

**FCC PART 15.247
TEST REPORT**

For

Victorwood Holdings Limited

Unit 15, 8/F., Block B, Sun Fung Centre, 88 Kwok Shui Road, Kwai Chung, N.T., Hong Kong, China

FCC ID: T5HBS-207

Report Type: Original Report	Product Type: Bluetooth Stereo Speaker
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Victorwood Holdings Limited*'s product, model number: *BS-207 (FCC ID: T5HBS-207)* or the "EUT" in this report was a *Bluetooth Stereo Speaker*, which was measured approximately: 20.4 cm (L) x 6.0 cm (W) x 5.2 cm (H), rated input voltage: DC 3.7 V battery.

** All measurement and test data in this report was gathered from production sample serial number: 1210117 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2012-10-26.*

Objective

This test report is prepared on behalf of *Victorwood Holdings Limited* 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 compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

N/A

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.

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 a testing mode which was controlled by bluetooth tester.

EUT Exercise Software

Test software supplied by client.

Equipment Modifications

No modification was made to the EUT tested.

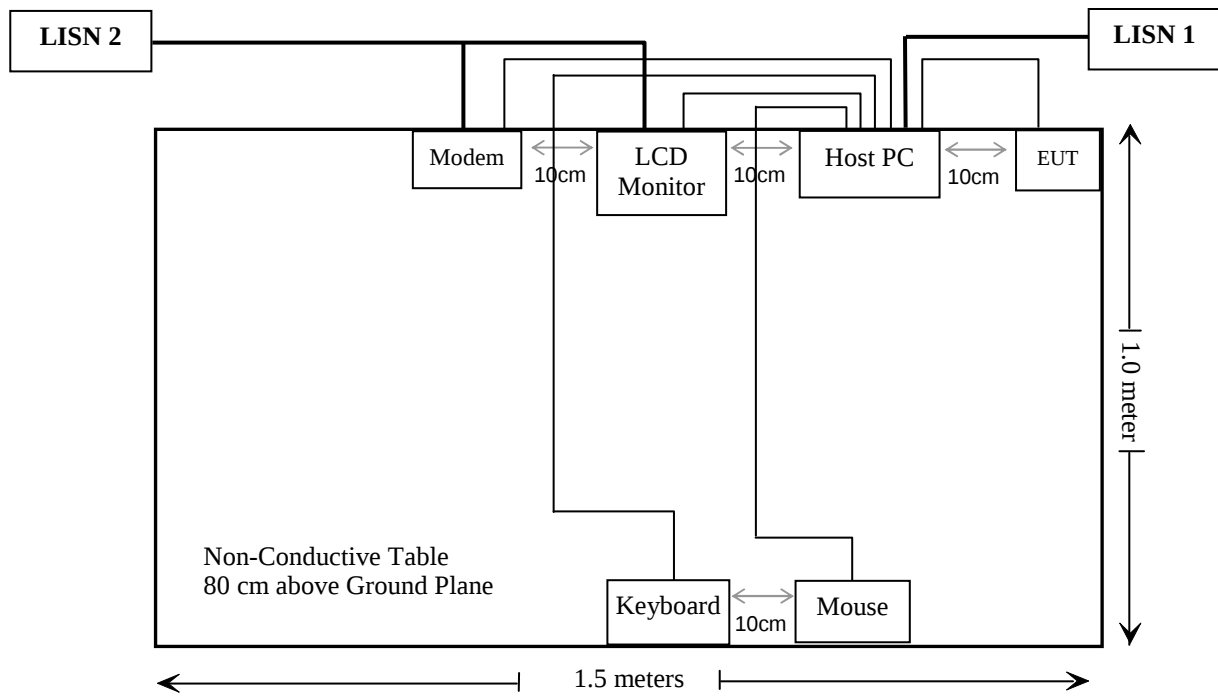
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Host PC	VOSTRO 220S	127BP2X
DELL	Keyboard	L100	CNORH656658907BL04TY
DELL	Mouse	MOC5UO	G1B0096D
DELL	LCD Monitor	E178WFPC	CN-OWY564-64180-7C4-2SQH
HP	Laser Jet5L	C3941A	JPTVOB2337
SAST	Modem	AEM-2100	0293

External I/O Cable

Cable Description	Length (m)	From Port	To
Shielded Detachable K/B Cable	1.5	K/B Port / Host	K/B
Shielded Detachable Mouse Cable	1.5	Mouse Port / Host	Mouse
Shielded Detachable Serial Cable	1.2	Serial Port / Host	Modem
Shielded Detachable VGA Cable	1.5	VGA Port / Host	LCD Monitor
Unshielded Detachable USB Cable	1.0	EUT	Host PC

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliance
§15.247(a)(1)	20 dB Emission 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 FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 Mobile Portable RF Exposure v05, no SAR required if power is lower than the threshold (10mW).

Measurement Result:

Max conducted peak output power (P): 3.12dBm

Antenna Gain: 0 dBi

EIRP = 3.12 dBm

$P_{\text{Max}} = 3.12 \text{ dBm} = 2.051 \text{ mW}$

SAR exempted threshold: 10 mW

$P_{\text{Max}} < 10 \text{ mW}$

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 use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has a component antenna arrangement for bluetooth, which was permanently attached and the gain was 0 dBi, fulfill the requirement of this section. Please refer to the internal photos.

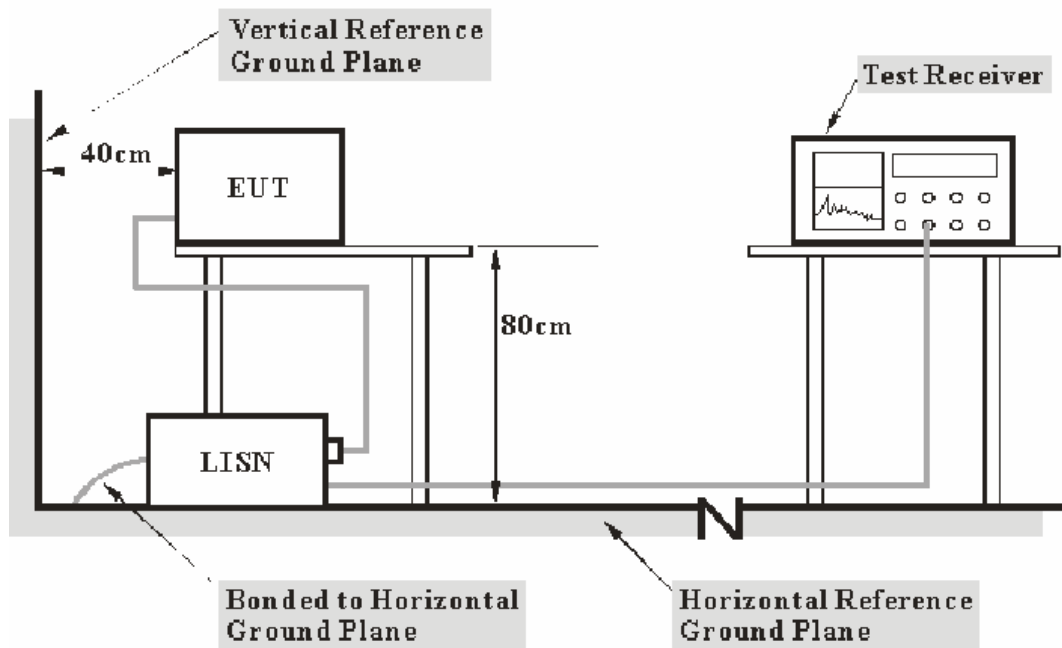
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207

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 measurement procedure of EUT setup is according with ANSI C63.4-2009. The related limit was specified in FCC Part 15.207.

The spacing between the relevant peripherals was 10 cm.

The host PC and other relevant equipments were 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 host PC was connected to the outlet of the first LISN and other relevant equipments was connected to the outlet of the second 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	100176	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2012-08-22	2013-08-21
Rohde & Schwarz	Pulse limiter	ESH3Z2	DE25985	2012-07-08	2013-07-07
BACL	CE Test software	BACL-CE	V1.0	-	-

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

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Pulse Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Pulse Limiter Attenuation}$$

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

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

Test Results Summary

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

5.46 dB at 20.205 MHz in the Neutral conducted mode

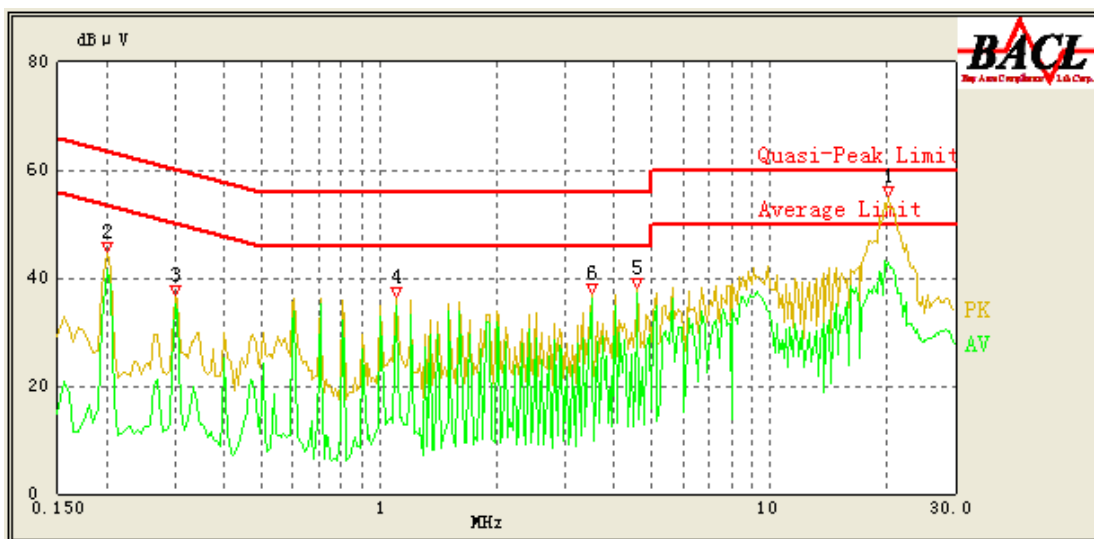
Test Data**Environmental Conditions**

Temperature:	25°C
Relative Humidity:	55 %
ATM Pressure:	100.0 kPa

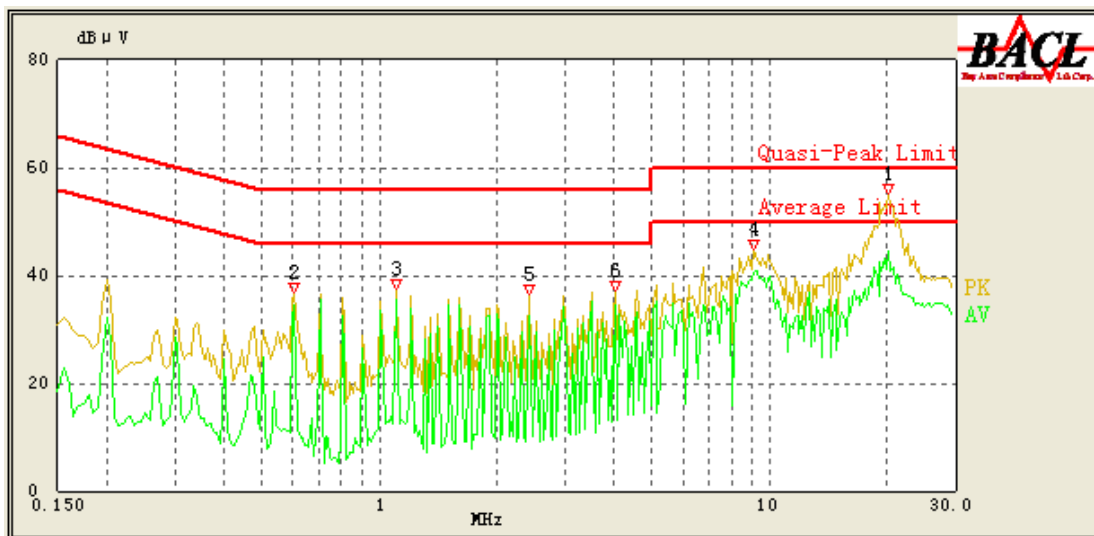
The testing was performed by Gardon Zhang on 2012-10-31.

EUT operation mode: Transmitting

AC 120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
20.180	42.82	12.55	50.00	7.18	Ave.
4.575	37.01	10.28	46.00	8.99	Ave.
3.500	36.10	10.24	46.00	9.90	Ave.
1.105	34.86	10.17	46.00	11.14	Ave.
0.200	41.45	10.24	54.57	13.12	Ave.
20.175	43.52	12.55	60.00	16.48	QP
0.300	35.05	10.25	51.71	16.66	Ave.
4.575	37.22	10.28	56.00	18.78	QP
3.500	36.42	10.24	56.00	19.58	QP
1.105	34.87	10.17	56.00	21.13	QP
0.200	43.21	10.24	64.57	21.36	QP
0.300	35.37	10.25	61.71	26.34	QP

AC 120V, 60 Hz, Neutral:

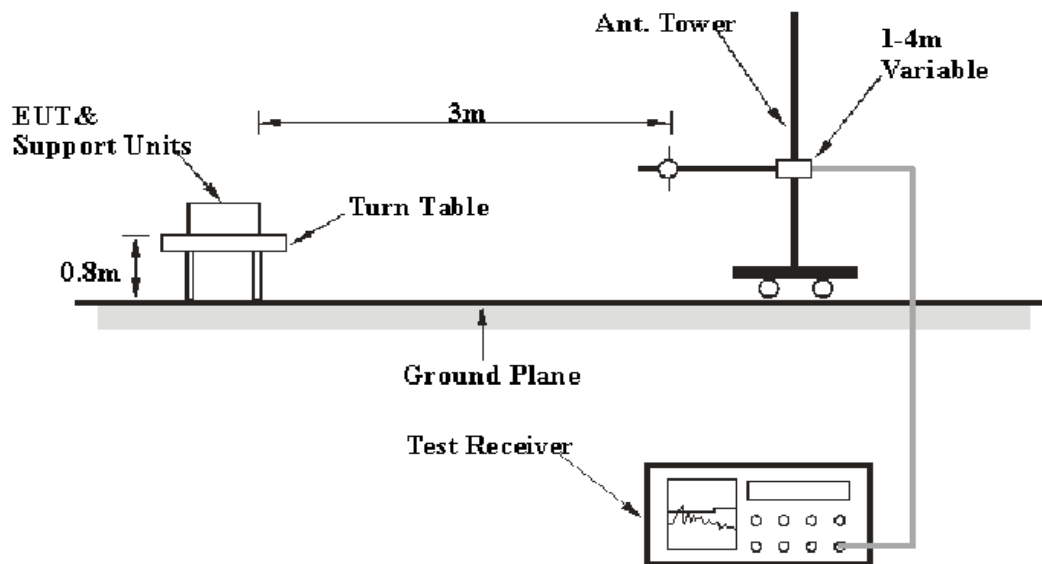
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
20.205	44.54	12.55	50.00	5.46	Ave.
9.155	40.52	10.46	50.00	9.48	Ave.
1.105	35.56	10.17	46.00	10.44	Ave.
4.040	34.43	10.26	46.00	11.57	Ave.
0.605	34.40	10.23	46.00	11.60	Ave.
20.205	47.28	12.55	60.00	12.72	QP
2.420	31.99	10.21	46.00	14.01	Ave.
9.155	41.26	10.46	60.00	18.74	QP
1.105	35.68	10.17	56.00	20.32	QP
0.605	35.51	10.23	56.00	20.49	QP
4.040	34.89	10.26	56.00	21.11	QP
2.420	32.45	10.21	56.00	23.55	QP

FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

Applicable Standard

FCC §15.205; §15.209; §15.247(d)

EUT Setup



The radiated emission tests were performed in the 3 meters, 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 relevant peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	100 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	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 and peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01057	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2012-11-27
Mini-Circuits	Amplifier	ZVA-213+	N/A	2011-11-24	2012-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Agilent	Spectrum Analyzer	8564E	3943A01781	2012-04-12	2013-04-11
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2012-10-14	2013-10-13
R&S	Auto test Software	EMC32	V6.30	-	-

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

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:

2.25 dB at 4960.0 MHz in the Vertical polarization

Test Data

Environmental Conditions

Temperature:	25°C
Relative Humidity:	55 %
ATM Pressure:	100 kPa

The testing was performed by Gardon Zhang on 2012-10-31.

