FCC PART 15.247
RSS-GEN, ISSUE 4, NOVEMBER 2014
RSS-247, ISSUE 2, FEBRUARY 2017

TEST REPORT

For

The Singing Machine Company, Inc.

6301 NW 5th Way, Suite 2900, Fort Lauderdale, FL 33309, USA.

FCC ID: 2AAXO-SML645BT
IC: 11387A-SML645BT

Report Type:	**Product Name:**
Original Report	Karaoke System

Test Engineer:	*Kevin Hu*
Report Number:	RDG170510801A
Report Date:	2017-07-01
Reviewed By:	Henry Ding EMC Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) No.5040, Huilongwan Plaza, No.1, Shawan Road, Jinniu District, Chengdu, Sichuan, China Tel: 028-65525123, Fax: 028-65525125 www.baclcorp.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ***The Singing Machine Company, Inc.***'s product, model number: *SML645BT* ***(FCC ID:2AAXO-SML645BT, IC: 11387A-SML645BT)*** (the "EUT") in this report was a *Karaoke System*, which was measured approximately: 14.9(H) x 10.1(W) x 9.0(D) inches / 37.8(H) x 25.6(W) x 22.8(D) cm, rated input voltage: DC 12V from adapter.

Adapter Information:
MODEL: GKYPS0150120US1
INPUT: AC 100-240V, 50/60Hz, 0.5A
OUTPUT: DC 12V, 1500mA

Note: The series product for USA, model SML645BT, SML645BTXX (X can be A to Z or N/A) are electrically identical, the difference them is the model name, we selected SML645BT for fully testing, the details was explained in the declaration letter.

**All measurement and test data in this report was gathered from final production sample, serial number: 170510801 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2017-05-10, and EUT conformed to test requirement.*

Objective

This report is prepared on behalf of ***The Singing Machine Company, Inc.*** in accordance with Part 2, Subpart J, Part 15, Subparts A, and C of the Federal Communications Commission's rules and RSS-247, Issue 2, February 2017 of the Innovation, Science and Economic Development Canada, RSS-Gen Issue 4, November 2014 of the Innovation, Science and Economic Development Canada.

The tests were performed in order to determine the compliance of the EUT with FCC Rules Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209, 15.247 rules and RSS-247, Issue 2, February 2017, RSS-Gen Issue 4, November 2014 of the Innovation, Science and Economic Development Canada.

Related Submittal(s)/Grant(s)

No related submittal(s)/grant(s)

Test Methodology

All measurements detailed in this Test Report were performed in accordance with ANSI C63.10-2013 “American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”.

All of the measurements detailed in this Test Report were performed by Bay Area Compliance Laboratories Corp. (Chengdu).

The Bay Area Compliance Laboratories Corp. Chengdu’s measurement Uncertainties (calculated for a k=2 Coverage Factor corresponding to approximately 95% Coverage) were as follows:

-For all of the AC Line Conducted Emissions Tests reported herein: ±3.17 dB.
-For of all of the Direct Antenna Conducted Emissions Tests reported herein: ±0.56 dB.

-For of all of the direct Radiated Emissions Tests reported herein are:
30 MHz to 200 MHz: ±4.7 dB;
200 MHz to 1 GHz: ±6.0 dB;
1 GHz to 6 GHz: ±5.13dB; and,
6 GHz to 40 GHz: ±5.47dB.

And the uncertainty will not be taken into consideration for all test data recorded in the report.

Test Facility

The test site used by BACL to collect test data is located in the No.5040, Huilongwan Plaza, No.1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Test site at BACL 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 April 24, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. 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 engineering mode.

EUT Exercise Software

Test software: ' HC_Data_Test.exe' was used in test, the system configured maximum power as default setting. Test Software was used for changing modes and channels.

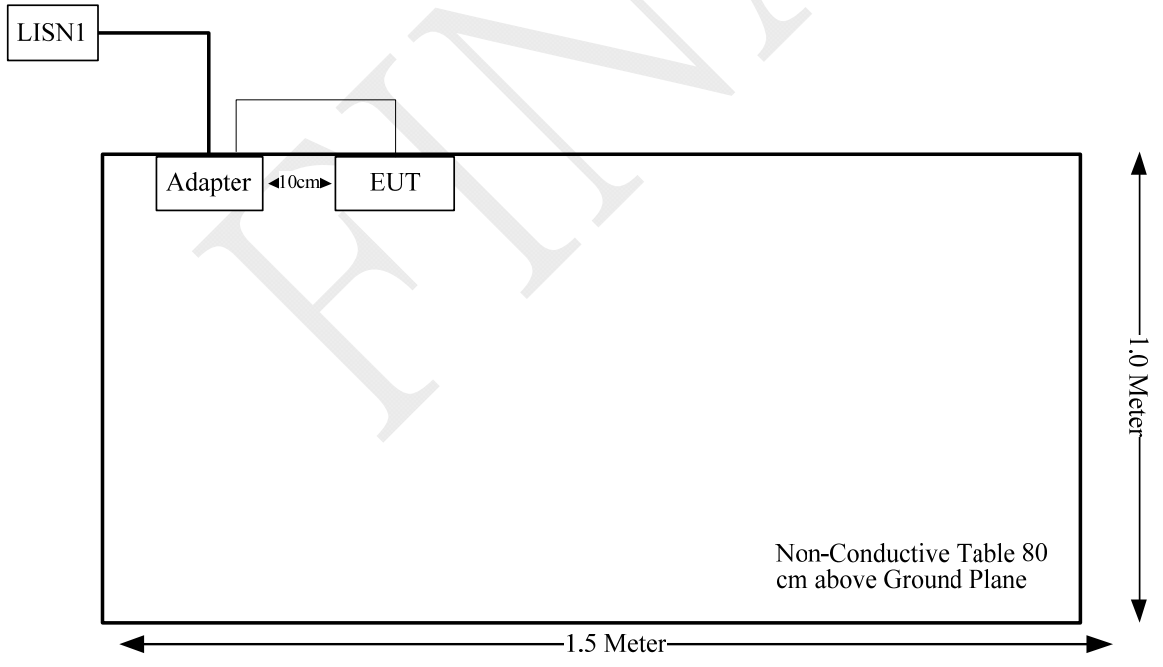
Equipment Modifications

No modification was made to the EUT.

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Adapter DC Cable	No	No	1.6	Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliance
RSS-102 Clause 2.5.2	Exemption Limits For Routine Evaluation - RF Exposure Evaluation	Compliance
FCC§15.203 RSS-Gen Clause 8.3	Antenna Requirement	Compliance
FCC§15.207 (a) RSS-Gen Clause 8.8	Conducted Emissions	Compliance
FCC§15.205, §15.209, FCC §15.247(d) RSS-247 Clause 5.5, RSS-Gen Clause 8.10	Spurious Emissions	Compliance
FCC§15.247 (a)(1) RSS-247 Clause 5.1 b) RSS-Gen Clause 6.6	20 dB Bandwidth	Compliance
FCC§15.247(a)(1) RSS-247 Clause 5.1 b)	Channel Separation Test	Compliance
FCC§15.247(a)(1)(iii) RSS-247 Clause 5.1 d)	Time of Occupancy (Dwell Time)	Compliance
FCC§15.247(a)(1)(iii) RSS-247 Clause 5.1 d)	Quantity of hopping channel Test	Compliance
FCC§15.247(b)(1) RSS-247 Clause 5.4 b)	Peak Output Power Measurement	Compliance
FCC§15.247(d) RSS-247 Clause 5.5	Band Edges	Compliance

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

Applicable Standard

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

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

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

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

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

Calculated Formulary:

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

Calculated Data:

Frequency (MHz)	**Antenna Gain**		**Tune-up Power**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
	(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
2402-2480	0	1.00	-1	0.79	20.00	0.0002	1.0

Note: The maximum tune-up power including tolerance was declared by manufacturer.

Result: The device meet FCC MPE at 20 cm distance

RSS-102 CLAUSE 2.5.2 - EXEMPTION LIMITS FOR ROUTINE EVALUATION – RF EXPOSURE EVALUATION

Applicable Standard

According to RSS-102 § (2.5.2):

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

• below 20 MHz[6] and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);

• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

Calculated Data:

The maximum power including tune-up tolerance is -1.0 dBm, the antenna gain is 0 dBi, so the maximum e.r.i.p. is -1.0dBm (0.00079W),

Exemption from Routine Evaluation Limit is:
$1.31 \times 10^{-2} f^{0.6834}$ W = $1.31 \times 10^{-2} \times 2402^{0.6834}$ W= 2.68 W> 0.00079W

So the device is compliance exemption from Routine Evaluation Limits –RF exposure Evaluation.

Result: Compliance

FCC §15.203& RSS-GEN CLAUSE 8.3 - 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.

According to RSS-Gen §8.3, The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the licence-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level.When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

Antenna Connector Construction

The EUT has one internal antenna arrangement for BT, and the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

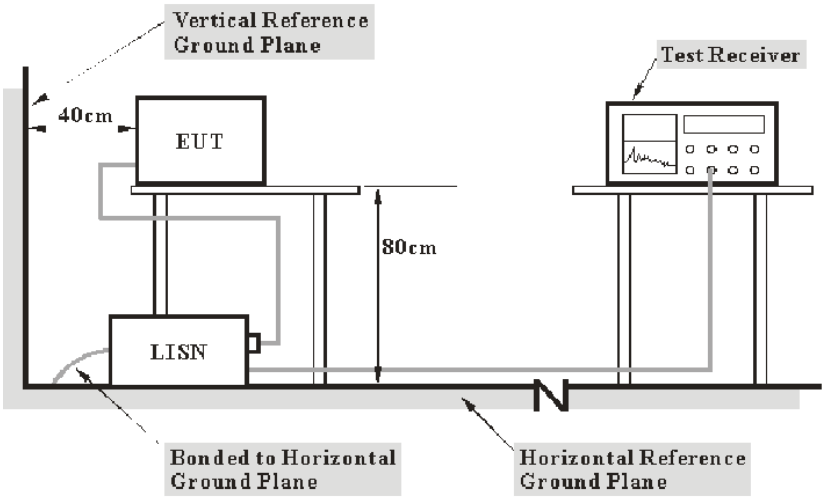
Result: Compliance.

FCC §15.207 (a)& RSS-GEN CLAUSE 8.8 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207 and RSS-GEN CLAUSE 8.8

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 C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 and RSS-Gen clause 8.8 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to the LISN with 120 V/60 Hz AC power.

EMI Test Receiver Setup

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

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

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

Test Procedure

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

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,
V_C: corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN or ISN

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

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2016-12-02	2017-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	100018	2016-12-02	2017-12-01
SOLAR ELECTRONICS	L.I.S.N.	9252-50-24-BNC	984413	2016-12-02	2017-12-01
Rohde & Schwarz	PULSE LIMITER	ESH3Z2	DE14781	2016-10-31	2017-10-30
Unknown	Conducted Cable	Unknown	NO.5	2016-11-10	2017-11-09
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B "Implementation of traceability policy in accredited laboratories".

Test Data

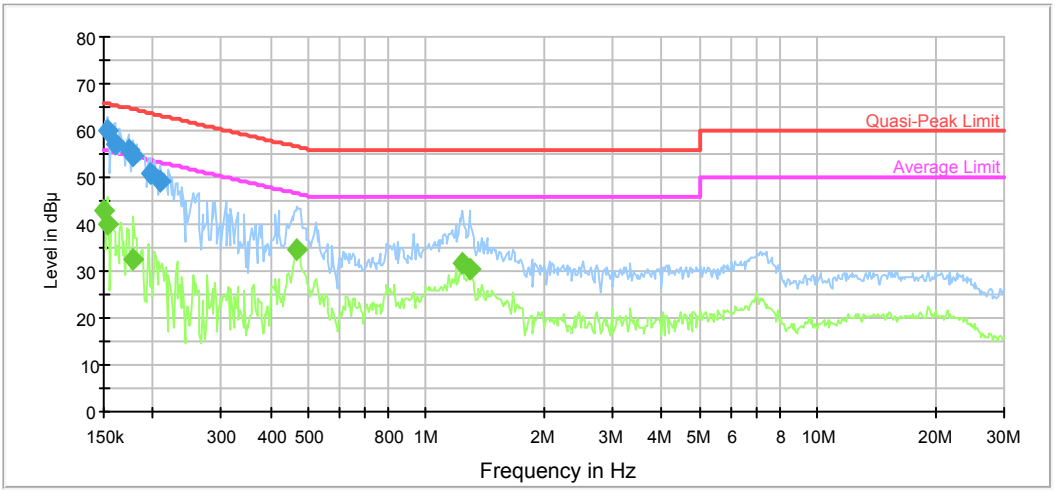
Environmental Conditions

Temperature:	27 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Kevin Hu on 2017-05-31.

Test Mode: Operating

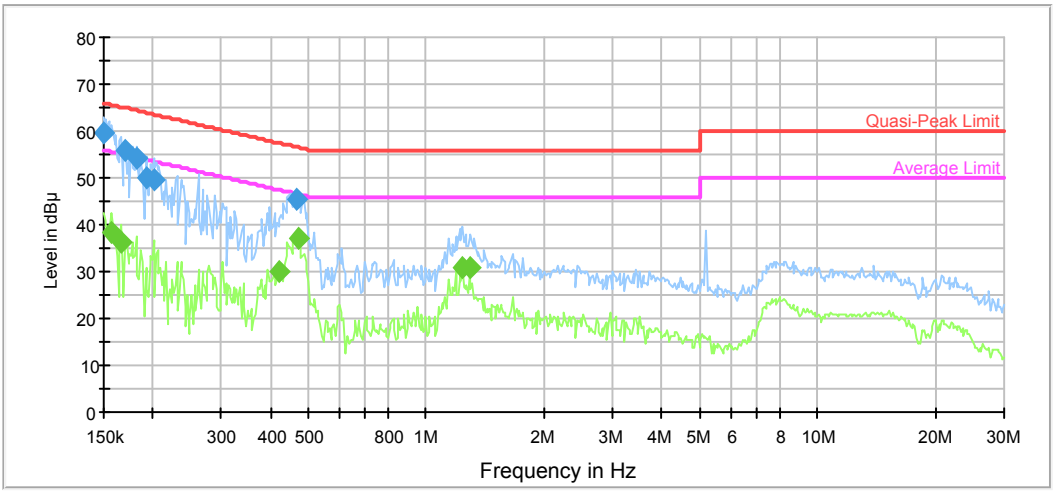
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.153629	59.9	9.000	L1	19.7	5.9	65.8	Compliance
0.159873	57.2	9.000	L1	19.7	8.3	65.5	Compliance
0.173134	56.0	9.000	L1	19.7	8.8	64.8	Compliance
0.178741	54.5	9.000	L1	19.7	10.0	64.5	Compliance
0.198249	50.7	9.000	L1	19.7	13.0	63.7	Compliance
0.209621	49.3	9.000	L1	19.7	13.9	63.2	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	42.9	9.000	L1	19.7	13.1	56.0	Compliance
0.153629	39.9	9.000	L1	19.7	15.9	55.8	Compliance
0.178741	32.5	9.000	L1	19.7	22.0	54.5	Compliance
0.468757	34.8	9.000	L1	19.7	11.7	46.5	Compliance
1.239175	31.8	9.000	L1	19.7	14.2	46.0	Compliance
1.289541	30.6	9.000	L1	19.7	15.4	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	59.8	9.000	N	19.7	6.2	66.0	Compliance
0.170396	55.7	9.000	N	19.7	9.3	64.9	Compliance
0.181612	54.1	9.000	N	19.7	10.3	64.4	Compliance
0.192030	49.9	9.000	N	19.6	14.0	63.9	Compliance
0.201433	49.4	9.000	N	19.6	14.2	63.6	Compliance
0.465037	45.3	9.000	N	19.6	11.3	56.6	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.157346	38.4	9.000	N	19.7	17.2	55.6	Compliance
0.166371	36.3	9.000	N	19.7	18.8	55.1	Compliance
0.422630	30.2	9.000	N	19.6	17.2	47.4	Compliance
0.472507	37.1	9.000	N	19.6	9.4	46.5	Compliance
1.239175	30.8	9.000	N	19.6	15.2	46.0	Compliance
1.289541	30.8	9.000	N	19.6	15.2	46.0	Compliance

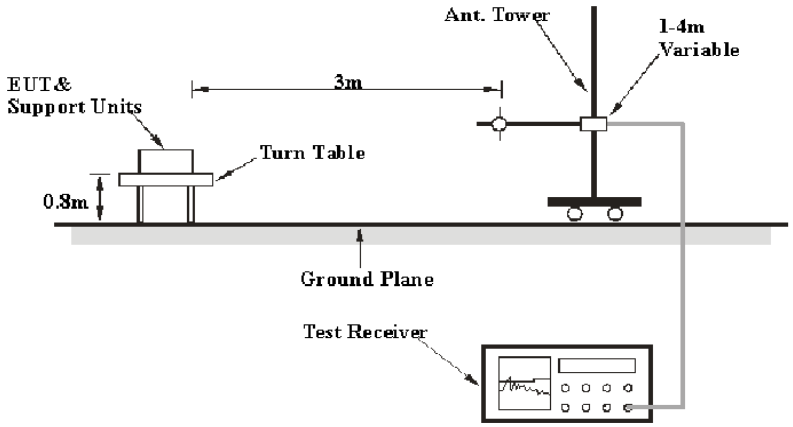
FCC §15.209, §15.205 & §15.247(d) & RSS-247 CLAUSE 5.5, RSS-GEN CLAUSE 8.10- SPURIOUS EMISSIONS

Applicable Standard

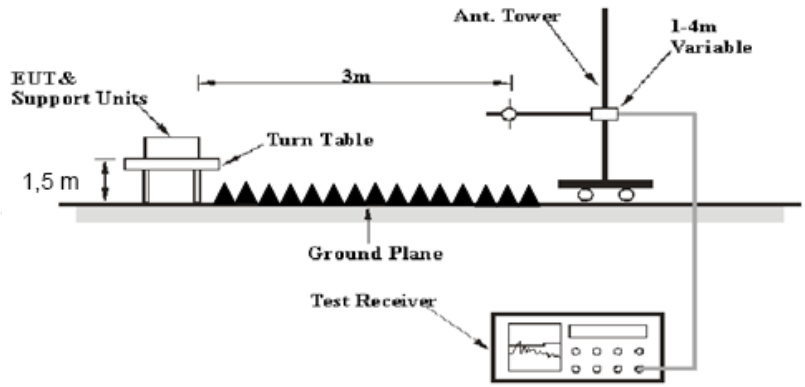
FCC §15.247 (d); §15.209; §15.205; RSS-247 Clause 5.5, RSS-GEN Clause 8.10

