

FCC PART 15.247

TEST REPORT

For

Avantronics Limited

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FCC ID: WJ5-BTTC400

Report Type: Original Report	Product Type: Bluetooth Audio Transmitter
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Avantronics Limited*'s product, model number: *BTTC-400 (FCC ID: WJ5-BTTC400)* (the "EUT") in this report was a *Bluetooth Audio Transmitter*, which was measured approximately: 5.3 cm (L) x 5.3 cm (W) x 2.0 cm (H), rated input voltage: DC 3.7V from rechargeable Li-ion battery.

All measurement and test data in this report was gathered from production sample serial number: 140721002 (Assigned by BACL, Dongguan). The EUT was received on 2014-07-22.

Objective

This report is prepared on behalf of *Avantronics 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 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)

No related submittal(s)/grant(s).

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.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

EUT Exercise Software

The software “CSR bluesuite 2.5.0” was used for testing, which was provided by manufacturer. The power setting was shown as the following table:

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

Equipment Modifications

No modification was made to the EUT.

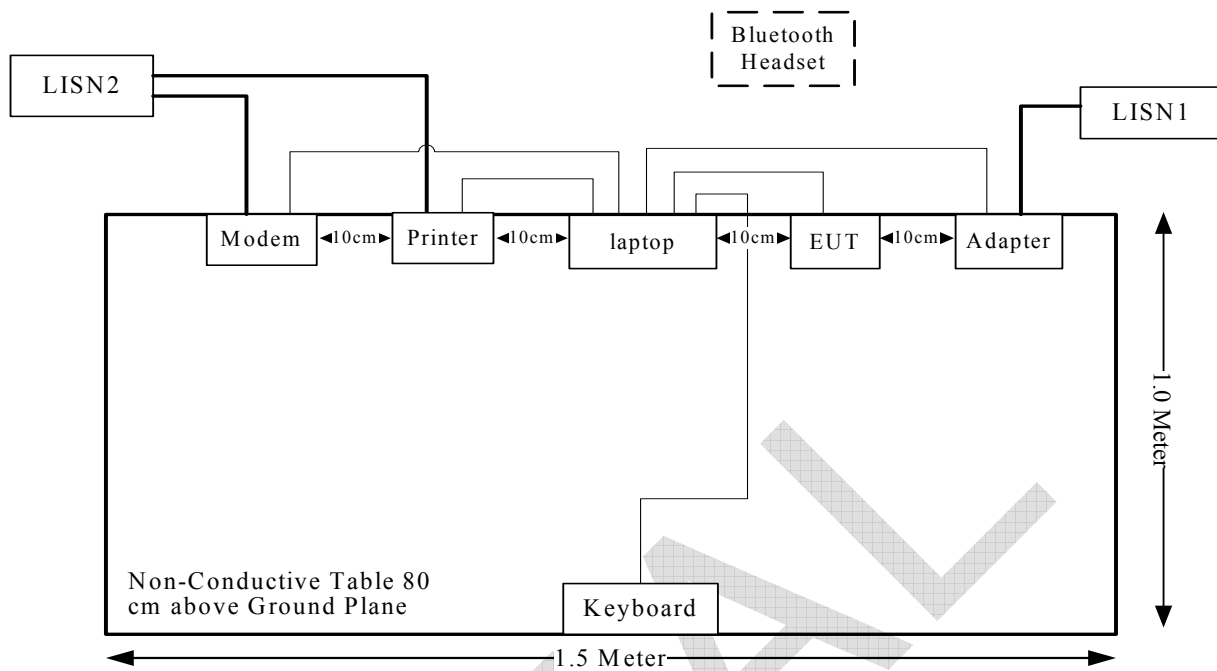
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017
HP	Printer	C3941A	JPTVOB2337
DELL	Keyboard	L100	CNORH656658907BL05DC
SAST	Modem	AEM-2100	0293
K-mate	Bluetooth Headset	N/A	N/A

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Serial Cable	Yes	No	1.2	Serial Port of Laptop	Modem
Parallel Cable	Yes	No	1.2	Parallel Port of Laptop	Printer
Keyboard Cable	Yes	No	1.5	USB Port of Laptop	Keyboard
USB Cable	No	No	0.9	USB Port of Laptop	EUT
Audio Cable	No	No	1.0	Audio Port of Laptop	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	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) & §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

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

According to KDB447498 D01 General RF Exposure Guidance v05r02:

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

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

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

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

Measurement Result

The maximum conducted output power= 5.17 dBm (3.29 mW) at 2402 MHz
 $[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$
 $= 3.29/5 \cdot (\sqrt{2.402}) = 1.019 < 3.0$

So the stand-alone SAR evaluation is not necessary.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

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

Result: Compliance.

FCC §15.207 – AC LINE CONDUCTED EMISSIONS

Measurement Uncertainty

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

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

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

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

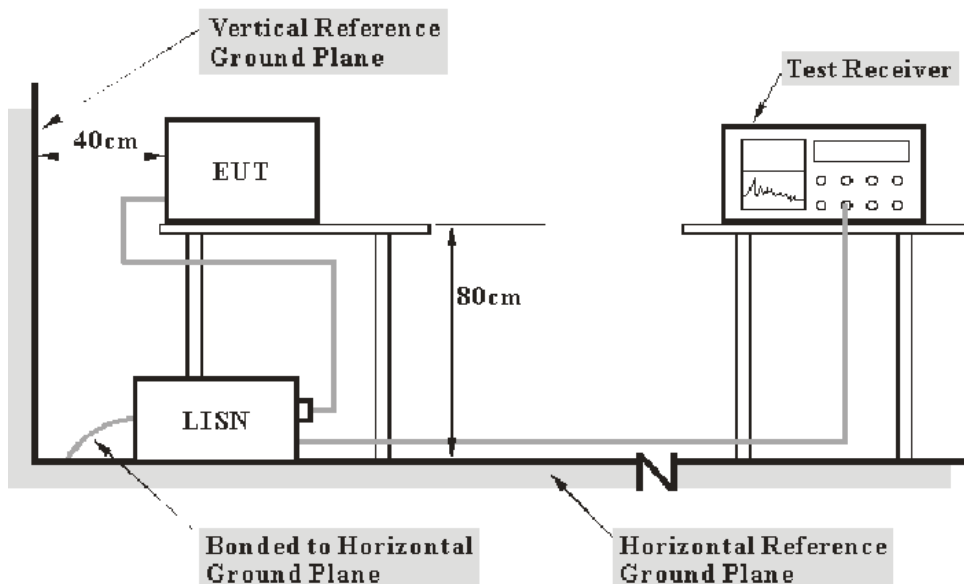
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

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

Table 1 – Values of U_{cisp}

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

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

The adapter of laptop 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 laptop 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:

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

Test Equipment List and Details

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

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

Test Results Summary

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

16.40 dB at 0.390261 MHz in the Neutral conducted mode

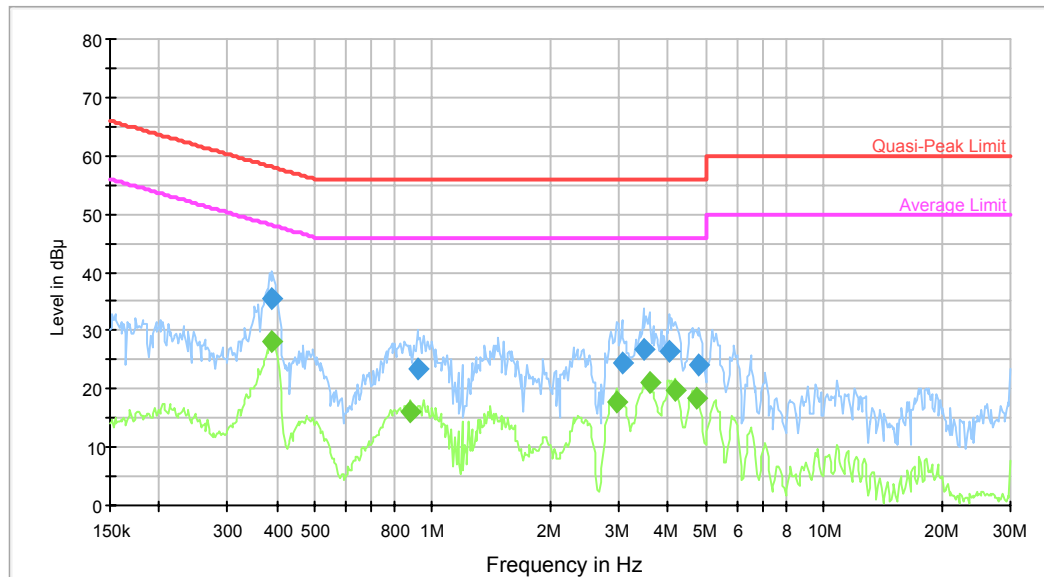
Test Data**Environmental Conditions**

Temperature:	28.4 °C
Relative Humidity:	49 %
ATM Pressure:	99.4 kPa

The testing was performed by Allen Qiao on 2014-07-24.

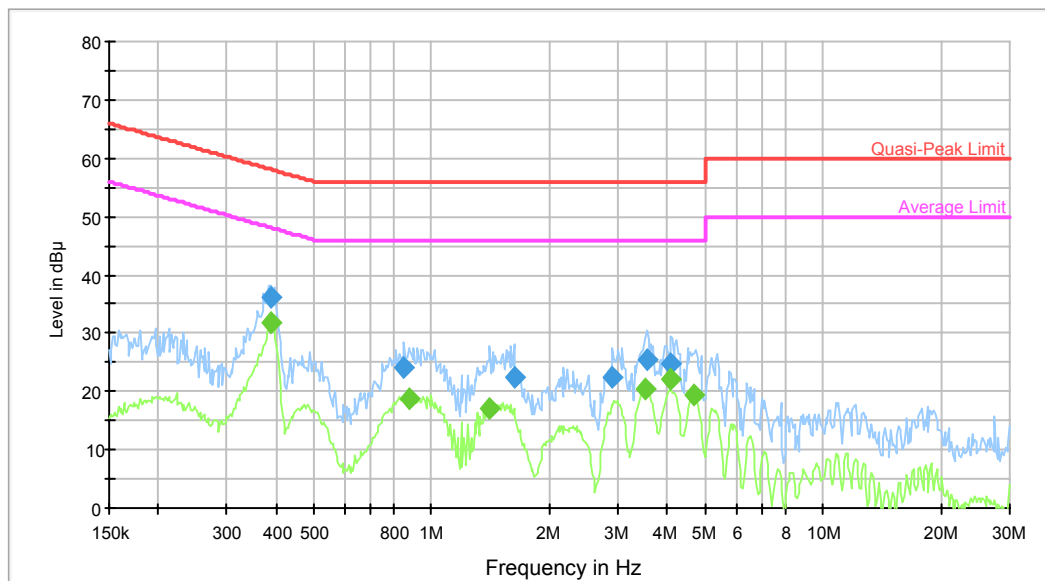
Test mode: Transmitting

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.390261	35.6	9.000	L1	10.6	22.4	58.1	Compliance
0.915445	23.4	9.000	L1	10.5	32.6	56.0	Compliance
3.049107	24.5	9.000	L1	10.6	31.5	56.0	Compliance
3.463707	26.9	9.000	L1	10.7	29.1	56.0	Compliance
4.029873	26.4	9.000	L1	10.7	29.6	56.0	Compliance
4.802010	24.2	9.000	L1	10.7	31.8	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.390261	28.2	9.000	L1	10.6	19.8	48.1	Compliance
0.879690	16.0	9.000	L1	10.5	30.0	46.0	Compliance
2.953456	17.9	9.000	L1	10.6	28.1	46.0	Compliance
3.575883	21.2	9.000	L1	10.7	24.8	46.0	Compliance
4.160384	19.9	9.000	L1	10.7	26.1	46.0	Compliance
4.726090	18.3	9.000	L1	10.7	27.7	46.0	Compliance

AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.390261	36.0	9.000	N	10.9	22.0	58.1	Compliance
0.852094	24.1	9.000	N	10.5	31.9	56.0	Compliance
1.624765	22.3	9.000	N	10.5	33.7	56.0	Compliance
2.906762	22.4	9.000	N	10.6	33.6	56.0	Compliance
3.547503	25.4	9.000	N	10.7	30.6	56.0	Compliance
4.094608	24.8	9.000	N	10.8	31.2	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.390261	31.7	9.000	N	10.9	16.4	48.1	Compliance
0.879690	18.8	9.000	N	10.6	27.2	46.0	Compliance
1.407671	17.2	9.000	N	10.5	28.8	46.0	Compliance
3.519348	20.3	9.000	N	10.7	25.7	46.0	Compliance
4.094608	22.0	9.000	N	10.8	24.0	46.0	Compliance
4.688581	19.3	9.000	N	10.8	26.7	46.0	Compliance

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

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

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

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

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

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

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

30M~200MHz: 5.0 dB

200M~1GHz: 6.2 dB

1G~6GHz: 4.45 dB

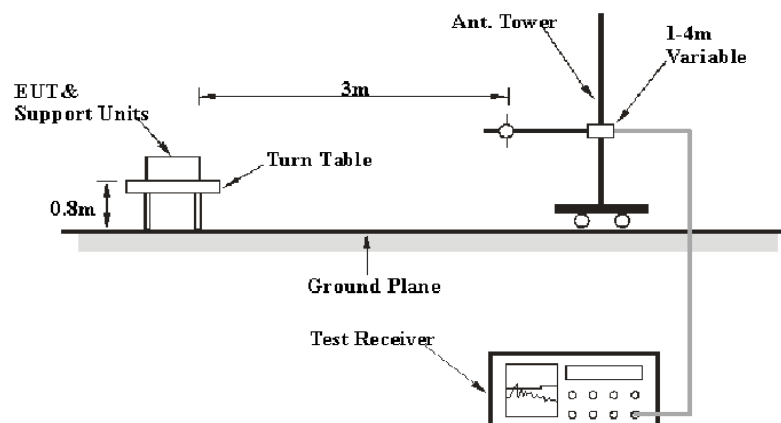
6G~18GHz: 5.23 dB

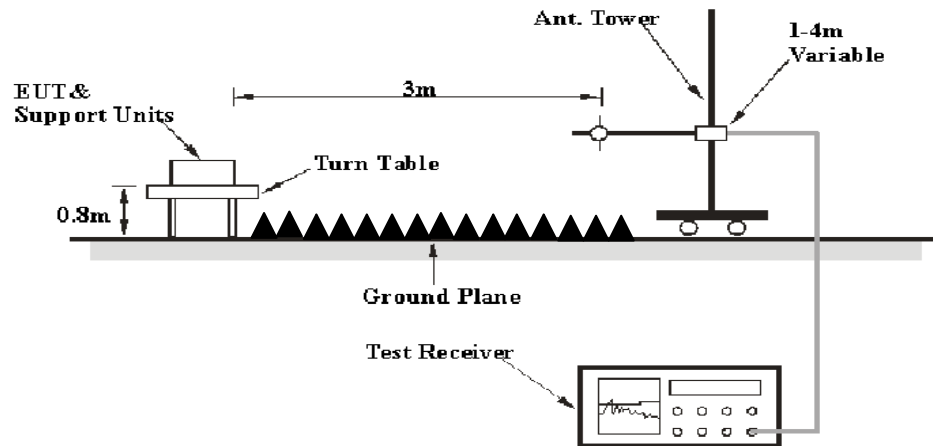
Table 1 – Values of U_{cisp}

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

EUT Setup

Below 1GHz:



Above 1GHz:

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

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

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test Procedure

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

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

Test Equipment List and Details

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

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

Corrected Amplitude & Margin Calculation

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

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

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

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

Test Results Summary

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

4.30 dB at 2483.5 MHz in the Vertical polarization of EDR Mode ($\pi/4$ -DQPSK)

Test Data

Environmental Conditions

Temperature:	28.3 °C
Relative Humidity:	57 %
ATM Pressure:	99.4 kPa

The testing was performed by Allen Qiao on 2014-07-24.

Mode: Transmitting

BDR Mode (GFSK):

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402 MHz									
2402	69.54	PK	H	25.65	4.42	0.00	99.61	N/A	N/A
2402	60.03	AV	H	25.65	4.42	0.00	90.10	N/A	N/A
2402	69.88	PK	V	25.65	4.42	0.00	99.95	N/A	N/A
2402	60.09	AV	V	25.65	4.42	0.00	90.16	N/A	N/A
2390	30.41	PK	V	25.61	4.39	0.00	60.41	74.00	13.59
2390	17.23	AV	V	25.61	4.39	0.00	47.23	54.00	6.77
4804	33.61	PK	V	30.59	5.98	27.41	42.77	74.00	31.23
4804	22.54	AV	V	30.59	5.98	27.41	31.70	54.00	22.30
7206	29.87	PK	V	34.09	7.45	25.91	45.50	74.00	28.50
7206	19.27	AV	V	34.09	7.45	25.91	34.90	54.00	19.10
9608	28.26	PK	V	35.96	8.80	27.55	45.47	74.00	28.53
9608	17.14	AV	V	35.96	8.80	27.55	34.35	54.00	19.65
2920	34.1	PK	V	26.99	6.65	27.54	40.20	74.00	33.80
2920	20.07	AV	V	26.99	6.65	27.54	26.17	54.00	27.83
163.7	35.77	QP	V	12.51	1.56	21.44	28.40	43.50	15.10
Middle Channel: 2441 MHz									
2441	67.79	PK	H	25.75	4.40	0.00	97.94	N/A	N/A
2441	57.72	AV	H	25.75	4.40	0.00	87.87	N/A	N/A
2441	69.29	PK	V	25.75	4.40	0.00	99.44	N/A	N/A
2441	59.3	AV	V	25.75	4.40	0.00	89.45	N/A	N/A
4882	34.59	PK	V	30.79	6.08	27.42	44.04	74.00	29.96
4882	21.03	AV	V	30.79	6.08	27.42	30.48	54.00	23.52
7323	30.24	PK	V	34.38	7.51	25.88	46.25	74.00	27.75
7323	18.57	AV	V	34.38	7.51	25.88	34.58	54.00	19.42
9764	28.97	PK	V	36.33	8.83	27.20	46.93	74.00	27.07
9764	17.46	AV	V	36.33	8.83	27.20	35.42	54.00	18.58
2920	34.4	PK	V	26.99	6.65	27.54	40.50	74.00	33.50
2920	20.1	AV	V	26.99	6.65	27.54	26.20	54.00	27.80
1825	36.55	PK	V	24.25	3.63	27.52	36.91	74.00	37.09
1825	23.65	AV	V	24.25	3.63	27.52	24.01	54.00	29.99
163.7	35.49	QP	V	12.51	1.56	21.44	28.12	43.50	15.38
High Channel: 2480 MHz									
2480	65.92	PK	H	25.85	4.48	0.00	96.25	N/A	N/A
2480	55.84	AV	H	25.85	4.48	0.00	86.17	N/A	N/A
2480	66.92	PK	V	25.85	4.48	0.00	97.25	N/A	N/A
2480	57.5	AV	V	25.85	4.48	0.00	87.83	N/A	N/A
2483.5	30.24	PK	V	25.86	4.49	0.00	60.59	74.00	13.41
2483.5	17.42	AV	V	25.86	4.49	0.00	47.77	54.00	6.23
4960	33.13	PK	V	31.00	5.90	27.43	42.60	74.00	31.40
4960	23.29	AV	V	31.00	5.90	27.43	32.76	54.00	21.24
7440	32.57	PK	V	34.66	7.58	25.97	48.84	74.00	25.16
7440	18.69	AV	V	34.66	7.58	25.97	34.96	54.00	19.04
9920	29.3	PK	V	36.71	8.87	26.66	48.22	74.00	25.78
9920	17.44	AV	V	36.71	8.87	26.66	36.36	54.00	17.64
2920	34.46	PK	V	26.99	6.65	27.54	40.56	74.00	33.44
2920	19.85	AV	V	26.99	6.65	27.54	25.95	54.00	28.05
163.7	35.98	QP	V	12.51	1.56	21.44	28.61	43.50	14.89

