

FCC PART 15.247 TEST REPORT

For

HONGKONG IPRO TECHNOLOGY CO., LIMITED

ROOM C1D, 6/F, WING HING INDUSTRIAL BUILDING, 14 HING YIP STREET,
KWUN TONG, KOWLOON, HONG KONG.

FCC ID: PQ4IPROVENUSS

Report Type: Original Report	Product Type: GSM Mobile Phone
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Report Number: RSZ130412001-00B	
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *HONGKONG IPRO TECHNOLOGY CO., LIMITED*'s product, model number: *VENUS S (FCC ID: PQ4IPROVENUSS)* or the "EUT" in this report was a *GSM Mobile Phone*, which was measured approximately: 10.25 cm (L) x 5.85 cm (W) x 1.05 cm (H), rated input voltage: DC 3.7 V Li-ion battery or DC 5V charging from adapter.

Adapter Information:

Model: M49-050050

Input: AC 100-240 V, 50/60Hz, 0.1A

Output: DC 5V, 500mA

**All measurement and test data in this report was gathered from production sample serial number: IPROVENUSS000001 (Assigned by the applicant). The EUT supplied by the applicant was received on 2013-04-12.*

Objective

This test report is prepared on behalf of *HONGKONG IPRO TECHNOLOGY CO., 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)

FCC Part 22H/24E PCE and Part 15B JBP submissions with FCC ID: PQ4IPROVENUSS

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.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineer mode.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

No exercise software was used.

Support Equipment List and Details

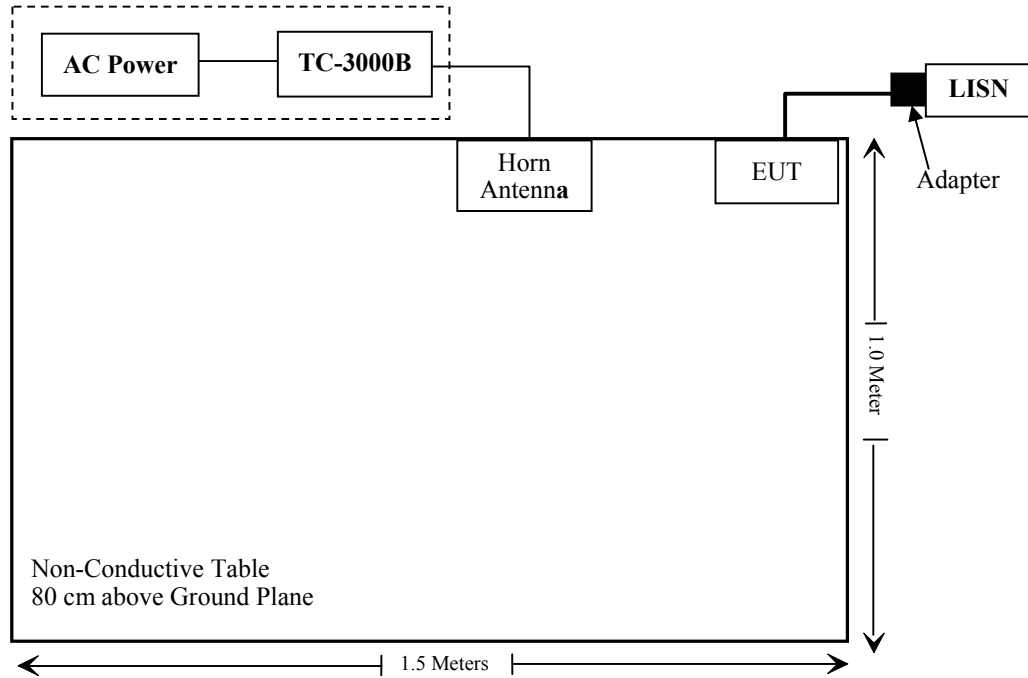
Manufacturer	Description	Model	Serial Number
TESCOM	Bluetooth Tester	TC-3000B	3000B630010

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielding Detachable USB Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

For conducted emission



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 §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: 2.014 mW

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

Conclusion:

The time-averaged output power is 2.014 mW < the exclusion thresholds 10 mW, so stand-alone SAR evaluation is not required.

The other SAR data please refer to the SAR report, report No.: RSZ130412001-20.

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 monopole antenna arrangement for bluetooth, which was permanently attached, the antenna gain is -2 dBi, fulfill the requirement of this section. Please refer to the internal photos.

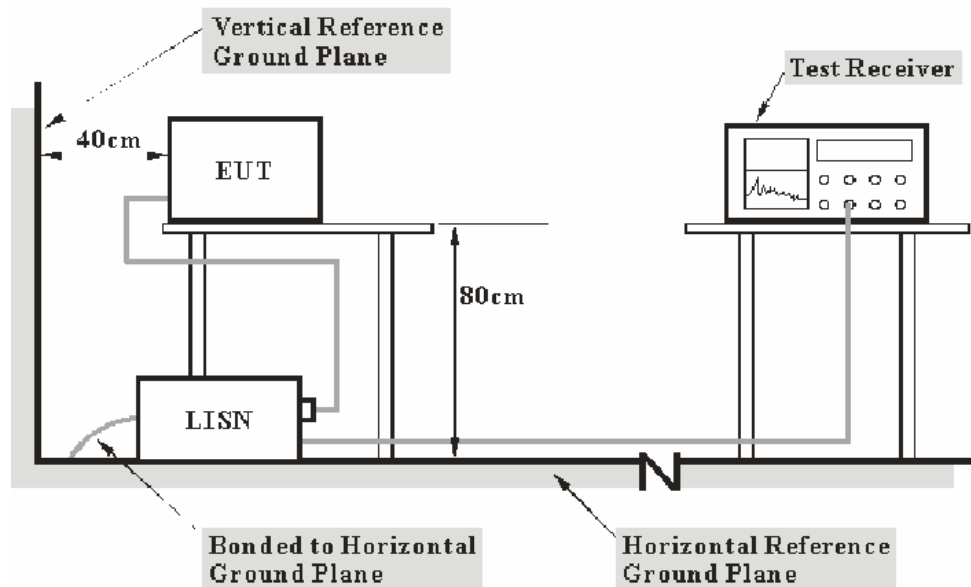
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

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 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 Procedure

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-08
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2012-08-22	2013-08-21
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 requirements, traceable to National Primary Standards and International System of Units (SI).

Corrected Factor & Margin Calculation

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

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

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:

17.5 dB at 0.168844 MHz in the **Neutral** conducted mode

Test Data

Environmental Conditions

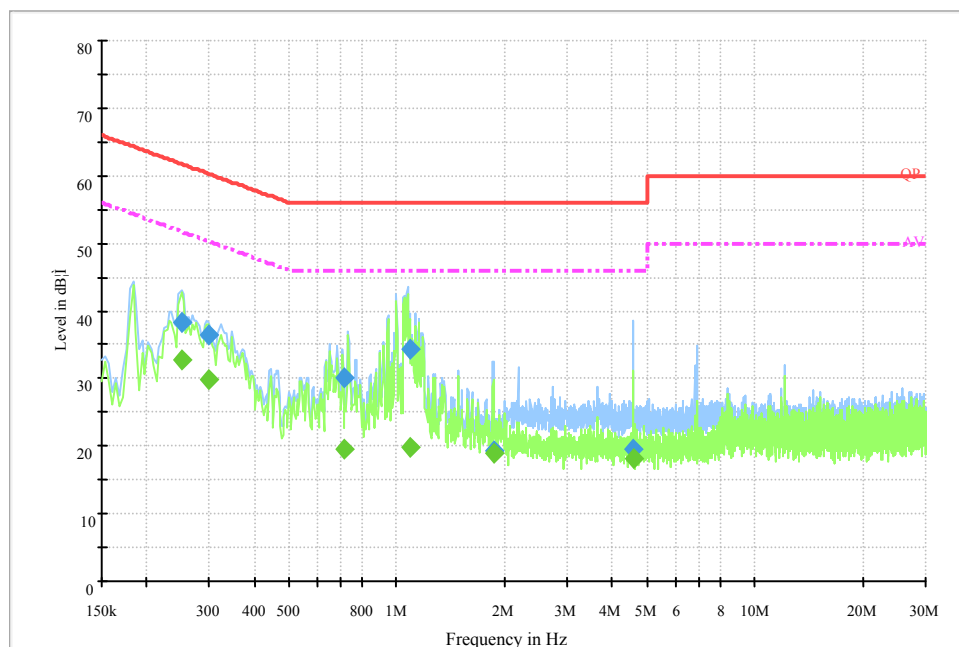
Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	100.0 kPa

The testing was performed by Tiger Ye on 2013-05-14.

EUT operation mode: Charging & Transmitting

AC 120 V, 60 Hz, Line:

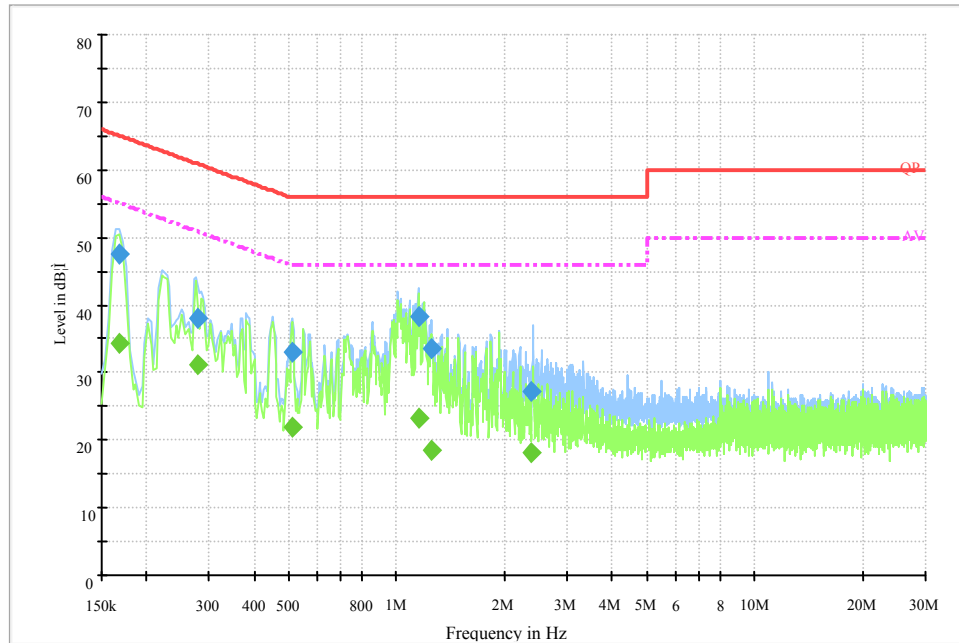
EMI Auto Test L



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.250727	32.7	0.3	51.7	19.0	Ave.
0.299858	29.9	0.4	50.2	20.4	Ave.
1.085126	34.4	0.4	56.0	21.6	QP
0.250727	38.3	0.3	61.7	23.4	QP
0.299858	36.4	0.4	60.2	23.8	QP
0.709592	30.0	0.4	56.0	26.0	QP
1.085126	19.8	0.4	46.0	26.2	Ave.
0.709592	19.5	0.4	46.0	26.5	Ave.
1.865416	19.2	0.4	46.0	26.8	Ave.
4.596173	18.9	0.4	46.0	27.1	Ave.
1.865416	19.8	0.4	56.0	36.2	QP
4.596173	19.7	0.4	56.0	36.4	QP

AC 120V, 60 Hz, Neutral:

EMI Auto Test N



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.168844	47.5	0.3	65.0	17.5	QP
1.150706	38.3	0.4	56.0	17.7	QP
0.279546	31.1	0.4	50.8	19.7	Ave.
0.168844	34.3	0.3	55.0	20.7	Ave.
1.252058	33.6	0.4	56.0	22.4	QP
1.150706	23.3	0.4	46.0	22.7	Ave.
0.279546	38.0	0.4	60.8	22.9	QP
0.511869	33.0	0.4	56.0	23.0	QP
0.511869	22.0	0.4	46.0	24.0	Ave.
2.383487	19.2	0.4	46.0	26.8	Ave.
1.252058	18.4	0.4	46.0	27.6	Ave.
2.383487	27.3	0.4	56.0	28.7	QP

Note:

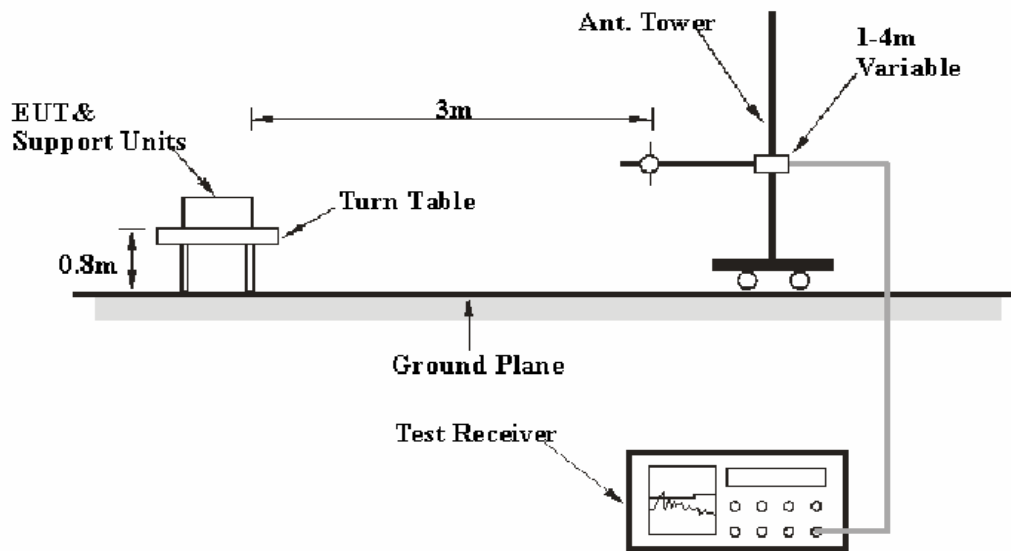
- 1) Correction Factor = LISN/ISN VDF (Voltage Division Factor) + Cable Loss
The corrected factor has been input into the transducer of the test software.
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

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

Applicable Standard

FCC §15.205; §15.209; §15.247(d)

EUT Setup



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.

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:

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Corrected Factor}$$

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
Agilent	Spectrum Analyzer	8564E	3943A01781	2012-05-17	2013-05-16
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 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.

2.27 dB at 7206.0 MHz in the Vertical polarization

Test Data

Environmental Conditions

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

The testing was performed by Tiger Ye on 2013-05-14.

