Lab Code: 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Nexpro International Limitada

San Jose-Goicoechea, Guadalupe, Barrio Tournon, frente Al Hotel Villas Tournon,

Oficinas Del Bufete Facio Y Canas, Costa Rica

FCC ID: ZYPP180A

Report Type:	Product Type:
Original Report	GSM Mobile Phone

Test Engineer:	Dean Lau
Report Number:	R1DG111227010-00A
Report Date:	2012-02-06
Reviewed By:	Merry Zhao 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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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Nexpro International Limitada*'s product, model number: *P180A (FCC ID: ZYPP180A)* (the "EUT") in this report was a *GSM Mobile Phone,* which was measured approximately: 109mm (W) x 55 mm (D) x 13 mm (H), rated input voltage: DC 3.7V Lithium battery or DC 5.0V from adapter for charging.

Adapter Information:
Manufacturer: Sendtel
Model: P180A
Input: 100-240V~50-60Hz 0.15A
Output: 5V 500mA

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

Transmitter Output Power:
Cellular Band: 32.74 dBm (Conducted)
PCS Band: 29.73 dBm (Conducted)
Bluetooth: 6.79 dBm (Conducted)

** All measurement and test data in this report was gathered from production sample serial number: 11122710 (Assigned by BACL, Shenzhen). The EUT was received on 2011-12-27.*

Objective

This report is prepared on behalf of *Nexpro International Limitada 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, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 22H&24E PCE and Part 15B JBP submissions with FCC ID: ZYPP180A.

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 was controlled by the bluetooth tester.

EUT Exercise Software

No exercise software.

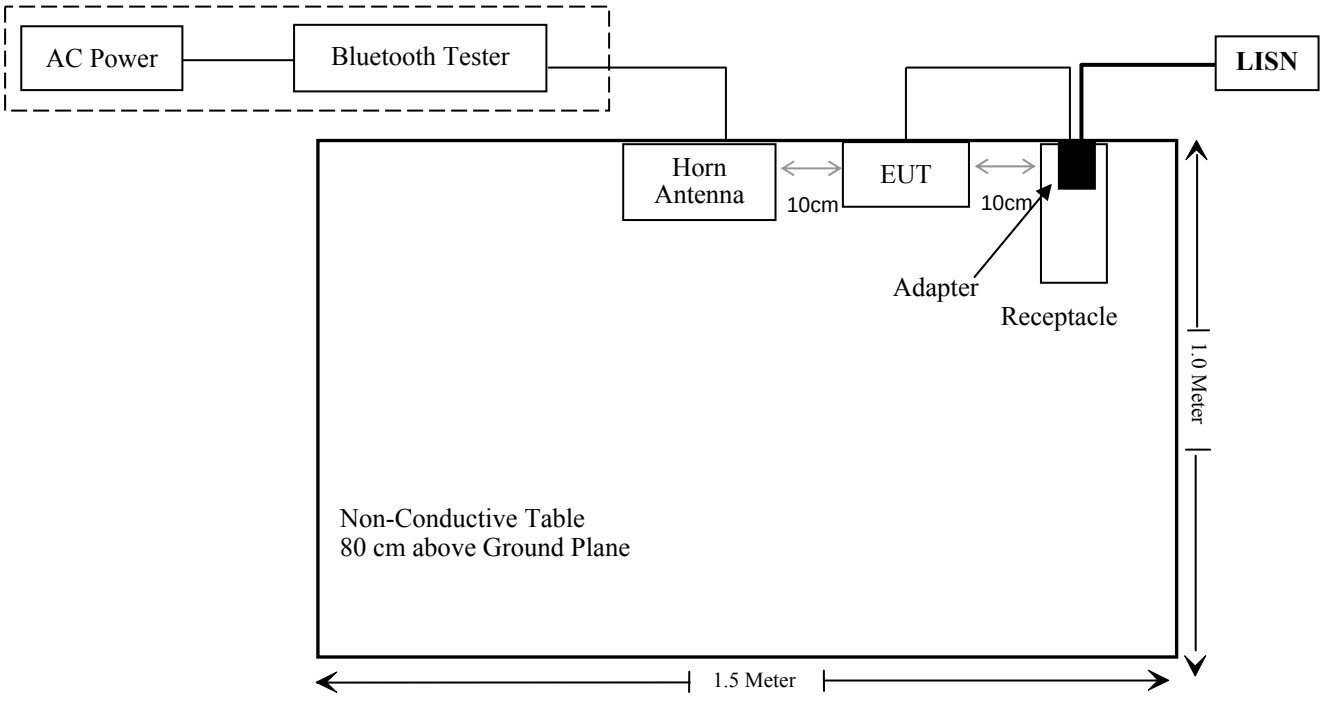
Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
TESCOM	Bluetooth Tester	TC-3000B	3000B650083

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

Applicable Standard

According to §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 o when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed o when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas o 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 – o output ≤ 60/f: SAR not required o output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when o output ≤ 2·P_{Ref} and antenna is ≥ 5.0 cm from other antennas o output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas o 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 o test SAR on highest output channel for each wireless mode and exposure condition o 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 o 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 o 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 § 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) GSM can transmit simultaneously with Bluetooth.
2) The distance between BT and GSM antenna is 7.1 cm,which is more than 5 cm,the max output power of Bluetooth is 4.775 mW(6.79 dBm) < 2PRef (24 mW).According to KDB648474, stand-alone SAR is not required for BT antenna and simultaneous SAR evaluation is not required for Bluetooth and GSM antennas.

Result: Compliance

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to §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.

Antenna Connector Construction

The EUT has a PIFA antenna, the gain is -1.93 dBi, 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

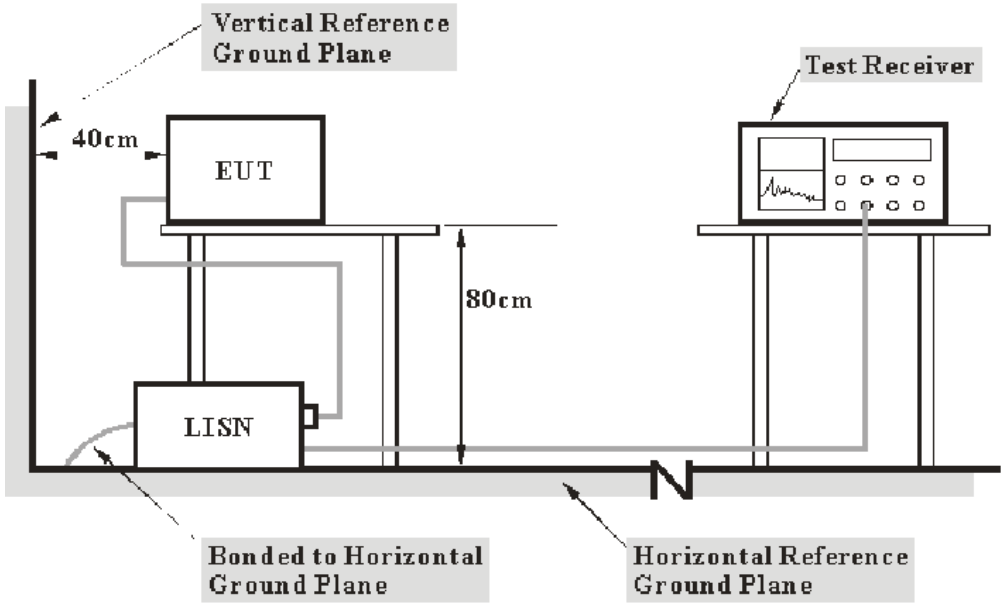
FCC §15.207

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.

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 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:

9.54 dB at **0.650 MHz** in the **Line** conducted mode

Test Data

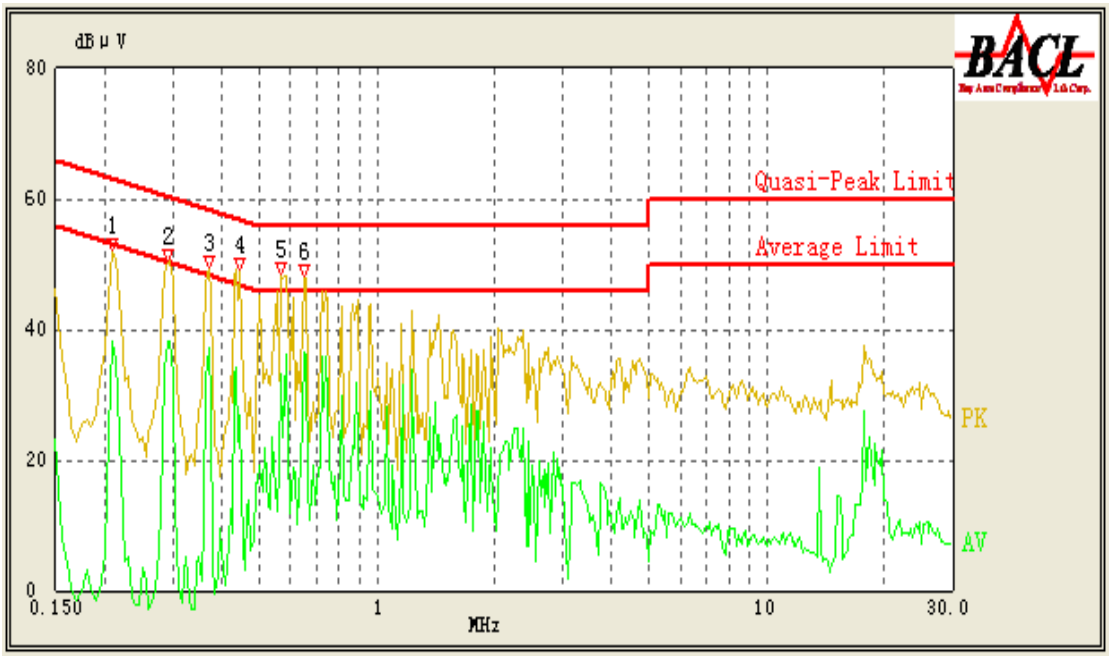
Environmental Conditions

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

** The testing was performed by Dean Lau on 2011-12-30.*

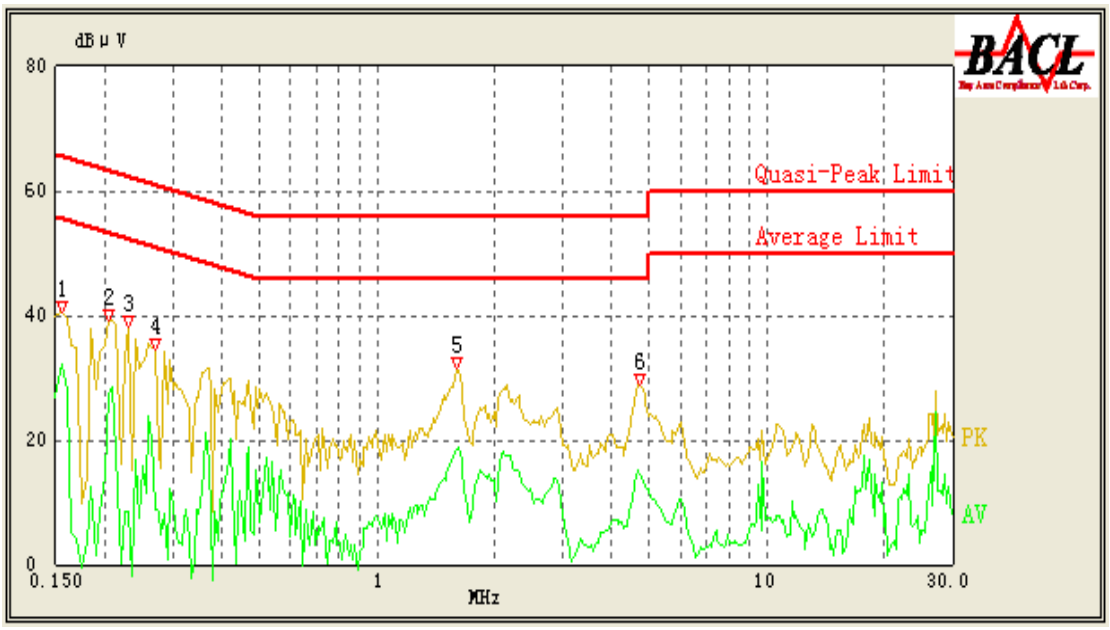
Test Mode: Adapter Charging & Transmitting

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.650	36.46	1.10	46.00	9.54	Ave.
0.370	37.24	1.10	49.71	12.47	Ave.
0.570	33.33	1.10	46.00	12.67	Ave.
0.290	38.08	1.10	52.00	13.92	Ave.
0.650	41.87	1.10	56.00	14.13	QP
0.290	47.65	1.10	62.00	14.35	QP
0.210	38.22	1.10	54.29	16.07	Ave.
0.445	26.98	1.10	47.57	20.59	Ave.
0.210	39.25	1.10	64.29	25.04	QP
0.370	34.23	1.10	59.71	25.48	QP
0.565	28.74	1.10	56.00	27.26	QP
0.445	20.63	1.10	57.57	36.94	QP

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.155	32.12	1.10	55.86	23.74	Ave.
0.155	39.77	1.10	65.86	26.09	QP
0.205	38.00	1.10	64.43	26.43	QP
0.205	27.43	1.10	54.43	27.00	Ave.
1.600	18.64	1.10	46.00	27.36	Ave.
1.600	26.75	1.10	56.00	29.25	QP
4.740	14.41	1.10	46.00	31.59	Ave.
4.715	24.05	1.10	56.00	31.95	QP
0.230	26.23	1.10	63.71	37.48	QP
0.270	24.92	1.10	62.57	37.65	QP
0.270	8.67	1.10	52.57	43.90	Ave.
0.230	8.41	1.10	53.71	45.30	Ave.

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

Applicable Standard

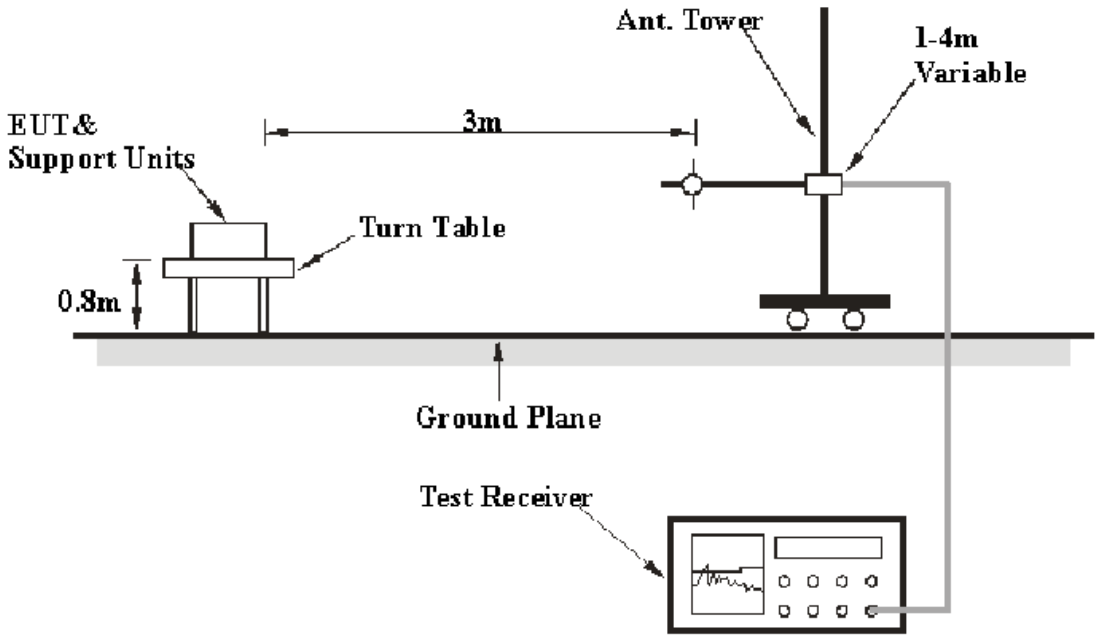
FCC §15.247 (d); §15.209; §15.205;

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.

