

FCC PART 15.247

TEST REPORT

For

Galaxy Microsystems Ltd.

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Kowloon, Hong Kong

FCC ID: Y3GGALAPAD7G2

Report Type: Original Report	Product Type: Galapad 7
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Galaxy Microsystems Ltd.*'s product, model number: *Galapad7(G2)* (FCC ID: *Y3GGALAPAD7G2*) (the "EUT") in this report was a *Galapad 7*, which was measured approximately: 19.5 cm (L) x 12.5 cm (W) x 1.0 cm (H), rated input voltage: DC 3.8 V from lithium battery or DC 5V from adapter.

Adapter information: GALAPAD
Model: LFS0502000D-A8S
Input: AC 100-240V, 50/60Hz, 500mA max
Output: DC 5V, 2.0A

** All measurement and test data in this report was gathered from production sample serial number: 130508007 (Assigned by BACL.Dongguan). The EUT was received on 2013-05-09.*

Objective

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

The tests were performed in order to determine the Bluetooth of EUT compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: *Y3GGALAPAD7G2*
FCC Part 15C DTS submissions with FCC ID: *Y3GGALAPAD7G2* for Wifi.

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. (Dongguan). 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. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) 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 February 02, 2012. 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.: 273710. 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. (Dongguan) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 500069-0).



The current scope of accreditations can be found at <http://ts.nist.gov/standards/scopes/5000690.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

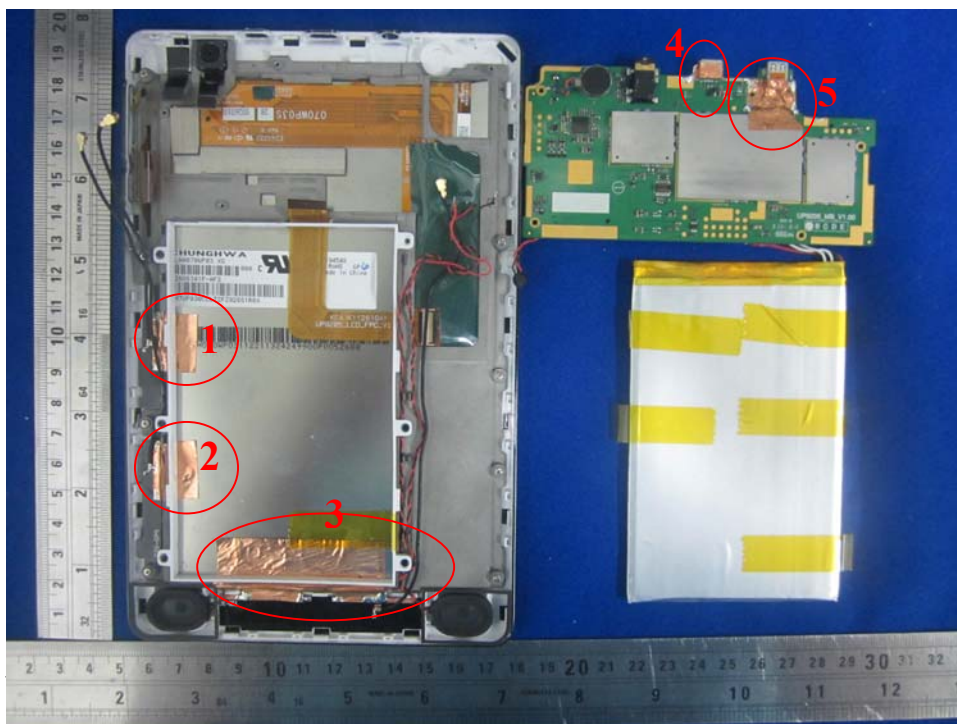
The system was configured for testing in an engineering mode, which was provided by manufacturer.

EUT Exercise Software

The software “adb.exe” was used, which was provided by the manufacturer.

Equipment Modifications

1. As shown on below, paste the copper on the position of the point 1, 2, 3, 4, 5.



2. Add an cord on the USB cable.

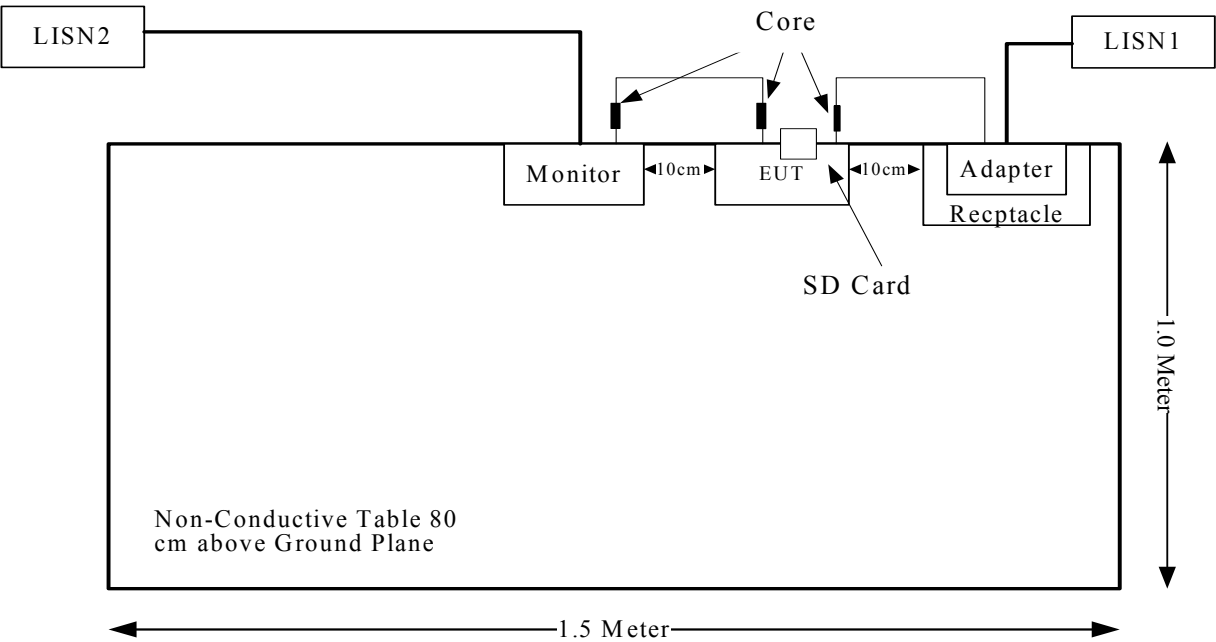
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Monitor	U3011t	CN-OPH5NY-74445-16T-290L
Kinston	Micro SD Card	4G	N/A

External Cable

Cable Description	Length (m)	From Port	To
Shielded Detachable HDMI Cable	1.5	LCD Monitor	EUT
Shielded Detachable USB Cable	1.0	Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions	Compliance
§15.247 (a)(1)	20 dB Bandwidth	Compliance
§15.247(a)(1)	Channel Separation Test	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliance
§15.247(b)(1)	Peak Output Power Measurement	Compliance
§15.247(d)	Band Edges	Compliance

FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

FCC§15.247 (i), §1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: R1DG130508007-20

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 an internal PIFA antennas, which was permanently attached to the EUT, and the maximum gain is 1.6dBi, please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:

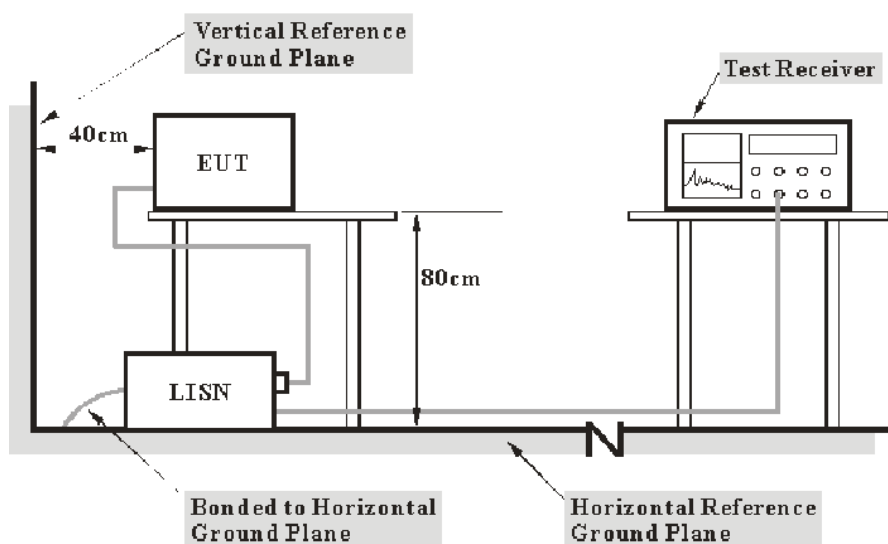
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

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 Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

V_C : corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF : voltage division factor of AMN or ISN

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB 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
R&S	EMI TEST RECIEVER	ESCS 30	830245/006	2013-1-10	2014-1-9
R&S	L.I.S.N	ESH3-Z5	843331/015	2012-9-17	2013-9-16
R&S	L.I.S.N	ESH3-Z5	100113	2012-11-29	2013-11-28
BACL	Test Software	BACL-EMC	V1.0-2010	N/A	N/A

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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 Part 15.207, with the worst margin reading of:

8.27 dB at 0.560 MHz in the Neutral conducted mode

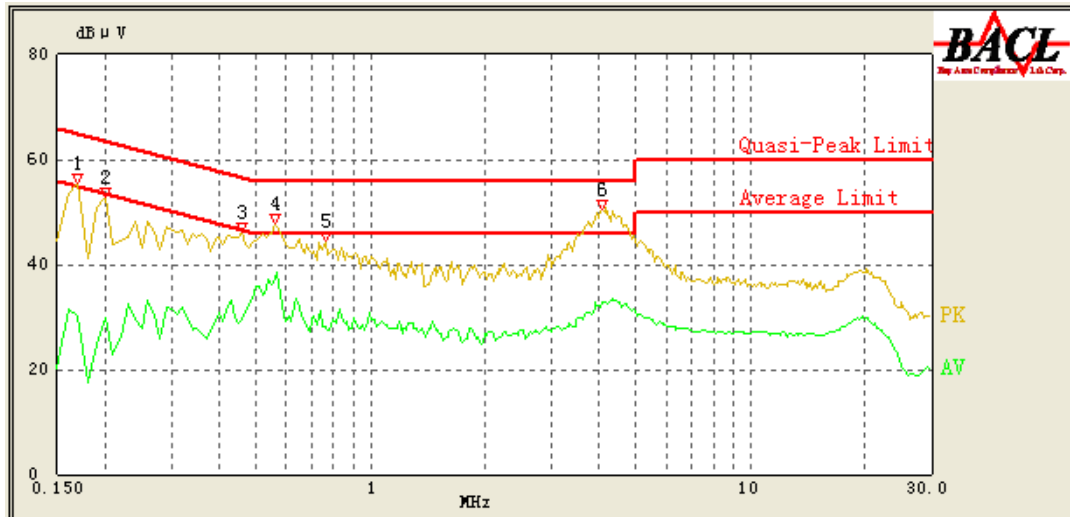
Test Data**Environmental Conditions**

Temperature:	28.3 °C
Relative Humidity:	61 %
ATM Pressure:	100.2 kPa

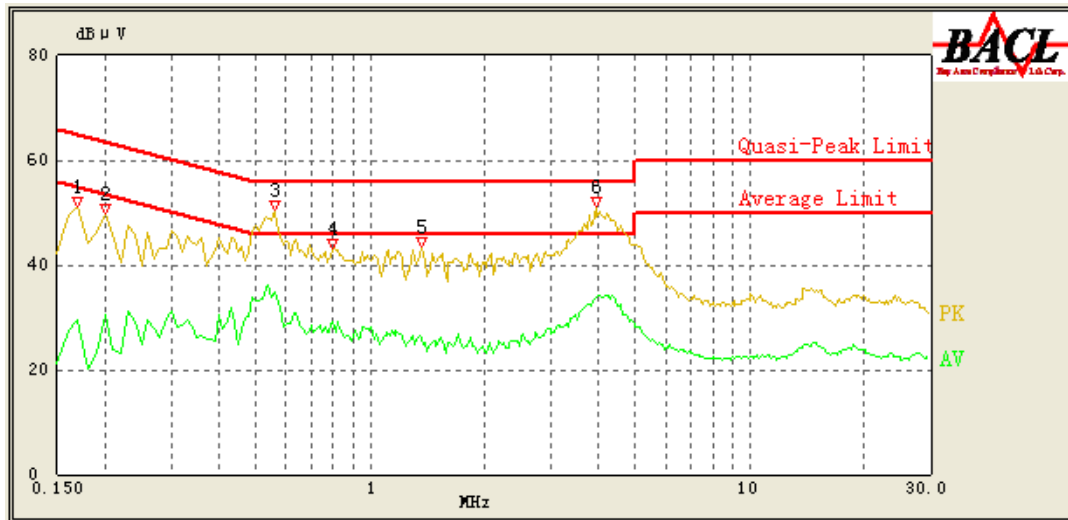
The testing was performed by Leon Chen on 2013-07-15.

Test Mode: Transmitting

120 V, 60 Hz, Line:



Frequency (MHz)	Cord. Reading (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
0.170	47.50	0.45	64.96	17.46	QP
0.170	30.17	0.45	54.96	24.79	AV
0.200	45.20	0.43	63.61	18.41	QP
0.200	29.67	0.43	53.61	23.94	AV
0.460	39.86	0.32	56.69	16.83	QP
0.460	29.35	0.32	46.69	17.34	AV
0.560	45.20	0.31	56.00	10.80	QP
0.560	37.33	0.31	46.00	8.67	AV
0.760	39.19	0.32	56.00	16.81	QP
0.760	28.28	0.32	46.00	17.72	AV
4.080	44.14	0.44	56.00	11.86	QP
4.080	32.77	0.44	46.00	13.23	AV

120 V, 60 Hz, Neutral:

Frequency (MHz)	Cord. Reading (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
0.170	45.54	0.26	64.96	19.42	QP
0.170	29.60	0.26	54.96	25.36	AV
0.200	42.90	0.25	63.61	20.71	QP
0.200	30.49	0.25	53.61	23.12	AV
0.560	47.73	0.21	56.00	8.27	QP
0.560	34.89	0.21	46.00	11.11	AV
0.800	38.88	0.22	56.00	17.12	QP
0.800	29.02	0.22	46.00	16.98	AV
1.360	37.75	0.24	56.00	18.25	QP
1.360	26.19	0.24	46.00	19.81	AV
3.950	44.33	0.35	56.00	11.67	QP
3.950	33.67	0.35	46.00	12.33	AV

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cisp} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cisp} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:

30M~200MHz: 5.0 dB

200M~1GHz: 6.2 dB

1G~6GHz: 4.45 dB

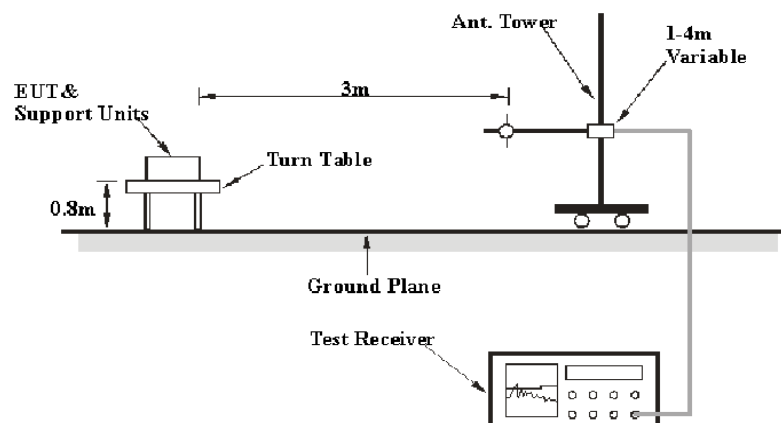
6G~18GHz: 5.23 dB

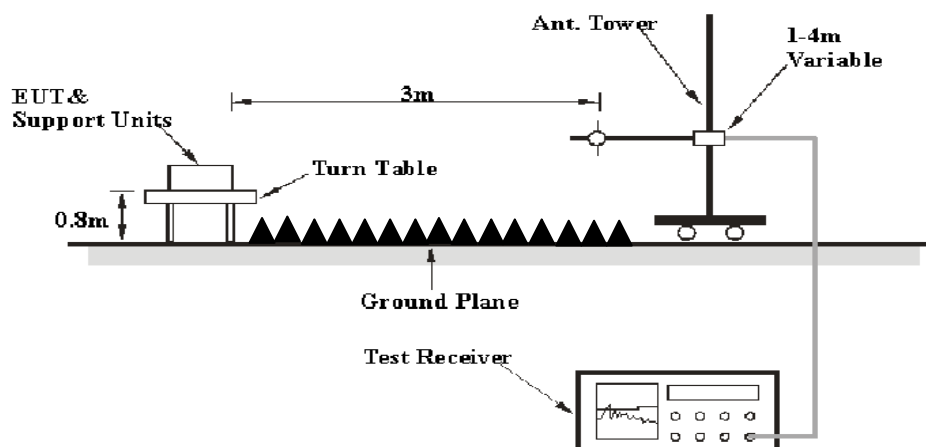
Table 1 – Values of U_{cisp}

Measurement	U_{cisp}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1GHz:



Above 1GHz:

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.247 limits.

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

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

During the radiated emissions, the EUT was connected to the AC floor outlet and the other support equipments were connected to the second AC floor outlet. #

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz - 1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI TEST RECEIVER	ESCI	100224	2013-5-6	2014-5-5
Sunol Sciences	Antenna	JB3	A060611-1	2012-9-6	2015-9-5
HP	HP AMPLIFIER	8447E	2434A02181	N/A	N/A
R&S	Spectrum analyzer	FSEM 30	849016/001	2012-9-4	2013-9-3
ETS LINDGREN	horn antenna	3115	000 527 35	2012-9-6	2015-9-5
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	N/A	N/A

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

Corrected Amplitude & Margin Calculation

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

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

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB 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 Title 47, Part 15, Subpart C, and section 15.205, 15.209 and 15.247, with the worst margin reading of:

8.09 dB at 111.84 MHz in the Horizontal polarization of EDR Mode ($\pi/4$ -DQPSK)

Test Data**Environmental Conditions**

Temperature:	22.6 ° C
Relative Humidity:	68 %
ATM Pressure:	99.8 kPa

The testing was performed by Leon Chen on 2013-05-12.

