

FCC PART 15.247

TEST REPORT

For

MASTER CHOICE, S.A. de C.V.

Magallanes #1155, Col Santa Anita, Tlaquepaque, Jalisco, 45603, México

FCC ID: ZF8-PC-217237

Report Type: Original Report	Product Type: Bluetooth Stereo Headset
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Report Number: R1DG111220002-00	
Report Date: 2012-02-14	
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government.

* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *MASTER CHOICE, S.A. de C.V.*'s product, model number: *PC-217237 (FCC ID: ZF8-PC-217237)* (the "EUT") in this report was a *Bluetooth Stereo Headset*, which was measured approximately: 158 mm (L) x 156 mm (W) x 55 mm (H), rated input voltage: DC 3.7 V built-in rechargeable battery.

** All measurement and test data in this report was gathered from production sample serial number: 1112271 (Assigned by BACL, Shenzhen). The EUT was received on 2011-12-20.*

Objective

This report is prepared on behalf of *MASTER CHOICE, S.A. de C.V.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s)

Test Methodology

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

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

The uncertainty of any RF tests which use conducted method measurement is ± 0.96 dB, the uncertainty of any radiation on emissions measurement is ± 4.0 dB

Test Facility

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

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

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

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

EUT Exercise Software

Exercise Software “Bluetest 3”

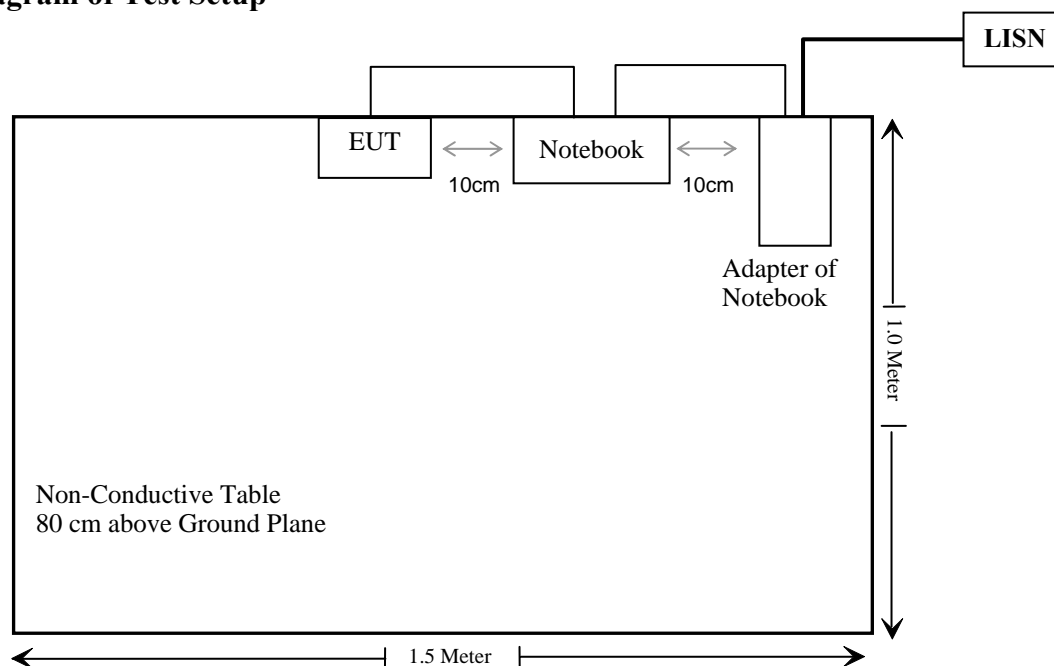
Equipment Modifications

No modification was made to the EUT tested.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Notebook	PP05L	N/A

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 15.247 (i), § 2.1093	RF Exposure	Compliance
§ 15.203	Antenna Requirement	Compliance
§ 15.207 (a)	Conducted Emissions	Not Applicable*
§ 15.205, § 15.209, § 15.247(d)	Radiated Emissions	Compliance
§ 15.247 (a)(1)	20 dB Bandwidth	Compliance
§ 15.247(a)(1)	Channel Separation Test	Compliance
§ 15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§ 15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliance
§ 15.247(b)(1)	Peak Output Power Measurement	Compliance
§ 15.247(d)	Band Edges	Compliance

Note: Not Applicable* The EUT was powered by battery.

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

Applicable Standard

According to §15.247(e)(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to FCC KDB 447498, 1) c), unless excluded by specific FCC test procedures, portable device with output power $> 60/f_{\text{GHz}}$ mW shall include SAR data for equipment approval.

Result:

Maximum peak output power of device:

GFSK: 3.00dBm=1.995mW

$\pi/4$ -DQPSK: 2.10dBm=1.62mW

8-DPSK: 2.23dBm=1.67mW

$$60/f_{\text{GHz}} = 60/2441 = 24.58 \text{ mW}$$

This is a portable device and the Max peak output power of EUT is less than 24.58mW, the SAR measurement is not necessary.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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

Antenna Connector Construction

The EUT has a printed antenna on PCB; the gain is 0 dBi, which in accordance to section 15.203, please refers to the internal photos.

Result: Compliance.

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

Applicable Standard

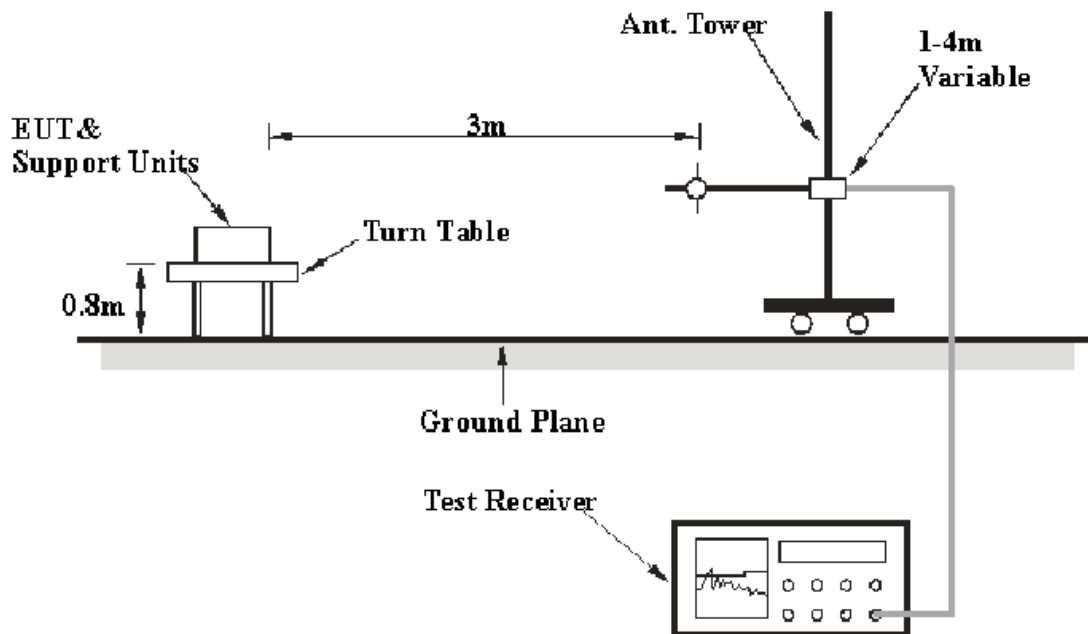
FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

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

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 4.0 dB(k=2, 95% level of confidence).

EUT Setup



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

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

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>Detector</i>
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	Ave.

Test Procedure

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2011-08-02	2012-08-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2011-07-05	2012-07-04
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2011-03-08	2012-03-07
Sunol Sciences	Horn Antenna	DRH-118	A052604	2011-05-05	2012-05-04
Rohde & Schwarz	Signal Analyzer	FSIQ 26	609358	2011-07-08	2012-07-07

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

Corrected Amplitude & Margin Calculation

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

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

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

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

Test Results Summary

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

Transmitting (BDR) Mode: 2.86 dB at 4804 MHz in the Horizontal polarization at low channel

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Ivan Cao on 2012-02-14.

30MHz – 25 GHz*Test Mode: Transmitting (BDR)*

Indicated		Detector (PK/Ave.)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209/15.205			
Frequency (MHz)	S.A. Reading (dBμV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2402 MHz)												
2402	62.33	PK	120	1.2	H	30.09	3.02	0	96.25	N/A	Fundamental	
2402	48.19	Ave.	120	1.2	H	30.09	3.02	0	82.11	N/A	Fundamental	
2402	56.22	PK	150	1.2	V	30.09	3.02	0	90.14	N/A	Fundamental	
2402	42.97	Ave.	150	1.2	V	30.09	3.02	0	76.89	N/A	Fundamental	
4804	36.99	Ave.	130	1.8	H	36.60	4.30	26.75	51.14	54	2.86*	harmonic
4804	36.31	Ave.	155	1.8	V	35.40	4.30	26.75	49.26	54	4.74	harmonic
4804	54.25	PK	130	1.8	H	36.60	4.30	26.75	68.40	74	5.60	harmonic
4804	51.55	PK	155	1.8	V	35.40	4.30	26.75	65.40	74	8.60	harmonic
2327.6	35.11	Ave.	260	1.5	V	30.60	2.98	26.83	41.86	54	12.14	spurious
2314.7	34.20	Ave.	125	2.0	H	30.60	2.98	26.83	40.95	54	13.05	spurious
125.92	31.65	QP	265	1.1	H	14.44	1.84	21.35	26.58	43.5	16.92	spurious
2314.7	49.40	PK	125	2.0	H	30.60	2.98	26.83	56.15	74	17.85	spurious
125.94	29.32	QP	124	1.1	V	14.44	1.84	21.35	24.25	43.5	19.25	spurious
2327.6	47.48	PK	260	1.5	V	30.60	2.98	26.83	54.23	74	19.77	spurious
Middle Channel (2441 MHz)												
2441	60.26	PK	120	1.2	H	30.09	3.12	0	94.28	N/A	Fundamental	
2441	46.45	Ave.	120	1.2	H	30.09	3.12	0	80.47	N/A	Fundamental	
2441	55.73	PK	150	1.2	V	30.09	3.12	0	89.75	N/A	Fundamental	
2441	42.67	Ave.	150	1.2	V	30.09	3.12	0	76.69	N/A	Fundamental	
4882	36.65	Ave.	122	1.7	H	36.60	4.36	26.75	50.86	54	3.14*	harmonic
4882	37.02	Ave.	155	1.8	V	35.40	4.36	26.75	50.03	54	3.97*	harmonic
4882	54.79	PK	122	1.7	H	36.60	4.36	26.75	69.00	74	5.00	harmonic
4882	52.43	PK	155	1.8	V	35.40	4.36	26.75	65.44	74	8.56	harmonic
125.62	32.51	QP	245	1.1	H	14.44	1.84	21.35	27.44	43.5	16.06	spurious
125.24	30.21	QP	129	1.1	V	14.44	1.84	21.35	25.14	43.5	18.36	spurious
High Channel (2480 MHz)												
2480	61.9	PK	120	1.2	H	31.10	3.25	0	96.25	N/A	Fundamental	
2480	46.24	Ave.	120	1.2	H	31.10	3.25	0	80.59	N/A	Fundamental	
2480	56.67	PK	150	1.2	V	31.10	3.25	0	91.02	N/A	Fundamental	
2480	42.63	Ave.	150	1.2	V	31.10	3.25	0	76.98	N/A	Fundamental	
4960	36.23	Ave.	116	1.9	H	36.60	4.40	26.75	50.48	54	3.52*	harmonic
4960	36.11	Ave.	165	1.8	V	35.40	4.40	26.75	49.16	54	4.84	harmonic
4960	51.99	PK	116	1.9	H	36.60	4.40	26.75	66.24	74	7.76	harmonic
4960	50.45	PK	165	1.8	V	35.40	4.40	26.75	63.50	74	10.50	harmonic
2483.5	35.12	Ave.	180	1.7	H	30.60	3.03	26.88	41.87	54	12.13	spurious
2483.5	34.76	Ave.	151	1.3	V	29.80	3.03	26.88	40.71	54	13.29	spurious
125.91	31.81	QP	264	1.1	H	14.44	1.84	21.35	26.74	43.5	16.76	spurious
2483.5	49.58	PK	180	1.7	H	30.60	3.03	26.88	56.93	74	17.07	spurious
2483.5	49.90	PK	151	1.3	V	29.80	3.03	26.88	55.85	74	18.15	spurious
125.44	29.63	QP	140	1.1	V	14.44	1.84	21.35	24.56	43.5	18.94	spurious

*Within measurement uncertainty.

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

Applicable Standard

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

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

Test Procedure

1. Set the EUT in transmitting mode, spectrum Bandwidth was set at 100 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another truce
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

* The testing was performed by Ivan Cao on 2011-12-28.

Test Result: Compliance.

Please refer to following tables and plots

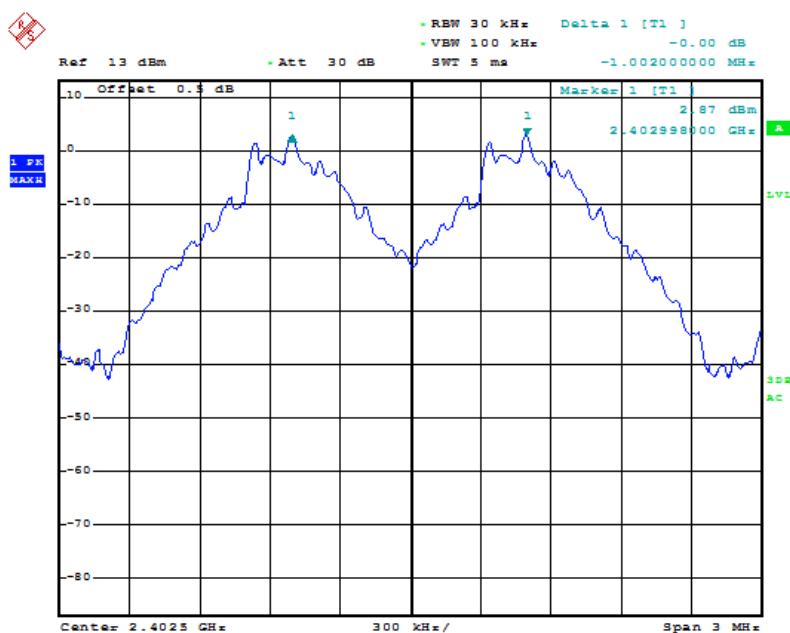
Test Mode: Transmitting

BDR Mode (GFSK):

Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.002	0.56	Pass
Adjacent	2403			
Middle	2441	1.002	0.56	Pass
Adjacent	2442			
High	2480	1.002	0.56	Pass
Adjacent	2479			

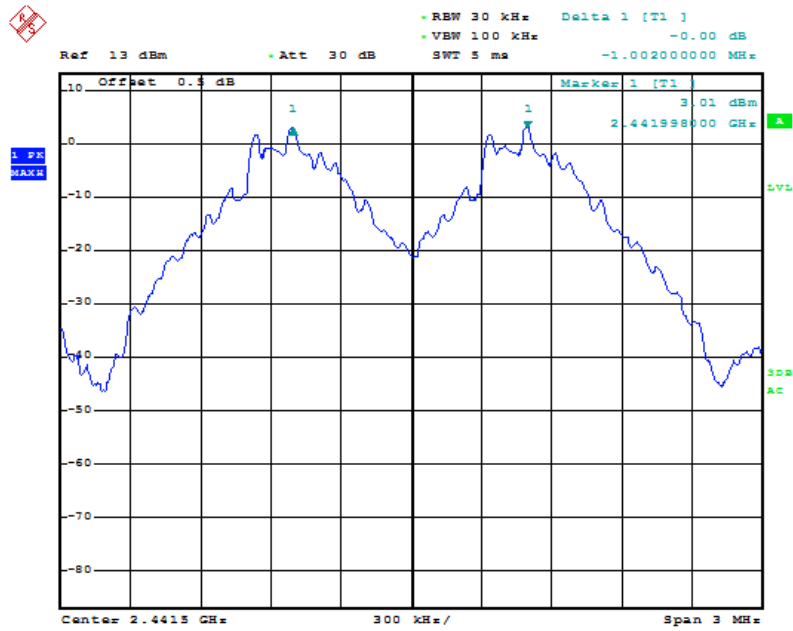
Please refer to the following plots.

