



**CFR 47 FCC PART 15 SUBPART C
ISED RSS-247 ISSUE 2**

CERTIFICATION TEST REPORT

For

Dongle

MODEL NUMBER: RDA0026

FCC ID: 2AAFMRDA0026

IC: 10954A-RDA0026

REPORT NUMBER: 4789084430.6-2

ISSUE DATE: July 30, 2019

Prepared for

**Corsair Memory, Inc.
47100 Bayside Pkwy, Fremont, CA 94538**

Prepared by

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V0	7/30/2019	Initial Issue	



Summary of Test Results			
Clause	Test Items	FCC/ISED Rules	Test Results
1	6dB Bandwidth and 99% Occupied Bandwidth	FCC Part 15.247 (a) (2) RSS-247 Clause 5.2 (a) ISED RSS-Gen Clause 6.7	Pass
2	Peak Conducted Output Power	FCC Part 15.247 (b) (3) RSS-247 Clause 5.4 (d)	Pass
3	Power Spectral Density	FCC Part 15.247 (e) RSS-247 Clause 5.2 (b)	Pass
4	Conducted Bandedge and Spurious Emission	FCC Part 15.247 (d) RSS-247 Clause 5.5	Pass
5	Radiated Bandedge and Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	Pass
6	Conducted Emission Test for AC Power Port	FCC Part 15.207 RSS-GEN Clause 8.8	Pass
7	Antenna Requirement	FCC Part 15.203 RSS-GEN Clause 6.8	Pass



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Corsair Memory, Inc.
Address: 47100 Bayside Pkwy, Fremont, CA 94538

Manufacturer Information

Company Name: Corsair Memory, Inc.
Address: 47100 Bayside Pkwy, Fremont, CA 94538

EUT Information

EUT Name: Dongle
Brand Name: CORSAIR
Model: RDA0026
Sample Status: Normal
Sample ID: 2427838
Sample Received Date: July 16, 2019
Date of Tested: July 18, 2019 ~ July 25, 2019

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART C	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 5	PASS

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 558074 D01 DTS Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013, ISED RSS-247 Issue 2 and ISED RSS-GEN Issue 5.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p>A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be compliance with A2LA.</p> <p>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</p> <p>ISED (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.</p> <p>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 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</p>
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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: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OFS.



4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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



5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	Dongle		
Model Name	RDA0026		
Product Description	Operation Frequency	2401.35 MHz ~ 2479.35 MHz	
	Modulation Type	pi/4-DQPSK	
Rated Input	DC 5V		

5.2. MAXIMUM OUTPUT POWER

Mode	Frequency (MHz)	Channel Number	Max Output Power (dBm)	EIRP (dBm)
pi/4-DQPSK (Antenna 0)	2401.35 ~ 2479.35	0-39[40]	1.418	4.078
pi/4-DQPSK (Antenna 1)	2401.35 ~ 2479.35	0-39[40]	1.790	4.450

5.3. CHANNEL LIST

Channel	Frequency (MHz)						
00	2401.35	11	2423.35	22	2445.35	33	2467.35
01	2403.35	12	2425.35	23	2447.35	34	2469.35
02	2405.35	13	2427.35	24	2449.35	35	2471.35
03	2407.35	14	2429.35	25	2451.35	36	2473.35
04	2409.35	15	2431.35	26	2453.35	37	2475.35
05	2411.35	16	2433.35	27	2455.35	38	2477.35
06	2413.35	17	2435.35	28	2457.35	39	2479.35
07	2415.35	18	2437.35	29	2459.35	/	/
08	2417.35	19	2439.35	30	2461.35	/	/
09	2419.35	20	2441.35	31	2463.35	/	/
10	2421.35	21	2443.35	32	2465.35	/	/

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
pi/4-DQPSK	LCH, MCH, HCH	2401.35MHz, 2439.35MHz, 2479.35MHz



5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worst Case Power Setting Parameter under 2401.35 ~ 2479.35 MHz Band				
Test Software		VMI debug		
Modulation Type	Transmit Antenna Number	Test Channel		
		CH 0	CH 19	CH 39
pi/4-DQPSK	1	8	8	8

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
0	2401.35-2479.35	Multilayer Ceramic Antenna	2.66

Test Mode	Transmit and Receive Mode	Description
pi/4-DQPSK	1TX, 1RX	Chain 0 can be used as transmitting/receiving antenna.

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2401.35-2479.35	Multilayer Ceramic Antenna	2.66

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

Note 1: The EUT have 2 antennas, but only 1 antenna active at any moment in time.
 Note 2: Both the antennas and circuit before antenna are the same, Pre-Scan has been conducted to determine the worst-case mode from both antennas, but only the worst data were recorded in this report.

5.7. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	45 ~ 70%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	22 ~ 28°C
Voltage:	VL	/
	VN	DC 5.0V
	VH	/

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



5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	Laptop	ThinkPad	T460S	SL10K24796 JS

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB	/	1	/

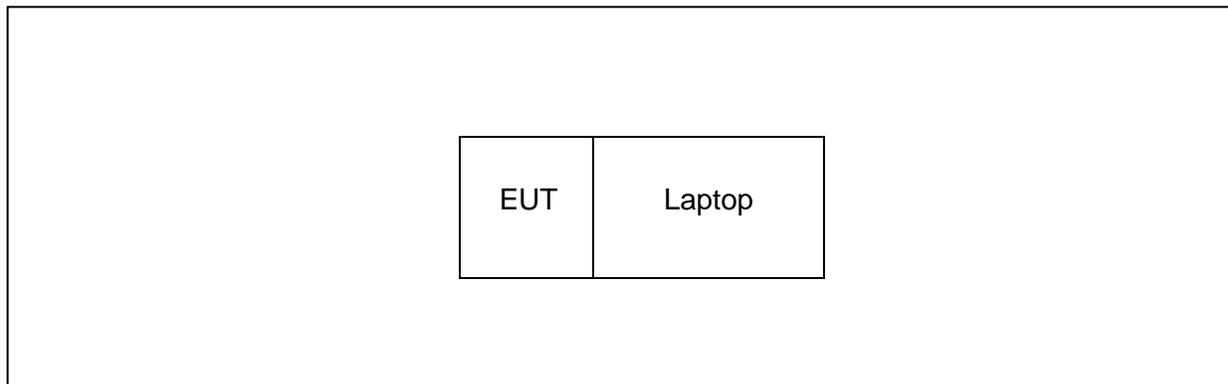
ACCESSORY

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

TEST SETUP

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

SETUP DIAGRAM FOR TEST





5.9. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ESR3	101961	Dec.10,2018	Dec.10,2019
<input checked="" type="checkbox"/>	Two-Line V- Network	R&S	ENV216	101983	Dec.10,2018	Dec.10,2019
<input checked="" type="checkbox"/>	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.10,2018	Dec.10,2019
Software						
Used	Description	Manufacturer	Name	Version		
<input checked="" type="checkbox"/>	Test Software for Conducted disturbance	Farad	EZ-EMC	Ver. UL-3A1		
Radiated Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.10,2018	Dec.10,2019
<input checked="" type="checkbox"/>	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Sep.17, 2018	Sep.17, 2021
<input checked="" type="checkbox"/>	Preamplifier	HP	8447D	2944A09099	Dec.10,2018	Dec.10,2019
<input checked="" type="checkbox"/>	EMI Measurement Receiver	R&S	ESR26	101377	Dec.10,2018	Dec.10,2019
<input checked="" type="checkbox"/>	Horn Antenna	TDK	HRN-0118	130939	Sep.17, 2018	Sep.17, 2021
<input checked="" type="checkbox"/>	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Aug.11, 2018	Aug.11, 2021
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-0118	TRS-305- 00066	Dec.10,2018	Dec.10,2019
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-2	TRS-307- 00003	Dec.10,2018	Dec.10,2019
<input checked="" type="checkbox"/>	Loop antenna	Schwarzbeck	1519B	00008	Jan.07, 2019	Jan.07, 2022
<input checked="" type="checkbox"/>	Band Reject Filter	Wainwright	WRCJV8- 2350-2400- 2483.5- 2533.5- 40SS	4	Dec.10, 2018	Dec.10, 2019
<input checked="" type="checkbox"/>	High Pass Filter	Wi	WHKX10- 2700-3000- 18000-40SS	23	Dec.10,2018	Dec.10,2019
Software						
Used	Description	Manufacturer	Name	Version		
<input checked="" type="checkbox"/>	Test Software for Radiated disturbance	Farad	EZ-EMC	Ver. UL-3A1		



Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.10,2018	Dec.10,2019
<input checked="" type="checkbox"/>	Power Meter	Keysight	N9031A	MY55416024	Dec.10,2018	Dec.10,2019
<input checked="" type="checkbox"/>	Power Sensor	Keysight	N9323A	MY55440013	Dec.10,2018	Dec.10,2019



6. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6 dB Bandwidth	KDB 558074 D01 DTS Meas Guidance v05r02	8.2
2	Peak Output Power	KDB 558074 D01 DTS Meas Guidance v05r02	8.3.1.3
3	Power Spectral Density	KDB 558074 D01 DTS Meas Guidance v05r02	8.4
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 DTS Meas Guidance v05r02	8.5
5	Out-of-band emissions in restricted bands	KDB 558074 D01 DTS Meas Guidance v05r02	8.6
6	Band-edge	KDB 558074 D01 DTS Meas Guidance v05r02	8.7
7	Conducted Emission Test for AC Power Port	ANSI C63.10-2013	6.2
8	99% Bandwidth	ANSI C63.10-2013	6.9.3



7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

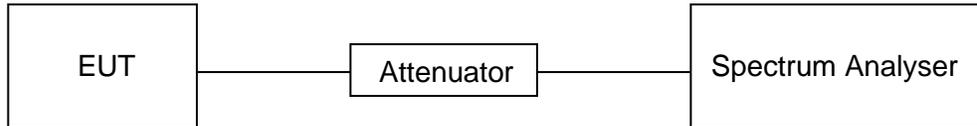
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



TEST ENVIRONMENT

Temperature	24.6°C	Relative Humidity	60%
Atmosphere Pressure	101kPa	Test Voltage	DC 5.0V

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)
pi/4-DQPSK	100	100	1.00	100%	0.00	0.01	0.01

Note:

Duty Cycle Correction Factor=10log(1/x).

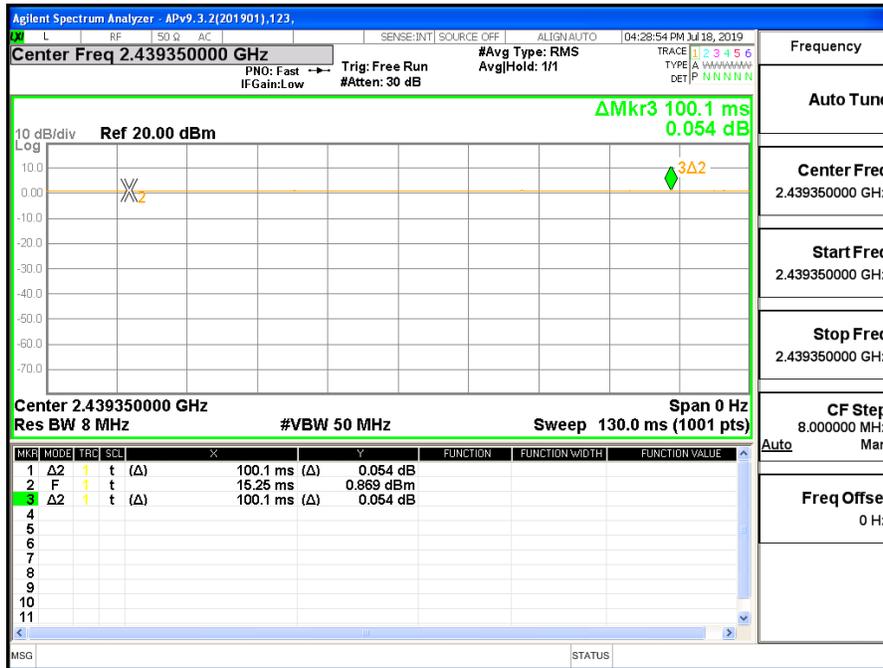
Where: x is Duty Cycle (Linear)

Where: T is On Time (transmit duration)

If that calculated VBW is not available on the analyzer then the next higher value should be used.



pi/4-DQPSK ANTENNA 1 ON TIME AND DUTY CYCLE MID CH



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

7.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH

LIMITS

CFR 47FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(a)(2) ISED RSS-247 5.2 (a)	6dB Bandwidth	$\geq 500\text{kHz}$	2400-2483.5
ISED RSS-Gen Clause 6.6	99% Occupied Bandwidth	For reporting purposes only.	2400-2483.5

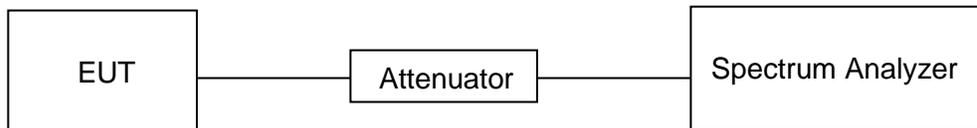
TEST PROCEDURE

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

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth: 100KHz For 99% Occupied Bandwidth :1% to 5% of the actual occupied bandwidth
VBW	For 6dB Bandwidth: $\geq 3 \times \text{RBW}$ For 99% Occupied Bandwidth: approximately $3 \times \text{RBW}$
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 6 dB/99% relative to the maximum level measured in the fundamental emission.

TEST SETUP





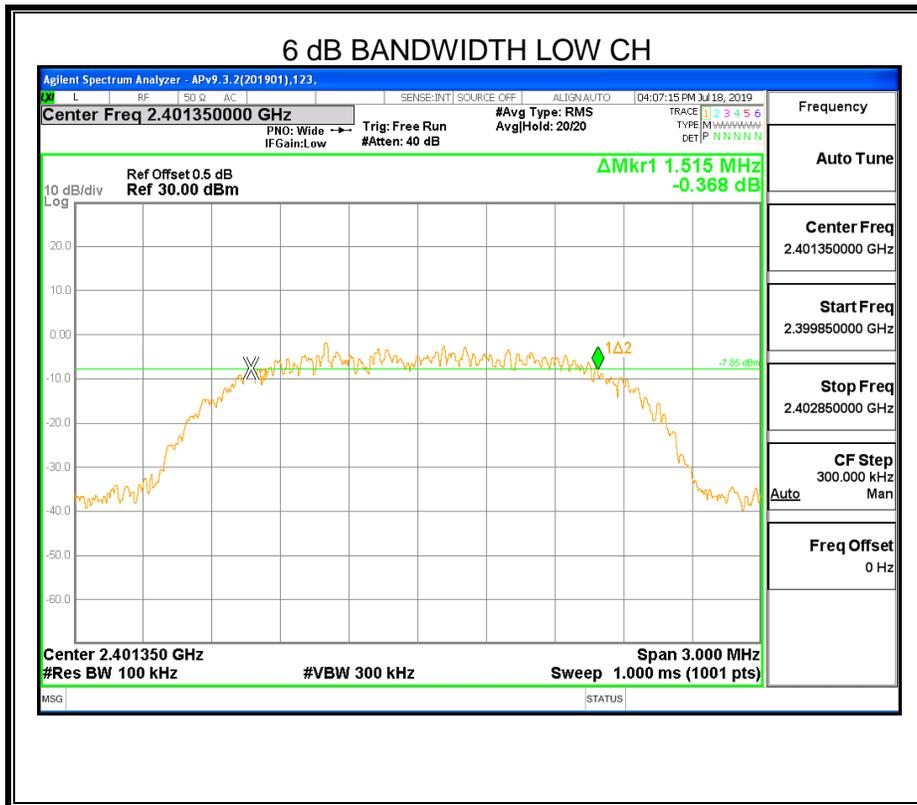
TEST ENVIRONMENT

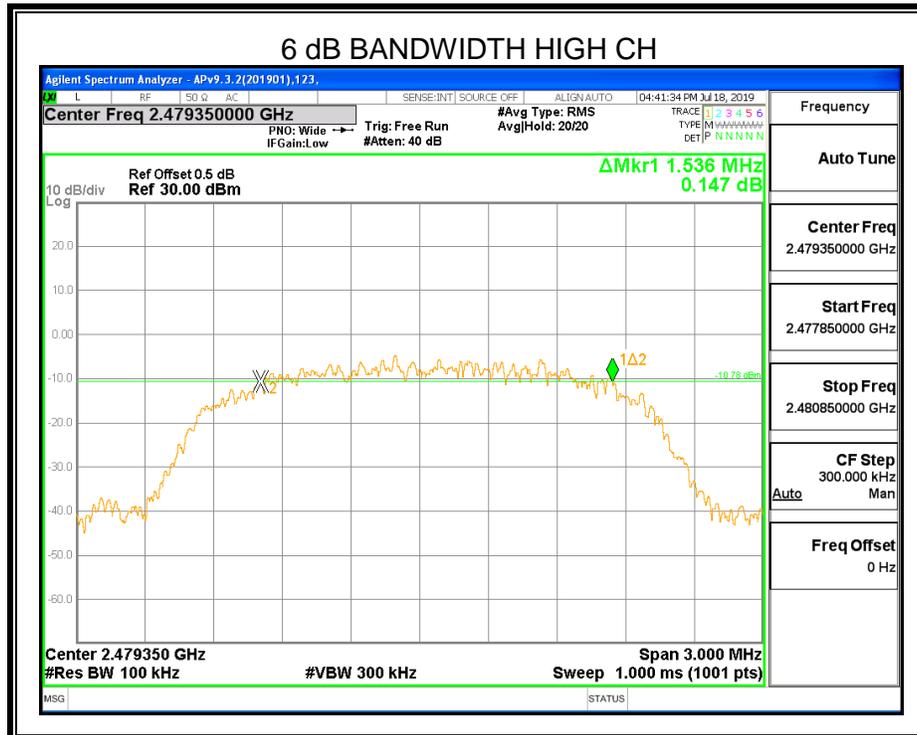
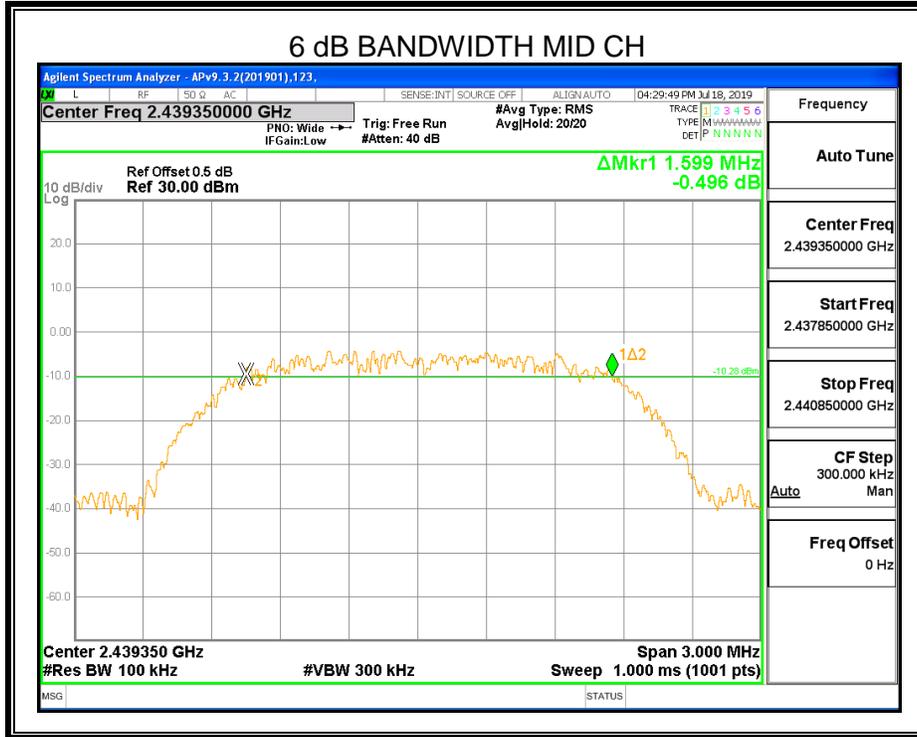
Temperature	24.6°C	Relative Humidity	60%
Atmosphere Pressure	101kPa	Test Voltage	DC 5.0V

