FCC PART 15.247

TEST REPORT

For

Onglory Rich Limited

Room 208A, 2/F Unit A, 2 Chong Yip Street, Meyer Industrial Building, Kuwn Tong, Kowloon, Hong Kong

FCC ID: R6DTL700

Report Type:	Product Type:
Original Report	Mobile phone

Test Engineer:	Leon Chen
Report Number:	R1DG121116004-00B
Report Date:	2012-11-29
Reviewed By:	Ivan Cao EMC Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Onglory Rich Limited*'s product, model number: *TL700 (FCC ID: R6DTL700)* (the "EUT") in this report was a *Mobile phone,* which was measured approximately: 12.5 cm (L) x 7.0 cm (W) x 1.5 cm (H), rated input voltage: DC 3.7 V from battery or DC 5V form adapter.

Adapter information: Tonino
Model No: HB12-050100SPA
Input: AC 100-250V, 50/60Hz
Output: AC 100-250V, 50/60Hz or DC 5V

Product function:
GSM and GPRS Multislots class 10
Bluetooth:v2.1+EDR
Wifi:802.11b/g

The Operating Frequency Range:
GSM850: 824 ~ 849 MHz (TX), 869 ~ 894 MHz (RX);
DCS1900: 1850 ~ 1910 MHz (TX), 1930 ~ 1990 MHz (RX);
Wi-Fi: 2412~2462 MHz (TX/RX);
Bluetooth: 2402 ~ 2480 MHz (TX/RX)

** All measurement and test data in this report was gathered from production sample serial number: 121116004 (Assigned by BACL.Dongguan). The EUT was received on 2012-11-19.*

Objective

This report is prepared on behalf of *Onglory Rich 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 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 22H&24E PCE submissions with FCC ID: *R6DTL700.*
FCC Part 15B JBP submissions with FCC ID: *R6DTL700*
FCC Part 15C DTS submissions with FCC ID: *R6DTL700* for Wifi.

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 Emission from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emission measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

The uncertainty of any RF tests which use conducted method measurement is ±0.96 dB, the uncertainty of any radiation on emission measurement is ±4.0 dB

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 C63.4-2009.

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.

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

No EUT Exercise Software

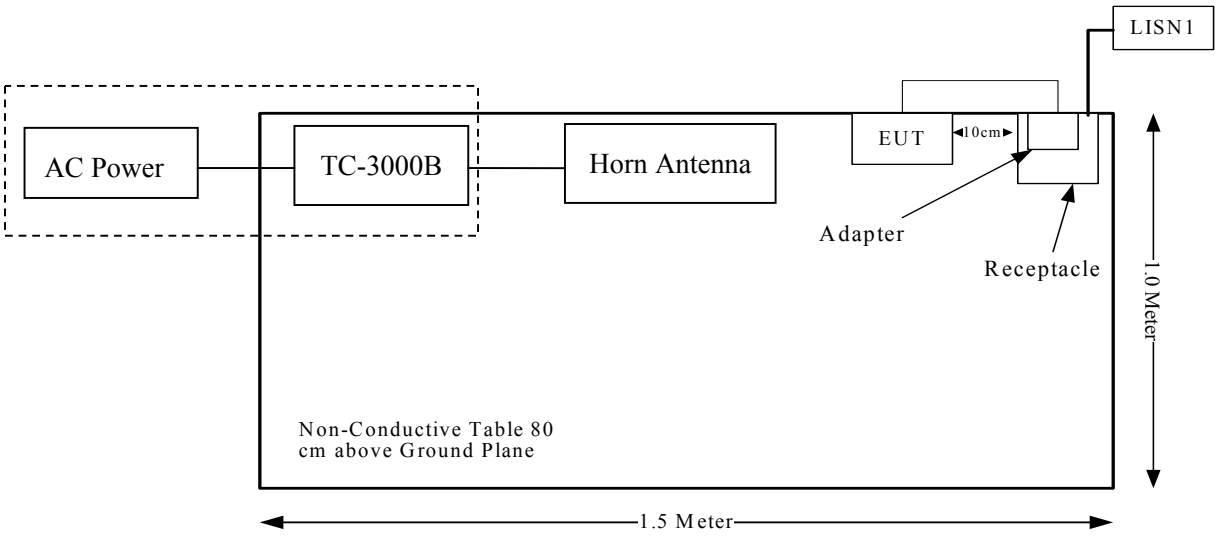
Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1093	RF Exposure	Compliace
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emission	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emission	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 Edge	Compliance

FCC §15.247 (i) & §1.1307 (b) (1) & §2.1093- RF EXPOSURE

Applicable Standard

According to§15.247(e)(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 Mobile Portable RF Exposure V05 Appendix A, SAR can be exempted if the output power is less than the SAR exclusion threshold:

For f=2450MHz, the output power is less 19mW at distance of 10mm.

Measurement Result

Peak conducted output power= 3.77 dBm
Antenna gain = -1 dBi
SAR exclusion threshold 19 mW (12.79dBm) > 3.77 dBm

So the SAR evaluation is not necessary.

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 antenna, which was complied with 15.203, the maximum gain is -1 dBi, please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

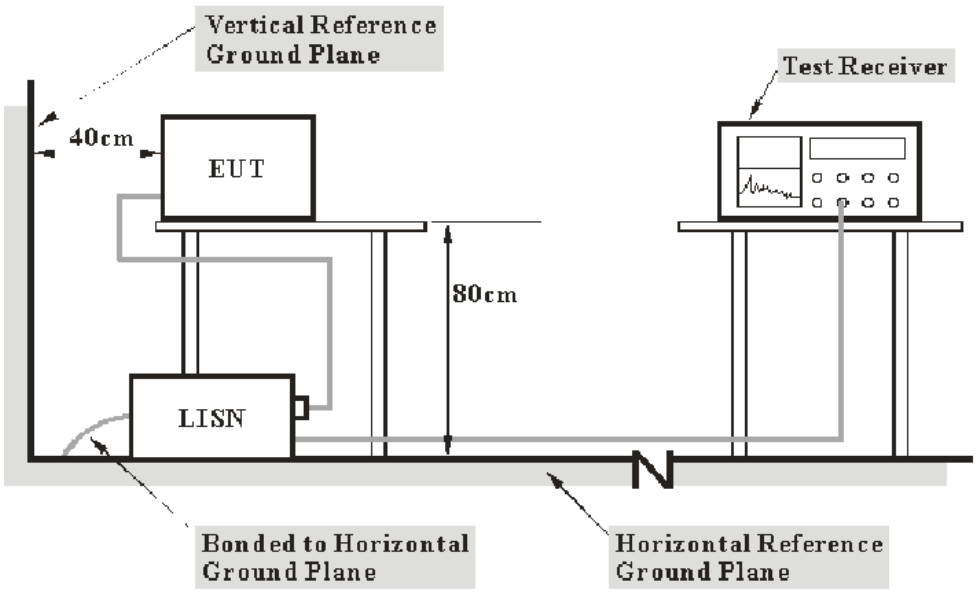
FCC§15.207

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Dongguan) is ±2.4 dB (k=2, 95% level of confidence), and the uncertainty will not be taken into consideration for all the test data recorded in the report.

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2012-10-08	2013-10-07
R&S	LISN1	ESH3-Z5	843331/015	2012-09-17	2013-09-16
R&S	LISN2	ESH3-Z5	100113	2012-10-08	2013-10-07

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:

4.70 dB at **0.180 MHz** in the **Neutral** conducted mode.

Test Data

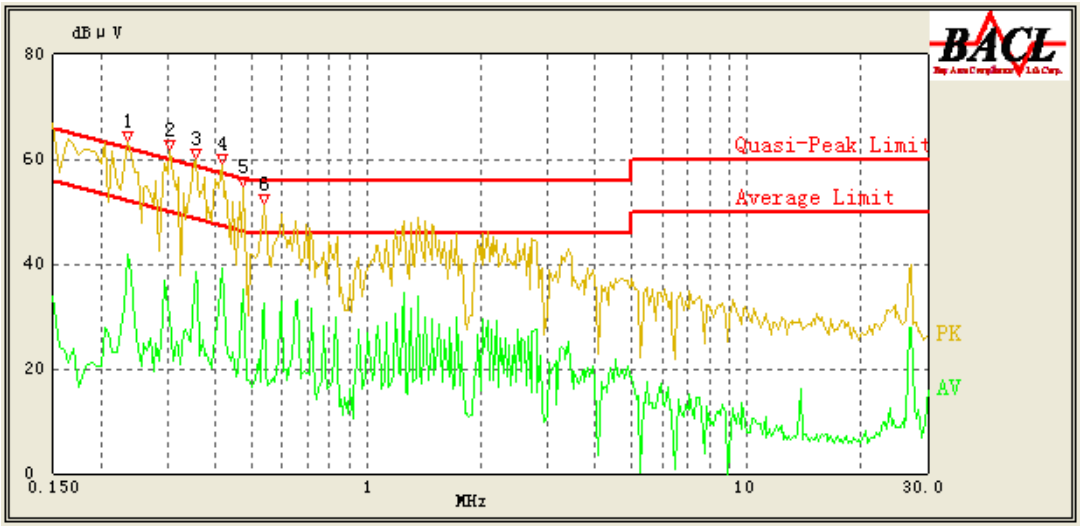
Environmental Conditions

Temperature:	22.1 ° C
Relative Humidity:	53 %
ATM Pressure:	101.3kPa

The testing was performed by Leon Chen on 2012-11-26.

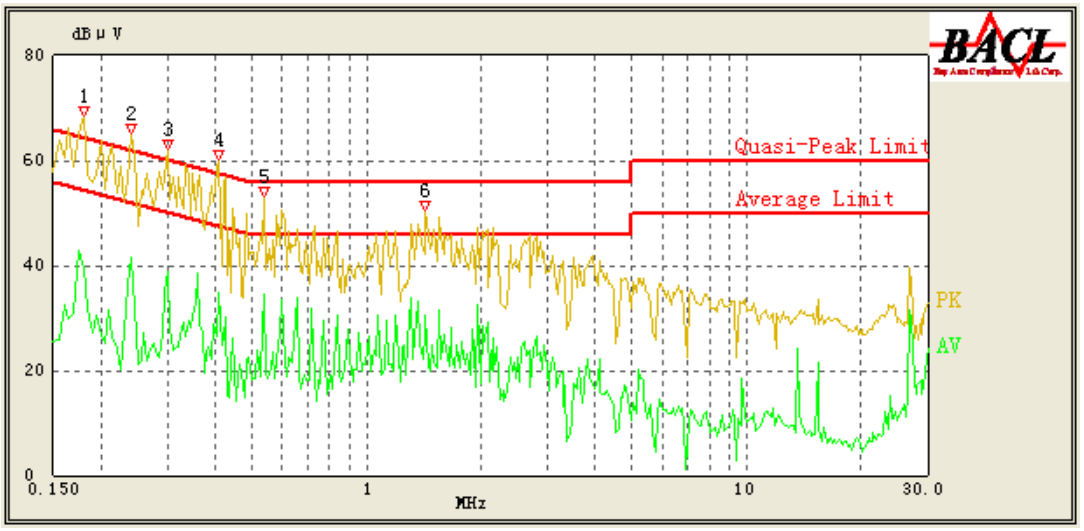
Test Mode: Transmitting

AC 120V/60 Hz, Line



Frequency (MHz)	Cord. Reading (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/AV/QP)
0.235	53.23	0.38	63.57	10.34	QP
0.235	41.68	0.38	53.57	11.89	AV
0.305	49.50	0.34	61.57	12.07	QP
0.305	30.14	0.34	51.57	21.43	AV
0.355	49.17	0.34	60.14	10.97	QP
0.355	38.36	0.34	50.14	11.78	AV
0.415	50.85	0.32	58.43	7.58	QP
0.415	39.29	0.32	48.43	9.14	AV
0.475	41.37	0.31	56.71	15.34	QP
0.475	35.07	0.31	46.71	11.64	AV
0.535	42.98	0.31	56.00	13.02	QP
0.535	32.60	0.31	46.00	13.40	AV

AC 120V/60 Hz, Neutral



Frequency (MHz)	Cord. Reading (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/AV/QP)
0.180	60.44	0.24	65.14	4.70	QP
0.180	39.41	0.24	55.14	15.73	AV
0.240	56.91	0.23	63.43	6.52	QP
0.240	41.51	0.23	53.43	11.92	AV
0.300	53.46	0.23	61.71	8.25	QP
0.300	38.99	0.23	51.71	12.72	AV
0.410	52.38	0.22	58.57	6.19	QP
0.410	34.97	0.22	48.57	13.60	AV
0.535	44.64	0.21	56.00	11.36	QP
0.535	34.51	0.21	46.00	11.49	AV
1.430	42.30	0.25	56.00	13.70	QP
1.430	30.49	0.25	46.00	15.51	AV

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

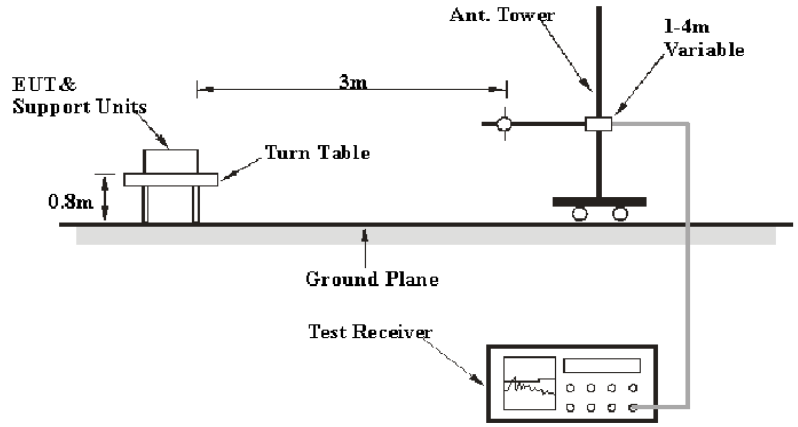
Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

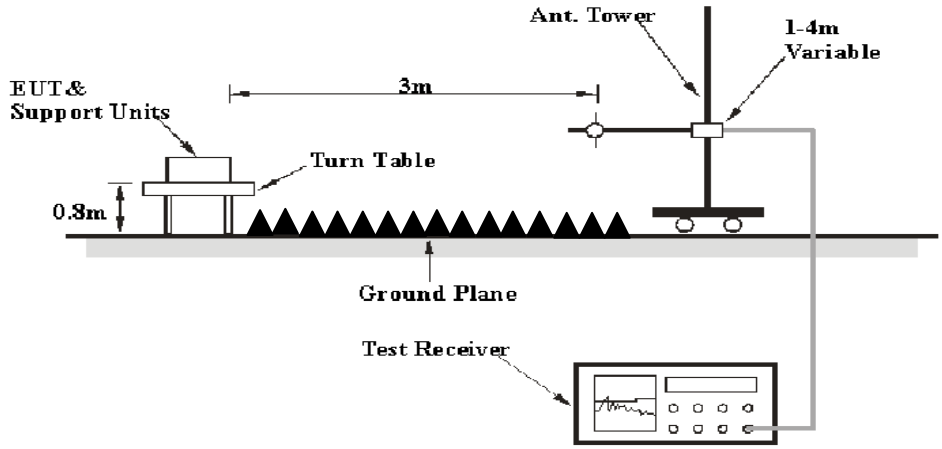
Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emission measurement at Bay Area Compliance Laboratories Corp. (Dongguan) is 4.0 dB(k=2, 95% level of confidence), and the uncertainty will not be taken into consideration for all the test data recorded in the report.

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.

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 BW***	***Detector***
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	Ave.

Test Procedure

Maximizing procedure was performed on the highest emission 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
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2012-05-14	2013-05-13
Sunol Sciences	Hybrid Antennas	JB3	A060611-1	2011-09-06	2013-09-05
HP	Pre-amplifier	8447E	2434A02181	2012-10-08	2013-10-07
R&S	Spectrum Analyzer	FSEM 30	DE31388	2012-03-15	2013-03-14
ETS-LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2014-09-05
Mini-Circuits	Wideband Amplifier	ZVA-183-S+	96901149	N/A	N/A

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

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

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, and section 15.205, 15.209 and 15.247, with the worst margin reading of:

10.84dB at **2390 MHz** in the **Vertical** polarization for model *Tansmitting (EDR*-8DPSK)

Test Data

Environmental Conditions

Temperature:	25.8℃
Relative Humidity:	57 %
ATM Pressure:	100.1kPa

The testing was performed by Leon Chen on 2012-11-22.

