

**FCC PART 15.247  
TEST REPORT**

For

**Amgoo Telecom Co., Ltd.**

6/F, Block 3, Tongjian Building, Middle Shennan Rd, Futian District, Shenzhen, China

**FCC ID: UOSAM215**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Mobile phone
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<b>Report Number:</b> <u>RSZ121228008-00B</u>	
<b>Report Date:</b> <u>2013-01-07</u>	
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\* This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★"

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## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The *Amgoo Telecom Co., Ltd.*'s product, model number: *AM215 (FCC ID: UOSAM215)* or the "EUT" in this report was a *Mobile phone*, which was measured approximately: 108 mm (L) x 48 mm (W) x 14.5 mm (H), rated input voltage: DC 3.7 V Li-ion battery or DC 5V charging from adapter.

Adapter Information: AMGOO

Model: CH4

Input: 100-240V ~ 50/60Hz 0.3A

Output: DC 5V 500mA

*\* All measurement and test data in this report was gathered from production sample serial number: 1212170 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2012-12-28.*

### Objective

This test report is prepared on behalf of *Amgoo Telecom Co., Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine 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)

FCC Part 22H&24E PCE and Part 15B JBP submissions with FCC ID: UOSAM215.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, 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 3<sup>rd</sup> 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 C63.4-2003.

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.

### Equipment Modifications

No modification was made to the EUT tested.

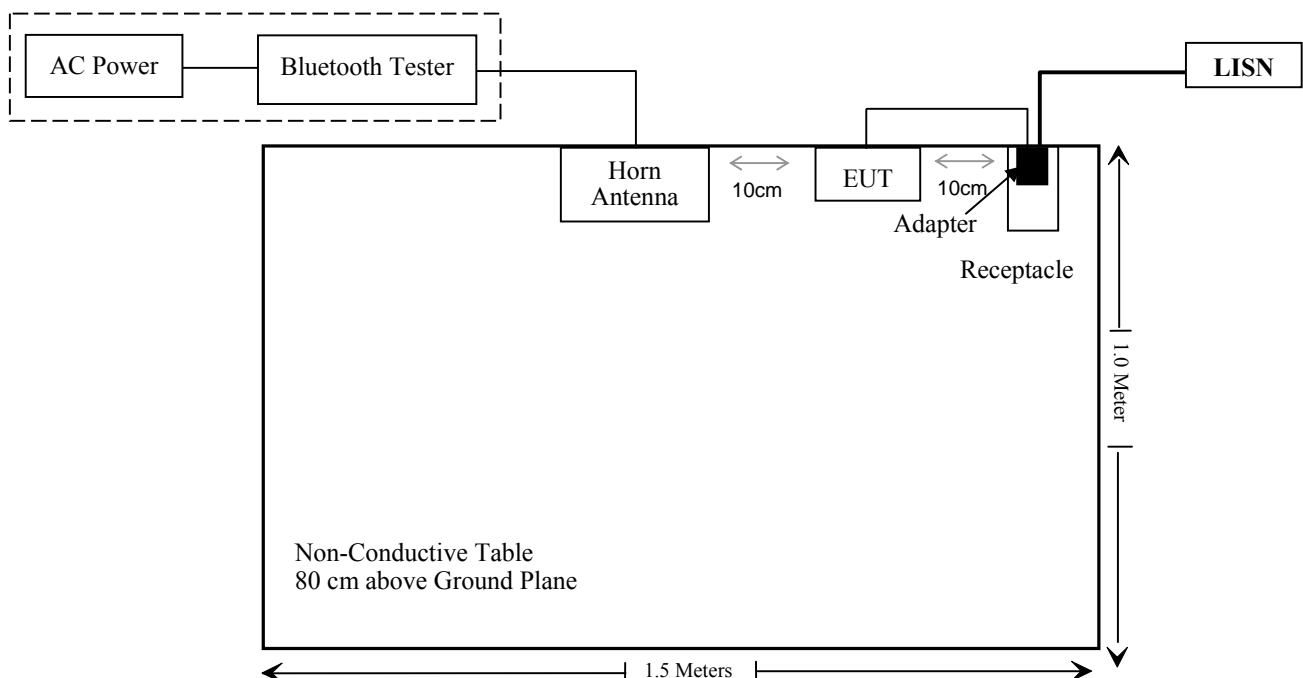
### Support Equipment List and Details

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

### External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable DC Power Cable	1.0	EUT	Adapter

### Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1)& §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

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## **FCC§15.247 (i), §1.1307 (b) (1) &§2.1093 – RF EXPOSURE**

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### **Applicable Standard**

According to FCC §2.1093 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 General RF Exposure Guidance v05

### **Result**

According to FCC KDB 447498 D01 General RF Exposure Guidance v05 generic portable criteria

The distance between antenna and test point is 5 mm

The Max output power: 9.311mW

According to the Appendix A of KDB 447498, the exclusion thresholds for 2450 MHz is 10 mW.

### **Conclusion:**

The time-averaged output power is 9.311 mW < the SAR exclusion thresholds is 10 mW

So stand-alone SAR evaluation is not required



**FCC §15.203 – ANTENNA REQUIREMENT**

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**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 an integrated 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.

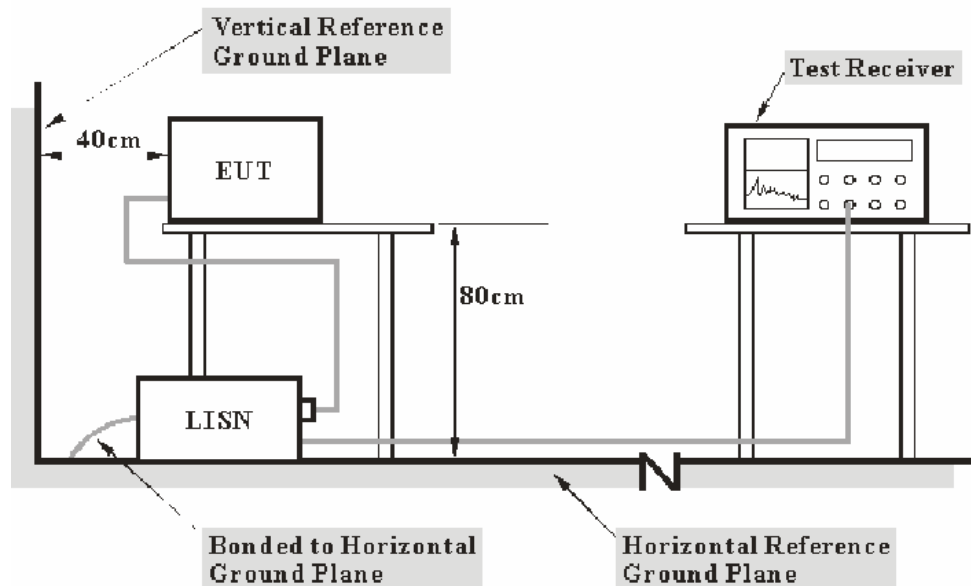
**Result:** Compliance.

## 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 setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

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

### EMI Test Receiver Setup

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

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

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

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2012-11-24	2013-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2012-08-22	2013-08-21
Rohde & Schwarz	Transient limiter	ESH3Z2	DE25985	2012-07-08	2013-07-07
BACL	CE Test software	BACL-CE	V1.0	-	-

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

**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 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:

**26.63 dB at 0.345 MHz in the Line conducted mode**

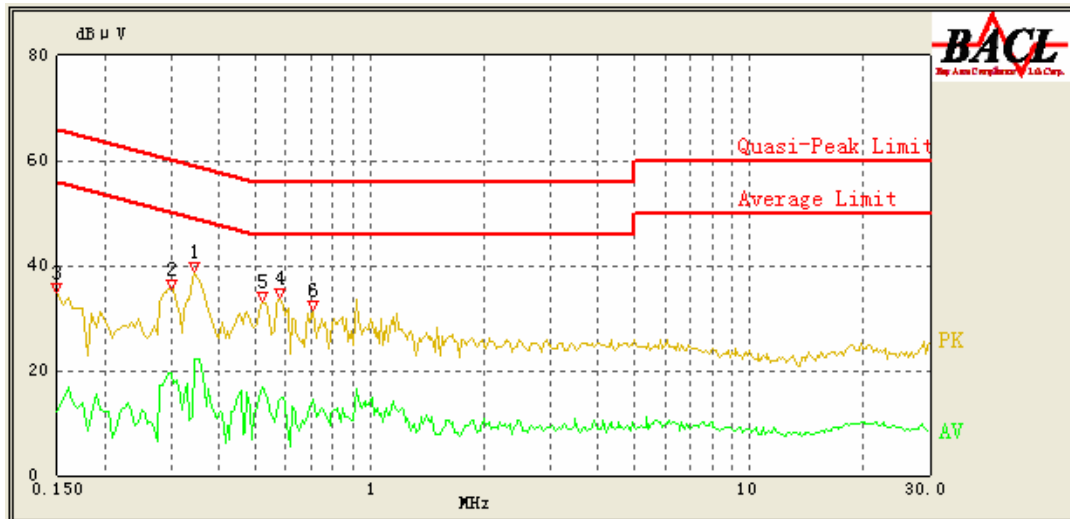
**Test Data****Environmental Conditions**

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

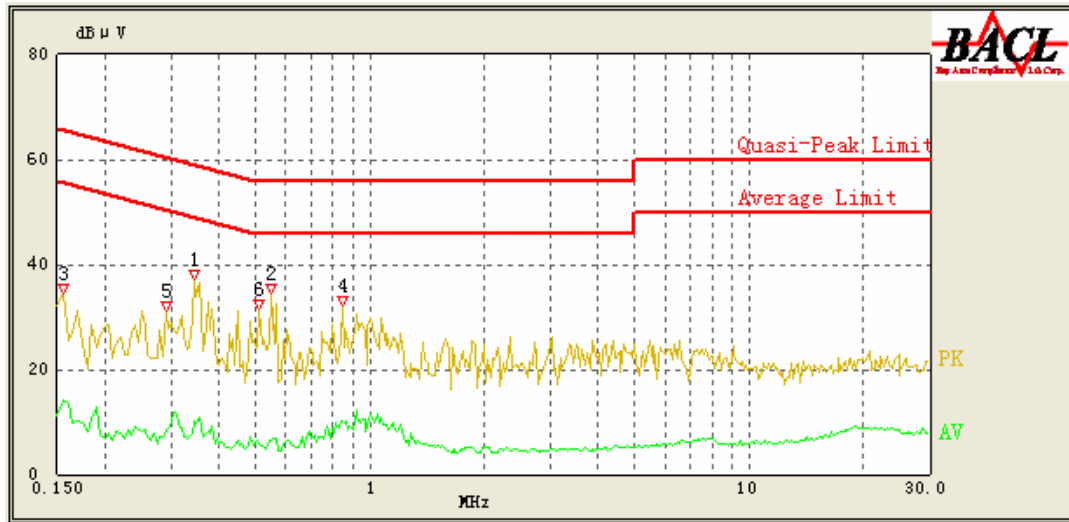
*The testing was performed by Brown Lu on 2012-12-05.*

Test Mode: Charging & Transmitting

AC 120 V, 60 Hz, Line:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.345	33.80	10.26	60.43	26.63	QP
0.345	22.24	10.26	50.43	28.19	Ave.
0.520	16.76	10.25	46.00	29.24	Ave.
0.580	14.49	10.24	46.00	31.51	Ave.
0.705	14.49	10.22	46.00	31.51	Ave.
0.300	19.57	10.26	51.71	32.14	Ave.
0.580	23.70	10.24	56.00	32.30	QP
0.300	28.38	10.26	61.71	33.33	QP
0.705	22.15	10.22	56.00	33.85	QP
0.520	21.68	10.25	56.00	34.32	QP
0.150	25.35	10.27	66.00	40.65	QP
0.150	12.20	10.27	56.00	43.80	Ave.

**AC 120V, 60 Hz, Neutral:**

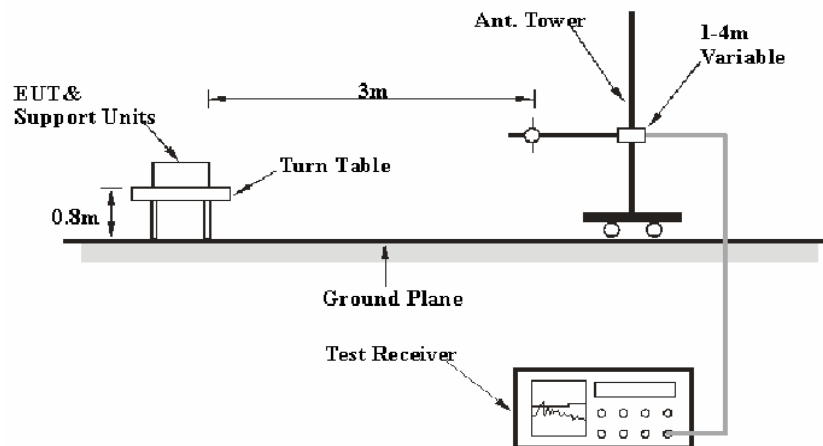
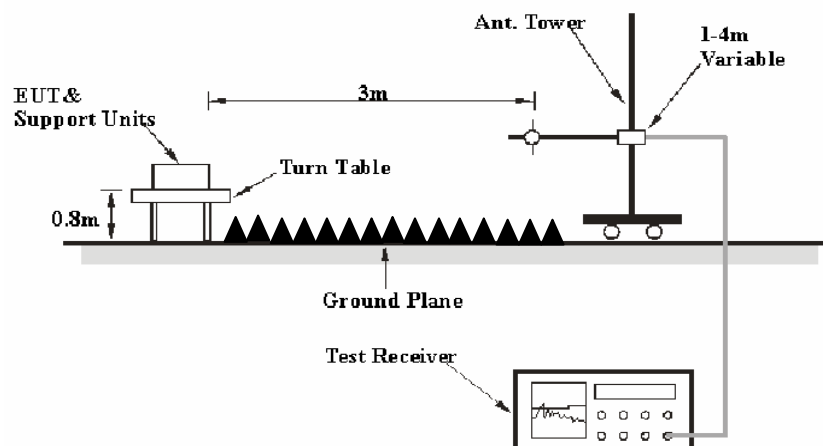
Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.845	26.11	10.19	56.00	29.89	QP
0.550	23.67	10.24	56.00	32.33	QP
0.840	10.04	10.19	46.00	35.96	Ave.
0.345	24.40	10.25	60.43	36.03	QP
0.510	19.12	10.24	56.00	36.88	QP
0.155	27.76	10.24	65.86	38.10	QP
0.550	6.64	10.24	46.00	39.36	Ave.
0.510	6.28	10.24	46.00	39.72	Ave.
0.345	10.26	10.25	50.43	40.17	Ave.
0.290	21.43	10.25	62.00	40.57	QP
0.155	14.28	10.24	55.86	41.58	Ave.
0.290	8.06	10.25	52.00	43.94	Ave.

**Note:**

- 1) Correction Factor = LISN/ISN VDF (Voltage Division Factor) + Cable Loss + Pulse Limiter Attenuation  
The corrected factor has been input into the transducer of the test software.
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

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

FCC §15.205; §15.209; §15.247(d)

**EUT Setup****Below 1 GHz:****Above 1 GHz:**

The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.247 limits.

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

The spacing between the peripherals was 10 cm.

## 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
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Ave.

## Test Procedure

For radiated emissions, the EUT was set to in a continuous transmitting with modulation mode.

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:

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

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	1937A01046	2012-11-24	2013-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
SUPER ULTRA	Amplifier	ZVA-213+	N/A	2012-11-24	2013-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2010-10-14	2013-10-13

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

**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:

**5.65 dB at 7206.0 MHz in the Vertical polarization**

**Test Data****Environmental Conditions**

<b>Temperature:</b>	25°C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.1 kPa

*The testing was performed by Brown Lu on 2013-01-04.*

*Test mode: Transmitting*



**30 MHz ~25 GHz:** (Scan with GFSK,  $\pi/4$ -DQPSK, 8DPSK, the worst case is BDR Mode (GFSK))

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247		
	Reading (dBμV/m)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2402 MHz)										
2402.0	88.82	PK	56	1.1	H	6.13	94.95	/	/	Fund.
2402.0	79.85	Ave.	56	1.1	H	6.13	85.98	/	/	Fund.
2402.0	84.21	PK	117	1.0	V	6.13	90.34	/	/	Fund.
2402.0	75.53	Ave.	117	1.0	V	6.13	81.66	/	/	Fund.
7206.0	51.29	PK	175	1.2	V	17.06	68.35	74	5.65	Harmonic
7206.0	27.78	Ave.	175	1.2	V	17.06	44.84	54	9.16	Harmonic
9608.0	22.07	Ave.	96	1.4	V	19.28	41.35	54	12.65	Harmonic
9608.0	40.87	PK	96	1.4	V	19.28	60.15	74	13.85	Harmonic
4804.0	21.38	Ave.	304	1.4	V	12.40	33.78	54	20.22	Harmonic
2499.6	21.06	Ave.	218	1.1	V	7.21	28.27	54	25.73	Spurious
4804.0	35.73	PK	304	1.4	V	12.40	48.13	74	25.87	Harmonic
2389.2	21.31	Ave.	133	1.2	H	6.13	27.44	54	26.56	Spurious
2357.6	21.34	Ave.	26	1.1	V	5.48	26.82	54	27.18	Spurious
2389.2	37.55	PK	133	1.2	H	6.13	43.68	74	30.32	Spurious
2499.6	35.97	PK	218	1.1	V	7.21	43.18	74	30.82	Spurious
2357.6	35.51	PK	26	1.1	V	5.48	40.99	74	33.01	Spurious
Middle Channel (2441 MHz)										
2441.0	87.82	PK	56	1.1	H	7.21	95.03	/	/	Fund.
2441.0	78.21	Ave.	56	1.1	H	7.21	85.42	/	/	Fund.
2441.0	85.60	PK	133	1.3	V	7.21	92.81	/	/	Fund.
2441.0	76.58	Ave.	133	1.3	V	7.21	83.79	/	/	Fund.
7323.0	51.44	PK	76	1.3	V	16.49	67.93	74	6.07	Harmonic
7323.0	26.84	Ave.	76	1.3	V	16.49	43.33	54	10.67	Harmonic
9764.0	20.81	Ave.	237	1.1	V	19.40	40.21	54	13.79	Harmonic
9764.0	38.41	PK	237	1.1	V	19.40	57.81	74	16.19	Harmonic
4882.0	19.98	Ave.	155	1.2	V	12.46	32.44	54	21.56	Harmonic
2491.3	21.67	Ave.	96	1.0	V	7.21	28.88	54	25.12	Spurious
2386.4	22.03	Ave.	57	1.1	H	6.13	28.16	54	25.84	Spurious
2356.3	21.46	Ave.	12	1.2	V	5.48	26.94	54	27.06	Spurious
4882.0	34.16	PK	155	1.2	V	12.46	46.62	74	27.38	Harmonic
2491.3	35.78	PK	96	1.0	V	7.21	42.99	74	31.01	Spurious
2386.4	36.72	PK	57	1.1	H	6.13	42.85	74	31.15	Spurious
2356.3	35.21	PK	12	1.2	V	5.48	40.69	74	33.31	Spurious

