TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.247

RSS-GEN, ISSUE 4, NOVEMBER 2014

RSS-247, ISSUE 2, FEBRUARY 2017

TEST REPORT

For

Fujian LANDI Commercial Equipment Co., Ltd.

Building 17, Section A, Software Park, No. 89 Software Road, Gulou District, Fuzhou Municipality, Fujian Province, P.R. China.

FCC ID: 2AG6NAPOSA8LEWF
IC: 23725-APOSA8LEWF

Report Type:	**Product Name:**
Original Report	APOS A8

Report Number:	RXM171225059-00B
Report Date:	2018-04-03
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		APOS A8
EUT Model:		APOS A8
FCC ID:		2AG6NAPOSA8LEWF
IC:		23725-APOSA8LEWF
Rated Input Voltage:		DC 7.2V from battery or DC 5V from adapter
Adapter #1 Information	**Model:**	HKC0115021-2D
	Input:	AC 100-240V~50/60Hz, 0.5A
	Output:	DC 5V, 2A
Adapter #2 Information	**Model:**	A8A-050200U-US1
	Input:	AC 100-240V~50/60Hz, 0.35A
	Output:	DC 5V, 2A
External Dimension:		Length (183mm)*Width (84mm)*High (64mm)
Serial Number:		171225059
EUT Received Date:		2017.12.25

Objective

This report is prepared on behalf of ***Fujian Landi Commercial Equipment Co., Ltd.*** 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 Bluetooth BDR and EDR mode of EUT compliance with FCC Rules Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 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)

FCC Part 15C DTS submissions with FCC ID: 2AG6NAPOSA8LEWF.
FCC Part 15C DXX submissions with FCC ID: 2AG6NAPOSA8LEWF.
FCC Part 22H,24E,27,90 PCB submissions with FCC ID: 2AG6NAPOSA8LEWF.
RSS-247 DTSs, RSS-132, RSS-133, RSS-139, RSS-199, RSS-130, RSS-210 submissions with IC: 23725-APOSA8LEWF.

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", 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.

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

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~26.5GHz: 5.23 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Test Facility

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

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218,the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in engineering mode.

Special Accessories

Manufacturer	Description	Model	Serial Number
Shenzhen Mbell Electronics Co.,Ltd	Battery#1	LD18650D	MBPD12716032800145
Fuzhou SCUD Commercial Equipment Co.,Ltd.	Battery#2	LD18650D	PC02000080,01,171123

Note: all tests were performed with battery#1, except AC line test and Radiation test with both batteries.

EUT Exercise Software

The test software 'QRCT ' was configured the maximum power level as below setting, which was provided by manufacturer:

Test Software Version	QRCT		
Test Frequency	2402MHz	2441MHz	2480MHz
GFSK	9	9	9
π/4-DQPSK	9	9	9
8DPSK	9	9	9

Equipment Modifications

No modification was made to the EUT.

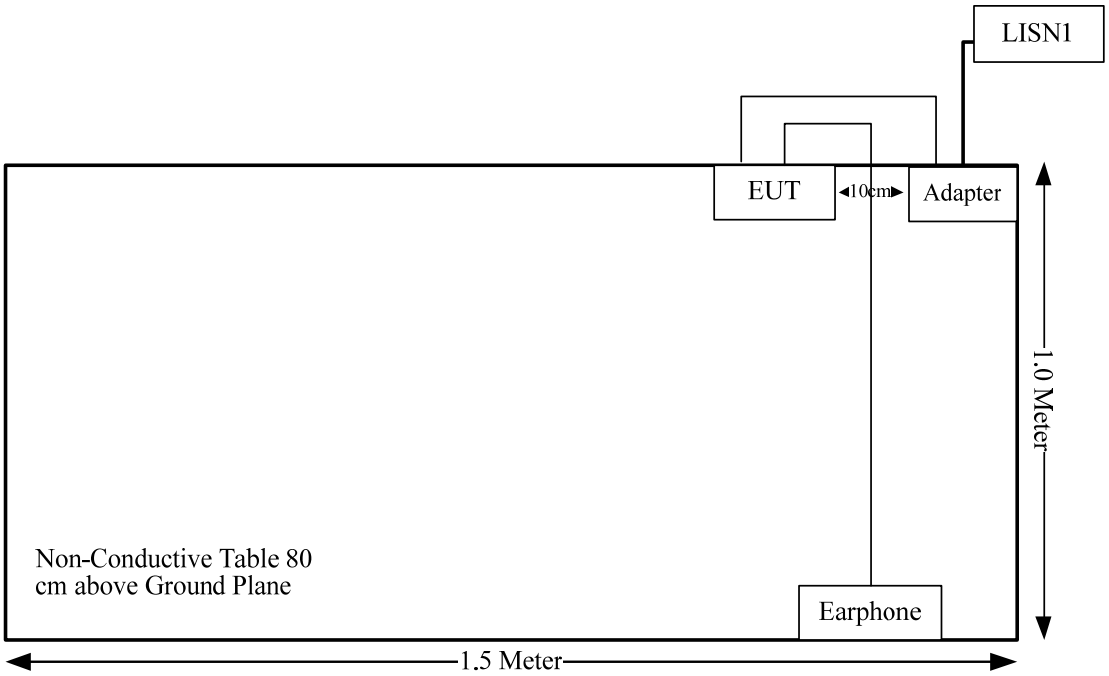
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
HUAWEI	Earphone	/	/

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB cable	yes	No	1.5	Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i) & §1.1310 & §2.1093 RSS-102 Clause 4	RF Exposure	Compliance
§15.203 RSS-GEN Clause 8.3	Antenna Requirement	Compliance
§15.207 (a) RSS-Gen Clause 8.8	Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d) RSS-247 Clause 5.5, RSS-Gen Clause 8.10	Spurious Emissions	Compliance
§15.247 (a)(1) RSS-247 Clause 5.1 b) RSS-Gen Clause 6.6	20 dB Bandwidth	Compliance
§15.247(a)(1) RSS-247 Clause 5.1 b)	Channel Separation Test	Compliance
§15.247(a)(1)(iii) RSS-247 Clause 5.1 d)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii) RSS-247 Clause 5.1 d)	Quantity of hopping channel Test	Compliance
§15.247(b)(1) RSS-247 Clause 5.4 b)	Peak Output Power Measurement	Compliance
§15.247(d) RSS-247 Clause 5.5	Band Edges	Compliance

FCC §15.247 (i) & §1.1310 & §2.1093& RSS-102 CLAUSE 4- RF EXPOSURE

Applicable Standard

Applicable Standard

According to§15.247(i),§1.1310 and §2.1093.

According to RSS-102 Clause 4 Table 3, SAR limits for device used by the general public.

Body Region	Average SAR (W/Kg)	Averaging Time (minutes)	Mass Average (g)
Whole Body	0.08	6	Whole Body
Localized Head, Neck and Trunk	1.6	6	1
Localized Limbs	4	6	10

Test Result

Compliant, please refer to the SAR report: RDG171225059-20.

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 1.5 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

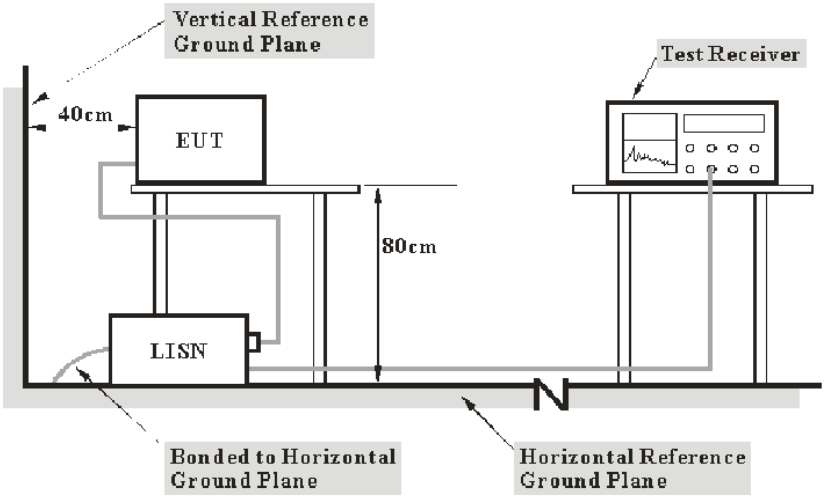
Result: Compliance.

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

Applicable Standard

FCC§15.207(a) 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 limits and RSS-Gen limits.

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Test Procedure

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

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 limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2017-12-11	2018-12-11
R&S	Two-line V-network	ENV 216	101614	2017-12-08	2018-12-08
N/A	Coaxial Cable	C-NJNJ-50	C-0200-01	2017-09-05	2018-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

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

Test Data

Environmental Conditions

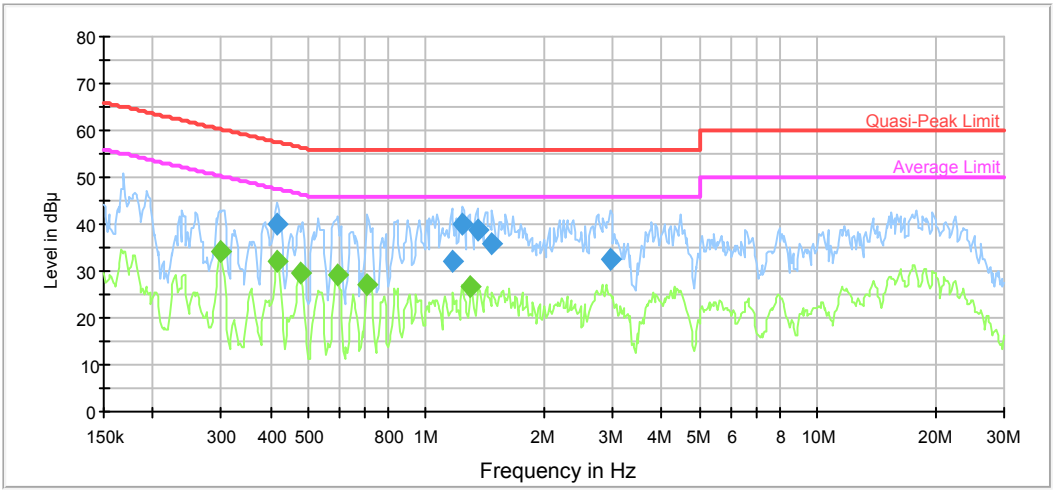
Temperature:	24.3 °C
Relative Humidity:	42 %
ATM Pressure:	101.2 kPa

The testing was performed by Jim Zhang on 2018-01-26.

Test Mode: *Transmitting*

Battery #1& Adapter #1:

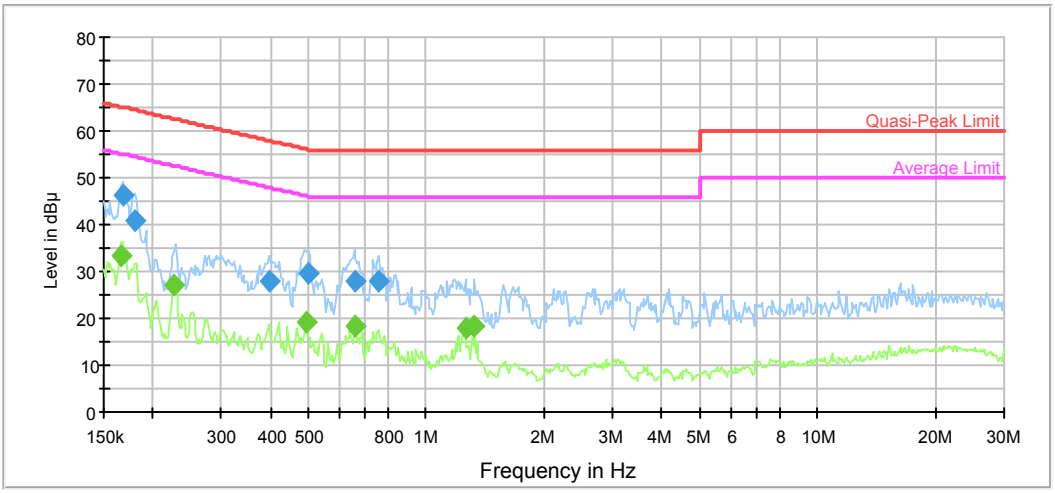
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.415949	39.8	9.000	L1	10.0	17.7	57.5	Compliance
1.162648	32.1	9.000	L1	9.8	23.9	56.0	Compliance
1.239175	39.8	9.000	L1	9.8	16.2	56.0	Compliance
1.352690	38.9	9.000	L1	9.7	17.1	56.0	Compliance
1.476605	35.9	9.000	L1	9.7	20.1	56.0	Compliance
2.953456	32.4	9.000	L1	9.8	23.6	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.297644	34.3	9.000	L1	10.2	16.0	50.3	Compliance
0.415949	31.9	9.000	L1	10.0	15.7	47.5	Compliance
0.476287	29.7	9.000	L1	9.9	16.7	46.4	Compliance
0.590613	29.2	9.000	L1	9.8	16.8	46.0	Compliance
0.709407	27.0	9.000	L1	9.8	19.0	46.0	Compliance
1.299858	26.6	9.000	L1	9.8	19.4	46.0	Compliance

AC120 V, 60 Hz, Neutral:

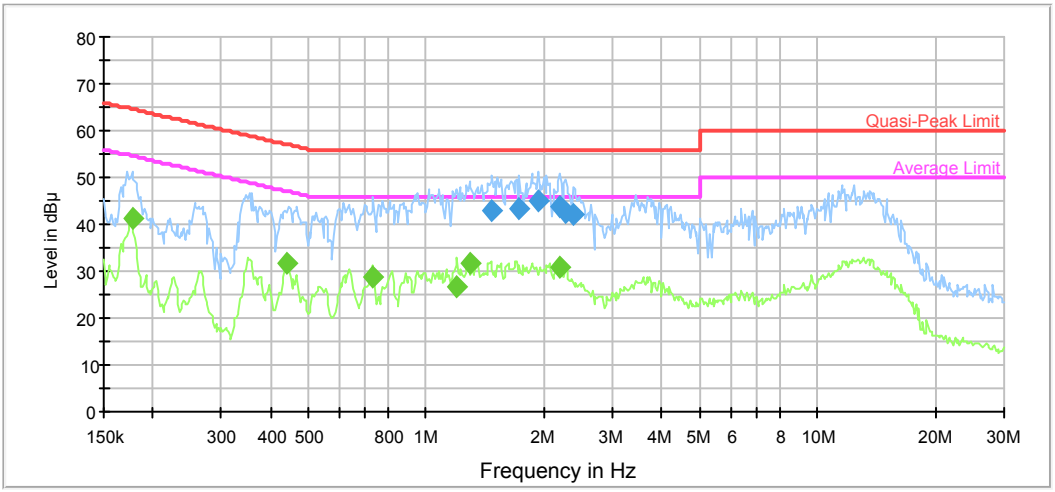


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.167702	46.1	9.000	N	10.9	19.0	65.1	Compliance
0.180171	40.7	9.000	N	10.8	23.8	64.5	Compliance
0.396530	27.8	9.000	N	10.0	30.1	57.9	Compliance
0.499611	29.5	9.000	N	9.9	26.5	56.0	Compliance
0.655073	28.0	9.000	N	9.8	28.0	56.0	Compliance
0.756101	27.8	9.000	N	9.8	28.2	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.166371	33.2	9.000	N	10.9	21.9	55.1	Compliance
0.227007	26.9	9.000	N	10.5	25.7	52.6	Compliance
0.491712	19.0	9.000	N	9.9	27.1	46.1	Compliance
0.655073	18.2	9.000	N	9.8	27.8	46.0	Compliance
1.259081	18.1	9.000	N	9.8	27.9	46.0	Compliance
1.331304	18.3	9.000	N	9.7	27.7	46.0	Compliance

Battery #1& Adapter #2:

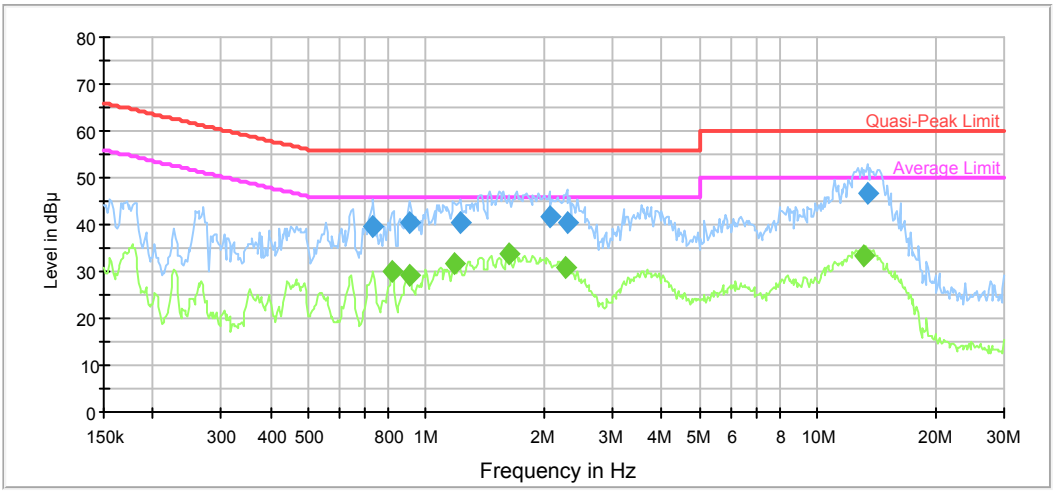
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
1.476605	43.0	9.000	L1	9.7	13.0	56.0	Compliance
1.731709	43.2	9.000	L1	9.7	12.8	56.0	Compliance
1.936076	45.1	9.000	L1	9.7	10.9	56.0	Compliance
2.199332	43.7	9.000	L1	9.7	12.3	56.0	Compliance
2.270560	42.4	9.000	L1	9.8	13.6	56.0	Compliance
2.381750	42.1	9.000	L1	9.8	13.9	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.177322	41.3	9.000	L1	10.8	13.3	54.6	Compliance
0.439808	31.5	9.000	L1	9.9	15.6	47.1	Compliance
0.732382	28.6	9.000	L1	9.8	17.4	46.0	Compliance
1.200302	26.8	9.000	L1	9.8	19.2	46.0	Compliance
1.289541	31.6	9.000	L1	9.8	14.4	46.0	Compliance
2.199332	30.7	9.000	L1	9.7	15.3	46.0	Compliance

AC120 V, 60 Hz, Neutral:

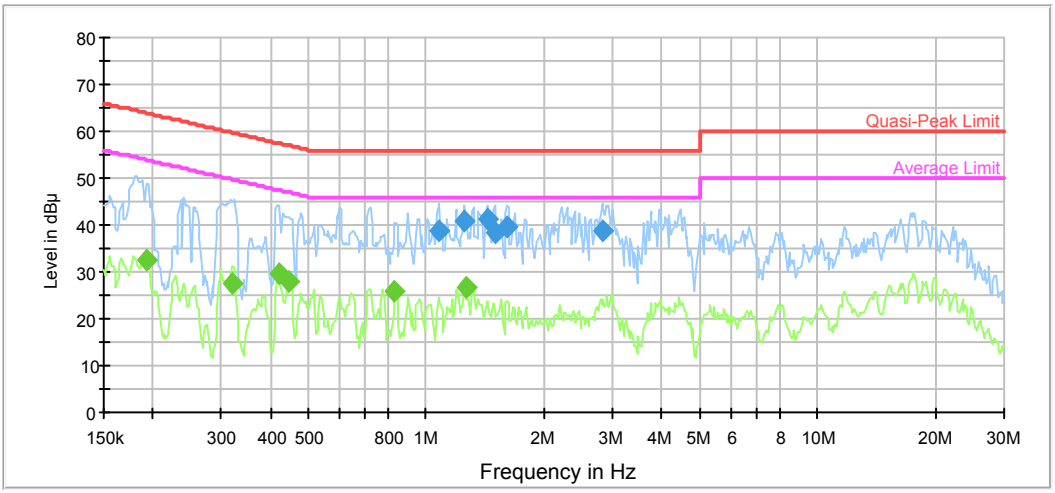


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.732382	39.6	9.000	N	9.8	16.4	56.0	Compliance
0.908180	40.4	9.000	N	9.8	15.6	56.0	Compliance
1.229340	40.3	9.000	N	9.8	15.7	56.0	Compliance
2.063510	41.9	9.000	N	9.8	14.1	56.0	Compliance
2.288725	40.5	9.000	N	9.8	15.5	56.0	Compliance
13.422446	46.8	9.000	N	9.9	13.2	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.818813	29.9	9.000	N	9.8	16.1	46.0	Compliance
0.908180	29.0	9.000	N	9.8	17.0	46.0	Compliance
1.181325	31.5	9.000	N	9.8	14.5	46.0	Compliance
1.624765	33.6	9.000	N	9.7	12.4	46.0	Compliance
2.270560	31.0	9.000	N	9.8	15.0	46.0	Compliance
13.210237	33.3	9.000	N	9.9	16.7	50.0	Compliance

Battery #2& Adapter #1:

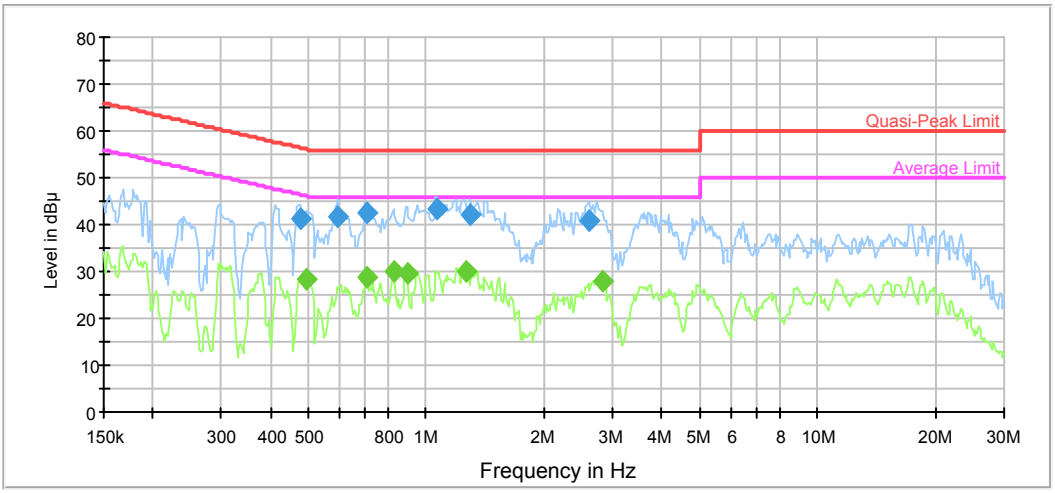
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
1.082190	38.9	9.000	L1	9.8	17.1	56.0	Compliance
1.249088	40.9	9.000	L1	9.8	15.1	56.0	Compliance
1.430284	41.1	9.000	L1	9.7	14.9	56.0	Compliance
1.500325	38.2	9.000	L1	9.7	17.8	56.0	Compliance
1.611870	39.7	9.000	L1	9.7	16.3	56.0	Compliance
2.815577	38.9	9.000	L1	9.8	17.1	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.192030	32.6	9.000	L1	10.7	21.3	53.9	Compliance
0.319773	27.5	9.000	L1	10.1	22.2	49.7	Compliance
0.419276	29.6	9.000	L1	10.0	17.9	47.5	Compliance
0.446873	28.1	9.000	L1	9.9	18.8	46.9	Compliance
0.831967	25.9	9.000	L1	9.8	20.1	46.0	Compliance
1.259081	26.5	9.000	L1	9.8	19.5	46.0	Compliance