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

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 frequency 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	2011-05-04	2012-05-03
Electro-Mechanics	Horn Antenna	3116	9510-2270	2011-10-11	2012-10-10
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, section 15.205, 15.209 and 15.247, with the worst margin reading of:

16.92 dB at **466.5000 MHz** in the **Horizontal** polarization

Test Data

Environmental Conditions

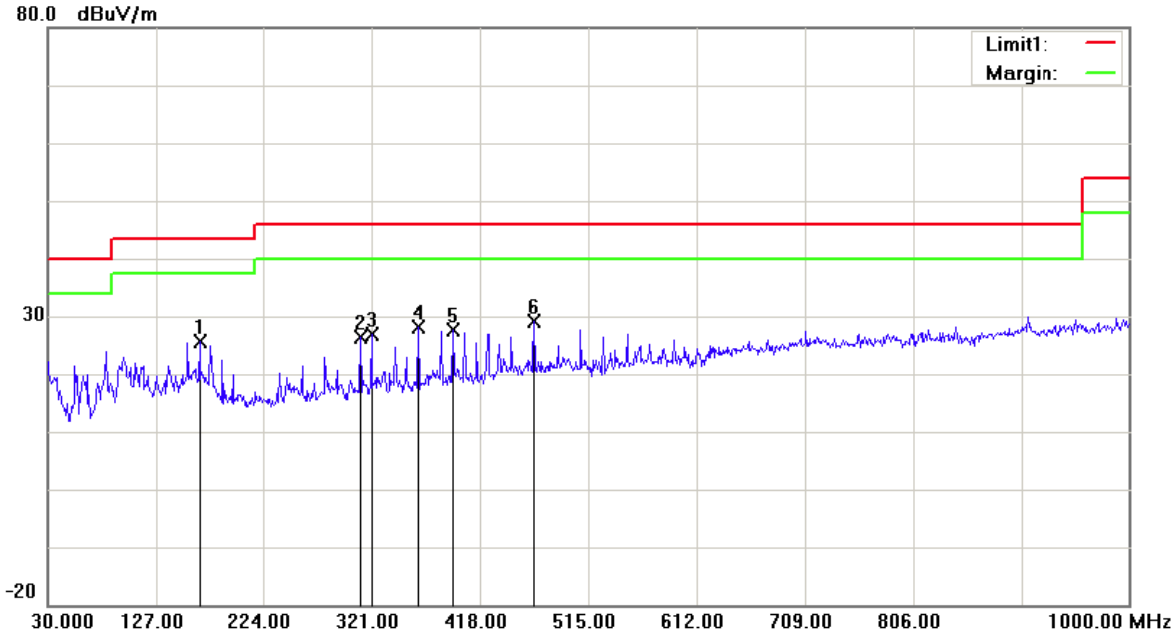
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Dean Lau on 2011-12-30.

Test Mode: Transmitting

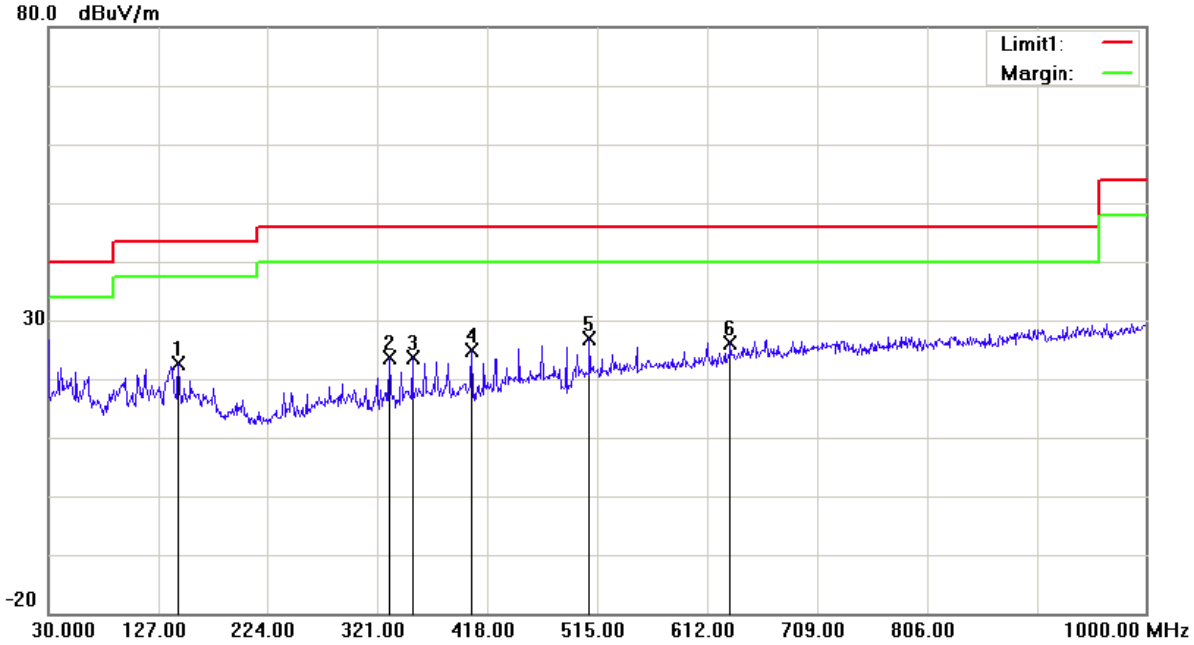
1) 30 MHz - 1 GHz

Horizontal



Frequency (MHz)	Detector (PK/QP)	Correction Factor (dB)	Corrected Amplitude (dBµV/m)	Limit (dBuV/m)	Margin (dB)
466.5000	QP	-0.92	29.08	46.00	16.92
362.7100	QP	-3.15	28.16	46.00	17.84
165.8000	QP	-7.09	25.61	43.50	17.89
393.7500	QP	-2.73	27.64	46.00	18.36
321.0000	QP	-4.35	26.79	46.00	19.21
311.3000	QP	-4.58	26.50	46.00	19.50

Vertical



Frequency (MHz)	Detector (PK/QP)	Correction Factor (dB)	Corrected Amplitude (dBµV/m)	Limit (dBuV/m)	Margin (dB)
508.2100	QP	-0.59	26.85	46.00	19.15
632.3700	QP	1.63	26.22	46.00	19.78
144.4600	QP	-6.46	22.61	43.50	20.89
404.4200	QP	-2.39	24.88	46.00	21.12
352.0400	QP	-3.57	23.73	46.00	22.27
331.6700	QP	-4.24	23.62	46.00	22.38

3) 1 GHz ~ 25 GHz (*BDR mode was the worst case*)

Frequency (MHz)	S.A. Reading (dBuV/M)	Detector (PK/Ave.)	Ant. Polar (H /V)	Corrected Factor (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/15.209		Comment
						Limit (dBuV/m)	Margin (dB)	
Low Channel (2402 MHz)								
2402	68.05	PK	H	33.2	101.25	/	/	Fundamental
2402	52.06	Ave.	H	33.2	85.26	/	/	Fundamental
2402	61.05	PK	V	33.2	94.25	/	/	Fundamental
2402	46.91	Ave.	V	33.2	80.11	/	/	Fundamental
4824	13.48	Ave.	H	21.03	34.51	54	19.49	harmonic
4824	13.48	Ave.	V	21.03	34.51	54	19.49	harmonic
2356.23	13.48	Ave.	H	17.55	31.03	54	22.97	spurious
2356.23	13.48	Ave.	V	17.55	31.03	54	22.97	spurious
4824	29.35	PK	H	21.03	50.38	74	23.62	harmonic
4824	28.95	PK	V	21.03	49.98	74	24.02	harmonic
2356.23	29.05	PK	V	17.55	46.6	74	27.4	spurious
2356.23	29.01	PK	H	17.55	46.56	74	27.44	spurious
Middle Channel (2441 MHz)								
2441	67.19	PK	H	33.4	100.59	/	/	Fundamental
2441	51.29	Ave.	H	33.4	84.69	/	/	Fundamental
2441	60.15	PK	V	33.4	93.55	/	/	Fundamental
2441	46.74	Ave.	V	33.4	80.14	/	/	Fundamental
4882	13.48	Ave.	H	21.19	34.67	54	19.33	harmonic
4882	13.48	Ave.	V	21.19	34.67	54	19.33	harmonic
4882	29.94	PK	H	21.19	51.13	74	22.87	harmonic
4882	28.6	PK	V	21.19	49.79	74	24.21	harmonic
High Channel (2480 MHz)								
2480	65.37	PK	H	34.5	99.87	/	/	Fundamental
2480	50.49	Ave.	H	34.5	84.99	/	/	Fundamental
2480	59.08	PK	V	34.5	93.58	/	/	Fundamental
2480	46.54	Ave.	V	34.5	81.04	/	/	Fundamental
4924	13.48	Ave.	H	21.35	34.83	54	19.17	harmonic
4924	13.48	Ave.	V	21.35	34.83	54	19.17	harmonic
2483.5	13.48	Ave.	H	18.76	32.24	54	21.76	spurious
2483.5	13.48	Ave.	V	18.76	32.24	54	21.76	spurious
4924	29.01	PK	V	21.35	50.36	74	23.64	harmonic
2483.5	31.73	PK	V	18.76	50.49	74	23.51	harmonic
4924	28.99	PK	H	21.35	50.34	74	23.66	spurious
2483.5	29.67	PK	H	18.76	48.43	74	25.57	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	2011-11-11	2012-11-10
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2011-12-07	2012-12-06

*** 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, RBW was set at 30 kHz; VBW 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 Dean Lau on 2011-12-30.*

Test Result: Compliance.

Please refer to following tables and plots

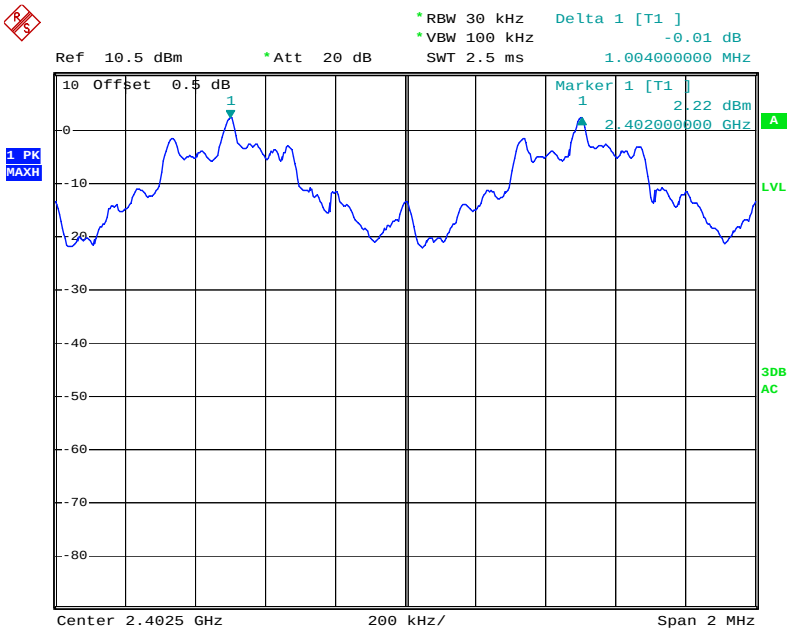
Test Mode: Transmitting

BDR Mode (GFSK):

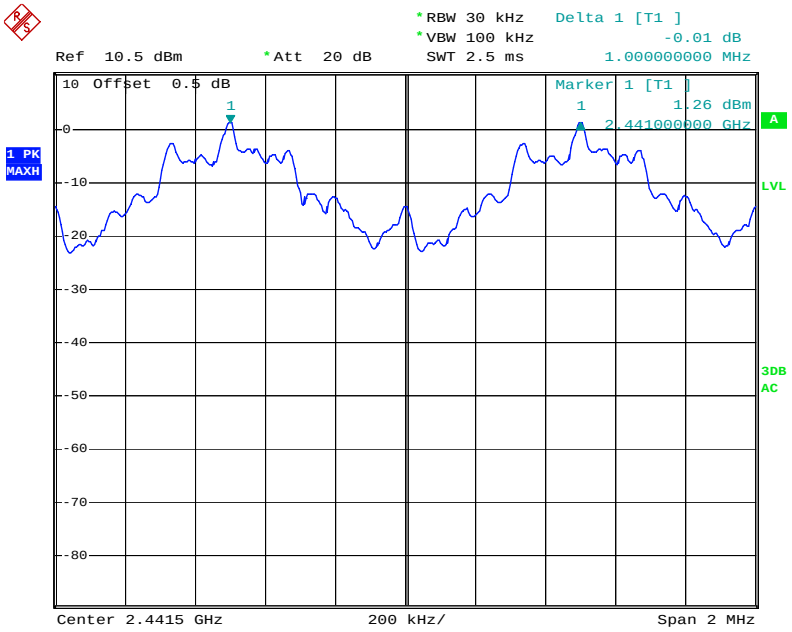
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.004	0.683	Pass
Adjacent	2403			
Middle	2441	1.000	0.629	Pass
Adjacent	2442			
High	2480	1.004	0.683	Pass
Adjacent	2479			

Please refer to the following plots.

Low Channel



Middle Channel



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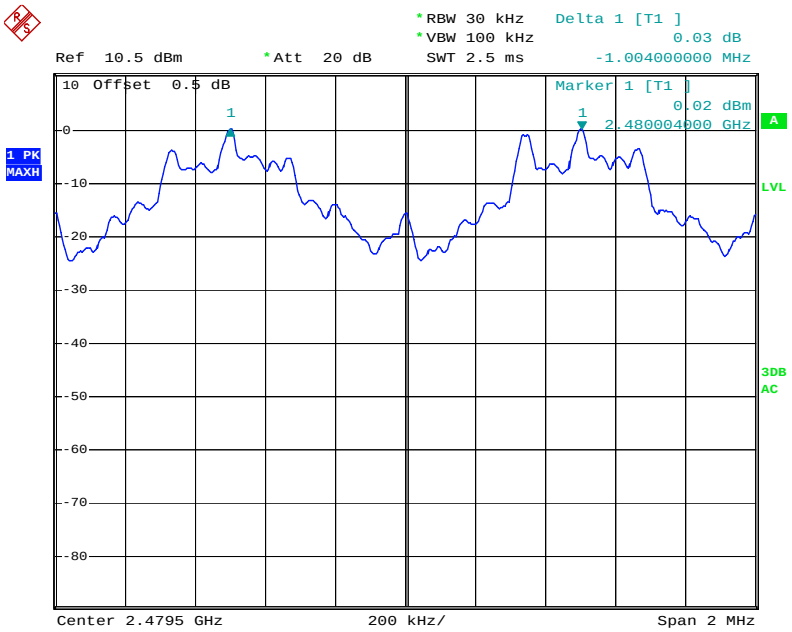
High Channel



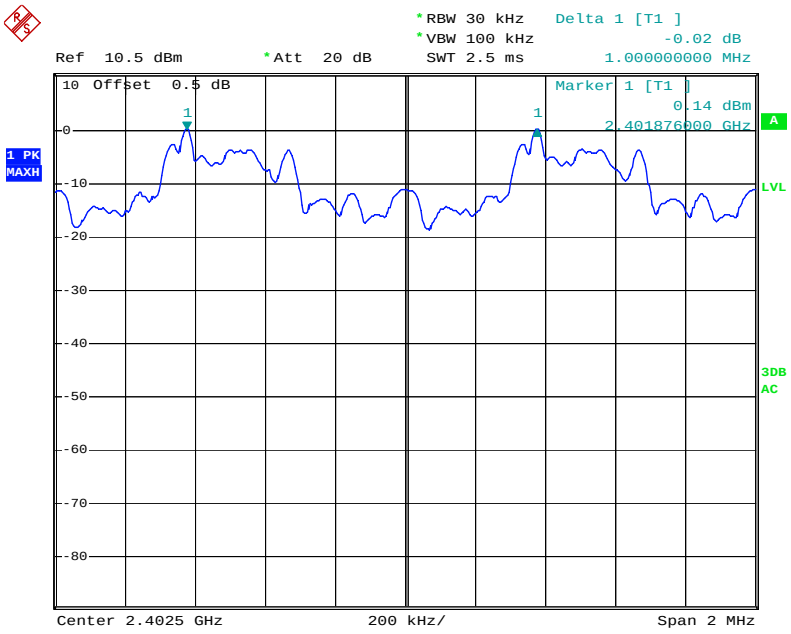
Date: 30.DEC.2011 10:34:47

EDR Mode (π /4-DQPSK):

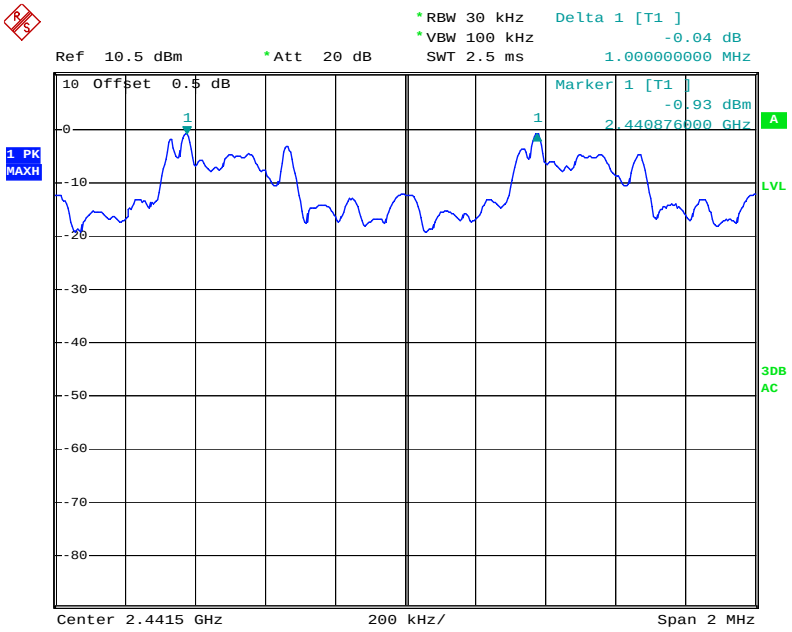
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.000	0.747	Pass
Adjacent	2403			
Middle	2441	1.000	0.747	Pass
Adjacent	2442			
High	2480	1.000	0.747	Pass
Adjacent	2479			

Please refer to the following plots.