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247		
	Reading (dBμV/m)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)	Comment
High Channel (2480 MHz)										
2480.0	85.53	PK	54	1.6	H	7.21	92.74	/	/	Fund.
2480.0	76.61	Ave.	54	1.6	H	7.21	83.82	/	/	Fund.
2480.0	85.20	PK	60	1.4	V	7.21	92.41	/	/	Fund.
2480.0	75.29	Ave.	60	1.4	V	7.21	82.50	/	/	Fund.
7440.0	52.03	PK	75	1.4	V	15.90	67.93	74	6.07	Harmonic
7440.0	27.01	Ave.	75	1.4	V	15.90	42.91	54	11.09	Harmonic
9920.0	21.88	Ave.	37	1.1	V	19.38	41.26	54	12.74	Harmonic
9920.0	37.60	PK	37	1.1	V	19.38	56.98	74	17.02	Harmonic
4960.0	19.26	Ave.	106	1.1	H	12.50	31.76	54	22.24	Harmonic
2484.2	24.43	Ave.	157	1.4	H	7.21	31.64	54	22.36	Spurious
2484.2	44.16	PK	157	1.4	H	7.21	51.37	74	22.63	Spurious
2483.6	23.07	Ave.	71	1.2	V	7.21	30.28	54	23.72	Spurious
2483.6	39.98	PK	71	1.2	V	7.21	47.19	74	26.81	Spurious
4960.0	34.05	PK	106	1.1	H	12.50	46.55	74	27.45	Harmonic
2338.6	21.06	Ave.	112	1.1	V	5.48	26.54	54	27.46	Spurious
2338.6	35.11	PK	112	1.1	V	5.48	40.59	74	33.41	Spurious

**Note:**

- 1) Corrected Amplitude = Corrected Factor + Reading
- 2) Corrected Factor=Antenna factor (RX) + cable loss – amplifier factor
- 3) Margin = Limit - Corrected Amplitude
- 4) For below 1 GHz, all radiated emissions are 20 dB below the limit or are on the system noise floor level

**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, RBW of spectrum was set at 30 kHz, 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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2012-12-07	2013-12-06

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

**Test Data****Environmental Conditions**

Temperature:	25°C
Relative Humidity:	56 %
ATM Pressure:	100.1 kPa

\* The testing was performed by Brown Lu on 2013-01-04.

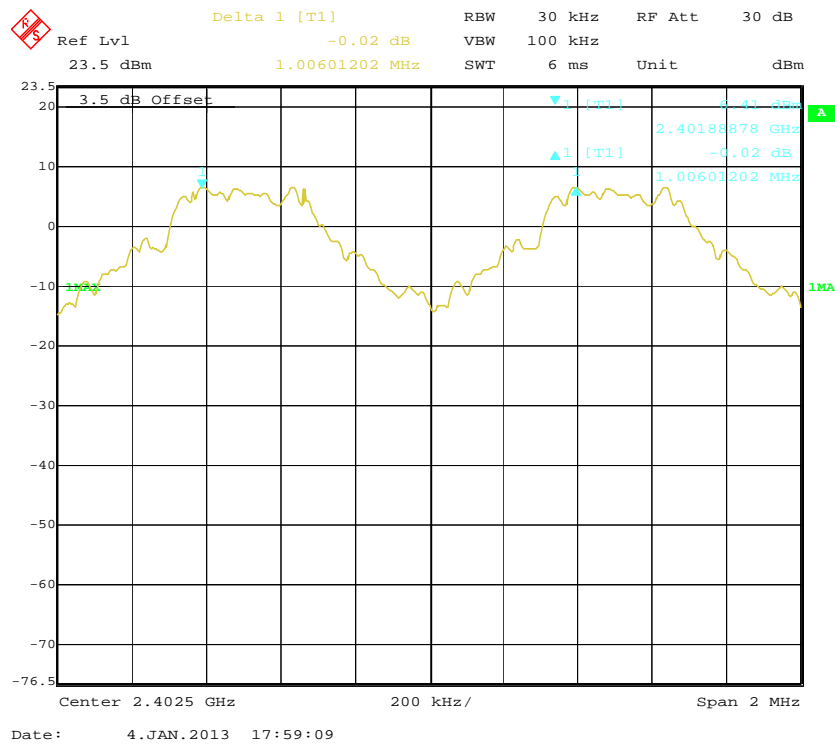
Test Mode: Transmitting

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

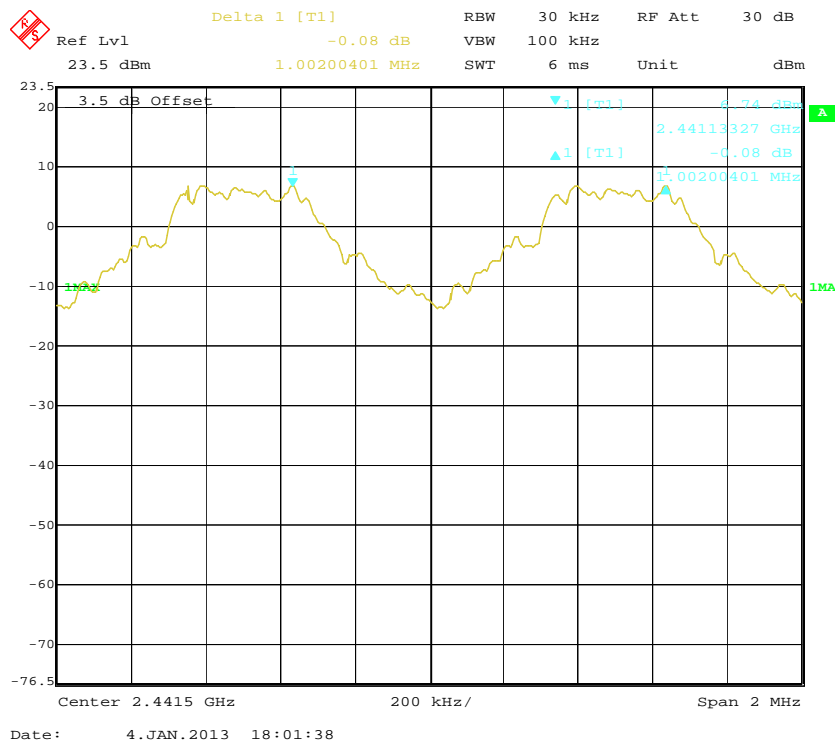
Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	$\geq$ Limit (MHz)	Result
BDR (GFSK)	Low	2402	1.006	0.641	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.673	Pass
	Adjacent	2442			
	High	2480	1.002	0.676	Pass
	Adjacent	2479			
EDR ( $\pi/4$ -DQPSK)	Low	2402	1.002	0.852	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.855	Pass
	Adjacent	2442			
	High	2480	1.002	0.865	Pass
	Adjacent	2479			
EDR (8DPSK)	Low	2402	1.002	0.847	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.847	Pass
	Adjacent	2442			
	High	2480	1.002	0.847	Pass
	Adjacent	2479			

Note: Limit = 20 dB bandwidth \*2/3

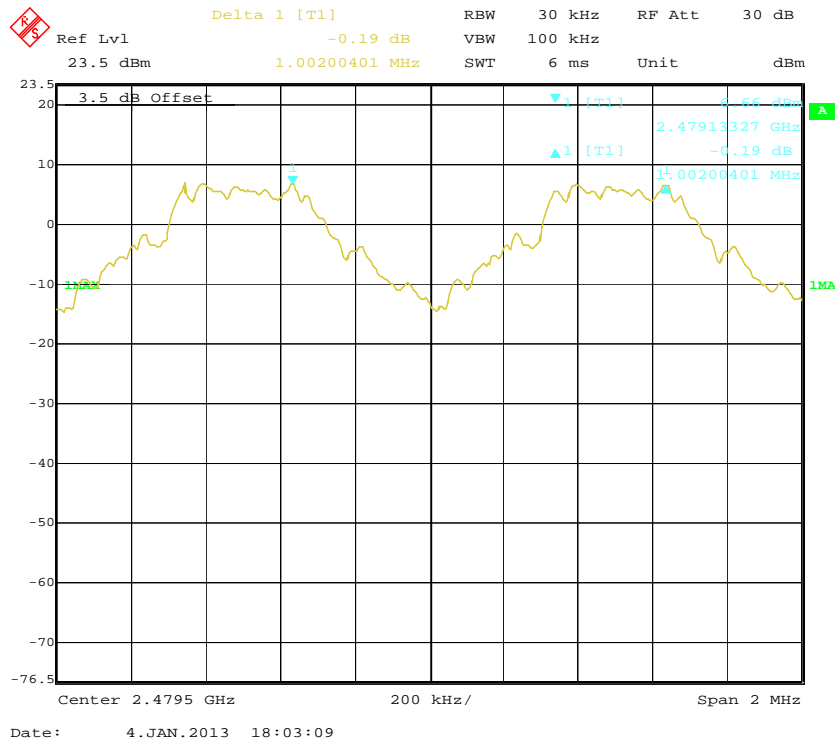
### BDR (GFSK): Low Channel



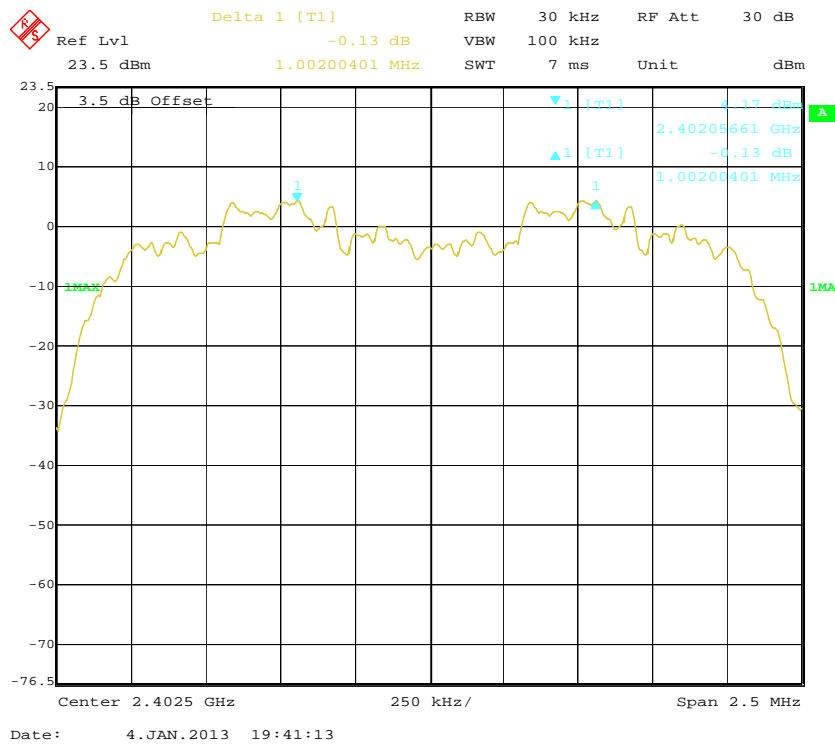
### BDR (GFSK): Middle Channel



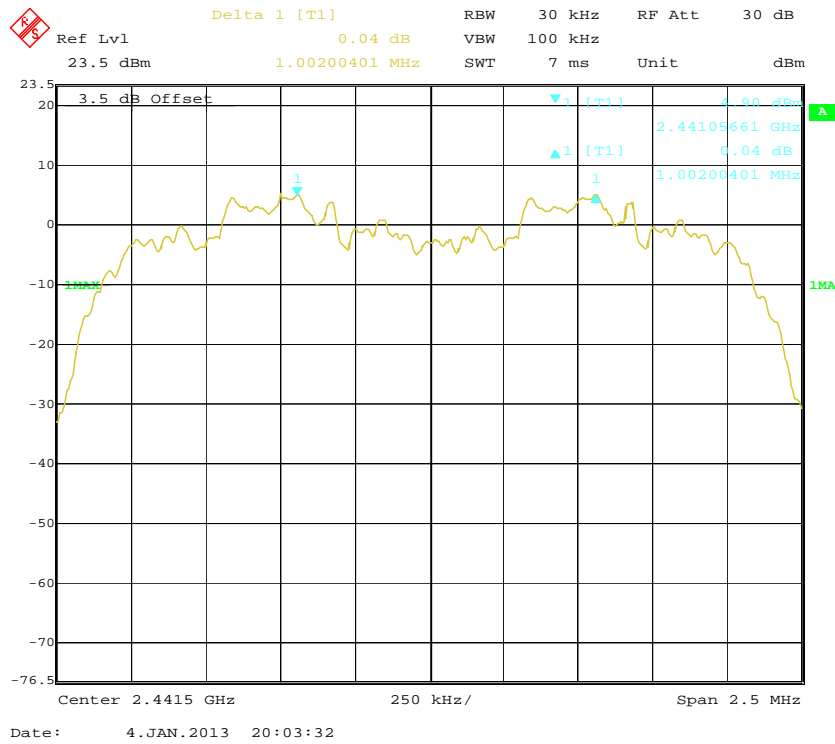
### BDR (GFSK): High Channel



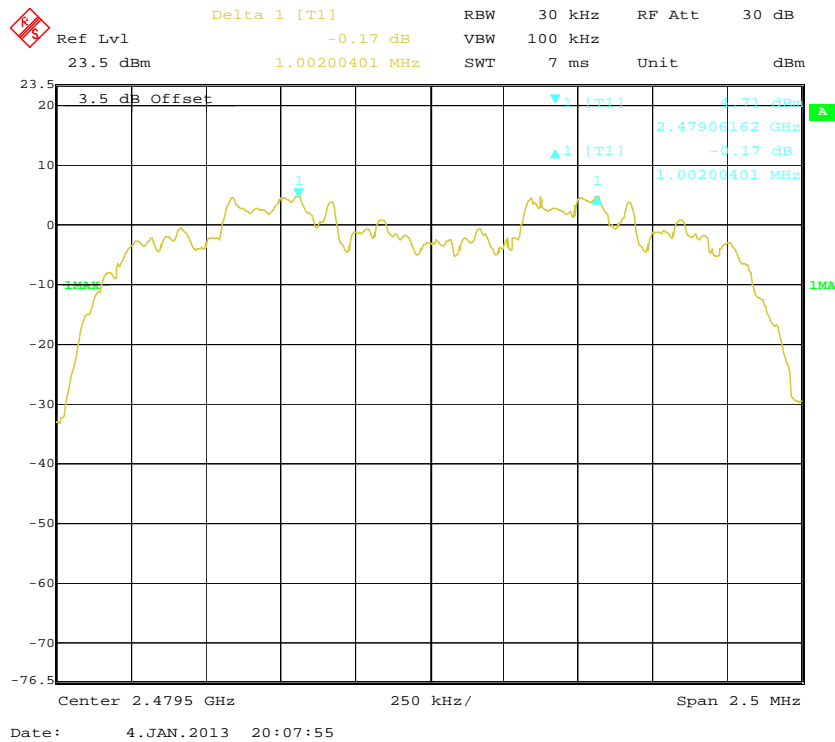
### EDR ( $\pi/4$ -DQPSK): Low Channel



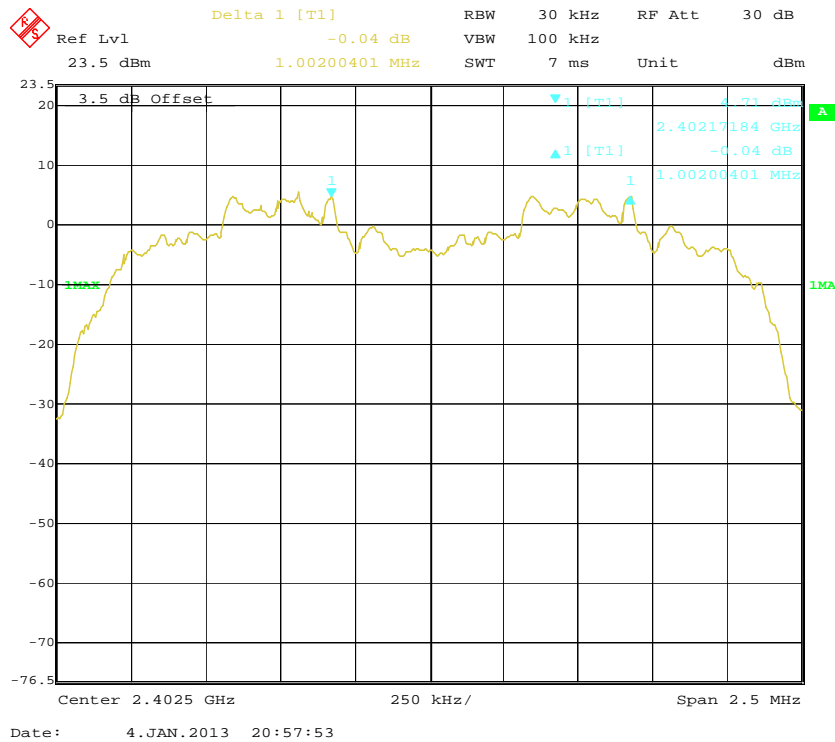
### EDR ( $\pi/4$ -DQPSK): Middle Channel