EUT operation mode: Transmitting

30 MHz ~25 GHz:

(Scan with GFSK, $\pi/4$ -DQPSK, 8-DPSK, the worst case is BDR Mode (GFSK))

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
Low Channel (2402 MHz)									
2402.0	88.35	PK	63	1.2	H	6.13	94.48	/	/
2402.0	78.26	Ave.	63	1.2	H	6.13	84.39	/	/
2402.0	87.32	PK	41	1.3	V	6.13	93.45	/	/
2402.0	77.39	Ave.	41	1.3	V	6.13	83.52	/	/
7206.0	35.26	PK	332	1.2	V	17.06	52.32	74	21.68
7206.0	20.33	Ave.	332	1.2	V	17.06	37.39	54	16.61
2337.2	33.16	PK	9	1.2	H	5.48	38.64	74	35.36
2337.2	21.02	Ave.	9	1.2	H	5.48	26.50	54	27.50
2367.4	33.94	PK	46	1.1	V	5.48	39.42	74	34.58
2367.4	21.15	Ave.	46	1.1	V	5.48	26.63	54	27.37
2489.3	33.58	PK	36	1.3	V	6.81	40.39	74	33.61
2489.3	20.11	Ave.	36	1.3	V	6.81	26.92	54	27.08
9608.0	18.25	Ave.	55	1.3	H	19.28	37.53	54	16.47
4804.0	44.25	PK	306	1.2	V	12.40	56.65	74	17.35
4804.0	23.32	Ave.	306	1.2	V	12.40	35.72	54	18.28
9608.0	33.61	PK	55	1.3	H	19.28	52.89	74	21.11
353.98	39.65	QP	48	1.3	H	-13.5	36.15	46.0	9.85
246.31	48.54	QP	49	1.0	H	-15.8	32.74	46.0	13.26
353.98	45.98	QP	26	1.1	V	-13.5	32.48	46.0	13.52
246.31	43.49	QP	126	1.2	V	-15.8	27.69	46.0	18.31

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
Middle Channel (2441 MHz)									
2441.0	87.62	PK	95	1.3	H	7.21	94.83	/	/
2441.0	77.39	Ave.	95	1.3	H	7.21	84.60	/	/
2441.0	87.88	PK	61	1.3	V	6.81	94.69	/	/
2441.0	77.25	Ave.	61	1.3	V	6.81	84.06	/	/
9764.0	20.12	Ave.	83	1.3	H	19.40	39.52	54	14.48
4882.0	45.36	PK	266	1.3	V	12.46	57.82	74	16.18
7323.0	21.03	Ave.	52	1.2	V	16.49	37.52	54	16.48
4882.0	23.69	Ave.	266	1.3	V	12.46	36.15	54	17.85
9764.0	33.26	PK	83	1.3	H	19.40	52.66	74	21.34
7323.0	36.02	PK	52	1.2	V	16.49	52.51	74	21.49
2489.3	21.63	Ave.	85	1.3	V	6.81	28.44	54	25.56
2337.3	20.44	Ave.	116	1.2	H	5.48	25.92	54	28.08
2367.9	20.15	Ave.	91	1.3	V	5.48	25.63	54	28.37
2489.3	34.51	PK	85	1.3	V	6.81	41.32	74	32.68
2337.3	34.12	PK	116	1.2	H	5.48	39.60	74	34.40
2367.9	33.91	PK	91	1.3	V	5.48	39.39	74	34.61
353.98	40.10	QP	48	1.3	H	-13.5	36.60	46.0	9.40
353.98	46.97	QP	103	1.0	V	-13.5	33.47	46.0	12.53
246.31	48.60	QP	36	1.1	H	-15.8	32.80	46.0	13.20
246.31	44.26	QP	87	1.2	V	-15.8	28.46	46.0	17.54

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
High Channel (2480 MHz)									
2480.0	87.91	PK	91	1.2	H	7.21	95.12	/	/
2480.0	78.02	Ave.	91	1.2	H	7.21	85.23	/	/
2480.0	87.22	PK	66	1.1	V	6.81	94.03	/	/
2480.0	77.15	Ave.	66	1.1	V	6.81	83.96	/	/
4960.0	39.25	Ave.	8	1.2	V	12.50	51.75	54	2.25*
4960.0	54.12	PK	8	1.2	V	12.50	66.62	74	7.38
9920.0	20.91	Ave.	95	1.1	H	19.38	40.29	54	13.71
7440.0	20.15	Ave.	166	1.1	V	15.90	36.05	54	17.95
9920.0	34.26	PK	95	1.1	H	19.38	53.64	74	20.36
7440.0	33.69	PK	166	1.1	V	15.90	49.59	74	24.41
2489.5	20.58	Ave.	13	1.2	V	6.81	27.39	54	26.61
2367.7	21.03	Ave.	152	1.1	V	5.48	26.51	54	27.49
2335.2	20.11	Ave.	78	1.2	H	5.48	25.59	54	28.41
2489.5	34.26	PK	13	1.2	V	6.81	41.07	74	32.93
2367.7	34.02	PK	152	1.1	V	5.48	39.50	74	34.50
2335.2	33.25	PK	78	1.2	H	5.48	38.73	74	35.27
353.98	49.18	QP	28	1.0	H	-13.5	35.68	46.0	10.32
353.98	46.67	QP	103	1.3	V	-13.5	33.17	46.0	12.83
246.31	47.87	QP	63	1.1	H	-15.8	32.07	46.0	13.93
246.31	44.09	QP	158	1.2	V	-15.8	28.29	46.0	17.71

*Within measurement uncertainty.

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

Applicable Standard

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. 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. Set the EUT in transmitting mode, maxhold the channel.
2. Set the adjacent channel of the EUT and maxhold another trace
3. Measure the channel separation.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

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

Test Data

Environmental Conditions

Temperature:	25°C
Relative Humidity:	55 %
ATM Pressure:	100 kPa

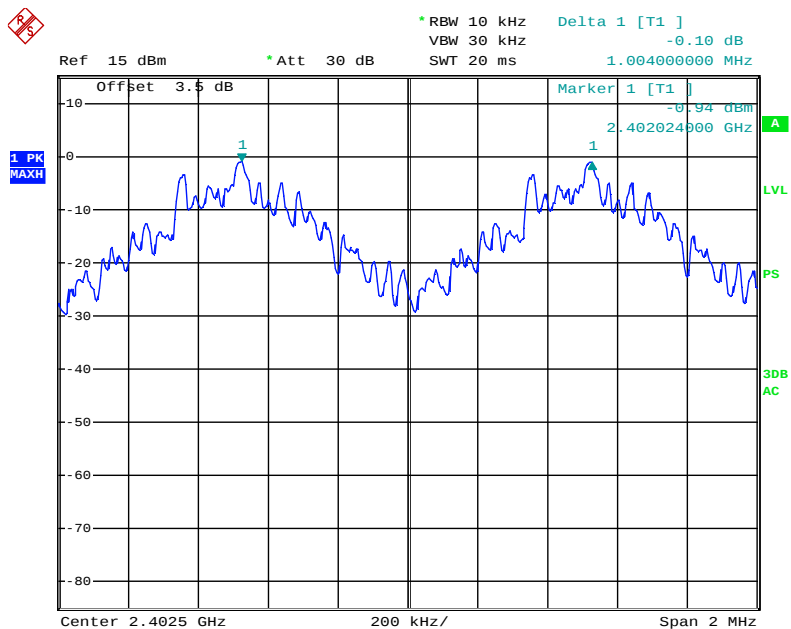
The testing was performed by Gardon Zhang on 2012-10-31.

EUT operation mode: Transmitting

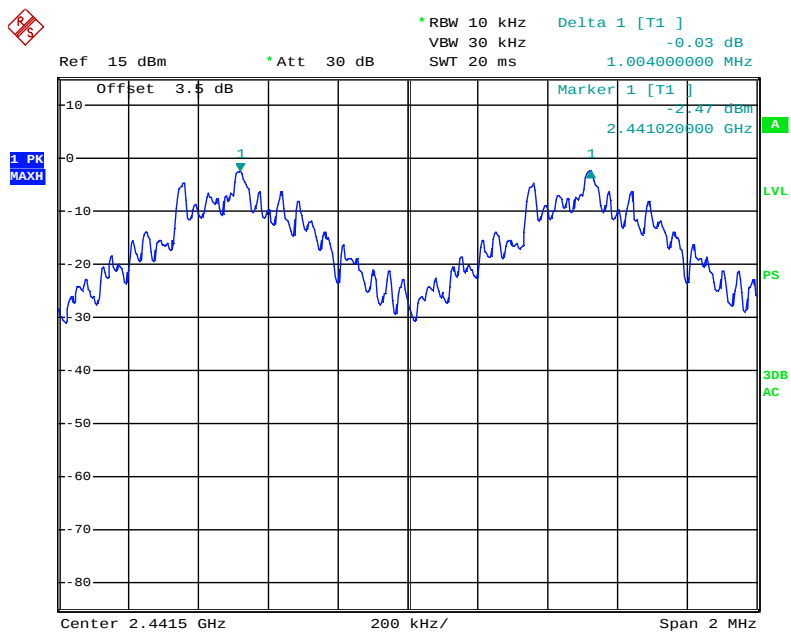
Test Result: Compliance. Please refer to following tables and plots

Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	$\geq$ Limit (MHz)	Result
BDR (GFSK)	Low	2402	1.004	0.557	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.557	Pass
	Adjacent	2442			
	High	2480	1.004	0.557	Pass
	Adjacent	2479			
EDR ($\pi/4$-DQPSK)	Low	2402	1.002	0.813	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.813	Pass
	Adjacent	2442			
	High	2480	1.002	0.813	Pass
	Adjacent	2479			
EDR (8DPSK)	Low	2402	1.002	0.808	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.808	Pass
	Adjacent	2442			
	High	2480	1.002	0.808	Pass
	Adjacent	2479			