Low Channel

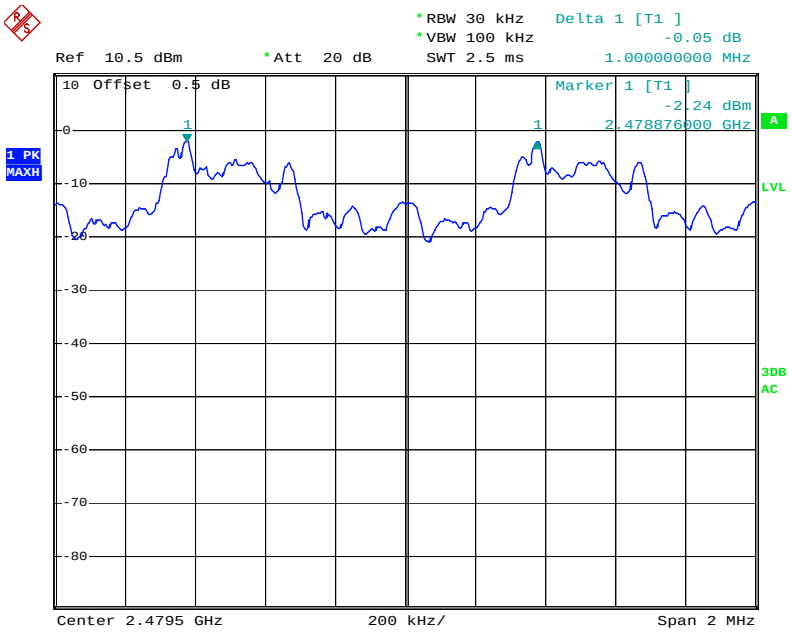


Middle Channel



Date: 30.DEC.2011 10:39:40

High Channel



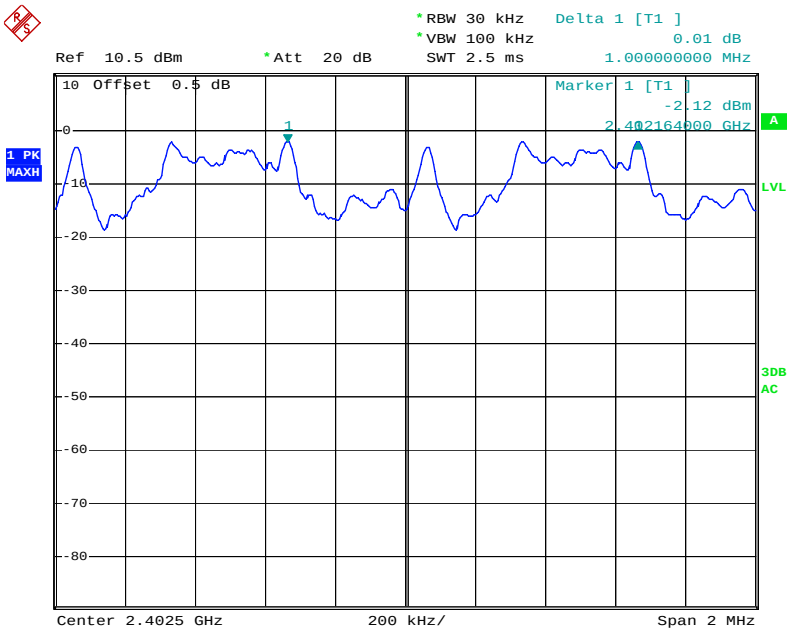
Date: 30.DEC.2011 10:40:13

EDR Mode (8DPSK):

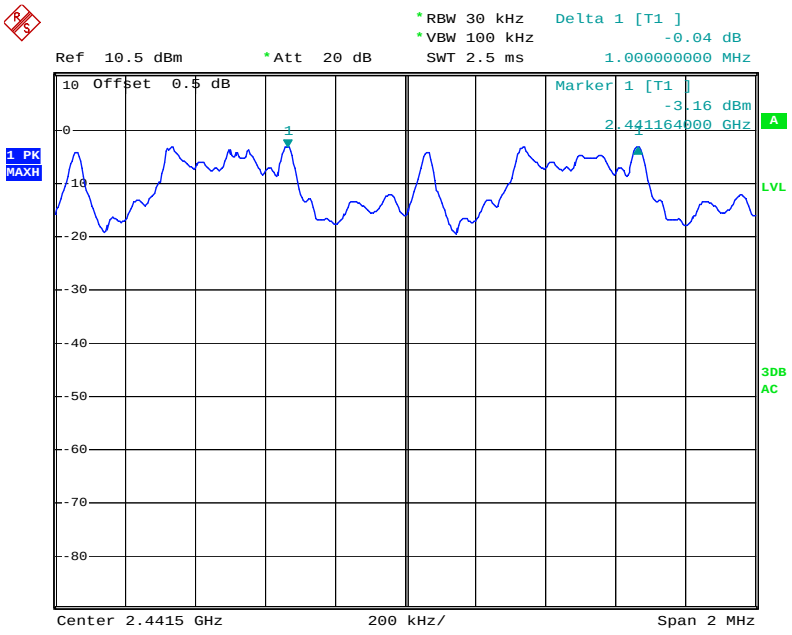
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.000	0.808	Pass
Adjacent	2403			
Middle	2441	1.000	0.811	Pass
Adjacent	2442			
High	2480	1.004	0.813	Pass
Adjacent	2479			

Please refer to the following plots.

Low Channel

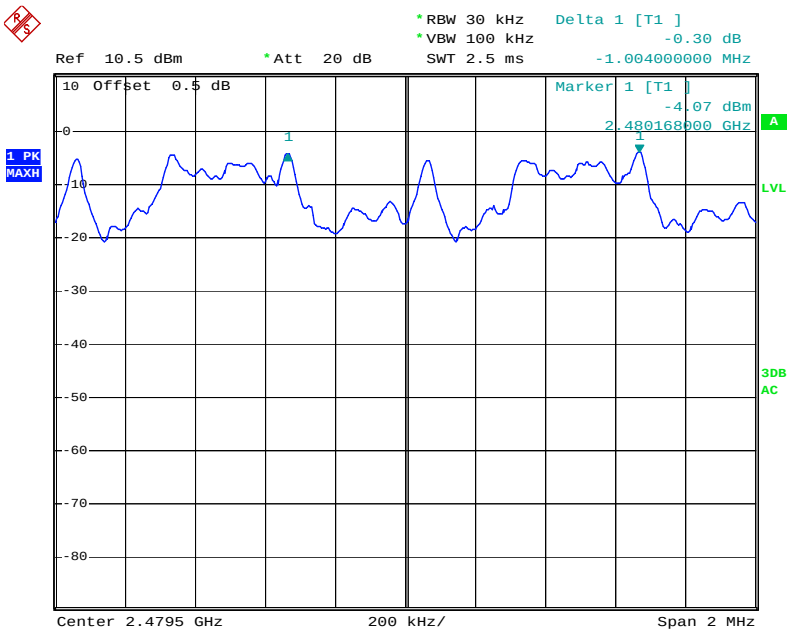


Middle Channel



Date: 30.DEC.2011 10:42:05

High Channel



Date: 30.DEC.2011 10:40:58

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
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2011-12-07	2012-12-06

*** 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 Dean Lau from 2011-12-15 to 2011-12-30.*

Test Result: Compliance.

Please refer to following tables and plots

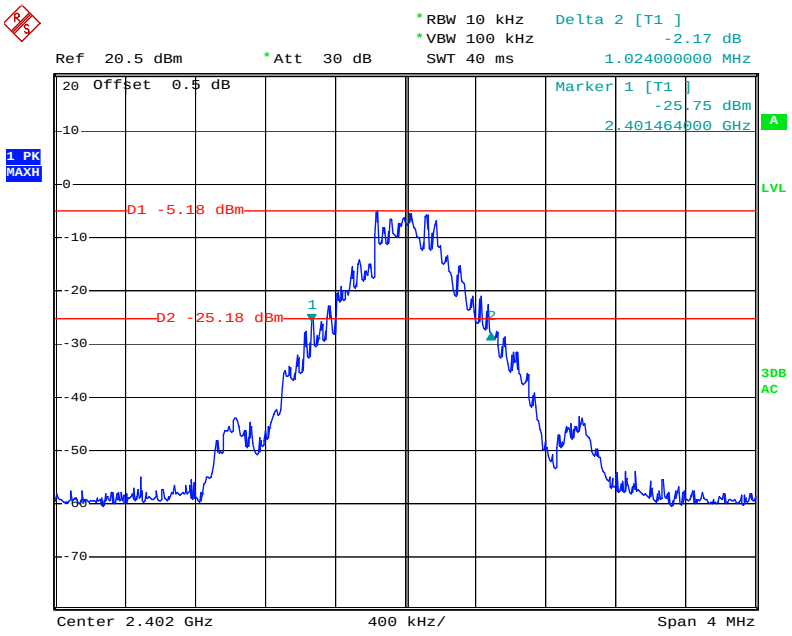
Test Mode: Transmitting

BDR Mode (GFSK):

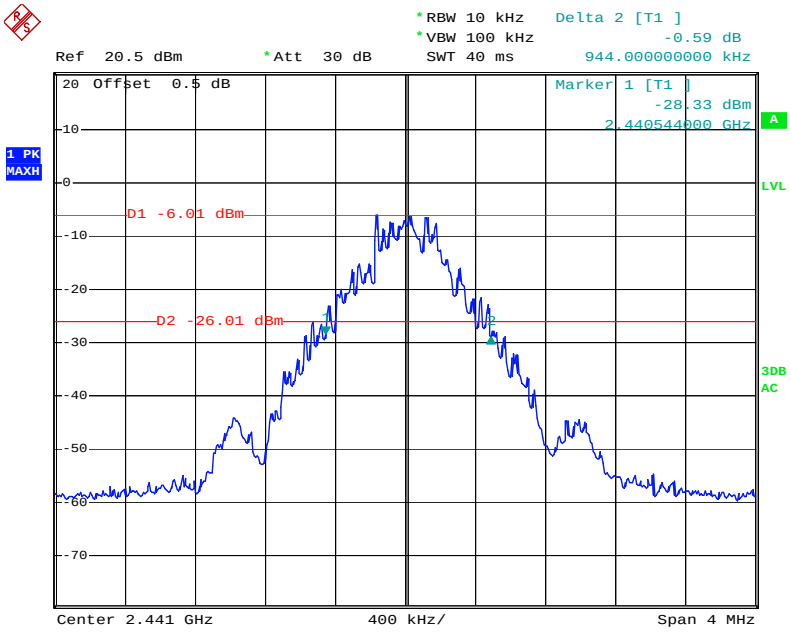
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.024
Middle	2441	0.944
High	2480	1.024

Please refer to the following plots.

Low Channel

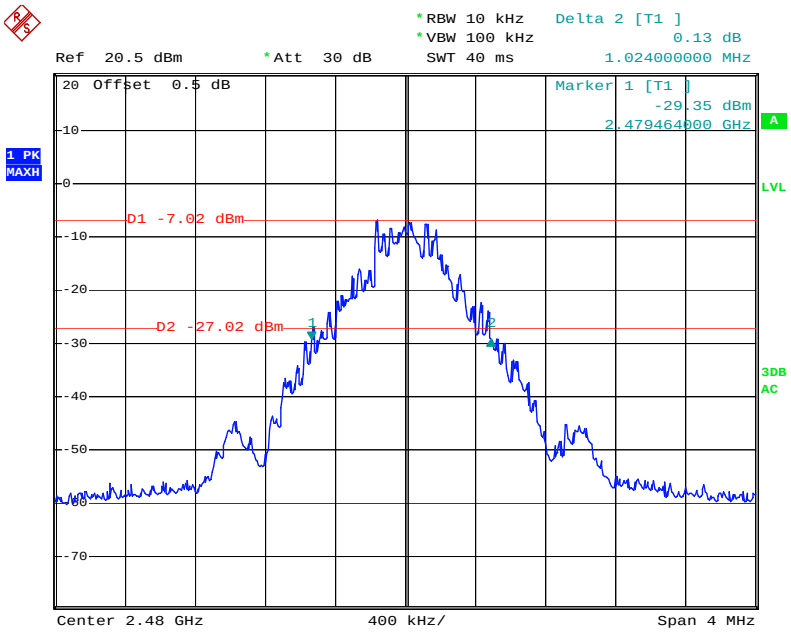


Middle Channel



Date: 15.DEC.2011 12:54:01

High Channel



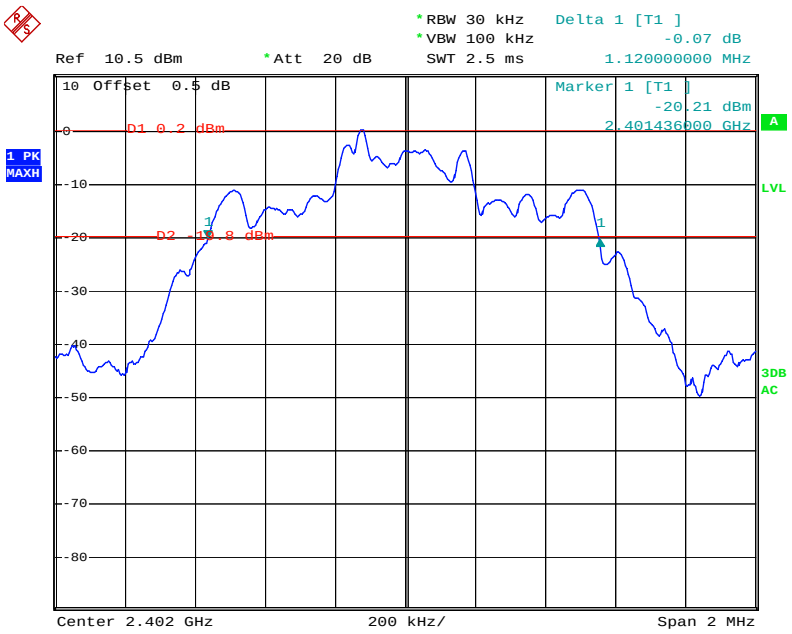
Date: 15.DEC.2011 12:56:31

EDR Mode(π/4-DQPSK):

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.12
Middle	2441	1.12
High	2480	1.12

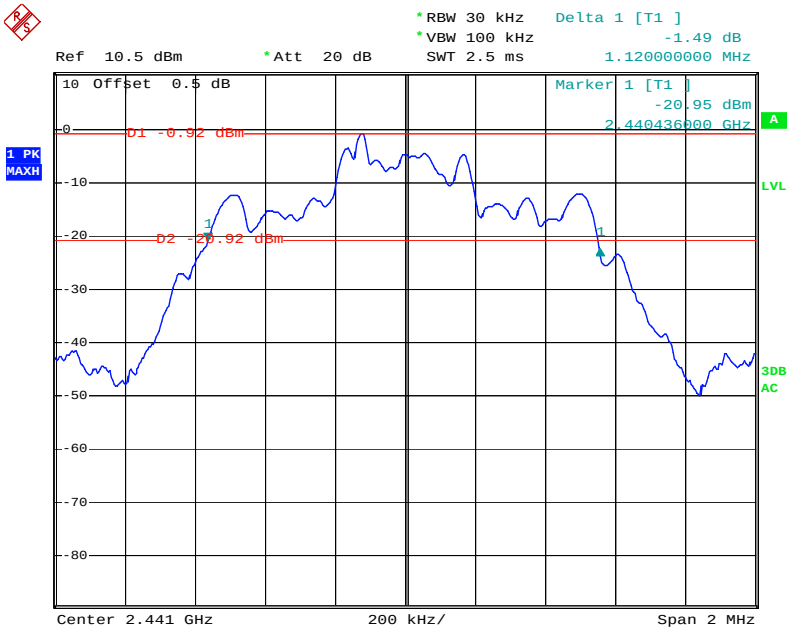
Please refer to the following plots.