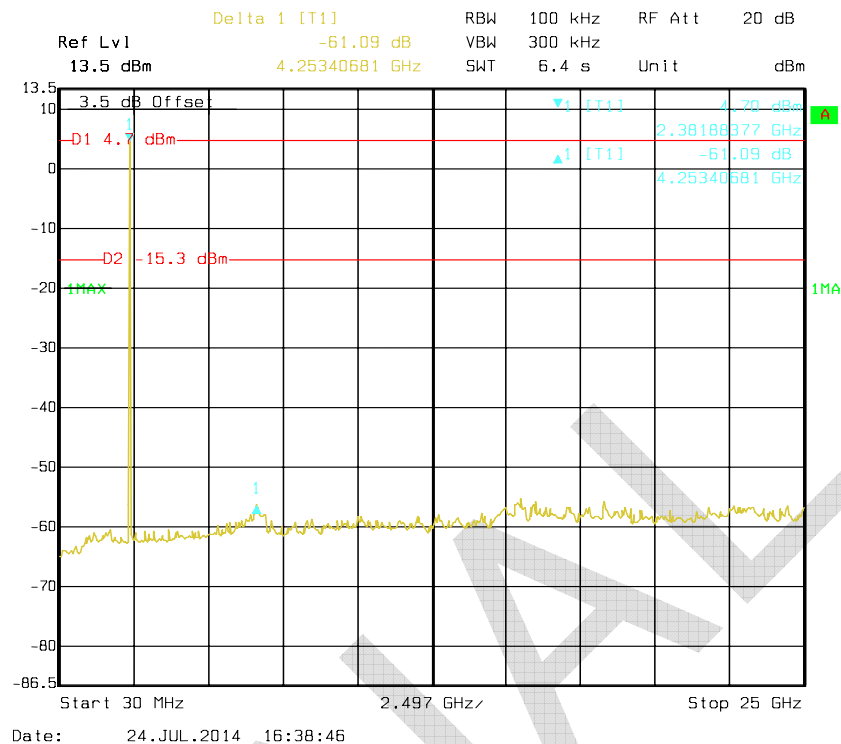
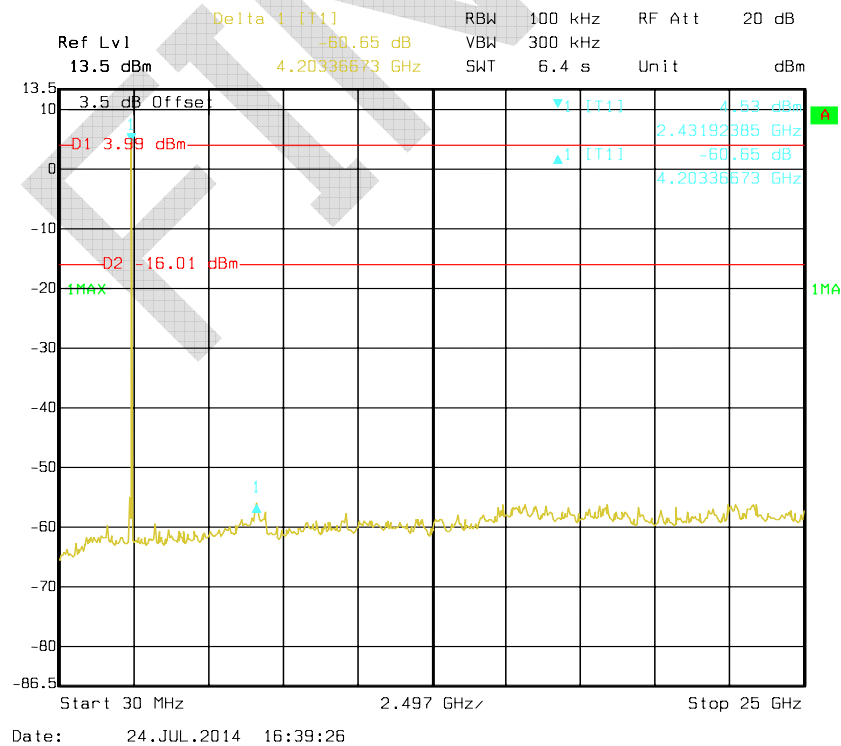
EDR Mode ($\pi/4$ -DQPSK):

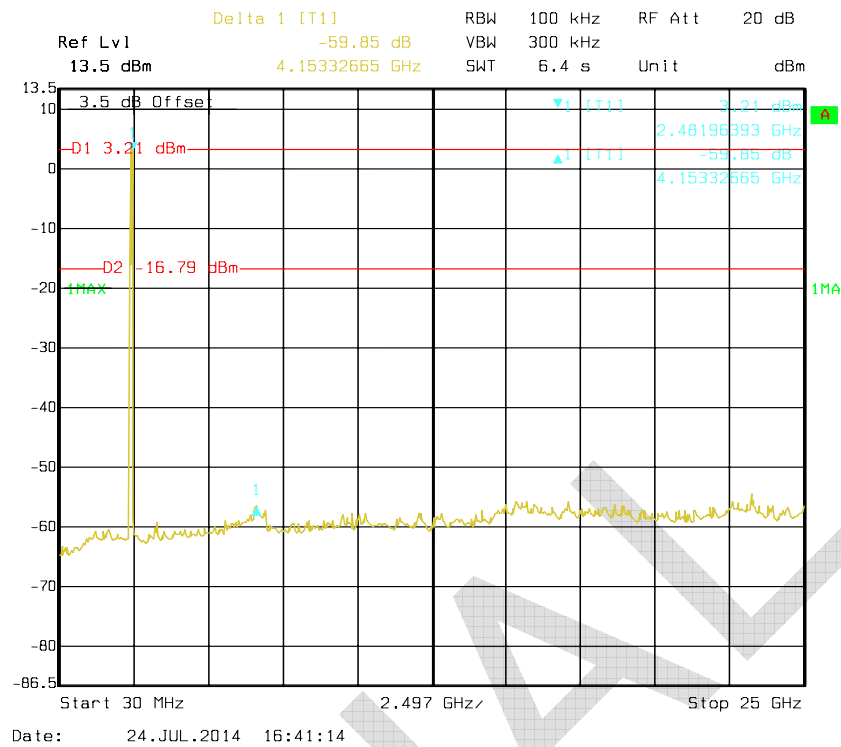
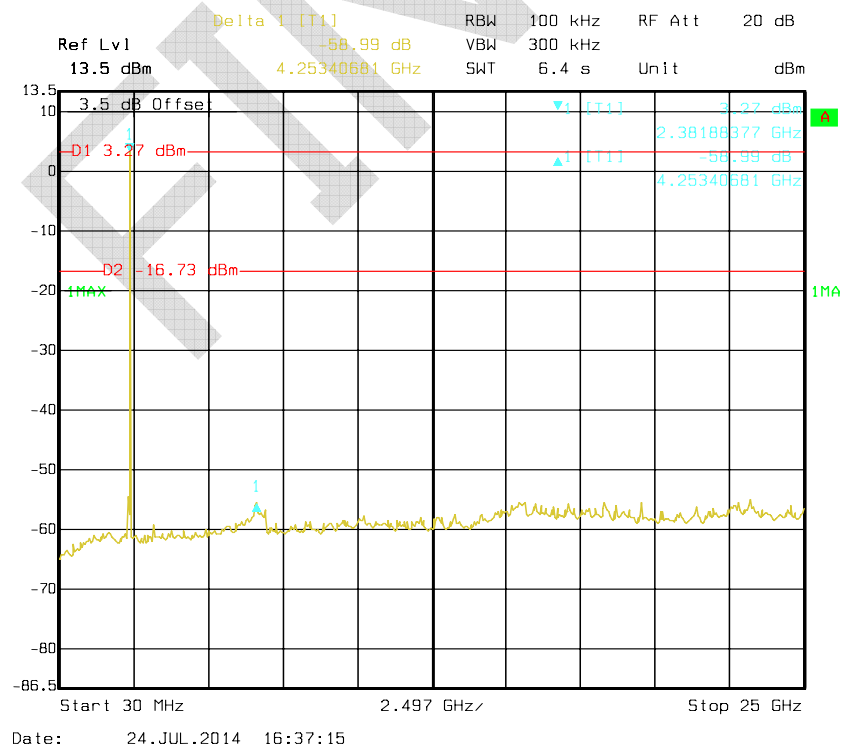
Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402 MHz									
2402	67.77	PK	H	25.65	4.42	0.00	97.84	N/A	N/A
2402	56.88	AV	H	25.65	4.42	0.00	86.95	N/A	N/A
2402	68	PK	V	25.65	4.42	0.00	98.07	N/A	N/A
2402	56.12	AV	V	25.65	4.42	0.00	86.19	N/A	N/A
2390	30.74	PK	V	25.61	4.39	0.00	60.74	74.00	13.26
2390	16.85	AV	V	25.61	4.39	0.00	46.85	54.00	7.15
4804	31.97	PK	V	30.59	5.98	27.41	41.13	74.00	32.87
4804	19.4	AV	V	30.59	5.98	27.41	28.56	54.00	25.44
7206	29.87	PK	V	34.09	7.45	25.91	45.50	74.00	28.50
7206	18.37	AV	V	34.09	7.45	25.91	34.00	54.00	20.00
9608	28.47	PK	V	35.96	8.80	27.55	45.68	74.00	28.32
9608	18.09	AV	V	35.96	8.80	27.55	35.30	54.00	18.70
2920	33.78	PK	V	26.99	6.65	27.54	39.88	74.00	34.12
2920	21.15	AV	V	26.99	6.65	27.54	27.25	54.00	26.75
163.7	35.49	QP	V	12.51	1.56	21.44	28.12	43.50	15.38
Middle Channel: 2441 MHz									
2441	66.79	PK	H	25.75	4.40	0.00	96.94	N/A	N/A
2441	56.06	AV	H	25.75	4.40	0.00	86.21	N/A	N/A
2441	68.22	PK	V	25.75	4.40	0.00	98.37	N/A	N/A
2441	56.45	AV	V	25.75	4.40	0.00	86.60	N/A	N/A
4882	32.63	PK	V	30.79	6.08	27.42	42.08	74.00	31.92
4882	20.17	AV	V	30.79	6.08	27.42	29.62	54.00	24.38
7323	30.51	PK	V	34.38	7.51	25.88	46.52	74.00	27.48
7323	19.83	AV	V	34.38	7.51	25.88	35.84	54.00	18.16
9764	28.36	PK	V	36.33	8.83	27.20	46.32	74.00	27.68
9764	17.42	AV	V	36.33	8.83	27.20	35.38	54.00	18.62
2920	33.78	PK	V	26.99	6.65	27.54	39.88	74.00	34.12
2920	20.83	AV	V	26.99	6.65	27.54	26.93	54.00	27.07
1825	35.55	PK	V	24.25	3.63	27.52	35.91	74.00	38.09
1825	23.56	AV	V	24.25	3.63	27.52	23.92	54.00	30.08
163.7	35.86	QP	V	12.51	1.56	21.44	28.49	43.50	15.01
High Channel: 2480 MHz									
2480	64.67	PK	H	25.85	4.48	0.00	95.00	N/A	N/A
2480	54.42	AV	H	25.85	4.48	0.00	84.75	N/A	N/A
2480	66.17	PK	V	25.85	4.48	0.00	96.50	N/A	N/A
2480	55.29	AV	V	25.85	4.48	0.00	85.62	N/A	N/A
2483.5	32.03	PK	V	25.86	4.49	0.00	62.38	74.00	11.62
2483.5	19.35	AV	V	25.86	4.49	0.00	49.70	54.00	4.30*
4960	32.03	PK	V	31.00	5.90	27.43	41.50	74.00	32.50
4960	20.04	AV	V	31.00	5.90	27.43	29.51	54.00	24.49
7440	30.01	PK	V	34.66	7.58	25.97	46.28	74.00	27.72
7440	18.67	AV	V	34.66	7.58	25.97	34.94	54.00	19.06
9920	29.58	PK	V	36.71	8.87	26.66	48.50	74.00	25.50
9920	17.67	AV	V	36.71	8.87	26.66	36.59	54.00	17.41
2920	33.95	PK	V	26.99	6.65	27.54	40.05	74.00	33.95
2920	19.82	AV	V	26.99	6.65	27.54	25.92	54.00	28.08
163.7	35.74	QP	V	12.51	1.56	21.44	28.37	43.50	15.13

*Within measurement uncertainty!

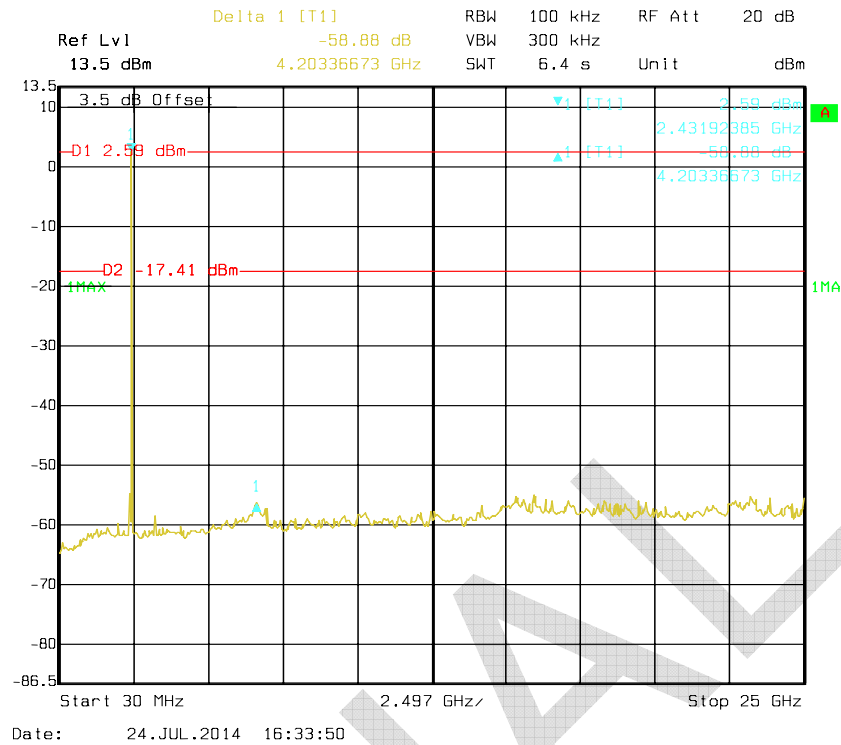
EDR Mode (8-DPSK):

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402 MHz									
2402	68.07	PK	H	25.65	4.42	0.00	98.14	N/A	N/A
2402	56.90	AV	H	25.65	4.42	0.00	86.97	N/A	N/A
2402	68.76	PK	V	25.65	4.42	0.00	98.83	N/A	N/A
2402	57.51	AV	V	25.65	4.42	0.00	87.58	N/A	N/A
2390	33.03	PK	V	25.61	4.39	0.00	63.03	74.00	10.97
2390	15.02	AV	V	25.61	4.39	0.00	45.02	54.00	8.98
4804	31.28	PK	V	30.59	5.98	27.41	40.44	74.00	33.56
4804	19.60	AV	V	30.59	5.98	27.41	28.76	54.00	25.24
7206	29.13	PK	V	34.09	7.45	25.91	44.76	74.00	29.24
7206	18.29	AV	V	34.09	7.45	25.91	33.92	54.00	20.08
9608	27.02	PK	V	35.96	8.80	27.55	44.23	74.00	29.77
9608	17.26	AV	V	35.96	8.80	27.55	34.47	54.00	19.53
2920	33.90	PK	V	26.99	6.65	27.54	40.00	74.00	34.00
2920	20.48	AV	V	26.99	6.65	27.54	26.58	54.00	27.42
163.7	35.90	QP	V	12.51	1.56	21.44	28.53	43.50	14.97
Middle Channel: 2441 MHz									
2441	66.12	PK	H	25.75	4.40	0.00	96.27	N/A	N/A
2441	55.75	AV	H	25.75	4.40	0.00	85.90	N/A	N/A
2441	67.04	PK	V	25.75	4.40	0.00	97.19	N/A	N/A
2441	56.49	AV	V	25.75	4.40	0.00	86.64	N/A	N/A
4882	31.89	PK	V	30.79	6.08	27.42	41.34	74.00	32.66
4882	20.25	AV	V	30.79	6.08	27.42	29.70	54.00	24.30
7323	30.10	PK	V	34.38	7.51	25.88	46.11	74.00	27.89
7323	18.07	AV	V	34.38	7.51	25.88	34.08	54.00	19.92
9764	27.46	PK	V	36.33	8.83	27.20	45.42	74.00	28.58
9764	17.25	AV	V	36.33	8.83	27.20	35.21	54.00	18.79
2920	33.21	PK	V	26.99	6.65	27.54	39.31	74.00	34.69
2920	20.76	AV	V	26.99	6.65	27.54	26.86	54.00	27.14
1825	35.02	PK	V	24.25	3.63	27.52	35.38	74.00	38.62
1825	23.49	AV	V	24.25	3.63	27.52	23.85	54.00	30.15
163.7	35.73	QP	V	12.51	1.56	21.44	28.36	43.50	15.14
High Channel: 2480 MHz									
2480	67.97	PK	H	25.85	4.48	0.00	98.30	N/A	N/A
2480	55.26	AV	H	25.85	4.48	0.00	85.59	N/A	N/A
2480	68.53	PK	V	25.85	4.48	0.00	98.86	N/A	N/A
2480	56.72	AV	V	25.85	4.48	0.00	87.05	N/A	N/A
2483.5	35.71	PK	V	25.86	4.49	0.00	66.06	74.00	7.94
2483.5	18.16	AV	V	25.86	4.49	0.00	48.51	54.00	5.49
4960	32.68	PK	V	31.00	5.90	27.43	42.15	74.00	31.85
4960	19.90	AV	V	31.00	5.90	27.43	29.37	54.00	24.63
7440	30.21	PK	V	34.66	7.58	25.97	46.48	74.00	27.52
7440	18.77	AV	V	34.66	7.58	25.97	35.04	54.00	18.96
9920	28.41	PK	V	36.71	8.87	26.66	47.33	74.00	26.67
9920	18.20	AV	V	36.71	8.87	26.66	37.12	54.00	16.88
2920	34.17	PK	V	26.99	6.65	27.54	40.27	74.00	33.73
2920	21.56	AV	V	26.99	6.65	27.54	27.66	54.00	26.34
163.7	35.68	QP	V	12.51	1.56	21.44	28.31	43.50	15.19

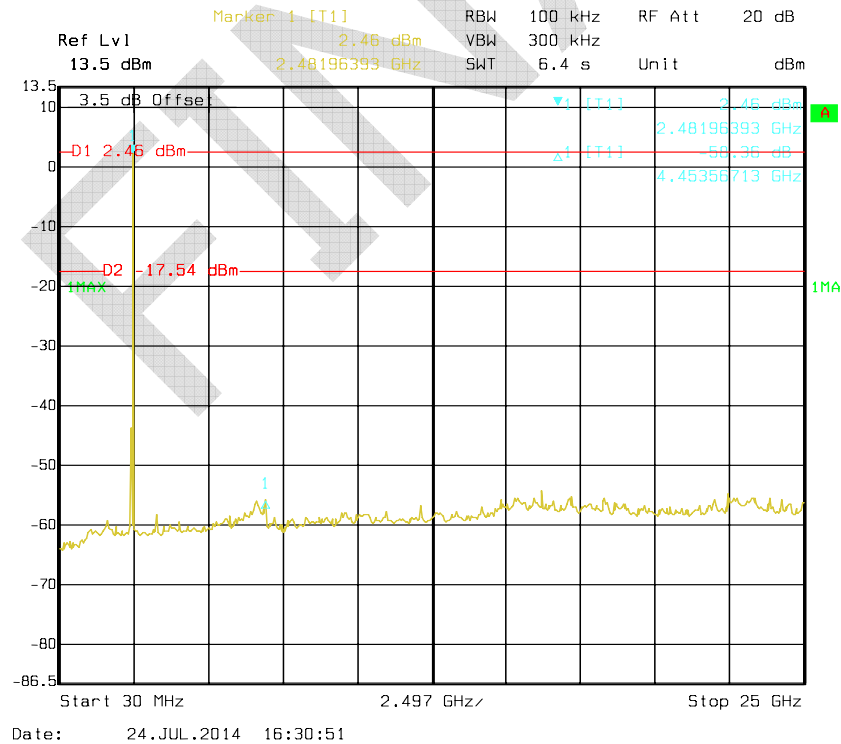
Conducted Spurious Emissions at Antenna Port*BDR Mode (GFSK):***Low Channel****Middle Channel**

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

Middle Channel

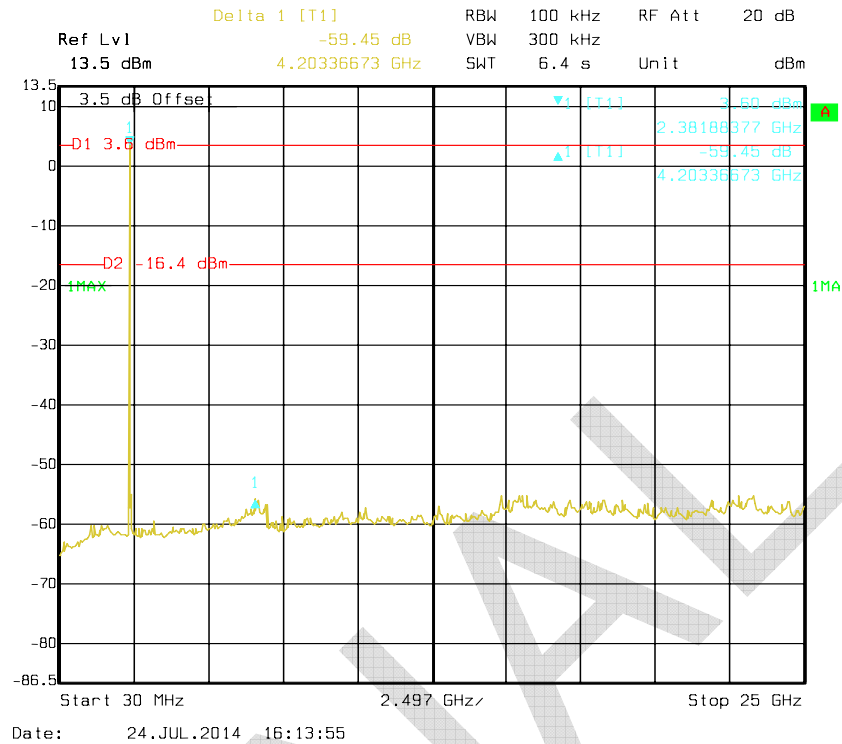


High Channel

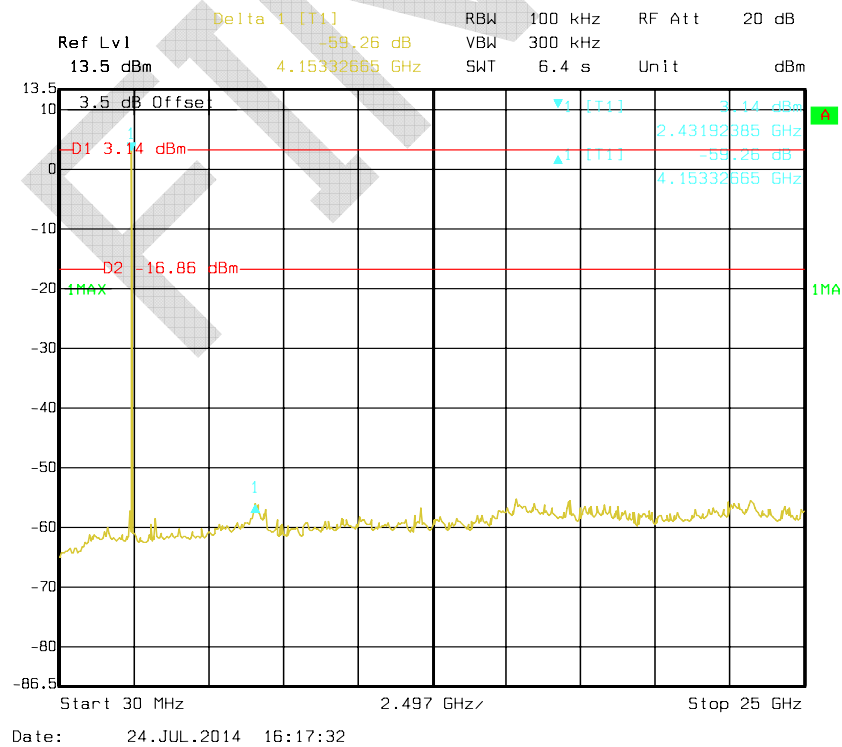


EDR Mode (8-DPSK):

