



TESTING CERT #3478.01



TEST REPORT

EUT Description	WLAN and BT, 2x2 PCIe M.2 1216 SD adapter card
Brand Name	Intel® Dual Band Wireless-AC 8265
Model Name	8265D2W
Serial Number	TA#: J10070-002 WF MAC: 34:13:E8:53:75:37 / 34:13:E8:53:75:05 / 34:13:E8:53:74:C9 BT MAC: 34:13:E8:53:75:3B / 34:13:E8:53:75:09 / 34:13:E8:53:74:CD (see section 4)
FCC/IC ID	FCC ID: PD98265D2 IC ID: 1000M-8265D2
Antenna type	SkyCross WIMAX/WLAN Reference Antenna
Hardware/Software Version	HW: WsP1216 cfg15.2SD Test SW: DRTU 1.8.7-03036 Op SW: 19.0.0.3
Date of Sample Receipt	2016-04-27
Date of Test	2016-05-10 / 2016-06-24
Features	802.11 a/b/g/n/ac Wireless LAN + BT 4.2 (see section 5)

Applicant	Intel Mobile Communications
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Contact Person	Steven Hackett
Telephone/Fax/ Email	steven.c.hackett@intel.com

Reference Standards	FCC CFR Title 47 Part 15C RSS-247 issue 1, RSS-Gen issue 4 (see section 1)
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Test Report number	160321-02.TR05
Revision Control	Rev. 01

The test results relate only to the samples tested.

The test report shall not be reproduced in full, without written approval of the laboratory.

Issued by

Reviewed by

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1. Standards, reference documents and applicable test methods

1. FCC 47 CFR part 15 - Subpart C – §15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
2. FCC 47 CFR part 15 - Subpart C – §15.209 Radiated emission limits; general requirements.
3. Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems - DA 00-705 Released March 30, 2000
4. RSS-247 — Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices.
5. RSS-Gen Issue 4 - General Requirements for Compliance of Radio Apparatus.
6. ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

2. General conditions, competences and guarantees

- ✓ Intel Mobile Communications Wireless RF Lab (Intel WRF Lab) is a testing laboratory accredited by the American Association for Laboratory Accreditation (A2LA).
- ✓ Intel Mobile Communications Wireless RF Lab (Intel WRF Lab) is an Accredited Test Firm listed by the FCC, with Designation Number FR0011.
- ✓ Intel Mobile Communications Wireless RF Lab (Intel WRF Lab) is a Registered Test Site listed by IC, with IC Assigned Code 1000Y.
- ✓ Intel WRF Lab only provides testing services and is committed to providing reliable, unbiased test results and interpretations.
- ✓ Intel WRF Lab is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.
- ✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.
- ✓ This report is only referred to the item that has undergone the test.
- ✓ This report does not imply an approval of the product by the Certification Bodies or competent Authorities.
- ✓ Complete or partial reproduction of the report cannot be made without written permission of Intel WRF Lab.

3. Environmental Conditions

- ✓ At the site where the measurements were performed the following limits were not exceeded during the tests:

Temperature	21°C ± 4°C
Humidity	40% ± 10%

4. Test samples

Sample	Control #	Description	Model	Serial #	Date of reception	Note
#01	160321-02.S07	WiFi/BT Module	8265D2W	WF MAC: 34:13:E8:53:74:C9 BT MAC: 34:13:E8:53:74:CD	2016-04-27	Used for conducted tests
	160107-01.S14	Extender board	PCB00495	ASS00495-01 4950414-064	2016-01-07	
	160107-01.S19	AC/DC Adapter	SPU60-102	08741187 1350	2016-01-07	
	13112601.S05	Laptop	DELL Latitude	27078391477	2014-02-12	
	15111801-S11	Socket	8260D2W	8882-095	2015-12-07	
	160107-01.S17	Adapter USB	NA	NA	2016-01-07	
#02	160321-02.S03	WiFi/BT Module	8265D2W	WF MAC: 34:13:E8:53:75:05 BT MAC: 34:13:E8:53:75:09	2016-04-27	Used for radiated tests (from 30 MHz to 1 GHz)
	160321-02.S13	Socket	D2W	8882-031	2016-04-27	
	160107-01.S11	Extender board	PC00495	4955013-097	2016-01-07	
	160107-01.S28	Laptop	Latitude E5440	BJSYN32	2016-01-15	
#03	160321-02.S01	WiFi/BT Module	8265D2W	WF MAC: 34:13:E8:53:75:37 BT MAC: 34:13:E8:53:75:3B	2016-04-27	Used for radiated tests (from 1GHz to 26.5GHz)
	160321-02.S11	Socket	D2W	8880-017	2016-04-27	
	160107-01.S12	Extender board	PC00495	4955013-034	2016-01-07	
	15051101.S09	Laptop	Dell E5440	9FSYN32	2015-05-12	

NA: Not Applicable

5. EUT features

These are the detailed bands and modes supported by the Equipment Under Test:

802.11b/g/n	2.4GHz (2400.0 – 2483.5 MHz)
802.11a/n/ac	5.2GHz (5150.0 – 5250.0 MHz) 5.3GHz (5250.0 – 5350.0 MHz) 5.6GHz (5470.0 – 5725.0 MHz) 5.8GHz (5725.0 – 5850.0 MHz)
BDR/EDR/BLE 4.2	2.4GHz (2400.0 – 2483.5 MHz)

6. Remarks and comments

N/A

7. Test Verdicts summary

7.1. BT Basic Data Rate / Enhanced Data Rate

FCC part	RSS part	Test name	Verdict
15.247 (a) (1)	RSS-247 Clause 5.1 (1) and (2)	20dB Bandwidth and Carrier frequency separation	P
15.247 (a) (1) (iii)	RSS-247 Clause 5.1 (4)	Number of hopping channels	P
15.247 (a) (1) (iii)	RSS-247 Clause 5.1 (4)	Time of Occupancy (Dwell Time)	P
15.247 (b) (1)	RSS-247 Clause 5.4 (2)	Maximum Peak Output Power and antenna gain	P
15.247 (d)	RSS-247 Clause 5.5	Out-of-band Emissions (conducted)	P
15.247 (d) 15.209	RSS-247 Clause 5.5	Out-of-band Emissions (radiated)	P

P: Pass

F: Fail

NM: Not Measured

NA: Not Applicable

8. Document Revision History

Revision #	Date	Modified by	Details
Rev. 00	2016-06-14	G. Gerbaud Z.Ouachicha	First issue
Rev. 01	2016-06-24	E.Gilles	Measurement update with antenna gain : 3.24dBi

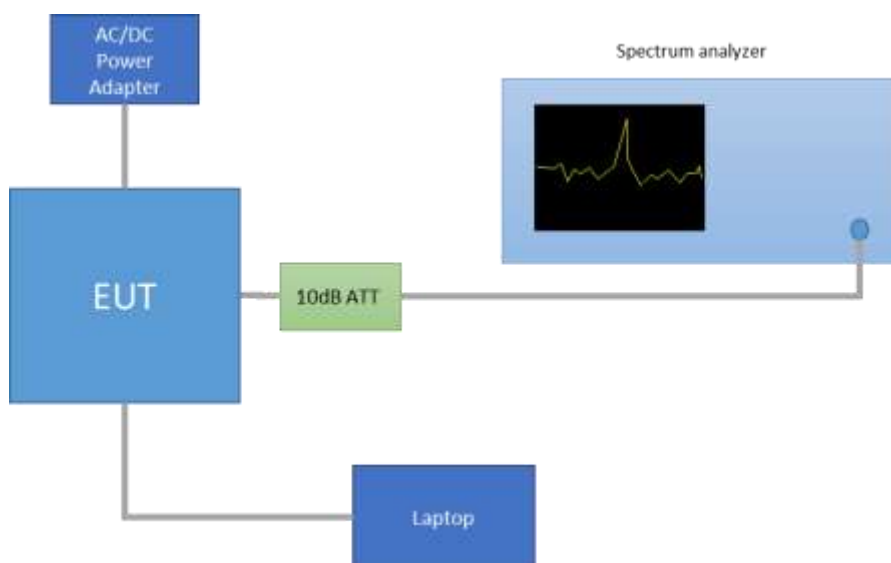
Annex A. Test & System Description

A.1 Measurement system

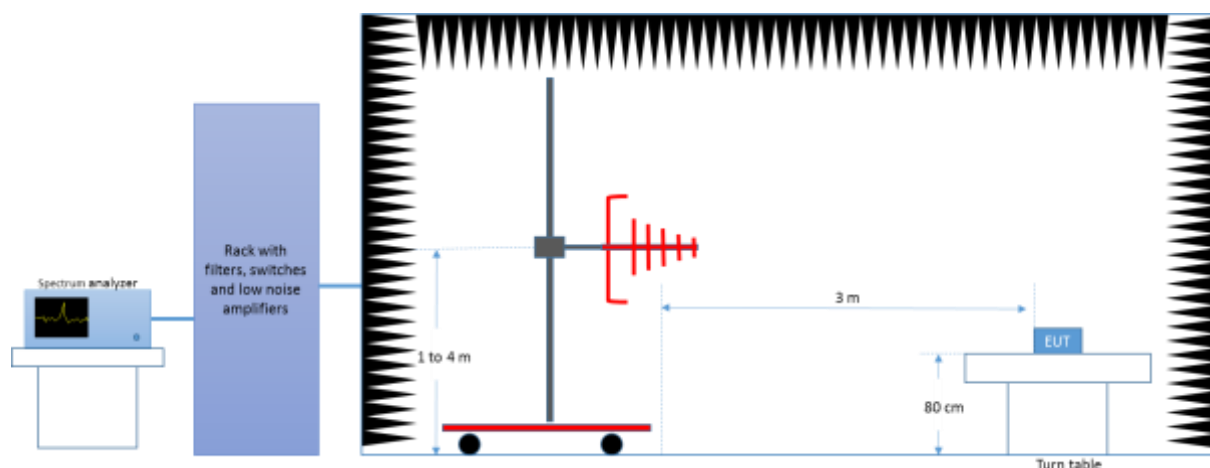
Measurements were performed using the following setups.

The DUT was installed in a test fixture and this test fixture is connected to a laptop computer and AC/DC power adapter. The laptop computer was used to configure the EUT to continuously transmit at a specified output power using all different modes and modulation schemes.

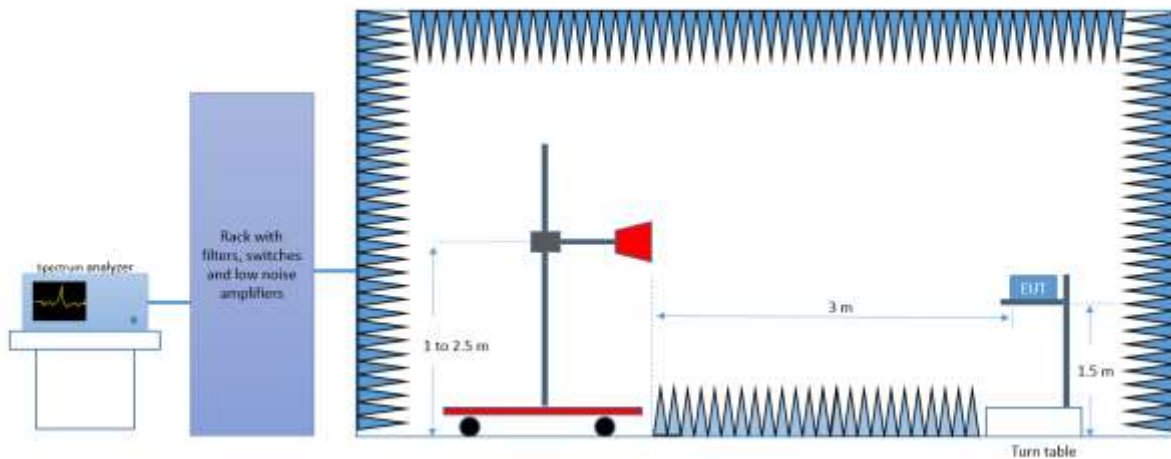
Conducted Setup



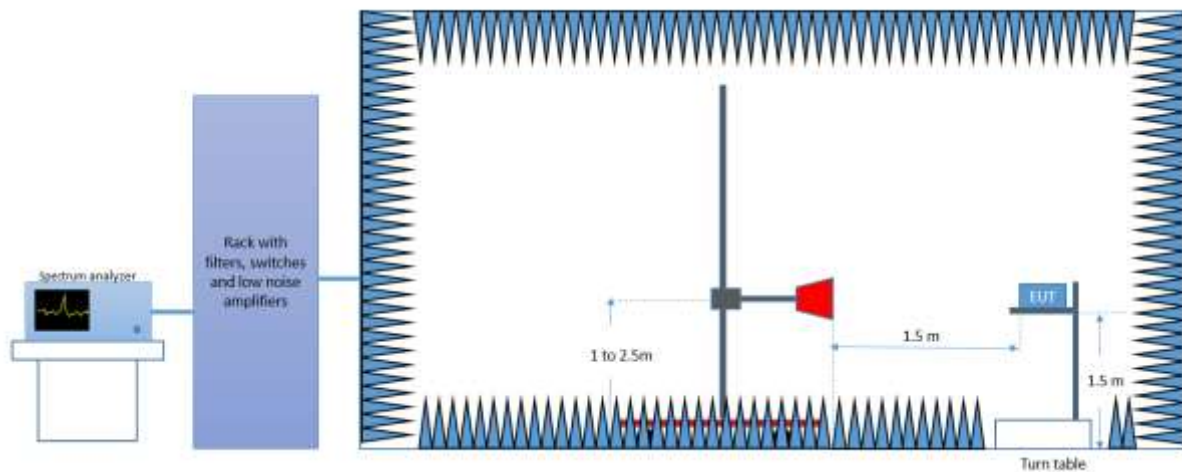
Radiated Setup < 1GHz



Radiated Setup 1GHz - 18GHz



Radiated Setup 18 GHz - 25 GHz



A.2 Test Equipment List

Conducted Setup

ID#	Device	Type/Model	Serial Number	Manufacturer	Cal. Date	Cal. Due Date
0316	Spectrum analyzer	FSV30	103309	Rohde & Schwarz	2015-03-20	2017-03-20

Radiated Setup

ID#	Device	Type/Model	Serial Number	Manufacturer	Cal. Date	Cal. Due Date
0133	Spectrum analyzer	FSV40	101358	Rohde & Schwarz	2016-04-15	2018-04-15
0258	Spectrum analyzer	FSV30	101318	Rohde & Schwarz	2016-04-27	2018-04-27
0137	Log antenna 30 MHz – 1 GHz	3142E	00156946	ETS Lindgren	2015-12-11	2017-12-11
0138	Horn antenna 1 GHz – 6.4 GHz	3117	00157734	ETS Lindgren	2016-03-14	2018-03-14
0343	Horn Antenna 6.4 GHz – 18 GHz	3117-PA	00201542	ETS Lindgren	2015-07-16	2017-07-16
0334	Horn Antenna 10 GHz – 40 GHz	3116C	00169308	ETS Lindgren	2015-07-15	2017-07-15
0139	Horn Antenna 18 GHz - 26.5 GHz	114514	00167100	ETS Lindgren	2014-08-14	2016-08-14
0135	Semi Anechoic chamber	FACT 3	5720	ETS Lindgren	2016-04-28	2018-04-28
0337	Full Anechoic chamber	RFD_FA_100	5996	ETS Lindgren	2016-04-28	2018-04-28
0329	Measurement Software	EMC32	1300.7027.00 (100401)	Rohde & Schwarz	N/A	N/A
N/A	Measurement Software	EMC32	012109650000013B (009977)	Rohde & Schwarz	N/A	N/A

A.3 Measurement Uncertainty Evaluation

The system uncertainty evaluation is shown in the below table:

Measurement type	Uncertainty [±dB]
Conducted Power (power meter)	± 1.0
Conducted spurious emission	± 2.9
Radiated test < 1GHz	± 3.8
Radiated test 1GHz -26 GHz	± 4.7

Annex B. Test Results

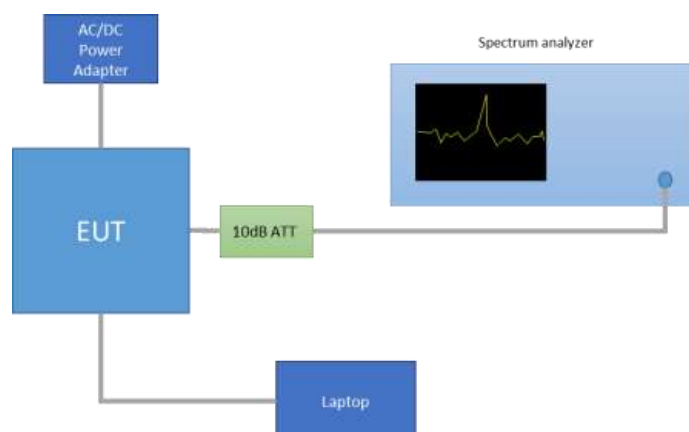
B.1 20dB Bandwidth and Carrier frequency separation

Test limits:

FCC part	RSS part	Limits
15.247 (a) (1)	RSS-247 Clause 5.1 (1) and (2)	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Test procedure:

The setup below was used to measure the 20dB Bandwidth and Carrier frequency separation. The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



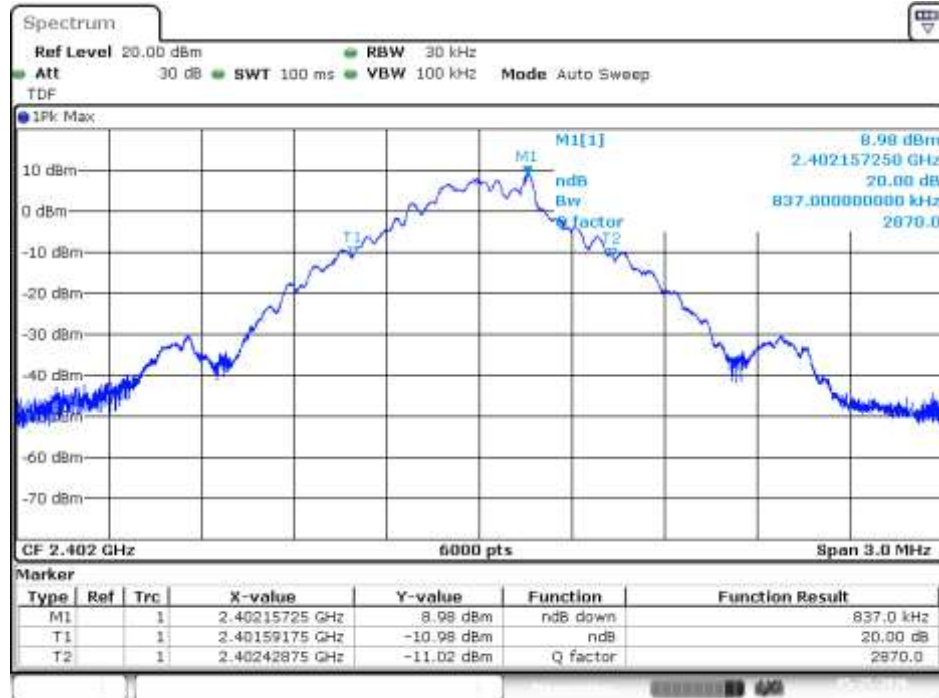
Results tables:

Mode	Channel Number	Frequency [MHz]	20dB BW [MHz]	Freq. Separation [kHz]
Basic Rate GFSK	0	2402	0.837	1000
	39	2441	0.838	
	78	2480	0.840	
EDR $\pi/4$ -DQPSK	0	2402	1.434	1000
	39	2441	1.433	
	78	2480	1.421	
EDR 8-DPSK	0	2402	1.413	1000
	39	2441	1.432	
	78	2480	1.431	

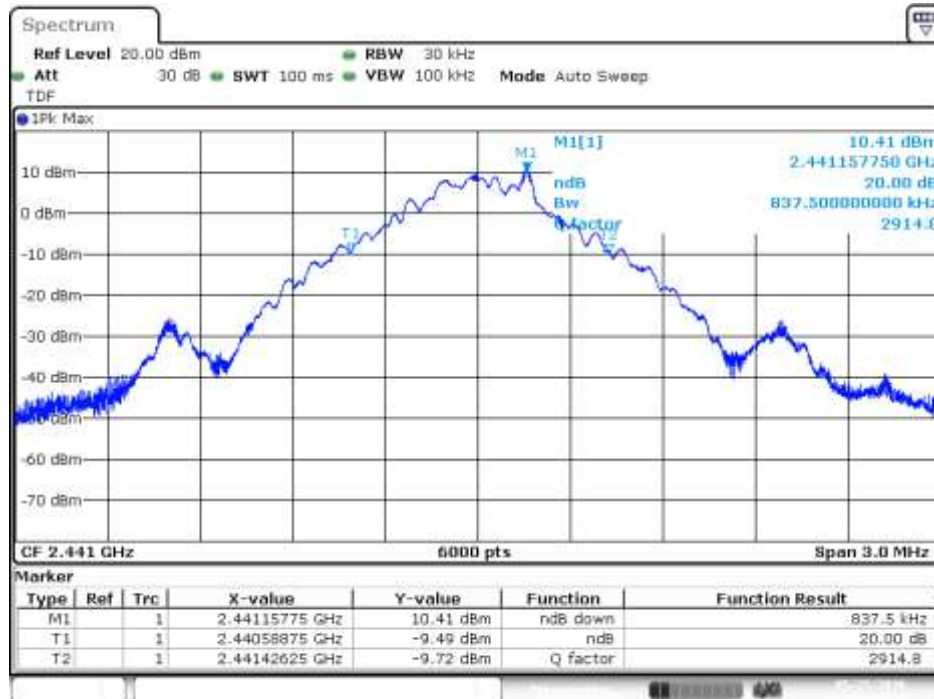
Results screenshot:

Basic Rate - GFSK

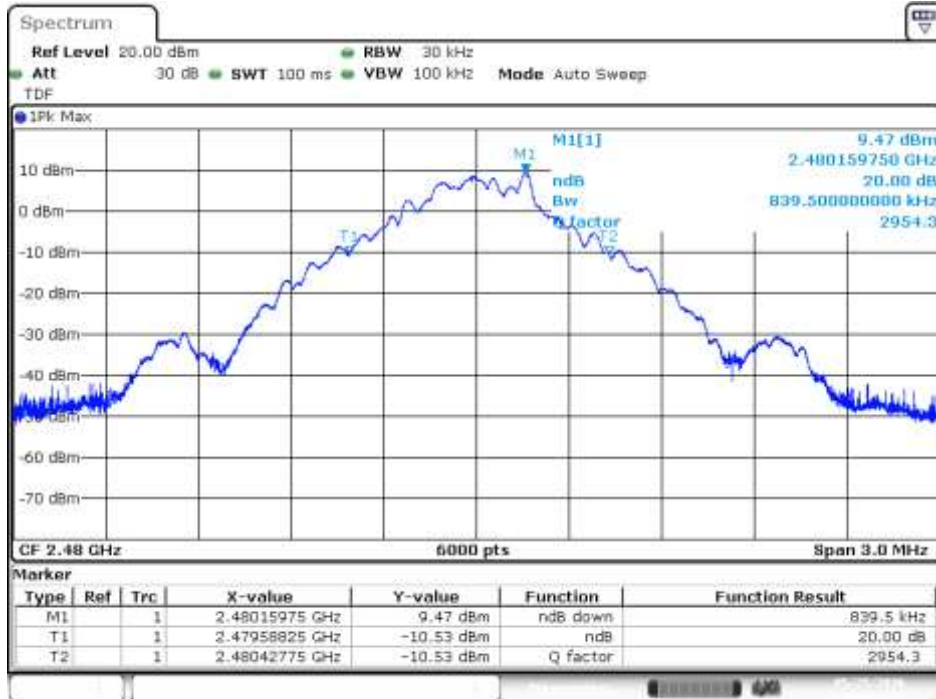
20dB BW - CH0



20dB BW - CH39

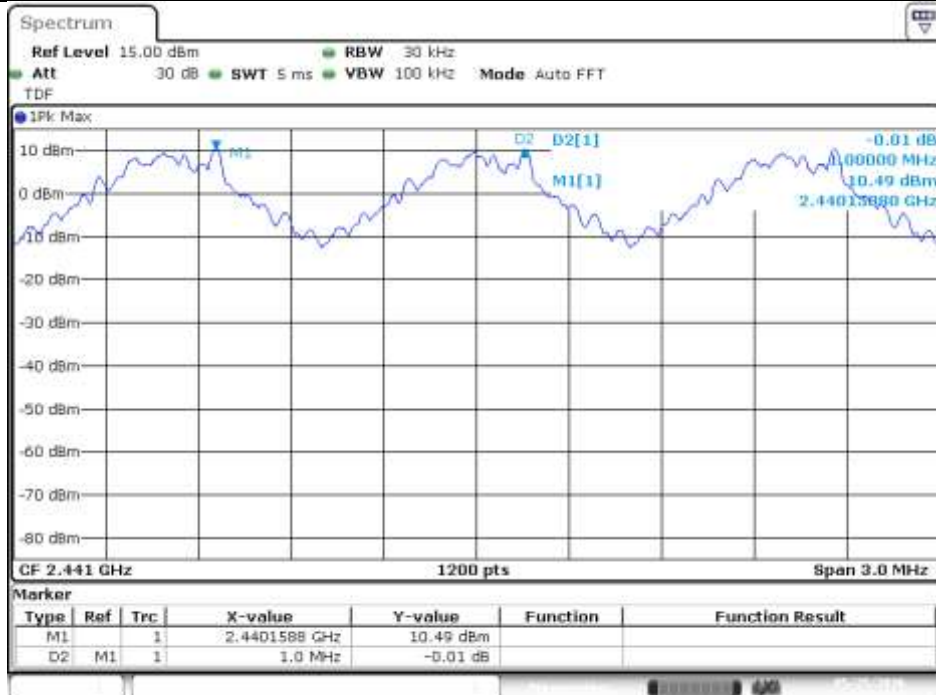


20dB BW - CH78



Date: 25 MAY 2016 16:21:21

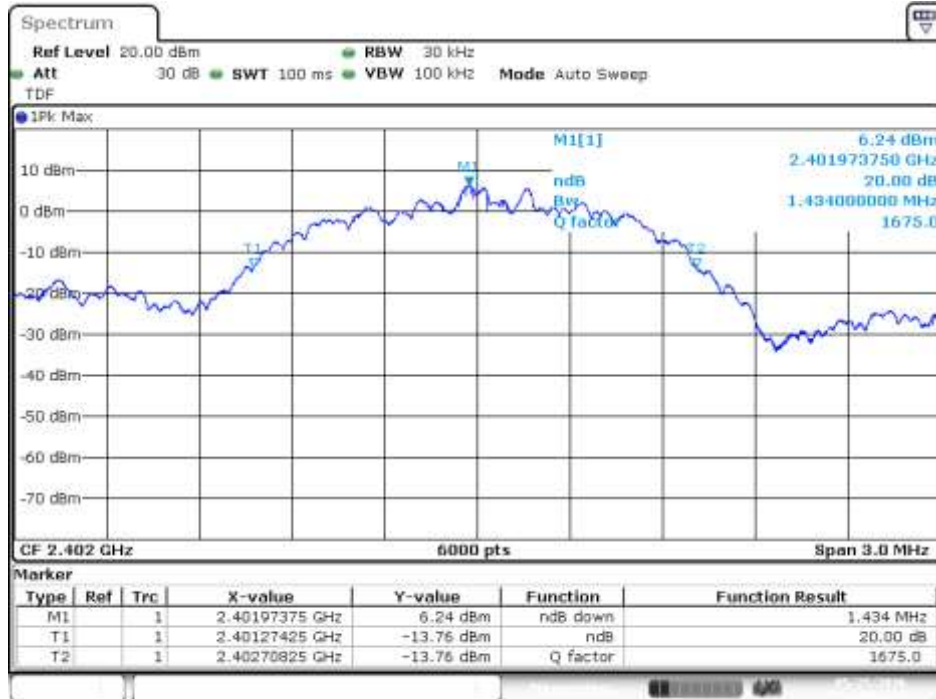
Freq. Separation



Date: 25 MAY 2016 14:37:33

EDR – $\pi/4$ -DQPSK

20dB BW - CH0



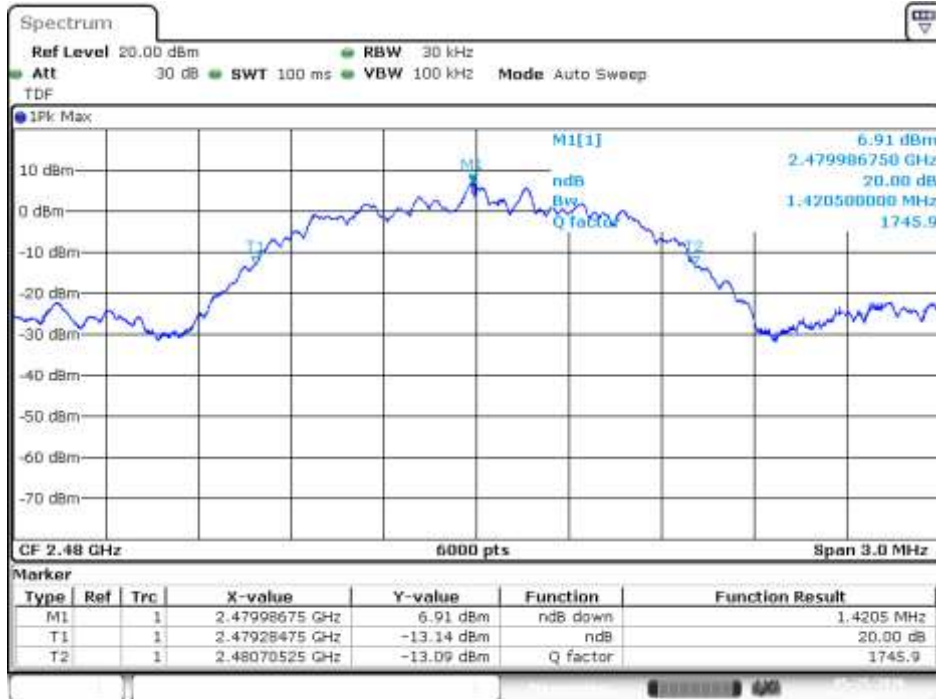
Date: 25 MAY 2016 17:49:16

20dB BW - CH39



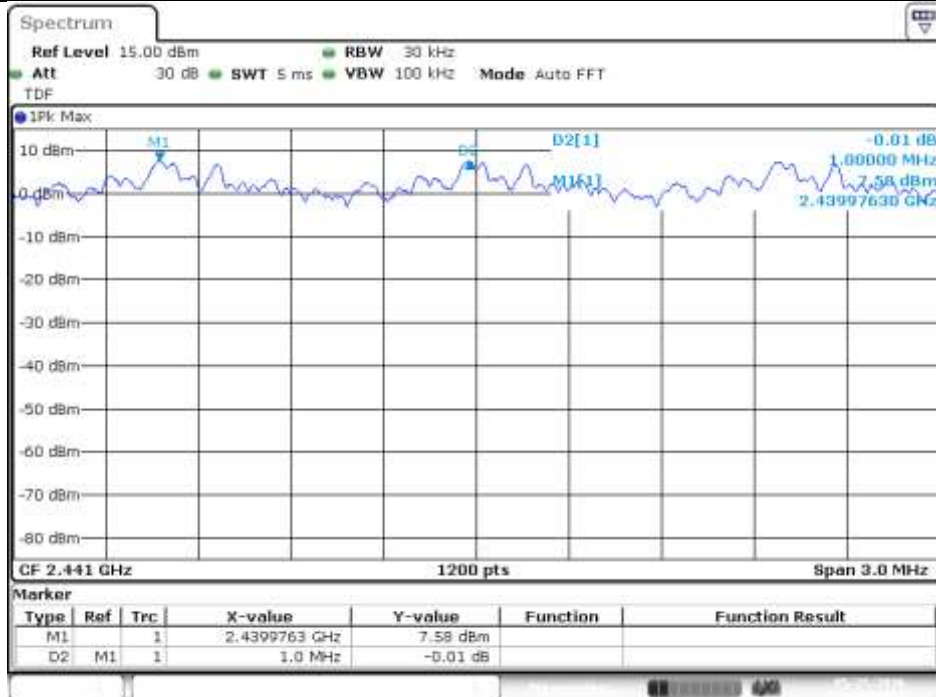
Date: 25 MAY 2016 17:50:12

20dB BW - CH78



Date: 25 MAY 2016 17:51:29

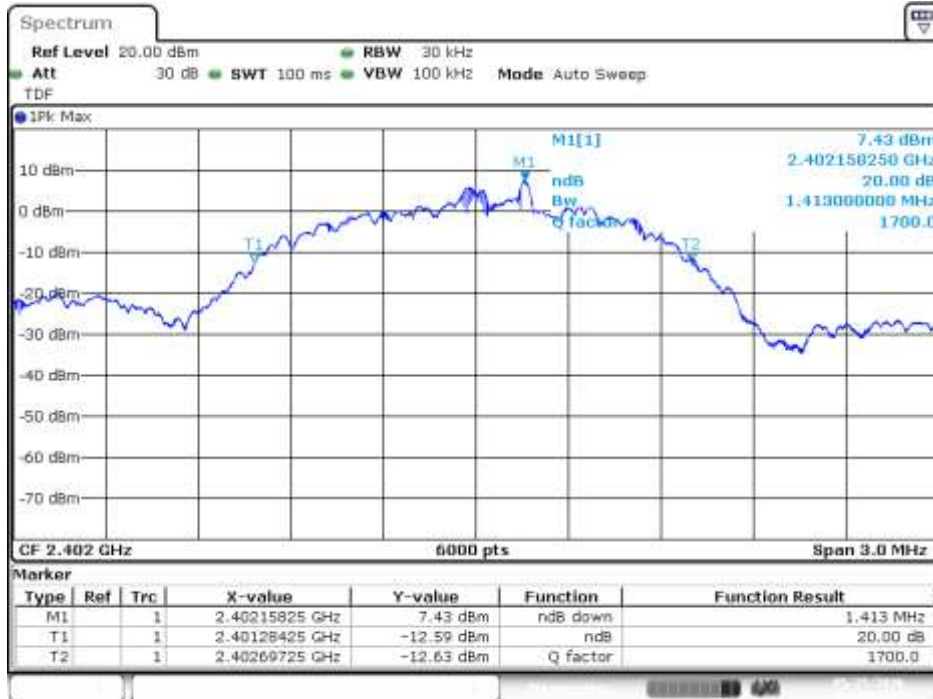
Freq. Separation



Date: 25 MAY 2016 17:41:00

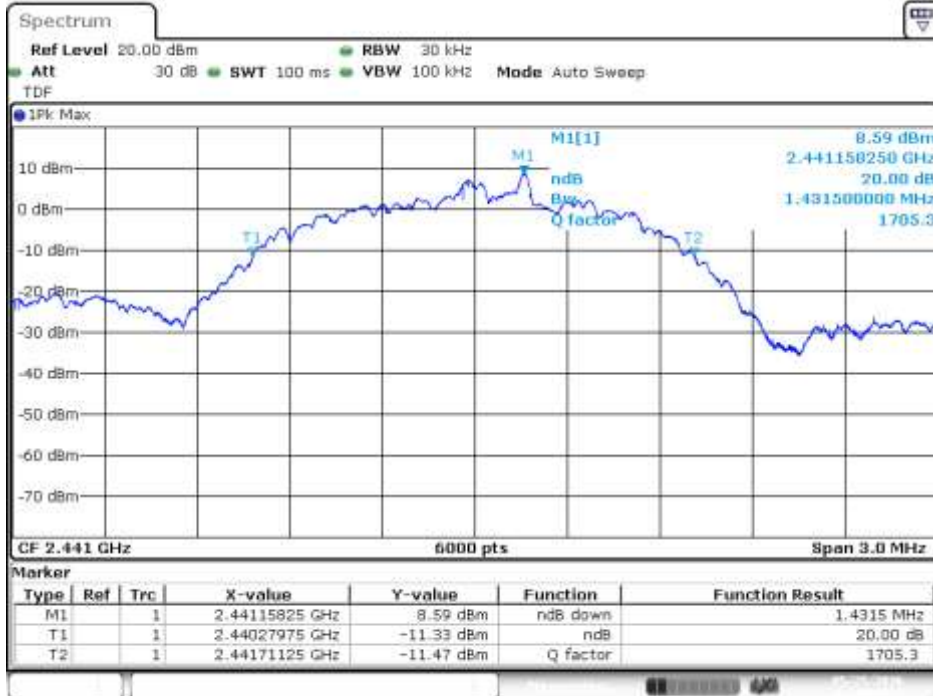
EDR – 8-DPSK

20dB BW - CH0



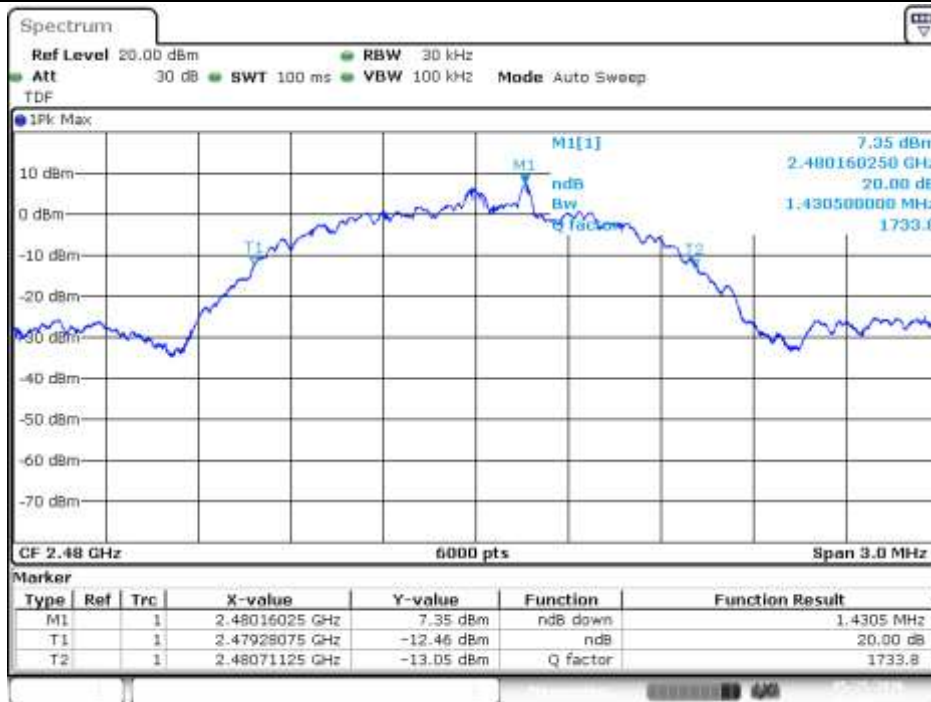
Date: 25 MAY 2016 18:19:02

20dB BW - CH39



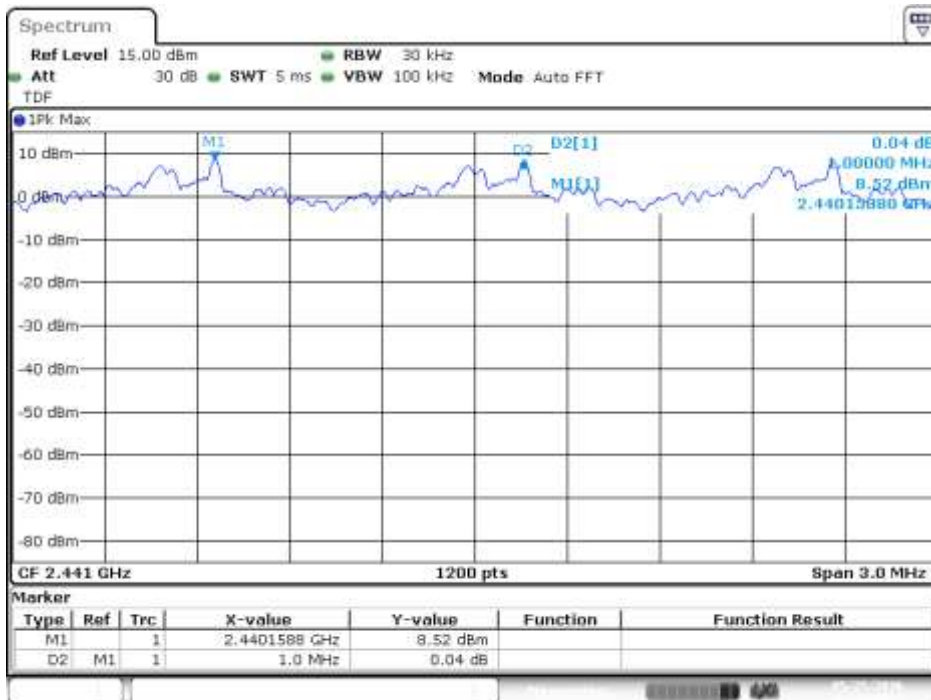
Date: 25 MAY 2016 18:24:08

20dB BW - CH78



Date: 25 MAY 2016 18:24:54

Freq. Separation



Date: 25 MAY 2016 18:10:20

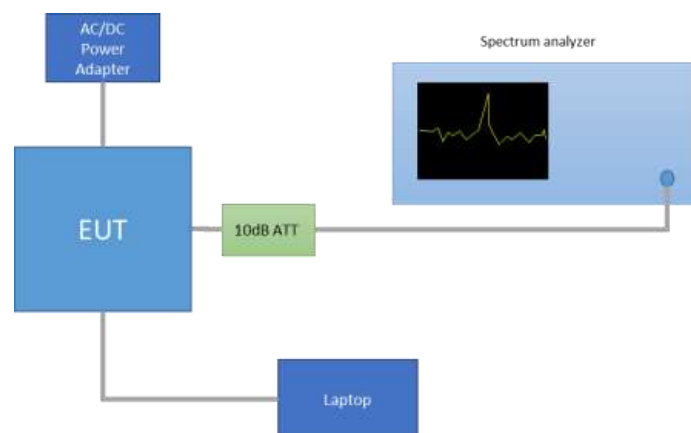
B.2 Number of hopping channels

Test limits:

FCC part	RSS part	Limits
15.247 (a) (1) (iii)	RSS-247 Clause 5.1 (4)	Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

Test procedure:

The setup below was used to measure the number of hopping channels. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



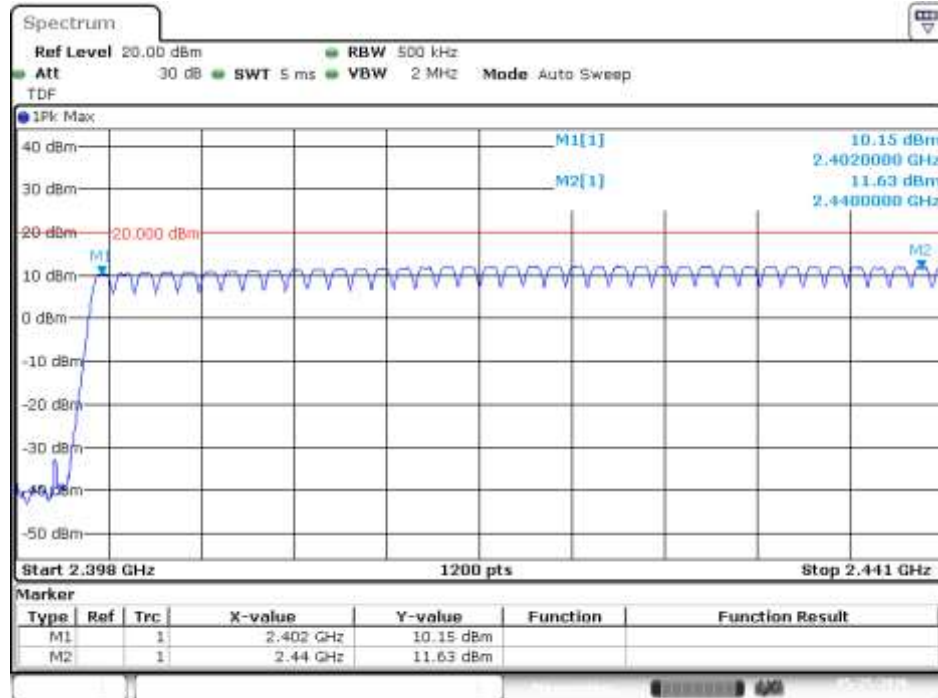
Results tables:

Mode	Number of hopping channels
Basic Rate GFSK	79
EDR $\pi/4$ -DQPSK	79
EDR 8-DPSK	79

Results screenshot:

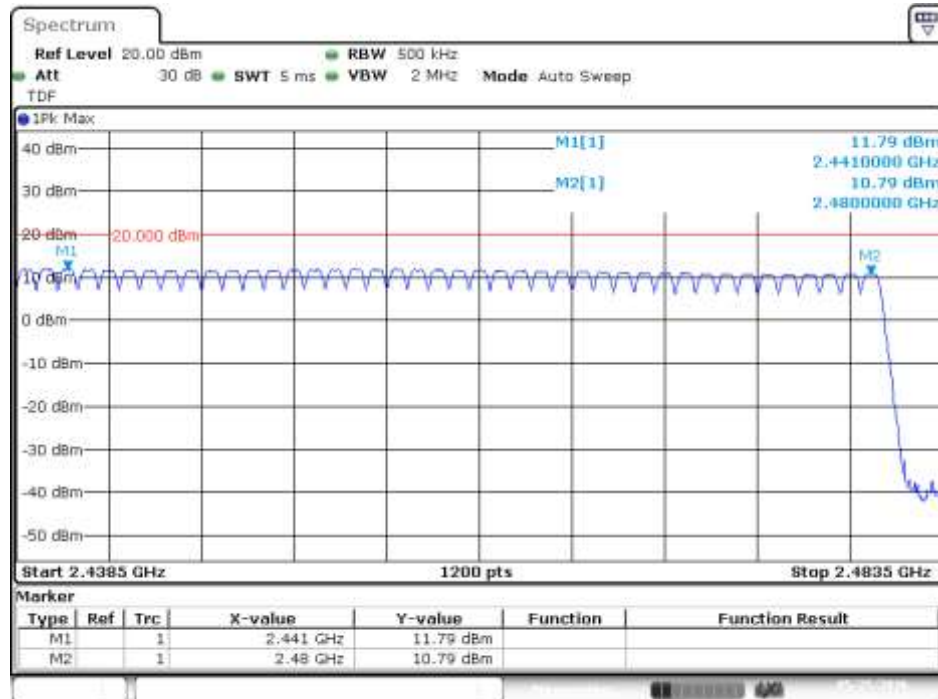
Number of hopping channels

Basic Rate - GFSK



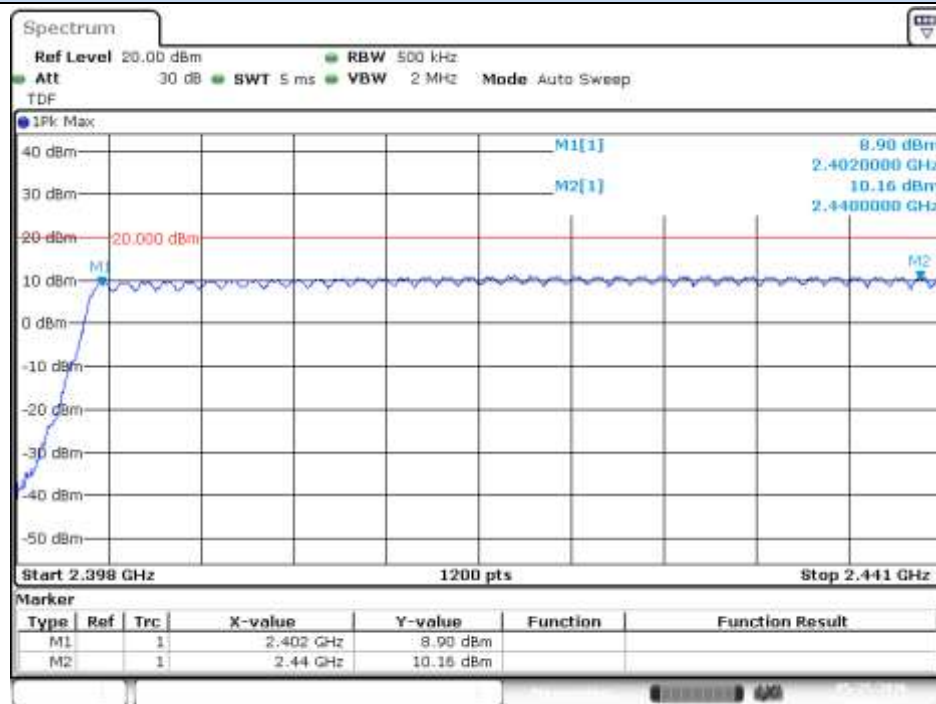
Date: 25 MAY 2016 14:47:15

Basic Rate - GFSK



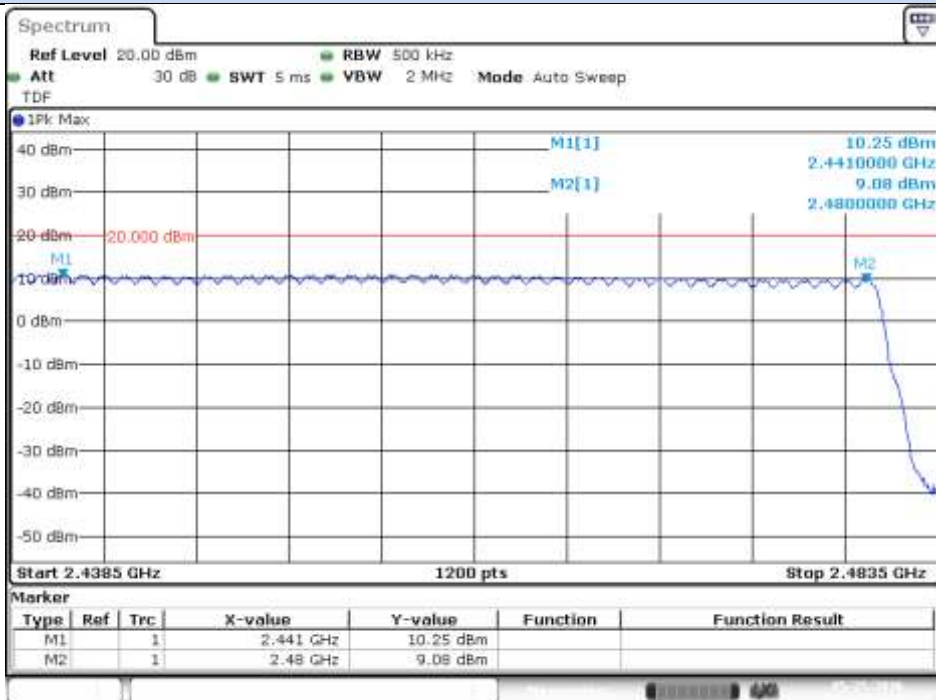
Date: 25 MAY 2016 14:48:33

EDR – $\pi/4$ -DQPSK



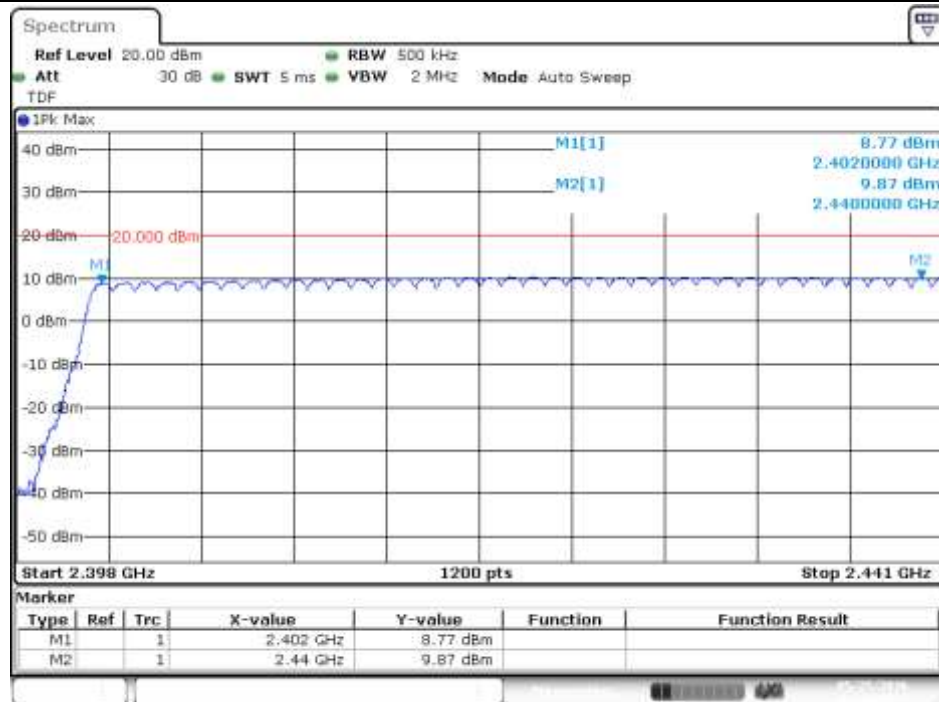
Date: 25 MAY 2016 17:46:31

EDR – $\pi/4$ -DQPSK



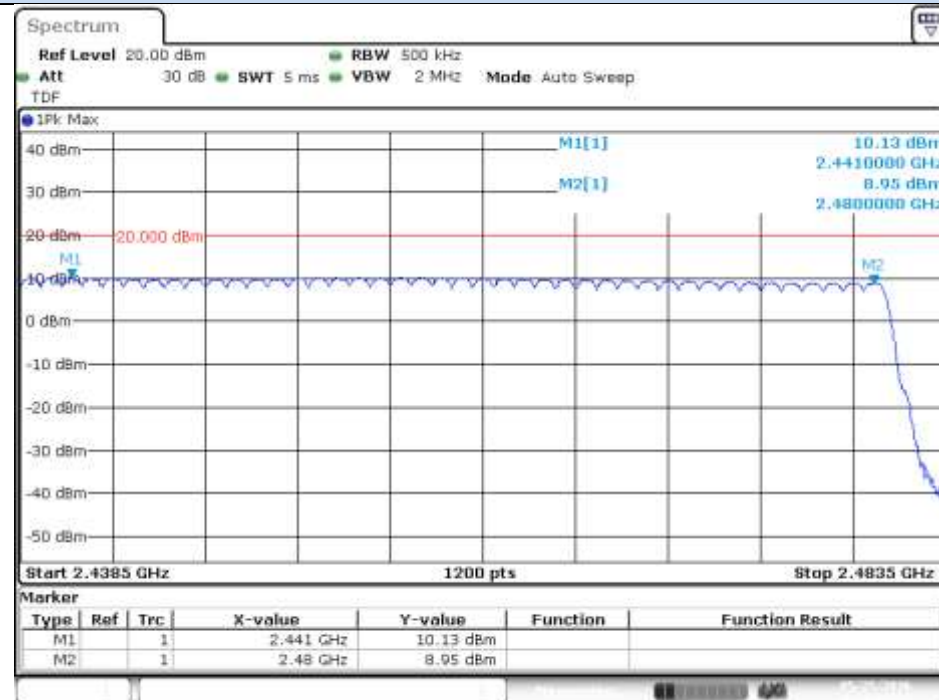
Date: 25 MAY 2016 17:47:12

EDR – 8-DPSK



Date: 25 MAY 2016 18:16:40

EDR – 8-DPSK



Date: 25 MAY 2016 18:16:20

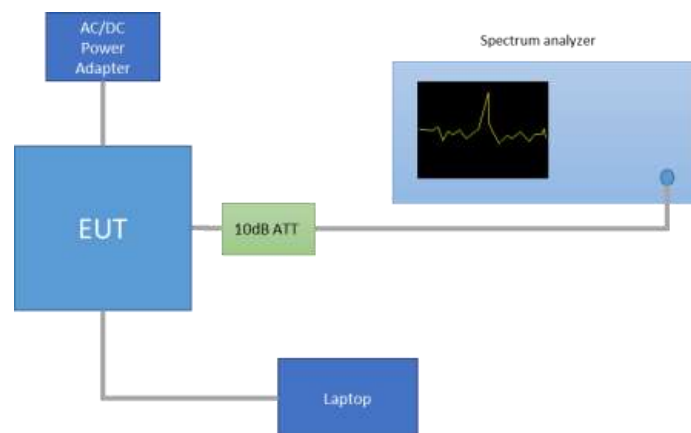
B.3 Time of Occupancy (Dwell Time)

Test limits:

FCC part	RSS part	Limits
15.247 (a) (1) (iii)	RSS-247 Clause 5.1 (4)	The average time of occupancy (Dwell Time) 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.

Test procedure:

The setup below was used to measure the dwell time. The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



In the worst case, the system makes 1600 hops per second with 79 channels, providing a 1 timeslot length of 625μs.

A DH1 packet, with independence of the modulation, needs 1 time slot for transmitting and 1 time slot for receiving. Then, the system makes in the worst case $1600/2 = 800$ hops per second with 79 channels. So each channel appears $800/79 = 10.13$ times per second and, for a period of $0.4 \times 79 = 31.6$ seconds, each channel appears $10.13 \times 31.6 = 320.11$ times.

A DH3 packet, with independence of the modulation, needs 3 time slots for transmitting and 1 time slot for receiving. Then, the system makes in the worst case $1600/4 = 400$ hops per second with 79 channels. So each channel appears $400/79 = 5.1$ times per second and, for a period of $0.4 \times 79 = 31.6$ seconds, each channel appears $5.1 \times 31.6 = 161.16$ times.

A DH5 packet, with independence of the modulation, needs 5 time slots for transmitting and 1 time slot for receiving. Then, the system makes in the worst case $1600/6 = 266.67$ hops per second with 79 channels. So each channel appears $266.67/79 = 3.37$ times per second and, for a period of $0.4 \times 79 = 31.6$ seconds, each channel appears $3.37 \times 31.6 = 106.49$ times.

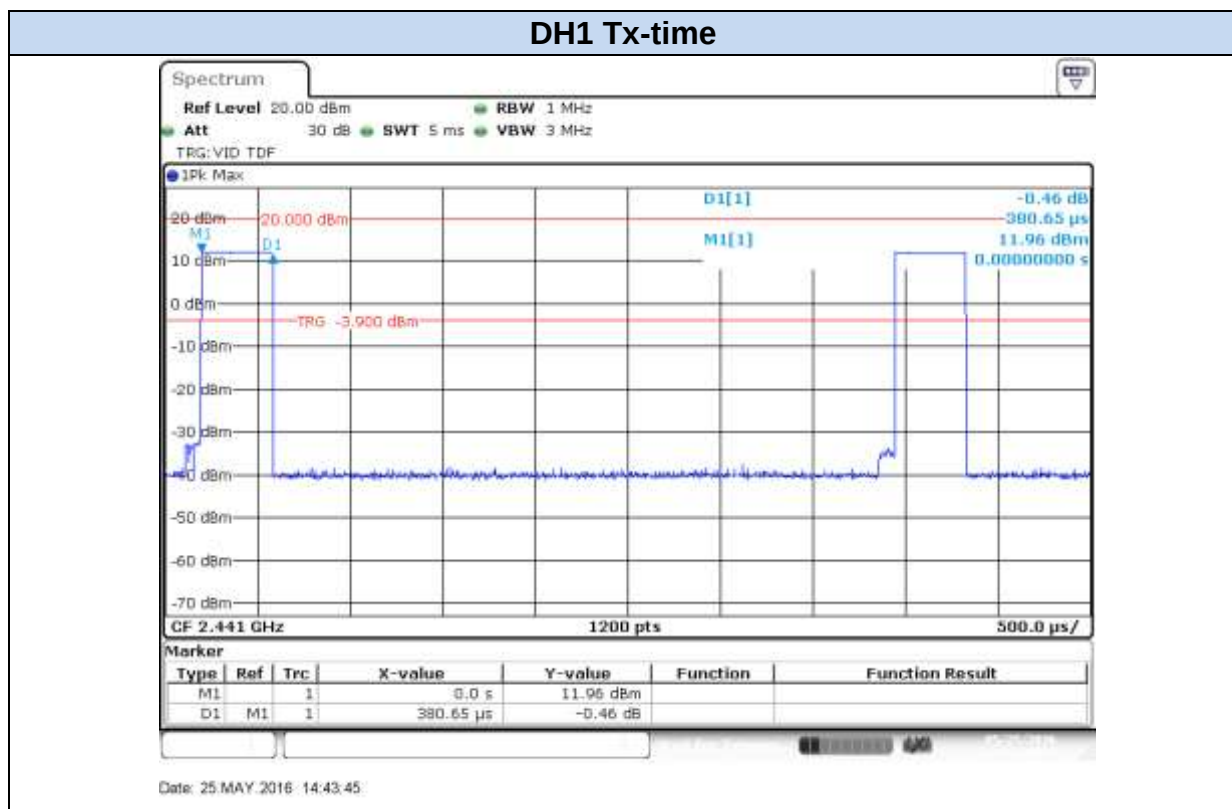
Thus, the total time of occupancy is obtained by multiplying the calculated maximum number of appearances per packet type and the measured Tx-time, as shown in the results screenshots.

