BACL
Bay Area Compliance Labs Corp.

FCC PART 15.247
TEST REPORT

For

FKA Distributing Co., LLC

3000 N. Pontiac Trail, Commerce Township, Michigan, 48390, United States

FCC ID: TG3-HXHP101

Report Type:	Product Type:
Original Report	Wireless headphone

Report Number:	RSZ190423801-00
Report Date:	2019-05-09
Reviewed By:	Hill He RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Wireless headphone
Model	HX-HP101
Frequency Range	Bluetooth: 2402~2480MHz
Transmit Power	Bluetooth: 3.6 mW
Modulation Technique	Bluetooth: GFSK, π/4-DQPSK, 8DPSK
Antenna Specification	PCB Antenna:-0.68 dBi
Voltage Range	DC 3.7V from battery
Date of Test	2019-04-28 to 2019-04-30
Sample serial number	190423801
Received date	2019-04-23
Sample/EUT Status	Good condition

Objective

This test report is prepared on behalf of *FKA Distributing Co., LLC* 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)

No related submittal.

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.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

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

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Output Power with Power meter		±0.73dB
RF conducted test with spectrum		±1.6dB
AC Power Lines Conducted Emissions		±1.95dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±1℃
Humidity		±6%
Supply voltages		±0.4%

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

EUT Exercise Software

"Non Signaling Test Tool" software was used to the EUT tested.

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
N/A	N/A	N/A	N/A

Block Diagram of Test Setup

For Radiation emission

Non-Conductive Table
80/150 cm above Ground Plane

1.0 Meter

1.5 Meters
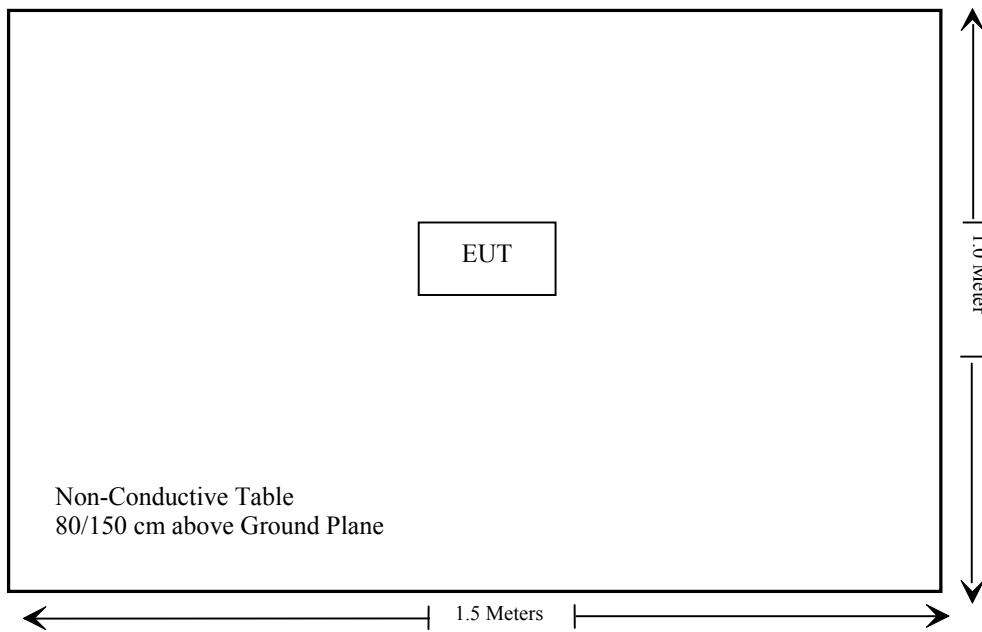
SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1)& §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Not Applicable
§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

Not Applicable: The BT function can't normal operation when it is in charging .

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2018-07-11	2019-07-11
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
Sonoma instrument	Amplifier	310 N	186238	2018-11-12	2019-05-12
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2018-06-23	2019-06-23
Rohde & Schwarz	Signal Analyzer	FSV40	101473	2019-01-09	2020-01-08
COM-POWER	Pre-amplifier	PA-122	181919	2018-11-12	2019-11-12
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
UTiFLEX MICRO-C0AX	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-07-11	2021-07-10
Ducommun technologies	RF Cable	104PEA	218124002	2018-11-12	2019-11-12
Ducommun technologies	RF Cable	RG-214	1	2018-11-19	2019-05-21
Ducommun technologies	RF Cable	RG-214	2	2018-11-12	2019-11-12
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Heatsink Required	Amplifier	QLW-18405536-J0	15964001002	2018-11-12	2019-11-12
Sinoscite	Band Reject Filter	BSF2402-2480MN-0898-001	99632	2018-11-12	2019-11-12
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR
RF Conducted Test					
Agilent	USB wideband power meter	U2021XA	MY54250003	2018-06-23	2019-06-23
WEINSCHEL	10dB Attenuator	5324	AU 3842	Each Time	
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2018-12-24	2019-12-24
Ducommun technologies	RF Cable	RG-214	3	Each Time	

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) 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 Tune-up power		Calculated Distance (mm)	Calculated Value	Threshold (1-g SAR)	SAR Test Exclusion
	(dBm)	(mW)				
2480	6	3.98	5	1.25	3.0	**Yes**

Result: No Standalone 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, which was permanently attached and the antenna gain is -0.68dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

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:
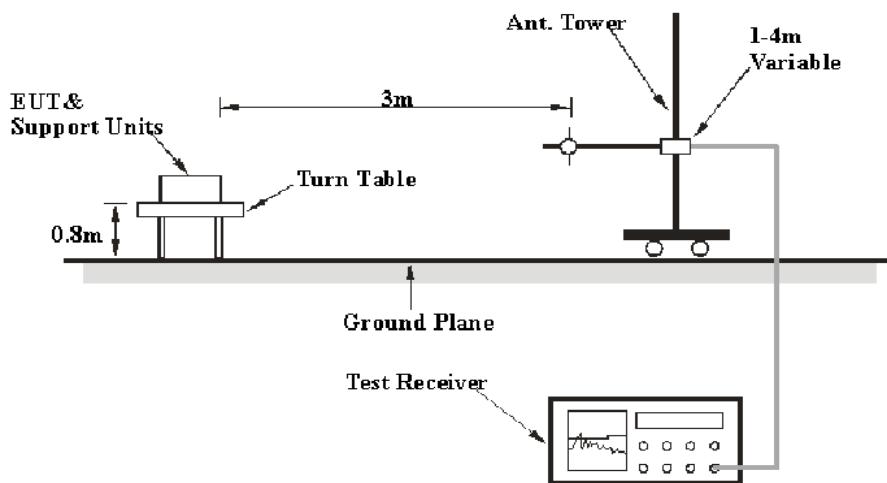
Above 1GHz:
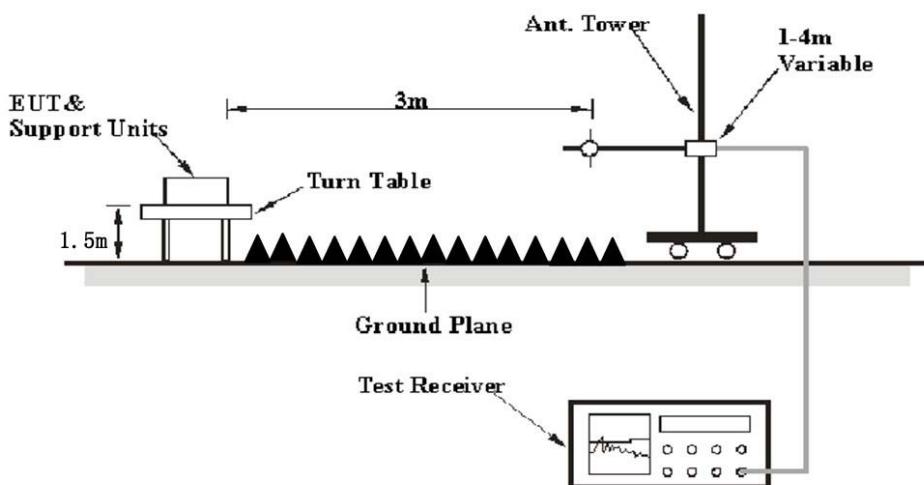
The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.247 limits.

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	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Average

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:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Yooube Zhao and Leo Huang on 2019-04-30.

EUT operation mode: Transmitting (Scan with GFSK, π/4-DQPSK, 8DPSK mode, the worst case is 8DPSK Mode)

30 MHz~1 GHz: *(the worst case is 8DPSK Mode, Middle channel)*
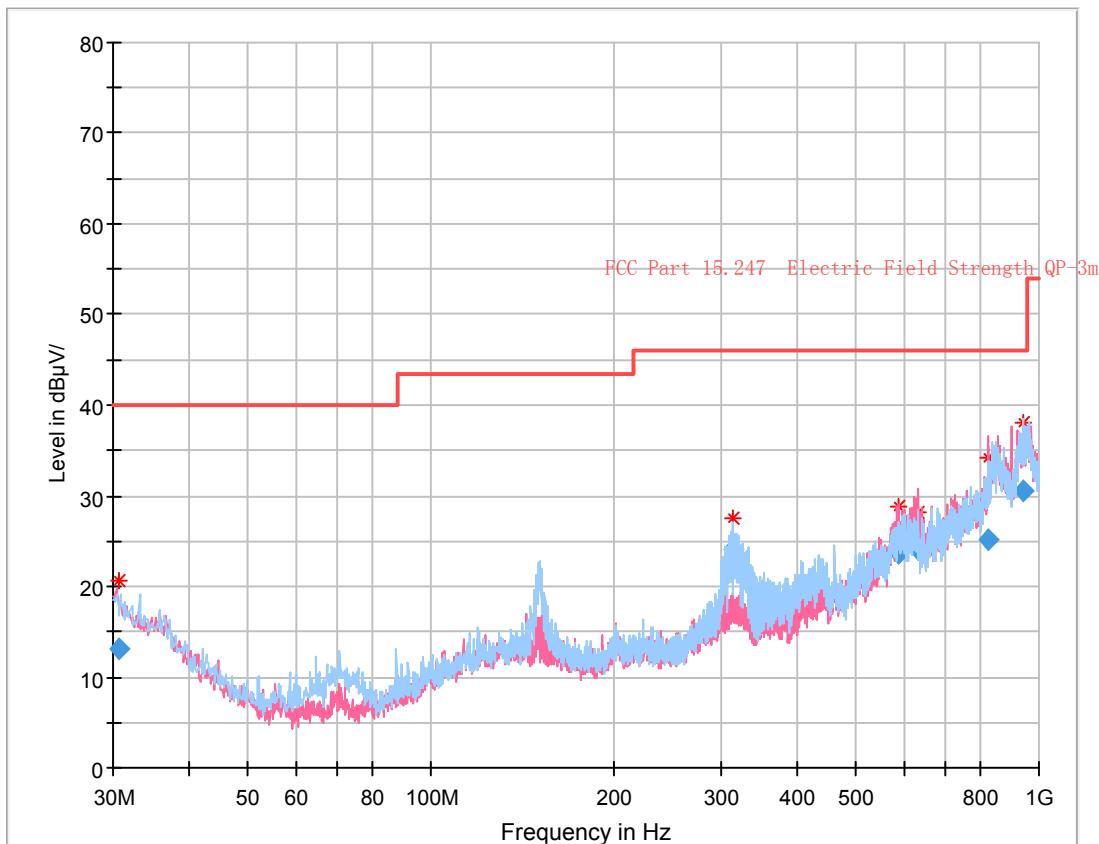
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
30.560034	13.15	274.0	V	269.0	-8.0	40.00	26.85
313.069250	23.98	119.0	H	113.0	-10.7	46.00	22.02
587.756875	23.70	104.0	V	189.0	-2.5	46.00	22.30
634.269375	23.98	108.0	V	179.0	-2.9	46.00	22.02
826.675625	25.20	298.0	V	95.0	4.6	46.00	20.80
940.835375	30.56	329.0	H	137.0	8.9	46.00	15.44

1 GHz - 25 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2402 MHz)									
2389.63	28.10	PK	79	1.7	H	31.87	59.97	74	14.03
2389.63	13.87	Ave.	79	1.7	H	31.87	45.74	54	8.26
2484.23	28.43	PK	138	1.3	H	32.13	60.56	74	13.44
2484.23	13.59	Ave.	138	1.3	H	32.13	45.72	54	8.28
4804.00	42.58	PK	260	1.6	H	6.28	48.86	74	25.14
4804.00	28.46	Ave.	260	1.6	H	6.28	34.74	54	19.26
Middle Channel (2441 MHz)									
4882.00	43.54	PK	241	1.6	H	6.76	50.30	74	23.70
4882.00	30.55	Ave.	241	1.6	H	6.76	37.31	54	16.69
High Channel (2480 MHz)									
2389.58	28.47	PK	114	2.5	H	31.87	60.34	74	13.66
2389.58	13.54	Ave.	114	2.5	H	31.87	45.41	54	8.59
2483.53	34.14	PK	103	1.2	H	32.13	66.27	74	7.73
2483.53	17.61	Ave.	103	1.2	H	32.13	49.74	54	4.26
4960.00	42.25	PK	78	1.1	H	6.80	49.05	74	24.95
4960.00	28.22	Ave.	78	1.1	H	6.80	35.02	54	18.98

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.
And for the pre-scan is performed with the 2400-2483.5MHz band filter.

Pre-scan with middle channel Peak
Horizontal

	Marker 1 [T1]	RBW	1 MHz	RF Att	0 dB
Ref Lvl	61.13 dBμV	VBW	3 MHz		
97 dBμV	12.75350701 GHz	SWT	98 ms	Unit	dBμV

▽1 [T1]   61.13 dBμV
                12.75350701 GHz
▽2 [T1]   49.72 dBμV

D1 74 dBμV

1MAX   1MA

                                    TDF

Start 1 GHz   1.7 GHz/   Stop 18 GHz

Date: 30.APR.2019   13:34:48

	Marker 2 [T1]	RBW	1 MHz	RF Att	0 dB
Ref Lvl	66.05 dBμV	VBW	3 MHz		
97 dBμV	24.91583166 GHz	SWT	40 ms	Unit	dBμV

▽2 [T1]   66.05 dBμV
                24.91583166 GHz

D1 74 dBμV

1MAX   1MA

                                    TDF

Start 18 GHz   700 MHz/   Stop 25 GHz

Date: 30.APR.2019   14:17:46

Vertical

Marker 2 [T1]　　　RBW　1 MHz　RF Att　0 dB
Ref Lvl　　　60.41 dBμV　　VBW　3 MHz
97 dBμV　　12.75350701 GHz　SWT　98 ms　Unit　dBμV

▽2 [T1]　　60.41 dBμV
　　12.75350701 GHz
▽1 [T1]　　47.19 dBμV

Start 1 GHz　　　　　1.7 GHz/　　　　　Stop 18 GHz
Date:　　30.APR.2019　13:38:52

Marker 2 [T1]　　　RBW　1 MHz　RF Att　0 dB
Ref Lvl　　　65.24 dBμV　　VBW　3 MHz
97 dBμV　　24.98597194 GHz　SWT　40 ms　Unit　dBμV

▽2 [T1]　　65.24 dBμV
　　24.98597194 GHz

Start 18 GHz　　　　700 MHz/　　　　　Stop 25 GHz
Date:　　30.APR.2019　14:11:38

Pre-scan for Average
Horizontal

Marker 1 [T1]	RBW	1 MHz	RF Att	0 dB

Ref Lvl 　　　　46.64 dBµV　　　VBW　10 Hz
97 dBµV　　　12.76274549 GHz　SWT　5 s　Unit　dBµV

▼1 [T1]　　46.64 dBµV　A
12.76274549 GHz

1MAX　　　　　　　　　　　　　　　　　　　1MA
D2 54 dBµV

TDF

Center 12.75350701 GHz　　　2 MHz/　　　Span 20 MHz

Date:　　30.APR.2019　13:36:48

Ref Lvl 　　　　44.55 dBµV　　　VBW　10 Hz
97 dBµV　　　24.90583166 GHz　SWT　5 s　Unit　dBµV

Marker 2 [T1]　　RBW　1 MHz　RF Att　0 dB

▼2 [T1]　　44.55 dBµV　A
24.90583166 GHz

1MAX　　　　　　　　　　　　　　　　　　　1MA
D2 54 dBµV

TDF

Center 24.91583166 GHz　　　2 MHz/　　　Span 20 MHz

Date:　　30.APR.2019　14:20:06

Vertical

Marker 2 [T1]   RBW   1 MHz   RF Att   0 dB
Ref Lvl   46.61 dBμV   VBW   10 Hz
97 dBμV   12.76342685 GHz   SWT   5 s   Unit   dBμV

```
                                              ▽2 [T1]        46.61 dBμV   A
 90                                                   12.76342685 GHz
 80
 70
 1MAX                                                              1MA
 60
    D2 54 dBμV
 50
 40                                                               TDF
 30
 20
 10
  0
   Center 12.75350701 GHz          2 MHz/              Span 20 MHz
```

Date: 30.APR.2019 13:40:31

Marker 2 [T1]   RBW   1 MHz   RF Att   0 dB
Ref Lvl   44.09 dBμV   VBW   10 Hz
97 dBμV   24.99204409 GHz   SWT   5 s   Unit   dBμV

```
                                              ▽2 [T1]        44.09 dBμV   A
 90                                                   24.99204409 GHz
 80
 70
 1MAX                                                              1MA
 60
    D2 54 dBμV
 50
 40                                                               TDF
 30
 20
 10
  0
   Center 24.98597194 GHz          2 MHz/              Span 20 MHz
```

Date: 30.APR.2019 14:14:06

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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

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:	25~26 ℃
Relative Humidity:	55~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-04-28.