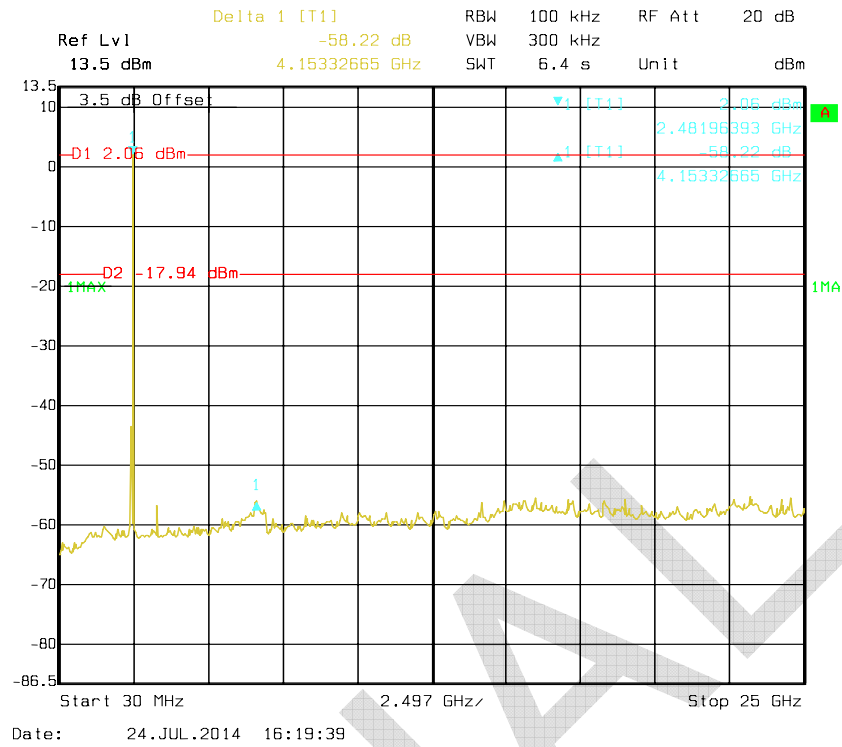
Low Channel



Middle Channel



High Channel



FCC §15.247(a) (1) - CHANNEL SEPARATION TEST**Applicable Standard**

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

Test Equipment List and Details

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

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

Test Procedure

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

Test Data**Environmental Conditions**

Temperature:	30.8 °C
Relative Humidity:	65 %
ATM Pressure:	99.4 kPa

* The testing was performed by Allen Qiao on 2014-07-24.

Test Result: Compliance.

Please refer to following tables and plots

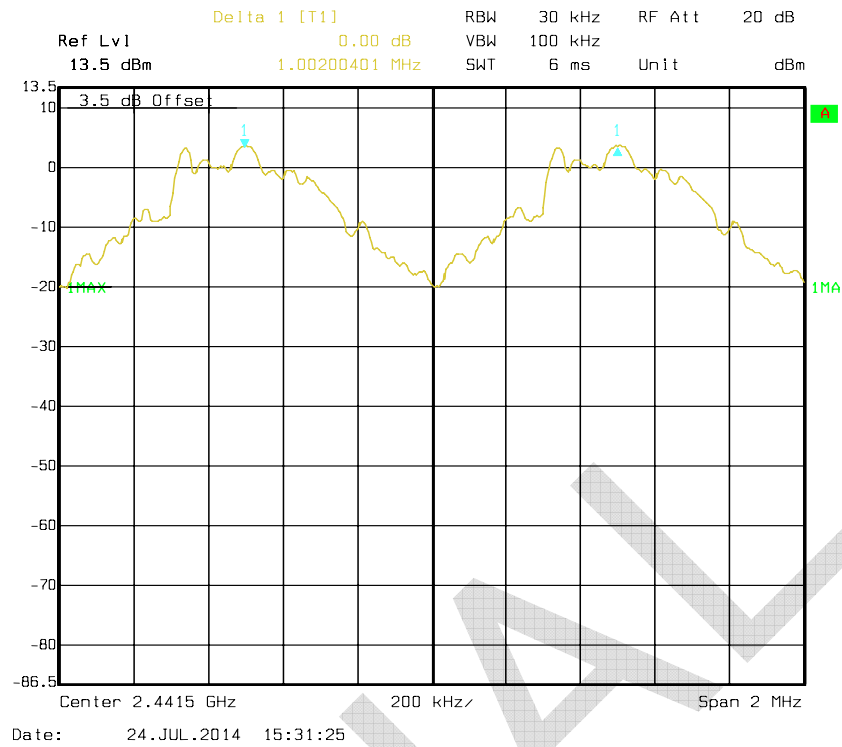
Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
BDR Mode (GFSK)	Low	2402	1.002	0.59	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.59	Pass
	Adjacent	2442			
	High	2480	1.006	0.60	Pass
	Adjacent	2479			
EDR Mode ($\pi/4$ -DQPSK):	Low	2402	1.002	0.81	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.81	Pass
	Adjacent	2442			
	High	2480	1.002	0.82	Pass
	Adjacent	2479			
EDR Mode (8-DPSK):	Low	2402	1.002	0.81	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.82	Pass
	Adjacent	2442			
	High	2480	1.002	0.82	Pass
	Adjacent	2479			

Low Channel

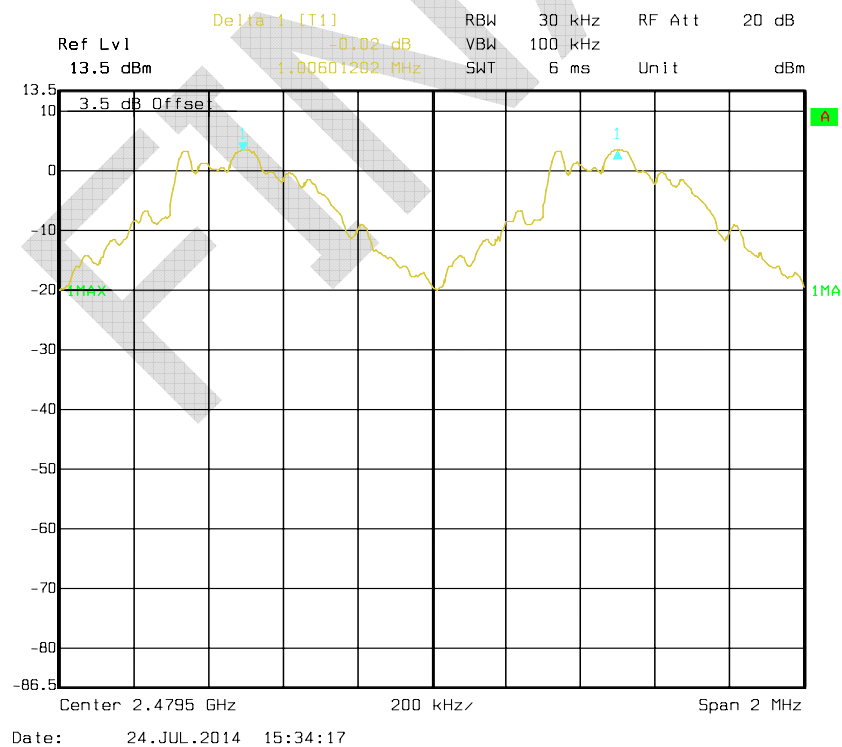
Ref Lvl 13.5 dBm	Delta 1 [T1] -0.09 dB	RBW 30 kHz
	1.00200401 MHz	VBW 100 kHz
		SWT 6 ms
		Unit dBm

Center 2.4025 GHz 200 kHz Span 2 MHz

Middle Channel

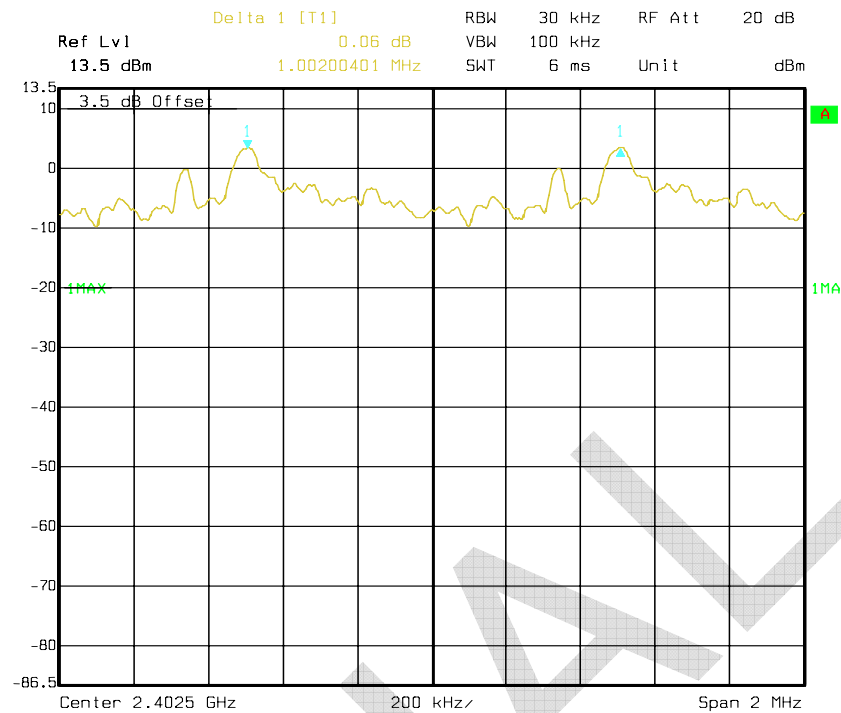


High Channel



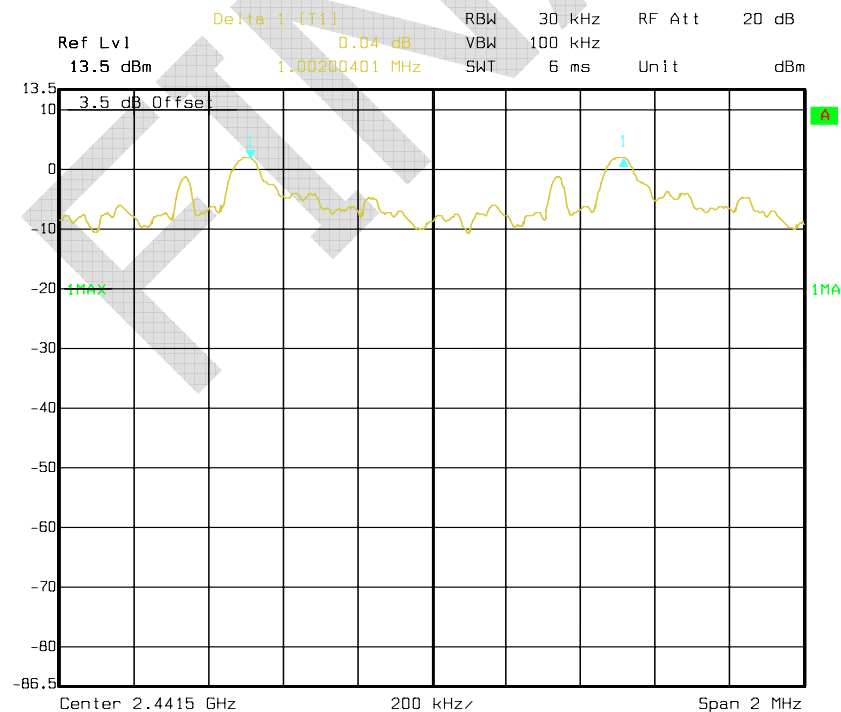
EDR Mode ($\pi/4$ -DQPSK):

Low Channel



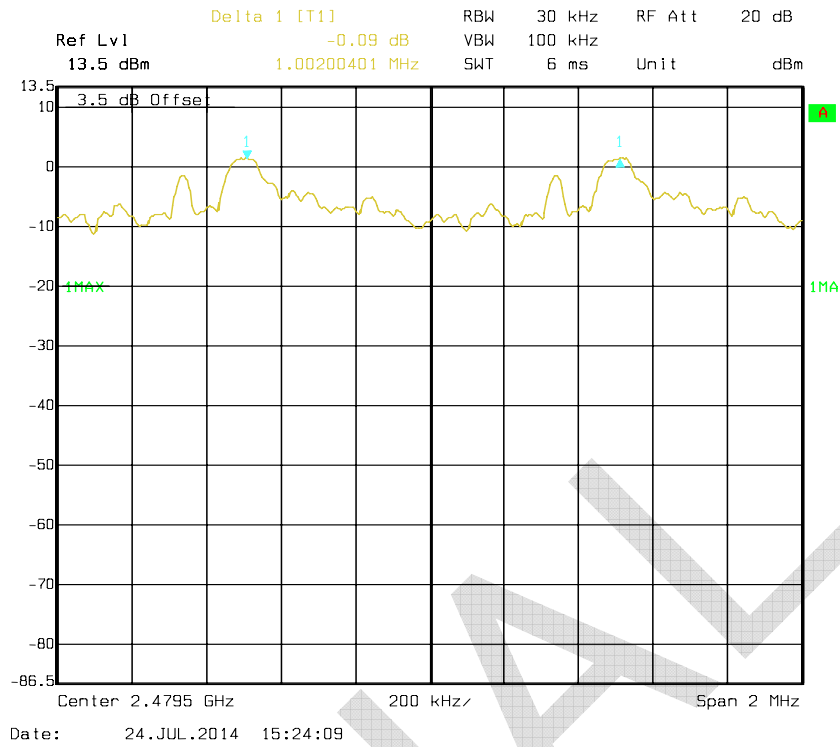
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Middle Channel



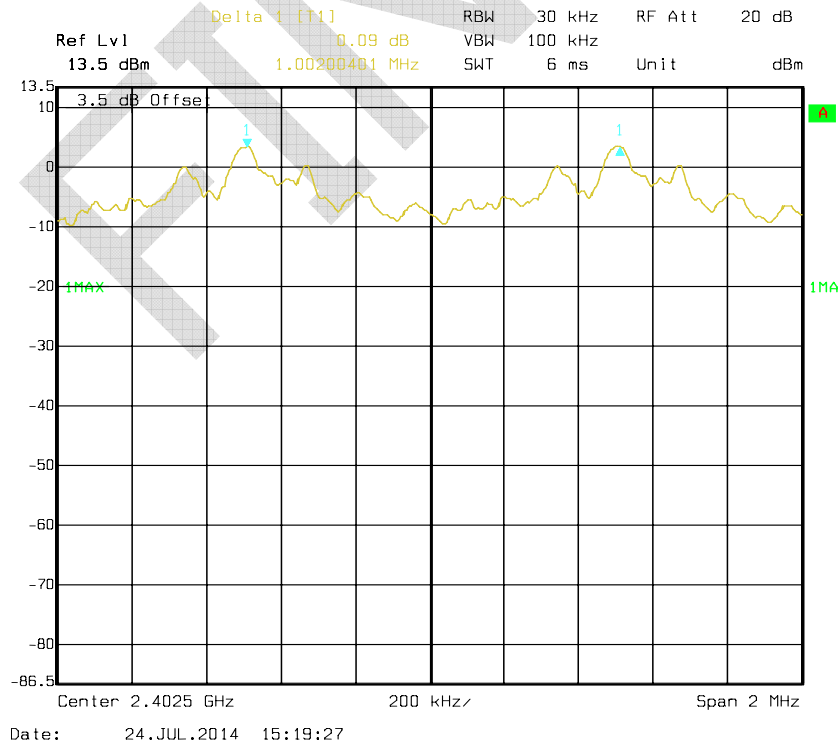
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High Channel

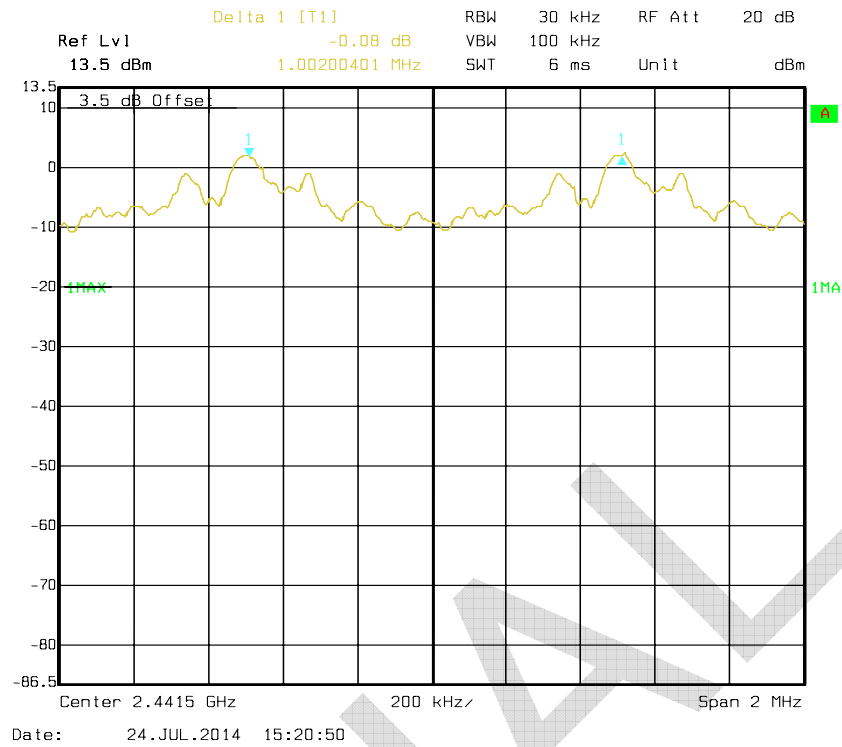


EDR Mode (8-DPSK):

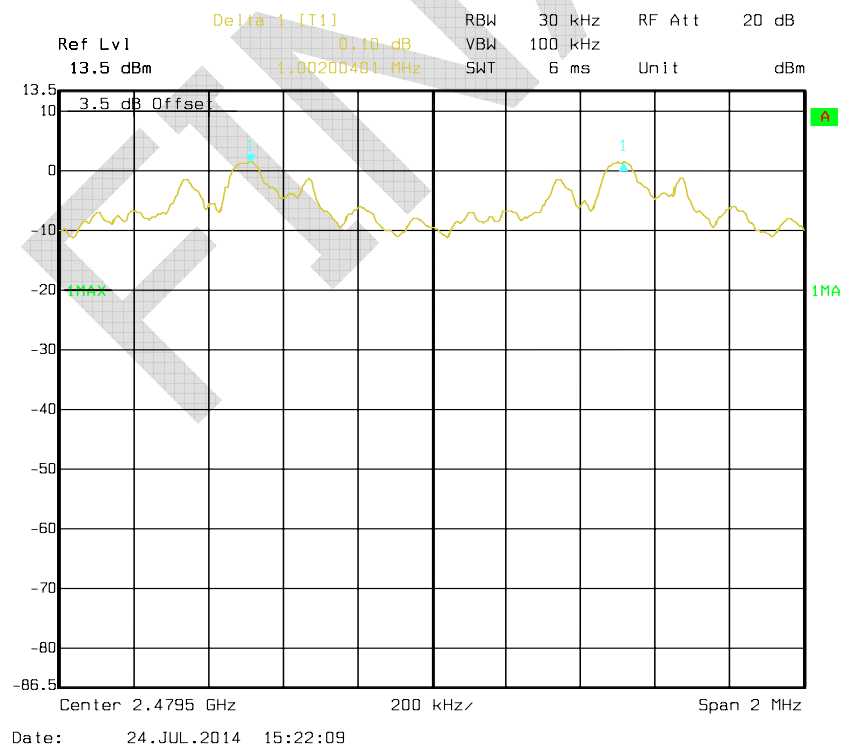
Low Channel



Middle Channel



High Channel



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

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

Test Procedure

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

Test Equipment List and Details

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

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

Test Data**Environmental Conditions**

Temperature:	30.8 °C
Relative Humidity:	65 %
ATM Pressure:	99.4 kPa

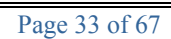
* The testing was performed by Allen Qiao on 2014-07-24.

Test Result: Compliance.

