TESTING CERT #3478.01

TEST REPORT

EUT Description	**WLAN and BT, 2x2 PCIe M.2 adapter card**
Brand Name	**Intel**
Model Name	**Intel® Dual-Band Wireless-AC 8260**
Serial Number	**TA#: H76739-001 / H76739-001** **WF MAC: 34:13:E8:42:D2:27 / 34:13:E8:42:D2:F4** **BT MAC: 34:13:E8:42:D2:2B / 34:13:E8:42:D2:F8** (see section 4)
FCC/IC ID	**FCC ID: PD98260NGH / PD98260NGHU** **IC ID: 1000M-8260NGH**
Antenna type	**SkyCross WIMAX/WLAN Reference Antenna**
Hardware/Software Version	**HW: TF5 – cfg20.1HE** **Test SW: DRTU version 1.8.3** **Op SW: 18.10.0.19 / 18.11.0.8**
Date of Sample Receipt	**2015-06-01**
Date of Test	**2015-06-18 / 2015-08-17**
Features	**802.11 a/b/g/n/ac Wireless LAN + BDR/EDR 2.1 + BLE 4.0** (see section 5)

Applicant	**Intel Mobile Communications**
Address	**100 Center Point Circle, Suite 200** **Columbia, South Carolina 29210** **USA**
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)

Test Report number	**15051101.TR06**
Revision Control	**Rev. 00**

The test results relate only to the samples tested.
The test report shall not be reproduced in full, without written approval of the laboratory.

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Table of Contents

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 Issue 1 - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment.
5. RSS-Gen Issue 4 - General Requirements for Compliance of Radio Apparatus.
6. ANSI C63.10-2009 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).
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3. Environmental Conditions

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

Temperature	22ºC ± 2ºC
Humidity	52% ± 5%

4. Test samples

Sample	Control #	Description	Model	Serial #	Date of reception	Note
#01	15051101.S23	WiFi/BT High End Module	8260NGW H	WF MAC: 34:13:E8:42:D2:27	2015-06-12	Used for conducted tests
	15051101.S19	Extender board	PCB00495	ASS0495-001, 4955013-084	2015-05-20	
	15051101.S18	AC/DC Adapter	90W 19.5V 4.62A	CN-06C3W2-72438-4C8-44DD-A01	2015-05-20	
	15051101.S17	Laptop	DELL E5440	7CSYN32	2015-05-20	
#02	15051101.S32	WiFi/BT High End Module	8260NGW H	WF MAC: 3413E8369322	2015-05-11	Used for radiated tests
	15051101.S05	Switching power supply SINPRO 5V 6A	SPU60-102	07990495-1249	2015-06-12	
	15051101.S06	Extender board	PCB00495	ASS0495-001, 4950414-019	2015-05-12	
	15051101.S07	USB Cable	E154336	NA	2015-05-12	
	15051101.S08	PCI Cable	Blue cable 1 meter	NA	2015-05-12	
	15051101.S09	Laptop	Dell E5440	9FSYN32	2015-05-12	
	15051101.S10	AC/DC Adapter	90W 19.5V 4.62A	CN-OJCF3V-48661-51S-OPIC-A02	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	5.3GHz (5250.0 – 5350.0 MHz) 5.6GHz (5470.0 – 5725.0 MHz) 5.8GHz (5725.0 – 5850.0 MHz)
BDR/EDR 2.1 BLE 4.0	2.4GHz (2400.0 – 2483.5 MHz)

6. Remarks and comments

N/A

7. Test Verdicts summary

7.1. BT 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	2015-08-19	O.Fargant	First Issue

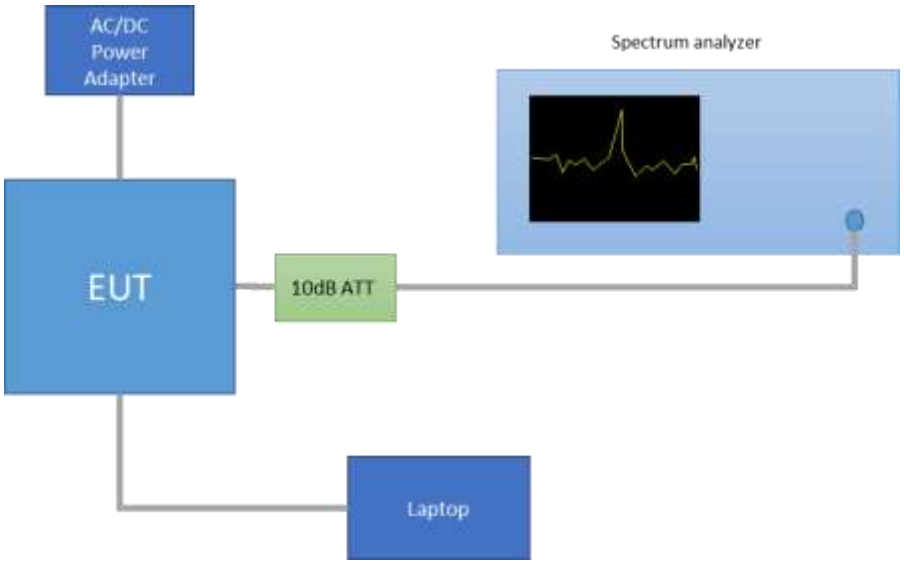
Annex A. Test & System Description

A.1 Measurement system

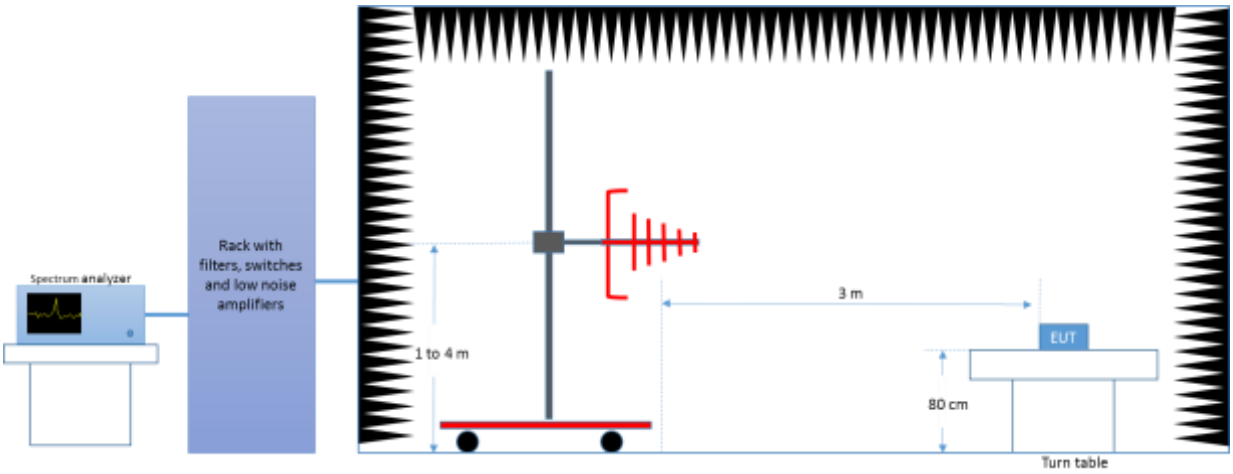
Measurements were performed using the following setups.

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.

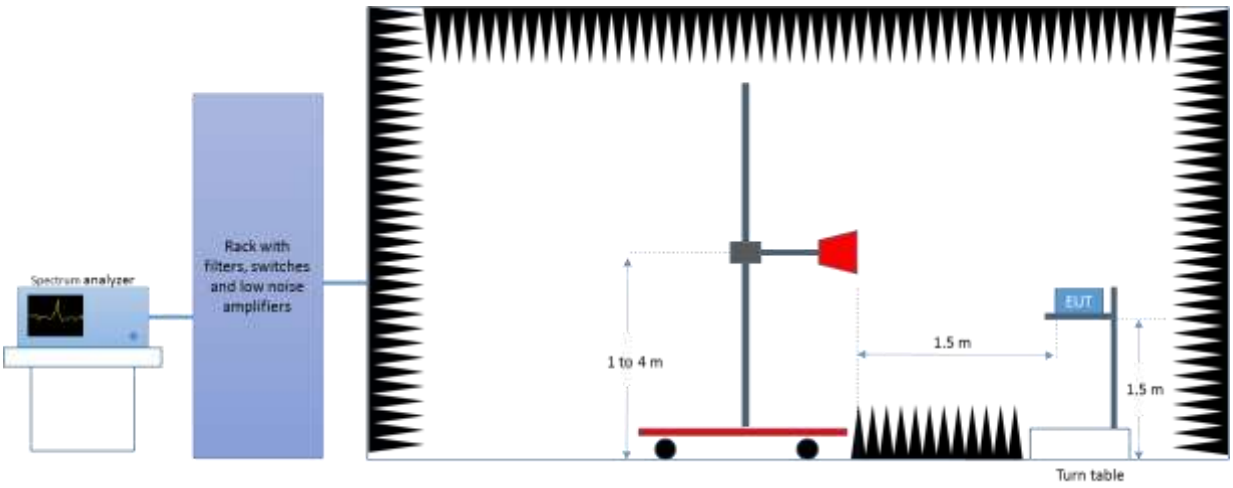
Conducted Setup



Radiated Setup < 1GHz



Radiated Setup > 1GHz



A.2 Test Equipment List

Conducted Setup

ID#	Device	Type/Model	Serial Number	Manufacturer	Cal. Date	Cal. Due Date
0033	Spectrum analyzer	FSV40	101072	Rohde & Schwarz	2014-01-30	2016-01-30

Radiated Setup

ID#	Device	Type/Model	Serial Number	Manufacturer	Cal. Date	Cal. Due Date
0133	Spectrum analyzer	FSV40	101358	Rohde & Schwarz	2014-05-09	2016-05-09
0137	Log antenna 30 MHz – 1 GHz	3142E	00156946	ETS Lindgren	2014-03-05	2016-03-05
0138	Hors antenna 1 GHz – 6.4 GHz	3117	00152266	ETS Lindgren	2014-03-04	2016-03-04
0141	Horn Antenna 6.4 GHz – 18 GHz	3117-PA	00157736	ETS Lindgren	2014-06-03	2016-06-03
0248	Horn Antenna 1 GHz – 18 GHz	3117-PA	00167062	ETS Lindgren	2014-08-13	2016-08-13
0139	Horn Antenna 18GHz – 26GHz	114514	00167100	ETS Lindgren	2014-04-25	2016-04-25
0140	Horn Antenna 26GHz – 40GHz	120722	00169638	ETS Lindgren	2014-08-14	2016-08-14
0135	Anechoic chamber	FACT 3	RFD_FA_100	ETS Lindgren	2014-05-06	2016-05-06
0329	Measurement Software	EMC32	1300.7027.00 (100401)	Rohde & Schwarz	N/A	N/A
0133	Spectrum analyzer	FSV40	101358	Rohde & Schwarz	2014-05-09	2016-05-09

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

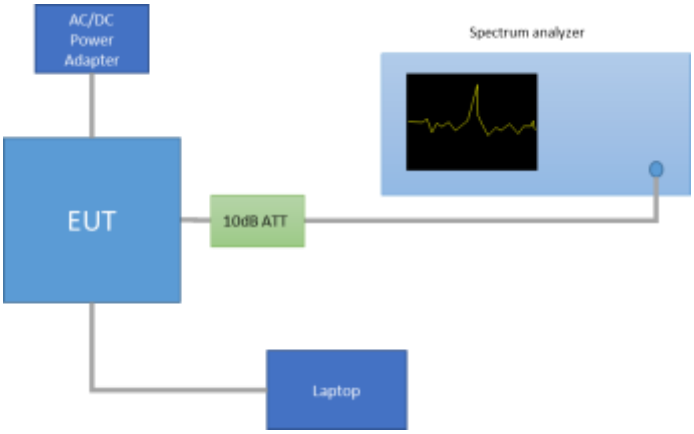
B.1 20dB Bandwidth and Carrier frequency separation

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 through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



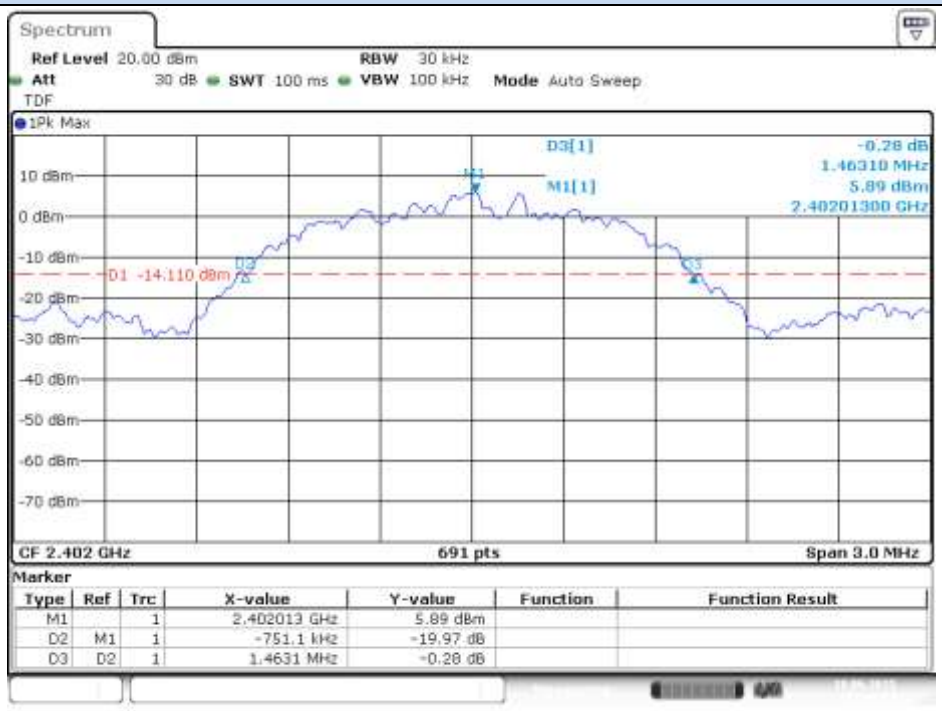
Results tables:

Mode	Channel Number	Frequency [MHz]	20dB BW [MHz]	Freq. Separation [kHz]
EDR π/4-DQPSK	0	2402	1.463	1000.00
	39	2441	1.489	
	78	2480	1.489	
EDR 8-DPSK	0	2402	1.433	1000.00
	39	2441	1.437	
	78	2480	1.441	

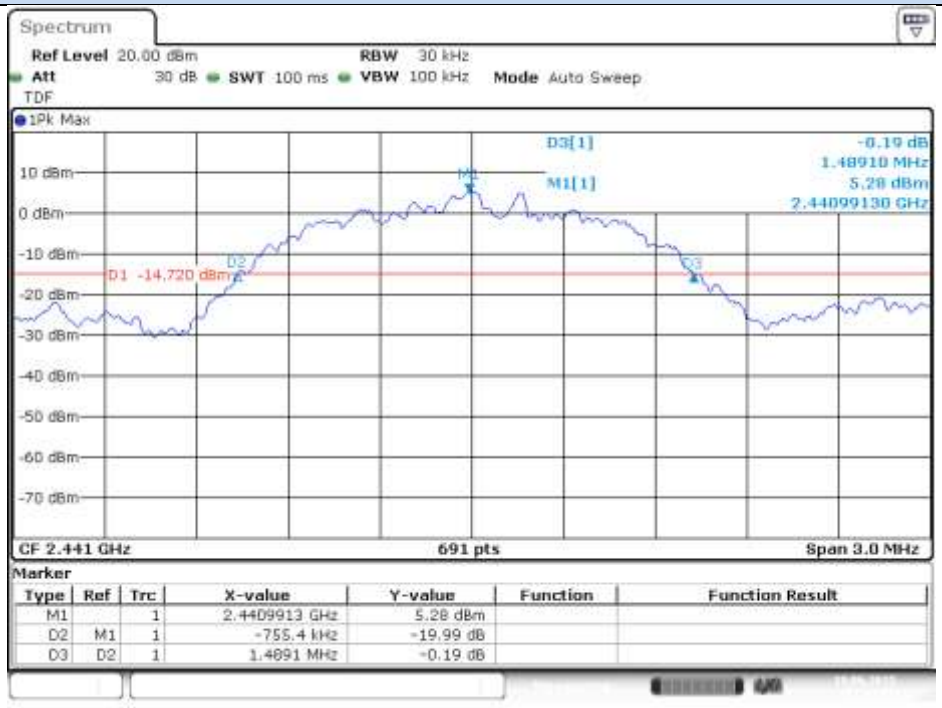
Results screenshot:

EDR – π/4-DQPSK

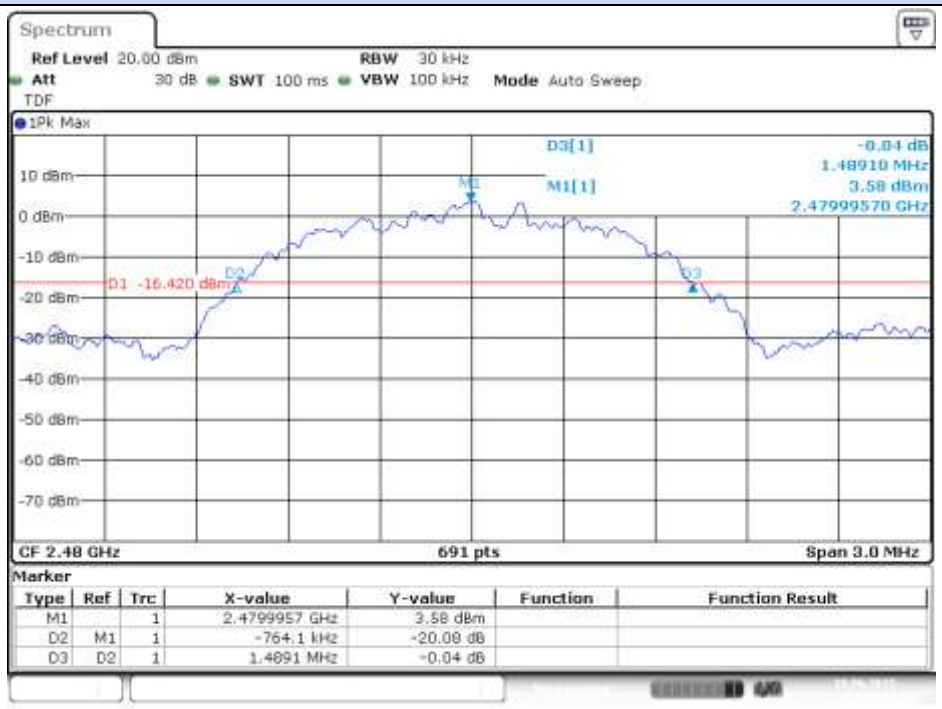
20dB BW - CH0



20dB BW - CH39

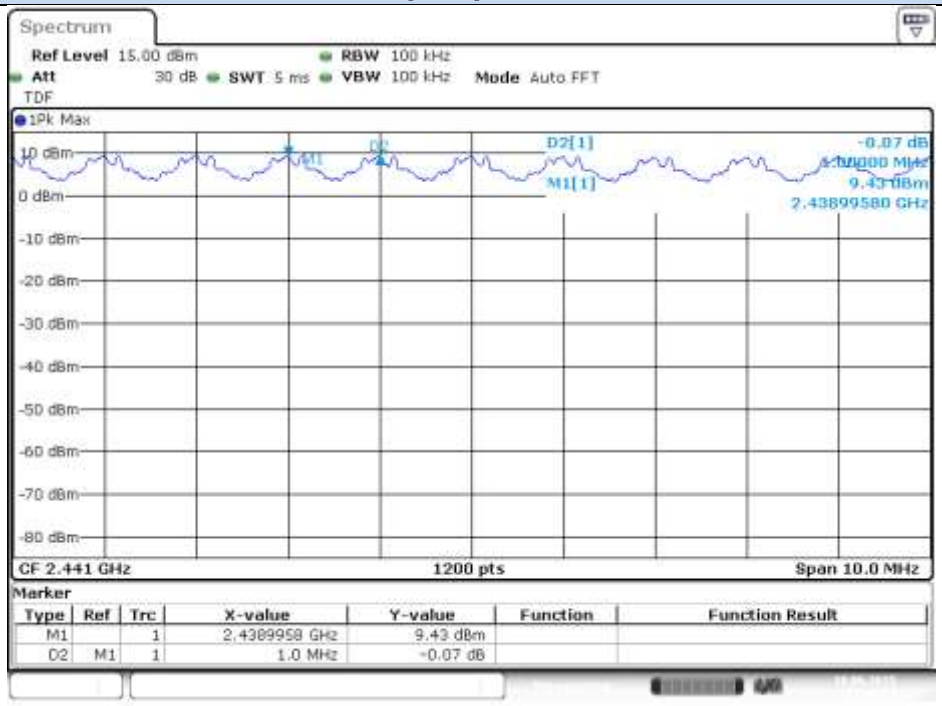


20dB BW - CH78



Date: 19.JUN.2015 17:00:52

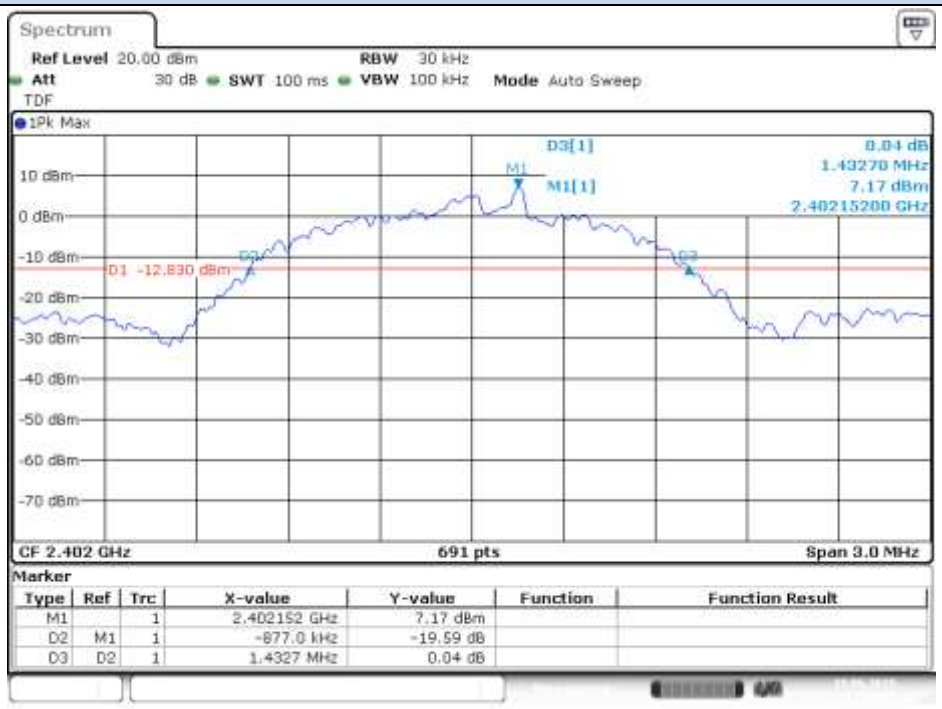
Freq. Separation



Date: 18.JUN.2015 15:38:14

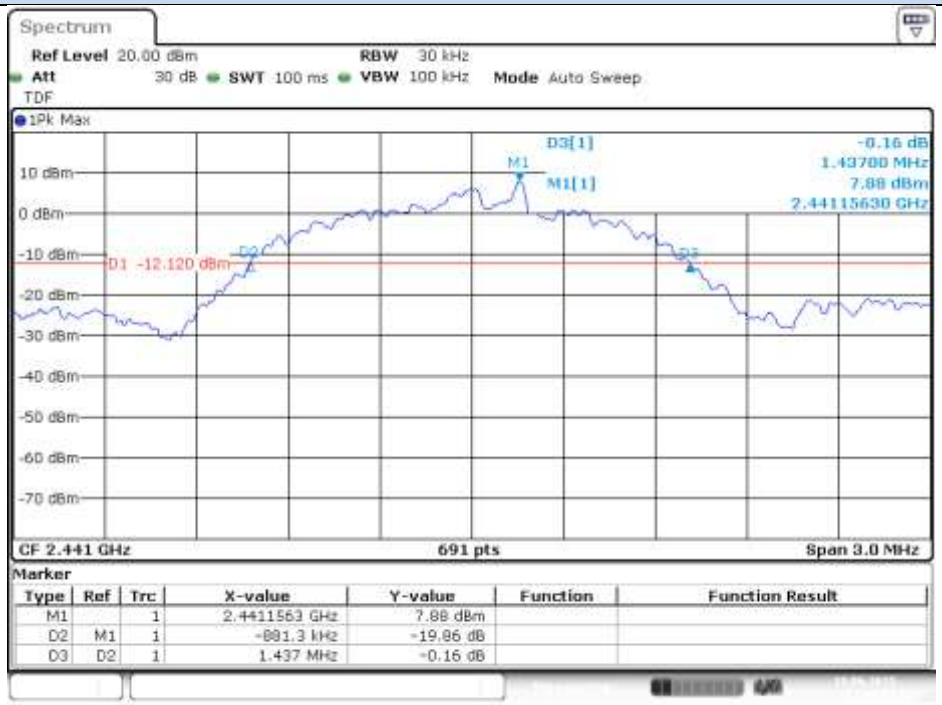
EDR – 8-DPSK

20dB BW - CH0



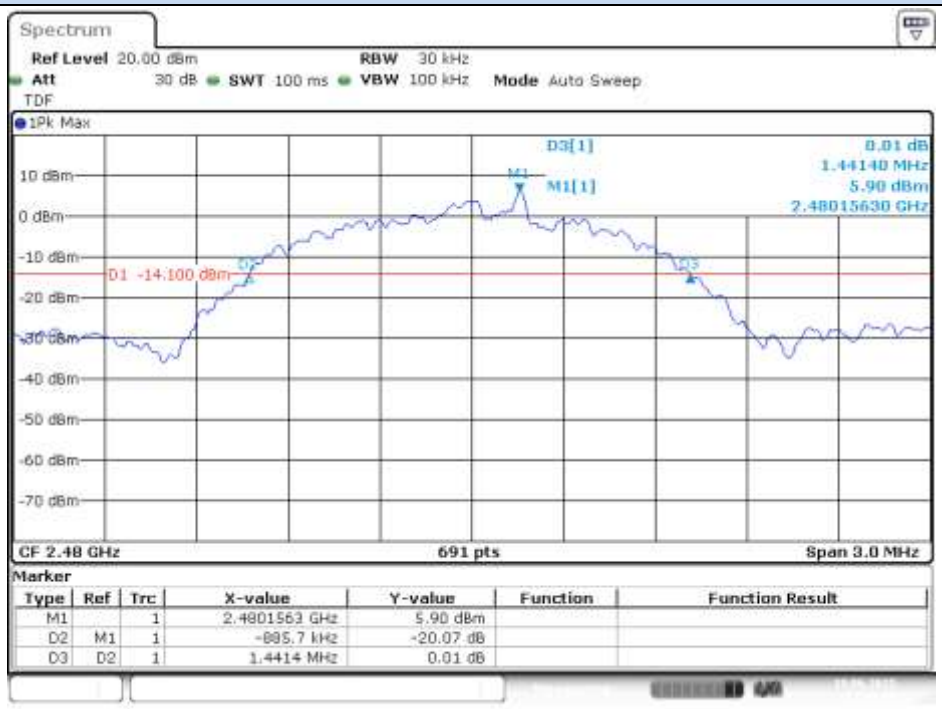
Date: 19.JUN.2015 17:05:45

20dB BW - CH39



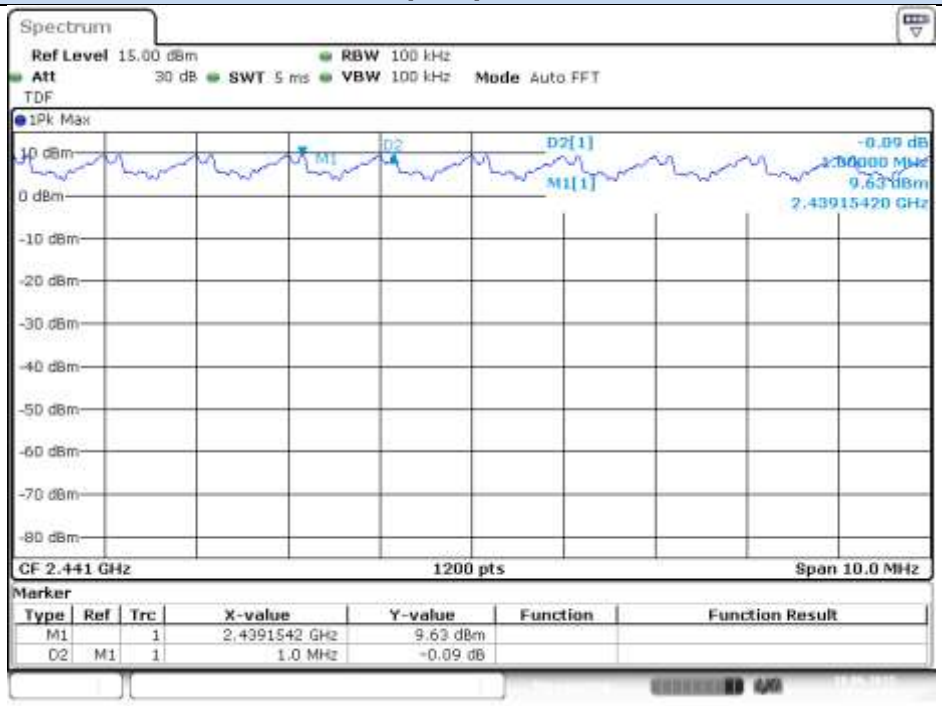
Date: 19.JUN.2015 17:14:23

20dB BW - CH78



Date: 19.JUN.2015 17:19:48

Freq. Separation



Date: 18.JUN.2015 15:36:58

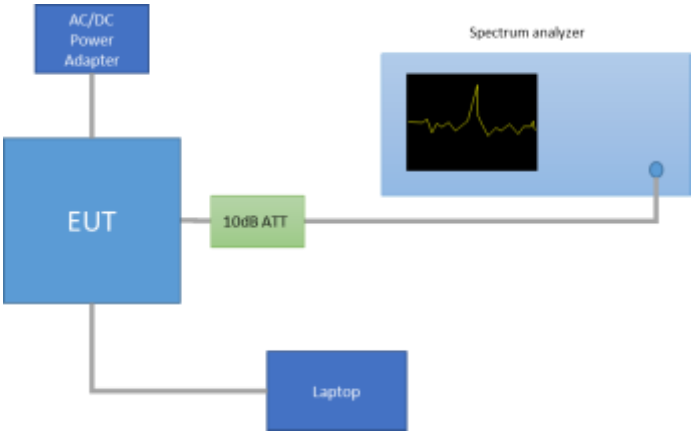
B.2 Number of hopping channels

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.



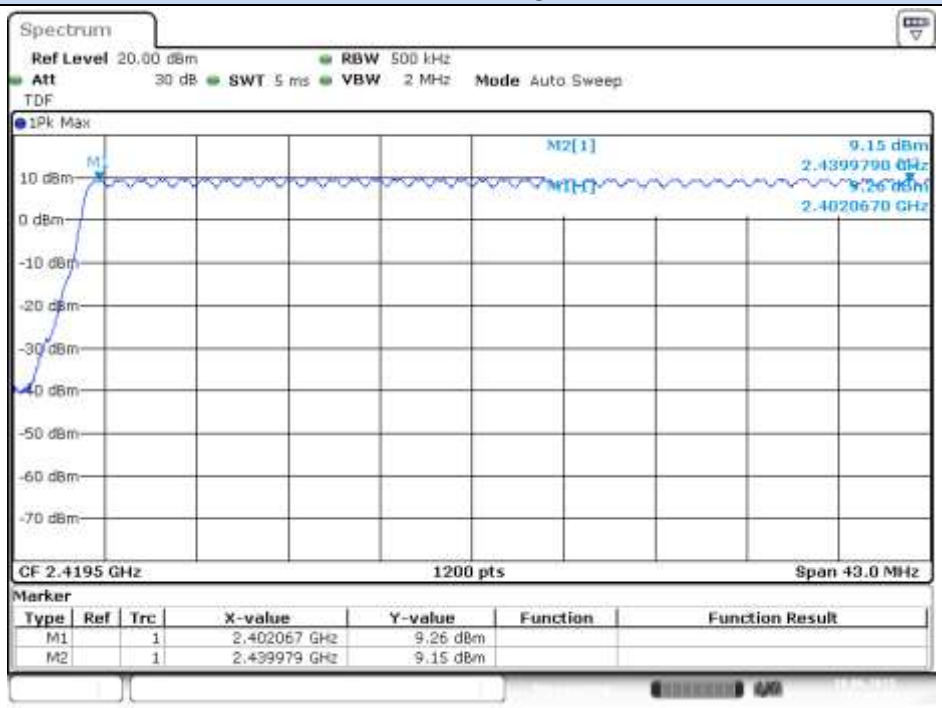
Results tables:

Mode	Number of hopping channels
EDR π/4-DQPSK	79
EDR 8-DPSK	79

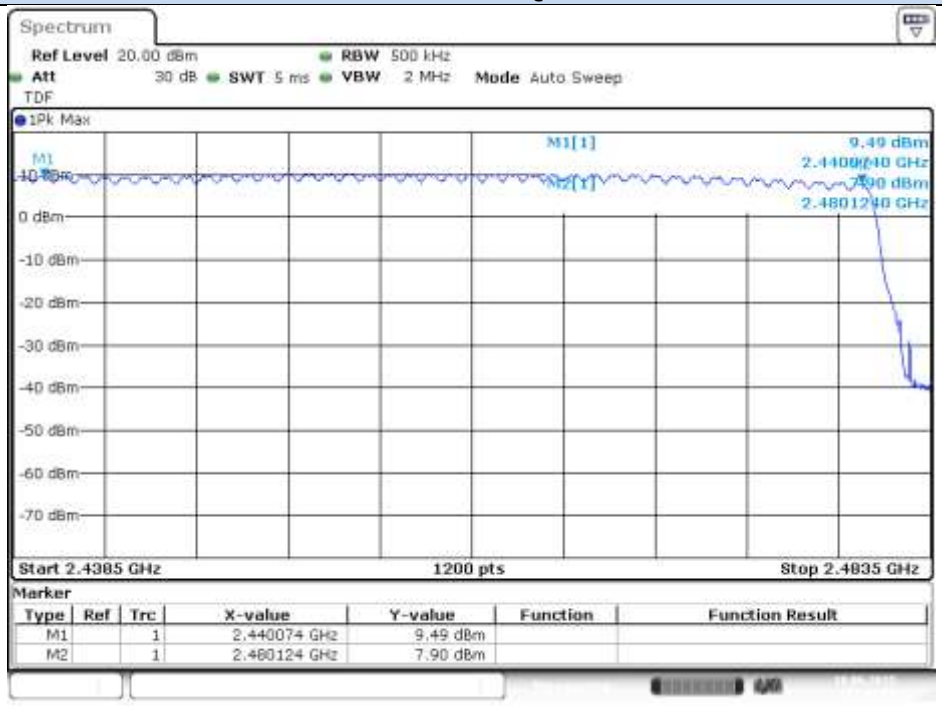
Results screenshot:

Number of hopping channels

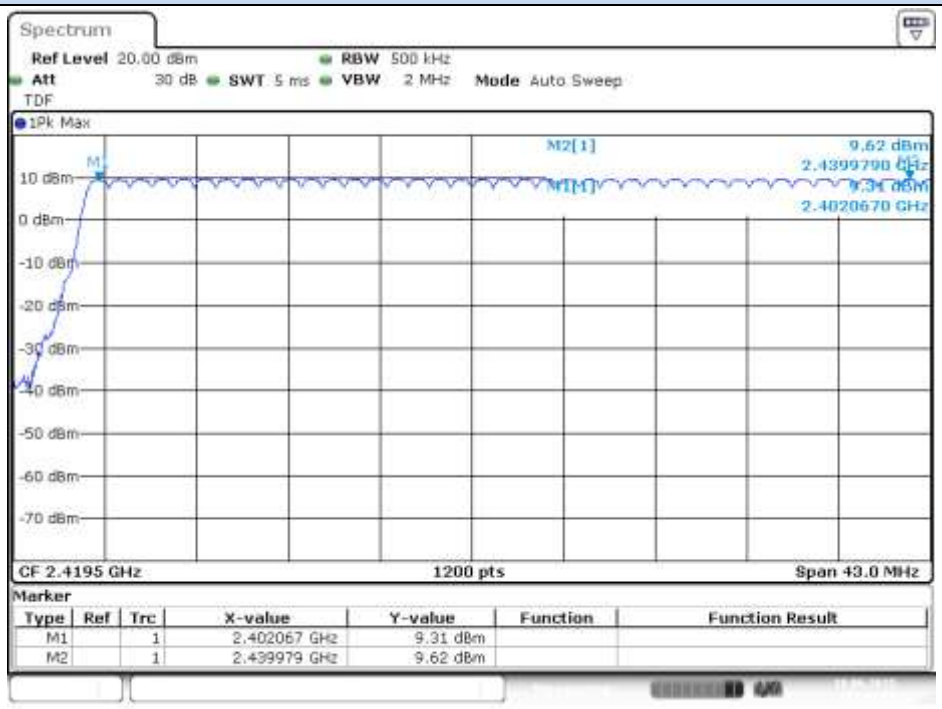
EDR – π/4-DQPSK



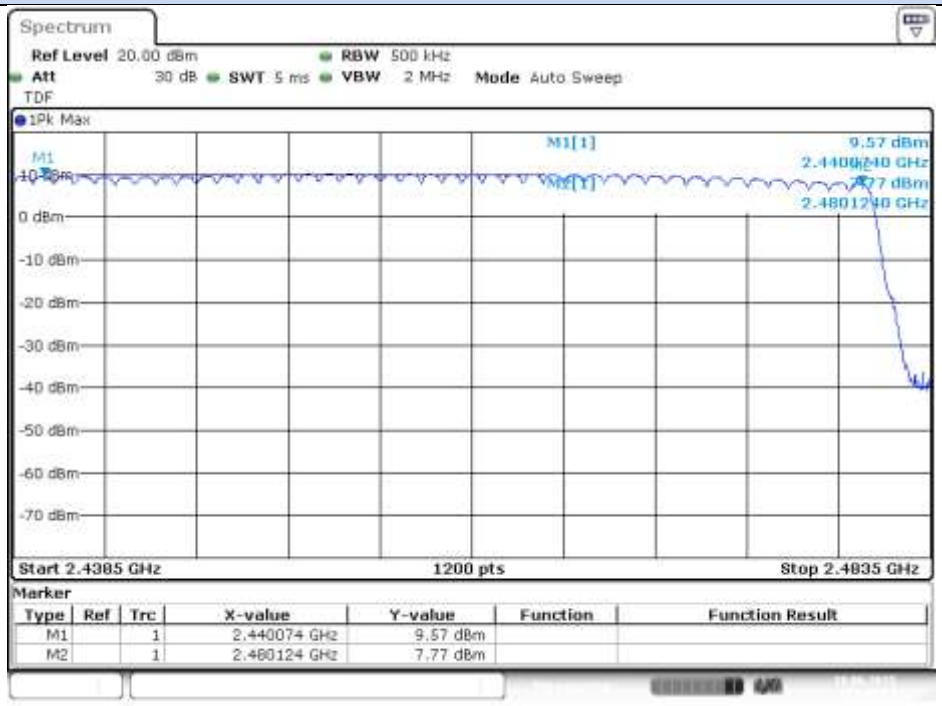
EDR – π/4-DQPSK



EDR – 8-DPSK



EDR – 8-DPSK



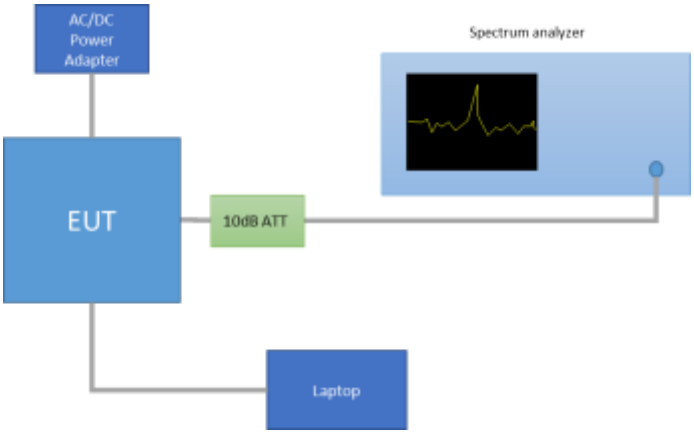
B.3 Time of Occupancy (Dwell Time)

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 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 x 79 = 31.6 seconds, each channel appears 10.13 x 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 x 79 = 31.6 seconds, each channel appears 5.1 x 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 166.67/79 = 3.37 times per second and, for a period of 0.4 x 79 = 31.6 seconds, each channel appears 3.37 x 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.

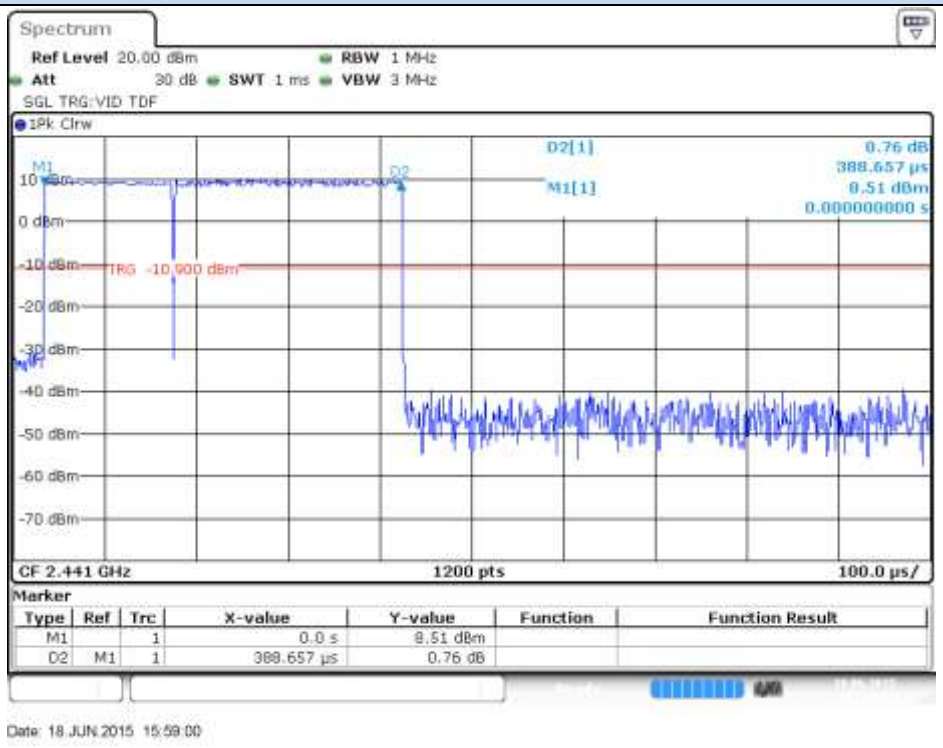
Results tables:

Mode	Packet Type	Times of appearance	Tx-time [ms]	Dwell Time [ms]
EDR π/4-DQPSK	2-DH1	320.11	0.389	124.52
	2-DH3	161.16	1.635	263.50
	2-DH5	106.49	2.887	307.44
EDR 8-DPSK	3-DH1	320.11	0.390	124.84
	3-DH3	161.16	1.636	263.66
	3-DH5	106.49	2.887	307.44

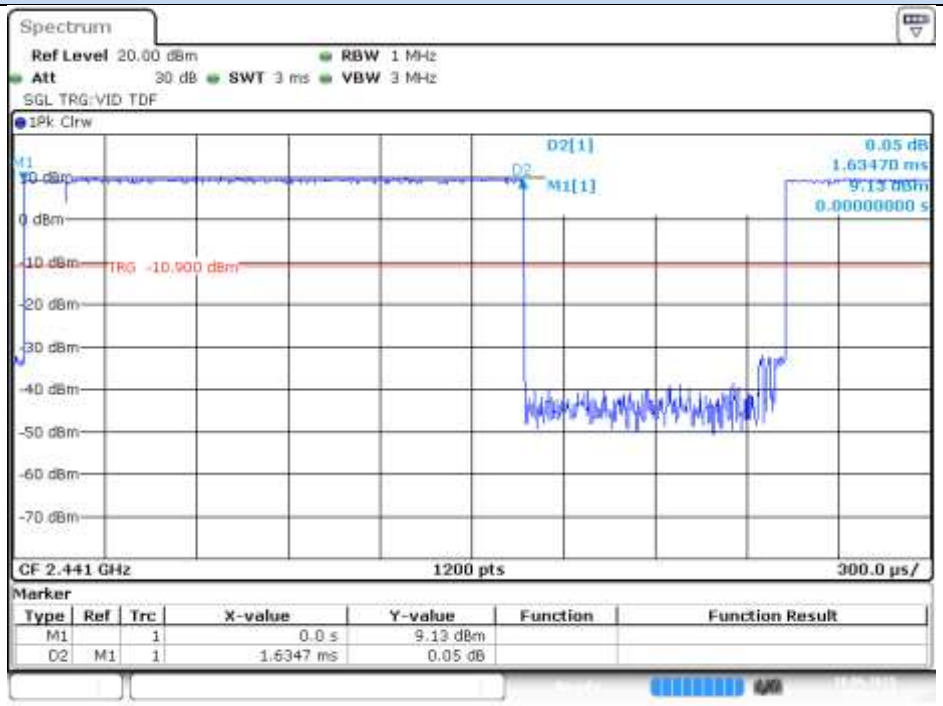
Results Screenshot:

