Lab Code: 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Shenzhen Hongjiayuan Communication Technology Co., Ltd.

Room 2406, Block A, Electronic and Technology Building,

2070 Shennan Zhong Road, Shenzhen, Guangdong 518000, China

FCC ID: XUTGMATE2011

Report Type:	Product Type:
Original Report	Gmate (Mobile Phone Accessory)

Test Engineer:	Eric Lee
Report Number:	RSZ110923001-00-15.247
Report Date:	2011-11-17
Reviewed By:	Alvin Huang EMC Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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* 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 *Shenzhen Hongjiayuan Communication Technology Co., Ltd.*'s product, model number: *Gmate (FCC ID: XUTGMATE2011)* (the "EUT") in this report is a *Mobile phone accessory,* which was measured approximately: 8.5 cm (L) x 4.8 cm (W) x 1.3 cm (H), rated input voltage: DC 3.7 V li-ion battery.

Frequency Range:
Cellular Band: 824-849 MHz (Tx), 869-894 MHz (Rx)
PCS Band: 1850-1910 MHz (Tx), 1930-1990 MHz (Rx)
Bluetooth: 2402-2480 MHz (Tx/Rx)

Modulation Mode: GMSK, 8PSK (Cellular/PCS); GFSK, π/4-DQPSK, 8-DPSK (Bluetooth)

Transmitter Output Power:
Cellular Band: 33 dBm, PCS Band: 30 dBm
Bluetooth: 3 dBm

** All measurement and test data in this report was gathered from production sample serial number: SIMOACJWR89ILIyII (Assigned by Applicant). The EUT was received on 2011-09-23.*

Objective

This report is prepared on behalf of *Shenzhen Hongjiayuan Communication Technology Co., Ltd. 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)

FCC Part 22H&24E PCB submission with FCC ID: XUTGMATE2011.

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 manufacture.

EUT Exercise Software

Bluetest 3

Equipment Modifications

No modification was made to the EUT tested.

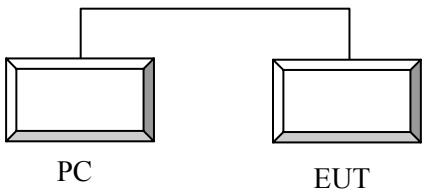
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R & S	Universal Radio CommutationTester	CMU200	109038
DELL	System PC	1#	N/A

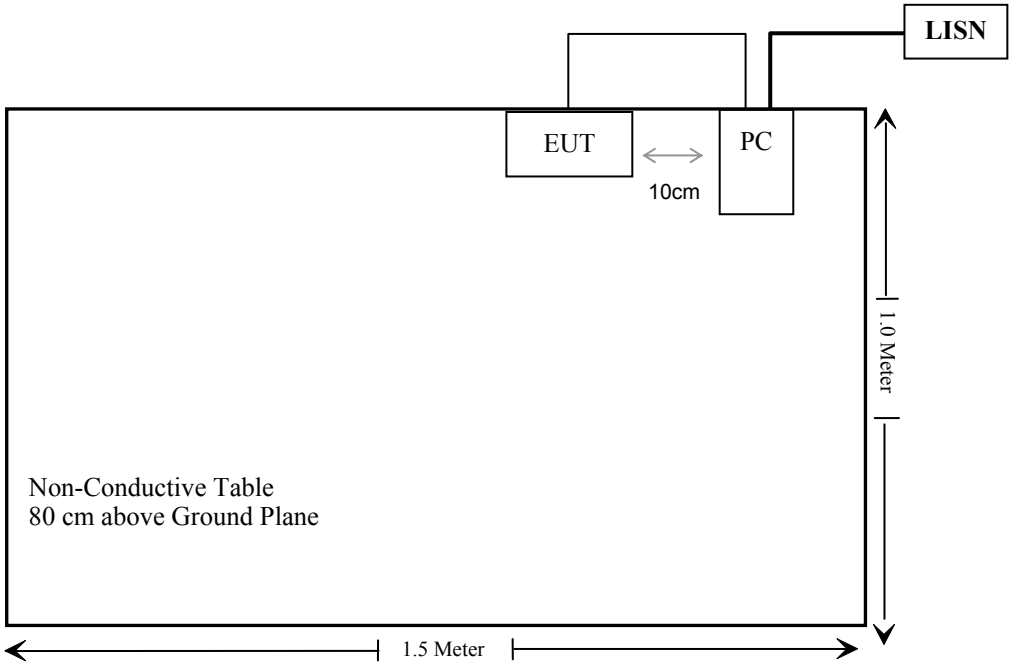
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable USB Cable	1.0	EUT	PC

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1093	RF Exposure	Compliace
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions	Compliance
§15.247 (a)(1)	20 dB Bandwidth	Compliance
§15.247(a)(1)	Channel Separation Test	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliance
§15.247(b)(1)	Peak Output Power Measurement	Compliance
§15.247(d)	Band Edges	Compliance

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

Applicable Standard

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

Table 2 – Summary of SAR Evaluation Requirements for a Cell Phone with Multiple Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	Routine evaluation required	SAR not required: Unlicensed only ○ when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed ○ when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas ○ when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	When there is no simultaneous transmission – ○ output ≤ 60/f: SAR not required ○ output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when ○ output ≤ 2·P_{Ref} and antenna is ≥ 5.0 cm from other antennas ○ output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas ○ output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg Otherwise stand-alone SAR is required When stand-alone SAR is required ○ test SAR on highest output channel for each wireless mode and exposure condition ○ if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	
Jaw, Mouth and Nose	Flat phantom SAR required ○ when measurement is required in tight regions of SAM and it is not feasible or the results can be questionable due to probe tilt, calibration, positioning and orientation issues ○ position rectangular and clam-shell phones according to flat phantom procedures and conduct SAR measurements for these specific locations	When simultaneous transmission SAR testing is required, contact the FCC Laboratory for interim guidance.

Routine SAR evaluation refers to that specifically required by FCC §2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

1) The distance between BT and GSM antenna is 4.8 cm < 5.0 cm.The maximum output power of Bluetooth antenna is 2.36 dBm+4.0 = 6.36 dBm (4.33 mW) which is less than PRef (12 mW).
2) The maximum 1g SAR value of GSM antenna with body-worn back configuration is 1.514 W/Kg which is less than 1.6 W/Kg.
3) According to KDB648474, simultaneous transmission SAR evaluation is not required for BT and GSM antenna.
4) Stand alone SAR for Bluetooth is not reqired.

Result:

The SAR measurement is exempt.

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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has a spring contact leg antenna, the gain is 4.0dBi, which is in accordance to section 15.203, please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

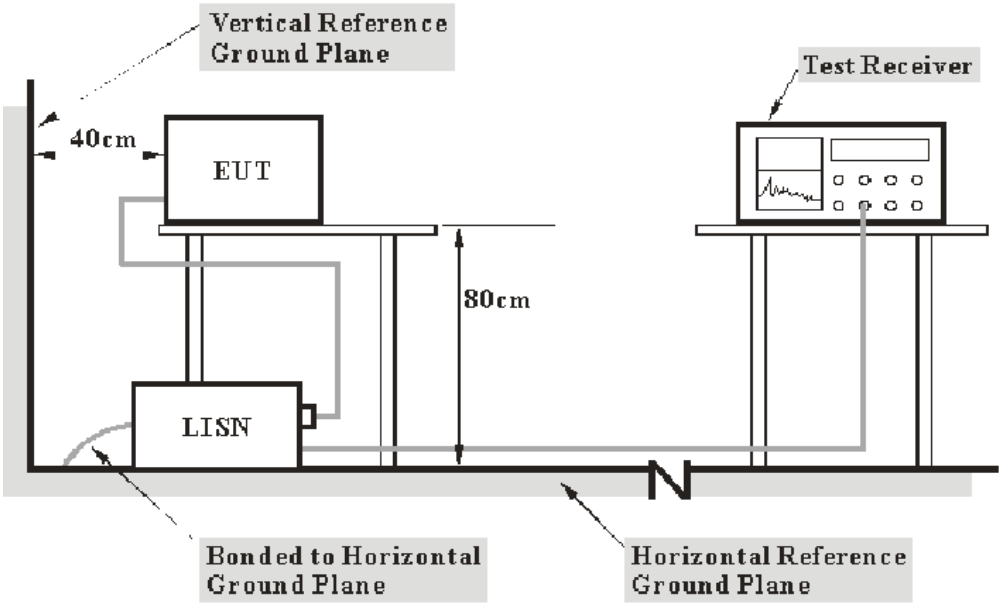
FCC §15.207

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on CISPR 16-4-4, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ±2.4 dB(k=2, 95% level of confidence).

EUT Setup



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

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 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 PC was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

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

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

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

Test Procedure

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2011-03-03	2012-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-03-09	2012-03-08

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

Test Results Summary

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

10.26 dB at **0.700 MHz** in the **Neutral** conducted mode

Test Data

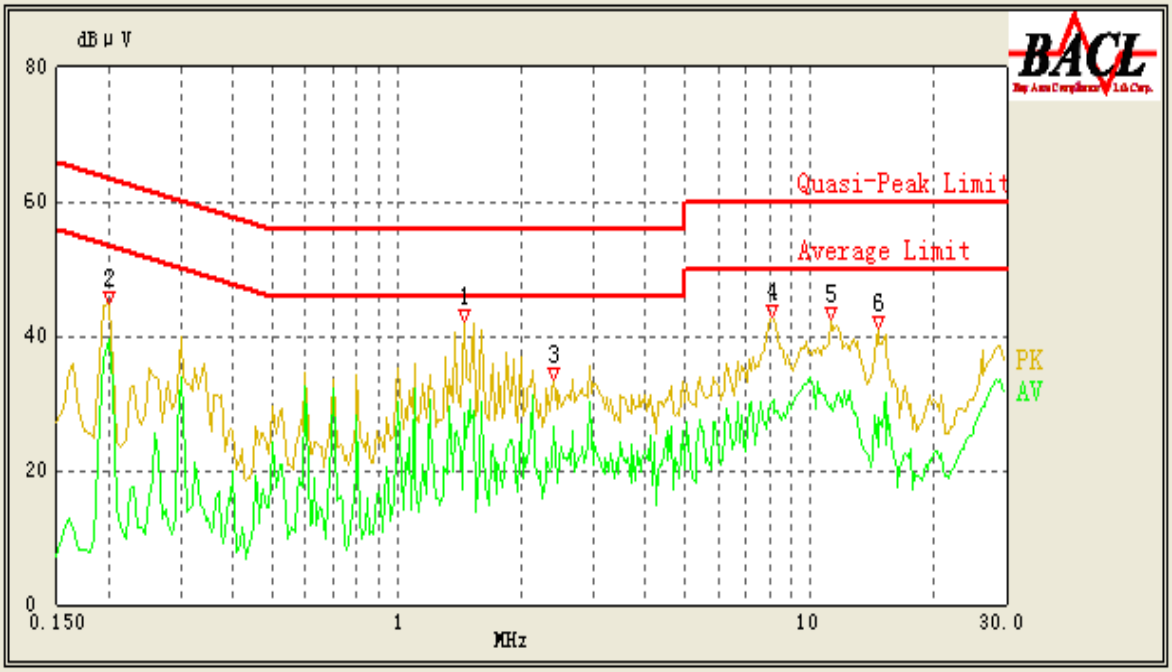
Environmental Conditions

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

** The testing was performed by Eric Lee on 2011-11-02.*

Test Mode: Charging & Transmitting

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave.)
0.200	39.49	9.96	54.57	15.08	Ave
1.455	39.28	9.97	56.00	16.72	QP
1.455	28.35	9.97	46.00	17.65	Ave
2.405	26.45	9.97	46.00	19.55	Ave
8.150	30.42	9.98	50.00	19.58	Ave
11.315	29.68	10.01	50.00	20.32	Ave
0.200	43.26	9.96	64.57	21.31	QP
8.145	38.54	9.98	60.00	21.46	QP
2.405	30.55	9.97	56.00	25.45	QP
11.300	33.54	10.01	60.00	26.46	QP
14.615	23.47	10.05	50.00	26.53	Ave
14.665	30.24	10.05	60.00	29.76	QP

AC 120V/60 Hz, Neutral

Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave.)
0.700	35.74	9.97	46.00	10.26	Ave
1.100	35.61	9.97	46.00	10.39	Ave
1.605	34.04	9.97	46.00	11.96	Ave
8.110	35.71	9.98	50.00	14.29	Ave
0.195	39.19	9.96	54.71	15.52	Ave
11.820	33.08	10.01	50.00	16.92	Ave
1.100	36.54	9.97	56.00	19.46	QP
8.110	40.53	9.98	60.00	19.47	QP
1.605	35.54	9.97	56.00	20.46	QP
0.700	35.19	9.97	56.00	20.81	QP
0.195	43.34	9.96	64.71	21.37	QP
11.720	37.37	10.01	60.00	22.63	QP

