FCC PART 15.247
TEST REPORT

For

CETIS, INC.

5025 GALLEY ROAD, COLORADO SPRINGS, CO 80915 USA

FCC ID: ZTUM200BW10

Report Type:	**Product Type:**
Original Report	Corded telephone with BT & WIFI function

Test Engineer:	Mike Hu
Report Number:	RSZ140421008-00A
Report Date:	2014-06-12
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *CETIS,INC.* 's product, model number: *M200BW10 (FCC ID: ZTUM200BW10)* or the "EUT" in this report was a *Corded telephone with BT & WIFI function,* which was measured approximately: 22 cm (L) x 14.5 cm (W) x 9.2 cm (H), rated with input voltage: DC 5.0V from adapter.

Adapter Information:
Model: PSYA05020US
Input: AC 100-240V, 50/60 Hz, 0.6A
Output: DC 5.0 V, 4.0 A

Note: The serial models M100BW5, M100BW10, M200BW5, M200BW10 share the same schematics, they are different in storage area, the details was explained in the attached product similarity declaration letter provided and guaranteed by applicant. Model M200BW10 was selected for testing.

**All measurement and test data in this report was gathered from production sample serial number: 1404127 (Assigned by the BACL, Shenzhen). The EUT supplied by the applicant was received on 2014-04-21.*

Objective

This test report is prepared on behalf of *CETIS,INC.* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS submission with FCC ID: ZTUM200BW10.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz, and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

EUT Exercise Software

The software "CSR Bluesuite 2.4.13" was used, which was provided by manufacturer. The maximum power was set as follows:

Test Software Version		CSR Bluesuite 2.4.13		
Test Frequency		2402MHz	2441MHz	2480MHz
Power Level Setting	GFSK	50	50	50
	π/4 DQPSK	50	50	50
	8DPSK	50	50	50

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

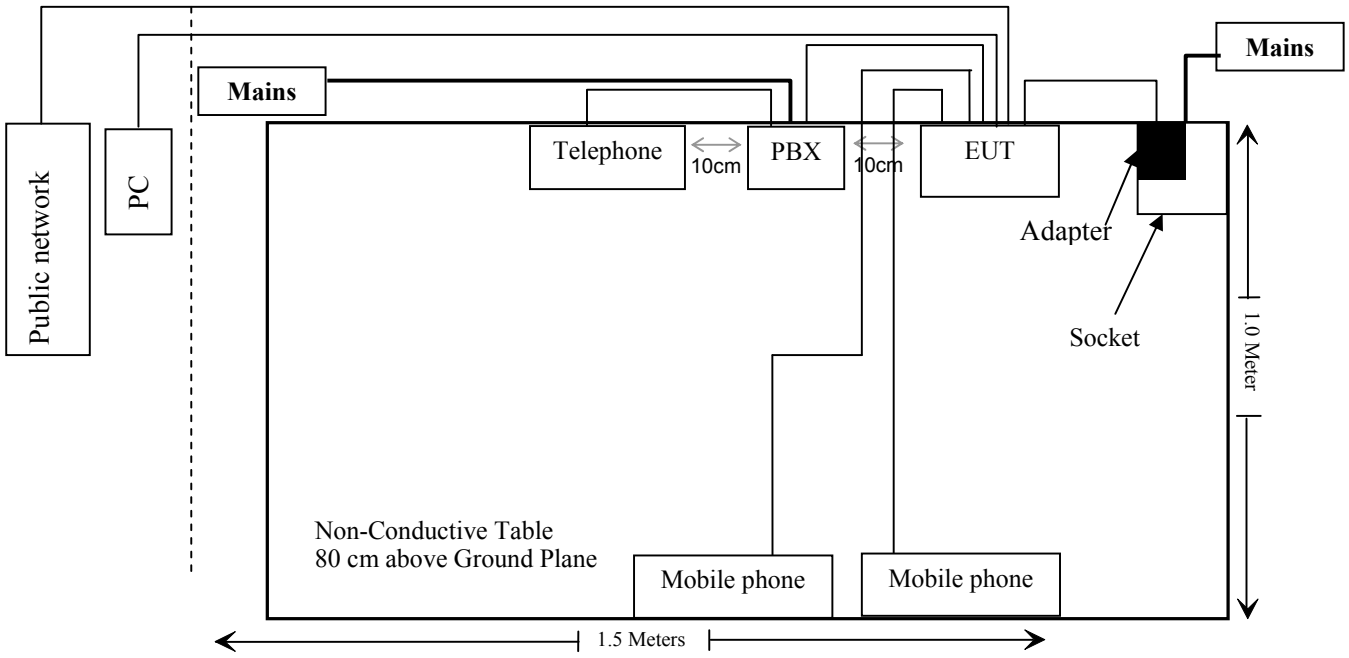
Manufacturer	Description	Model	Serial Number
Kinhao	Telephone	--	14589612
YIKE	PBX	N/A	35879653
Sprocomm	GSM Mobile Phone	N/A	N/A

External I/O Cable

Cable Description		Length (m)	From / Port	To
1	Un-shielding undetacable AC cable	1.0	Main	PBX
2	Un-shielding undetacable DC cable	1.5	Adapter	EUT
3	Un-shielding undetacable AC cable	1.5	Socket	Main
4	Un-shielding detacable RJ45 cable	6.0	EUT	PC
5	Un-shielding detacable RJ45 cable	6.0	EUT	Public Internet
6	Un-shielding detacable RJ11 cable	1.0	PBX	EUT
7	Un-shielding detacable RJ11 cable	1.0	PBX	Telephone
8	Un-shielding detacable USB cable	0.8	EUT	Mobile Phone
9	Un-shielding detacable USB cable	0.8	EUT	Mobile Phone

Block Diagram of Test Setup

For conducted emission



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b)(1), §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliance
§15.247(a)(1)	20 dB Emission 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) & §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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

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

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2480	2.0	1.58	3.31	2.14	20	0.00067	1.0

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance

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 a PCB antenna arrangement for Bluetooth, which was permanently attached and the antenna gain is 2.0dBi, 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(a)

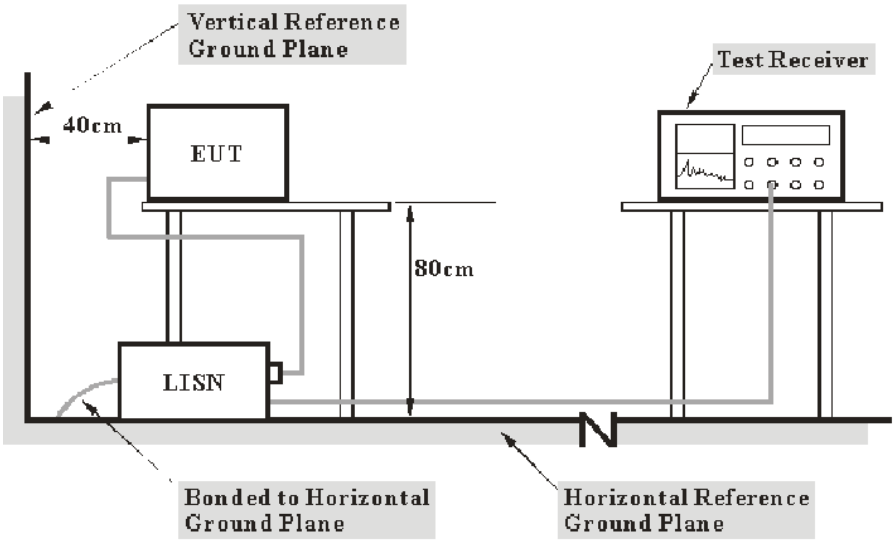
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN and receiver, LISN voltage division factor, LISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report.

Port	Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

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 measurement procedure of EUT setup is according with ANSI C63.4-2009. The related limit was specified in FCC Part 15.207.

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

EMI Test Receiver Setup

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

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

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

Test Procedure

During the conducted emission test, the adapter of EUT was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2013-06-17	2014-06-17
Rohde & Schwarz	LISN 1	ENV216	3560.6650.12-101613-Yb	2014-05-07	2015-05-07
Rohde & Schwarz	LISN 2	ESH2-Z5	892107/021	2013-08-22	2014-08-22
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2013-10-15	2014-10-15
Rohde & Schwarz	CE Test software	EMC 32	V8.53	--	--

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

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB 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 Part 15.207, the worst margin reading as below:

16.0 dB at **0.150000 MHz** in the **Neutral** conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level compliances with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL., $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

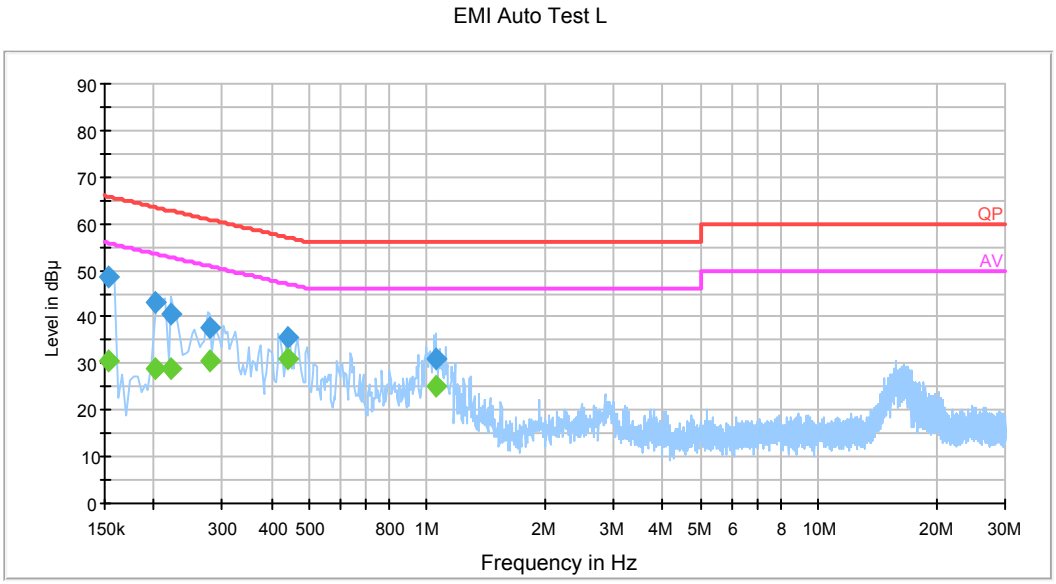
Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	53 %
ATM Pressure:	101.0 kPa

The testing was performed by Mike Hu on 2014-06-10.

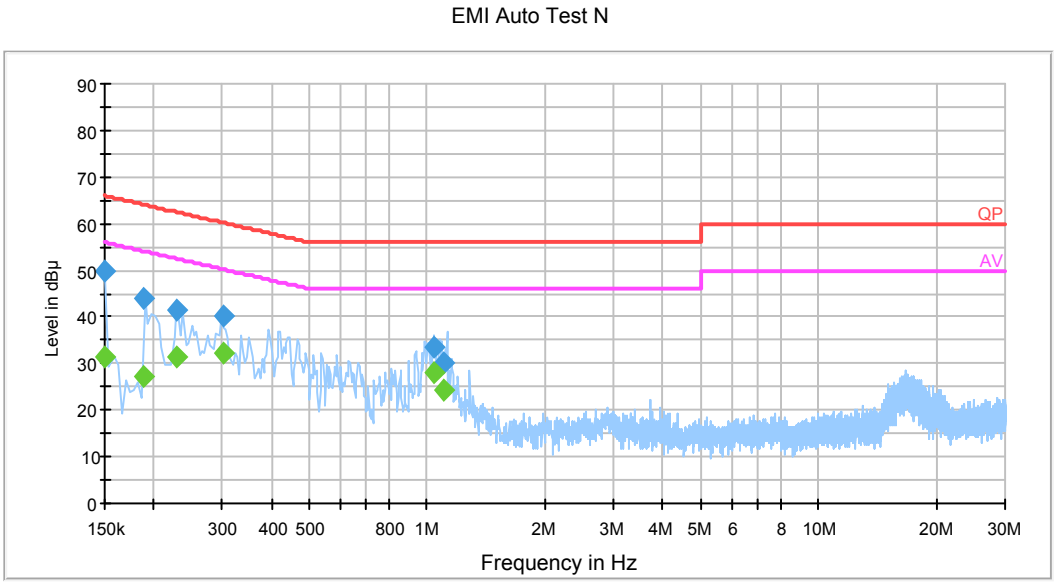
EUT operation mode: Transmitting

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.154000	48.5	19.6	65.8	17.3	QP
0.154000	30.8	19.6	55.8	25.0	Ave.
0.201500	43.1	19.6	63.5	20.5	QP
0.201500	29.0	19.6	53.5	24.5	Ave.
0.221500	40.6	19.5	62.8	22.2	QP
0.221500	28.7	19.5	52.8	24.1	Ave.
0.278501	37.5	19.5	60.9	23.3	QP
0.278501	30.6	19.5	50.9	20.3	Ave.
0.443310	35.8	19.6	57.0	21.2	QP
0.443310	30.8	19.6	47.0	16.2	Ave.
1.050190	31.0	19.5	56.0	25.0	QP
1.050190	25.1	19.5	46.0	20.9	Ave.

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.150000	50.0	19.6	66.0	16.0	QP
0.150000	31.4	19.6	56.0	24.6	Ave.
0.189500	44.1	19.6	64.1	20.0	QP
0.189500	27.2	19.6	54.1	26.9	Ave.
0.229500	41.4	19.5	62.5	21.0	QP
0.229500	31.5	19.5	52.5	21.0	Ave.
0.301500	40.1	19.5	60.2	20.1	QP
0.301500	32.4	19.5	50.2	17.8	Ave.
1.046370	33.7	19.5	56.0	22.3	QP
1.046370	28.0	19.5	46.0	18.0	Ave.
1.109110	30.0	19.5	56.0	26.0	QP
1.109110	24.3	19.5	46.0	21.7	Ave.

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
2) Corrected Amplitude = Reading + Correction Factor
3) Margin = Limit – Corrected Amplitude

FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

Applicable Standard

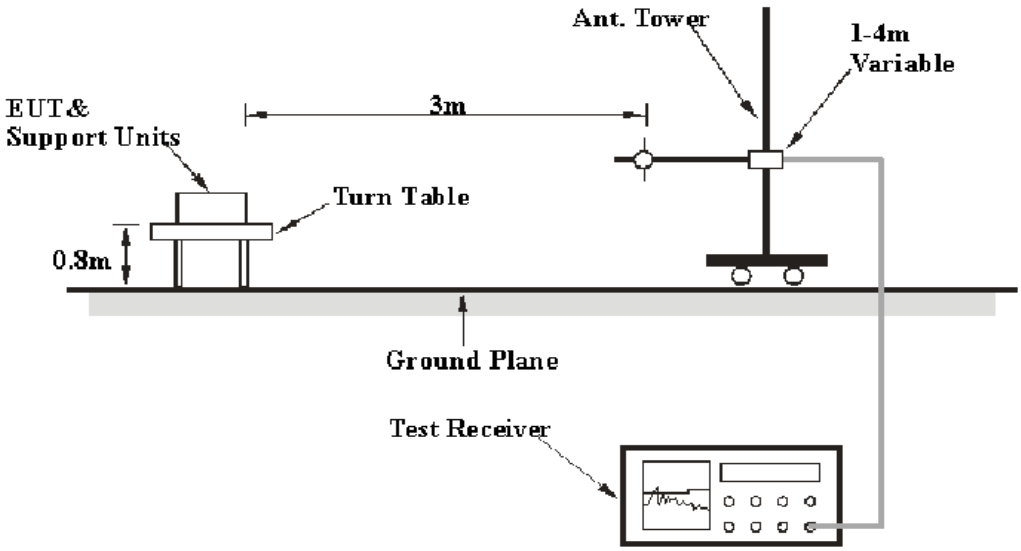
FCC §15.205; §15.209; §15.247(d)

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is 5.91 dB for 30MHz-1GHz, and 4.92 dB for above 1GHz. And this uncertainty will not be taken into consideration for the test data recorded in the report.

EUT Setup



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209 and FCC 15.247 limits.

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	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Ave.

Test Procedure

During the radiated emissions, the adapter of EUT was connected to the 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 and peak and Average detection modes for frequencies above 1 GHz.

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2013-09-30	2014-09-30
R&S	EMI Test Receiver	ESCI	101122	2013-09-25	2014-09-25
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Mini	Amplifier	ZVA-183-S+	5969001149	2014-04-03	2015-04-03
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2015-02-10
DUCOMMUN	Pre-amplifier	ALN-22093530-01	991373-01	2013-08-03	2014-08-03
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2013-10-14	2016-10-13
R&S	Auto test Software	EMC32	V9.10	--	--

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that 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 Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247, the worst margin reading as below:

4.21 dB at **129.3 MHz** in the **Horizontal** polarization

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level compliances with the limit if

$$L_m + + U_{(Lm)} \leq L_{lim} + + U_{cispr}$$

In BACL., $U_{(Lm)}$ is less than + U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	53 %
ATM Pressure:	101.0 kPa

The testing was performed by Mike Hu on 2014-06-10.