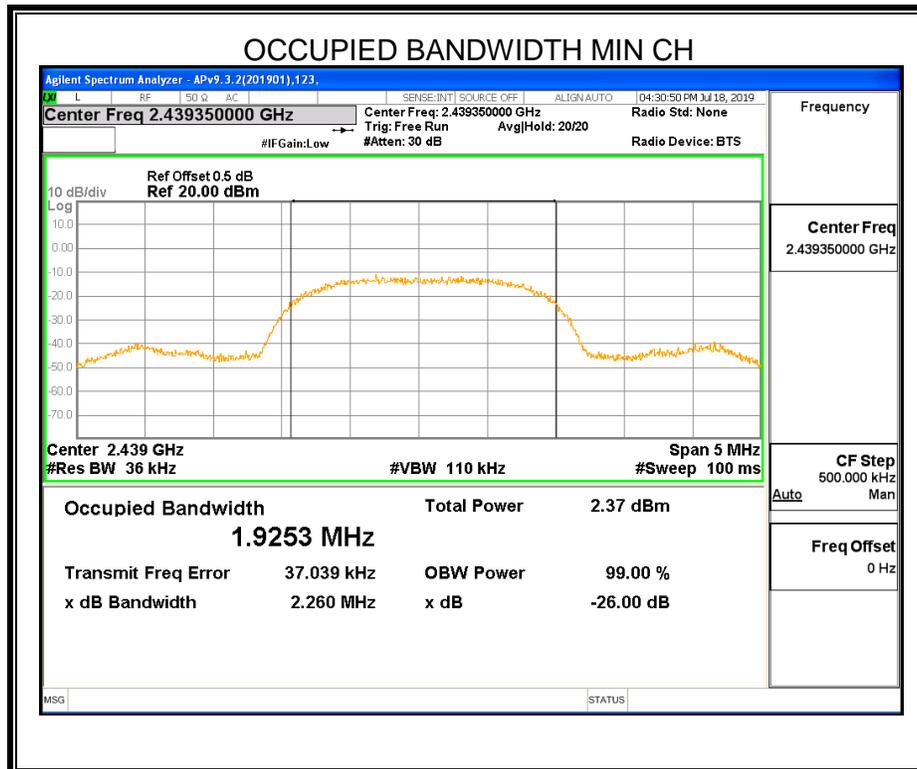
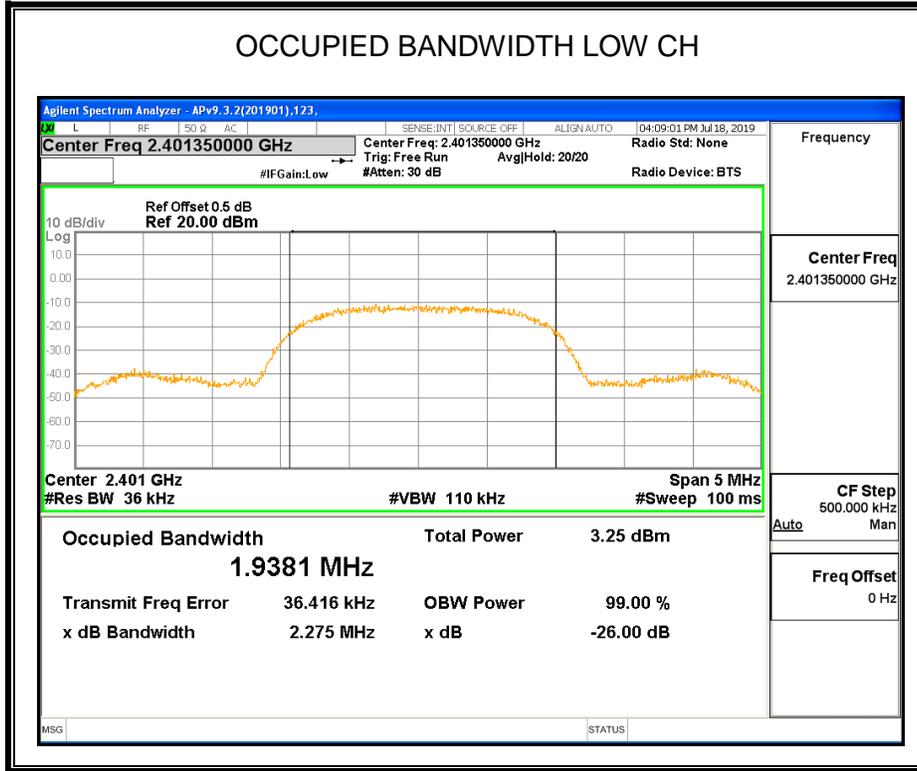
RESULTS

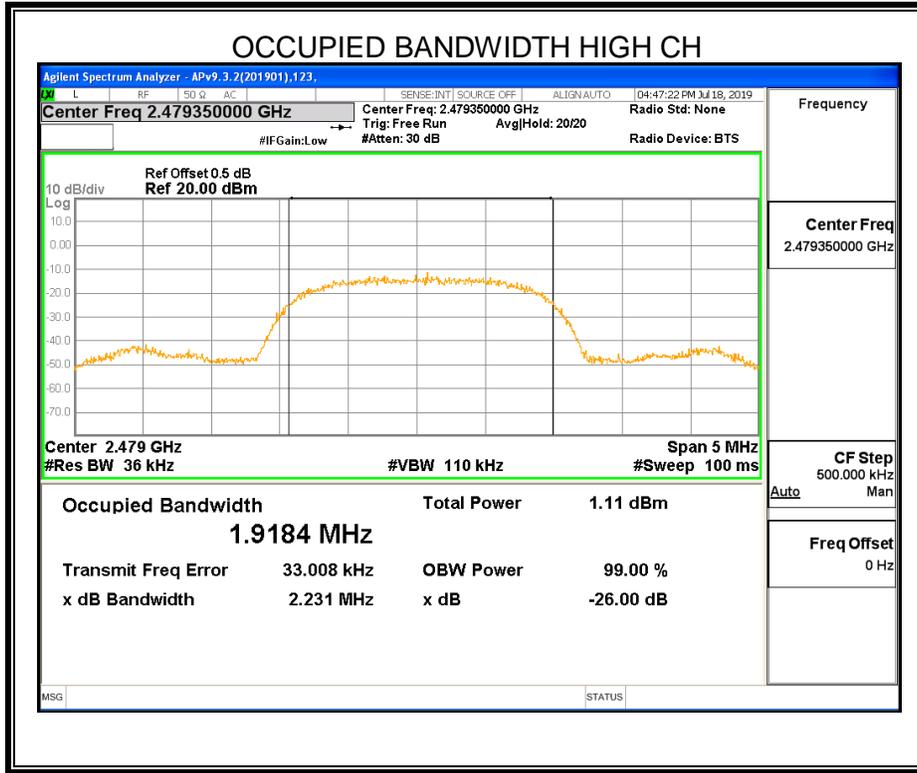
7.2.1. pi/4-DQPSK MODE ANTENNA 1

Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	6dB BW Limit (kHz)	Result
Low	1.515	1.9381	500	Pass
Middle	1.599	1.9253	500	Pass
High	1.536	1.9184	500	Pass









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



7.3. PEAK CONDUCTED OUTPUT POWER

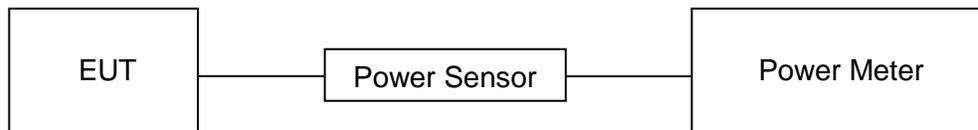
LIMITS

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3) ISED RSS-247 5.4 (d)	Peak 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



TEST ENVIRONMENT

Temperature	24.6°C	Relative Humidity	60%
Atmosphere Pressure	101kPa	Test Voltage	DC 5.0V



7.3.1. pi/4-DQPSK MODE ANTENNA 0

Test Channel	Maximum Conducted Output Power (PK)	EIRP	LIMIT
	(dBm)	(dBm)	dBm
Low	1.418	4.078	30
Middle	0.378	3.038	30
High	-1.229	1.431	30

7.3.2. pi/4-DQPSK MODE ANTENNA 1

Test Channel	Maximum Conducted Output Power (PK)	EIRP	LIMIT
	(dBm)	(dBm)	dBm
Low	1.790	4.450	30
Middle	0.661	3.321	30
High	-0.697	1.963	30

Note: EIRP=Maximum Conducted Output Power (PK) + Antenna Gain

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



7.4. POWER SPECTRAL DENSITY

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.247 (e) ISED RSS-247 5.2 (b)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5

TEST PROCEDURE

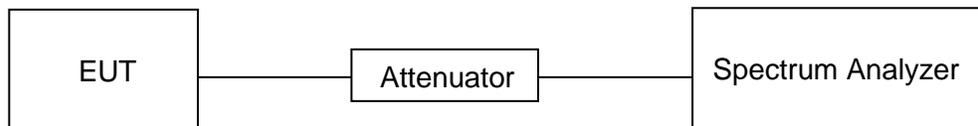
Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP





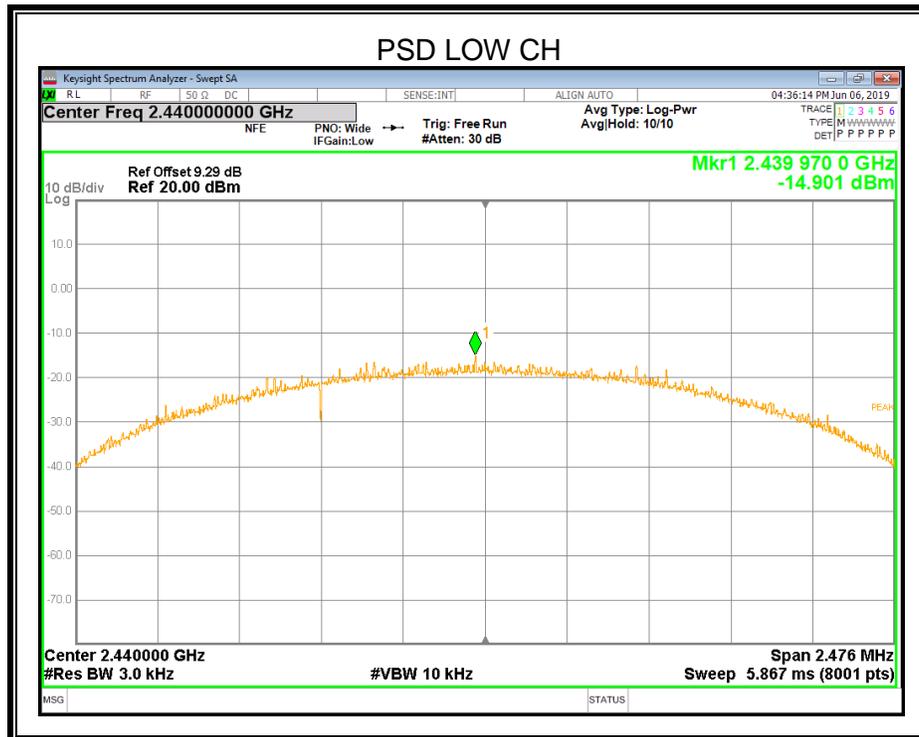
TEST ENVIRONMENT

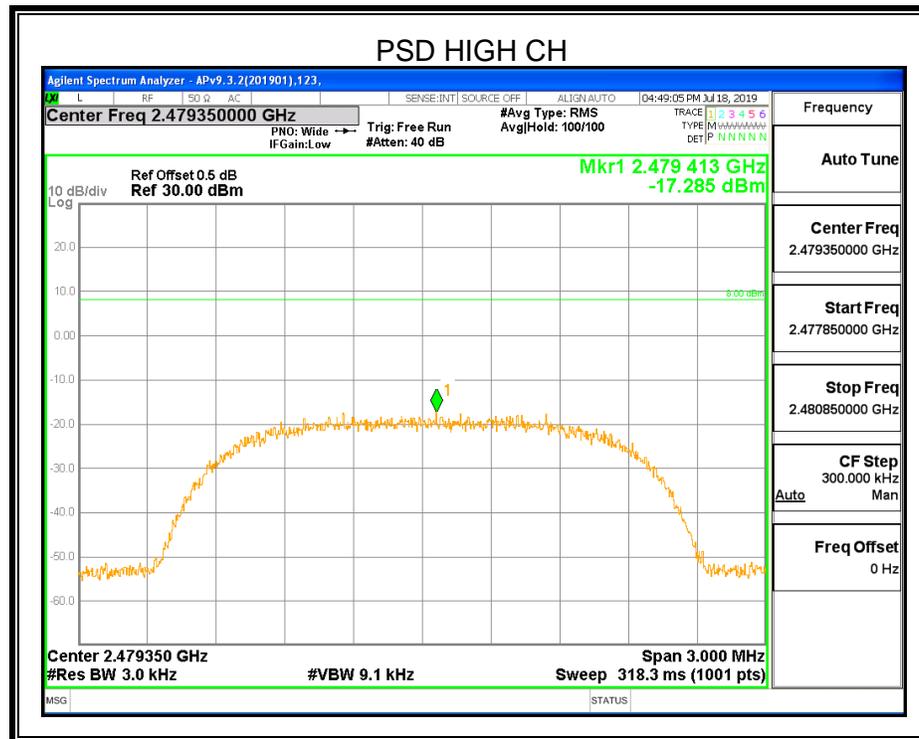
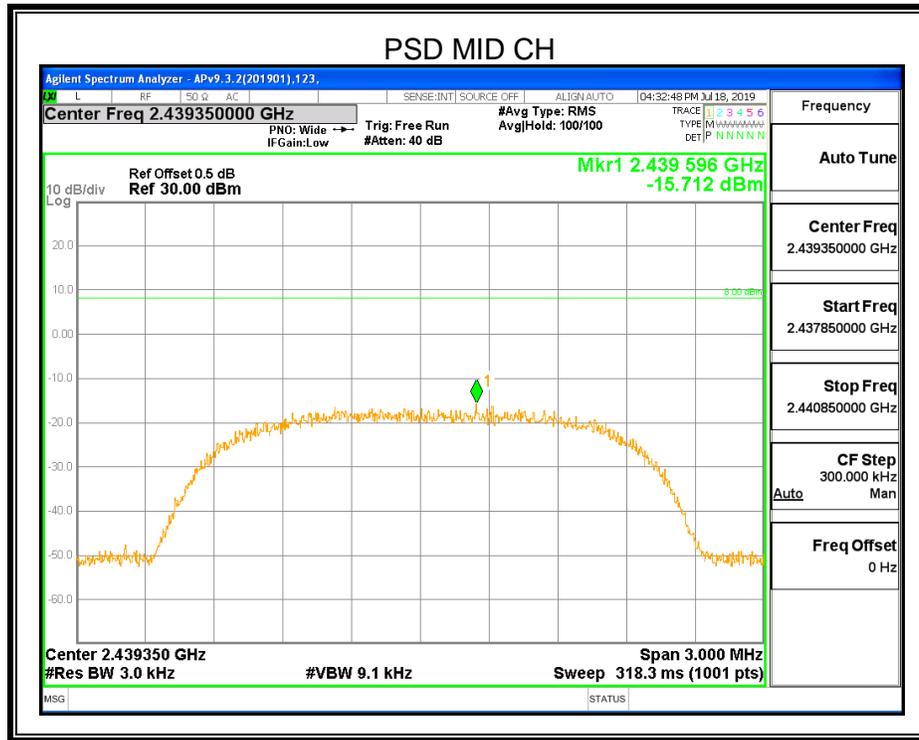
Temperature	24.6°C	Relative Humidity	60%
Atmosphere Pressure	101kPa	Test Voltage	DC 5.0V

RESULTS

7.4.1. pi/4-DQPSK MODE ANTENNA 1

Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low	-14.901	8	PASS
Middle	-15.712	8	PASS
High	-17.285	8	PASS





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



7.5. CONDUCTED BANDEGE AND SPURIOUS EMISSIONS

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2		
Section	Test Item	Limit
CFR 47 FCC §15.247 (d) ISED RSS-247 5.5	Conducted Bandedge and Spurious Emissions	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

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

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100kHz
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

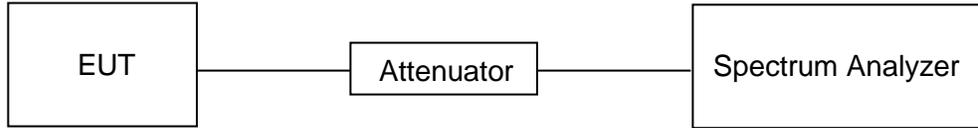
Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100kHz
VBW	$\geq 3 \times \text{RBW}$
measurement points	$\geq \text{span}/\text{RBW}$
Trace	Max hold
Sweep time	Auto couple.