Low Channel



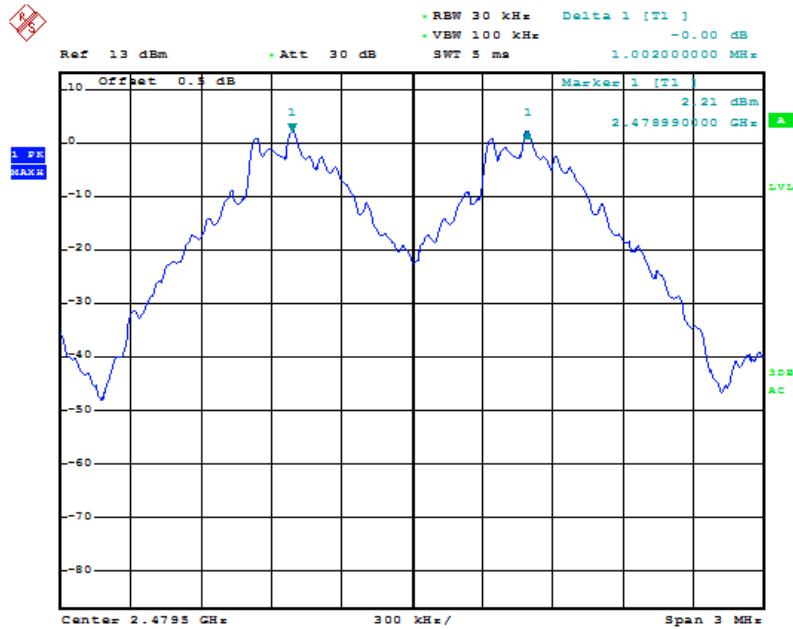
Date: 28.DEC.2011 05:11:04

Middle Channel



Date: 28.DEC.2011 05:12:53

High Channel

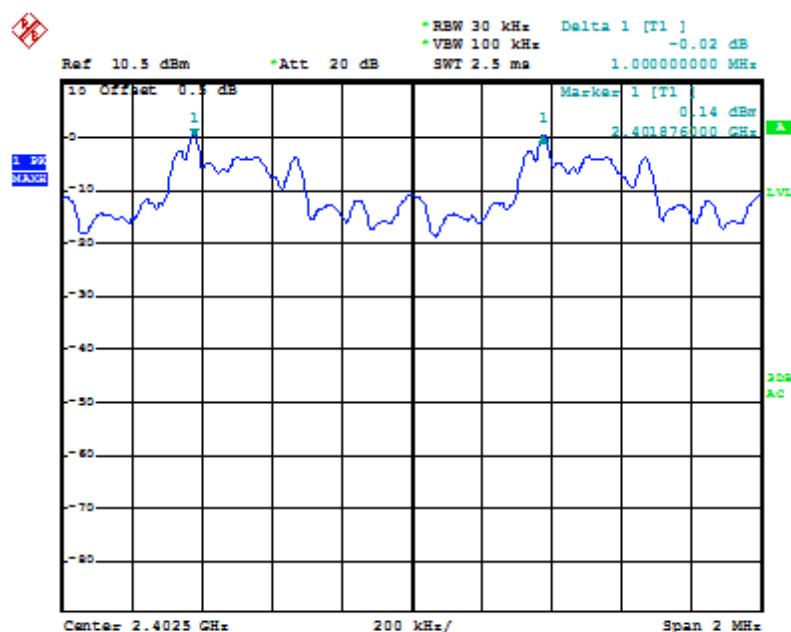


Date: 28.DEC.2011 05:15:15

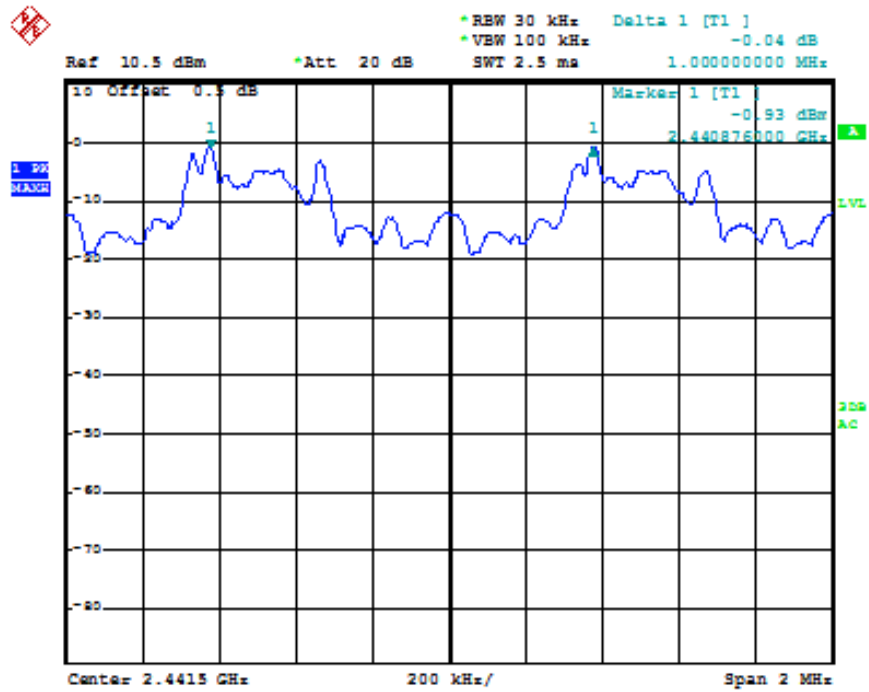
EDR Mode ($\pi/4$ -DQPSK):

Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.00	0.874	Pass
Adjacent	2403			
Middle	2441	1.00	0.874	Pass
Adjacent	2442			
High	2480	1.00	0.874	Pass
Adjacent	2479			

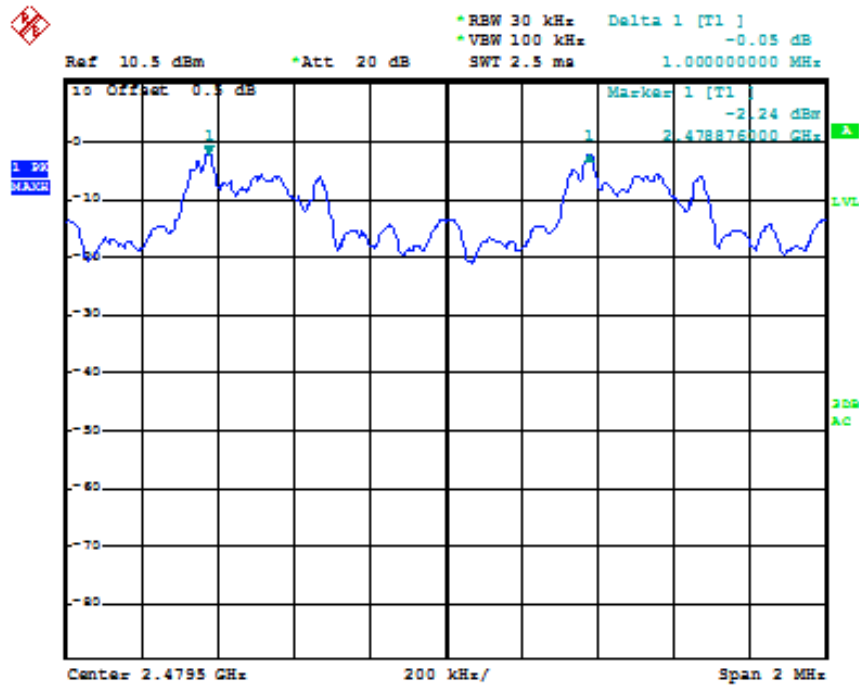
Please refer to the following plots.

Low Channel

Middle Channel



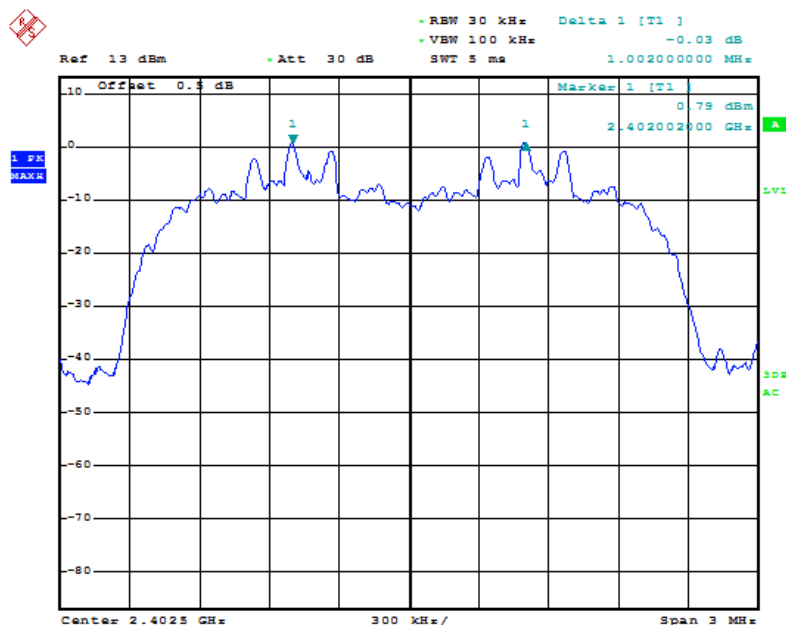
High Channel



EDR Mode (8-DPSK):

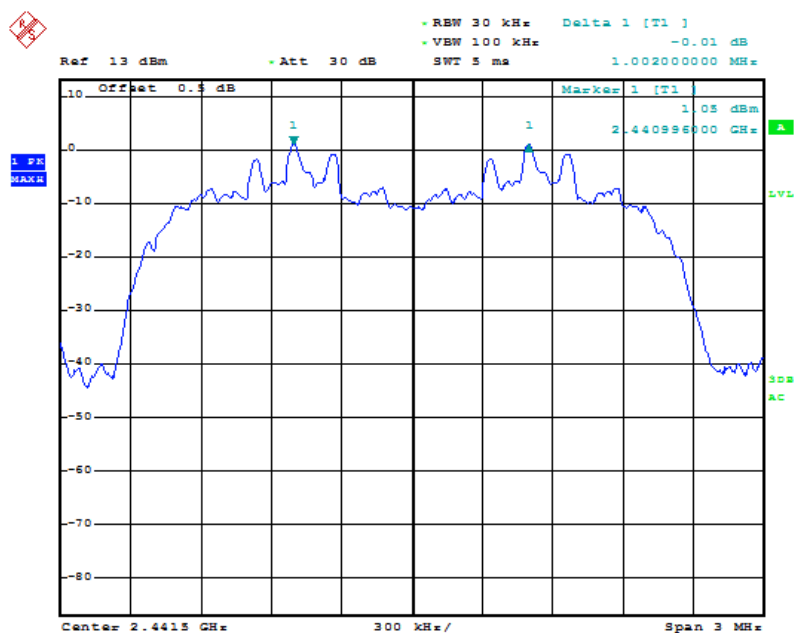
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.002	0.84	Pass
Adjacent	2403			
Middle	2441	1.002	0.84	Pass
Adjacent	2442			
High	2480	1.002	0.84	Pass
Adjacent	2479			

Please refer to the following plots.

Low Channel

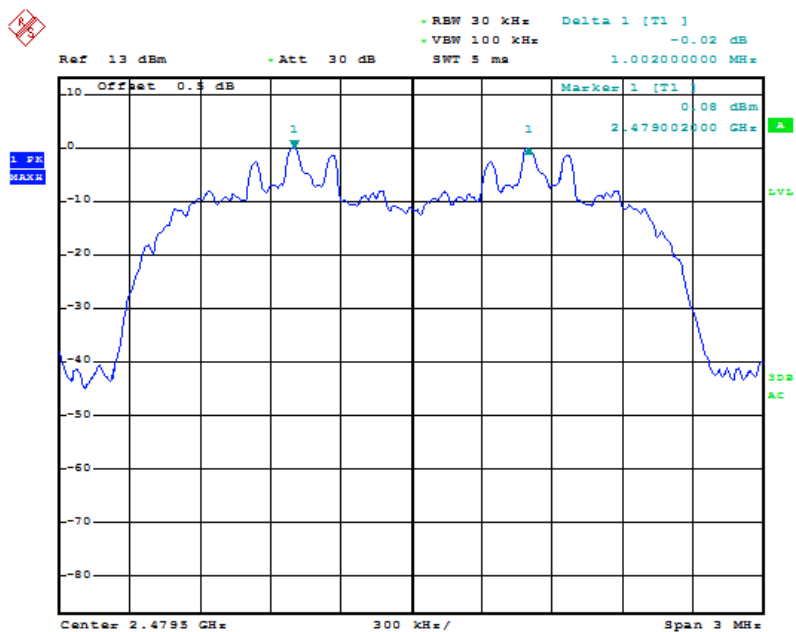
Date: 28.DEC.2011 03:30:36

Middle Channel



Date: 28.DEC.2011 03:33:38

High Channel



Date: 28.DEC.2011 03:36:14

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

Applicable Standard

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

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

* The testing was performed by Ivan Cao on 2011-12-28.

Test Result: Compliance.

