LABCODE: 500069-0

FCC PART 15.247

TEST REPORT

For

ITALCOM GROUP

1728 Coral Way, Coral Gables, Miami, Florida 33145, USA

FCC ID: YPVITALCOMFLYMINI

Report Type:	**Product Type:**
Original Report	Mobile Phone

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Report Number:	RSZ140304015-00A
Report Date:	2014-03-19
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *ITALCOM GROUP*'s product, model number: *FLY MINI (FCC ID: YPVITALCOMFLYMINI)* (the "EUT") in this report was a *Mobile Phone,* which was measured approximately: 11.8 cm (L) x 6.3 cm (W) x 1.0 cm (H), rated input voltage: DC 3.7 V from lithium battery or DC 4.2V charging from adapter.

Adapter information:
Input: AC 100-250V, 50-60Hz
Output: DC 4.2V±0.5V, 500mA

** All measurement and test data in this report was gathered from production sample serial number: 140304015 (Assigned by BACL.Dongguan). The EUT was received on 2014-03-07.*

Objective

This report is prepared on behalf of *ITALCOM GROUP* 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 15B JBP submissions with FCC ID: YPVITALCOMFLYMINI
FCC Part 15C DTS submissions with FCC ID: YPVITALCOMFLYMINI
FCC Part 22H & 24E PCE submissions with FCC ID: YPVITALCOMFLYMINI

Test Methodology

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

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

Test Facility

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

Additionally, Bay Area Compliance Laboratories Corp. (Dongguan) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 500069-0).

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The current scope of accreditations can be found at http://ts.nist.gov/standards/scopes/5000690.htm

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

EUT Exercise Software

No software was used.

Equipment Modifications

No modification was made to the EUT.

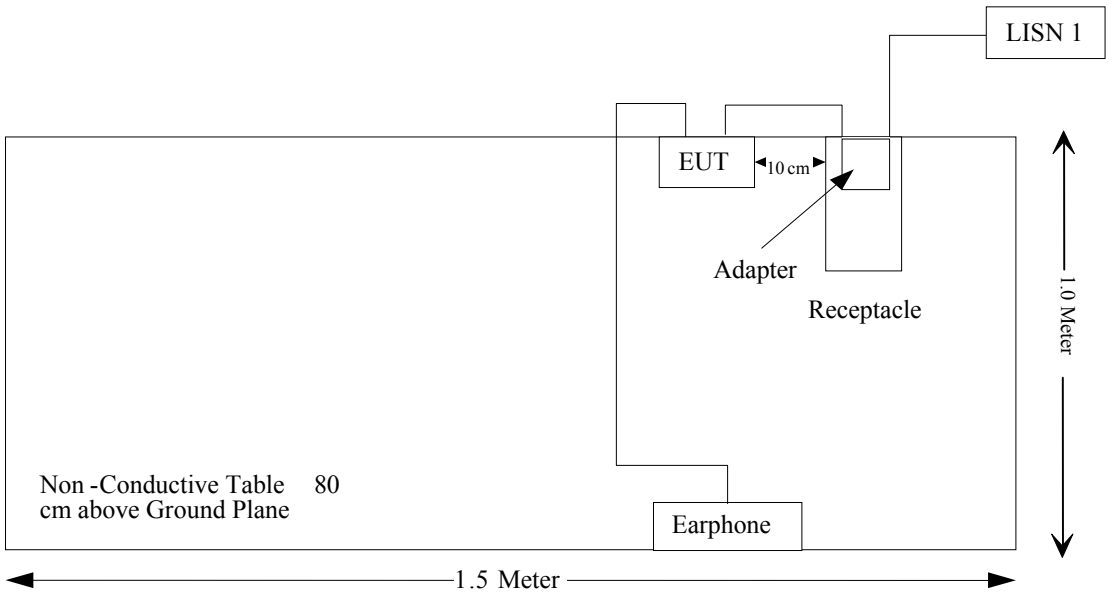
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
TESCOM	Bluetooth Tester	TC-3000C	3000C000314

External I/O Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	yes	No	1.0	EUT	Adapter
Earphone Cable	No	No	0.8	EUT	Earphone

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1)& §2.1093	RF Exposure	Compliace
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliace
§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

FCC §15.247 (i) & §2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), 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.

The SAR data please refer to the SAR report, report No.: RSZ140304015-20.

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 internal antenna arrangement for bluetooth, the antenna gain is 2.4 dBi, fulfill the requirement of this section. Please refer to the internal 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.

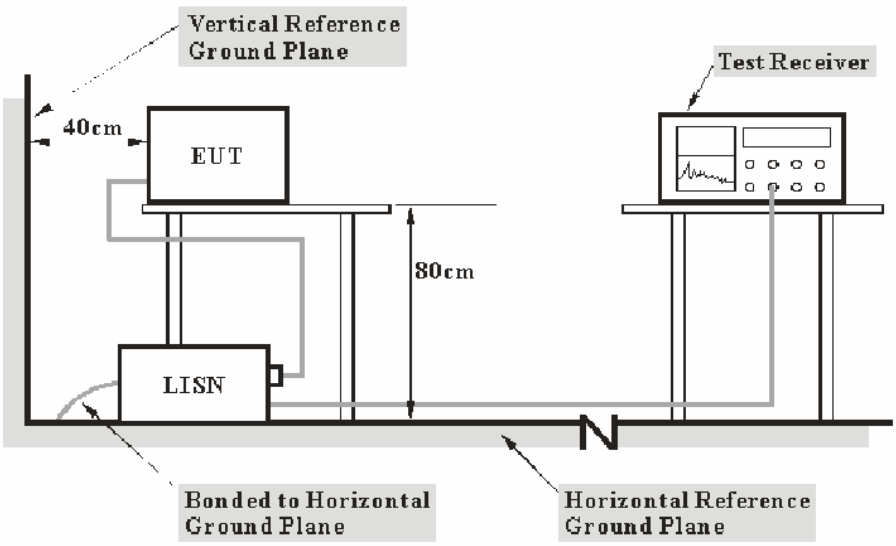
If U_{lab} is greater than U_{cispr} of Table 1, then:
- compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$),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

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Test Procedure

During the conducted emission test, the adapter 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:

$V_C = V_R + A_C + VDF$

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:

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	2014-11-19
R&S	Two-line V-network	ENV216	3560.6550.12	2014-01-22	2015-01-21
R&S	L.I.S.N	ESH3-Z5	100113	N/A	N/A
BACL	Test Software	BACL-EMC	V1.0-2010	N/A	N/A

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, 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:

10.59 dB at **0.830 MHz** in the **Neutral** conducted mode

Test Data

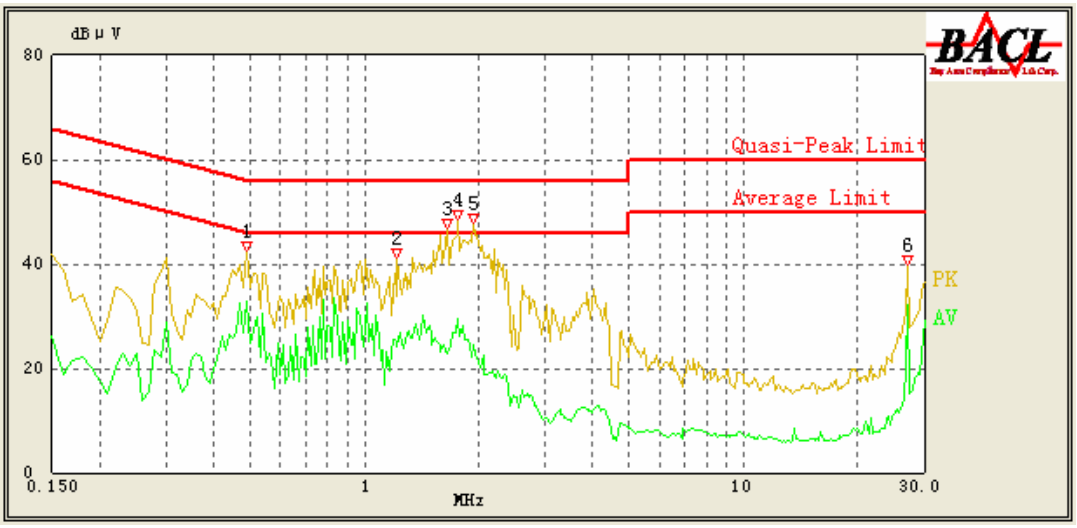
Environmental Conditions

Temperature:	22.7 °C
Relative Humidity:	40 %
ATM Pressure:	101.6 kPa

The testing was performed by Ares Liu on 2014-03-14.

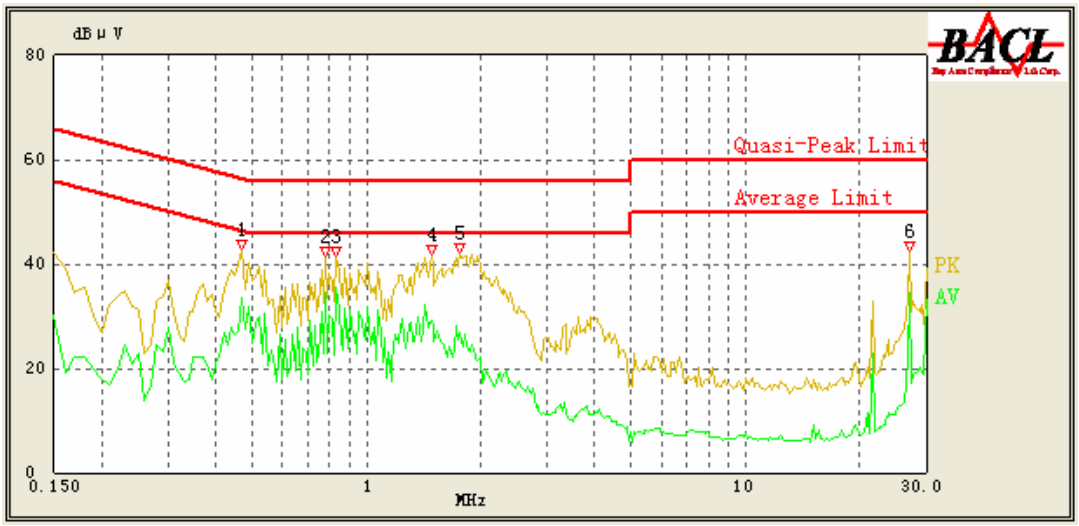
Test Mode: Charging&Transmitting

AC 120 V, 60 Hz, Line:



Frequency (MHz)	Cord. Reading (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
0.490	38.15	9.96	56.17	18.02	QP
0.490	32.96	9.96	46.17	13.21	AV
1.220	33.66	9.72	56.00	22.34	QP
1.220	24.13	9.72	46.00	21.87	AV
1.650	37.92	9.72	56.00	18.08	QP
1.650	22.91	9.72	46.00	23.09	AV
1.770	39.89	9.72	56.00	16.11	QP
1.770	29.38	9.72	46.00	16.62	AV
1.940	39.97	9.72	56.00	16.03	QP
1.940	24.37	9.72	46.00	21.63	AV
27.120	38.53	9.98	60.00	21.47	QP
27.120	32.11	9.98	50.00	17.89	AV

AC 120 V, 60 Hz, Neutral:



Frequency (MHz)	Cord. Reading (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
0.470	38.33	10.03	56.51	18.18	QP
0.470	33.54	10.03	46.51	12.97	AV
0.780	38.32	9.82	56.00	17.68	QP
0.780	34.62	9.82	46.00	11.38	AV
0.830	38.85	9.82	56.00	17.15	QP
0.830	35.41	9.82	46.00	10.59	AV
1.480	37.52	9.77	56.00	18.48	QP
1.480	29.14	9.77	46.00	16.86	AV
1.770	37.38	9.74	56.00	18.62	QP
1.770	26.70	9.74	46.00	19.30	AV
27.120	40.45	10.02	60.00	19.55	QP
27.120	34.35	10.02	50.00	15.65	AV

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.

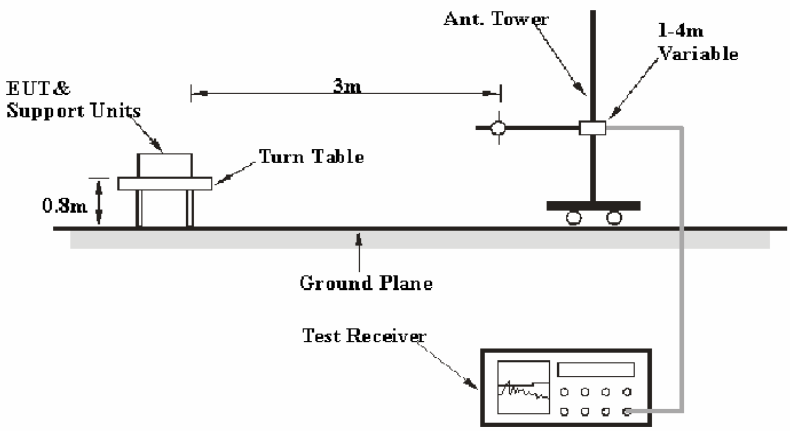
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:
30M~200MHz: 5.0 dB
200M~1GHz: 6.2 dB
1G~6GHz: 4.45 dB
6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

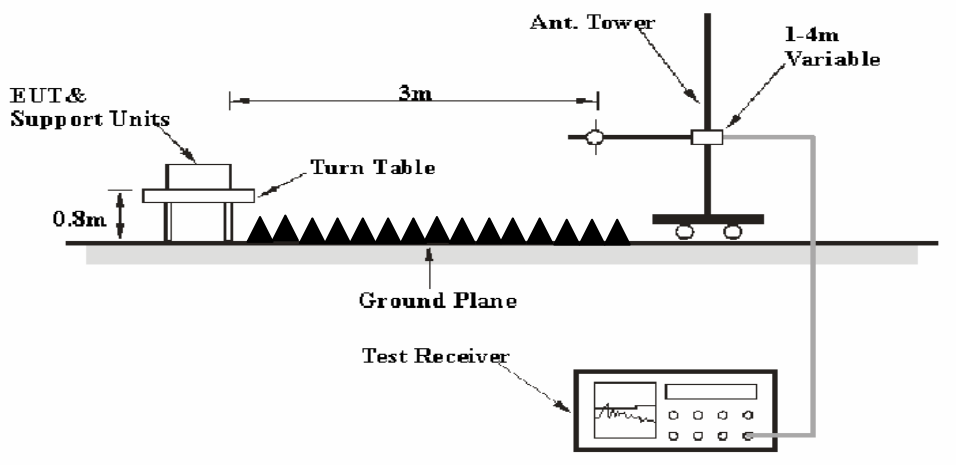
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

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 C63.4-2003. 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 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
30MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second 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	2013-05-06	2014-05-05
Sunol Sciences	Antenna	JB3	A060611-1	2011-09-06	2014-09-05
HP	Amplifier	8447E	2434A02181	2013-09-06	2014-09-05
R&S	Spectrum Analyzer	FSEM	DE31388	2013-05-07	2014-05-06
ETS-Lindgren	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-18
R&S	Spectrum Analyzer	FSP 38	100478	2013-06-16	2014-06-15
Ducommun Technolagies	horn antenna	ARH-4223-02	1007726-01 1304	2013-06-16	2014-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2013-09-06	2014-09-05

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, 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:

6.53 dB at **2390 MHz** in the **Horizontal** polarization of EDR Mode (π/4-DQPSK)

Test Data

Environmental Conditions

Temperature:	19.4 °C
Relative Humidity:	67 %
ATM Pressure:	100.0 kPa

The testing was performed by Ares Liu on 2014-03-12.

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/m)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402(MHz)									
2402	65.39	PK	H	25.65	4.42	0.00	95.46	N/A	N/A
2402	28.63	AV	H	25.65	4.42	0.00	58.70	N/A	N/A
2402	57.12	PK	V	25.65	4.42	0.00	87.19	N/A	N/A
2402	22.41	AV	V	25.65	4.42	0.00	52.48	N/A	N/A
2390	28.52	PK	H	25.61	4.39	0.00	58.52	74.00	15.48
2390	15.41	AV	H	25.61	4.39	0.00	45.41	54.00	8.59
4804	57.24	PK	H	30.59	5.98	27.41	66.40	74.00	7.60
4804	25.31	AV	H	30.59	5.98	27.41	34.47	54.00	19.53
7206	45.63	PK	H	34.09	7.45	25.91	61.26	74.00	12.74
7206	21.1	AV	H	34.09	7.45	25.91	36.73	54.00	17.27
9608	35.47	PK	H	35.96	8.80	27.55	52.68	74.00	21.32
9608	20.14	AV	H	35.96	8.80	27.55	37.35	54.00	16.65
2654	32.22	PK	H	26.30	4.83	27.46	35.89	74.00	38.11
2654	18.46	AV	H	26.30	4.83	27.46	22.13	54.00	31.87
182	27.6	QP	H	11.37	1.56	21.45	19.08	43.50	24.42
Middle Channel: 2441(MHz)									
2441	64.47	PK	H	25.75	4.40	0.00	94.62	N/A	N/A
2441	27.63	AV	H	25.75	4.40	0.00	57.78	N/A	N/A
2441	56.14	PK	V	25.75	4.40	0.00	86.29	N/A	N/A
2441	21.1	AV	V	25.75	4.40	0.00	51.25	N/A	N/A
4882	56.24	PK	H	30.79	6.08	27.42	65.69	74.00	8.31
4882	23.17	AV	H	30.79	6.08	27.42	32.62	54.00	21.38
7323	42.58	PK	H	34.38	7.51	25.88	58.59	74.00	15.41
7323	21.15	AV	H	34.38	7.51	25.88	37.16	54.00	16.84
9764	36.57	PK	H	36.33	8.83	27.20	54.53	74.00	19.47
9764	21.49	AV	H	36.33	8.83	27.20	39.45	54.00	14.55
2654	33.21	PK	H	26.30	4.83	27.46	36.88	74.00	37.12
2654	18.2	AV	H	26.30	4.83	27.46	21.87	54.00	32.13
1852	30.56	PK	H	24.30	3.76	27.52	31.10	74.00	42.90
1852	17.54	AV	H	24.30	3.76	27.52	18.08	54.00	35.92
182	26.8	QP	H	11.37	1.56	21.45	18.28	43.50	25.22
High Channel: 2480(MHz)									
2480	65.12	PK	H	25.85	4.48	0.00	95.45	N/A	N/A
2480	28.05	AV	H	25.85	4.48	0.00	58.38	N/A	N/A
2480	56.94	PK	V	25.85	4.48	0.00	87.27	N/A	N/A
2480	22.06	AV	V	25.85	4.48	0.00	52.39	N/A	N/A
2483.5	33.26	PK	H	25.86	4.49	0.00	63.61	74.00	10.39
2483.5	14.5	AV	H	25.86	4.49	0.00	44.85	54.00	9.15
4960	54.17	PK	H	31.00	5.90	27.43	63.64	74.00	10.36
4960	22.04	AV	H	31.00	5.90	27.43	31.51	54.00	22.49
7440	39.87	PK	H	34.66	7.58	25.97	56.14	74.00	17.86
7440	19.57	AV	H	34.66	7.58	25.97	35.84	54.00	18.16
9920	35.48	PK	H	36.71	8.87	26.66	54.40	74.00	19.60
9920	20.44	AV	H	36.71	8.87	26.66	39.36	54.00	14.64
2654	30.56	PK	H	26.30	4.83	27.46	34.23	74.00	39.77
2654	16.88	AV	H	26.30	4.83	27.46	20.55	54.00	33.45
182	26.5	QP	H	11.37	1.56	21.45	17.98	43.50	25.52