AC120 V, 60 Hz, Neutral:

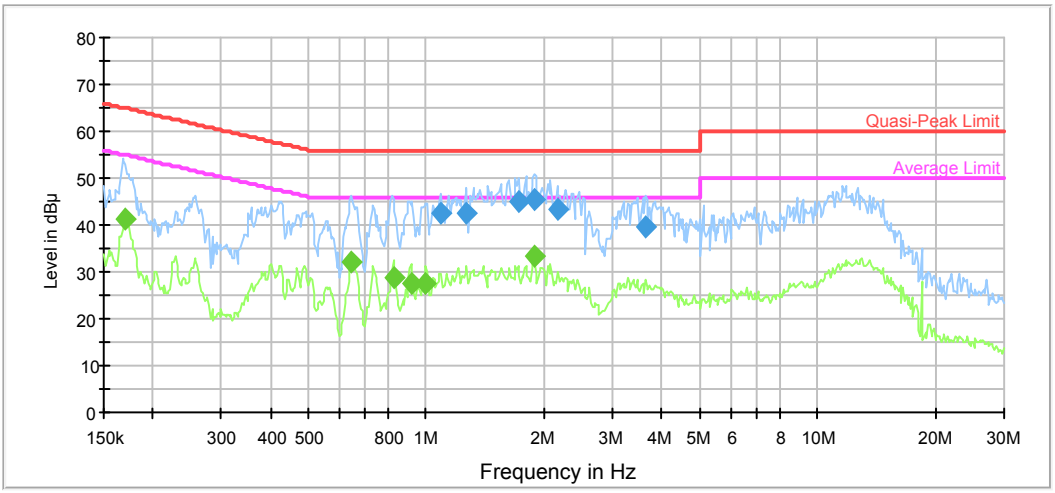


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.476287	41.4	9.000	N	9.9	15.0	56.4	Compliance
0.595338	41.6	9.000	N	9.8	14.4	56.0	Compliance
0.709407	42.5	9.000	N	9.8	13.5	56.0	Compliance
1.065081	43.3	9.000	N	9.8	12.7	56.0	Compliance
1.299858	42.2	9.000	N	9.8	13.8	56.0	Compliance
2.599932	40.9	9.000	N	9.8	15.1	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.495646	28.3	9.000	N	9.9	17.8	46.1	Compliance
0.703777	28.7	9.000	N	9.8	17.3	46.0	Compliance
0.825364	29.9	9.000	N	9.8	16.1	46.0	Compliance
0.893821	29.6	9.000	N	9.8	16.4	46.0	Compliance
1.259081	29.9	9.000	N	9.8	16.1	46.0	Compliance
2.815577	28.1	9.000	N	9.8	17.9	46.0	Compliance

Battery #2& Adapter #2:

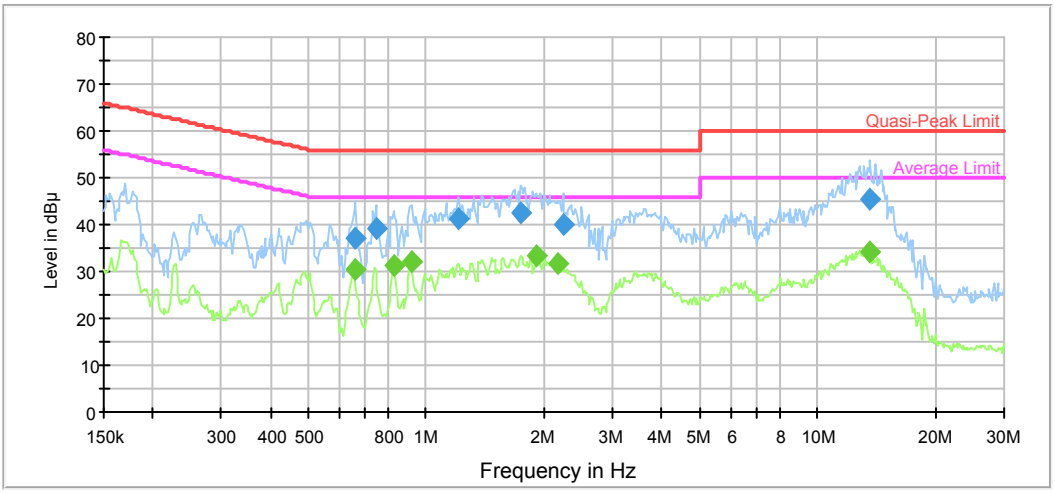
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
1.090848	42.4	9.000	L1	9.8	13.6	56.0	Compliance
1.269154	42.7	9.000	L1	9.8	13.3	56.0	Compliance
1.717965	45.1	9.000	L1	9.7	10.9	56.0	Compliance
1.890344	45.2	9.000	L1	9.7	10.8	56.0	Compliance
2.164561	43.2	9.000	L1	9.7	12.8	56.0	Compliance
3.633326	39.5	9.000	L1	9.8	16.5	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.170396	41.2	9.000	L1	10.9	13.7	54.9	Compliance
0.644717	31.9	9.000	L1	9.8	14.1	46.0	Compliance
0.825364	28.9	9.000	L1	9.8	17.1	46.0	Compliance
0.915445	27.5	9.000	L1	9.8	18.5	46.0	Compliance
0.999305	27.3	9.000	L1	9.8	18.7	46.0	Compliance
1.890344	33.3	9.000	L1	9.7	12.7	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.660314	37.1	9.000	N	9.8	18.9	56.0	Compliance
0.744147	39.1	9.000	N	9.8	16.9	56.0	Compliance
1.209904	41.3	9.000	N	9.8	14.7	56.0	Compliance
1.745563	42.3	9.000	N	9.7	13.7	56.0	Compliance
2.234662	39.8	9.000	N	9.8	16.2	56.0	Compliance
13.638064	45.4	9.000	N	9.9	14.6	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.655073	30.3	9.000	N	9.8	15.7	46.0	Compliance
0.825364	31.4	9.000	N	9.8	14.6	46.0	Compliance
0.915445	32.1	9.000	N	9.8	13.9	46.0	Compliance
1.920710	33.2	9.000	N	9.7	12.8	46.0	Compliance
2.164561	31.7	9.000	N	9.8	14.3	46.0	Compliance
13.529825	34.1	9.000	N	9.9	15.9	50.0	Compliance

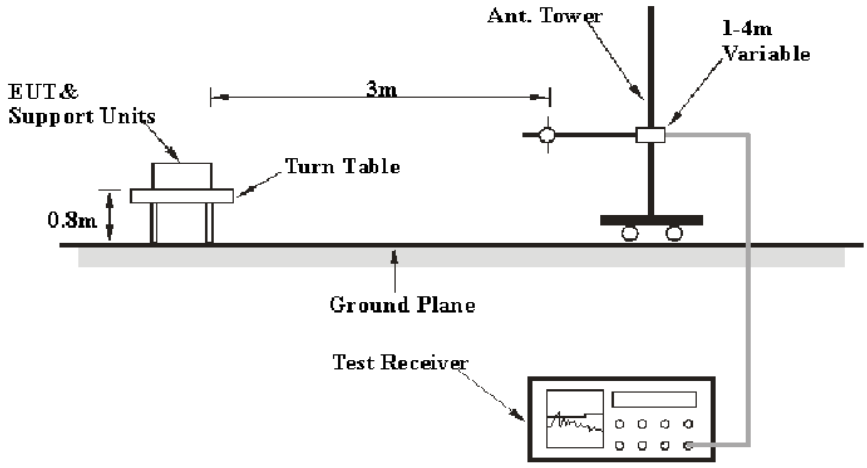
FCC §15.209, §15.205 & §15.247(d) & RSS-247 CLAUSE 5.5,RSS -GEN CLAUSE 8.10 - SPURIOUS EMISSIONS

Applicable Standard

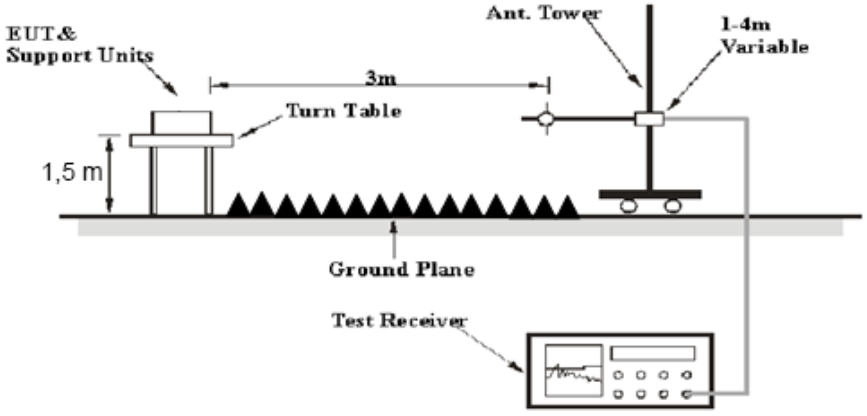
FCC §15.247 (d); §15.209; §15.205 and RSS-247 Clause 5.5, RSS-GEN Clause 8.10

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission Below 1GHz tests were performed in the 3 meters chamber A, above 1GHz tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits 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	Measurement
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
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2017-12-08	2018-12-08
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-04
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2017-09-05	2018-09-05
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2016-11-18	2019-11-18
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2017-06-27	2018-06-27
Chengdu Ouli	Band Rejection Filter	2400-2483.5	002	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-SJSJ-50	C-0800-01	2017-09-05	2018-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

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

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

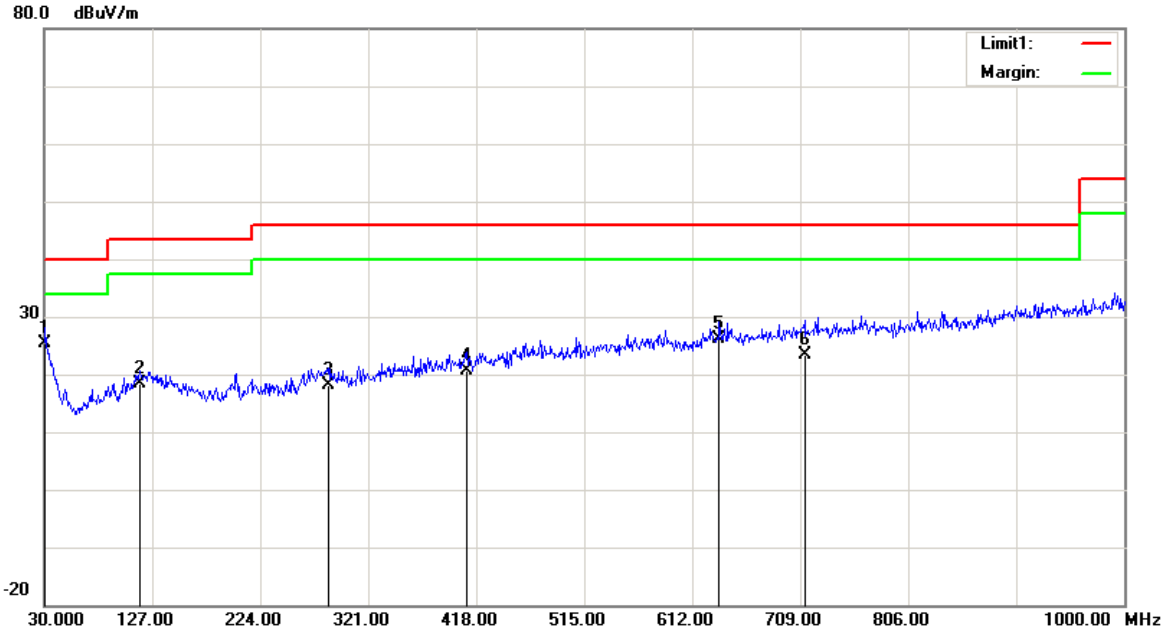
Temperature:	18.6~21.9 °C
Relative Humidity:	34~42 %
ATM Pressure:	101.2~101.3 kPa

** The testing was performed by Sunny Cen and Eric Xiao on 2018-01-26 & 2018-02-04.*

Test Mode: Transmitting(Battery #1&adapter #1 was the worst)

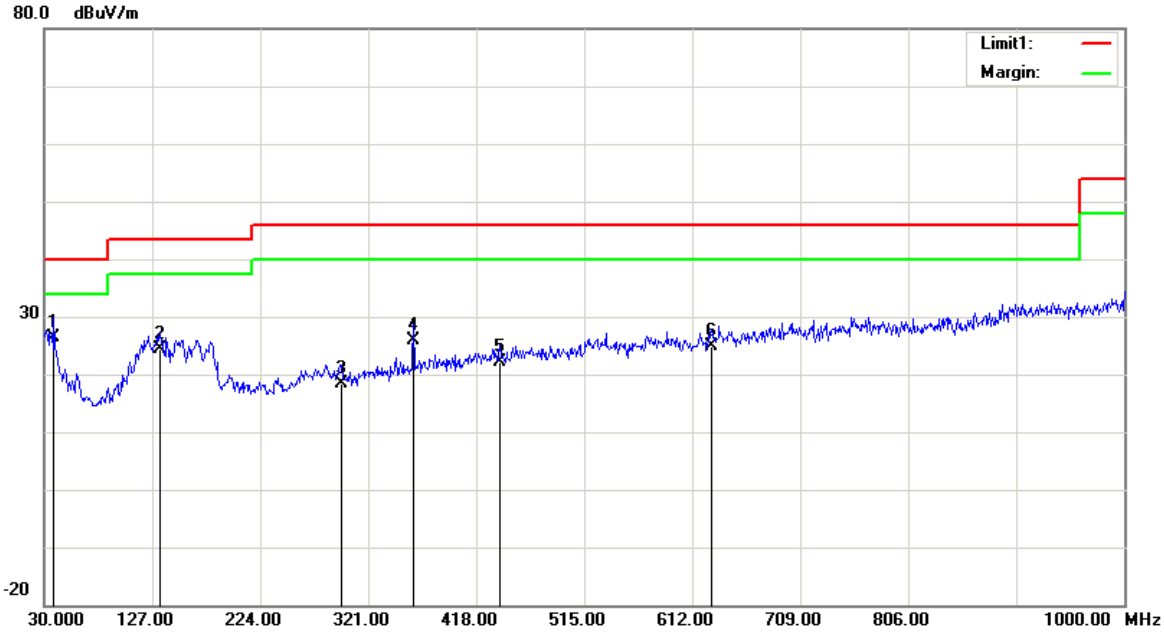
1) 30MHz-1GHz(8DPSK middle channel was the worst)

Horizontal:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30.9700	24.95	QP	0.35	25.30	40.00	14.70
115.3600	23.49	QP	-5.19	18.30	43.50	25.20
285.1100	21.90	QP	-3.80	18.10	46.00	27.90
409.2700	22.69	QP	-2.09	20.60	46.00	25.40
636.2500	24.37	QP	1.73	26.10	46.00	19.90
712.8800	20.65	QP	2.85	23.50	46.00	22.50

Vertical:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
38.7300	31.67	QP	-5.37	26.30	40.00	13.70
133.7900	29.71	QP	-5.41	24.30	43.50	19.20
296.7500	22.77	QP	-4.27	18.50	46.00	27.50
361.7400	28.80	QP	-2.90	25.90	46.00	20.10
439.3400	23.73	QP	-1.63	22.10	46.00	23.90
629.4600	23.47	QP	1.33	24.80	46.00	21.20

2)1GHz-25GHz:

BDR Mode (GFSK):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2402 MHz									
2402.00	71.25	PK	H	28.10	1.80	0.00	101.15	N/A	N/A
2402.00	66.31	AV	H	28.10	1.80	0.00	96.21	N/A	N/A
2402.00	72.83	PK	V	28.10	1.80	0.00	102.73	N/A	N/A
2402.00	67.48	AV	V	28.10	1.80	0.00	97.38	N/A	N/A
2390.00	24.63	PK	V	28.08	1.80	0.00	54.51	74.00	19.49
2390.00	13.97	AV	V	28.08	1.80	0.00	43.85	54.00	10.15
4804.00	48.72	PK	V	32.91	3.17	37.20	47.60	74.00	26.40
4804.00	42.15	AV	V	32.91	3.17	37.20	41.03	54.00	12.97
7206.00	46.33	PK	V	35.74	4.82	37.23	49.66	74.00	24.34
7206.00	38.72	AV	V	35.74	4.82	37.23	42.05	54.00	11.95
Middle Channel: 2441 MHz									
2441.00	70.73	PK	H	28.18	1.82	0.00	100.73	N/A	N/A
2441.00	65.34	AV	H	28.18	1.82	0.00	95.34	N/A	N/A
2441.00	71.98	PK	V	28.18	1.82	0.00	101.98	N/A	N/A
2441.00	67.62	AV	V	28.18	1.82	0.00	97.62	N/A	N/A
4882.00	49.74	PK	V	33.06	3.27	37.21	48.86	74.00	25.14
4882.00	42.44	AV	V	33.06	3.27	37.21	41.56	54.00	12.44
7323.00	46.37	PK	V	36.04	4.62	37.38	49.65	74.00	24.35
7323.00	39.87	AV	V	36.04	4.62	37.38	43.15	54.00	10.85
High Channel: 2480 MHz									
2480.00	69.10	PK	H	28.26	1.84	0.00	99.20	N/A	N/A
2480.00	64.32	AV	H	28.26	1.84	0.00	94.42	N/A	N/A
2480.00	71.07	PK	V	28.26	1.84	0.00	101.17	N/A	N/A
2480.00	64.55	AV	V	28.26	1.84	0.00	94.65	N/A	N/A
2483.50	27.32	PK	V	28.27	1.84	0.00	57.43	74.00	16.57
2483.50	15.67	AV	V	28.27	1.84	0.00	45.78	54.00	8.22
4960.00	51.34	PK	V	33.22	3.23	37.25	50.54	74.00	23.46
4960.00	45.33	AV	V	33.22	3.23	37.25	44.53	54.00	9.47
7440.00	46.74	PK	V	36.34	4.41	37.52	49.97	74.00	24.03
7440.00	39.54	AV	V	36.34	4.41	37.52	42.77	54.00	11.23

EDR Mode (π/4-DQPSK):

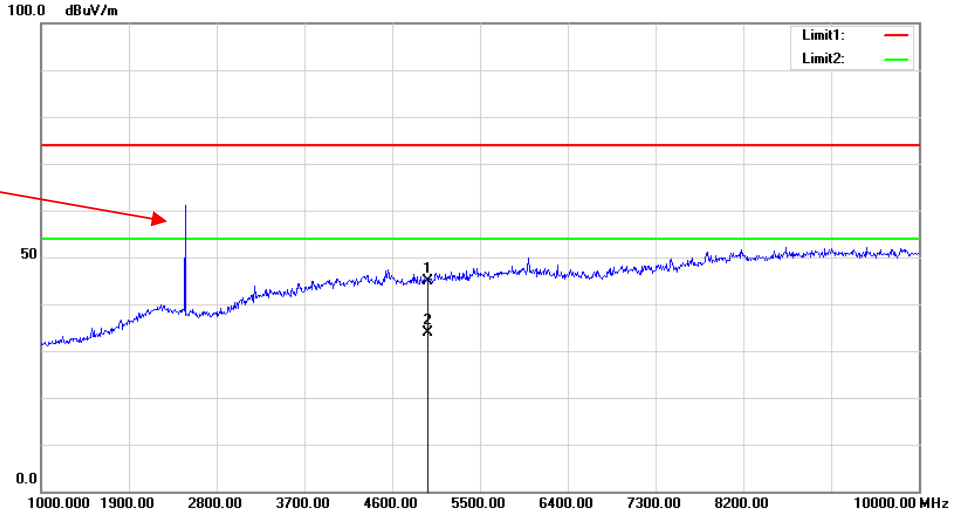
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2402 MHz									
2402.00	70.55	PK	H	28.10	1.80	0.00	100.45	N/A	N/A
2402.00	65.72	AV	H	28.10	1.80	0.00	95.62	N/A	N/A
2402.00	72.68	PK	V	28.10	1.80	0.00	102.58	N/A	N/A
2402.00	66.09	AV	V	28.10	1.80	0.00	95.99	N/A	N/A
2390.00	24.62	PK	V	28.08	1.80	0.00	54.50	74.00	19.50
2390.00	13.70	AV	V	28.08	1.80	0.00	43.58	54.00	10.42
4804.00	48.43	PK	V	32.91	3.17	37.20	47.31	74.00	26.69
4804.00	35.78	AV	V	32.91	3.17	37.20	34.66	54.00	19.34
7206.00	44.77	PK	V	35.74	4.82	37.23	48.10	74.00	25.90
7206.00	34.99	AV	V	35.74	4.82	37.23	38.32	54.00	15.68
Middle Channel: 2441 MHz									
2441.00	70.18	PK	H	28.18	1.82	0.00	100.18	N/A	N/A
2441.00	65.49	AV	H	28.18	1.82	0.00	95.49	N/A	N/A
2441.00	73.87	PK	V	28.18	1.82	0.00	103.87	N/A	N/A
2441.00	67.42	AV	V	28.18	1.82	0.00	97.42	N/A	N/A
4882.00	48.34	PK	V	33.06	3.27	37.21	47.46	74.00	26.54
4882.00	34.87	AV	V	33.06	3.27	37.21	33.99	54.00	20.01
7323.00	45.63	PK	V	36.04	4.62	37.38	48.91	74.00	25.09
7323.00	35.82	AV	V	36.04	4.62	37.38	39.10	54.00	14.90
High Channel: 2480 MHz									
2480.00	71.34	PK	H	28.26	1.84	0.00	101.44	N/A	N/A
2480.00	64.83	AV	H	28.26	1.84	0.00	94.93	N/A	N/A
2480.00	72.54	PK	V	28.26	1.84	0.00	102.64	N/A	N/A
2480.00	65.27	AV	V	28.26	1.84	0.00	95.37	N/A	N/A
2483.50	26.46	PK	V	28.27	1.84	0.00	56.57	74.00	17.43
2483.50	15.32	AV	V	28.27	1.84	0.00	45.43	54.00	8.57
4960.00	47.44	PK	V	33.22	3.23	37.25	46.64	74.00	27.36
4960.00	36.24	AV	V	33.22	3.23	37.25	35.44	54.00	18.56
7440.00	45.33	PK	V	36.34	4.41	37.52	48.56	74.00	25.44
7440.00	35.02	AV	V	36.34	4.41	37.52	38.25	54.00	15.75