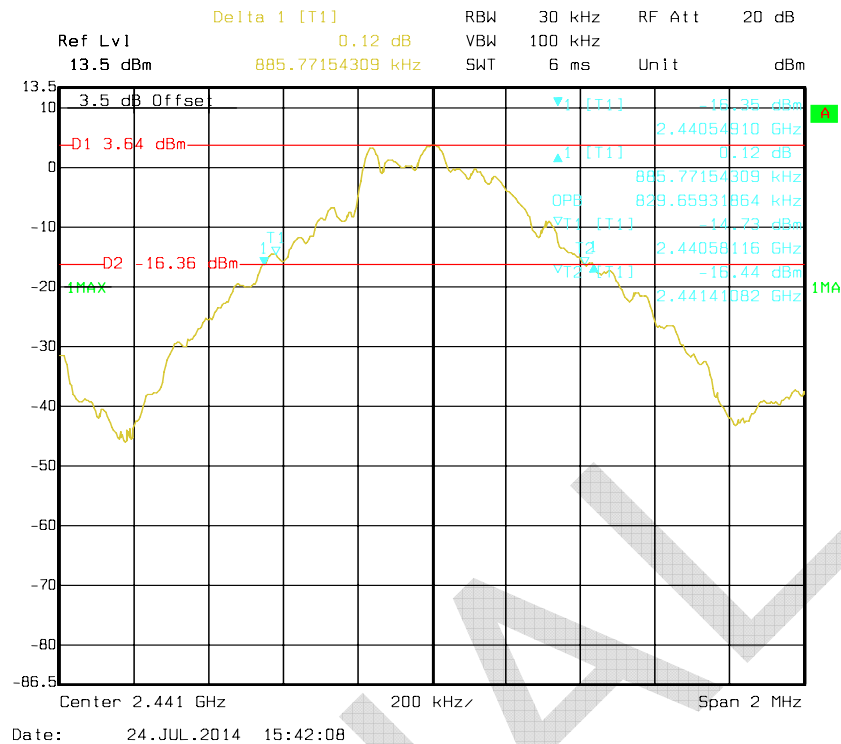
Please refer to following tables and plots

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.886
	Middle	2441	0.886
	High	2480	0.898
EDR Mode ($\pi/4$ -DQPSK):	Low	2402	1.218
	Middle	2441	1.222
	High	2480	1.230
EDR Mode (8-DPSK):	Low	2402	1.218
	Middle	2441	1.226
	High	2480	1.230

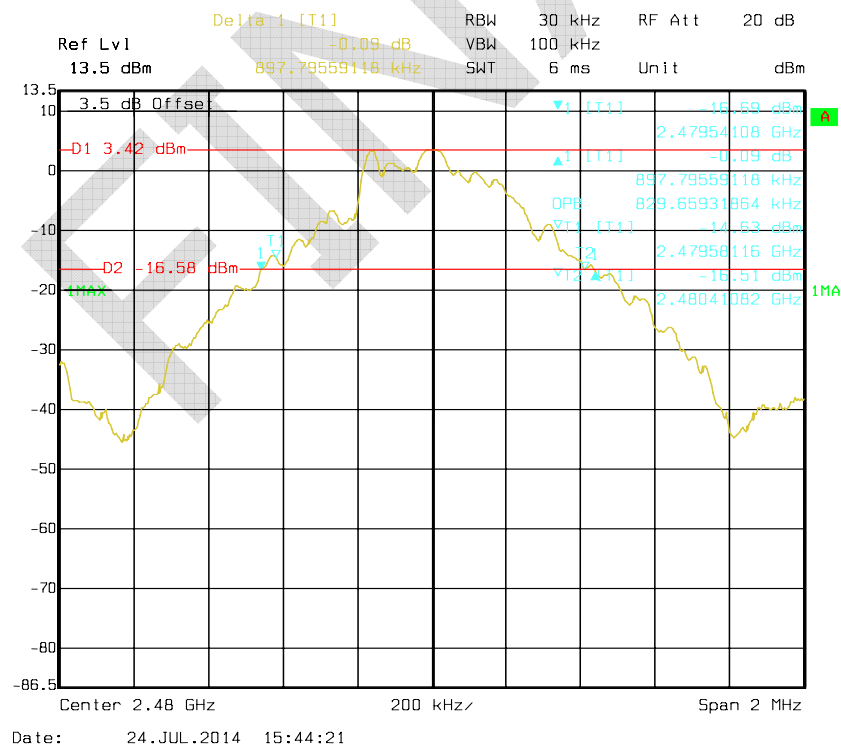
BDR Mode (GFSK):

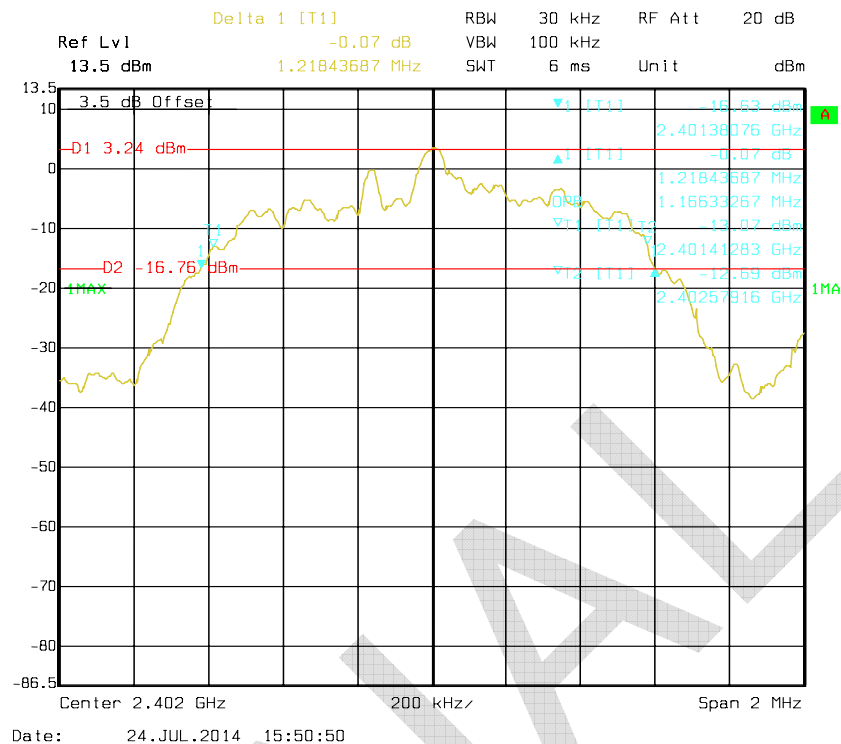
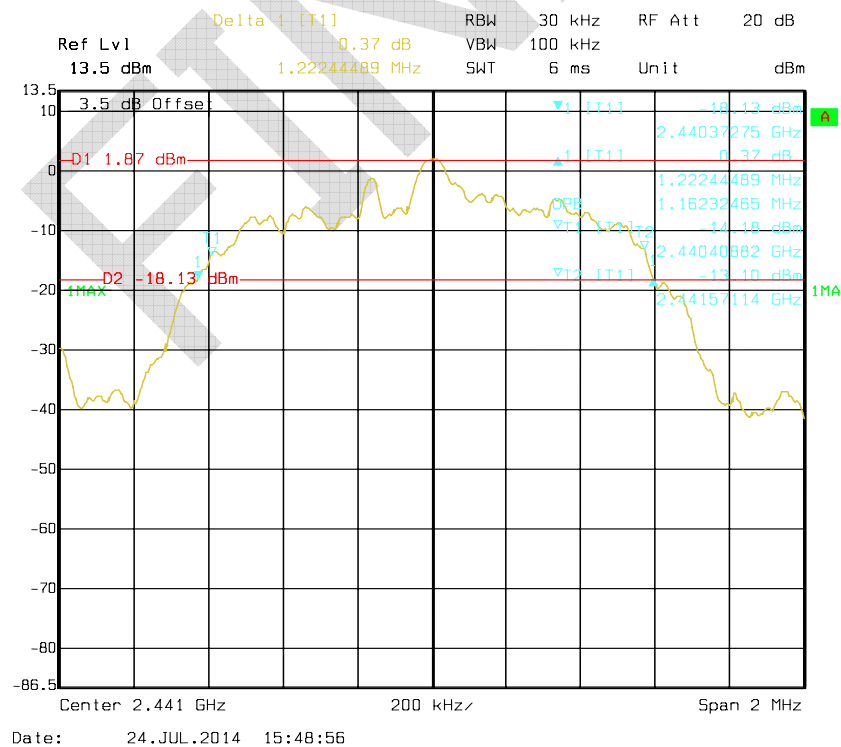


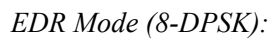
Middle Channel



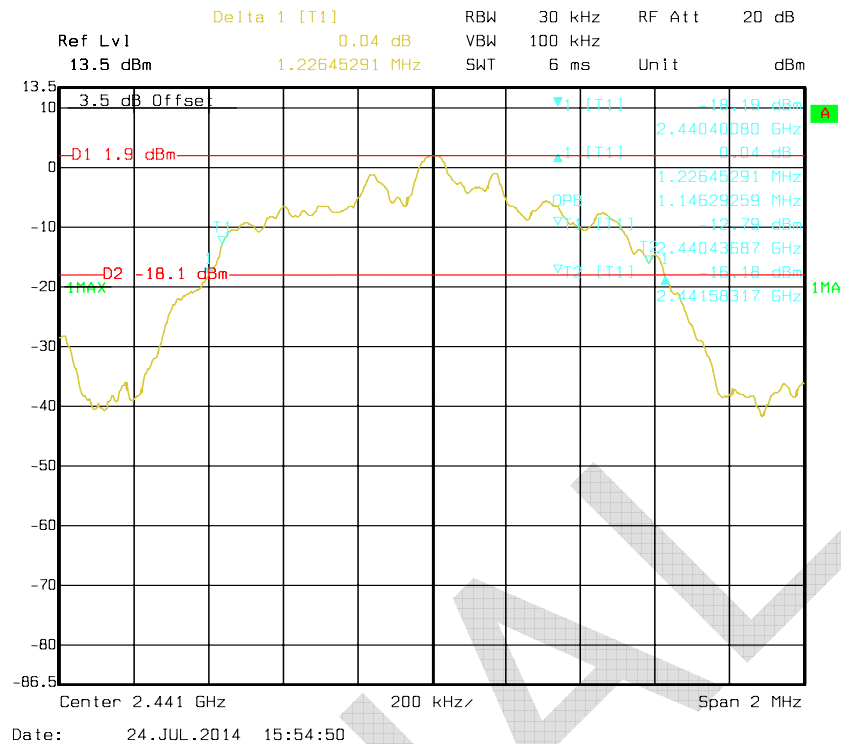
High Channel



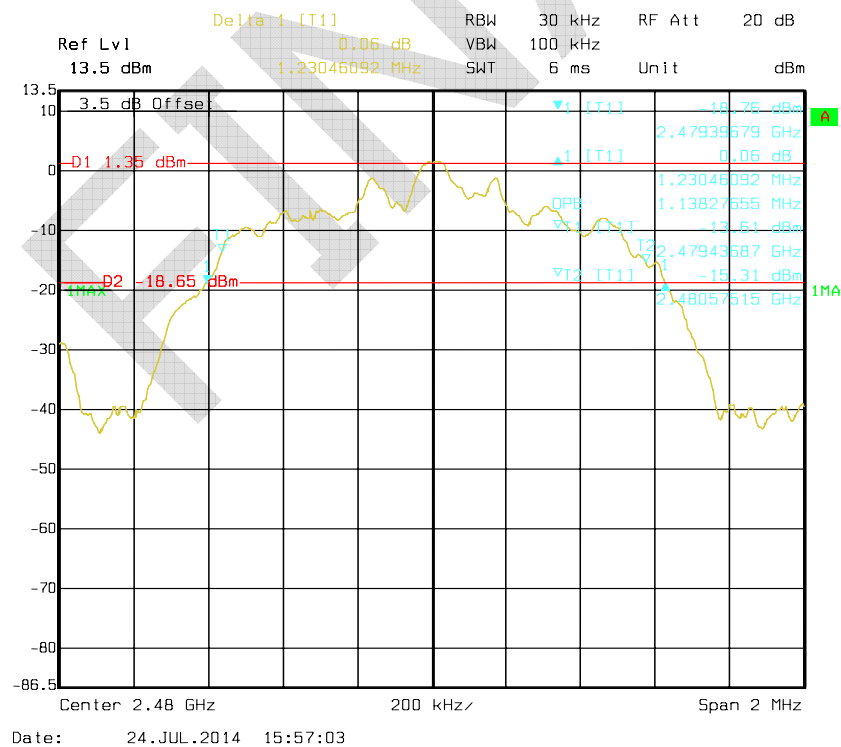
*EDR Mode ($\pi/4$ -DQPSK):***Low Channel****Middle Channel**



Middle Channel



High Channel



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

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

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

Test Equipment List and Details

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

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

Test Data

Environmental Conditions

Temperature:	30.8 °C
Relative Humidity:	65 %
ATM Pressure:	99.4 kPa

* The testing was performed by Allen Qiao on 2014-07-24.

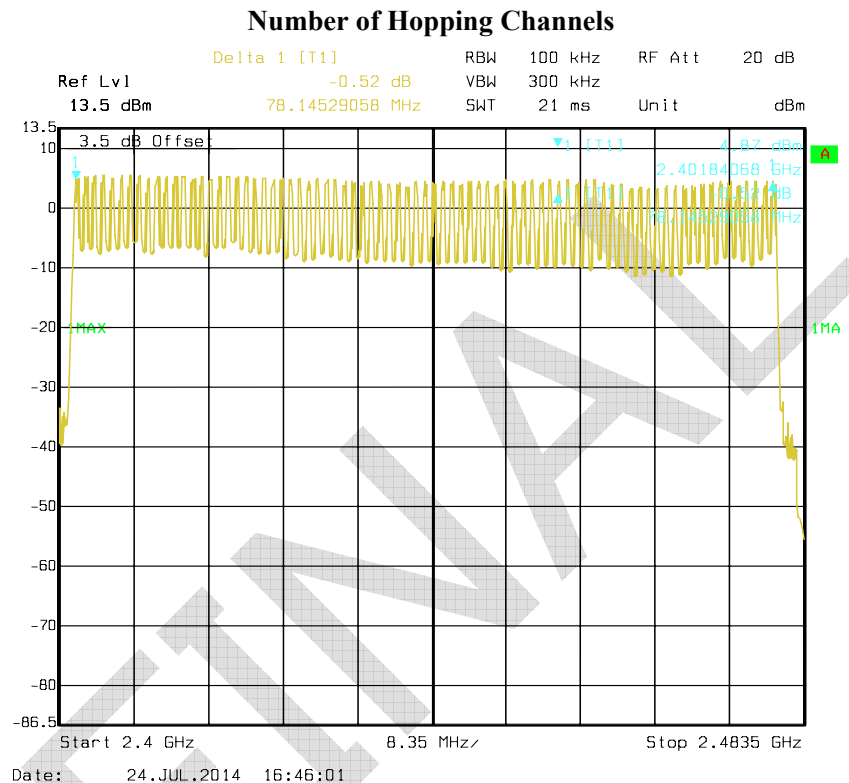
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

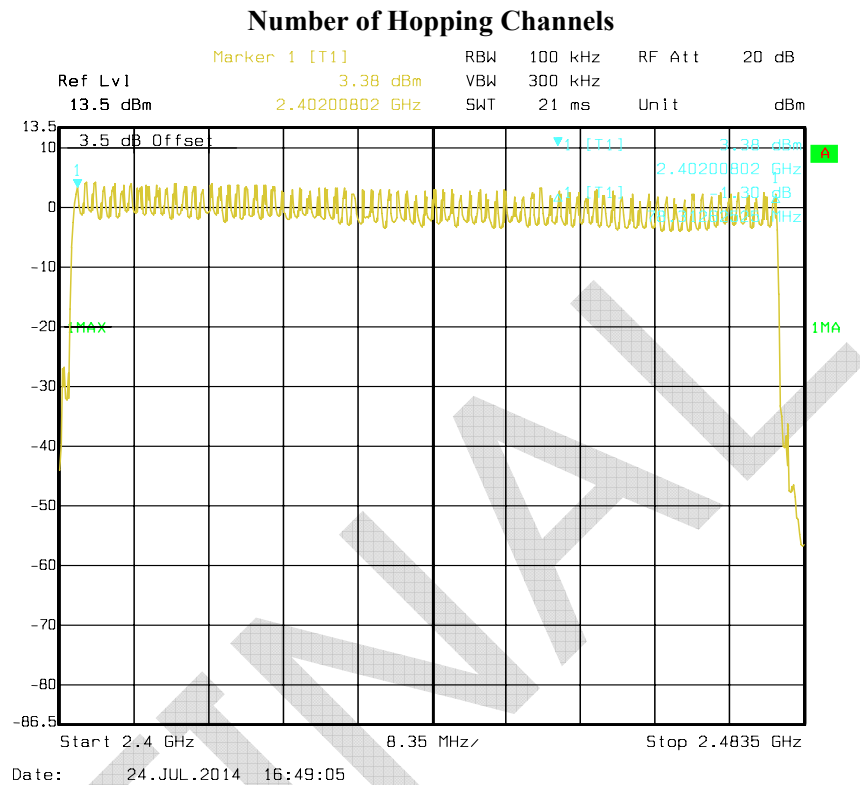
BDR Mode (GFSK):

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



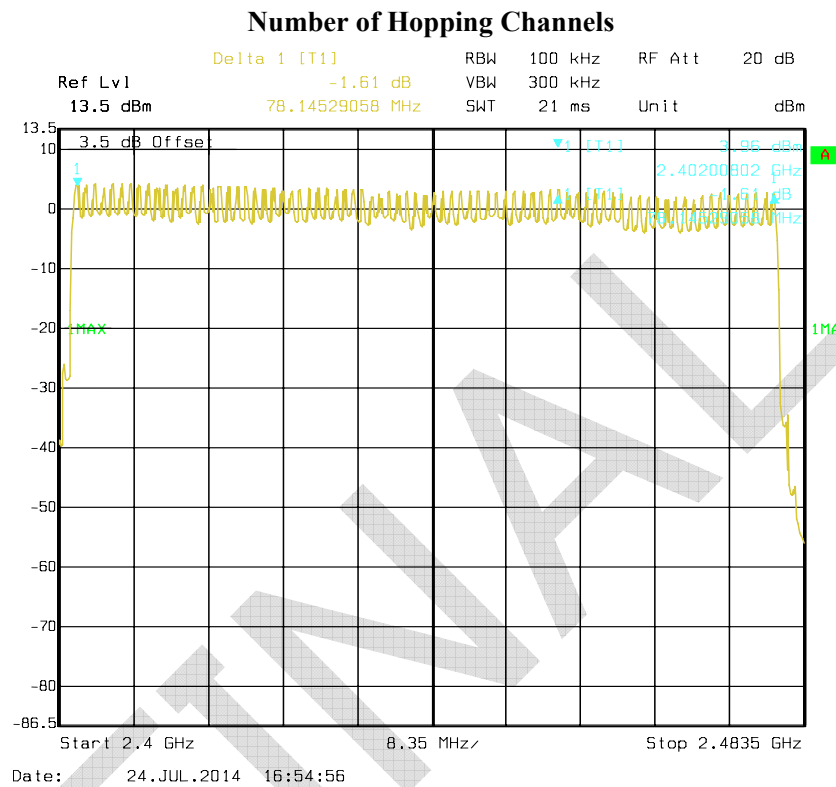
EDR Mode ($\pi/4$ -DQPSK):

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



EDR Mode (8-DPSK):

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



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

Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

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

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

Test Equipment List and Details

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

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

Test Data

Environmental Conditions

Temperature:	30.8 °C
Relative Humidity:	65 %
ATM Pressure:	99.4 kPa

* The testing was performed by Allen Qiao on 2014-07-24.

Test Result: Compliance.