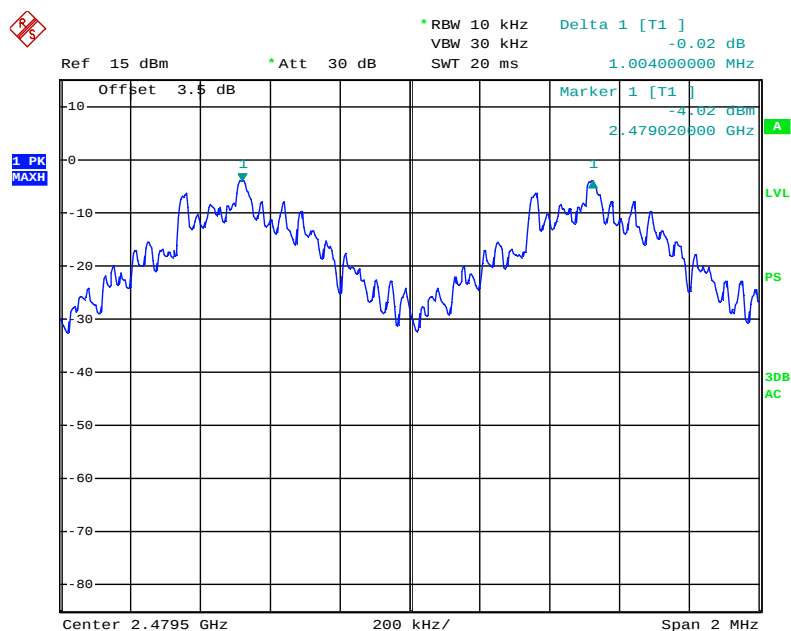
Note: Limit = 20 dB bandwidth *2/3

BDR (GFSK): Low Channel

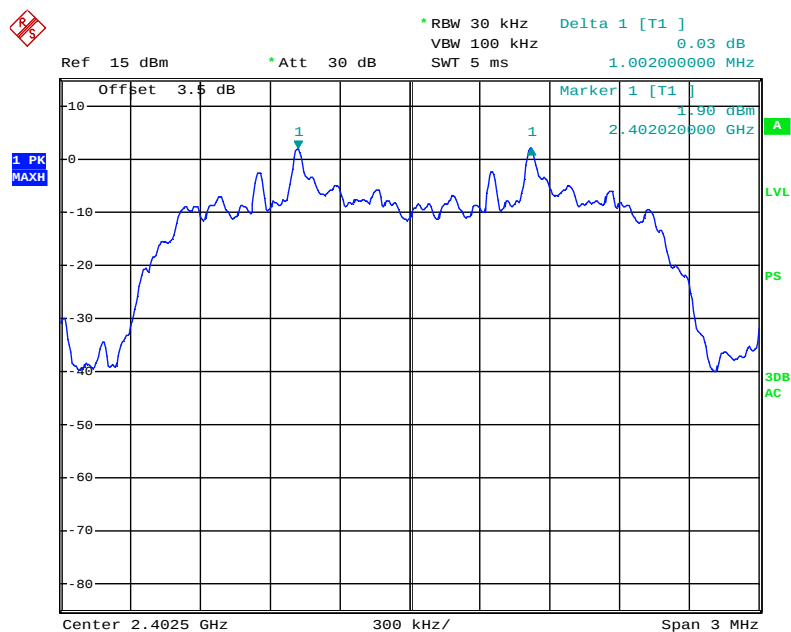
Date: 31.OCT.2012 13:11:05

BDR (GFSK): Middle Channel

Date: 31.OCT.2012 13:08:29

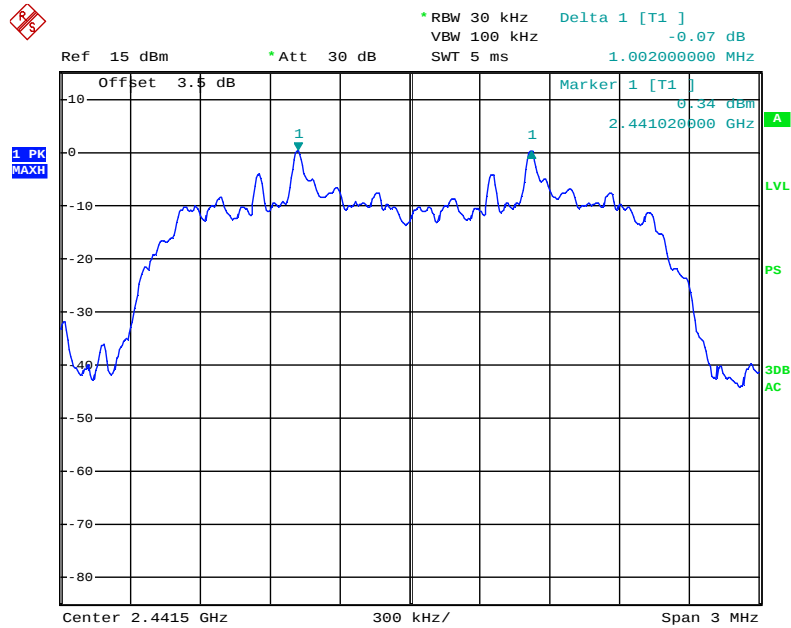
BDR (GFSK): High Channel

Date: 31.OCT.2012 13:13:21

EDR ($\pi/4$ -DQPSK): Low Channel

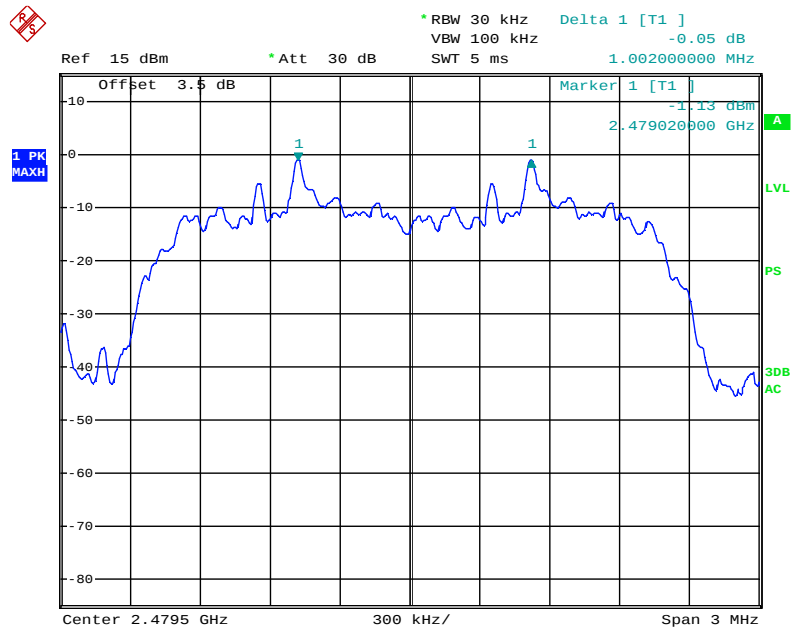
Date: 31.OCT.2012 14:50:03

EDR ($\pi/4$ -DQPSK): Middle Channel

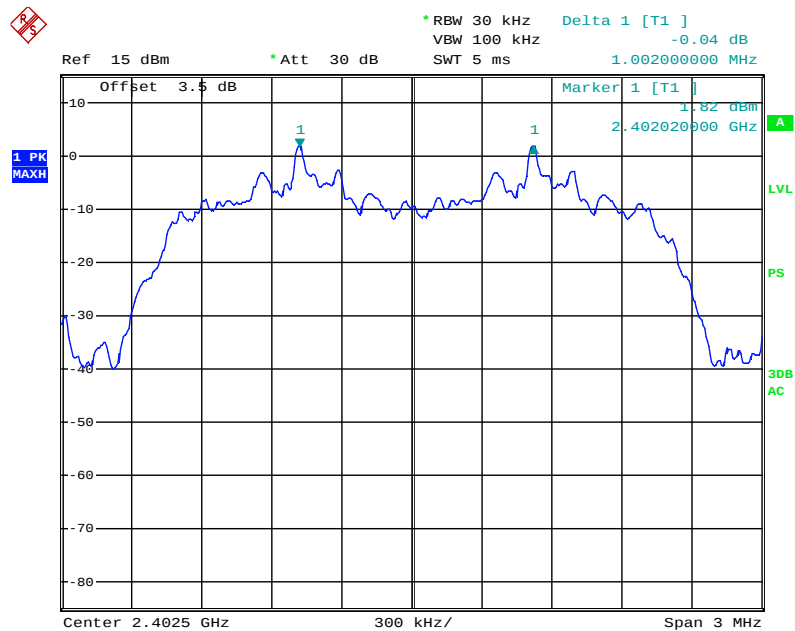


Date: 31.OCT.2012 14:52:13

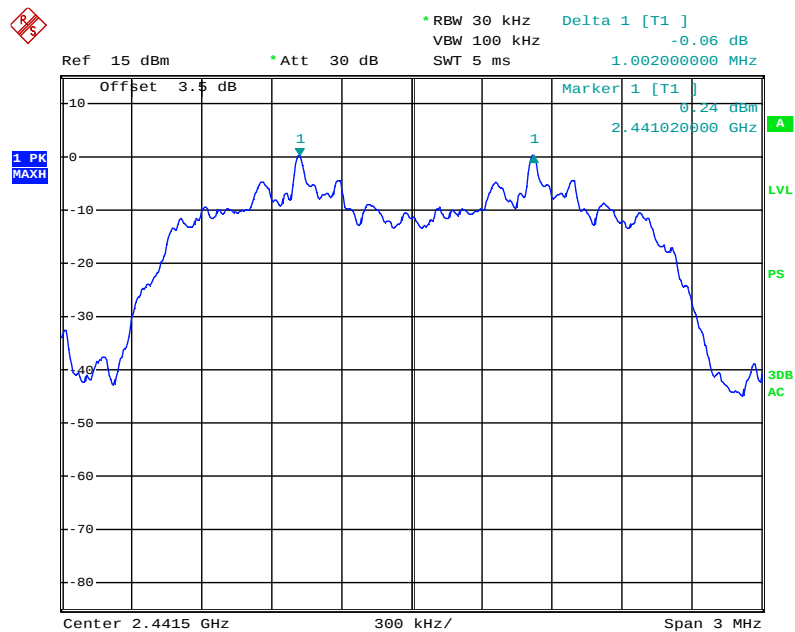
EDR ($\pi/4$ -DQPSK): High Channel



Date: 31.OCT.2012 14:54:18

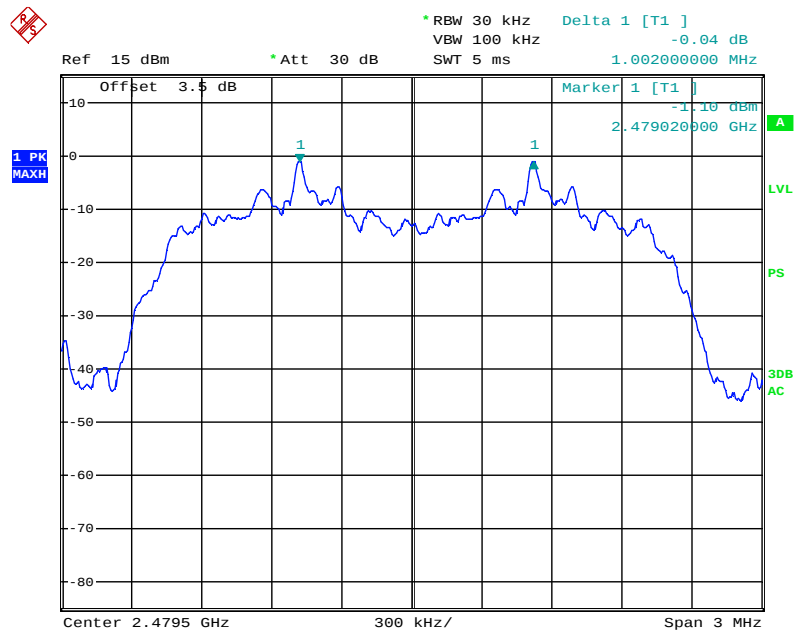
EDR (8DPSK): Low Channel

Date: 31.OCT.2012 15:49:31

EDR (8DPSK): Middle Channel

Date: 31.OCT.2012 15:46:16

EDR (8DPSK): High Channel



Date: 31.OCT.2012 15:45:04

FCC §15.247(a) (1) – 20 dB EMISSION 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 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. 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	101122	2012-08-08	2013-08-07

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

Test Data

Environmental Conditions

Temperature:	25°C
Relative Humidity:	55 %
ATM Pressure:	100 kPa

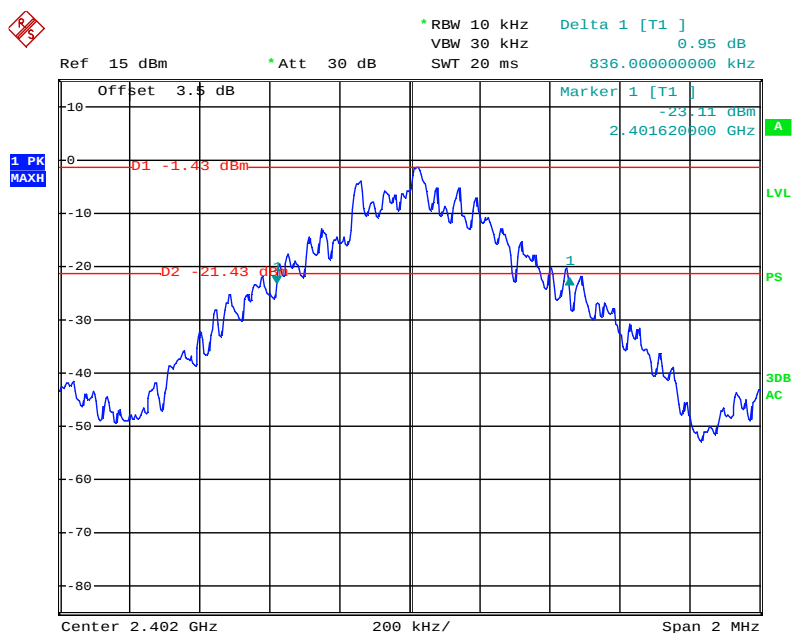
The testing was performed by Gardon Zhang on 2012-10-31.

EUT operation mode: Transmitting

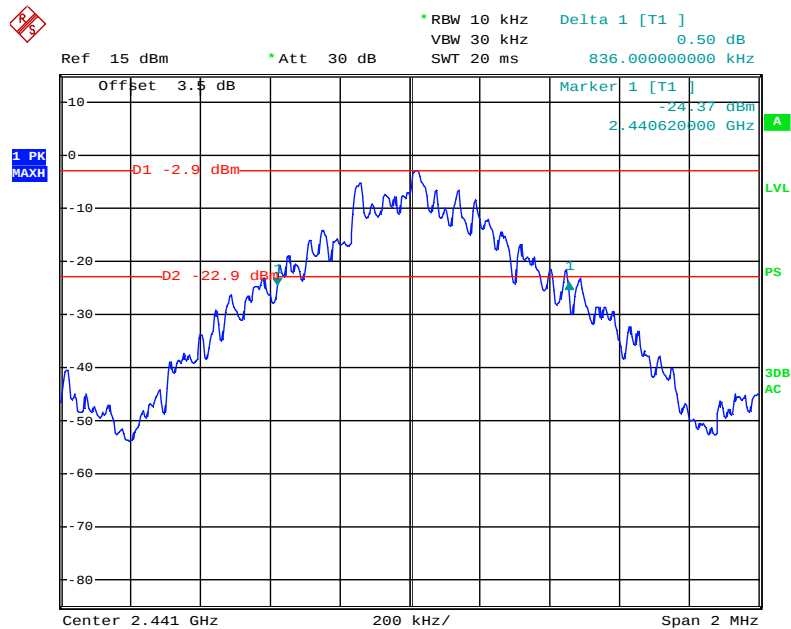
Test Result: Compliance. Please refer to following tables and plots

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.836
	Middle	2441	0.836
	High	2480	0.836
EDR ($\pi/4$ -DQPSK)	Low	2402	1.220
	Middle	2441	1.220
	High	2480	1.220
EDR (8DPSK)	Low	2402	1.212
	Middle	2441	1.212
	High	2480	1.212