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 (dBμV/m)	Margin (dB)
Low Channel (2402 MHz)									
2402.0	91.19	PK	117	1.4	H	6.13	97.32	/	/
2402.0	81.32	Ave.	117	1.4	H	6.13	87.45	/	/
2402.0	91.02	PK	231	1.8	V	6.13	97.15	/	/
2402.0	81.22	Ave.	231	1.8	V	6.13	87.35	/	/
7206.0	34.67	Ave.	136	1.1	V	17.06	51.73	54	2.27
2399.3	45.52	Ave.	60	1.1	H	5.48	51.00	54	3.00
2489.6	36.61	Ave.	226	1.2	V	6.81	43.42	54	10.58
2334.2	36.11	Ave.	237	1.6	V	5.48	41.59	54	12.41
2399.3	54.55	PK	60	1.1	H	5.48	60.03	74	13.97
7206.0	42.70	PK	136	1.1	V	17.06	59.76	74	14.24
4804.0	25.89	Ave.	106	1.4	V	12.4	38.29	54	15.71
9608.0	17.20	Ave.	138	1.8	H	19.28	36.48	54	17.52
4804.0	41.28	PK	106	1.4	V	12.4	53.68	74	20.32
2489.6	46.13	PK	226	1.2	V	6.81	52.94	74	21.06
9608.0	32.48	PK	138	1.8	H	19.28	51.76	74	22.24
2334.2	45.86	PK	237	1.6	V	5.48	51.34	74	22.66
Middle Channel (2441 MHz)									
2441.0	91.70	PK	132	1.9	H	7.21	98.91	/	/
2441.0	80.31	Ave.	132	1.9	H	7.21	87.52	/	/
2441.0	92.18	PK	207	1.9	V	6.81	98.99	/	/
2441.0	80.68	Ave.	207	1.9	V	6.81	87.49	/	/
7323.0	34.85	Ave.	256	1.6	V	16.49	51.34	54	2.66
7323.0	49.14	PK	256	1.6	V	16.49	65.63	74	8.37
2362.9	35.67	Ave.	178	1.8	H	5.48	41.15	54	12.85
2489.3	34.30	Ave.	59	1.1	V	6.81	41.11	54	12.89
2331.5	35.27	Ave.	167	1.1	V	5.48	40.75	54	13.25
4882.0	26.55	Ave.	241	1.4	V	12.46	39.01	54	14.99
9764.0	17.67	Ave.	189	1.1	H	19.4	37.07	54	16.93
9764.0	34.02	PK	189	1.1	H	19.4	53.42	74	20.58
4882.0	40.66	PK	241	1.4	V	12.46	53.12	74	20.88
2489.3	46.17	PK	59	1.1	V	6.81	52.98	74	21.02
2362.9	46.98	PK	178	1.8	H	5.48	52.46	74	21.54
2331.5	46.89	PK	167	1.1	V	5.48	52.37	74	21.63

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 (dBμV/m)	Margin (dB)
High Channel (2480 MHz)									
2480.0	93.24	PK	80	1.5	H	7.21	100.45	/	/
2480.0	80.09	Ave.	80	1.5	H	7.21	87.30	/	/
2480.0	93.84	PK	63	1.2	V	6.81	100.65	/	/
2480.0	81.00	Ave.	63	1.2	V	6.81	87.81	/	/
7440.0	35.21	Ave.	237	1.1	V	15.9	51.11	54	2.89
2483.6	43.76	Ave.	259	1.0	V	6.81	50.57	54	3.43
2483.6	55.51	PK	259	1.0	V	6.81	62.32	74	11.68
2333.5	36.64	Ave.	267	1.3	V	5.48	42.12	54	11.88
7440.0	45.55	PK	237	1.1	V	15.9	61.45	74	12.55
2359.6	35.84	Ave.	114	1.5	H	5.48	41.32	54	12.68
4960.0	27.41	Ave.	41	1.2	V	12.5	39.91	54	14.09
9920.0	17.59	Ave.	232	1.8	H	19.38	36.97	54	17.03
4960.0	42.58	PK	41	1.2	V	12.5	55.08	74	18.92
2359.6	46.42	PK	114	1.5	H	5.48	51.90	74	22.10
2333.5	46.36	PK	267	1.3	V	5.48	51.84	74	22.16
9920.0	31.82	PK	232	1.8	H	19.38	51.20	74	22.80

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor

Margin = Limit- Corr. Amplitude

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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

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

Test Data**Environmental Conditions**

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

* The testing was performed by Tiger Ye on 2013-05-15.

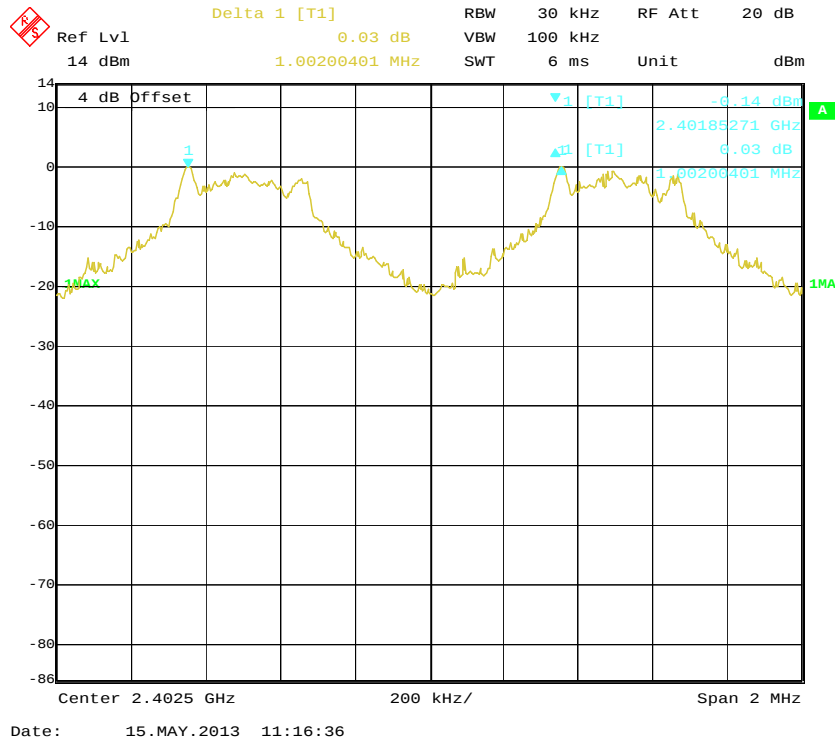
EUT operation mode: Transmitting

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

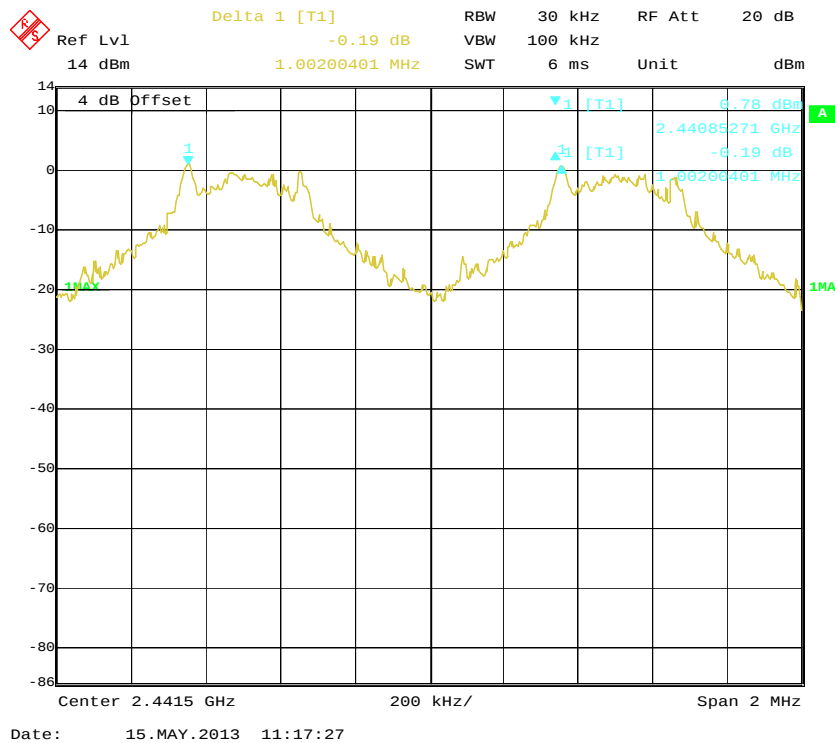
Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	$\geq$ Limit (MHz)	Result
BDR (GFSK)	Low	2402	1.002	0.601	Pass
	Adjacent	2403			
	Middle	2441	1.002	0.601	Pass
	Adjacent	2440			
	High	2480	1.002	0.601	Pass
	Adjacent	2479			
EDR ($\pi/4$-DQPSK)	Low	2402	1.004	0.853	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.853	Pass
	Adjacent	2440			
	High	2480	1.004	0.853	Pass
	Adjacent	2479			
EDR (8DPSK)	Low	2402	1.004	0.855	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.855	Pass
	Adjacent	2440			
	High	2480	1.004	0.855	Pass
	Adjacent	2479			

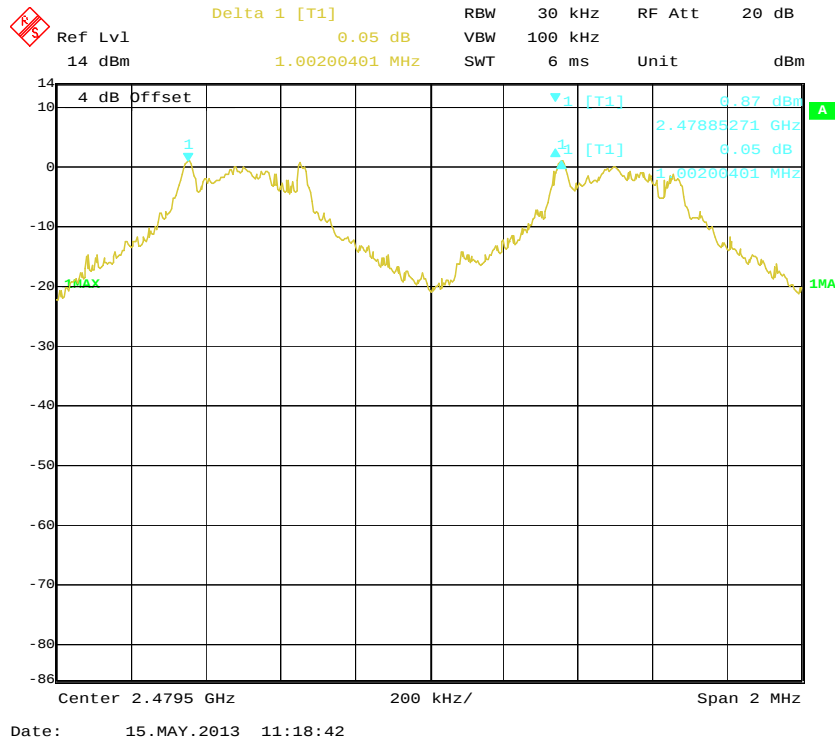
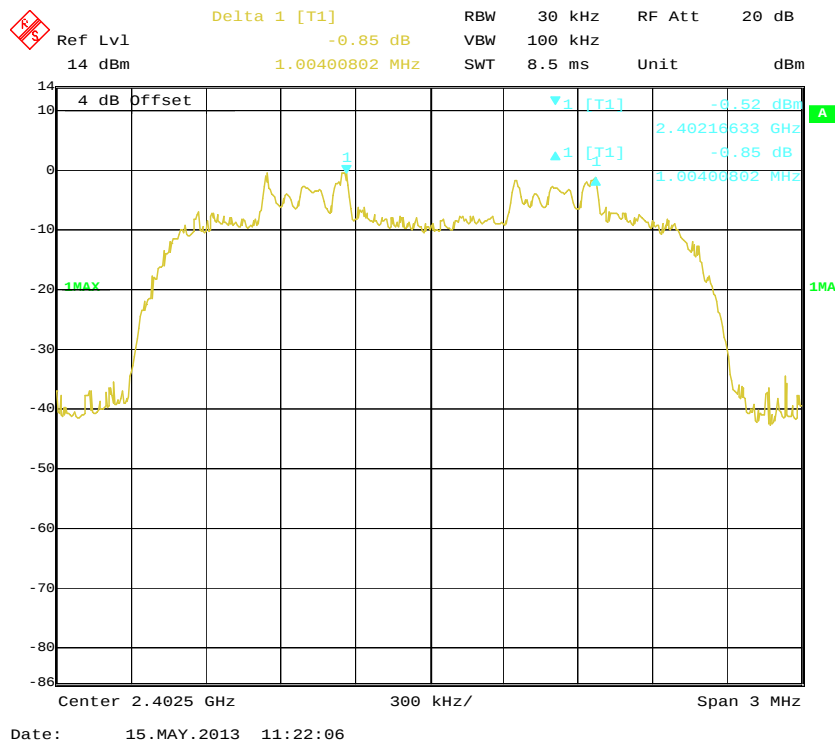
Note: Limit = 20 dB bandwidth *2/3

