FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

Personal Computer

MODEL NUMBER: Tiburn NCC-1701-A

FCC ID: 2AR77TIBURNNCC1701A

REPORT NUMBER:4788636465-9

ISSUE DATE: December 21, 2018

Prepared for

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Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	12/21/2018	Initial Issue	

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Summary of Test Results			
Clause	**Test Items**	**FCC/IC Rules**	**Test Results**
1	20dB Bandwidth And 99% Bandwidth	FCC 15.247 (a) (1)	Pass
2	Peak Conducted Output Power	FCC 15.247 (b) (1)	Pass
3	Carrier Hopping Channel Separation	FCC 15.247 (a) (1)	Pass
4	Number of Hopping Frequency	15.247 (a) (1) III	Pass
5	Time of Occupancy (Dwell Time)	15.247 (a) (1) III	Pass
6	Conducted Bandedge	FCC 15.247 (d)	Pass
7	Radiated Bandedge and Spurious	FCC 15.247 (d) FCC 15.209 FCC 15.205	Pass
8	Conducted Emission Test For AC Power Port	FCC 15.207	Pass
9	Antenna Requirement	FCC 15.203	Pass

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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS 6

2. TEST METHODOLOGY 7

3. FACILITIES AND ACCREDITATION 7

4. CALIBRATION AND UNCERTAINTY 7

4.1. MEASURING INSTRUMENT CALIBRATION 7

4.2. MEASUREMENT UNCERTAINTY 8

5. EQUIPMENT UNDER TEST 9

5.1. DESCRIPTION OF EUT 9

5.2. MAXIMUM OUTPUT POWER 9

5.3. PACKET TYPE CONFIGURATION 9

5.4. CHANNEL LIST 10

5.5. TEST CHANNEL CONFIGURATION 10

5.6. THE WORSE CASE POWER SETTING PARAMETER 10

5.7. DESCRIPTION OF AVAILABLE ANTENNAS 11

5.8. WORST-CASE CONFIGURATIONS 11

5.9. TEST ENVIRONMENT 11

5.10. DESCRIPTION OF TEST SETUP 12

5.11. MEASURING INSTRUMENT AND SOFTWARE USED 13

6. ANTENNA PORT TEST RESULTS 14

6.1. ON TIME AND DUTY CYCLE 14

6.2. 20 dB BANDWIDTH AND 99% BANDWIDTH 16

6.2.1. GFSK MODE 17

6.2.2. Π/4-DQPSK 20

6.3. PEAK CONDUCTED OUTPUT POWER 24

6.3.1. GFSK MODE 25

6.3.2. Π/4-DQPSK 25

6.4. CARRIER HOPPING CHANNEL SEPARATION 26

6.4.1. GFSK MODE 27

6.4.2. Π/4-DQPSK 28

6.5. NUMBER OF HOPPING FREQUENCY 29

6.5.1. GFSK MODE 30

6.5.2. Π/4-DQPSK 31

6.6. TIME OF OCCUPANCY (DWELL TIME) 32

6.6.1. GFSK MODE 33

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6.6.2. Π/4-DQPSK 36

6.7. CONDUCTED SPURIOUS EMISSION 38
6.7.1. GFSK MODE 39
6.7.2. Π/4-DQPSK 46

7. RADIATED TEST RESULTS 53

7.1. LIMITS AND PROCEDURE 53

7.2. RESTRICTED BANDEDGE 59
7.2.1. GFSK MODE 59
7.2.2. Π/4-DQPSK 63

7.3. SPURIOUS EMISSIONS (1~3GHz) 67
7.3.1. GFSK MODE 67
7.3.2. Π/4-DQPSK 73

7.4. SPURIOUS EMISSIONS (3~18GHz) 79
7.4.1. GFSK MODE 79
7.4.2. Π/4-DQPSK 85

7.5. SPURIOUS EMISSIONS 18G ~ 26GHz 91
7.5.1. Π/4-DQPSK 91

7.6. SPURIOUS EMISSIONS 30M ~ 1 GHz 93
7.6.1. Π/4-DQPSK 93

7.7. SPURIOUS EMISSIONS BELOW 30M 95
7.7.1. Π/4-DQPSK 95

8. AC POWER LINE CONDUCTED EMISSIONS 101

8.1.1. Π/4-DQPSK MODE 102

9. ANTENNA REQUIREMENTS 104

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	Tiburn Technology Co., Ltd.
Address:	606, 6 / f, Building 10, No. 44, Beisanhuan middle road, Haidian district, Beijing

Manufacturer Information

Company Name:	Tiburn Technology Co., Ltd.
Address:	606, 6 / f, Building 10, No. 44, Beisanhuan middle road, Haidian district, Beijing

EUT Description

EUT Name:	Personal Computer
Model:	Tiburn NCC-1701-A
Brand Name:	Tiburn
Series Model	Please refer to clause 5.1 the description of EUT
Sample Received Date:	December 2, 2018
Sample ID:	12467549
Sample Status:	Normal
Date of Tested:	December 10, 2018 ~ December 20, 2018

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC Part 15 Subpart C	PASS

Tested By:

Denny Huang
Engineer Project Associate

Checked By:

Shawn Wen
Laboratory Leader

Approved By:

Stephen Guo
Laboratory Manager

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with DA 00-705,KDB414788 D01 Radiated Test Site v01, ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011

Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2 : For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OATS.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.62dB
Radiation Emission test(include Fundamental emission) (9kHz-30MHz)	2.2dB
Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.00dB
Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.78dB (1GHz-18Gz)
	5.23dB (18GHz-26Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	Personal Computer	
Model	Tiburn NCC-1701-A	
Series Model	Tiburn NCC-1701-A*, 1000* (Where * maybe any alphanumeric character, symbol or blank of 0~7 digits, for marketing purpose.)	
Model Difference	All the same except for the model name.	
Product Description (Bluetooth)	Operation Frequency	2402 MHz ~ 2480 MHz
	Modulation Type	Data Rate
	GFSK	1Mbps
	∏/4-DQPSK	2Mbps
Rated Input	AC 100~240V, 50~60Hz	

Note: The EUT only support GFSK and ∏/4-DQPSK modulations.

5.2. MAXIMUM OUTPUT POWER

Bluetooth Mode	Frequency (MHz)	Channel Number	Max Output Power (dBm)	EIRP (dBm)
GFSK	2402-2480	0-78[79]	-2.738	-0.638
∏/4-DQPSK	2402-2480	0-78[79]	-1.548	0.552

5.3. PACKET TYPE CONFIGURATION

Test Mode	Packet Type	Setting(Packet Length)
GFSK	DH1	27
	DH3	183
	DH5	339
∏/4-DQPSK	2-DH1	54
	2-DH3	367
	2-DH5	679

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5.4. CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2422	40	2442	60	2462
01	2403	21	2423	41	2443	61	2463
02	2404	22	2424	42	2444	62	2464
03	2405	23	2425	43	2445	63	2465
04	2406	24	2426	44	2446	64	2466
05	2407	25	2427	45	2447	65	2467
06	2408	26	2428	46	2448	66	2468
07	2409	27	2429	47	2449	67	2469
08	2410	28	2430	48	2450	68	2470
09	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	\	\

5.5. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel Number	Test Channel
GFSK	CH 00, CH 39, CH 78	Low, Middle, High
∏/4-DQPSK	CH 00, CH 39, CH 78	Low, Middle, High

5.6. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band				
Test Software		FCCAssist		
Modulation Type	Transmit Antenna Number	Test Channel		
		CH 00	CH 39	CH 78
GFSK	1	7	7	7
∏/4-DQPSK	1	7	7	7

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5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2402-2480	PCB Antenna	2.10

Test Mode	Transmit and Receive Mode	Description
GFSK	1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.
∏/4-DQPSK	1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.

5.8. WORST-CASE CONFIGURATIONS

Bluetooth Mode	Modulation Technology	Modulation Type	Data Rate (Mbps)
BR	FHSS	GFSK	1Mbit/s
EDR	FHSS	∏/4-DQPSK	2Mbit/s

Note: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

5.9. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	23 ~ 28 °C
Voltage :	VL	/
	VN	AC 120V 60Hz
	VH	/

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage.
VH= Upper Extreme Test Voltage
TN= Normal Temperature

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5.10. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	Laptop	ThinkPad	T460S	SL10K24796 JS
2	Monitor	Dell	P2715Q	CN-040FHF-WS200-79C-390L
3	Mouse	Dell	/	/

I/O CABLES

Cable No	Port	Cable Type	Cable Length(m)	Remarks
1	USB	Unshielded	0.5	/
2	HDMI	Unshielded	1.5	/
3	DP	Unshielded	1.5	/
4	Type-C	Unshielded	0.5	/
5	Optical	Unshielded	1.2	/

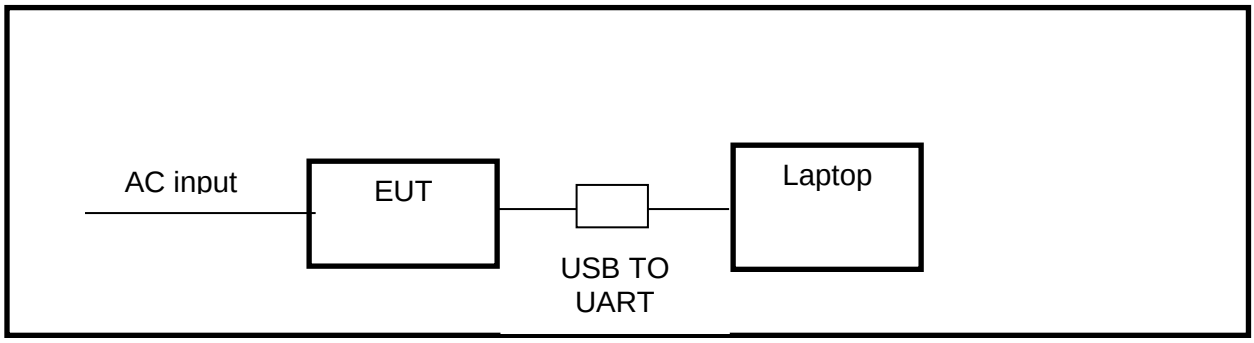
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	/	/	/	/

TEST SETUP

The EUT can work in an engineer mode with a software through a PC.

SETUP DIAGRAM FOR TEST



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5.11. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions							
Instrument							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	Two-Line V-Network	R&S	ENV216	101983	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
Software							
Used	Description			Manufacturer	Name	Version	
☑	Test Software for Conducted disturbance			Farad	EZ-EMC	Ver. UL-3A1	
Radiated Emissions							
Instrument							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	/	Jan.09, 2016	Jan.09, 2019
☑	Preamplifier	HP	8447D	2944A09099	Feb. 13, 2017	Dec.12, 2017	Dec.11, 2018
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2016	Jan. 09, 2019
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2016	Jan.06, 2019
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	Loop antenna	Schwarzbeck	1519B	00008	/	Mar. 26, 2016	Mar. 26, 2019
Software							
Used	Description			Manufacturer	Name	Version	
☑	Test Software for Radiated disturbance			Farad	EZ-EMC	Ver. UL-3A1	
Other instruments							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	Power Meter	Keysight	N9031A	MY55416024	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	Power Sensor	Keysight	N9323A	MY55440013	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019
☑	High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23	Dec.12, 2017	Dec.10, 2018	Dec.10, 2019

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6. ANTENNA PORT TEST RESULTS

6.1. ON TIME AND DUTY CYCLE

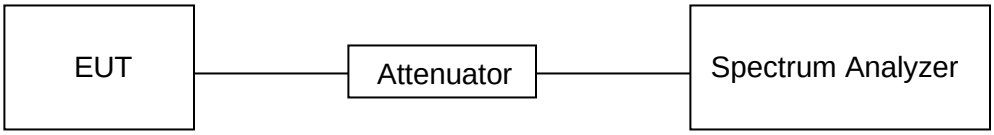
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/T Minimum VBW (KHz)	Final setting For VBW (KHz)
GFSK	2.911	3.751	0.776	77.6	1.101	0.34	0.5
∏/4-DQPSK	2.916	3.749	0.779	77.9	1.085	0.34	0.5

Note: Duty Cycle Correction Factor=10log(1/x).
Where: x is Duty Cycle(Linear)
Where: T is On Time (transmit duration)

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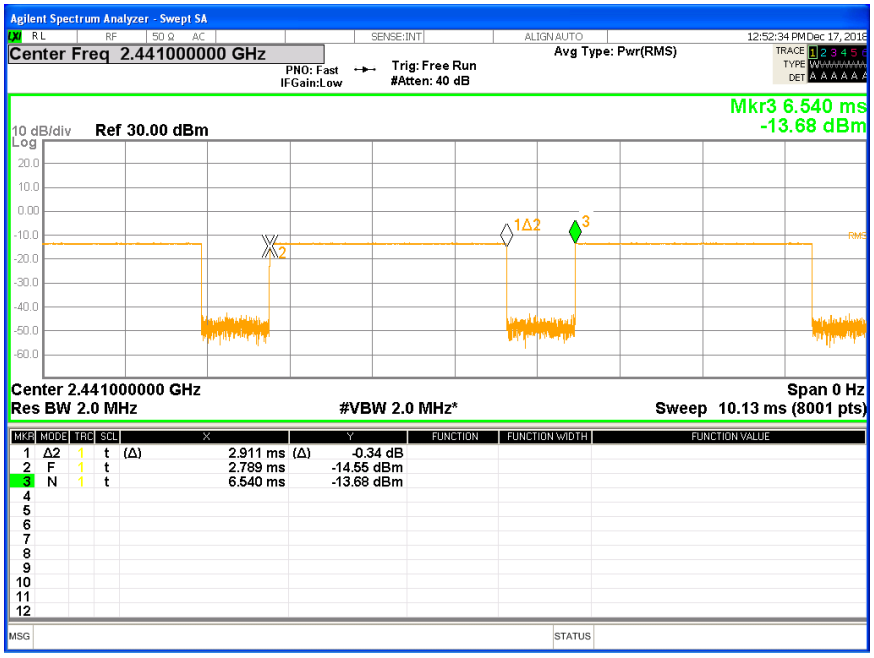
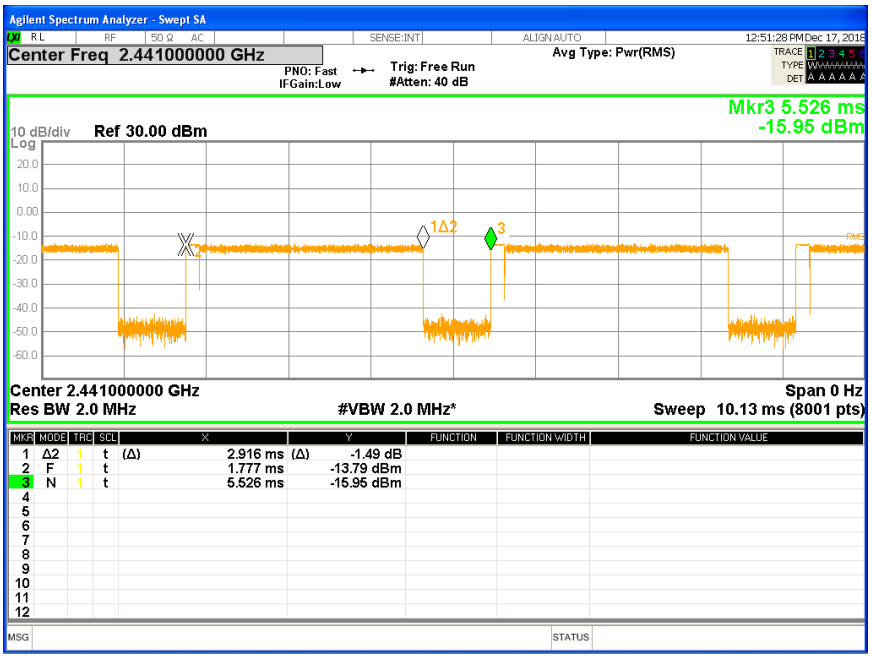
DH5 ON TIME AND DUTY CYCLE MID CH



2DH5 ON TIME AND DUTY CYCLE MID CH



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6.2. 20 dB BANDWIDTH AND 99% BANDWIDTH

LIMITS

FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247 (a) (1)	20dB Bandwidth	N/A	2400-2483.5

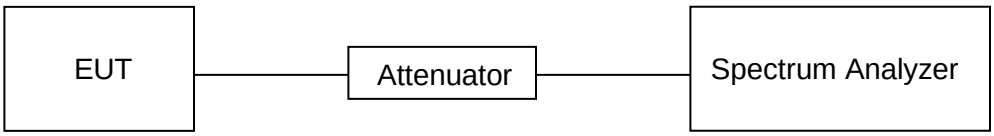
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	For 20dB Bandwidth:1% of the 20 dB bandwidth For 99% Bandwidth: 1% to 5% of the occupied bandwidth
VBW	For 20dB Bandwidth: ≥ RBW For 99% Bandwidth: approximately 3×RBW
Span	approximately 2 to 3 times the 20 dB bandwidth
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

TEST SETUP



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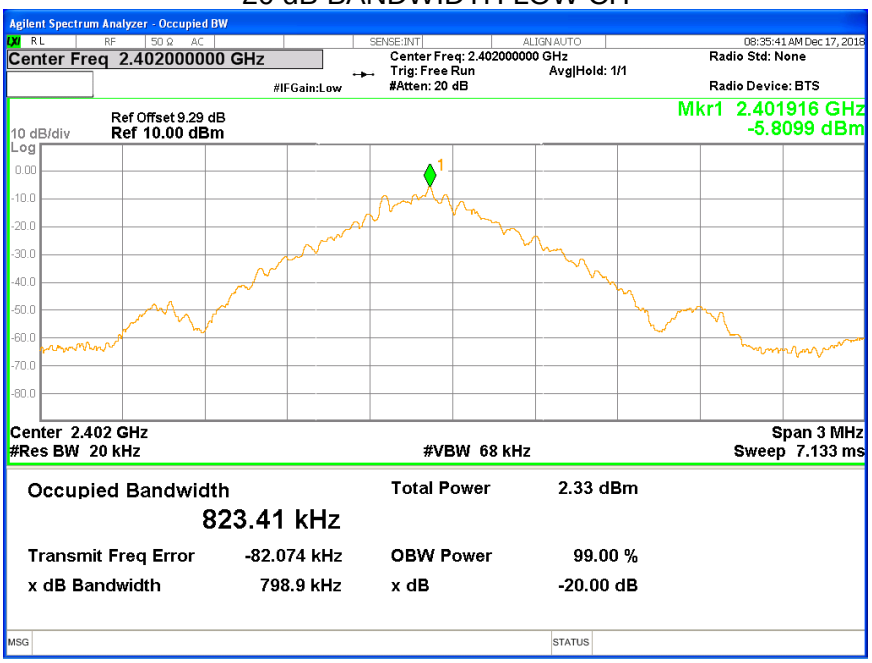
RESULTS

6.2.1. GFSK MODE

Channel	Frequency (MHz)	20dB bandwidth (MHz)	99% bandwidth (MHz)	Result
Low	2402	0.799	0.833	PASS
Middle	2441	0.799	0.818	PASS
High	2480	0.800	0.829	PASS

Test Graph

20 dB BANDWIDTH LOW CH



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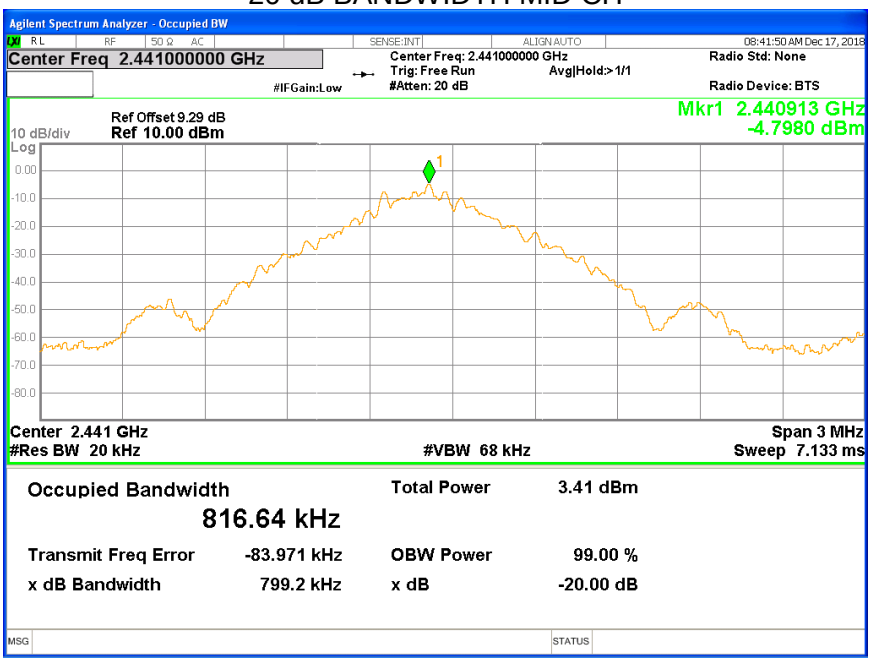
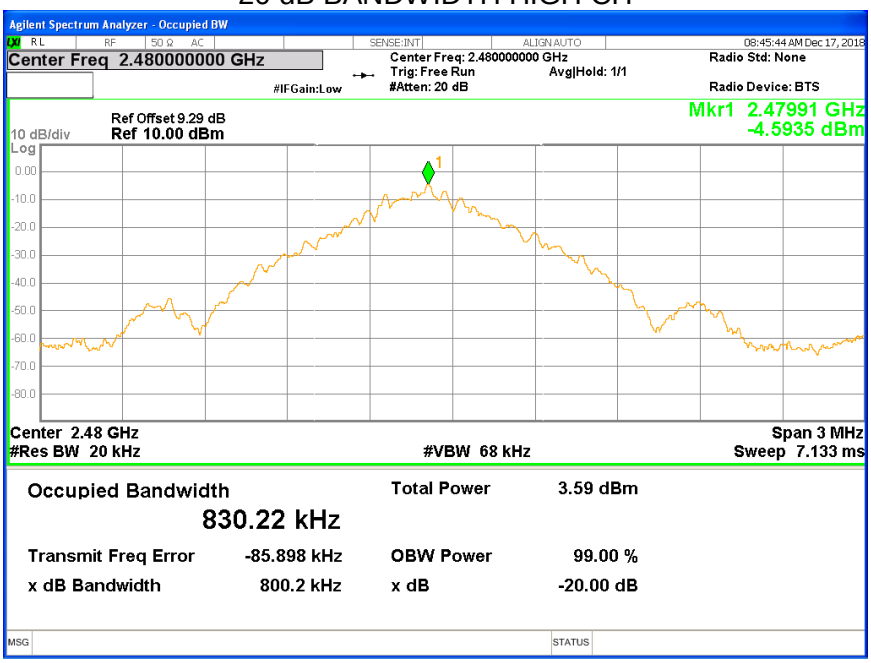
20 dB BANDWIDTH MID CH



20 dB BANDWIDTH HIGH CH



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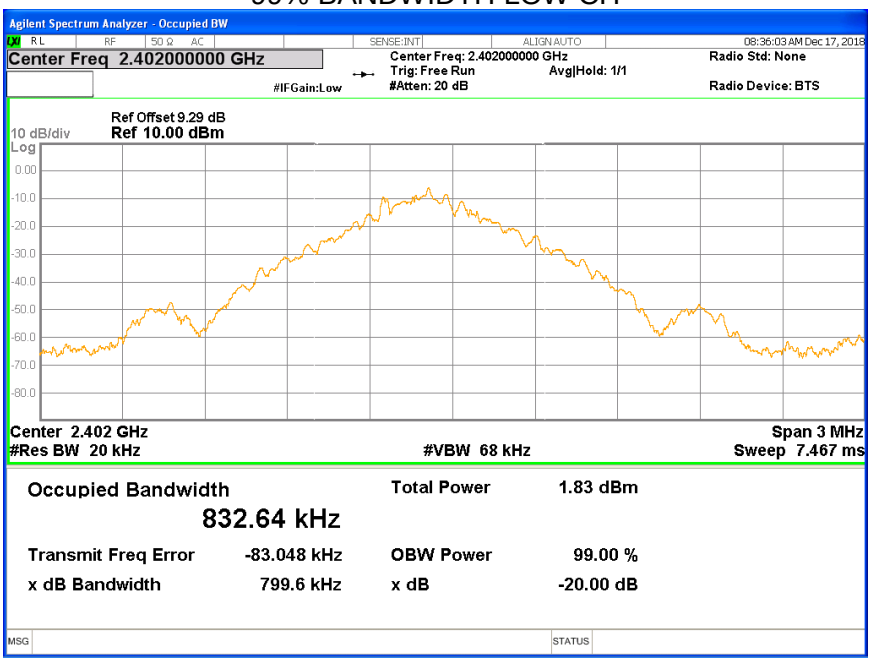
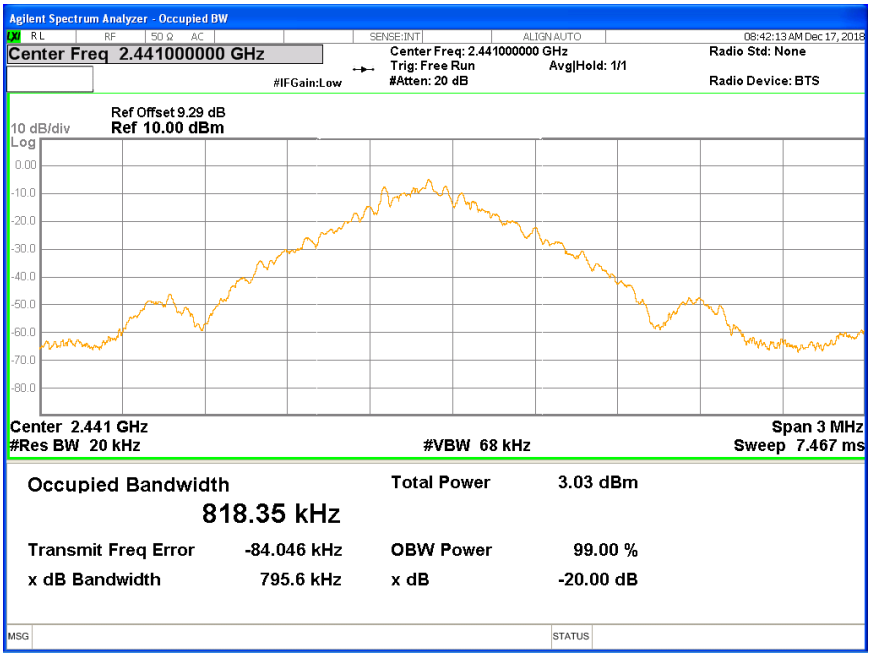
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



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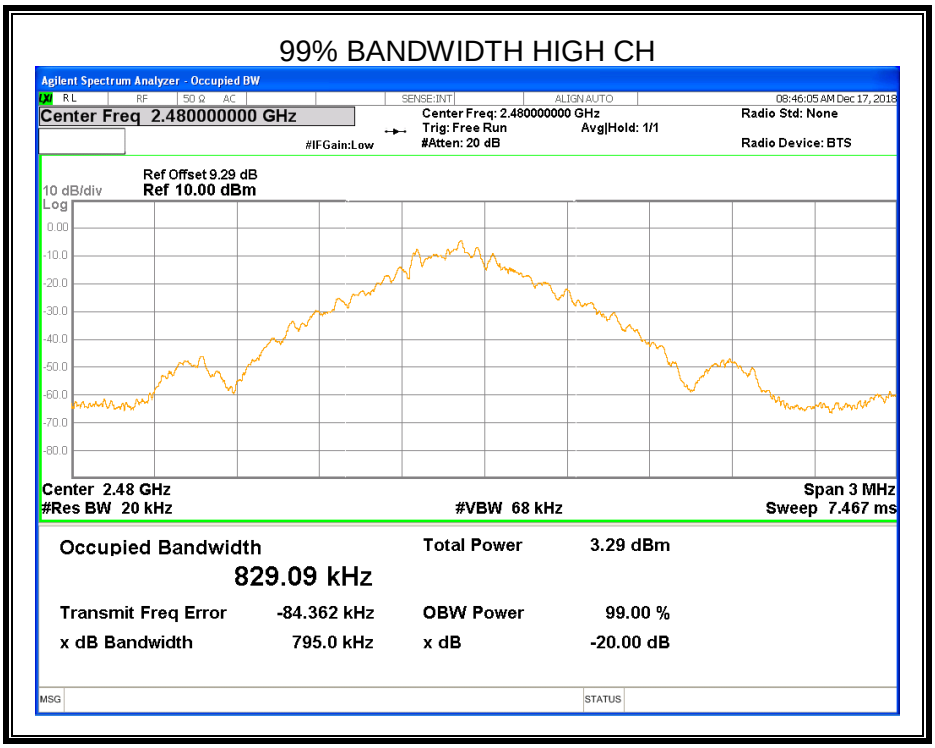

6.2.2. ∏/4-DQPSK

Channel	Frequency (MHz)	20dB bandwidth (MHz)	99% bandwidth (MHz)	Result
Low	2402	1.183	1.1735	PASS
Middle	2441	1.192	1.1770	PASS
High	2480	1.183	1.1746	PASS

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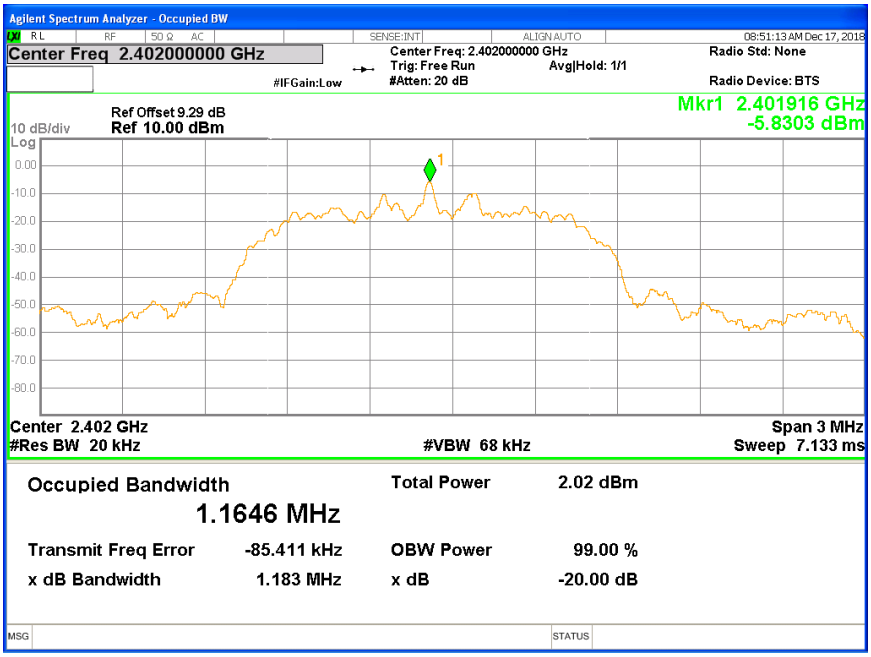
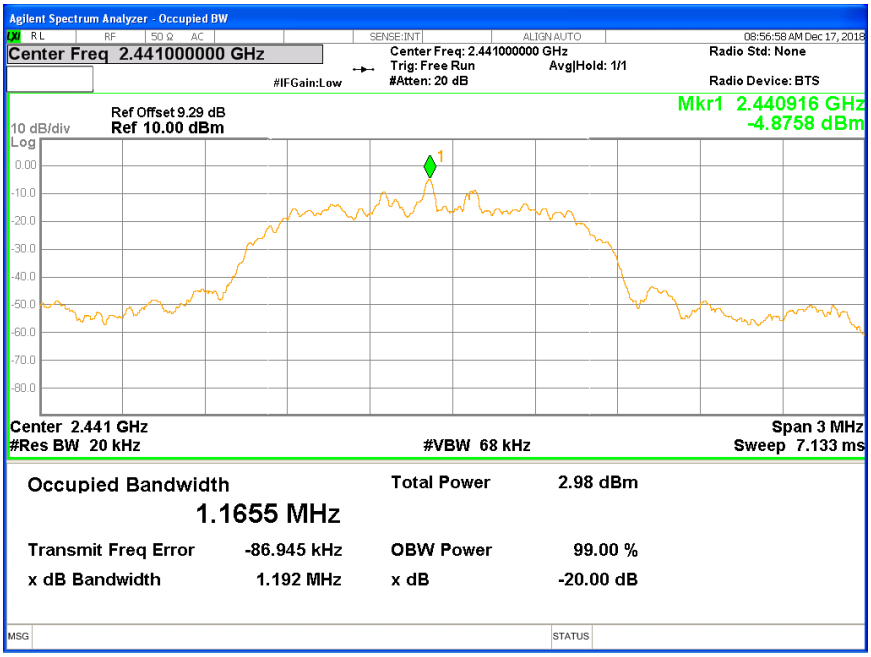
20 dB BANDWIDTH LOW CH