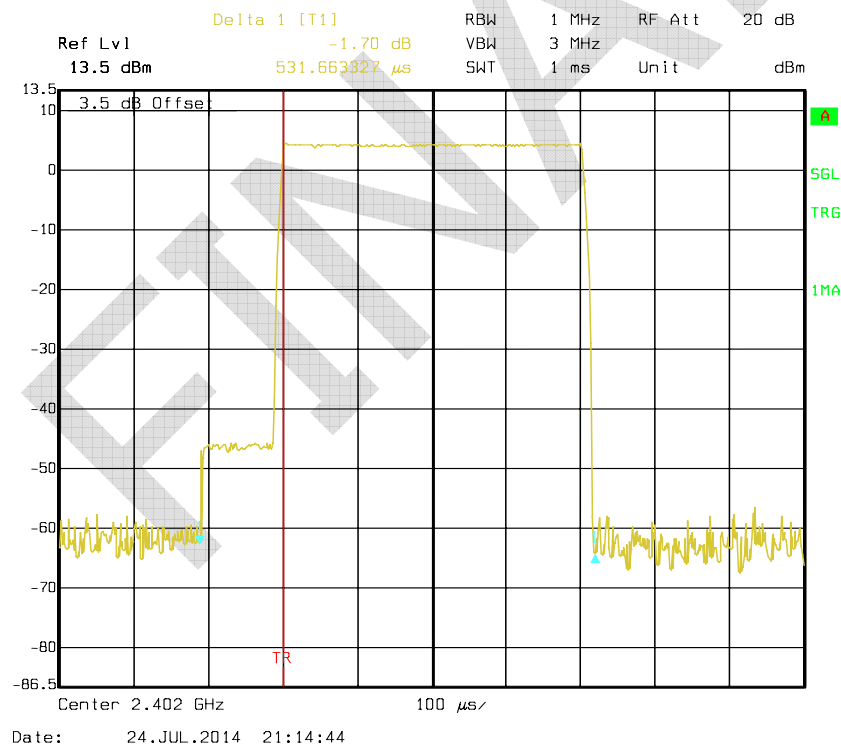
Please refer to following tables and plots

Test Mode: Transmitting

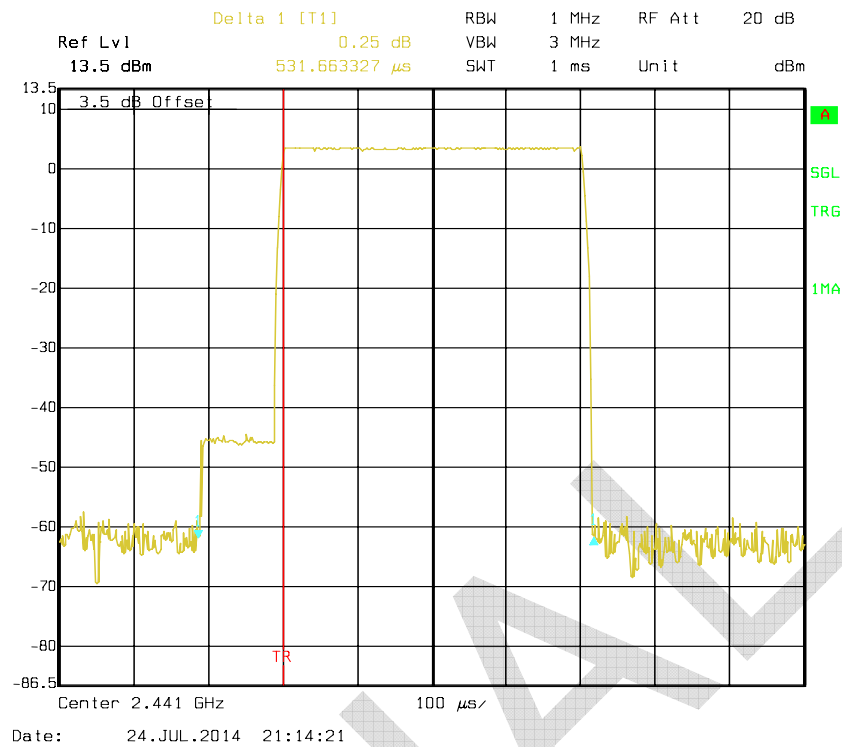
BDR Mode (GFSK):

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.532	0.170	0.4	Pass
	Middle	0.532	0.170	0.4	Pass
	High	0.534	0.171	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.796	0.287	0.4	Pass
	Middle	1.802	0.288	0.4	Pass
	High	1.796	0.287	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	3.058	0.326	0.4	Pass
	Middle	3.049	0.325	0.4	Pass
	High	3.059	0.326	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

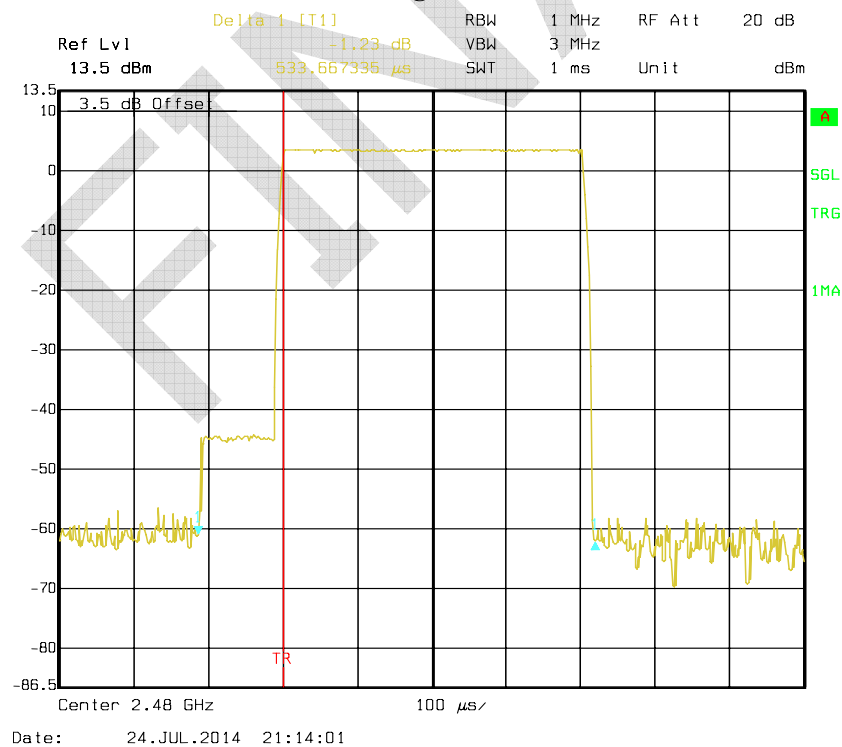
DH1: Low Channel



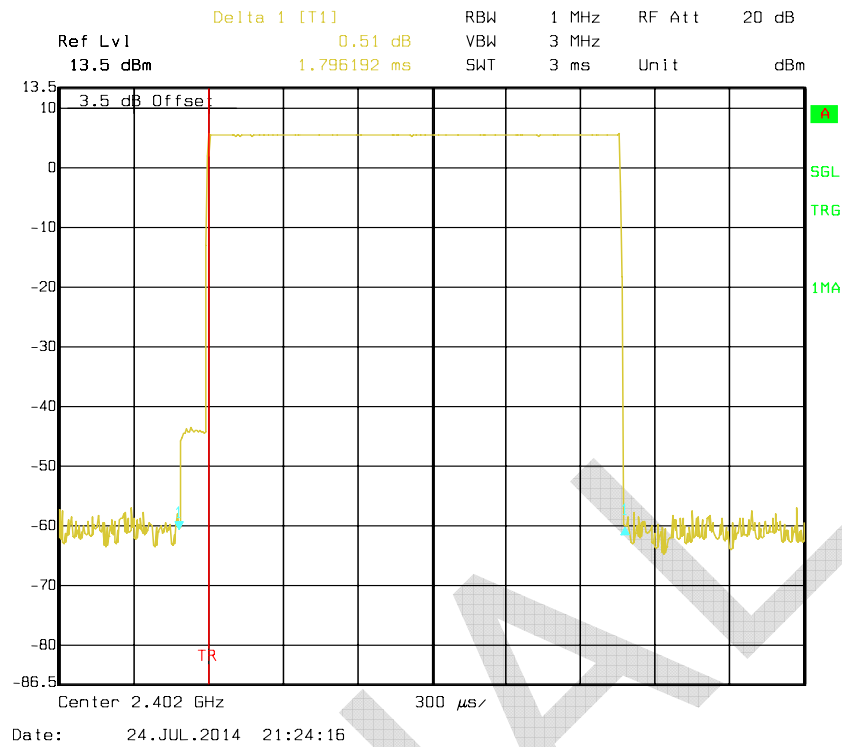
DH1: Middle Channel



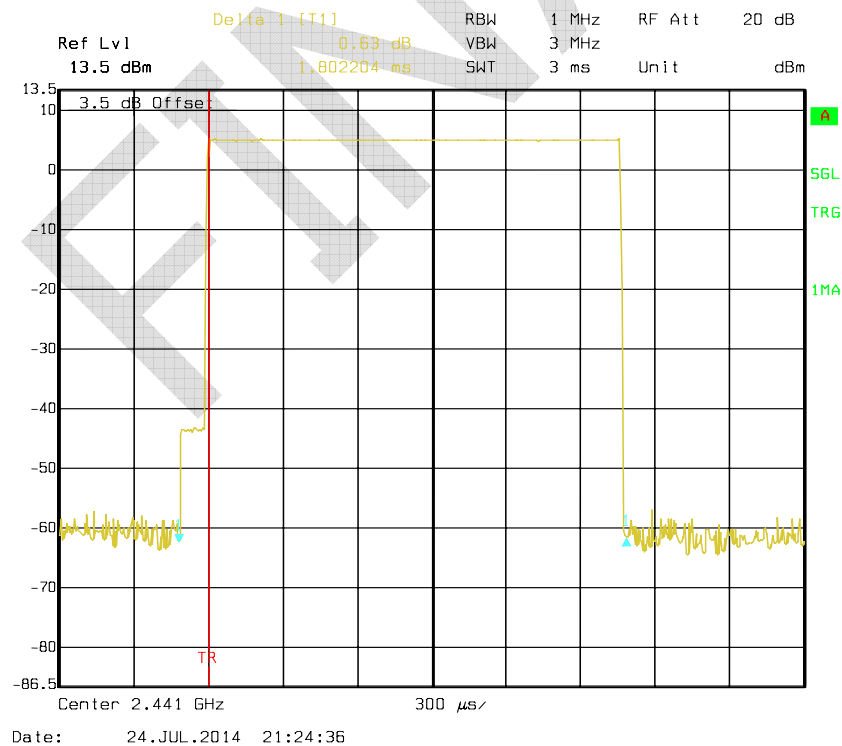
DH1: High Channel



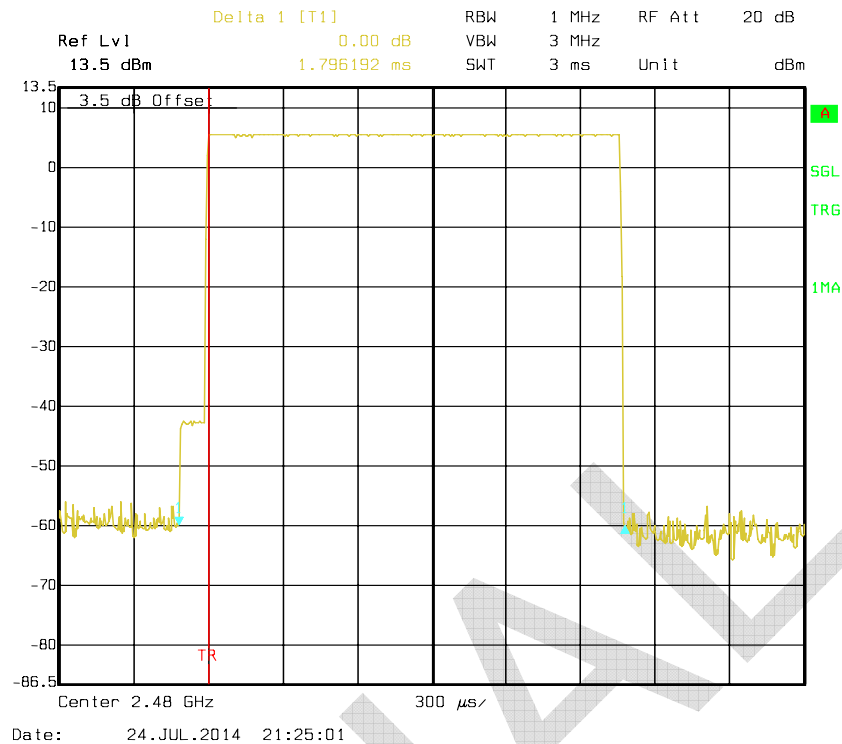
DH3: Low Channel



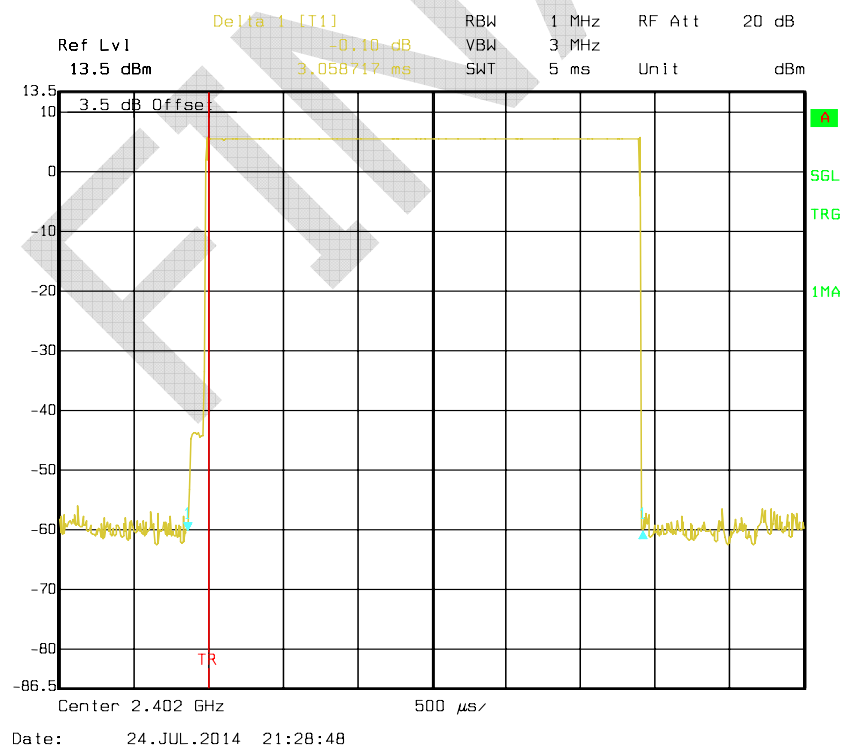
DH3: Middle Channel



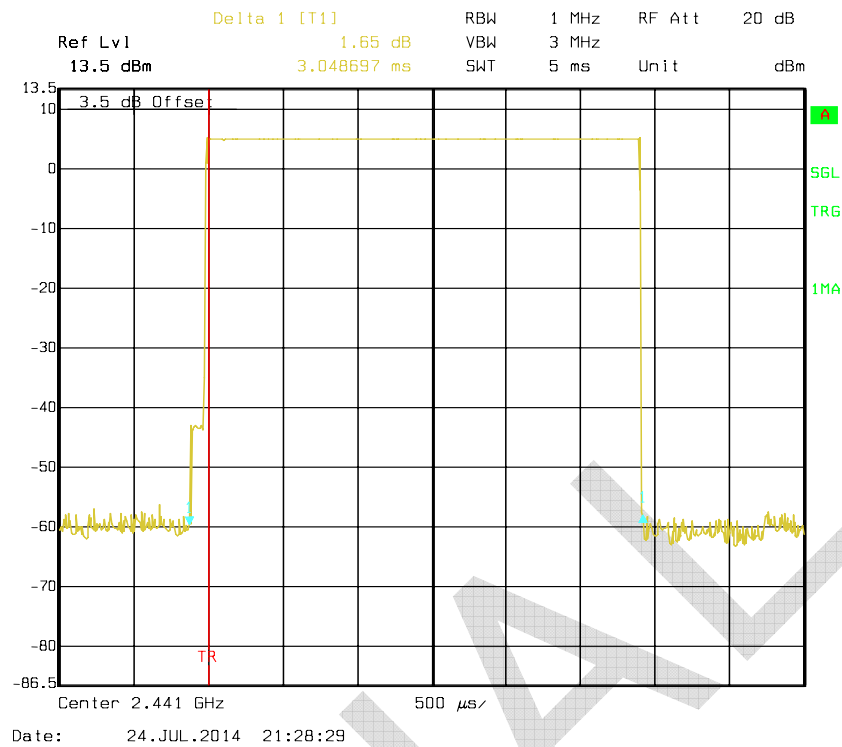
DH3: High Channel



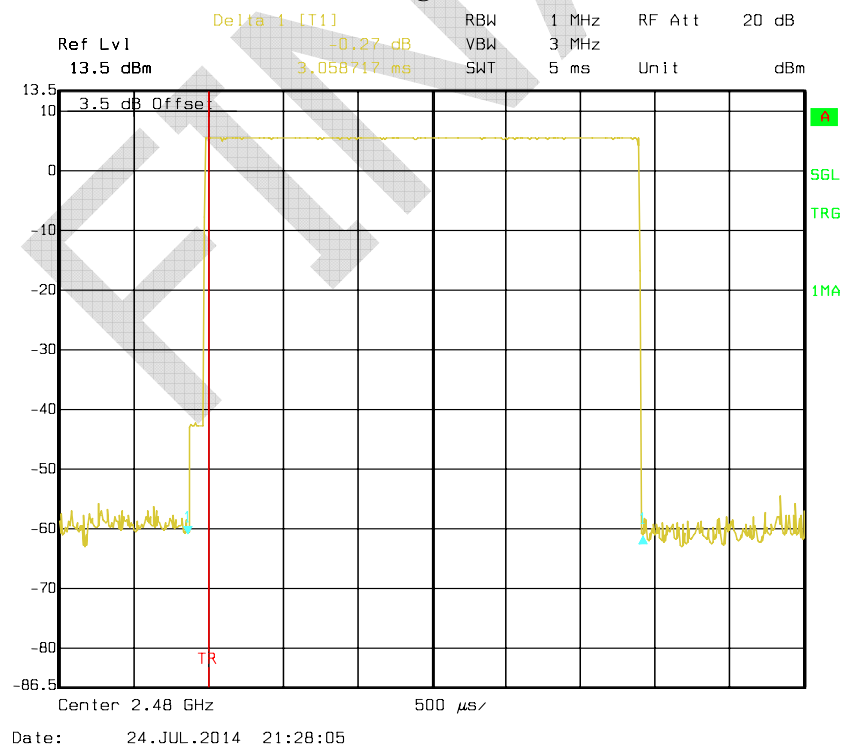
DH5: Low Channel



DH5: Middle Channel



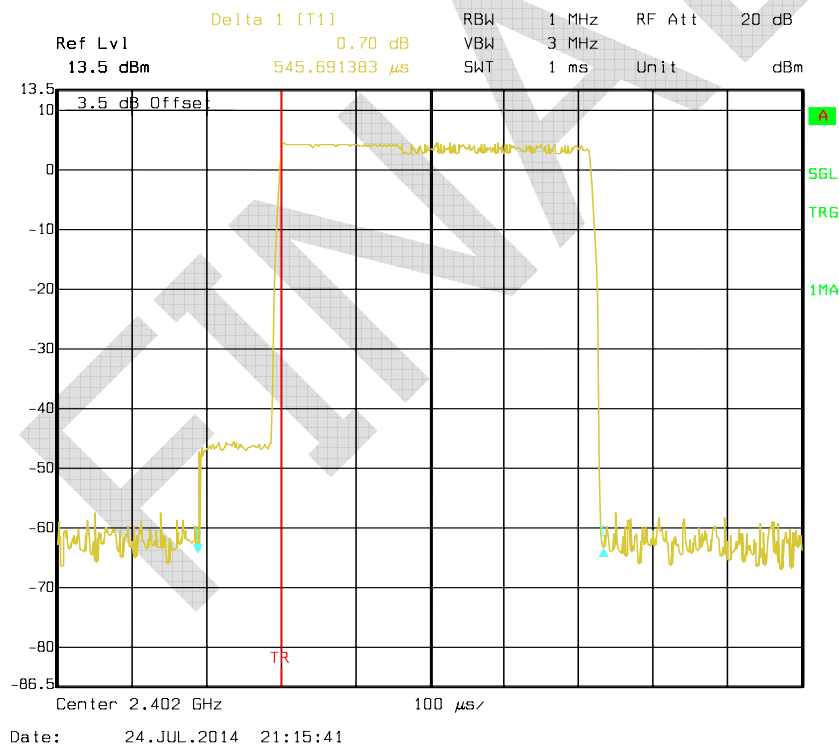
DH5: High Channel



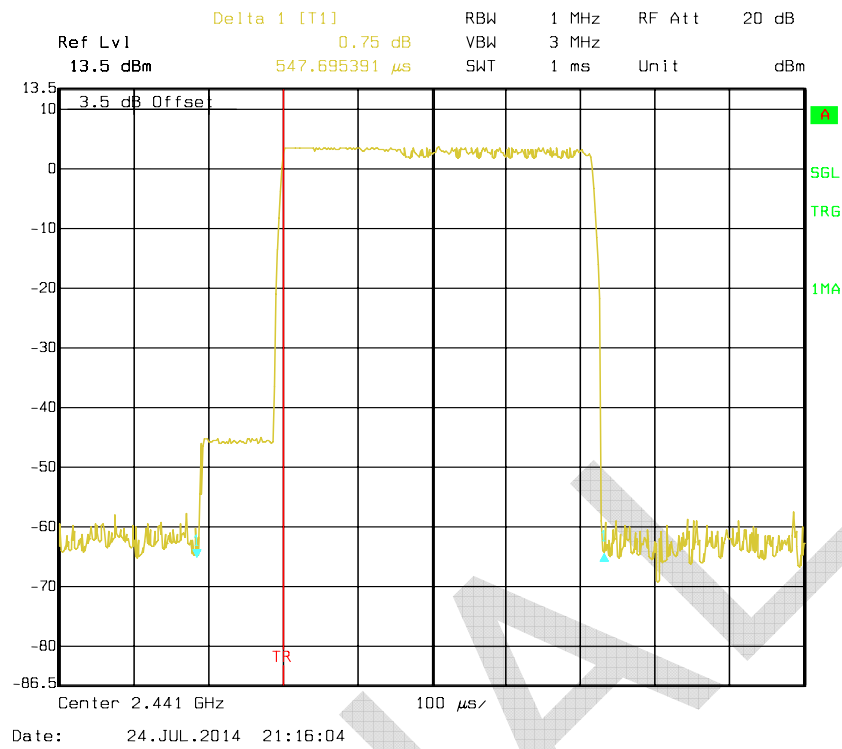
EDR Mode ($\pi/4$ -DQPSK):

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.546	0.175	0.4	Pass
	Middle	0.548	0.175	0.4	Pass
	High	0.546	0.175	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.802	0.288	0.4	Pass
	Middle	1.802	0.288	0.4	Pass
	High	1.814	0.290	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	3.079	0.328	0.4	Pass
	Middle	3.059	0.326	0.4	Pass
	High	3.079	0.328	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