Results tables:

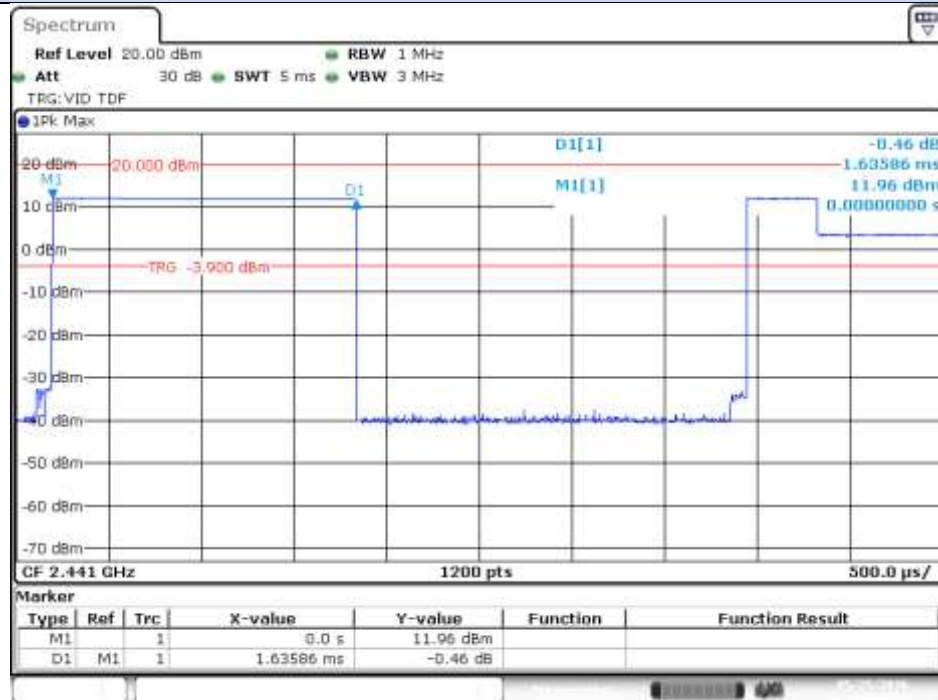
Mode	Packet Type	Times of appearance	Tx-time [ms]	Dwell Time [ms]
Basic Rate GFSK	DH1	320.11	0.381	121.96
	DH3	161.16	1.636	263.66
	DH5	106.49	2.883	307.01
EDR $\pi/4$ -DQPSK	2-DH1	320.11	0.388	124.25
	2-DH3	161.16	1.639	264.17
	2-DH5	106.49	2.886	307.34
EDR 8-DPSK	3-DH1	320.11	0.388	124.25
	3-DH3	161.16	1.639	264.17
	3-DH5	106.49	2.886	307.34

Results Screenshot:

BDR – GFSK

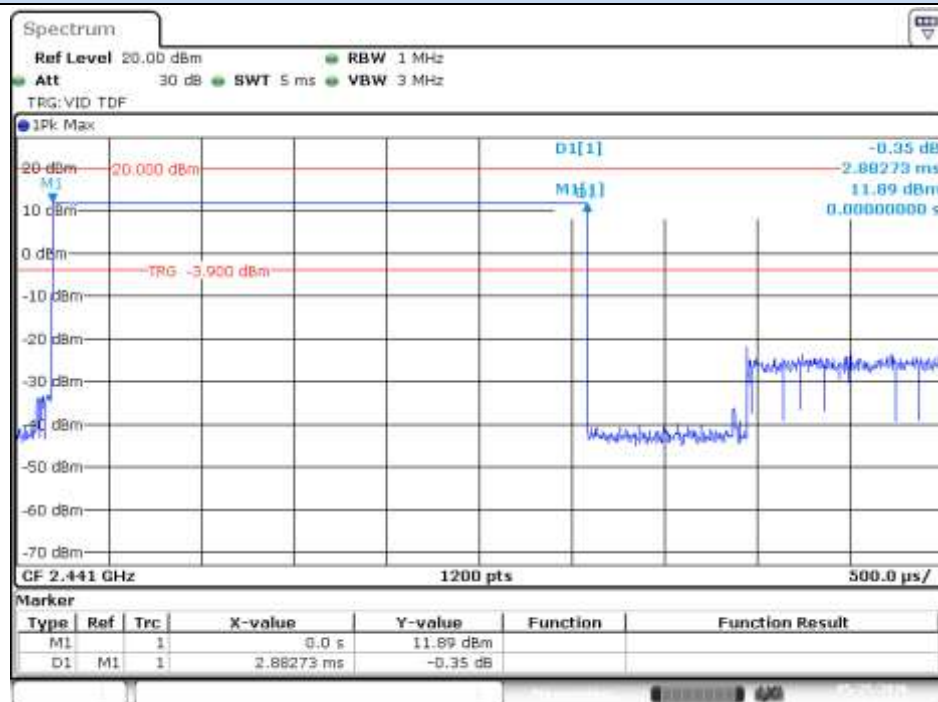


DH3 Tx-time



Date: 25 MAY 2016 14:44:47

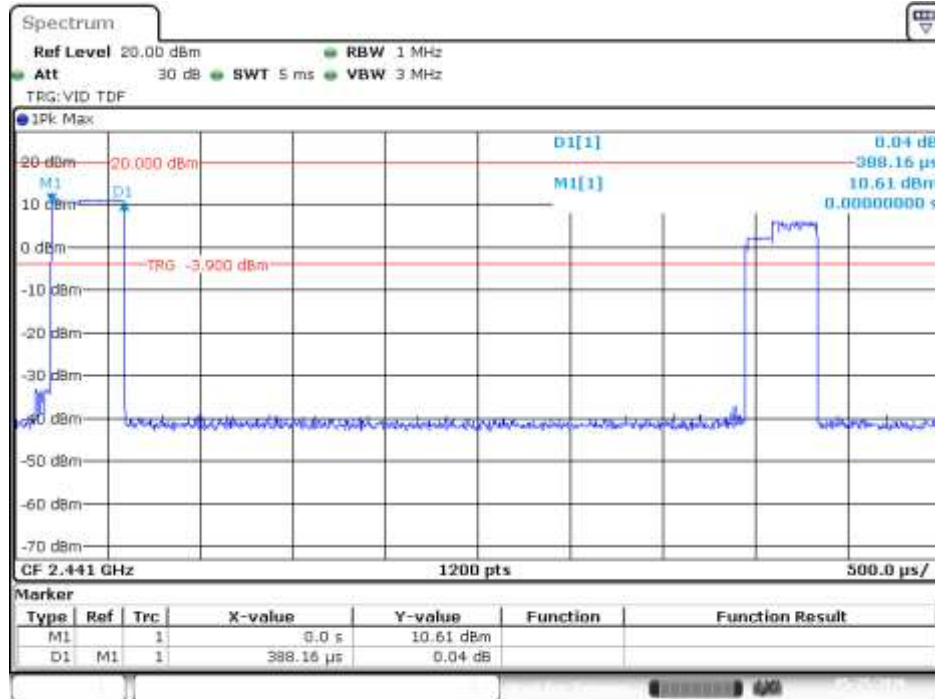
DH5 Tx-time



Date: 25 MAY 2016 14:46:16

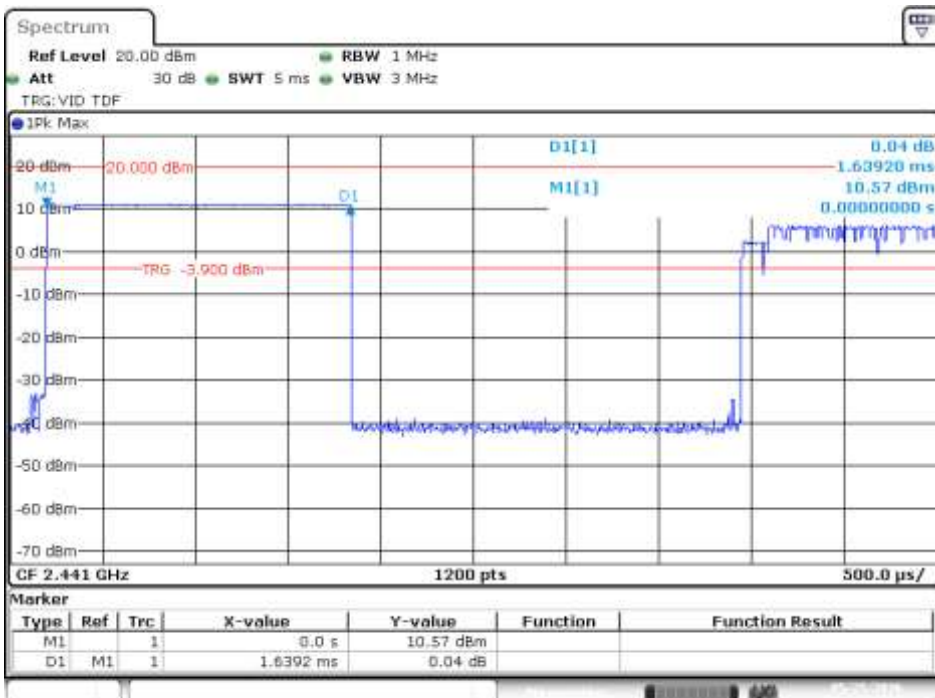
EDR – $\pi/4$ -DQPSK

2-DH1 Tx-time

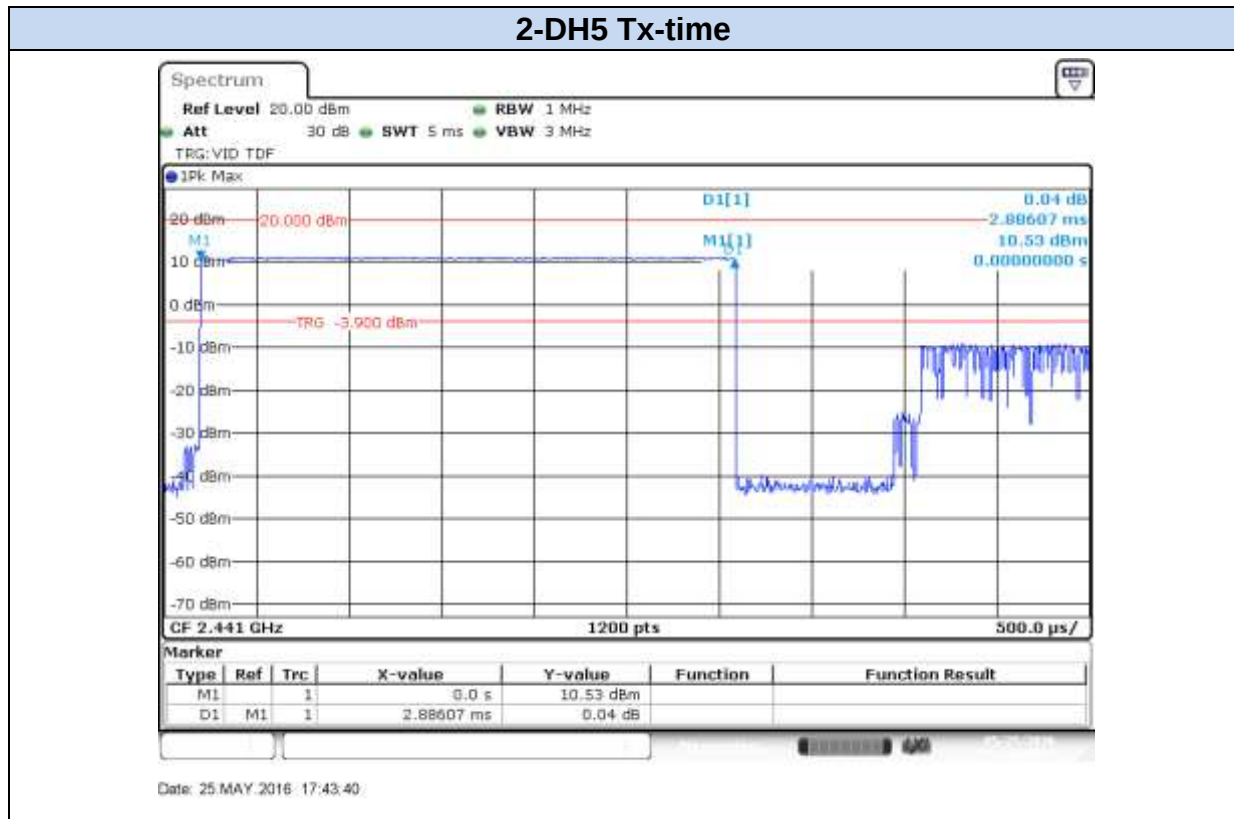


Date: 25 MAY 2016 17:45:21

2-DH3 Tx-time

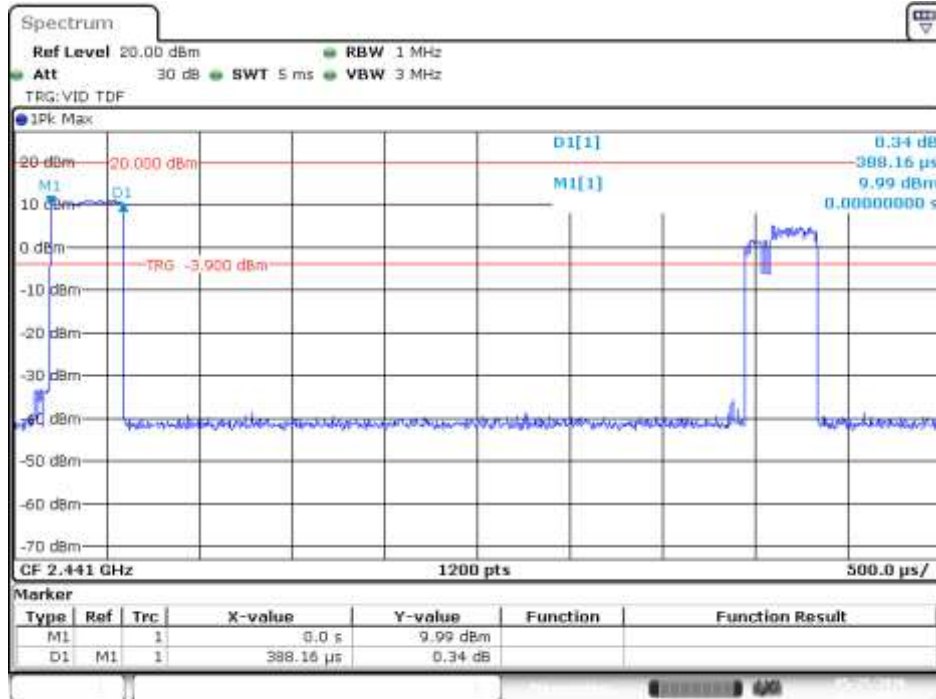


Date: 25 MAY 2016 17:44:47



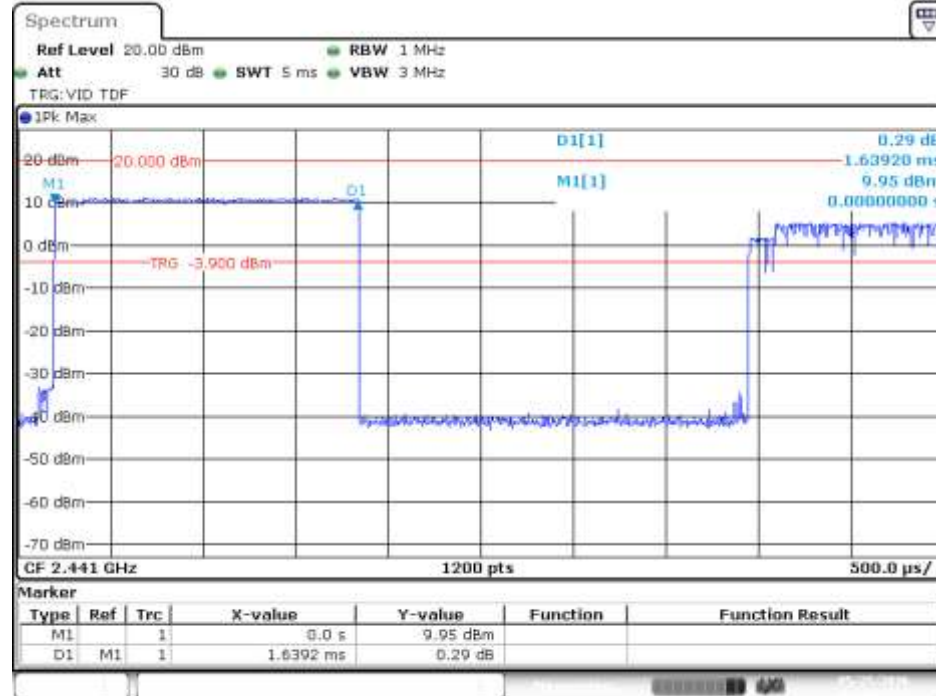
EDR – 8-DPSK

3-DH1 Tx-time

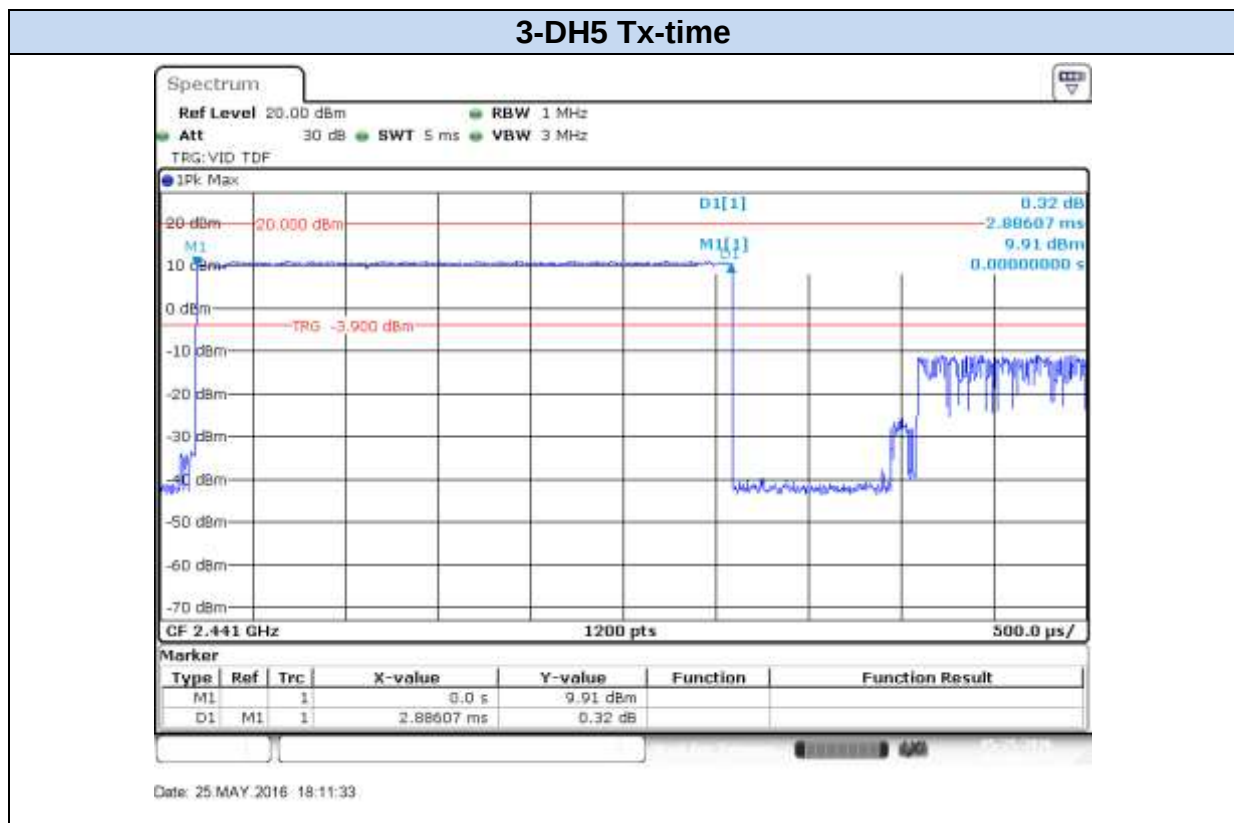


Date: 25 MAY 2016 18:12:40

3-DH3 Tx-time



Date: 25 MAY 2016 18:12:03



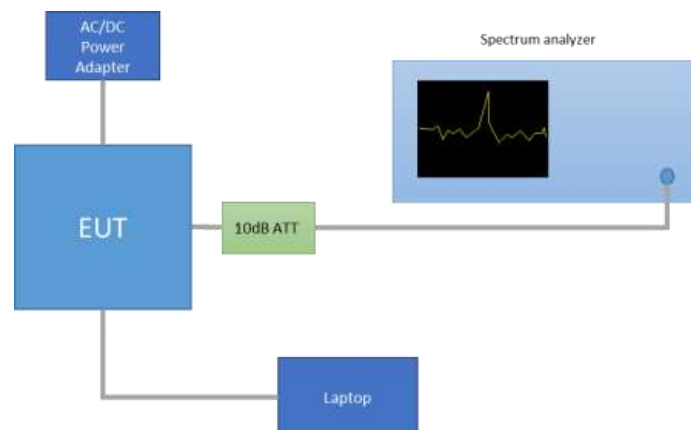
B.4 Maximum Peak Output Power and antenna gain

Test limits:

FCC part	RSS part	Limits
15.247 (b) (1)	RSS-247 Clause 5.4 (2)	(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (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. (...) (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.

Test procedure:

The setup below was used to measure the maximum peak output power. The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



The declared maximum antenna gain is 3.24 dBi.

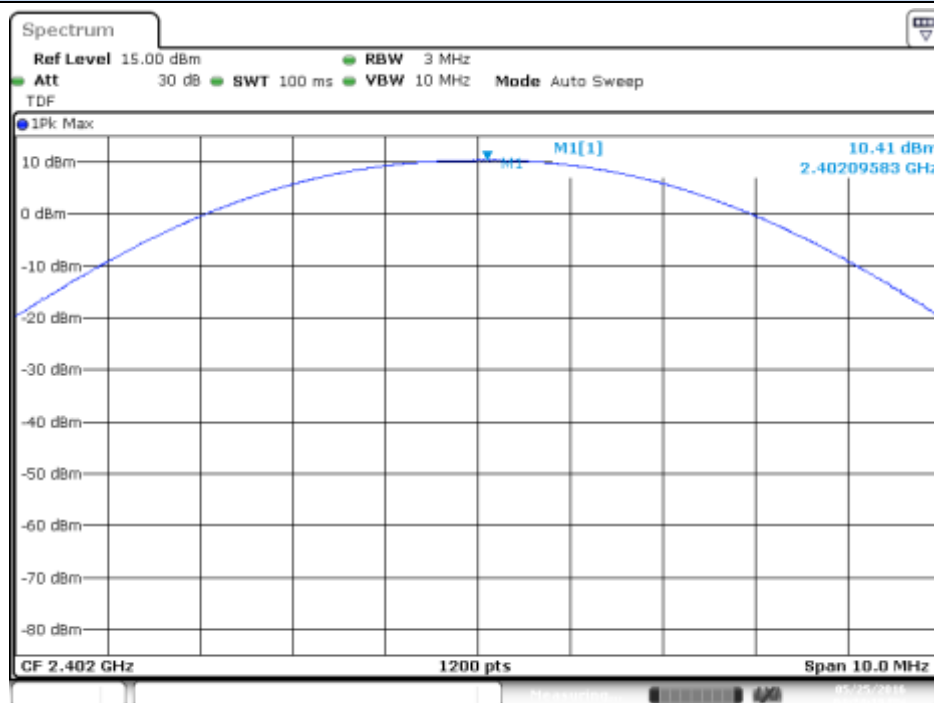
Results tables:

Mode	Channel Number	Frequency [MHz]	Peak Power [dBm]	Peak Power [mW]	Peak Power EIRP [dBm]	Peak Power EIRP [mW]
Basic Rate GFSK	0	2402	10.41	10.99	13.65	23.17
	39	2441	11.87	15.38	15.11	32.43
	78	2480	10.89	12.27	14.13	25.88
EDR $\pi/4$ -DQPSK	0	2402	10.21	10.50	13.45	22.13
	39	2441	11.62	14.52	14.86	30.62
	78	2480	10.61	11.51	13.85	24.27
EDR 8-DPSK	0	2402	9.95	9.89	13.19	20.84
	39	2441	11.34	13.61	14.58	28.71
	78	2480	10.29	10.69	13.53	22.54

Results Screenshot:

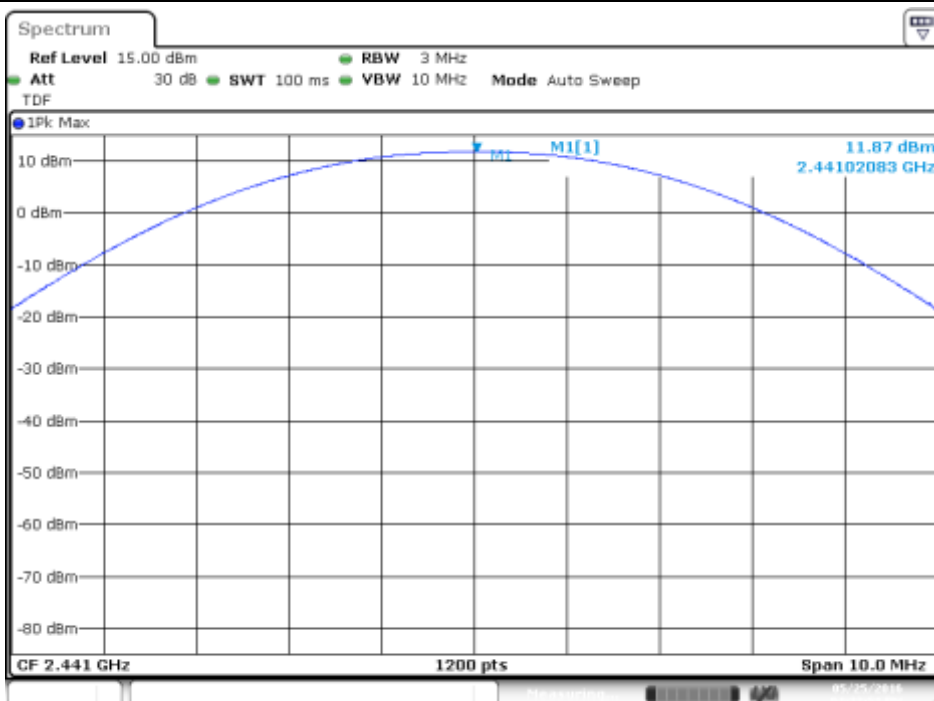
Basic Rate - GFSK

Peak Power - CH0

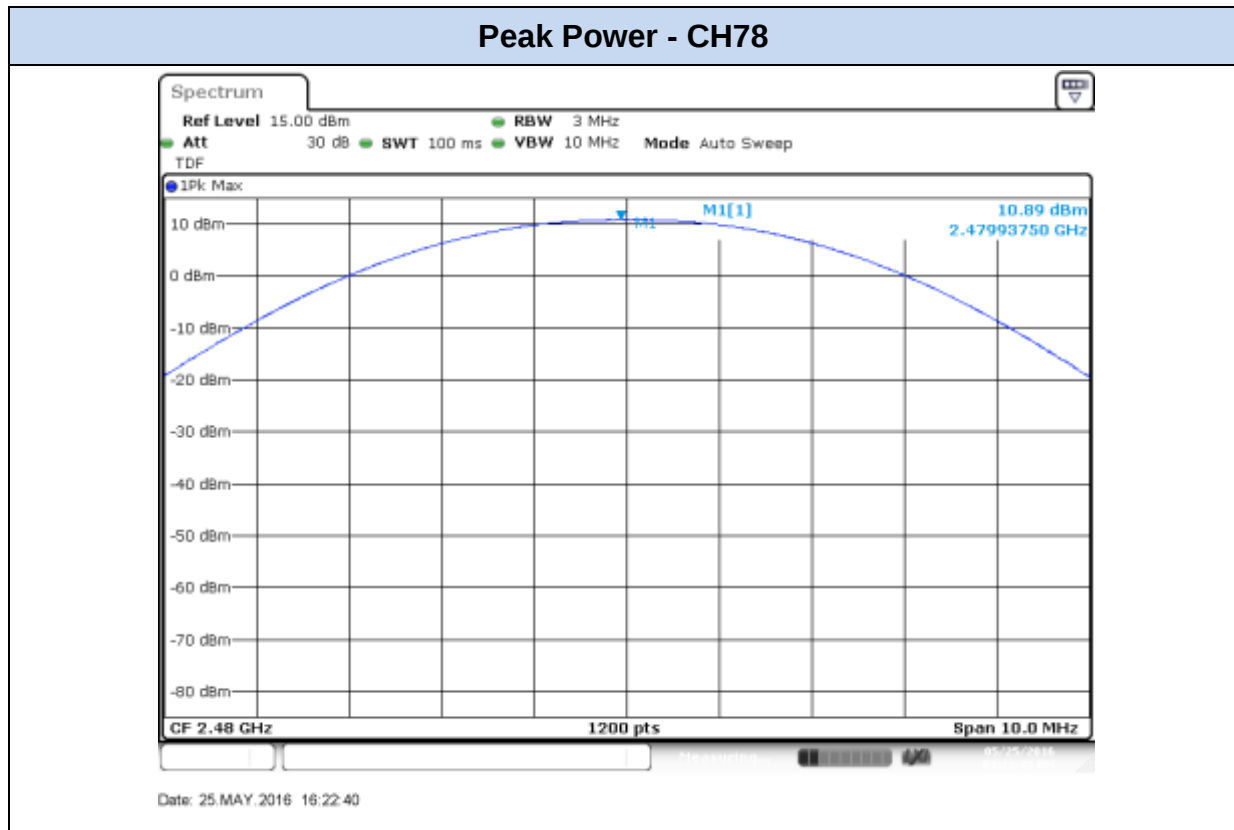


Date: 25.MAY.2016 16:24:18

Peak Power - CH39

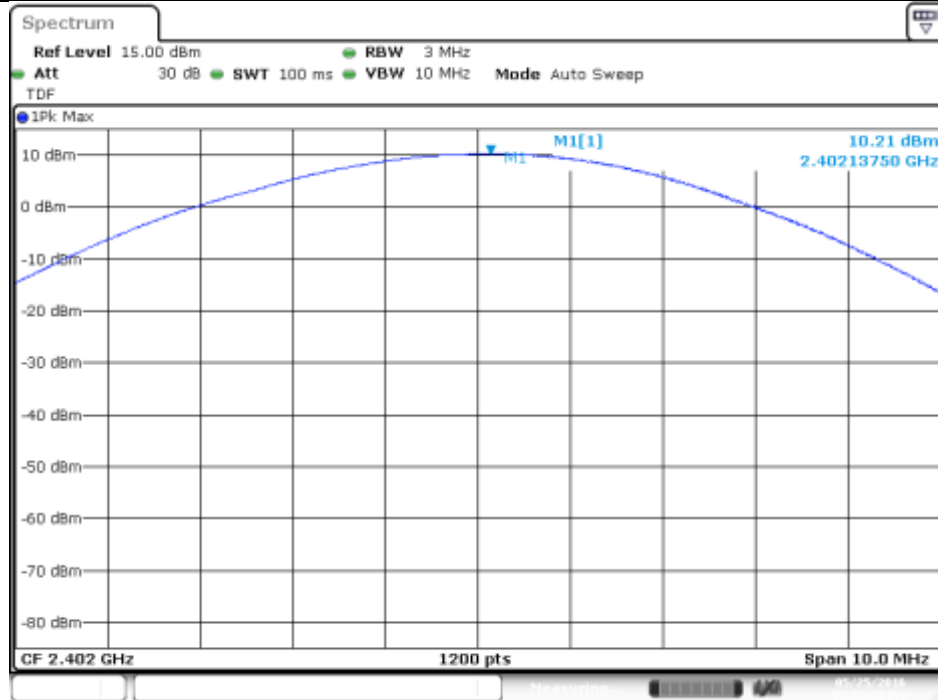


Date: 25.MAY.2016 16:23:51



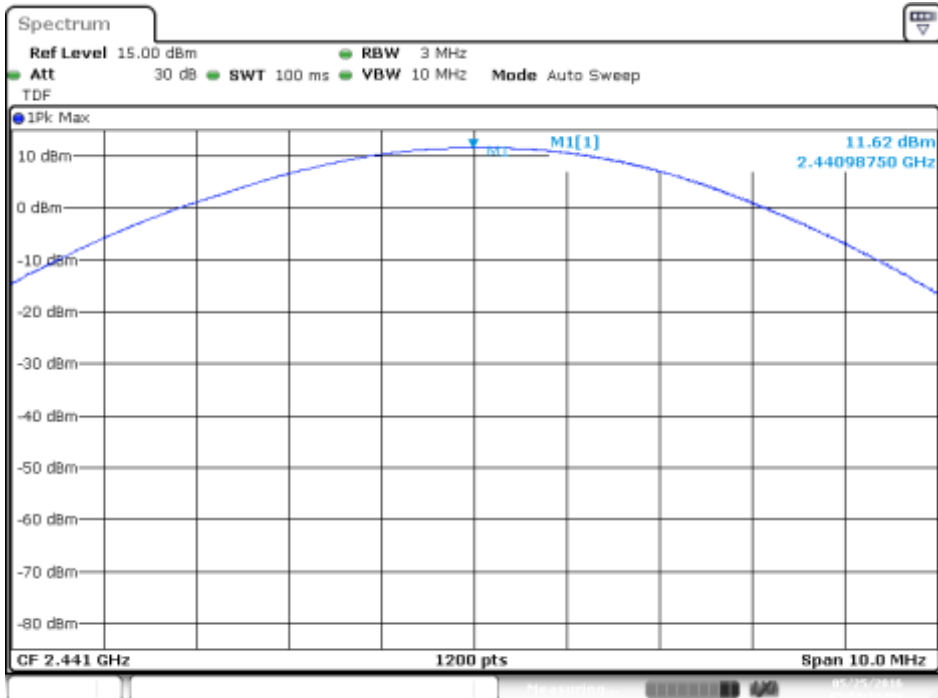
EDR – $\pi/4$ -DQPSK

Peak Power - CH0

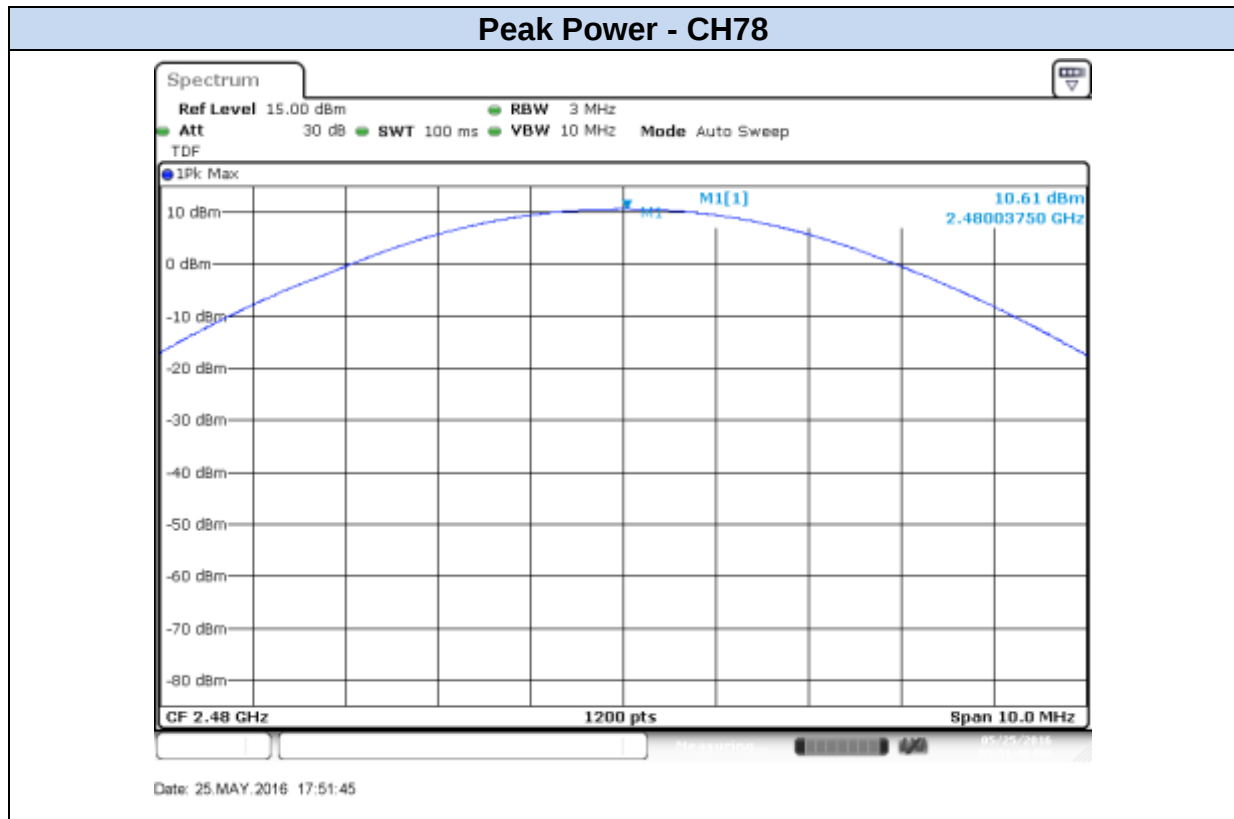


Date: 25.MAY.2016 17:52:33

Peak Power - CH39

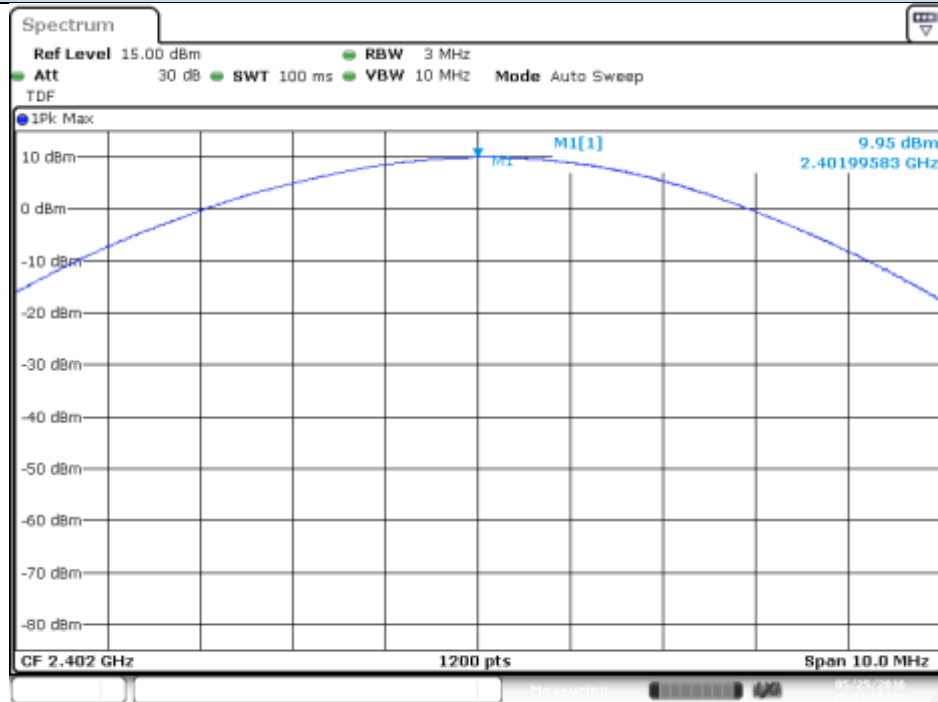


Date: 25.MAY.2016 17:52:14

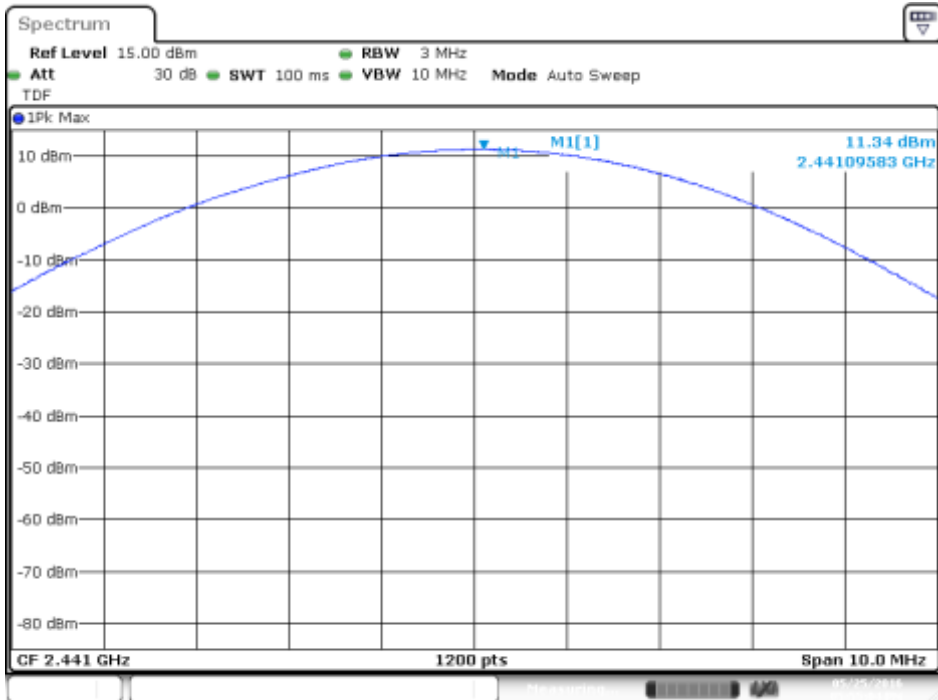


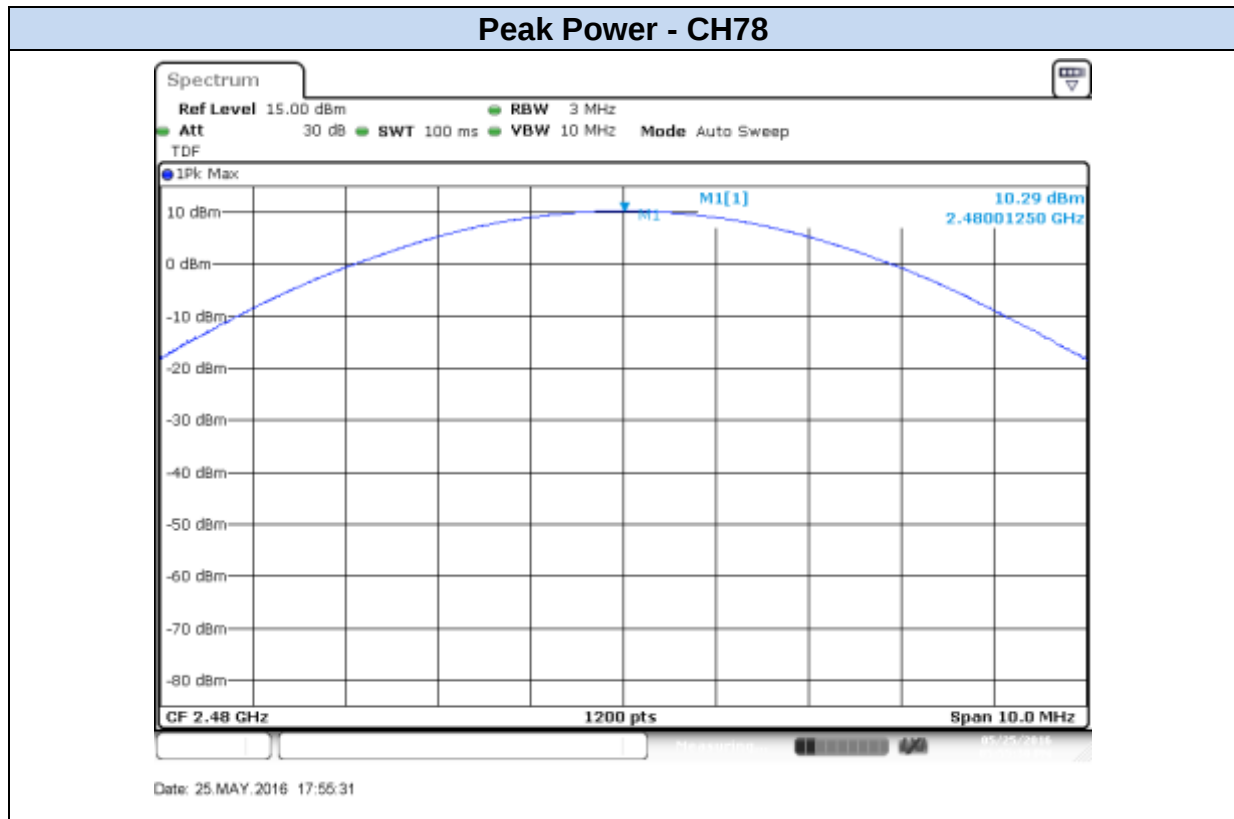
EDR – 8-DPSK

Peak Power - CH0



Peak Power - CH39





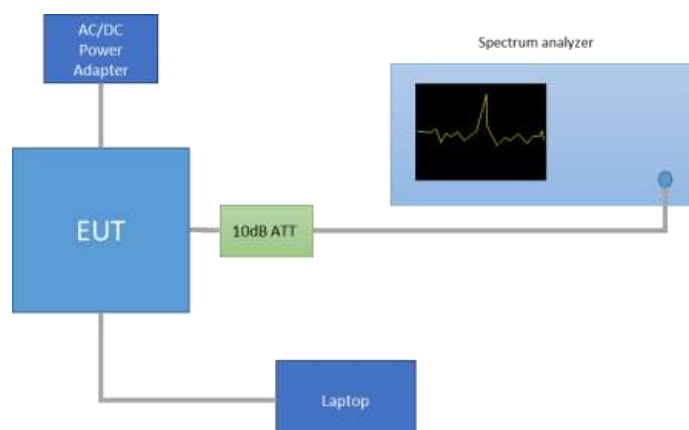
B.5 Out-of-band emissions (conducted)

Test limits:

FCC part	RSS part	Limits																																
15.247 (d)	RSS-247 Clause 5.5	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.																																
15.209	RSS-247 Clause 6.2.2 (2)	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): <table><tr><th>Freq Range (MHz)</th><th>Field Strength (μV/m)</th><th>Field Strength (dBμV/m)</th><th>Meas. Distance (m)</th></tr><tr><td>0.009-0.490</td><td>2400/f(kHz)</td><td>-</td><td>300</td></tr><tr><td>0.490-1.705</td><td>24000/f(kHz)</td><td>-</td><td>300</td></tr><tr><td>1.705-30.0</td><td>30</td><td>-</td><td>30</td></tr><tr><td>30-88</td><td>100</td><td>40</td><td>3</td></tr><tr><td>88-216</td><td>150</td><td>43.5</td><td>3</td></tr><tr><td>216-960</td><td>200</td><td>46</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>54</td><td>3</td></tr></table> The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.	Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Meas. Distance (m)	0.009-0.490	2400/f(kHz)	-	300	0.490-1.705	24000/f(kHz)	-	300	1.705-30.0	30	-	30	30-88	100	40	3	88-216	150	43.5	3	216-960	200	46	3	Above 960	500	54	3
Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Meas. Distance (m)																															
0.009-0.490	2400/f(kHz)	-	300																															
0.490-1.705	24000/f(kHz)	-	300																															
1.705-30.0	30	-	30																															
30-88	100	40	3																															
88-216	150	43.5	3																															
216-960	200	46	3																															
Above 960	500	54	3																															

Test procedure:

The setup below was used to measure the out-of-band emissions (conducted). The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



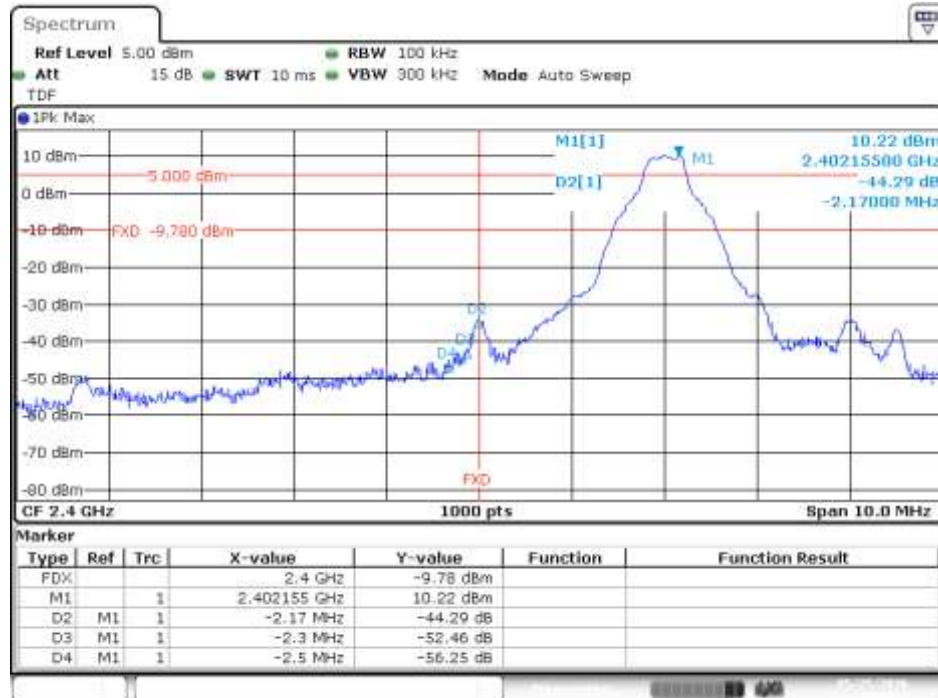
Note: these PSD_{Peak} values are shown just as a reference for the compliance of the Out-of-band Measurements. Thus the RBW used for these measurements was 100kHz.

Mode	CH	Frequency [MHz]	PSD Peak [dBm]
Basic Rate - GFSK	0	2402	10.22
	39	2441	11.70
	78	2480	10.79
EDR – $\pi/4$ -DQPSK	0	2402	8.95
	39	2441	10.17
	79	2480	9.20
EDR – 8-DPSK	0	2402	8.59
	39	2441	9.70
	78	2480	8.62

Band Edge results Screenshot:

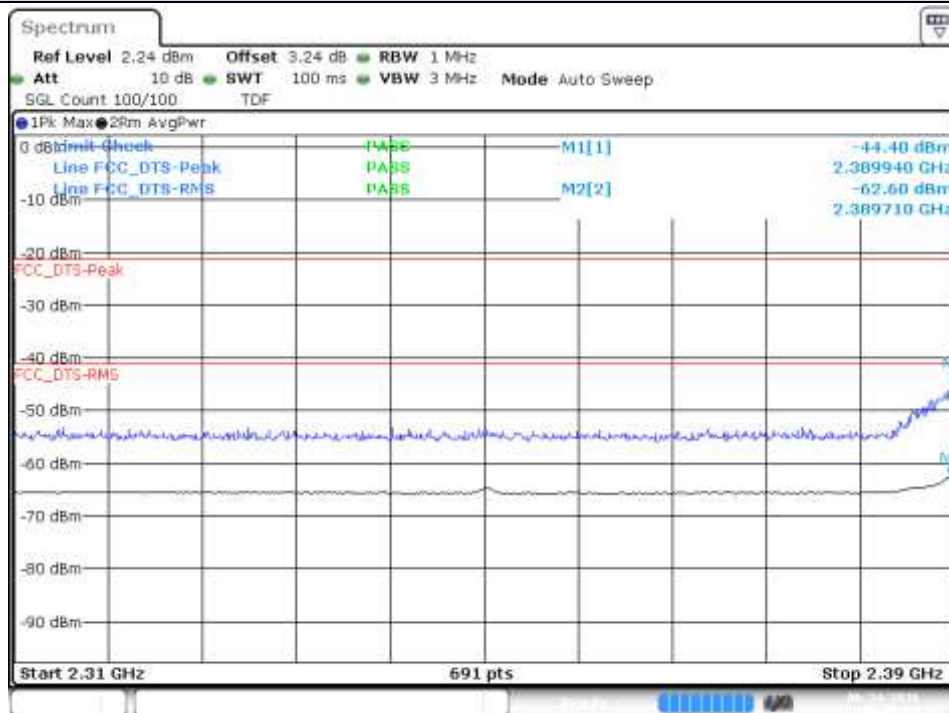
Basic Rate - GFSK

BE Low Freq Section - CH0



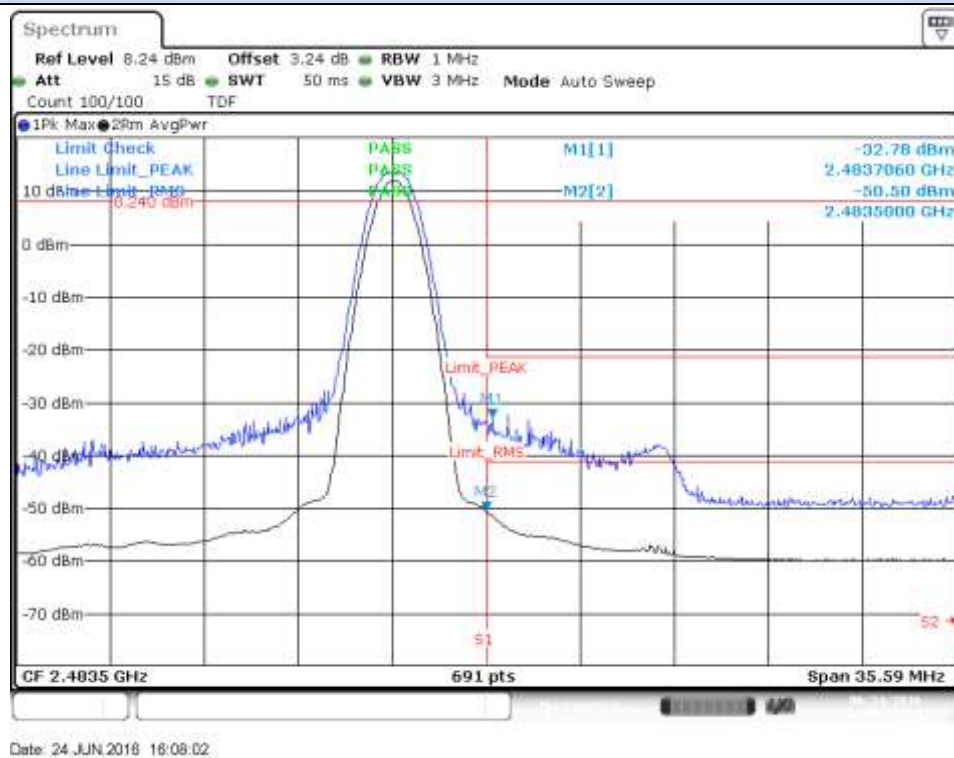
Date: 25 MAY 2016 14:29:40

BE extended Low Freq Section - CH0

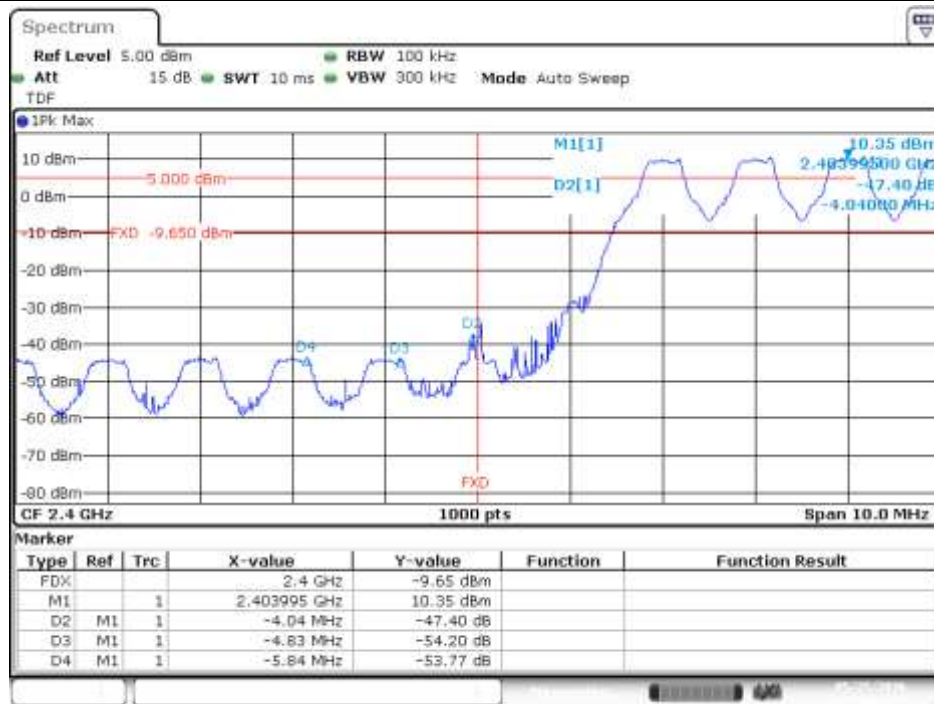


Date: 24 JUN 2016 16:08:49

BE High Freq Section - CH78

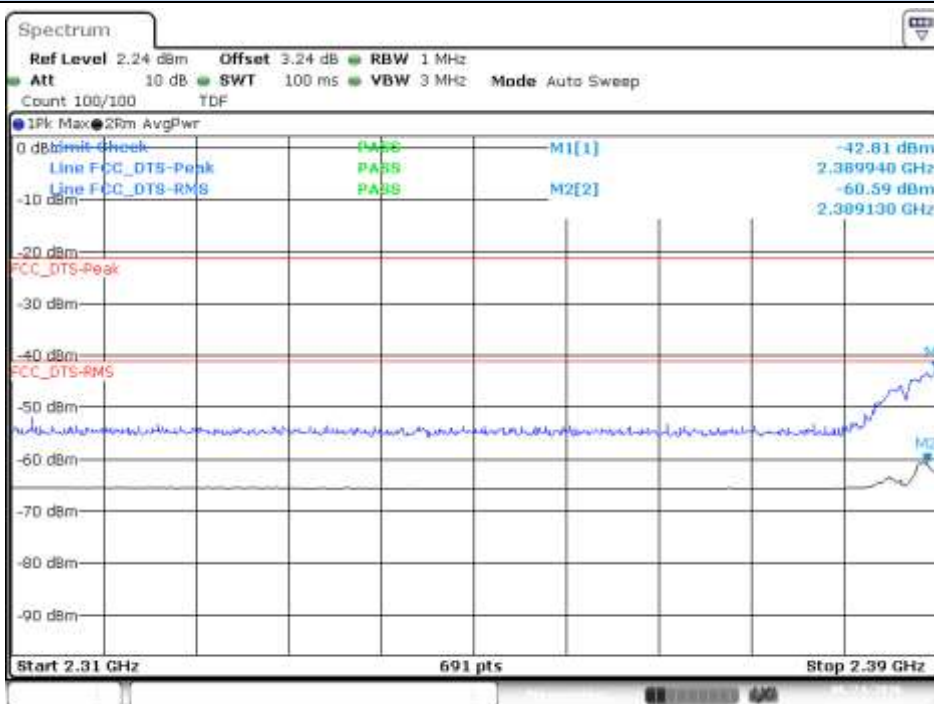


BE Low Freq Section - Hopping



Date: 25 MAY 2016 14:32:32

BE extended Low Freq Section - Hopping



Date: 24 JUN 2016 12:57:11

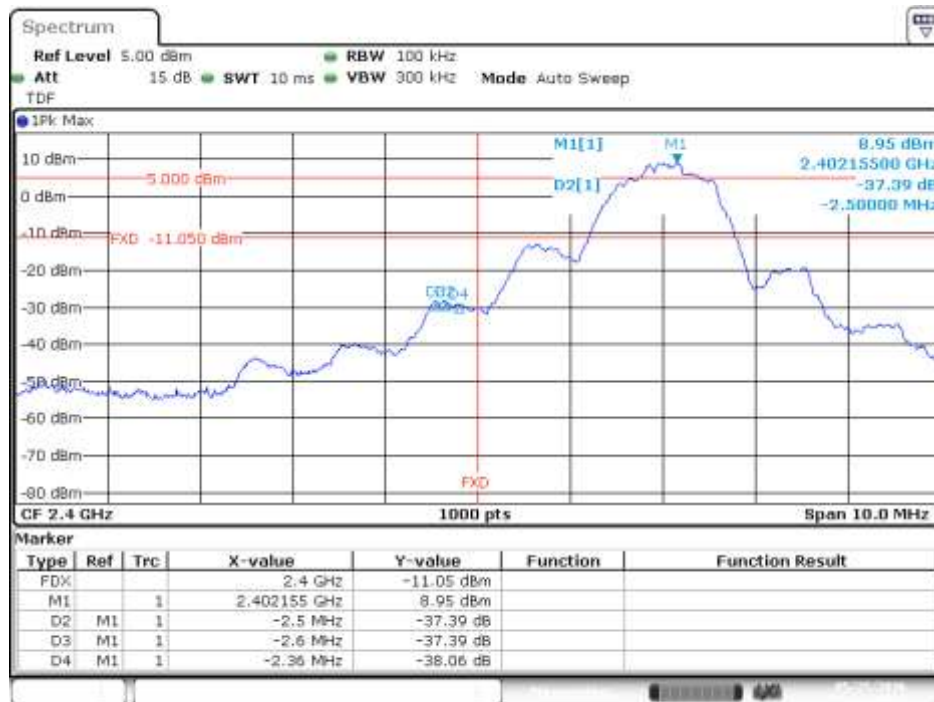
BE High Freq Section - Hopping



Date: 24 JUN 2016 16:09:57

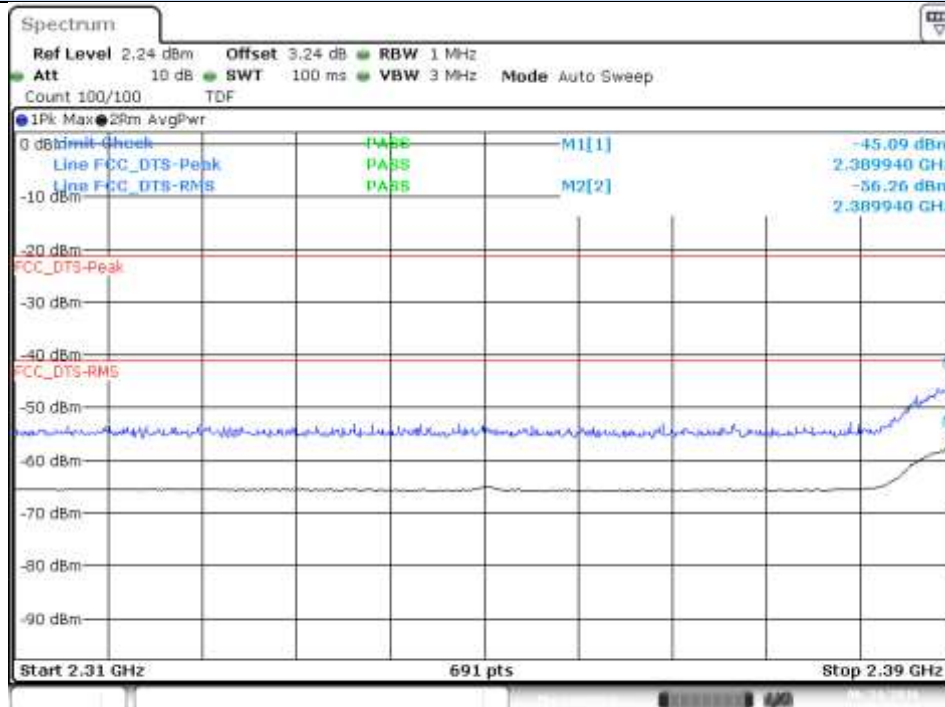
EDR – $\pi/4$ -DQPSK

BE Low Freq Section - CH0



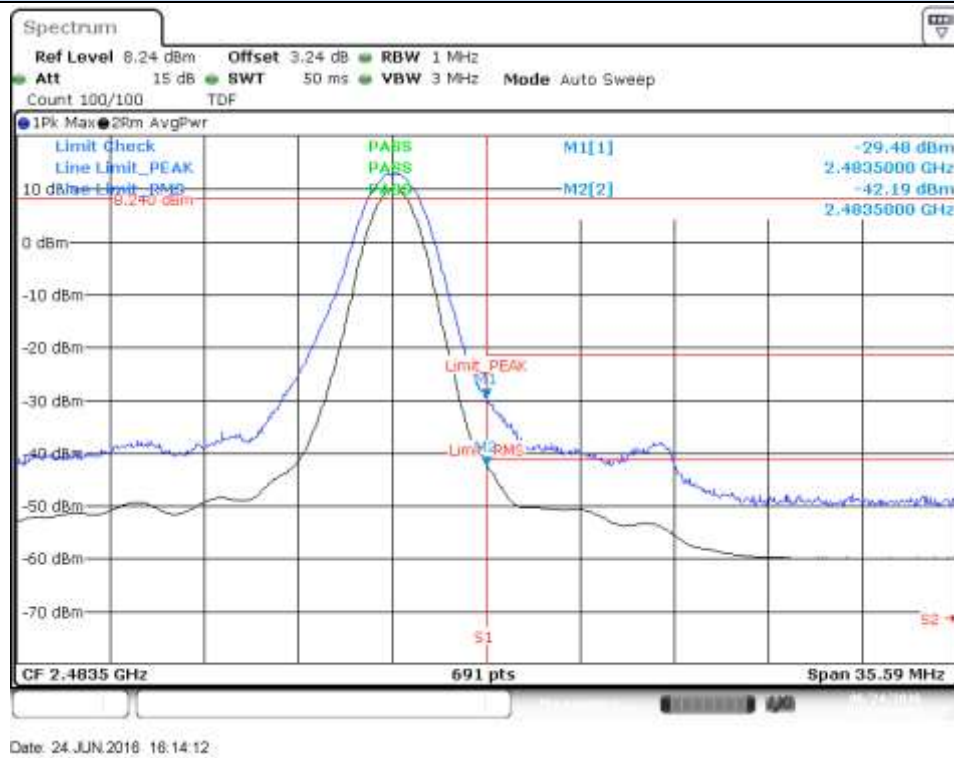
Date: 25 MAY 2016 17:33:44

BE extended Low Freq Section - CH0

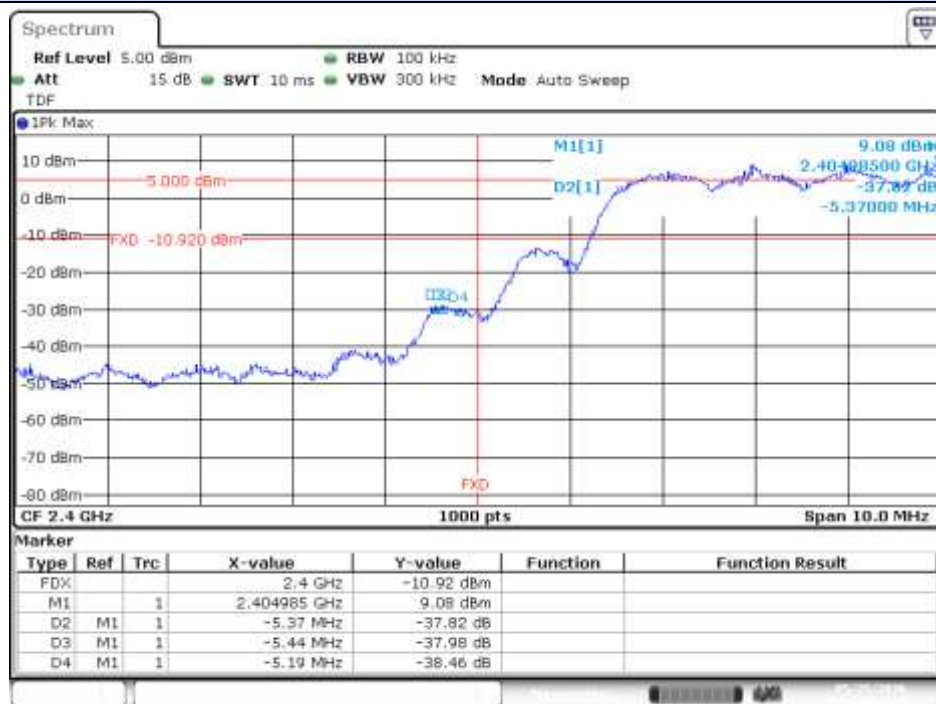


Date: 24 JUN 2016 16:09:26

BE High Freq Section - CH78

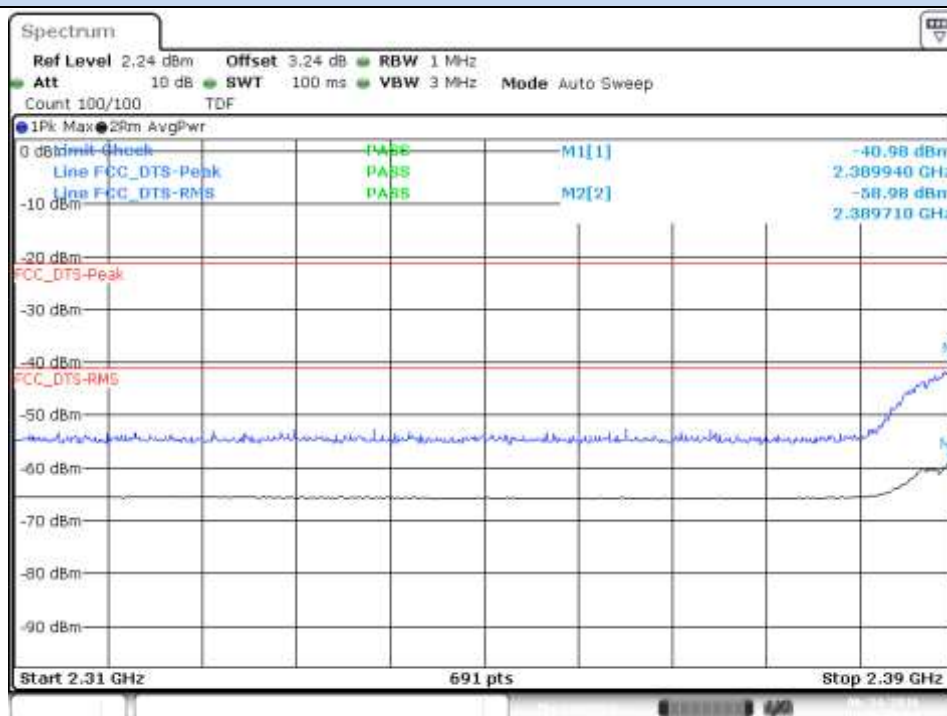


BE Low Freq Section - Hopping



Date: 25 MAY 2016 17:35:21

BE extended Low Freq Section - Hopping



Date: 24 JUN 2016 16:10:30

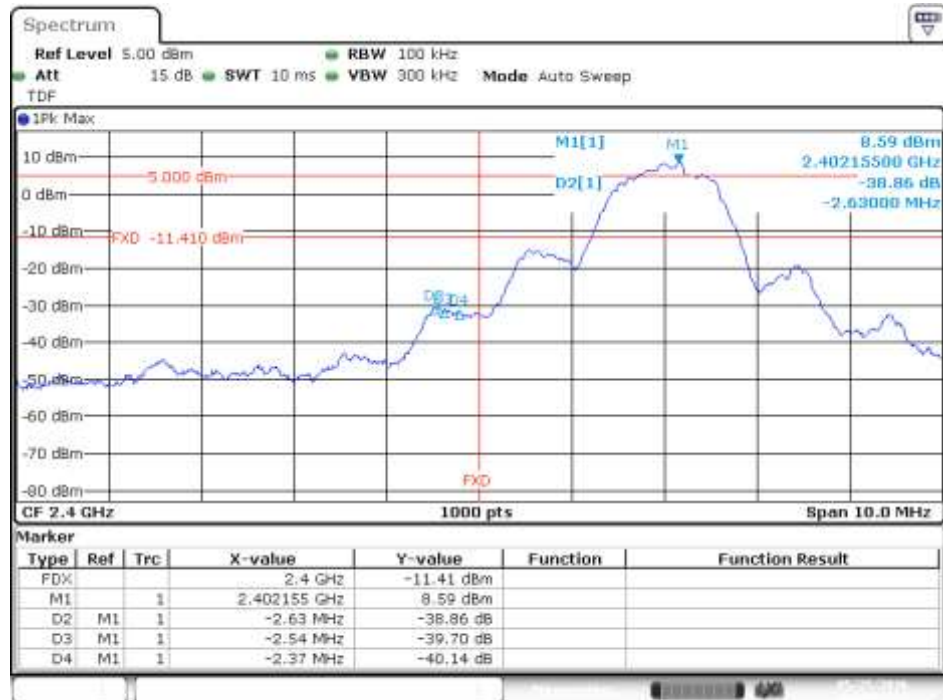
BE High Freq Section - Hopping



Date: 24 JUN 2016 16:13:47

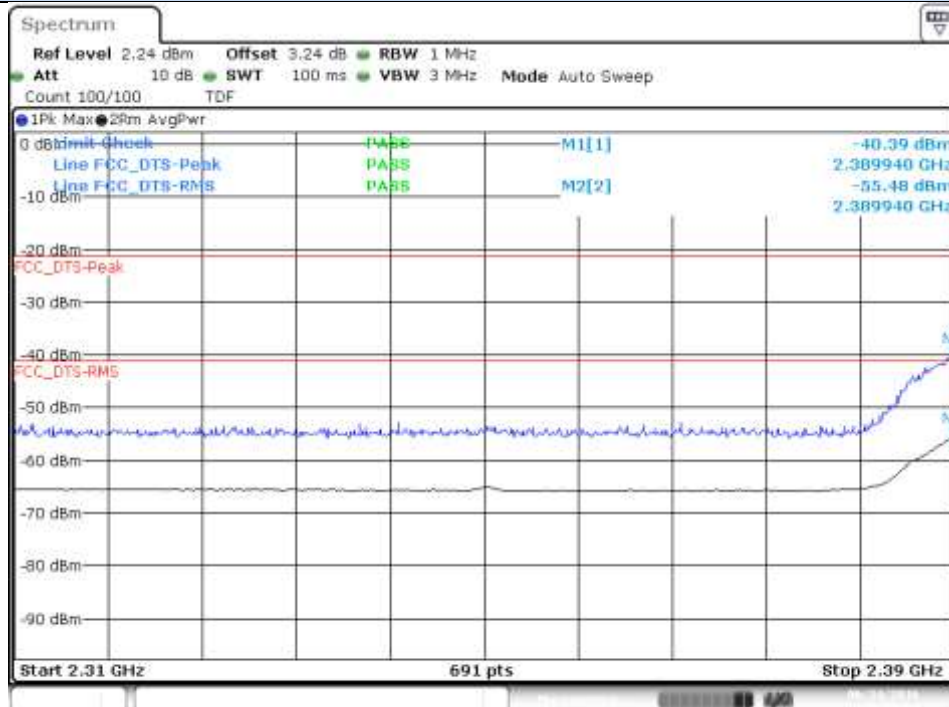
EDR – 8-DPSK

BE Low Freq Section - CH0



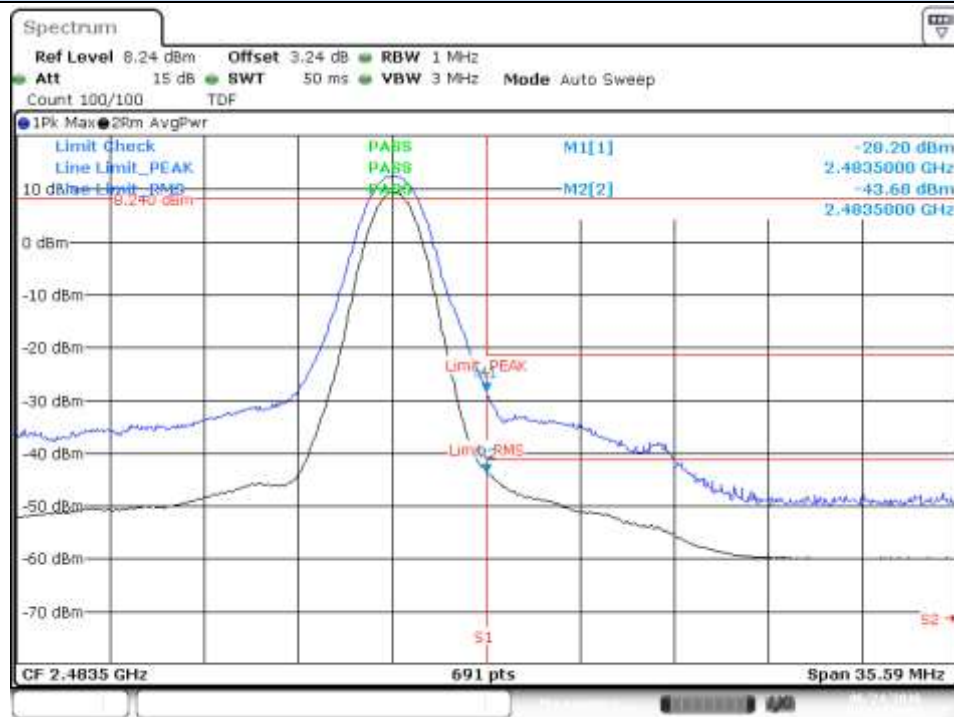
Date: 25 MAY 2016 18:08:54

BE extendedLow Freq Section - CH0



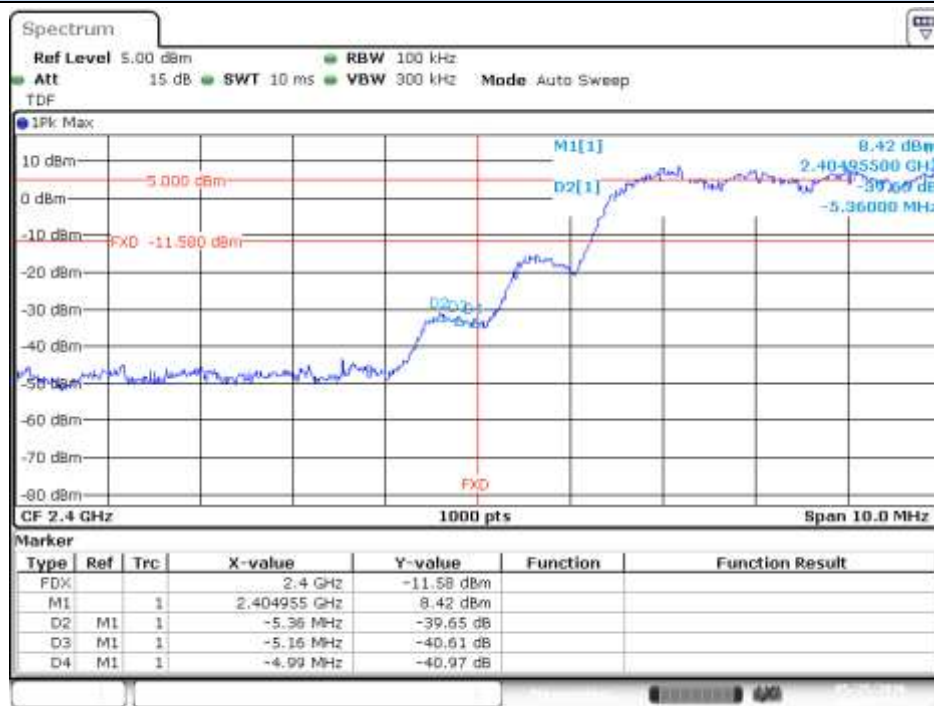
Date: 24 JUN 2016 18:17:53

BE High Freq Section - CH78



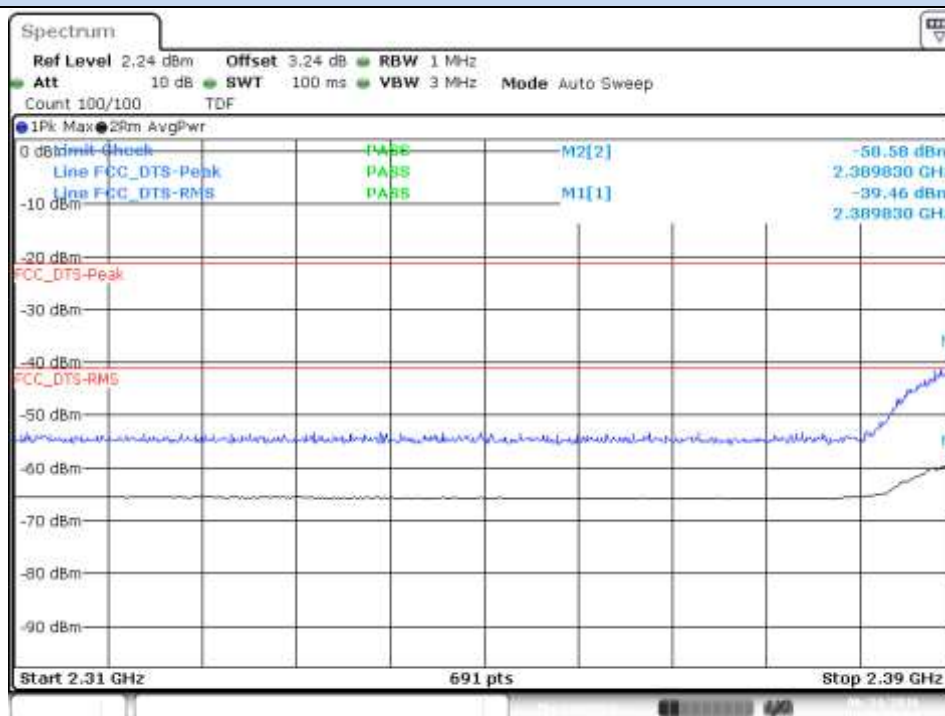
Date: 24 JUN 2016 16:15:54

BE Low Freq Section - Hopping



Date: 25 MAY 2016 18:07:27

BE extended Low Freq Section - Hopping



Date: 24 JUN 2016 18:17:20

BE High Freq Section - Hopping

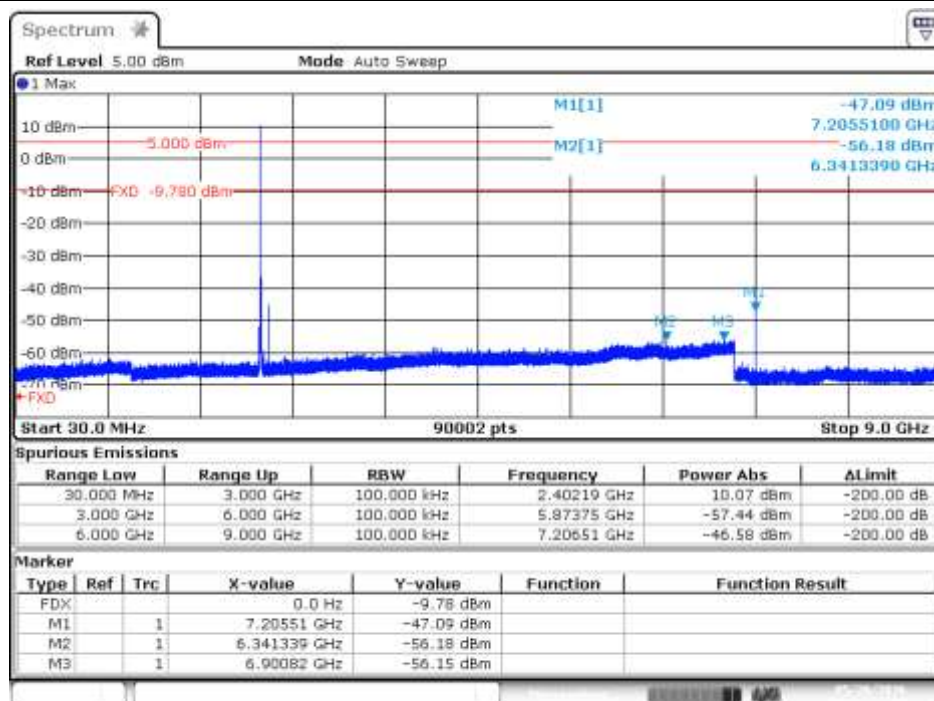


Date: 24 JUN 2016 16:14:55

Conducted Spurious results Screenshot:

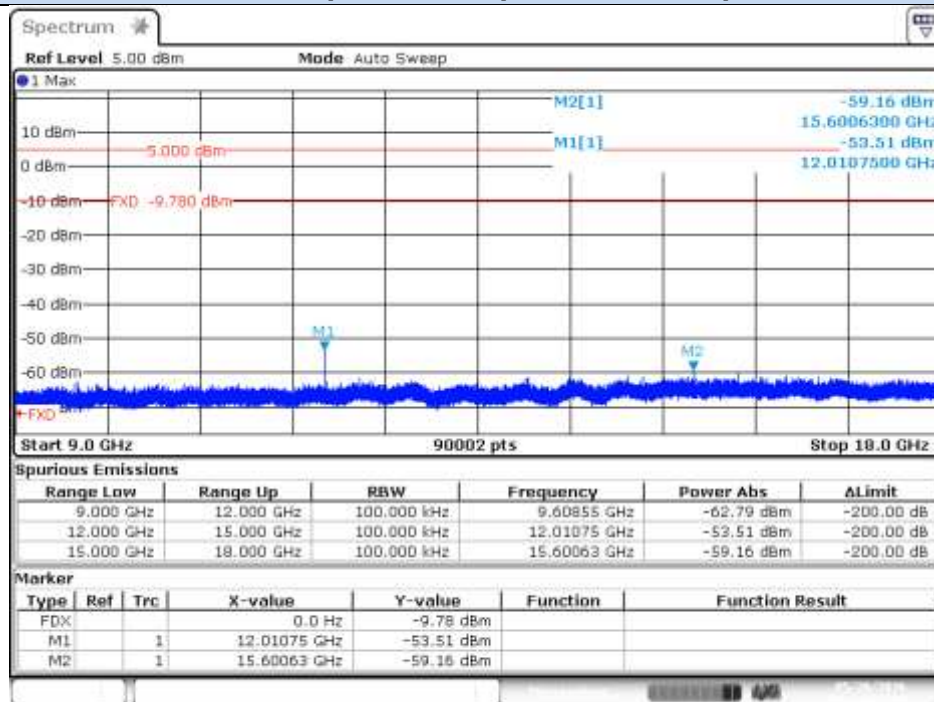
Basic Rate - GFSK

Cond Spur – CH0 (30MHz – 9GHz)



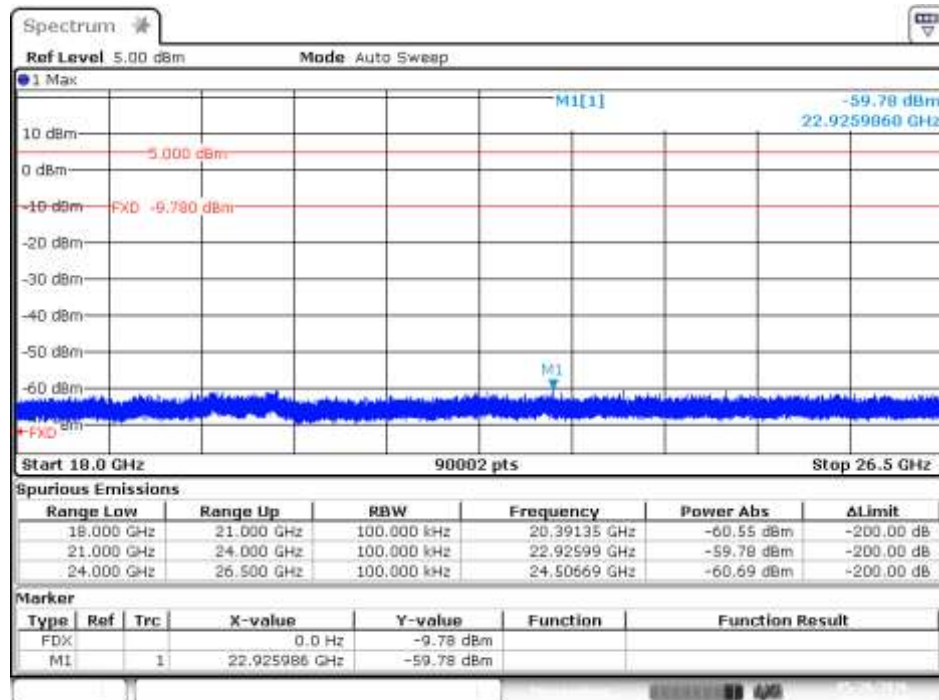
Date: 26 MAY 2016 09:42:16

Cond Spur – CH0 (9GHz – 18GHz)



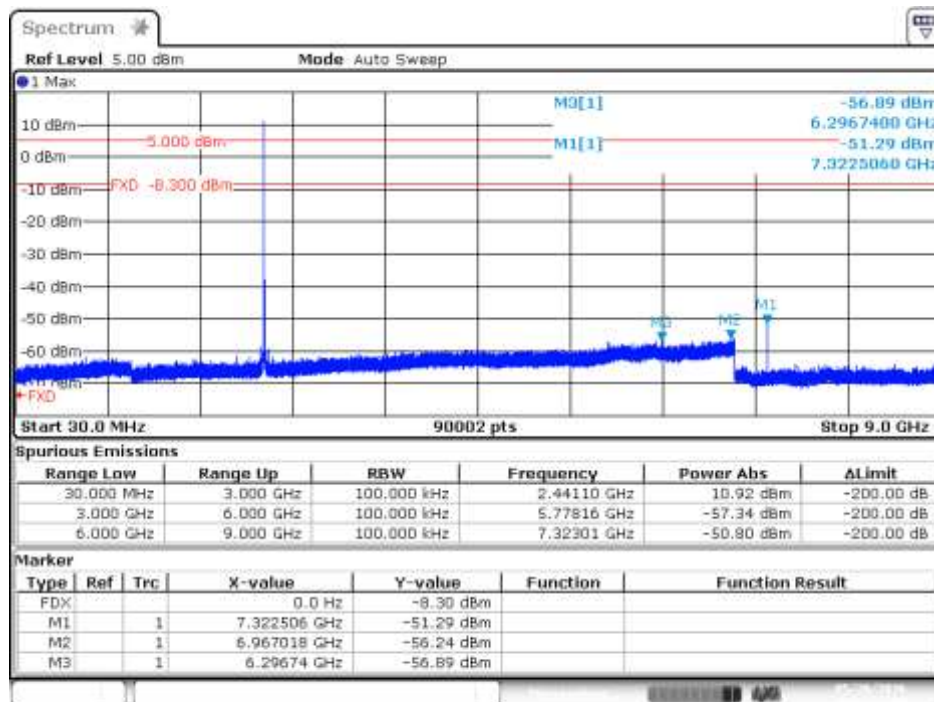
Date: 26 MAY 2016 09:44:20

Cond Spur – CH0 (18GHz – 26.5GHz)



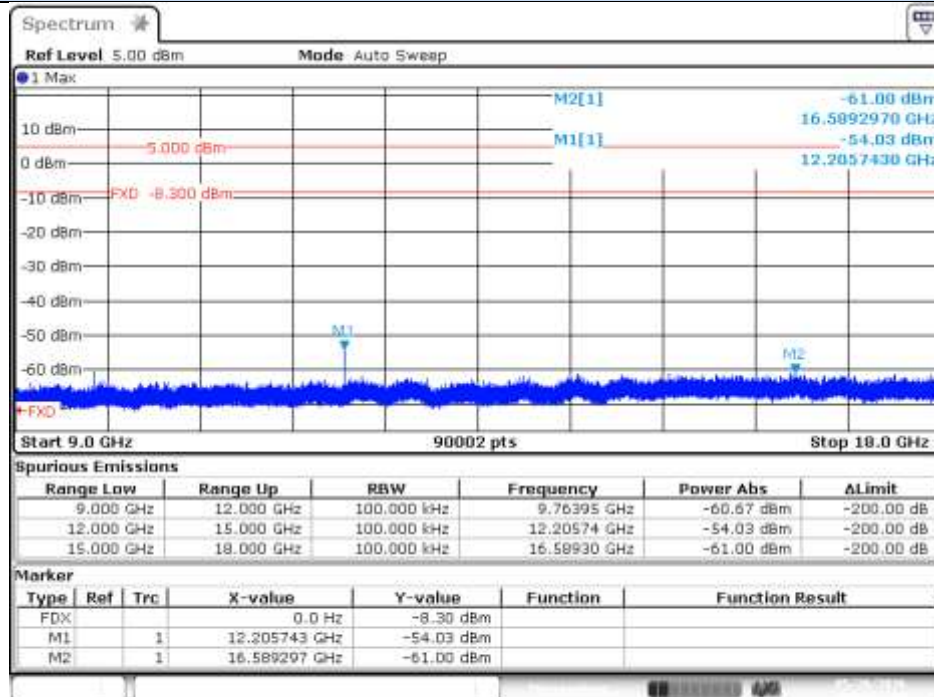
Date: 26 MAY 2016 10:05:26

Cond Spur – CH39 (30MHz – 9GHz)