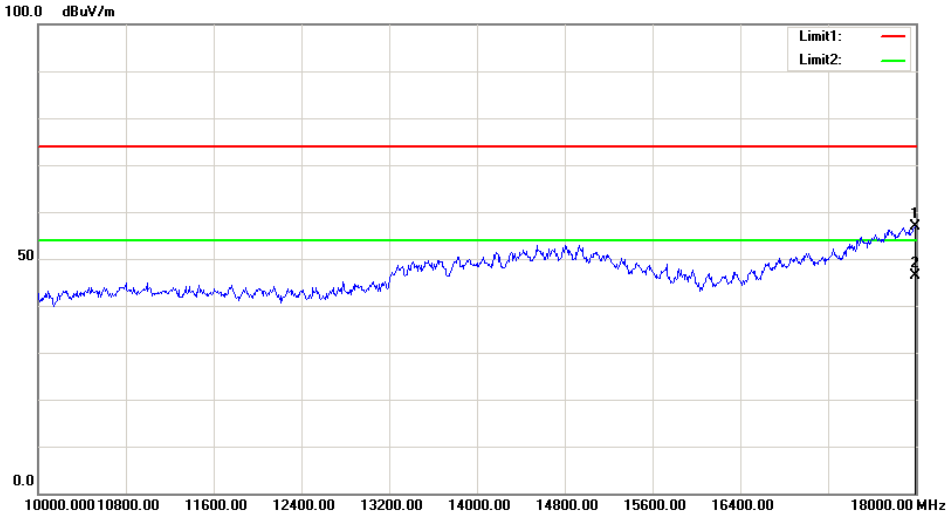
EDR Mode (8-DPSK):

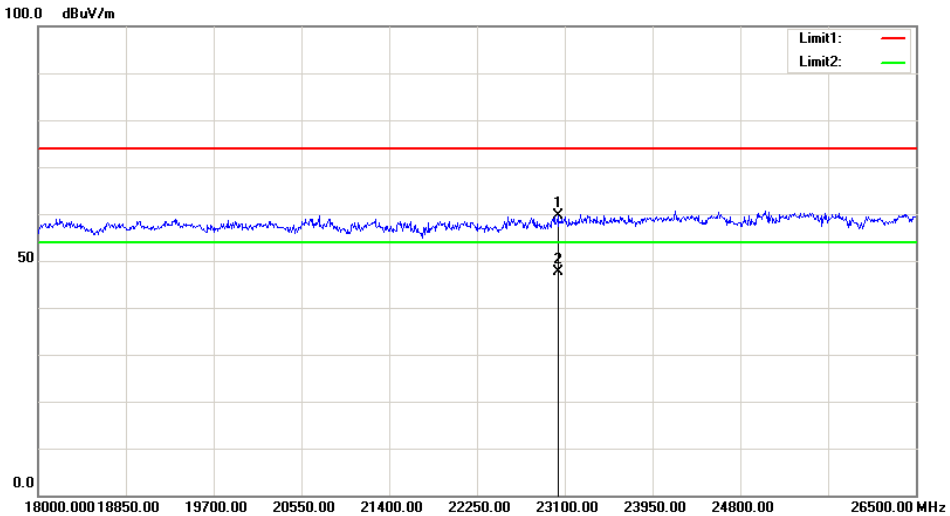
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2402 MHz									
2402.00	70.83	PK	H	28.10	1.80	0.00	100.73	N/A	N/A
2402.00	66.48	AV	H	28.10	1.80	0.00	96.38	N/A	N/A
2402.00	71.73	PK	V	28.10	1.80	0.00	101.63	N/A	N/A
2402.00	66.58	AV	V	28.10	1.80	0.00	96.48	N/A	N/A
2390.00	23.52	PK	V	28.08	1.80	0.00	53.40	74.00	20.60
2390.00	13.25	AV	V	28.08	1.80	0.00	43.13	54.00	10.87
4804.00	49.92	PK	V	32.91	3.17	37.20	48.80	74.00	25.20
4804.00	38.24	AV	V	32.91	3.17	37.20	37.12	54.00	16.88
7206.00	46.09	PK	V	35.74	4.82	37.23	49.42	74.00	24.58
7206.00	35.65	AV	V	35.74	4.82	37.23	38.98	54.00	15.02
Middle Channel: 2441 MHz									
2441.00	71.34	PK	H	28.18	1.82	0.00	101.34	N/A	N/A
2441.00	63.99	AV	H	28.18	1.82	0.00	93.99	N/A	N/A
2441.00	74.34	PK	V	28.18	1.82	0.00	104.34	N/A	N/A
2441.00	67.01	AV	V	28.18	1.82	0.00	97.01	N/A	N/A
4882.00	48.49	PK	V	33.06	3.27	37.21	47.61	74.00	26.39
4882.00	34.84	AV	V	33.06	3.27	37.21	33.96	54.00	20.04
7323.00	44.17	PK	V	36.04	4.62	37.38	47.45	74.00	26.55
7323.00	35.91	AV	V	36.04	4.62	37.38	39.19	54.00	14.81
High Channel: 2480 MHz									
2480.00	68.32	PK	H	28.26	1.84	0.00	98.42	N/A	N/A
2480.00	63.87	AV	H	28.26	1.84	0.00	93.97	N/A	N/A
2480.00	72.89	PK	V	28.26	1.84	0.00	102.99	N/A	N/A
2480.00	64.56	AV	V	28.26	1.84	0.00	94.66	N/A	N/A
2483.50	26.07	PK	V	28.27	1.84	0.00	56.18	74.00	17.82
2483.50	14.38	AV	V	28.27	1.84	0.00	44.49	54.00	9.51
4960.00	48.21	PK	V	33.22	3.23	37.25	47.41	74.00	26.59
4960.00	35.48	AV	V	33.22	3.23	37.25	34.68	54.00	19.32
7440.00	45.90	PK	V	36.34	4.41	37.52	49.13	74.00	24.87
7440.00	34.97	AV	V	36.34	4.41	37.52	38.20	54.00	15.80

Worst plots(GFSK high channel)
Horizontal

Fundamental
Test with Band
Rejection Filter

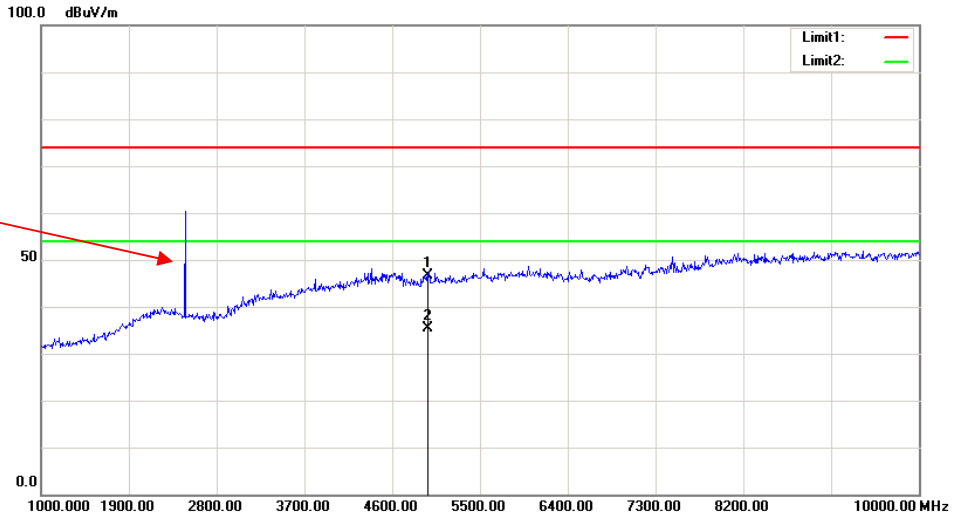


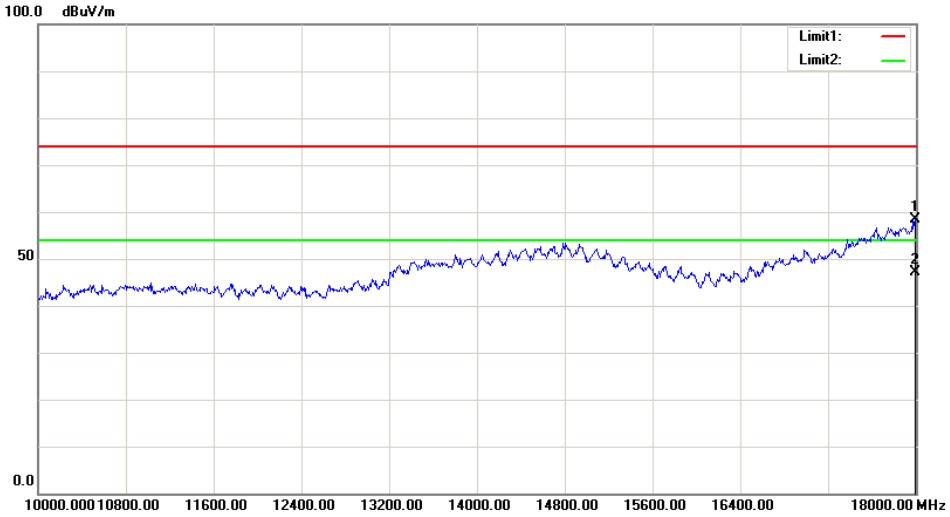


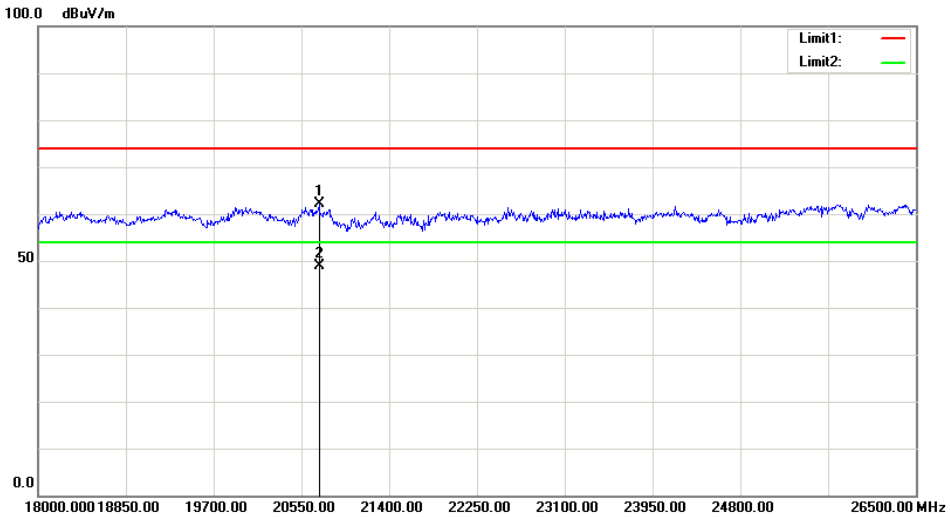


Vertical

Fundamental Test with Band Rejection Filter







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

Applicable Standard

According to FCC §15.247(a) (1)&RSS-247 Clause 5.1 b)

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Reciever	ESCI	101121	2017-03-02	2018-03-02
N/A	Coaxial Cable	C-SJ00-0010	C0010/01	Each Time	/

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

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	48 %
ATM Pressure:	100.8 kPa

** The testing was performed by David Huang on 2018-01-23.*

Test Result: Compliance.

Please refer to following tables and plots

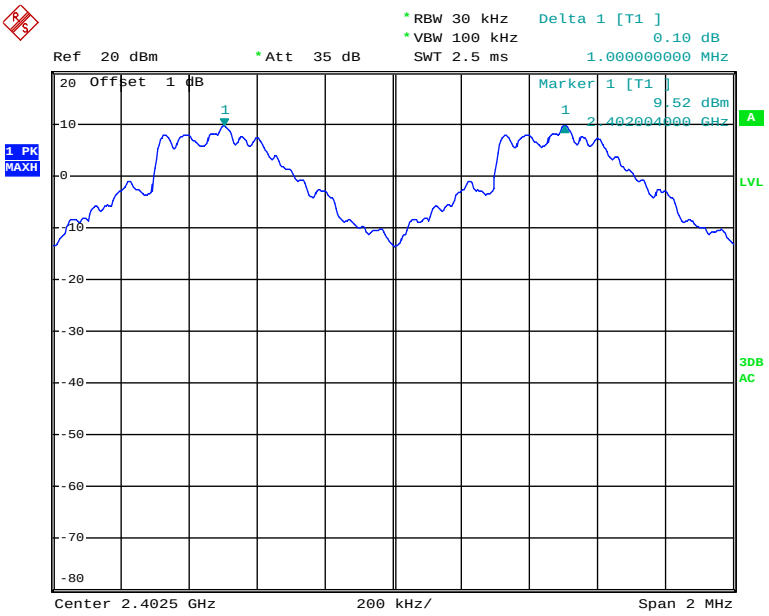
Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
BDR (GFSK)	Low	2402	1.000	0.62
	Middle	2441	1.004	0.61
	High	2480	1.000	0.59
EDR (π/4-DQPSK)	Low	2402	1.000	0.84
	Middle	2441	1.004	0.84
	High	2480	1.004	0.83
EDR (8-DPSK)	Low	2402	1.004	0.80
	Middle	2441	1.000	0.81
	High	2480	1.004	0.81

Note: Limit= (2/3) × 20dB bandwidth

BDR Mode (GFSK):

Low Channel



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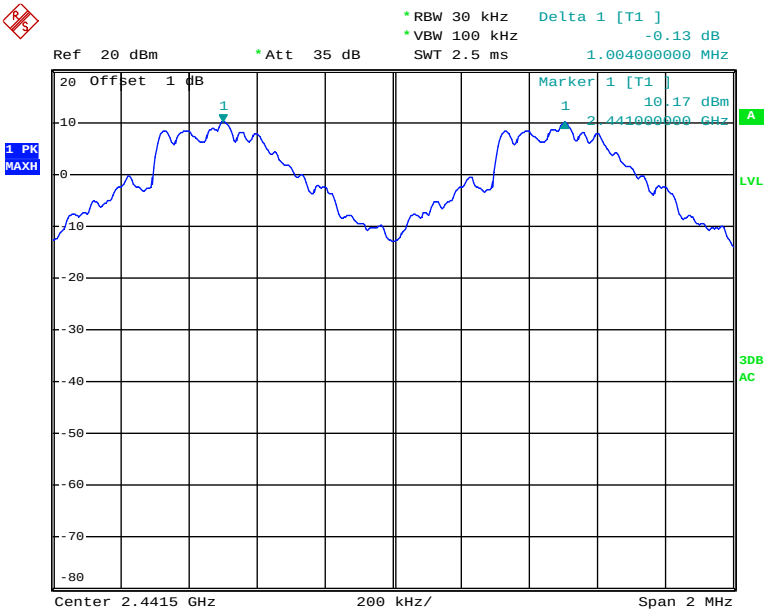
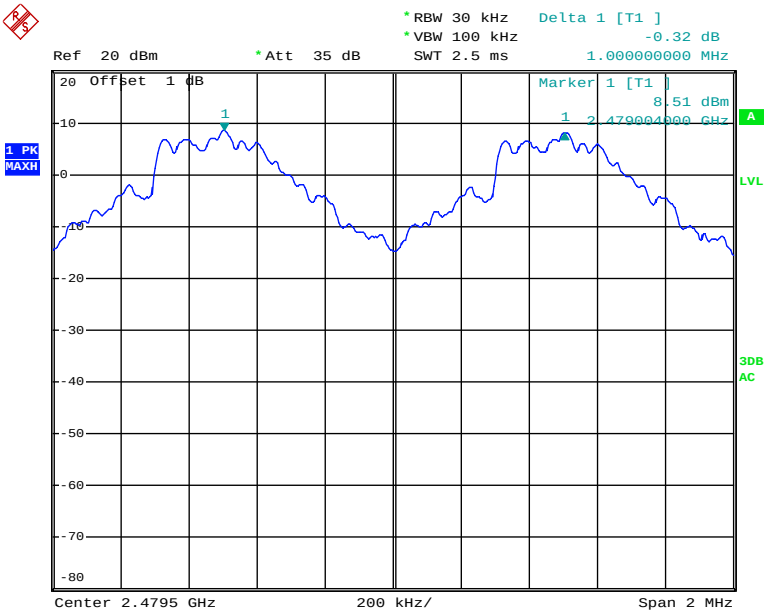
Middle Channel



Date: 23.JAN.2018 10:27:16

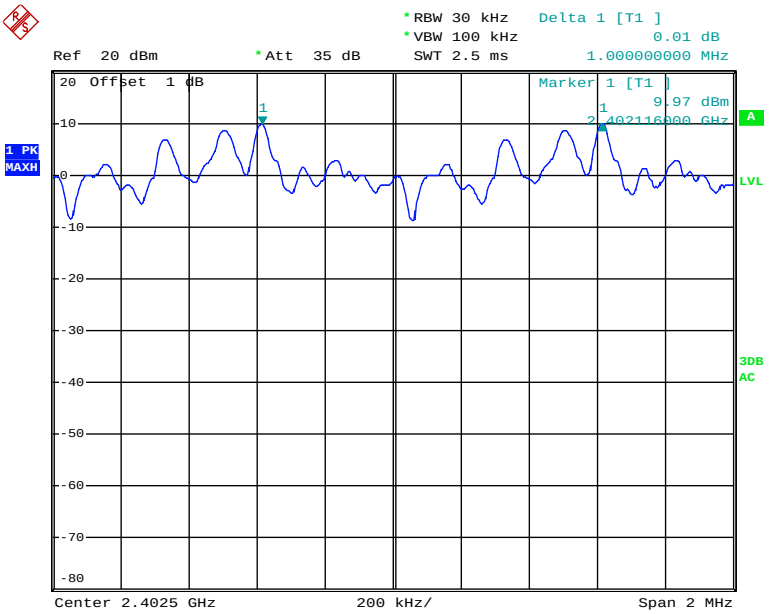
High Channel



Date: 23.JAN.2018 10:28:20

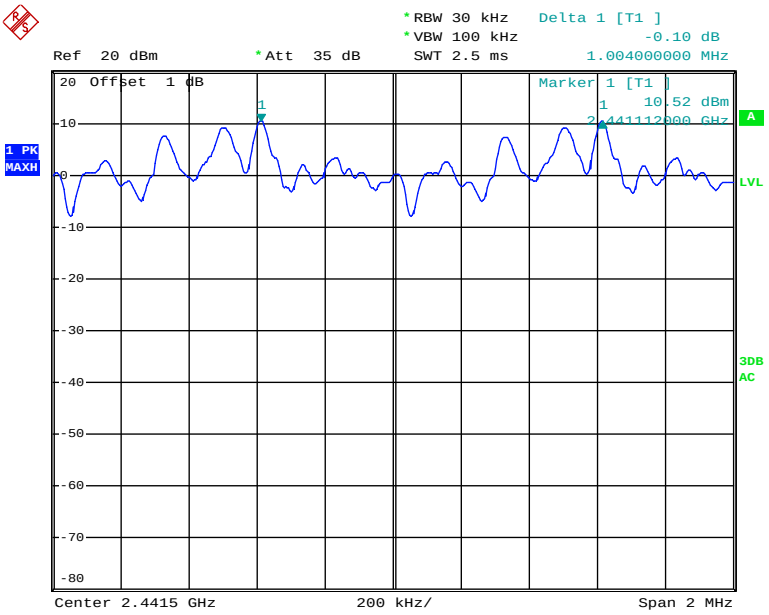
EDR Mode (π/4-DQPSK):

Low Channel



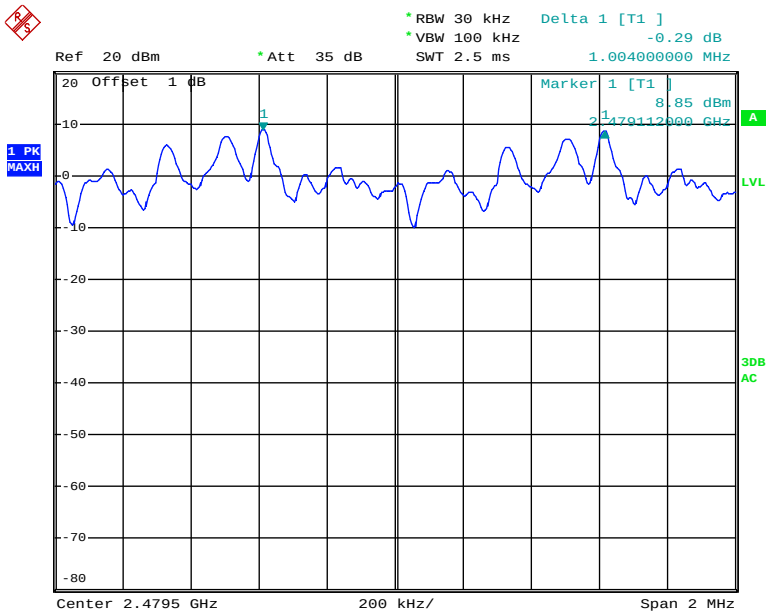
Date: 23.JAN.2018 10:32:26

Middle Channel



Date: 23.JAN.2018 10:31:12

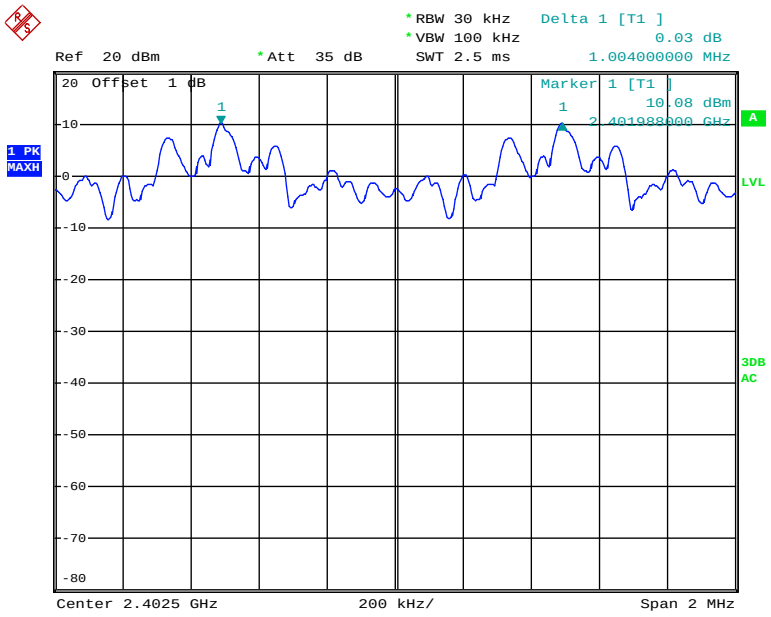
High Channel



Date: 23.JAN.2018 10:30:11

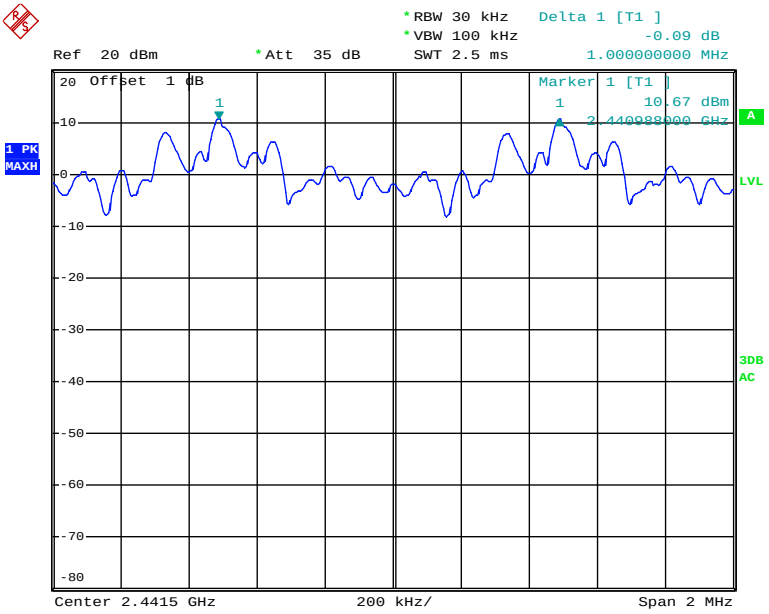
EDR Mode (8-DPSK):

Low Channel



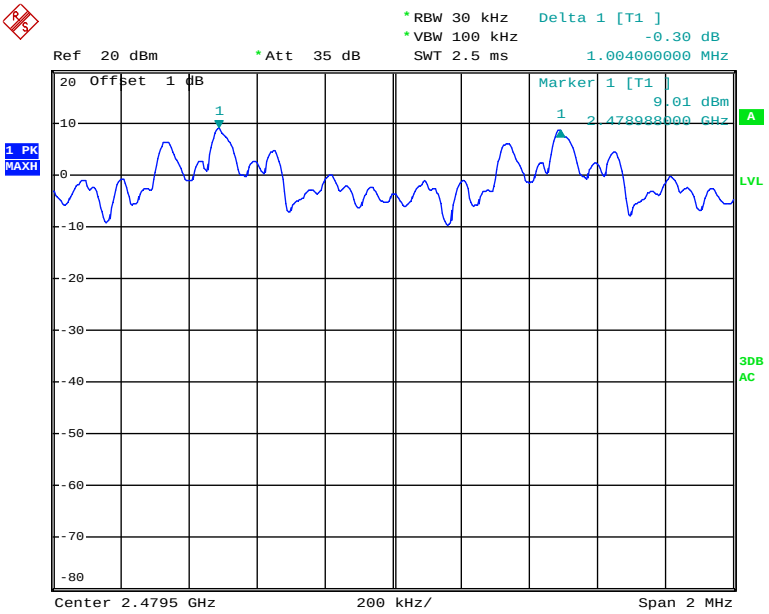
Date: 23.JAN.2018 10:33:23

Middle Channel



Date: 23.JAN.2018 10:34:29

High Channel



Date: 23.JAN.2018 10:35:18

FCC §15.247(a) (1) & RSS-247 CLUASE 5.1&RSS-GEN CLAUSE 6.6– 20 dB BANDWIDTH TESTING

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. Use Occupied bandwidth test function, measure the 99% Occupied bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Reciever	ESCI	101121	2017-03-02	2018-03-02
N/A	Coaxial Cable	C-SJ00-0010	C0010/01	Each Time	/

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

Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	48 %
ATM Pressure:	100.8 kPa

** The testing was performed by David Huang on 2018-01-23.*

Test Result: Compliance.