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



TEST SETUP



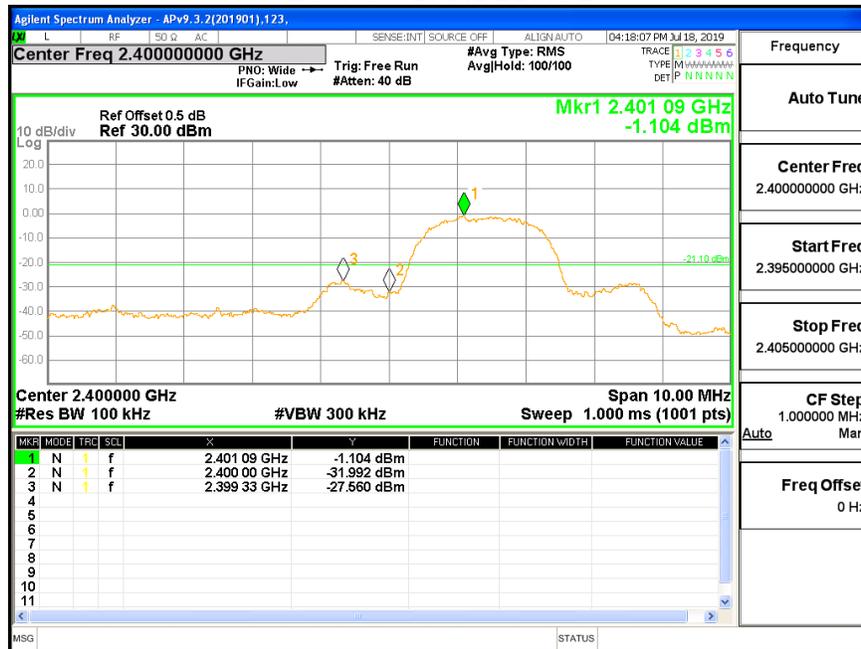
TEST ENVIRONMENT

Temperature	24.6°C	Relative Humidity	60%
Atmosphere Pressure	101kPa	Test Voltage	DC 5.0V

RESULTS

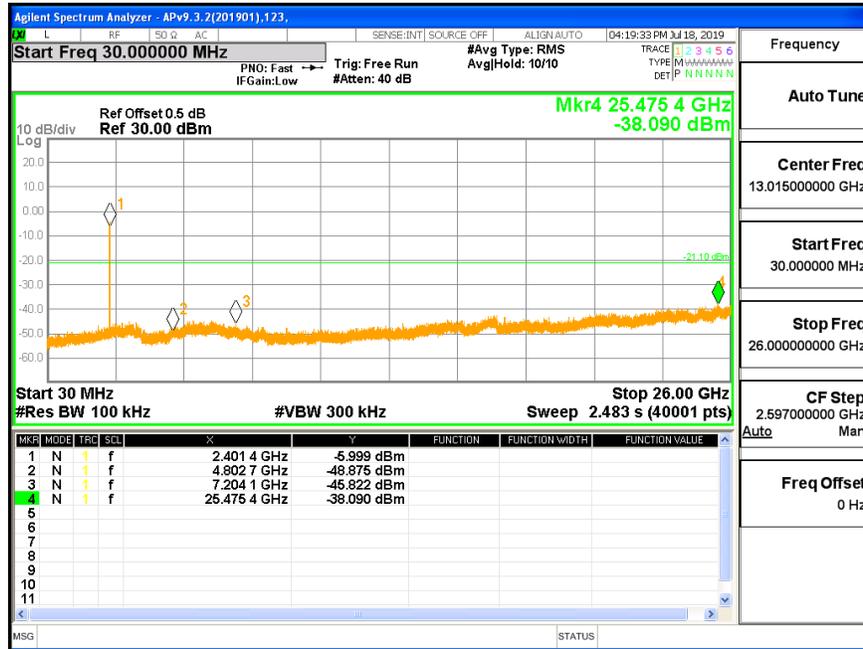
7.5.1. pi/4-DQPSK MODE ANTENNA 1

LOW CH BANDEDGE

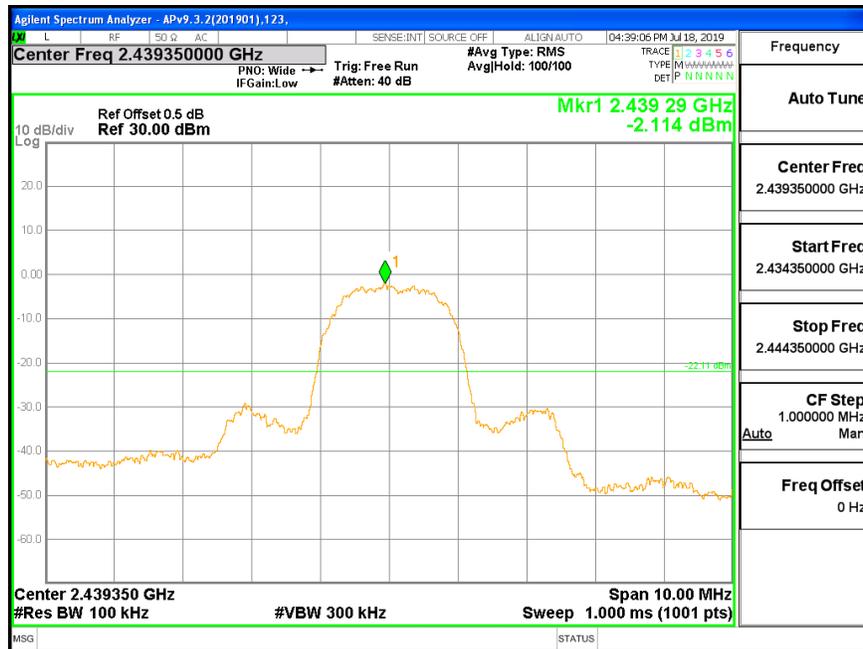




LOW CH SPURIOUS EMISSIONS 30M-26G

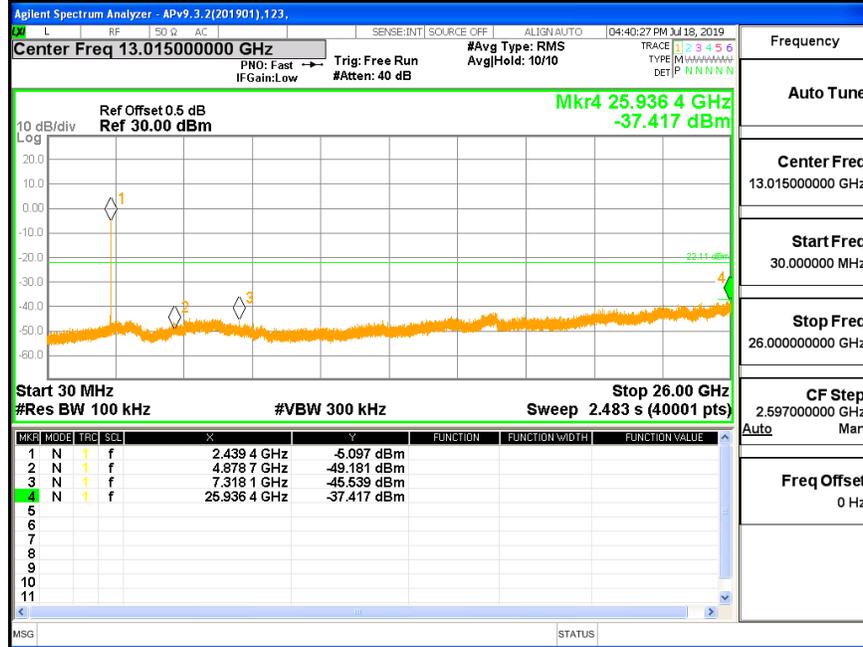


MID CH SPURIOUS EMISSIONS REFERENCE

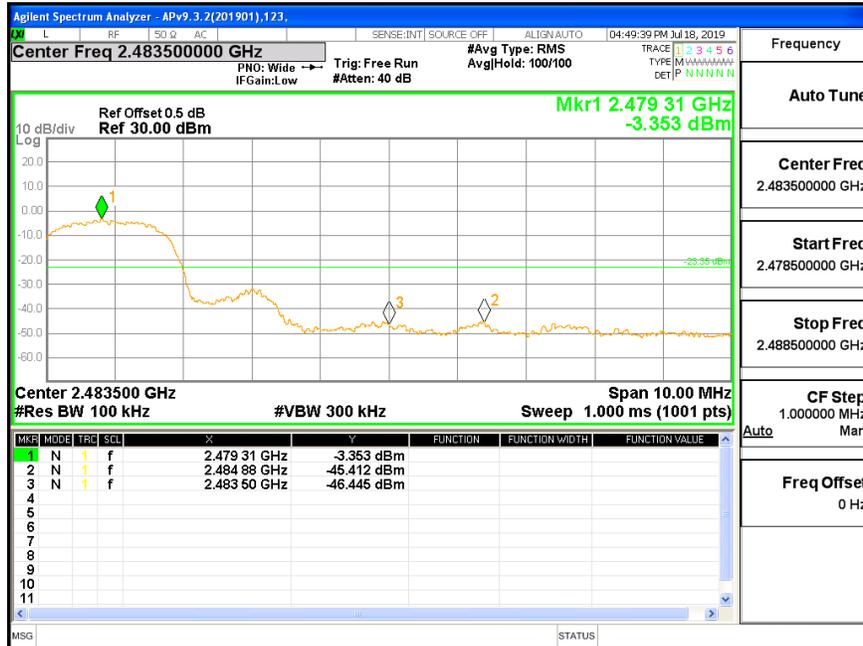




MID CH SPURIOUS EMISSIONS 30M-26G

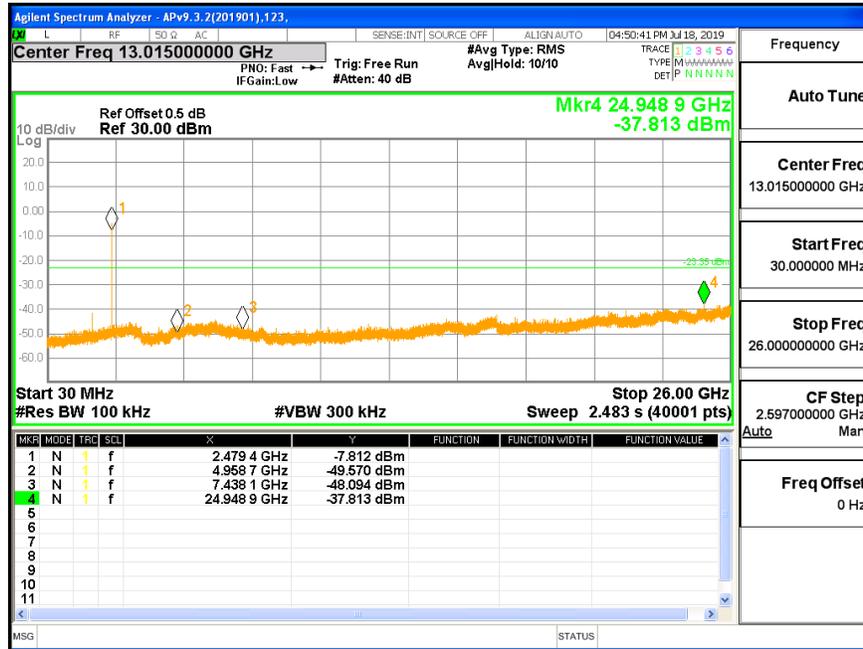


HIGH CH BANDEDAGE





HIGH CH SPURIOUS EMISSIONS 30M-26G



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



8. RADIATED TEST RESULTS

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209

Please refer to ISED RSS-GEN Clause 8.9 and 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.

Radiation Disturbance Test Limit for FCC (Above 1G)

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



FCC Restricted bands of operation refer to and FCC §15.205 (a)

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



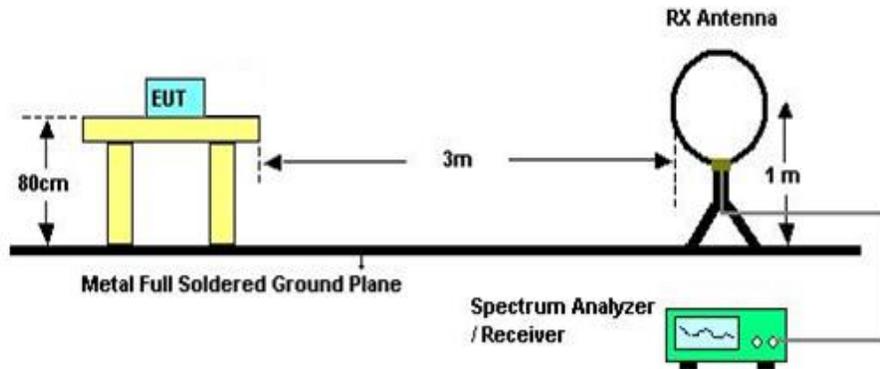
IC Restricted bands please refer to ISED RSS-GEN Clause 8.10

Table 7 – Restricted frequency bands ^{M200-1}		
MHz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 - 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138		

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

TEST SETUP AND PROCEDURE

Below 30MHz

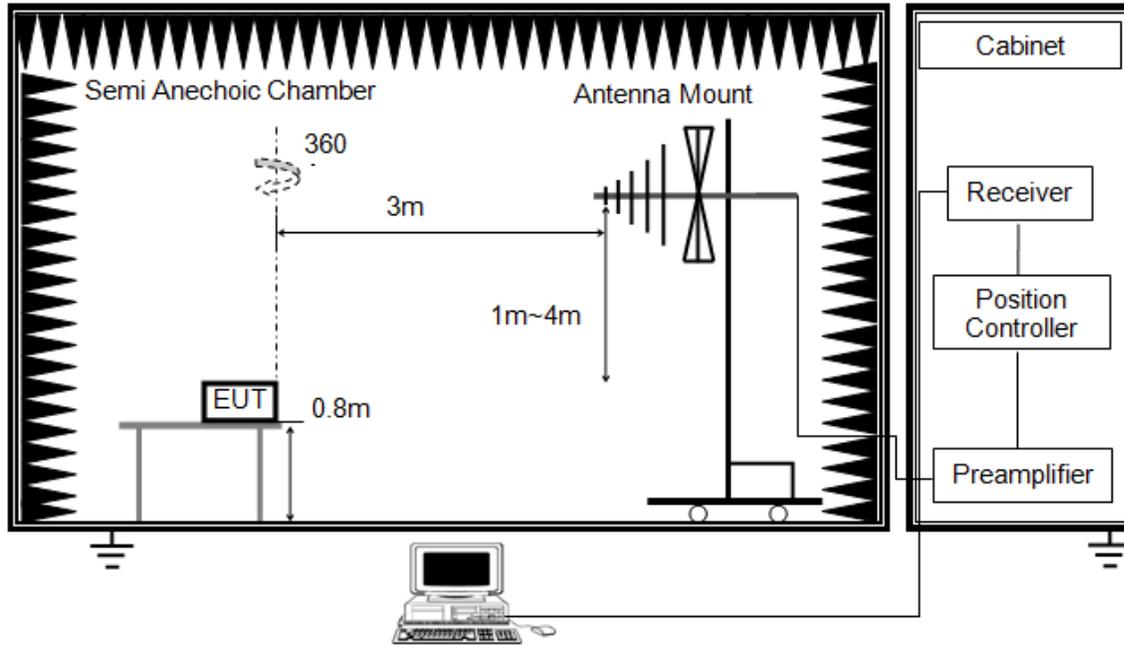


The setting of the spectrum analyser

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
Detector	Peak/QP/ Average
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 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, Face-on and Face-off 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 1m 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 and average 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 and average detector and reported.
7. Although these tests were performed other than open field 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.

Below 1G and above 30MHz

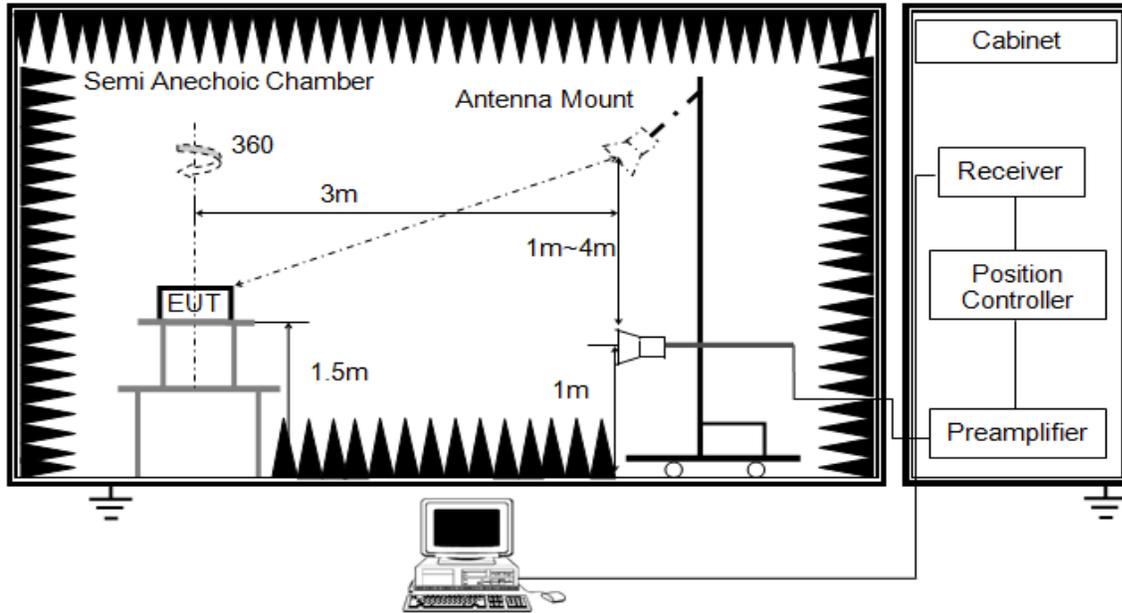


The setting of the spectrum analyser

RBW	120K
VBW	300K
Sweep	Auto
Detector	Peak/QP
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.