Low Channel



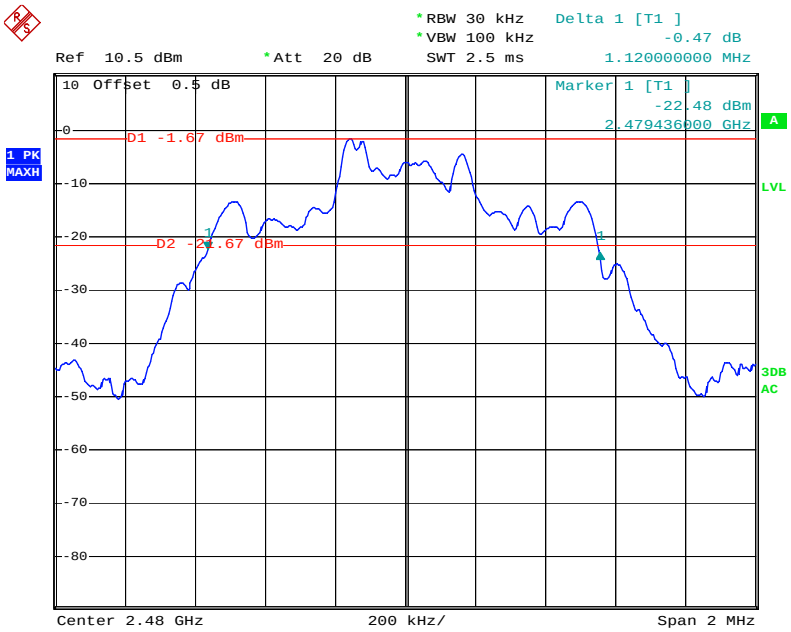
Date: 30.DEC.2011 10:29:42

Middle Channel



Date: 30.DEC.2011 10:28:33

High Channel



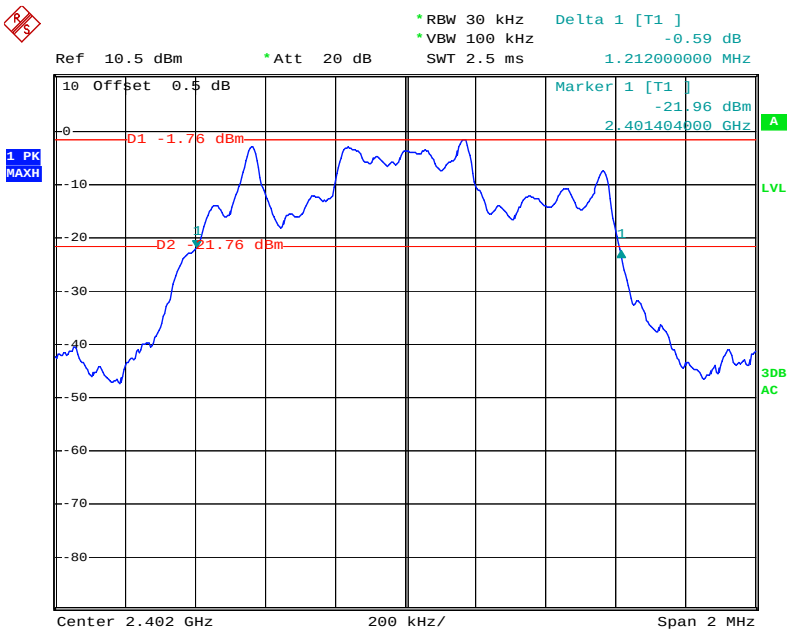
Date: 30.DEC.2011 10:27:20

EDR Mode(8DPSK):

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.212
Middle	2441	1.216
High	2480	1.220

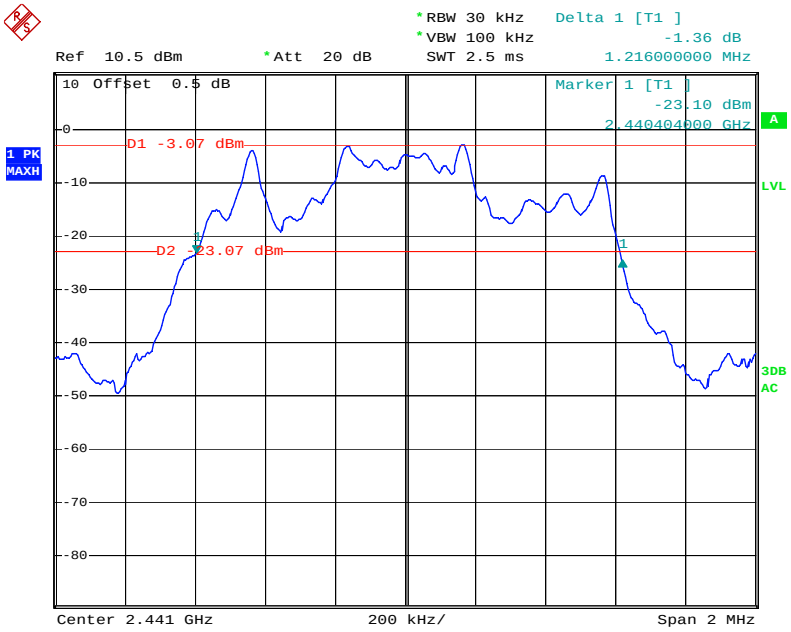
Please refer to the following plots.

Low Channel



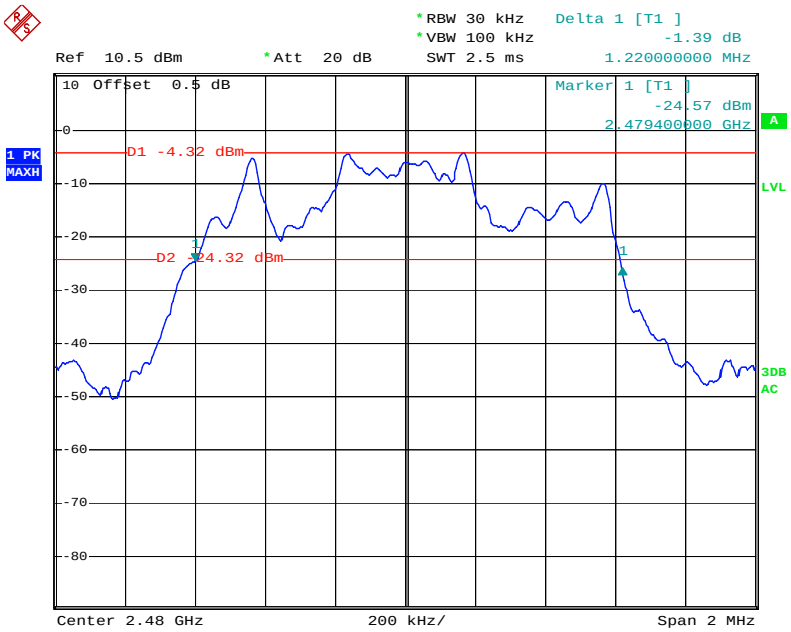
Date: 30.DEC.2011 10:30:46

Middle Channel



Date: 30.DEC.2011 10:31:49

High Channel



Date: 30.DEC.2011 10:33:05

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
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2011-12-07	2012-12-06

*** 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 Dean Lau on 2011-12-30.*

Test Result: Compliance.

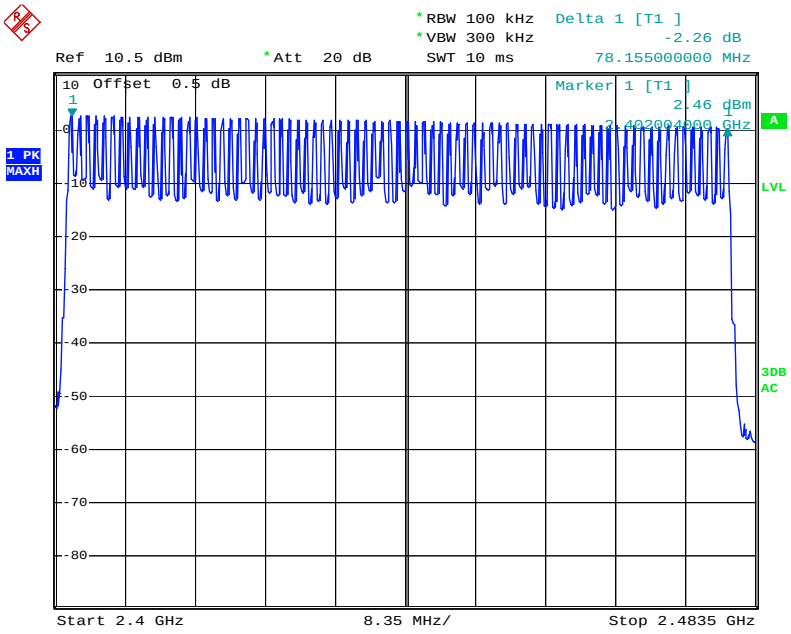
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

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

Number of Hopping Channels

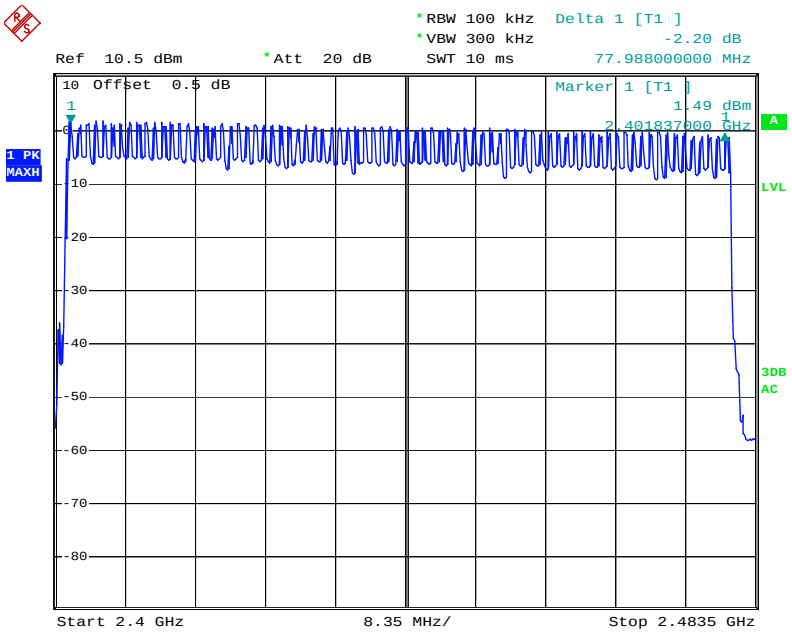


Date: 30.DEC.2011 11:39:45

EDR Mode(π/4-DQPSK):

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

Number of Hopping Channels

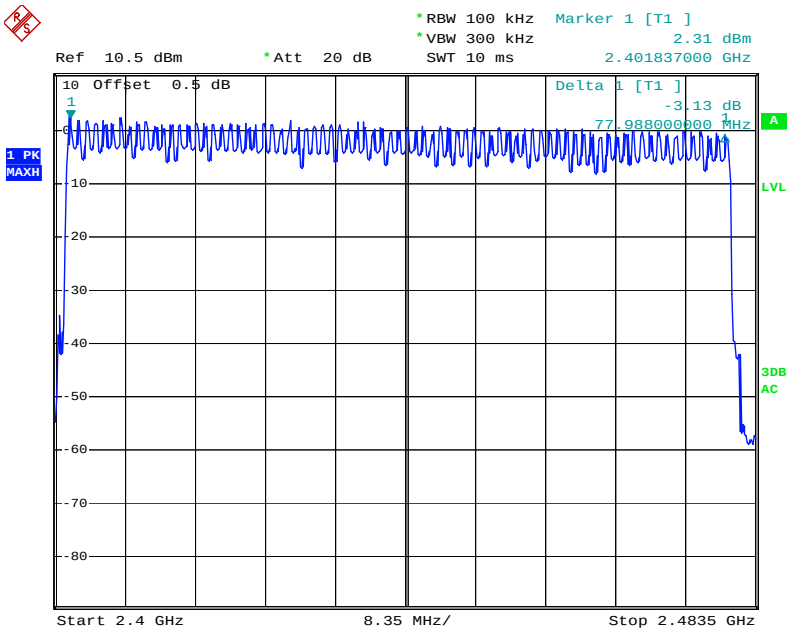


Date: 30.DEC.2011 11:52:50

EDR Mode(8DPSK):

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

Number of Hopping Channels



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

Applicable Standard

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

Test Procedure

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 * 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
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2011-12-07	2012-12-06

*** 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 Dean Lau on 2011-12-30.*

Test Result: Compliance.

Please refer to following tables and plots

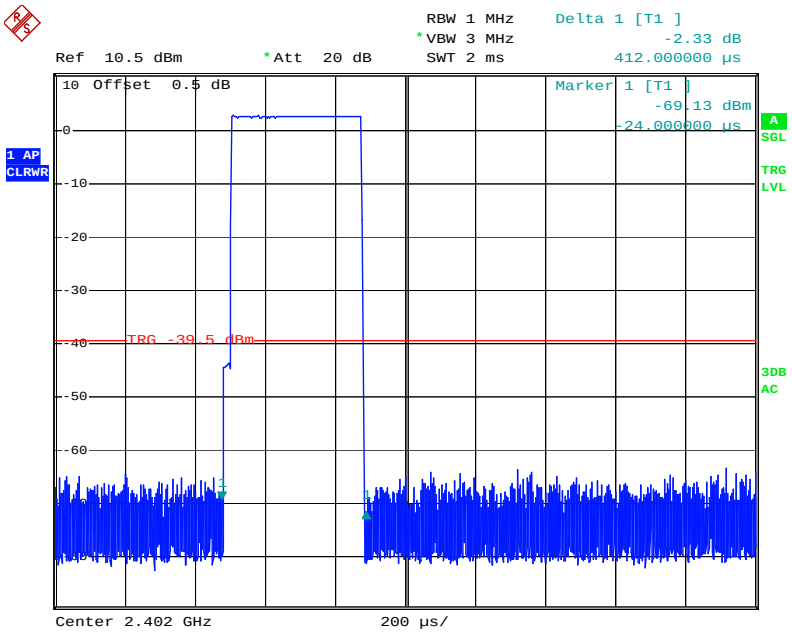
Test Mode: Transmitting

BDR Mode (GFSK):

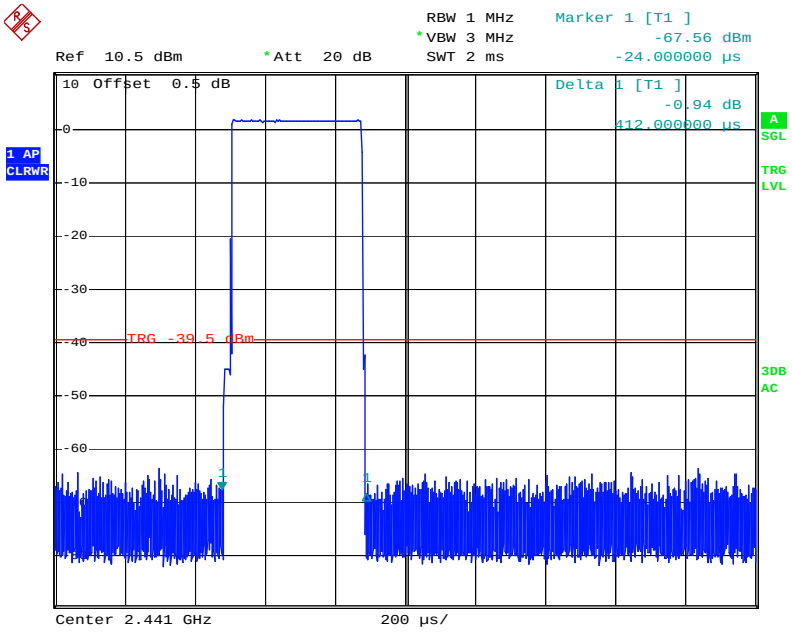
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.412	0.132	0.4	Pass
	Middle	0.412	0.132	0.4	Pass
	High	0.412	0.132	0.4	Pass
	Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
DH 3	Low	1.68	0.269	0.4	Pass
	Middle	1.68	0.269	0.4	Pass
	High	1.68	0.269	0.4	Pass
	Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
DH 5	Low	2.96	0.316	0.4	Pass
	Middle	2.96	0.316	0.4	Pass
	High	2.96	0.316	0.4	Pass
	Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				

Please refer to the following plots.