EUT operation mode: Transmitting

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

Channel	Channel Separation (MHz)	20 dBc BW (MHz)	Two-thirds of the 20 dB bandwidth (MHz)	Channel Separation Limit	Result
BDR(GFSK)					
Low	1.004	1.036	0.691	> two-thirds of the 20 dB bandwidth	Compliance
Middle	1.016	1.035	0.690	> two-thirds of the 20 dB bandwidth	Compliance
High	1.000	1.038	0.692	> two-thirds of the 20 dB bandwidth	Compliance
EDR(π/4-DQPSK)					
Low	1.000	1.208	0.805	> two-thirds of the 20 dB bandwidth	Compliance
Middle	1.000	1.202	0.801	> two-thirds of the 20 dB bandwidth	Compliance
High	1.003	1.196	0.797	> two-thirds of the 20 dB bandwidth	Compliance
EDR(8DPSK)					
Low	1.004	1.205	0.803	> two-thirds of the 20 dB bandwidth	Compliance
Middle	1.000	1.202	0.801	> two-thirds of the 20 dB bandwidth	Compliance
High	1.001	1.204	0.803	> two-thirds of the 20 dB bandwidth	Compliance

Please refer to the following plots.

BDR (GFSK): Low Channel

```
                                        *RBW 100 kHz     Delta 1 [T1 ]
                                        *VBW 300 kHz              0.01 dB
    Ref  25 dBm        *Att  20 dB      SWT 2.5 ms      1.004000000 MHz
       Offset  10.5 dB                             Marker 1 [T1 ]
    -20                                                  3.99 dBm
                                                     2.402024000 GHz    A
    -10
1 PK                                                                  LVL
MAXH
      0
    -10

    -20

    -30                                                              3DB

    -40

    -50

    -60

    -70

    Center  2.4025 GHz            200 kHz/              Span  2 MHz
```
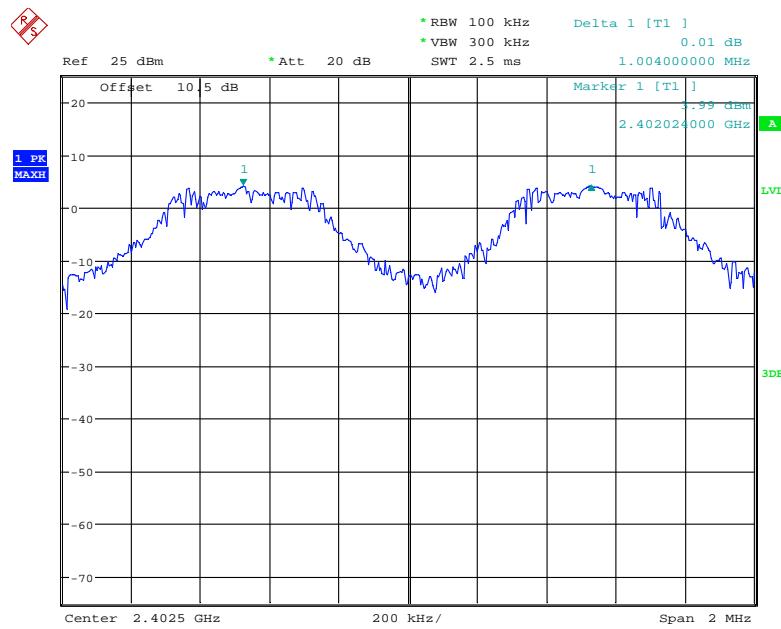
Date: 28.APR.2019 14:55:43

BDR (GFSK): Middle Channel

```
                                        *RBW 100 kHz     Delta 1 [T1 ]
                                        *VBW 300 kHz             -0.15 dB
    Ref  25 dBm        *Att  20 dB      SWT 2.5 ms      1.016000000 MHz
       Offset  10.5 dB                             Marker 1 [T1 ]
    -20                                                  4.15 dBm
                                                     2.441032000 GHz    A
    -10
1 PK                                                                  LVL
MAXH
      0
    -10

    -20

    -30                                                              3DB

    -40

    -50

    -60

    -70

    Center  2.4415 GHz            200 kHz/              Span  2 MHz
```
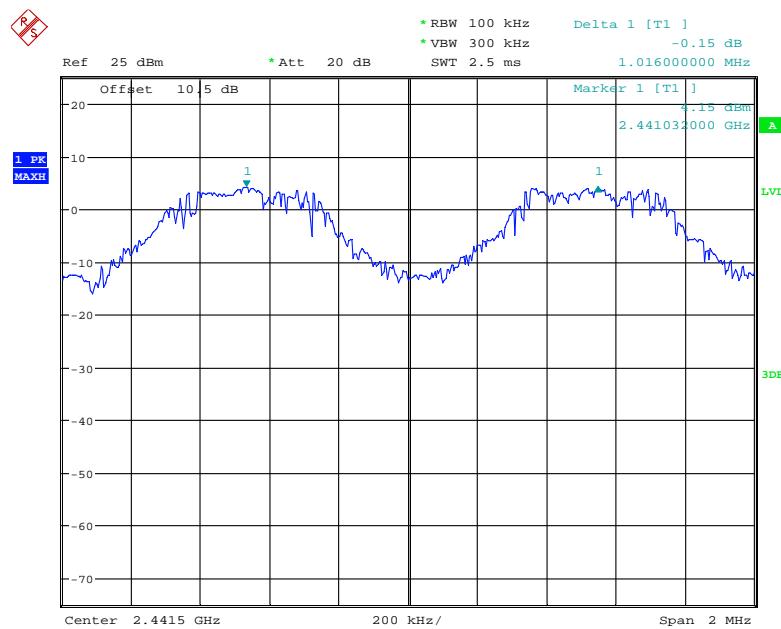
Date: 28.APR.2019 14:57:50

BDR (GFSK): High Channel
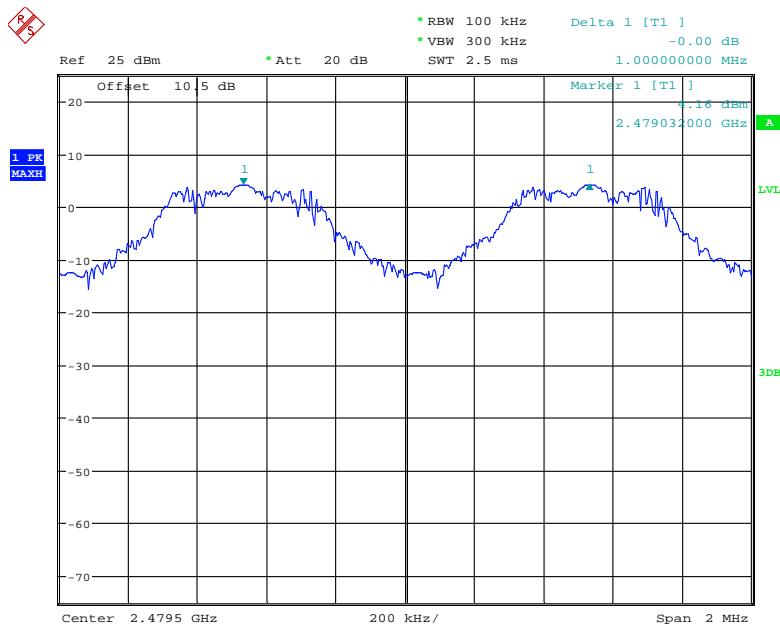
Date: 28.APR.2019 15:00:42

EDR (π/4-DQPSK): Low Channel
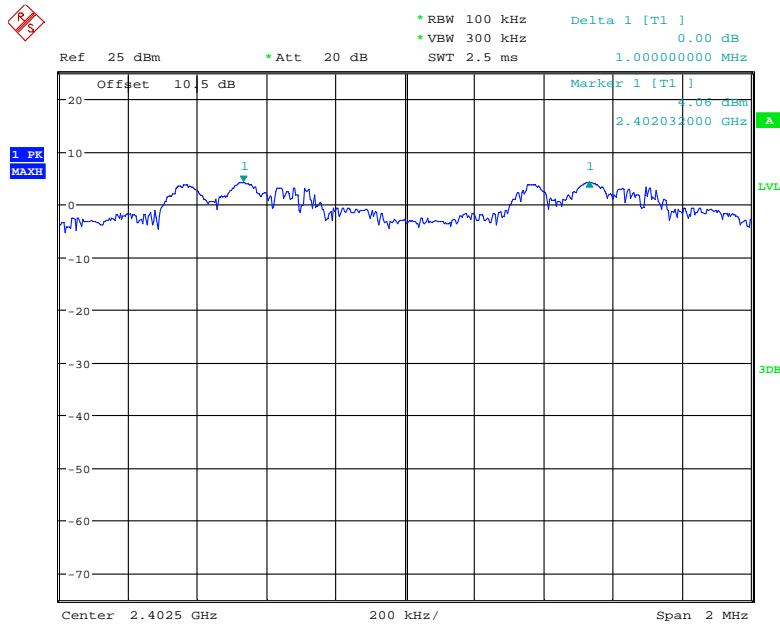
Date: 28.APR.2019 14:53:50

EDR (π/4-DQPSK): Middle Channel

	* RBW 100 kHz	Delta 1 [T1]
	* VBW 300 kHz	0.00 dB
Ref 25 dBm	* Att 20 dB SWT 2.5 ms	1.000000000 MHz
Offset 10.5 dB		Marker 1 [T1]
		4.28 dBm
		2.441032000 GHz
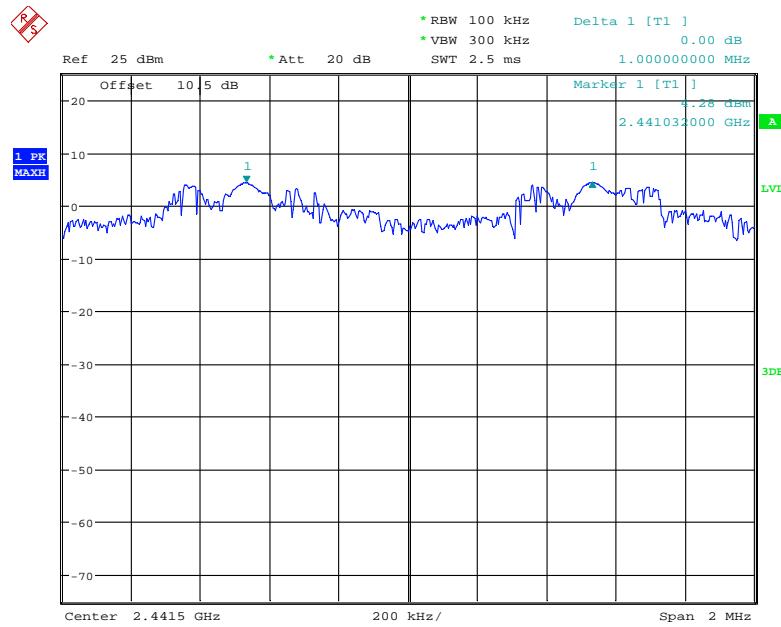
Date: 28.APR.2019 14:47:02

EDR (π/4-DQPSK): High Channel

	* RBW 100 kHz	Delta 1 [T1]
	* VBW 300 kHz	0.01 dB
Ref 25 dBm	* Att 20 dB SWT 2.5 ms	1.002923077 MHz
Offset 10.5 dB		Marker 1 [T1]
		4.14 dBm
		2.479035487 GHz
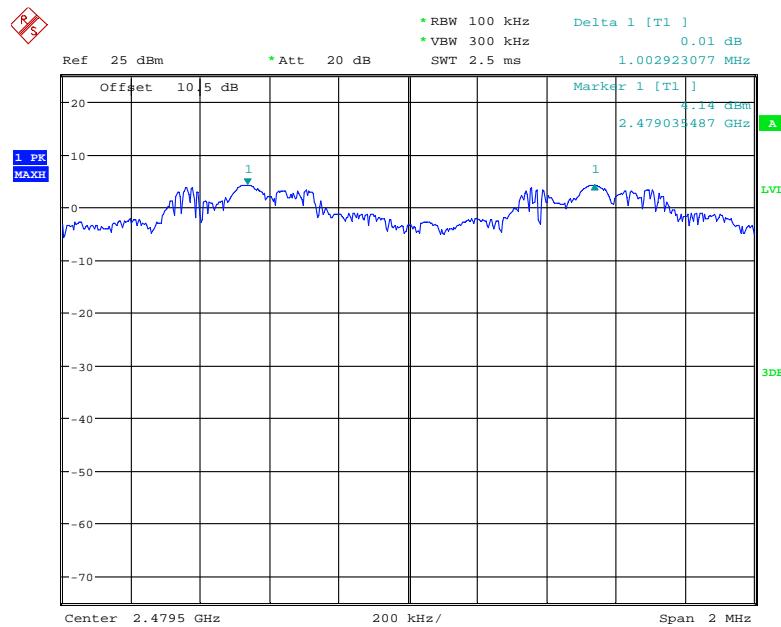
Date: 28.APR.2019 14:43:34

EDR (8DPSK): Low Channel
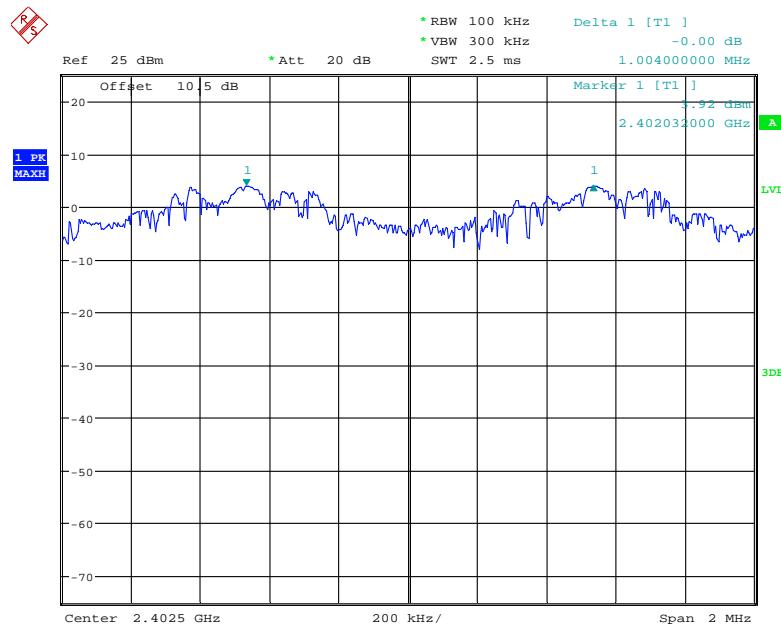
Date: 28.APR.2019 14:30:04

EDR (8DPSK): Middle Channel
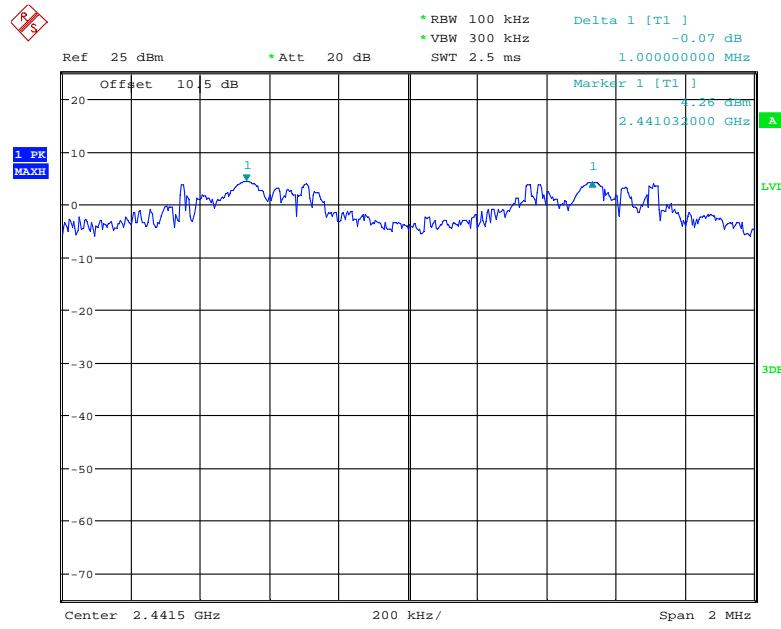
Date: 28.APR.2019 14:34:16

EDR (8DPSK): High Channel


```
                                            * RBW  100 kHz    Delta 1 [T1 ]
                                            * VBW  300 kHz              0.00 dB
           Ref   25 dBm        * Att  20 dB   SWT 2.5 ms      1.000538462 MHz
              Offset  10.5 dB                          Marker 1 [T1 ]
           20                                                    4.16 dBm
                                                         2.479031462 GHz   A
   1  PK    10
   MAXH
            0                                                           LVL

           -10

           -20

           -30                                                         3DB

           -40

           -50

           -60

           -70
           Center  2.4795 GHz            200 kHz/            Span  2 MHz
```
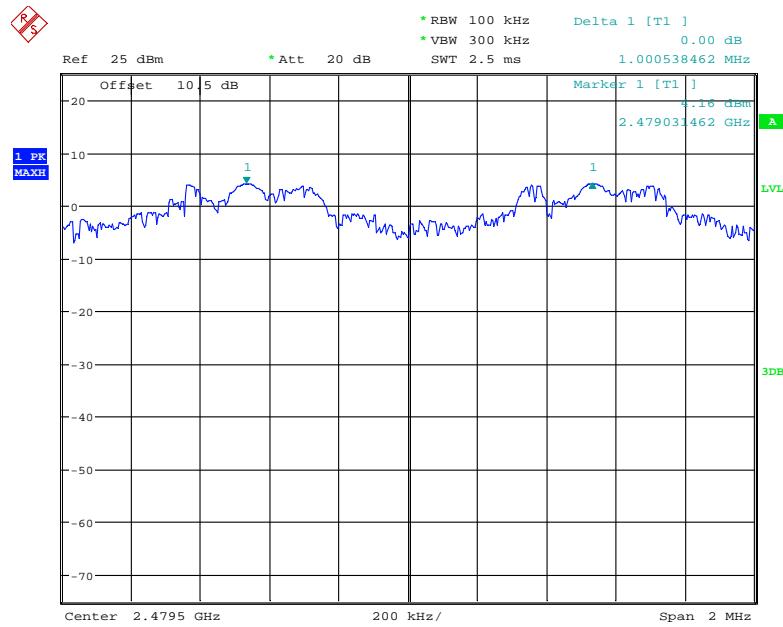
Date: 28.APR.2019 14:38:32

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:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-04-29.