20 dB BANDWIDTH MID CH



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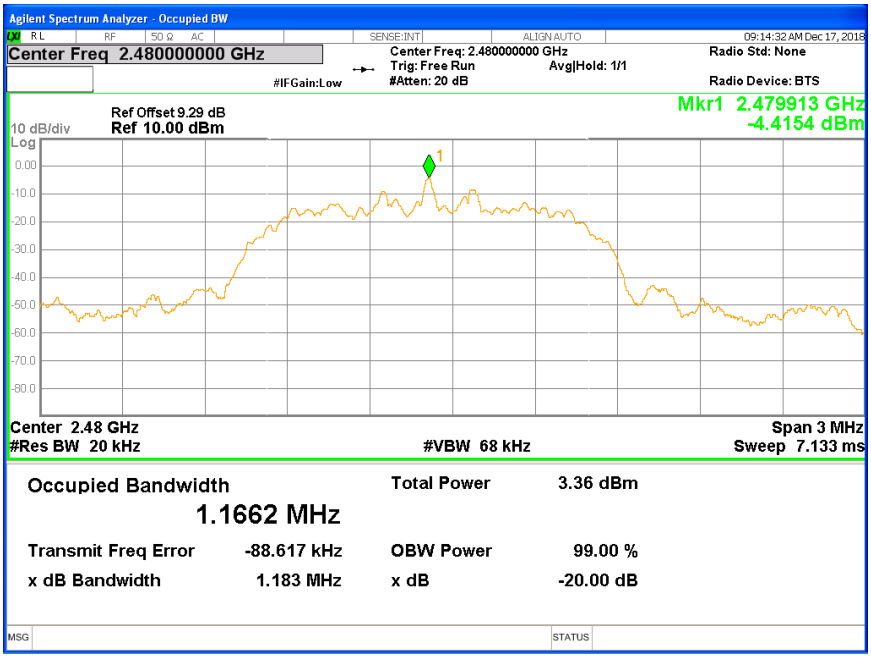
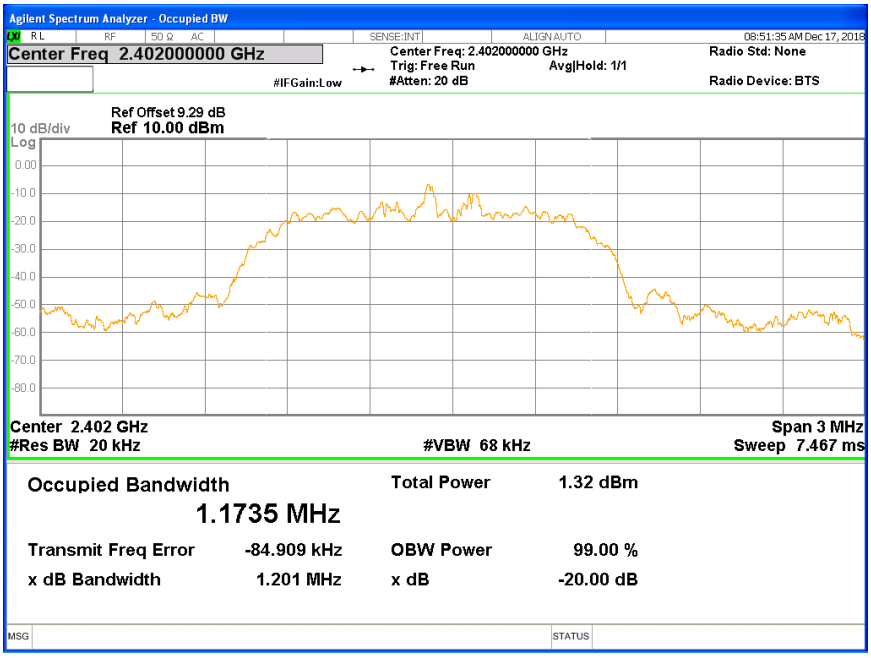
20 dB BANDWIDTH HIGH CH



99% BANDWIDTH LOW CH



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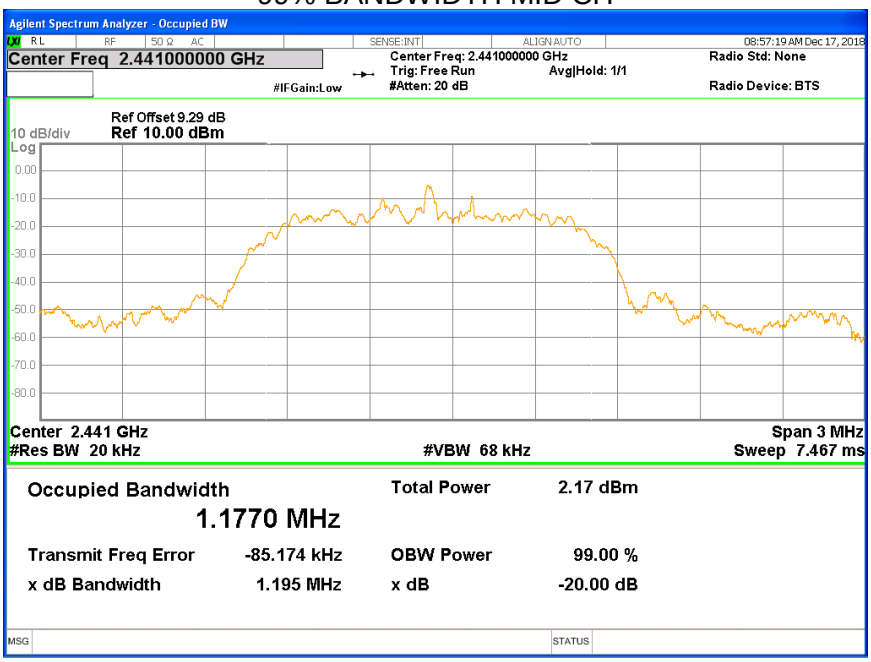
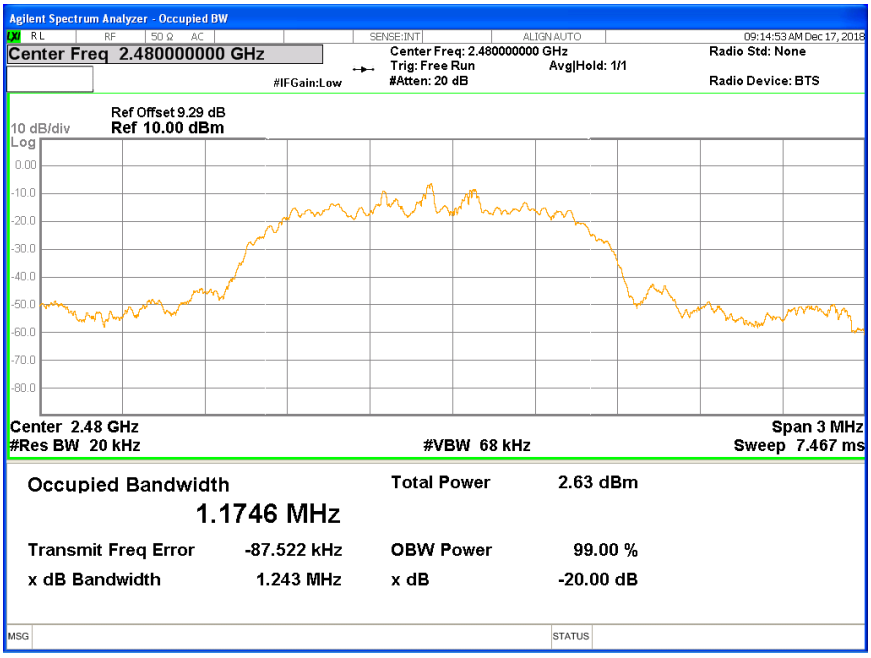
99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



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6.3. PEAK CONDUCTED OUTPUT POWER

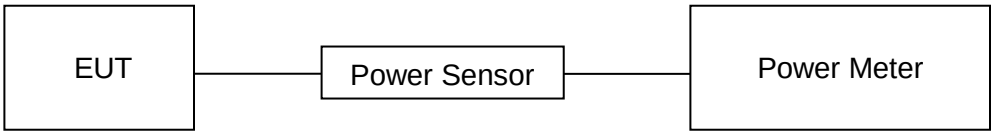
LIMITS

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247 (b) (1)	Peak Conducted Output Power	1 watt or 30dBm	2400-2483.5

TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.
Measure peak power each channel.

TEST SETUP



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RESULTS

6.3.1. GFSK MODE

Channel	Frequency	PK Maximum Conducted Output Power	PK EIRP	Result
	(MHz)	(dBm)	(dBm)	
Low	2402	-4.144	-2.044	Pass
Middle	2441	-3.126	-1.026	Pass
High	2480	-2.738	-0.638	Pass

6.3.2. ∏/4-DQPSK

Channel	Frequency	PK Maximum Conducted Output Power	PK EIRP	Result
	(MHz)	(dBm)	(dBm)	
Low	2402	-2.928	-0.828	Pass
Middle	2441	-1.916	0.184	Pass
High	2480	-1.548	0.552	Pass

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6.4. CARRIER HOPPING CHANNEL SEPARATION

LIMITS

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247 (a) (1)	Carrier Hopping Channel Separation	25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.	2400-2483.5

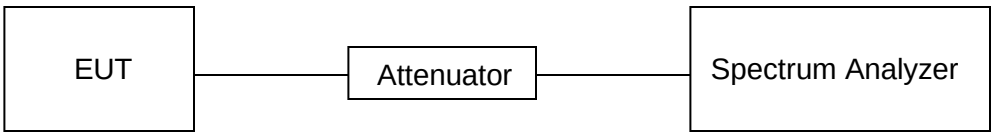
TEST PROCEDURE

Connect the UUT to the spectrum Analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Span	wide enough to capture the peaks of two adjacent channels
Detector	Peak
RBW	Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
VBW	≥RBW
Trace	Max hold
Sweep time	Auto couple

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.
Compliance of an EUT with the appropriate regulatory limit shall be determined.
A plot of the data shall be included in the test report.

TEST SETUP



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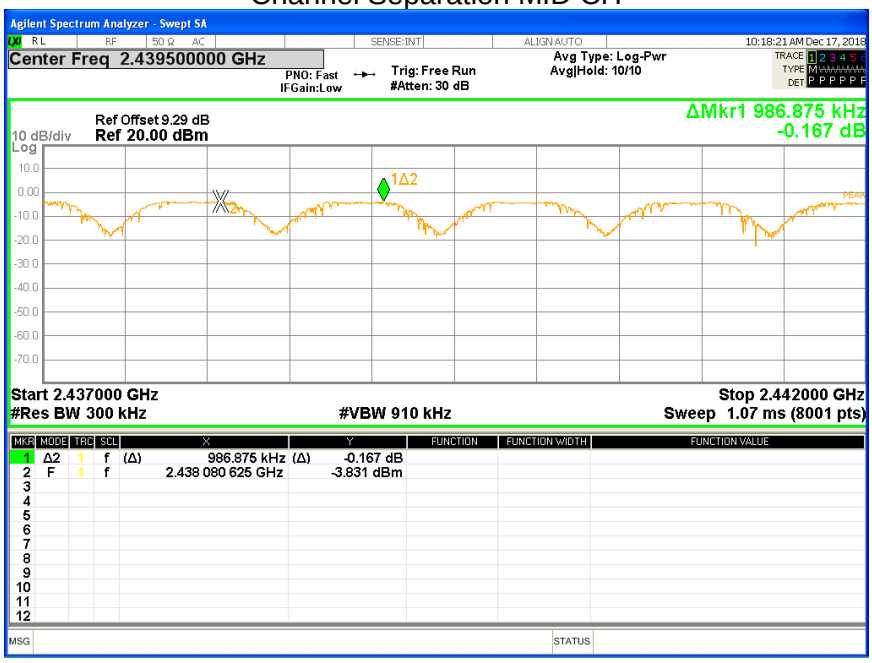
RESULTS

6.4.1. GFSK MODE

Channel	Carrier Hopping Channel Separation (MHz)	Limit (MHz)	Result
Middle	1.0	≥ two-thirds of the 20 dB Bandwidth Of The Hopping Channel	PASS

Channel Separation MID CH



Note: For 20 dB Bandwidth of The Hopping Channel, please refer to clause 6.1.1.

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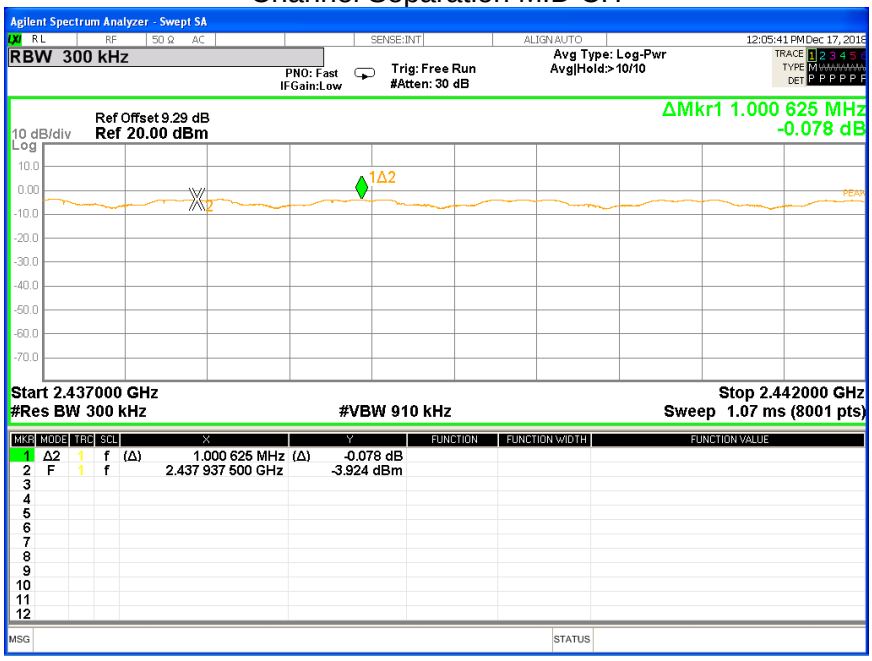
6.4.2. ∏/4-DQPSK

Channel	Carrier Hopping Channel Separation (MHz)	Limit (MHz)	Result
Middle	1.0	≥ two-thirds of the 20 dB Bandwidth Of The Hopping Channel	PASS

Channel Separation MID CH



Note: For 20 dB Bandwidth of The Hopping Channel, please refer to clause 6.1.2.

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6.5. NUMBER OF HOPPING FREQUENCY

LIMITS

FCC Part15 (15.247) , Subpart C		
Section	Test Item	Limit
15.247 (a) (1) III	Number of Hopping Frequency	at least 15 hopping channels

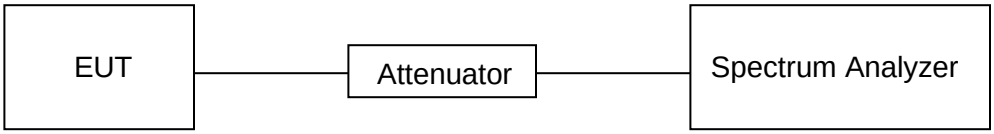
TEST PROCEDURE

Connect the EUT to the spectrum Analyzer and use the following settings:

Detector	Peak
RBW	To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
VBW	≥RBW
Span	The frequency band of operation
Trace	Max hold
Sweep time	Auto couple

Set EUT to transmit maximum output power and switch on frequency hopping function. then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.
Count the quantity of peaks to get the number of hopping channels.
Normal Mode: 79 Channels observed.
AFH Mode: 20 Channels declared.

TEST SETUP



RESULTS

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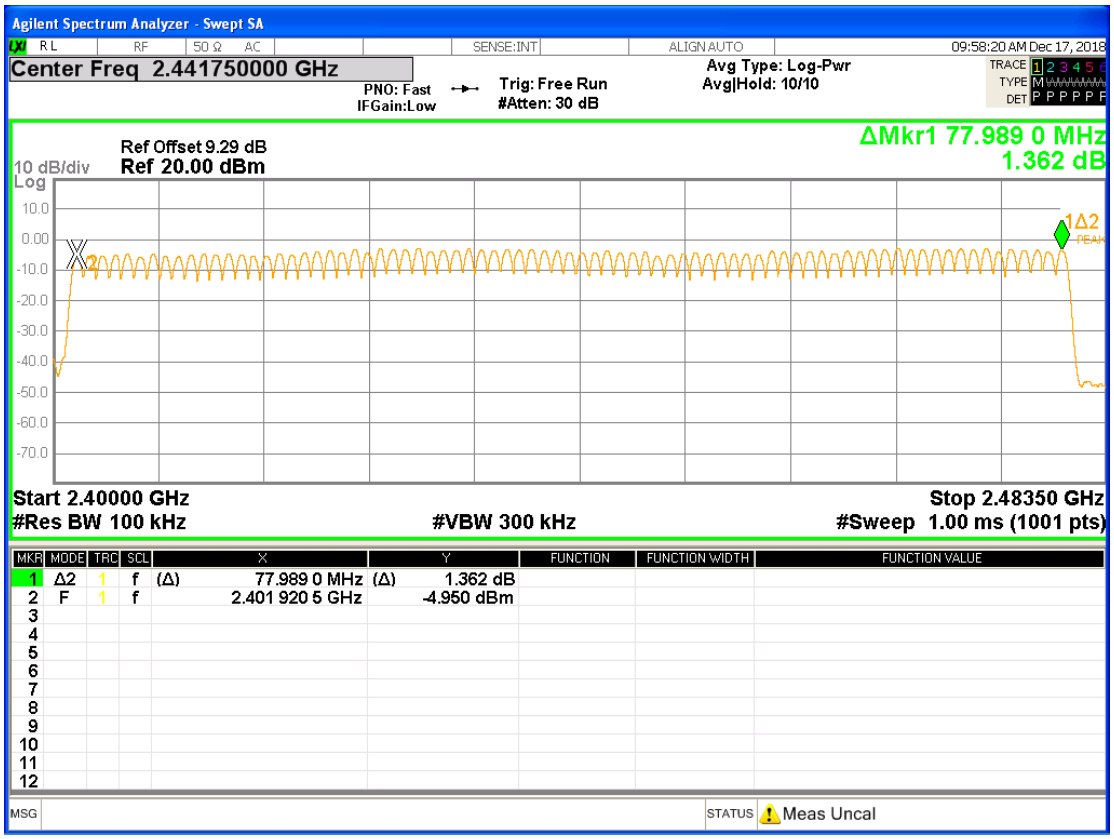
6.5.1. GFSK MODE

Hopping numbers	Limit	Results
79	>15	Pass



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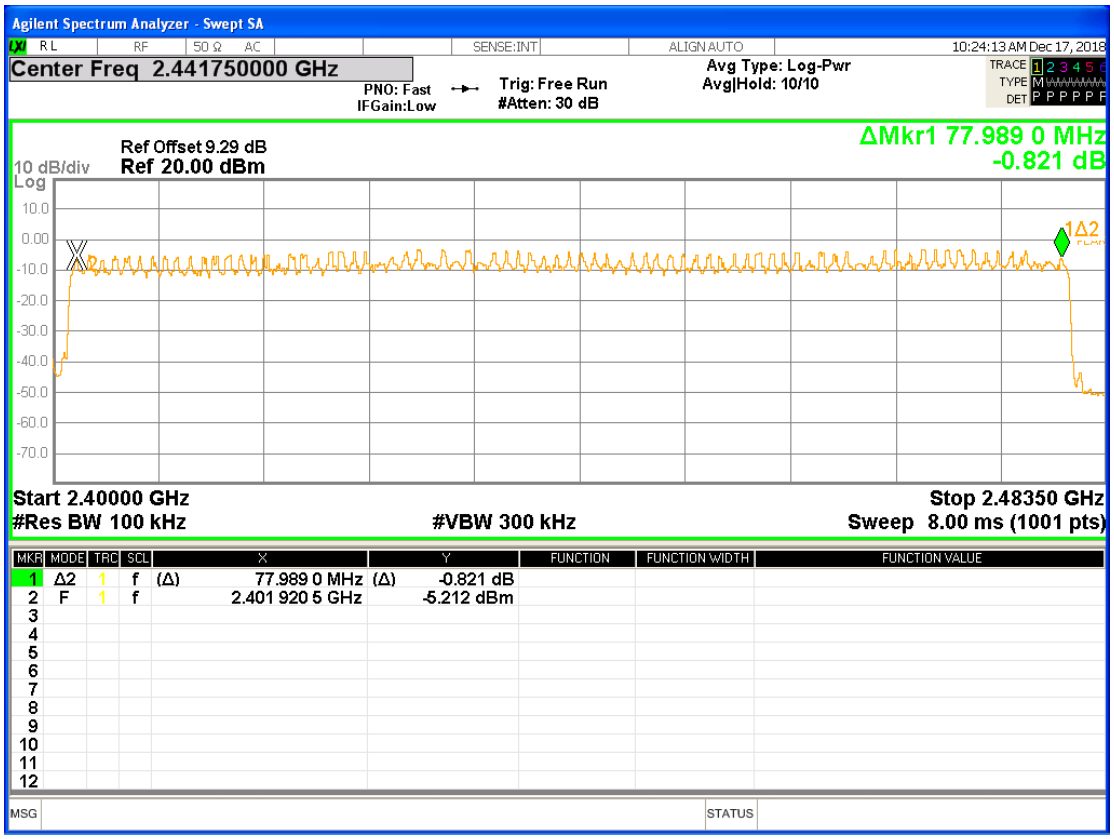
6.5.2. ∏/4-DQPSK

Hopping numbers	Limit	Results
79	>15	Pass



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6.6. TIME OF OCCUPANCY (DWELL TIME)

LIMITS

FCC Part15 (15.247) , Subpart C		
Section	Test Item	Limit
15.247 (a) (1) III	Time of Occupancy (Dwell Time)	The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed.

TEST PROCEDURE

Connect the UUT to the spectrum Analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	1 MHz
VBW	≥RBW
Span	zero span
Trace	Max hold
Sweep time	As necessary to capture the entire dwell time per hopping channel

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
h. Measure the maximum time duration of one single pulse.
A Period Time = (channel number)*0.4

For Normal Mode (79 Channel):
DH1 Time Slot: Reading * (1600/2)*31.6/(channel number)
DH3 Time Slot: Reading * (1600/4)*31.6/(channel number)
DH5 Time Slot: Reading * (1600/6)*31.6/(channel number)

For AFH Mode (20 Channel):
DH1 Time Slot: Reading * (1600/2)*8/(channel number)
DH3 Time Slot: Reading * (1600/4)*8/(channel number)
DH5 Time Slot: Reading * (1600/6)*8/(channel number)

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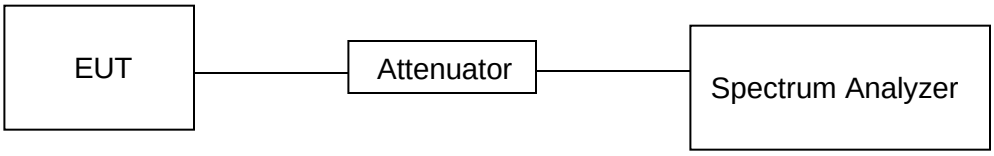
TEST SETUP



RESULTS

6.6.1. GFSK MODE

Normal Mode					
Packet	**Channel**	**Burst Width [ms/hop/ch]**	**Dwell Time [ms]**	**Duty Cycle [%]**	**Results**
DH1	MCH	0.407	0.130	32.6	PASS
DH3	MCH	1.663	0.266	66.5	PASS
DH5	MCH	2.911	0.311	77.6	PASS
AFH Mode					
DH1	MCH	0.407	0.130	32.6	PASS
DH3	MCH	1.663	0.266	66.5	PASS
DH5	MCH	2.911	0.311	77.6	PASS

Test Graph

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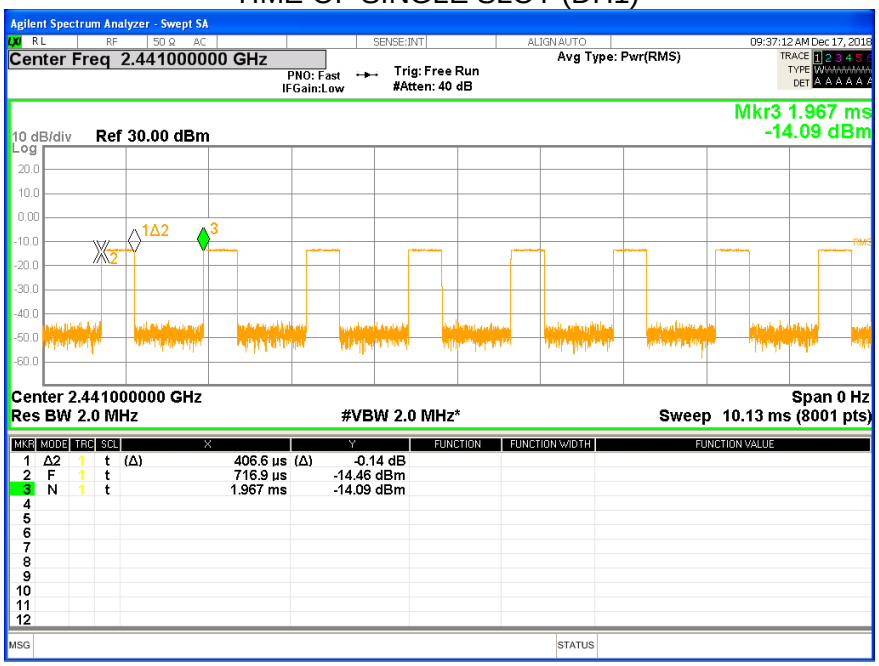
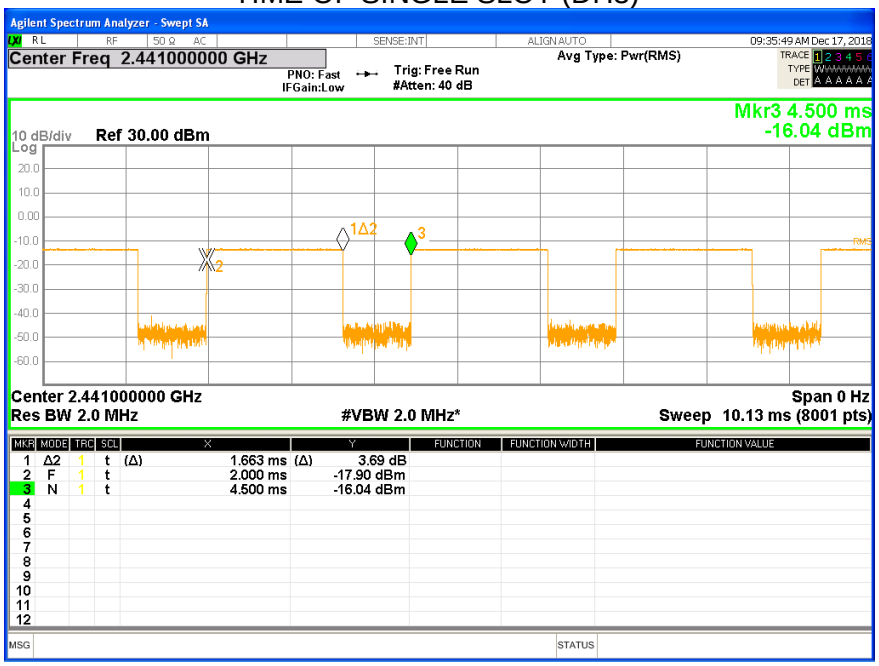
TIME OF SINGLE SLOT (DH1)



TIME OF SINGLE SLOT (DH3)



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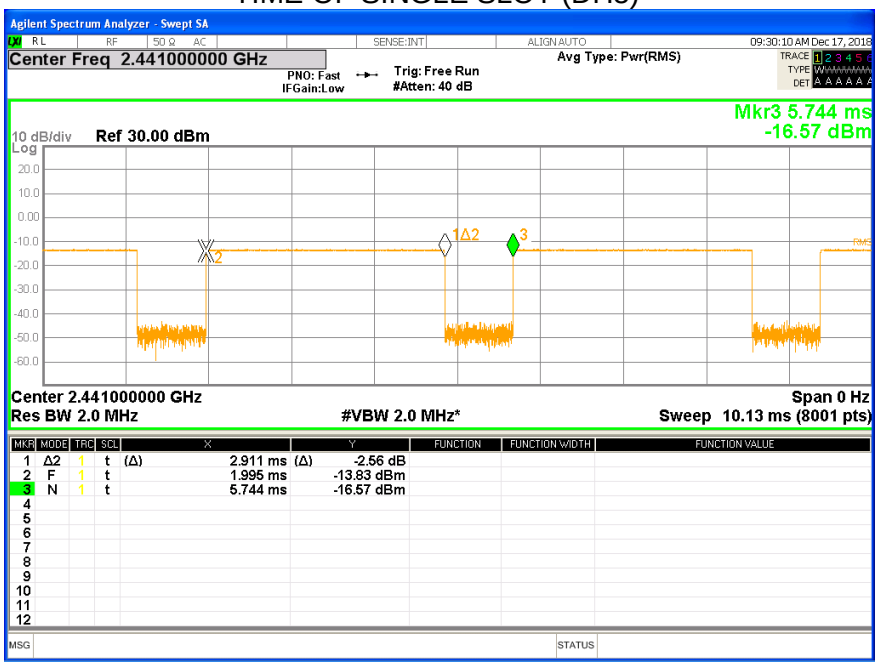
TIME OF SINGLE SLOT (DH5)



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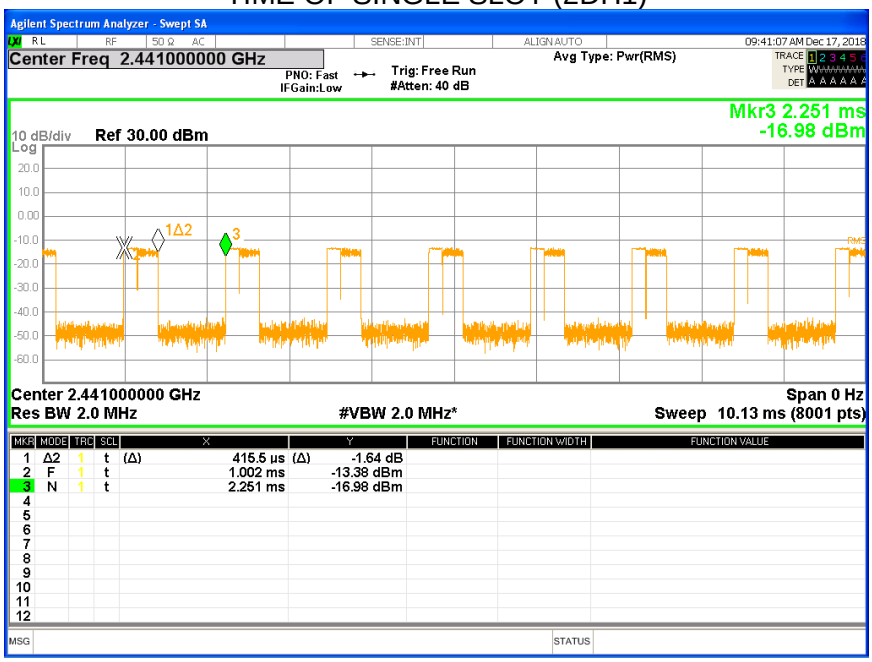
6.6.2. ∏/4-DQPSK

Normal Mode					
Packet	**Channel**	**Burst Width [ms/hop/ch]**	**Dwell Time [ms]**	**Duty Cycle [%]**	**Results**
2DH1	MCH	0.416	0.133	33.3	PASS
2DH3	MCH	1.669	0.267	66.8	PASS
2DH5	MCH	2.916	0.311	77.8	PASS
AFH Mode					
2DH1	MCH	0.416	0.133	33.3	PASS
2DH3	MCH	1.669	0.267	66.8	PASS
2DH5	MCH	2.916	0.311	77.8	PASS

Test Graph

TIME OF SINGLE SLOT (2DH1)



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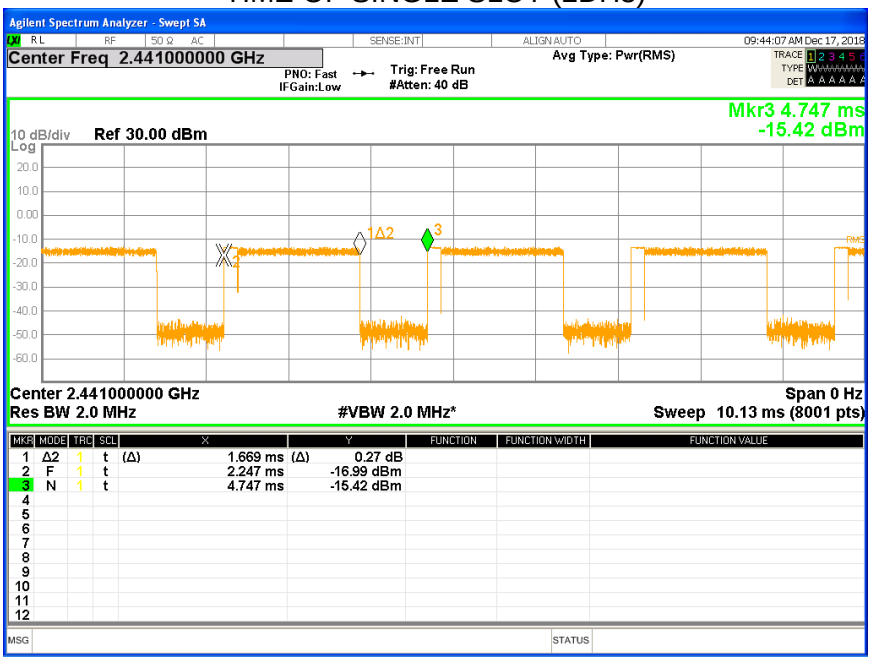
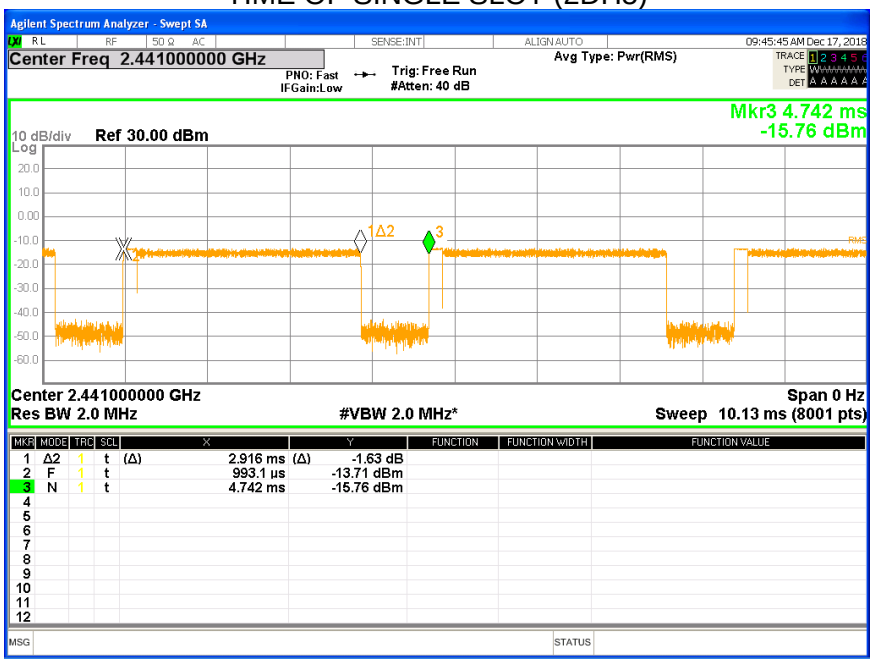
TIME OF SINGLE SLOT (2DH3)



TIME OF SINGLE SLOT (2DH5)



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6.7. CONDUCTED SPURIOUS EMISSION

LIMITS

FCC Part15 (15.247) , Subpart C		
Section	Test Item	Limit
FCC §15.247 (d)	Conducted Spurious Emission	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Please refer to the ANSI C63.10 section 6.10.