Please refer to following tables and plots

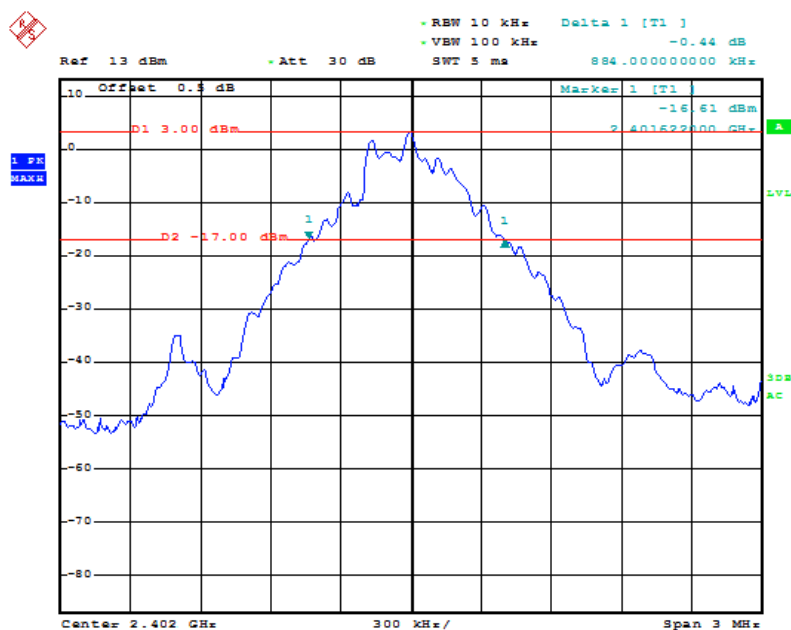
Test Mode: Transmitting

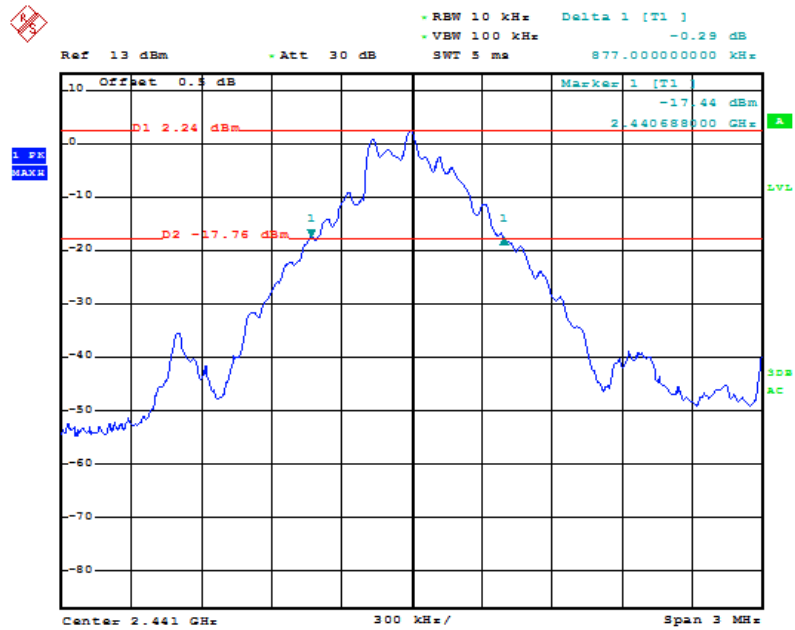
BDR Mode (GFSK):

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	0.884
Middle	2441	0.877
High	2480	0.889

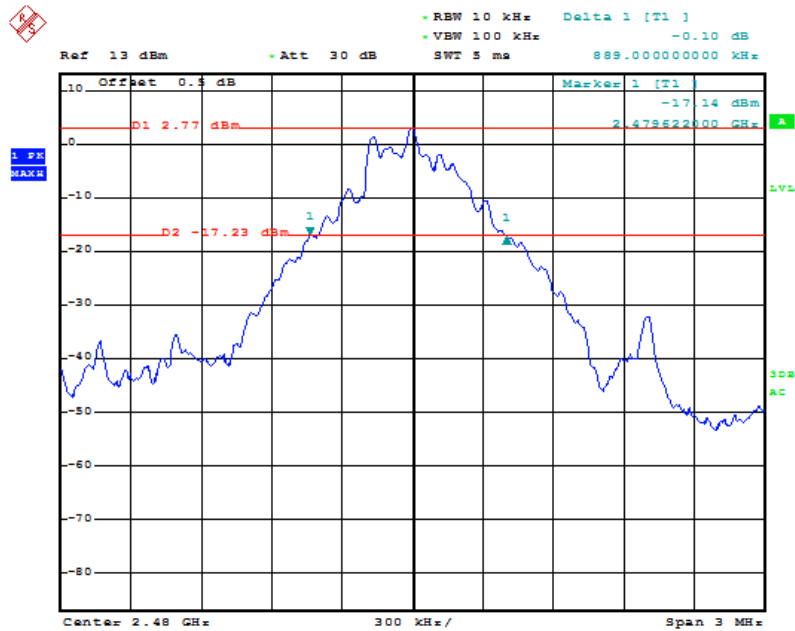
Please refer to the following plots.

Low Channel





High Channel

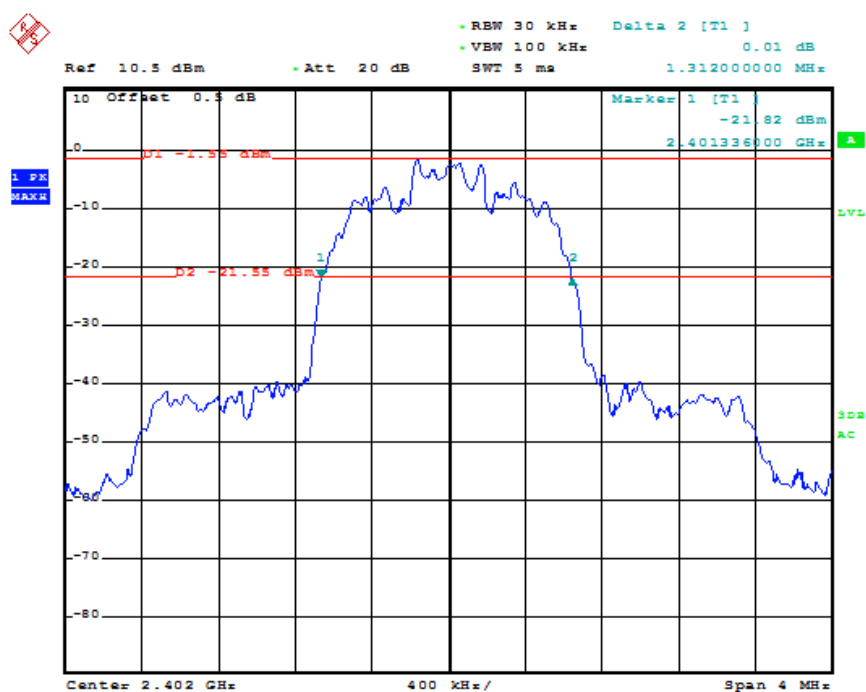


EDR Mode ($\pi/4$ -DQPSK):

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.312
Middle	2441	1.312
High	2480	1.312

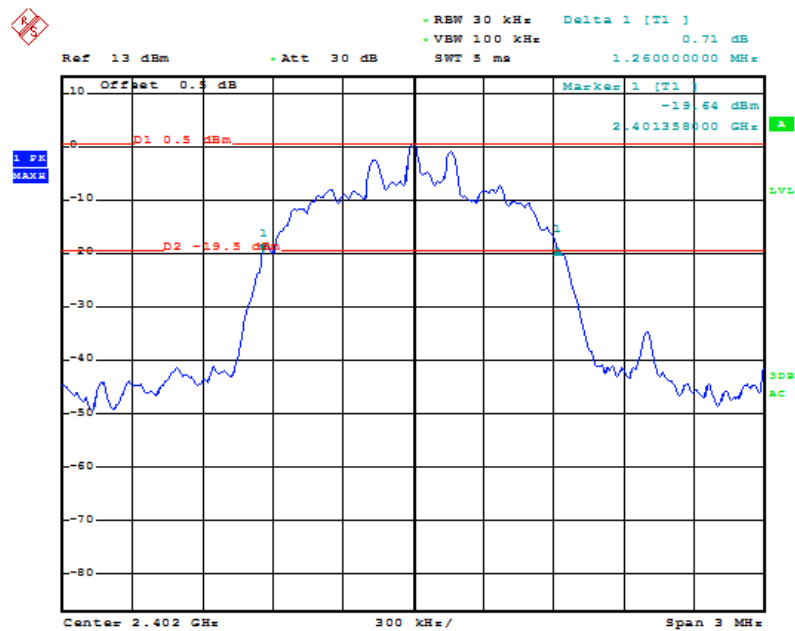
Please refer to the following plots.

Low Channel



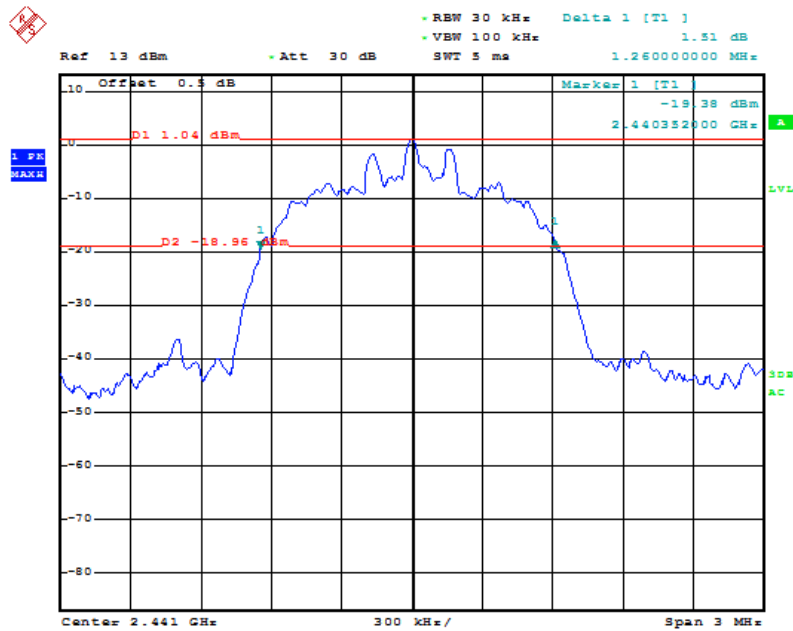
EDR Mode(8-DPSK):

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.260
Middle	2441	1.260
High	2480	1.260

Low Channel

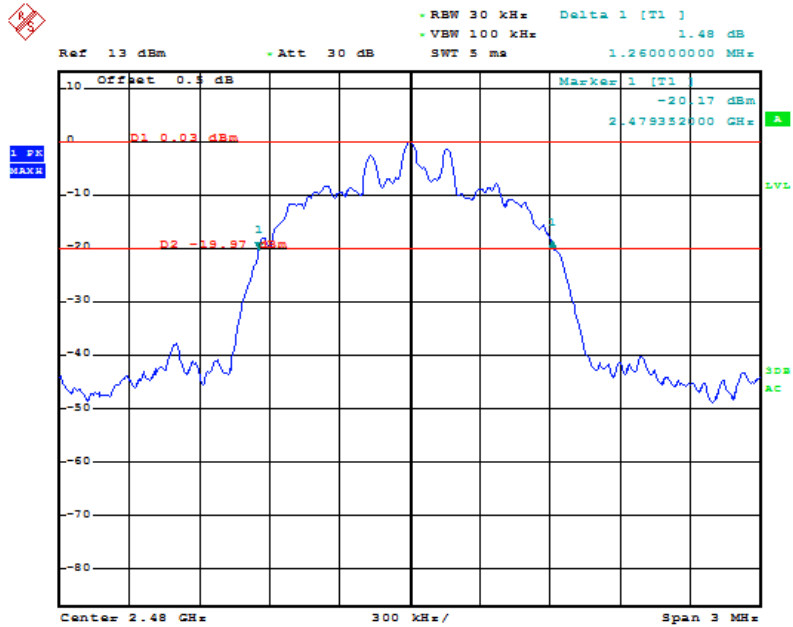
Date: 28.DEC.2011 03:24:51

Middle Channel



Date: 28.DEC.2011 03:26:52

High Channel



Date: 28.DEC.2011 03:28:41

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

Applicable Standard

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

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

The testing was performed by Ivan Cao on 2011-12-28.

Test Result: Compliance.

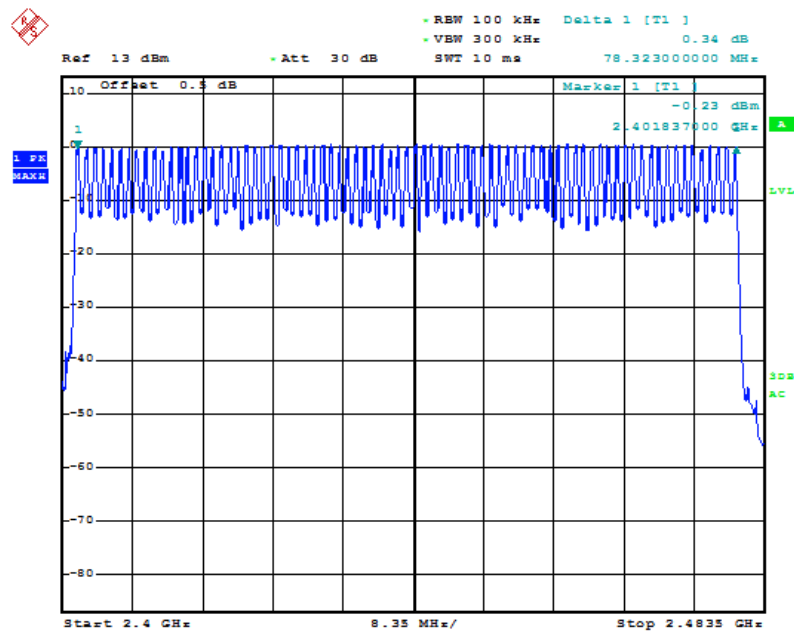
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.50	79	≥ 15

Number of Hopping Channels

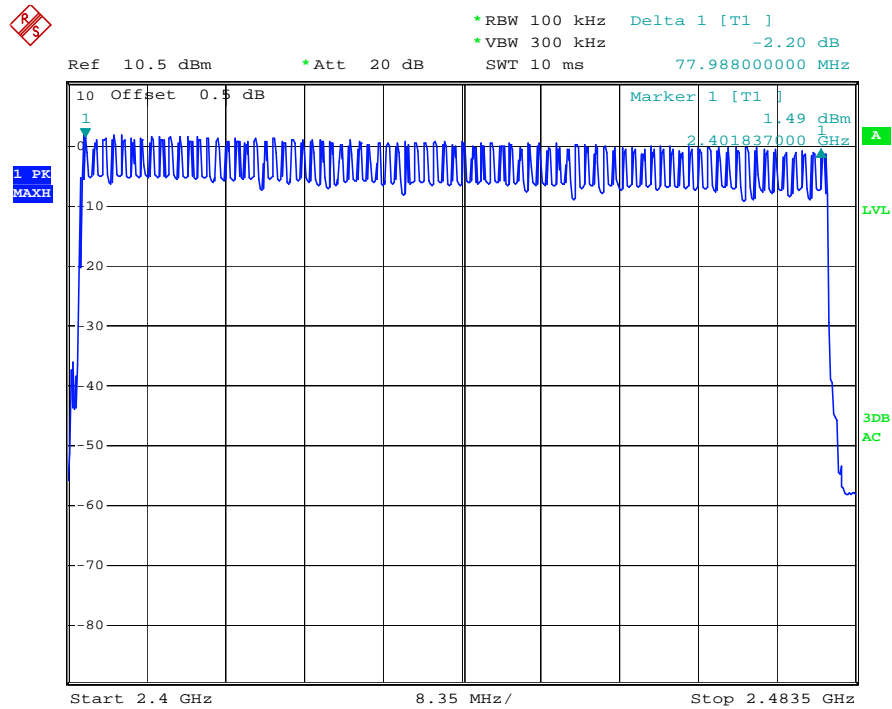


Date: 28.DEC.2011 04:56:17

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

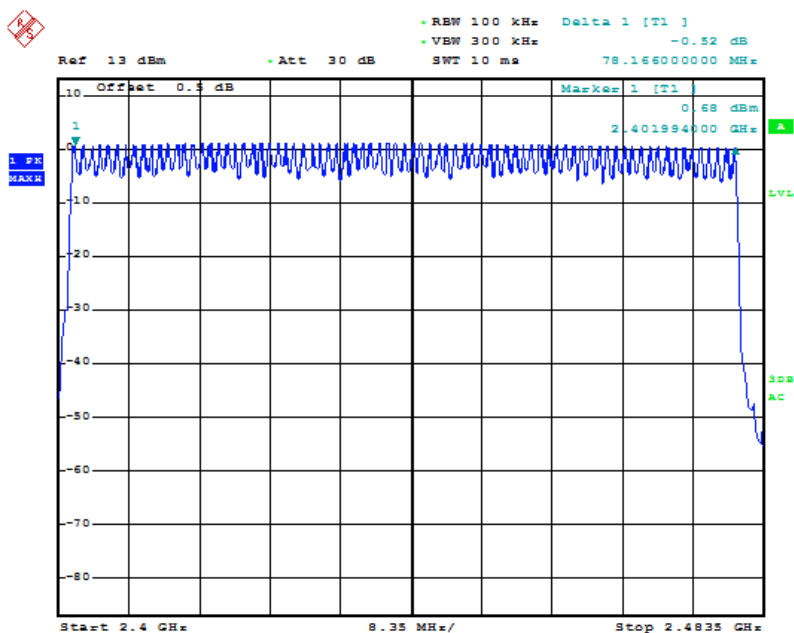
Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.50	79	≥ 15

Number of Hopping Channels



EDR Mode (8-DPSK):

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.50	79	≥ 15

Number of Hopping Channels

Date: 28.DEC.2011 06:37:58

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

Applicable Standard

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

Test Procedure

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

* The testing was performed by Ivan Cao on 2011-12-28.

