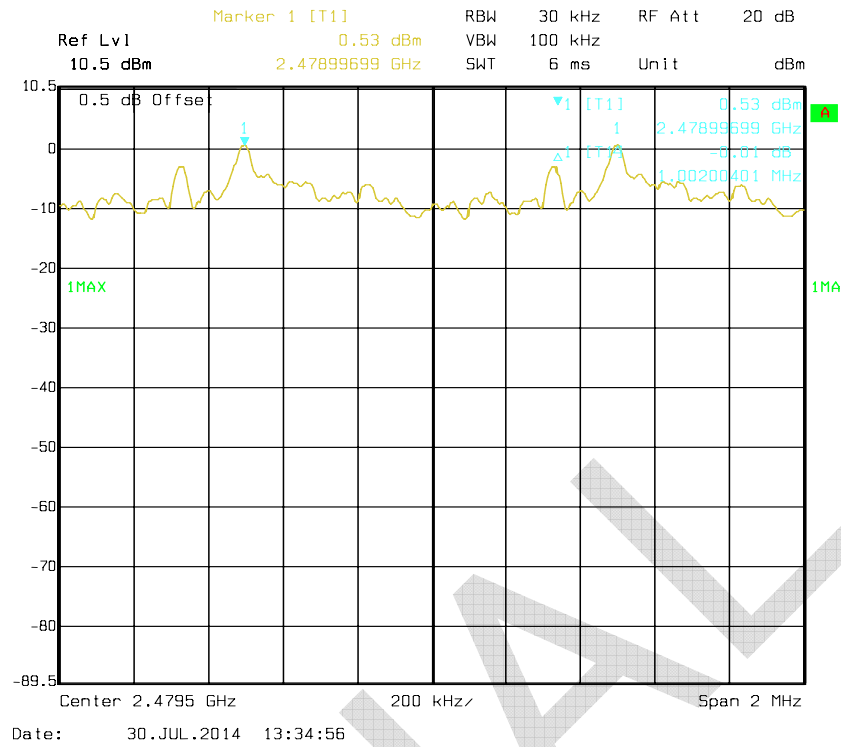


### High Channel



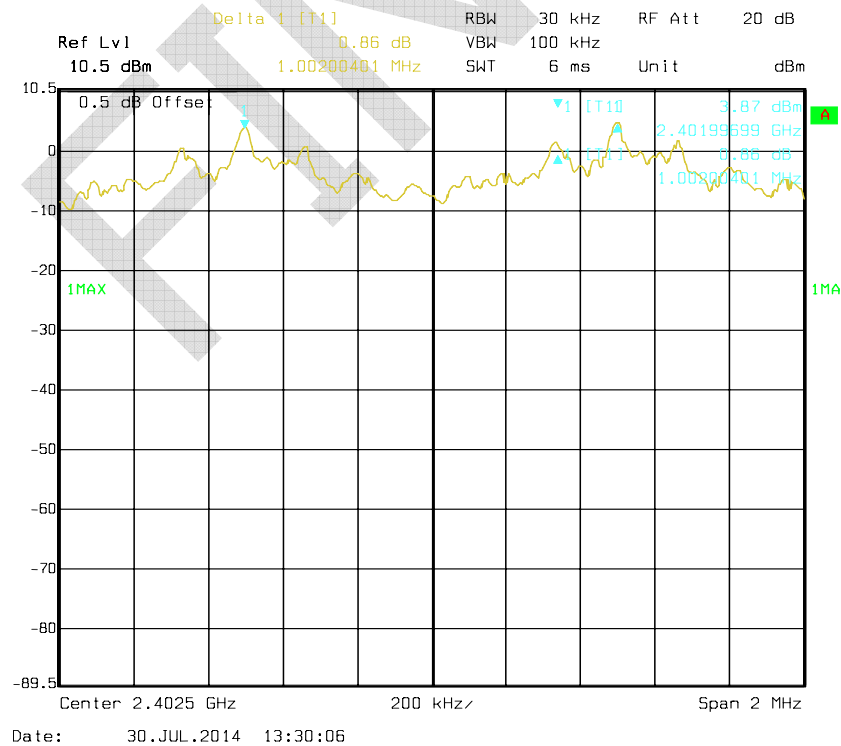
*EDR Mode ( $\pi/4$ -DQPSK):***Low Channel****Middle Channel**

### High Channel

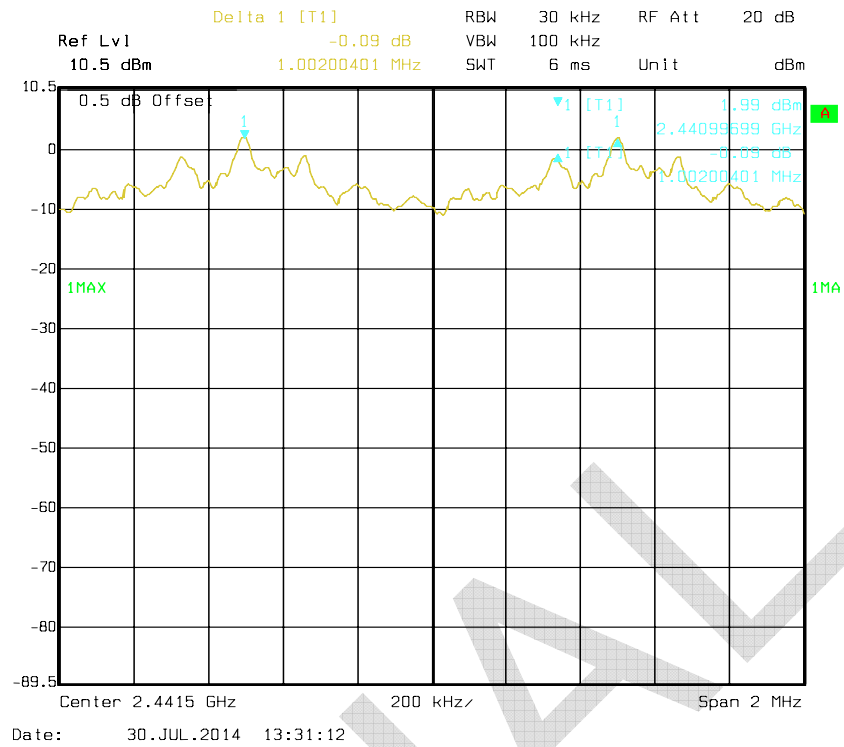


EDR Mode (8-DPSK):

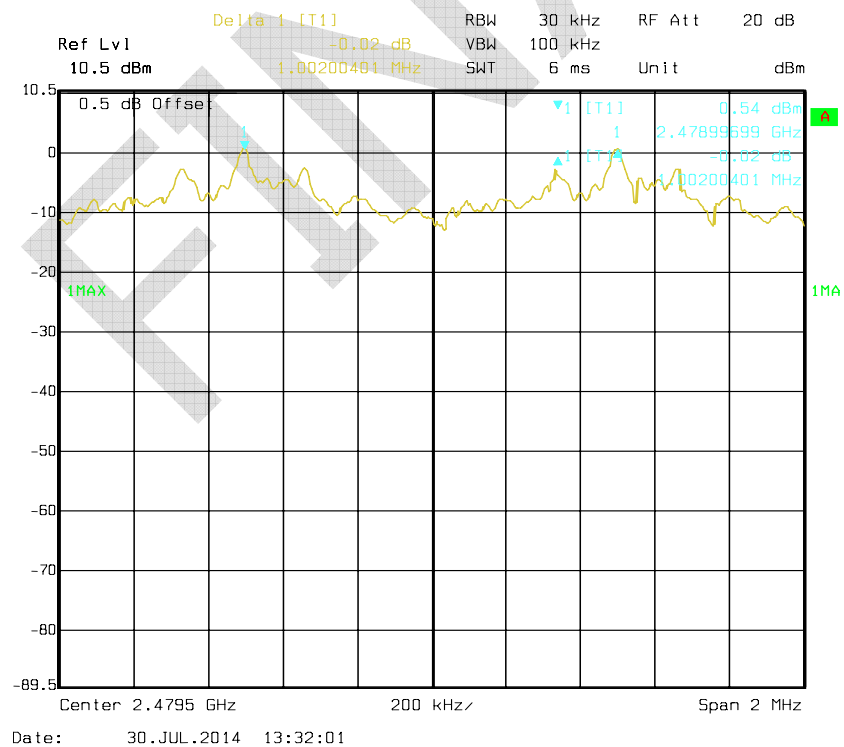
### Low Channel



### Middle Channel



### High Channel





## FCC §15.247(a) (1) – 20 dB BANDWIDTH TESTING

### Applicable Standard

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.

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Data

#### Environmental Conditions

Temperature:	30.4~21.1 °C
Relative Humidity:	56~61 %
ATM Pressure:	100 kPa

\* The testing was performed by Allen Qiao from 2014-07-29 to 2014-07-30.

**Test Result:** Compliance.

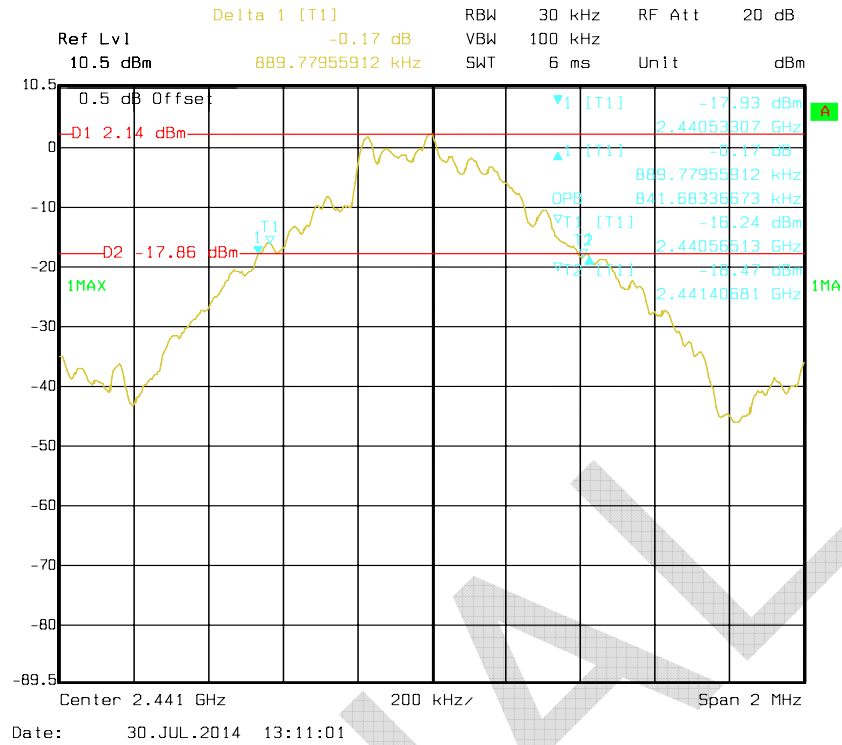
Please refer to following tables and plots

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.898
	Middle	2441	0.890
	High	2480	0.894
EDR Mode ( $\pi/4$ -DQPSK):	Low	2402	1.246
	Middle	2441	1.259
	High	2480	1.275
EDR Mode (8-DPSK):	Low	2402	1.226
	Middle	2441	1.222
	High	2480	1.226