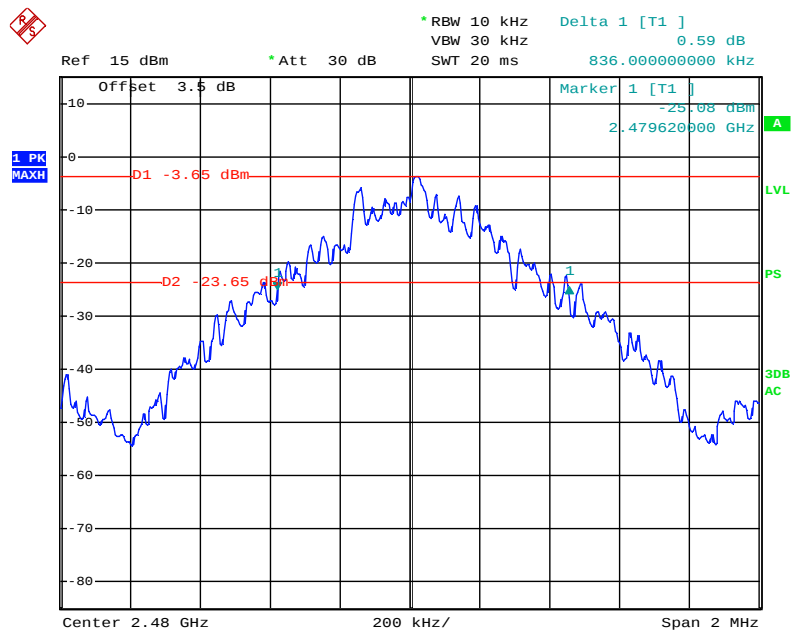
BDR (GFSK): Low Channel



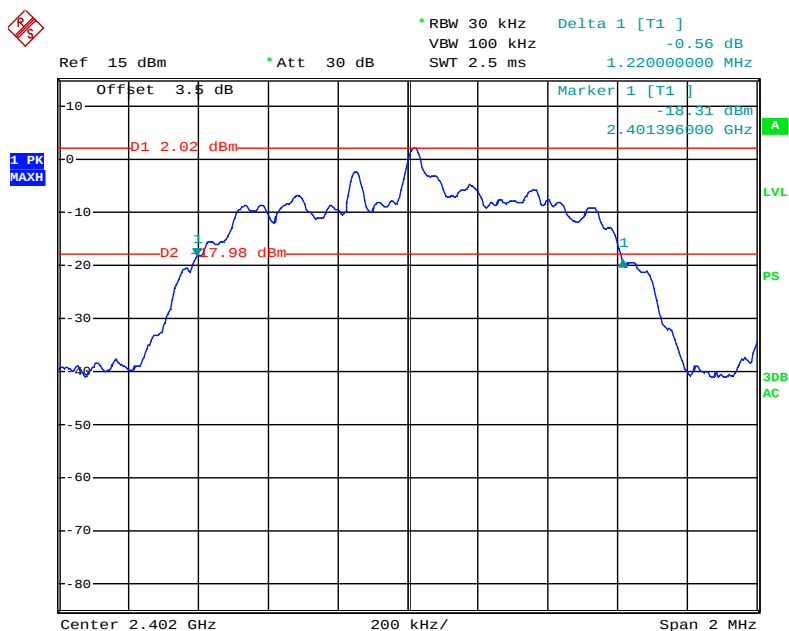
Date: 31.OCT.2012 12:32:50

BDR (GFSK): Middle Channel

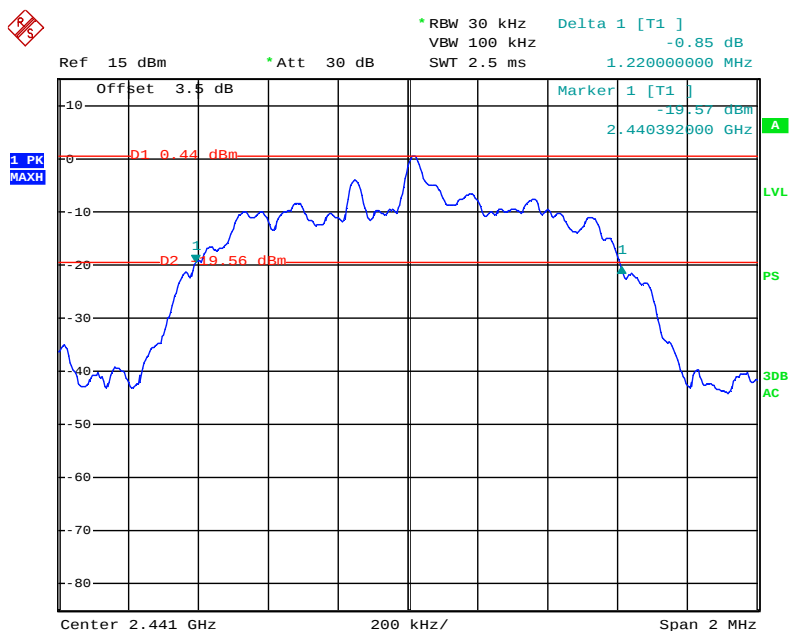
Date: 31.OCT.2012 13:02:22

BDR (GFSK): High Channel

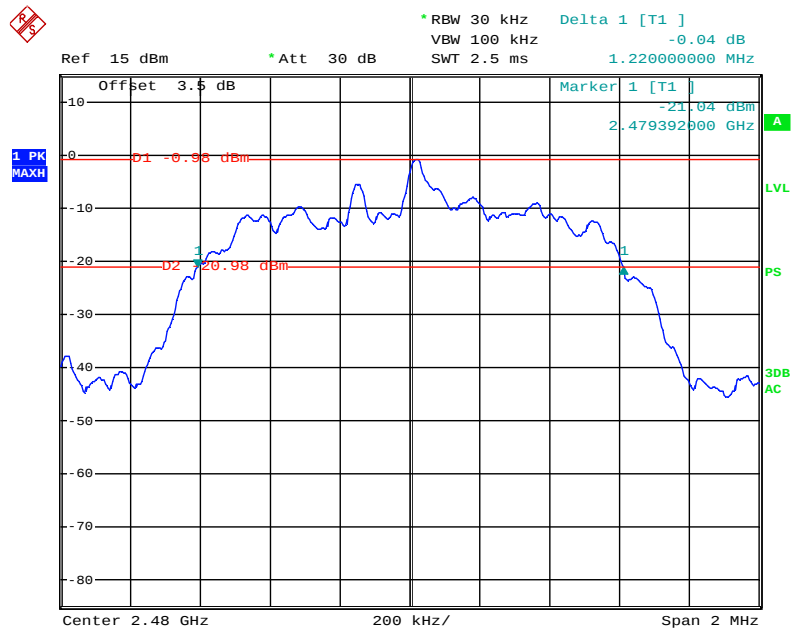
Date: 31.OCT.2012 12:40:59

EDR ($\pi/4$ -DQPSK): Low Channel

Date: 31.OCT.2012 14:47:20

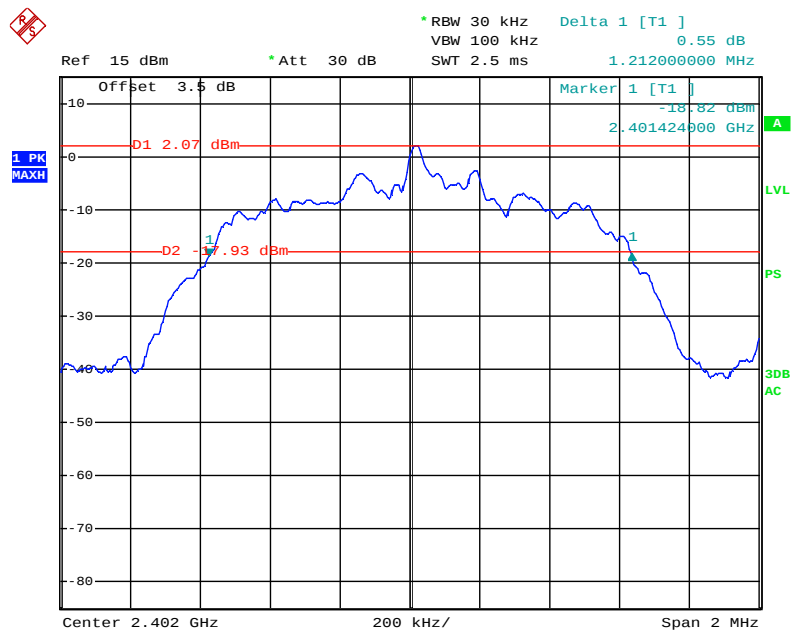
EDR ($\pi/4$ -DQPSK): Middle Channel

Date: 31.OCT.2012 14:20:44

EDR ($\pi/4$ -DQPSK): High Channel

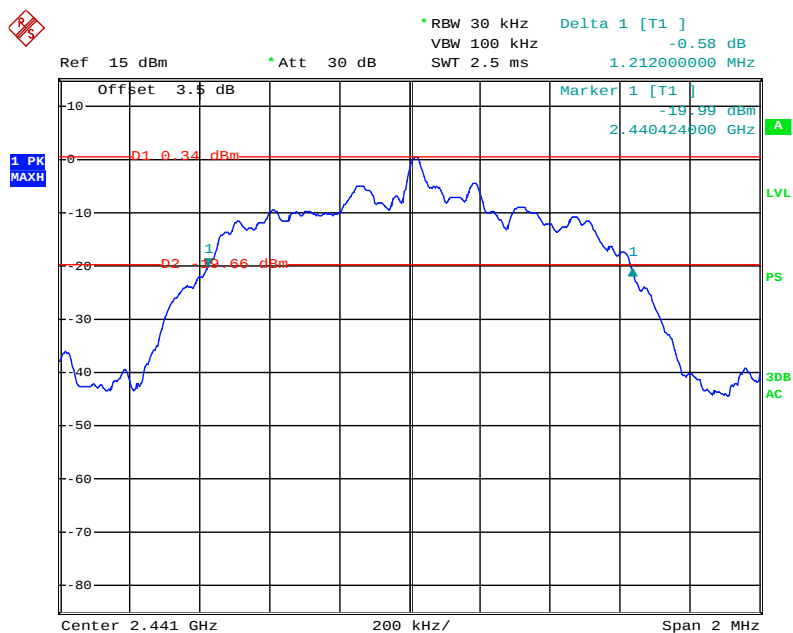
Date: 31.OCT.2012 14:19:28

EDR (8DPSK): Low Channel



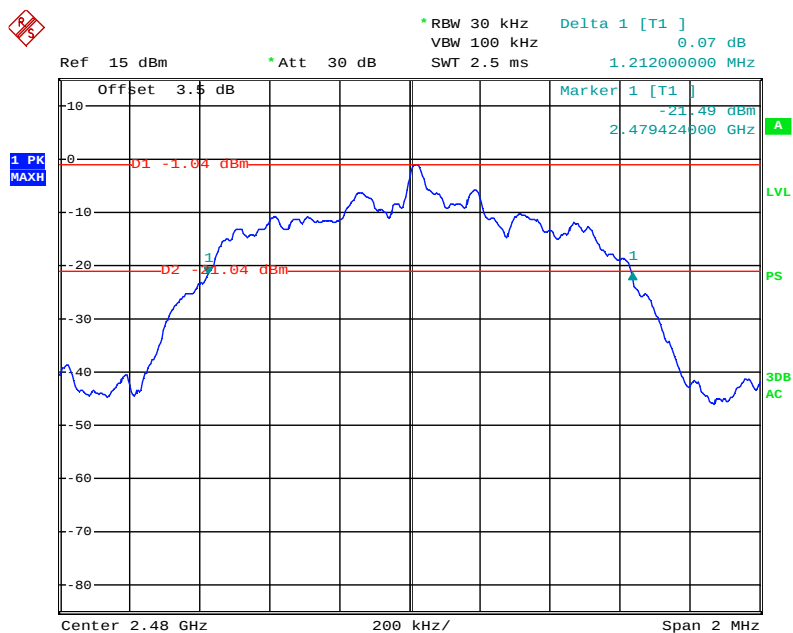
Date: 31.OCT.2012 15:37:23

EDR (8DPSK): Middle Channel



Date: 31.OCT.2012 15:33:09

EDR (8DPSK): High Channel



Date: 31.OCT.2012 15:35:11

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	101122	2012-08-08	2013-08-07

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

Test Data**Environmental Conditions**

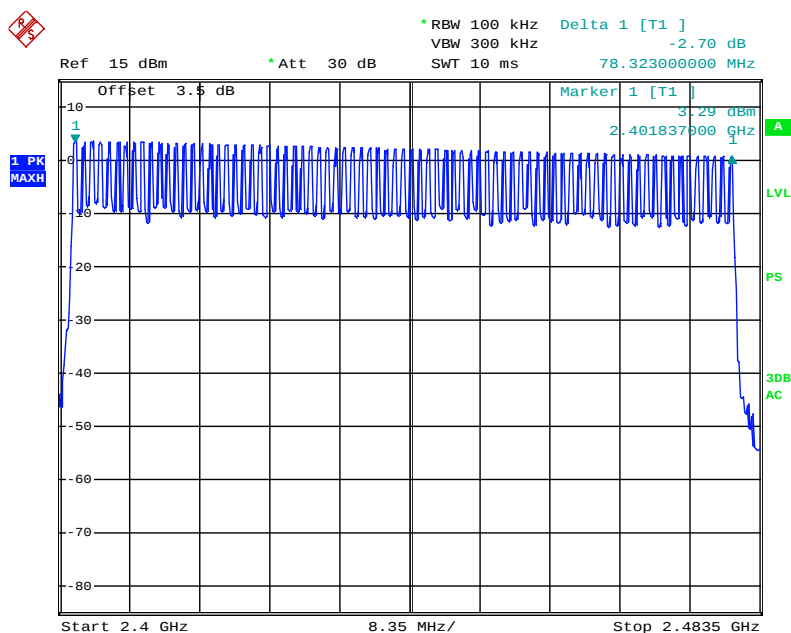
Temperature:	25°C
Relative Humidity:	55 %
ATM Pressure:	100 kPa

The testing was performed by Gardon Zhang on 2012-10-31.

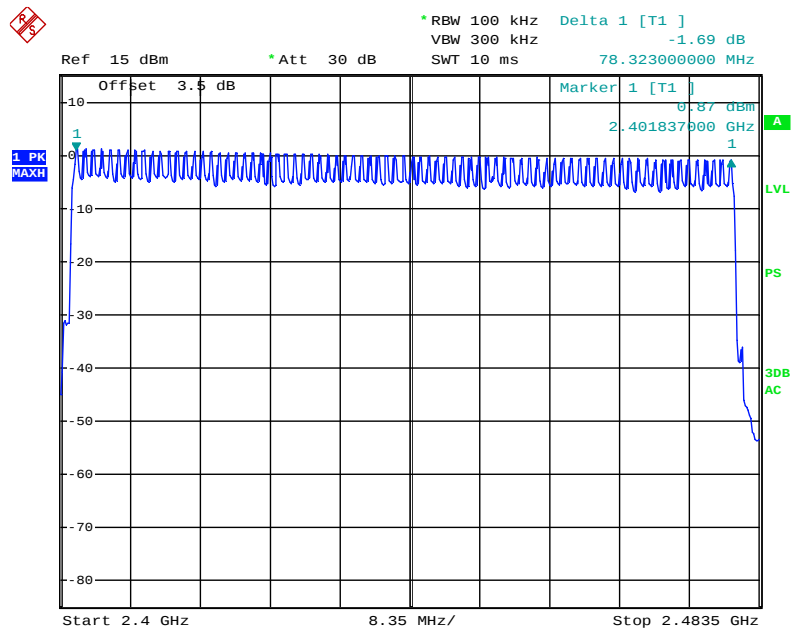
EUT operation mode: Transmitting

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

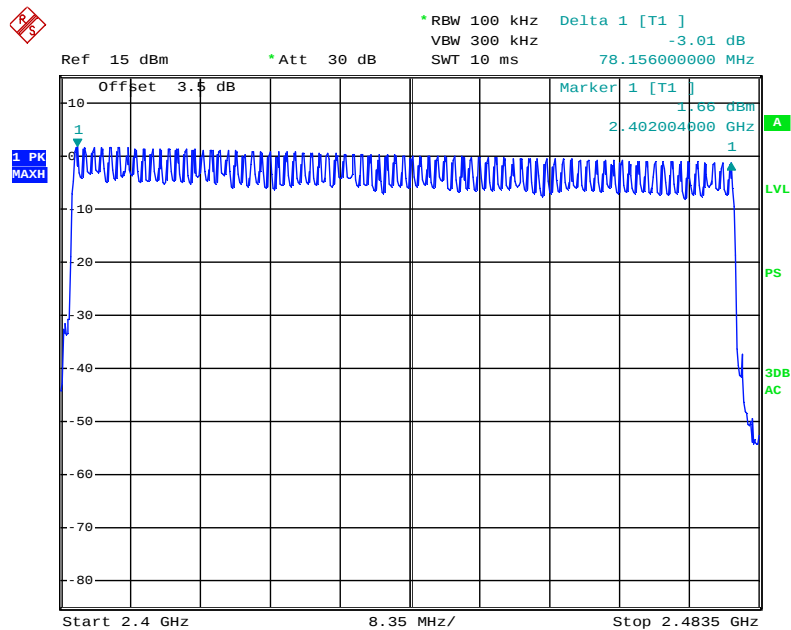
Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
BDR (GFSK)	2402-2480	79	≥ 15
EDR ($\pi/4$ -DQPSK)	2402-2480	79	≥ 15
EDR (8DPSK)	2402-2480	79	≥ 15

BDR (GFSK): Number of Hopping Channels

Date: 31.OCT.2012 13:33:26

EDR ($\pi/4$ -DQPSK): Number of Hopping Channels

Date: 1.NOV.2012 08:23:31

EDR (8DPSK): Number of Hopping Channels

Date: 31.OCT.2012 16:00:08

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 X channel no. (s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Dwell time = Pulse time*hop 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	101122	2012-08-08	2013-08-07

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

Test Data**Environmental Conditions**

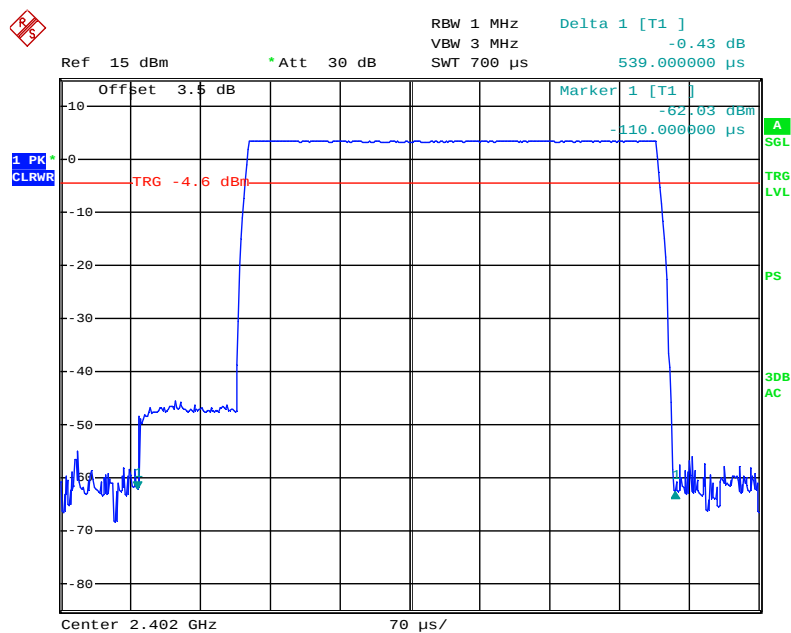
Temperature:	25~26℃
Relative Humidity:	55~56 %
ATM Pressure:	100 kPa

The testing was performed by Gardon Zhang on 2012-10-31 and 2012-11-01.

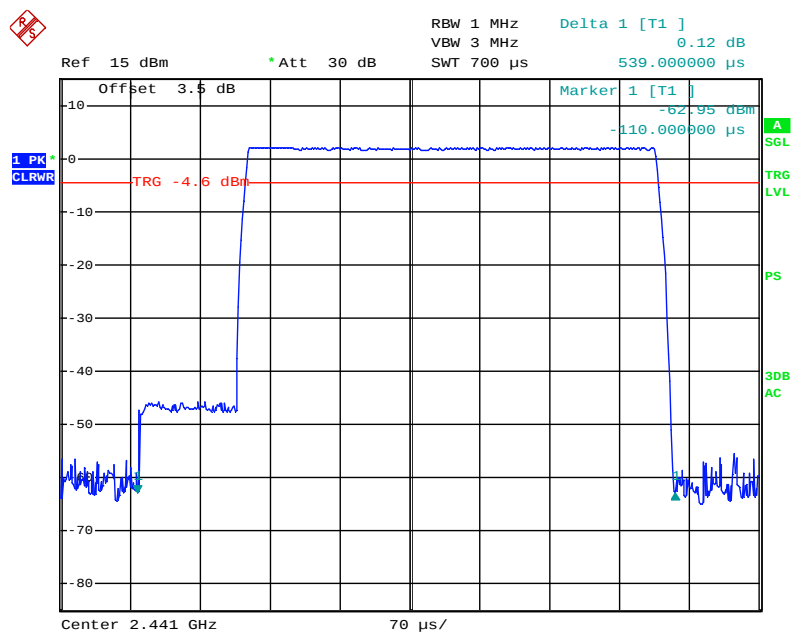
EUT operation mode: Transmitting

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

Mode		Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
BDR (GFSK)	DH 1	Low	0.5390	0.1725	0.4	Pass
		Middle	0.5390	0.1725	0.4	Pass
		High	0.5390	0.1725	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH 3	Low	1.8158	0.2905	0.4	Pass
		Middle	1.8158	0.2905	0.4	Pass
		High	1.8158	0.2905	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH 5	Low	3.0668	0.3271	0.4	Pass
		Middle	3.0668	0.3271	0.4	Pass
		High	3.0668	0.3271	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR ($\pi/4$ -DQPSK)	DH 1	Low	0.5532	0.1770	0.4	Pass
		Middle	0.5532	0.1770	0.4	Pass
		High	0.5532	0.1770	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH 3	Low	1.8188	0.2910	0.4	Pass
		Middle	1.8188	0.2910	0.4	Pass
		High	1.8188	0.2910	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH 5	Low	3.0788	0.3284	0.4	Pass
		Middle	3.0788	0.3284	0.4	Pass
		High	3.0788	0.3284	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR (8DPSK)	DH 1	Low	0.5488	0.1756	0.4	Pass
		Middle	0.5488	0.1756	0.4	Pass
		High	0.5488	0.1756	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH 3	Low	1.8200	0.2912	0.4	Pass
		Middle	1.8200	0.2912	0.4	Pass
		High	1.8200	0.2912	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH 5	Low	3.0710	0.3276	0.4	Pass
		Middle	3.0710	0.3276	0.4	Pass
		High	3.0710	0.3276	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				

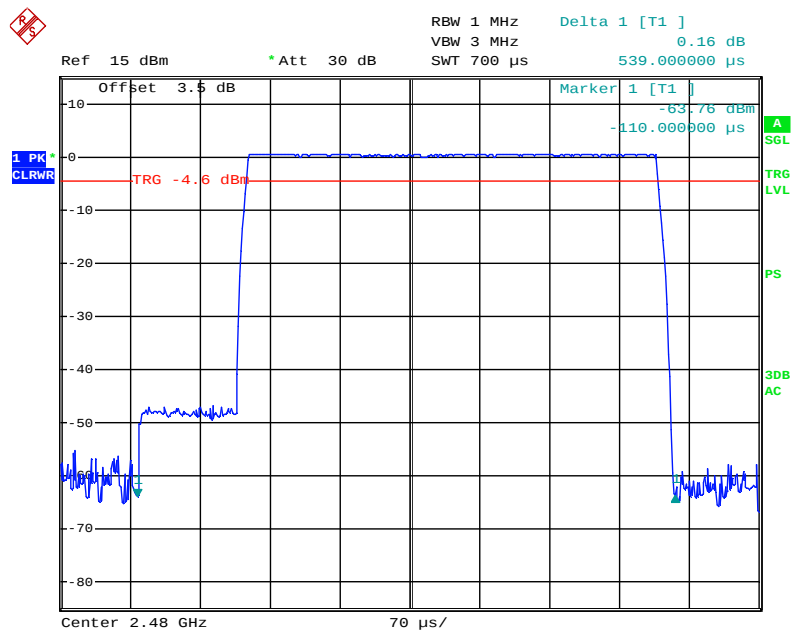
BDR (GFSK):**Pulse time, Low Channel, DH1**