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 C63.10-2013. The specification used was the FCC 15.209, 15.247 and RSS-247 Clause 5.5, RSS-GEN Clause 8.10 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	/	AV

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
Agilent	Amplifier	8447D	2944A10442	2016-12-02	2017-12-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Sunol Sciences	Broadband Antenna	JB3	A121808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
ETS	Horn Antenna	3115	003-6076	2016-12-02	2017-12-01
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113024	2017-06-16	2020-06-15
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2017-05-20	2018-05-19
EMCT	Semi-Anechoic Chamber	966	966-1	2015-04-24	2018-04-23
Unknown	RF Cable (below 1GHz)	Unknown	NO.1	2016-11-10	2017-11-09
Unknown	RF Cable (below 1GHz)	Unknown	NO.4	2016-11-10	2017-11-09
Unknown	RF Cable (above 1GHz)	Unknown	NO.2	2016-11-10	2017-11-09
Ducommun Technolagies	Horn Antenna	ARH-2823-02	1007726-01 1312	2016-08-18	2017-08-18
Quinstar	Amplifier	QLW-18405536-JO	15964001032	2016-08-18	2017-08-18
Agilent	Spectrum Analyzer	8564E	5943A01752	2016-08-18	2017-08-18

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

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 Data

Environmental Conditions

Temperature:	27.3 °C
Relative Humidity:	50.7 %
ATM Pressure:	100.1 kPa

** The testing was performed by Kevin Hu on 2017-06-24.*

Test Mode: Transmitting

30MHz-25GHz:

BDR(GFSK mode was the worst) :

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB)					
Low Channel: 2402 MHz									
2402	66.23	PK	H	23.53	3.00	0.00	92.76	N/A	N/A
2402	57.93	AV	H	23.53	3.00	0.00	84.46	N/A	N/A
2402	63.81	PK	V	23.53	3.00	0.00	90.34	N/A	N/A
2402	52.75	AV	V	23.53	3.00	0.00	80.28	N/A	N/A
2390	26.77	PK	H	23.57	3.00	0.00	53.34	74.00	20.66
2390	13.64	AV	H	23.57	3.00	0.00	40.21	54.00	13.79
4804	42.17	PK	H	30.77	5.12	26.87	51.19	74.00	22.81
4804	27.12	AV	H	30.77	5.12	26.87	36.14	54.00	17.86
7206	34.01	PK	H	34.71	6.16	26.35	48.53	74.00	25.47
7206	21.35	AV	H	34.71	6.16	26.35	35.87	54.00	18.13
9608	32.59	PK	H	37.06	7.82	26.18	51.29	74.00	22.71
9608	23.54	AV	H	37.06	7.82	26.18	42.24	54.00	11.76
239.52	51.6	QP	H	12.28	1.07	27.55	37.40	46.00	8.60
191.99	50.2	QP	H	12.22	0.88	27.80	35.50	43.50	8.00
Middle Channel: 2441 MHz									
2441	65.47	PK	H	23.40	3.00	0.00	91.87	N/A	N/A
2441	54.99	AV	H	23.40	3.00	0.00	81.39	N/A	N/A
2441	63.48	PK	V	23.40	3.00	0.00	89.88	N/A	N/A
2441	53.42	AV	V	23.40	3.00	0.00	79.82	N/A	N/A
4882	44.30	PK	H	31.02	5.09	26.87	53.54	74.00	20.46
4882	27.96	AV	H	31.02	5.09	26.87	37.20	54.00	16.80
7323	32.85	PK	H	34.95	6.22	26.40	47.62	74.00	26.38
7323	23.17	AV	H	34.95	6.22	26.40	37.94	54.00	16.06
9764	34.12	PK	H	37.16	7.71	26.27	52.72	74.00	21.28
9764	24.54	AV	H	37.16	7.71	26.27	43.14	54.00	10.86
3670	36.99	PK	H	27.68	4.43	26.58	42.52	74.00	31.48
3670	24.42	AV	H	27.68	4.43	26.58	29.95	54.00	24.05
239.52	51.5	QP	H	12.28	1.07	27.55	37.30	46.00	8.70
191.99	50.1	QP	H	12.22	0.88	27.80	35.40	43.50	8.10
High Channel: 2480 MHz									
2480	65.33	PK	H	23.27	2.99	0.00	91.59	N/A	N/A
2480	54.21	AV	H	23.27	2.99	0.00	80.47	N/A	N/A
2480	63.32	PK	V	23.27	2.99	0.00	89.58	N/A	N/A
2480	53.84	AV	V	23.27	2.99	0.00	80.10	N/A	N/A
2483.5	35.56	PK	H	23.26	2.99	0.00	61.81	74.00	12.19
2483.5	17.22	AV	H	23.26	2.99	0.00	43.47	54.00	10.53
4960	44.09	PK	H	31.27	5.05	26.88	53.53	74.00	20.47
4960	26.94	AV	H	31.27	5.05	26.88	36.38	54.00	17.62
7440	32.73	PK	H	35.18	6.27	26.45	47.73	74.00	26.27
7440	22.06	AV	H	35.18	6.27	26.45	37.06	54.00	16.94
9920	32.88	PK	H	37.25	7.60	26.37	51.36	74.00	22.64
9920	24.78	AV	H	37.25	7.60	26.37	43.26	54.00	10.74
239.52	51.6	QP	H	12.28	1.07	27.55	37.40	46.00	8.60
191.99	50.2	QP	H	12.22	0.88	27.80	35.50	43.50	8.00

FCC §15.247(a) (1)& RSS-247 CLAUSE 5.1 b) - CHANNEL SEPARATION

Applicable Standard

According toFCC§15.247(a) (1)

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

According to RSS-247 Clause 5.1 b)

b) FHSs shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, FHSs operating in the band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Unknown	Attenuator	3dB	3dB-1	Each Time	/
Unknown	RF Cable	Unknown	C-5	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

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 trace.
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	27.4 °C
Relative Humidity:	47.5 %
ATM Pressure:	100.1 kPa

** The testing was performed by Kevin Hu on 2017-06-30.*

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

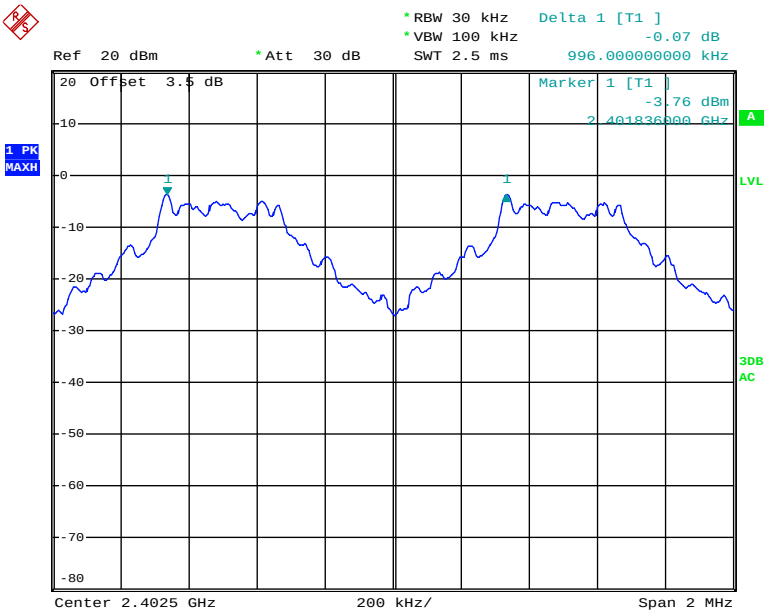
Test Mode: Transmitting

Mode	Channel	Frequency	Channel Separation	Limit
		MHz	MHz	MHz
BDR (GFSK)	Low	2402	0.996	0.63
	Middle	2441	1.004	0.62
	High	2480	1.004	0.59
EDR (π/4-DQPSK)	Low	2402	1.004	0.84
	Middle	2441	1.004	0.84
	High	2480	1.004	0.83
EDR (8DPSK)	Low	2402	0.996	0.84
	Middle	2441	1.004	0.85
	High	2480	1.000	0.85

Note: Limit= (2/3)× 20dB bandwidth

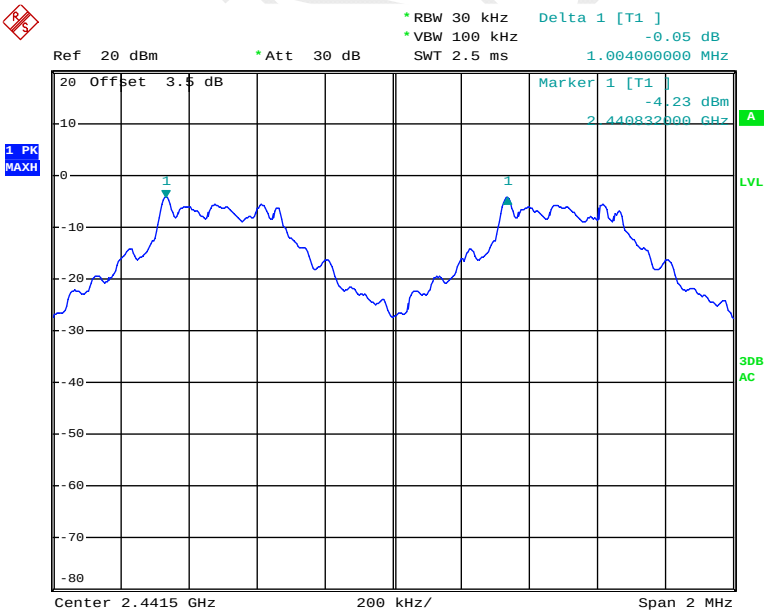
BDR Mode (GFSK):

Low Channel



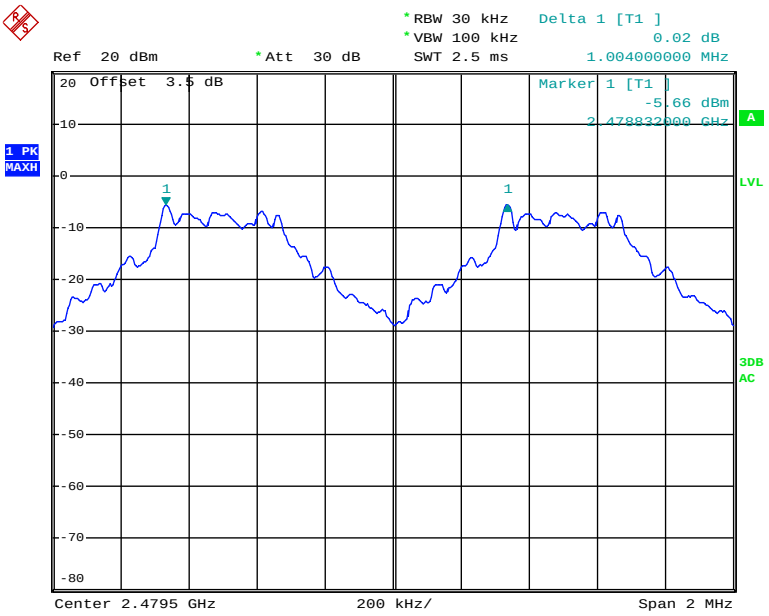
Date: 30.JUN.2017 21:30:11

Middle Channel



Date: 30.JUN.2017 21:32:32

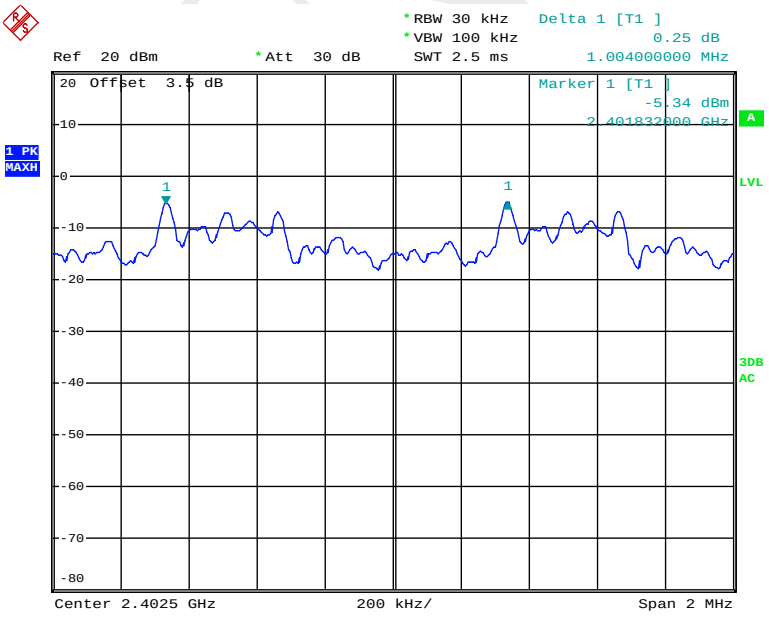
High Channel



Date: 30.JUN.2017 21:33:21

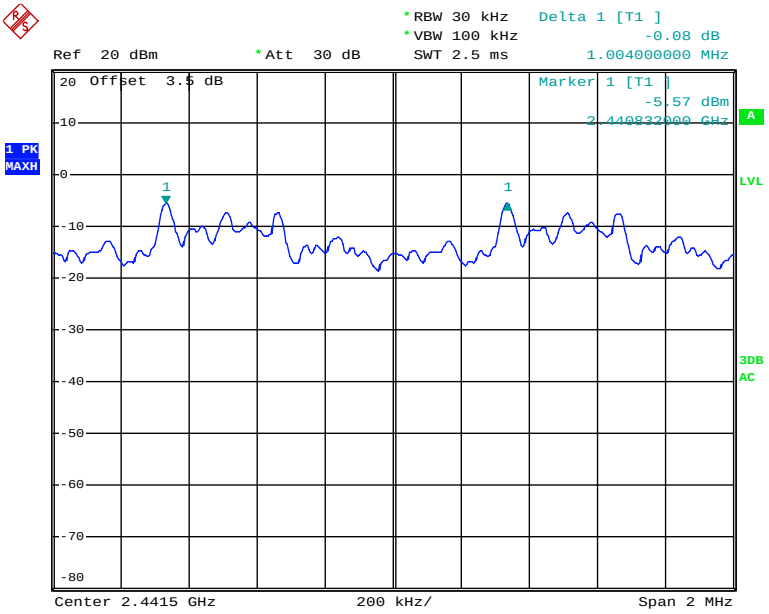
EDR Mode (π/4-DQPSK):

Low Channel



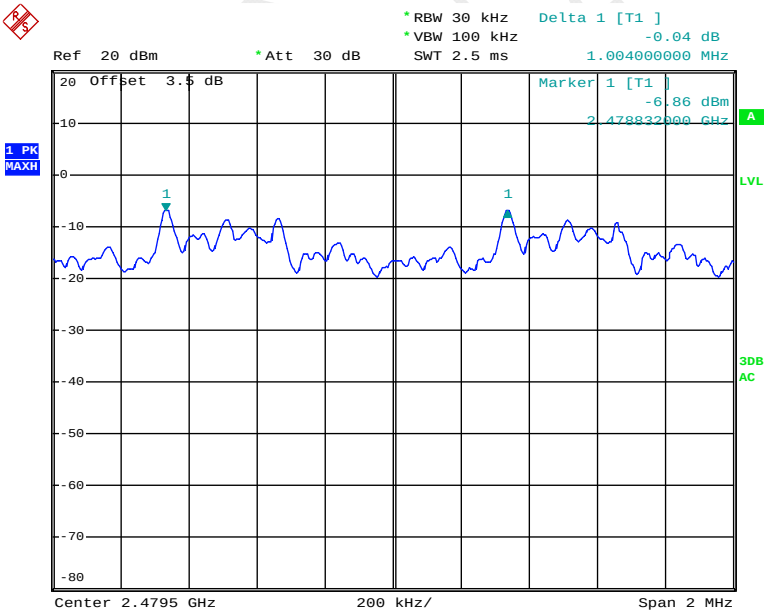
Date: 30.JUN.2017 21:34:23

Middle Channel



Date: 30.JUN.2017 21:35:08

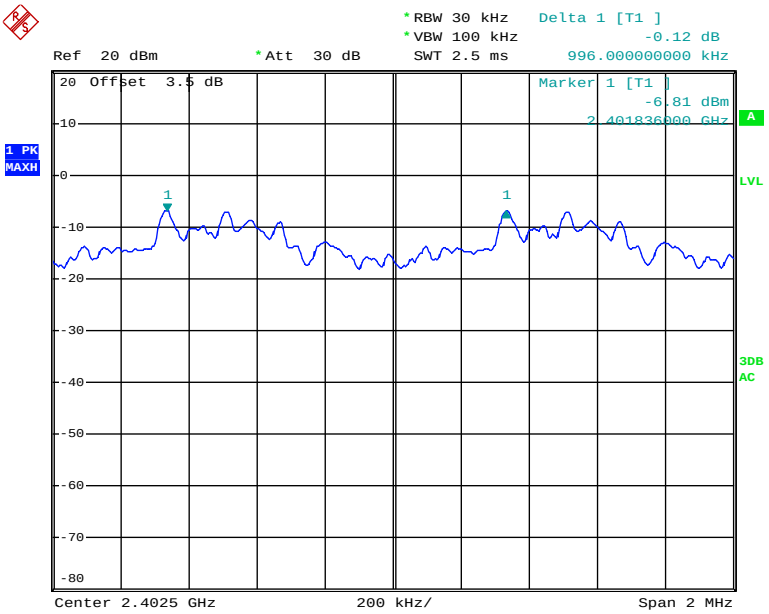
High Channel



Date: 30.JUN.2017 21:35:53

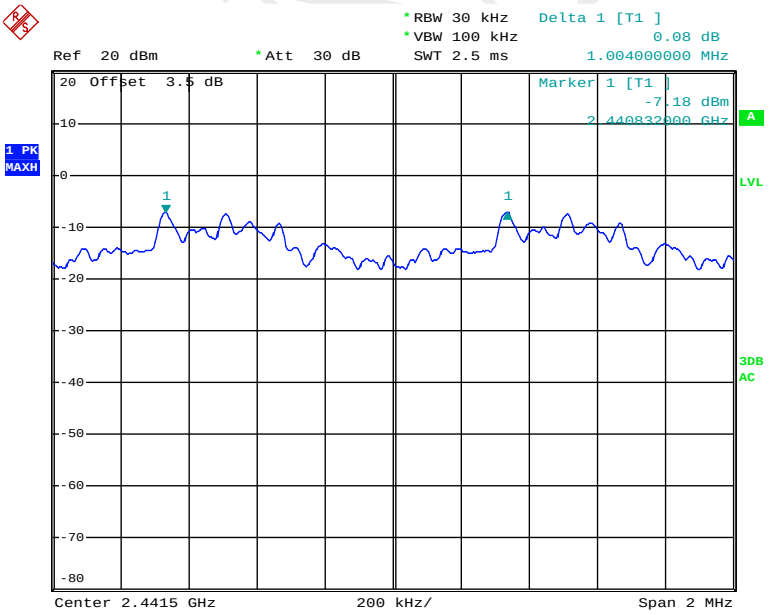
EDR Mode (8-DPSK):