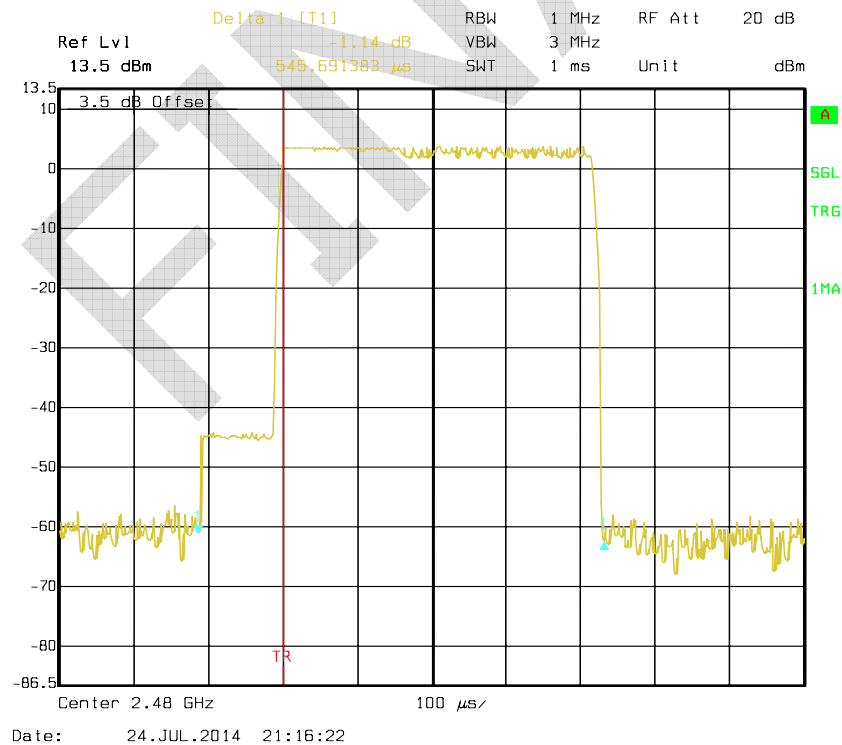
DH1: Low Channel



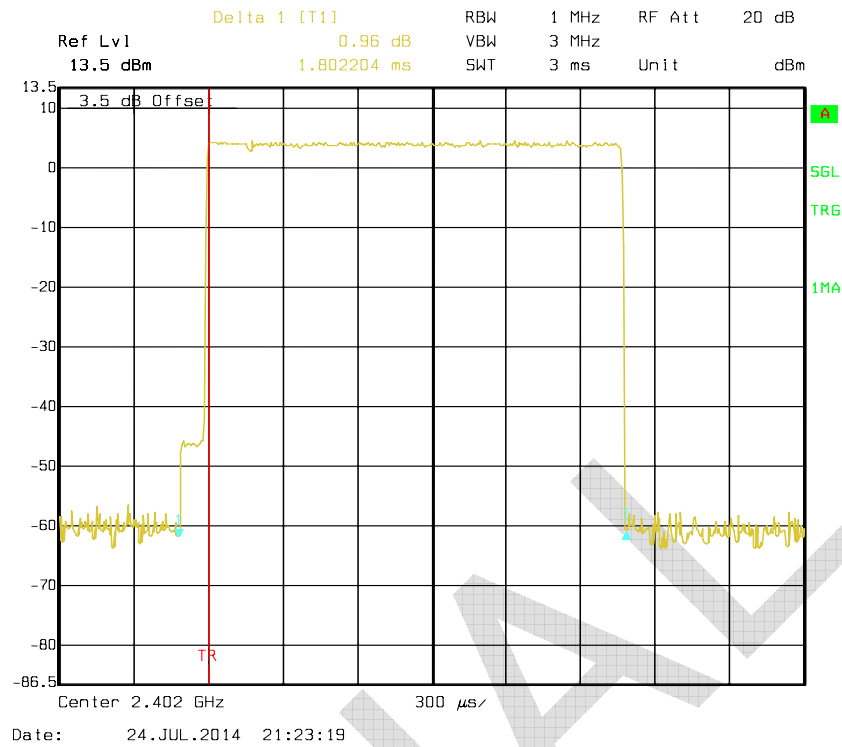
DH1: Middle Channel



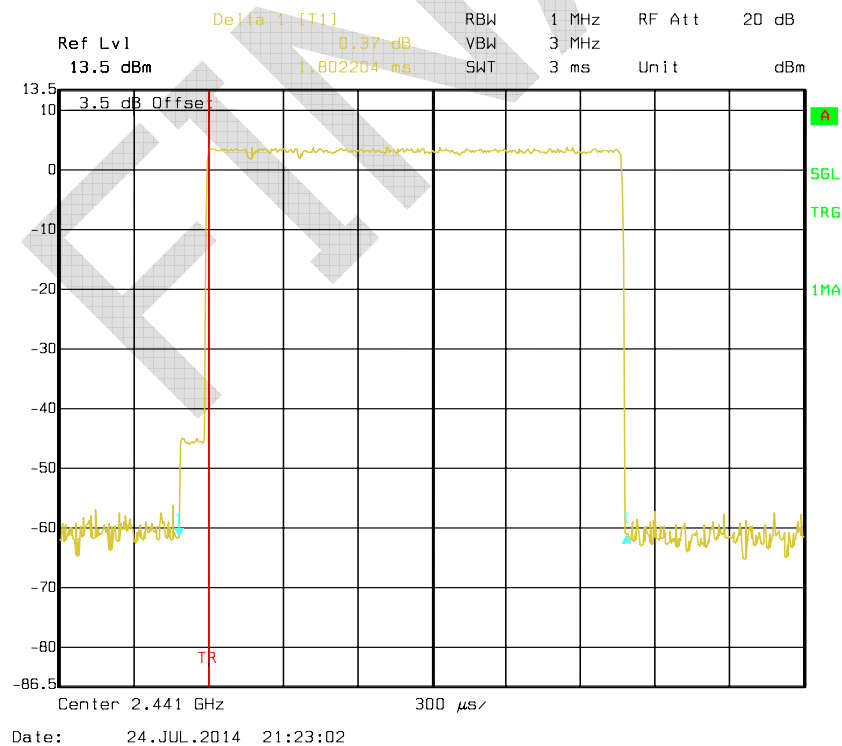
DH1: High Channel

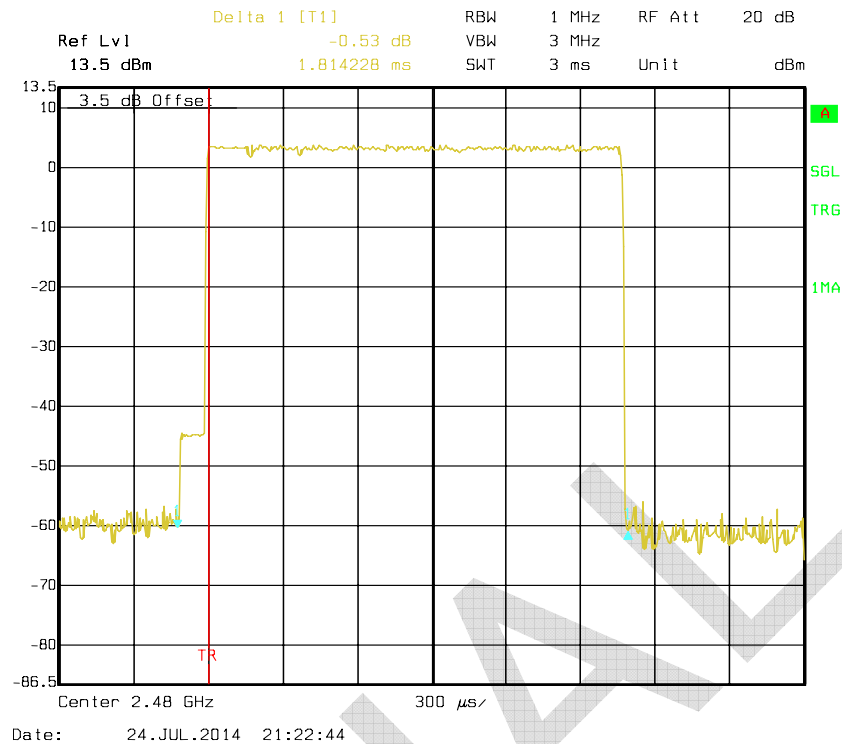
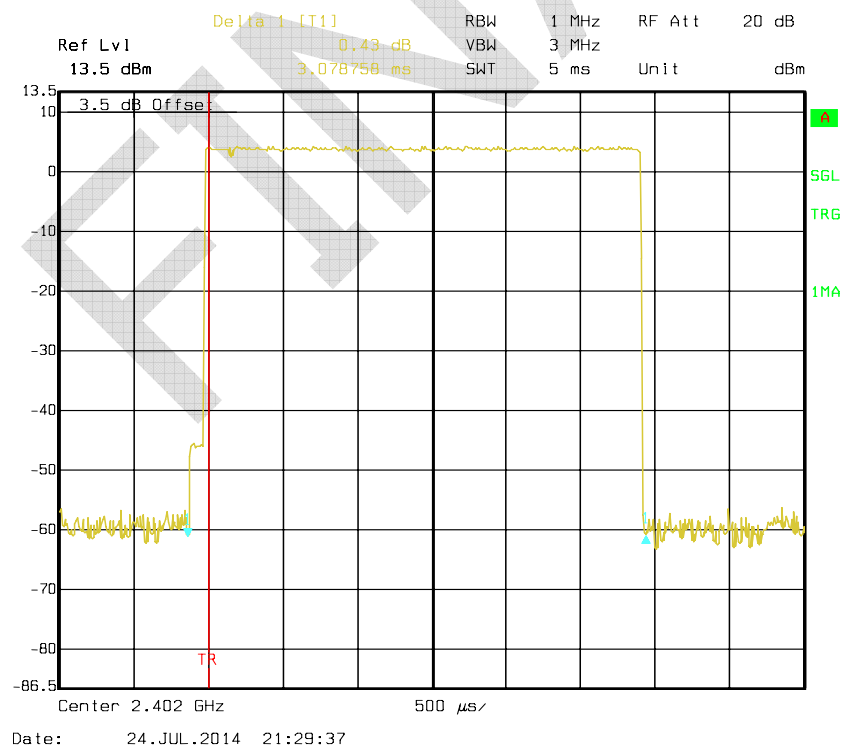


DH3: Low Channel

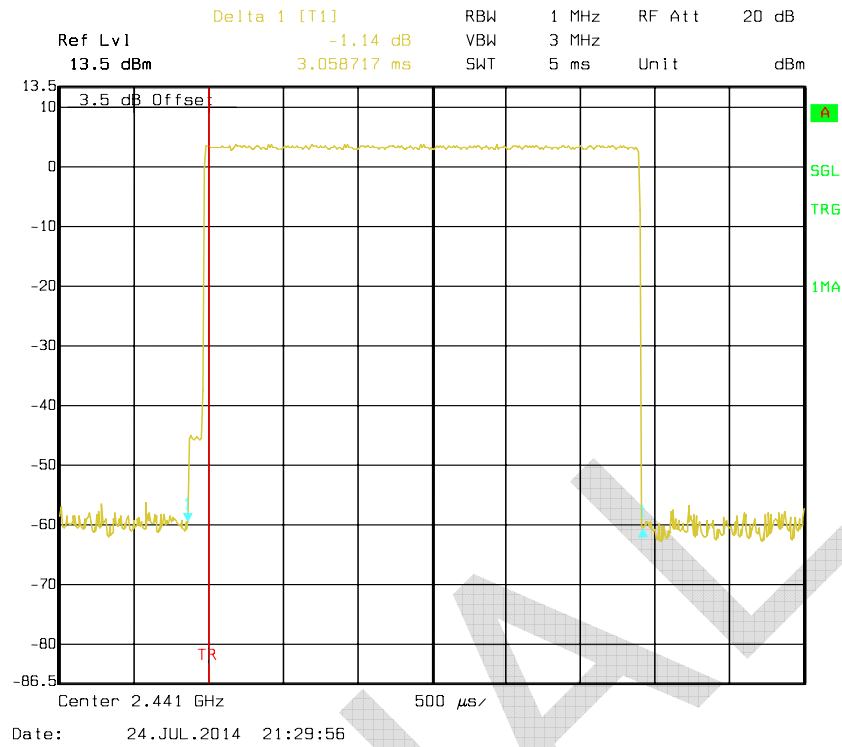


DH3: Middle Channel

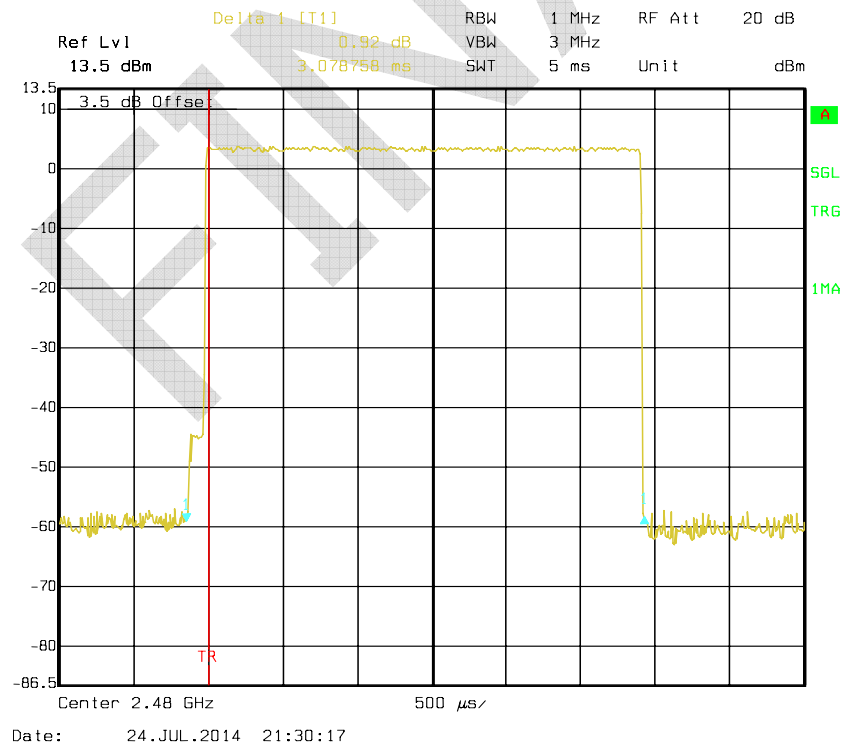


DH3: High Channel**DH5: Low Channel**

DH5: Middle Channel

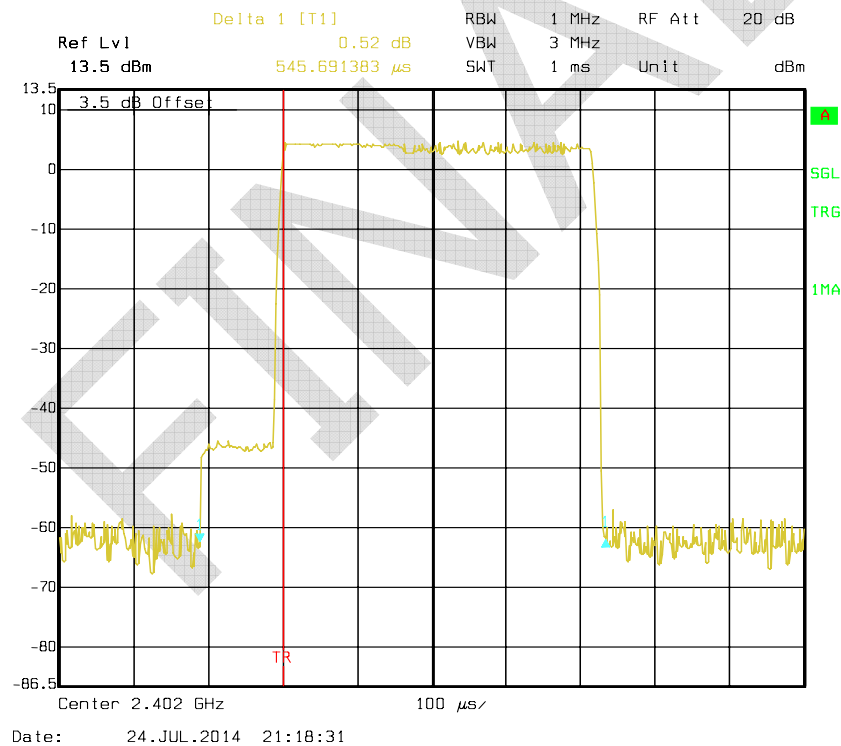


DH5: High Channel

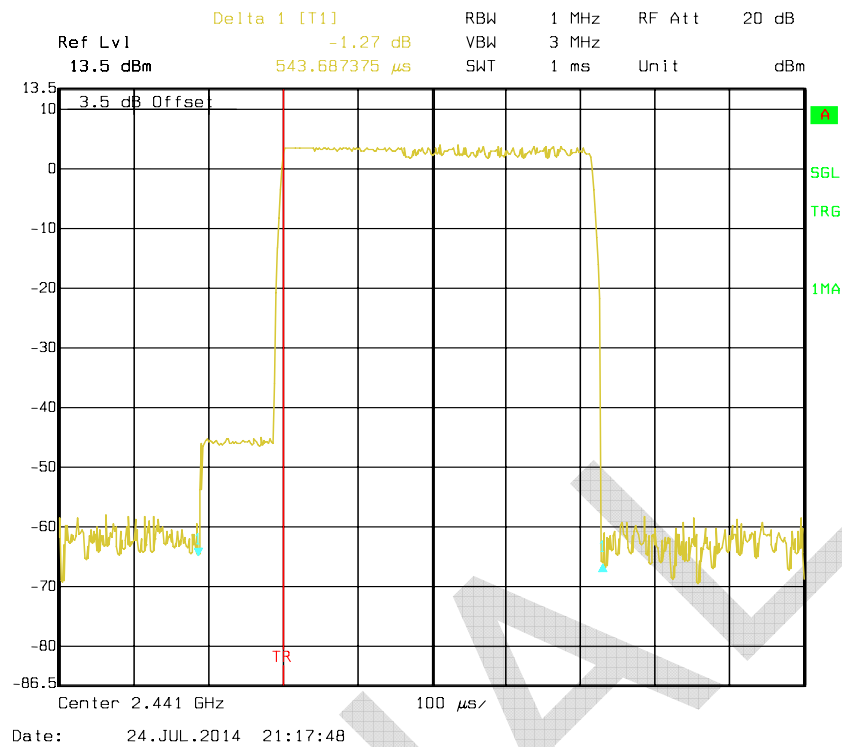


EDR Mode (8-DPSK):

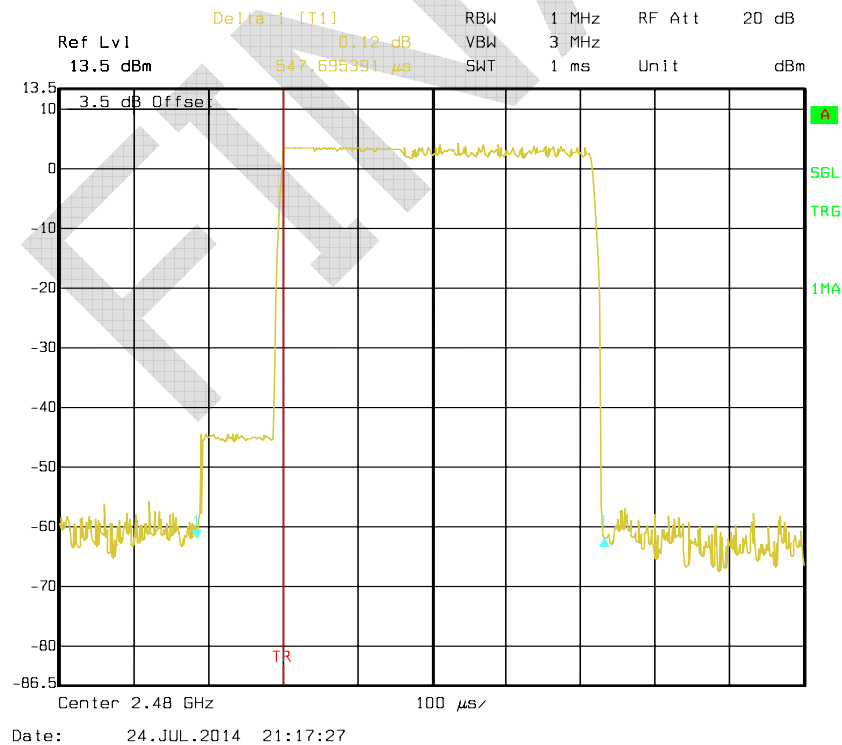
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.546	0.175	0.4	Pass
	Middle	0.544	0.174	0.4	Pass
	High	0.548	0.175	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.802	0.288	0.4	Pass
	Middle	1.802	0.288	0.4	Pass
	High	1.808	0.289	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	3.079	0.328	0.4	Pass
	Middle	3.069	0.327	0.4	Pass
	High	3.069	0.327	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