EUT operation mode: Transmitting

30 MHz -25 GHz: (*Scan with GFSK, π/4-DQPSK, 8-DPSK, the worst case is BDR Mode (GFSK)*)

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2402 MHz)									
129.3	51.10	QP	241	1.3	H	-12.6	38.5	43.5	5.00
2402	92.64	PK	252	1.3	H	5.48	98.12	/	/
2402	83.64	Ave.	252	1.3	H	5.48	89.12	/	/
2402	91.24	PK	207	1.3	V	5.48	96.72	/	/
2402	81.43	Ave.	207	1.3	V	5.48	86.91	/	/
2347.5	34.64	PK	68	1.5	H	5.48	40.12	74	33.88
2347.5	23.04	Ave.	68	1.5	H	5.48	28.52	54	25.48
2388.6	35.71	PK	174	1.4	V	5.48	41.19	74	32.81
2388.6	24.12	Ave.	174	1.4	V	5.48	29.60	54	24.40
2490.1	36.24	PK	317	1.5	H	7.21	43.45	74	30.55
2490.1	23.46	Ave.	317	1.5	H	7.21	30.67	54	23.33
4804	47.26	PK	299	1.2	V	12.44	59.70	74	14.30
4804	34.10	Ave.	299	1.2	V	12.44	46.54	54	7.46
7206	35.64	PK	94	1.4	V	17.06	52.70	74	21.30
7206	23.25	Ave.	94	1.4	V	17.06	40.31	54	13.69
9608	34.54	PK	258	1.5	H	19.28	53.82	74	20.18
9608	22.75	Ave.	258	1.5	H	19.28	42.03	54	11.97
Middle Channel (2441 MHz)									
129.3	51.89	QP	109	1.3	H	-12.6	39.29	43.5	4.21
2441	91.64	PK	73	1.4	H	6.13	97.77	/	/
2441	82.34	Ave.	73	1.4	H	6.13	88.47	/	/
2441	91.21	PK	332	1.4	V	6.13	97.34	/	/
2441	82.44	Ave.	332	1.4	V	6.13	88.57	/	/
2357.2	35.64	PK	277	1.4	V	5.48	41.12	74	32.88
2357.2	23.28	Ave.	277	1.4	V	5.48	28.76	54	25.24
2488.9	36.05	PK	34	1.2	H	7.21	43.26	74	30.74
2488.9	23.41	Ave.	34	1.2	H	7.21	30.62	54	23.38
2485.7	35.64	PK	173	1.5	V	7.21	42.85	74	31.15
2485.7	23.49	Ave.	173	1.5	V	7.21	30.70	54	23.30
4882	46.64	PK	219	1.2	V	12.4	59.04	74	14.96
4882	33.79	Ave.	219	1.2	V	12.4	46.19	54	7.81
7323	35.64	PK	163	1.5	H	16.49	52.13	74	21.87
7323	23.27	Ave.	163	1.5	H	16.49	39.76	54	14.24
9764	36.15	PK	48	1.5	H	19.4	55.55	74	18.45
9764	22.85	Ave.	48	1.5	H	19.4	42.25	54	11.75

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2480 MHz)									
129.3	51.77	QP	196	1	H	-12.6	39.17	43.5	4.33
2480	90.64	PK	248	1.4	H	7.21	97.85	/	/
2480	81.53	Ave.	248	1.4	H	7.21	88.74	/	/
2480	90.17	PK	183	1.5	V	7.21	97.38	/	/
2480	81.79	Ave.	183	1.5	V	7.21	89.00	/	/
2348.5	35.64	PK	212	1.3	H	5.48	41.12	74	32.88
2348.5	23.15	Ave.	212	1.3	H	5.48	28.63	54	25.37
2483.7	36.20	PK	123	1.2	H	7.21	43.41	74	30.59
2483.7	22.87	Ave.	123	1.2	H	7.21	30.08	54	23.92
2490.5	35.76	PK	264	1.3	H	7.21	42.97	74	31.03
2490.5	23.15	Ave.	264	1.3	H	7.21	30.36	54	23.64
4960	47.28	PK	306	1.5	V	12.5	59.78	74	14.22
4960	34.52	Ave.	306	1.5	V	12.5	47.02	54	6.98
7440	35.67	PK	4	1.4	V	15.9	51.57	74	22.43
7440	23.91	Ave.	4	1.4	V	15.9	39.81	54	14.19
9920	35.42	PK	152	1.2	H	19.39	54.81	74	19.19
9920	22.17	Ave.	152	1.2	H	19.39	41.56	54	12.44

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

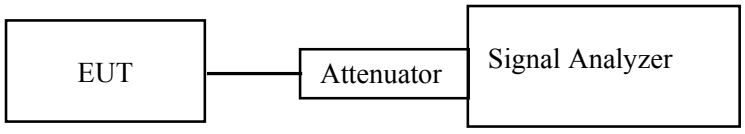
FCC §15.247(a) (1)-CHANNEL SEPARATION TEST

Applicable Standard

Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. 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. Set the EUT in transmitting mode, maxhold the channel.
2. Set the adjacent channel of the EUT and maxhold another trace.
3. Measure the channel separation.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2013-05-31	2014-05-31

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

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Mike Hu on 2014-05-04.

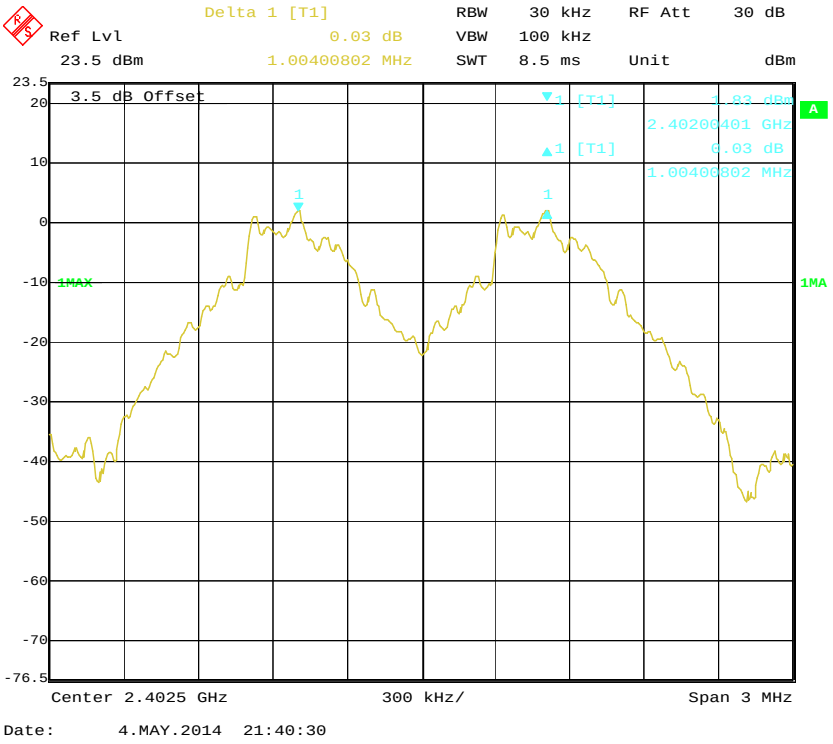
EUT operation mode: Transmitting

Test Result: Compliance. Please refer to following tables and plots

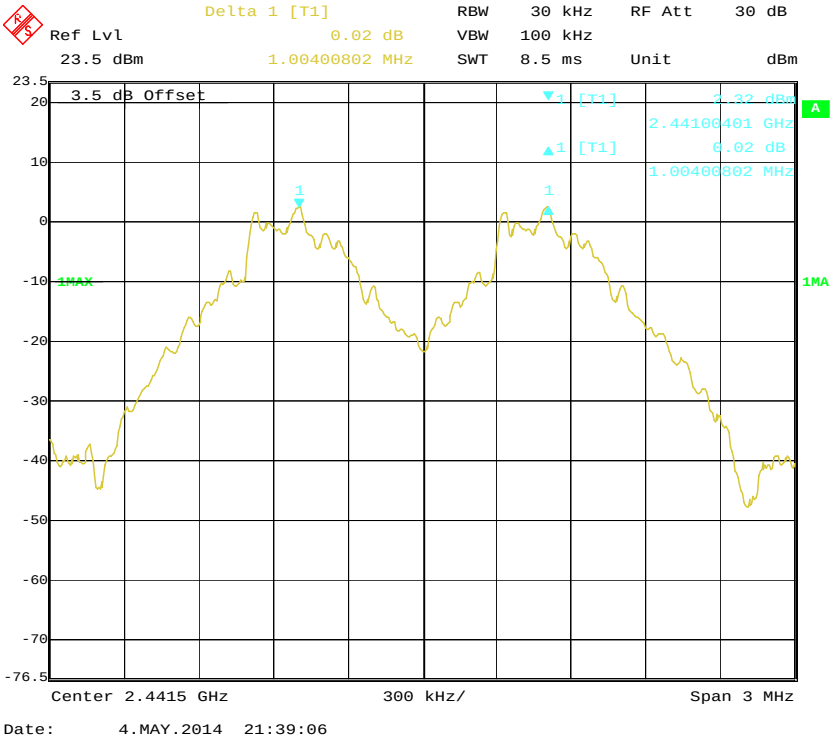
Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	≥Limit (MHz)	Result
BDR (GFSK)	Low	2402	1.004	0.569	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.569	Pass
	Adjacent	2442			
	High	2480	1.004	0.569	Pass
	Adjacent	2479			
EDR (π/4-DQPSK)	Low	2402	1.004	0.838	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.821	Pass
	Adjacent	2442			
	High	2480	1.004	0.817	Pass
	Adjacent	2479			
EDR (8DPSK)	Low	2402	1.004	0.813	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.813	Pass
	Adjacent	2442			
	High	2480	1.004	0.817	Pass
	Adjacent	2479			

Note: Limit = 20 dB bandwidth *2/3

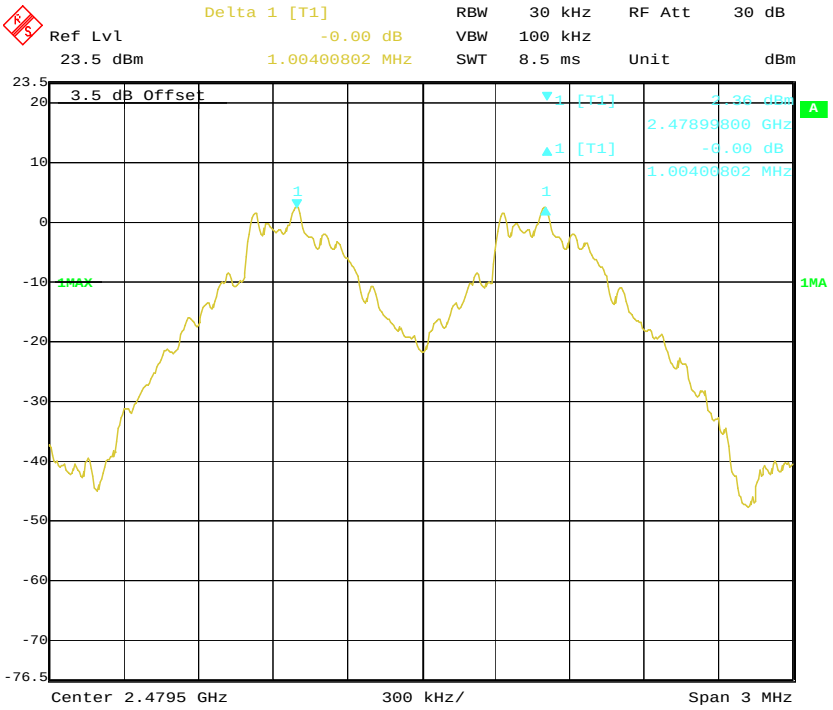
BDR (GFSK): Low Channel



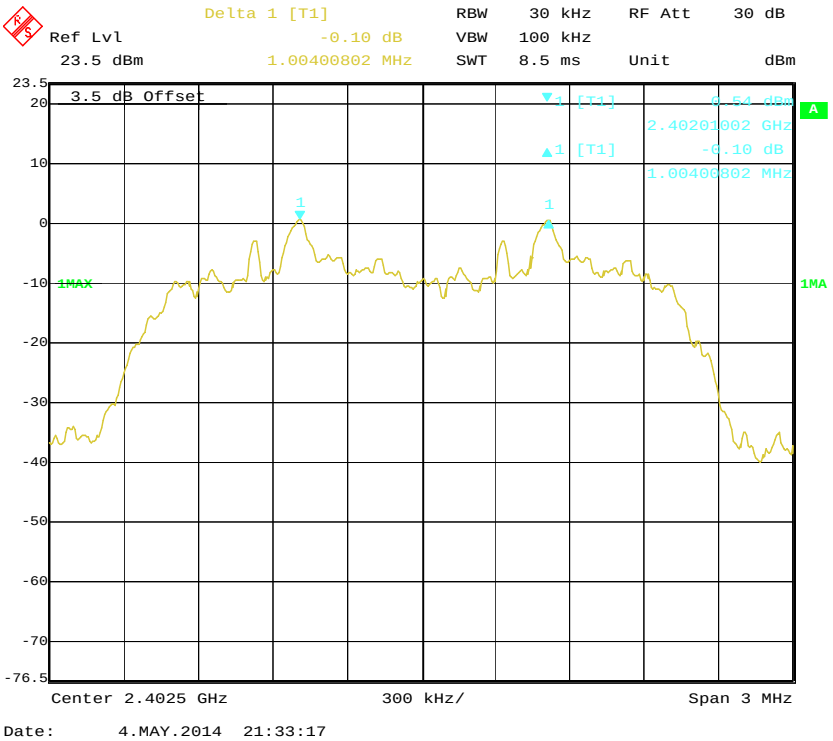
BDR (GFSK): Middle Channel



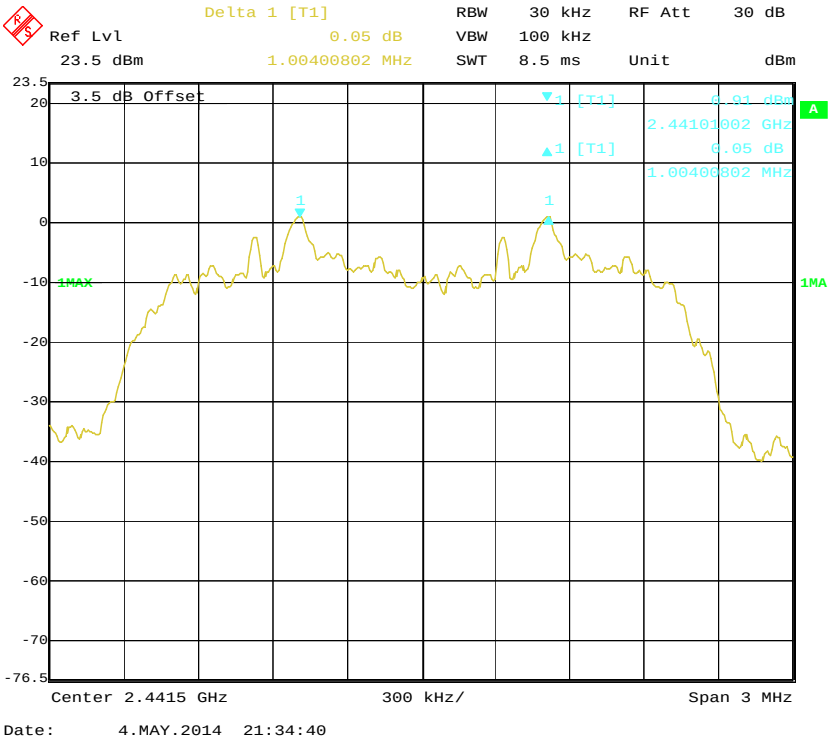
BDR (GFSK): High Channel



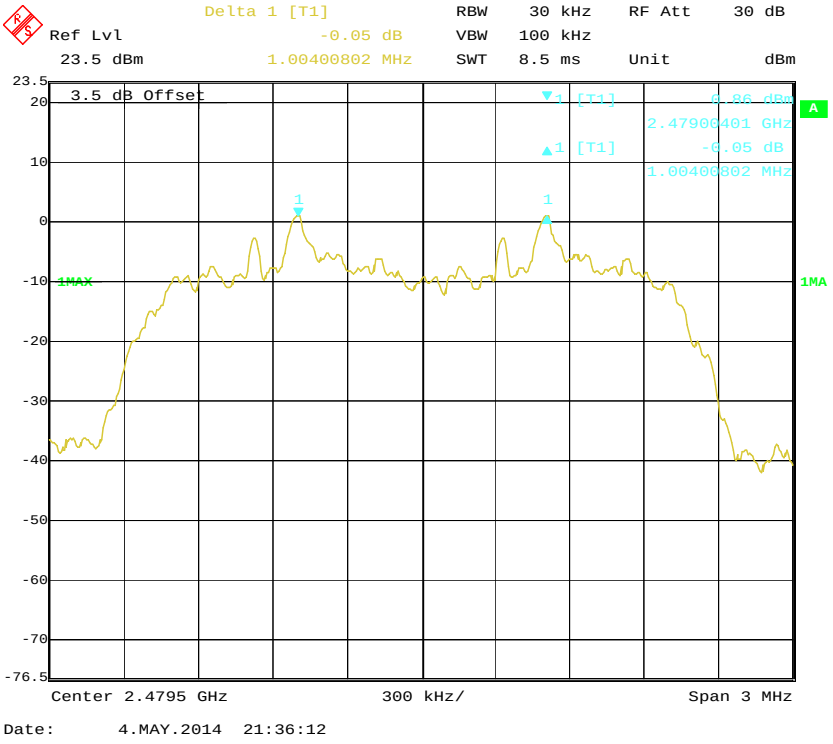
EDR (π/4-DQPSK): Low Channel



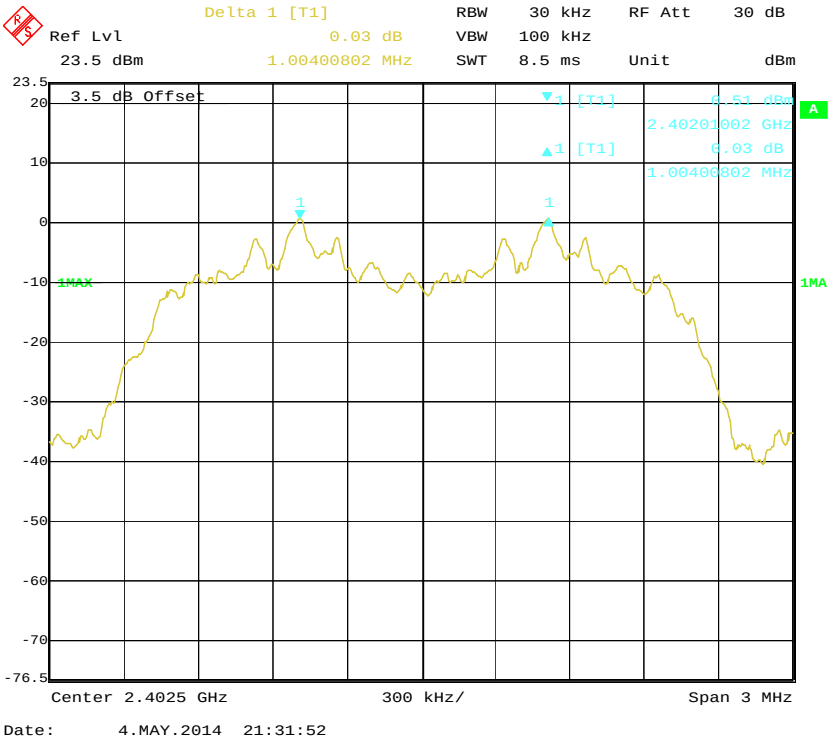
EDR (π/4-DQPSK): Middle Channel



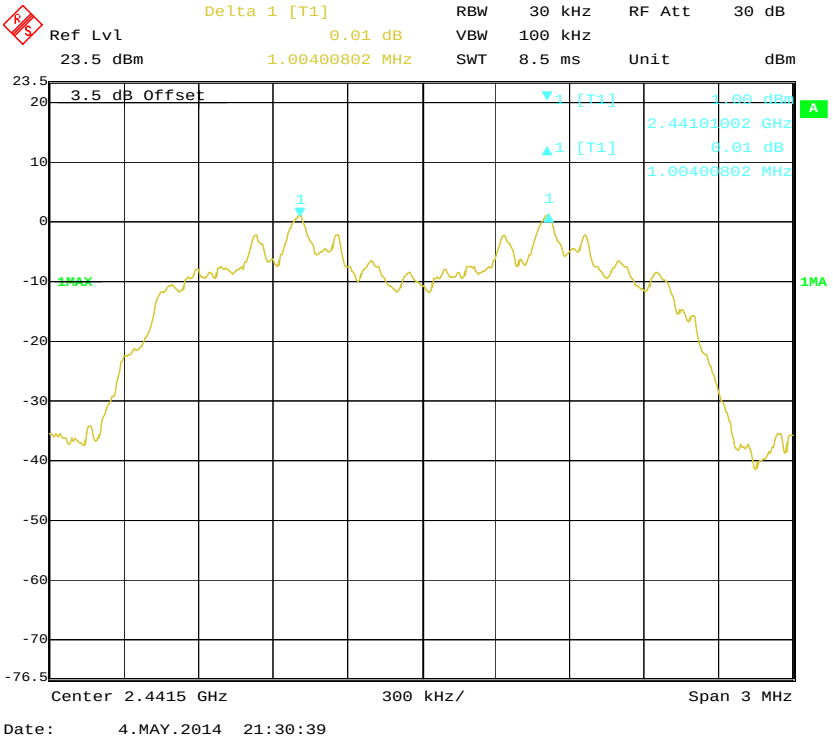
EDR (π/4-DQPSK): High Channel



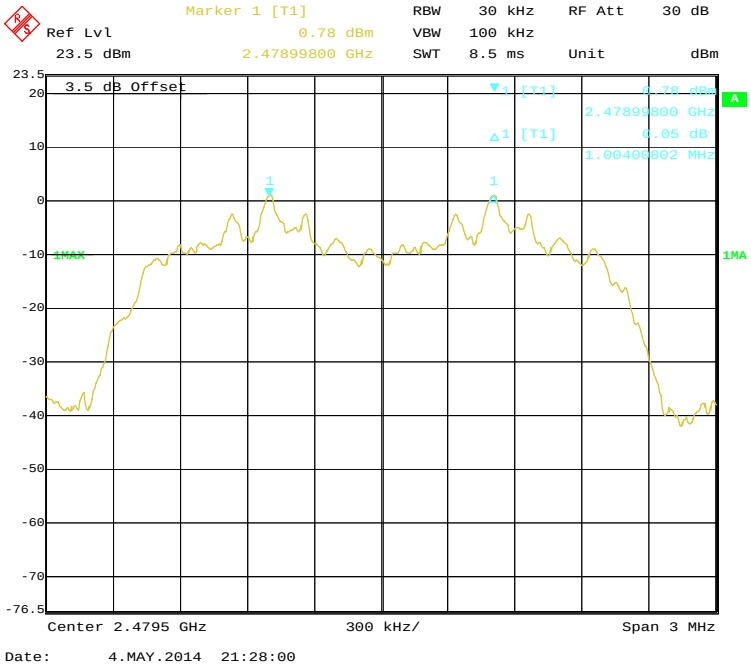
EDR (8DPSK): Low Channel



EDR (8DPSK): Middle Channel



EDR (8DPSK): High Channel



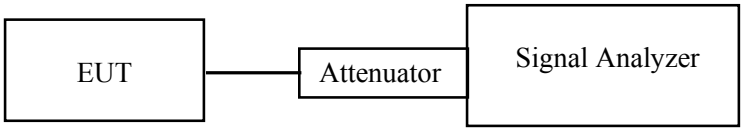
FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH

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 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. 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
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2013-05-31	2014-05-31

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

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

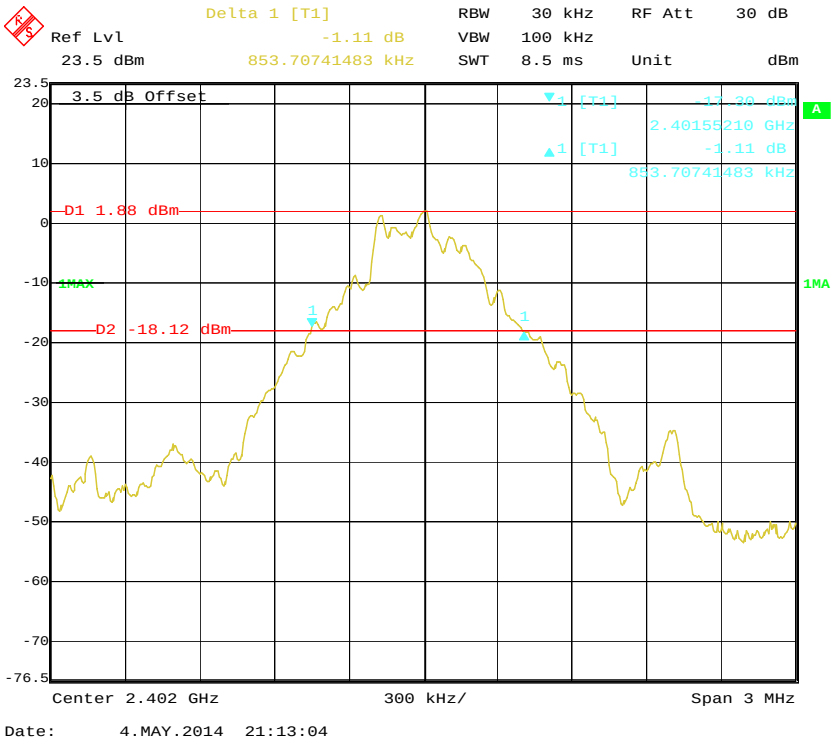
The testing was performed by Mike Hu on 2014-05-04.

EUT operation mode: Transmitting

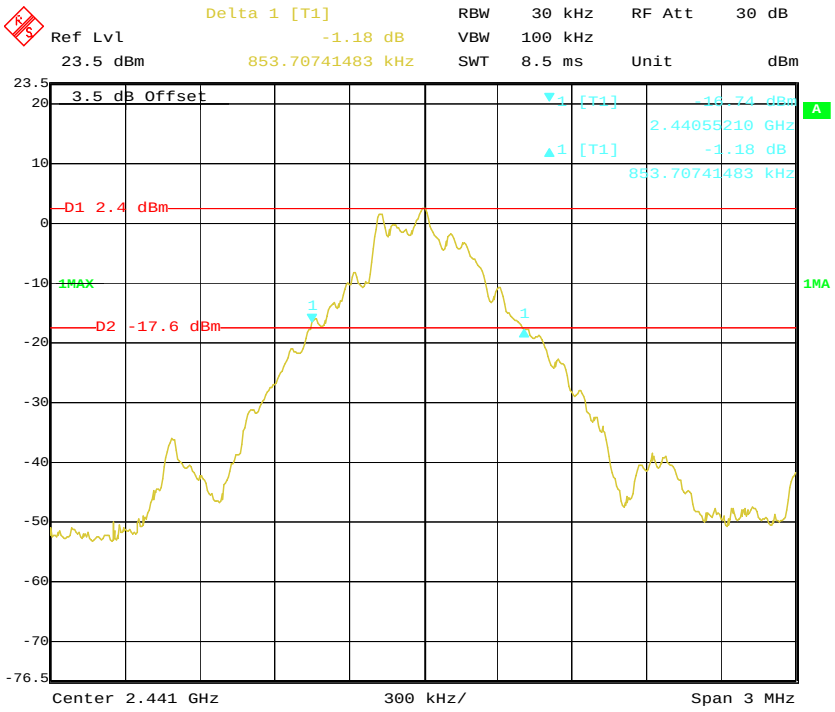
Test Result: Compliance. Please refer to following tables and plots

Mode	Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.854
	Middle	2441	0.854
	High	2480	0.854
EDR (π/4-DQPSK)	Low	2402	1.257
	Middle	2441	1.232
	High	2480	1.226
EDR (8DPSK)	Low	2402	1.220
	Middle	2441	1.220
	High	2480	1.226

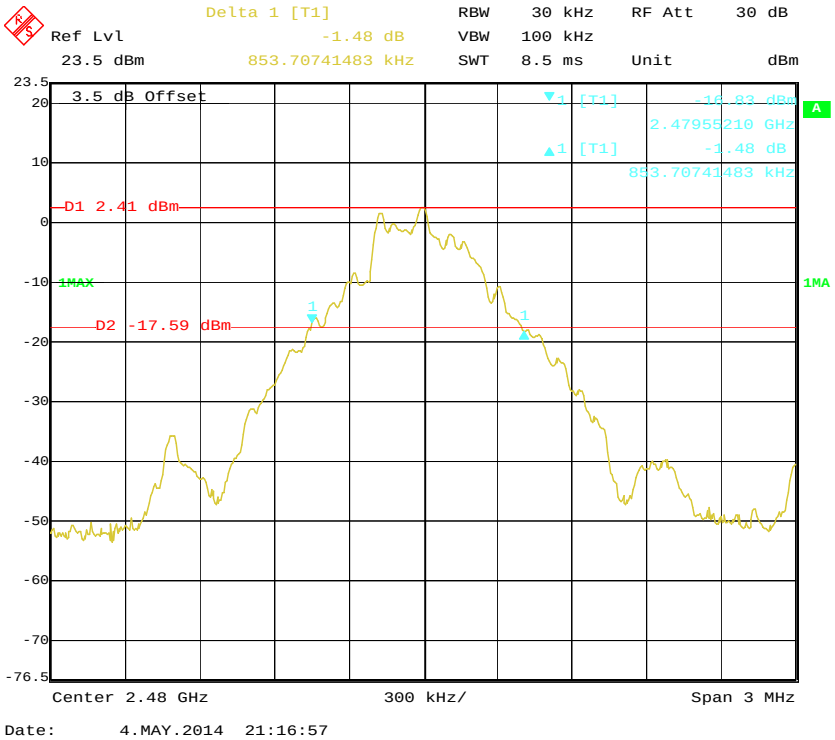
BDR (GFSK): Low Channel



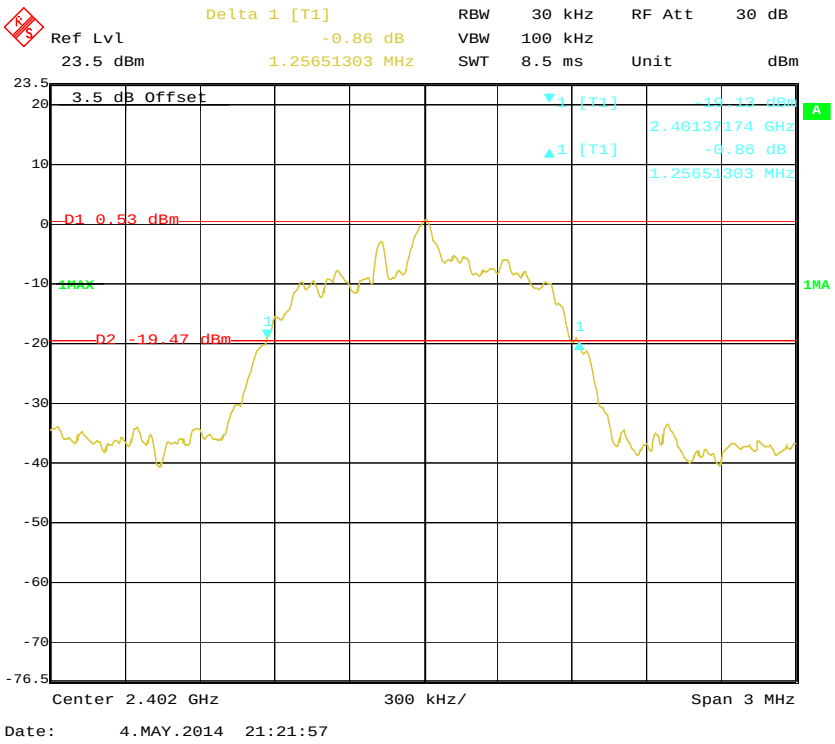
BDR (GFSK): Middle Channel



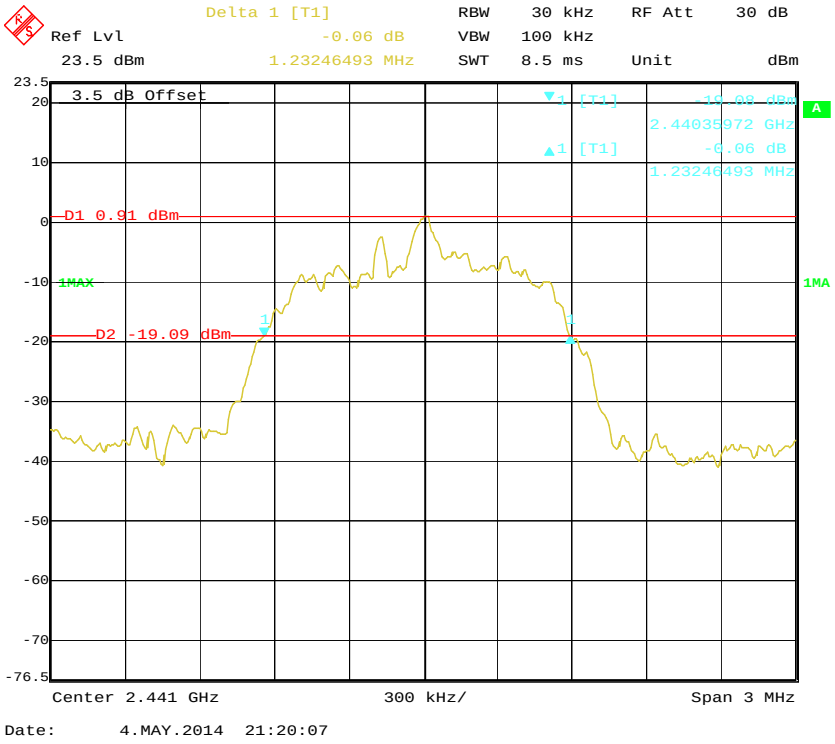
BDR (GFSK): High Channel



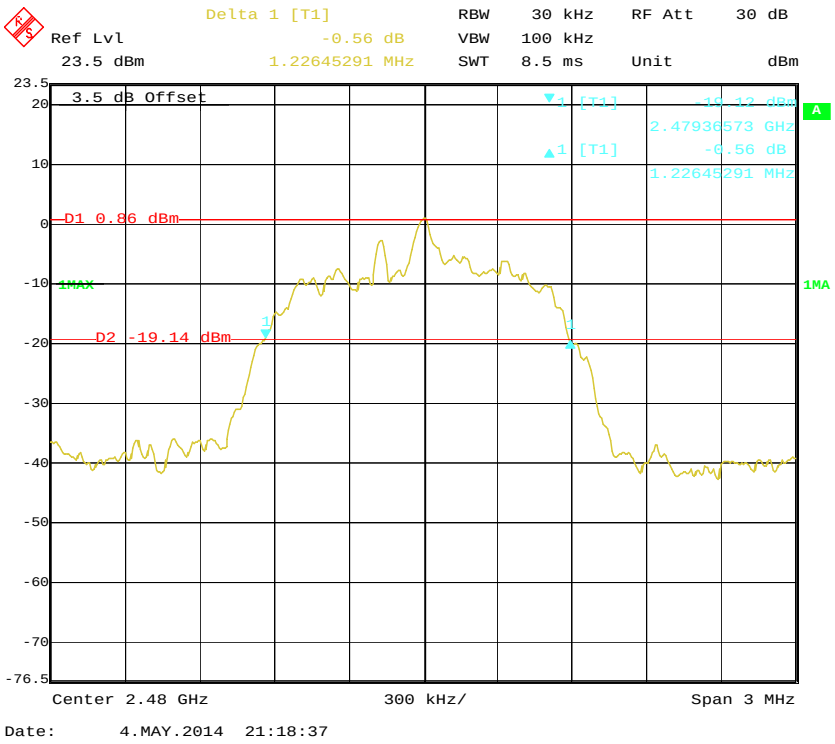
EDR (π/4-DQPSK): Low Channel



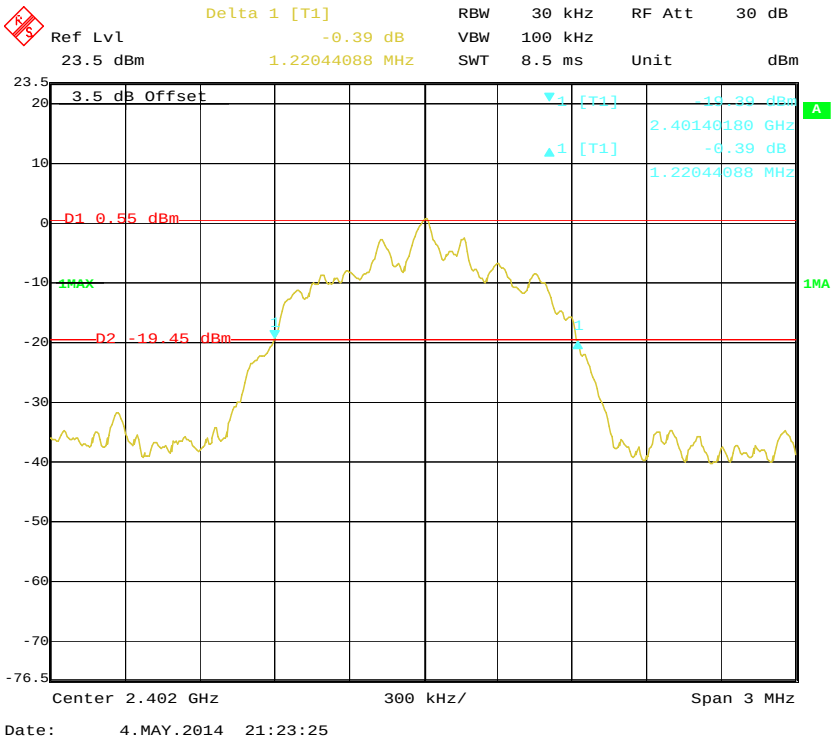
EDR (π/4-DQPSK): Middle Channel



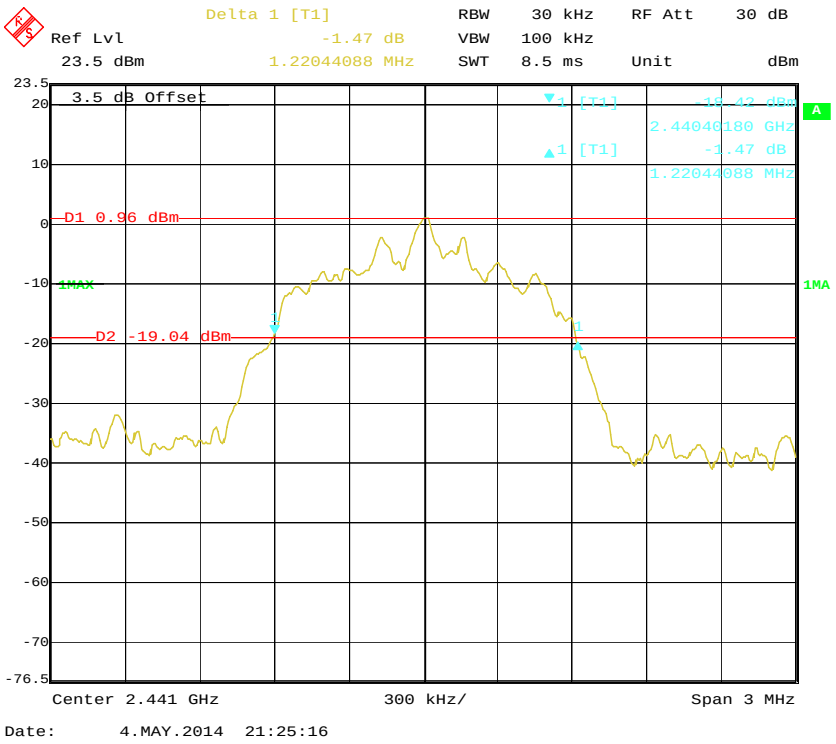
EDR (π/4-DQPSK): High Channel



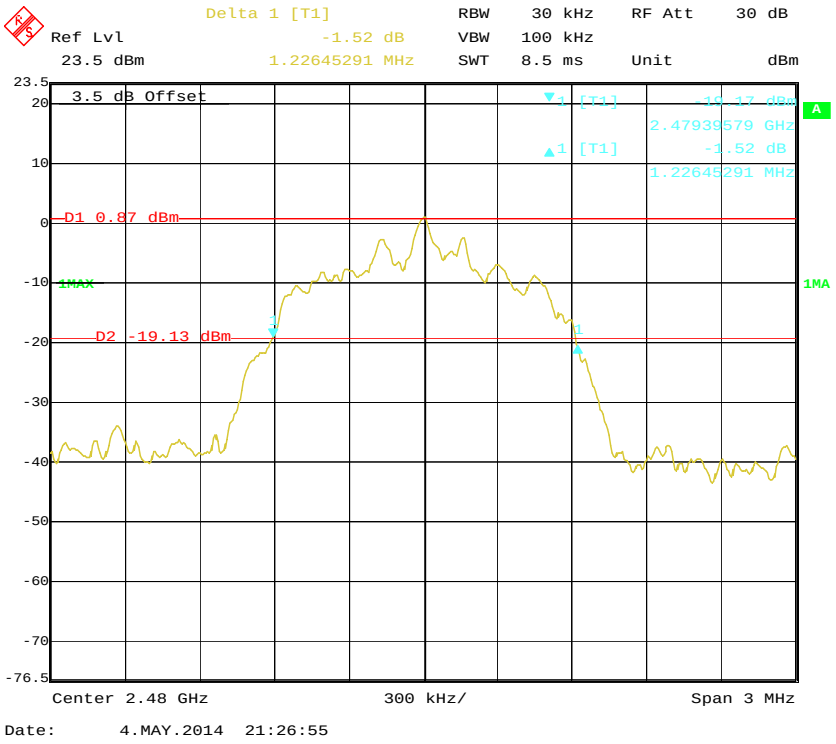
EDR (8DPSK): Low Channel



EDR (8DPSK): Middle Channel



EDR (8DPSK): High Channel



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

Applicable Standard

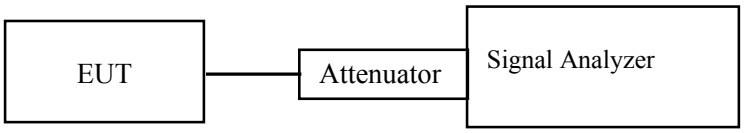
Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress 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
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2013-05-31	2014-05-31