Low Channel



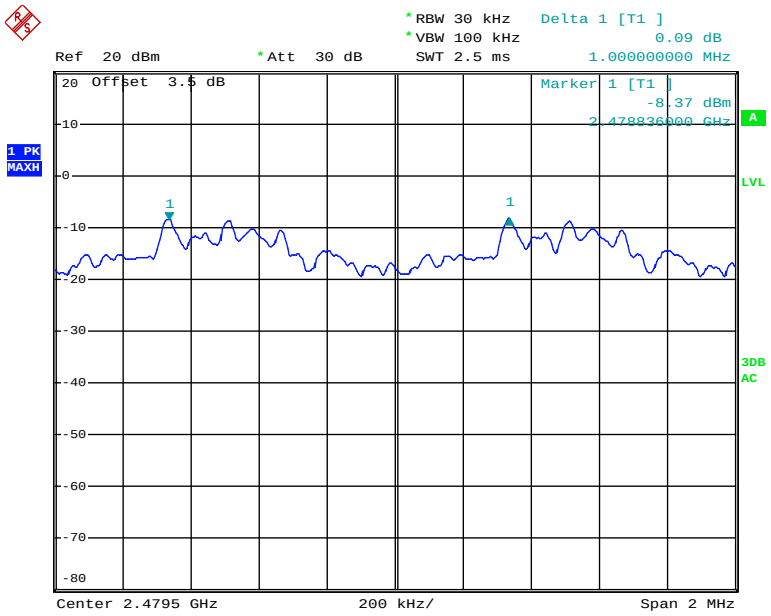
Date: 30.JUN.2017 21:37:09

Middle Channel



Date: 30.JUN.2017 21:38:10

High Channel



FCC §15.247(a) (1)& RSS-247 CLAUSE 5.1 b) ,RSS-GEN CLAUSE 6.6 – EMISSION BANDWIDTH

Applicable Standard

According to FCC §15.247(a) (1)

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.

According to RSS-247 Clause 5.1 b)

b) FHSs shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, FHSs operating in the band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W.

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
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Unknown	Attenuator	3dB	3dB-1	Each Time	/
Unknown	RF Cable	Unknown	C-5	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Data

Environmental Conditions

Temperature:	27.4°C
Relative Humidity:	47.5 %
ATM Pressure:	100.1 kPa

** The testing was performed by Kevin Hu on 2017-06-30.*

Test Result: Compliance.

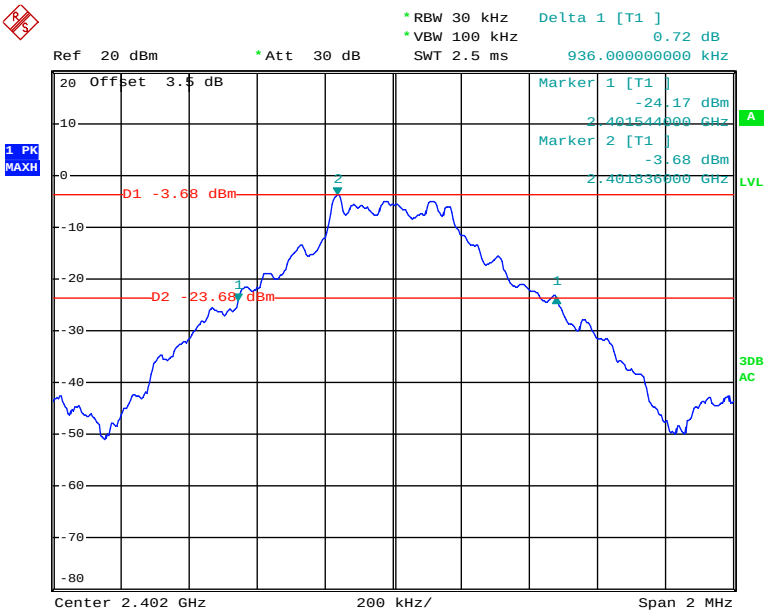
Please refer to following tables and plots

Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% occupied Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.94	0.86
	Middle	2441	0.93	0.84
	High	2480	0.88	0.84
EDR Mode (π/4-DQPSK)	Low	2402	1.26	1.16
	Middle	2441	1.26	1.16
	High	2480	1.25	1.17
EDR Mode (8-DPSK)	Low	2402	1.26	1.16
	Middle	2441	1.27	1.16
	High	2480	1.27	1.17

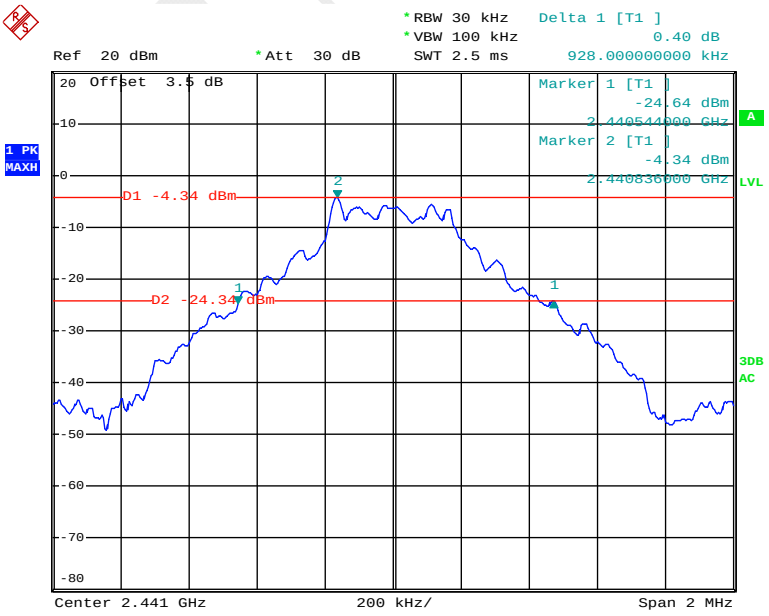
20dB Bandwidth:
BDR Mode (GFSK):

Low Channel



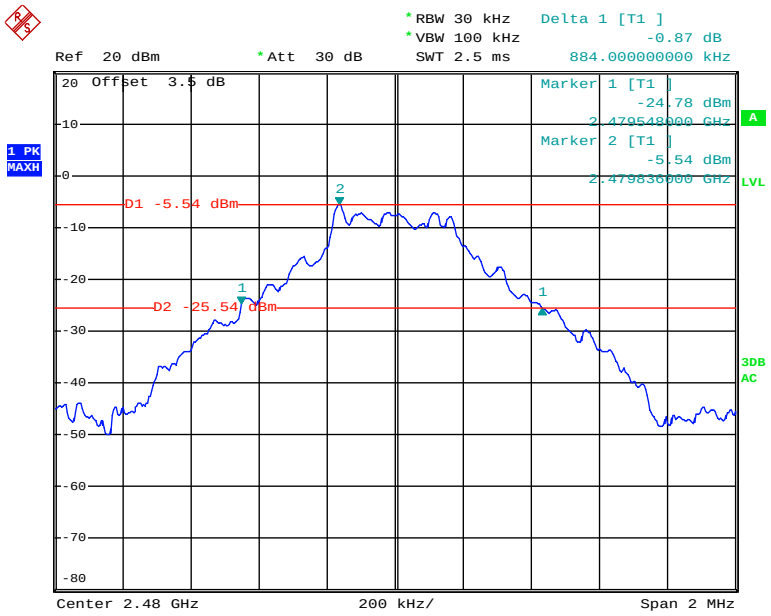
Date: 30.JUN.2017 20:59:29

Middle Channel



Date: 30.JUN.2017 21:00:55

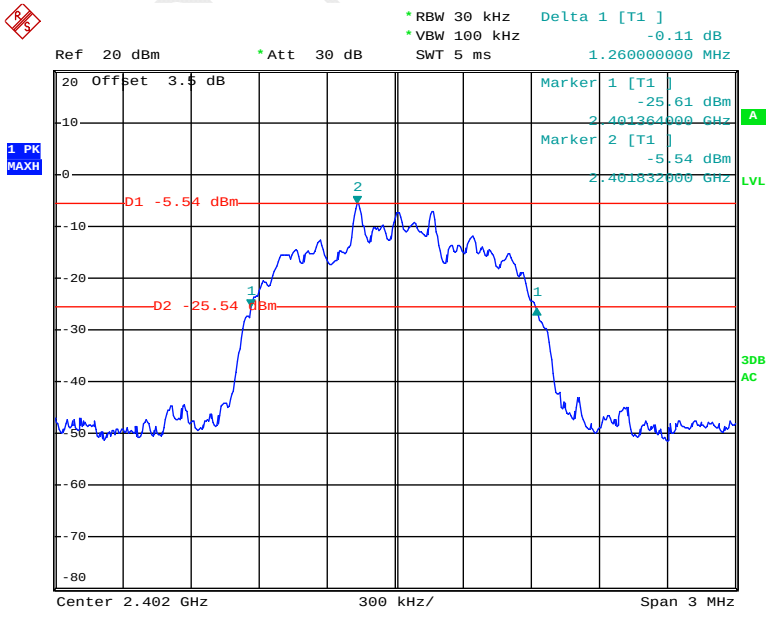
High Channel



Date: 30.JUN.2017 21:02:06

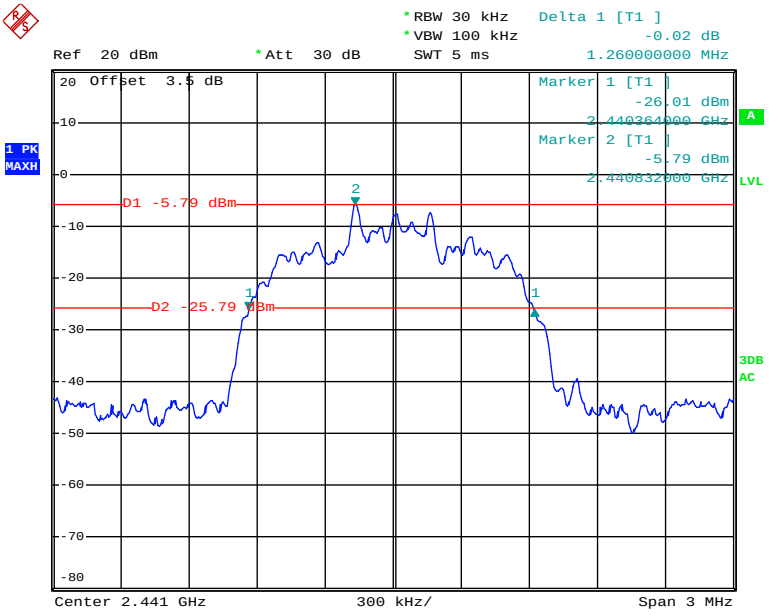
EDR Mode (π/4-DQPSK):

Low Channel



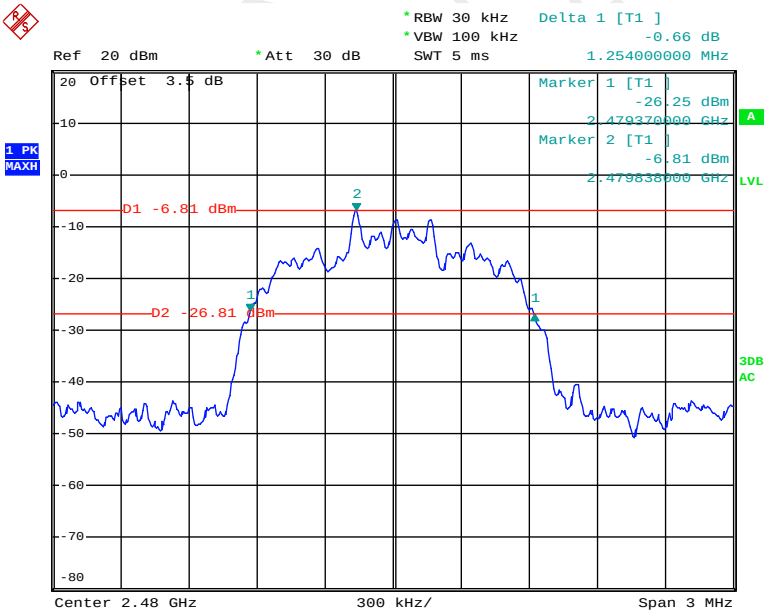
Date: 30.JUN.2017 21:03:53

Middle Channel



Date: 30.JUN.2017 21:05:53

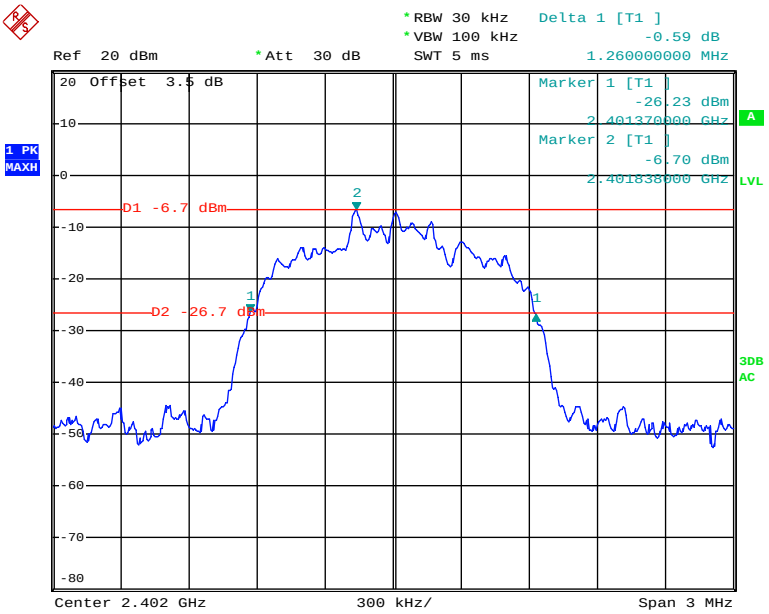
High Channel



Date: 30.JUN.2017 21:06:51

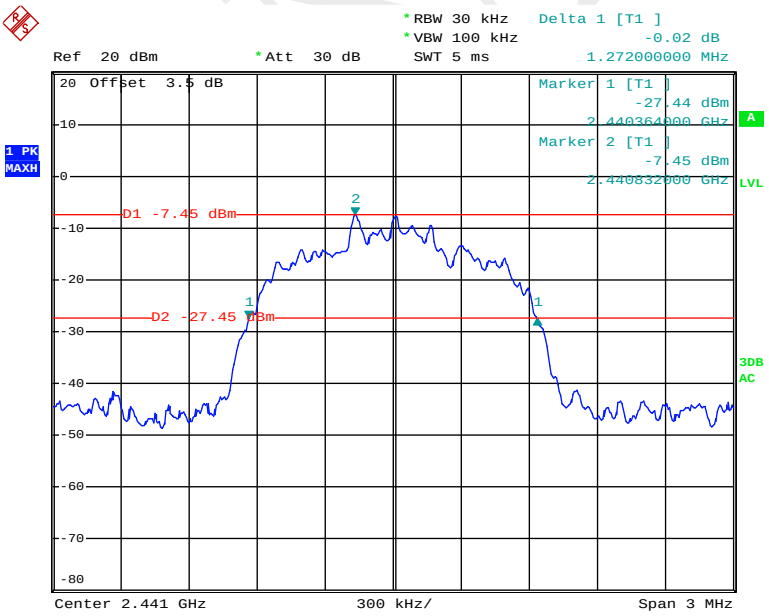
EDR Mode (8-DPSK):

