FCC PART 15.247

TEST REPORT

For

Airsound Technologies Limited

Chapel House, West Mead Drive, Swindon, SN5 7UN, United Kingdom

FCC ID: 2AA8C-A70-01

Report Type: Original Report	**Product Type:** Spatial Soundbar with Bluetooth and Wireless Subwoofer

Test Engineer:	Dean Liu
Report Number:	RDG140916002-00A
Report Date:	2014-10-14
Reviewed By:	Sula Huang RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Airsound Technologies Limited 's* product, model number: *A70 (FCC ID: 2AA8C-A70-01) or* ("EUT") in this report is a *Spatial Soundbar with Bluetooth and Wireless Subwoofer,* which was measured approximately:77.5 cm (L) x 6.9 cm (W) x 7.2 cm (H), rated input voltage: DC 22V from adapter.

Adapter1 information: ORBITSOUND
Model: KSAS0652200250M2
Input: AC 100-240V, 50/60Hz, 1.2A
Output: DC 22V, 2.5A

Adapter2 information: Mass Power
Model: SKF2200250Y1BA
Input: AC 100-240V, 50/60Hz, 1.3A
Output: DC 22V, 2.5A

** All measurement and test data in this report was gathered from production sample serial number: 140916002. (Assigned by BACL. Dongguan). The EUT was received on 2014-09-16.*

Objective

This report is prepared on behalf of *Airsound Technologies Limited* 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 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 Part15C DTS submissions with FCC ID: *2AA8C-A70-01 for Bluetooth BLE 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). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

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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 Communication 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.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

EUT Exercise Software

The software "CSR BlueSuite 2.50" 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 2.50		
Test Frequency		2402MHz	2441MHz	2480MHz
Power Level Setting	GFSK	63	63	63
	π/4 DQPSK	100	100	100
	8DPSK	100	100	100

Equipment Modifications

No modification was made to the EUT.

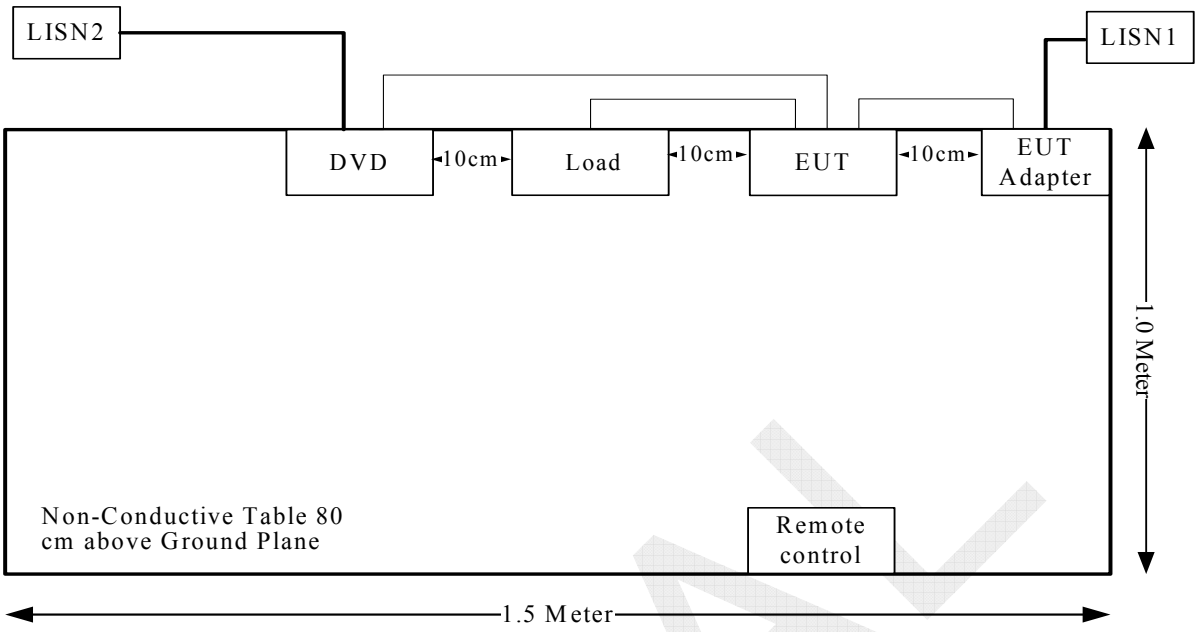
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
PHILIPS	DVD	DVP3560K/93	KX1C1108079973

External Cable

Cable Description	Shielding Type	Ferrite Core	Length(m)	From Port	To
Audio Cable	No	No	1.5	DVD	EUT
Adapter Cable	No	No	1.4	Adapter	EUT
USB calbe	No	No	1.0	10Ω Load	EUT

Block Diagram of Test Setup



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SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307,§2.1091	Maximum Permissible Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated 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

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FCC §15.247 (i) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

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

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2480	0.54	1.13	4.9	3.09	20.00	0.00070	1.0

Result: The device meet FCC MPE at 20 cm distance

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 permanently attached and the antenna gain is 0.54 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

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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.

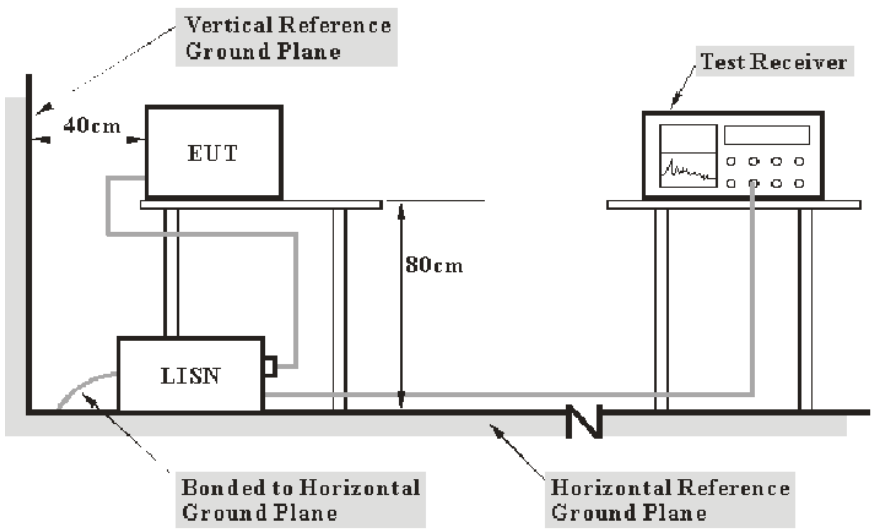
If U_{lab} is greater than U_{cispr} of Table 1, then:
- compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), 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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter of EUT 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 of EUT was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second 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:

$V_C = V_R + A_C + VDF$
$C_f = A_C + VDF$

Herein,
V_C (cord. Reading): corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN
C_f: Correction Factor

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:

Margin = Limit – 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:

4.90 at **0.384091 MHz** in the **Neutral** conducted mode(supply from adapter1)
8.60 at **0.384091 MHz** in the **Neutral** conducted mode(supply from adapter2)

Test Data

Environmental Conditions

Temperature:	30.4 °C
Relative Humidity:	57 %
ATM Pressure:	99.8kPa

The testing was performed by Dean Liu on 2014-09-18.

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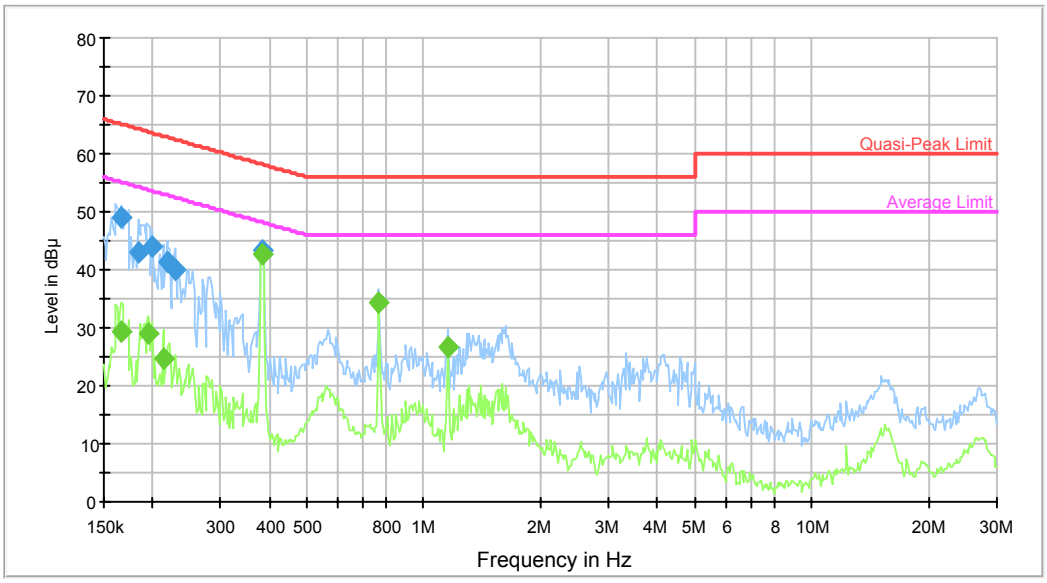
Test Mode: Transmitting

Supply from adapter1:

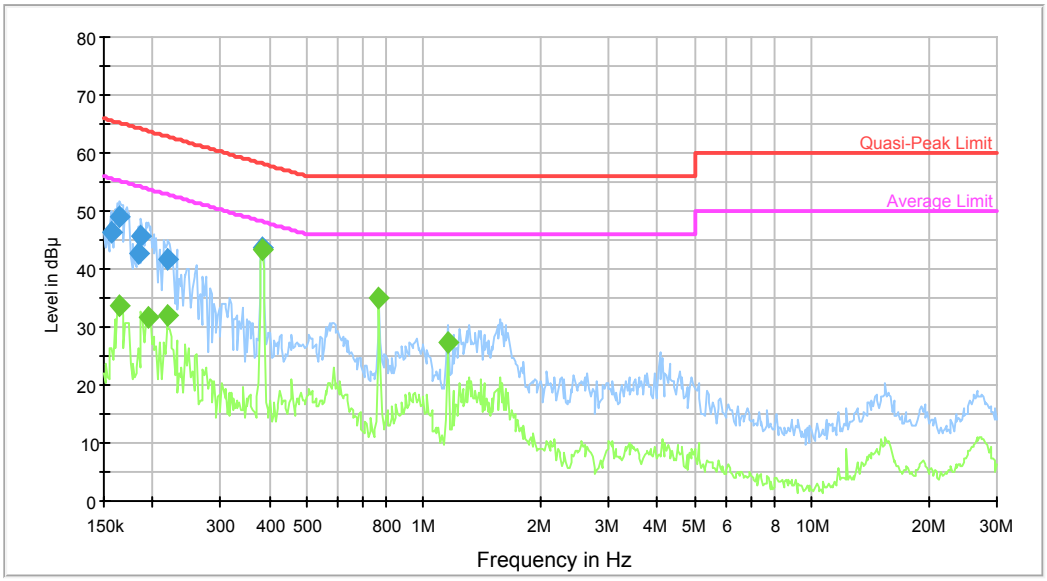
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.166371	49.0	9.000	L1	10.2	16.1	65.1	Compliance
0.184529	43.2	9.000	L1	10.5	21.1	64.3	Compliance
0.199835	44.1	9.000	L1	10.8	19.6	63.6	Compliance
0.218141	41.4	9.000	L1	10.7	21.5	62.9	Compliance
0.228823	40.1	9.000	L1	10.7	22.4	62.5	Compliance
0.384091	43.3	9.000	L1	10.6	14.9	58.2	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.166371	29.4	9.000	L1	10.2	25.8	55.1	Compliance
0.195114	29.1	9.000	L1	10.7	24.7	53.8	Compliance
0.212988	24.6	9.000	L1	10.7	28.5	53.1	Compliance
0.384091	42.6	9.000	L1	10.6	5.6	48.2	Compliance
0.768247	34.5	9.000	L1	10.5	11.5	46.0	Compliance
1.153421	26.8	9.000	L1	10.4	19.2	46.0	Compliance

AC120 V, 60 Hz, Neutral:

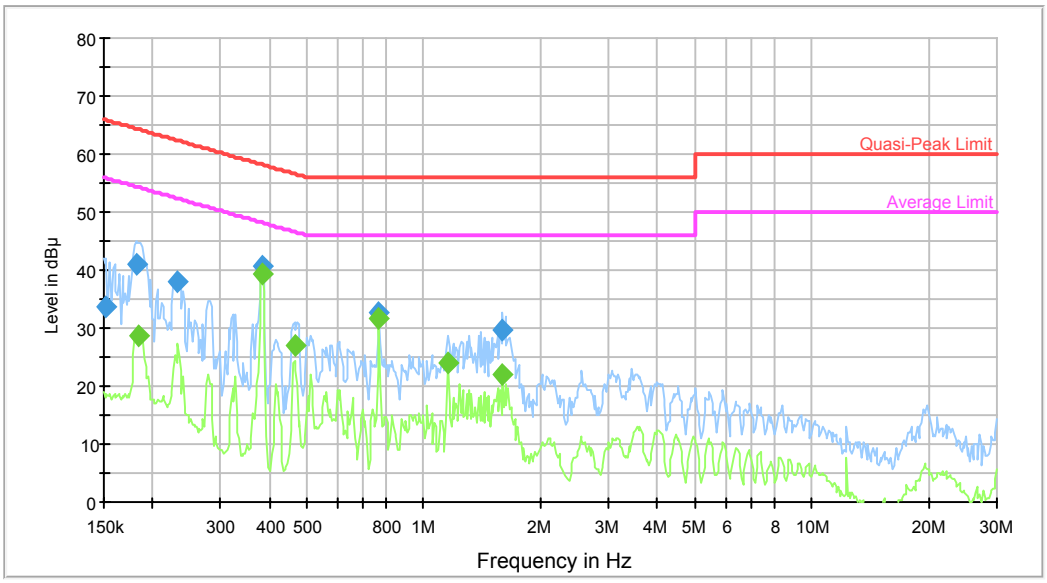


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.157346	46.3	9.000	N	10.4	19.3	65.6	Compliance
0.165051	49.0	9.000	N	10.5	16.2	65.2	Compliance
0.184529	42.7	9.000	N	11.0	21.6	64.3	Compliance
0.187494	45.5	9.000	N	11.1	18.6	64.1	Compliance
0.219886	41.7	9.000	N	11.3	21.1	62.8	Compliance
0.384091	43.7	9.000	N	10.8	14.5	58.2	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.165051	33.6	9.000	N	10.5	21.6	55.2	Compliance
0.195114	31.6	9.000	N	11.2	22.3	53.8	Compliance
0.218141	32.1	9.000	N	11.3	20.8	52.9	Compliance
0.384091	43.3	9.000	N	10.8	**4.9**	48.2	Compliance
0.768247	35.1	9.000	N	10.5	10.9	46.0	Compliance
1.153421	27.2	9.000	N	10.5	18.8	46.0	Compliance

Supply from adapter2:

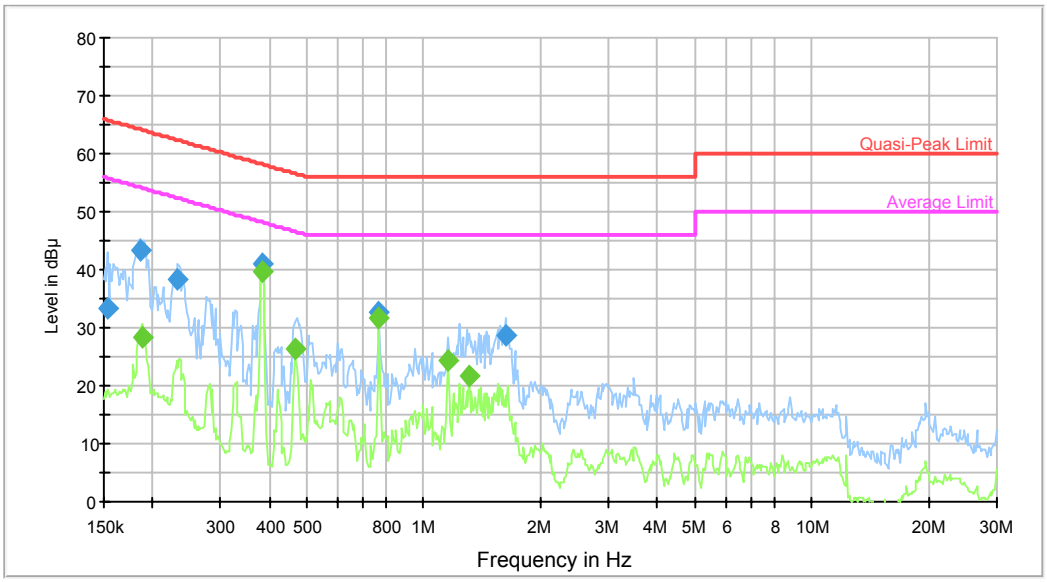
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.152410	33.5	9.000	L1	10.1	32.4	65.9	Compliance
0.181612	41.0	9.000	L1	10.5	23.4	64.4	Compliance
0.232499	38.0	9.000	L1	10.7	24.3	62.4	Compliance
0.384091	40.7	9.000	L1	10.6	17.5	58.2	Compliance
0.768247	32.7	9.000	L1	10.5	23.3	56.0	Compliance
1.599078	29.5	9.000	L1	10.4	26.5	56.0	Compliance

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.184529	28.7	9.000	L1	10.5	25.6	54.3	Compliance
0.384091	39.5	9.000	L1	10.6	8.7	48.2	Compliance
0.465037	26.8	9.000	L1	10.4	19.8	46.6	Compliance
0.768247	31.6	9.000	L1	10.5	14.4	46.0	Compliance
1.153421	23.9	9.000	L1	10.4	22.1	46.0	Compliance
1.599078	21.9	9.000	L1	10.4	24.1	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.153629	33.4	9.000	N	10.3	32.4	65.8	Compliance
0.186006	43.5	9.000	N	11.0	20.7	64.2	Compliance
0.232499	38.4	9.000	N	11.3	24.0	62.4	Compliance
0.384091	41.0	9.000	N	10.8	17.2	58.2	Compliance
0.768247	32.7	9.000	N	10.5	23.3	56.0	Compliance
1.624765	28.6	9.000	N	10.5	27.4	56.0	Compliance

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.188994	28.4	9.000	N	11.1	25.7	54.1	Compliance
0.384091	39.6	9.000	N	10.8	8.6	48.2	Compliance
0.465037	26.2	9.000	N	10.5	20.4	46.6	Compliance
0.768247	31.6	9.000	N	10.5	14.4	46.0	Compliance
1.153421	24.2	9.000	N	10.5	21.8	46.0	Compliance
1.310256	21.6	9.000	N	10.5	24.4	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 2, 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.

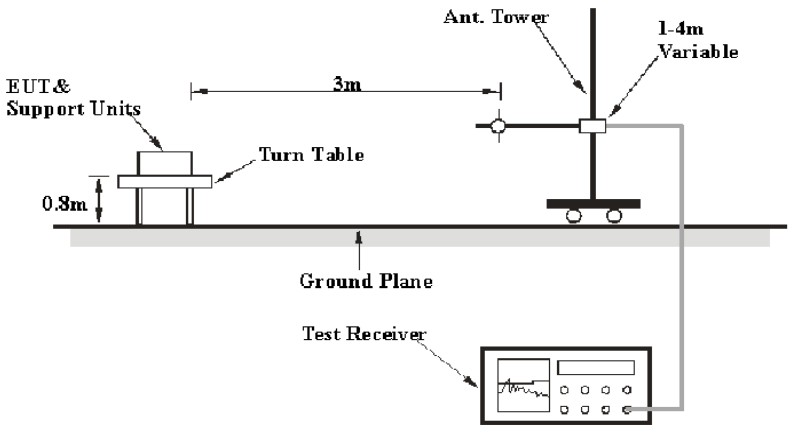
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:
30M~200MHz: 5.0 dB
200M~1GHz: 6.2 dB
1G~6GHz: 4.45 dB
6G~18GHz: 5.23 dB

Table 2 – Values of U_{cispr}

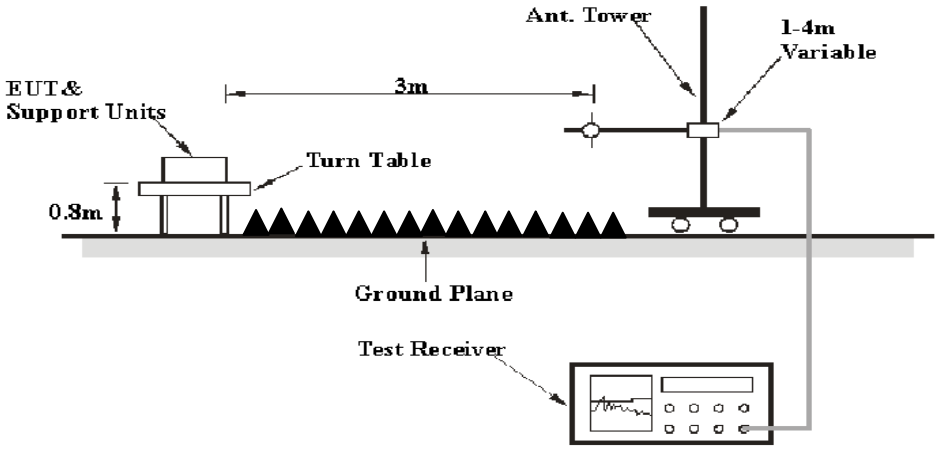
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

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 C63.4-2003. 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.

