FCC PART 15.247
TEST REPORT

For

Compumax Computer S.A.S

Calle 41 N 35 - 47, Bucaramanga, Santander 680003, Colombia.

FCC ID: 2AHF7-BLUES10

Report Type:	**Product Type:**
Original Report	Tablet

Report Number: RSZ170525001-00B

Report Date: 2017-06-12

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Compumax Computer S.A.S's* product, model number: *BLUE S10 (FCC ID: 2AHF7-BLUES10)* in this report is a *Tablet* which was measured approximately: 25.8 cm (L) * 15.8 cm (W) * 1.1 cm (H), rated with input voltage: DC 3.7 V battery or DC 5.0V from adapter.

Adapter Information:
Model: TEKA012-0502000UK
Input: AC 100-240V, 50/60Hz, 0.3A MAX
Output: DC 5.0V, 2A

Notes: This series products model: BLUE S10 and MID1025-ME are identical; they have the identical schematics, only named differently. Model BLUE S10 was selected for fully testing, the detailed information can be referred to the declaration which was stated and guaranteed by the applicant.

** All measurement and test data in this report was gathered from production sample serial number: 171108 (Assigned by BACL, Kunshan). The EUT supplied by the applicant was received on 2017-05-25.*

Objective

This test report is prepared on behalf of *Compumax Computer S.A.S* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 22H & 24E PCE, FCC Part 15.247 DTS and Part 15B JBP submissions with FCC ID: 2AHF7-BLUES10.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		±3.26 dB
RF conducted test with spectrum		±0.9dB
RF Output Power with Power meter		±0.5dB
Radiated emission	30MHz~1GHz	±5.91dB
	Above 1G	±4.92dB
Occupied Bandwidth		±0.5kHz
Temperature		±1.0℃
Humidity		±6%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) 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 November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. 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 engineering mode.

EUT Exercise Software

No exercise software was used

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

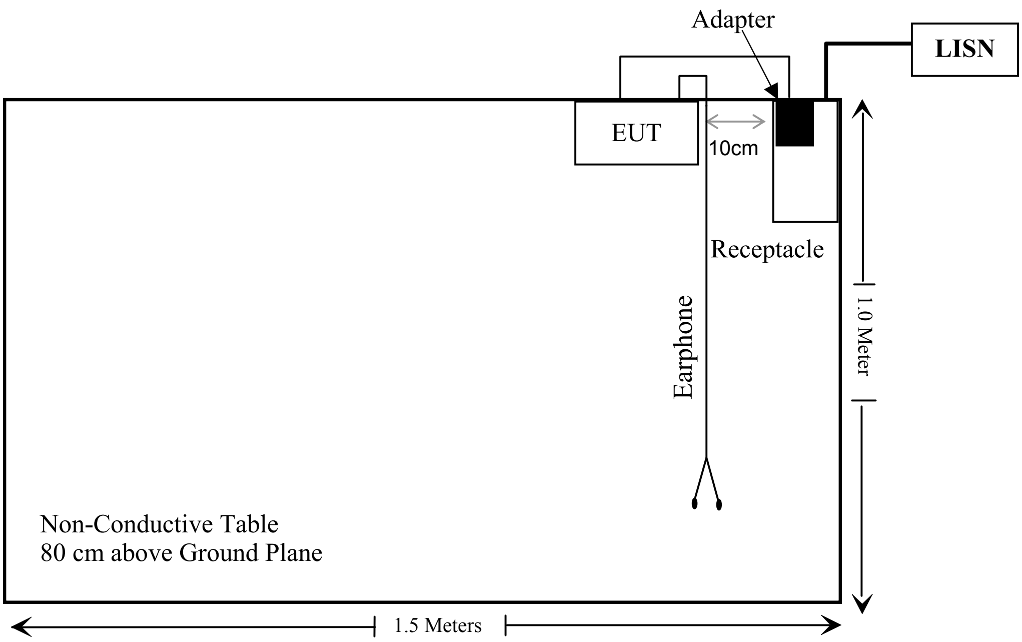
Manufacturer	Description	Model	Serial Number
N/A	N/A	N/A	N/A

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielding Detachable USB Cable	1.5	EUT	Adapter
Un-shielding Detachable Earphone Cable	1.1	EUT	Earphone

Block Diagram of Test Setup

For conducted emission



SUMMARY OF TEST RESULTS

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

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conducted test					
Rohde & Schwarz	EMI Test Receiver	ESCS30	834115/007	2016-11-25	2017-11-25
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2016-10-10	2017-10-10
Rohde & Schwarz	Pulse limiter	ESH3-Z2	879940/0058	2016-06-19	2017-06-18
MICRO-COAX	Coaxial line	UFB-293B-1-0480-50X50	97F0173	2016-09-08	2017-09-08
Rohde & Schwarz	CE Test software	EMC 32	V 09.10.0	NCR	NCR
Radiation test					
Sonoma Instrunent	Pre-Amplifier	330	171377	2016-12-12	2017-12-11
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-09-08	2017-09-08
EMCO	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-25
ETS	Horn Antenna	3115	6229	2016-12-12	2019-12-12
R&S	Auto test Software	EMC32	V 09.10.0	NCR	NCR
haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-12
RF Conducted test					
BACL	TS 8997 Cable-01	T-KS-EMC086	T-KS-EMC086	2016-12-09	2017-12-08
BACL	RF cable	KS-LAB-012	KS-LAB-012	2016-12-15	2017-12-15
WEINSCHEL	10dB Attenuator	5328	N/A	2016-06-18	2017-06-18
Agilent	Power Meter	N1912A	MY5000492	2016-11-17	2017-11-16
Agilent	Power Sensor	N1921A	MY54210024	2016-11-17	2017-11-16
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2016-09-21	2017-09-21

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

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

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

For worst case:

Frequency (MHz)	Maximum couducted Tune-up power		Calculated Distance (mm)	Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
	Power (dBm)	Power (mW)				
2480	7.0	5.01	5	1.6	3.0	**Yes**

Result: No SAR test is required

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 one internal antenna arrangement for bluetooth which was permanently attached and the antenna gain is 1.39 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

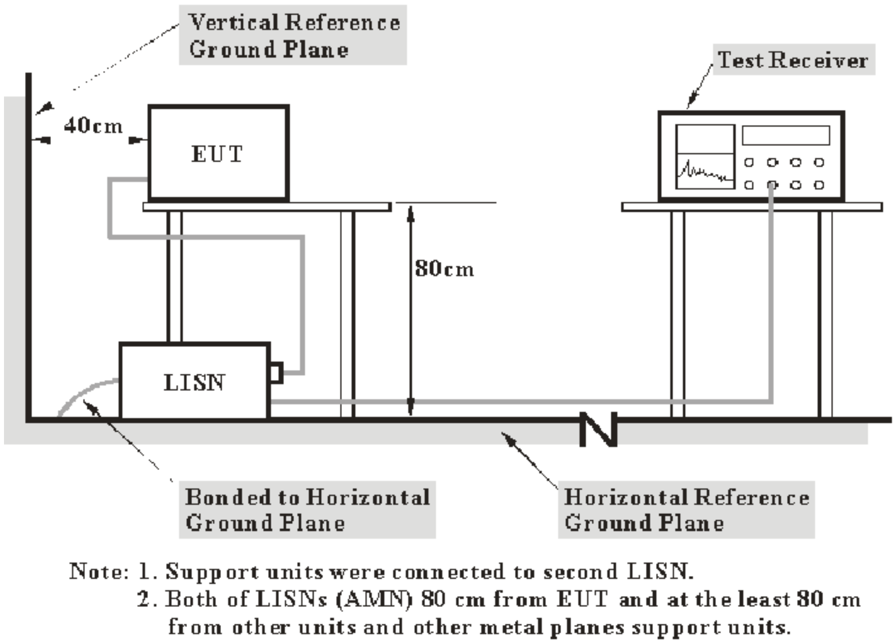
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

EUT Setup



The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

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

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

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

Corrected Factor & Margin Calculation

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

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the 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 Part 15.207.

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_{\mathrm{m}} + U_{(Lm)} \leq L_{\mathrm{lim}} + U_{\mathrm{cispr}}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_{m} is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

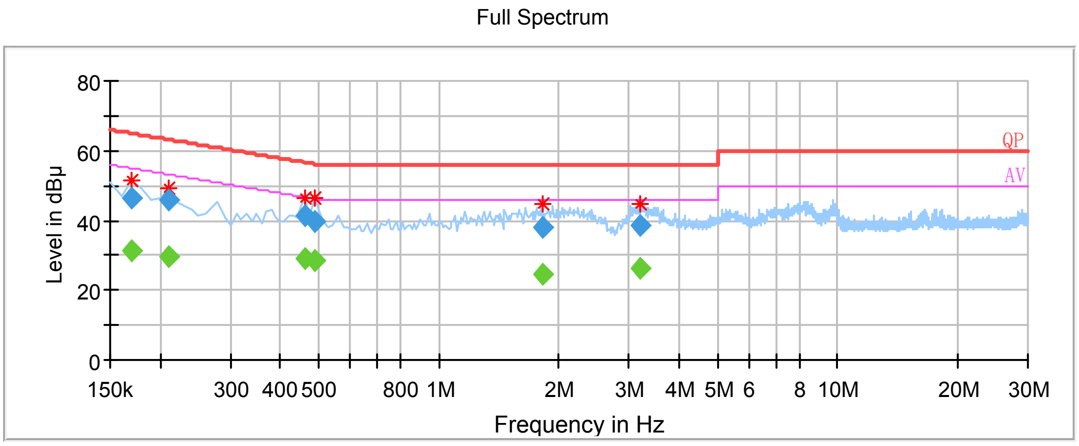
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Layne Li on 2017-06-12.

EUT operation mode: Transmitting

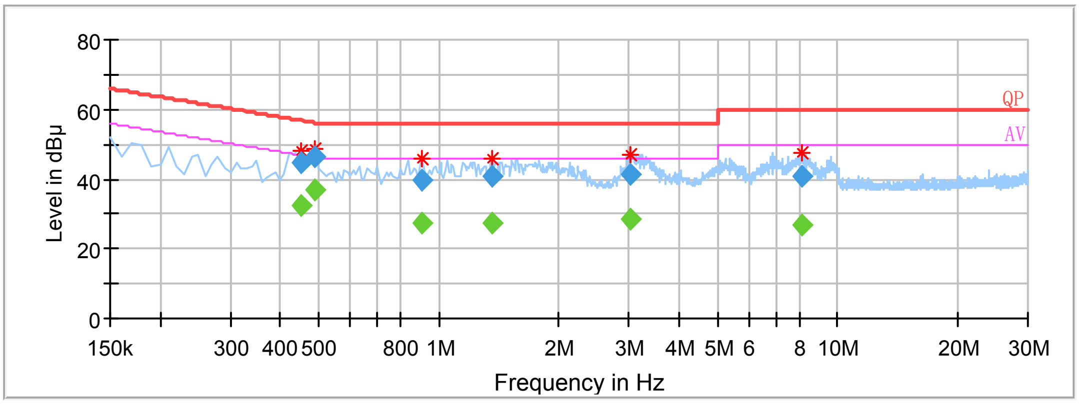
AC 120V/60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.170000	---	31.49	9.000	L1	10.0	23.47	54.96	Compliance
0.170000	46.38	---	9.000	L1	10.0	18.58	64.96	Compliance
0.210000	---	29.48	9.000	L1	10.0	23.73	53.21	Compliance
0.210000	45.93	---	9.000	L1	10.0	17.28	63.21	Compliance
0.460000	---	28.89	9.000	L1	10.1	17.80	46.69	Compliance
0.460000	41.37	---	9.000	L1	10.1	15.32	56.69	Compliance
0.490000	---	28.72	9.000	L1	10.1	17.45	46.17	Compliance
0.490000	39.58	---	9.000	L1	10.1	16.59	56.17	Compliance
1.820000	---	24.65	9.000	L1	9.9	21.35	46.00	Compliance
1.820000	37.82	---	9.000	L1	9.9	18.18	56.00	Compliance
3.190000	---	26.39	9.000	L1	9.9	19.61	46.00	Compliance
3.190000	38.66	---	9.000	L1	9.9	17.34	56.00	Compliance

AC 120V/60 Hz, Neutral

Full Spectrum



Frequency (MHz)	QuasiPeak (dBµV)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.450000	---	32.61	9.000	N	10.1	14.27	46.88	Compliance
0.450000	44.86	---	9.000	N	10.1	12.02	56.88	Compliance
0.490000	---	36.89	9.000	N	10.1	9.28	46.17	Compliance
0.490000	46.65	---	9.000	N	10.1	9.52	56.17	Compliance
0.910000	---	27.46	9.000	N	10.0	18.54	46.00	Compliance
0.910000	39.94	---	9.000	N	10.0	16.06	56.00	Compliance
1.360000	---	27.41	9.000	N	9.9	18.59	46.00	Compliance
1.360000	40.77	---	9.000	N	9.9	15.23	56.00	Compliance
3.040000	---	28.42	9.000	N	9.9	17.58	46.00	Compliance
3.040000	41.19	---	9.000	N	9.9	14.81	56.00	Compliance
8.140000	---	26.65	9.000	N	9.9	23.35	50.00	Compliance
8.140000	41.09	---	9.000	N	9.9	18.91	60.00	Compliance

Note:

1) Corrected Amplitude = Reading + Correction Factor
2) Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation
3) Margin = Limit – Corrected Amplitude

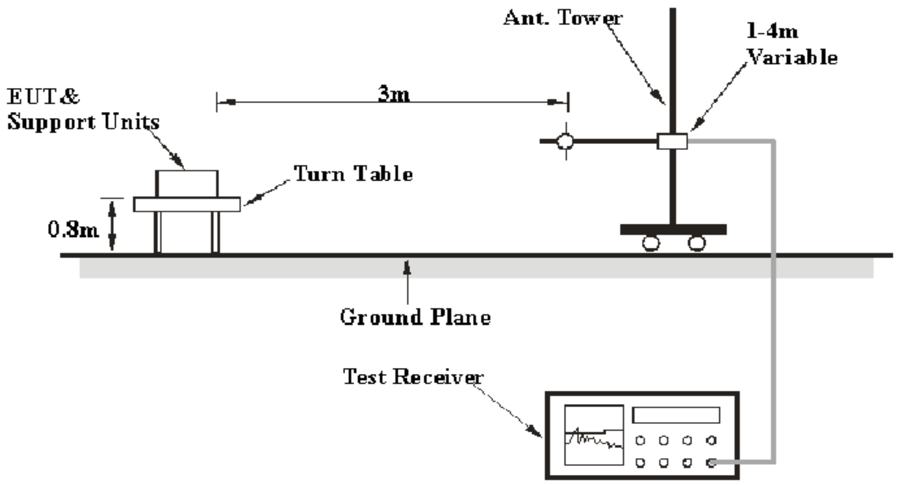
FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

Applicable Standard

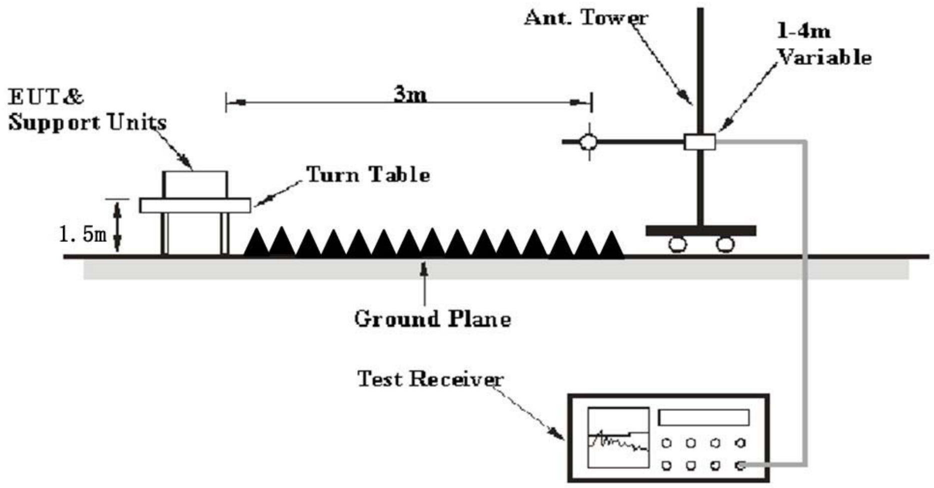
FCC §15.205; §15.209; §15.247(d)

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, 205 and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Ave.

Test Procedure

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

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

Corrected Amplitude & Margin Calculation

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

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, section 15.205, 15.209 and 15.247.

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_{\mathrm{m}} + U_{(L\mathrm{m})} \leq L_{\mathrm{lim}} + U_{\mathrm{cispr}}$$

In BACL, $U_{(L\mathrm{m})}$ is less than U_{cispr}, if L_{m} is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	46 %
ATM Pressure:	101.0 kPa

The testing was performed by Layne Li on 2017-06-10.