Low Channel



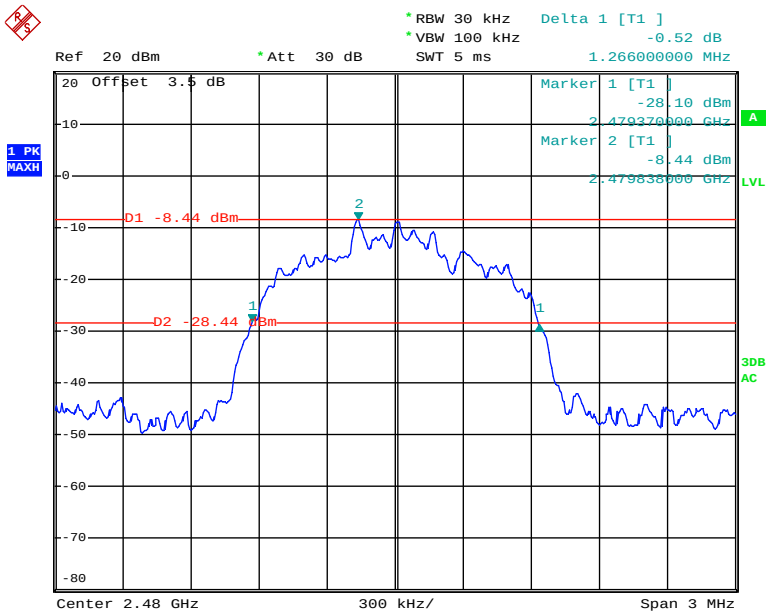
Date: 30.JUN.2017 21:09:50

Middle Channel



Date: 30.JUN.2017 21:11:13

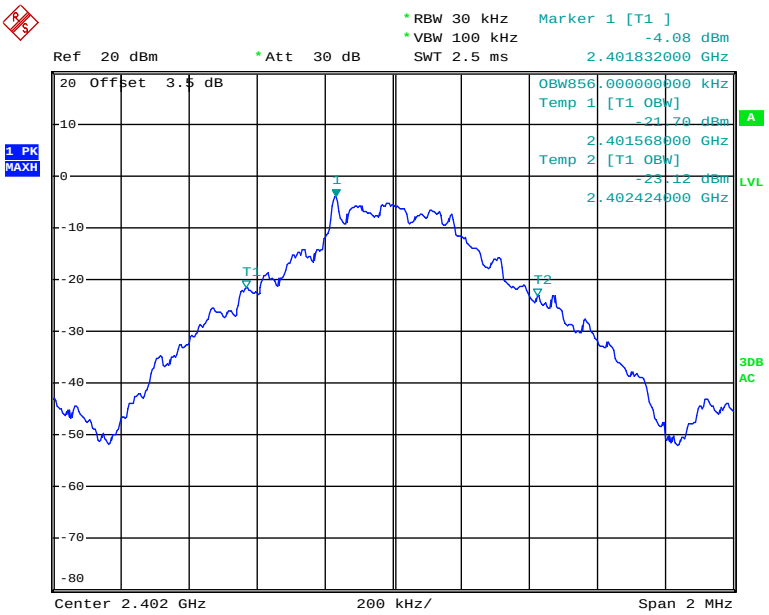
High Channel



Date: 30.JUN.2017 21:12:09

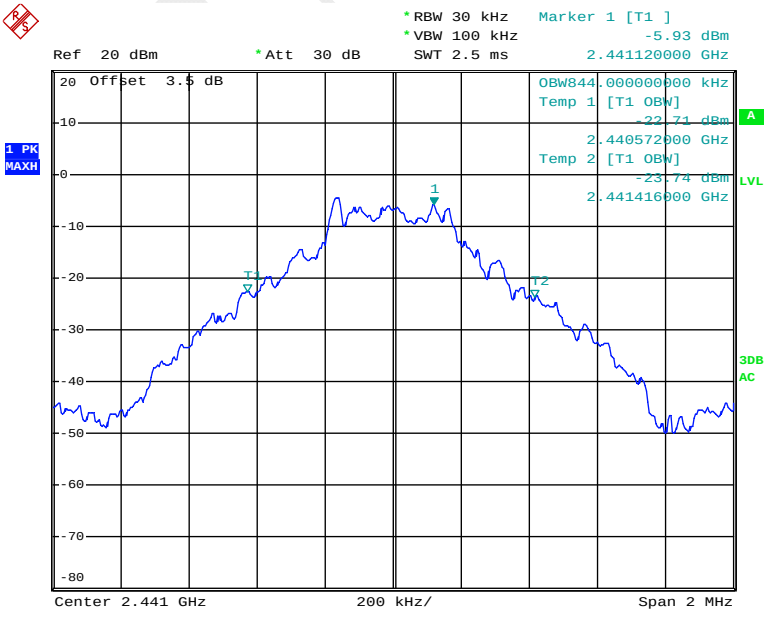
99% Occupied Bandwidth:
BDR Mode (GFSK):

Low Channel



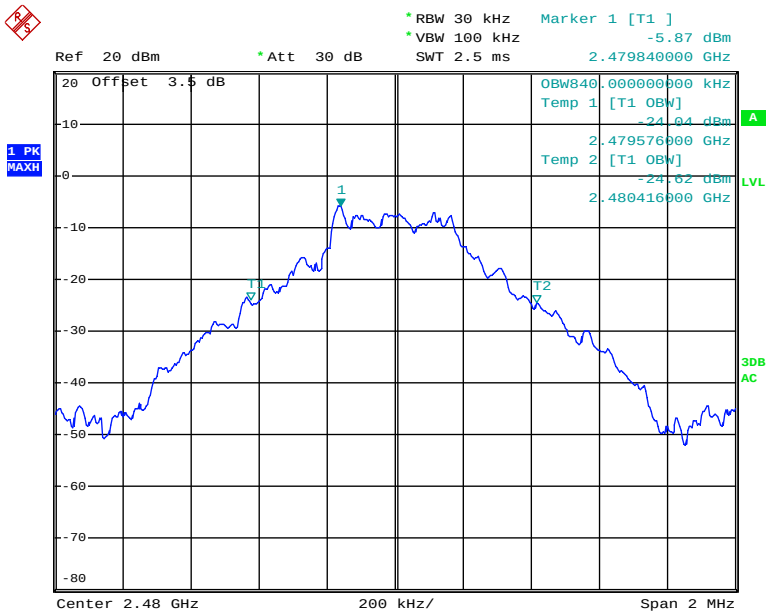
Date: 30.JUN.2017 20:59:41

Middle Channel



Date: 30.JUN.2017 21:01:05

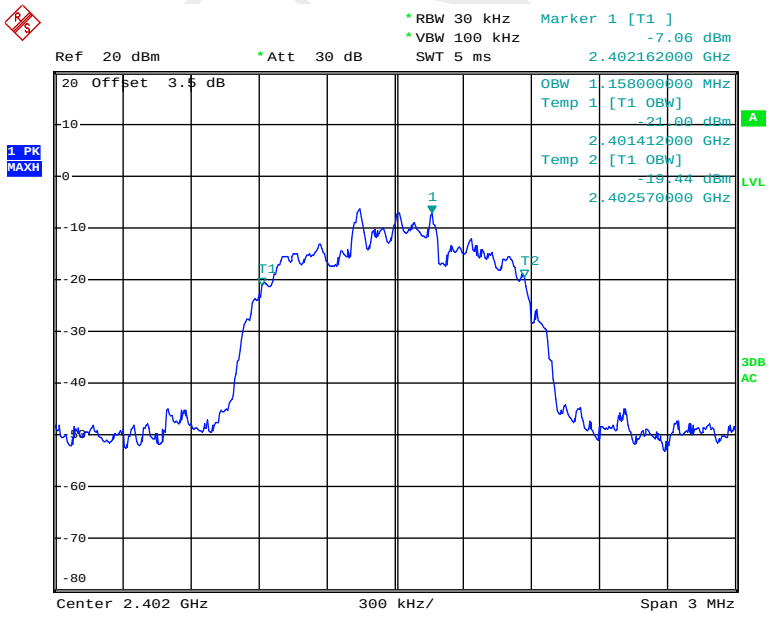
High Channel



Date: 30.JUN.2017 21:02:18

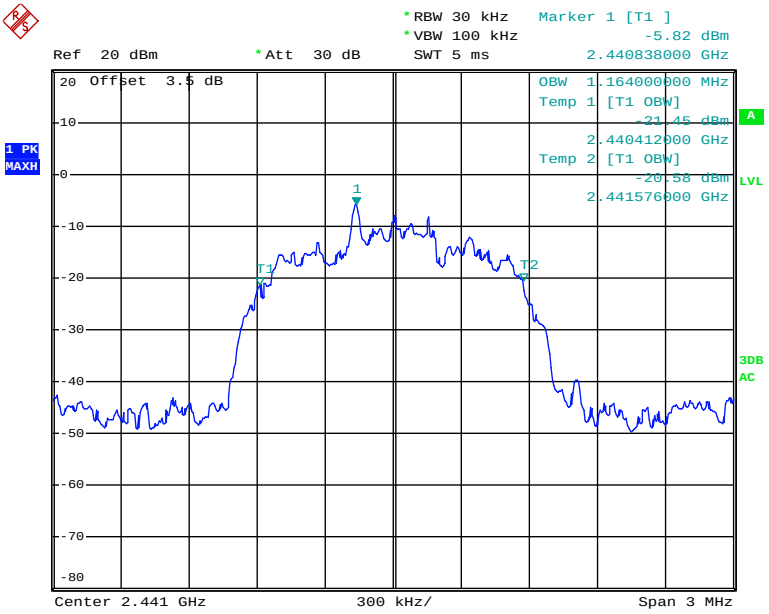
EDR Mode (π/4-DQPSK):

Low Channel



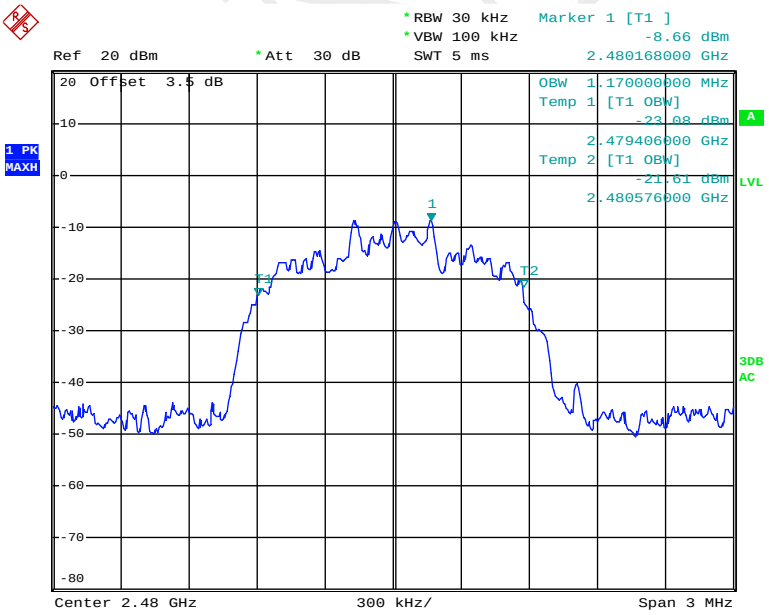
Date: 30.JUN.2017 21:04:06

Middle Channel



Date: 30.JUN.2017 21:06:04

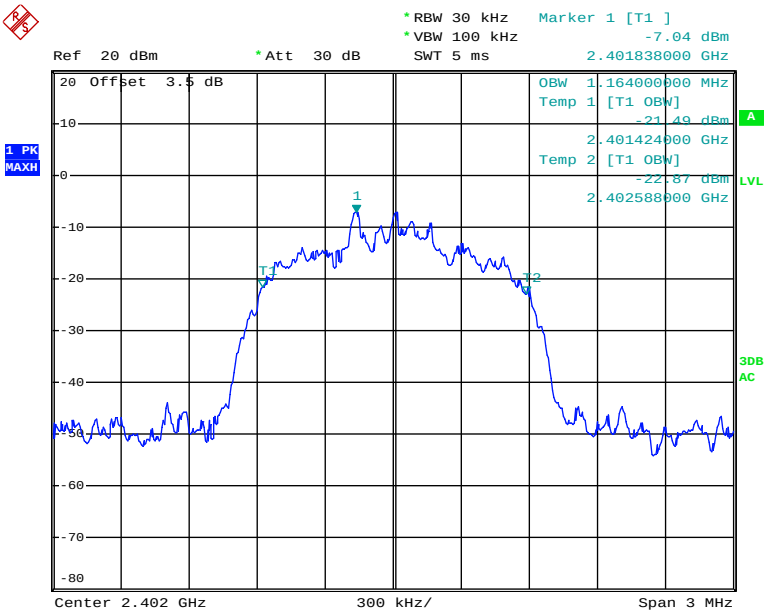
High Channel



Date: 30.JUN.2017 21:07:02

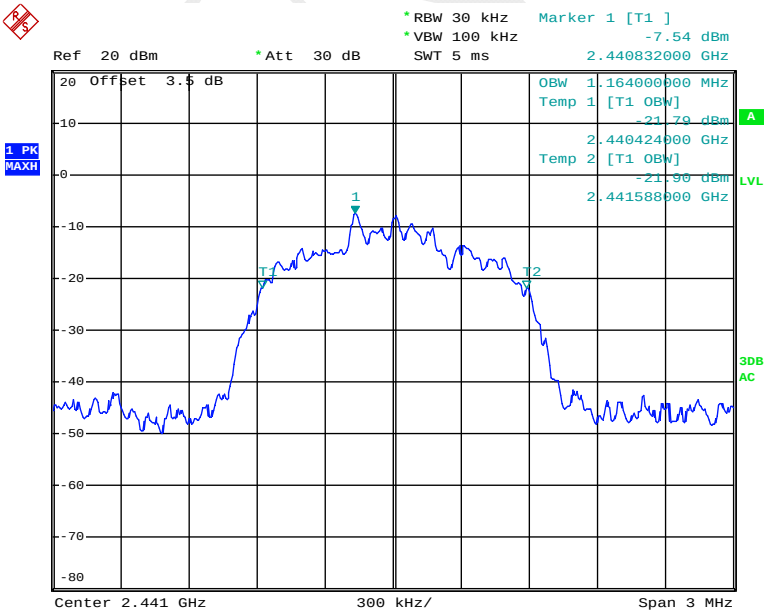
EDR Mode (8-DPSK):

Low Channel



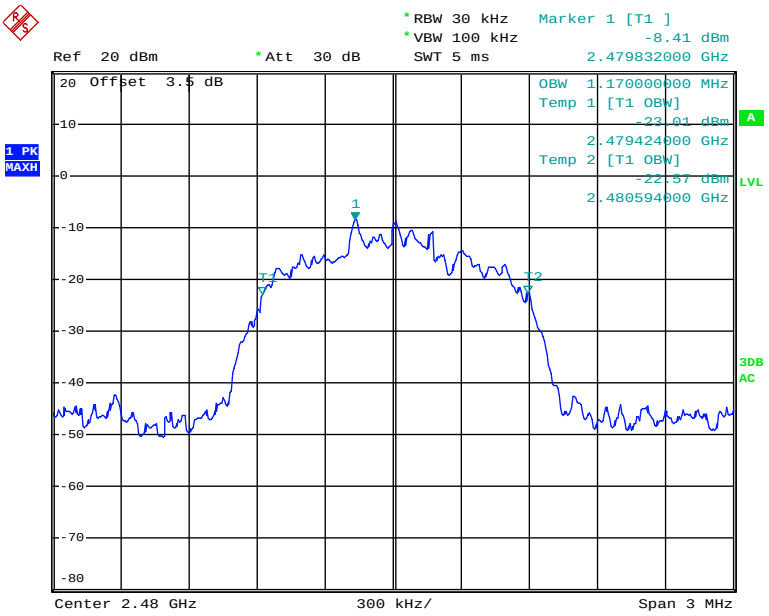
Date: 30.JUN.2017 21:10:00

Middle Channel



Date: 30.JUN.2017 21:11:26

High Channel



Date: 30.JUN.2017 21:12:21

FCC §15.247(a) (1) (iii)& RSS-247 CLAUSE 5.1 d) - QUANTITY OF HOPPING CHANNEL

Applicable Standard

According to FCC §15.247(a) (1) (iii)

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.

According to RSS-247 Clause 5.1 d)

d) FHSs operating in the band 2400-2483.5 MHz shall use at least 15 hopping 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. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping 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	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Unknown	Attenuator	3dB	3dB-1	Each Time	/
Unknown	RF Cable	Unknown	C-5	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Data

Environmental Conditions

Temperature:	27.4°C
Relative Humidity:	47.5%
ATM Pressure:	100.1 kPa

** The testing was performed by Kevin Hu from 2017-06-30.*

Test Result: Compliance.

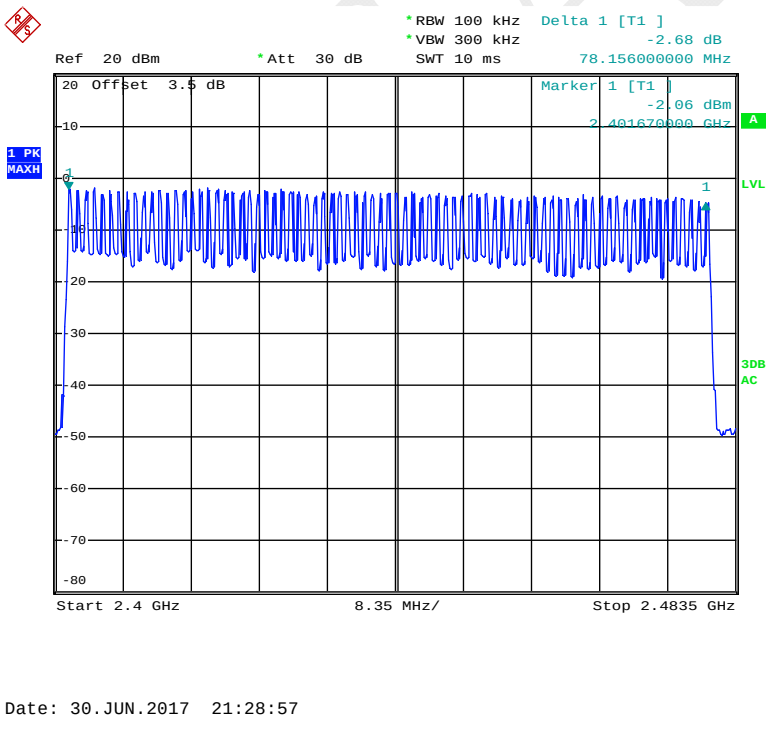
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

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

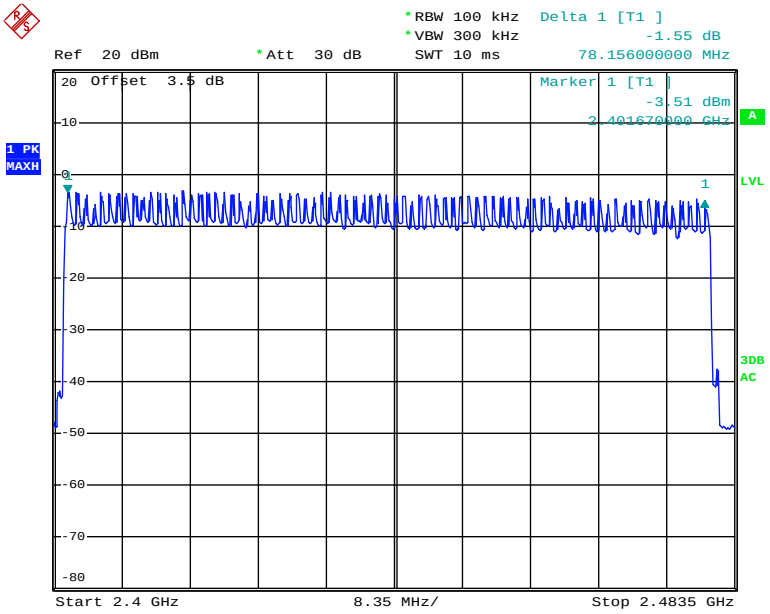
Number of Hopping Channels



EDR Mode (π/4-DQPSK):

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

Number of Hopping Channels

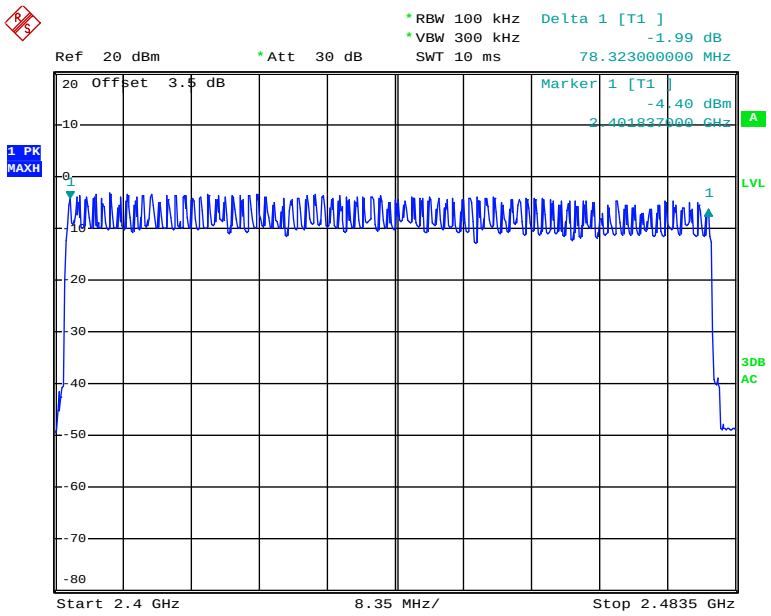


Date: 30.JUN.2017 21:25:29

EDR Mode (8-DPSK):

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

Number of Hopping Channels



Date: 30.JUN.2017 21:19:39

FCC §15.247(a) (1) (iii)&RSS-247 CLAUSE 5.1 d) - TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

According to FCC §15.247(a) (1) (iii)

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.