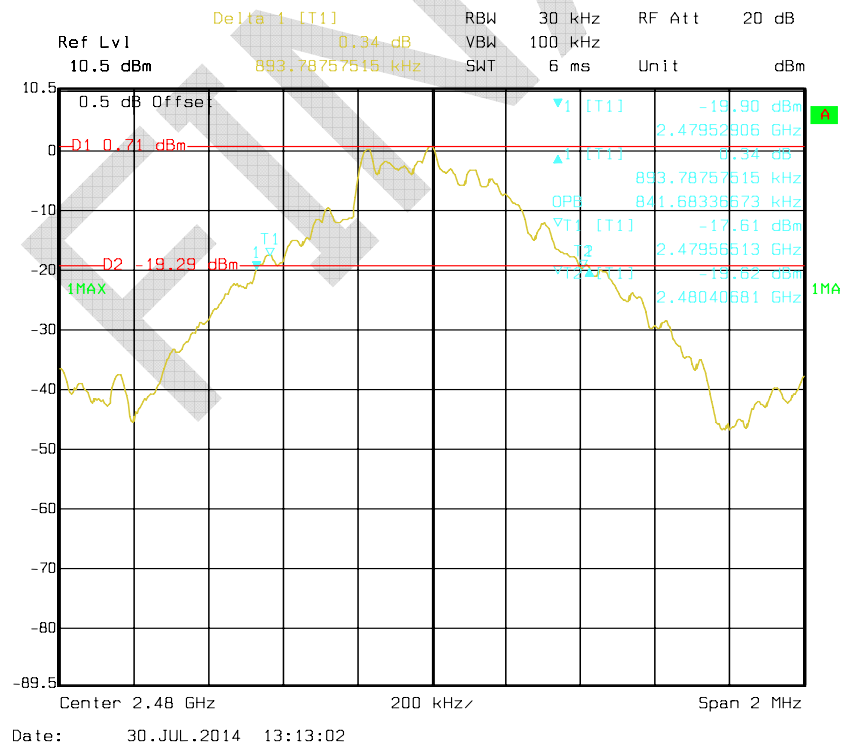
*BDR Mode (GFSK):*

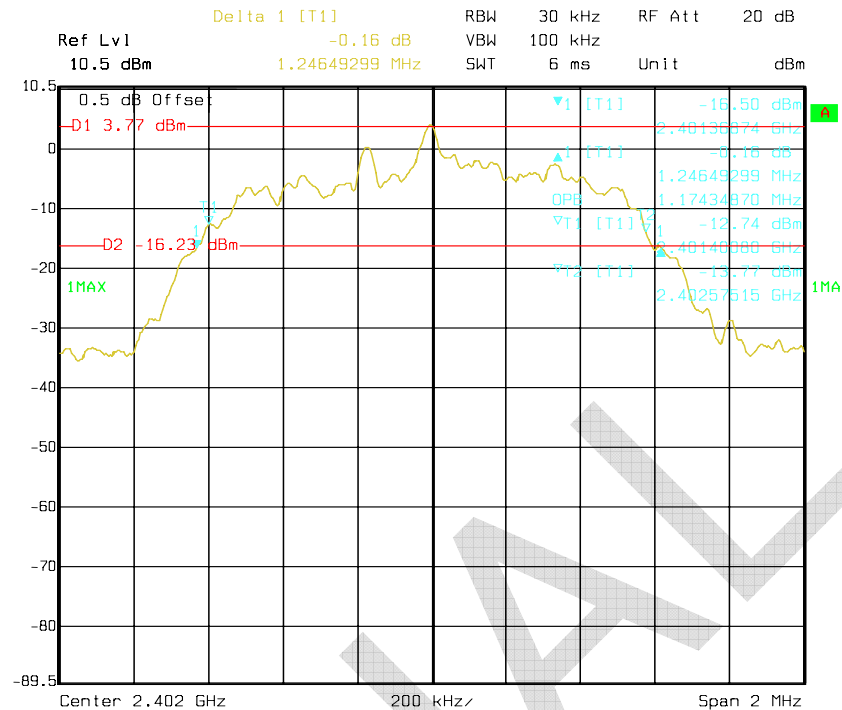


### Middle Channel

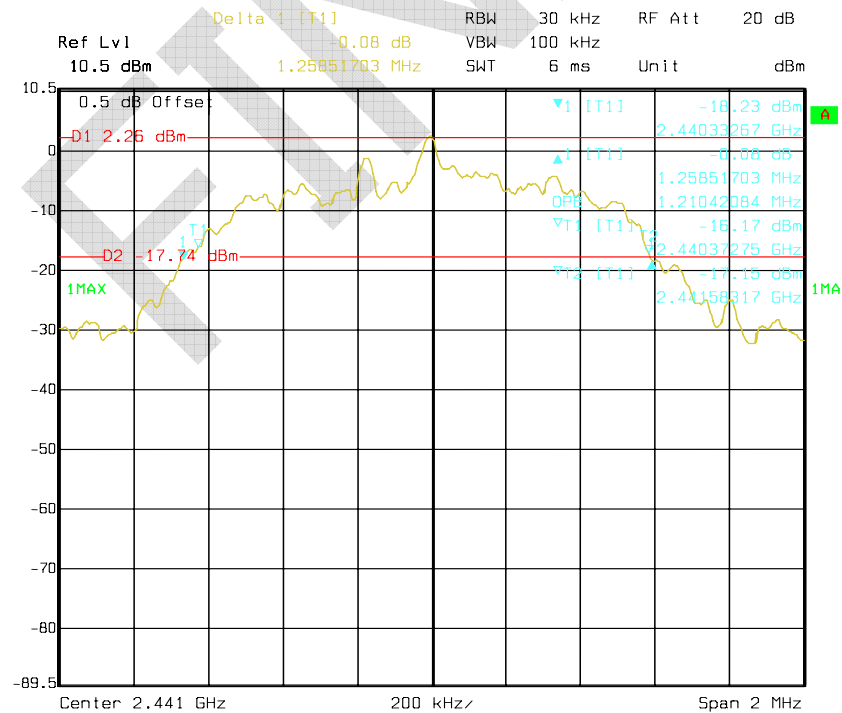


### High Channel

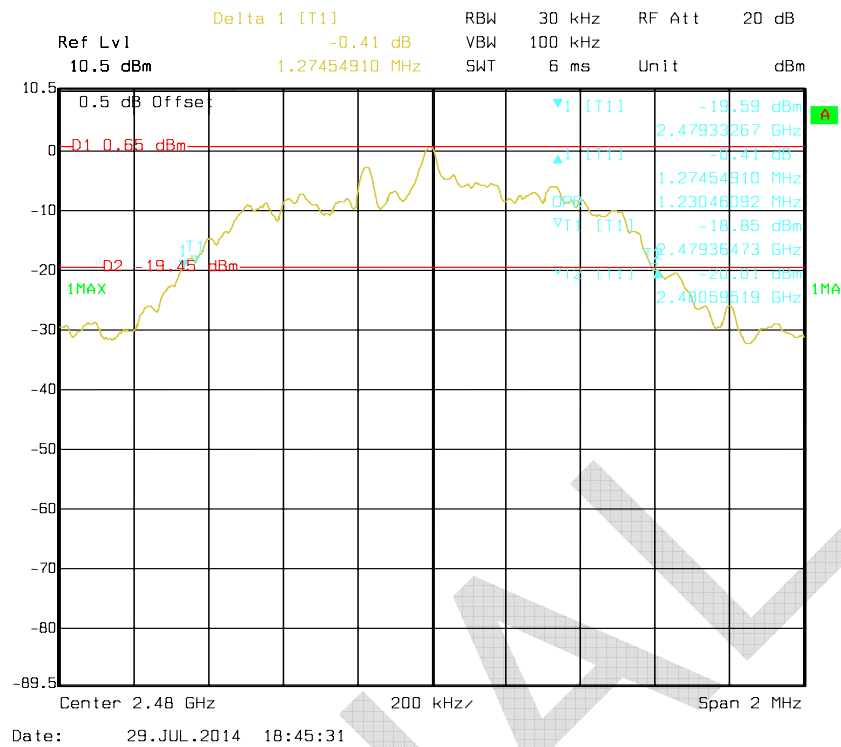
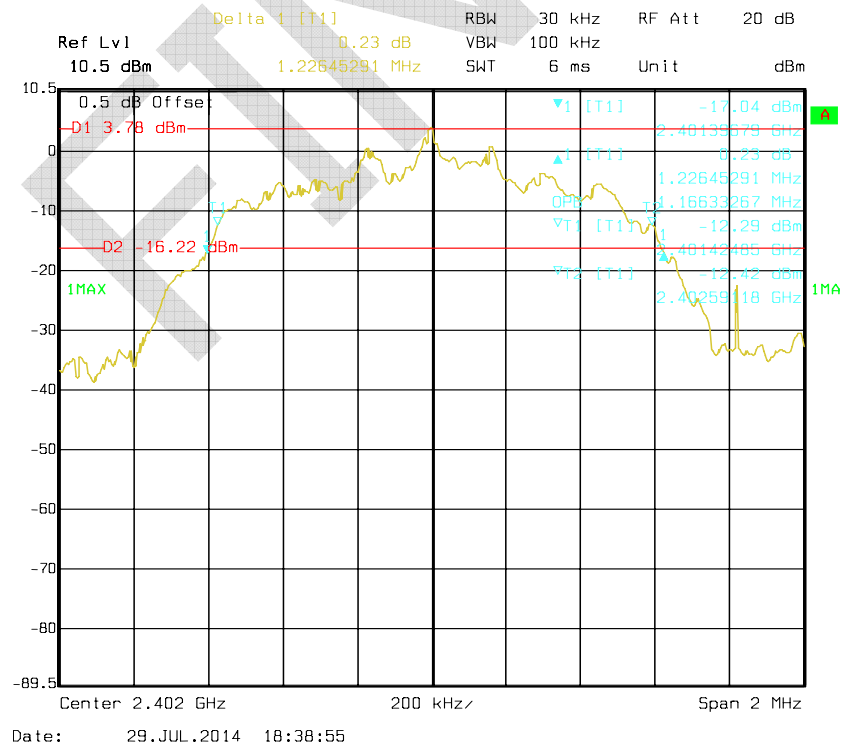


*EDR Mode ( $\pi/4$ -DQPSK):***Low Channel**

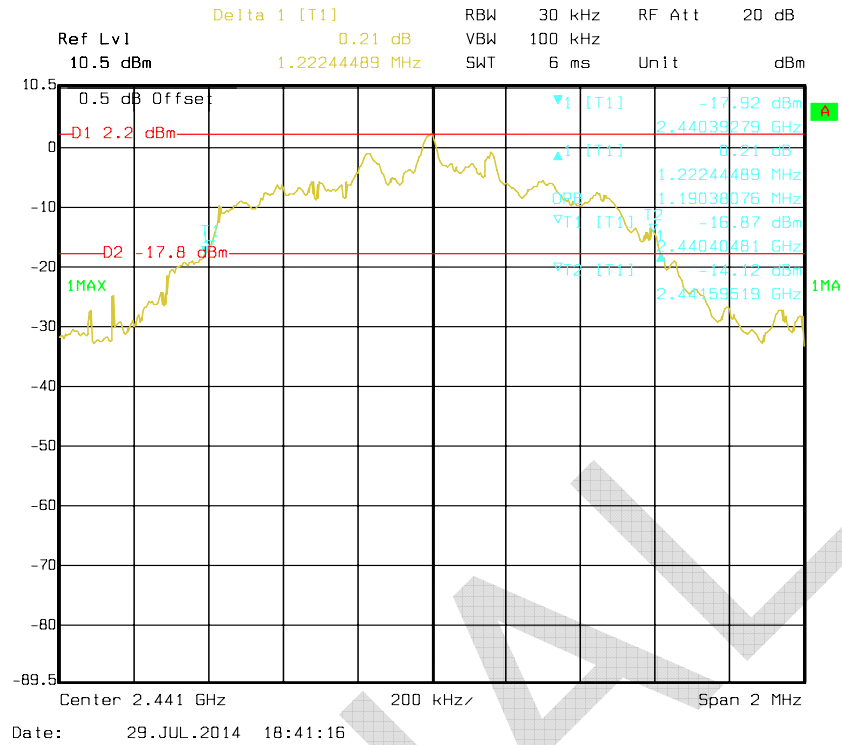
Date: 29.JUL.2014 18:50:12

**Middle Channel**

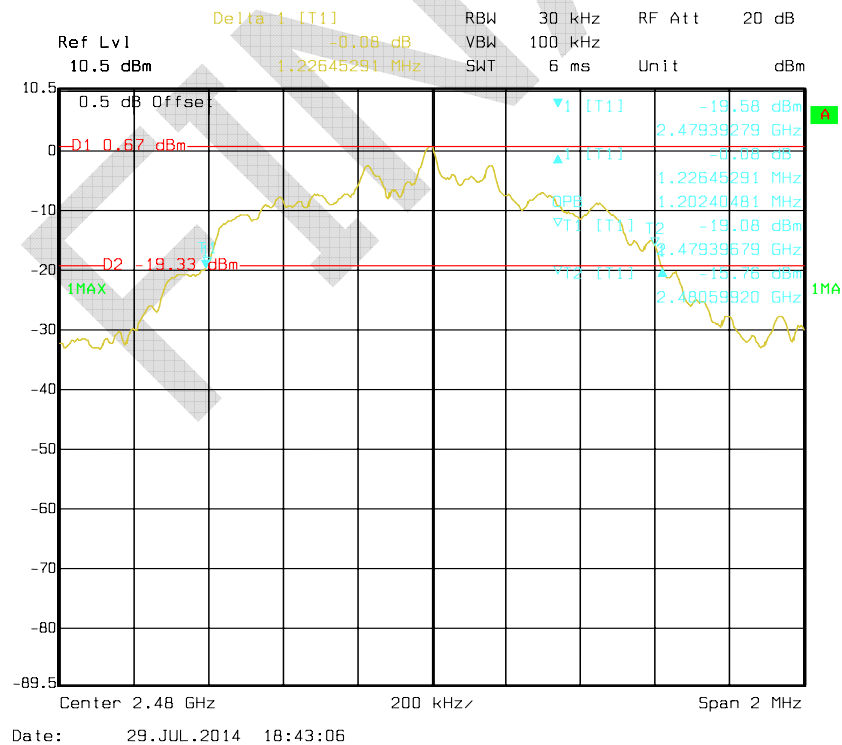
Date: 29.JUL.2014 18:46:58

**High Channel***EDR Mode (8-DPSK):***Low Channel**

### Middle Channel



### High Channel



## FCC §15.247(a) (1) (iii) - QUANTITY OF HOPPING CHANNEL TEST

### Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in hopping mode from first channel to last.
3. By using the Max-Hold function record the Quantity of the channel.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Data

#### Environmental Conditions

Temperature:	31.1 °C
Relative Humidity:	61 %
ATM Pressure:	100 kPa

\* The testing was performed by Allen Qiao on 2014-07-30.

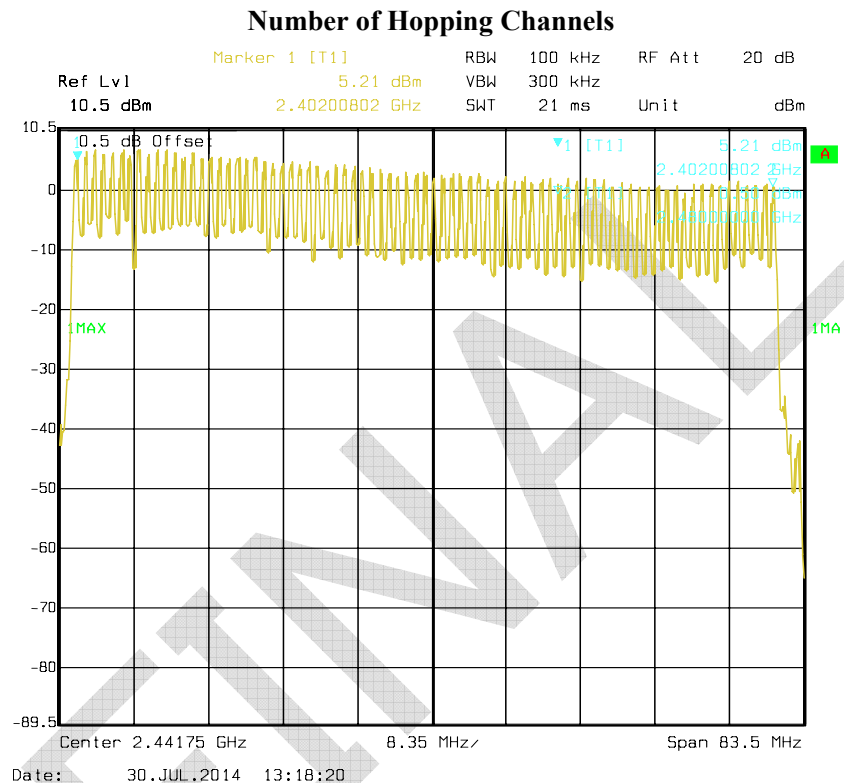
**Test Result:** Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	79	≥15

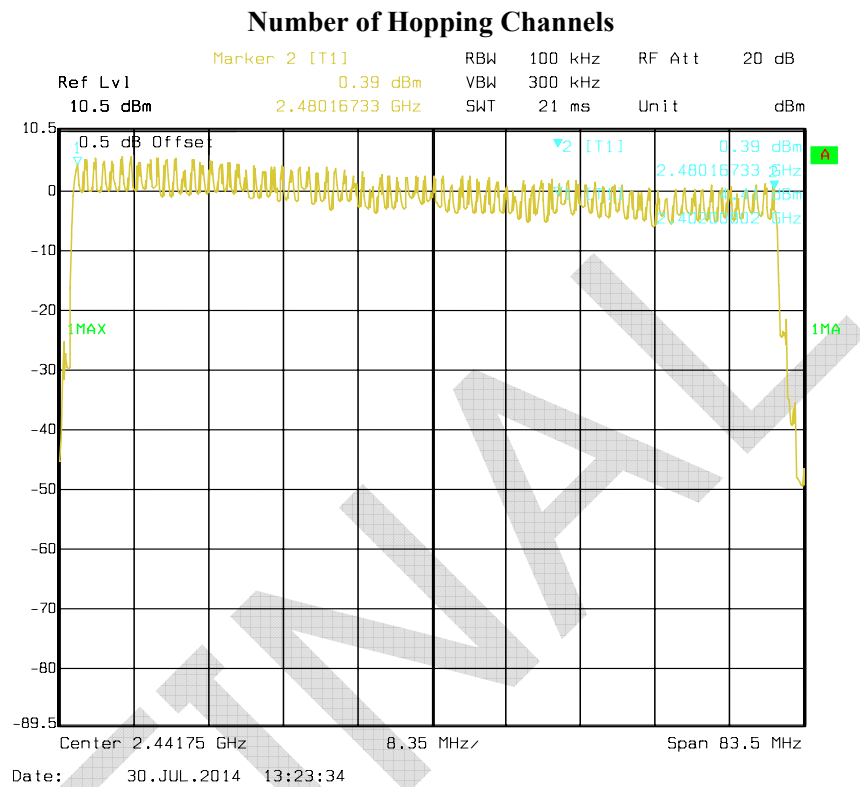




Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	79	$\geq 15$

*EDR Mode (8-DPSK):*

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	79	$\geq 15$



## **FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)**

### **Applicable Standard**

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### **Test Procedure**

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as  $0.4 \times \text{channel no. (s)}$ , the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Dwell Time= time slot length \* hope rate/ number of hopping channels \* 31.6s  
Hop rate=1600/s

### **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	30.4~31.1 °C
<b>Relative Humidity:</b>	57~61 %
<b>ATM Pressure:</b>	99.8~100 kPa

\* The testing was performed by Allen Qiao from 2014-07-30 to 2014-07-31.