Please refer to following tables and plots

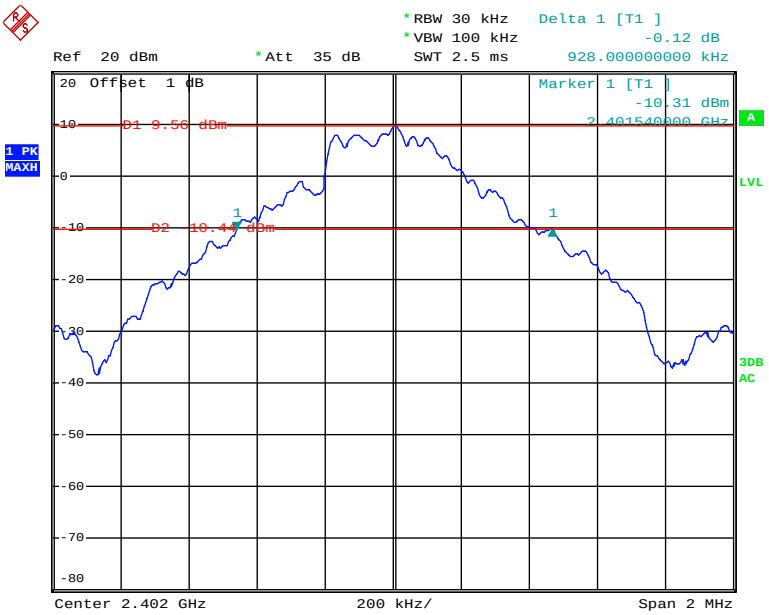
Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% occupied Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.93	0.86
	Middle	2441	0.92	0.86
	High	2480	0.88	0.86
EDR Mode (π/4-DQPSK)	Low	2402	1.26	1.17
	Middle	2441	1.26	1.17
	High	2480	1.25	1.14
EDR Mode (8-DPSK)	Low	2402	1.20	1.14
	Middle	2441	1.22	1.15
	High	2480	1.22	1.15

20 dB Bandwidth

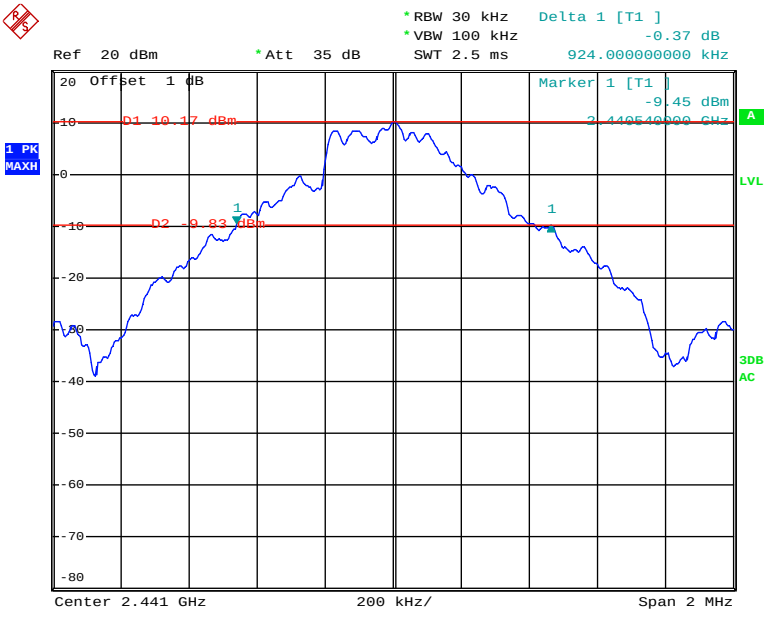
BDR Mode (GFSK):

Low Channel



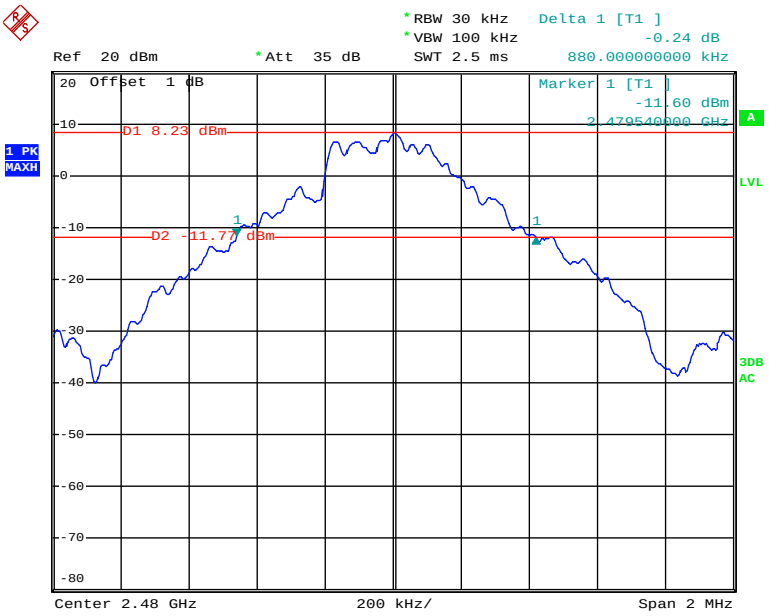
Date: 23.JAN.2018 10:03:43

Middle Channel



Date: 23.JAN.2018 10:06:06

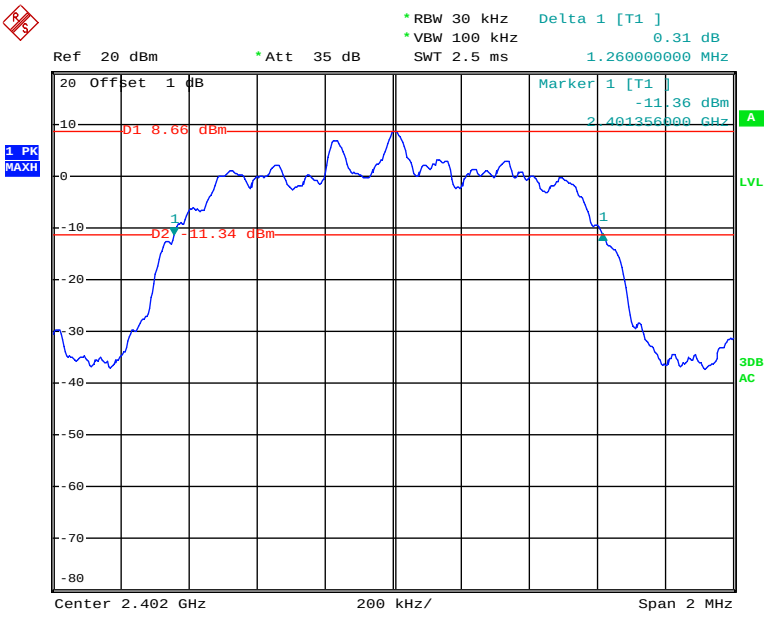
High Channel



Date: 23.JAN.2018 10:08:02

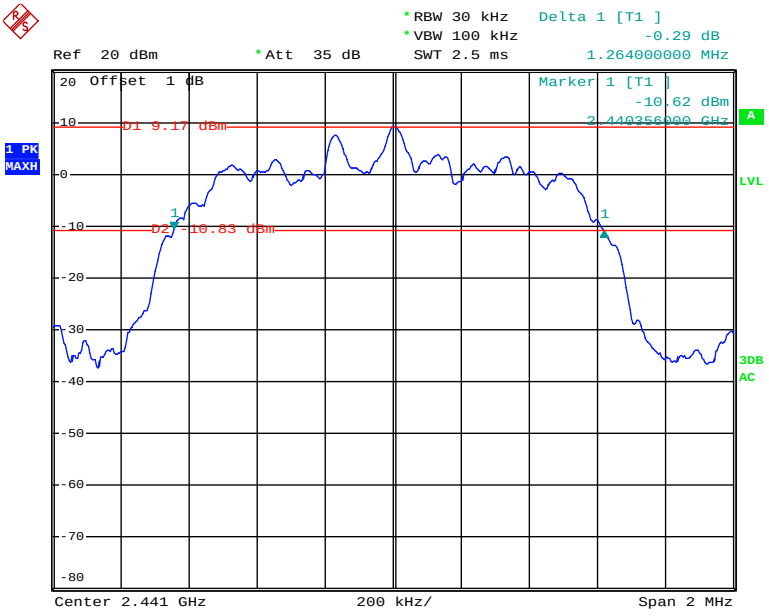
EDR Mode (π/4-DQPSK):

Low Channel



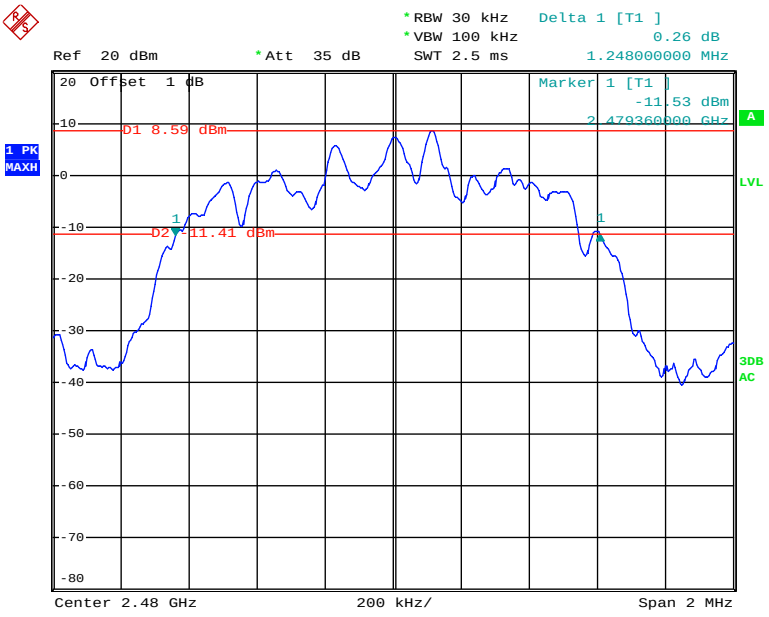
Date: 23.JAN.2018 10:12:58

Middle Channel



Date: 23.JAN.2018 10:11:42

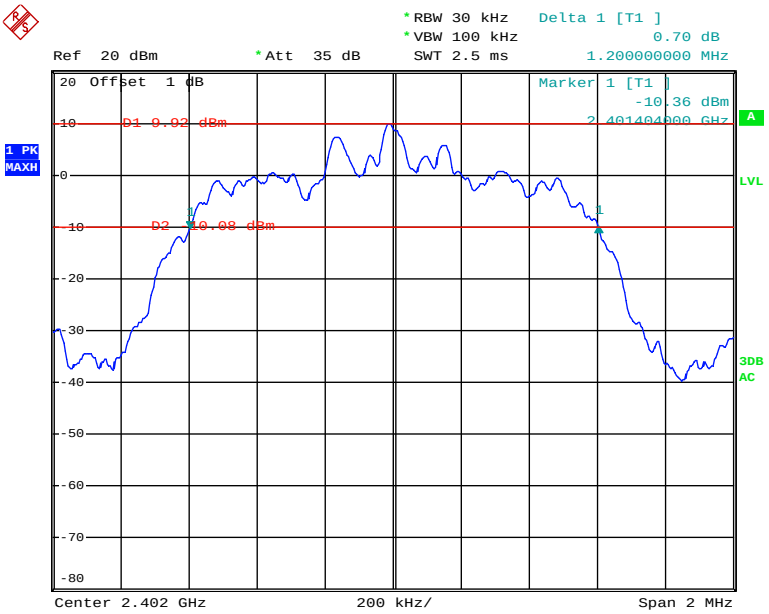
High Channel



Date: 23.JAN.2018 10:09:39

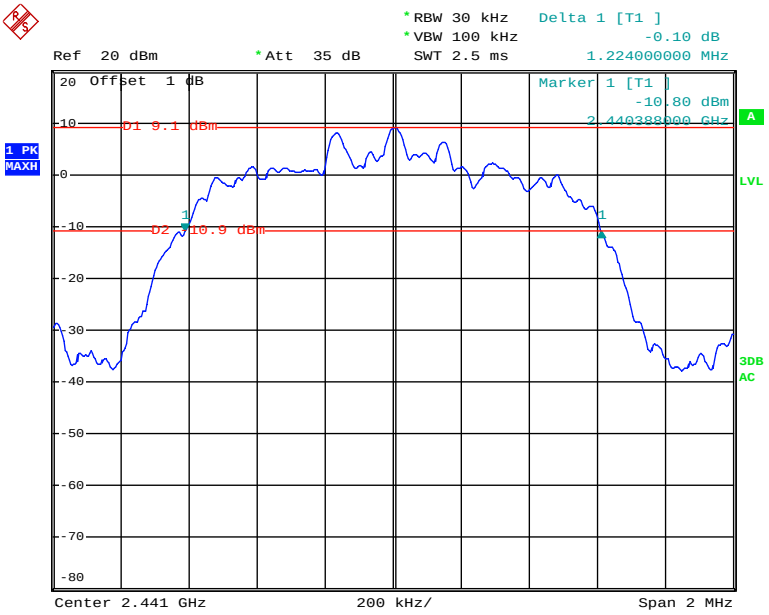
EDR Mode (8-DPSK):

Low Channel



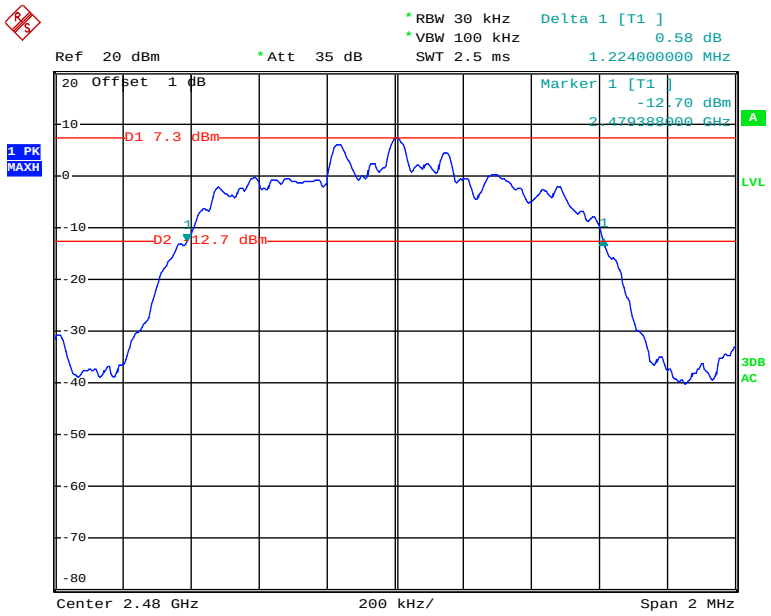
Date: 23.JAN.2018 10:15:31

Middle Channel



Date: 23.JAN.2018 10:17:27

High Channel

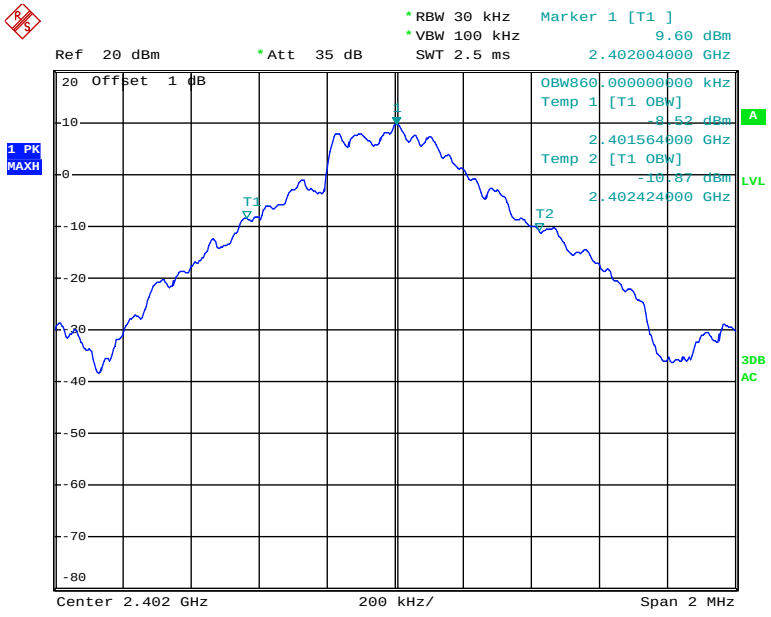


Date: 23.JAN.2018 10:18:54

99% occupied Bandwidth

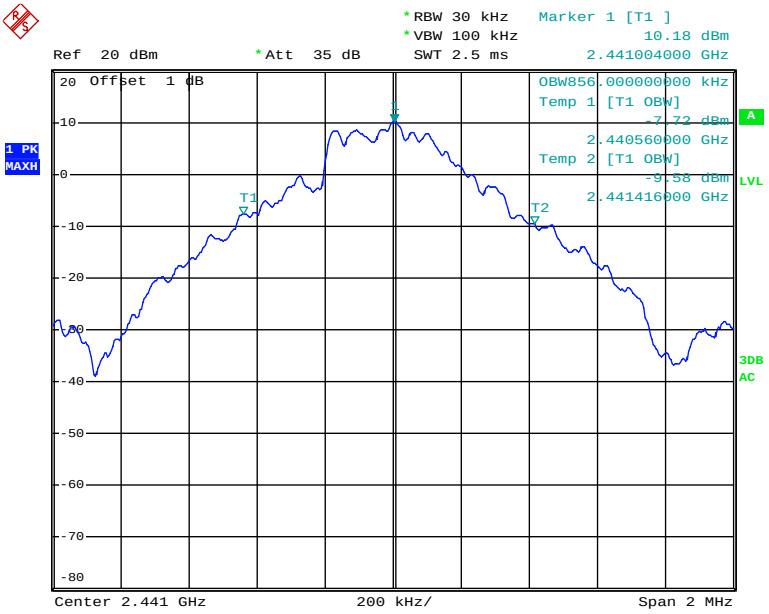
BDR Mode (GFSK):

Low Channel



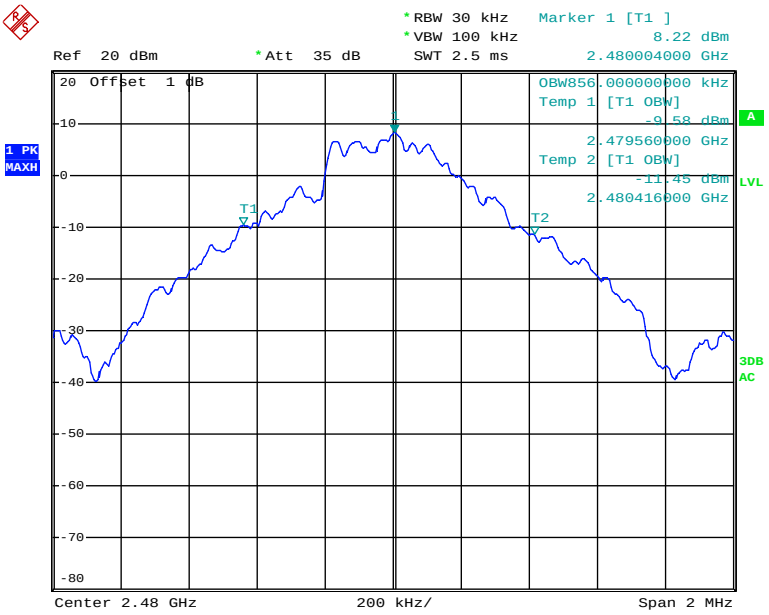
Date: 23.JAN.2018 10:04:03

Middle Channel



Date: 23.JAN.2018 10:06:25

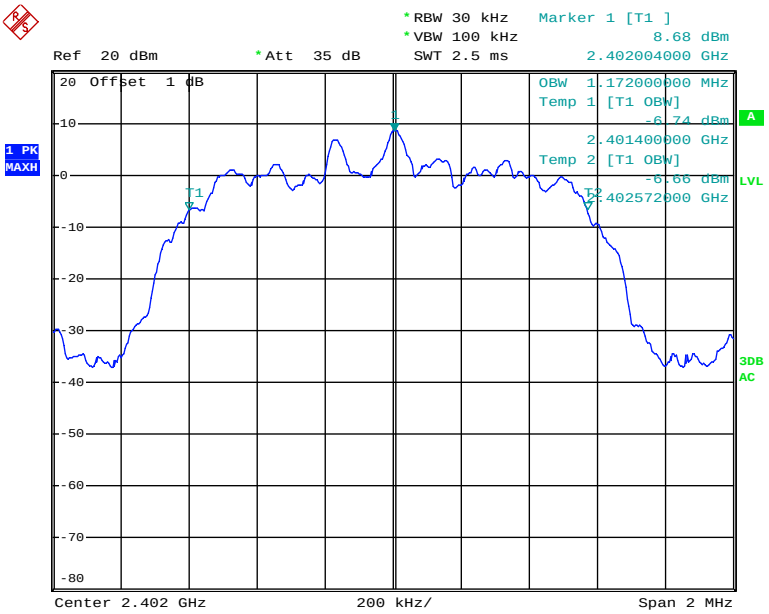
High Channel



Date: 23.JAN.2018 10:08:21

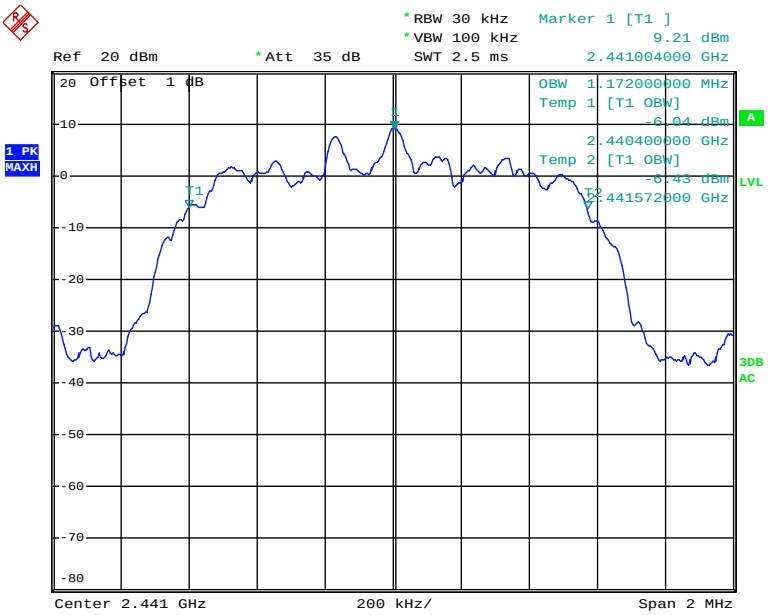
EDR Mode (π/4-DQPSK):