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	1.036
	Middle	2441	1.035
	High	2480	1.038
EDR (π/4-DQPSK)	Low	2402	1.208
	Middle	2441	1.202
	High	2480	1.196
EDR (8DPSK)	Low	2402	1.205
	Middle	2441	1.202
	High	2480	1.204

BDR (GFSK): Low Channel
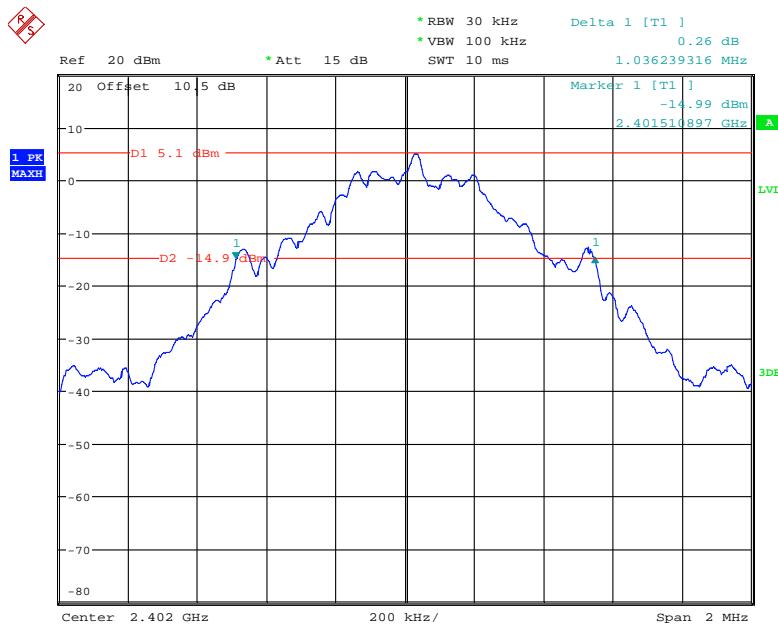
Date: 29.APR.2019 15:42:30

BDR (GFSK): Middle Channel
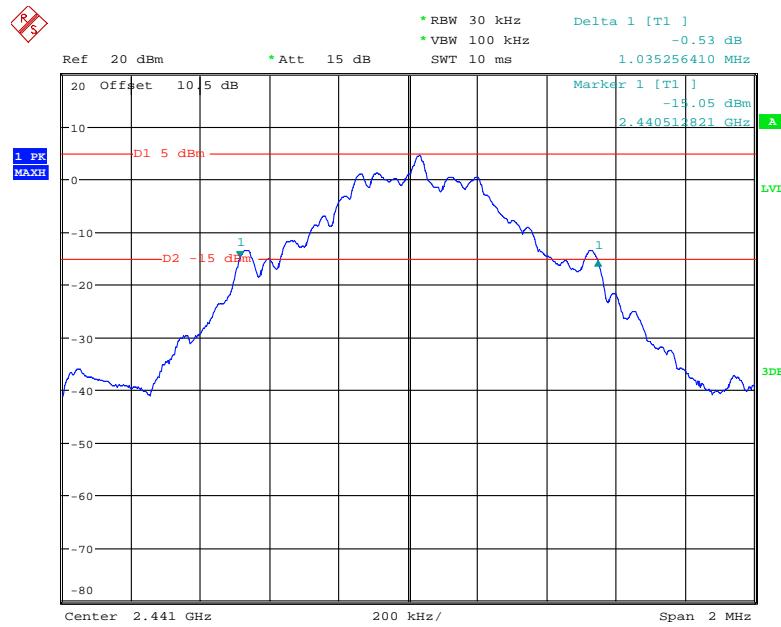

Date: 29.APR.2019 15:43:36

BDR (GFSK): High Channel
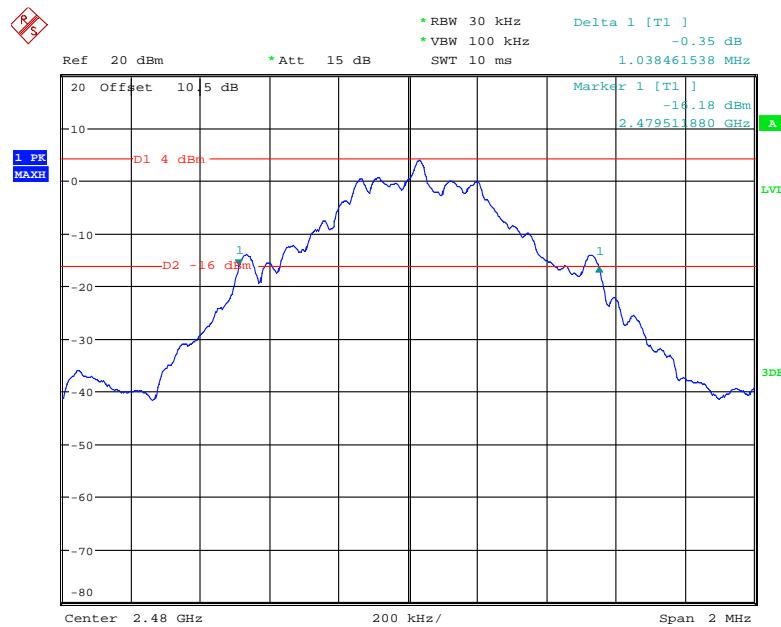
Date: 29.APR.2019 15:47:33

EDR (π/4-DQPSK): Low Channel

```
                                      * RBW  30 kHz      Delta 1 [T1 ]
                                      * VBW  100 kHz              0.40 dB
         Ref  20 dBm      * Att  15 dB   SWT 10 ms     1.208333333 MHz
      20  Offset  10.5 dB                          Marker 1 [T1 ]
                                                          -15.70 dBm
       10                                          2.401412521 GHz    A
  1 PK      D1 4.8 dBm
  MAXH                                                               LVL

        0

      -10

      -20      D2 -15.2 dBm                                    1

      -30

      -40                                                           3DB

      -50

      -60

      -70

      -80
      Center  2.402 GHz        200 kHz/           Span  2 MHz
```
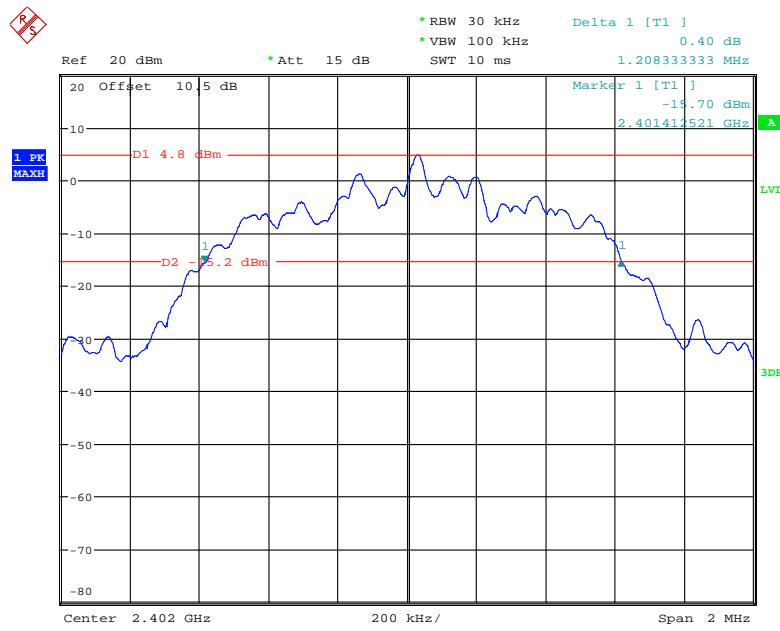
Date: 29.APR.2019 15:51:40

EDR (π/4-DQPSK): Middle Channel

```
                                      * RBW  30 kHz      Delta 1 [T1 ]
                                      * VBW  100 kHz             -0.11 dB
         Ref  20 dBm      * Att  15 dB   SWT 10 ms     1.201923077 MHz
      20  Offset  10.5 dB                          Marker 1 [T1 ]
                                                          -15.56 dBm
       10                                          2.440418932 GHz    A
  1 PK      D1 4.3 dBm
  MAXH                                                               LVL

        0

      -10

      -20      D2 -15.7 dBm                                    1

      -30

      -40                                                           3DB

      -50

      -60

      -70

      -80
      Center  2.441 GHz        200 kHz/           Span  2 MHz
```
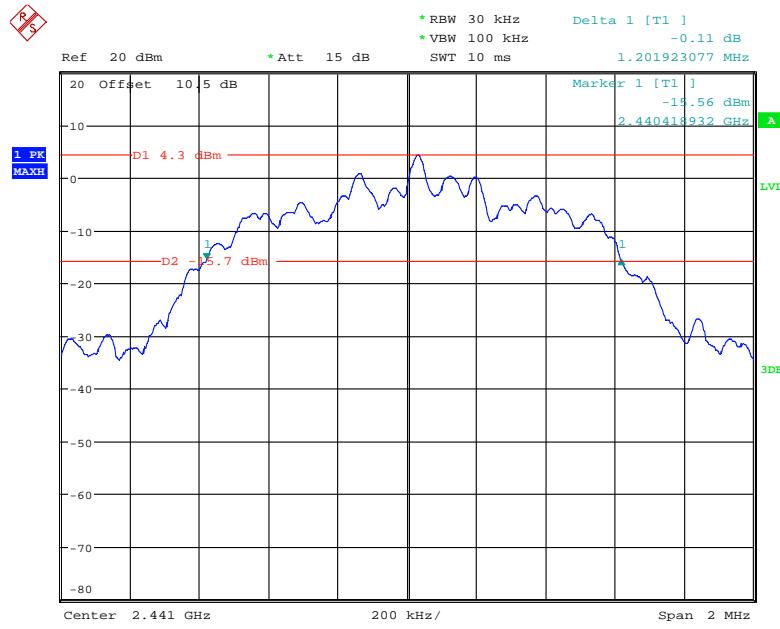
Date: 29.APR.2019 15:49:25

EDR (π/4-DQPSK): High Channel

```
                                        * RBW  30 kHz      Delta 1 [T1 ]
                                        * VBW 100 kHz                -0.82 dB
        Ref  20 dBm     * Att  15 dB      SWT 10 ms         1.195512821 MHz
     20 Offset  10.5 dB                              Marker 1 [T1 ]
                                                            -15.51 dBm
    -10                                               2.479425342 GHz    A
         D1 3.9 dBm
    -0                                                                 LVL

    -10
         D2 -15.1 dBm

    -20

    -30

    -40                                                                3DB

    -50

    -60

    -70

    -80
     Center  2.48 GHz           200 kHz/              Span  2 MHz
```
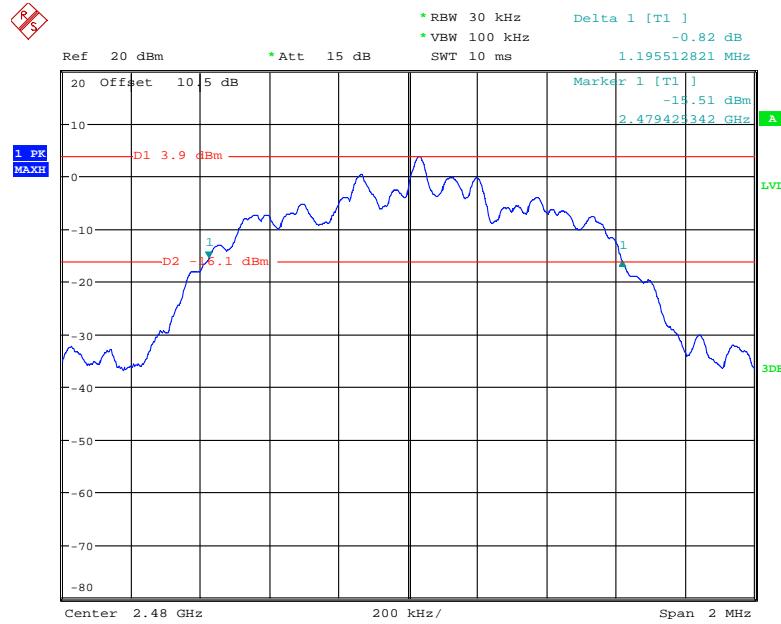
Date: 29.APR.2019 15:48:36

EDR (8DPSK): Low Channel

```
                                        * RBW  30 kHz      Delta 1 [T1 ]
                                        * VBW 100 kHz                -0.45 dB
        Ref  20 dBm     * Att  15 dB      SWT 10 ms         1.205128205 MHz
     20 Offset  10.5 dB                              Marker 1 [T1 ]
                                                            -15.41 dBm
    -10                                               2.401444573 GHz    A
         D1 4.8 dBm
    -0                                                                 LVL

    -10
         D2 -15.2 dBm

    -20

    -30

    -40                                                                3DB

    -50

    -60

    -70

    -80
     Center  2.402 GHz          200 kHz/              Span  2 MHz
```
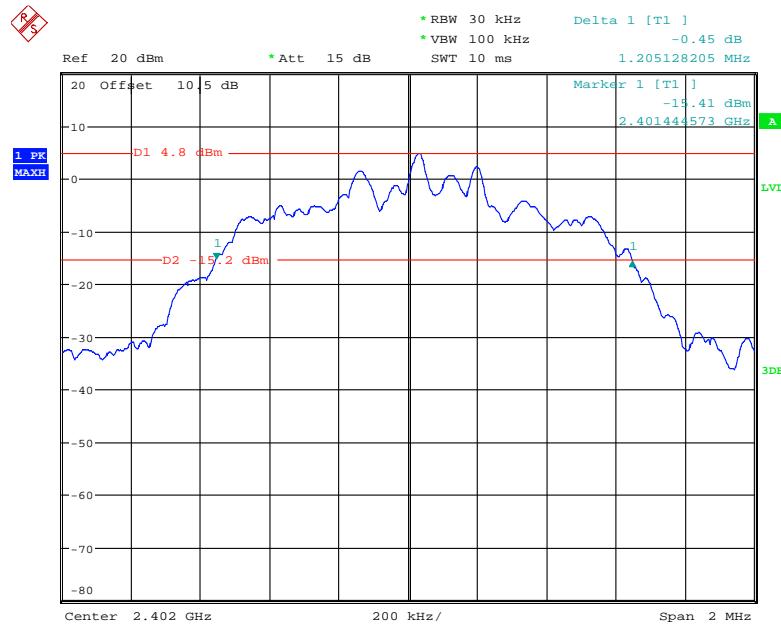
Date: 29.APR.2019 15:53:01

EDR (8DPSK): Middle Channel
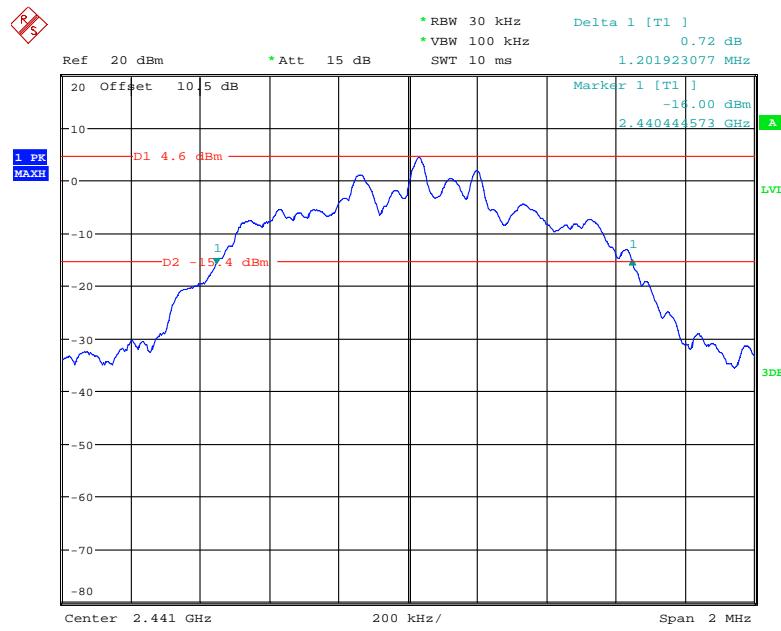
Date: 29.APR.2019 15:54:12

EDR (8DPSK): High Channel
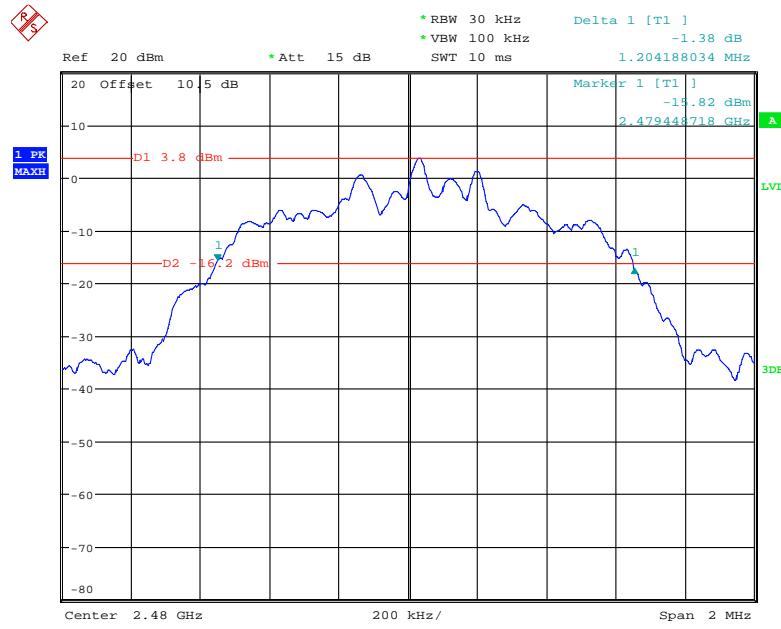
Date: 29.APR.2019 15:55:16

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:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-04-28.