For Bandedge use the following settings:

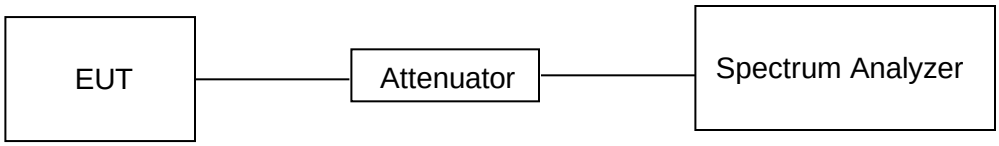
Detector	Peak
RBW	100KHz
VBW	300KHz
Span	wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation
Trace	Max hold
Sweep time	Couple

For Spurious Emission use the following settings:

Detector	Peak
RBW	100KHz
VBW	300KHz
Span	Wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
Trace	Max hold
Sweep time	Couple

Use the peak marker function to determine the maximum amplitude level**.**

TEST SETUP



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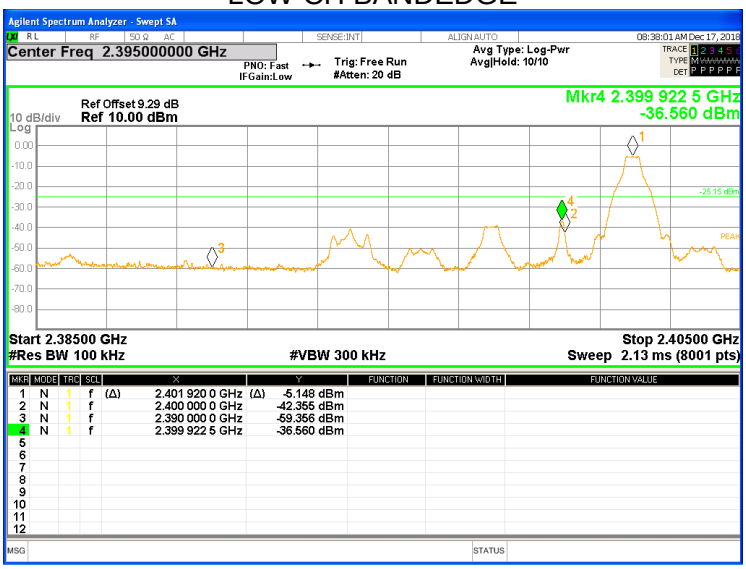
RESULTS

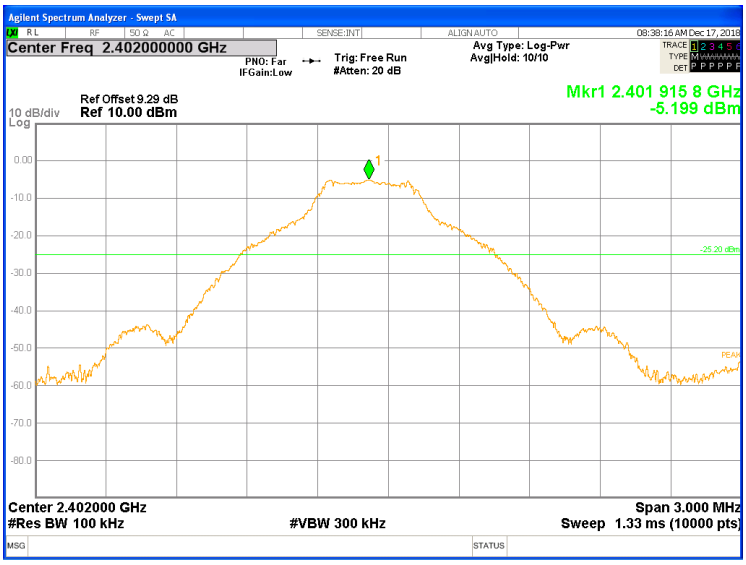
6.7.1. GFSK MODE

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CH BANDEDGE



LOW CH REFERENCE



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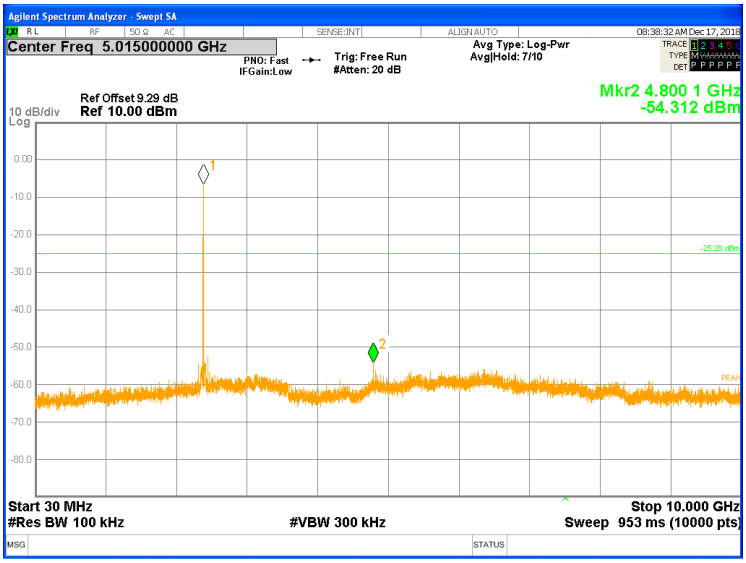
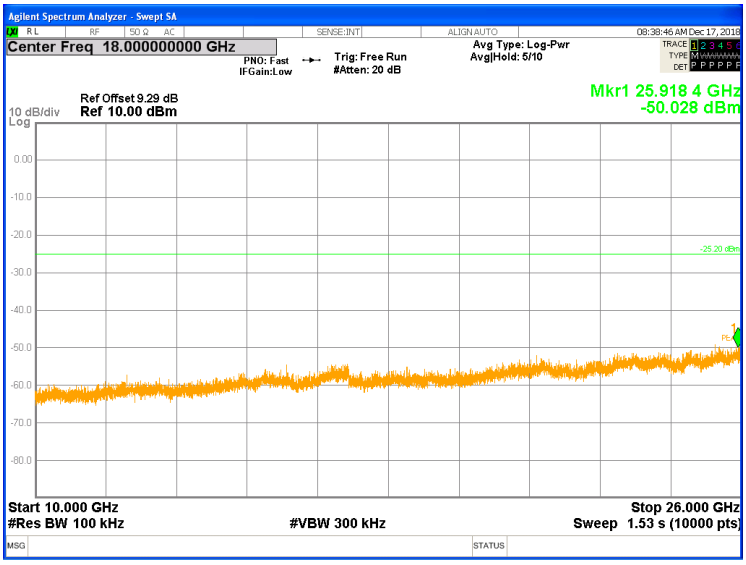
LOW CH SPURIOUS – 30MHz~10GHz



LOW CH SPURIOUS – 30MHz~10GHz



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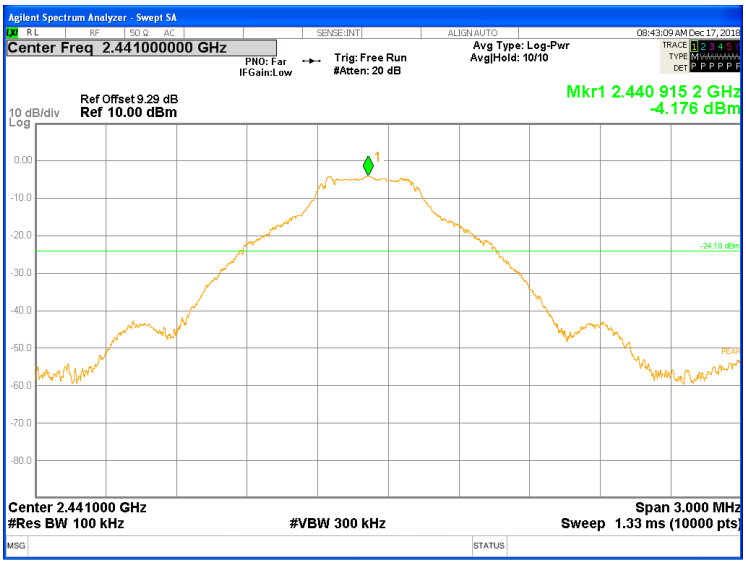
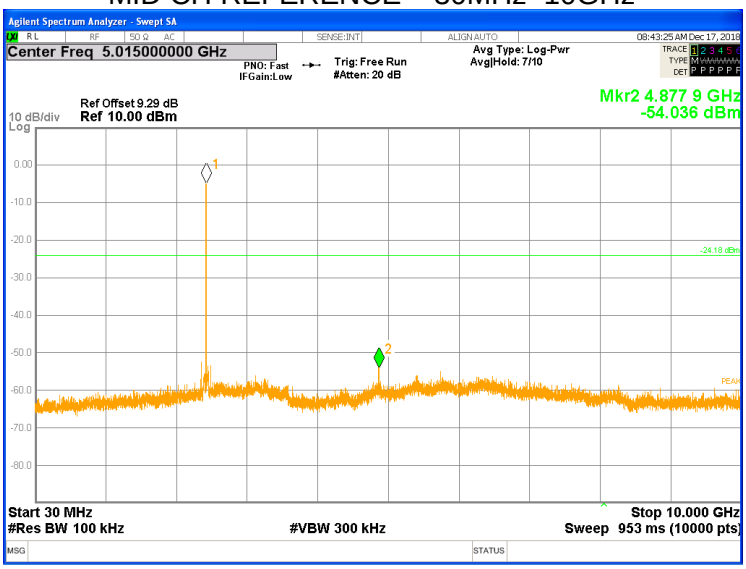
SPURIOUS EMISSIONS, MID CHANNEL

MID CH REFERENCE



MID CH REFERENCE – 30MHz~10GHz



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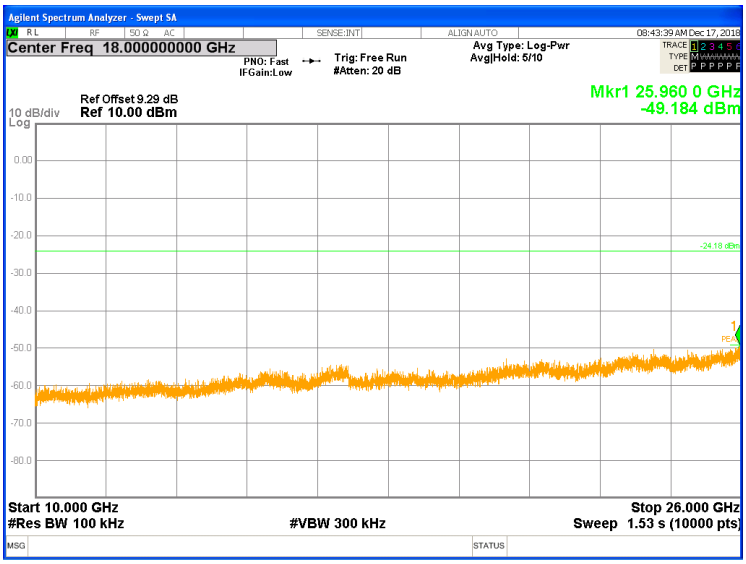
MID CH SPURIOUS – 30MHz~10GHz



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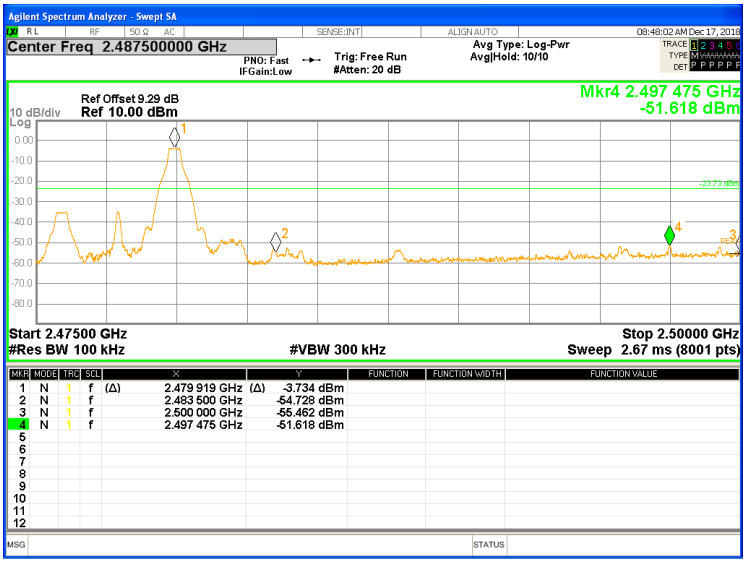
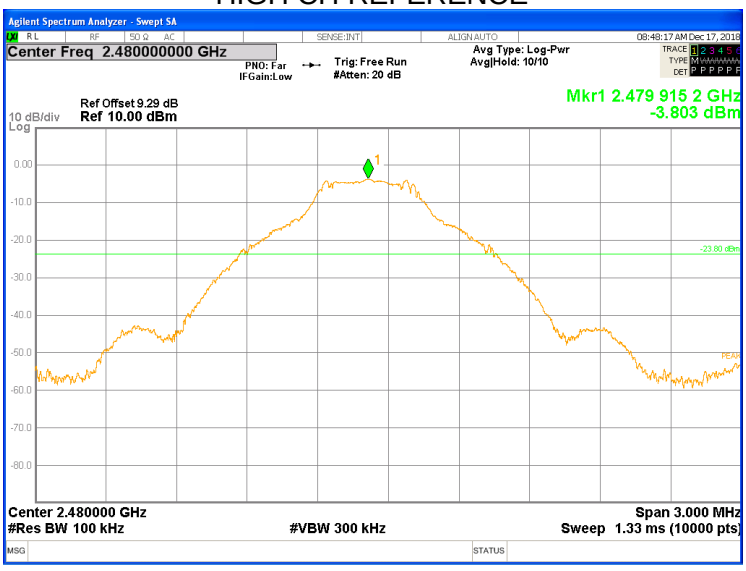
SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CH BANDEDGE



HIGH CH REFERENCE



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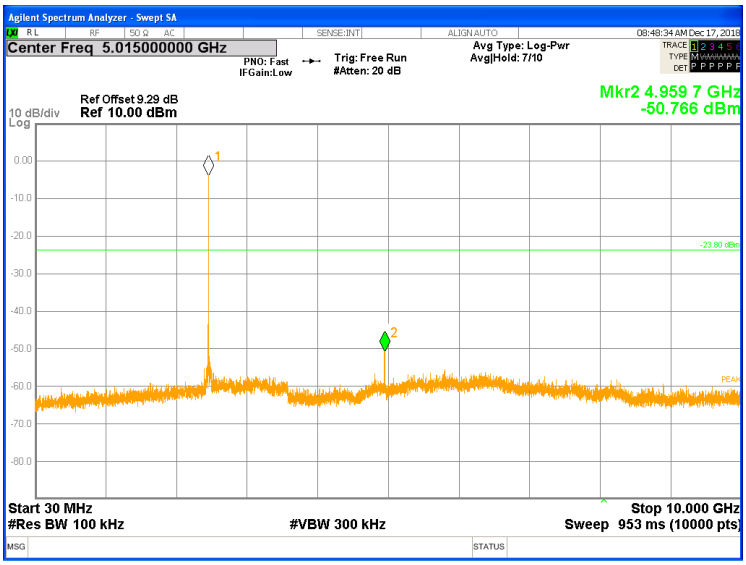
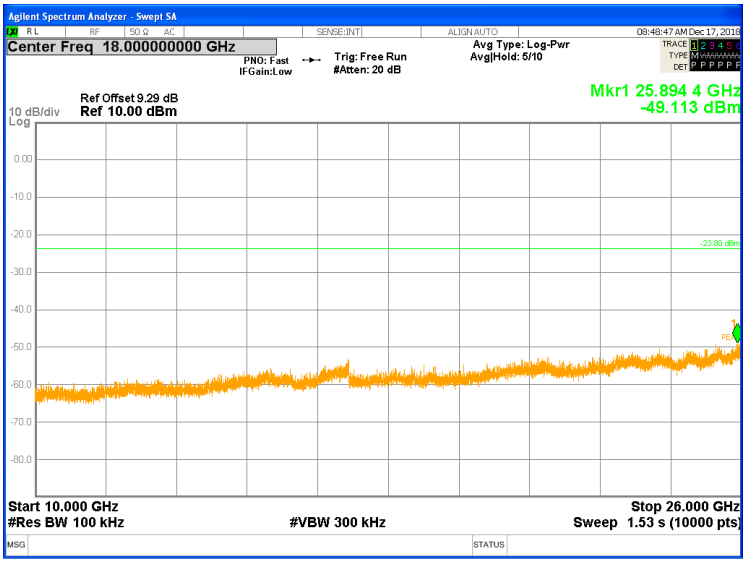
HIGH CH SPURIOUS – 30MHz~10GHz



HIGH CH SPURIOUS – 10GHz~26GHz



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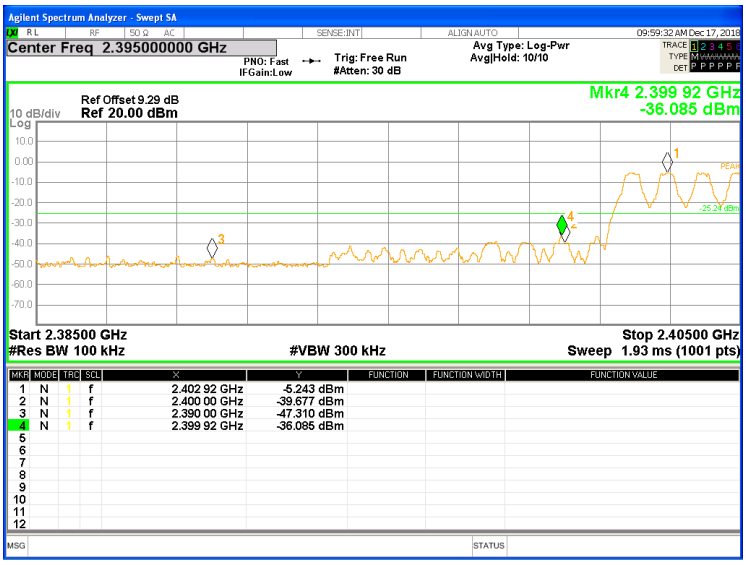
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW CH BANDEDGE WITH HOPPING ON



HIGH CH SPURIOUS WITH HOPPING ON

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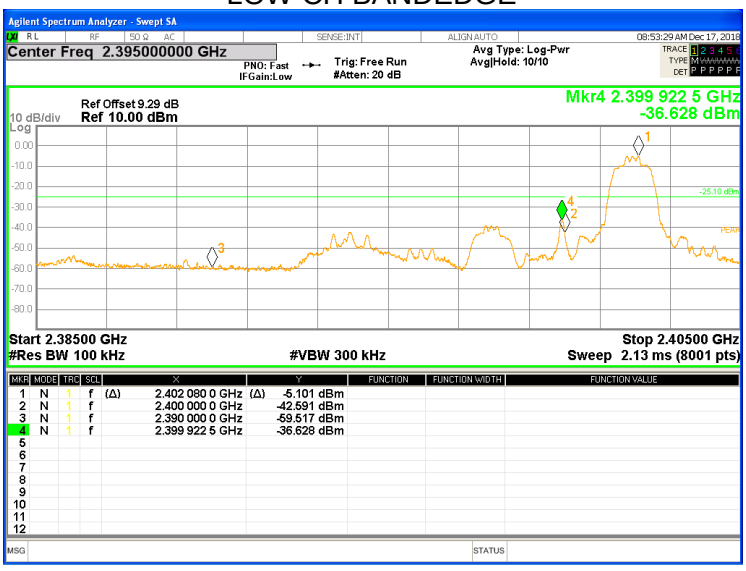
6.7.2. ∏/4-DQPSK

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CH BANDEDGE



LOW CH REFERENCE

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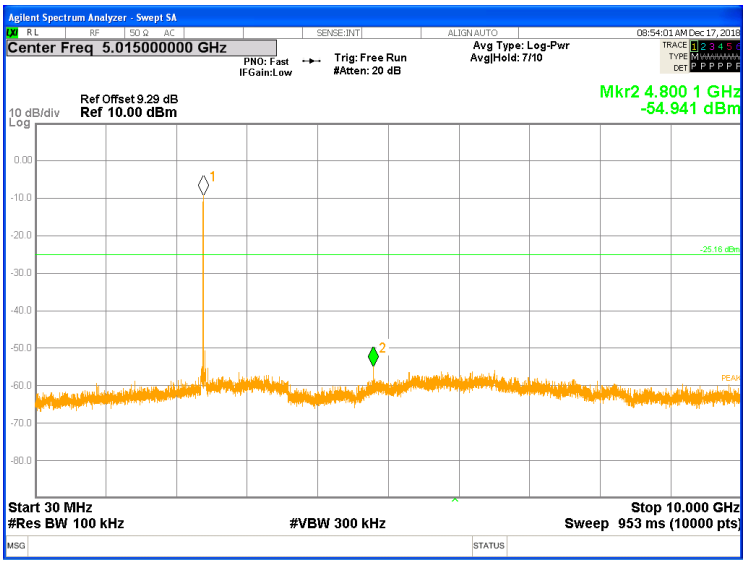
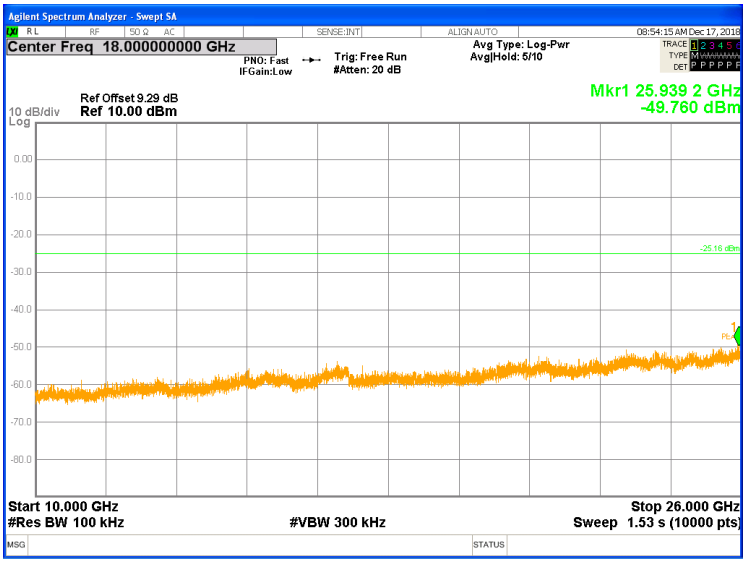
LOW CH SPURIOUS – 30MHz~10GHz



LOW CH SPURIOUS – 10GHz~26GHz



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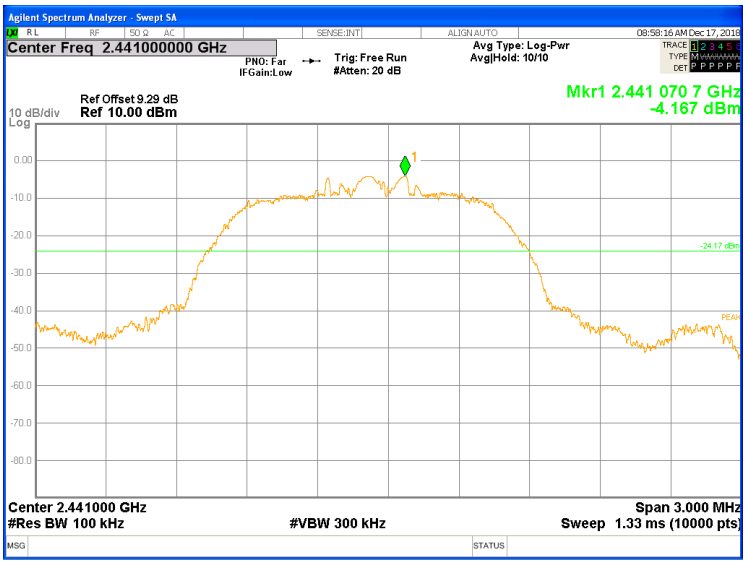
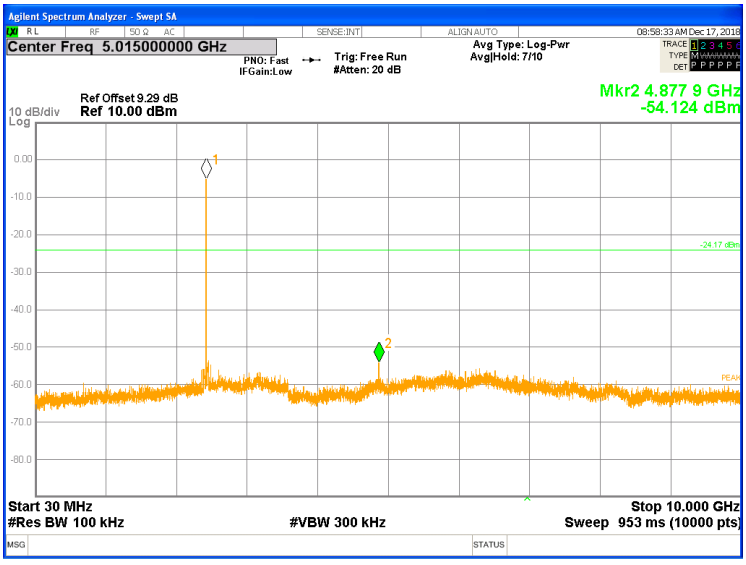
SPURIOUS EMISSIONS, MID CHANNEL

MID CH REFERENCE



MID CH SPURIOUS – 30MHz~10GHz



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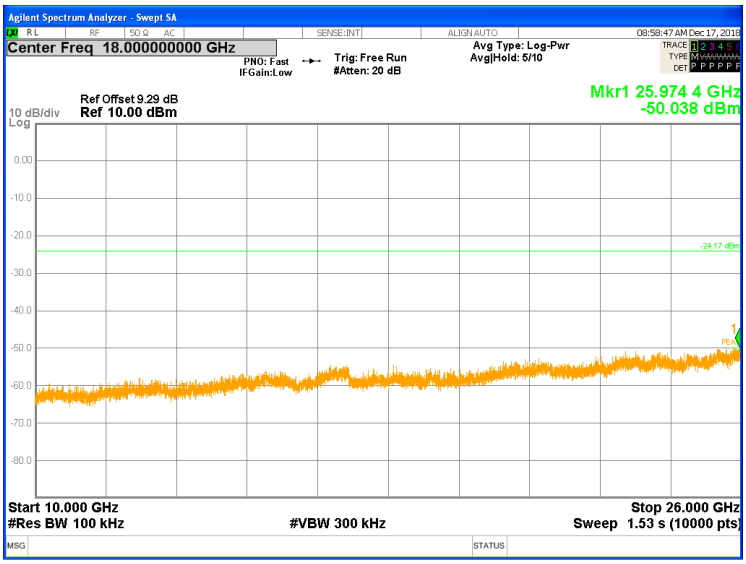
MID CH SPURIOUS – 10GHz~26GHz