The adapter of EUT 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

For the radiated emissions test, the adapter of EUT was connected to the AC floor outlet.

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	A060611-3	2014-07-28	2017-07-27
HP	Amplifier	8447E	2434A02181	2014-09-01	2015-09-01
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
Ducommun Technolagies	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:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - 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:

Margin = Limit – 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:

Bellow 1GHz:

2.70 dB at **195.8700 MHz** in the **Vertical** polarization(supply from adapter1)
3.90 dB at **51.3400 MHz** in the **Horizontal** polarization(supply from adapter2)

Above 1GHz:
13.10 dB at **7323 MHz** in the **Horizontal** polarization in *BDR Mode (GFSK):*

Test Data

Environmental Conditions

Temperature:	26.5 °C
Relative Humidity:	51 %
ATM Pressure:	100.6kPa

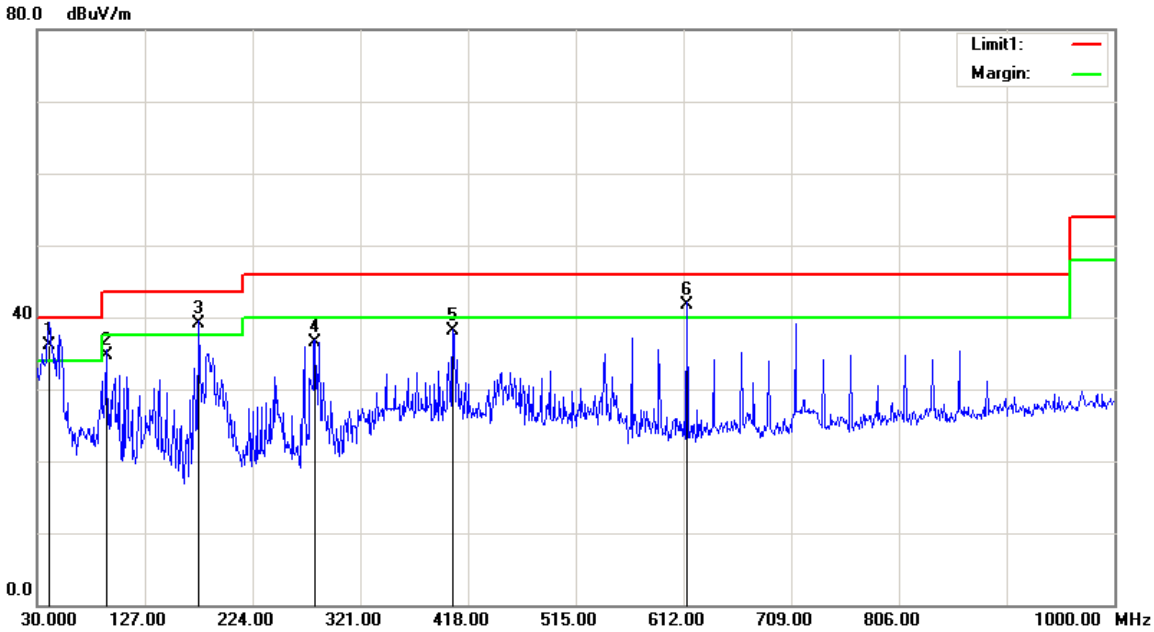
The testing was performed by Dean Liu on 2014-09-29.

1). Bellow 1GHz

Test Mode: Transmitting (worst case in GFSK mode)

Supply from adapter1:

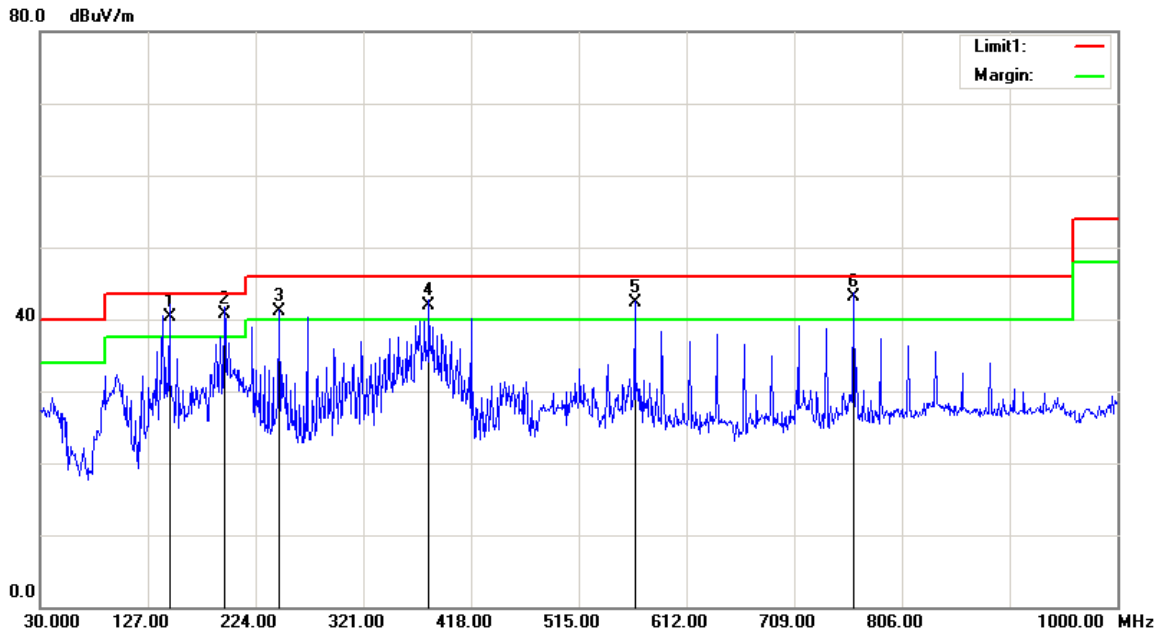
Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40.6700	42.74	QP	-6.54	36.20	40.00	3.80*
92.0800	46.45	QP	-11.65	34.80	43.50	8.70
175.5000	47.37	QP	-8.17	39.20	43.50	4.30*
280.2600	42.12	QP	-5.62	36.50	46.00	9.50
404.4200	40.98	QP	-2.88	38.10	46.00	7.90
614.9100	41.61	QP	0.19	41.80	46.00	4.20*

*Within measurement uncertainty!

Vertical

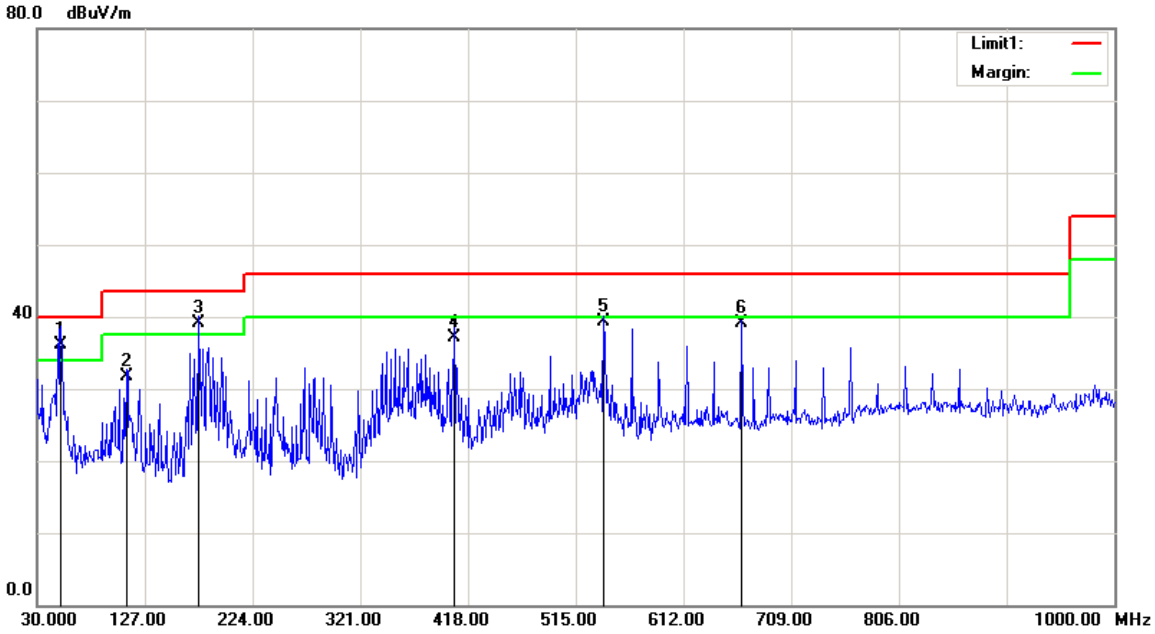


Frequency (MHz)	Receiver Reading (dBµV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
146.4000	47.20	QP	-6.90	40.30	43.50	3.20*
195.8700	48.28	QP	-7.48	40.80	43.50	2.70*
245.3400	48.36	QP	-7.26	41.10	46.00	4.90*
380.1700	45.37	QP	-3.47	41.90	46.00	4.10*
565.4400	42.60	QP	-0.30	42.30	46.00	3.70*
762.3500	41.05	QP	2.15	43.20	46.00	2.80*

*Within measurement uncertainty!

Supply from adapter2:

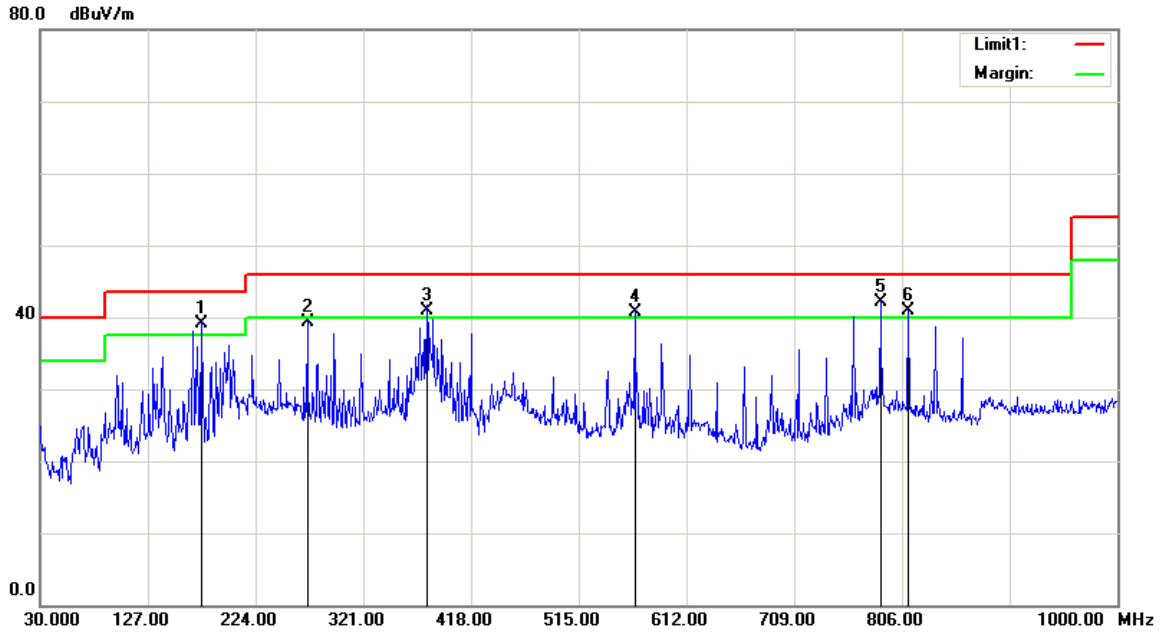
Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
51.3400	48.14	QP	-12.04	36.10	40.00	3.90*
110.5100	38.68	QP	-6.88	31.80	43.50	11.70
175.5000	47.27	QP	-8.17	39.10	43.50	4.40*
405.3900	40.04	QP	-2.84	37.20	46.00	8.80
540.2200	40.14	QP	-0.74	39.40	46.00	6.60
664.3800	37.93	QP	1.17	39.10	46.00	6.90

*Within measurement uncertainty!

Vertical



Frequency (MHz)	Receiver Reading (dBµV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
175.5000	47.37	QP	-8.17	39.20	43.50	4.30*
270.5600	45.06	QP	-5.76	39.30	46.00	6.70
378.2300	44.40	QP	-3.50	40.90	46.00	5.10*
565.4400	41.10	QP	-0.30	40.80	46.00	5.20*
786.6000	39.44	QP	2.66	42.10	46.00	3.90*
811.8200	37.82	QP	3.18	41.00	46.00	5.00*

*Within measurement uncertainty!

2). Above 1G (test with the worse adapter 1)

Test Mode: Transmitting

BDR Mode (GFSK):

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel: 2402MHz									
2402	95.34	PK	H	25.65	4.42	27.32	98.09	N/A	N/A
2402	84.52	AV	H	25.65	4.42	27.32	87.27	N/A	N/A
2402	94.89	PK	V	25.65	4.42	27.32	97.64	N/A	N/A
2402	84.29	AV	V	25.65	4.42	27.32	87.04	N/A	N/A
2390	37.99	PK	H	25.61	4.39	27.32	40.67	74.00	33.33
2390	21.39	AV	H	25.61	4.39	27.32	24.07	54.00	29.93
4804	40.21	PK	H	30.59	5.98	27.41	49.37	74.00	24.63
4804	21.64	AV	H	30.59	5.98	27.41	30.80	54.00	23.20
7206	36.03	PK	H	34.09	7.45	25.91	51.66	74.00	22.34
7206	20.53	AV	H	34.09	7.45	25.91	36.16	54.00	17.84
9608	30.26	PK	H	35.96	8.80	27.55	47.47	74.00	26.53
9608	19.48	AV	H	35.96	8.80	27.55	36.69	54.00	17.31
2558	40.57	PK	H	26.05	4.64	27.40	43.86	74.00	30.14
2558	30.03	AV	V	26.05	4.64	27.40	33.32	54.00	20.68
Middle Channel: 2441MHz									
2441	96.47	PK	H	25.75	4.40	27.34	99.28	N/A	N/A
2441	86.58	AV	H	25.75	4.40	27.34	89.39	N/A	N/A
2441	94.57	PK	H	25.75	4.40	27.34	97.38	N/A	N/A
2441	84.62	AV	H	25.75	4.40	27.34	87.43	N/A	N/A
4882	44.14	PK	H	30.79	6.08	27.42	53.59	74.00	20.41
4882	28.07	AV	H	30.79	6.08	27.42	37.52	54.00	16.48
7323	40.08	PK	H	34.38	7.51	25.88	56.09	74.00	17.91
7323	24.89	AV	H	34.38	7.51	25.88	40.90	54.00	13.10
9764	28.76	PK	H	36.33	8.83	27.20	46.72	74.00	27.28
9764	19.06	AV	H	36.33	8.83	27.20	37.02	54.00	16.98
2597	40.36	PK	H	26.15	4.63	27.42	43.72	74.00	30.28
2597	29.81	AV	H	26.15	4.63	27.42	33.17	54.00	20.83
5745	32.78	PK	H	32.15	6.10	26.60	44.43	74.00	29.57
5745	19.87	QP	H	32.15	6.10	26.60	31.52	54.00	22.48
High Channel: 2480 MHz									
2480	95.65	PK	H	25.85	4.48	27.36	98.62	N/A	N/A
2480	84.87	AV	H	25.85	4.48	27.36	87.84	N/A	N/A
2480	94.06	PK	V	25.85	4.48	27.36	97.03	N/A	N/A
2480	83.47	AV	V	25.85	4.48	27.36	86.44	N/A	N/A
4960	43.62	PK	H	31.00	5.90	27.43	53.09	74.00	20.91
4960	28.79	AV	H	31.00	5.90	27.43	38.26	54.00	15.74
7440	34.62	PK	H	34.66	7.58	25.97	50.89	74.00	23.11
7440	20.61	AV	H	34.66	7.58	25.97	36.88	54.00	17.12
9920	29.62	PK	H	36.71	8.87	26.66	48.54	74.00	25.46
9920	18.95	AV	H	36.71	8.87	26.66	37.87	54.00	16.13
2483.5	47.39	PK	H	25.86	4.49	27.36	50.38	74.00	23.62
2483.5	30.05	AV	H	25.86	4.49	27.36	33.04	54.00	20.96
2636	40.39	PK	H	26.25	4.77	27.45	43.96	74.00	30.04
2636	29.67	AV	H	26.25	4.77	27.45	33.24	54.00	20.76

EDR Mode (π/4-DQPSK):

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel: 2402MHz									
2402	94.9	PK	H	25.65	4.42	27.32	97.65	N/A	N/A
2402	83.61	AV	H	25.65	4.42	27.32	86.36	N/A	N/A
2402	93.71	PK	V	25.65	4.42	27.32	96.46	N/A	N/A
2402	82.67	AV	V	25.65	4.42	27.32	85.42	N/A	N/A
2390	34.42	PK	H	25.61	4.39	27.32	37.10	74.00	36.90
2390	21.32	AV	H	25.61	4.39	27.32	24.00	54.00	30.00
4804	39.62	PK	H	30.59	5.98	27.41	48.78	74.00	25.22
4804	27.2	AV	H	30.59	5.98	27.41	36.36	54.00	17.64
7206	31.47	PK	H	34.09	7.45	25.91	47.10	74.00	26.90
7206	21.45	AV	H	34.09	7.45	25.91	37.08	54.00	16.92
9608	30.21	PK	H	35.96	8.80	27.55	47.42	74.00	26.58
9608	18.94	AV	H	35.96	8.80	27.55	36.15	54.00	17.85
2558	41.99	PK	H	26.05	4.64	27.40	45.28	74.00	28.72
2558	31.45	AV	H	26.05	4.64	27.40	34.74	54.00	19.26
Middle Channel: 2441MHz									
2441	94.35	PK	H	25.75	4.40	27.34	97.16	N/A	N/A
2441	83.07	AV	H	25.75	4.40	27.34	85.88	N/A	N/A
2441	93.24	PK	V	25.75	4.40	27.34	96.05	N/A	N/A
2441	82.76	AV	V	25.75	4.40	27.34	85.57	N/A	N/A
4882	42.71	PK	H	30.79	6.08	27.42	52.16	74.00	21.84
4882	27.98	AV	H	30.79	6.08	27.42	37.43	54.00	16.57
7323	32.41	PK	H	34.38	7.51	25.88	48.42	74.00	25.58
7323	20.78	AV	H	34.38	7.51	25.88	36.79	54.00	17.21
9764	29.62	PK	H	36.33	8.83	27.20	47.58	74.00	26.42
9764	18.74	AV	H	36.33	8.83	27.20	36.70	54.00	17.30
2597	40.41	PK	H	26.15	4.63	27.42	43.77	74.00	30.23
2597	29.35	AV	H	26.15	4.63	27.42	32.71	54.00	21.29
5750	33.28	PK	H	32.15	6.11	26.60	44.94	74.00	29.06
5750	19.91	AV	H	32.15	6.11	26.60	31.57	54.00	22.43
High Channel: 2480 MHz									
2480	94.69	PK	H	25.85	4.48	27.36	97.66	N/A	N/A
2480	83.74	AV	H	25.85	4.48	27.36	86.71	N/A	N/A
2480	93.17	PK	V	25.85	4.48	27.36	96.14	N/A	N/A
2480	82.84	AV	V	25.85	4.48	27.36	85.81	N/A	N/A
4960	40.41	PK	H	31.00	5.90	27.43	49.88	74.00	24.12
4960	24.32	AV	H	31.00	5.90	27.43	33.79	54.00	20.21
7440	34.12	PK	V	34.66	7.58	25.97	50.39	74.00	23.61
7440	22.7	AV	H	34.66	7.58	25.97	38.97	54.00	15.03
9920	30.07	PK	H	36.71	8.87	26.66	48.99	74.00	25.01
9920	18.57	AV	H	36.71	8.87	26.66	37.49	54.00	16.51
2483.5	57.62	PK	H	25.86	4.49	27.36	60.61	74.00	13.39
2483.5	32.42	AV	H	25.86	4.49	27.36	35.41	54.00	18.59
2635	40.62	PK	H	26.25	4.77	27.44	44.20	74.00	29.80
2635	30.24	AV	H	26.25	4.77	27.44	33.82	54.00	20.18