EDR Mode (π/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/m)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402(MHz)									
2402	64.74	PK	H	25.65	4.42	0.00	94.81	N/A	N/A
2402	26.11	AV	H	25.65	4.42	0.00	56.18	N/A	N/A
2402	54.36	PK	V	25.65	4.42	0.00	84.43	N/A	N/A
2402	19.47	AV	V	25.65	4.42	0.00	49.54	N/A	N/A
2390	32.55	PK	H	25.61	4.39	0.00	62.55	74.00	11.45
2390	17.47	AV	H	25.61	4.39	0.00	47.47	54.00	6.53
4804	52.11	PK	H	30.59	5.98	27.41	61.27	74.00	12.73
4804	25.63	AV	H	30.59	5.98	27.41	34.79	54.00	19.21
7206	46.28	PK	H	34.09	7.45	25.91	61.91	74.00	12.09
7206	21.14	AV	H	34.09	7.45	25.91	36.77	54.00	17.23
9608	35.49	PK	H	35.96	8.80	27.55	52.70	74.00	21.30
9608	18.65	AV	H	35.96	8.80	27.55	35.86	54.00	18.14
2654	35.16	PK	H	26.30	4.83	27.46	38.83	74.00	35.17
2654	20.11	AV	H	26.30	4.83	27.46	23.78	54.00	30.22
185	26.7	QP	H	11.37	1.63	21.45	18.25	43.50	25.25
Middle Channel: 2441(MHz)									
2441	64.26	PK	H	25.75	4.40	0.00	94.41	N/A	N/A
2441	26.53	AV	H	25.75	4.40	0.00	56.68	N/A	N/A
2441	56.23	PK	V	25.75	4.40	0.00	86.38	N/A	N/A
2441	19.85	AV	V	25.75	4.40	0.00	50.00	N/A	N/A
4882	56.32	PK	H	30.79	6.08	27.42	65.77	74.00	8.23
4882	25.14	AV	H	30.79	6.08	27.42	34.59	54.00	19.41
7323	45.2	PK	H	34.38	7.51	25.88	61.21	74.00	12.79
7323	19.87	AV	H	34.38	7.51	25.88	35.88	54.00	18.12
9764	36.74	PK	H	36.33	8.83	27.20	54.70	74.00	19.30
9764	21.07	AV	H	36.33	8.83	27.20	39.03	54.00	14.97
2654	33.26	PK	H	26.30	4.83	27.46	36.93	74.00	37.07
2654	18.23	AV	H	26.30	4.83	27.46	21.90	54.00	32.10
1852	32.26	PK	H	24.30	3.76	27.52	32.80	74.00	41.20
1852	17.05	AV	H	24.30	3.76	27.52	17.59	54.00	36.41
185	26.9	QP	H	11.37	1.63	21.45	18.45	43.50	25.05
High Channel: 2480(MHz)									
2480	63.86	PK	H	25.85	4.48	0.00	94.19	N/A	N/A
2480	25.87	AV	H	25.85	4.48	0.00	56.20	N/A	N/A
2480	55.23	PK	V	25.85	4.48	0.00	85.56	N/A	N/A
2480	18.69	AV	V	25.85	4.48	0.00	49.02	N/A	N/A
2483.5	34.21	PK	H	25.86	4.49	0.00	64.56	74.00	9.44
2483.5	15.26	AV	H	25.86	4.49	0.00	45.61	54.00	8.39
4960	52.34	PK	H	31.00	5.90	27.43	61.81	74.00	12.19
4960	21.47	AV	H	31.00	5.90	27.43	30.94	54.00	23.06
7440	43.36	PK	H	34.66	7.58	25.97	59.63	74.00	14.37
7440	21.25	AV	H	34.66	7.58	25.97	37.52	54.00	16.48
9920	37.28	PK	H	36.71	8.87	26.66	56.20	74.00	17.80
9920	21.17	AV	H	36.71	8.87	26.66	40.09	54.00	13.91
2654	33.63	PK	H	26.30	4.83	27.46	37.30	74.00	36.70
2654	18.26	AV	H	26.30	4.83	27.46	21.93	54.00	32.07
185	26.9	QP	H	11.37	1.63	21.45	18.45	43.50	25.05

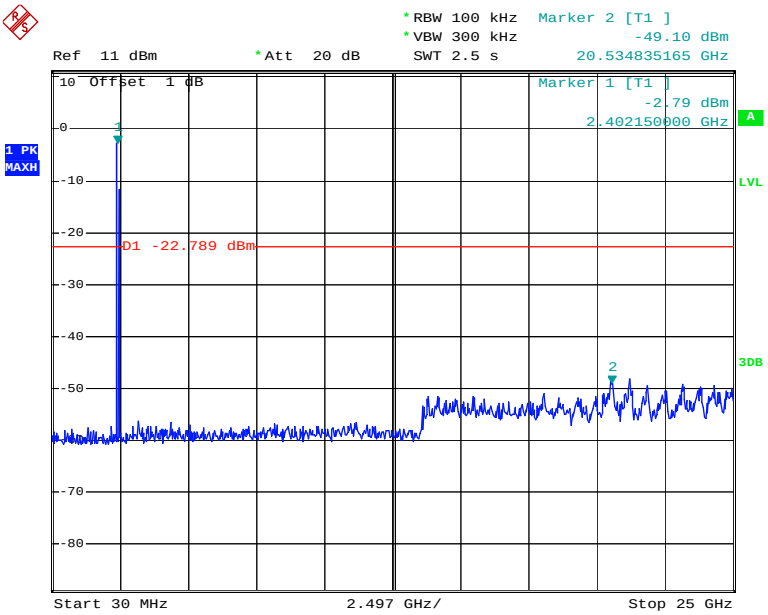
EDR Mode (8-DPSK):

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/m)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402(MHz)									
2402	63.52	PK	H	25.65	4.42	0.00	93.59	N/A	N/A
2402	26.41	AV	H	25.65	4.42	0.00	56.48	N/A	N/A
2402	56.44	PK	V	25.65	4.42	0.00	86.51	N/A	N/A
2402	20.37	AV	V	25.65	4.42	0.00	50.44	N/A	N/A
2390	32.36	PK	H	25.61	4.39	0.00	62.36	74.00	11.64
2390	16.54	AV	H	25.61	4.39	0.00	46.54	54.00	7.46
4804	56.47	PK	H	30.59	5.98	27.41	65.63	74.00	8.37
4804	26.3	AV	H	30.59	5.98	27.41	35.46	54.00	18.54
7206	45.13	PK	H	34.09	7.45	25.91	60.76	74.00	13.24
7206	20.63	AV	H	34.09	7.45	25.91	36.26	54.00	17.74
9608	36.54	PK	H	35.96	8.80	27.55	53.75	74.00	20.25
9608	20.23	AV	H	35.96	8.80	27.55	37.44	54.00	16.56
2654	33.41	PK	H	26.30	4.83	27.46	37.08	74.00	36.92
2654	18.56	AV	H	26.30	4.83	27.46	22.23	54.00	31.77
185	26.5	QP	H	11.37	1.63	21.45	18.05	43.50	25.45
Middle Channel: 2441(MHz)									
2441	63.24	PK	H	25.75	4.40	0.00	93.39	N/A	N/A
2441	26.37	AV	H	25.75	4.40	0.00	56.52	N/A	N/A
2441	55.49	PK	V	25.75	4.40	0.00	85.64	N/A	N/A
2441	20.04	AV	V	25.75	4.40	0.00	50.19	N/A	N/A
4882	55.93	PK	H	30.79	6.08	27.42	65.38	74.00	8.62
4882	25.12	AV	H	30.79	6.08	27.42	34.57	54.00	19.43
7323	44.24	PK	H	34.38	7.51	25.88	60.25	74.00	13.75
7323	21.06	AV	H	34.38	7.51	25.88	37.07	54.00	16.93
9764	36.57	PK	H	36.33	8.83	27.20	54.53	74.00	19.47
9764	21.14	AV	H	36.33	8.83	27.20	39.10	54.00	14.90
2654	33.32	PK	H	26.30	4.83	27.46	36.99	74.00	37.01
2654	19.04	AV	H	26.30	4.83	27.46	22.71	54.00	31.29
1852	32.52	PK	H	24.30	3.76	27.52	33.06	74.00	40.94
1852	18.17	AV	H	24.30	3.76	27.52	18.71	54.00	35.29
185	26.7	QP	H	11.37	1.63	21.45	18.25	43.50	25.25
High Channel: 2480(MHz)									
2480	63.54	PK	H	25.85	4.48	0.00	93.87	N/A	N/A
2480	26.11	AV	H	25.85	4.48	0.00	56.44	N/A	N/A
2480	55.28	PK	V	25.85	4.48	0.00	85.61	N/A	N/A
2480	20.3	AV	V	25.85	4.48	0.00	50.63	N/A	N/A
2483.5	32.63	PK	H	25.86	4.49	0.00	62.98	74.00	11.02
2483.5	14.52	AV	H	25.86	4.49	0.00	44.87	54.00	9.13
4960	55.47	PK	H	31.00	5.90	27.43	64.94	74.00	9.06
4960	24.3	AV	H	31.00	5.90	27.43	33.77	54.00	20.23
7440	43.26	PK	H	34.66	7.58	25.97	59.53	74.00	14.47
7440	20.54	AV	H	34.66	7.58	25.97	36.81	54.00	17.19
9920	35.63	PK	H	36.71	8.87	26.66	54.55	74.00	19.45
9920	20.3	AV	H	36.71	8.87	26.66	39.22	54.00	14.78
2654	33.63	PK	H	26.30	4.83	27.46	37.30	74.00	36.70
2654	18.5	AV	H	26.30	4.83	27.46	22.17	54.00	31.83
185	26.9	QP	H	11.37	1.63	21.45	18.45	43.50	25.05

Conducted Spurious Emissions at Antenna Port

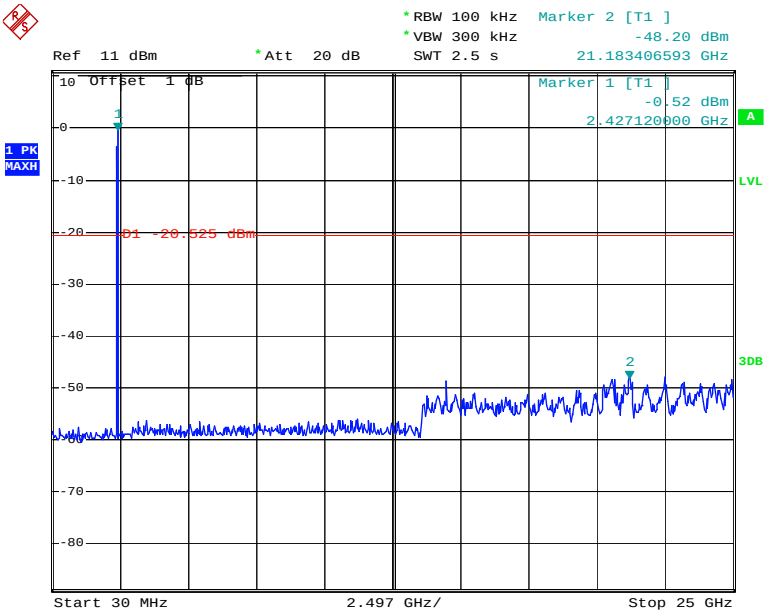
BDR Mode (GFSK):

Low Channel



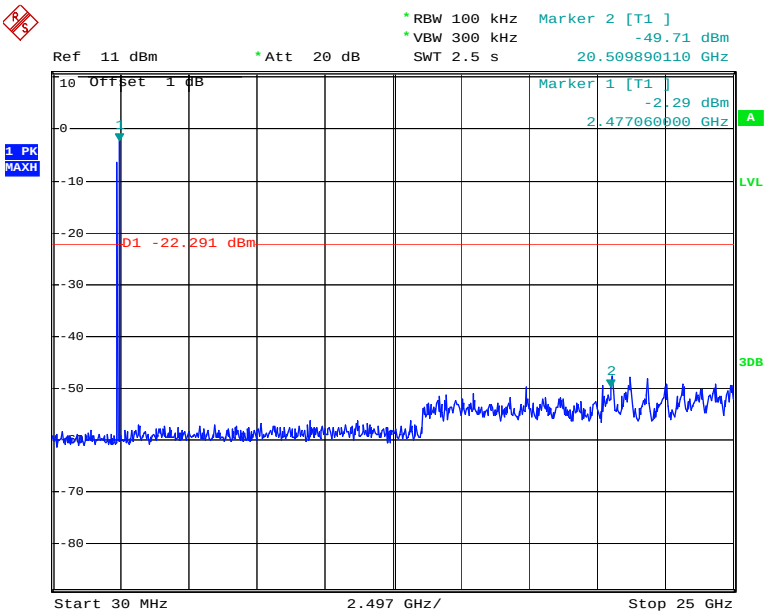
Date: 12.MAR.2014 17:45:29

Middle Channel



Date: 12.MAR.2014 17:46:13

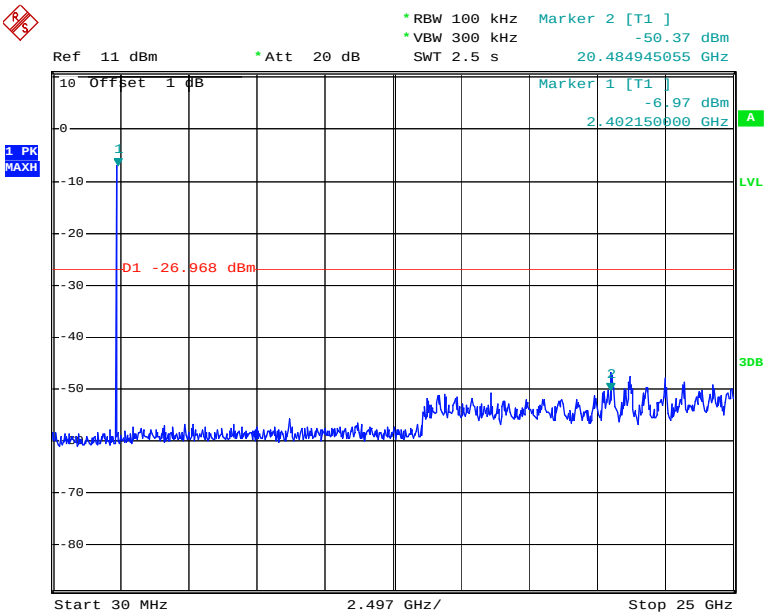
High Channel



Date: 12.MAR.2014 17:46:31

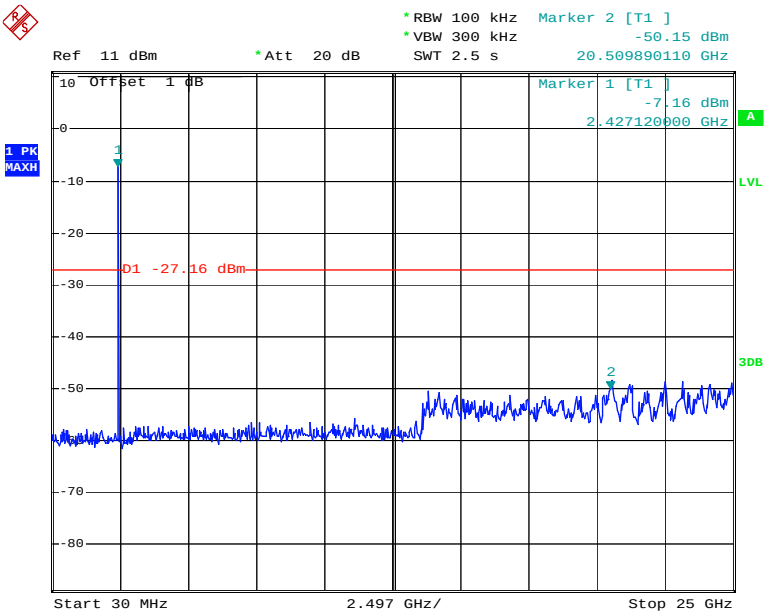
EDR Mode (π/4-DQPSK):