Low Channel for DH1

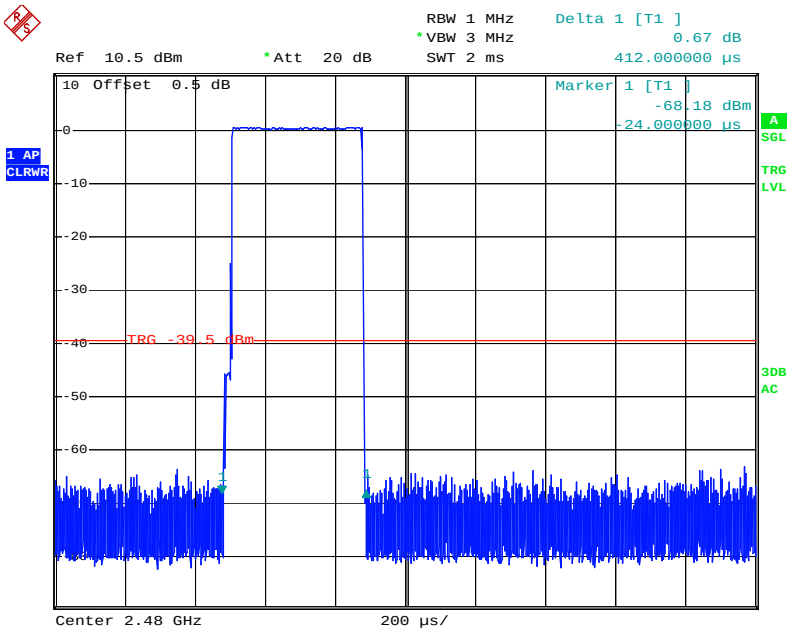


Middle Channel for DH1



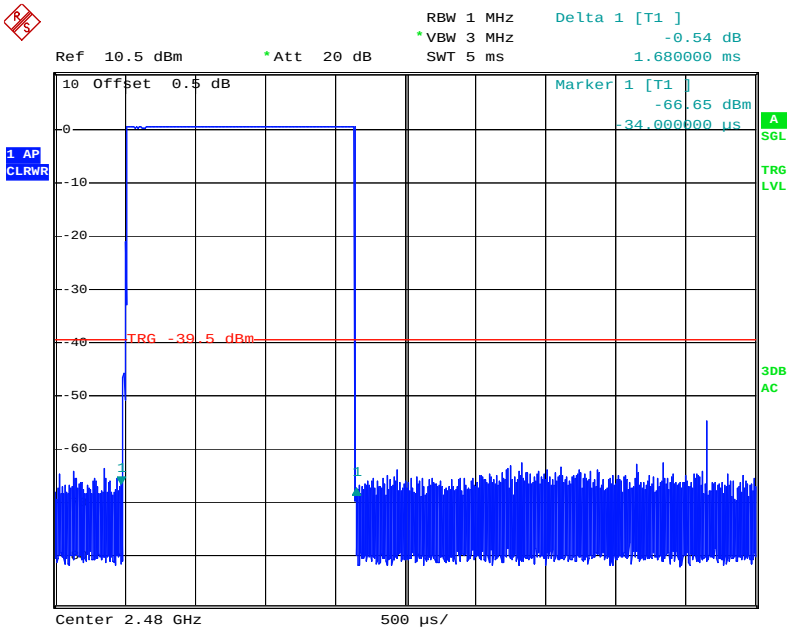
Date: 30.DEC.2011 11:18:58

High Channel for DH1



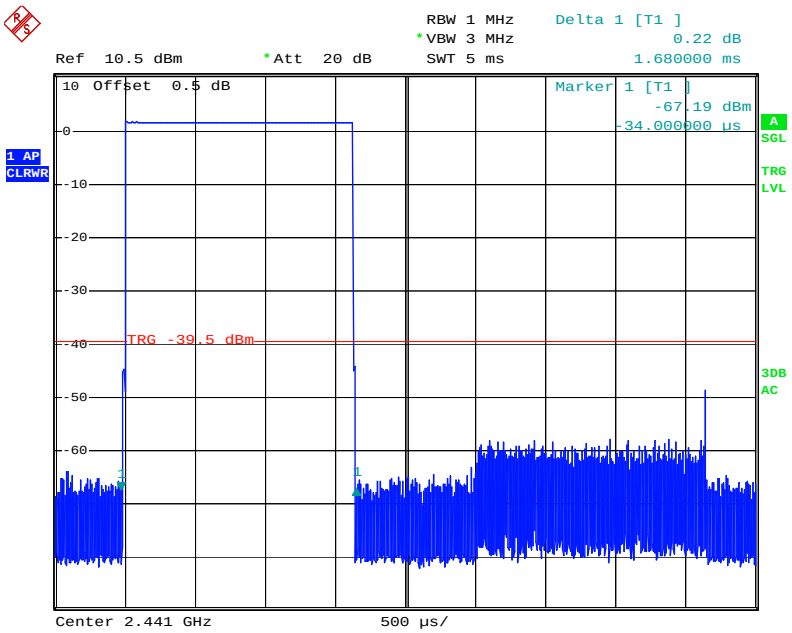
Date: 30.DEC.2011 11:19:27

Low Channel for DH3



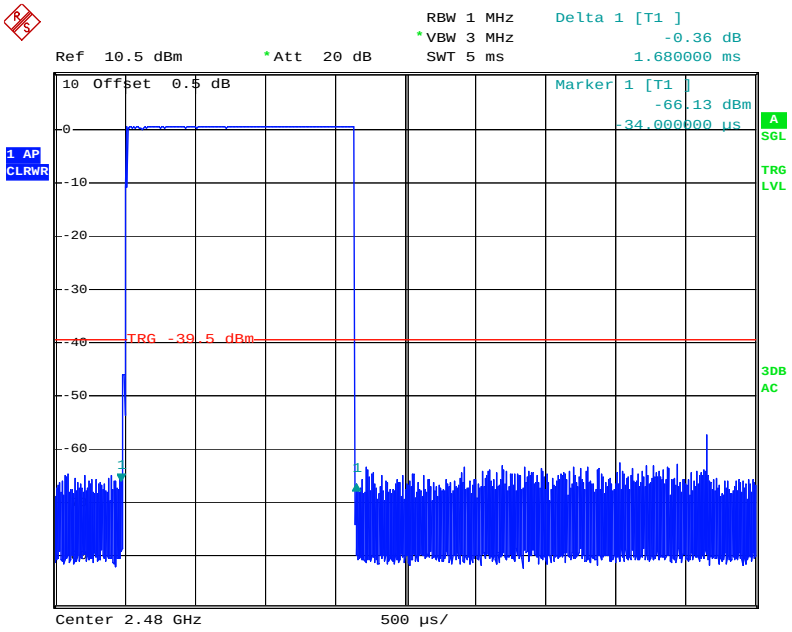
Date: 30.DEC.2011 11:23:49

Middle Channel for DH3



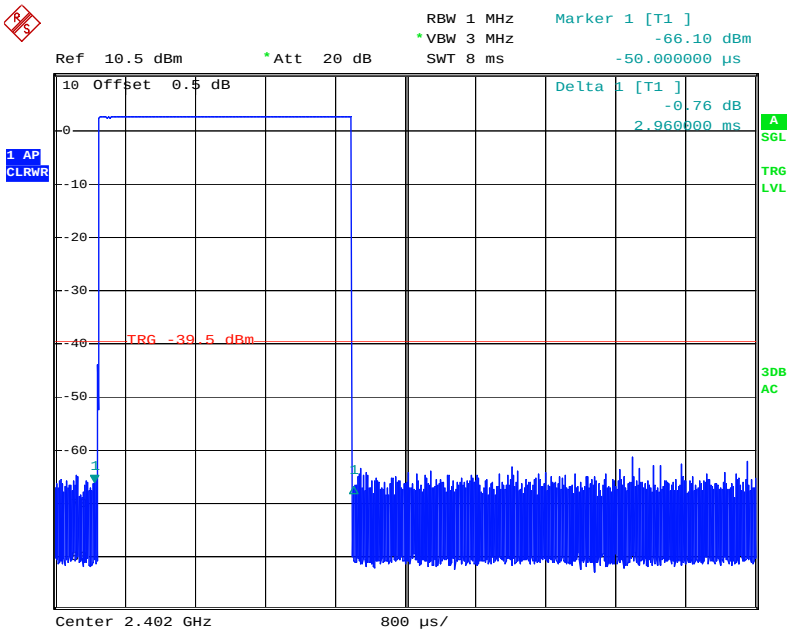
Date: 30.DEC.2011 11:24:30

High Channel for DH3



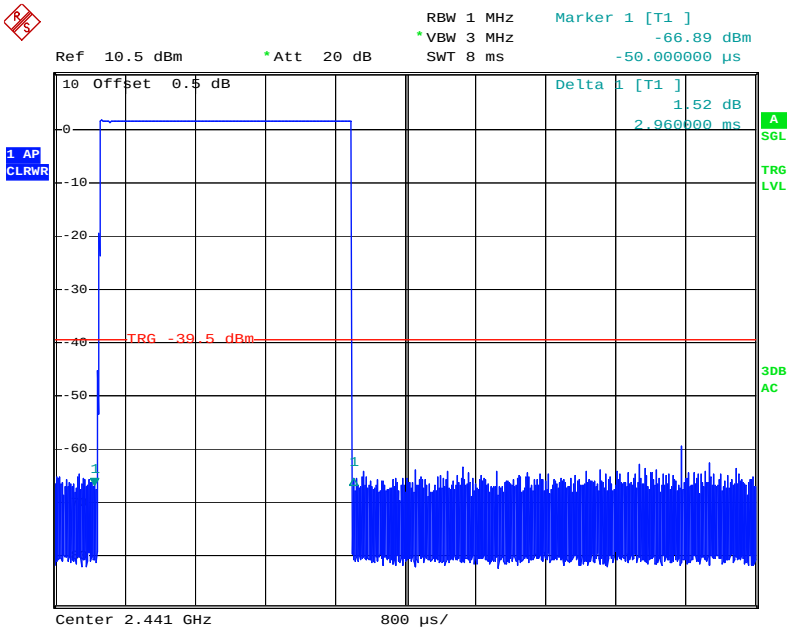
Date: 30.DEC.2011 11:25:15

Low Channel for DH5



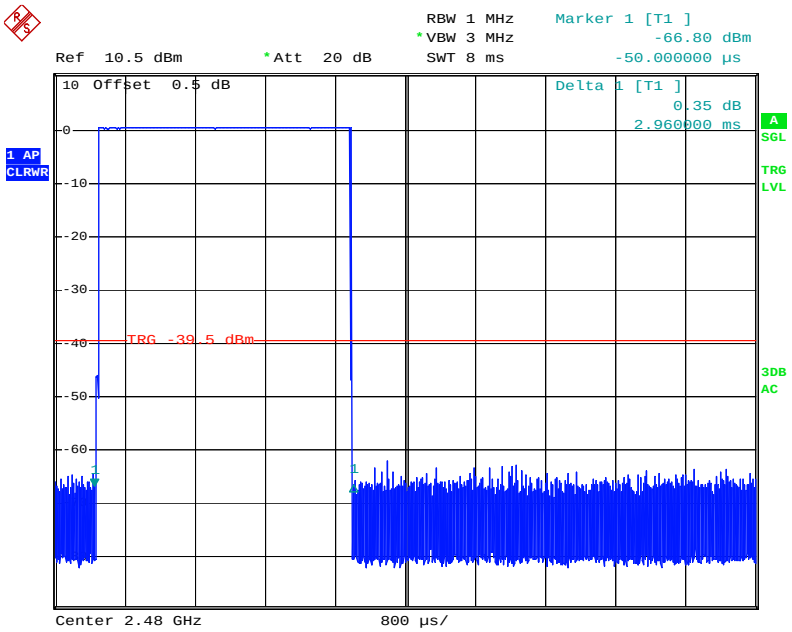
Date: 30.DEC.2011 11:31:09

Middle Channel for DH5



Date: 30.DEC.2011 11:30:41

High Channel for DH5



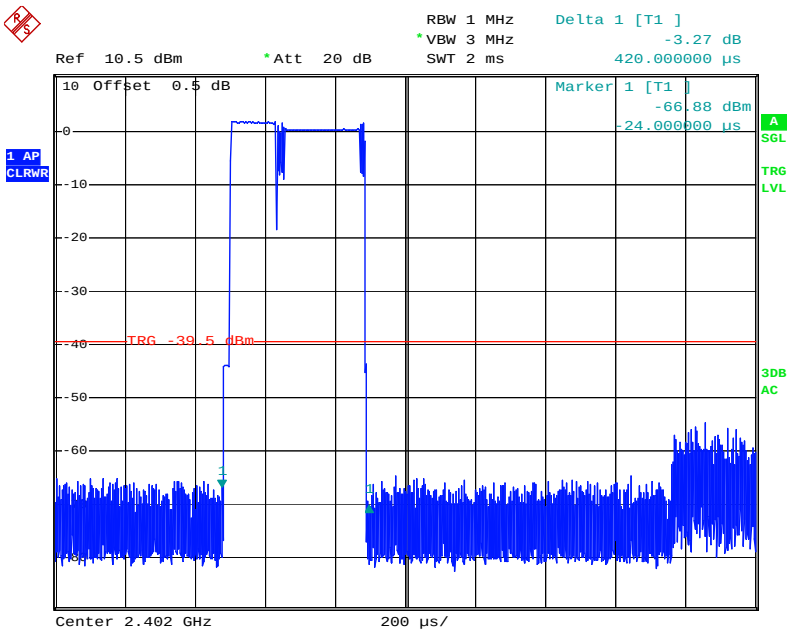
Date: 30.DEC.2011 11:30:22

EDR Mode (π/4-DQPSK):

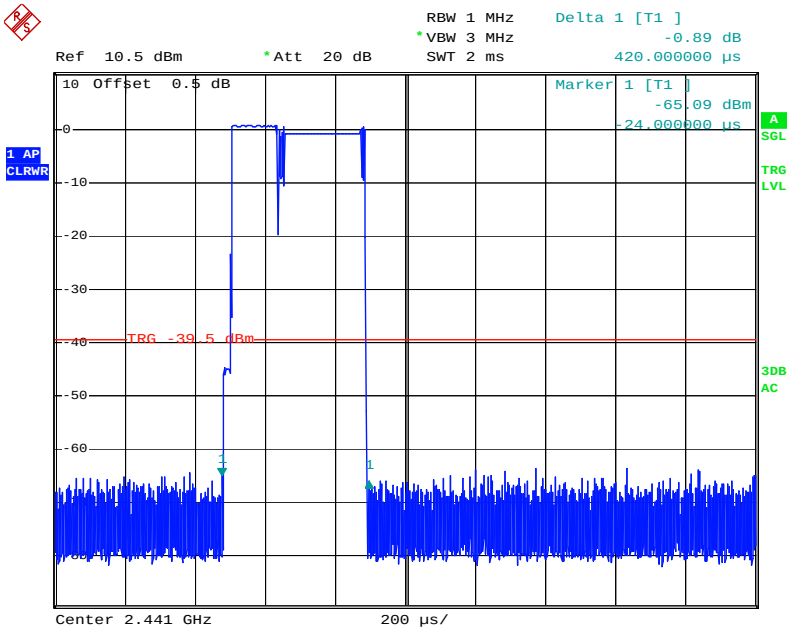
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.420	0.134	0.4	Pass
	Middle	0.420	0.134	0.4	Pass
	High	0.416	0.133	0.4	Pass
	Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
DH 3	Low	1.68	0.269	0.4	Pass
	Middle	1.68	0.269	0.4	Pass
	High	1.68	0.269	0.4	Pass
	Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
DH 5	Low	2.960	0.316	0.4	Pass
	Middle	2.944	0.314	0.4	Pass
	High	2.944	0.314	0.4	Pass
	Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				

Please refer to the following plots.

