

FCC PART 15.247

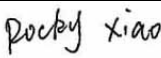
TEST REPORT

For

Shenzhen Rapoo Technology Co., Ltd.

22,Jinxiu Road East,Pingshan District,Shenzhen,China

FCC ID: PP2S160

Report Type: Original Report	Product Type: Bluetooth Touch Headset
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Report Number: RDG150826003-00A	
Report Date: 2015-09-06	
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TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	5
DESCRIPTION OF TEST CONFIGURATION	5
EUT EXERCISE SOFTWARE	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL CABLE.....	5
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE	8
APPLICABLE STANDARD	8
FCC §15.203 - ANTENNA REQUIREMENT.....	9
APPLICABLE STANDARD	9
ANTENNA CONNECTOR CONSTRUCTION	9
FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS	10
APPLICABLE STANDARD	10
MEASUREMENT UNCERTAINTY.....	10
EUT SETUP.....	10
EMI TEST RECEIVER SETUP.....	11
TEST PROCEDURE	11
CORRECTED AMPLITUDE & MARGIN CALCULATION	11
TEST EQUIPMENT LIST AND DETAILS.....	12
TEST RESULTS SUMMARY	12
TEST DATA	12
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS.....	15
APPLICABLE STANDARD	15
MEASUREMENT UNCERTAINTY.....	15
EUT SETUP	15
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	16
TEST PROCEDURE	16
TEST EQUIPMENT LIST AND DETAILS.....	17
CORRECTED AMPLITUDE & MARGIN CALCULATION	17
TEST RESULTS SUMMARY	17
TEST DATA	17
FCC §15.247(a) (1) - CHANNEL SEPARATION TEST	26
APPLICABLE STANDARD	26
TEST EQUIPMENT LIST AND DETAILS.....	26
TEST PROCEDURE	26
TEST DATA	26
FCC §15.247(a) (1) – 20 dB BANDWIDTH TESTING.....	32

APPLICABLE STANDARD	32
TEST PROCEDURE	32
TEST EQUIPMENT LIST AND DETAILS.....	32
TEST DATA	32
FCC §15.247(a) (1) (iii) - QUANTITY OF HOPPING CHANNEL TEST	38
APPLICABLE STANDARD	38
TEST PROCEDURE	38
TEST EQUIPMENT LIST AND DETAILS.....	38
TEST DATA	38
FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME).....	42
APPLICABLE STANDARD	42
TEST PROCEDURE	42
TEST EQUIPMENT LIST AND DETAILS.....	42
TEST DATA	42
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT	58
APPLICABLE STANDARD	58
TEST PROCEDURE	58
TEST EQUIPMENT LIST AND DETAILS.....	58
TEST DATA	58
FCC §15.247(d) - BAND EDGES TESTING	64
APPLICABLE STANDARD	64
TEST PROCEDURE	64
TEST EQUIPMENT LIST AND DETAILS.....	64
TEST DATA	64

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Shenzhen Rapoo Technology Co., Ltd.*'s product, model number: *S160 (FCC ID: PP2S160)* (the "EUT") in this report was a *Bluetooth Touch Headset*, which was measured approximately: 17.0cm (L) x 15.0 cm (W) x 6.3 cm (H), rated input voltage: DC3.7V from Li-ion battery or DC5V from system.

All measurement and test data in this report was gathered from production sample serial number: 150826003 (Assigned by BACL, Dongguan). The EUT was received on 2015-08-26.

Objective

This report is prepared on behalf of *Shenzhen Rapoo Technology Co., Ltd.* 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: PP2S160.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, 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, Puxinhu 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 06, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

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.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

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	45	45	45
	$\pi/4$ -DQPSK	50	50	50
	8DPSK	50	50	50

Equipment Modifications

No modification was made to the EUT.

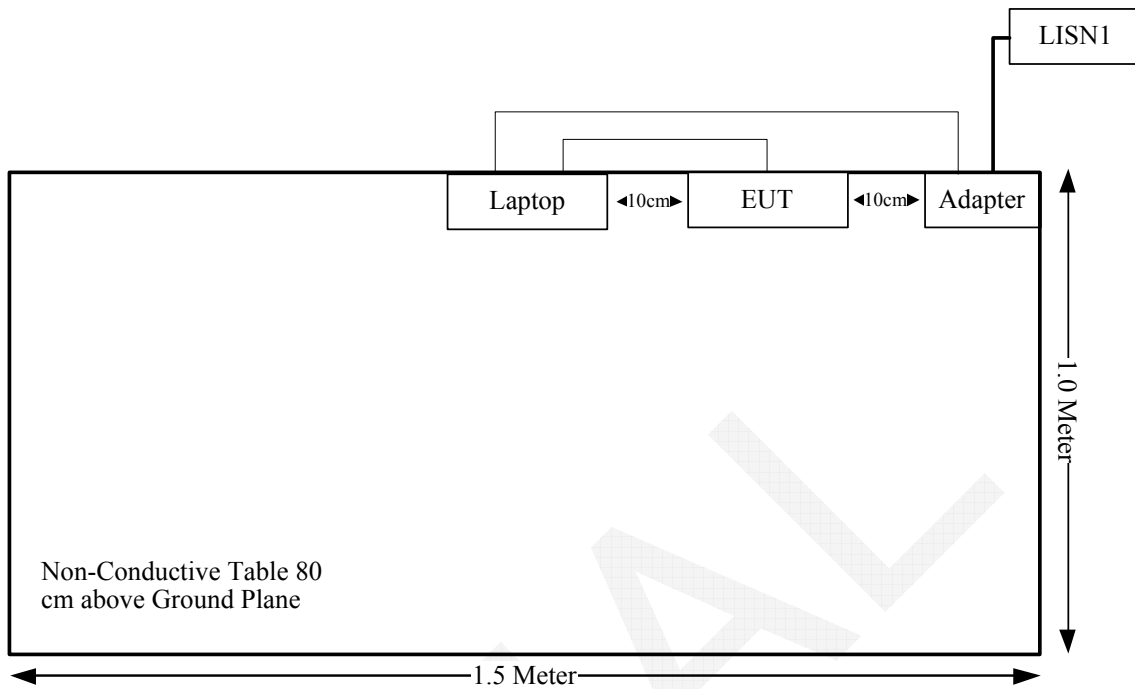
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Dell	Laptop	PP11L	325GP71

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	0.8	USB Port of Laptop	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 ≤ 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 ≤ 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 ≤ 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 target output power = 9.55 dBm (9.02mW) at 2480 MHz

$[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})][\sqrt{f(\text{GHz})}]$
 $= 9.02/5 \cdot (\sqrt{2.48}) = 2.84 < 3.0$

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 for BT, which was permanently attached and the antenna gain is 2.78 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_{cispr} 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_{cispr} of Table 1, then:

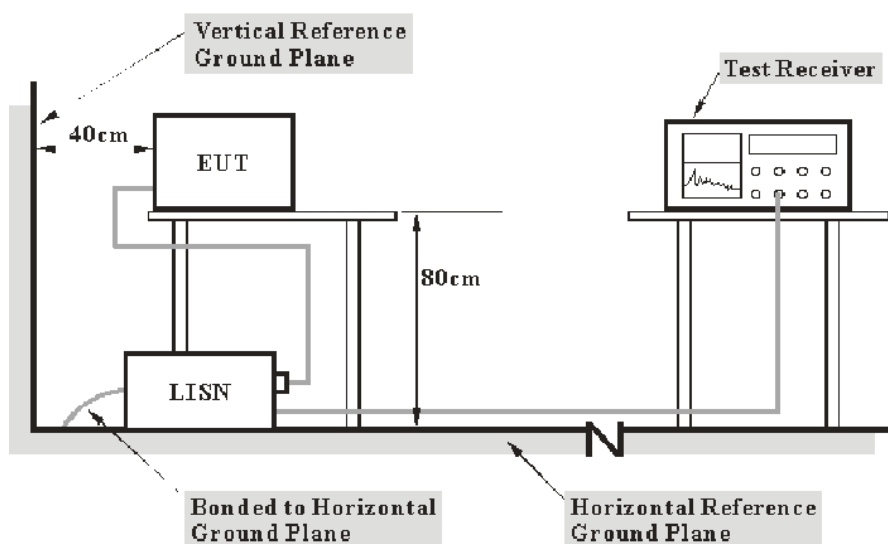
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

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_{cispr}

Measurement	U_{cispr}
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 C63.4-2009 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

During the conducted emission test, the adapter was connected to the outlet of the first LISN.

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	2014-10-20	2015-10-20
R&S	L.I.S.N	ESH2-Z5	892107/021	2015-06-09	2016-06-09
R&S	Two-line V-network	ENV 216	3560.6550.12	2014-12-11	2015-12-11
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:

16.3 dB at 0.302425 MHz in the **Neutral** conducted mode

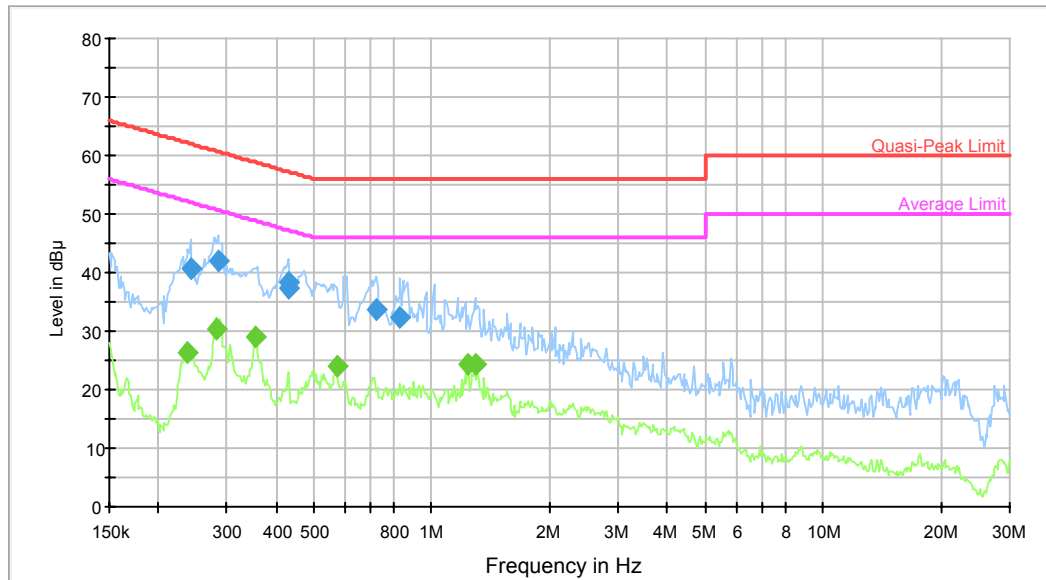
Test Data**Environmental Conditions**

Temperature:	28.7 °C
Relative Humidity:	57 %
ATM Pressure:	100.1 kPa

The testing was performed by Rocky Xiao on 2015-08-27.

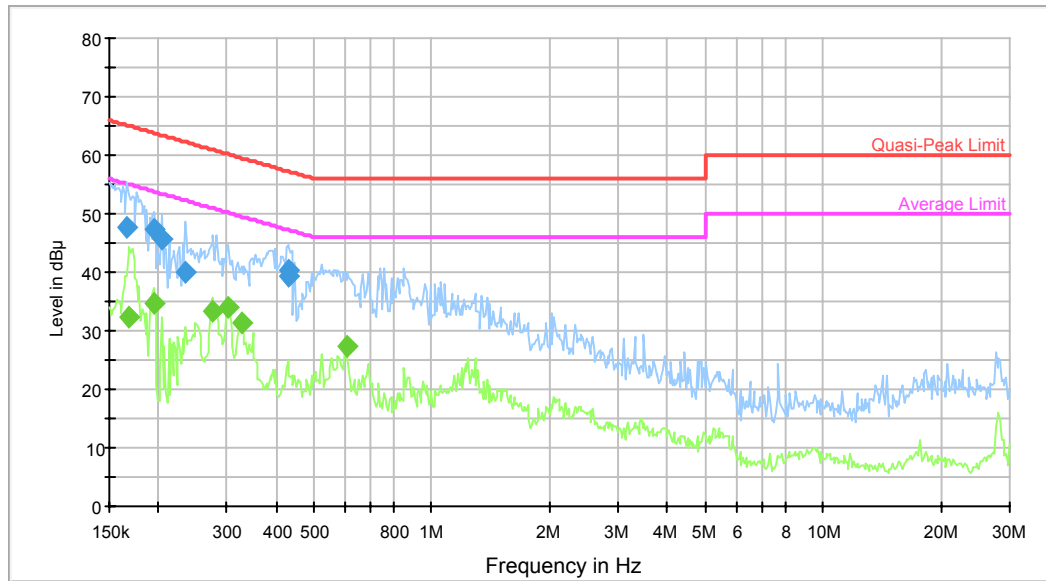
Test Mode: Transmitting

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.241949	40.6	9.000	L1	9.8	21.4	62.0	Compliance
0.283749	41.8	9.000	L1	9.8	18.9	60.7	Compliance
0.429420	38.4	9.000	L1	9.8	18.9	57.3	Compliance
0.432855	37.4	9.000	L1	9.8	19.8	57.2	Compliance
0.720803	33.5	9.000	L1	9.8	22.5	56.0	Compliance
0.831967	32.5	9.000	L1	9.8	23.5	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.238124	26.4	9.000	L1	9.8	25.8	52.2	Compliance
0.281497	30.3	9.000	L1	9.8	20.5	50.8	Compliance
0.354674	28.9	9.000	L1	9.8	19.9	48.9	Compliance
0.572086	24.1	9.000	L1	9.8	21.9	46.0	Compliance
1.239175	24.2	9.000	L1	9.8	21.8	46.0	Compliance
1.289541	24.2	9.000	L1	9.8	21.8	46.0	Compliance

AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.166371	47.7	9.000	N	9.8	17.4	65.1	Compliance
0.195114	47.2	9.000	N	9.8	16.6	63.8	Compliance
0.204669	45.7	9.000	N	9.8	17.7	63.4	Compliance
0.234359	39.9	9.000	N	9.8	22.4	62.3	Compliance
0.429420	40.4	9.000	N	9.8	16.8	57.3	Compliance
0.432855	39.2	9.000	N	9.8	18.0	57.2	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.169044	32.3	9.000	N	9.8	22.7	55.0	Compliance
0.195114	34.7	9.000	N	9.8	19.1	53.8	Compliance
0.274848	33.3	9.000	N	9.8	17.7	51.0	Compliance
0.302425	33.9	9.000	N	9.8	16.3	50.2	Compliance
0.327509	31.4	9.000	N	9.8	18.1	49.5	Compliance
0.604902	27.5	9.000	N	9.8	18.5	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_{cispr} 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_{cispr} of Table 1, then:

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

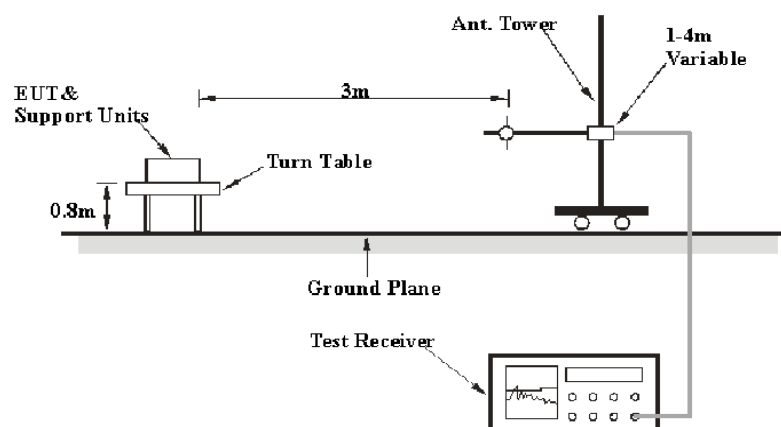
6G~18GHz: 5.23 dB

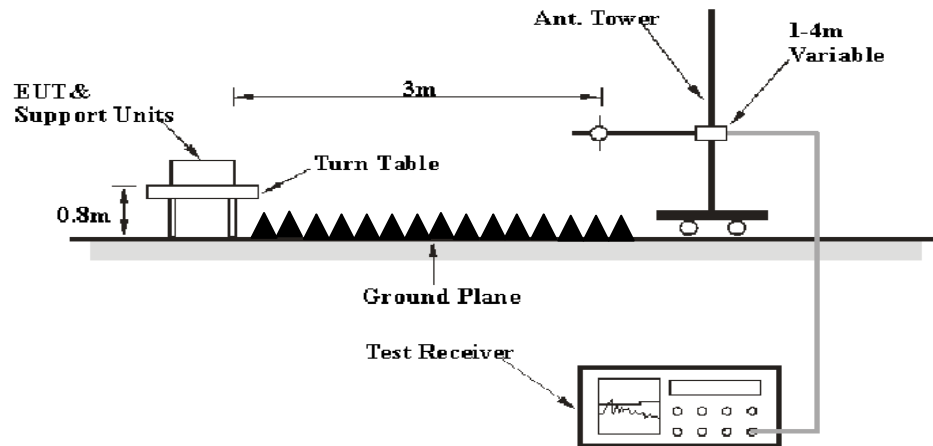
Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
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 C63.4-2009. 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.

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

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	2015-05-09	2016-05-09
Sunol Sciences	Antenna	JB3	A060611-3	2014-07-28	2017-07-27
HP	Amplifier	8447E	2434A02181	2014-09-01	2015-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2015-05-09	2016-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-15	2016-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2014-09-06	2015-09-06

* **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:

2.31 dB at 7440 MHz in the Vertical polarization

Test Data**Environmental Conditions**

Temperature:	27.2°C
Relative Humidity:	54 %
ATM Pressure:	100.2 kPa

* The testing was performed by Rocky Xiao on 2015-09-01.