**Test Result:** Compliance.

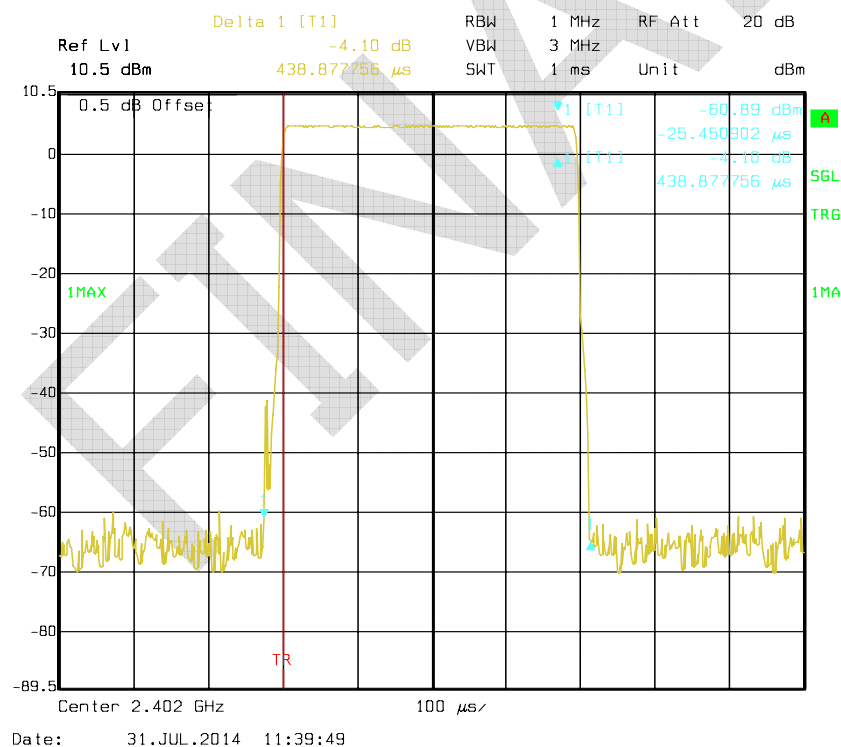
Please refer to following tables and plots

Test Mode: Transmitting

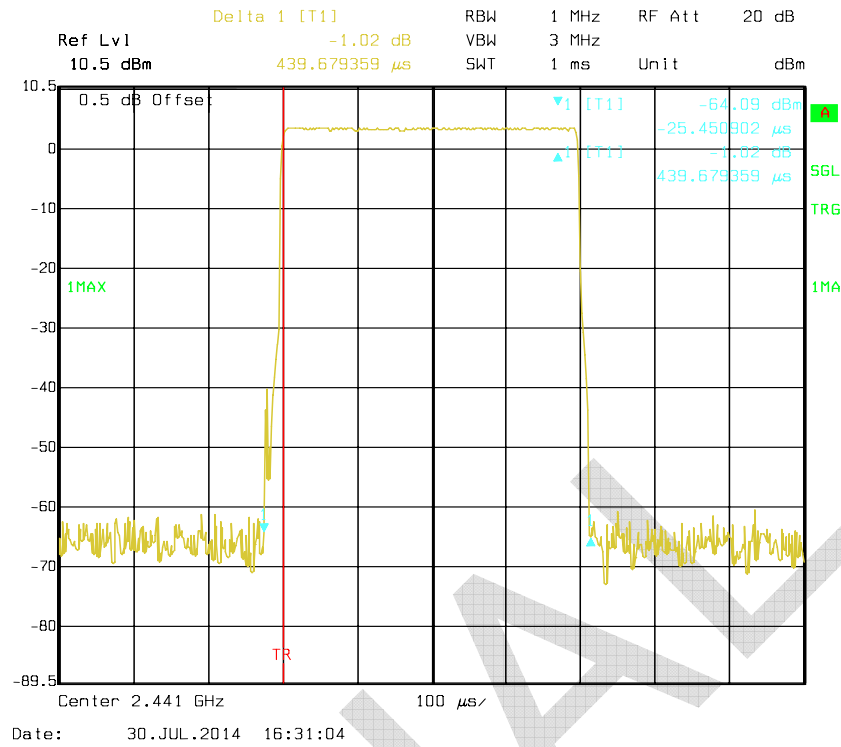
BDR Mode (GFSK):

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.439	0.140	0.4	Pass
	Middle	0.440	0.141	0.4	Pass
	High	0.440	0.141	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.708	0.273	0.4	Pass
	Middle	1.708	0.273	0.4	Pass
	High	1.707	0.273	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	2.966	0.316	0.4	Pass
	Middle	2.966	0.316	0.4	Pass
	High	2.966	0.316	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

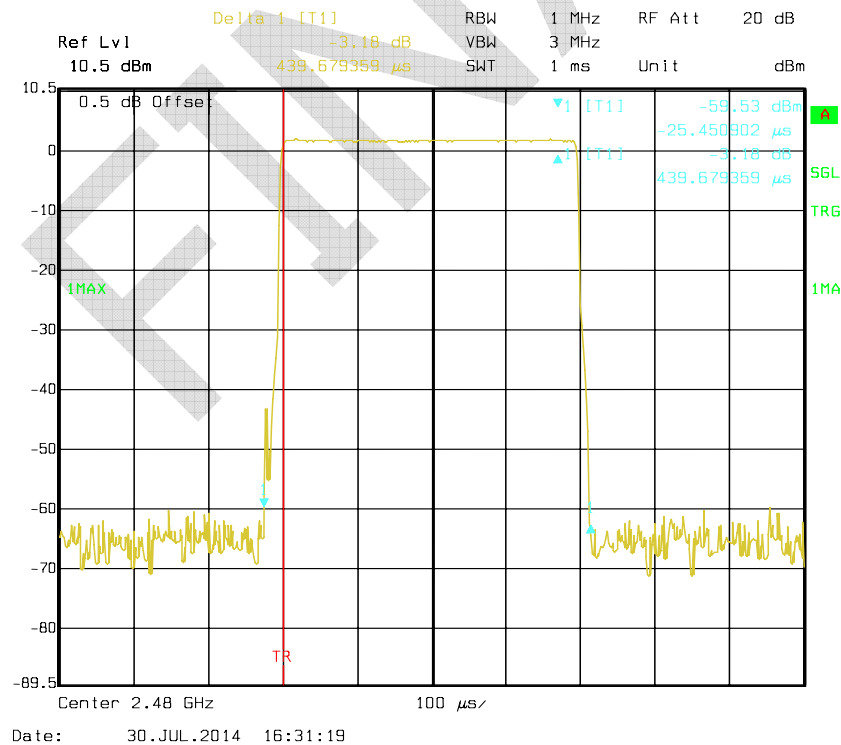
### DH1: Low Channel



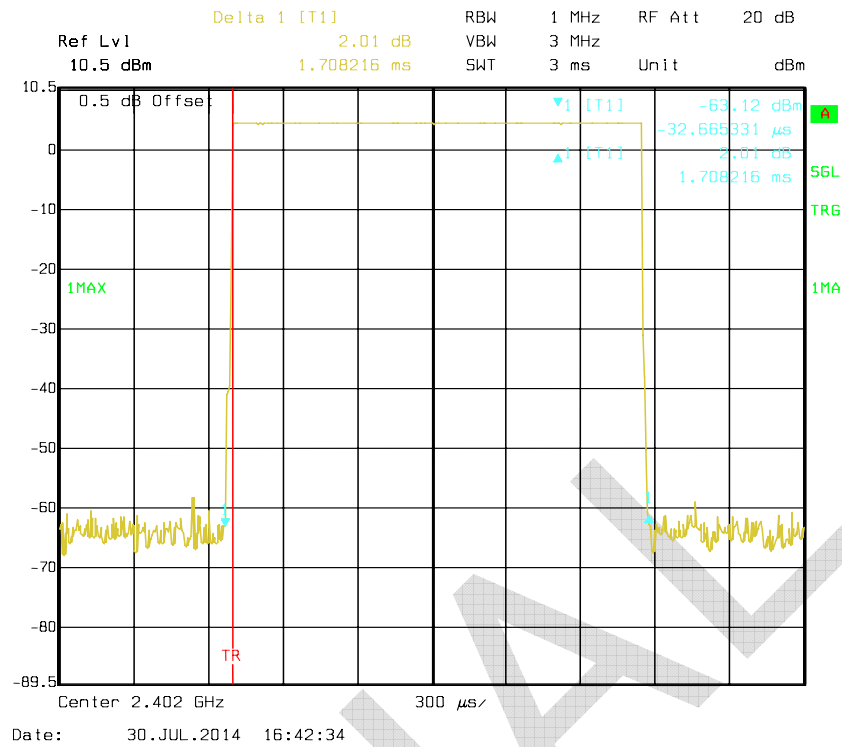
### DH1: Middle Channel



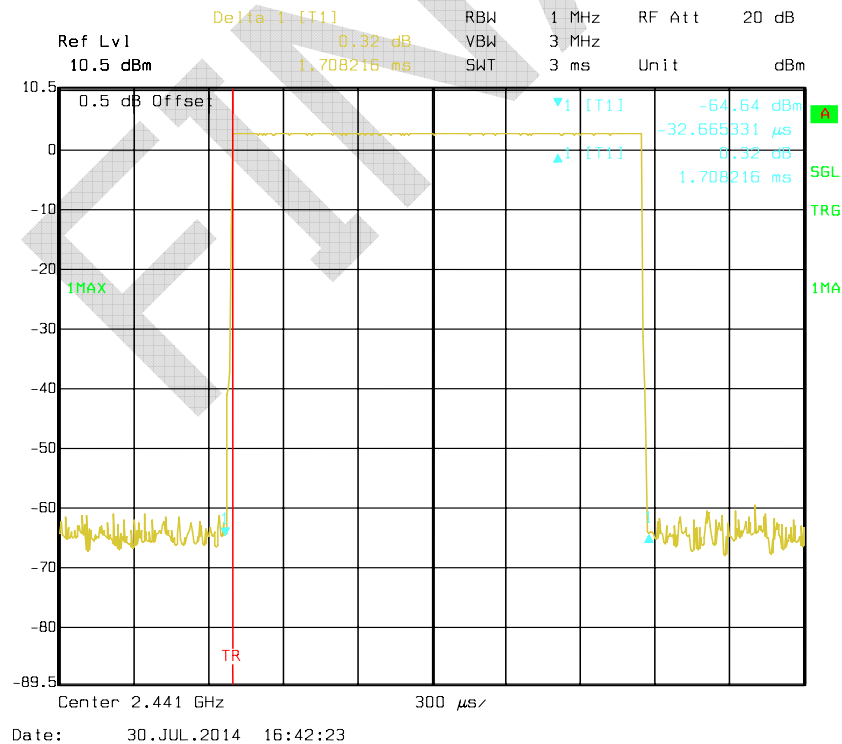
### DH1: High Channel

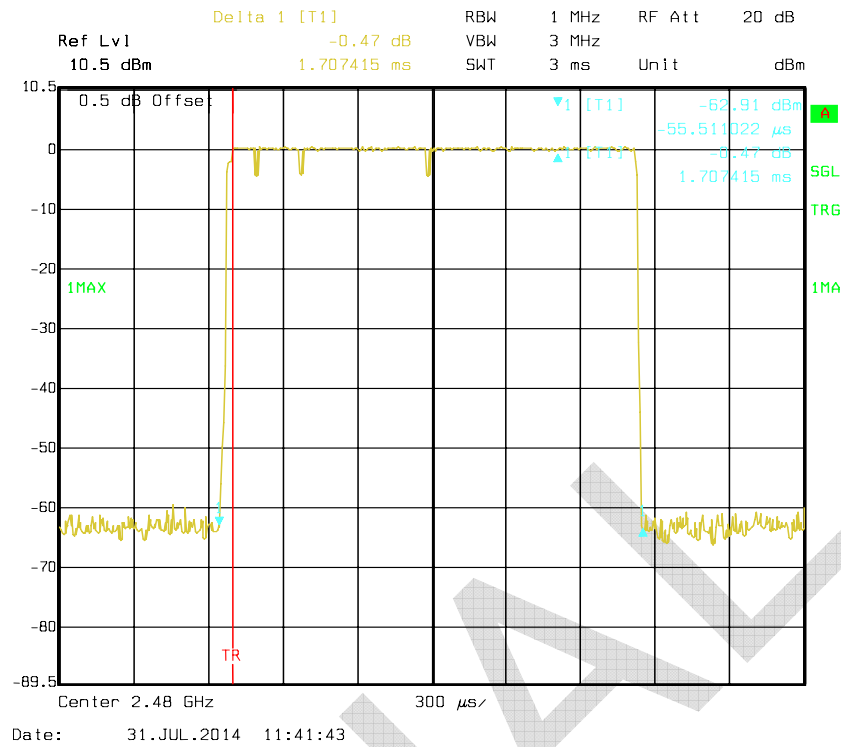
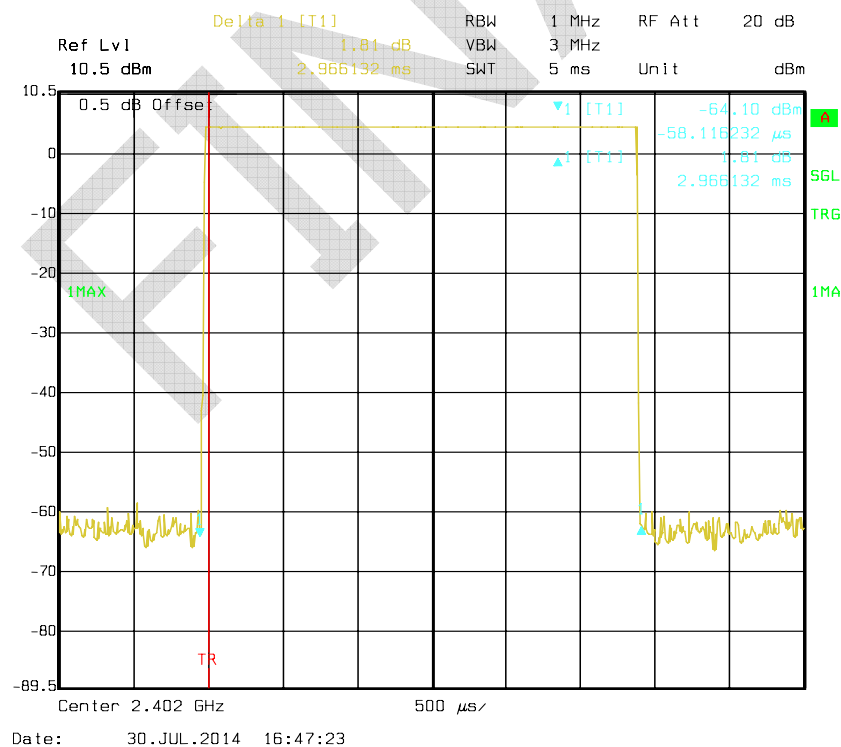