EUT operation mode: Transmitting

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

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBµV/m)	FCC Part 15.247/205/209	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBµV/m)	Margin (dB)
Low Channel (2402 MHz)									
182.15	34.89	QP	187	1.6	H	-2.01	32.88	43.5	10.62
2402.00	103.38	PK	239	1.6	H	-6.19	97.19	/	/
2402.00	92.81	Ave.	239	1.6	H	-6.19	86.62	/	/
2402.00	102.74	PK	213	2.4	V	-6.19	96.55	/	/
2402.00	93.34	Ave.	213	2.4	V	-6.19	87.15	/	/
2358.09	67.07	PK	176	1.3	V	-6.19	60.88	74	13.12
2358.09	51.38	Ave.	176	1.3	V	-6.19	45.19	54	8.81
2377.33	67.17	PK	188	1.8	V	-6.19	60.98	74	13.02
2377.33	51.38	Ave.	188	1.8	V	-6.19	45.19	54	8.81
2486.07	66.73	PK	120	2.3	V	-5.97	60.76	74	13.24
2486.07	51.66	Ave.	120	2.3	V	-5.97	45.69	54	8.31
4804.00	51.88	PK	124	1.3	V	1.6	53.48	74	20.52
4804.00	34.21	Ave.	124	1.3	V	1.6	35.81	54	18.19
7206.00	45.67	PK	222	2.0	V	7.54	53.21	74	20.79
7206.00	29.66	Ave.	222	2.0	V	7.54	37.20	54	16.80

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBµV/m)	FCC Part 15.247/205/209	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBµV/m)	Margin (dB)
Middle Channel (2441 MHz)									
182.15	34.37	QP	158	1.6	H	-2.01	32.36	43.5	10.64
2441.00	106.97	PK	107	1.7	H	-6.19	100.78	/	/
2441.00	97.33	Ave.	107	1.7	H	-6.19	91.14	/	/
2441.00	104.64	PK	272	1.0	V	-6.19	98.45	/	/
2441.00	95.22	Ave.	272	1.0	V	-6.19	89.03	/	/
2343.18	66.89	PK	319	1.1	V	-6.42	60.47	74	13.53
2343.18	51.5	Ave.	319	1.1	V	-6.42	45.08	54	8.92
2368.35	67.47	PK	265	2.0	V	-6.19	61.28	74	12.72
2368.35	51.38	Ave.	265	2.0	V	-6.19	45.19	54	8.81
2493.32	66.55	PK	349	2.1	V	-5.97	60.58	74	13.42
2493.32	51.66	Ave.	349	2.1	V	-5.97	45.69	54	8.31
4882.00	49.84	PK	166	1.9	V	1.83	51.67	74	22.33
4882.00	33.63	Ave.	166	1.9	V	1.83	35.46	54	18.54
7323.00	45.39	PK	30	2.2	V	7.54	52.93	74	21.07
7323.00	29.91	Ave.	30	2.2	V	7.54	37.45	54	16.55
High Channel (2480 MHz)									
182.15	32.23	QP	112	1.6	H	-2.01	30.22	43.5	13.28
2480.00	108.91	PK	7	2.3	H	-5.97	102.94	/	/
2480.00	98.71	Ave.	7	2.3	H	-5.97	92.74	/	/
2480.00	103.78	PK	148	1.9	V	-5.97	97.81	/	/
2480.00	94.21	Ave.	148	1.9	V	-5.97	88.24	/	/
2312.4	66.7	PK	104	1.1	V	-6.42	60.28	74	13.72
2312.4	51.5	Ave.	104	1.1	V	-6.42	45.08	54	8.92
2483.53	69.32	PK	137	1.7	V	-5.97	63.35	74	10.65
2483.53	56.09	Ave.	137	1.7	V	-5.97	50.12	54	3.88
2484.06	67.51	PK	20	1.7	V	-5.97	61.54	74	12.46
2484.06	51.66	Ave.	20	1.7	V	-5.97	45.69	54	8.31
4960.00	51.77	PK	115	1.5	V	2.06	53.83	74	20.17
4960.00	36.03	Ave.	115	1.5	V	2.06	38.09	54	15.91
7440.00	43.45	PK	49	2.0	V	7.54	50.99	74	23.01
7440.00	28.44	Ave.	49	2.0	V	7.54	35.98	54	18.02

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude
The other spurious emission which is 20dB to the limit was not recorded.

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

Test Procedure

1. Set the EUT in transmitting mode, maxhold the channel.
2. Set the adjacent channel of the EUT and maxhold another trace.
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Echo Wu on 2017-05-30.

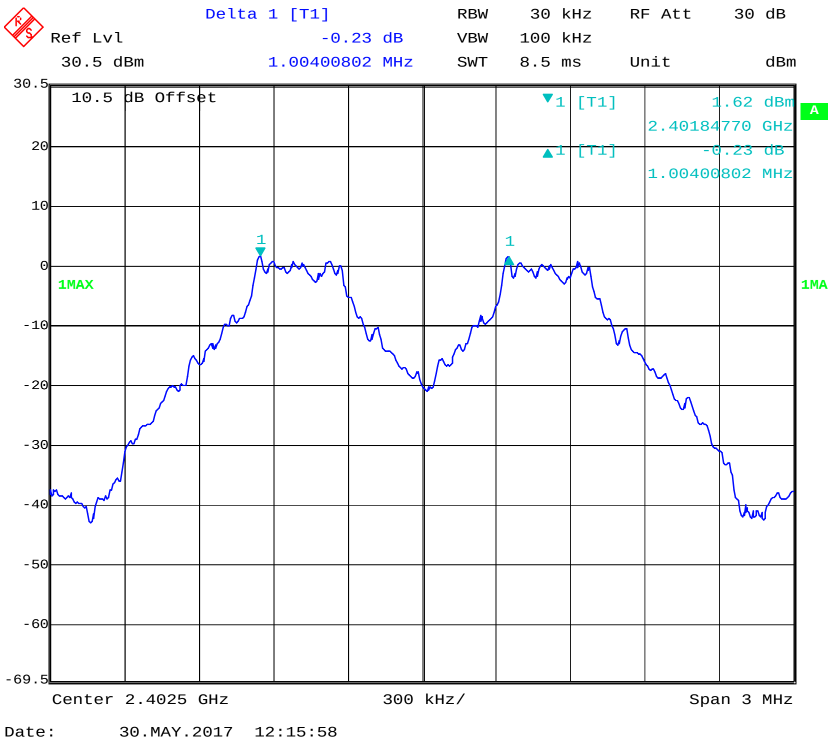
EUT operation mode: Transmitting

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

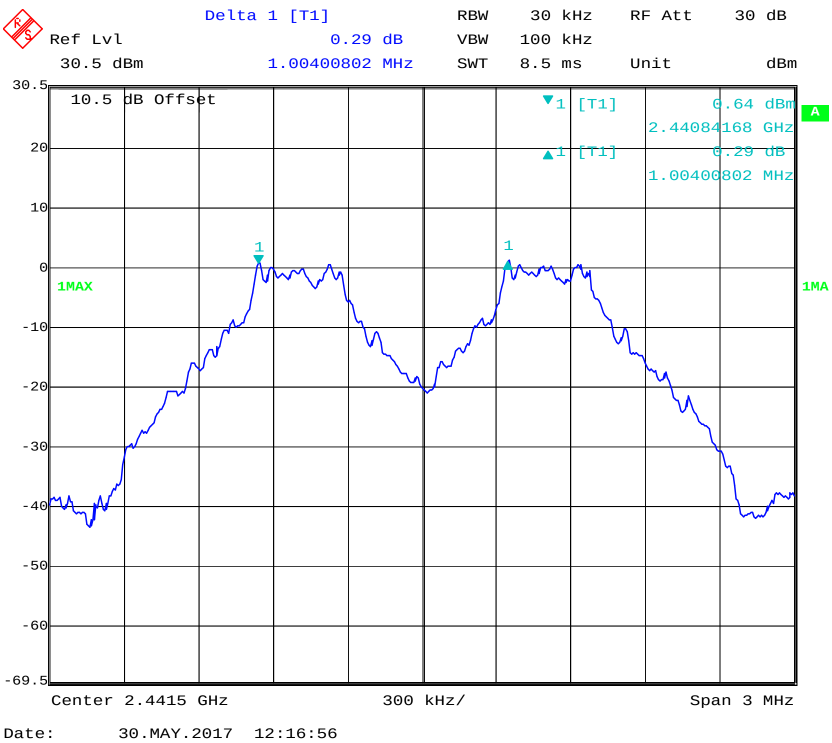
Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	≥Limit (MHz)	Result
BDR (GFSK)	Low	2402	1.004	0.625	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.628	Pass
	Adjacent	2442			
	High	2480	1.004	0.625	Pass
	Adjacent	2479			
EDR (π/4-DQPSK)	Low	2402	1.004	0.842	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.842	Pass
	Adjacent	2442			
	High	2480	1.004	0.839	Pass
	Adjacent	2479			
EDR (8DPSK)	Low	2402	1.004	0.850	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.853	Pass
	Adjacent	2442			
	High	2480	1.004	0.853	Pass
	Adjacent	2479			