EDR – π/4-DQPSK

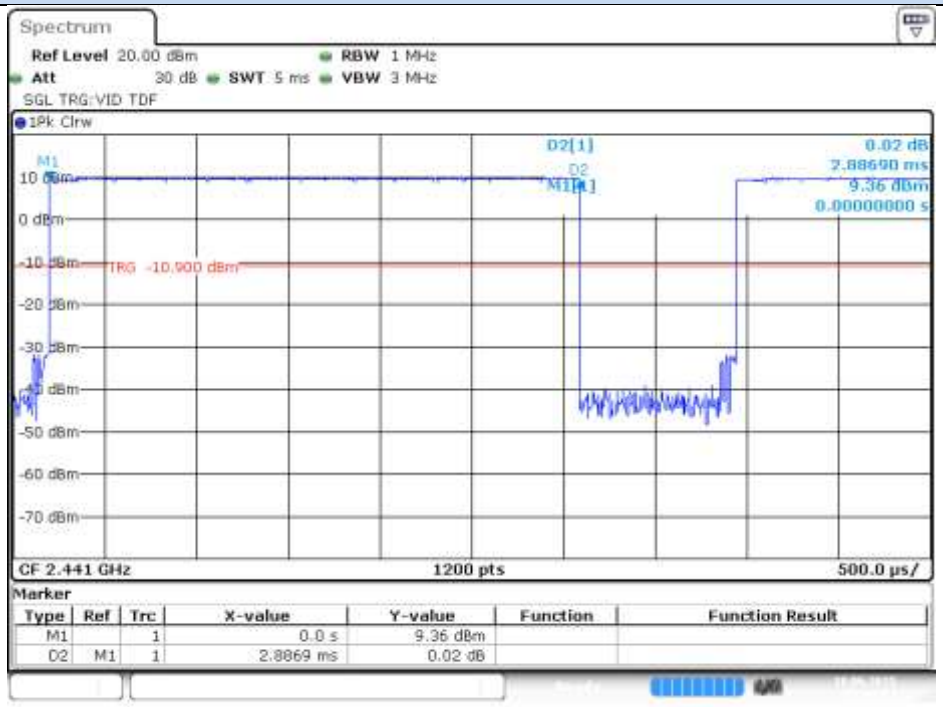
2-DH1 Tx-time



2-DH3 Tx-time

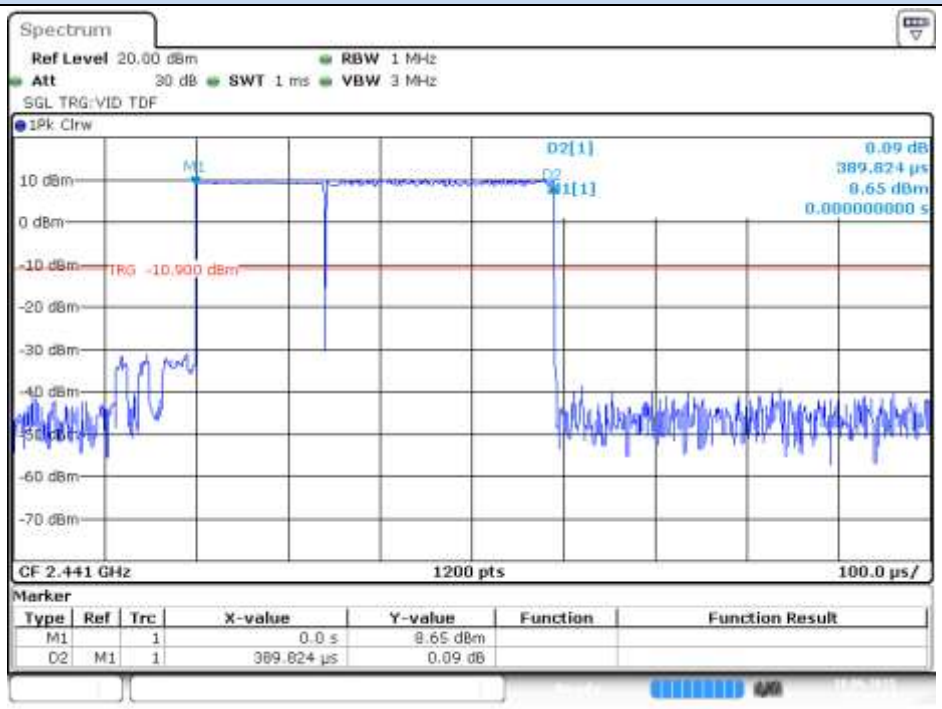


2-DH5 Tx-time

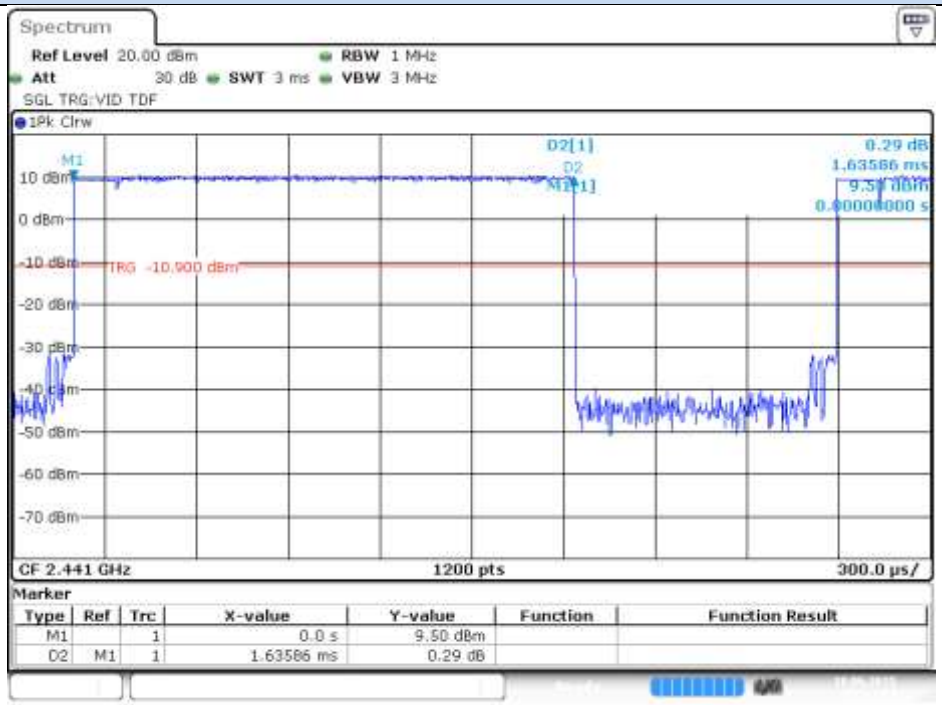


EDR – 8-DPSK

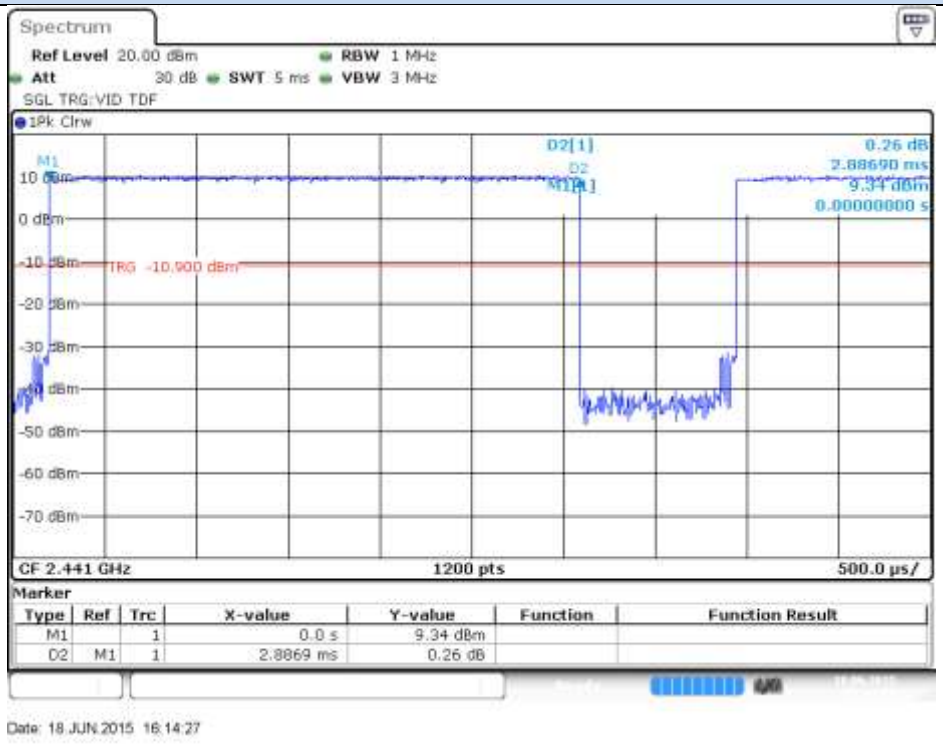
3-DH1 Tx-time



3-DH3 Tx-time



3-DH5 Tx-time



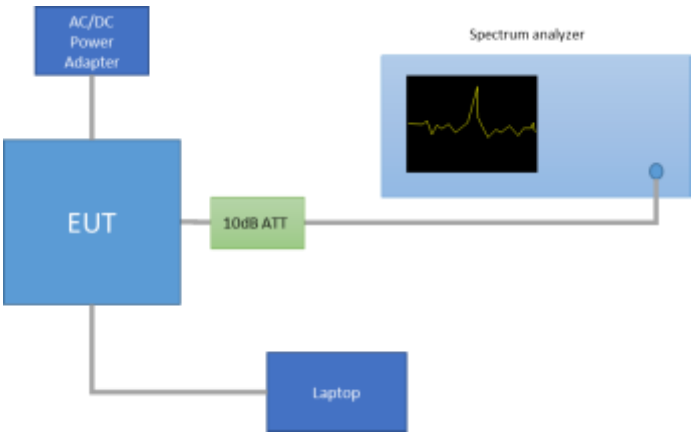
B.4 Maximum Peak Output Power and antenna gain

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 through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



The declared maximum antenna gain is 3.24dBi.

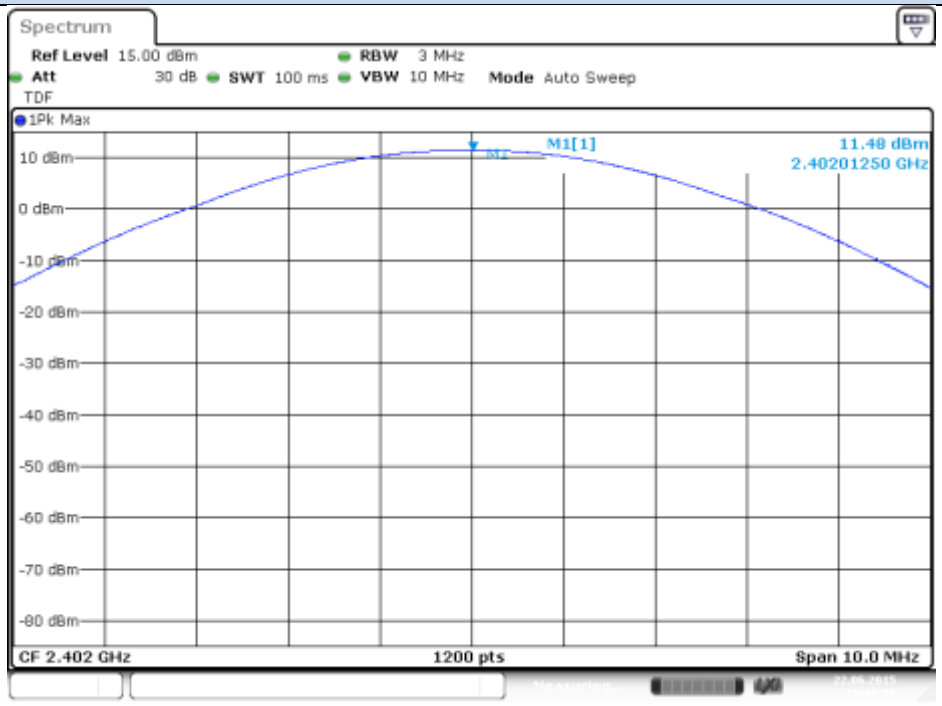
Results tables:

Mode	Channel Number	Frequency [MHz]	Peak Power [dBm]
EDR π/4-DQPSK	0	2402	11.48
	39	2441	10.72
	78	2480	10.22
EDR 8-DPSK	0	2402	11.11
	39	2441	10.82
	78	2480	10.31

Results Screenshot:

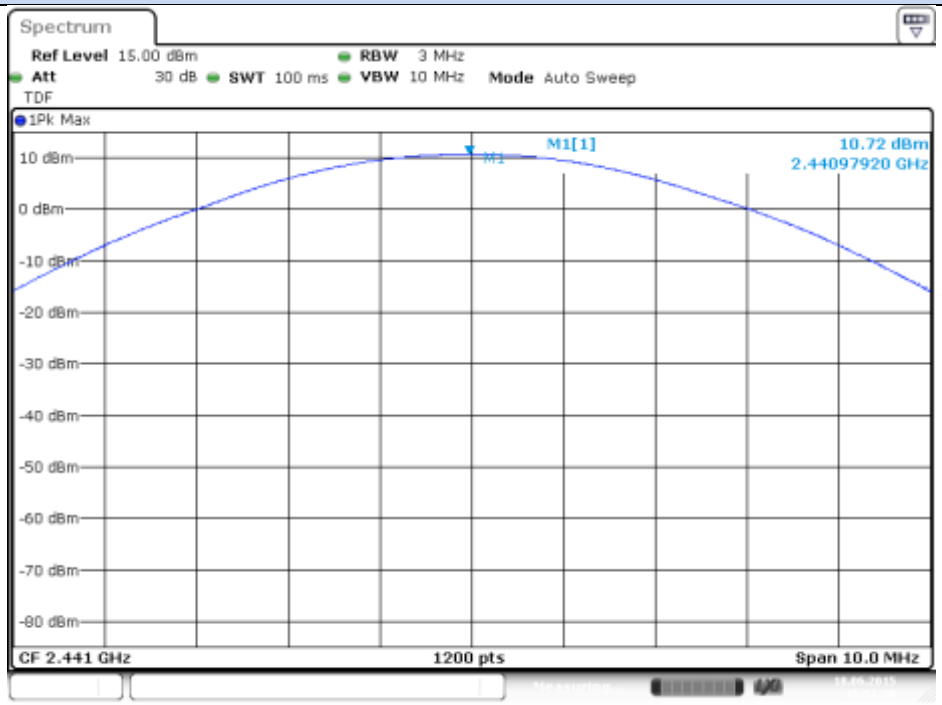
EDR – π/4-DQPSK

Peak Power - CH0



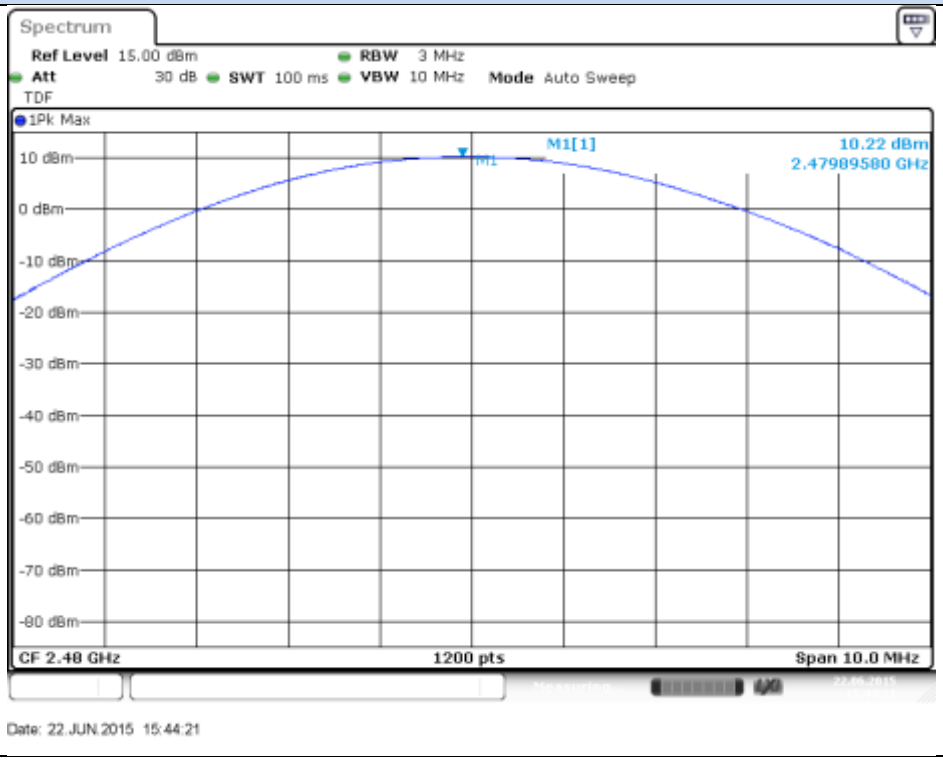
Date: 22.JUN.2015 15:40:59

Peak Power - CH39



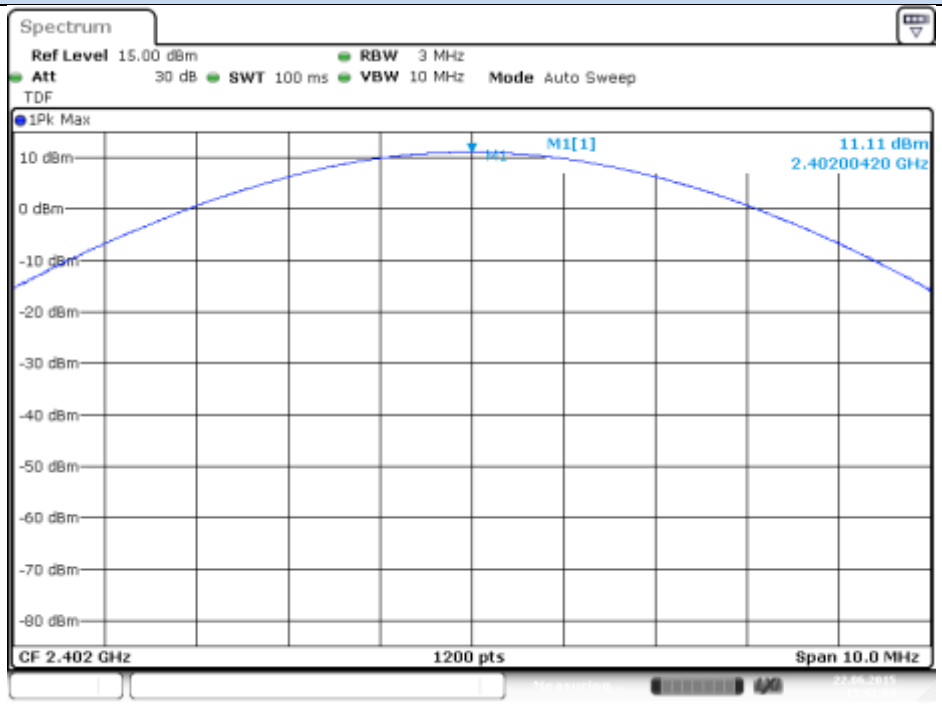
Date: 18.JUN.2015 15:51:50

Peak Power - CH78

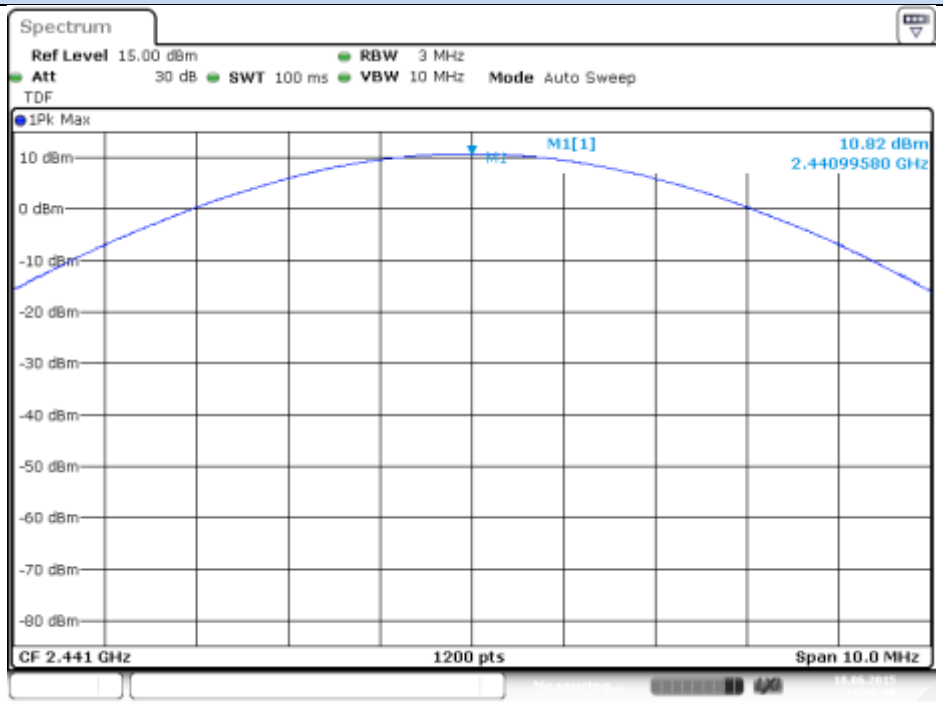


EDR – 8-DPSK

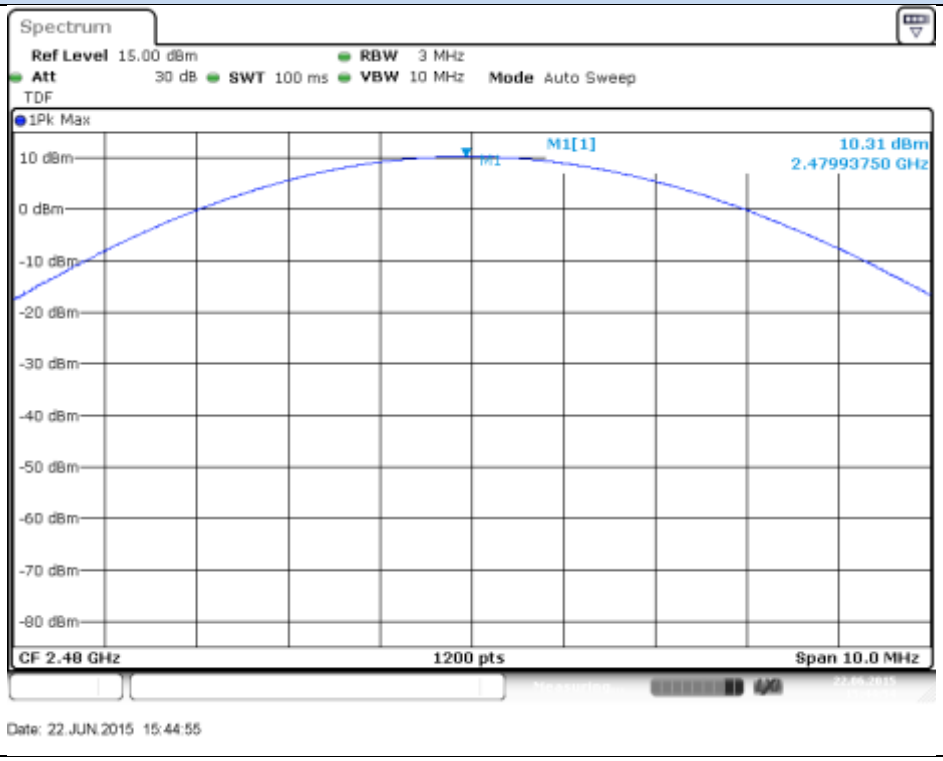
Peak Power - CH0



Peak Power - CH39



Peak Power - CH78



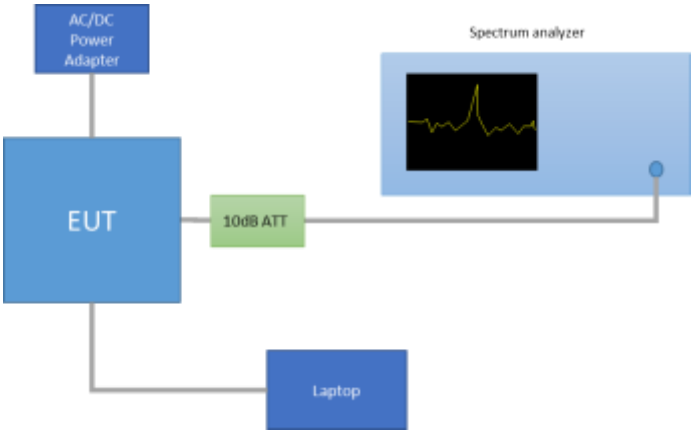
B.5 Out-of-band emissions (conducted)

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.