### DH3: Low Channel

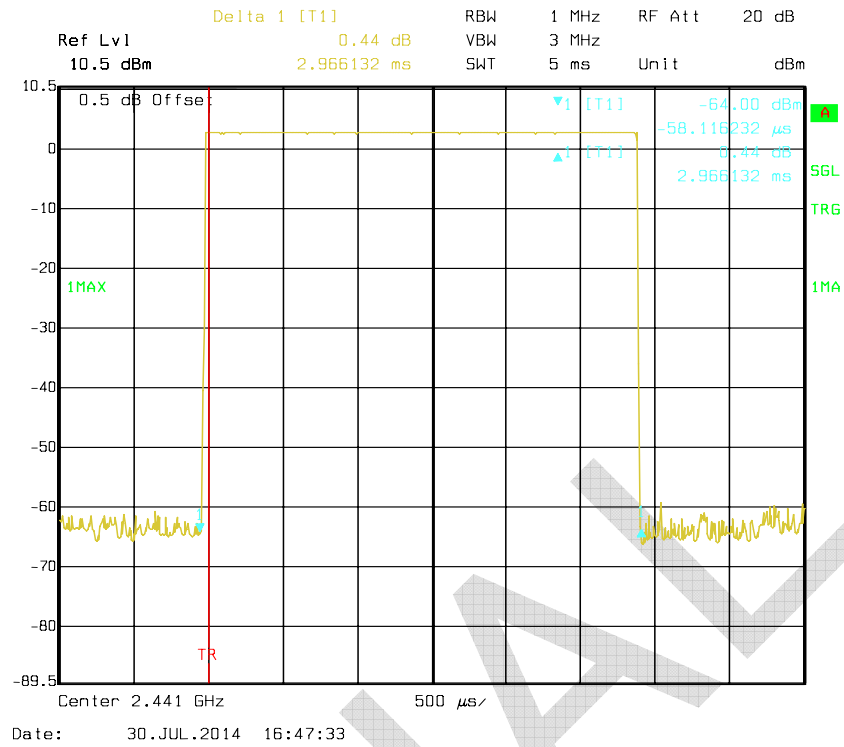


### DH3: Middle Channel

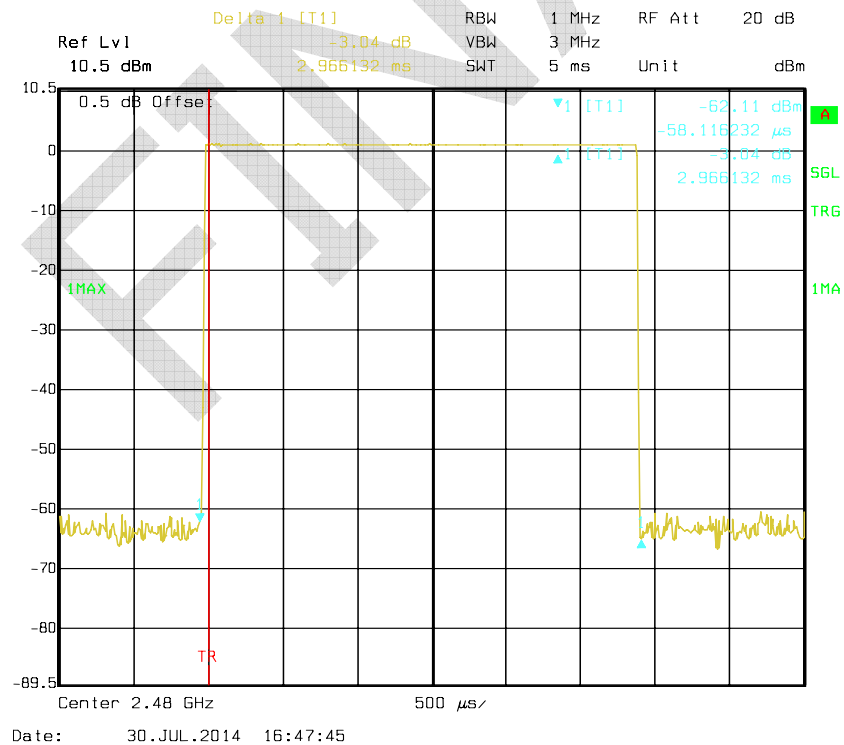


**DH3: High Channel****DH5: Low Channel**

### DH5: Middle Channel



### DH5: High Channel

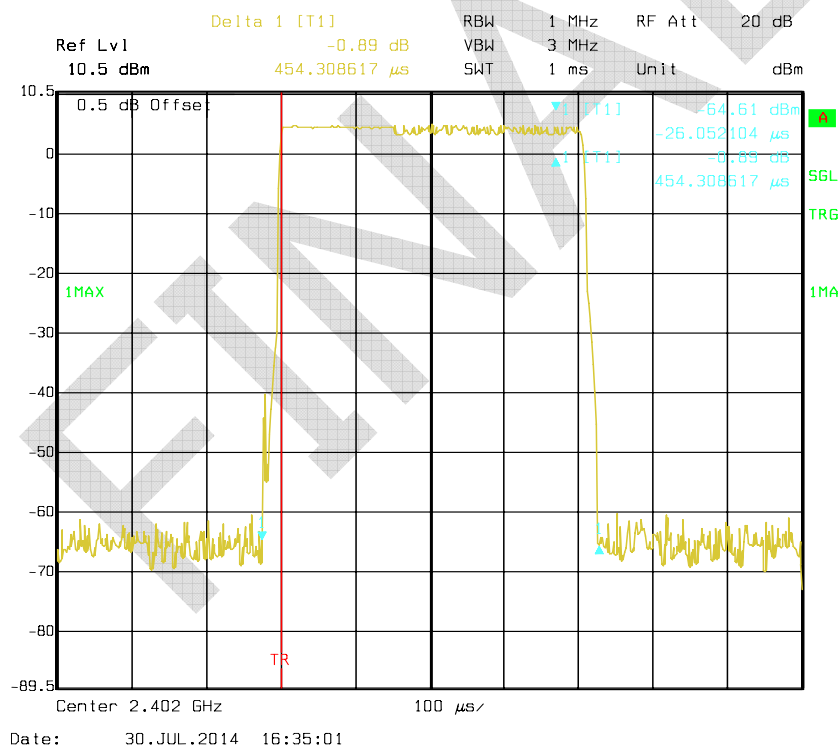




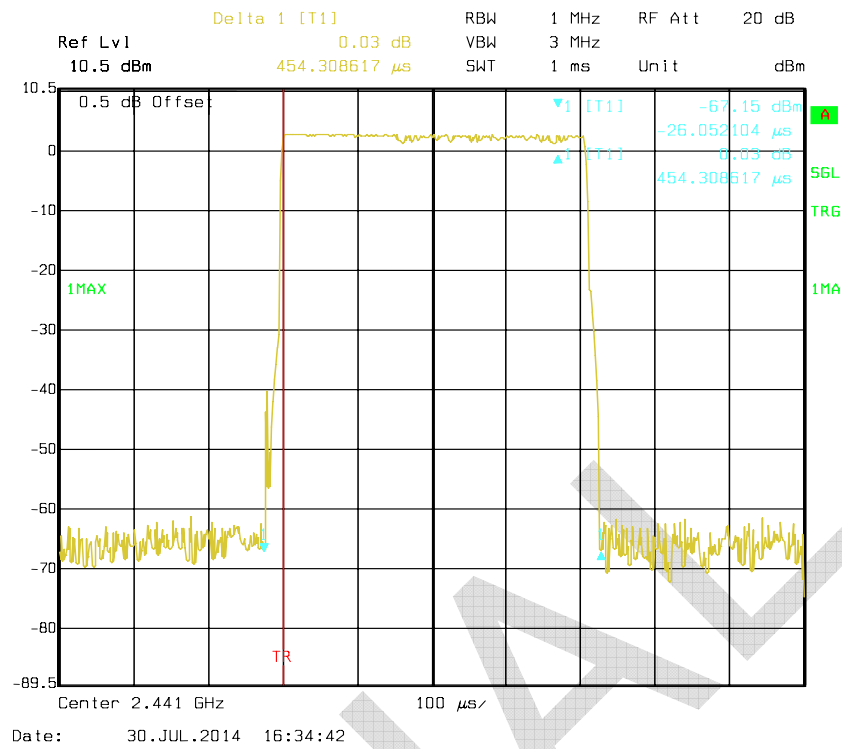
EDR Mode ( $\pi/4$ -DQPSK):

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.454	0.145	0.4	Pass
	Middle	0.454	0.145	0.4	Pass
	High	0.454	0.145	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.720	0.275	0.4	Pass
	Middle	1.720	0.275	0.4	Pass
	High	1.720	0.275	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	2.986	0.319	0.4	Pass
	Middle	2.986	0.319	0.4	Pass
	High	2.986	0.319	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