BDR (GFSK): Low Channel

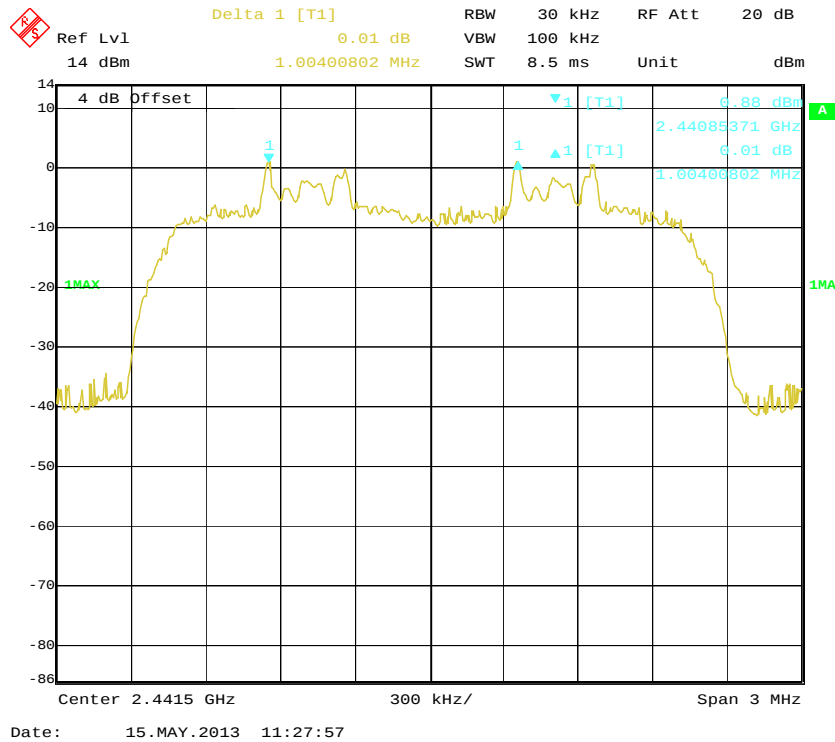


BDR (GFSK): Middle Channel

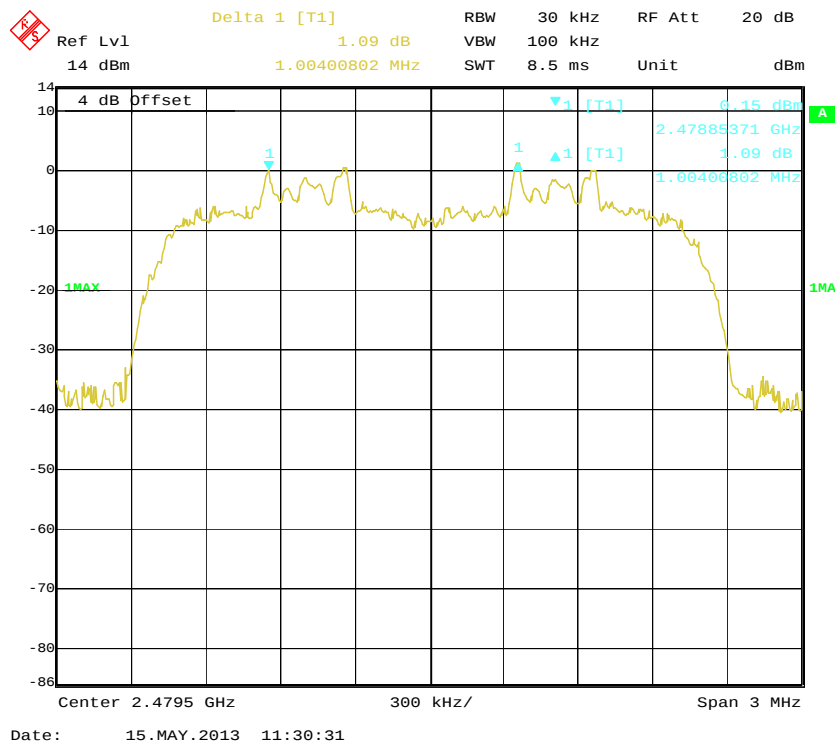


BDR (GFSK): High Channel**EDR ($\pi/4$ -DQPSK): Low Channel**

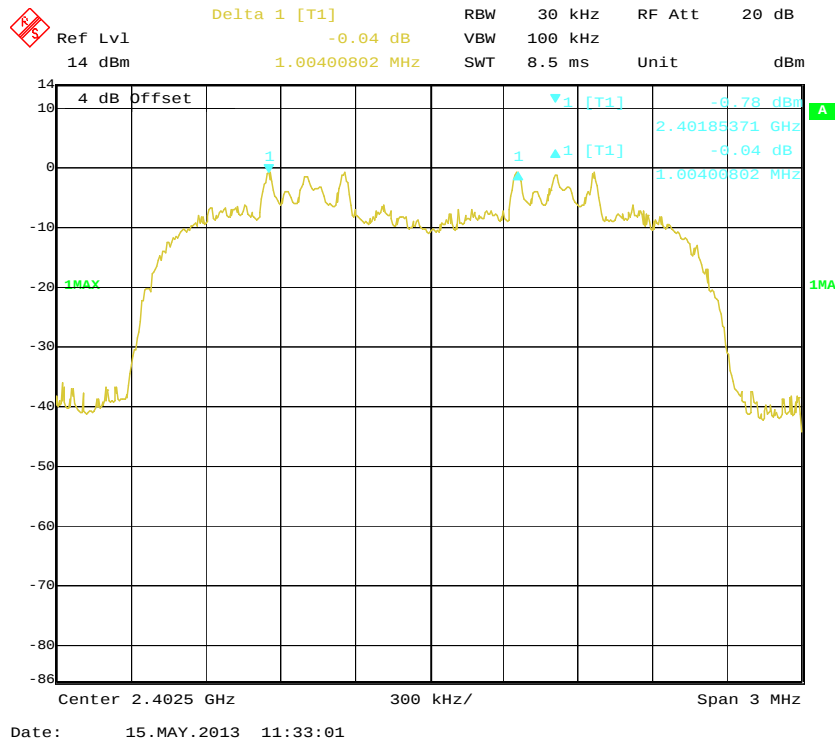
EDR ($\pi/4$ -DQPSK): Middle Channel



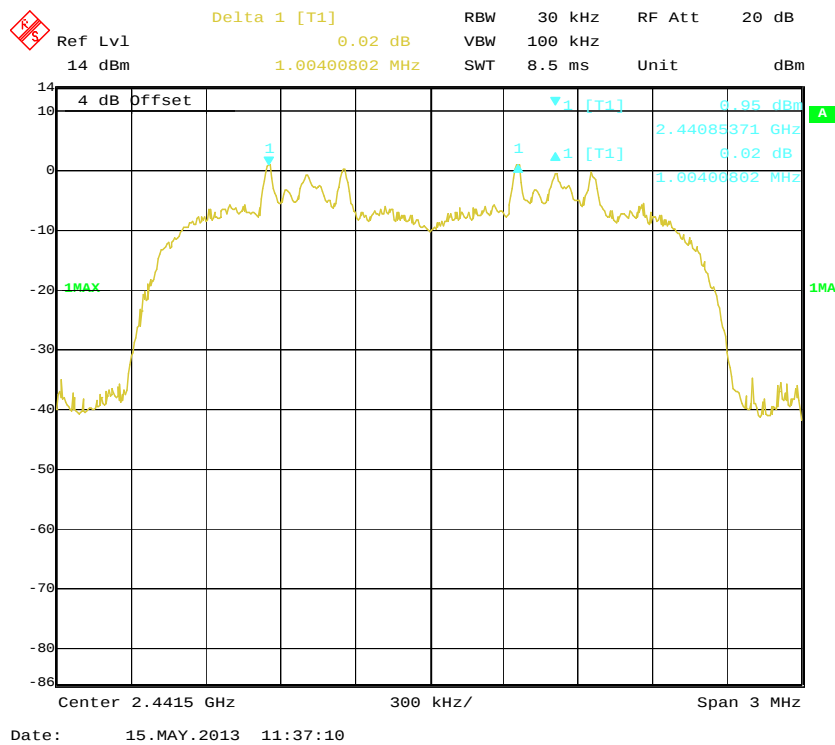
EDR ($\pi/4$ -DQPSK): High Channel



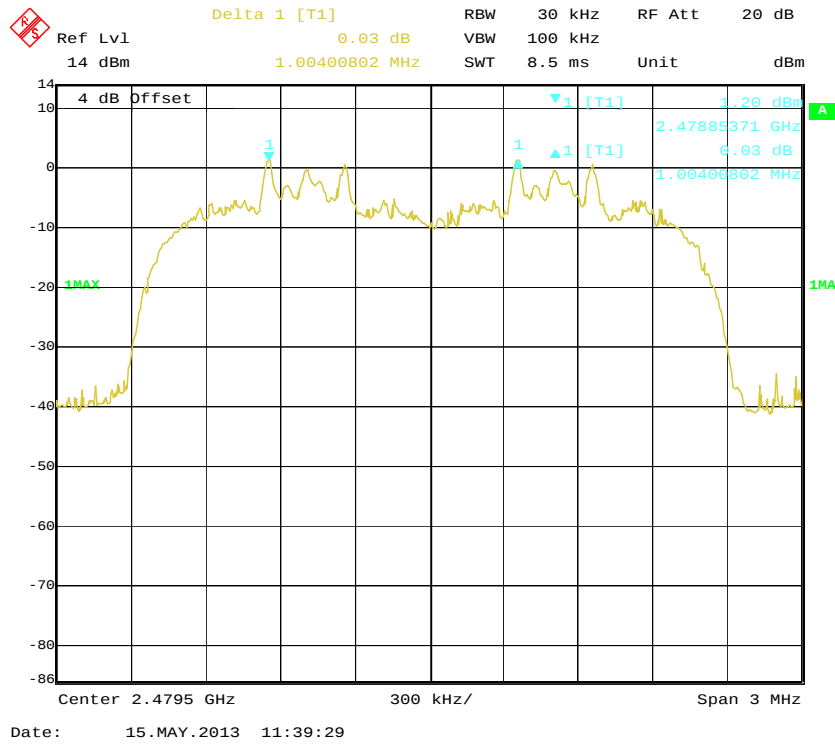
EDR (8DPSK): Low Channel



EDR (8DPSK): Middle Channel



EDR (8DPSK): High Channel



FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH**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

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

Test Data**Environmental Conditions**

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

* The testing was performed by Tiger Ye on 2013-05-15 and 2013-05-16.

EUT operation mode: Transmitting

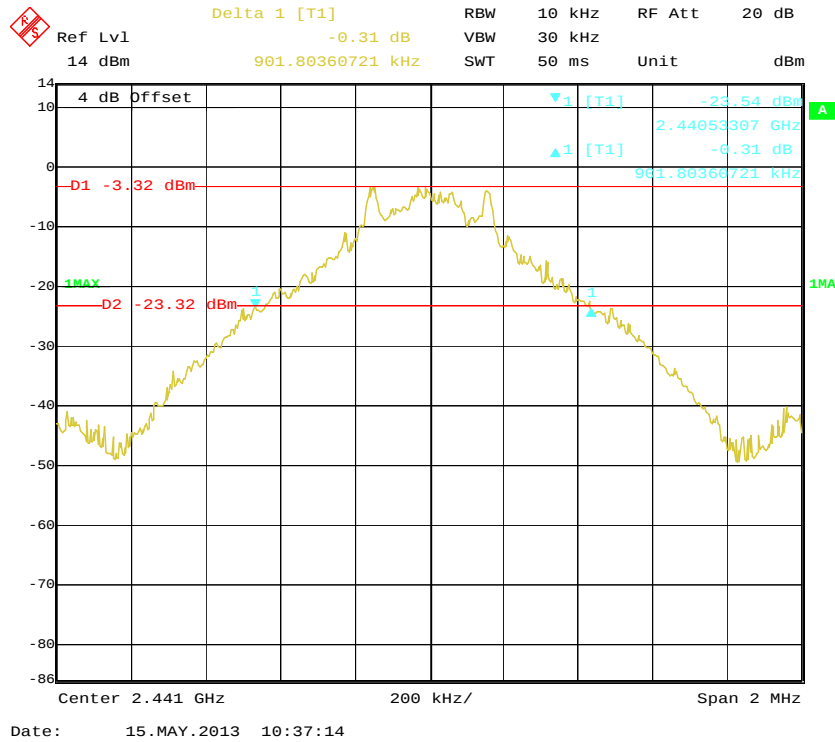
Test Result: Compliance. Please refer to following tables and plots

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.902
	Middle	2441	0.902
	High	2480	0.902
EDR ($\pi/4$-DQPSK)	Low	2402	1.279
	Middle	2441	1.279
	High	2480	1.279
EDR (8DPSK)	Low	2402	1.283
	Middle	2441	1.283
	High	2480	1.283

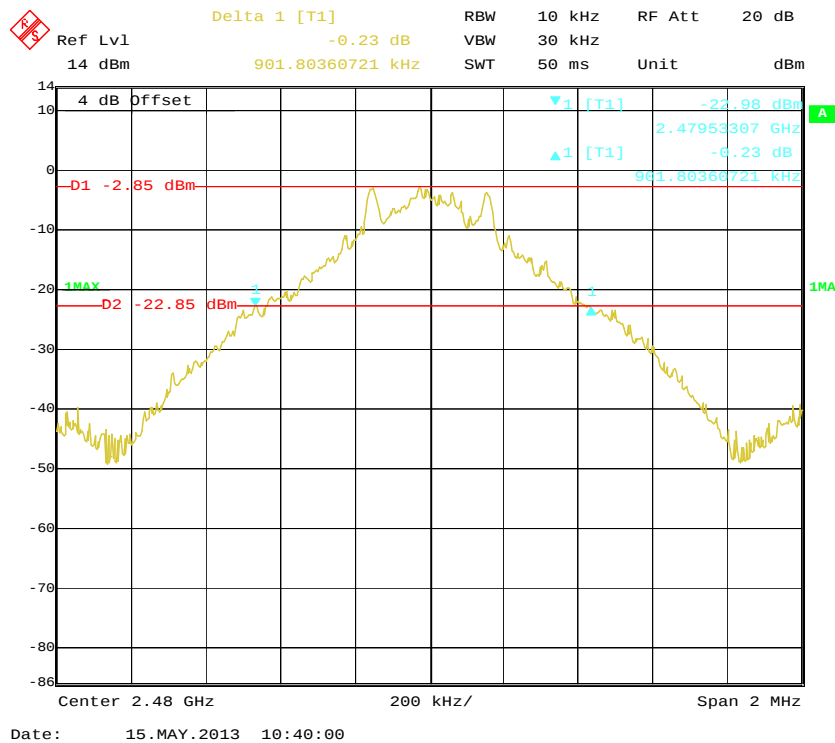
Delta 1 [T1] -0.03 dB
 RBW 10 kHz VBW 30 kHz RF Att 20 dB
 Ref Lvl 14 dBm 901.80360722 KHz SWT 50 ms Unit dBm

4 dB Offset
 D1 -3.87 dBm
 D2 -23.87 dBm
 1MAX
 1MAX
 2.40153307 GHz
 -23.99 dBm
 -6.03 dB
 901.80360722 KHz
 Center 2.402 GHz 200 kHz/ Span 2 MHz

BDR (GFSK): Middle Channel



BDR (GFSK): High Channel



Ref Lvl 14 dBm Delta 1 [T1] 0.14 dB RBW 30 kHz RF Att 20 dB
 1.27855711 MHz VBW 100 kHz Unit dBm
 6 ms
 4 dB Offset
 -21.07 dBm
 2.40136473 GHz
 0.14 dB
 1.27855711 MHz
 -20.62 dBm
 1MAX
 1 [T1]
 1MAX
 Center 2.402 GHz 200 kHz/ Span 2 MHz
 Date: 15.MAY.2013 10:47:32

Ref Lvl 14 dBm Delta 1 [T1] 1.06 dB RBW 30 kHz RF Att 20 dB

14 dBm 1.27855711 MHz SWT 6 ms Unit dBm

4 dB Offset

▼1 [T1] -15.74 dBm

▲1 [T1] 2.44036874 GHz

D1 0.15 dBm

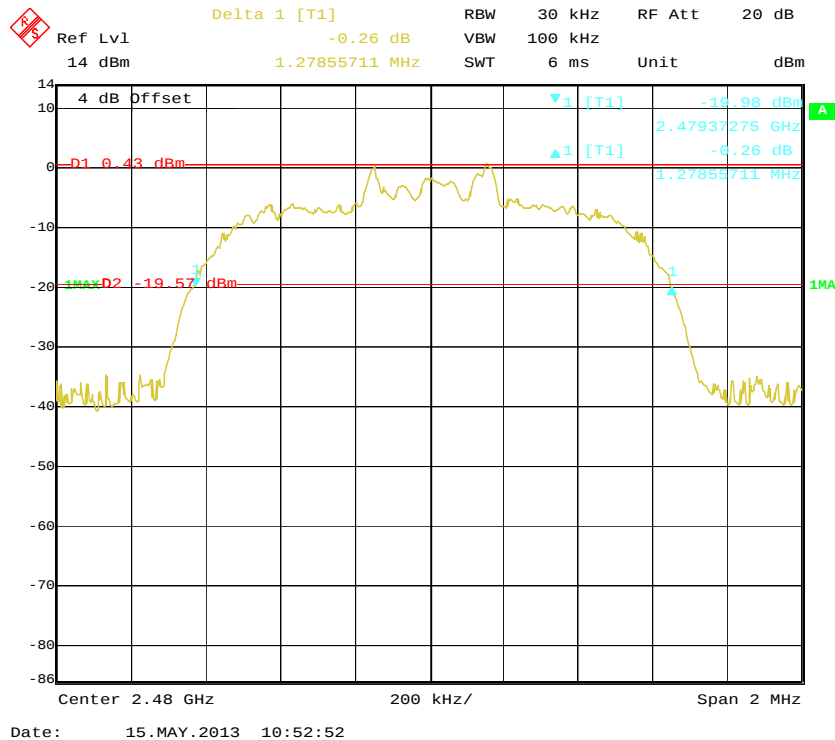
1.27855711 MHz

19.85 dBm

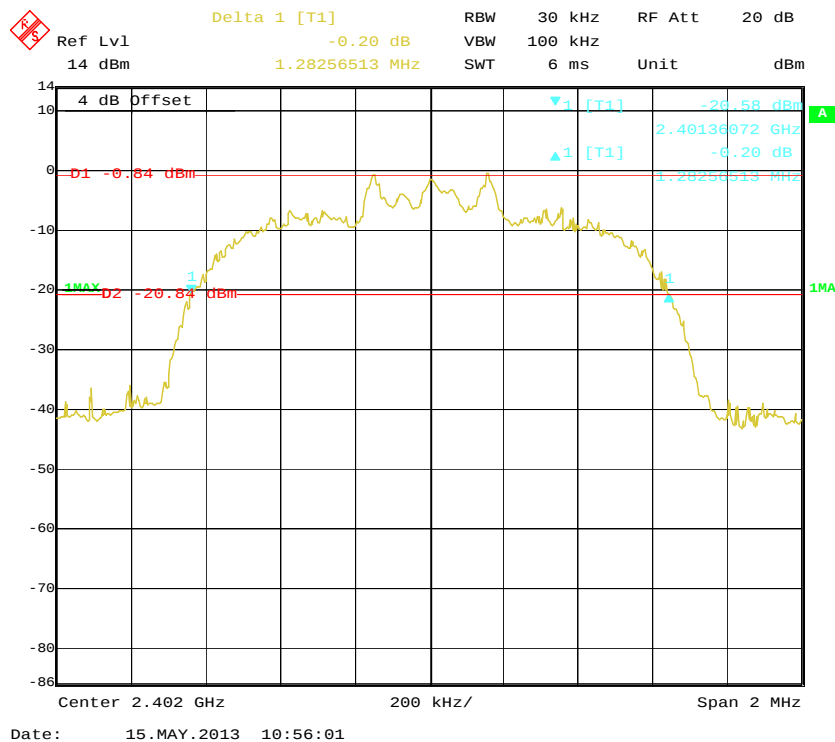
1

Center 2.441 GHz 200 kHz/ Span 2 MHz

Date: 15.MAY.2013 10:50:28

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

EDR (8DPSK): Low Channel



[illegible]

Ref Lvl 14 dBm Delta 1 [T1] 0.23 dB RBW 30 kHz RF Att 20 dB
 14 dBm 1.28256513 MHz SWT 6 ms Unit dBm

4 dB Offset

D1 0.46 dBm

D2 -19.54 dBm

1 [T1] -26.45 dBm

1 [T1] 2.47936473 GHz

1 [T1] 6.23 dB

1 [T1] 1.28256513 MHz

Center 2.48 GHz 200 kHz/ Span 2 MHz

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

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

Test Data**Environmental Conditions**

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

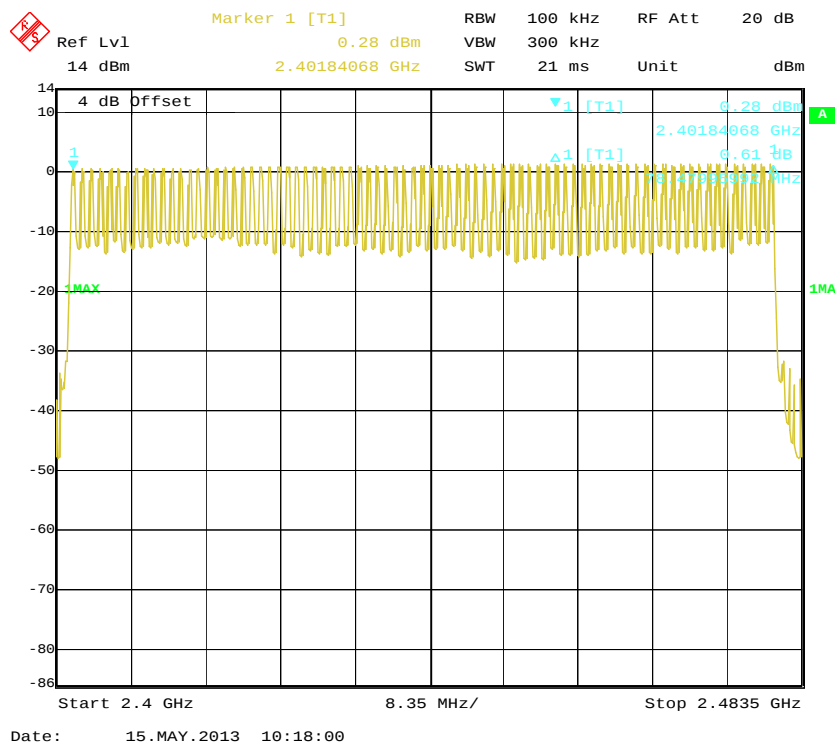
The testing was performed by Tiger Ye on 2013-05-15.