Test 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	74.63	PK	H	25.65	3.66	0.00	103.94	N/A	N/A
2402	64.35	AV	H	25.65	3.66	0.00	93.66	N/A	N/A
2402	75.21	PK	V	25.65	3.66	0.00	104.52	N/A	N/A
2402	65.45	AV	V	25.65	3.66	0.00	94.76	N/A	N/A
2390	26.44	PK	V	25.61	3.63	0.00	55.68	74.00	18.32
2390	13.49	AV	V	25.61	3.63	0.00	42.73	54.00	11.27
4804	40.19	PK	V	30.59	5.06	27.41	48.43	74.00	25.57
4804	28.8	AV	V	30.59	5.06	27.41	37.04	54.00	16.96
7206	48.89	PK	V	34.09	6.61	25.91	63.68	74.00	10.32
7206	36.73	AV	V	34.09	6.61	25.91	51.52	54.00	2.48*
9608	34.95	PK	V	35.96	8.53	27.55	51.89	74.00	22.11
9608	21.64	AV	V	35.96	8.53	27.55	38.58	54.00	15.42
4315	32.34	PK	V	29.84	4.92	26.97	40.13	74.00	33.87
4315	20.11	AV	V	29.84	4.92	26.97	27.90	54.00	26.10
359.8	32.6	QP	H	15.58	2.31	21.67	28.82	46.00	17.18
Middle Channel: 2441 MHz									
2441	74.41	PK	H	25.75	3.76	0.00	103.92	N/A	N/A
2441	63.96	AV	H	25.75	3.76	0.00	93.47	N/A	N/A
2441	74.9	PK	V	25.75	3.76	0.00	104.41	N/A	N/A
2441	65.01	AV	V	25.75	3.76	0.00	94.52	N/A	N/A
4882	39.93	PK	V	30.79	5.19	27.42	48.49	74.00	25.51
4882	28.42	AV	V	30.79	5.19	27.42	36.98	54.00	17.02
7323	48.54	PK	V	34.38	6.75	25.88	63.79	74.00	10.21
7323	36.28	AV	V	34.38	6.75	25.88	51.53	54.00	2.47*
9764	34.45	PK	V	36.33	8.62	27.20	52.20	74.00	21.80
9764	21.16	AV	V	36.33	8.62	27.20	38.91	54.00	15.09
4315	32	PK	V	29.84	4.92	26.97	39.79	74.00	34.21
4315	19.8	AV	V	29.84	4.92	26.97	27.59	54.00	26.41
3775	32.14	PK	V	29.41	4.60	27.37	38.78	74.00	35.22
3775	19.89	AV	V	29.41	4.60	27.37	26.53	54.00	27.47
359.8	32.9	QP	H	15.58	2.31	21.67	29.12	46.00	16.88
High Channel: 2480 MHz									
2480	74	PK	H	25.85	3.68	0.00	103.53	N/A	N/A
2480	63.54	AV	H	25.85	3.68	0.00	93.07	N/A	N/A
2480	74.63	PK	V	25.85	3.68	0.00	104.16	N/A	N/A
2480	64.74	AV	V	25.85	3.68	0.00	94.27	N/A	N/A
2483.5	28.9	PK	V	25.86	3.67	0.00	58.43	74.00	15.57
2483.5	15.99	AV	V	25.86	3.67	0.00	45.52	54.00	8.48
4960	39.91	PK	V	31.00	5.34	27.43	48.82	74.00	25.18
4960	28.33	AV	V	31.00	5.34	27.43	37.24	54.00	16.76
7440	48.36	PK	V	34.66	6.89	25.97	63.94	74.00	10.06
7440	36.11	AV	V	34.66	6.89	25.97	51.69	54.00	2.31*
9920	34.28	PK	V	36.71	8.71	26.66	53.04	74.00	20.96
9920	21.01	AV	V	36.71	8.71	26.66	39.77	54.00	14.23
4315	31.9	PK	V	29.84	4.92	26.97	39.69	74.00	34.31
4315	19.62	AV	V	29.84	4.92	26.97	27.41	54.00	26.59
359.8	32.9	OP	H	15.58	2.31	21.67	29.12	46.00	16.88

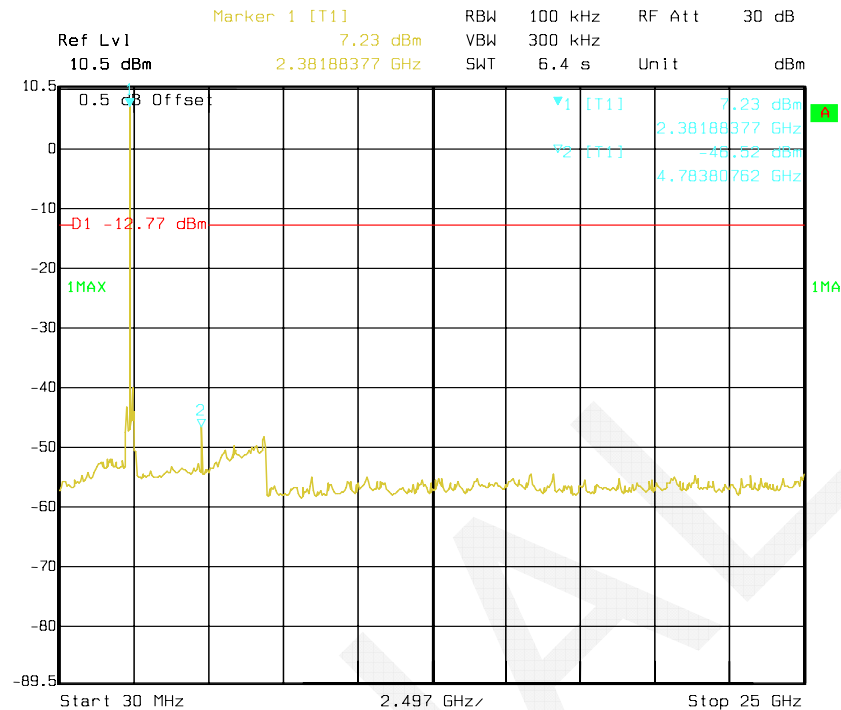
*Within measurement uncertainty!

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

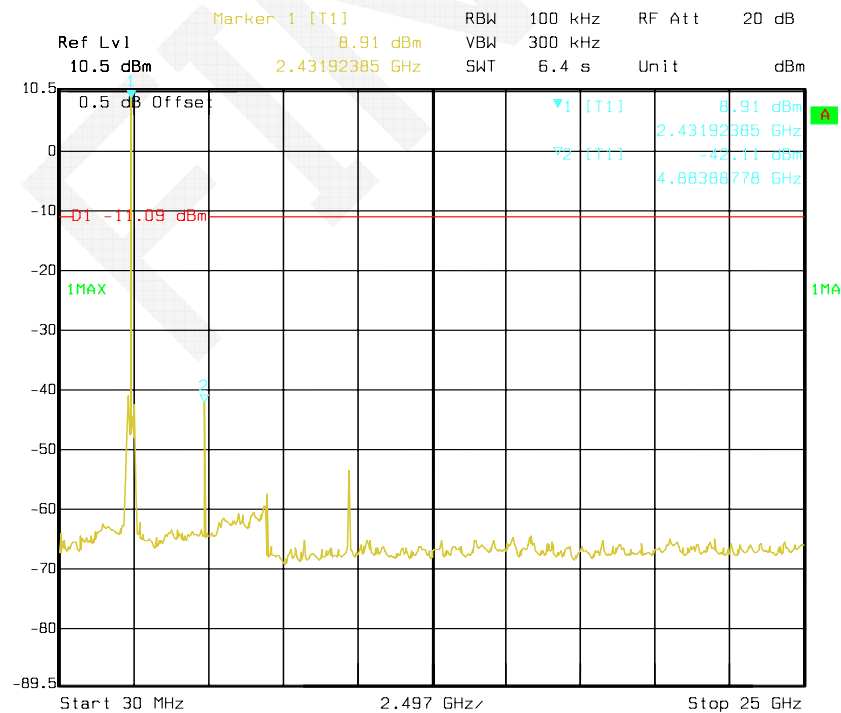
Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402 MHz									
2402	72.21	PK	H	25.65	3.66	0.00	101.52	N/A	N/A
2402	60.96	AV	H	25.65	3.66	0.00	90.27	N/A	N/A
2402	74.01	PK	V	25.65	3.66	0.00	103.32	N/A	N/A
2402	62.73	AV	V	25.65	3.66	0.00	92.04	N/A	N/A
2390	26.84	PK	V	25.61	3.63	0.00	56.08	74.00	17.92
2390	13.46	AV	V	25.61	3.63	0.00	42.70	54.00	11.30
4804	40.2	PK	V	30.59	5.06	27.41	48.44	74.00	25.56
4804	27.88	AV	V	30.59	5.06	27.41	36.12	54.00	17.88
7206	43.83	PK	V	34.09	6.61	25.91	58.62	74.00	15.38
7206	31.28	AV	V	34.09	6.61	25.91	46.07	54.00	7.93
9608	31.79	PK	V	35.96	8.53	27.55	48.73	74.00	25.27
9608	18.99	AV	V	35.96	8.53	27.55	35.93	54.00	18.07
3580	32.08	PK	V	28.98	4.58	27.26	38.38	74.00	35.62
3580	19.67	AV	V	28.98	4.58	27.26	25.97	54.00	28.03
359.8	32.5	QP	H	15.58	2.31	21.67	28.72	46.00	17.28
Middle Channel: 2441 MHz									
2441	72.02	PK	H	25.75	3.76	0.00	101.53	N/A	N/A
2441	60.56	AV	H	25.75	3.76	0.00	90.07	N/A	N/A
2441	73.56	PK	V	25.75	3.76	0.00	103.07	N/A	N/A
2441	62.42	AV	V	25.75	3.76	0.00	91.93	N/A	N/A
4882	40.62	PK	V	30.79	5.19	27.42	49.18	74.00	24.82
4882	28.09	AV	V	30.79	5.19	27.42	36.65	54.00	17.35
7323	43.99	PK	V	34.38	6.75	25.88	59.24	74.00	14.76
7323	31.58	AV	V	34.38	6.75	25.88	46.83	54.00	7.17
9764	31.91	PK	V	36.33	8.62	27.20	49.66	74.00	24.34
9764	19.11	AV	V	36.33	8.62	27.20	36.86	54.00	17.14
3580	32.24	PK	V	28.98	4.58	27.26	38.54	74.00	35.46
3580	19.95	AV	V	28.98	4.58	27.26	26.25	54.00	27.75
4210	32.06	PK	V	29.86	5.01	27.06	39.87	74.00	34.13
4210	19.66	AV	V	29.86	5.01	27.06	27.47	54.00	26.53
359.8	32.7	QP	H	15.58	2.31	21.67	28.92	46.00	17.08
High Channel: 2480 MHz									
2480	71.98	PK	H	25.85	3.68	0.00	101.51	N/A	N/A
2480	60.87	AV	H	25.85	3.68	0.00	90.40	N/A	N/A
2480	73.53	PK	V	25.85	3.68	0.00	103.06	N/A	N/A
2480	62.5	AV	V	25.85	3.68	0.00	92.03	N/A	N/A
2483.5	28.3	PK	V	25.86	3.67	0.00	57.83	74.00	16.17
2483.5	15.03	AV	V	25.86	3.67	0.00	44.56	54.00	9.44
4960	40.59	PK	V	31.00	5.34	27.43	49.50	74.00	24.50
4960	28.11	AV	V	31.00	5.34	27.43	37.02	54.00	16.98
7440	44.01	PK	V	34.66	6.89	25.97	59.59	74.00	14.41
7440	31.46	AV	V	34.66	6.89	25.97	47.04	54.00	6.96
9920	31.91	PK	V	36.71	8.71	26.66	50.67	74.00	23.33
9920	19.12	AV	V	36.71	8.71	26.66	37.88	54.00	16.12
3580	32.35	PK	V	28.98	4.58	27.26	38.65	74.00	35.35
3580	19.78	AV	V	28.98	4.58	27.26	26.08	54.00	27.92
359.8	32.7	OP	H	15.58	2.31	21.67	28.92	46.00	17.08

EDR Mode (8-DPSK):

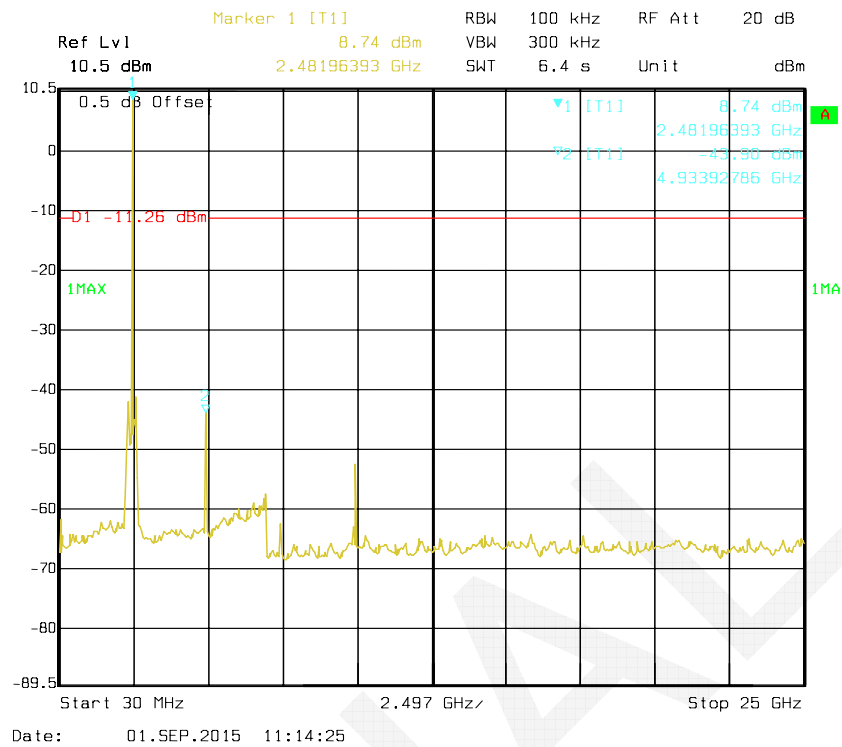
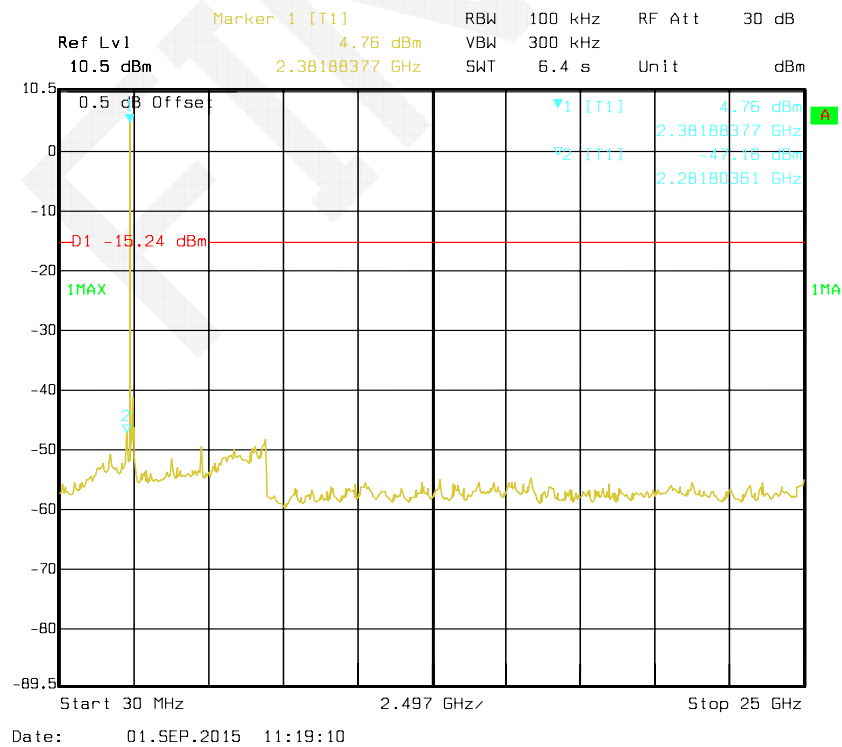
Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402 MHz									
2402	72.42	PK	H	25.65	3.66	0.00	101.73	N/A	N/A
2402	61.04	AV	H	25.65	3.66	0.00	90.35	N/A	N/A
2402	74.14	PK	V	25.65	3.66	0.00	103.45	N/A	N/A
2402	62.68	AV	V	25.65	3.66	0.00	91.99	N/A	N/A
2390	26.57	PK	V	25.61	3.63	0.00	55.81	74.00	18.19
2390	13.45	AV	V	25.61	3.63	0.00	42.69	54.00	11.31
4804	40.15	PK	V	30.59	5.06	27.41	48.39	74.00	25.61
4804	27.9	AV	V	30.59	5.06	27.41	36.14	54.00	17.86
7206	44.52	PK	V	34.09	6.61	25.91	59.31	74.00	14.69
7206	32.11	AV	V	34.09	6.61	25.91	46.90	54.00	7.10
9608	31.16	PK	V	35.96	8.53	27.55	48.10	74.00	25.90
9608	18.99	AV	V	35.96	8.53	27.55	35.93	54.00	18.07
3535	32.98	PK	V	28.88	4.51	27.25	39.12	74.00	34.88
3535	20.54	AV	V	28.88	4.51	27.25	26.68	54.00	27.32
359.8	32.1	QP	H	15.58	2.31	21.67	28.32	46.00	17.68
Middle Channel: 2441 MHz									
2441	72.16	PK	H	25.75	3.76	0.00	101.67	N/A	N/A
2441	60.64	AV	H	25.75	3.76	0.00	90.15	N/A	N/A
2441	73.9	PK	V	25.75	3.76	0.00	103.41	N/A	N/A
2441	62.55	AV	V	25.75	3.76	0.00	92.06	N/A	N/A
4882	40.45	PK	V	30.79	5.19	27.42	49.01	74.00	24.99
4882	28.1	AV	V	30.79	5.19	27.42	36.66	54.00	17.34
7323	44.76	PK	V	34.38	6.75	25.88	60.01	74.00	13.99
7323	32.4	AV	V	34.38	6.75	25.88	47.65	54.00	6.35
9764	31.39	PK	V	36.33	8.62	27.20	49.14	74.00	24.86
9764	19.14	AV	V	36.33	8.62	27.20	36.89	54.00	17.11
3535	33.22	PK	V	28.88	4.51	27.25	39.36	74.00	34.64
3535	20.76	AV	V	28.88	4.51	27.25	26.90	54.00	27.10
4210	32.05	PK	V	29.86	5.01	27.06	39.86	74.00	34.14
4210	19.86	AV	V	29.86	5.01	27.06	27.67	54.00	26.33
359.8	32.3	QP	H	15.58	2.31	21.67	28.52	46.00	17.48
High Channel: 2480 MHz									
2480	72	PK	H	25.85	3.68	0.00	101.53	N/A	N/A
2480	60.76	AV	H	25.85	3.68	0.00	90.29	N/A	N/A
2480	73.65	PK	V	25.85	3.68	0.00	103.18	N/A	N/A
2480	62.24	AV	V	25.85	3.68	0.00	91.77	N/A	N/A
2483.5	27.66	PK	V	25.86	3.67	0.00	57.19	74.00	16.81
2483.5	14.98	AV	V	25.86	3.67	0.00	44.51	54.00	9.49
4960	40.72	PK	V	31.00	5.34	27.43	49.63	74.00	24.37
4960	28.31	AV	V	31.00	5.34	27.43	37.22	54.00	16.78
7440	44.92	PK	V	34.66	6.89	25.97	60.50	74.00	13.50
7440	32.52	AV	V	34.66	6.89	25.97	48.10	54.00	5.90
9920	31.48	PK	V	36.71	8.71	26.66	50.24	74.00	23.76
9920	19.45	AV	V	36.71	8.71	26.66	38.21	54.00	15.79
3535	33.36	PK	V	28.88	4.51	27.25	39.50	74.00	34.50
3535	20.93	AV	V	28.88	4.51	27.25	27.07	54.00	26.93
359.8	32.3	OP	H	15.58	2.31	21.67	28.52	46.00	17.48