Low Channel for DH1

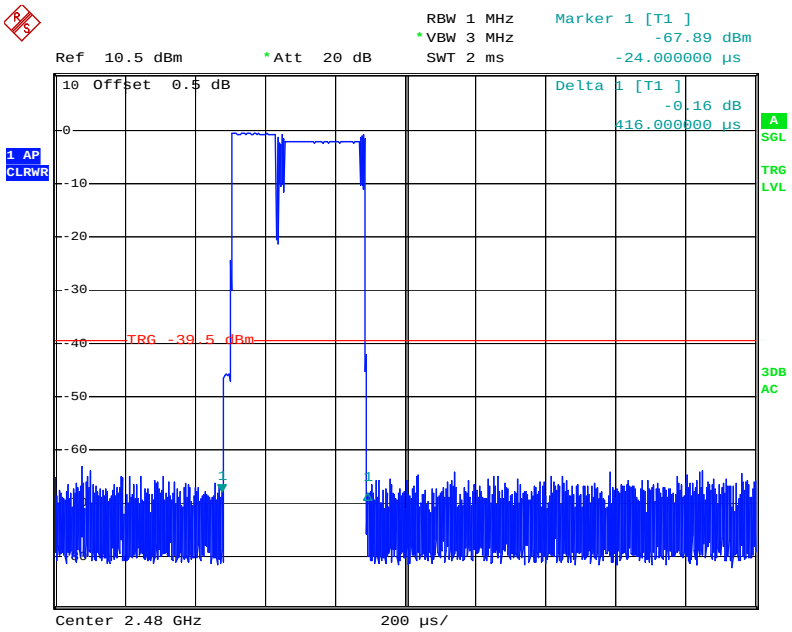


Middle Channel for DH1



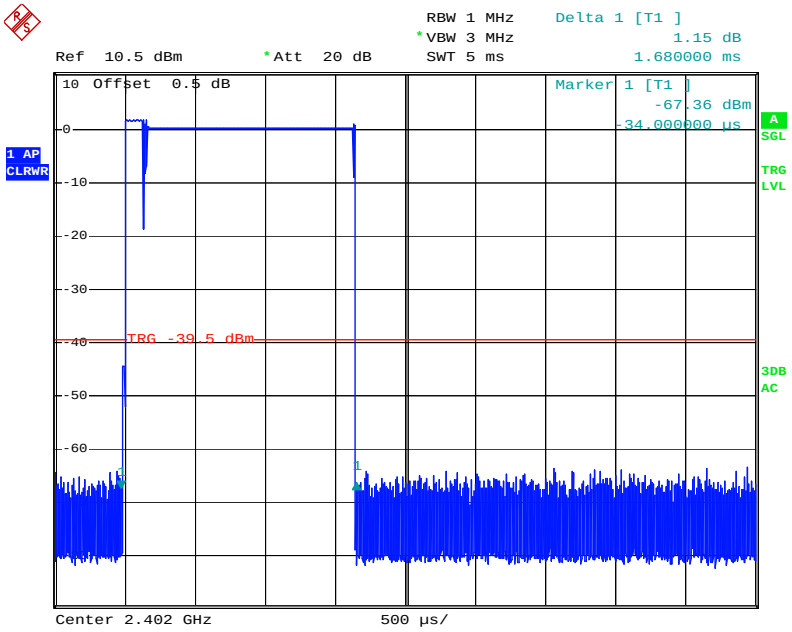
Date: 30.DEC.2011 11:21:16

High Channel for DH1



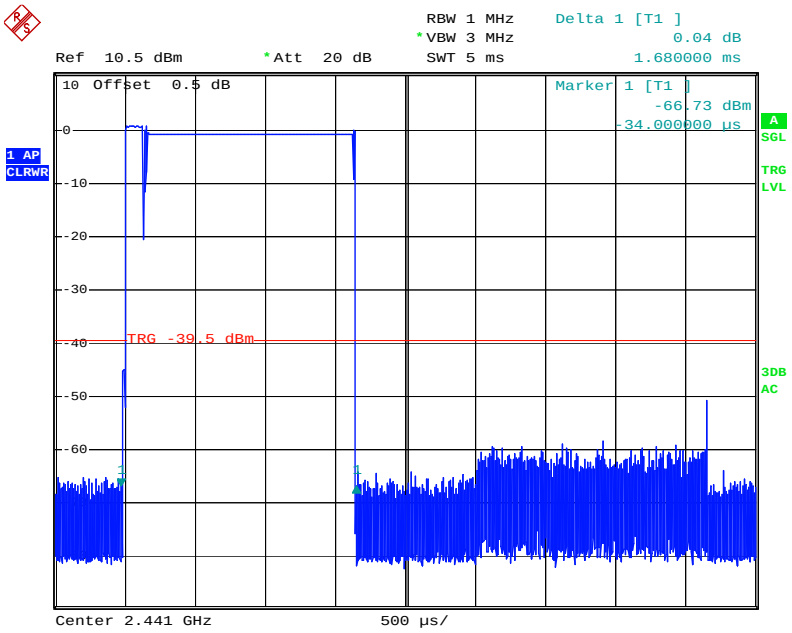
Date: 30.DEC.2011 11:20:11

Low Channel for DH3



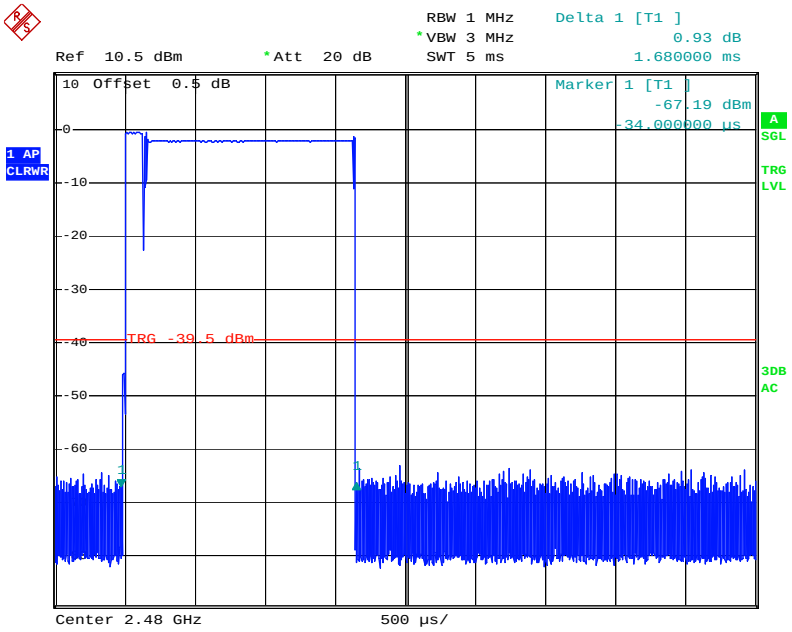
Date: 30.DEC.2011 11:27:02

Middle Channel for DH3



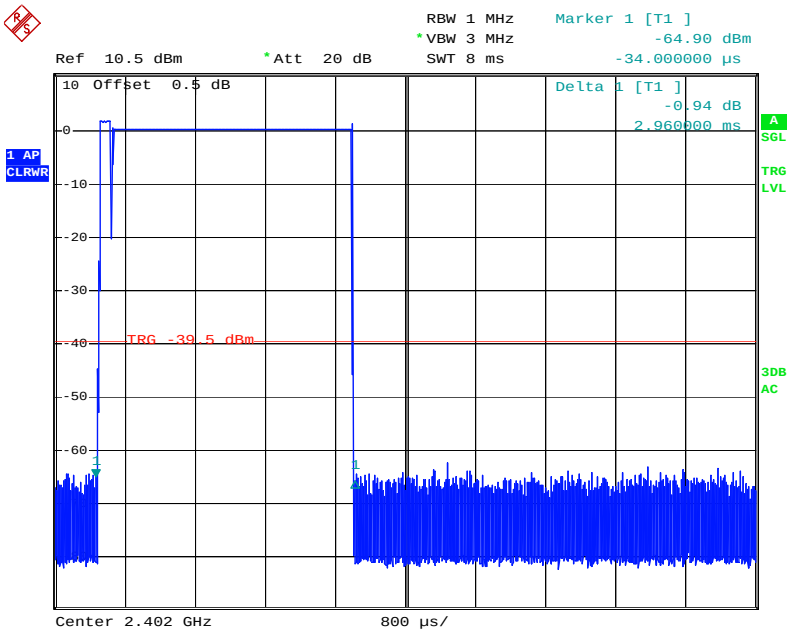
Date: 30.DEC.2011 11:26:28

High Channel for DH3



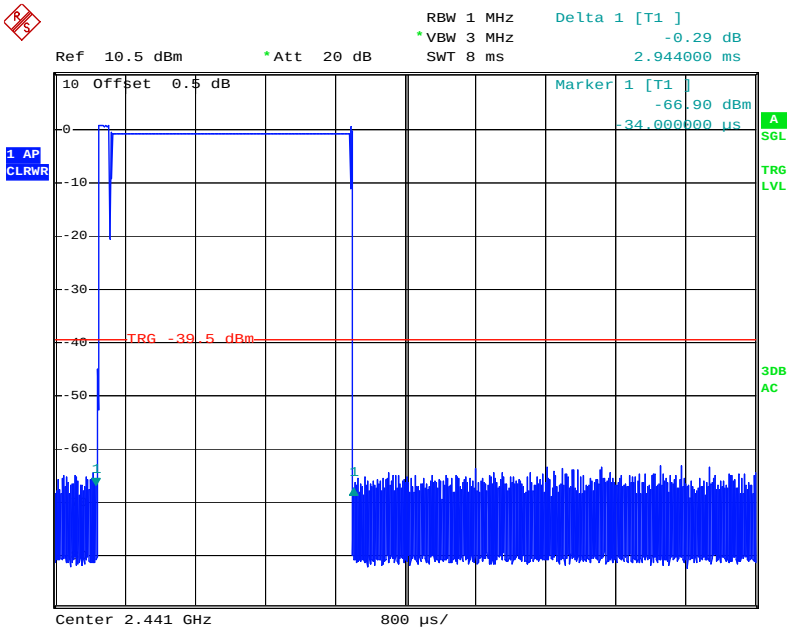
Date: 30.DEC.2011 11:25:47

Low Channel for DH5



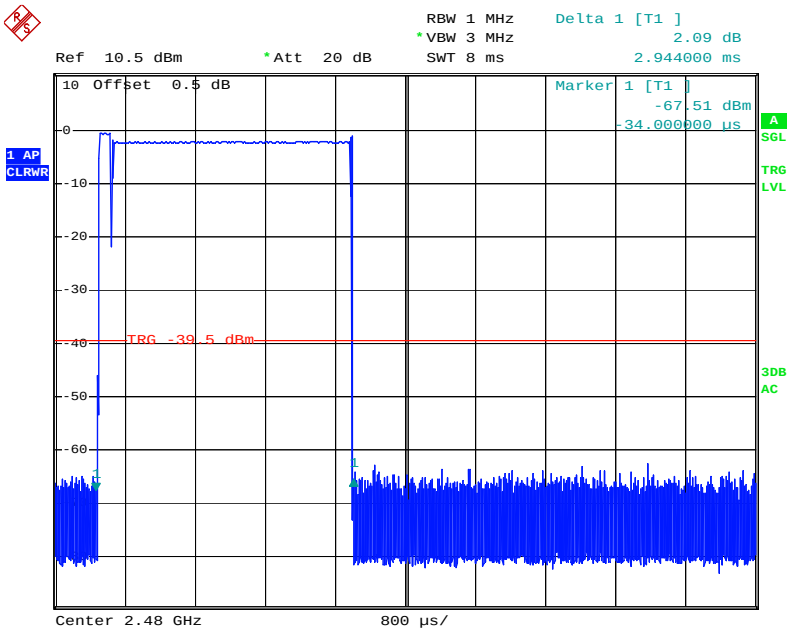
Date: 30.DEC.2011 11:31:38

Middle Channel for DH5



Date: 30.DEC.2011 11:32:16

High Channel for DH5



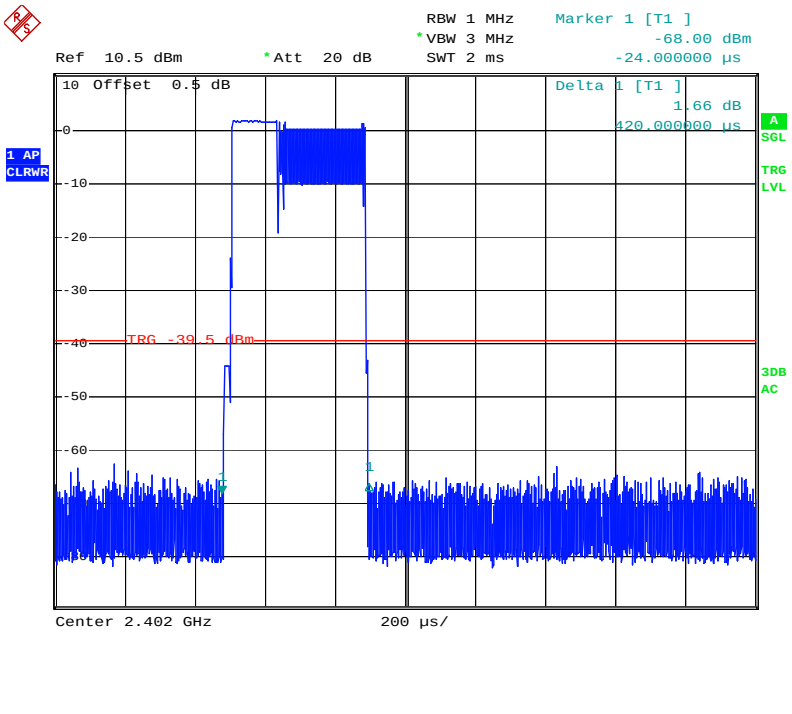
Date: 30.DEC.2011 11:32:47

EDR Mode (8DPSK):

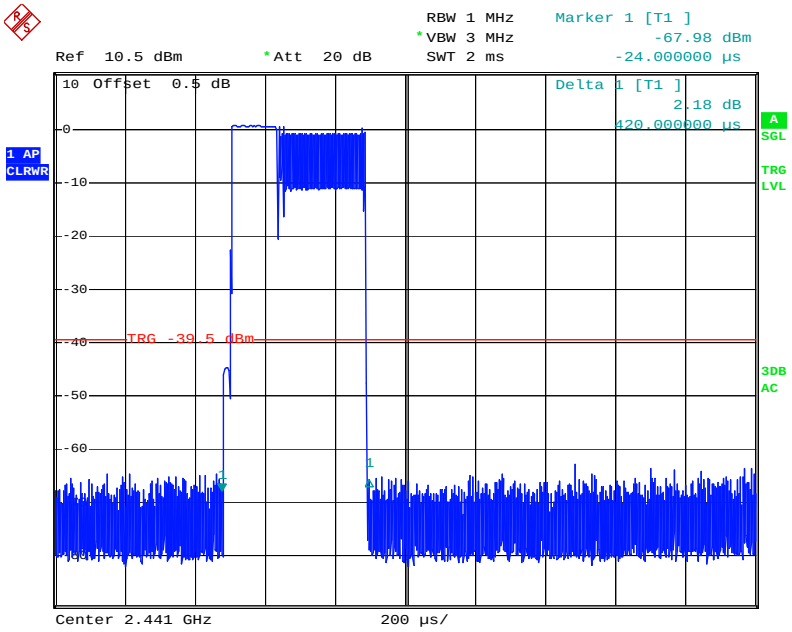
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.42	0.134	0.4	Pass
	Middle	0.42	0.134	0.4	Pass
	High	0.42	0.134	0.4	Pass
	Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
DH 3	Low	1.68	0.269	0.4	Pass
	Middle	1.68	0.269	0.4	Pass
	High	1.68	0.269	0.4	Pass
	Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
DH 5	Low	2.96	0.316	0.4	Pass
	Middle	2.944	0.314	0.4	Pass
	High	2.96	0.316	0.4	Pass
	Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				

Please refer to the following plots.