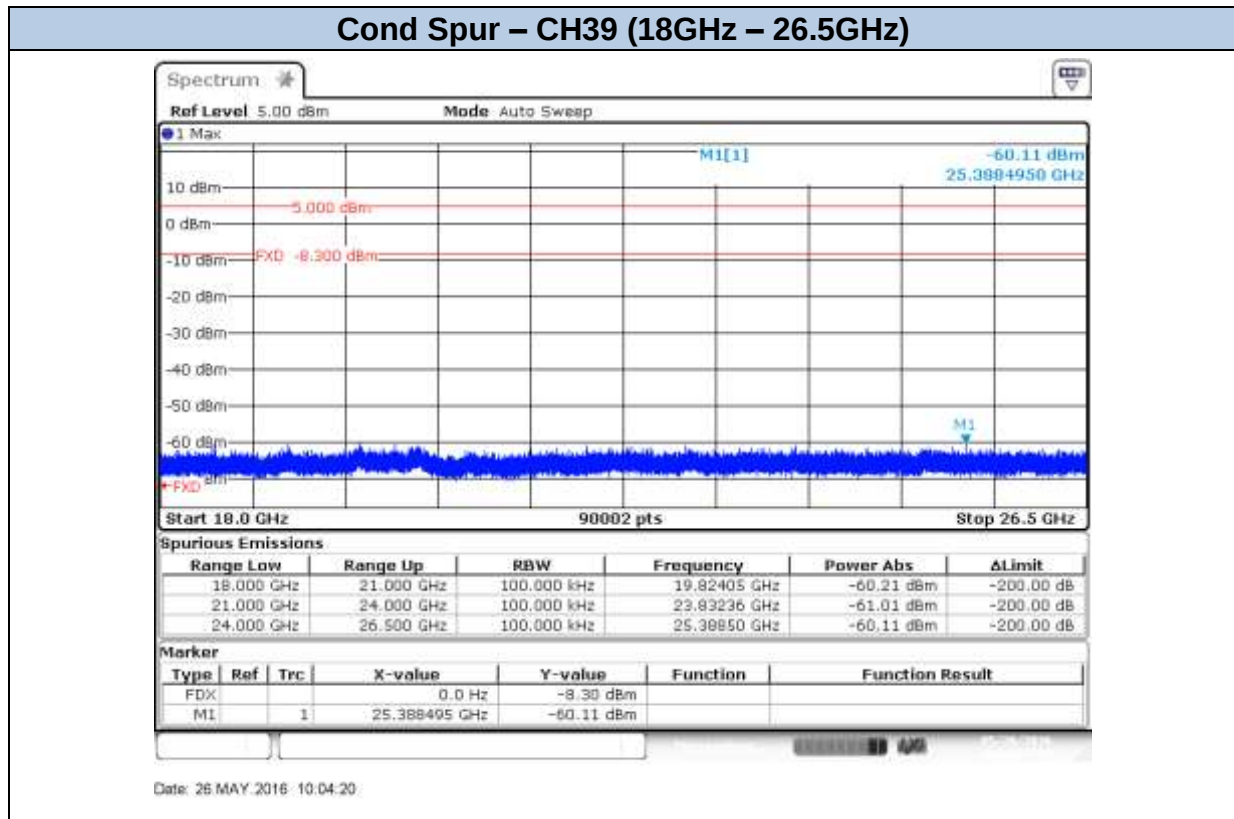


Date: 26 MAY 2016 10:02:12

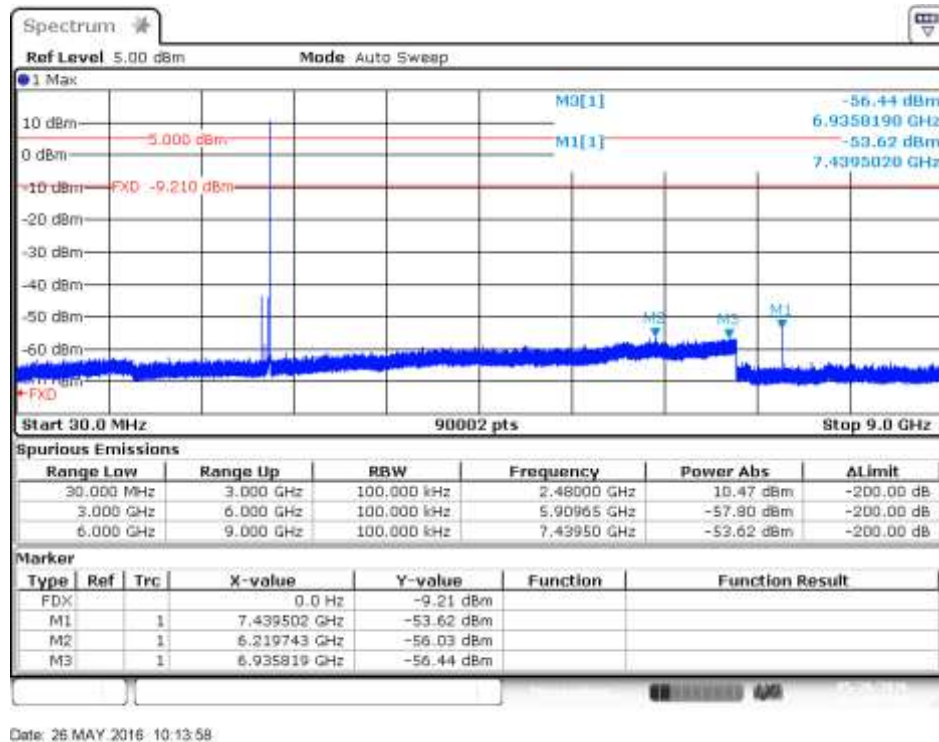
Cond Spur - CH39 (9GHz – 18GHz)



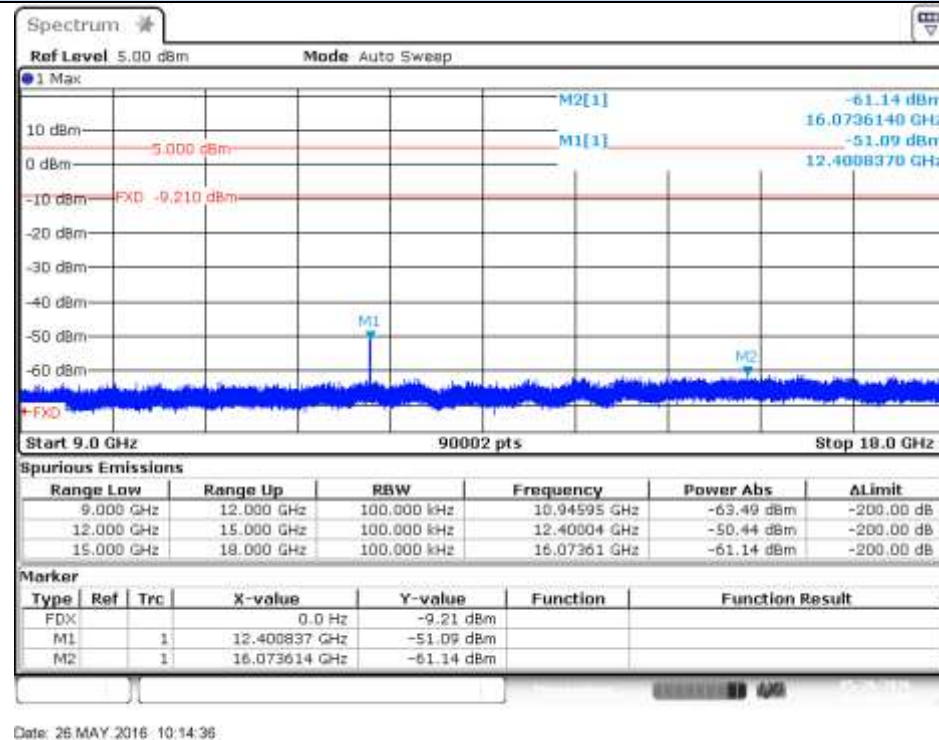
Date: 26 MAY 2016 10:03:23



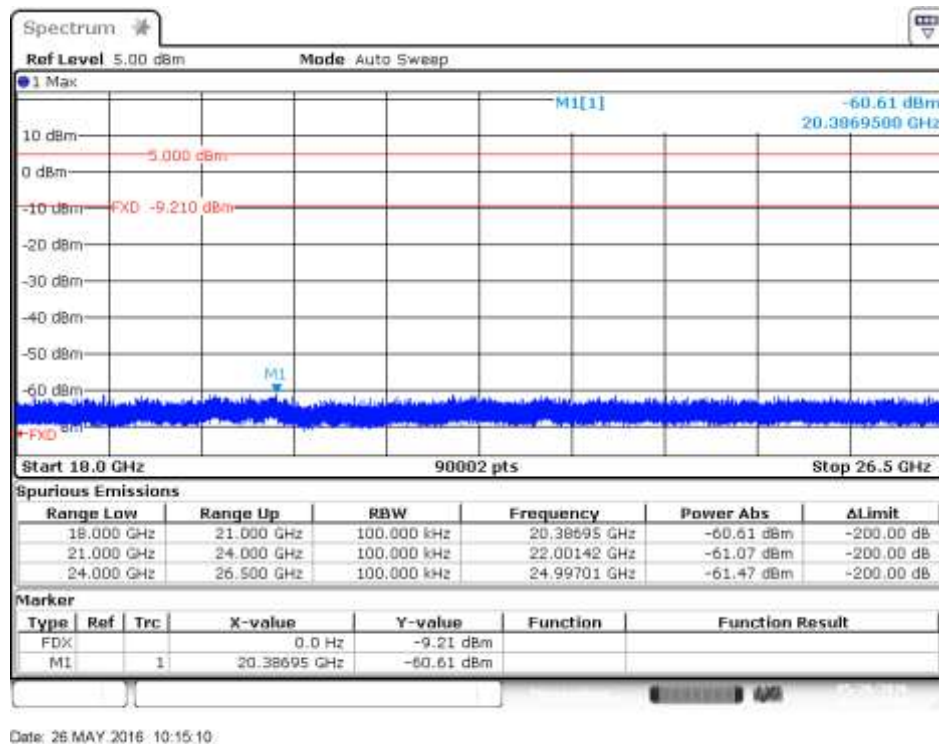
Cond Spur – CH78 (30MHz – 9GHz)



Cond Spur – CH78 (9GHz – 18GHz)

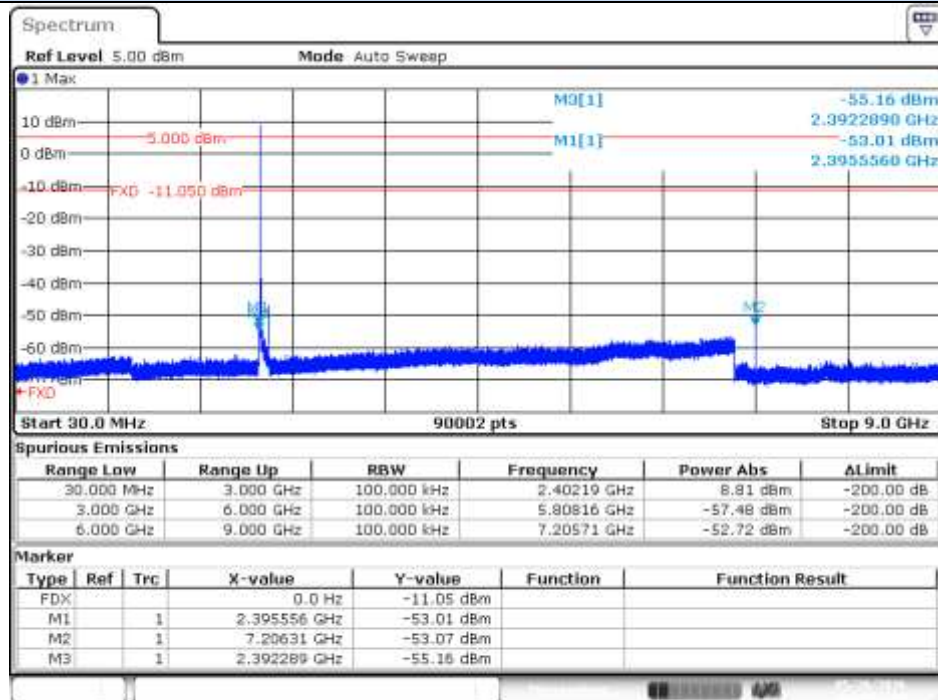


Cond Spur – CH78 (18GHz – 26.5GHz)



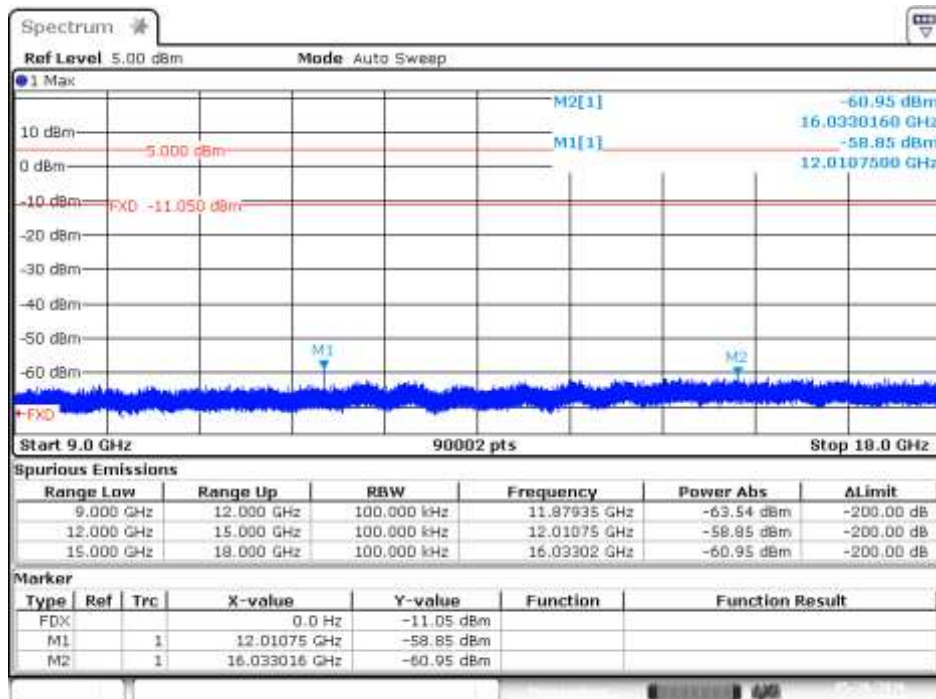
EDR – $\pi/4$ -DQPSK

Cond Spur – CH0 (30MHz – 9GHz)



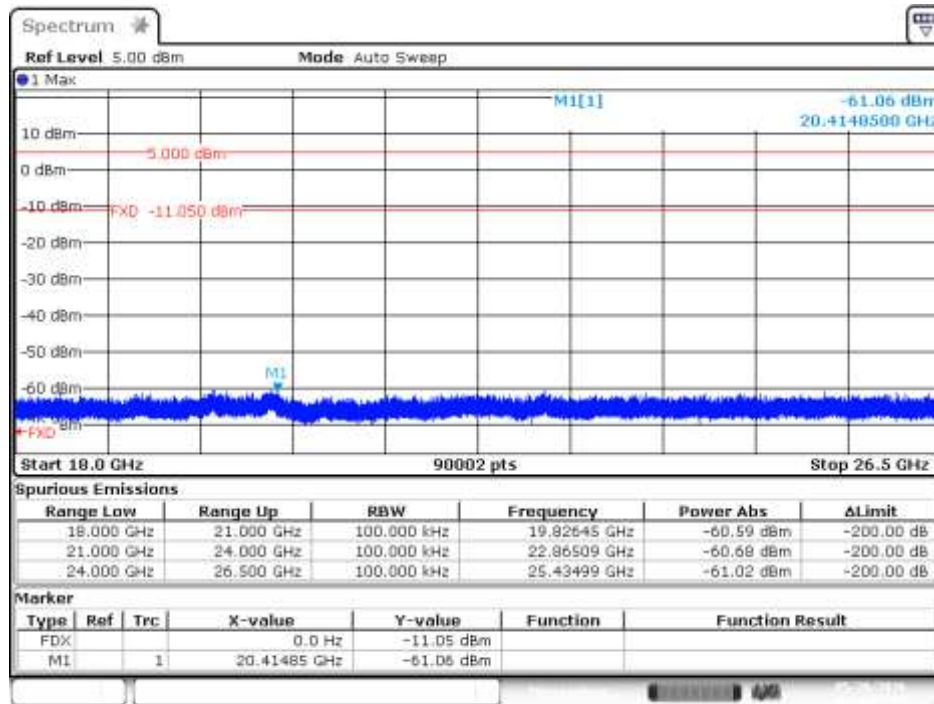
Date: 26 MAY 2016 10:20:43

Cond Spur – CH0 (9GHz – 18GHz)



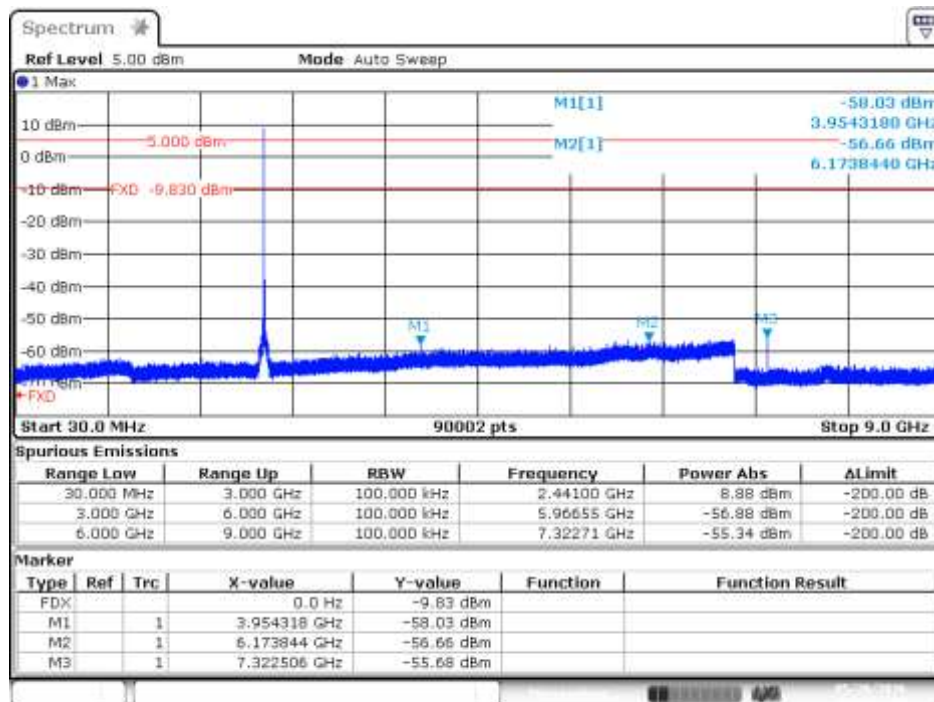
Date: 26 MAY 2016 10:21:27

Cond Spur – CH0 (18GHz – 26.5GHz)



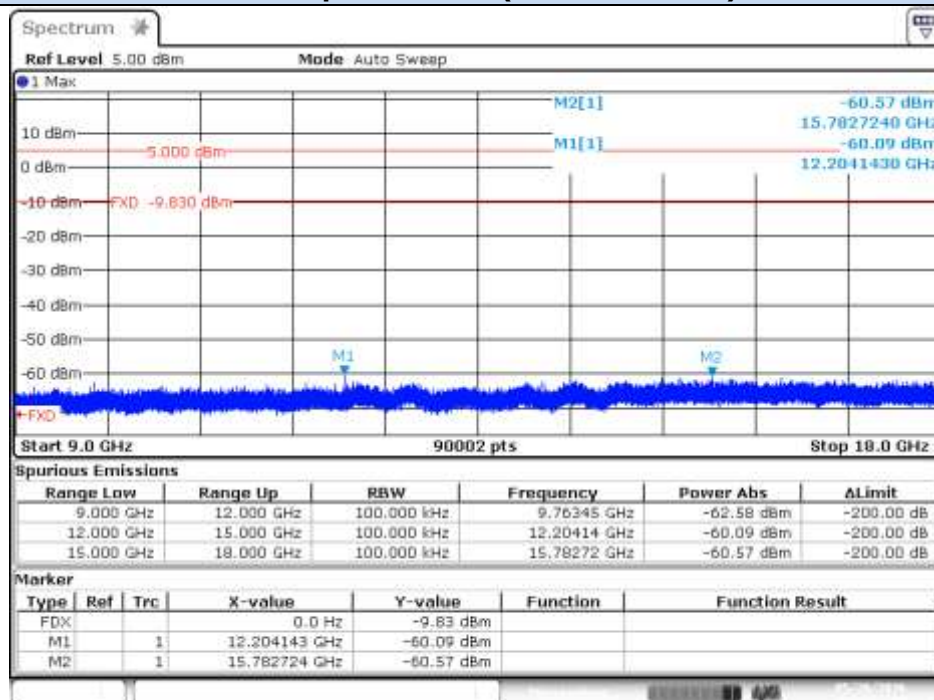
Date: 26 MAY 2016 10:19:29

Cond Spur – CH39 (30MHz – 9GHz)

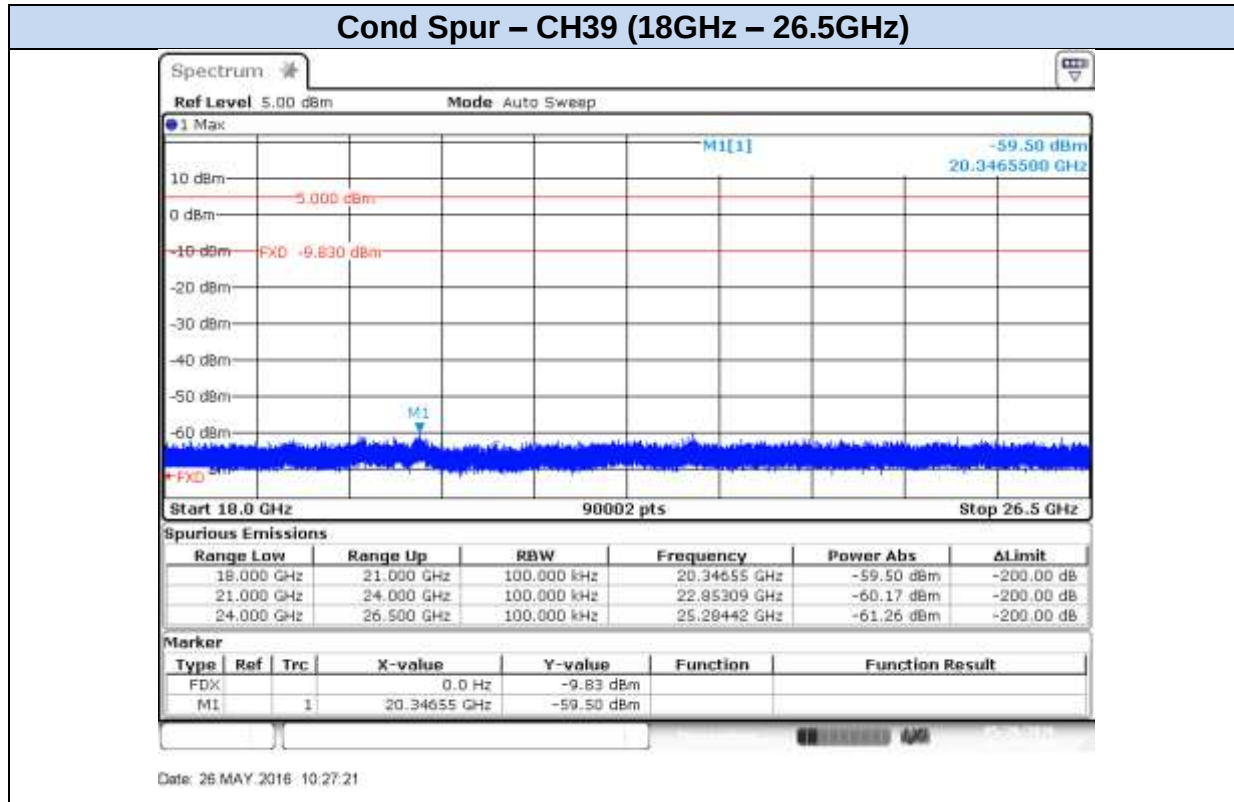


Date: 26 MAY 2016 10:26:02

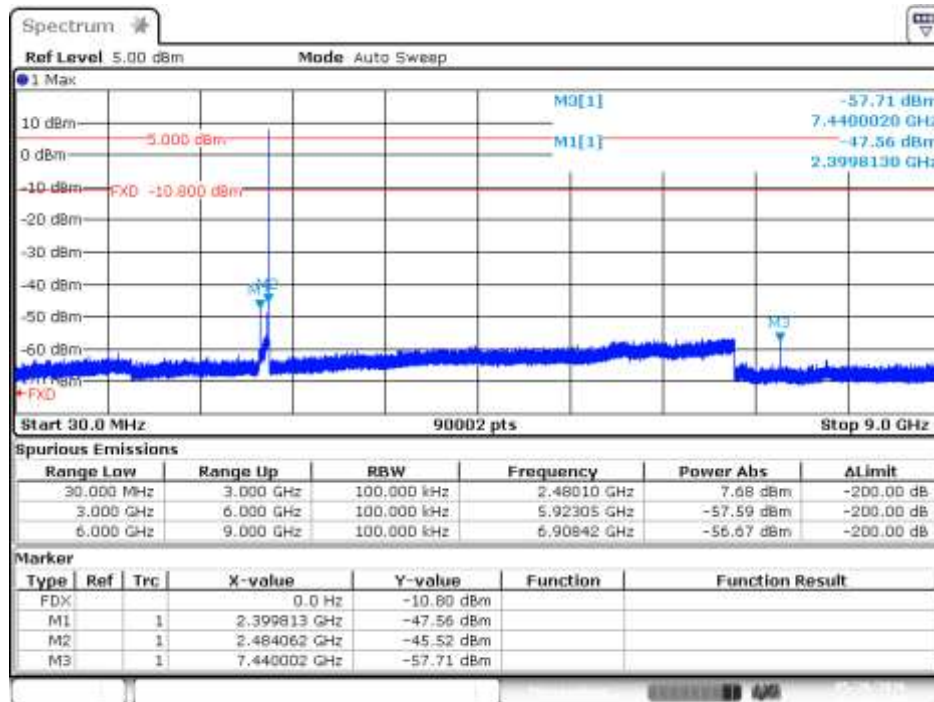
Cond Spur – CH39 (9GHz – 18GHz)



Date: 26 MAY 2016 10:26:52

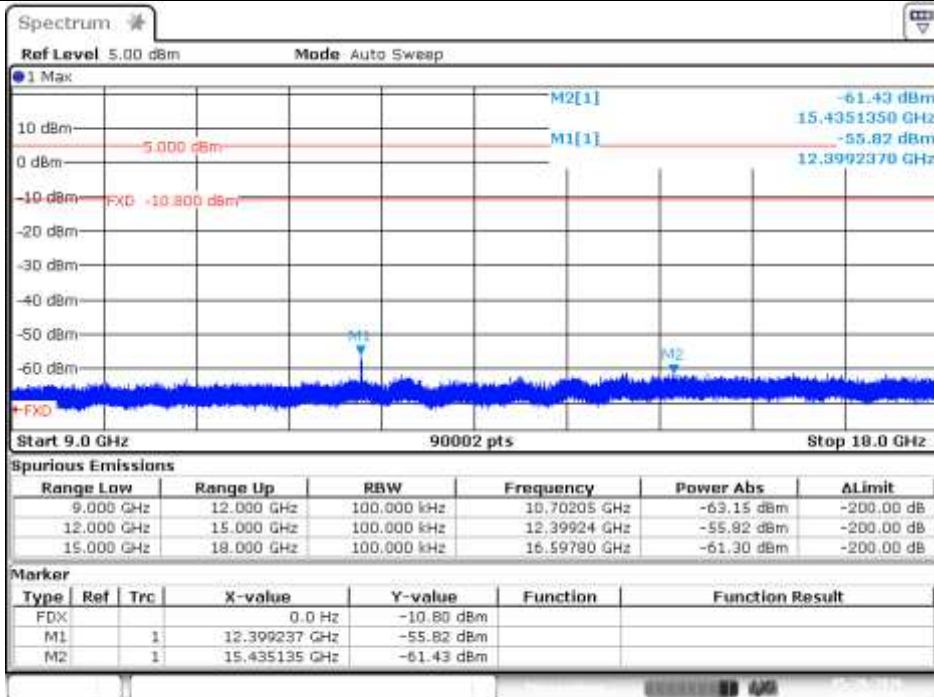


Cond Spur – CH78 (30MHz – 9GHz)



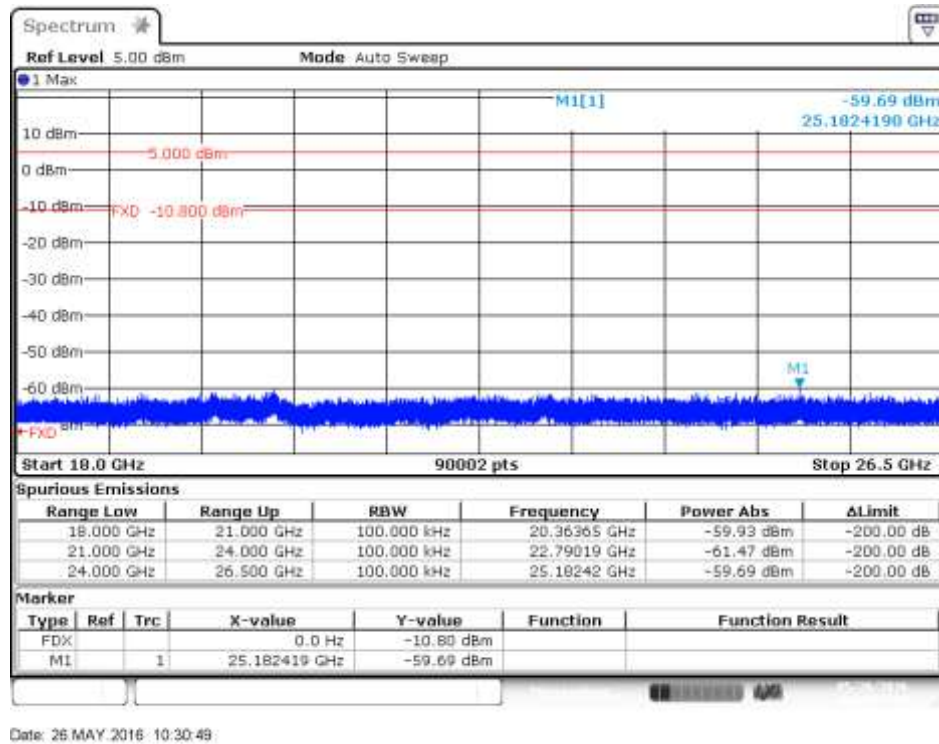
Date: 26 MAY 2016 10:29:11

Cond Spur – CH78 (9GHz – 18GHz)



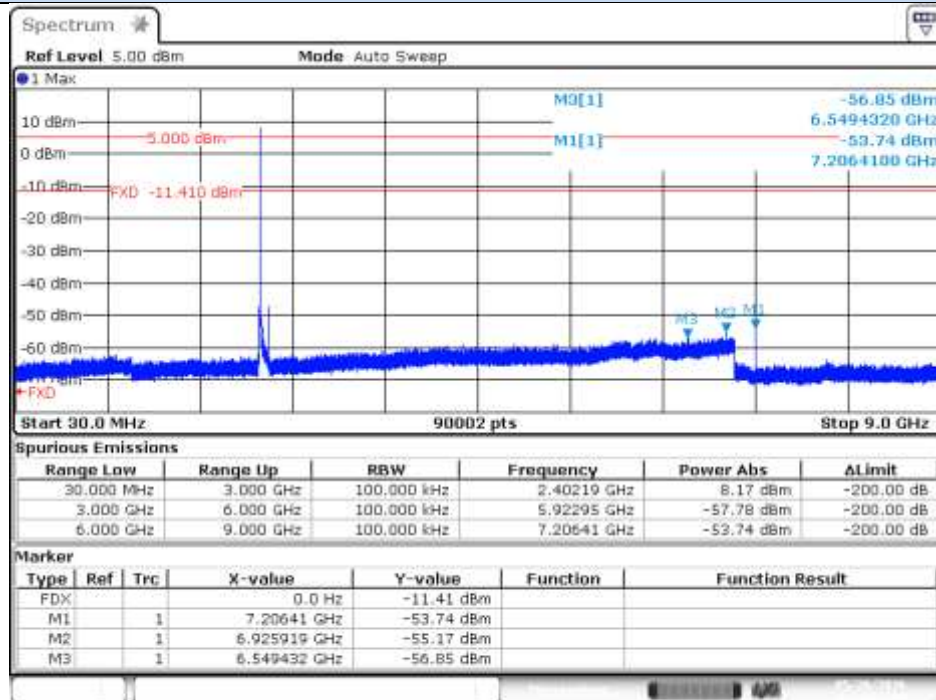
Date: 26 MAY 2016 10:30:01

Cond Spur – CH78 (18GHz – 26.5GHz)