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 through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



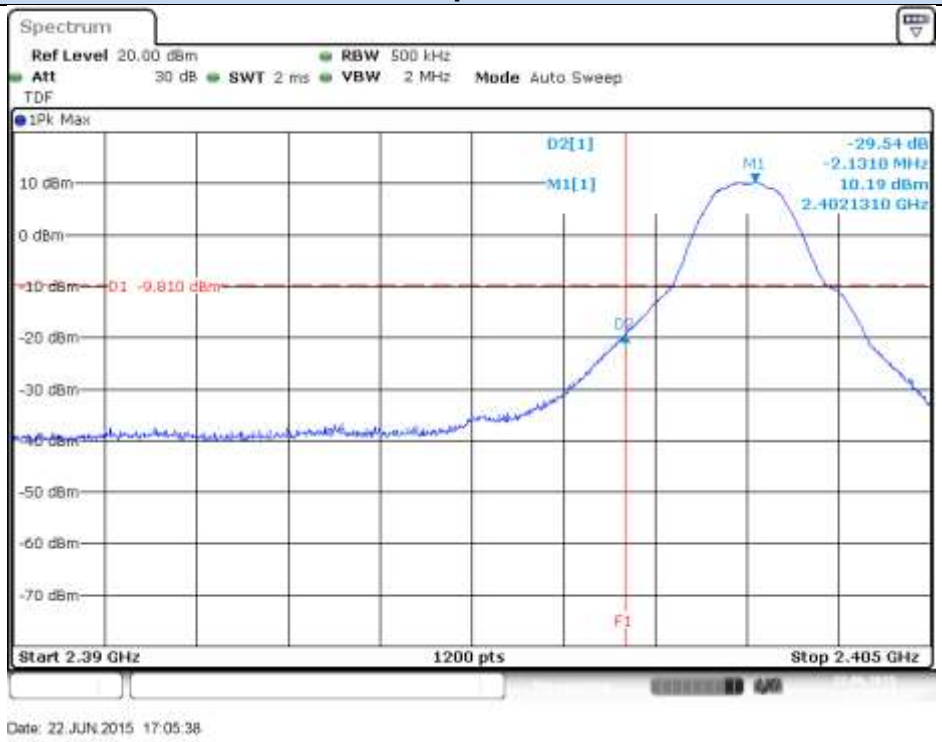
All values reported are converted in dBm, the table below shows the limits of the radiated emission (FCC part 15.209(a)) converted from dBµV/m to dBm.

FCC part 15.209 (a)		Converted values	
Distance (m)	Field strength (microvolts/meter)	Field strength (dB microvolts/meter)	Power (dBm)
3	500	53.98	-41.2
3	200	46.02	-49.2
3	150	43.52	-51.7
3	100	40.00	-55.2

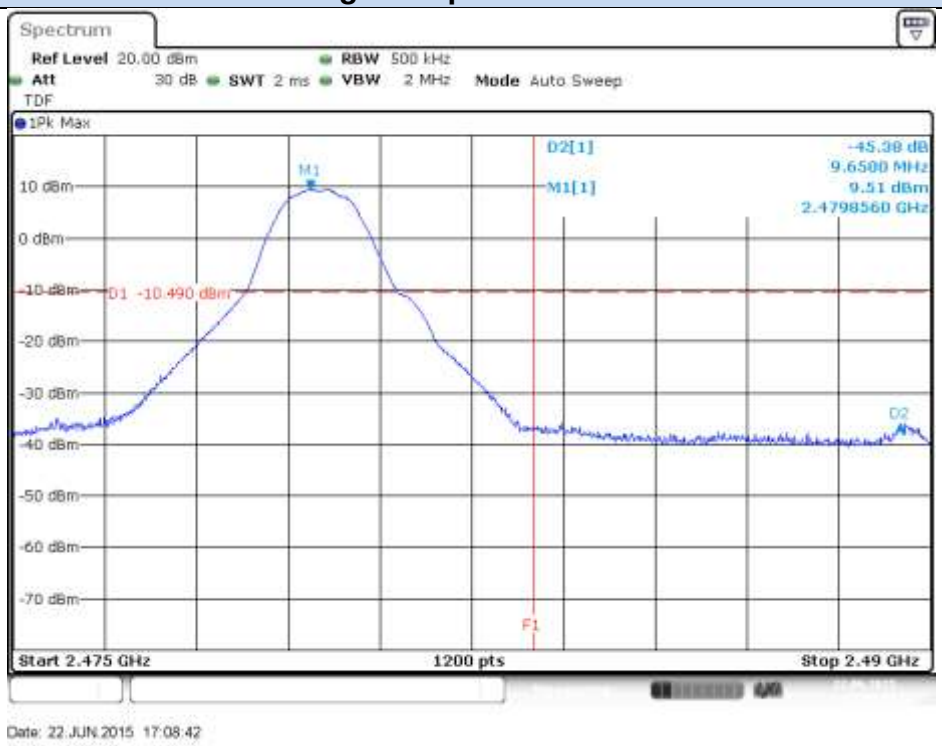
Band Edge results Screenshot:

EDR – π/4-DQPSK

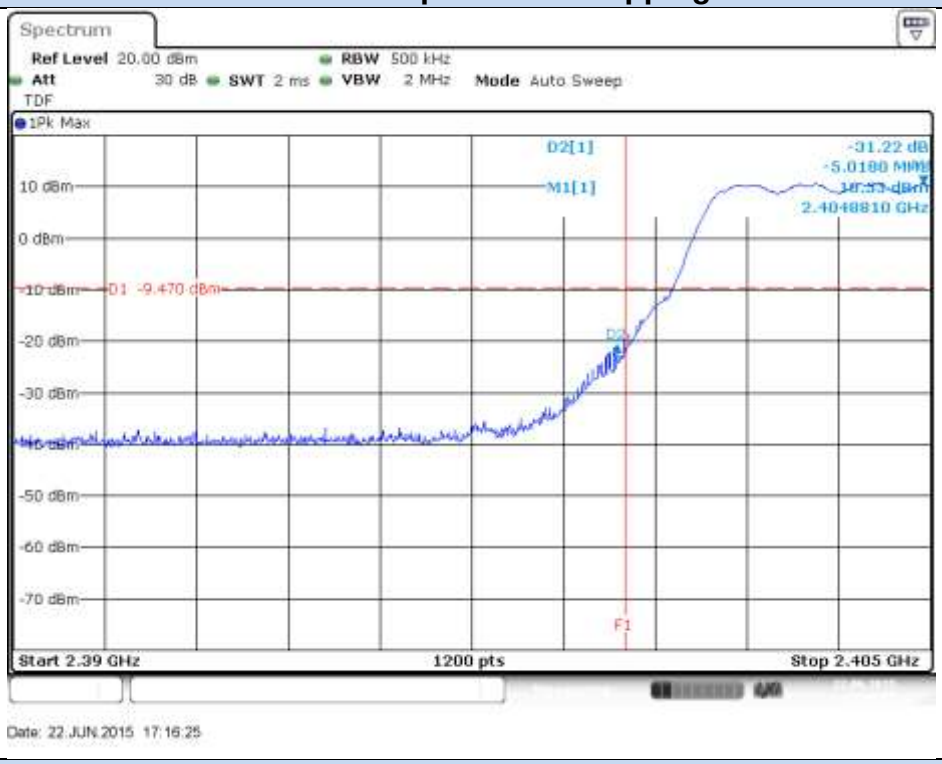
BE Low Freq Section - CH0



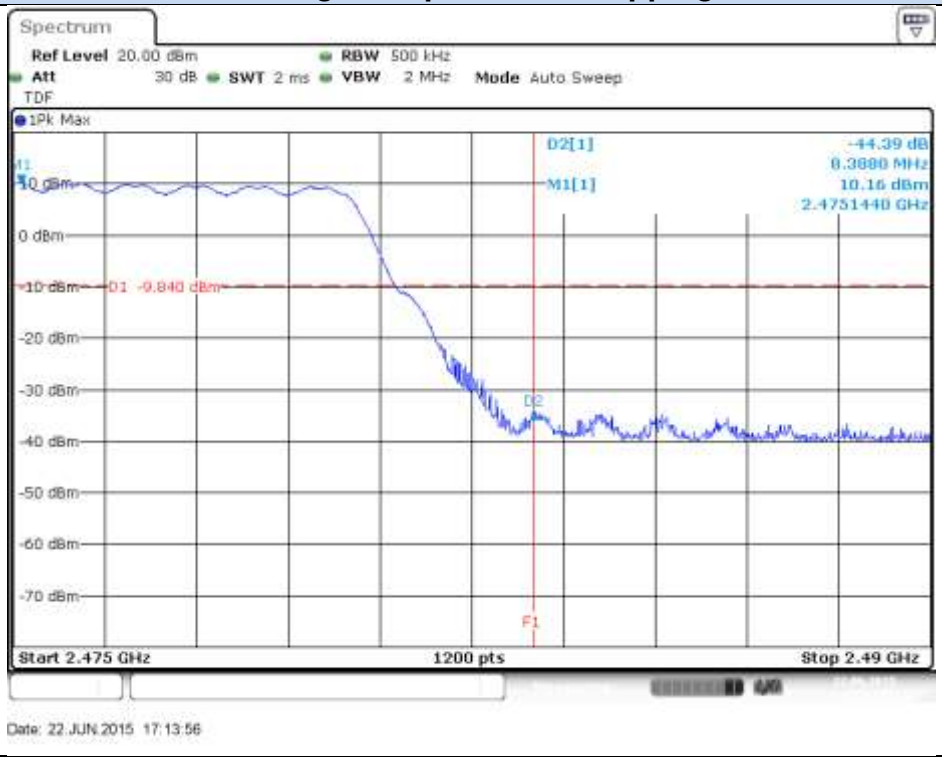
BE High Freq Section - CH78



BE Low Freq Section - Hopping

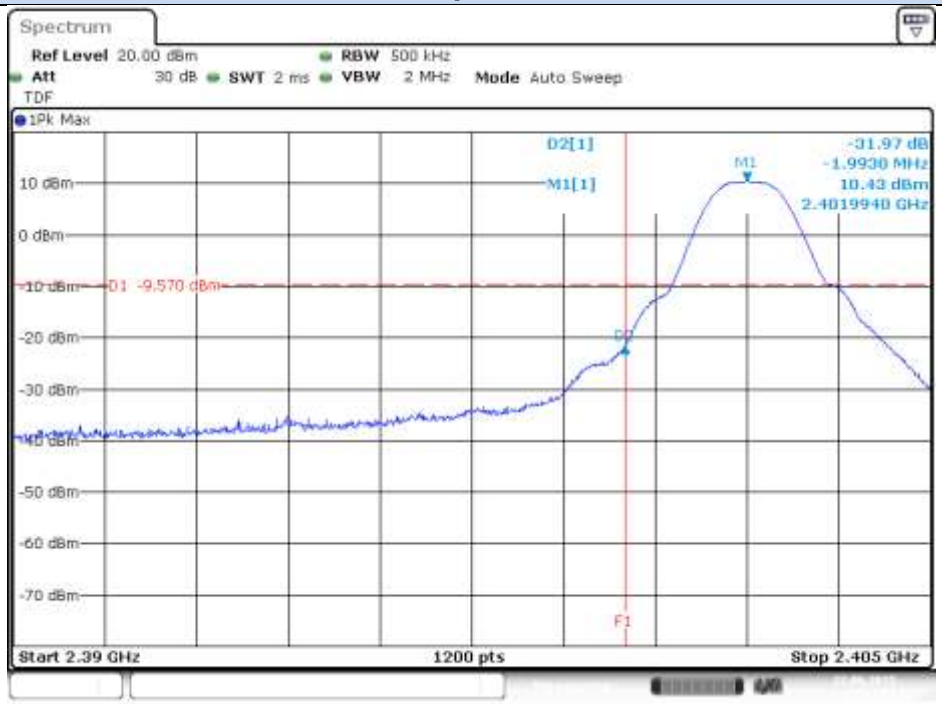


BE High Freq Section - Hopping

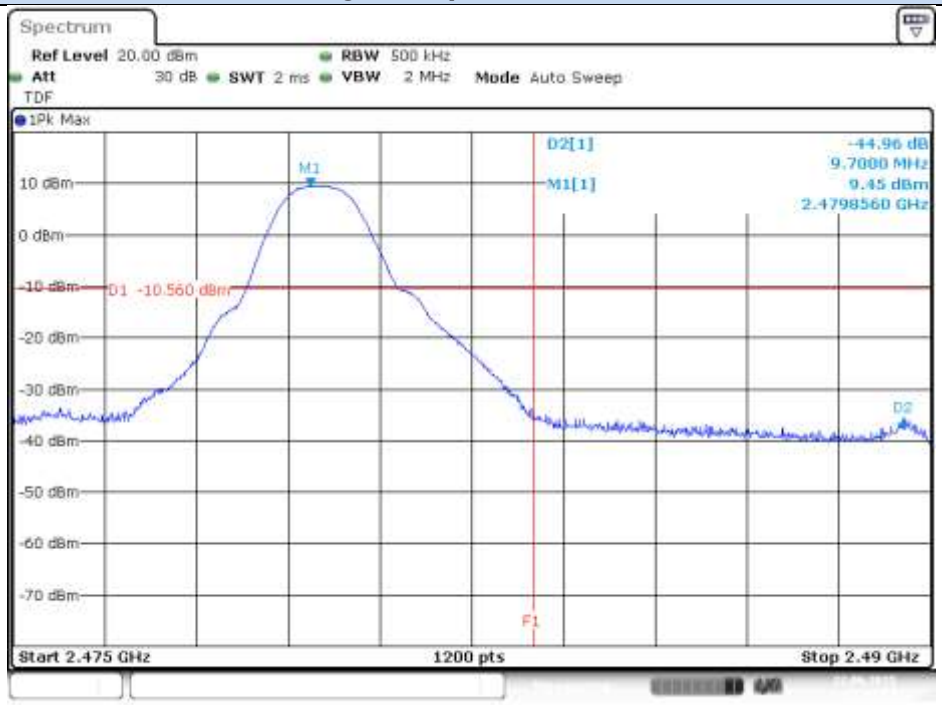


EDR – 8-DPSK

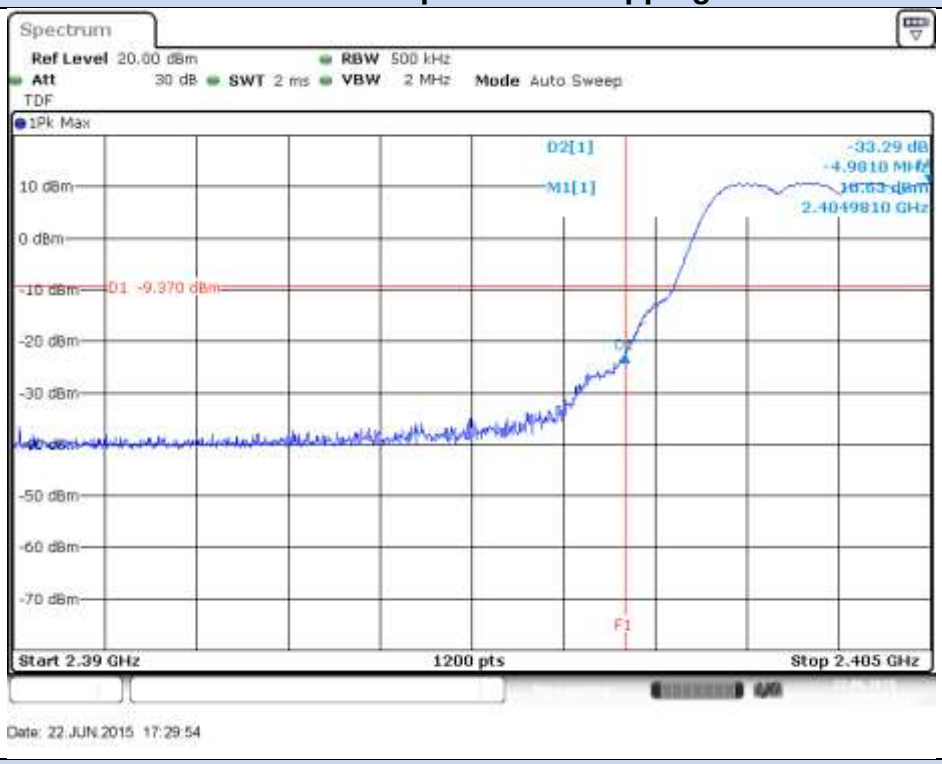
BE Low Freq Section - CH0



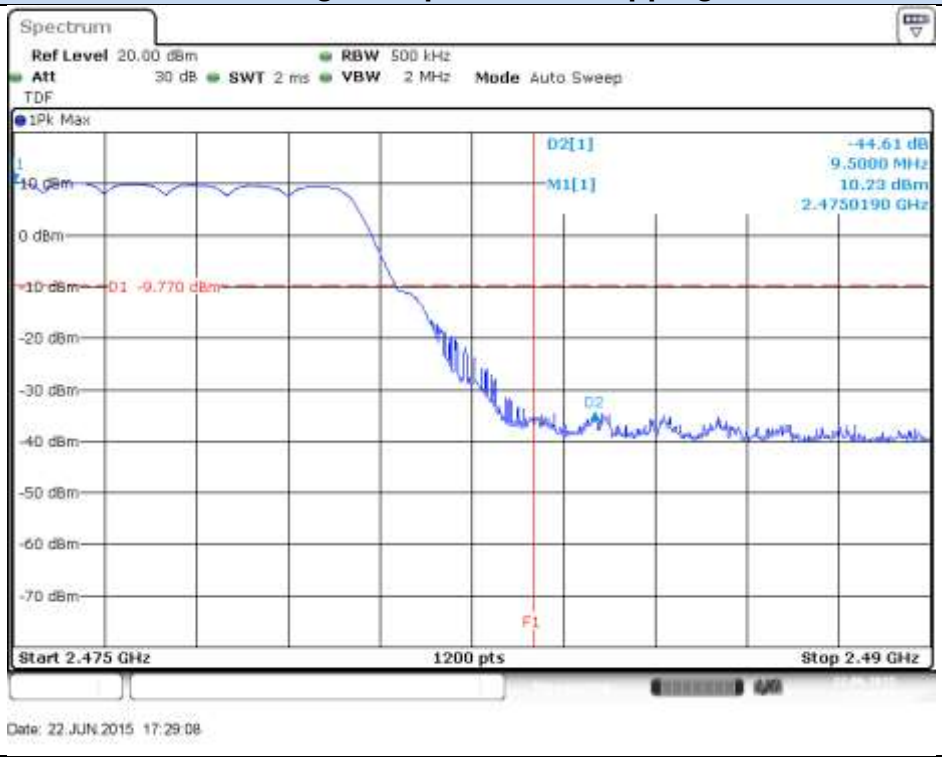
BE High Freq Section - CH78



BE Low Freq Section - Hopping



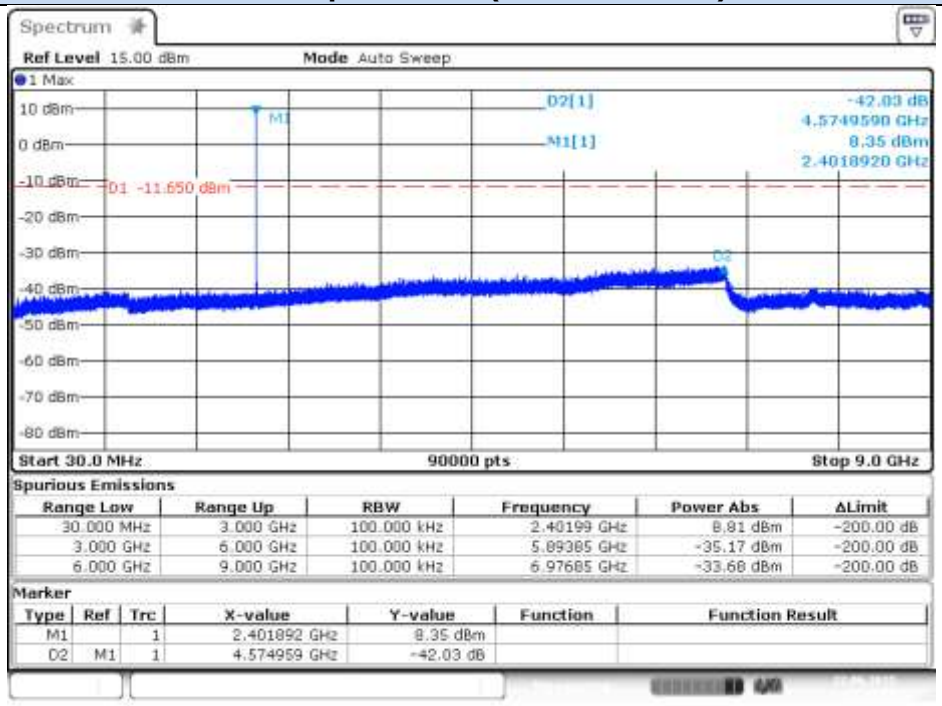
BE High Freq Section - Hopping



Conducted Spurious results Screenshot:

EDR – π/4-DQPSK

Cond Spur – CH0 (30MHz – 9GHz)



Spurious Emissions

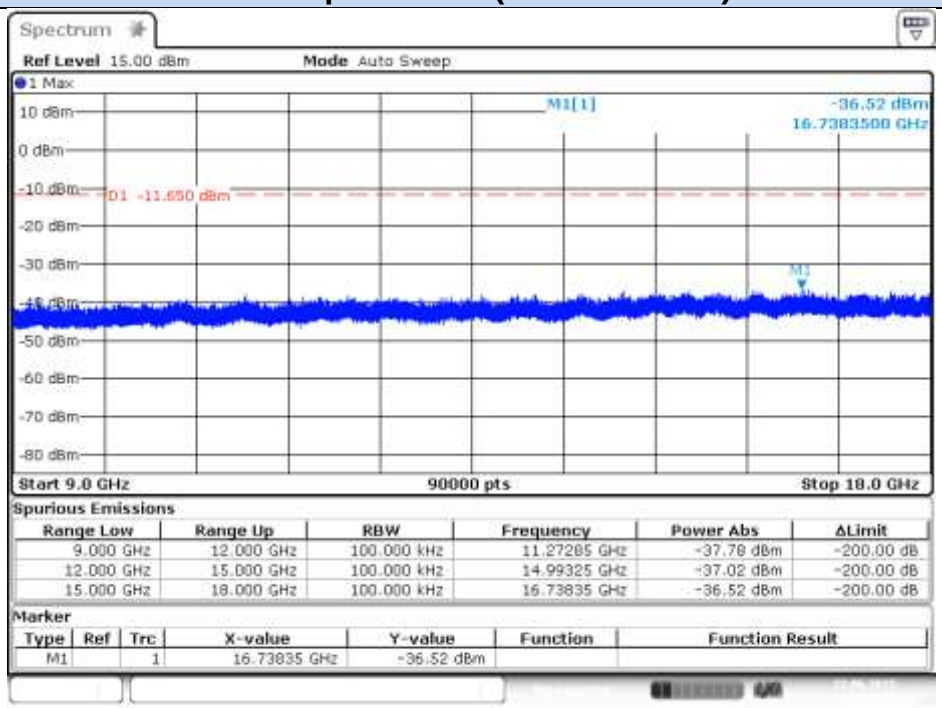
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	3.000 GHz	100.000 kHz	2.40199 GHz	8.81 dBm	-200.00 dB
3.000 GHz	6.000 GHz	100.000 kHz	5.89385 GHz	-35.17 dBm	-200.00 dB
6.000 GHz	9.000 GHz	100.000 kHz	6.97685 GHz	-33.68 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.401892 GHz	8.35 dBm		
D2	M1	1	4.574959 GHz	-42.03 dB		