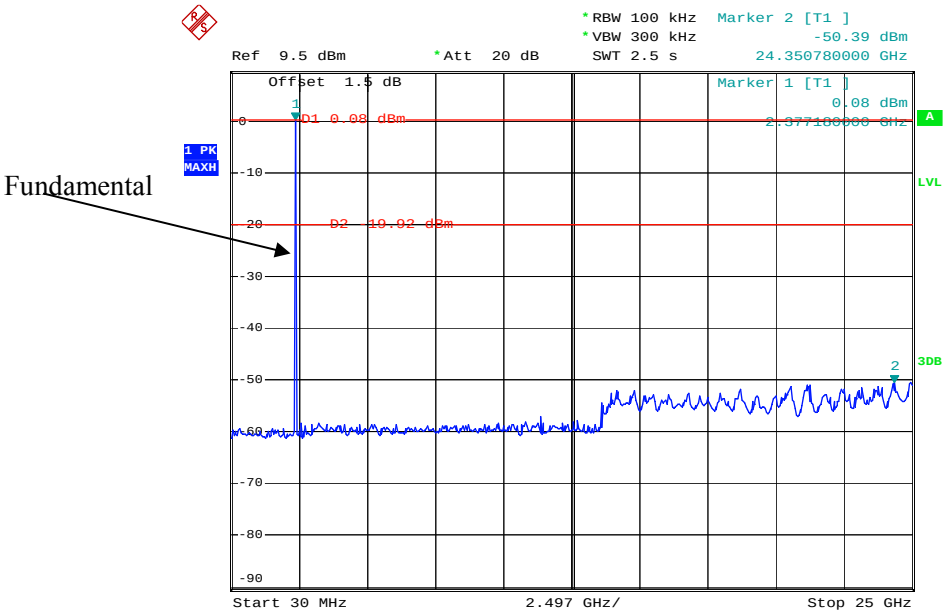
EDR Mode (8-DPSK):

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	FCC 15.247	
(MHz)	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low Channel: 2402MHz									
2402	94.54	PK	H	25.65	4.42	27.32	97.29	N/A	N/A
2402	83.17	AV	H	25.65	4.42	27.32	85.92	N/A	N/A
2402	92.64	PK	V	25.65	4.42	27.32	95.39	N/A	N/A
2402	82.13	AV	V	25.65	4.42	27.32	84.88	N/A	N/A
2390	32.79	PK	H	25.61	4.39	27.32	35.47	74.00	38.53
2390	21.34	AV	H	25.61	4.39	27.32	24.02	54.00	29.98
4804	41.05	PK	H	30.59	5.98	27.41	50.21	74.00	23.79
4804	28.97	AV	H	30.59	5.98	27.41	38.13	54.00	15.87
7206	34.21	PK	H	34.09	7.45	25.91	49.84	74.00	24.16
7206	21.62	AV	H	34.09	7.45	25.91	37.25	54.00	16.75
9608	29.36	PK	H	35.96	8.80	27.55	46.57	74.00	27.43
9608	18.71	AV	H	35.96	8.80	27.55	35.92	54.00	18.08
2558	40.52	PK	H	26.05	4.64	27.40	43.81	74.00	30.19
2558	30.67	AV	H	26.05	4.64	27.40	33.96	54.00	20.04
Middle Channel: 2441MHz									
2441	94.69	PK	H	25.75	4.40	27.34	97.50	N/A	N/A
2441	83.7	AV	H	25.75	4.40	27.34	86.51	N/A	N/A
2441	92.51	PK	V	25.75	4.40	27.34	95.32	N/A	N/A
2441	82.34	AV	V	25.75	4.40	27.34	85.15	N/A	N/A
4882	40.47	PK	H	30.79	6.08	27.42	49.92	74.00	24.08
4882	30.19	AV	H	30.79	6.08	27.42	39.64	54.00	14.36
7323	30.84	PK	H	34.38	7.51	25.88	46.85	74.00	27.15
7323	19.68	AV	H	34.38	7.51	25.88	35.69	54.00	18.31
9764	29.47	PK	H	36.33	8.83	27.20	47.43	74.00	26.57
9764	18.62	AV	H	36.33	8.83	27.20	36.58	54.00	17.42
2597	40.64	PK	H	26.15	4.63	27.42	44.00	74.00	30.00
2597	30.53	AV	H	26.15	4.63	27.42	33.89	54.00	20.11
5752	32.84	PK	H	32.15	6.11	26.60	44.50	74.00	29.50
5752	19.82	AV	H	32.15	6.11	26.60	31.48	54.00	22.52
High Channel: 2480 MHz									
2480	94.54	PK	H	25.85	4.48	27.36	97.51	N/A	N/A
2480	83.63	AV	H	25.85	4.48	27.36	86.60	N/A	N/A
2480	93.04	PK	V	25.85	4.48	27.36	96.01	N/A	N/A
2480	82.45	AV	V	25.85	4.48	27.36	85.42	N/A	N/A
4960	41.65	PK	H	31.00	5.90	27.43	51.12	74.00	22.88
4960	30.12	AV	H	31.00	5.90	27.43	39.59	54.00	14.41
7440	36.12	PK	H	34.66	7.58	25.97	52.39	74.00	21.61
7440	23.44	AV	H	34.66	7.58	25.97	39.71	54.00	14.29
9920	29.89	PK	H	36.71	8.87	26.66	48.81	74.00	25.19
9920	18.49	AV	H	36.71	8.87	26.66	37.41	54.00	16.59
2483.5	57.24	PK	H	25.86	4.49	27.36	60.23	74.00	13.77
2483.5	32.86	AV	H	25.86	4.49	27.36	35.85	54.00	18.15
2636	40.36	PK	H	26.25	4.77	27.45	43.93	74.00	30.07
2636	30.21	AV	H	26.25	4.77	27.45	33.78	54.00	20.22

Conducted Spurious Emissions at Antenna Port

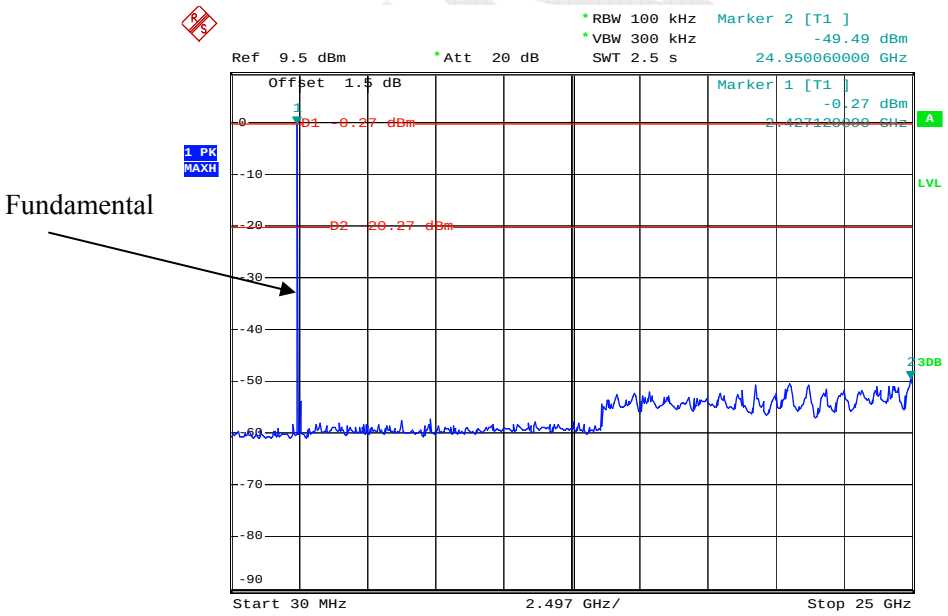
BDR Mode (GFSK):

Low Channel



Date: 29.SEP.2014 12:03:23

Middle Channel



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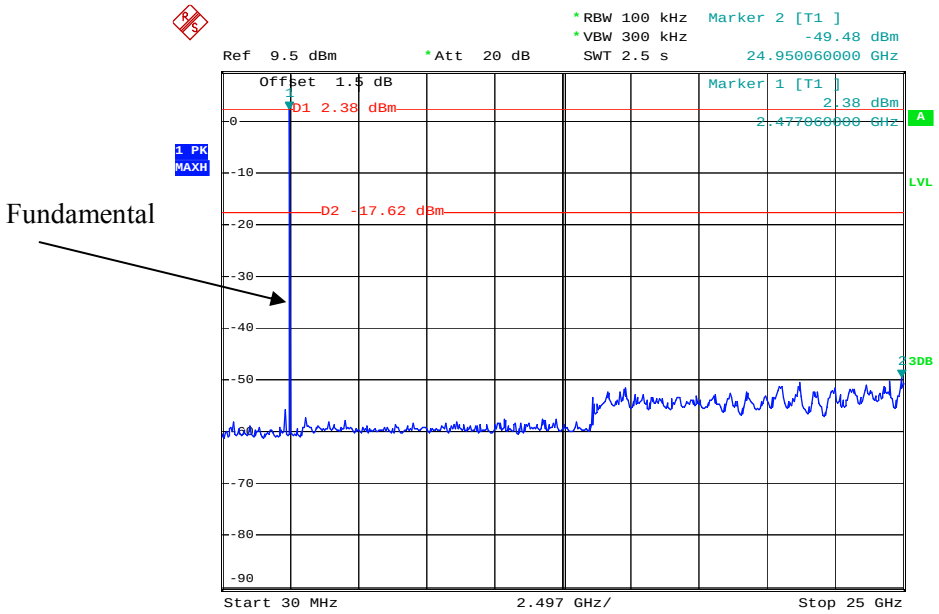
High Channel



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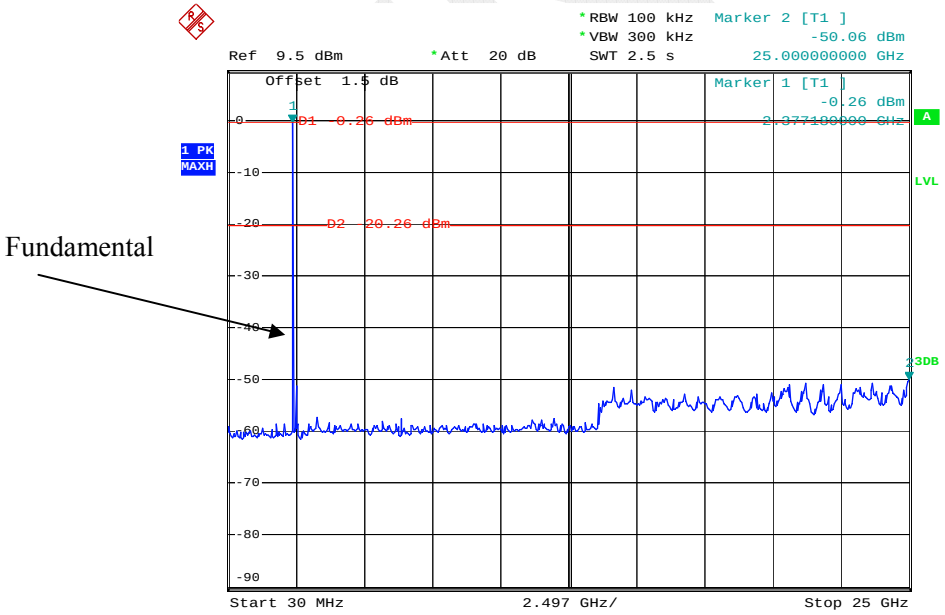
EDR Mode (π/4-DQPSK):

Low Channel



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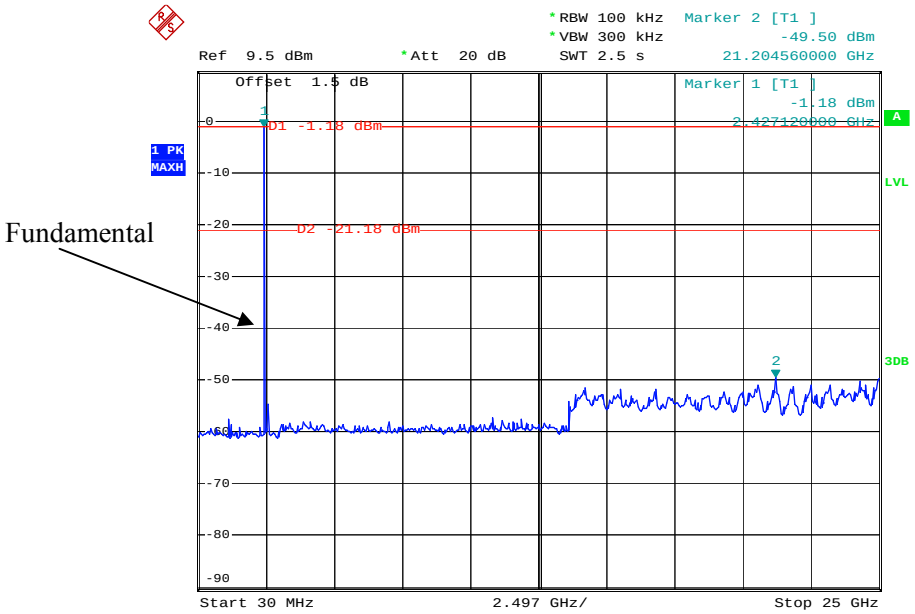
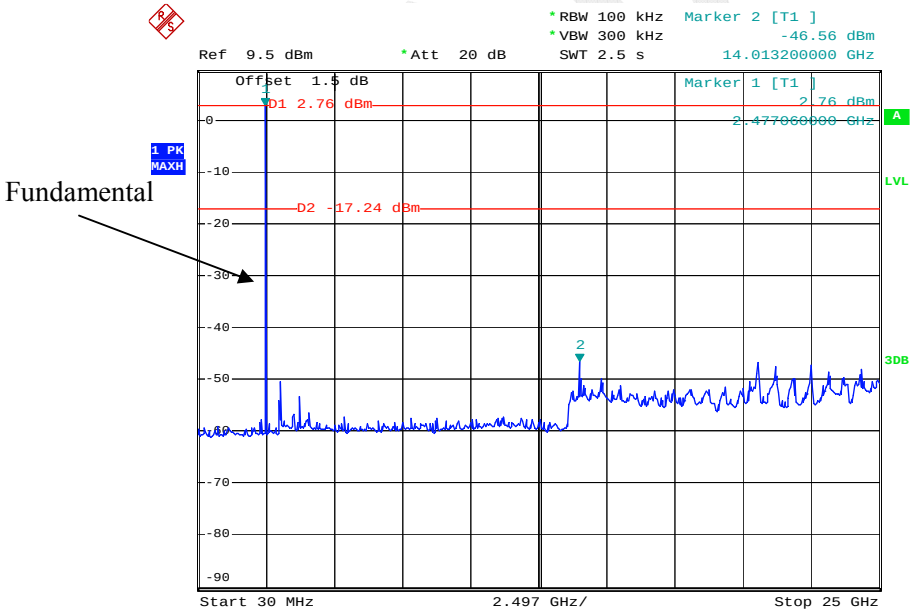
Middle Channel



Date: 29.SEP.2014 14:17:56

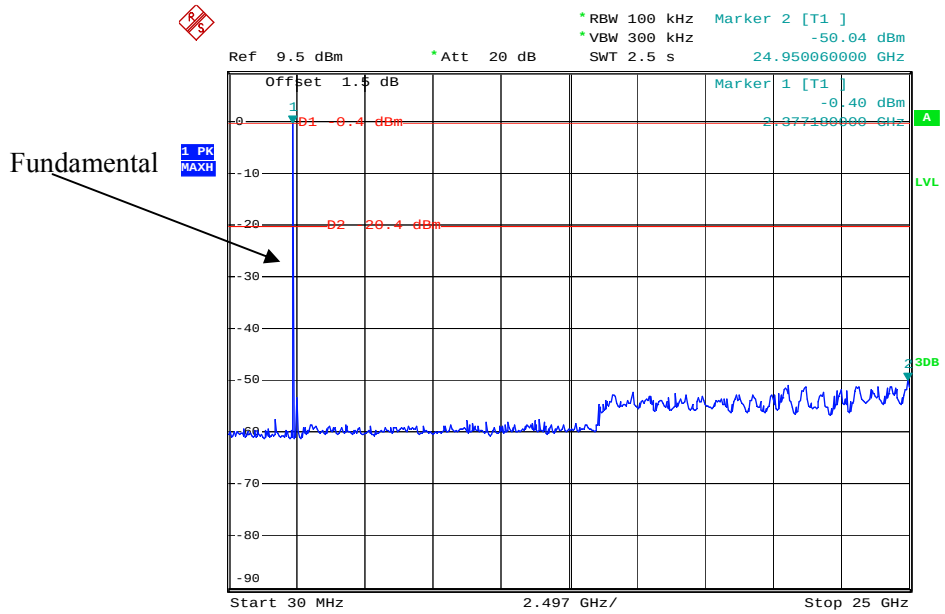
High Channel



Date: 29.SEP.2014 14:12:27

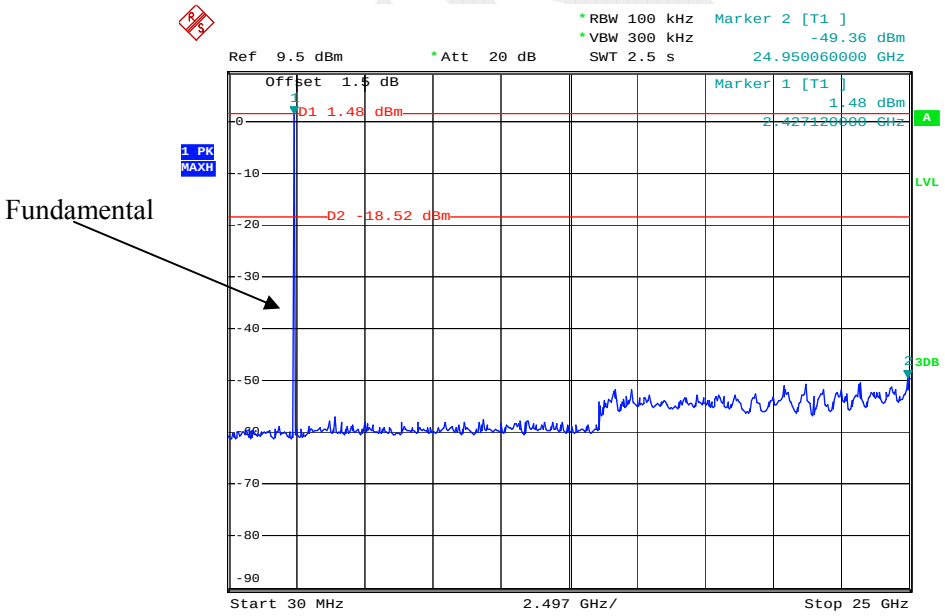
EDR Mode (8-DPSK):

Low Channel



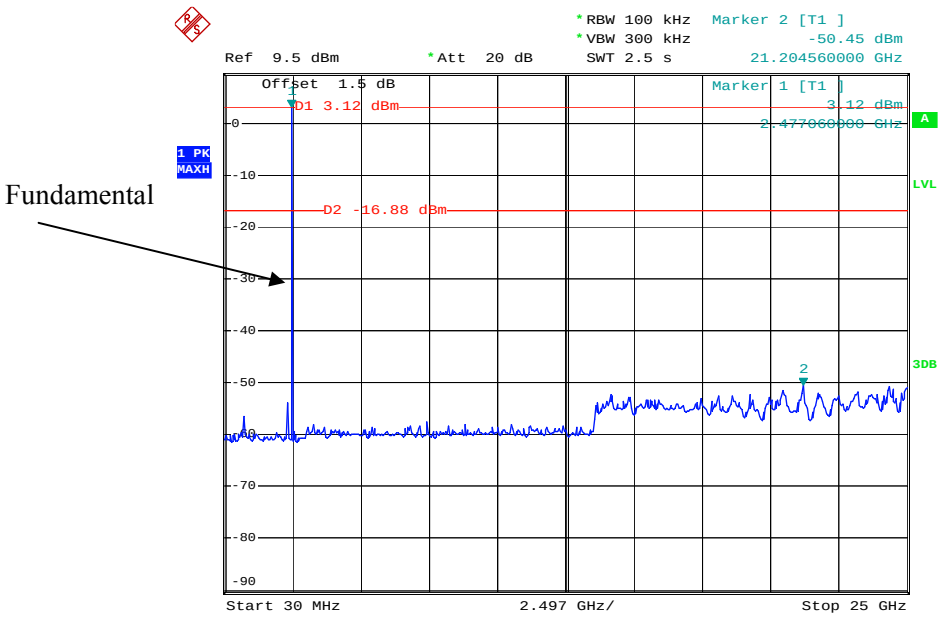
Date: 29.SEP.2014 14:18:53

Middle Channel



Date: 29.SEP.2014 14:16:43

High Channel



Date: 29.SEP.2014 14:14:04

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

Applicable Standard

Frequency hopping systems shall have hoping 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	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

Set the EUT in transmitting mode, maxhold the trace, Allow it to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

Test Data

Environmental Conditions

Temperature:	28.1 °C
Relative Humidity:	62 %
ATM Pressure:	100.6kPa

The testing was performed by Dean Liu on 2014-09-29.