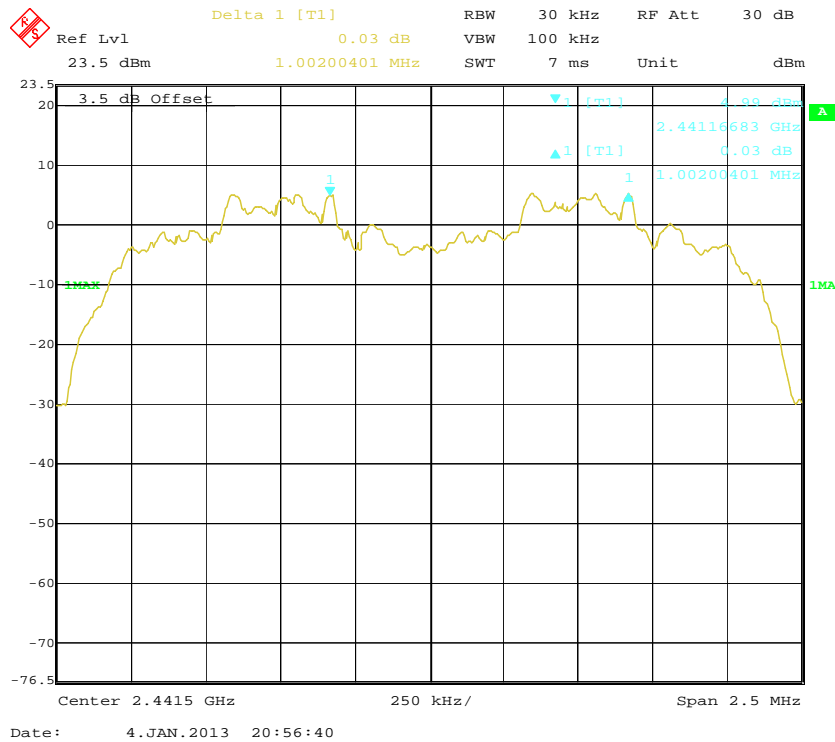
### EDR ( $\pi/4$ -DQPSK): High Channel



### EDR (8DPSK): Low Channel

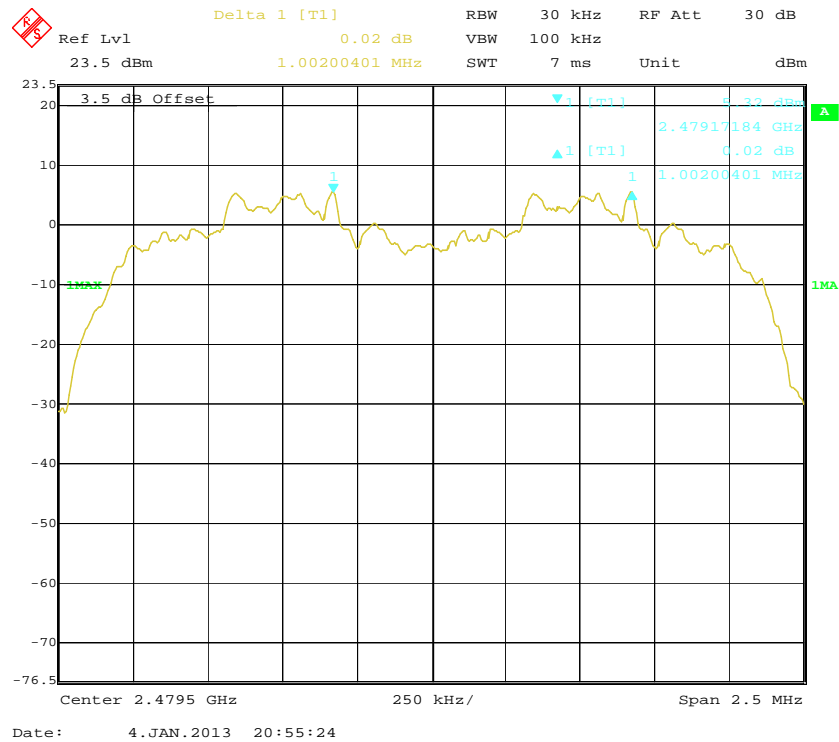


### EDR (8DPSK): Middle Channel





EDR (8DPSK): High Channel



## 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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2012-12-07	2013-12-06

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

### Test Data

#### Environmental Conditions

Temperature:	25°C
Relative Humidity:	56 %
ATM Pressure:	100.1 kPa

\* The testing was performed by Brown Lu on 2013-01-04.

Test Mode: Transmitting

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

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.962
	Middle	2441	1.010
	High	2480	1.014
EDR ( $\pi/4$ -DQPSK)	Low	2402	1.278
	Middle	2441	1.282
	High	2480	1.298
EDR (8DPSK)	Low	2402	1.270
	Middle	2441	1.270
	High	2480	1.270

Delta 1 [T1] RBW 10 kHz RF Att 20 dB

Ref Lvl 1.26 dB VBW 30 kHz

13.5 dBm 961.92384769 kHz SWT 50 ms Unit dBm

3.5 dB Offset

D1 1.62 dBm

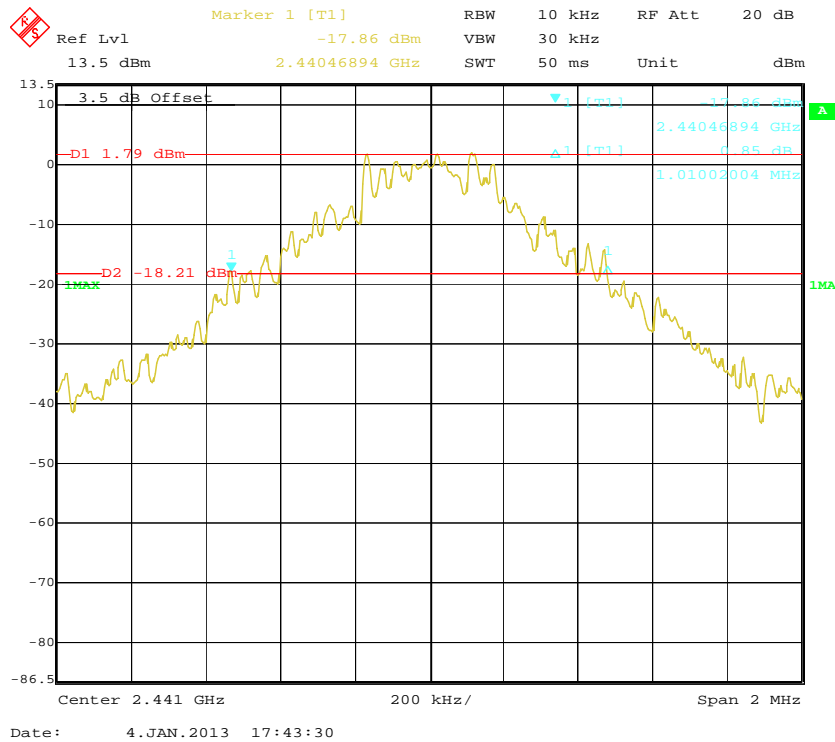
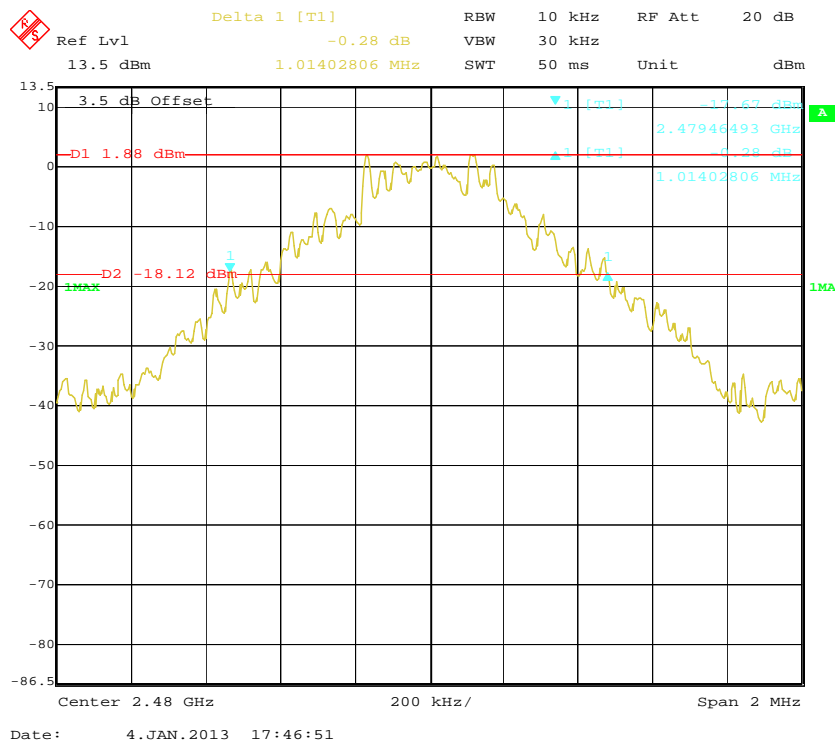
D2 -18.38 dBm

1 [T1]

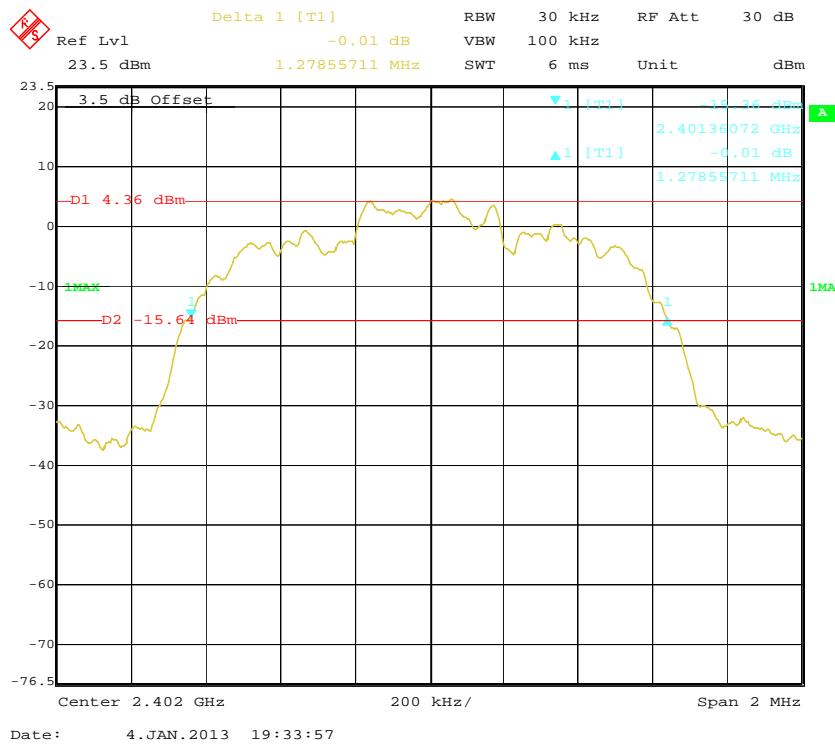
1MA

Center 2.402 GHz 200 kHz/ Span 2 MHz

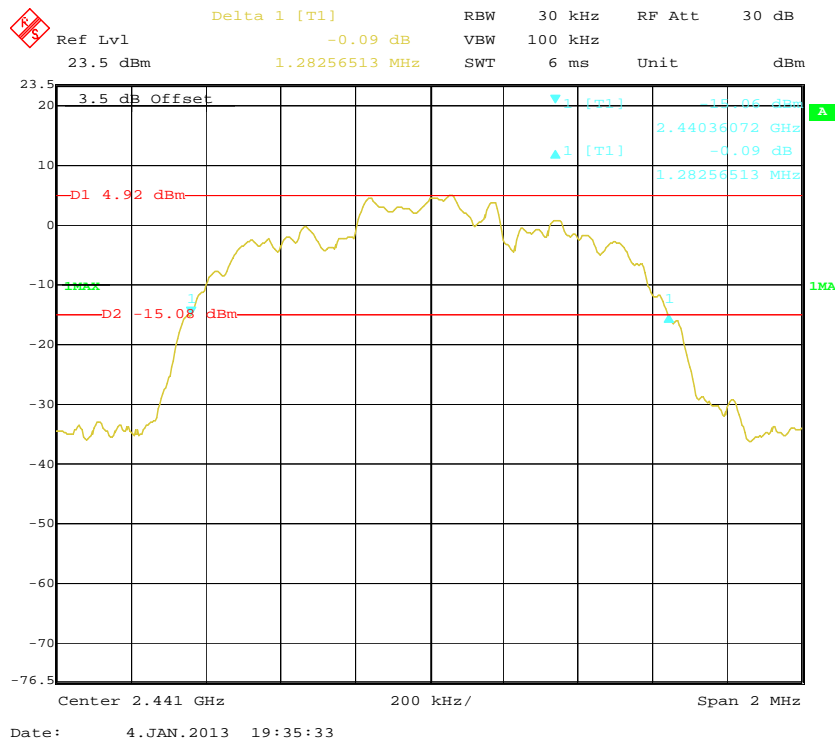
Date: 4.JAN.2013 17:56:14

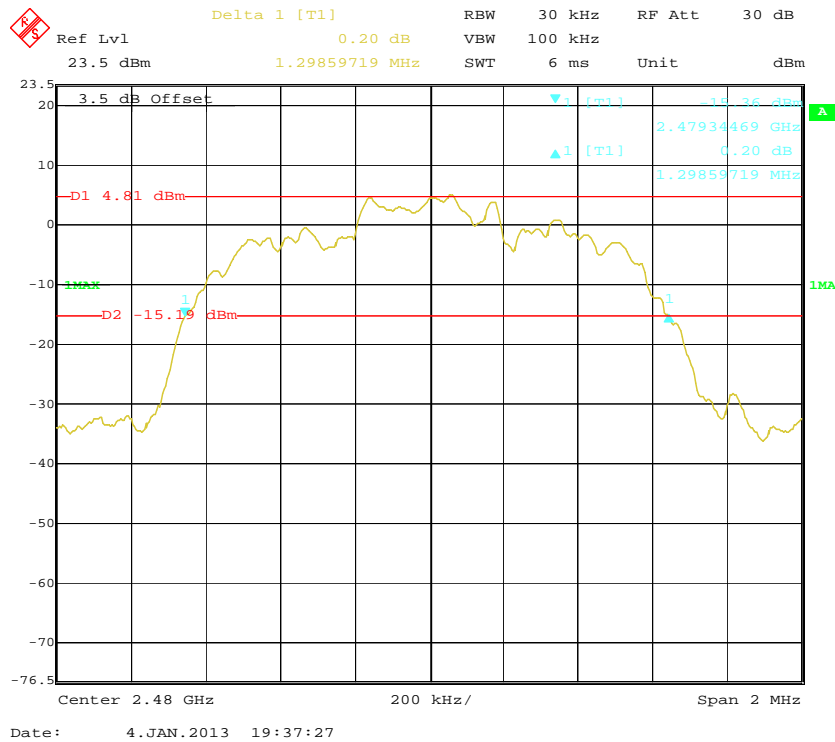
**BDR (GFSK): Middle Channel****BDR (GFSK): High Channel**

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

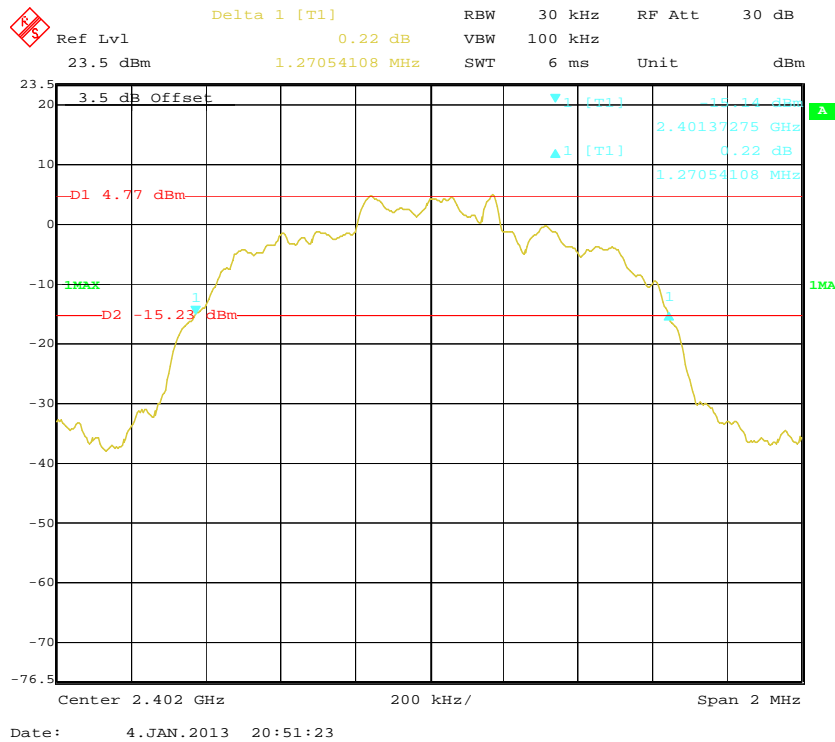


### EDR ( $\pi/4$ -DQPSK): Middle Channel



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

## EDR (8DPSK): Low Channel



Delta 1 [T1] 0.73 dB RBW 30 kHz RF Att 30 dB

Ref Lvl 23.5 dBm 1.27054108 MHz SWT 6 ms Unit dBm

3.5 dB Offset

D1 5.29 dBm

D2 -14.71 dBm

1 [T1] 2.44037275 GHz 0.73 dB 1.27054108 MHz

Center 2.441 GHz 200 kHz/ Span 2 MHz

Date: 4.JAN.2013 20:52:42

Delta 1 [T1] 0.18 dB

Ref Lvl 23.5 dBm

2.47937675 GHz

1.27054108 MHz

RBW 30 kHz

VBW 100 kHz

SWT 6 ms

RF Att 30 dB

Unit dBm

3.5 dB Offset

D1 5.32 dBm

D2 -14.68 dBm

Center 2.48 GHz

200 kHz/

Span 2 MHz

Date: 4. JAN. 2013 20:53:52

## 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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
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 National Primary Standards and International System of Units (SI).