Date: 22.JUN.2015 17:37:59

Cond Spur – CH0 (9GHz – 18GHz)



Spurious Emissions

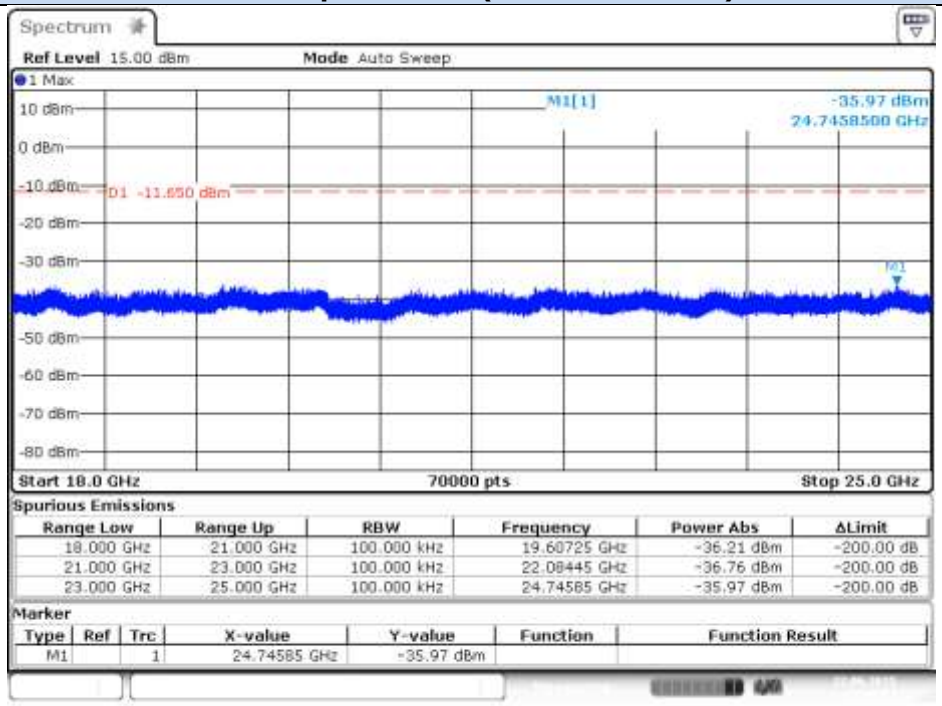
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
9.000 GHz	12.000 GHz	100.000 kHz	11.27285 GHz	-37.78 dBm	-200.00 dB
12.000 GHz	15.000 GHz	100.000 kHz	14.99325 GHz	-37.02 dBm	-200.00 dB
15.000 GHz	18.000 GHz	100.000 kHz	16.73835 GHz	-36.52 dBm	-200.00 dB

Marker

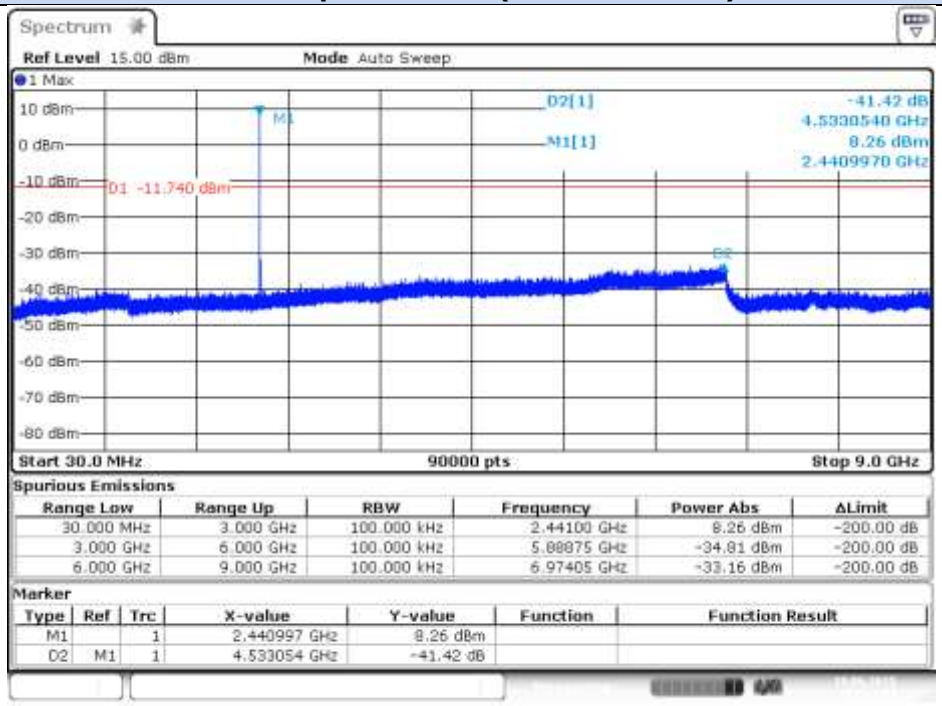
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	16.73835 GHz	-36.52 dBm		

Date: 22.JUN.2015 17:39:30

Cond Spur – CH0 (18GHz – 25GHz)



Cond Spur – CH39 (30MHz – 9GHz)



Spurious Emissions

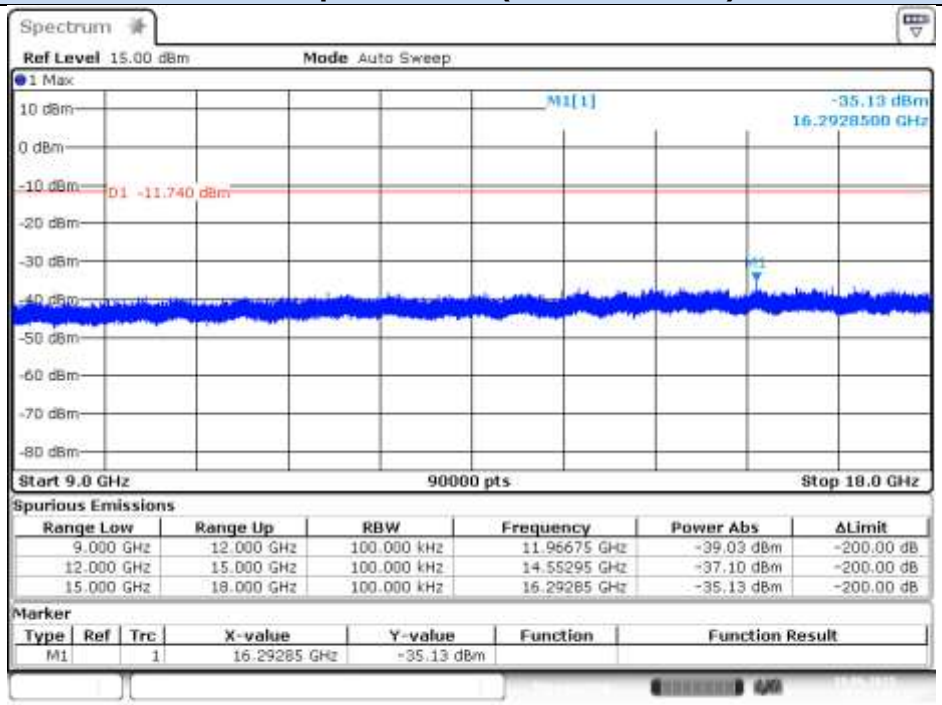
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	3.000 GHz	100.000 kHz	2.44100 GHz	8.26 dBm	-200.00 dB
3.000 GHz	6.000 GHz	100.000 kHz	5.00875 GHz	-34.81 dBm	-200.00 dB
6.000 GHz	9.000 GHz	100.000 kHz	6.97405 GHz	-33.16 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.440997 GHz	8.26 dBm		
D2	M1	1	4.533054 GHz	-41.42 dB		

Date: 19.JUN.2015 16:51:34

Cond Spur - CH39 (9GHz – 18GHz)



Spurious Emissions

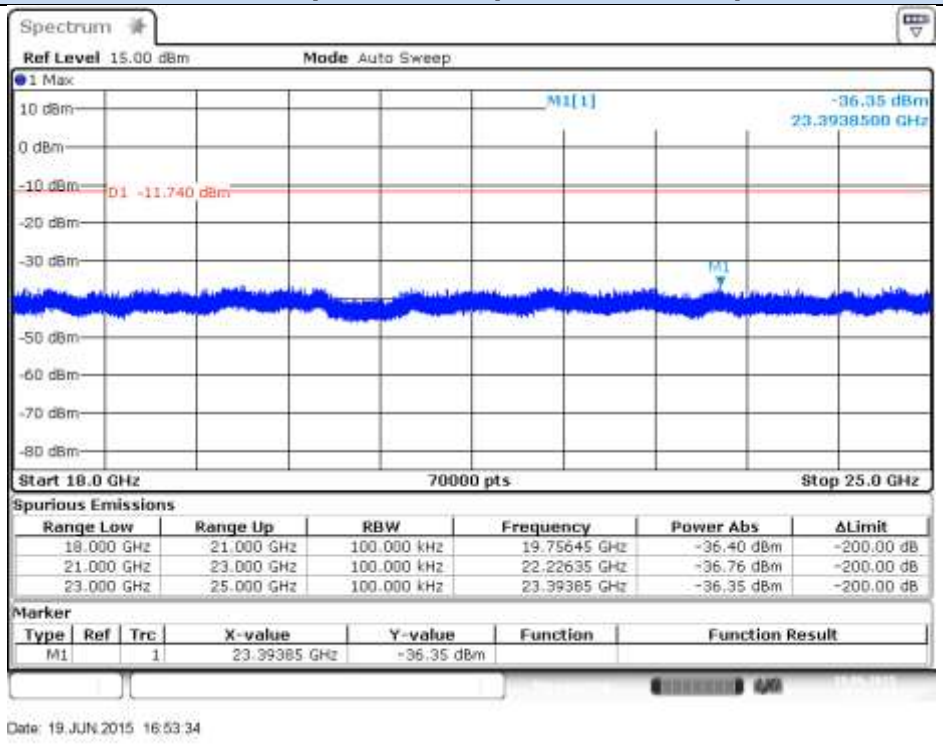
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
9.000 GHz	12.000 GHz	100.000 kHz	11.96675 GHz	-39.03 dBm	-200.00 dB
12.000 GHz	15.000 GHz	100.000 kHz	14.55295 GHz	-37.10 dBm	-200.00 dB
15.000 GHz	18.000 GHz	100.000 kHz	16.29285 GHz	-35.13 dBm	-200.00 dB

Marker

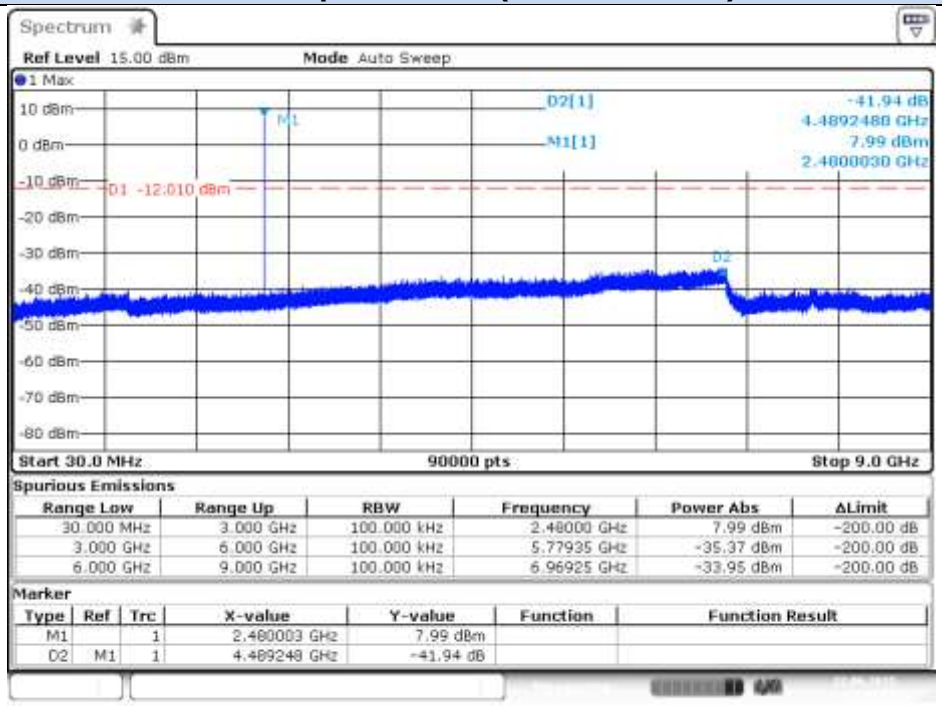
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	16.29285 GHz	-35.13 dBm		

Date: 19.JUN.2015 16:52:47

Cond Spur – CH39 (18GHz – 25GHz)



Cond Spur – CH78 (30MHz – 9GHz)



Spurious Emissions

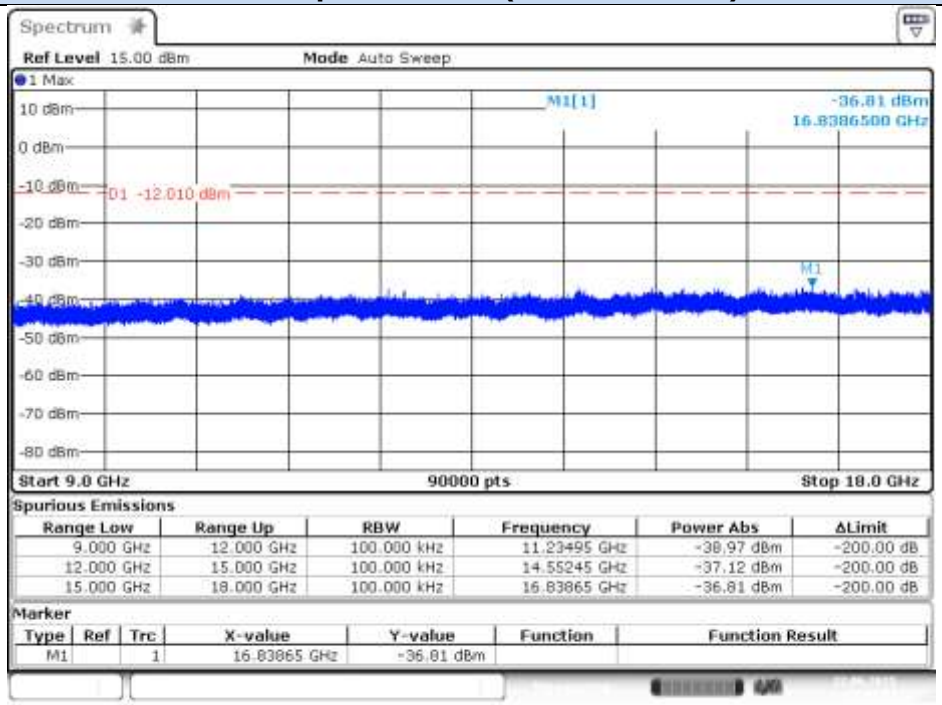
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	3.000 GHz	100.000 kHz	2.48000 GHz	7.99 dBm	-200.00 dB
3.000 GHz	6.000 GHz	100.000 kHz	5.77935 GHz	-35.37 dBm	-200.00 dB
6.000 GHz	9.000 GHz	100.000 kHz	6.96925 GHz	-33.95 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.480003 GHz	7.99 dBm		
D2	M1	1	4.489248 GHz	-41.94 dB		

Date: 22.JUN.2015 17:42:19

Cond Spur – CH78 (9GHz – 18GHz)



Spurious Emissions

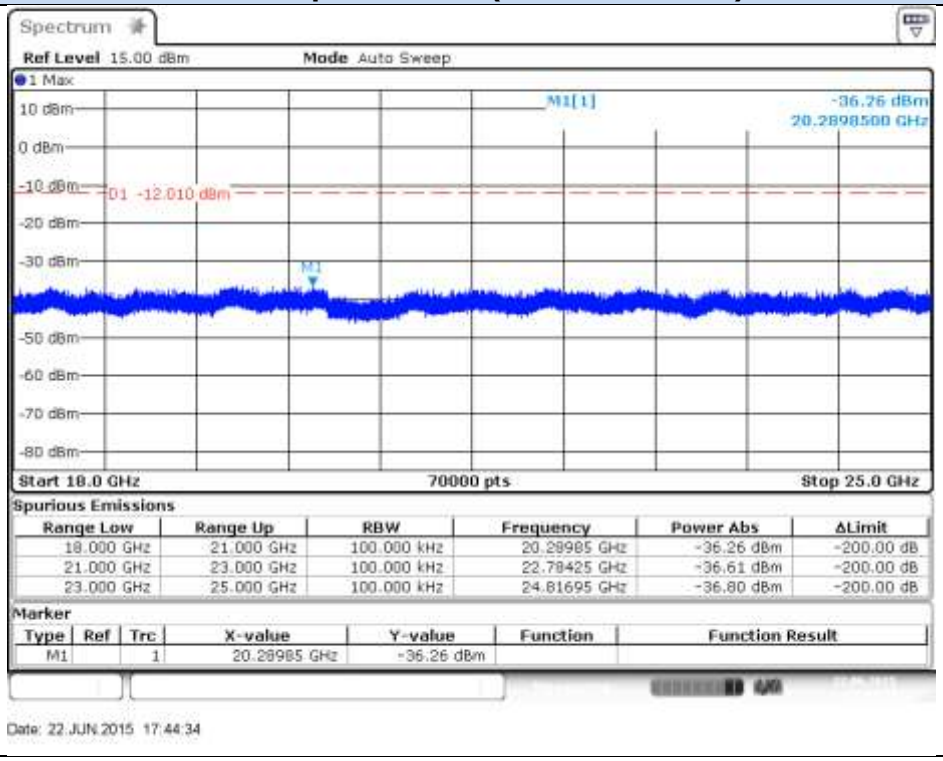
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
9.000 GHz	12.000 GHz	100.000 kHz	11.23495 GHz	-38.97 dBm	-200.00 dB
12.000 GHz	15.000 GHz	100.000 kHz	14.55245 GHz	-37.12 dBm	-200.00 dB
15.000 GHz	18.000 GHz	100.000 kHz	16.83865 GHz	-36.81 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	16.83865 GHz	-36.81 dBm		

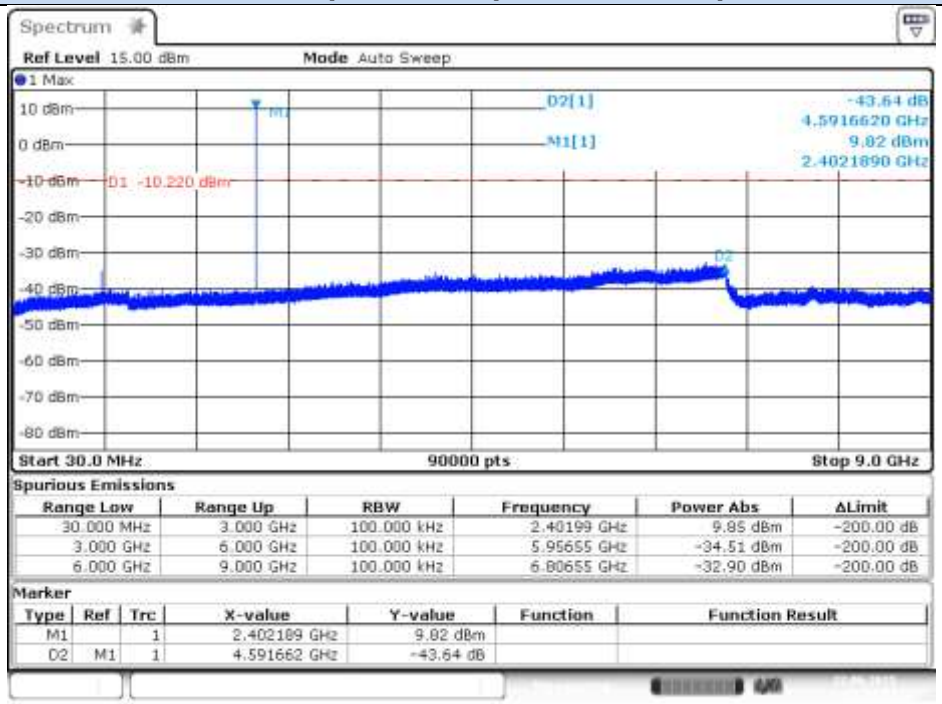
Date: 22.JUN.2015 17:43:31

Cond Spur – CH78 (18GHz – 25GHz)



EDR – 8-DPSK

Cond Spur – CH0 (30MHz – 9GHz)



Spurious Emissions

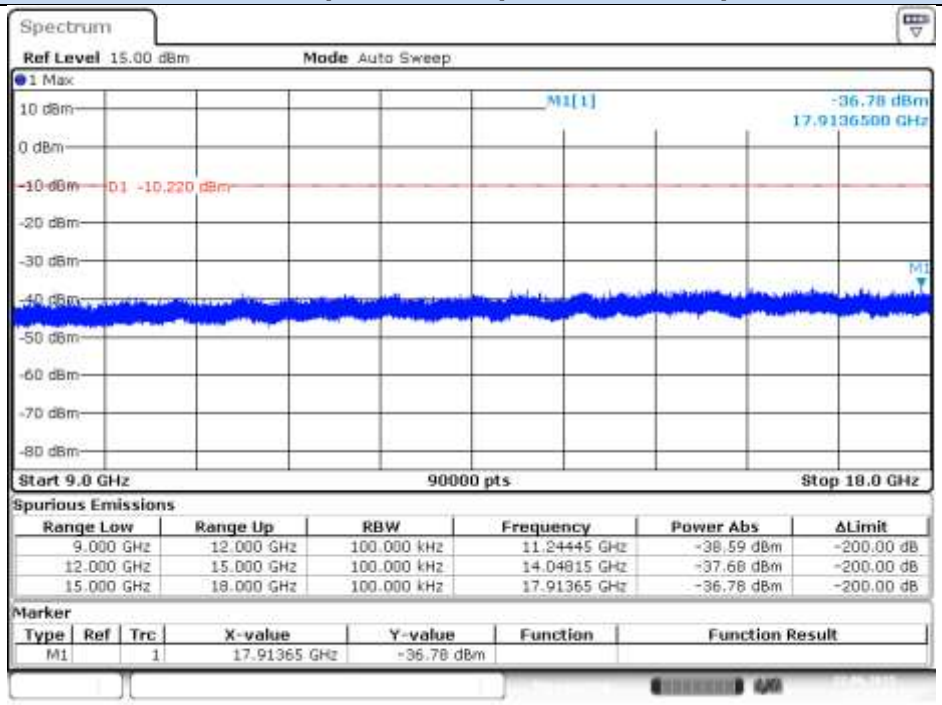
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	3.000 GHz	100.000 kHz	2.40199 GHz	9.85 dBm	-200.00 dB
3.000 GHz	6.000 GHz	100.000 kHz	5.95655 GHz	-34.51 dBm	-200.00 dB
6.000 GHz	9.000 GHz	100.000 kHz	6.80655 GHz	-32.90 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402189 GHz	9.82 dBm		
D2	M1	1	4.591662 GHz	-43.64 dB		

Date: 22.JUN.2015 17:54:31

Cond Spur – CH0 (9GHz – 18GHz)