Low Channel



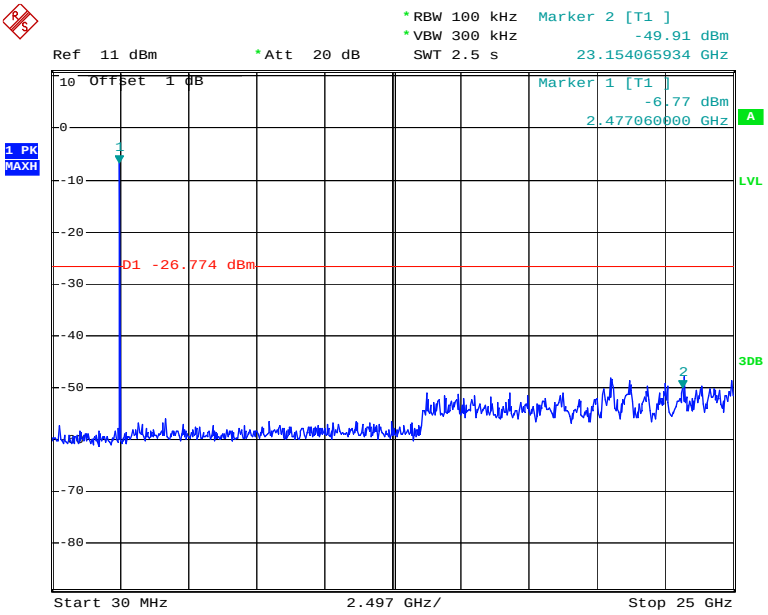
Date: 12.MAR.2014 17:46:48

Middle Channel



Date: 12.MAR.2014 17:47:06

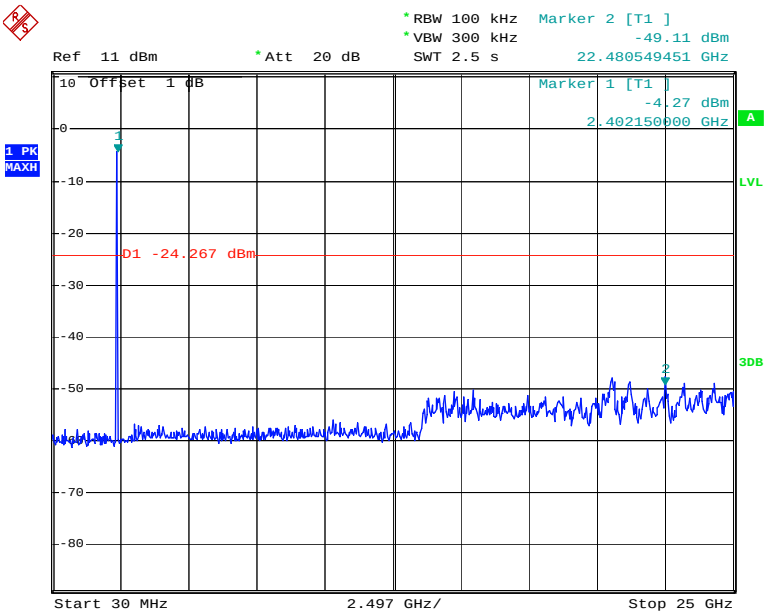
High Channel



Date: 12.MAR.2014 17:47:24

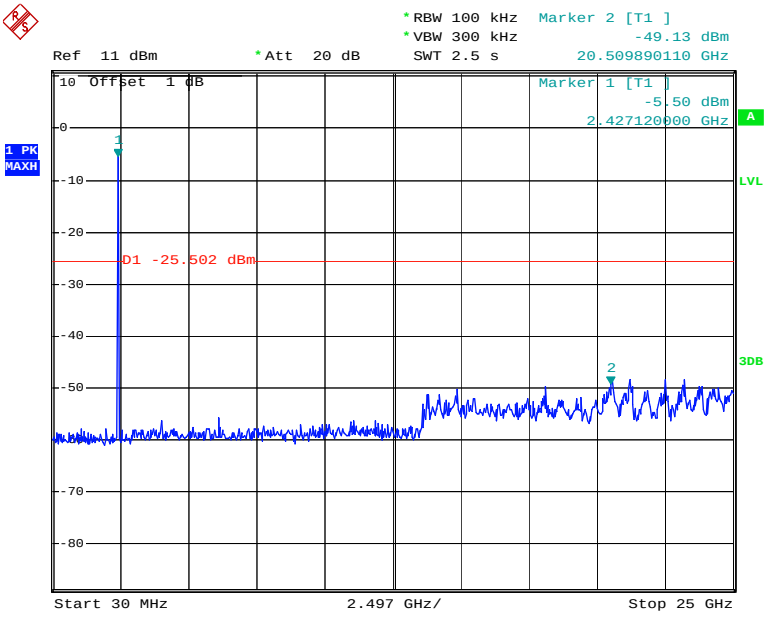
EDR Mode (8-DPSK):

Low Channel



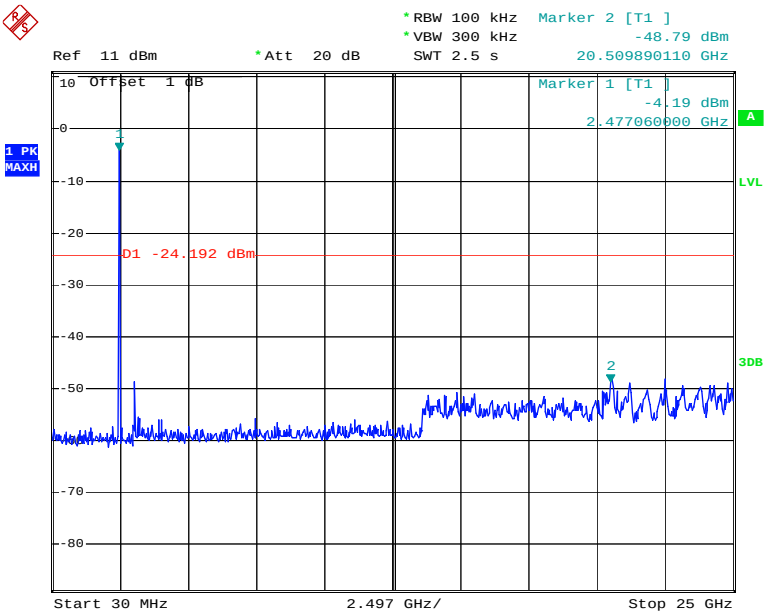
Date: 12.MAR.2014 17:47:41

Middle Channel



Date: 12.MAR.2014 17:47:59

High Channel



Date: 12.MAR.2014 17:48:16

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	2013-06-16	2014-06-15

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

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	22.8 °C
Relative Humidity:	61 %
ATM Pressure:	100.0 kPa

** The testing was performed by Ares Liu on 2014-03-12*

Test Result: Compliance.

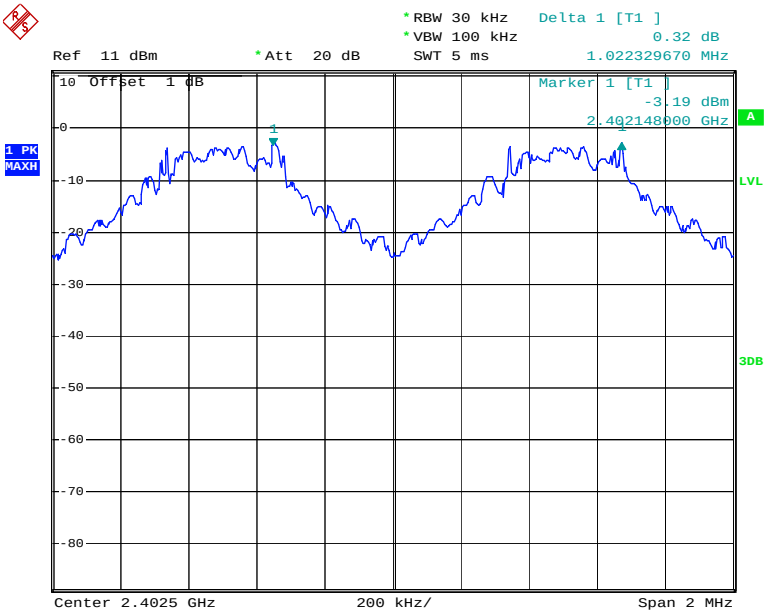
Please refer to following tables and plots

Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
BDR Mode (GFSK)	Low	2402	1.022	0.615	Pass
	Adjacent	2403			
	Middle	2441	1.010	0.615	Pass
	Adjacent	2442			
	High	2480	1.002	0.617	Pass
	Adjacent	2479			
EDR Mode (π/4-DQPSK):	Low	2402	1.010	0.847	Pass
	Adjacent	2403			
	Middle	2441	1.001	0.871	Pass
	Adjacent	2442			
	High	2480	1.002	0.859	Pass
	Adjacent	2479			
EDR Mode (8-DPSK):	Low	2402	1.004	0.850	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.865	Pass
	Adjacent	2442			
	High	2480	1.000	0.866	Pass
	Adjacent	2479			

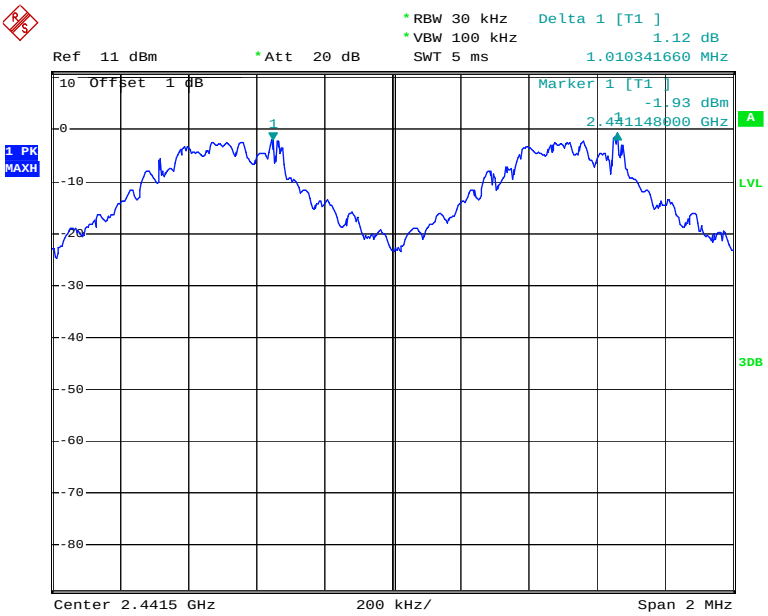
BDR Mode (GFSK):

Low Channel



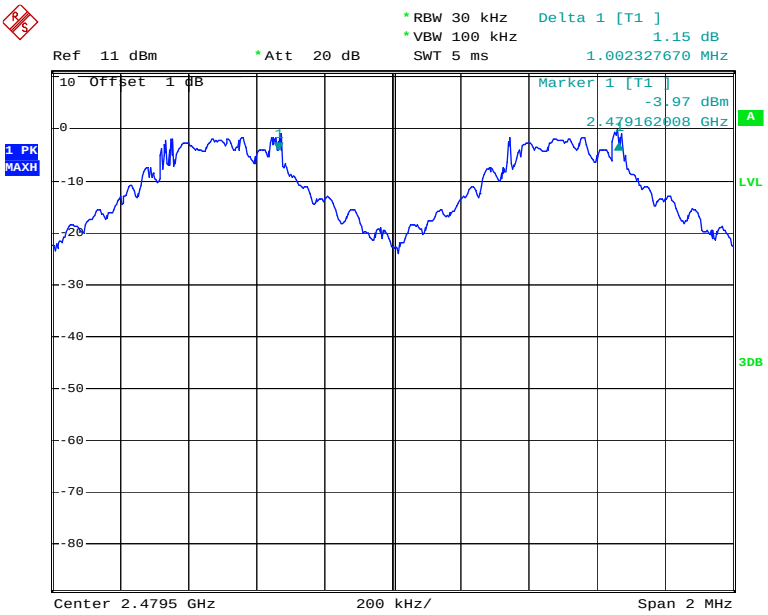
Date: 12.MAR.2014 17:52:05

Middle Channel



Date: 12.MAR.2014 17:52:23

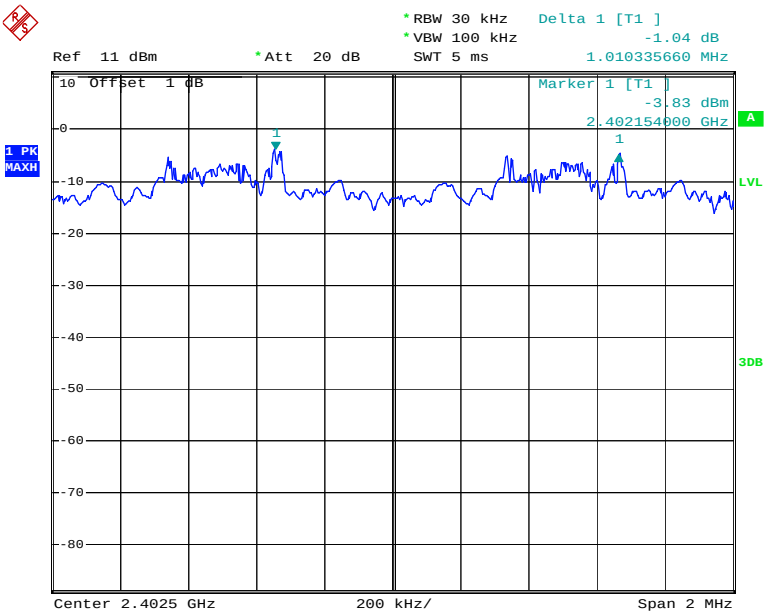
High Channel



Date: 12.MAR.2014 17:52:42

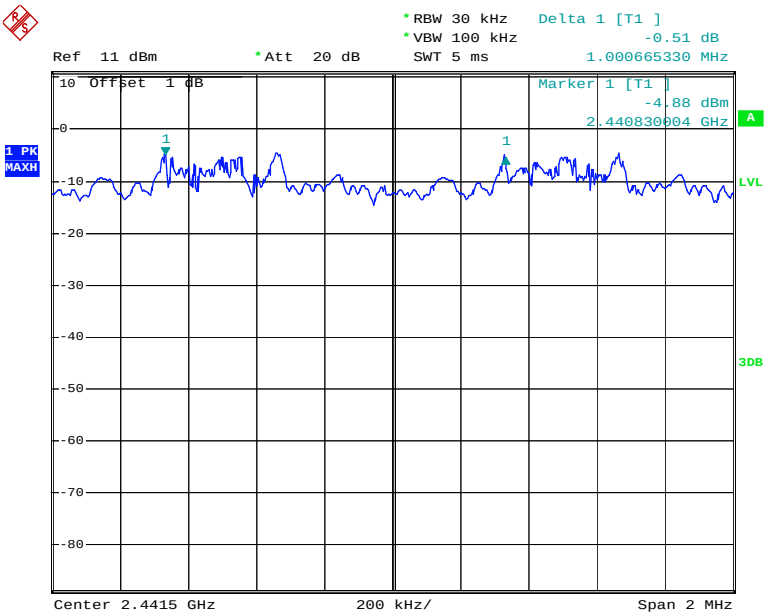
EDR Mode (π/4-DQPSK):

Low Channel



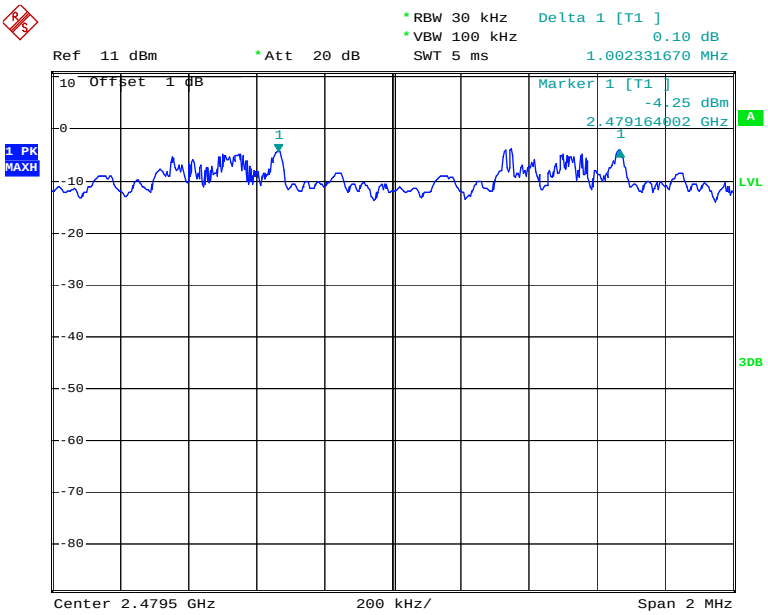
Date: 12.MAR.2014 17:53:01

Middle Channel



Date: 12.MAR.2014 17:53:20

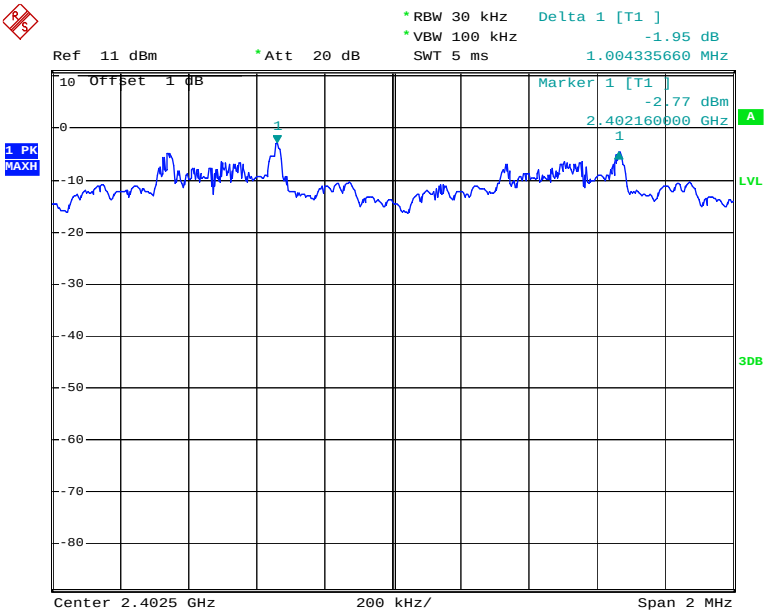
High Channel



Date: 12.MAR.2014 17:53:38

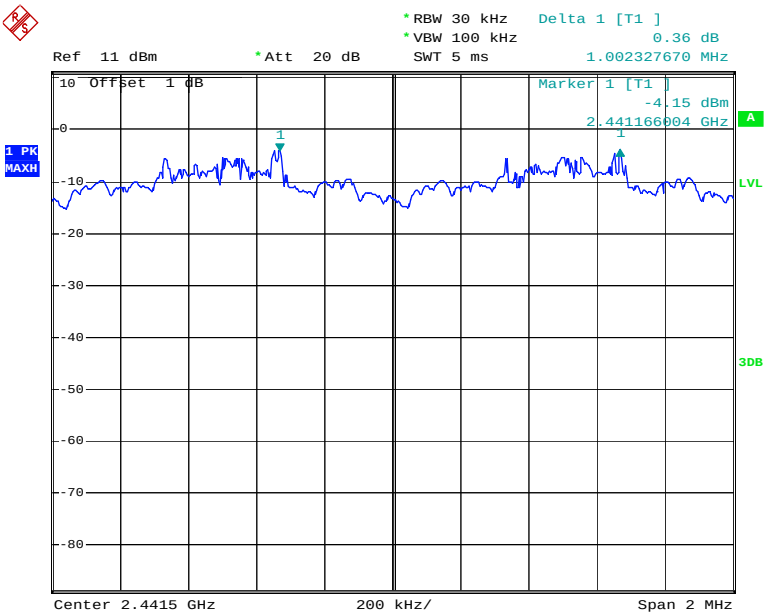
EDR Mode (8-DPSK):

Low Channel



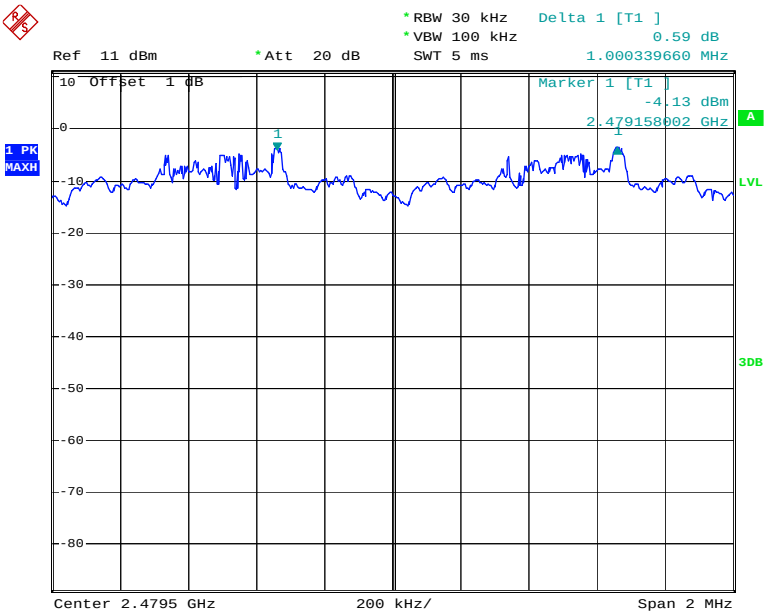
Date: 12.MAR.2014 17:53:57

Middle Channel



Date: 12.MAR.2014 17:54:15

High Channel



Date: 12.MAR.2014 17:54:34

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

Applicable Standard

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum analyzer	FSP 38	100478	2013-06-16	2014-06-15

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

Test Data

Environmental Conditions

Temperature:	22.8 °C
Relative Humidity:	61 %
ATM Pressure:	100.0 kPa

** The testing was performed by Ares Liu on 2014-03-12*

Test Result: Compliance.