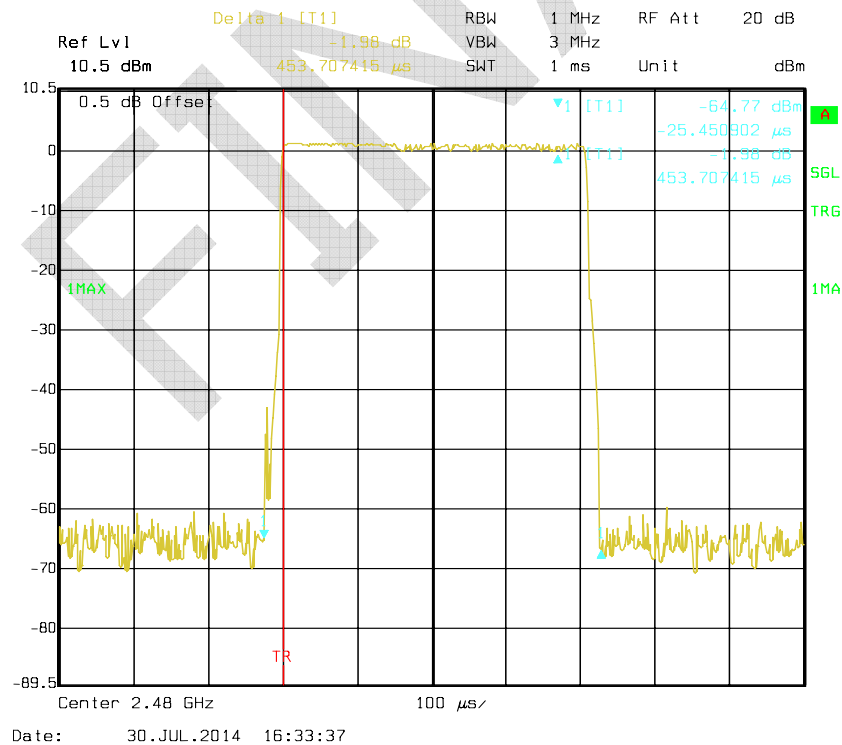
## DH1: Low Channel



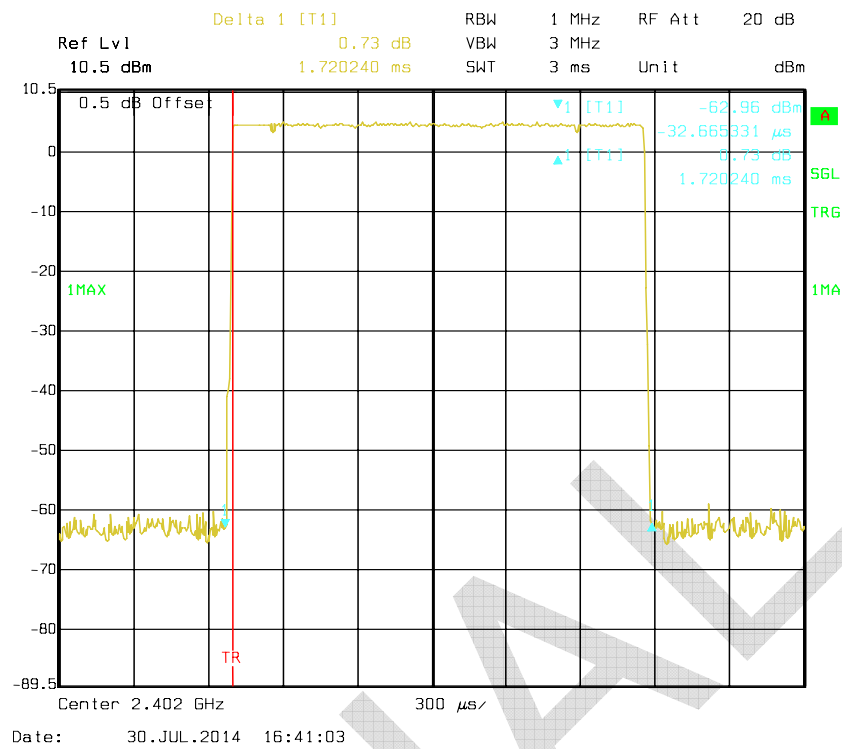
### DH1: Middle Channel



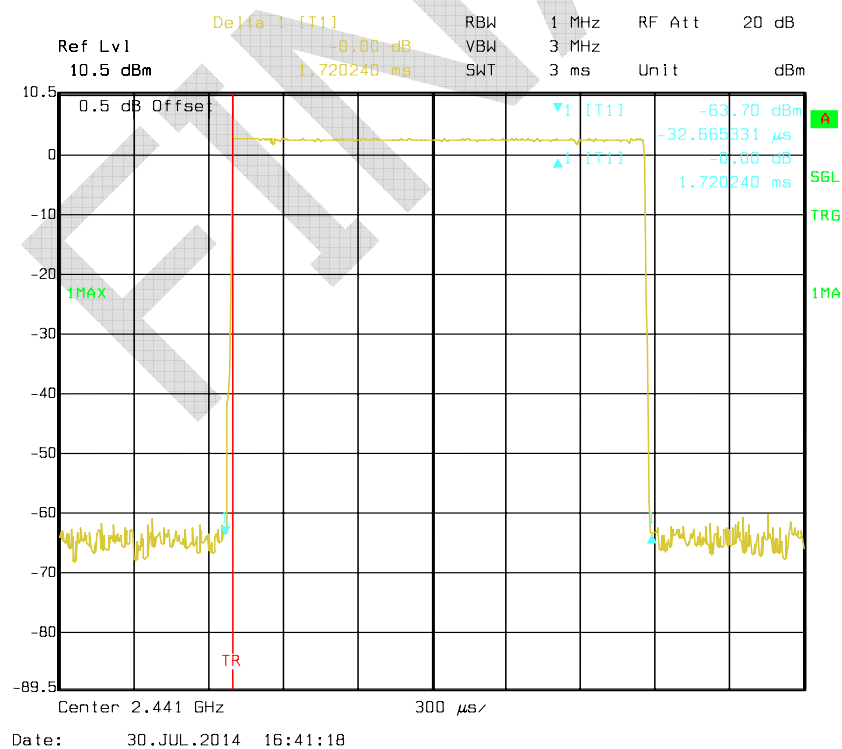
### DH1: High Channel

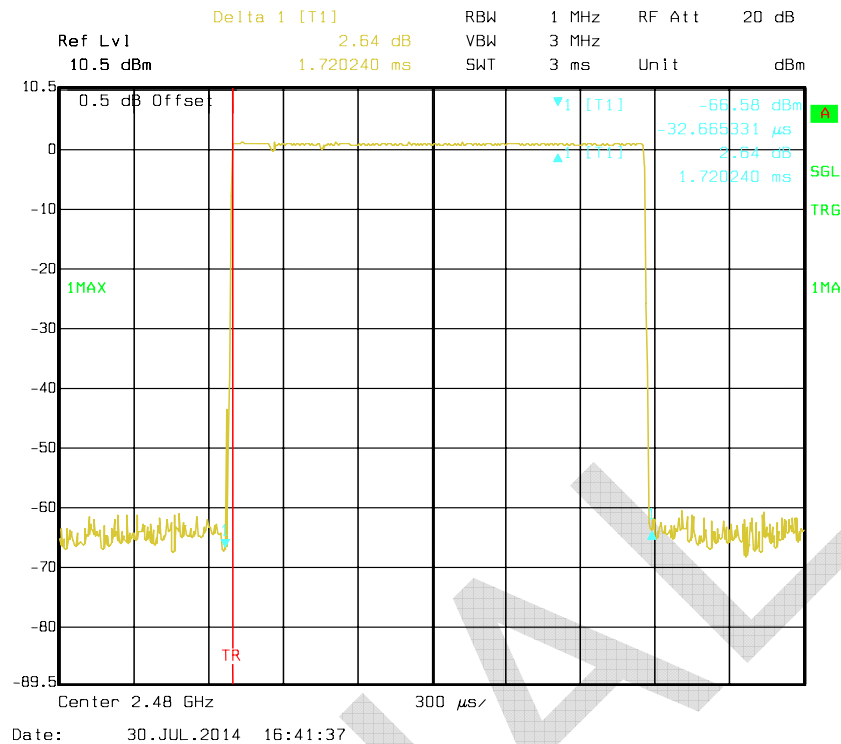
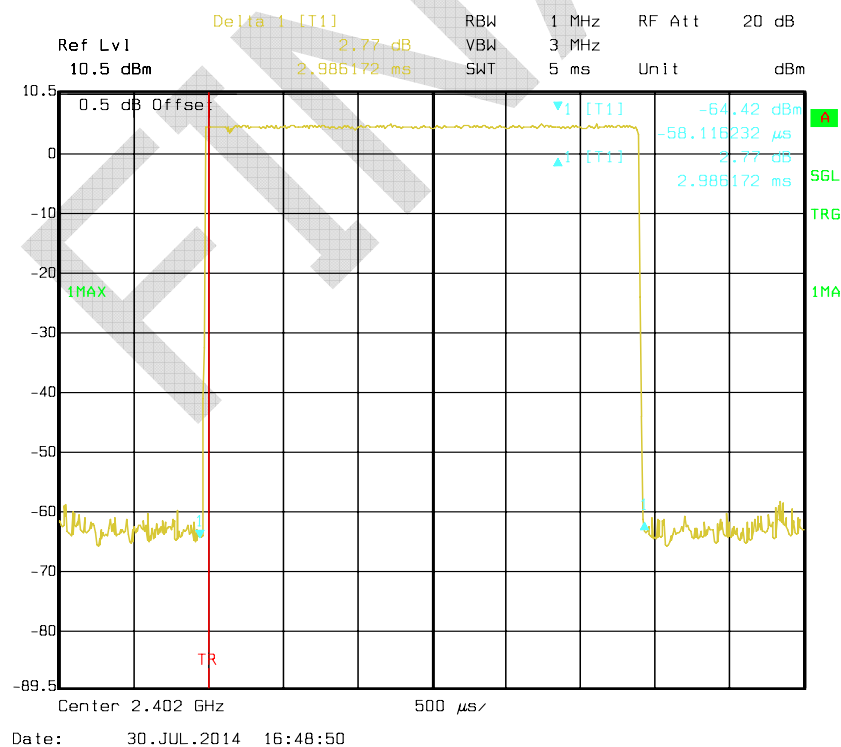


### DH3: Low Channel

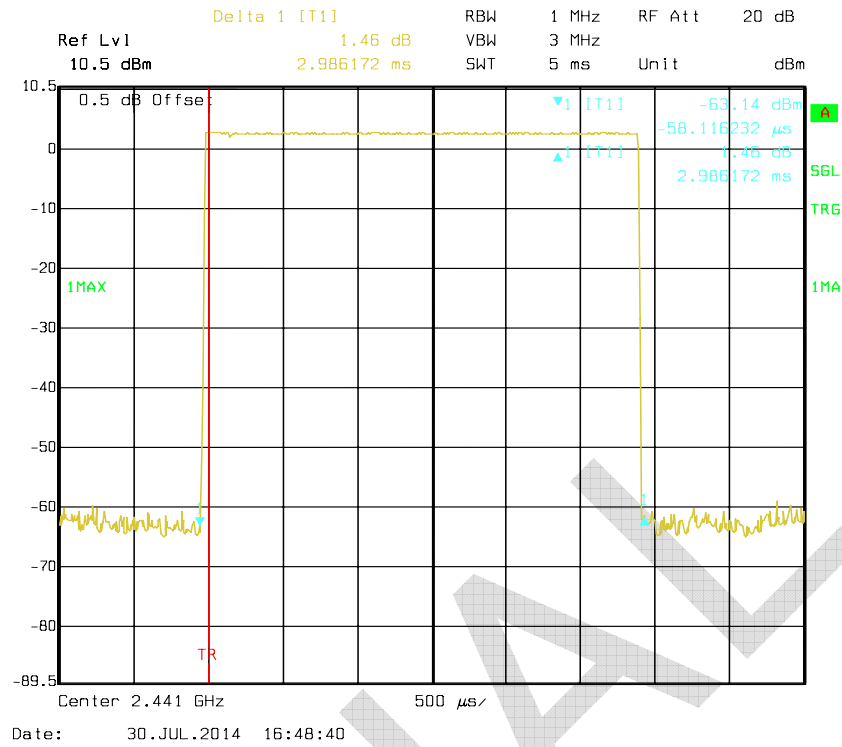


### DH3: Middle Channel

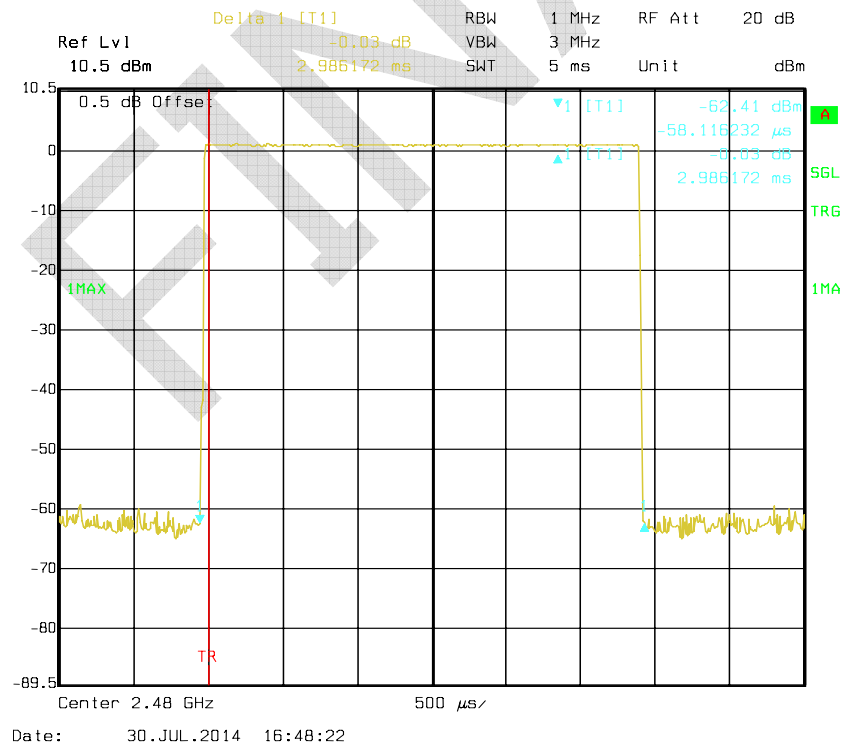


**DH3: High Channel****DH5: Low Channel**

### DH5: Middle Channel

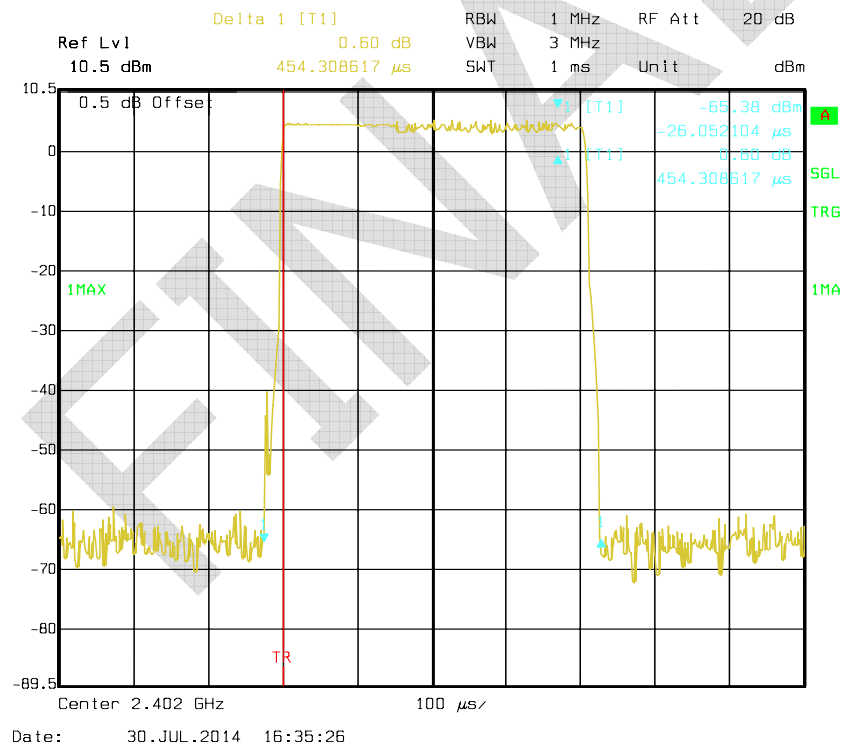


### DH5: High Channel

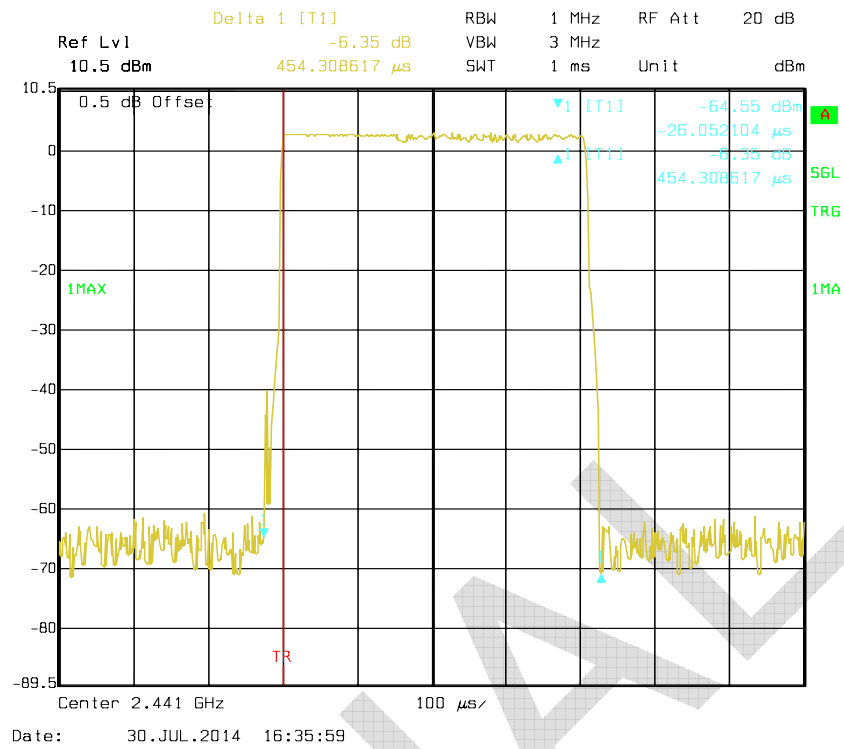


*EDR Mode (8-DPSK):*

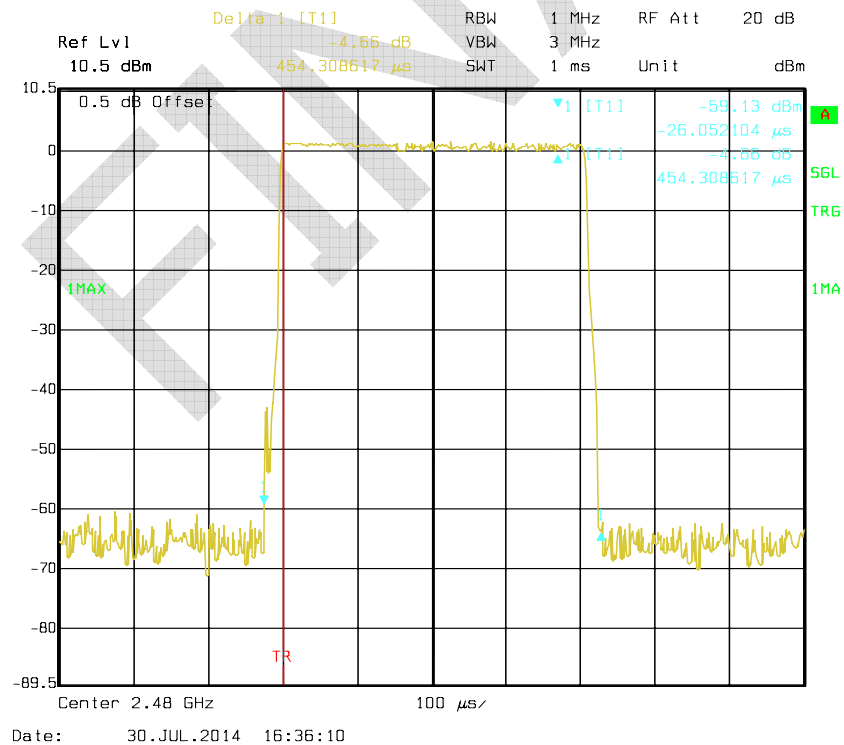
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
<b>DH1</b>	Low	0.454	0.145	0.4	Pass
	Middle	0.454	0.145	0.4	Pass
	High	0.454	0.145	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
<b>DH3</b>	Low	1.714	0.274	0.4	Pass
	Middle	1.714	0.274	0.4	Pass
	High	1.714	0.274	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
<b>DH5</b>	Low	2.986	0.319	0.4	Pass
	Middle	2.986	0.319	0.4	Pass
	High	2.986	0.319	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