Note: Limit = 20 dB bandwidth *2/3

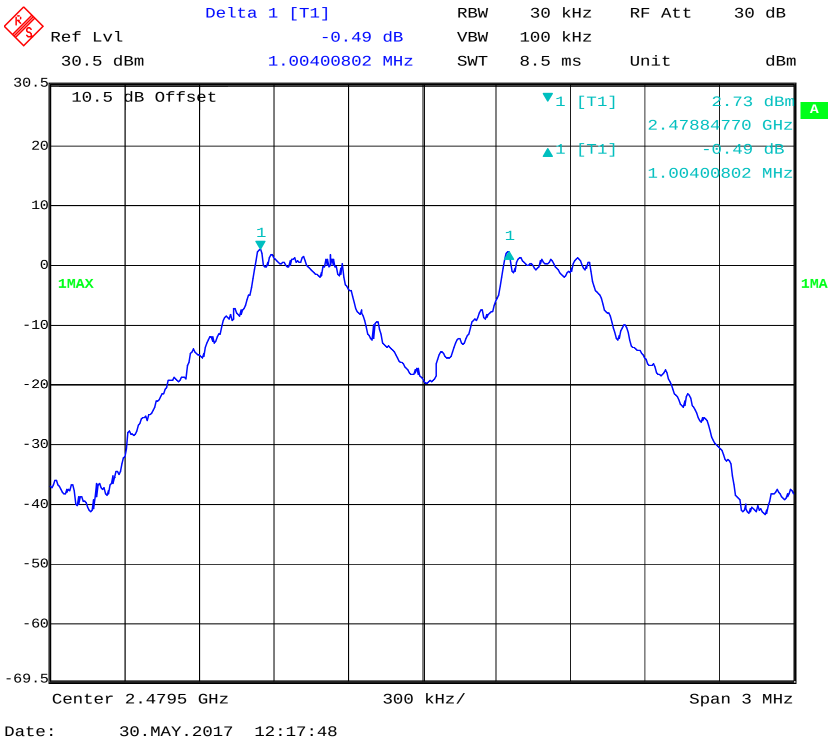
BDR (GFSK): Low Channel



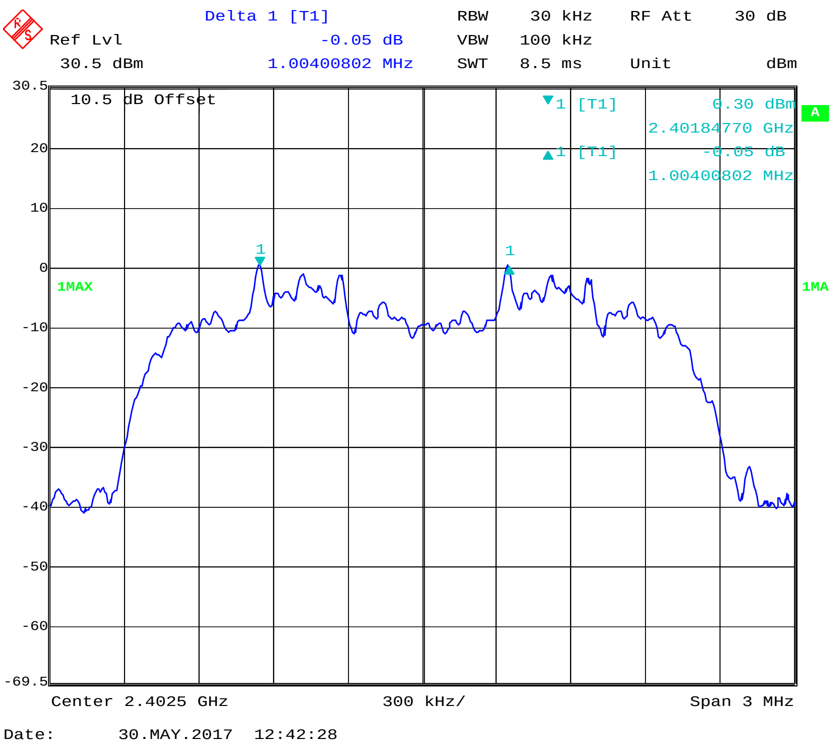
BDR (GFSK): Middle Channel



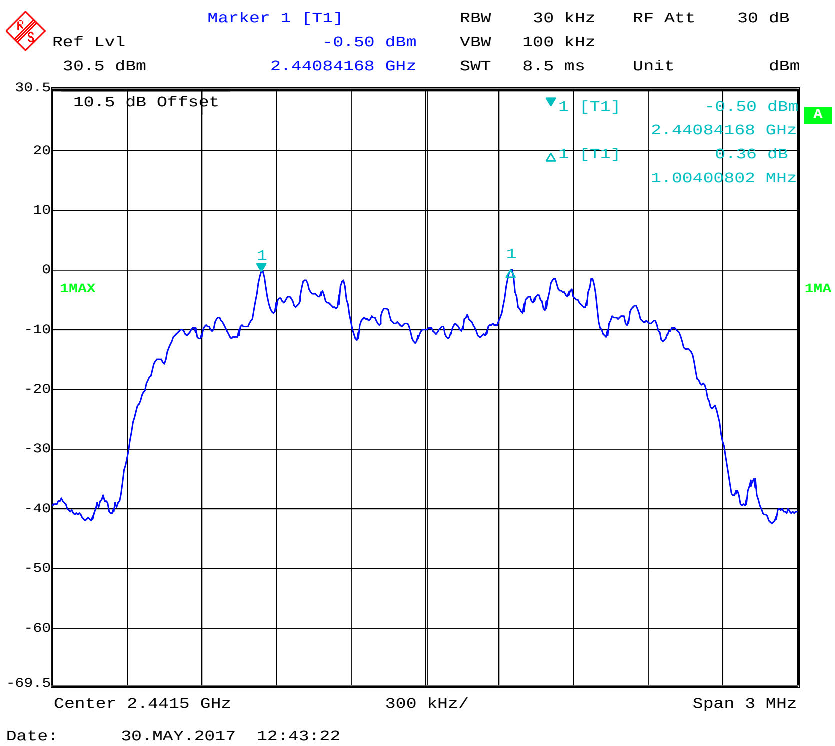
BDR (GFSK): High Channel



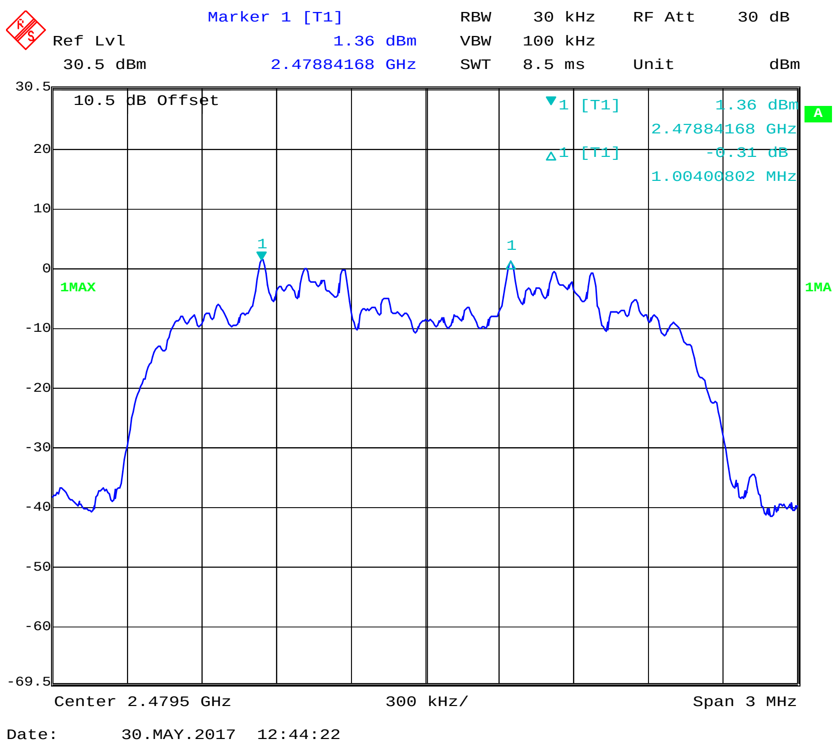
EDR (π/4-DQPSK): Low Channel



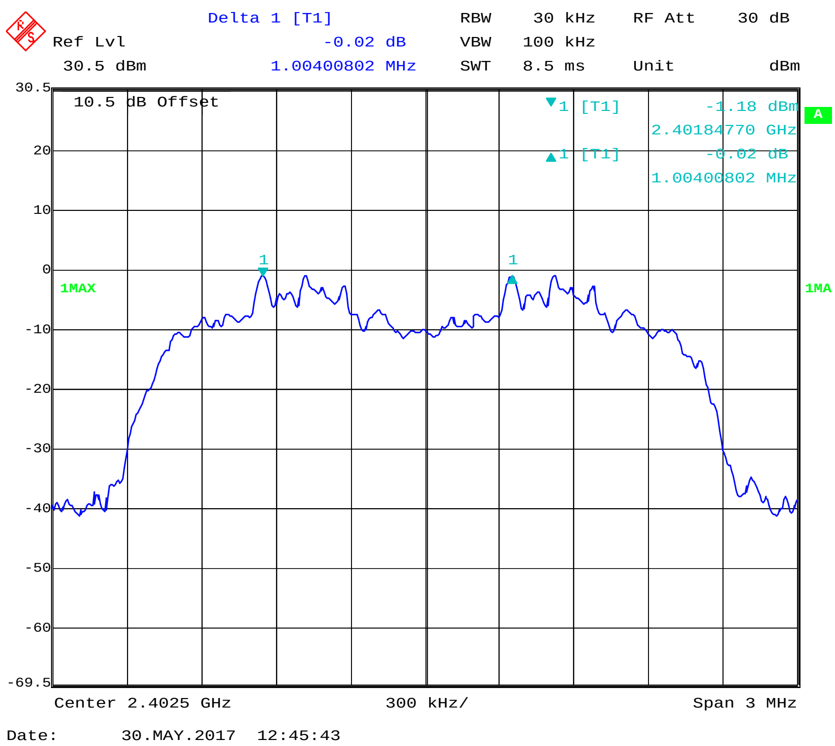
EDR (π/4-DQPSK): Middle Channel



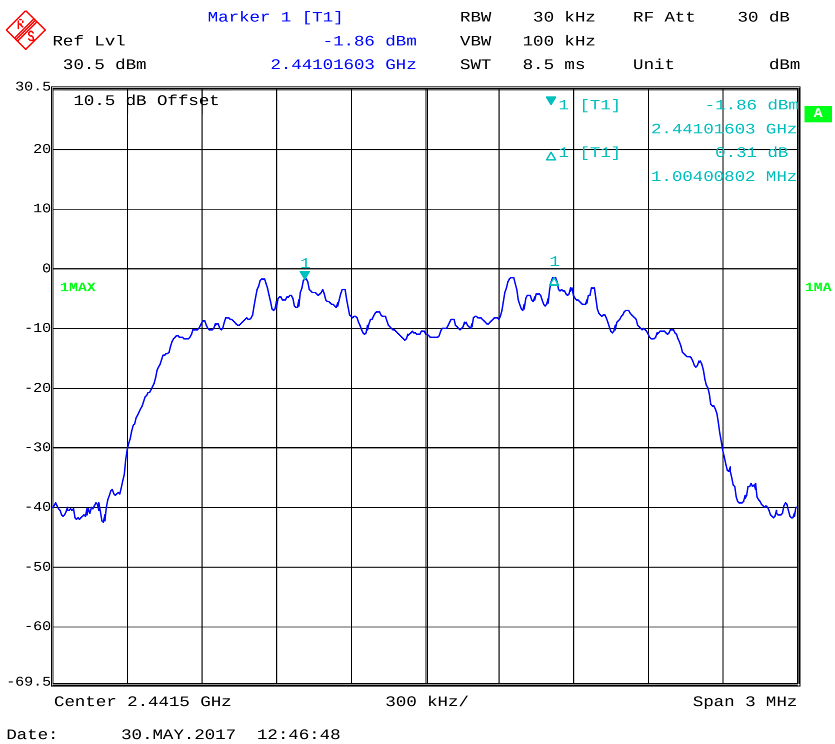
EDR (π/4-DQPSK): High Channel



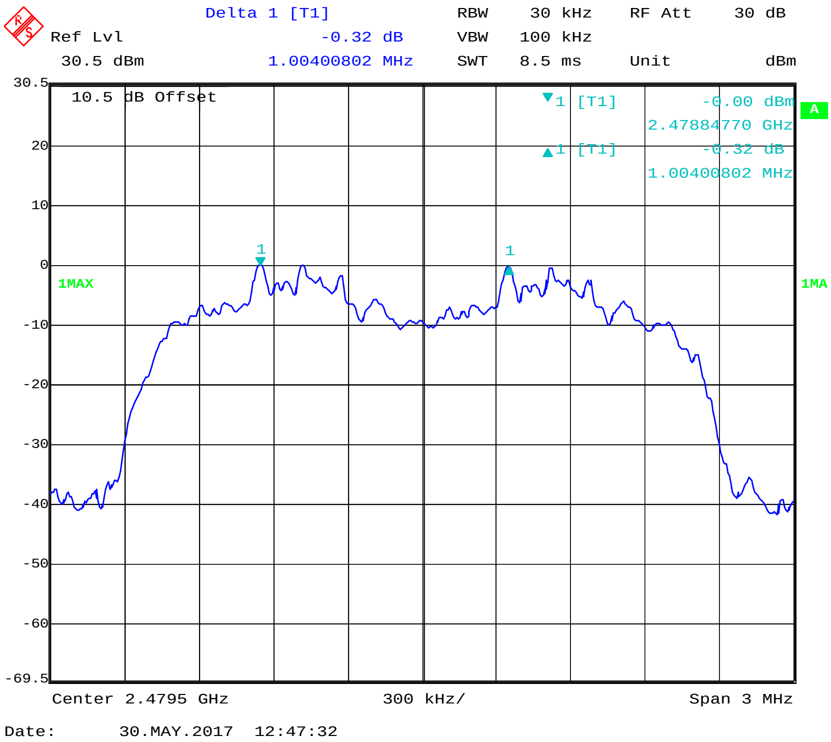
EDR (8DPSK): Low Channel



EDR (8DPSK): Middle Channel



EDR (8DPSK): High Channel



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

Applicable Standard

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

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

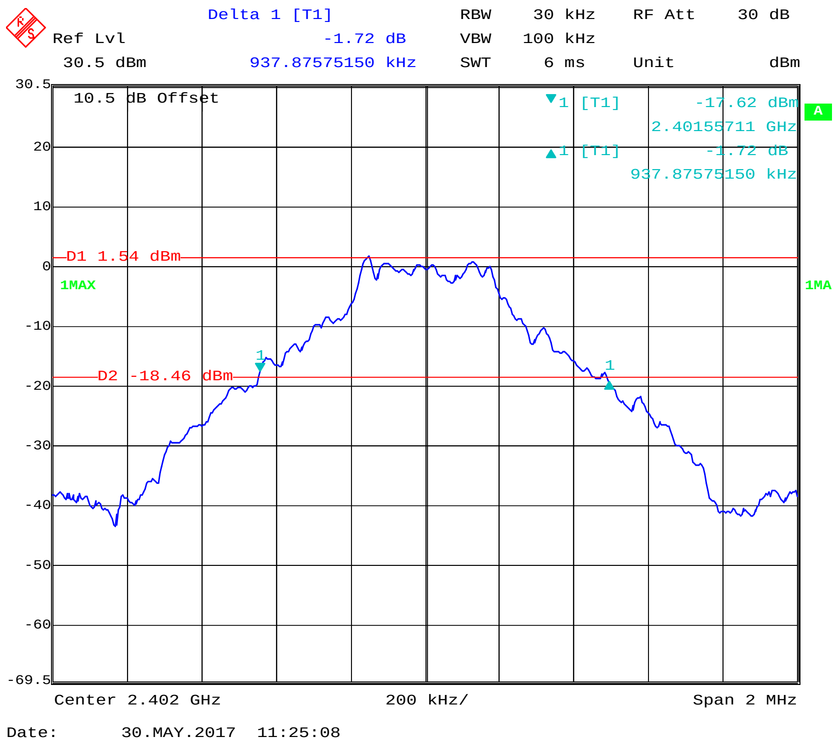
The testing was performed by Echo Wu on 2017-05-30.

EUT operation mode: Transmitting

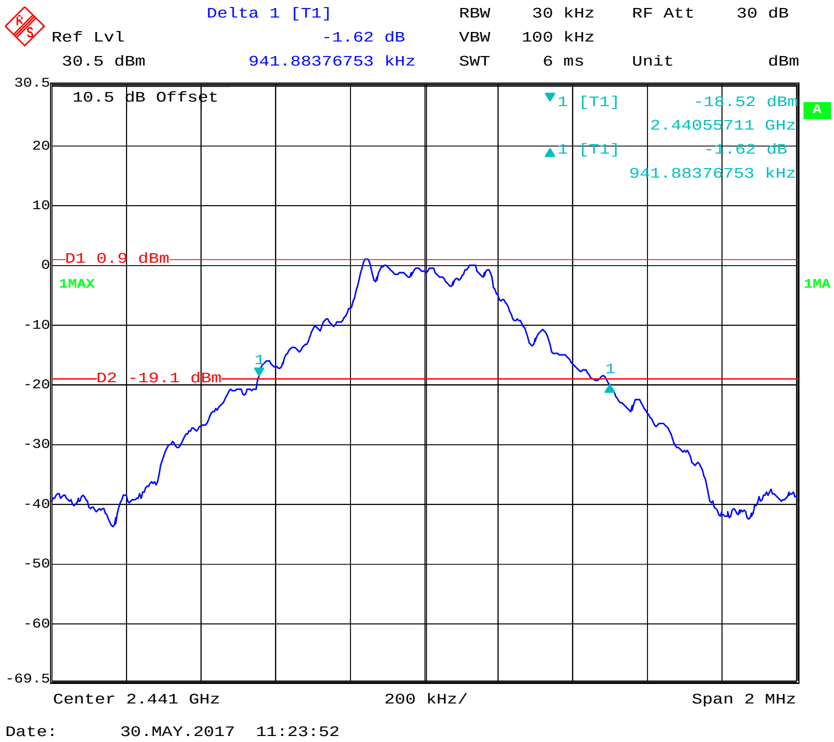
Test Result: Compliance. Please refer to following table and plots.

Mode	Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.938
	Middle	2441	0.942
	High	2480	0.938
EDR (π/4-DQPSK)	Low	2402	1.263
	Middle	2441	1.263
	High	2480	1.259
EDR (8DPSK)	Low	2402	1.275
	Middle	2441	1.279
	High	2480	1.279