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

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

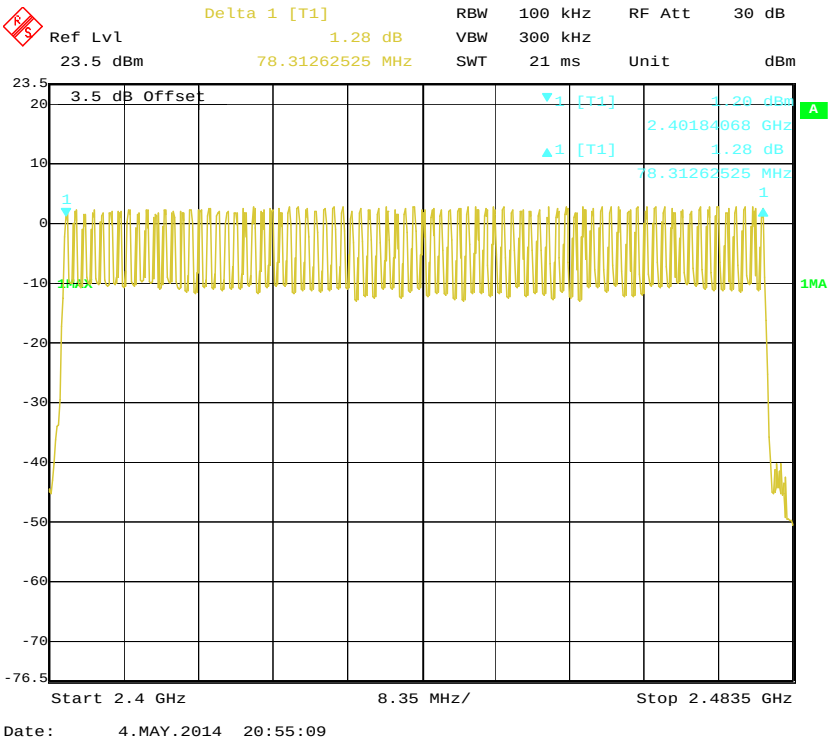
The testing was performed by Mike Hu on 2014-05-04.

EUT operation mode: Transmitting

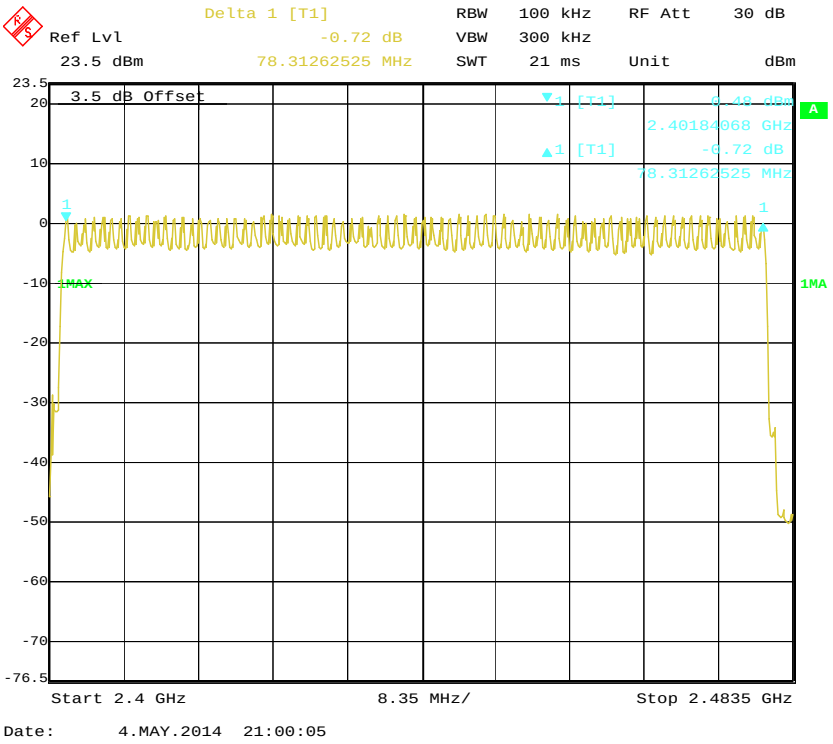
Test Result: Compliance. Please refer to following tables and plots

Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
BDR (GFSK)	2400-2483.5	79	≥15
EDR (π/4-DQPSK)	2400-2483.5	79	≥15
EDR (8DPSK)	2400-2483.5	79	≥15

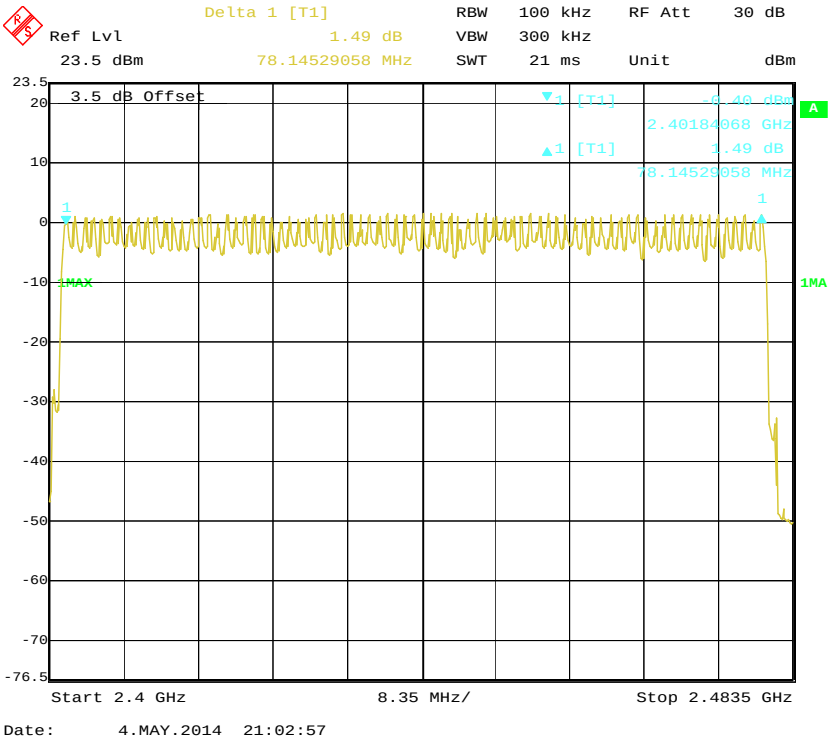
BDR (GFSK): Number of Hopping Channels



EDR (π/4-DQPSK): Number of Hopping Channels



EDR (8DPSK): Number of Hopping Channels



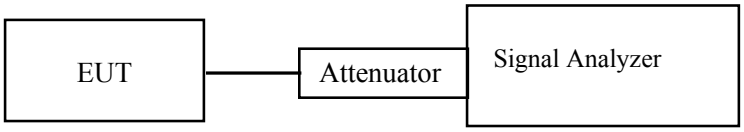
FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)

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 X channel no. (s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2013-05-31	2014-05-31

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

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Mike Hu on 2014-05-04.

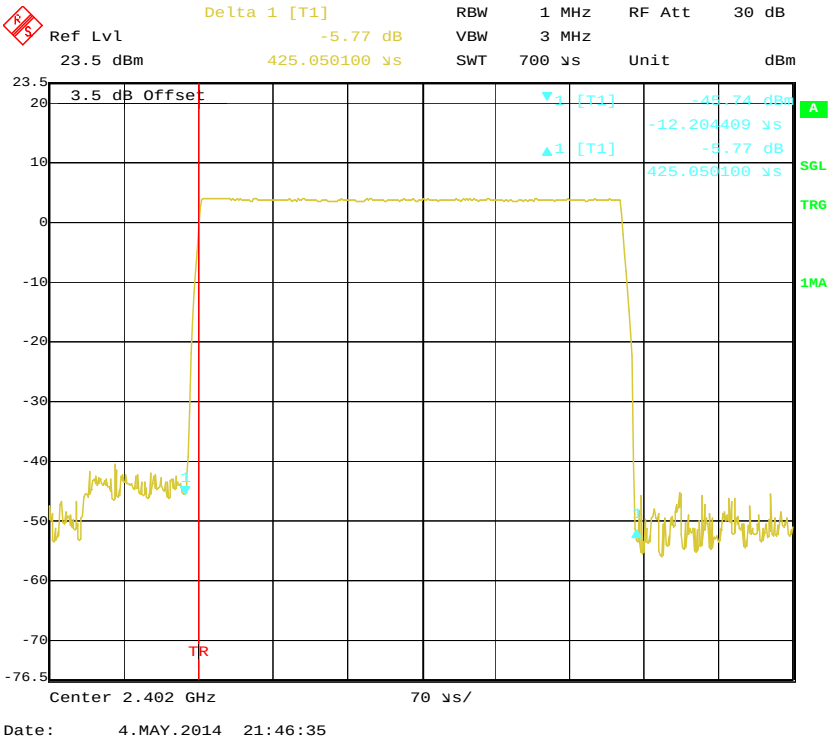
EUT operation mode: Transmitting

Test Result: Compliance. Please refer to following tables and plots

Mode		Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
BDR (GFSK)	DH1	Low	0.425	0.136	0.4	Pass
		Middle	0.425	0.136	0.4	Pass
		High	0.425	0.136	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH3	Low	1.689	0.270	0.4	Pass
		Middle	1.689	0.270	0.4	Pass
		High	1.689	0.270	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH5	Low	2.942	0.314	0.4	Pass
		Middle	2.942	0.314	0.4	Pass
		High	2.942	0.314	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR (π/4-DQPSK)	2DH1	Low	0.435	0.139	0.4	Pass
		Middle	0.435	0.139	0.4	Pass
		High	0.435	0.139	0.4	Pass
		Note: 2DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	2DH3	Low	1.695	0.271	0.4	Pass
		Middle	1.695	0.271	0.4	Pass
		High	1.695	0.271	0.4	Pass
		Note: 2DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	2DH5	Low	2.952	0.315	0.4	Pass
		Middle	2.952	0.315	0.4	Pass
		High	2.952	0.315	0.4	Pass
		Note: 2DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR (8DPSK)	3DH1	Low	0.435	0.139	0.4	Pass
		Middle	0.435	0.139	0.4	Pass
		High	0.435	0.139	0.4	Pass
		Note: 3DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	3DH3	Low	1.695	0.271	0.4	Pass
		Middle	1.695	0.271	0.4	Pass
		High	1.695	0.271	0.4	Pass
		Note: 3DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	3DH5	Low	2.952	0.315	0.4	Pass
		Middle	2.952	0.315	0.4	Pass
		High	2.952	0.315	0.4	Pass
		Note: 3DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				

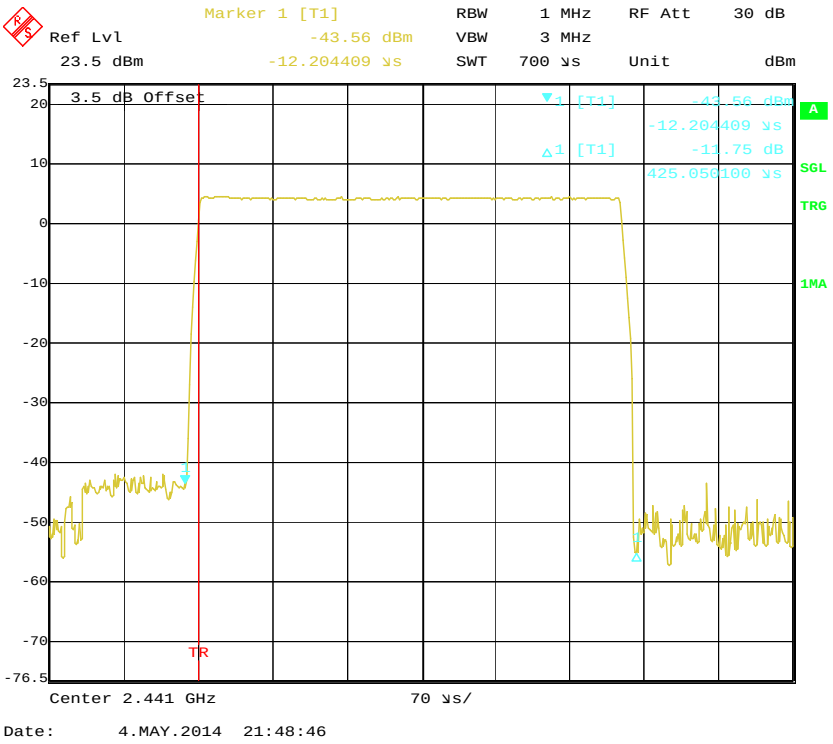
BDR (GFSK):