Low Channel



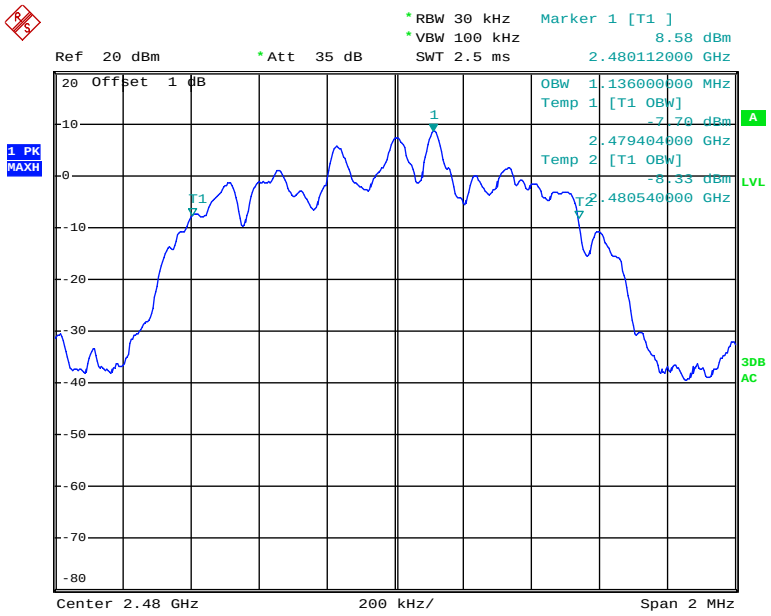
Date: 23.JAN.2018 10:13:17

Middle Channel



Date: 23.JAN.2018 10:12:01

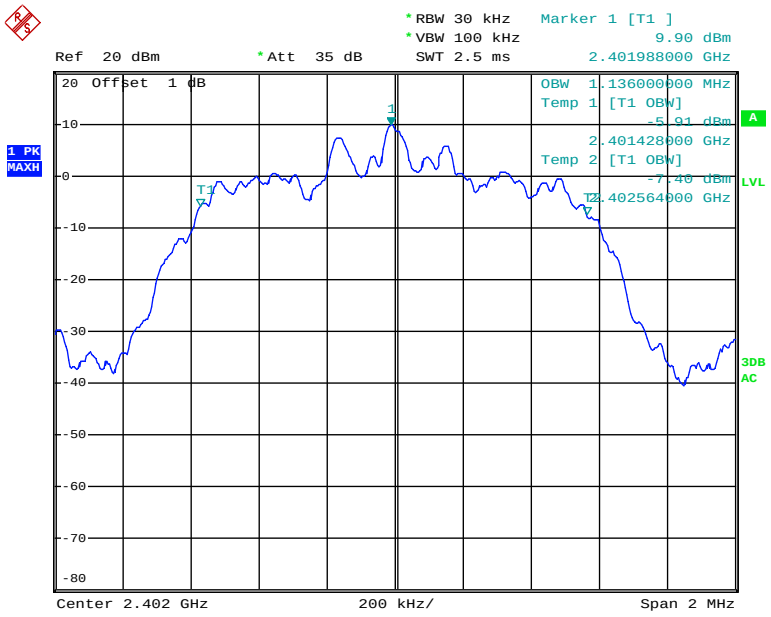
High Channel



Date: 23.JAN.2018 10:09:58

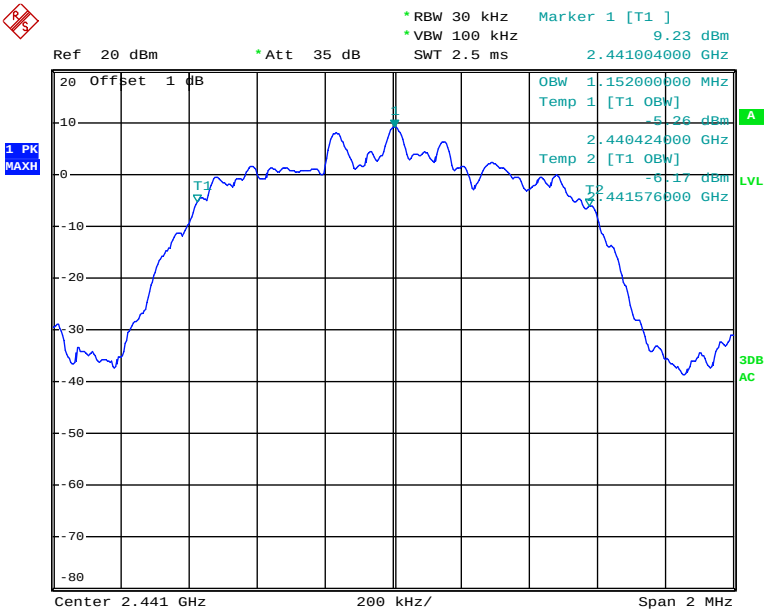
EDR Mode (8-DPSK):

Low Channel



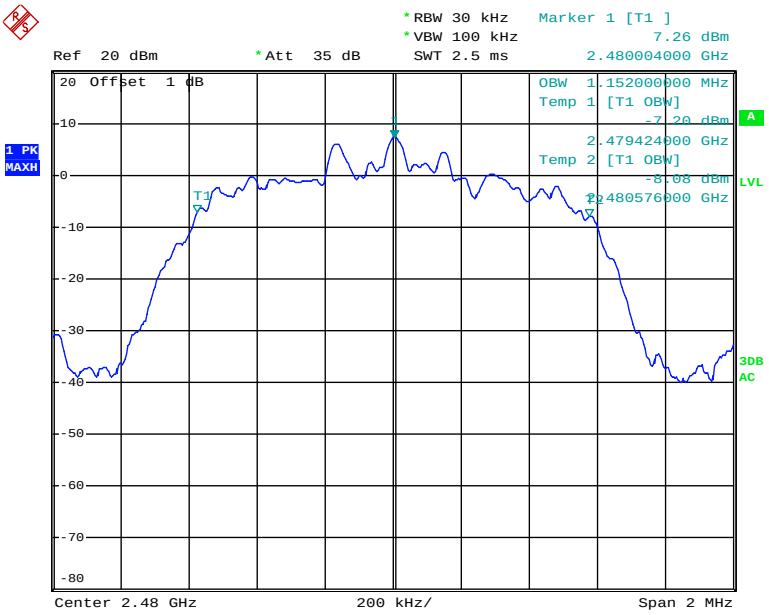
Date: 23.JAN.2018 10:15:51

Middle Channel



Date: 23.JAN.2018 10:17:50

High Channel



Date: 23.JAN.2018 10:19:13

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

Applicable Standard

According to FCC §15.247(a) (1) (iii) &RSS-247 Clause 5.1 d)

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

Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

2. Set the EUT in hopping mode from first channel to last.

3. By using the Max-Hold function record the Quantity of the channel.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Reciever	ESCI	101121	2017-03-02	2018-03-02
N/A	Coaxial Cable	C-SJ00-0010	C0010/01	Each Time	/

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

Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	48 %
ATM Pressure:	100.8 kPa

** The testing was performed by David Huang on 2018-01-23.*

Test Result: Compliance.

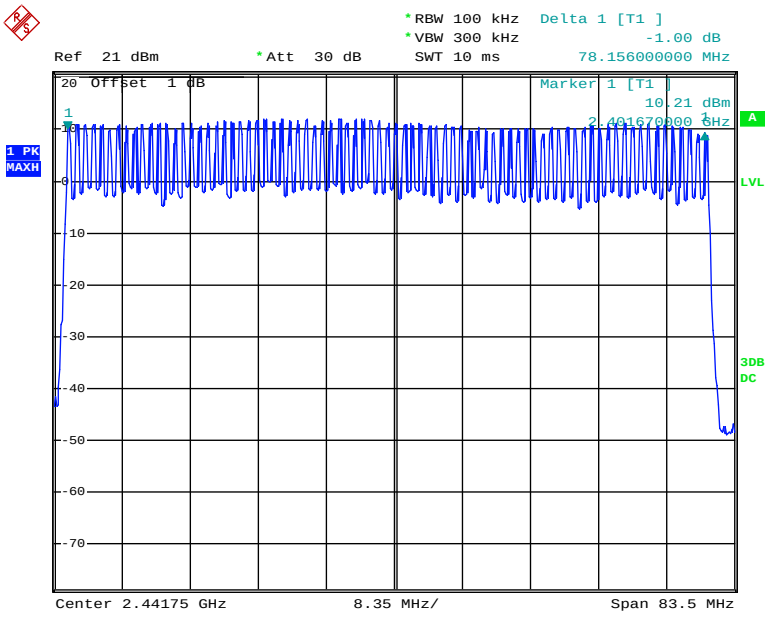
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

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

Number of Hopping Channels

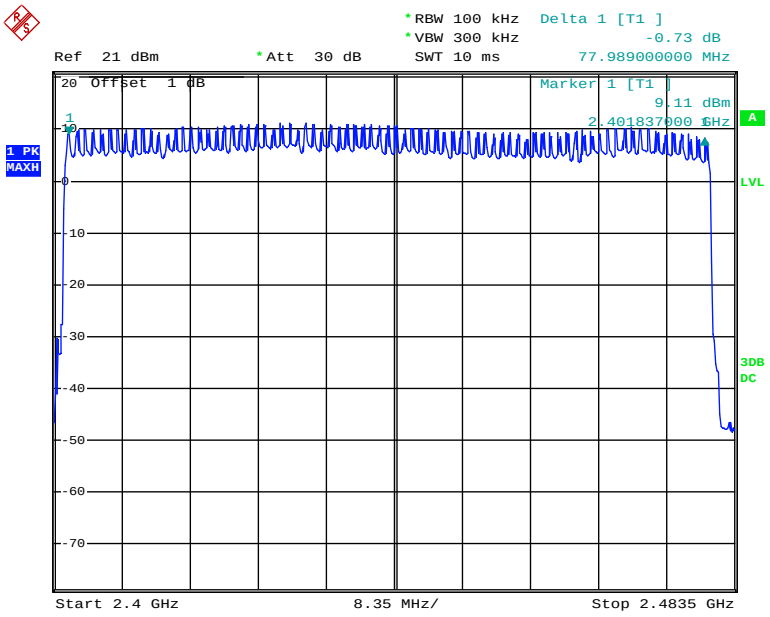


Date: 23.JAN.2018 16:16:16

EDR Mode (π/4-DQPSK):

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

Number of Hopping Channels

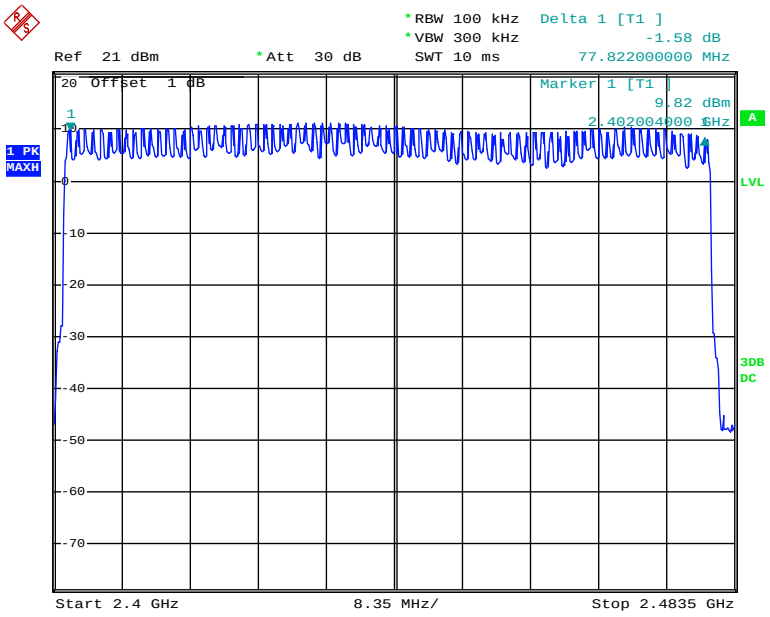


Date: 23.JAN.2018 16:33:48

EDR Mode (8-DPSK):

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

Number of Hopping Channels



Date: 23.JAN.2018 16:26:47

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) & RSS-247 Clause 5.1 d)

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; the time of single pulses was tested.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Reciever	ESCI	101121	2017-03-02	2018-03-02
N/A	Coaxial Cable	C-SJ00-0010	C0010/01	Each Time	/

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

Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	48%
ATM Pressure:	100.8 kPa

** The testing was performed by David Huang on 2018-01-23.*

Test Result: Compliance.

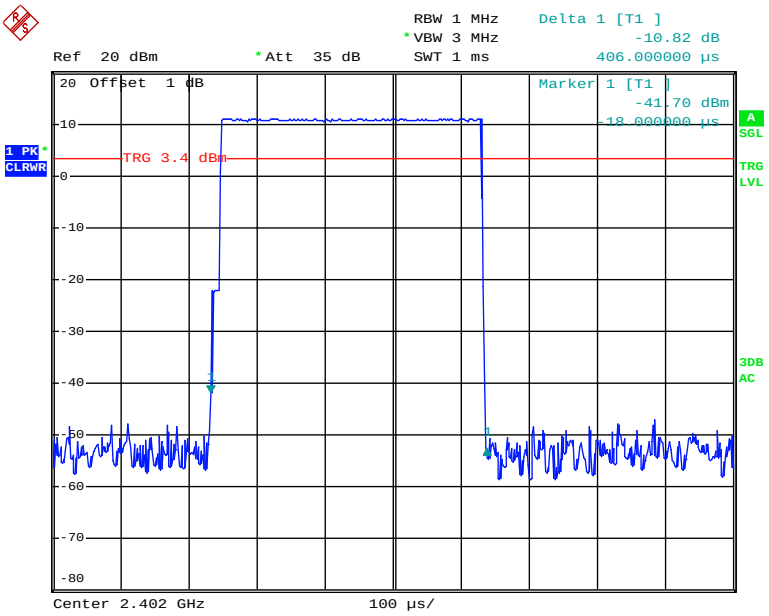
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

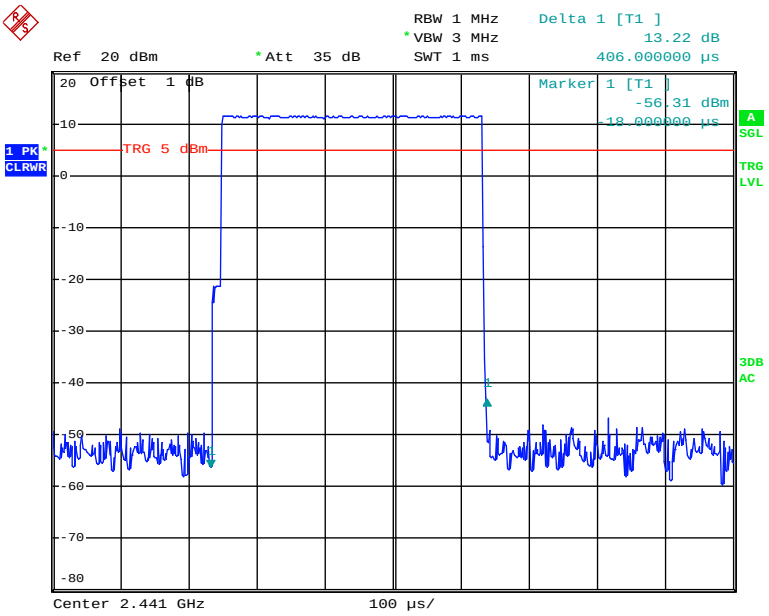
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.406	0.13	0.4	Compliance
	Middle	0.406	0.13	0.4	Compliance
	High	0.406	0.13	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s				
DH3	Low	1.674	0.268	0.4	Compliance
	Middle	1.680	0.269	0.4	Compliance
	High	1.674	0.268	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s				
DH5	Low	2.930	0.313	0.4	Compliance
	Middle	2.940	0.314	0.4	Compliance
	High	2.930	0.313	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s				