Please refer to following tables and plots

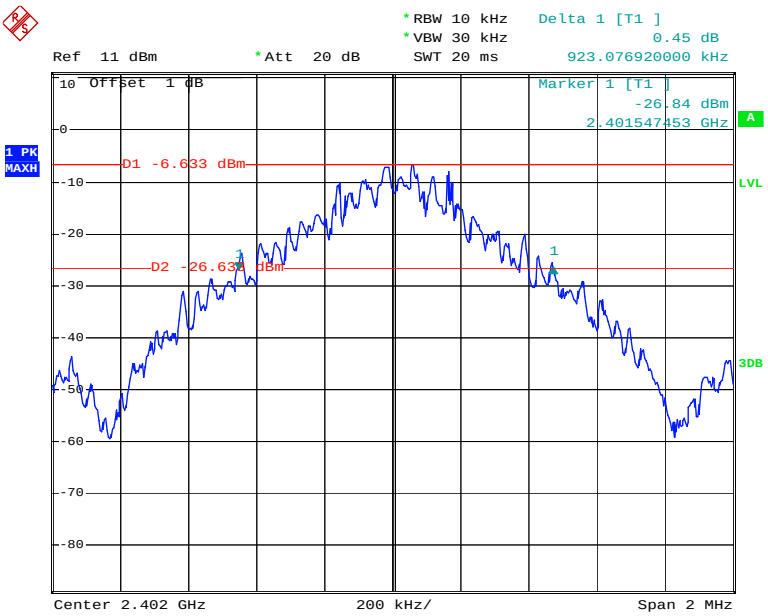
Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.923
	Middle	2441	0.923
	High	2480	0.925
EDR Mode (π/4-DQPSK):	Low	2402	1.271
	Middle	2441	1.307
	High	2480	1.289
EDR Mode (8-DPSK):	Low	2402	1.275
	Middle	2441	1.297
	High	2480	1.299

Please refer to the following plots.

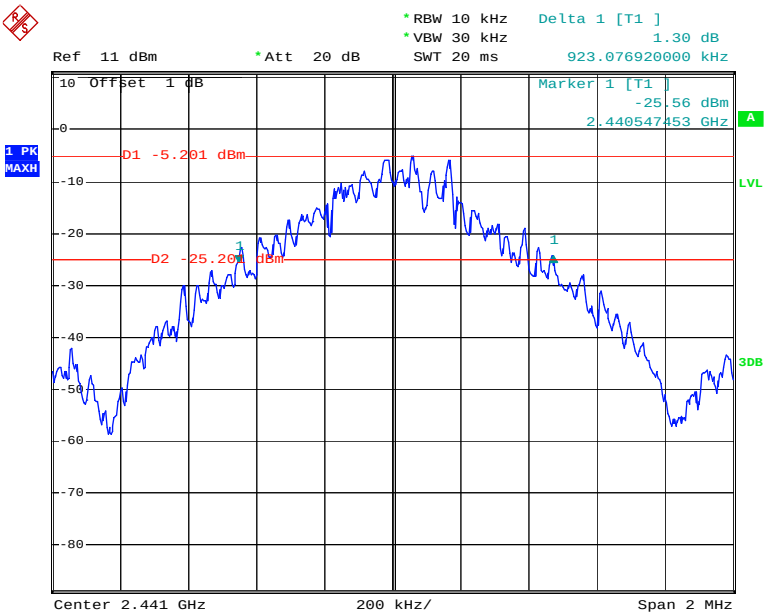
BDR Mode (GFSK):

Low Channel



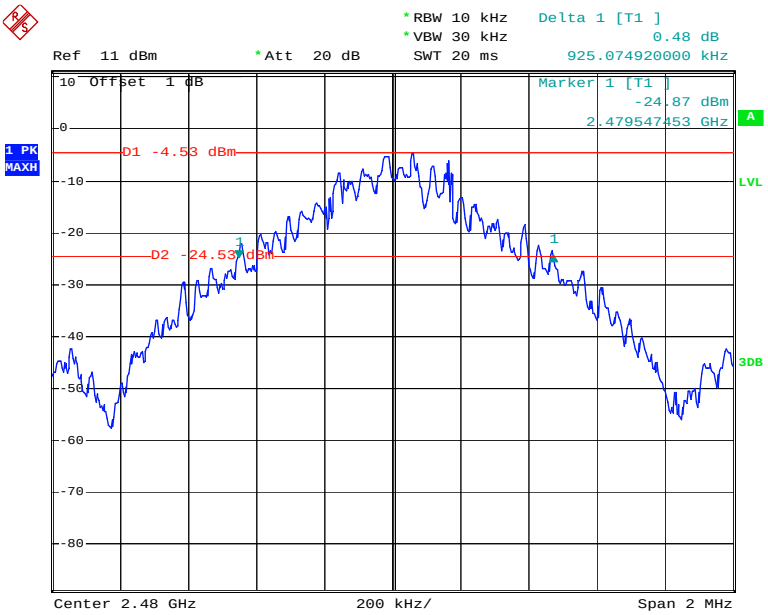
Date: 12.MAR.2014 17:39:28

Middle Channel



Date: 12.MAR.2014 17:39:48

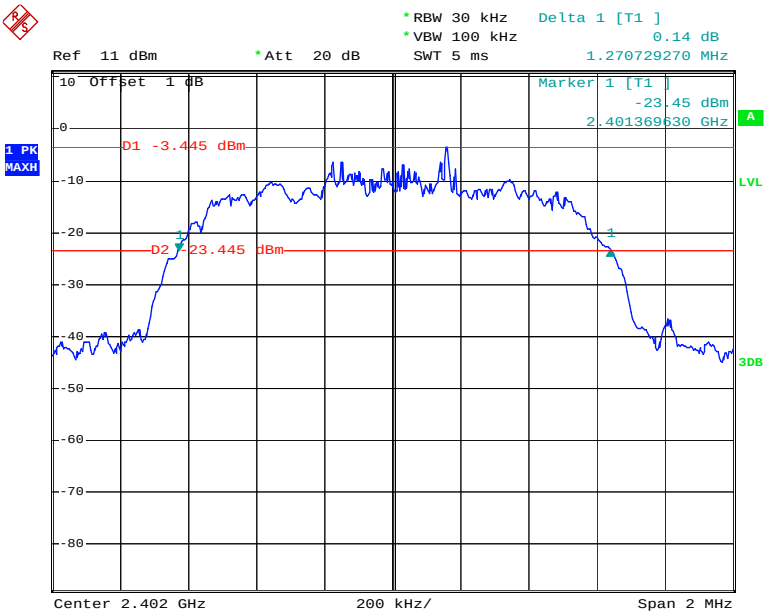
High Channel



Date: 12.MAR.2014 17:40:08

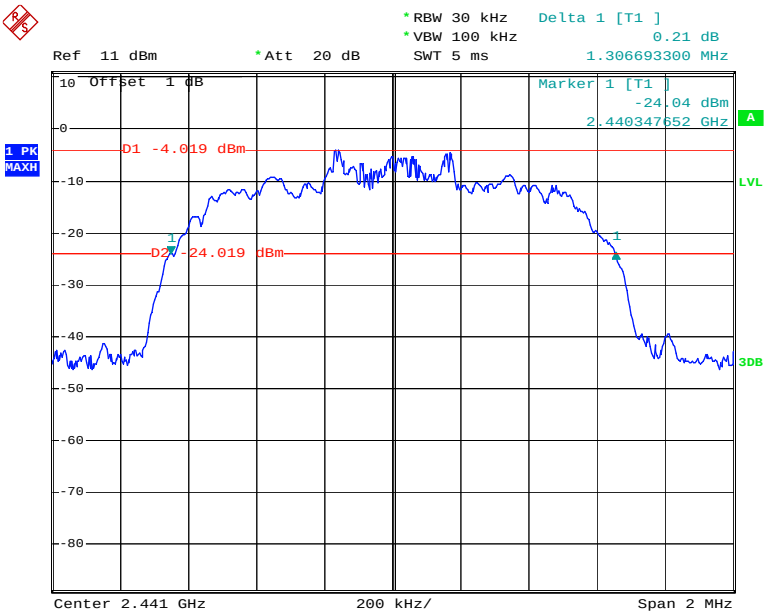
EDR Mode (π/4-DQPSK):

Low Channel



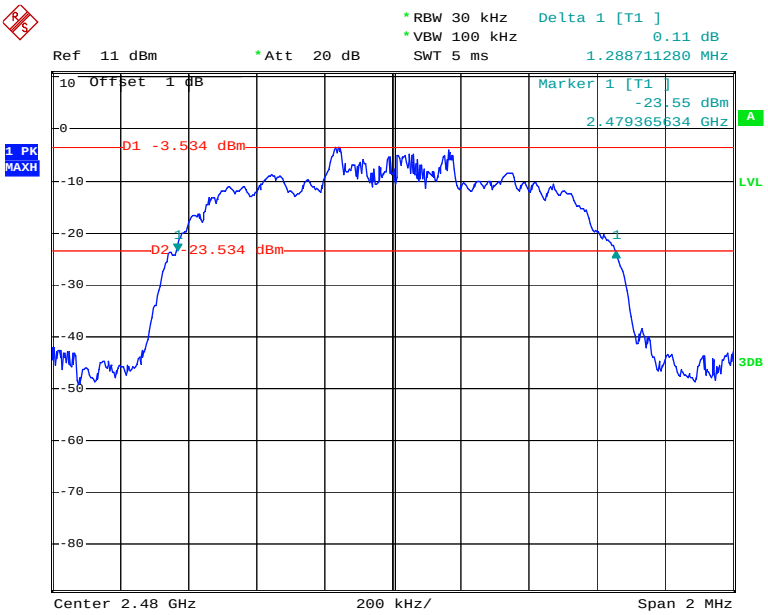
Date: 12.MAR.2014 17:40:28

Middle Channel



Date: 12.MAR.2014 17:40:48

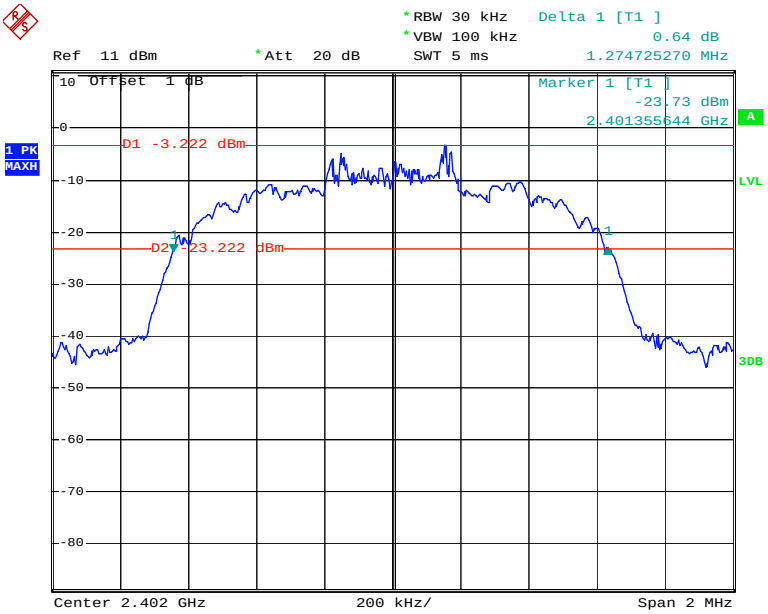
High Channel



Date: 12.MAR.2014 17:41:08

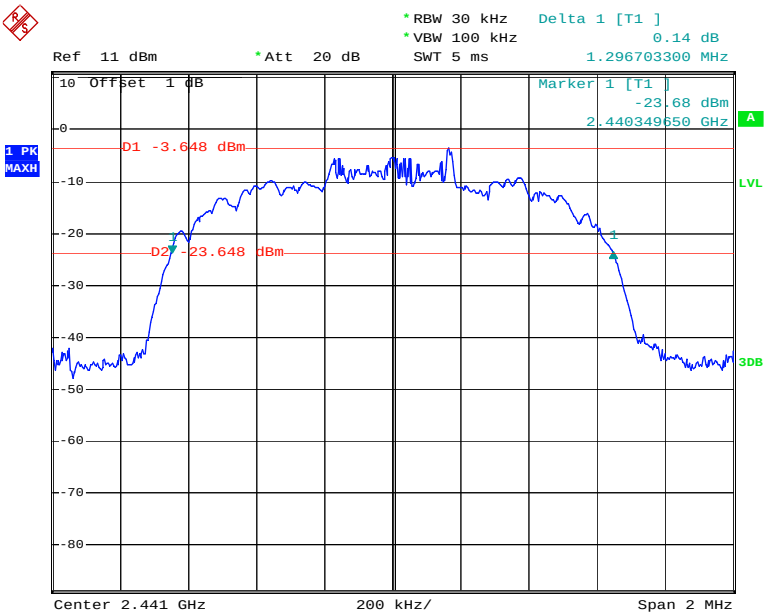
EDR Mode (8-DPSK):

Low Channel



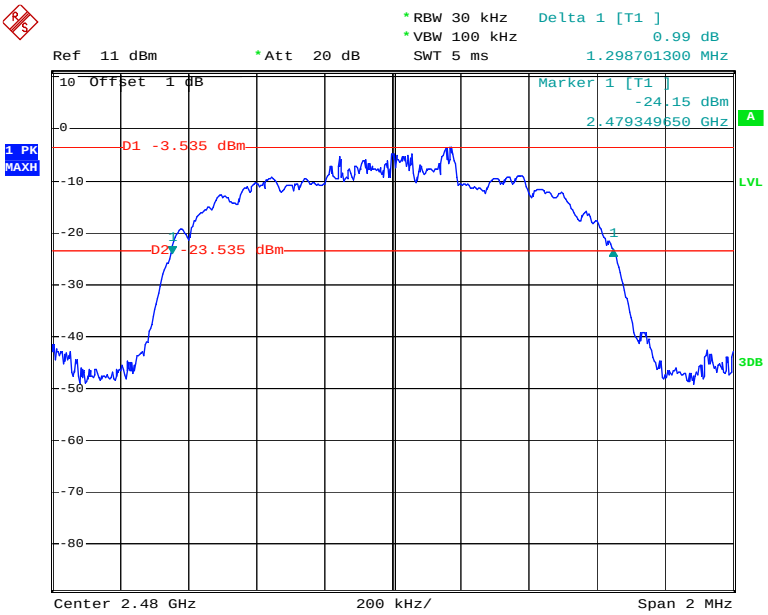
Date: 12.MAR.2014 17:41:28

Middle Channel



Date: 12.MAR.2014 17:41:48

High Channel



Date: 12.MAR.2014 17:42:10

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	2013-06-16	2014-06-15

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

Test Data

Environmental Conditions

Temperature:	22.8 °C
Relative Humidity:	61 %
ATM Pressure:	100.0 kPa

** The testing was performed by Ares Liu on 2014-03-12*

Test Result: Compliance.