**DH1: Low Channel**

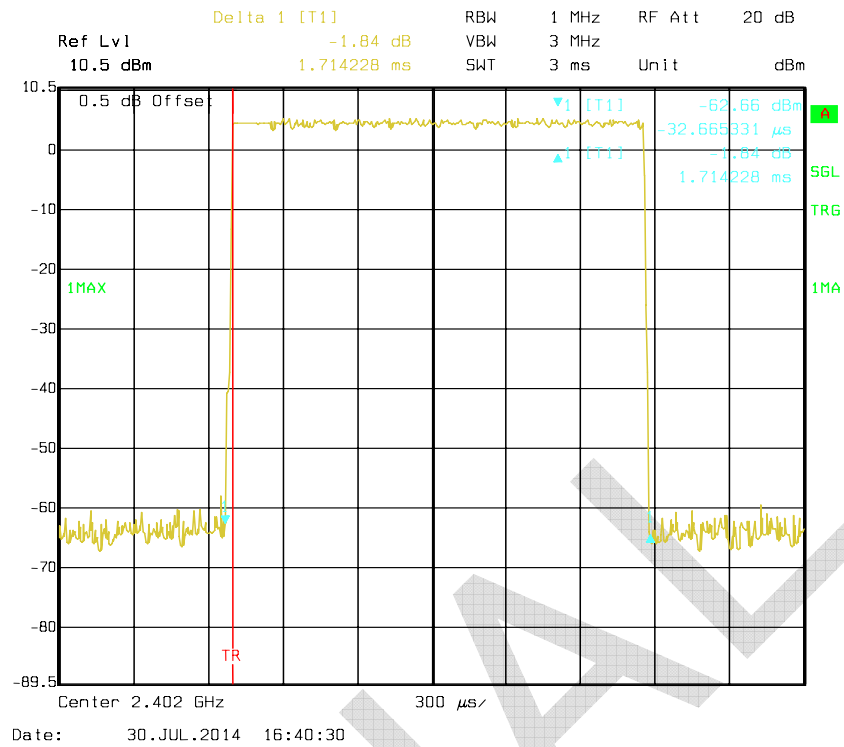
### DH1: Middle Channel



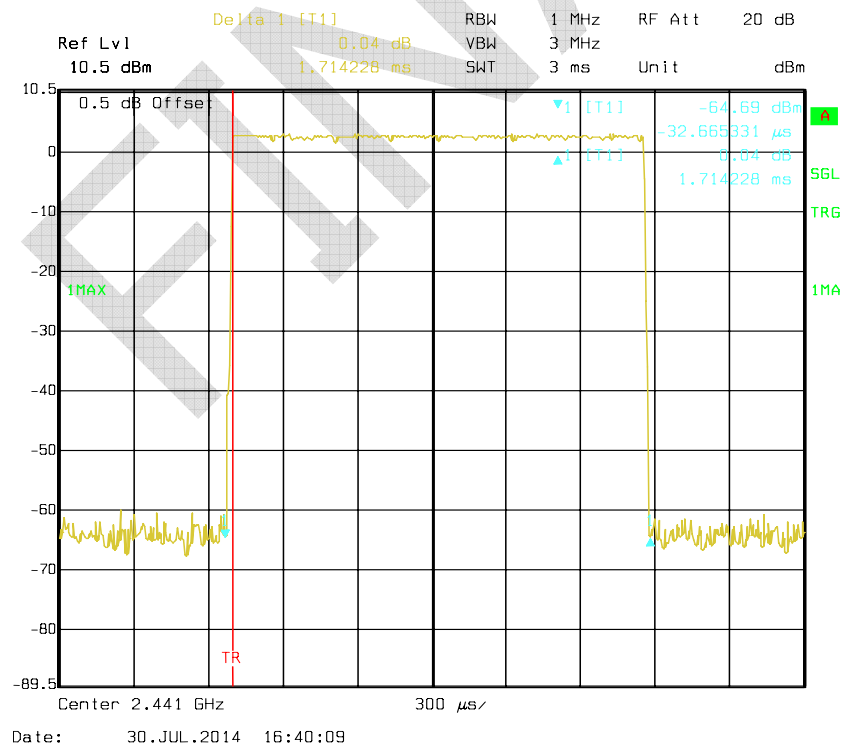
### DH1: High Channel



### DH3: Low Channel

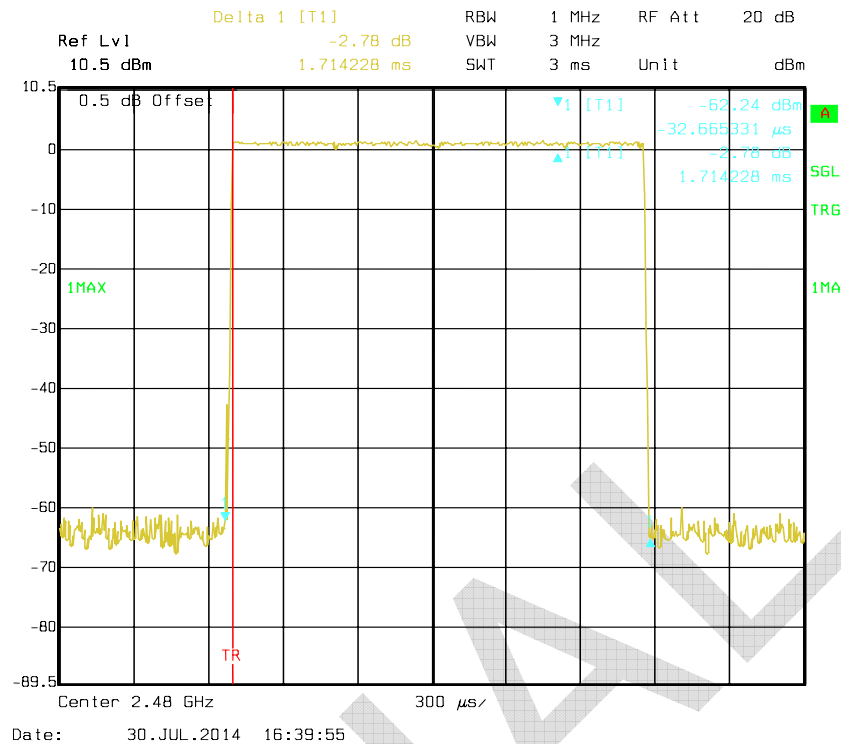


### DH3: Middle Channel

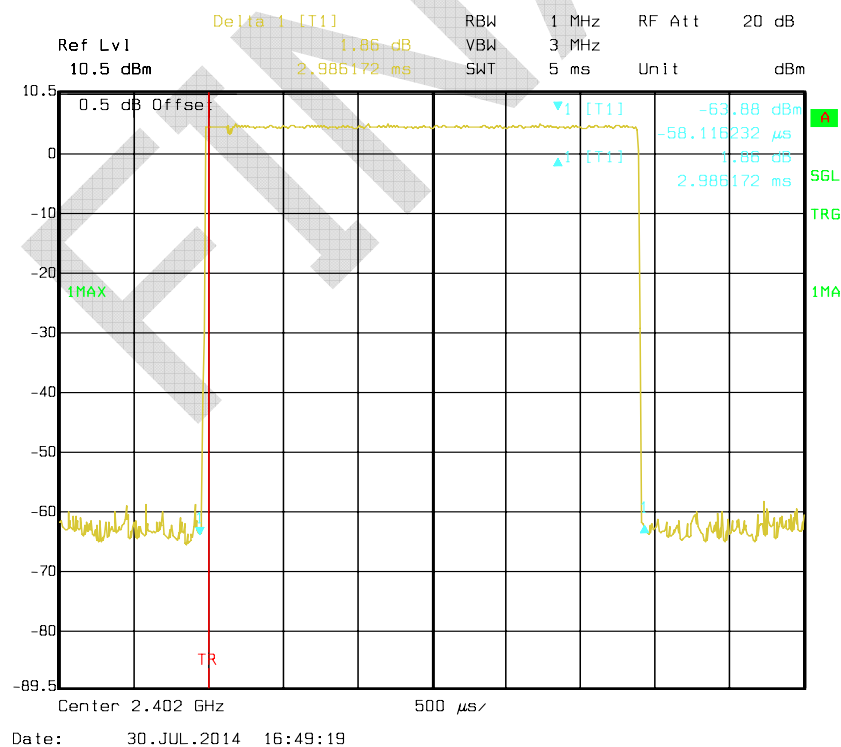




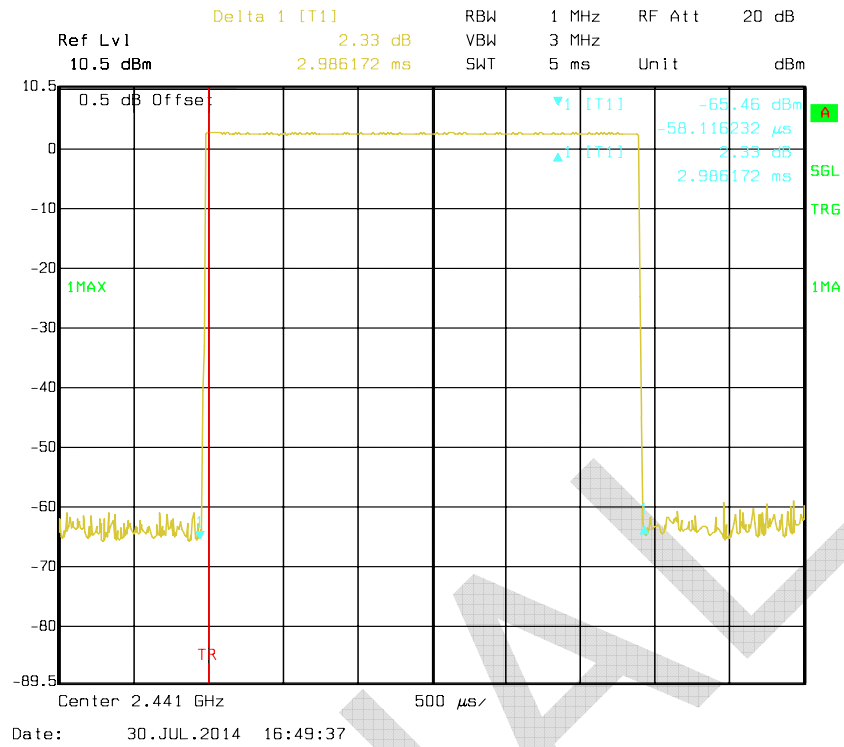
### DH3: High Channel



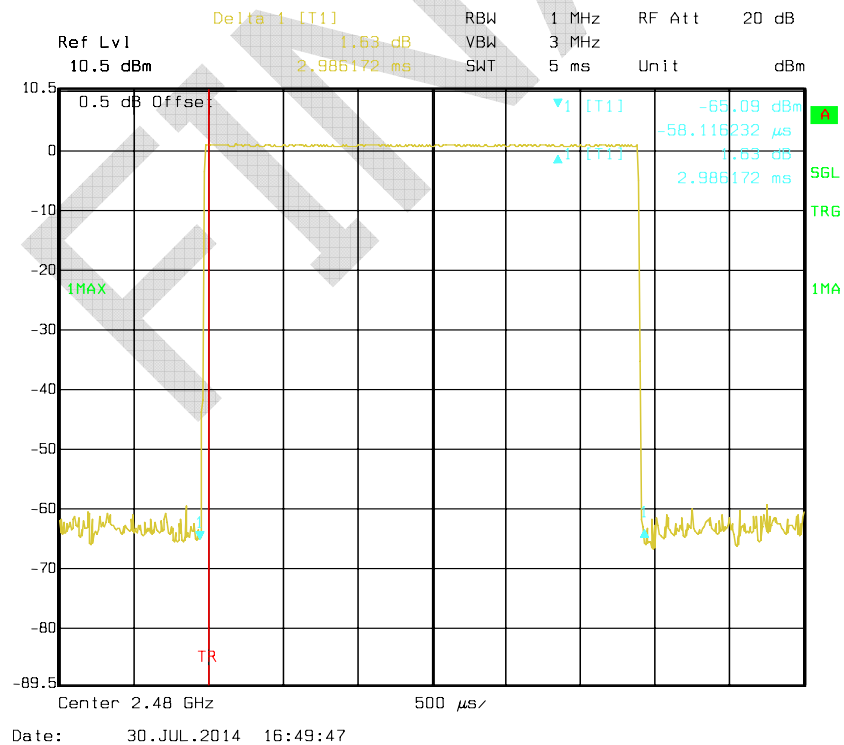
### DH5: Low Channel



### DH5: Middle Channel



### DH5: High Channel



**FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT****Applicable Standard**

According to §15.247(b) (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

**Test Procedure**

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI test receiver.
3. Add a correction factor to the display.

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Data****Environmental Conditions**

Temperature:	30.4 °C
Relative Humidity:	56 %
ATM Pressure:	100 kPa

\* The testing was performed by Allen Qiao on 2014-07-29.

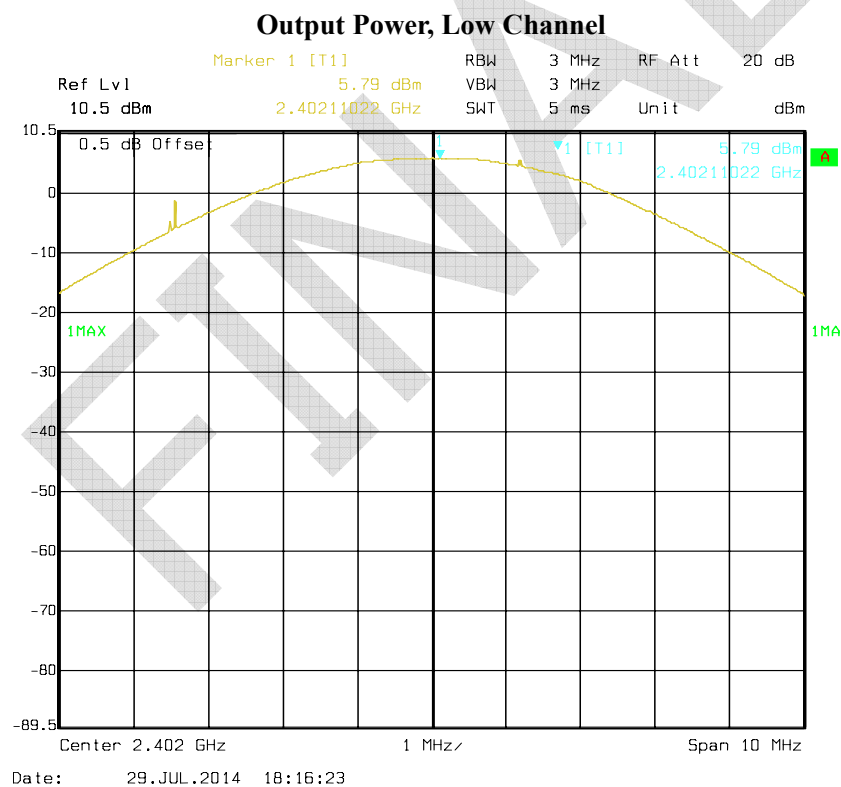
**Test Result:** Compliance.