DH1: Low Channel



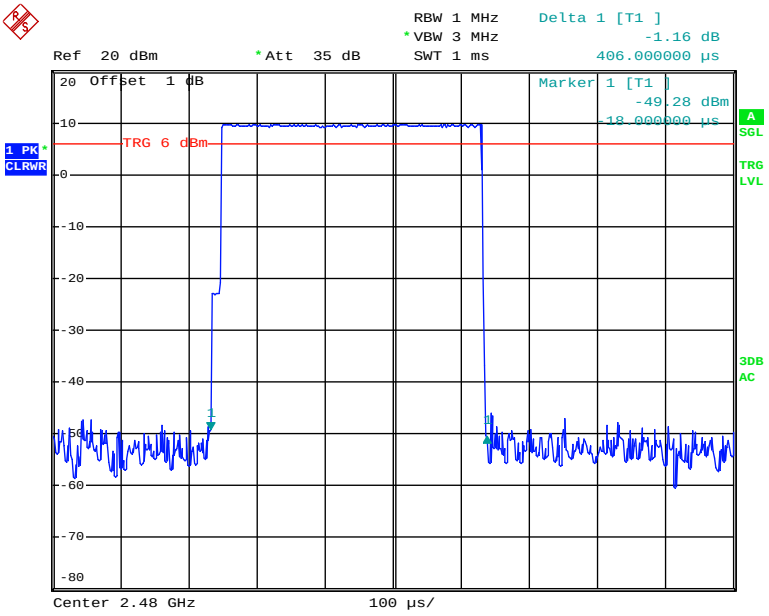
Date: 23.JAN.2018 10:44:38

DH1: Middle Channel



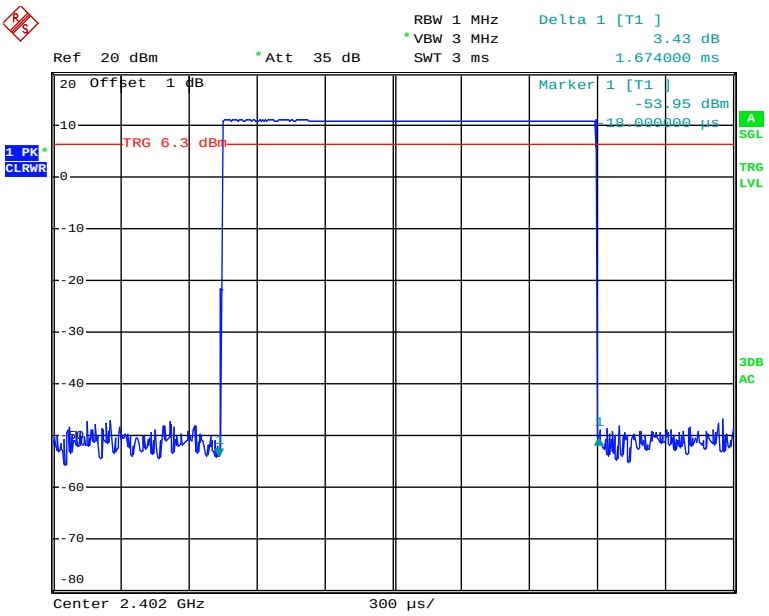
Date: 23.JAN.2018 10:44:42

DH1: High Channel



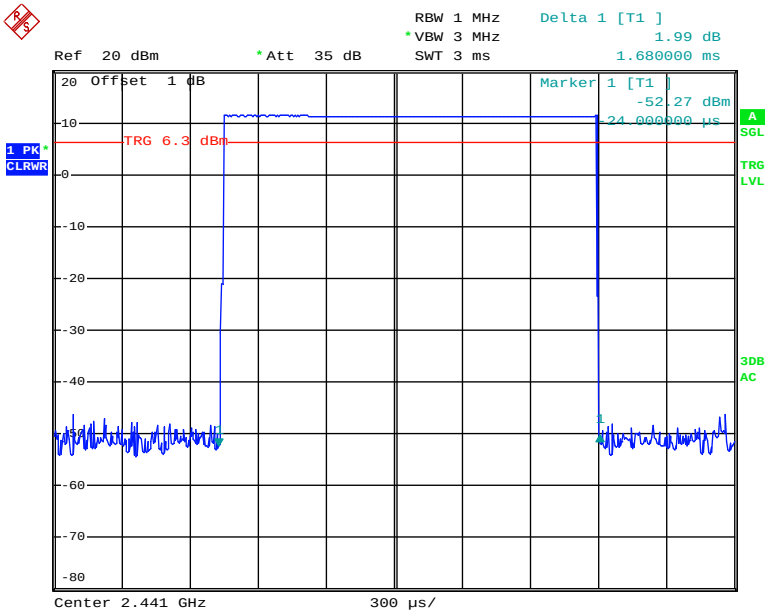
Date: 23.JAN.2018 10:44:48

DH3: Low Channel



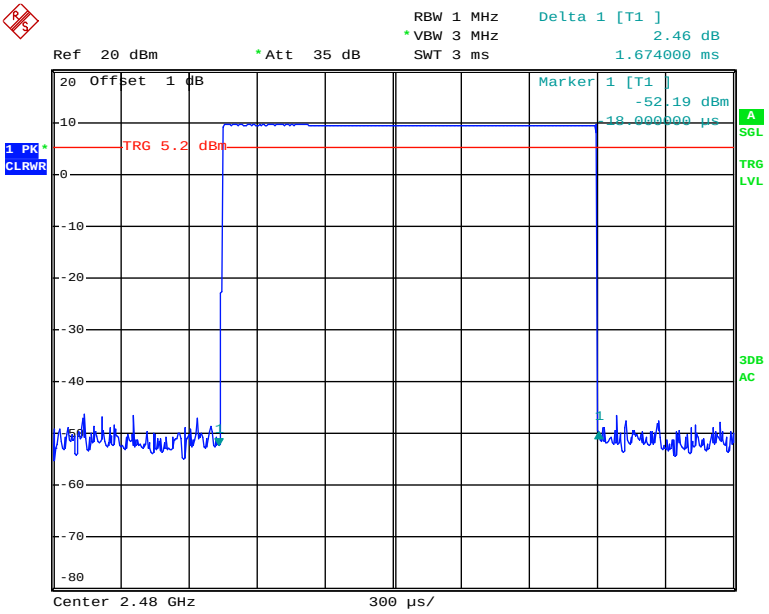
Date: 23.JAN.2018 10:47:24

DH3: Middle Channel



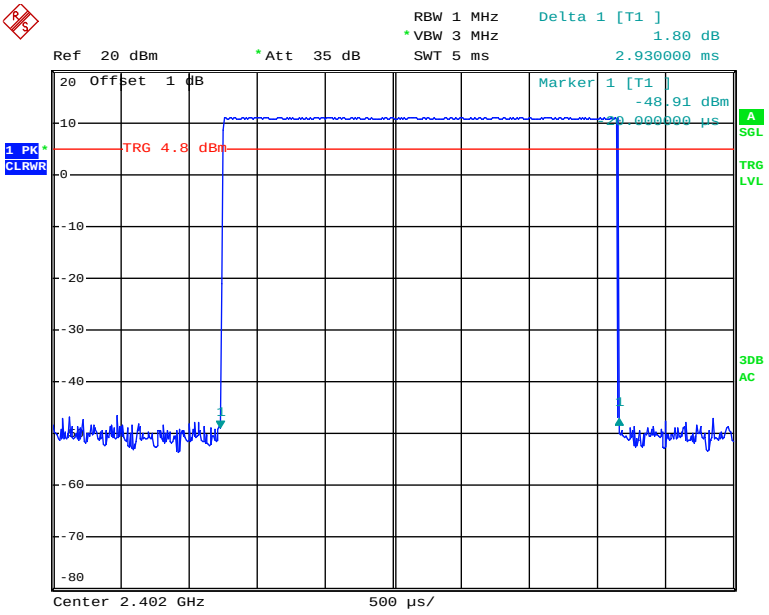
Date: 23.JAN.2018 10:47:29

DH3: High Channel



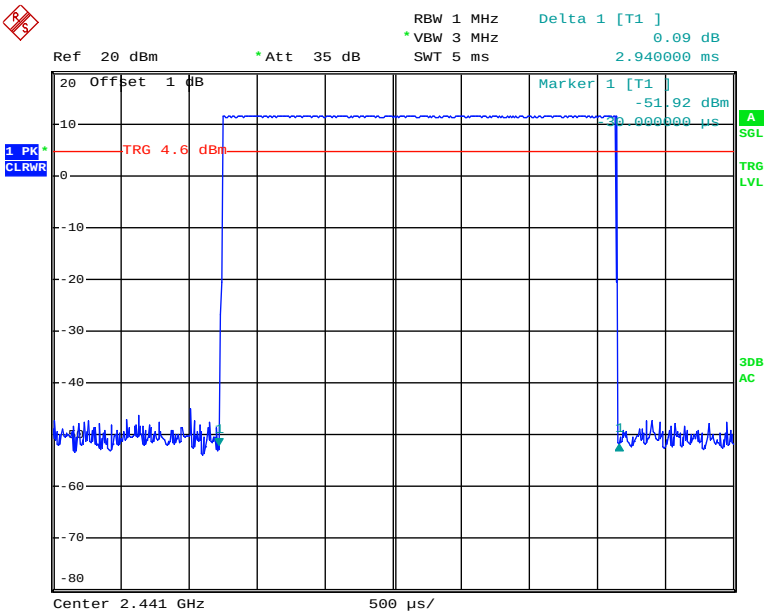
Date: 23.JAN.2018 10:47:35

DH5: Low Channel



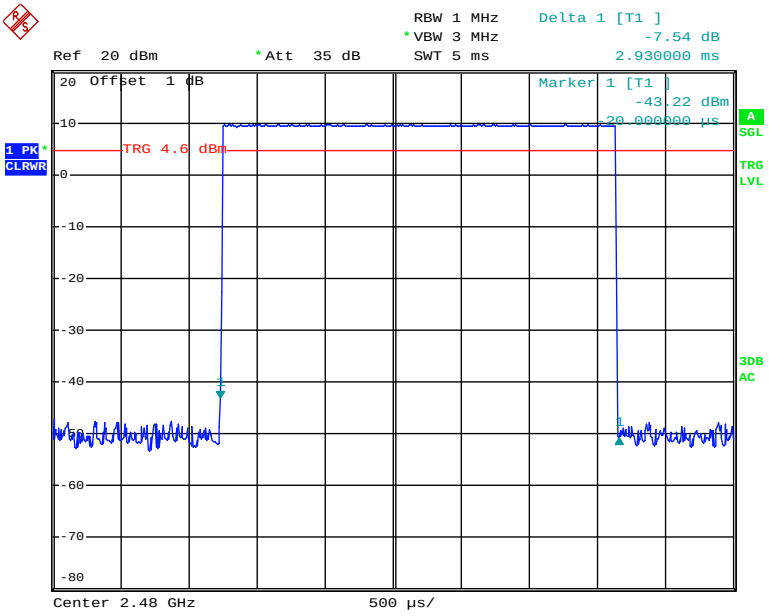
Date: 23.JAN.2018 10:48:01

DH5: Middle Channel



Date: 23.JAN.2018 10:48:06

DH5: High Channel

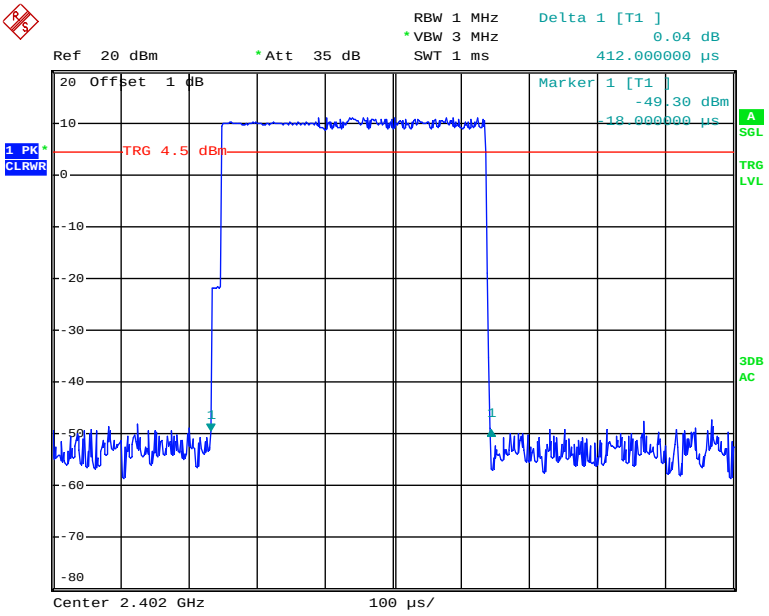


Date: 23.JAN.2018 10:48:10

EDR Mode (π/4-DQPSK):

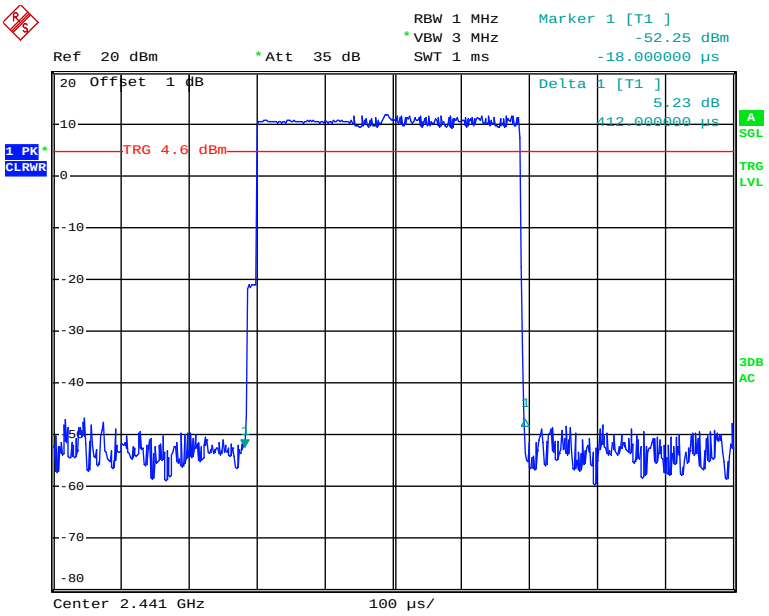
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
2DH1	Low	0.412	0.132	0.4	Compliance
	Middle	0.412	0.132	0.4	Compliance
	High	0.412	0.132	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s				
2DH3	Low	1.680	0.269	0.4	Compliance
	Middle	1.678	0.268	0.4	Compliance
	High	1.674	0.268	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s				
2DH5	Low	2.930	0.313	0.4	Compliance
	Middle	2.940	0.314	0.4	Compliance
	High	2.930	0.313	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s				

2DH1: Low Channel



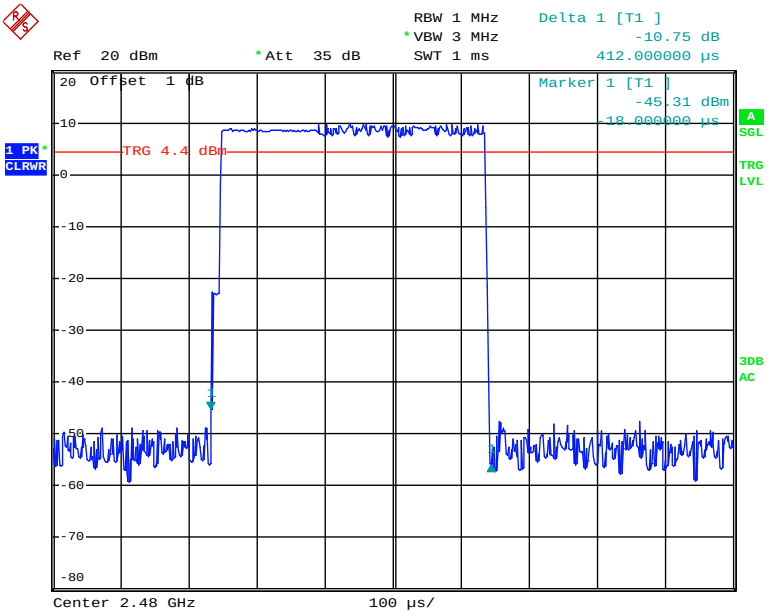
Date: 23.JAN.2018 11:06:09

2DH1: Middle Channel



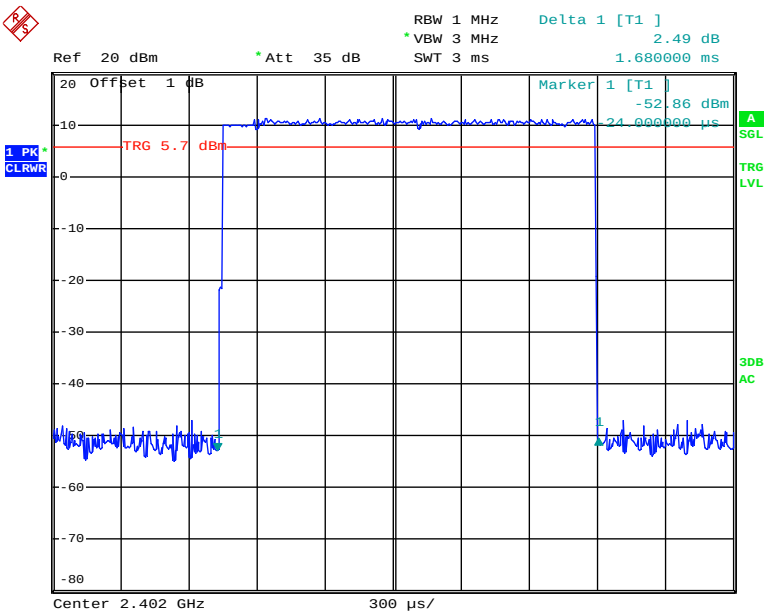
Date: 23.JAN.2018 11:36:44

2DH1: High Channel



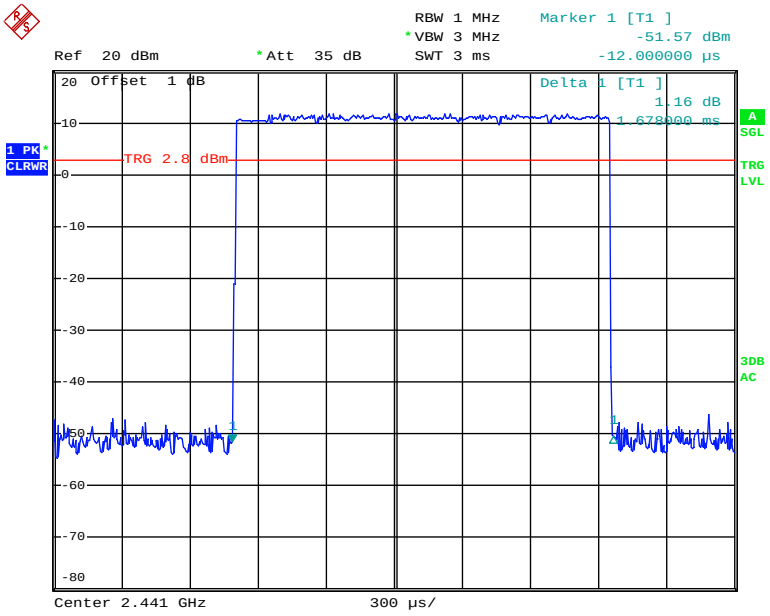
Date: 23.JAN.2018 11:06:19

2DH3: Low Channel



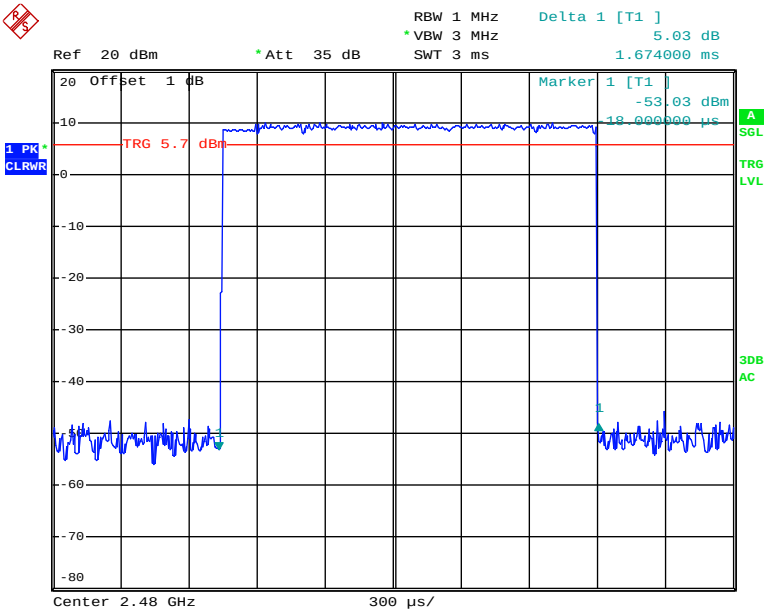
Date: 23.JAN.2018 11:22:09

2DH3: Middle Channel



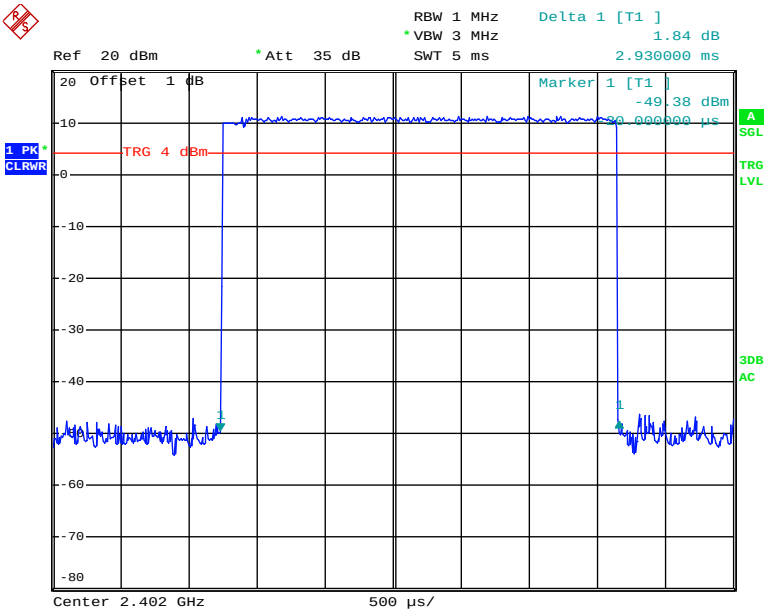
Date: 23.JAN.2018 11:26:09

2DH3: High Channel



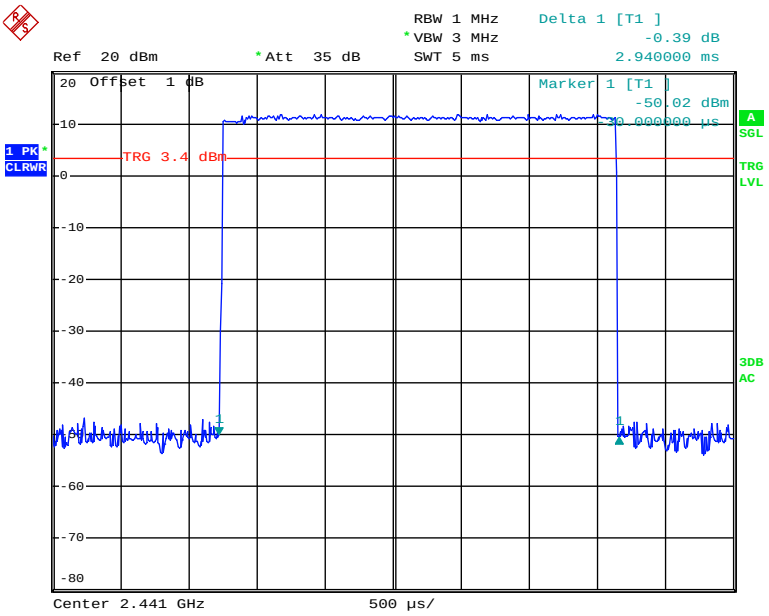
Date: 23.JAN.2018 11:22:21

2DH5: Low Channel



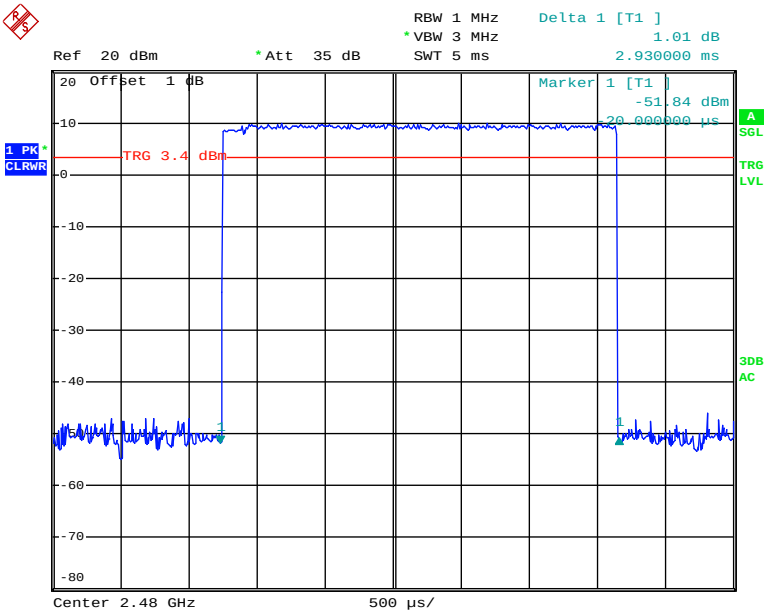
Date: 23.JAN.2018 11:22:47

2DH5: Middle Channel



Date: 23.JAN.2018 11:23:46

2DH5: High Channel

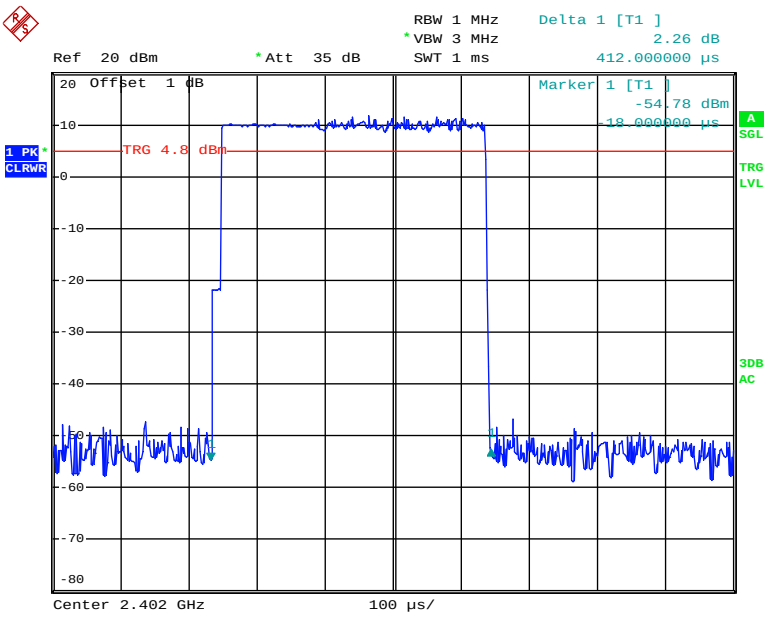


Date: 23.JAN.2018 11:22:59

EDR Mode (8-DPSK):

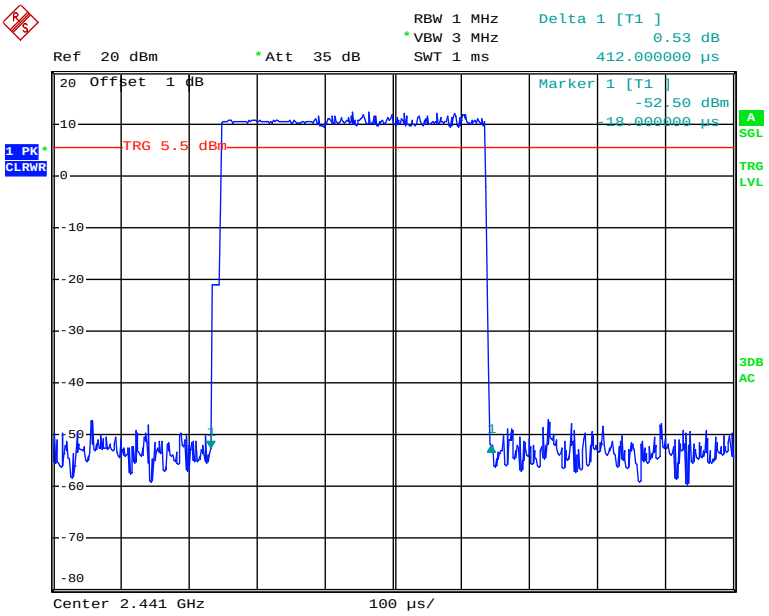
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
3DH1	Low	0.412	0.132	0.4	Compliance
	Middle	0.412	0.132	0.4	Compliance
	High	0.412	0.132	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s				
3DH3	Low	1.680	0.269	0.4	Compliance
	Middle	1.674	0.268	0.4	Compliance
	High	1.674	0.268	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s				
3DH5	Low	2.940	0.314	0.4	Compliance
	Middle	2.930	0.313	0.4	Compliance
	High	2.930	0.313	0.4	Compliance
	Note: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s				