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

```
                                    *RBW 100 kHz    Delta 1 [T1 ]
                                    *VBW 300 kHz              0.44 dB
        Ref   25 dBm       *Att  20 dB    SWT 10 ms       78.272685897 MHz
          Offset  10.5 dB                       Marker 1 [T1 ]
   20                                                        3.90 dBm
                                                    2.401873397 GHz   A
   10
 1 PK  1                                                      1        LVL
 MAXH

  -10

  -20

  -30                                                                 3DB

  -40

  -50

  -60

  -70

      Start  2.4 GHz            8.35 MHz/          Stop  2.4835 GHz
```
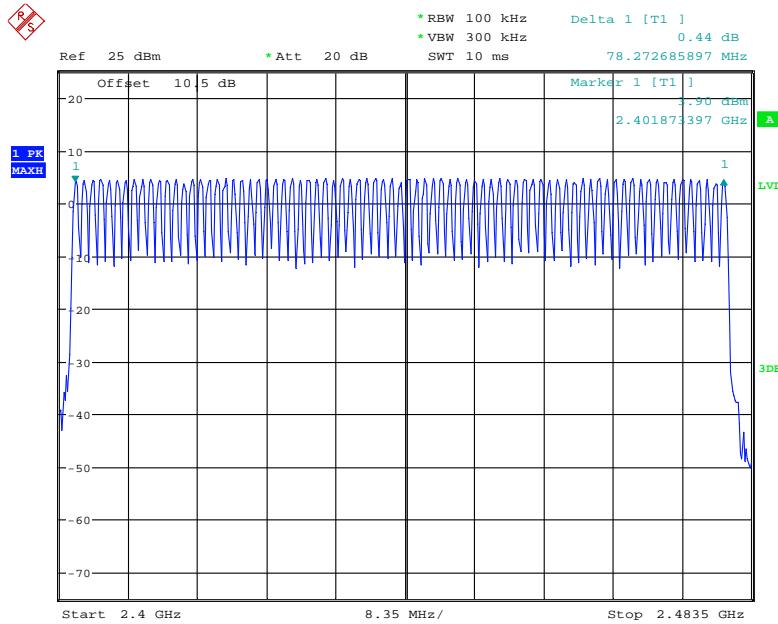
Date: 28.APR.2019 15:18:05

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

```
                                    *RBW 100 kHz    Delta 1 [T1 ]
                                    *VBW 300 kHz              0.06 dB
        Ref   25 dBm       *Att  20 dB    SWT 10 ms       78.070358974 MHz
          Offset  10.5 dB                       Marker 1 [T1 ]
   20                                                        4.47 dBm
                                                    2.402007212 GHz   A
   10
 1 PK  1                                                      1        LVL
 MAXH

  -10

  -20

  -30                                                                 3DB

  -40

  -50

  -60

  -70

      Start  2.4 GHz            8.35 MHz/          Stop  2.4835 GHz
```
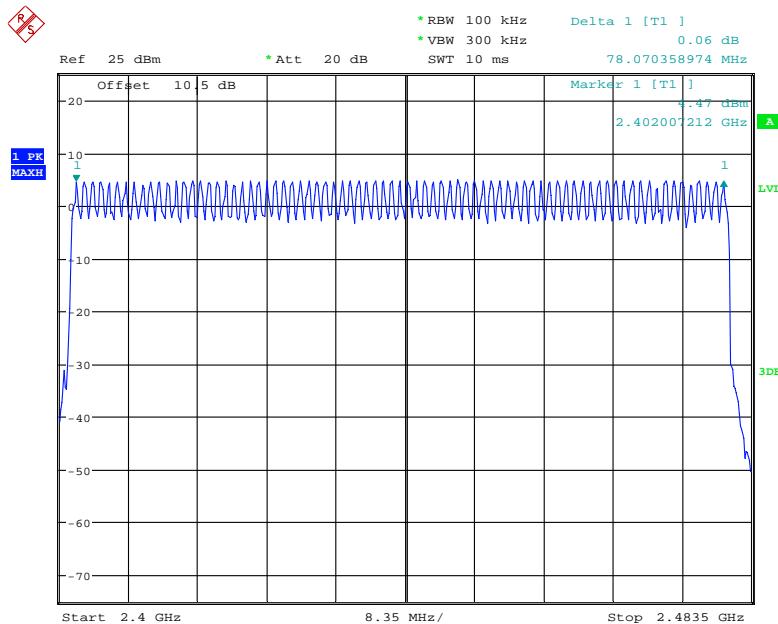
Date: 28.APR.2019 15:25:21

EDR (8DPSK): Number of Hopping Channels

```
                                    *RBW  100 kHz      Delta 1 [T1 ]
                                    *VBW  300 kHz            0.01 dB
     Ref  25 dBm          *Att  20 dB   SWT 10 ms      78.175269231 MHz
        Offset  10.5 dB                          Marker 1 [T1 ]
      -20                                                  4.33 dBm
                                                     2.402007212 GHz   A
1 PK  -10
MAXH   1                                                     1         LVL

        0

      -10

      -20

      -30                                                             3DB

      -40

      -50

      -60

      -70

     Start  2.4 GHz              8.35 MHz/              Stop  2.4835 GHz
```
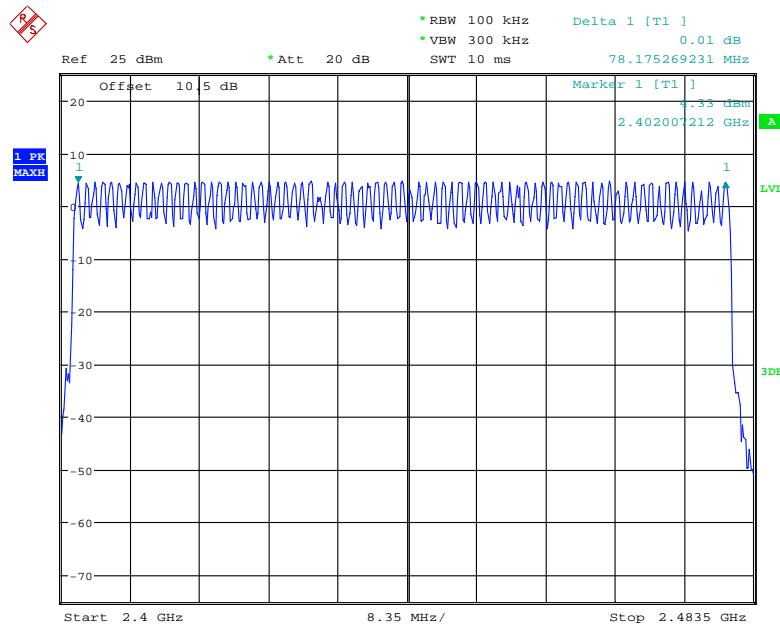
Date: 28.APR.2019 15:36:23

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

1. The EUT was worked in channel hopping.
2. Set the RBW to: 1MHz.
3. Set the VBW ≥ 3×RBW.
4. Set the span to 0Hz.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Recorded the time of single pulses

Test Data

Environmental Conditions

|	
Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-04-28.

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	0.424	0.136	0.4	Pass
		Middle	0.424	0.136	0.4	Pass
		High	0.423	0.135	0.4	Pass
	Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S					
	DH 3	Low	1.695	0.271	0.4	Pass
		Middle	1.695	0.271	0.4	Pass
		High	1.700	0.272	0.4	Pass
	Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S					
	DH 5	Low	2.977	0.318	0.4	Pass
		Middle	2.969	0.317	0.4	Pass
		High	2.961	0.316	0.4	Pass
	Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S					
EDR (π/4-DQPSK)	2DH 1	Low	0.431	0.138	0.4	Pass
		Middle	0.432	0.138	0.4	Pass
		High	0.432	0.138	0.4	Pass
	Note: 2DH1:Dwell time = Pulse time*(1600/2/79)*31.6S					
	2DH 3	Low	1.700	0.272	0.4	Pass
		Middle	1.700	0.272	0.4	Pass
		High	1.700	0.272	0.4	Pass
	Note: 2DH3:Dwell time = Pulse time*(1600/4/79)*31.6S					
	2DH 5	Low	2.969	0.317	0.4	Pass
		Middle	2.961	0.316	0.4	Pass
		High	2.977	0.318	0.4	Pass
	Note:2DH5:Dwell time = Pulse time*(1600/6/79)*31.6S					
EDR (8DPSK)	3DH 1	Low	0.432	0.138	0.4	Pass
		Middle	0.431	0.138	0.4	Pass
		High	0.431	0.138	0.4	Pass
	Note: 3DH1:Dwell time = Pulse time*(1600/2/79)*31.6S					
	3DH 3	Low	1.700	0.272	0.4	Pass
		Middle	1.704	0.273	0.4	Pass
		High	1.700	0.272	0.4	Pass
	Note: 3DH3:Dwell time = Pulse time*(1600/4/79)*31.6S					
	3DH 5	Low	2.969	0.317	0.4	Pass
		Middle	2.945	0.314	0.4	Pass
		High	2.953	0.315	0.4	Pass
	Note: 3DH5:Dwell time = Pulse time*(1600/6/79)*31.6S					

BDR (GFSK):

Pulse time, Low Channel, DH1
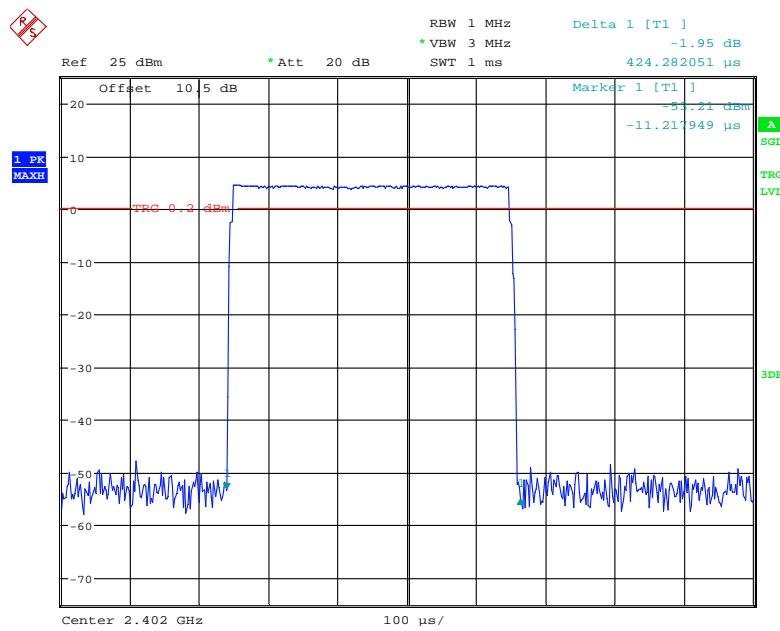
Date: 28.APR.2019 15:56:31

Pulse time, Middle Channel, DH1
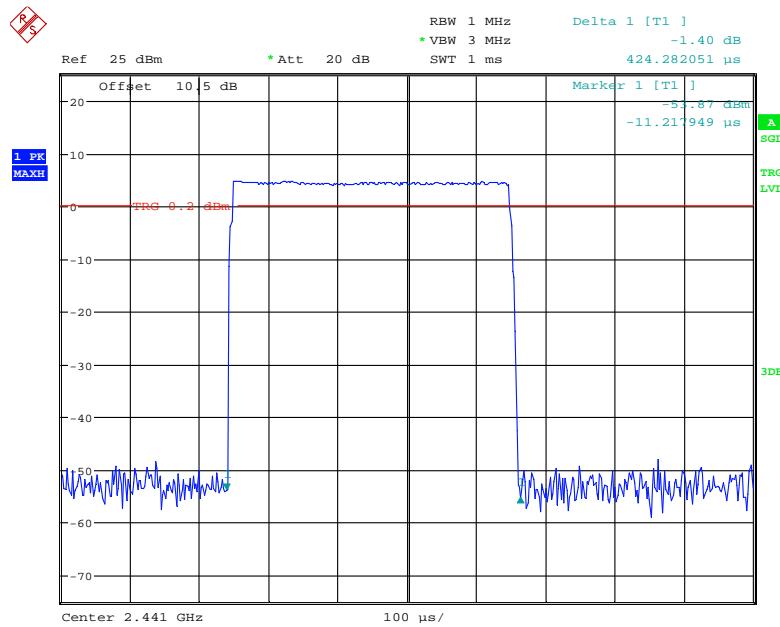
Date: 28.APR.2019 15:56:49

Pulse time, High Channel, DH1

```
                              RBW 1 MHz      Delta 1 [T1 ]
                            * VBW 3 MHz                -2.87 dB
      Ref   25 dBm        * Att   20 dB     SWT 1 ms        422.679487 µs
         Offset   10.5 dB                          Marker 1 [T1 ]
                                                          -54.35 dBm
                                                          -11.217949 µs    A
                                                                          SGL
  1 PK
  MAXH                                                                     TRG
                                                                          LVL
      TRG 0.2 dBm


                                                                          3DB




      Center 2.48 GHz                        100 µs/
```
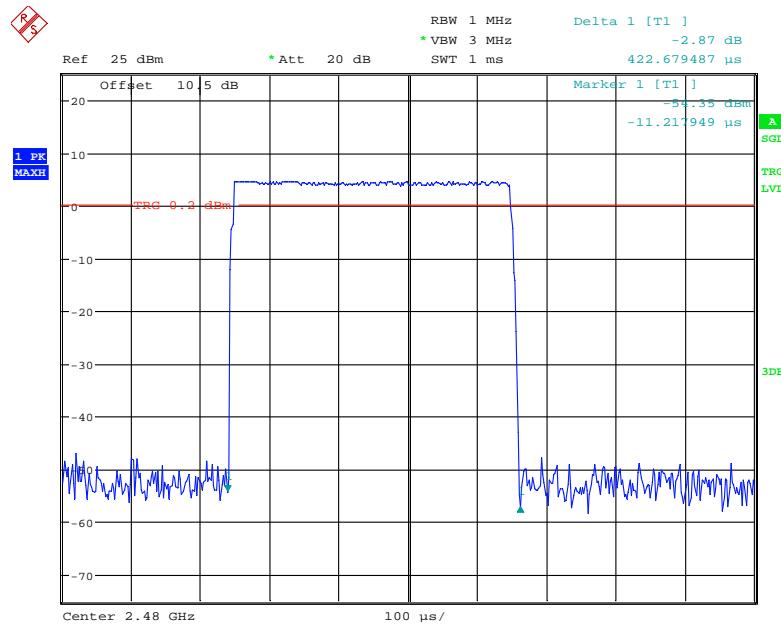
Date: 28.APR.2019 15:57:04