According to RSS-247 Clause 5.1 d)

d) FHSs operating in the band 2400-2483.5 MHz shall use at least 15 hopping 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. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

Test Procedure

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. The time of single pulses was tested.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Unknown	Attenuator	3dB	3dB-1	Each Time	/
Unknown	RF Cable	Unknown	C-5	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Data

Environmental Conditions

Temperature:	27.4°C
Relative Humidity:	47.5%
ATM Pressure:	100.1 kPa

** The testing was performed by Kevin Hu on 2017-06-30*

Test Result: Compliance.

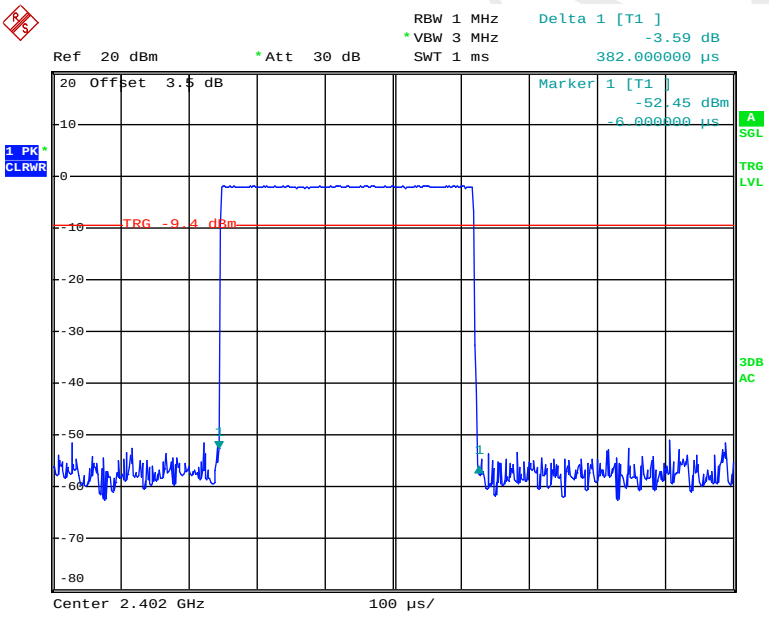
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

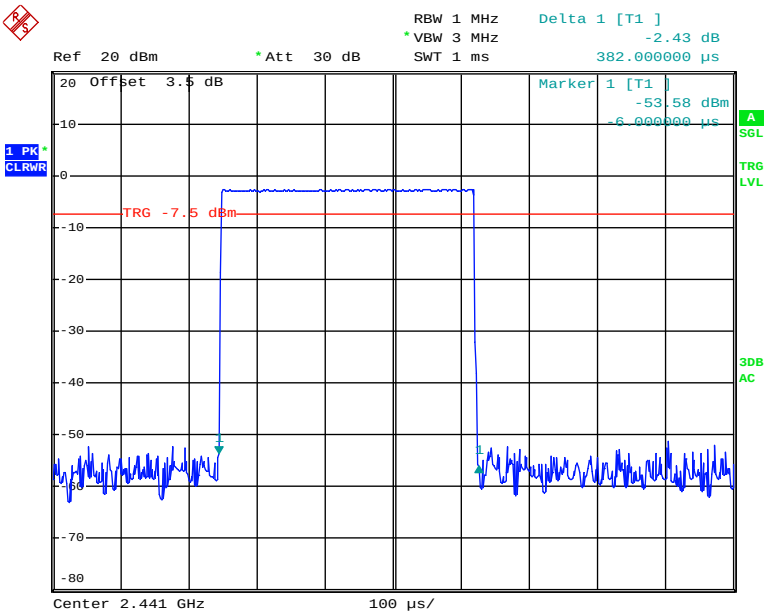
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.382	0.122	0.4	Compliance
	Middle	0.382	0.122	0.4	Compliance
	High	0.380	0.122	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s				
DH3	Low	1.650	0.264	0.4	Compliance
	Middle	1.650	0.264	0.4	Compliance
	High	1.656	0.265	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s				
DH5	Low	2.910	0.310	0.4	Compliance
	Middle	2.900	0.309	0.4	Compliance
	High	2.900	0.309	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s				

DH1: Low Channel



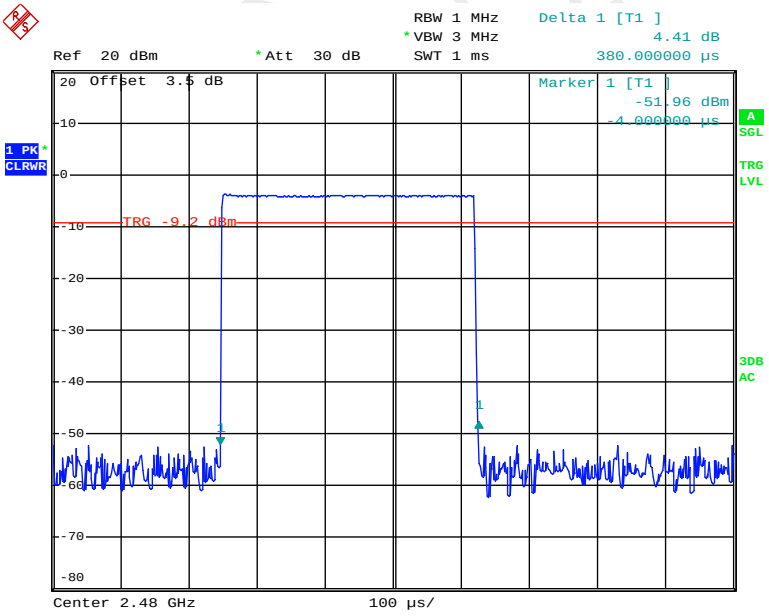
Date: 30.JUN.2017 21:39:45

DH1: Middle Channel



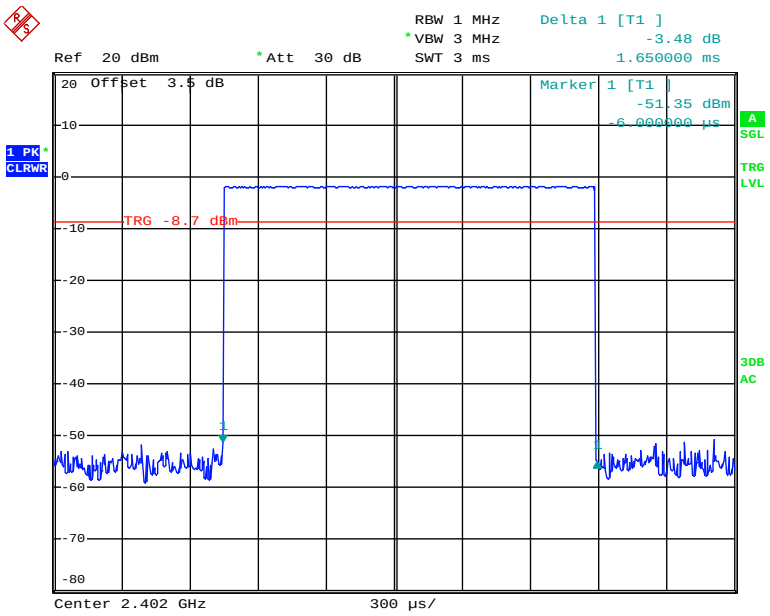
Date: 30.JUN.2017 21:39:52

DH1: High Channel



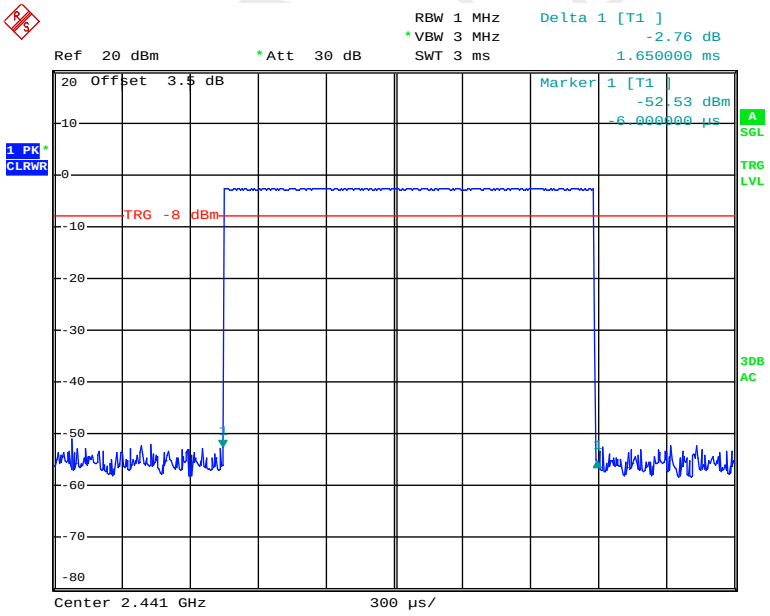
Date: 30.JUN.2017 21:39:59

DH3: Low Channel



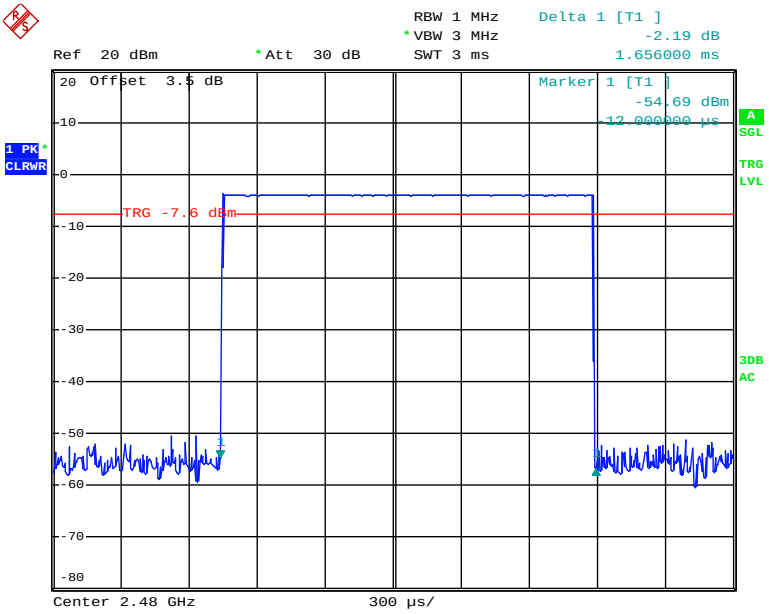
Date: 30.JUN.2017 21:40:53

DH3: Middle Channel



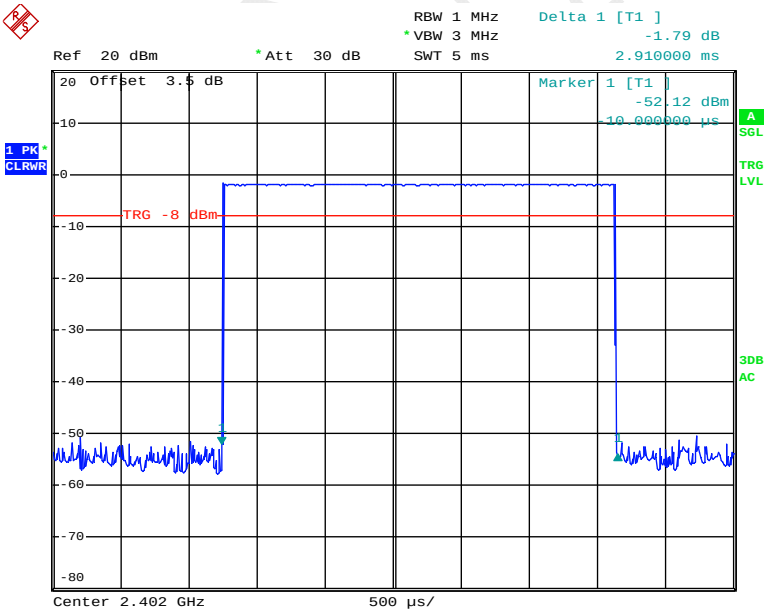
Date: 30.JUN.2017 21:41:00

DH3: High Channel



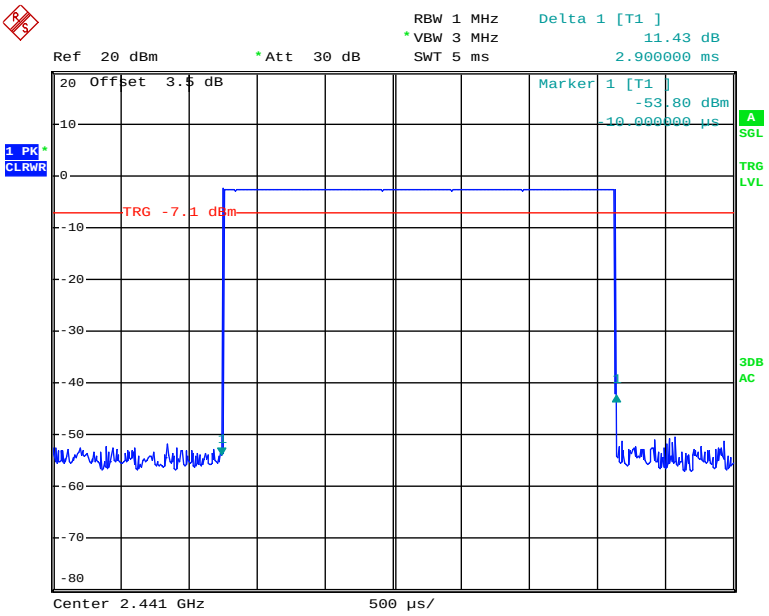
Date: 30.JUN.2017 21:41:06

DH5: Low Channel



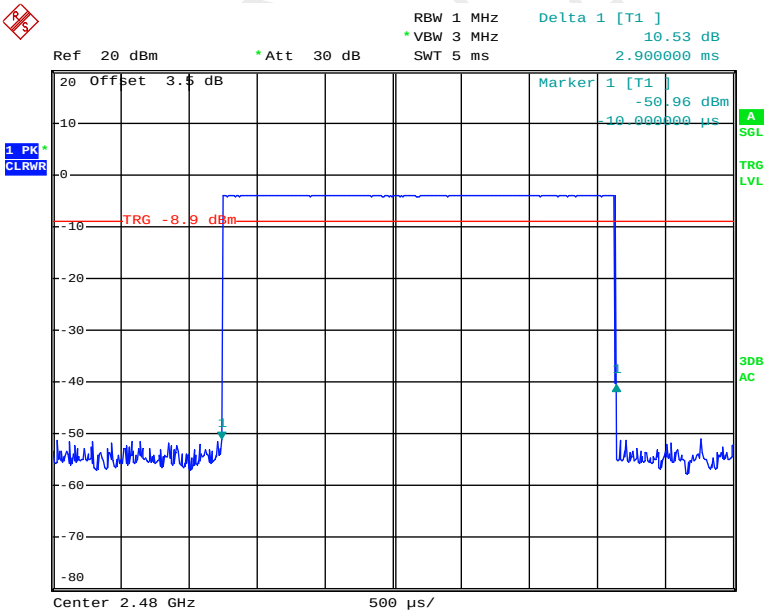
Date: 30.JUN.2017 21:41:35

DH5: Middle Channel



Date: 30.JUN.2017 21:41:41

DH5: High Channel

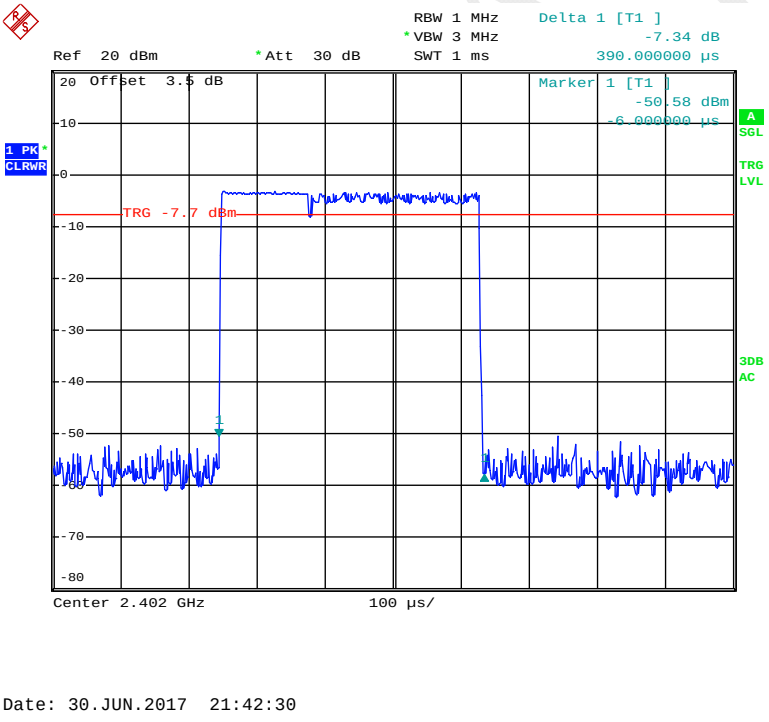


Date: 30.JUN.2017 21:41:50

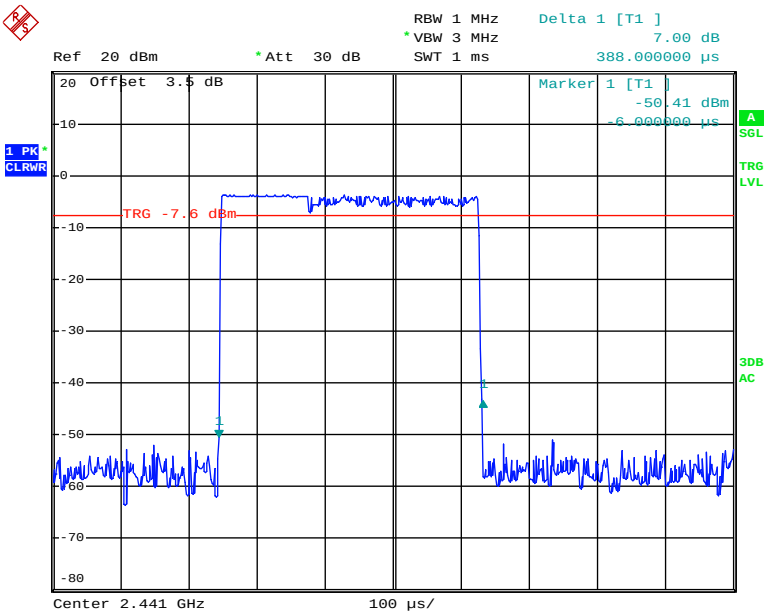
EDR Mode (π/4-DQPSK):