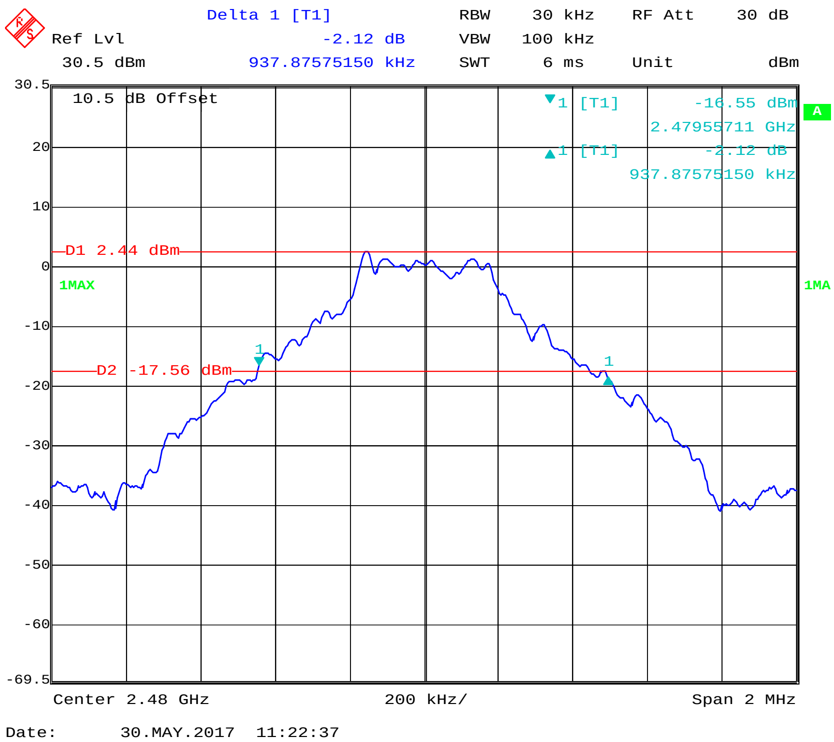
BDR (GFSK): Low Channel



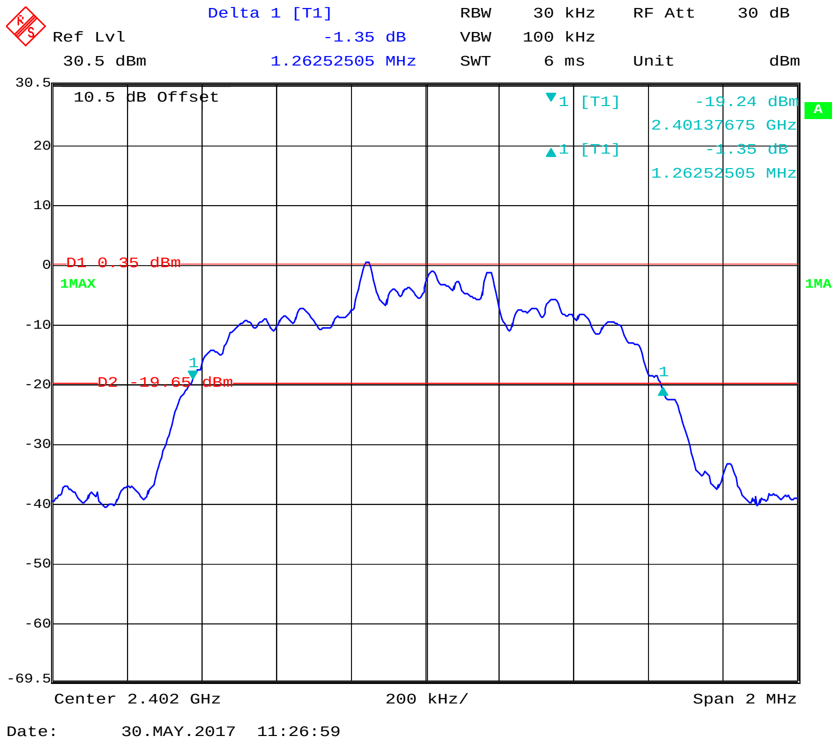
BDR (GFSK): Middle Channel



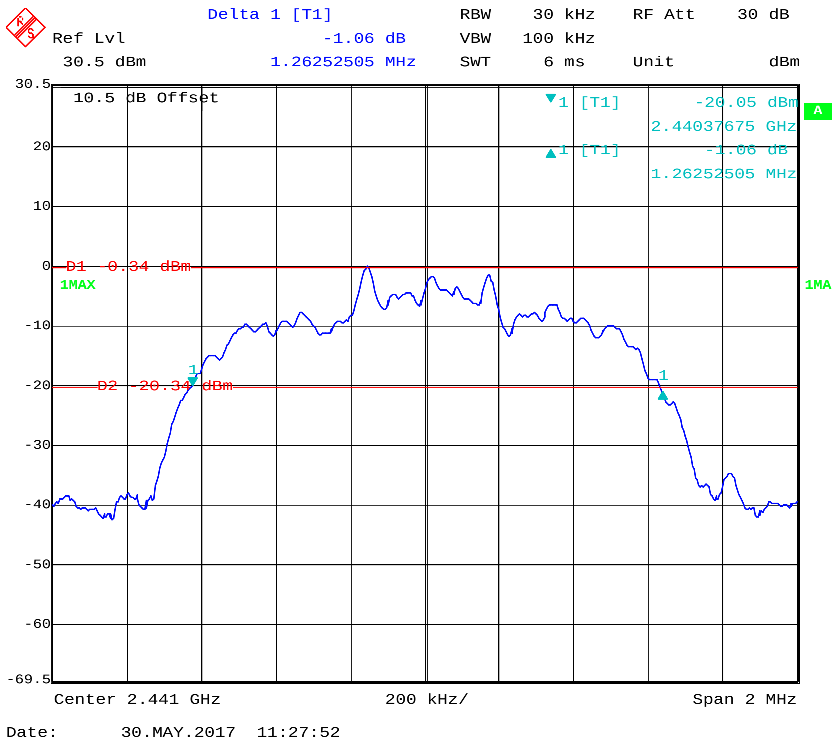
BDR (GFSK): High Channel



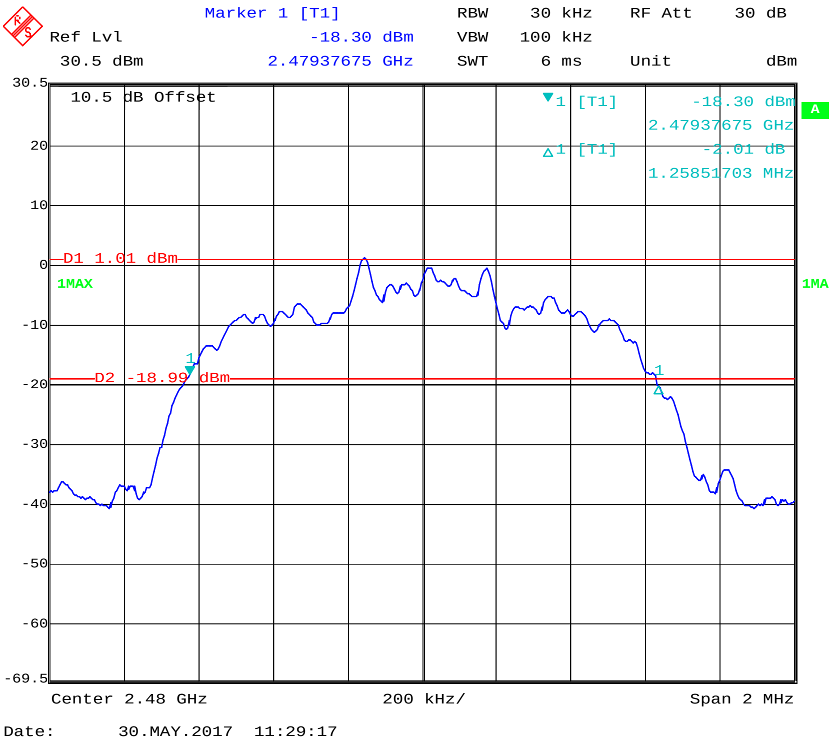
EDR (π/4-DQPSK): Low Channel



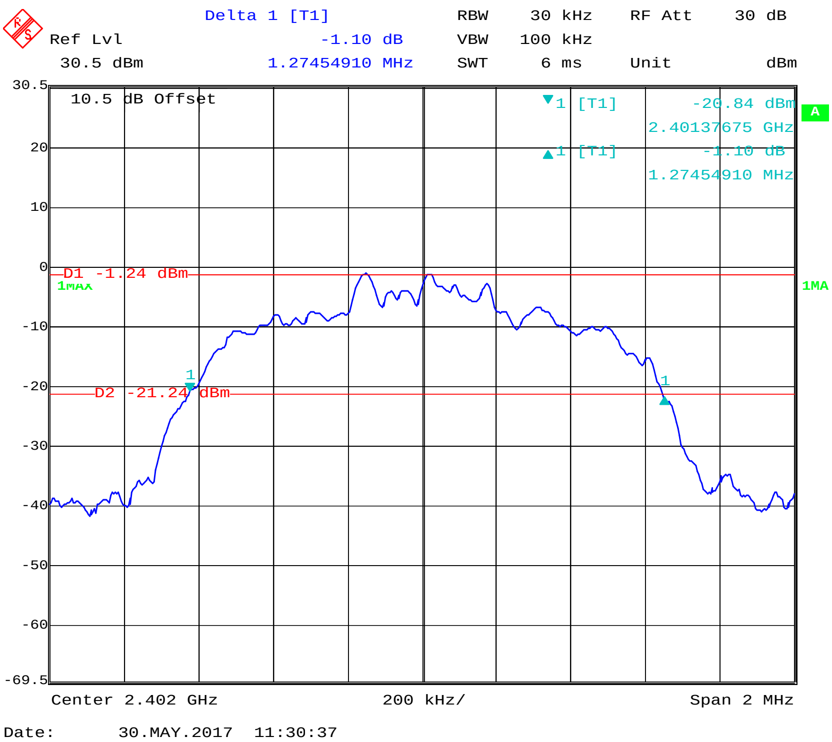
EDR (π/4-DQPSK): Middle Channel



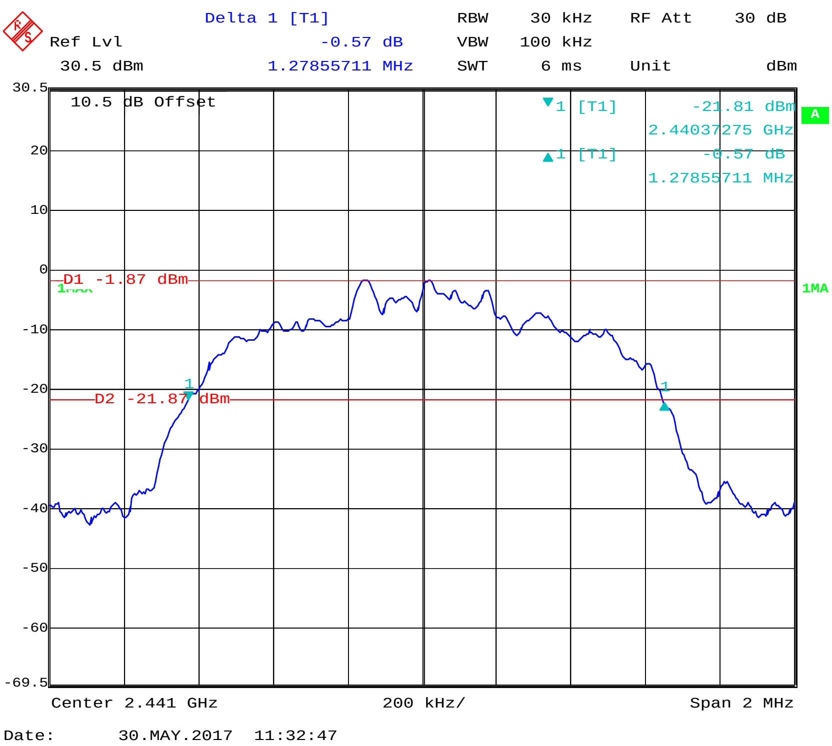
EDR (π/4-DQPSK): High Channel



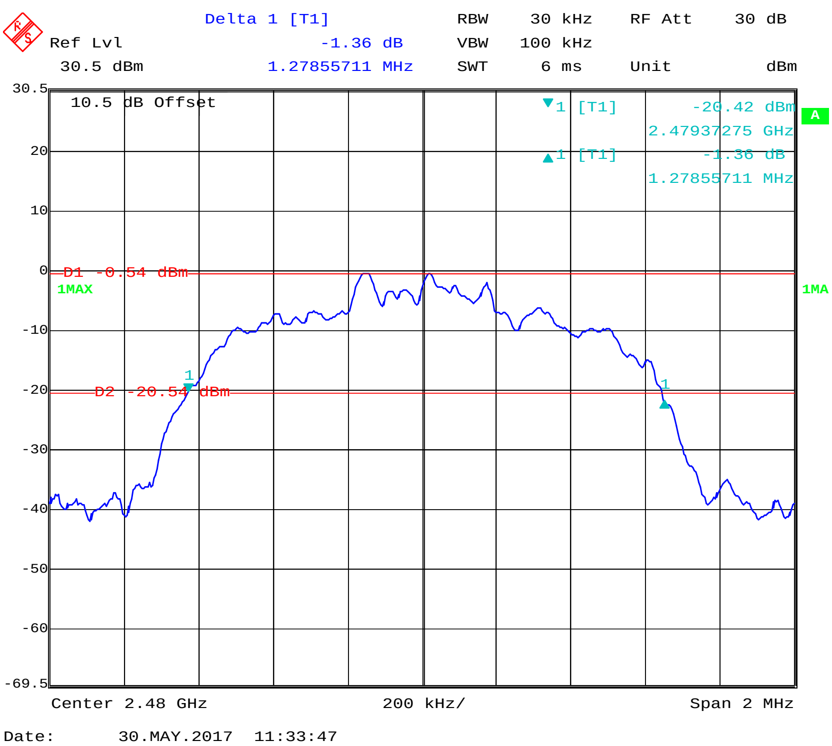
EDR (8DPSK): Low Channel



EDR (8DPSK): Middle Channel



EDR (8DPSK): High Channel



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 Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

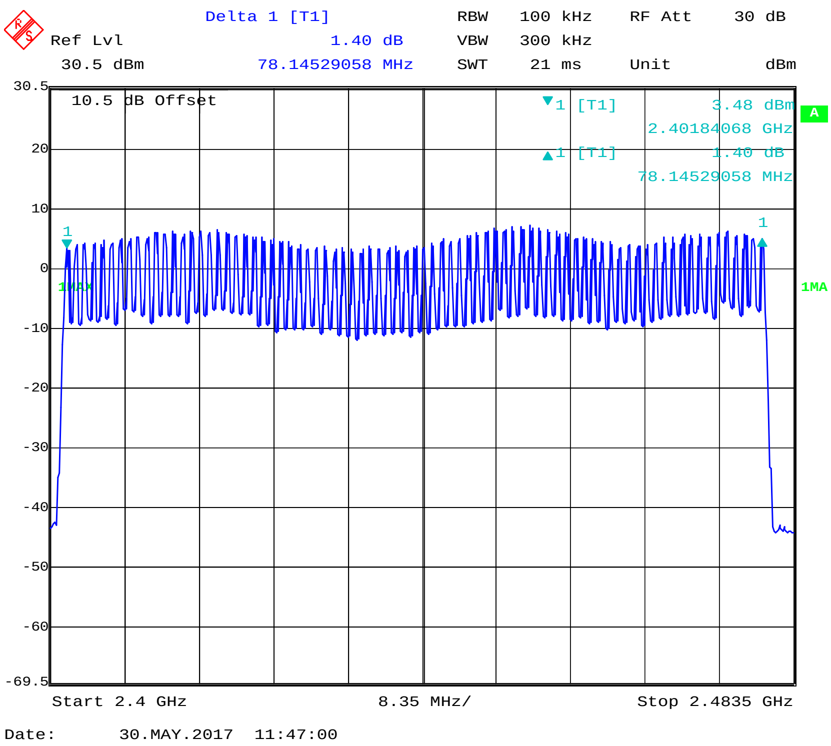
The testing was performed by Echo Wu on 2017-05-30.

EUT operation mode: Transmitting

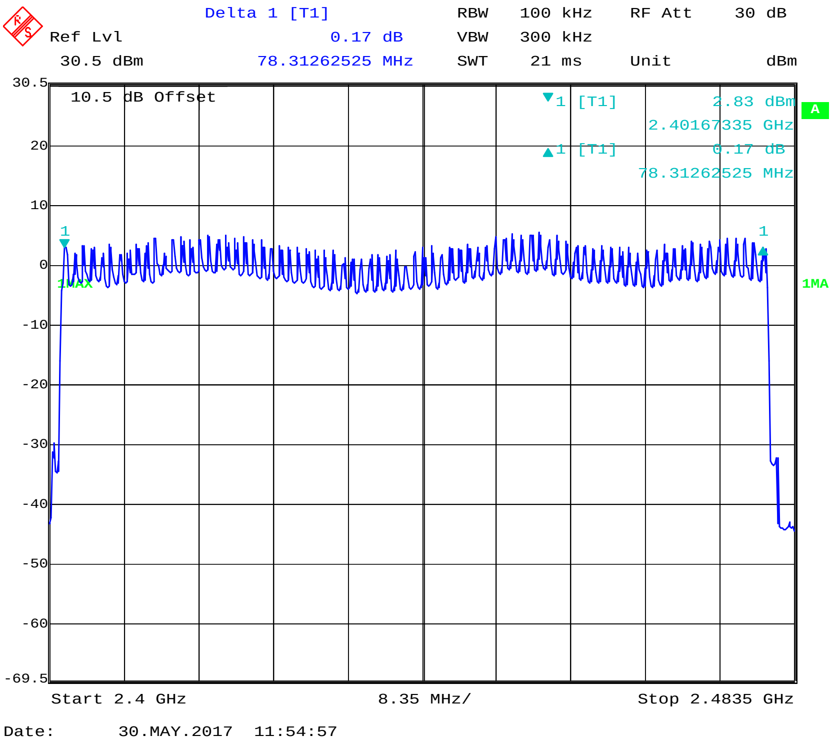
Test Result: Compliance. Please refer to following table and plots.

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

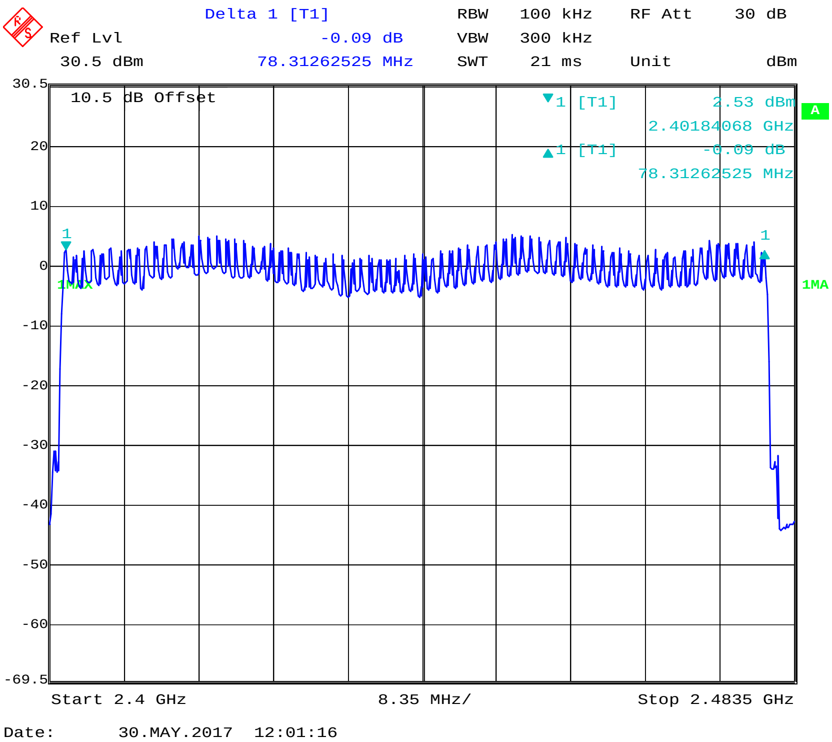
BDR (GFSK): Number of Hopping Channels



EDR (π/4-DQPSK): Number of Hopping Channels



EDR (8DPSK): Number of Hopping Channels



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

Applicable Standard

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

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Echo Wu on 2017-05-30.