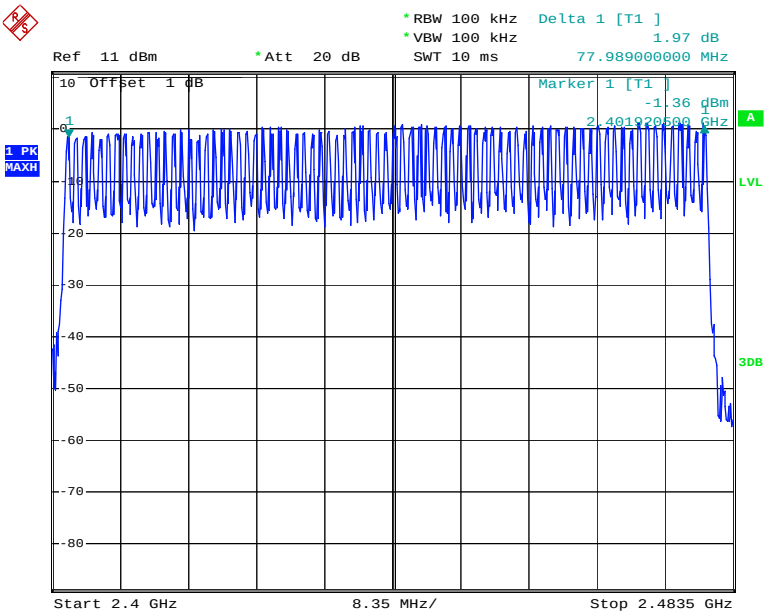
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

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

Number of Hopping Channels

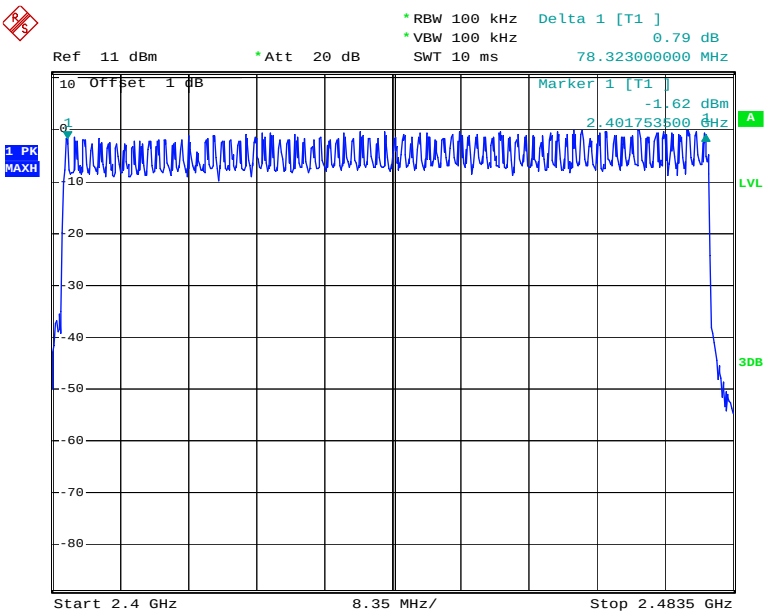


Date: 12.MAR.2014 18:50:40

EDR Mode (π/4-DQPSK):

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

Number of Hopping Channels

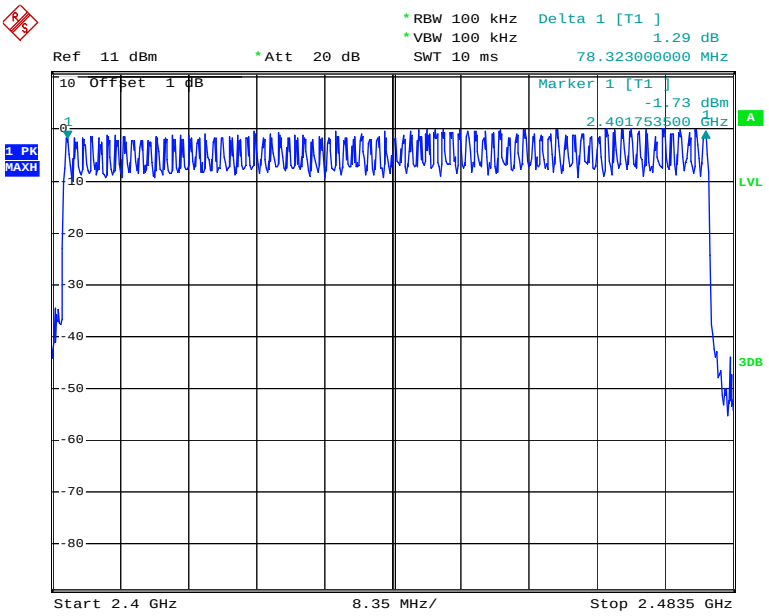


Date: 12.MAR.2014 18:56:12

EDR Mode (8-DPSK):

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

Number of Hopping Channels



Date: 12.MAR.2014 19:01:38

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 * 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	2013-06-16	2014-06-15

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

Test Data

Environmental Conditions

Temperature:	22.8 °C
Relative Humidity:	61 %
ATM Pressure:	100.0 kPa

* *The testing was performed by Ares Liu on 2014-03-12*

Test Result: Compliance.

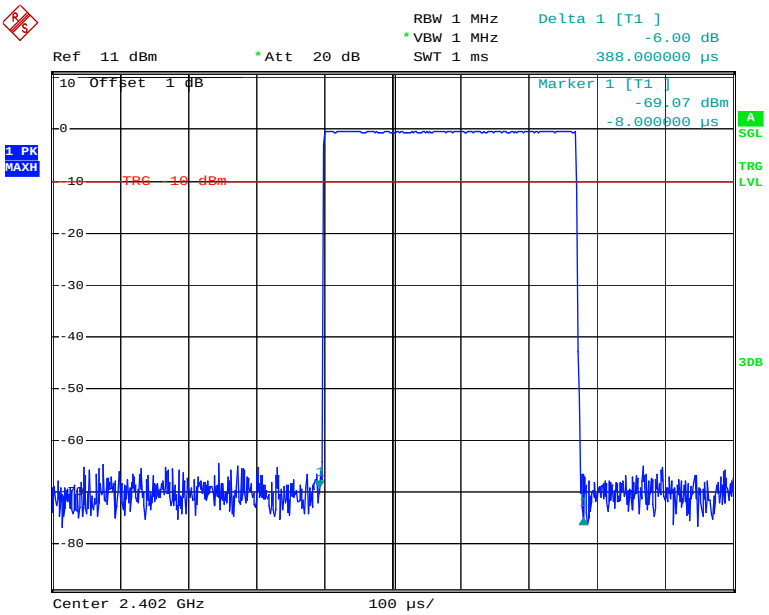
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

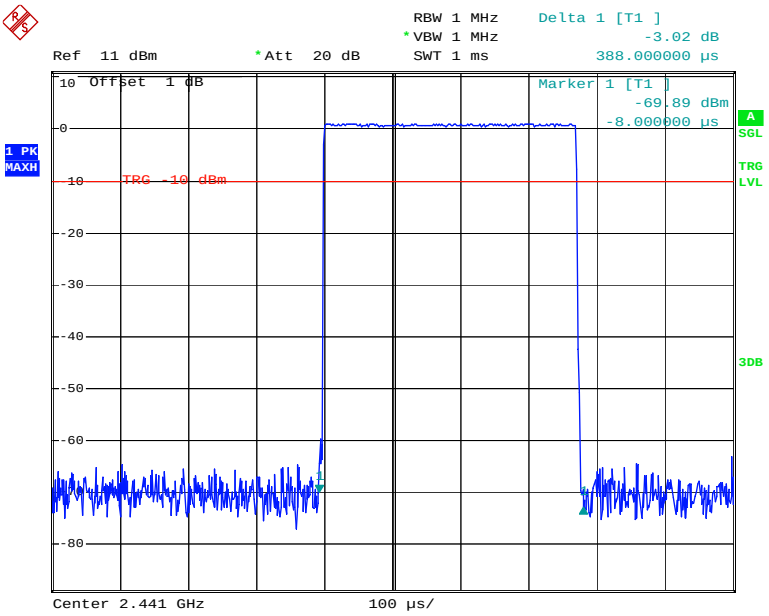
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.388	0.124	0.4	Pass
	Middle	0.388	0.124	0.4	Pass
	High	0.388	0.124	0.4	Pass
	Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s				
DH3	Low	1.668	0.267	0.4	Pass
	Middle	1.680	0.269	0.4	Pass
	High	1.668	0.267	0.4	Pass
	Note: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s				
DH5	Low	2.918	0.311	0.4	Pass
	Middle	2.918	0.311	0.4	Pass
	High	2.918	0.311	0.4	Pass
	Note: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s				

DH1: Low Channel



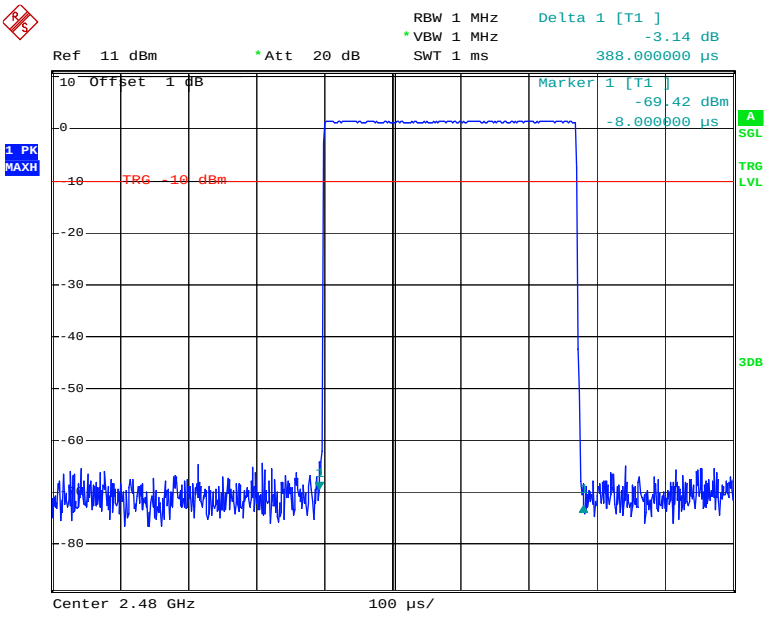
Date: 12.MAR.2014 19:51:13

DH1: Middle Channel



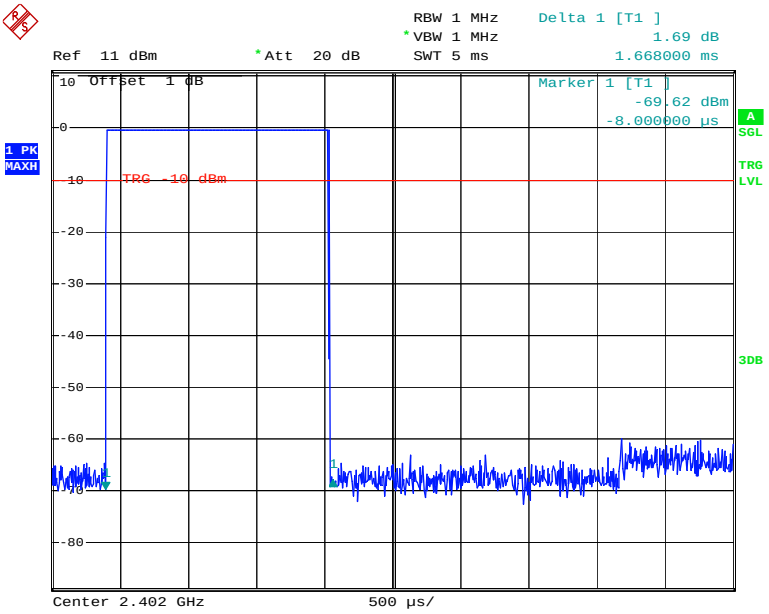
Date: 12.MAR.2014 19:51:21

DH1: High Channel



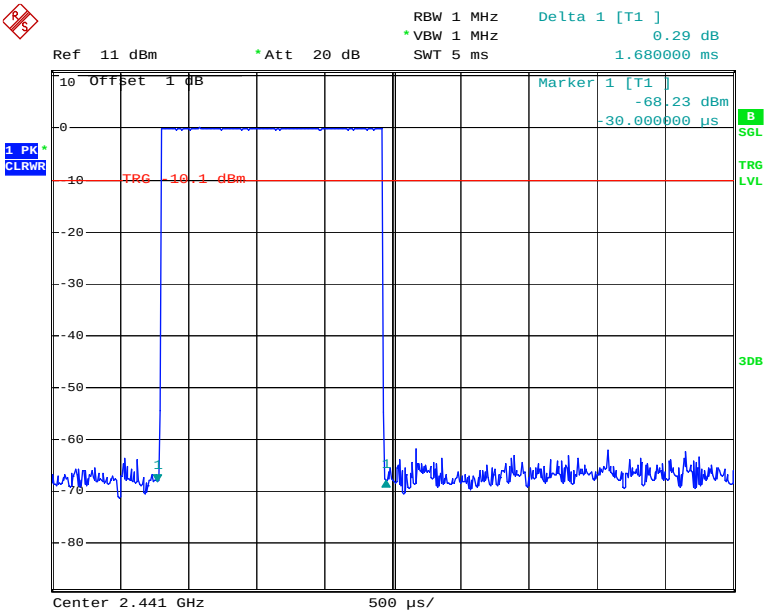
Date: 12.MAR.2014 19:51:30

DH3: Low Channel



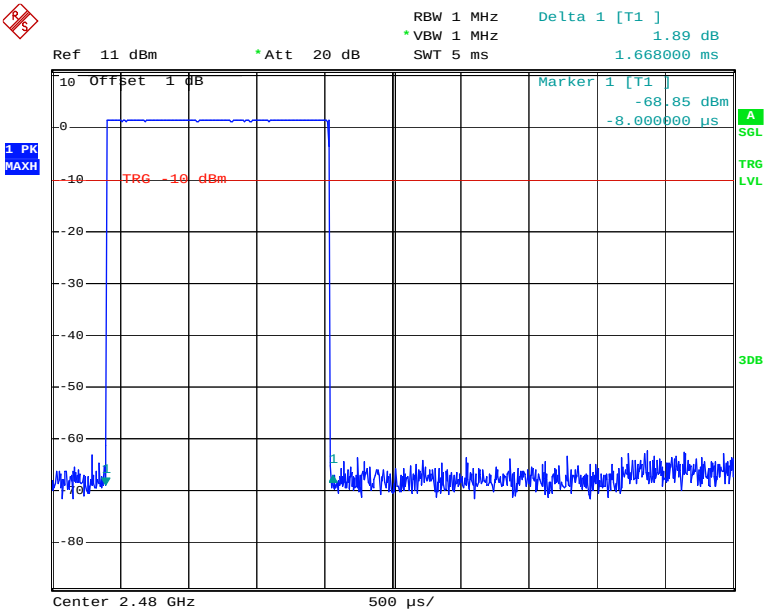
Date: 12.MAR.2014 19:52:55

DH3: Middle Channel



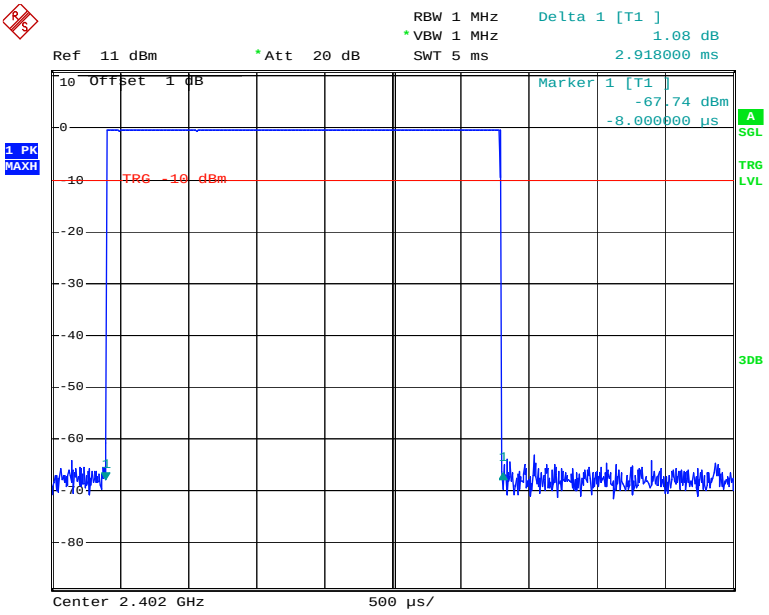
Date: 12.MAR.2014 19:52:10

DH3: High Channel



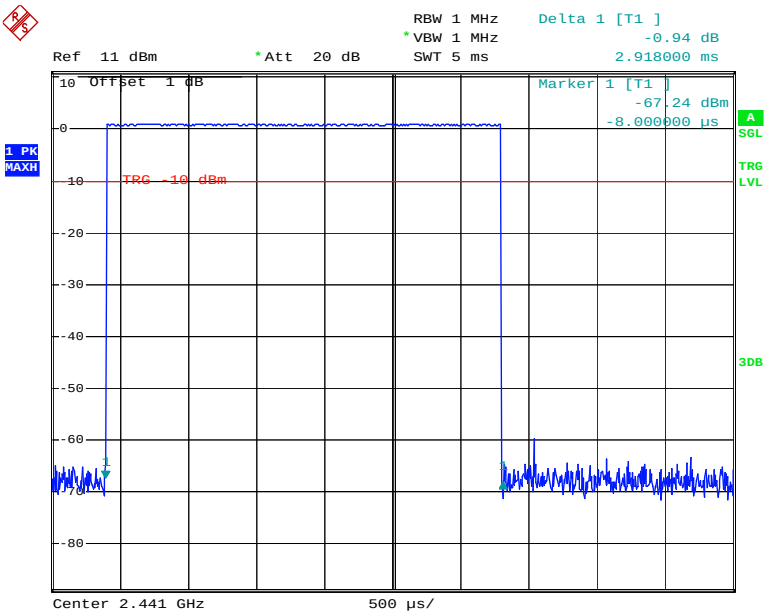
Date: 12.MAR.2014 19:52:20

DH5: Low Channel



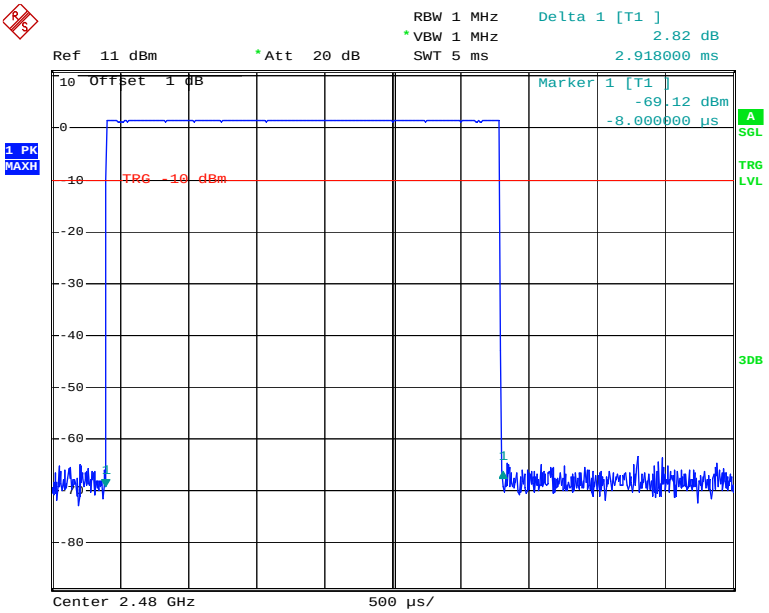
Date: 12.MAR.2014 19:53:39

DH5: Middle Channel



Date: 12.MAR.2014 19:53:55

DH5: High Channel

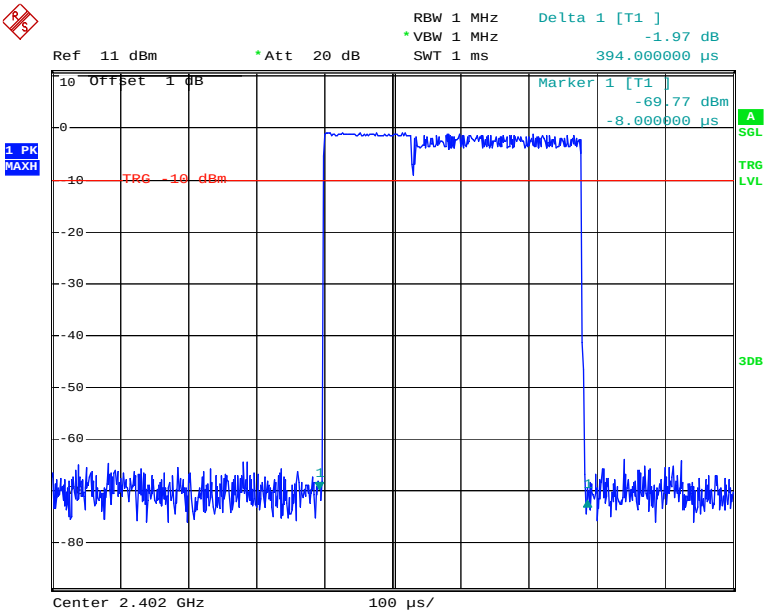


Date: 12.MAR.2014 19:54:03

EDR Mode (π/4-DQPSK):