Test Mode: Transmitting

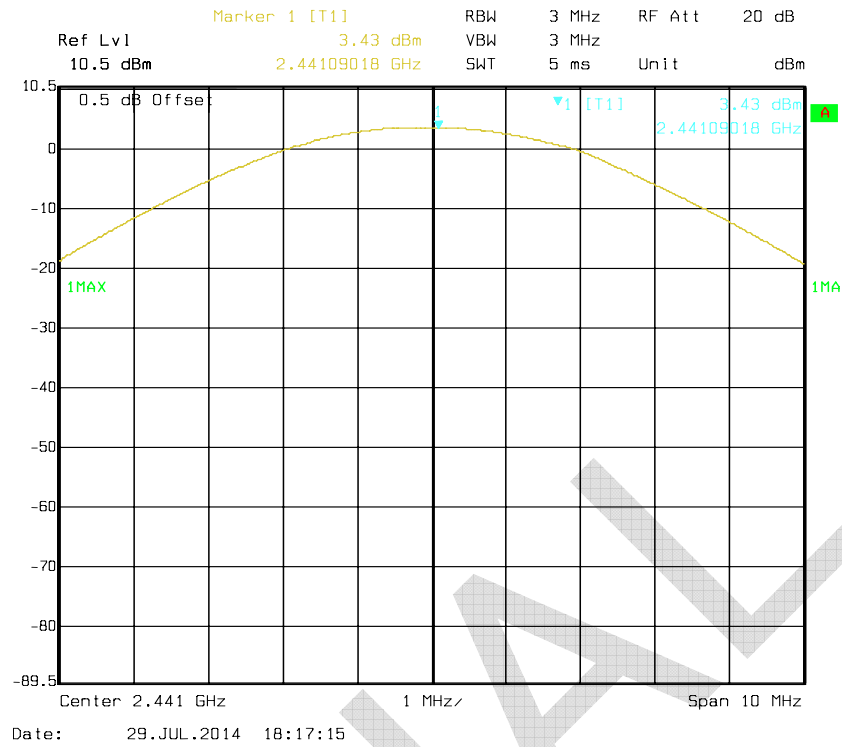
Mode	Channel	Frequency (MHz)	Output power (dBm)	Limit (dBm)
BDR Mode (GFSK)	Low	2402	5.79	30
	Middle	2441	3.43	30
	High	2480	1.79	30
EDR Mode ( $\pi/4$ -DQPSK)	Low	2402	5.05	30
	Middle	2441	3.07	30
	High	2480	1.41	30
EDR Mode (8-DPSK)	Low	2402	5.18	30
	Middle	2441	3.08	30
	High	2480	1.47	30

Note: The data above was tested in conducted mode.

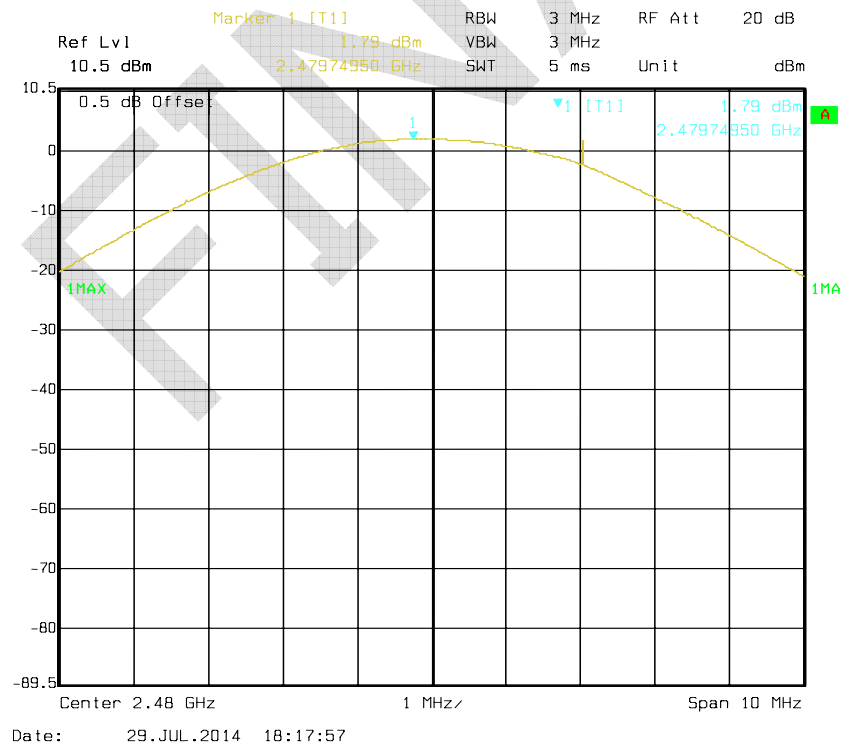
BDR Mode (GFSK):



### Output Power, Middle Channel

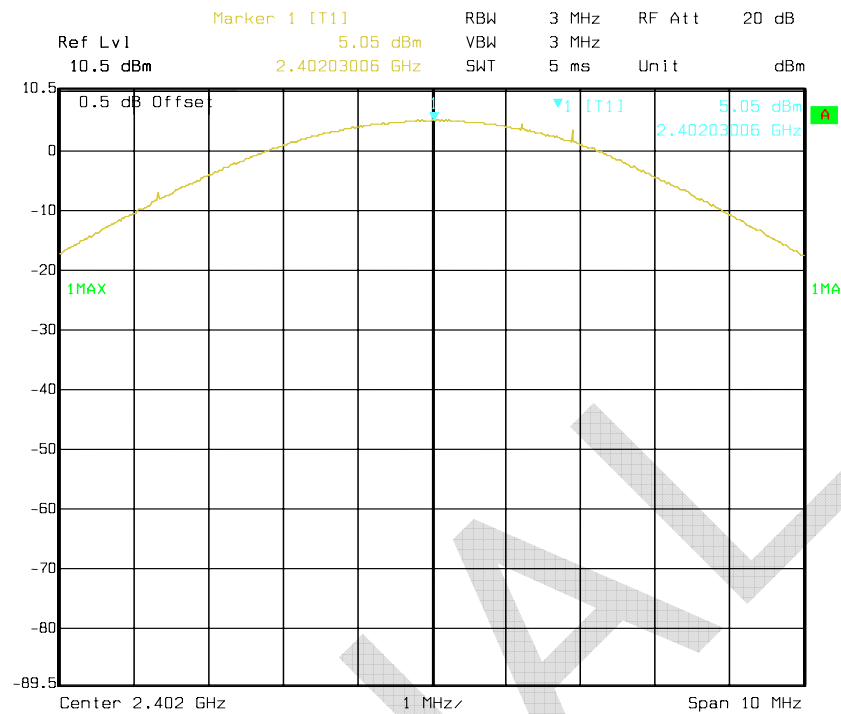


### Output Power, High Channel



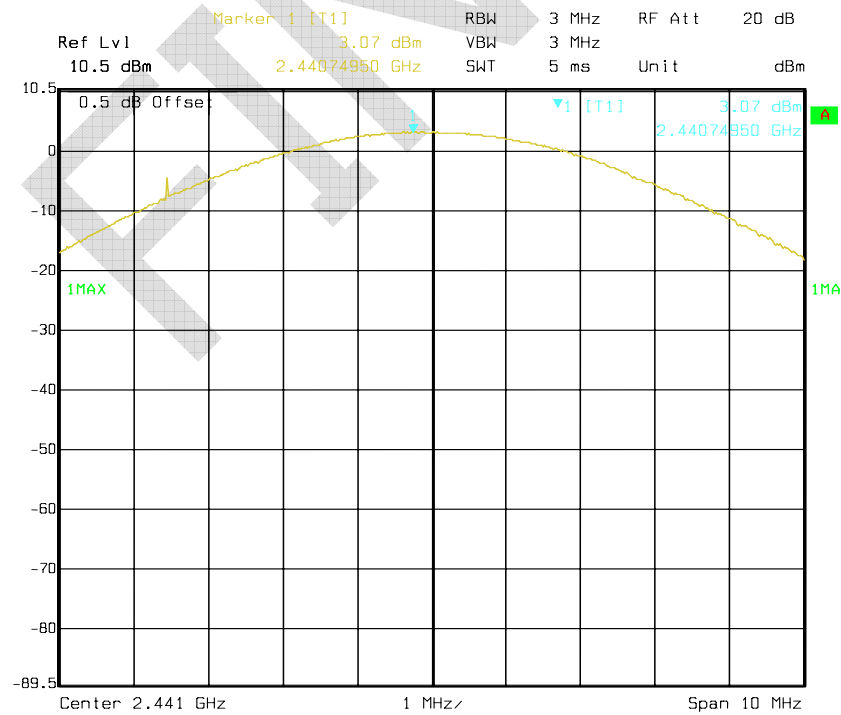
EDR Mode ( $\pi/4$ -DQPSK):

### Output Power, Low Channel



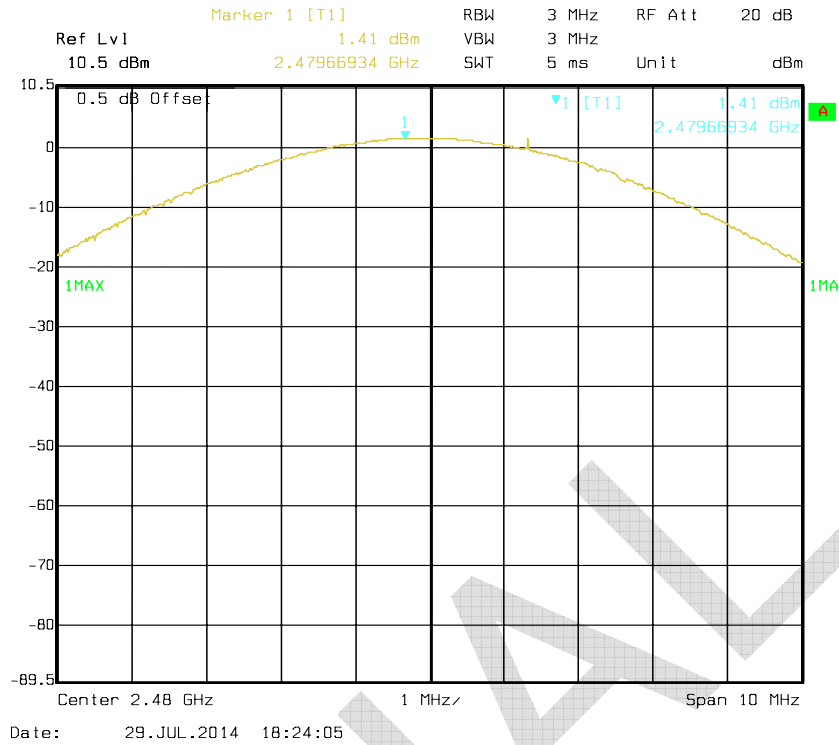
Date: 29.JUL.2014 18:22:29

### Output Power, Middle Channel



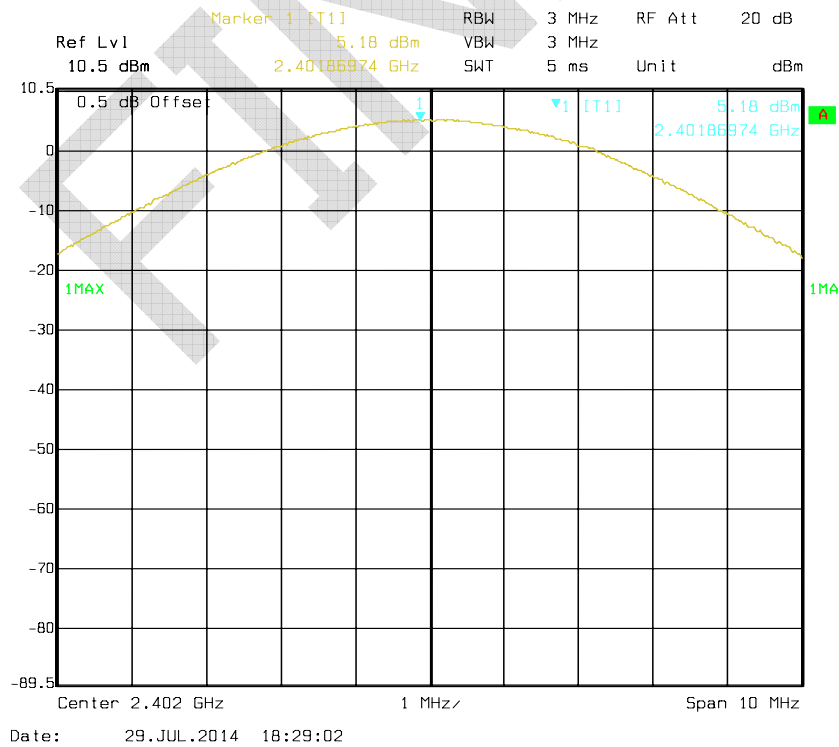
Date: 29.JUL.2014 18:22:59

### Output Power, High Channel

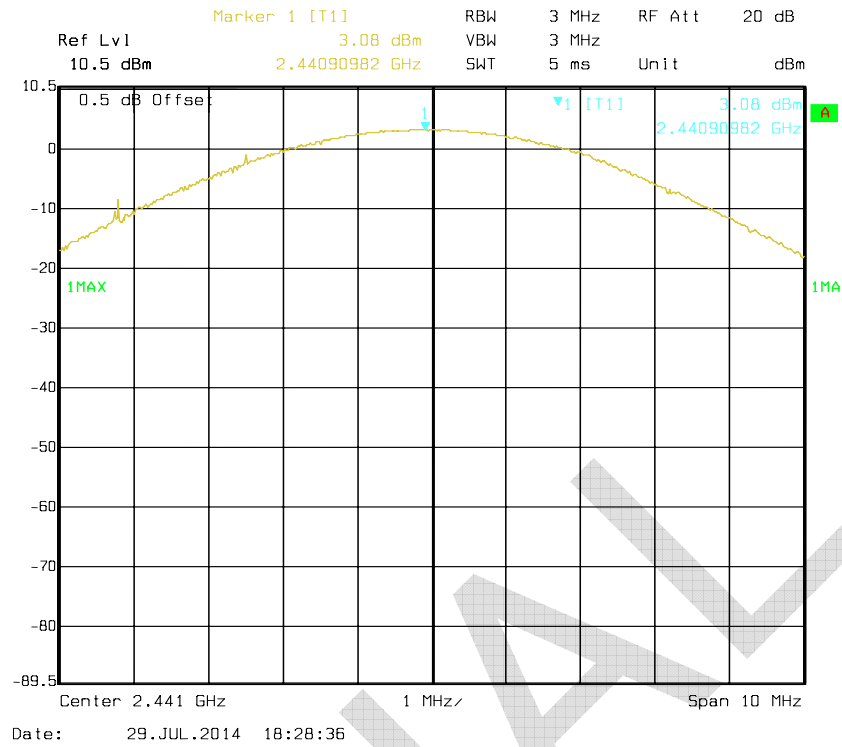


EDR Mode (8-DPSK):

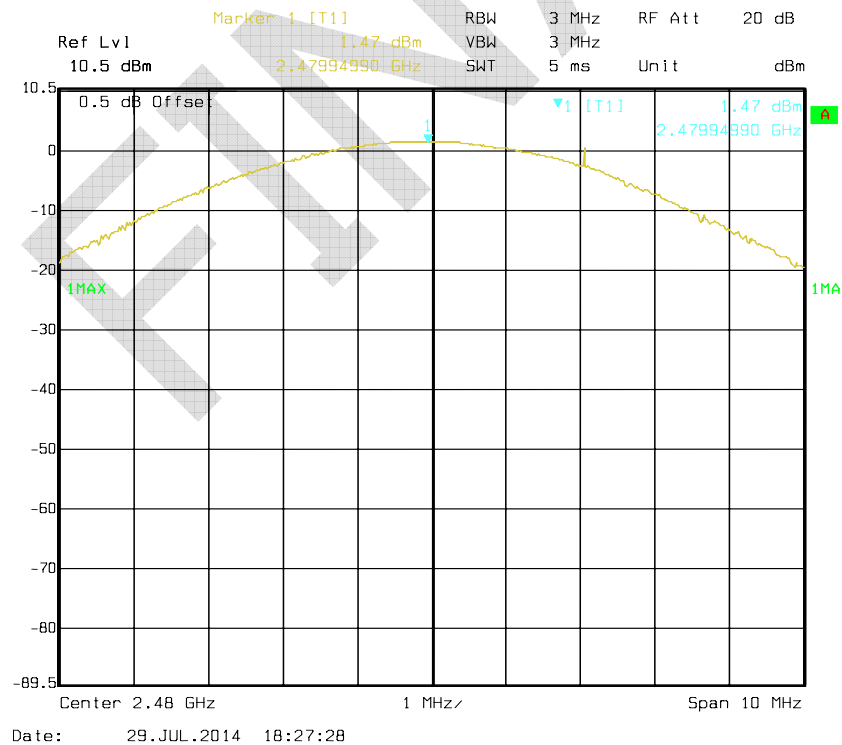
### Output Power, Low Channel



### Output Power, Middle Channel



### Output Power, High Channel





## FCC §15.247(d) - BAND EDGES TESTING

### Applicable Standard

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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09