Test Result: Compliance.

Please refer to following tables and plots

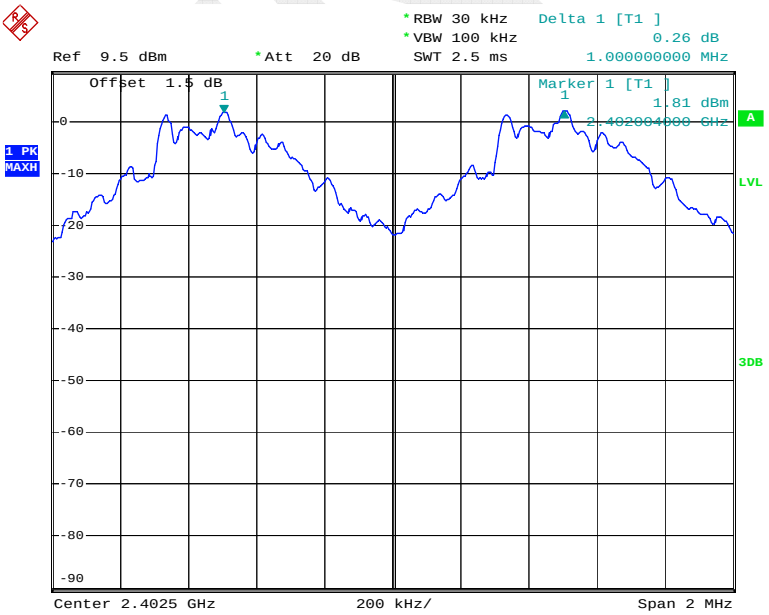
FINAL

Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
BDR Mode (GFSK)	Low	2402	1.000	0.659	Pass
	Adjacent	2403			
	Middle	2441	1.000	0.667	Pass
	Adjacent	2440			
	High	2480	1.004	0.669	Pass
	Adjacent	2479			
EDR Mode (π/4-DQPSK):	Low	2402	1.000	0.848	Pass
	Adjacent	2403			
	Middle	2441	1.000	0.860	Pass
	Adjacent	2440			
	High	2480	1.004	0.860	Pass
	Adjacent	2479			
EDR Mode (8-DPSK):	Low	2402	1.000	0.768	Pass
	Adjacent	2403			
	Middle	2441	1.000	0.768	Pass
	Adjacent	2440			
	High	2480	1.000	0.768	Pass
	Adjacent	2479			

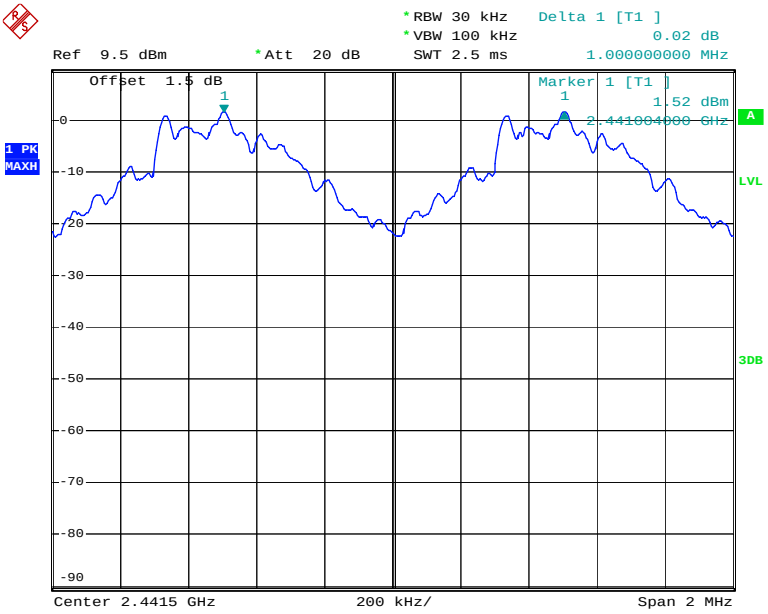
BDR Mode (GFSK):

Low Channel



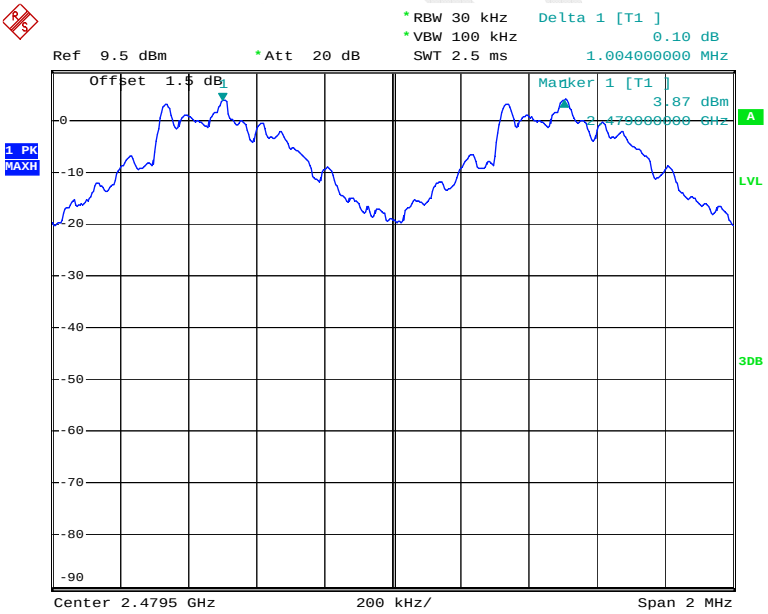
Date: 29.SEP.2014 11:58:06

Middle Channel



Date: 29.SEP.2014 12:09:28

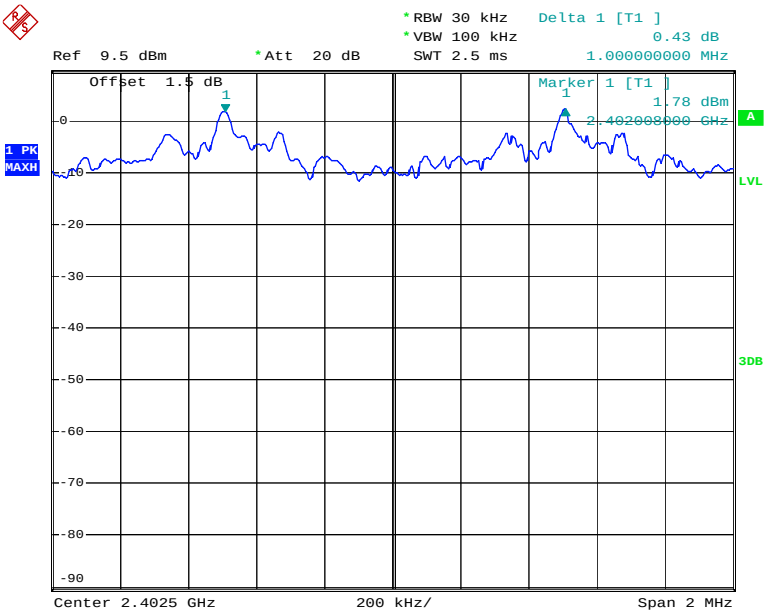
High Channel



Date: 29.SEP.2014 12:11:04

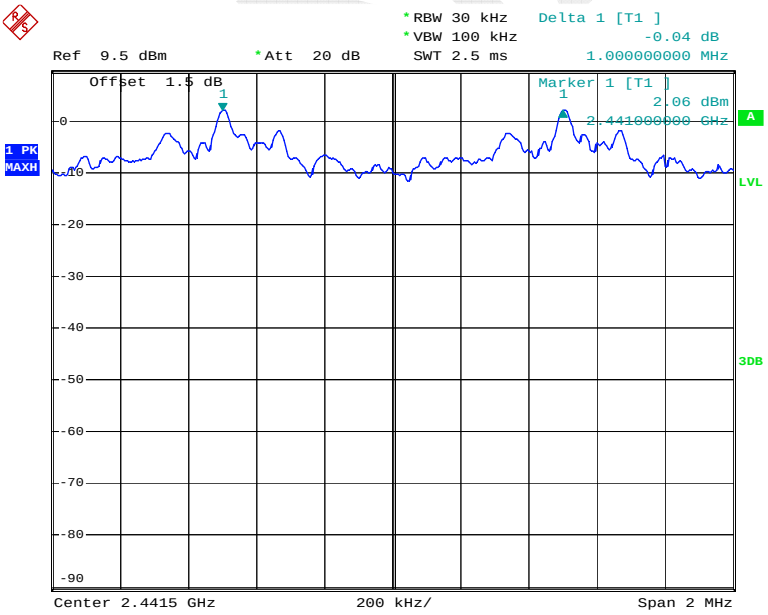
EDR Mode (π/4-DQPSK):

Low Channel



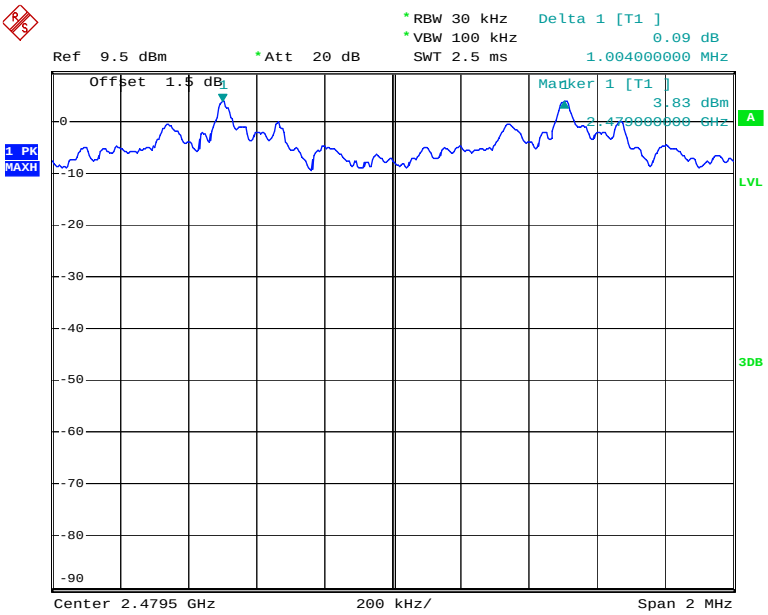
Date: 29.SEP.2014 13:55:44

Middle Channel



Date: 29.SEP.2014 13:55:02

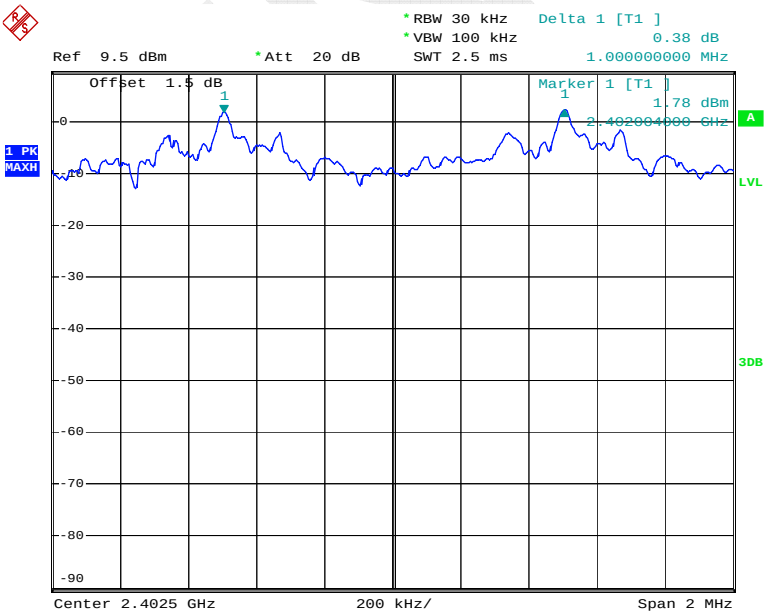
High Channel



Date: 29.SEP.2014 13:51:59

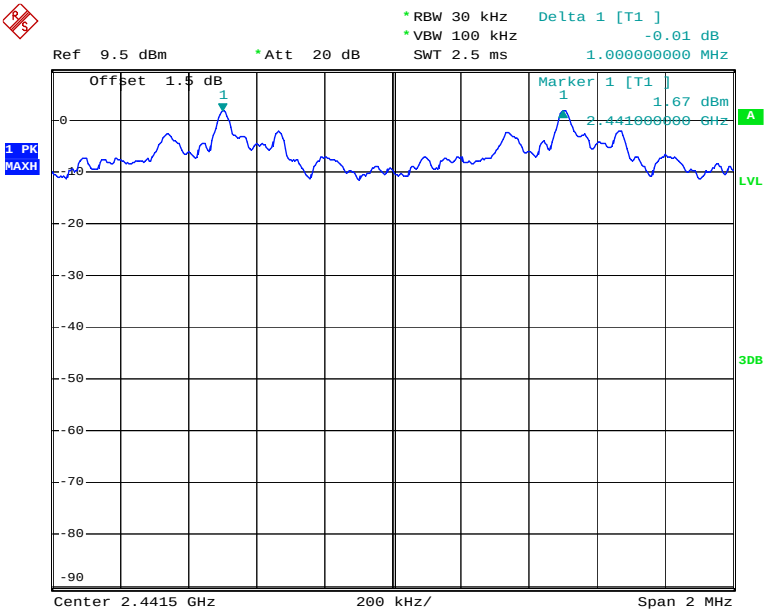
EDR Mode (8-DPSK):

Low Channel



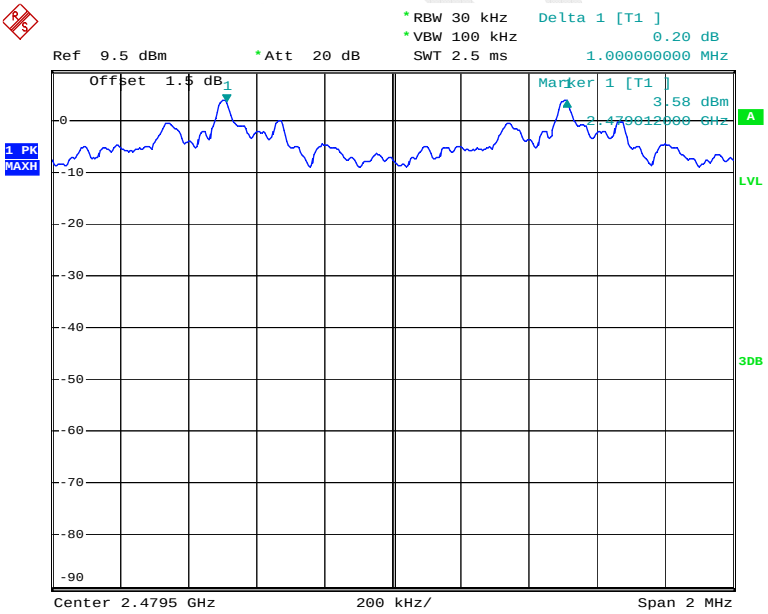
Date: 29.SEP.2014 14:00:18

Middle Channel



Date: 29.SEP.2014 13:58:22

High Channel



Date: 29.SEP.2014 13:57:42

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

Set the EUT in transmitting mode, maxhold the trace, Allow it to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	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:	26.2°C
Relative Humidity:	41 %
ATM Pressure:	101.3kPa

The testing was performed by Dean Liu on 2014-10-14.

Test Result: Compliance.

Please refer to following tables and plots

FINAL

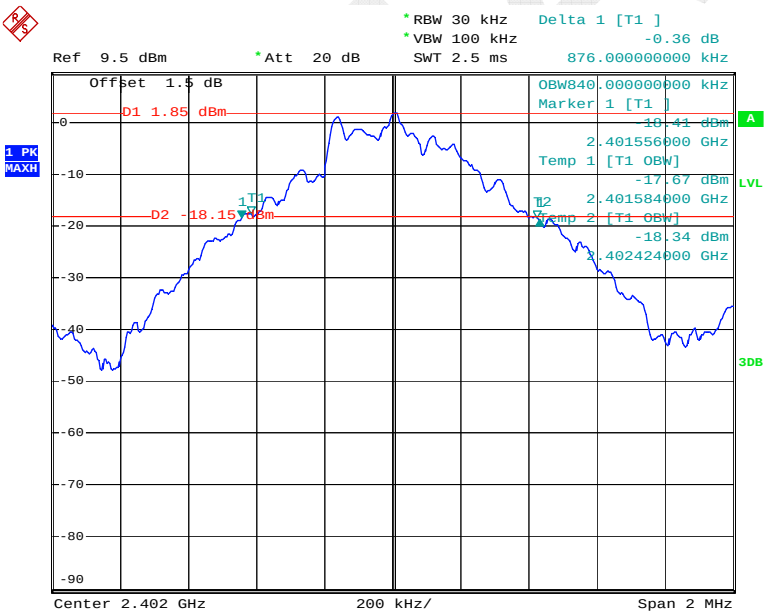
Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.876
	Middle	2441	0.868
	High	2480	0.872
EDR Mode (π/4-DQPSK):	Low	2402	1.230
	Middle	2441	1.236
	High	2480	1.272
EDR Mode (8-DPSK):	Low	2402	1.218
	Middle	2441	1.224
	High	2480	1.230

Please refer to the following plots.

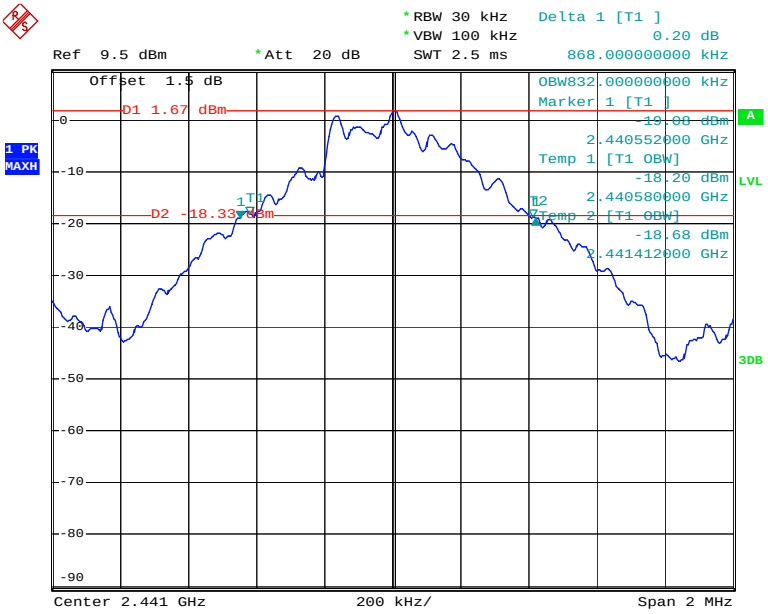
BDR Mode (GFSK):