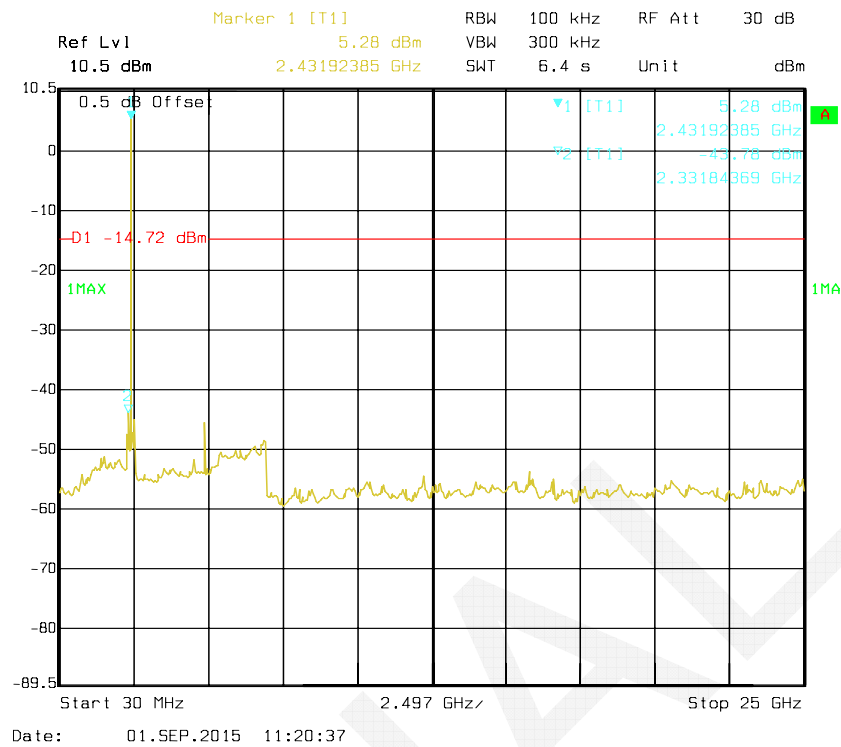
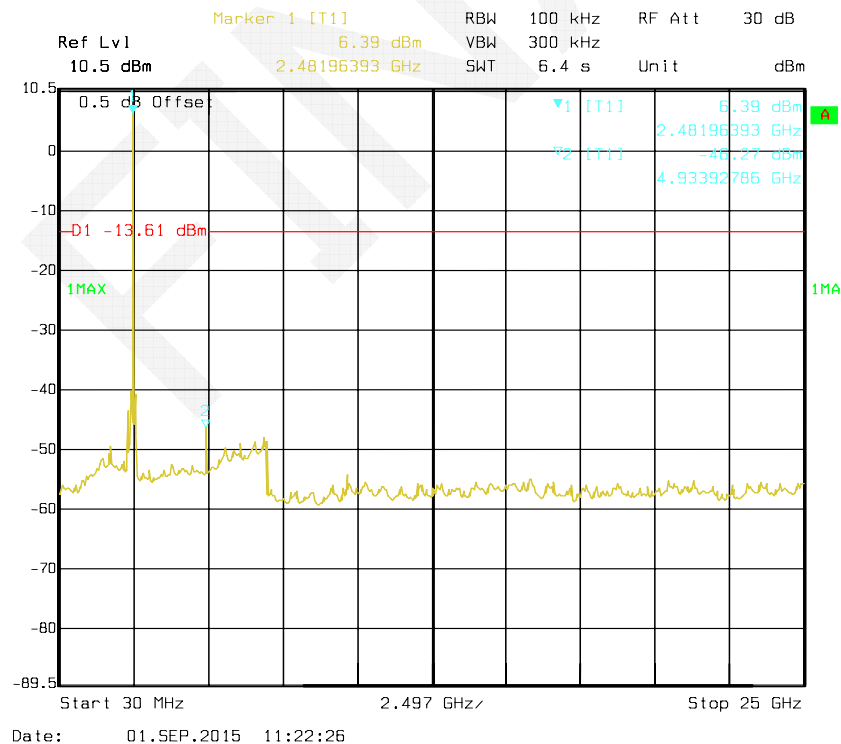
Conducted Spurious Emissions at Antenna Port*BDR Mode (GFSK):***Low Channel**

Date: 01.SEP.2015 11:17:15

Middle Channel

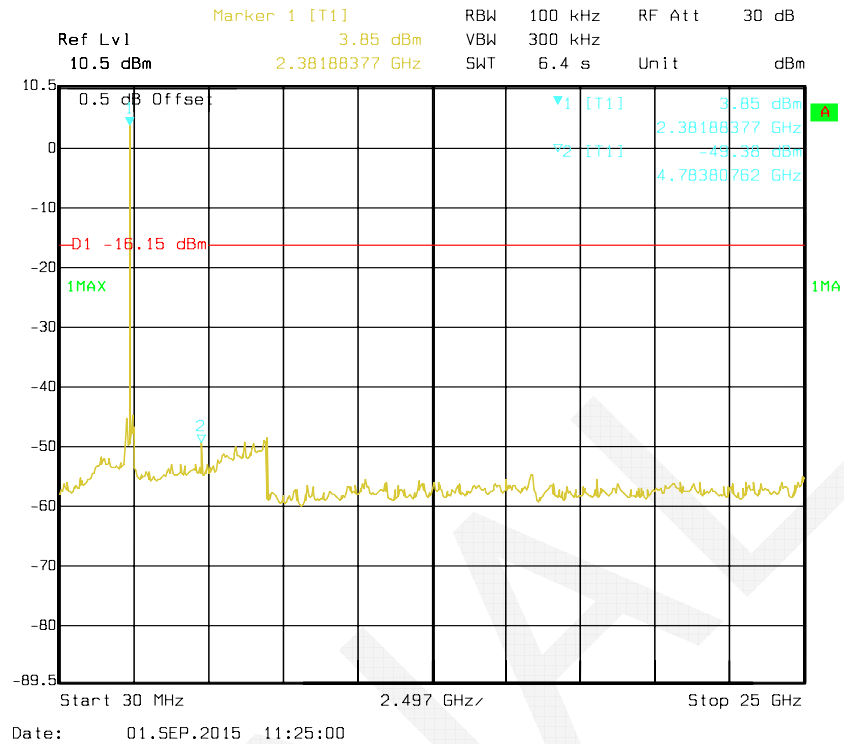
Date: 01.SEP.2015 11:12:41

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

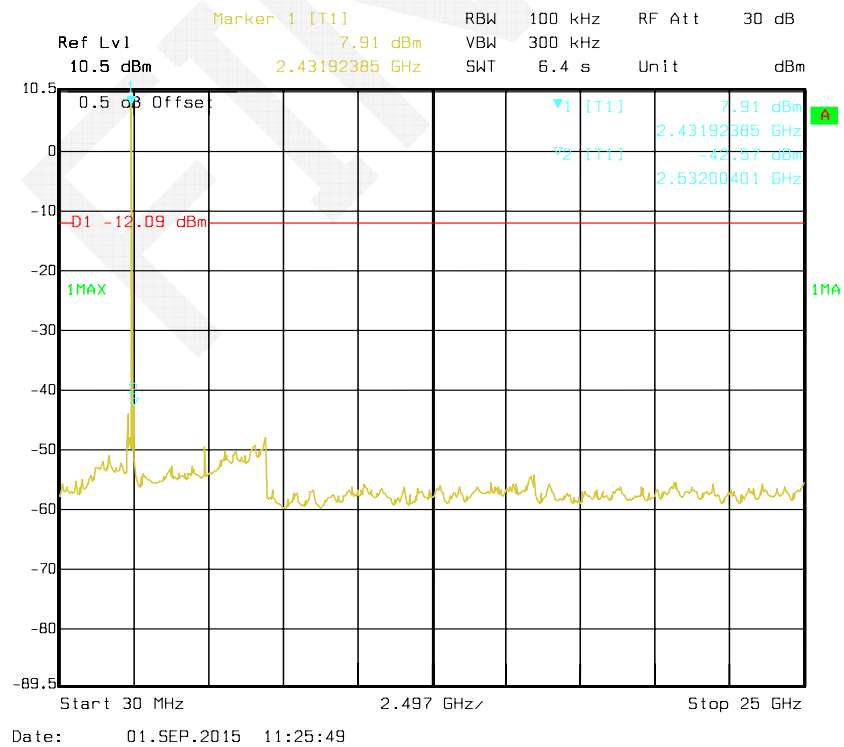
Middle Channel**High Channel**

EDR Mode (8-DPSK):

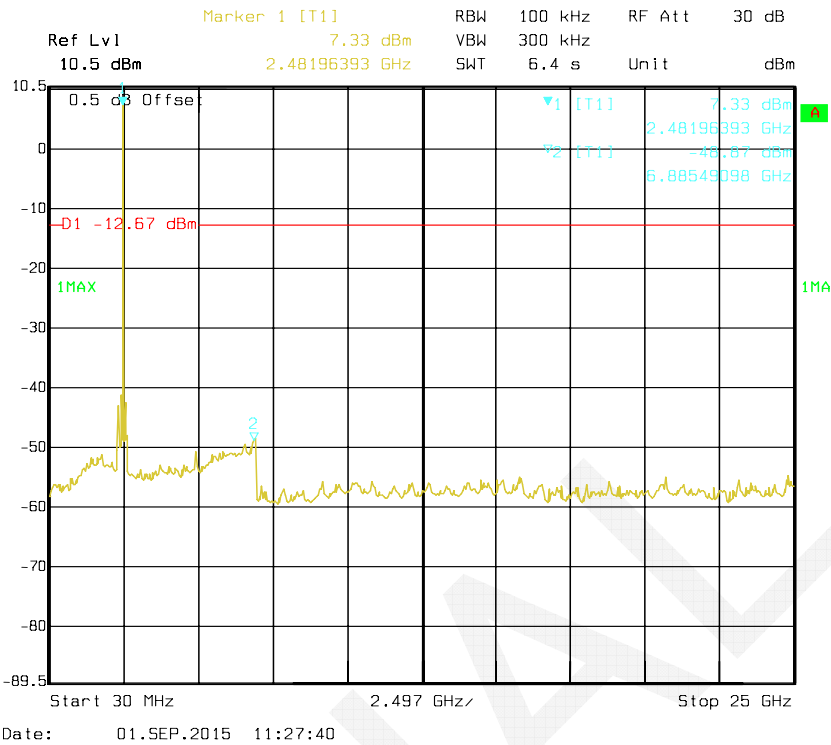
Low Channel



Middle Channel



High Channel



FCC §15.247(a) (1) - 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	FSP 38	100478	2015-05-09	2016-05-09

* **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

According to PUBLIC NOTICE DA 00-705
Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

Test Data**Environmental Conditions**

Temperature:	26.8°C
Relative Humidity:	56 %
ATM Pressure:	99.9 kPa

* The testing was performed by Rocky Xiao on 2015-08-31.

Test Result: Compliance.

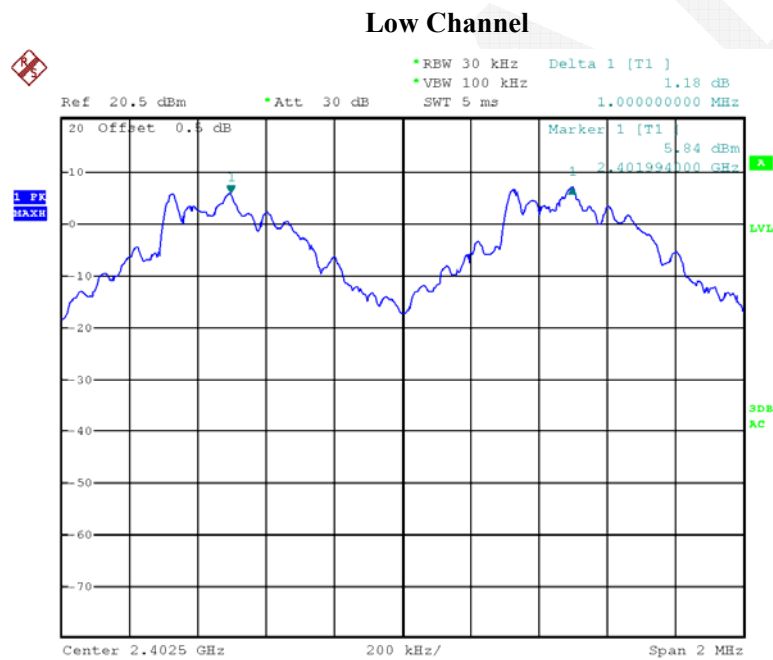
Please refer to following tables and plots

Test Mode: Transmitting

Mode	Channel	Frequency	Channel Separation	Limit	Result
		MHz	MHz	MHz	
BDR (GFSK)	Low	2402	1	0.62	Compliance
	Middle	2441	1.002		
	High	2480	1.002		
EDR ($\pi/4$ -DQPSK)	Low	2402	1.002	0.84	Compliance
	Middle	2441	1.004		
	High	2480	1.002		
EDR (8DPSK)	Low	2402	1.002	0.85	Compliance
	Middle	2441	1		
	High	2480	1.004		

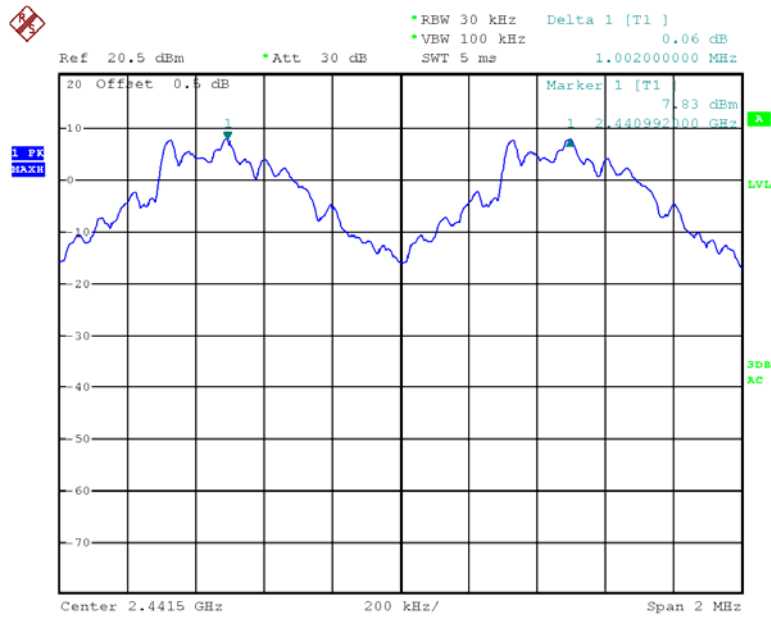
Note: Limit = $(2/3) * 20\text{dB bandwidth}$

BDR Mode (GFSK):



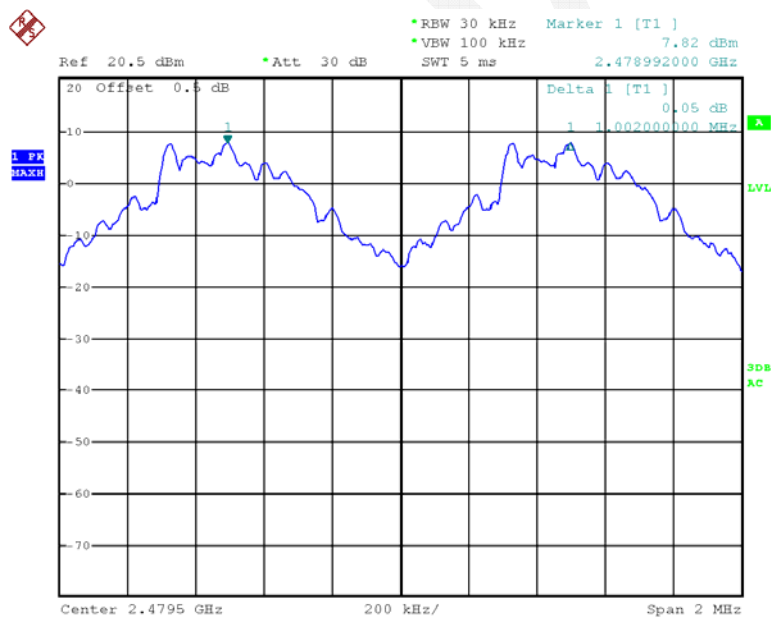
Date: 31.AUG.2015 16:39:58

Middle Channel



Date: 31.AUG.2015 16:40:39

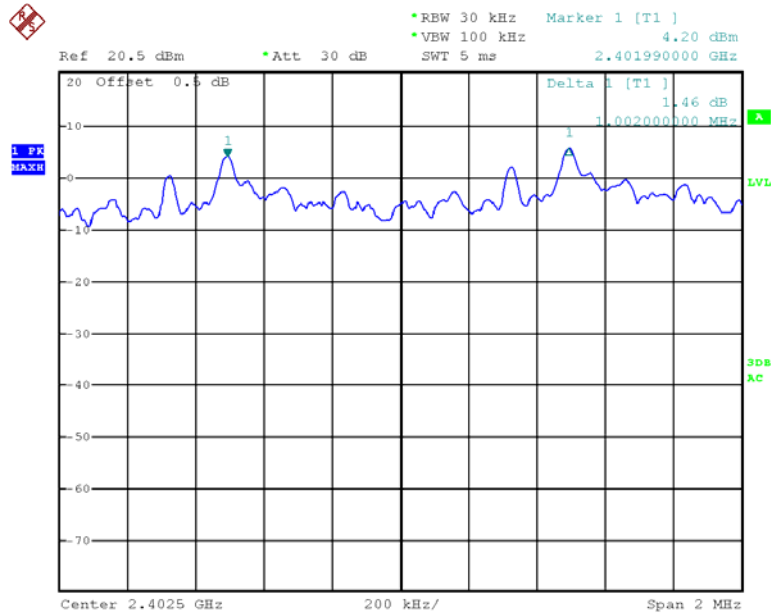
High Channel



Date: 31.AUG.2015 16:41:26

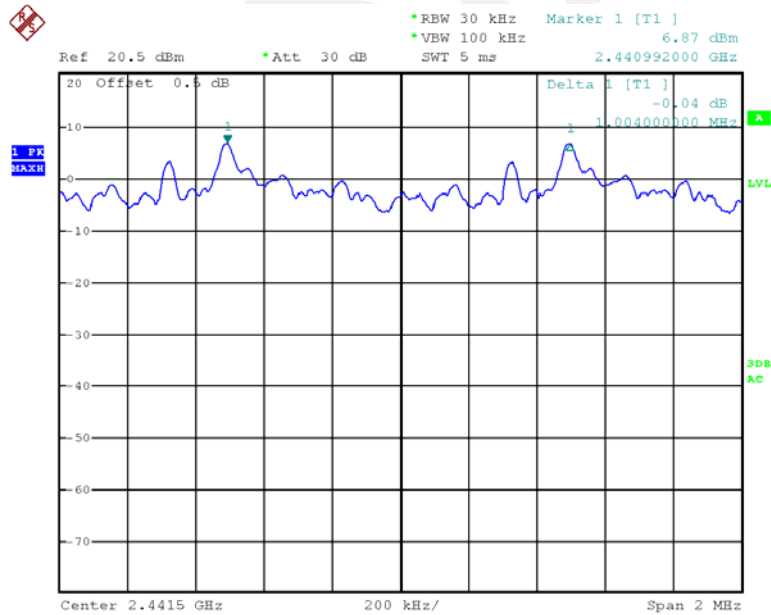
EDR Mode ($\pi/4$ -DQPSK):