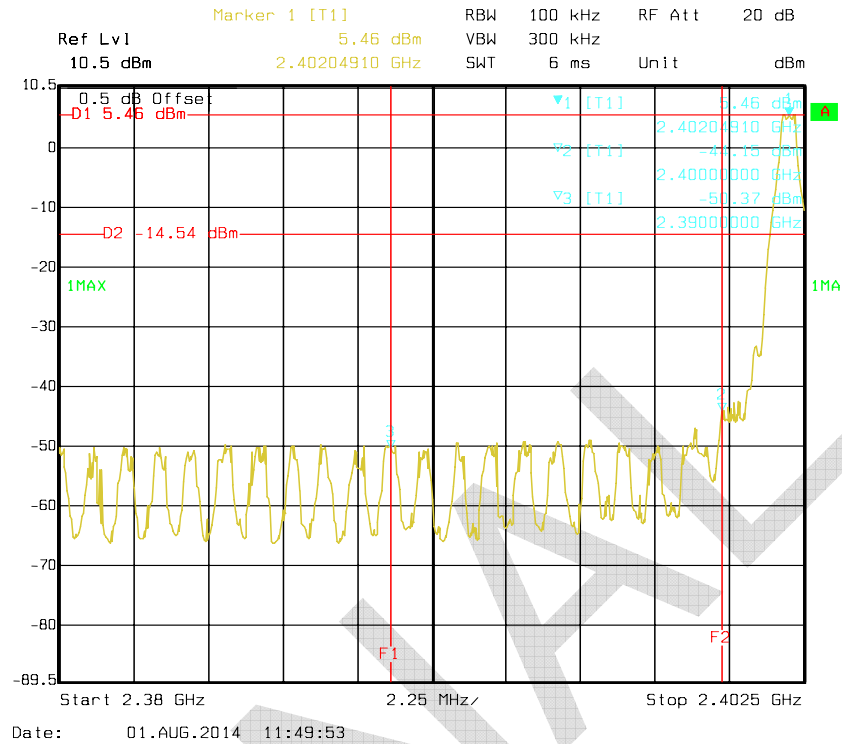
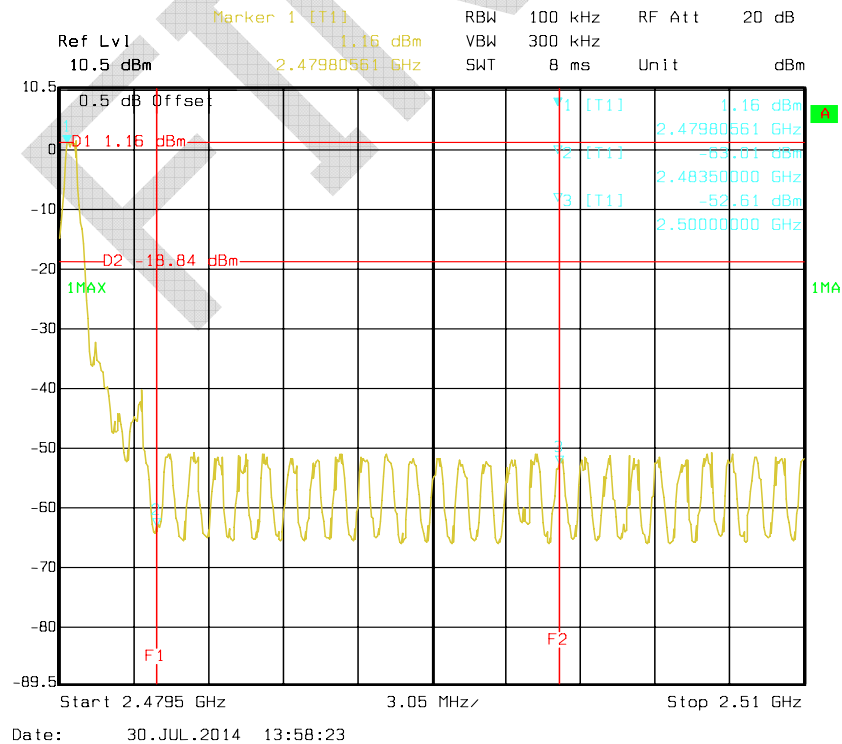
\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

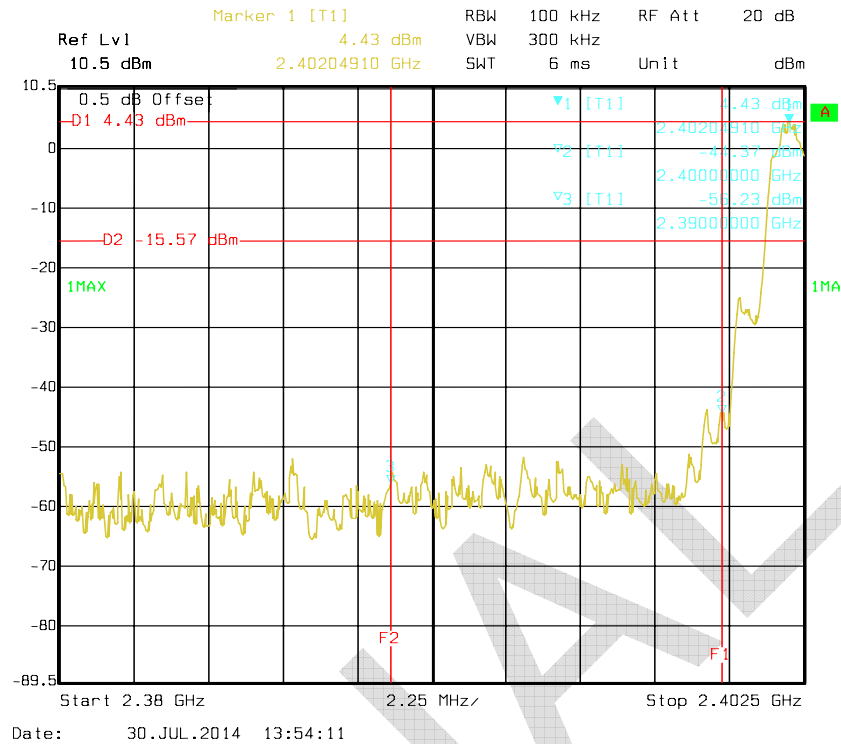
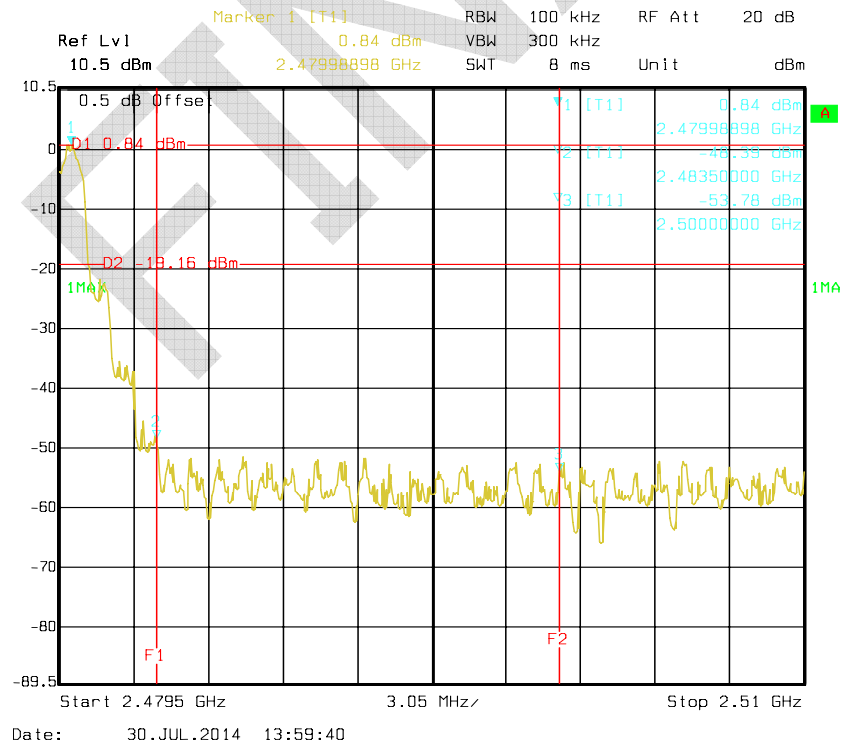
### Test Data

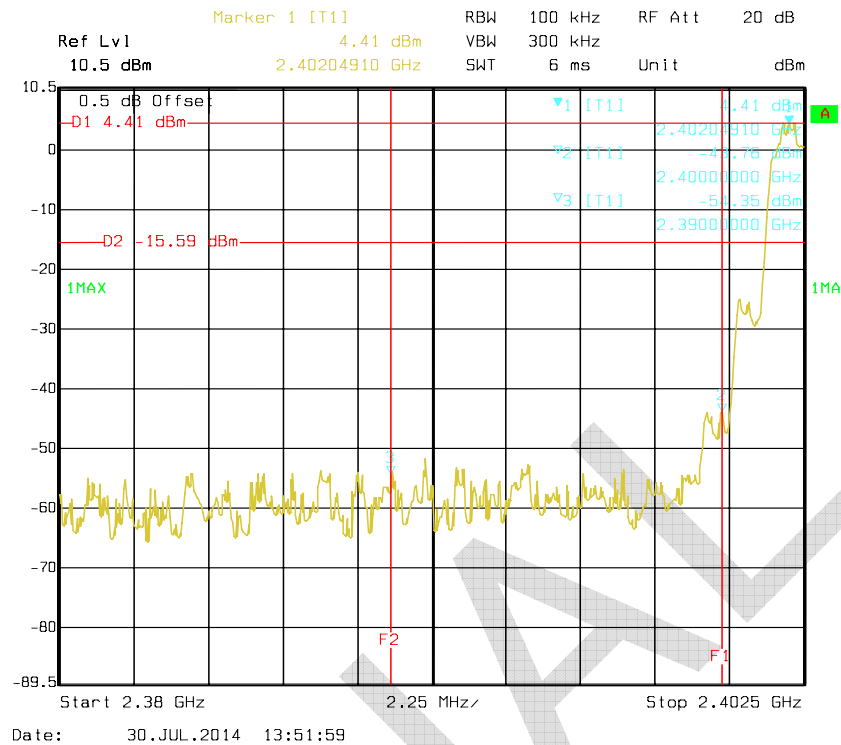
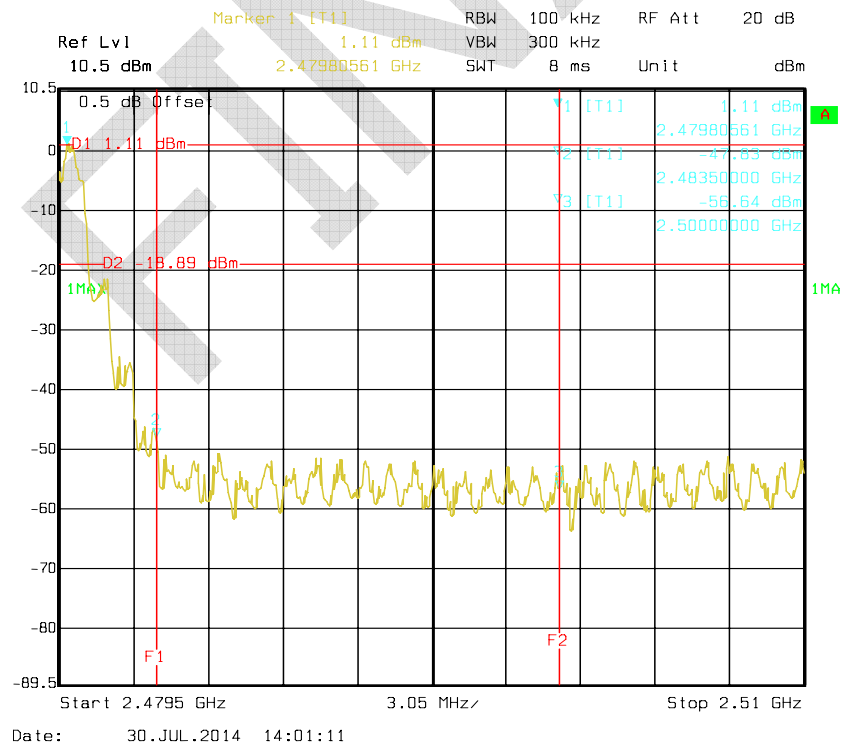
#### Environmental Conditions

Temperature:	30.3~31.1 °C
Relative Humidity:	53~61 %
ATM Pressure:	99.1~100 kPa

\* The testing was performed by Allen Qiao from 2014-07-30 to 2014-08-01.

**Test Result: Compliance***BDR Mode (GFSK):***Band Edge, Left Side****Band Edge, Right Side**

*EDR Mode ( $\pi/4$ -DQPSK):***Band Edge, Left Side****Band Edge, Right Side**

*EDR Mode (8-DPSK):***Band Edge, Left Side****Band Edge, Right Side**

**DECLARATION OF SIMILARITY**

Acomdata Technology, INC.

**Declaration of Alteration**

To Whom It May Concern,

We, Acomdata Technology, INC., hereby declare that there are some differences between our Multiple Models and testing products. Details as below:

Products Description	Name	Wireless Speaker		
	Brand	N/A		
	Manufacturer	Qinyi Electronic Company Limited		
	Project No.	RDG140716001, RDG140716002		
Differences Description				
Testing Products		Multiple Models	Differences Items	Details
PowerBoom mobile150		PowerBoom 5A , PowerBoom_150, PowerBoom, SportsBuddy, MB-20-5, MB-20-5-A, MB-20-5-B, MB-20-5-C, MB-20-5-D, MB-20-5-E, MB-20-5-F	Color of appearance, model name	

Notes: Testing products-the products tested by BACL

Multiple Model- have the same or similar appearance, structure, PCB, Material and function to the testing products, and only are different for color of appearance and model name.

Besides the differences in the table above, we declare the products are identical. We guarantee all the information provided above is true, and notice that we'll bear all the consequences caused by any false information or concealing.

Best Regards,

Signature: *Tina Heish*  
Print Name: Tina Heish  
Title: Manager

12F.-I, No.99, Sec. I, Nankan Rd., Luzhu Township, Taoyuan County 338, Taiwan (R.O.C.)

tina@marquess-inc.com Tel: 886.3.2126157 Fax: 886.3.2124480

QPDG004R32 Version1.0 (20140717)

**\*\*\*\*\* END OF REPORT \*\*\*\*\***