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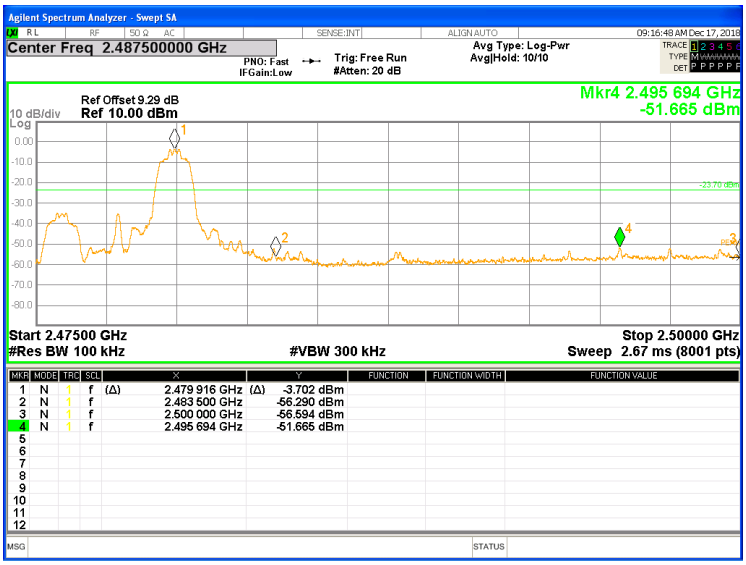
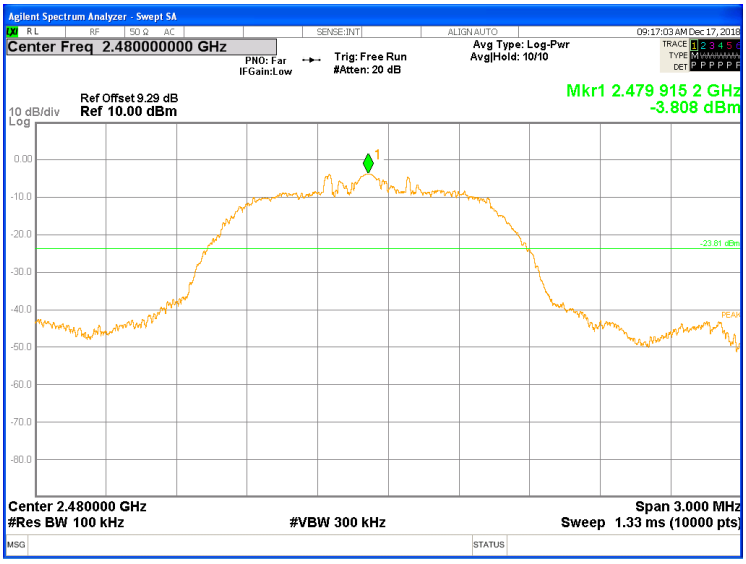
SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CH BANDEDGE



HIGH CH REFERENCE



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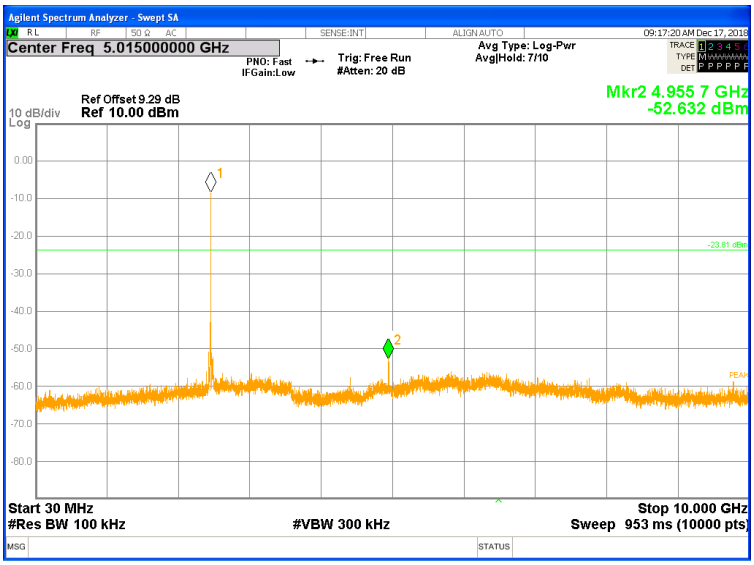
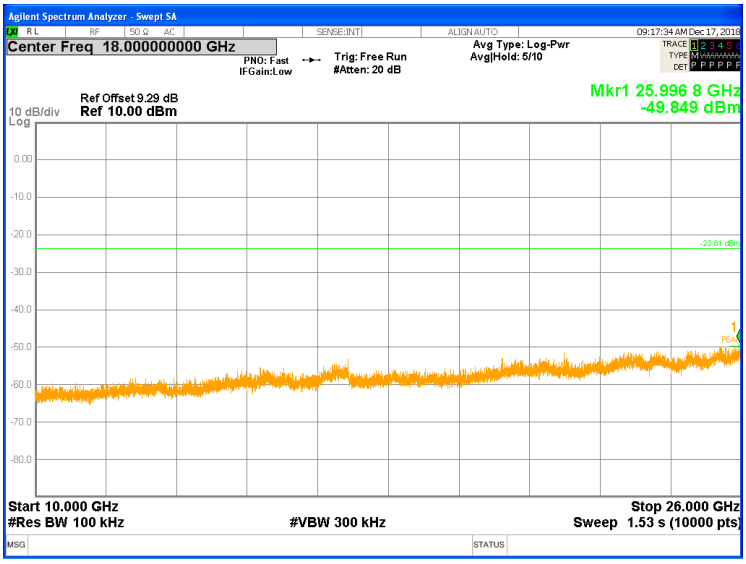
HIGH CH SPURIOUS – 30MHz~10GHz



HIGH CH SPURIOUS – 10GHz~26GHz



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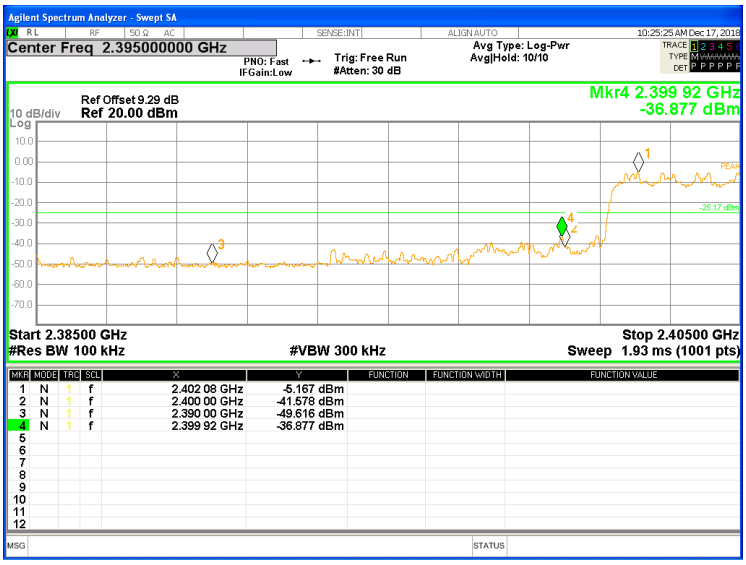
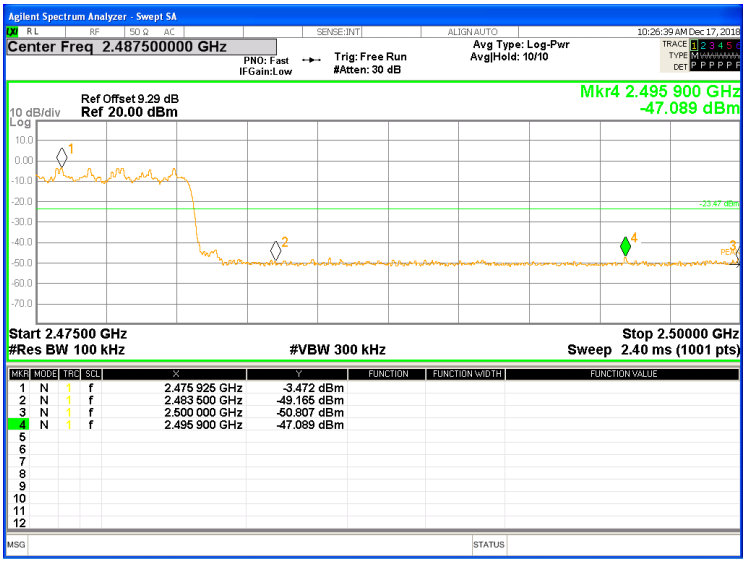
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW CH BANDEDGE WITH HOPPING ON



HIGH CH SPURIOUS WITH HOPPING ON



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7. RADIATED TEST RESULTS

7.1. LIMITS AND PROCEDURE

LIMITS

Please refer to FCC §15.205 and §15.209

Please refer to Clause 8.10

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

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Radiation Disturbance Test Limit for FCC (Above 1G)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

Note: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c

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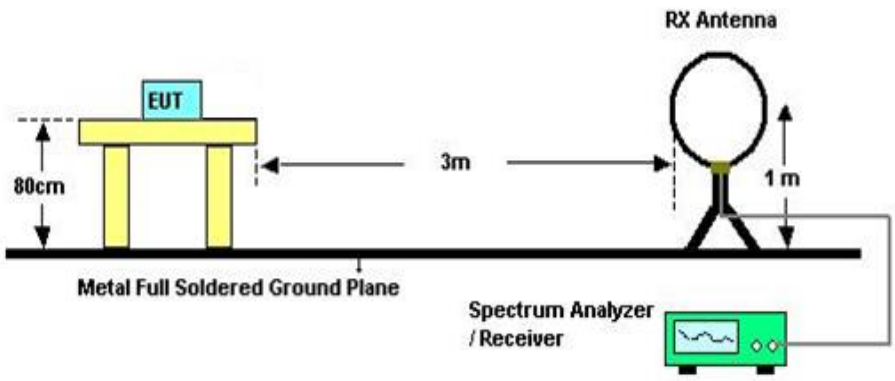
TEST SETUP AND PROCEDURE
Below 30MHz



The setting of the spectrum Analyzer

RBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 and 414788 D01 Radiated Test Site v01.

2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80cm meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. The radiated emission limits are based on measurements employing a 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.

6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

7. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

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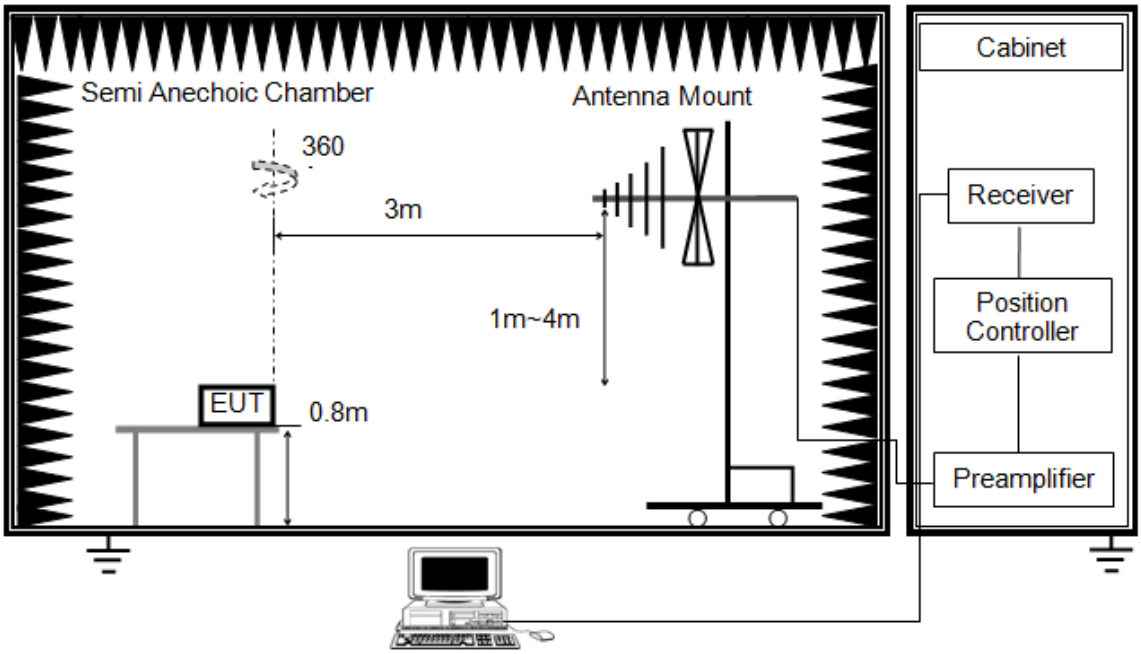
Below 1G and above 30MHz



The setting of the spectrum Analyzer

RBW	120K
VBW	300K
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

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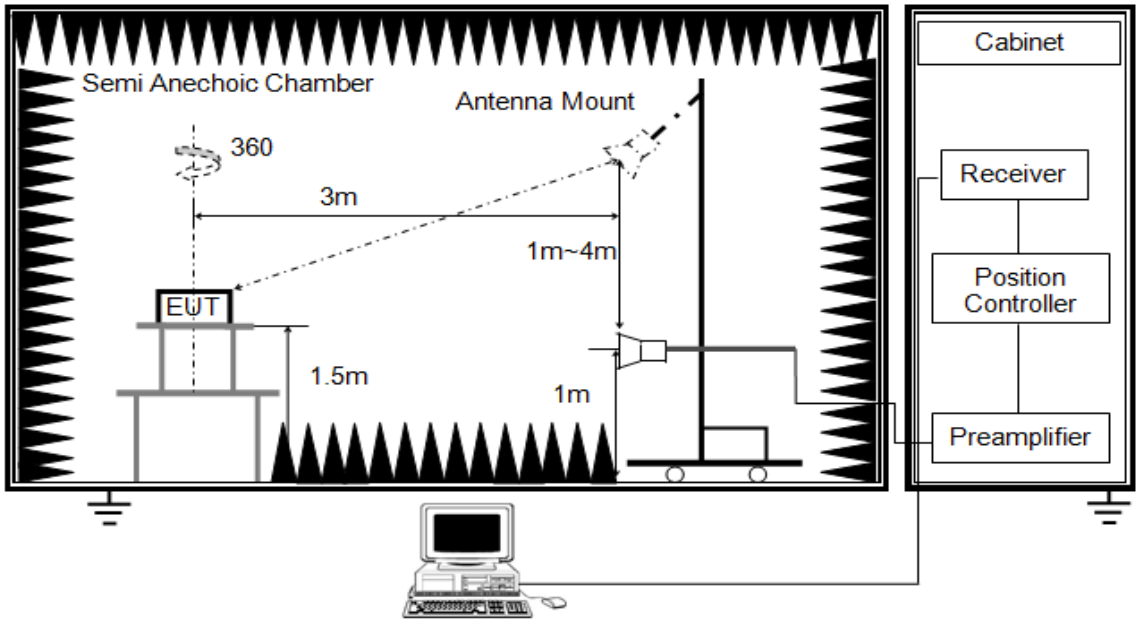
Above 1G



RBW	1M
VBW	PEAK: 3M AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector. For the Duty Cycle and Correction Factor please refer to clause 6.1.ON TIME AND DUTY CYCLE.

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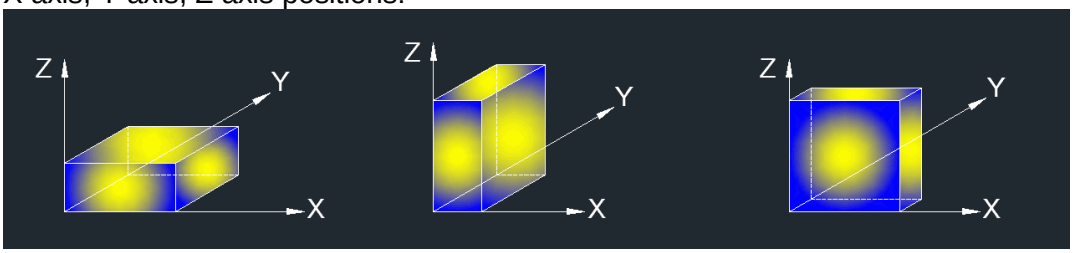
X axis, Y axis, Z axis positions:



Note 1: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

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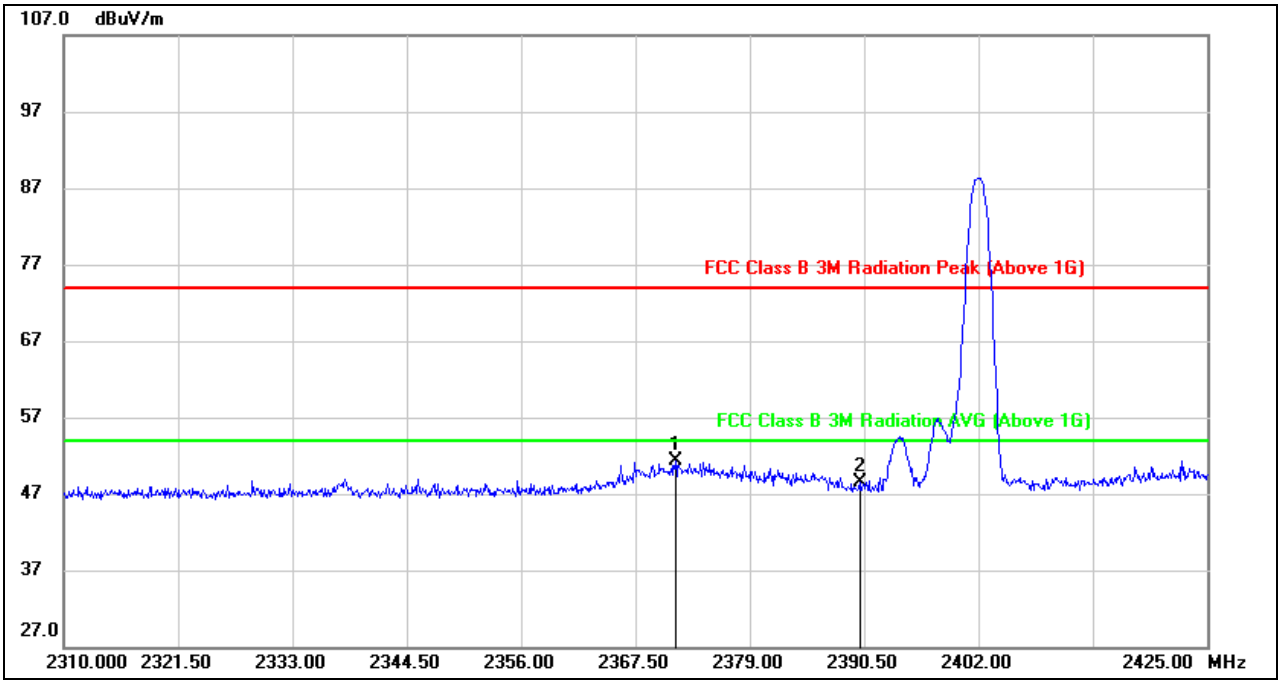
7.2. RESTRICTED BANDEDGE

7.2.1. GFSK MODE

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2371.525	18.52	32.88	51.40	74.00	-22.60	peak
2	2390.000	15.60	32.94	48.54	74.00	-25.46	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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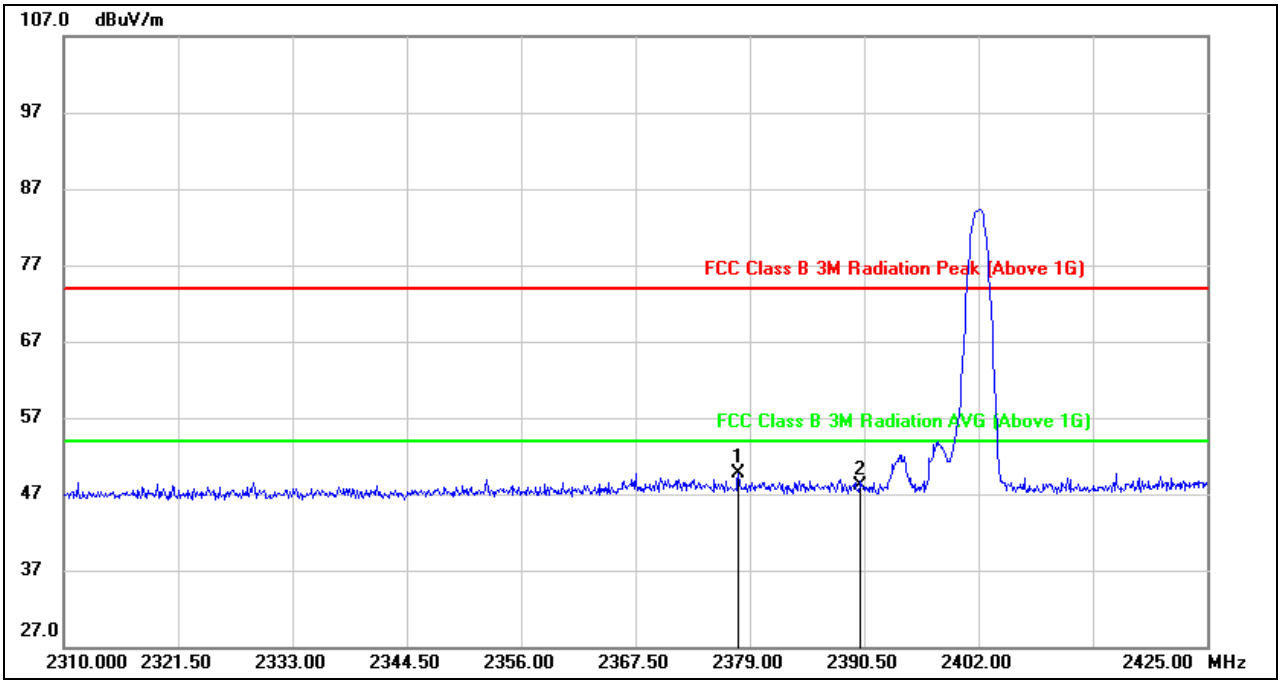
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2377.850	16.73	32.90	49.63	74.00	-24.37	peak
2	2390.000	15.10	32.94	48.04	74.00	-25.96	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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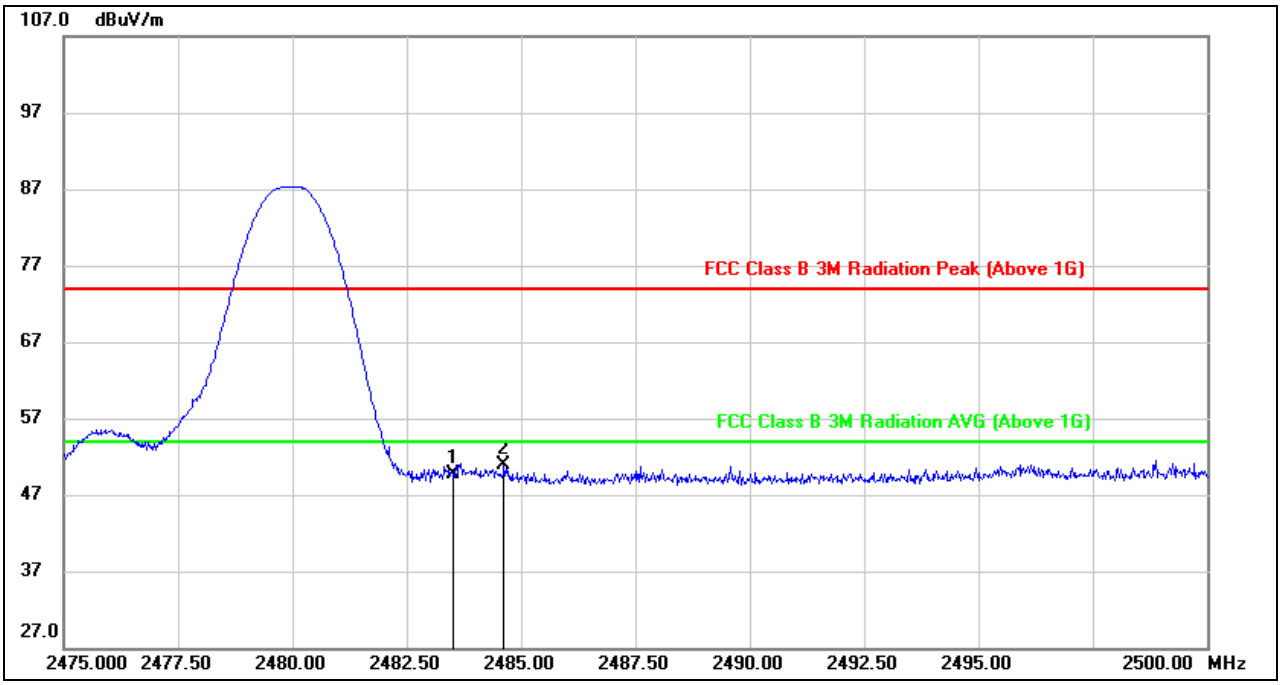
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	16.16	33.58	49.74	74.00	-24.26	peak
2	2484.625	17.29	33.59	50.88	74.00	-23.12	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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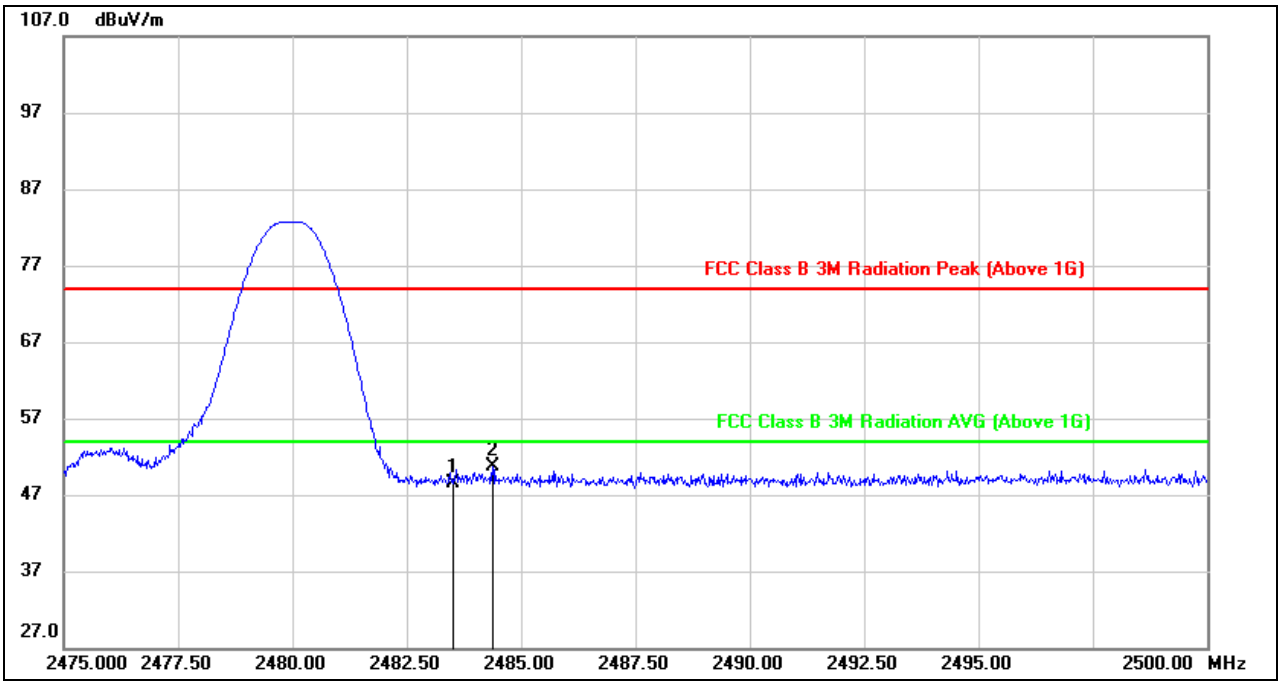
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	14.96	33.58	48.54	74.00	-25.46	peak
2	2484.375	17.20	33.59	50.79	74.00	-23.21	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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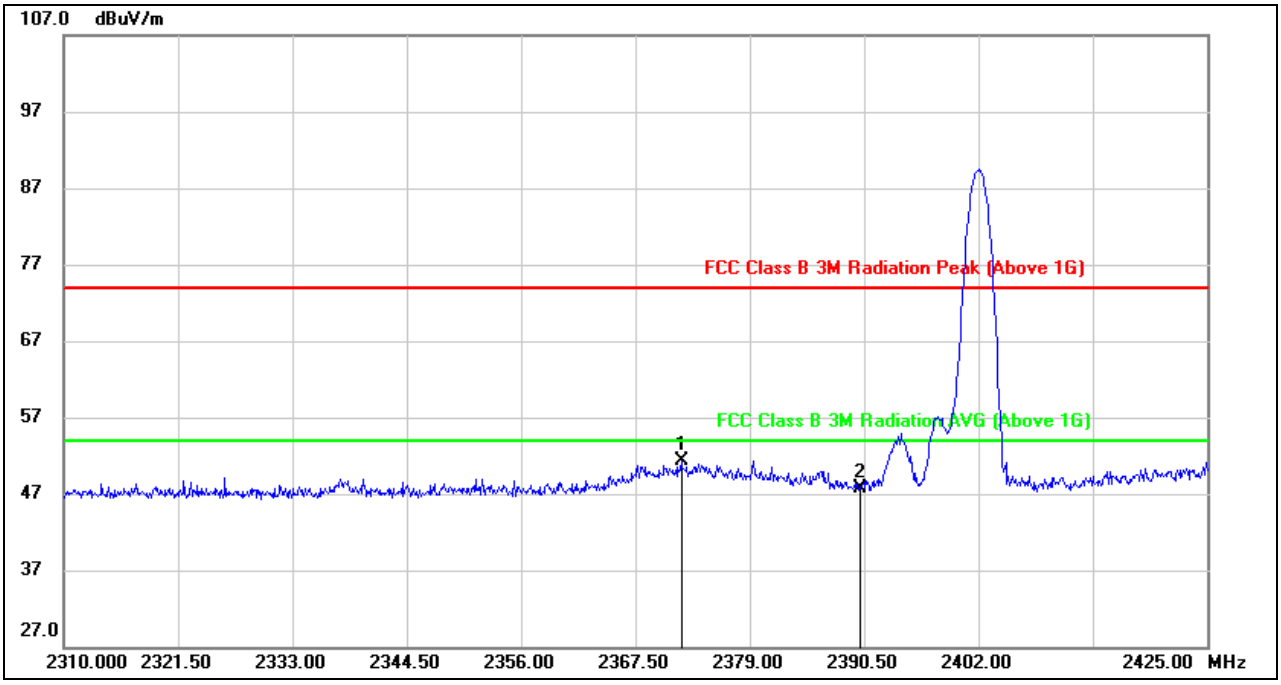
7.2.2. ∏/4-DQPSK