Low Channel



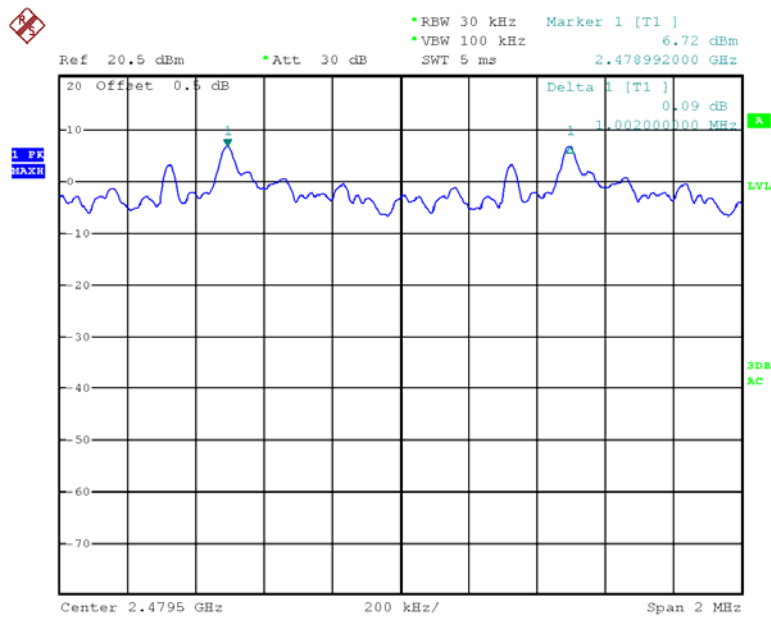
Date: 31.AUG.2015 16:45:16

Middle Channel



Date: 31.AUG.2015 16:46:14

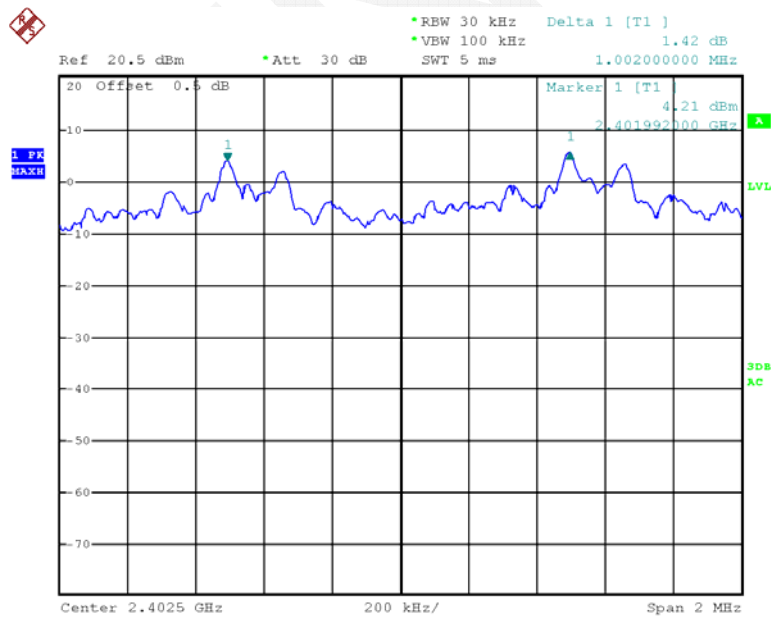
High Channel



Date: 31.AUG.2015 16:47:27

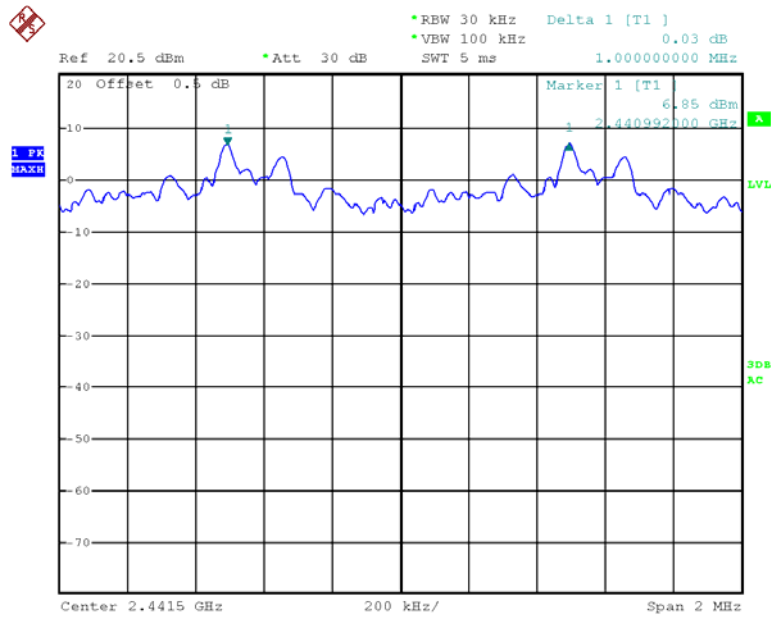
EDR Mode (8-DPSK):

Low Channel



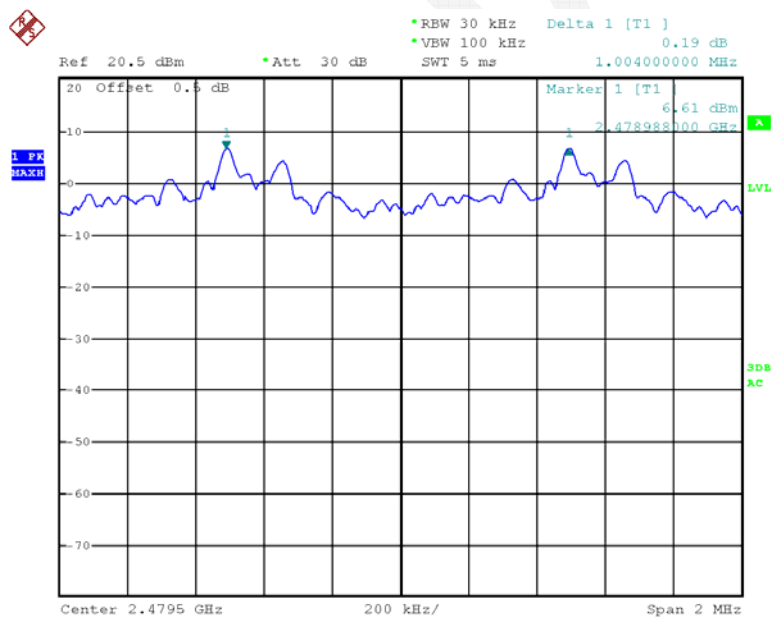
Date: 31.AUG.2015 16:50:39

Middle Channel



Date: 31.AUG.2015 16:50:02

High Channel



Date: 31.AUG.2015 16:49:19

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

According to PUBLIC NOTICE DA 00-705
Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09

* **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:	27.2°C
Relative Humidity:	54 %
ATM Pressure:	100.2 kPa

* The testing was performed by Rocky Xiao on 2015-09-01.

Test Result: Compliance.

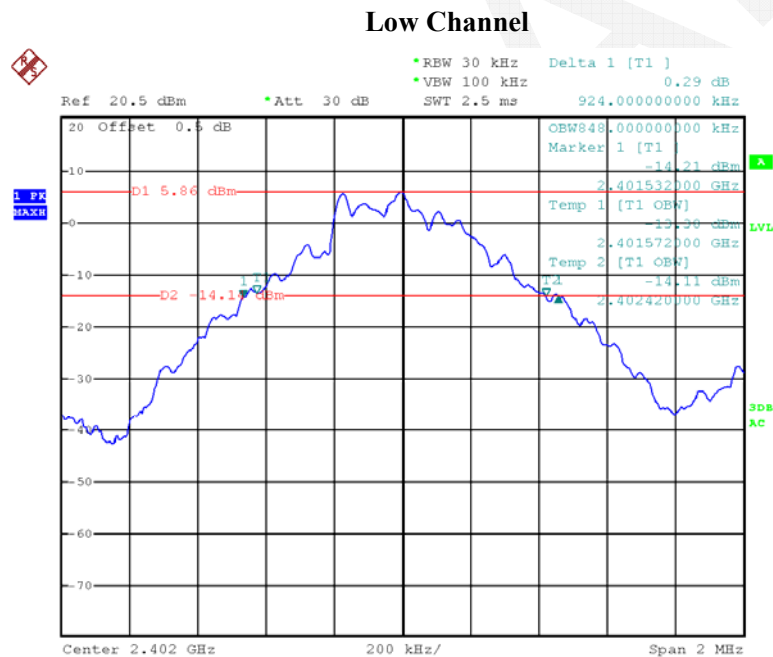
Please refer to following tables and plots

Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.924
	Middle	2441	0.888
	High	2480	0.88
EDR Mode ($\pi/4$ -DQPSK):	Low	2402	1.22
	Middle	2441	1.22
	High	2480	1.228
EDR Mode (8-DPSK):	Low	2402	1.212
	Middle	2441	1.212
	High	2480	1.212

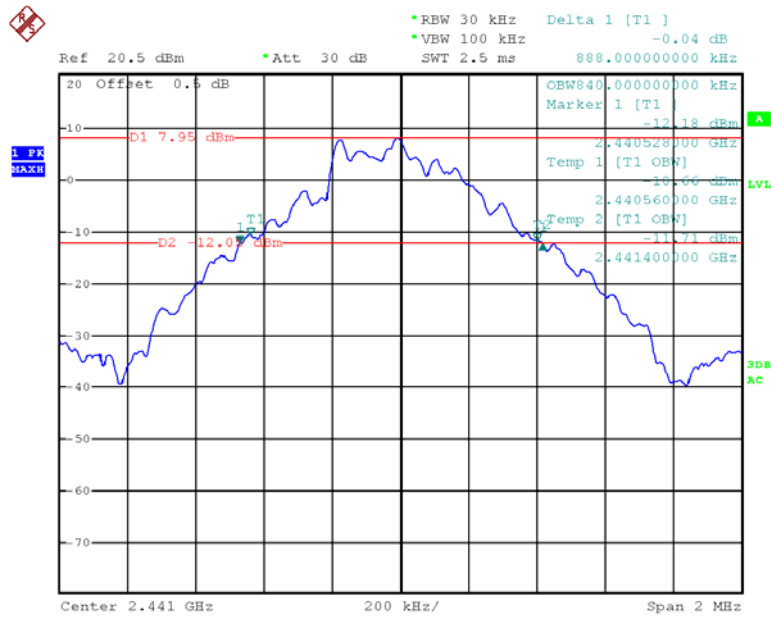
Please refer to the following plots.

BDR Mode (GFSK):



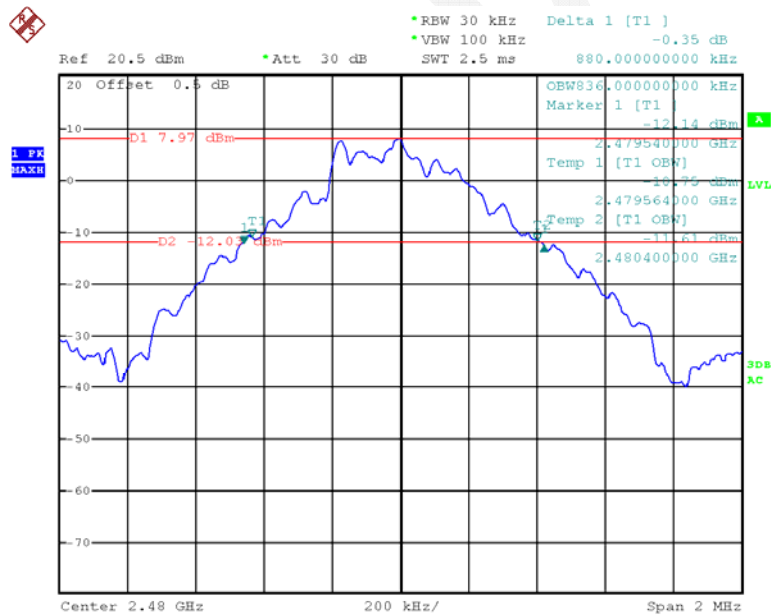
Date: 1.SEP.2015 11:32:23

Middle Channel

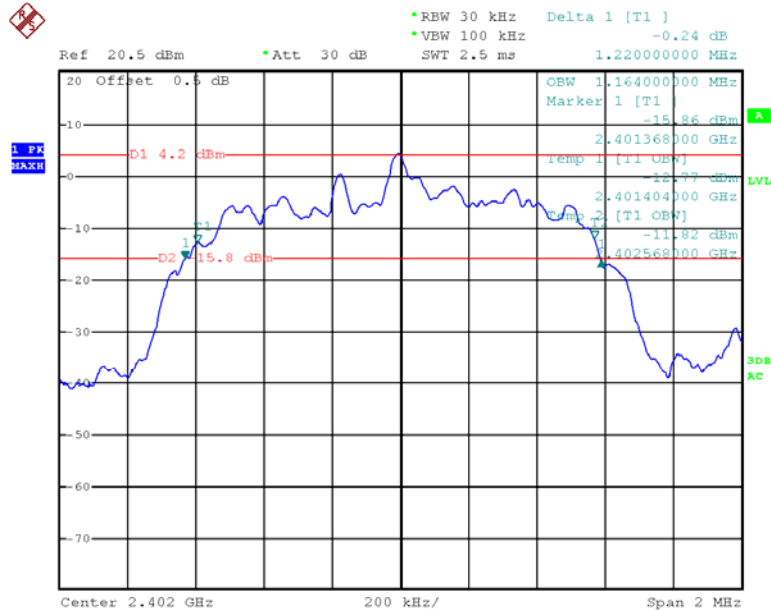


Date: 1.SEP.2015 11:30:49

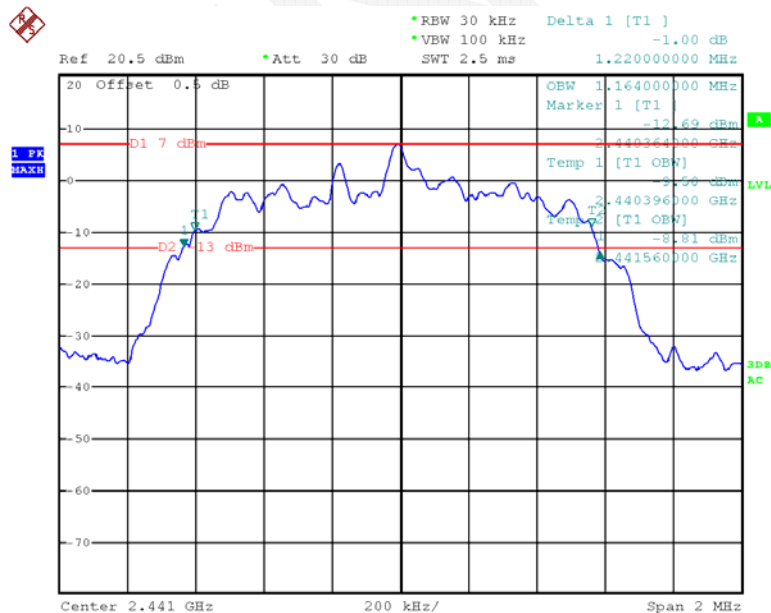
High Channel



Date: 1.SEP.2015 11:33:23

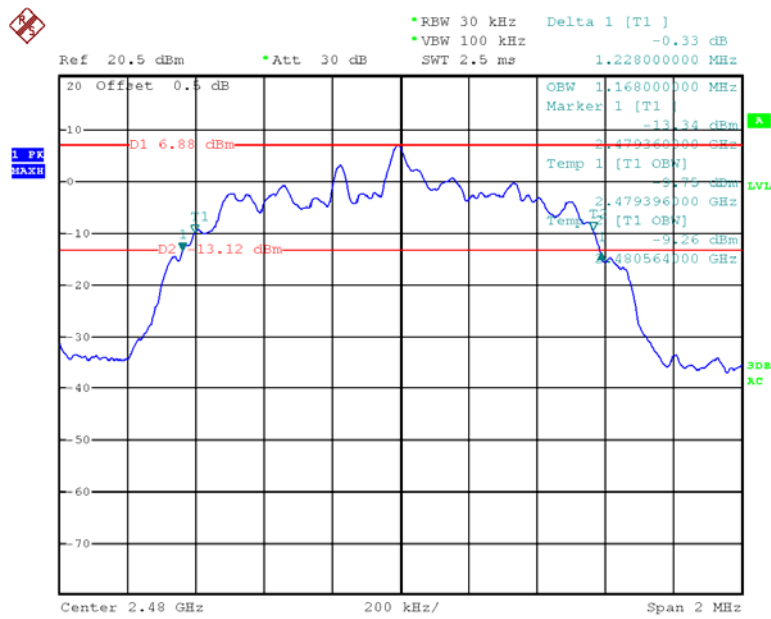
*EDR Mode ($\pi/4$ -DQPSK):***Low Channel**