Above 1G

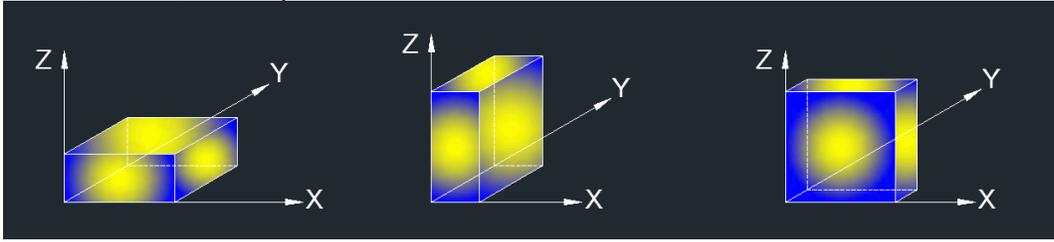


The setting of the spectrum analyser

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 (1.5 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 1.5m 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 average measurements. For the Duty Cycle and Correction Factor please refer to clause 7.1.ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions:



Note: For radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

TEST ENVIRONMENT

Temperature	24.2°C	Relative Humidity	61%
Atmosphere Pressure	101kPa	Test Voltage	DC 5.0V

RESULTS

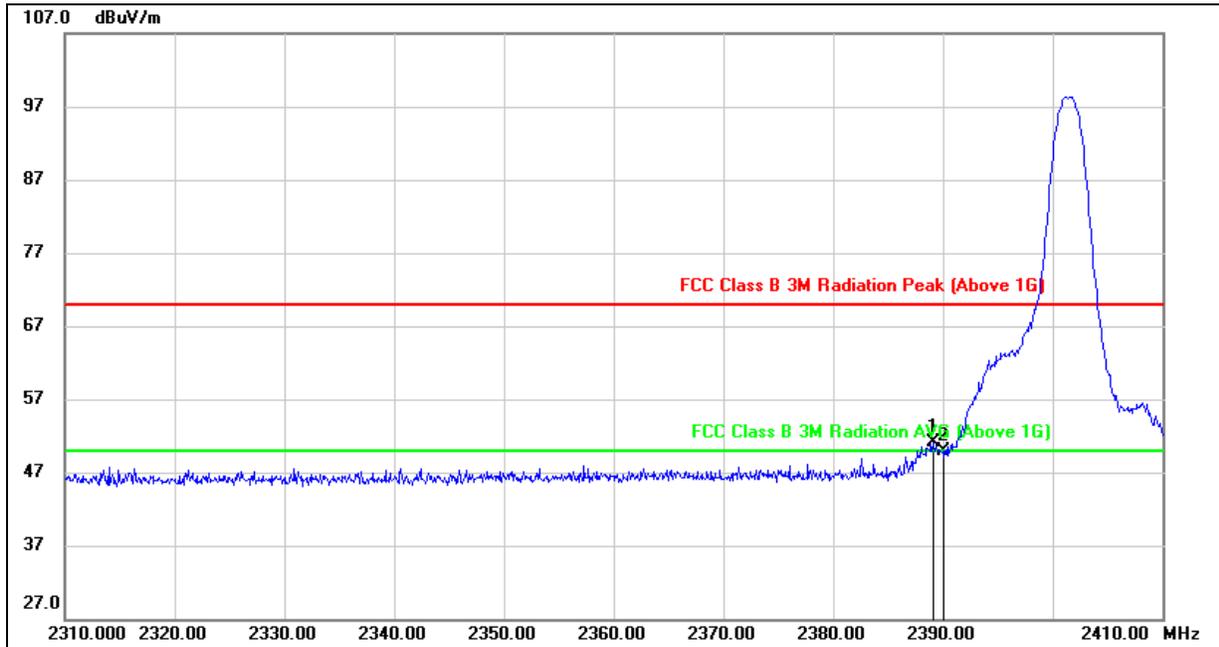


8.1. RESTRICTED BANDEDGE

8.1.1. pi/4-DQPSK MODE ANTENNA 1

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK

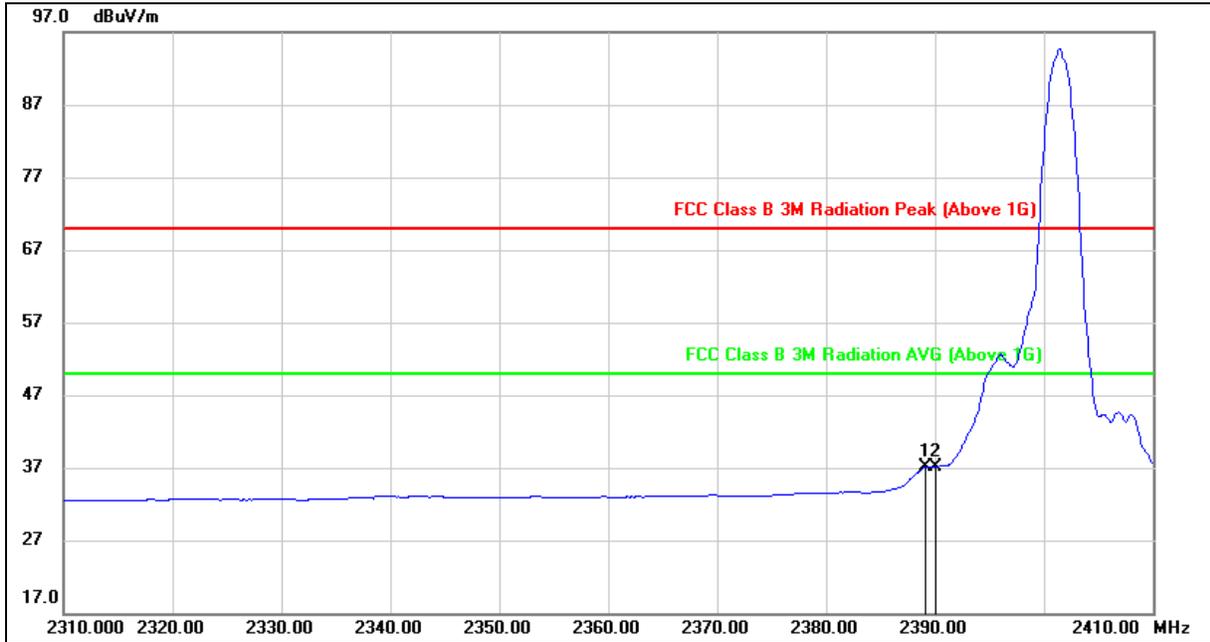


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2389.100	18.09	32.94	51.03	70.00	-18.97	peak
2	2390.000	16.87	32.94	49.81	70.00	-20.19	peak

- 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. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



AVG



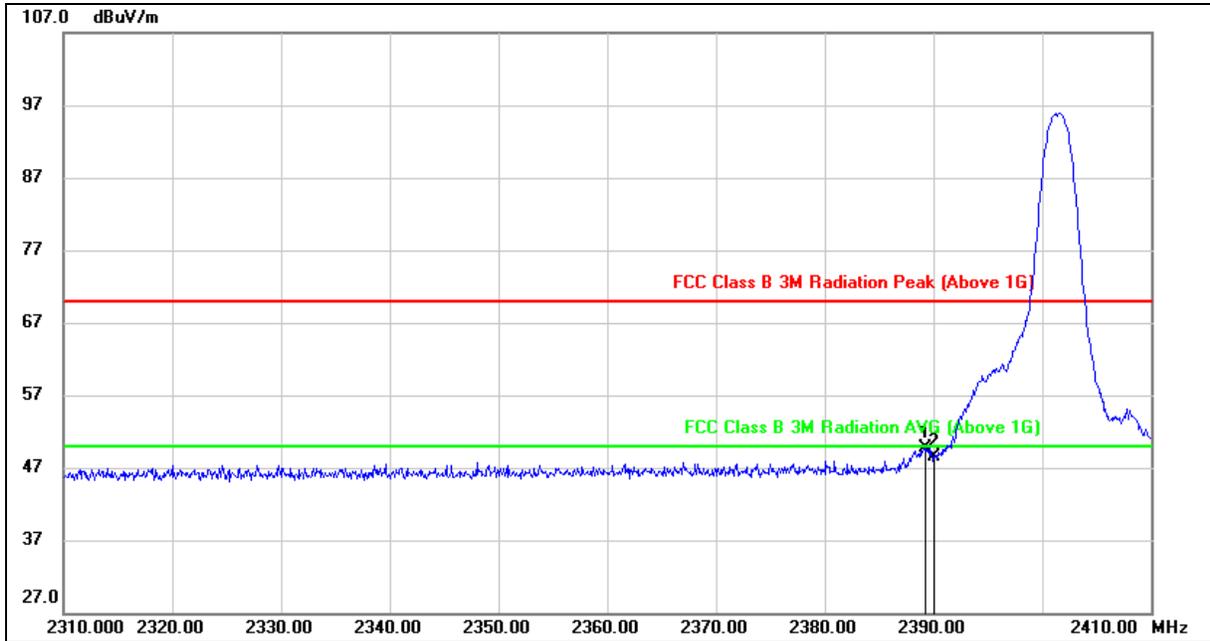
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2389.100	4.17	32.94	37.11	50.00	-12.89	AVG
2	2390.000	4.16	32.94	37.10	50.00	-12.90	AVG

- 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. AVG: $VBW=1/Ton$ where: ton is transmit duration.
 4. For transmit duration, please refer to clause 7.1.
 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

PEAK

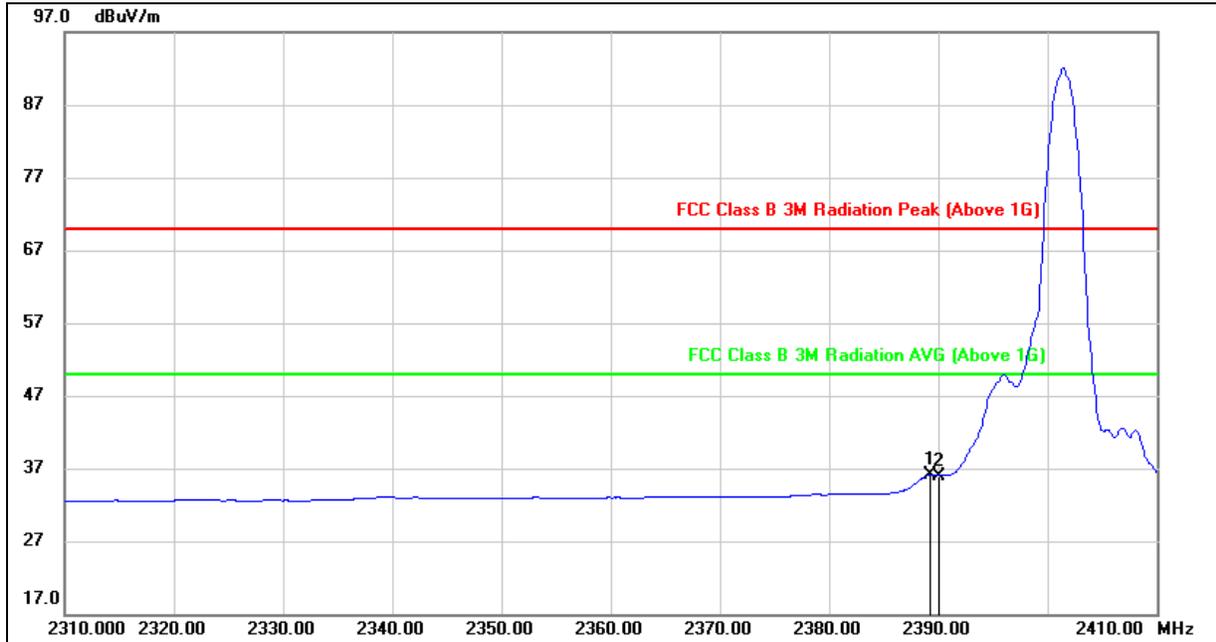


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2389.300	16.75	32.94	49.69	70.00	-20.31	peak
2	2390.000	15.50	32.94	48.44	70.00	-21.56	peak

- 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. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



AVG



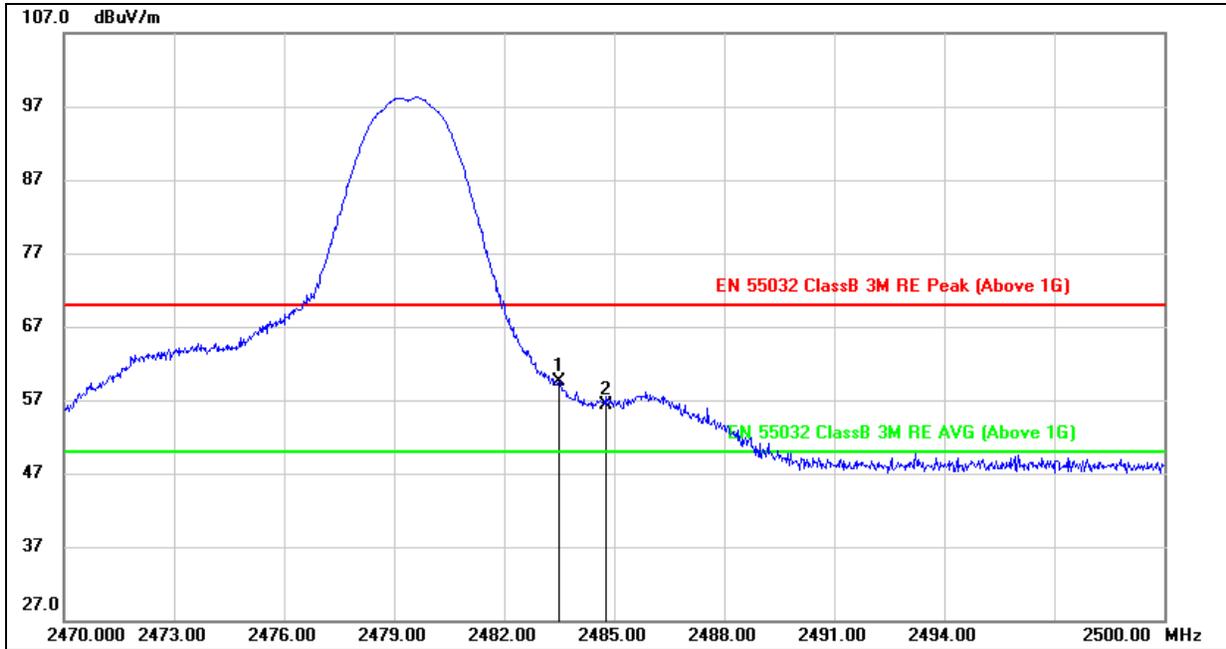
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2389.300	3.22	32.94	36.16	50.00	-13.84	AVG
2	2390.000	3.06	32.94	36.00	50.00	-14.00	AVG

- 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. AVG: $VBW=1/Ton$ where: ton is transmit duration.
 4. For transmit duration, please refer to clause 7.1.
 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

PEAK

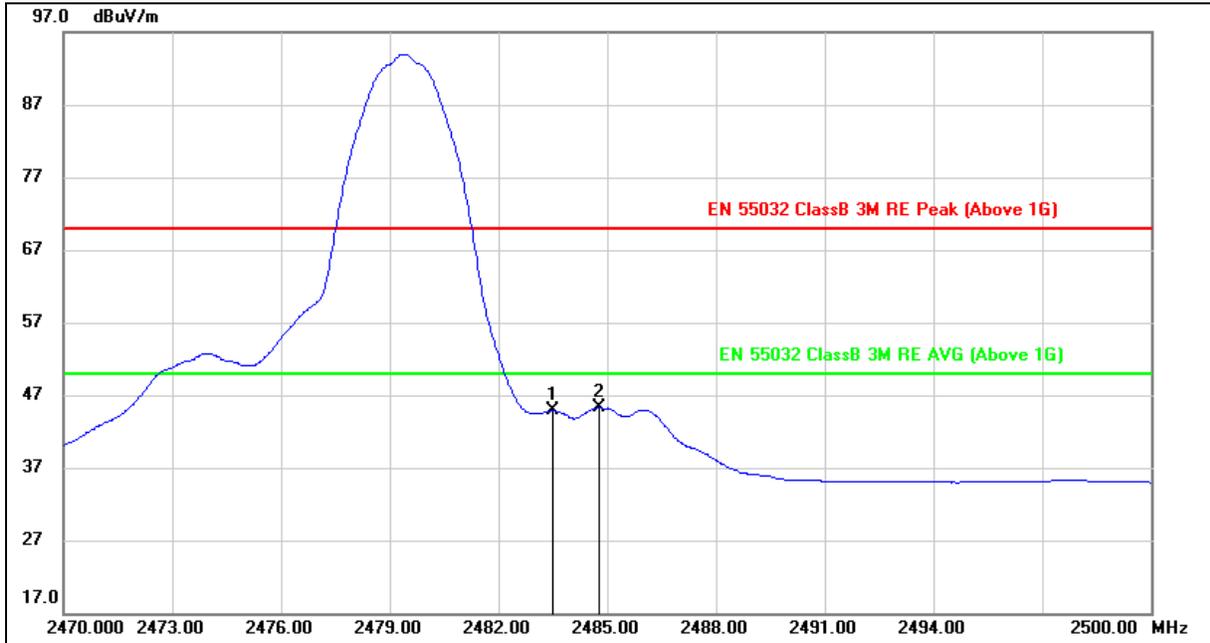


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2483.500	25.89	33.58	59.47	70.00	-10.53	peak
2	2484.790	22.67	33.59	56.26	70.00	-13.74	peak

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. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



AVG



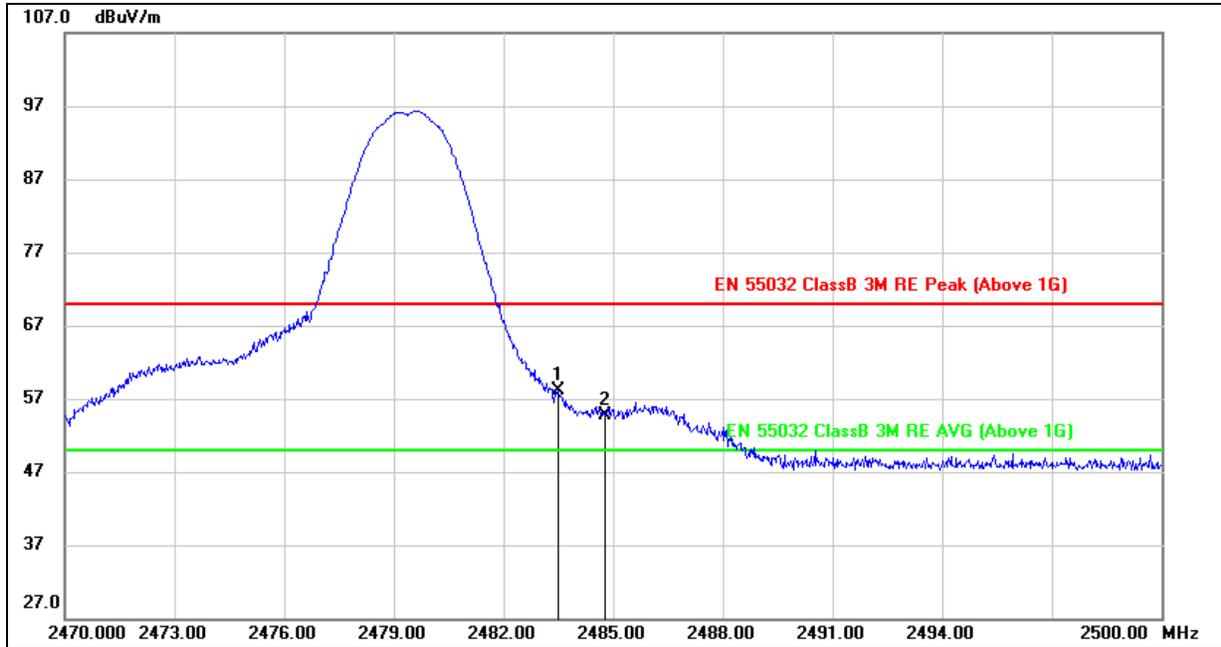
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2483.500	11.29	33.58	44.87	50.00	-5.13	AVG
2	2484.790	11.65	33.59	45.24	50.00	-4.76	AVG