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	25°C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.1 kPa

*The testing was performed by Brown Lu on 2013-01-04.*

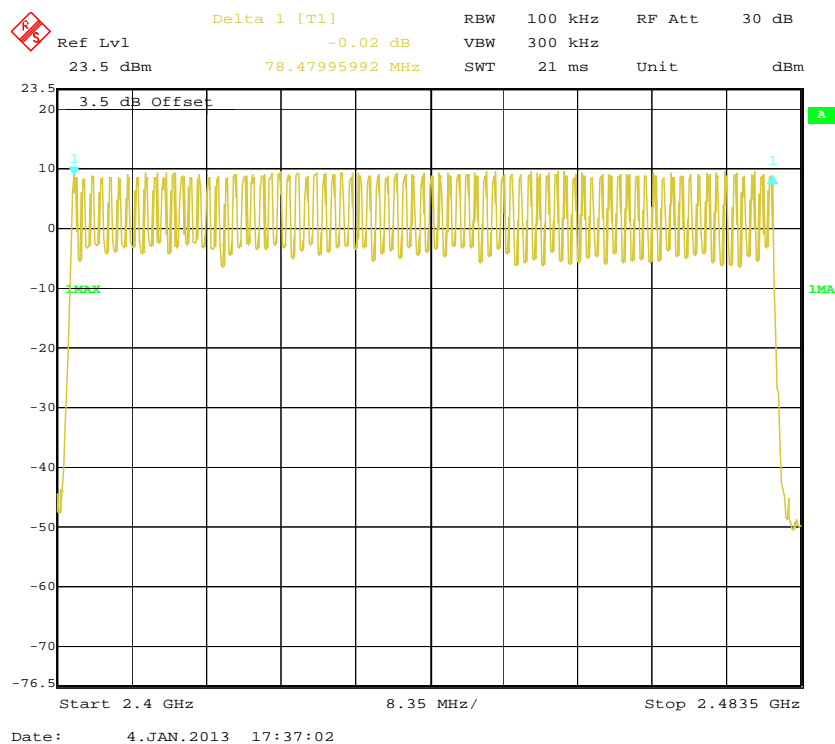
*Test Mode: Transmitting*

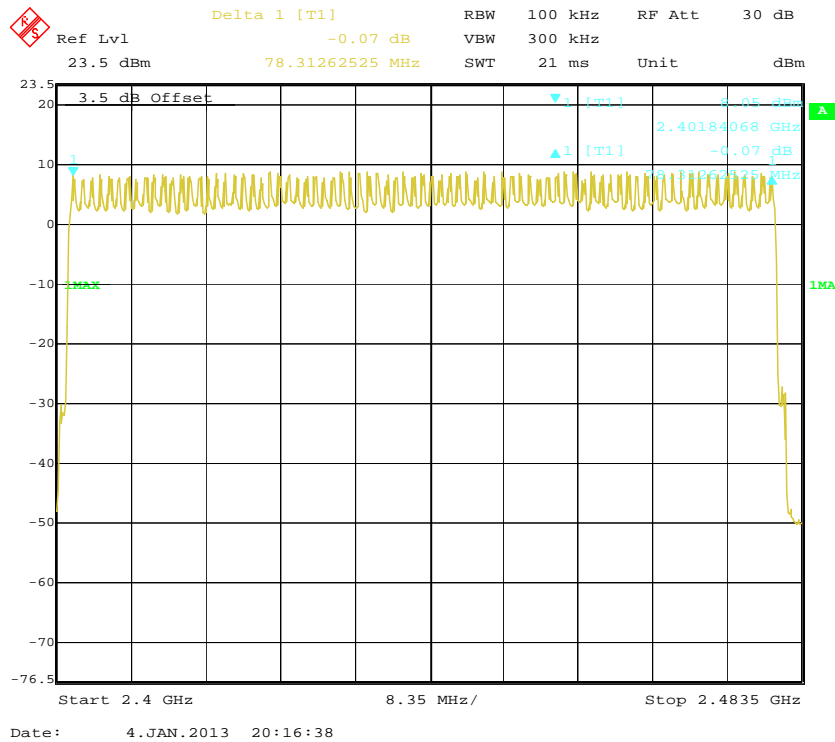
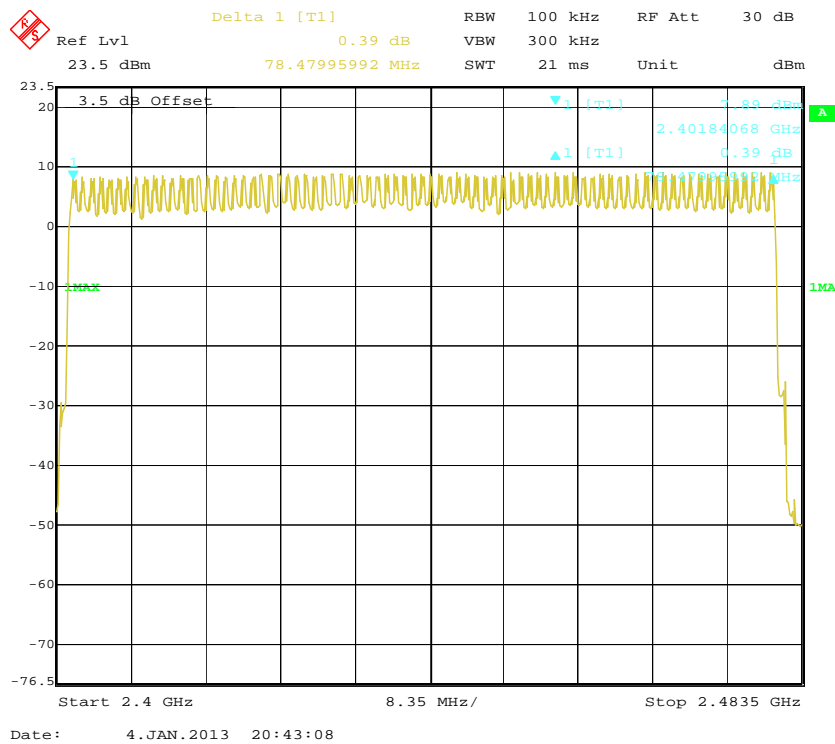
*Test Result: Compliance. Please refer to following tables and plots*



Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
BDR (GFSK)	2400-2483.50	79	≥15
EDR (π/4-DQPSK)	2400-2483.50	79	≥15
EDR (8DPSK)	2400-2483.50	79	≥15

### BDR (GFSK): Number of Hopping Channels



**EDR ( $\pi/4$ -DQPSK): Number of Hopping Channels****(8DPSK): 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 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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2012-12-07	2013-12-06

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

**Test Data****Environmental Conditions**

Temperature:	24~25℃
Relative Humidity:	55~56 %
ATM Pressure:	100.0~100.1 kPa

*The testing was performed by Brown Lu on 2013-01-04 and 2013-01-06.*

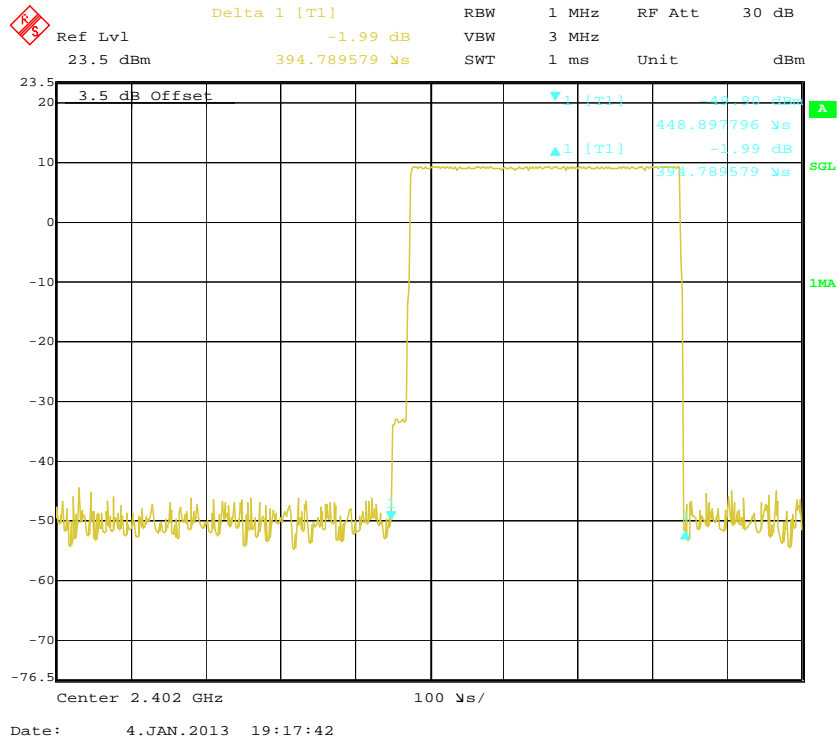
*Test Mode: Transmitting*

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

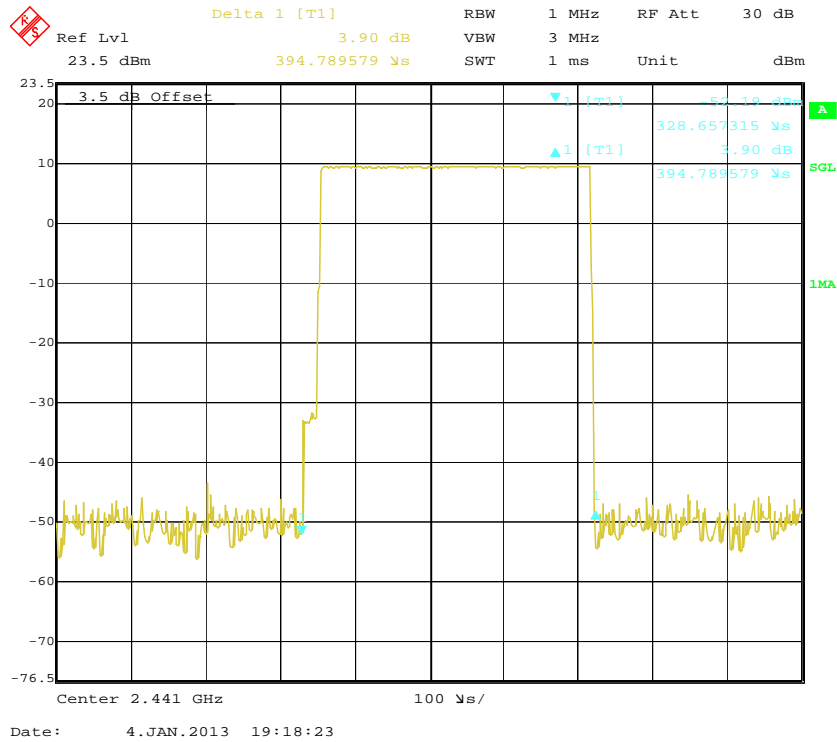
Mode		Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
BDR (GFSK)	DH 1	Low	0.395	0.126	0.4	Pass
		Middle	0.395	0.126	0.4	Pass
		High	0.395	0.126	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH 3	Low	1.675	0.268	0.4	Pass
		Middle	1.675	0.268	0.4	Pass
		High	1.675	0.268	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH 5	Low	2.926	0.312	0.4	Pass
		Middle	2.926	0.312	0.4	Pass
		High	2.926	0.312	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR ( $\pi/4$ -DQPSK)	DH 1	Low	0.409	0.131	0.4	Pass
		Middle	0.409	0.131	0.4	Pass
		High	0.409	0.131	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH 3	Low	1.669	0.267	0.4	Pass
		Middle	1.669	0.267	0.4	Pass
		High	1.669	0.267	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH 5	Low	2.926	0.312	0.4	Pass
		Middle	2.918	0.311	0.4	Pass
		High	2.926	0.312	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR (8DPSK)	DH 1	Low	0.409	0.131	0.4	Pass
		Middle	0.409	0.131	0.4	Pass
		High	0.409	0.131	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH 3	Low	1.674	0.268	0.4	Pass
		Middle	1.671	0.267	0.4	Pass
		High	1.665	0.266	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH 5	Low	2.932	0.313	0.4	Pass
		Middle	2.932	0.313	0.4	Pass
		High	2.924	0.312	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				