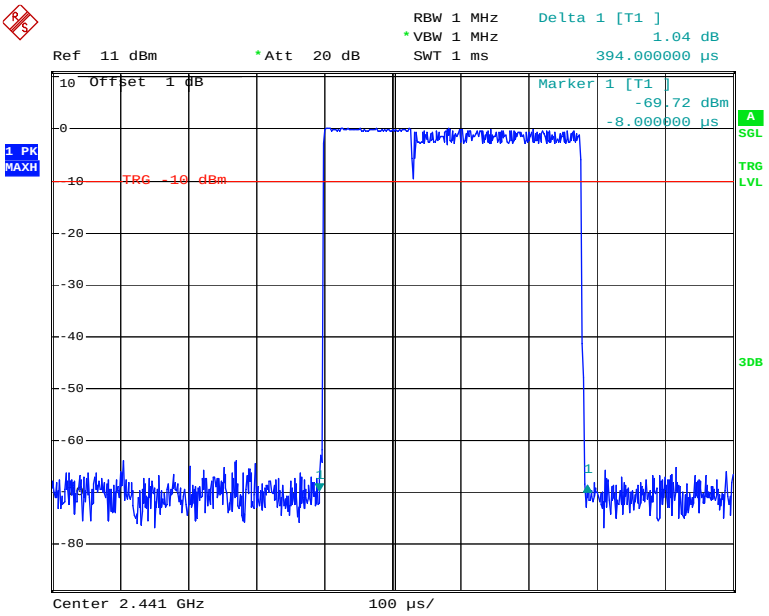
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.394	0.126	0.4	Pass
	Middle	0.394	0.126	0.4	Pass
	High	0.394	0.126	0.4	Pass
	Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s				
DH3	Low	1.674	0.268	0.4	Pass
	Middle	1.680	0.269	0.4	Pass
	High	1.674	0.268	0.4	Pass
	Note: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s				
DH5	Low	2.934	0.313	0.4	Pass
	Middle	2.934	0.313	0.4	Pass
	High	2.934	0.313	0.4	Pass
	Note: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s				

DH1: Low Channel



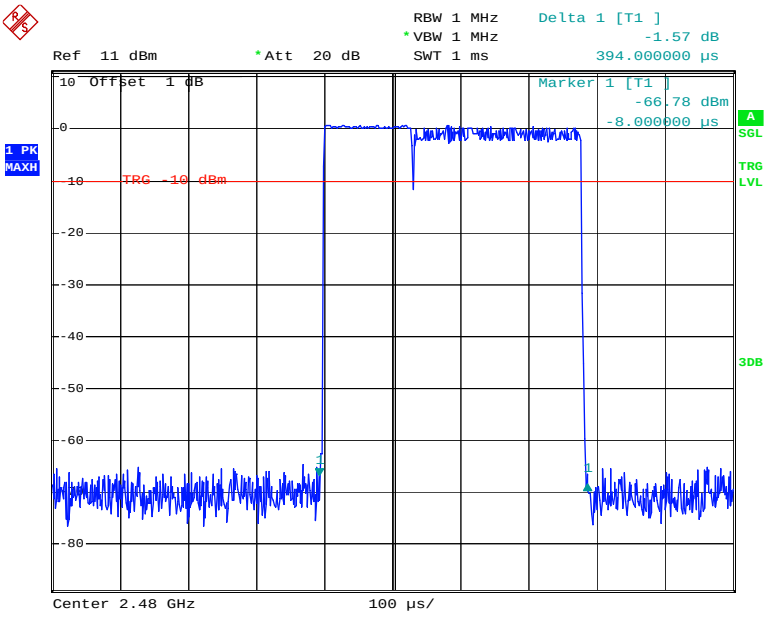
Date: 12.MAR.2014 19:44:04

DH1: Middle Channel



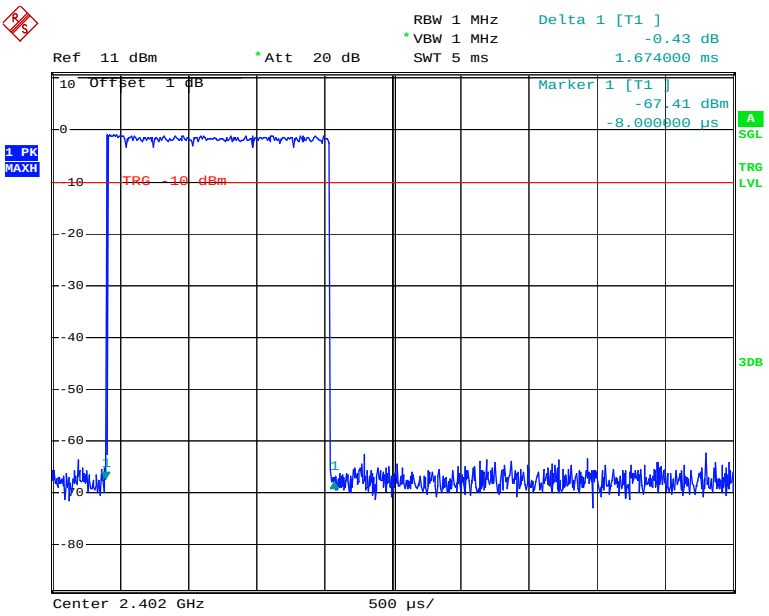
Date: 12.MAR.2014 19:43:54

DH1: High Channel



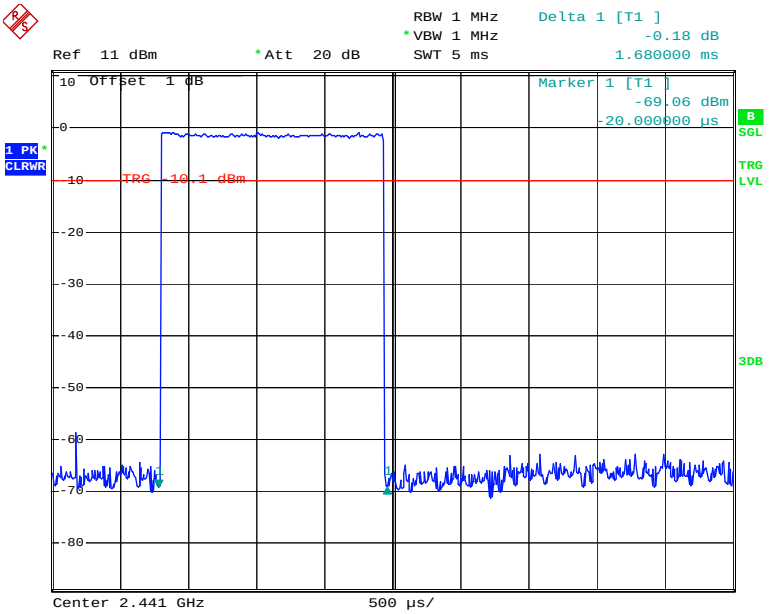
Date: 12.MAR.2014 19:43:47

DH3: Low Channel



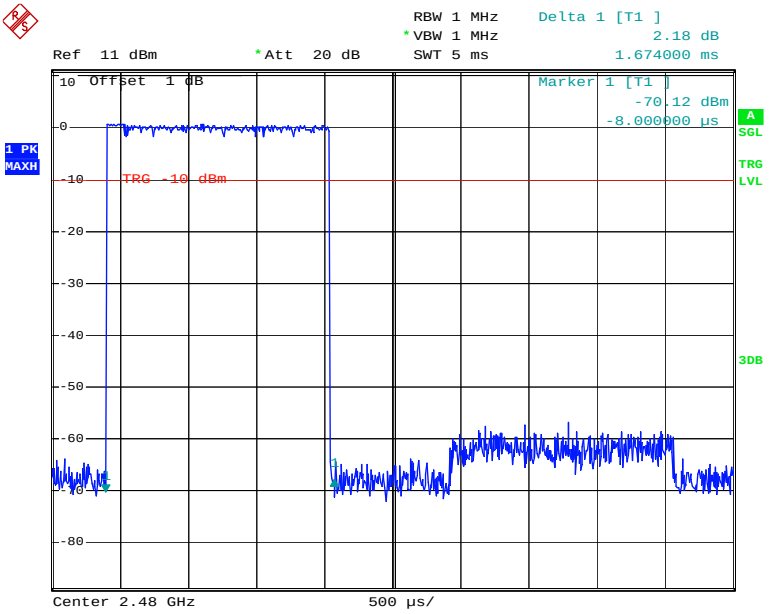
Date: 12.MAR.2014 19:45:01

DH3: Middle Channel



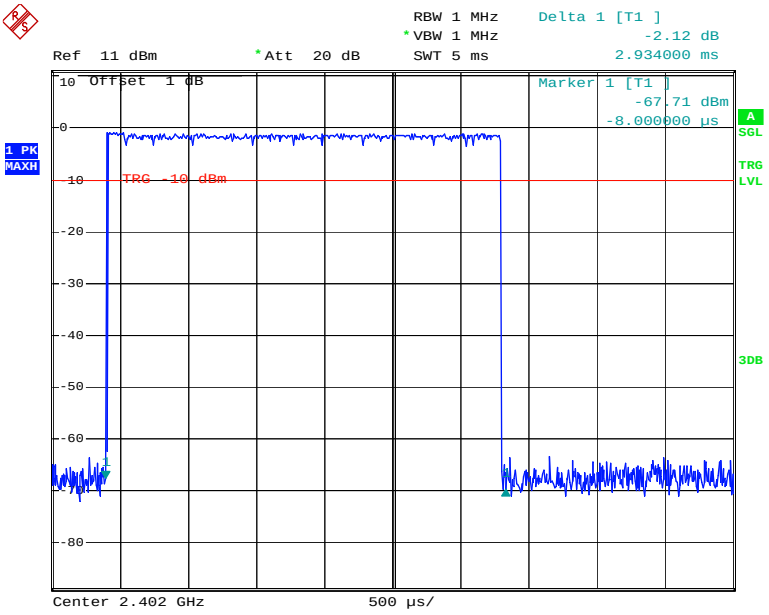
Date: 12.MAR.2014 19:57:03

DH3: High Channel



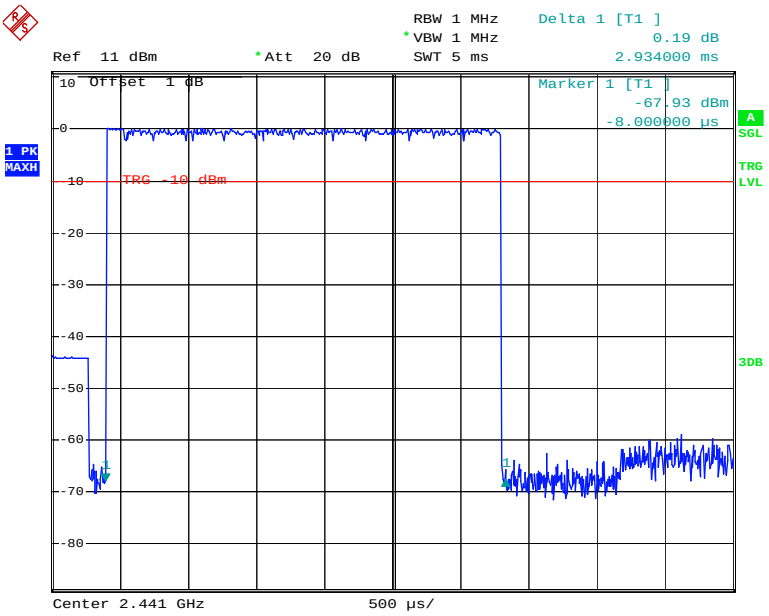
Date: 12.MAR.2014 19:45:22

DH5: Low Channel



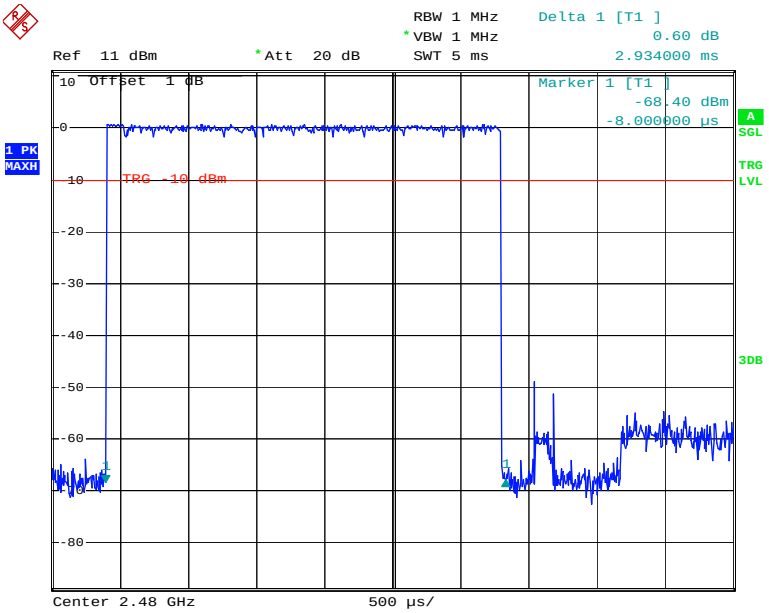
Date: 12.MAR.2014 19:46:17

DH5: Middle Channel



Date: 12.MAR.2014 19:46:08

DH5: High Channel

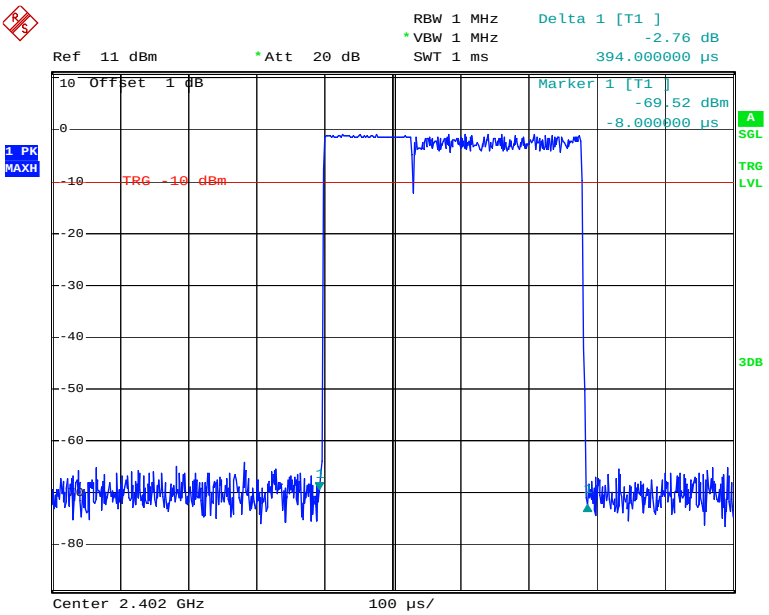


Date: 12.MAR.2014 19:46:01

EDR Mode (8-DPSK):

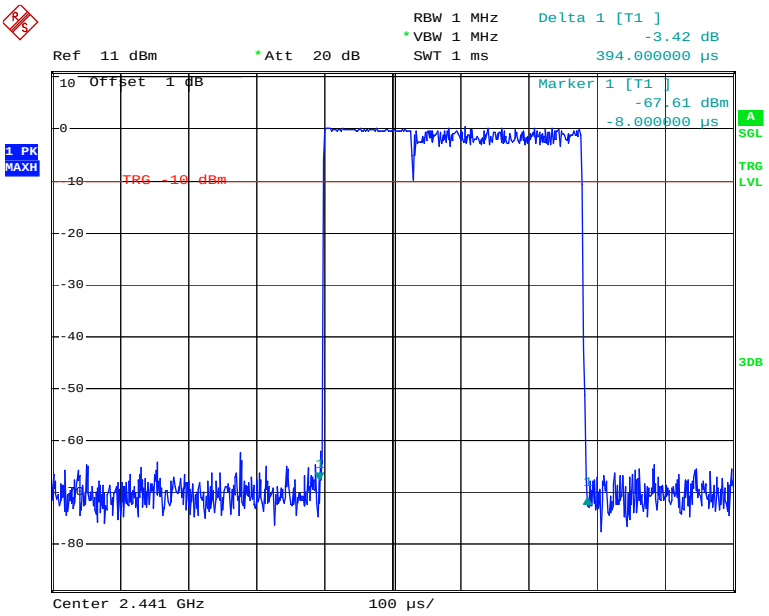
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.394	0.126	0.4	Pass
	Middle	0.394	0.126	0.4	Pass
	High	0.394	0.126	0.4	Pass
	Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s				
DH3	Low	1.684	0.269	0.4	Pass
	Middle	1.684	0.269	0.4	Pass
	High	1.680	0.269	0.4	Pass
	Note: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s				
DH5	Low	2.930	0.313	0.4	Pass
	Middle	2.914	0.311	0.4	Pass
	High	2.914	0.311	0.4	Pass
	Note: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s				