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2372.100	18.39	32.89	51.28	74.00	-22.72	peak
2	2390.000	14.81	32.94	47.75	74.00	-26.25	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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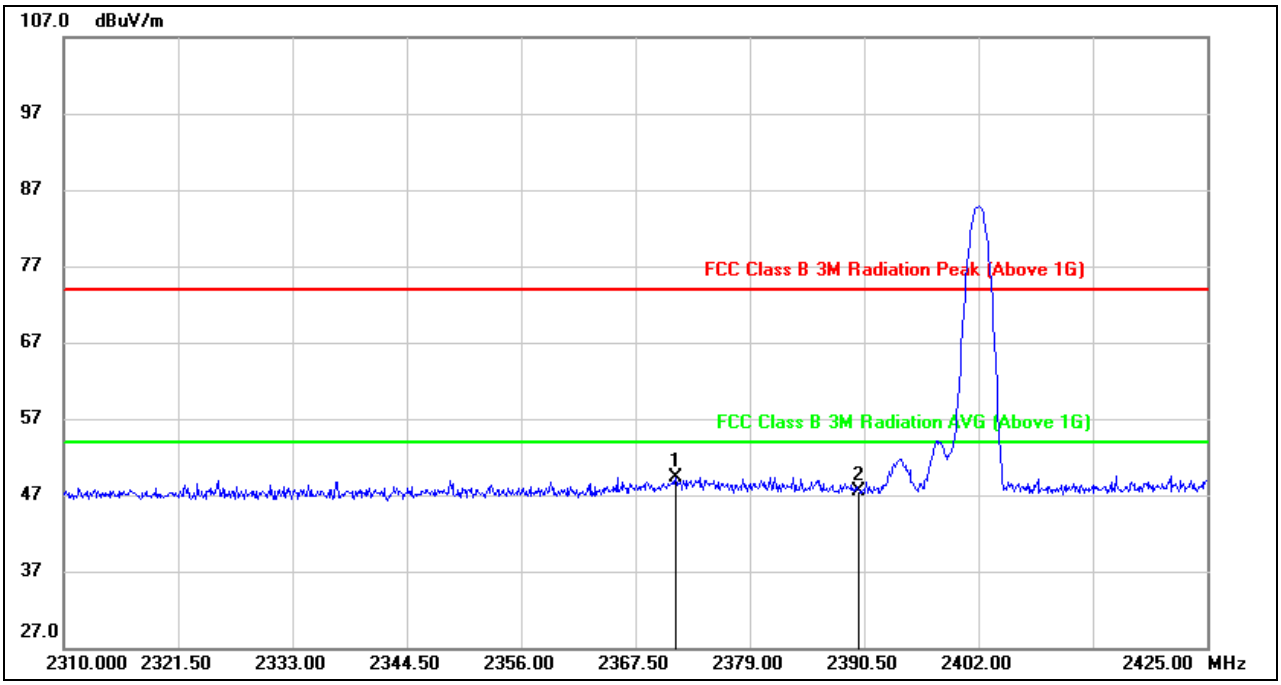
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2371.525	16.50	32.88	49.38	74.00	-24.62	peak
2	2390.000	14.58	32.94	47.52	74.00	-26.48	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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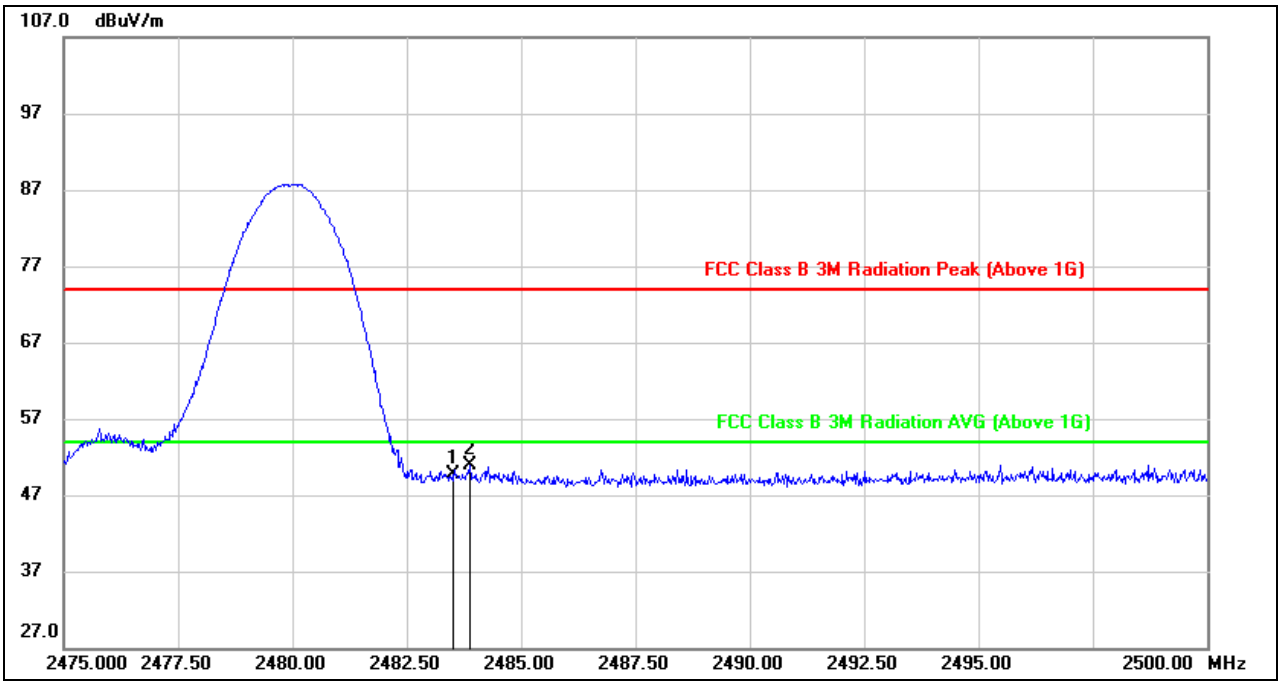
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	16.19	33.58	49.77	74.00	-24.23	peak
2	2483.875	17.38	33.58	50.96	74.00	-23.04	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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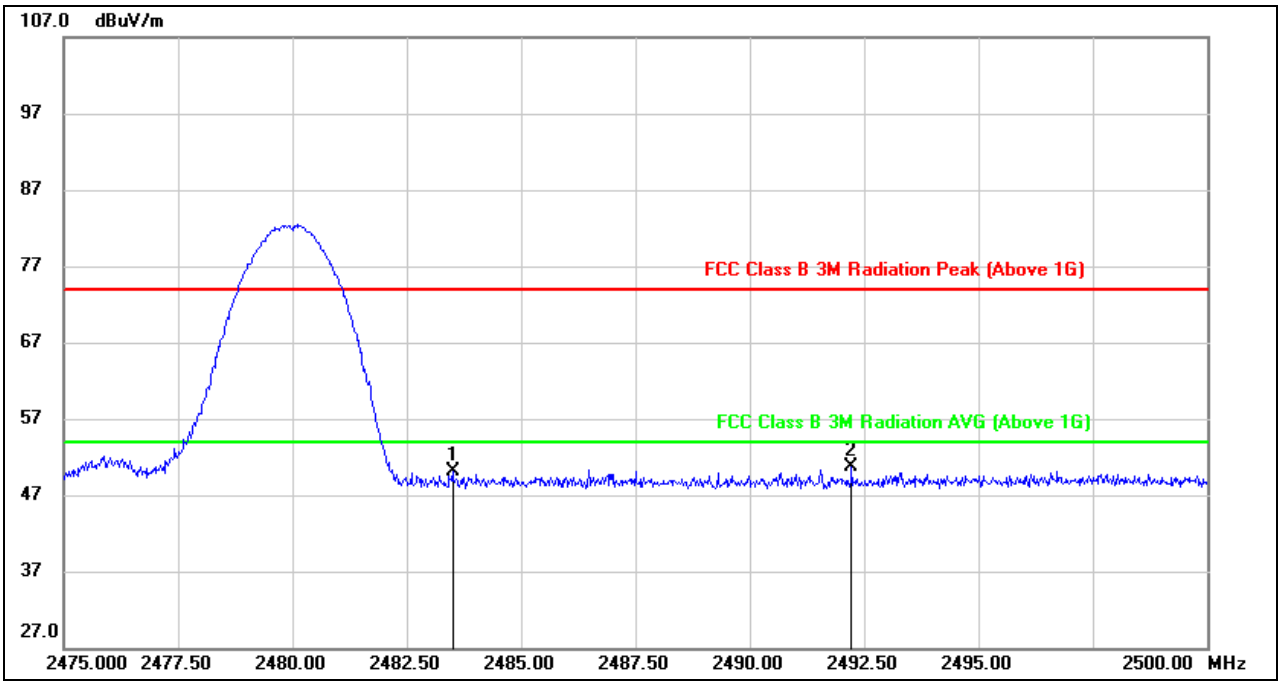
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	16.57	33.58	50.15	74.00	-23.85	peak
2	2492.225	17.00	33.65	50.65	74.00	-23.35	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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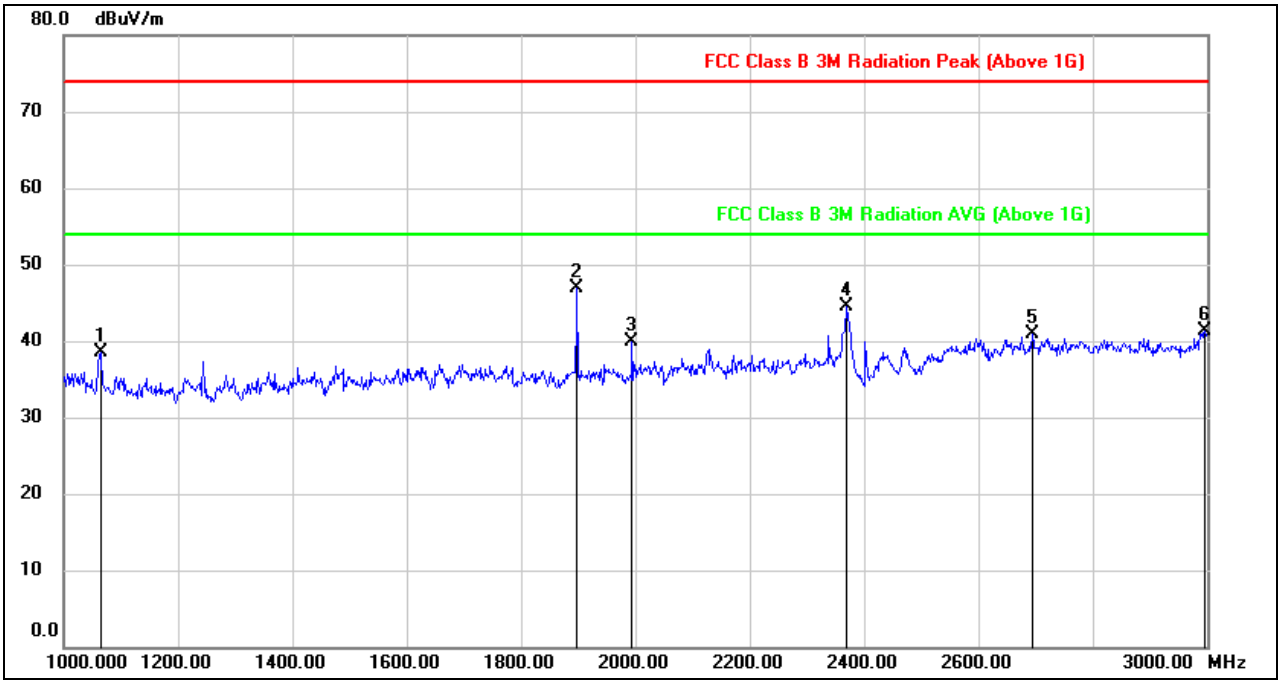
7.3. SPURIOUS EMISSIONS (1~3GHz)

7.3.1. GFSK MODE

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.000	51.09	-12.62	38.47	74.00	-35.53	peak
2	1898.000	55.98	-9.14	46.84	74.00	-27.16	peak
3	1994.000	49.47	-9.59	39.88	74.00	-34.12	peak
4	2368.000	51.71	-7.16	44.55	74.00	-29.45	peak
5	2694.000	48.35	-7.38	40.97	74.00	-33.03	peak
6	2996.000	45.99	-4.67	41.32	74.00	-32.68	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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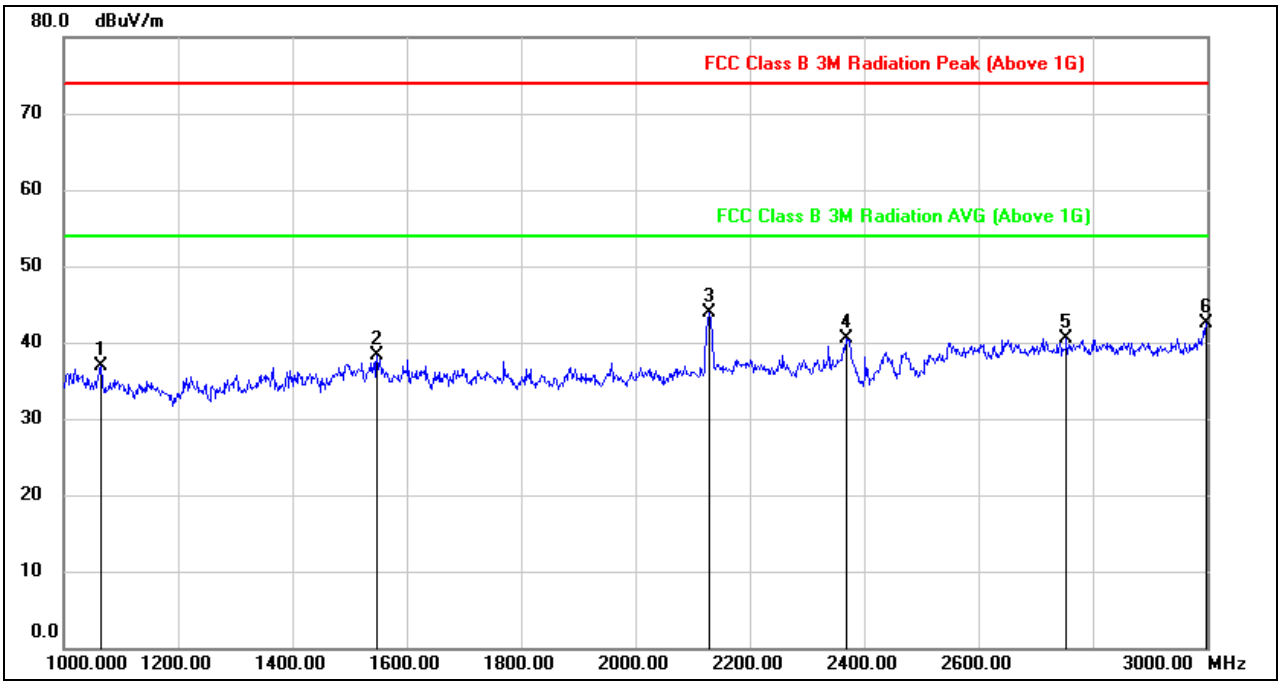
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.000	49.58	-12.62	36.96	74.00	-37.04	peak
2	1548.000	49.21	-10.96	38.25	74.00	-35.75	peak
3	2128.000	52.18	-8.23	43.95	74.00	-30.05	peak
4	2368.000	47.74	-7.16	40.58	74.00	-33.42	peak
5	2754.000	46.77	-6.23	40.54	74.00	-33.46	peak
6	2998.000	47.08	-4.67	42.41	74.00	-31.59	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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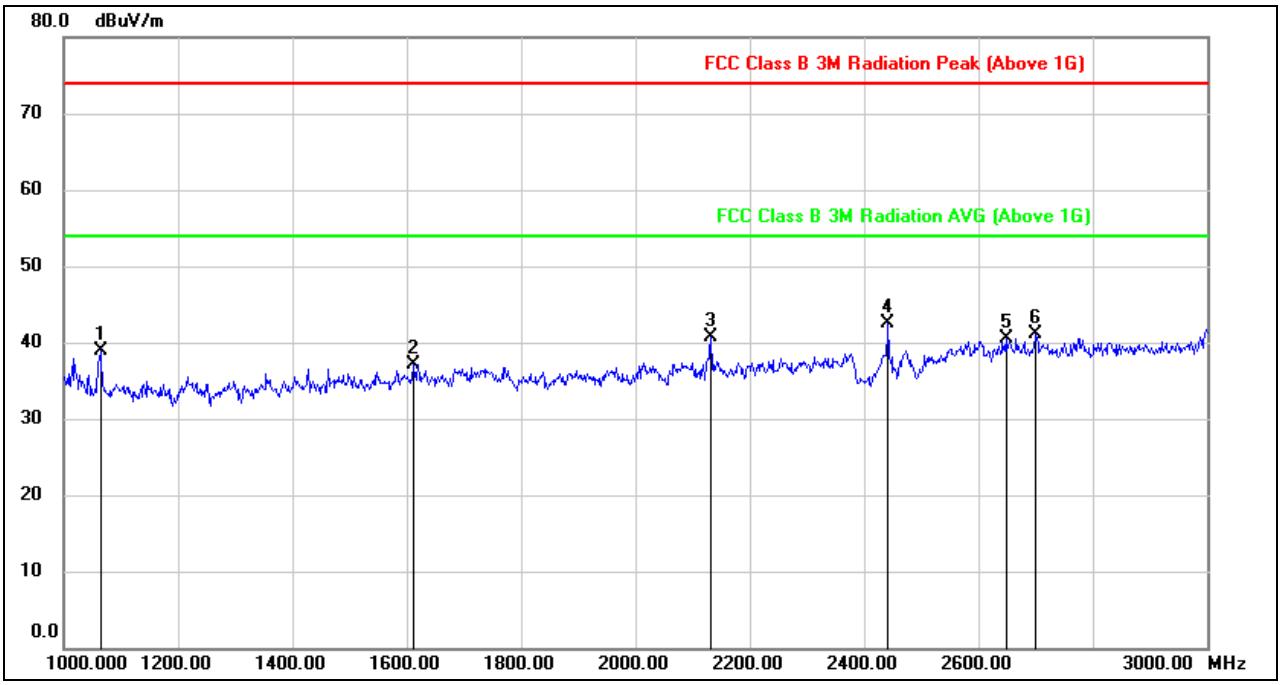
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.000	51.57	-12.62	38.95	74.00	-35.05	peak
2	1612.000	47.51	-10.46	37.05	74.00	-36.95	peak
3	2132.000	48.89	-8.22	40.67	74.00	-33.33	peak
4	2442.000	49.13	-6.72	42.41	74.00	-31.59	peak
5	2648.000	47.62	-7.09	40.53	74.00	-33.47	peak
6	2700.000	48.50	-7.42	41.08	74.00	-32.92	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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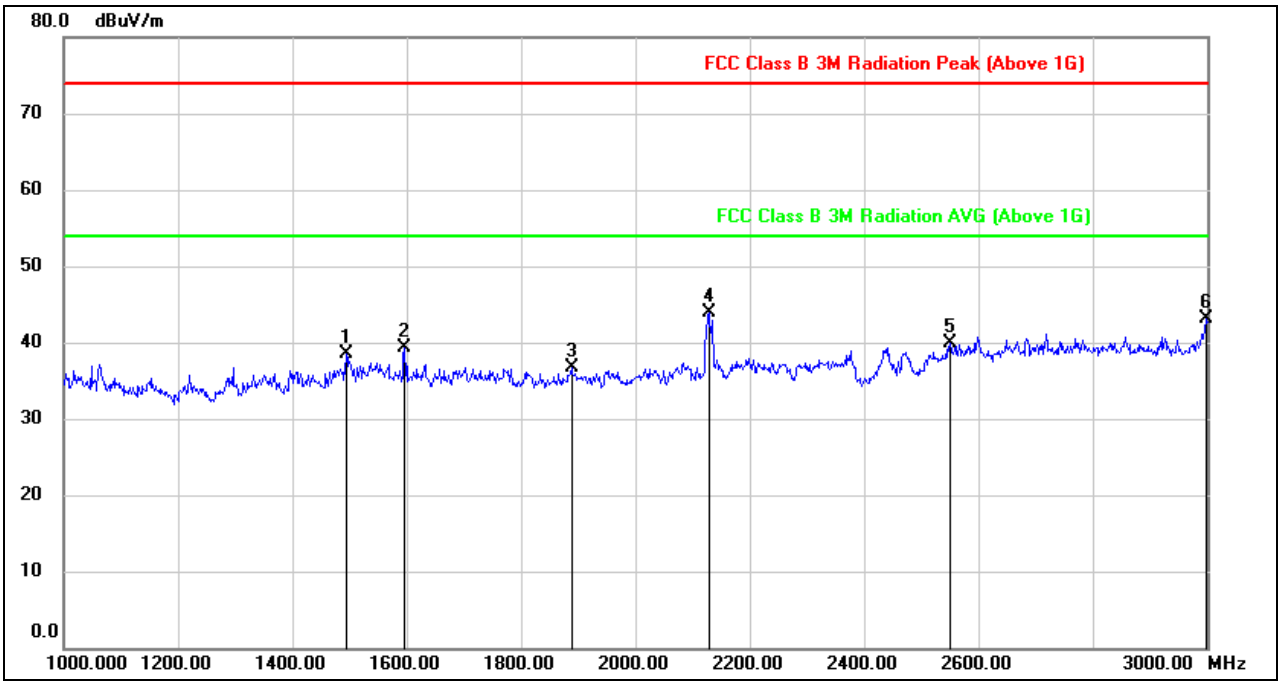
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1494.000	50.00	-11.46	38.54	74.00	-35.46	peak
2	1596.000	49.77	-10.49	39.28	74.00	-34.72	peak
3	1888.000	45.91	-9.16	36.75	74.00	-37.25	peak
4	2128.000	52.14	-8.23	43.91	74.00	-30.09	peak
5	2550.000	46.40	-6.53	39.87	74.00	-34.13	peak
6	2998.000	47.73	-4.67	43.06	74.00	-30.94	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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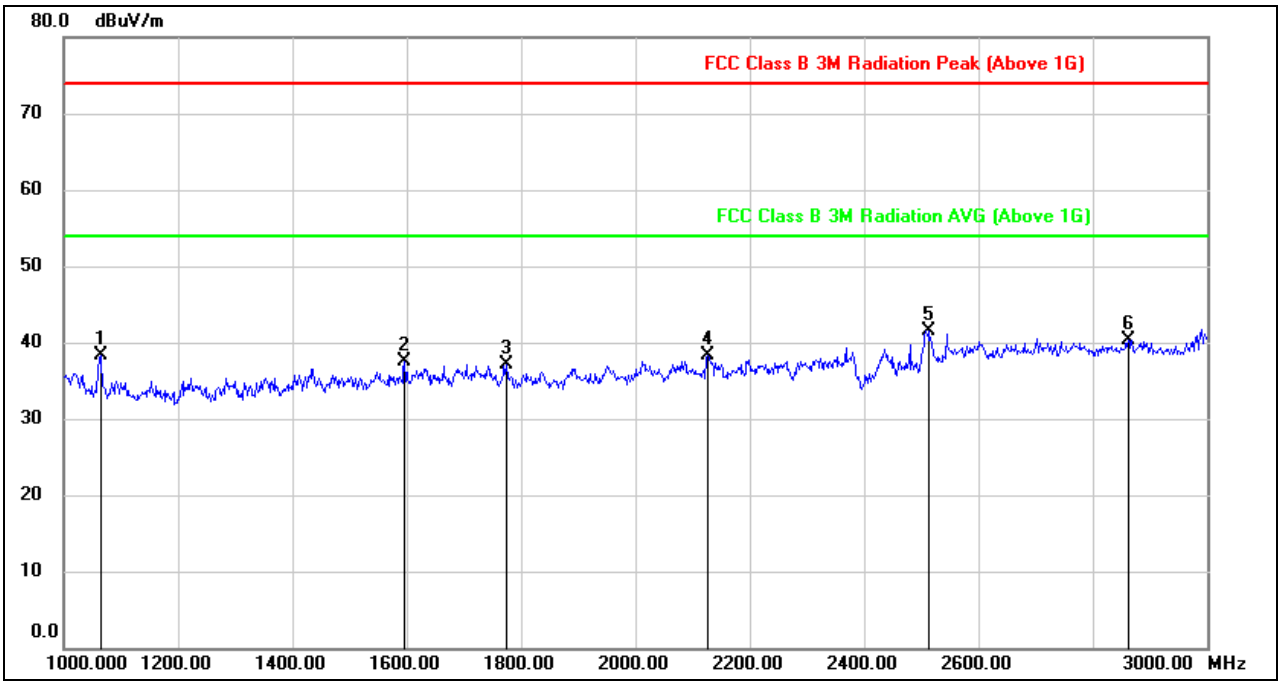
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.000	50.86	-12.62	38.24	74.00	-35.76	peak
2	1596.000	48.07	-10.49	37.58	74.00	-36.42	peak
3	1774.000	46.75	-9.60	37.15	74.00	-36.85	peak
4	2126.000	46.56	-8.22	38.34	74.00	-35.66	peak
5	2512.000	47.91	-6.35	41.56	74.00	-32.44	peak
6	2862.000	45.56	-5.21	40.35	74.00	-33.65	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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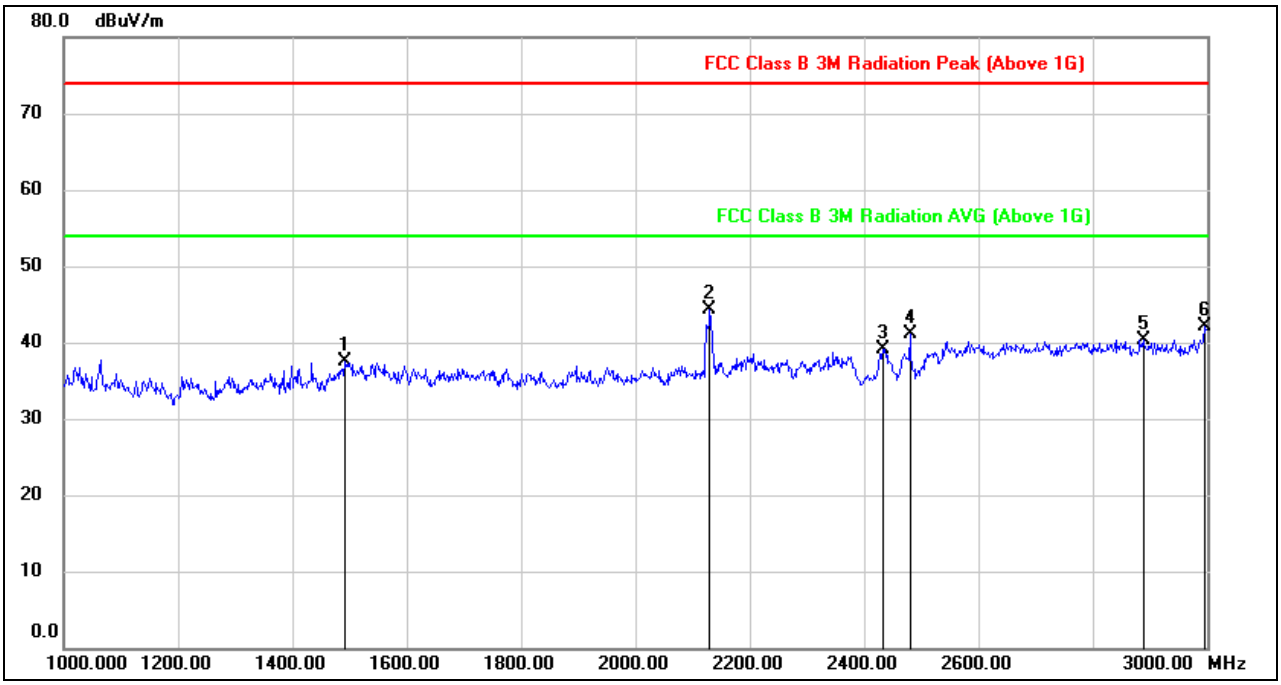
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1492.000	48.91	-11.46	37.45	74.00	-36.55	peak
2	2130.000	52.61	-8.22	44.39	74.00	-29.61	peak
3	2432.000	45.92	-6.79	39.13	74.00	-34.87	peak
4	2480.000	47.57	-6.44	41.13	74.00	-32.87	peak
5	2888.000	45.51	-5.19	40.32	74.00	-33.68	peak
6	2996.000	46.83	-4.67	42.16	74.00	-31.84	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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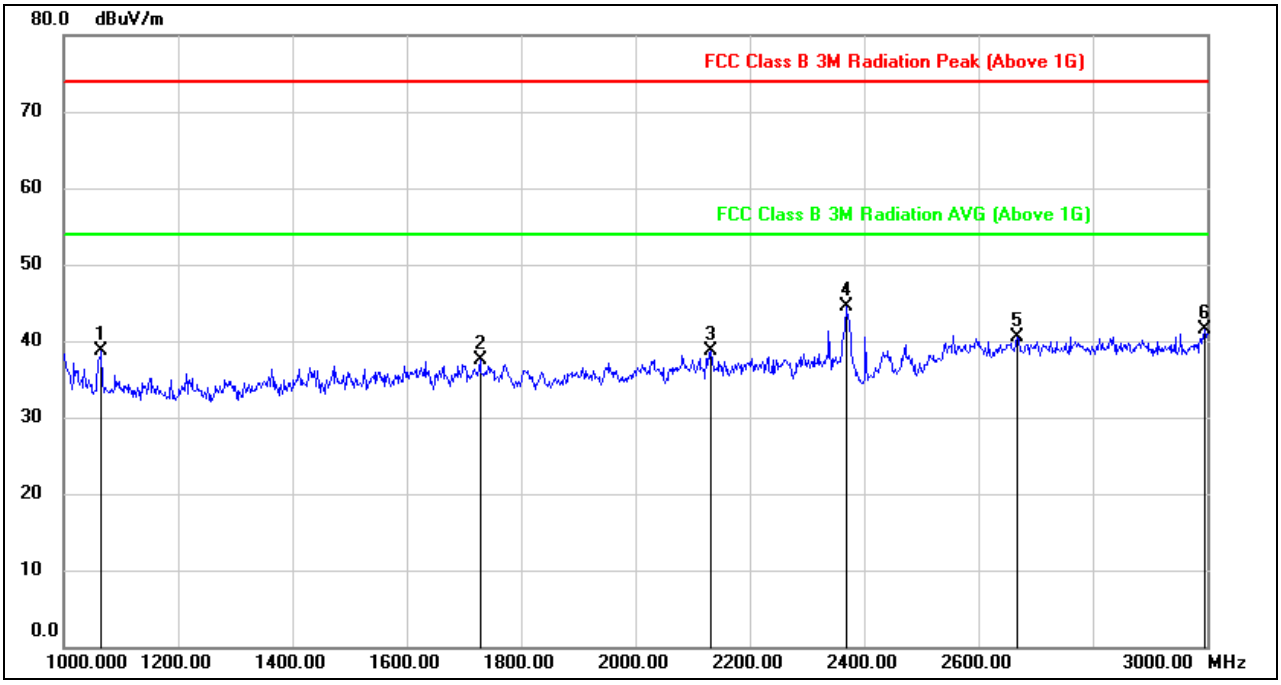
7.3.2. ∏/4-DQPSK