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

Applicable Standard

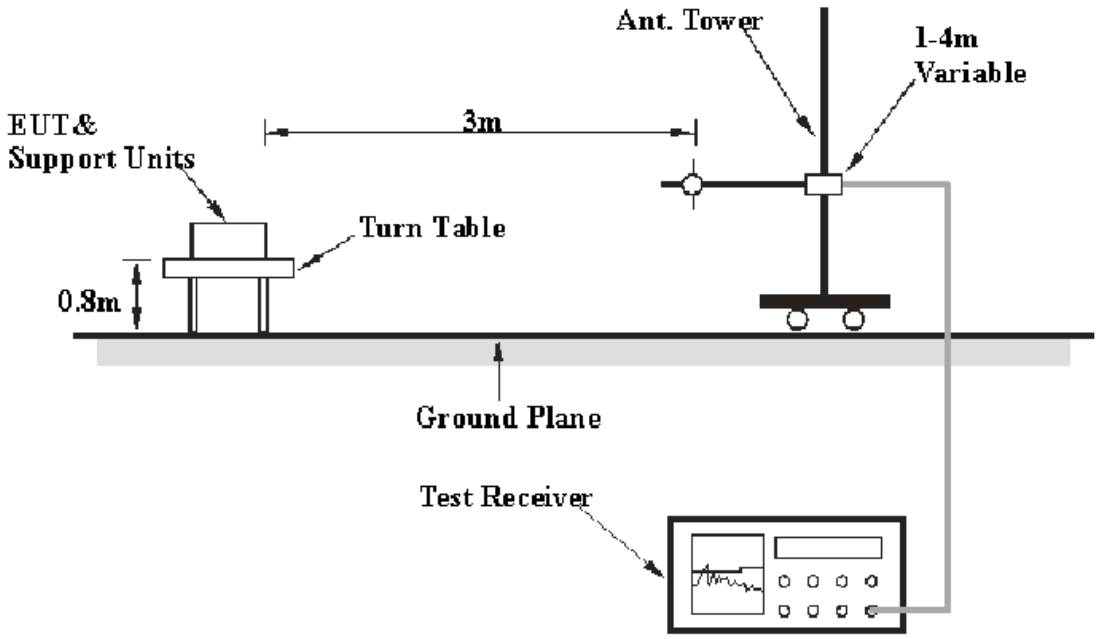
FCC §15.247 (d); §15.209; §15.205;

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 CISPR 16-4-4, 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 chamber B 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 spacing between the peripherals was 10 cm.

The PC 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:

Frequency Range	***RBW***	***Video B/W***	***Detector***
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

For the radiated emissions test, the PC was connected to the outlet of the LISN

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	2010-11-11	2011-11-10
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:

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 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

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

12.1 dB at **705.182250 MHz** in the **Horizontal** polarization for Standby mode

Test Data

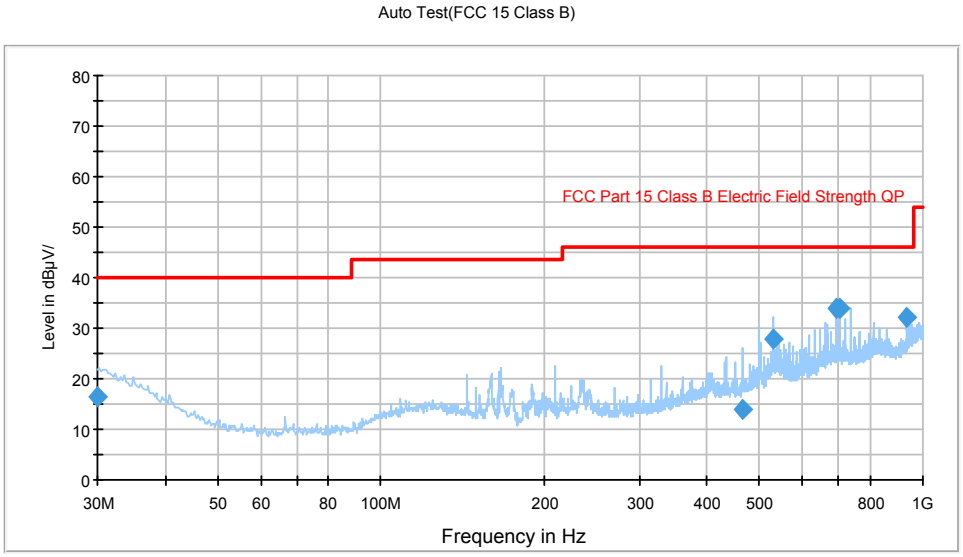
Environmental Conditions

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

The testing was performed by Eric Lee on 2011-11-02.

Test Mode: Standby

1) Below 1 GHz



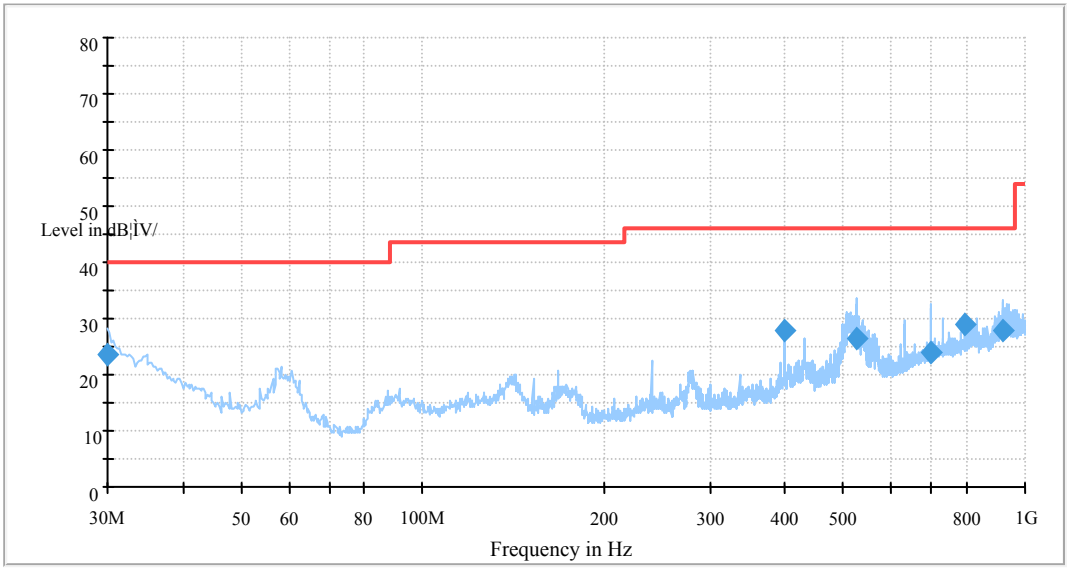
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
705.182250	33.9	105.0	H	174.0	-3.0	46.0	12.1
690.181000	33.8	205.0	H	172.0	-3.4	46.0	12.2
934.040250	32.1	128.0	H	356.0	0.3	46.0	13.9
528.005000	27.9	139.0	V	256.0	-7.9	46.0	18.1
30.076106	16.5	204.0	V	206.0	-5.4	40.0	23.5
465.055500	14.0	123.0	V	333.0	-8.9	46.0	32.0

2) **Above 1 GHz**

The data under 20 dB of the limit were not recorded.

Test Mode: Charging & Transmitting

1) Below 1 GHz



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)				
30.022375	23.5	103.0	V	355.0	-5.4	40.0	16.5
796.314250	28.9	103.0	V	286.0	-1.9	46.0	17.1
399.796500	28.0	206.0	H	164.0	-10.0	46.0	18.0
920.670250	27.9	103.0	V	248.0	0.0	46.0	18.1
524.961750	26.4	124.0	V	268.0	-7.9	46.0	19.6
698.107750	23.8	171.0	H	228.0	-3.1	46.0	22.2

2) Above 1 GHz (worst case)

Indicated		Detector (PK/Ave.)	Table Angle Degree	Test 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)												
4804	20.76	Ave	150	1.4	H	36.3	4.28	26.73	34.61	54	19.39	harmonic
4804	21.85	Ave	160	1.5	V	35.2	4.28	26.73	34.60	54	19.41	harmonic
4804	35.26	PK	160	1.5	V	35.2	4.28	26.73	48.01	74	25.99	harmonic
4804	37.21	PK	150	1.4	H	36.3	4.28	26.73	51.06	74	22.94	harmonic
Middle Channel (2441 MHz)												
4882	20.27	Ave	200	1.5	H	36.6	4.37	26.75	34.49	54	19.51	harmonic
4882	21.11	Ave	110	1.5	V	35.4	4.37	26.75	34.13	54	19.87	harmonic
4882	37.05	PK	110	1.5	V	35.4	4.37	26.75	50.07	74	23.93	harmonic
4882	35.41	PK	200	1.5	H	36.6	4.37	26.75	49.63	74	24.37	harmonic
High Channel (2480 MHz)												
4960	21.04	Ave	150	1.6	H	36.6	4.37	26.75	35.26	54	18.74	harmonic
4960	22.12	Ave	160	1.6	V	35.4	4.37	26.75	35.14	54	18.86	harmonic
4960	36.81	PK	160	1.6	V	35.4	4.37	26.75	49.83	74	24.17	harmonic
4960	35.22	PK	150	1.6	H	36.6	4.37	26.75	49.44	74	24.56	harmonic

3) Spurious emission in restricted band:

Indicated		Detector (PK/Ave.)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209/15.205			
Frequency (MHz)	Receiver 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
2486.5	22.42	Ave	250	1.1	V	30.6	3.16	26.85	29.33	54	24.67	spurious
2486.5	22.24	Ave	100	1.6	H	30.6	3.16	26.85	29.15	54	24.85	spurious
2388.8	21.76	Ave	251	1.8	H	30.4	2.99	26.84	28.31	54	25.69	spurious
2388.8	21.24	Ave	190	1.5	V	30.3	2.99	26.84	27.69	54	26.31	spurious
2486.5	36.73	PK	250	1.1	V	30.6	3.16	26.85	43.64	74	30.36	spurious
2388.8	37.15	PK	190	1.5	V	30.3	2.99	26.84	43.6	74	30.40	spurious
2388.8	36.77	PK	251	1.8	H	30.4	2.99	26.84	43.32	74	30.68	spurious
2486.5	36.24	PK	100	1.6	H	30.6	3.16	26.85	43.15	74	30.85	spurious

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

Applicable Standard

Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 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	2010-11-11	2011-11-10

*** 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 Eric Lee on 2011-10-14.*

Test Result: Compliance.