3DH1: Low Channel



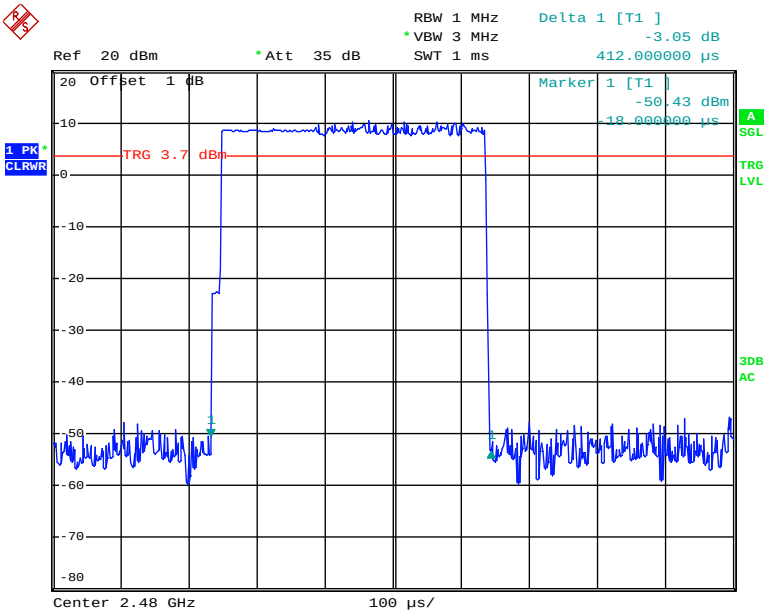
Date: 23.JAN.2018 11:12:37

3DH1: Middle Channel



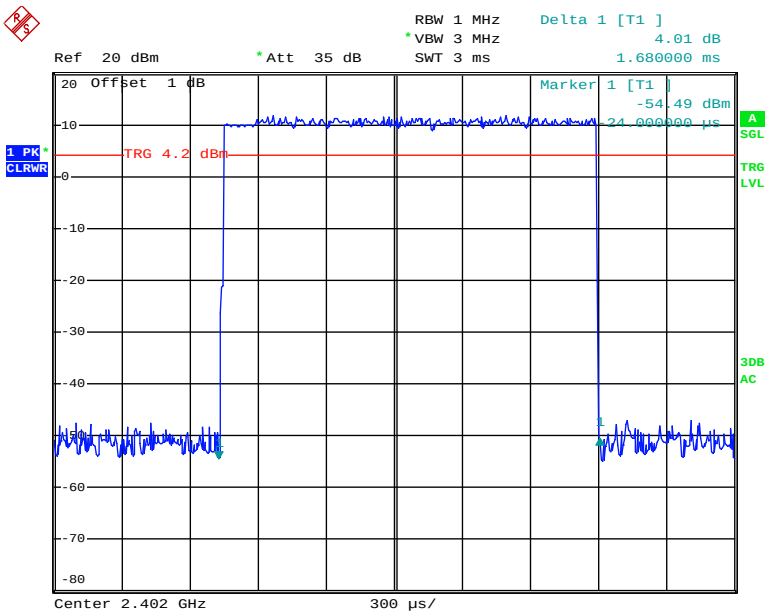
Date: 23.JAN.2018 11:12:47

3DH1: High Channel



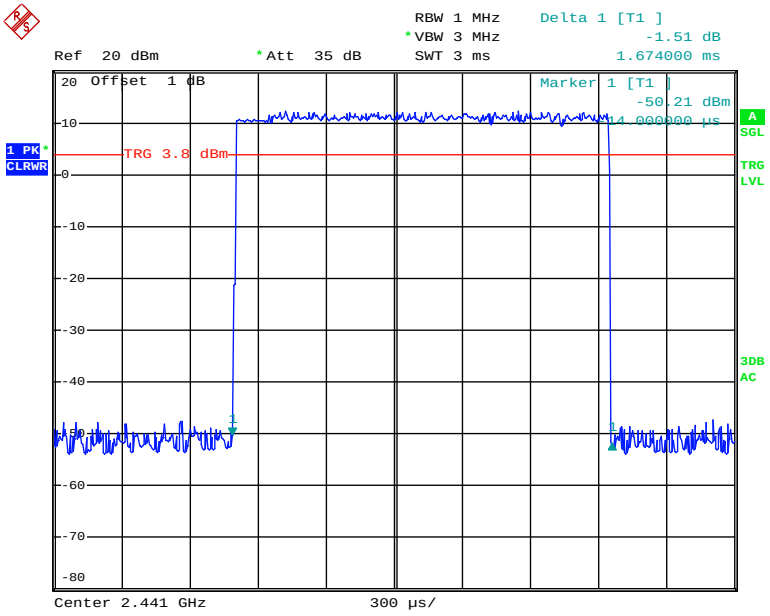
Date: 23.JAN.2018 11:13:01

3DH3: Low Channel



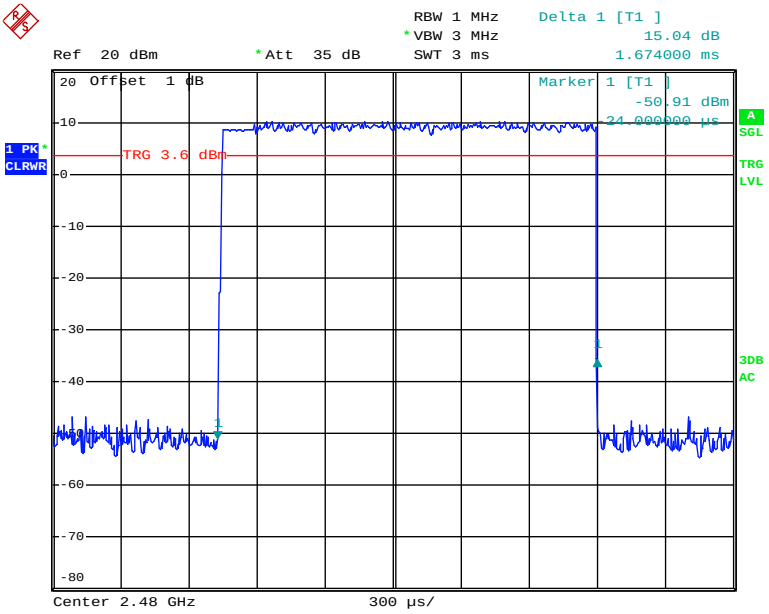
Date: 23.JAN.2018 11:13:28

3DH3: Middle Channel



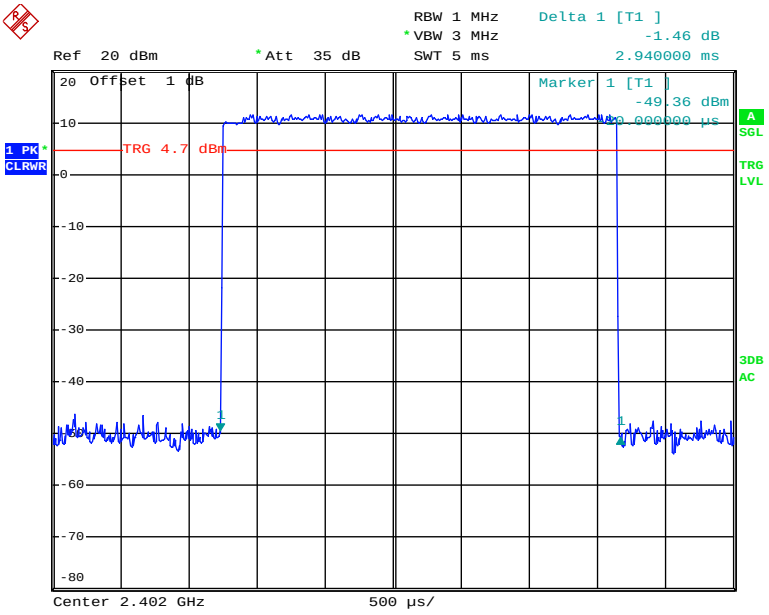
Date: 23.JAN.2018 11:20:10

3DH3: High Channel



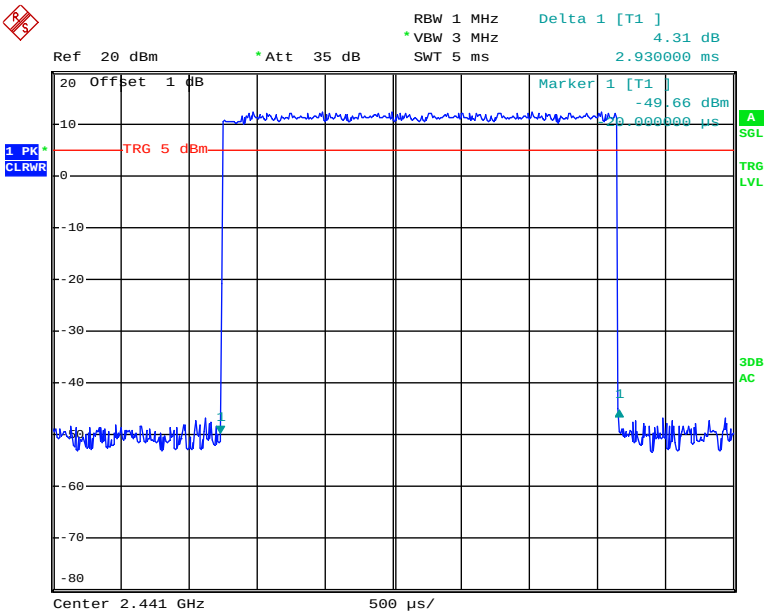
Date: 23.JAN.2018 11:13:37

3DH5: Low Channel



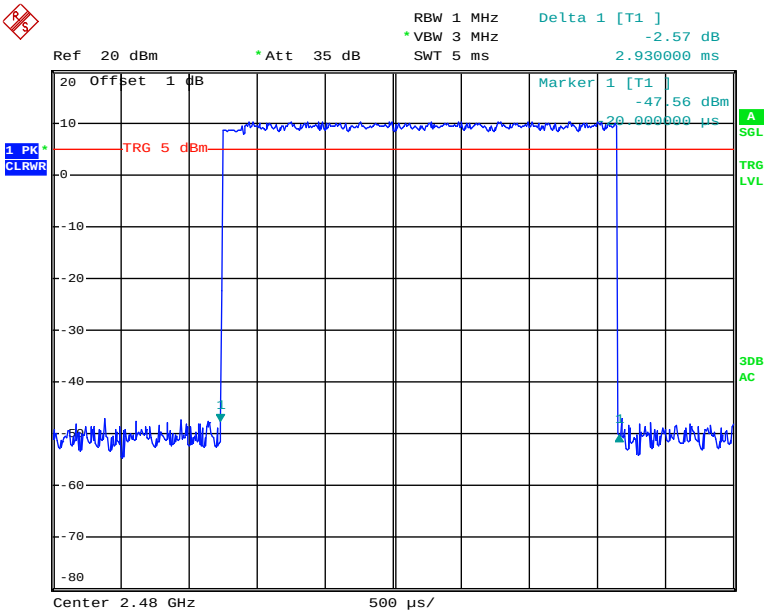
Date: 23.JAN.2018 11:14:15

3DH5: Middle Channel



Date: 23.JAN.2018 11:17:04

3DH5: High Channel



Date: 23.JAN.2018 11:14:25

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
R&S	EMI Test Reciever	ESCI	101121	2017-03-02	2018-03-02
N/A	Coaxial Cable	C-SJ00-0010	C0010/01	Each Time	/

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

Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	48%
ATM Pressure:	100.8 kPa

** The testing was performed by David Huang on 2018-01-23.*

Test Result: Compliance.

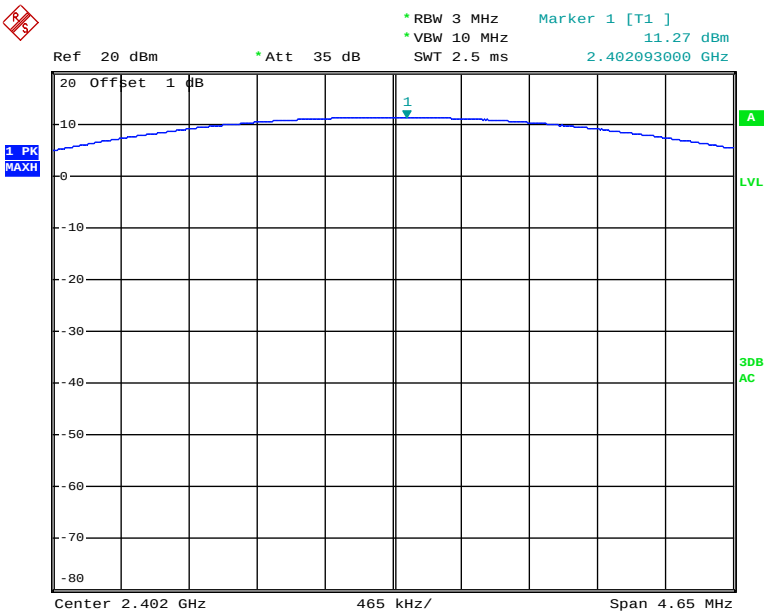
Test Mode: Transmitting

Mode	Frequency (MHz)	Peak Conducted Output power (dBm)	Limit (dBm)
BDR Mode (GFSK)	2402	11.27	21
	2441	11.85	21
	2480	9.93	21
EDR Mode (π/4-DQPSK)	2402	11.91	21
	2441	12.49	21
	2480	10.6	21
EDR Mode (8-DPSK)	2402	12.43	21
	2441	13.01	21
	2480	11.18	21

Note: The data above was tested in conducted mode.

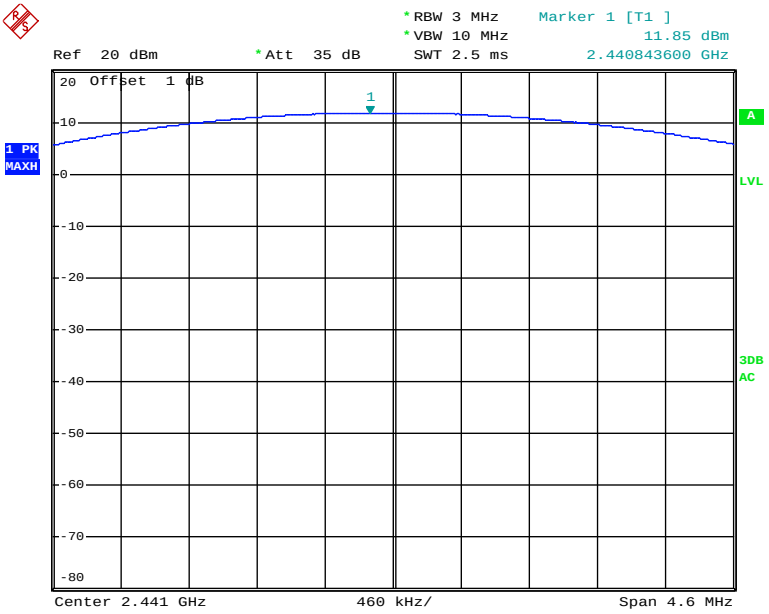
BDR Mode (GFSK):

Low Channel



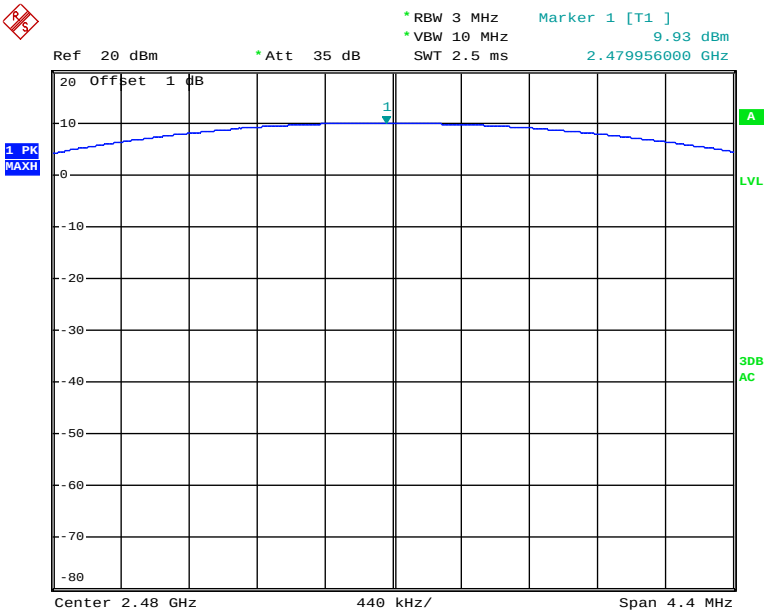
Date: 23.JAN.2018 10:04:28

Middle Channel



Date: 23.JAN.2018 10:06:42

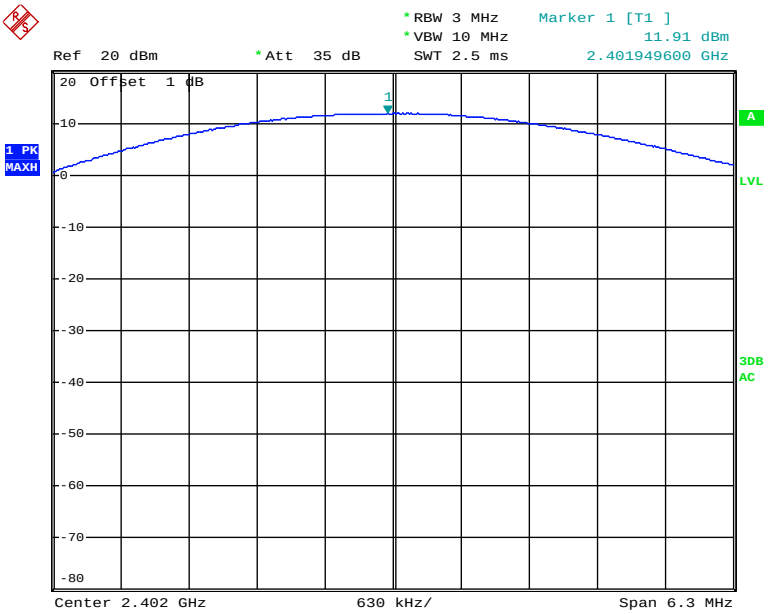
High Channel



Date: 23.JAN.2018 10:08:34

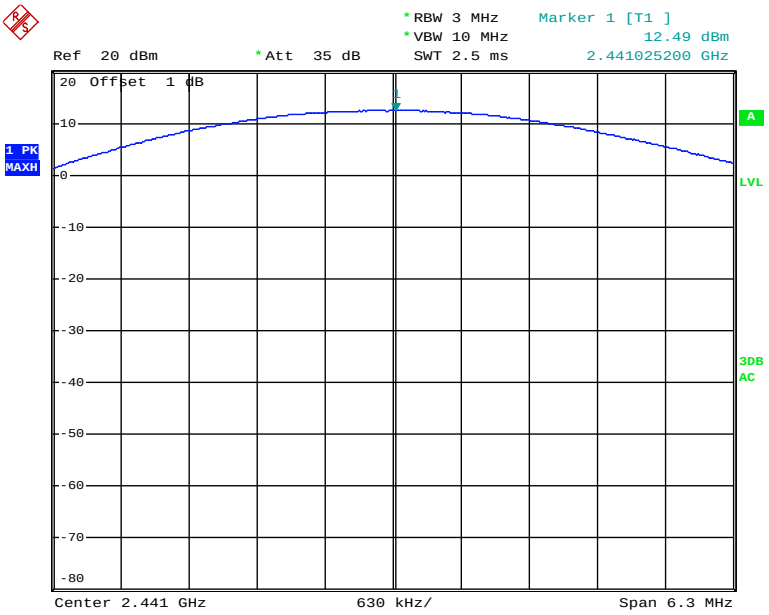
EDR Mode (π/4-DQPSK):

Low Channel



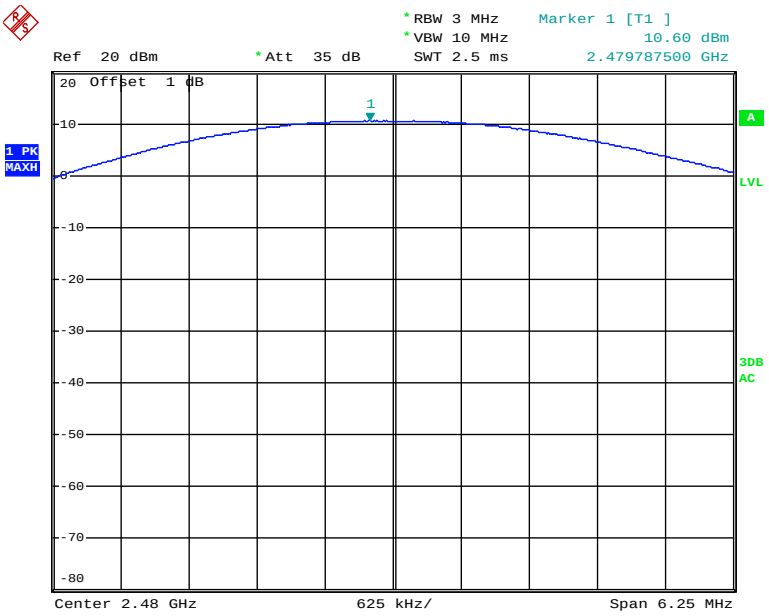
Date: 23.JAN.2018 10:13:34

Middle Channel



Date: 23.JAN.2018 10:12:18

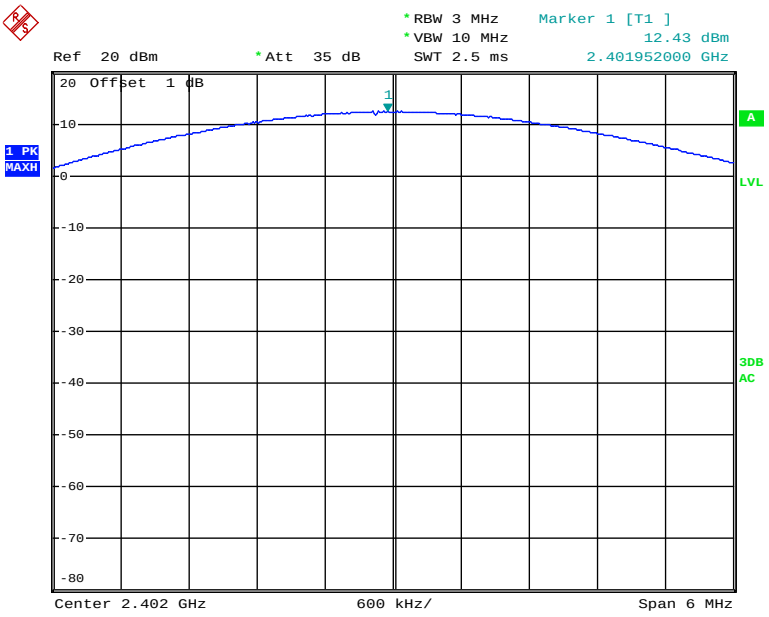
High Channel



Date: 23.JAN.2018 10:10:15

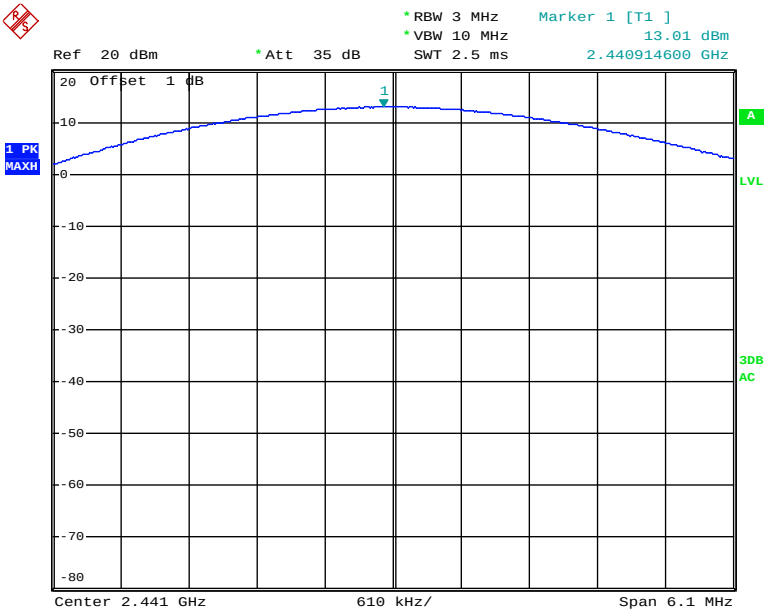
EDR Mode (8-DPSK):