**BDR (GFSK):**

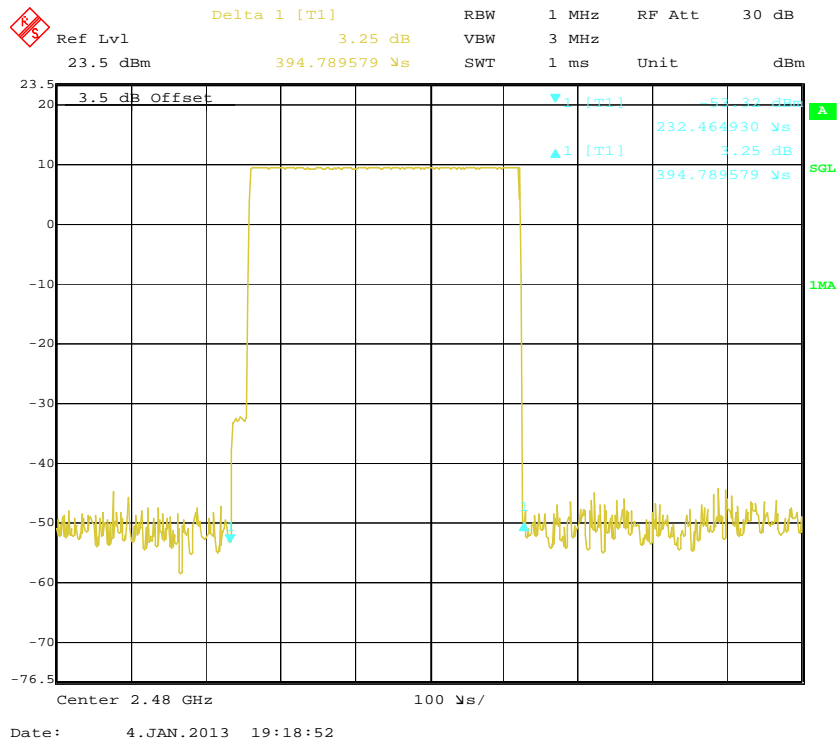
**Pulse time, Low Channel, DH1**



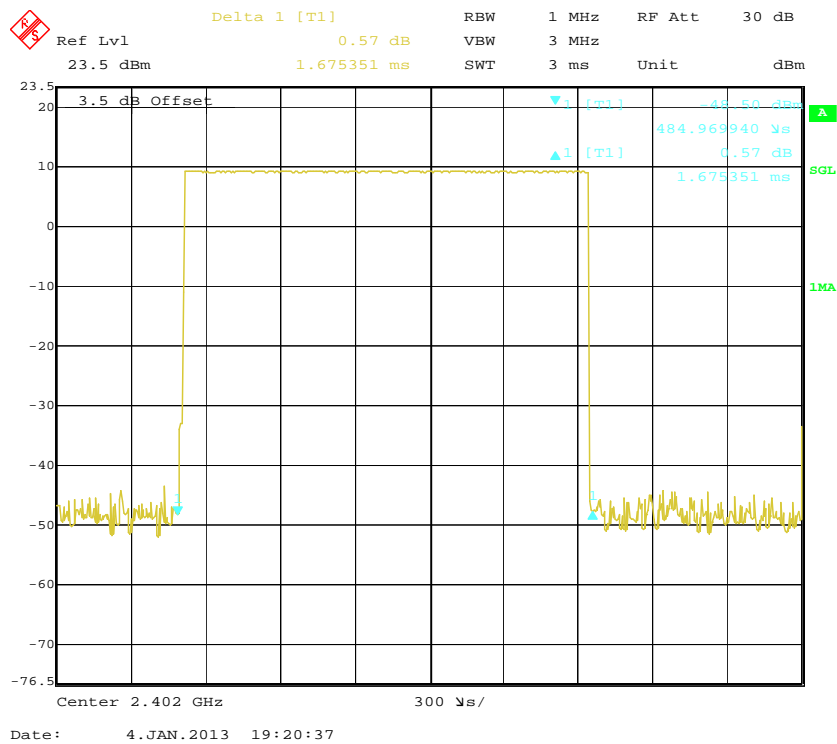
**Pulse time, Middle Channel, DH1**



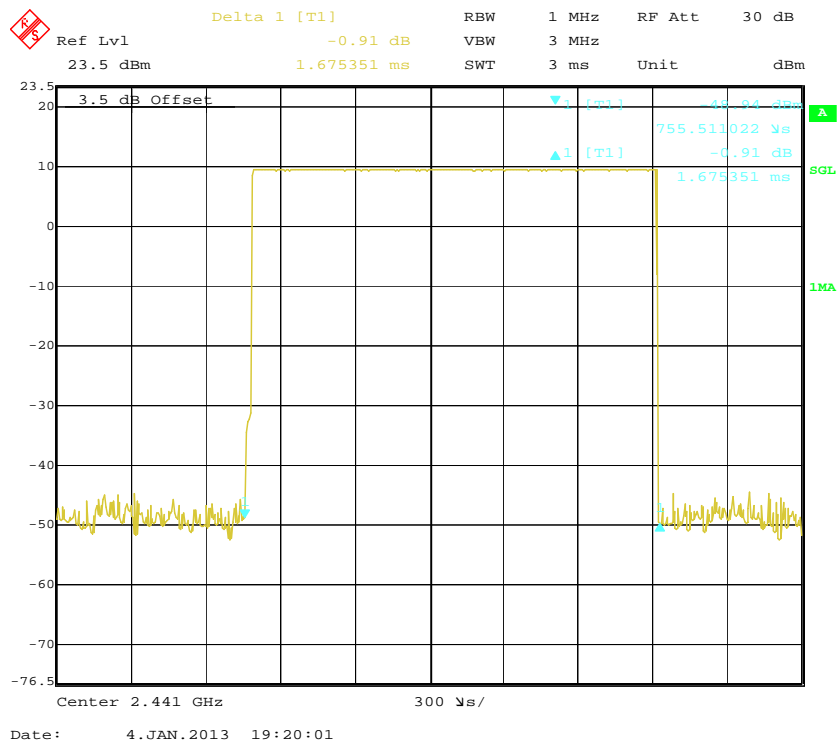
### Pulse time, High Channel, DH1



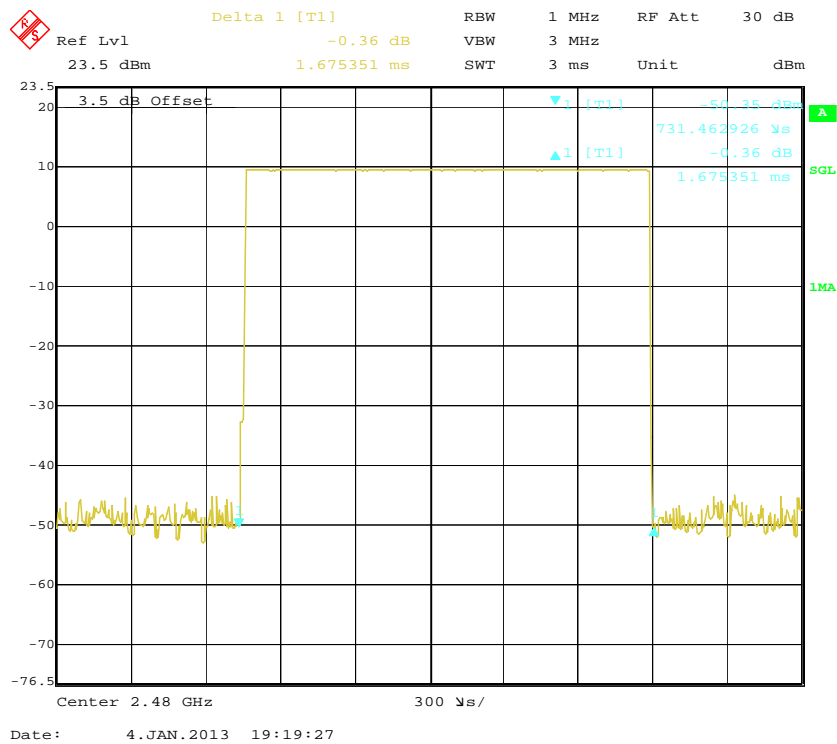
### Pulse time, Low Channel, DH3



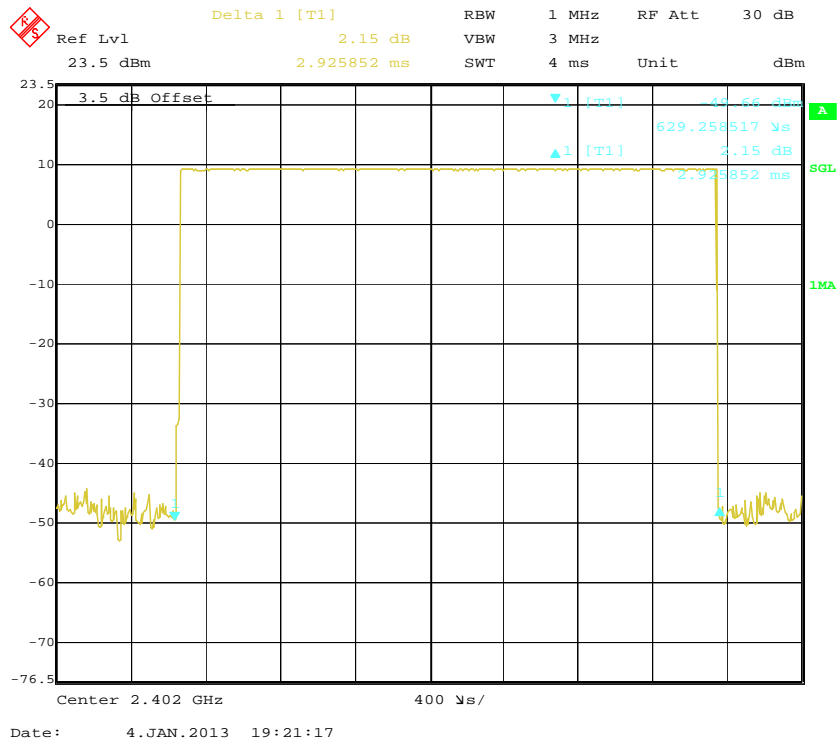
## Pulse time, Middle Channel, DH3



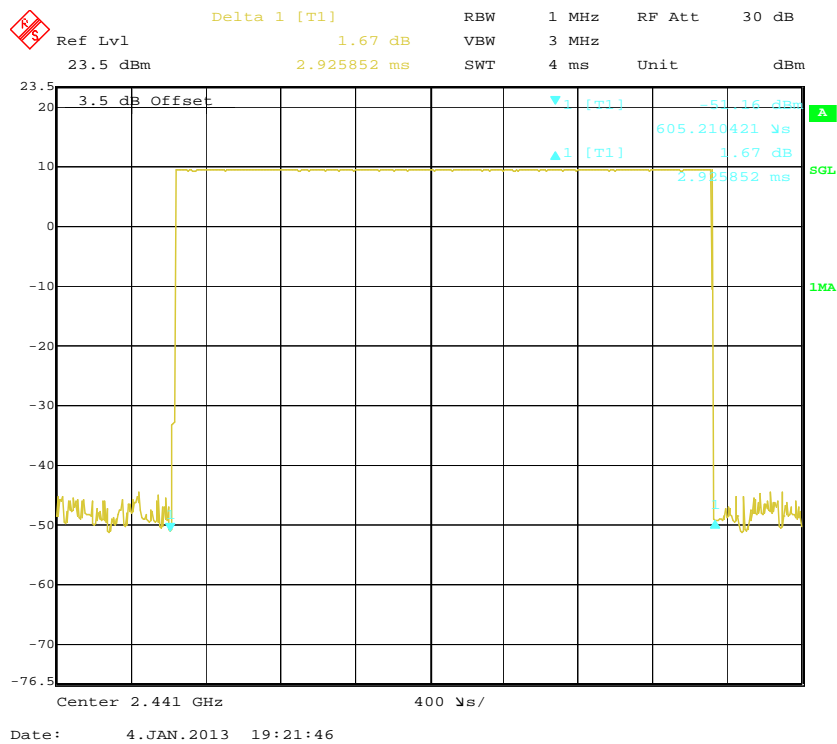
## Pulse time, High Channel, DH3



### Pulse time, Low Channel, DH5

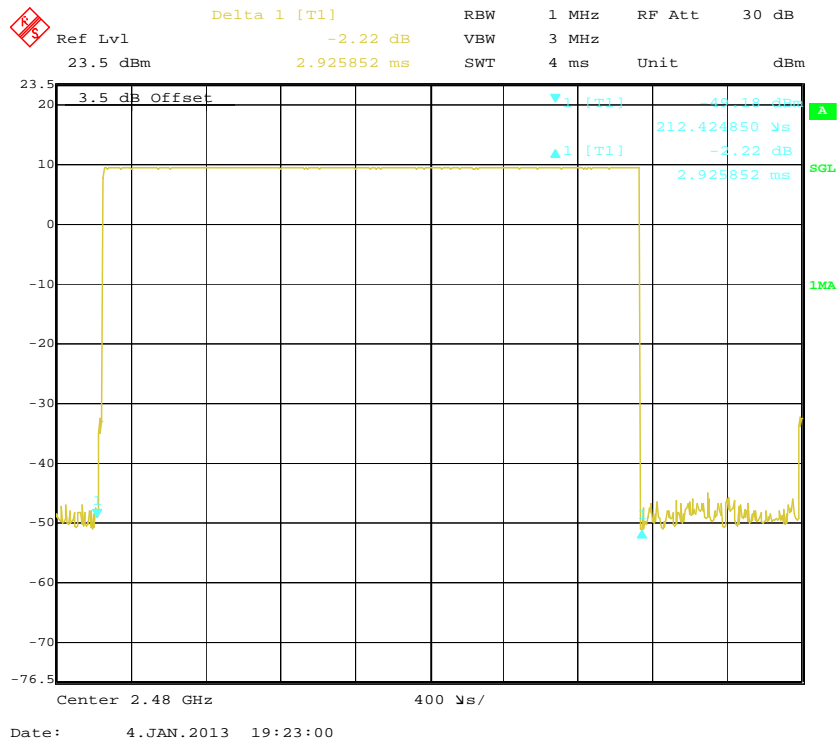


### Pulse time, Middle Channel, DH5

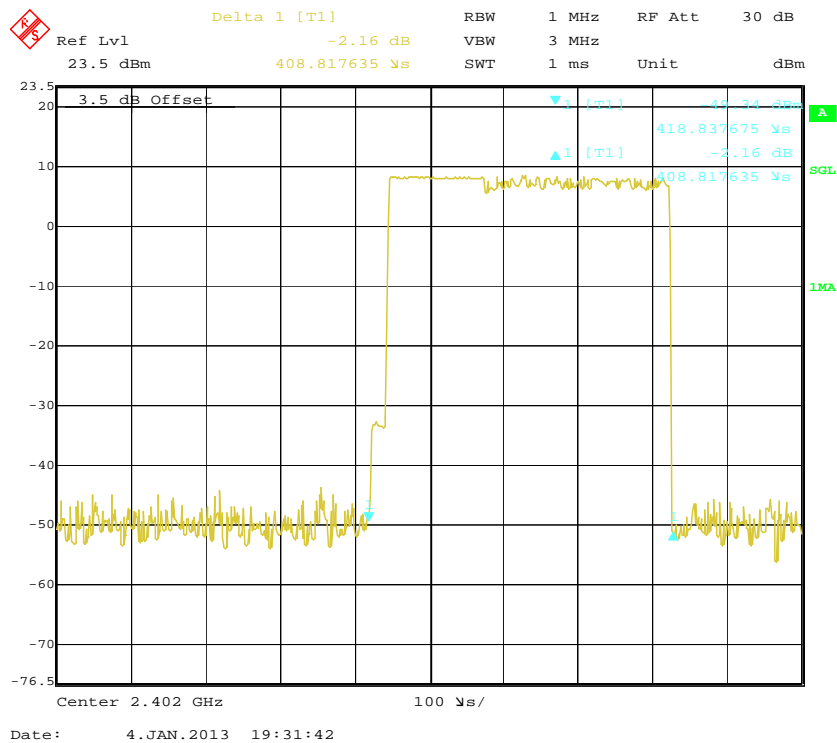




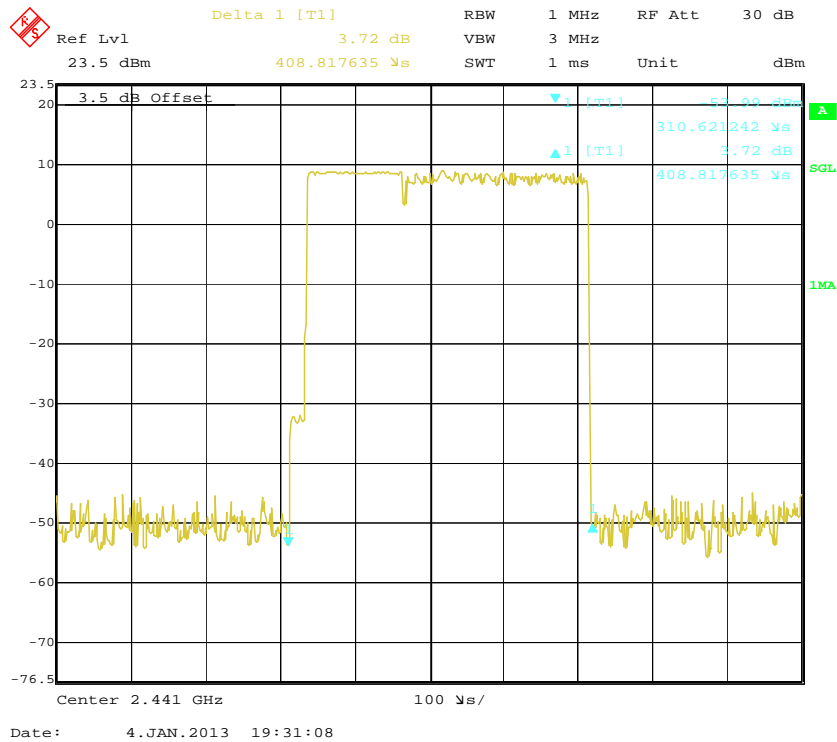
## Pulse time, High Channel, DH5

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