EUT operation mode: Transmitting

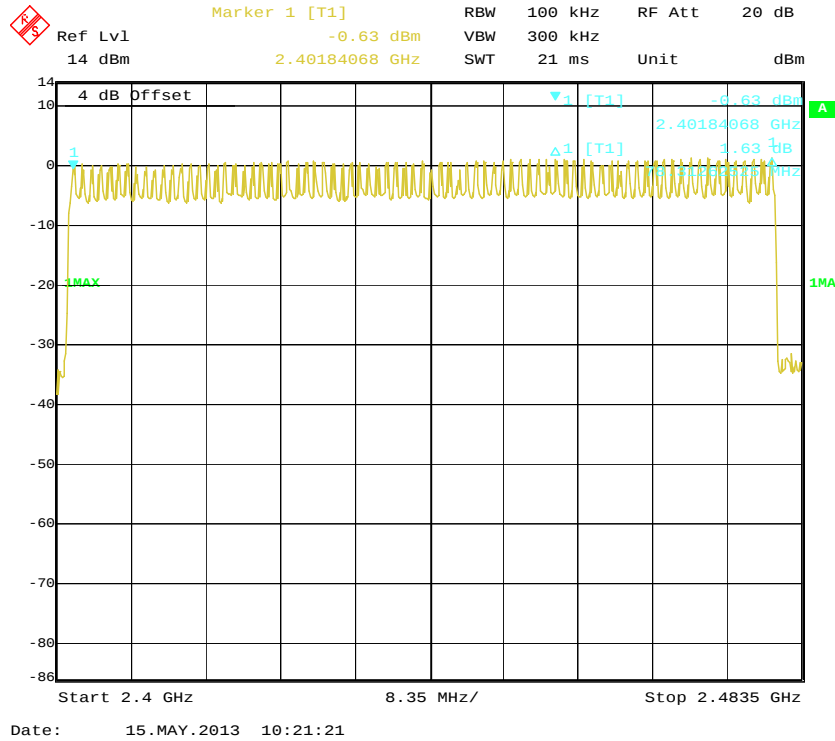
Test Result: Compliance. Please refer to following tables and plots

Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
BDR (GFSK)	2400-2483.5	79	≥ 15
EDR ($\pi/4$ -DQPSK)	2400-2483.5	79	≥ 15
EDR (8DPSK)	2400-2483.5	79	≥ 15

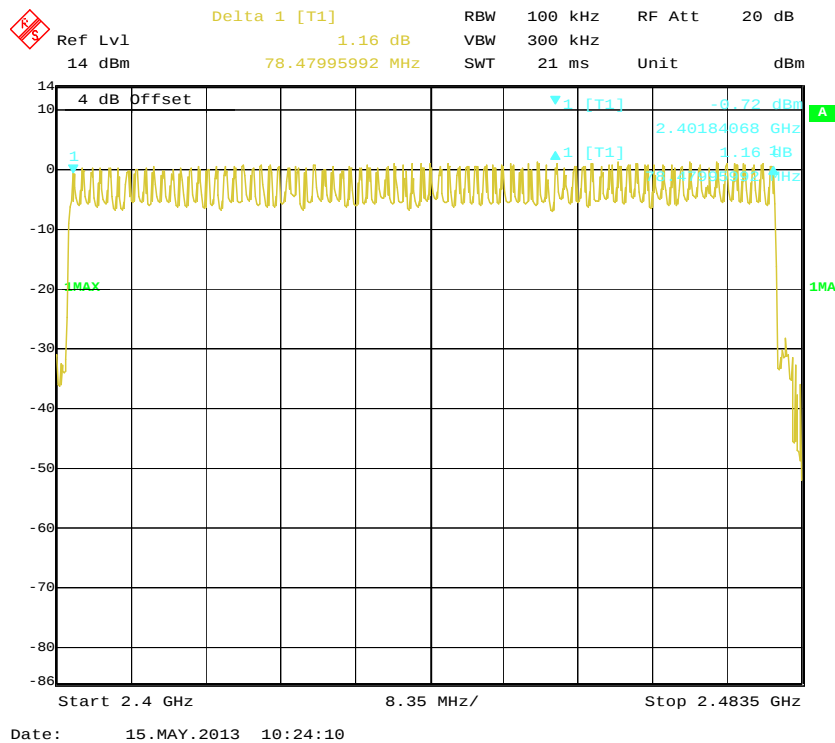
BDR (GFSK): Number of Hopping Channels



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



EDR (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

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

Test Data**Environmental Conditions**

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

The testing was performed by Tiger Ye on 2013-05-15.

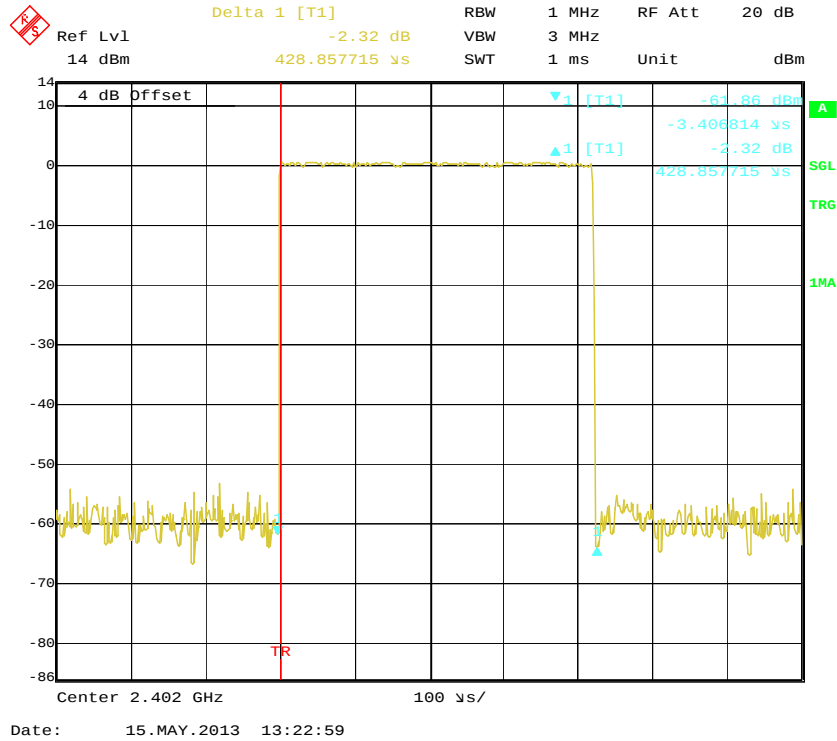
EUT operation mode: Transmitting

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

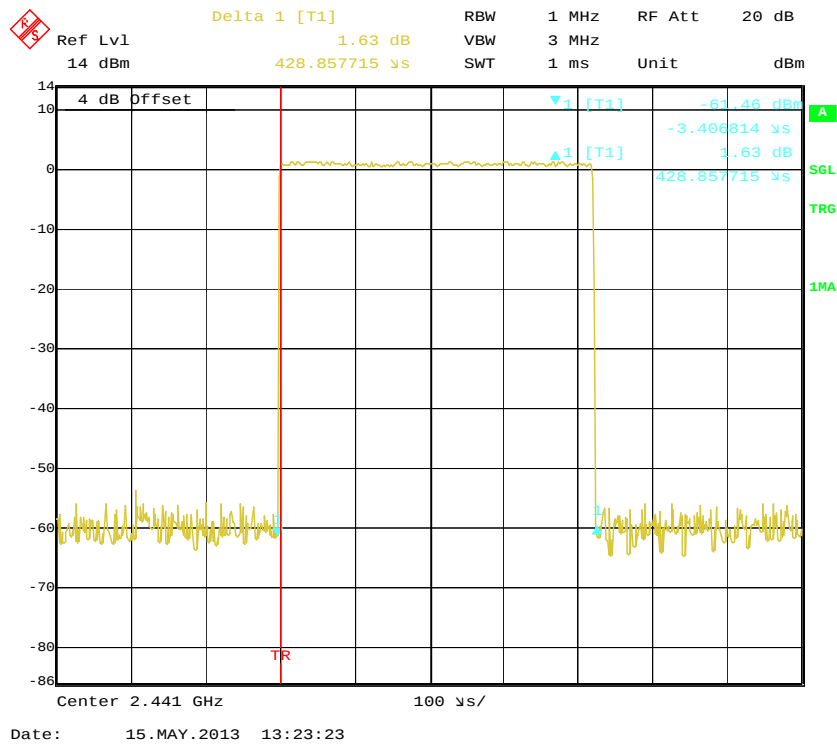
Mode		Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
BDR (GFSK)	DH 1	Low	0.429	0.137	0.4	Pass
		Middle	0.429	0.137	0.4	Pass
		High	0.429	0.137	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH 3	Low	1.691	0.271	0.4	Pass
		Middle	1.691	0.271	0.4	Pass
		High	1.691	0.271	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH 5	Low	2.954	0.315	0.4	Pass
		Middle	2.954	0.315	0.4	Pass
		High	2.954	0.315	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR ($\pi/4$ -DQPSK)	DH 1	Low	0.429	0.137	0.4	Pass
		Middle	0.429	0.137	0.4	Pass
		High	0.429	0.137	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH 3	Low	1.691	0.271	0.4	Pass
		Middle	1.691	0.271	0.4	Pass
		High	1.691	0.271	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH 5	Low	2.954	0.315	0.4	Pass
		Middle	2.954	0.315	0.4	Pass
		High	2.954	0.315	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR (8DPSK)	DH 1	Low	0.429	0.137	0.4	Pass
		Middle	0.429	0.137	0.4	Pass
		High	0.429	0.137	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH 3	Low	1.691	0.271	0.4	Pass
		Middle	1.691	0.271	0.4	Pass
		High	1.691	0.271	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH 5	Low	2.954	0.315	0.4	Pass
		Middle	2.954	0.315	0.4	Pass
		High	2.954	0.315	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				

BDR (GFSK):