Low Channel for DH1

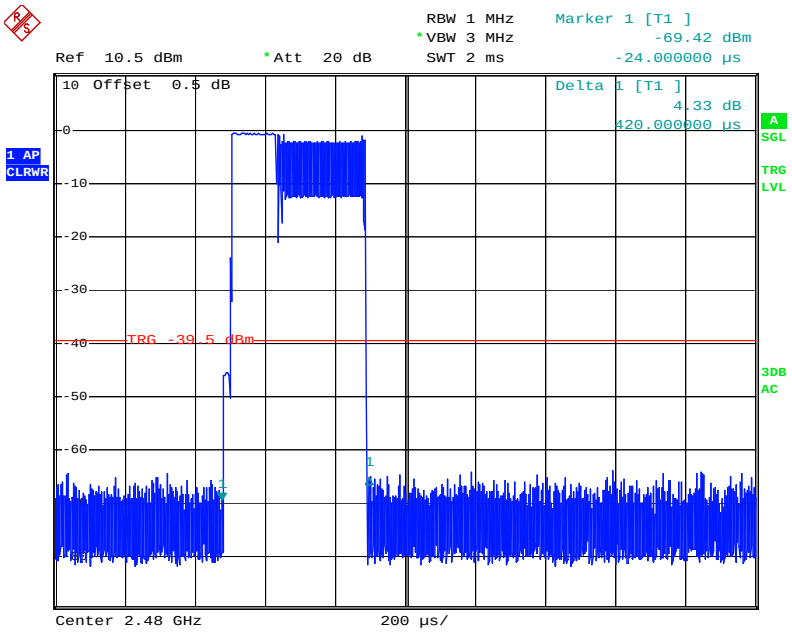


Middle Channel for DH1



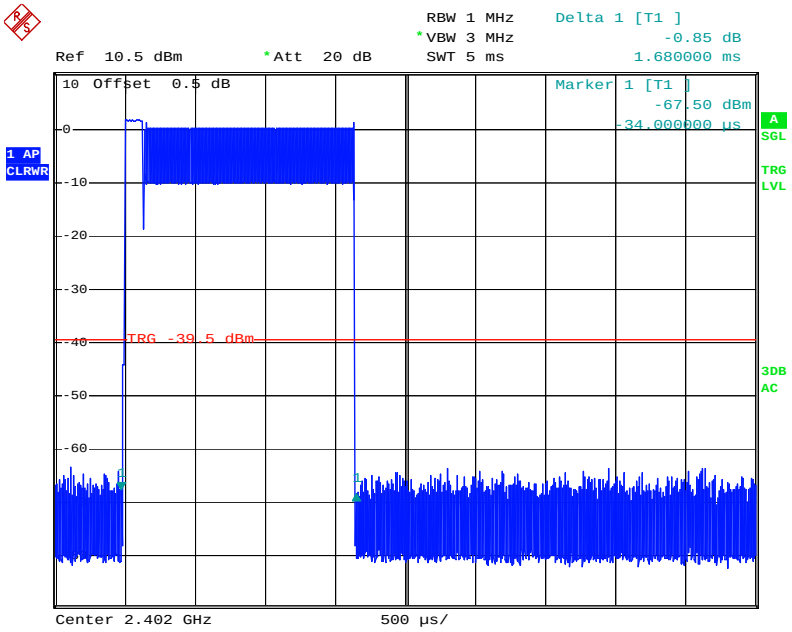
Date: 30.DEC.2011 11:22:28

High Channel for DH1



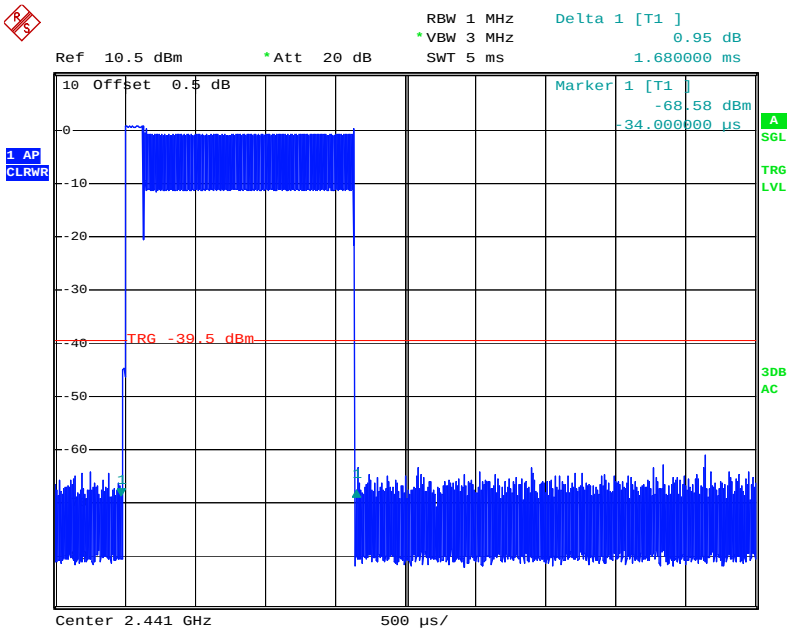
Date: 30.DEC.2011 11:22:58

Low Channel for DH3



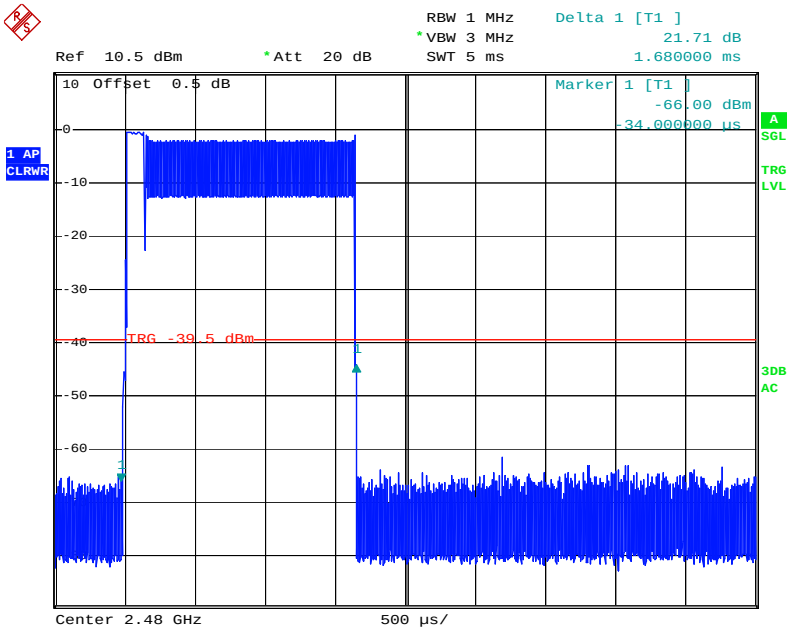
Date: 30.DEC.2011 11:27:37

Middle Channel for DH3



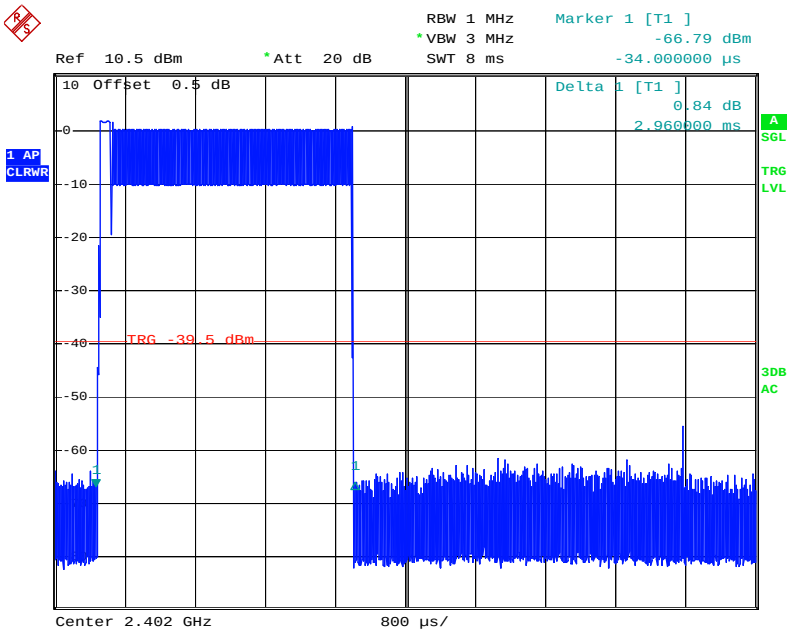
Date: 30.DEC.2011 11:28:32

High Channel for DH3



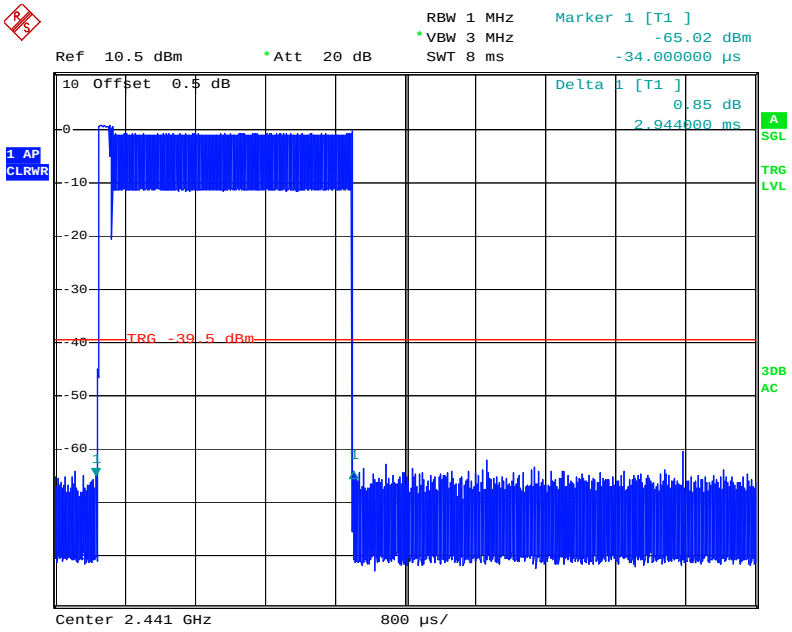
Date: 30.DEC.2011 11:28:59

Low Channel for DH5



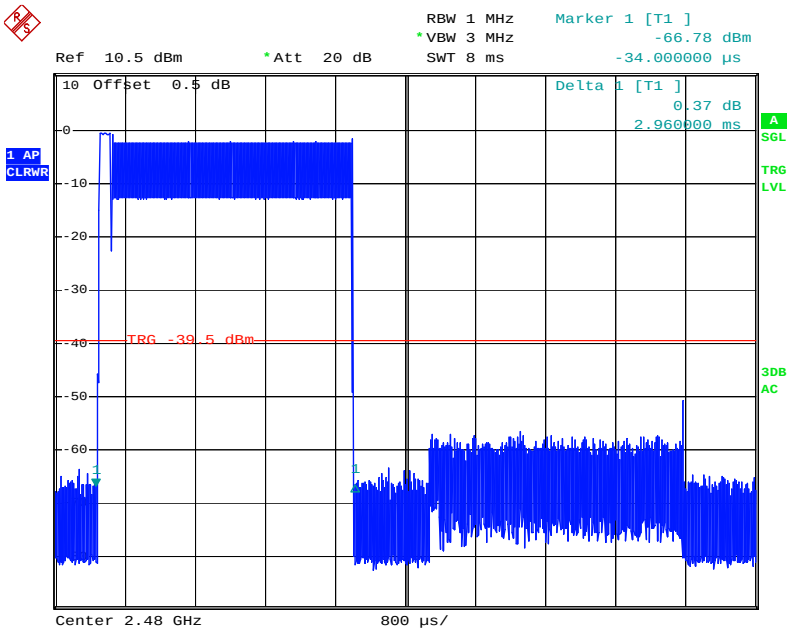
Date: 30.DEC.2011 11:34:46

Middle Channel for DH5



Date: 30.DEC.2011 11:34:16

High Channel for DH5



Date: 30.DEC.2011 11:33:37

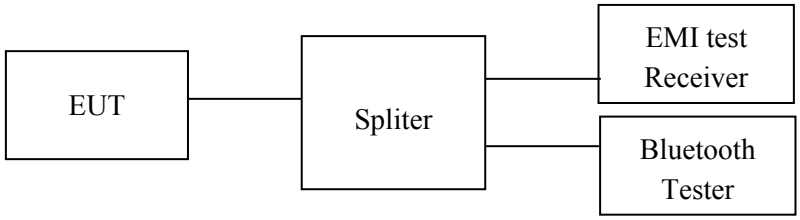
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

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
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2011-12-07	2012-12-06

*** 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 Dean Lau on 2011-12-19.*

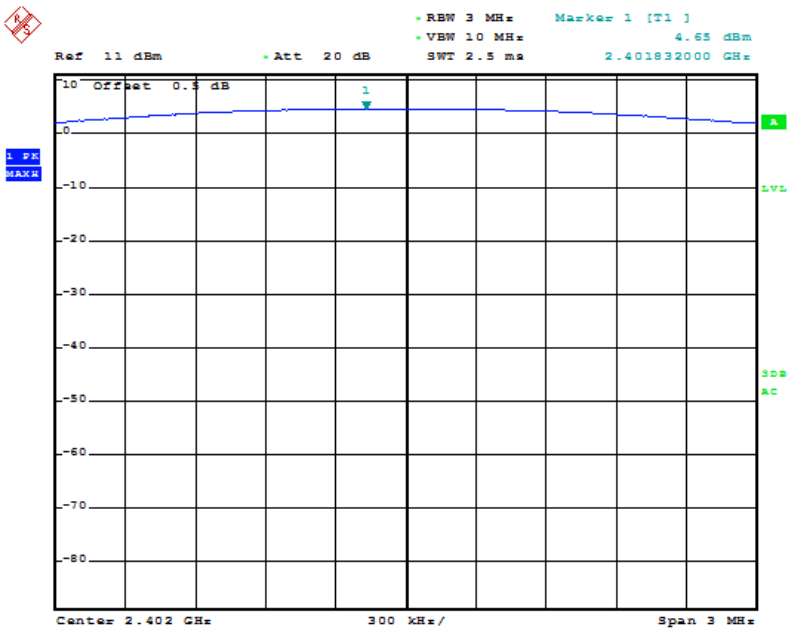
Test Result: Compliance.

Test Mode: Transmitting

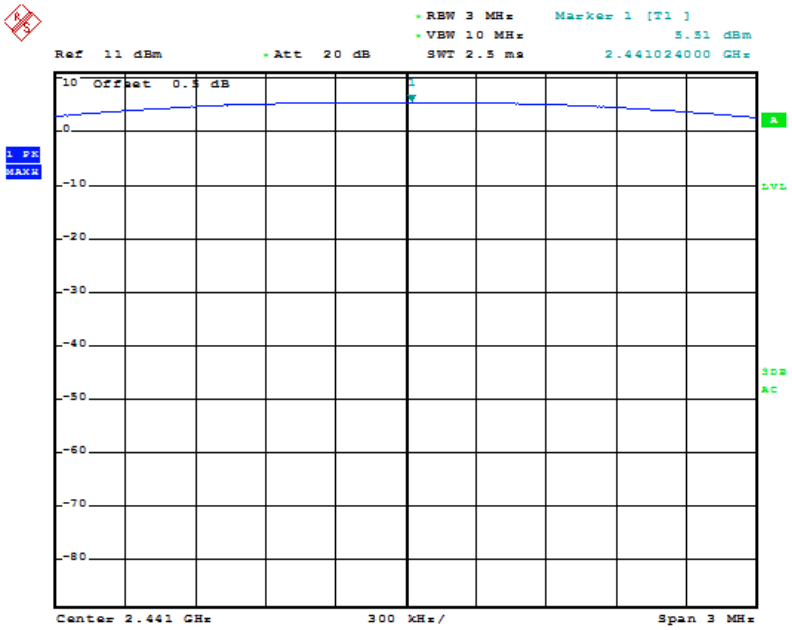
BDR Mode (GFSK):

Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	4.65	2.917	1000
Middle	2441	5.51	3.556	1000
High	2480	6.79	4.775	1000

Low Channel

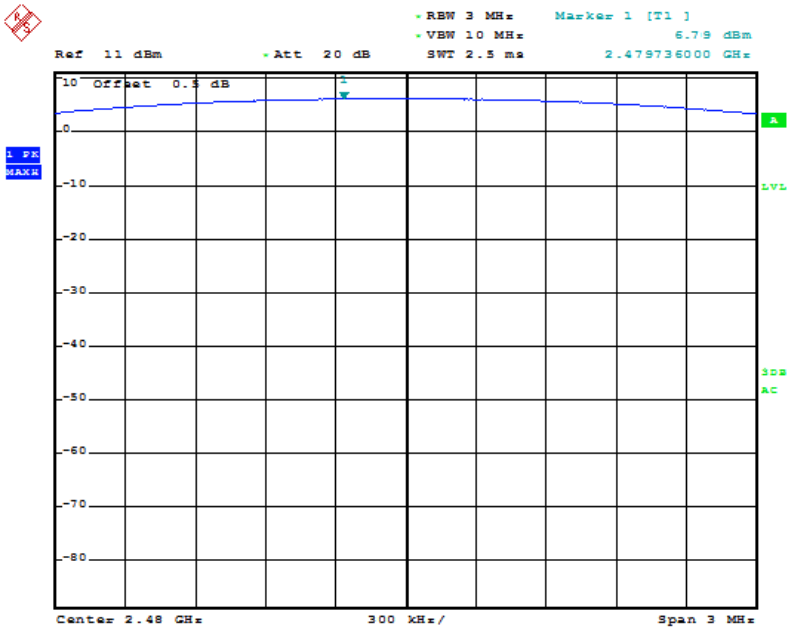


Middle Channel



Date: 19.DEC.2011 05:46:03

High Channel

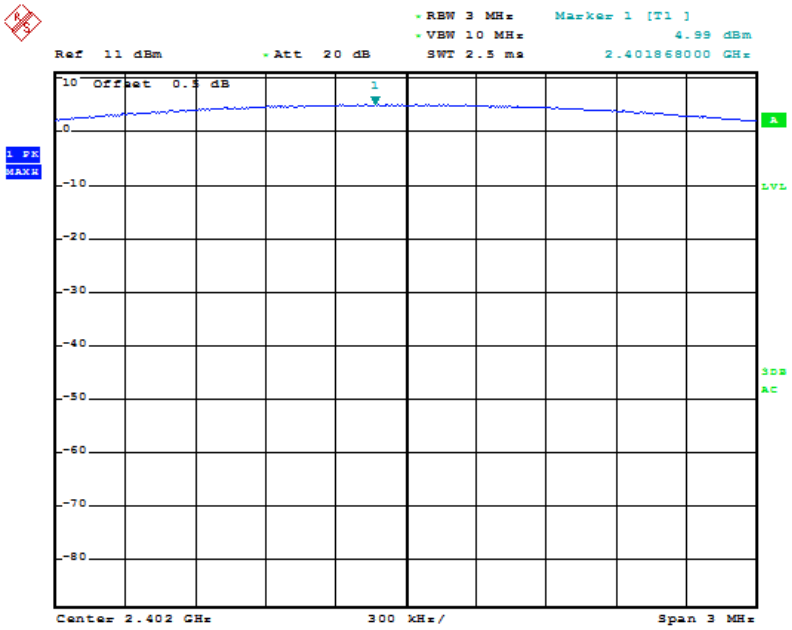


Date: 19.DEC.2011 05:47:30

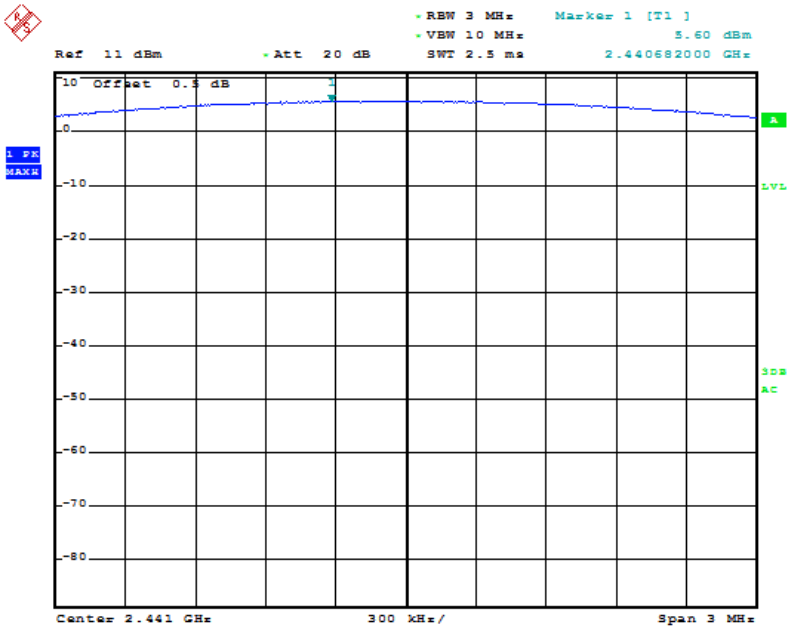
EDR Mode (π/4-DQPSK):

Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	4.99	3.155	1000
Middle	2441	5.60	3.631	1000
High	2480	6.36	4.325	1000