Spurious Emissions

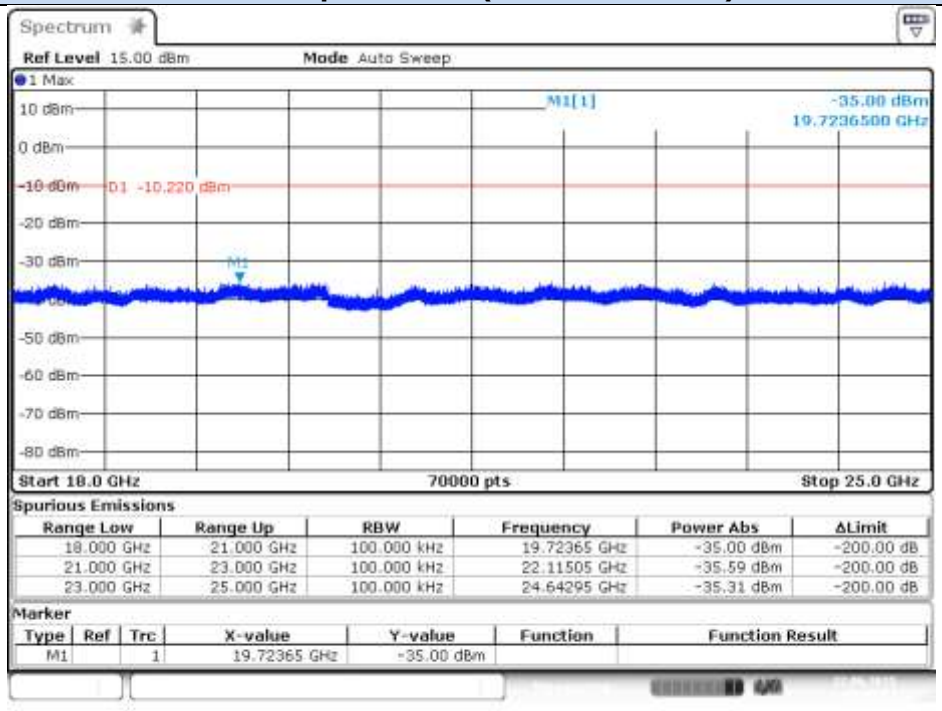
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
9.000 GHz	12.000 GHz	100.000 kHz	11.24445 GHz	-38.59 dBm	-200.00 dB
12.000 GHz	15.000 GHz	100.000 kHz	14.04815 GHz	-37.68 dBm	-200.00 dB
15.000 GHz	18.000 GHz	100.000 kHz	17.91365 GHz	-36.78 dBm	-200.00 dB

Marker

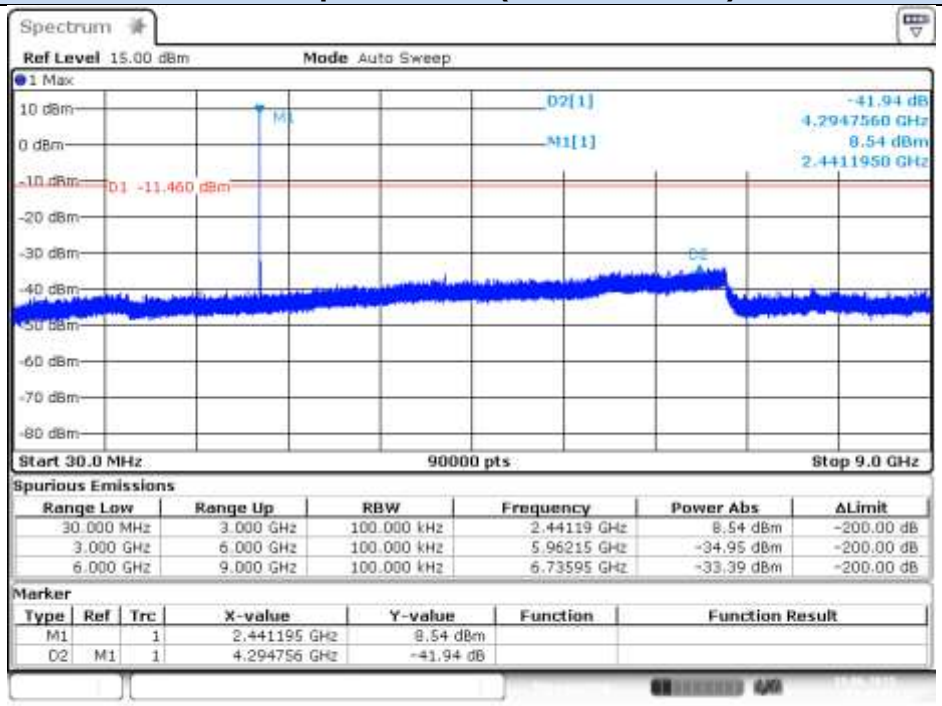
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	17.91365 GHz	-36.78 dBm		

Date: 22.JUN.2015 17:55:22

Cond Spur – CH0 (18GHz – 25GHz)



Cond Spur – CH39 (30MHz – 9GHz)



Spurious Emissions

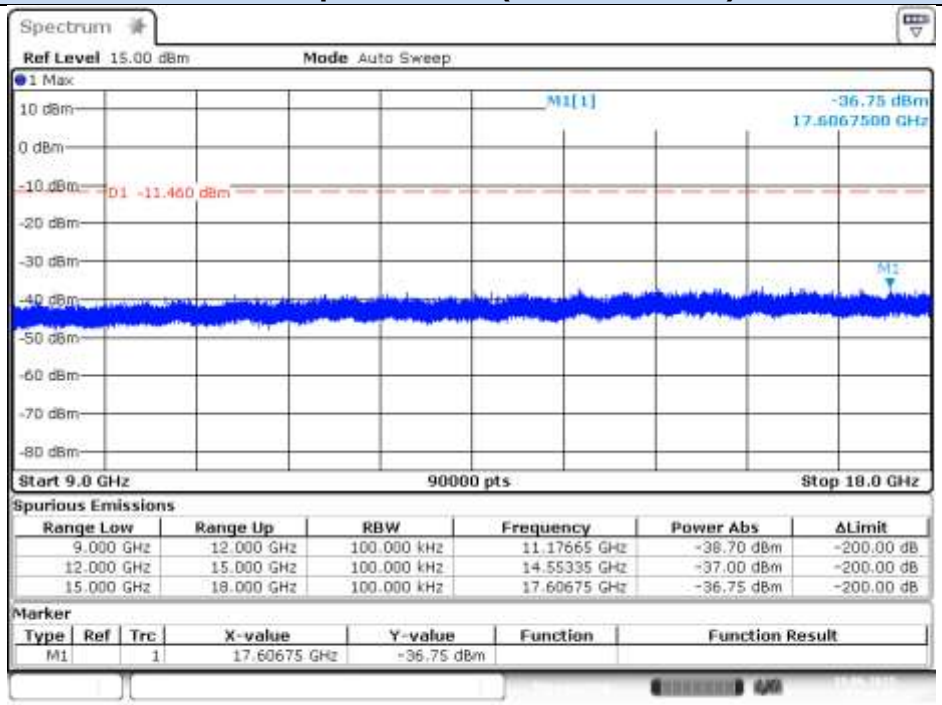
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	3.000 GHz	100.000 kHz	2.44119 GHz	8.54 dBm	-200.00 dB
3.000 GHz	6.000 GHz	100.000 kHz	5.96215 GHz	-34.95 dBm	-200.00 dB
6.000 GHz	9.000 GHz	100.000 kHz	6.73595 GHz	-33.39 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.441195 GHz	8.54 dBm		
D2	M1	1	4.294756 GHz	-41.94 dB		

Date: 19.JUN.2015 10:45:26

Cond Spur - CH39 (9GHz – 18GHz)



Spurious Emissions

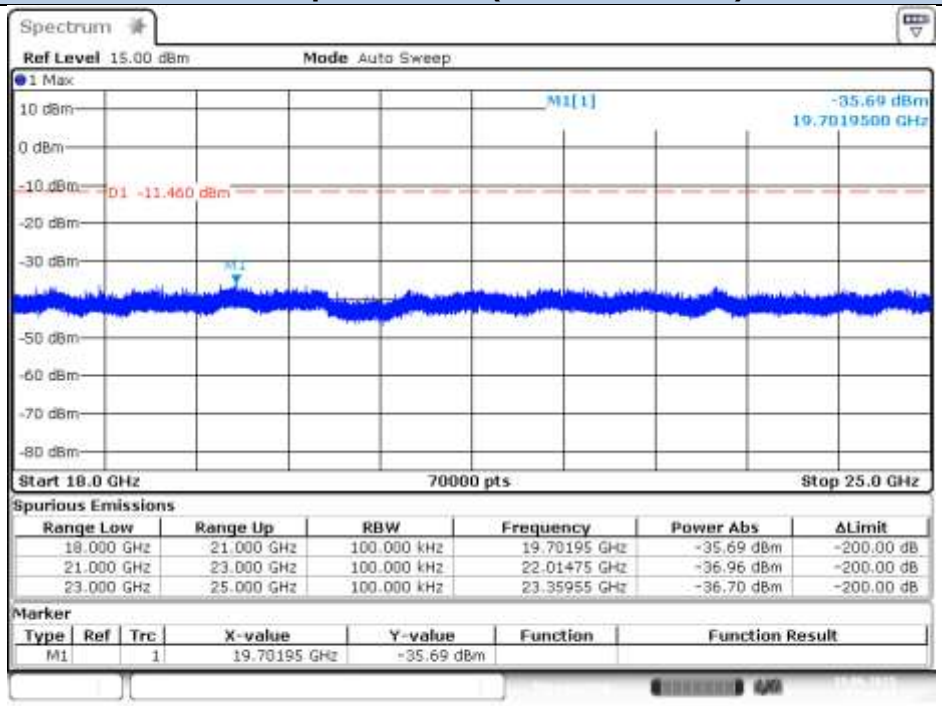
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
9.000 GHz	12.000 GHz	100.000 kHz	11.17665 GHz	-38.70 dBm	-200.00 dB
12.000 GHz	15.000 GHz	100.000 kHz	14.55335 GHz	-37.00 dBm	-200.00 dB
15.000 GHz	18.000 GHz	100.000 kHz	17.60675 GHz	-36.75 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	17.60675 GHz	-36.75 dBm		

Date: 19.JUN.2015 10:48:45

Cond Spur – CH39 (18GHz – 25GHz)



Spurious Emissions

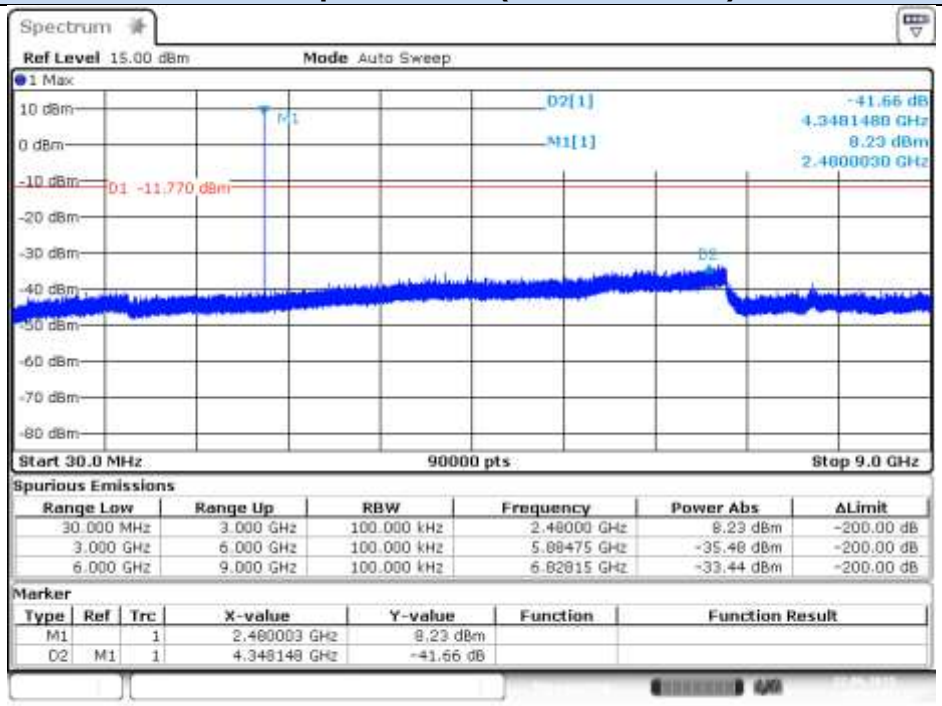
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
18.000 GHz	21.000 GHz	100.000 kHz	19.70195 GHz	-35.69 dBm	-200.00 dB
21.000 GHz	23.000 GHz	100.000 kHz	22.01475 GHz	-36.96 dBm	-200.00 dB
23.000 GHz	25.000 GHz	100.000 kHz	23.35955 GHz	-36.70 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	19.70195 GHz	-35.69 dBm		

Date: 19.JUN.2015 10:49:48

Cond Spur – CH78 (30MHz – 9GHz)



Spurious Emissions

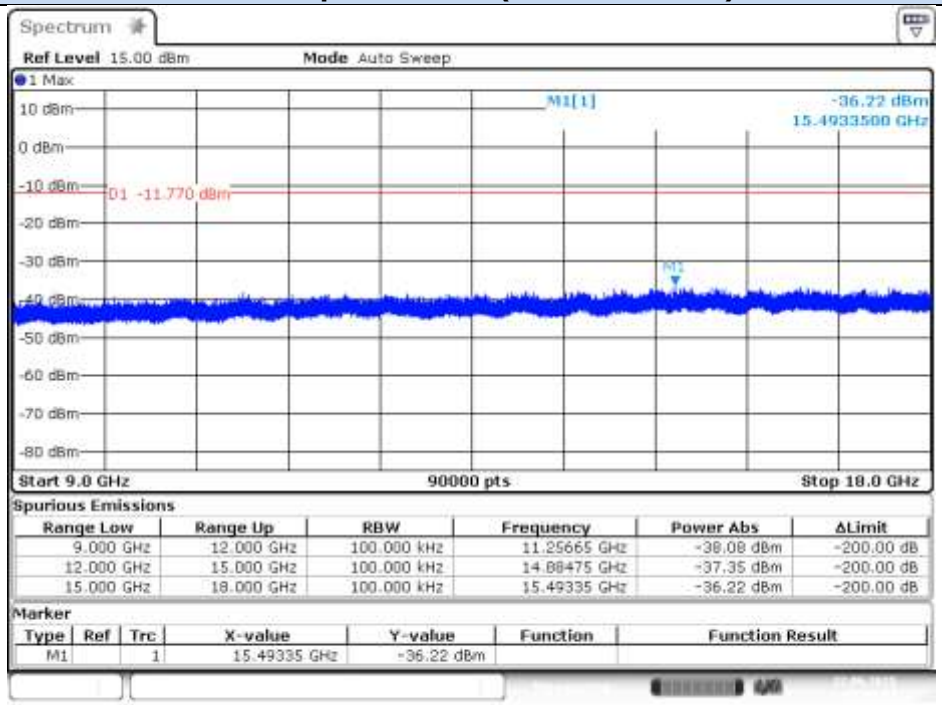
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	3.000 GHz	100.000 kHz	2.48000 GHz	8.23 dBm	-200.00 dB
3.000 GHz	6.000 GHz	100.000 kHz	5.88475 GHz	-35.48 dBm	-200.00 dB
6.000 GHz	9.000 GHz	100.000 kHz	6.82815 GHz	-33.44 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.480003 GHz	8.23 dBm		
D2	M1	1	4.348148 GHz	-41.66 dB		

Date: 22.JUN.2015 18:07:07

Cond Spur – CH78 (9GHz – 18GHz)



Spurious Emissions

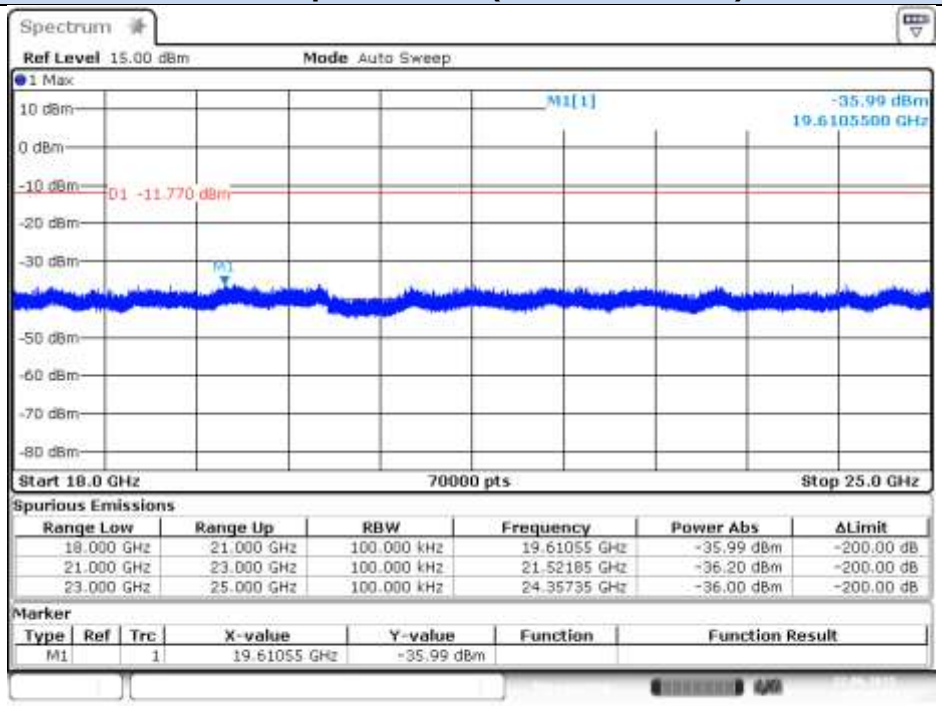
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
9.000 GHz	12.000 GHz	100.000 kHz	11.25665 GHz	-38.08 dBm	-200.00 dB
12.000 GHz	15.000 GHz	100.000 kHz	14.88475 GHz	-37.35 dBm	-200.00 dB
15.000 GHz	18.000 GHz	100.000 kHz	15.49335 GHz	-36.22 dBm	-200.00 dB

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	15.49335 GHz	-36.22 dBm		

Date: 22.JUN.2015 18:08:43

Cond Spur – CH78 (18GHz – 25GHz)



B.6 Radiated spurious emission

Standard references:

<table>
<tr><th>FCC part</th><th>RSS part</th><th>Limits</th></tr>
<tr><td>15.247 (d)</td><td>RSS-247
Clause 5.5</td><td>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):

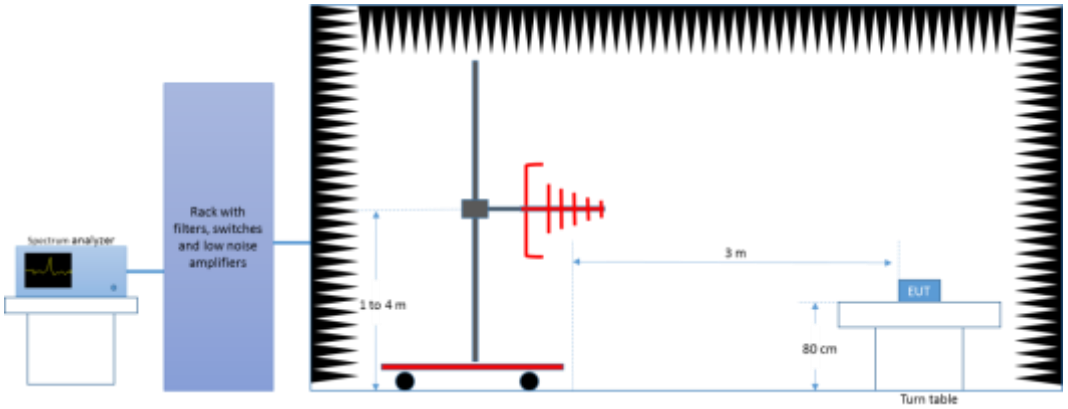
<table>
<tr><th>Freq Range (MHz)</th><th>Field Stregth (µV/m)</th><th>Field Stregth (dBµV/m)</th><th>Meas. Distance (m)</th></tr>
<tr><td>0.009-0.490</td><td>2400/f(kHz)</td><td>-</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/f(kHz)</td><td>-</td><td>300</td></tr>
<tr><td>1.705-30.0</td><td>30</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>960-25000</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.</td></tr>
</table>

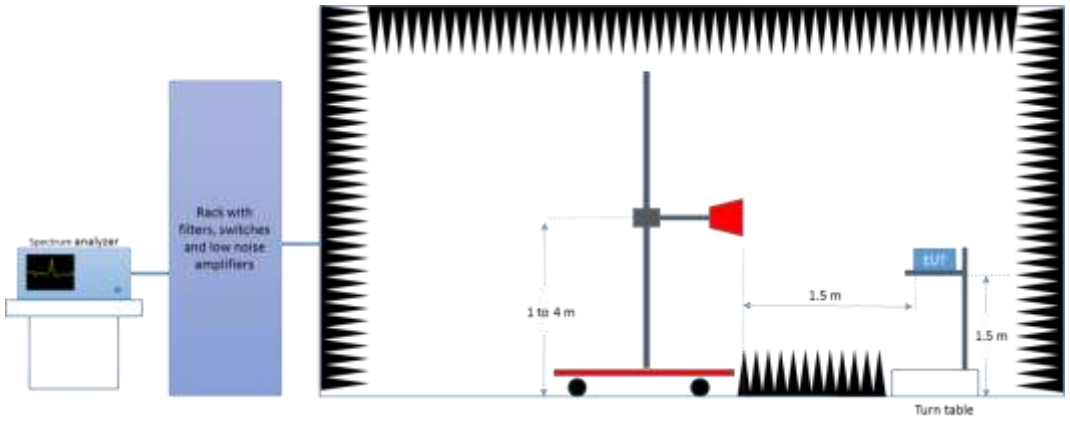
Test procedure:

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 360º 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



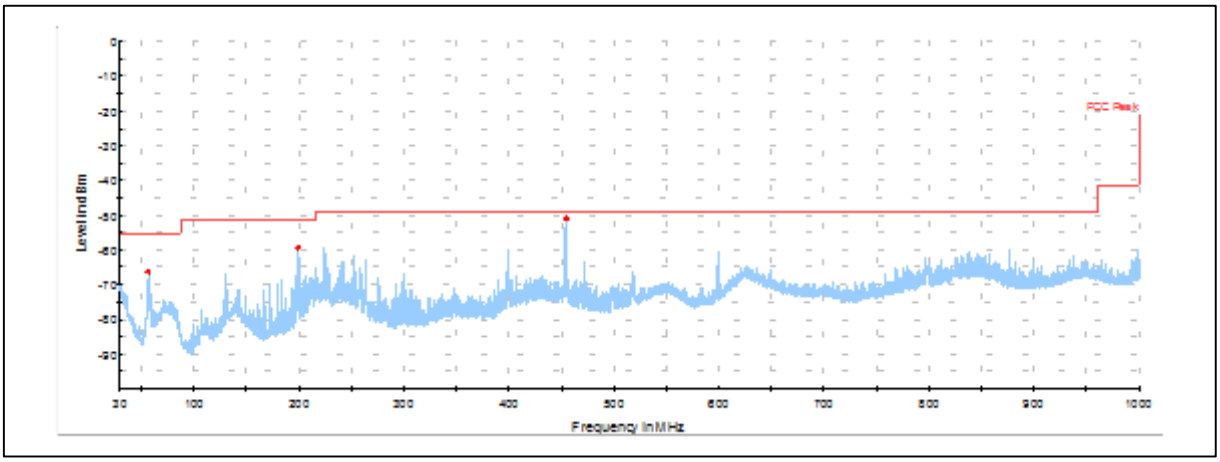
All values reported are converted in dBm, the table below shows the limits of the radiated emission (FCC part 15.209(a)) converted from dBµV/m to dBm.