Mode: Transmitting

BDR Mode (GFSK):

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402(MHz)									
2402	70.39	PK	H	25.65	3.90	0.00	99.94	N/A	N/A
2402	51.9	AV	H	25.65	3.90	0.00	81.45	N/A	N/A
2402	63.17	PK	V	25.65	3.90	0.00	92.72	N/A	N/A
2402	45.29	AV	V	25.65	3.90	0.00	74.84	N/A	N/A
2390	29.04	PK	H	25.61	3.84	0.00	58.49	74.00	15.51
2390	14.03	AV	H	25.61	3.84	0.00	43.48	54.00	10.52
4804	39.43	PK	H	30.59	4.67	27.26	47.43	74.00	26.57
4804	22.94	AV	H	30.59	4.67	27.26	30.94	54.00	23.06
7206	31.62	PK	H	34.09	6.50	26.30	45.91	74.00	28.09
7206	17.63	AV	H	34.09	6.50	26.30	31.92	54.00	22.08
9608	31.95	PK	H	35.96	8.75	26.22	50.44	74.00	23.56
9608	17.97	AV	H	35.96	8.75	26.22	36.46	54.00	17.54
3202	32.25	PK	H	27.85	4.83	27.49	37.44	74.00	36.56
3202	18.59	AV	H	27.85	4.83	27.49	23.78	54.00	30.22
112.45	41.14	QP	H	13.26	1.28	21.41	34.27	43.50	9.23
Middle Channel: 2441(MHz)									
2441	70.86	PK	H	25.75	3.99	0.00	100.60	N/A	N/A
2441	52.01	AV	H	25.75	3.99	0.00	81.75	N/A	N/A
2441	63.28	PK	V	25.75	3.99	0.00	93.02	N/A	N/A
2441	45.47	AV	V	25.75	3.99	0.00	75.21	N/A	N/A
4882	39.51	PK	H	30.79	4.75	27.26	47.79	74.00	26.21
4882	22.97	AV	H	30.79	4.75	27.26	31.25	54.00	22.75
7323	31.69	PK	H	34.38	6.72	26.53	46.26	74.00	27.74
7323	17.74	AV	H	34.38	6.72	26.53	32.31	54.00	21.69
9764	31.89	PK	H	36.33	8.58	25.62	51.18	74.00	22.82
9764	17.88	AV	H	36.33	8.58	25.62	37.17	54.00	16.83
3202	32.34	PK	H	27.85	4.83	27.49	37.53	74.00	36.47
3202	18.71	AV	H	27.85	4.83	27.49	23.90	54.00	30.10
3830	32.22	PK	H	29.53	4.76	27.38	39.13	74.00	34.87
3830	18.57	AV	H	29.53	4.76	27.38	25.48	54.00	28.52
111.84	40.65	QP	H	13.17	1.28	21.41	33.69	43.50	9.81
High Channel: 2480(MHz)									
2480	72.36	PK	H	25.85	3.82	0.00	102.03	N/A	N/A
2480	52.37	AV	H	25.85	3.82	0.00	82.04	N/A	N/A
2480	63.62	PK	V	25.85	3.82	0.00	93.29	N/A	N/A
2480	46.63	AV	V	25.85	3.82	0.00	76.30	N/A	N/A
2483.5	28.28	PK	H	25.86	3.80	0.00	57.94	74.00	16.06
2483.5	15.61	AV	H	25.86	3.80	0.00	45.27	54.00	8.73
4960	39.59	PK	H	31.00	4.70	27.27	48.02	74.00	25.98
4960	23.02	AV	H	31.00	4.70	27.27	31.45	54.00	22.55
7440	31.53	PK	H	34.66	6.95	26.56	46.58	74.00	27.42
7440	17.57	AV	H	34.66	6.95	26.56	32.62	54.00	21.38
9920	31.89	PK	H	36.71	8.41	25.50	51.51	74.00	22.49
9920	17.88	AV	H	36.71	8.41	25.50	37.50	54.00	16.50
3202	32.21	PK	H	27.85	4.83	27.49	37.40	74.00	36.60
3202	18.55	AV	H	27.85	4.83	27.49	23.74	54.00	30.26
112.26	39.71	OP	H	13.23	1.28	21.41	32.81	43.50	10.69

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

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402(MHz)									
2402	70.26	PK	H	25.65	3.90	0.00	99.81	N/A	N/A
2402	51.63	AV	H	25.65	3.90	0.00	81.18	N/A	N/A
2402	63.03	PK	V	25.65	3.90	0.00	92.58	N/A	N/A
2402	45.27	AV	V	25.65	3.90	0.00	74.82	N/A	N/A
2390	29.91	PK	H	25.61	3.84	0.00	59.36	74.00	14.64
2390	14.12	AV	H	25.61	3.84	0.00	43.57	54.00	10.43
4804	42.46	PK	H	30.59	4.67	27.26	50.46	74.00	23.54
4804	23.7	AV	H	30.59	4.67	27.26	31.70	54.00	22.30
7206	31.65	PK	H	34.09	6.50	26.30	45.94	74.00	28.06
7206	17.61	AV	H	34.09	6.50	26.30	31.90	54.00	22.10
9608	31.92	PK	H	35.96	8.75	26.22	50.41	74.00	23.59
9608	17.9	AV	H	35.96	8.75	26.22	36.39	54.00	17.61
3202	32.36	PK	H	27.85	4.83	27.49	37.55	74.00	36.45
3202	18.74	AV	H	27.85	4.83	27.49	23.93	54.00	30.07
112.45	41.08	QP	H	13.26	1.28	21.41	34.21	43.50	9.29
Middle Channel: 2441(MHz)									
2441	70.85	PK	H	25.75	3.99	0.00	100.59	N/A	N/A
2441	51.91	AV	H	25.75	3.99	0.00	81.65	N/A	N/A
2441	63.2	PK	V	25.75	3.99	0.00	92.94	N/A	N/A
2441	45.33	AV	V	25.75	3.99	0.00	75.07	N/A	N/A
4882	42.25	PK	H	30.79	4.75	27.26	50.53	74.00	23.47
4882	23.64	AV	H	30.79	4.75	27.26	31.92	54.00	22.08
7323	31.68	PK	H	34.38	6.72	26.53	46.25	74.00	27.75
7323	17.68	AV	H	34.38	6.72	26.53	32.25	54.00	21.75
9764	32.04	PK	H	36.33	8.58	25.62	51.33	74.00	22.67
9764	18.02	AV	H	36.33	8.58	25.62	37.31	54.00	16.69
3202	32.32	PK	H	27.85	4.83	27.49	37.51	74.00	36.49
3202	18.73	AV	H	27.85	4.83	27.49	23.92	54.00	30.08
3830	32.29	PK	H	29.53	4.76	27.38	39.20	74.00	34.80
3830	18.57	AV	H	29.53	4.76	27.38	25.48	54.00	28.52
111.84	42.37	QP	H	13.17	1.28	21.41	35.41	43.50	8.09
High Channel: 2480(MHz)									
2480	72.28	PK	H	25.85	3.82	0.00	101.95	N/A	N/A
2480	52.2	AV	H	25.85	3.82	0.00	81.87	N/A	N/A
2480	63.49	PK	V	25.85	3.82	0.00	93.16	N/A	N/A
2480	46.45	AV	V	25.85	3.82	0.00	76.12	N/A	N/A
2483.5	28.11	PK	H	25.86	3.80	0.00	57.77	74.00	16.23
2483.5	15.46	AV	H	25.86	3.80	0.00	45.12	54.00	8.88
4960	42.46	PK	H	31.00	4.70	27.27	50.89	74.00	23.11
4960	23.7	AV	H	31.00	4.70	27.27	32.13	54.00	21.87
7440	32.29	PK	H	34.66	6.95	26.56	47.34	74.00	26.66
7440	18.48	AV	H	34.66	6.95	26.56	33.53	54.00	20.47
9920	31.76	PK	H	36.71	8.41	25.50	51.38	74.00	22.62
9920	18.07	AV	H	36.71	8.41	25.50	37.69	54.00	16.31
3202	31.59	PK	H	27.85	4.83	27.49	36.78	74.00	37.22
3202	18.78	AV	H	27.85	4.83	27.49	23.97	54.00	30.03
112.26	40.41	QP	H	13.23	1.28	21.41	33.51	43.50	9.99

EDR Mode (8-DPSK):

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402(MHz)									
2402	70.23	PK	H	25.65	3.90	0.00	99.78	N/A	N/A
2402	51.76	AV	H	25.65	3.90	0.00	81.31	N/A	N/A
2402	63.09	PK	V	25.65	3.90	0.00	92.64	N/A	N/A
2402	45.27	AV	V	25.65	3.90	0.00	74.82	N/A	N/A
2390	28.93	PK	H	25.61	3.84	0.00	58.38	74.00	15.62
2390	13.99	AV	H	25.61	3.84	0.00	43.44	54.00	10.56
4804	42.13	PK	H	30.59	4.67	27.26	50.13	74.00	23.87
4804	23.71	AV	H	30.59	4.67	27.26	31.71	54.00	22.29
7206	31.58	PK	H	34.09	6.50	26.30	45.87	74.00	28.13
7206	17.73	AV	H	34.09	6.50	26.30	32.02	54.00	21.98
9608	32.05	PK	H	35.96	8.75	26.22	50.54	74.00	23.46
9608	17.98	AV	H	35.96	8.75	26.22	36.47	54.00	17.53
3202	32.32	PK	H	27.85	4.83	27.49	37.51	74.00	36.49
3202	18.71	AV	H	27.85	4.83	27.49	23.90	54.00	30.10
112.45	41.29	QP	H	13.26	1.28	21.41	34.42	43.50	9.08
Middle Channel: 2441(MHz)									
2441	70.76	PK	H	25.75	3.99	0.00	100.50	N/A	N/A
2441	51.88	AV	H	25.75	3.99	0.00	81.62	N/A	N/A
2441	63.26	PK	V	25.75	3.99	0.00	93.00	N/A	N/A
2441	45.43	AV	V	25.75	3.99	0.00	75.17	N/A	N/A
4882	42.29	PK	H	30.79	4.75	27.26	50.57	74.00	23.43
4882	23.61	AV	H	30.79	4.75	27.26	31.89	54.00	22.11
7323	31.62	PK	H	34.38	6.72	26.53	46.19	74.00	27.81
7323	17.61	AV	H	34.38	6.72	26.53	32.18	54.00	21.82
9764	32.02	PK	H	36.33	8.58	25.62	51.31	74.00	22.69
9764	17.89	AV	H	36.33	8.58	25.62	37.18	54.00	16.82
3202	32.28	PK	H	27.85	4.83	27.49	37.47	74.00	36.53
3202	18.74	AV	H	27.85	4.83	27.49	23.93	54.00	30.07
3830	31.74	PK	H	29.53	4.76	27.38	38.65	74.00	35.35
3830	18.24	AV	H	29.53	4.76	27.38	25.15	54.00	28.85
111.84	41.66	QP	H	13.17	1.28	21.41	34.70	43.50	8.80
High Channel: 2480(MHz)									
2480	72.25	PK	H	25.85	3.82	0.00	101.92	N/A	N/A
2480	52.18	AV	H	25.85	3.82	0.00	81.85	N/A	N/A
2480	63.47	PK	V	25.85	3.82	0.00	93.14	N/A	N/A
2480	46.4	AV	V	25.85	3.82	0.00	76.07	N/A	N/A
2483.5	28.02	PK	H	25.86	3.80	0.00	57.68	74.00	16.32
2483.5	15.33	AV	H	25.86	3.80	0.00	44.99	54.00	9.01
4960	42.35	PK	H	31.00	4.70	27.27	50.78	74.00	23.22
4960	23.68	AV	H	31.00	4.70	27.27	32.11	54.00	21.89
7440	31.64	PK	H	34.66	6.95	26.56	46.69	74.00	27.31
7440	18.36	AV	H	34.66	6.95	26.56	33.41	54.00	20.59
9920	30.49	PK	H	36.71	8.41	25.50	50.11	74.00	23.89
9920	18.24	AV	H	36.71	8.41	25.50	37.86	54.00	16.14
3202	32.47	PK	H	27.85	4.83	27.49	37.66	74.00	36.34
3202	18.83	AV	H	27.85	4.83	27.49	24.02	54.00	29.98
112.26	40.26	QP	H	13.23	1.28	21.41	33.36	43.50	10.14

BDR Mode (GFSK):

Ref 15 dBm • Att 20 dB • RBW 100 kHz Marker 2 [T1] -44.20 dBm
 • VEW 300 kHz SWT 2.5 s 20.505400000 GHz

Offset 5 dB

Marker 1 [T1] -1.16 dBm
 2.377180000 GHz

1 PK
 MAXH

D1 -21.16 dBm

2

Start 30 MHz 2.497 GHz/ Stop 25 GHz

Date: 12.MAY.2013 18:13:25

Ref 15 dBm • Att 20 dB • BW 100 kHz Marker 2 [T1] -43.18 dBm
 • VEW 300 kHz SWT 2.5 s 20.555340000 GHz

Offset 5 dB

Marker 1 [T1] -21.85 dBm
 2.427120000 GHz

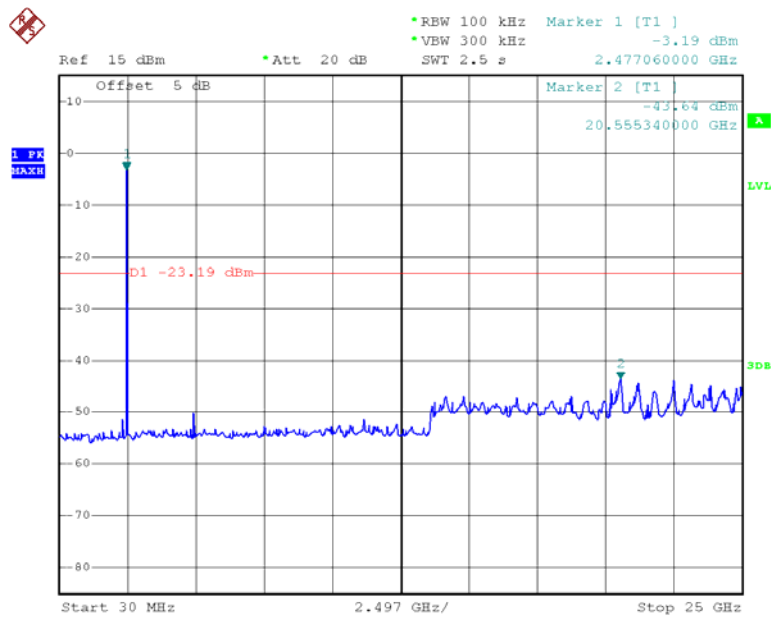
1 PK MAXH

D1 -21.85 dBm

Start 30 MHz 2.497 GHz/ Stop 25 GHz

Date: 12.MAY.2013 18:14:29

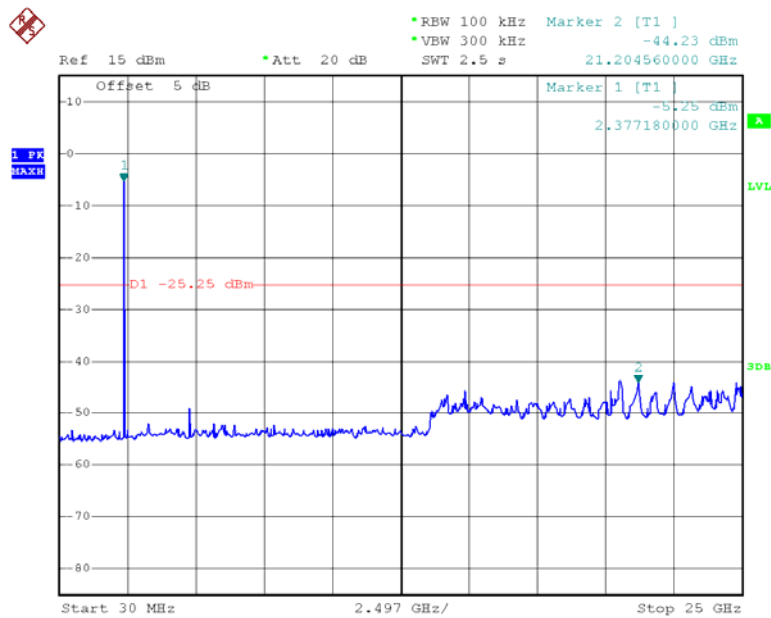
High Channel



Date: 12.MAY.2013 18:19:35

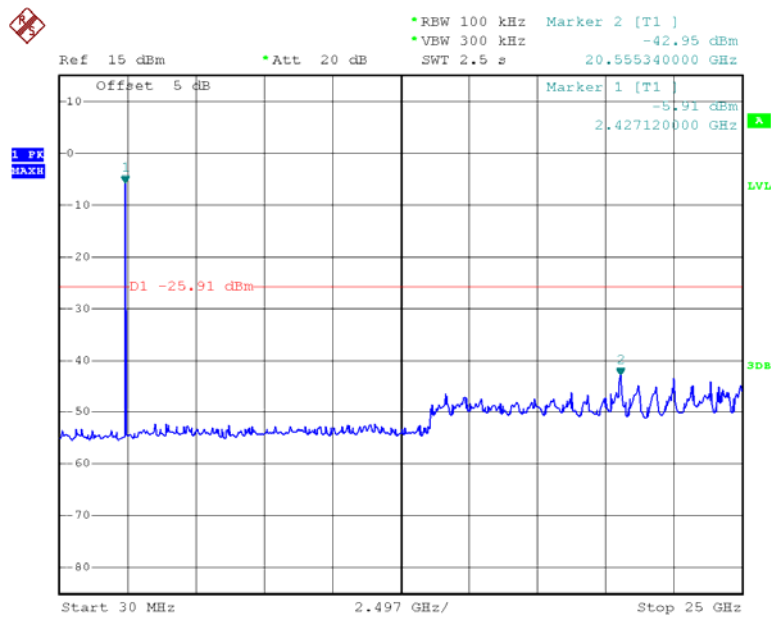
EDR Mode ($\pi/4$ -DQPSK):

Low Channel



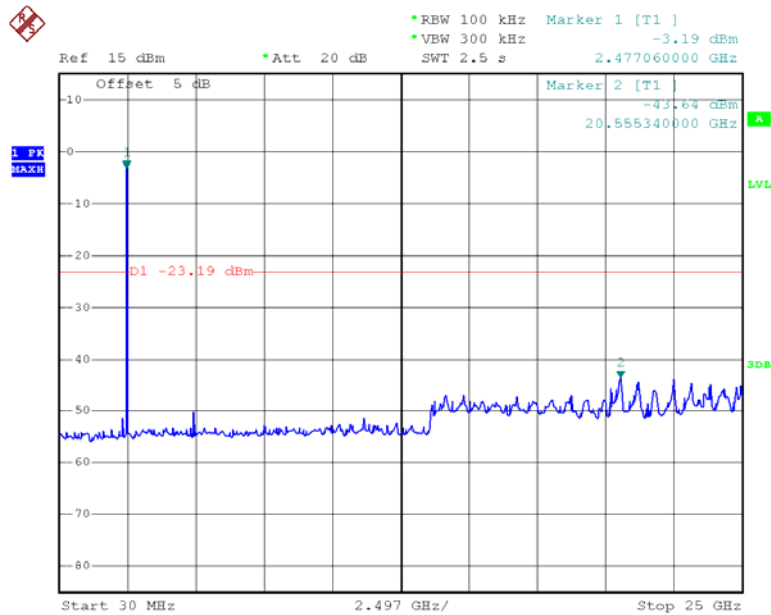
Date: 12.MAY.2013 18:16:54

Middle Channel



Date: 12.MAY.2013 18:18:17

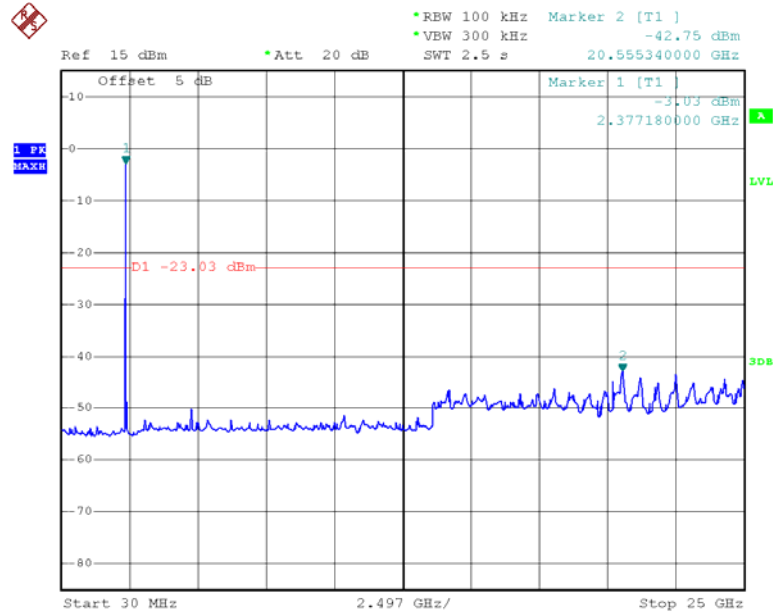
High Channel



Date: 12.MAY.2013 18:19:35

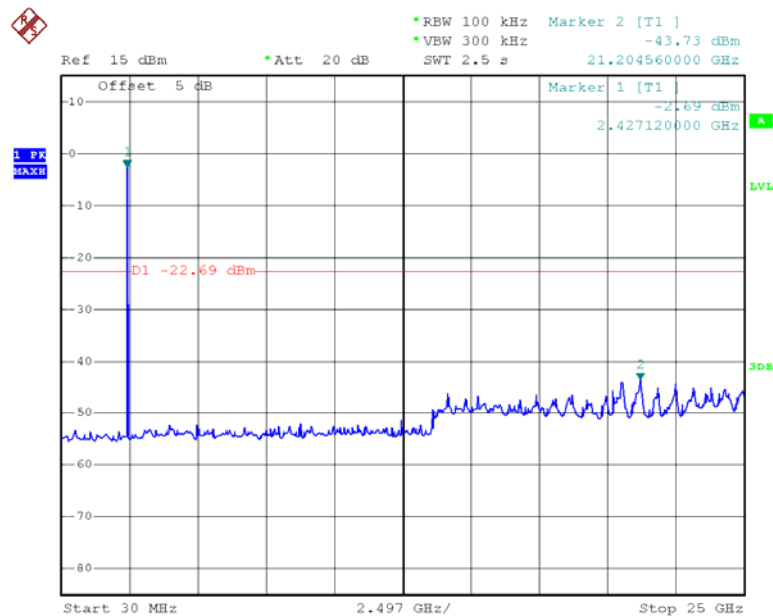
EDR Mode (8-DPSK):

Low Channel



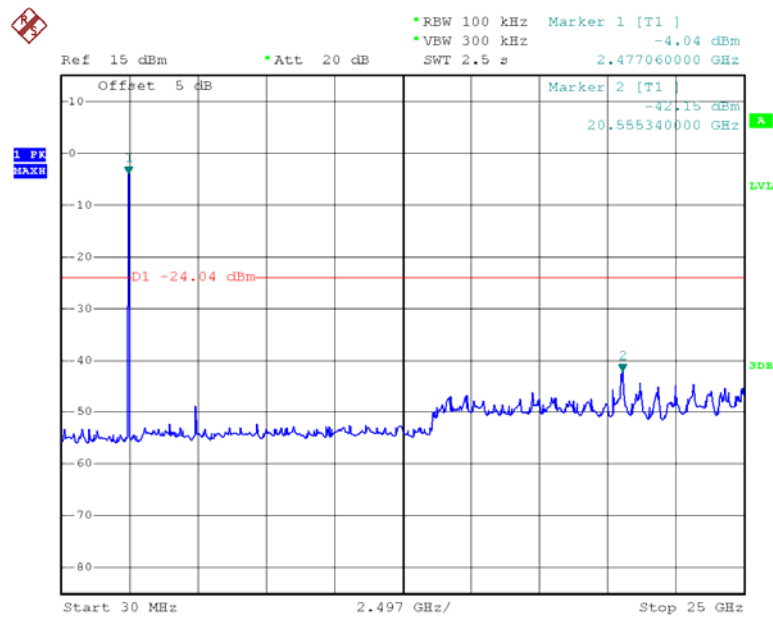
Date: 12.MAY.2013 18:22:41

Middle Channel



Date: 12.MAY.2013 18:21:34

High Channel



Date: 12.MAY.2013 18:20:30

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 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.50 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum analyzer	ESPI	100337	2012-11-10	2013-11-9

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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

1. Set the EUT in transmitting mode, spectrum Bandwidth was set at 100 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another trace
3. Measure the channel separation.