Date: 31.OCT.2012 13:42:10

Pulse time, Middle Channel, DH1

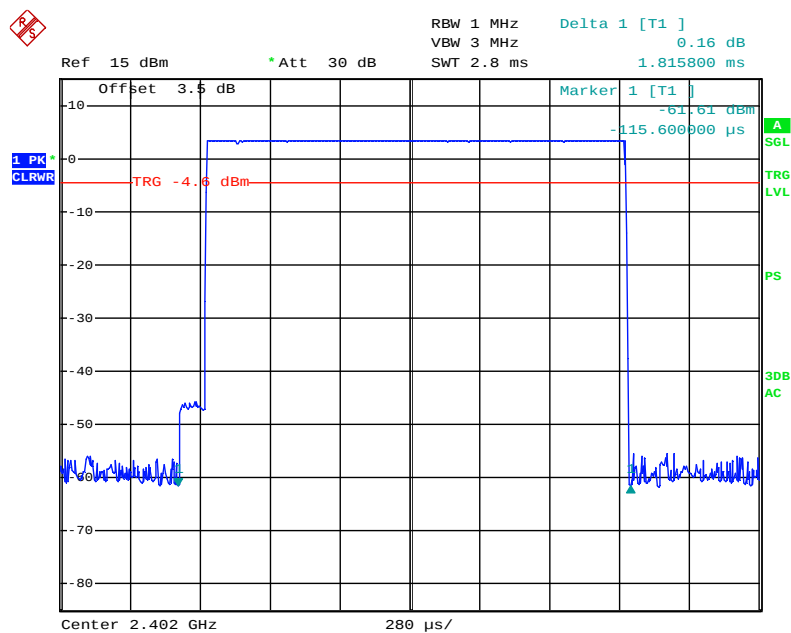
Date: 31.OCT.2012 13:41:40

Pulse time, High Channel, DH1



Date: 31.OCT.2012 13:44:02

Pulse time, Low Channel, DH3



Date: 31.OCT.2012 13:51:28

Ref 15 dBm *Att 30 dB RBW 1 MHz Delta 1 [T1] 0.69 dB
 VBW 3 MHz SWT 2.8 ms 1.815800 ms

Offset 3.5 dB Marker 1 [T1] -60.37 dBm -115.600000 μs

1 PK CLRWR TRG -4.6 dBm TRG LVL PS 3DB AC

Center 2.441 GHz 280 μs/

Date: 31.OCT.2012 13:50:51

Ref 15 dBm * Att 30 dB RBW 1 MHz Delta 1 [T1] -0.25 dB
 SWT 2.8 ms 1.815800 ms

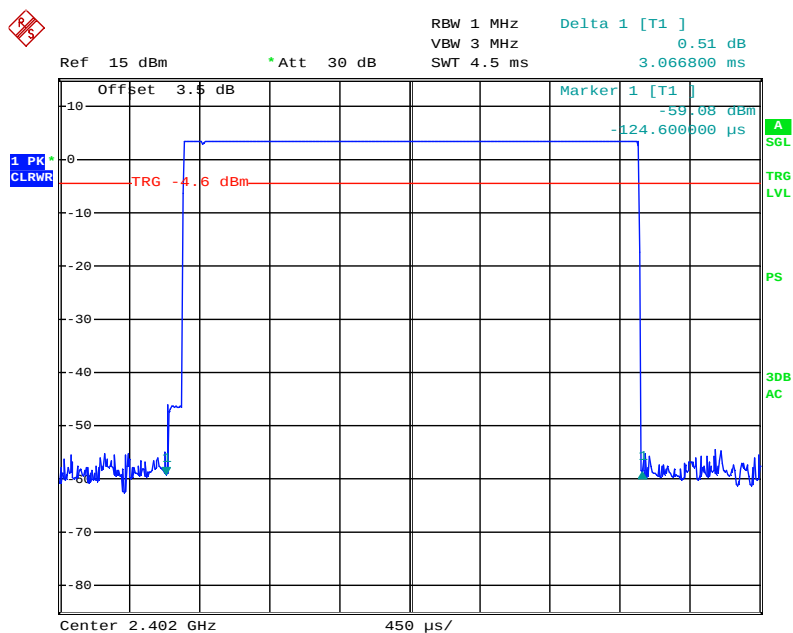
Offset 3.5 dB Marker 1 [T1] -59.70 dBm -115.600000 μs

1 PK CLRWR TRG -4.6 dBm TRG LVL PS 3DB AC

Center 2.48 GHz 280 μs/

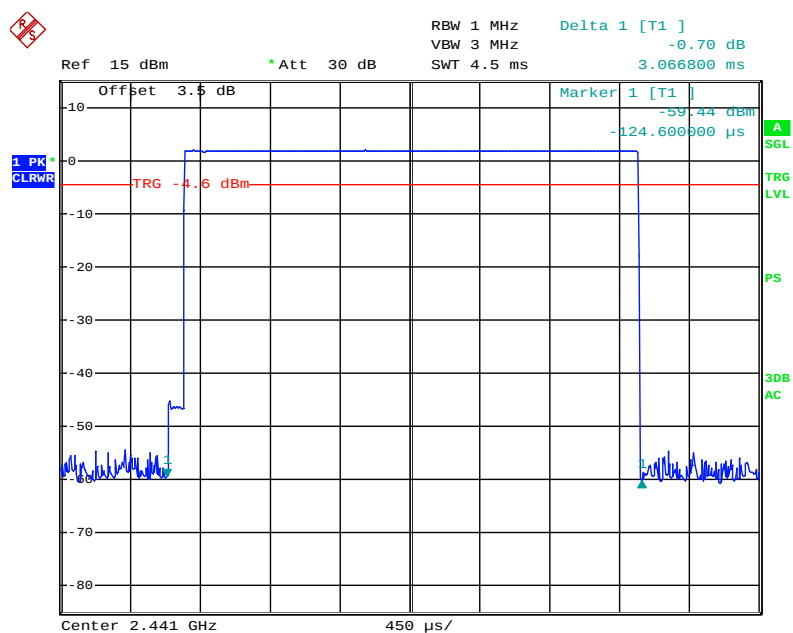
Date: 31.OCT.2012 13:50:33

Pulse time, Low Channel, DH5



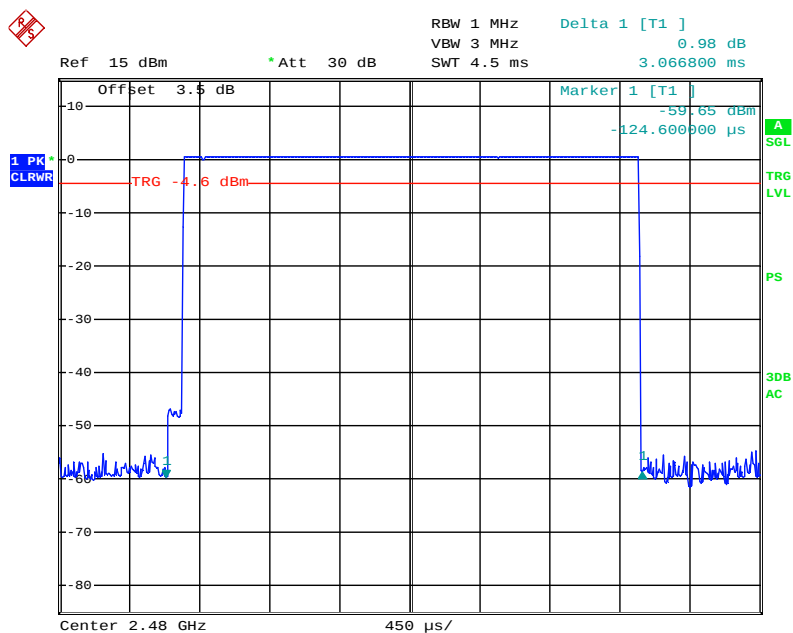
Date: 31.OCT.2012 13:56:53

Pulse time, Middle Channel, DH5



Date: 31.OCT.2012 13:57:29

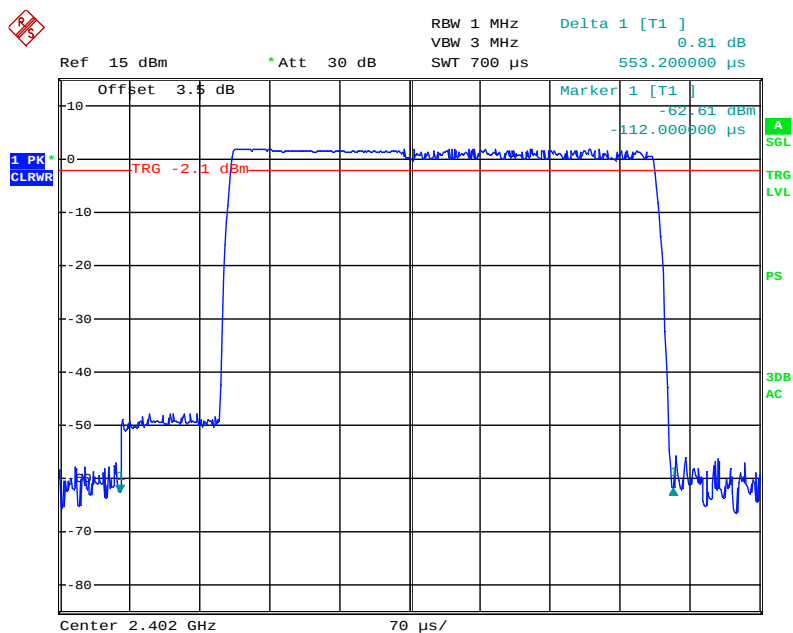
Pulse time, High Channel, DH5



Date: 31.OCT.2012 14:01:46

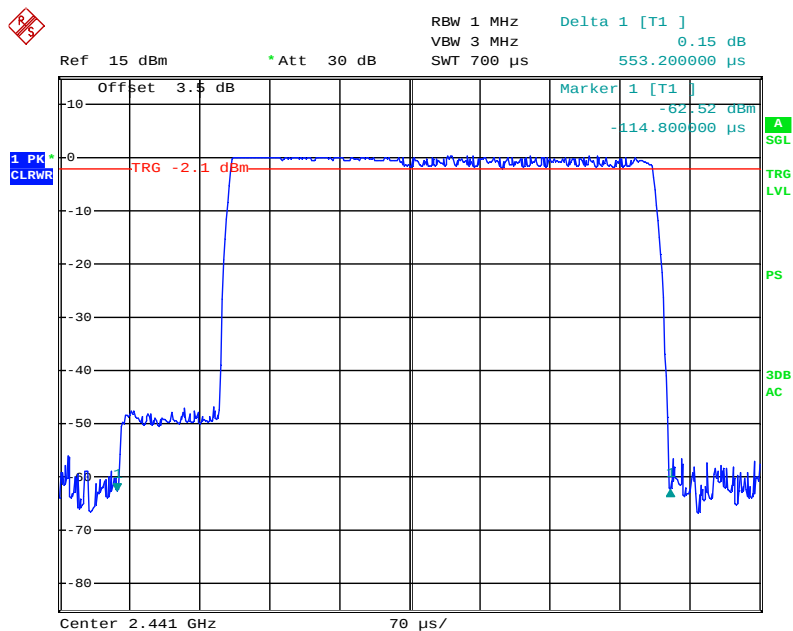
EDR ($\pi/4$ -DQPSK):