Date: 1.SEP.2015 11:34:31

Middle Channel

Date: 1.SEP.2015 11:35:18

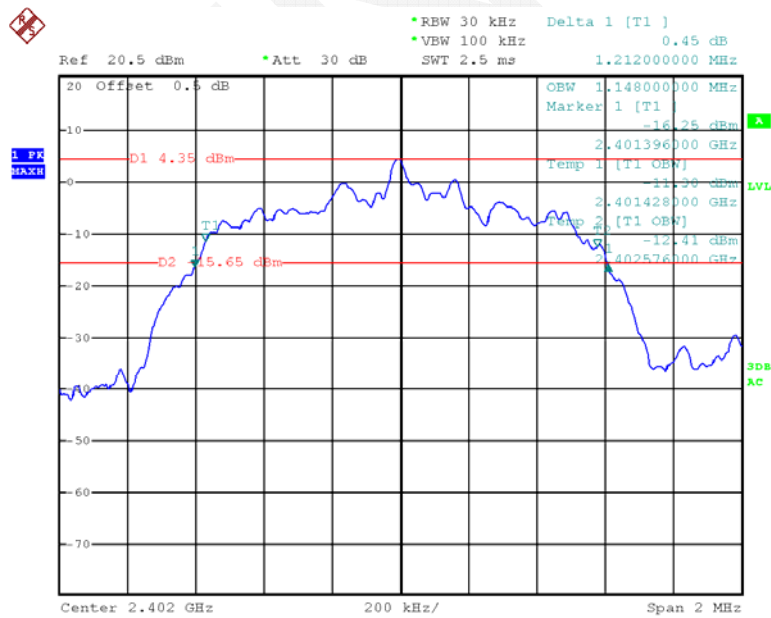
High Channel



Date: 1.SEP.2015 11:36:09

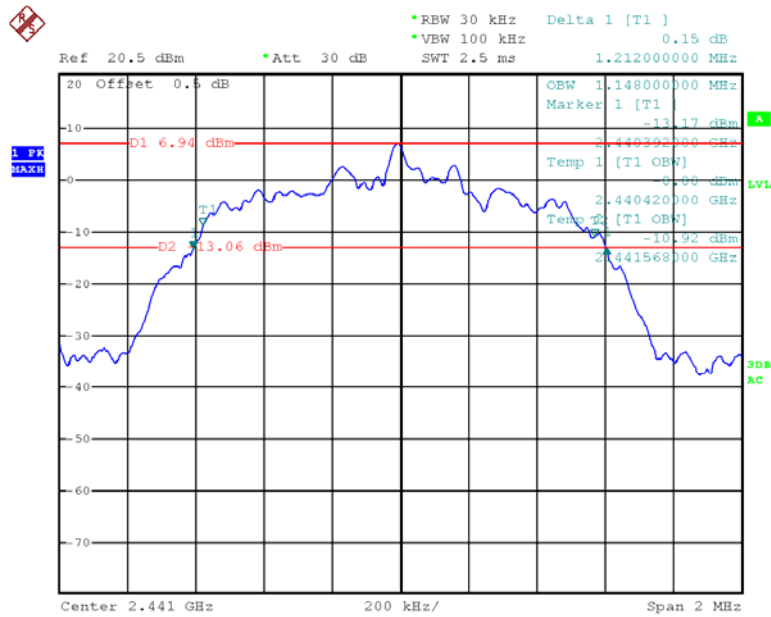
EDR Mode (8-DPSK):

Low Channel



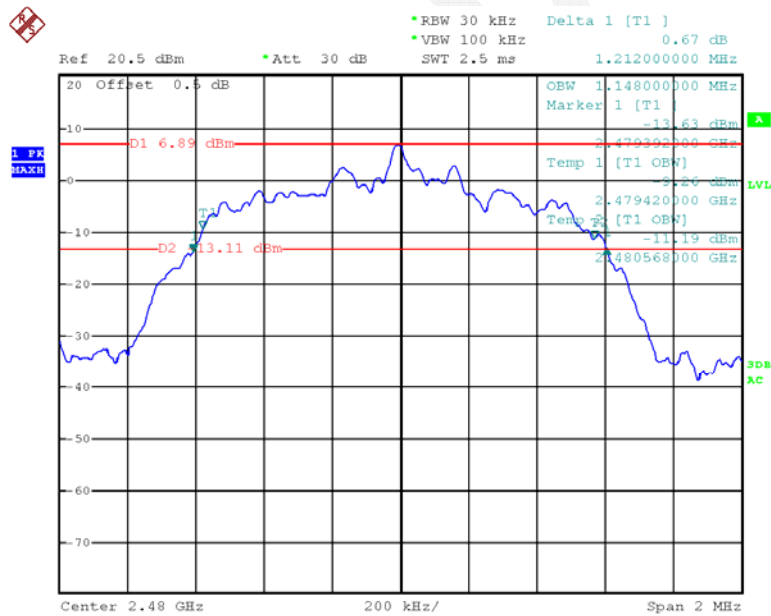
Date: 1.SEP.2015 11:41:41

Middle Channel



Date: 1.SEP.2015 11:38:44

High Channel



Date: 1.SEP.2015 11:39:30

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	FSP 38	100478	2015-05-09	2016-05-09

* **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:	26.8°C
Relative Humidity:	56 %
ATM Pressure:	99.9 kPa

* The testing was performed by Rocky Xiao on 2015-08-31.

Test Result: Compliance.

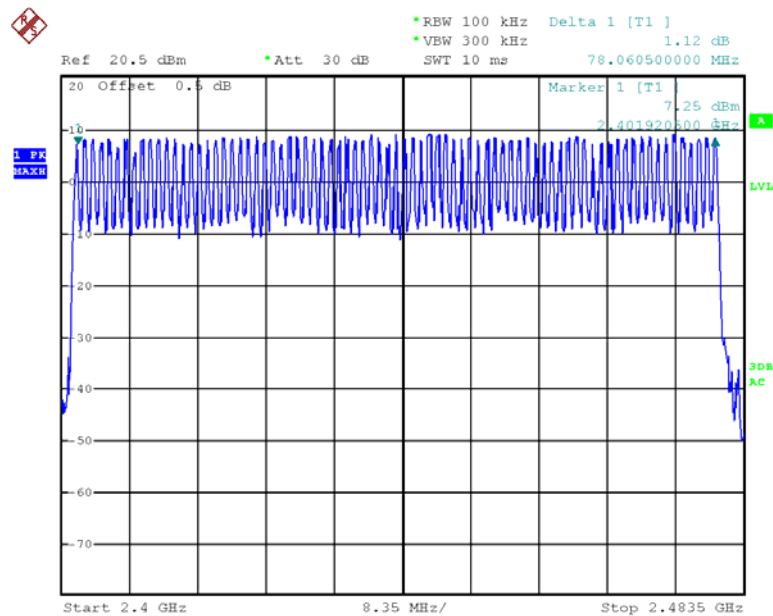
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

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

Number of Hopping Channels

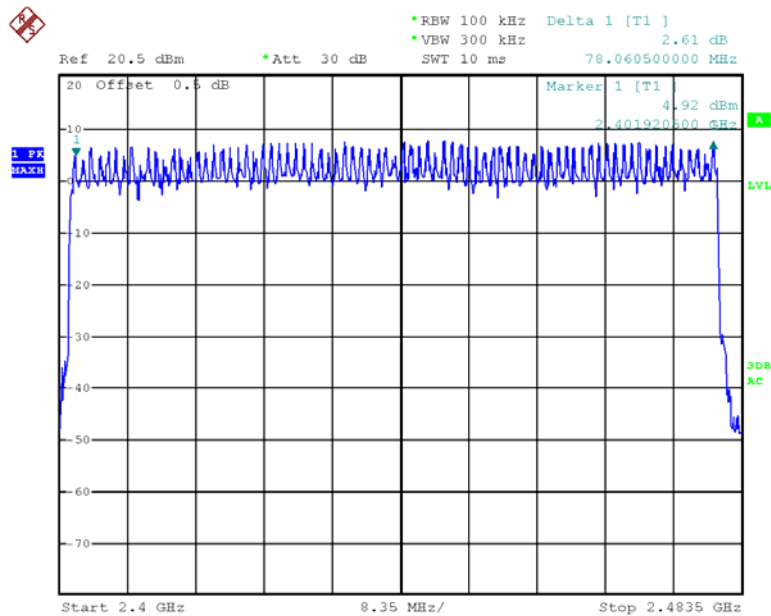


Date: 31.AUG.2015 16:54:52

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

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

Number of Hopping Channels

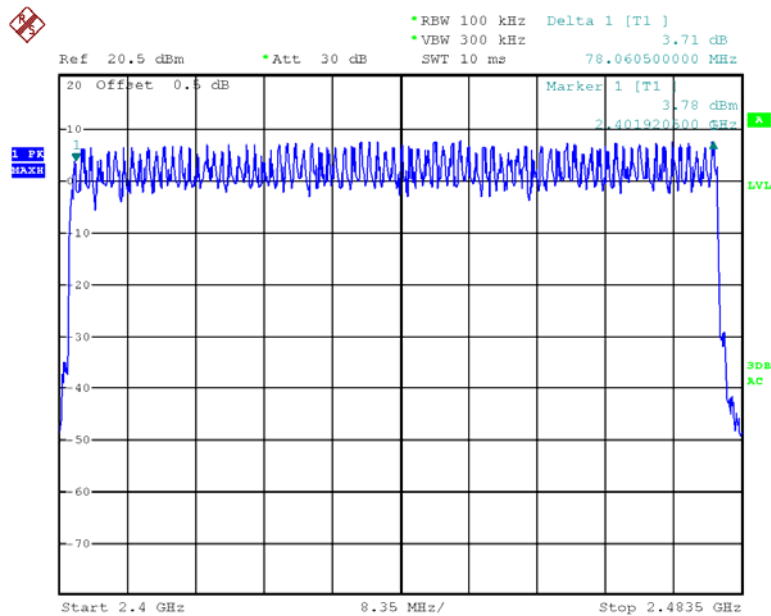


Date: 31.AUG.2015 16:57:19

EDR Mode (8-DPSK):

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

Number of Hopping Channels



Date: 31.AUG.2015 16:59:18

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	FSP 38	100478	2015-05-09	2016-05-09

* **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:	26.8°C
Relative Humidity:	56 %
ATM Pressure:	99.9 kPa

* The testing was performed by Rocky Xiao on 2015-08-31.

Test Result: Compliance.

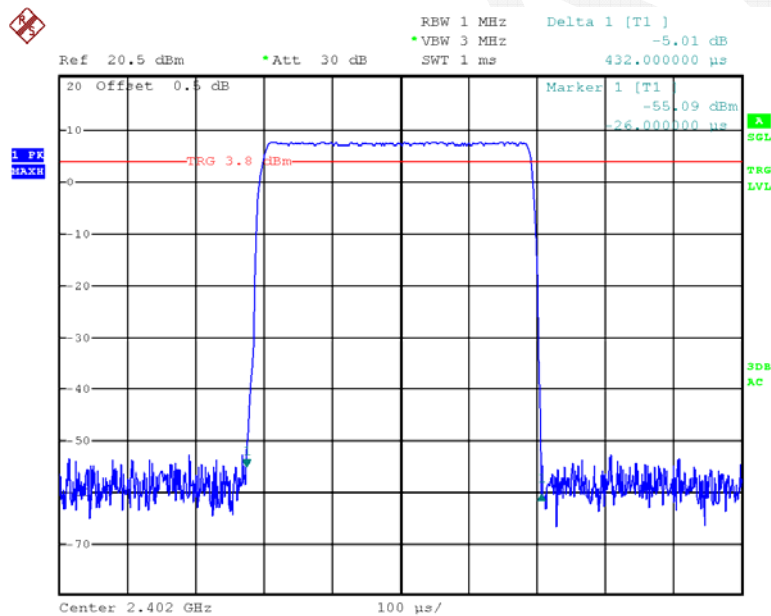
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

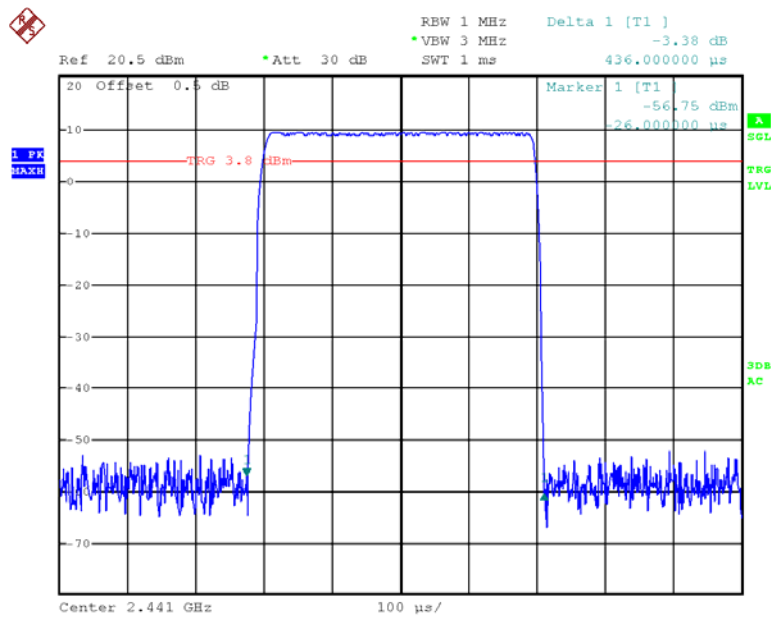
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.432	0.138	0.4	Pass
	Middle	0.436	0.140	0.4	Pass
	High	0.436	0.140	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.698	0.272	0.4	Pass
	Middle	1.698	0.272	0.4	Pass
	High	1.698	0.272	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	2.96	0.316	0.4	Pass
	Middle	2.97	0.317	0.4	Pass
	High	2.97	0.317	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

