

FCC Test Report

FCC ID : TLZ-CU277B
Equipment : IEEE 802.11 b/g/n + Bluetooth 4.0 HS Smart Energy Module
Model No. : AW-CU277B
Brand Name : AzureWave
Applicant : AzureWave Technologies, Inc.
Address : 8 F., No. 94, Baozhong Rd., Xindian, Taiwan 231
Standard : 47 CFR FCC Part 15.247
Received Date : May 03, 2016
Tested Date : May 11 ~ May 27, 2016

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:


Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR531203-01AD	Rev. 01	Initial issue	Jun. 08, 2016
FR531203-01AD	Rev. 02	Revised connector of antenna (page 5.)	Jun. 14, 2016

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.363MHz 38.99 (Margin -9.66dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 38.73MHz 36.87 (Margin -3.13dB) - PK	Pass
15.247(d)	Band Edge	Meet the requirement of limit	Pass
15.247(b)(1)	Conducted Output Power	Power [dBm]: 9.17	Pass
15.247(a)(1)(iii)	Number of Hopping Channels	Meet the requirement of limit	Pass
15.247(a)(1)	Hopping Channel Separation	Meet the requirement of limit	Pass
15.247(a)(1)(iii)	Dwell Time	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number	Data Rate
2400-2483.5	BR	2402-2480	0-78 [79]	1 Mbps
2400-2483.5	EDR	2402-2480	0-78 [79]	2 Mbps
2400-2483.5	EDR	2402-2480	0-78 [79]	3 Mbps
Note 1: RF output power specifies that Maximum Peak Conducted Output Power. Note 2: Bluetooth BR uses a GFSK. Note 3: Bluetooth EDR uses a combination of $\pi/4$ -DQPSK and 8DPSK.				

1.1.2 Antenna Details

Ant. No.	Model	Type	Connector	Antenna Gain (dBi)
1	ANT3216	Chip	N/A	3.29
2	FXP73.07.0100A	Monopole	UFL	3
3	NanoBlue	Monopole	UFL	2
4	PC11.07.0100A	Dipole	UFL	3
5	GW.17.07.0250E	Dipole	UFL	2.7
6	EDA-1313-2G4C1-A16	Dipole	UFL	2.39
7	DQ60CQA1200	Dipole	UFL	2.84
8	FXP74.07.0100A	PIFA	UFL	4
9	MSA-4008-25GC1-A1	PIFA	UFL	2.98
10	PC17.07.0070A	PIFA	UFL	0.9
11	T-543-80A1077-1	PIFA	UFL	0.55
Note: The antennas with highest gain of each type were selected for final testing in this test report.				

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	3.3Vdc from host.
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1.1.4 Accessories