Test Mode: Tansmitting (BDR- 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	27.4	AV	H	25.65	3.90	0.00	56.95	N/A	N/A
2402	56.46	PK	H	25.65	3.90	0.00	86.01	N/A	N/A
2402	31.01	AV	V	25.65	3.90	0.00	60.56	N/A	N/A
2402	62.99	PK	V	25.65	3.90	0.00	92.54	N/A	N/A
2390	13.68	AV	V	25.61	3.84	0.00	43.13	54.00	10.87
389.62	38.12	QP	V	15.90	2.38	21.74	34.66	46.00	11.34
2390	28.25	PK	V	25.61	3.84	0.00	57.70	74.00	16.30
9608	18.74	AV	H	35.96	8.75	26.39	37.06	54.00	16.94
7206	19.87	AV	H	34.09	6.50	26.54	33.92	54.00	20.08
9608	33.43	PK	H	35.96	8.75	26.39	51.75	74.00	22.25
7206	34.82	PK	H	34.09	6.50	26.54	48.87	74.00	25.13
4804	19.95	AV	V	30.59	4.67	27.34	27.87	54.00	26.13
3027.5	18.17	AV	H	27.29	6.75	27.49	24.72	54.00	29.28
4804	34.79	PK	V	30.59	4.67	27.34	42.71	74.00	31.29
3027.5	34.08	PK	H	27.29	6.75	27.49	40.63	74.00	33.37
Middle Channel: 2441(MHz)									
2441	27.14	AV	H	25.75	3.99	0.00	56.88	N/A	N/A
2441	57.35	PK	H	25.75	3.99	0.00	87.09	N/A	N/A
2441	30.49	AV	V	25.75	3.99	0.00	60.23	N/A	N/A
2441	62.37	PK	V	25.75	3.99	0.00	92.11	N/A	N/A
389.45	38.01	QP	V	15.90	2.38	21.74	34.55	46.00	11.45
9764	18.99	AV	H	36.33	8.58	26.54	37.36	54.00	16.64
7323	19.55	AV	H	34.38	6.72	26.67	33.98	54.00	20.02
9764	33.26	PK	H	36.33	8.58	26.54	51.63	74.00	22.37
6645.3	18.57	AV	V	32.68	5.59	26.15	30.69	54.00	23.31
7323	35.19	PK	H	34.38	6.72	26.67	49.62	74.00	24.38
4882	19.93	AV	V	30.79	4.75	27.04	28.43	54.00	25.57
3020	18.75	AV	H	27.26	6.95	27.52	25.44	54.00	28.56
6645.3	33.04	PK	V	32.68	5.59	26.15	45.16	74.00	28.84
4882	34.1	PK	V	30.79	4.75	27.04	42.60	74.00	31.40
3020	33.14	PK	H	27.26	6.95	27.52	39.83	74.00	34.17
High Channel: 2480(MHz)									
2480	27.04	AV	H	25.85	3.82	0.00	56.71	N/A	N/A
2480	58.77	PK	H	25.85	3.82	0.00	88.44	N/A	N/A
2480	30.58	AV	V	25.85	3.82	0.00	60.25	N/A	N/A
2480	62.62	PK	V	25.85	3.82	0.00	92.29	N/A	N/A
2483.5	13.38	AV	V	25.86	3.80	0.00	43.04	54.00	10.96
389.62	37.98	QP	V	15.90	2.38	21.74	34.52	46.00	11.48
9920	18.65	AV	H	36.71	8.41	26.70	37.07	54.00	16.93
2483.5	26.78	PK	V	25.86	3.80	0.00	56.44	74.00	17.56
7440	19.57	AV	H	34.66	6.95	26.79	34.39	54.00	19.61
9920	32.78	PK	H	36.71	8.41	26.70	51.20	74.00	22.80
7440	34.95	PK	H	34.66	6.95	26.79	49.77	74.00	24.23
4960	20.68	AV	V	31.00	4.70	27.26	29.12	54.00	24.88
3092.1	18.26	AV	H	27.49	5.42	27.51	23.66	54.00	30.34
4960	35.06	PK	V	31.00	4.70	27.26	43.50	74.00	30.50
3092.1	34.17	PK	H	27.49	5.42	27.51	39.57	74.00	34.43

Test Mode: Tansmitting (EDR-π/4-QPSK)

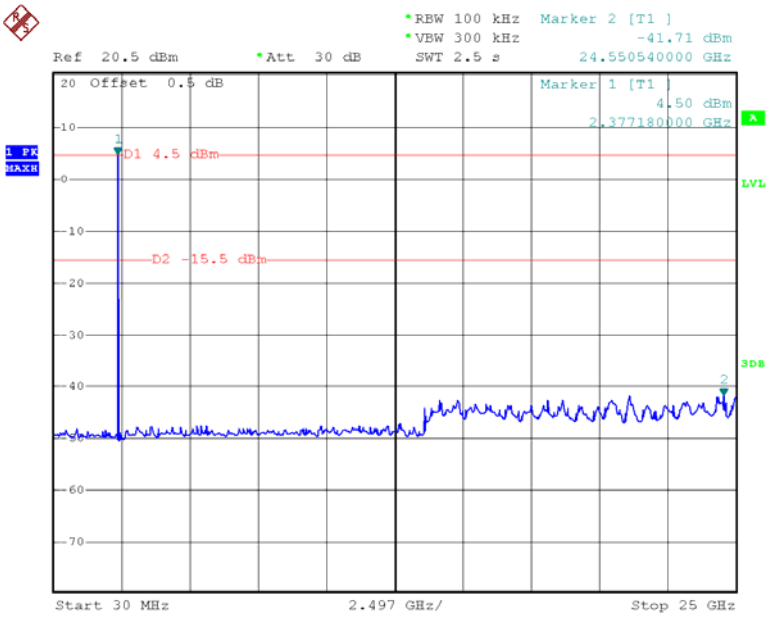
Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2402(MHz)									
2402	36.77	AV	H	25.65	3.90	0.00	66.32	N/A	N/A
2402	57.08	PK	H	25.65	3.90	0.00	86.63	N/A	N/A
2402	39.4	AV	V	25.65	3.90	0.00	68.95	N/A	N/A
2402	59.33	PK	V	25.65	3.90	0.00	88.88	N/A	N/A
2390	13.67	AV	V	25.61	3.84	0.00	43.12	54.00	10.88
389.62	38.25	QP	V	15.90	2.38	21.74	34.79	46.00	11.21
2390	27.62	PK	V	25.61	3.84	0.00	57.07	74.00	16.93
9608	17.83	AV	H	35.96	8.75	26.39	36.15	54.00	17.85
7206	17.92	AV	H	34.09	6.50	26.54	31.97	54.00	22.03
9608	31.81	PK	H	35.96	8.75	26.39	50.13	74.00	23.87
7206	31.93	PK	H	34.09	6.50	26.54	45.98	74.00	28.02
4804	17.7	AV	V	30.59	4.67	27.34	25.62	54.00	28.38
3036.4	18.05	AV	H	27.32	6.52	27.46	24.43	54.00	29.57
4804	32.72	PK	V	30.59	4.67	27.34	40.64	74.00	33.36
3036.4	32.73	PK	H	27.32	6.52	27.46	39.11	74.00	34.89
Middle Channel: 2441(MHz)									
2441	36.68	AV	H	25.75	3.99	0.00	66.42	N/A	N/A
2441	56.18	PK	H	25.75	3.99	0.00	85.92	N/A	N/A
2441	39.38	AV	V	25.75	3.99	0.00	69.12	N/A	N/A
2441	60.07	PK	V	25.75	3.99	0.00	89.81	N/A	N/A
389.45	38.13	QP	V	15.90	2.38	21.74	34.67	46.00	11.33
9764	18.77	AV	H	36.33	8.58	26.54	37.14	54.00	16.86
7323	19.81	AV	H	34.38	6.72	26.67	34.24	54.00	19.76
9764	33.23	PK	H	36.33	8.58	26.54	51.60	74.00	22.40
6637.1	18.77	AV	V	32.66	5.58	26.15	30.86	54.00	23.14
7323	34.05	PK	H	34.38	6.72	26.67	48.48	74.00	25.52
4882	19.87	AV	V	30.79	4.75	27.04	28.37	54.00	25.63
6637.1	33.05	PK	V	32.66	5.58	26.15	45.14	74.00	28.86
3022.4	18.47	AV	H	27.27	6.89	27.51	25.12	54.00	28.88
4882	34.08	PK	V	30.79	4.75	27.04	42.58	74.00	31.42
3022.4	32.71	PK	H	27.27	6.89	27.51	39.36	74.00	34.64
High Channel: 2480(MHz)									
2480	36.62	AV	H	25.85	3.82	0.00	66.29	N/A	N/A
2480	55.89	PK	H	25.85	3.82	0.00	85.56	N/A	N/A
2480	39.37	AV	V	25.85	3.82	0.00	69.04	N/A	N/A
2480	60.52	PK	V	25.85	3.82	0.00	90.19	N/A	N/A
2483.5	13.22	AV	V	25.86	3.80	0.00	42.88	54.00	11.12
389.62	38.06	QP	V	15.90	2.38	21.74	34.60	46.00	11.40
9920	18.83	AV	H	36.71	8.41	26.70	37.25	54.00	16.75
2483.5	26.66	PK	V	25.86	3.80	0.00	56.32	74.00	17.68
7440	19.75	AV	H	34.66	6.95	26.79	34.57	54.00	19.43
9920	32.46	PK	H	36.71	8.41	26.70	50.88	74.00	23.12
7440	33.73	PK	H	34.66	6.95	26.79	48.55	74.00	25.45
4960	19.88	AV	V	31.00	4.70	27.26	28.32	54.00	25.68
3091.5	18.09	AV	H	27.49	5.43	27.51	23.50	54.00	30.50
4960	33.98	PK	V	31.00	4.70	27.26	42.42	74.00	31.58
3091.5	33.01	PK	H	27.49	5.43	27.51	38.42	74.00	35.58

Test Mode: Tansmitting (EDR-8DPSK)

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	36.74	AV	H	25.65	3.90	0.00	66.29	N/A	N/A
2402	57.14	PK	H	25.65	3.90	0.00	86.69	N/A	N/A
2402	39.35	AV	V	25.65	3.90	0.00	68.90	N/A	N/A
2402	59.75	PK	V	25.65	3.90	0.00	89.30	N/A	N/A
2390	13.71	AV	V	25.61	3.84	0.00	43.16	54.00	10.84
389.62	38.19	QP	V	15.90	2.38	21.74	34.73	46.00	11.27
2390	27.81	PK	V	25.61	3.84	0.00	57.26	74.00	16.74
9608	18.11	AV	H	35.96	8.75	26.39	36.43	54.00	17.57
7206	18.04	AV	H	34.09	6.50	26.54	32.09	54.00	21.91
9608	32.04	PK	H	35.96	8.75	26.39	50.36	74.00	23.64
7206	32.08	PK	H	34.09	6.50	26.54	46.13	74.00	27.87
4804	17.83	AV	V	30.59	4.67	27.34	25.75	54.00	28.25
3030.5	18.14	AV	H	27.30	6.67	27.48	24.63	54.00	29.37
4804	32.81	PK	V	30.59	4.67	27.34	40.73	74.00	33.27
3030.5	33.16	PK	H	27.30	6.67	27.48	39.65	74.00	34.35
Middle Channel: 2441(MHz)									
2441	36.47	AV	H	25.75	3.99	0.00	66.21	N/A	N/A
2441	56.17	PK	H	25.75	3.99	0.00	85.91	N/A	N/A
2441	39.34	AV	V	25.75	3.99	0.00	69.08	N/A	N/A
2441	60.18	PK	V	25.75	3.99	0.00	89.92	N/A	N/A
389.45	37.96	QP	V	15.90	2.38	21.74	34.50	46.00	11.50
9764	18.57	AV	H	36.33	8.58	26.54	36.94	54.00	17.06
7323	19.76	AV	H	34.38	6.72	26.67	34.19	54.00	19.81
6628.4	18.78	AV	V	32.63	5.57	26.14	30.84	54.00	23.16
9764	32.16	PK	H	36.33	8.58	26.54	50.53	74.00	23.47
7323	33.91	PK	H	34.38	6.72	26.67	48.34	74.00	25.66
4882	19.77	AV	V	30.79	4.75	27.04	28.27	54.00	25.73
3017.8	18.45	AV	H	27.26	7.01	27.53	25.19	54.00	28.81
6628.4	33.08	PK	V	32.63	5.57	26.14	45.14	74.00	28.86
4882	34.11	PK	V	30.79	4.75	27.04	42.61	74.00	31.39
3017.8	32.7	PK	H	27.26	7.01	27.53	39.44	74.00	34.56
High Channel: 2480(MHz)									
2480	36.45	AV	H	25.85	3.82	0.00	66.12	N/A	N/A
2480	55.13	PK	H	25.85	3.82	0.00	84.80	N/A	N/A
2480	39.31	AV	V	25.85	3.82	0.00	68.98	N/A	N/A
2480	60.29	PK	V	25.85	3.82	0.00	89.96	N/A	N/A
2483.5	13.25	AV	V	25.86	3.80	0.00	42.91	54.00	11.09
389.62	37.84	QP	V	15.90	2.38	21.74	34.38	46.00	11.62
9920	18.81	AV	H	36.71	8.41	26.70	37.23	54.00	16.77
2483.5	26.58	PK	V	25.86	3.80	0.00	56.24	74.00	17.76
7440	19.68	AV	H	34.66	6.95	26.79	34.50	54.00	19.50
9920	32.51	PK	H	36.71	8.41	26.70	50.93	74.00	23.07
7440	33.62	PK	H	34.66	6.95	26.79	48.44	74.00	25.56
4960	19.82	AV	V	31.00	4.70	27.26	28.26	54.00	25.74
3092.8	18.11	AV	H	27.50	5.41	27.51	23.51	54.00	30.49
4960	33.85	PK	V	31.00	4.70	27.26	42.29	74.00	31.71
3092.8	32.77	PK	H	27.50	5.41	27.51	38.17	74.00	35.83

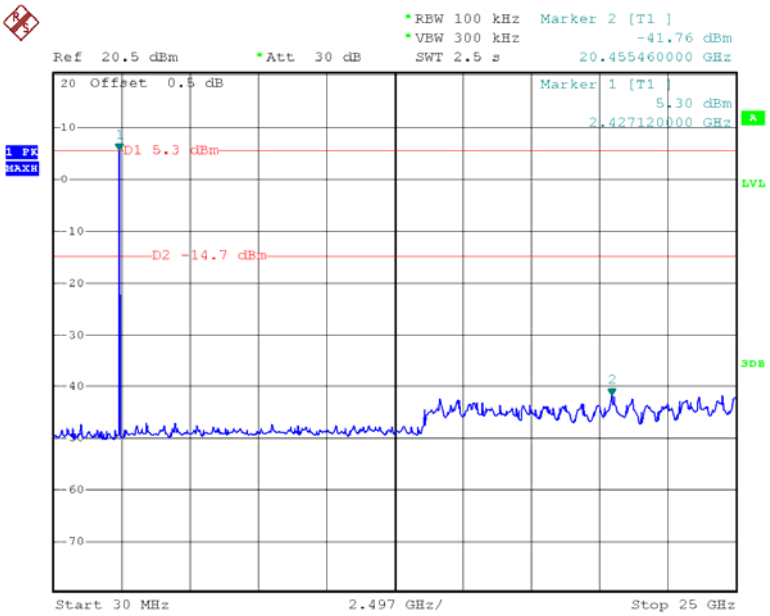
Conducted Spurious Emission at Antenna Port