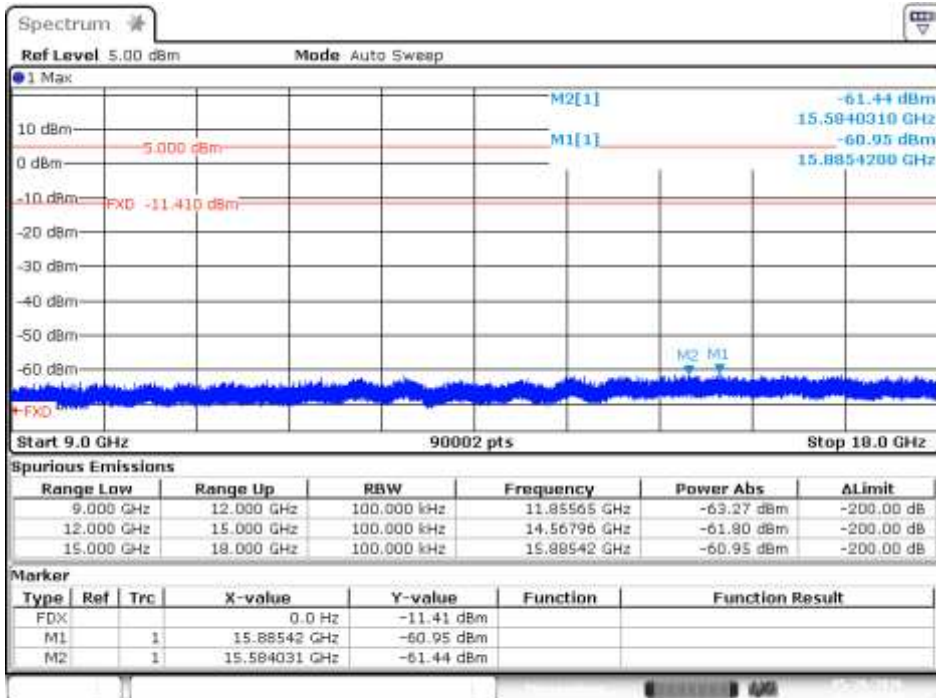
EDR – 8-DPSK

Cond Spur – CH0 (30MHz – 9GHz)



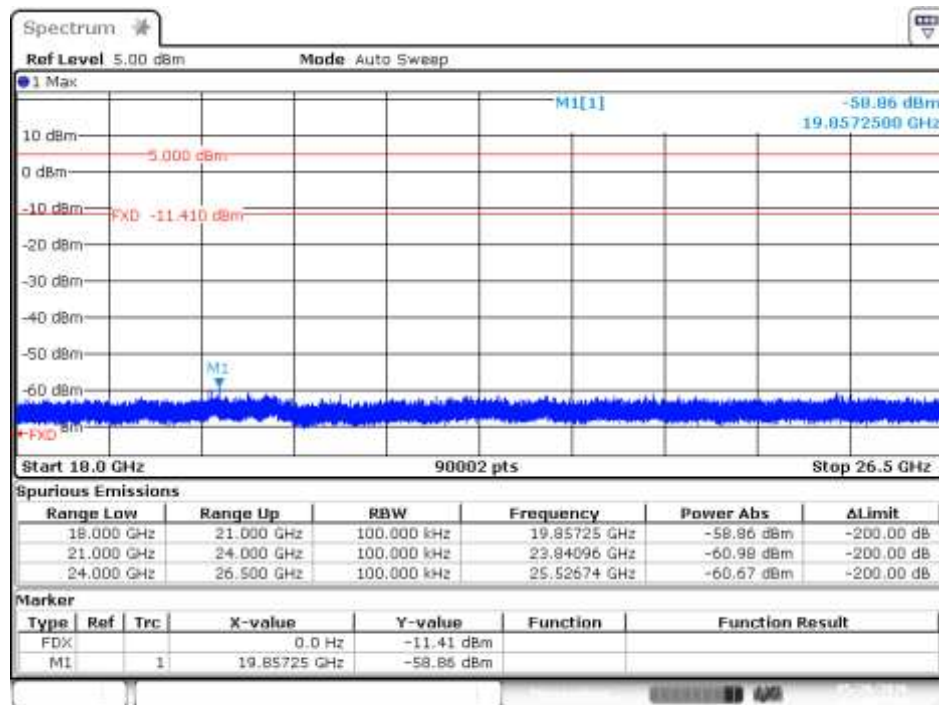
Date: 26 MAY 2016 10:52:20

Cond Spur – CH0 (9GHz – 18GHz)



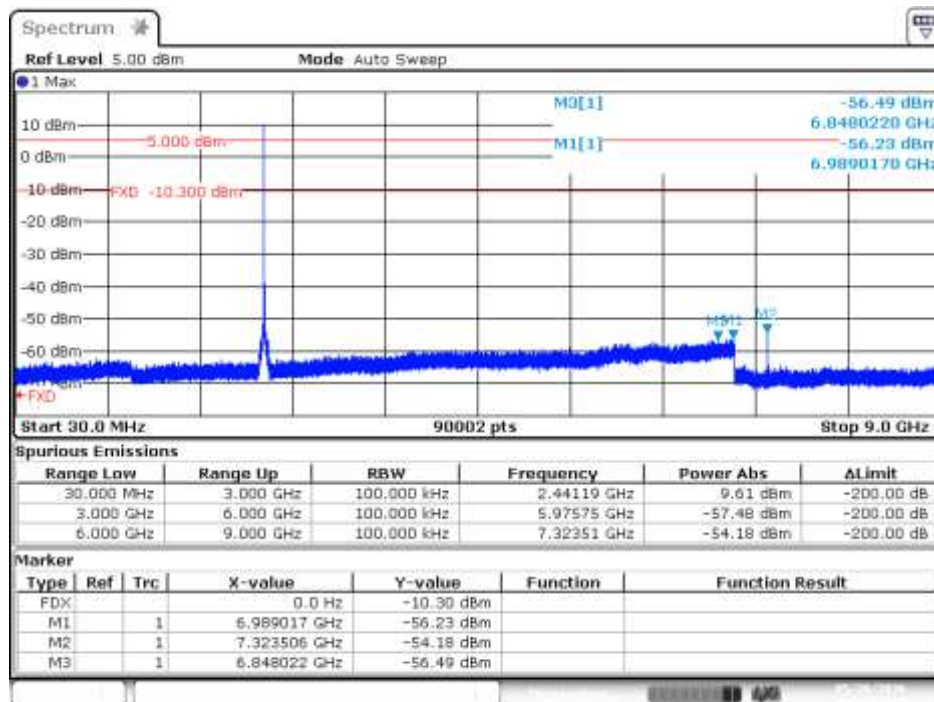
Date: 26 MAY 2016 10:53:30

Cond Spur – CH0 (18GHz – 26.5GHz)



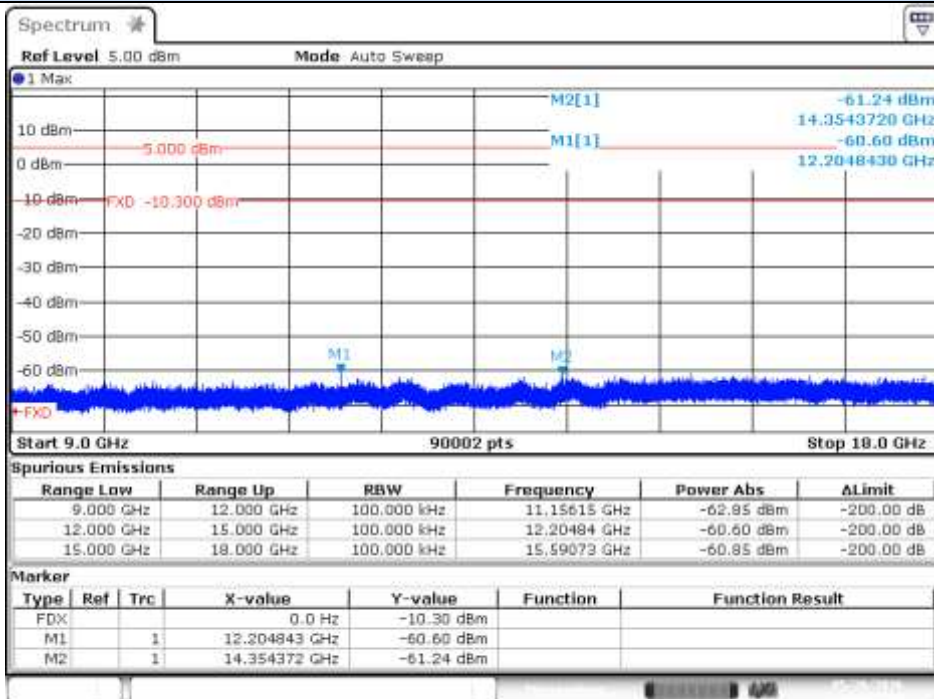
Date: 26 MAY 2016 10:54:06

Cond Spur – CH39 (30MHz – 9GHz)



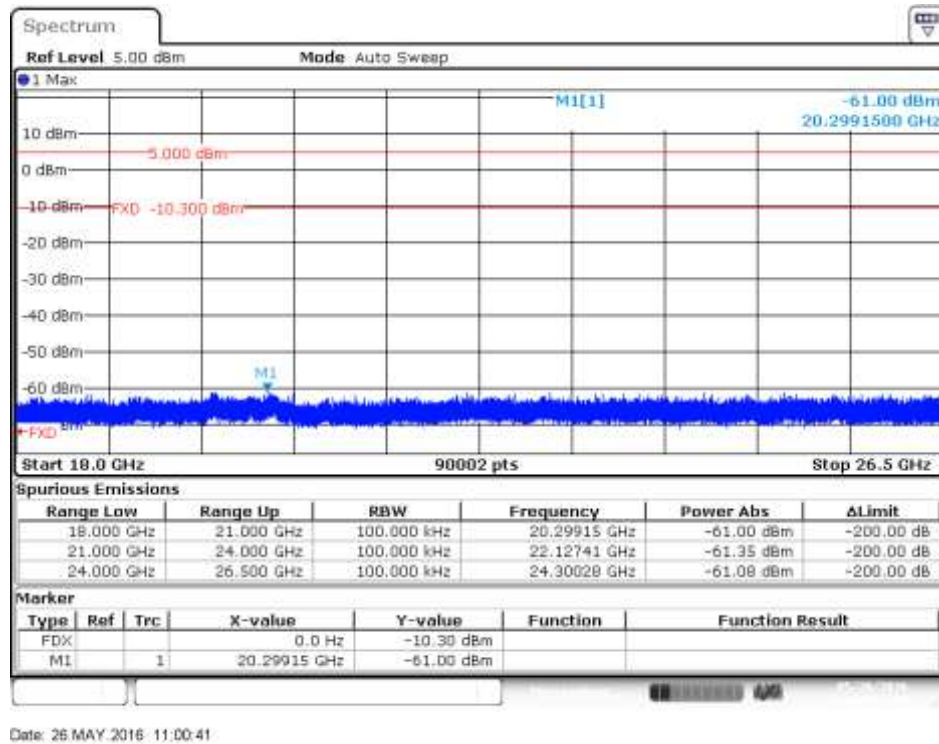
Date: 26 MAY 2016 10:59:29

Cond Spur – CH39 (9GHz – 18GHz)

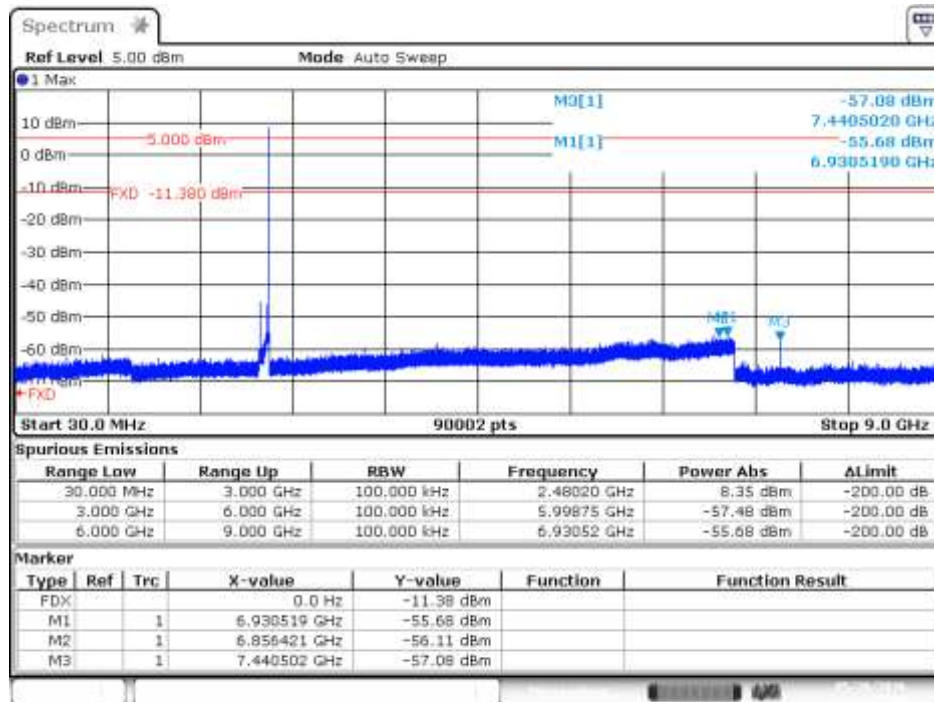


Date: 26 MAY 2016 11:00:15

Cond Spur – CH39 (18GHz – 26.5GHz)

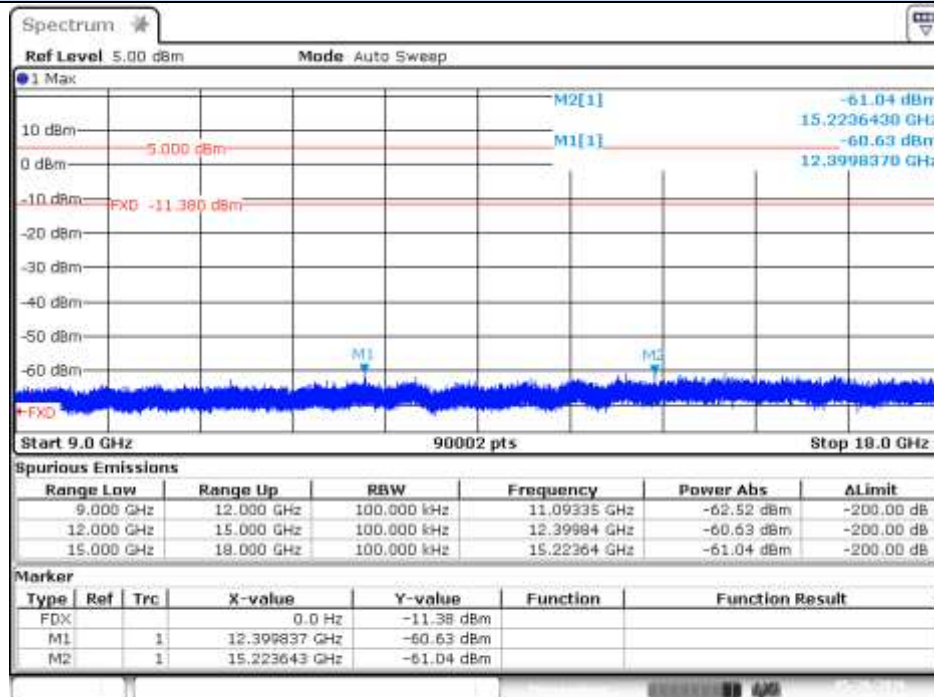


Cond Spur – CH78 (30MHz – 9GHz)



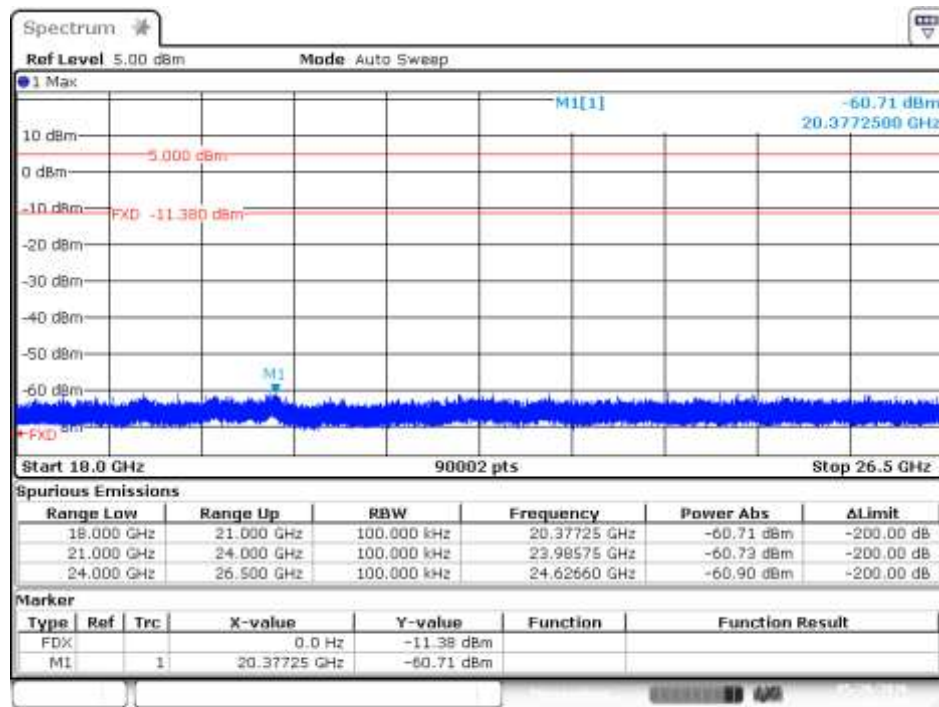
Date: 26 MAY 2016 11:02:17

Cond Spur – CH78 (9GHz – 18GHz)



Date: 26 MAY 2016 11:02:55

Cond Spur – CH78 (18GHz – 26.5GHz)



Date: 26 MAY 2016 11:03:22

B.6 Radiated spurious emission

Standard references:

FCC part	RSS part	Limits			
15.247 (d)	RSS-247 Clause 5.5	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):			
		Freq Range (MHz)	Field Strength (dB μ V/m)	Field Strength (dB μ V/m)	Meas. Distance (m)
		0.009-0.490	2400/f(kHz)	-	300
		0.490-1.705	24000/f(kHz)	-	300
		1.705-30.0	30	-	30
		30-88	100	40	3
		88-216	150	43.5	3
		216-960	200	46	3
		Above 960	500	54	3
		The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.			

Test procedure:

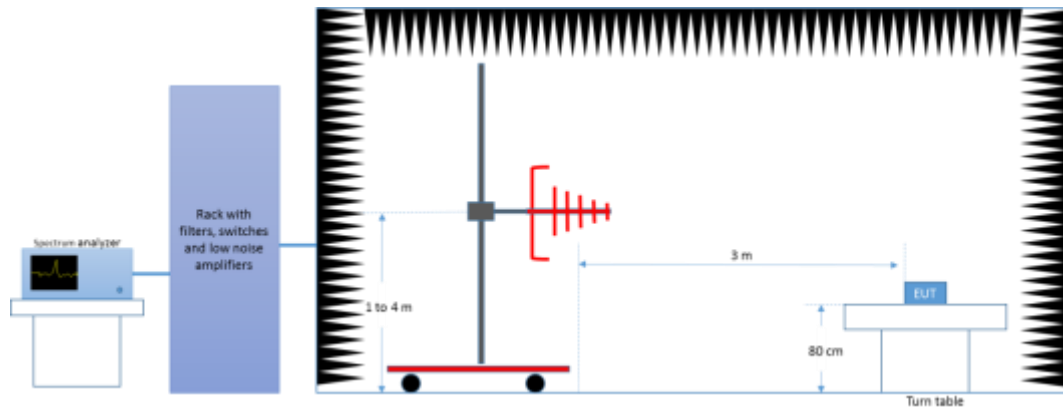
The setups below were used to measure the radiated spurious emissions.

Depending of the frequency range and bands being tested, different antennas and filters were used.

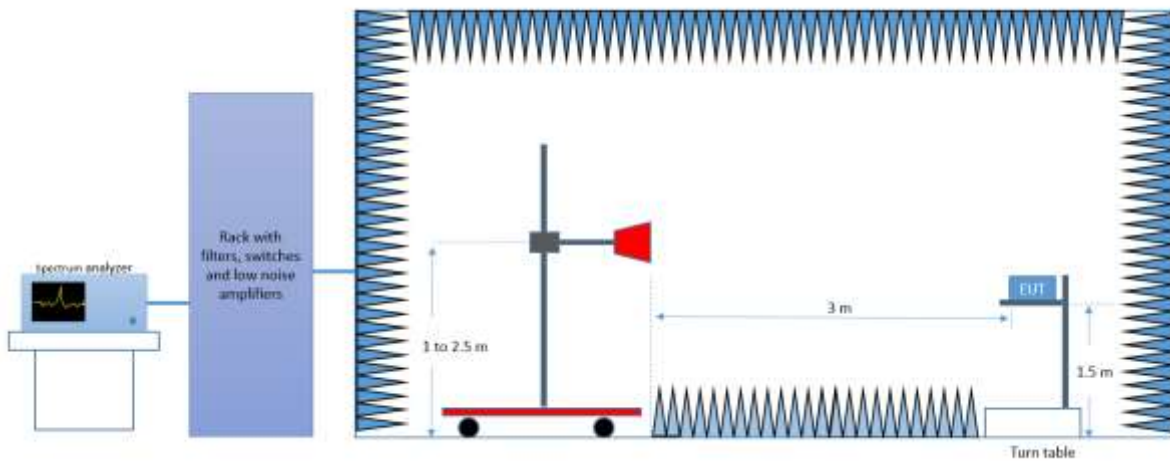
The final measurement is done by varying the antenna height from 1 to 4 meters, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

The radiated spurious emission was measured on the worst case configuration found.

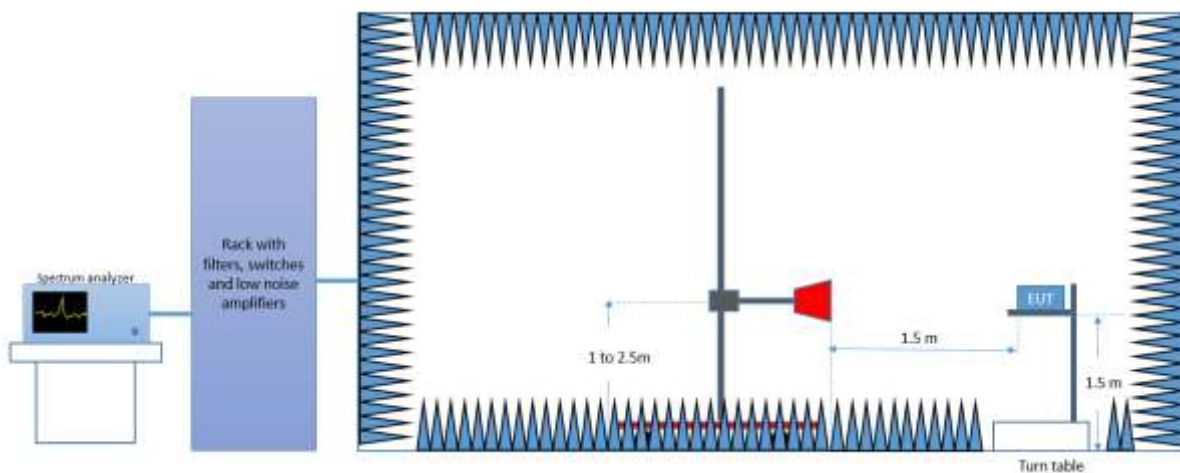
Radiated Setup < 1GHz

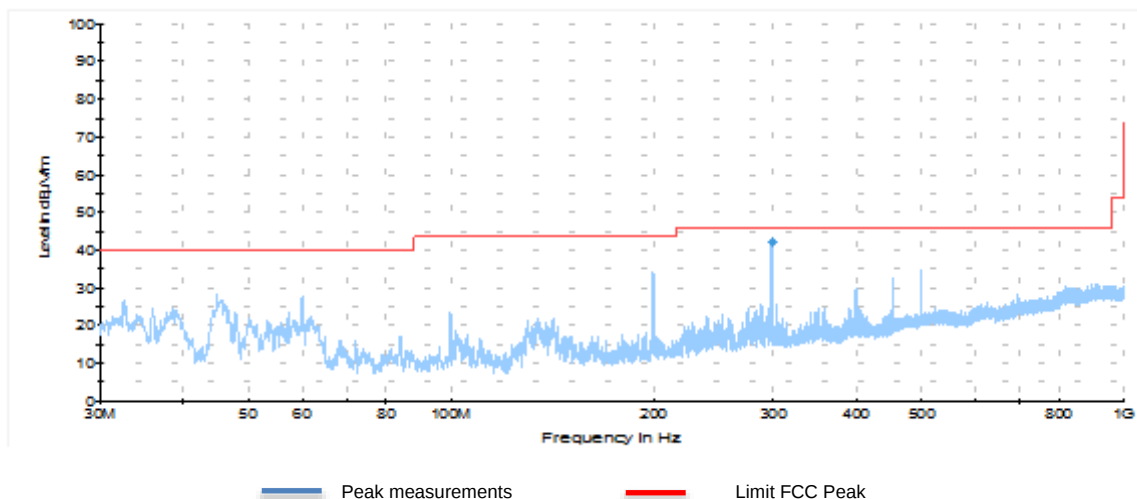


Radiated Setup 1GHz - 18GHz



Radiated Setup 18 GHz - 25 GHz



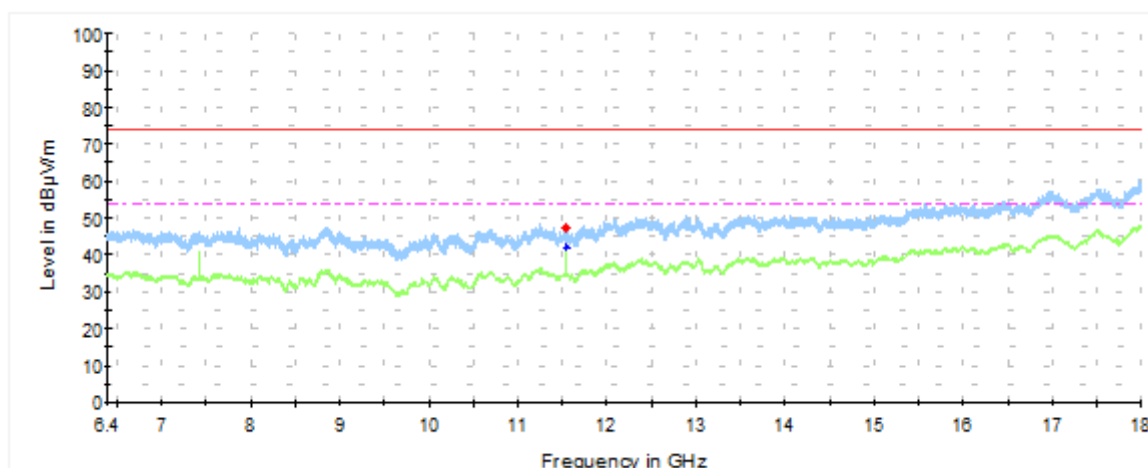
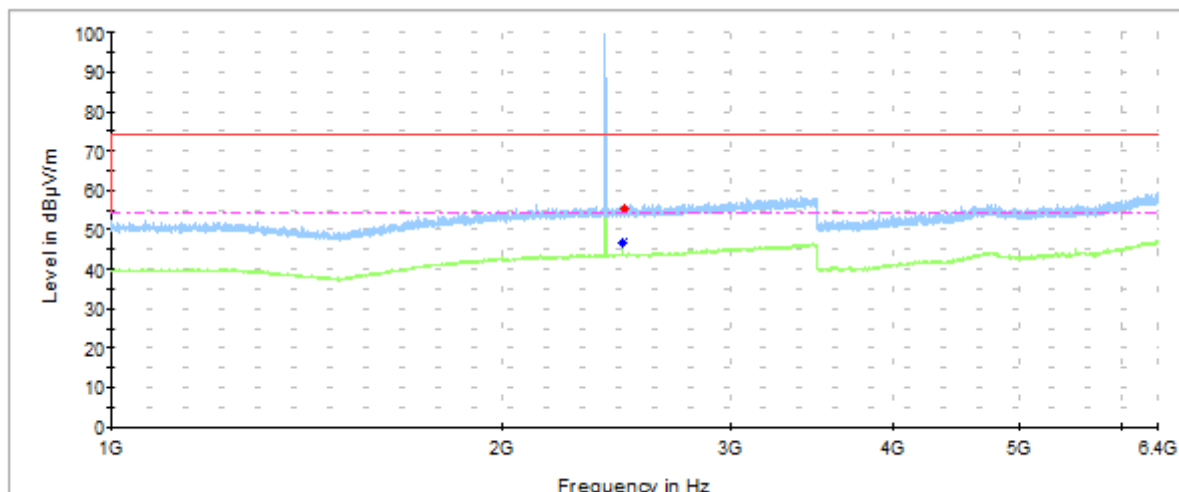
Test result:**30 MHz – 1 GHz****Radiated Spurious – All Modes**

Frequency	Max Peak	Limit	Margin
MHz	dBuV/m	dBuV/m	dB
300	42.1	46	3.9

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

BR – GFSK – 1 GHz – 18 GHz

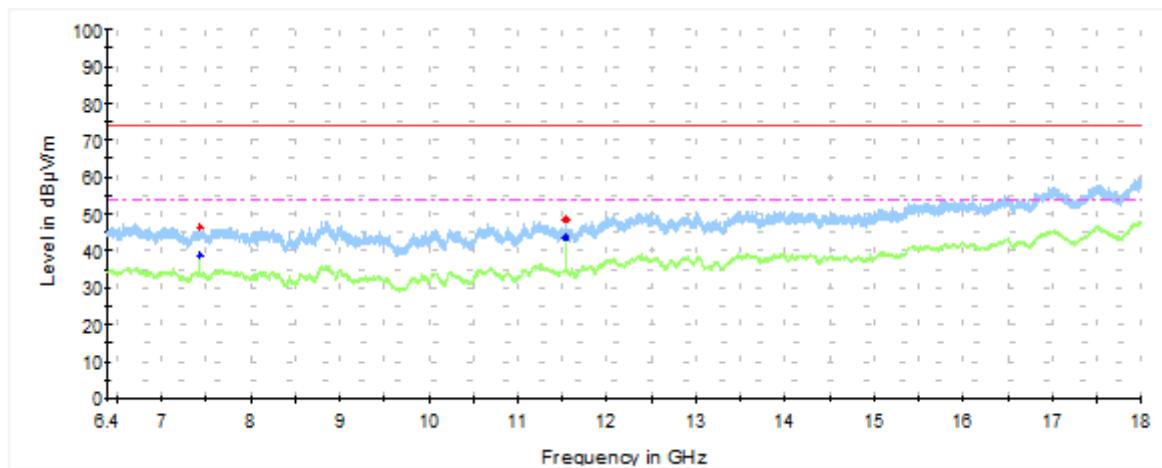
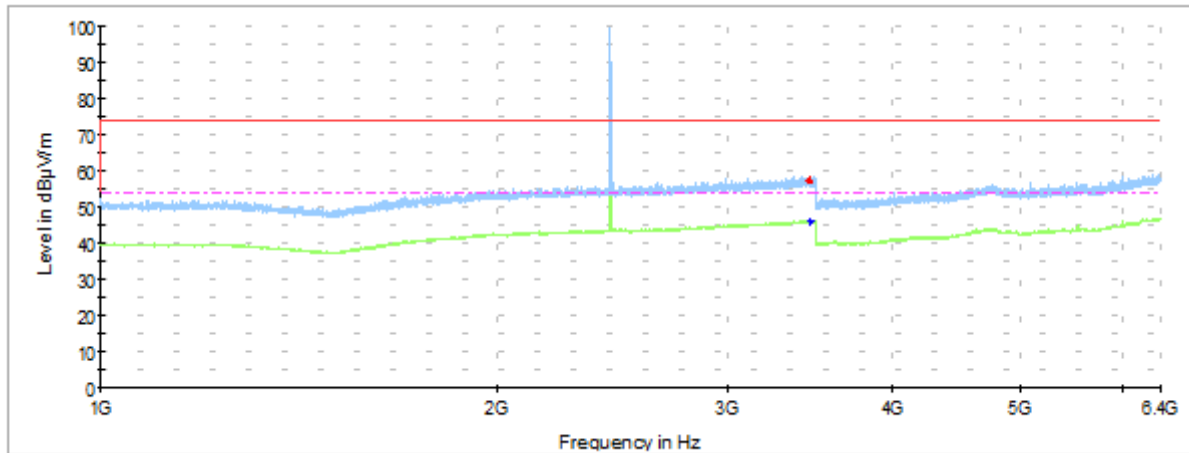
Radiated Spurious – Ch0 DH5