Low Channel



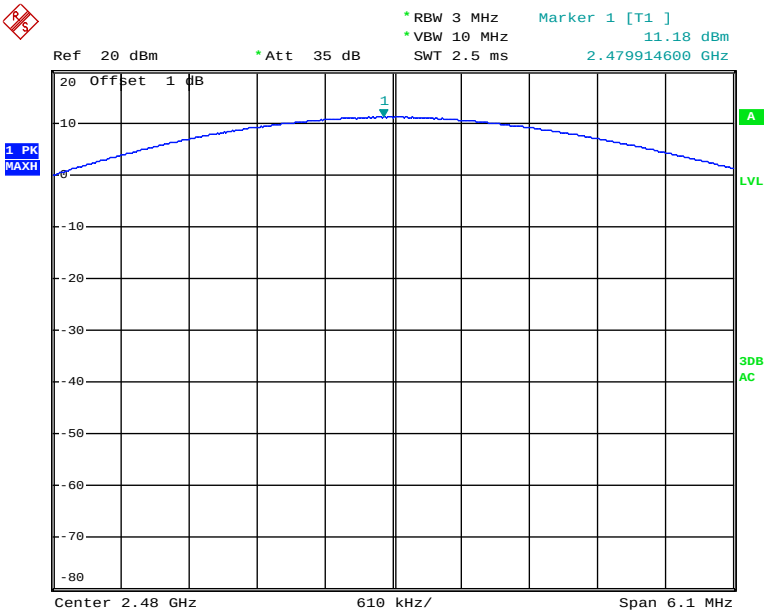
Date: 23.JAN.2018 10:16:08

Middle Channel



Date: 23.JAN.2018 10:18:07

High Channel



Date: 23.JAN.2018 10:19:30

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 of spectrum analyzer to 100/300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Reciever	ESCI	101121	2017-03-02	2018-03-02
N/A	Coaxial Cable	C-SJ00-0010	C0010/01	Each Time	/

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

Test Data

Environmental Conditions

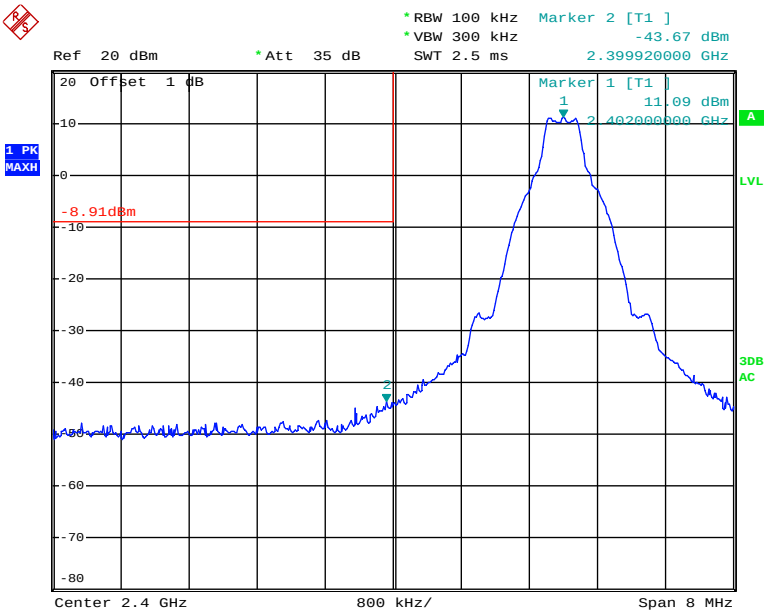
Temperature:	22.7~25.2 °C
Relative Humidity:	40~48 %
ATM Pressure:	100.8~102.2 kPa

** The testing was performed by David Huang on 2018-01-23 &2018-01-29.*

Test Result: Compliance

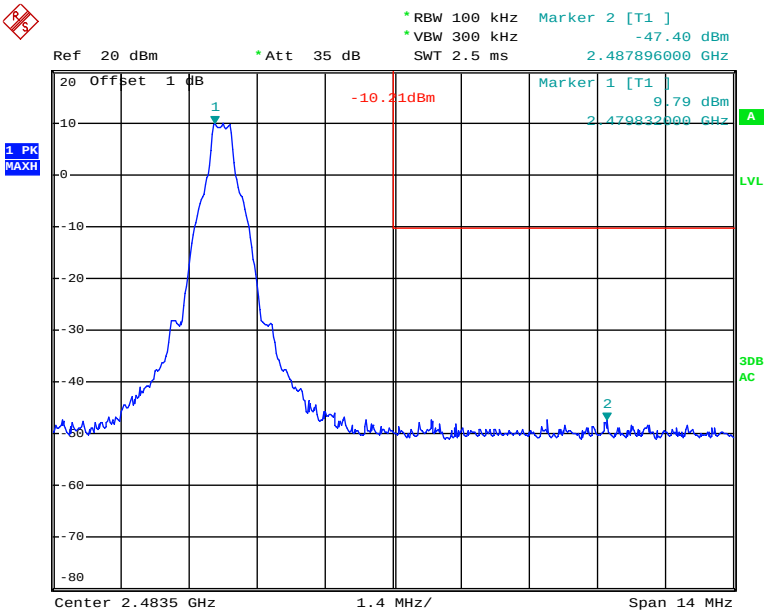
Single Channel Mode,
BDR Mode (GFSK):

Band Edge, Left Side



Date: 23.JAN.2018 10:05:02

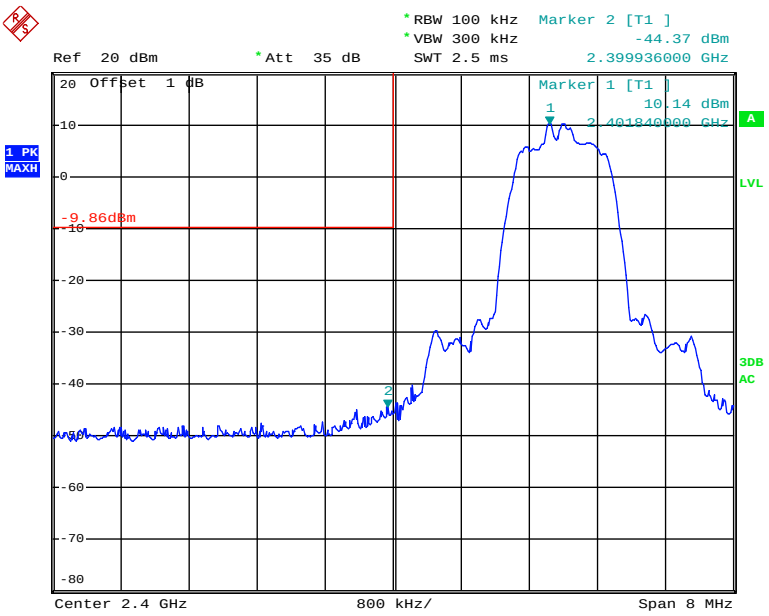
Band Edge, Right Side



Date: 23.JAN.2018 10:08:57

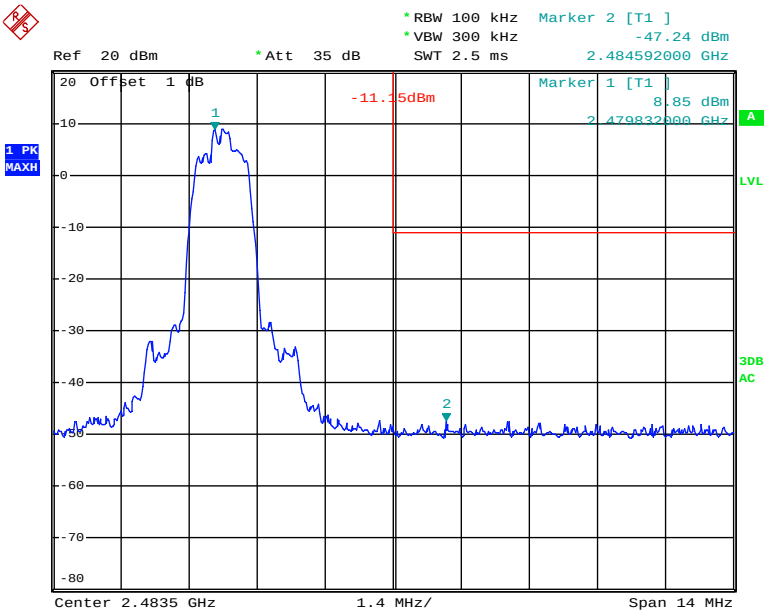
EDR Mode (π/4-DQPSK):

Band Edge, Left Side



Date: 23.JAN.2018 10:14:01

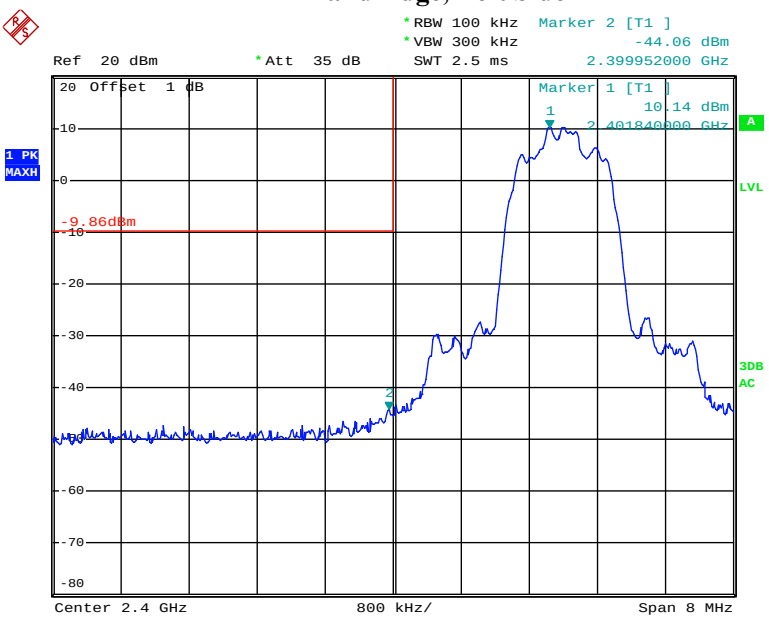
Band Edge, Right Side



Date: 23.JAN.2018 10:10:49

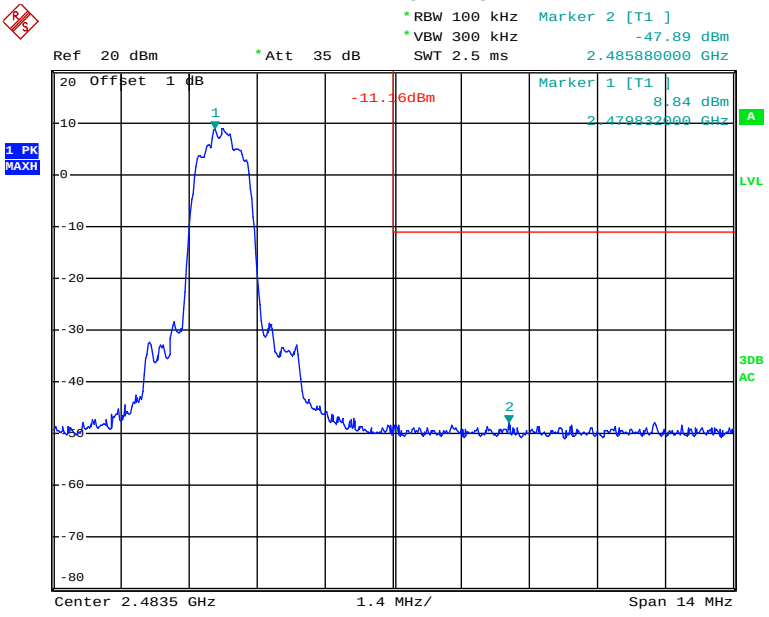
EDR Mode (8-DPSK):

Band Edge, Left Side



Date: 23.JAN.2018 10:16:42

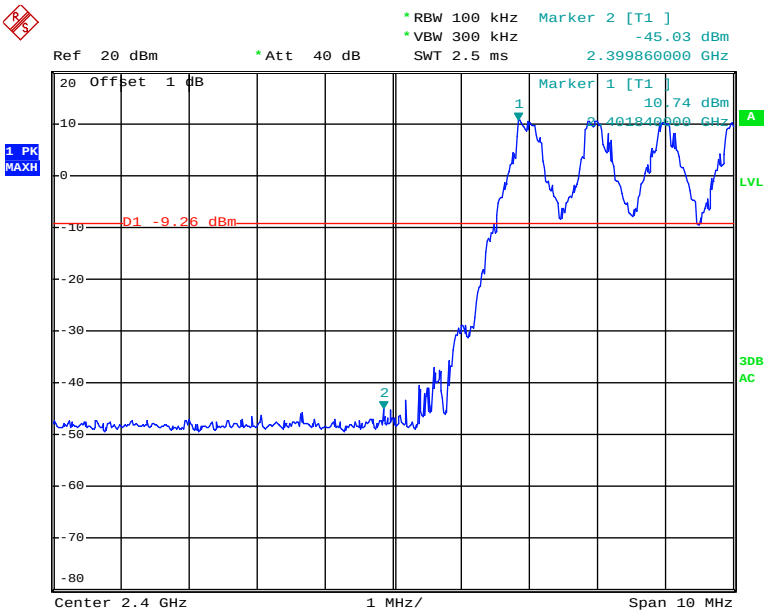
Band Edge, Right Side



Date: 23.JAN.2018 10:20:04

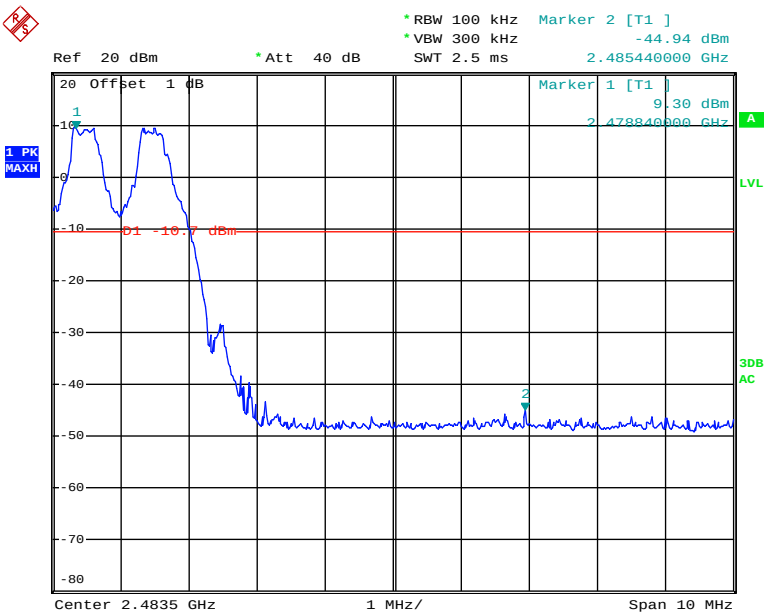
Hopping Mode,
BDR Mode (GFSK):

Band Edge, Left Side



Date: 29.JAN.2018 12:31:43

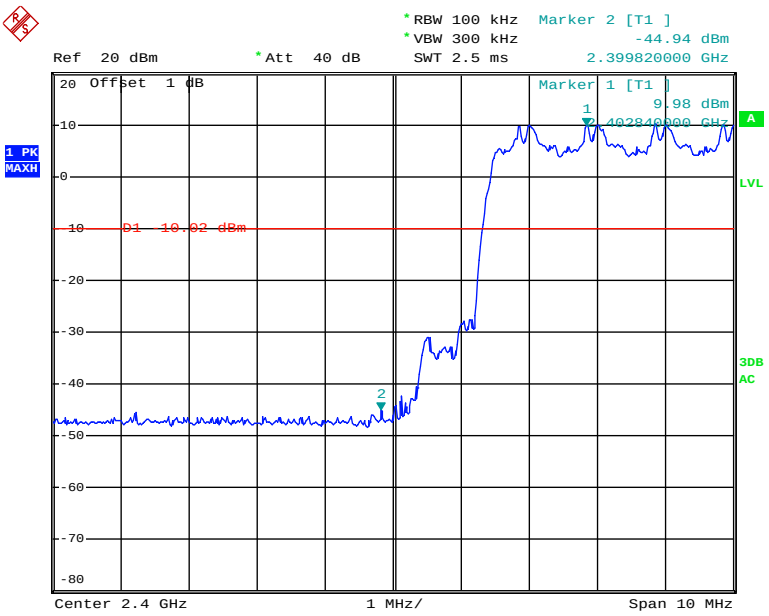
Band Edge, Right Side



Date: 29.JAN.2018 12:30:02

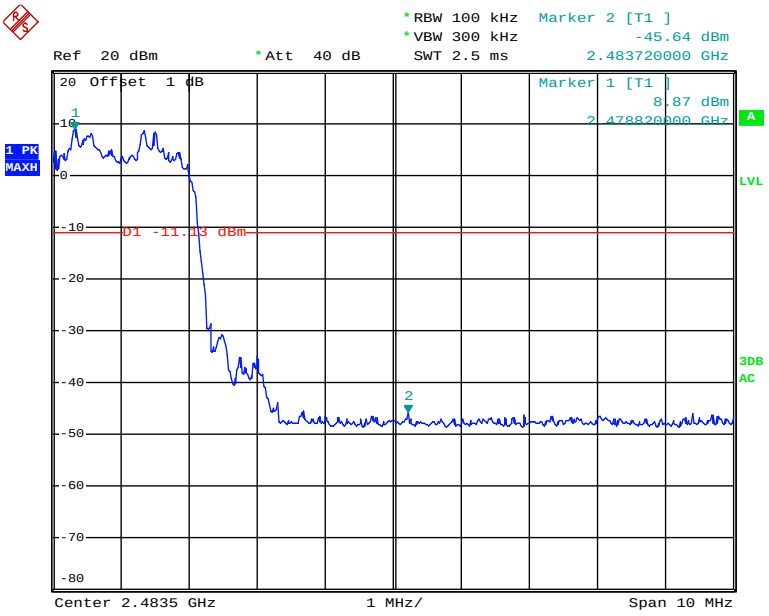
EDR Mode (π/4-DQPSK):

Band Edge, Left Side



Date: 29.JAN.2018 12:44:40

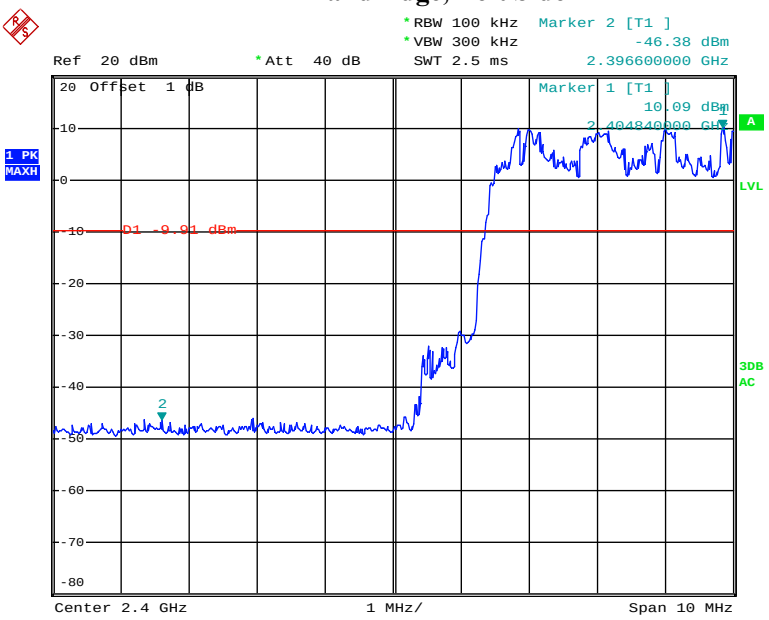
Band Edge, Right Side



Date: 29.JAN.2018 12:48:08

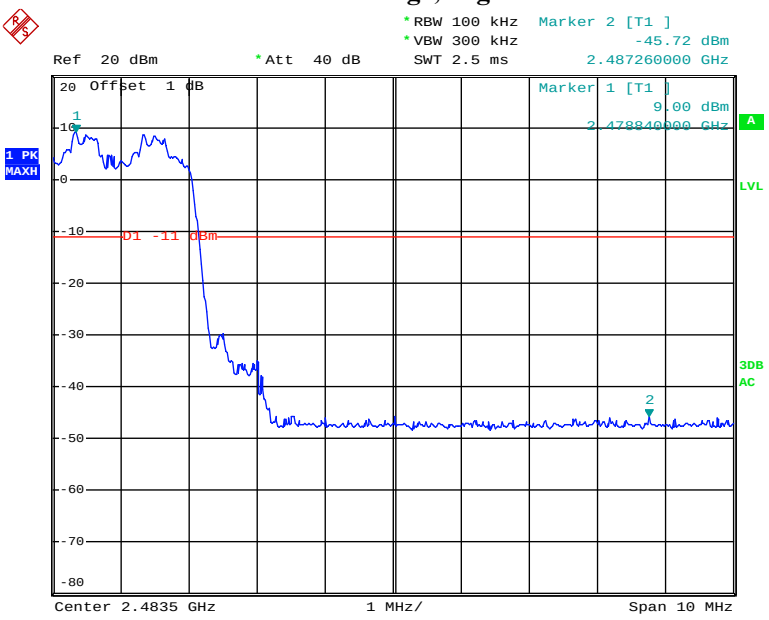
EDR Mode (8-DPSK)

Band Edge, Left Side



Date: 29.JAN.2018 12:58:38

Band Edge, Right Side



Date: 29.JAN.2018 12:56:54

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