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1066.000	51.23	-12.62	38.61	74.00	-35.39	peak
2	1728.000	47.78	-10.18	37.60	74.00	-36.40	peak
3	2132.000	46.86	-8.22	38.64	74.00	-35.36	peak
4	2368.000	51.67	-7.16	44.51	74.00	-29.49	peak
5	2668.000	47.70	-7.22	40.48	74.00	-33.52	peak
6	2996.000	46.10	-4.67	41.43	74.00	-32.57	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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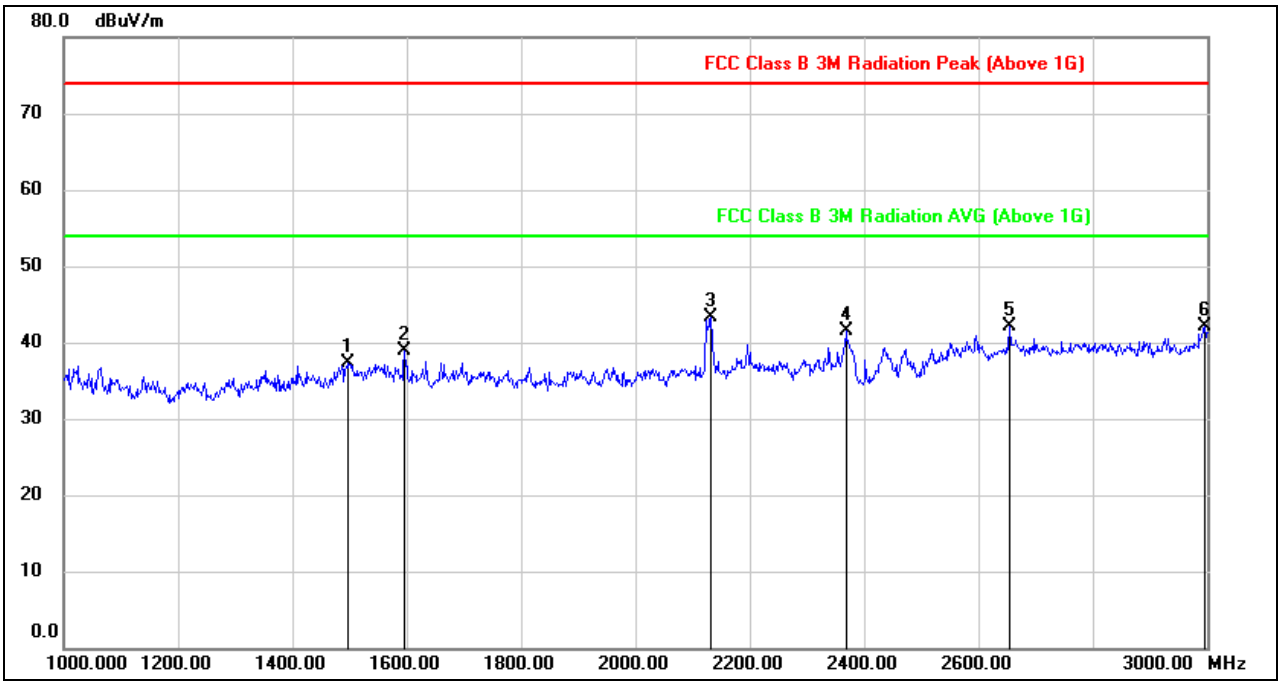
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1498.000	48.77	-11.44	37.33	74.00	-36.67	peak
2	1596.000	49.31	-10.49	38.82	74.00	-35.18	peak
3	2132.000	51.61	-8.22	43.39	74.00	-30.61	peak
4	2368.000	48.64	-7.16	41.48	74.00	-32.52	peak
5	2654.000	49.30	-7.13	42.17	74.00	-31.83	peak
6	2996.000	46.78	-4.67	42.11	74.00	-31.89	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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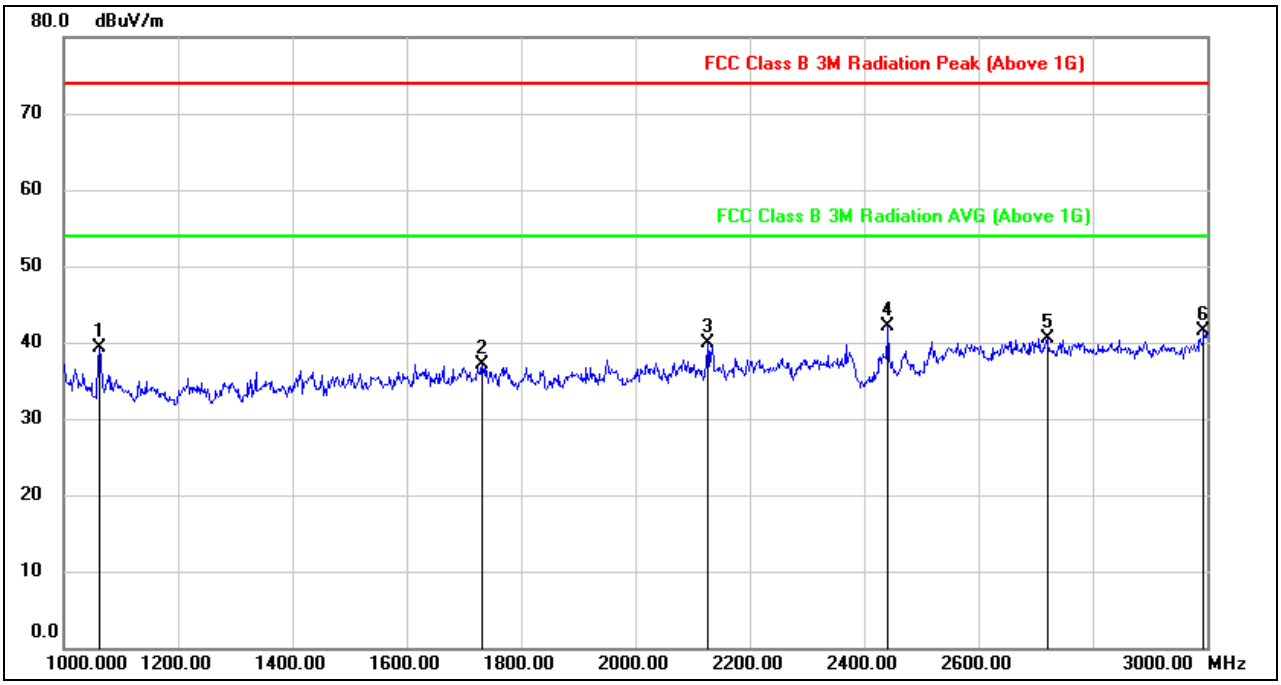
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1062.000	51.96	-12.64	39.32	74.00	-34.68	peak
2	1732.000	47.22	-10.14	37.08	74.00	-36.92	peak
3	2126.000	48.19	-8.22	39.97	74.00	-34.03	peak
4	2442.000	48.73	-6.72	42.01	74.00	-31.99	peak
5	2720.000	47.45	-6.98	40.47	74.00	-33.53	peak
6	2994.000	46.28	-4.69	41.59	74.00	-32.41	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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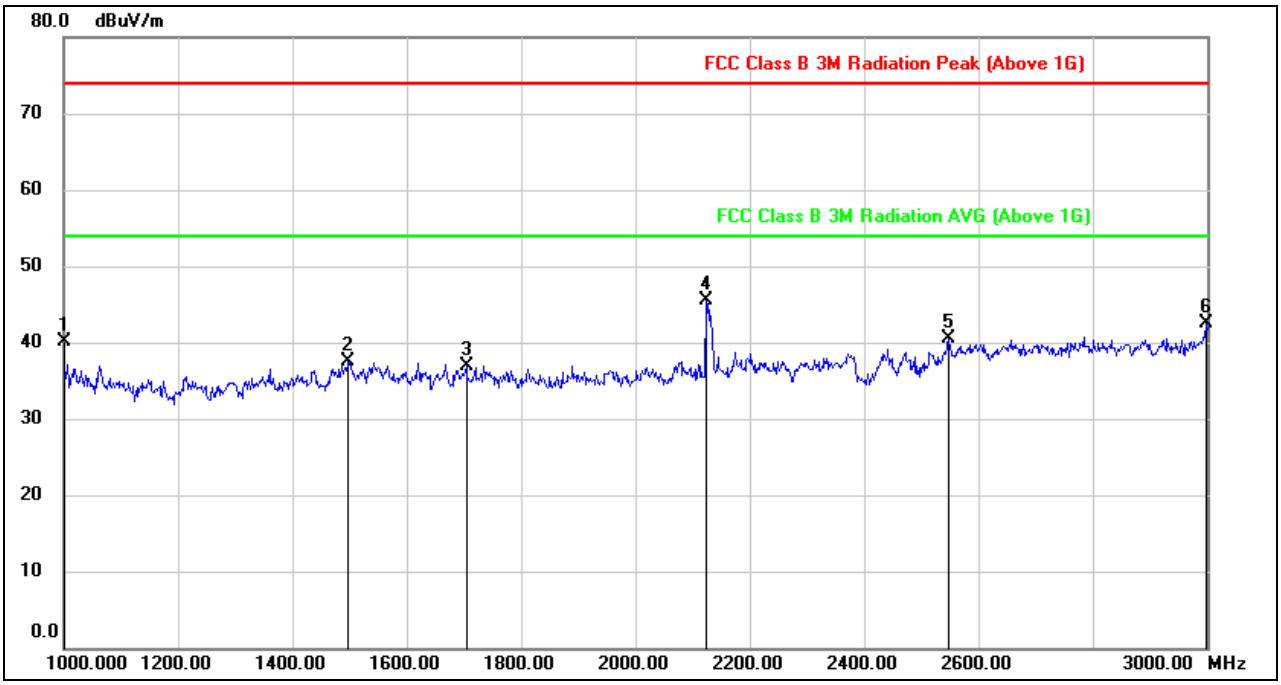
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1000.0000	53.12	-12.95	40.17	74.00	-33.83	peak
2	1498.000	48.94	-11.44	37.50	74.00	-36.50	peak
3	1704.000	47.48	-10.49	36.99	74.00	-37.01	peak
4	2124.000	53.75	-8.22	45.53	74.00	-28.47	peak
5	2548.000	47.09	-6.53	40.56	74.00	-33.44	peak
6	2998.000	47.25	-4.67	42.58	74.00	-31.42	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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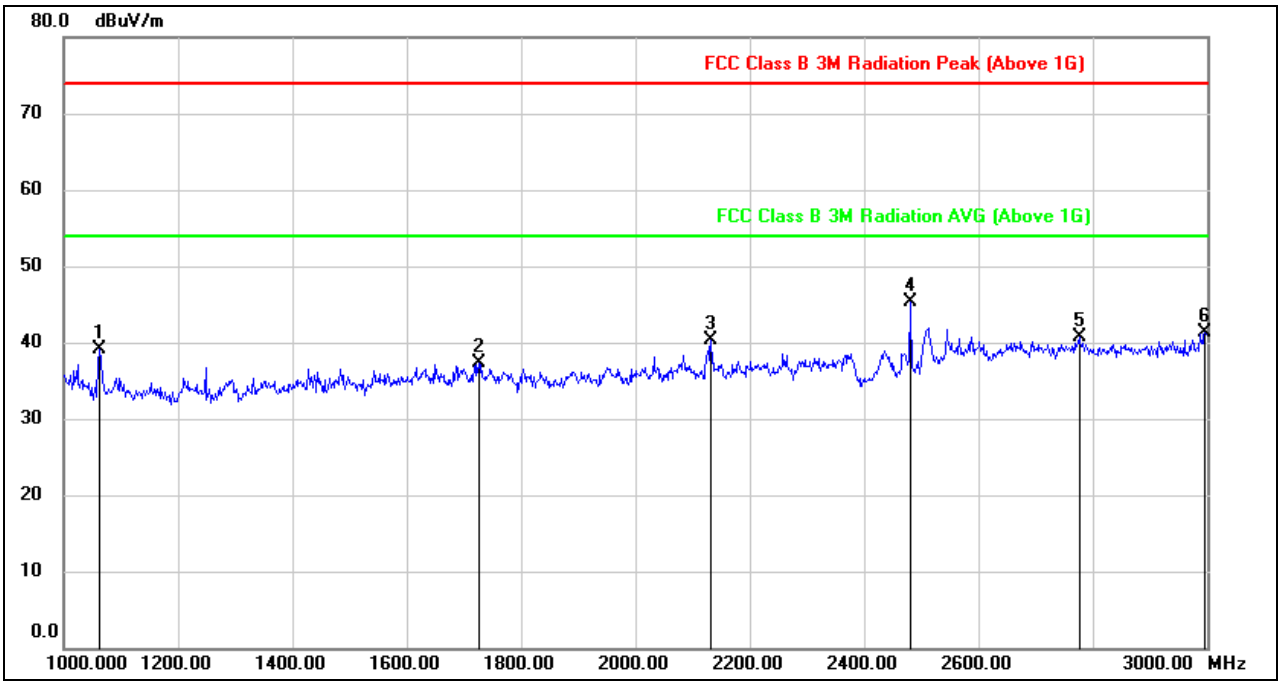
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1062.000	51.65	-12.64	39.01	74.00	-34.99	peak
2	1726.000	47.49	-10.21	37.28	74.00	-36.72	peak
3	2132.000	48.44	-8.22	40.22	74.00	-33.78	peak
4	2480.000	51.78	-6.44	45.34	74.00	-28.66	peak
5	2776.000	46.53	-5.75	40.78	74.00	-33.22	peak
6	2996.000	45.98	-4.67	41.31	74.00	-32.69	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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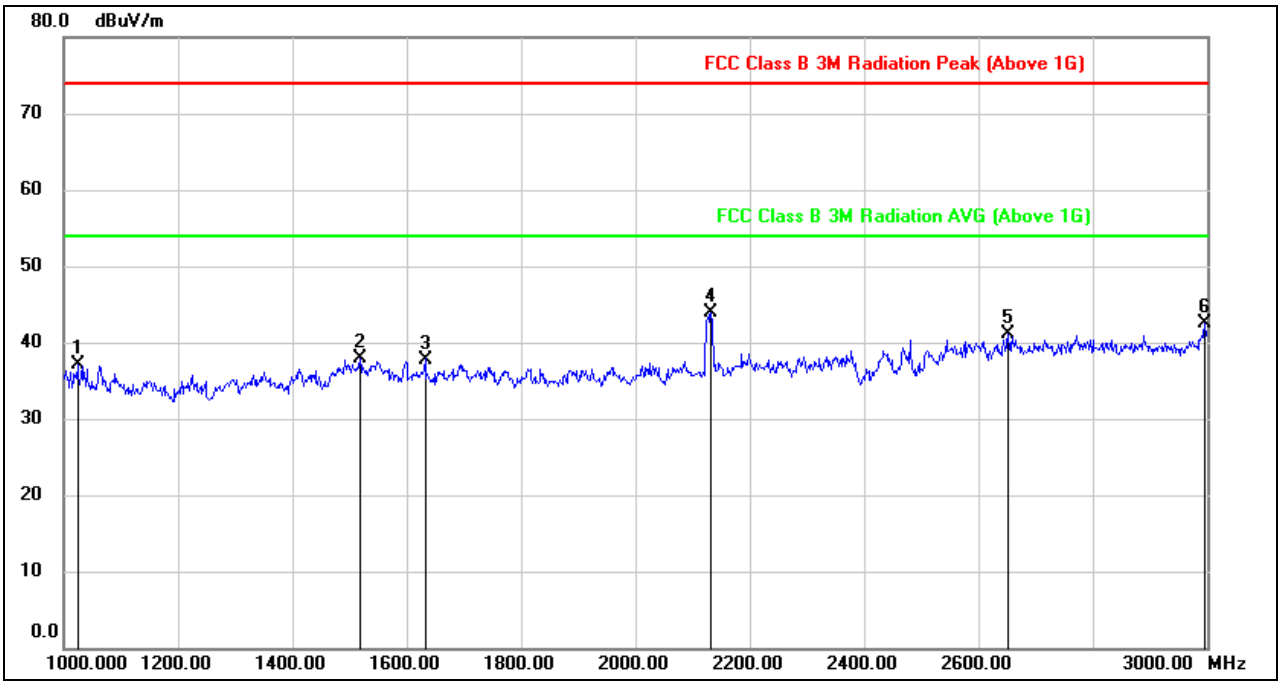
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1024.000	49.85	-12.83	37.02	74.00	-36.98	peak
2	1518.000	49.07	-11.26	37.81	74.00	-36.19	peak
3	1632.000	48.28	-10.48	37.80	74.00	-36.20	peak
4	2132.000	52.03	-8.22	43.81	74.00	-30.19	peak
5	2652.000	48.20	-7.11	41.09	74.00	-32.91	peak
6	2996.000	47.11	-4.67	42.44	74.00	-31.56	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Band Reject Filter losses in all these band except 2400~2483.5MHz had already added into the correct factor, the authorized band 2400~2483.5MHz was not corrected for BRF losses.

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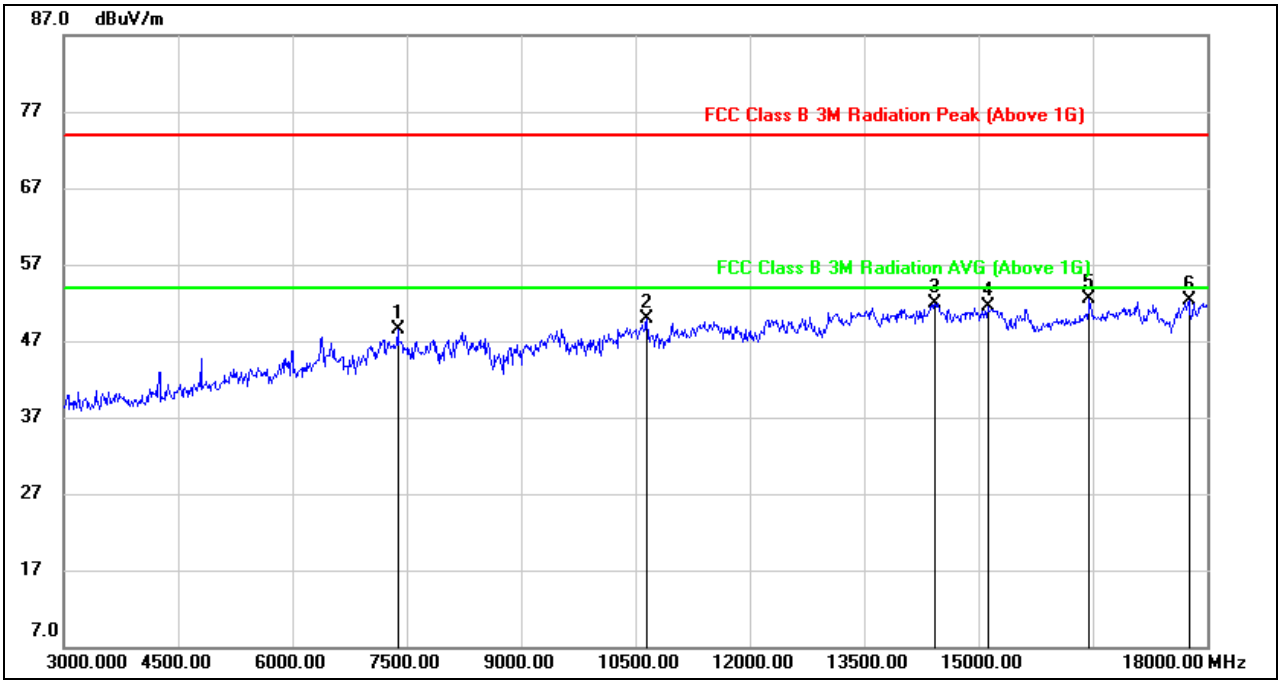
7.4. SPURIOUS EMISSIONS (3~18GHz)

7.4.1. GFSK MODE

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7380.000	41.35	7.17	48.52	74.00	-25.48	peak
2	10650.000	38.07	11.82	49.89	74.00	-24.11	peak
3	14430.000	35.49	16.43	51.92	74.00	-22.08	peak
4	15120.000	35.59	15.94	51.53	74.00	-22.47	peak
5	16455.000	34.31	18.22	52.53	74.00	-21.47	peak
6	17760.000	30.18	22.05	52.23	74.00	-21.77	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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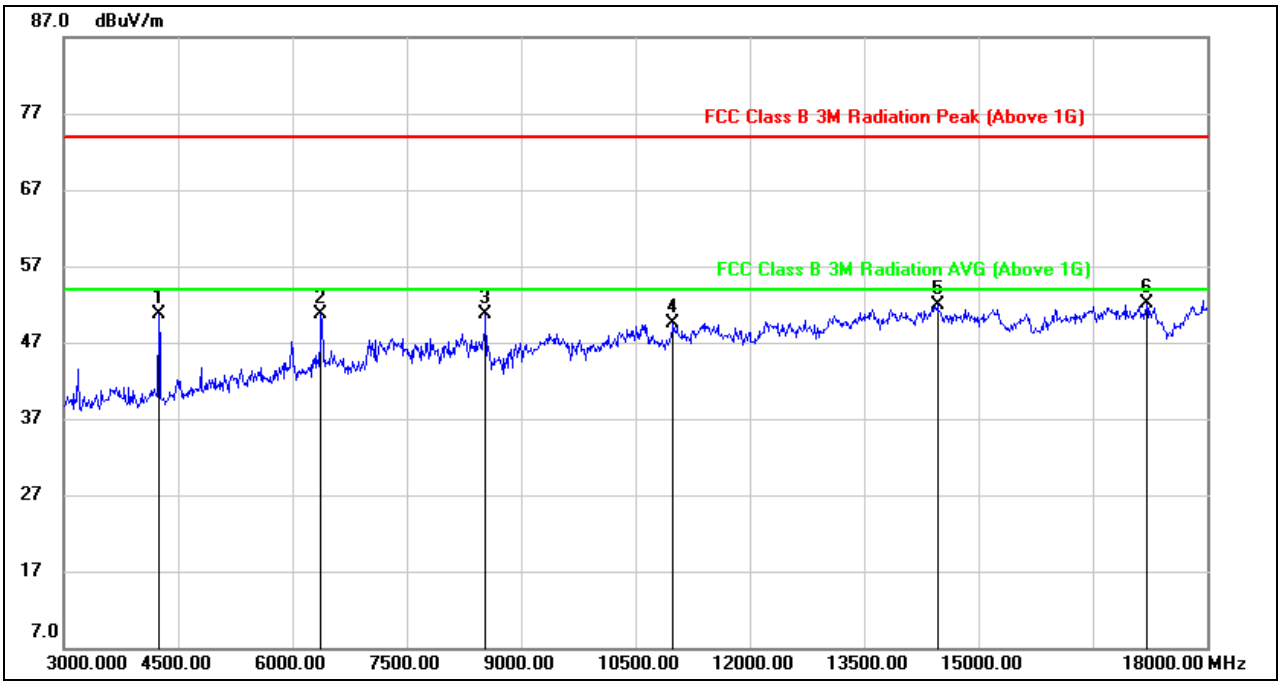
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4245.000	53.02	-2.24	50.78	74.00	-23.22	peak
2	6375.000	46.22	4.47	50.69	74.00	-23.31	peak
3	8535.000	42.84	7.94	50.78	74.00	-23.22	peak
4	10995.000	37.18	12.31	49.49	74.00	-24.51	peak
5	14460.000	35.49	16.41	51.90	74.00	-22.10	peak
6	17205.000	31.85	20.31	52.16	74.00	-21.84	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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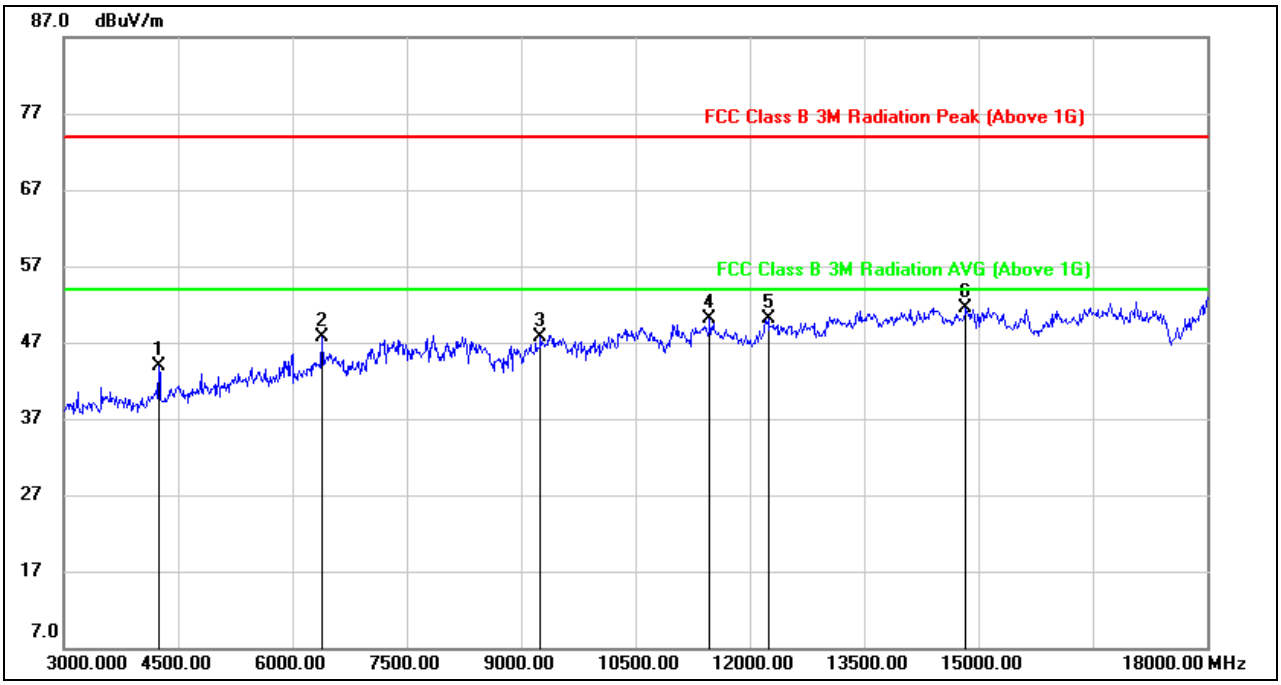
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4245.000	46.22	-2.24	43.98	74.00	-30.02	peak
2	6390.000	43.10	4.54	47.64	74.00	-26.36	peak
3	9255.000	38.64	8.98	47.62	74.00	-26.38	peak
4	11475.000	37.32	12.85	50.17	74.00	-23.83	peak
5	12240.000	36.70	13.32	50.02	74.00	-23.98	peak
6	14835.000	35.49	16.00	51.49	74.00	-22.51	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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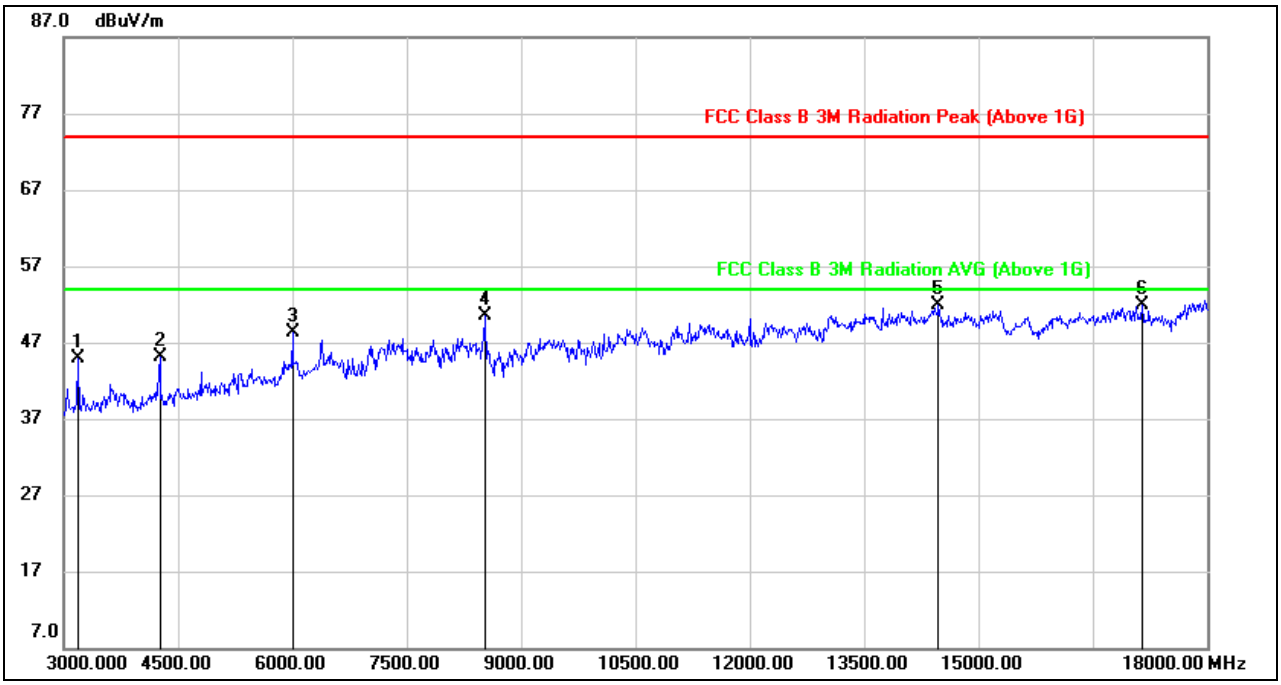
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3180.000	49.52	-4.55	44.97	74.00	-29.03	peak
2	4260.000	47.48	-2.30	45.18	74.00	-28.82	peak
3	6000.000	45.10	3.13	48.23	74.00	-25.77	peak
4	8520.000	42.52	7.97	50.49	74.00	-23.51	peak
5	14475.000	35.51	16.40	51.91	74.00	-22.09	peak
6	17145.000	31.68	20.15	51.83	74.00	-22.17	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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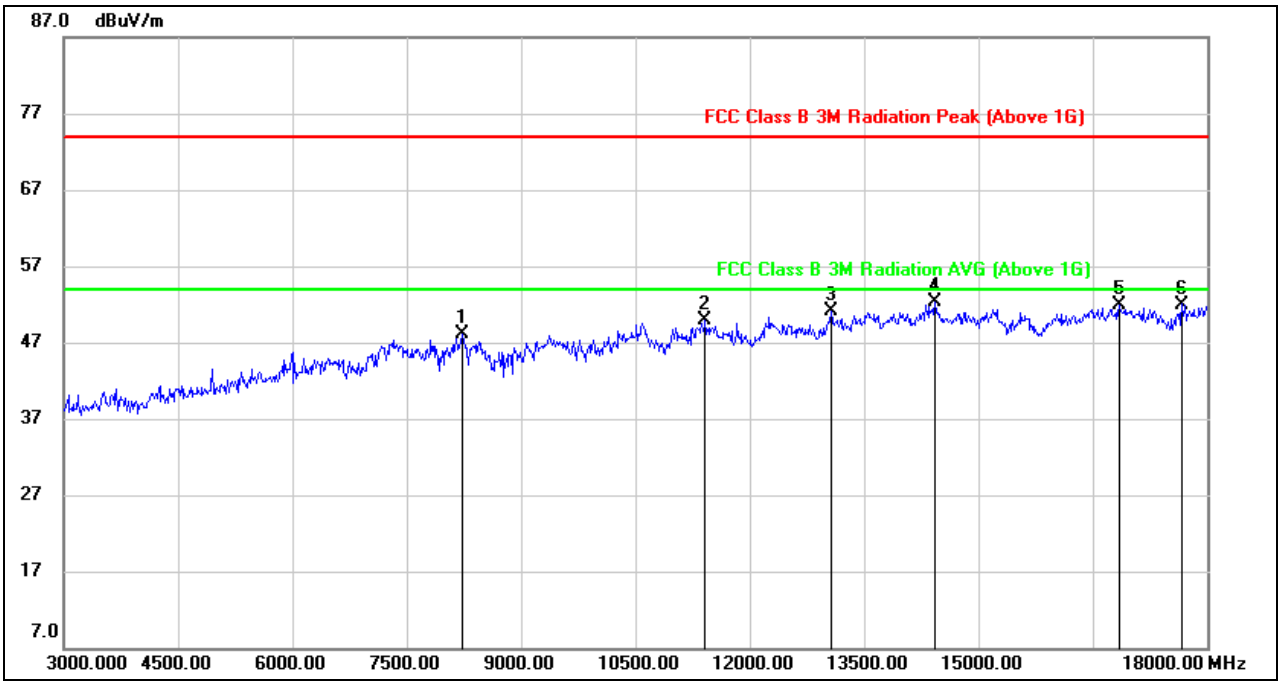
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8220.000	39.23	8.90	48.13	74.00	-25.87	peak
2	11415.000	37.48	12.43	49.91	74.00	-24.09	peak
3	13065.000	36.60	14.56	51.16	74.00	-22.84	peak
4	14430.000	35.81	16.43	52.24	74.00	-21.76	peak
5	16845.000	32.56	19.25	51.81	74.00	-22.19	peak
6	17670.000	30.79	21.21	52.00	74.00	-22.00	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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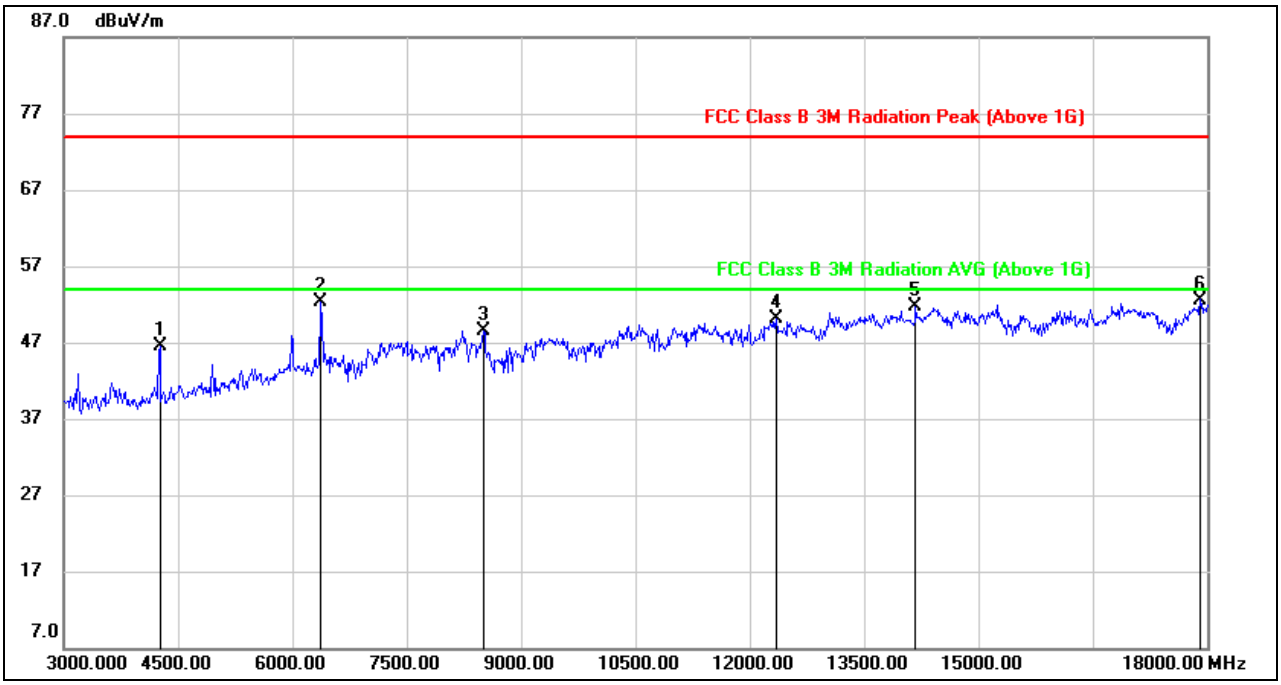
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4260.000	48.81	-2.30	46.51	74.00	-27.49	peak
2	6375.000	47.89	4.47	52.36	74.00	-21.64	peak
3	8505.000	40.46	8.00	48.46	74.00	-25.54	peak
4	12345.000	36.68	13.46	50.14	74.00	-23.86	peak
5	14175.000	35.39	16.22	51.61	74.00	-22.39	peak
6	17910.000	30.22	22.38	52.60	74.00	-21.40	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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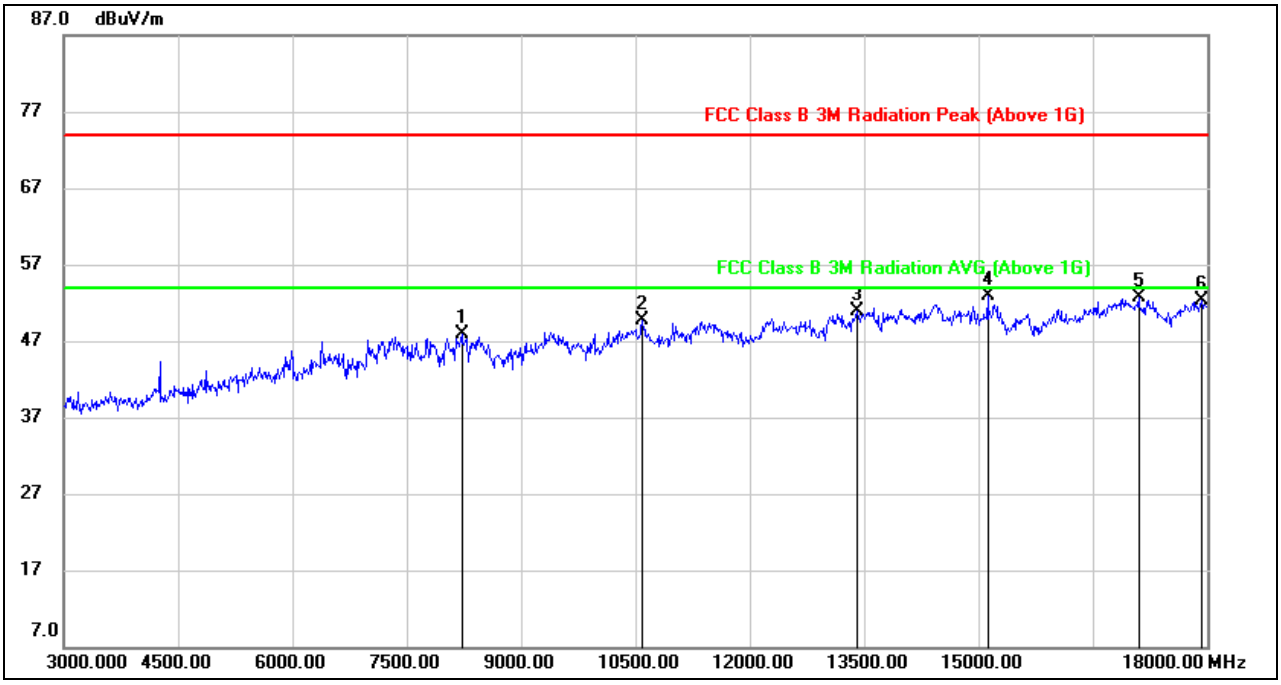
7.4.2. ∏/4-DQPSK