— Peak measurements
 — Avg measurements
 — Limit FCC Peak
 - - - Limit FCC Avg

Frequency MHz	Max Peak dBuV/m	Avg dBuV/m	Limit dBuV/m	Margin dB
2481	55.6	-	74	18.4
2481	-	46.7	54	7.3
11550	48.9	-	74	25.1
11549	-	43.1	54	10.9

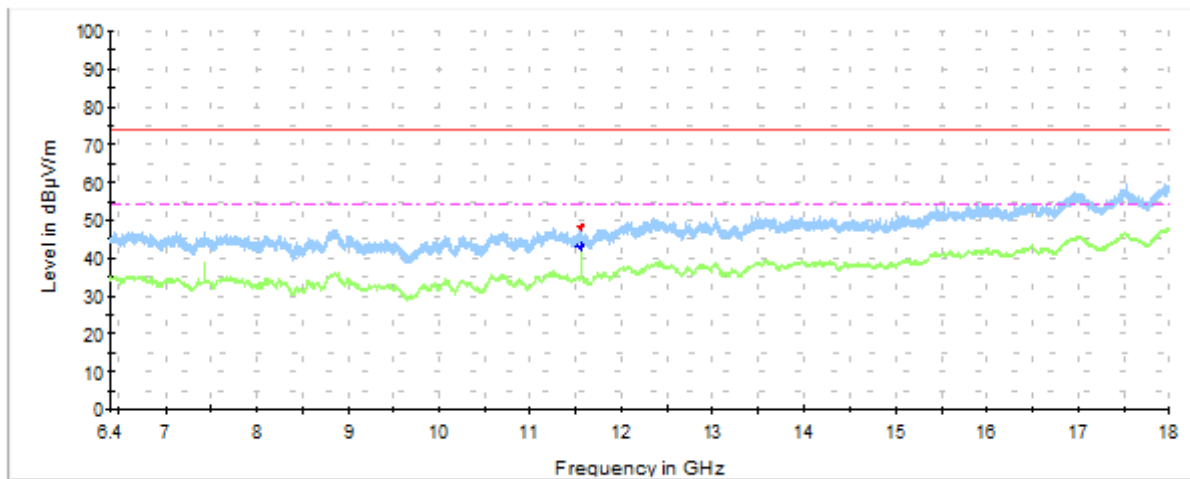
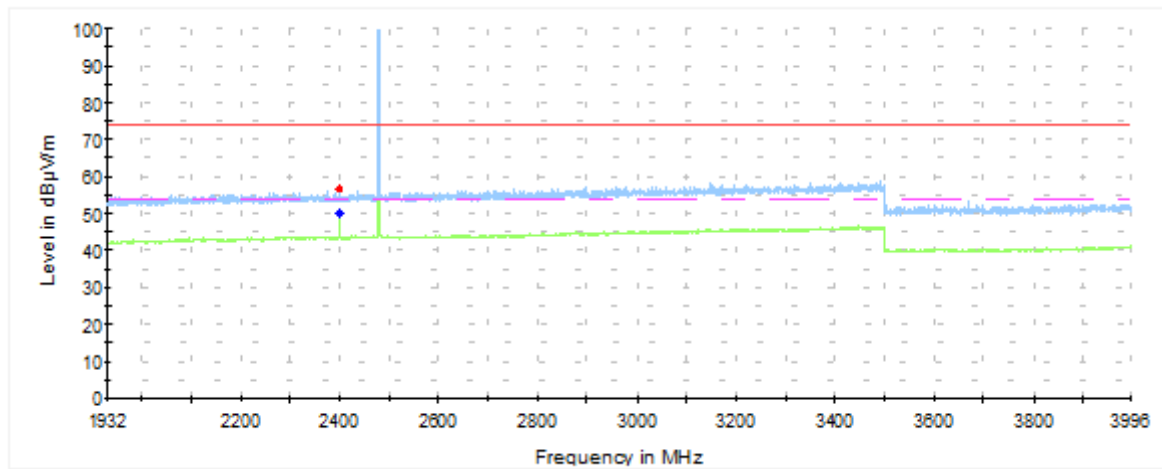
Radiated Spurious – Ch39 DH5



— Peak measurements
 — Avg measurements
 — Limit FCC Peak
 - - Limit FCC Avg

Frequency MHz	Max Peak dBuV/m	Avg dBuV/m	Limit dBuV/m	Margin dB
3461	57.3	-	74	16.7
3468	-	46.1	54	7.9
7439	48.6	-	74	25.4
7439	-	41.4	54	12.6
11549	49.9	-	74	21.1
11549	-	43.9	54	10.1

Radiated Spurious – Ch78 DH5

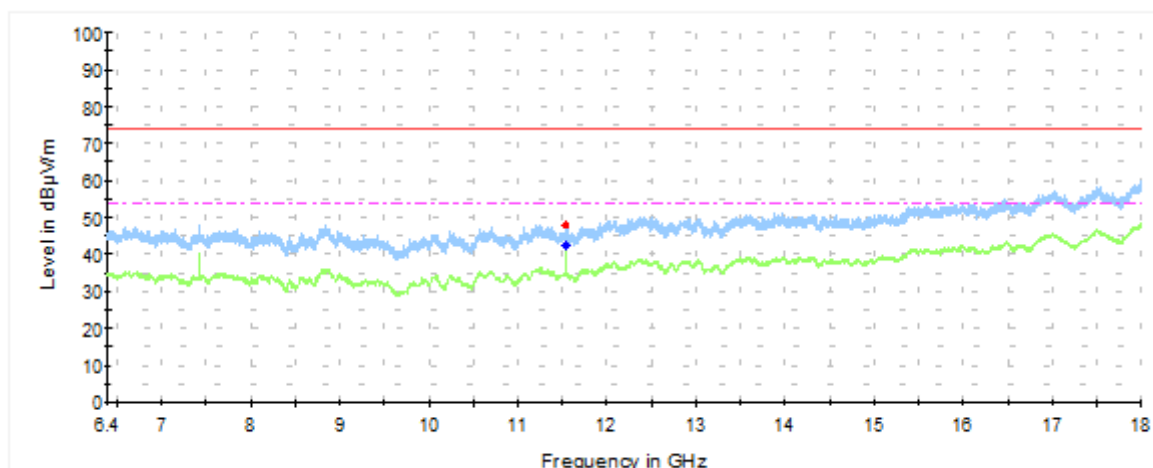
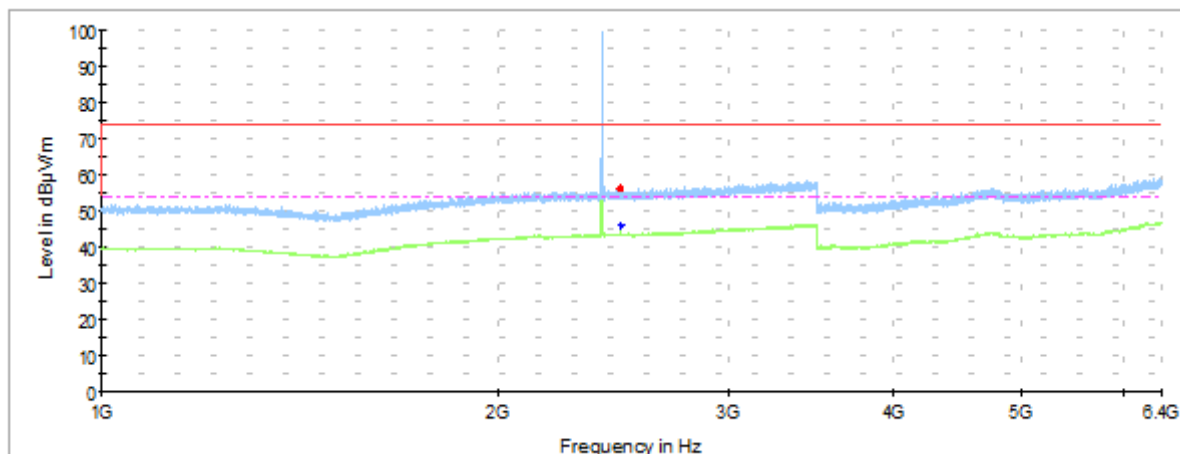


— Peak measurements
 — Avg measurements
 — Limit FCC Peak
 — Limit FCC Avg

Frequency	Max Peak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
2400	59.2		74	14.8
2400		52.2	54	1.8
11549	50.1	-	74	23.9
11549	-	43.4	54	10.6

EDR – $\pi/4$ -DQPSK – 1 GHz – 18 GHz

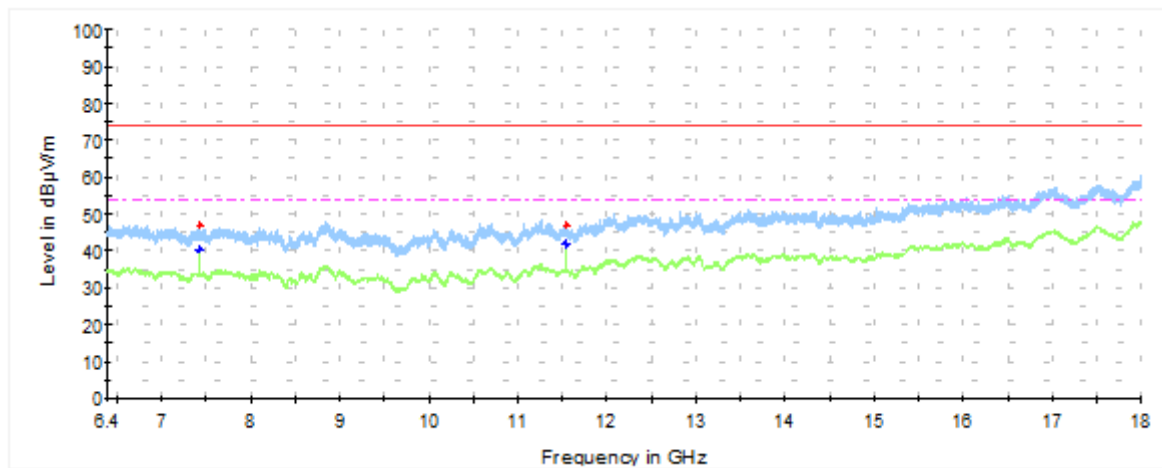
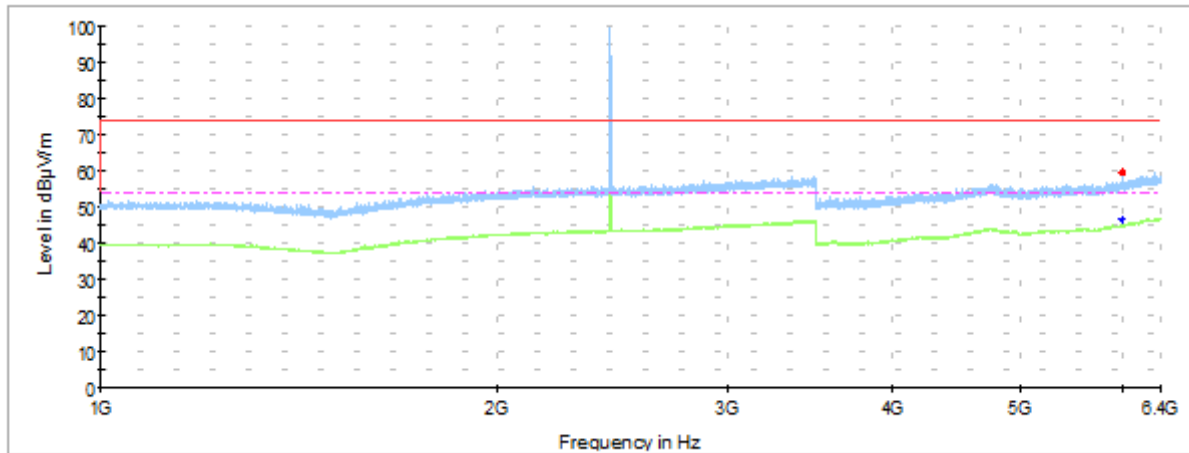
Radiated Spurious – Ch0 2DH5



— Peak measurements
 — Avg measurements
 — Limit FCC Peak
 - - - Limit FCC Avg

Frequency	Max Peak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
2482	56.4	-	74	17.6
2482	-	46.1	54	7.9
11549	48.4	-	74	25.6
11549	-	44.1	54	9.9

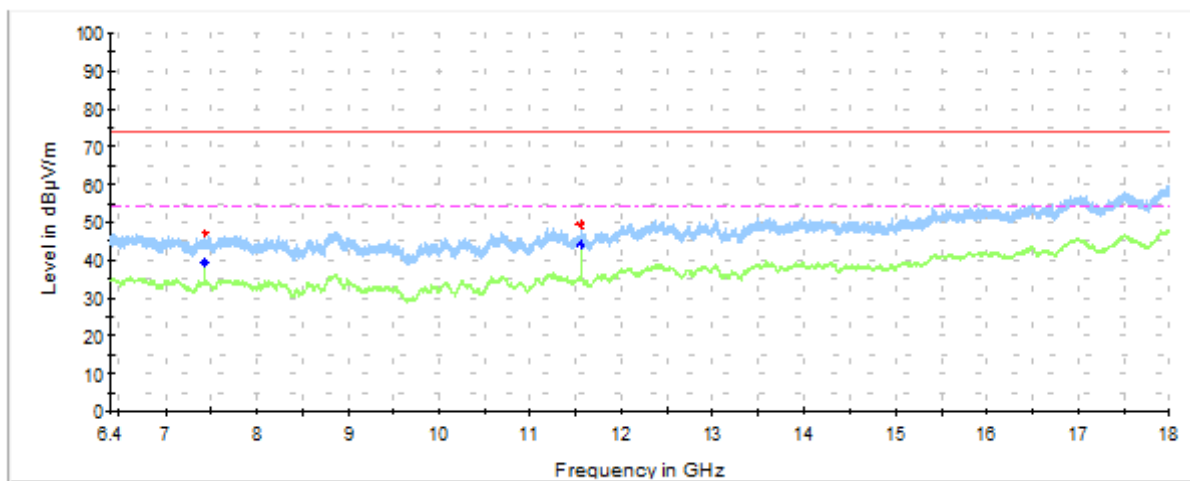
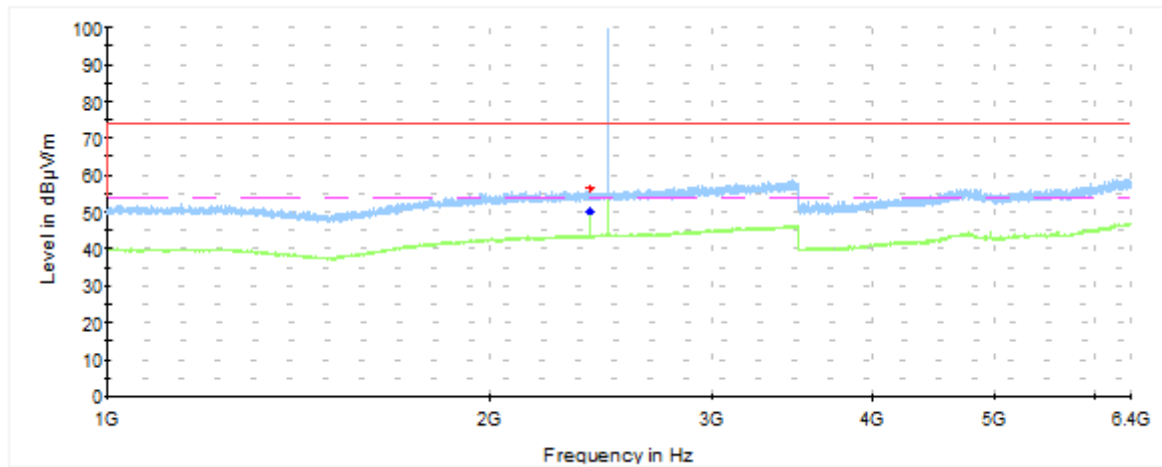
Radiated Spurious – Ch39 2DH5



— Peak measurements
 — Avg measurements
 — Limit FCC Peak
 - - - Limit FCC Avg

Frequency MHz	Max Peak dBuV/m	Avg dBuV/m	Limit dBuV/m	Margin dB
5988	59.8		74	14.2
5988		46.8	54	7.2
7440	48.6	-	74	25.4
7440	-	41.6	54	12.4
11549	48.5	-	74	25.5
11549	-	43.8	54	10.2

Radiated Spurious – Ch78 2DH5

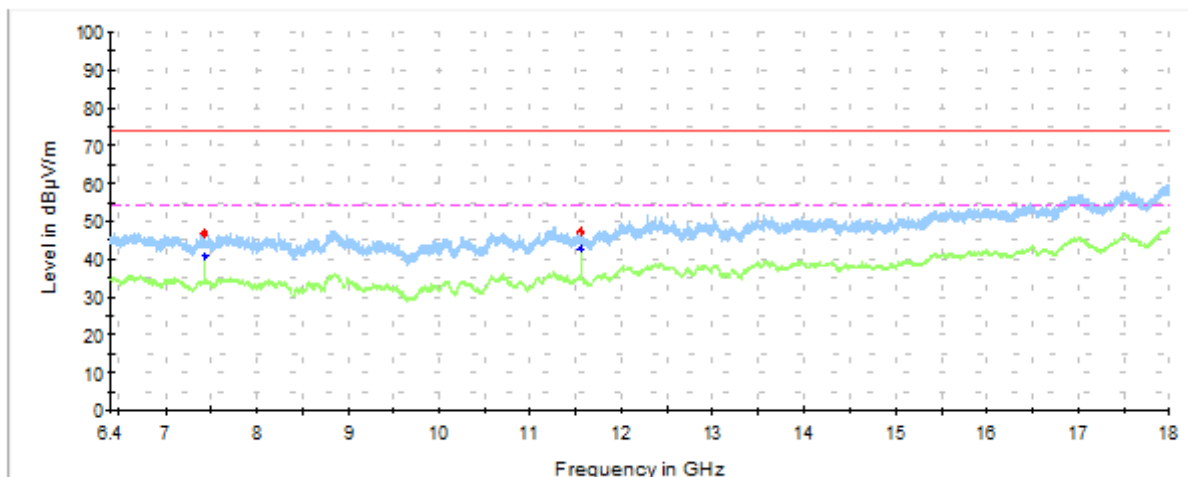
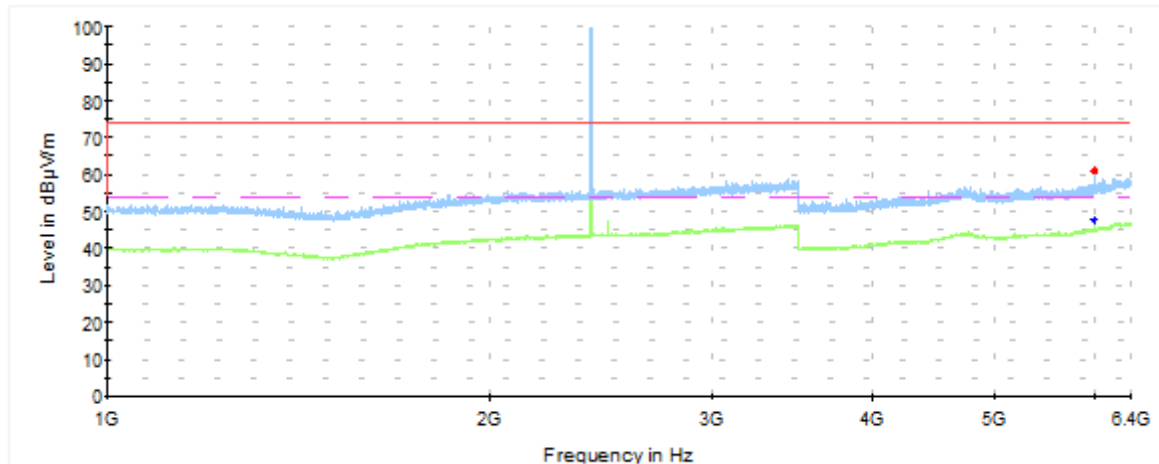


—●— Peak measurements
 —●— Avg measurements
 — Limit FCC Peak
 - - - Limit FCC Avg

Frequency MHz	Max Peak dBuV/m	Avg dBuV/m	Limit dBuV/m	Margin dB
2399	58.0	-	54	16.0
2400	-	48.7	74	5.3
7439	48.2	-	54	25.8
7439	-	40.5	74	13.5
11550	50.2	-	54	23.8
11549	-	46.1	74	7.9

EDR – 8-DPSK – 1 GHz – 18 GHz

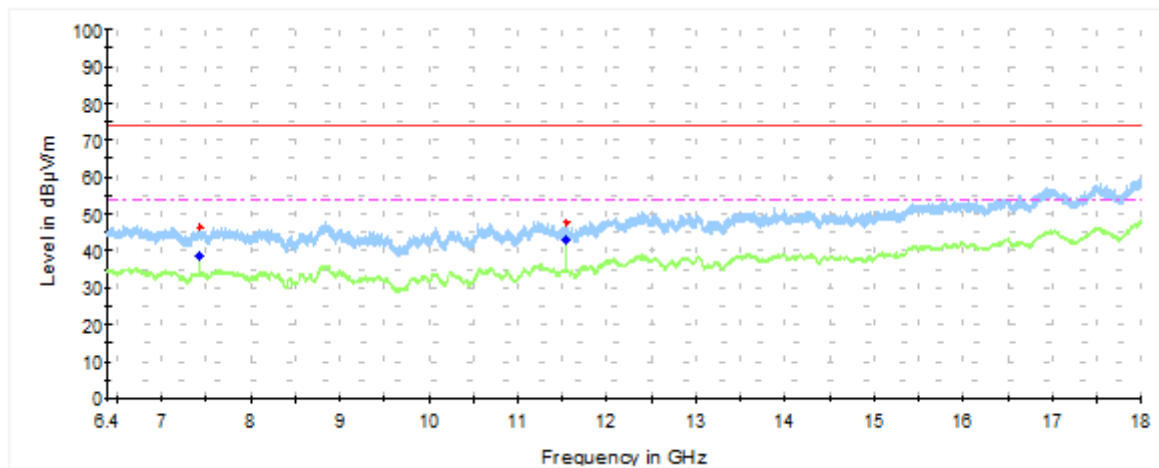
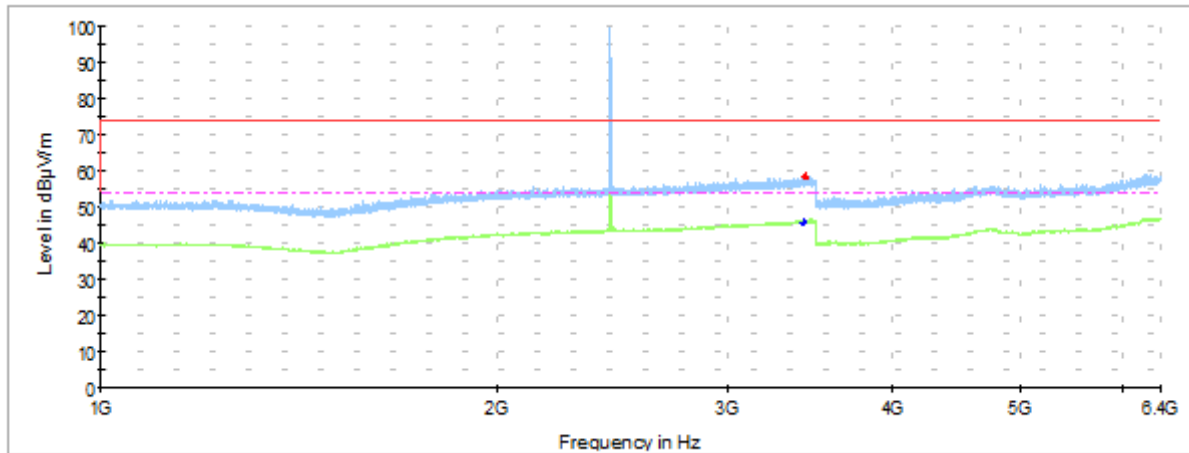
Radiated Spurious – Ch0 3DH5



— Peak measurements
 — Avg measurements
 — Limit FCC Peak
 - - Limit FCC Avg

Frequency	Max Peak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
5990	54.1	-	74	19.9
5990	-	42.2	54	11.8
7439	49.2	-	74	24.9
7439	-	41.3	54	12.7
11550	48.5	-	74	25.5
11549	-	43.1	54	10.9

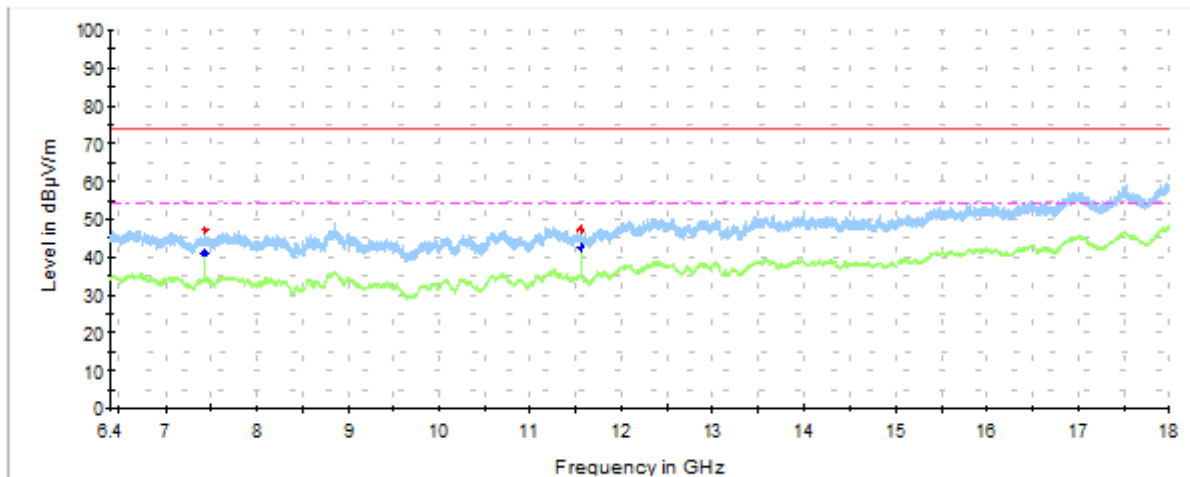
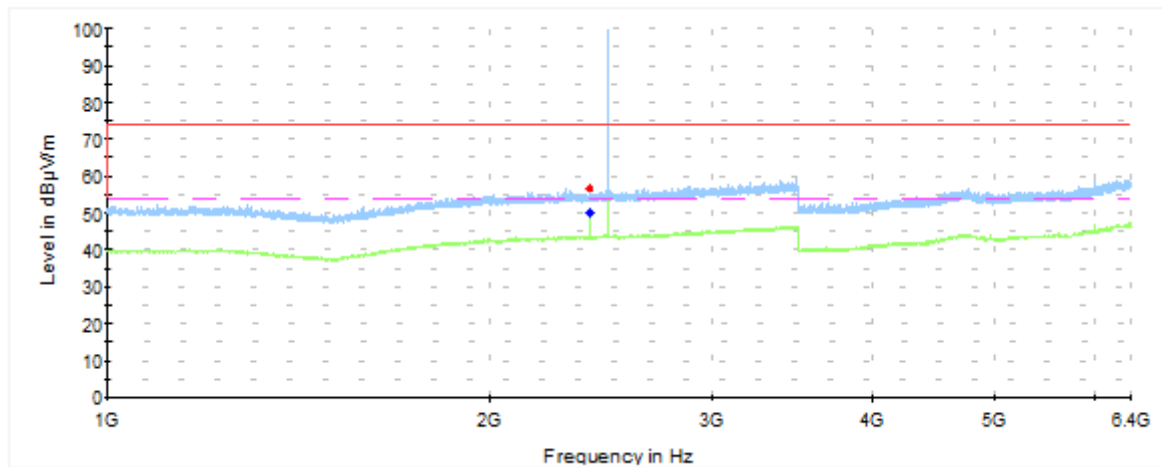
Radiated Spurious – Ch39 3DH5



— Peak measurements
 — Avg measurements
 — Limit FCC Peak
 - - Limit FCC Avg

Frequency	Max Peak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
3432	58.2	-	74	15.8
3432	-	45.8	54	8.2
7439	48.5	-	74	25.5
7439	-	40.2	54	13.8
11550	50.6	-	74	23.4
11549	-	45.1	54	8.9

Radiated Spurious – Ch78 3DH5

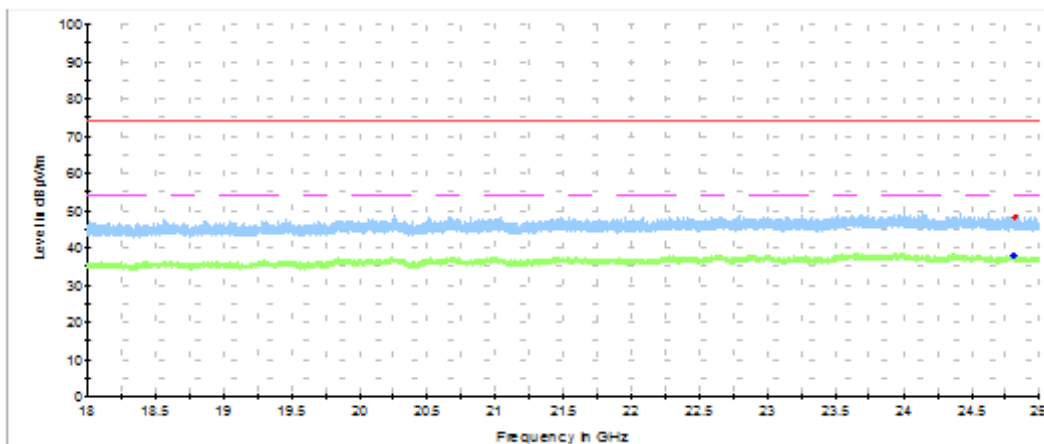


— Peak measurements
 — Avg measurements
 — Limit FCC Peak
 - - Limit FCC Avg

Frequency	Max Peak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
2399	56.8	-	74	17.2
2400	-	52.4	54	1.6
7439	49.2	-	74	24.8
7439	-	40.6	54	13.4
11550	51.0	-	74	23.0
11549	-	45.2	54	8.8

18 GHz – 25 GHz

Radiated Spurious – All Modes



— Peak measurements
 — Avg measurements
 — Limit FCC Peak
 — Limit FCC Avg

Frequency	Max Peak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
24811	48.2	-	74	25.8
24821	-	38.0	54	16.0

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.