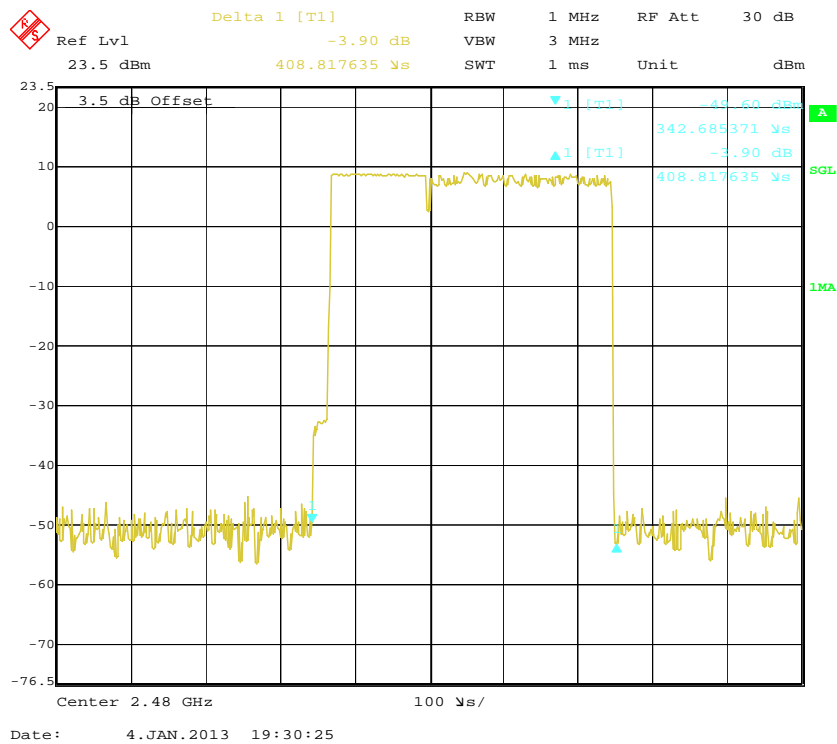
## Pulse time, Low Channel, DH1



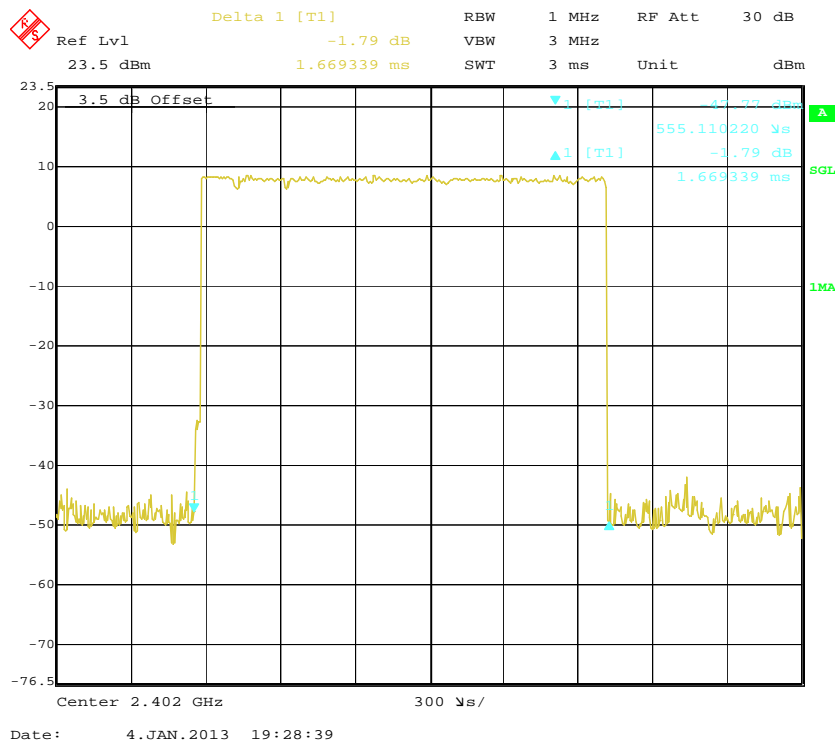
### Pulse time, Middle Channel, DH1



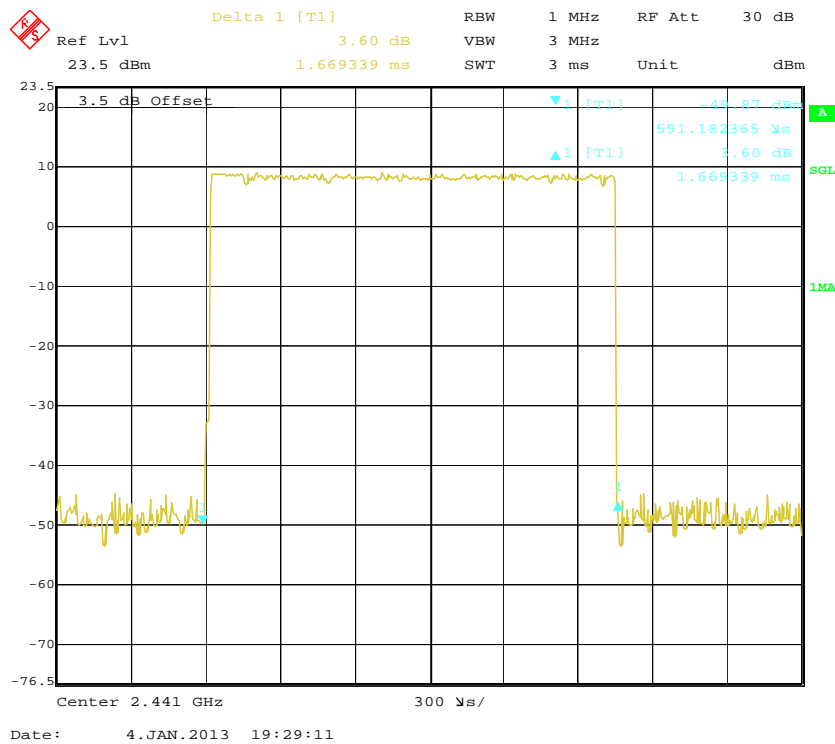
### Pulse time, High Channel, DH1



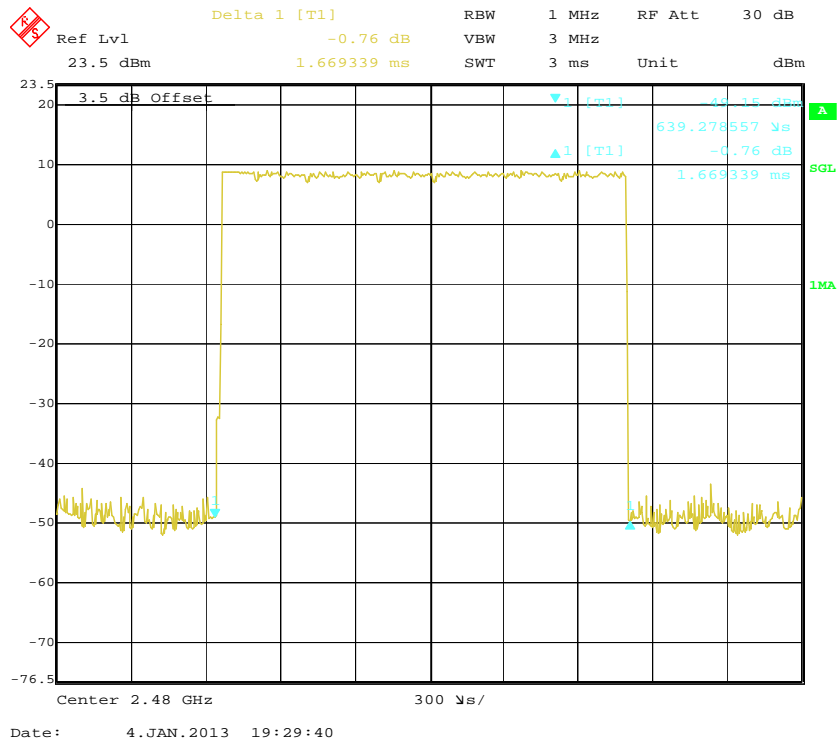
## Pulse time, Low Channel, DH3



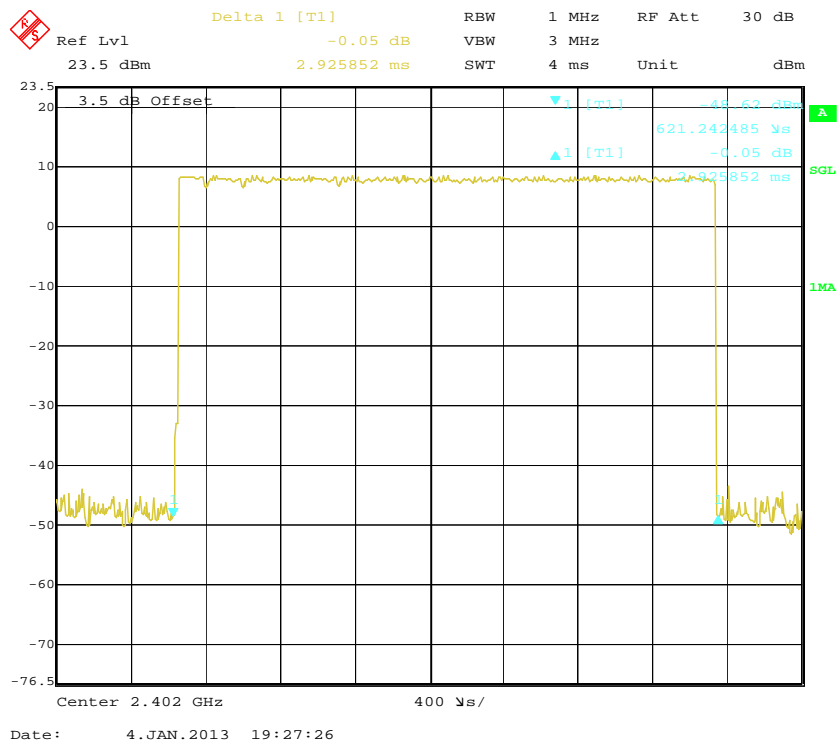
## Pulse time, Middle Channel, DH3



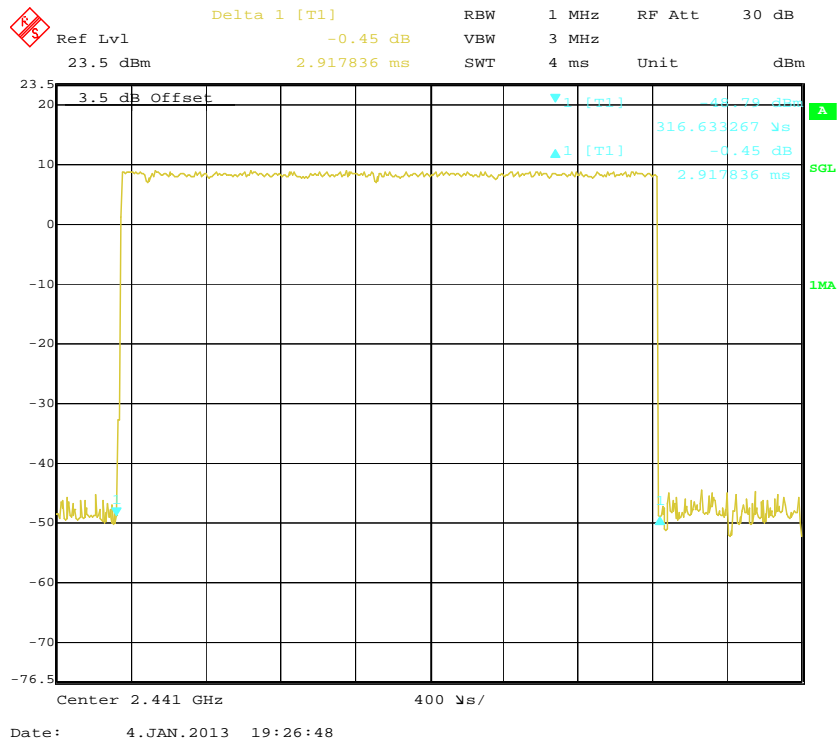
### Pulse time, High Channel, DH3



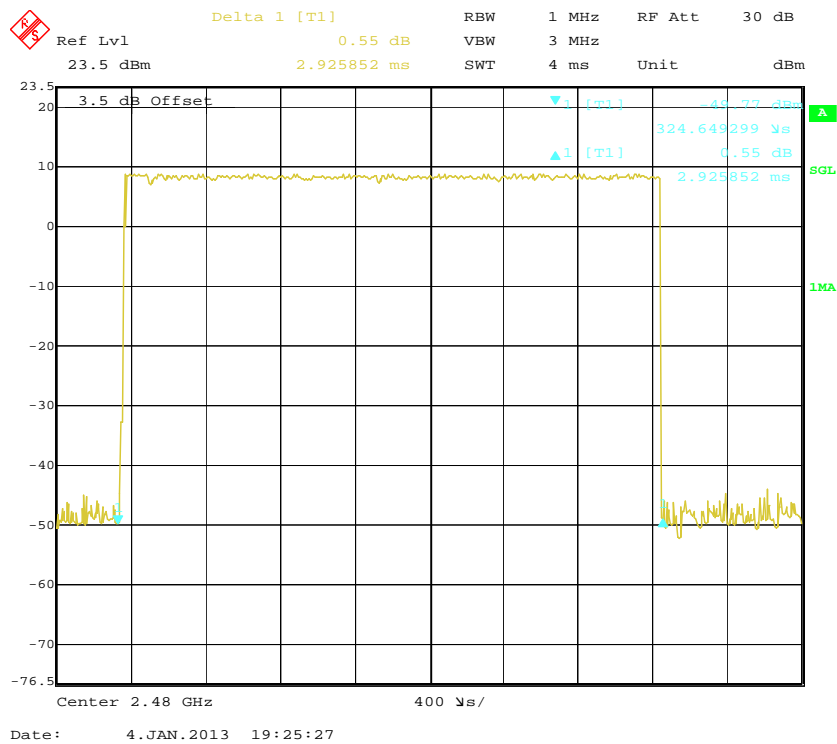
### Pulse time, Low Channel, DH5



### Pulse time, Middle Channel, DH5

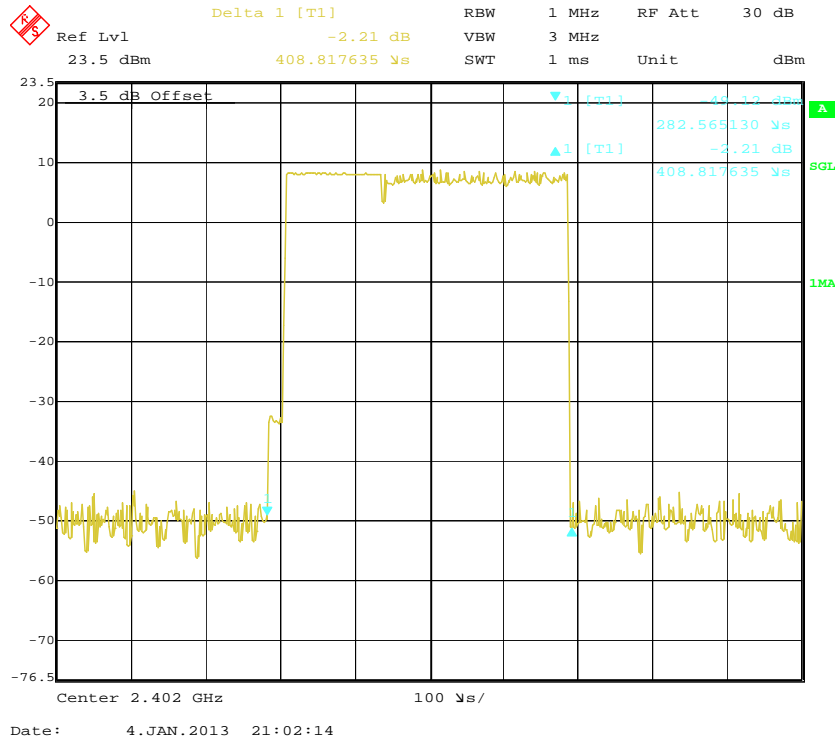


### Pulse time, High Channel, DH5

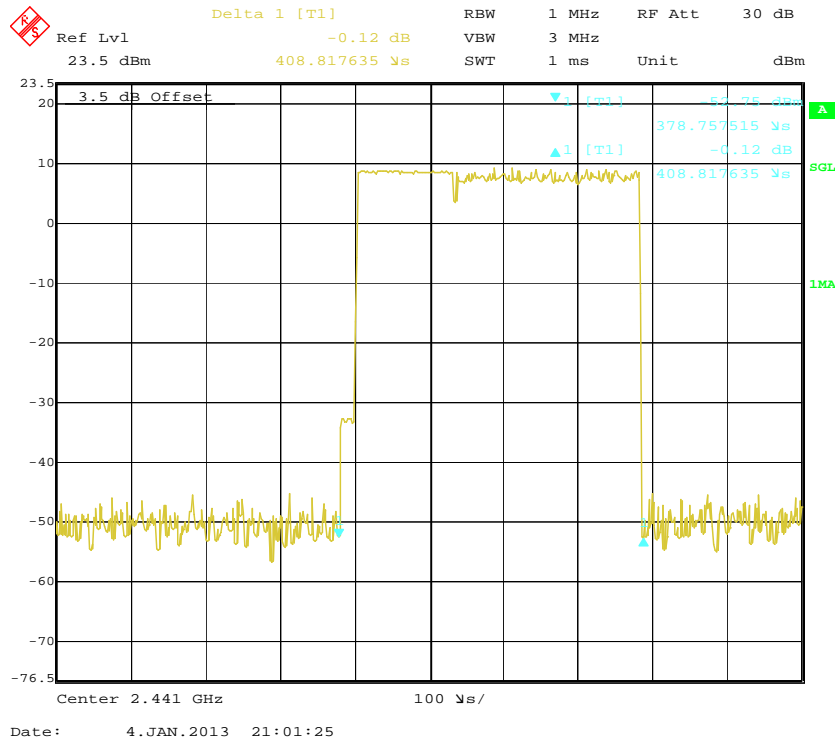


EDR (8DPSK):