Please refer to following tables and plots

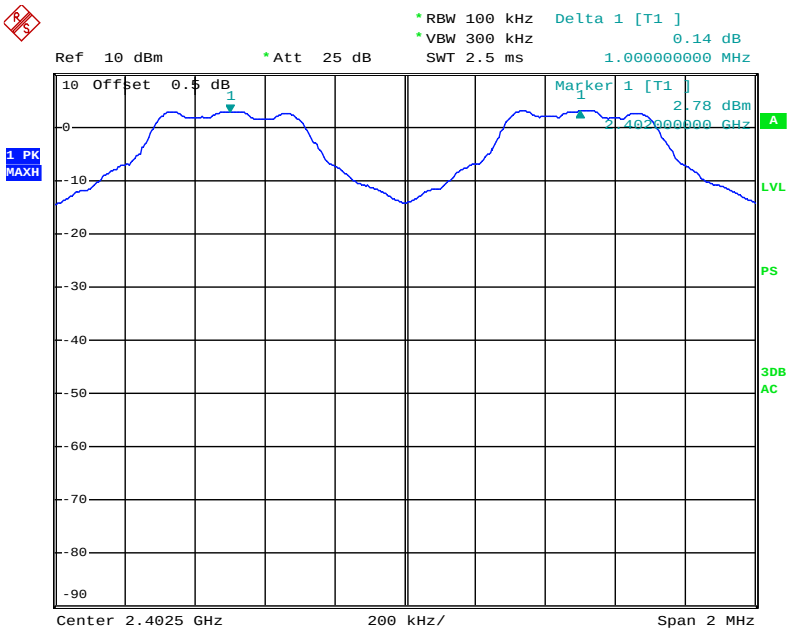
Test Mode: Transmitting

BDR Mode (GFSK):

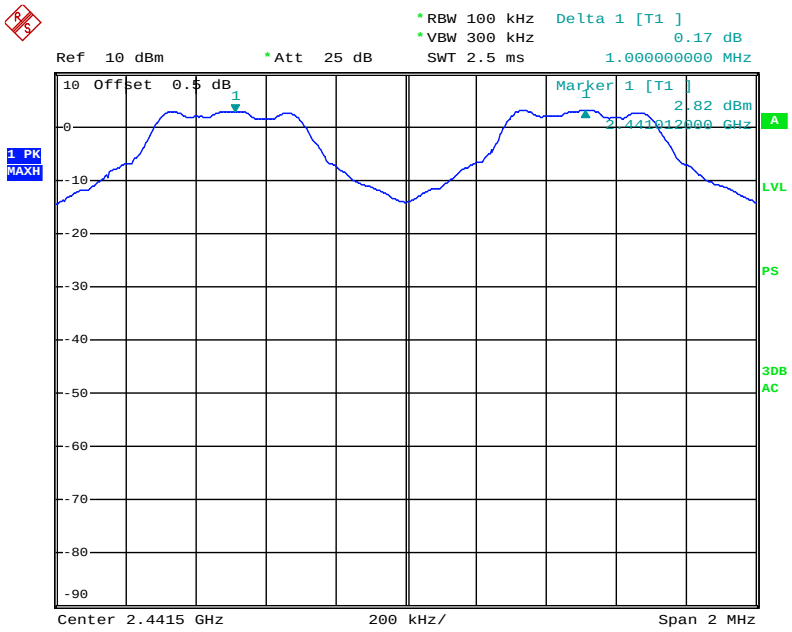
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.000	0.571	Pass
Adjacent	2403			
Middle	2441	1.000	0.571	Pass
Adjacent	2442			
High	2480	1.004	0.571	Pass
Adjacent	2479			

Please refer to the following plots.

Low Channel

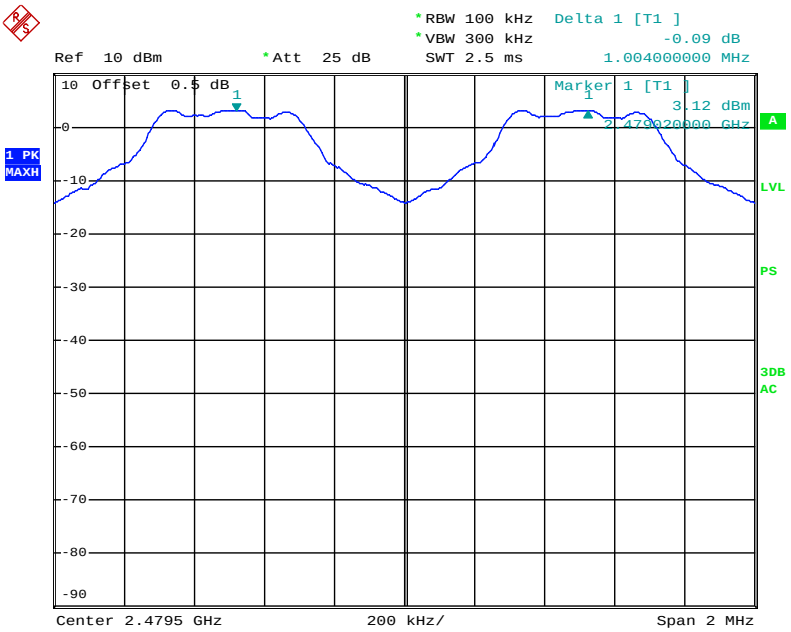


Middle Channel



Date: 14.OCT.2011 09:49:52

High Channel



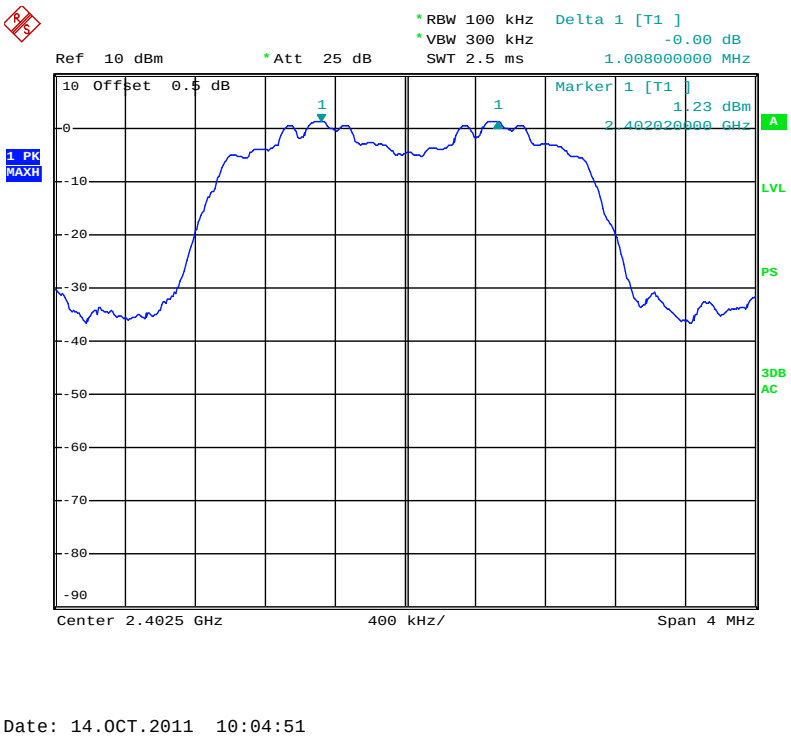
Date: 14.OCT.2011 09:51:46

EDR Mode (π /4-DQPSK):

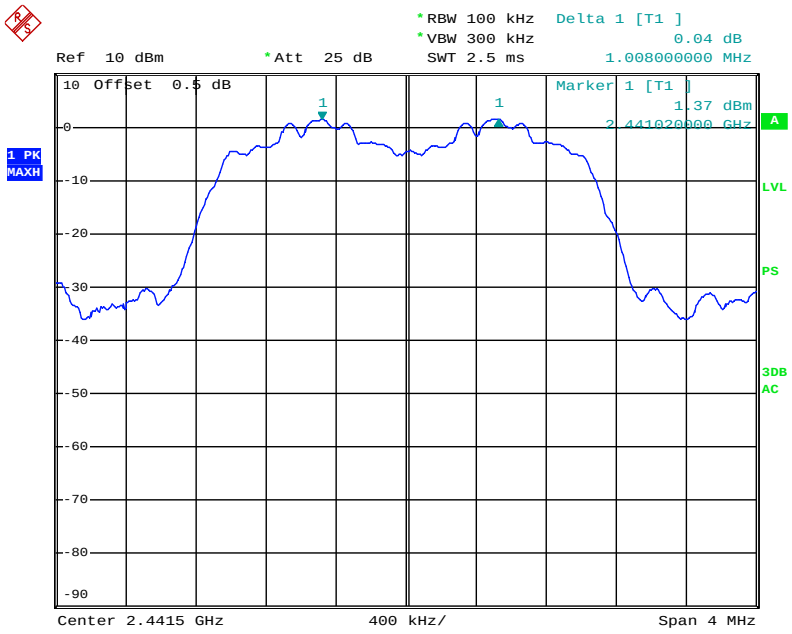
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.008	0.808	Pass
Adjacent	2403			
Middle	2441	1.008	0.808	Pass
Adjacent	2442			
High	2480	1.000	0.811	Pass
Adjacent	2479			

Please refer to the following plots.

Low Channel

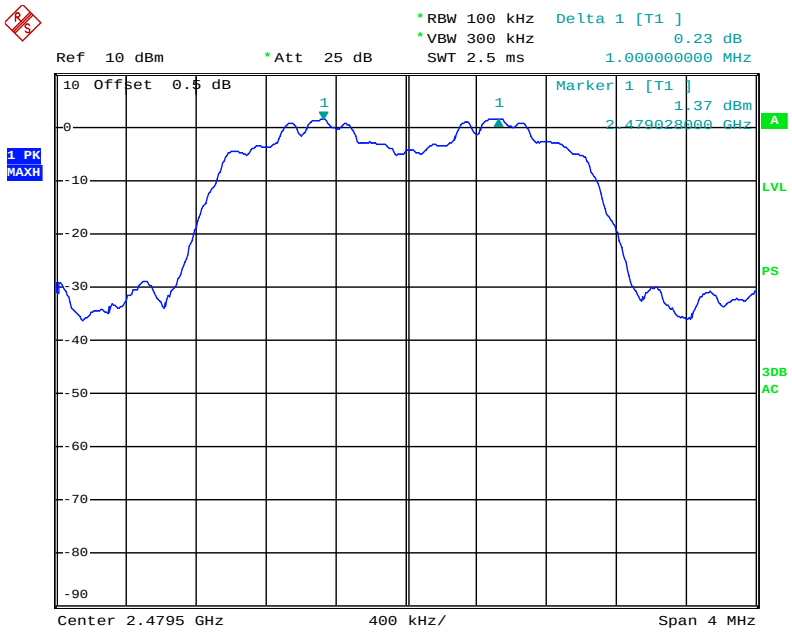


Middle Channel



Date: 14.OCT.2011 09:57:06

High Channel



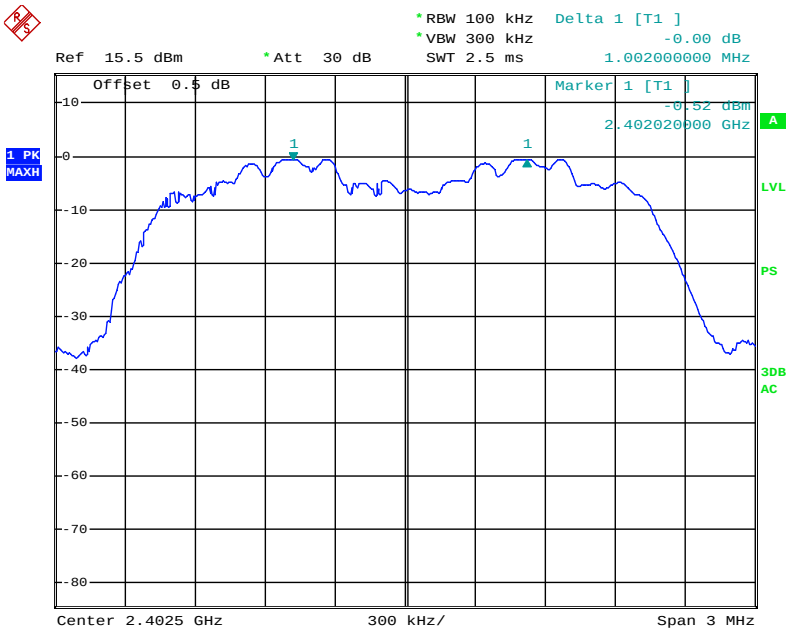
Date: 14.OCT.2011 09:55:38

EDR Mode (8-DPSK):

Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.002	0.816	Pass
Adjacent	2403			
Middle	2441	1.020	0.816	Pass
Adjacent	2442			
High	2480	1.002	0.816	Pass
Adjacent	2479			

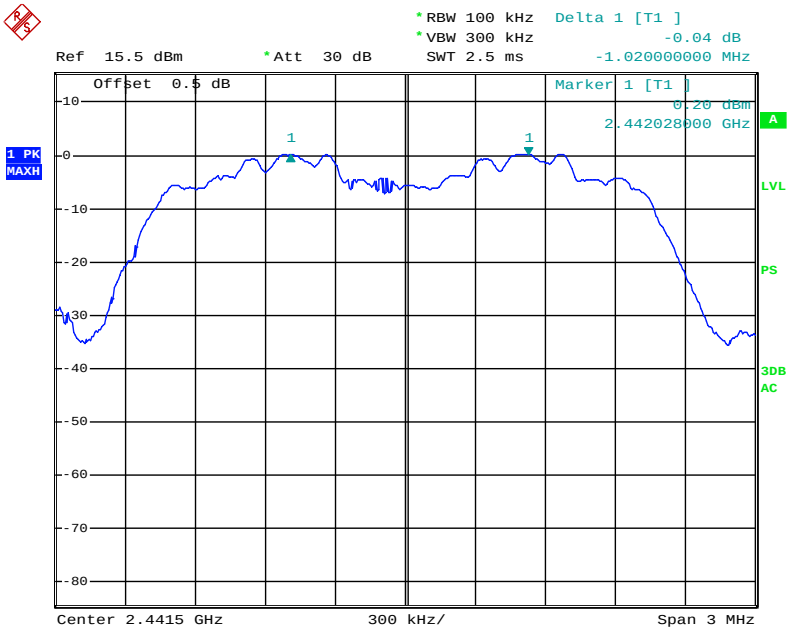
Please refer to the following plots.