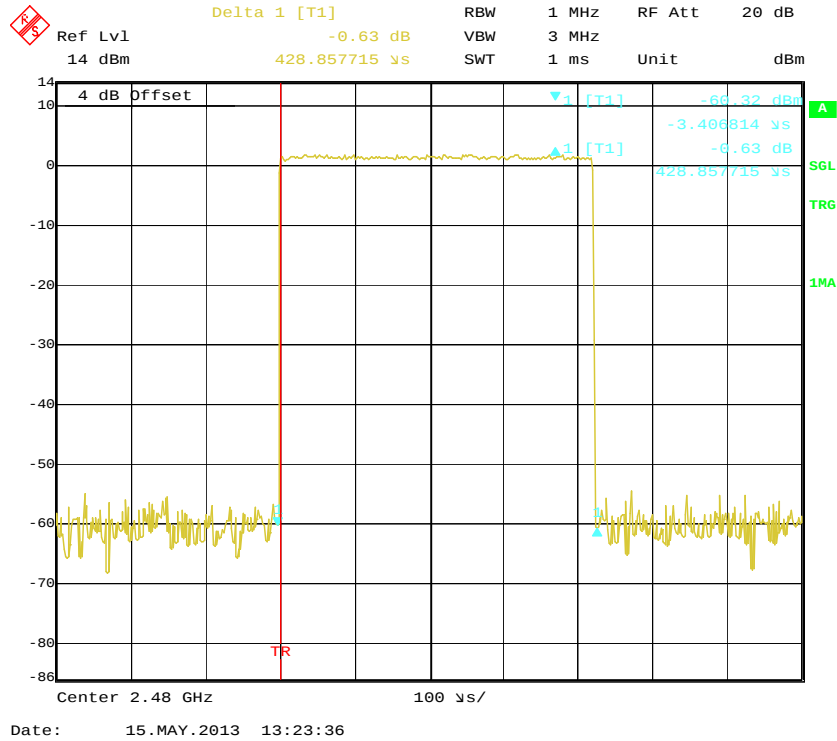
Pulse time, Low Channel, DH1



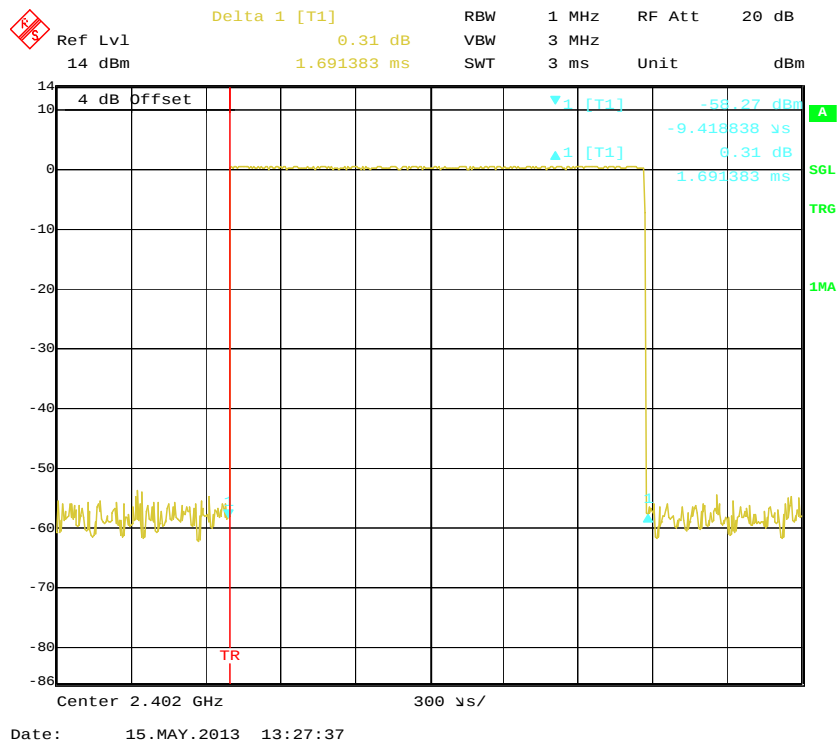
Pulse time, Middle Channel, DH1



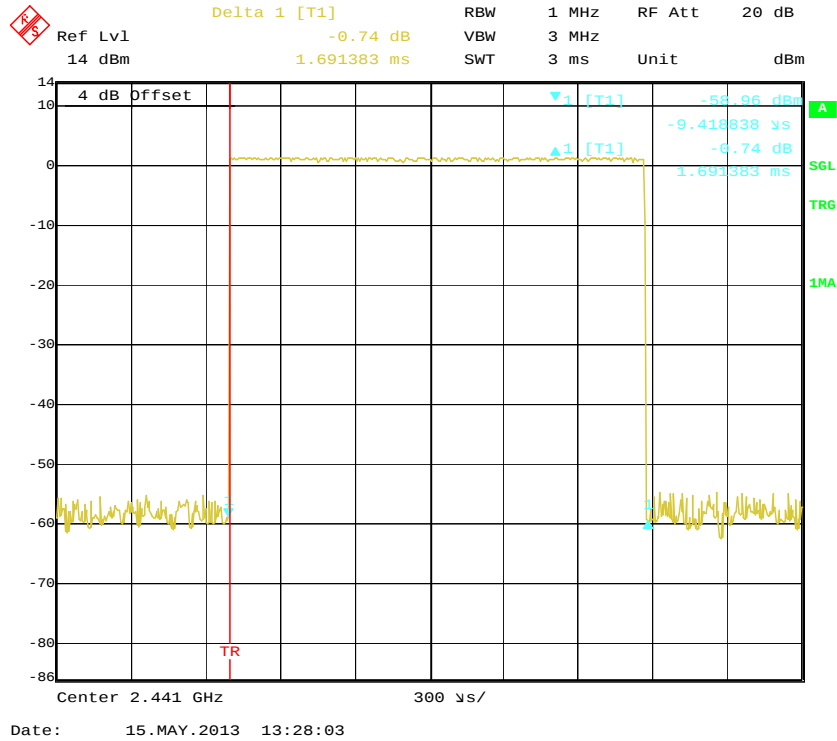
Pulse time, High Channel, DH1



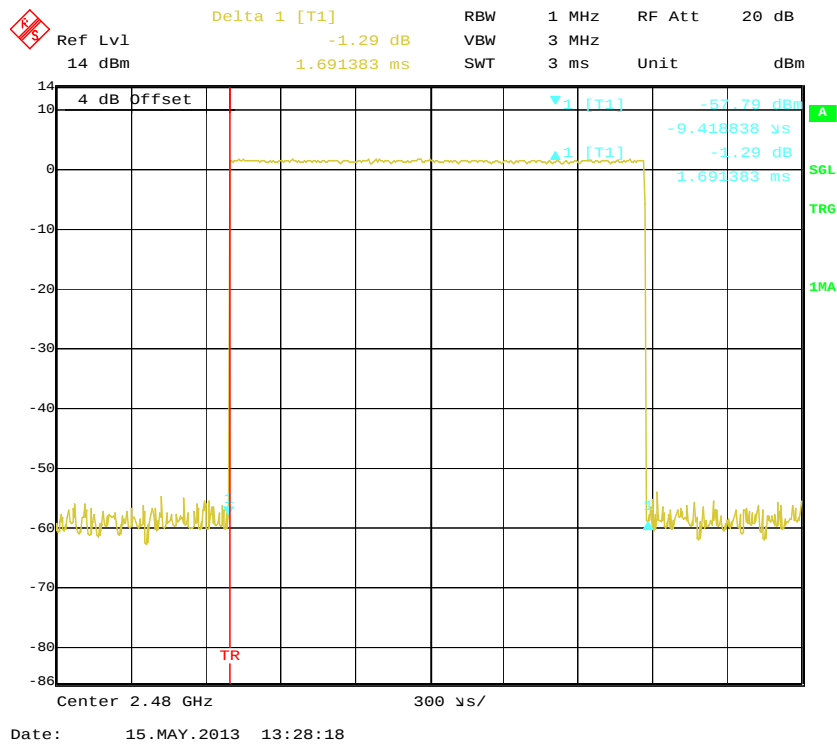
Pulse time, Low Channel, DH3



Pulse time, Middle Channel, DH3



Pulse time, High Channel, DH3



Ref Lvl
14 dBm

Delta 1 [T1]
0.99 dB

RBW
1 MHz

VBW
3 MHz

RF Att
20 dB

Unit
dBm

2.953914 ms

SWT
5 ms

4 dB Offset

TR

Center 2.402 GHz

500 us/div

Date: 15.MAY.2013 13:35:50

Ref Lvl 14 dBm Delta 1 [T1] 0.72 dB RBW 1 MHz RF Att 20 dB
 4 dB Offset 2.953914 ms SWT 3 MHz Unit dBm

Center 2.441 GHz 500 μ s/

Delta 1 [T1] 0.72 dB
 -58.36 dBm
 -29.458918 μ s
 6.72 dB
 2.953914 ms

TR

1MA

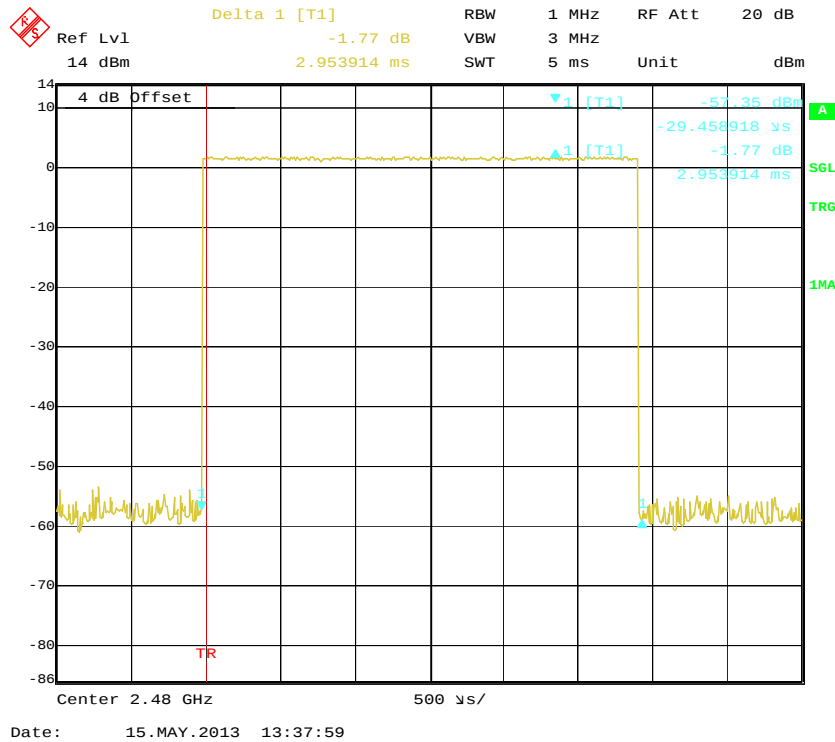
1A

TRG

SGL

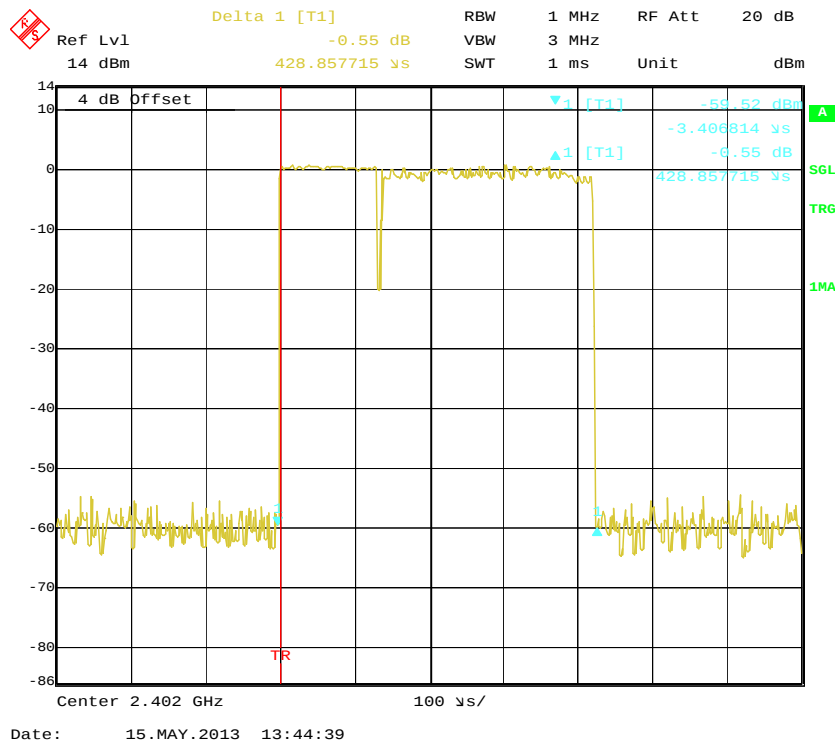
Date: 15.MAY.2013 13:36:18

Pulse time, High Channel, DH5

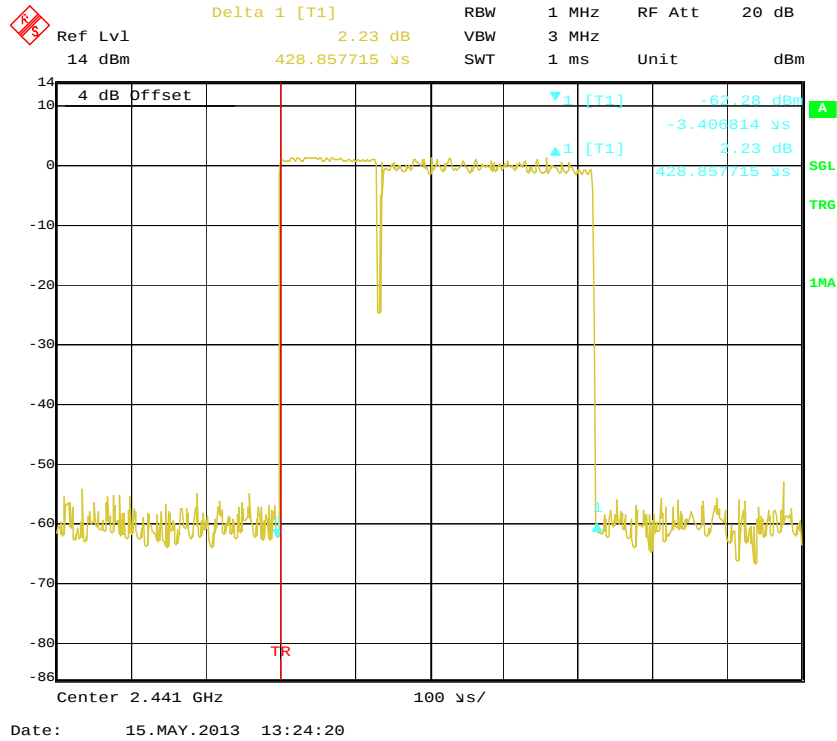


EDR ($\pi/4$ -DQPSK):