BDR - Low Channel



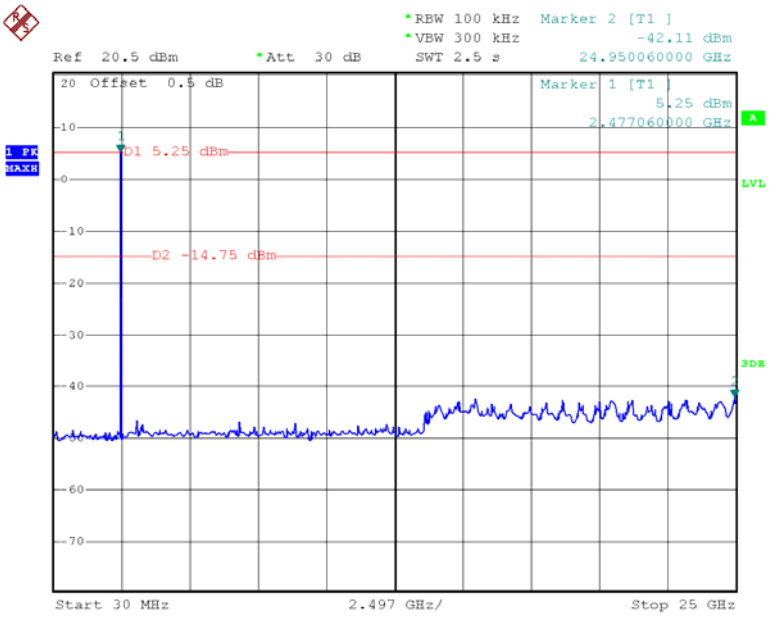
Date: 22.NOV.2012 15:19:30

BDR- Middle Channel



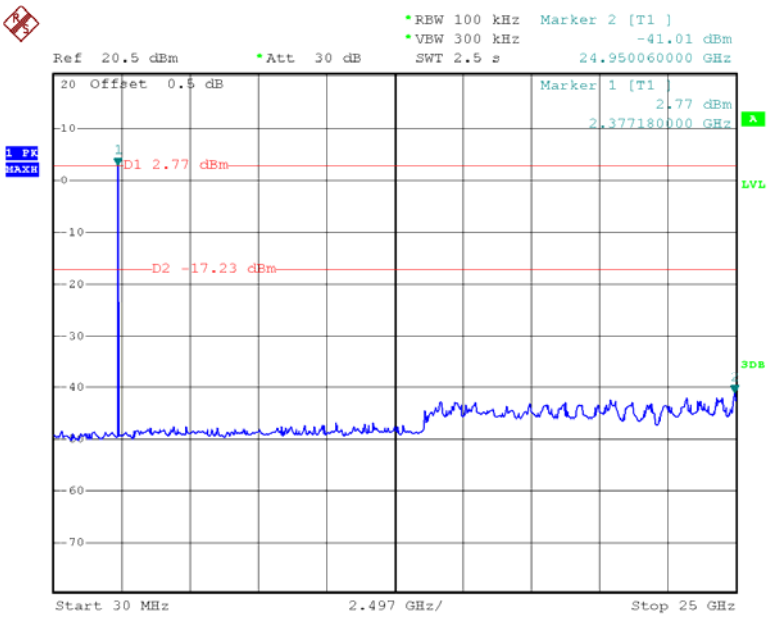
Date: 22.NOV.2012 15:21:27

BDR- High Channel



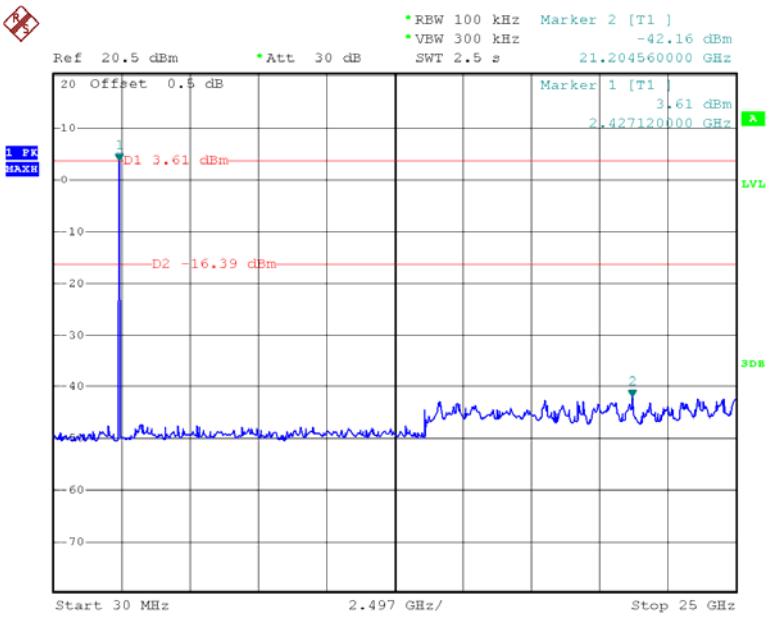
Date: 22.NOV.2012 15:26:16

EDR (π/4-QPSK) Low Channel



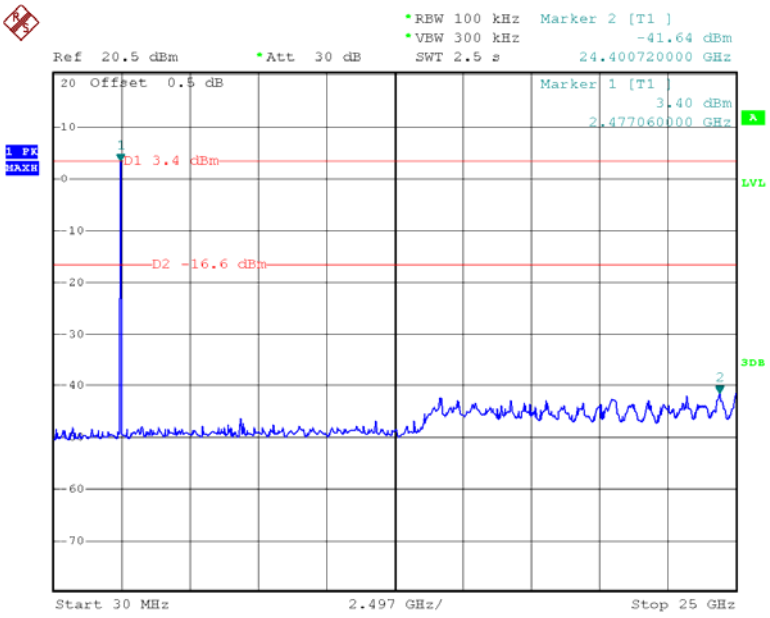
Date: 22.NOV.2012 15:37:26

EDR (π/4-QPSK) Middle Channel



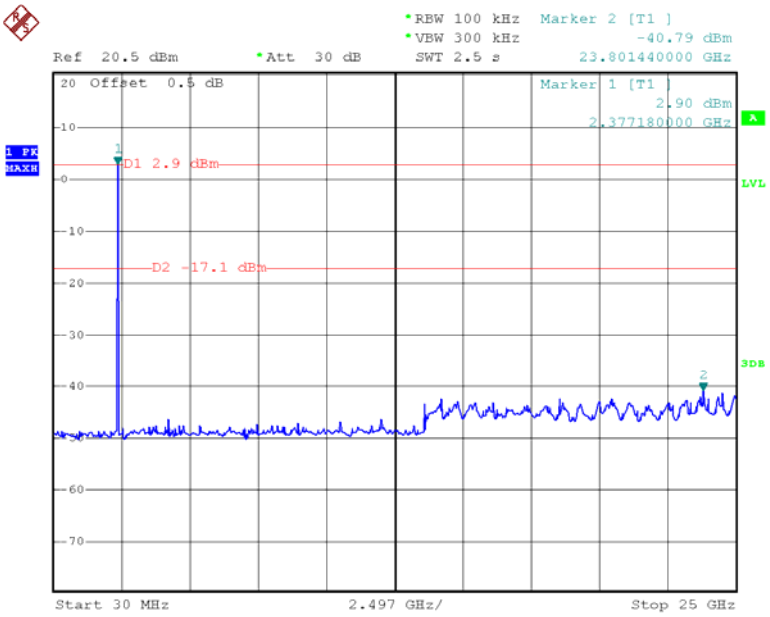
Date: 22.NOV.2012 15:35:20

EDR (π/4-QPSK) High Channel



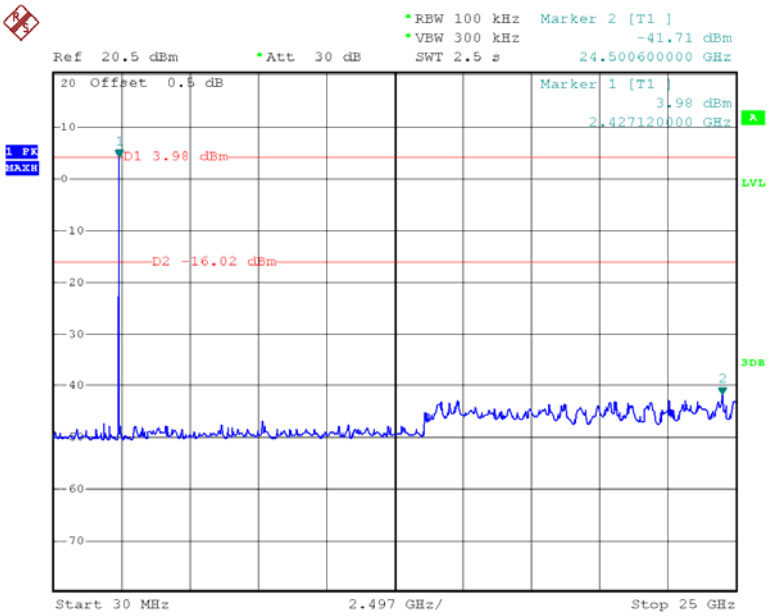
Date: 22.NOV.2012 15:32:34

EDR (8DPSK) - Low Channel



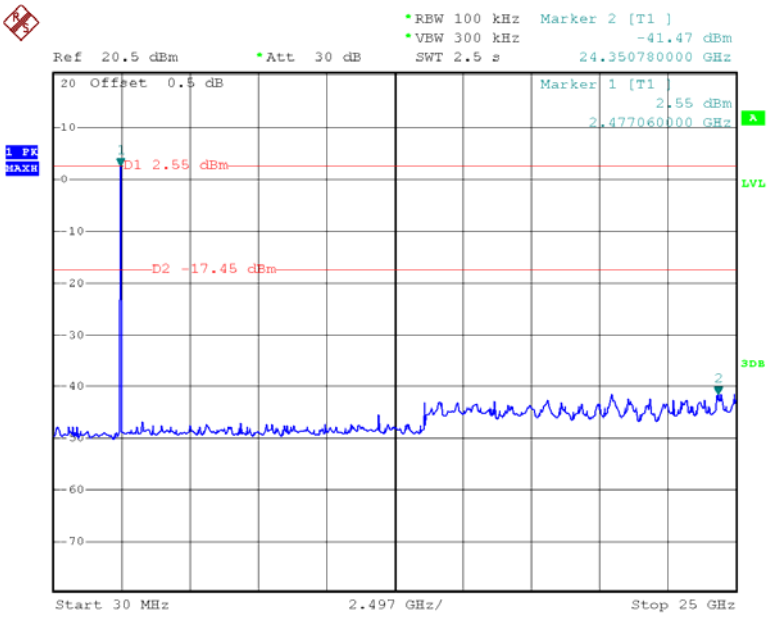
Date: 22.NOV.2012 15:44:00

EDR (8DPSK) - Middle Channel



Date: 22.NOV.2012 15:45:49

EDR (8DPSK) - High Channel



Date: 22.NOV.2012 15:47:43

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

Applicable Standard

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

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 truce
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	26.3℃
Relative Humidity:	55 %
ATM Pressure:	100.1kPa

** The testing was performed by Leon Chen on 2012-11-22.*

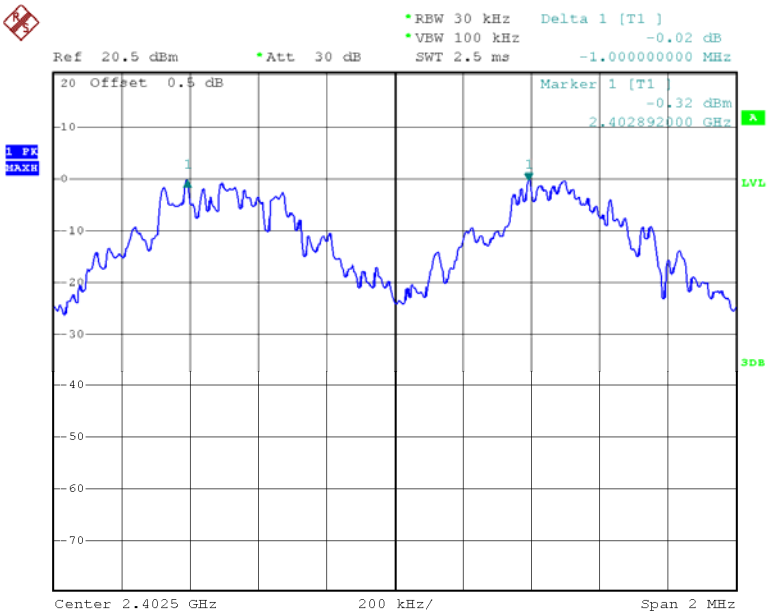
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

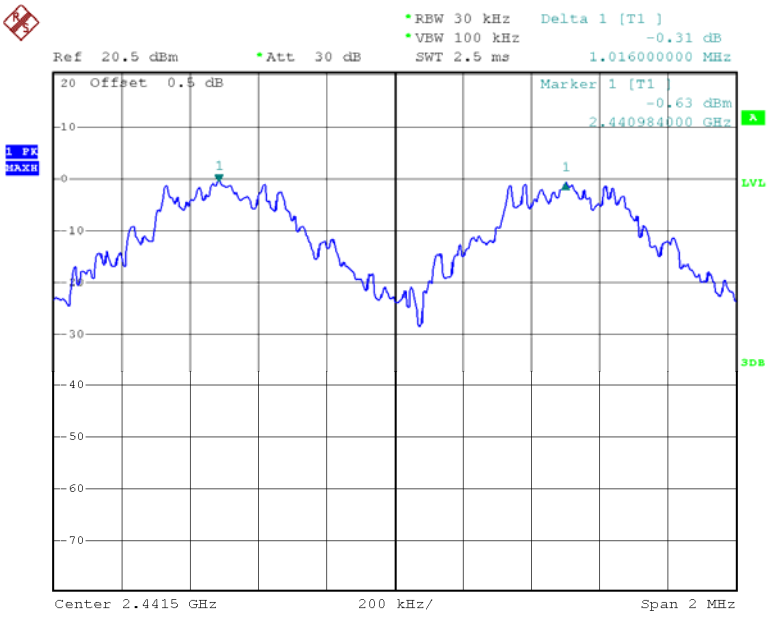
Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
BDR Mode (GFSK)	Low	2402	1.00	0.59	Pass
	Adjacent	2403			
	Middle	2441	1.016	0.63	Pass
	Adjacent	2442			
	High	2480	1.00	0.62	Pass
	Adjacent	2479			
EDR Mode (π/4-QPSK)	Low	2402	1.004	0.83	Pass
	Adjacent	2403			
	Middle	2441	1.012	0.87	Pass
	Adjacent	2442			
	High	2480	1.00	0.86	Pass
	Adjacent	2479			
EDR Mode (8DPSK)	Low	2402	1.004	0.84	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.84	Pass
	Adjacent	2442			
	High	2480	1.004	0.84	Pass
	Adjacent	2479			

BDR - Low Channel



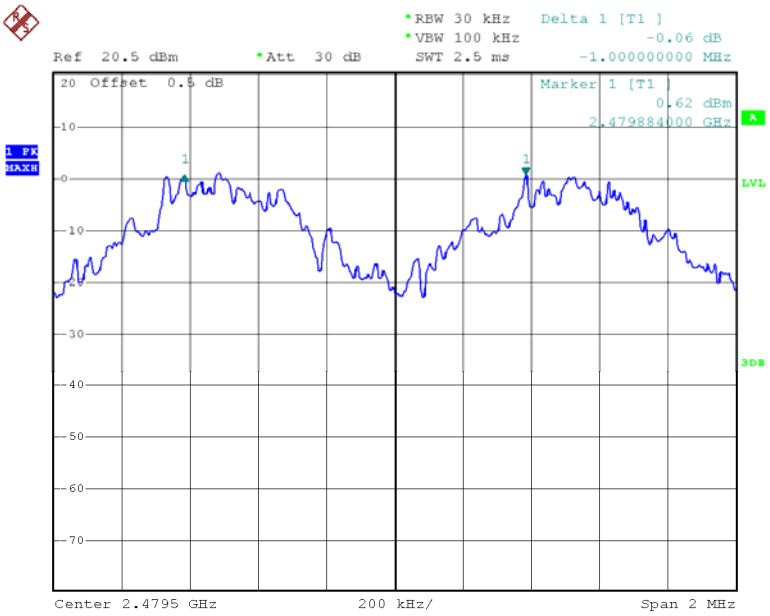
Date: 22.NOV.2012 21:58:40

BDR - Middle Channel



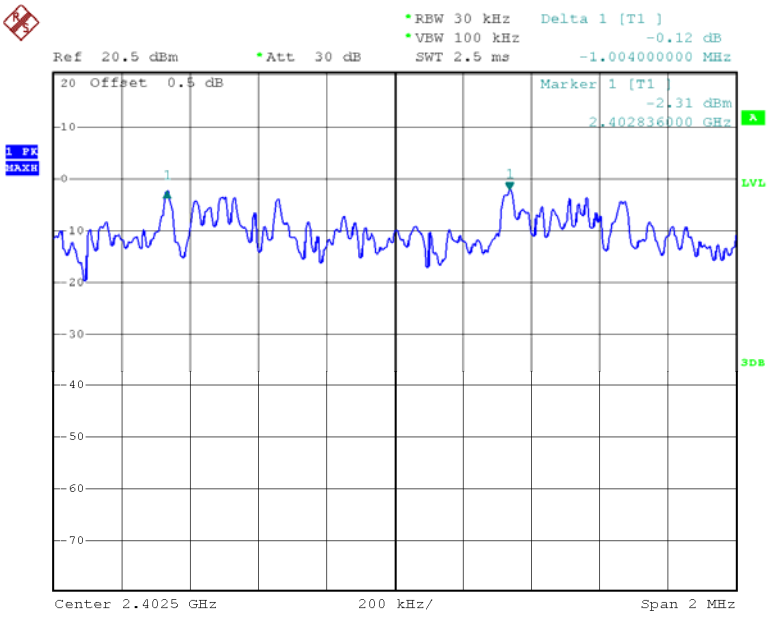
Date: 22.NOV.2012 21:59:59

BDR - High Channel



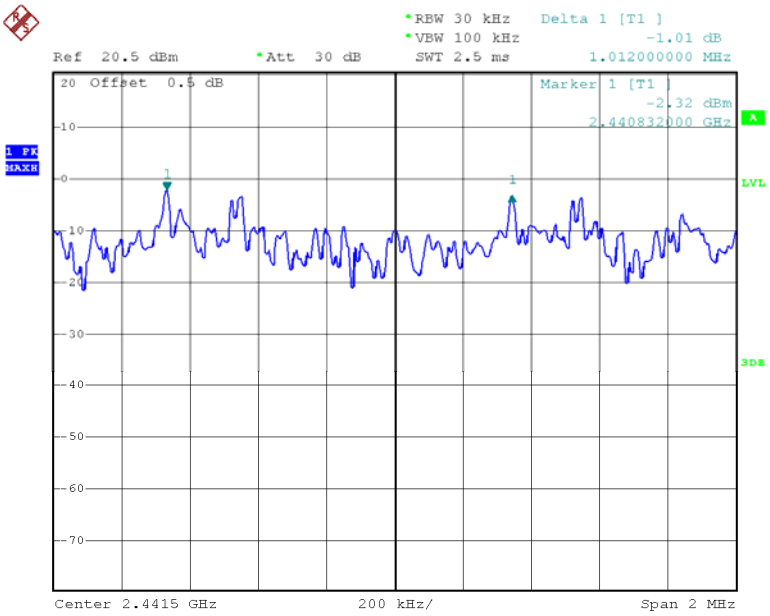
Date: 22.NOV.2012 22:00:56

EDR (π/4-QPSK) - Low Channel



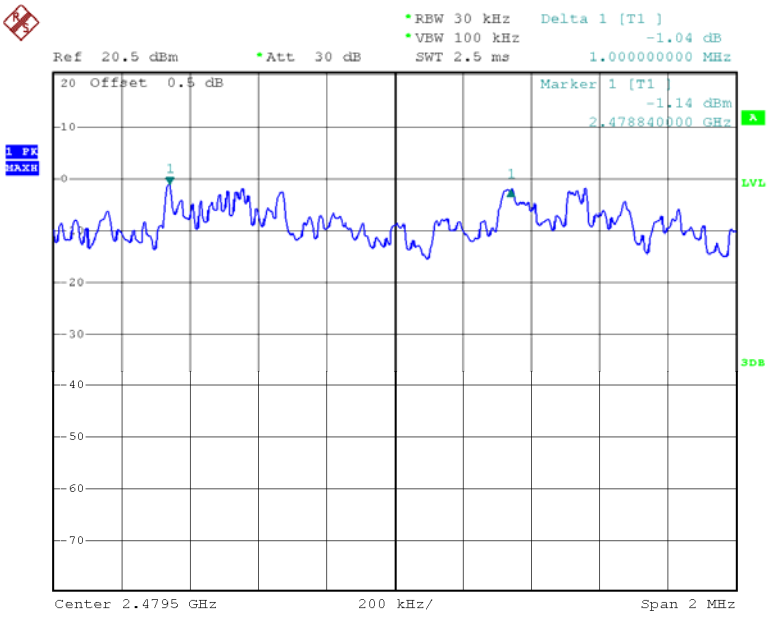
Date: 22.NOV.2012 22:25:39

EDR (π/4-QPSK) - Middle Channel



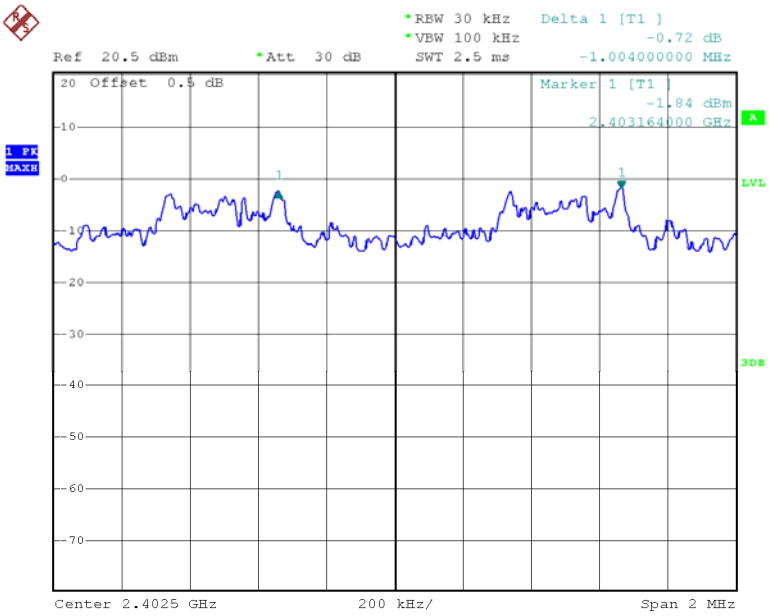
Date: 22.NOV.2012 22:27:54

EDR (π/4-QPSK) - High Channel



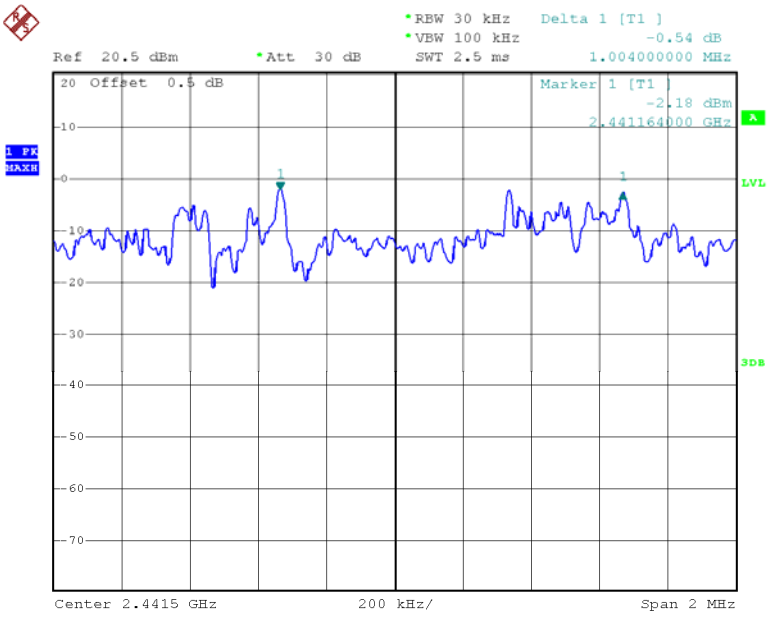
Date: 22.NOV.2012 22:29:00

EDR (8DPSK) - Low Channel



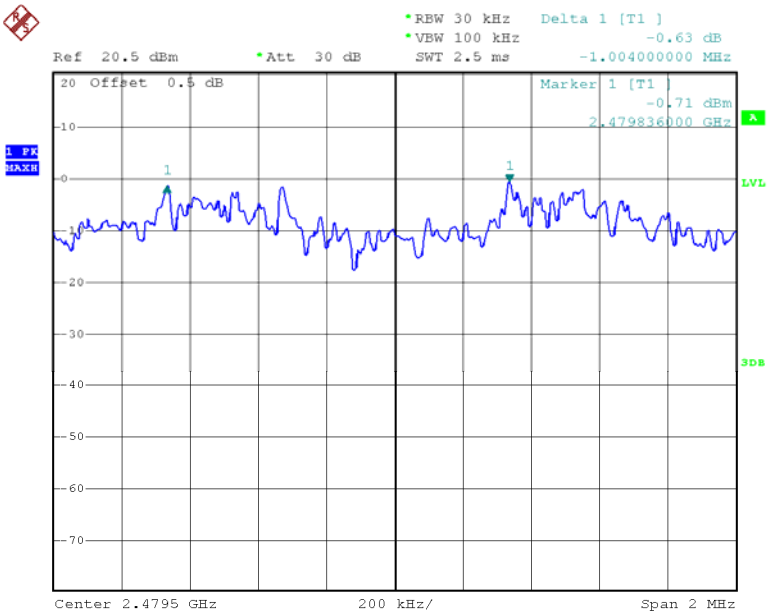
Date: 22.NOV.2012 00:01:22

EDR (8DPSK) - Middle Channel



Date: 22.NOV.2012 23:57:39

EDR (8DPSK) - High Channel



Date: 22.NOV.2012 00:03:09

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

Applicable Standard

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

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

Test Data

Environmental Conditions

Temperature:	26.3℃
Relative Humidity:	55 %
ATM Pressure:	100.1kPa

** The testing was performed by Leon Chen on 2012-11-22.*

Test Result: Compliance.