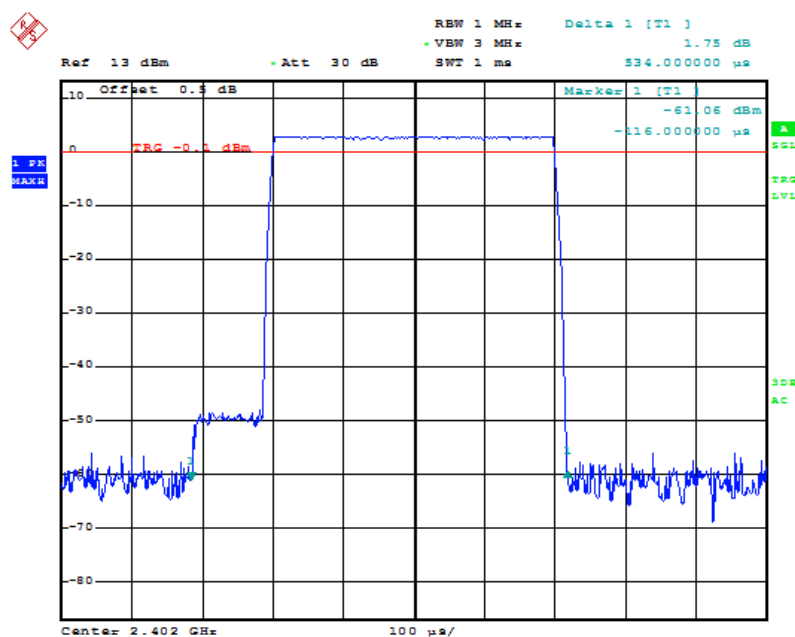
Test Result: Compliance.

Please refer to following tables and plots

BDR Mode (GFSK):

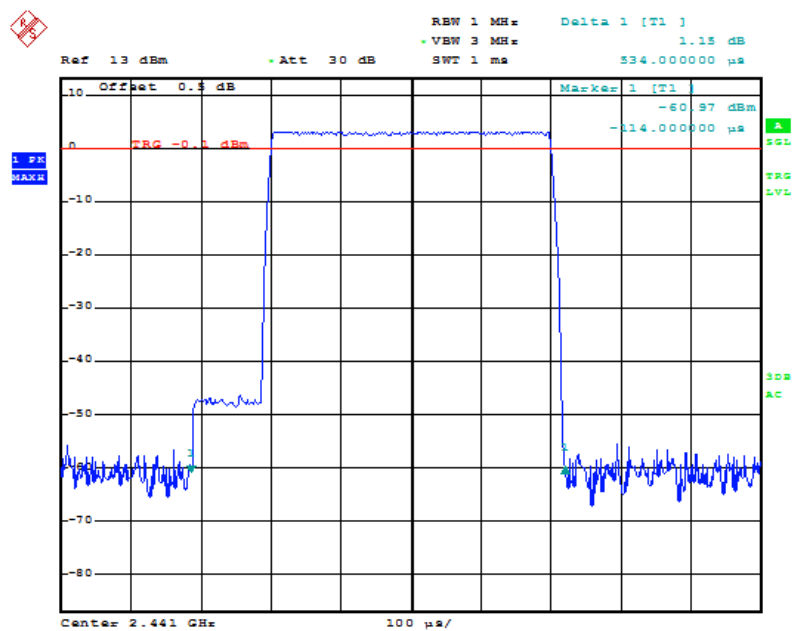
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.534	0.171	0.4	Pass
	Middle	0.534	0.171	0.4	Pass
	High	0.534	0.171	0.4	Pass
	Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
DH 3	Low	1.806	0.289	0.4	Pass
	Middle	1.806	0.289	0.4	Pass
	High	1.806	0.289	0.4	Pass
	Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
DH 5	Low	3.06	0.327	0.4	Pass
	Middle	3.06	0.327	0.4	Pass
	High	3.06	0.327	0.4	Pass
	Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				

Please refer to the following plots.