FCC part 15.209 (a)		Converted values	
Distance (m)	Field strength (microvolts/meter)	Field strength (dB microvolts/meter)	Power (dBm)
3	500	53.98	-41.2
3	200	46.02	-49.2
3	150	43.52	-51.7
3	100	40.00	-55.2

Test result:

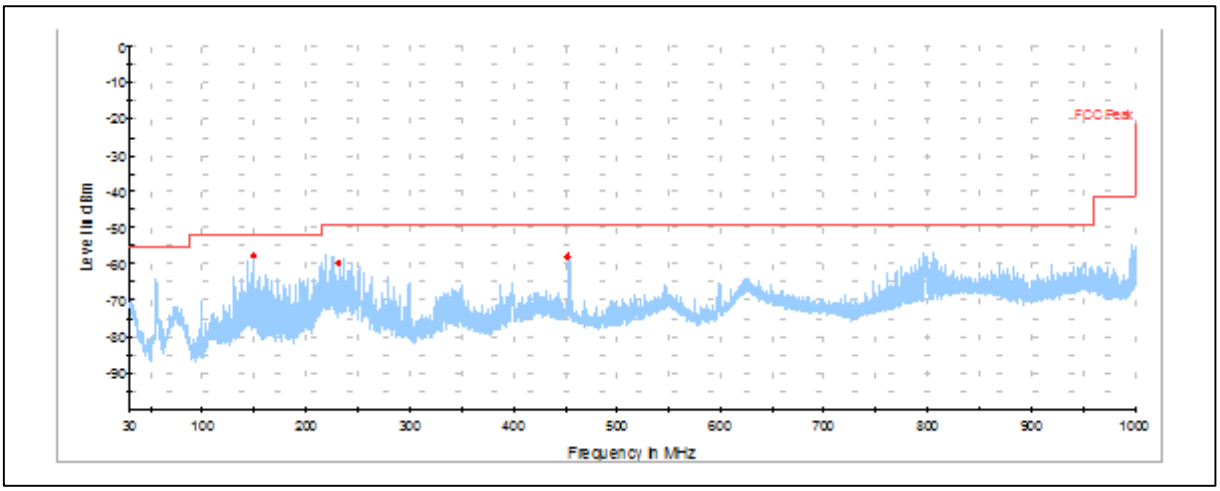
EDR – π/4-DQPSK – 30MHz-1GHz

Radiated Spurious – CH0 2DH5



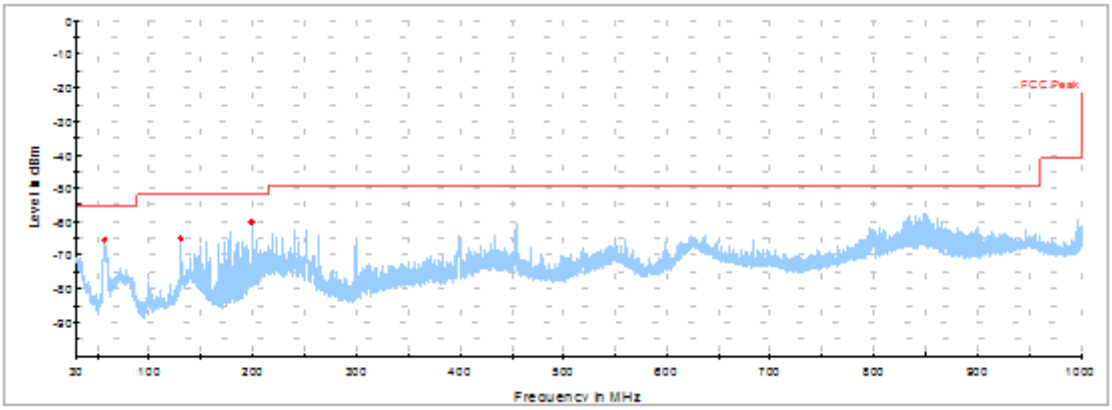
Frequency	Max Peak	Limit	Margin
MHz	dBm	dBm	dB
56.8	-66.5	-55.2	**11.3**
199.3	-59.2	-51.7	**7.5**
454.6	-51.1	-49.2	**1.9**

Radiated Spurious – Ch39 2DH5



Frequency	Max Peak	Limit	Margin
MHz	dBm	dBm	dB
149.5	-57.7	-51.7	6.0
231.6	-59.8	-49.2	10.6
452.7	-57.8	-49.2	8.6

Radiated Spurious – Ch78 2DH5

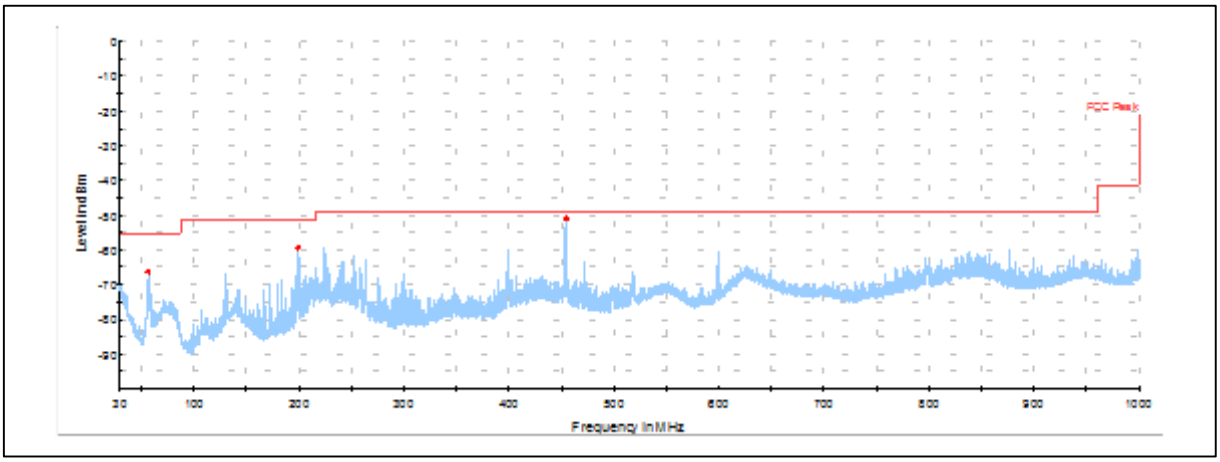


Frequency	Max Peak	Limit	Margin
MHz	dBm	dBm	dB
56.7	-65.3	-55.20	10.1
129.8	-65.2	-51.70	13.5
199.2	-60.0	-51.70	8.3

Test results:

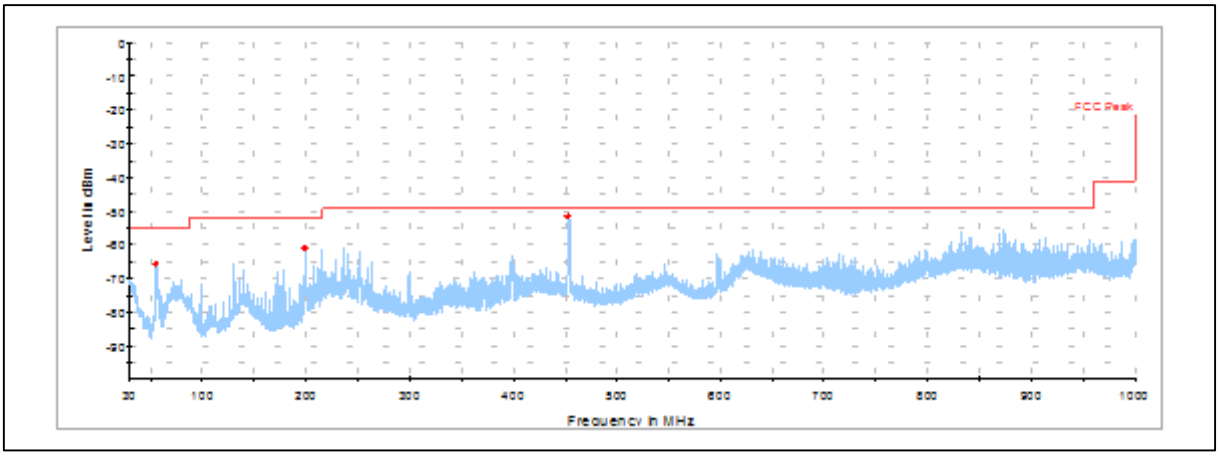
EDR – 8-DPSK – 30MHz-1GHz

Radiated Spurious – Ch0 3DH5



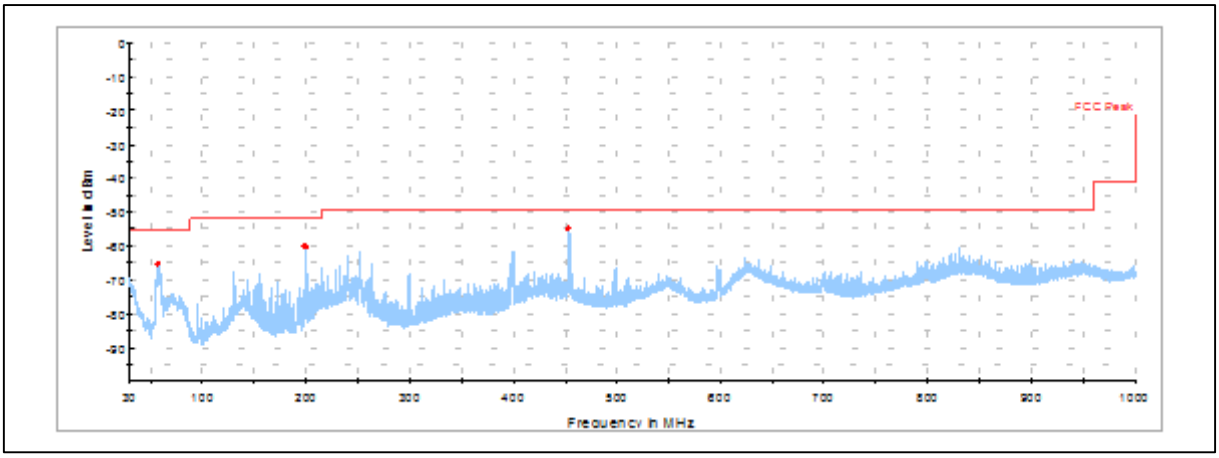
Frequency	Max Peak	Limit	Margin
MHz	dBm	dBm	dB
56.8	-66.3	-55.2	**11.1**
199.3	-59.4	-51.7	**7.7**
454.6	-51.3	-49.2	**2.1**

Radiated Spurious – Ch39 3DH5



Frequency	Max Peak	Limit	Margin
MHz	dBm	dBm	dB
55.7	-65.5	-55.2	**10.3**
199.2	-60.9	-51.7	**9.2**
452.7	-51.6	-49.2	**2.4**

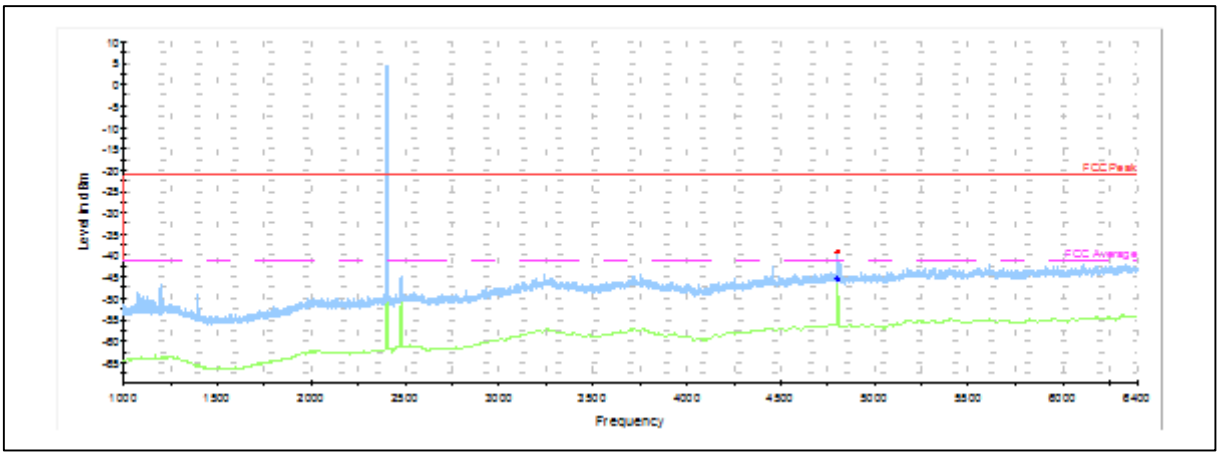
Radiated Spurious – Ch78 3DH5



Frequency	Max Peak	Limit	Margin
MHz	dBm	dBm	dB
57.2	-65.2	-55.20	10.0
199.4	-60.2	-51.70	8.5
452.7	-55.0	-49.20	5.8

EDR – π/4-DQPSK – 1GHz to 6.4GHz

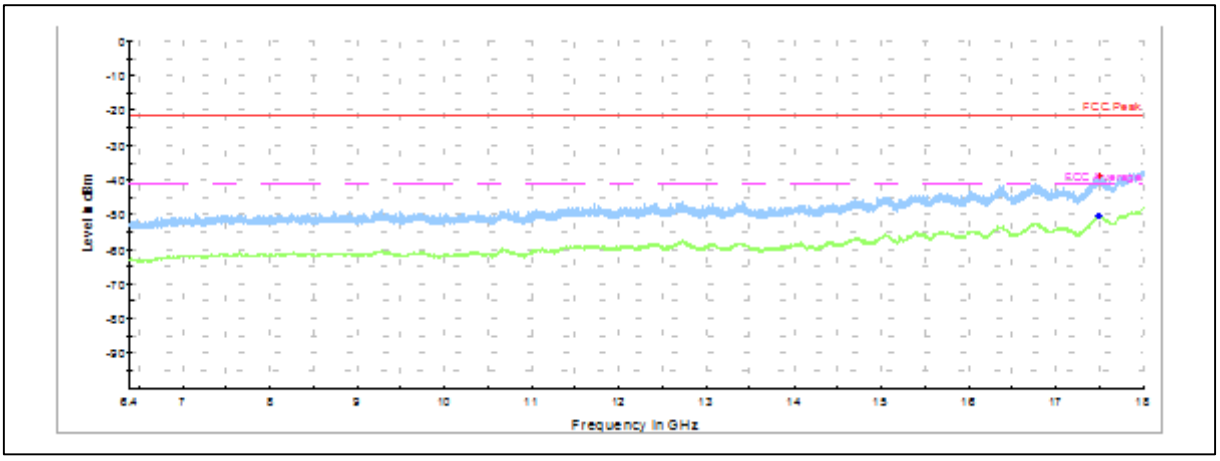
Radiated Spurious – Ch0 2DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
4804.0	---	-46.7	-41.20	5.5
4803.5	-40.0	---	-21.20	18.8

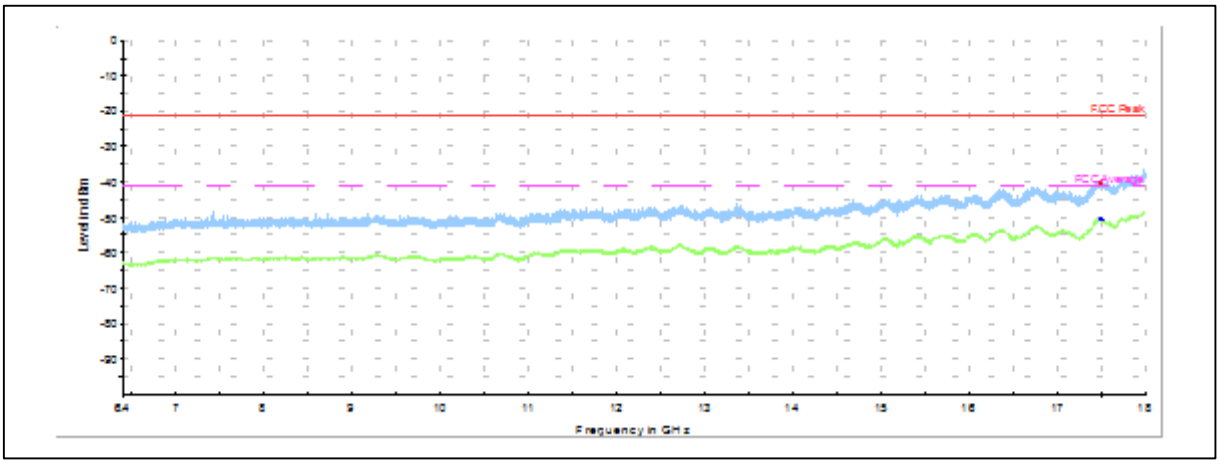
Radiated Spurious – Ch39 2DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
4882.0	---	-49.6	-41.20	8.4
4882.5	-41.7	---	-21.20	20.5

Radiated Spurious – Ch78 2DH5

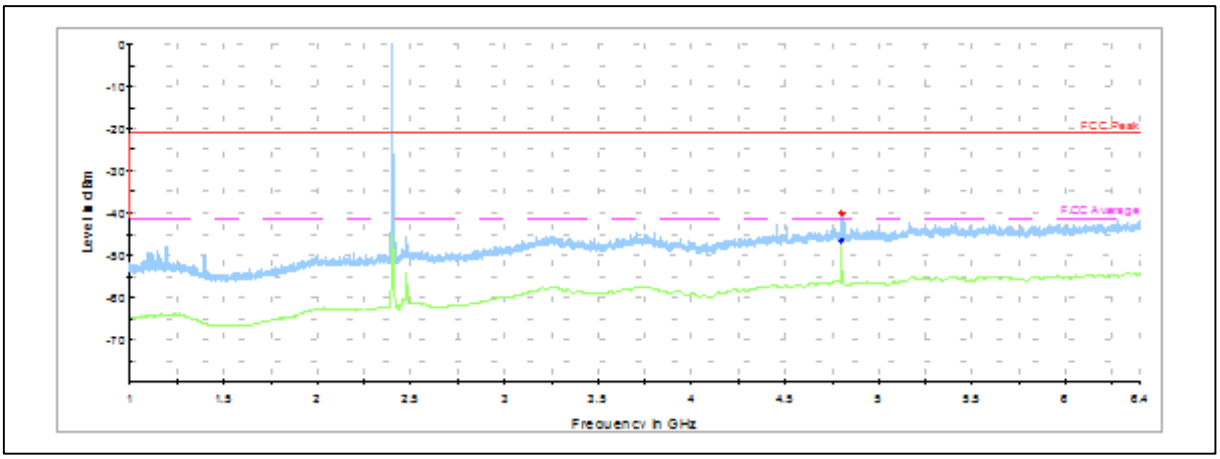


Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
4960.0	---	-49.7	-41.20	8.5
4960.5	-42.1	---	-21.20	20.9

EDR – 8-DPSK – 1GHz to 6.4GHz

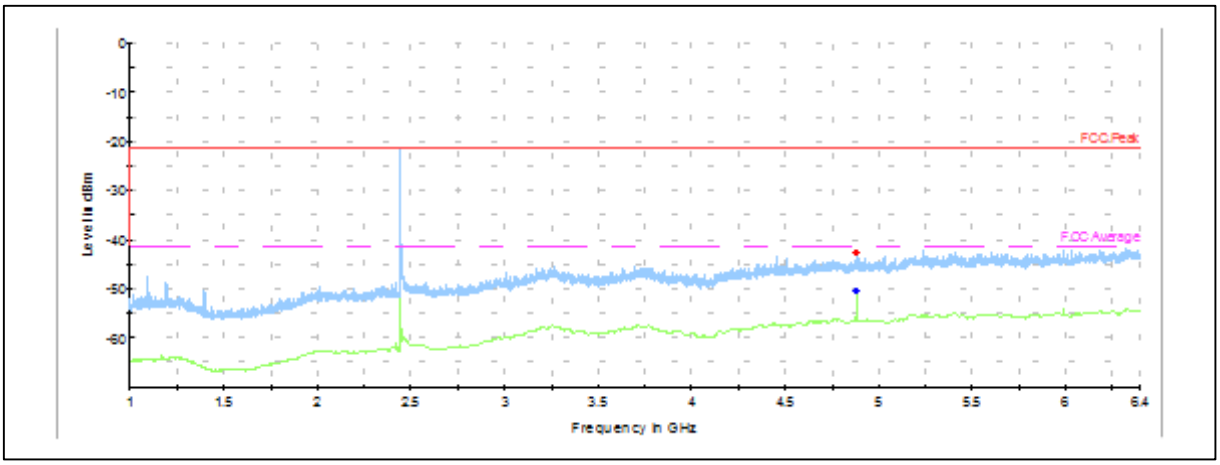
Radiated Spurious – Ch0 3DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
4804.0	---	-46.6	-41.20	5.4
4804.0	-40.2	---	-21.20	19.0

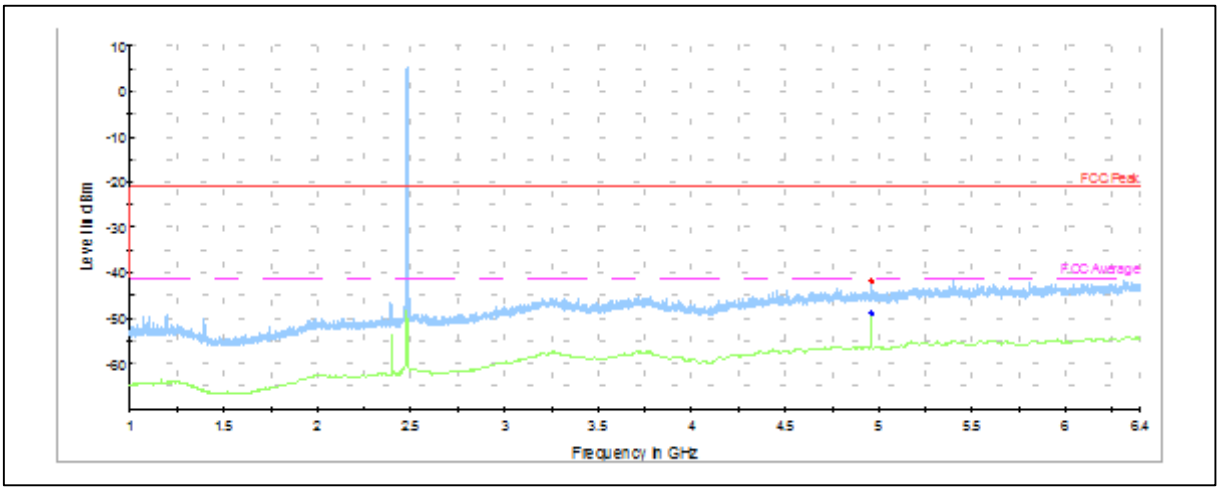
Radiated Spurious – Ch39 3DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
4882.0	---	-50.4	-41.20	9.2
4881.5	-42.5	---	-21.20	21.3