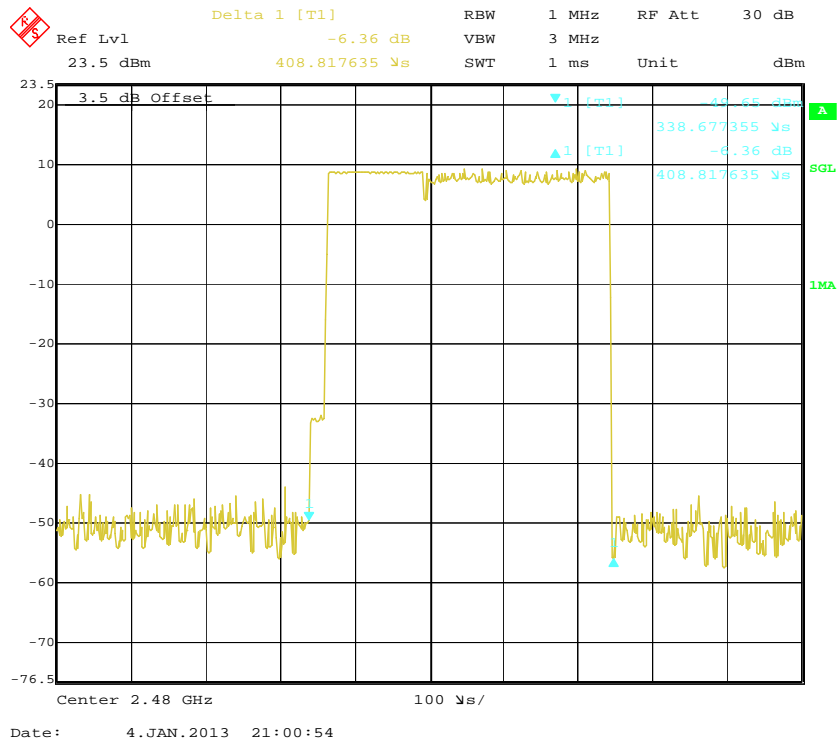
Pulse time, Low Channel, DH1



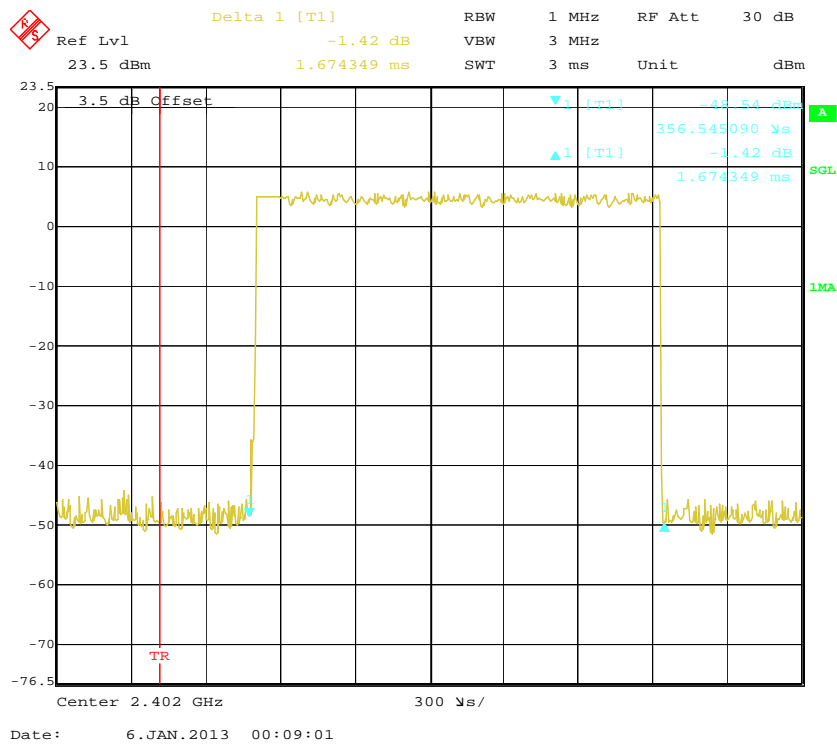
Pulse time, Middle Channel, DH1



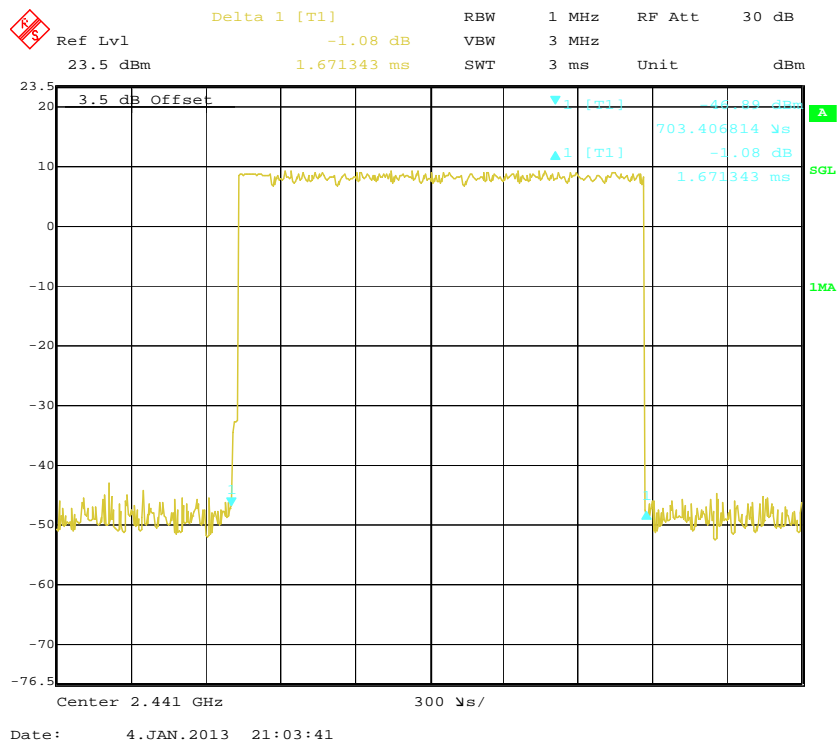
### Pulse time, High Channel, DH1



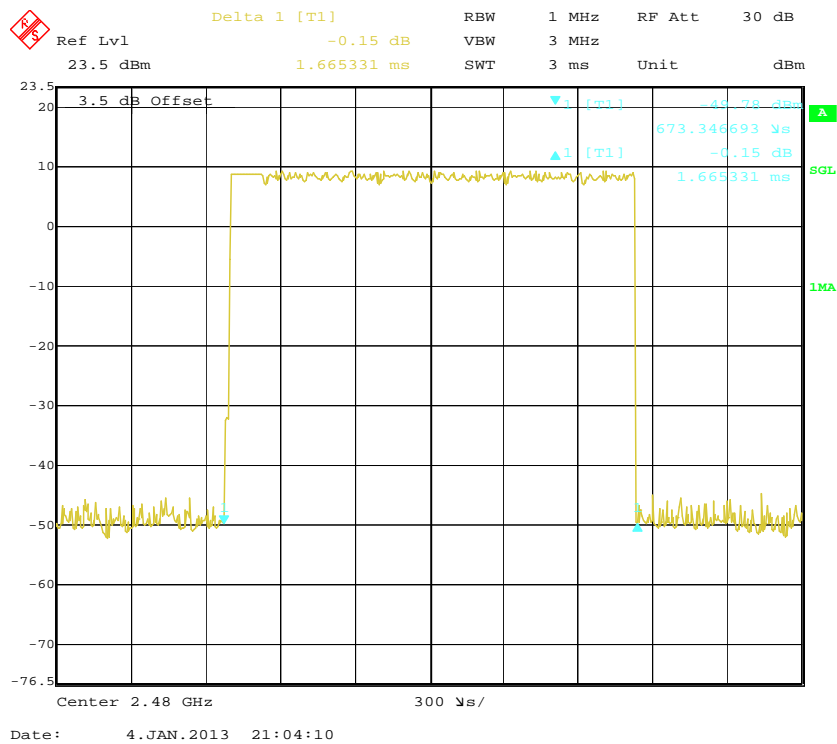
### Pulse time, Low Channel, DH3



## Pulse time, Middle Channel, DH3

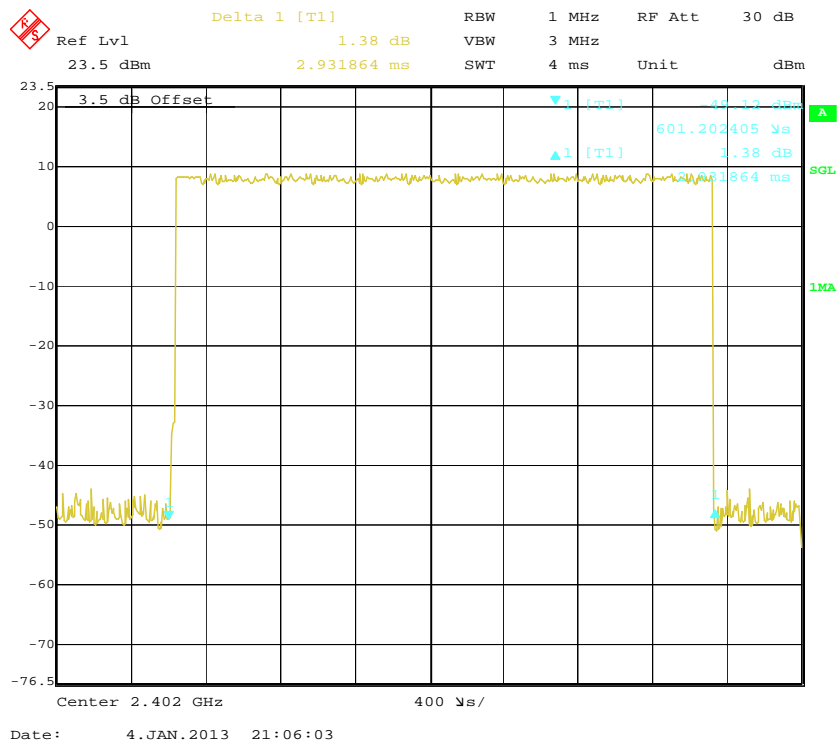


## Pulse time, High Channel, DH3

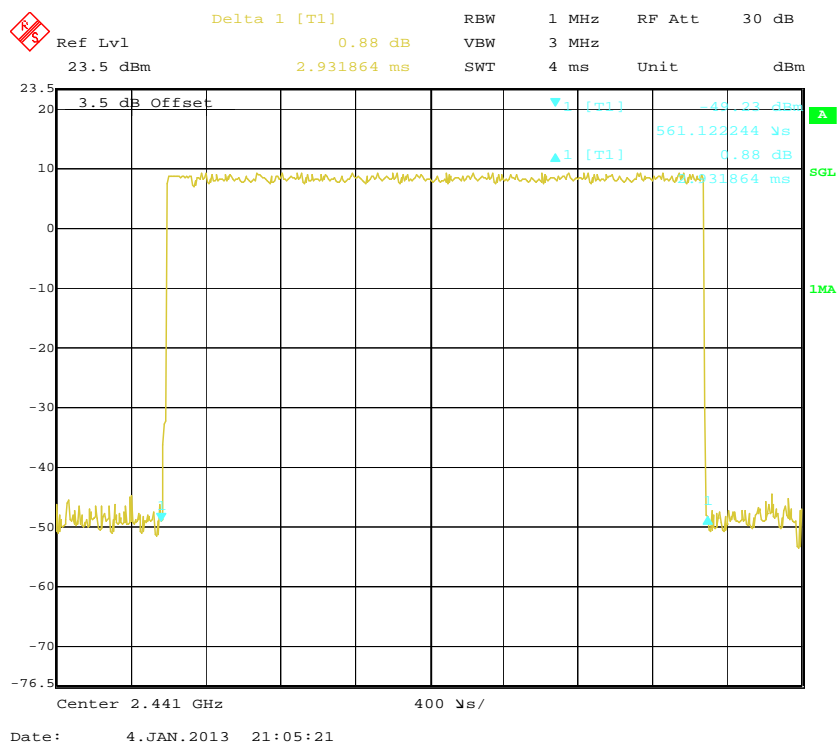




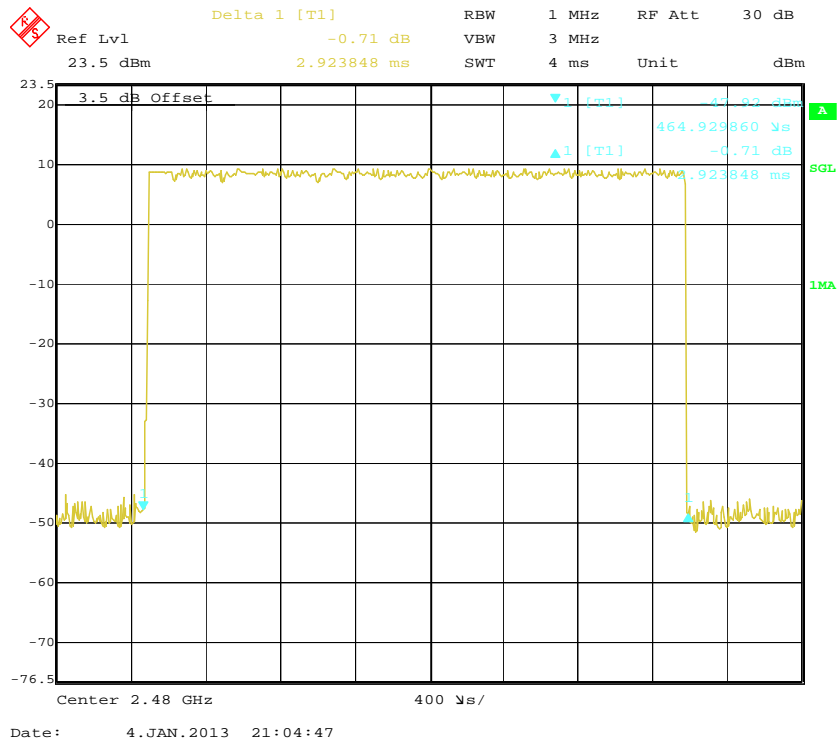
## Pulse time, Low Channel, DH5



## Pulse time, Middle Channel, DH5



# Pulse time, High Channel, DH5



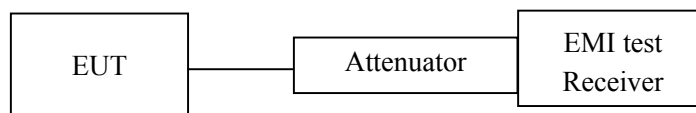
## FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

### 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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2012-12-07	2013-12-06

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

### Test Data

#### Environmental Conditions

Temperature:	25°C
Relative Humidity:	56 %
ATM Pressure:	100.1 kPa

*The testing was performed by Brown Lu on 2013-01-04.*

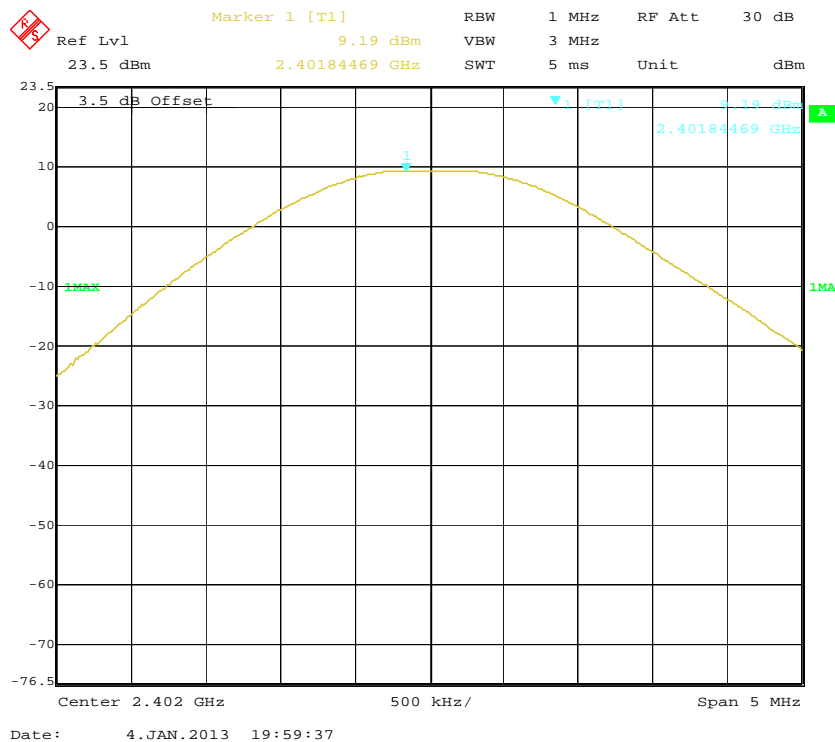
*Test Mode: Transmitting*

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

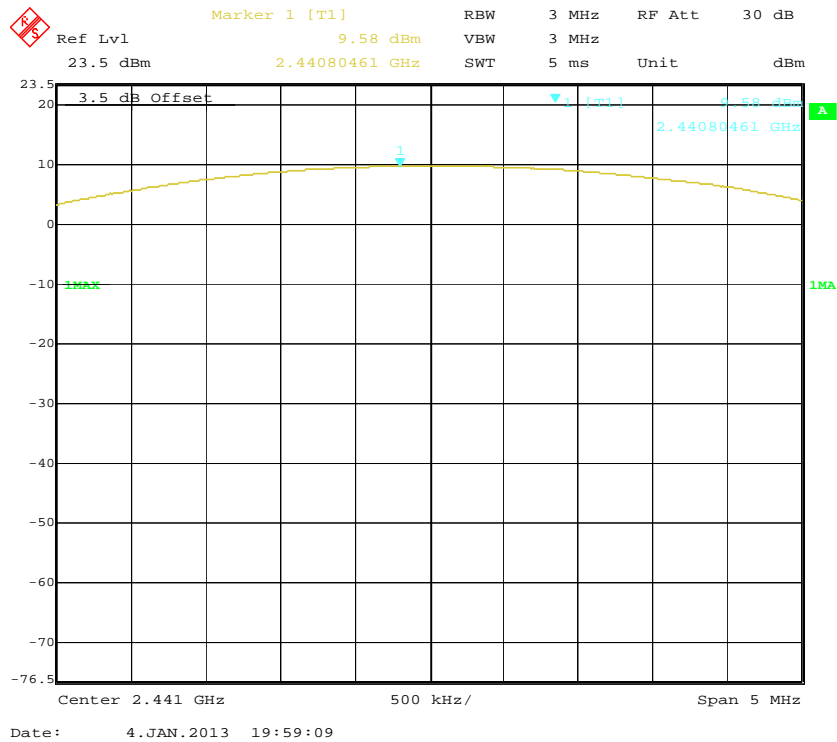
Mode	Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
			(dBm)	(mW)	
BDR (GFSK)	Low	2402	9.19	8.299	1000
	Middle	2441	9.58	9.078	1000
	High	2480	9.67	9.268	1000
EDR ( $\pi/4$ -DQPSK)	Low	2402	9.17	8.260	1000
	Middle	2441	9.51	8.933	1000
	High	2480	9.51	8.933	1000
EDR (8DPSK)	Low	2402	9.25	8.414	1000
	Middle	2441	9.67	9.268	1000
	High	2480	9.69	9.311	1000

Note: The data above was tested in conducted mode.

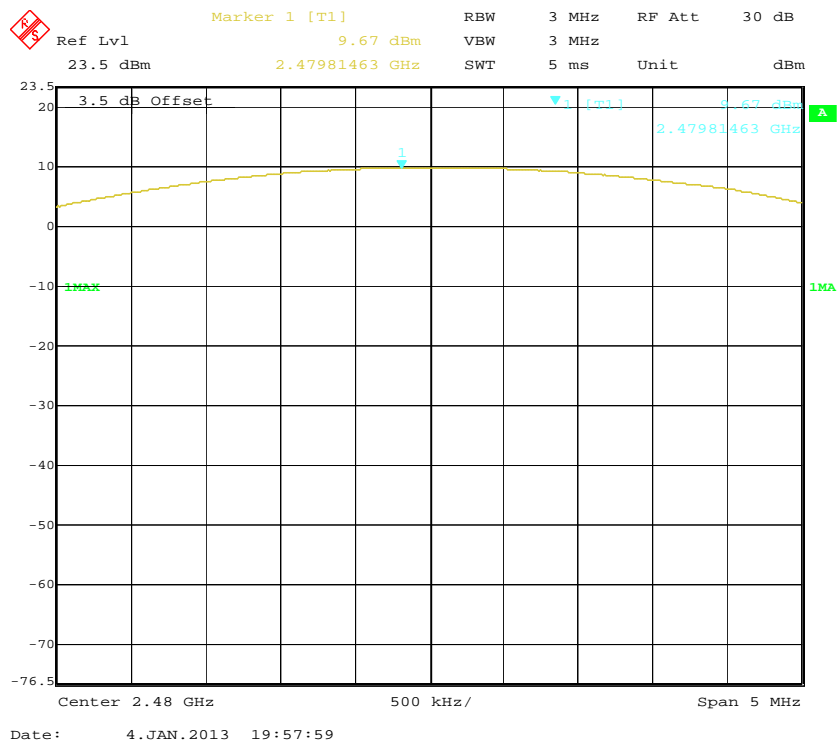
### BDR (GFSK): Low Channel



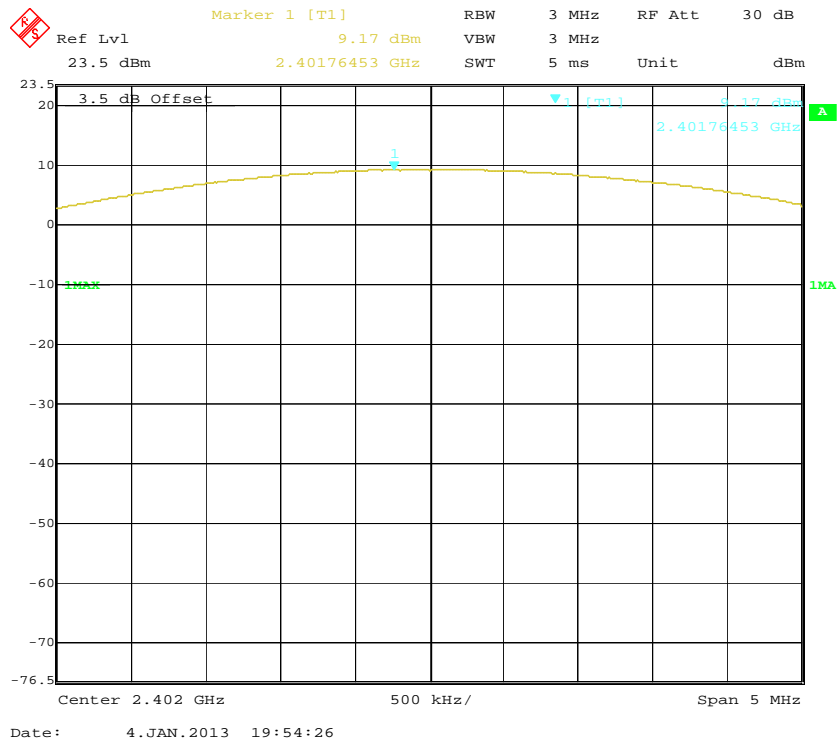
### BDR (GFSK): Middle Channel



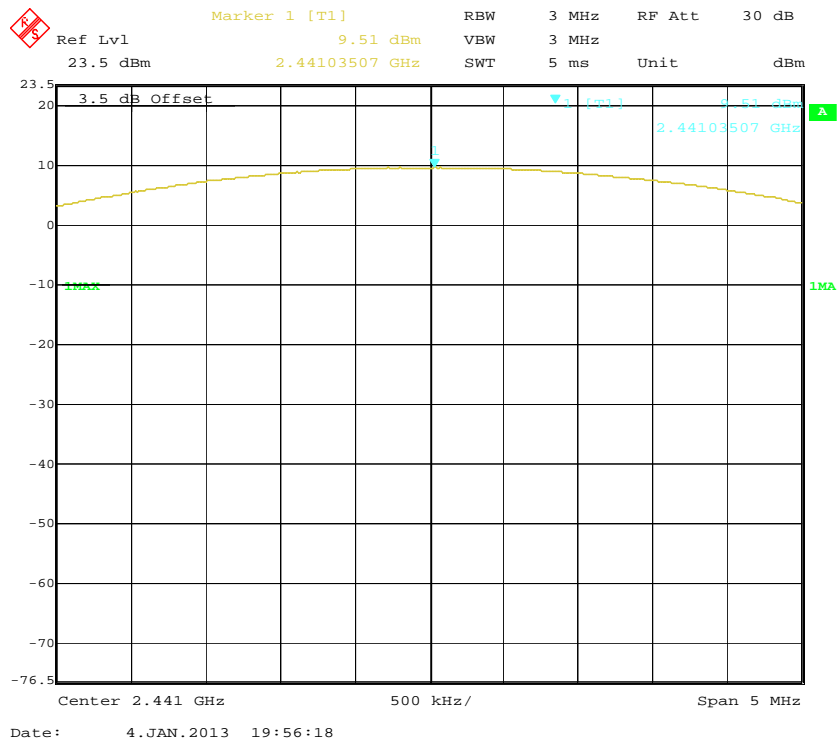
### BDR (GFSK): High Channel



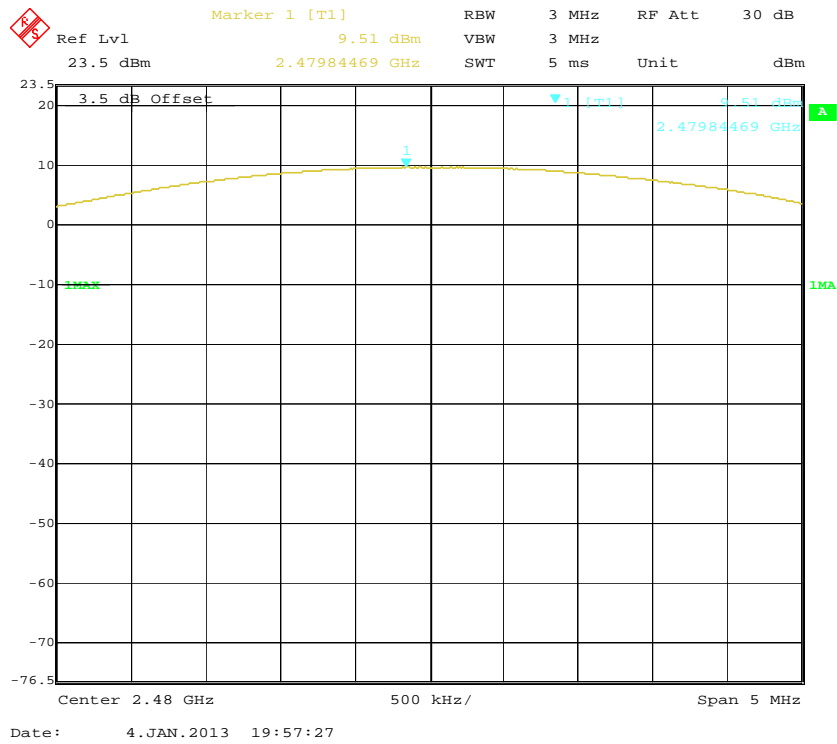
### EDR( $\pi/4$ -DQPSK): Low Channel



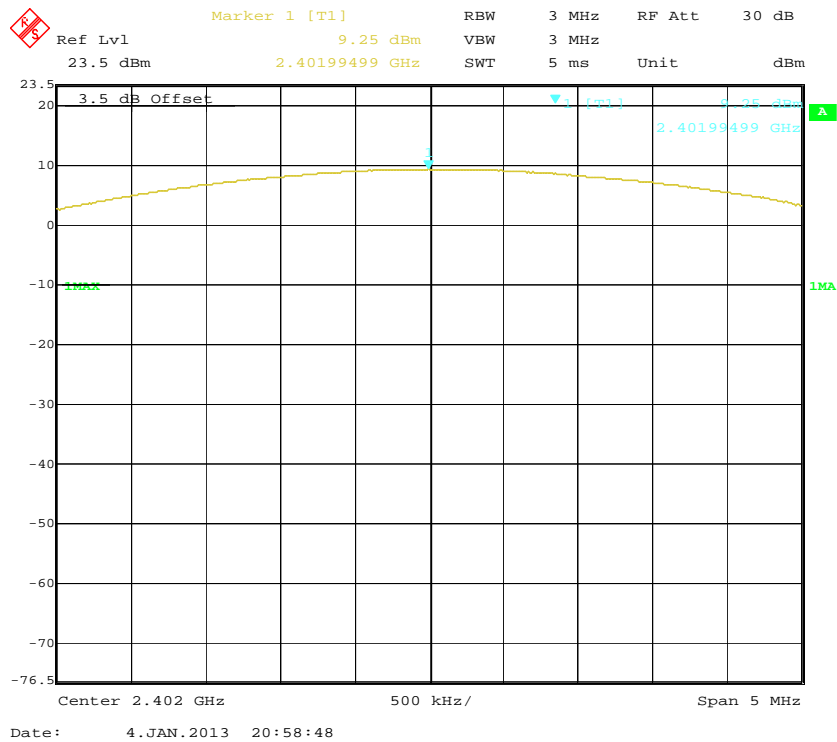
### EDR( $\pi/4$ -DQPSK): Middle Channel