Low Channel



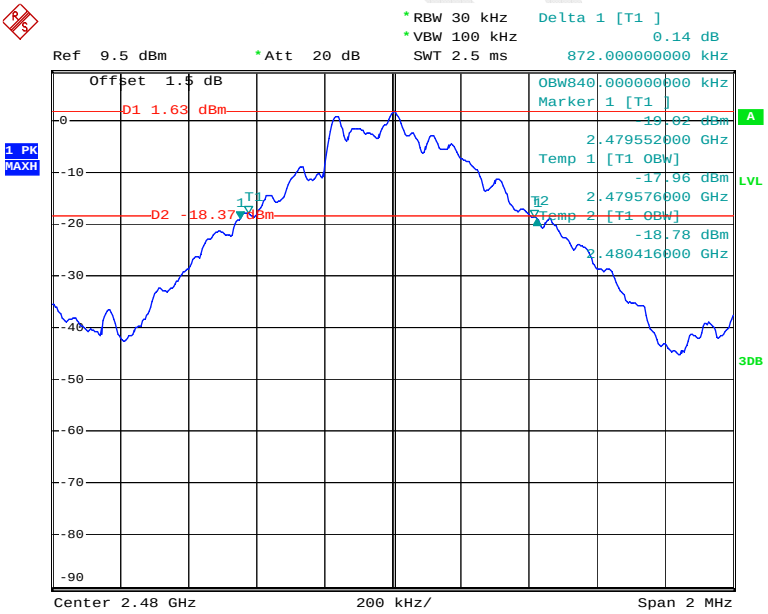
Date: 14.OCT.2014 17:56:06

Middle Channel



Date: 14.OCT.2014 17:57:45

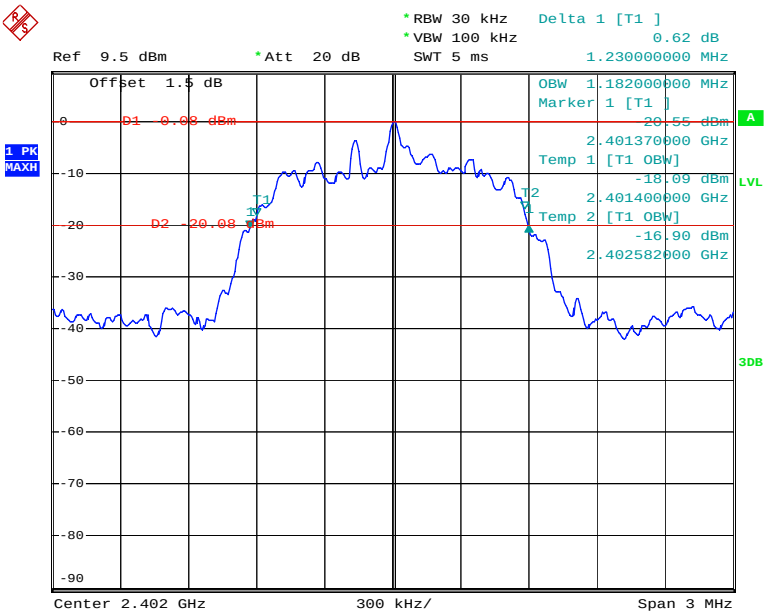
High Channel



Date: 14.OCT.2014 17:59:56

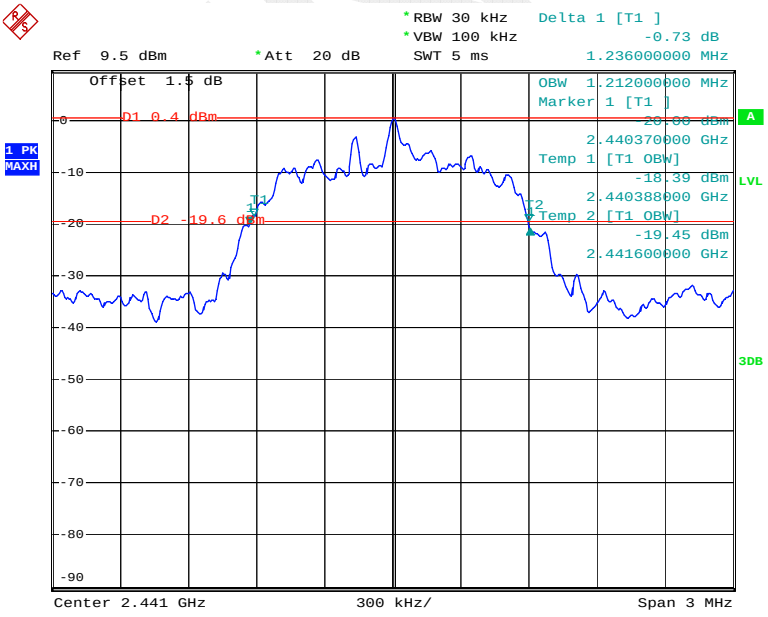
EDR Mode (π/4-DQPSK):

Low Channel



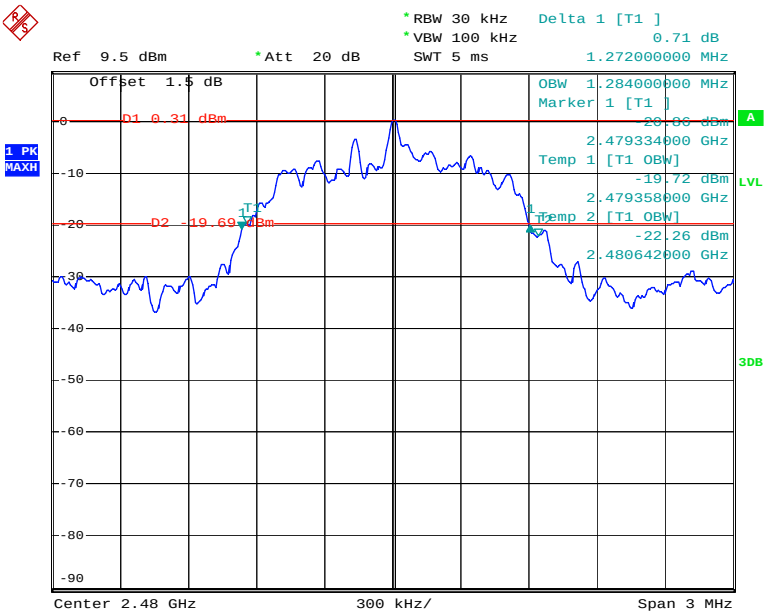
Date: 14.OCT.2014 18:16:42

Middle Channel



Date: 14.OCT.2014 18:14:10

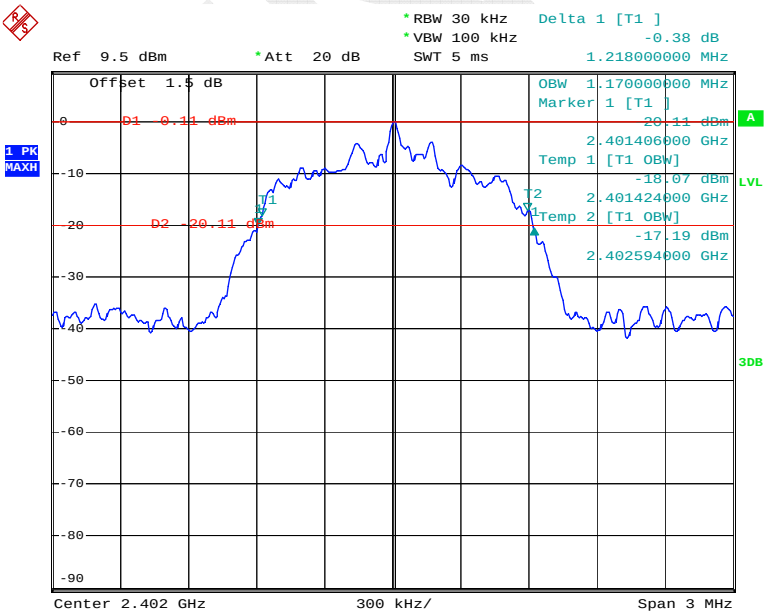
High Channel



Date: 14.OCT.2014 18:02:47

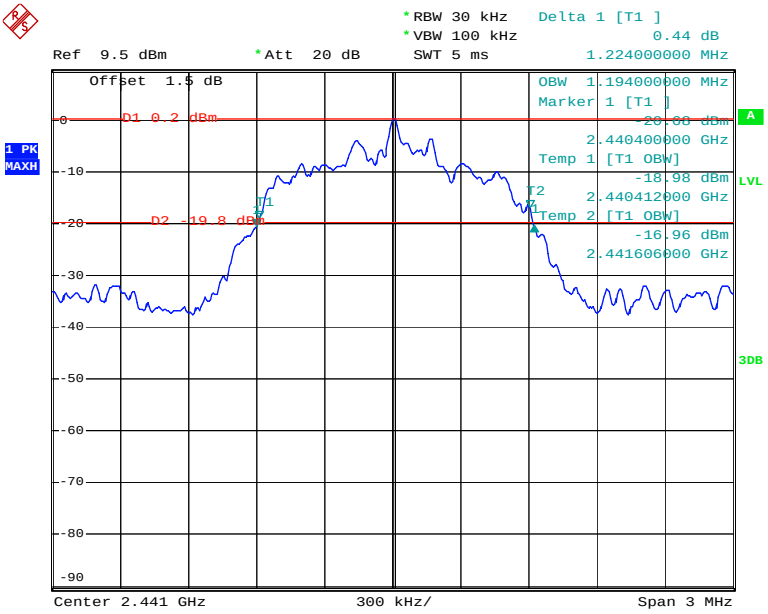
EDR Mode (8-DPSK):

Low Channel



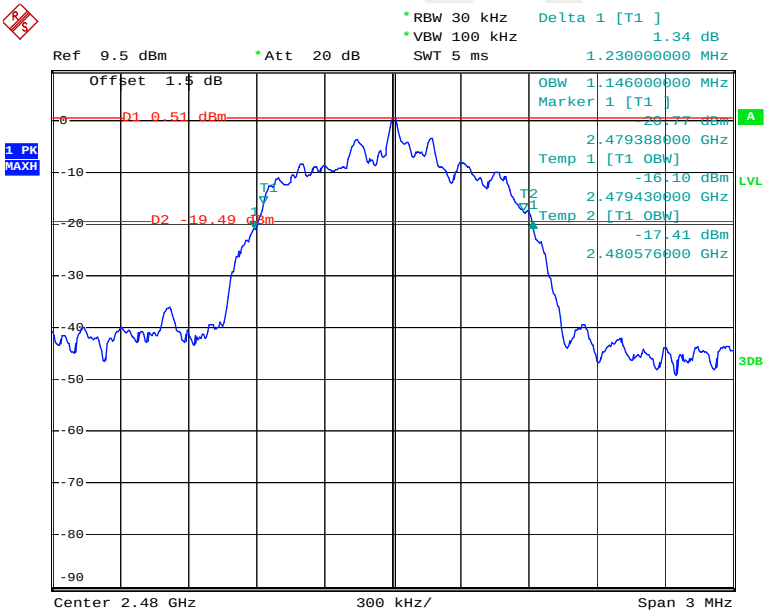
Date: 14.OCT.2014 18:18:21

Middle Channel



Date: 14.OCT.2014 18:20:49

High Channel



Date: 14.OCT.2014 18:34:30

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

Set the EUT in hopping mode, maxhold the trace, allow it to stabilize.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	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:	28.1 °C
Relative Humidity:	62 %
ATM Pressure:	100.6kPa

The testing was performed by Dean Liu on 2014-09-29.

Test Result: Compliance.

Please refer to following tables and plots

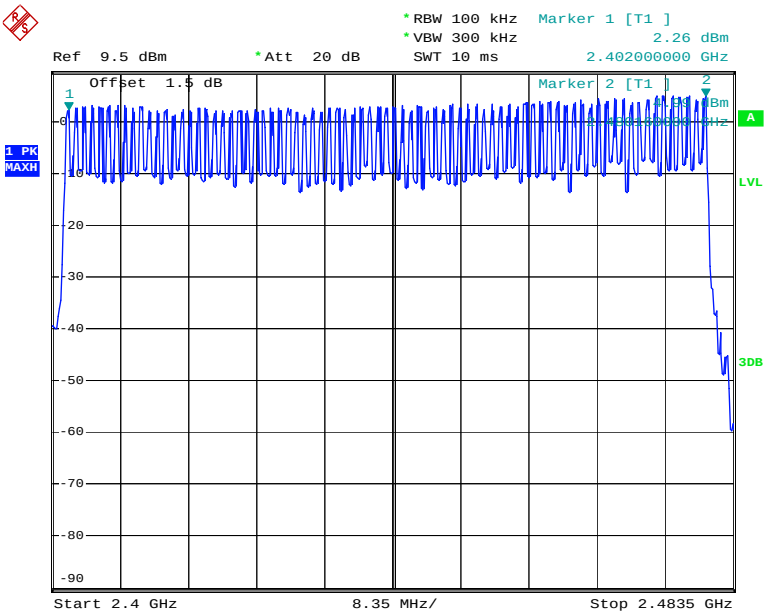
FINAL

Test Mode: Transmitting

BDR Mode (GFSK):

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

Number of Hopping Channels

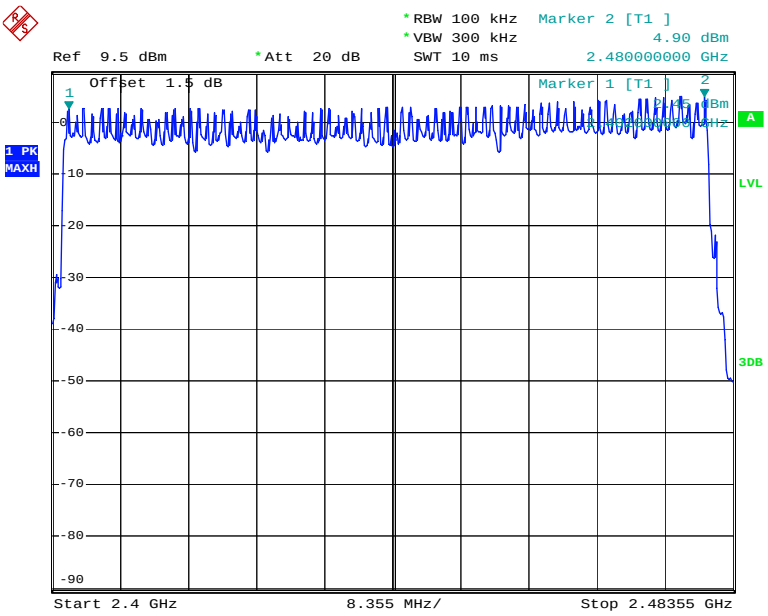


Date: 29.SEP.2014 12:19:31

EDR Mode (π/4-DQPSK):

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

Number of Hopping Channels

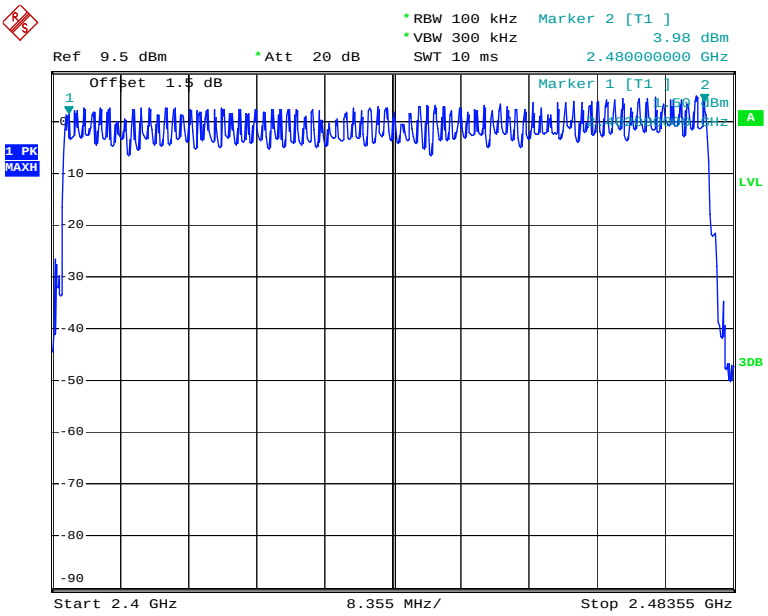


Date: 29.SEP.2014 14:54:43

EDR Mode (8-DPSK):

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

Number of Hopping Channels



Date: 29.SEP.2014 14:56:57

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 hopping mode; Spectrum SPAN was set as zero. Sweep time was set as necessary to capture the entire dwell time per hopping channel, the quantity of pulse was get from single sweep. In addition, the time of single pulse was tested.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	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:	28.1 °C
Relative Humidity:	62 %
ATM Pressure:	100.6kPa

The testing was performed by Dean Liu on 2014-09-29.

Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

FINAL

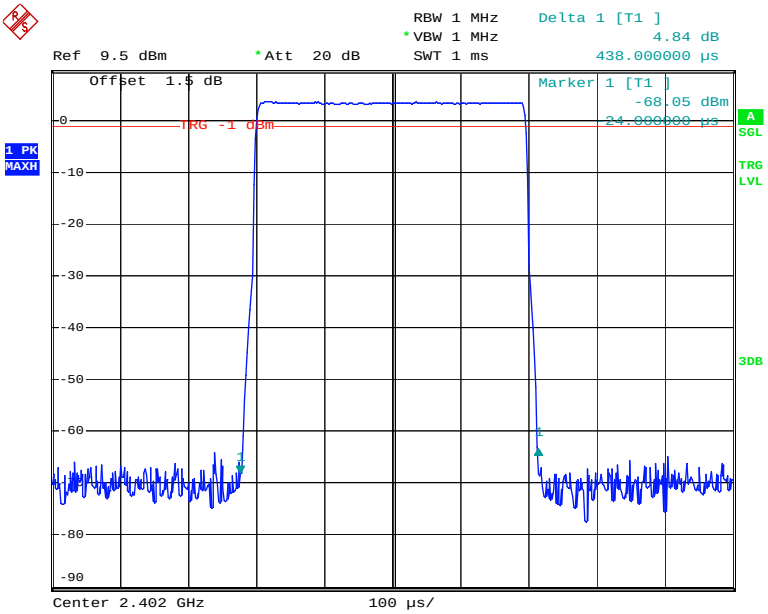
Mode	Channel	Frequency(s)	Packet Type	Pulse Width (ms)	Dwell time (s)	Limit (s)
GFSK	Low	2402	DH1	0.438	0.155	0.4
			DH3	1.724	0.278	0.4
			DH5	2.964	0.320	0.4
	Middle	2441	DH1	0.438	0.154	0.4
			DH3	1.724	0.278	0.4
			DH5	2.964	0.320	0.4
	High	2480	DH1	0.442	0.155	0.4
			DH3	1.724	0.278	0.4
			DH5	2.974	0.320	0.4
π / 4 DQPSK	Low	2402	DH1	0.452	0.154	0.4
			DH3	1.724	0.254	0.4
			DH5	2.974	0.321	0.4
	Middle	2441	DH1	0.452	0.156	0.4
			DH3	1.724	0.254	0.4
			DH5	2.974	0.320	0.4
	High	2480	DH1	0.452	0.156	0.4
			DH3	1.724	0.254	0.4
			DH5	2.974	0.322	0.4
8DPSK	Low	2402	DH1	0.452	0.156	0.4
			DH3	1.724	0.278	0.4
			DH5	2.974	0.321	0.4
	Middle	2441	DH1	0.452	0.156	0.4
			DH3	1.724	0.278	0.4
			DH5	2.974	0.321	0.4
	High	2480	DH1	0.452	0.156	0.4
			DH3	1.724	0.278	0.4
			DH5	2.974	0.321	0.4

Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s for DH1,
Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s for DH3,
Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s for DH5

FINAL

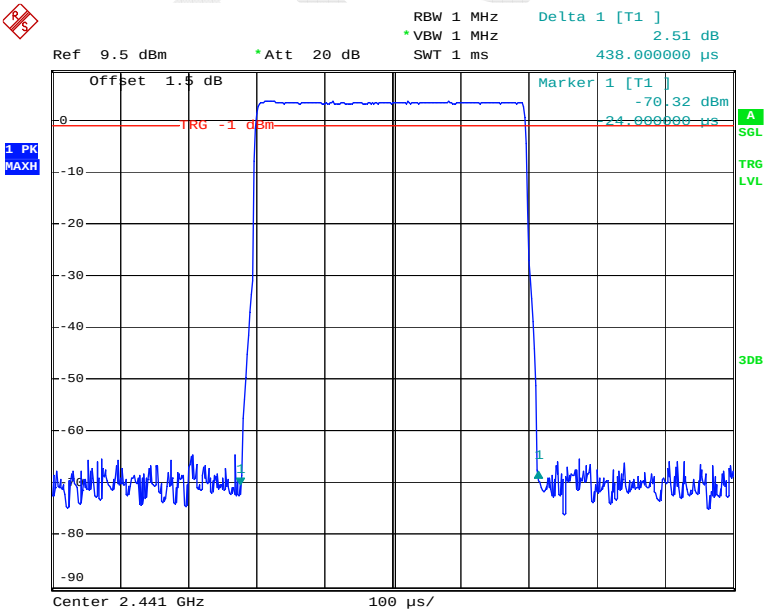
GFSKMode:

DH1: Low Channel



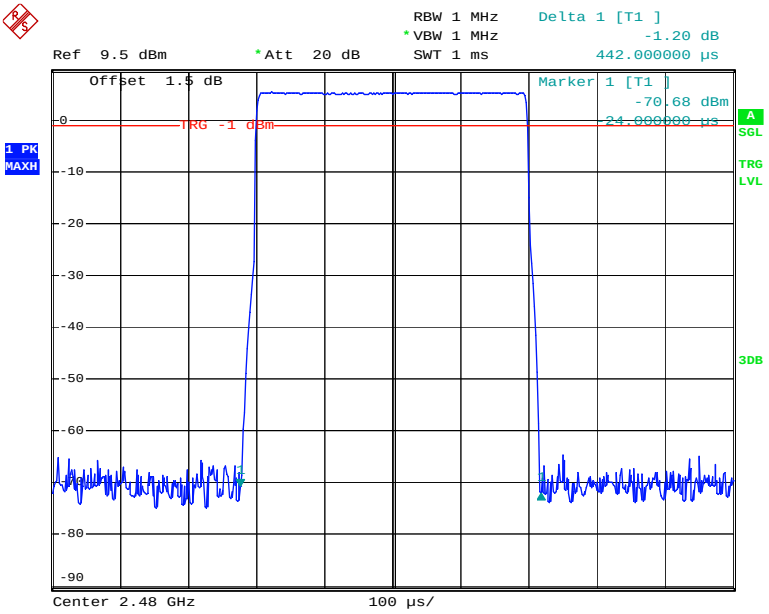
Date: 29.SEP.2014 14:23:54

DH1: Middle Channel



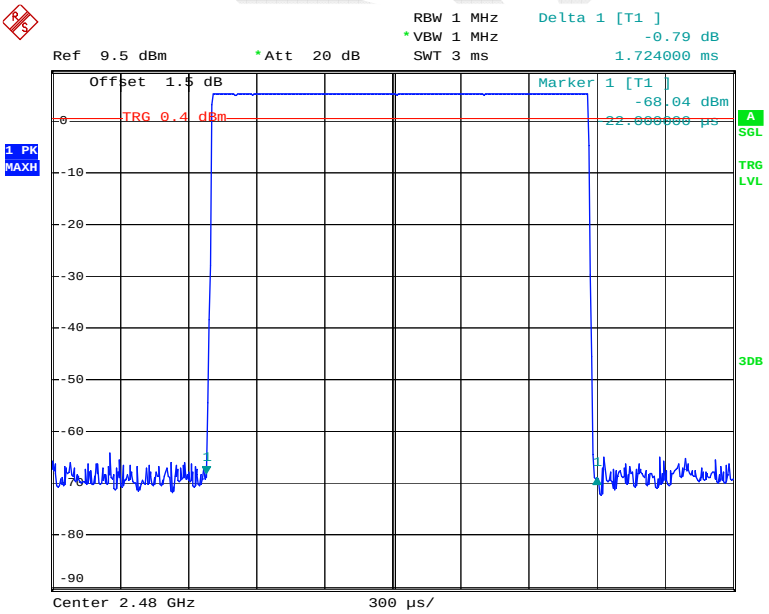
Date: 29.SEP.2014 14:23:45

DH1: High Channel



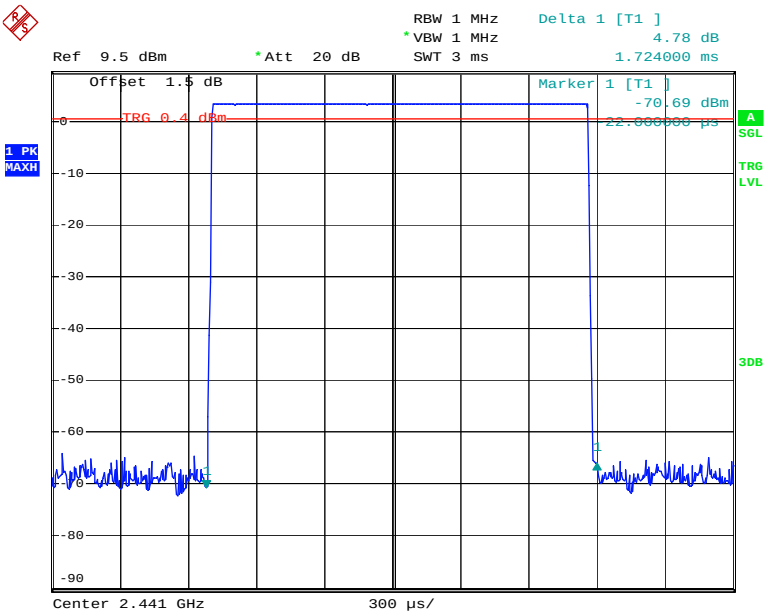
Date: 29.SEP.2014 14:24:11

DH3: Low Channel



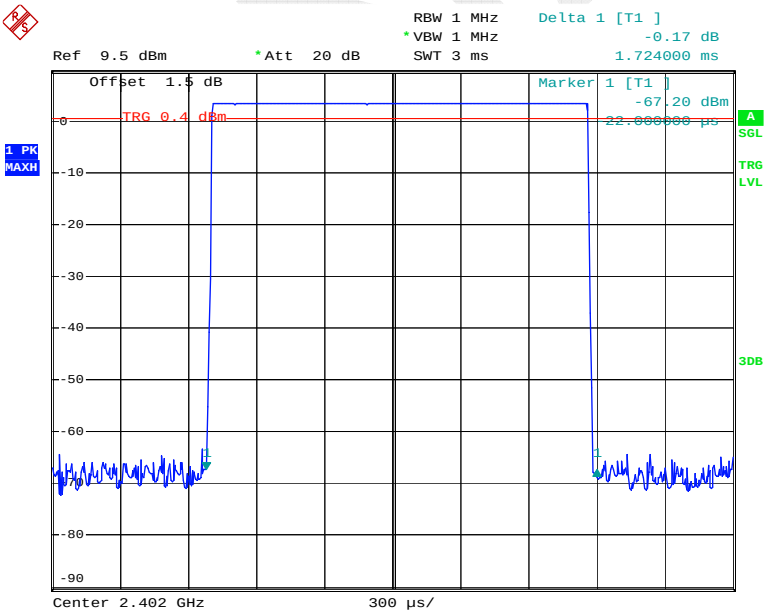
Date: 29.SEP.2014 14:32:37

DH3: Middle Channel



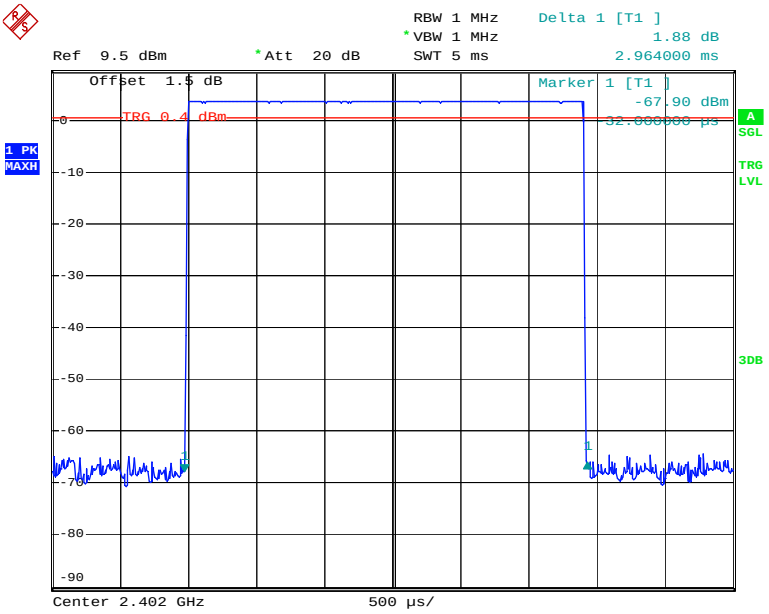
Date: 29.SEP.2014 14:32:44

DH3: High Channel



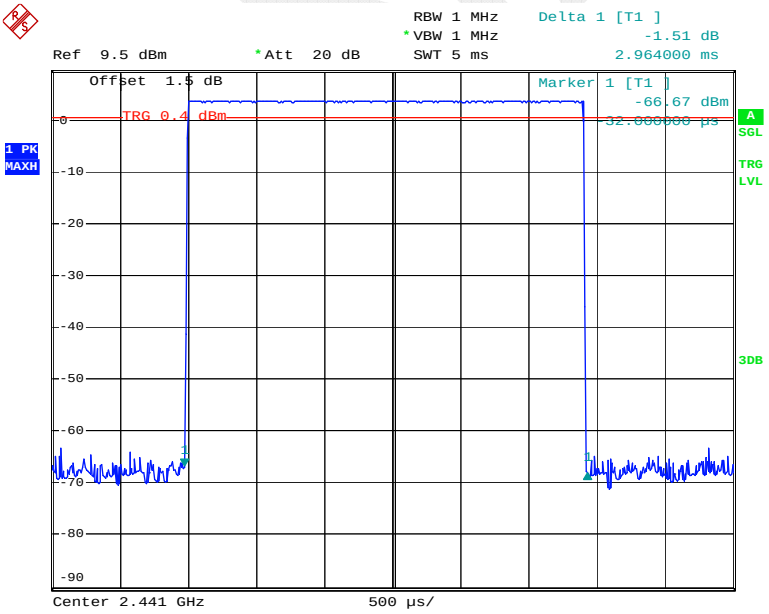
Date: 29.SEP.2014 14:32:54

DH5: Low Channel



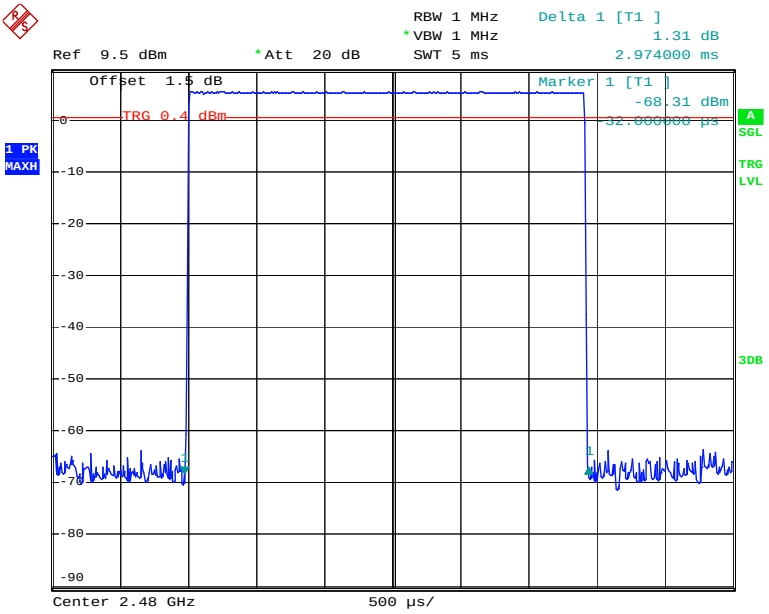
Date: 29.SEP.2014 14:44:35

DH5: Middle Channel



Date: 29.SEP.2014 14:44:41

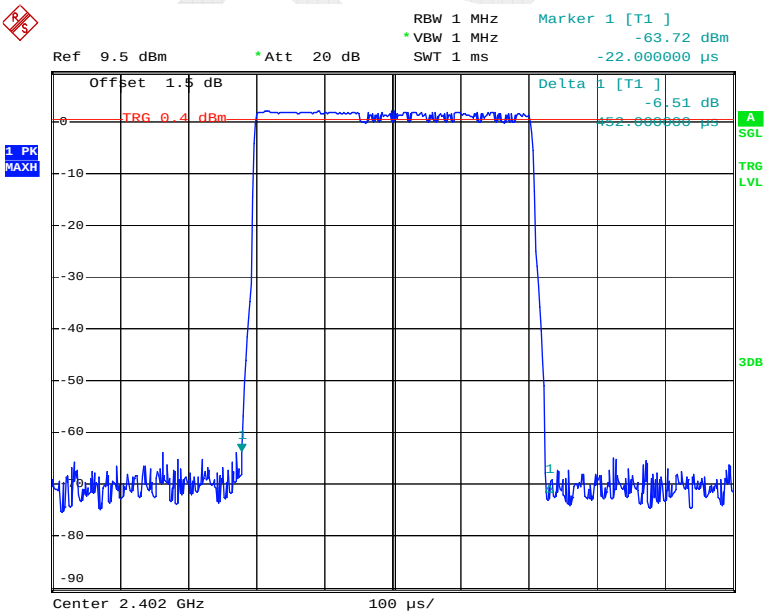
DH5: High Channel



Date: 29.SEP.2014 14:45:00

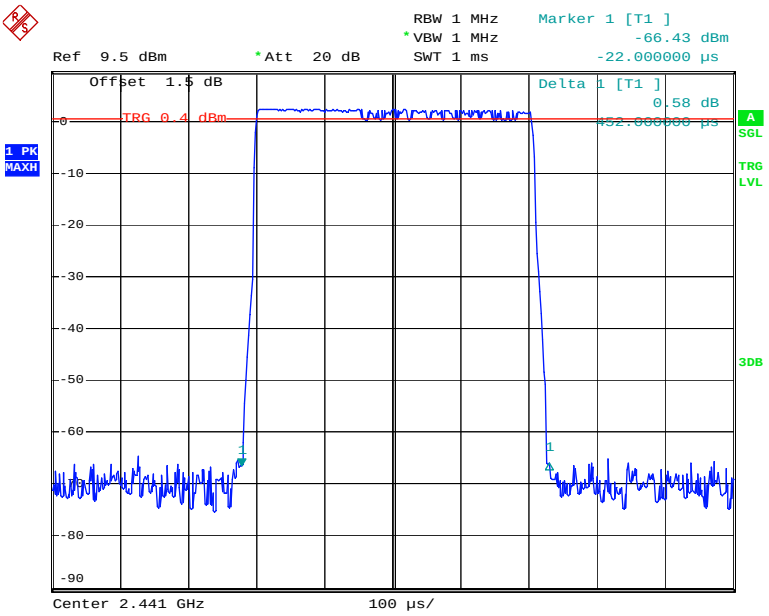
EDR Mode (π/4-DQPSK):