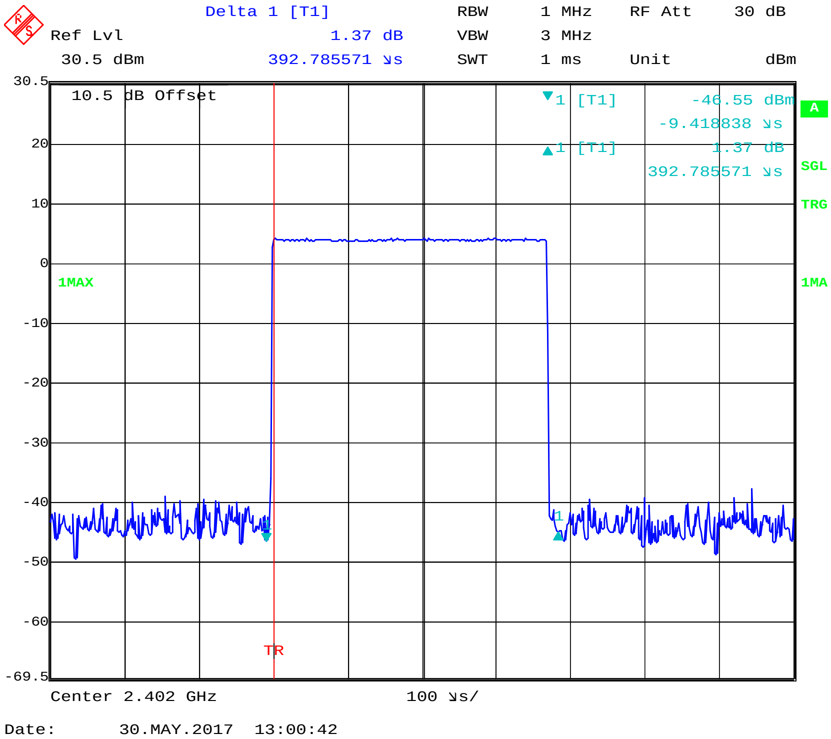
EUT operation mode: Transmitting

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

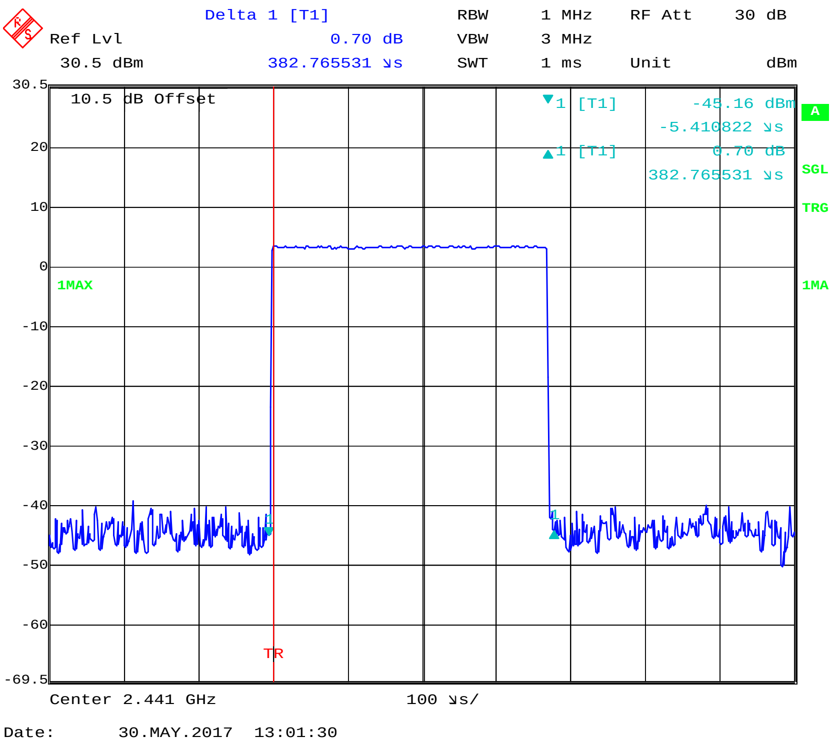
Mode		Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
BDR (GFSK)	DH 1	Low	0.393	0.126	0.4	Pass
		Middle	0.383	0.123	0.4	Pass
		High	0.391	0.125	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
	DH 3	Low	1.671	0.267	0.4	Pass
		Middle	1.671	0.267	0.4	Pass
		High	1.671	0.267	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
	DH 5	Low	2.926	0.312	0.4	Pass
		Middle	2.926	0.312	0.4	Pass
		High	2.926	0.312	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				
EDR (π/4-DQPSK)	2DH 1	Low	0.391	0.125	0.4	Pass
		Middle	0.391	0.125	0.4	Pass
		High	0.399	0.128	0.4	Pass
		Note: 2DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
	2DH 3	Low	1.665	0.266	0.4	Pass
		Middle	1.665	0.266	0.4	Pass
		High	1.659	0.265	0.4	Pass
		Note: 2DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
	2DH 5	Low	2.946	0.314	0.4	Pass
		Middle	2.946	0.314	0.4	Pass
		High	2.946	0.314	0.4	Pass
		Note: 2DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				
EDR (8DPSK)	3DH 1	Low	0.393	0.126	0.4	Pass
		Middle	0.407	0.130	0.4	Pass
		High	0.407	0.130	0.4	Pass
		Note: 3DH1:Dwell time = Pulse time*(1600/2/79)*31.6s				
	3DH 3	Low	1.659	0.265	0.4	Pass
		Middle	1.659	0.265	0.4	Pass
		High	1.665	0.266	0.4	Pass
		Note: 3DH3:Dwell time = Pulse time*(1600/4/79)*31.6s				
	3DH 5	Low	2.926	0.312	0.4	Pass
		Middle	2.936	0.313	0.4	Pass
		High	2.916	0.311	0.4	Pass
		Note: 3DH5:Dwell time = Pulse time*(1600/6/79)*31.6s				

BDR (GFSK):