DH1: Low Channel



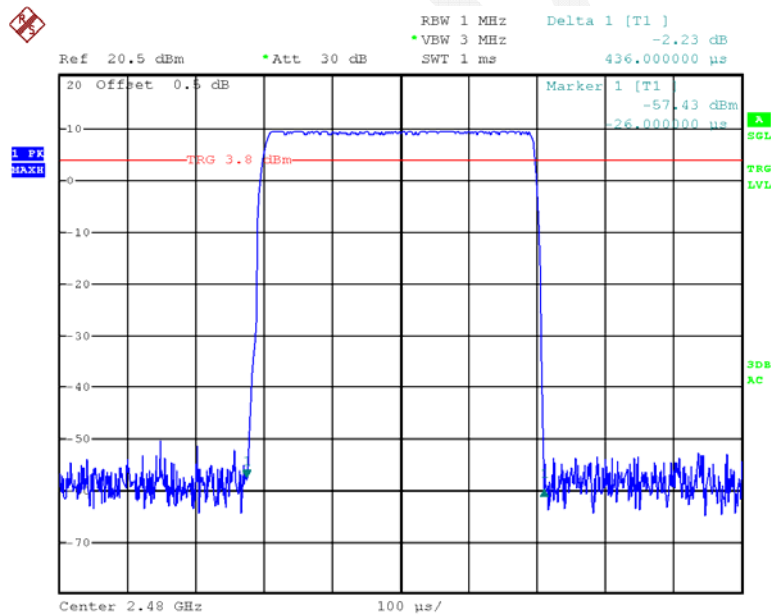
Date: 31.AUG.2015 17:50:26

DH1: Middle Channel



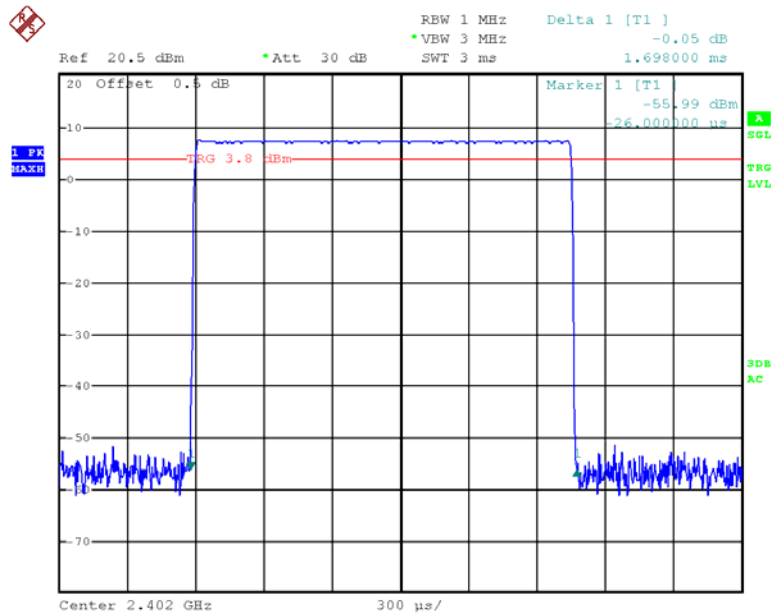
Date: 31.AUG.2015 17:50:58

DH1: High Channel



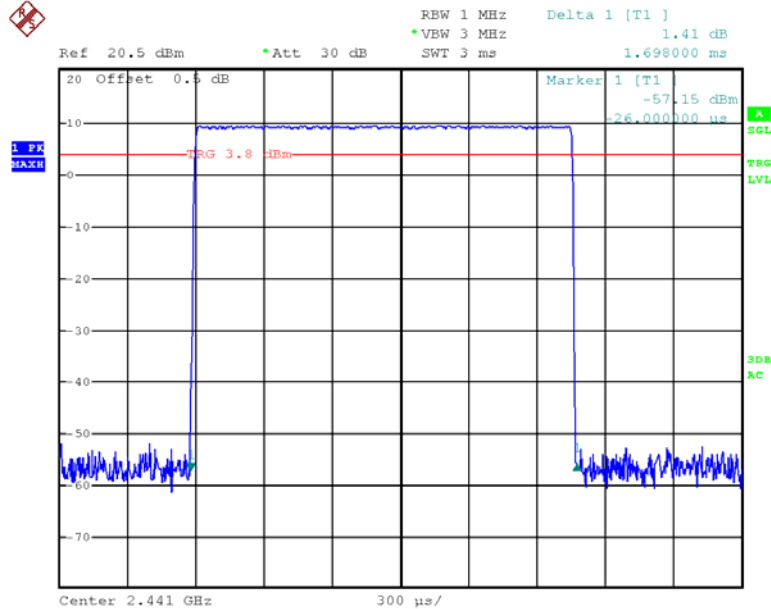
Date: 31.AUG.2015 17:51:04

DH3: Low Channel



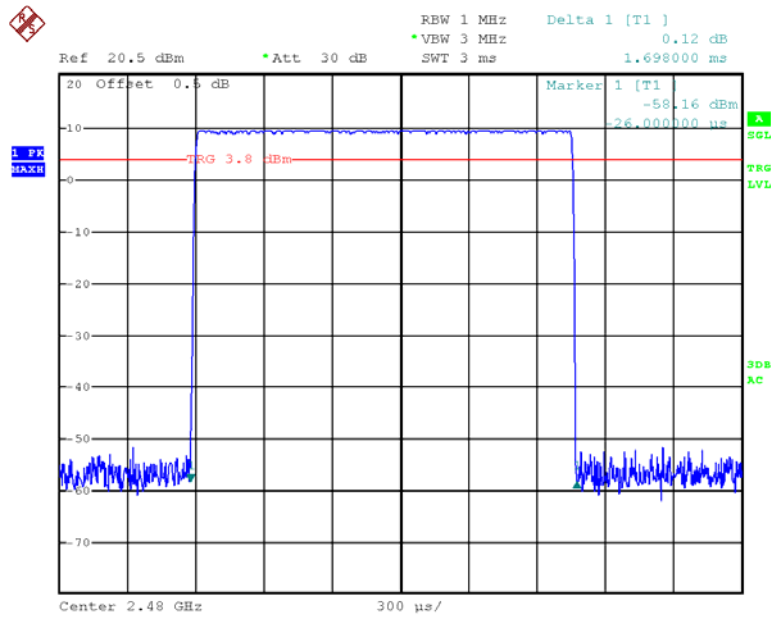
Date: 31.AUG.2015 18:01:52

DH3: Middle Channel



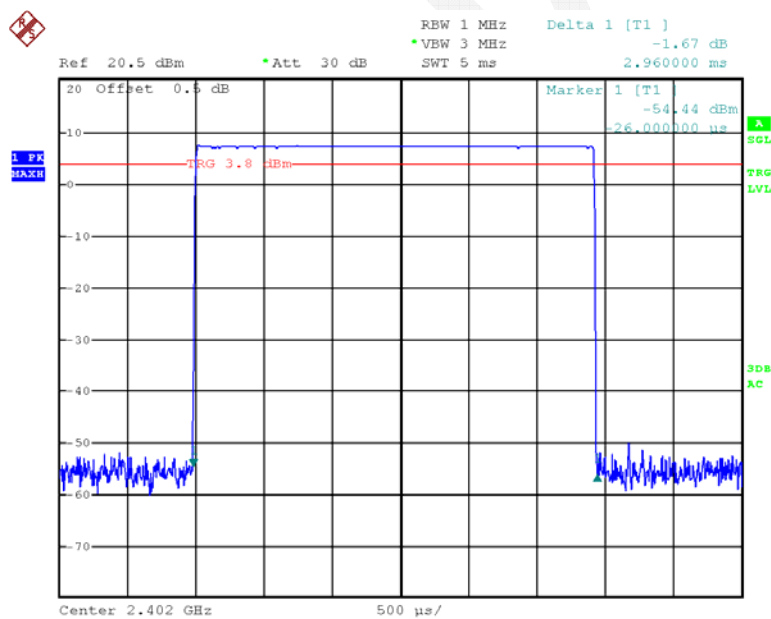
Date: 31.AUG.2015 18:01:44

DH3: High Channel



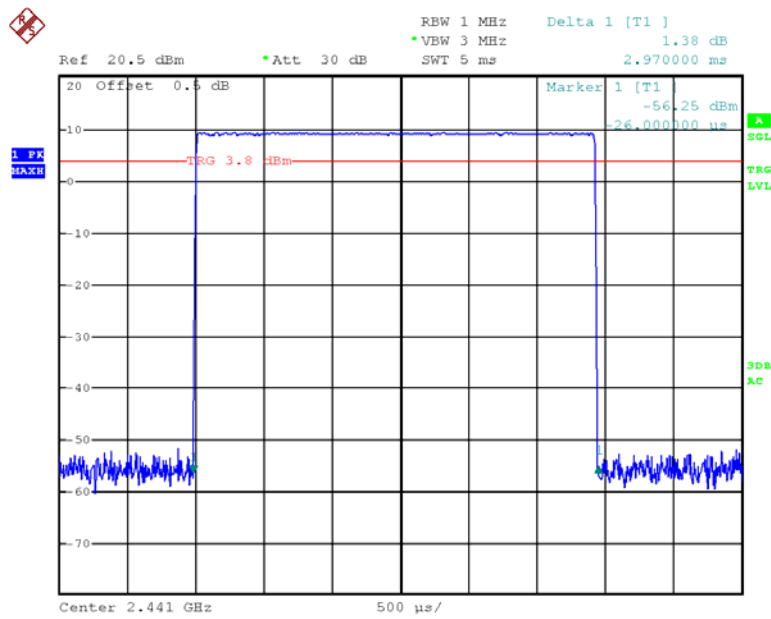
Date: 31.AUG.2015 18:01:35

DH5: Low Channel



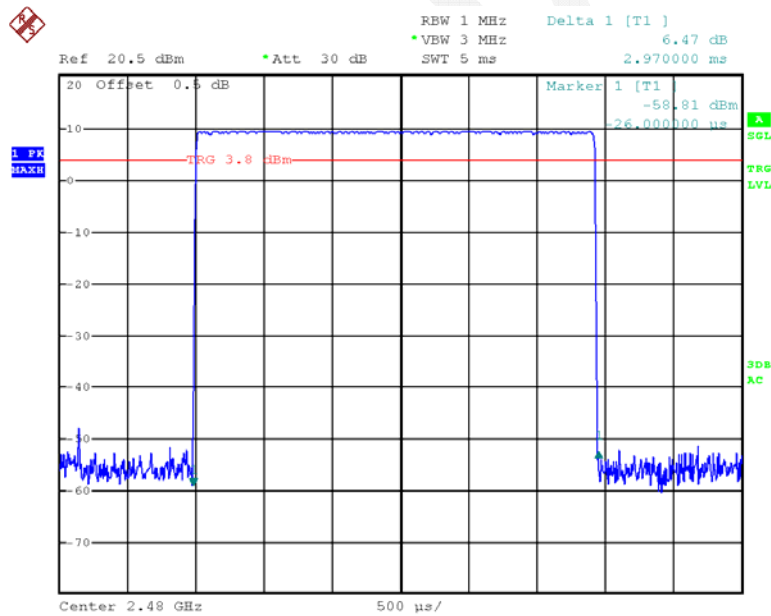
Date: 31.AUG.2015 18:06:19

DH5: Middle Channel



Date: 31.AUG.2015 18:06:32

DH5: High Channel

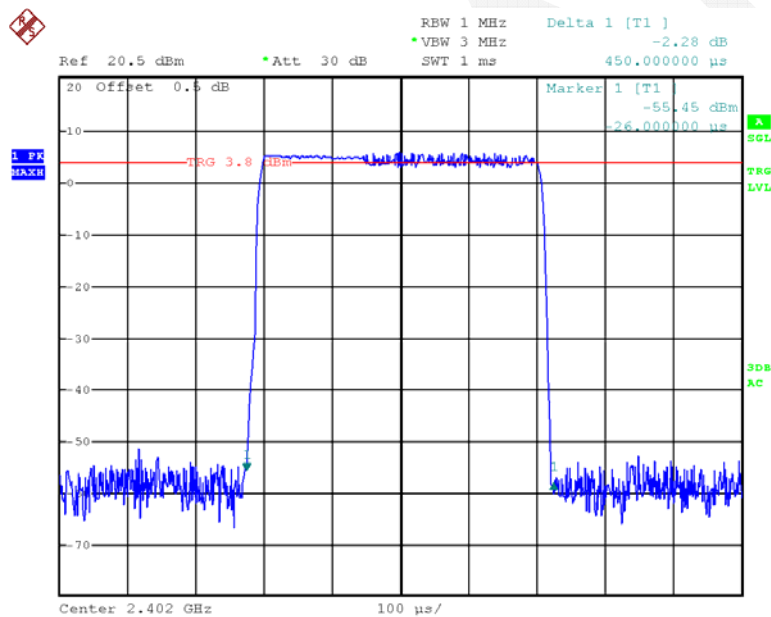


Date: 31.AUG.2015 18:07:10

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

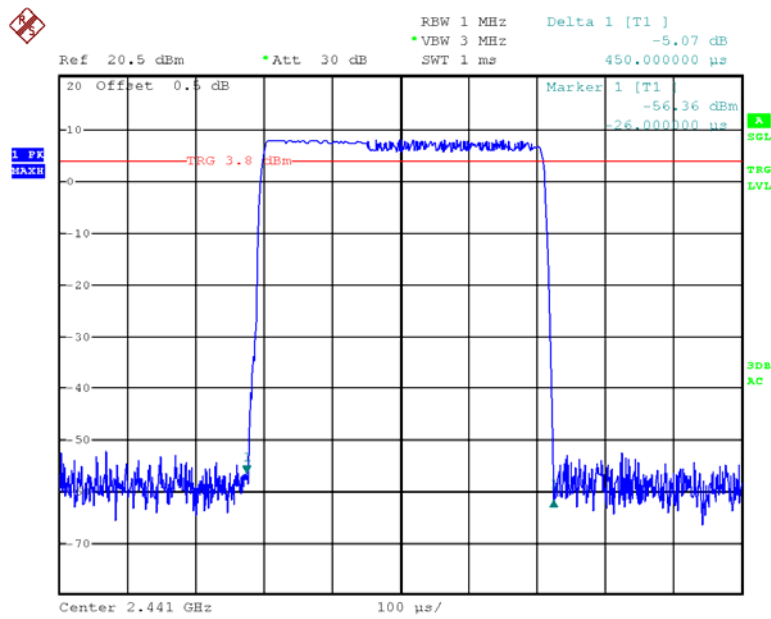
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.45	0.144	0.4	Pass
	Middle	0.45	0.144	0.4	Pass
	High	0.45	0.144	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.704	0.273	0.4	Pass
	Middle	1.71	0.274	0.4	Pass
	High	1.71	0.274	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	2.98	0.318	0.4	Pass
	Middle	2.98	0.318	0.4	Pass
	High	2.98	0.318	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