Test Data**Environmental Conditions**

Temperature:	27.3°C
Relative Humidity:	67 %
ATM Pressure:	99.9 kPa

* The testing was performed by Leon Chen on 2013-05-10

Test Result: Compliance.

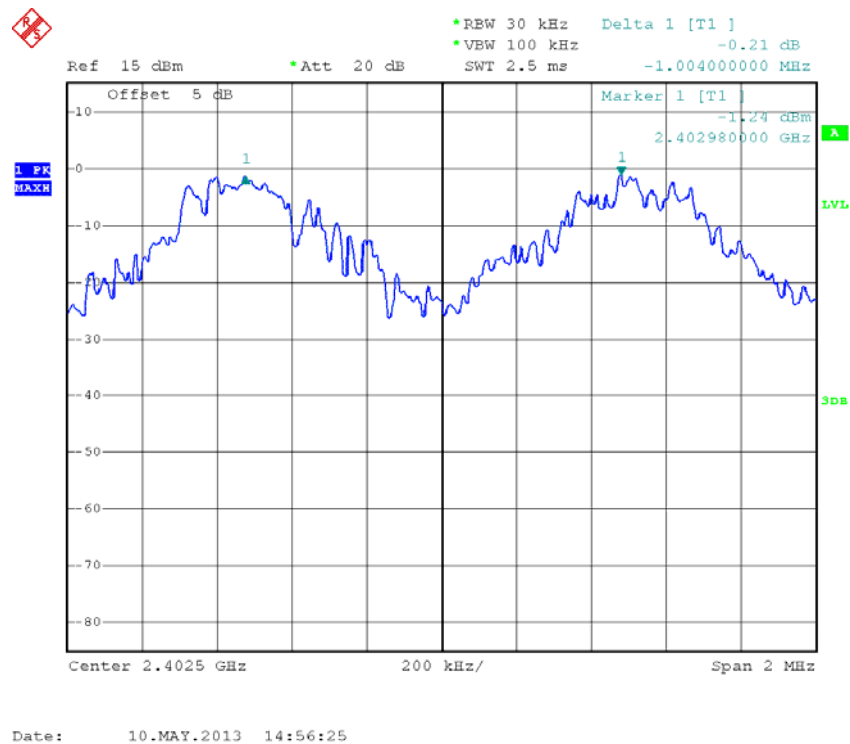
Please refer to following tables and plots

Test Mode: Transmitting

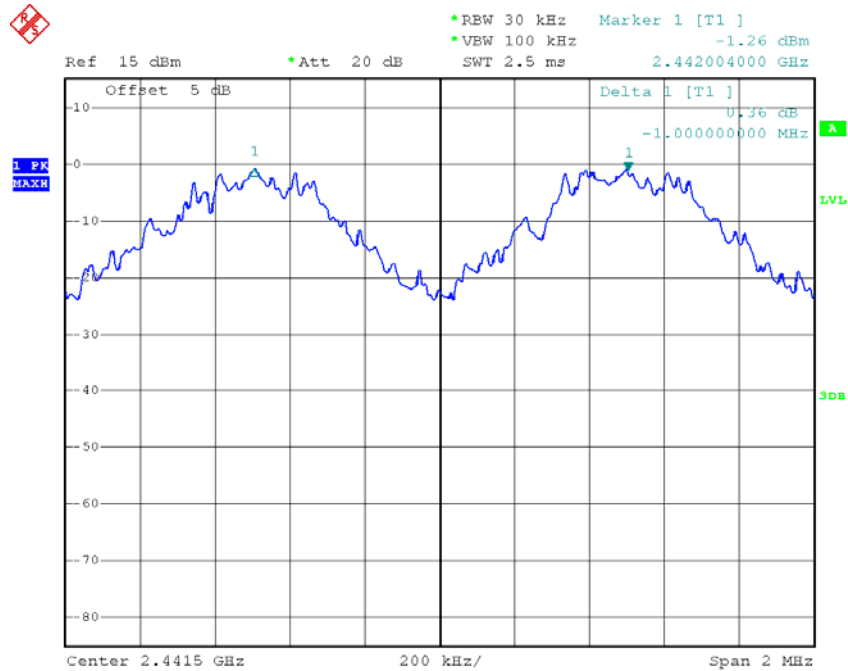
Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
BDR Mode (GFSK)	Low	2402	1.004	0.621	Pass
	Adjacent	2403			
	Middle	2441	1.000	0.621	Pass
	Adjacent	2442			
	High	2480	1.004	0.621	Pass
	Adjacent	2479			
EDR Mode ($\pi/4$ -DQPSK):	Low	2402	1.008	0.904	Pass
	Adjacent	2403			
	Middle	2441	1.000	0.904	Pass
	Adjacent	2442			
	High	2480	1.000	0.904	Pass
	Adjacent	2479			
EDR Mode (8-DPSK):	Low	2402	1.004	0.891	Pass
	Adjacent	2403			
	Middle	2441	1.008	0.891	Pass
	Adjacent	2442			
	High	2480	1.004	0.891	Pass
	Adjacent	2479			

BDR Mode (GFSK):

Low Channel

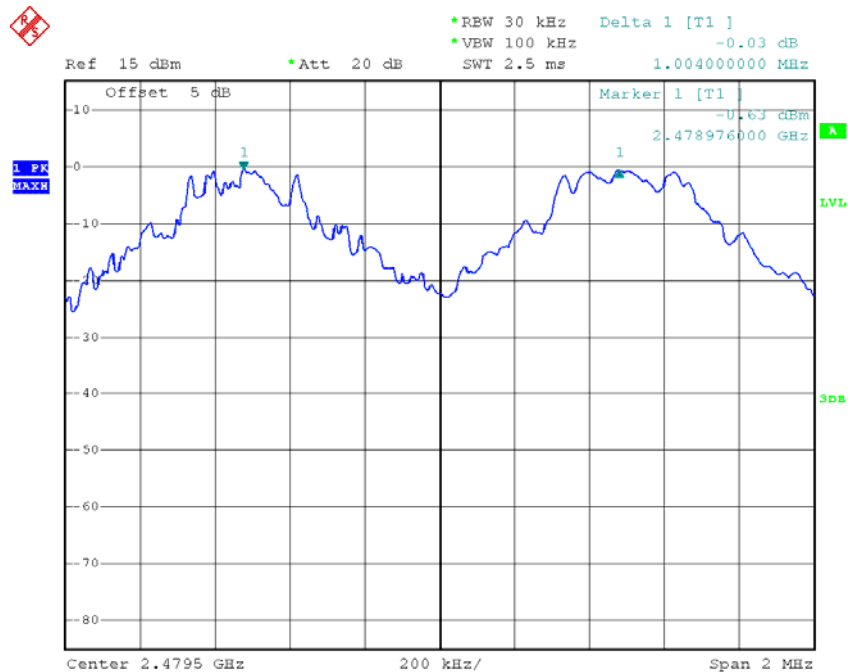


Middle Channel



Date: 10.MAY.2013 14:58:27

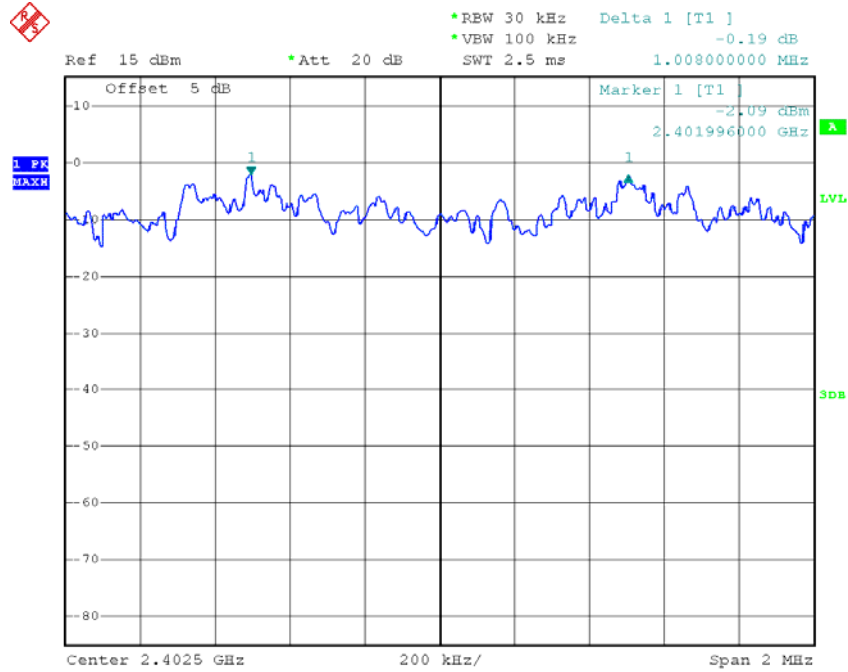
High Channel



Date: 10.MAY.2013 15:00:56

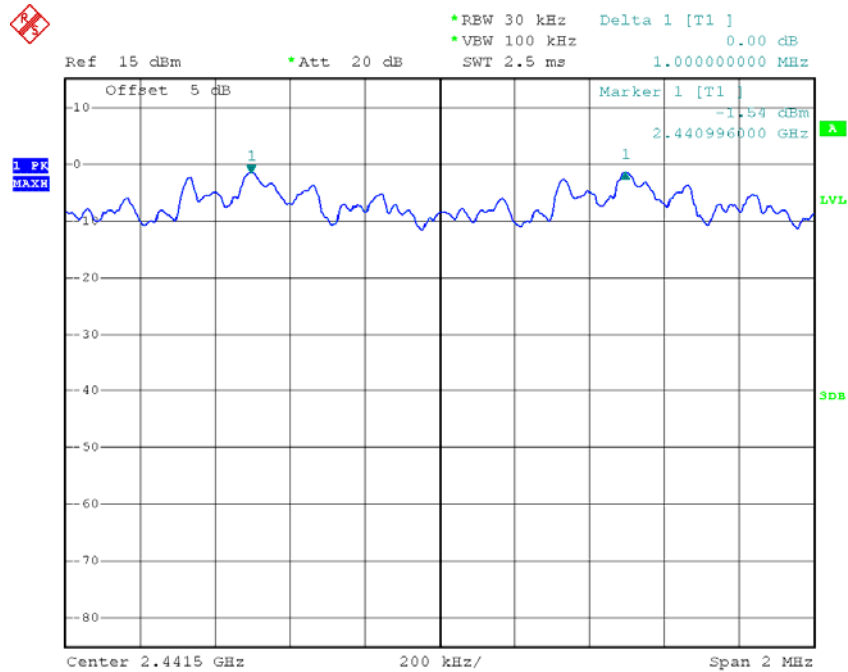
EDR Mode ($\pi/4$ -DQPSK):

Low Channel



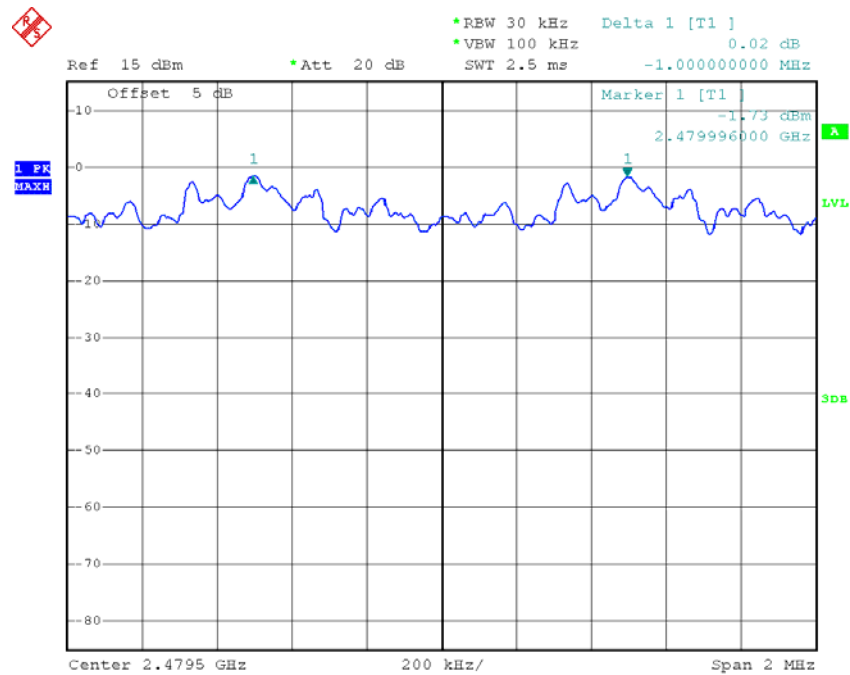
Date: 10.MAY.2013 15:11:05

Middle Channel



Date: 10.MAY.2013 15:04:02

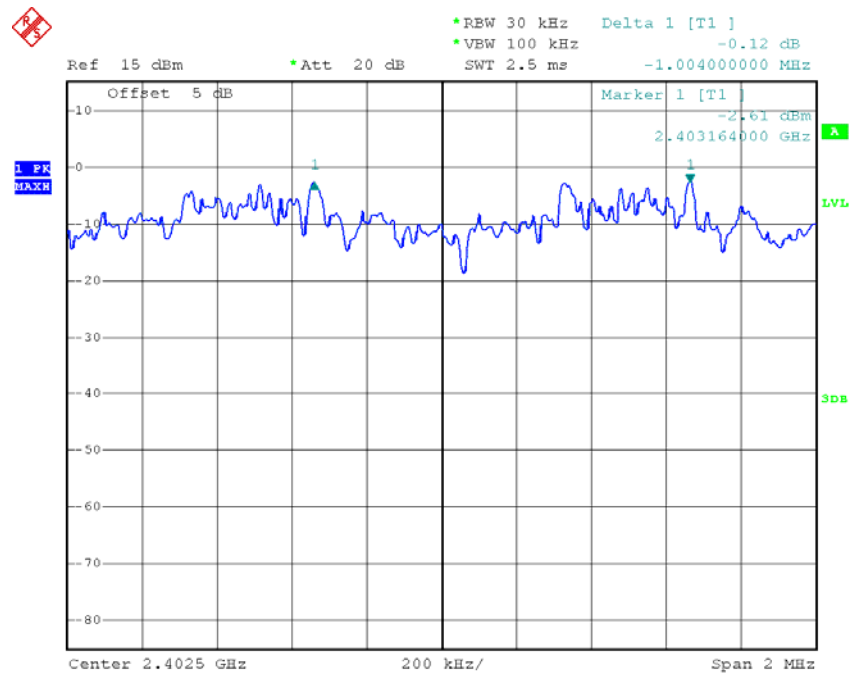
High Channel



Date: 10.MAY.2013 15:02:40

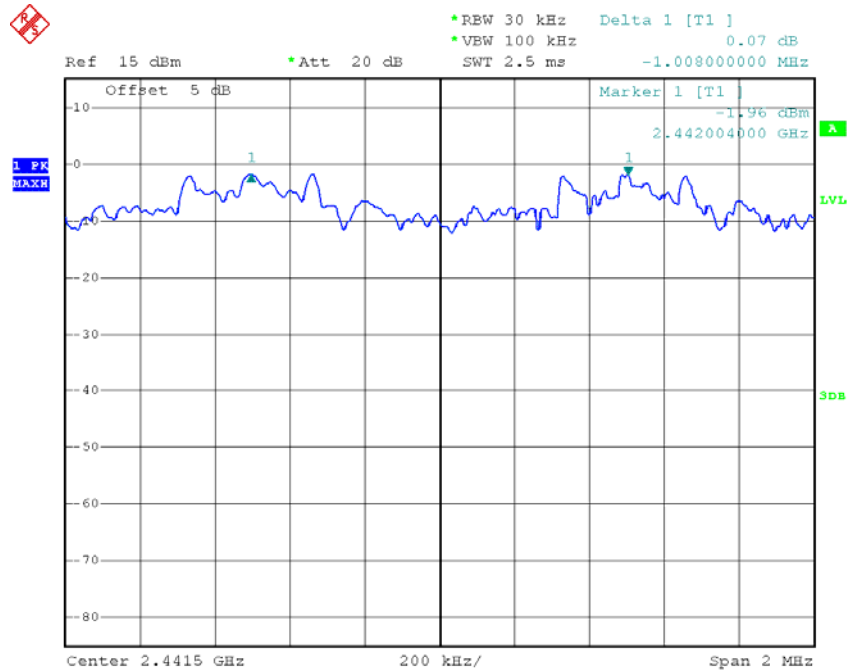
EDR Mode (8-DPSK):

Low Channel



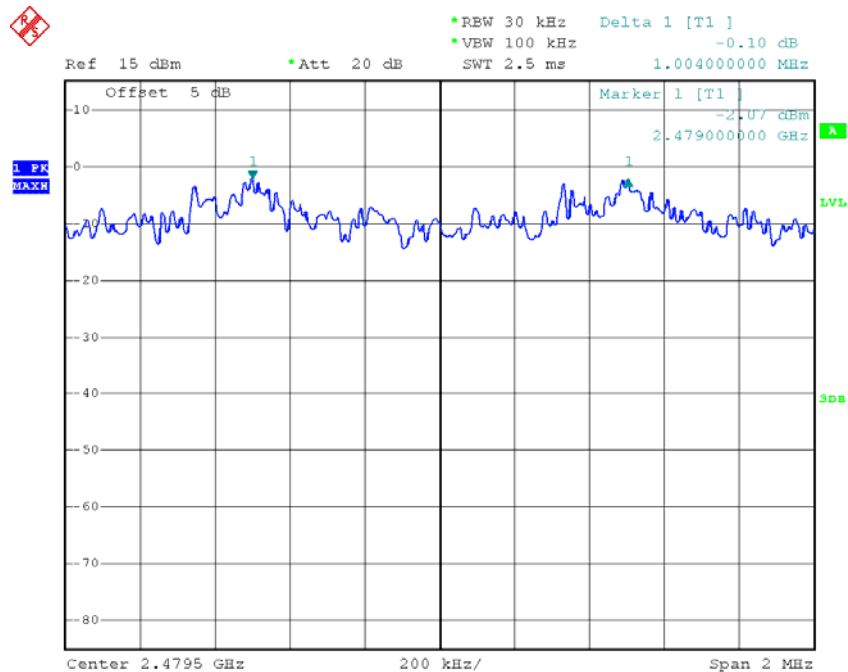
Date: 10.MAY.2013 15:18:45

Middle Channel



Date: 10.MAY.2013 15:22:55

High Channel



Date: 10.MAY.2013 15:24:54

FCC §15.247(a) (1) – 20 dB BANDWIDTH TESTING**Applicable Standard**

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum analyzer	ESPI	100337	2012-11-10	2013-11-9

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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:	27.3°C
Relative Humidity:	67 %
ATM Pressure:	99.9kPa

* The testing was performed by Leon Chen on 2013-05-10

Test Result: Compliance.