Pulse time, Low Channel, DH3

```
                              RBW 1 MHz      Delta 1 [T1 ]
                            * VBW 3 MHz                -1.12 dB
      Ref   25 dBm        * Att   20 dB     SWT 3 ms        1.695115 ms
         Offset   10.5 dB                          Marker 1 [T1 ]
                                                          -50.27 dBm
                                                          -16.025641 µs    A
                                                                          SGL
  1 PK
  MAXH                                                                     TRG
                                                                          LVL
      TRG 0.2 dBm


                                                                          3DB




      Center 2.402 GHz                       300 µs/
```
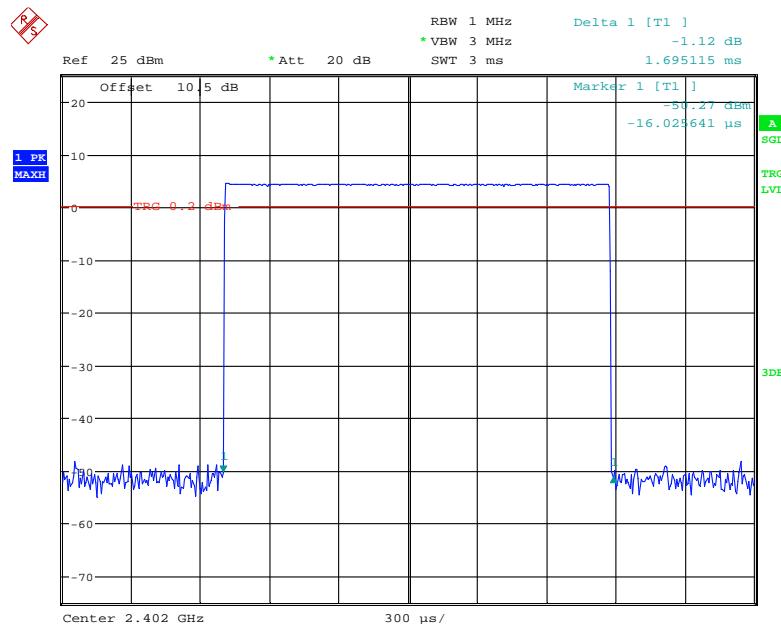
Date: 28.APR.2019 16:06:28

Pulse time, Middle Channel, DH3

```
                                    RBW  1 MHz      Delta 1 [T1 ]
                                  * VBW  3 MHz                2.49 dB
         Ref   25 dBm        * Att  20 dB   SWT 3 ms         1.695115 ms
            Offset   10.5 dB                        Marker 1 [T1 ]
          -20                                              -52.27 dBm       A
                                                         -16.025641 µs      SGL
 1 PK
 MAXH     -10                                                             TRG
                                                                          LVL
             0    TRG 0.2 dBm

          -10

          -20

          -30                                                            3DB

          -40



          -60

          -70

         Center 2.441 GHz                    300 µs/
```
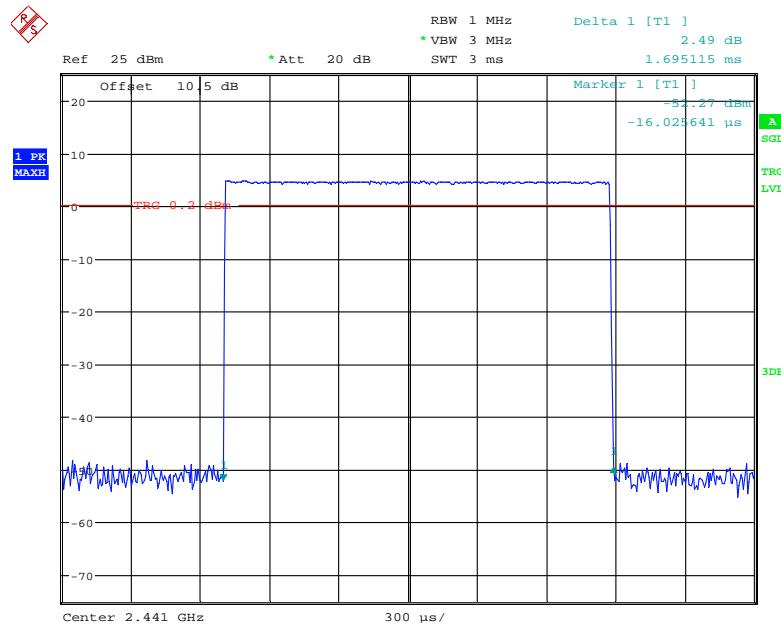
Date: 28.APR.2019 16:06:10

Pulse time, High Channel, DH3

```
                                    RBW  1 MHz      Delta 1 [T1 ]
                                  * VBW  3 MHz               -2.49 dB
         Ref   25 dBm        * Att  20 dB   SWT 3 ms         1.699923 ms
            Offset   10.5 dB                        Marker 1 [T1 ]
          -20                                              -50.46 dBm       A
                                                         -20.833333 µs      SGL
 1 PK
 MAXH     -10                                                             TRG
                                                                          LVL
             0    TRG 0.2 dBm

          -10

          -20

          -30                                                            3DB

          -40



          -60

          -70

         Center 2.48 GHz                     300 µs/
```
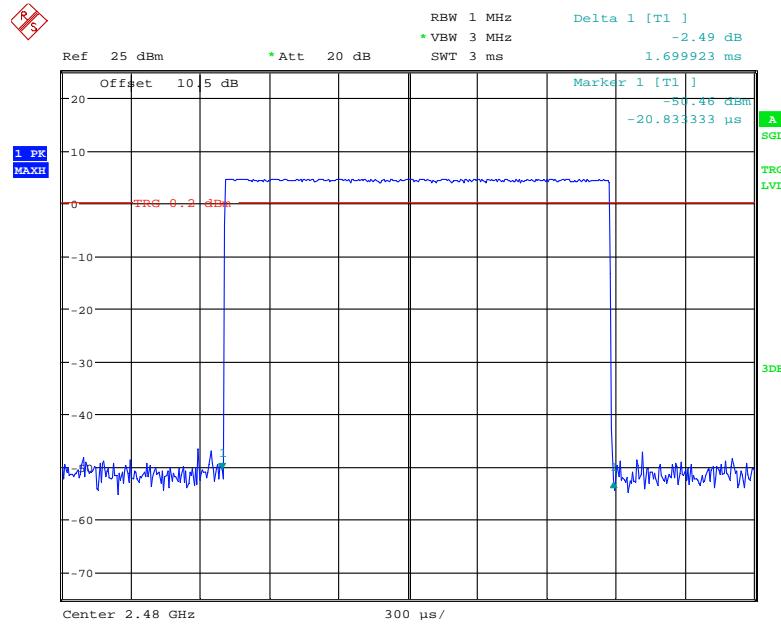
Date: 28.APR.2019 16:05:52

Pulse time, Low Channel, DH5


```
                                        RBW  1 MHz     Delta 1 [T1 ]
                                      * VBW  3 MHz              0.20 dB
  Ref   25 dBm         * Att   20 dB   SWT  5 ms        2.977167 ms
     Offset   10.5 dB                        Marker 1 [T1 ]
                                                       -52.48 dBm
                                                   -40.064103 µs
```

Center 2.402 GHz   500 µs/
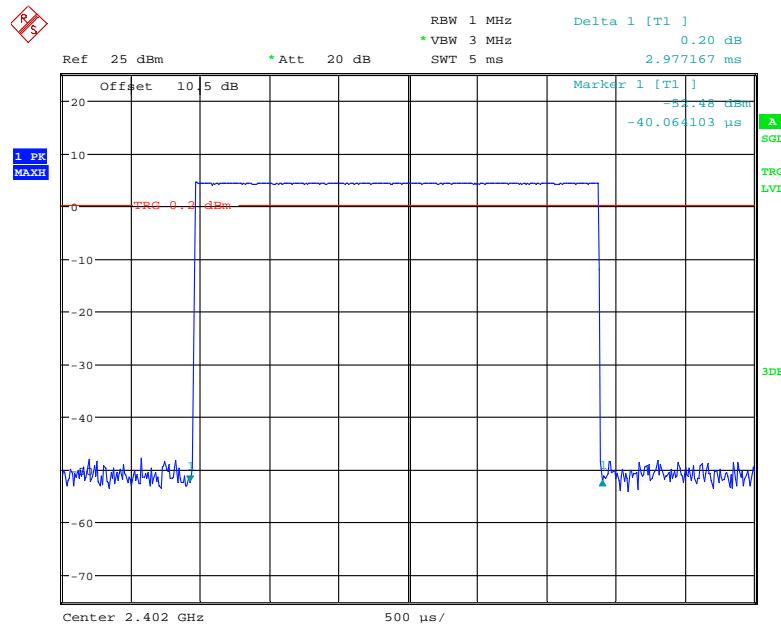
Date: 28.APR.2019 16:07:14

Pulse time, Middle Channel, DH5


```
                                        RBW  1 MHz     Delta 1 [T1 ]
                                      * VBW  3 MHz              1.17 dB
  Ref   25 dBm         * Att   20 dB   SWT  5 ms        2.969154 ms
     Offset   10.5 dB                        Marker 1 [T1 ]
                                                       -52.07 dBm
                                                   -32.051282 µs
```

Center 2.441 GHz   500 µs/
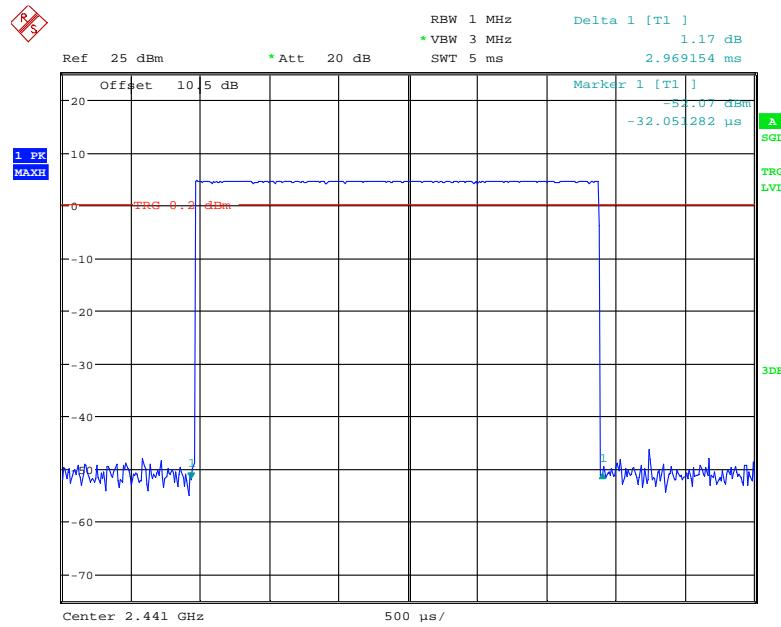
Date: 28.APR.2019 16:07:32

Pulse time, High Channel, DH5

	RBW 1 MHz	Delta 1 [T1]
	*VBW 3 MHz	0.41 dB
Ref 25 dBm	*Att 20 dB SWT 5 ms	2.961141 ms

Offset 10.5 dB

Marker 1 [T1]
-51.15 dBm
-32.051282 µs

1 PK MAXH

Center 2.48 GHz   500 µs/
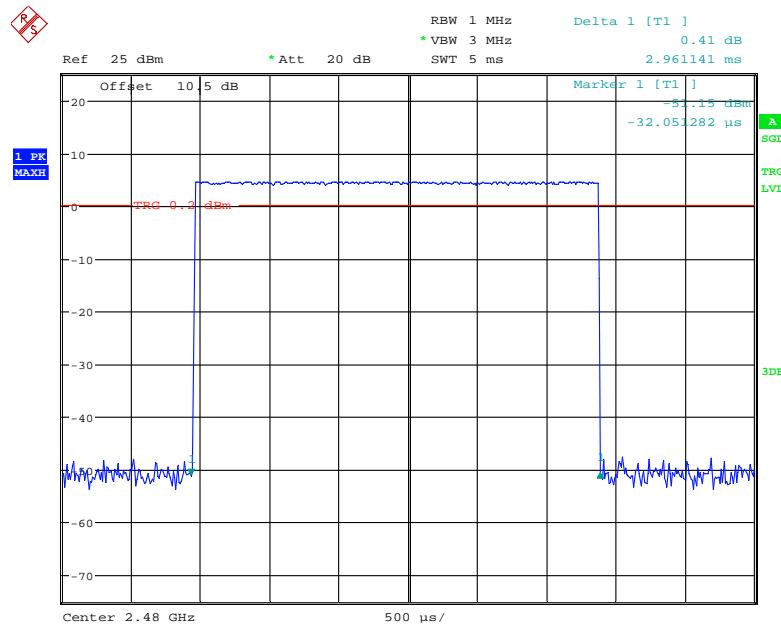
Date: 28.APR.2019 16:07:45

EDR (π/4-DQPSK):

Pulse time, Low Channel, 2DH1

	RBW 1 MHz	Delta 1 [T1]
	*VBW 3 MHz	1.35 dB
Ref 25 dBm	*Att 20 dB SWT 1 ms	430.692308 µs

Offset 10.5 dB

Marker 1 [T1]
-54.12 dBm
-11.217949 µs

1 PK MAXH

Center 2.402 GHz   100 µs/
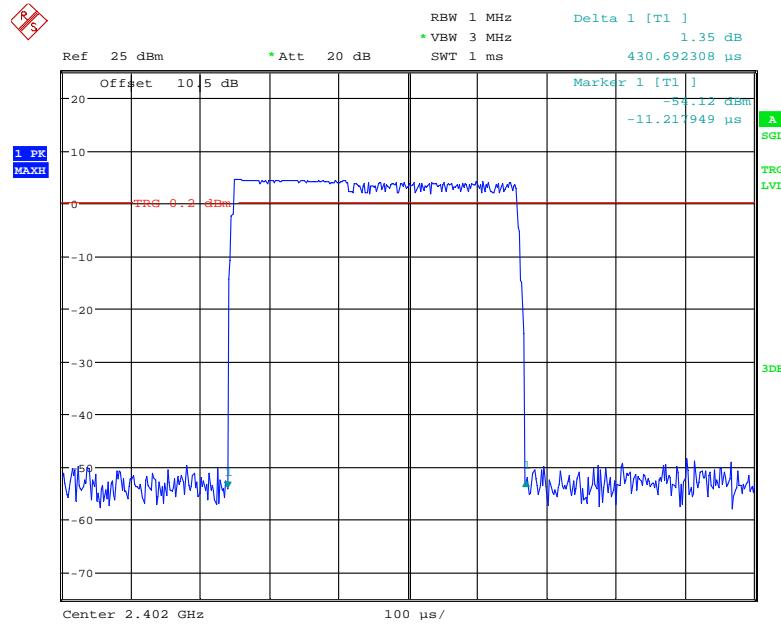
Date: 28.APR.2019 15:57:55

Pulse time, Middle Channel, 2DH1

	RBW 1 MHz	Delta 1 [T1]
	* VBW 3 MHz	3.68 dB
Ref 25 dBm	* Att 20 dB SWT 1 ms	432.294872 µs

Offset 10.5 dB

Marker 1 [T1]
-55.44 dBm
-11.217949 µs

1 PK MAXH

A SGL

TRG LVL

TRG 0.2 dBm

3DB

Center 2.441 GHz   100 µs/
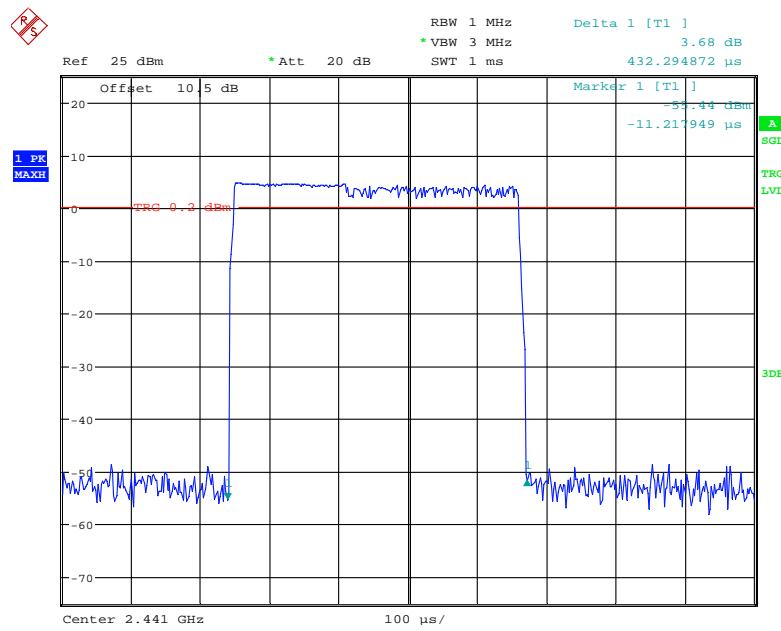
Date: 28.APR.2019 15:57:36

Pulse time, High Channel, 2DH1

	RBW 1 MHz	Delta 1 [T1]
	* VBW 3 MHz	-2.56 dB
Ref 25 dBm	* Att 20 dB SWT 1 ms	432.294872 µs