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8220.000	38.98	8.90	47.88	74.00	-26.12	peak
2	10590.000	37.59	12.04	49.63	74.00	-24.37	peak
3	13410.000	35.30	15.52	50.82	74.00	-23.18	peak
4	15120.000	36.87	15.94	52.81	74.00	-21.19	peak
5	17100.000	32.68	20.05	52.73	74.00	-21.27	peak
6	17925.000	29.82	22.39	52.21	74.00	-21.79	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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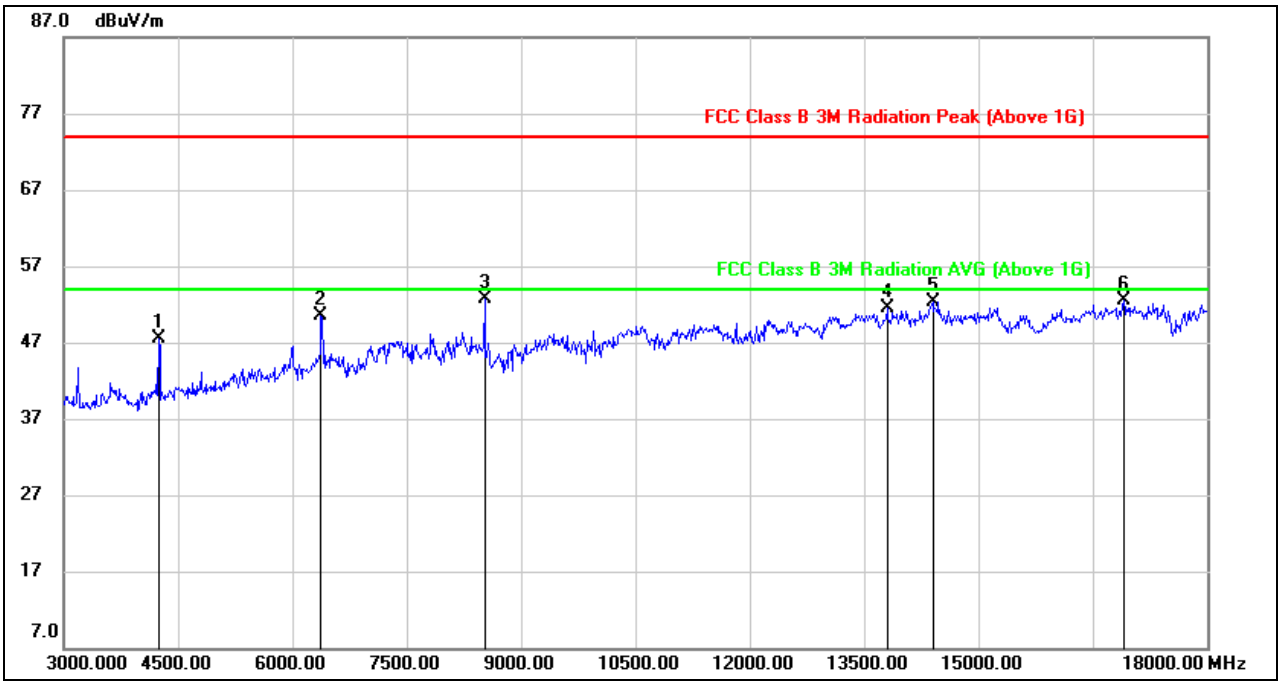
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4245.000	49.83	-2.24	47.59	74.00	-26.41	peak
2	6375.000	45.98	4.47	50.45	74.00	-23.55	peak
3	8520.000	44.73	7.97	52.70	74.00	-21.30	peak
4	13800.000	34.97	16.46	51.43	74.00	-22.57	peak
5	14400.000	35.89	16.44	52.33	74.00	-21.67	peak
6	16905.000	33.18	19.26	52.44	74.00	-21.56	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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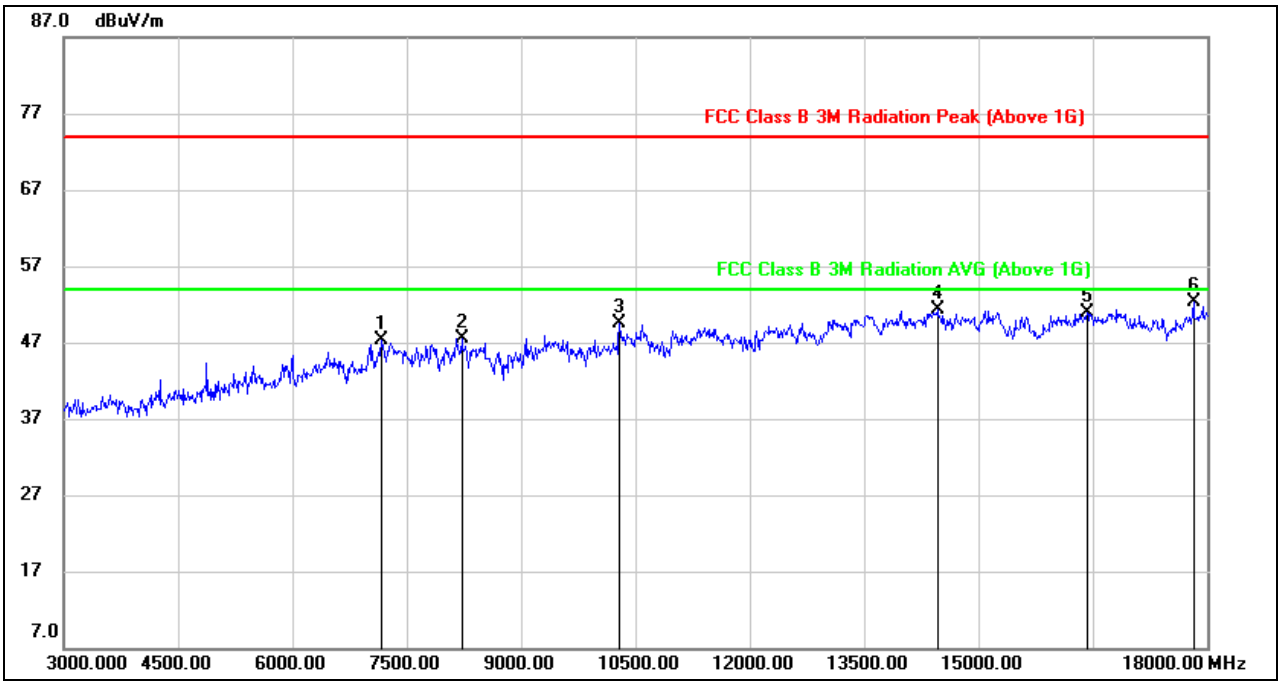
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7170.000	40.67	6.70	47.37	74.00	-26.63	peak
2	8220.000	38.63	8.90	47.53	74.00	-26.47	peak
3	10290.000	38.34	11.07	49.41	74.00	-24.59	peak
4	14460.000	34.96	16.41	51.37	74.00	-22.63	peak
5	16425.000	32.72	18.12	50.84	74.00	-23.16	peak
6	17820.000	29.92	22.42	52.34	74.00	-21.66	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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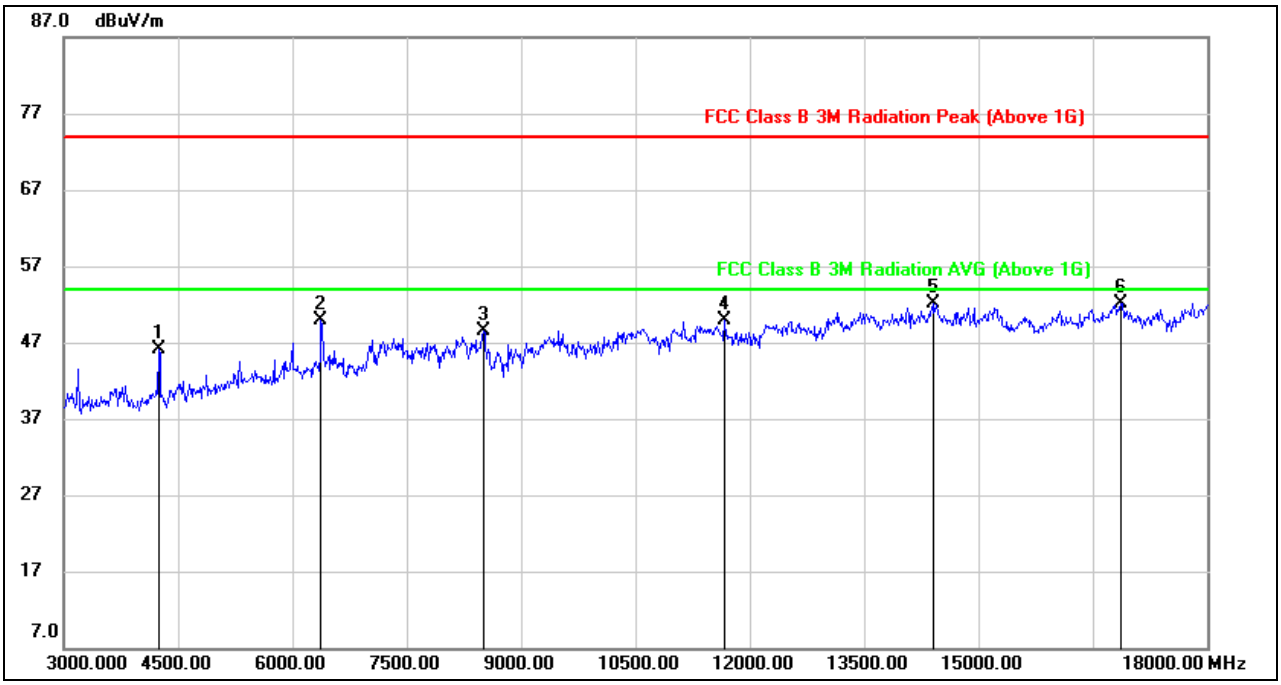
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4245.000	48.29	-2.24	46.05	74.00	-27.95	peak
2	6375.000	45.48	4.47	49.95	74.00	-24.05	peak
3	8505.000	40.50	8.00	48.50	74.00	-25.50	peak
4	11670.000	37.22	12.70	49.92	74.00	-24.08	peak
5	14415.000	35.66	16.43	52.09	74.00	-21.91	peak
6	16860.000	32.94	19.25	52.19	74.00	-21.81	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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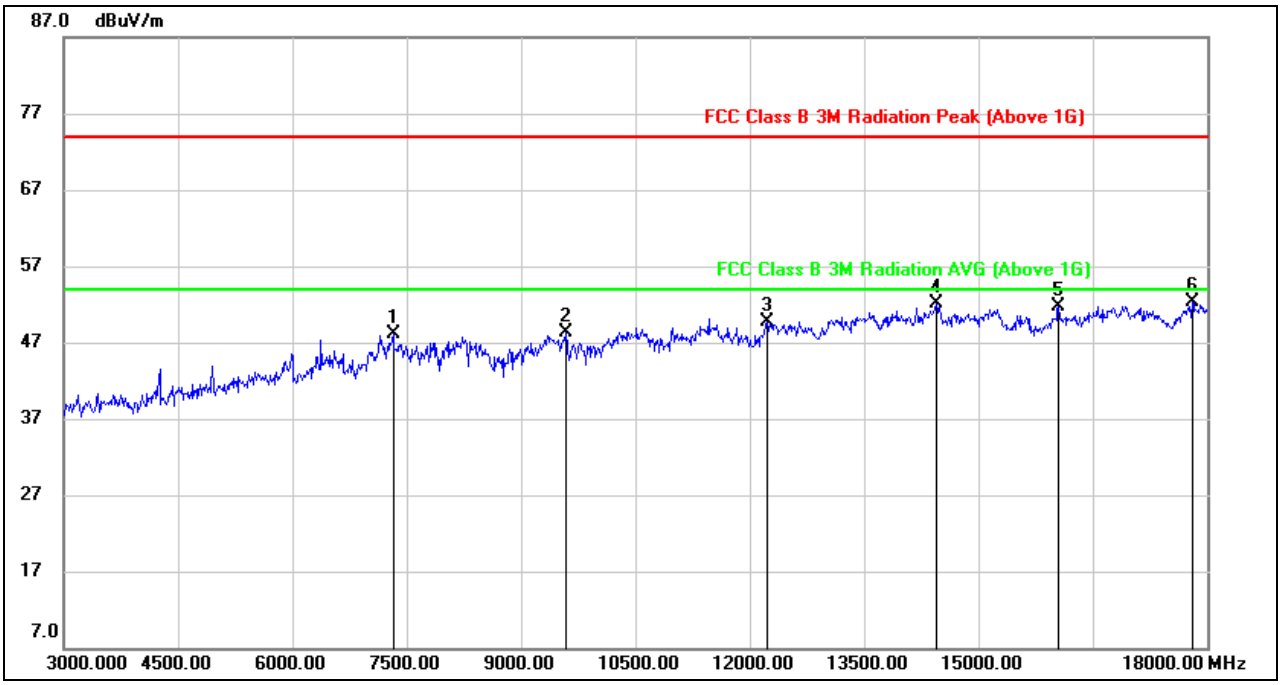
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7320.000	41.06	6.98	48.04	74.00	-25.96	peak
2	9585.000	38.67	9.66	48.33	74.00	-25.67	peak
3	12225.000	36.37	13.29	49.66	74.00	-24.34	peak
4	14445.000	35.74	16.42	52.16	74.00	-21.84	peak
5	16050.000	34.65	17.04	51.69	74.00	-22.31	peak
6	17805.000	29.91	22.44	52.35	74.00	-21.65	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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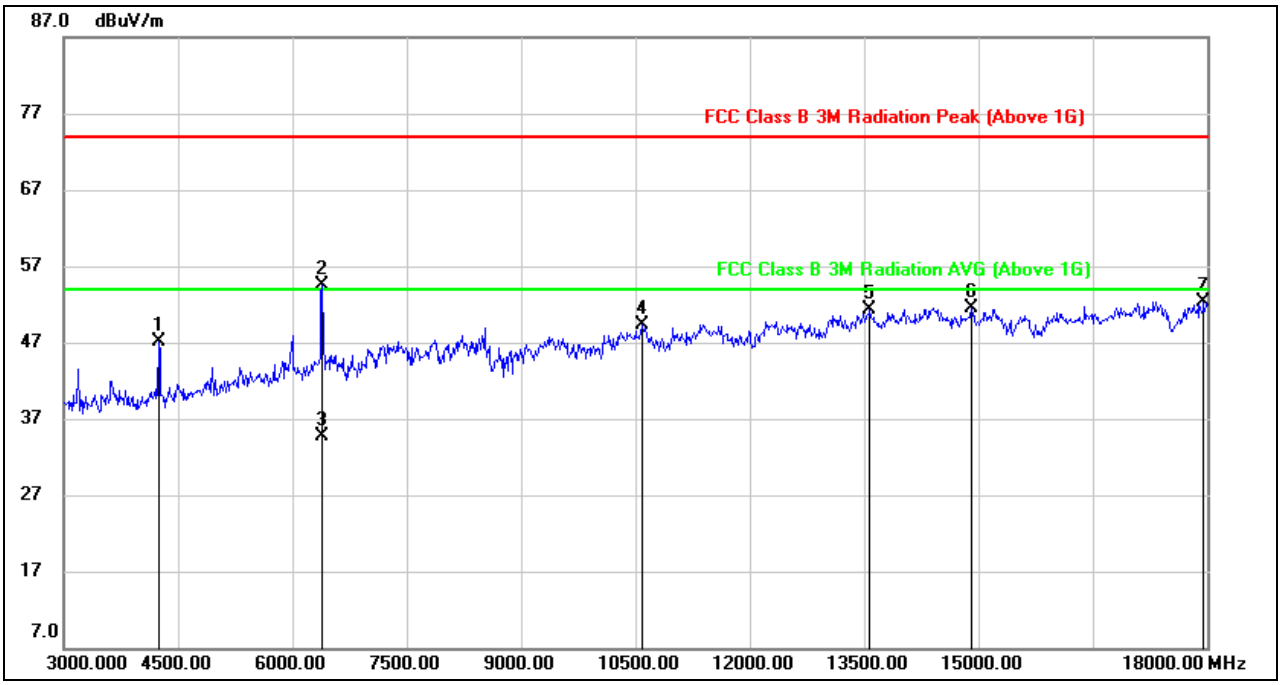
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4245.000	49.33	-2.24	47.09	74.00	-26.91	peak
2	6390.000	49.95	4.54	54.49	74.00	-19.51	peak
3	6390.000	30.10	4.54	34.64	54.00	-19.36	AVG
4	10590.000	37.34	12.04	49.38	74.00	-24.62	peak
5	13575.000	35.75	15.64	51.39	74.00	-22.61	peak
6	14910.000	35.50	15.97	51.47	74.00	-22.53	peak
7	17955.000	29.95	22.43	52.38	74.00	-21.62	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, please refer to clause 6.1.
6. High pass filter losses had already added into the correct factor.

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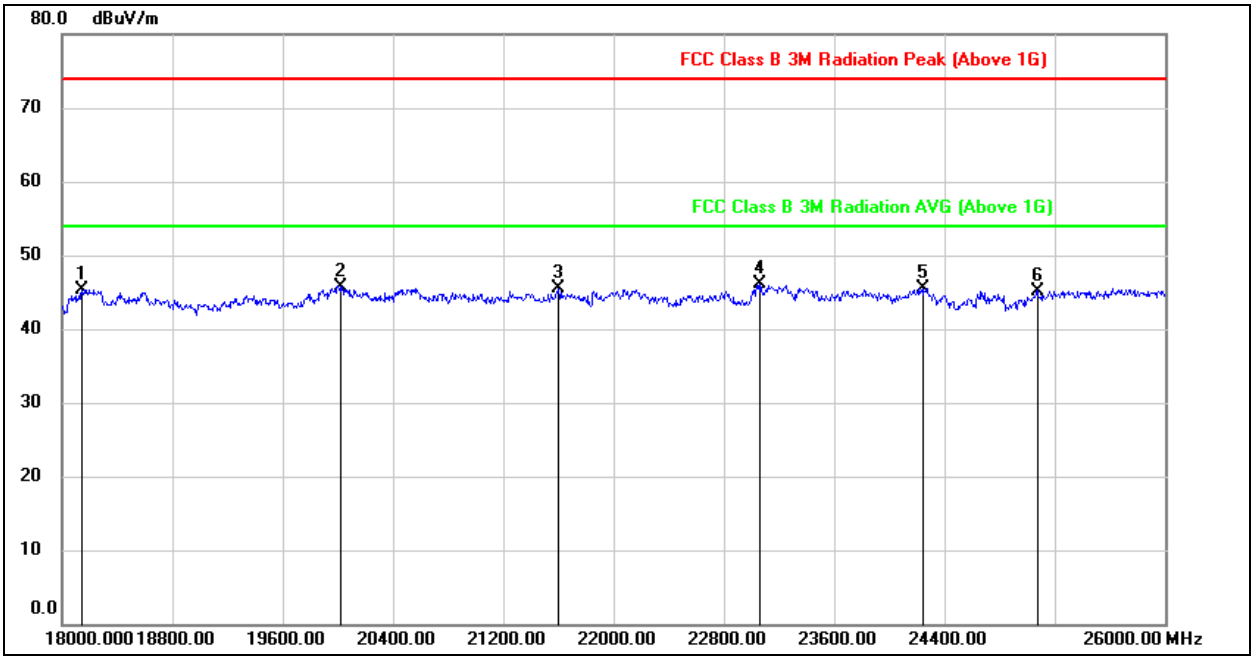
7.5. SPURIOUS EMISSIONS 18G ~ 26GHz

7.5.1. ∏/4-DQPSK

SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18144.000	50.77	-5.48	45.29	74.00	-28.71	peak
2	20024.000	51.25	-5.47	45.78	74.00	-28.22	peak
3	21600.000	50.02	-4.54	45.48	74.00	-28.52	peak
4	23064.000	49.49	-3.42	46.07	74.00	-27.93	peak
5	24248.000	48.32	-2.83	45.49	74.00	-28.51	peak
6	25072.000	47.17	-1.97	45.20	74.00	-28.80	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

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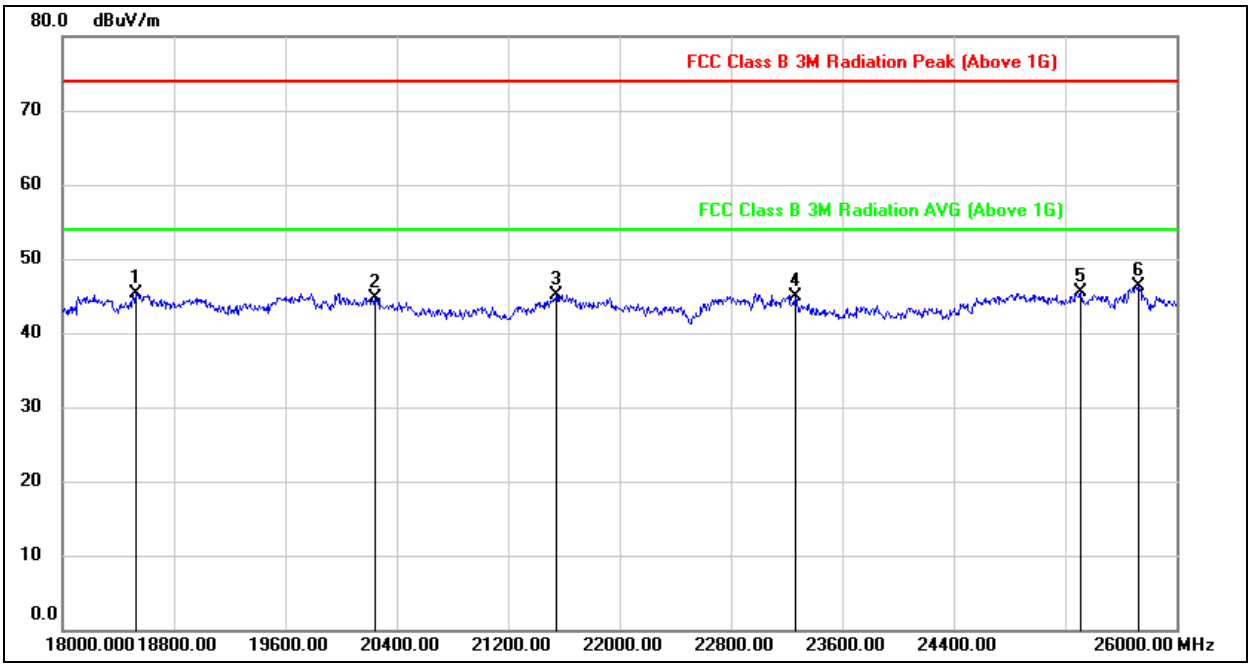
SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18528.000	50.61	-5.26	45.35	74.00	-28.65	peak
2	20240.000	50.32	-5.61	44.71	74.00	-29.29	peak
3	21544.000	49.76	-4.63	45.13	74.00	-28.87	peak
4	23264.000	48.26	-3.36	44.90	74.00	-29.10	peak
5	25312.000	47.20	-1.70	45.50	74.00	-28.50	peak
6	25728.000	47.11	-0.72	46.39	74.00	-27.61	peak

Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. High pass filter losses had already added into the correct factor.

Note: All the modulation and channels had been tested, but only the worst data recorded in the report.

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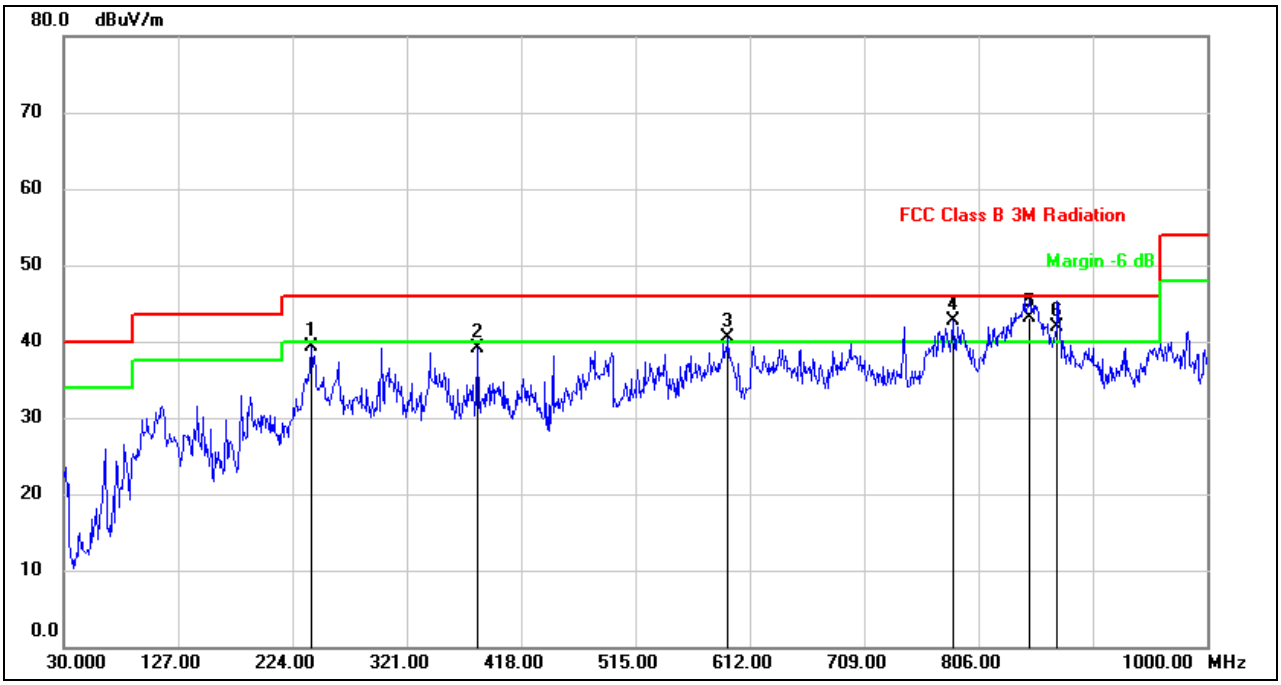
7.6. SPURIOUS EMISSIONS 30M ~ 1 GHz

7.6.1. ∏/4-DQPSK

SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	240.4900	56.71	-17.49	39.22	46.00	-6.78	QP
2	381.1400	52.39	-13.32	39.07	46.00	-6.93	QP
3	593.5700	49.76	-9.35	40.41	46.00	-5.59	QP
4	784.6599	48.85	-6.20	42.65	46.00	-3.35	QP
5	849.6500	48.13	-5.11	43.02	46.00	-2.98	QP
6	872.9300	46.88	-4.89	41.99	46.00	-4.01	QP

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

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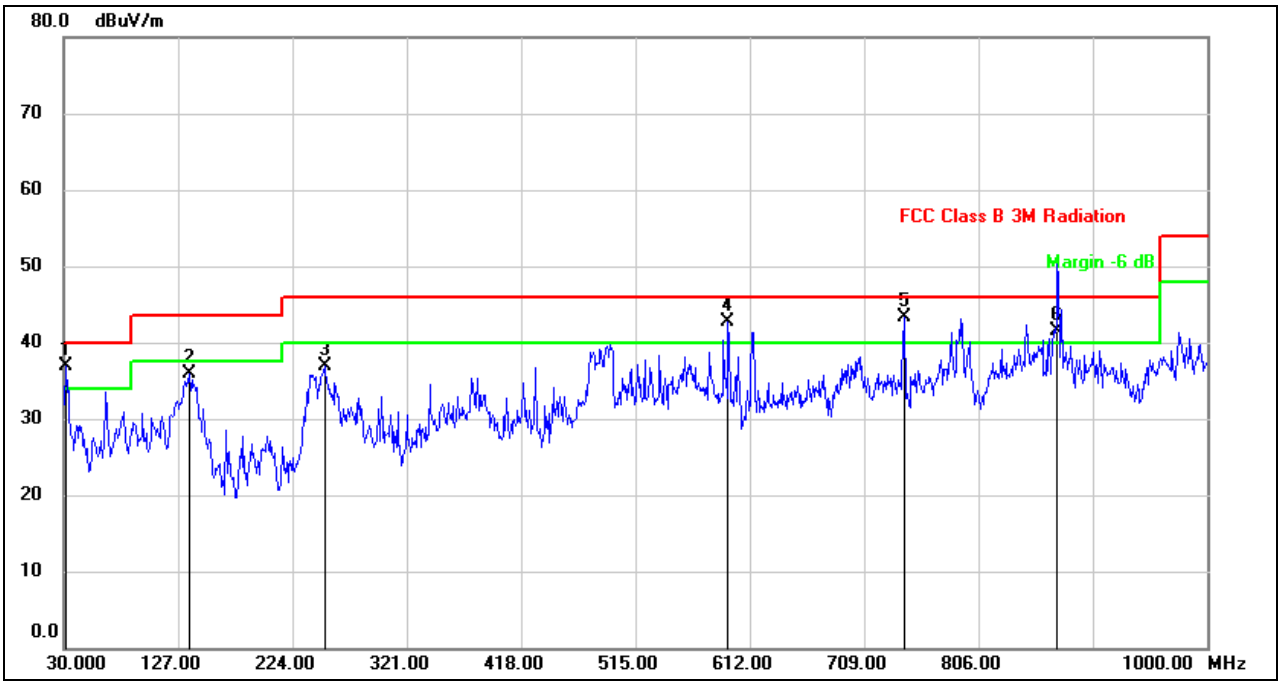
SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	31.9400	54.45	-17.53	36.92	40.00	-3.08	QP
2	136.7000	55.54	-19.71	35.83	43.50	-7.67	QP
3	251.1600	53.47	-16.64	36.83	46.00	-9.17	QP
4	593.5700	52.14	-9.35	42.79	46.00	-3.21	QP
5	742.9500	50.11	-6.74	43.37	46.00	-2.63	QP
6	872.9300	46.37	-4.89	41.48	46.00	-4.52	QP

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

Note: All the modulation and channels had been tested, but only the worst data recorded in the report.