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
2DH1	Low	0.390	0.125	0.4	Compliance
	Middle	0.388	0.124	0.4	Compliance
	High	0.388	0.124	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s				
2DH3	Low	1.656	0.265	0.4	Compliance
	Middle	1.656	0.265	0.4	Compliance
	High	1.656	0.265	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s				
2DH5	Low	2.910	0.310	0.4	Compliance
	Middle	2.910	0.310	0.4	Compliance
	High	2.910	0.310	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s				

2DH1: Low Channel

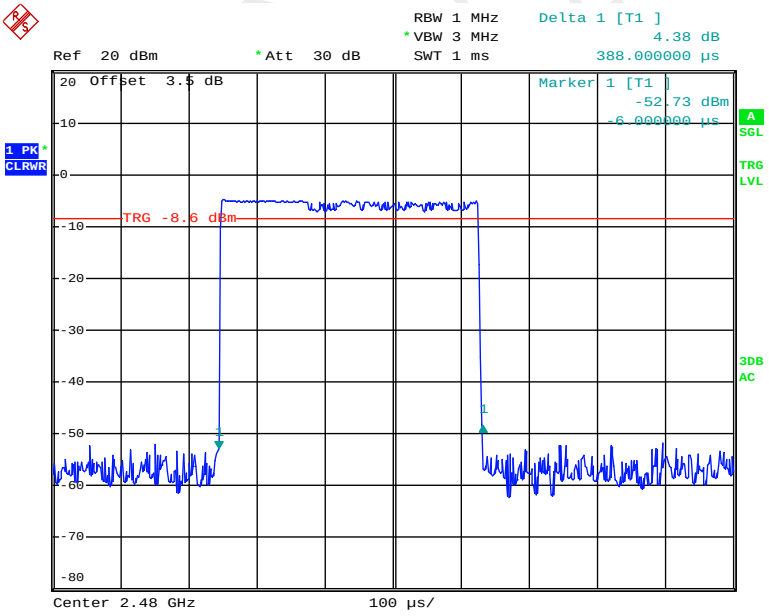


2DH1: Middle Channel



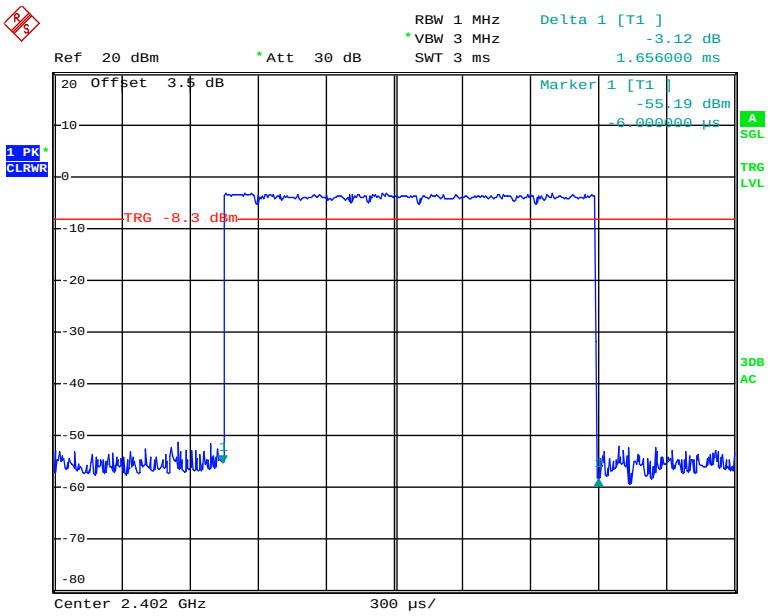
Date: 30.JUN.2017 21:42:36

2DH1: High Channel



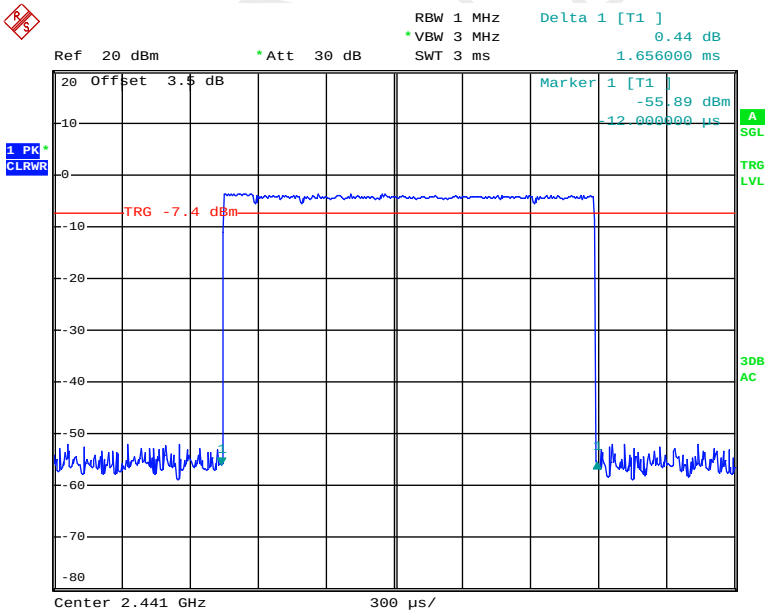
Date: 30.JUN.2017 21:42:43

2DH3: Low Channel



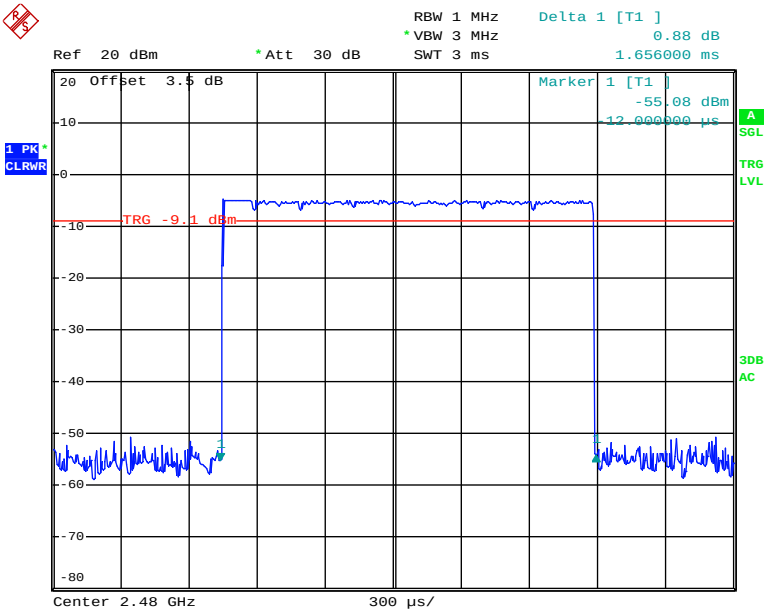
Date: 30.JUN.2017 21:43:17

2DH3: Middle Channel



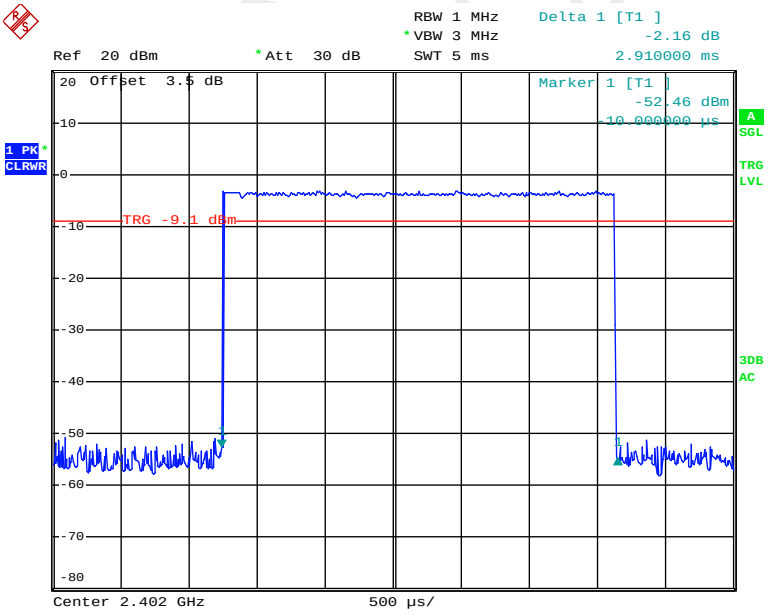
Date: 30.JUN.2017 21:43:23

2DH3: High Channel



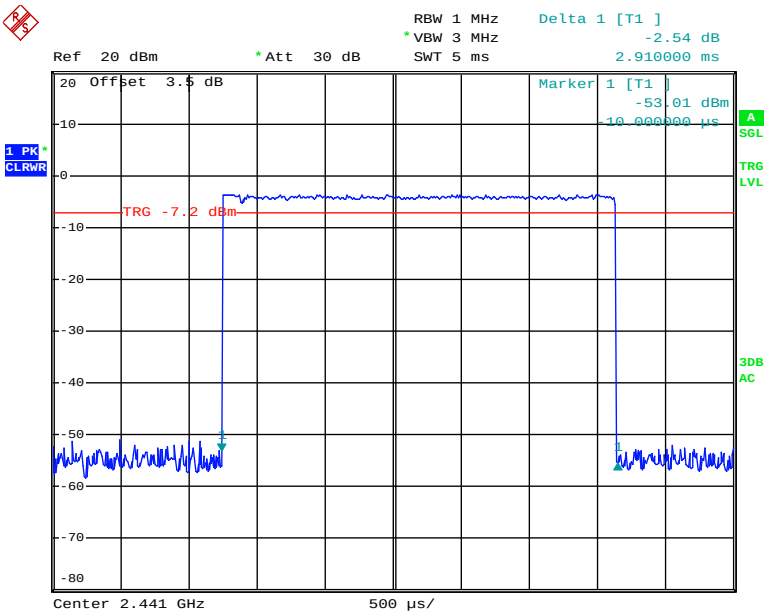
Date: 30.JUN.2017 21:43:30

2DH5: Low Channel



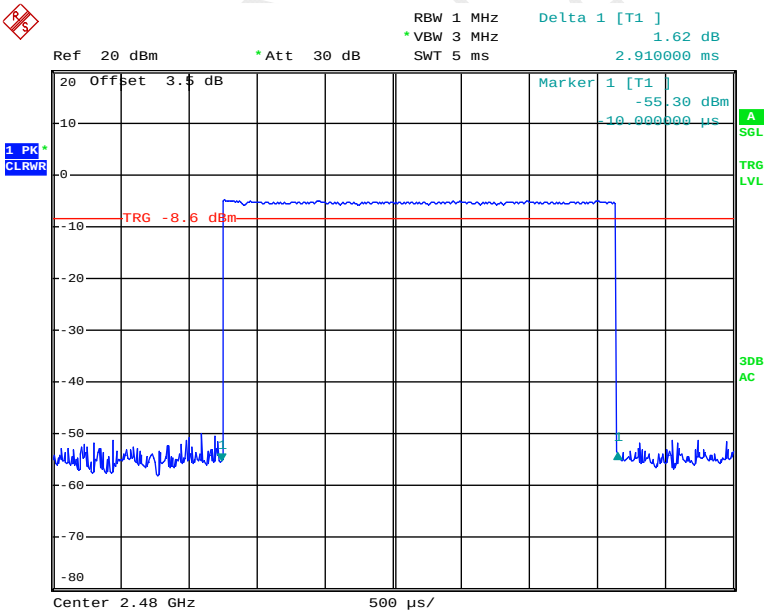
Date: 30.JUN.2017 21:43:59

2DH5: Middle Channel



Date: 30.JUN.2017 21:44:06

2DH5: High Channel

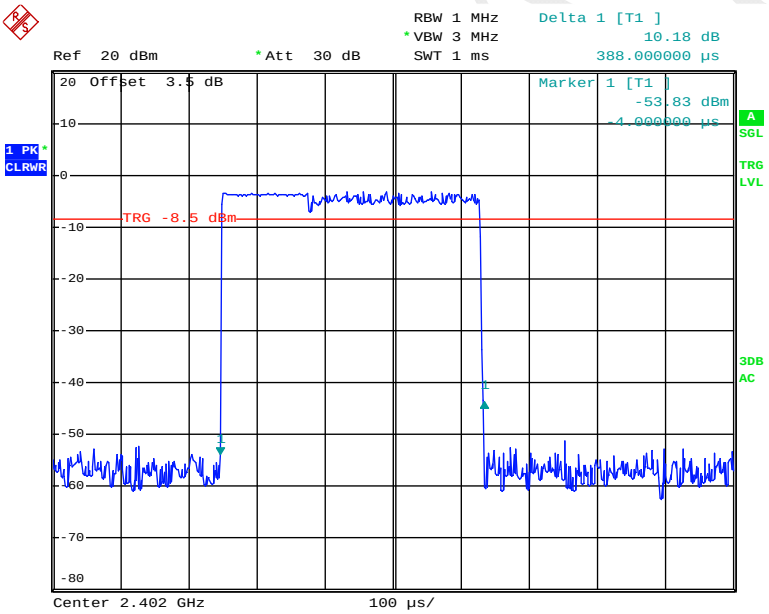


Date: 30.JUN.2017 21:44:13

EDR Mode (8-DPSK):

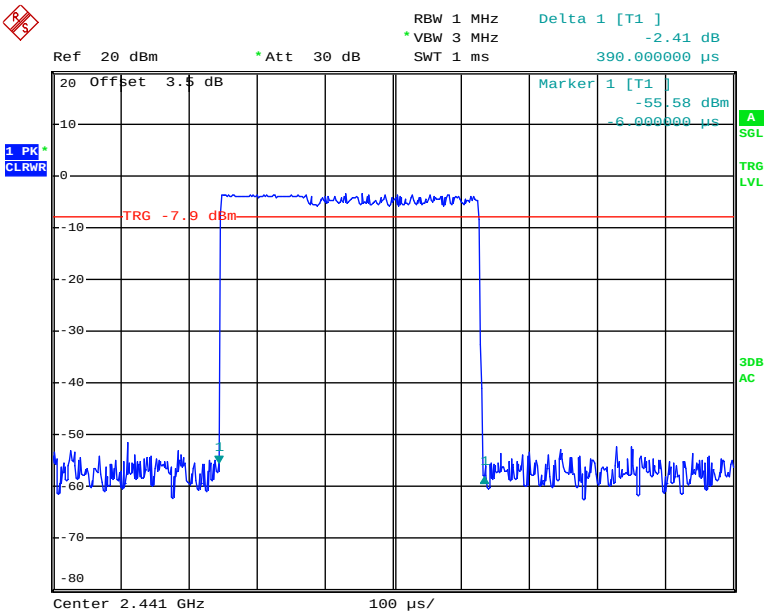
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
3DH1	Low	0.388	0.124	0.4	Compliance
	Middle	0.390	0.125	0.4	Compliance
	High	0.390	0.125	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s				
3DH3	Low	1.650	0.264	0.4	Compliance
	Middle	1.656	0.265	0.4	Compliance
	High	1.656	0.265	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s				
3DH5	Low	2.910	0.310	0.4	Compliance
	Middle	2.910	0.310	0.4	Compliance
	High	2.910	0.310	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s				