Pulse time, Low Channel, DH1



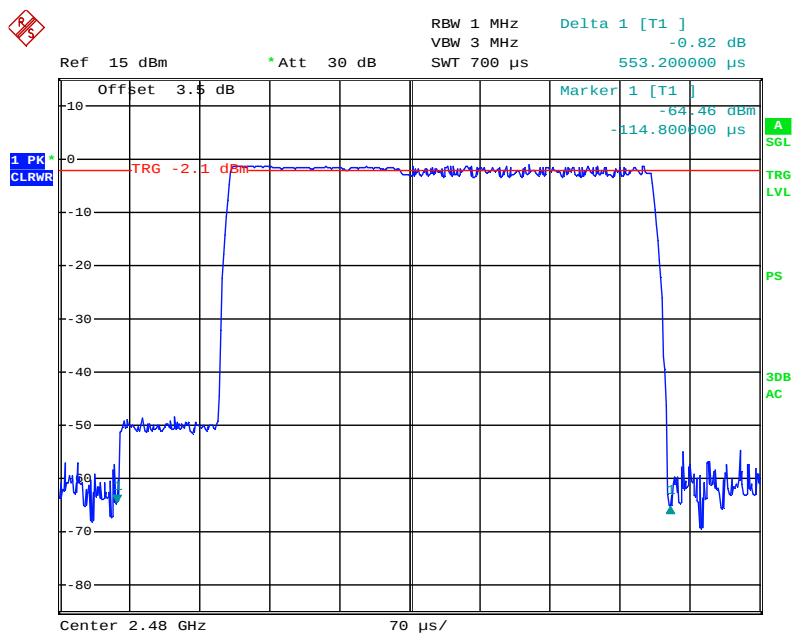
Date: 31.OCT.2012 15:14:45

Pulse time, Middle Channel, DH1



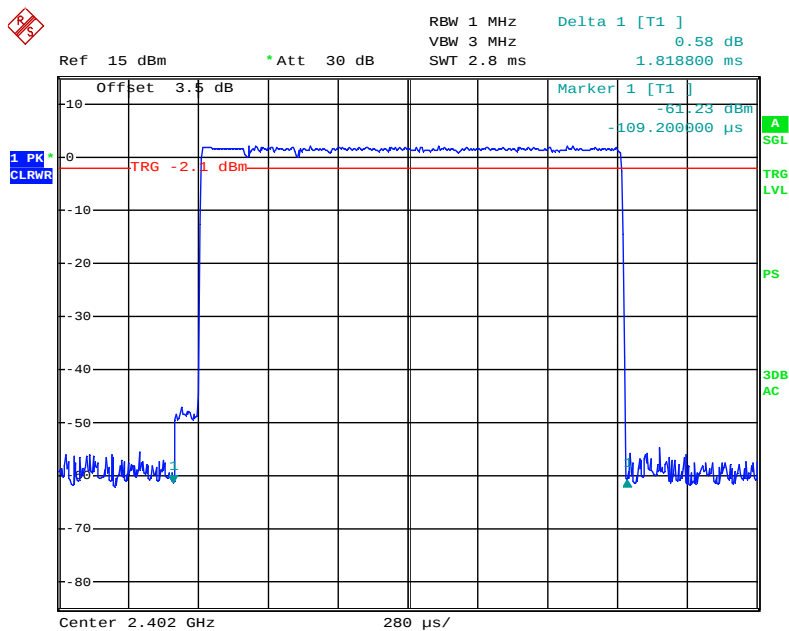
Date: 31.OCT.2012 15:16:31

Pulse time, High Channel, DH1



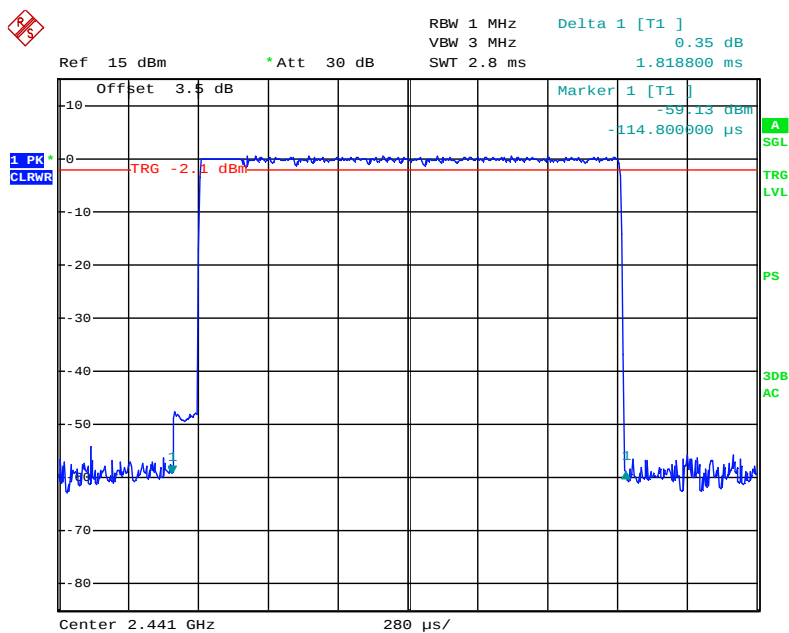
Date: 31.OCT.2012 15:17:08

Pulse time, Low Channel, DH3



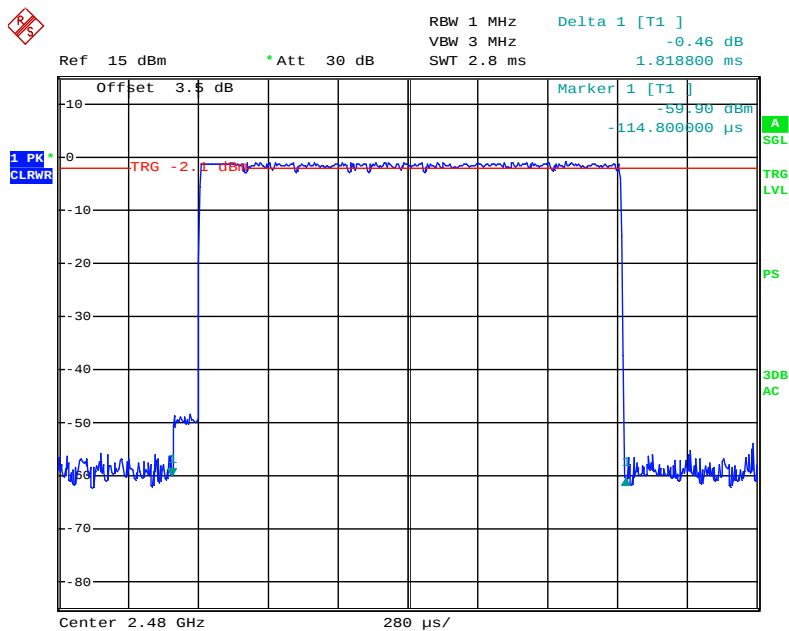
Date: 31.OCT.2012 15:21:53

Pulse time, Middle Channel, DH3



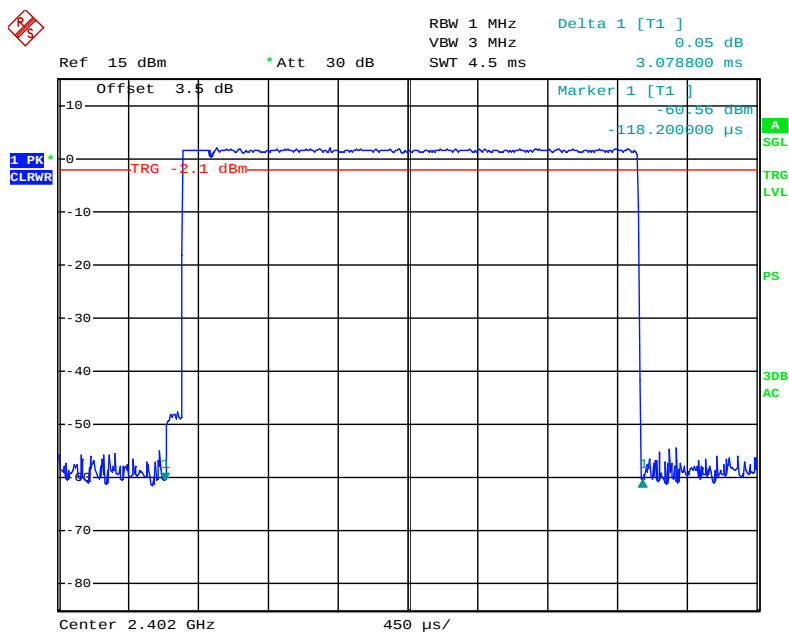
Date: 31.OCT.2012 15:19:26

Pulse time, High Channel, DH3



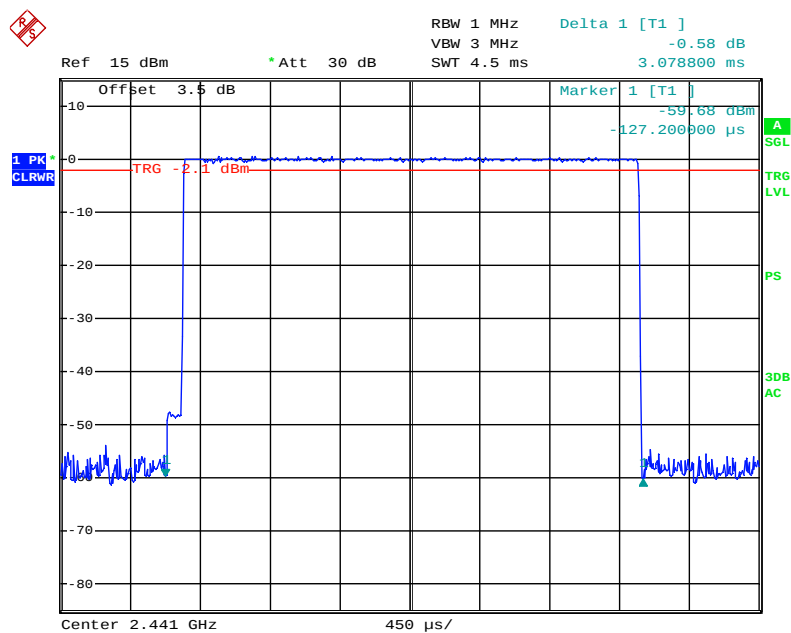
Date: 31.OCT.2012 15:18:49

Pulse time, Low Channel, DH5



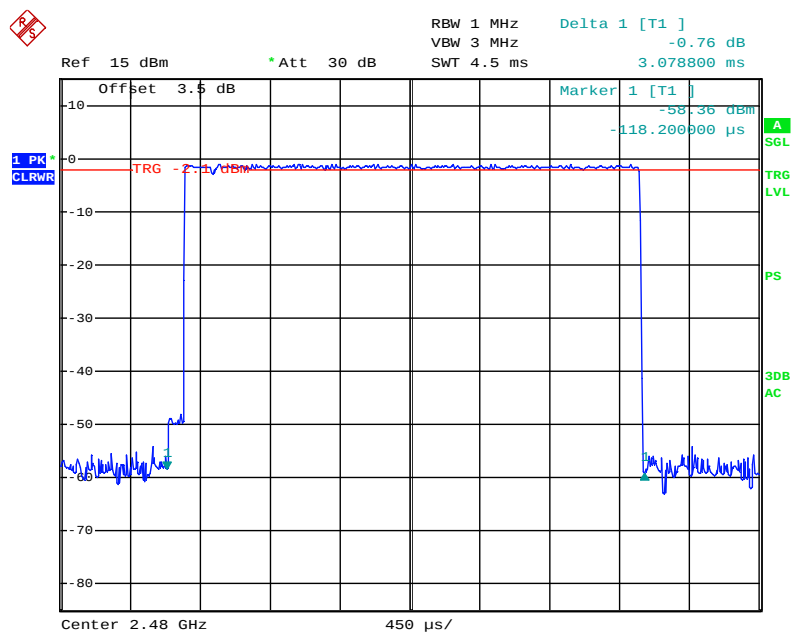
Date: 31.OCT.2012 15:23:44

Pulse time, Middle Channel, DH5



Date: 31.OCT.2012 15:26:17

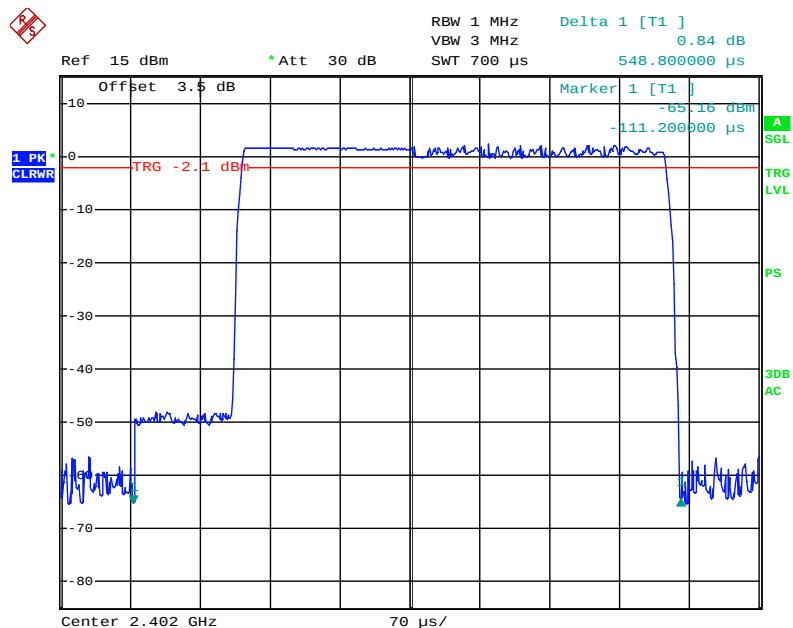
Pulse time, High Channel, DH5



Date: 31.OCT.2012 15:26:50

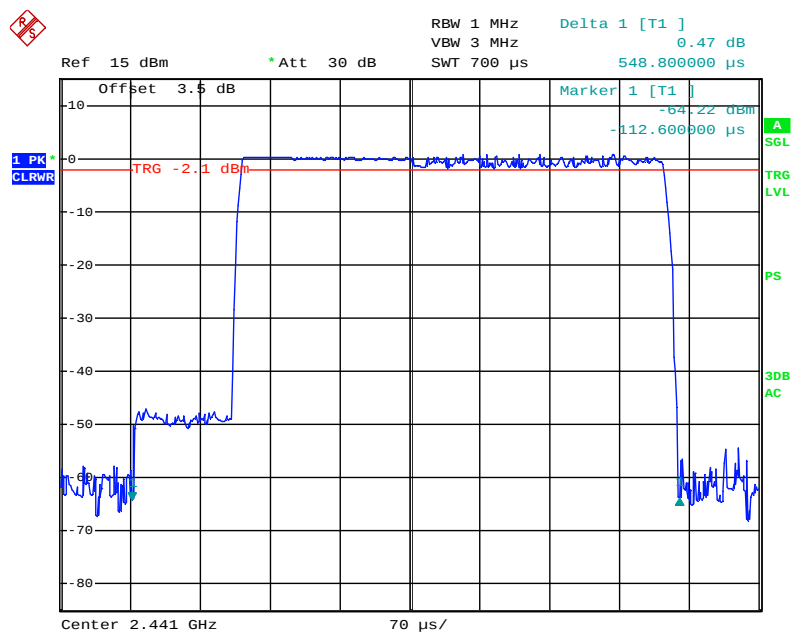
EDR (8DPSK):