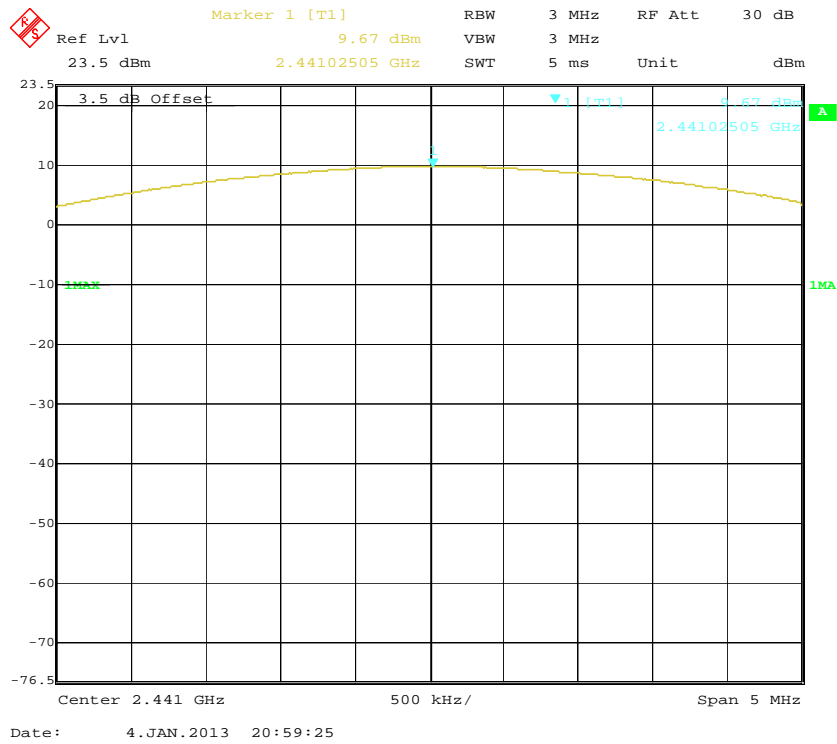
### EDR( $\pi/4$ -DQPSK): High Channel



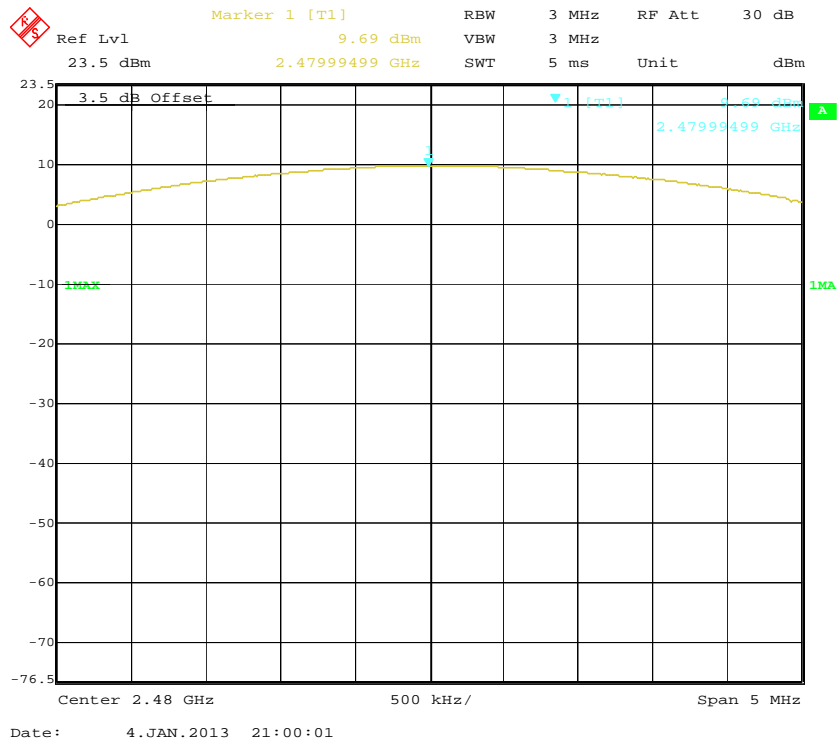
### EDR(8DPSK): Low Channel



### EDR(8DPSK): Middle Channel



### EDR(8DPSK): High Chanel





## 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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
TESCOM	Bluetooth Tester	TC-3000B	3000B650083	2012-12-07	2013-12-06

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

## Test Data

### Environmental Conditions

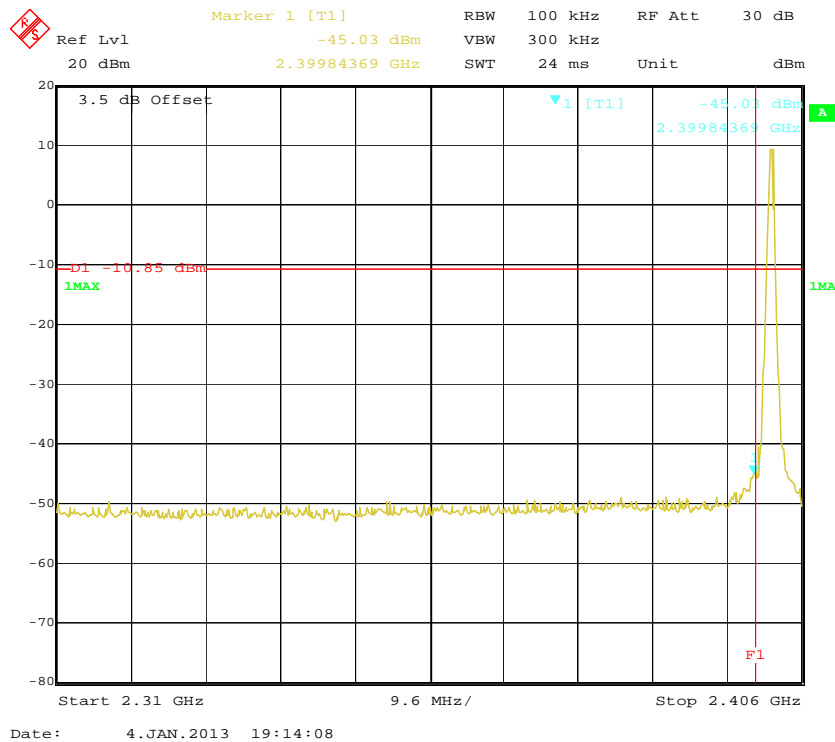
Temperature:	25°C
Relative Humidity:	56 %
ATM Pressure:	100.1 kPa

The testing was performed by Brown Lu on 2013-01-04.

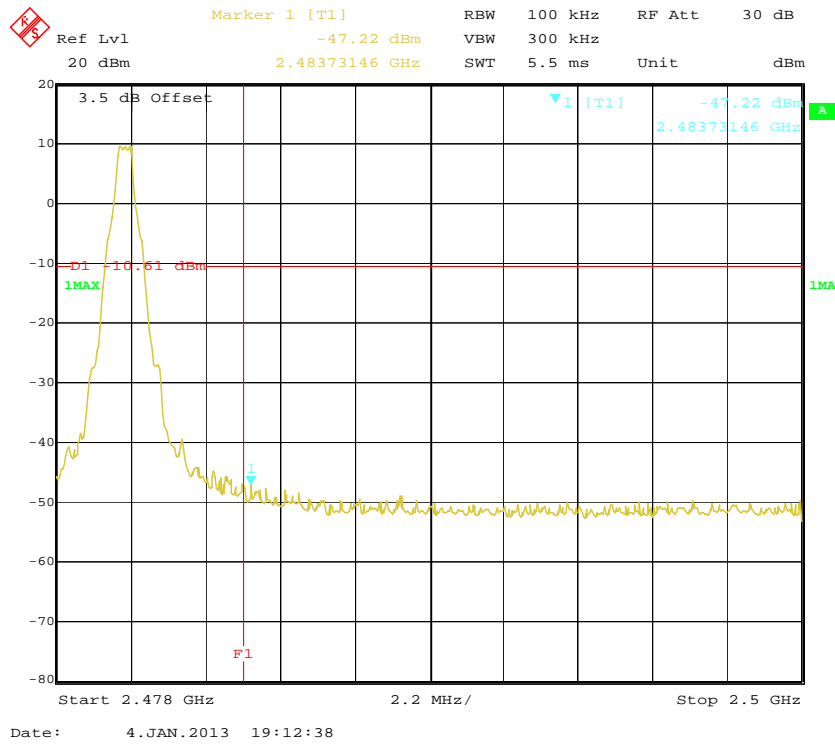
Test Mode: Transmitting

Test Result: Compliance. Please refer to following plots

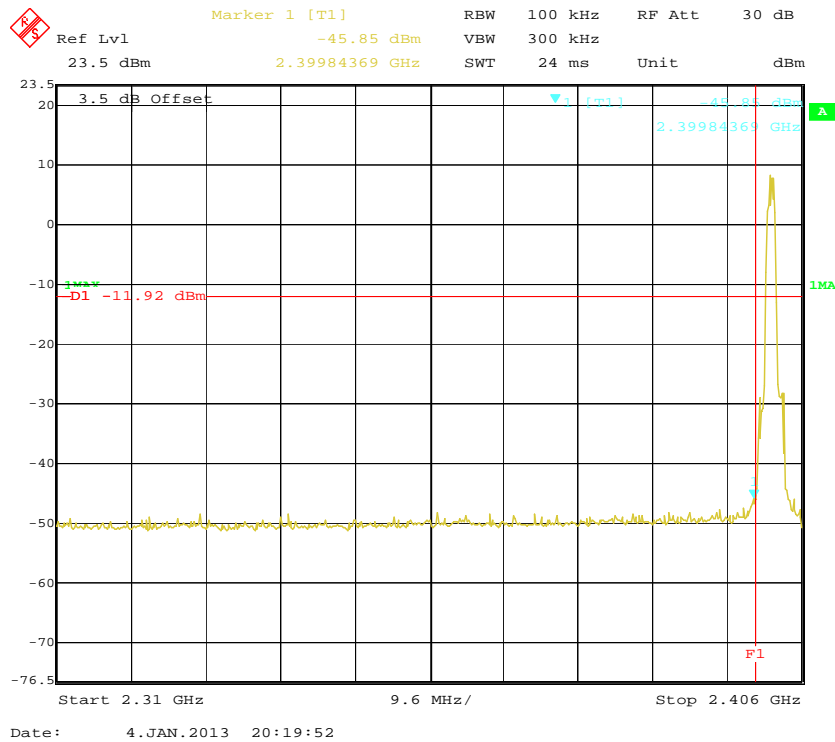
### BDR (GFSK): Band Edge-Left Side

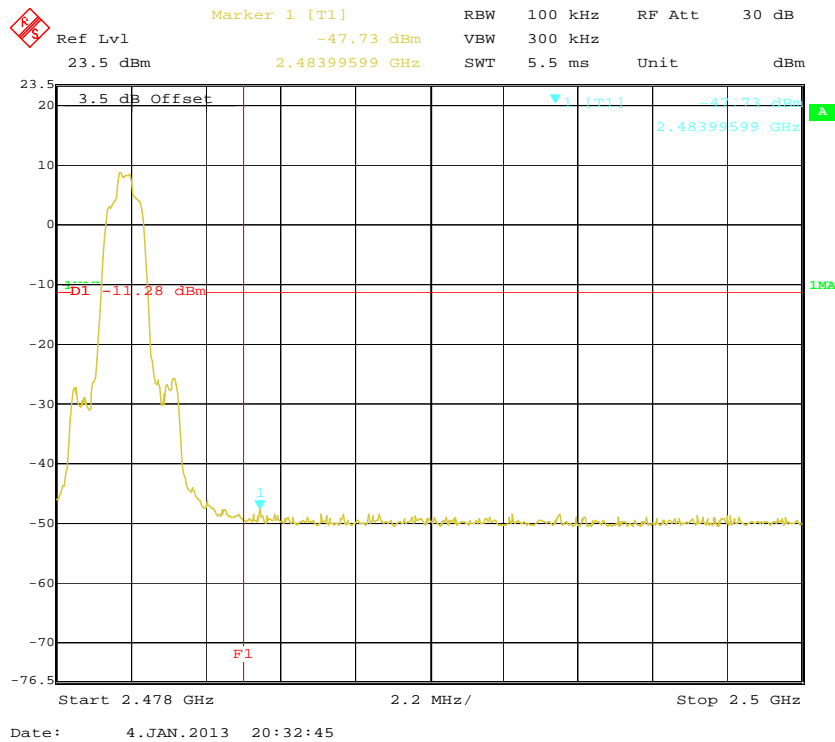
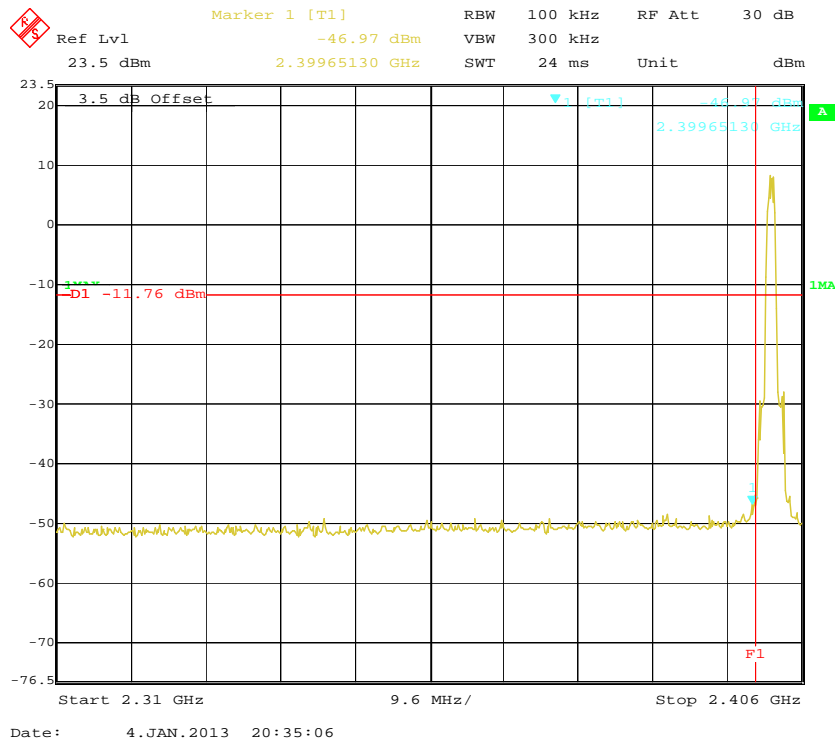


### BDR (GFSK): Band Edge-Right Side

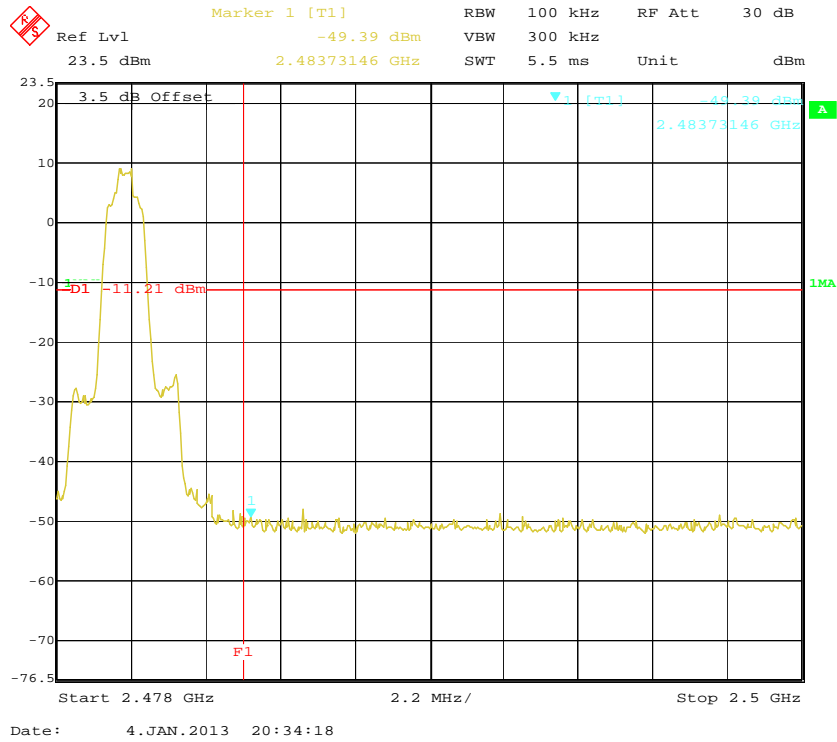


### EDR ( $\pi/4$ -DQPSK): Band Edge-Left Side



**EDR ( $\pi/4$ -DQPSK): Band Edge-Right Side****EDR (8DPSK): Band Edge-Left Side**

### BDR (8DPSK): Band Edge-Right Side



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