DH1: Low Channel

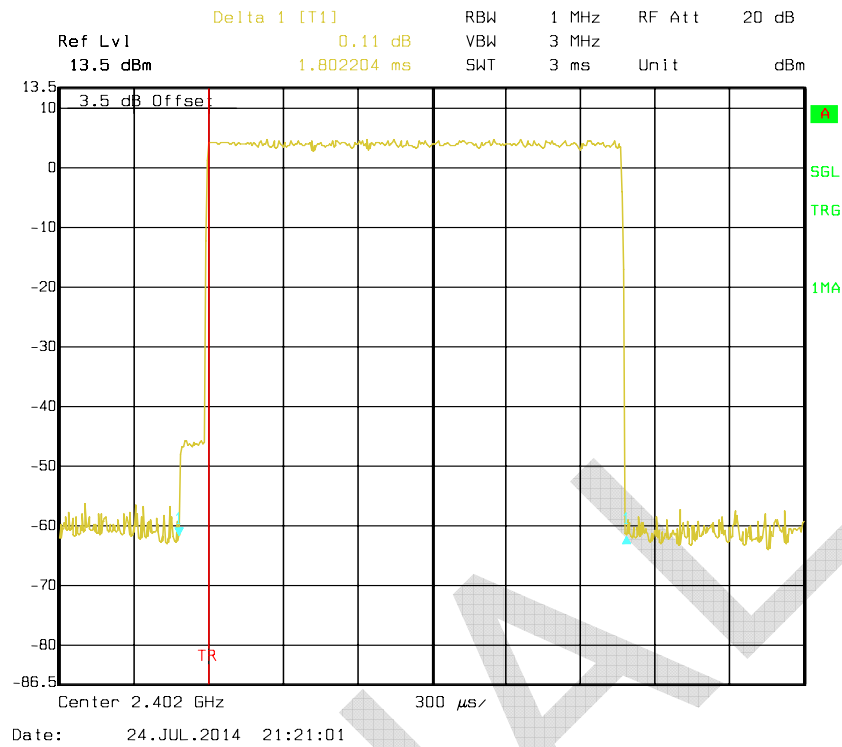
DH1: Middle Channel



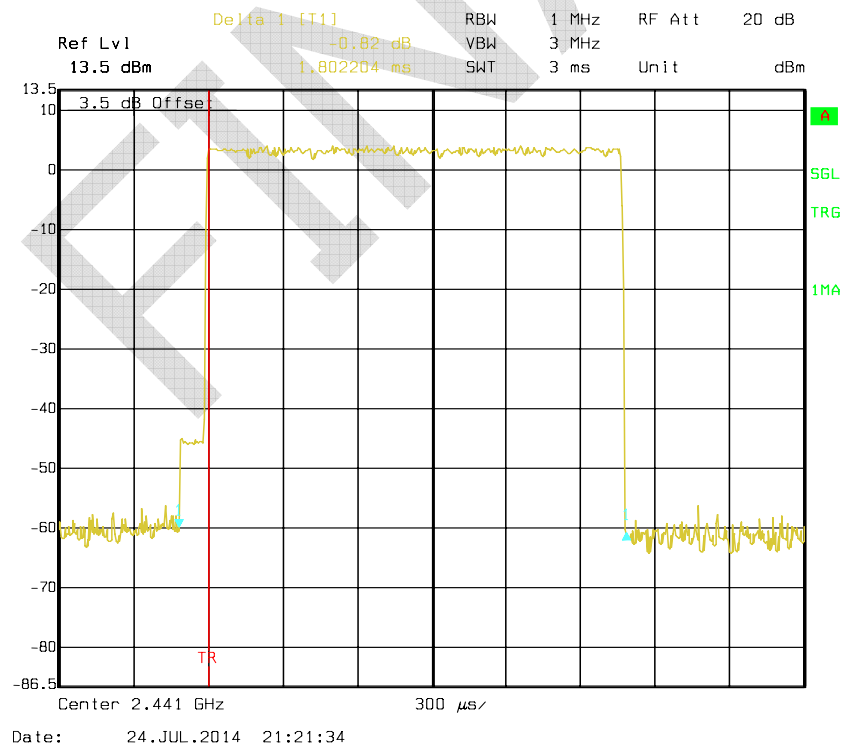
DH1: High Channel



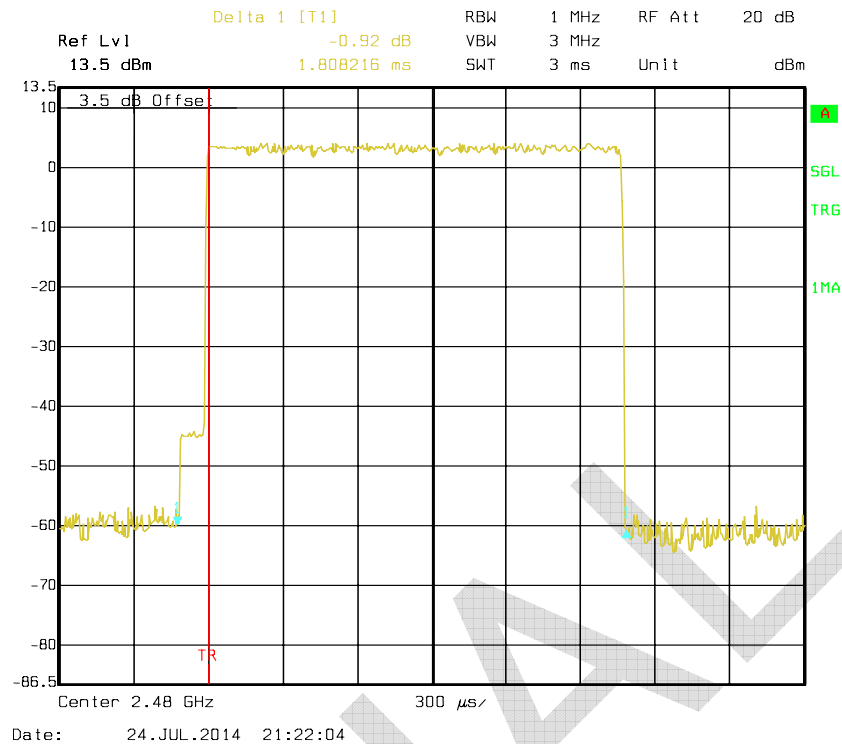
DH3: Low Channel



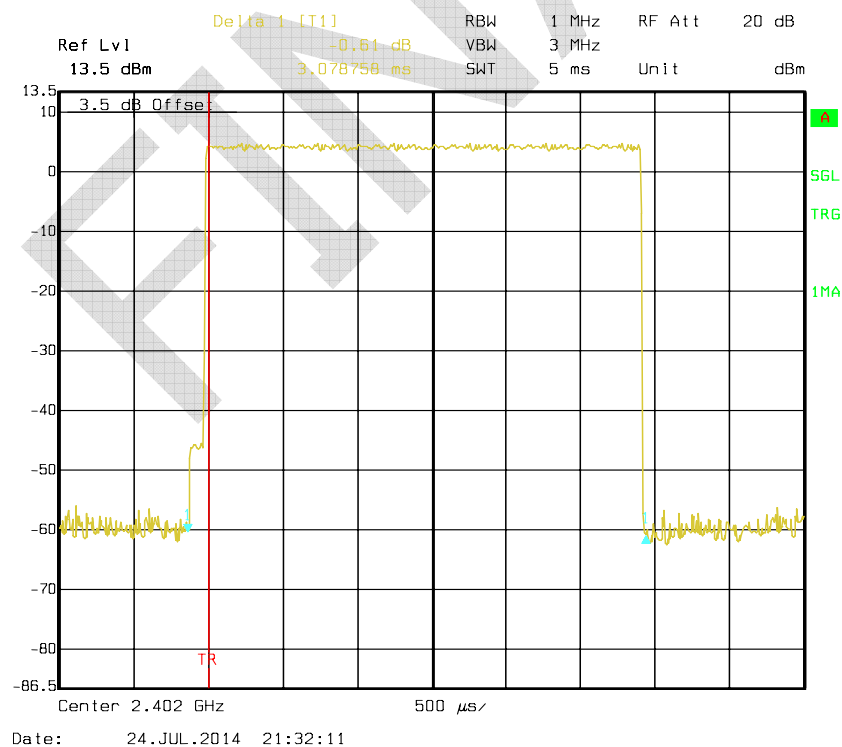
DH3: Middle Channel



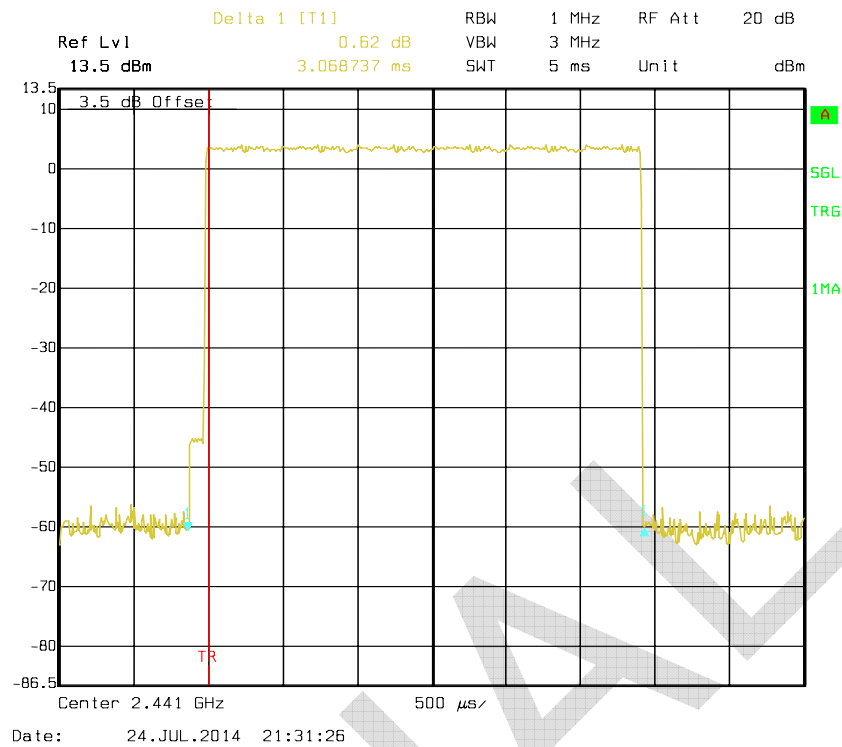
DH3: High Channel



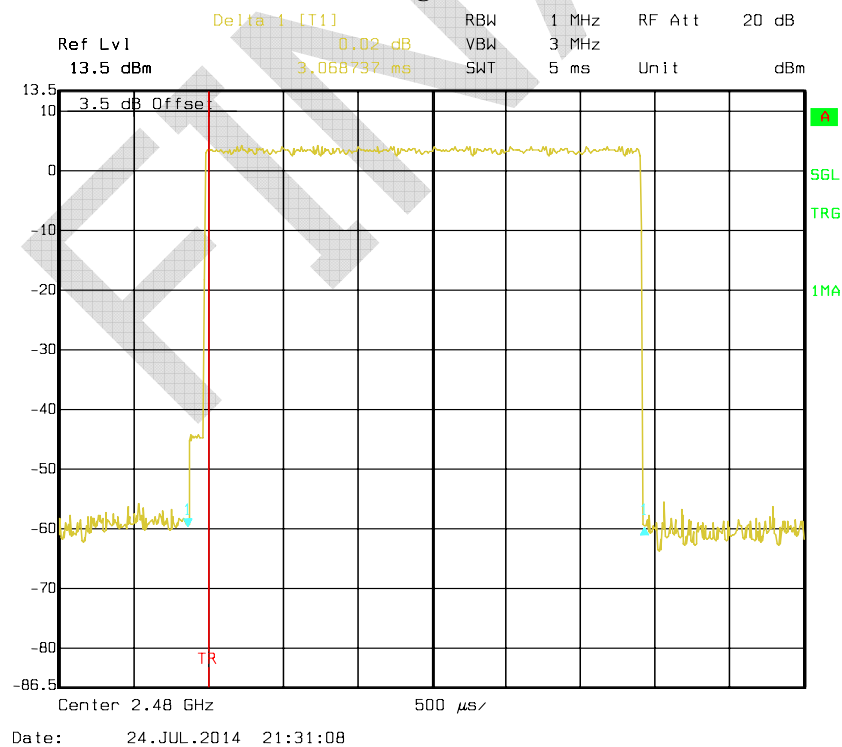
DH5: Low Channel



DH5: Middle Channel



DH5: High Channel



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

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

Test Procedure

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

Test Equipment List and Details

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

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

Test Data**Environmental Conditions**

Temperature:	30.8 °C
Relative Humidity:	65 %
ATM Pressure:	99.4 kPa

* The testing was performed by Allen Qiao on 2014-07-24.

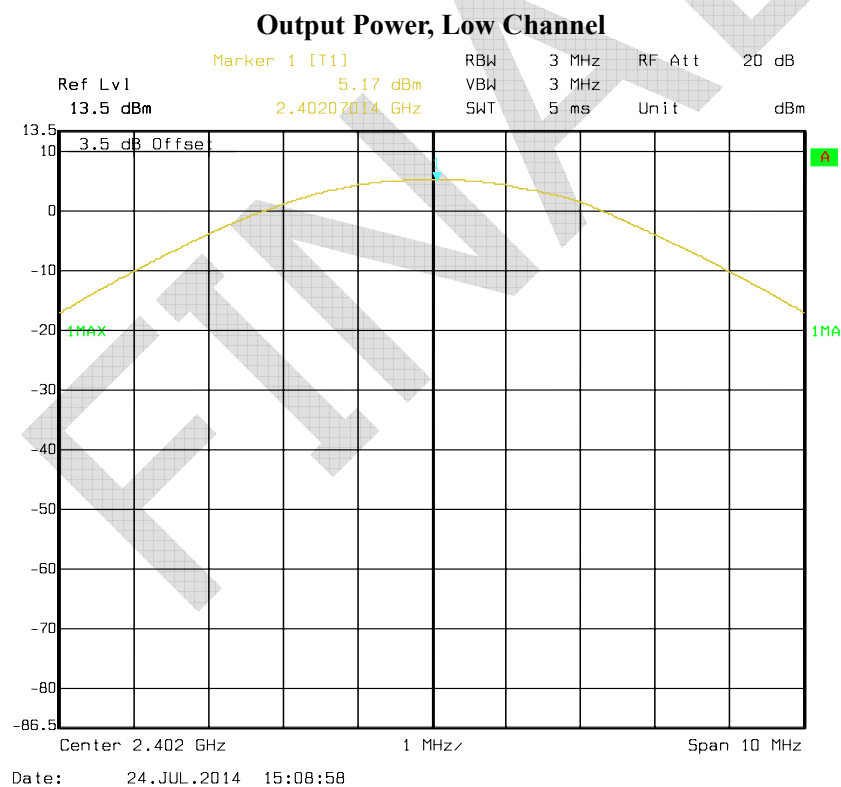
Test Result: Compliance.

Test Mode: Transmitting

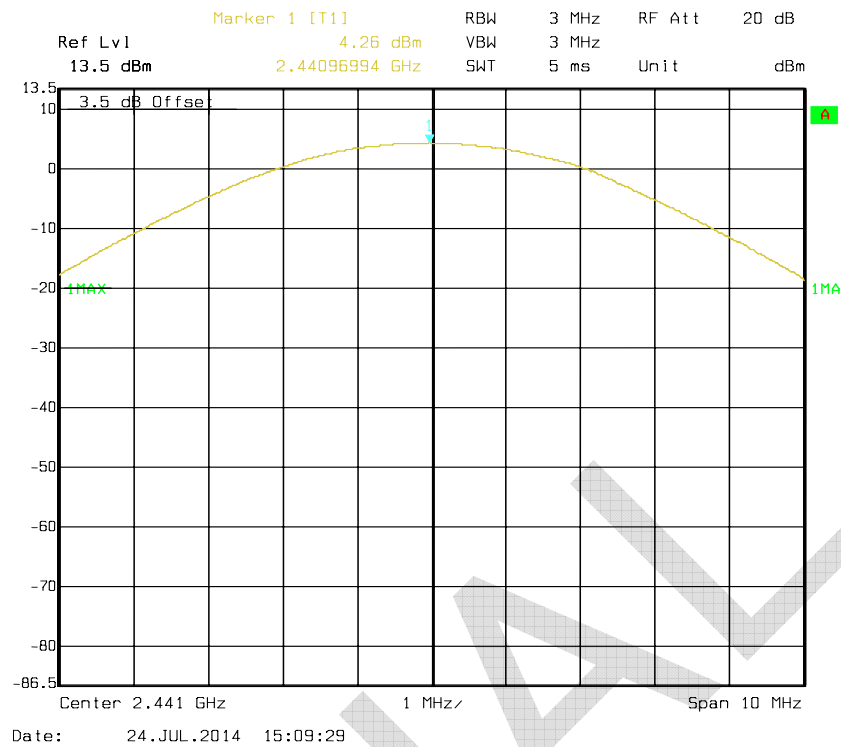
Mode	Channel	Frequency (MHz)	Output power (dBm)	Limit (dBm)
BDR Mode (GFSK)	Low	2402	5.17	30
	Middle	2441	4.26	30
	High	2480	4.31	30
EDR Mode ($\pi/4$ -DQPSK)	Low	2402	4.33	30
	Middle	2441	3.17	30
	High	2480	3.01	30
EDR Mode (8-DPSK)	Low	2402	4.47	30
	Middle	2441	3.39	30
	High	2480	3.33	30

Note: The data above was tested in conducted mode.

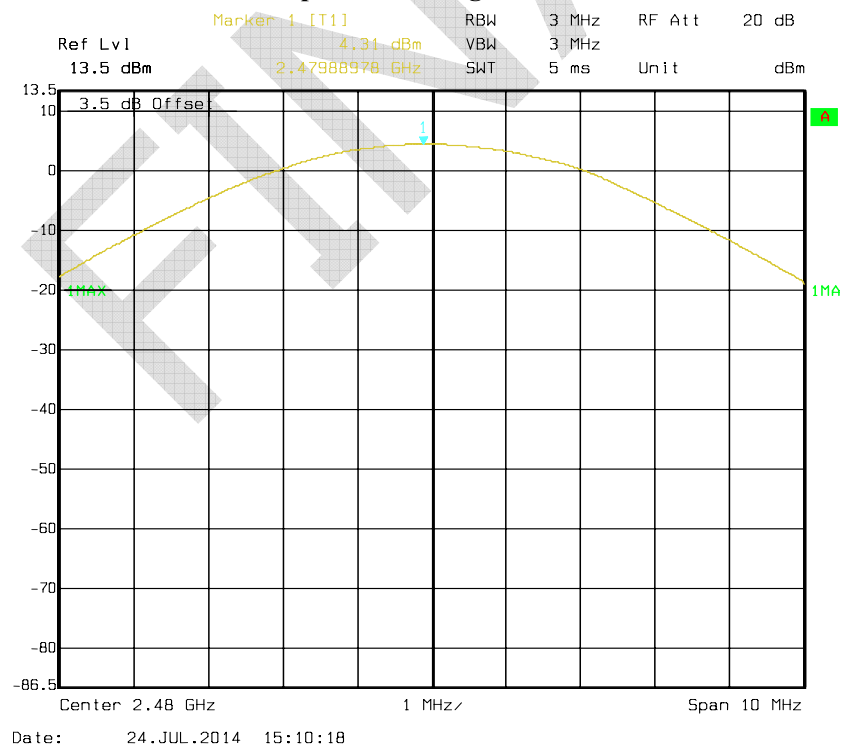
BDR Mode (GFSK):



Output Power, Middle Channel

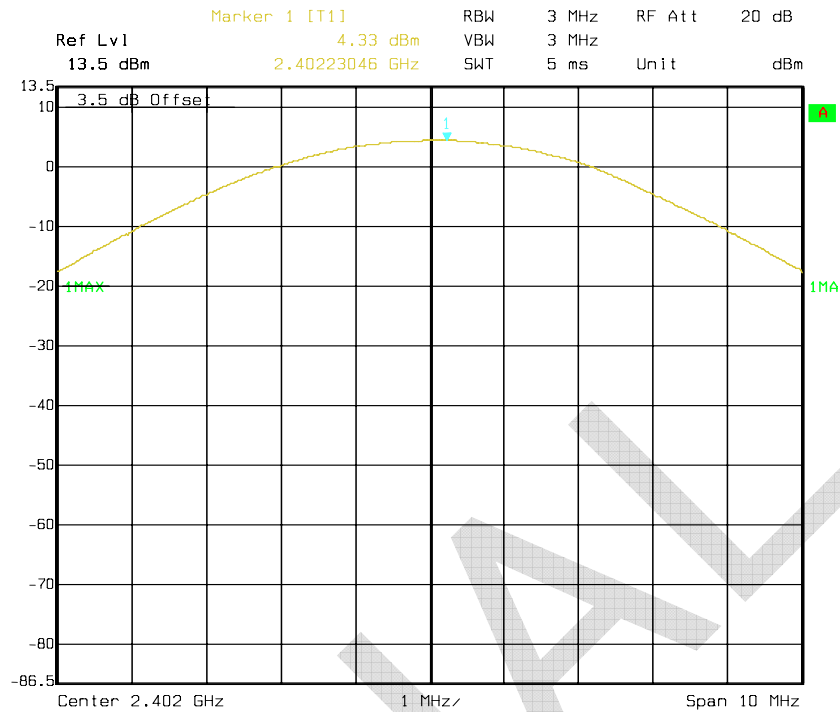


Output Power, High Channel



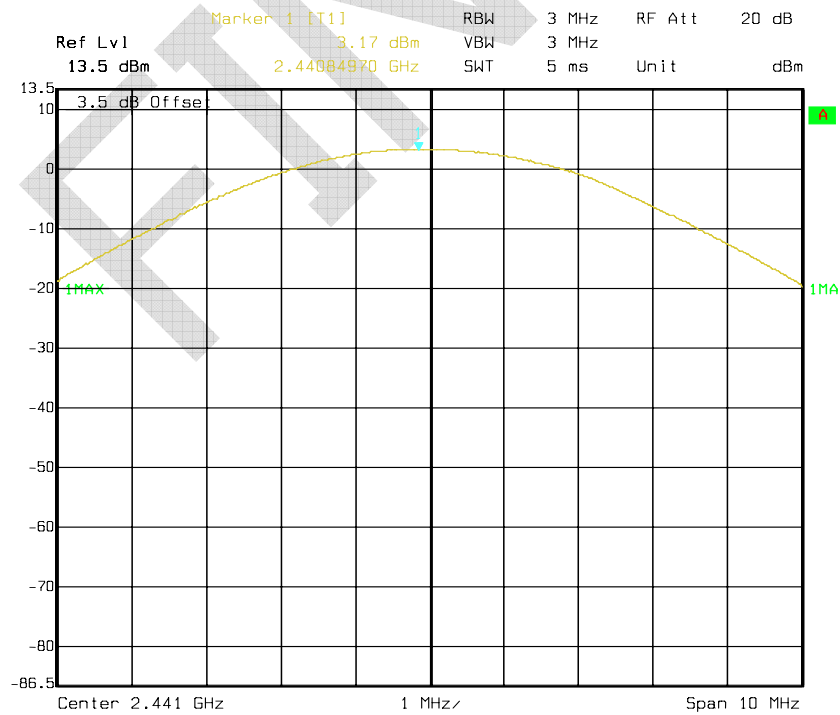
EDR Mode ($\pi/4$ -DQPSK):