Low Channel



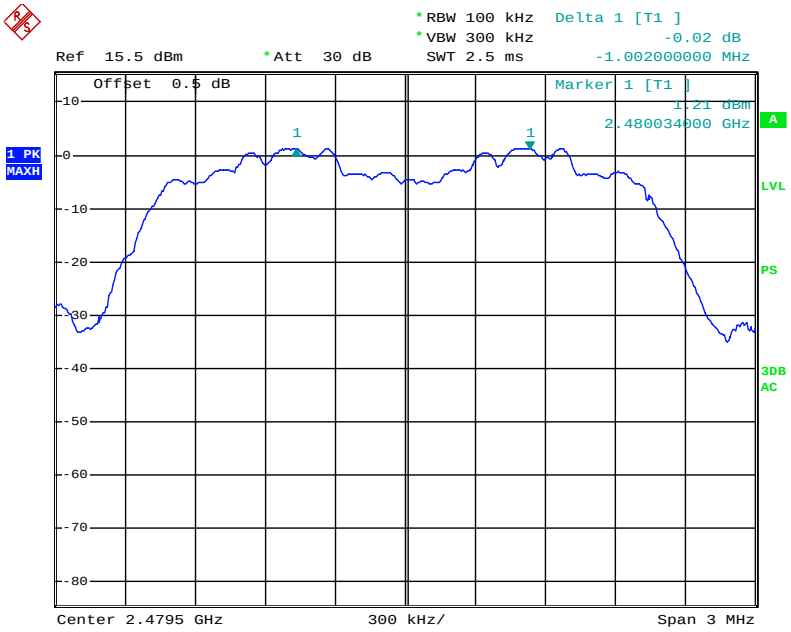
Date: 14.OCT.2011 15:46:05

Middle Channel



Date: 14.OCT.2011 15:46:48

High Channel



Date: 14.OCT.2011 15:47:36

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	2010-11-11	2011-11-10

*** 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 Eric Lee on 2011-10-14.*

Test Result: Compliance.

Please refer to following tables and plots

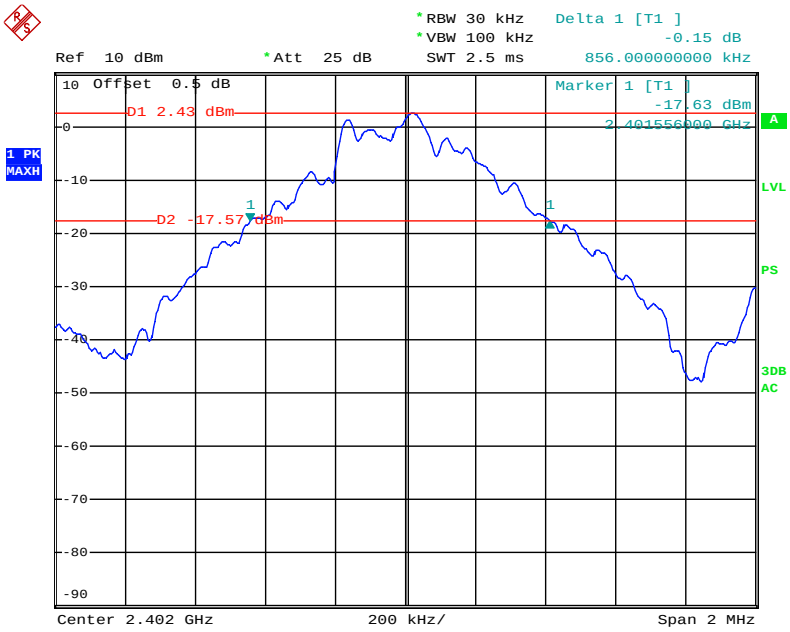
Test Mode: Transmitting

BDR Mode (GFSK):

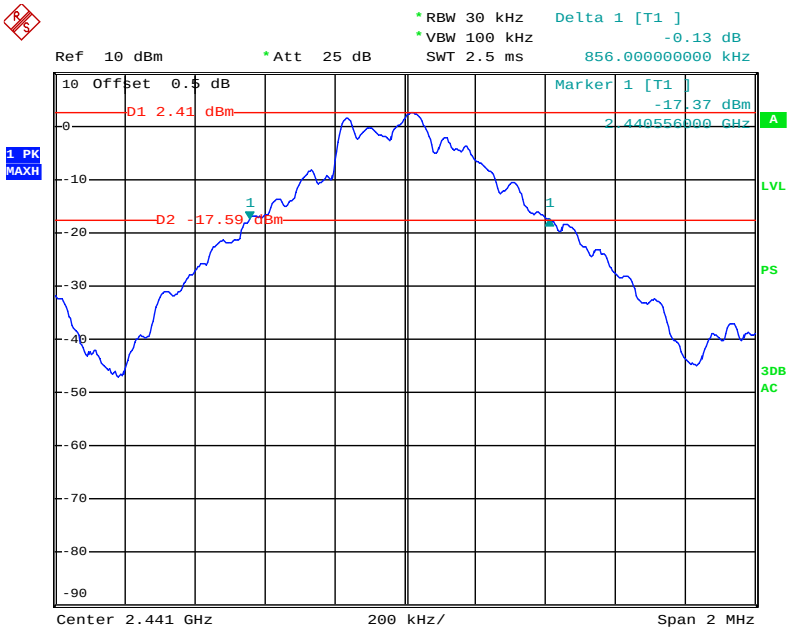
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	0.856
Middle	2441	0.856
High	2480	0.856

Please refer to the following plots.

Low Channel

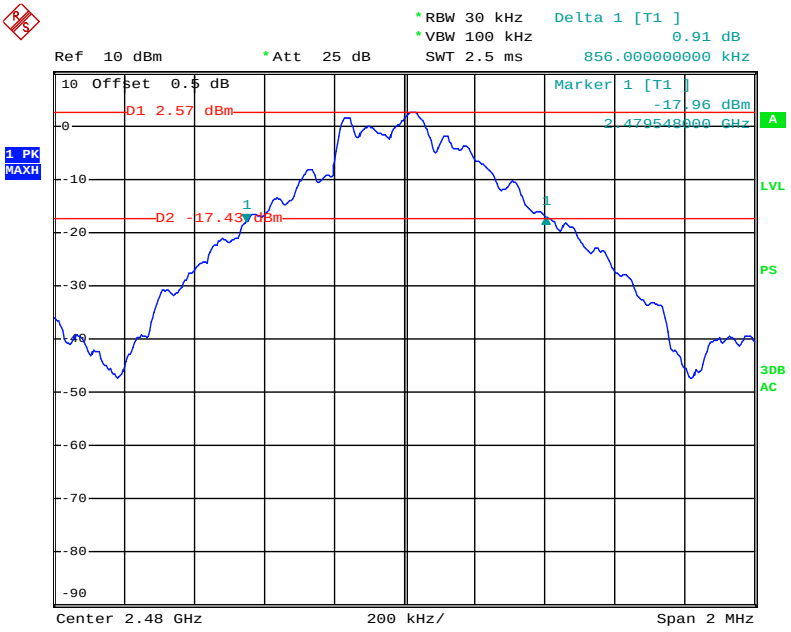


Middle Channel



Date: 14.OCT.2011 09:20:33

High Channel



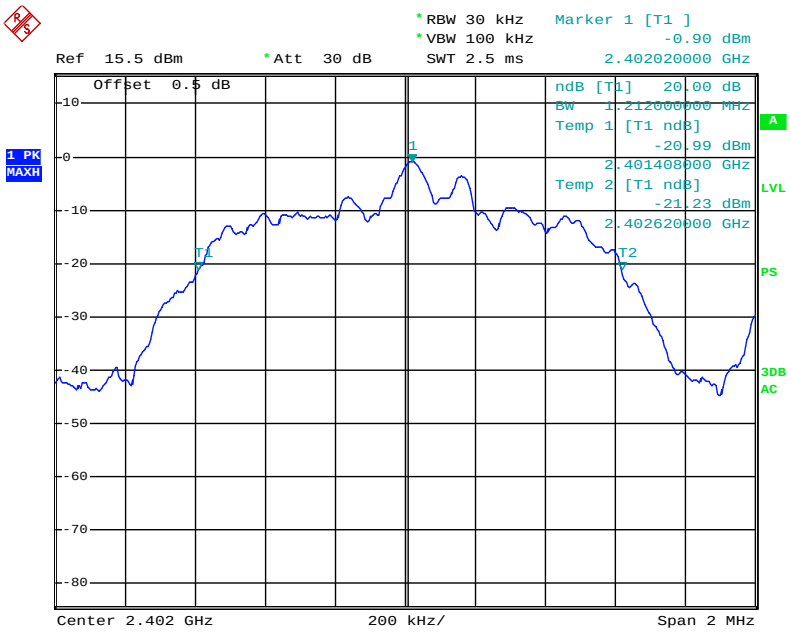
Date: 14.OCT.2011 09:22:27

EDR Mode(π/4-DQPSK):

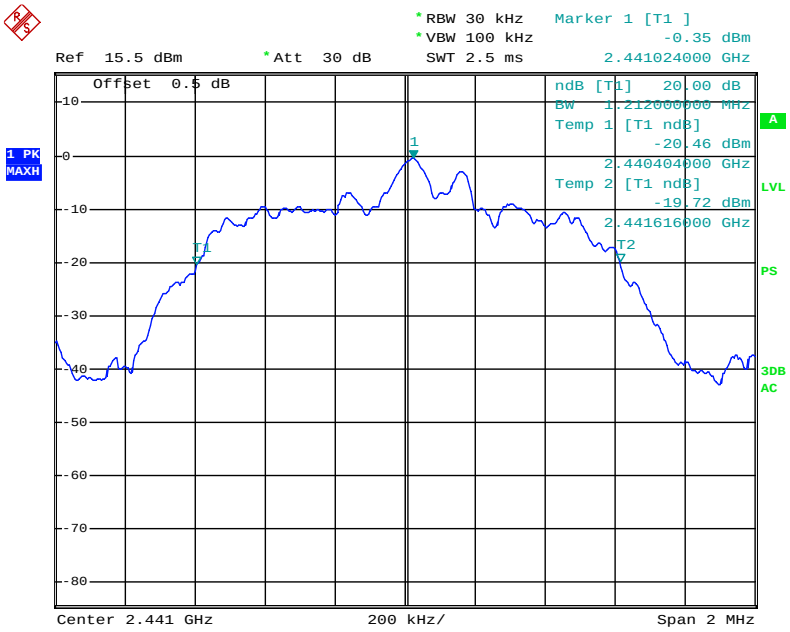
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.212
Middle	2441	1.212
High	2480	1.216

Please refer to the following plots.