Offset 10.5 dB

Marker 1 [T1]
-53.82 dBm
-11.217949 µs

1 PK MAXH

A SGL

TRG LVL

TRG 0.2 dBm

3DB

Center 2.48 GHz   100 µs/
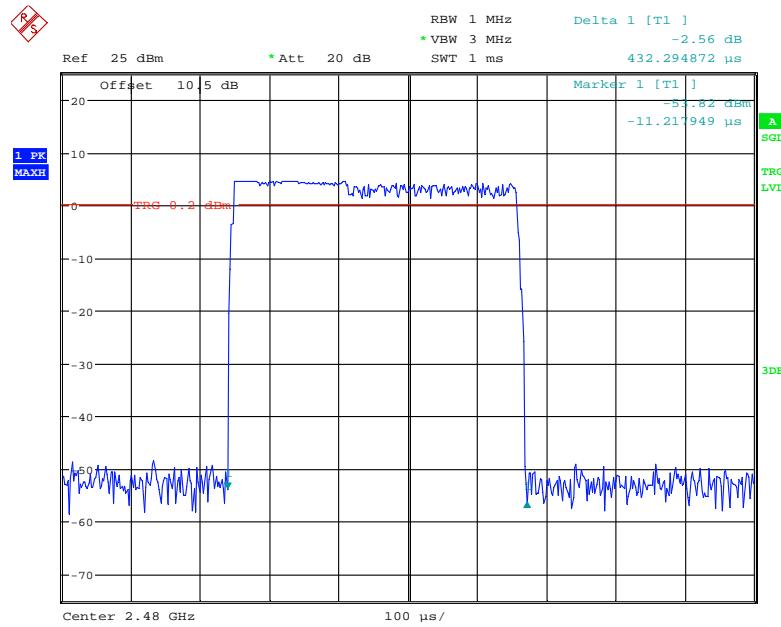
Date: 28.APR.2019 15:57:24

Pulse time, Low Channel, 2DH3
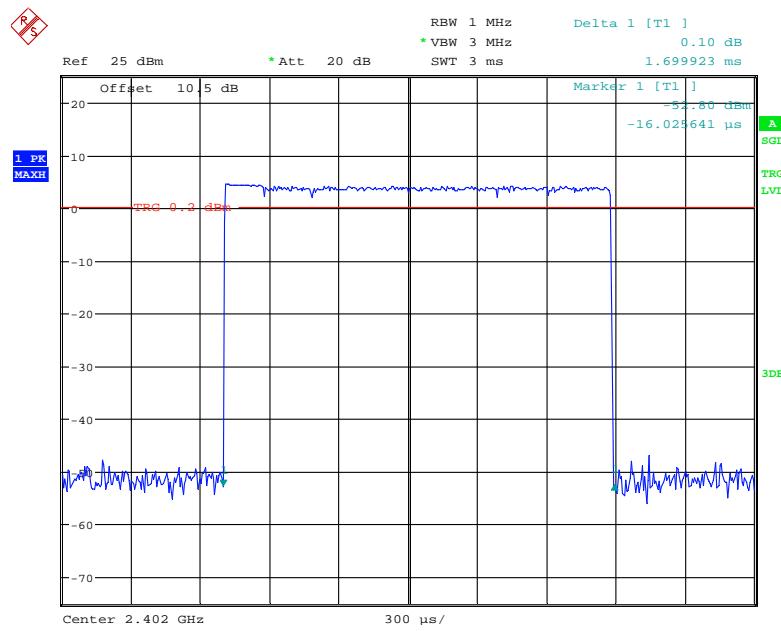

Date: 28.APR.2019 16:04:58

Pulse time, Middle Channel, 2DH3
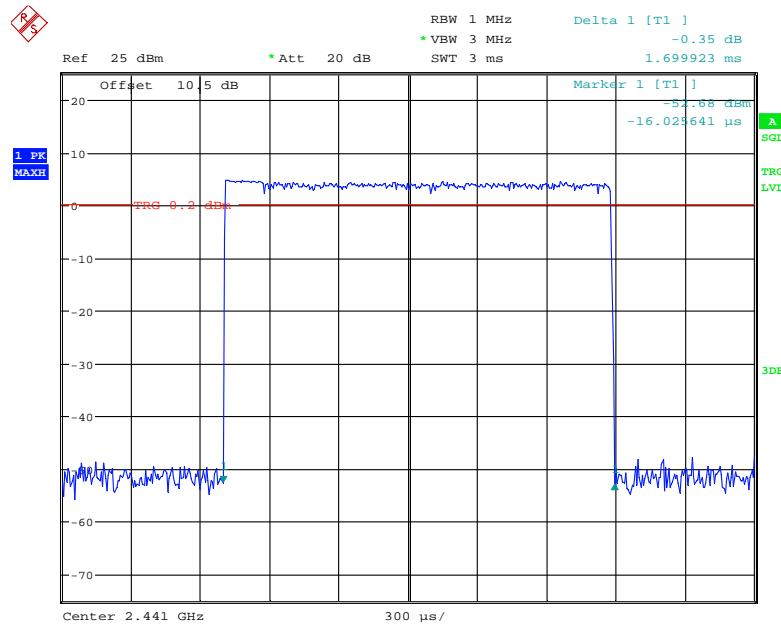
Date: 28.APR.2019 16:05:10

Pulse time, High Channel, 2DH3

	RBW 1 MHz	Delta 1 [T1]	
	* VBW 3 MHz	-1.09 dB	
Ref 25 dBm	* Att 20 dB SWT 3 ms	1.699923 ms	

Offset 10.5 dB

Marker 1 [T1]
-51.63 dBm
-20.833333 µs

TRG 0.2 dBm

Center 2.48 GHz   300 µs/
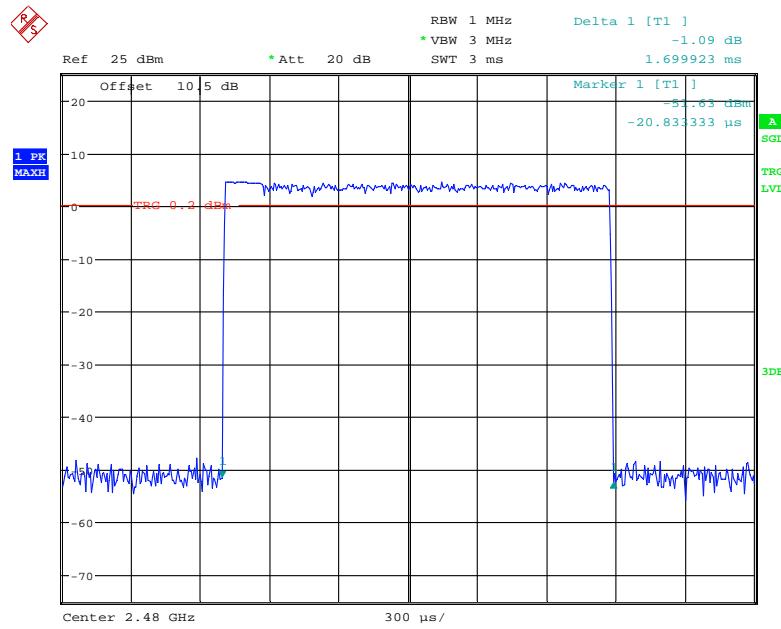
Date: 28.APR.2019 16:05:30

Pulse time, Low Channel, 2DH5

	RBW 1 MHz	Delta 1 [T1]	
	* VBW 3 MHz	3.79 dB	
Ref 25 dBm	* Att 20 dB SWT 5 ms	2.969154 ms	

Offset 10.5 dB

Marker 1 [T1]
-53.86 dBm
-32.051282 µs

TRG 0.2 dBm

Center 2.402 GHz   500 µs/
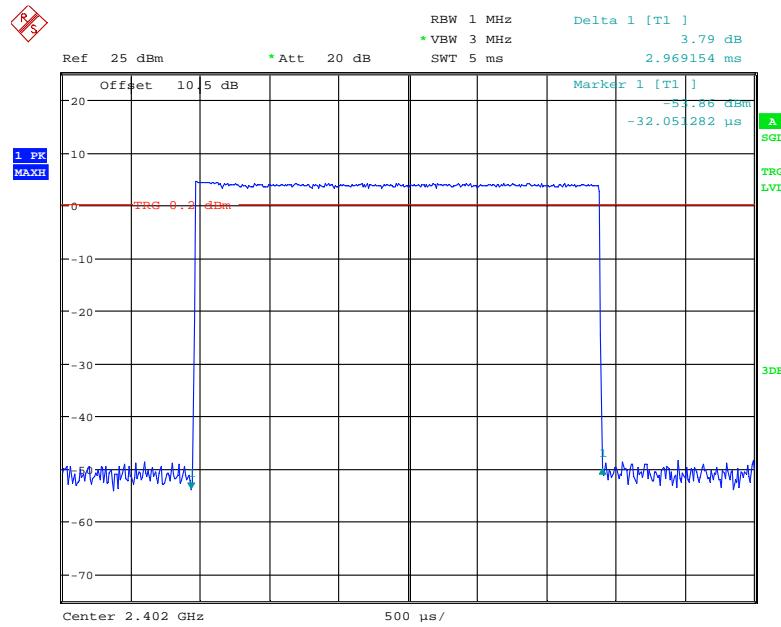
Date: 28.APR.2019 16:08:33

Pulse time, Middle Channel, 2DH5

```
                              RBW  1 MHz      Delta 1 [T1 ]
                            * VBW  3 MHz                2.47 dB
        Ref   25 dBm        * Att  20 dB      SWT  5 ms      2.961141 ms
          Offset  10.5 dB                     Marker 1 [T1 ]
      20                                              -52.17 dBm
                                                    -32.051282 µs    A
      10                                                            SGL
                                                                    TRG
   1 PK                                                             LVL
   MAXH   0    TRG 0.2 dBm
     -10
     -20
     -30                                                            3DB
     -40

     -60
     -70
        Center 2.441 GHz                  500 µs/
```
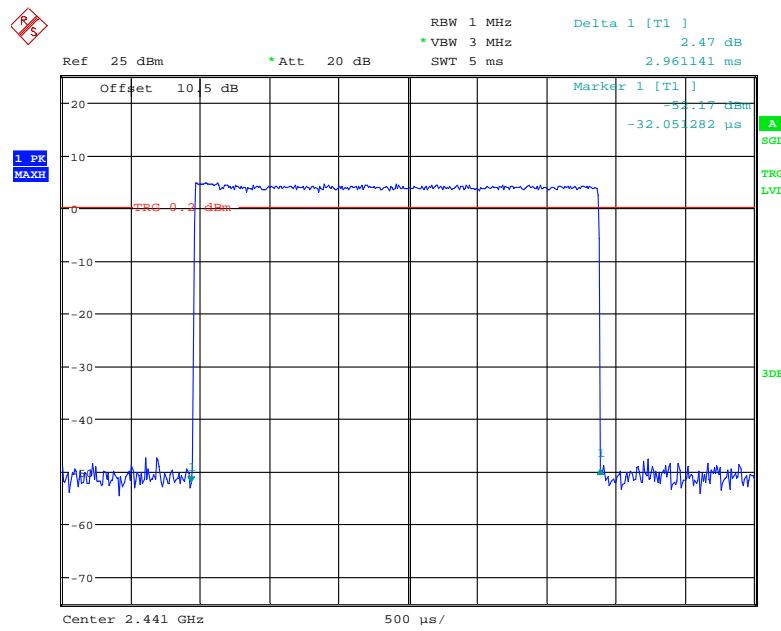
Date: 28.APR.2019 16:08:18

Pulse time, High Channel, 2DH5

```
                              RBW  1 MHz      Delta 1 [T1 ]
                            * VBW  3 MHz                0.45 dB
        Ref   25 dBm        * Att  20 dB      SWT  5 ms      2.977167 ms
          Offset  10.5 dB                     Marker 1 [T1 ]
      20                                              -51.66 dBm
                                                    -32.051282 µs    A
      10                                                            SGL
                                                                    TRG
   1 PK                                                             LVL
   MAXH   0    TRG 0.2 dBm
     -10
     -20
     -30                                                            3DB
     -40

     -60
     -70
        Center 2.48 GHz                   500 µs/
```
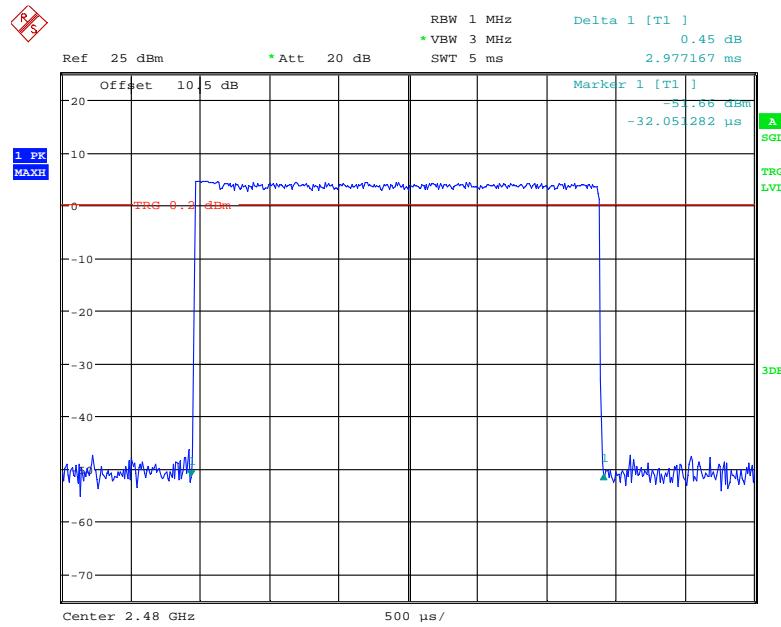
Date: 28.APR.2019 16:08:04

EDR (8DPSK):
Pulse time, Low Channel, 3DH1

```
                                    RBW  1 MHz      Delta 1 [T1 ]
                                   *VBW  3 MHz                -1.64 dB
         Ref  25 dBm      *Att  20 dB    SWT  1 ms        432.294872 µs
           Offset  10.5 dB                       Marker 1 [T1 ]
    20                                                    -51.08 dBm
                                                       -11.217949 µs     A
                                                                         SGL
 1 PK
 MAXH  10                                                                 TRG
                                                                         LVL
     0      TRG 0.2 dBm

   -10

   -20

   -30                                                                    3DB

   -40

   -50

   -60

   -70

         Center 2.402 GHz                        100 µs/
```
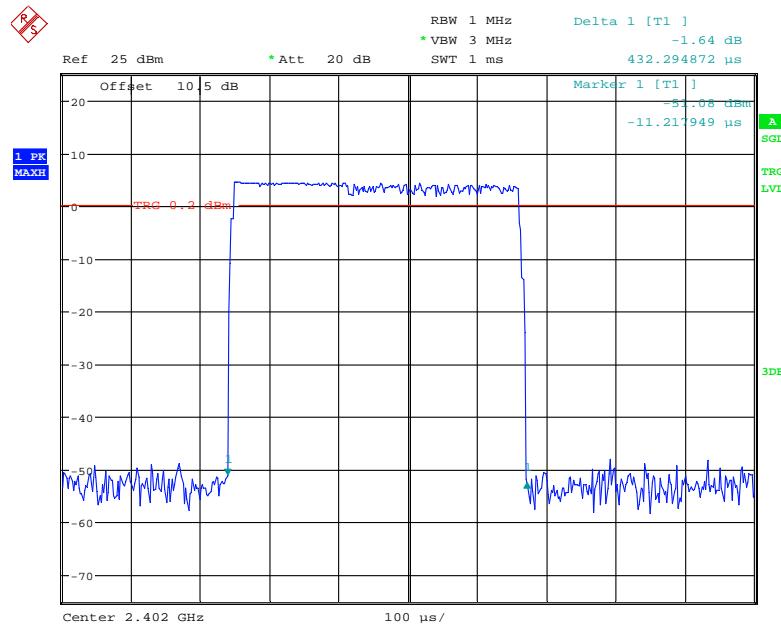
Date: 28.APR.2019 15:58:12

Pulse time, Middle Channel, 3DH1

```
                                    RBW  1 MHz      Delta 1 [T1 ]
                                   *VBW  3 MHz                 0.18 dB
         Ref  25 dBm      *Att  20 dB    SWT  1 ms        430.692308 µs
           Offset  10.5 dB                       Marker 1 [T1 ]
    20                                                    -51.46 dBm
                                                       -11.217949 µs     A
                                                                         SGL
 1 PK
 MAXH  10                                                                 TRG
                                                                         LVL
     0      TRG 0.2 dBm

   -10

   -20

   -30                                                                    3DB

   -40

   -50

   -60

   -70

         Center 2.441 GHz                        100 µs/
```
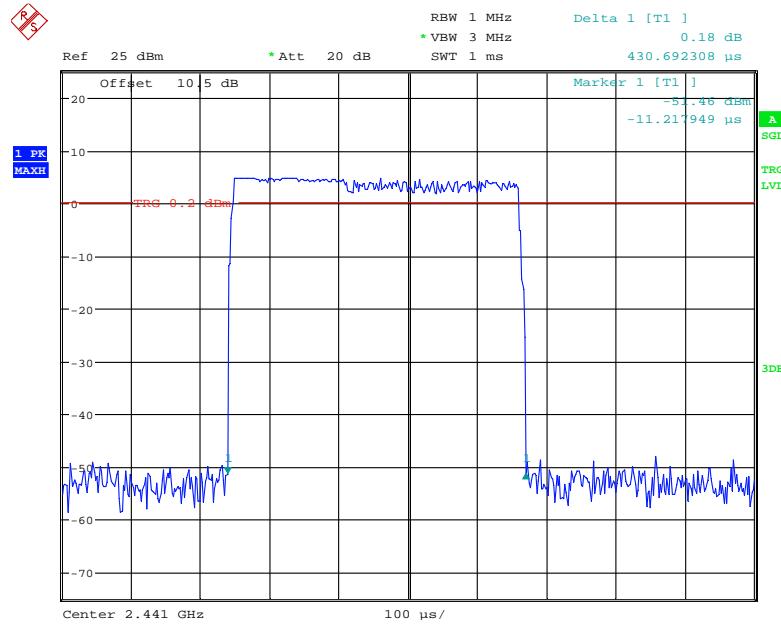
Date: 28.APR.2019 16:02:39