Low Channel for DH1

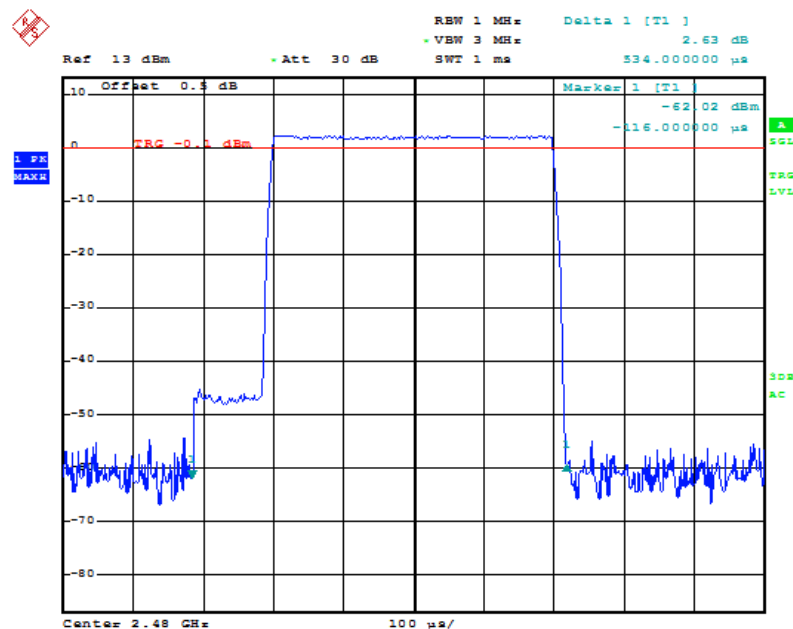
Date: 28.DEC.2011 06:11:38

Middle Channel for DH1



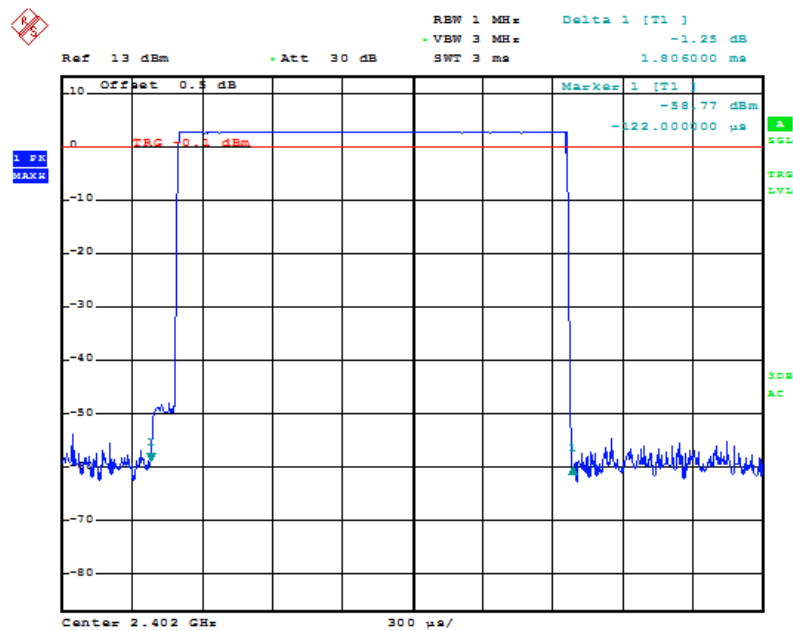
Date: 28.DEC.2011 06:10:02

High Channel for DH1



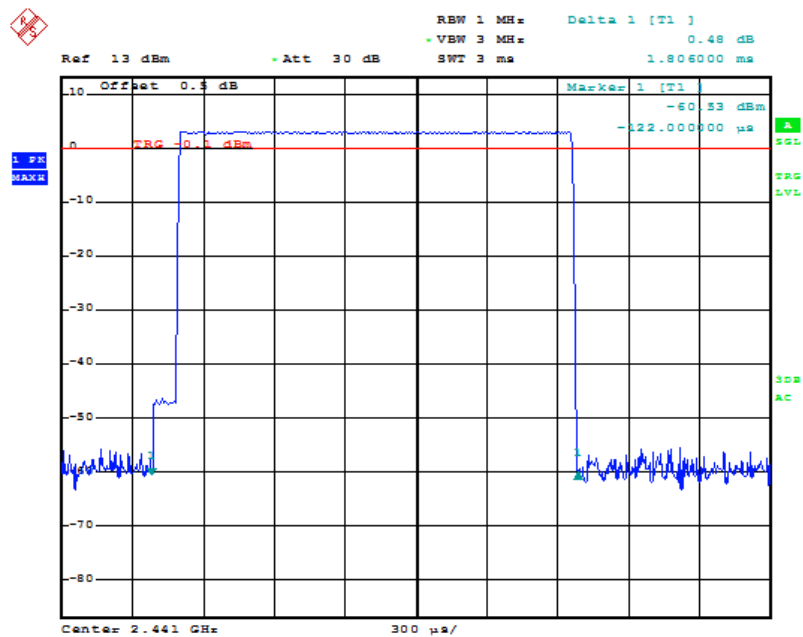
Date: 28.DEC.2011 06:12:27

Low Channel for DH3



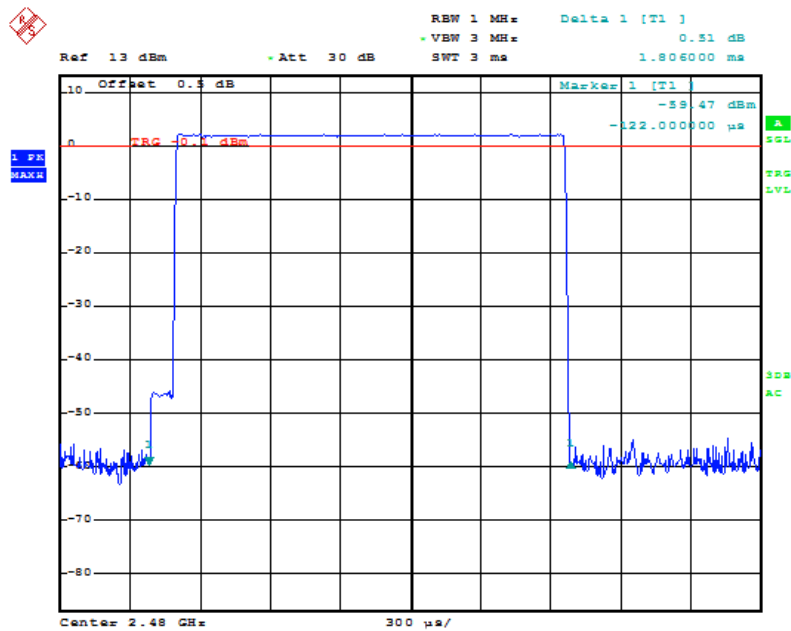
Date: 28.DEC.2011 06:15:14

Middle Channel for DH3



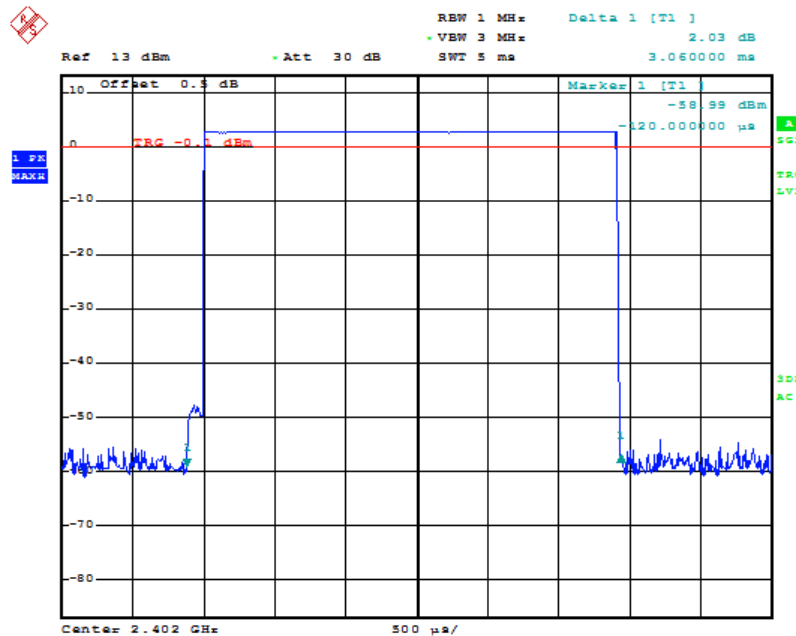
Date: 28.DEC.2011 06:16:14

High Channel for DH3



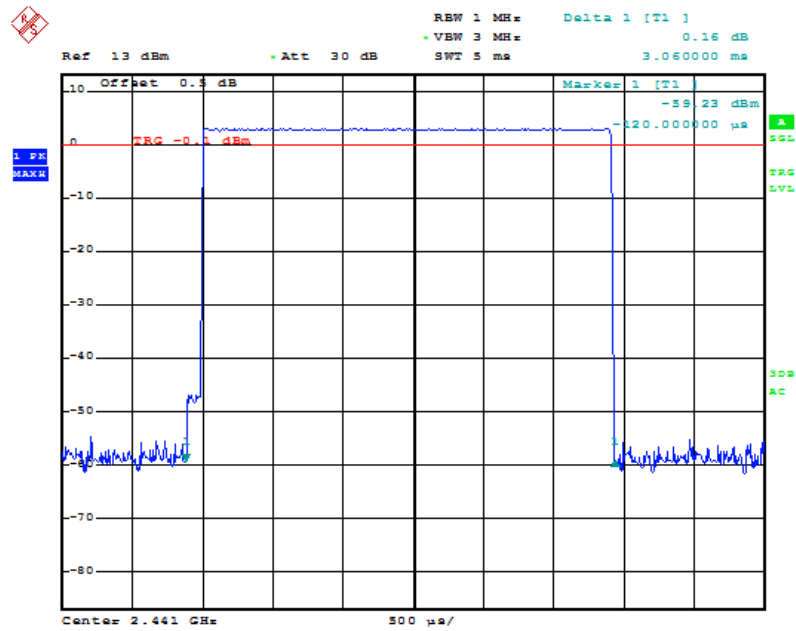
Date: 28.DEC.2011 06:17:11

Low Channel for DH5



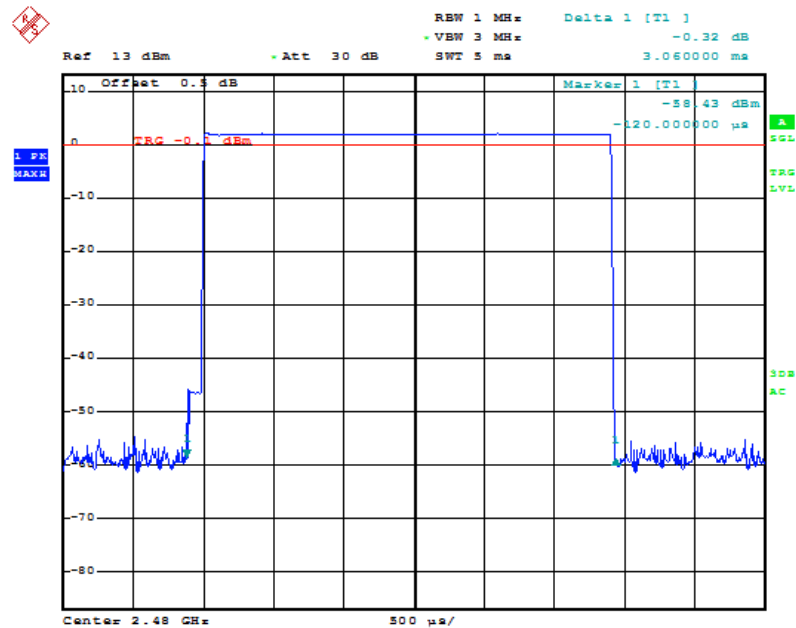
Date: 28.DEC.2011 06:23:15

Middle Channel for DH5



Date: 28.DEC.2011 06:24:11

High Channel for DH5



Date: 28.DEC.2011 06:25:02

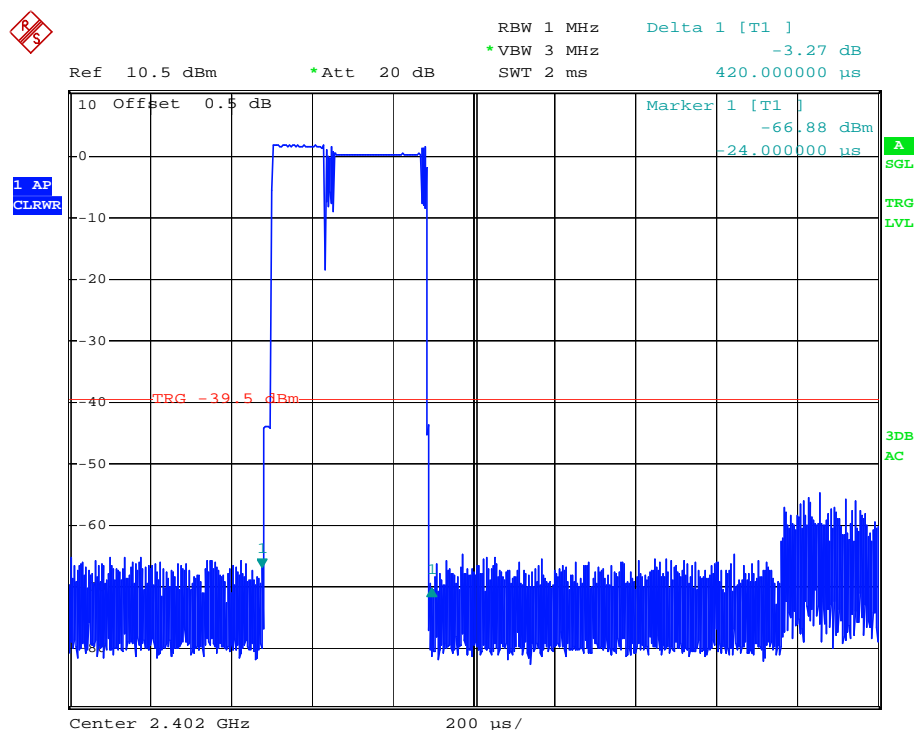
Test Mode: Transmitting

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

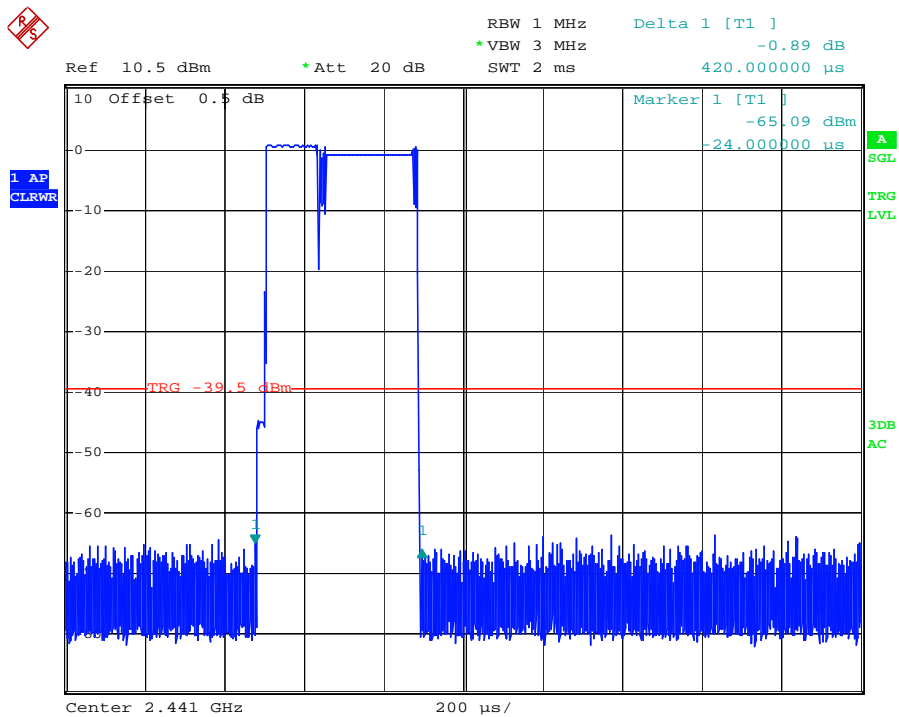
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.42	0.1344	0.4	Pass
	Middle	0.42	0.1344	0.4	Pass
	High	0.416	0.1331	0.4	Pass
	Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
DH 3	Low	1.68	0.2688	0.4	Pass
	Middle	1.68	0.5376	0.4	Pass
	High	1.68	0.5376	0.4	Pass
	Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
DH 5	Low	2.96	0.3157	0.4	Pass
	Middle	2.94	0.3136	0.4	Pass
	High	2.94	0.3136	0.4	Pass
	Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				

Please refer to the following plots.