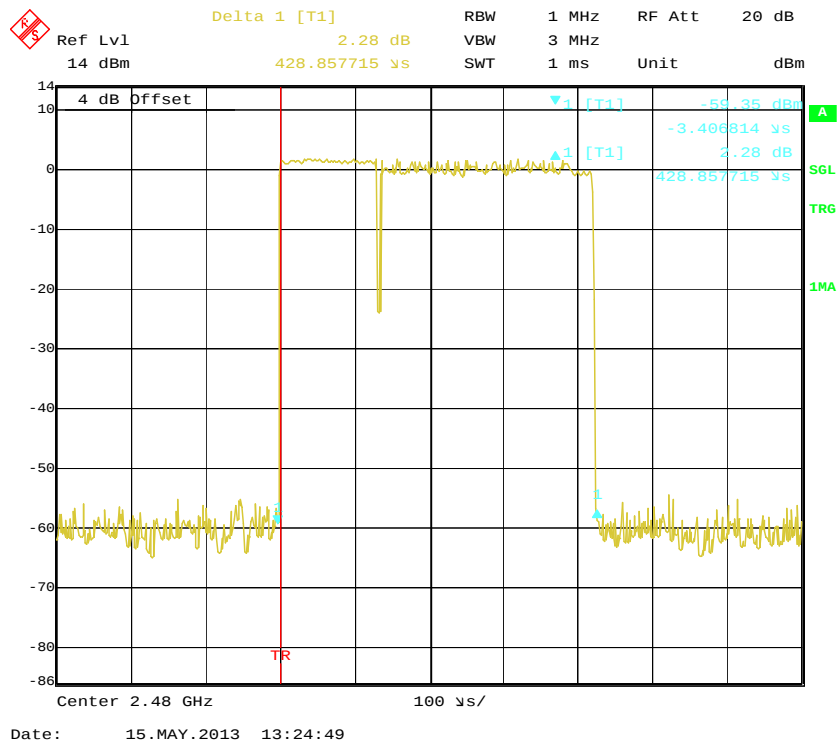
Pulse time, Low Channel, DH1



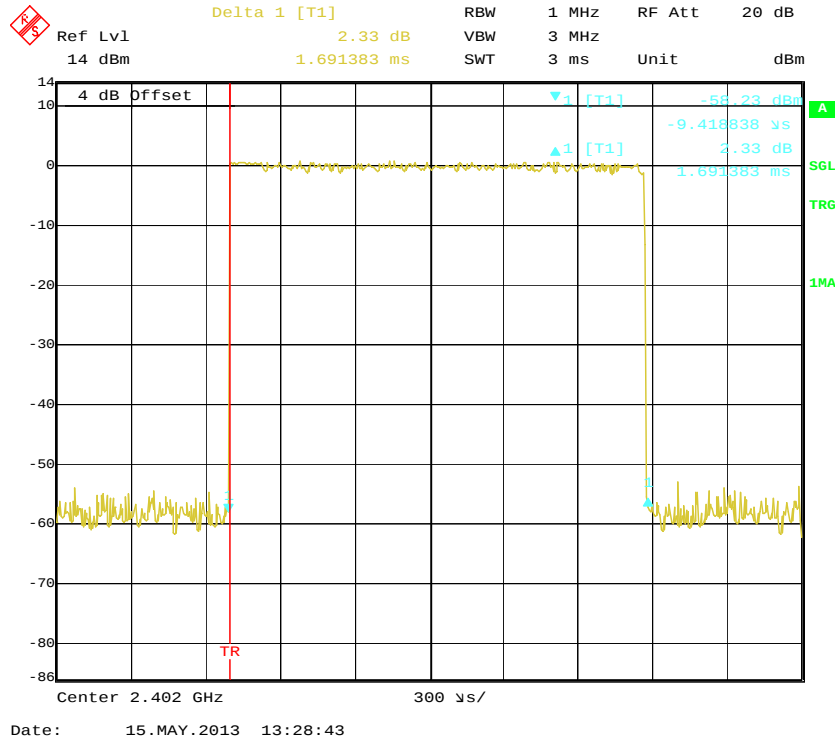
Pulse time, Middle Channel, DH1



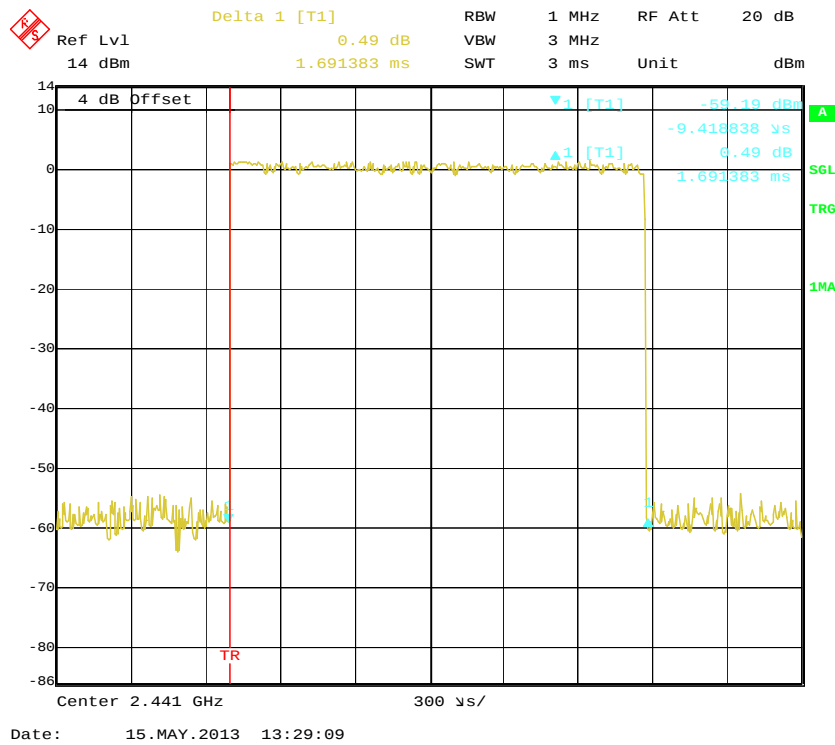
Pulse time, High Channel, DH1



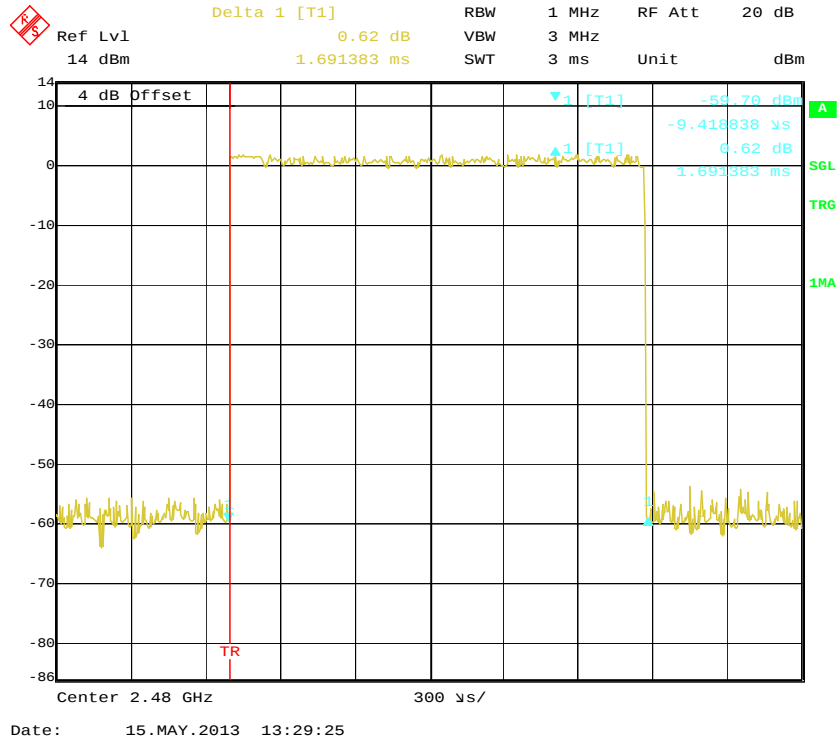
Pulse time, Low Channel, DH3



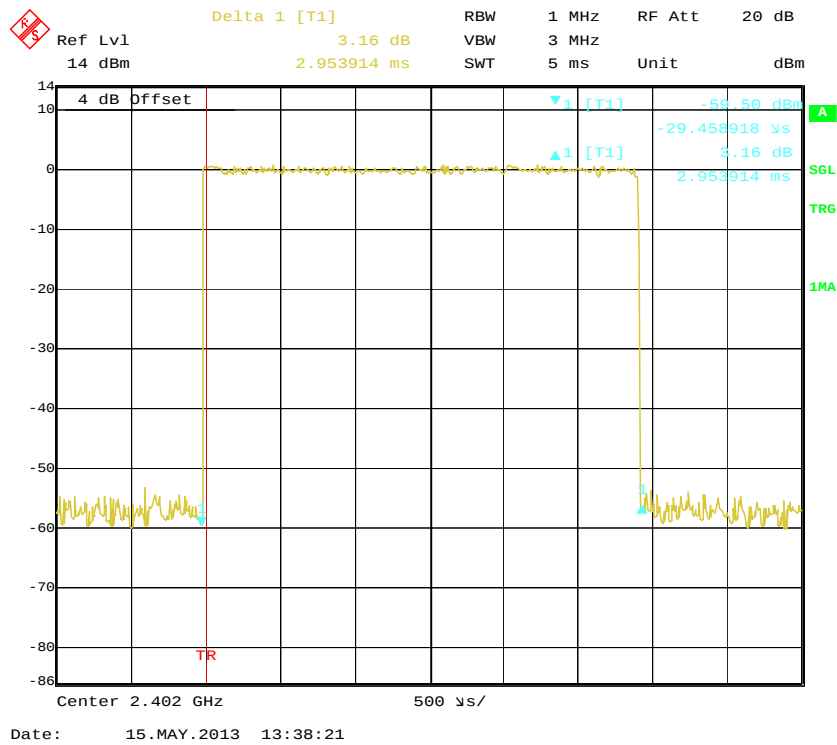
Pulse time, Middle Channel, DH3



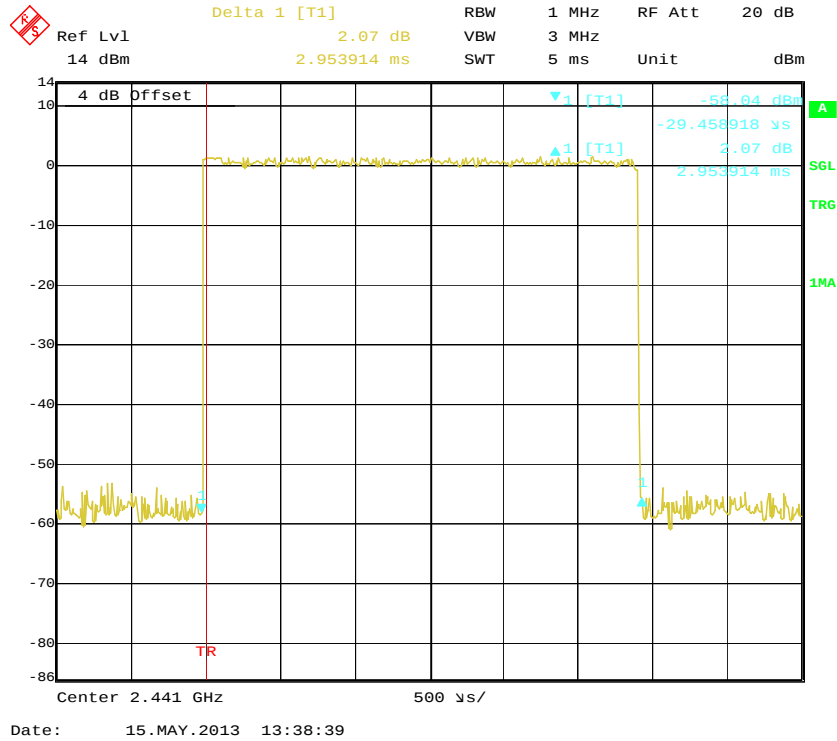
Pulse time, High Channel, DH3



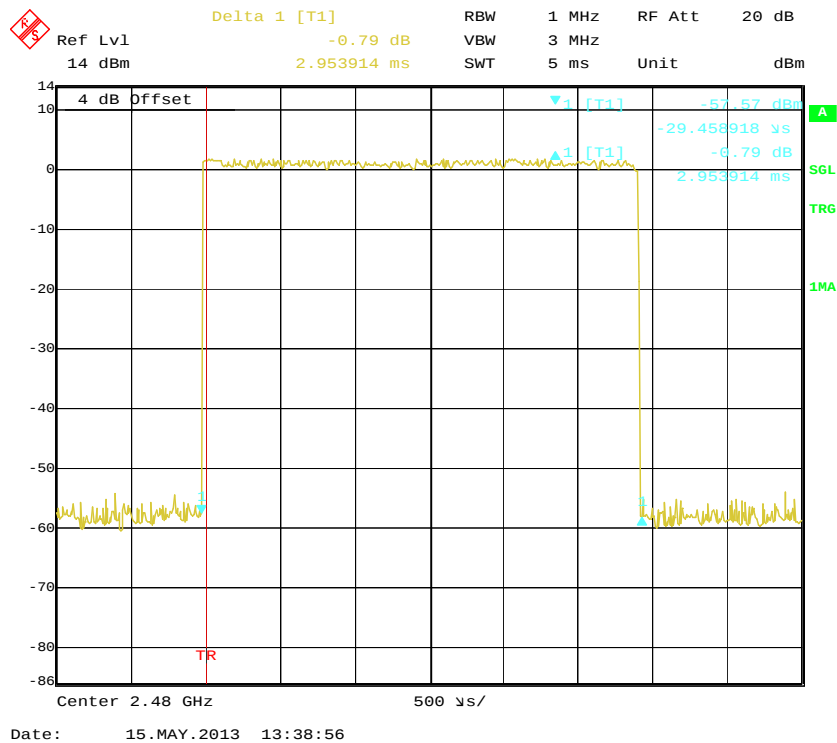
Pulse time, Low Channel, DH5



Pulse time, Middle Channel, DH5

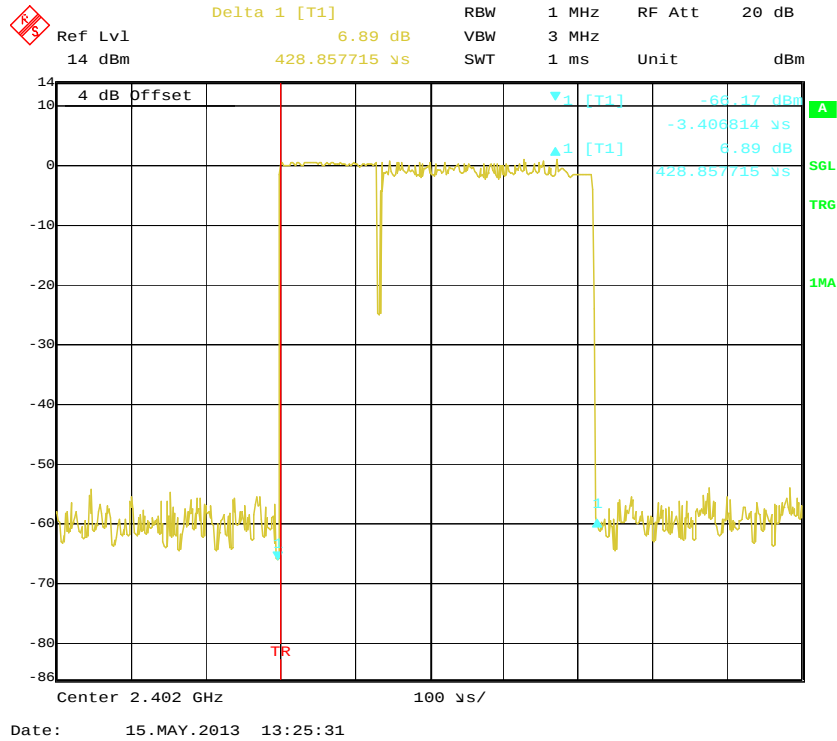


Pulse time, High Channel, DH5

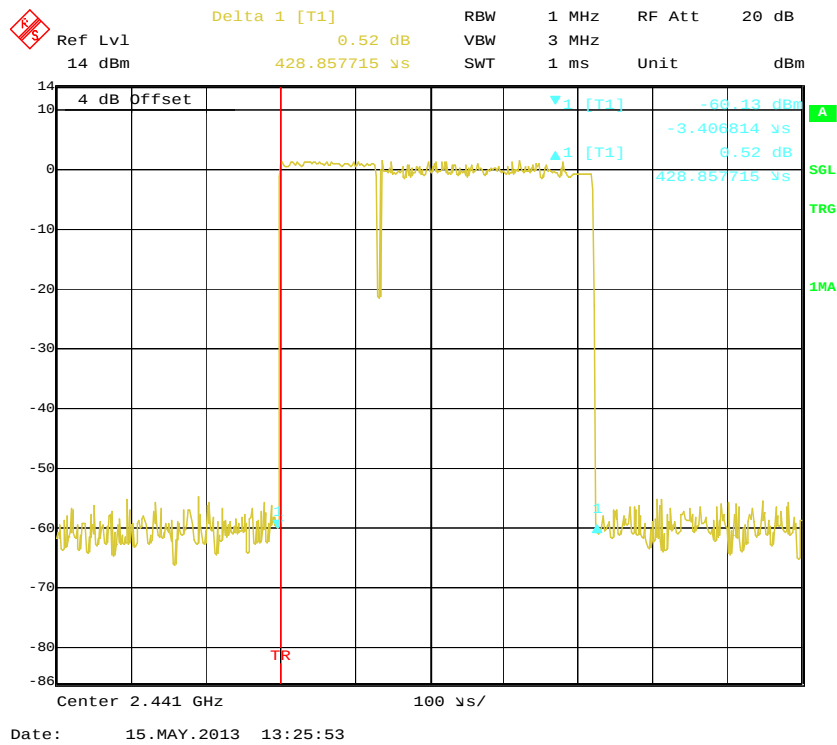


EDR (8DPSK):

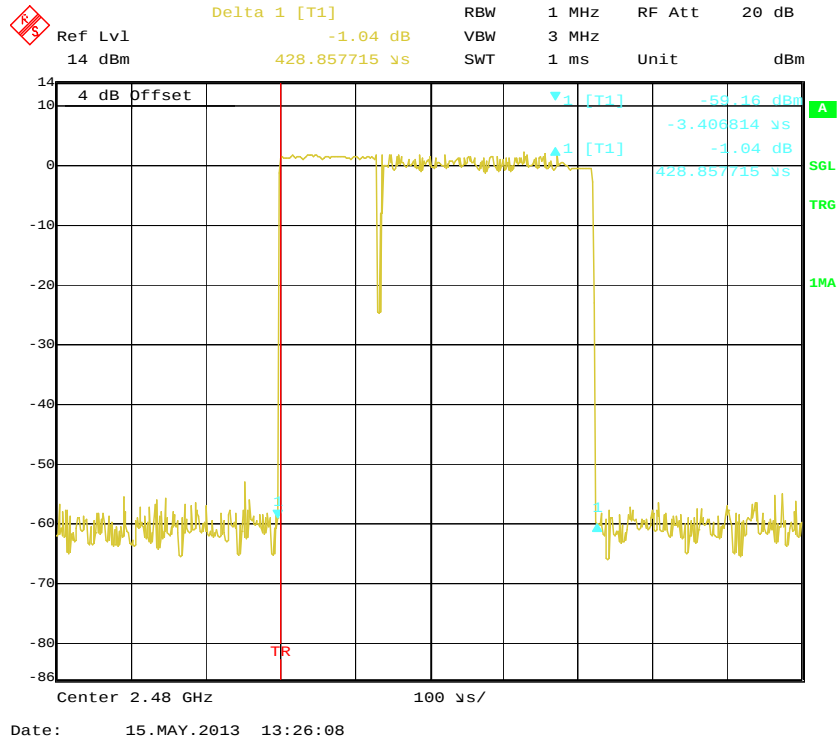
Pulse time, Low Channel, DH1



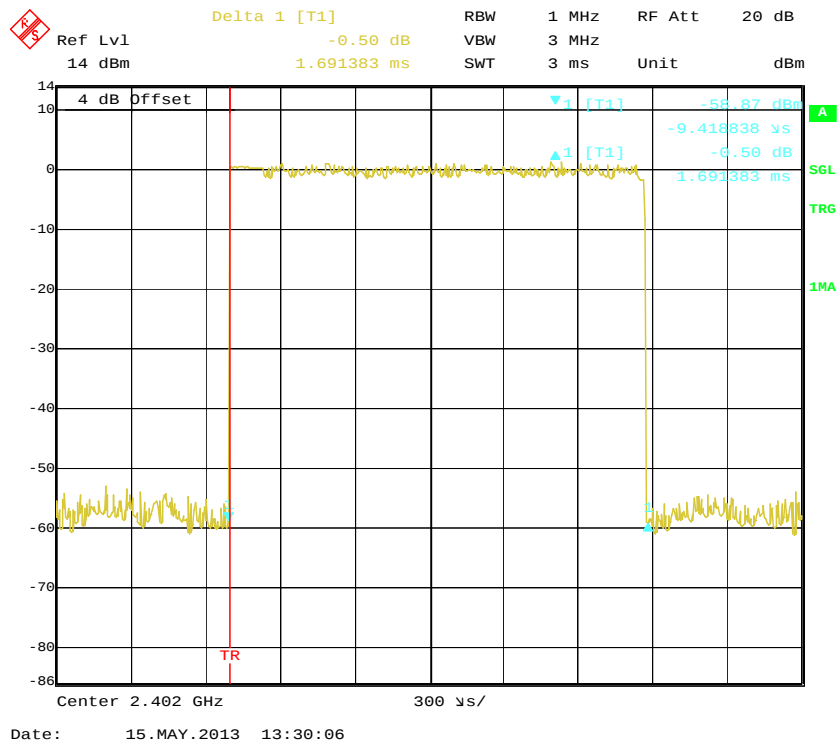
Pulse time, Middle Channel, DH1



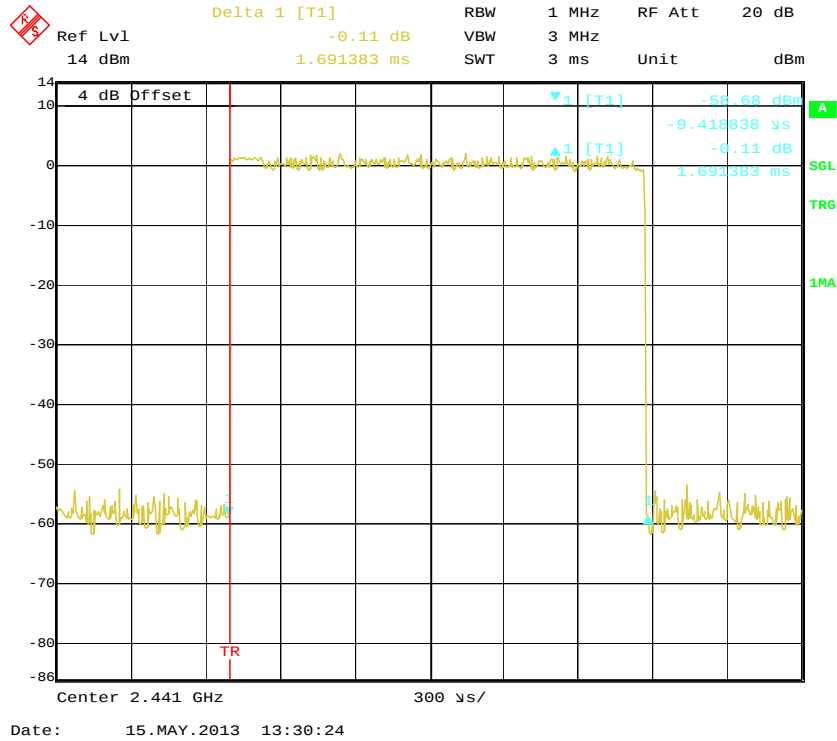
Pulse time, High Channel, DH1



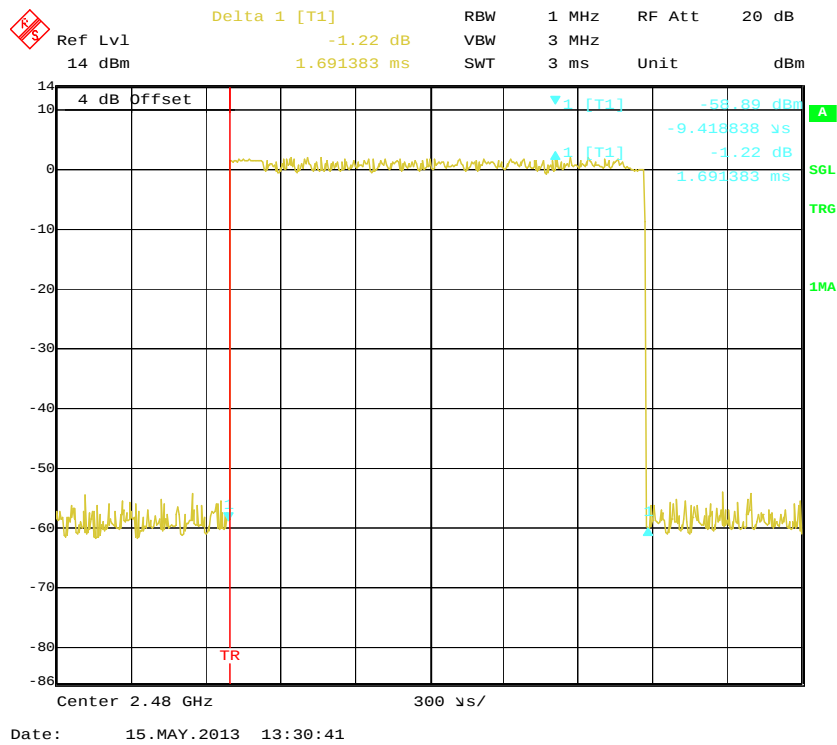
Pulse time, Low Channel, DH3



Pulse time, Middle Channel, DH3



Pulse time, High Channel, DH3



Ref Lvl 14 dBm Delta 1 [T1] -0.16 dB RBW 1 MHz RF Att 20 dB
 14 dBm 2.953914 ms SWT 3 MHz Unit dBm