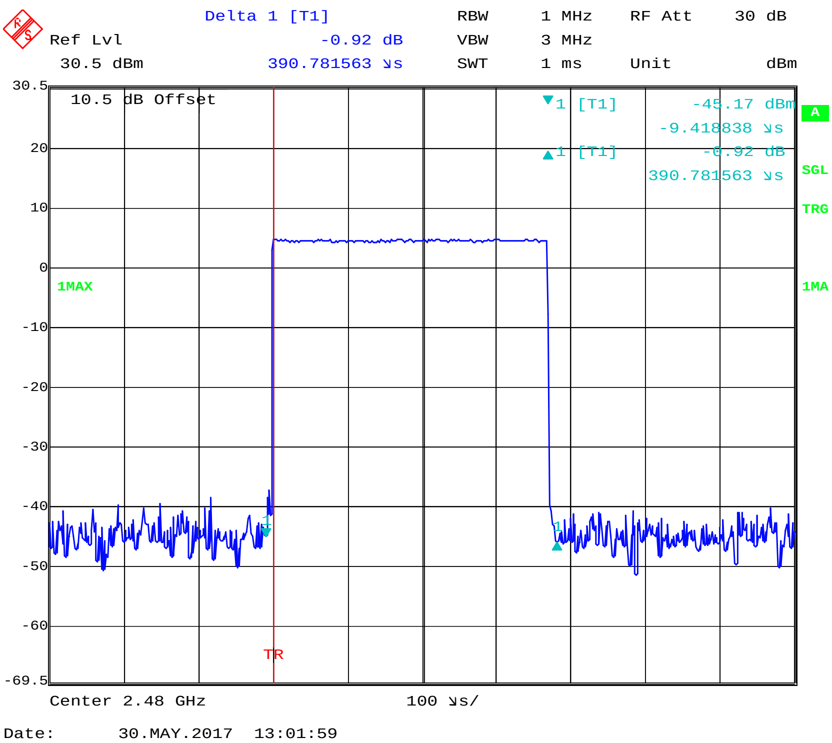
Pulse time, Low Channel, DH1



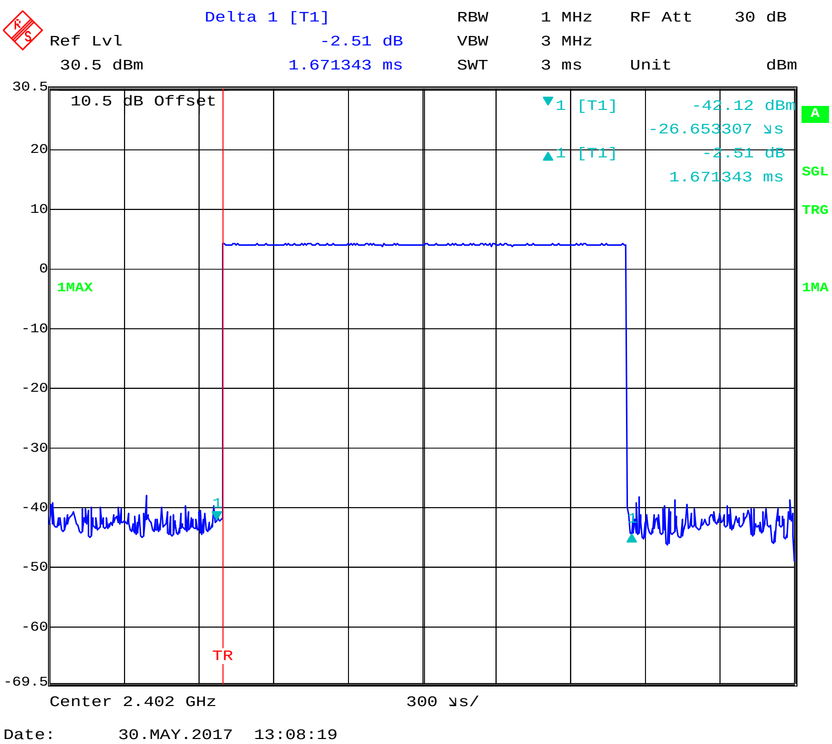
Pulse time, Middle Channel, DH1



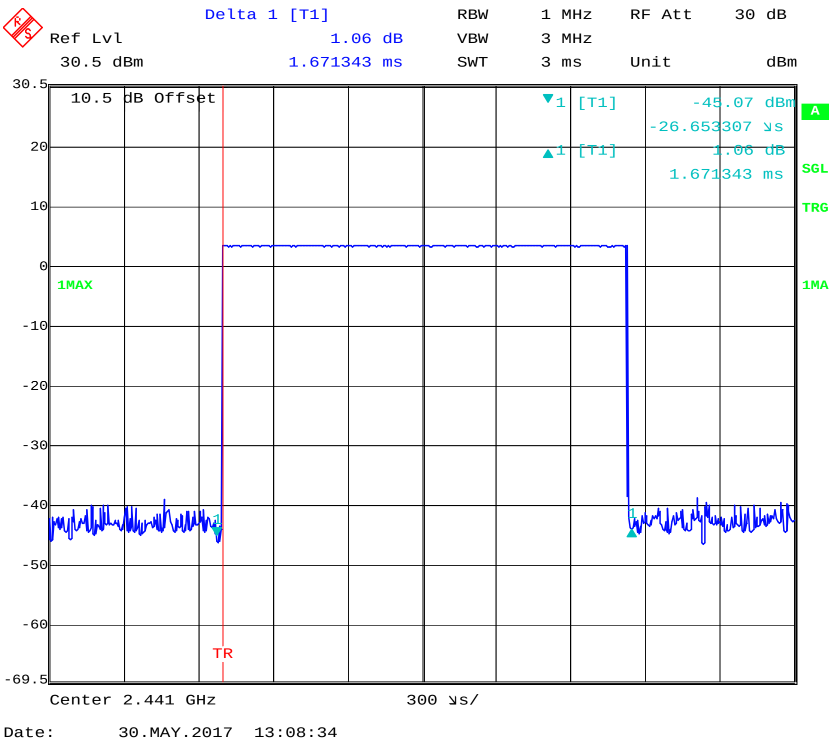
Pulse time, High Channel, DH1



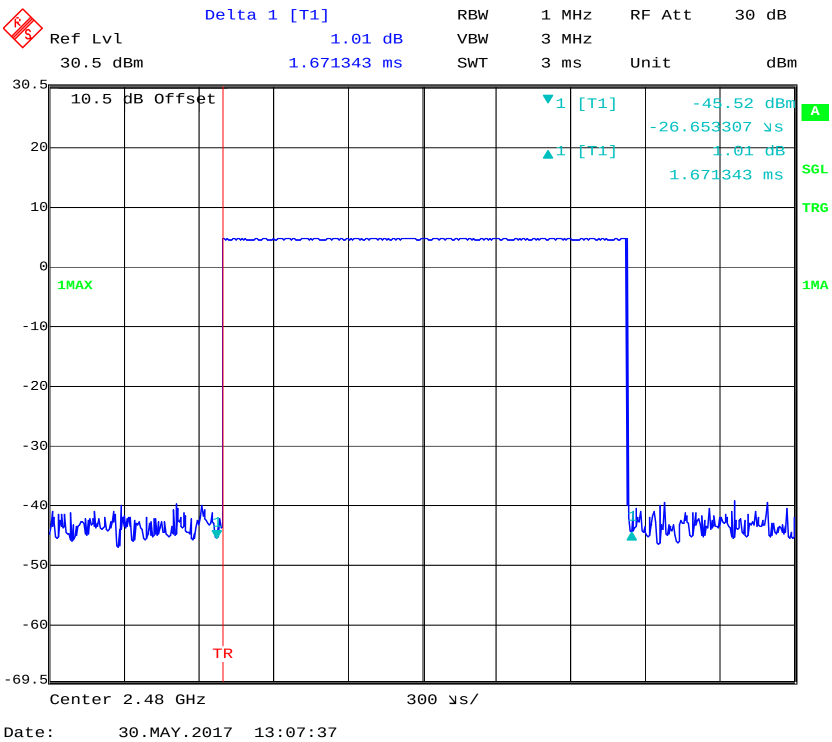
Pulse time, Low Channel, DH3



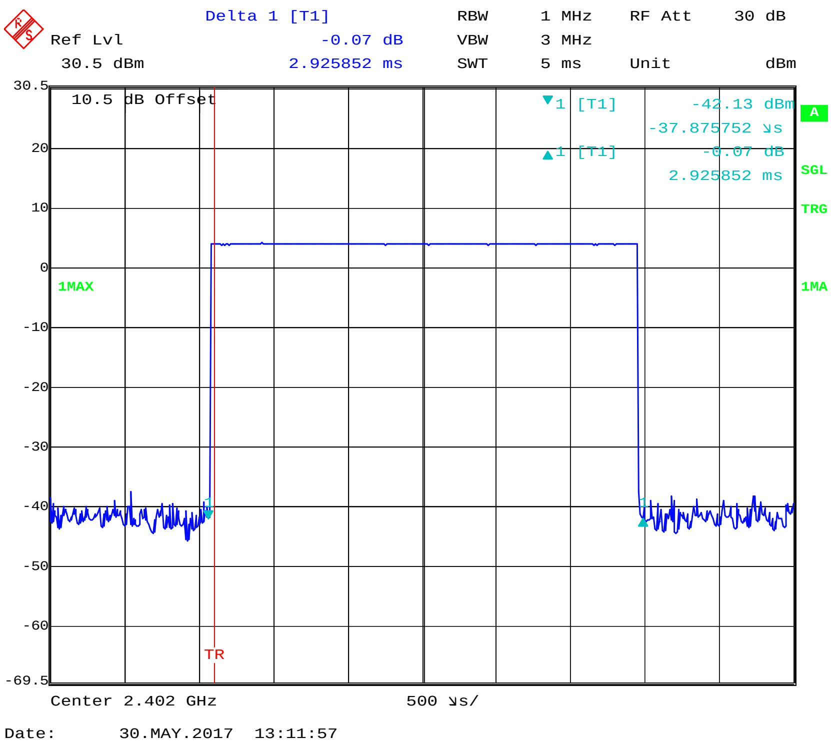
Pulse time, Middle Channel, DH3



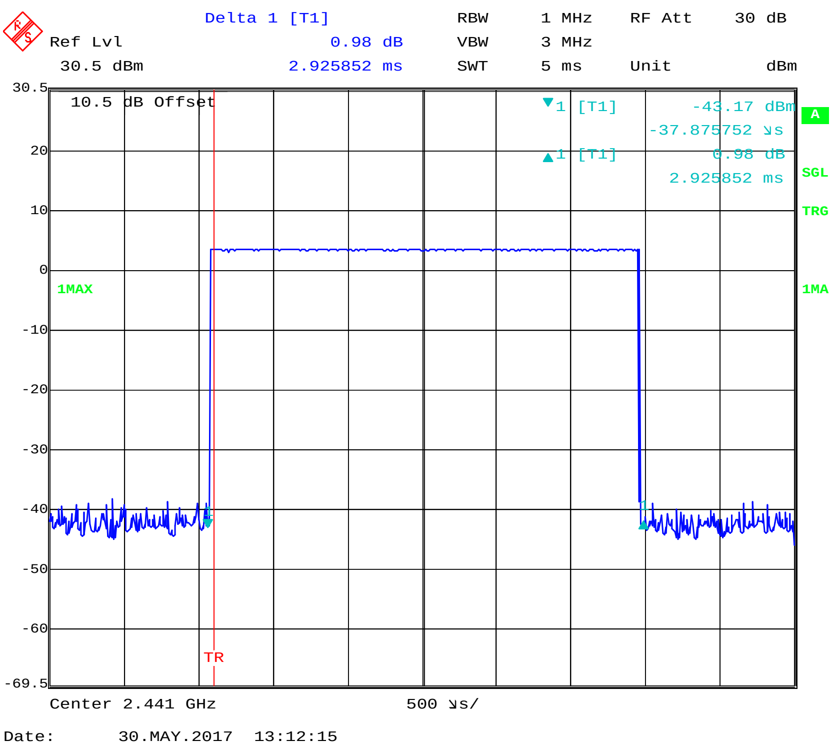
Pulse time, High Channel, DH3



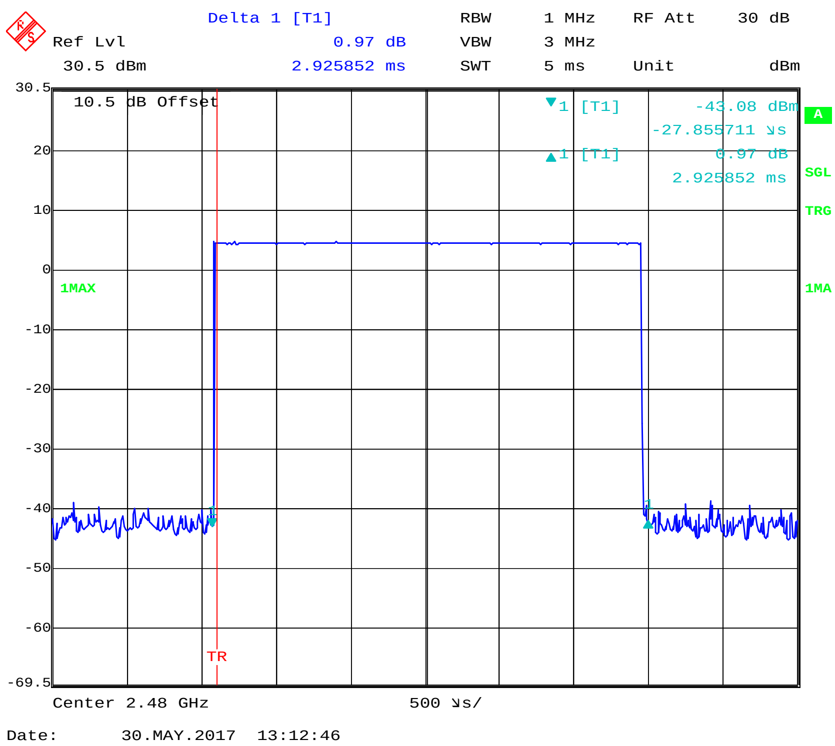
Pulse time, Low Channel, DH5



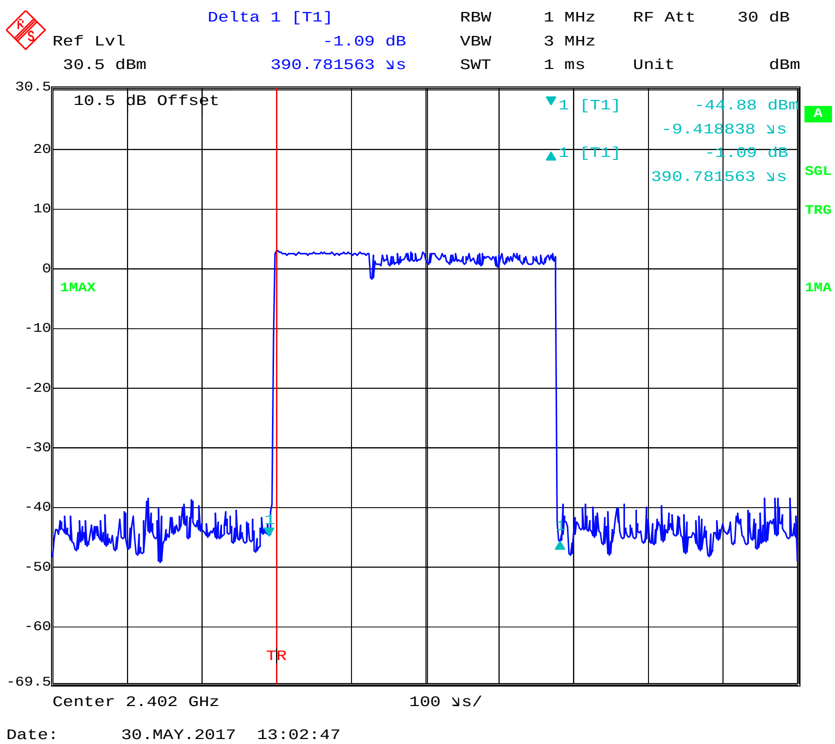
Pulse time, Middle Channel, DH5



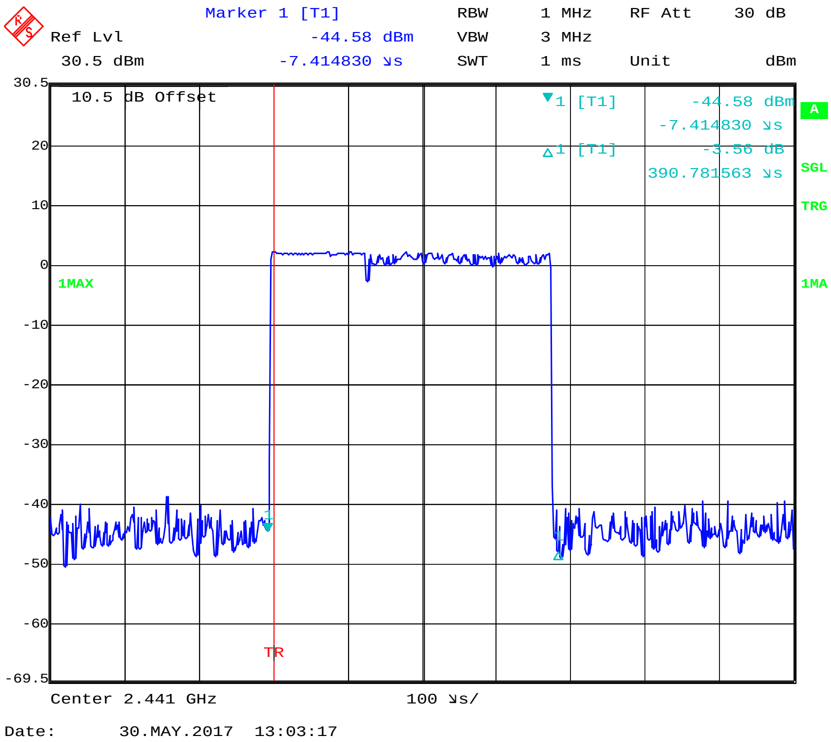
Pulse time, High Channel, DH5



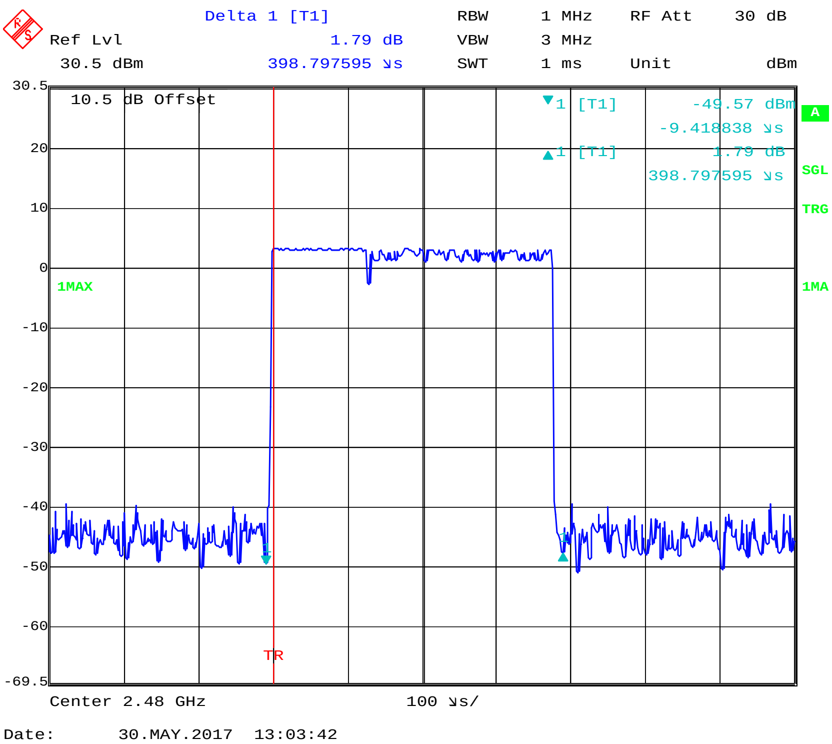
EDR (π/4-DQPSK):
Pulse time, Low Channel, 2DH1