- 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. AVG: $VBW=1/Ton$ where: ton is transmit duration.
 4. For transmit duration, please refer to clause 7.1.
 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

PEAK

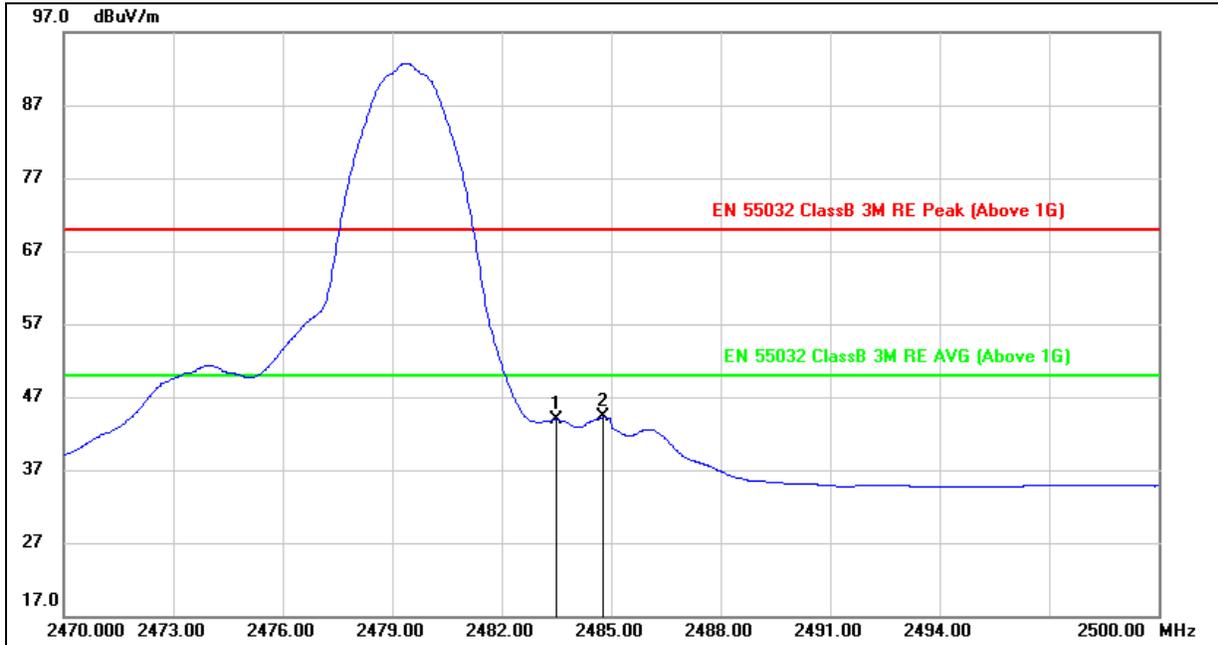


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2483.500	24.62	33.58	58.20	70.00	-11.80	peak
2	2484.790	21.13	33.59	54.72	70.00	-15.28	peak

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. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



AVG



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2483.500	10.37	33.58	43.95	50.00	-6.05	AVG
2	2484.790	10.64	33.59	44.23	50.00	-5.77	AVG

- 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. AVG: $VBW=1/Ton$ where: ton is transmit duration.
 4. For transmit duration, please refer to clause 7.1.
 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

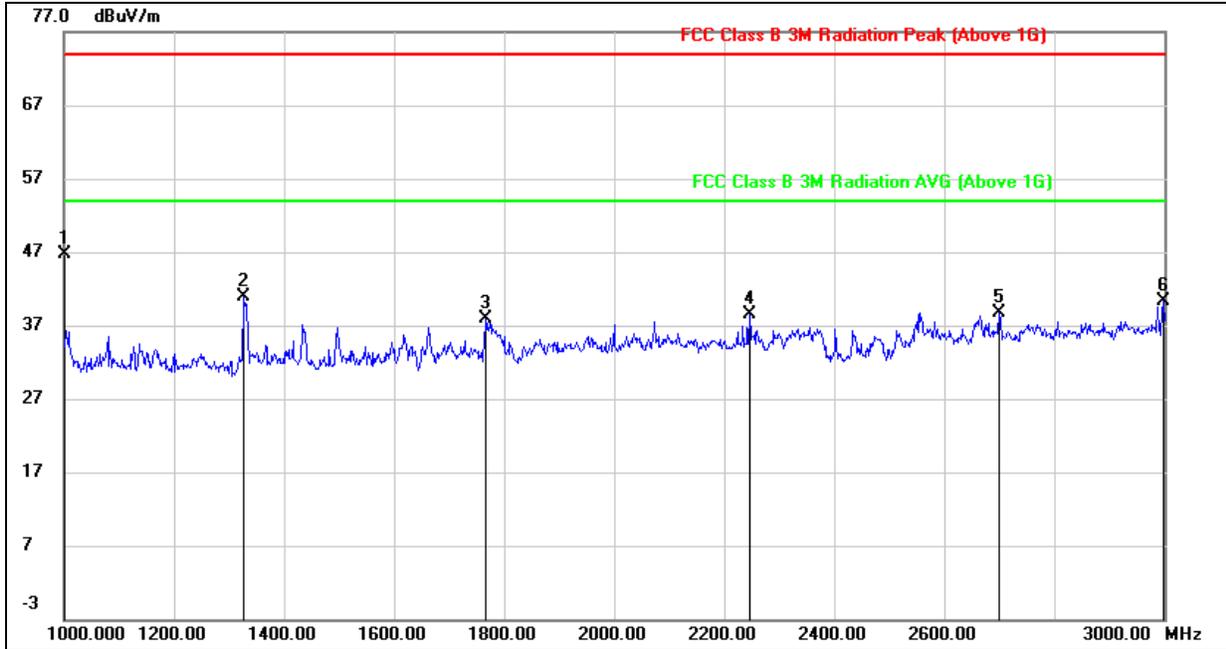
Note: All the antennas and modes had been tested, but only the worst data recorded in the report.



8.2. SPURIOUS EMISSIONS (1~3GHz)

8.2.1. pi/4-DQPSK MODE ANTENNA 1

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

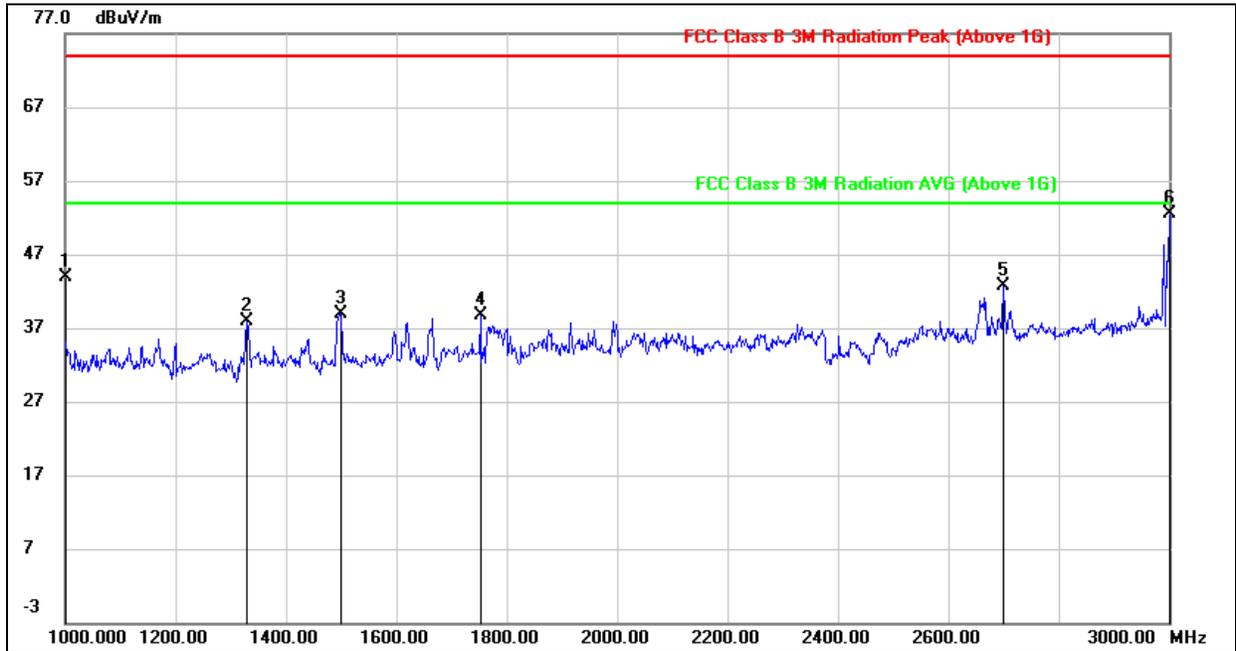


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	1000.0000	60.61	-13.87	46.74	74.00	-27.26	peak
2	1326.000	53.85	-13.00	40.85	74.00	-33.15	peak
3	1766.000	48.63	-10.81	37.82	74.00	-36.18	peak
4	2246.000	47.06	-8.58	38.48	74.00	-35.52	peak
5	2700.000	45.30	-6.58	38.72	74.00	-35.28	peak
6	2998.000	45.28	-5.04	40.24	74.00	-33.76	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. The Band Reject filter loss factor already add into the correct factor.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

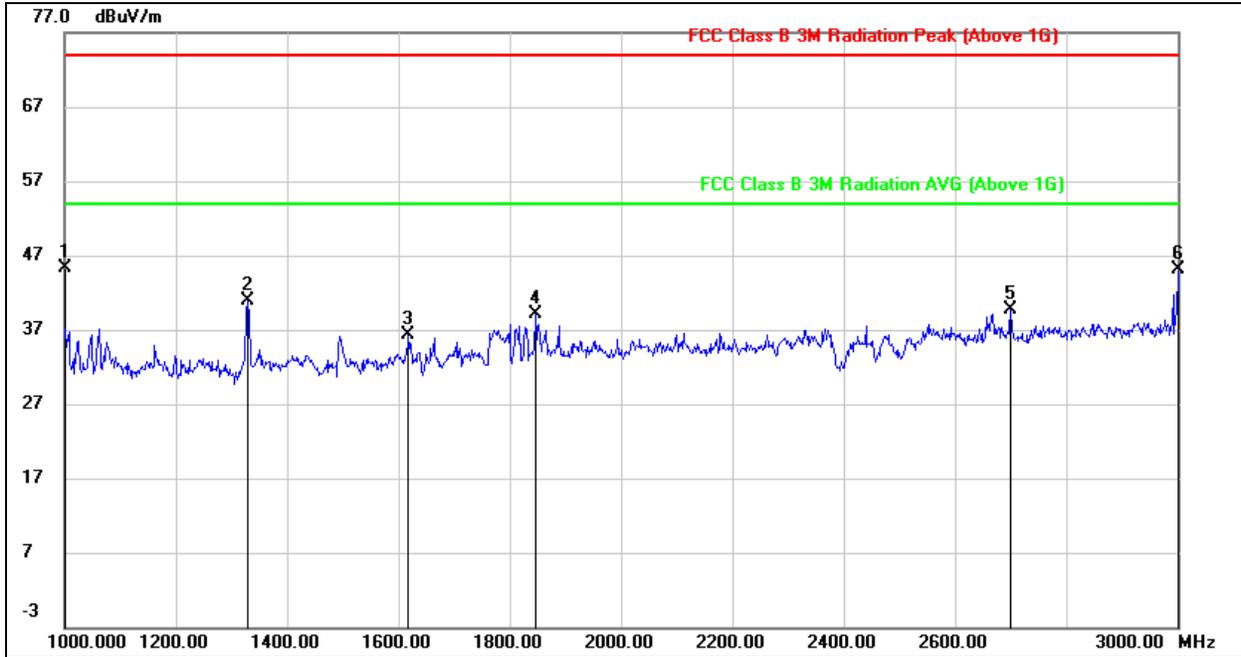


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	1000.0000	57.82	-13.87	43.95	74.00	-30.05	peak
2	1328.000	50.90	-12.99	37.91	74.00	-36.09	peak
3	1500.000	51.23	-12.34	38.89	74.00	-35.11	peak
4	1752.000	49.60	-10.88	38.72	74.00	-35.28	peak
5	2700.000	49.19	-6.58	42.61	74.00	-31.39	peak
6	3000.000	57.44	-5.03	52.41	74.00	-21.59	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. The Band Reject filter loss factor already add into the correct factor.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

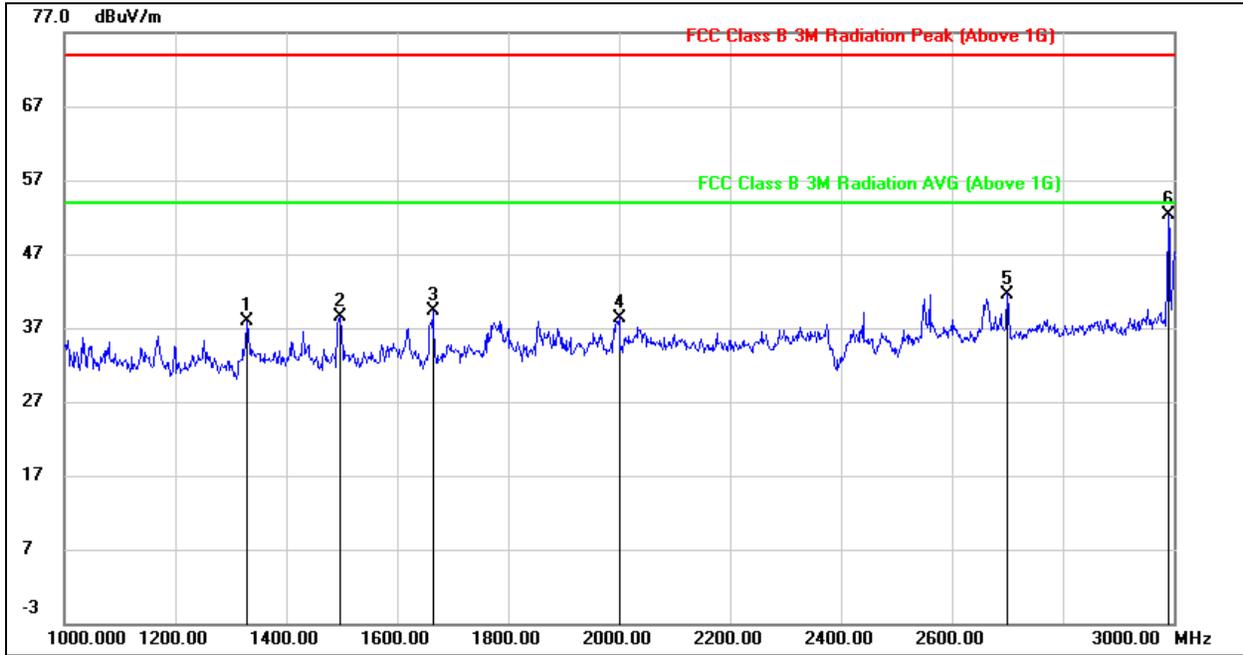


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	1000.0000	59.20	-13.87	45.33	74.00	-28.67	peak
2	1328.000	53.85	-12.99	40.86	74.00	-33.14	peak
3	1618.000	47.87	-11.62	36.25	74.00	-37.75	peak
4	1846.000	49.40	-10.34	39.06	74.00	-34.94	peak
5	2700.000	46.33	-6.58	39.75	74.00	-34.25	peak
6	3000.000	50.15	-5.03	45.12	74.00	-28.88	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. The Band Reject filter loss factor already add into the correct factor.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

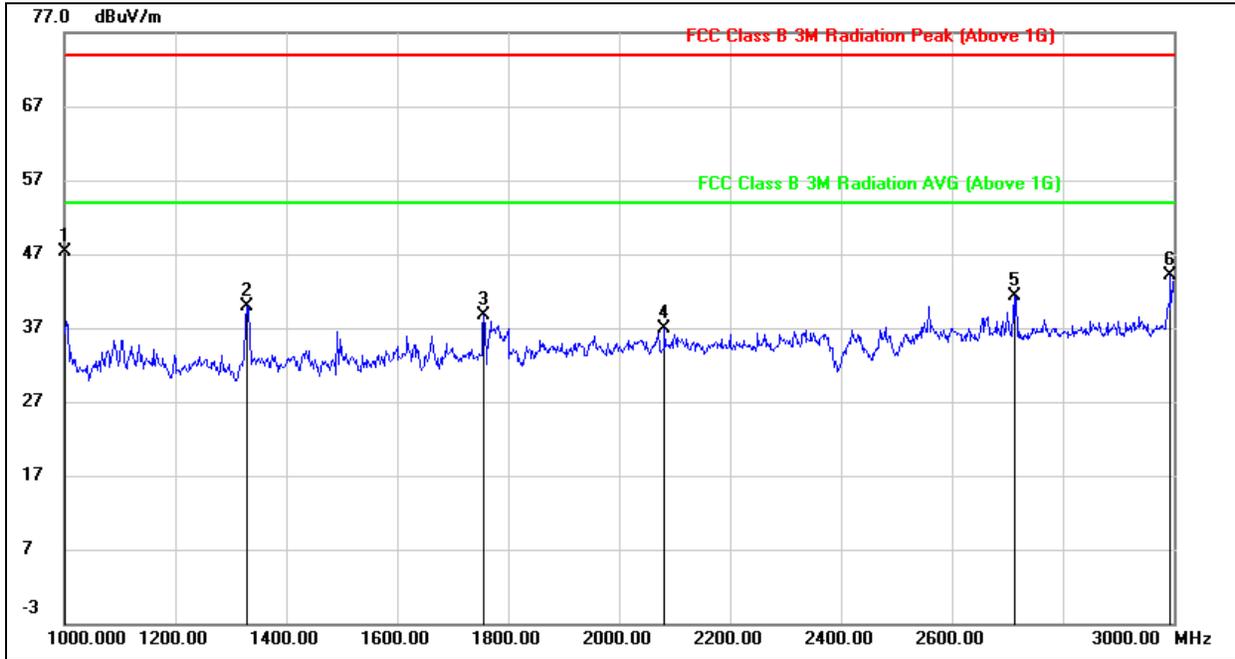


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	1328.000	50.96	-12.99	37.97	74.00	-36.03	peak
2	1496.000	50.83	-12.36	38.47	74.00	-35.53	peak
3	1664.000	50.68	-11.35	39.33	74.00	-34.67	peak
4	2000.000	48.09	-9.69	38.40	74.00	-35.60	peak
5	2700.000	48.18	-6.58	41.60	74.00	-32.40	peak
6	2990.000	57.45	-5.07	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. The Band Reject filter loss factor already add into the correct factor.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