N/A

1.1.5 Channel List

Frequency band (MHz)				2400~2483.5			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	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	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	CBT
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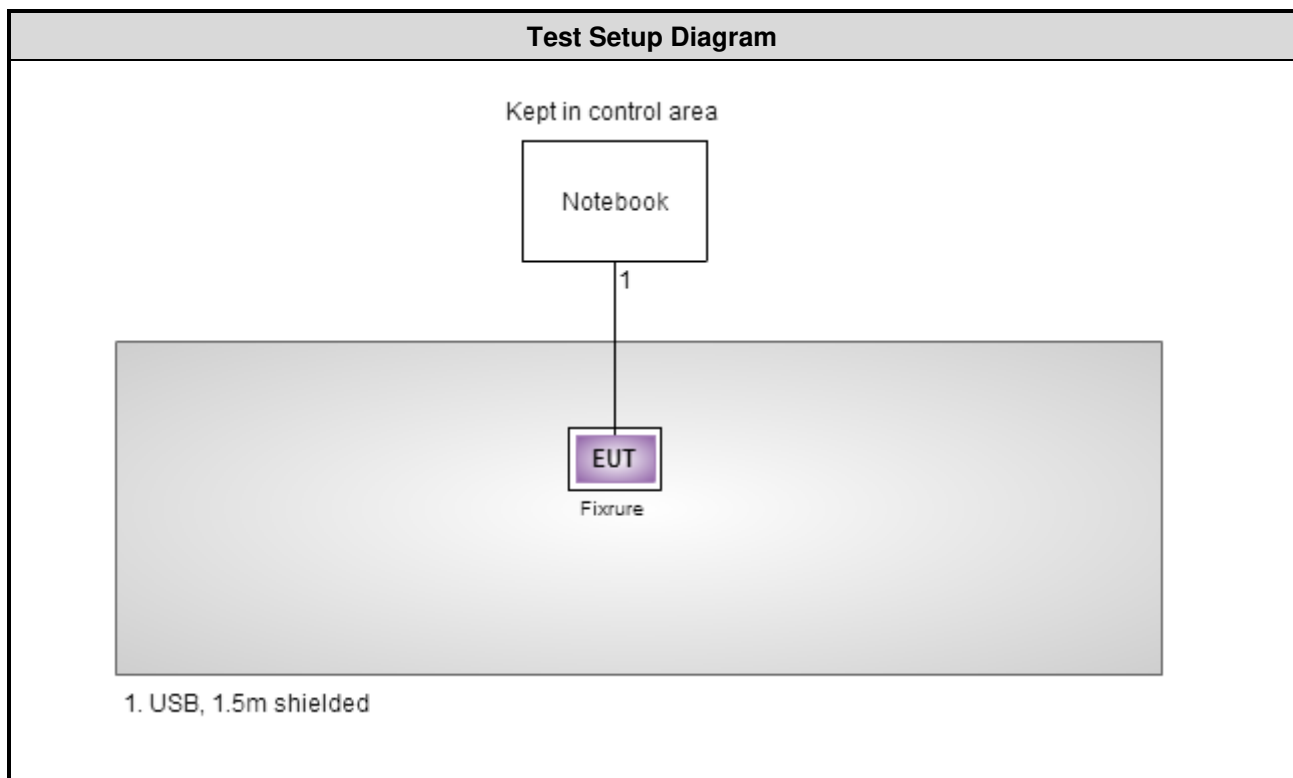
1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)		
	2402	2441	2480
GFSK/1Mbps	Max	Max	Max
$\pi/4$ -DQPSK	Max	Max	Max
8DPSK/3Mbps	Max	Max	Max

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E6440	DoC	USB, 1.5m shielded.

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
EMC Receiver	R&S	ESCS 30	100169	Oct. 21, 2015	Oct. 20, 2016
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 13, 2015	Nov. 12, 2016
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127-666	Nov. 26, 2015	Nov. 25, 2016
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 21, 2015	Dec. 20, 2016
50 ohm terminal (Support Unit)	NA	50	04	Apr. 12, 2016	Apr. 11, 2017
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 3 / (03CH03-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 14, 2015	Sep. 13, 2016
Receiver	Agilent	N9038A	MY53290044	Oct. 14, 2015	Oct. 13, 2016
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 26, 2016	Apr. 25, 2017
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 24, 2016	Feb. 23, 2017
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 04, 2015	Nov. 03, 2016
Loop Antenna	R&S	HFH2-Z2	11900	Nov. 16, 2015	Nov. 15, 2016
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 10, 2015	Dec. 09, 2016
Preamplifier	EMC	EMC02325	980187	Sep. 21, 2015	Sep. 20, 2016
Preamplifier	Agilent	83017A	MY53270014	Sep. 07, 2015	Sep. 06, 2016
Preamplifier	EMC	EMC184045B	980192	Sep. 01, 2015	Aug. 31, 2016
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Feb. 05, 2016	Feb. 04, 2017
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22600/4	Feb. 05, 2016	Feb. 04, 2017
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Feb. 05, 2016	Feb. 04, 2017
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-00 1	Feb. 05, 2016	Feb. 04, 2017
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Feb. 05, 2016	Feb. 04, 2017
LF cable-13M	EMC	EMC8D-NM-NM-1300 0	131104	Feb. 05, 2016	Feb. 04, 2017
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Feb. 17, 2016	Feb. 16, 2017
Power Meter	Anritsu	ML2495A	1241002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor	Anritsu	MA2411B	1207366	Sep. 21, 2015	Sep. 20, 2016
DC POWER SOURCE	GW INSTEK	GPC-3060D	EM884797	Oct. 20, 2015	Oct. 19, 2016
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 26, 2015	Oct. 25, 2016
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247