DH1: Low Channel



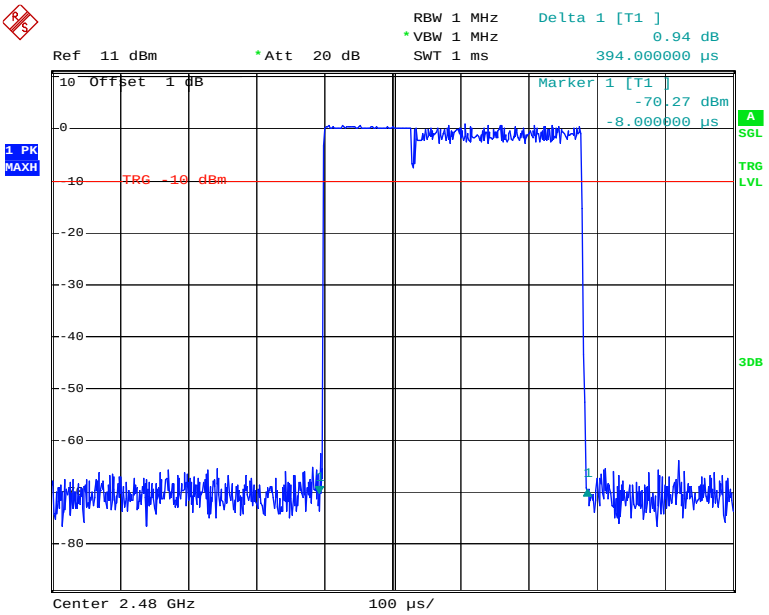
Date: 12.MAR.2014 19:02:55

DH1: Middle Channel



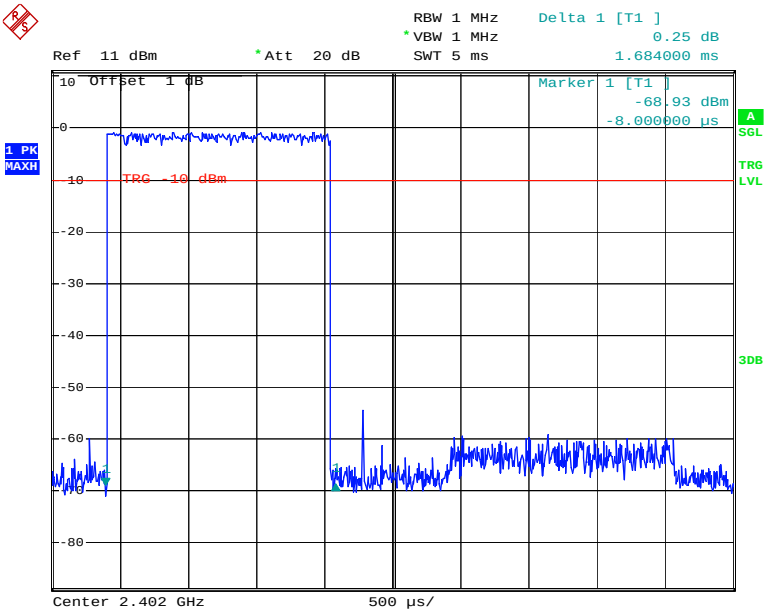
Date: 12.MAR.2014 19:03:05

DH1: High Channel



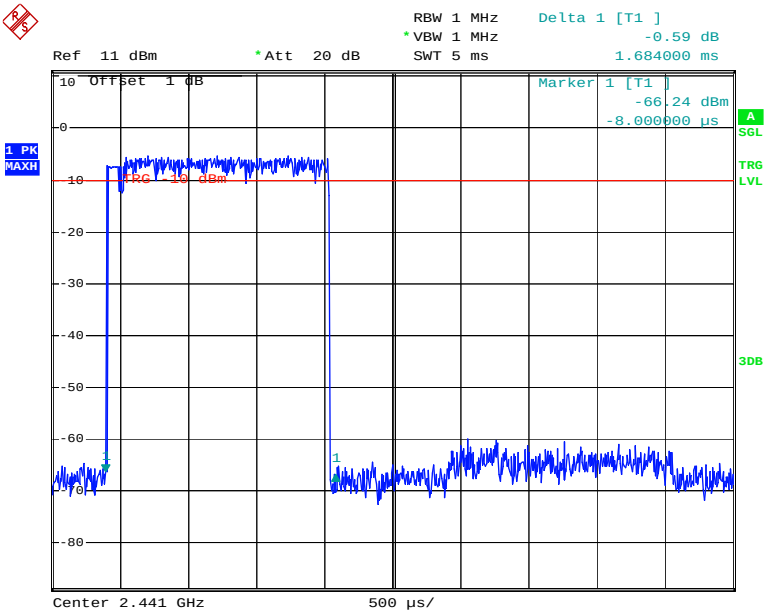
Date: 12.MAR.2014 19:03:19

DH3: Low Channel



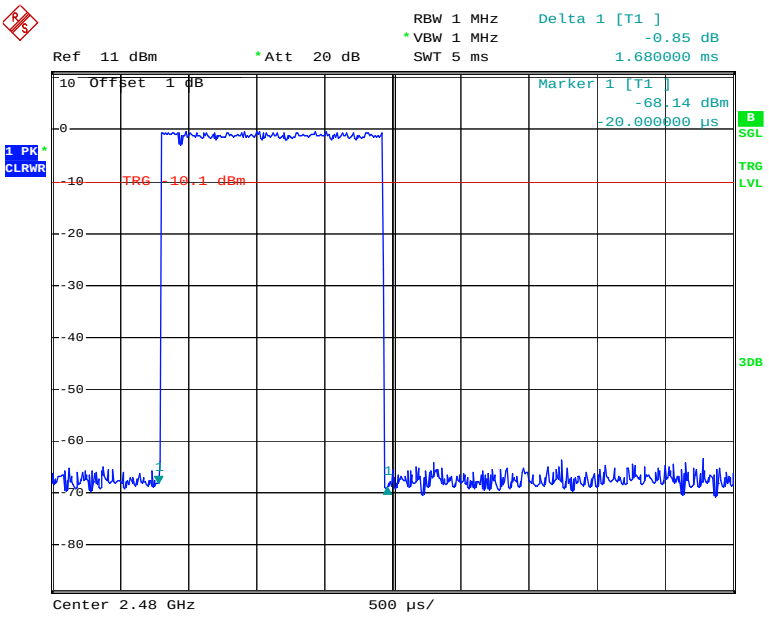
Date: 12.MAR.2014 19:37:24

DH3: Middle Channel



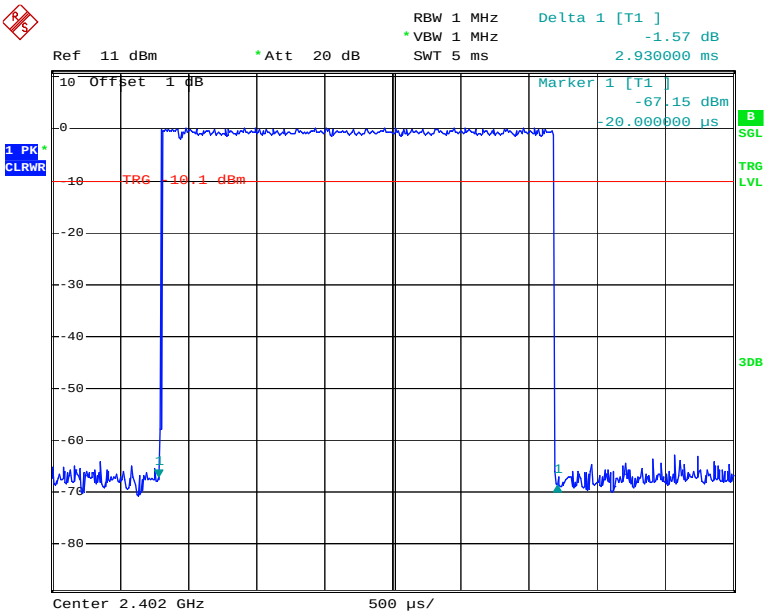
Date: 12.MAR.2014 19:37:16

DH3: High Channel



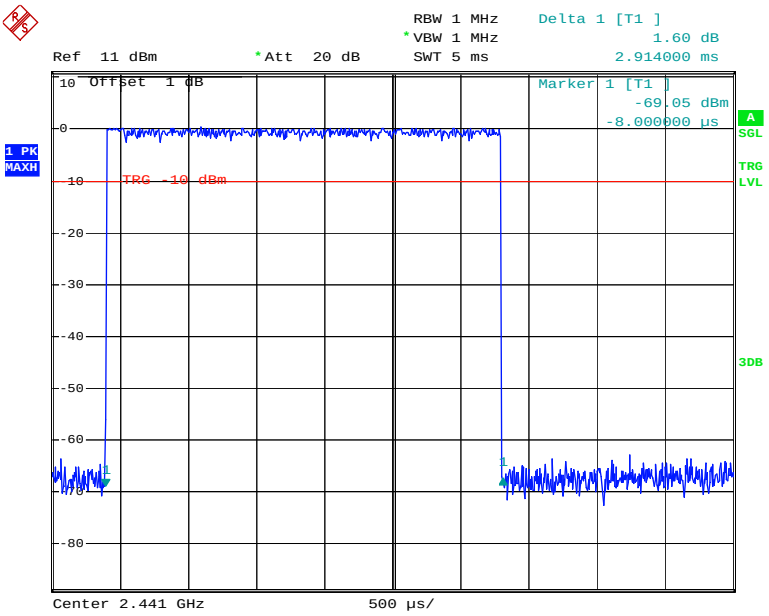
Date: 12.MAR.2014 19:58:49

DH5: Low Channel



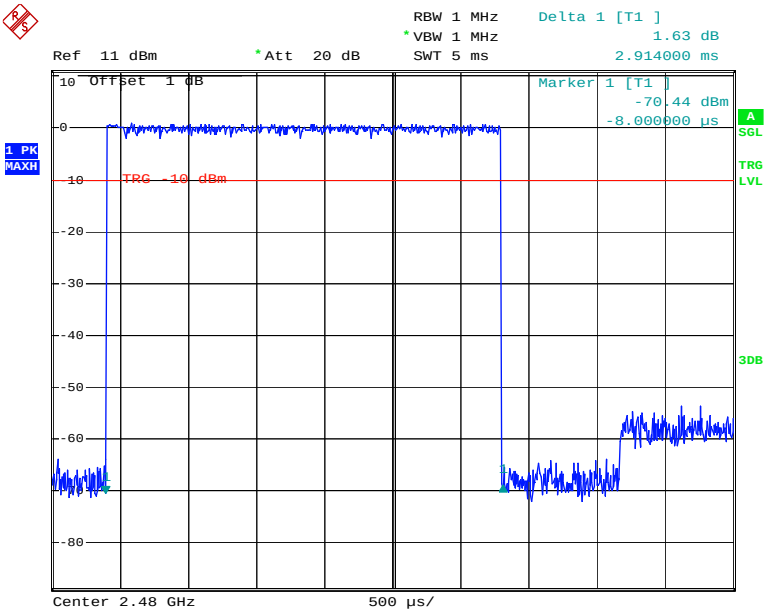
Date: 12.MAR.2014 20:00:27

DH5: Middle Channel



Date: 12.MAR.2014 19:38:08

DH5: High Channel



Date: 12.MAR.2014 19:38:16

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

Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts

Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one 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	2013-06-16	2014-06-15

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

Test Data

Environmental Conditions

Temperature:	22.8 °C
Relative Humidity:	61 %
ATM Pressure:	100.0 kPa

** The testing was performed by Ares Liu on 2014-03-12.*

Test Result: Compliance.

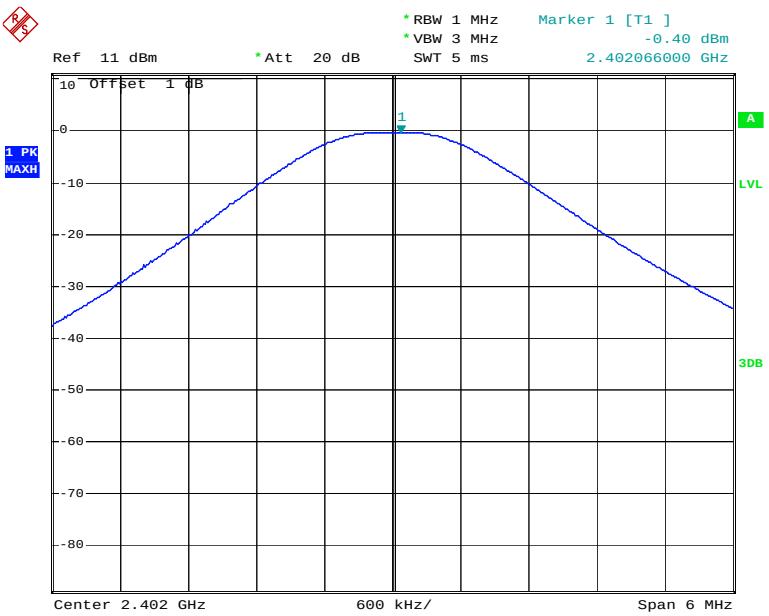
Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	Max Peak Output Power (dBm)	Limit (dBm)
BDR Mode (GFSK)	Low	2402	-0.40	30
	Middle	2441	0.86	30
	High	2480	1.44	30
EDR Mode (π/4-DQPSK)	Low	2402	-0.48	30
	Middle	2441	0.75	30
	High	2480	1.33	30
EDR Mode (8-DPSK)	Low	2402	-0.32	30
	Middle	2441	0.87	30
	High	2480	1.42	30

Note: The data above was tested in conducted mode.

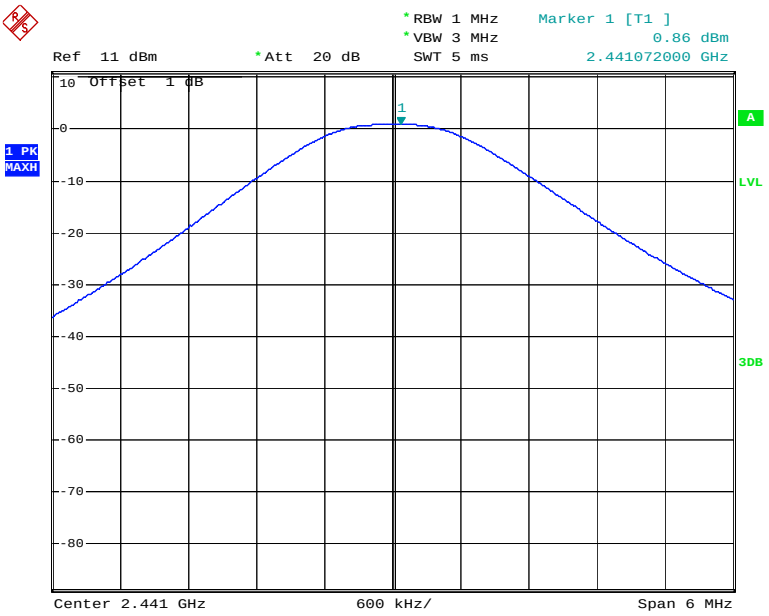
BDR Mode (GFSK):

Output Power, Low



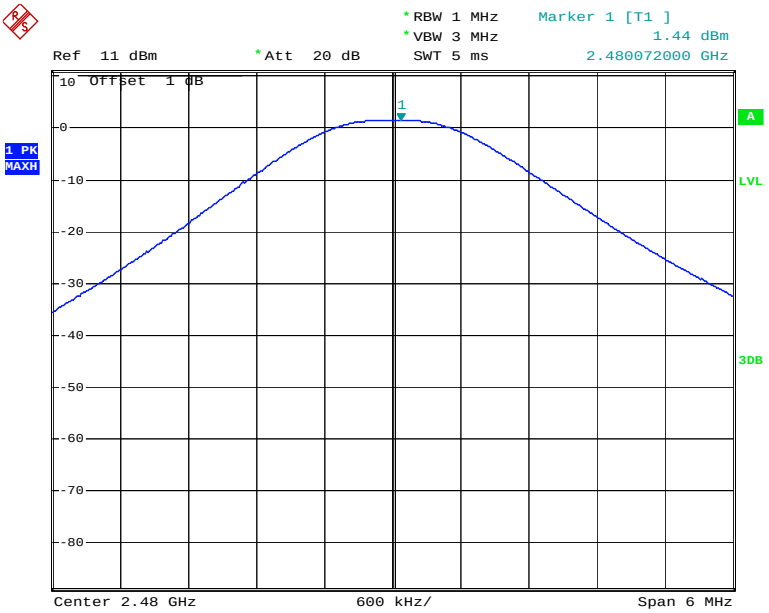
Date: 12.MAR.2014 17:37:58

Output Power, Middle



Date: 12.MAR.2014 17:38:08

Output Power, High



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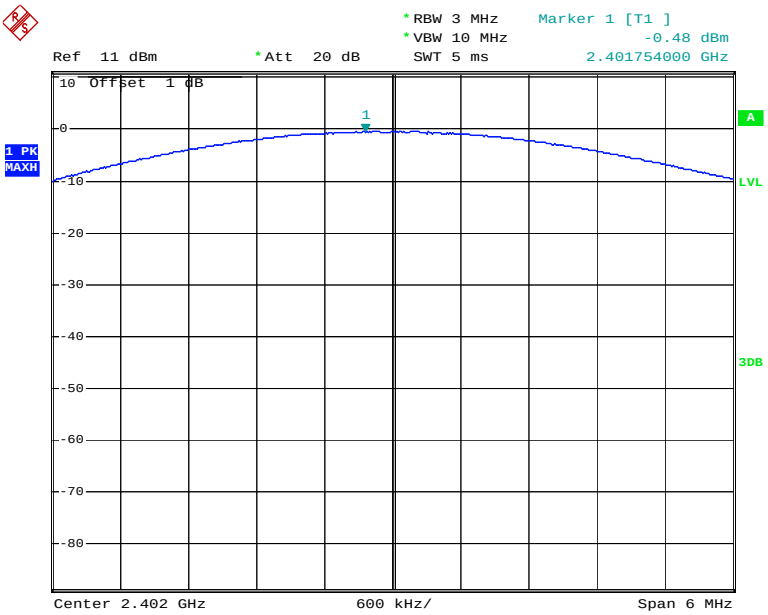
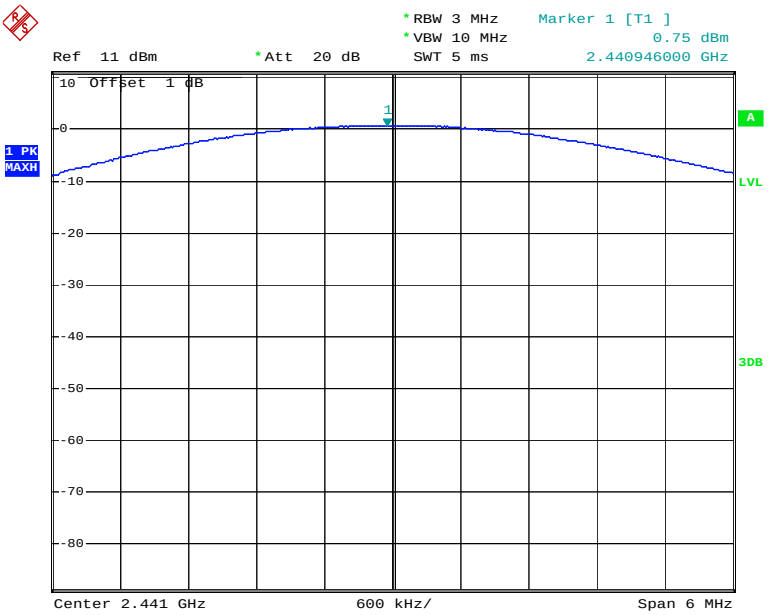
EDR Mode (π/4-DQPSK):