Low Channel

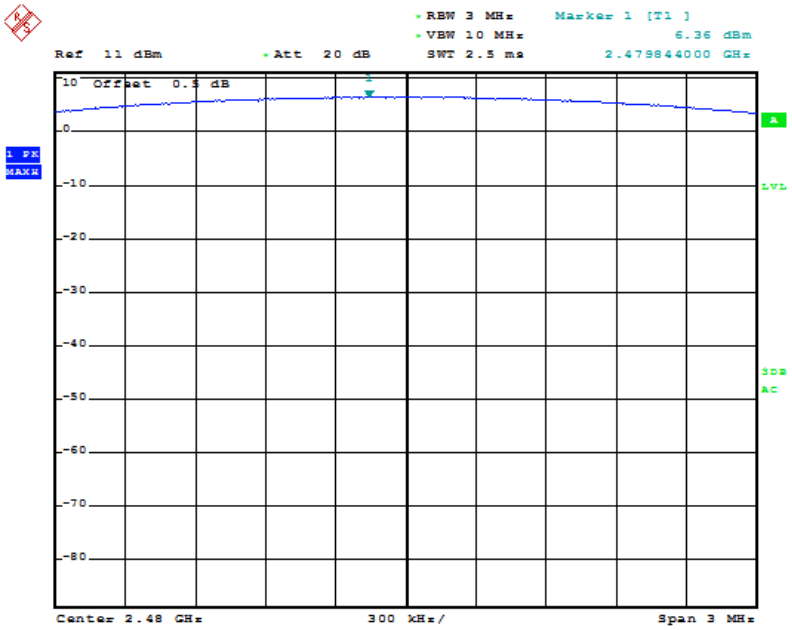


Middle Channel



Date: 19.DEC.2011 07:10:53

High Channel

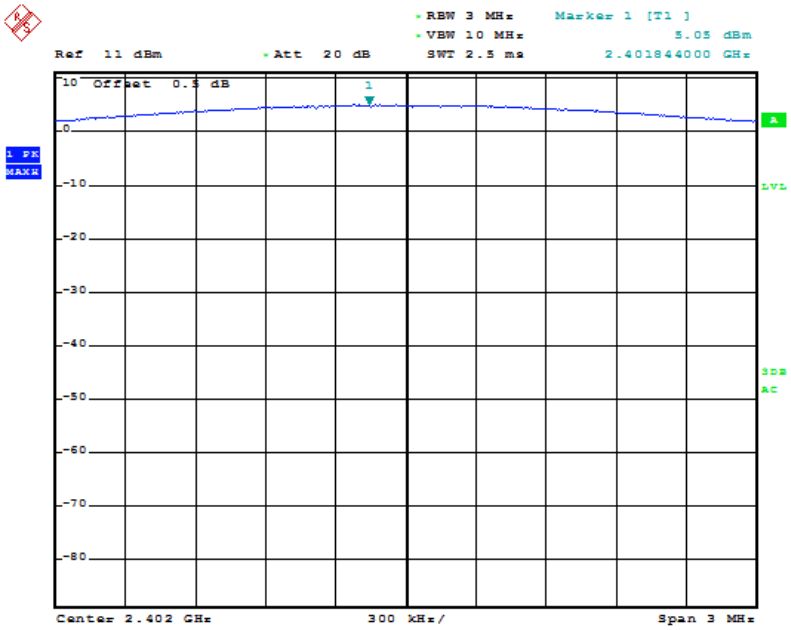


Date: 19.DEC.2011 07:09:57

EDR Mode (8DPSK):

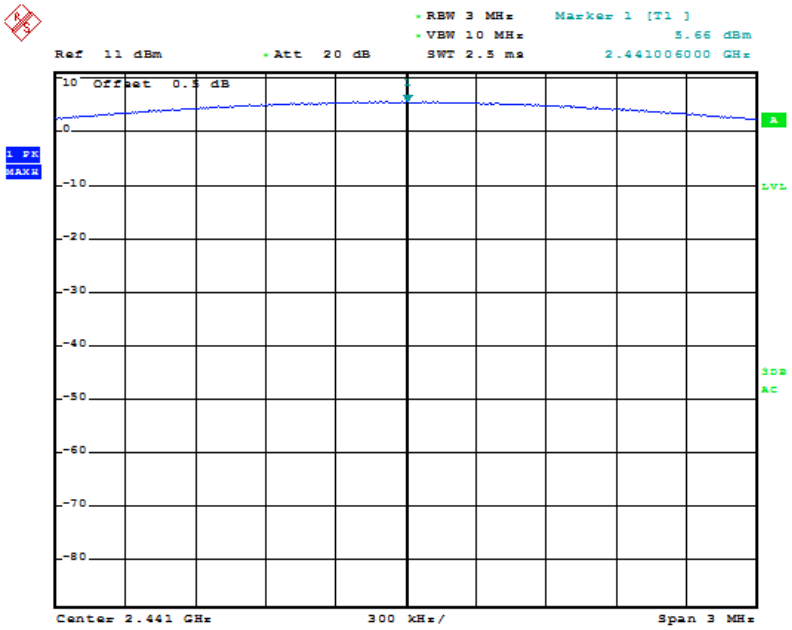
Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	5.05	3.199	1000
Middle	2441	5.66	3.681	1000
High	2480	6.33	4.295	1000

Low Channel



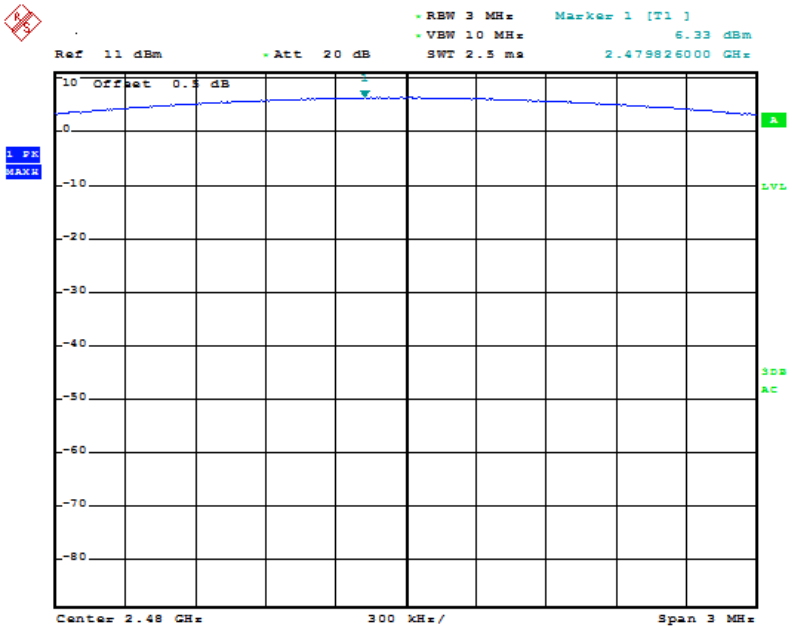
Date: 19.DEC.2011 07:50:27

Middle Channel



Date: 19.DEC.2011 07:51:08

High Channel



Date: 19.DEC.2011 07:52:06

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 an EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2011-12-07	2012-12-06

*** 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 Dean Lau on 2011-12-31.*

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)
2351.800	58.89	20
2488.296	56.22	20

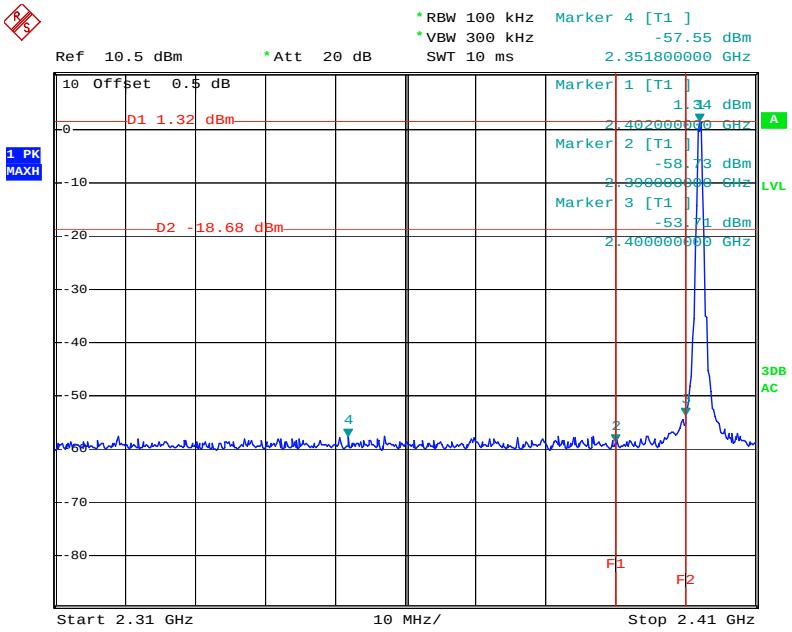
EDR Mode (π/4-DQPSK):

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2363.800	58.02	20
2496.168	55.55	20

EDR Mode (8DPSK):

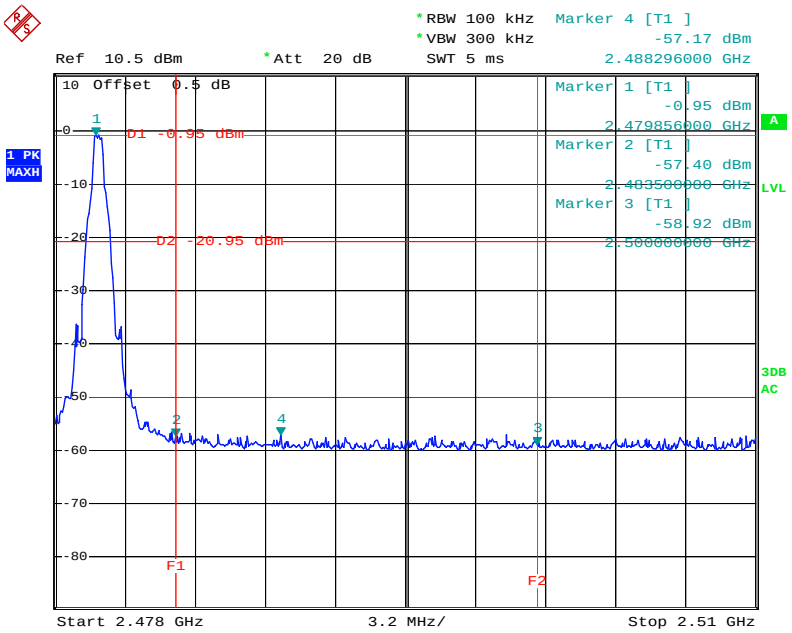
Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2355.800	58.04	20
2492.072	56.08	20

GFSK - Band Edge: Left Side



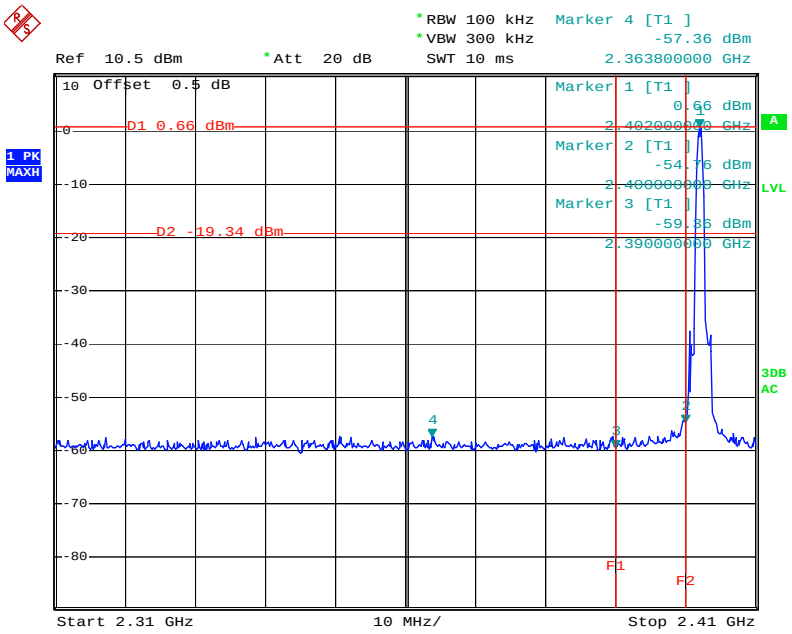
Date: 31.DEC.2011 15:49:13

GFSK - Band Edge: Right Side



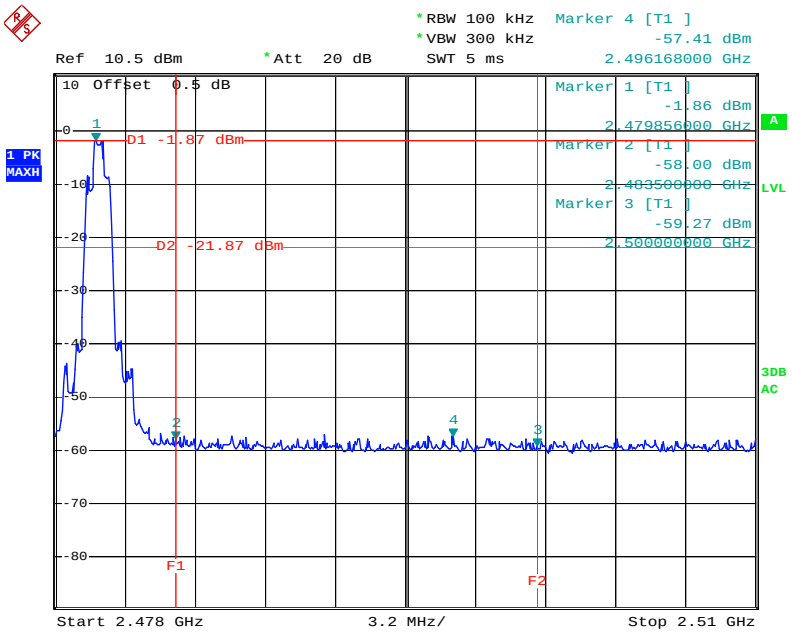
Date: 31.DEC.2011 15:52:51

π/4-DQPSK - Band Edge: Left Side



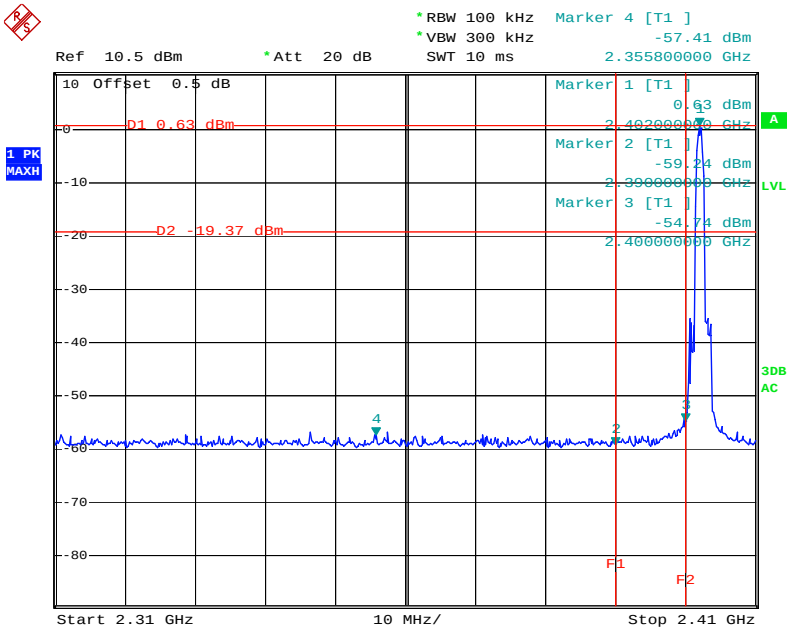
Date: 31.DEC.2011 16:50:52

π/4-DQPSK - Band Edge: Right Side



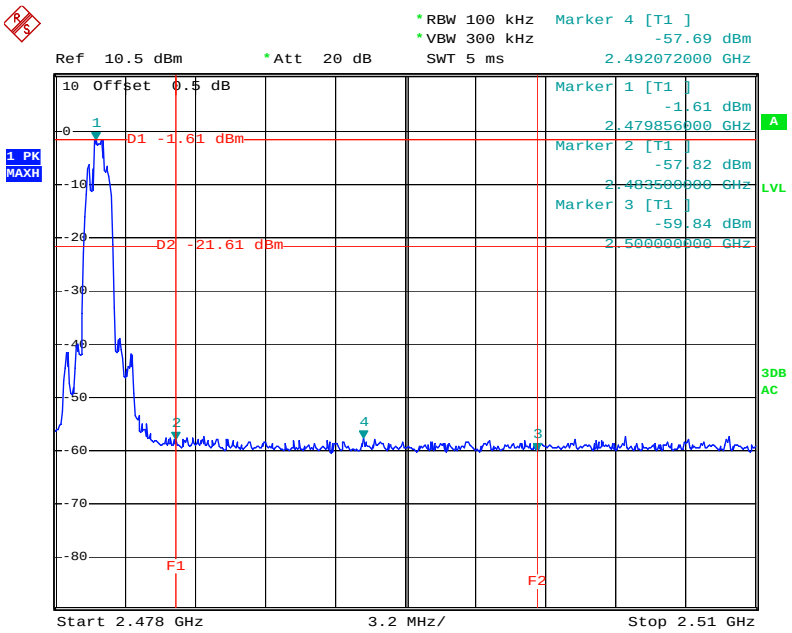
Date: 31.DEC.2011 15:54:06

8DPSK - Band Edge: Left Side



Date: 31.DEC.2011 15:46:35

8DPSK - Band Edge: Right Side



Date: 31.DEC.2011 15:55:33

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