Pulse time, Low Channel, DH1



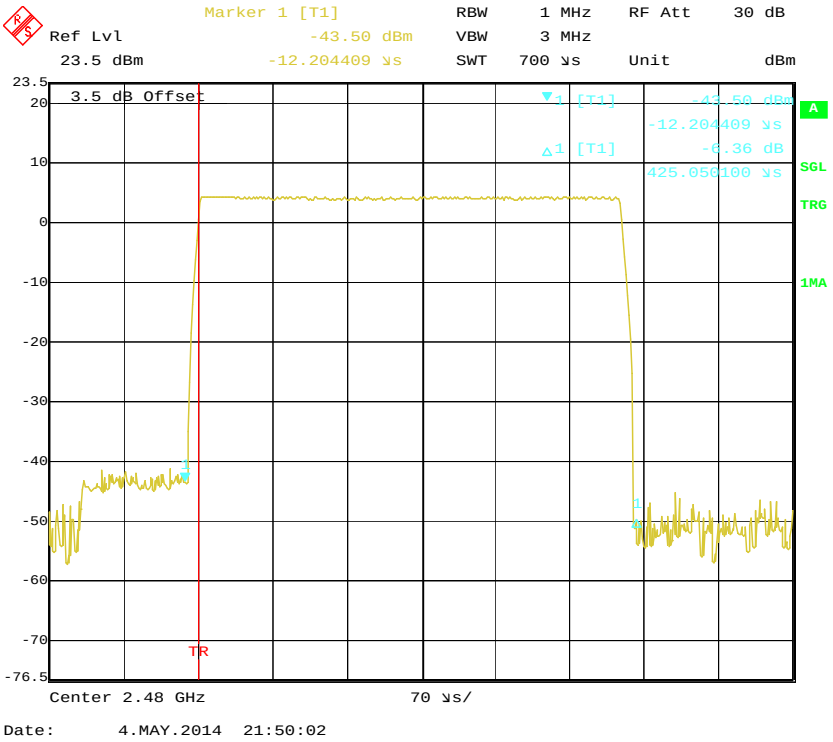
Date: 4.MAY.2014 21:46:35

Pulse time, Middle Channel, DH1

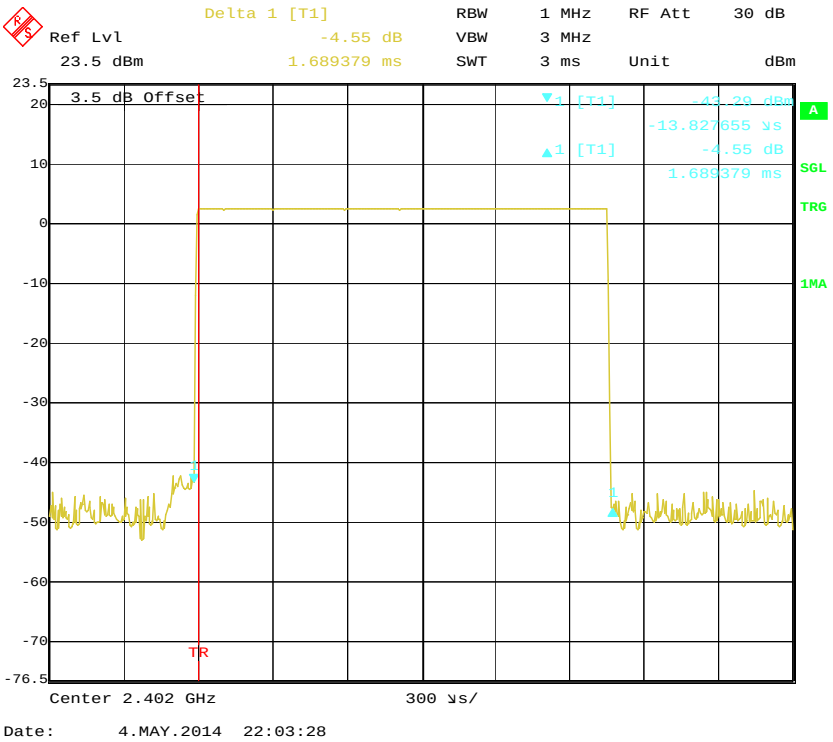


Date: 4.MAY.2014 21:48:46

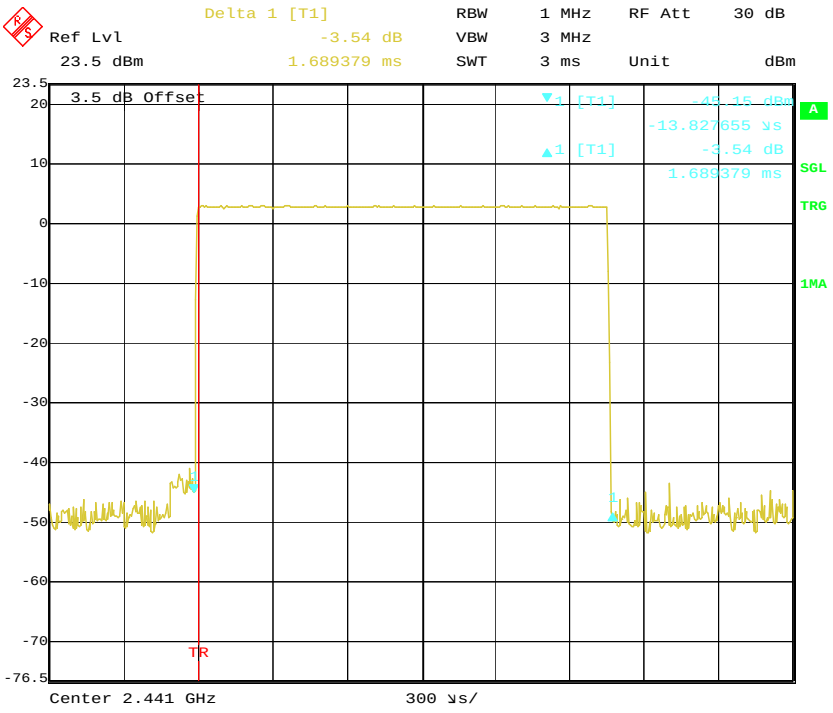
Pulse time, High Channel, DH1



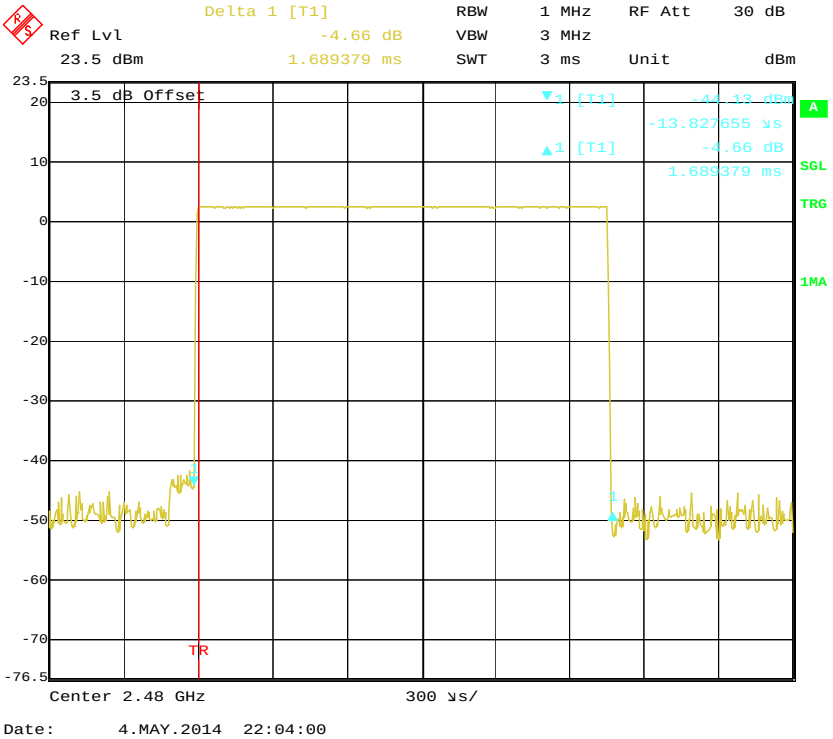
Pulse time, Low Channel, DH3



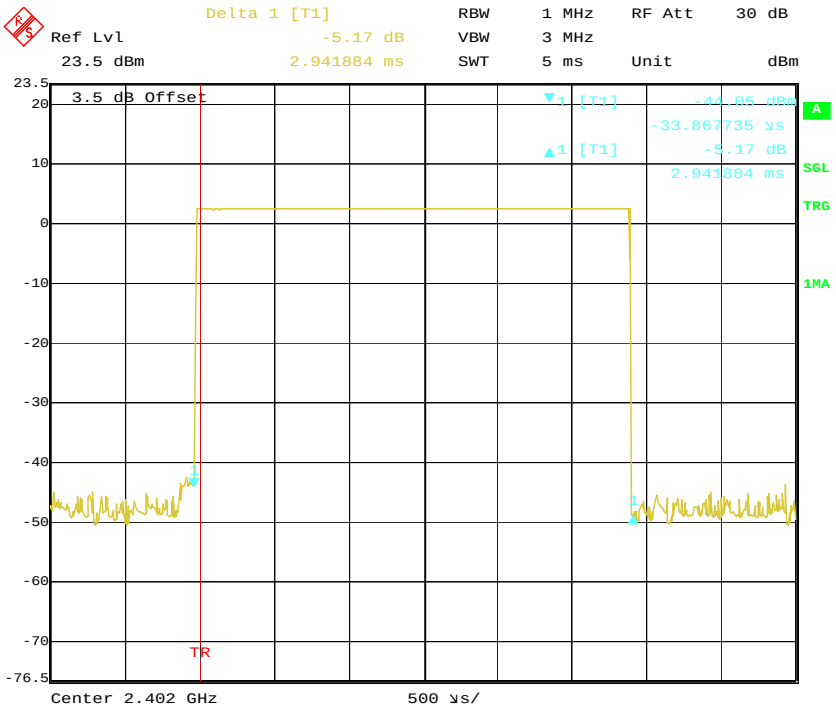
Pulse time, Middle Channel, DH3



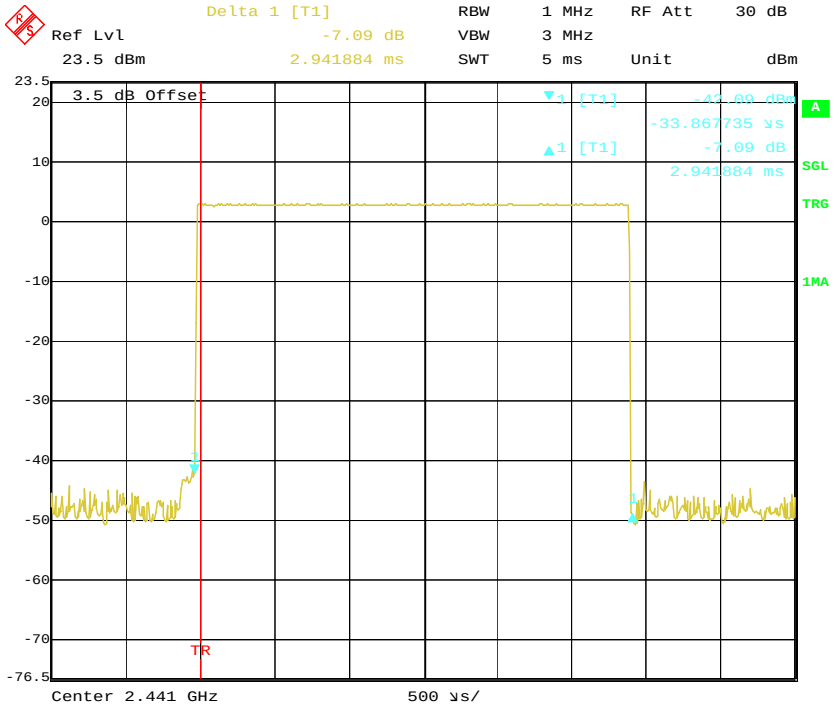
Pulse time, High Channel, DH3



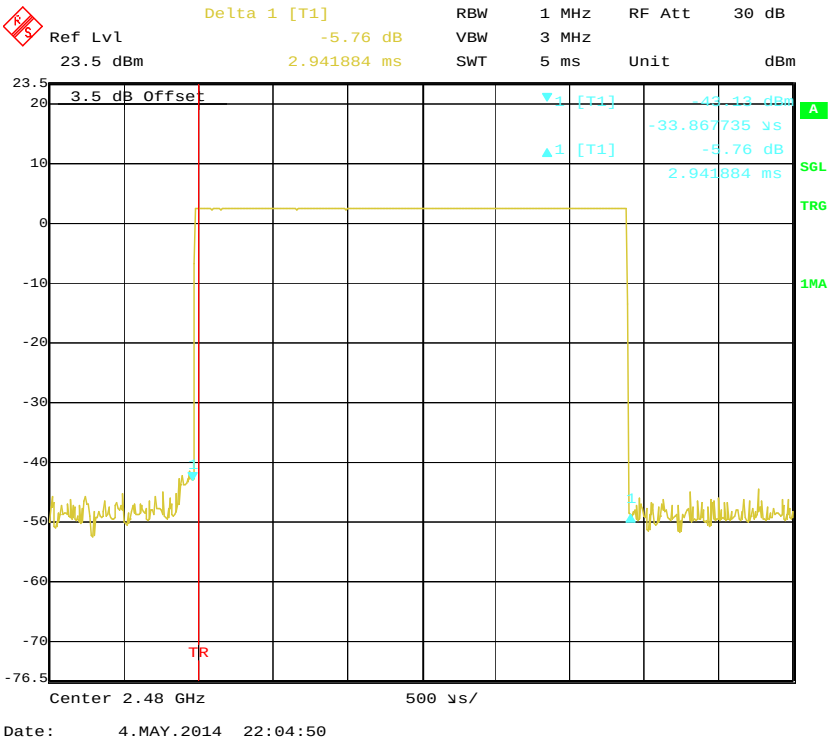
Pulse time, Low Channel, DH5



Pulse time, Middle Channel, DH5

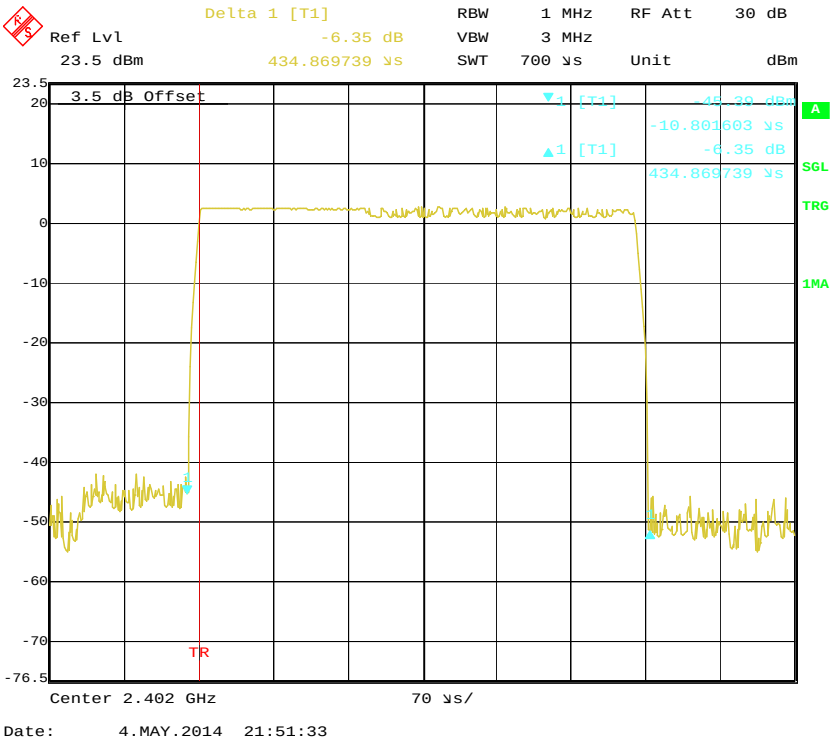


Pulse time, High Channel, DH5

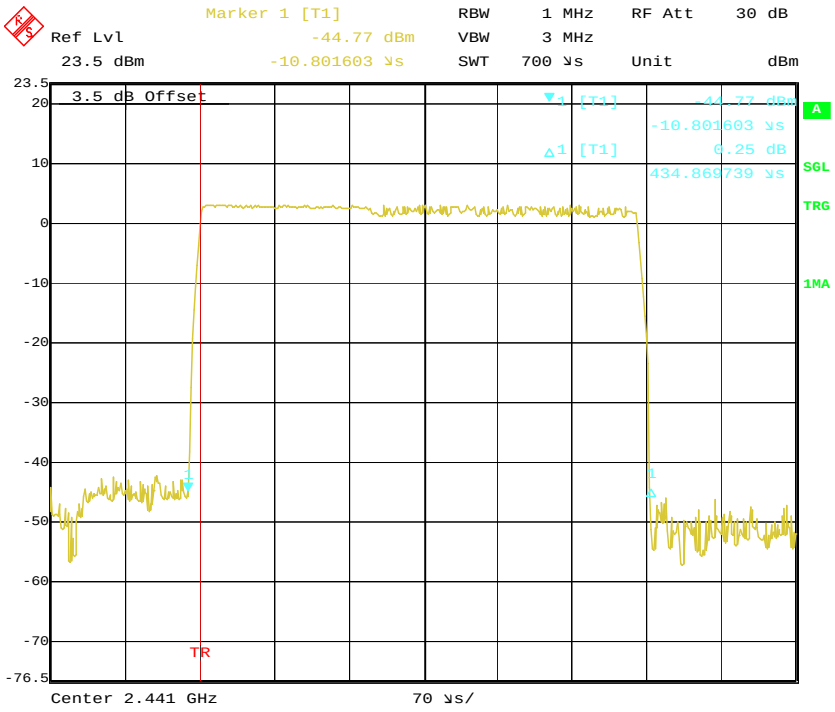


EDR (π/4-DQPSK):