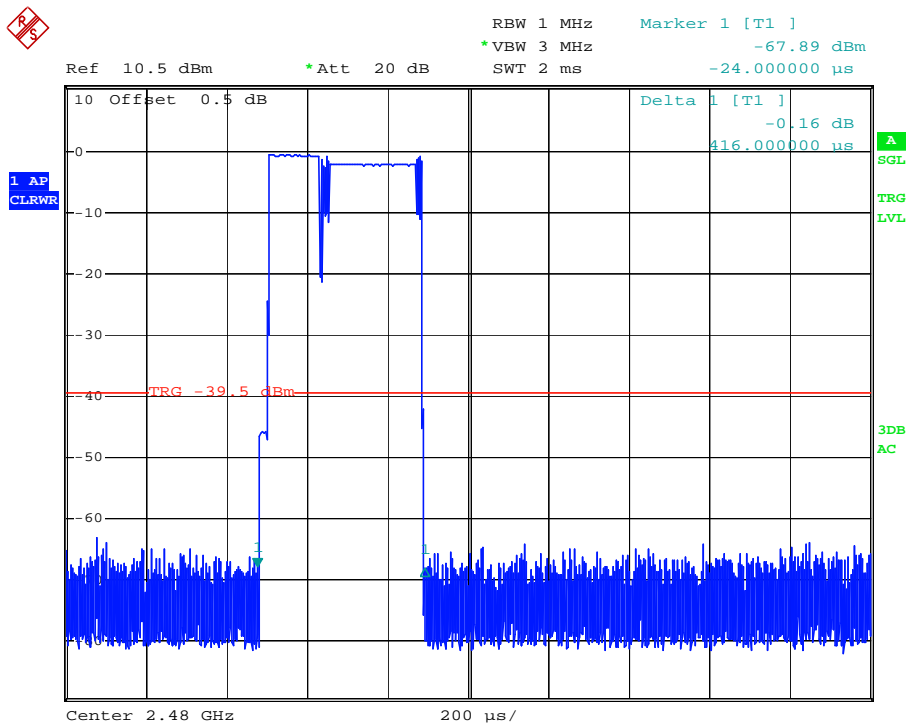
Low Channel for DH1



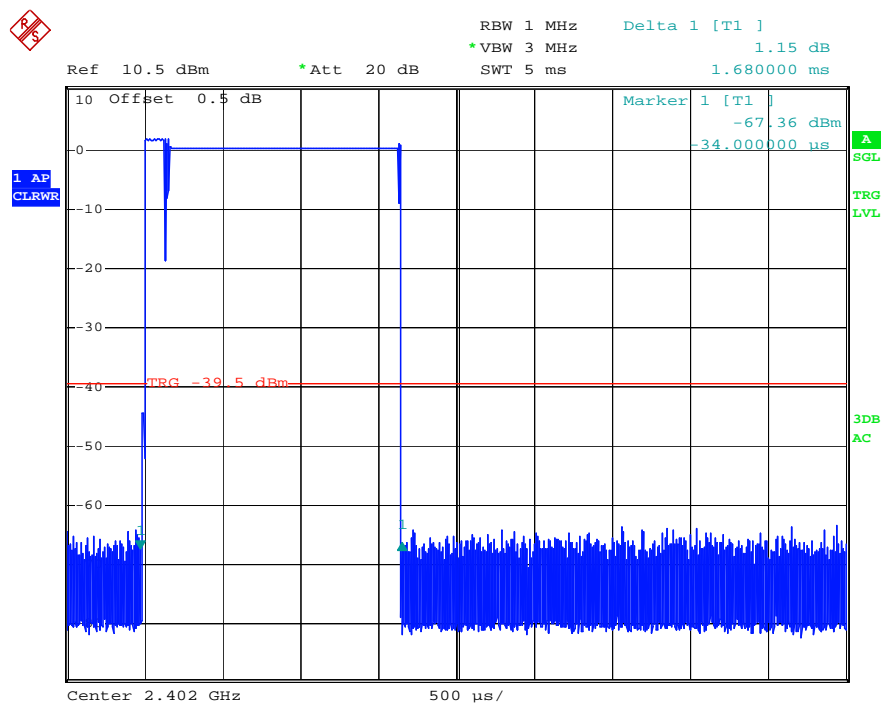
Middle Channel for DH1



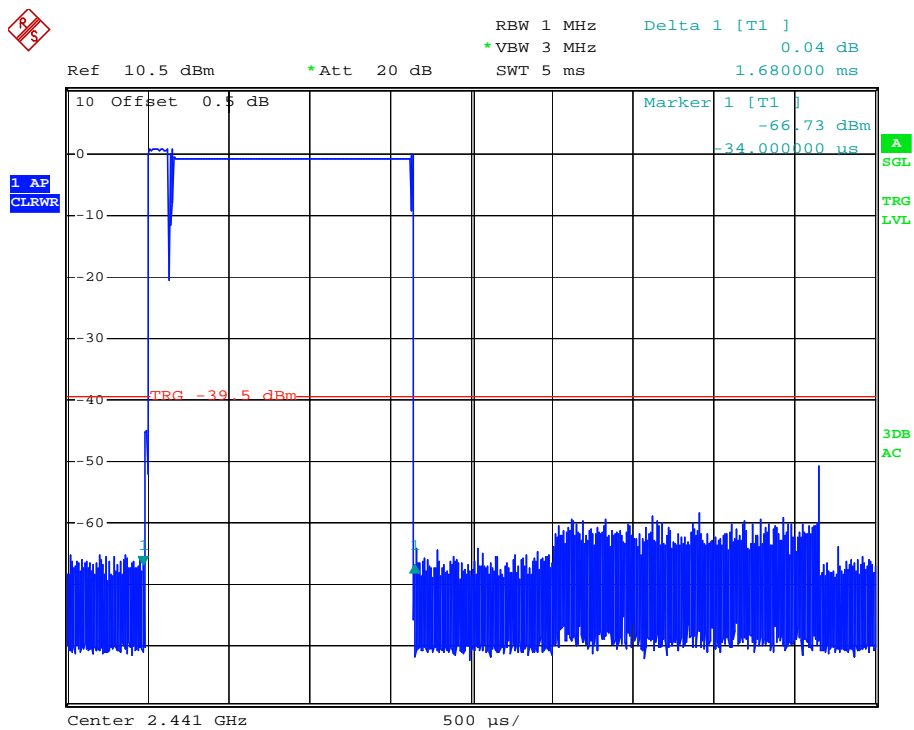
High Channel for DH1



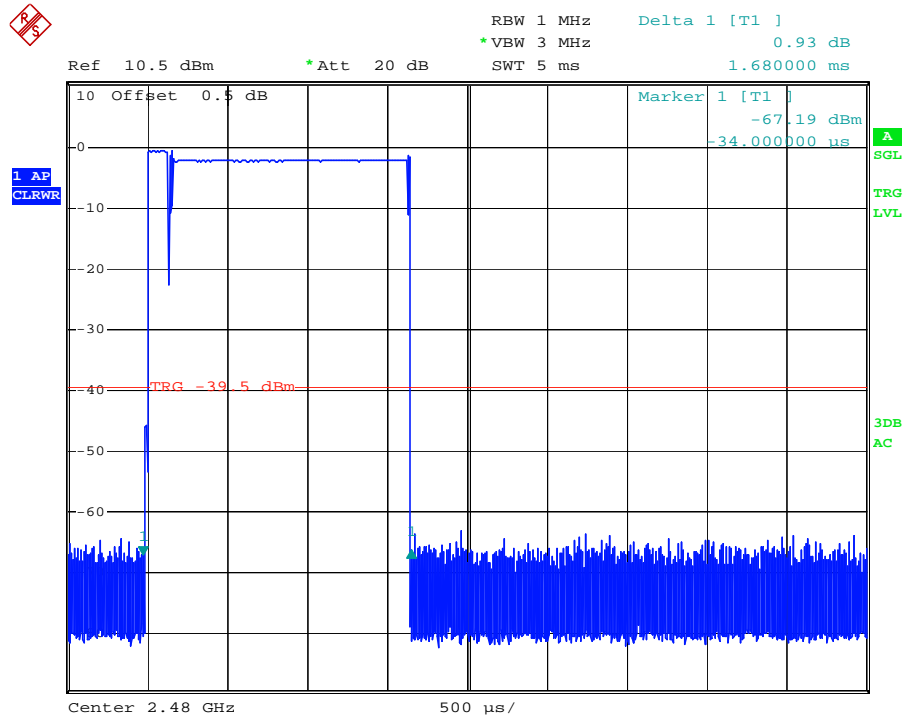
Low Channel for DH3



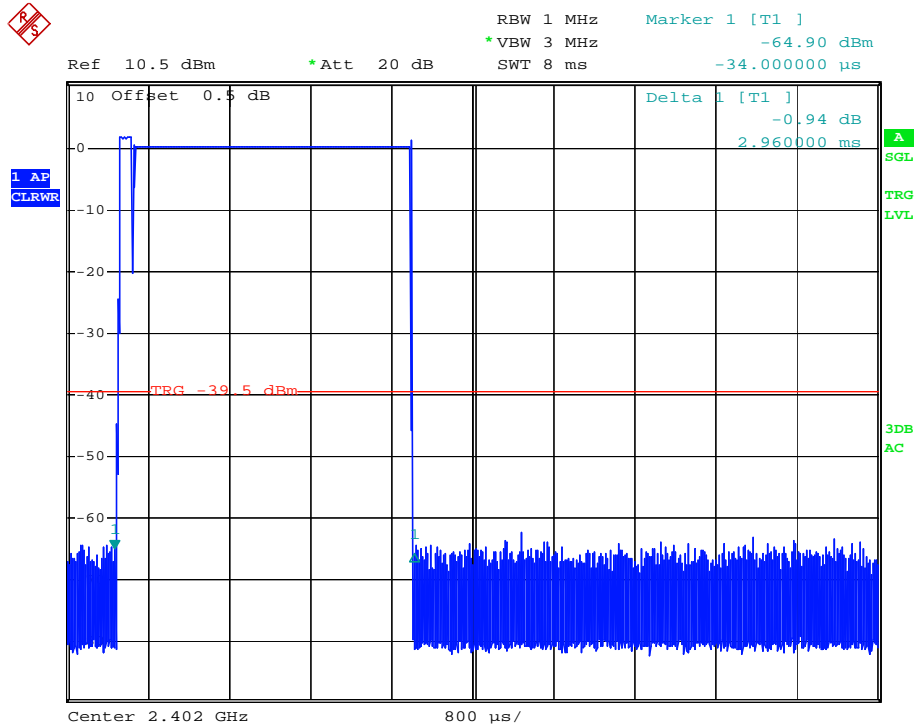
Middle Channel for DH3



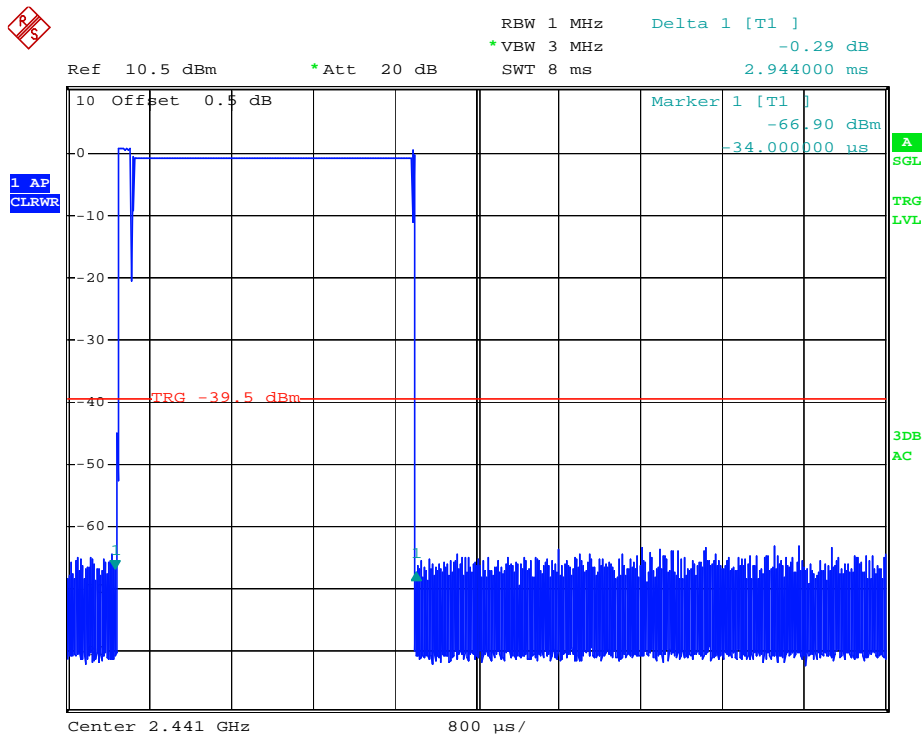
High Channel for DH3



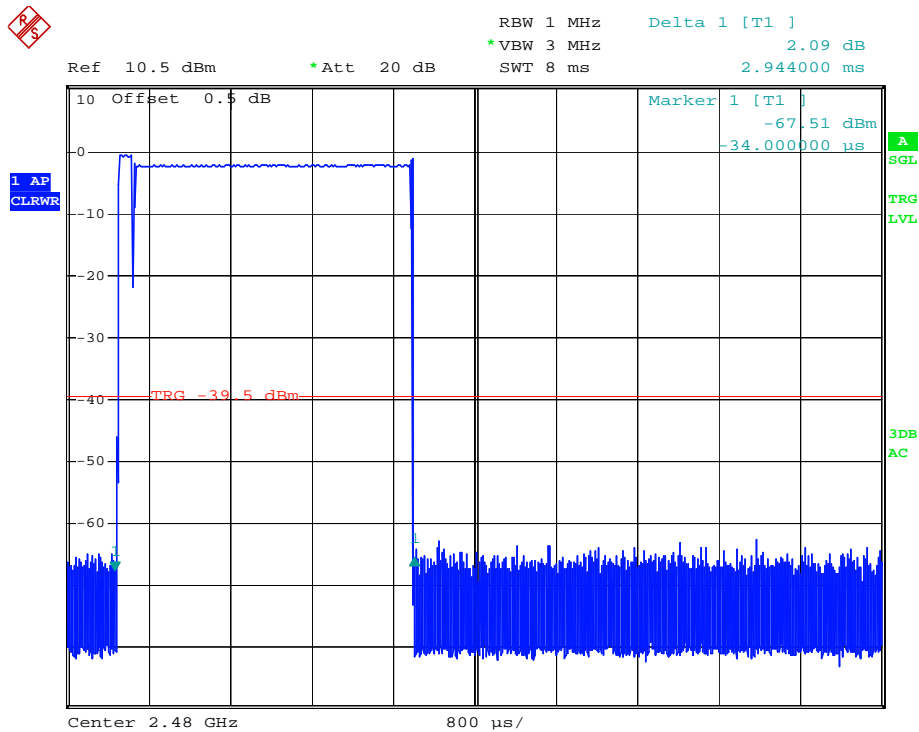
Low Channel for DH5



Middle Channel for DH5



High Channel for DH5



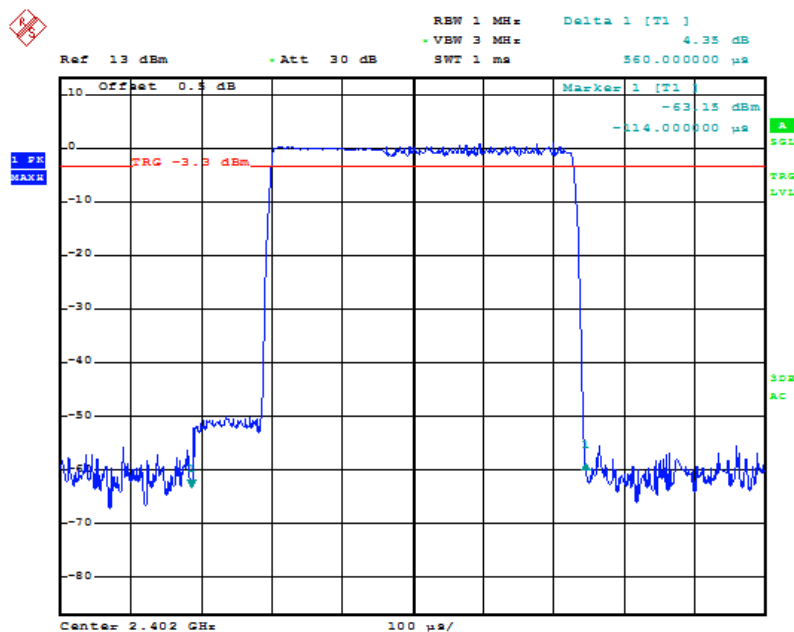
Test Mode: Transmitting

EDR Mode (8-DPSK):

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.560	0.179	0.4	Pass
	Middle	0.560	0.179	0.4	Pass
	High	0.560	0.179	0.4	Pass
	Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
DH 3	Low	1.812	0.290	0.4	Pass
	Middle	1.812	0.290	0.4	Pass
	High	1.812	0.290	0.4	Pass
	Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
DH 5	Low	3.07	0.328	0.4	Pass
	Middle	3.08	0.329	0.4	Pass
	High	3.07	0.328	0.4	Pass
	Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				

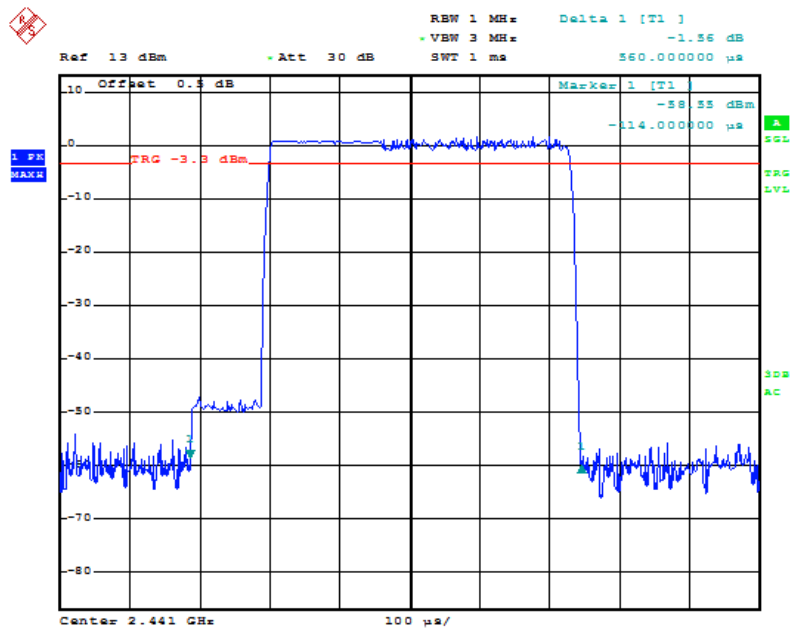
Please refer to the following plots.