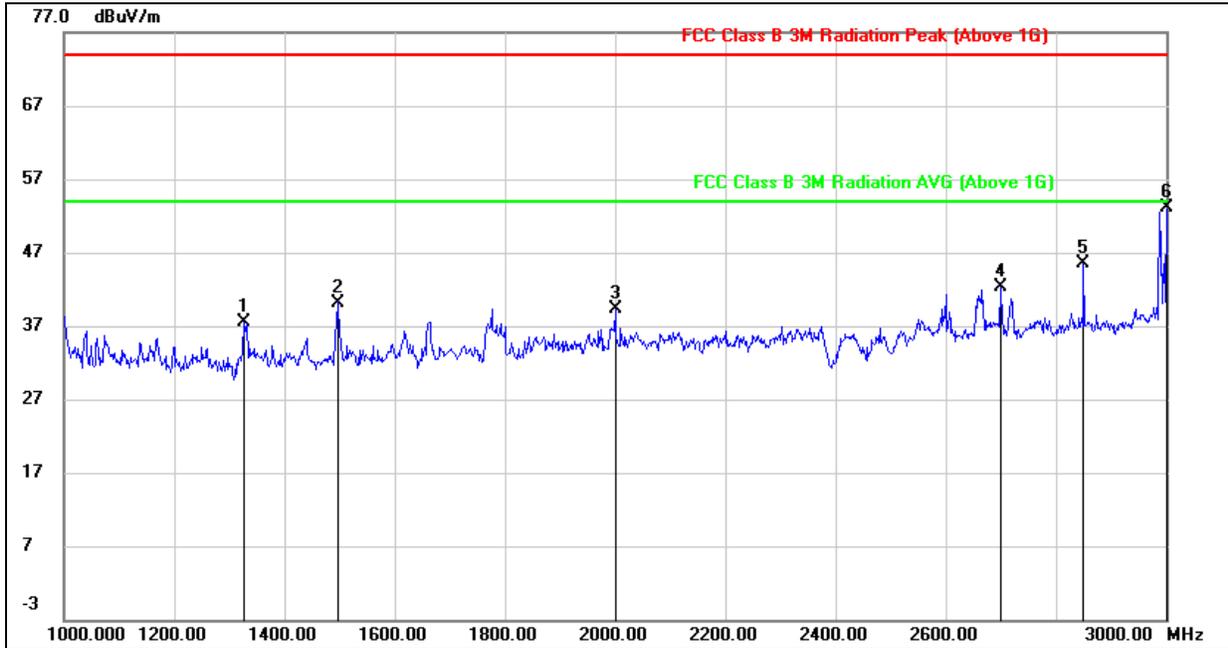


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	1000.0000	61.27	-13.87	47.40	74.00	-26.60	peak
2	1328.000	52.97	-12.99	39.98	74.00	-34.02	peak
3	1756.000	49.57	-10.86	38.71	74.00	-35.29	peak
4	2082.000	46.19	-9.31	36.88	74.00	-37.12	peak
5	2712.000	47.82	-6.52	41.30	74.00	-32.70	peak
6	2994.000	49.13	-5.04	44.09	74.00	-29.91	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. The Band Reject filter loss factor already add into the correct factor.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	1326.000	50.50	-13.00	37.50	74.00	-36.50	peak
2	1496.000	52.56	-12.36	40.20	74.00	-33.80	peak
3	2000.000	49.03	-9.69	39.34	74.00	-34.66	peak
4	2700.000	48.80	-6.58	42.22	74.00	-31.78	peak
5	2850.000	51.18	-5.70	45.48	74.00	-28.52	peak
6	3000.000	58.06	-5.03	53.03	74.00	-20.97	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. The Band Reject filter loss factor already add into the correct factor.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

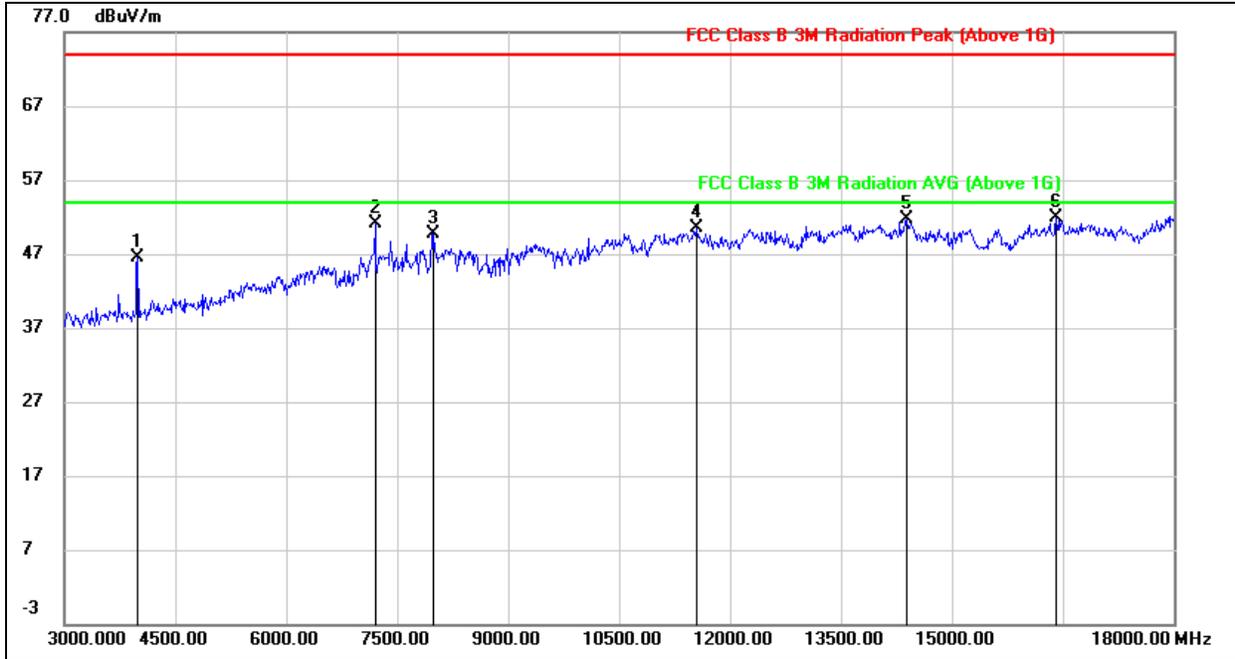
Note: All the antennas and modes had been tested, but only the worst data recorded in the report.



8.3. SPURIOUS EMISSIONS (3~18GHz)

8.3.1. pi/4-DQPSK MODE ANTENNA 1

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

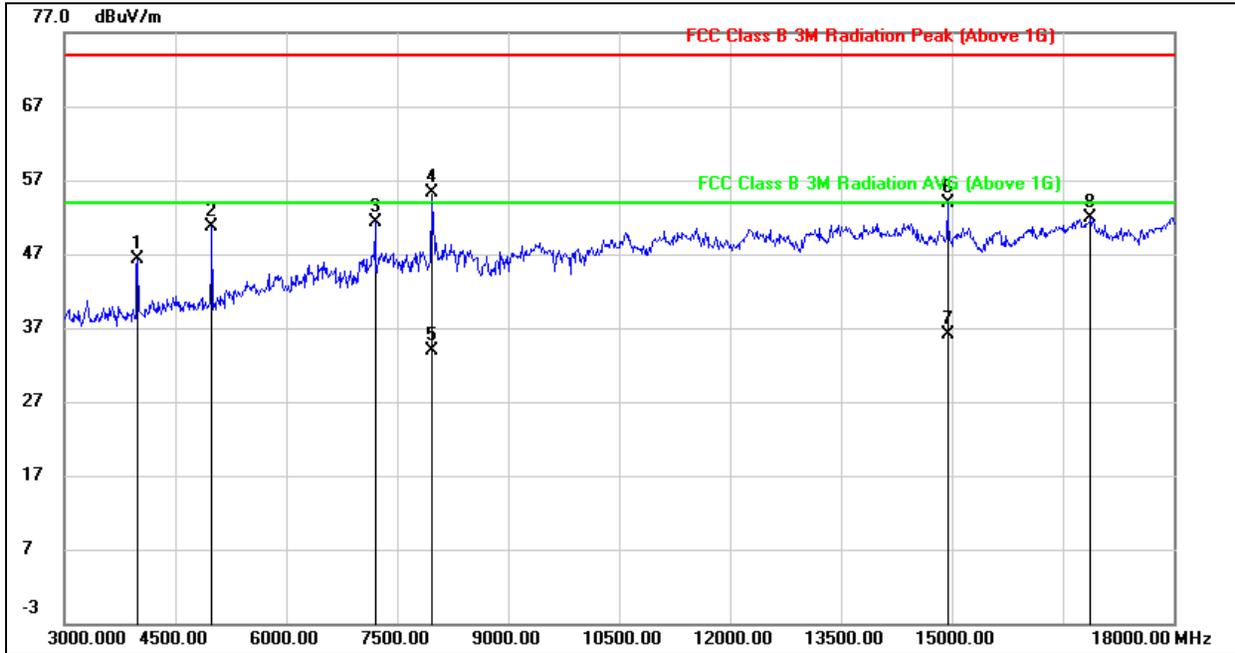


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	3990.000	49.40	-2.95	46.45	74.00	-27.55	peak
2	7200.000	44.28	6.88	51.16	74.00	-22.84	peak
3	7995.000	41.59	8.16	49.75	74.00	-24.25	peak
4	11550.000	36.40	14.13	50.53	74.00	-23.47	peak
5	14385.000	35.35	16.41	51.76	74.00	-22.24	peak
6	16410.000	33.21	18.61	51.82	74.00	-22.18	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. The High Pass filter loss factor already add into the correct factor.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

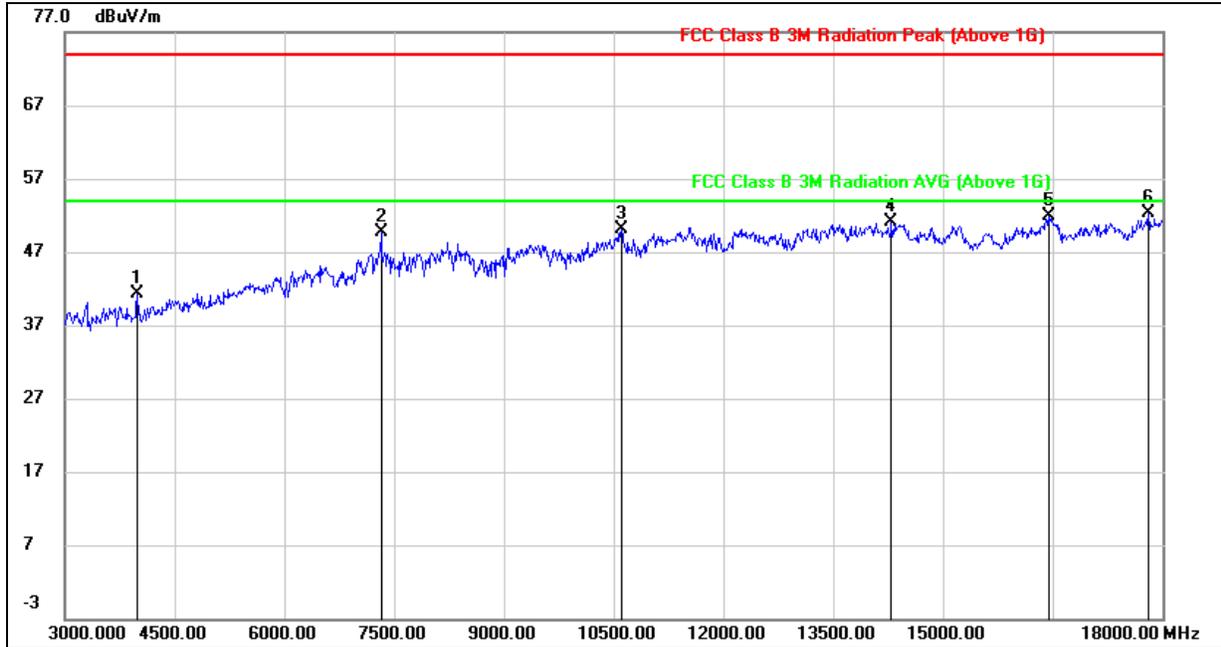


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	3990.000	49.27	-2.95	46.32	74.00	-27.68	peak
2	4995.000	50.28	0.46	50.74	74.00	-23.26	peak
3	7200.000	44.49	6.88	51.37	74.00	-22.63	peak
4	7966.900	47.06	8.25	55.31	74.00	-18.69	peak
5	7966.900	25.61	8.25	33.86	54.00	-20.14	AVG
6	14940.000	38.50	15.50	54.00	74.00	-20.00	peak
7	14940.000	20.70	15.50	36.20	54.00	-17.80	AVG
8	16875.000	31.99	19.93	51.92	74.00	-22.08	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 7.1.
 6. The High Pass filter loss factor already add into the correct factor.
 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

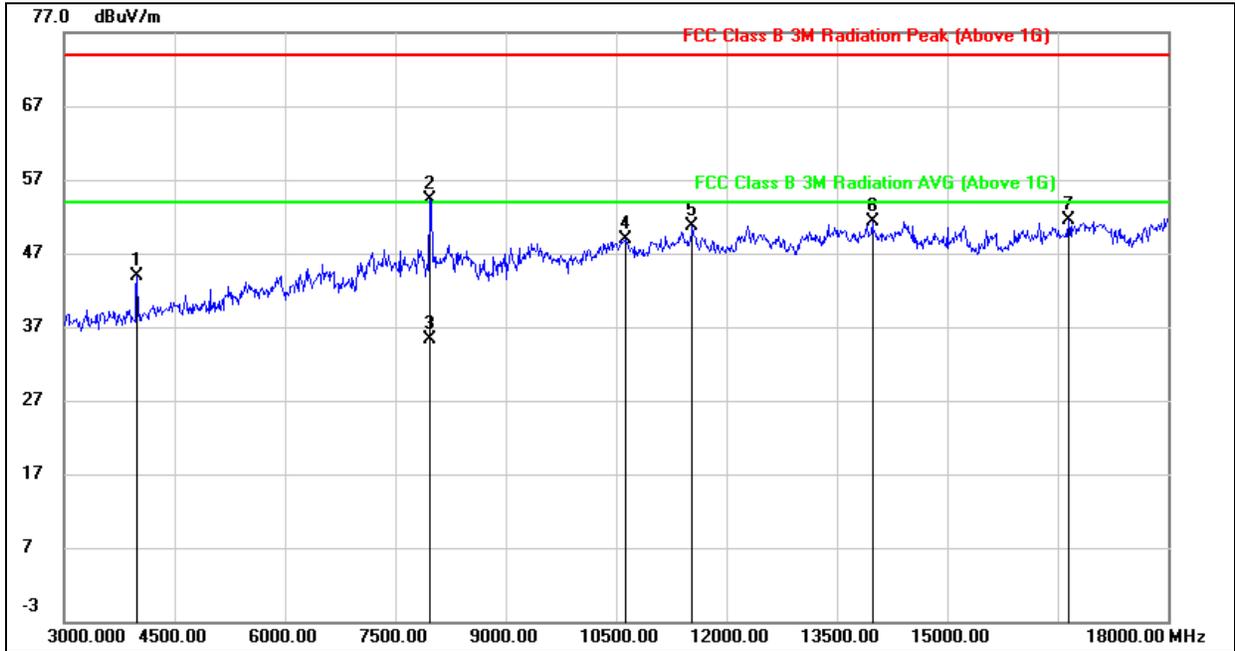


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	3990.000	44.25	-2.95	41.30	74.00	-32.70	peak
2	7320.000	42.53	7.20	49.73	74.00	-24.27	peak
3	10605.000	37.35	12.75	50.10	74.00	-23.90	peak
4	14295.000	34.70	16.31	51.01	74.00	-22.99	peak
5	16440.000	33.18	18.69	51.87	74.00	-22.13	peak
6	17805.000	28.99	23.22	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. The High Pass filter loss factor already add into the correct factor.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