Please refer to following tables and plots

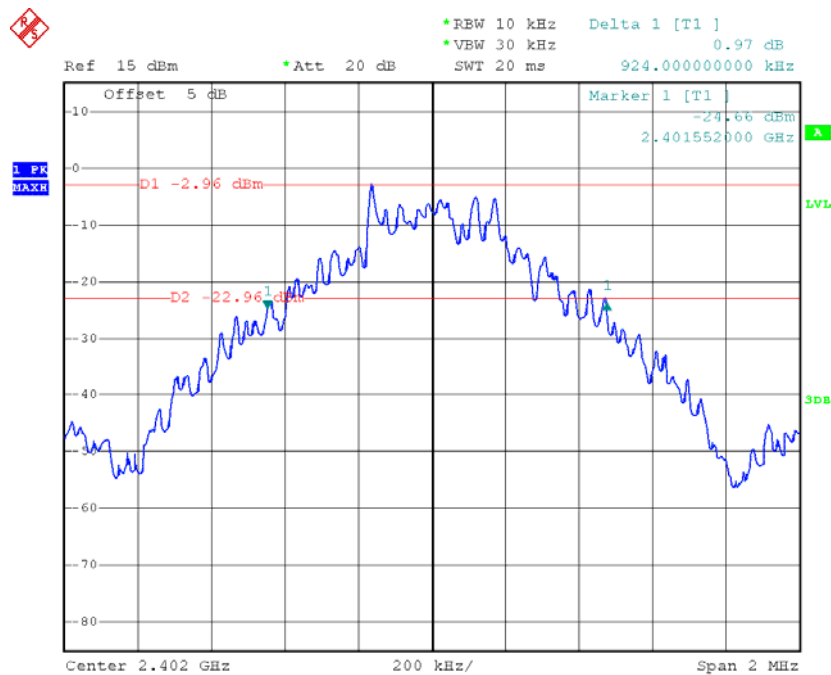
Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.924
	Middle	2441	0.932
	High	2480	0.928
EDR Mode ($\pi/4$ -DQPSK):	Low	2402	1.300
	Middle	2441	1.348
	High	2480	1.356
EDR Mode (8-DPSK):	Low	2402	1.328
	Middle	2441	1.332
	High	2480	1.336

Please refer to the following plots.

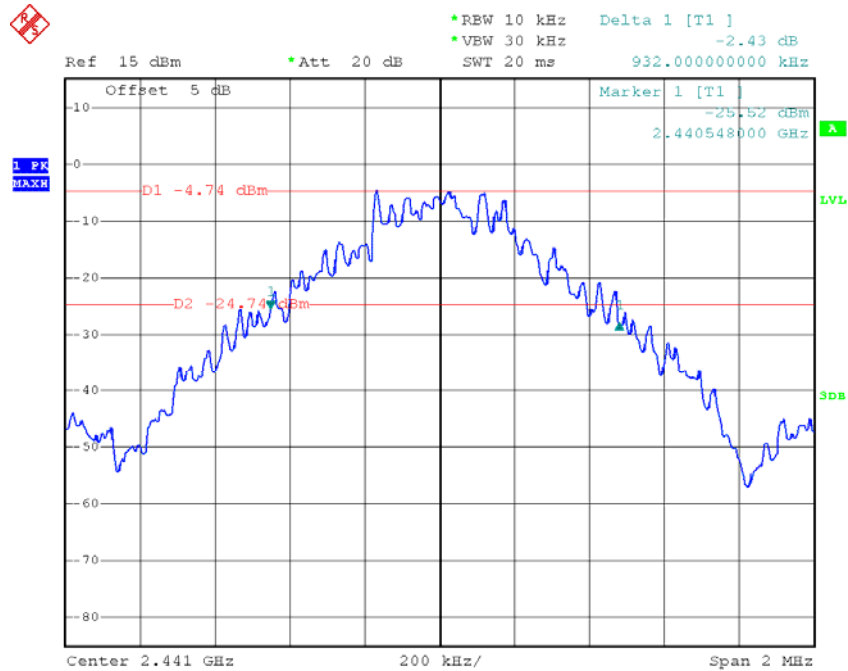
BDR Mode (GFSK):

Low Channel



Date: 10.MAY.2013 14:34:42

Middle Channel



Date: 10.MAY.2013 14:07:52

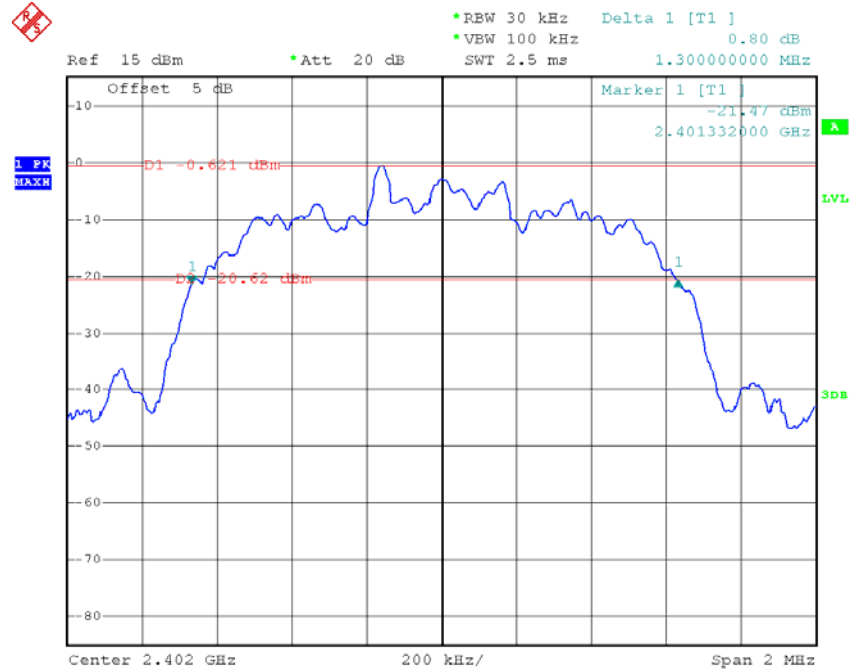
High Channel



Date: 10.MAY.2013 14:10:01

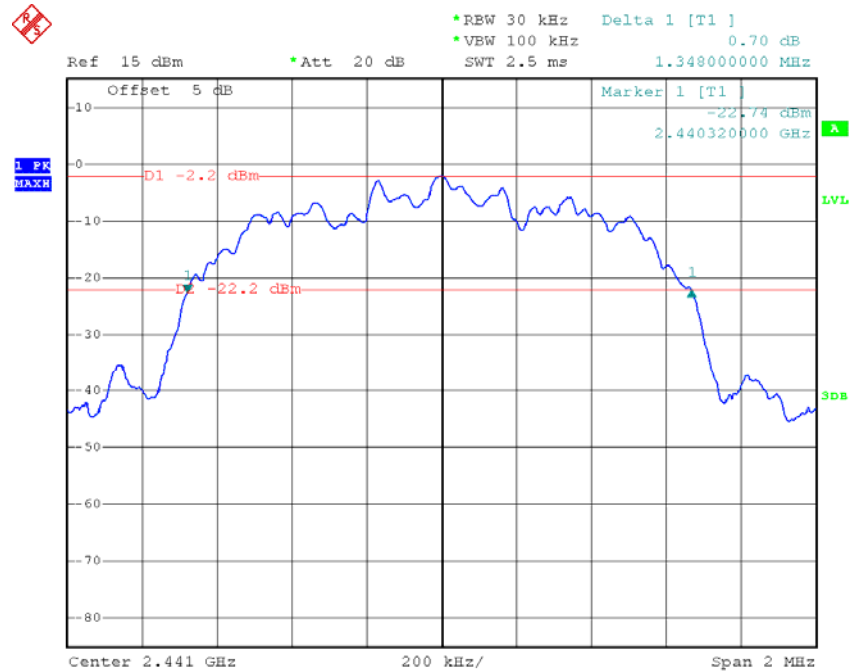
EDR Mode ($\pi/4$ -DQPSK):

Low Channel



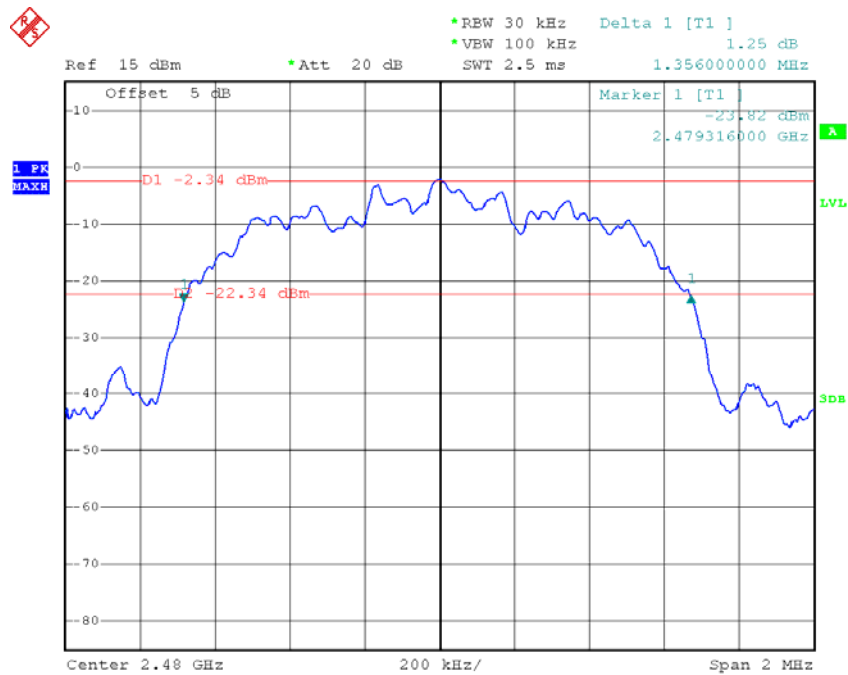
Date: 10.MAY.2013 14:48:09

Middle Channel



Date: 10.MAY.2013 14:50:05

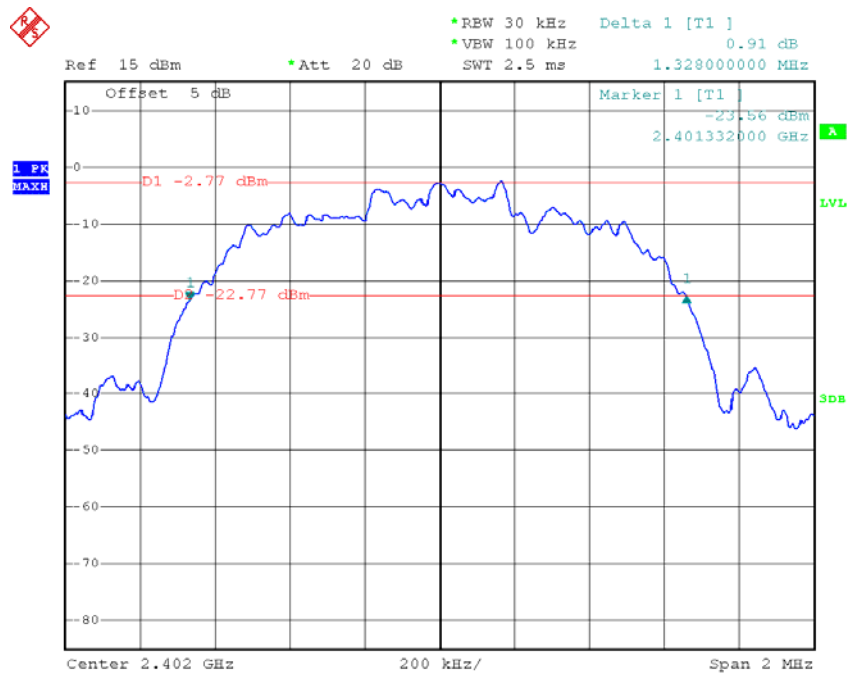
High Channel



Date: 10.MAY.2013 14:51:59

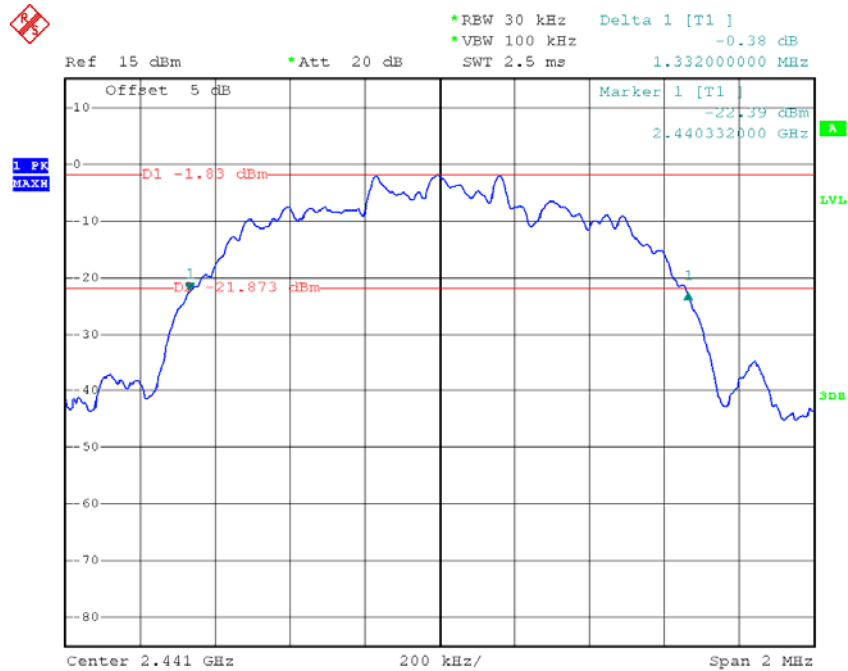
EDR Mode (8-DPSK):

Low Channel



Date: 10.MAY.2013 14:29:05

Middle Channel



Date: 10.MAY.2013 14:27:02

High Channel



Date: 10.MAY.2013 14:25:20

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
R&S	Spectrum analyzer	ESPI	100337	2012-11-10	2013-11-9

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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:	27.3°C
Relative Humidity:	67 %
ATM Pressure:	99.9kPa

* The testing was performed by Leon Chen on 2013-05-10

Test Result: Compliance.

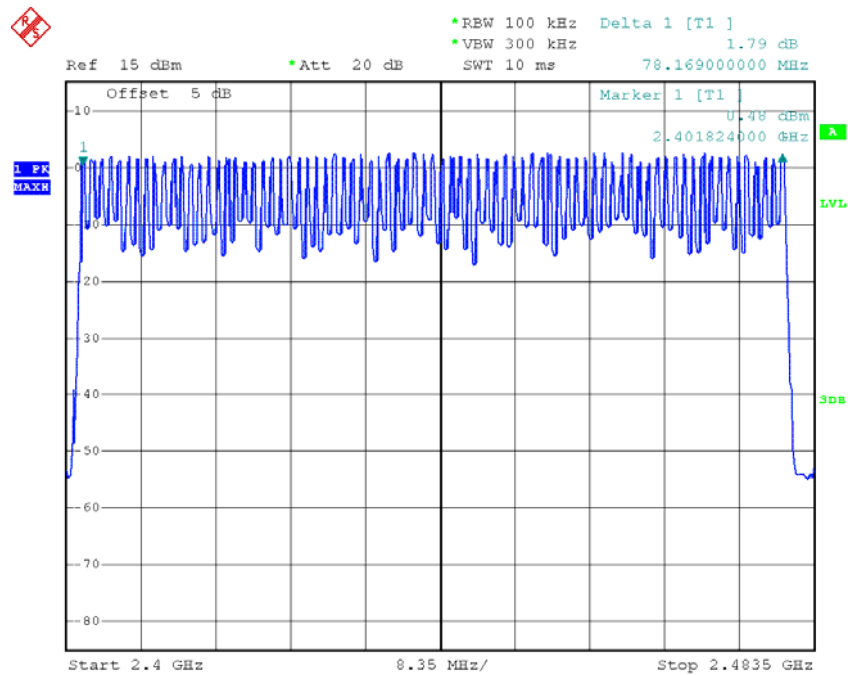
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

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

Number of Hopping Channels

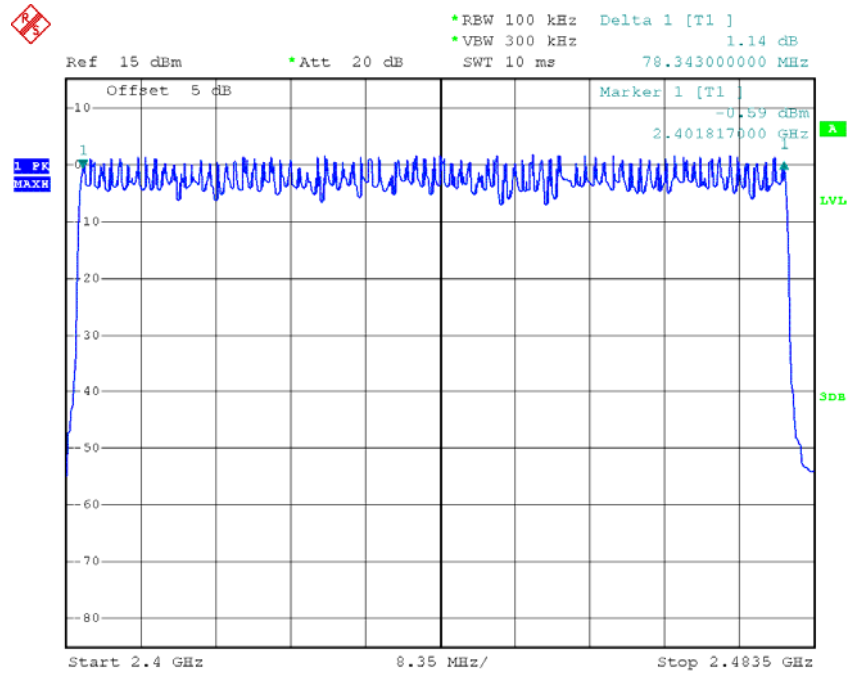


Date: 10.MAY.2013 14:54:48

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

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

Number of Hopping Channels

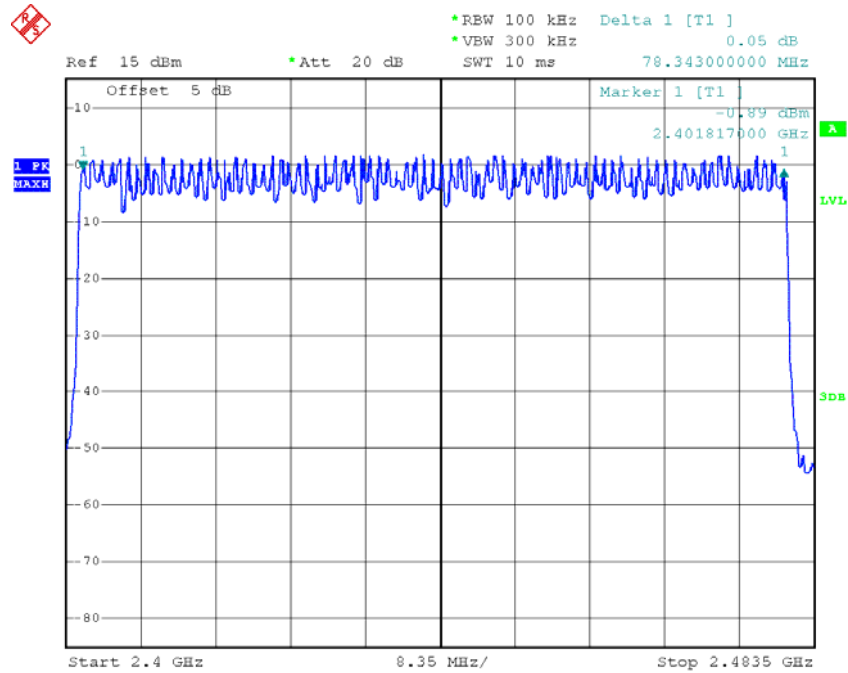


Date: 10.MAY.2013 15:14:18

EDR Mode (8-DPSK):

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

Number of Hopping Channels



Date: 10.MAY.2013 15:16:27

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 $0.4 \times \text{channel no. (s)}$, the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Dwell Time= time slot length * hope rate/ number of hopping channels * 31.6s

Hop rate=1600/s

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum analyzer	ESPI	100337	2012-11-10	2013-11-9

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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:	27.3°C
Relative Humidity:	67 %
ATM Pressure:	99.9kPa

* The testing was performed by Leon Chen on 2013-05-10

Test Result: Compliance.