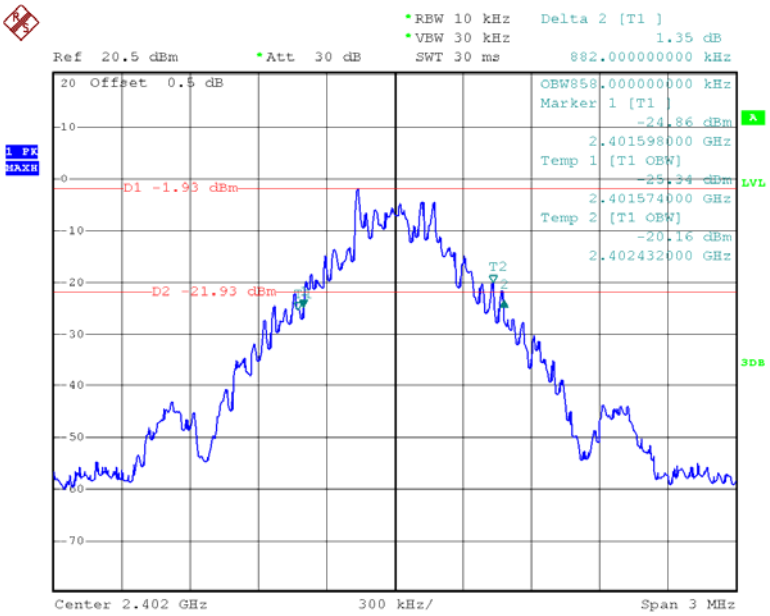
Please refer to following tables and plots

Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.882
	Middle	2441	0.942
	High	2480	0.936
EDR Mode (π/4-QPSK)	Low	2402	1.248
	Middle	2441	1.302
	High	2480	1.284
EDR Mode (8DPSK)	Low	2402	1.266
	Middle	2441	1.266
	High	2480	1.266

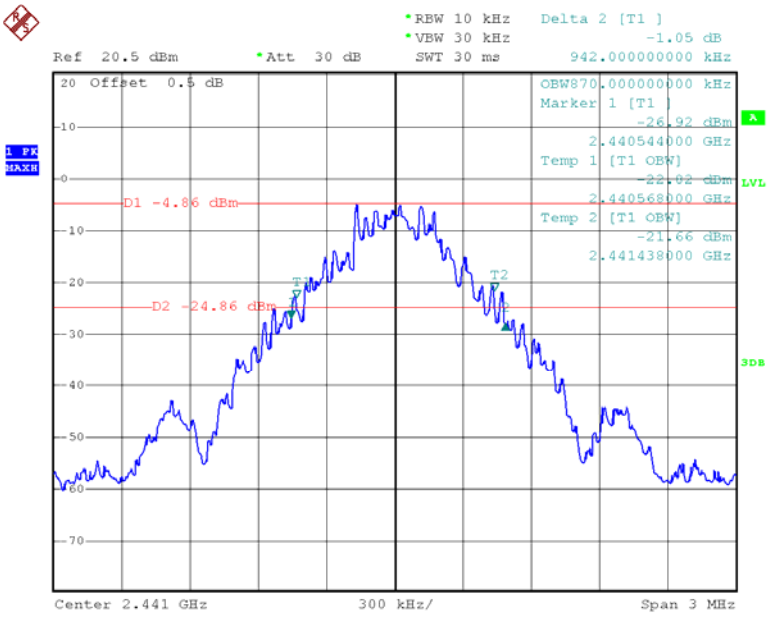
Please refer to the following plots.

BDR - Low Channel



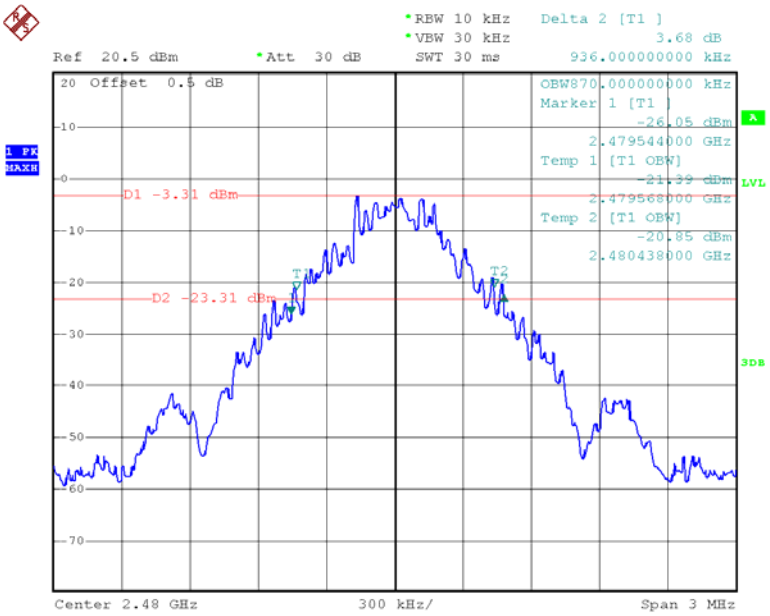
Date: 22.NOV.2012 21:39:23

BDR - Middle Channel



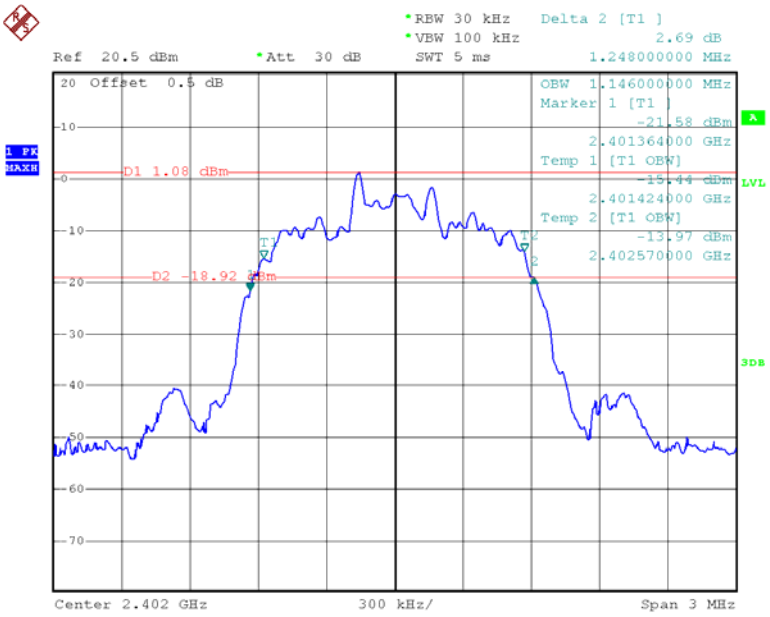
Date: 22.NOV.2012 21:43:38

BDR - High Channel



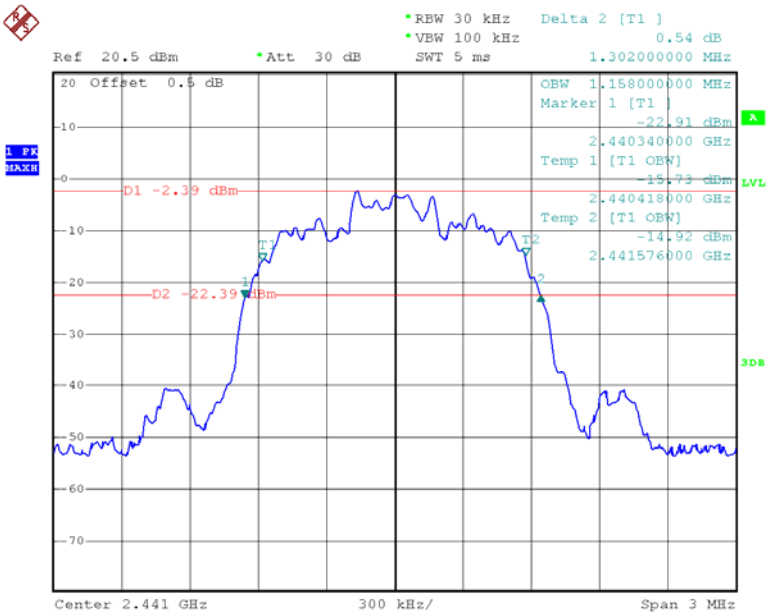
Date: 22.NOV.2012 21:49:55

EDR (π/4-QPSK) - Low Channel



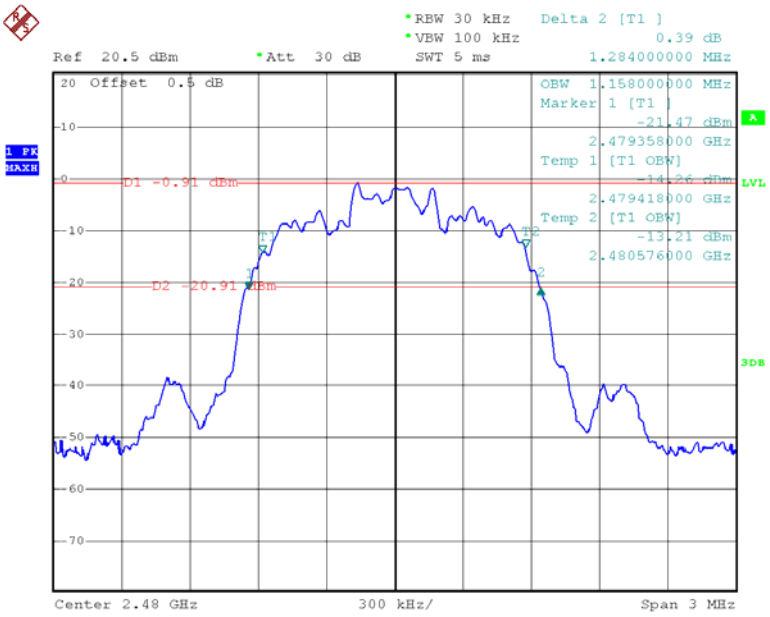
Date: 22.NOV.2012 23:00:29

EDR (π/4-QPSK) - Middle Channel



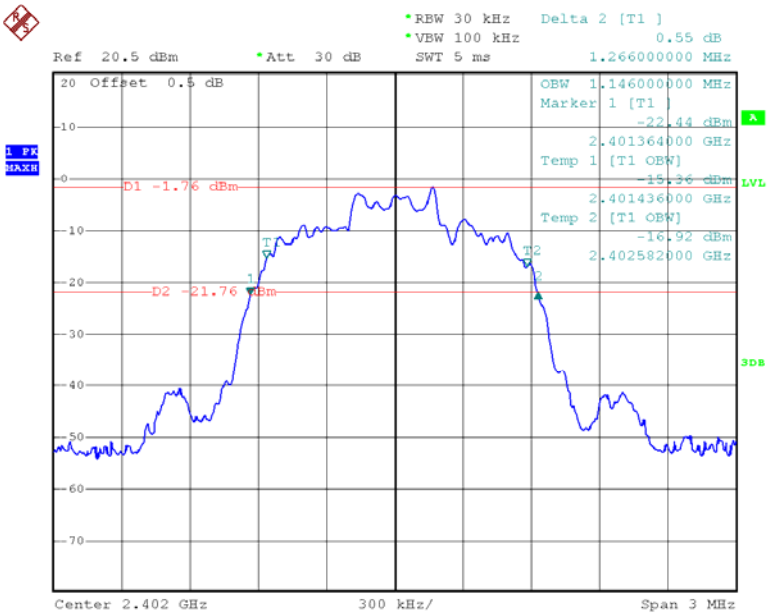
Date: 22.NOV.2012 22:57:54

EDR (π/4-QPSK) - High Channel



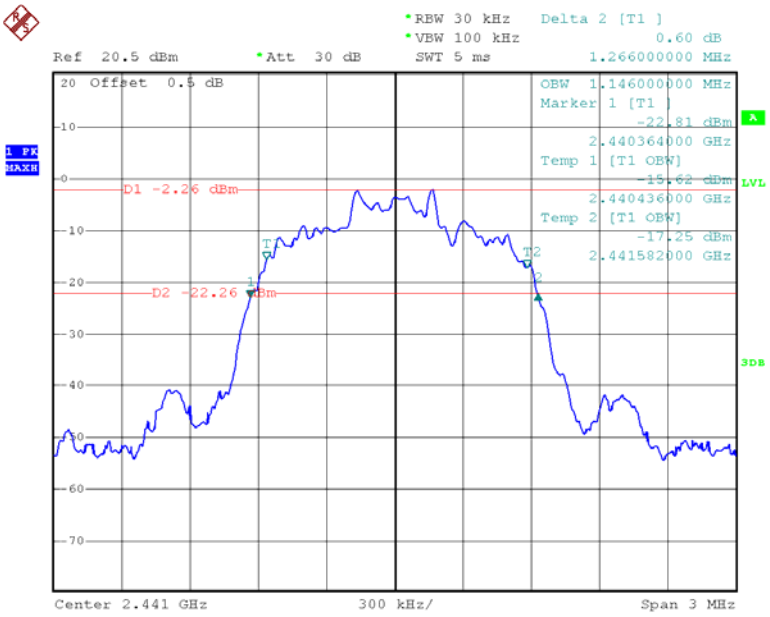
Date: 22.NOV.2012 22:54:21

EDR (8DPSK) - Low Channel



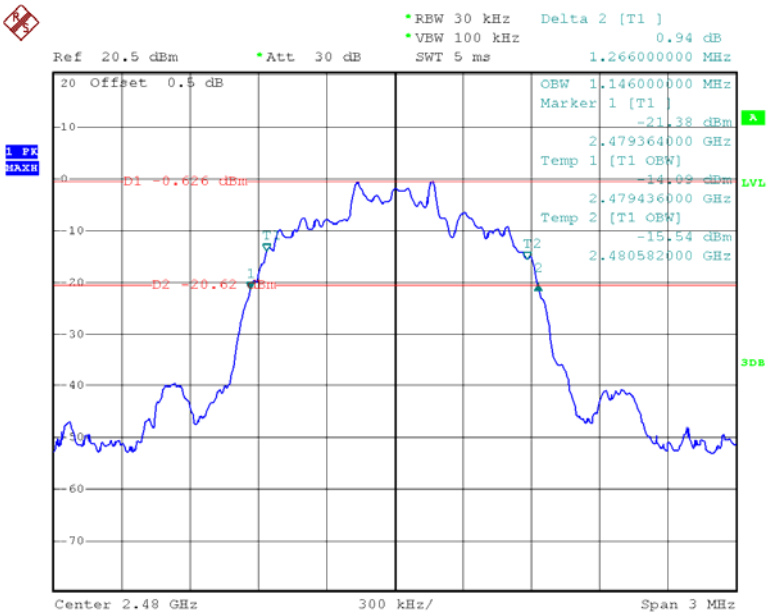
Date: 22.NOV.2012 00:20:04

EDR (8DPSK) - Middle Channel



Date: 22.NOV.2012 00:23:49

EDR (8DPSK) - High Channel



Date: 22.NOV.2012 00:31:37

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	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

Test Data

Environmental Conditions

Temperature:	26.3℃
Relative Humidity:	55 %
ATM Pressure:	100.1kPa

* *The testing was performed by Leon Chen on 2012-11-22.*

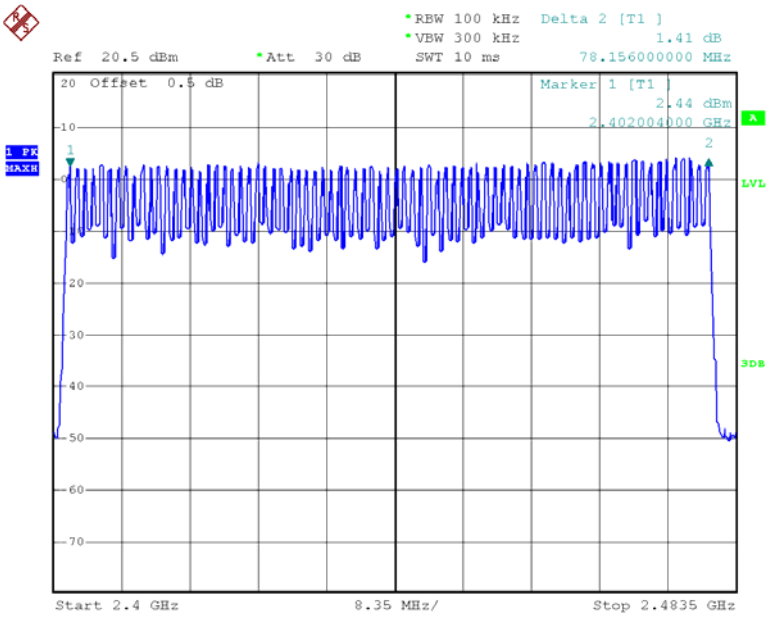
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