Output Power, Low



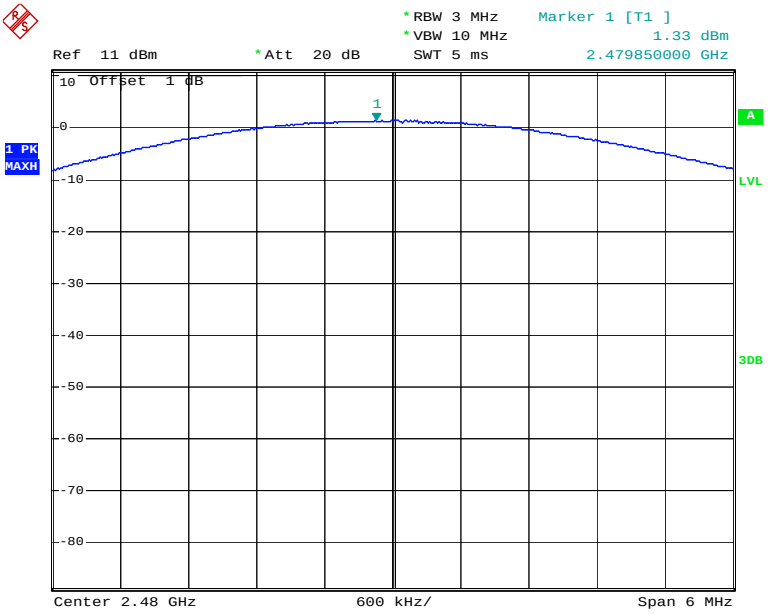
Date: 12.MAR.2014 17:38:27

Output Power, Middle



Date: 12.MAR.2014 17:38:37

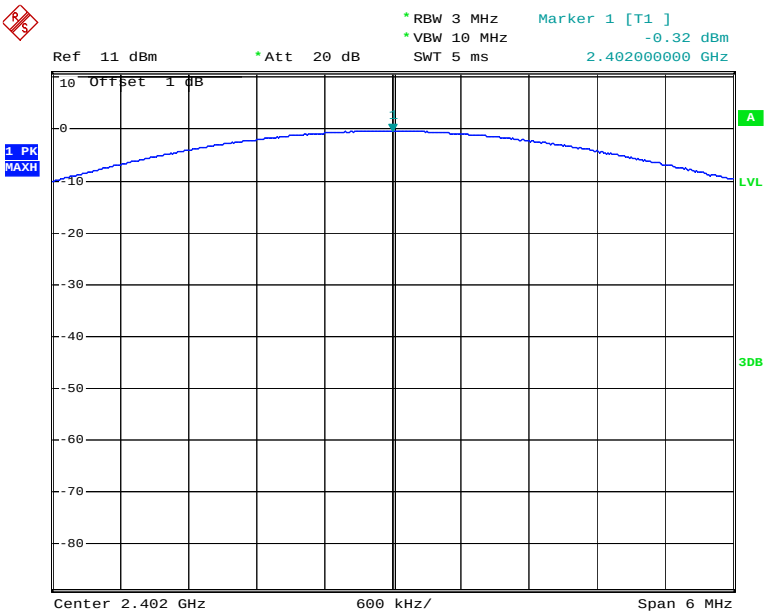
Output Power, High



Date: 12.MAR.2014 17:38:47

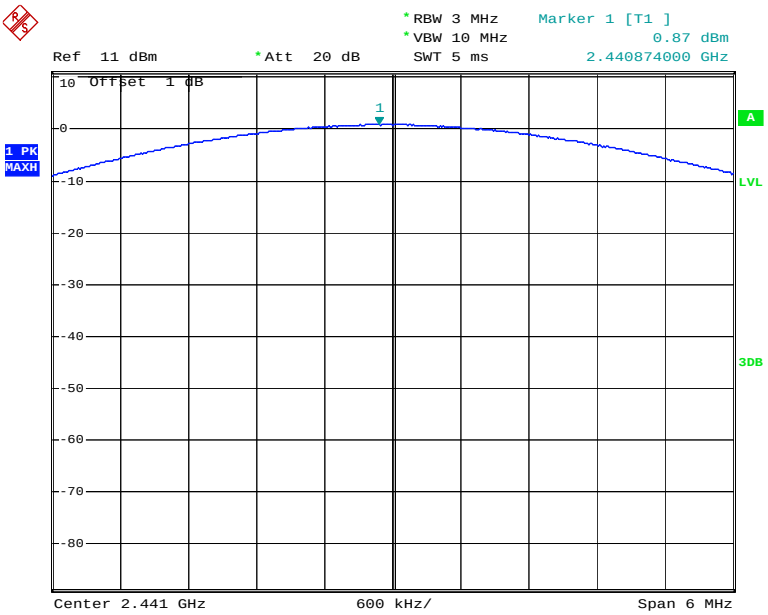
EDR Mode (8-DPSK):

Output Power, Low



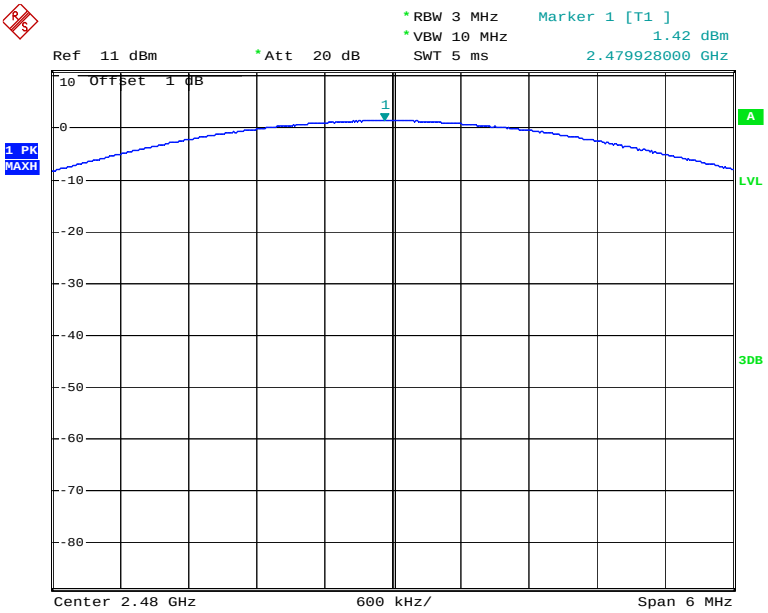
Date: 12.MAR.2014 17:38:56

Output Power, Middle



Date: 12.MAR.2014 17:39:06

Output Power, High



Date: 12.MAR.2014 17:39:16

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 the test equipment, 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	2013-06-16	2014-06-15

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

Test Data

Environmental Conditions

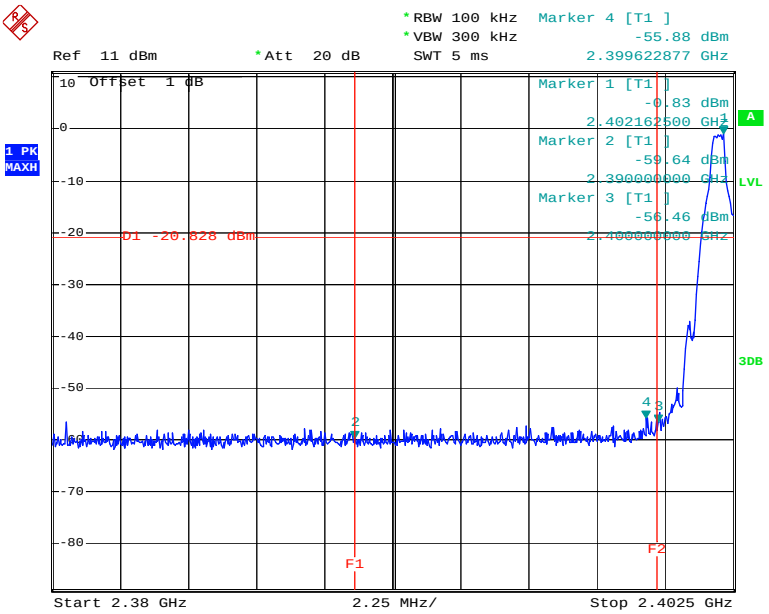
Temperature:	22.8 °C
Relative Humidity:	61 %
ATM Pressure:	100.0 kPa

** The testing was performed by Ares Liu on 2014-03-12.*

Test Result: Compliance

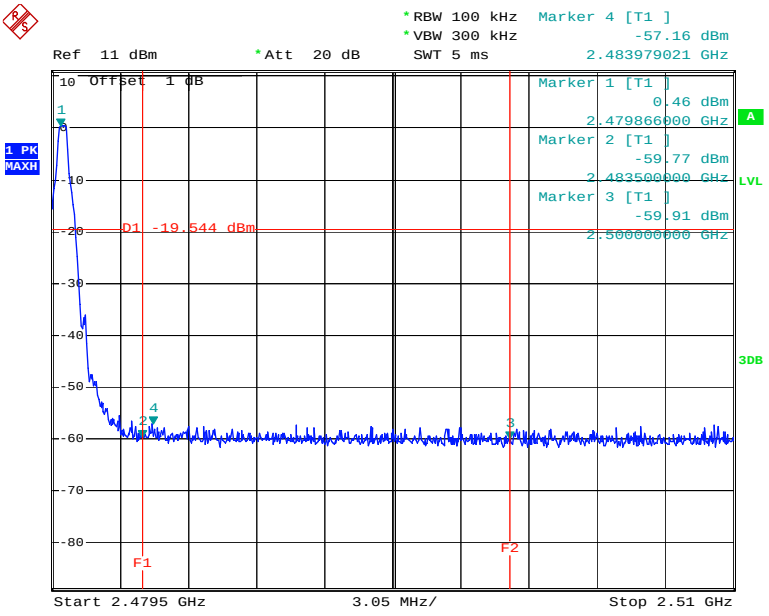
BDR Mode (GFSK):

Band Edge, Left Side



Date: 12.MAR.2014 17:48:33

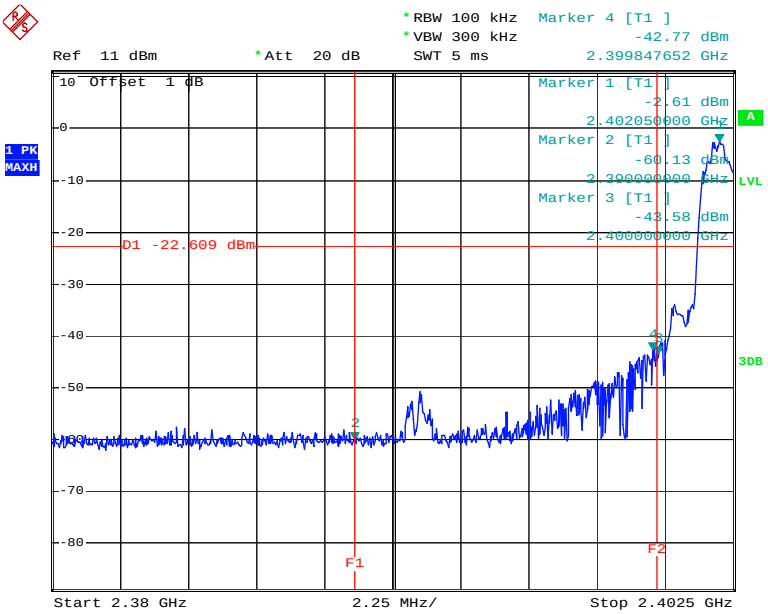
Band Edge, Right Side



Date: 12.MAR.2014 17:48:50

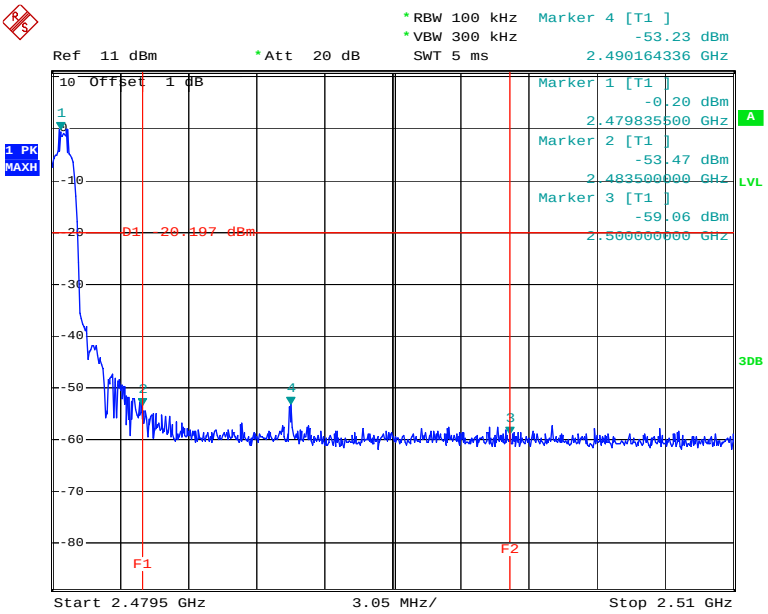
EDR Mode (π/4-DQPSK):

Band Edge, Left Side



Date: 12.MAR.2014 17:49:07

Band Edge, Right Side



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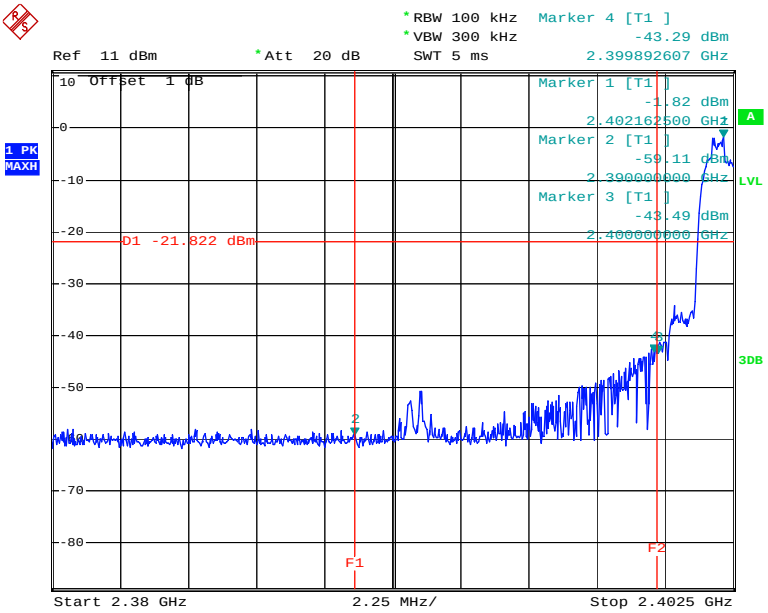
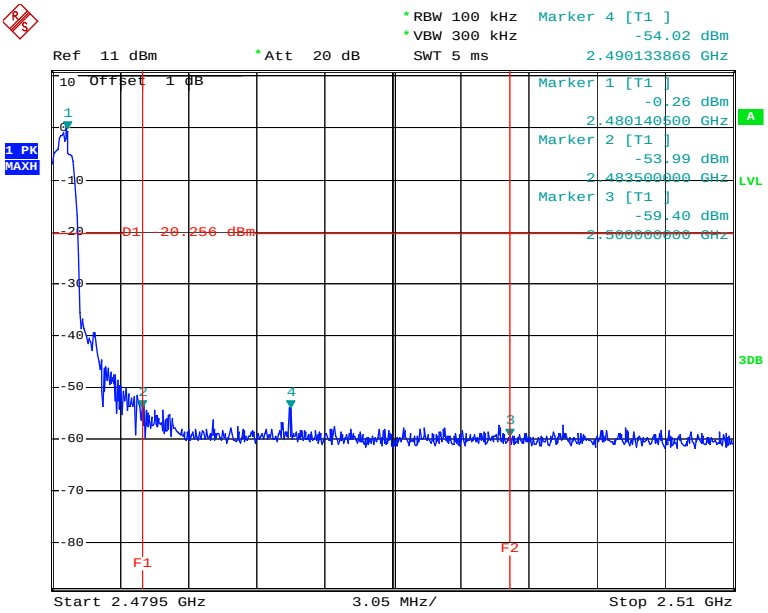
EDR Mode (8-DPSK):

Band Edge, Left Side



Date: 12.MAR.2014 17:49:41

Band Edge, Right Side



Date: 12.MAR.2014 17:49:58

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