Low Channel for DH1



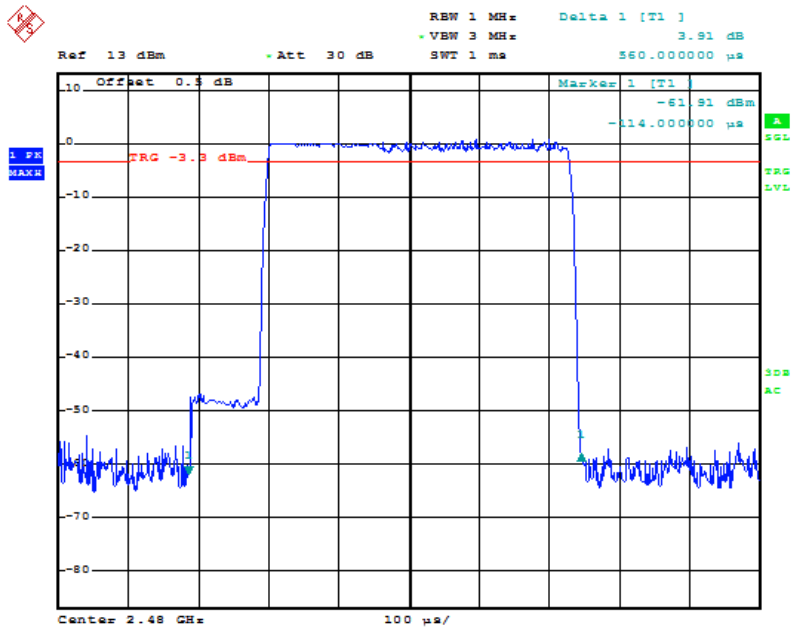
Date: 28.DEC.2011 05:07:04

Middle Channel for DH1



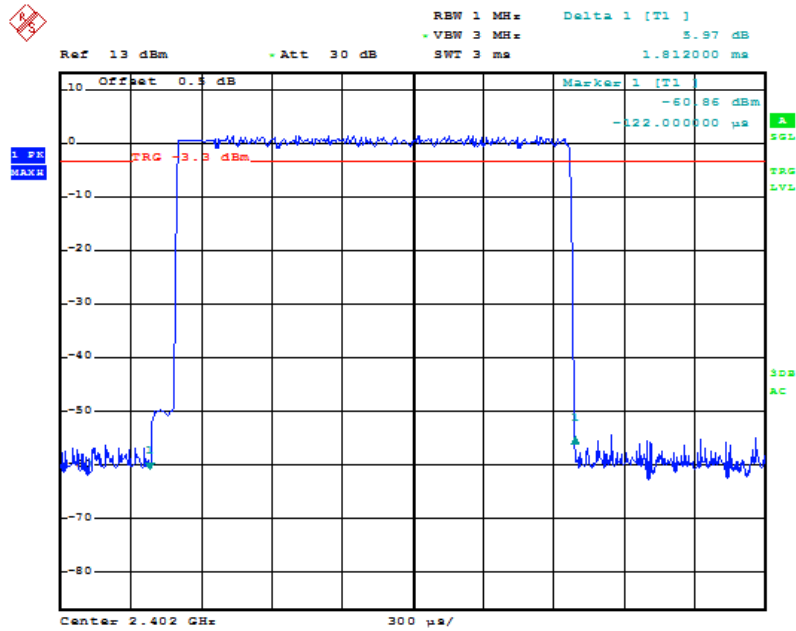
Date: 28.DEC.2011 04:33:07

High Channel for DH1



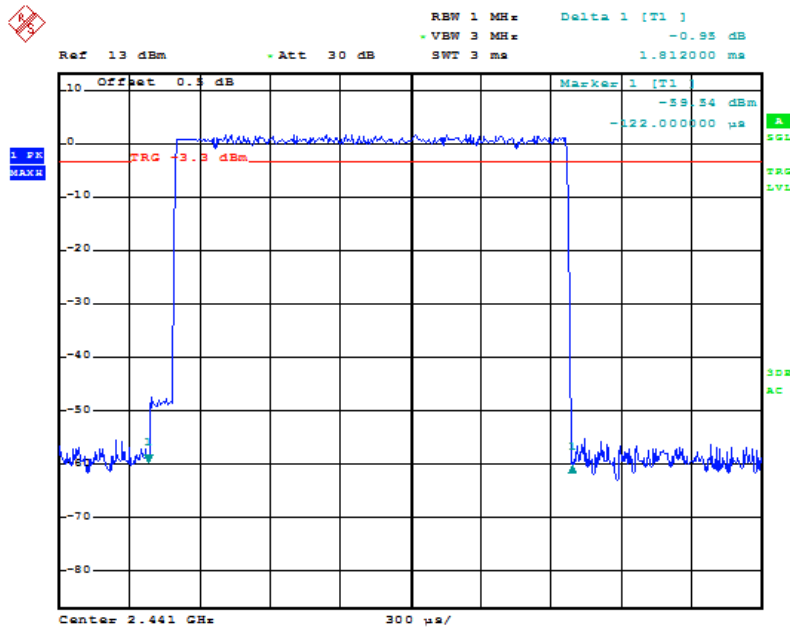
Date: 28.DEC.2011 04:33:46

Low Channel for DH3



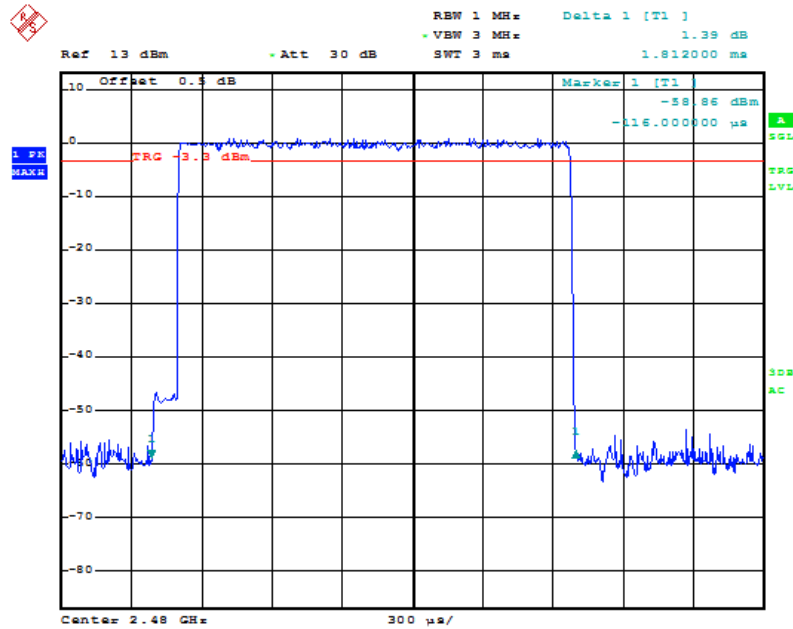
Date: 28.DEC.2011 04:35:33

Middle Channel for DH3



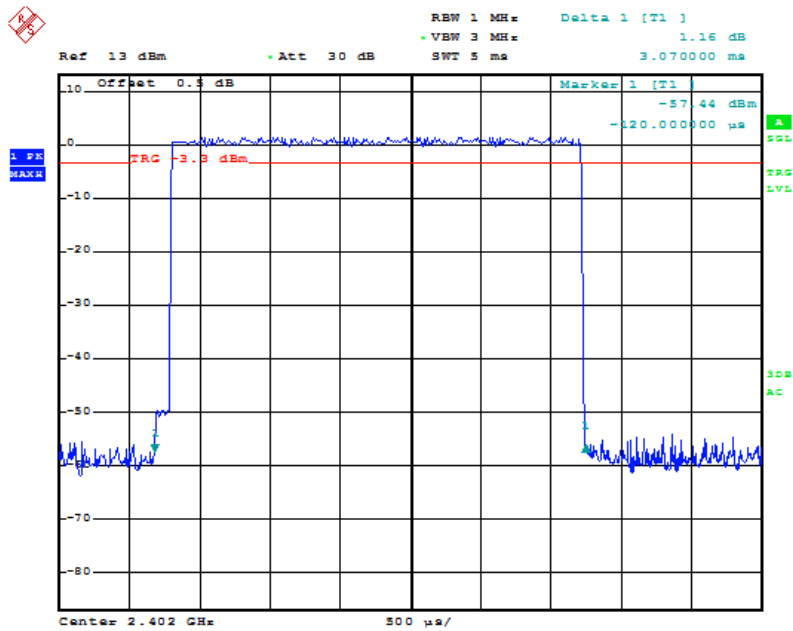
Date: 28.DEC.2011 04:37:02

High Channel for DH3



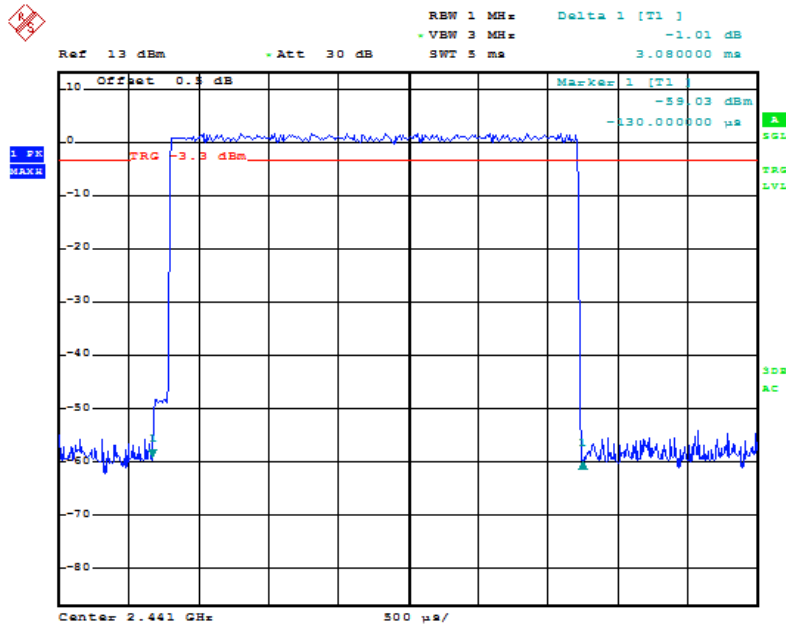
Date: 28.DEC.2011 04:37:51

Low Channel for DH5



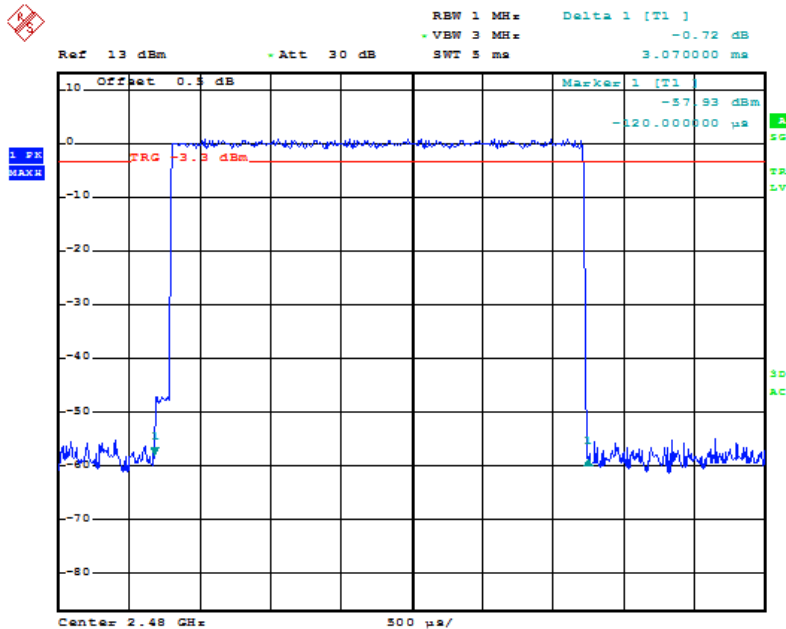
Date: 28.DEC.2011 04:40:18

Middle Channel for DH5



Date: 28.DEC.2011 04:41:00

High Channel for DH5



Date: 28.DEC.2011 04:41:42

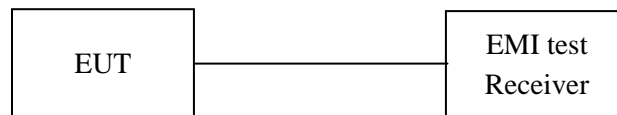
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

* The testing was performed by Ivan Cao on 2011-12-28.

Test Result: Compliance.

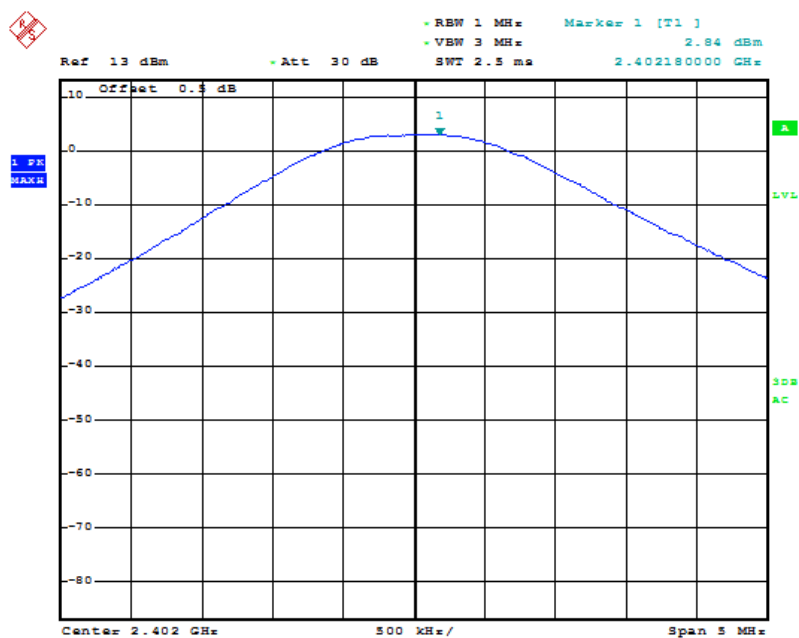
Test Mode: Transmitting

BDR Mode (GFSK):

channel	Channel frequency (MHz)	Reading output power (dBm)	Output Power (mW)	Limit (dBm)
Low	2402	2.84	1.92	30
Middle	2441	3.00	1.99	30
High	2480	2.17	1.65	30

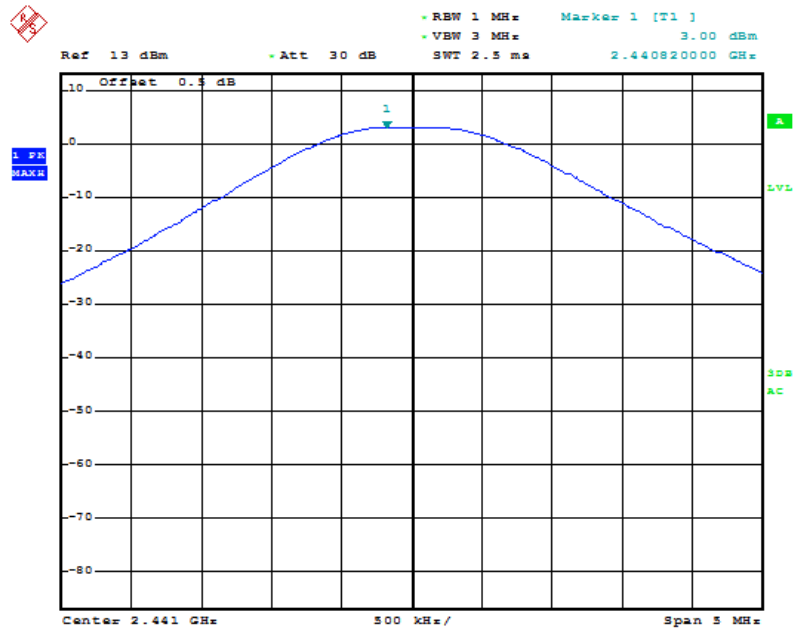
Note: The data above was tested in conducted mode.

Low Channel



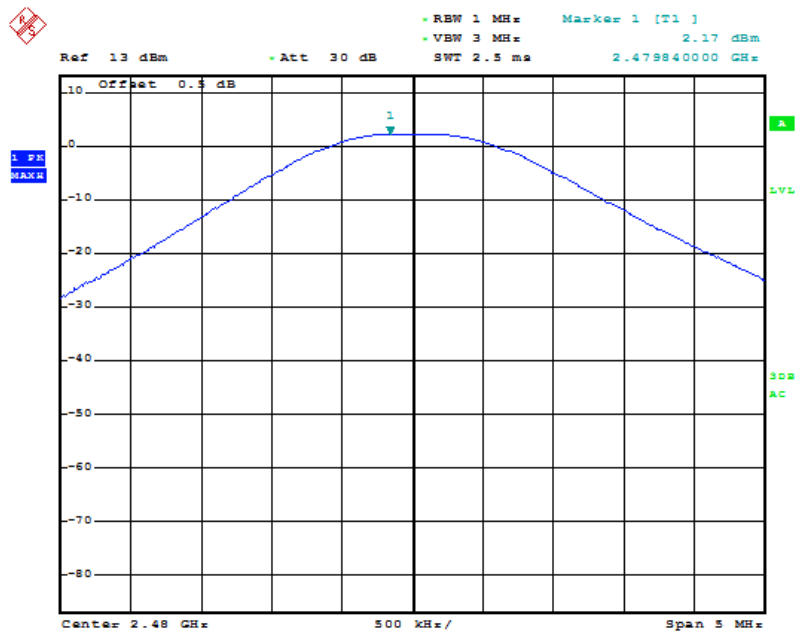
Date: 28.DEC.2011 05:16:54

Middle Channel



Date: 28.DEC.2011 05:18:14

High Channel

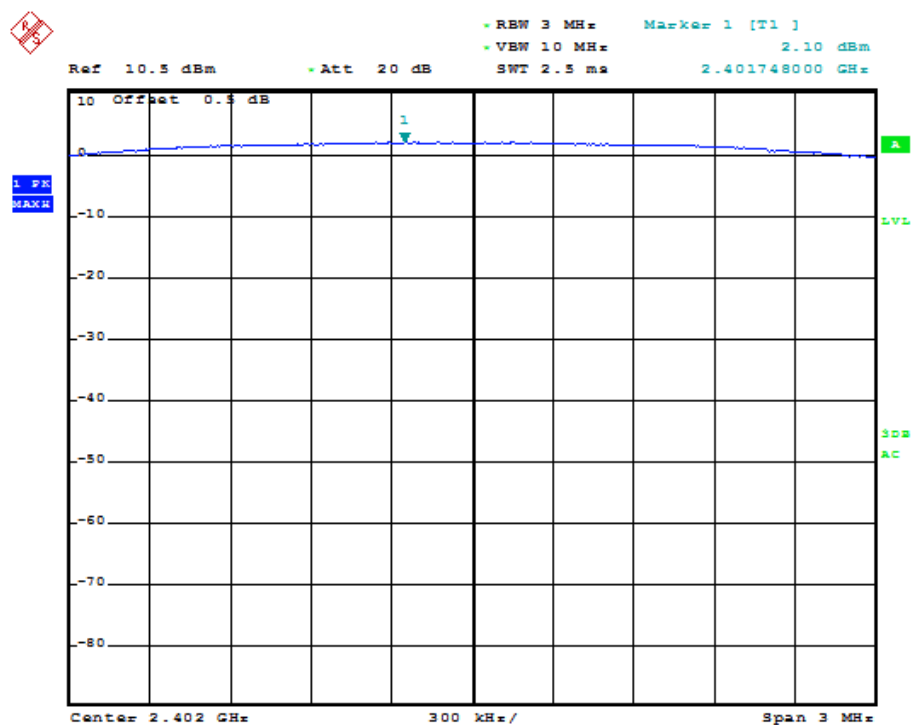


Date: 28.DEC.2011 05:19:17

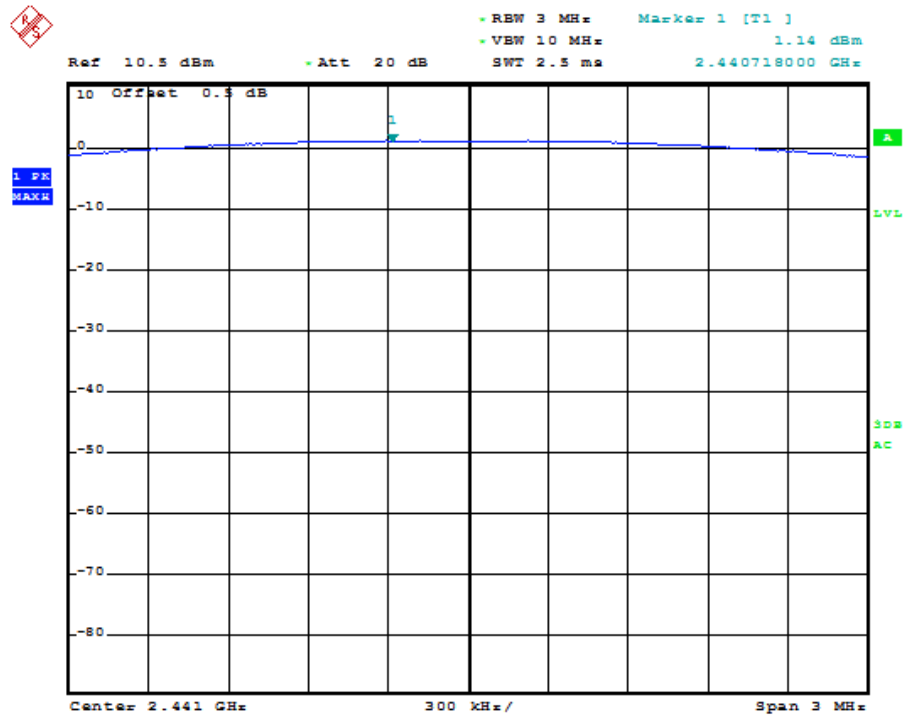
EDR Mode ($\pi/4$ -DQPSK):

channel	Channel frequency (MHz)	Reading output power (dBm)	Output Power (mW)	Limit (dBm)
Low channel	2402	2.10	1.62	30
Middle channel	2441	1.14	1.30	30
High channel	2480	-0.28	0.94	30