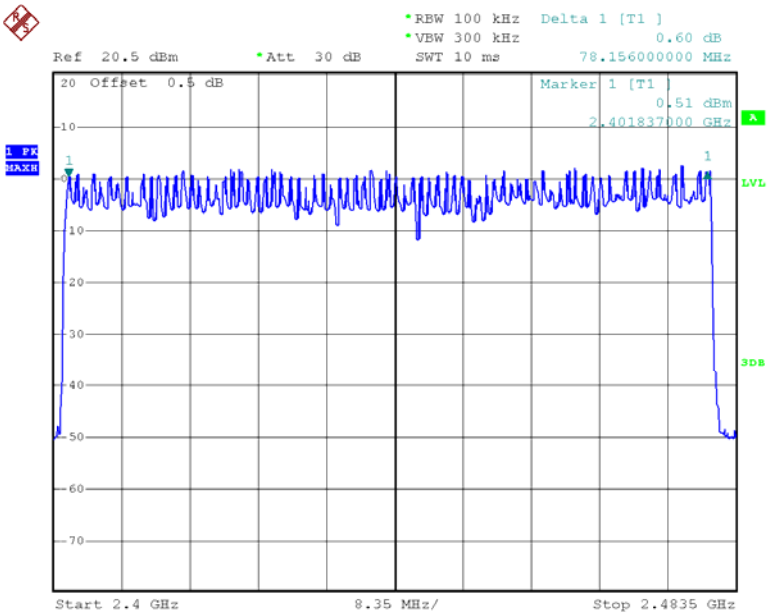
	Frequency Range (MHz)	Number of Hopping Channel	Limit
BDR(GFSK)	2400-2483.5	79	≥15
EDR (π/4-QPSK)	2400-2483.5	79	≥15
EDR (8DPSK)	2400-2483.5	79	≥15

BDR - Number of Hopping Channels



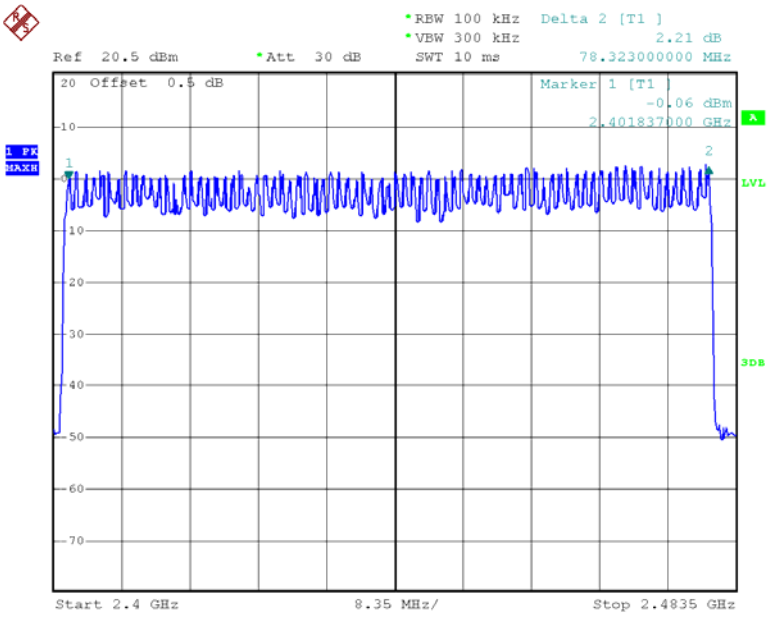
Date: 22.NOV.2012 21:55:43

EDR (π/4-QPSK) - Number of Hopping Channels



Date: 22.NOV.2012 22:30:51

EDR (8DPSK) - Number of Hopping Channels



Date: 22.NOV.2012 23:51:29

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

Applicable Standard

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

Test Procedure

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 * channel no. (s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Dwell Time= time slot length * hope rate/ number of hopping channels * 31.6s
Hop rate=1600/s

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

Test Data

Environmental Conditions

Temperature:	26.3℃
Relative Humidity:	55 %
ATM Pressure:	100.1kPa

** The testing was performed by Leon Chen on 2012-11-22.*

Test Result: Compliance.

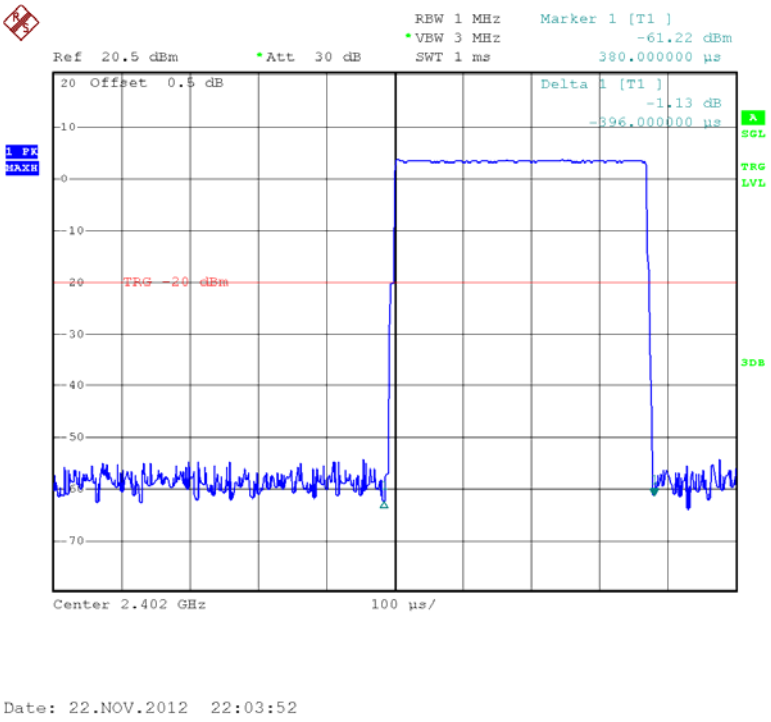
Please refer to following tables and plots

DH1:

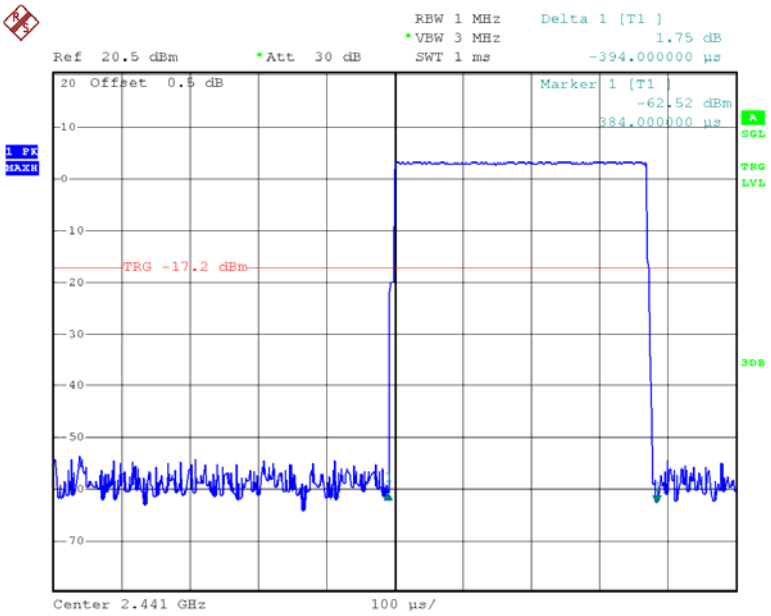
Test Mode: Transmitting

	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
BDR Mode (GFSK)	Low	0.382	0.122	0.4	Pass
	Middle	0.394	0.126	0.4	Pass
	High	0.380	0.122	0.4	Pass
	Note: Dwell time = Pulse time*(1600/2/79)*31.6S				
EDR Mode (π/4-QPSK)	Low	0.404	0.129	0.4	Pass
	Middle	0.398	0.127	0.4	Pass
	High	0.404	0.129	0.4	Pass
	Note: Dwell time = Pulse time*(1600/2/79)*31.6S				
EDR Mode (8DPSK)	Low	0.412	0.132	0.4	Pass
	Middle	0.404	0.129	0.4	Pass
	High	0.404	0.129	0.4	Pass
	Note: Dwell time = Pulse time*(1600/2/79)*31.6S				

BDR - Low Channel

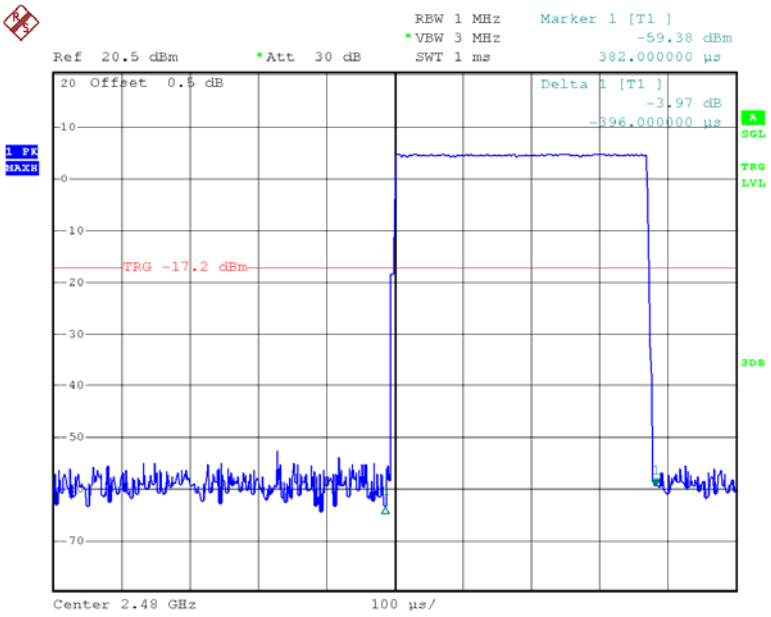


BDR - Middle Channel



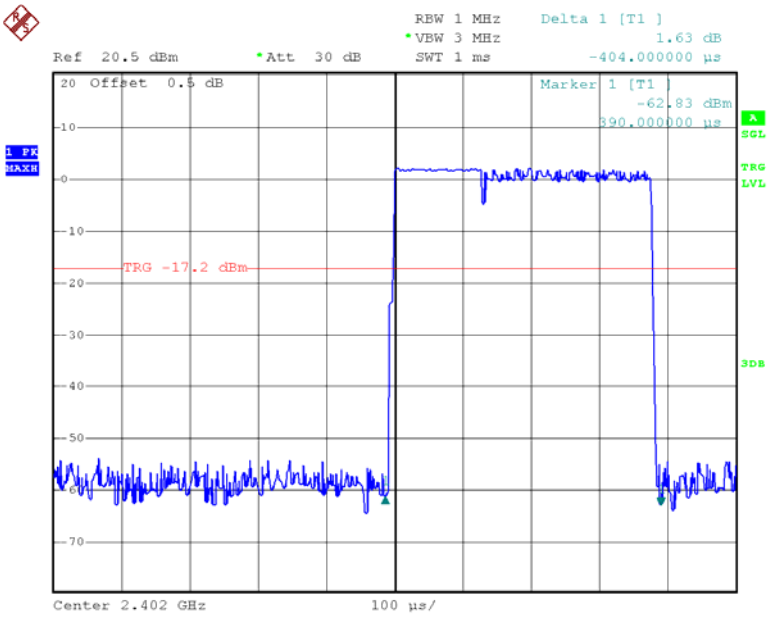
Date: 22.NOV.2012 22:04:34

BDR - High Channel



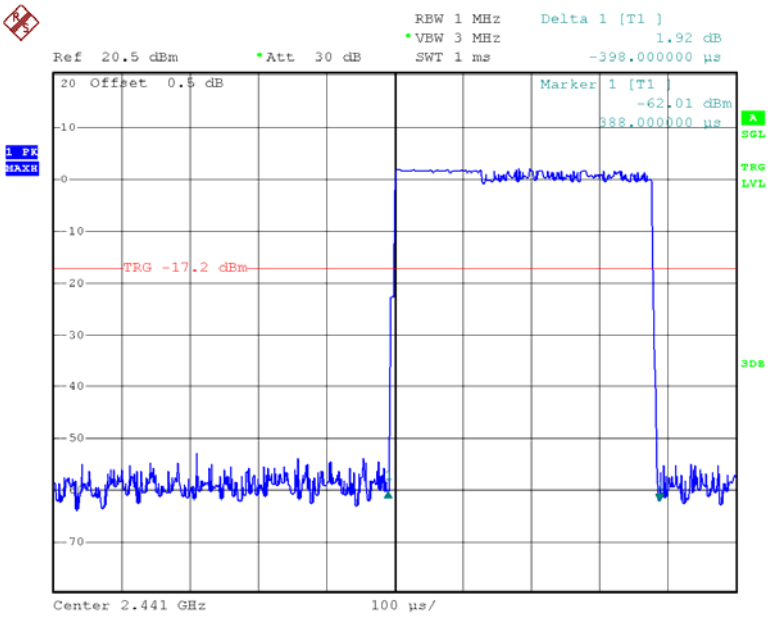
Date: 22.NOV.2012 22:05:08

EDR (π/4-QPSK) - Low Channel



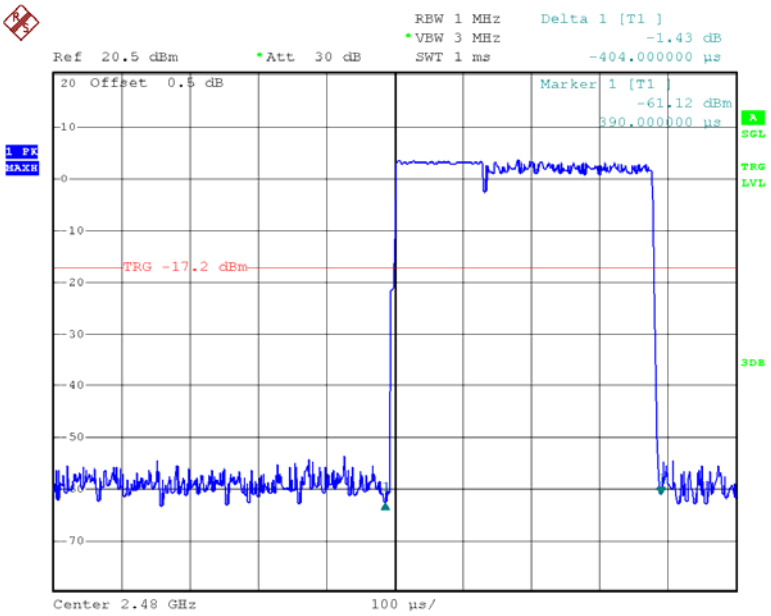
Date: 22.NOV.2012 22:15:33

EDR (π/4-QPSK) - Middle Channel



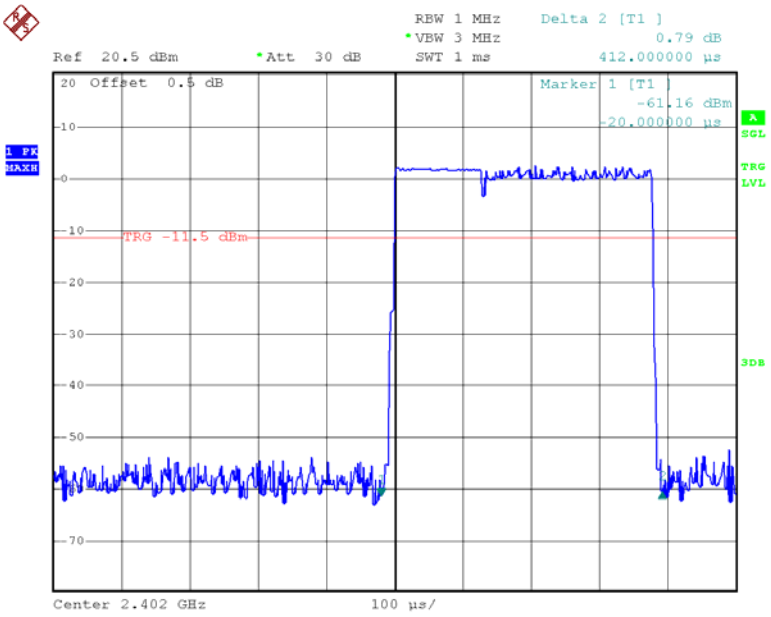
Date: 22.NOV.2012 22:16:05

EDR (π/4-QPSK) - High Channel



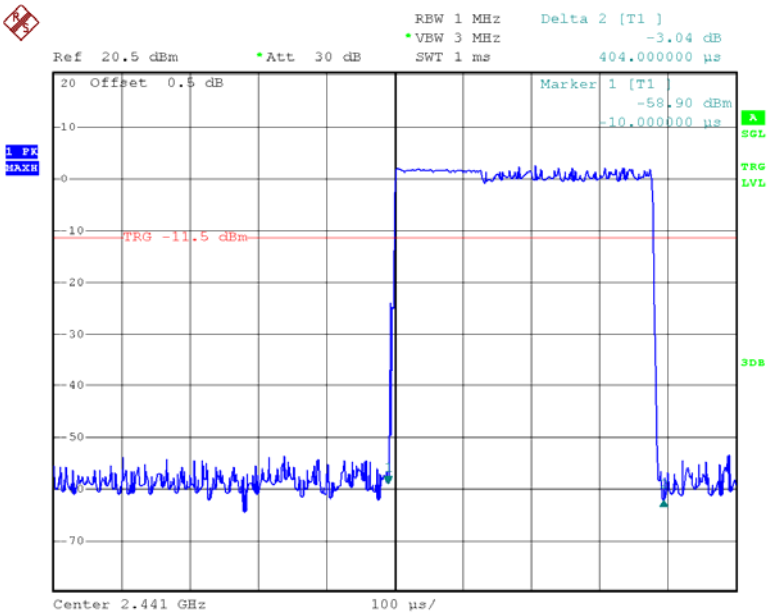
Date: 22.NOV.2012 22:16:59

EDR (8DPSK) - Low Channel



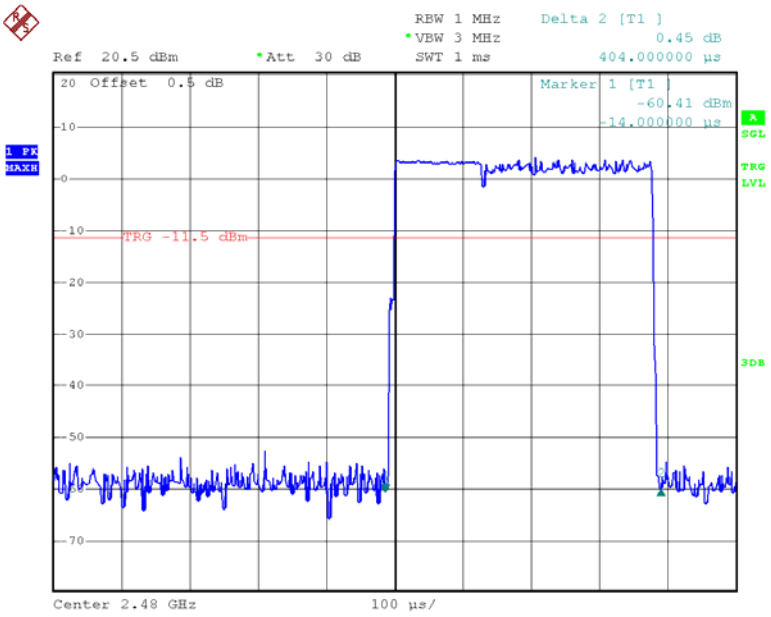
Date: 22.NOV.2012 00:04:08

EDR (8DPSK) - Middle Channel



Date: 22.NOV.2012 00:04:41

EDR (8DPSK) - High Channel



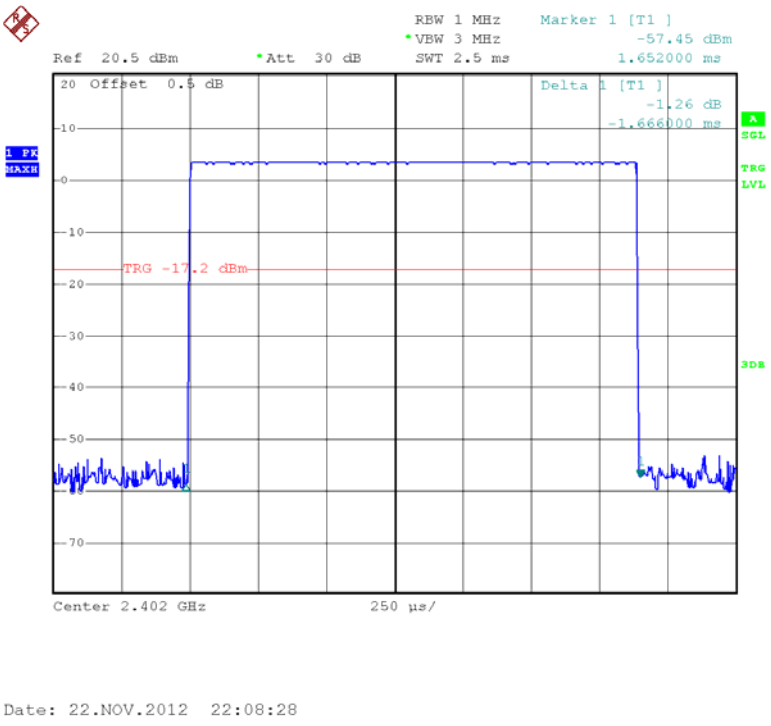
Date: 22.NOV.2012 00:05:08

DH3:

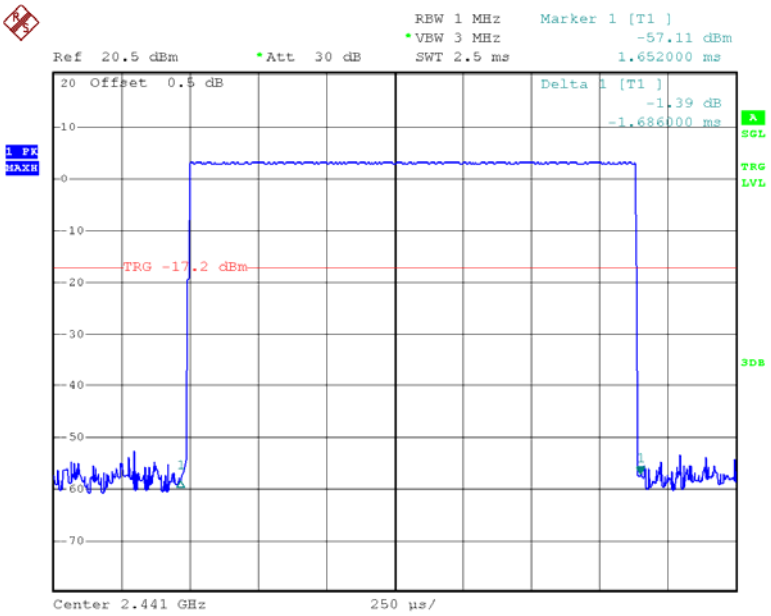
Test Mode: Transmitting

	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
BDR Mode (GFSK)	Low	1.666	0.267	0.4	Pass
	Middle	1.686	0.270	0.4	Pass
	High	1.666	0.267	0.4	Pass
	Note: Dwell time = Pulse time(1600/4/79)*31.6S*				
EDR Mode (π/4-QPSK)	Low	1.665	0.266	0.4	Pass
	Middle	1.680	0.269	0.4	Pass
	High	1.680	0.269	0.4	Pass
	Note: Dwell time = Pulse time(1600/4/79)*31.6S*				
EDR Mode (8DPSK)	Low	1.664	0.266	0.4	Pass
	Middle	1.684	0.269	0.4	Pass
	High	1.689	0.270	0.4	Pass
	Note: Dwell time = Pulse time(1600/4/79)*31.6S*				

BDR - Low Channel

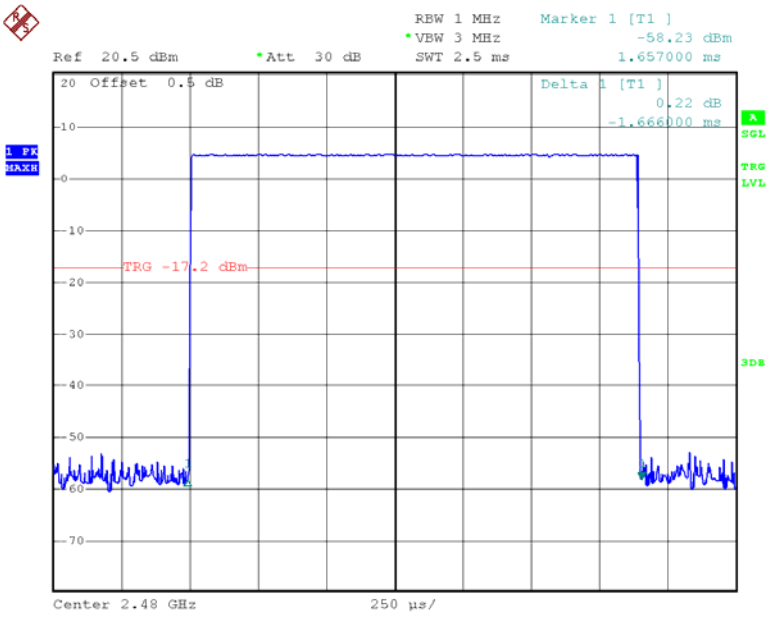


BDR - Middle Channel



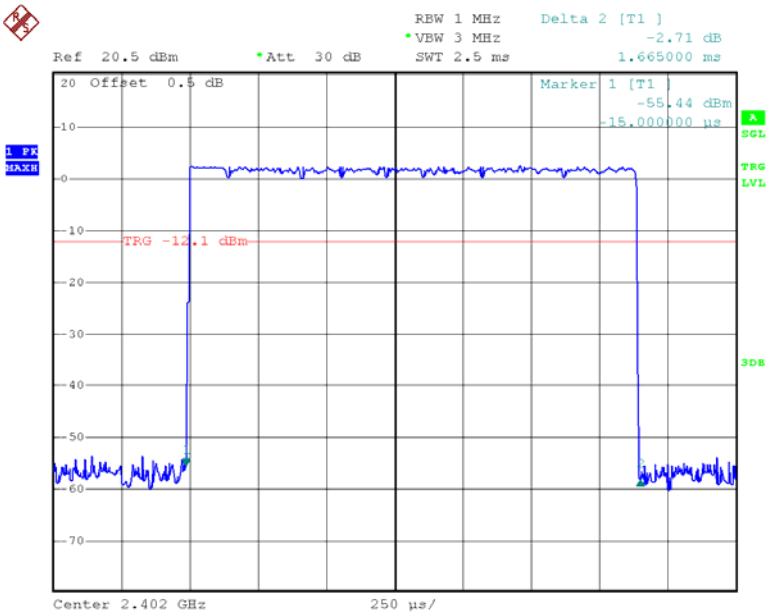
Date: 22.NOV.2012 22:08:00

BDR - High Channel



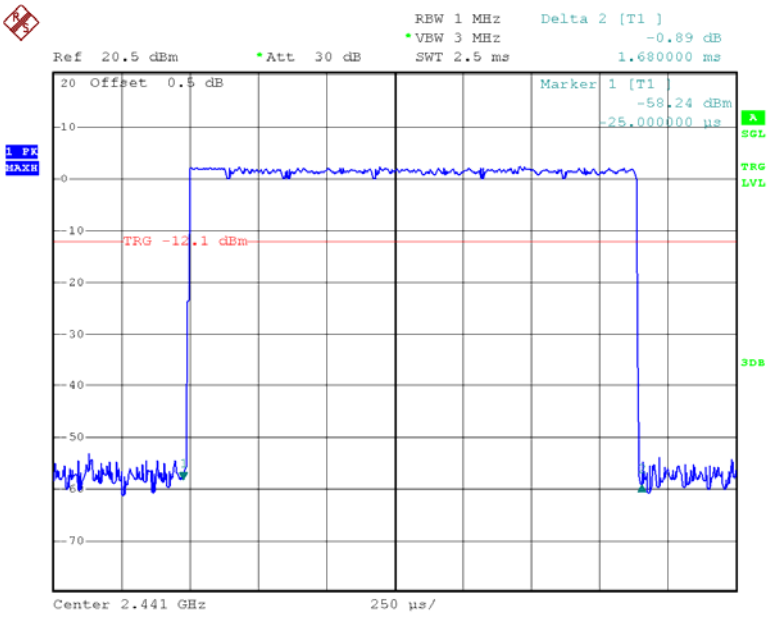
Date: 22.NOV.2012 22:07:14

EDR (π/4-QPSK) - Low Channel



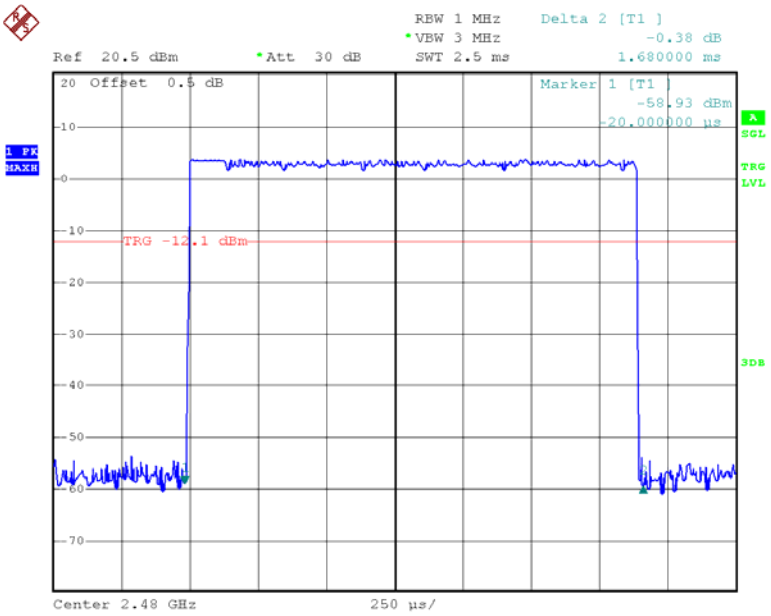
Date: 22.NOV.2012 22:35:09

EDR (π/4-QPSK) - Middle Channel



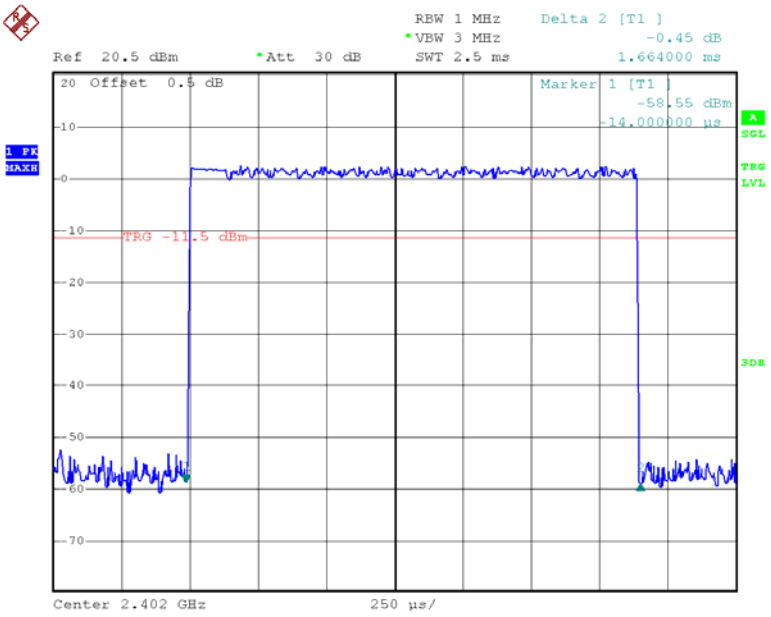
Date: 22.NOV.2012 22:35:36

EDR (π/4-QPSK) - High Channel



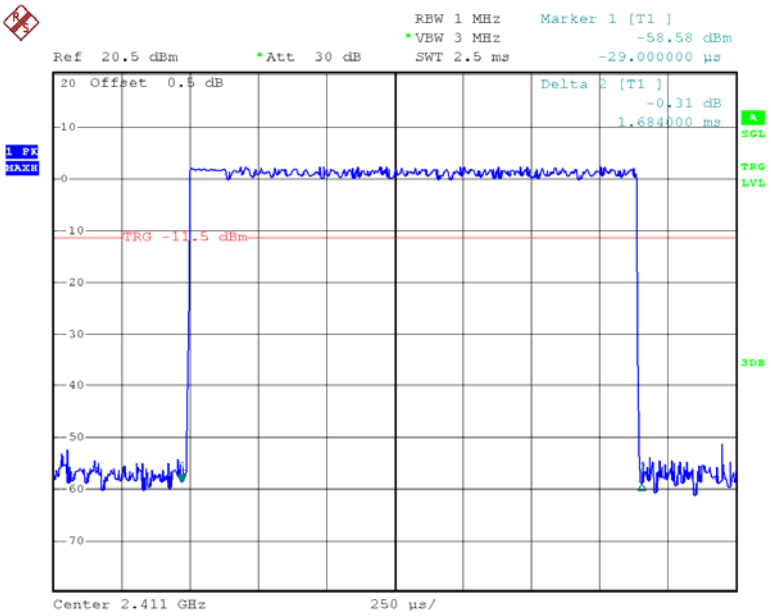
Date: 22.NOV.2012 22:36:06

EDR (8DPSK) - Low Channel



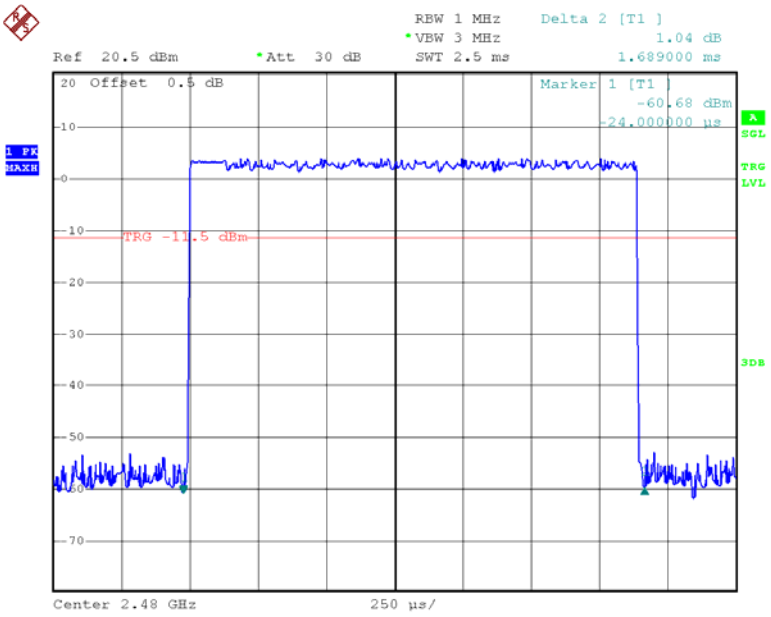
Date: 22.NOV.2012 00:11:00

EDR (8DPSK) - Middle Channel



Date: 22.NOV.2012 00:10:22

EDR (8DPSK) - High Channel



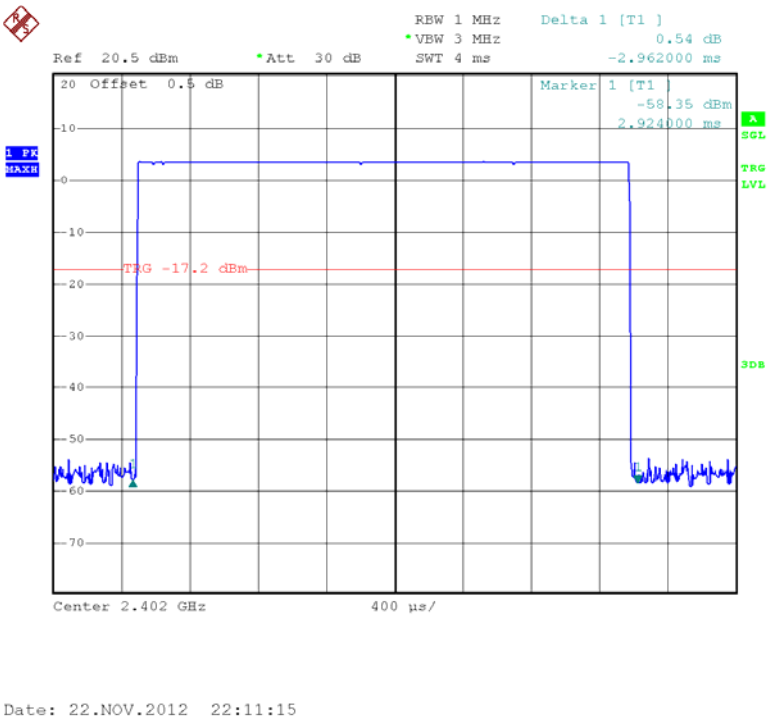
Date: 22.NOV.2012 00:09:25

DH5:

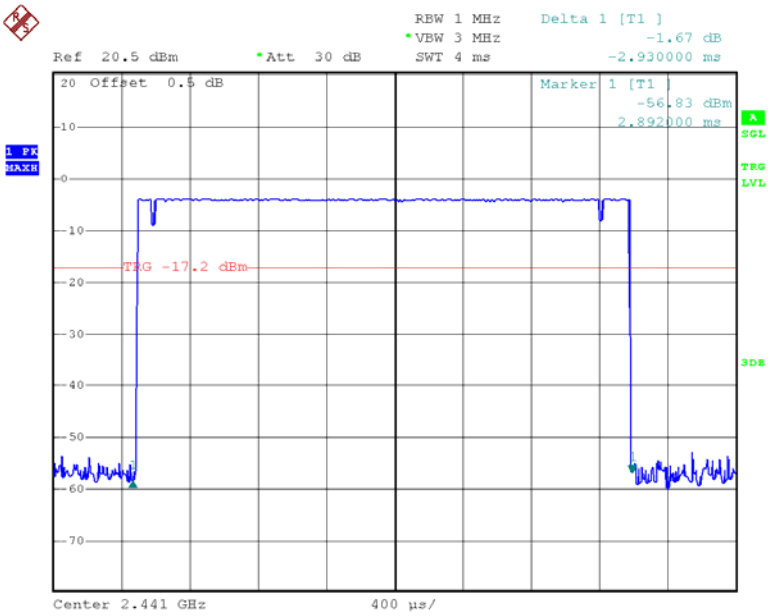
Test Mode: Transmitting

	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
BDR Mode (GFSK)	Low	2.962	0.316	0.4	Pass
	Middle	2.930	0.313	0.4	Pass
	High	2.946	0.314	0.4	Pass
	Note: Dwell time = Pulse time(1600/6/79)*31.6S*				
EDR Mode (π/4-QPSK)	Low	2.960	0.316	0.4	Pass
	Middle	2.944	0.314	0.4	Pass
	High	2.944	0.314	0.4	Pass
	Note: Dwell time = Pulse time(1600/6/79)*31.6S*				
EDR Mode (8DPSK)	Low	2.928	0.312	0.4	Pass
	Middle	2.928	0.312	0.4	Pass
	High	2.936	0.313	0.4	Pass
	Note: Dwell time = Pulse time(1600/6/79)*31.6S*				