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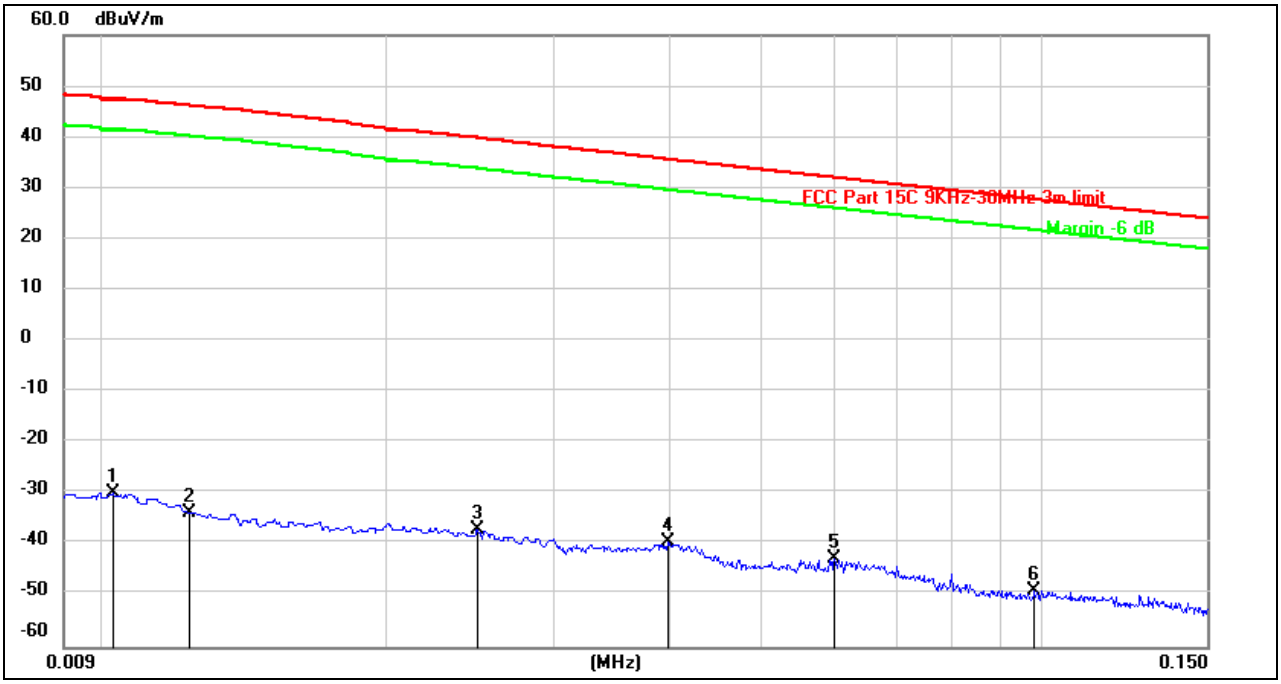
7.7. SPURIOUS EMISSIONS BELOW 30M

7.7.1. ∏/4-DQPSK

SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)

9KHz~ 150KHz



No.	Frequency (KHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0102	71.55	-101.40	-29.85	47.48	-77.33	peak
2	0.0123	67.69	-101.39	-33.70	46.22	-79.92	peak
3	0.0247	64.21	-101.37	-37.16	39.93	-77.09	peak
4	0.0398	61.86	-101.43	-39.57	35.61	-75.18	peak
5	0.0600	58.67	-101.52	-42.85	32.04	-74.89	peak
6	0.0981	52.77	-101.78	-49.01	27.77	-76.78	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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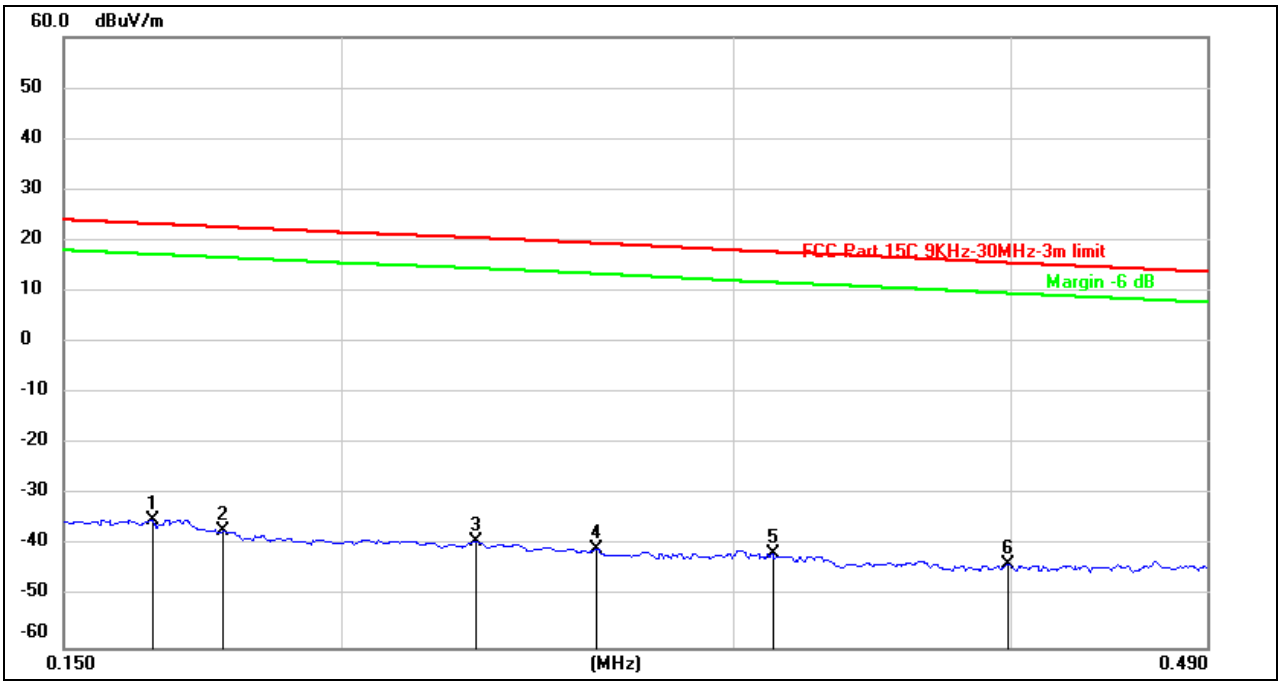
150KHz ~ 49 KHz



No.	Frequency (KHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1645	66.74	-101.65	-34.91	23.29	-58.20	peak
2	0.1768	64.49	-101.68	-37.19	22.66	-59.85	peak
3	0.2298	62.55	-101.77	-39.22	20.53	-59.75	peak
4	0.2605	61.14	-101.81	-40.67	19.45	-60.12	peak
5	0.3125	60.33	-101.87	-41.54	17.75	-59.29	peak
6	0.3988	58.25	-101.96	-43.71	15.59	-59.30	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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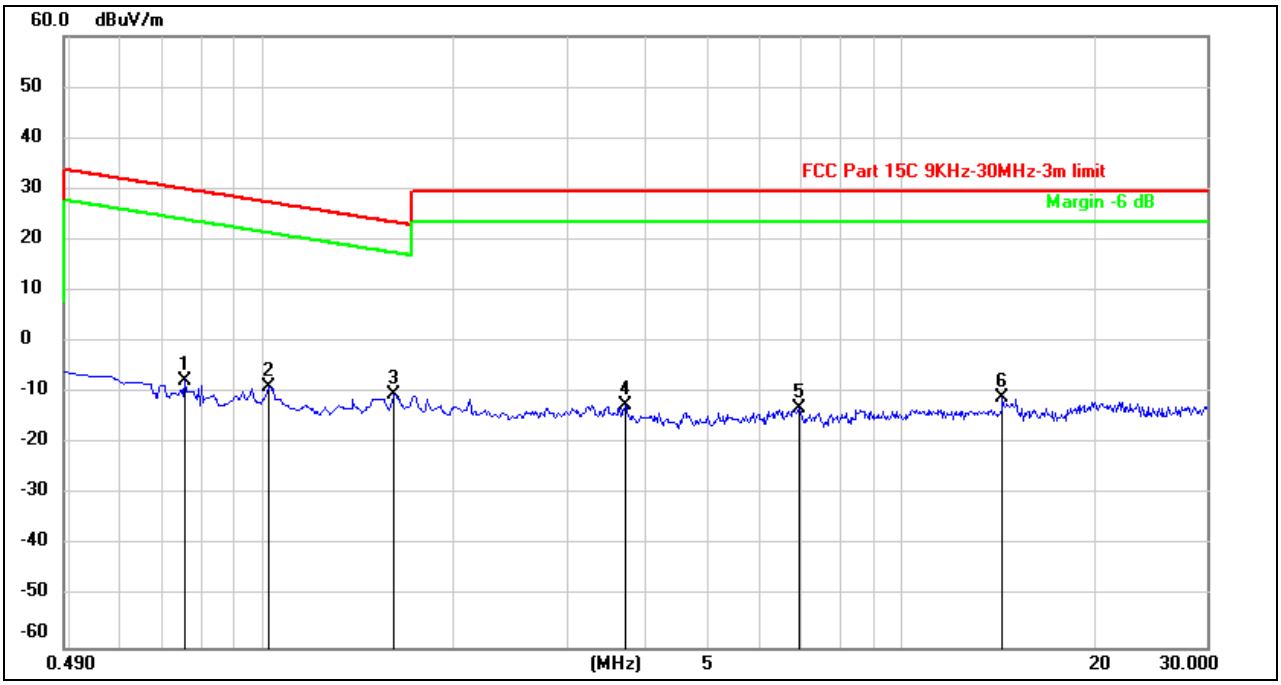
49KHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.7579	54.43	-62.12	-7.69	30.03	-37.72	peak
2	1.0234	53.44	-62.25	-8.81	27.41	-36.22	peak
3	1.6112	51.78	-62.00	-10.22	23.46	-33.68	peak
4	3.7065	48.87	-61.41	-12.54	29.54	-42.08	peak
5	6.9230	48.13	-61.22	-13.09	29.54	-42.63	peak
6	14.4185	49.93	-60.99	-11.06	29.54	-40.60	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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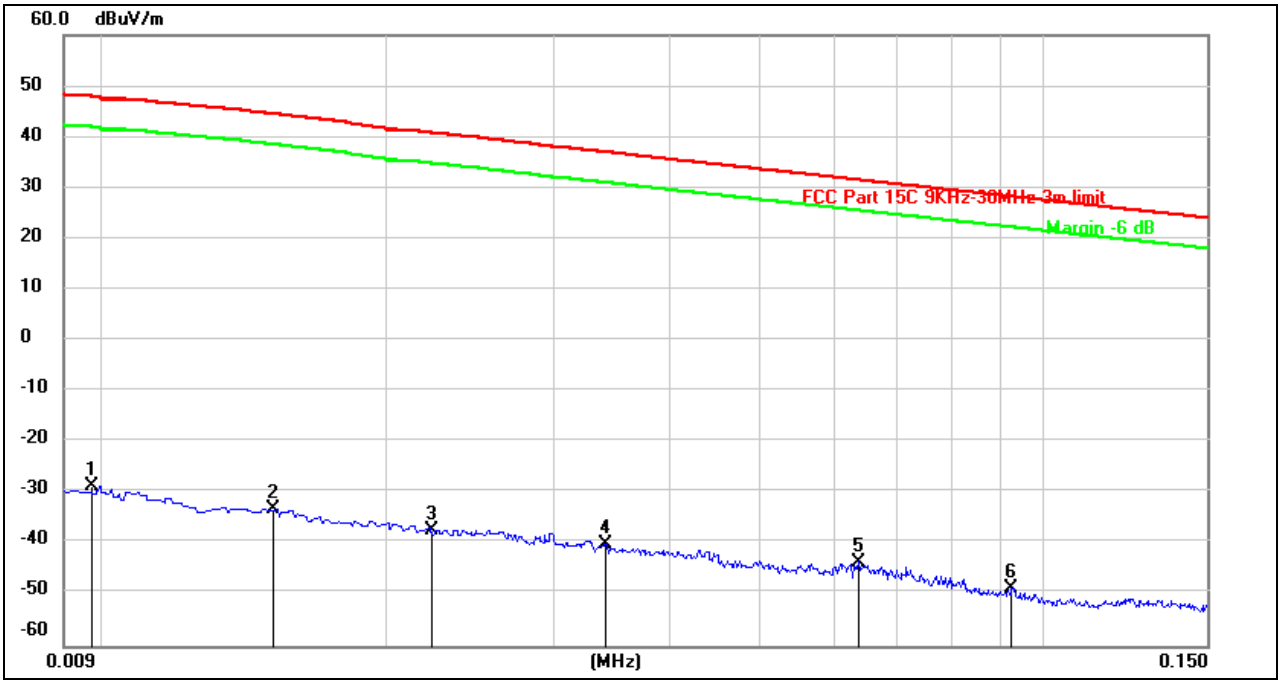
SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)

9KHz~ 150KHz



No.	Frequency (KHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0097	72.83	-101.38	-28.55	47.83	-76.38	peak
2	0.0151	68.35	-101.37	-33.02	44.53	-77.55	peak
3	0.0223	64.03	-101.35	-37.32	40.77	-78.09	peak
4	0.0342	61.43	-101.41	-39.98	37.01	-76.99	peak
5	0.0636	58.04	-101.54	-43.50	31.56	-75.06	peak
6	0.0926	53.07	-101.74	-48.67	28.28	-76.95	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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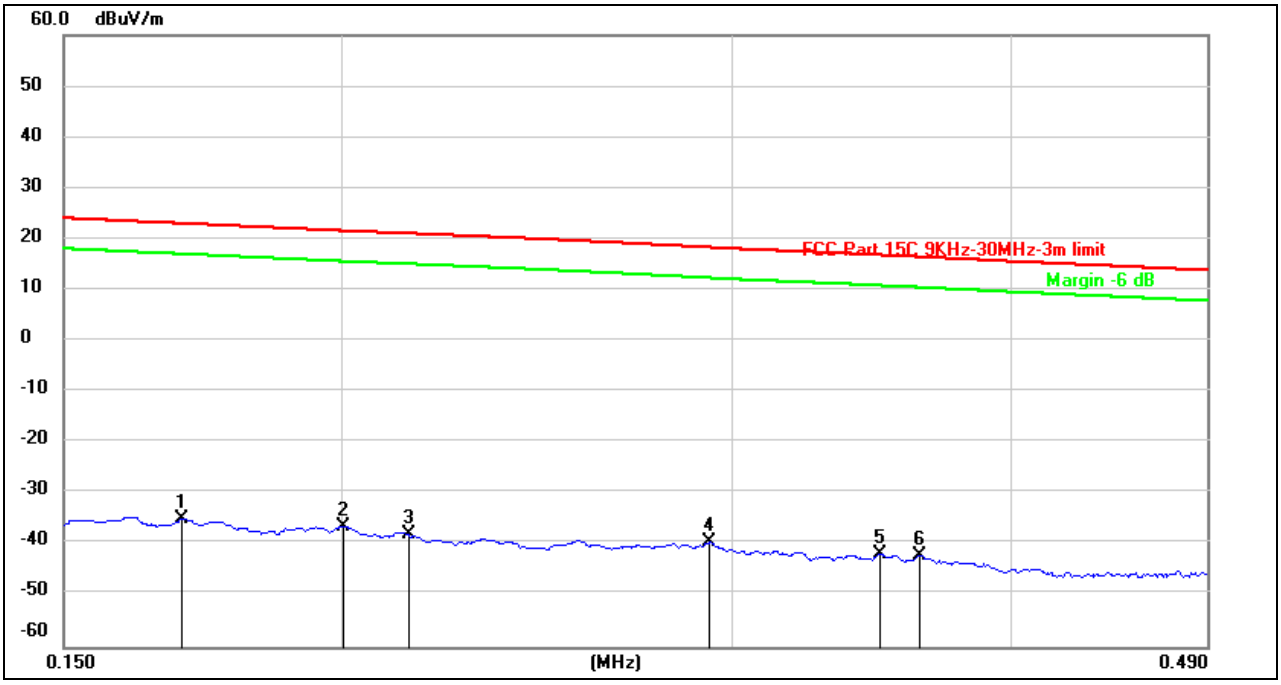
150KHz ~ 49KHz



No.	Frequency (KHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1696	66.64	-101.67	-35.03	23.02	-58.05	peak
2	0.2006	65.33	-101.72	-36.39	21.56	-57.95	peak
3	0.2146	63.71	-101.74	-38.03	21.07	-59.10	peak
4	0.2928	62.29	-101.85	-39.56	18.31	-57.87	peak
5	0.3496	60.02	-101.91	-41.89	16.82	-58.71	peak
6	0.3642	59.72	-101.93	-42.21	16.45	-58.66	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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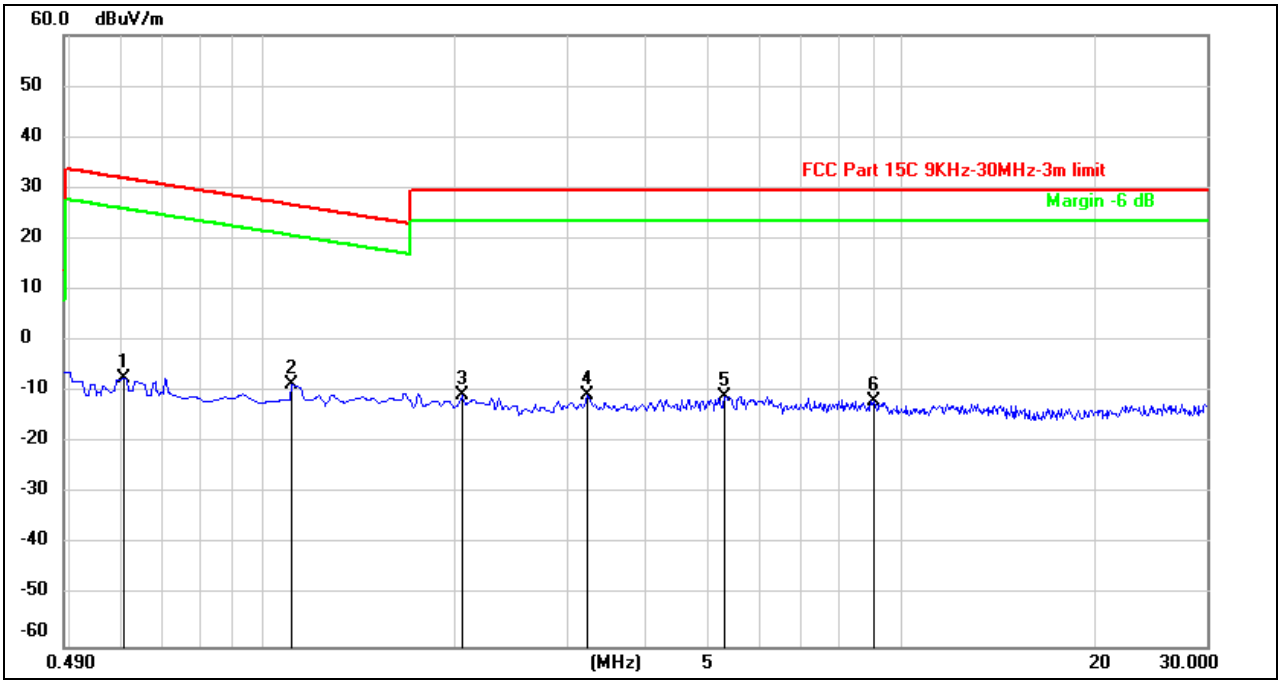
49KHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.6078	54.71	-62.09	-7.38	31.94	-39.32	peak
2	1.1110	53.74	-62.22	-8.48	26.70	-35.18	peak
3	2.0539	51.05	-61.81	-10.76	29.54	-40.30	peak
4	3.2343	50.91	-61.53	-10.62	29.54	-40.16	peak
5	5.3000	50.56	-61.45	-10.89	29.54	-40.43	peak
6	9.0774	49.18	-60.93	-11.75	29.54	-41.29	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

Note: All test mode has been tested, only the worst data record in the report

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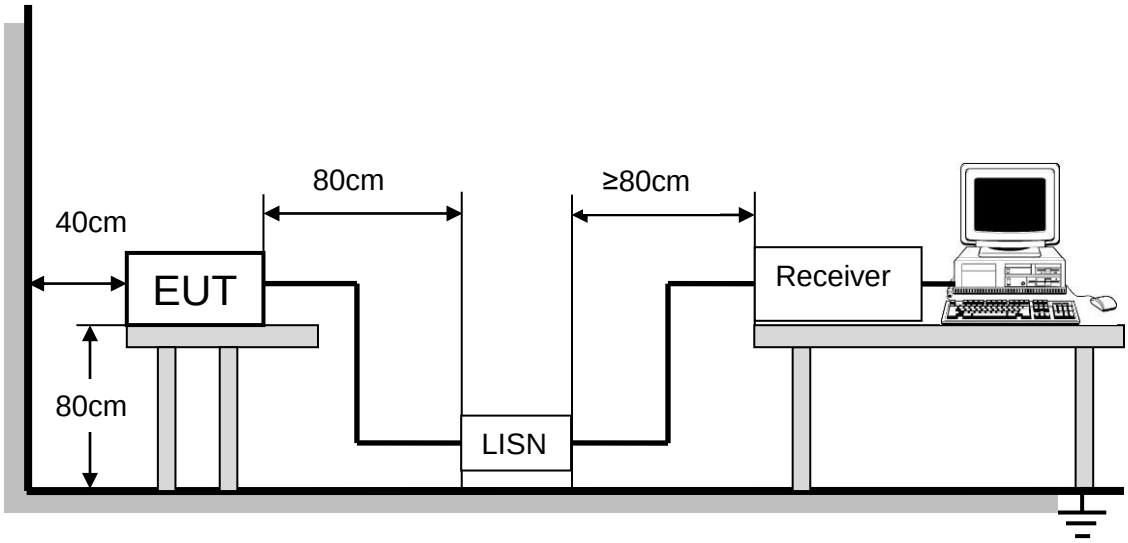
8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

Please refer to FCC §15.207 (a)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

TEST SETUP AND PROCEDURE



The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

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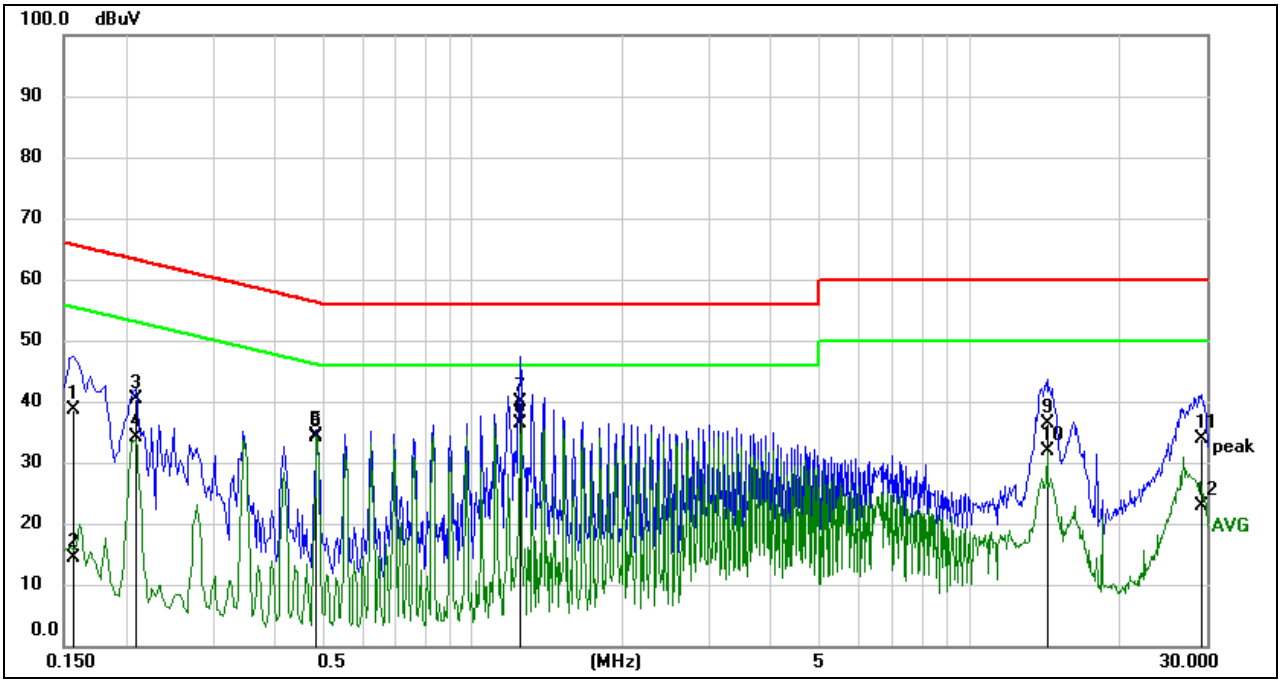
8.1.1. ∏/4-DQPSK MODE

TEST RESULTS (HIGH CHANNEL, WORST-CASE CONFIGURATION)

LINE N RESULTS



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1566	28.89	9.62	38.51	65.64	-27.13	QP
2	0.1566	4.82	9.62	14.44	55.64	-41.20	AVG
3	0.2095	30.74	9.62	40.36	63.23	-22.87	QP
4	0.2095	24.62	9.62	34.24	53.23	-18.99	AVG
5	0.4857	24.70	9.63	34.33	56.24	-21.91	QP
6	0.4857	24.49	9.63	34.12	46.24	-12.12	AVG
7	1.2493	30.20	9.64	39.84	56.00	-16.16	QP
8	1.2493	26.71	9.64	36.35	46.00	-9.65	AVG
9	14.3362	26.49	9.86	36.35	60.00	-23.65	QP
10	14.3362	21.90	9.86	31.76	50.00	-18.24	AVG
11	29.2928	23.80	10.01	33.81	60.00	-26.19	QP
12	29.2928	12.94	10.01	22.95	50.00	-27.05	AVG

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

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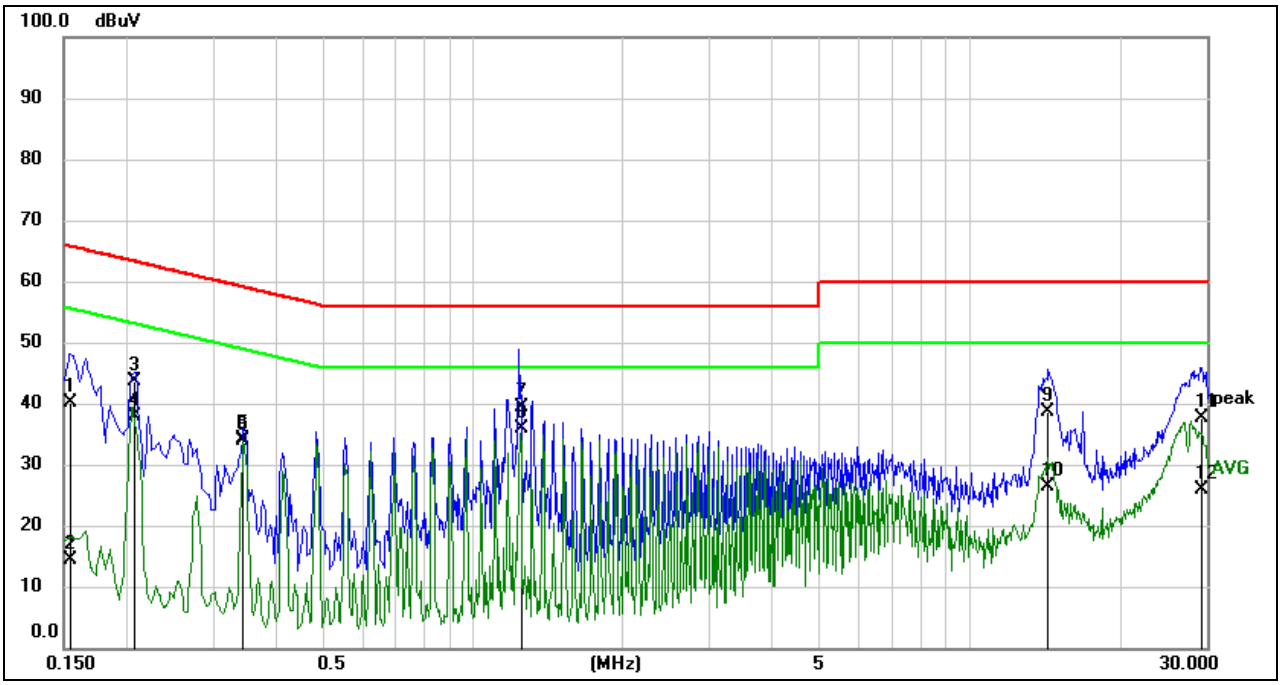
LINE L RESULTS



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1553	30.44	9.64	40.08	65.71	-25.63	QP
2	0.1553	4.86	9.64	14.50	55.71	-41.21	AVG
3	0.2083	34.08	9.63	43.71	63.27	-19.56	QP
4	0.2083	28.16	9.63	37.79	53.27	-15.48	AVG
5	0.3462	24.50	9.63	34.13	59.05	-24.92	QP
6	0.3462	24.26	9.63	33.89	49.05	-15.16	AVG
7	1.2483	29.65	9.64	39.29	56.00	-16.71	QP
8	1.2483	26.21	9.64	35.85	46.00	-10.15	AVG
9	14.4253	28.82	9.85	38.67	60.00	-21.33	QP
10	14.4253	16.56	9.85	26.41	50.00	-23.59	AVG
11	29.3353	27.62	9.96	37.58	60.00	-22.42	QP
12	29.3353	15.86	9.96	25.82	50.00	-24.18	AVG

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

Note: All the modulation and channels had been tested, but only the worst data recorded in the report.

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9. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(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. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

END OF REPORT

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