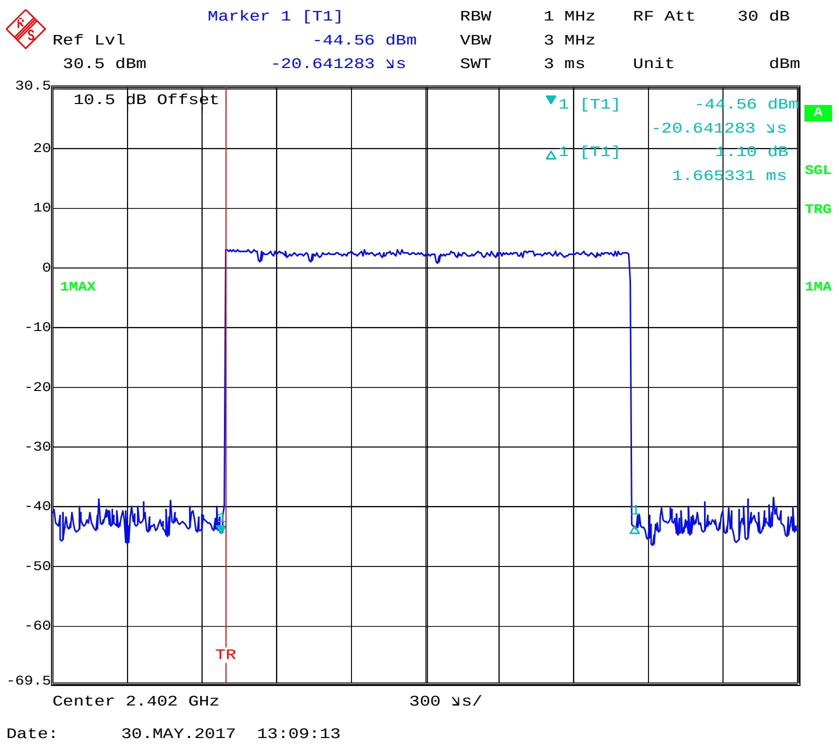
Pulse time, Middle Channel, 2DH1



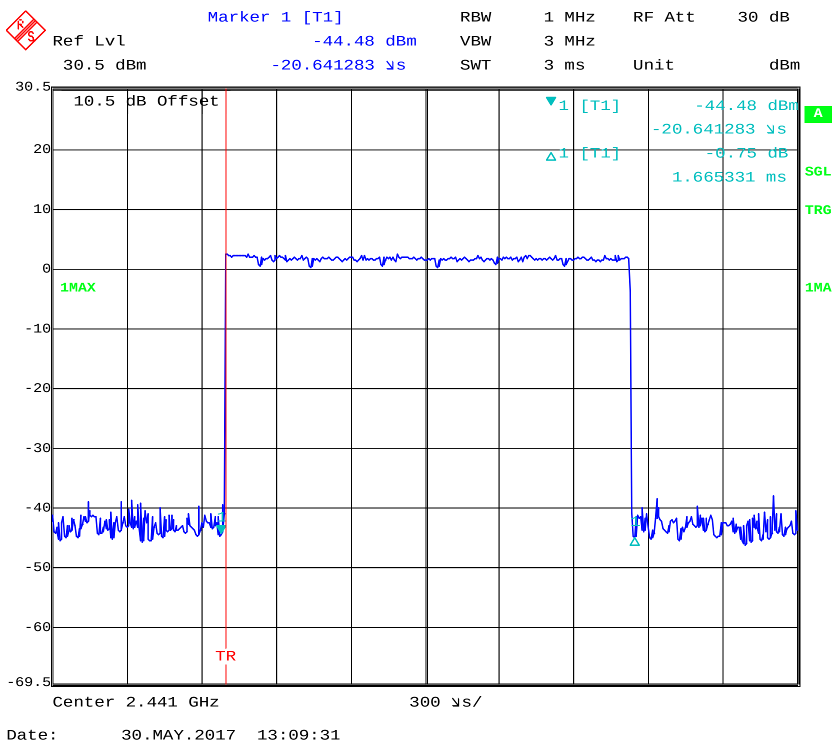
Pulse time, High Channel, 2DH1



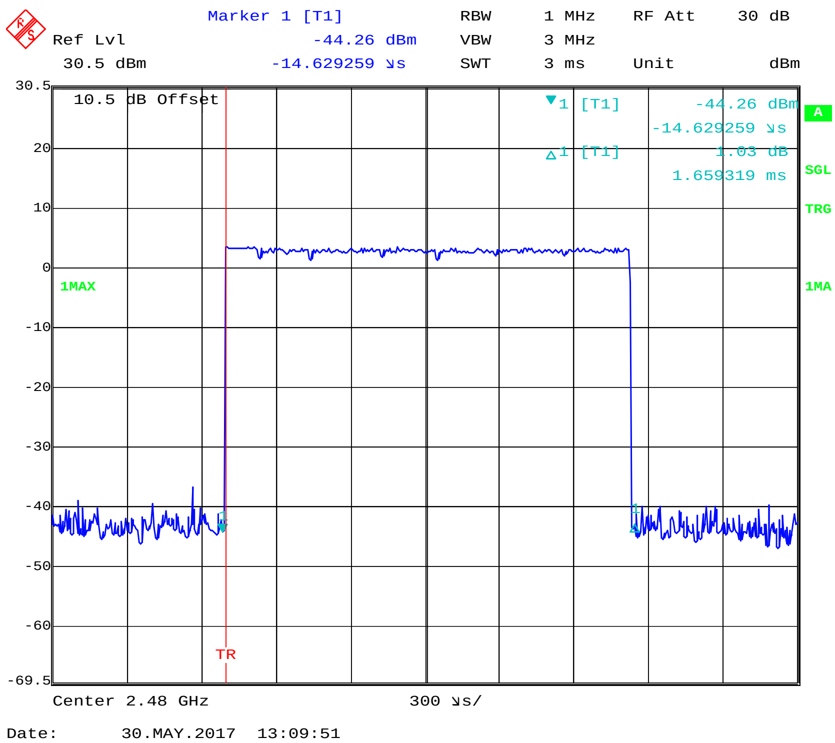
Pulse time, Low Channel, 2DH3



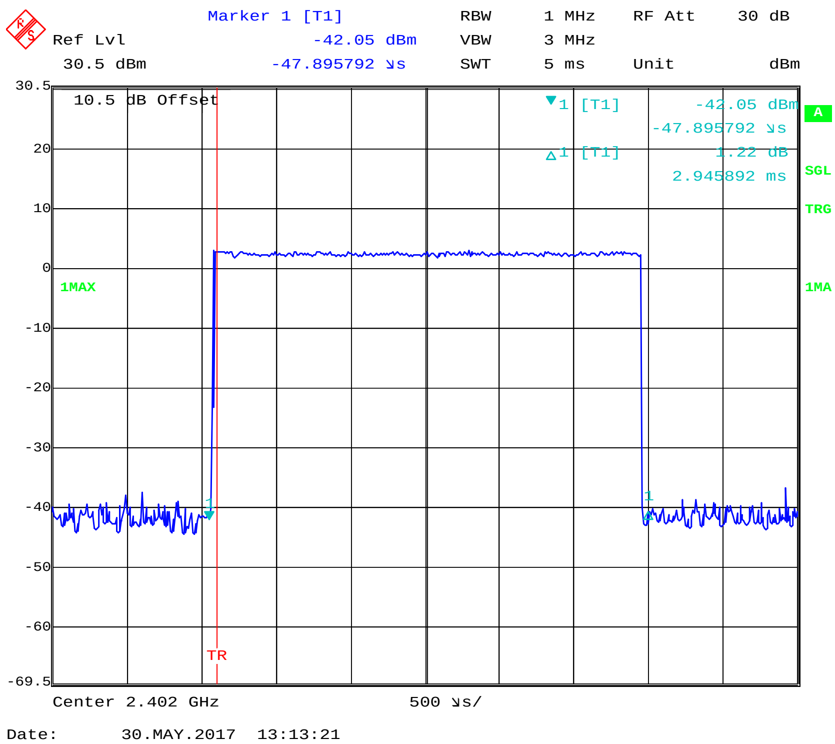
Pulse time, Middle Channel, 2DH3



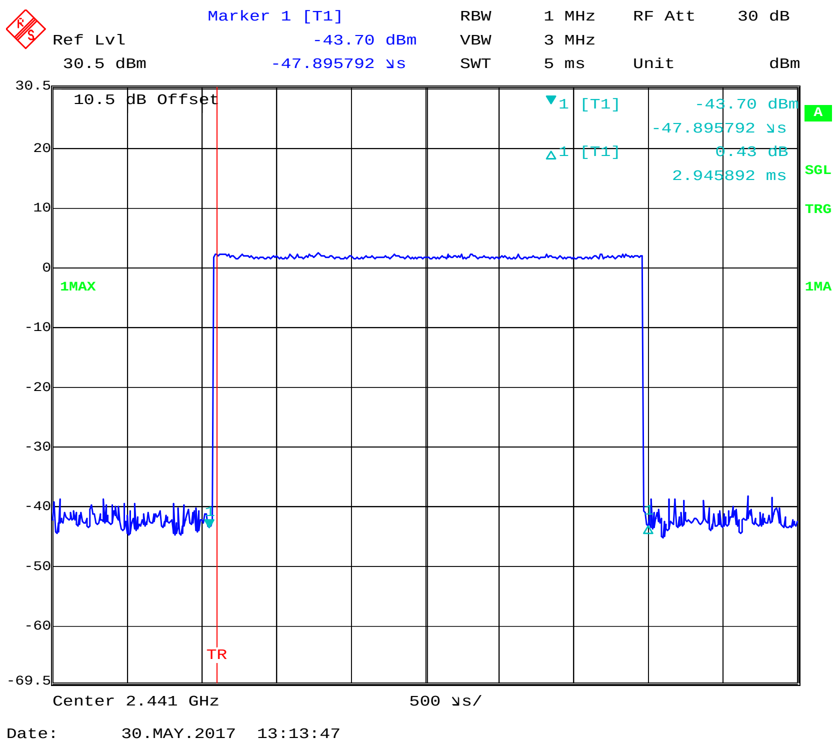
Pulse time, High Channel, 2DH3



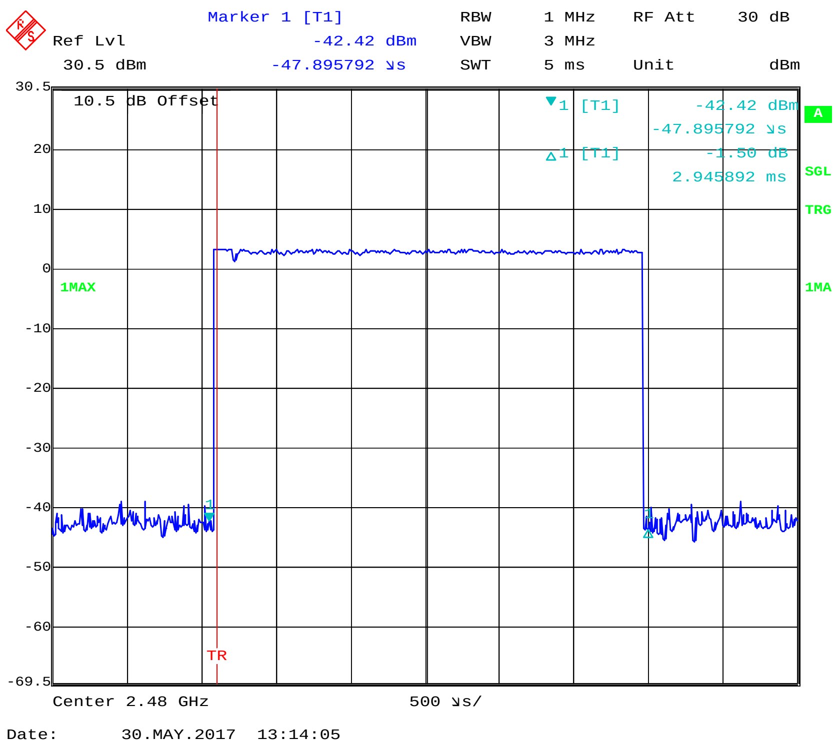
Pulse time, Low Channel, 2DH5



Pulse time, Middle Channel, 2DH5

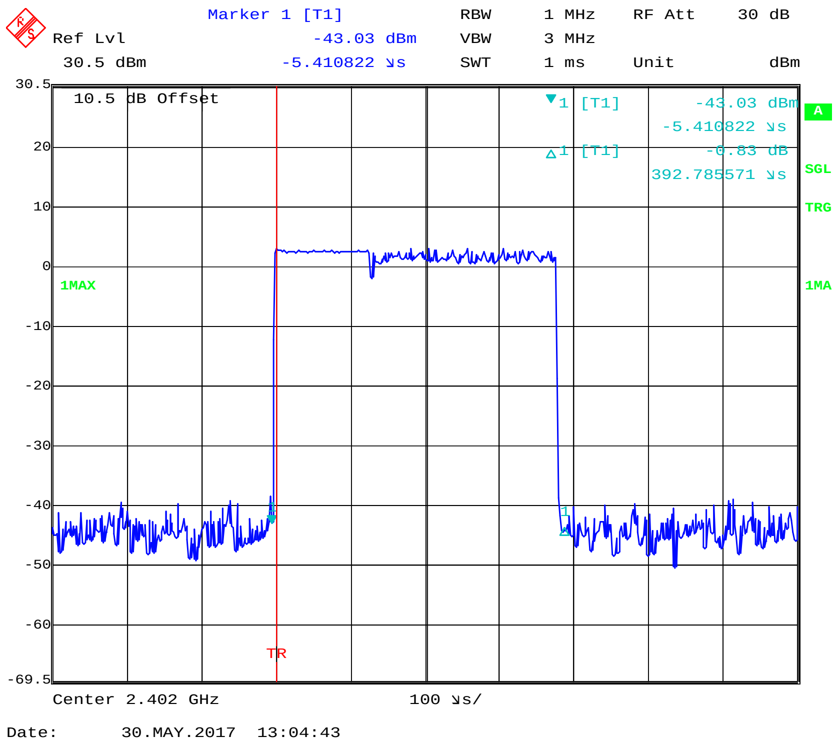


Pulse time, High Channel, 2DH5

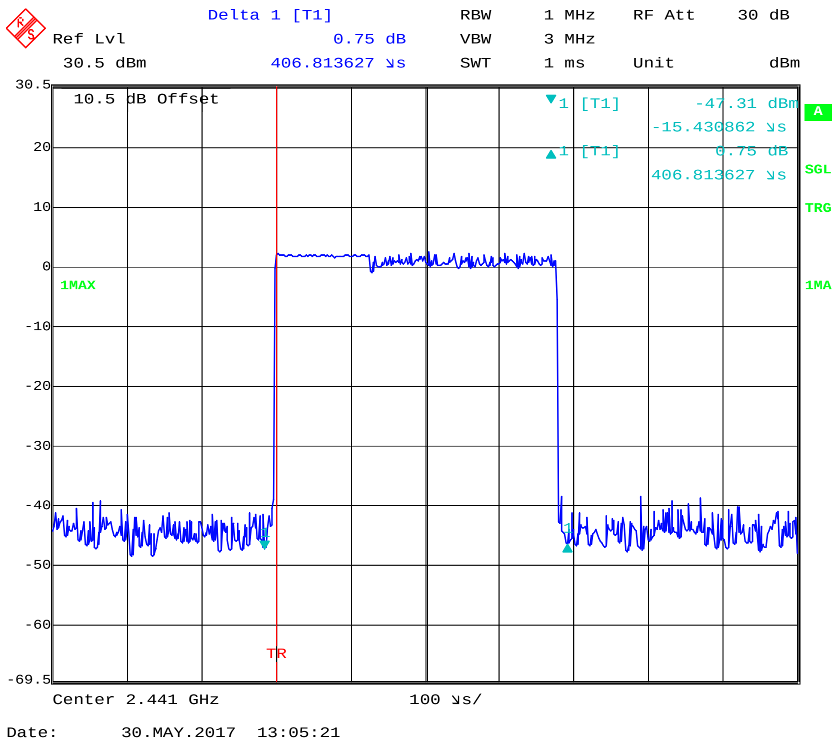


EDR (8DPSK):