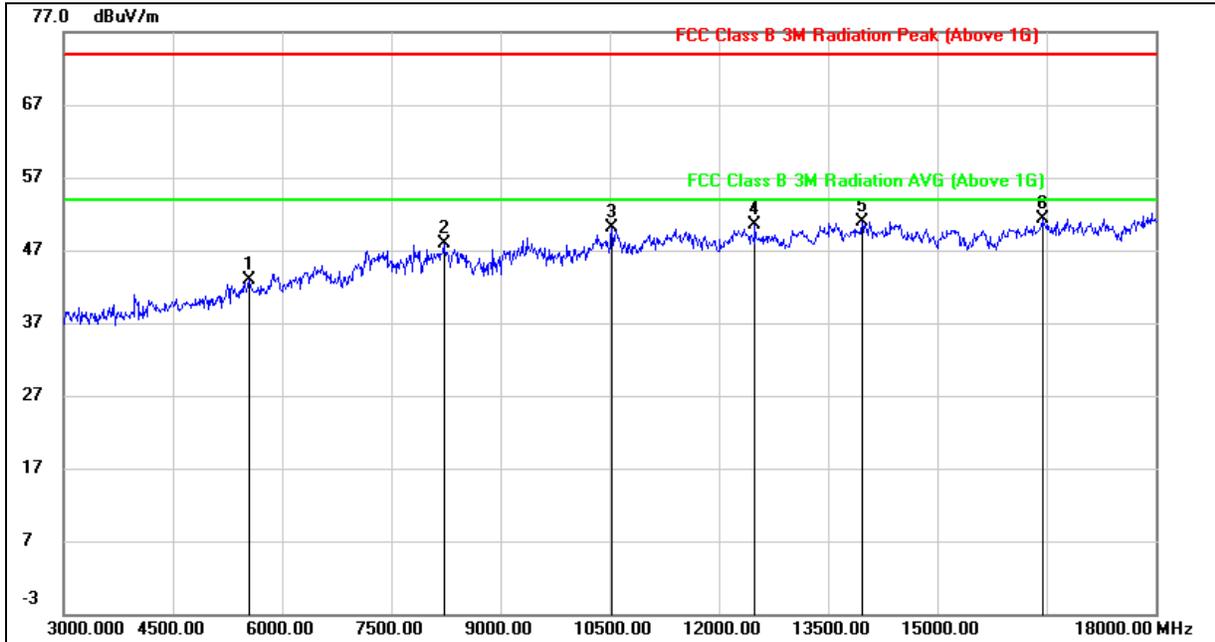


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	3990.000	46.87	-2.95	43.92	74.00	-30.08	peak
2	7965.000	45.99	8.26	54.25	74.00	-19.75	peak
3	7965.000	27.10	8.26	35.36	54.00	-18.64	AVG
4	10635.000	36.23	12.59	48.82	74.00	-25.18	peak
5	11535.000	36.61	14.10	50.71	74.00	-23.29	peak
6	13980.000	35.06	16.32	51.38	74.00	-22.62	peak
7	16650.000	31.82	19.60	51.42	74.00	-22.58	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 7.1.
 6. The High Pass filter loss factor already add into the correct factor.
 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

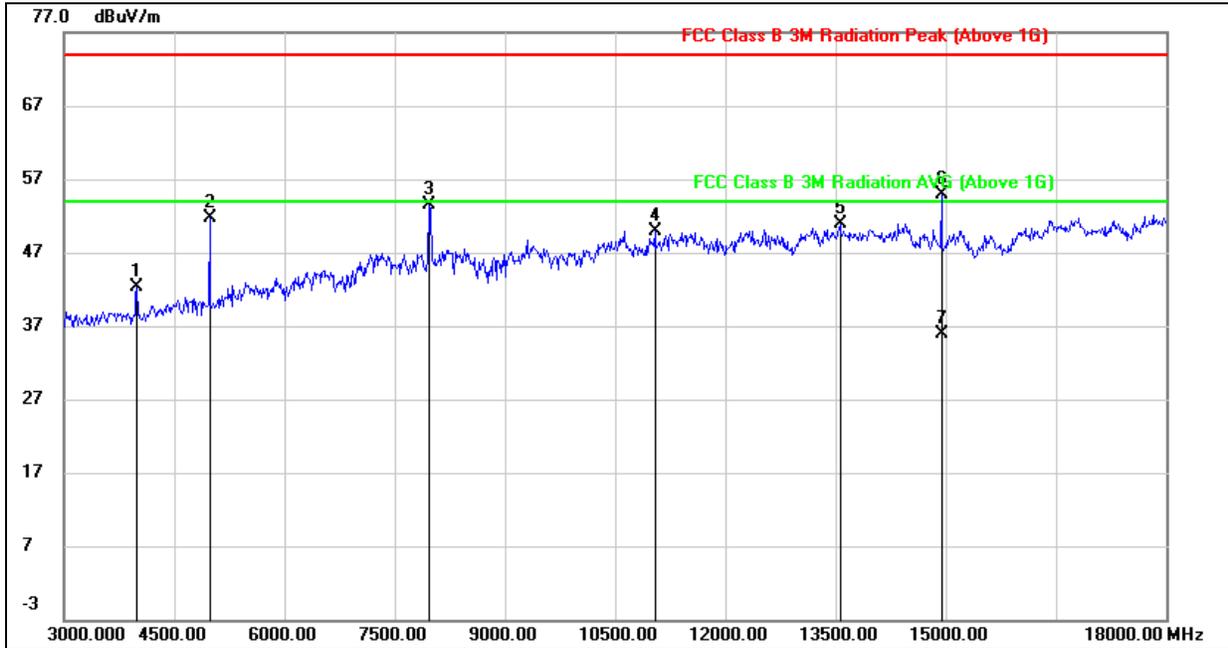


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	5550.000	40.12	2.77	42.89	74.00	-31.11	peak
2	8220.000	38.59	9.40	47.99	74.00	-26.01	peak
3	10530.000	38.09	12.05	50.14	74.00	-23.86	peak
4	12495.000	35.64	14.81	50.45	74.00	-23.55	peak
5	13965.000	34.56	16.29	50.85	74.00	-23.15	peak
6	16440.000	32.67	18.69	51.36	74.00	-22.64	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. The High Pass filter loss factor already add into the correct factor.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	3990.000	45.33	-2.95	42.38	74.00	-31.62	peak
2	4980.000	51.31	0.37	51.68	74.00	-22.32	peak
3	7965.000	45.23	8.26	53.49	74.00	-20.51	peak
4	11040.000	36.65	13.27	49.92	74.00	-24.08	peak
5	13560.000	35.07	15.91	50.98	74.00	-23.02	peak
6	14940.000	39.46	15.50	54.96	74.00	-19.04	peak
7	14940.000	20.32	15.50	35.82	54.00	-18.18	AVG

- 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 7.1.
 6. The High Pass filter loss factor already add into the correct factor.
 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

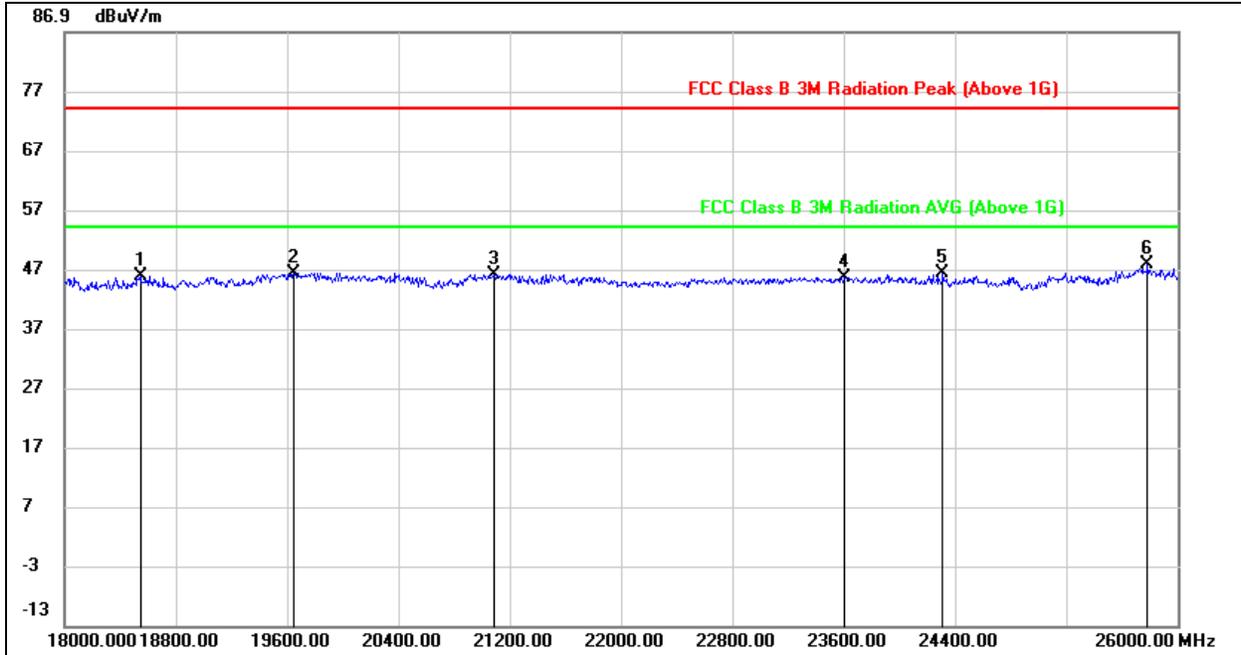
Note: All the antennas and modes had been tested, but only the worst data recorded in the report.



8.4. SPURIOUS EMISSIONS 18G ~ 26GHz

8.4.1. pi/4-DQPSK MODE ANTENNA 1

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

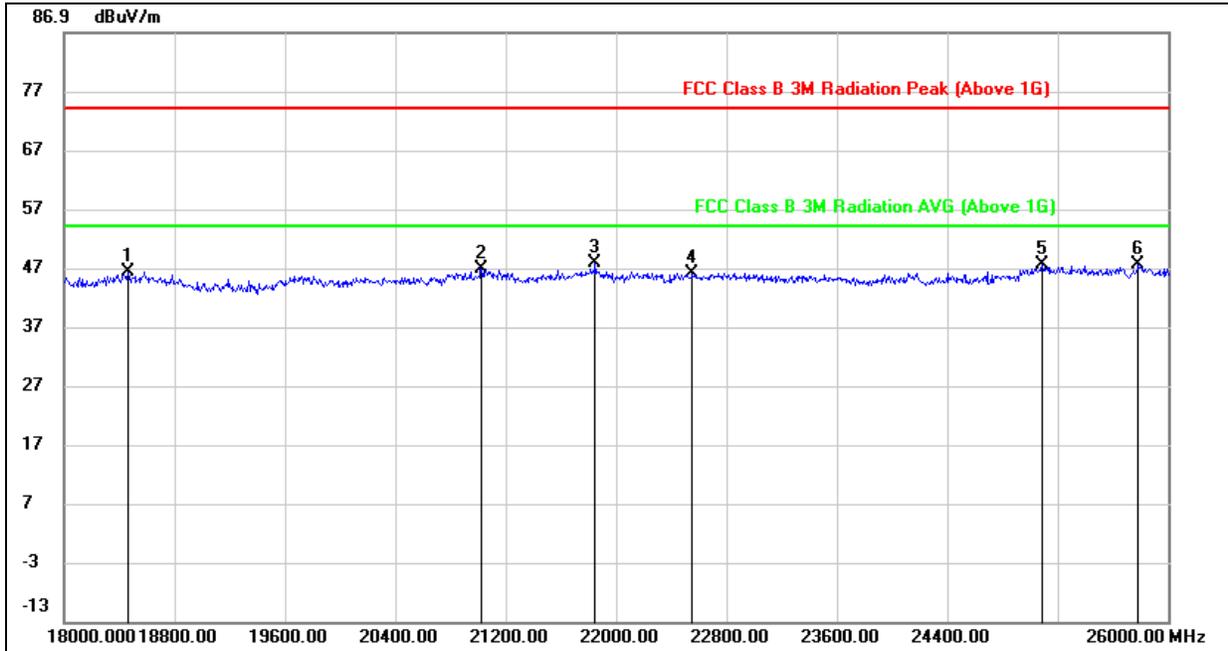


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	18544.000	50.26	-4.46	45.80	74.00	-28.20	peak
2	19648.000	50.91	-4.52	46.39	74.00	-27.61	peak
3	21088.000	51.49	-5.37	46.12	74.00	-27.88	peak
4	23600.000	50.29	-4.70	45.59	74.00	-28.41	peak
5	24312.000	49.60	-3.35	46.25	74.00	-27.75	peak
6	25784.000	49.23	-1.49	47.74	74.00	-26.26	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.



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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	18464.000	50.70	-4.39	46.31	74.00	-27.69	peak
2	21024.000	52.14	-5.30	46.84	74.00	-27.16	peak
3	21848.000	53.76	-5.95	47.81	74.00	-26.19	peak
4	22552.000	51.89	-5.78	46.11	74.00	-27.89	peak
5	25088.000	48.63	-1.12	47.51	74.00	-26.49	peak
6	25784.000	49.08	-1.49	47.59	74.00	-26.41	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.

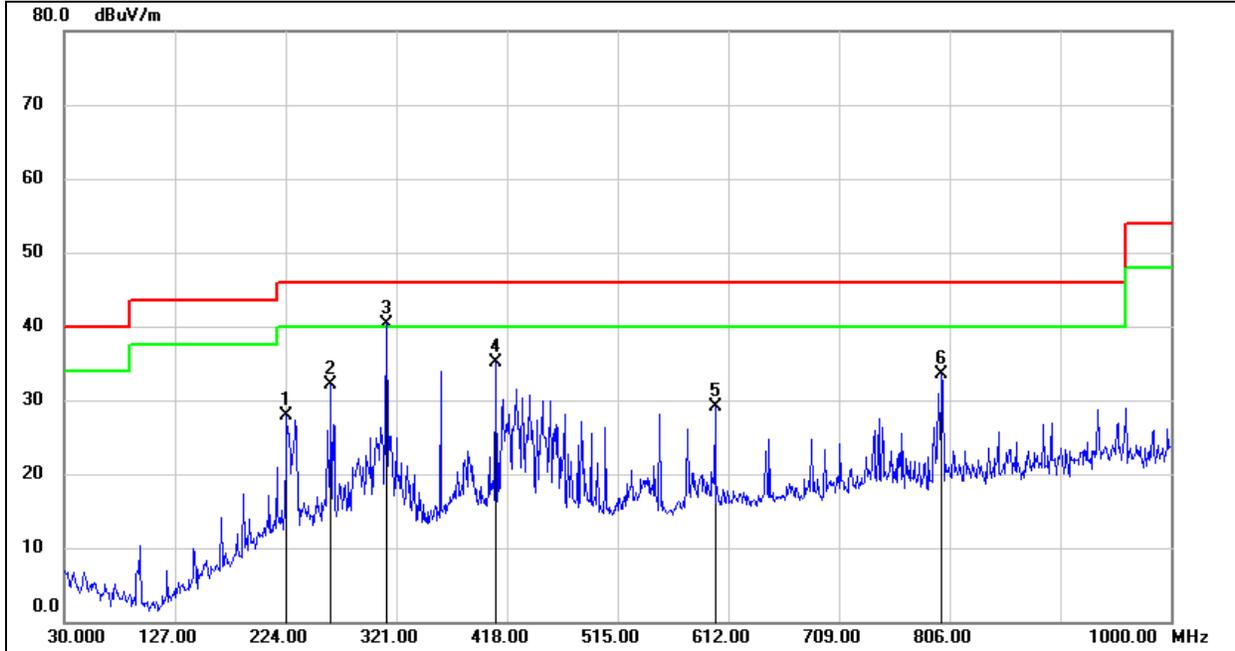
Note: All the antennas and modes had been tested, but only the worst data recorded in the report.



8.5. SPURIOUS EMISSIONS 30M ~ 1 GHz

8.5.1. pi/4-DQPSK MODE

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

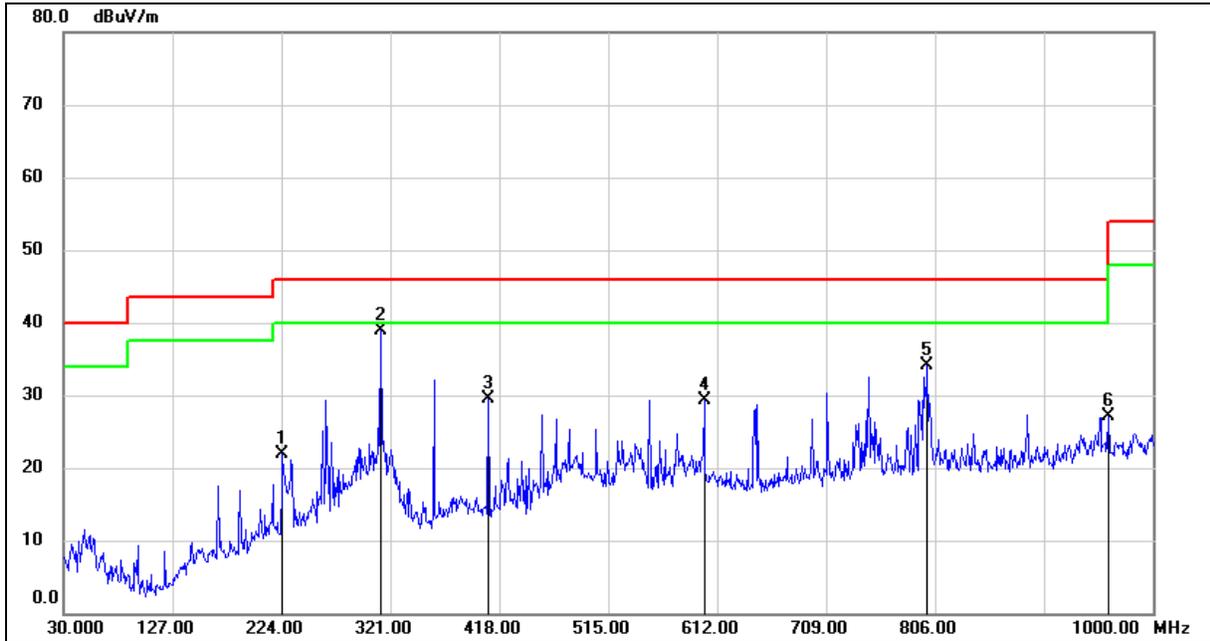


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	224.9700	45.35	-17.35	28.00	46.00	-18.00	QP
2	263.7700	47.73	-15.54	32.19	46.00	-13.81	QP
3	312.2700	54.04	-13.75	40.29	46.00	-5.71	QP
4	408.3000	47.32	-12.19	35.13	46.00	-10.87	QP
5	600.3600	37.52	-8.42	29.10	46.00	-16.90	QP
6	799.2100	38.78	-5.26	33.52	46.00	-12.48	QP

- Note: 1. Result Level = Read Level + Correct Factor.
 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.