DH1: Low Channel



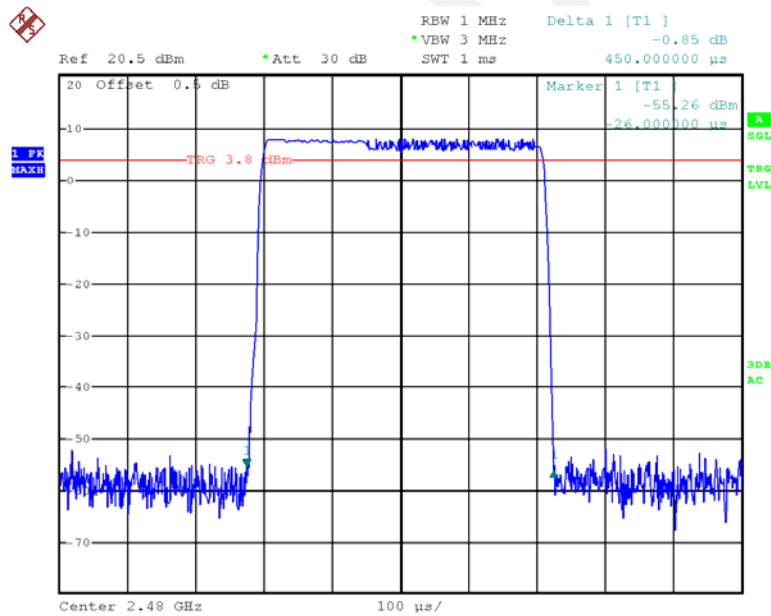
Date: 31.AUG.2015 17:52:25

DH1: Middle Channel



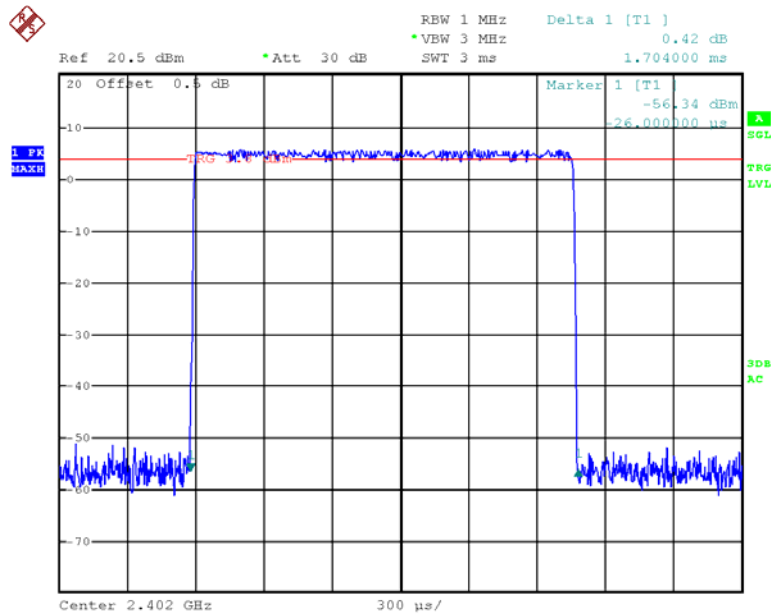
Date: 31.AUG.2015 17:52:31

DH1: High Channel



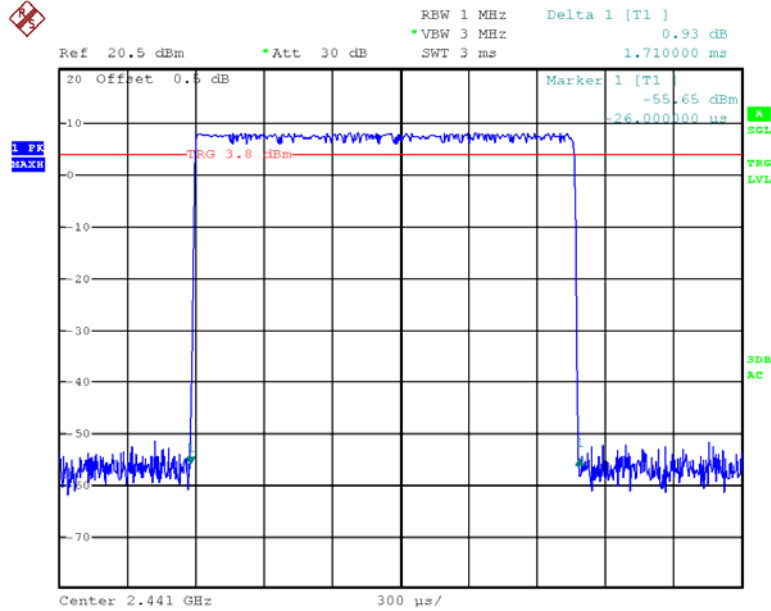
Date: 31.AUG.2015 17:52:36

DH3: Low Channel



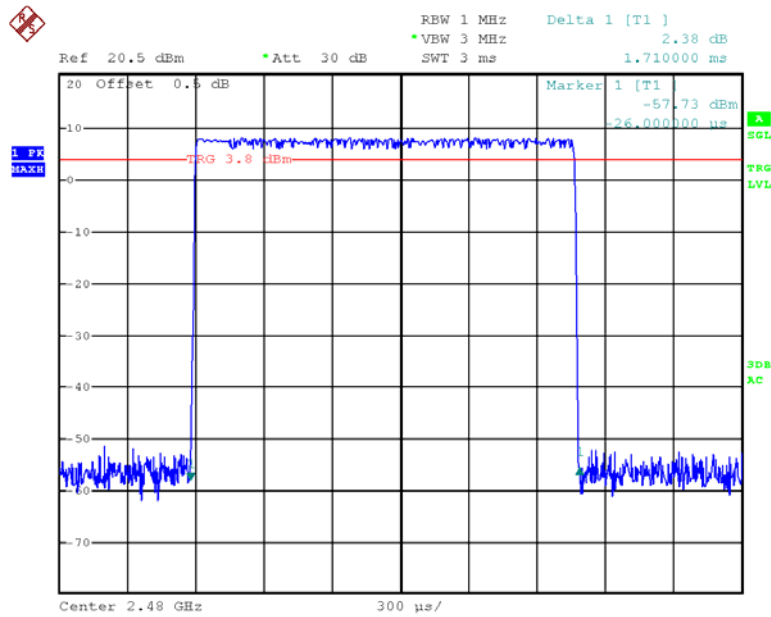
Date: 31.AUG.2015 18:02:29

DH3: Middle Channel



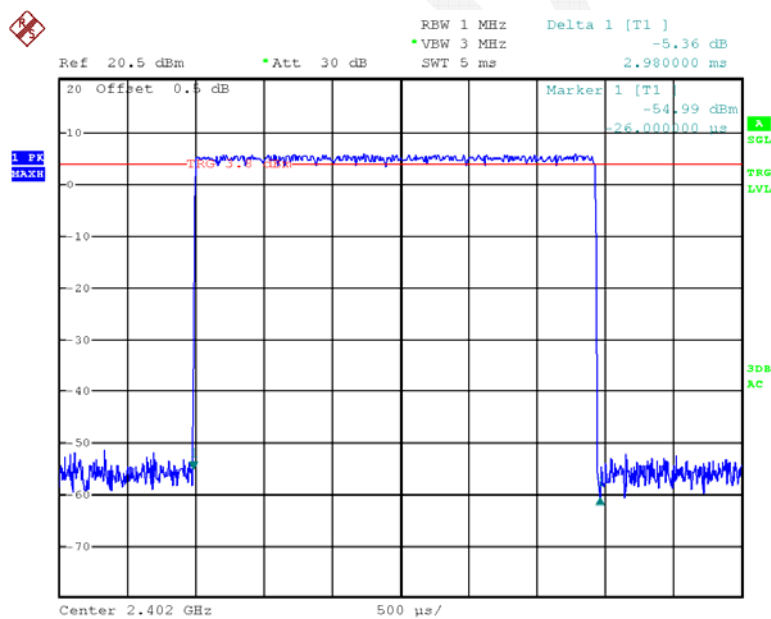
Date: 31.AUG.2015 18:02:42

DH3: High Channel



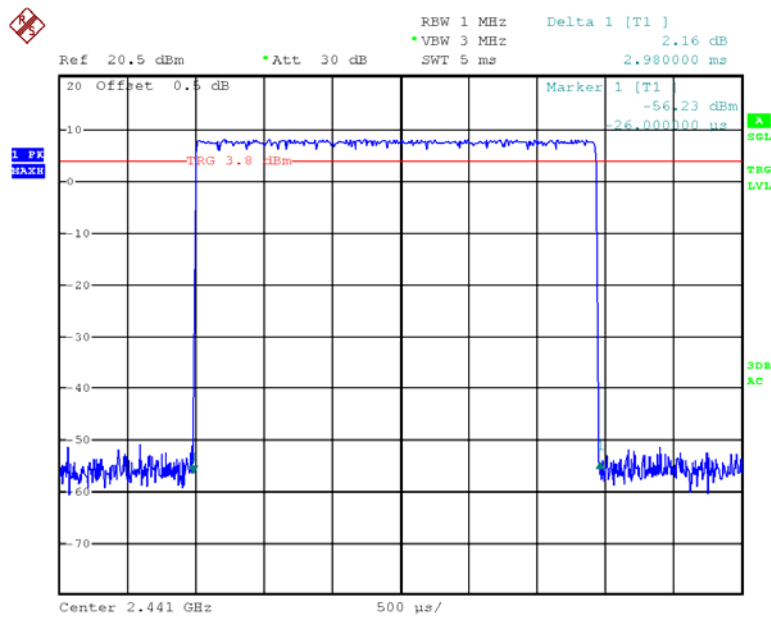
Date: 31.AUG.2015 18:02:48

DH5: Low Channel



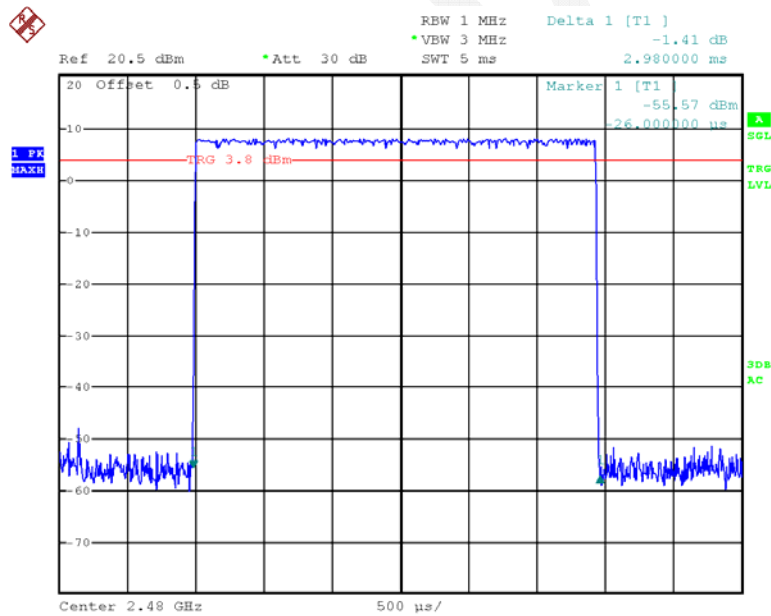
Date: 31.AUG.2015 18:05:39

DH5: Middle Channel



Date: 31.AUG.2015 18:05:32

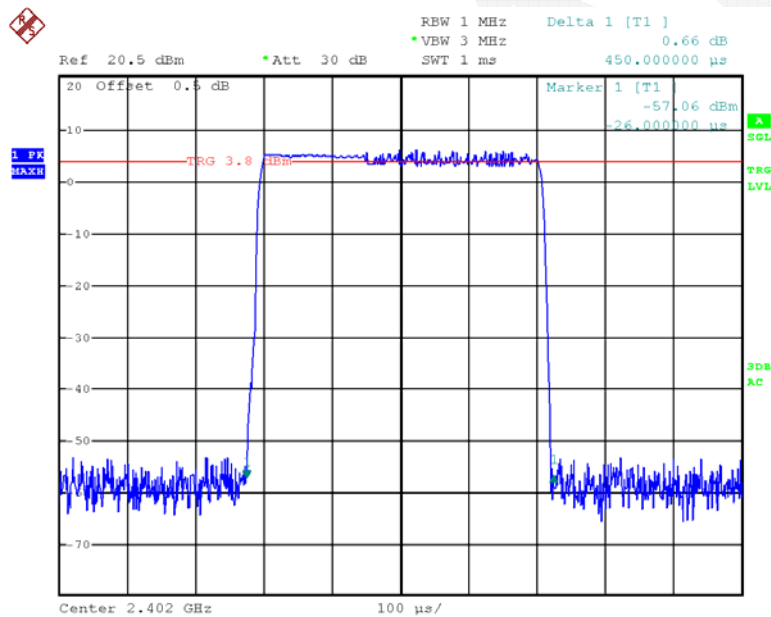
DH5: High Channel



Date: 31.AUG.2015 18:05:27

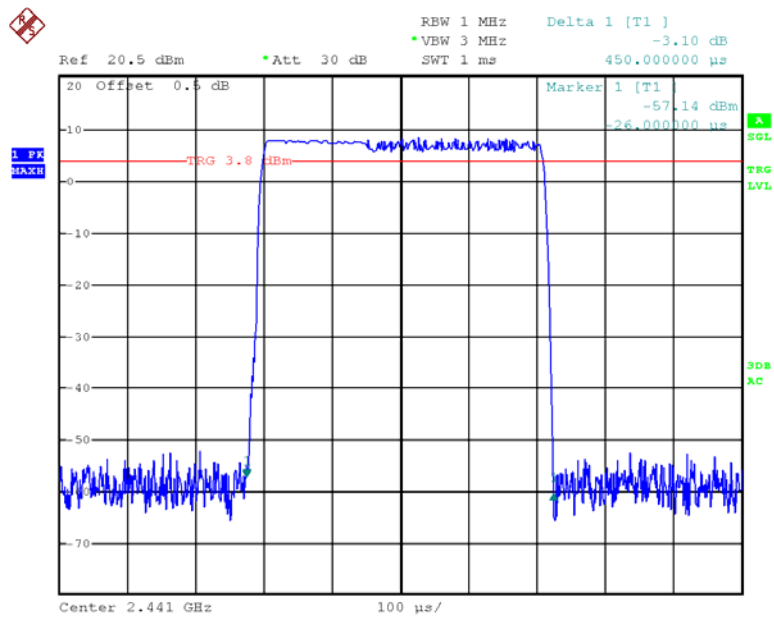
EDR Mode (8-DPSK):

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.45	0.144	0.4	Pass
	Middle	0.45	0.144	0.4	Pass
	High	0.45	0.144	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.71	0.274	0.4	Pass
	Middle	1.71	0.274	0.4	Pass
	High	1.71	0.274	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	2.97	0.317	0.4	Pass
	Middle	2.98	0.318	0.4	Pass
	High	2.98	0.318	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

DH1: Low Channel

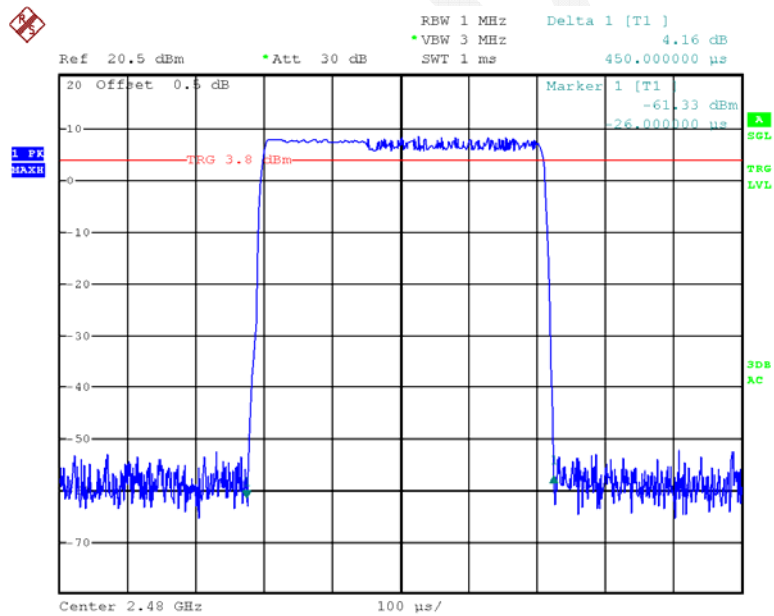
Date: 31.AUG.2015 17:53:03

DH1: Middle Channel



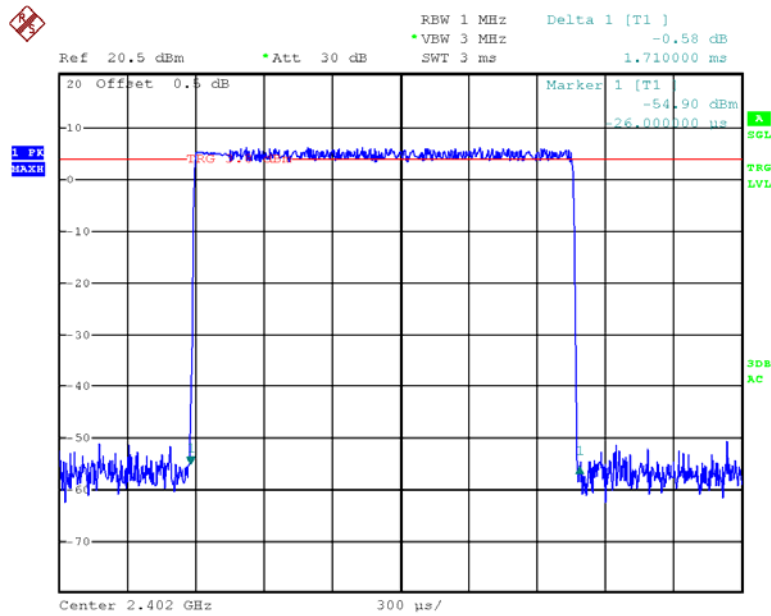
Date: 31.AUG.2015 17:53:09

DH1: High Channel



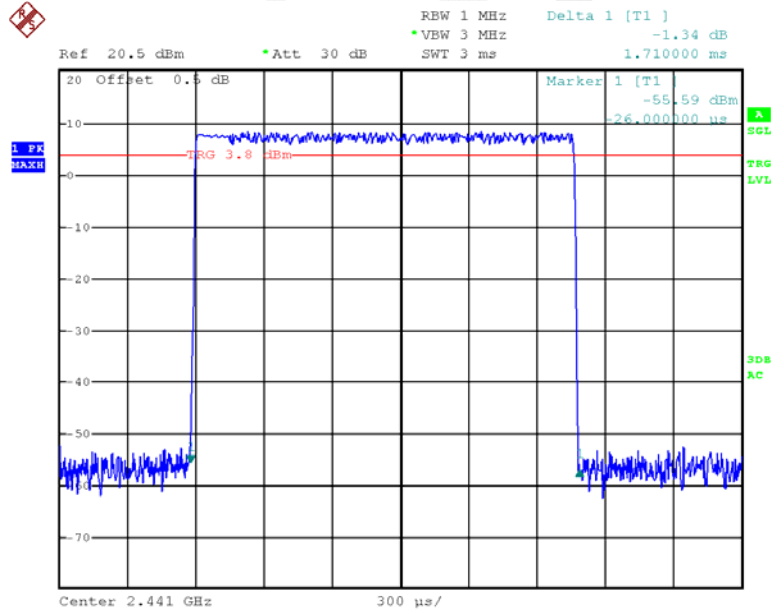
Date: 31.AUG.2015 17:53:21

DH3: Low Channel



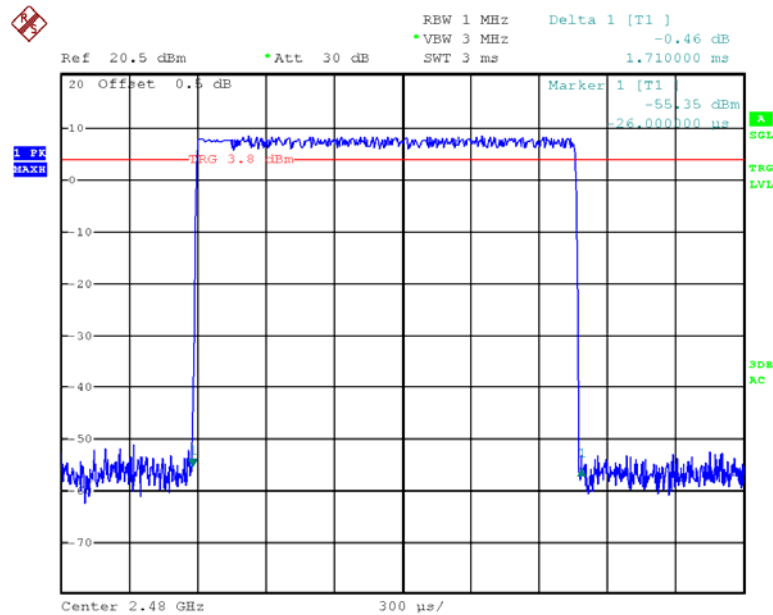
Date: 31.AUG.2015 18:03:26

DH3: Middle Channel



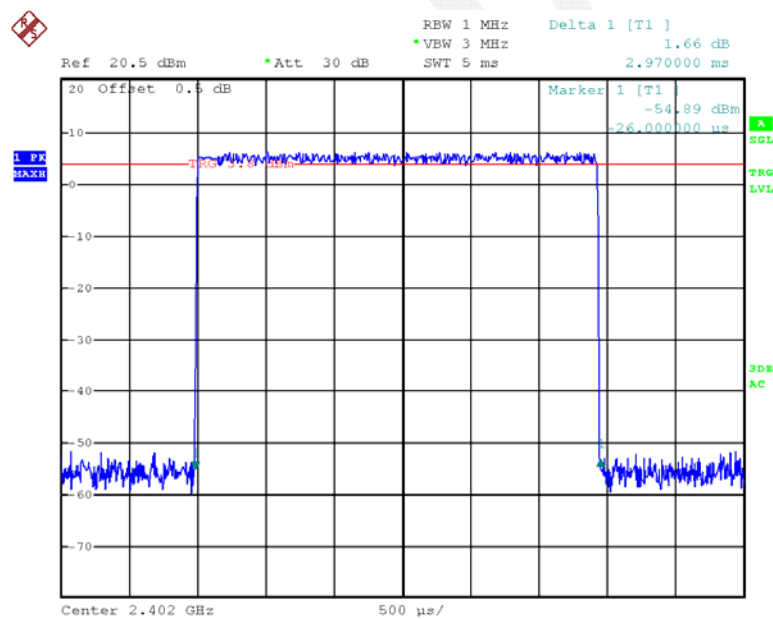
Date: 31.AUG.2015 18:03:18

DH3: High Channel



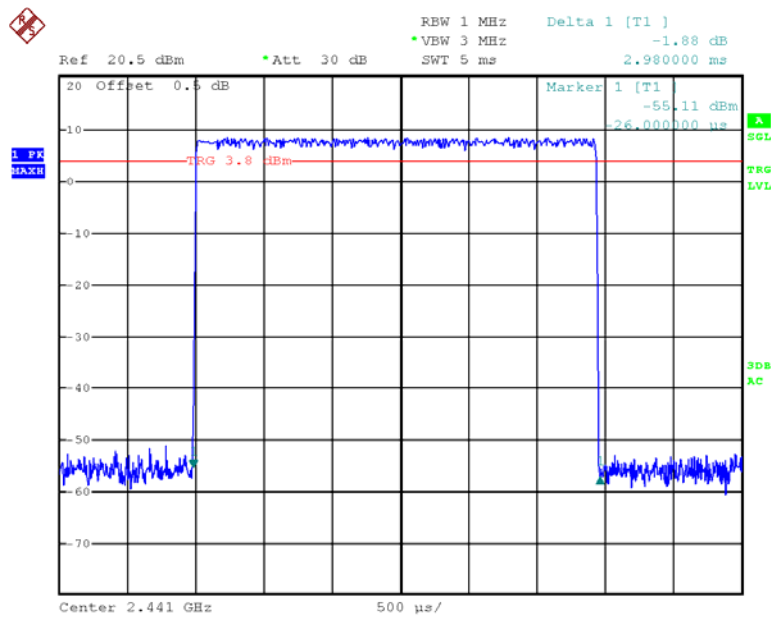
Date: 31.AUG.2015 18:03:10

DH5: Low Channel



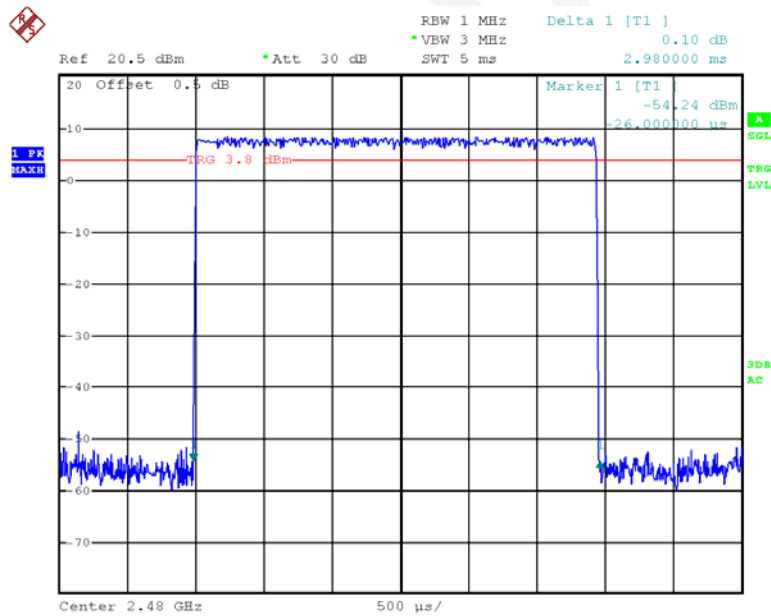
Date: 31.AUG.2015 18:04:32

DH5: Middle Channel



Date: 31.AUG.2015 18:04:43

DH5: High Channel



Date: 31.AUG.2015 18:04:50

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

According to PUBLIC NOTICE DA 00-705

Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

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 test equipment.
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	FSP 38	100478	2015-05-09	2016-05-09

* **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:	26.8°C
Relative Humidity:	56 %
ATM Pressure:	99.9 kPa

* The testing was performed by Rocky Xiao on 2015-08-31.

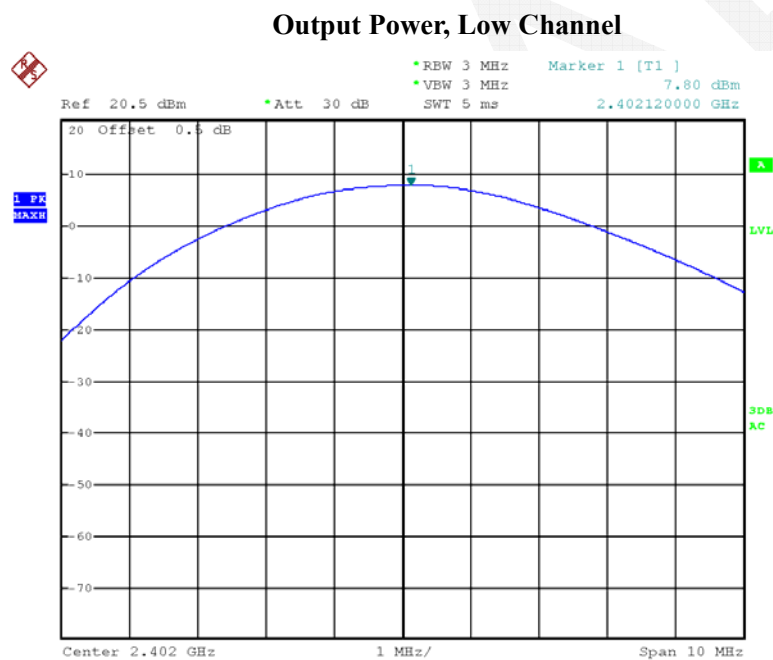
Test Result: Compliance.

Test Mode: Transmitting

Mode	Channel	Frequency	Output power	Limit
		MHz	dBm	dBm
BDR (GFSK)	Low	2402	7.8	30
	Middle	2441	9.52	30
	High	2480	9.55	30
EDR ($\pi/4$ -DQPSK)	Low	2402	6.46	30
	Middle	2441	8.72	30
	High	2480	8.66	30
EDR (8DPSK)	Low	2402	6.99	30
	Middle	2441	8.95	30
	High	2480	8.94	30

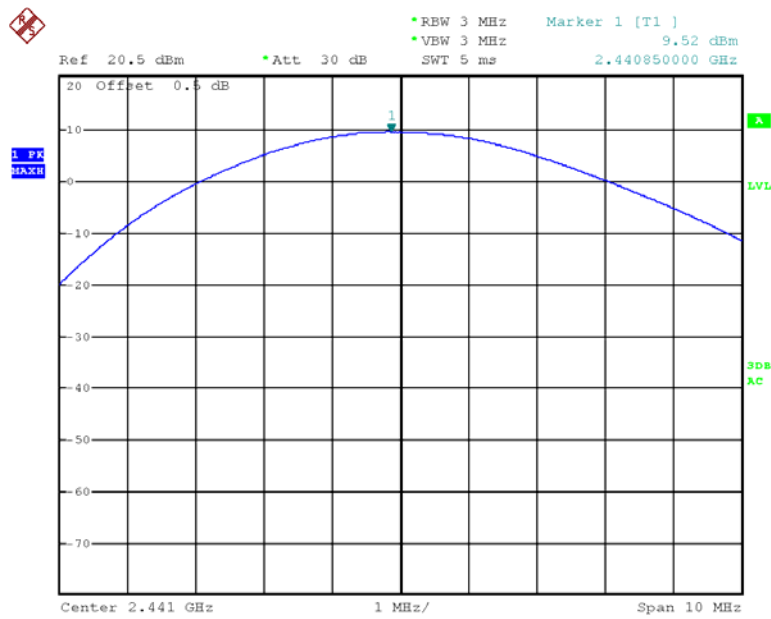
Note: The data above was tested in conducted mode.