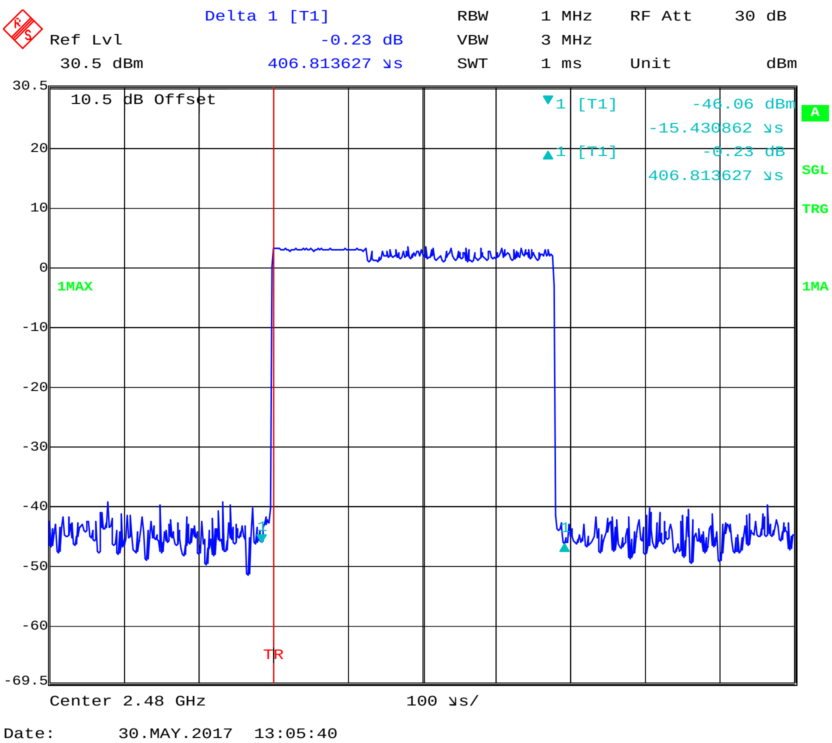
Pulse time, Low Channel, 3DH1



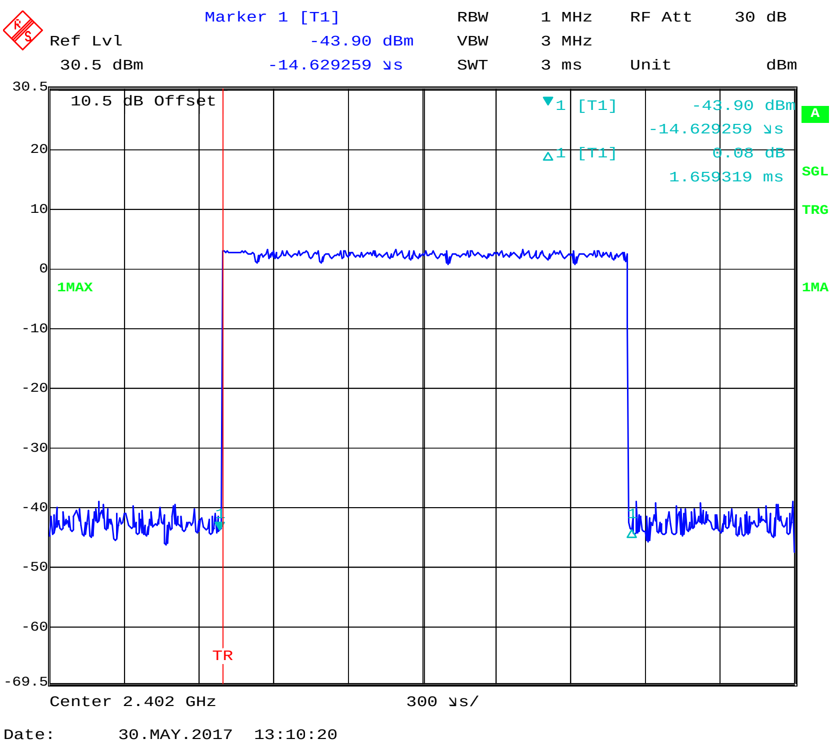
Pulse time, Middle Channel, 3DH1



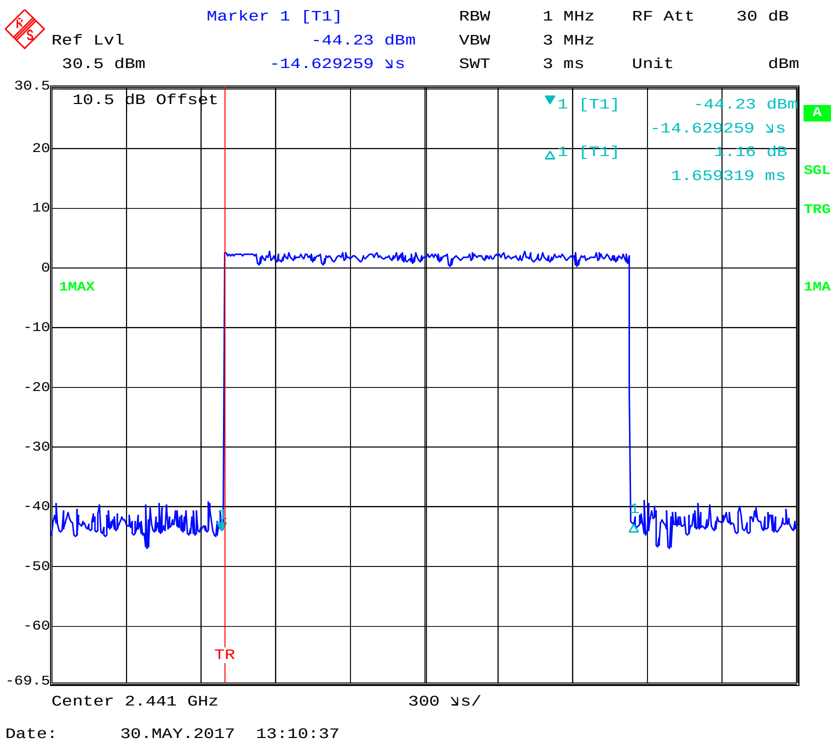
Pulse time, High Channel, 3DH1



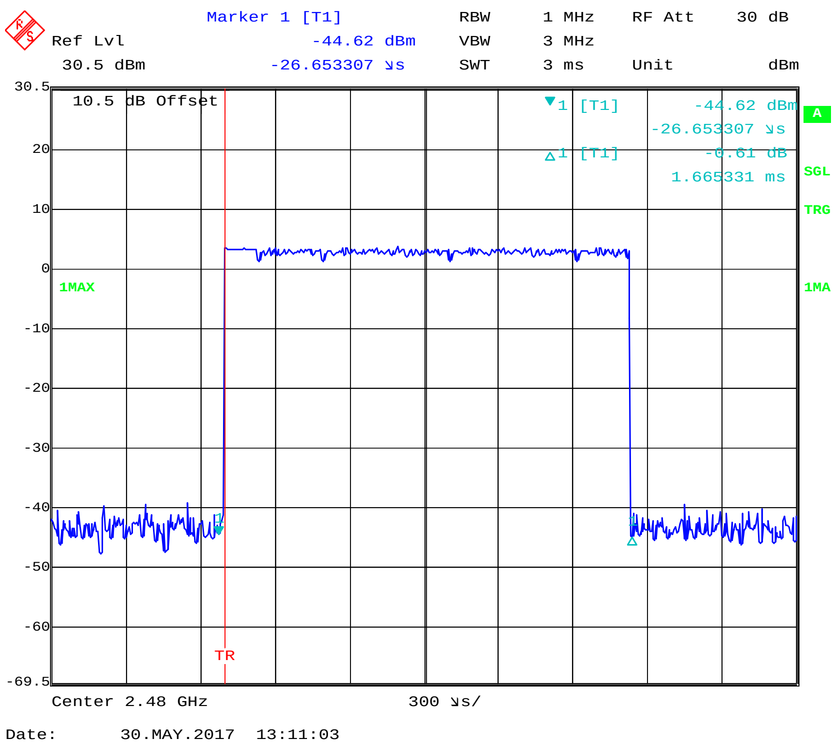
Pulse time, Low Channel, 3DH3



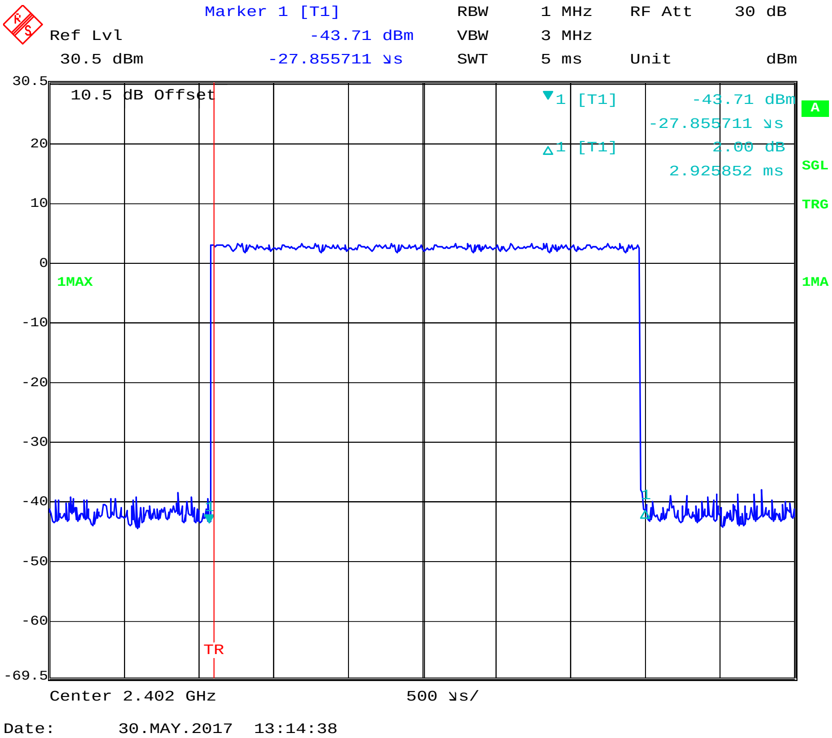
Pulse time, Middle Channel, 3DH3



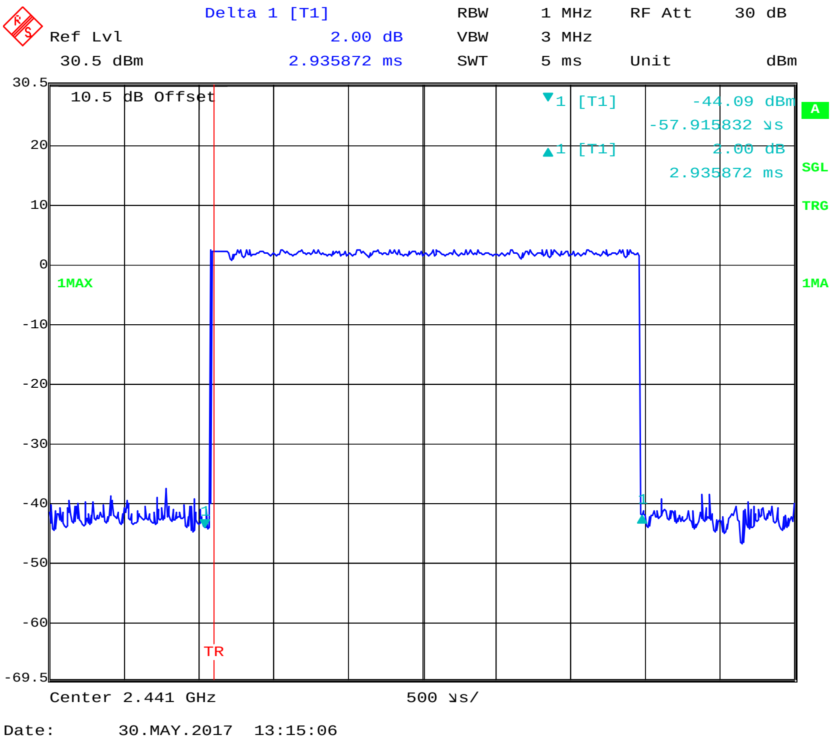
Pulse time, High Channel, 3DH3



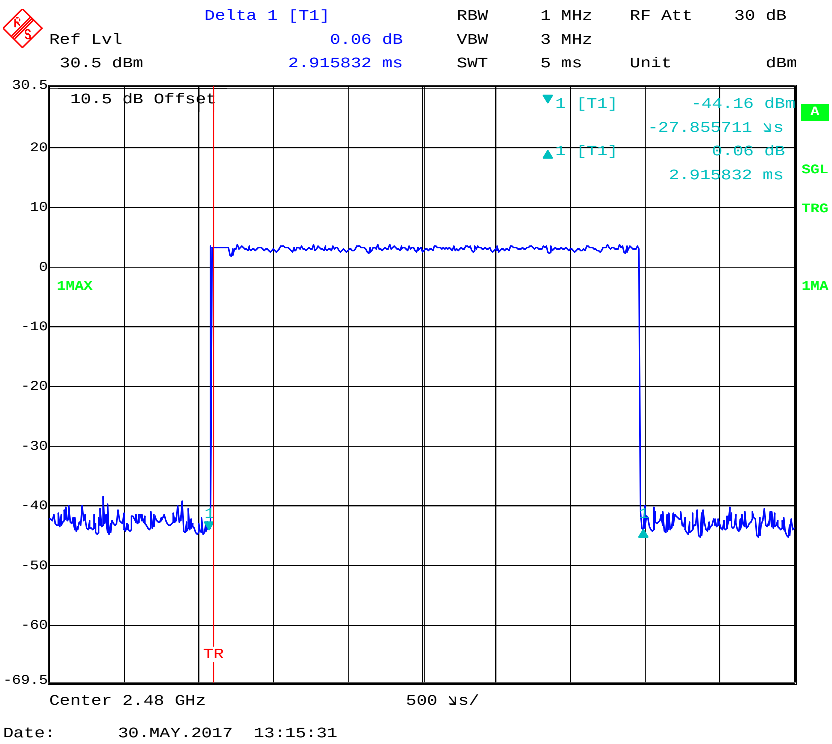
Pulse time, Low Channel, 3DH5



Pulse time, Middle Channel, 3DH5



Pulse time, High Channel, 3DH5



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

Applicable Standard

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

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Echo Wu on 2017-05-30.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to following table.

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (mW)
BDR (GFSK)	Low	2402	3.36	2.17	1000
	Middle	2441	3.09	2.04	1000
	High	2480	4.20	2.63	1000
	51	2453	6.81	4.80	1000
EDR (π/4-DQPSK)	Low	2402	2.83	1.92	1000
	Middle	2441	2.50	1.78	1000
	High	2480	3.35	2.16	1000
	52	2454	5.33	3.41	1000
EDR (8DPSK)	Low	2402	3.48	2.23	1000
	Middle	2441	3.16	2.07	1000
	High	2480	4.18	2.62	1000
	49	2451	5.61	3.64	1000

FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

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

Test Procedure

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

Test Data

Environmental Conditions

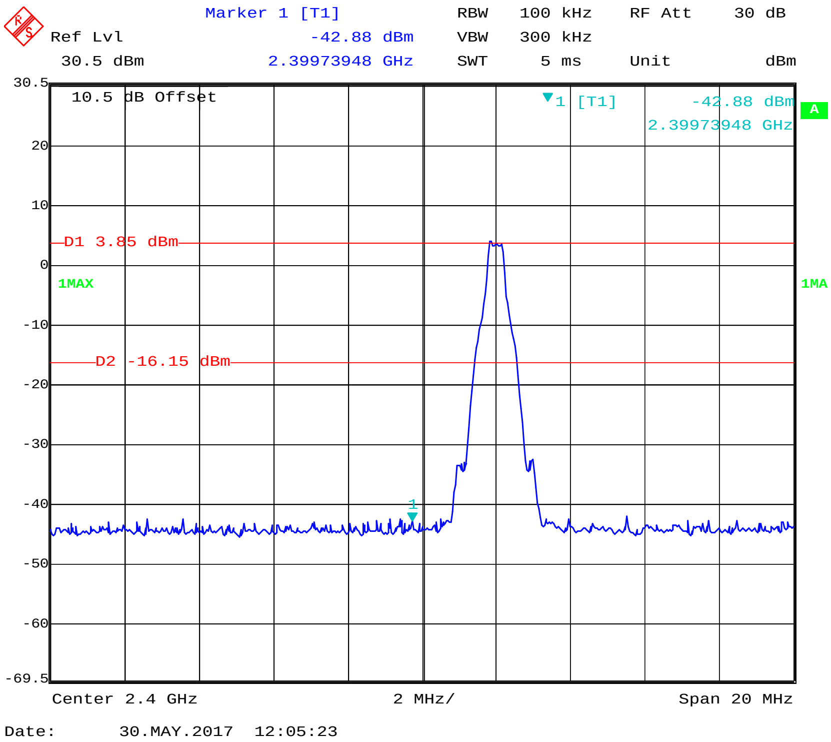
Temperature:	24 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Echo Wu on 2017-05-30.

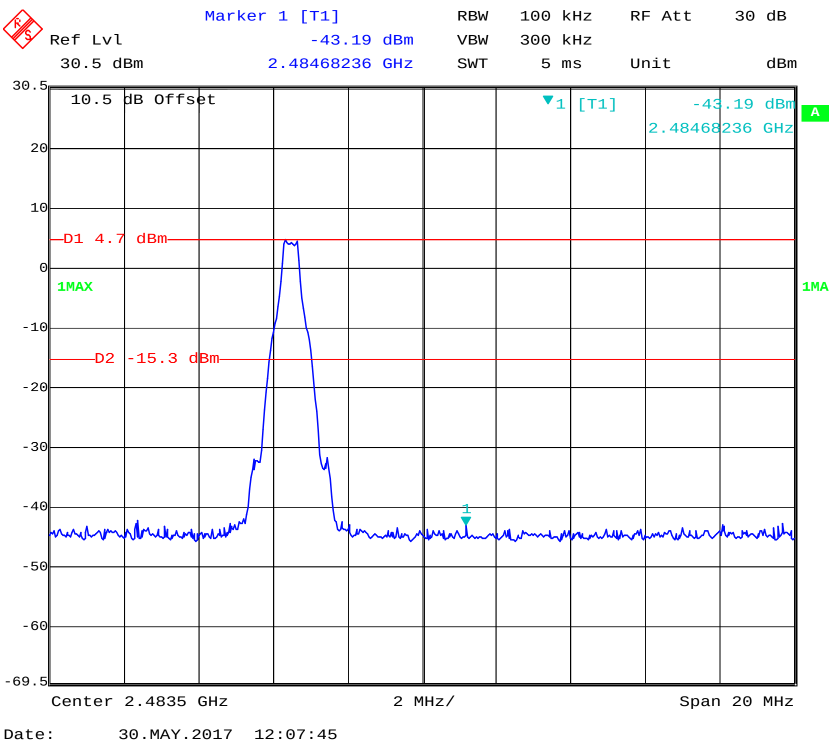
EUT operation mode: Transmitting

Test Result: Compliance. Please refer to following plots.

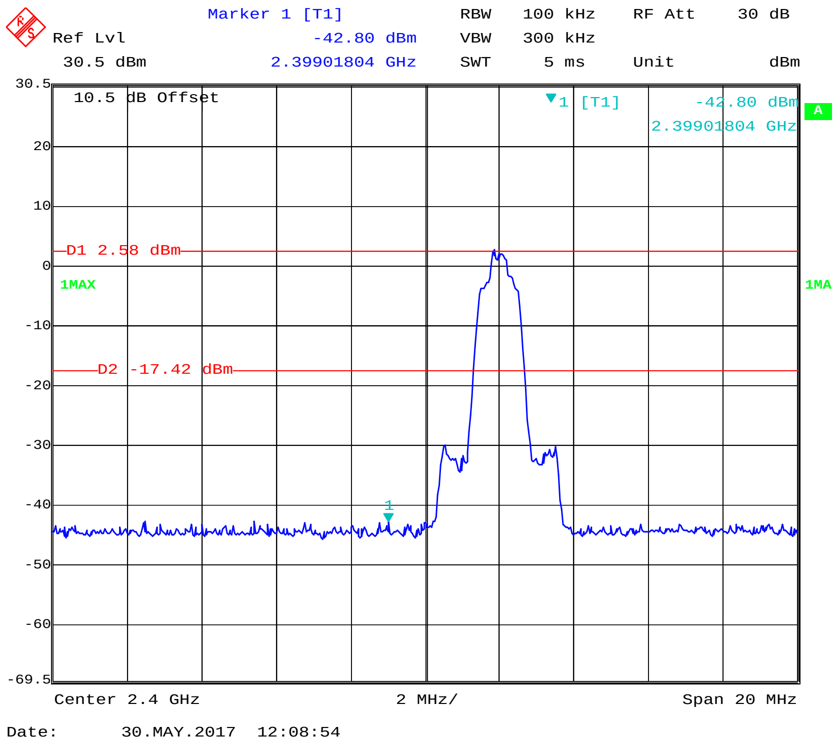
BDR (GFSK): Band Edge-Left Side



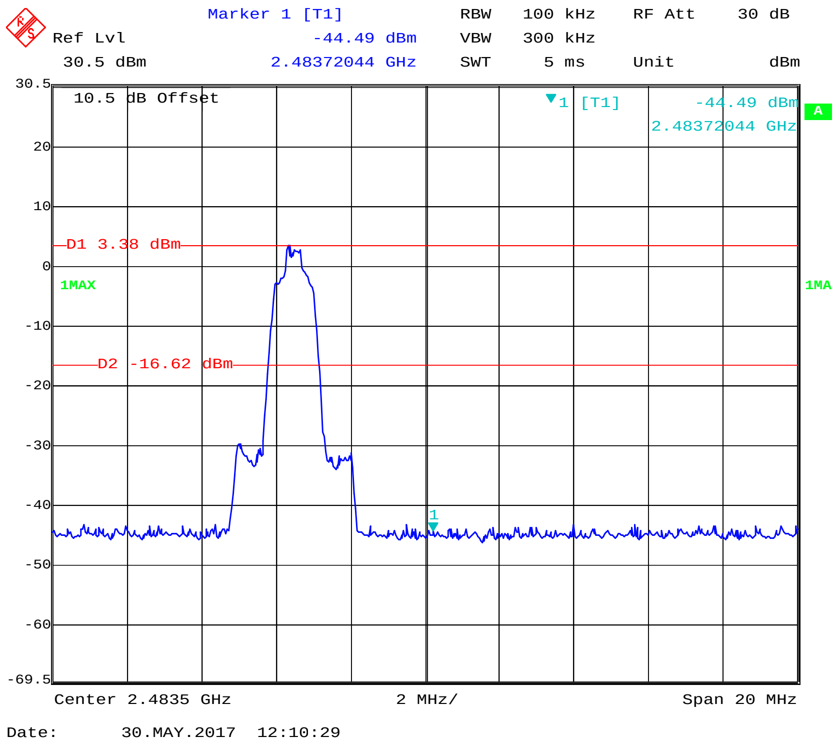
BDR (GFSK): Band Edge-Right Side



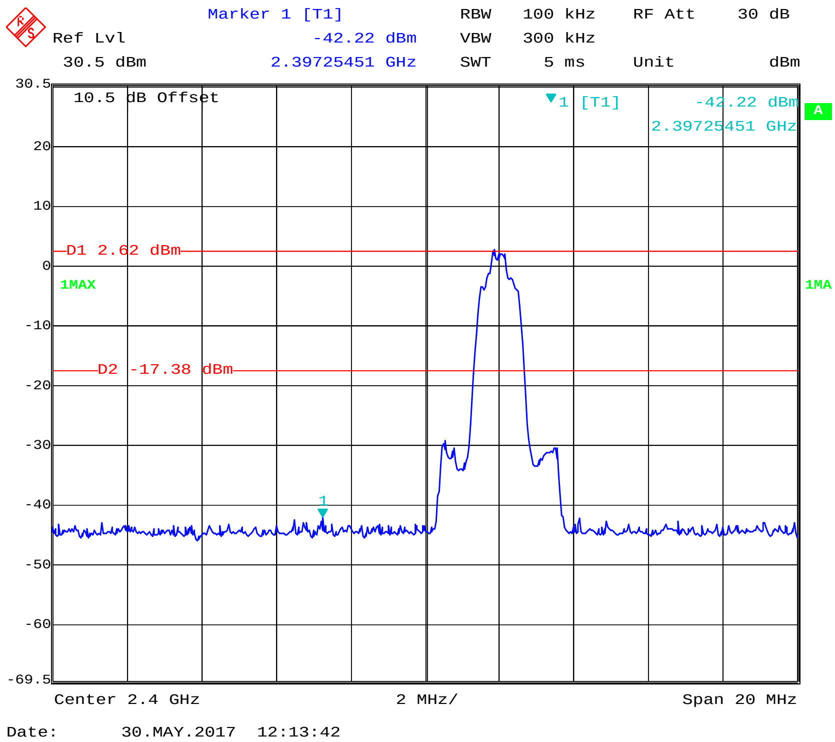
EDR (π/4-DQPSK): Band Edge-Left Side



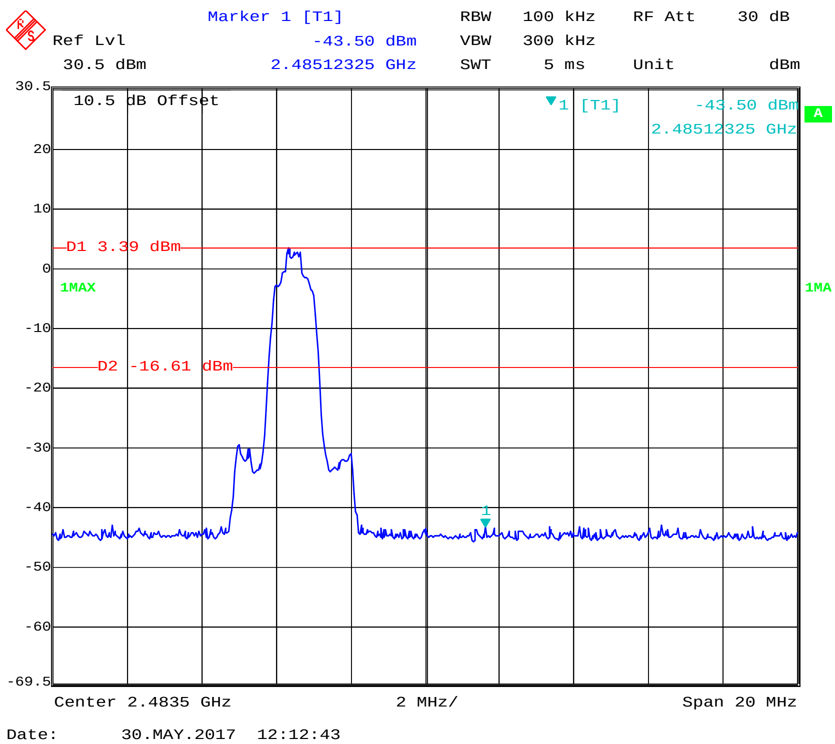
EDR (π/4-DQPSK): Band Edge-Right Side



EDR (8DPSK): Band Edge-Left Side



BDR (8DPSK): Band Edge-Right Side



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