Radiated Spurious – Ch78 3DH5

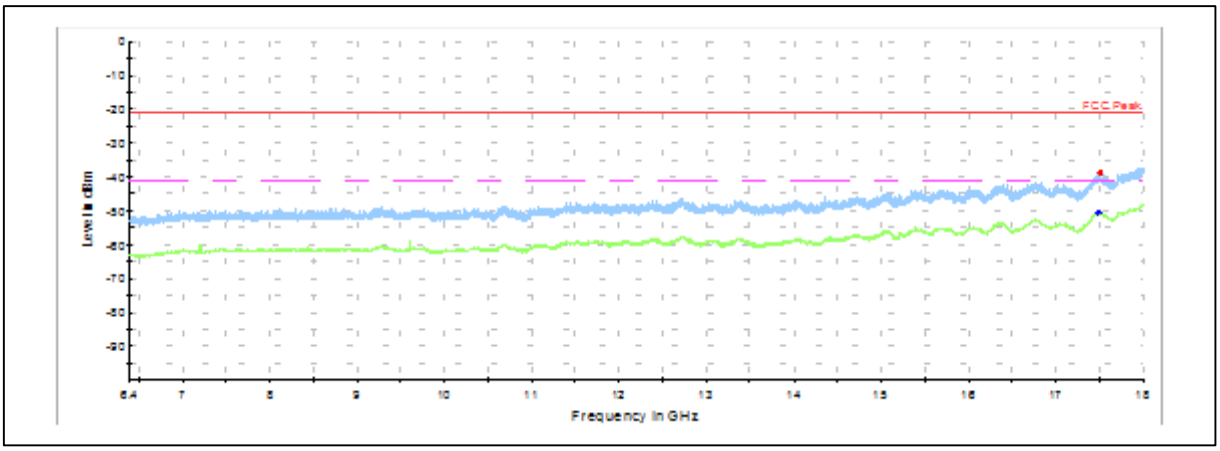


Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
4960.0	---	-49.0	-41.20	7.8
4960.0	-42.0	---	-21.20	20.8

EDR – π/4-DQPSK – 6.4GHz to 18GHz

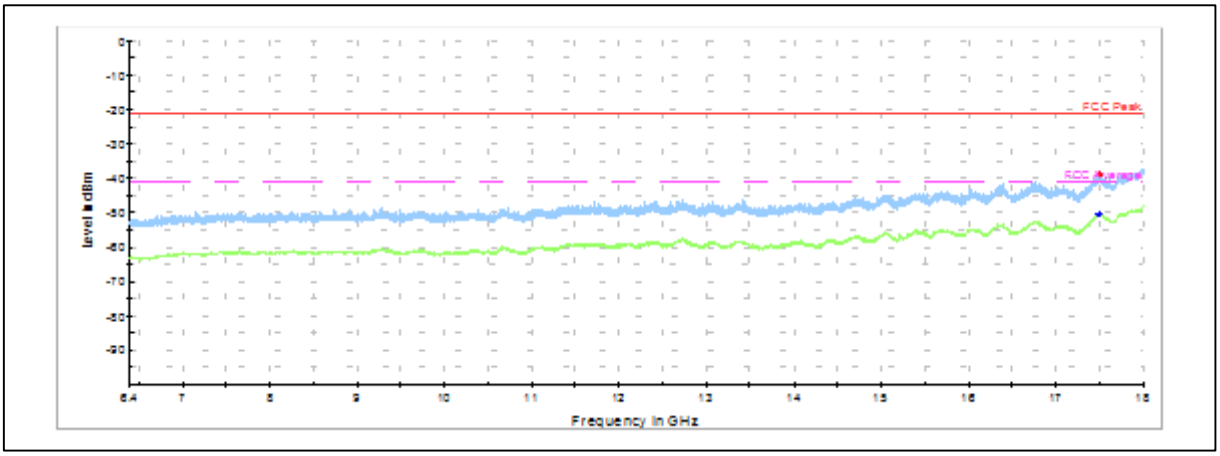
Radiated Spurious – Ch0 2DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
17490.6	---	-50.4	-41.20	9.2
17513.3	-38.6	---	-21.20	17.4

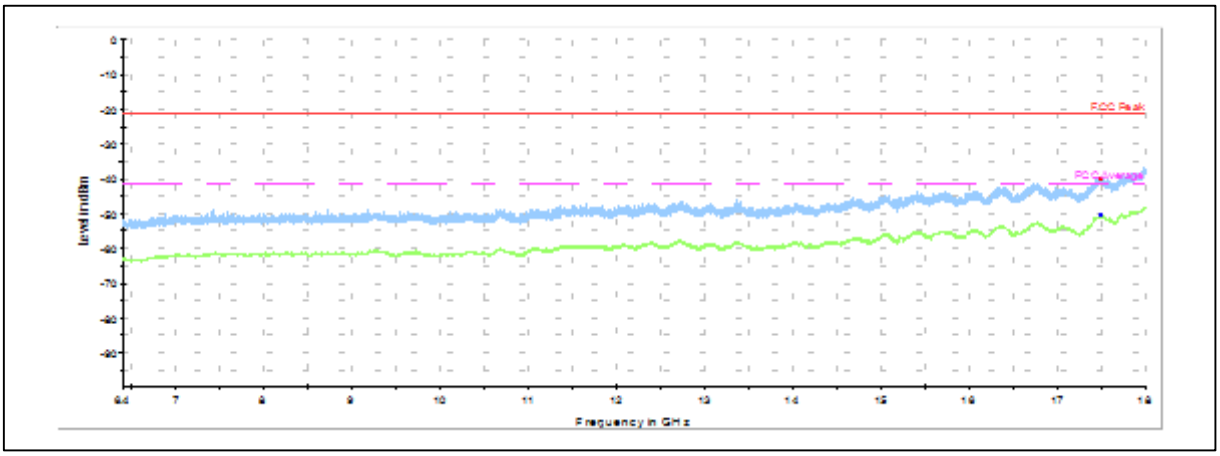
Radiated Spurious – Ch39 2DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
17496.9	---	-50.4	-41.20	9.2
17499.6	-38.9	---	-21.20	17.7

Radiated Spurious – Ch78 2DH5

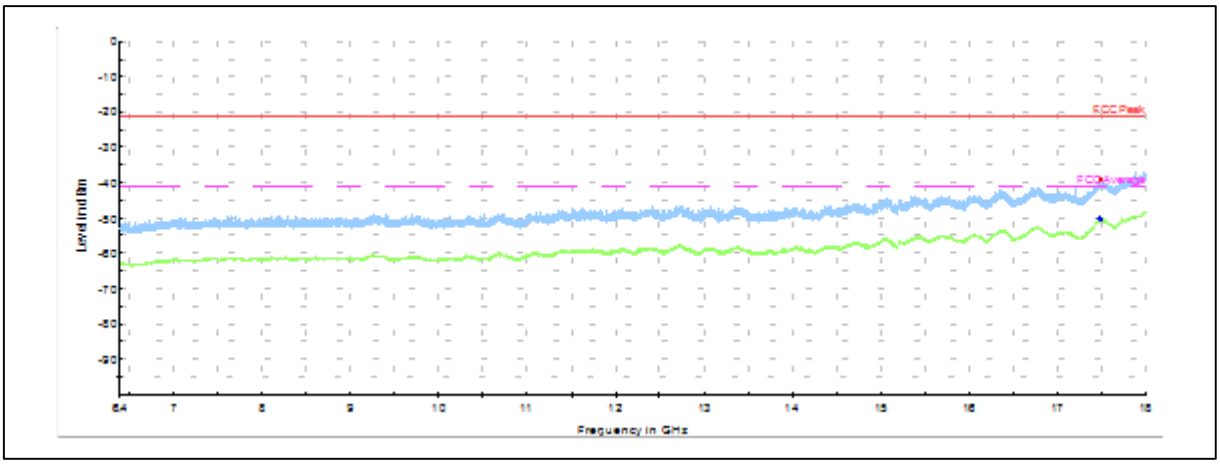


Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
17494.3	---	-50.5	-41.20	9.3
17496.9	-40.0	---	-21.20	18.8

EDR – 8-DPSK – 6.4GHz to 18GHz

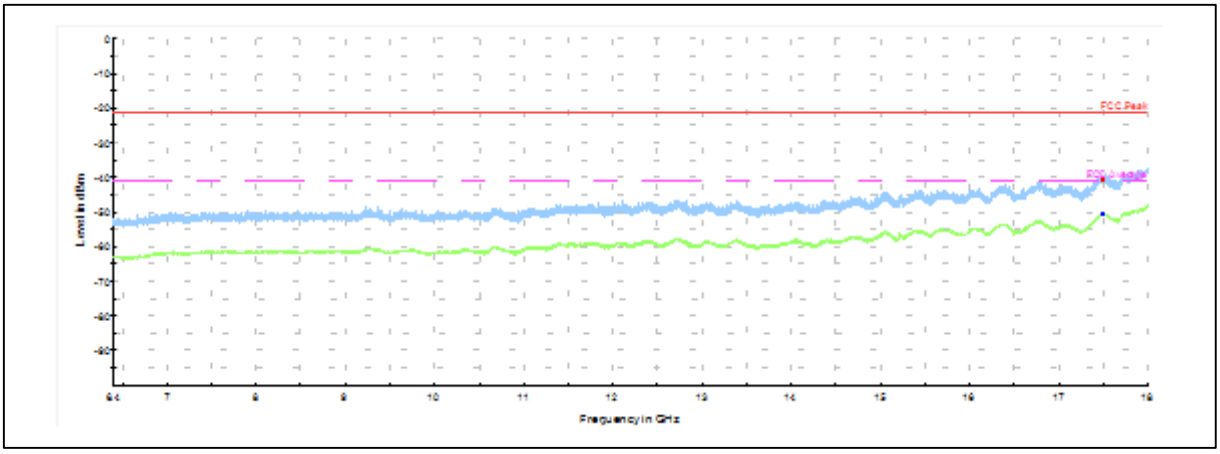
Radiated Spurious – Ch0 3DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
17480.6	---	-50.3	-41.20	9.1
17490.1	-39.1	---	-21.20	17.9

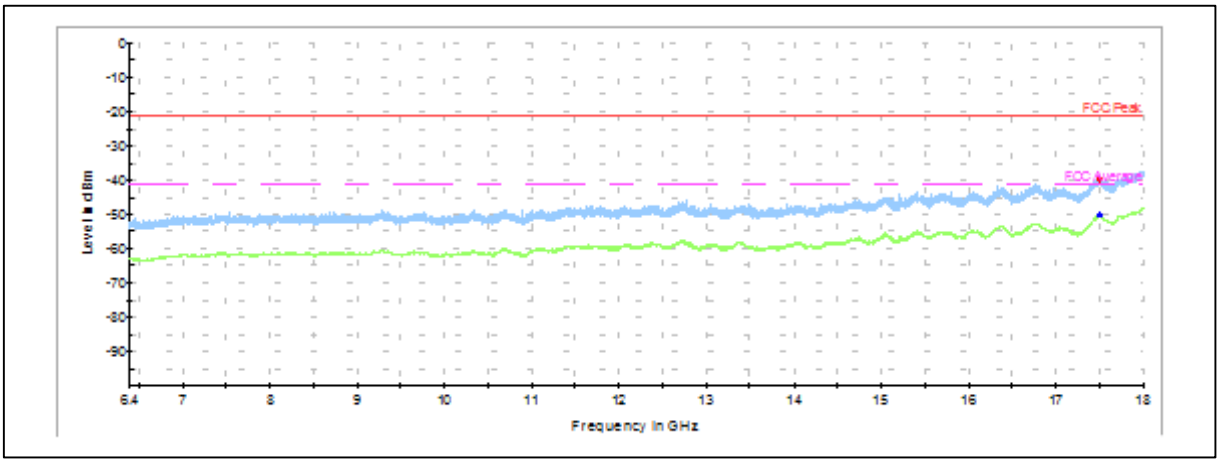
Radiated Spurious – Ch39 3DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
17494.3	---	-50.5	-41.20	9.3
17496.9	-40.5	---	-21.20	19.3

Radiated Spurious – Ch78 3DH5

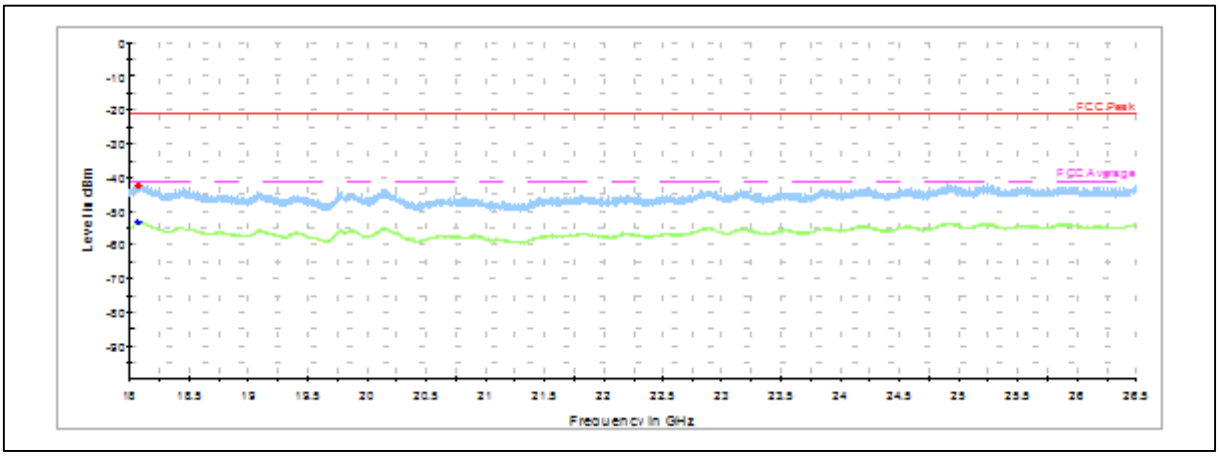


Peak measurements
RMS measurements
FCC Peak
FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
17502.2	---	-50.4	-41.20	9.2
17511.7	-39.8	---	-21.20	18.6

EDR – π/4-DQPSK – 18 GHz to 26 GHz

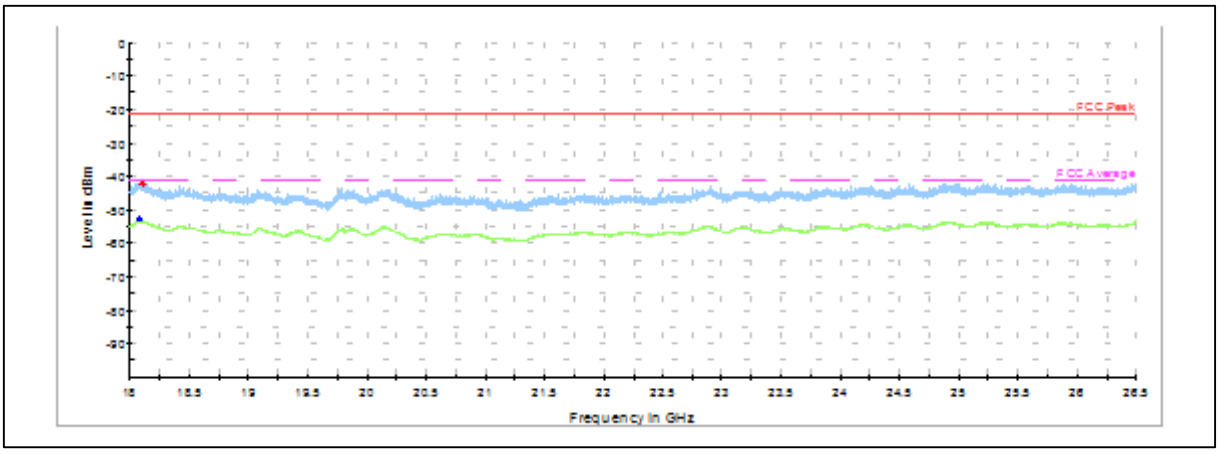
Radiated Spurious – Ch0 2DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
18070.8	---	-53.37	-41.20	12.17
18079.8	-42.45	---	-21.20	21.25

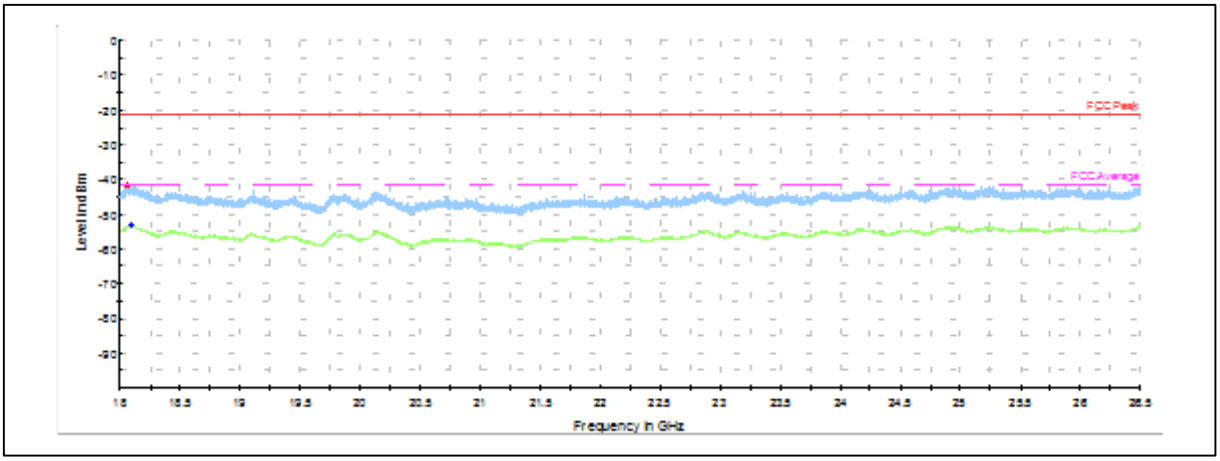
Radiated Spurious – Ch39 2DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
18077.9	---	-52.9	-41.20	11.7
18106.7	-42.0	---	-21.20	20.8

Radiated Spurious – Ch78 2DH5

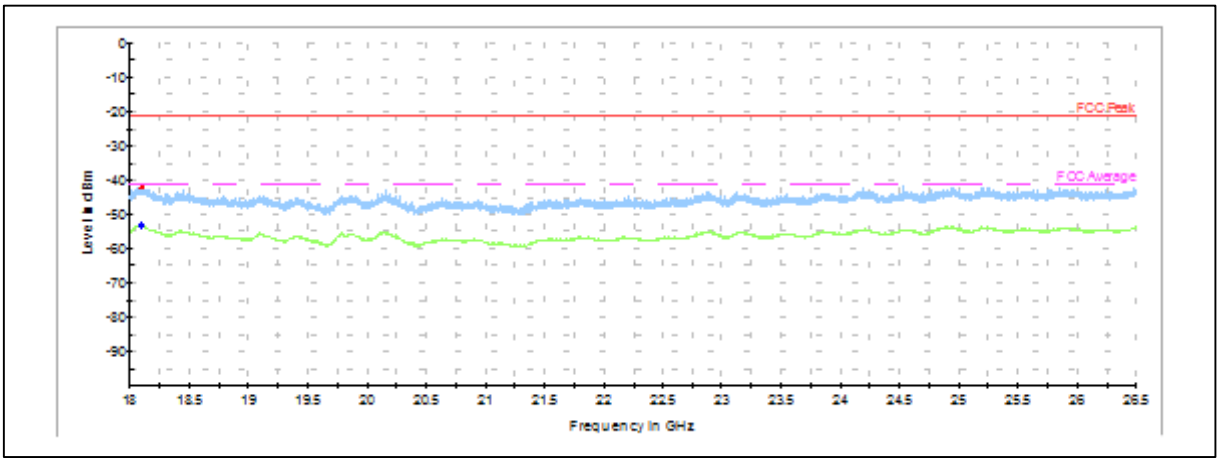


Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
18096.8	---	-53.2	-41.20	12.0
18059.9	-41.7	---	-21.20	20.5

EDR – 8-DPSK – 18 GHz to 26 GHz

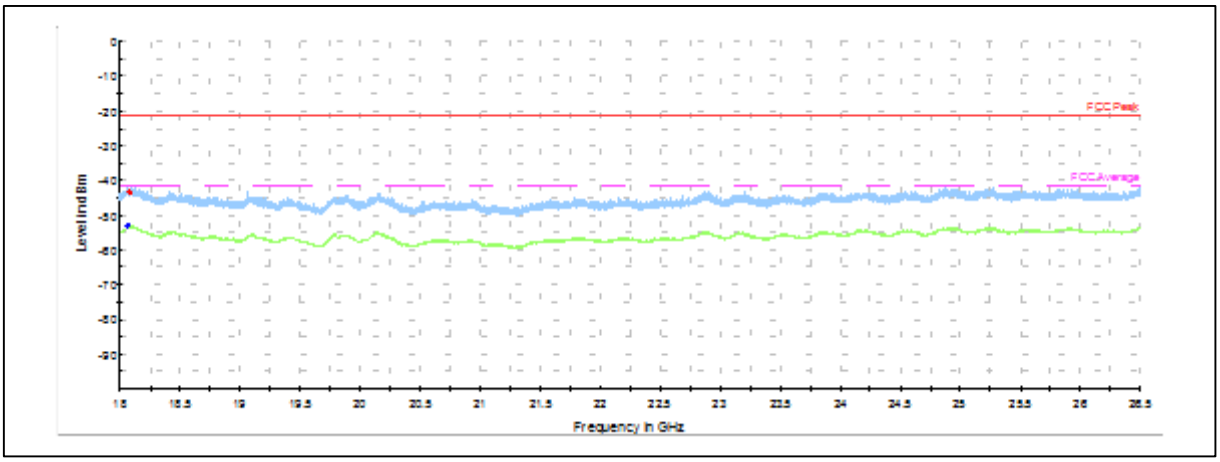
Radiated Spurious – Ch0 3DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
18093.9	---	-53.3	-41.20	12.1
18093.9	-42.0	---	-21.20	20.8

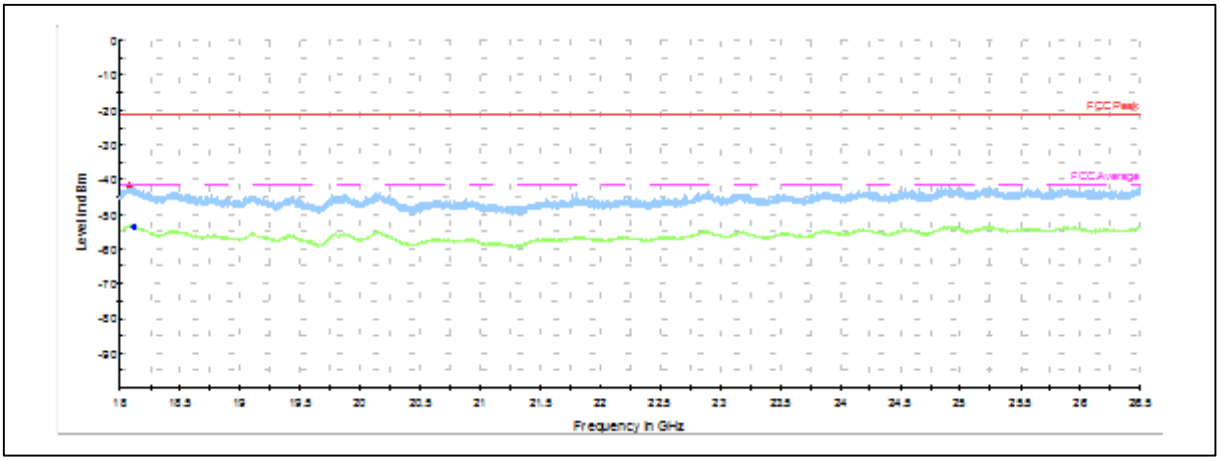
Radiated Spurious – Ch39 3DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
18068.5	---	-53.1	-41.2	11.9
18077.0	-43.5	---	-21.2	22.3

Radiated Spurious – Ch78 3DH5



Peak measurements | RMS measurements | FCC Peak | FCC Average

Frequency	Max Peak	RMS	Limit	Margin
MHz		dBm	dBm	dB
18122.7	---	-53.6	-41.20	12.4
18078.3	-41.6	---	-21.20	20.4