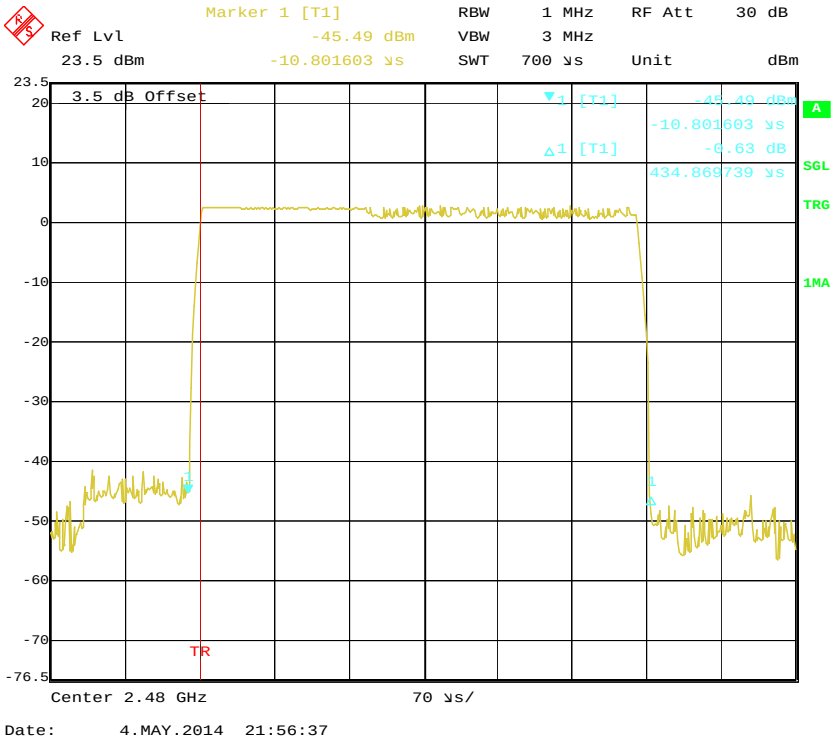
Pulse time, Low Channel, 2DH1



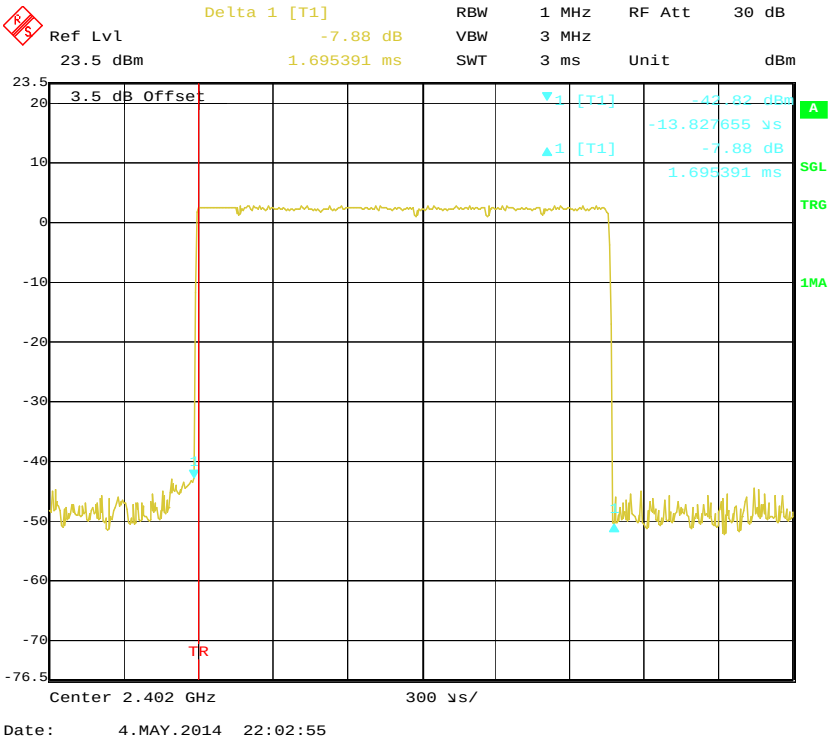
Pulse time, Middle Channel, 2DH1



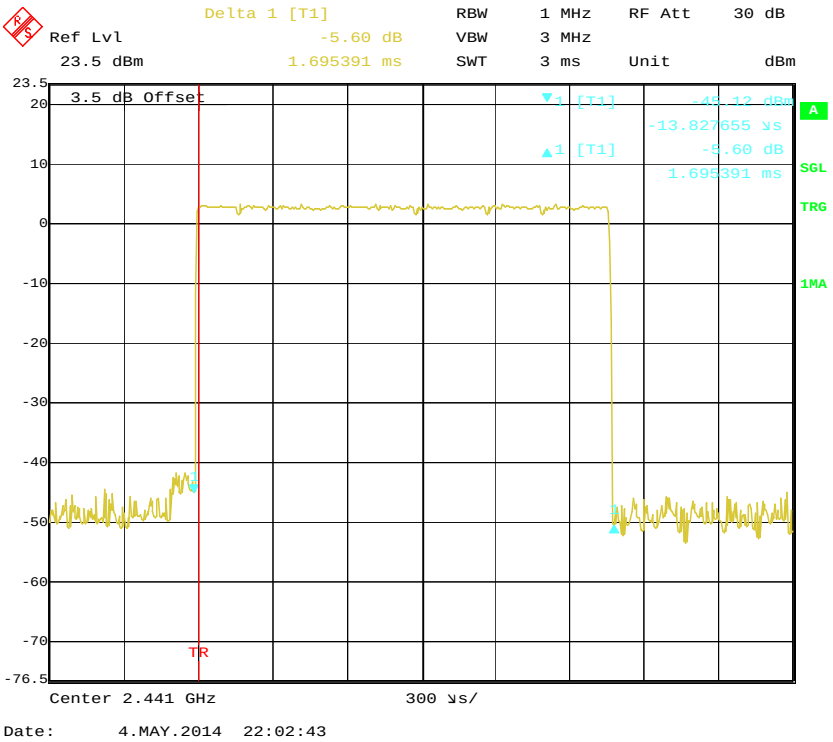
Pulse time, High Channel, 2DH1



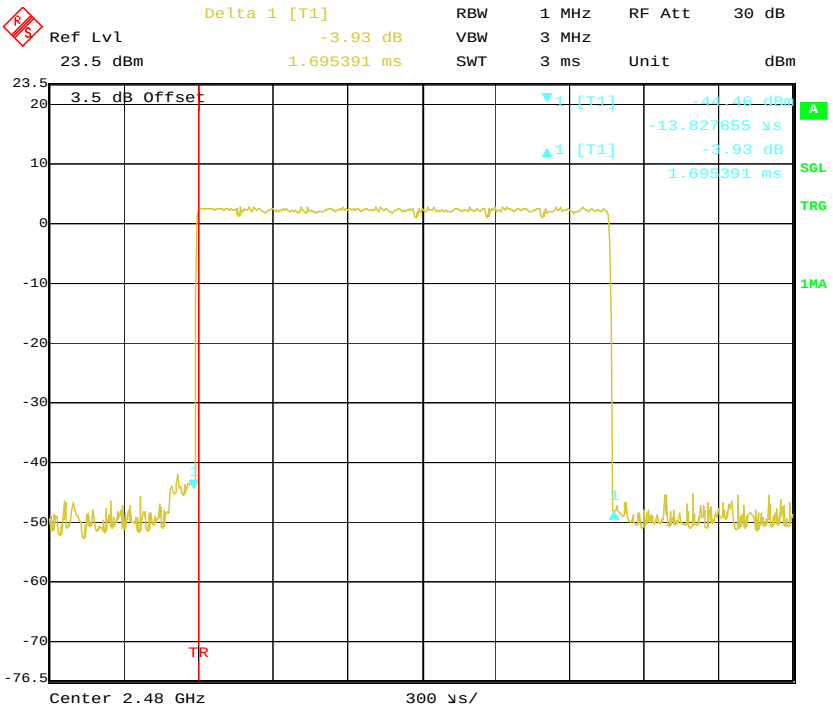
Pulse time, Low Channel, 2DH3



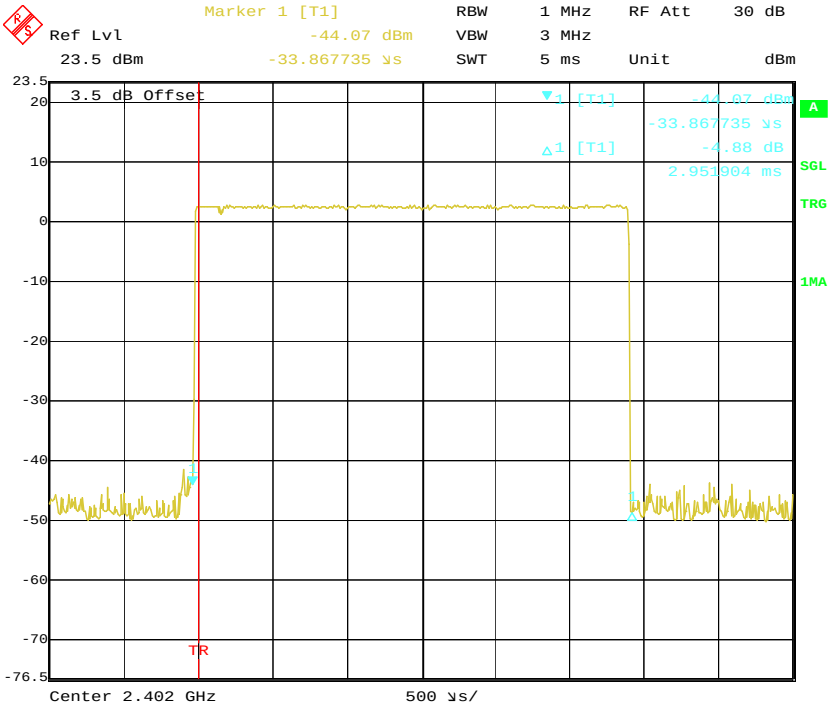
Pulse time, Middle Channel, 2DH3



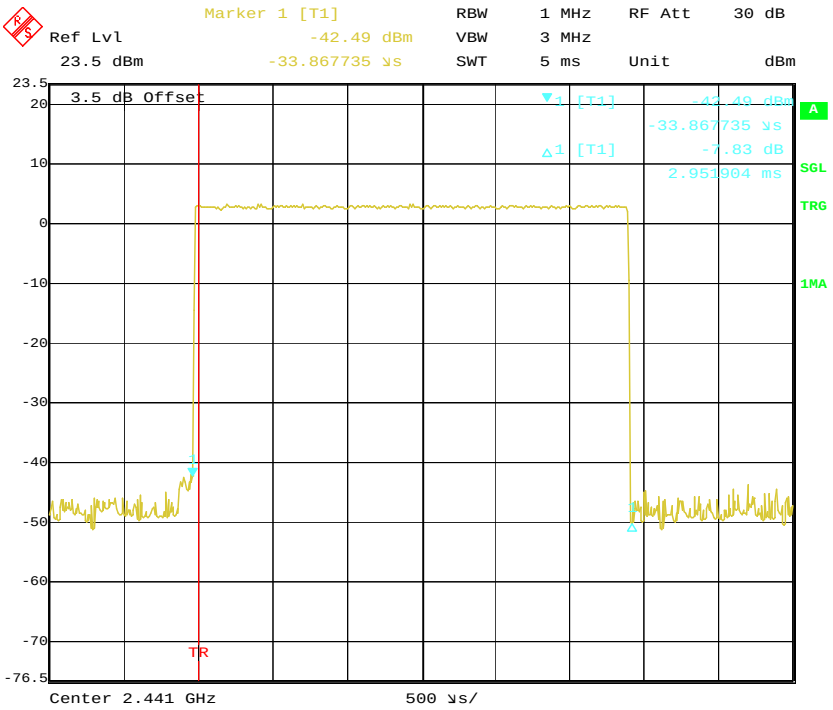
Pulse time, High Channel, 2DH3



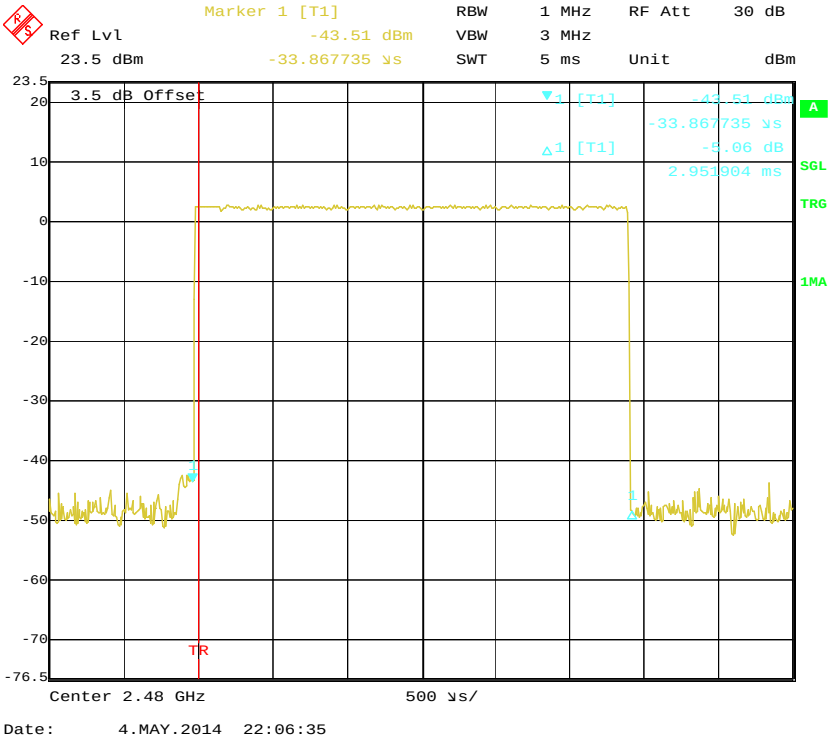
Pulse time, Low Channel, 2DH5



Pulse time, Middle Channel, 2DH5

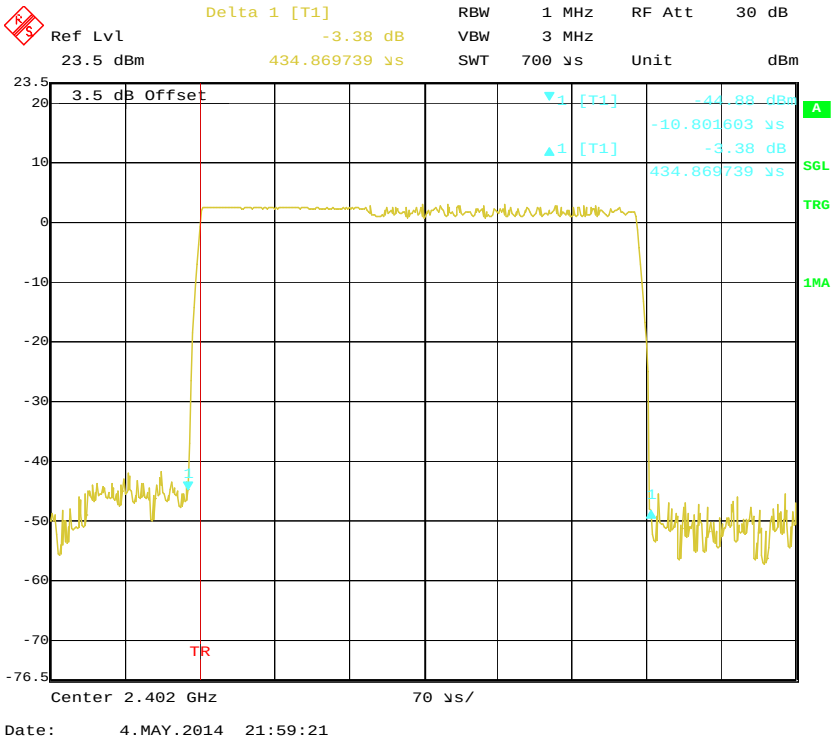


Pulse time, High Channel, 2DH5

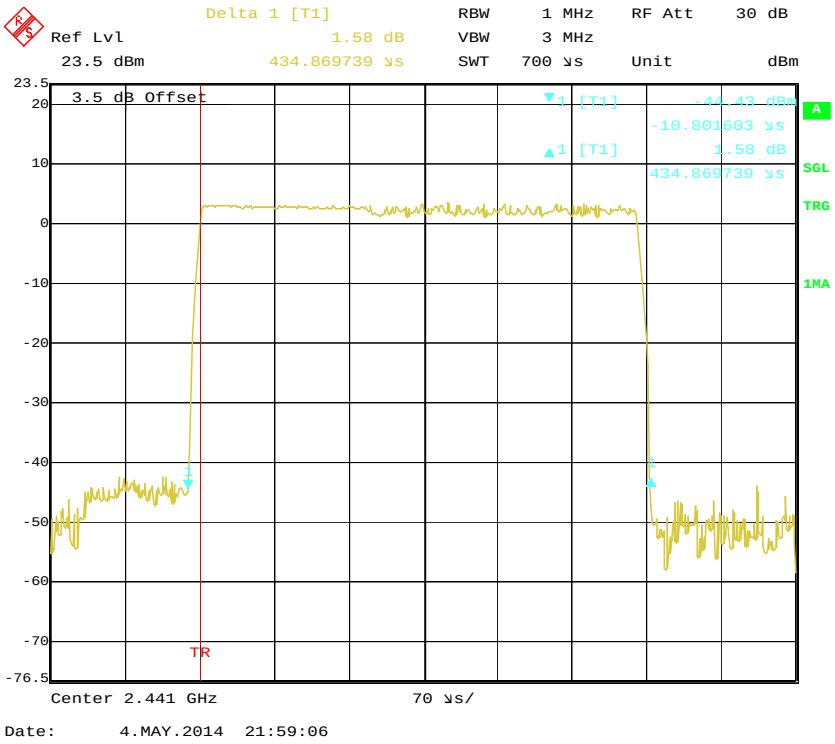


EDR (8DPSK):