Pulse time, High Channel, 3DH1
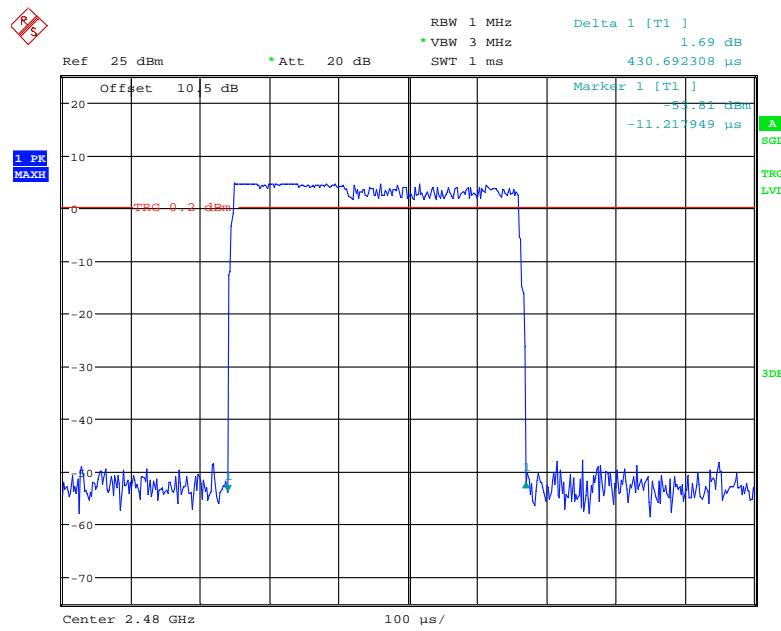
Date: 28.APR.2019 16:02:55

## Pulse time, Low Channel, 3DH3
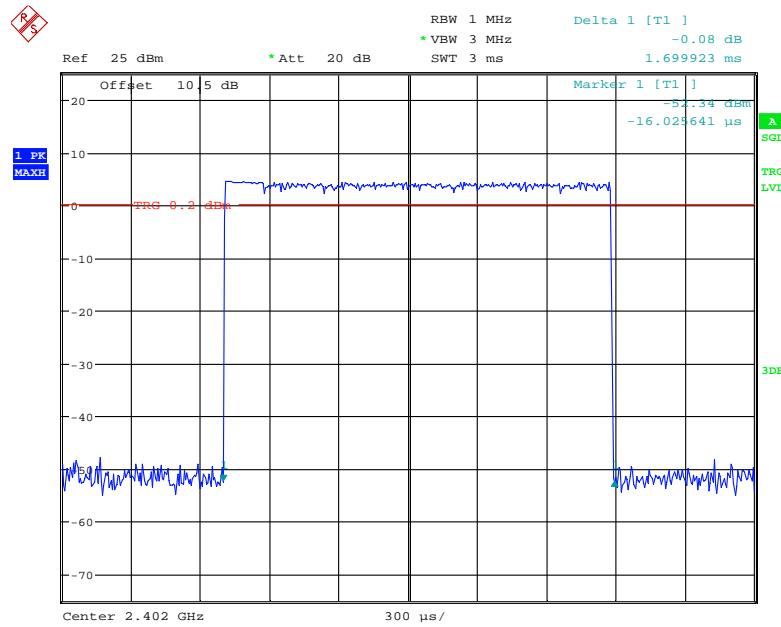
Date: 28.APR.2019 16:04:35

Pulse time, Middle Channel, 3DH3
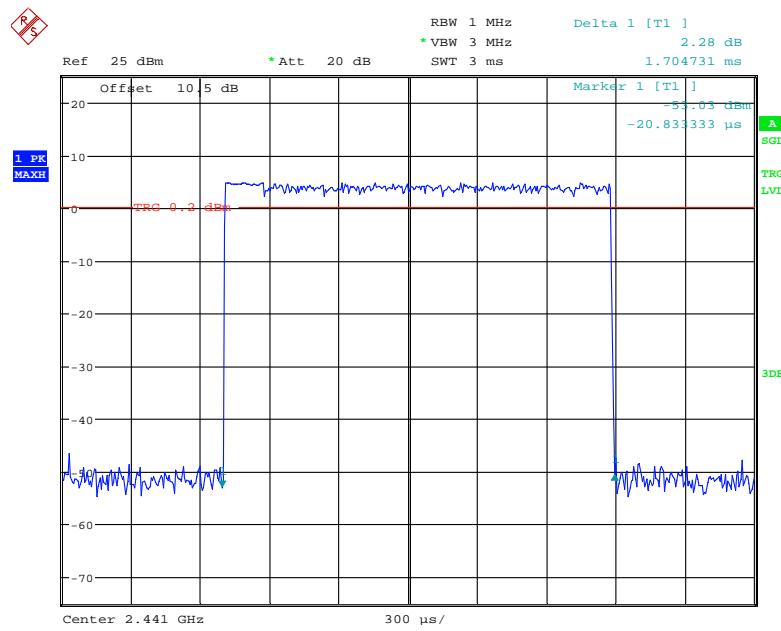
Date: 28.APR.2019 16:04:13

Pulse time, High Channel, 3DH3
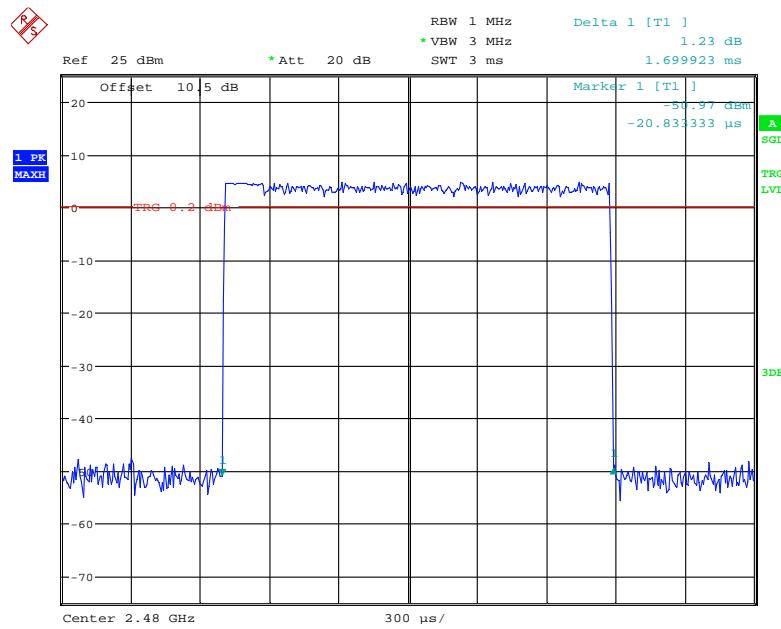
Date: 28.APR.2019 16:03:58

Pulse time, Low Channel, 3DH5

	RBW 1 MHz	Delta 1 [T1]
	* VBW 3 MHz	-0.23 dB
Ref 25 dBm * Att 20 dB	SWT 5 ms	2.969154 ms
Offset 10.5 dB		Marker 1 [T1]
		-50.64 dBm
		-32.051282 µs

```
20                                                    A
                                                      SGL
10                                          1 PK
                                            MAXH        TRG
 0   TRG 0.2 dBm                                        LVL
-10
-20
-30                                                    3DB
-40
-50
-60
-70
```

Center 2.402 GHz   500 µs/
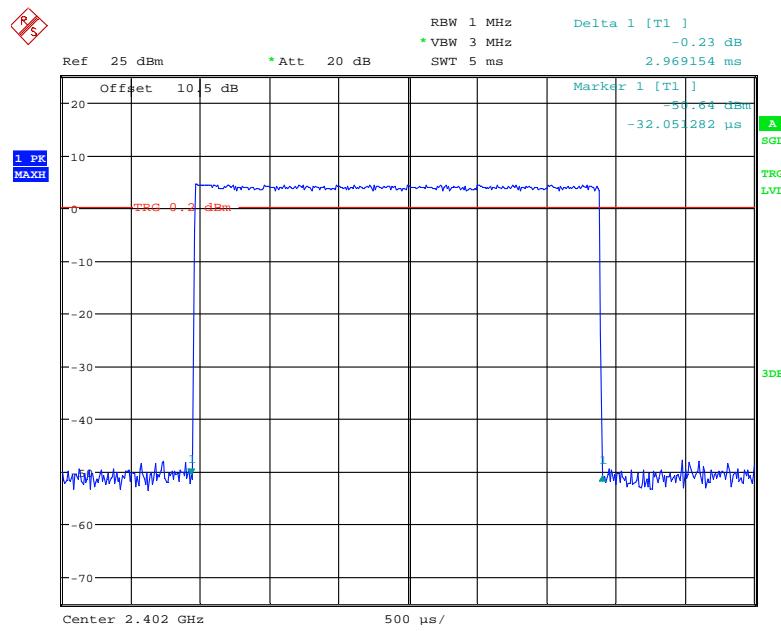
Date: 28.APR.2019 16:08:51

Pulse time, Middle Channel, 3DH5

	RBW 1 MHz	Delta 1 [T1]
	* VBW 3 MHz	3.57 dB
Ref 25 dBm * Att 20 dB	SWT 5 ms	2.945115 ms
Offset 10.5 dB		Marker 1 [T1]
		-52.18 dBm
		-8.012821 µs

```
20                                                    A
                                                      SGL
10                                          1 PK
                                            MAXH        TRG
 0   TRG 0.2 dBm                                        LVL
-10
-20
-30                                                    3DB
-40
-50
-60
-70
```

Center 2.441 GHz   500 µs/
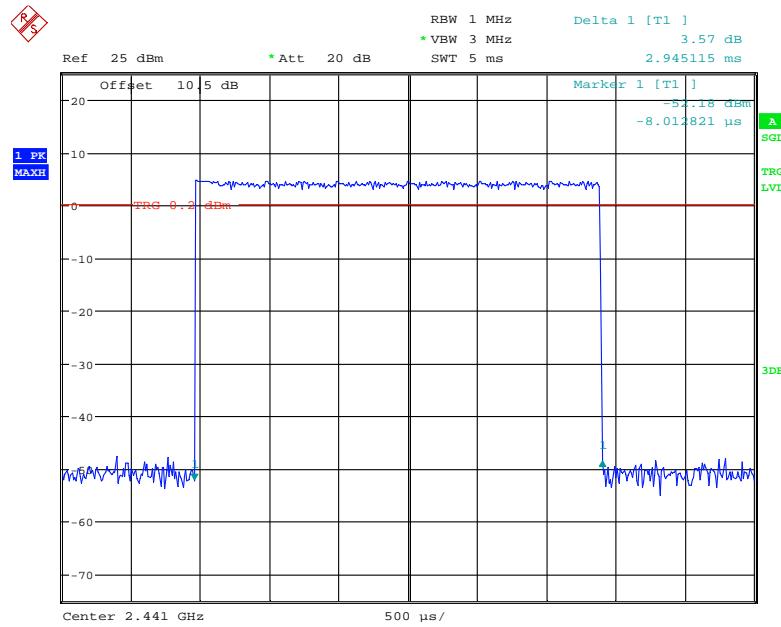
Date: 28.APR.2019 16:09:09

Pulse time, High Channel, 3DH5
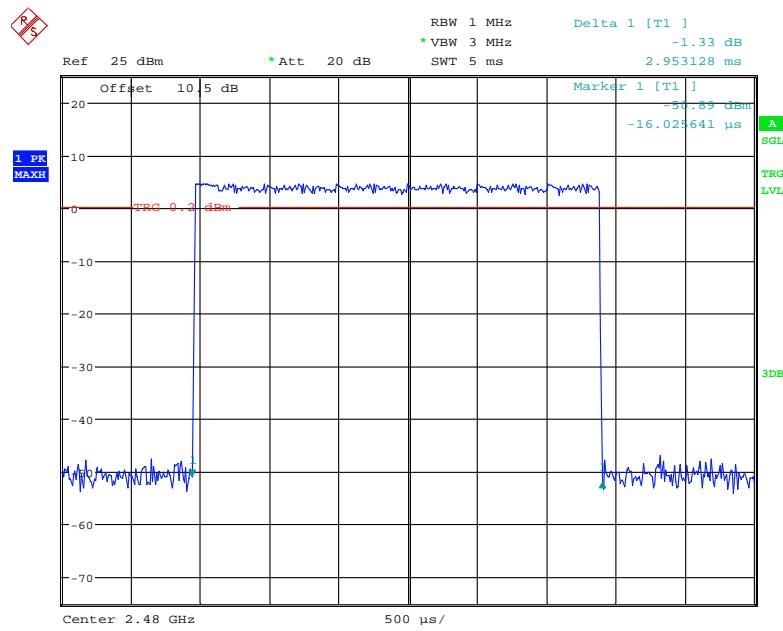
Date: 28.APR.2019 16:09:25

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:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-04-28.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to following table.

Mode	Channel	Frequency (MHz)	Peak Output Power		Limit (mW)
			(dBm)	(mW)	
BDR (GFSK)	Low	2402	4.86	3.06	125
	Middle	2441	5.06	3.21	125
	High	2480	4.98	3.15	125
EDR (π/4-DQPSK)	Low	2402	4.89	3.08	125
	Middle	2441	5.13	3.26	125
	High	2480	5.15	3.27	125
EDR (8DPSK)	Low	2402	5.11	3.24	125
	Middle	2441	5.43	3.49	125
	High	2480	5.56	3.60	125

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:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-04-28.

*EUT operation mode: Transmitting*

Test Result: Compliance. Please refer to following plots.

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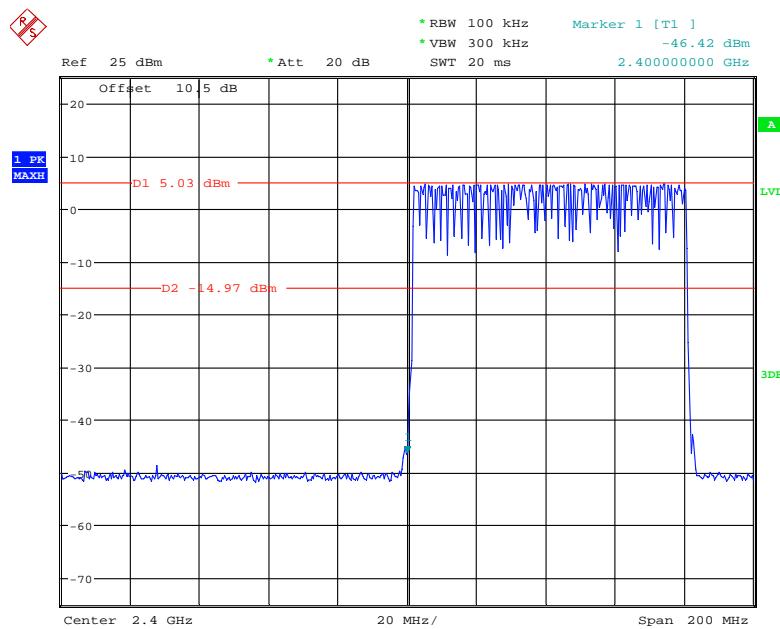
Hopping

Date: 28.APR.2019 15:50:32

Single
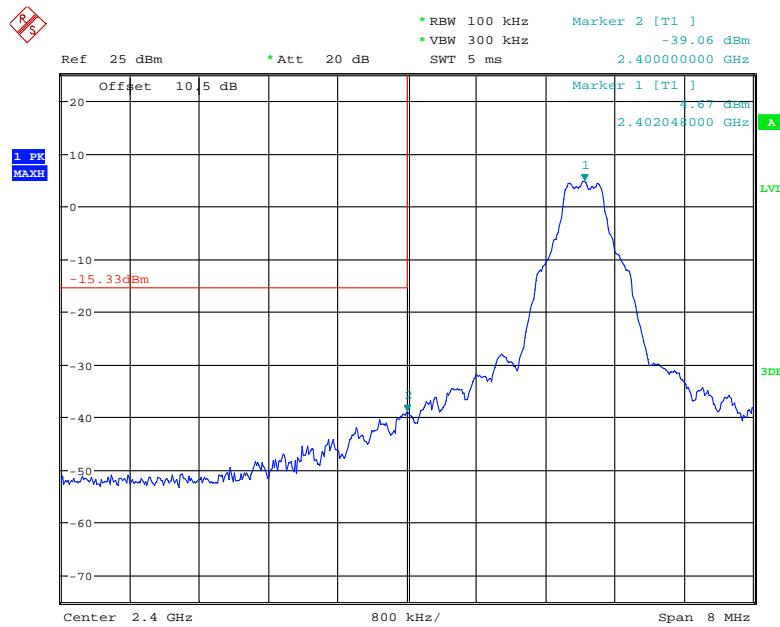
Date: 28.APR.2019 13:44:22

BDR (GFSK): Band Edge-Right Side
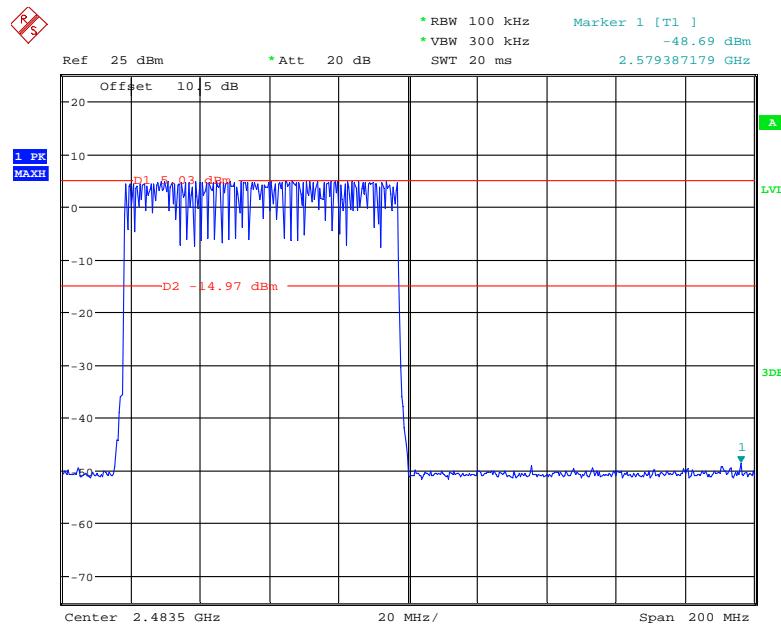
Hopping