3DH1: Low Channel



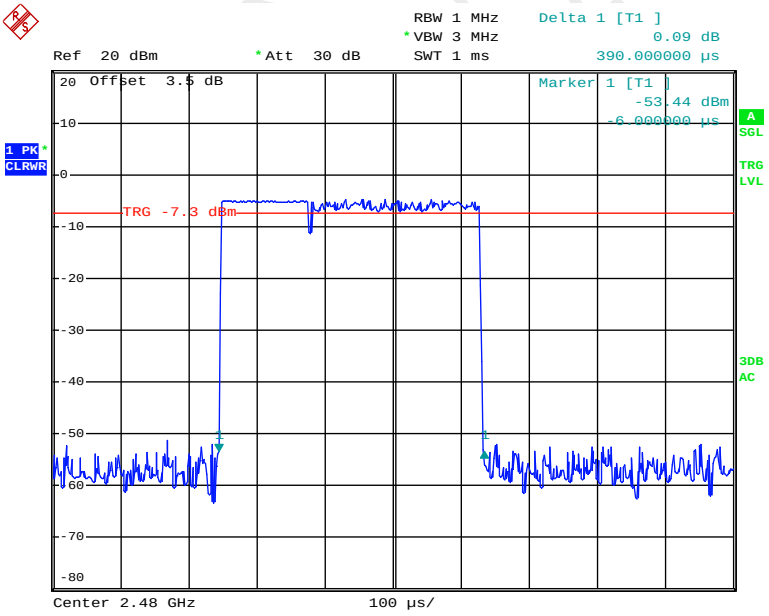
Date: 30.JUN.2017 21:45:45

3DH1: Middle Channel



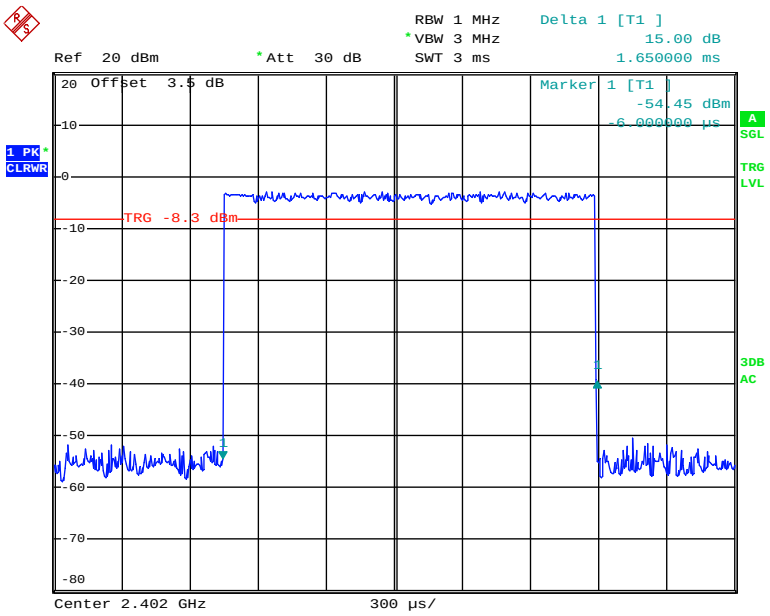
Date: 30.JUN.2017 21:45:53

3DH1: High Channel



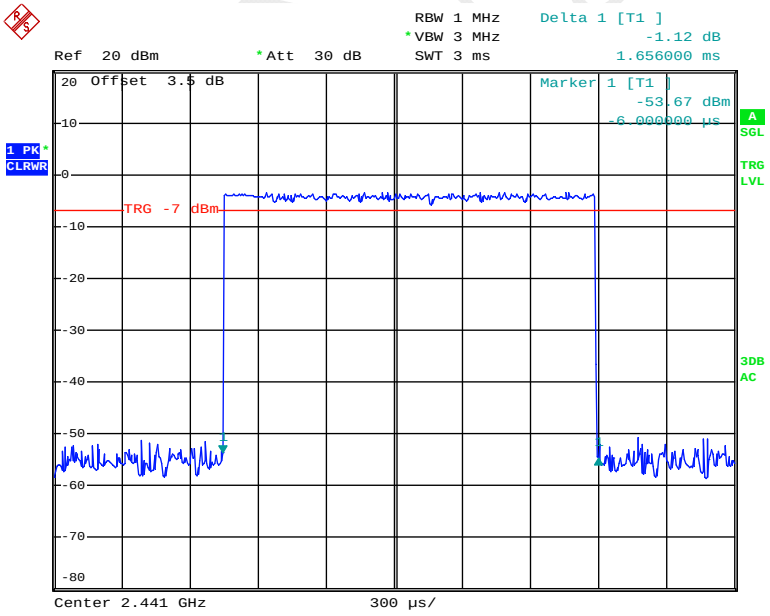
Date: 30.JUN.2017 21:46:00

3DH3: Low Channel



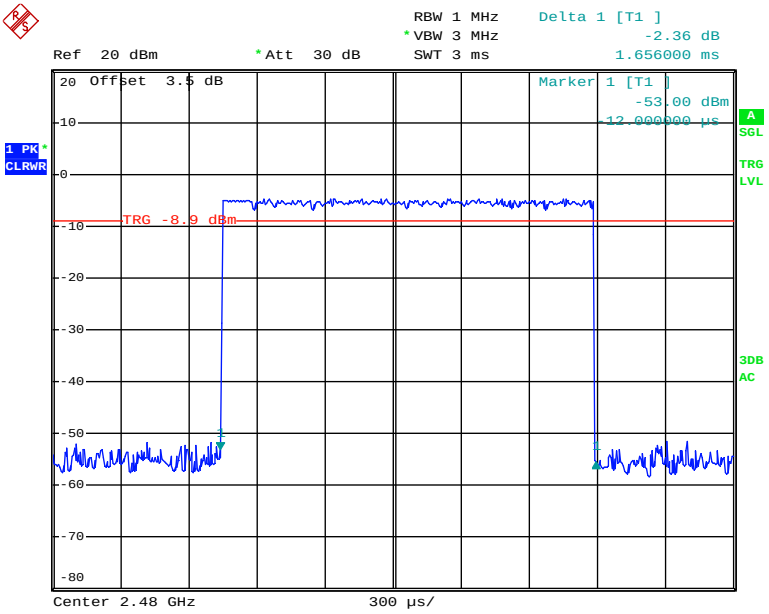
Date: 30.JUN.2017 21:47:02

3DH3: Middle Channel



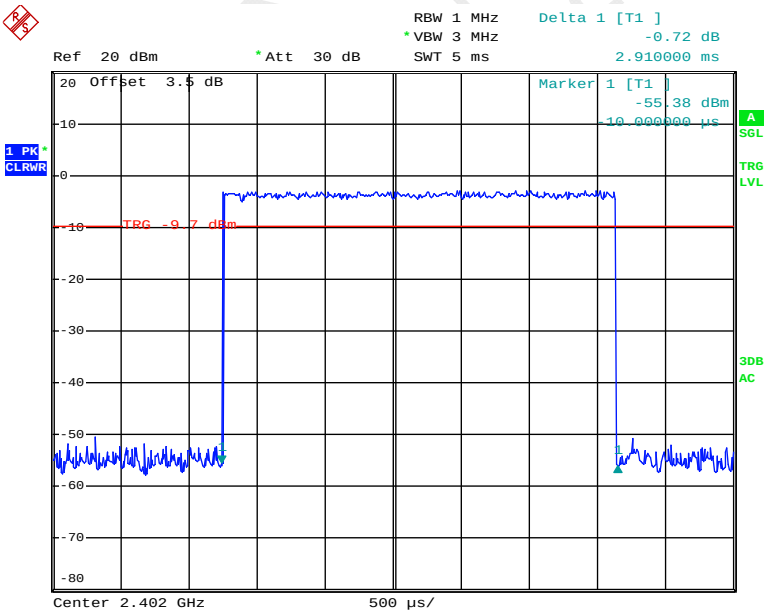
Date: 30.JUN.2017 21:47:08

3DH3: High Channel



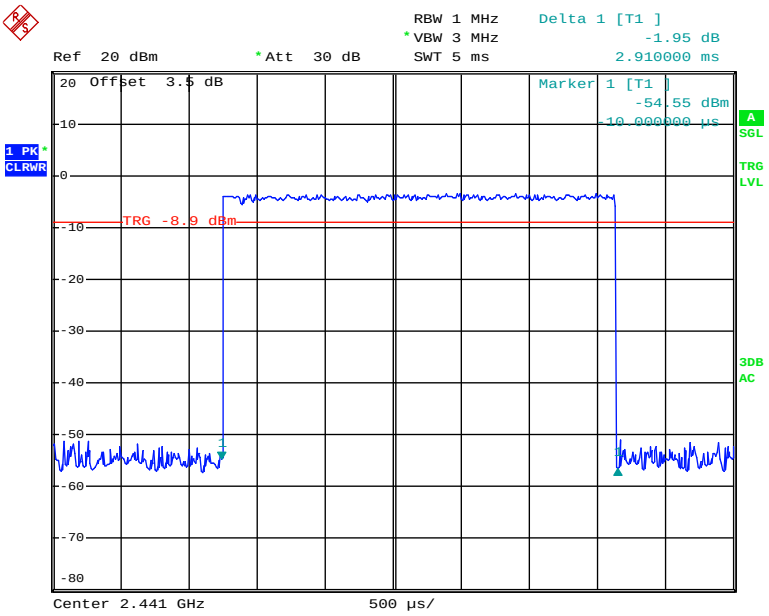
Date: 30.JUN.2017 21:47:15

3DH5: Low Channel



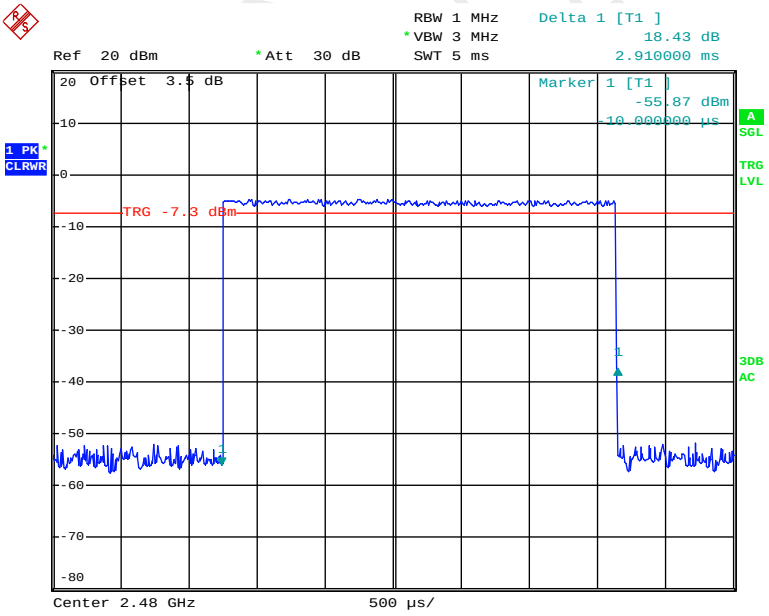
Date: 30.JUN.2017 21:48:13

3DH5: Middle Channel



Date: 30.JUN.2017 21:48:20

3DH5: High Channel



Date: 30.JUN.2017 21:48:27

FCC §15.247(b) (1)& RSS-247 CLAUSE 5.4 b) - 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

According to RSS-247 Clause 5.4 b)

b) For FHSs operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

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	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Unknown	Attenuator	3dB	3dB-1	Each Time	/
Unknown	RF Cable	Unknown	C-5	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Data

Environmental Conditions

Temperature:	27.4°C
Relative Humidity:	47.5 %
ATM Pressure:	100.1 kPa

** The testing was performed by Kevin Hu on 2017-06-30.*

Test Result: Compliance.

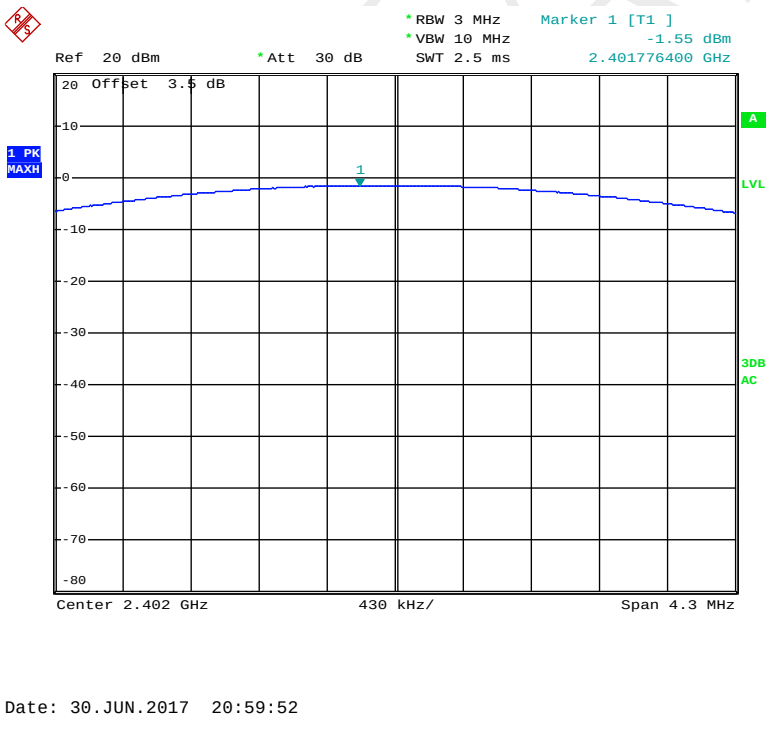
Test Mode: Transmitting

Mode	Frequency (MHz)	Peak Output power (dBm)	Limit (dBm)
BDR Mode (GFSK)	2402	-1.55	30
	2441	-2.28	30
	2480	-3.65	30
EDR Mode (π/4-DQPSK)	2402	-2.86	30
	2441	-3.29	30
	2480	-4.51	30
EDR Mode (8-DPSK)	2402	-2.34	30
	2441	-2.98	30
	2480	-4.2	30

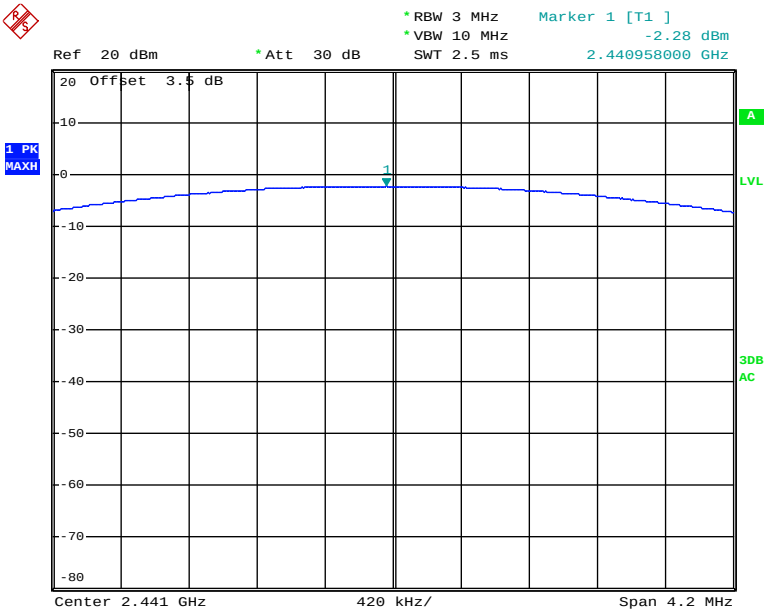
Note: The data above was tested in conducted mode.

BDR Mode (GFSK):

Low Channel

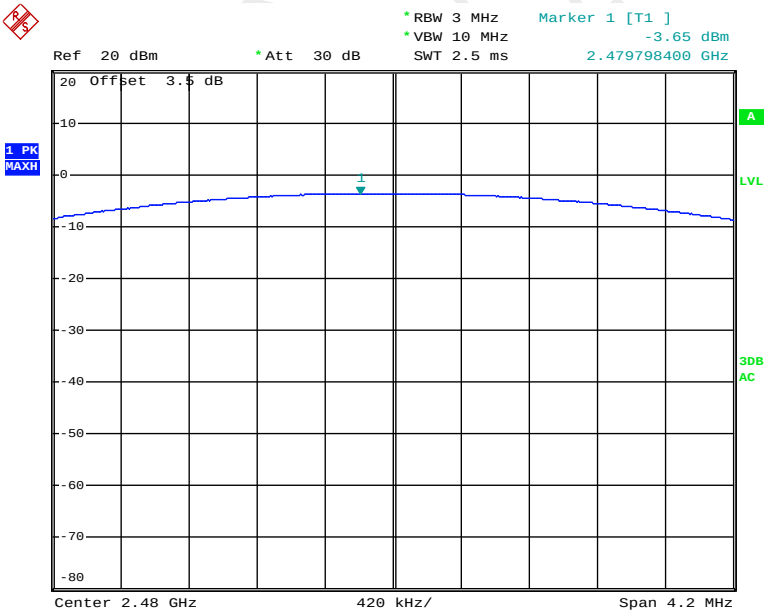


Middle Channel



Date: 30.JUN.2017 21:01:17

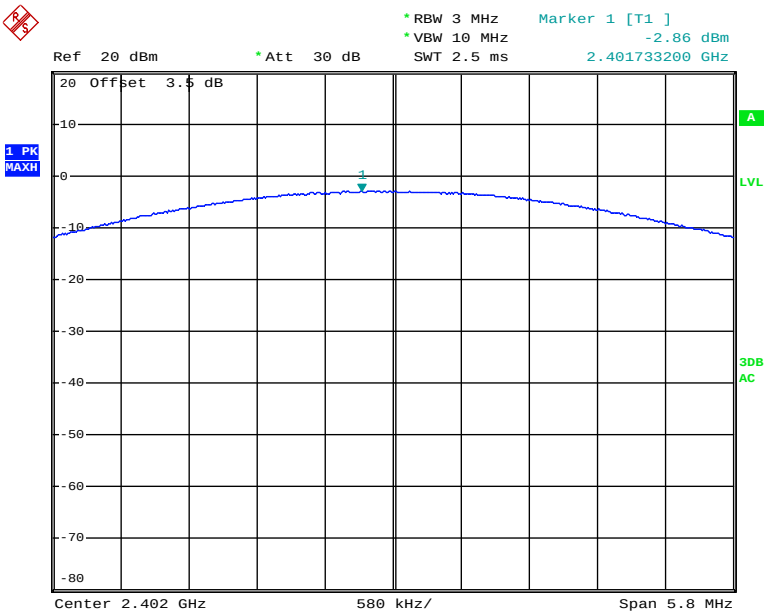
High Channel



Date: 30.JUN.2017 21:02:30

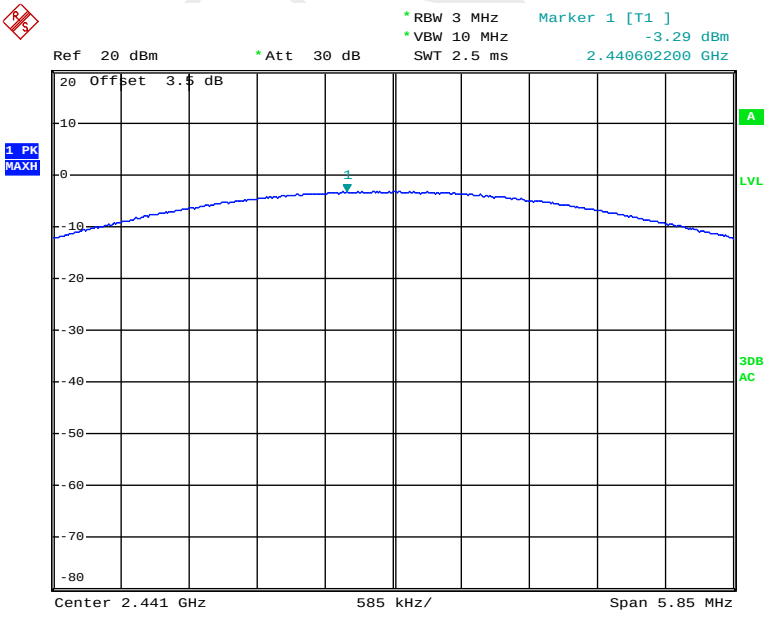
EDR Mode (π/4-DQPSK):