Pulse time, Low Channel, DH1



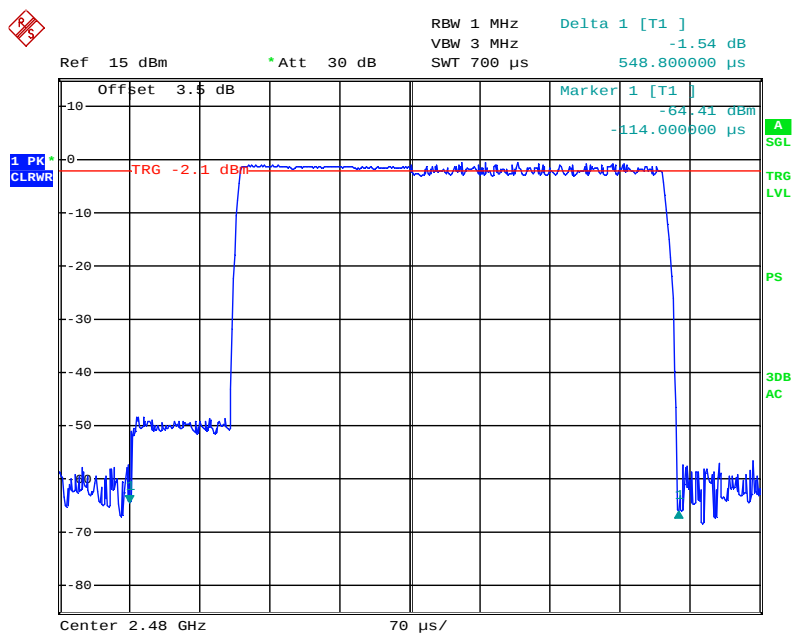
Date: 31.OCT.2012 16:02:18

Pulse time, Middle Channel, DH1



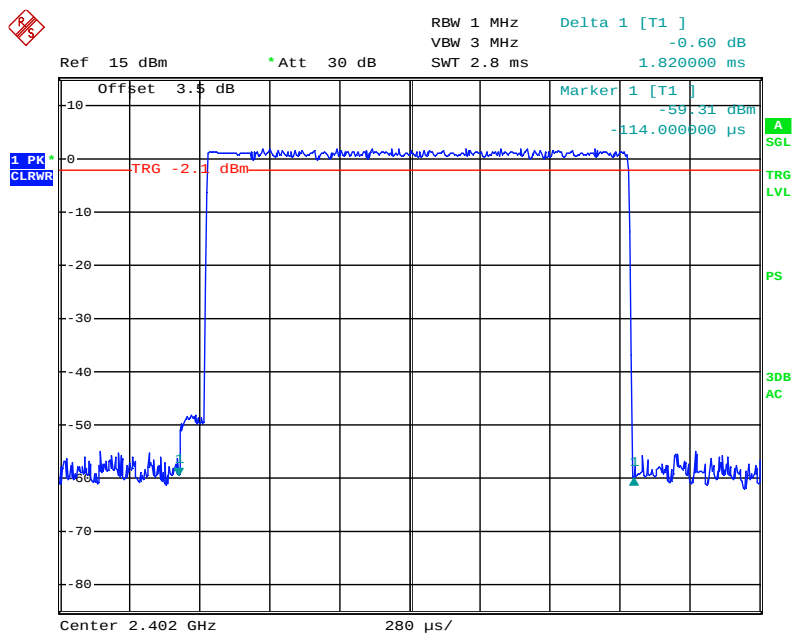
Date: 31.OCT.2012 16:31:59

Pulse time, High Channel, DH1



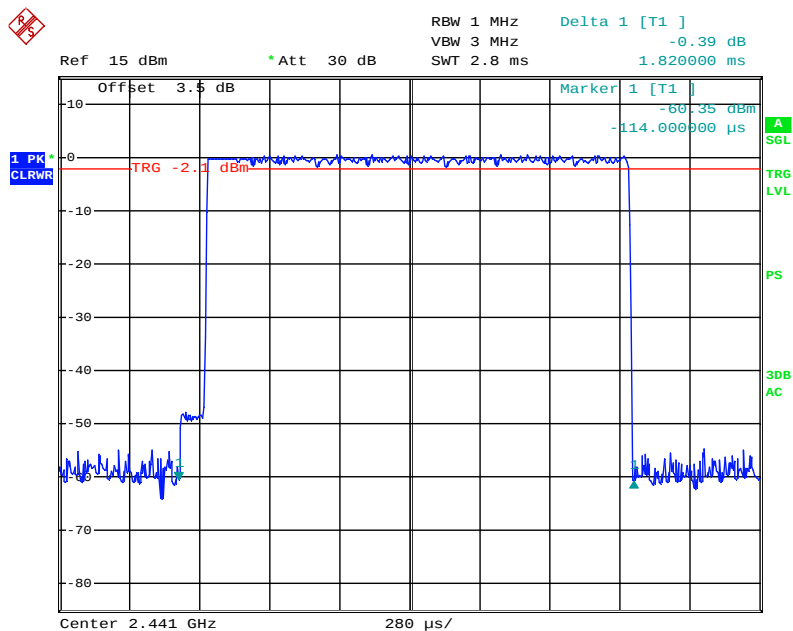
Date: 31.OCT.2012 16:34:46

Pulse time, Low Channel, DH3



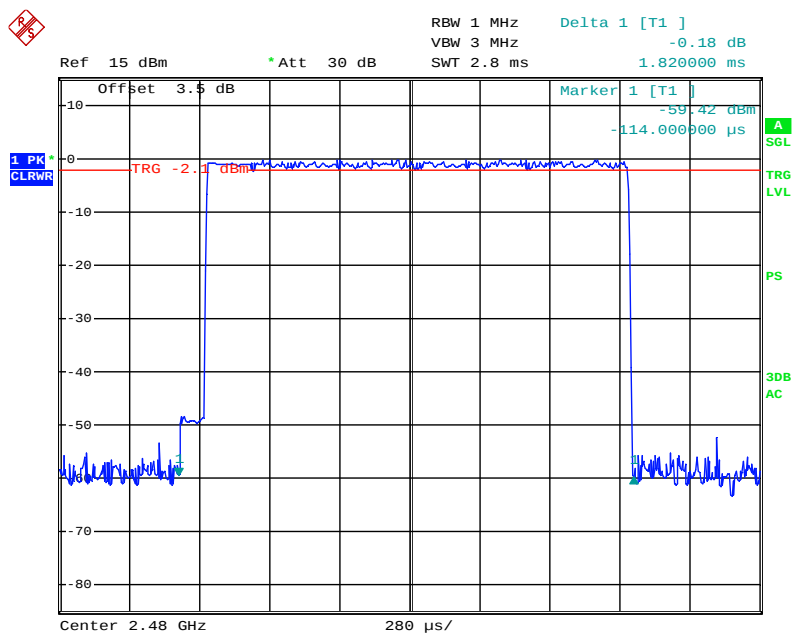
Date: 1.NOV.2012 07:52:15

Pulse time, Middle Channel, DH3



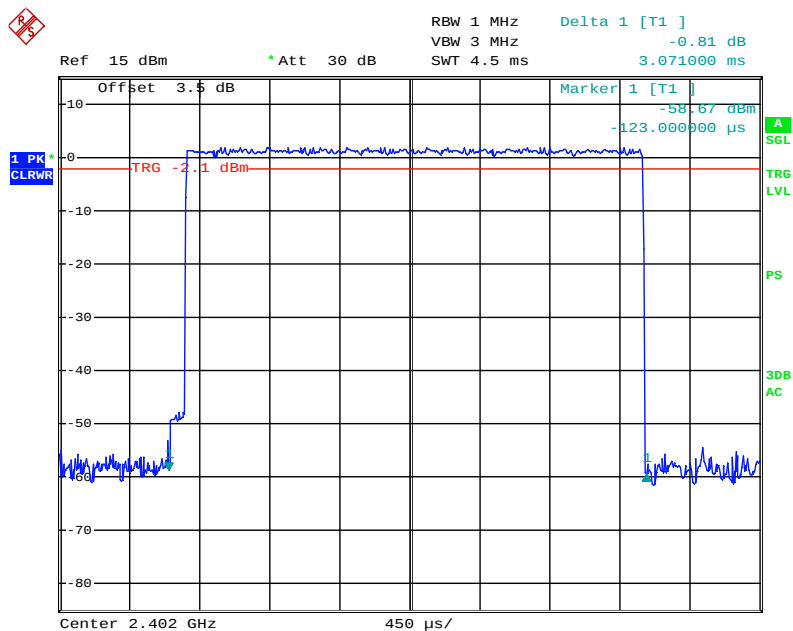
Date: 1.NOV.2012 07:52:47

Pulse time, High Channel, DH3



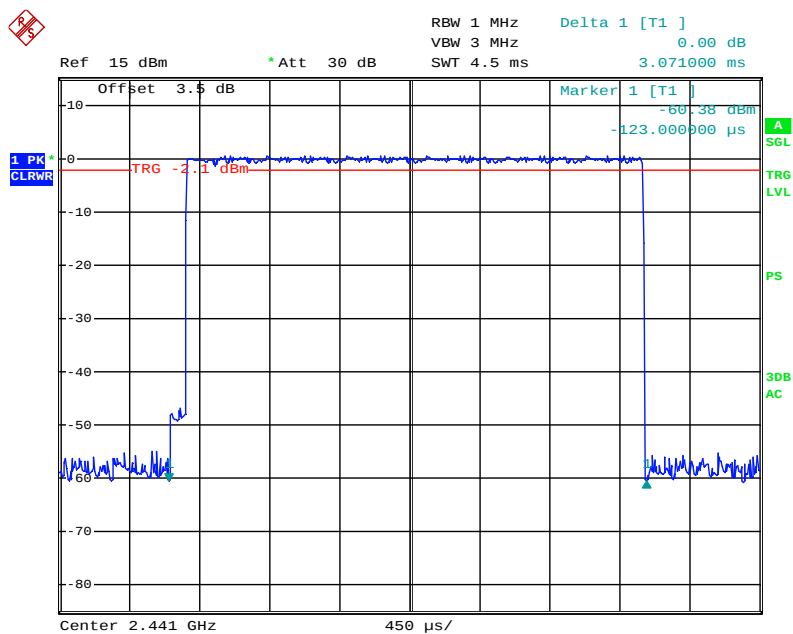
Date: 1.NOV.2012 07:53:39

Pulse time, Low Channel, DH5



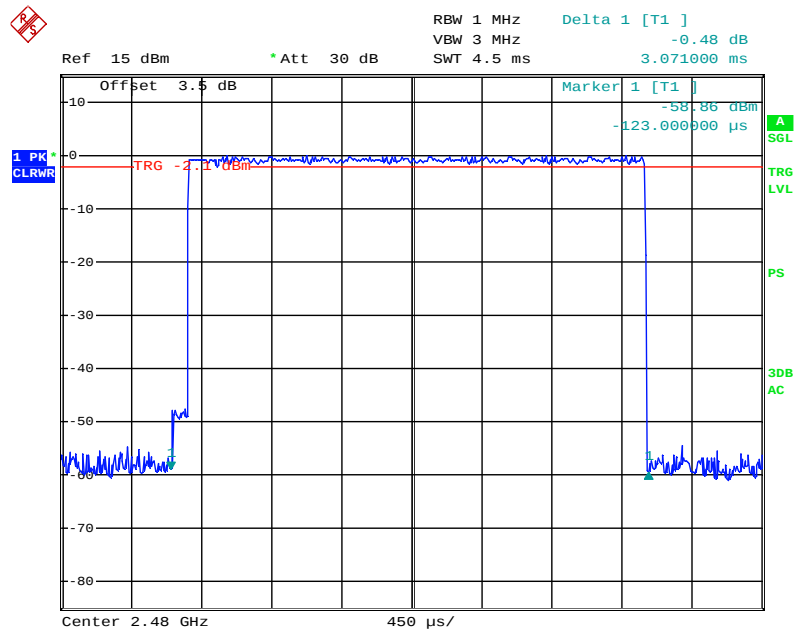
Date: 1.NOV.2012 08:00:29

Pulse time, Middle Channel, DH5



Date: 1.NOV.2012 07:58:40

Pulse time, High Channel, DH5



Date: 1.NOV.2012 07:56:53

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. And 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	101122	2012-08-08	2013-08-07

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

Test Data

Environmental Conditions

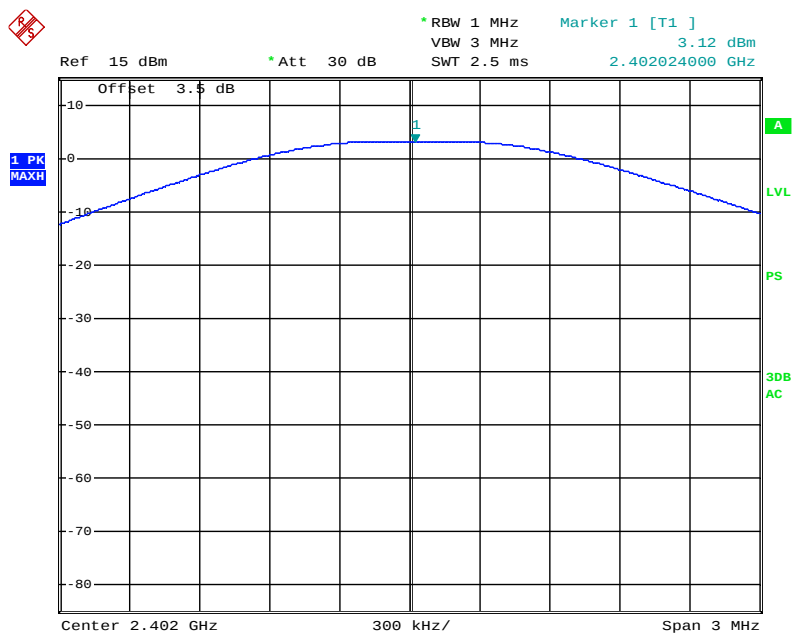
Temperature:	25°C
Relative Humidity:	55 %
ATM Pressure:	100 kPa

The testing was performed by Gardon Zhang on 2012-10-31.

EUT operation mode: Transmitting

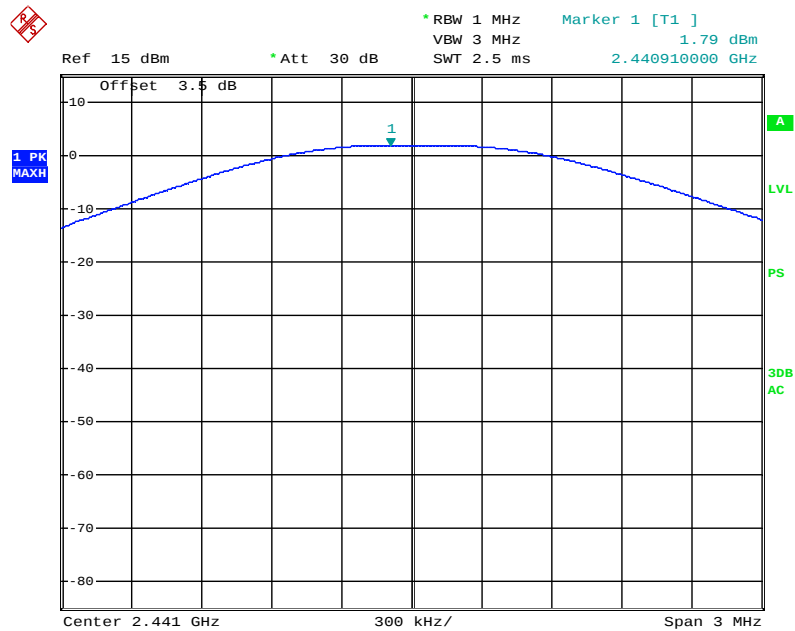
Test Result: Compliance. Please refer to following tables and plots

Mode	Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
			(dBm)	(mW)	
BDR (GFSK)	Low	2402	3.12	2.051	1000
	Middle	2441	1.79	1.510	1000
	High	2480	0.99	1.256	1000
EDR ($\pi/4$-DQPSK)	Low	2402	2.53	1.791	1000
	Middle	2441	0.93	1.239	1000
	High	2480	-0.54	0.883	1000
EDR (8DPSK)	Low	2402	2.87	1.936	1000
	Middle	2441	1.29	1.346	1000
	High	2480	-0.25	0.944	1000