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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	224.9700	39.23	-17.35	21.88	46.00	-24.12	QP
2	312.2700	52.56	-13.75	38.81	46.00	-7.19	QP
3	408.3000	41.65	-12.19	29.46	46.00	-16.54	QP
4	600.3600	37.64	-8.42	29.22	46.00	-16.78	QP
5	799.2100	39.43	-5.26	34.17	46.00	-11.83	QP
6	960.2300	30.56	-3.46	27.10	54.00	-26.90	QP

- Note: 1. Result Level = Read Level + Correct Factor.
 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

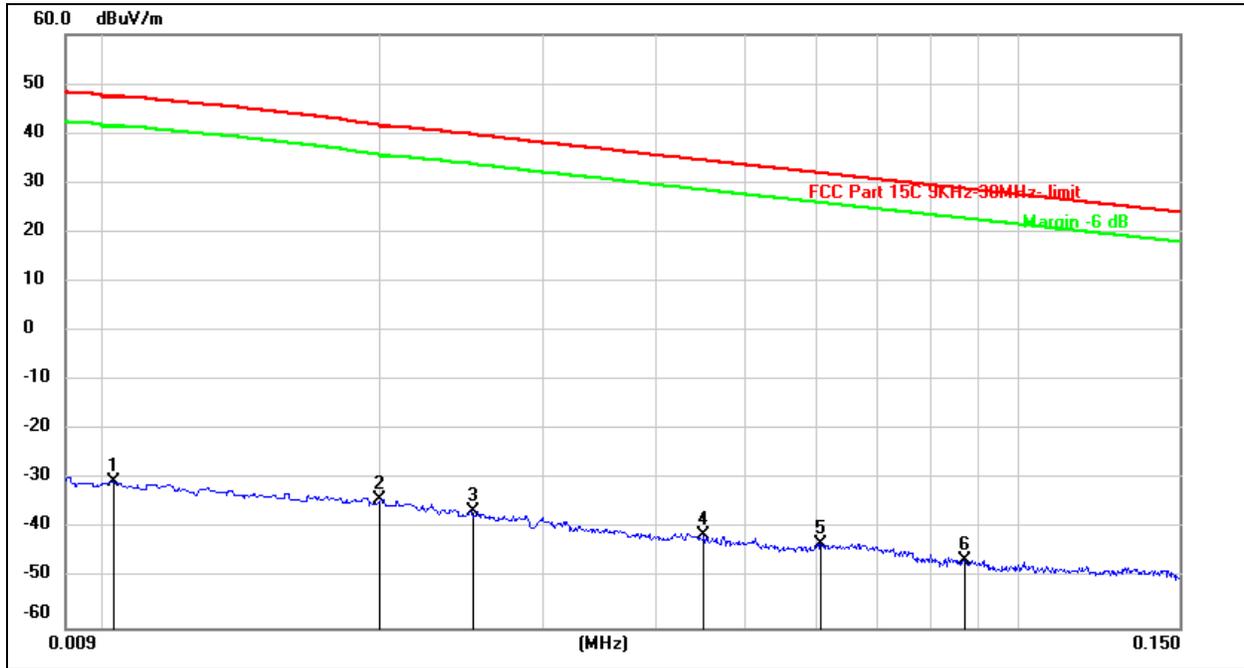
Note: All the antennas and modes had been tested, but only the worst data recorded in the report.

8.6. SPURIOUS EMISSIONS BELOW 30M

8.6.1. pi/4-DQPSK MODE ANTENNA 1

SPURIOUS EMISSIONS (LOW CHANNEL, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~150kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.0102	71.05	-101.40	-30.35	47.48	-77.83	peak
2	0.0200	67.36	-101.34	-33.98	41.58	-75.56	peak
3	0.0252	64.82	-101.37	-36.55	39.75	-76.30	peak
4	0.0451	60.09	-101.46	-41.37	34.57	-75.94	peak
5	0.0606	58.45	-101.52	-43.07	31.96	-75.03	peak
6	0.0873	55.46	-101.69	-46.23	28.80	-75.03	peak

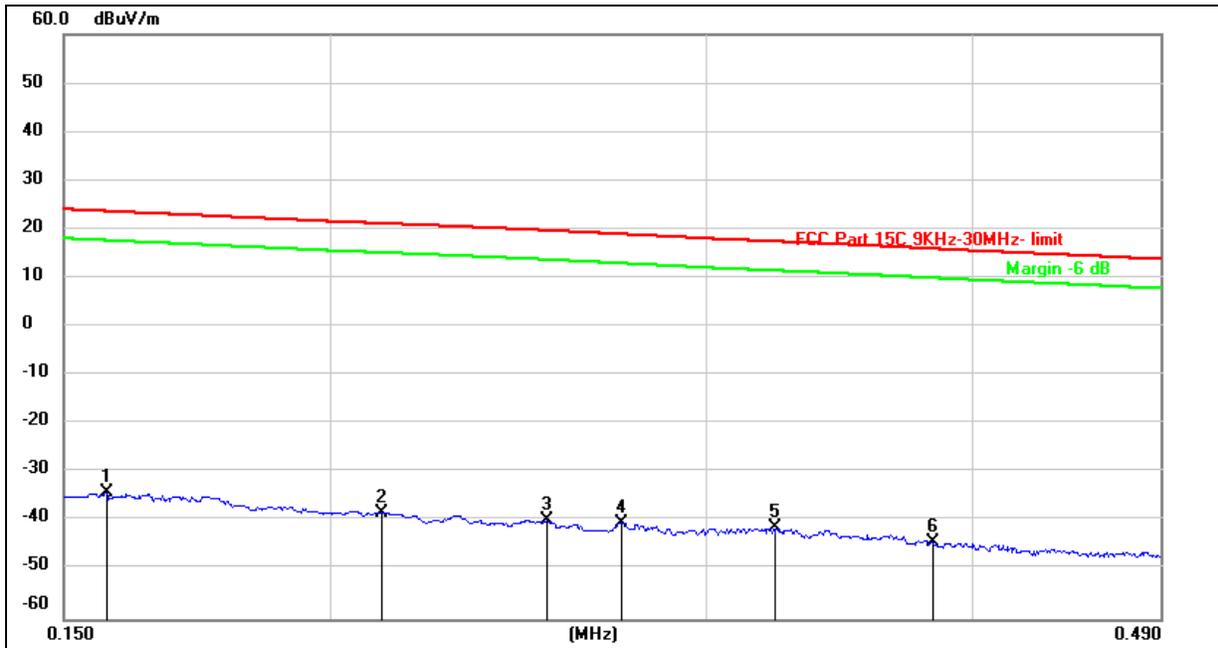
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.



150kHz ~ 490kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1570	67.53	-101.65	-34.12	23.69	-57.81	peak
2	0.2114	63.56	-101.73	-38.17	21.18	-59.35	peak
3	0.2530	62.09	-101.80	-39.71	19.71	-59.42	peak
4	0.2736	61.58	-101.83	-40.25	18.99	-59.24	peak
5	0.3234	60.48	-101.88	-41.40	17.47	-58.87	peak
6	0.3830	57.70	-101.94	-44.24	15.98	-60.22	peak

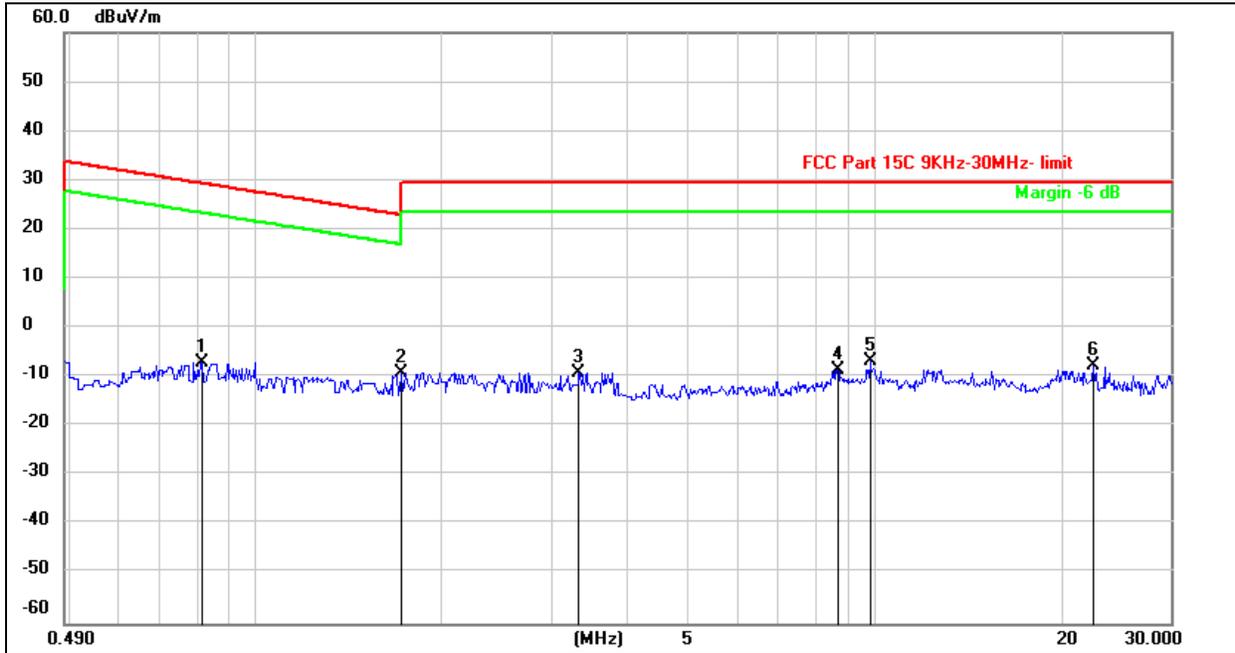
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.



490kHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.8195	55.16	-62.16	-7.00	29.34	-36.34	peak
2	1.7182	52.92	-61.94	-9.02	29.54	-38.56	peak
3	3.3229	52.39	-61.50	-9.11	29.54	-38.65	peak
4	8.7233	52.38	-60.98	-8.60	29.54	-38.14	peak
5	9.8152	54.08	-60.82	-6.74	29.54	-36.28	peak
6	22.5045	52.88	-60.64	-7.76	29.54	-37.30	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

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

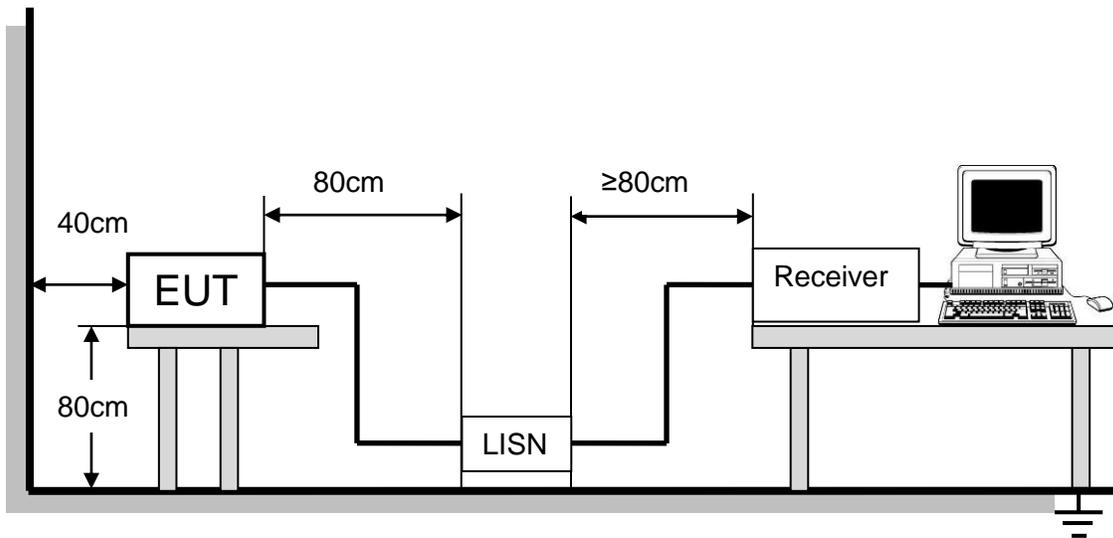
9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST SETUP AND PROCEDURE

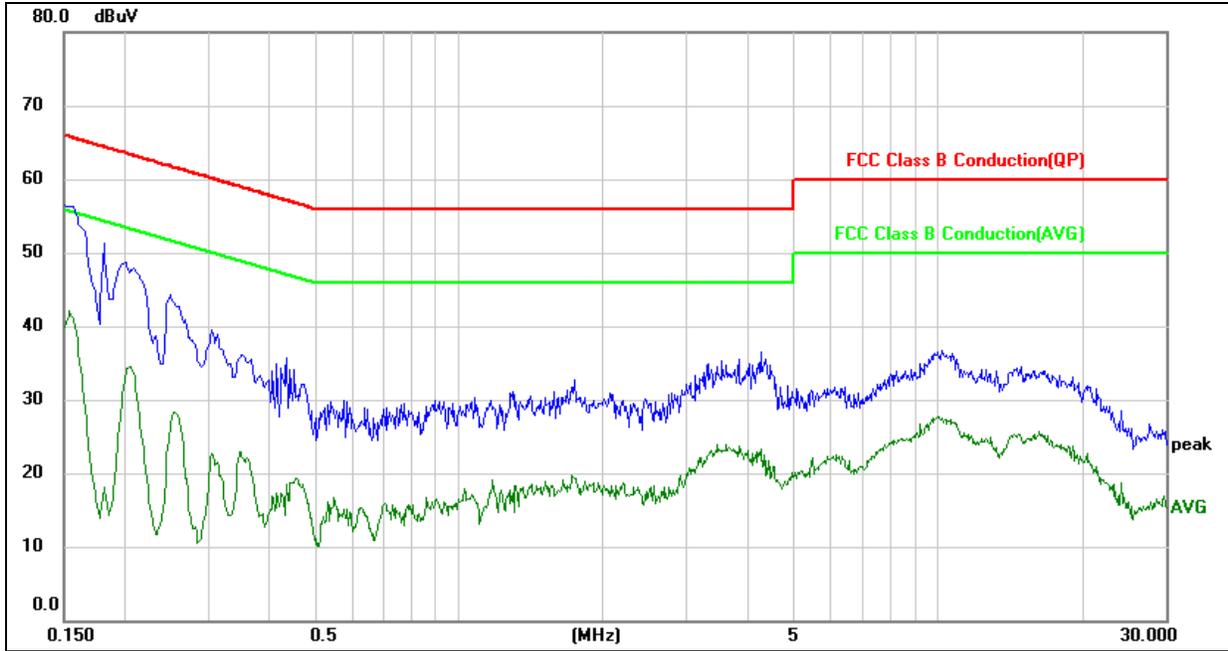


The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) 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.



9.1.1. pi/4-DQPSK MODE ANTENNA 1

LINE L RESULTS (MID CHANNEL, WORST-CASE CONFIGURATION)

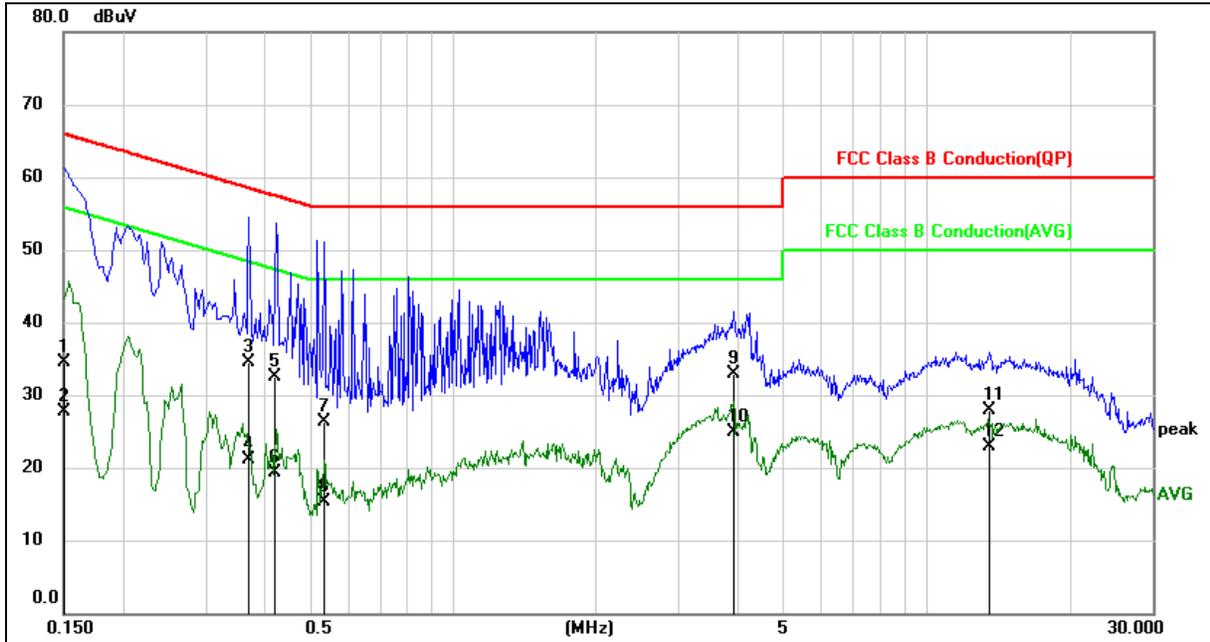


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1488	24.54	9.61	34.15	66.07	-31.92	QP
2	0.1488	17.94	9.61	27.55	56.07	-28.52	AVG
3	0.1987	36.05	9.60	45.65	63.66	-18.01	QP
4	0.1987	19.39	9.60	28.99	53.66	-24.67	AVG
5	0.2496	31.68	9.60	41.28	61.77	-20.49	QP
6	0.2496	16.08	9.60	25.68	51.77	-26.09	AVG
7	0.3076	26.31	9.60	35.91	60.04	-24.13	QP
8	0.3076	10.82	9.60	20.42	50.04	-29.62	AVG
9	4.2638	20.07	9.66	29.73	56.00	-26.27	QP
10	4.2638	10.60	9.66	20.26	46.00	-25.74	AVG
11	10.2135	21.28	9.74	31.02	60.00	-28.98	QP
12	10.2135	16.09	9.74	25.83	50.00	-24.17	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.



LINE N RESULTS (MID CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	24.95	9.61	34.56	66.00	-31.44	QP
2	0.1500	18.19	9.61	27.80	56.00	-28.20	AVG
3	0.3695	24.83	9.60	34.43	58.51	-24.08	QP
4	0.3695	11.49	9.60	21.09	48.51	-27.42	AVG
5	0.4188	22.89	9.60	32.49	57.47	-24.98	QP
6	0.4188	9.71	9.60	19.31	47.47	-28.16	AVG
7	0.5325	16.74	9.60	26.34	56.00	-29.66	QP
8	0.5325	5.78	9.60	15.38	46.00	-30.62	AVG
9	3.9161	23.32	9.66	32.98	56.00	-23.02	QP
10	3.9161	15.32	9.66	24.98	46.00	-21.02	AVG
11	13.5767	18.05	9.82	27.87	60.00	-32.13	QP
12	13.5767	13.12	9.82	22.94	50.00	-27.06	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 antennas and modes had been tested, but only the worst data recorded in the report.



10. 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

Complies

END OF REPORT