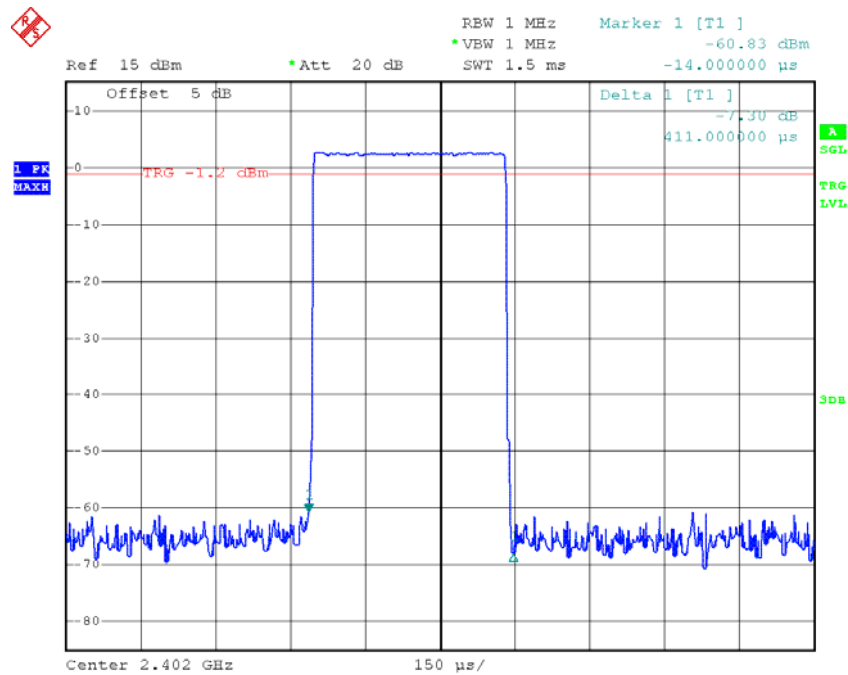
Please refer to following tables and plots

Test Mode: Transmitting

BDR Mode (GFSK):

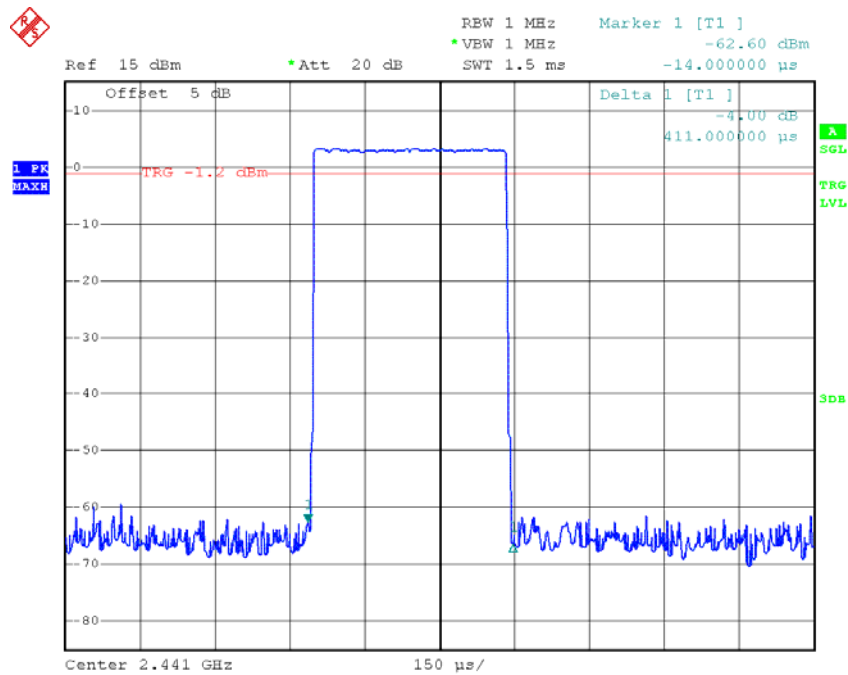
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.411	0.132	0.4	Pass
	Middle	0.411	0.132	0.4	Pass
	High	0.411	0.132	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.677	0.268	0.4	Pass
	Middle	1.677	0.268	0.4	Pass
	High	1.677	0.268	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	2.933	0.313	0.4	Pass
	Middle	2.933	0.313	0.4	Pass
	High	2.933	0.313	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