Low Channel



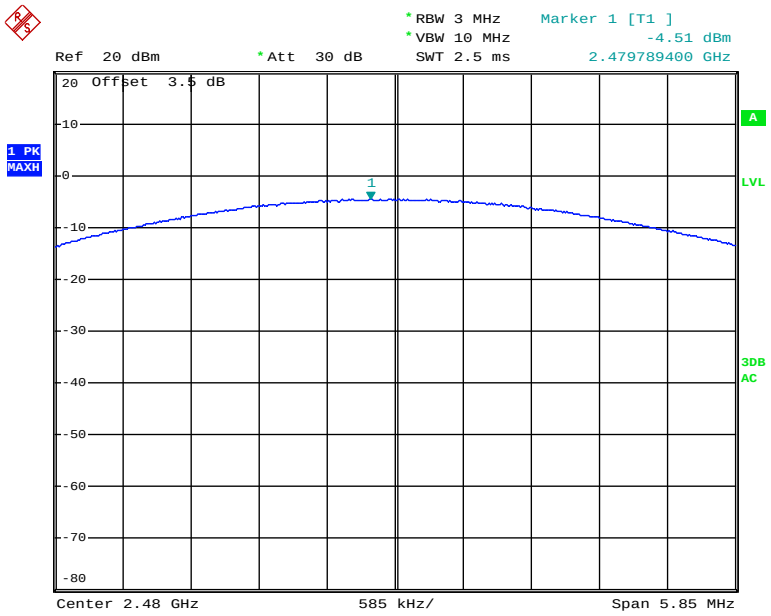
Date: 30.JUN.2017 21:04:17

Middle Channel



Date: 30.JUN.2017 21:06:15

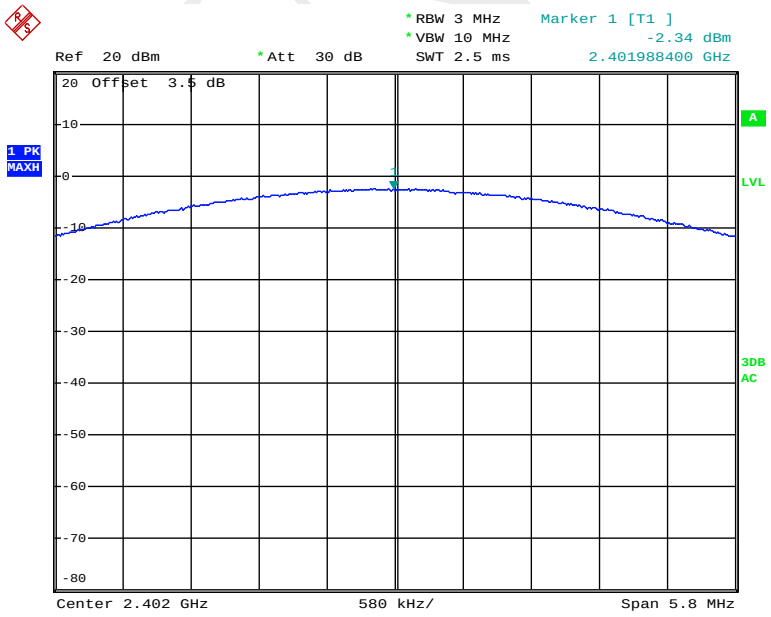
High Channel



Date: 30.JUN.2017 21:07:14

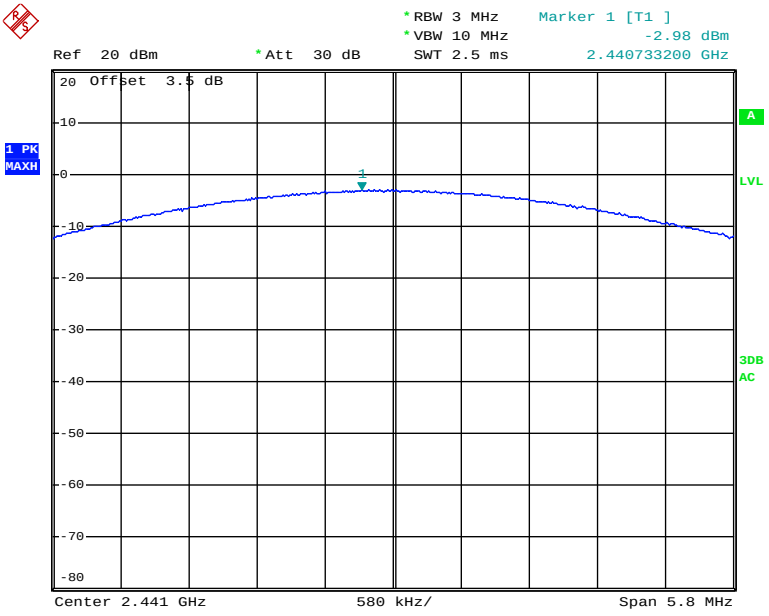
EDR Mode (8-DPSK):

Low Channel



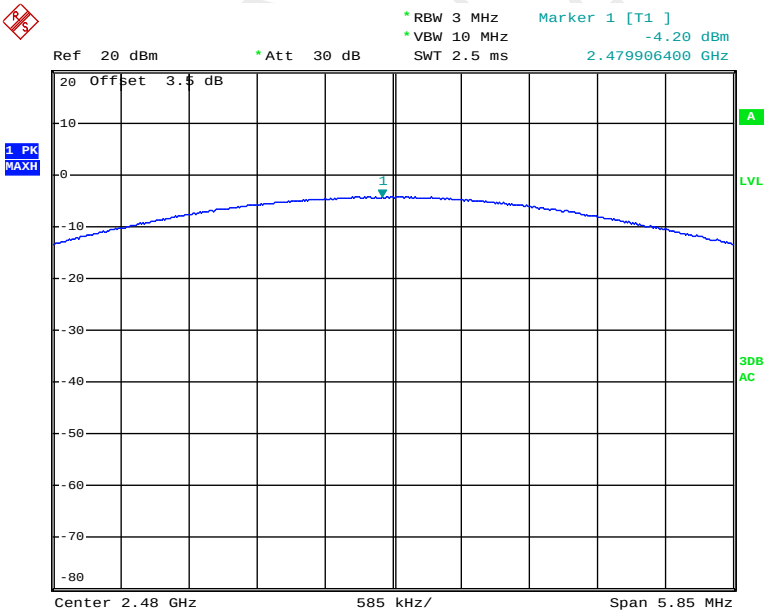
Date: 30.JUN.2017 21:10:12

Middle Channel



Date: 30.JUN.2017 21:11:37

High Channel



Date: 30.JUN.2017 21:12:33

FCC §15.247(d)& RSS-247 CLAUSE 5.5 - BAND EDGES TESTING

Applicable Standard

According to FCC §15.247(d)

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)).

According to RSS-247 Clause 5.5

> In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

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/VBW=100/300kHz of spectrum analyze 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	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Unknown	Attenuator	3dB	3dB-1	Each Time	/
Unknown	RF Cable	Unknown	C-5	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Data

Environmental Conditions

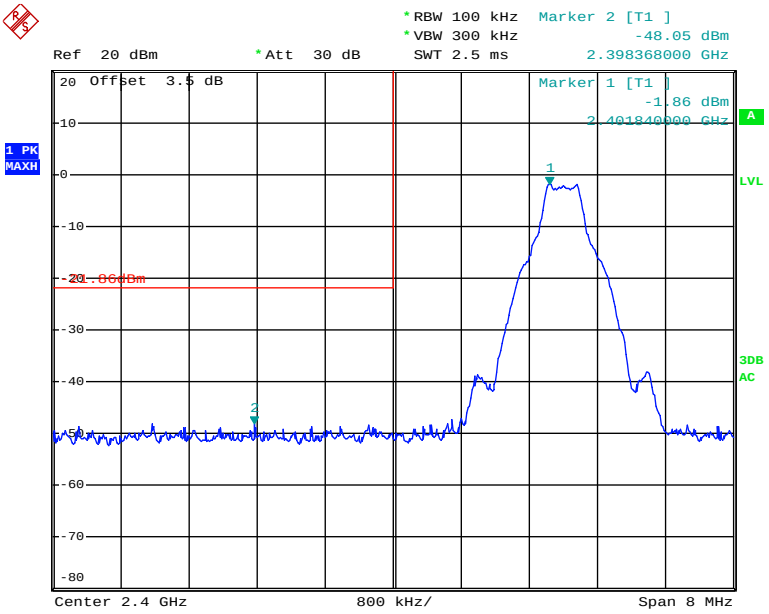
Temperature:	27.4°C
Relative Humidity:	47.5 %
ATM Pressure:	100.1 kPa

** The testing was performed by Kevin Hu on 2017-06-30.*

Test Result: Compliance

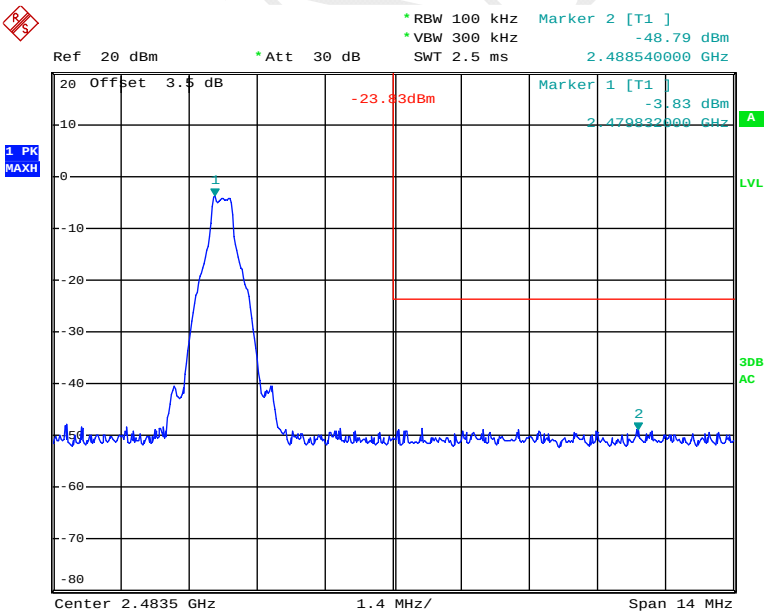
BDR Mode (GFSK):

Band Edge, Left Side



Date: 30.JUN.2017 21:00:14

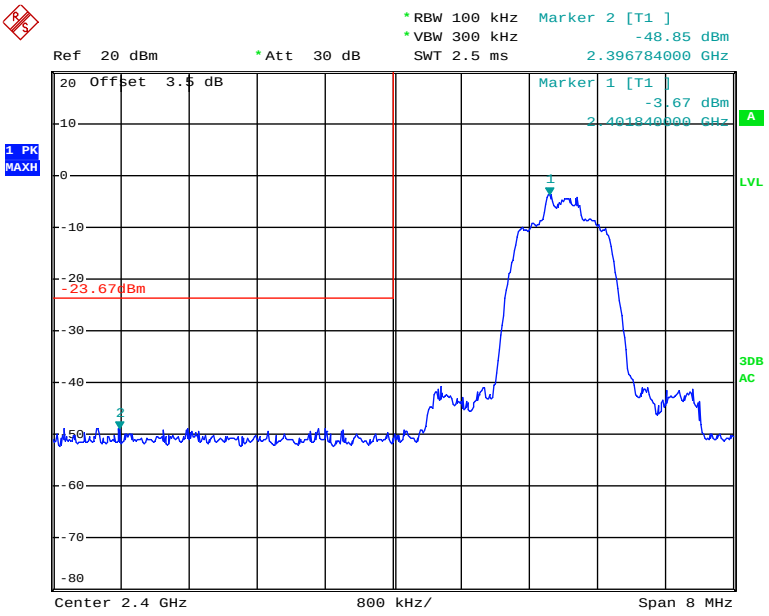
Band Edge, Right Side



Date: 30.JUN.2017 21:02:45

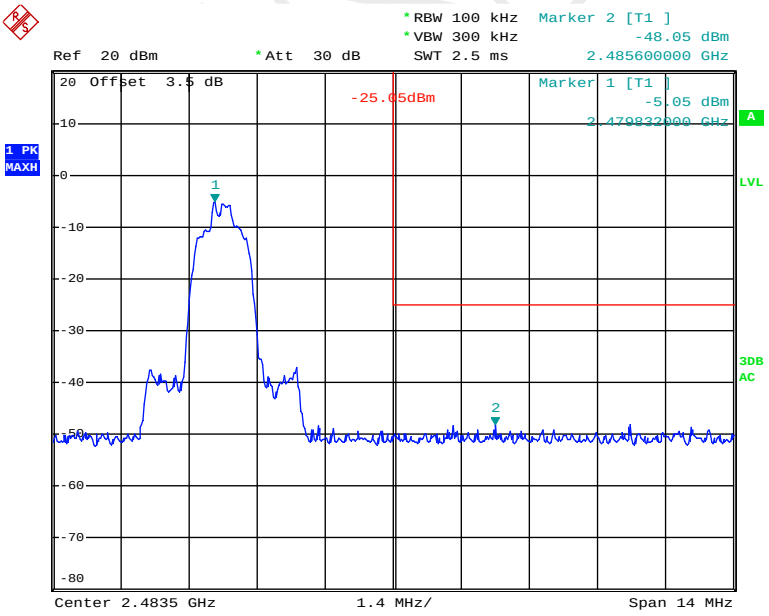
EDR Mode (π/4-DQPSK):

Band Edge, Left Side



Date: 30.JUN.2017 21:04:33

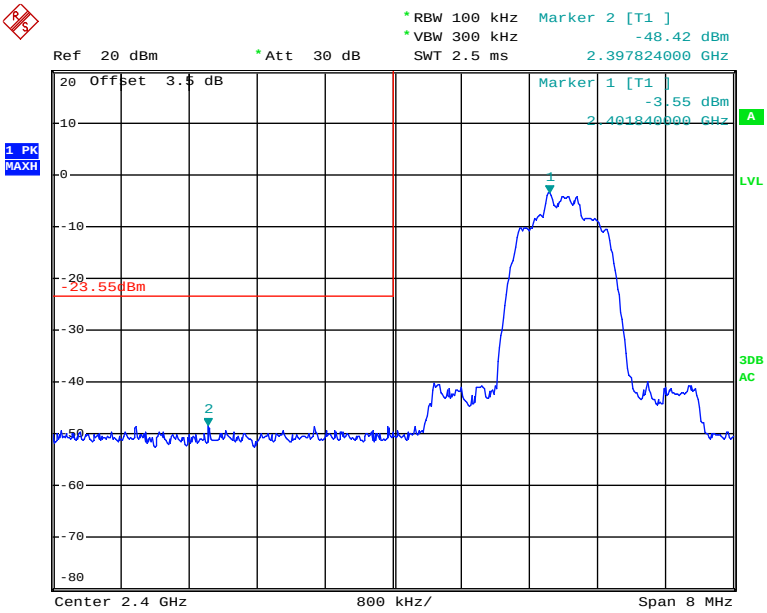
Band Edge, Right Side



Date: 30.JUN.2017 21:07:30

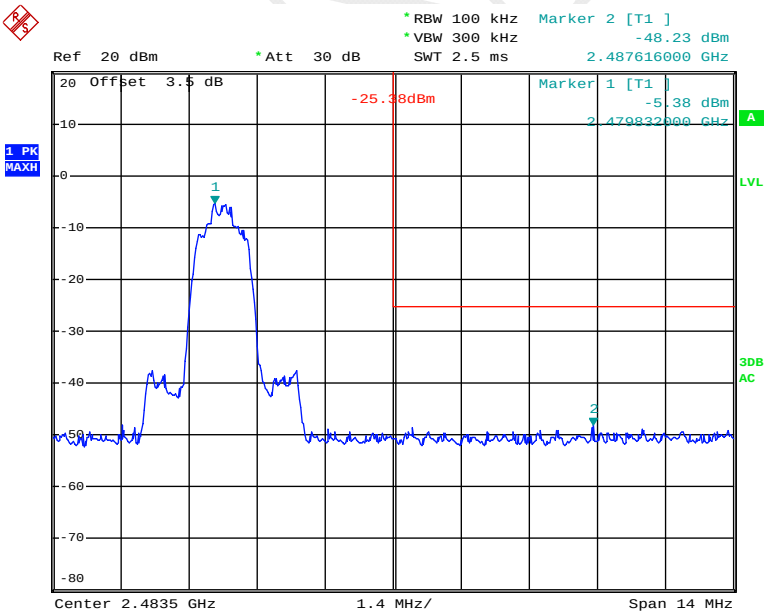
EDR Mode (8-DPSK):

Band Edge, Left Side



Date: 30.JUN.2017 21:10:34

Band Edge, Right Side



Date: 30.JUN.2017 21:12:49

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