Output Power, Low Channel



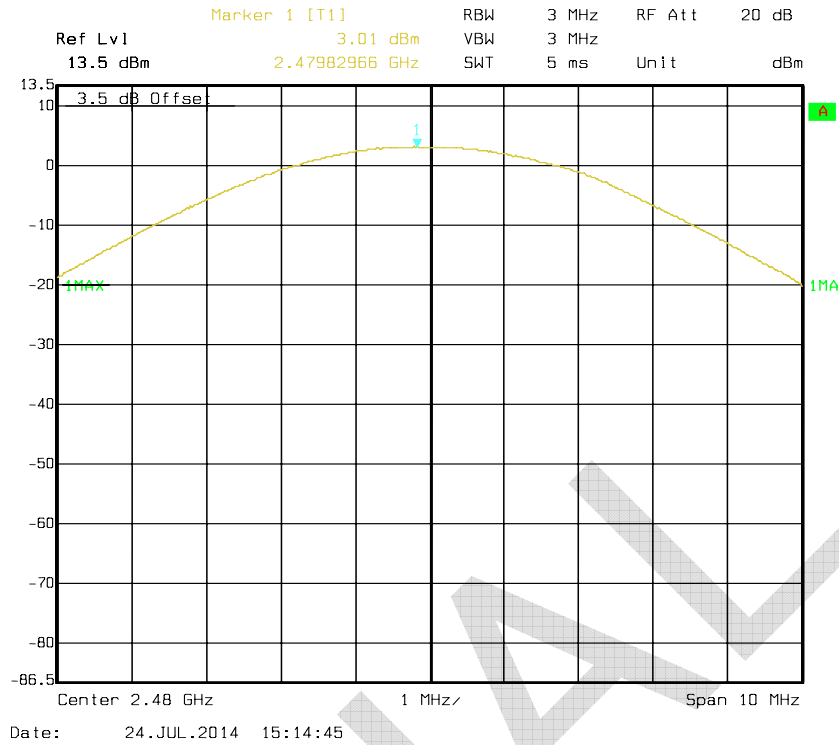
Date: 24.JUL.2014 15:14:06

Output Power, Middle Channel



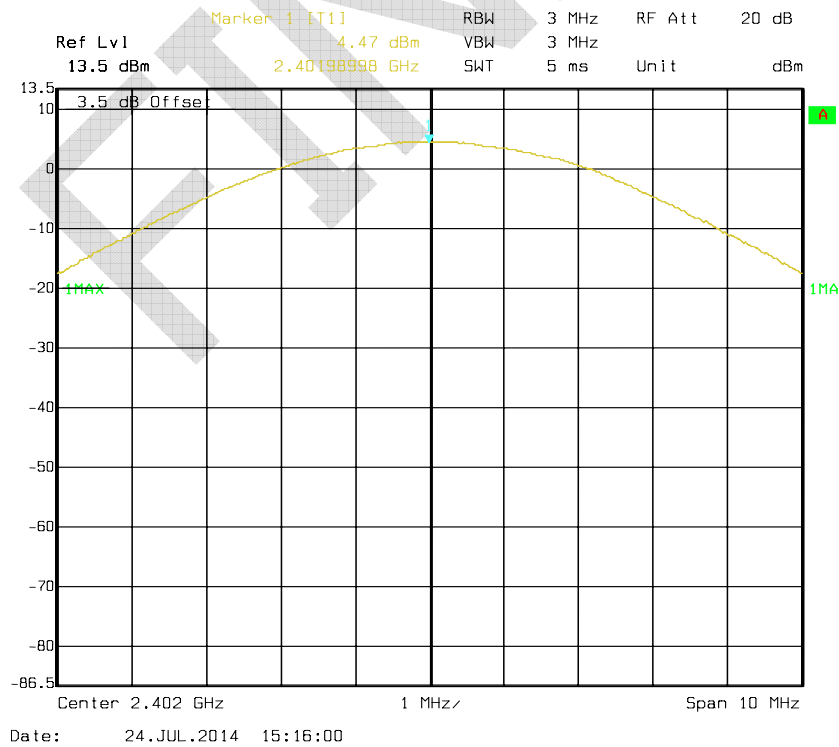
Date: 24.JUL.2014 15:14:25

Output Power, High Channel

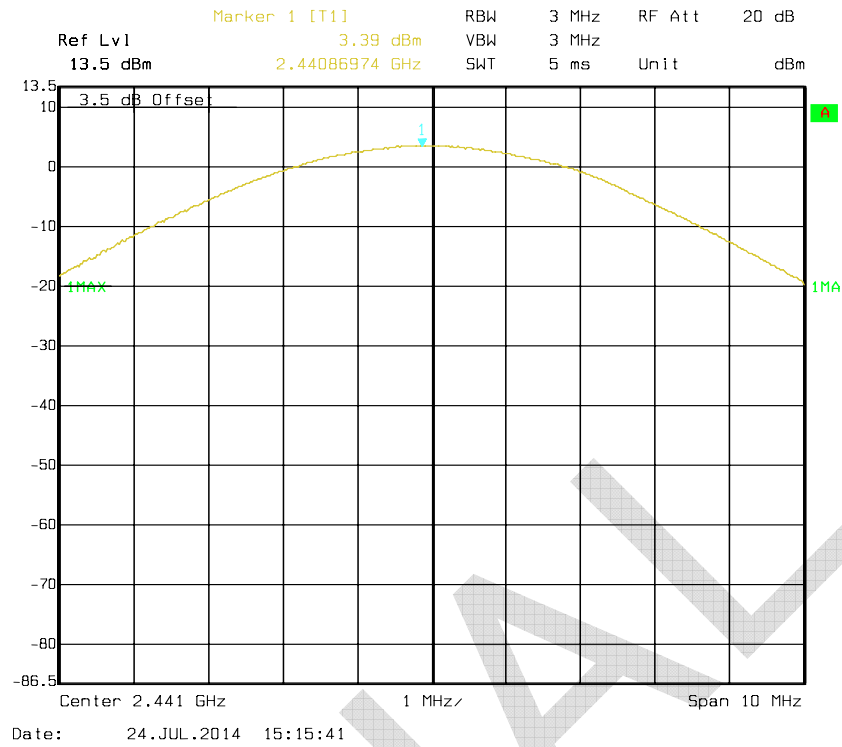


EDR Mode (8-DPSK):

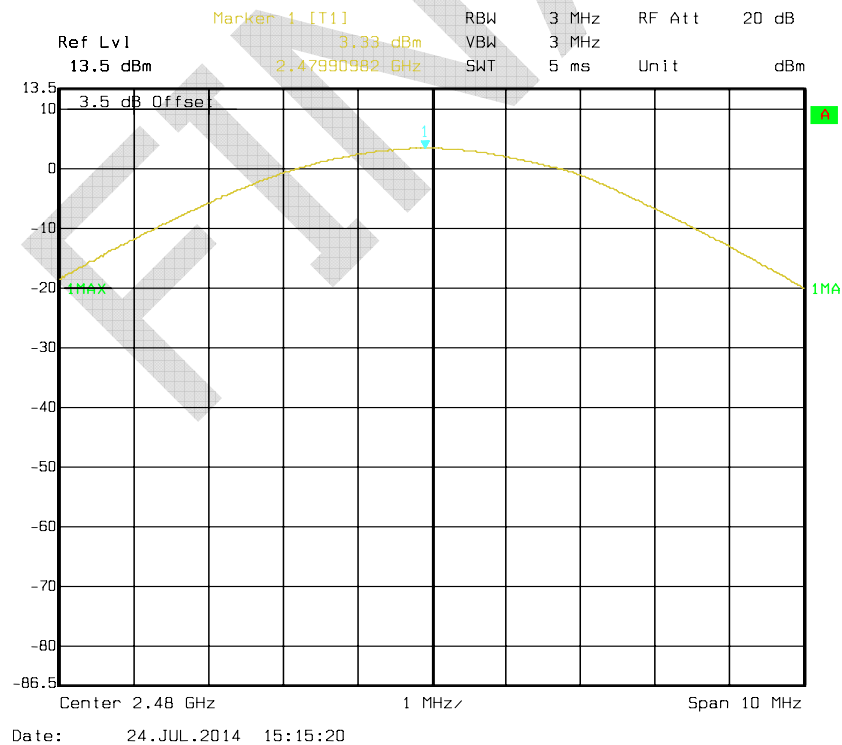
Output Power, Low Channel



Output Power, Middle Channel



Output Power, High Channel



FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

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

Test Equipment List and Details

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

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

Test Data

Environmental Conditions

Temperature:	30.8 °C
Relative Humidity:	65 %
ATM Pressure:	99.4 kPa

* The testing was performed by Allen Qiao on 2014-07-24.

BDR Mode (GFSK):

Ref Lvl 13.5 dBm
 Marker 4 [T1] -36.28 dBm
 RBW 100 kHz
 VBW 300 kHz
 SWT 6 ms
 RF Att 20 dB
 Unit dBm

3.5 dB Offset
 D1 5.33 dBm
 D2 -14.67 dBm
 1MAX
 1MA

2.39956914 GHz
 2.40200000 GHz
 2.38000000 GHz
 2.36000000 GHz
 2.34000000 GHz
 2.32000000 GHz
 2.30000000 GHz
 2.28000000 GHz
 2.26000000 GHz
 2.24000000 GHz
 2.22000000 GHz
 2.20000000 GHz
 2.18000000 GHz
 2.16000000 GHz
 2.14000000 GHz
 2.12000000 GHz
 2.10000000 GHz
 2.08000000 GHz
 2.06000000 GHz
 2.04000000 GHz
 2.02000000 GHz
 2.00000000 GHz
 1.98000000 GHz
 1.96000000 GHz
 1.94000000 GHz
 1.92000000 GHz
 1.90000000 GHz
 1.88000000 GHz
 1.86000000 GHz
 1.84000000 GHz
 1.82000000 GHz
 1.80000000 GHz
 1.78000000 GHz
 1.76000000 GHz
 1.74000000 GHz
 1.72000000 GHz
 1.70000000 GHz
 1.68000000 GHz
 1.66000000 GHz
 1.64000000 GHz
 1.62000000 GHz
 1.60000000 GHz
 1.58000000 GHz
 1.56000000 GHz
 1.54000000 GHz
 1.52000000 GHz
 1.50000000 GHz
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 1.14000000 GHz
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 1.04000000 GHz
 1.02000000 GHz
 1.00000000 GHz
 0.98000000 GHz
 0.96000000 GHz
 0.94000000 GHz
 0.92000000 GHz
 0.90000000 GHz
 0.88000000 GHz
 0.86000000 GHz
 0.84000000 GHz
 0.82000000 GHz
 0.80000000 GHz
 0.78000000 GHz
 0.76000000 GHz
 0.74000000 GHz
 0.72000000 GHz
 0.70000000 GHz
 0.68000000 GHz
 0.66000000 GHz
 0.64000000 GHz
 0.62000000 GHz
 0.60000000 GHz
 0.58000000 GHz
 0.56000000 GHz
 0.54000000 GHz
 0.52000000 GHz
 0.50000000 GHz
 0.48000000 GHz
 0.46000000 GHz
 0.44000000 GHz
 0.42000000 GHz
 0.40000000 GHz
 0.38000000 GHz
 0.36000000 GHz
 0.34000000 GHz
 0.32000000 GHz
 0.30000000 GHz
 0.28000000 GHz
 0.26000000 GHz
 0.24000000 GHz
 0.22000000 GHz
 0.20000000 GHz
 0.18000000 GHz
 0.16000000 GHz
 0.14000000 GHz
 0.12000000 GHz
 0.10000000 GHz
 0.08000000 GHz
 0.06000000 GHz
 0.04000000 GHz
 0.02000000 GHz
 0.00000000 GHz

Start 2.38 GHz
 2.25 MHz/
 Stop 2.4025 GHz

Date: 24.JUL.2014 16:07:00

Ref Lvl 13.5 dBm

Marker 4 [T1] -55.23 dBm

RBW 100 kHz

VBW 300 kHz

SWT 8 ms

RF Att 20 dB

Unit dBm

3.5 dB Offset

D1 4.52 dBm

D2 -15.48 dBm

1MAX

2.49123547 GHz

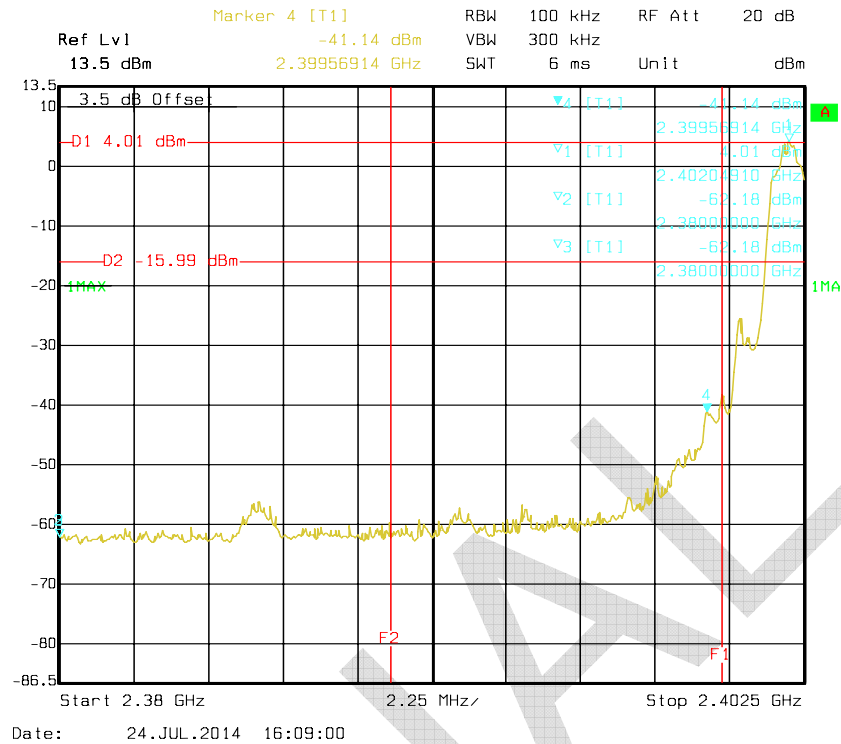
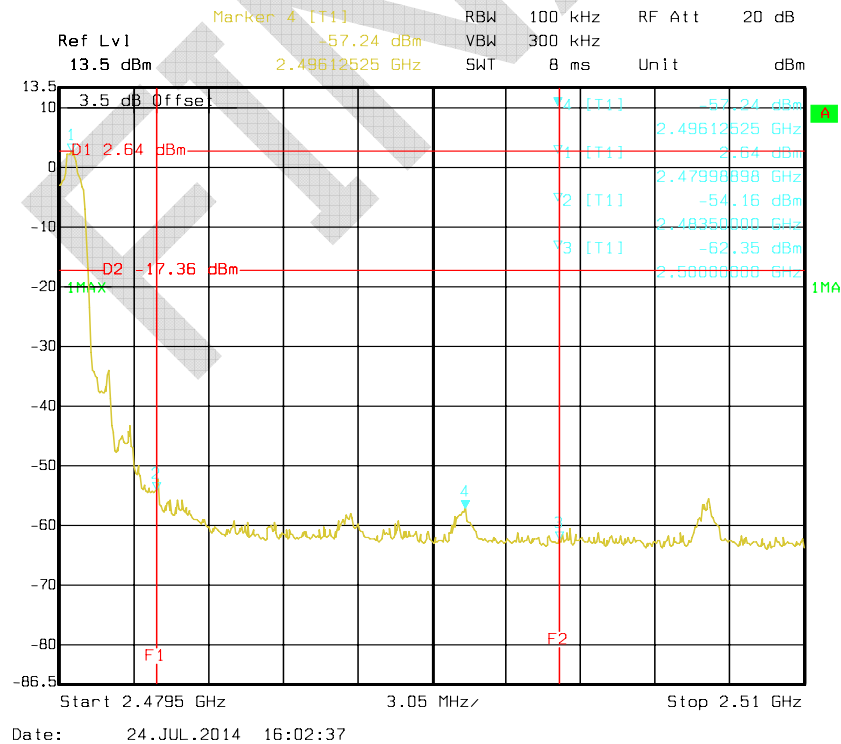
2.4795 GHz

3.05 MHz

2.51 GHz

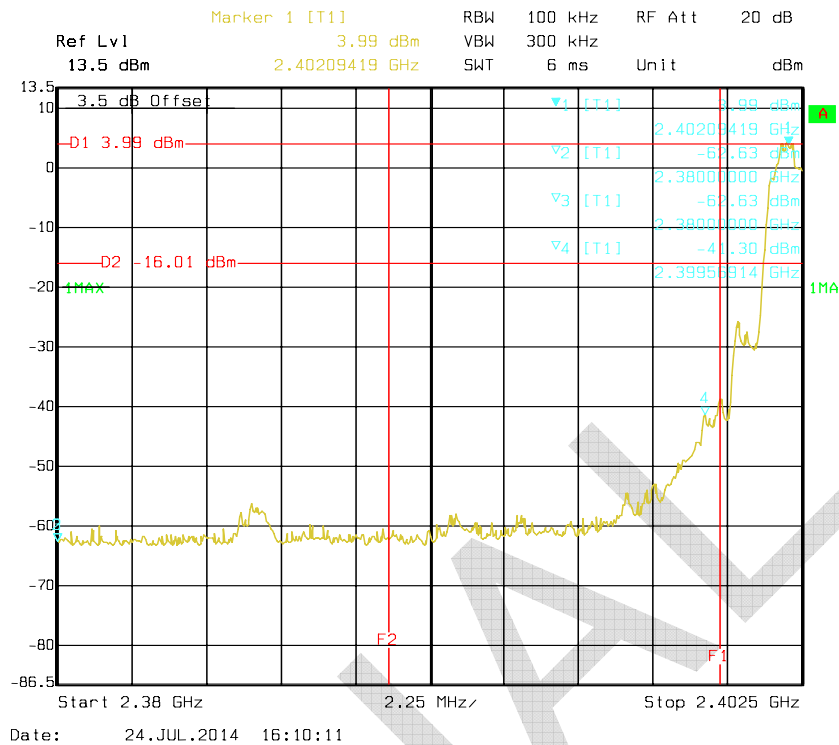
Stop 2.51 GHz

Date: 24.JUL.2014 16:04:29

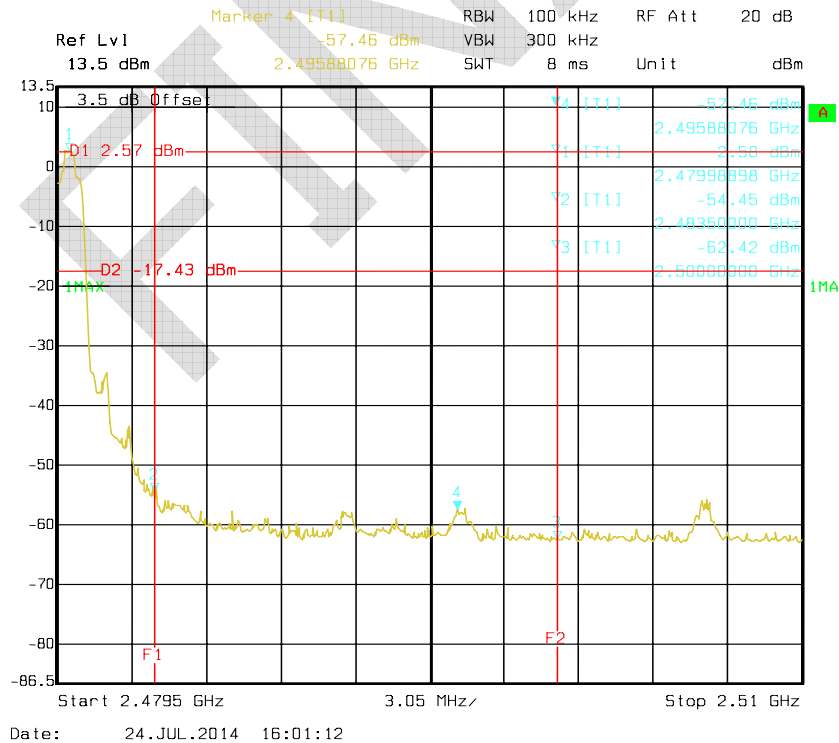
*EDR Mode ($\pi/4$ -DQPSK):***Band Edge, Left Side****Band Edge, Right Side**

EDR Mode (8-DPSK):

Band Edge, Left Side



Band Edge, Right Side



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