Low Channel

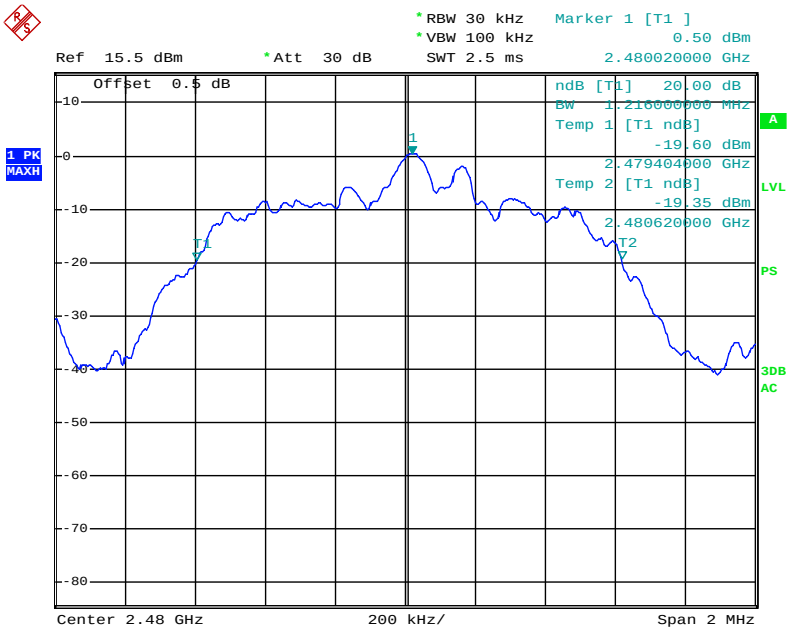


Middle Channel



Date: 14.OCT.2011 15:42:44

High Channel



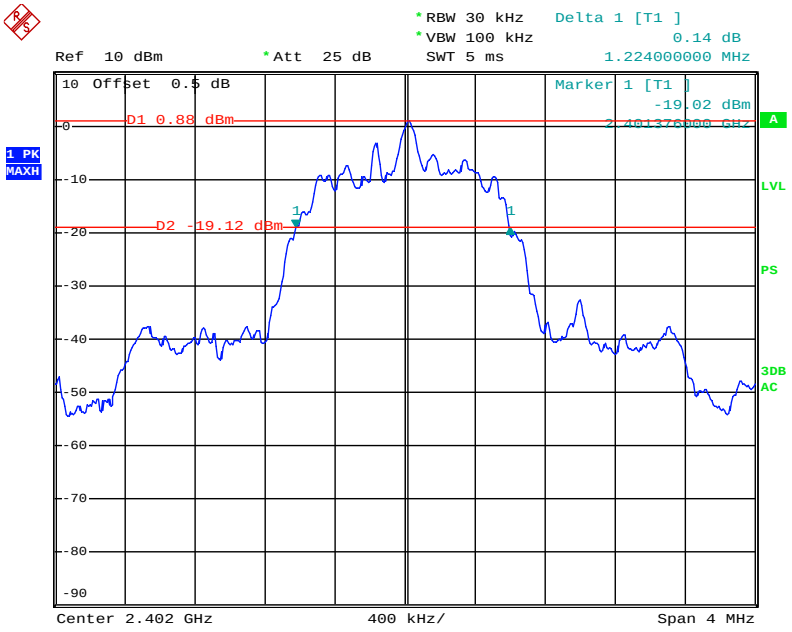
Date: 14.OCT.2011 15:43:22

EDR Mode(8-DPSK):

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.224
Middle	2441	1.224
High	2480	1.224

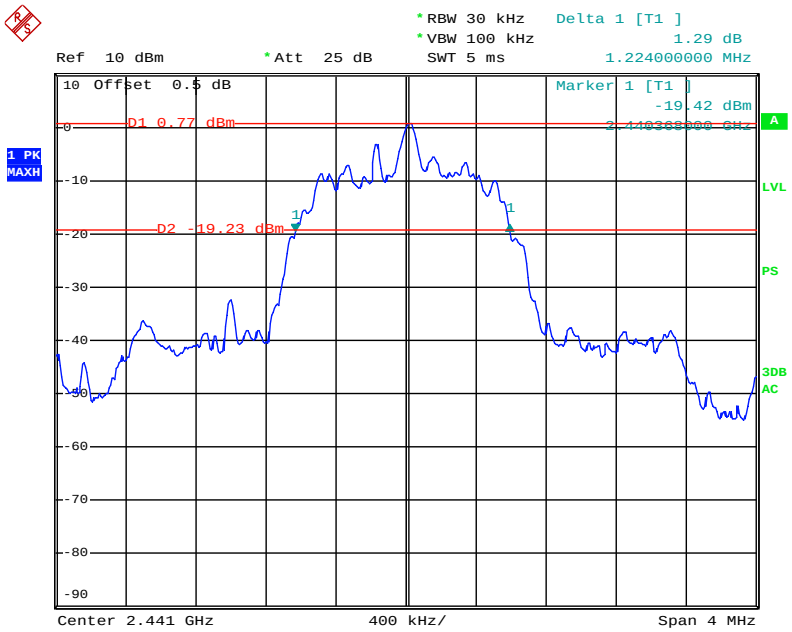
Please refer to the following plots.

Low Channel



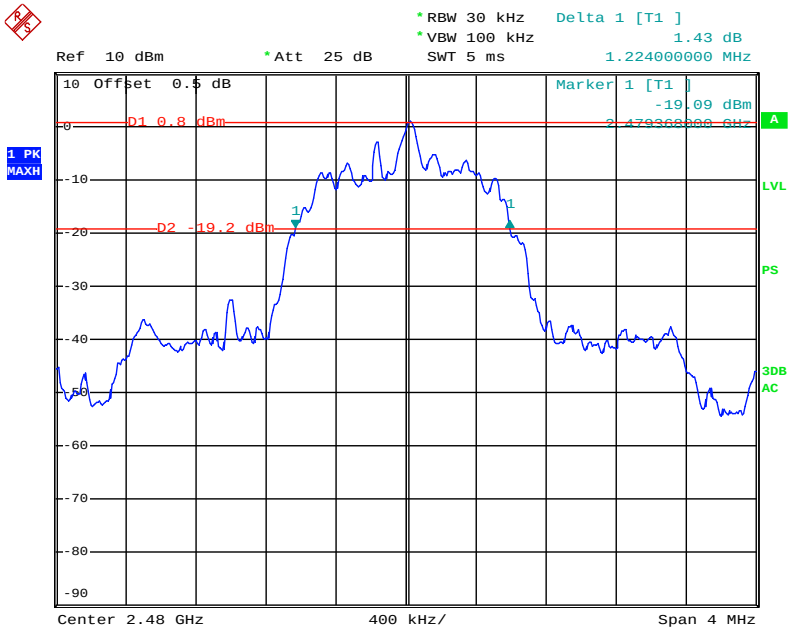
Date: 14.OCT.2011 09:41:12

Middle Channel



Date: 14.OCT.2011 09:42:10

High Channel



Date: 14.OCT.2011 09:43:25

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	2010-11-11	2011-11-10

*** 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 Eric Lee on 2011-10-14.

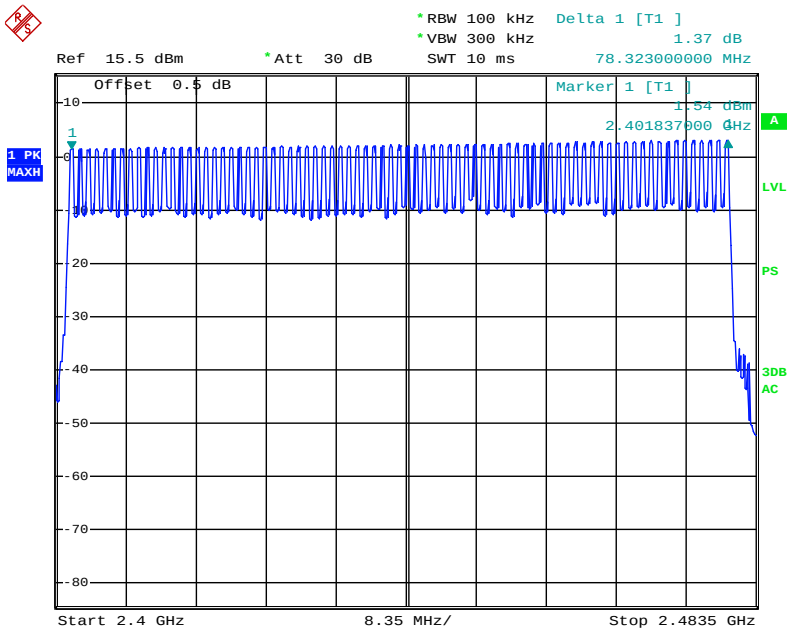
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

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

Number of Hopping Channels



Date: 14.OCT.2011 14:32:34

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

Applicable Standard

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

Test Procedure

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 * 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	2010-11-11	2011-11-10

*** 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 Eric Lee on 2011-10-14.*

Test Result: Compliance.

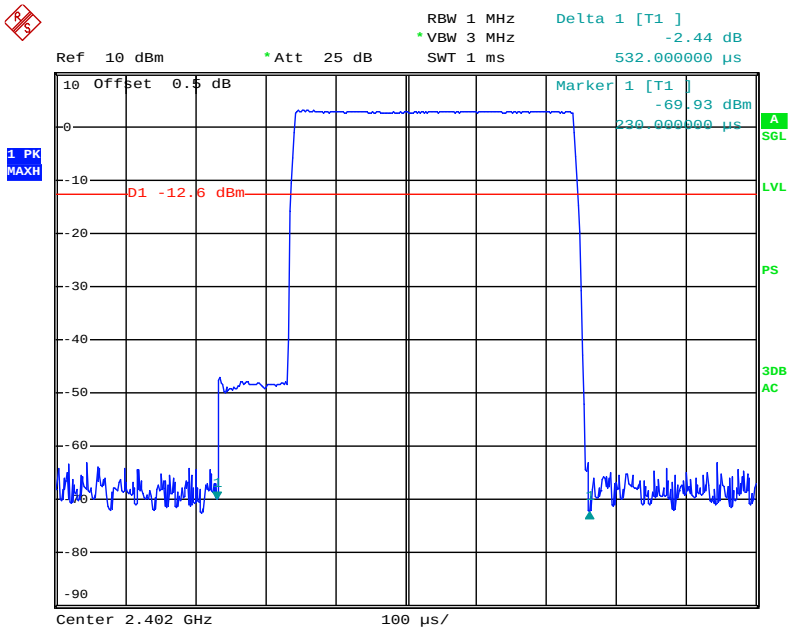
Please refer to following tables and plots

Test Mode: Transmitting

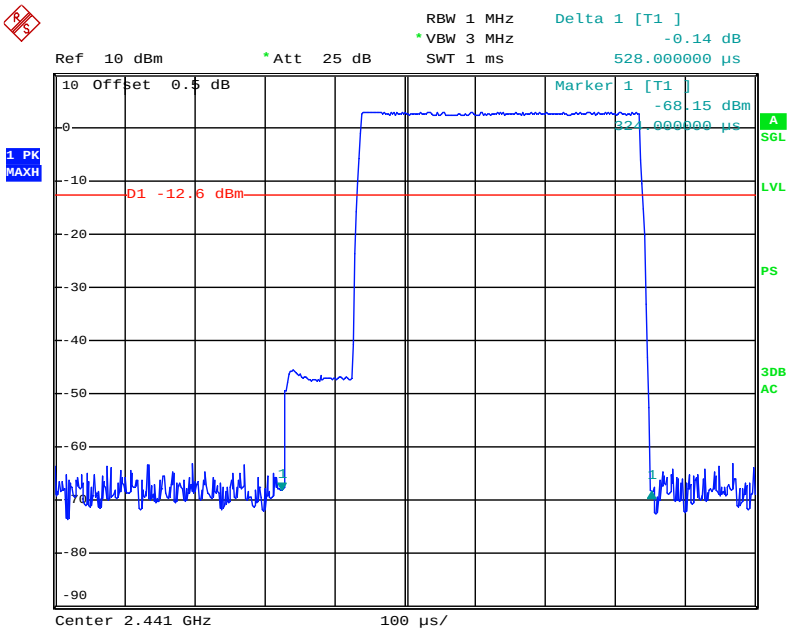
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.532	0.1702	0.4	Pass
	Middle	0.528	0.1690	0.4	Pass
	High	0.530	0.1696	0.4	Pass
	Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
DH 3	Low	0.538	0.0861	0.4	Pass
	Middle	0.540	0.0864	0.4	Pass
	High	0.530	0.0848	0.4	Pass
	Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
DH 5	Low	3.066	0.3270	0.4	Pass
	Middle	3.076	0.3281	0.4	Pass
	High	3.096	0.3302	0.4	Pass
	Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				

Please refer to the following plots.