DH1: Low Channel



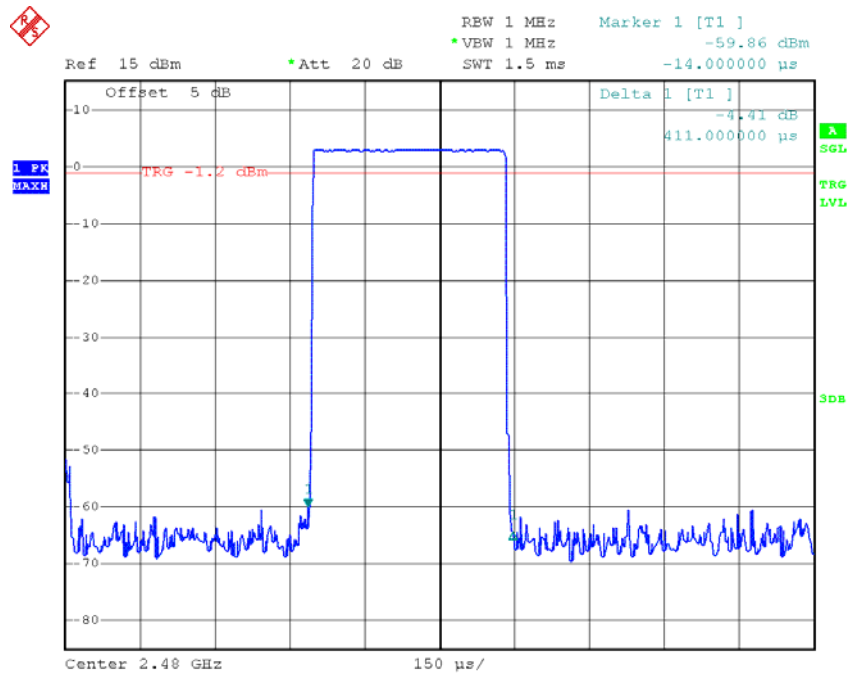
Date: 10.MAY.2013 15:31:10

DH1: Middle Channel



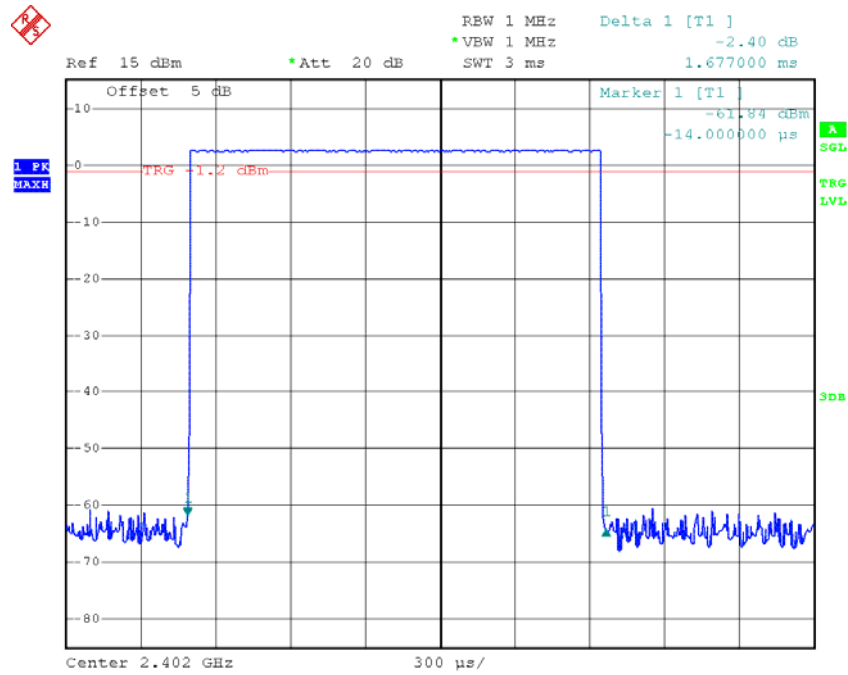
Date: 10.MAY.2013 15:31:25

DH1: High Channel



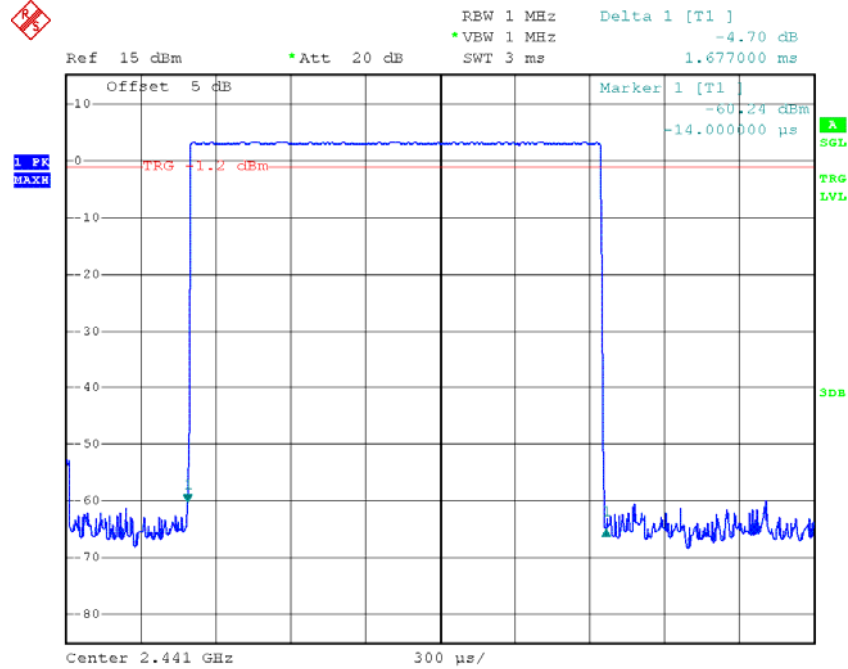
Date: 10.MAY.2013 15:31:39

DH3: Low Channel



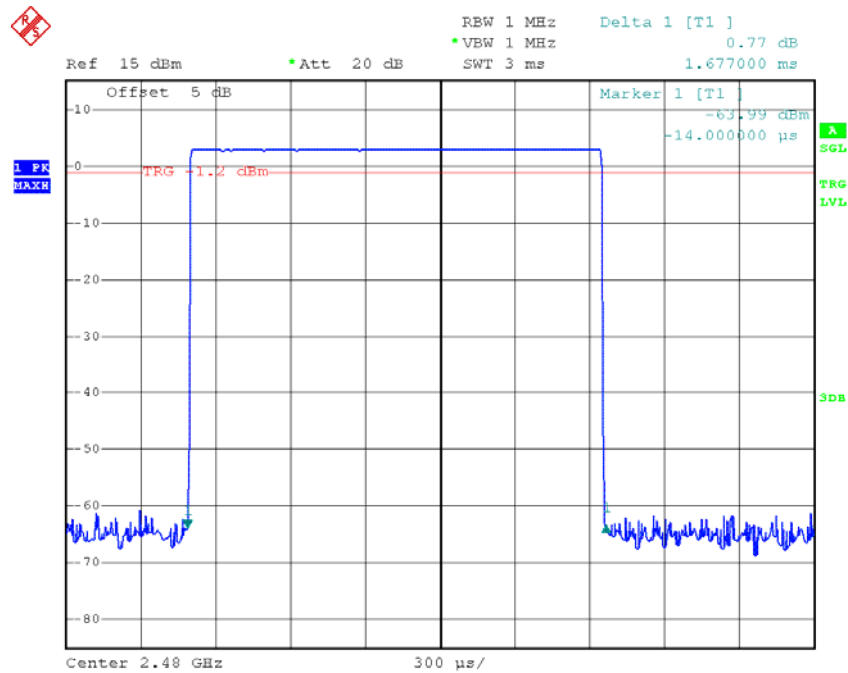
Date: 10.MAY.2013 15:33:21

DH3: Middle Channel



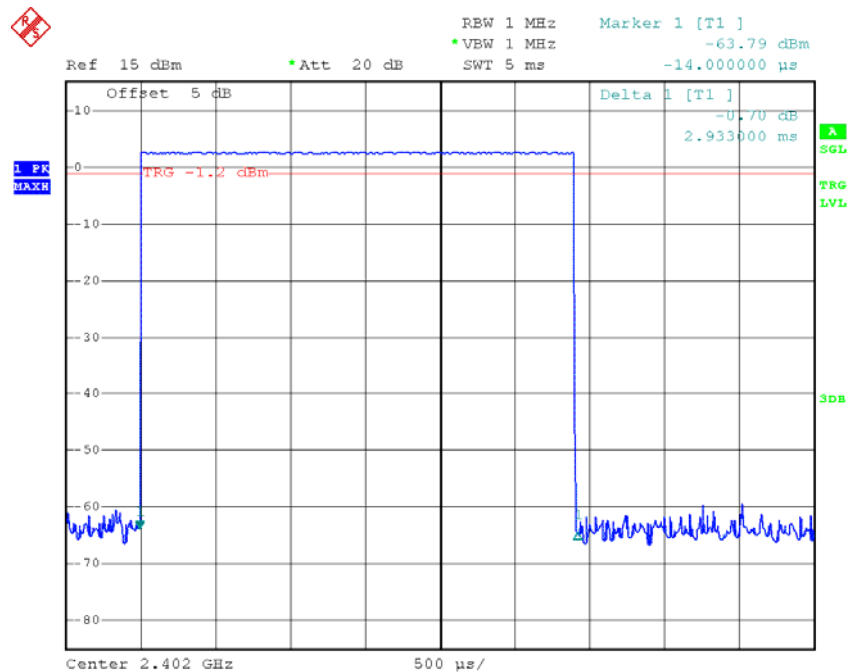
Date: 10.MAY.2013 15:33:11

DH3: High Channel



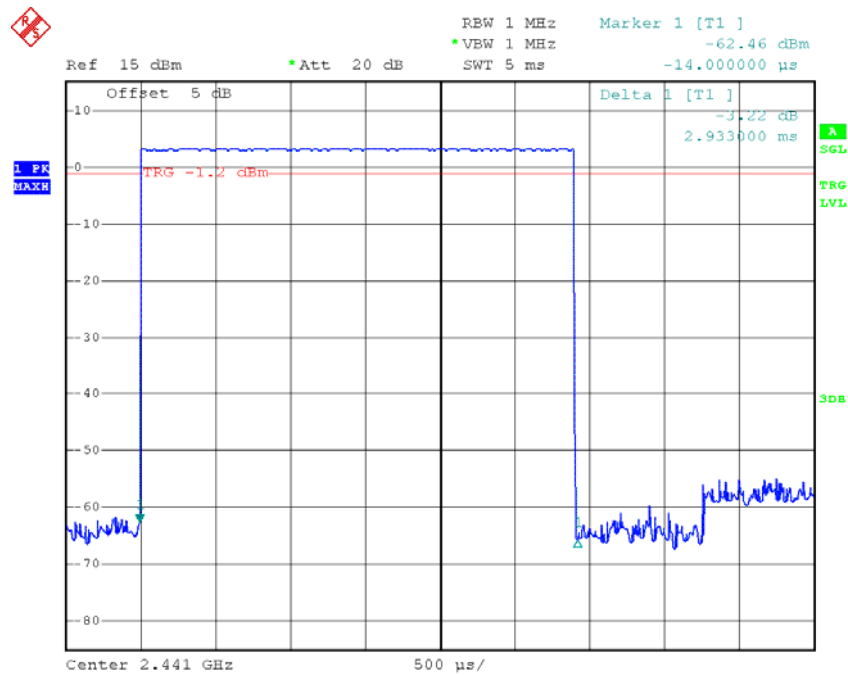
Date: 10.MAY.2013 15:32:58

DH5: Low Channel



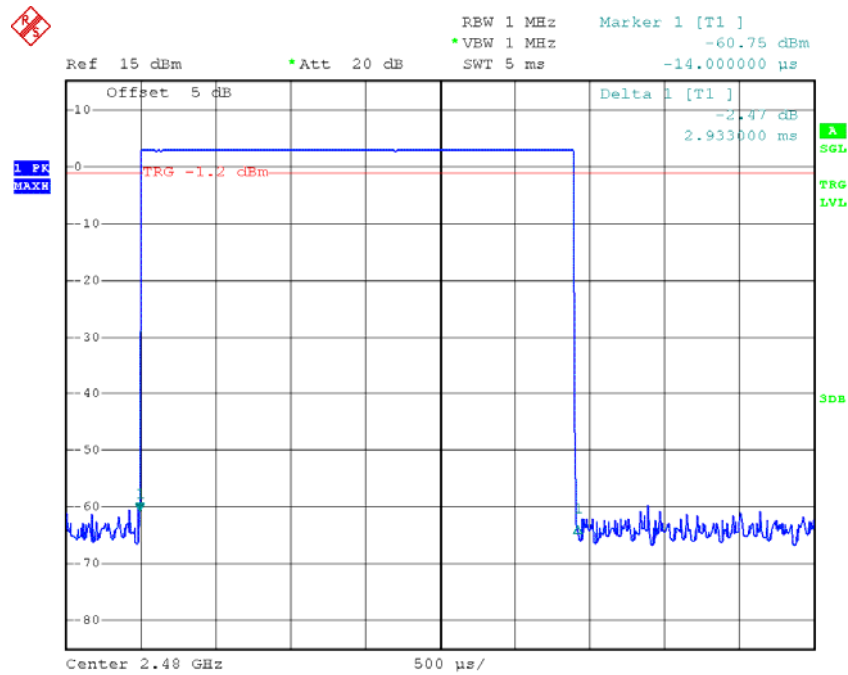
Date: 10.MAY.2013 15:55:13

DH5: Middle Channel



Date: 10.MAY.2013 15:55:24

DH5: High Channel

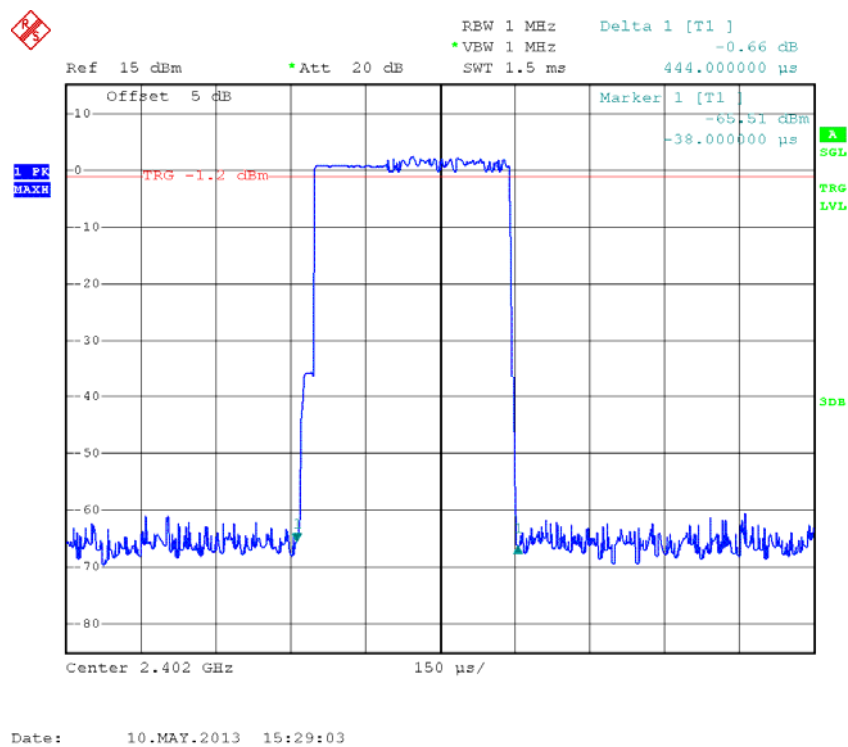


Date: 10.MAY.2013 15:55:36

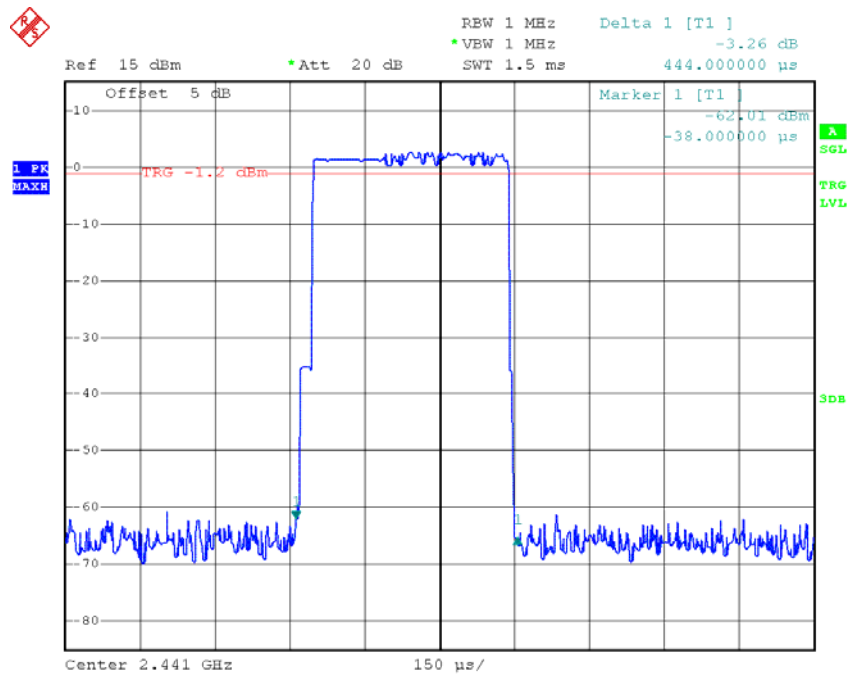
EDR Mode ($\pi/4$ -DQPSK):

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
<i>DH1</i>	Low	0.444	0.142	0.4	Pass
	Middle	0.444	0.142	0.4	Pass
	High	0.444	0.142	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
<i>DH3</i>	Low	1.707	0.273	0.4	Pass
	Middle	1.707	0.273	0.4	Pass
	High	1.707	0.273	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
<i>DH5</i>	Low	2.963	0.316	0.4	Pass
	Middle	2.963	0.316	0.4	Pass
	High	2.963	0.316	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

DH1: Low Channel

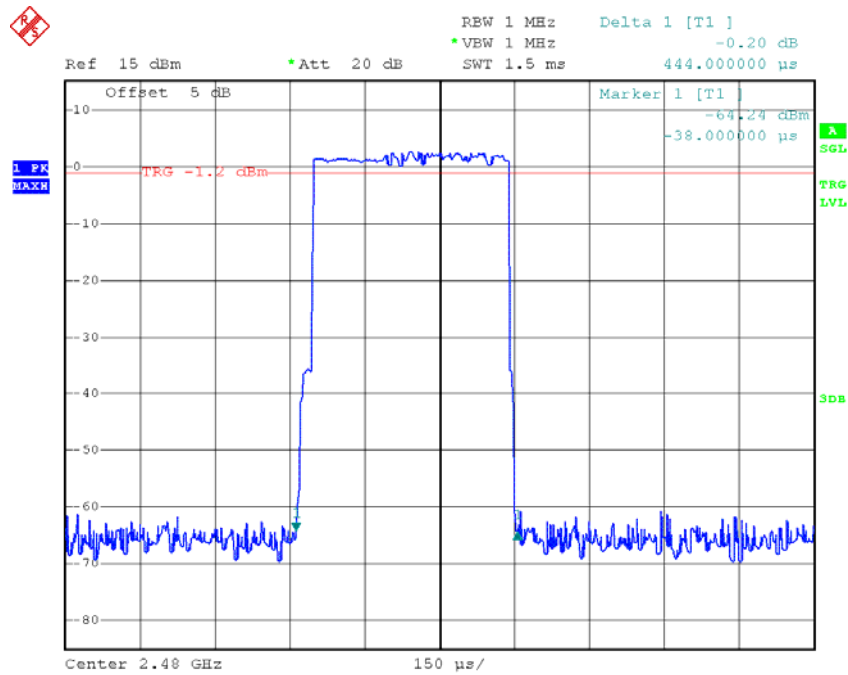


DH1: Middle Channel



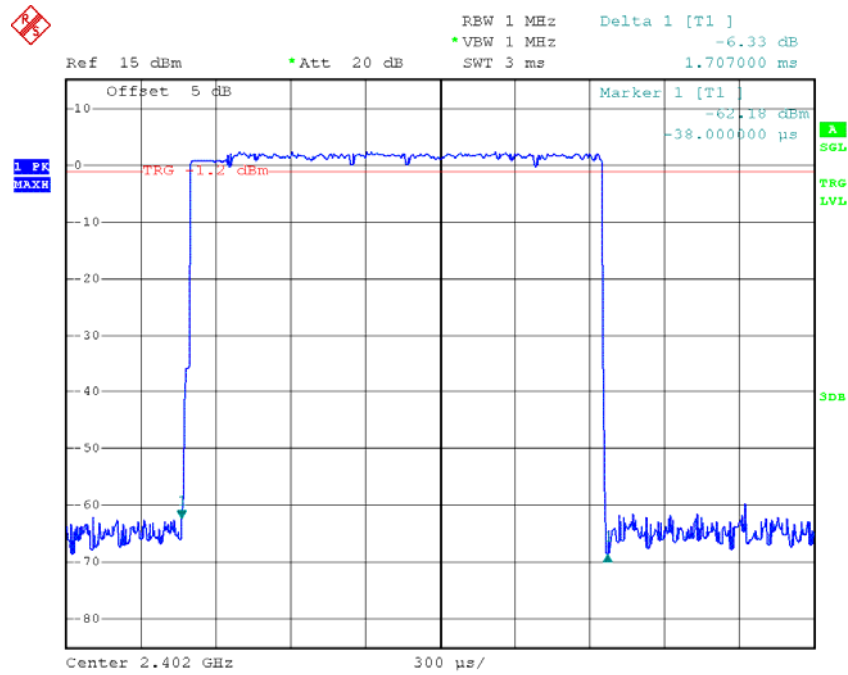
Date: 10.MAY.2013 15:28:52

DH1: High Channel



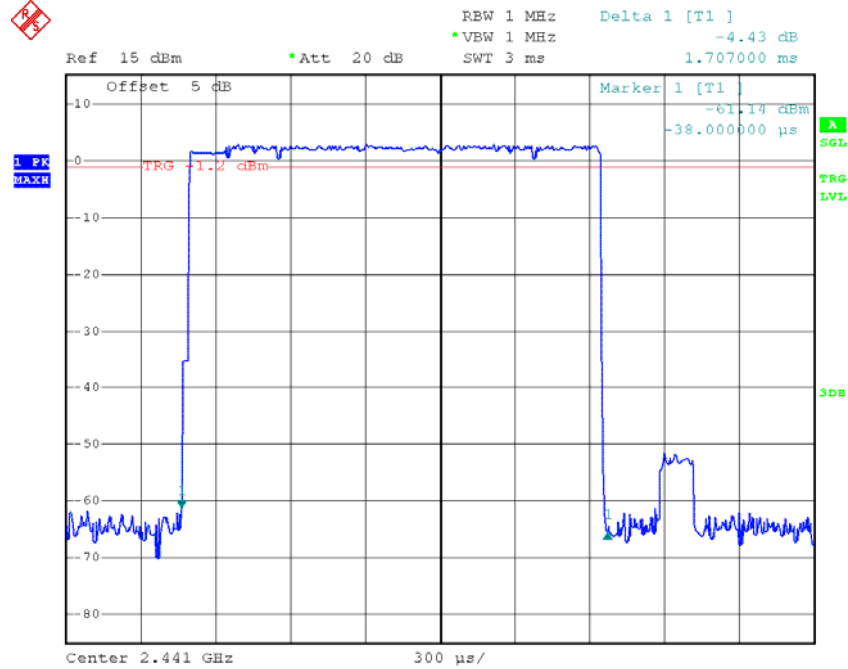
Date: 10.MAY.2013 15:28:39

DH3: Low Channel

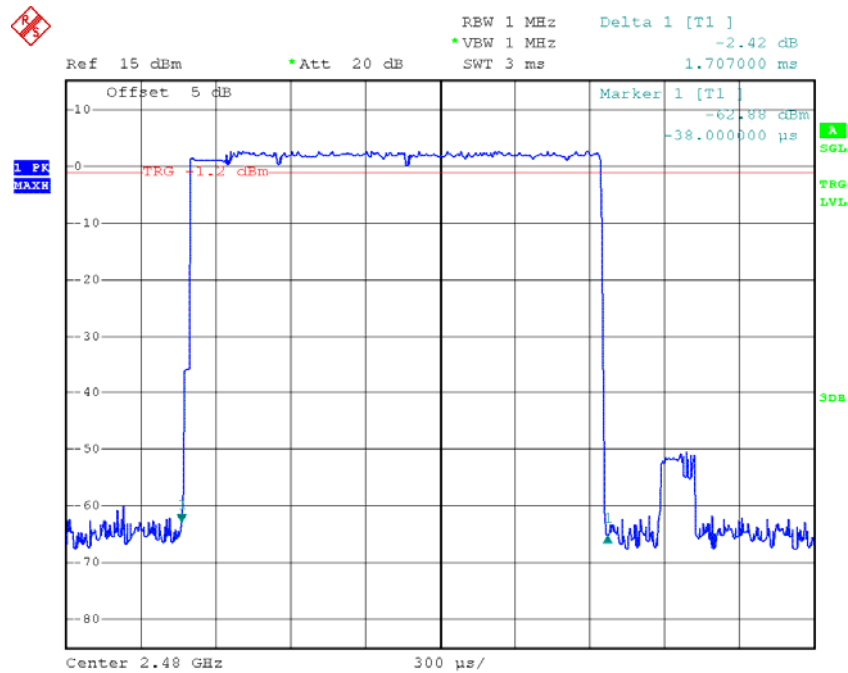


Date: 10.MAY.2013 15:49:31

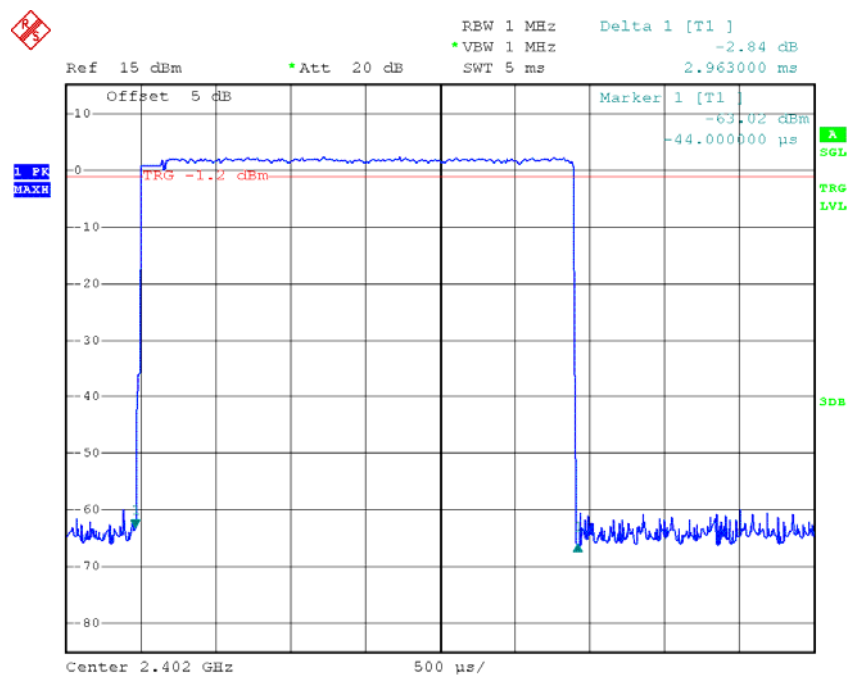
DH3: Middle Channel



Date: 10.MAY.2013 15:49:51

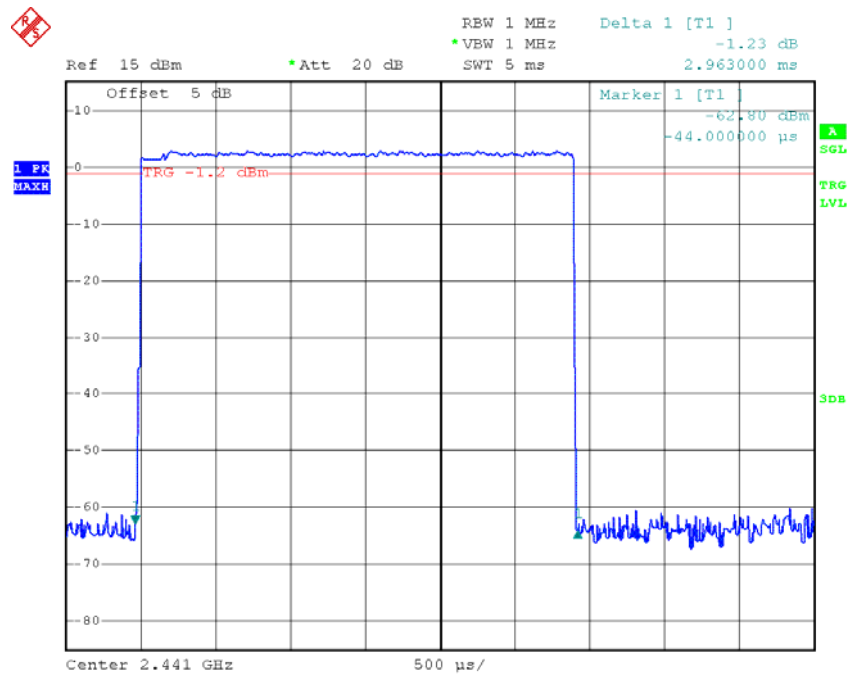
DH3: High Channel

Date: 10.MAY.2013 15:50:02

DH5: Low Channel

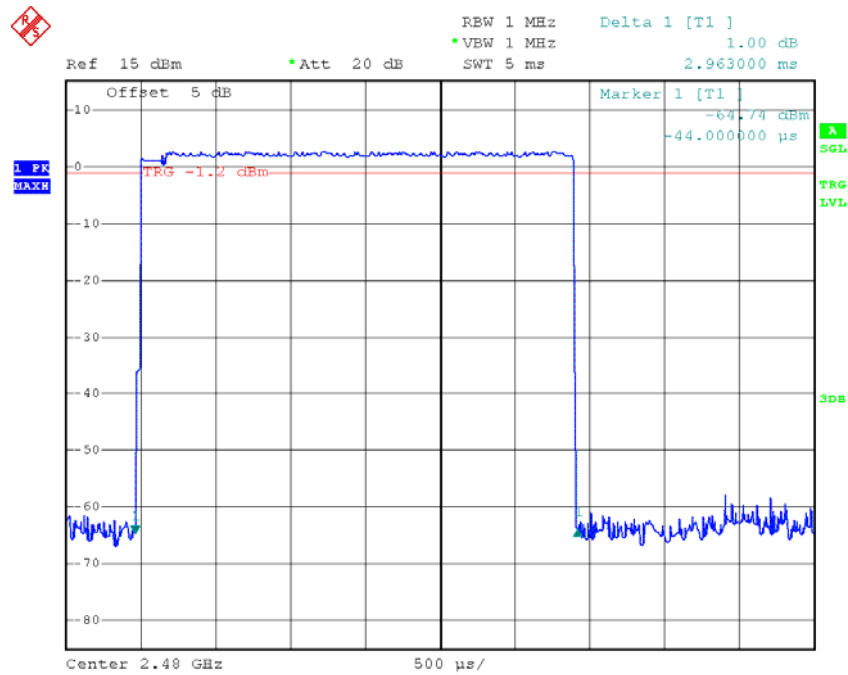
Date: 10.MAY.2013 15:54:15

DH5: Middle Channel



Date: 10.MAY.2013 15:54:07

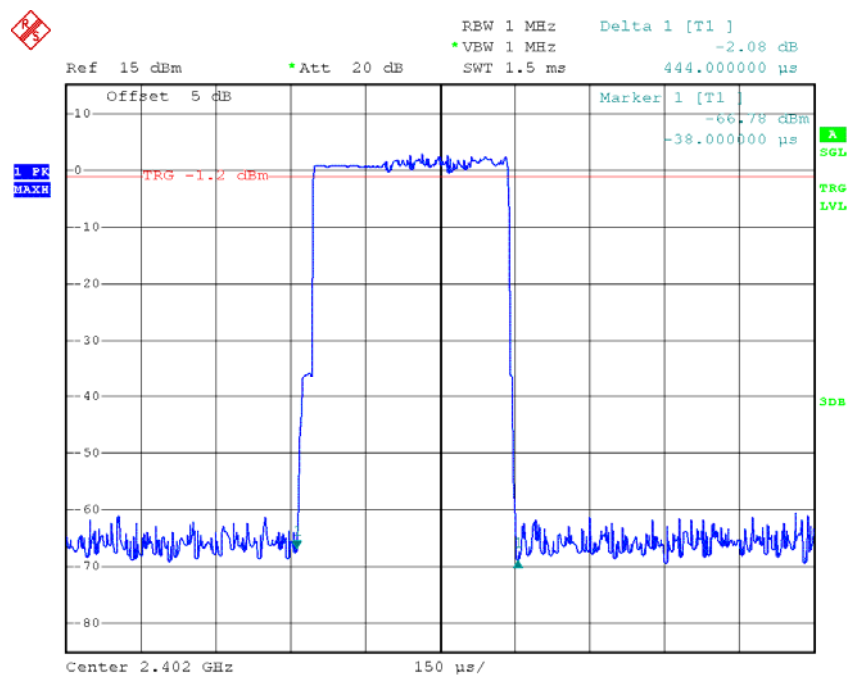
DH5: High Channel



Date: 10.MAY.2013 15:54:00

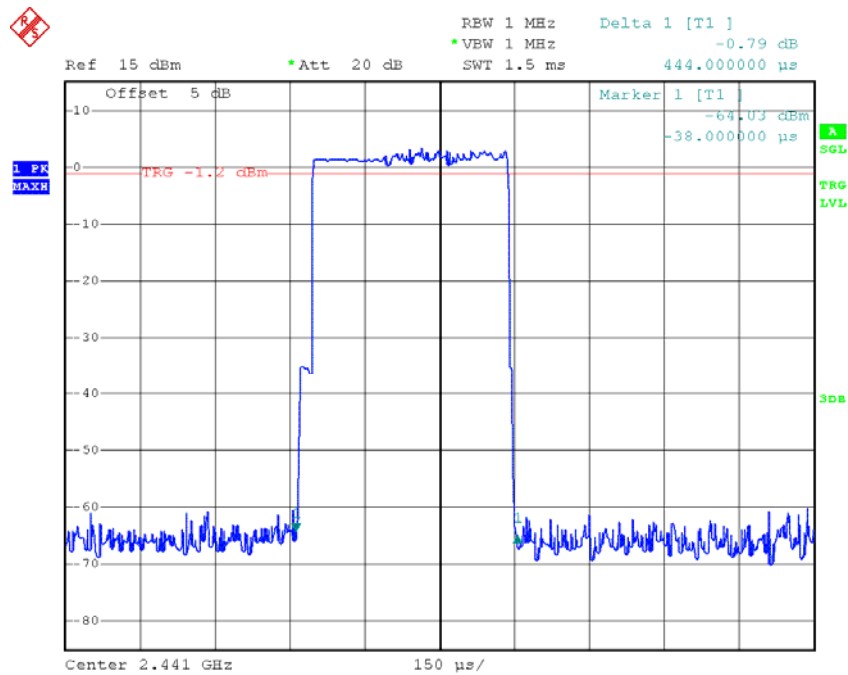
EDR Mode (8-DPSK):