4 dB Offset

Center 2.402 GHz 500 μ s/div

Delta 1 [T1] -57.12 dBm
 -29.458918 μ s
 -0.16 dB
 2.953914 ms

TR

1MA

Date: 15.MAY.2013 13:39:38

Ref Lvl 14 dBm Delta 1 [T1] 0.27 dB RBW 1 MHz RF Att 20 dB

4 dB Offset 2.953914 ms SWT 5 ms Unit dBm

Center 2.441 GHz 500 μ s/

-56.54 dBm

-29.458918 μ s

6.27 dB

2.953914 ms

TR

1MA

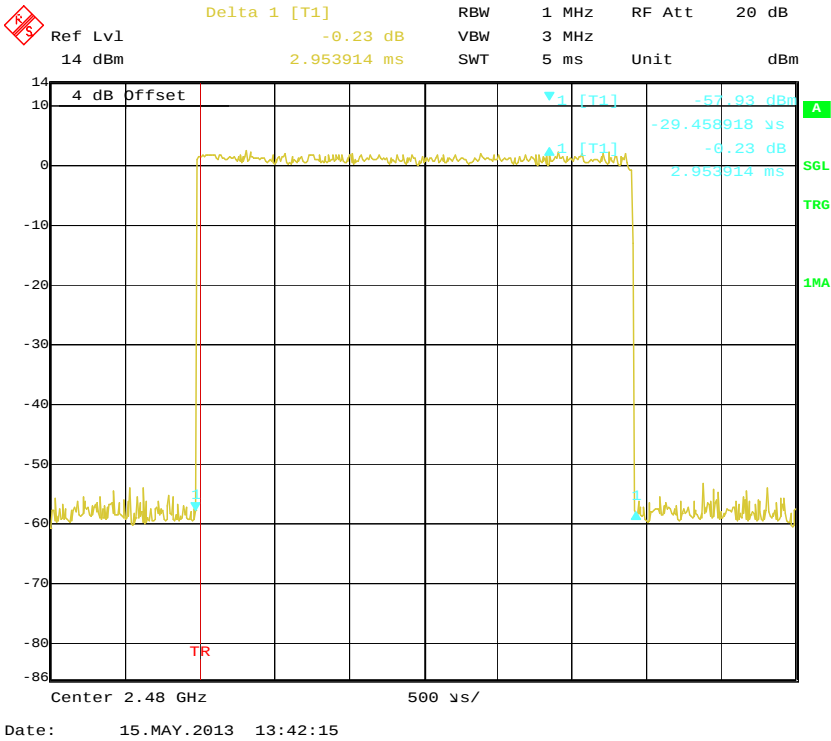
TRG

SGL

A

Date: 15.MAY.2013 13:39:50

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

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

Test Data**Environmental Conditions**

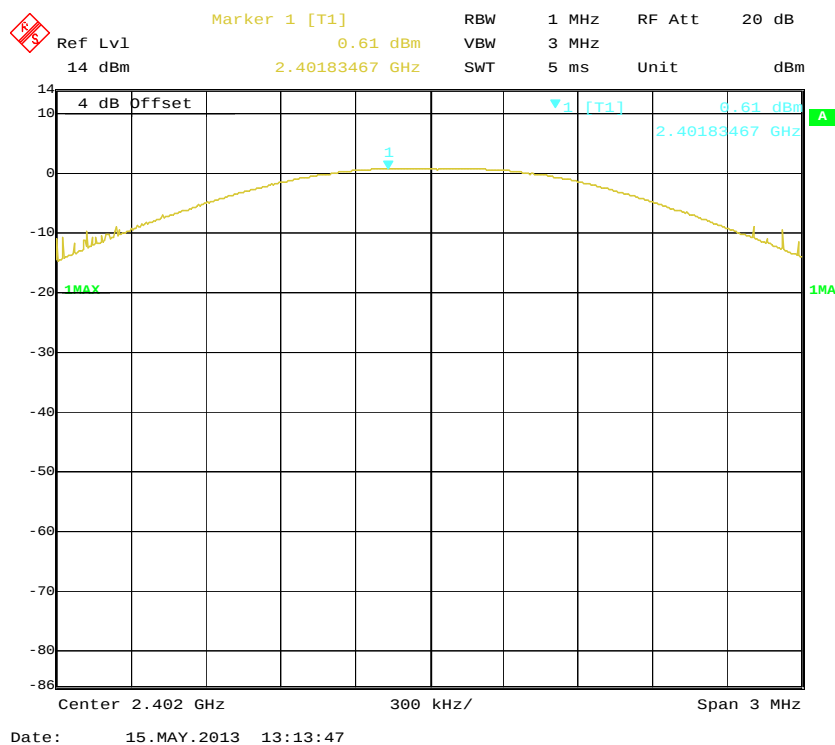
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Tiger Ye on 2013-05-15.

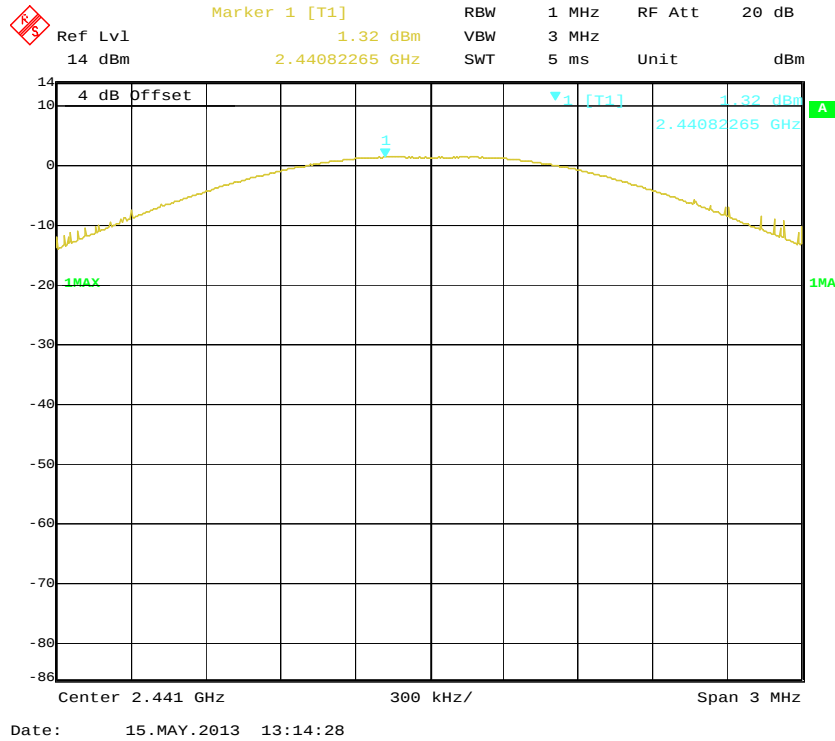
EUT operation mode: Transmitting

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

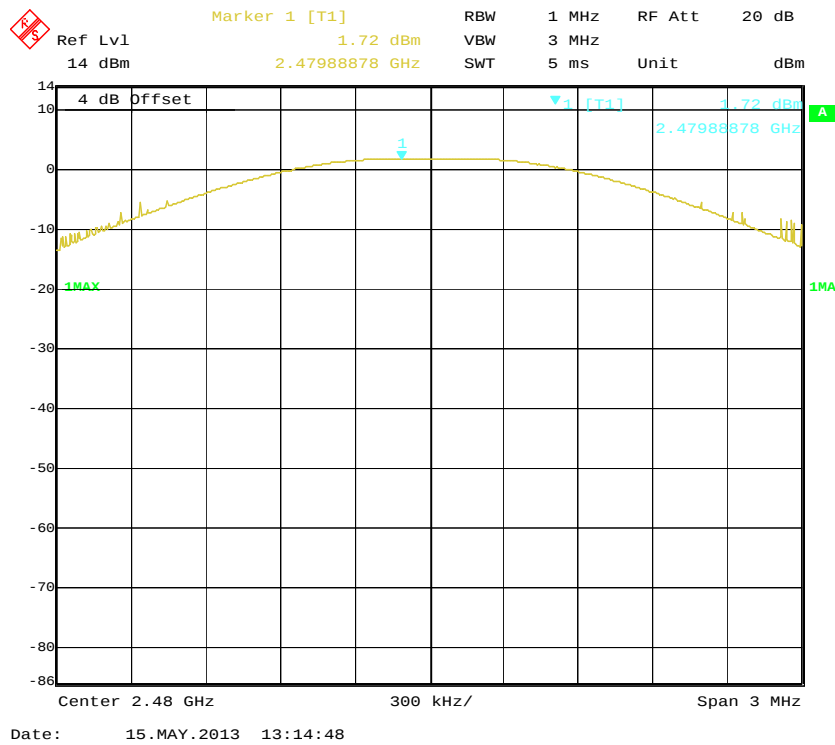
Mode	Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
			(dBm)	(mW)	
BDR (GFSK)	Low	2402	0.61	1.15	1000
	Middle	2441	1.32	1.36	1000
	High	2480	1.72	1.49	1000
EDR ($\pi/4$-DQPSK)	Low	2402	1.37	1.37	1000
	Middle	2441	2.03	1.60	1000
	High	2480	2.46	1.76	1000
EDR (8DPSK)	Low	2402	1.98	1.58	1000
	Middle	2441	2.65	1.84	1000
	High	2480	3.04	2.01	1000