Low Channel for DH1

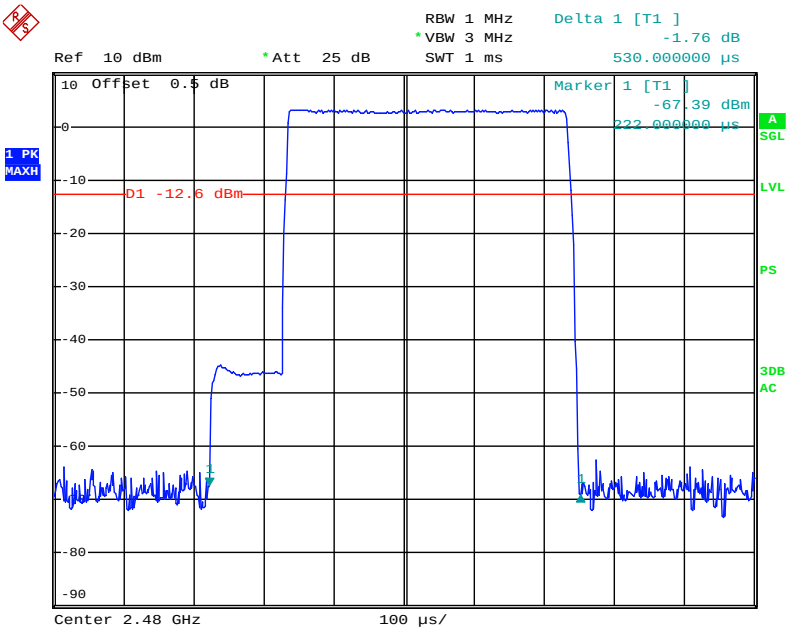


Middle Channel for DH1



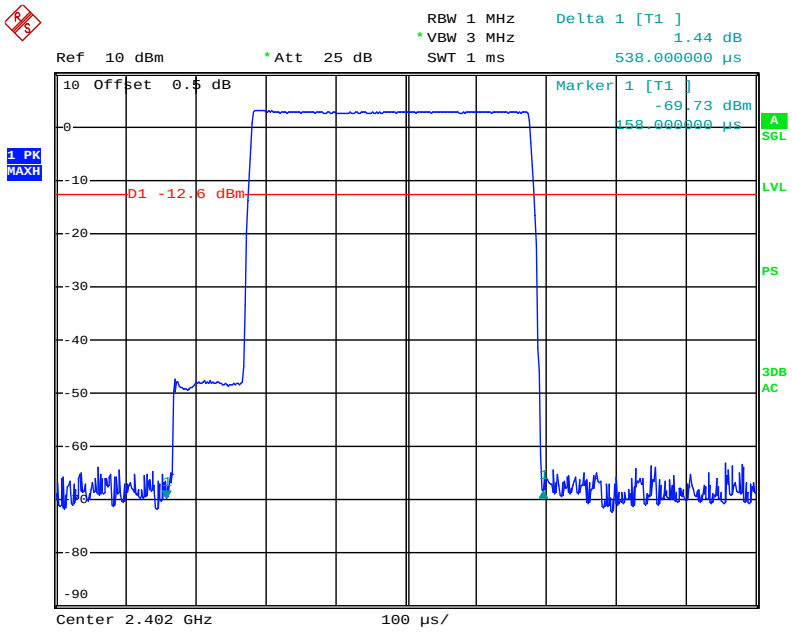
Date: 14.OCT.2011 10:48:13

High Channel for DH1



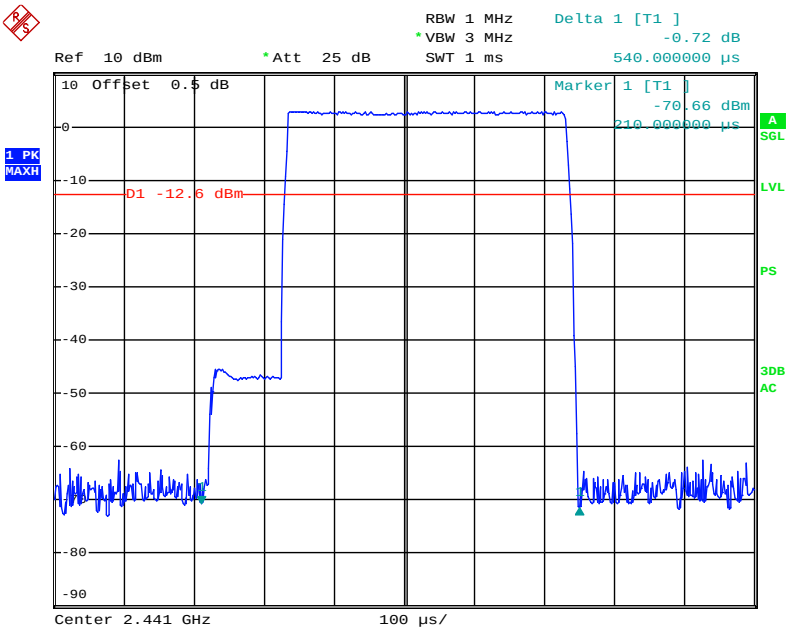
Date: 14.OCT.2011 10:49:23

Low Channel for DH3



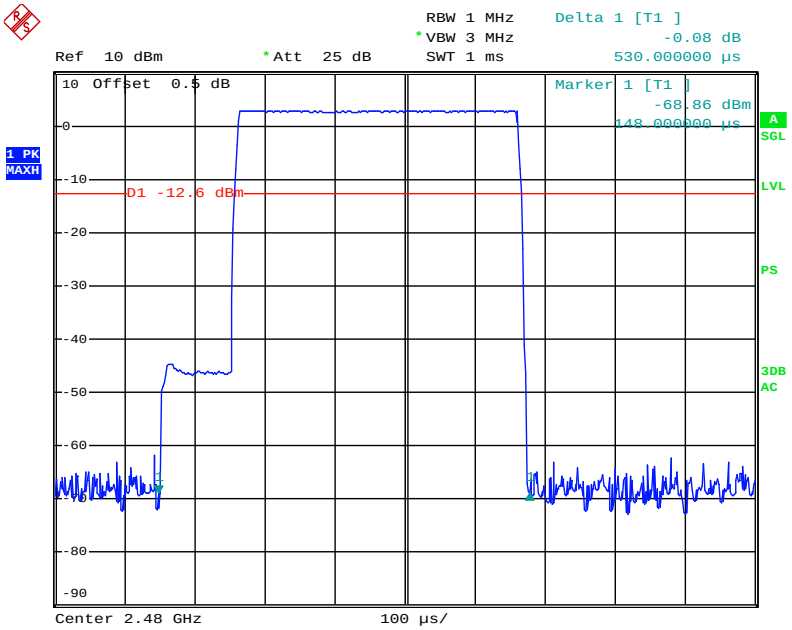
Date: 14.OCT.2011 10:52:37

Middle Channel for DH3



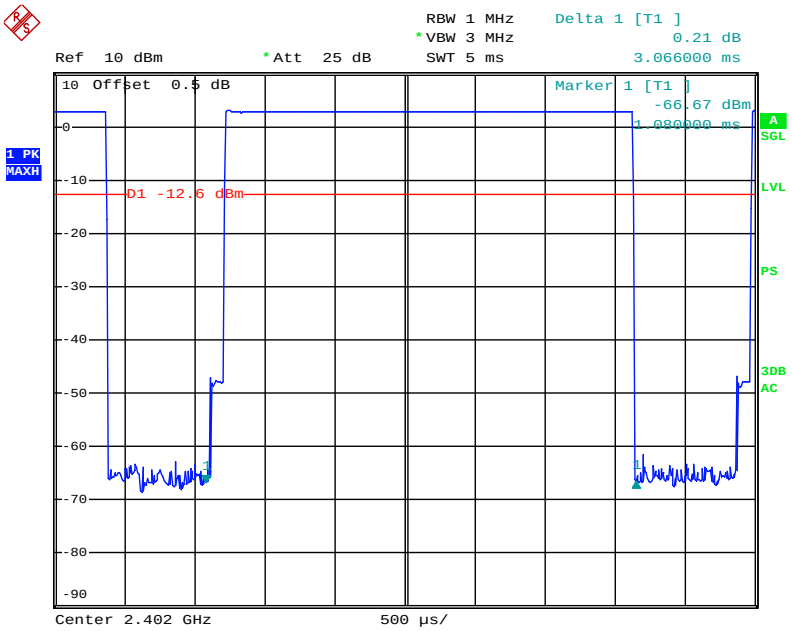
Date: 14.OCT.2011 10:51:53

High Channel for DH3



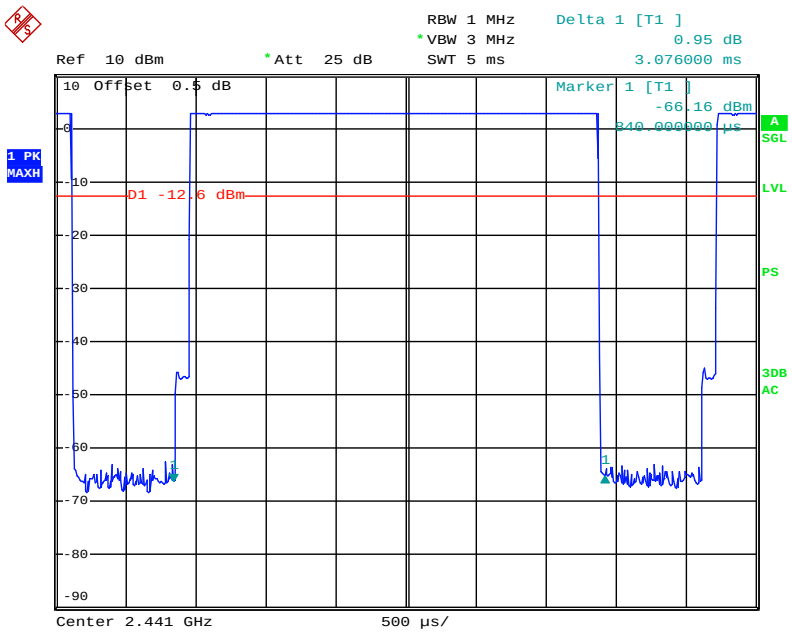
Date: 14.OCT.2011 10:51:04

Low Channel for DH5



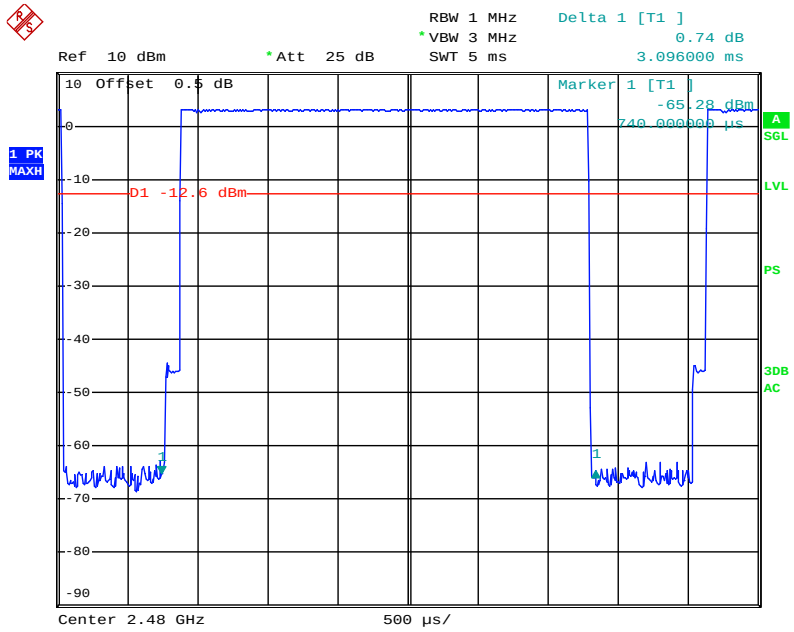
Date: 14.OCT.2011 10:54:43

Middle Channel for DH5



Date: 14.OCT.2011 10:55:29

High Channel for DH5



Date: 14.OCT.2011 10:57:12

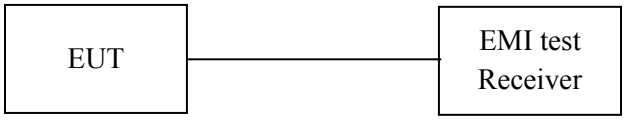
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to FCC §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	2010-11-11	2011-11-10

*** 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 Eric Lee on 2011-10-14.*

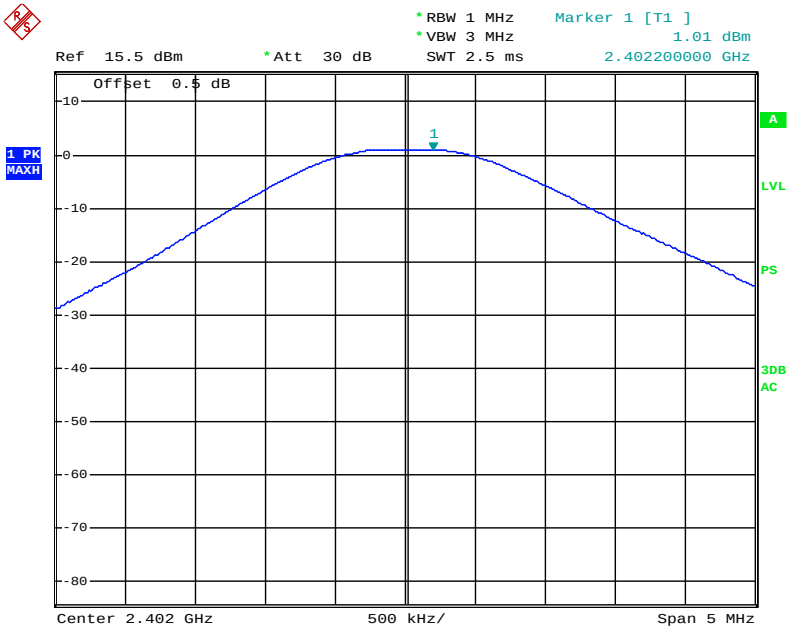
Test Result: Compliance.