BDR - Low Channel

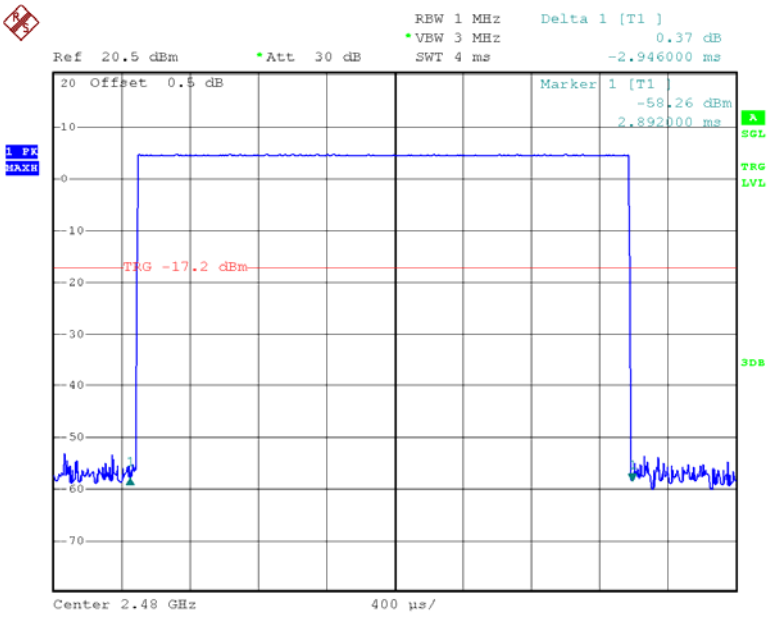


BDR - Middle Channel



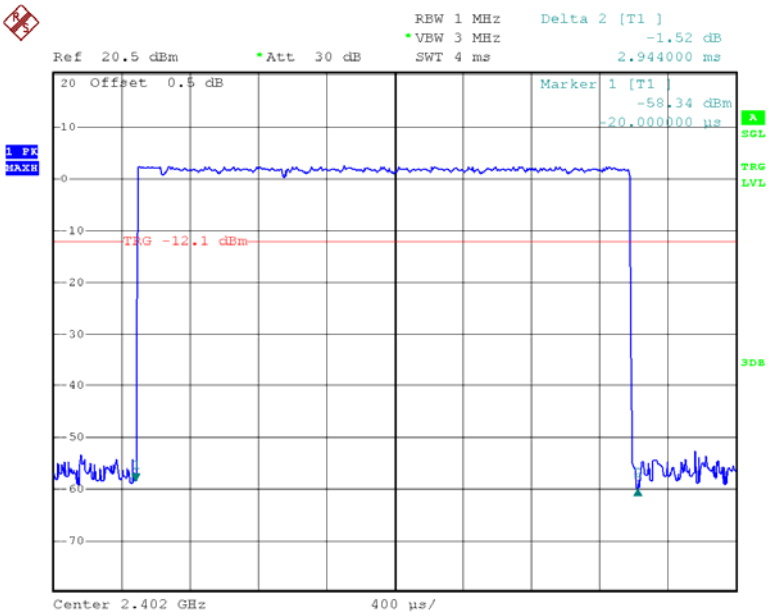
Date: 22.NOV.2012 22:11:49

BDR - High Channel



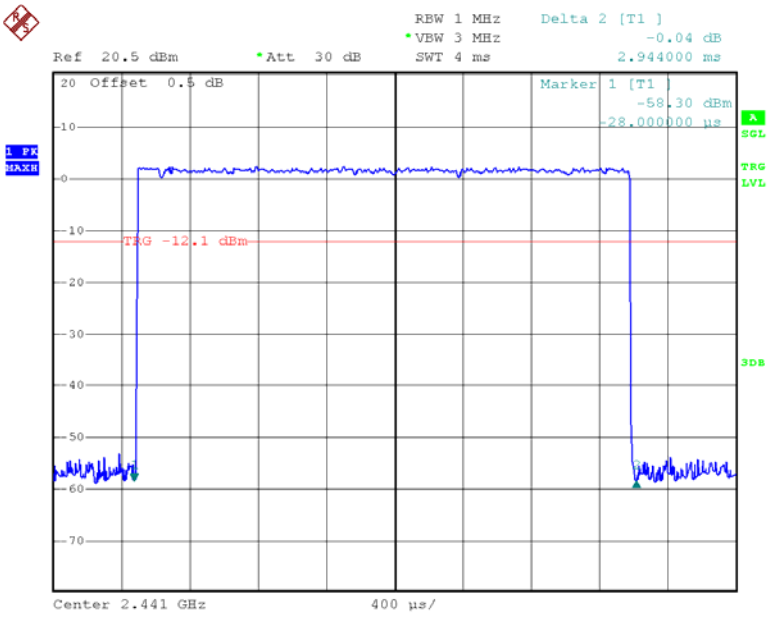
Date: 22.NOV.2012 22:12:15

EDR (π/4-QPSK) - Low Channel



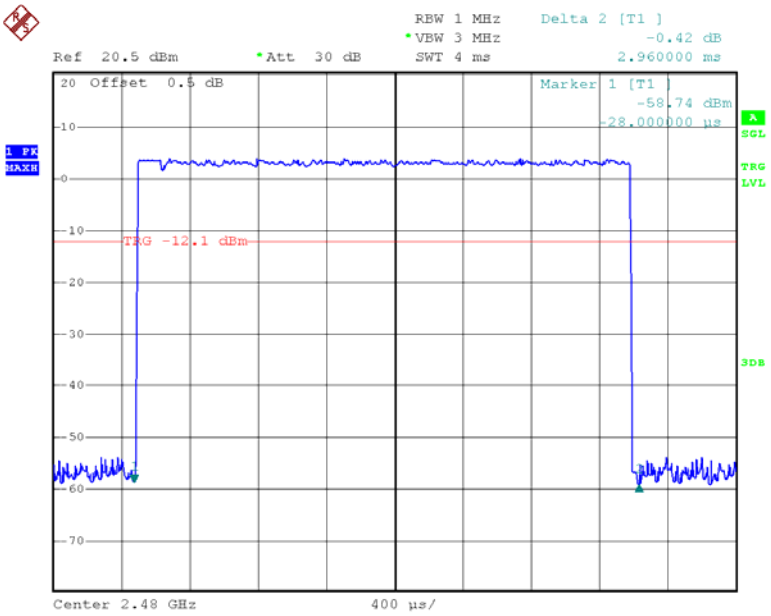
Date: 22.NOV.2012 22:39:21

EDR (π/4-QPSK) - Middle Channel



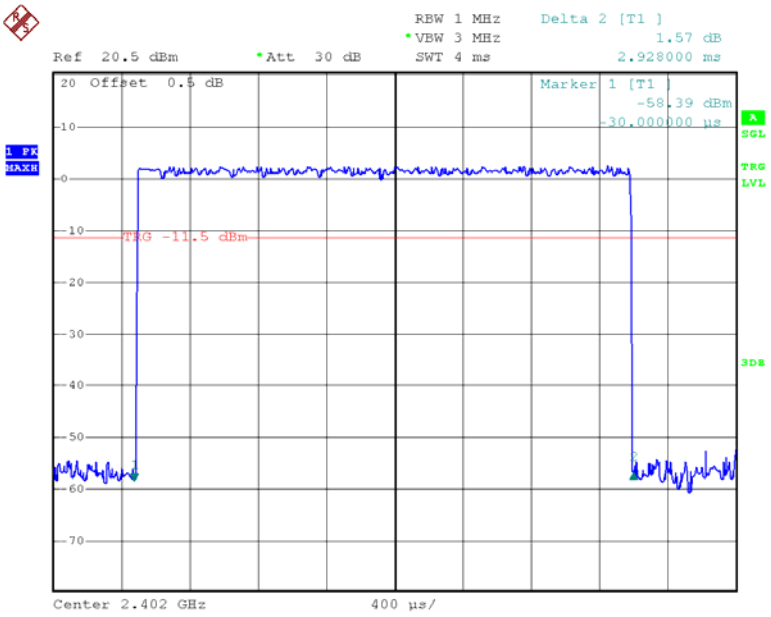
Date: 22.NOV.2012 22:38:52

EDR (π/4-QPSK) - High Channel



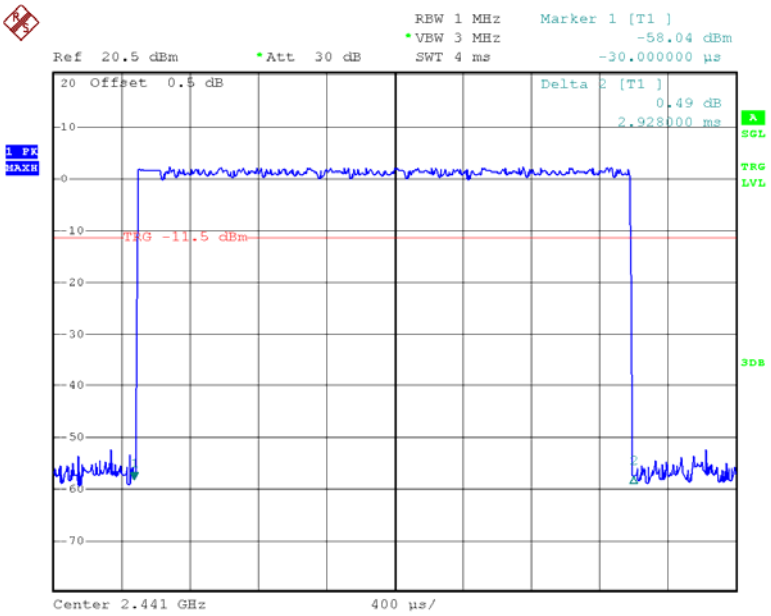
Date: 22.NOV.2012 22:38:24

EDR (8DPSK) - Low Channel



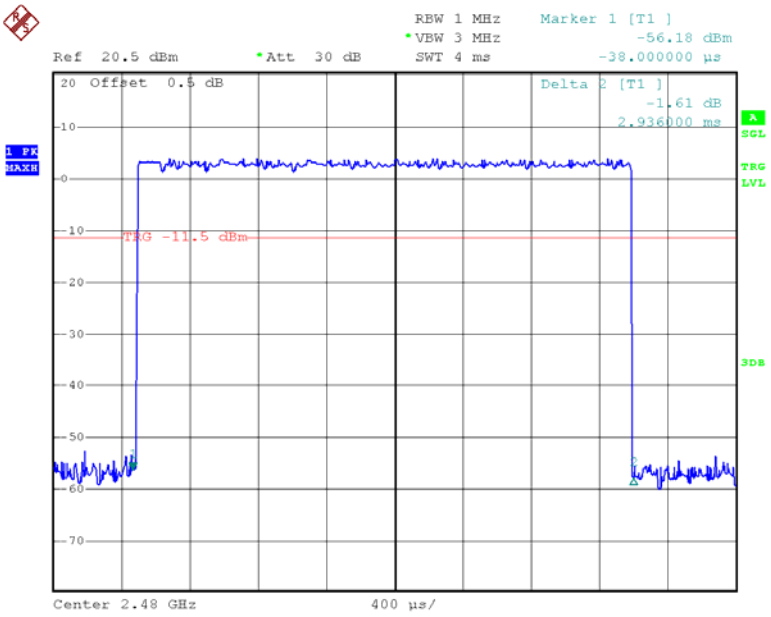
Date: 22.NOV.2012 00:13:49

EDR (8DPSK) - Middle Channel



Date: 22.NOV.2012 00:14:18

EDR (8DPSK) - High Channel



Date: 22.NOV.2012 00:14:55

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

Applicable Standard

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

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

Test Data

Environmental Conditions

Temperature:	26.3℃
Relative Humidity:	55 %
ATM Pressure:	100.1kPa

** The testing was performed by Leon Chen on 2012-11-22.*

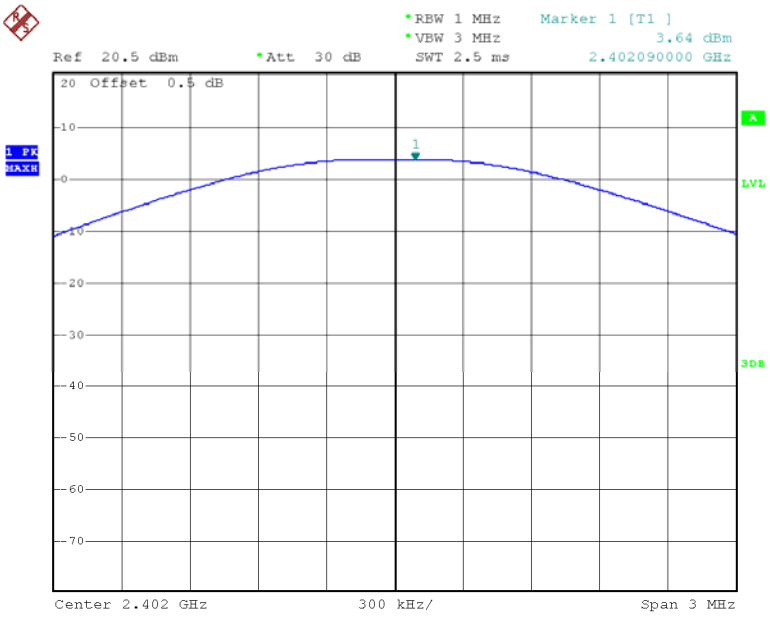
Test Result: Compliance.

Test Mode: Transmitting

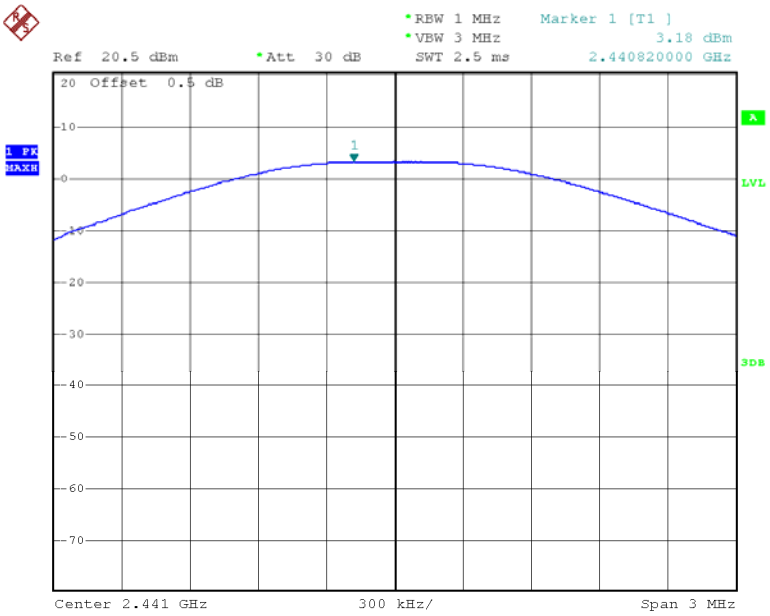
	Channel	Frequency (MHz)	Output power (dBm)	Limit (dBm)
BDR Mode (GFSK)	Low	2402	3.64	30
	Middle	2441	3.18	30
	High	2480	3.64	30
EDR Mode (π/4-QPSK)	Low	2402	3.24	30
	Middle	2441	3.25	30
	High	2480	3.77	30
EDR Mode (8DPSK)	Low	2402	3.24	30
	Middle	2441	3.03	30
	High	2480	3.57	30