DH1: Low Channel



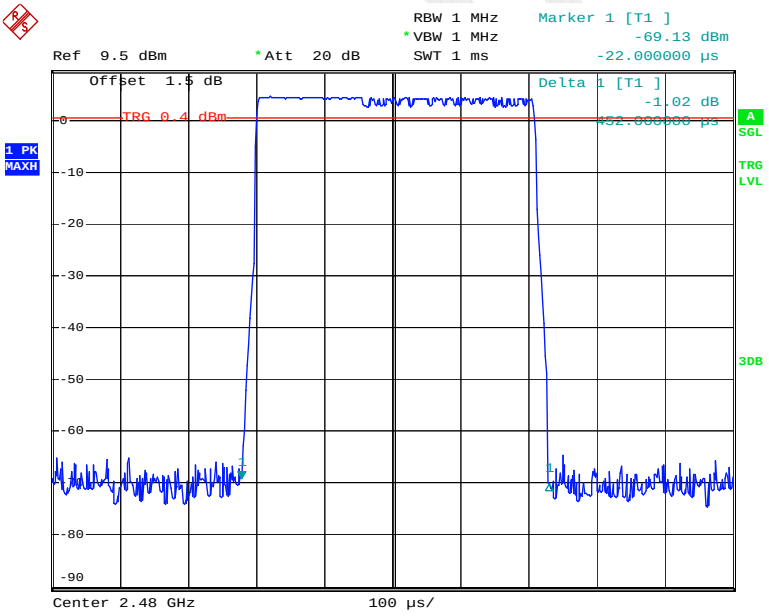
Date: 29.SEP.2014 14:26:50

DH1: Middle Channel



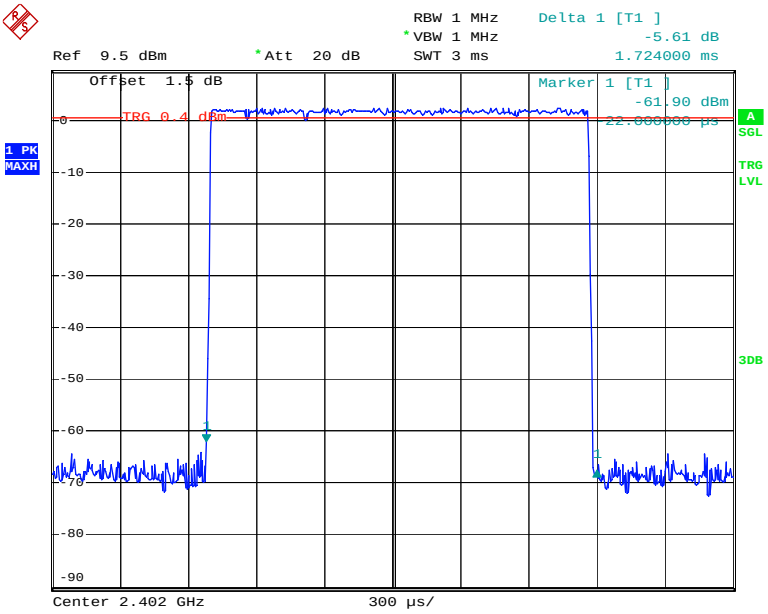
Date: 29.SEP.2014 14:26:33

DH1: High Channel



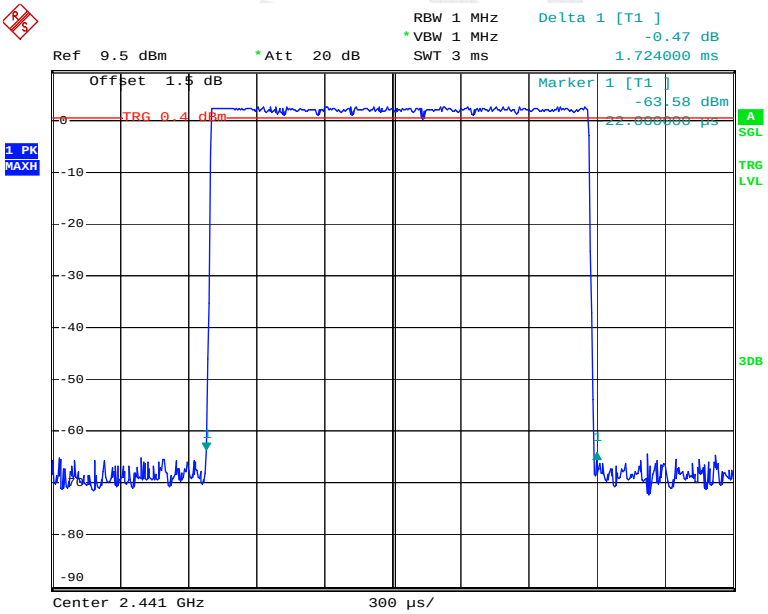
Date: 29.SEP.2014 14:26:18

DH3: Low Channel



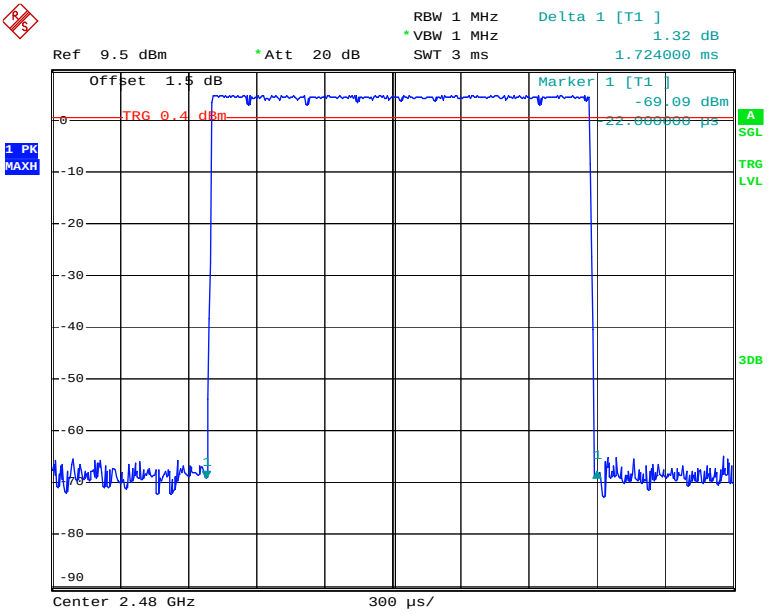
Date: 29.SEP.2014 14:31:27

DH3: Middle Channel



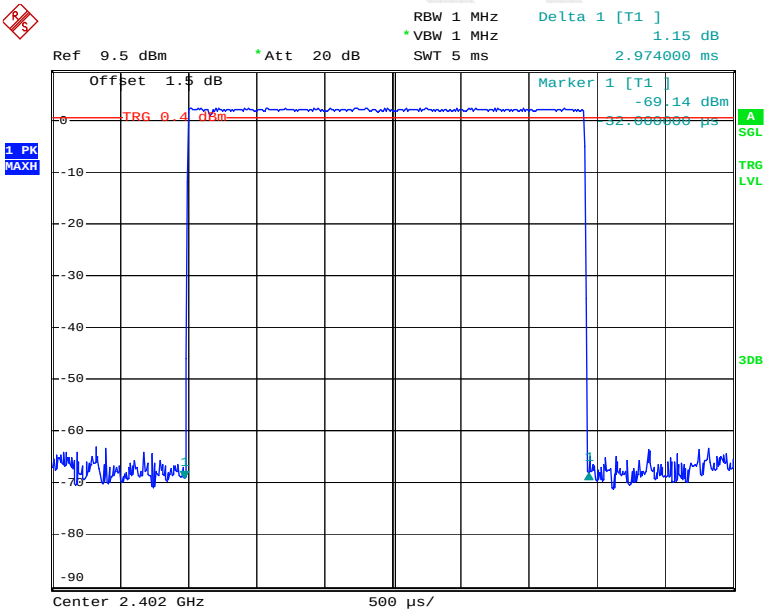
Date: 29.SEP.2014 14:31:04

DH3: High Channel



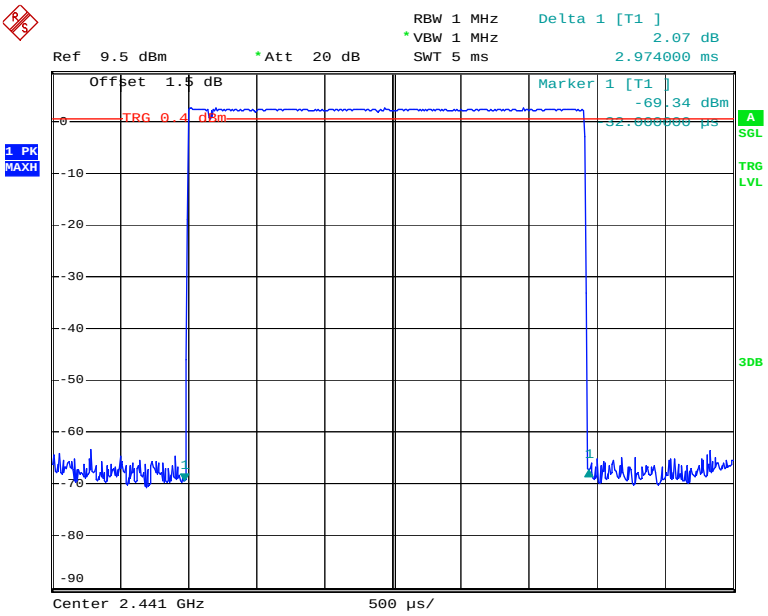
Date: 29.SEP.2014 14:30:55

DH5: Low Channel



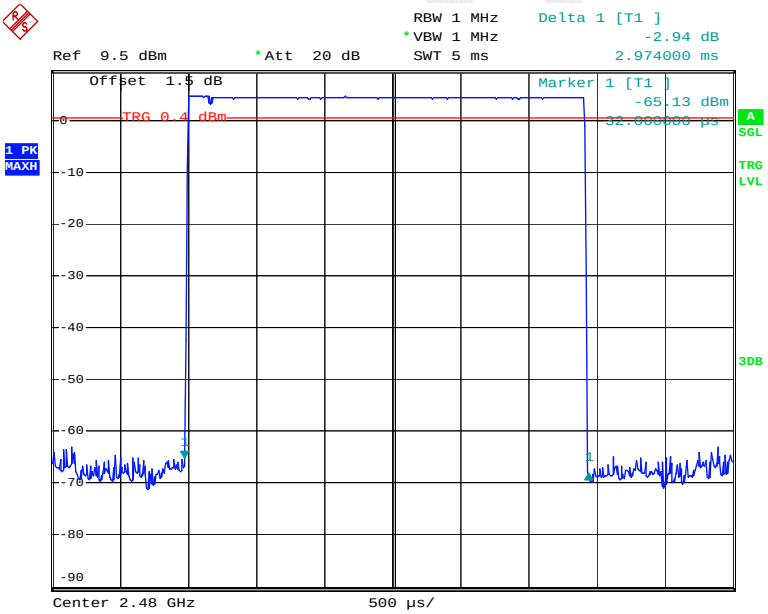
Date: 29.SEP.2014 14:46:09

DH5: Middle Channel



Date: 29.SEP.2014 14:46:00

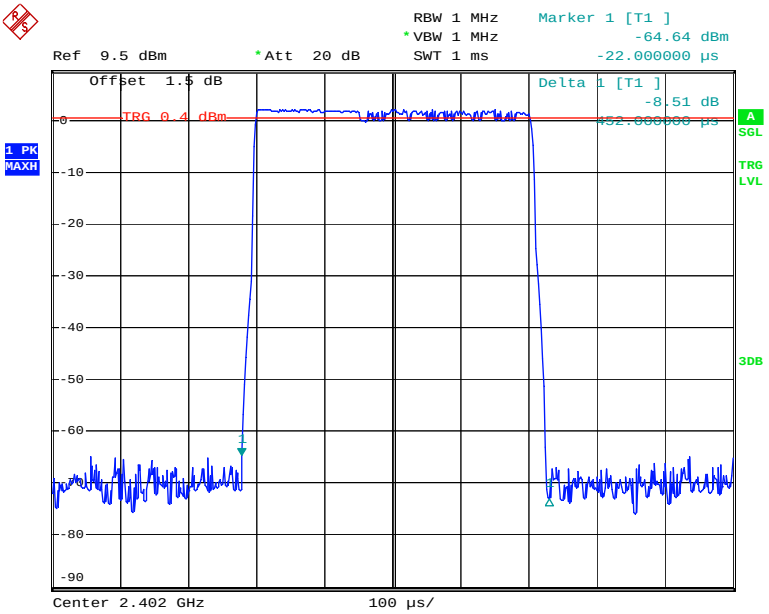
DH5: High Channel



Date: 29.SEP.2014 14:45:53

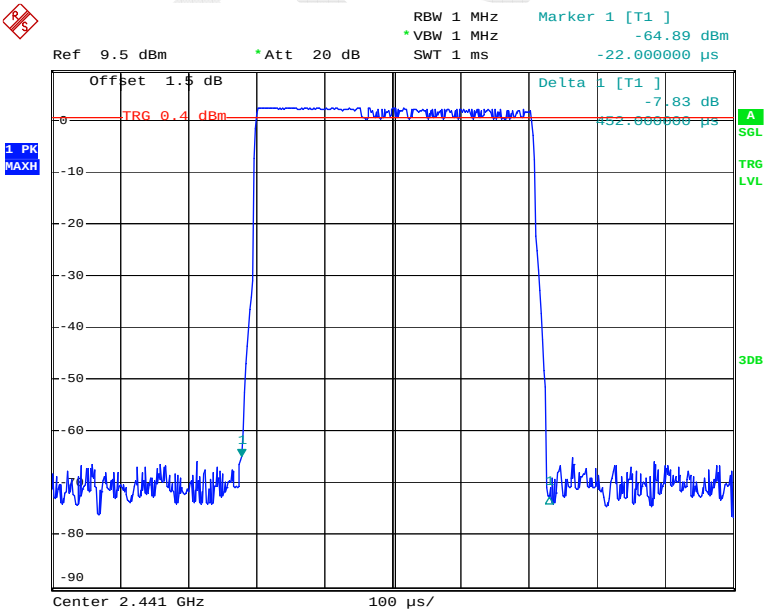
EDR Mode (8-DPSK):

DH1: Low Channel



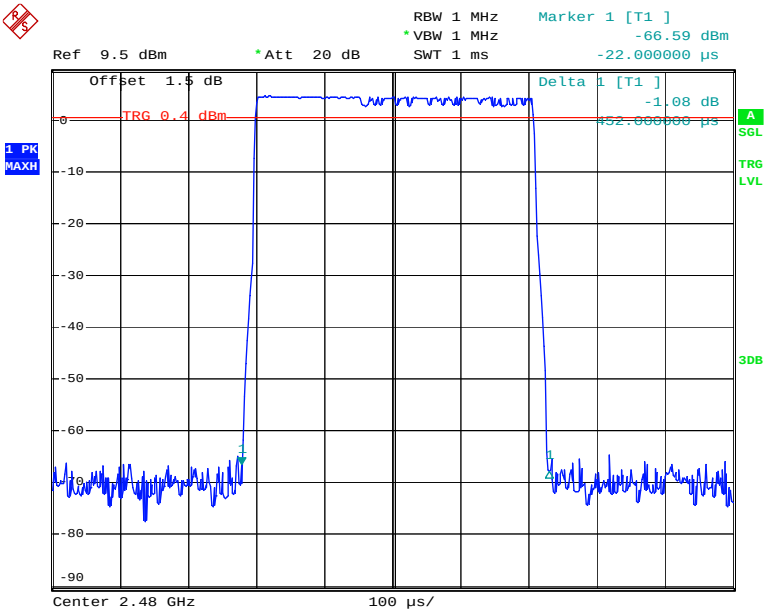
Date: 29.SEP.2014 14:27:51

DH1: Middle Channel



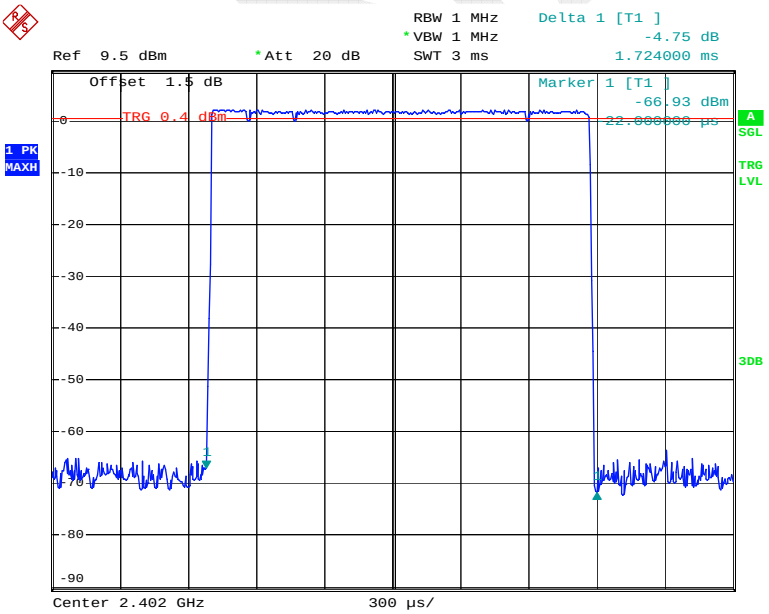
Date: 29.SEP.2014 14:27:59

DH1: High Channel



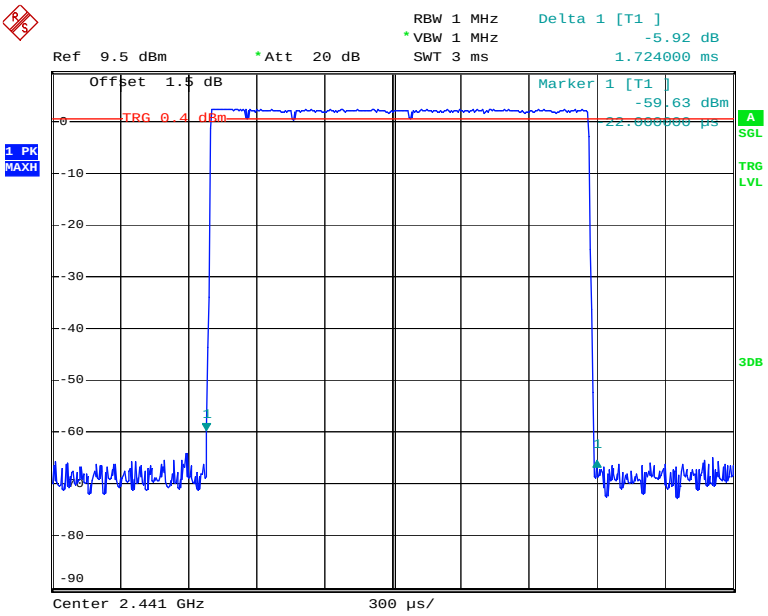
Date: 29.SEP.2014 14:28:07

DH3: Low Channel



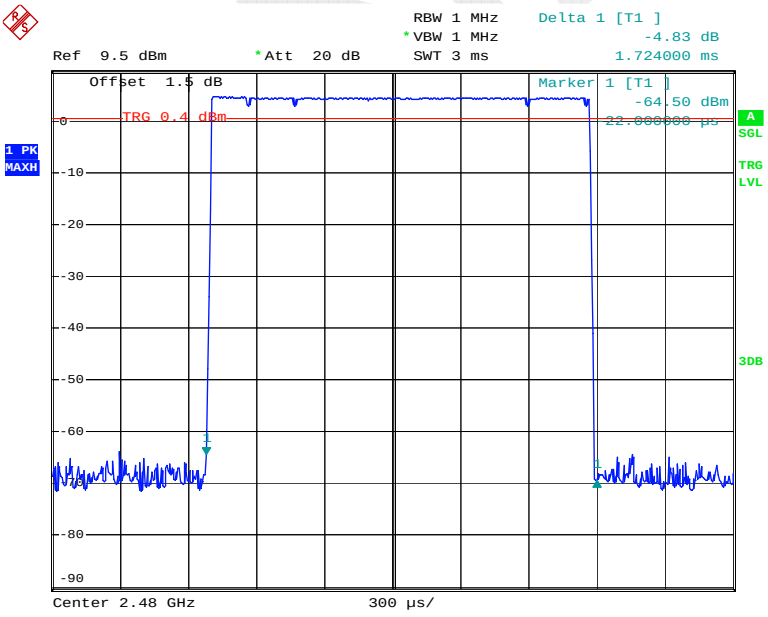
Date: 29.SEP.2014 14:31:53

DH3: Middle Channel



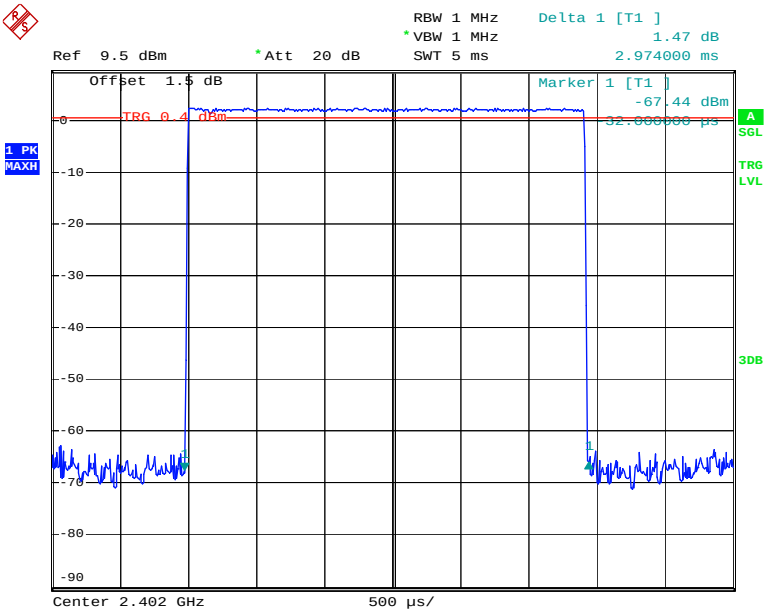
Date: 29.SEP.2014 14:32:00

DH3: High Channel



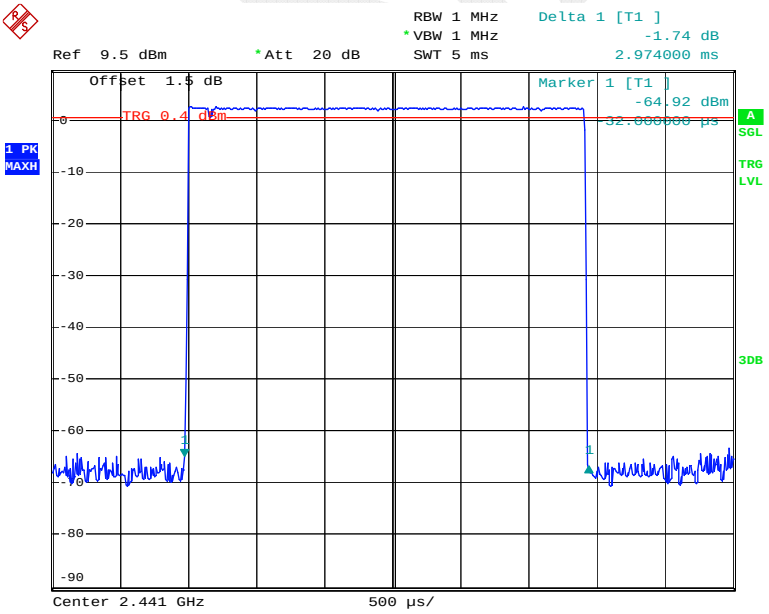
Date: 29.SEP.2014 14:32:08

DH5: Low Channel



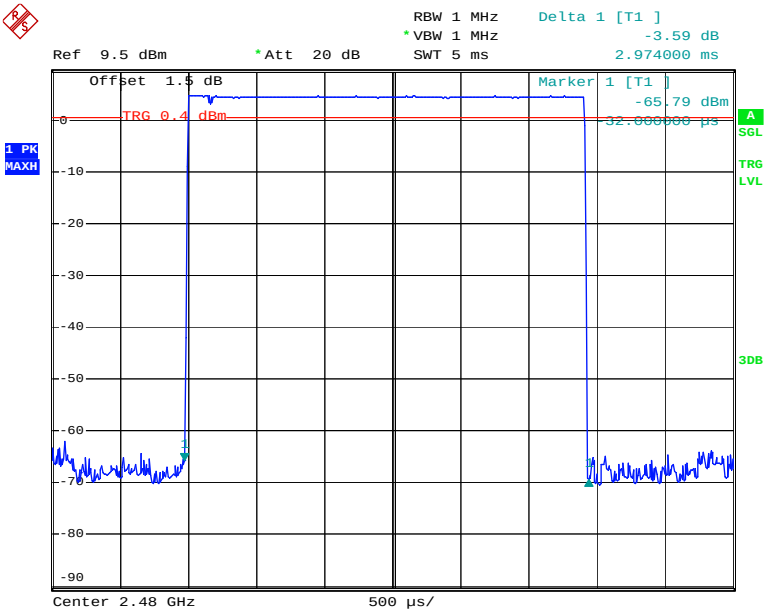
Date: 29.SEP.2014 14:46:19

DH5: Middle Channel



Date: 29.SEP.2014 14:46:27

DH5: High Channel



Date: 29.SEP.2014 14:46:37

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

Set the EUT in transmitting mode, maxhold the trace, Allow it to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	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:	28.1 °C
Relative Humidity:	62 %
ATM Pressure:	100.6kPa

The testing was performed by Dean Liu on 2014-09-29.

Test Result: Compliance.

FINAL

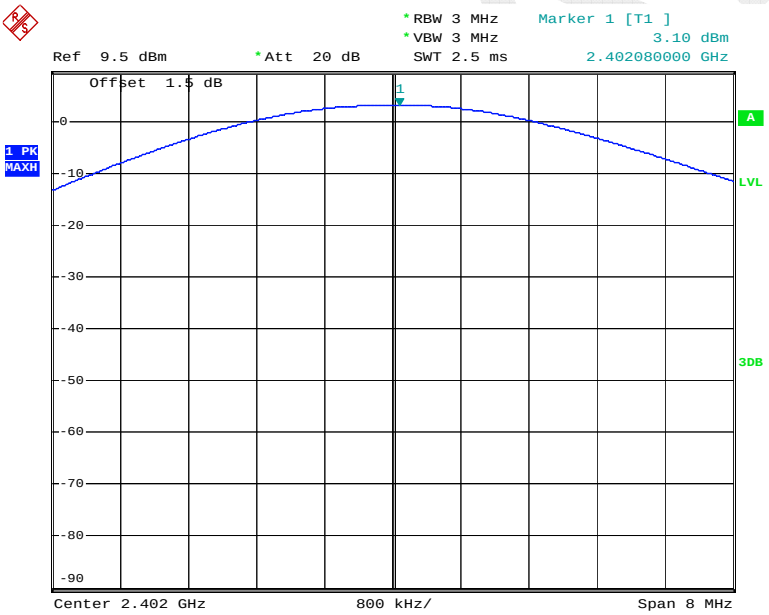
Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	Output power (dBm)	Limit (dBm)
BDR Mode (GFSK)	Low	2402	3.100	30
	Middle	2441	3.100	30
	High	2480	4.910	30
EDR Mode (π/4-DQPSK)	Low	2402	2.210	30
	Middle	2441	2.510	30
	High	2480	4.460	30
EDR Mode (8-DPSK)	Low	2402	2.420	30
	Middle	2441	2.640	30
	High	2480	4.530	30

Note: The data above was tested in conducted mode.