BDR Mode (GFSK):

Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	1.01	1.26	125
Middle	2441	1.47	1.40	125
High	2480	2.36	1.72	125

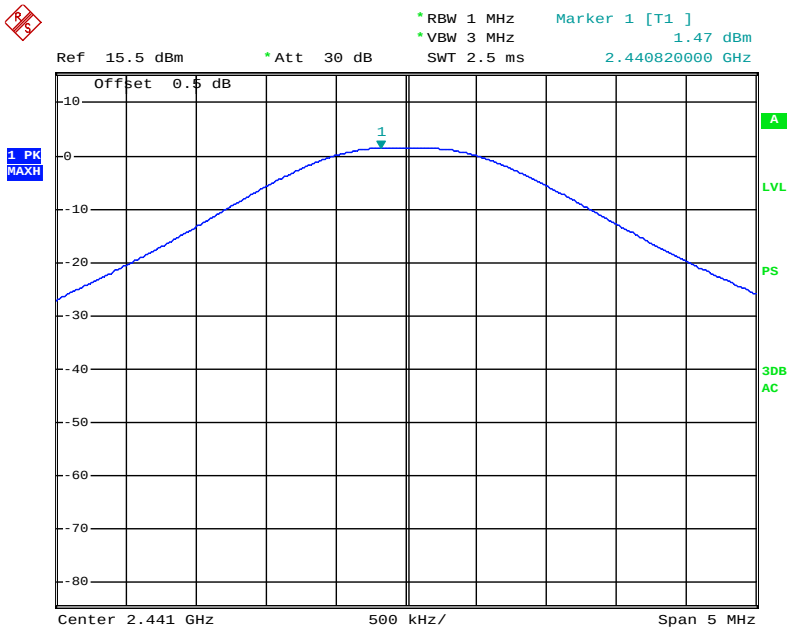
.

Low Channel



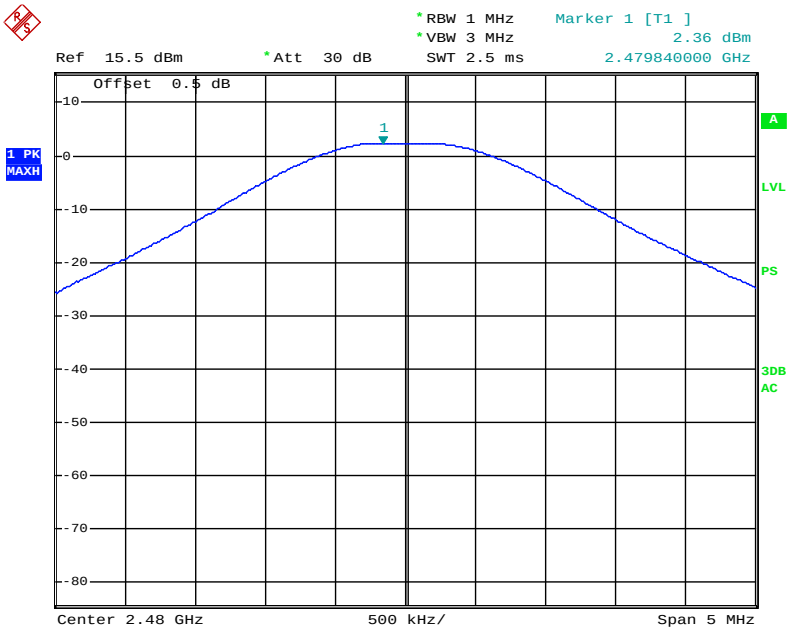
Date: 14.OCT.2011 13:19:19

Middle Channel



Date: 14.OCT.2011 13:18:36

High Channel

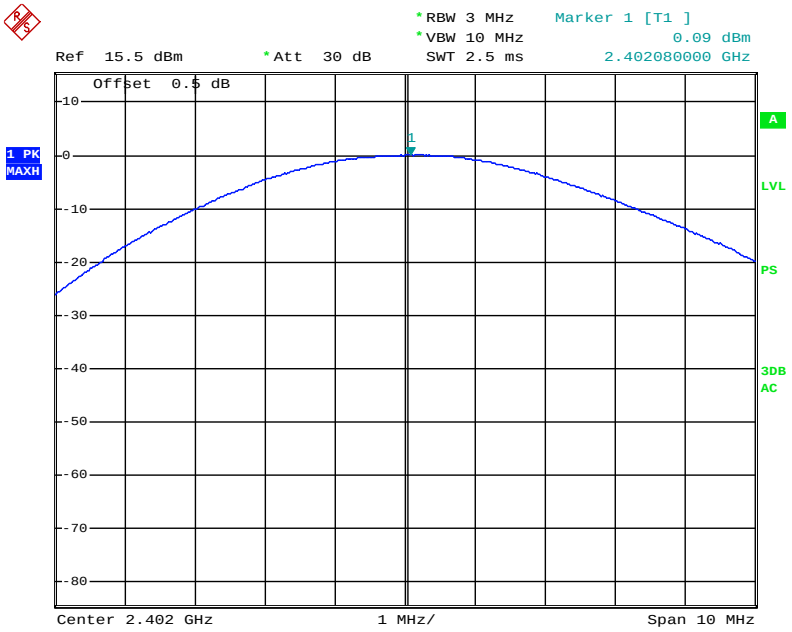


Date: 14.OCT.2011 13:14:38

EDR Mode (π /4-DQPSK):

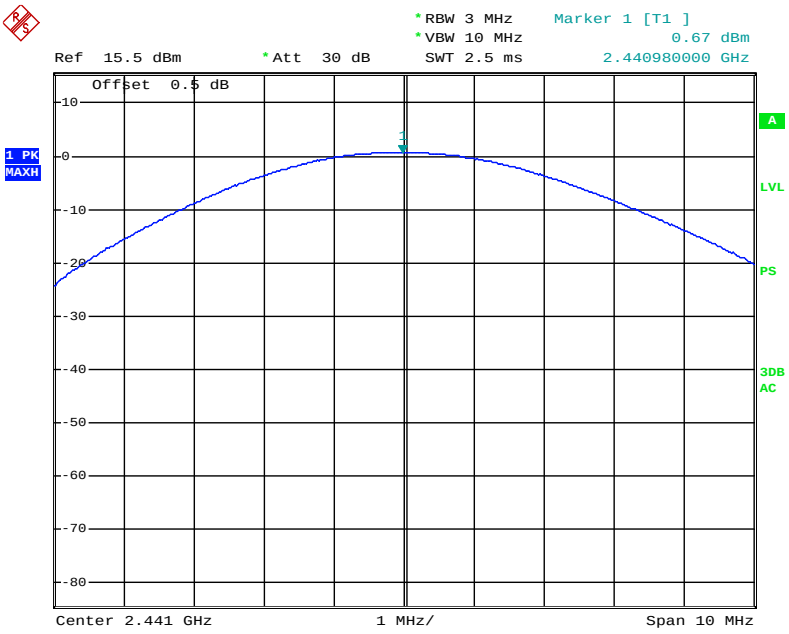
Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	0.09	1.02	125
Middle	2441	0.67	1.17	125
High	2480	1.80	1.51	125

Low Channel



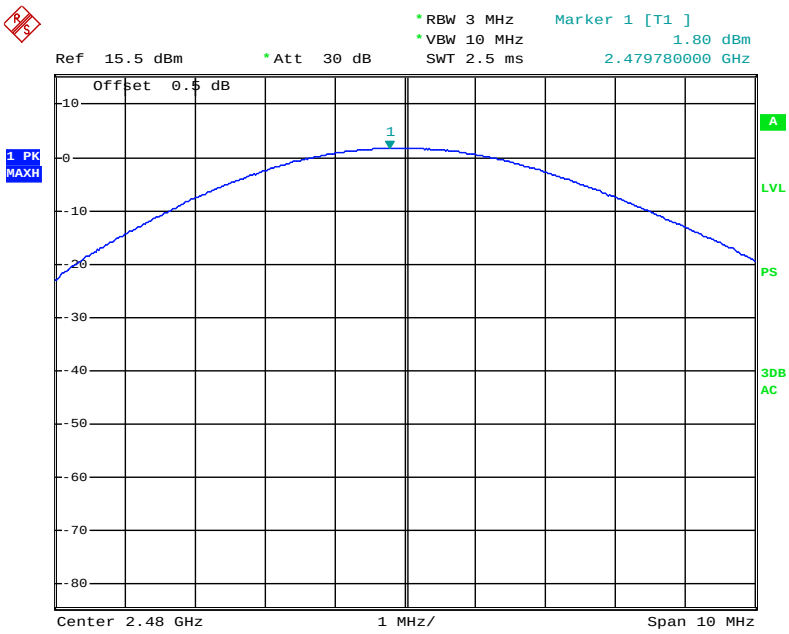
Date: 14.OCT.2011 14:59:48

Middle Channel



Date: 14.OCT.2011 14:59:17

High Channel

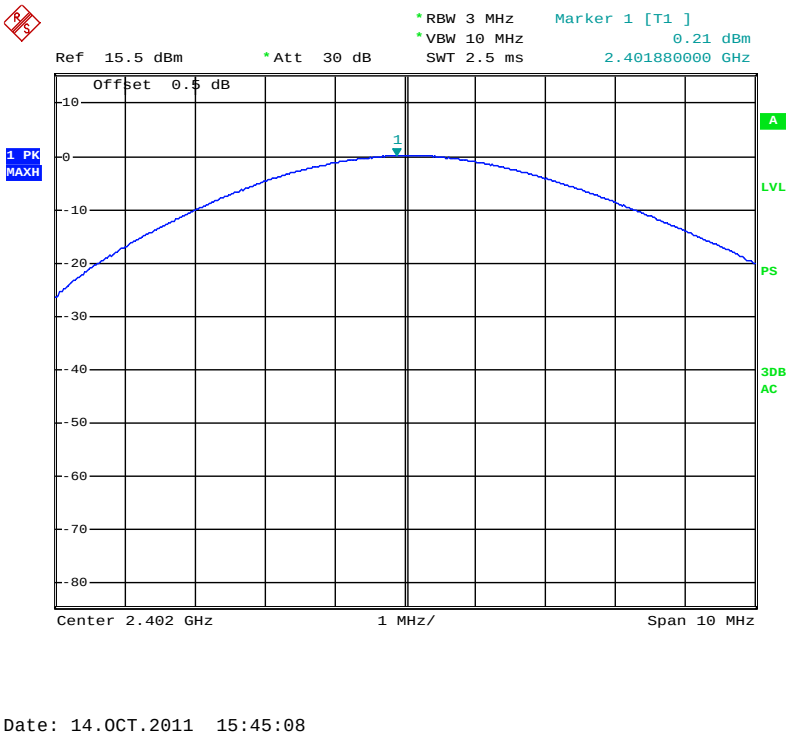


Date: 14.OCT.2011 14:58:52

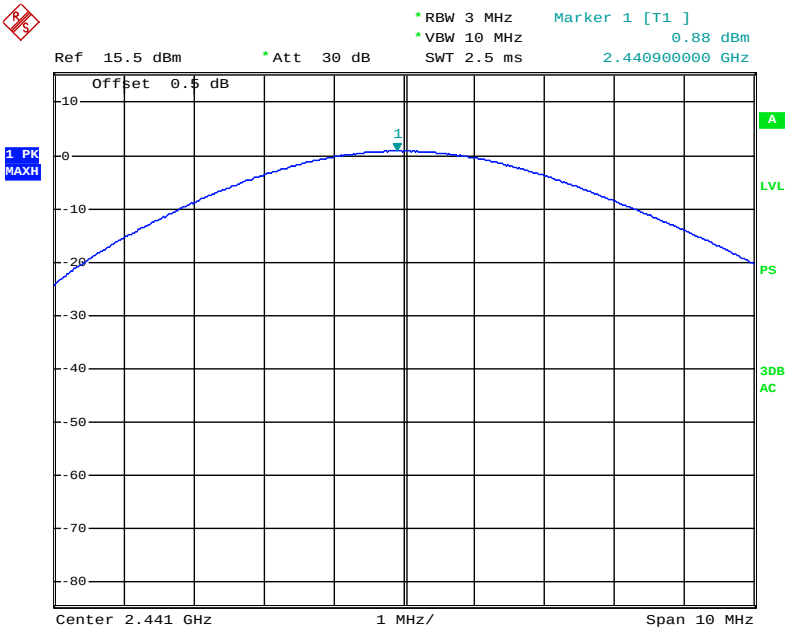
EDR Mode (8-DPSK):

Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	0.21	1.05	125
Middle	2441	0.88	1.22	125
High	2480	1.89	1.55	125

Low Channel

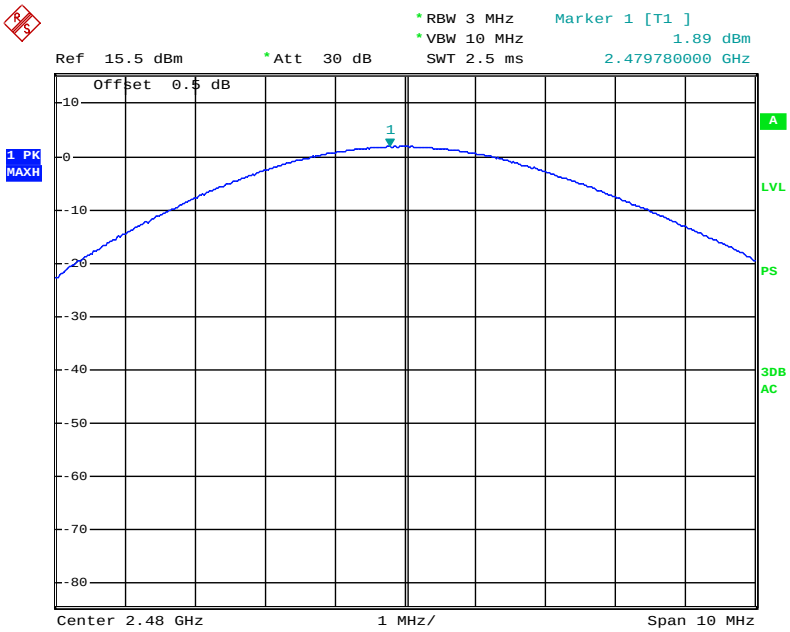


Middle Channel



Date: 14.OCT.2011 15:44:38

High Channel



Date: 14.OCT.2011 15:43:58

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	2010-11-11	2011-11-10

*** 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 Eric Lee on 2011-10-14.*

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)
2400.000	-43.09	20
2483.896	-53.13	20

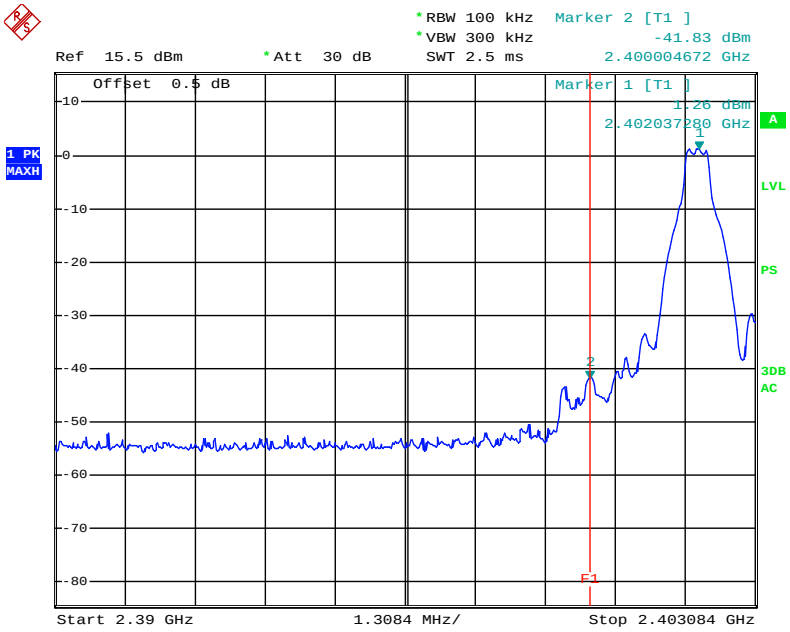
EDR Mode (π /4-DQPSK):

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.865	-49.11	20
2484.106	-52.76	20

EDR Mode (8-DPSK):

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.994	-48.73	20
2483.980	-51.88	20

GFSK - Band Edge: Left Side



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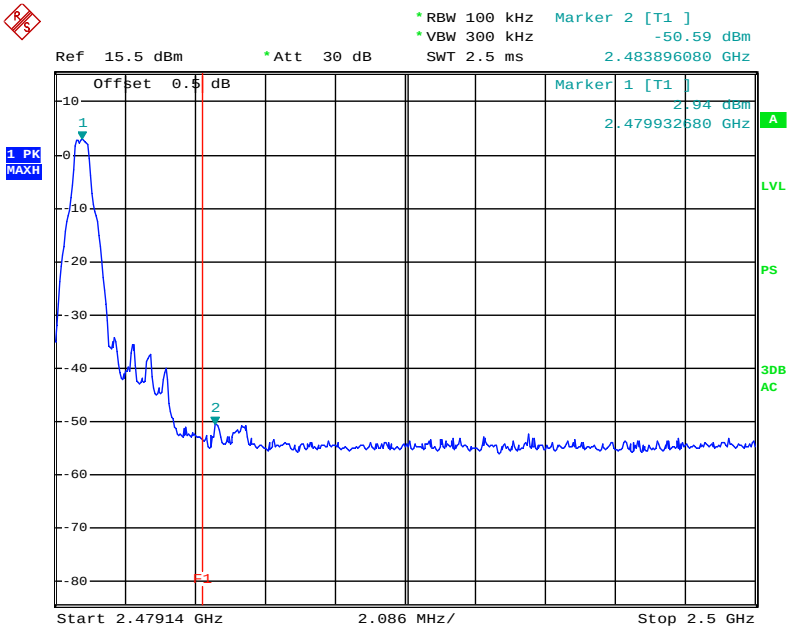
GFSK - Band Edge: Right Side



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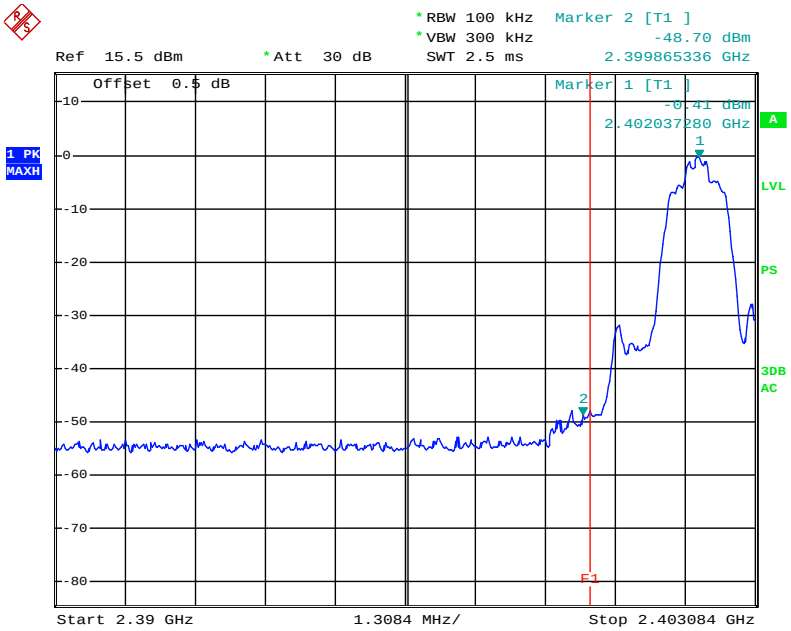
π/4-DQPSK - Band Edge: Left Side



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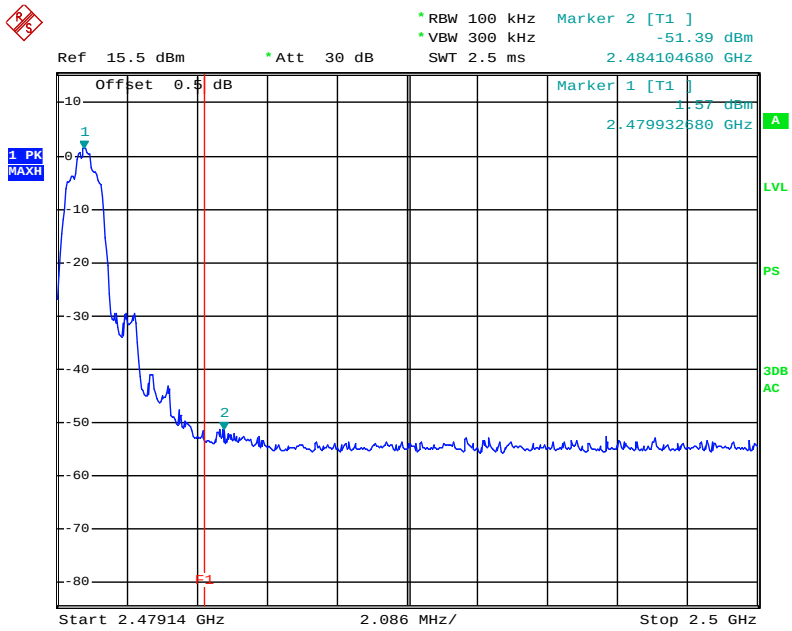
π/4-DQPSK - Band Edge: Right Side



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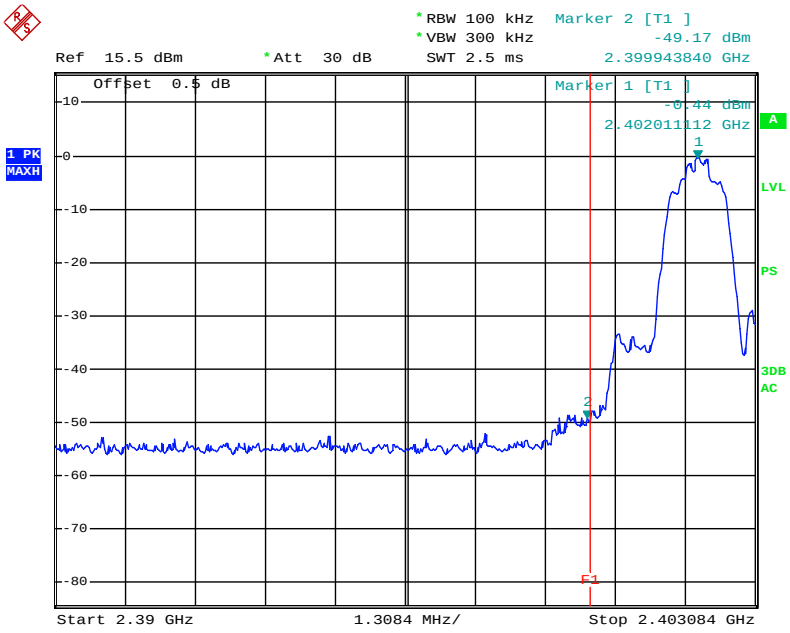
8-DPSK - Band Edge: Left Side



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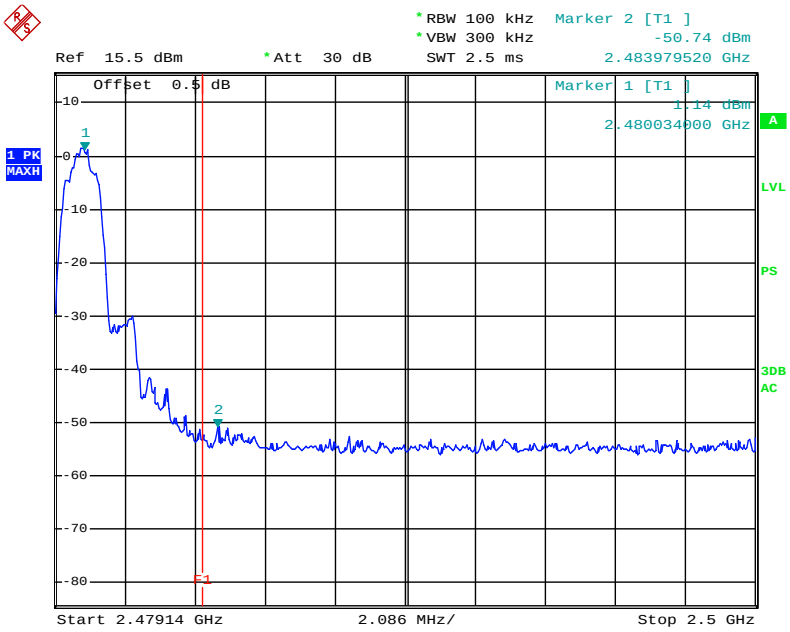
8-DPSK - Band Edge: Right Side



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