Note: The data above was tested in conducted mode

BDR: Output Power, Low

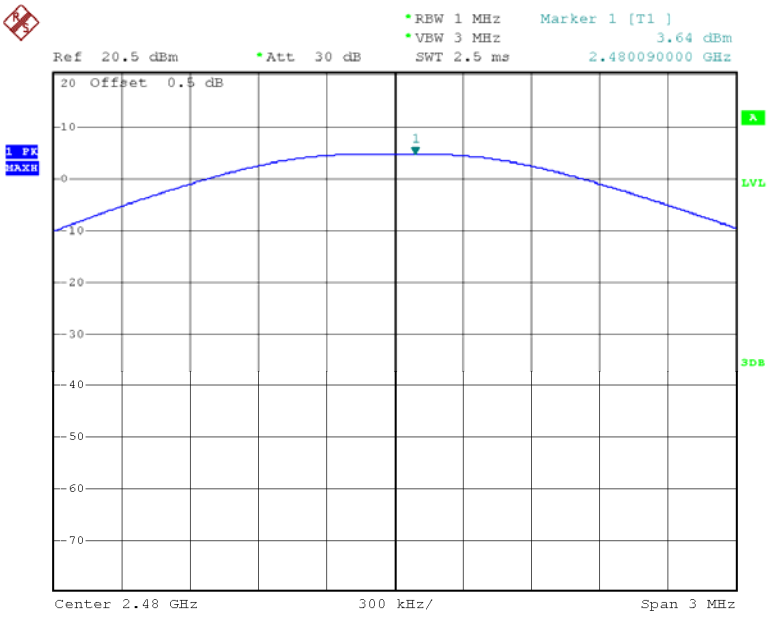


BDR: Output Power, Middle



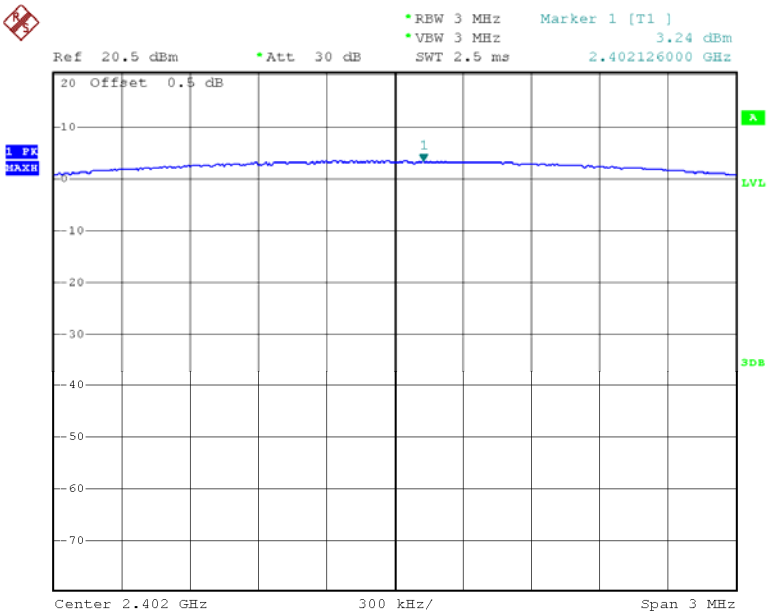
Date: 22.NOV.2012 21:44:04

BDR: Output Power, High



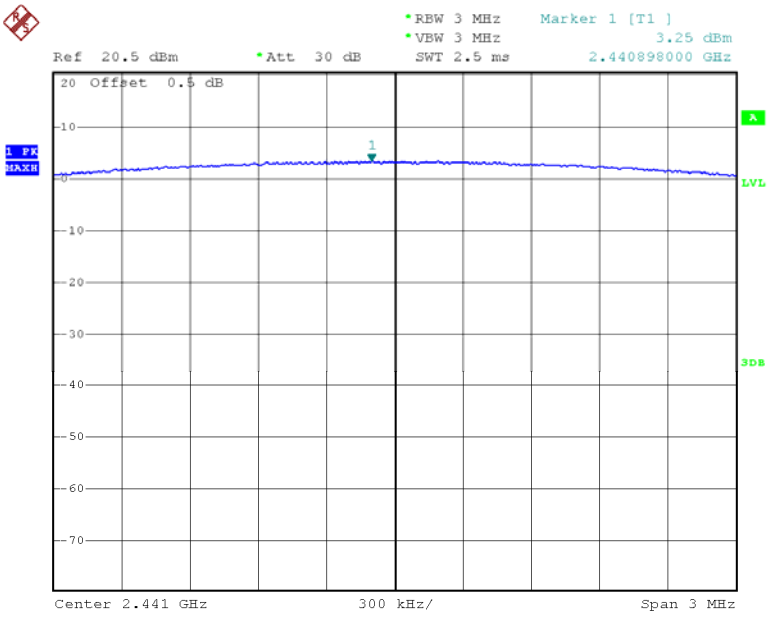
Date: 22.NOV.2012 21:46:11

EDR (π/4-QPSK) : Output Power, Low



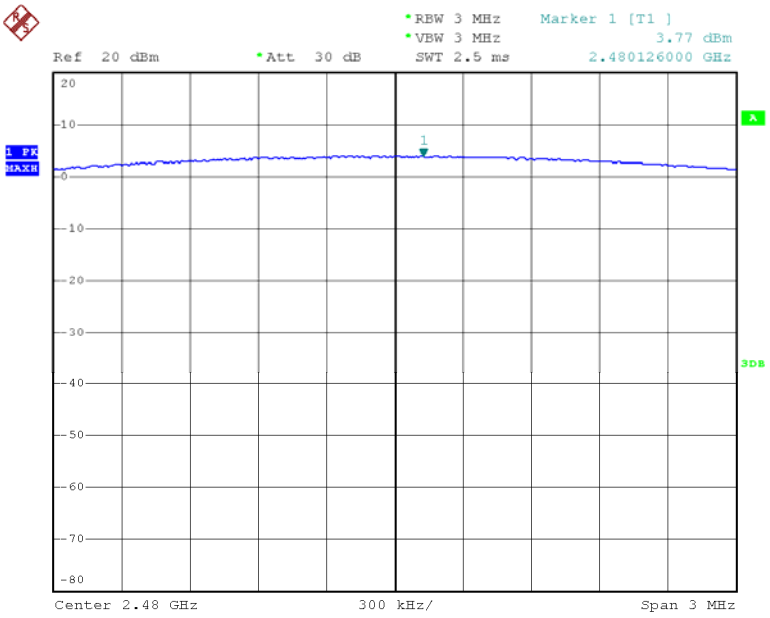
Date: 22.NOV.2012 22:40:50

EDR (π/4-QPSK) : Output Power, Middle



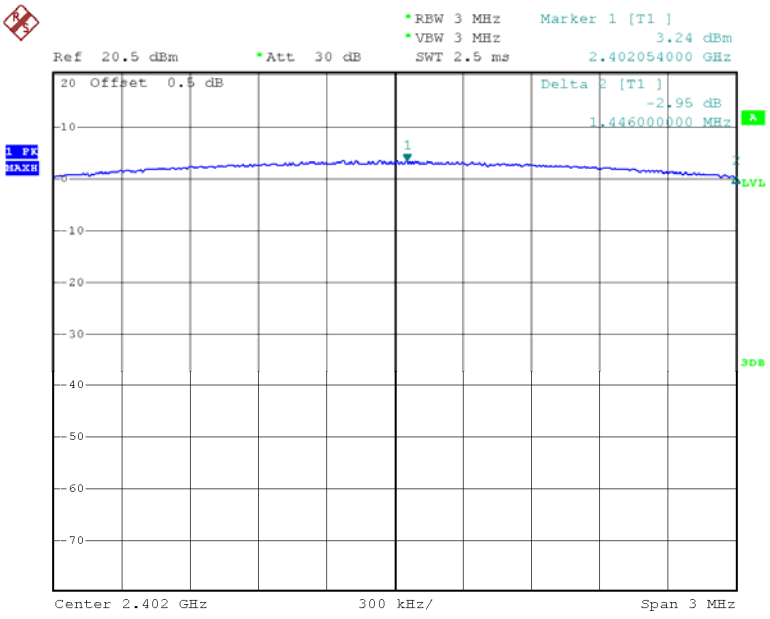
Date: 22.NOV.2012 22:46:56

EDR (π/4-QPSK) : Output Power, High



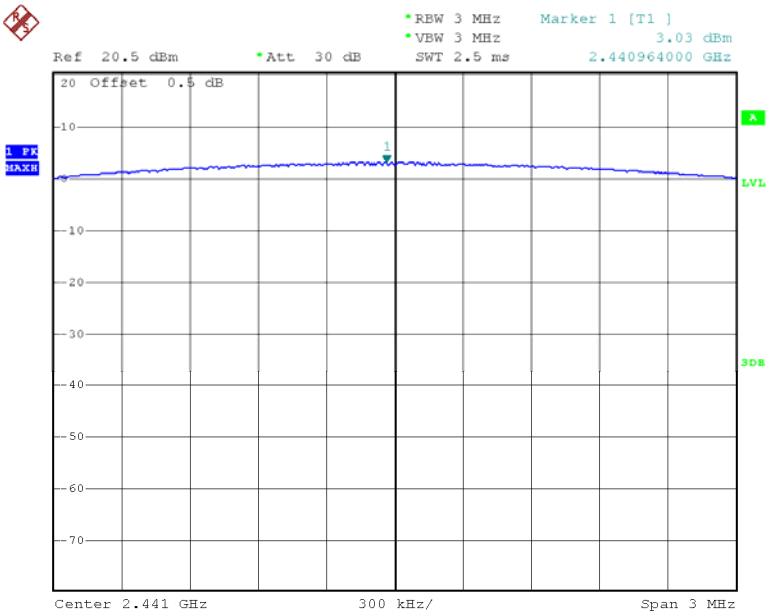
Date: 22.NOV.2012 22:52:33

EDR (8DPSK): Output Power, Low



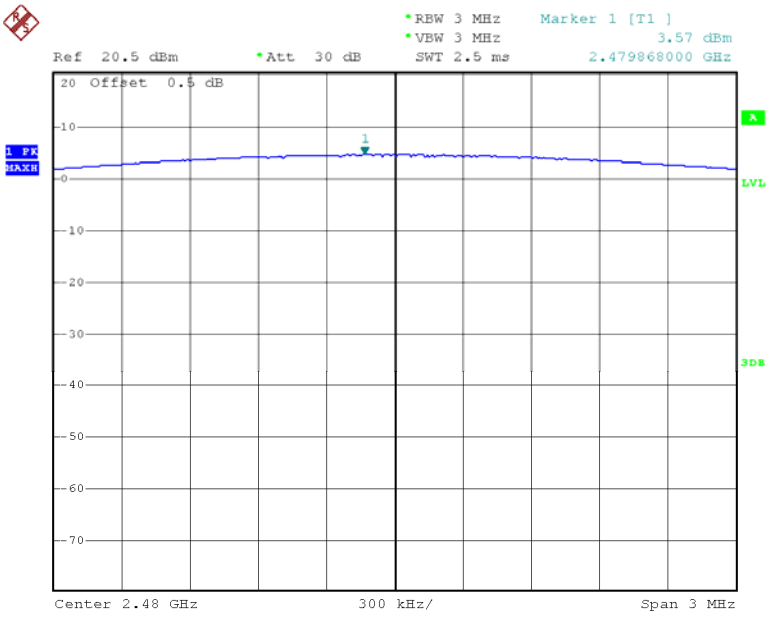
Date: 22.NOV.2012 00:19:12

EDR (8DPSK): Output Power, Middle



Date: 22.NOV.2012 00:24:18

EDR (8DPSK): Output Power, High



Date: 22.NOV.2012 00:29:15

FCC §15.247(d) - BAND EDGE 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 emission 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
Rohde & Schwarz	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

Test Data

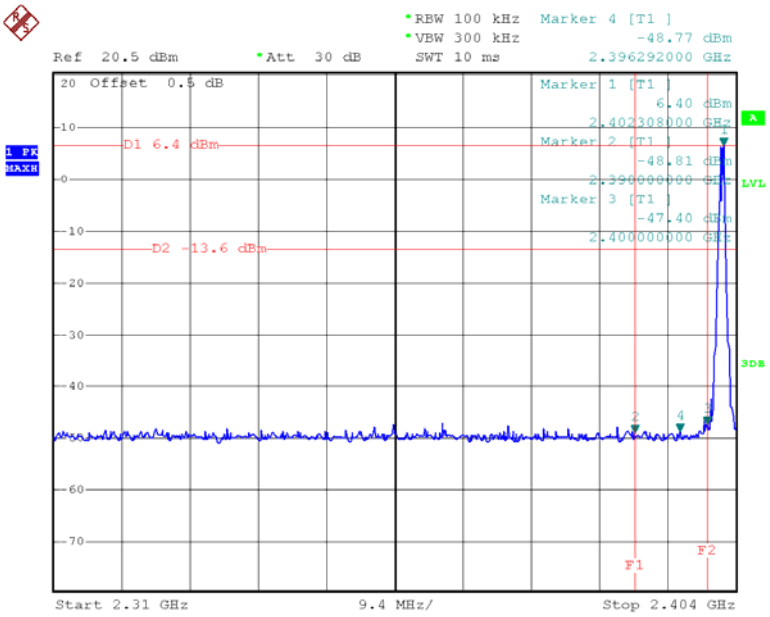
Environmental Conditions

Temperature:	26.3℃
Relative Humidity:	55 %
ATM Pressure:	100.1kPa

** The testing was performed by Leon Chen on 2012-11-22.*

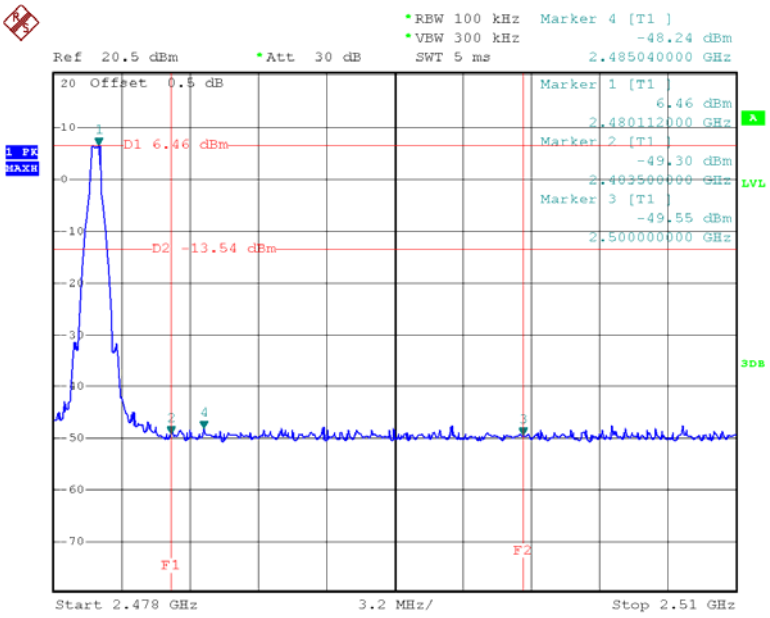
Test Result: Compliance

BDR: Band Edge, Left Side



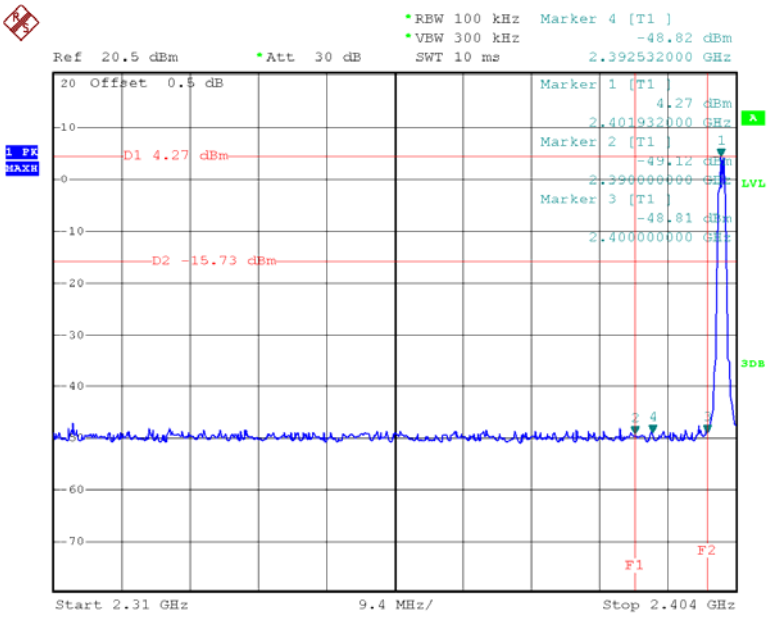
Date: 22.NOV.2012 15:16:06

BDR: Band Edge, Right Side



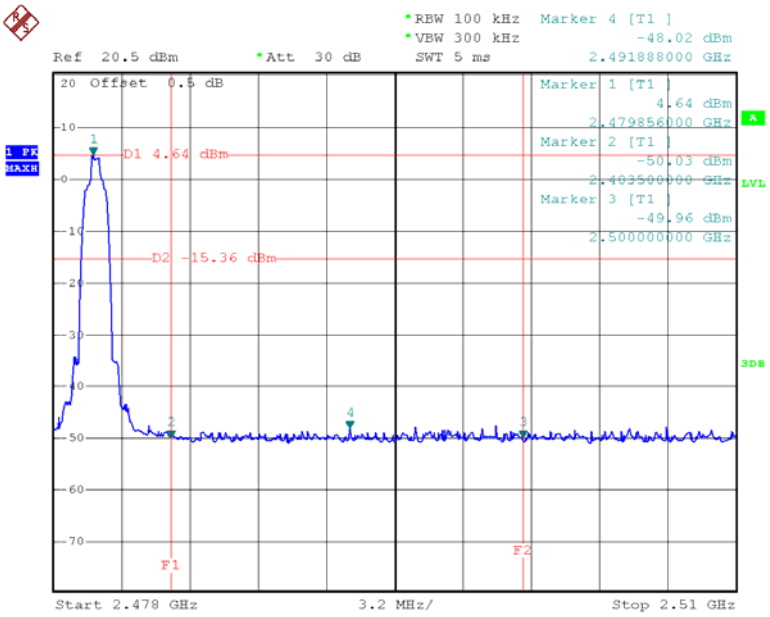
Date: 22.NOV.2012 15:28:27

EDR (π/4-QPSK) : Band Edge, Left Side



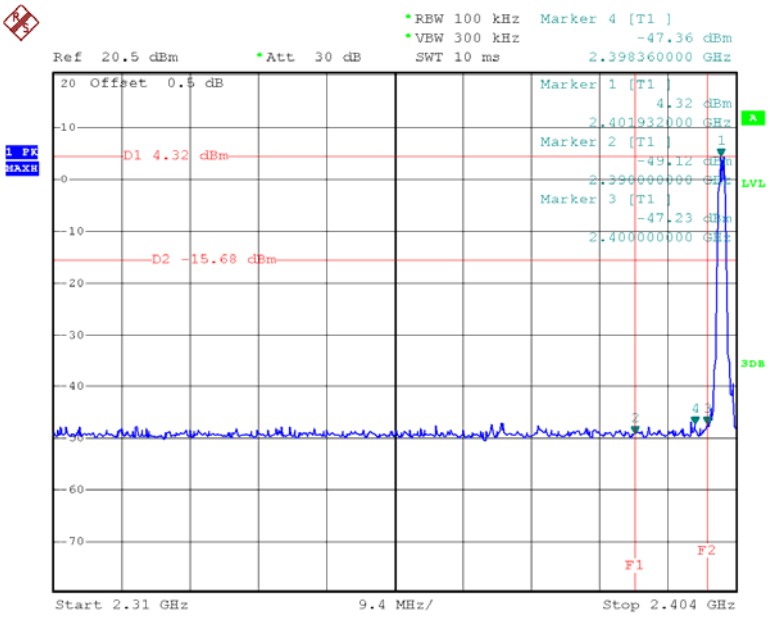
Date: 22.NOV.2012 15:38:16

EDR (π/4-QPSK) : Band Edge, Right Side



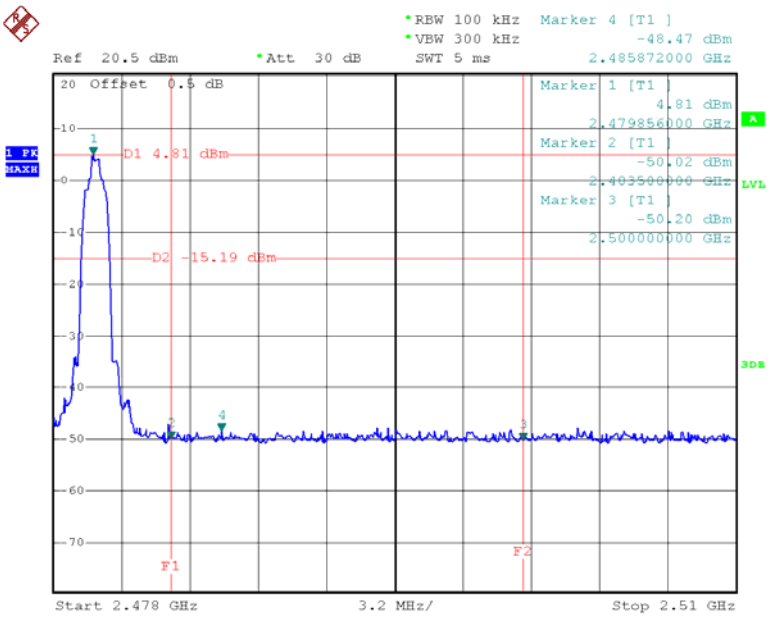
Date: 22.NOV.2012 15:31:00

EDR (8DPSK): Band Edge, Left Side



Date: 22.NOV.2012 15:43:12

EDR (8DPSK): Band Edge, Right Side



Date: 22.NOV.2012 15:48:57

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