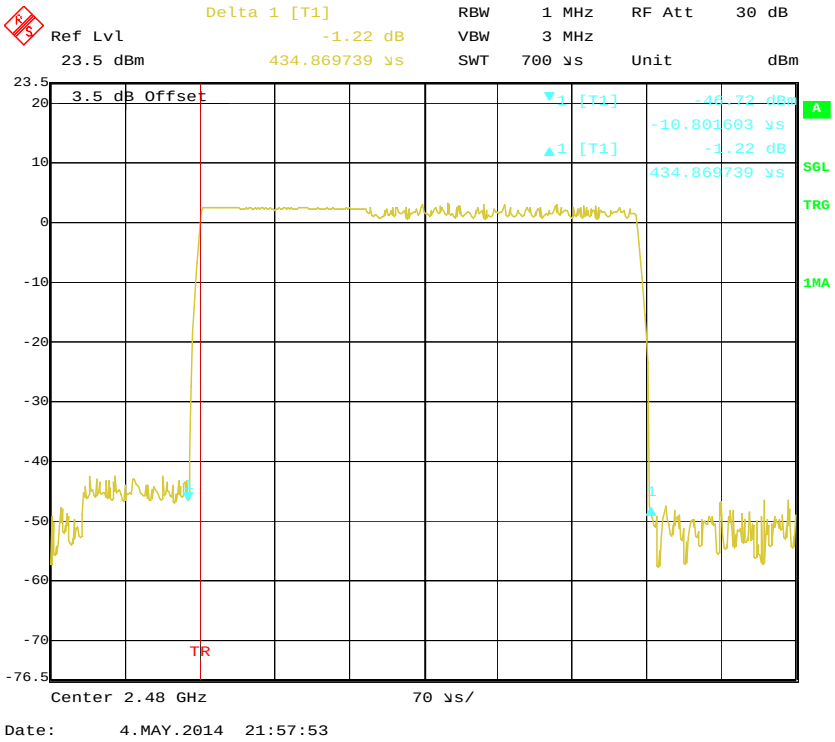
Pulse time, Low Channel, 3DH1



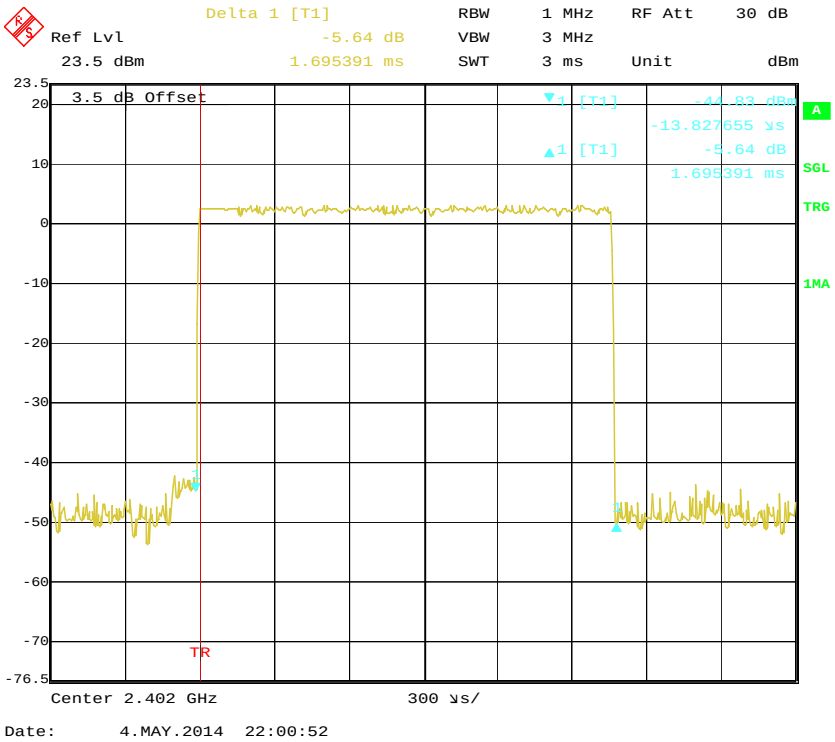
Pulse time, Middle Channel, 3DH1



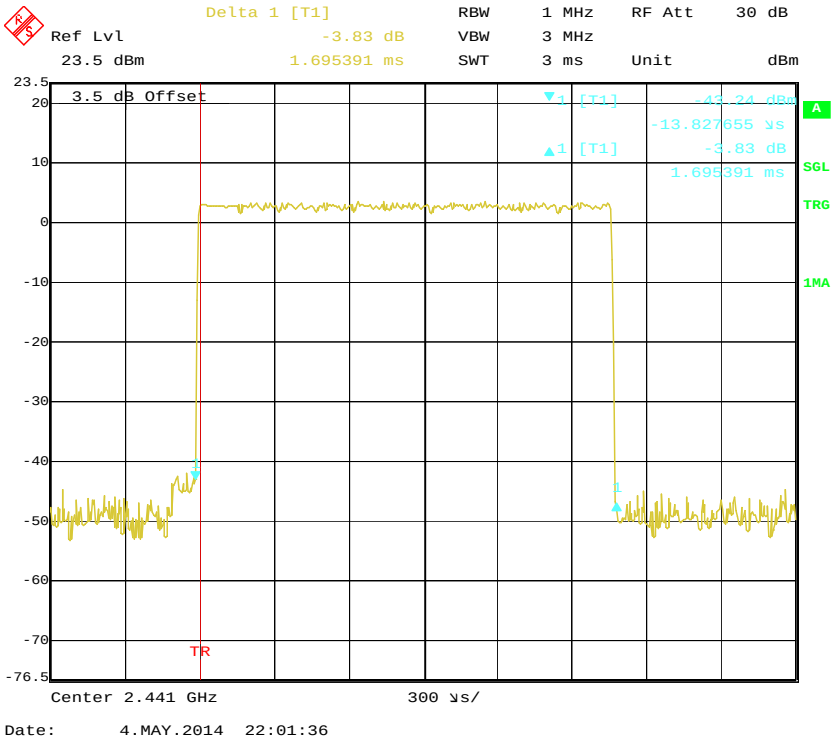
Pulse time, High Channel, 3DH1



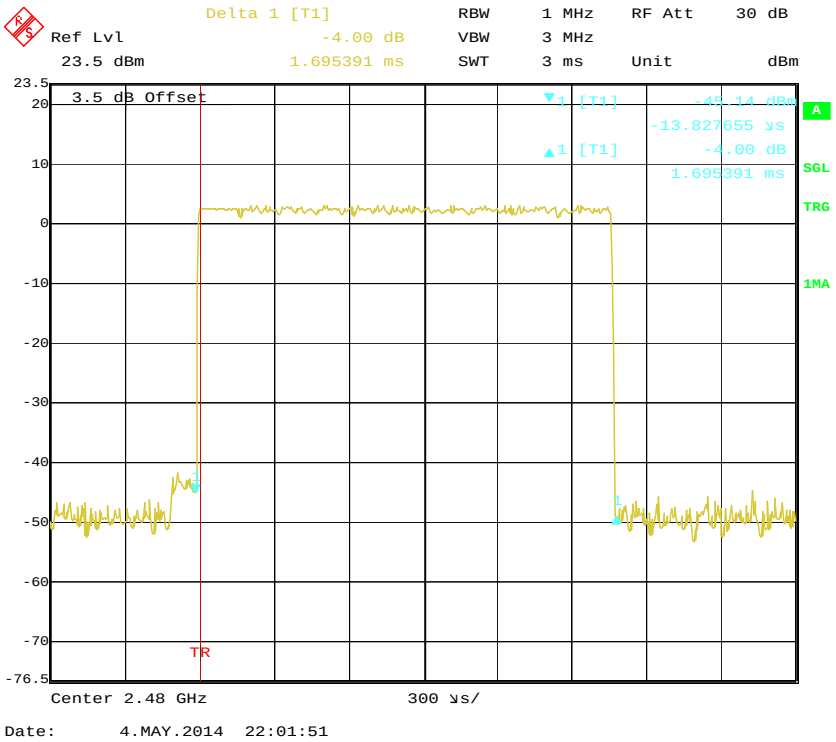
Pulse time, Low Channel, 3DH3



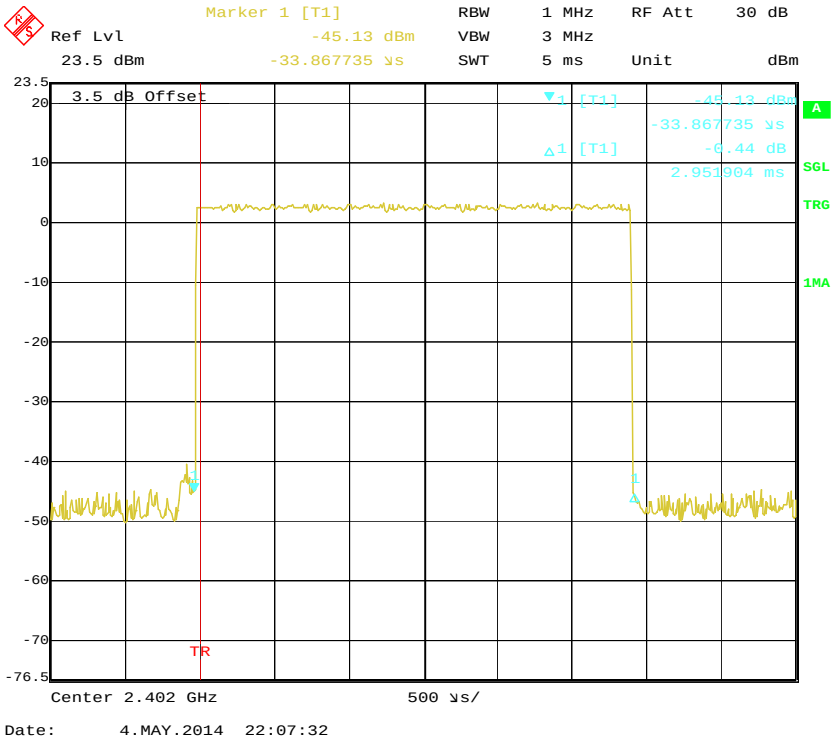
Pulse time, Middle Channel, 3DH3



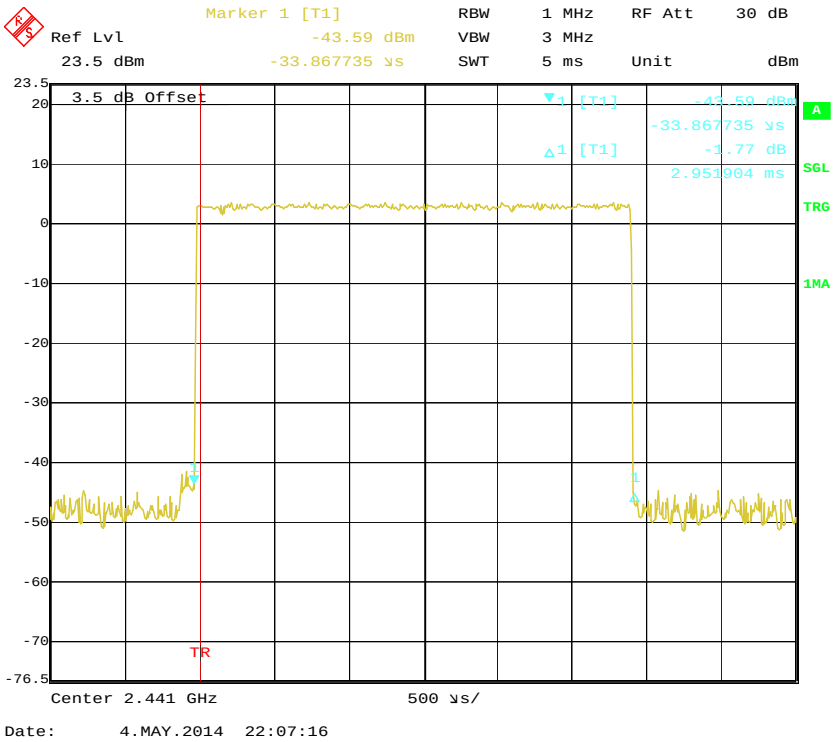
Pulse time, High Channel, 3DH3



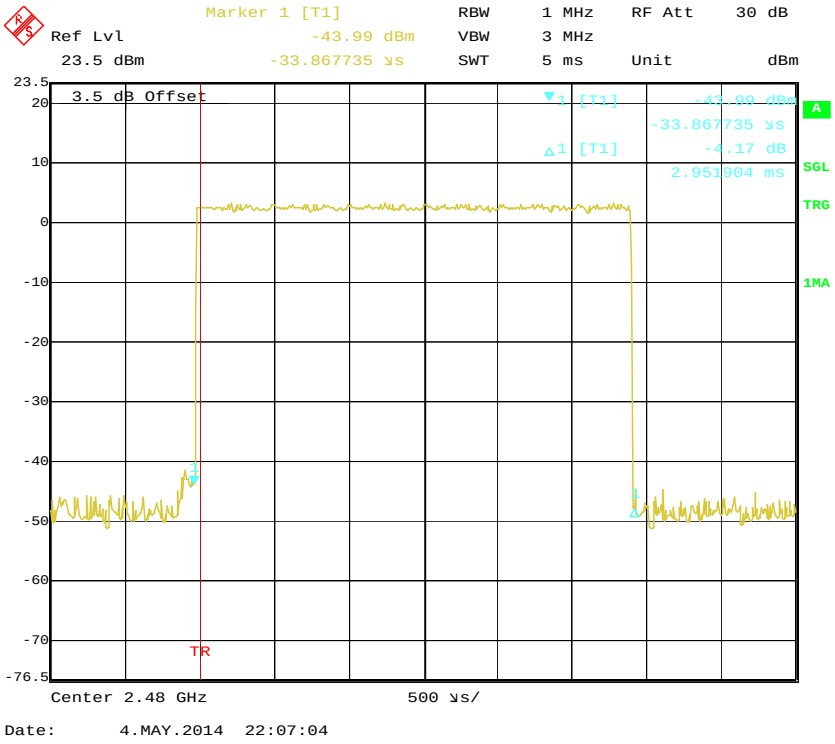
Pulse time, Low Channel, 3DH5



Pulse time, Middle Channel, 3DH5



Pulse time, High Channel, 3DH5



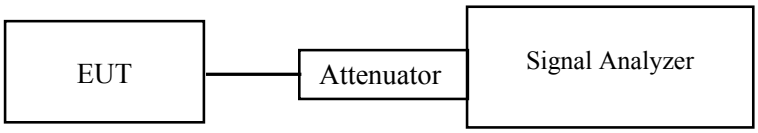
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

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. And 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
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2013-05-31	2014-05-31

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

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

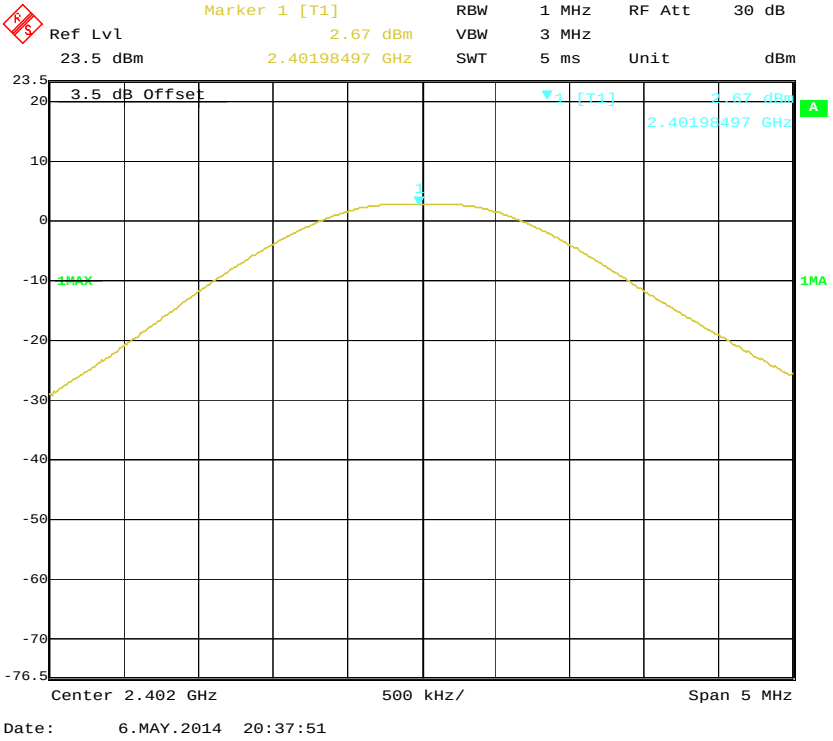
The testing was performed by Mike Hu on 2014-05-06.

EUT operation mode: Transmitting

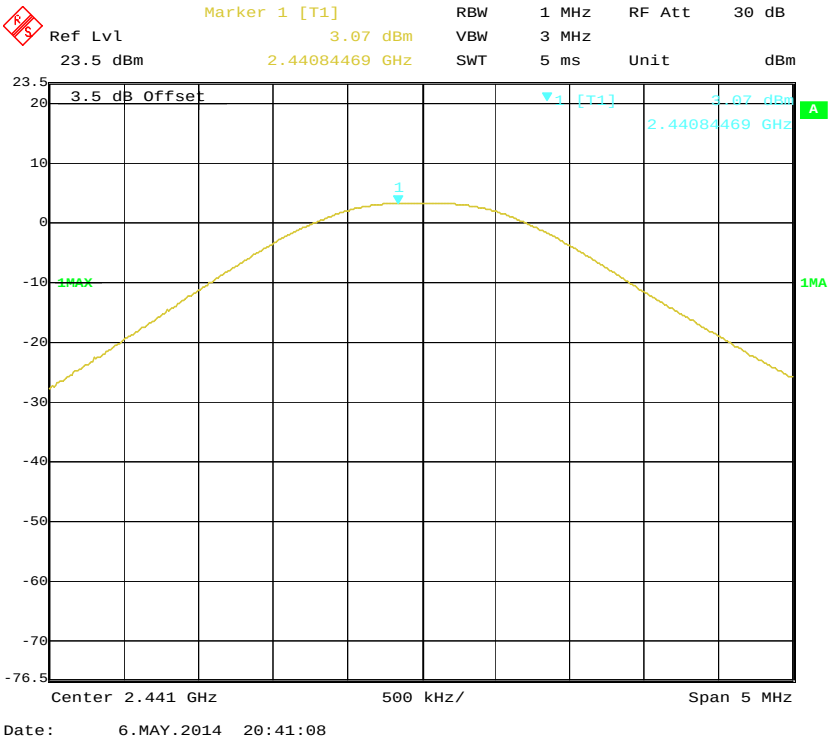
Test Result: Compliance. Please refer to following tables and plots

Mode	Channel	Frequency (MHz)	Peak Output Power		Limit (mW)
			(dBm)	(mW)	
BDR (GFSK)	Low	2402	2.67	1.85	1000
	Middle	2441	3.07	2.03	1000
	High	2480	3.31	2.14	1000
EDR (π/4-DQPSK)	Low	2402	2.09	1.62	1000
	Middle	2441	2.50	1.78	1000
	High	2480	2.60	1.82	1000
EDR (8DPSK)	Low	2402	2.25	1.68	1000
	Middle	2441	2.76	1.89	1000
	High	2480	2.88	1.94	1000