BDR (GFSK): Low Channel

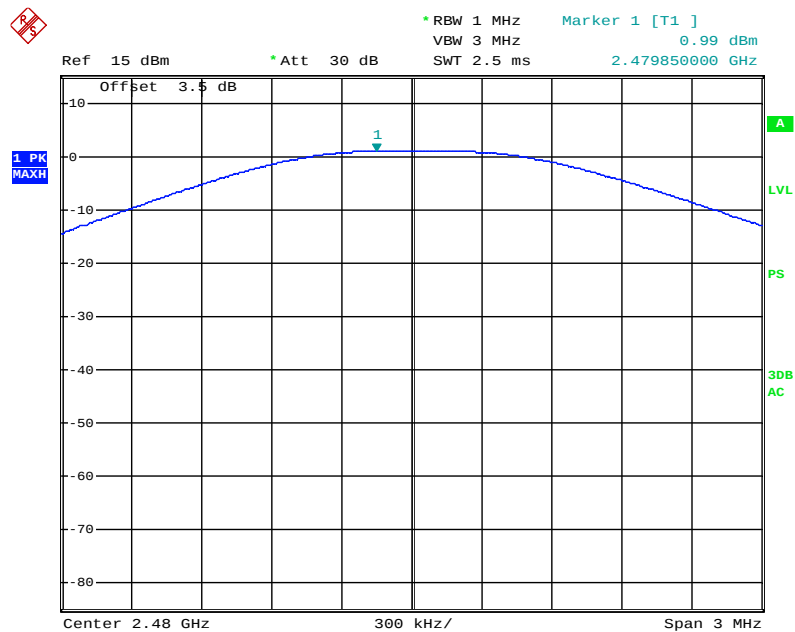
Date: 31.OCT.2012 12:35:26

BDR (GFSK): Middle Channel



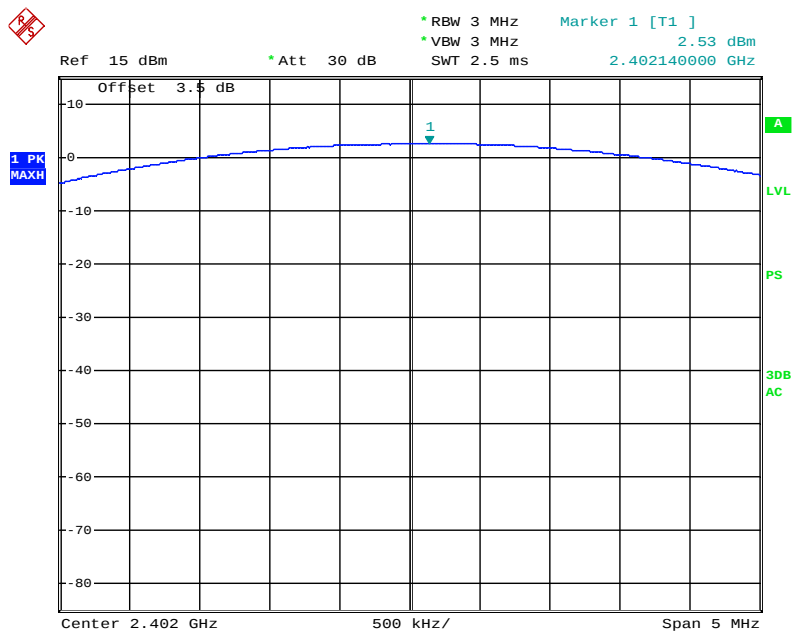
Date: 31.OCT.2012 12:37:41

BDR (GFSK): High Chanel



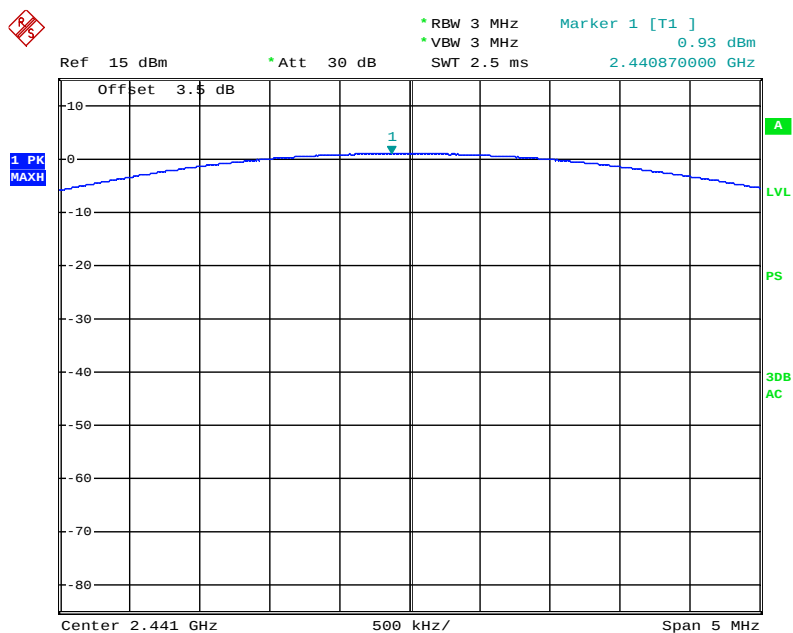
Date: 31.OCT.2012 12:38:27

EDR($\pi/4$ -DQPSK): Low Channel



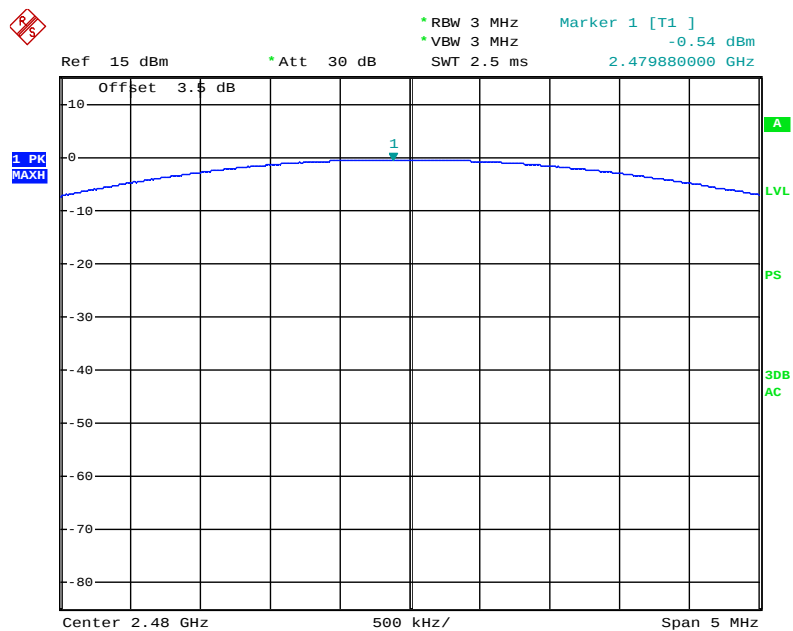
Date: 31.OCT.2012 14:43:23

EDR($\pi/4$ -DQPSK): Middle Channel



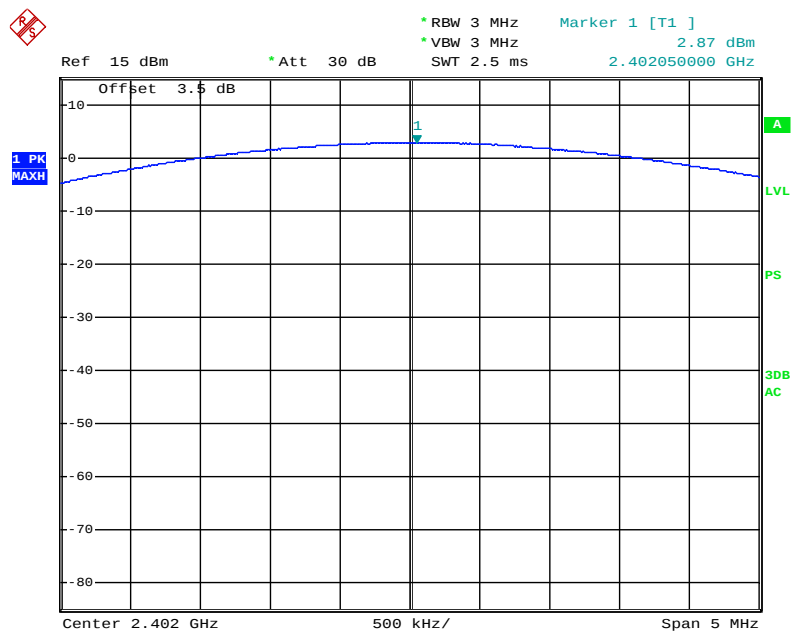
Date: 31.OCT.2012 14:38:01

EDR($\pi/4$ -DQPSK): High Chanel



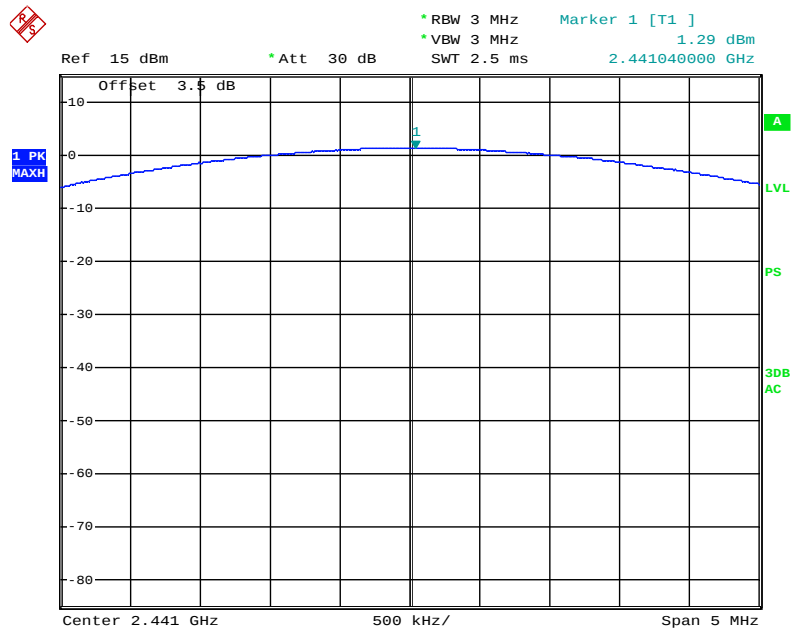
Date: 31.OCT.2012 14:39:35

EDR(8DPSK): Low Channel



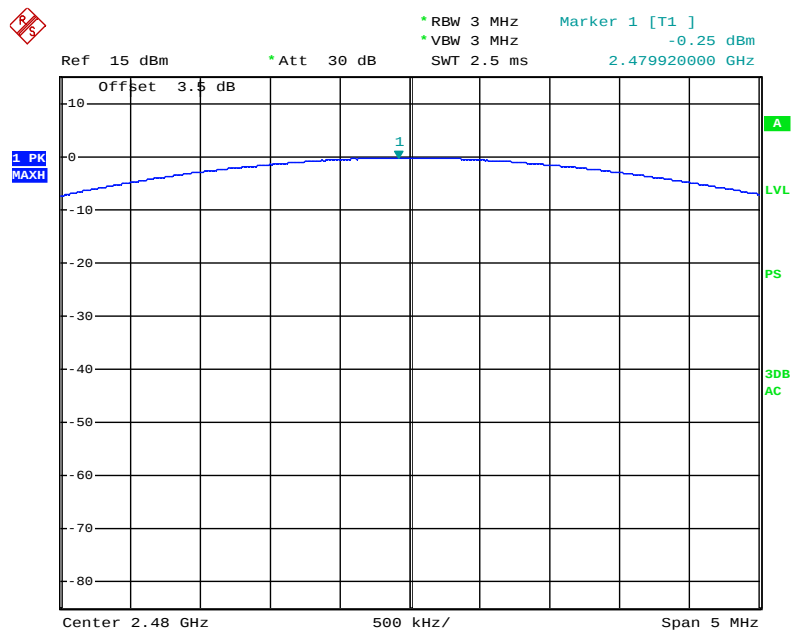
Date: 31.OCT.2012 15:40:09

EDR(8DPSK): Middle Channel



Date: 31.OCT.2012 15:42:33

EDR(8DPSK): High Chanel



Date: 31.OCT.2012 15:43:32

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 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	101122	2012-08-08	2013-08-07

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

Test Data

Environmental Conditions

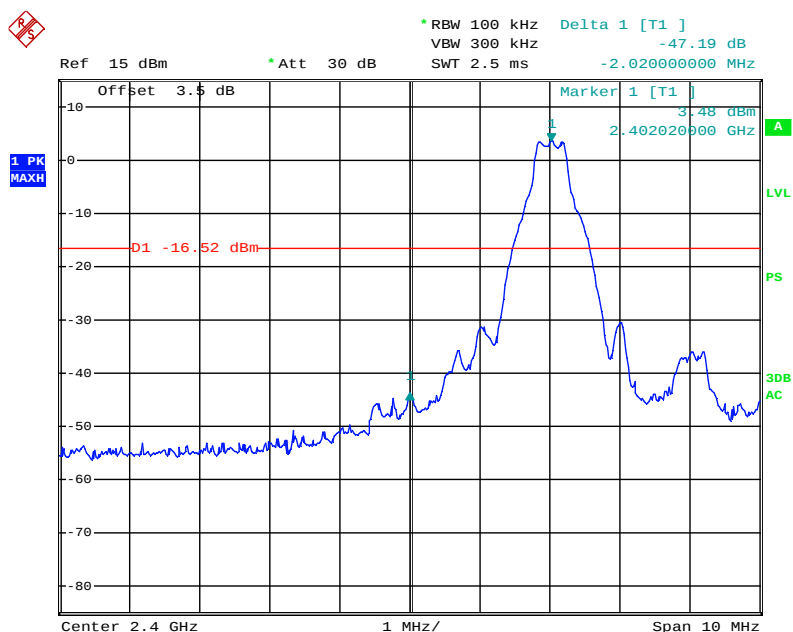
Temperature:	25°C
Relative Humidity:	55 %
ATM Pressure:	100 kPa

The testing was performed by Gardon Zhang on 2012-10-31.

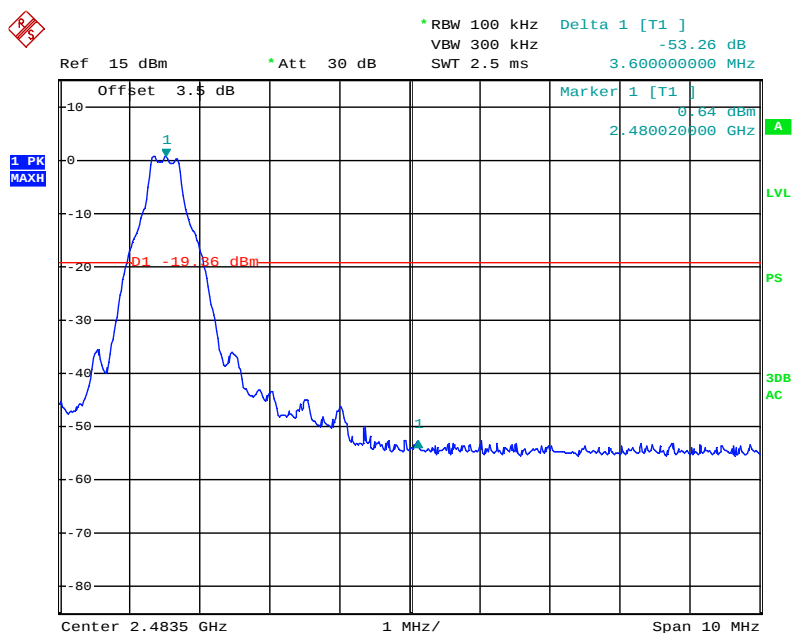
EUT operation mode: Transmitting

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

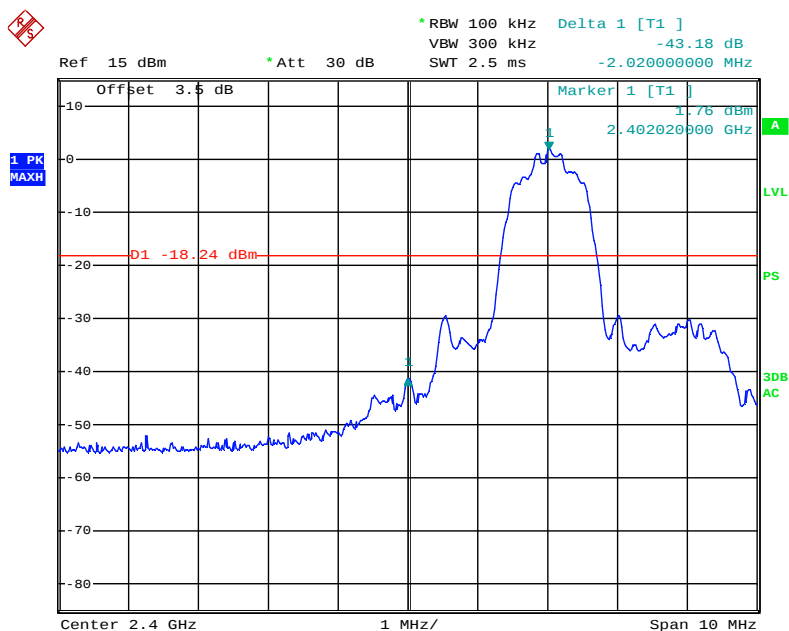
Mode	Frequency Band	Delta Peak to Band Emission (dBc)	Limit (dBc)
BDR (GFSK)	Left-band	47.19	> 20
	Right-band	53.26	> 20
EDR ($\pi/4$ -DQPSK)	Left-band	43.18	> 20
	Right-band	51.25	> 20
EDR (8DPSK)	Left-band	43.23	> 20
	Right-band	51.71	> 20

BDR (GFSK): Band Edge-Left Side

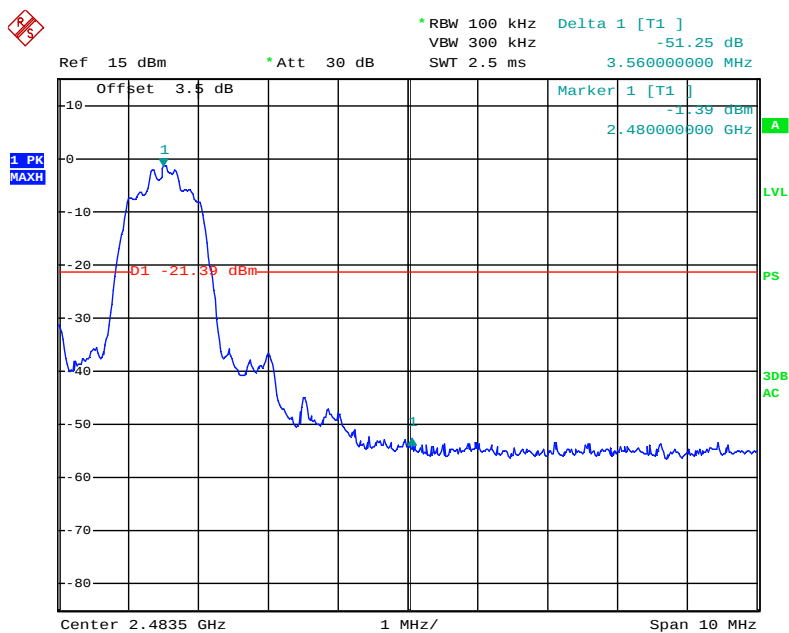
Date: 31.OCT.2012 13:25:38

BDR (GFSK): Band Edge-Right Side

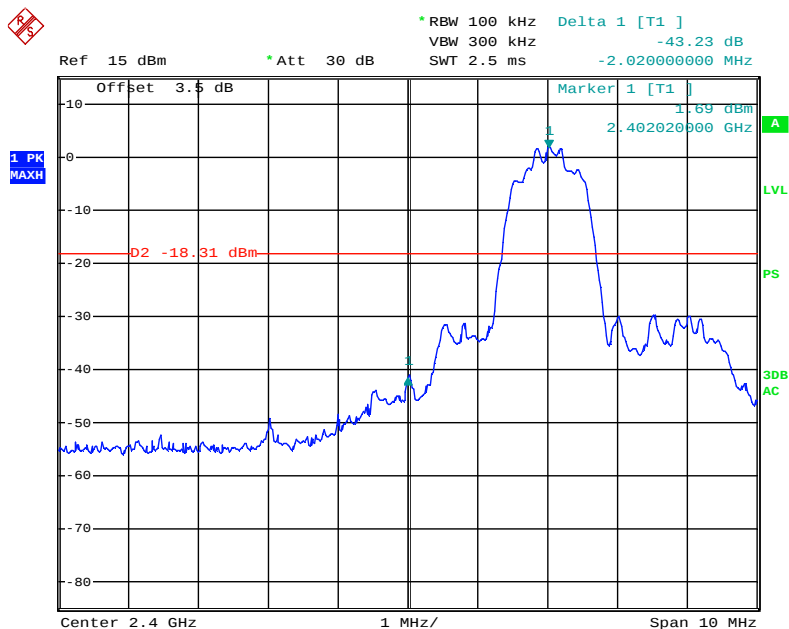
Date: 31.OCT.2012 13:23:37

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

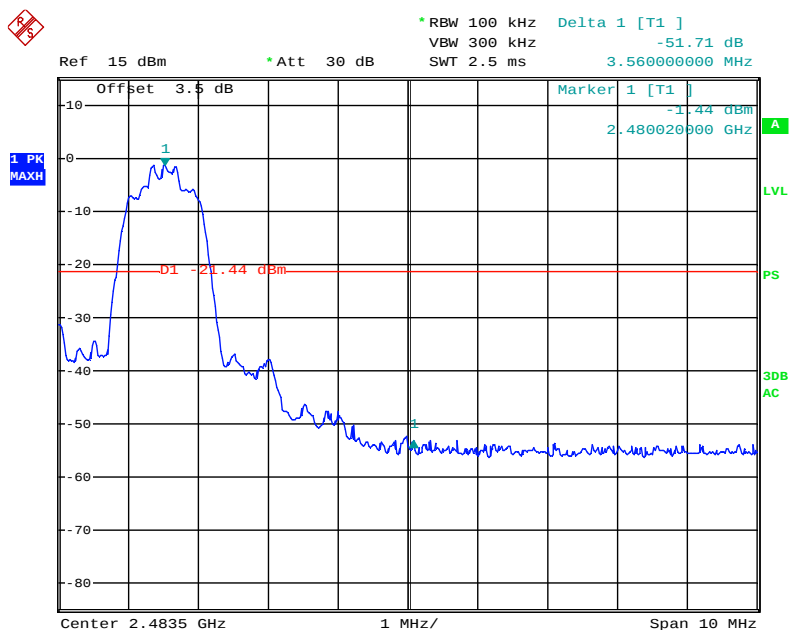
Date: 31.OCT.2012 15:02:23

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

Date: 31.OCT.2012 15:04:24

EDR (8DPSK): Band Edge-Left Side

Date: 31.OCT.2012 15:52:07

EDR (8DPSK): Band Edge-Right Side

Date: 31.OCT.2012 15:54:28

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