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH1	Low	0.444	0.142	0.4	Pass
	Middle	0.444	0.142	0.4	Pass
	High	0.444	0.142	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/2/79) $\times$ 31.6 s				
DH3	Low	1.713	0.274	0.4	Pass
	Middle	1.713	0.274	0.4	Pass
	High	1.713	0.274	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/4/79) $\times$ 31.6 s				
DH5	Low	2.963	0.316	0.4	Pass
	Middle	2.963	0.316	0.4	Pass
	High	2.963	0.316	0.4	Pass
	Note: Dwell time=Pulse time (ms) $\times$ (1600/6/79) $\times$ 31.6 s				

DH1: Low Channel

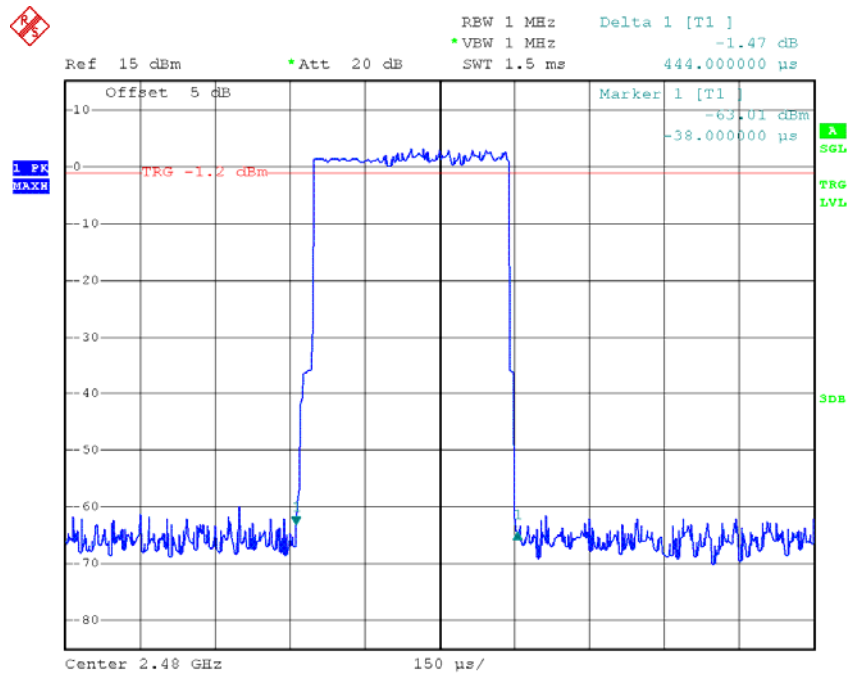
Date: 10.MAY.2013 15:26:51

DH1: Middle Channel



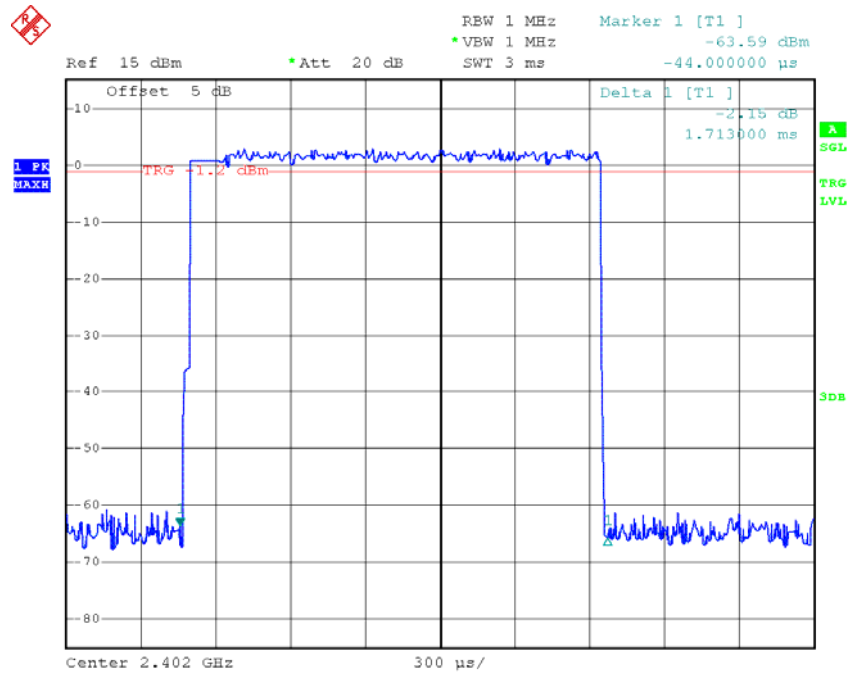
Date: 10.MAY.2013 15:27:05

DH1: High Channel



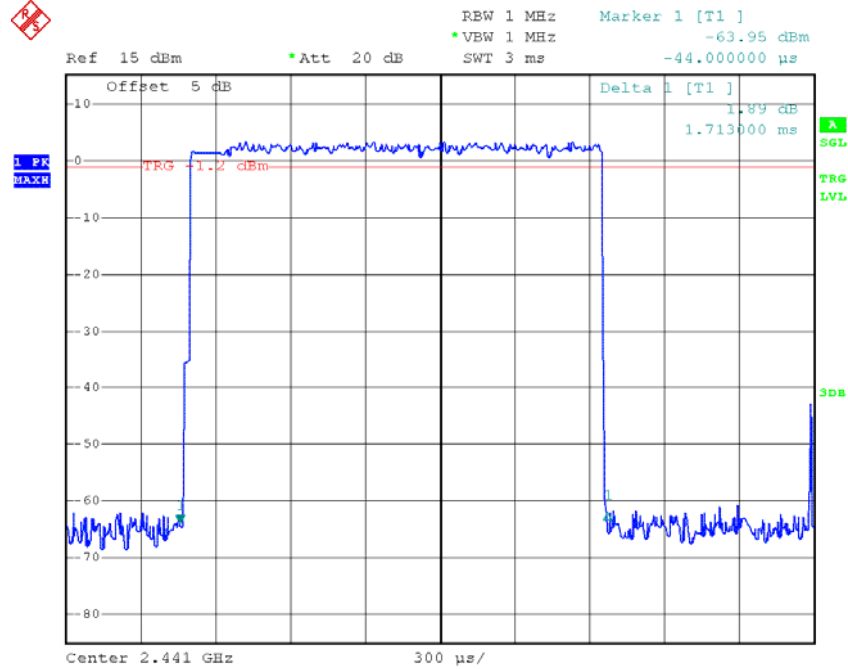
Date: 10.MAY.2013 15:27:23

DH3: Low Channel



Date: 10.MAY.2013 15:51:02

DH3: Middle Channel



Date: 10.MAY.2013 15:50:54

1 PK
MAXH

Offset 5 dB

Ref 15 dBm

*Att 20 dB

RBW 1 MHz

*VBW 1 MHz

SWT 3 ms

Marker 1 [T1]

-65.00 dBm

-44.000000 μ s

Delta 1 [T1]

0.20 dB

1.713000 ms

TRG 1.2 dBm

TRG LVL

3dB

Center 2.48 GHz

300 μ s/

Date: 10.MAY.2013 15:50:45

Ref 15 dBm *Att 20 dB REW 1 MHz Delta 1 [T1] -2.29 dB
 SWT 5 ms 2.963000 ms

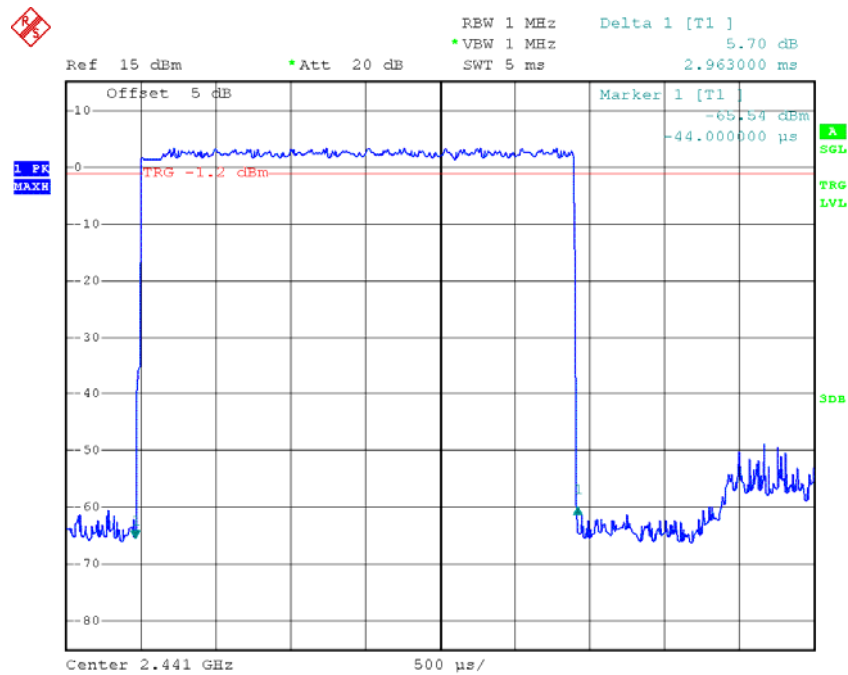
Offset 5 dB Marker 1 [T1] -63.22 dBm
 -44.000000 μs

1 PK MAXH TRG -1.2 dBm TRG LVL 3dB

Center 2.402 GHz 500 μs/

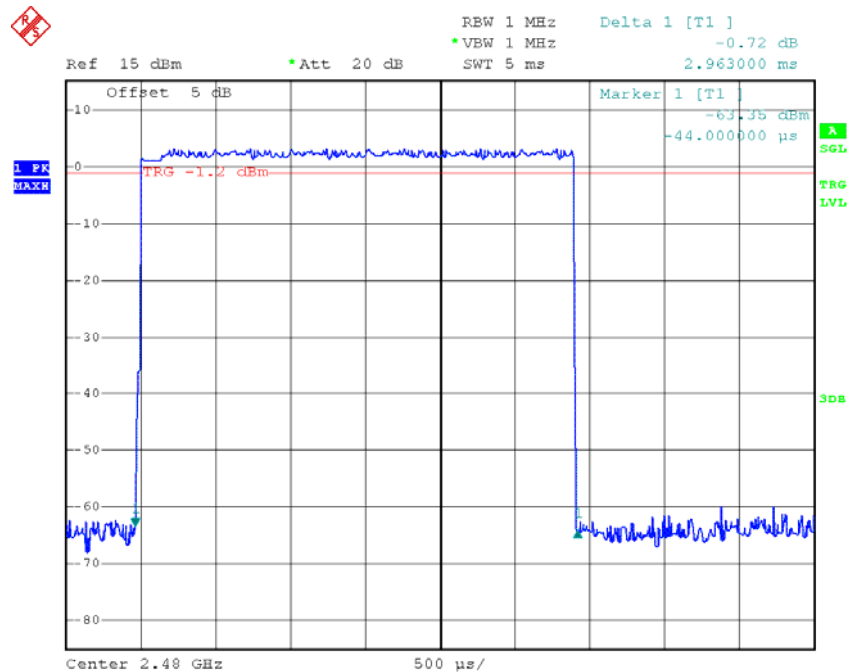
Date: 10.MAY.2013 15:52:17

DH5: Middle Channel



Date: 10.MAY.2013 15:52:30

DH5: High Channel



Date: 10.MAY.2013 15:52:44

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

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts

Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI test receiver.
3. Add a correction factor to the display.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum analyzer	ESPI	100337	2012-11-10	2013-11-9

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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:	27.3°C
Relative Humidity:	67 %
ATM Pressure:	99.9kPa

* The testing was performed by Leon Chen on 2013-05-10.

Test Result: Compliance.

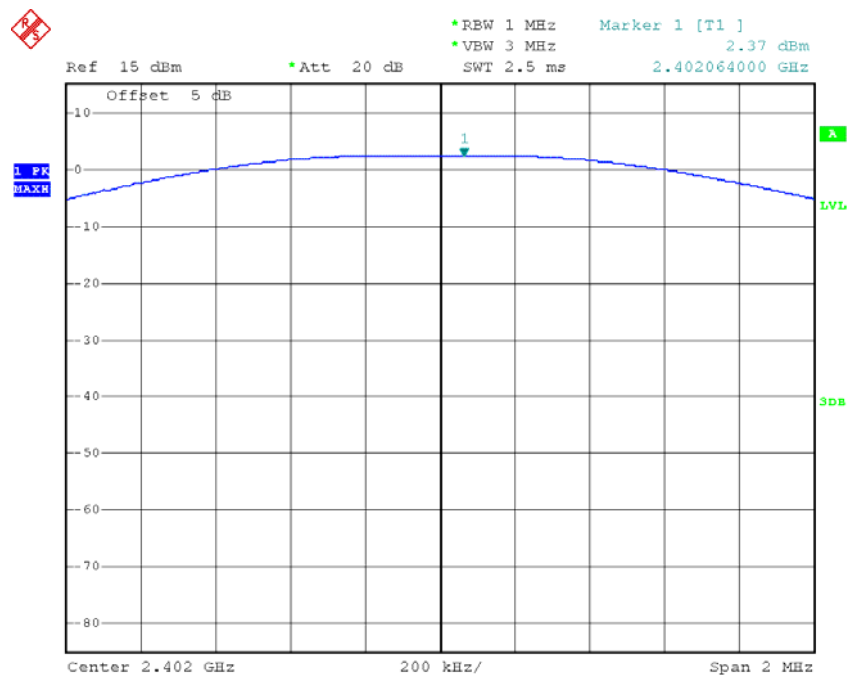
Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	Output power (dBm)	Limit (dBm)
BDR Mode (GFSK)	Low	2402	2.37	30
	Middle	2441	2.91	30
	High	2480	2.9	30
EDR Mode ($\pi/4$ -DQPSK)	Low	2402	2.24	30
	Middle	2441	2.79	30
	High	2480	2.67	30
EDR Mode (8-DPSK)	Low	2402	3.34	30
	Middle	2441	3.77	30
	High	2480	3.89	30

Note: The data above was tested in conducted mode.

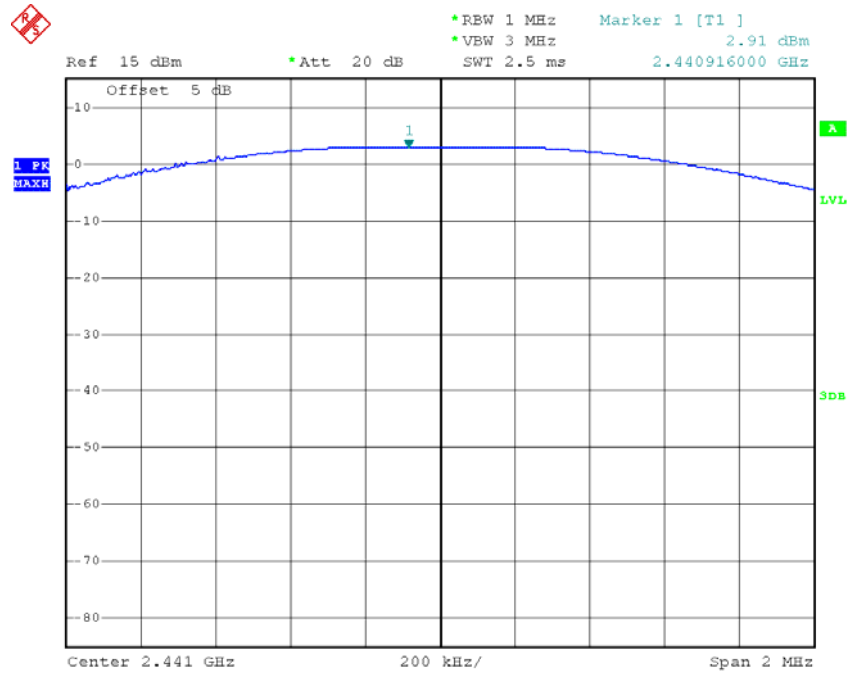
BDR Mode (GFSK):