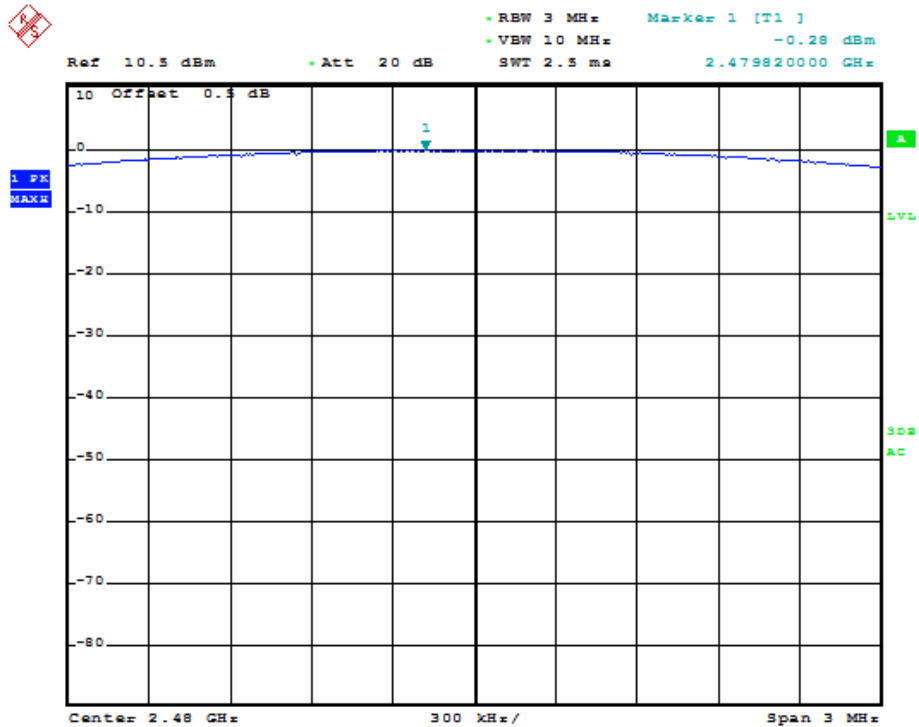
Note: The data above was tested in conducted mode

Low Channel

Middle Channel



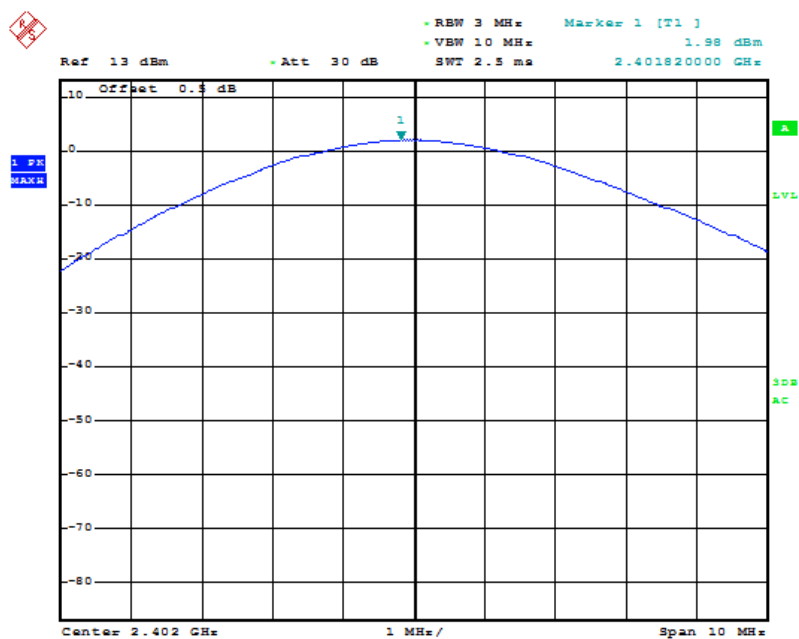
High Channel



EDR Mode (8-DPSK):

channel	Channel frequency (MHz)	Reading output power (dBm)	Output Power (mW)	Limit (dBm)
Low channel	2402	1.98	1.58	30
Middle channel	2441	2.23	1.67	30
High channel	2480	1.37	1.37	30

Note: The data above was tested in conducted mode

Low Channel

Date: 28.DEC.2011 03:39:14

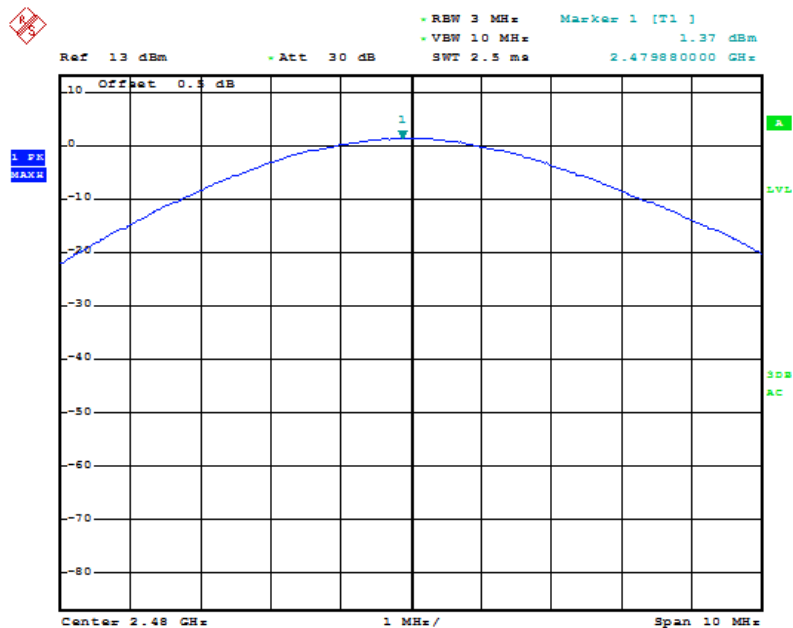
Ref 13 dBm Att 30 dB RBW 3 MHz VBW 10 MHz SWF 2.5 ms Marker 1 [T1] 2.23 dBm

Offset 0.4 dB

1.00 dBm

Center 2.441 GHz 1 MHz/ Span 10 MHz

High Channel



Date: 28.DEC.2011 03:40:35

FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

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

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

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

Test Data**Environmental Conditions**

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

**The testing was performed by Ivan Cao on 2011-12-23.*

Test Result: Compliant

Please refer to the following table and plots.

Test Mode: Transmitting

BDR Mode (GFSK):

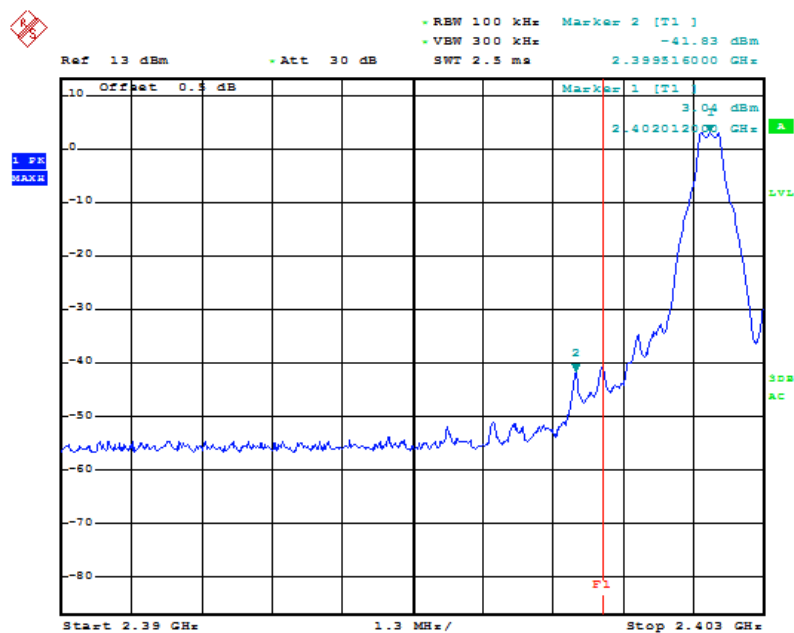
Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.516	44.83	20
2483.956	54.35	20

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

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2369.22	43.43	20
2489.08	41.31	20

EDR Mode (8-DPSK):

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.620	47.50	20
2483.872	53.09	20

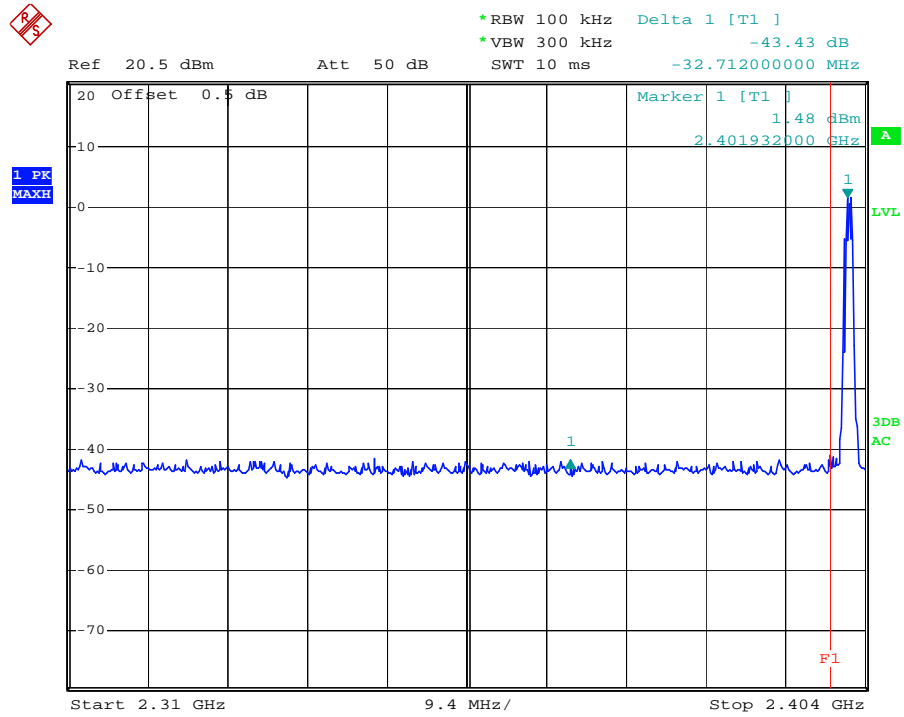
GFSK - Band Edge: Left Side

Date: 28.DEC.2011 05:49:19

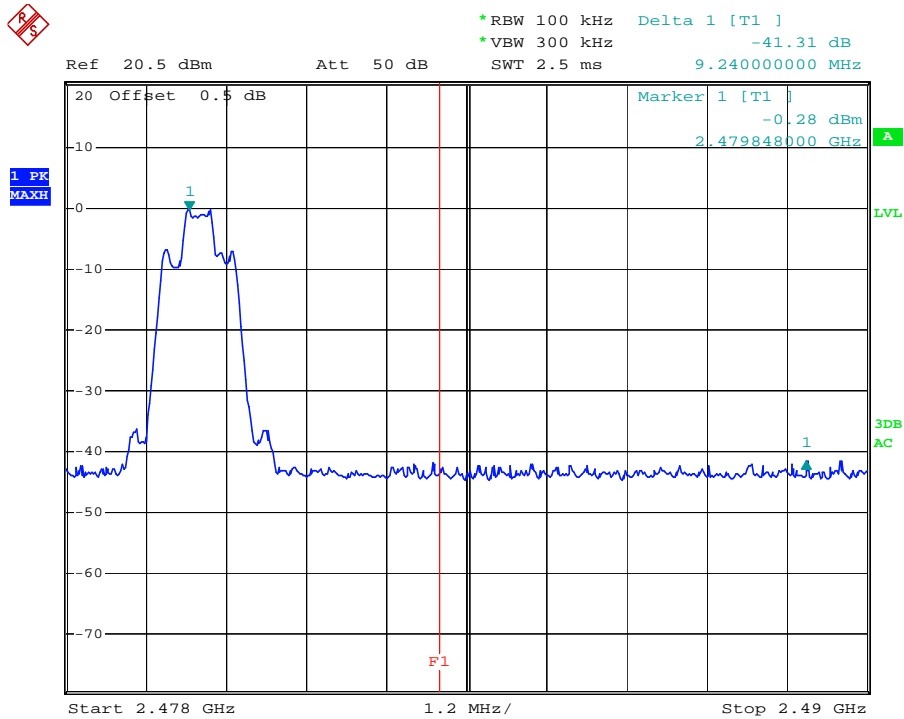
GFSK - Band Edge: Right Side

Date: 28.DEC.2011 05:51:40

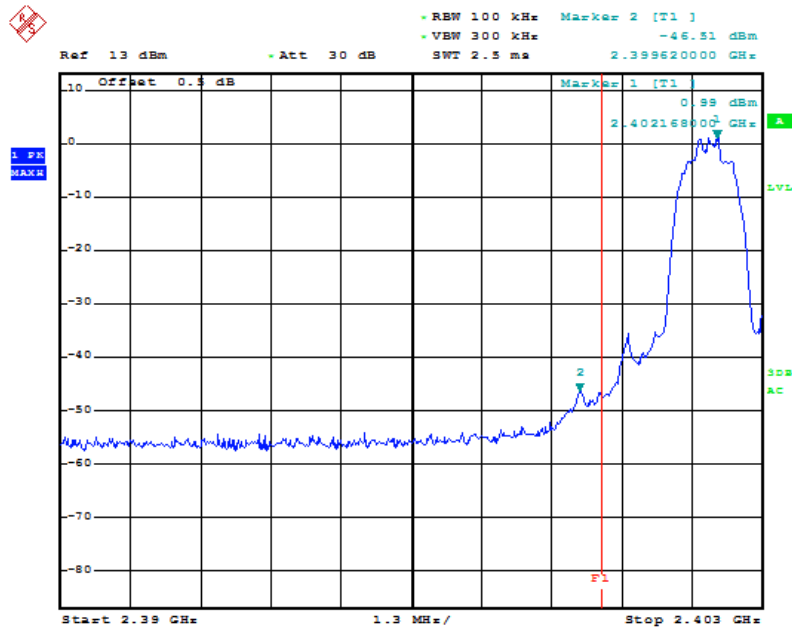
$\pi/4$ -DQPSK - Band Edge: Left Side



$\pi/4$ -DQPSK - Band Edge: Right Side

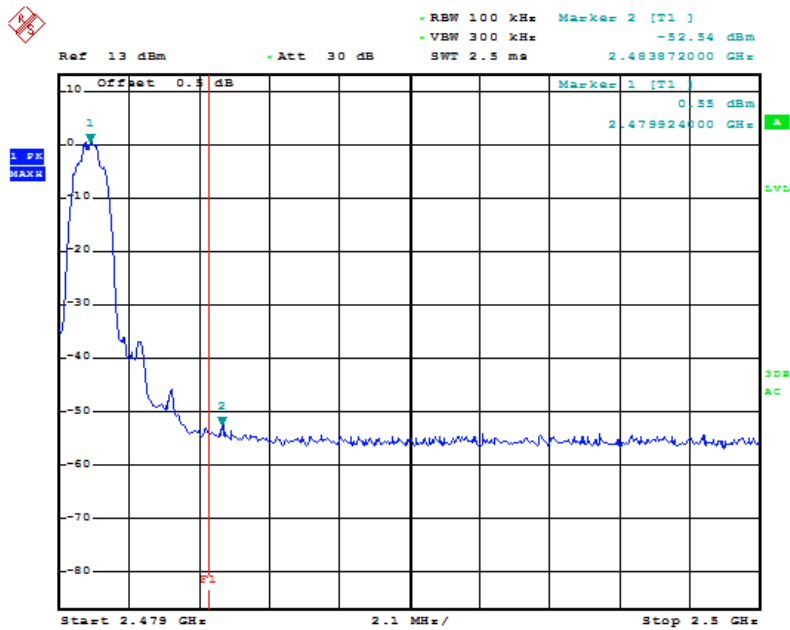


8-DPSK - Band Edge: Left Side



Date: 28.DEC.2011 04:11:47

8-DPSK - Band Edge: Right Side



Date: 28.DEC.2011 04:15:13

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