Date: 28.APR.2019 15:54:46

Single
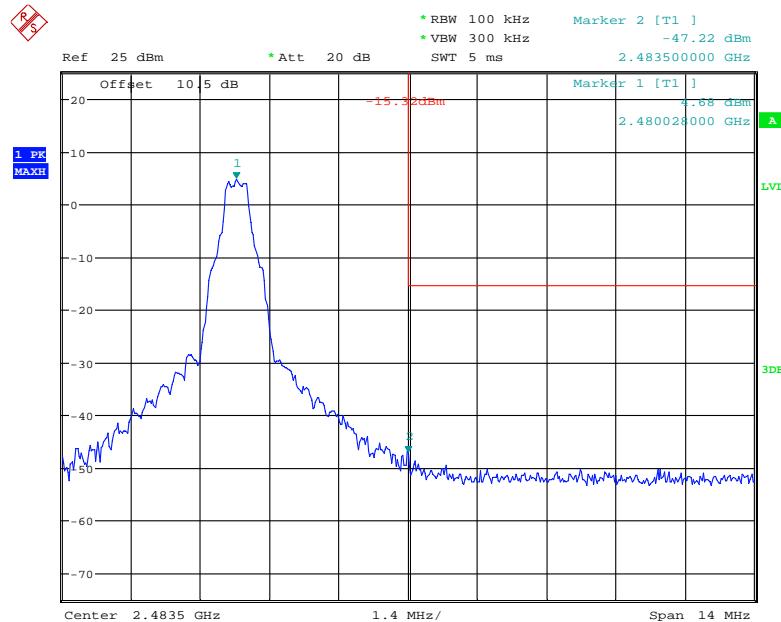
Date: 28.APR.2019 13:49:00

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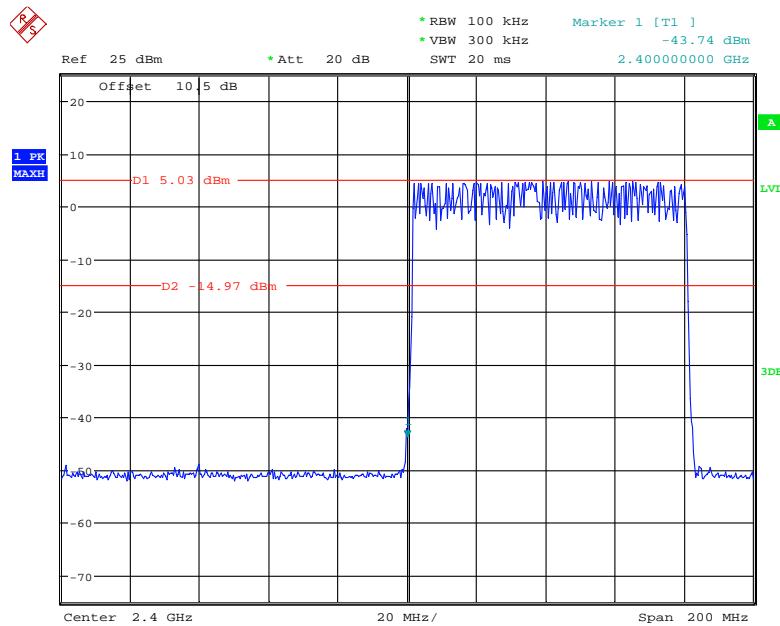
Hopping

Date: 28.APR.2019 15:47:07

Single
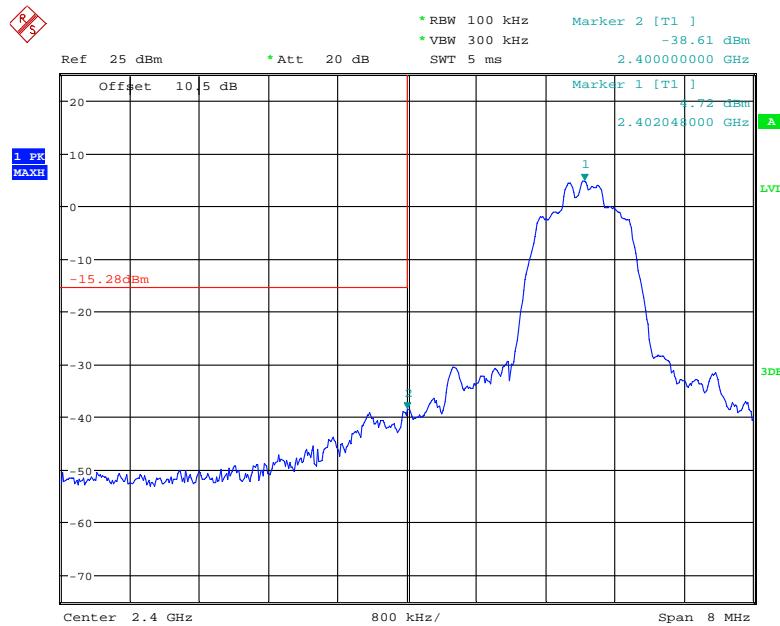
Date: 28.APR.2019 13:54:10

EDR (π/4-DQPSK): Band Edge-Right Side

Hopping


```
                                            *RBW 100 kHz      Marker 1 [T1 ]
                                            *VBW 300 kHz             -45.40 dBm
       Ref  25 dBm          *Att  20 dB     SWT 20 ms          2.577107692 GHz
          Offset  10.5 dB                                                      A
  -20
1 PK
MAXH   10
      D1 5.03 dBm                                                         LVL
    0

  -10
      D2 -14.97 dBm
  -20

  -30                                                                     3DB

  -40
                                                                1
  -50

  -60

  -70

       Center  2.4835 GHz            20 MHz/           Span  200 MHz
```
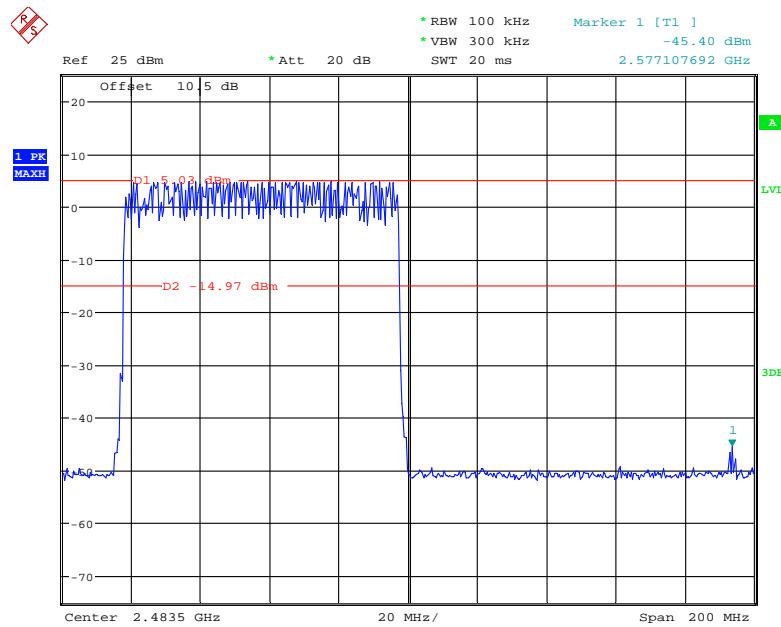
Date: 28.APR.2019 15:45:03

Single


```
                                            *RBW 100 kHz      Marker 2 [T1 ]
                                            *VBW 300 kHz             -48.23 dBm
       Ref  25 dBm          *Att  20 dB     SWT 5 ms           2.483556000 GHz
          Offset  10.5 dB                         Marker 1 [T1 ]
  -20                                -15.29dBm             4.71 dBm      A
1 PK                                                 2.480028000 GHz
MAXH   10
              1                                                          LVL
    0

  -10

  -20

  -30                                                                     3DB

  -40

  -50

  -60

  -70

       Center  2.4835 GHz            1.4 MHz/           Span  14 MHz
```
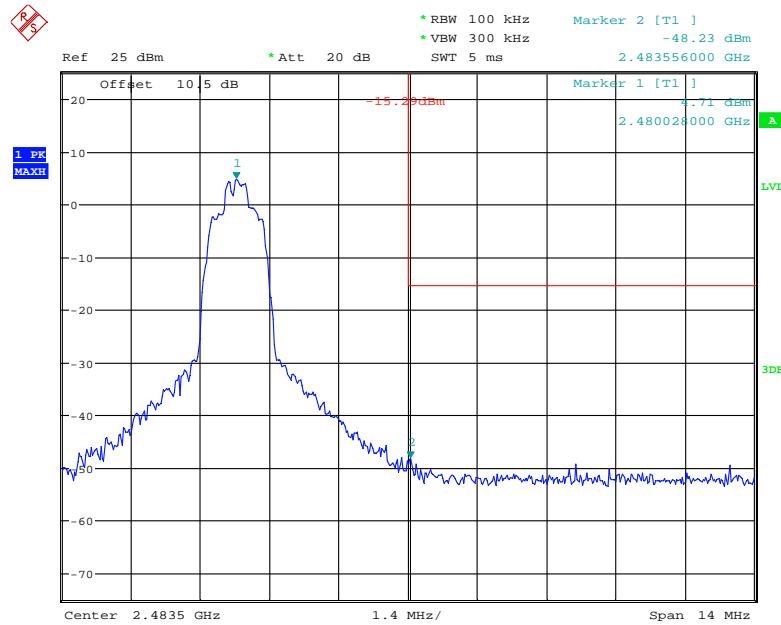
Date: 28.APR.2019 13:50:56

## EDR (8DPSK): Band Edge-Left Side
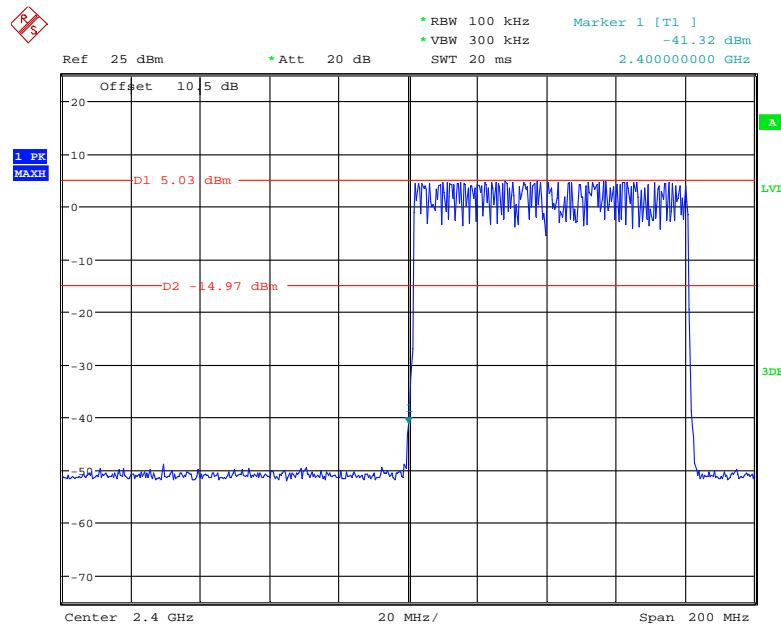
Hopping

Date: 28.APR.2019 15:39:16

Single
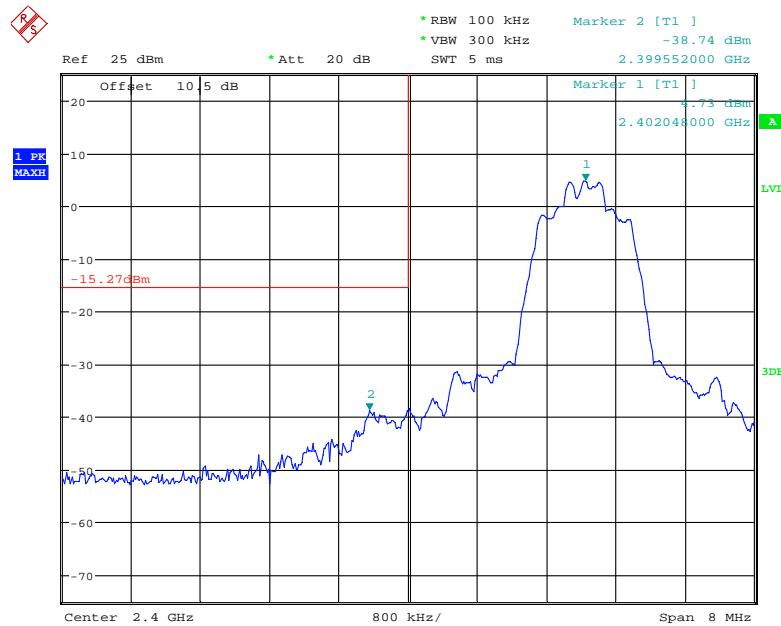
Date: 28.APR.2019 13:56:17

EDR (8DPSK): Band Edge-Right Side

Hopping
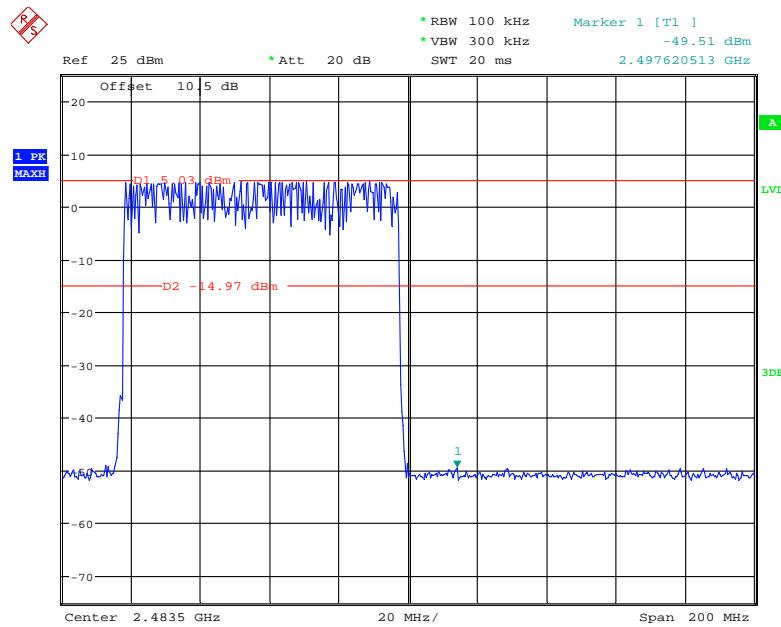
Date: 28.APR.2019 15:42:10

Single
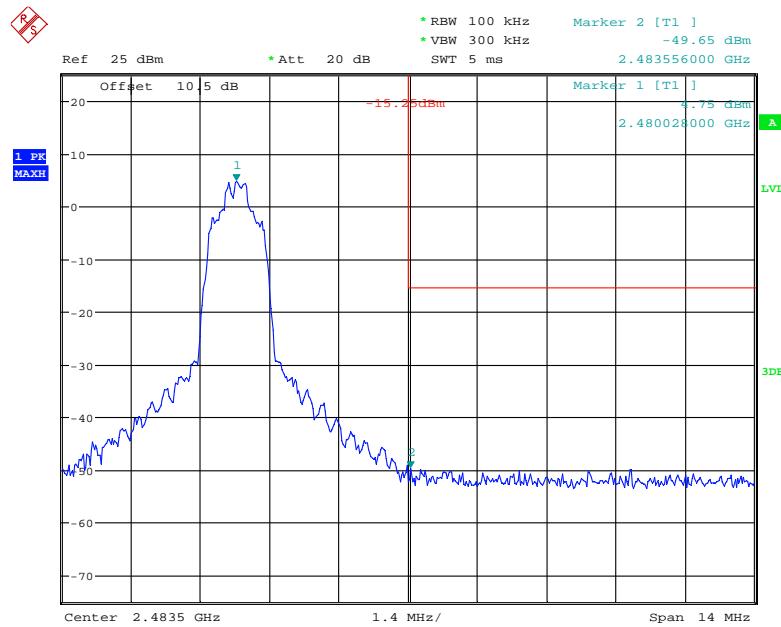
Date: 28.APR.2019 13:59:05

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