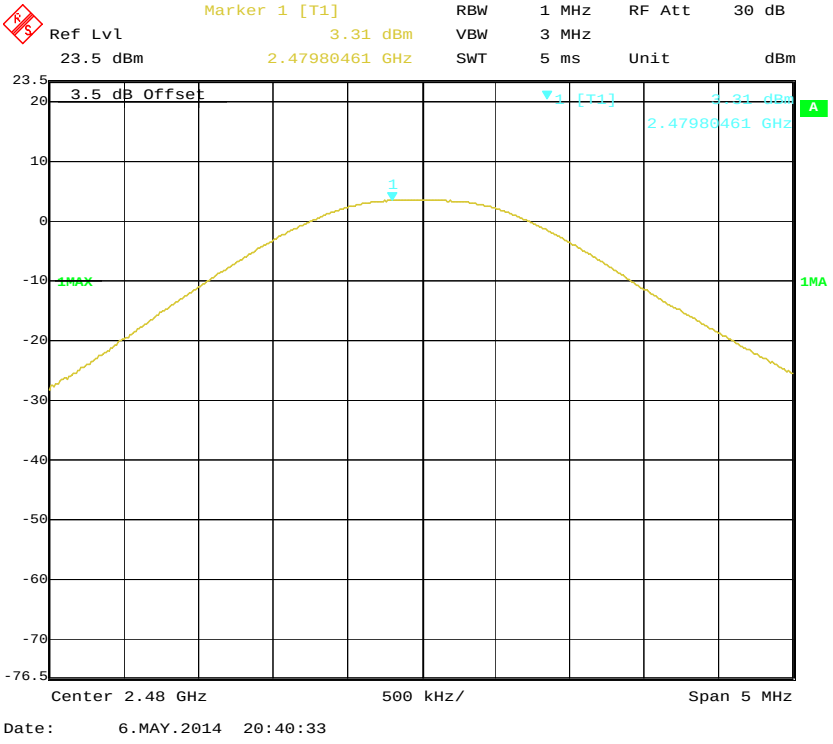
BDR (GFSK): Low Channel



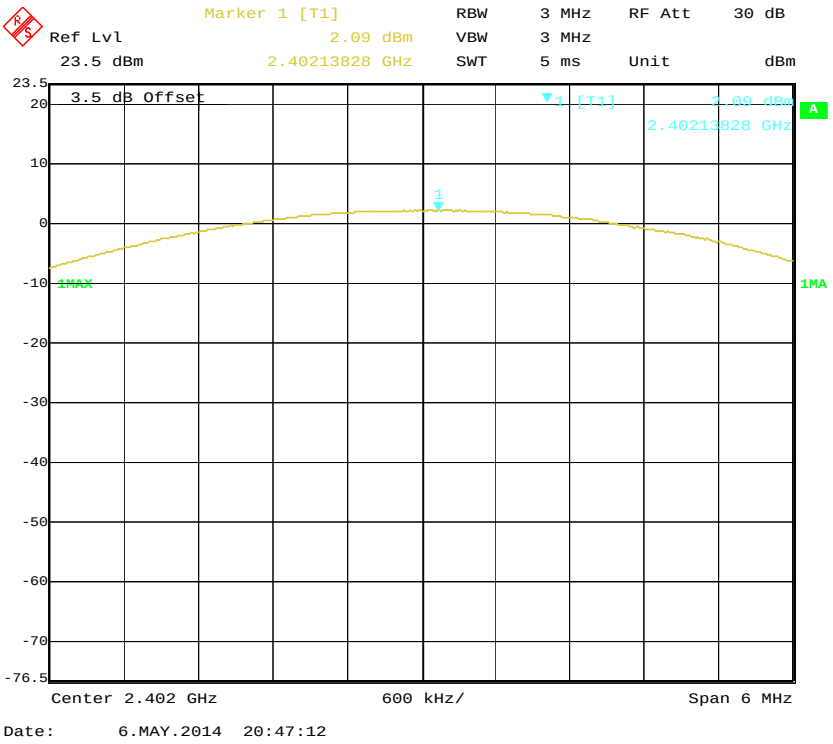
BDR (GFSK): Middle Channel



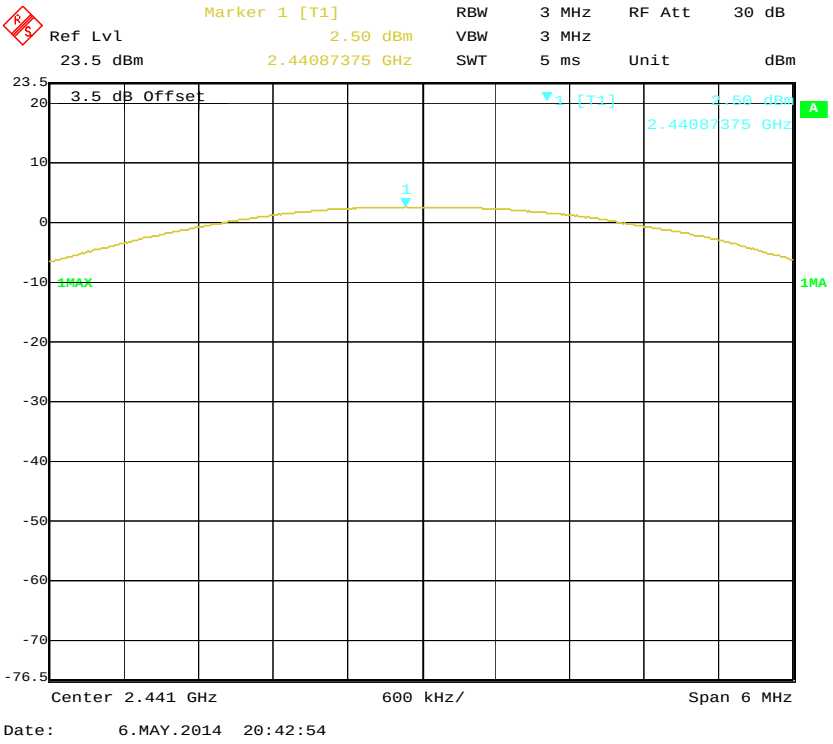
BDR (GFSK): High Channel



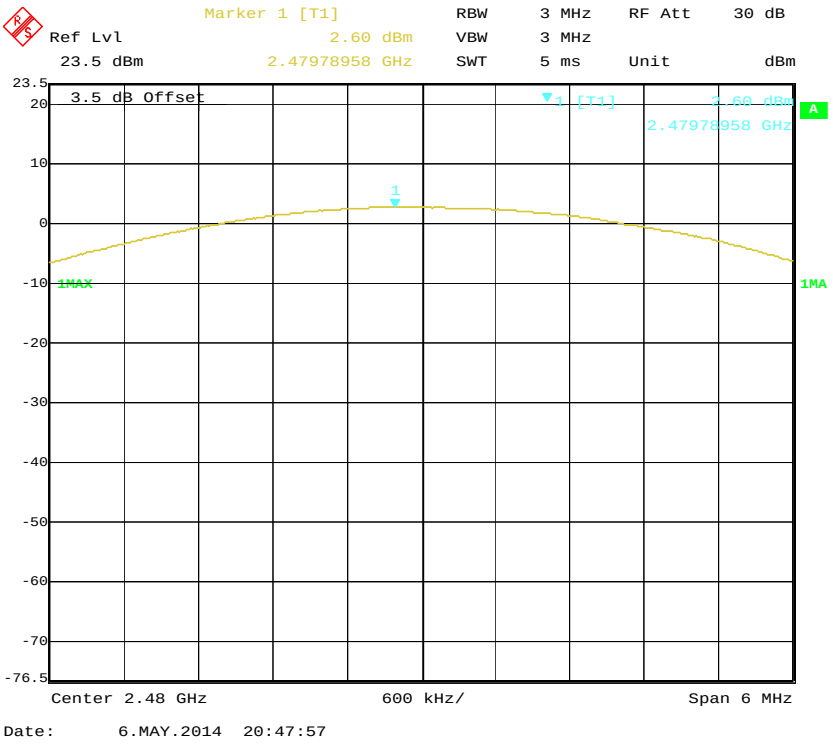
EDR(π/4-DQPSK): Low Channel



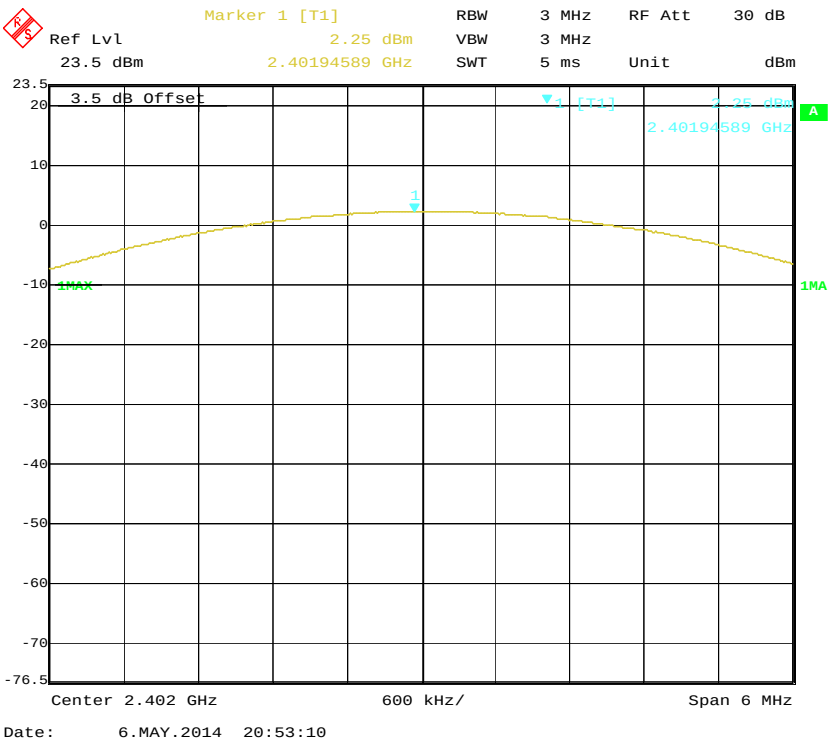
EDR(π/4-DQPSK): Middle Channel



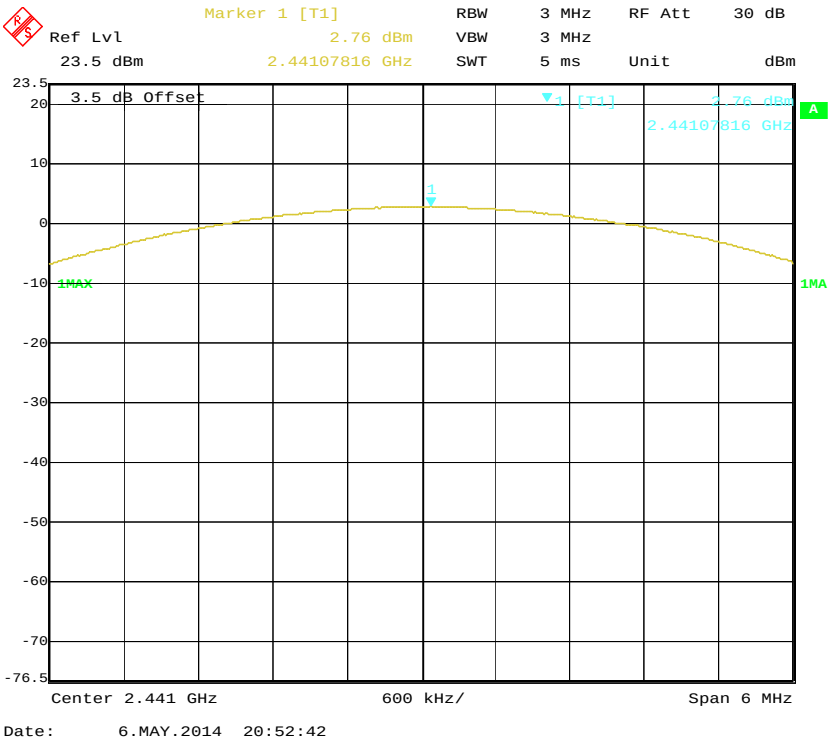
EDR(π/4-DQPSK): High Channel



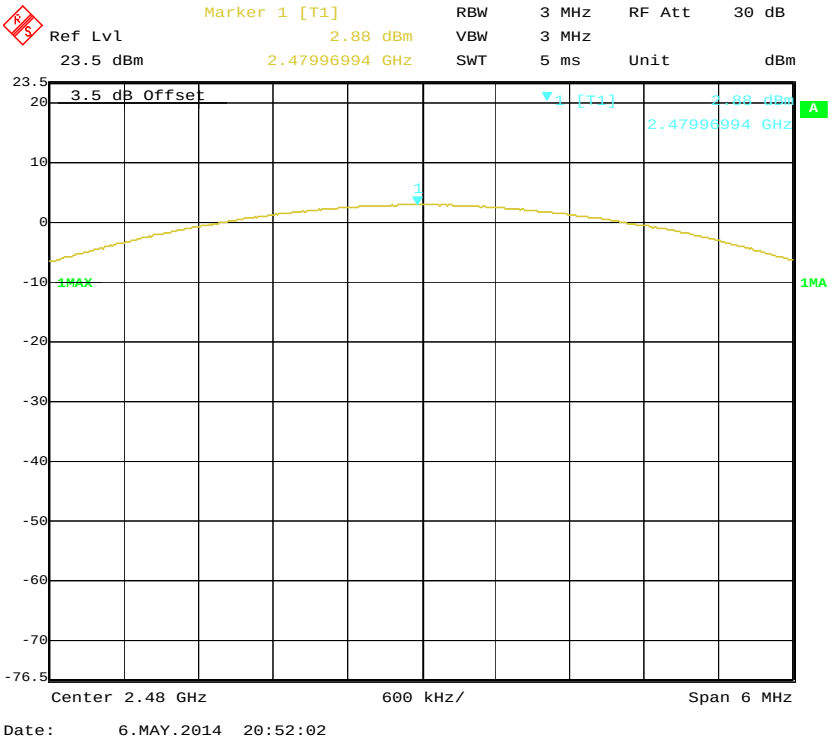
EDR(8DPSK): Low Channel



EDR(8DPSK): Middle Channel



EDR(8DPSK): High Channel



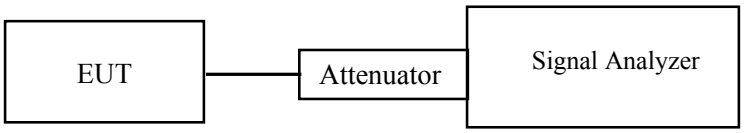
FCC §15.247(d) - BAND EDGES TESTING

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 RBW 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
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2013-05-31	2014-05-31

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

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

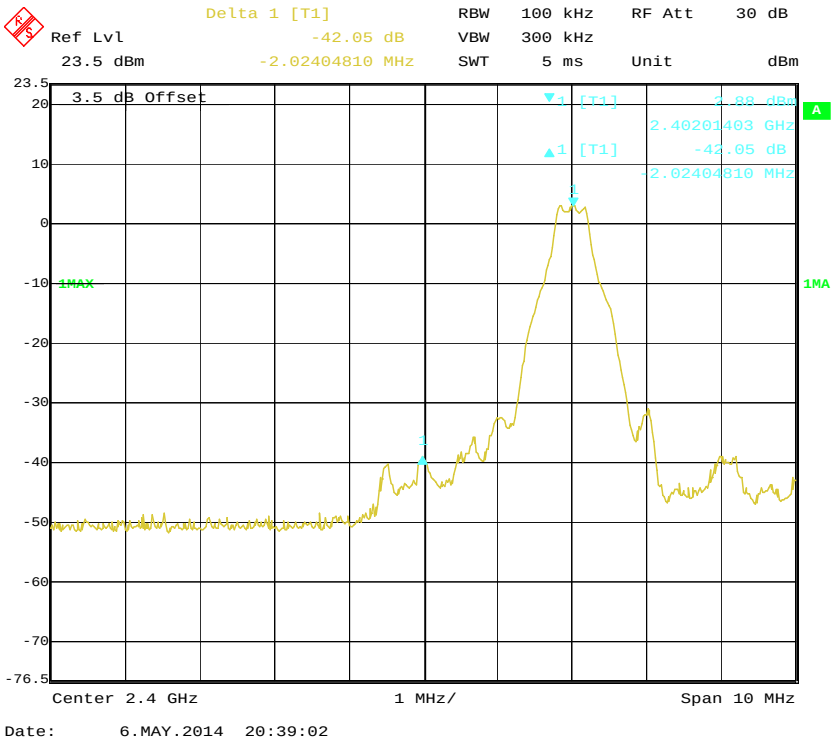
The testing was performed by Mike Hu on 2014-05-06.

EUT operation mode: Transmitting

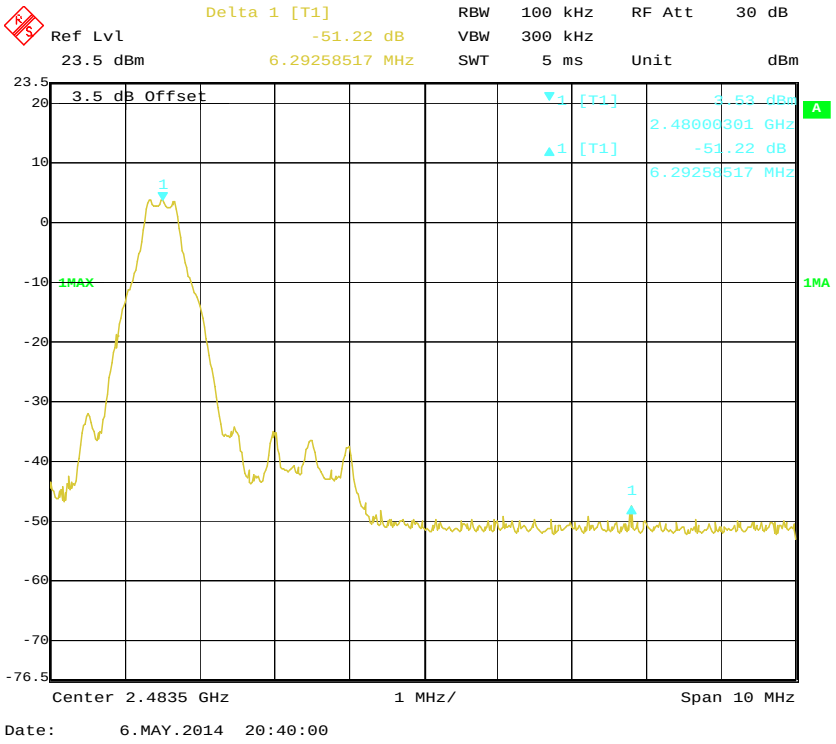
Test Result: Compliance. Please refer to following table and plots.

Mode	Band edges	Delta Peak to Band Emission (dBc)	Limit (dBc)
BDR (GFSK)	Left Side	42.05	20
	Right Side	51.22	20
EDR (π/4-DQPSK)	Left Side	45.67	20
	Right Side	51.54	20
EDR (8DPSK)	Left Side	46.23	20
	Right Side	51.10	20

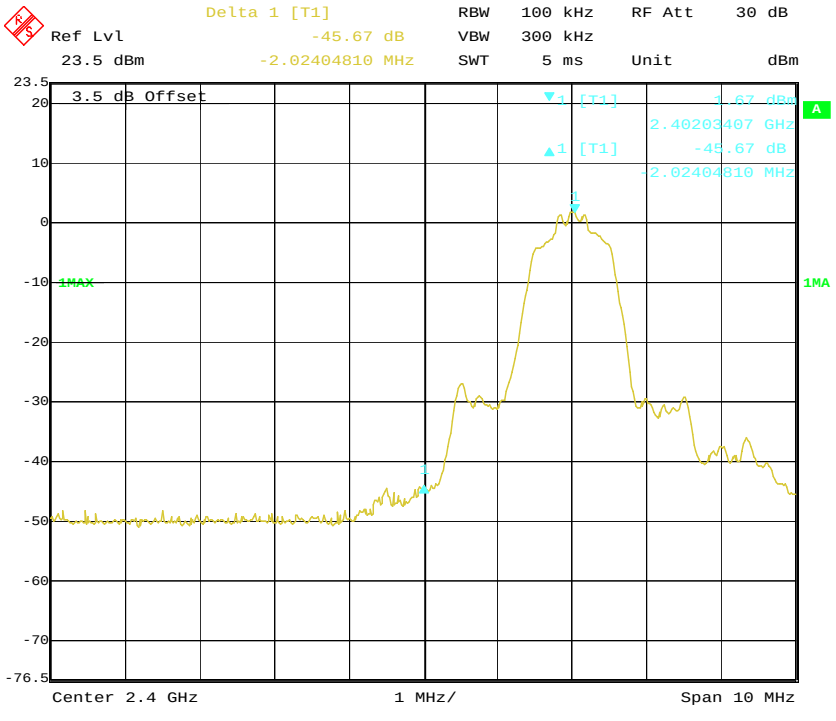
BDR (GFSK): Band Edge-Left Side



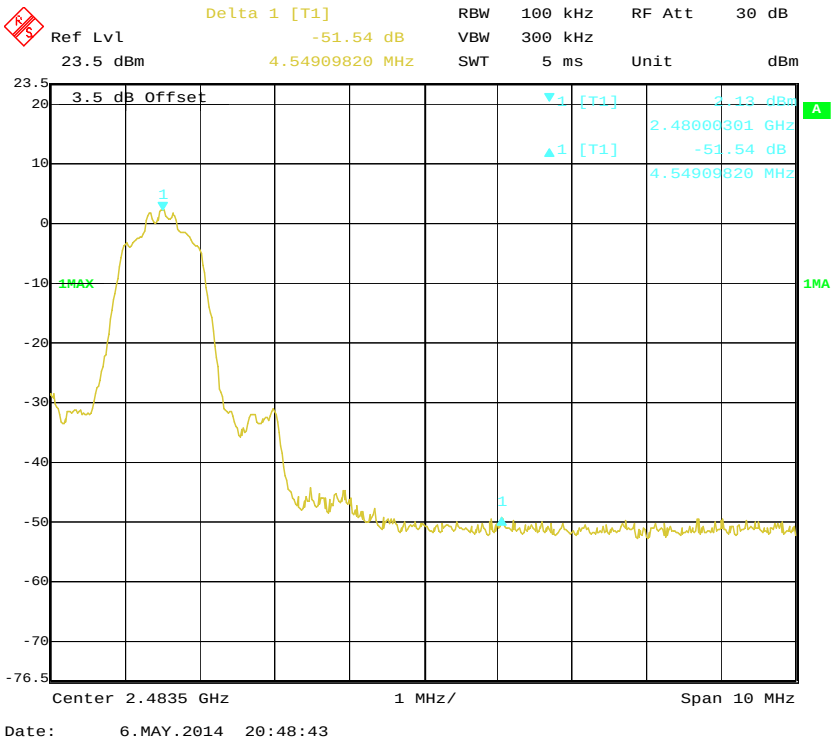
BDR (GFSK): Band Edge-Right Side



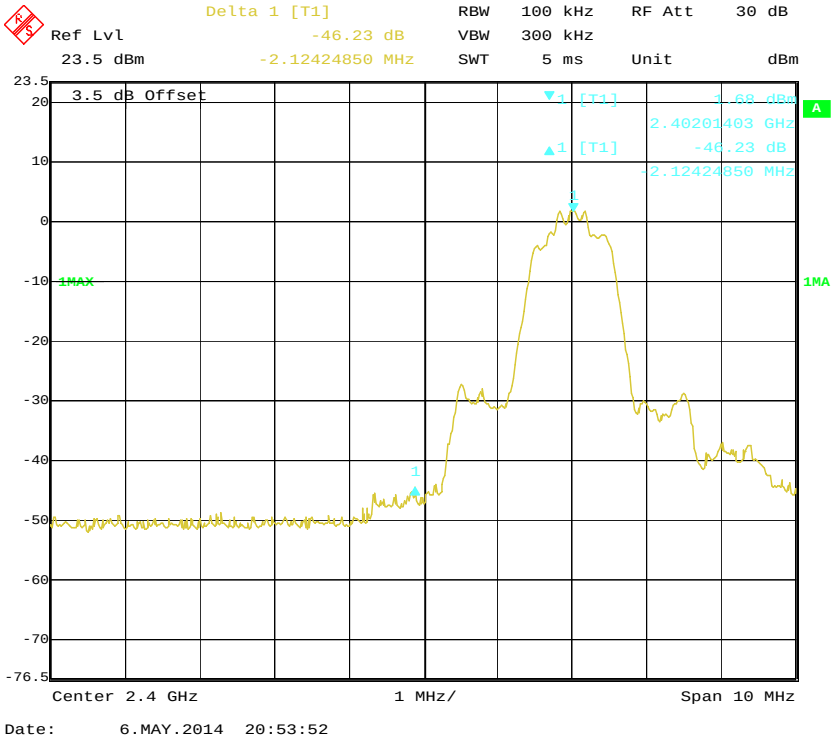
EDR (π/4-DQPSK): Band Edge-Left Side



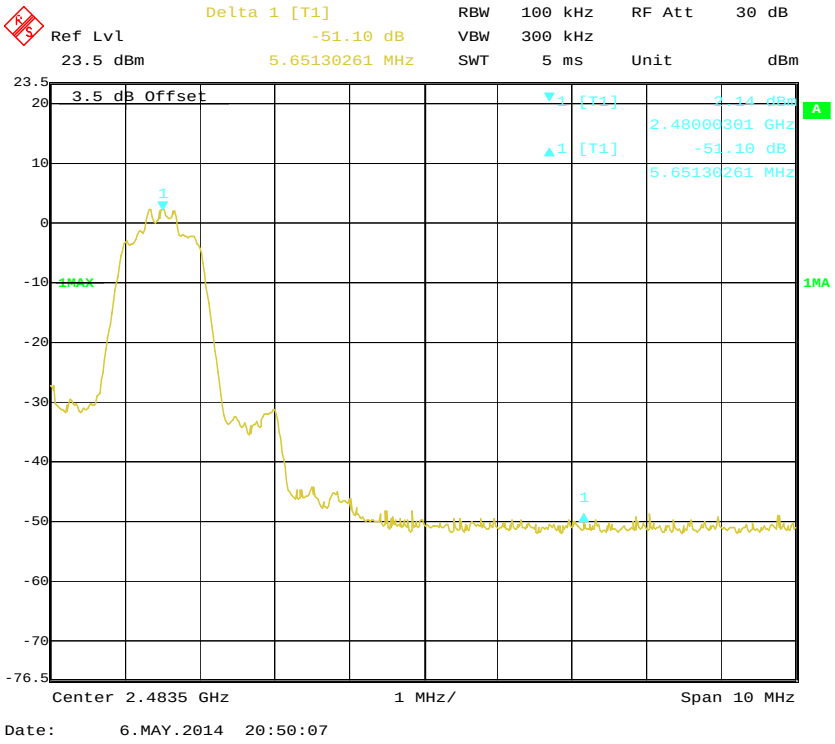
EDR (π/4-DQPSK): Band Edge-Right Side



EDR (8DPSK): Band Edge-Left Side



BDR (8DPSK): Band Edge-Right Side



PRODUCT SIMILARITY DECLARATION LETTER

Cetis, Inc.
Address: 5025 Galley Road, Colorado Springs CO, 80915, USA
Tel: 719-638-8821 Fax: 719-638-8815

8/1/14

Product Similarity Declaration

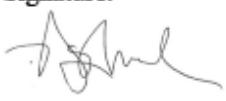
To Whom It May Concern,

We, Cetis,Inc., hereby declare that we have a product named as Corded telephone with BT &WIFI function (Model number: M200BW10) was tested by BACL, meanwhile, for our marketing purpose, we would like to list a series models (M100BW5,M100BW10, M 200BW5, M200BW10) on reports and certificate, all the models are identical schematics, except for the differences as below,

Trade name	Model no.	Description
Cetis	M100BW5	5 storage area with single line
Cetis	M100BW10	10 storage area with single line
Cetis	M200BW5	5storage area with double line
Cetis	M200BW10	10 storage area with double line

No other changes are made to them.
We confirm that all information above is true, and we'll be responsible for all the consequences. Please contact me if you have any question.

Signature:



Brock Munsell

Chief Technology Officer

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