Output Power, Low



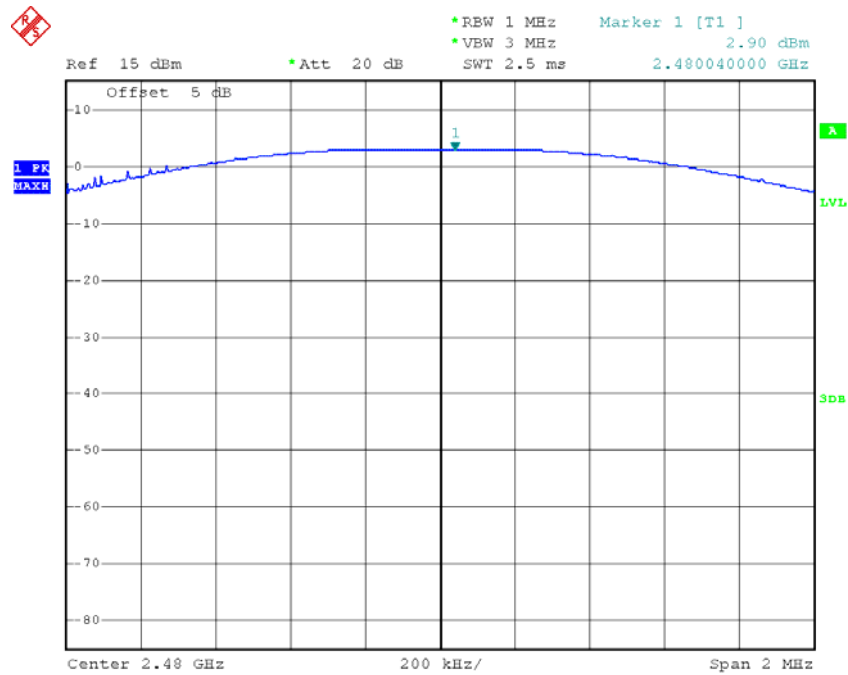
Date: 10.MAY.2013 14:05:56

Output Power, Middle



Date: 10.MAY.2013 14:07:10

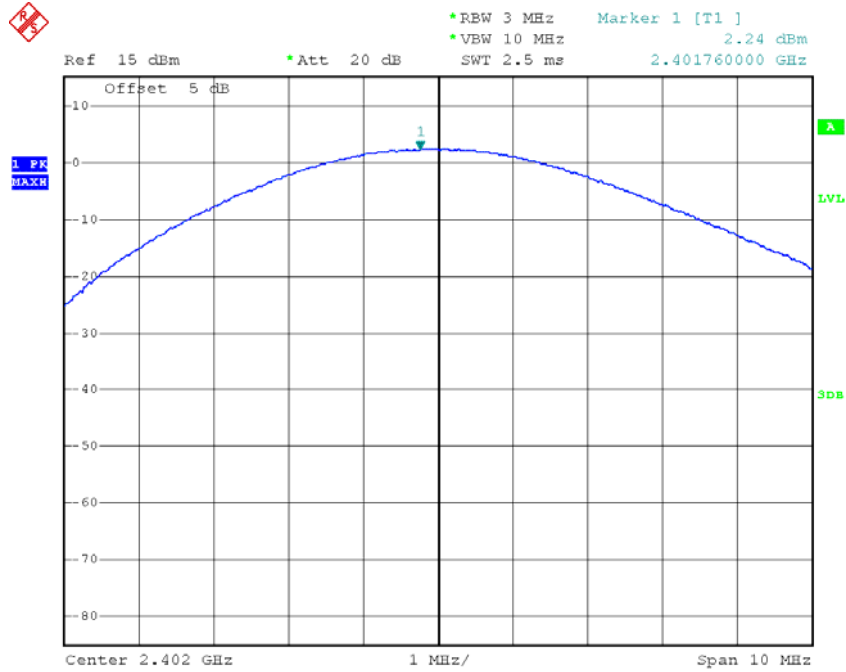
Output Power, High



Date: 10.MAY.2013 14:10:21

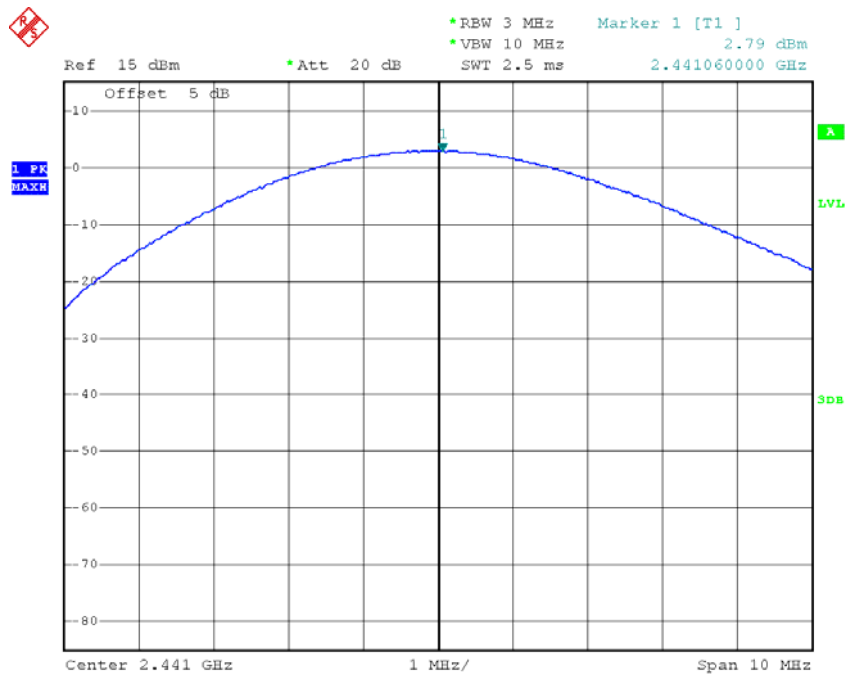
EDR Mode ($\pi/4$ -DQPSK):

Output Power, Low



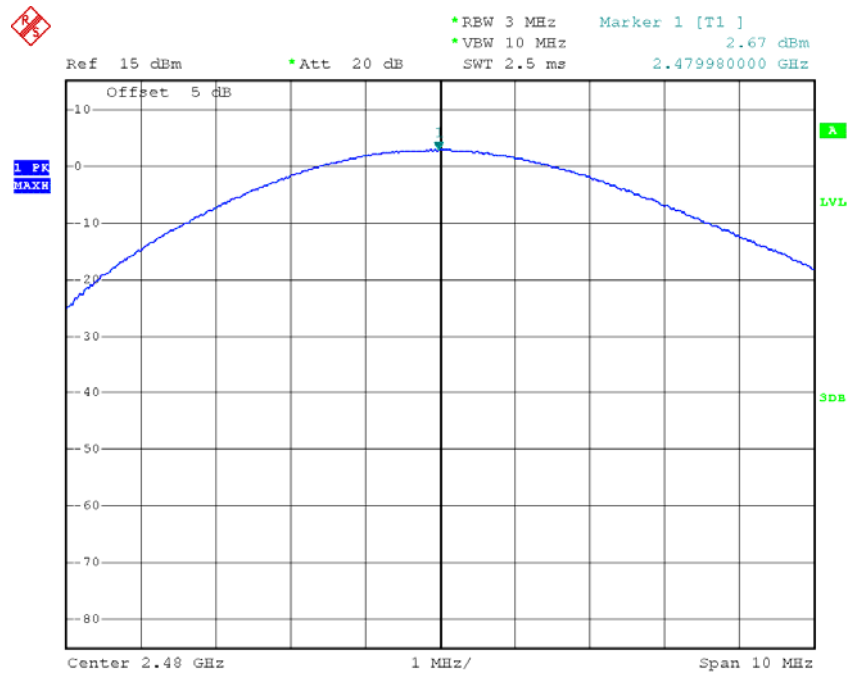
Date: 10.MAY.2013 14:47:08

Output Power, Middle



Date: 10.MAY.2013 14:50:21

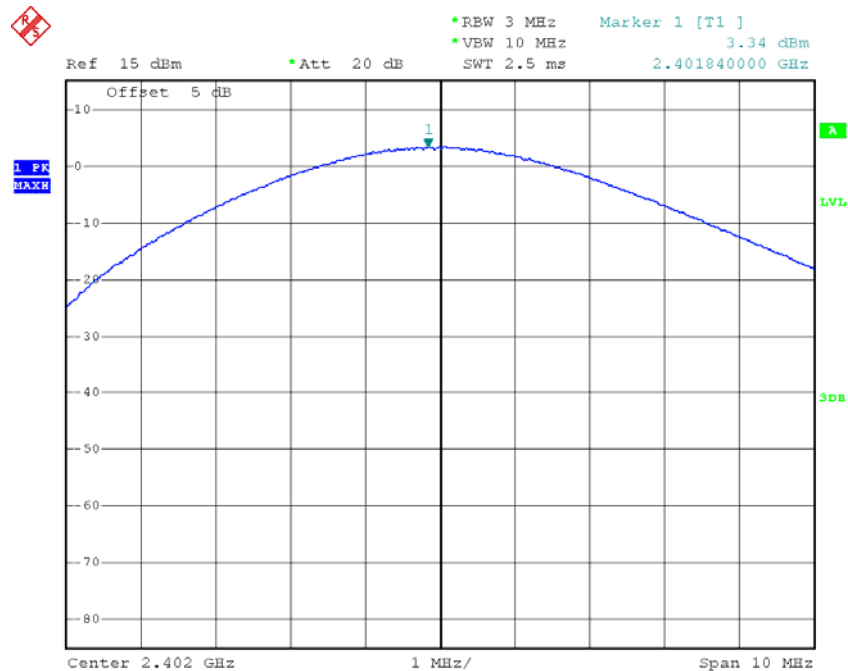
Output Power, High



Date: 10.MAY.2013 14:51:11

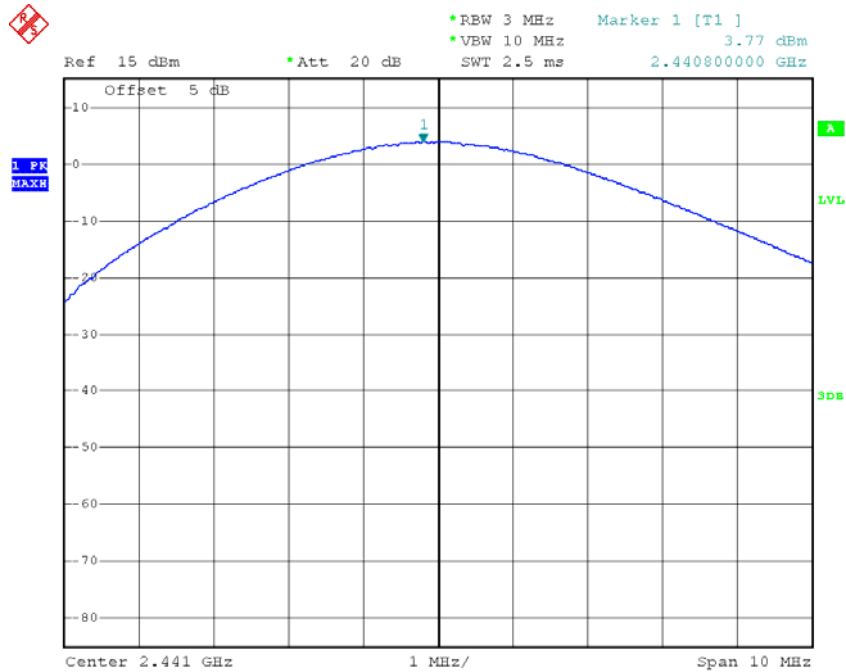
EDR Mode (8-DPSK):

Output Power, Low



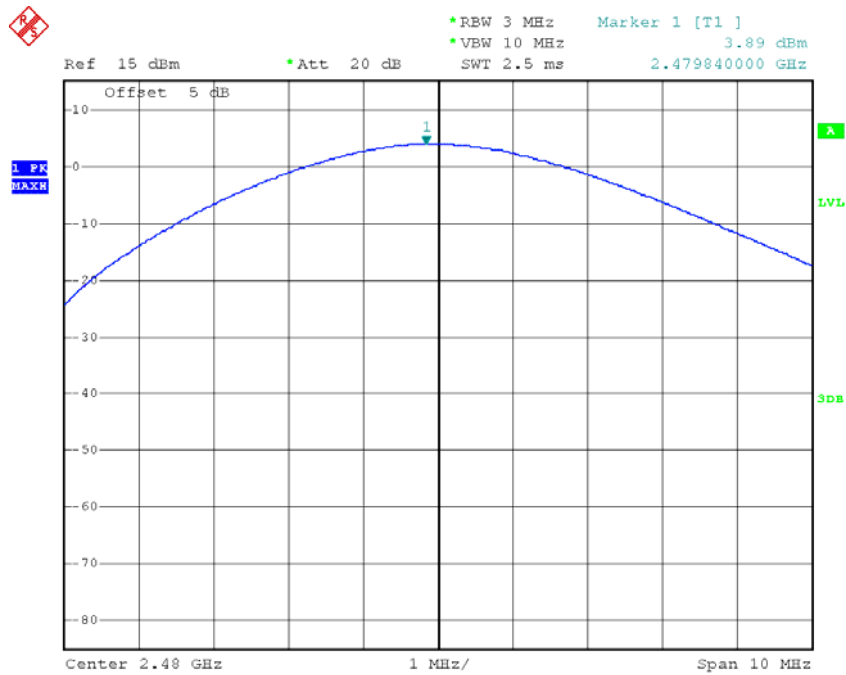
Date: 10.MAY.2013 14:28:25

Output Power, Middle



Date: 10.MAY.2013 14:27:21

Output Power, High



Date: 10.MAY.2013 14:22:02

FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum analyzer	ESPI	100337	2012-11-10	2013-11-9

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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:	27.3°C
Relative Humidity:	67 %
ATM Pressure:	99.9kPa

* The testing was performed by Leon Chen on 2013-05-10.

BDR Mode (GFSK):

Ref 15 dBm *Att 20 dB SWI 10 ms

Offset 5 dB

Marker 1 [T1] -54.44 dBm 2.390000000 GHz

Marker 2 [T1] -54.59 dBm 2.400000000 GHz

Marker 4 [T1] 2.42 dBm 2.402308000 GHz

D1 2.42 dBm

D2 -17.58 dBm

Center 2.357 GHz 9.4 MHz/ Span 94 MHz

1 PK MAXH

3dB

F1 F2

Date: 10.MAY.2013 14:33:47

Ref 15 dBm *Att 20 dB *RBW 100 kHz Marker 3 [T1] 2.95 dBm 2.479984000 GHz

Offset 5 dB

1 PK MAXH

Marker 1 [T1] -54.57 dBm 2.483500000 GHz

Marker 2 [T1] -54.60 dBm 2.500000000 GHz

Marker 4 [T1] -52.22 dBm 2.490736000 GHz

D1 2.95 dBm

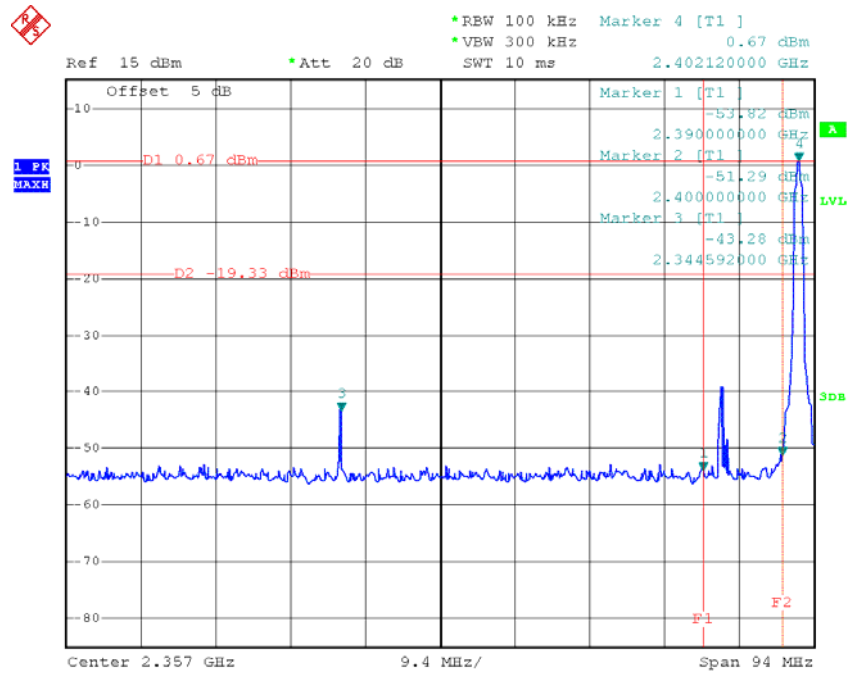
D2 -17.05 dBm

F1

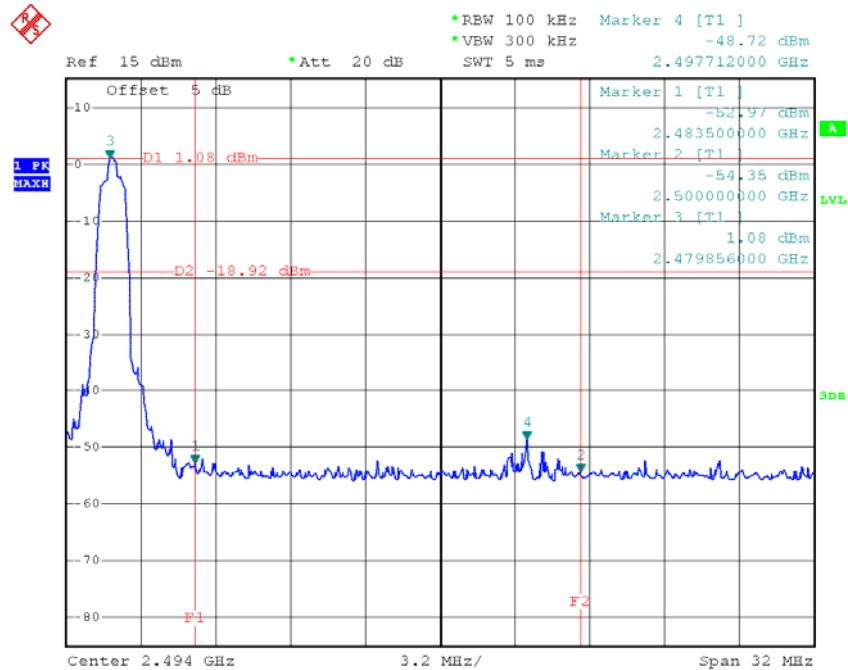
F2

Start 2.478 GHz 3.2 MHz/ Stop 2.51 GHz

Date: 10.MAY.2013 14:14:46

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

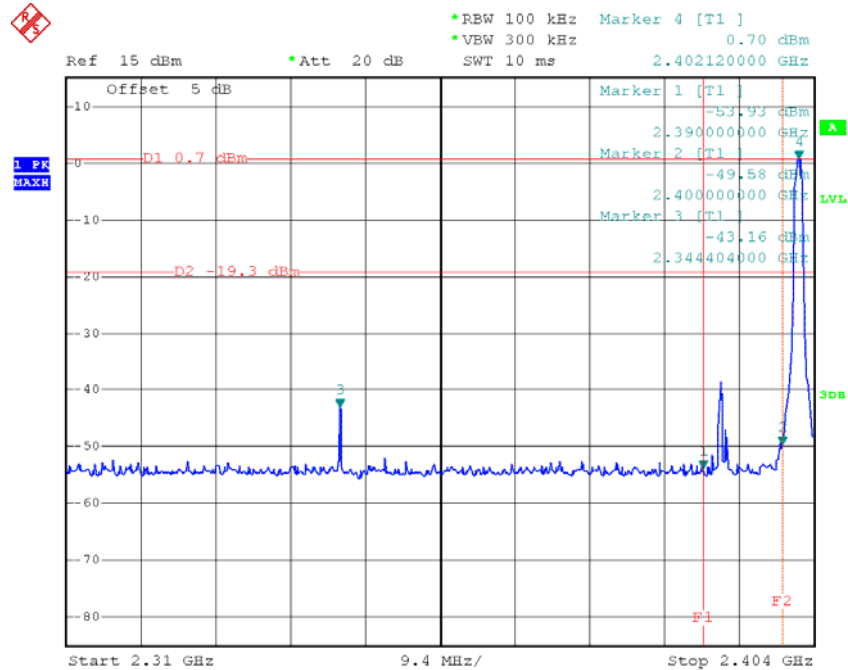
Date: 10.MAY.2013 14:32:43

Band Edge, Right Side

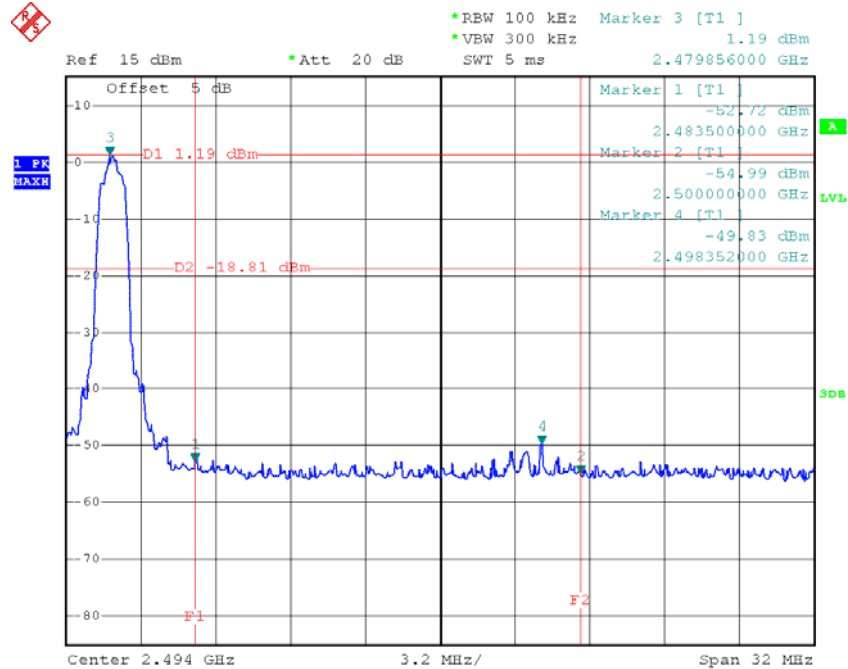
Date: 10.MAY.2013 14:17:09

EDR Mode (8-DPSK):

Band Edge, Left Side



Band Edge, Right Side



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