BDR Mode (GFSK):



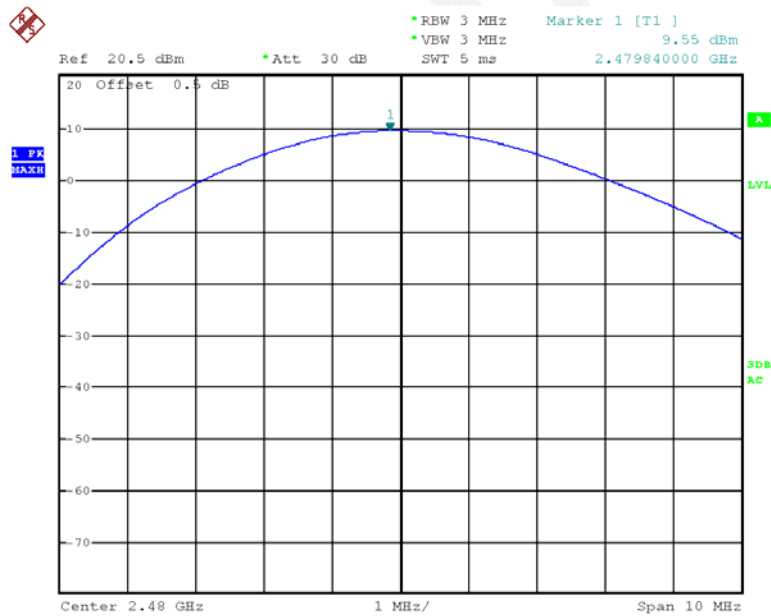
Date: 31.AUG.2015 16:33:47

Output Power, Middle Channel



Date: 31.AUG.2015 16:34:01

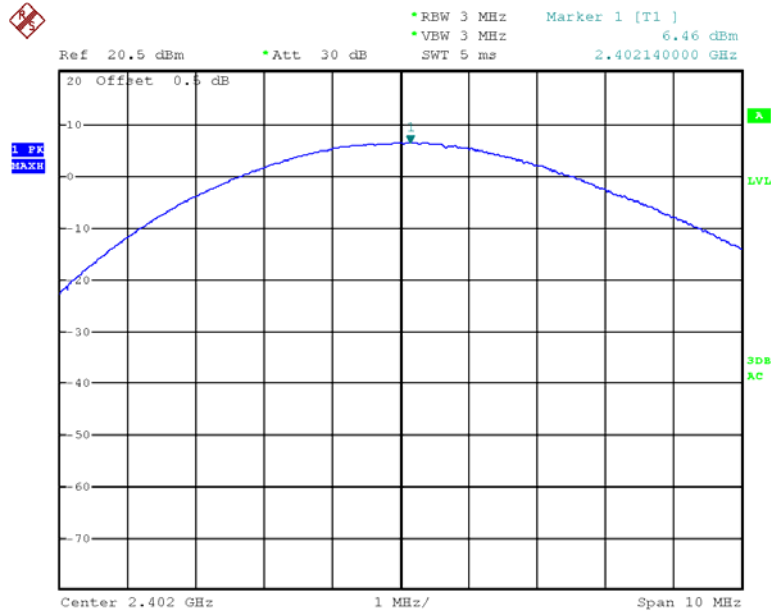
Output Power, High Channel



Date: 31.AUG.2015 16:34:18

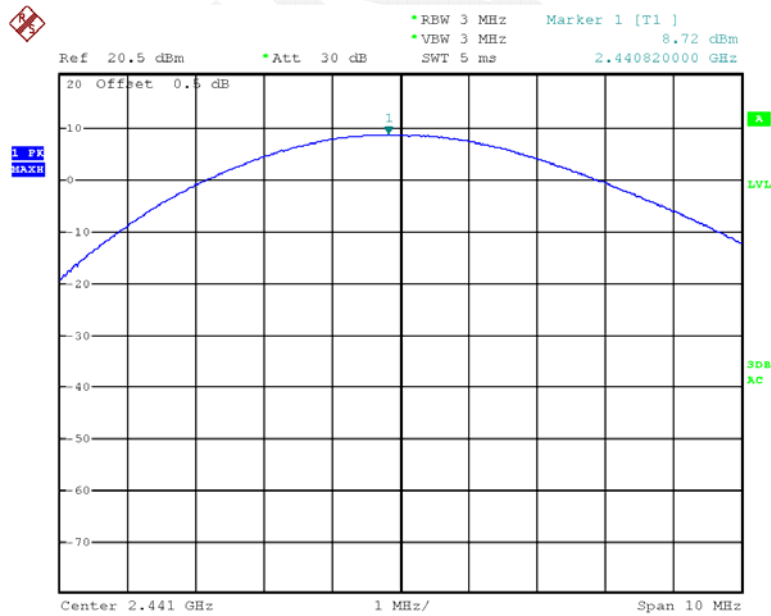
EDR Mode ($\pi/4$ -DQPSK):

Output Power, Low Channel



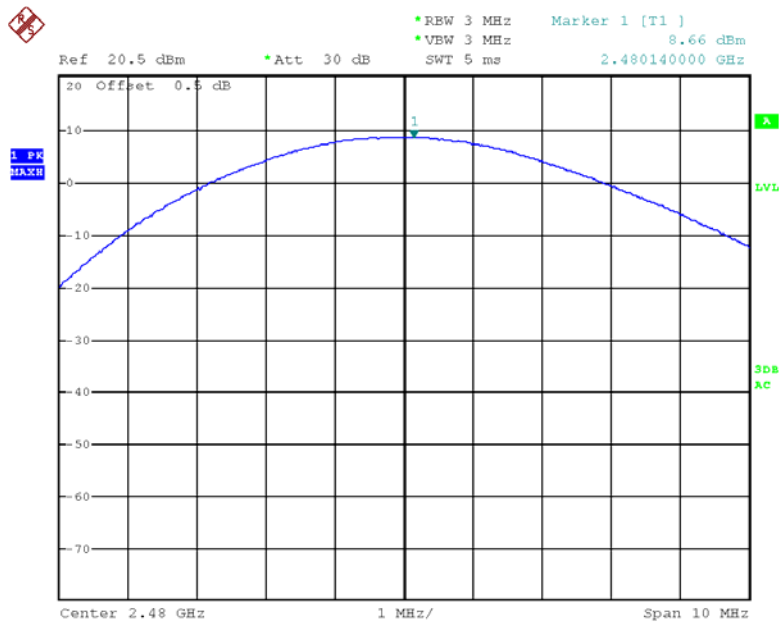
Date: 31.AUG.2015 16:35:24

Output Power, Middle Channel



Date: 31.AUG.2015 16:35:42

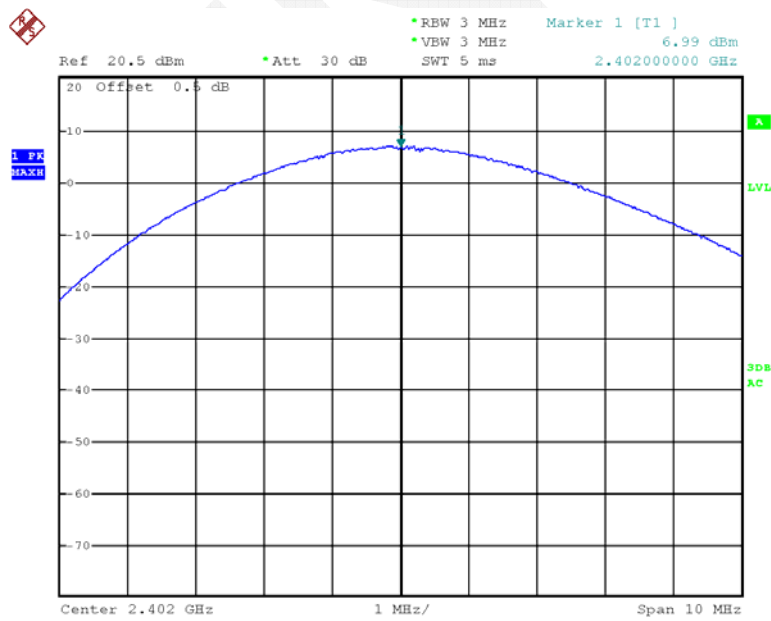
Output Power, High Channel



Date: 31.AUG.2015 16:36:00

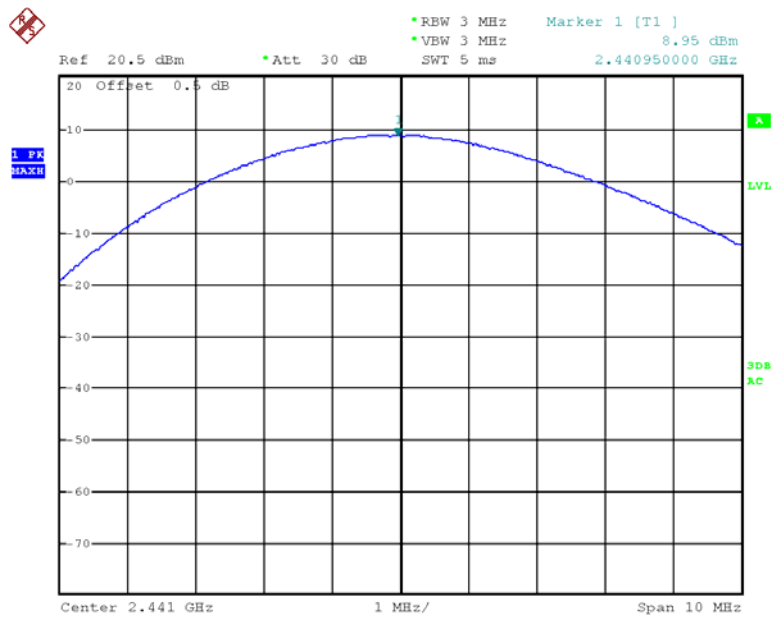
EDR Mode (8-DPSK):

Output Power, Low Channel



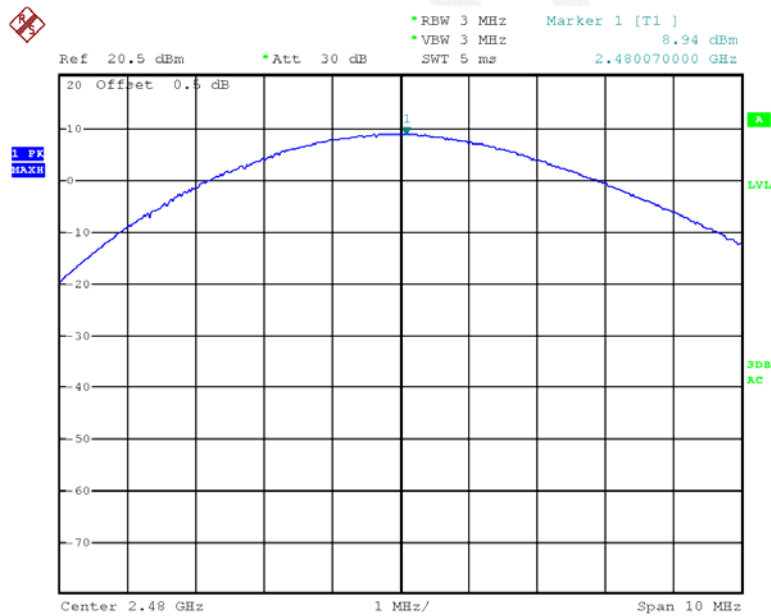
Date: 31.AUG.2015 16:36:33

Output Power, Middle Channel



Date: 31.AUG.2015 16:36:51

Output Power, High Channel



Date: 31.AUG.2015 16:37:03

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	FSP 38	100478	2015-05-09	2016-05-09

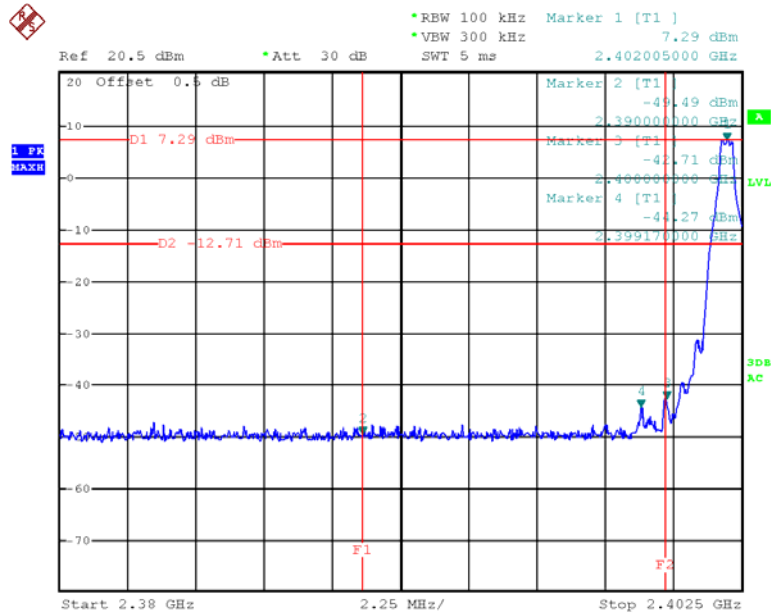
* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

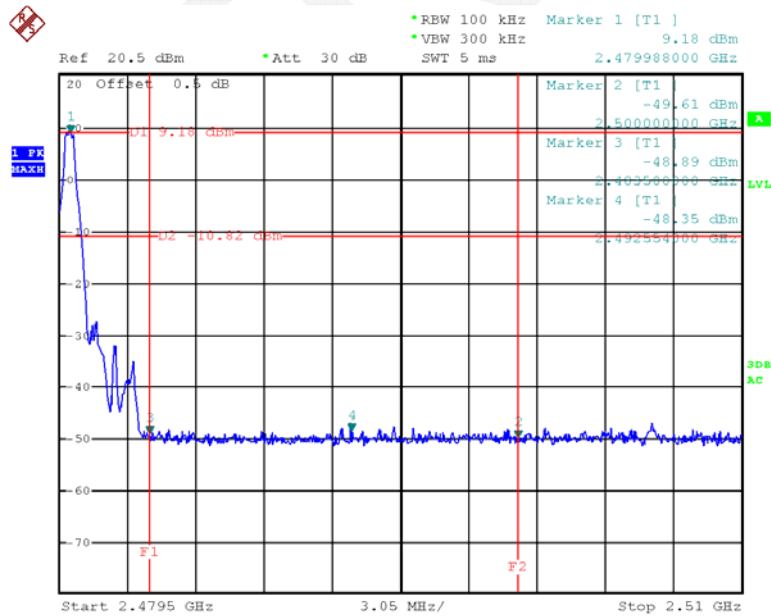
Environmental Conditions

Temperature:	26.8°C
Relative Humidity:	56 %
ATM Pressure:	99.9 kPa

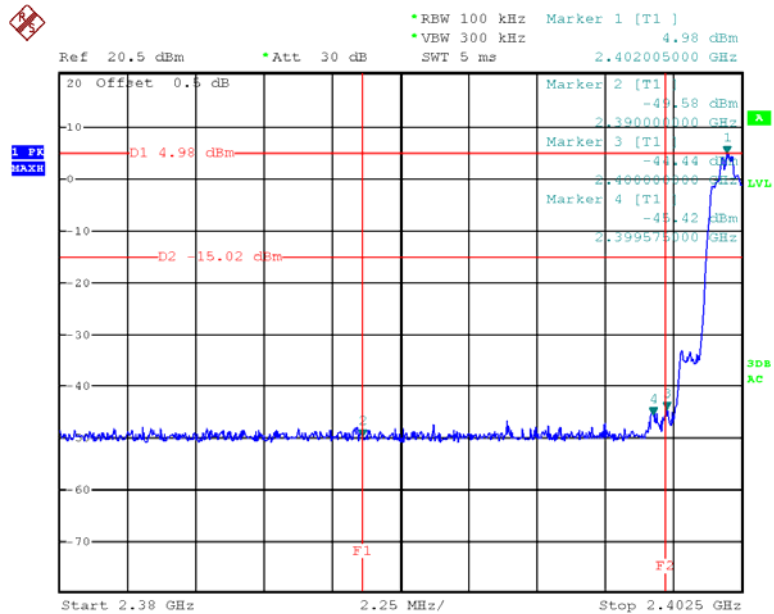
* The testing was performed by Rocky Xiao on 2015-08-31.

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

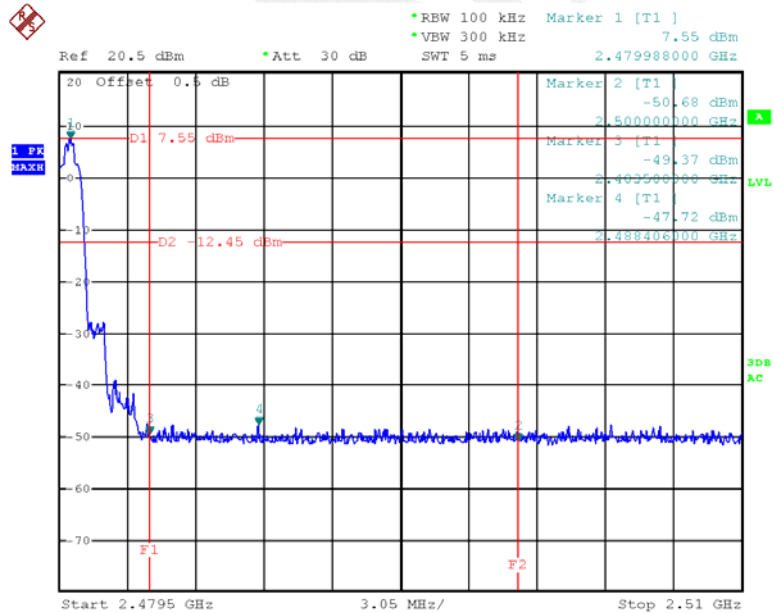
Date: 31.AUG.2015 17:03:05

Band Edge, Right Side

Date: 31.AUG.2015 17:11:33

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

Date: 31.AUG.2015 17:05:18

Band Edge, Right Side

Date: 31.AUG.2015 17:10:15

Band Edge, Left Side



Date: 31.AUG.2015 17:07:53

Page 67 of 67