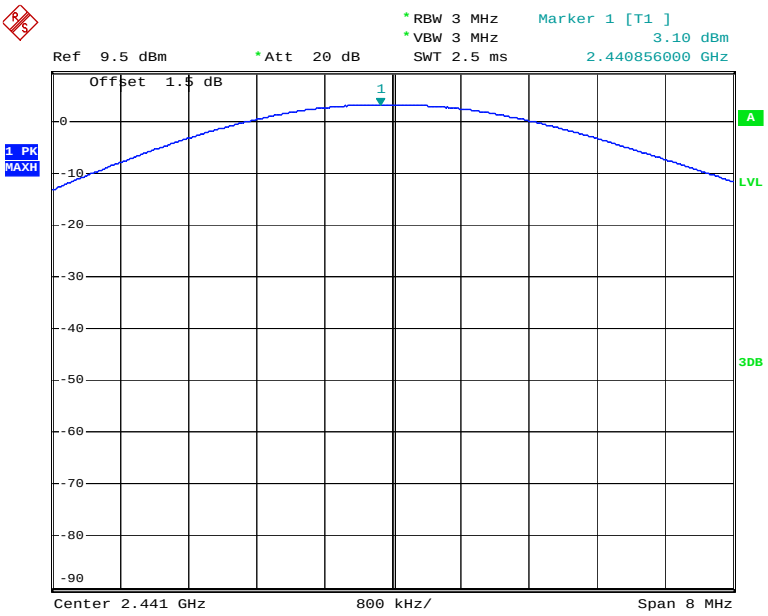
BDR Mode (GFSK):

Output Power, Low Channel



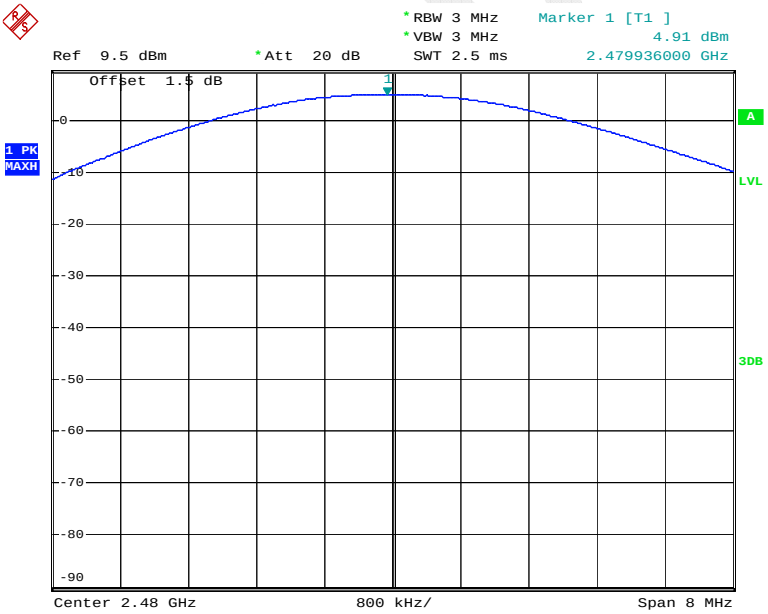
Date: 29.SEP.2014 13:39:50

Output Power, Middle Channel



Date: 29.SEP.2014 13:39:37

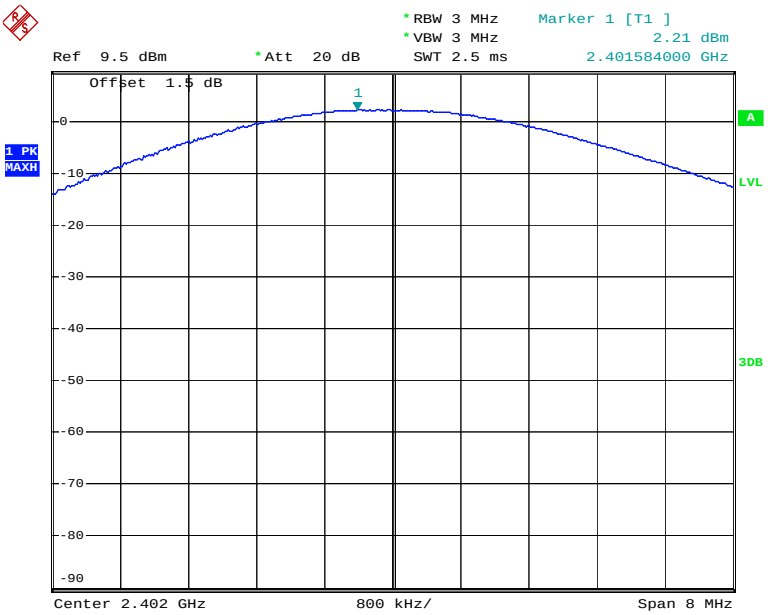
Output Power, High Channel



Date: 29.SEP.2014 13:40:04

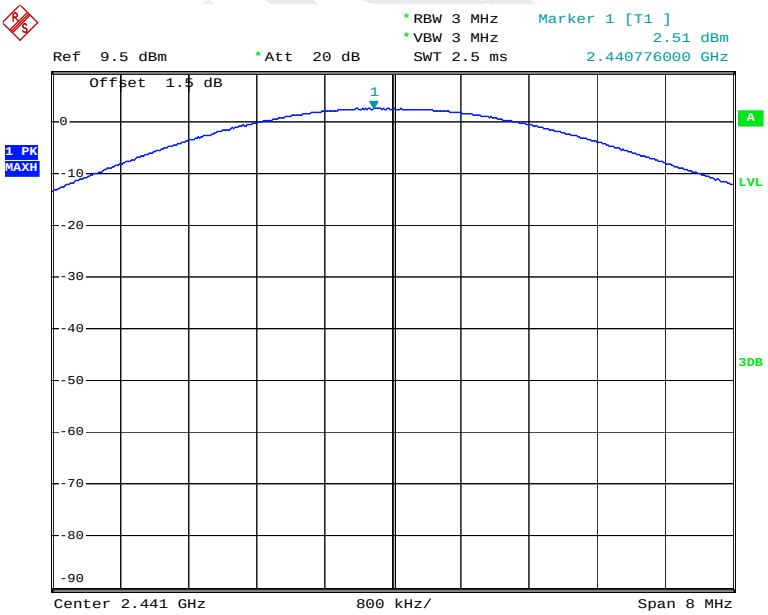
EDR Mode (π/4-DQPSK):

Output Power, Low Channel



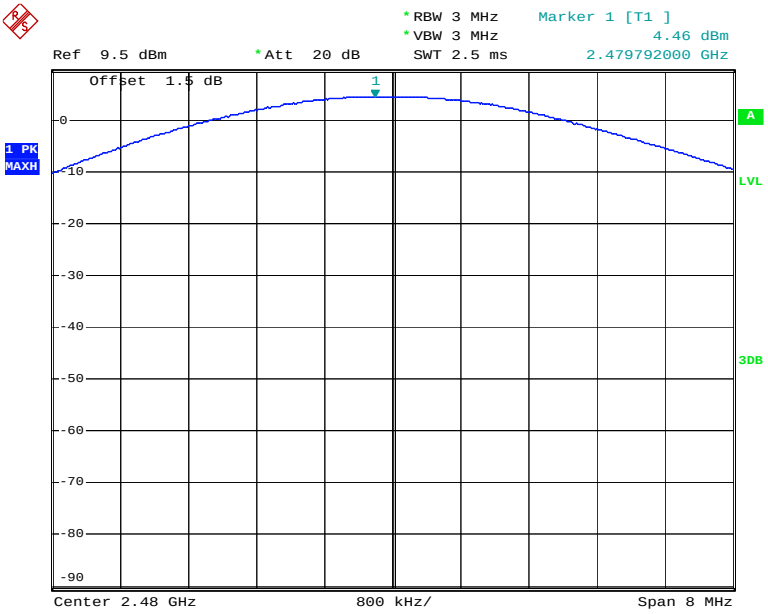
Date: 29.SEP.2014 13:38:30

Output Power, Middle Channel



Date: 29.SEP.2014 13:38:46

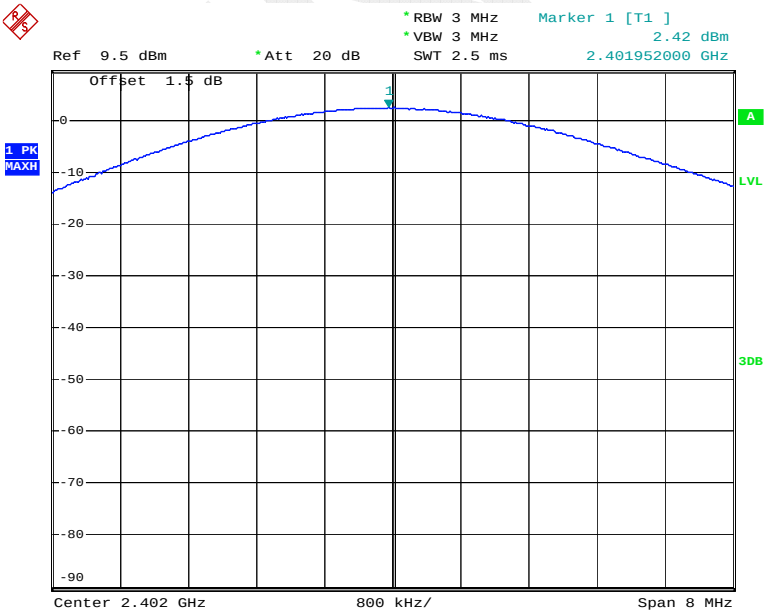
Output Power, High Channel



Date: 29.SEP.2014 13:38:17

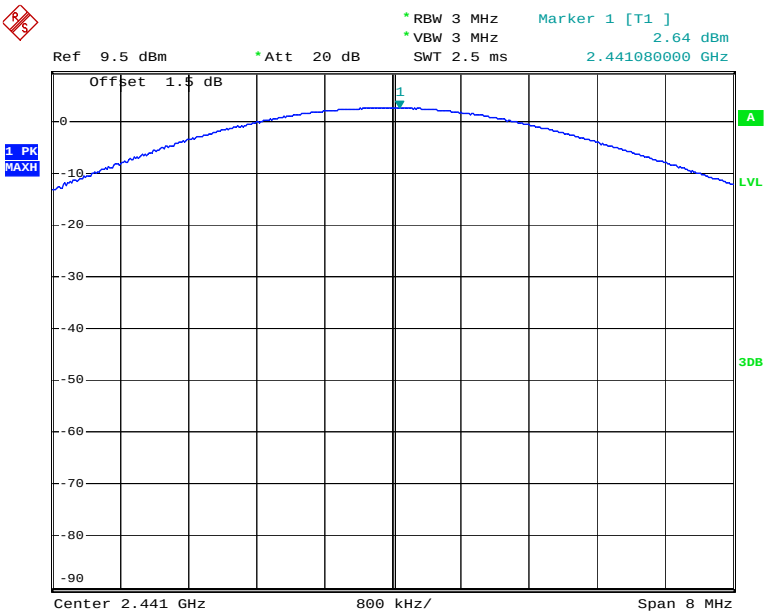
EDR Mode (8-DPSK):

Output Power, Low Channel



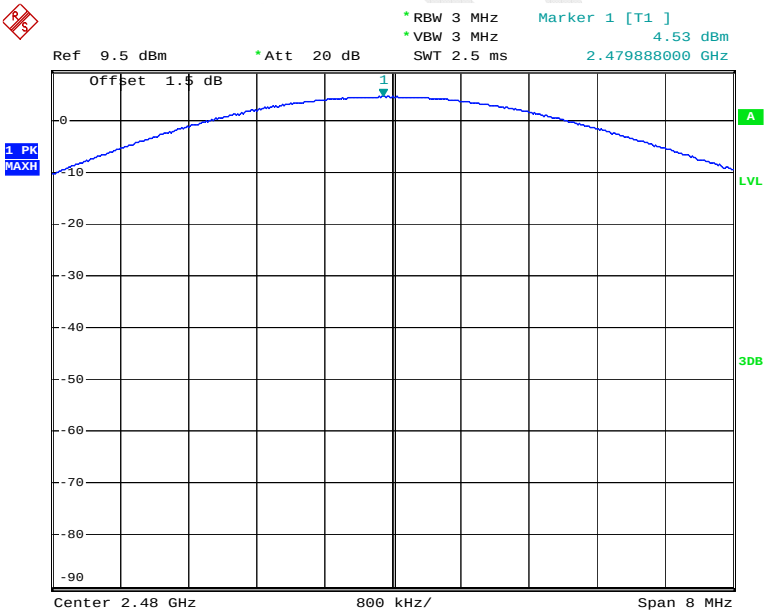
Date: 29.SEP.2014 13:44:49

Output Power, Middle Channel



Date: 29.SEP.2014 13:44:34

Output Power, High Channel



Date: 29.SEP.2014 13:44:21

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. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
2. 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	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:	28.1 °C
Relative Humidity:	62 %
ATM Pressure:	100.6kPa

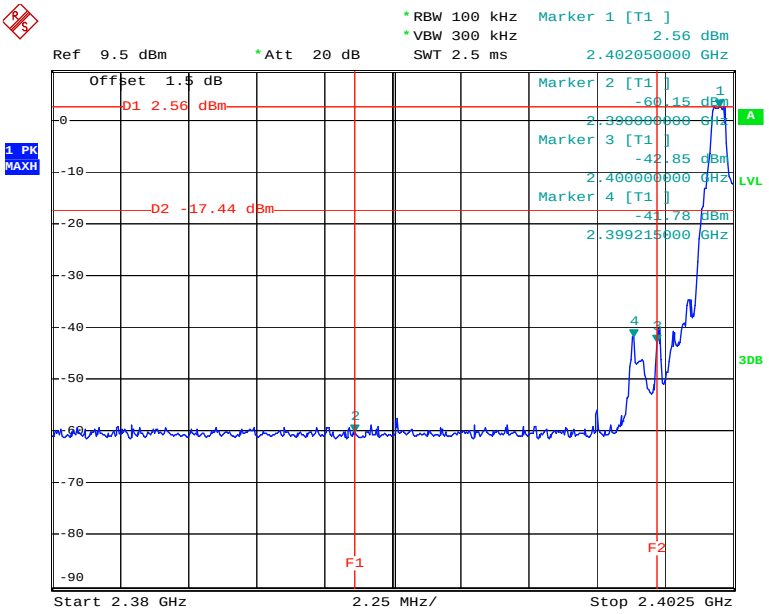
The testing was performed by Dean Liu on 2014-09-29.

Test Result: Compliance

FINAL

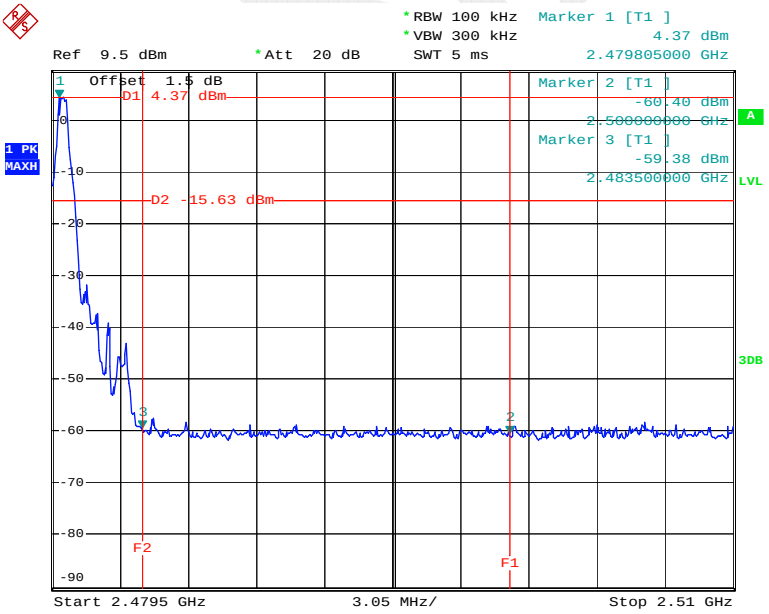
BDR Mode (GFSK):

Band Edge, Left Side



Date: 29.SEP.2014 12:01:12

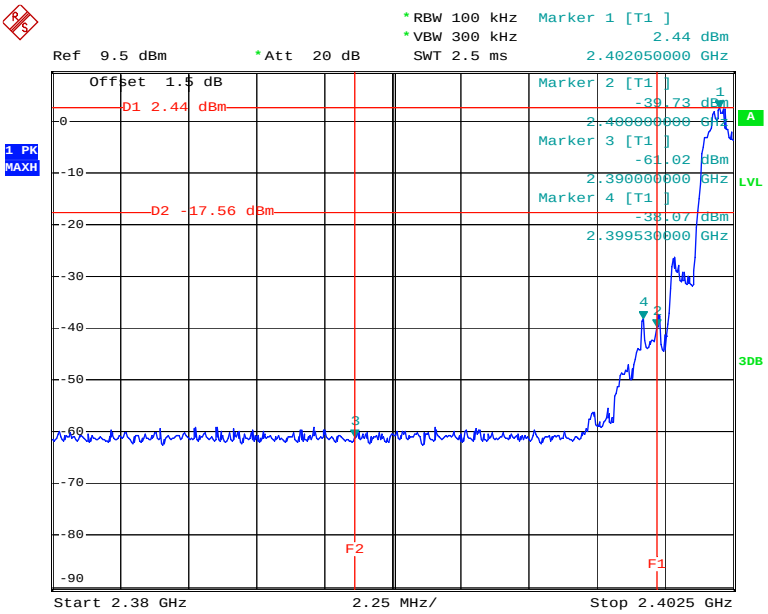
Band Edge, Right Side



Date: 29.SEP.2014 12:14:59

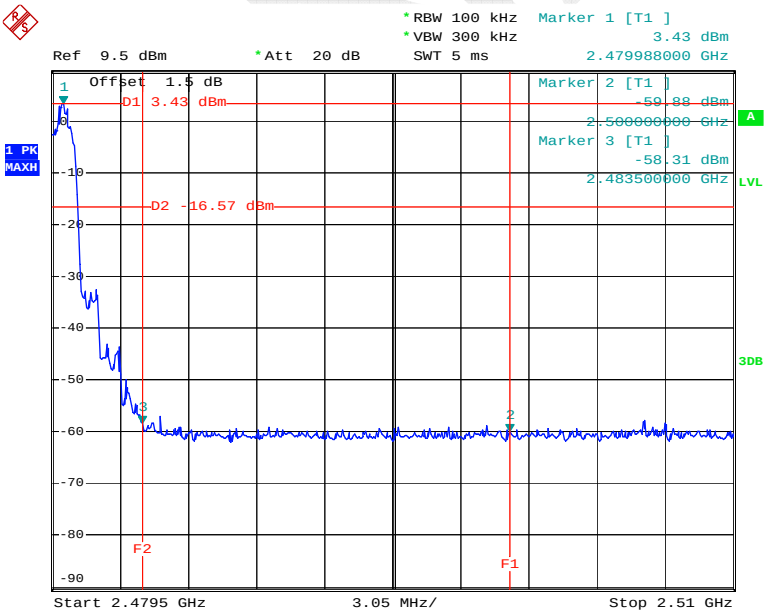
EDR Mode (π/4-DQPSK):

Band Edge, Left Side



Date: 29.SEP.2014 14:04:43

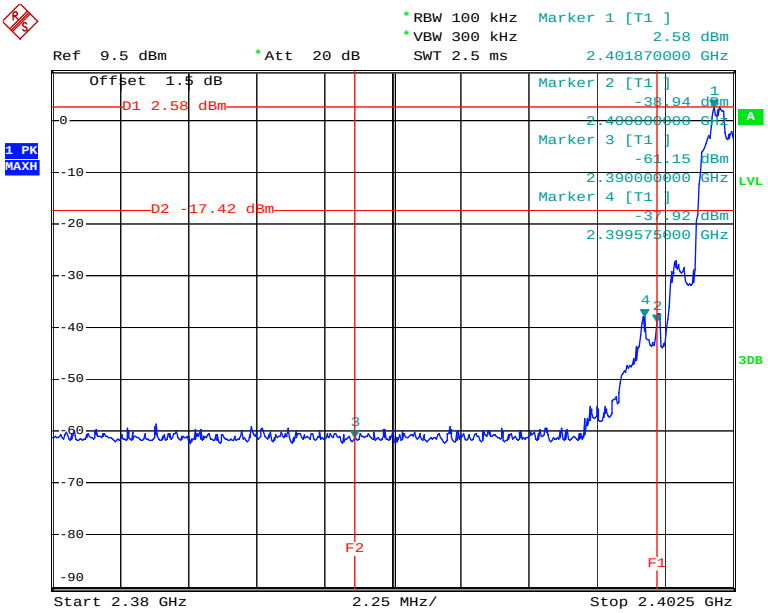
Band Edge, Right Side



Date: 29.SEP.2014 14:07:45

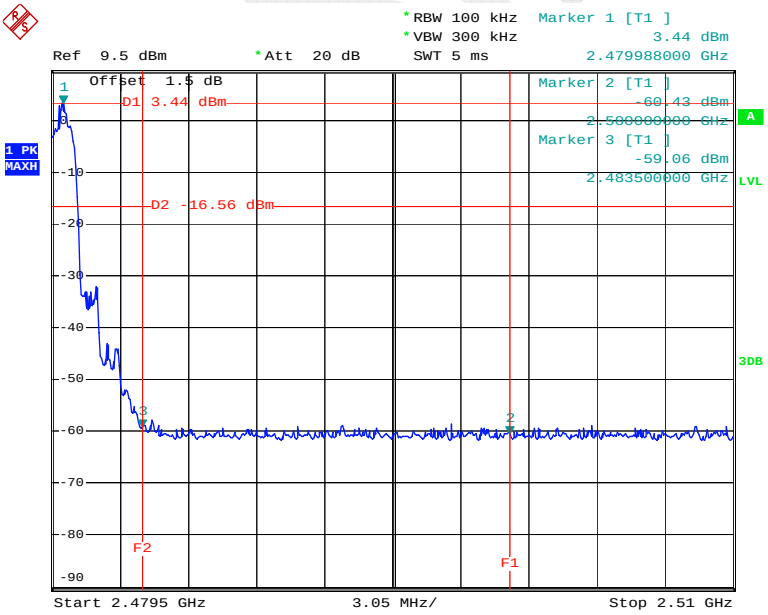
EDR Mode (8-DPSK):

Band Edge, Left Side



Date: 29.SEP.2014 14:05:25

Band Edge, Right Side



Date: 29.SEP.2014 14:08:41

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