BDR (GFSK): Low Channel

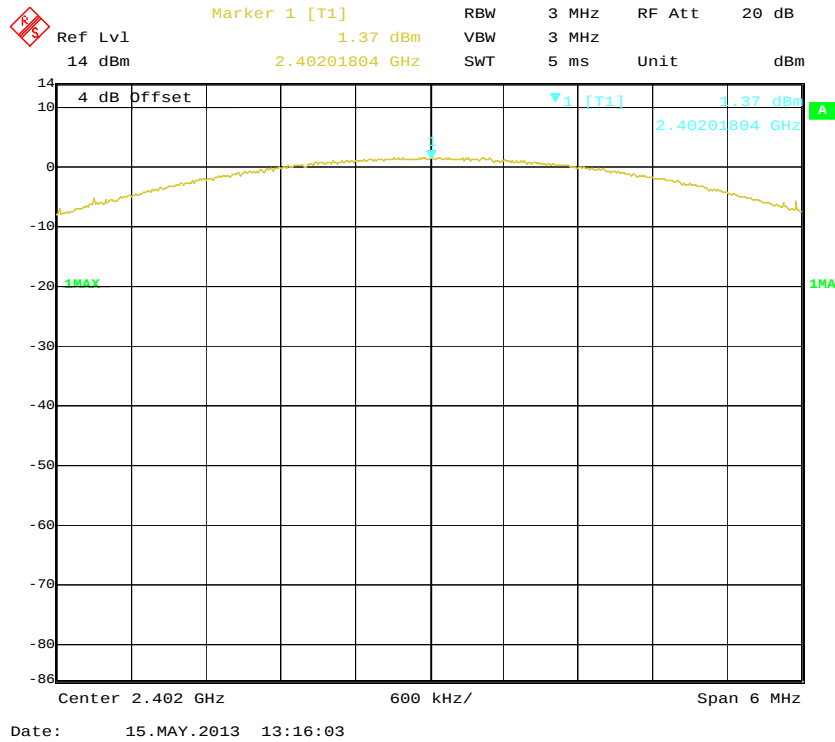
BDR (GFSK): Middle Channel



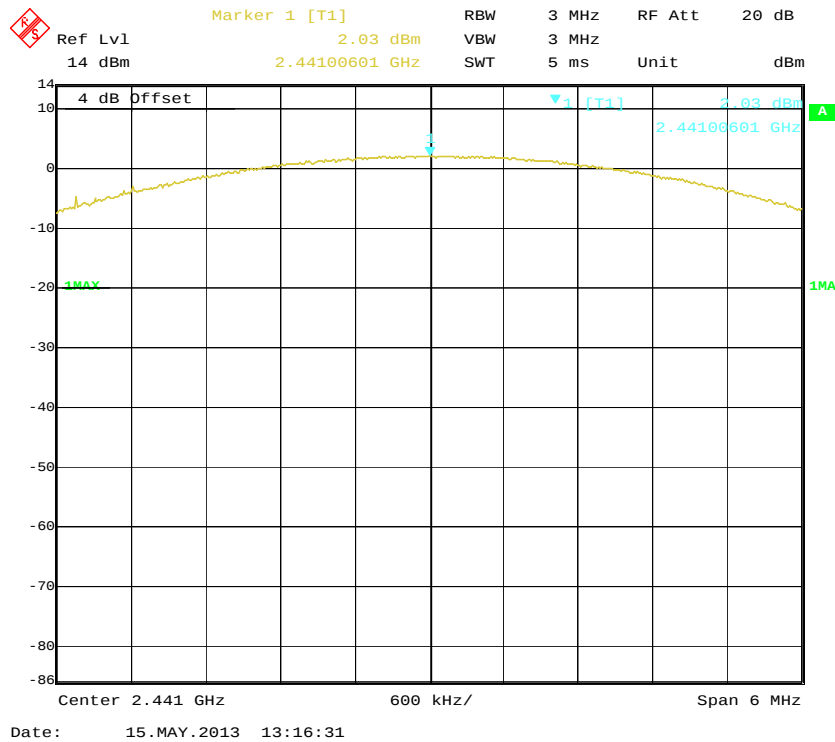
BDR (GFSK): High Channel



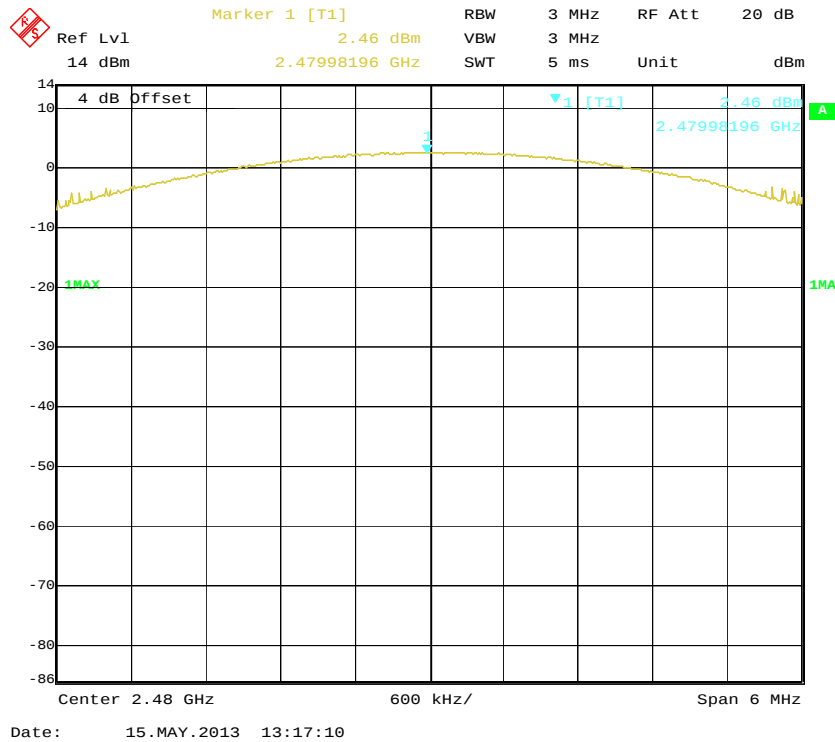
EDR($\pi/4$ -DQPSK): Low Channel



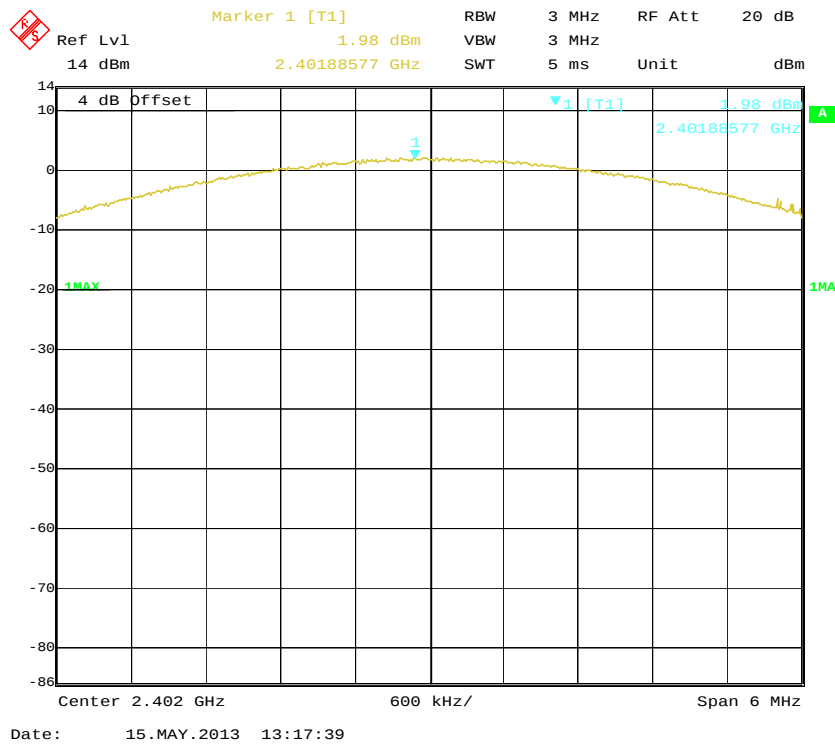
EDR($\pi/4$ -DQPSK): Middle Channel



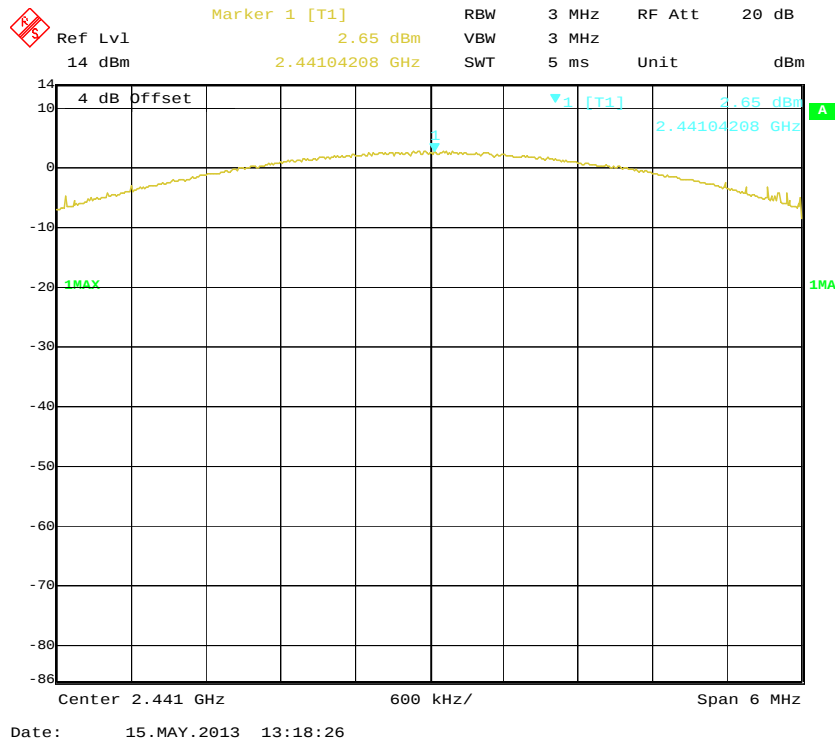
EDR($\pi/4$ -DQPSK): High Channel



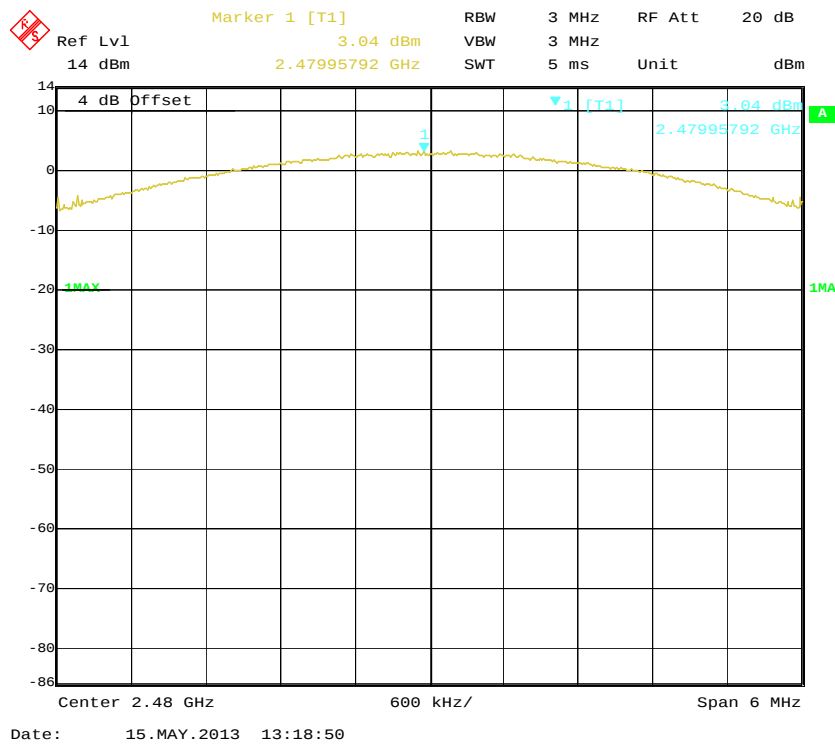
EDR(8DPSK): Low Channel



EDR(8DPSK): Middle Channel



EDR(8DPSK): High Channel



FCC §15.247(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

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

Test Data

Environmental Conditions

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

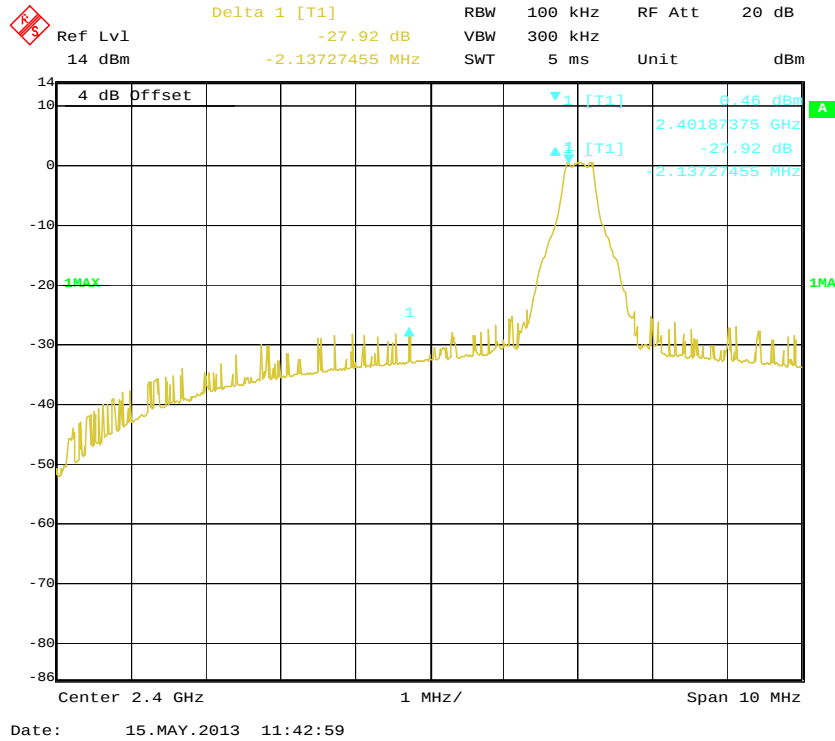
The testing was performed by Tiger Ye on 2013-05-15.

EUT operation mode: Transmitting

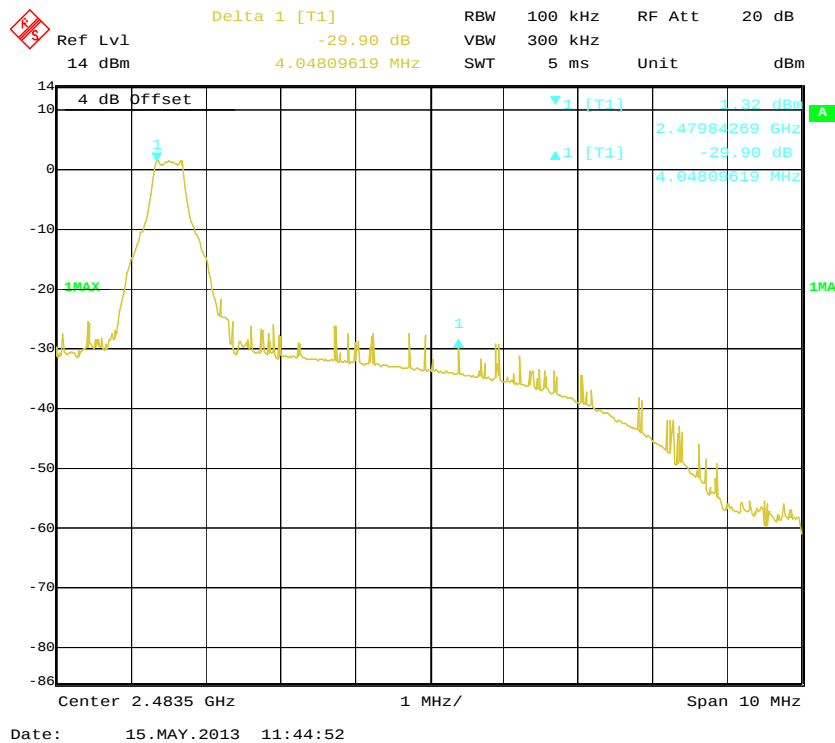
Test Result: Compliance. Please refer to following table and plots

Frequency Band	Delta Peak to band emission (dBc)	$\geq$ Limit (dBc)	Result
BDR mode (GFSK)			
Left-band	27.92	20	Pass
Right-band	29.90	20	Pass
EDR Mode ($\pi/4$ -DQPSK)			
Left-band	28.58	20	Pass
Right-band	30.58	20	Pass
EDR Mode (8 DPSK)			
Left-band	27.31	20	Pass
Right-band	28.08	20	Pass

BDR (GFSK): Band Edge-Left Side



BDR (GFSK): Band Edge-Right Side



[illegible]

Delta 1 [T1]
 -36.58 dB
 3.72745491 MHz

RBW 100 kHz
 VBW 300 kHz
 SWT 5 ms
 RF Att 20 dB

Ref Lvl 14 dBm
 Unit dBm

4 dB Offset

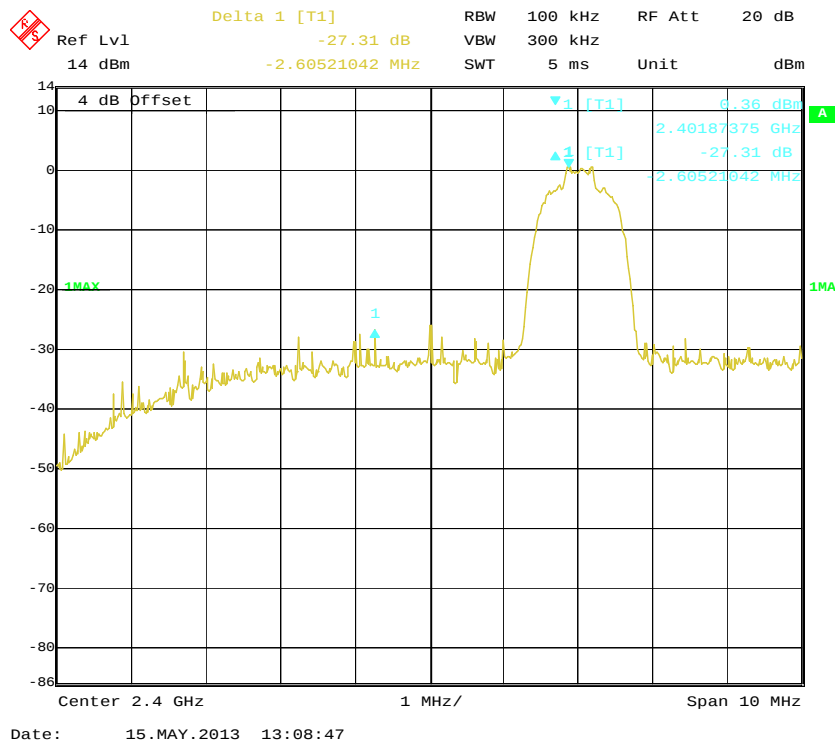
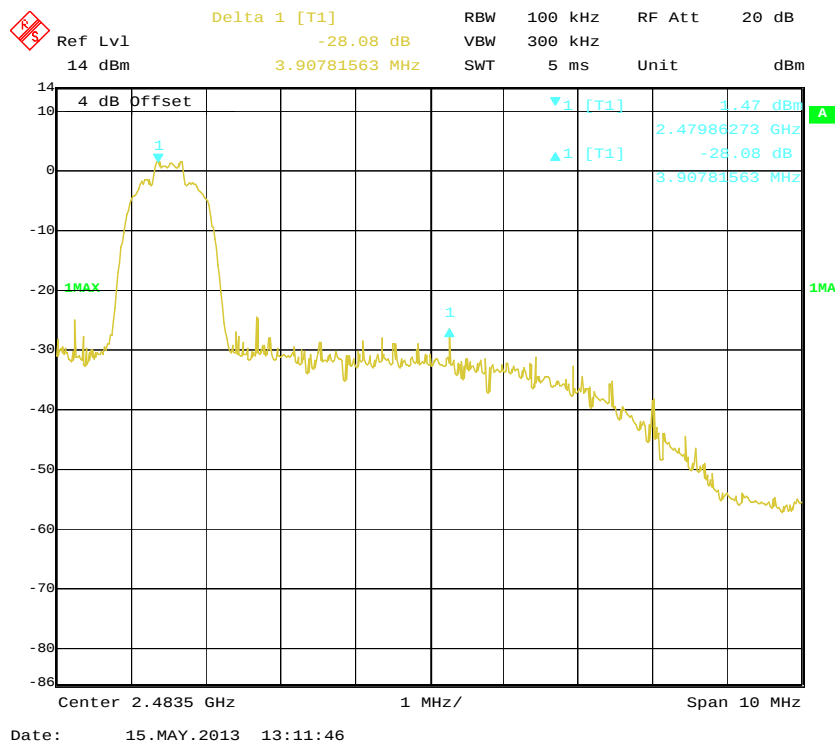
1 [T1] 1.29 dBm
 2.48018337 GHz
 -36.58 dB
 3.72745491 MHz

1MAX

1

Center 2.4835 GHz
 1 MHz/
 Span 10 MHz

Date: 15.MAY.2013 13:06:06

EDR (8DPSK): Band Edge-Left Side**BDR (8DPSK): Band Edge-Right Side********* END OF REPORT *******