FCC Public notice DA 00-705

ANSI C63.10-2013

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±34.134 Hz
Conducted power	±0.808 dB
Power density	±0.463 dB
Conducted emission	±2.670 dB
AC conducted emission	±2.90 dB
Radiated emission ≤ 1GHz	±3.66 dB
Radiated emission > 1GHz	±5.37 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 62%	Howard Huang
Radiated Emissions	03CH03-WS	22-23°C / 61-62%	Vincent Yeh Anderson Hung
RF Conducted	TH01-WS	24°C / 64%	Alex Huang

➤ FCC site registration No.: 207696

➤ IC site registration No.: 10807C-1

2.2 The Worst Test Modes and Channel Details

Test item	Mode	Test Frequency (MHz)	Data Rate (Mbps)	Test Configuration
Conducted Emissions	8DPSK	2480	1Mbps	1, 2, 3, 4
Radiated Emissions ≤ 1GHz	8DPSK	2480	1Mbps	1, 2, 3, 4
Radiated Emissions > 1GHz	GFSK 8DPSK	2402, 2441, 2480 2402, 2441, 2480	1Mbps 3Mbps	1, 2, 3, 4
Conducted Output Power	GFSK π/4 QDPSK 8DPSK	2402, 2441, 2480 2402, 2441, 2480 2402, 2441, 2480	1Mbps 2Mbps 3Mbps	4
Number of Hopping Channels	GFSK 8DPSK	2402~2480 2402~2480	1Mbps 3Mbps	4
Hopping Channel Separation	GFSK 8DPSK	2402, 2441, 2480 2402, 2441, 2480	1Mbps 3Mbps	4
Dwell Time	GFSK 8DPSK	2402	1Mbps 3Mbps	4

NOTE:

- The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The worst cases were shown in this report as below listed.
- 4 types antenna are used for this device, highest gain antenna of each type is selected to perform related tests as below test configuration.
 - Configuration 1 : Chip antenna with 3.29dBi gain , X-plane
 - Configuration 2 : Monopole antenna with 3dBi gain , X-plane
 - Configuration 3 : Dipole antenna with 3dBi gain, Z-plane
 - Configuration 4 : PIFA antenna with 4dBi gain, X-plane

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

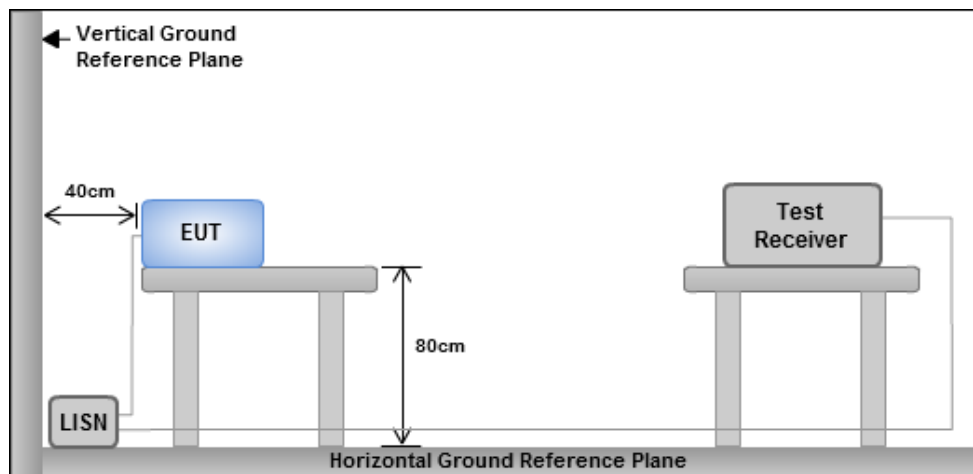
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

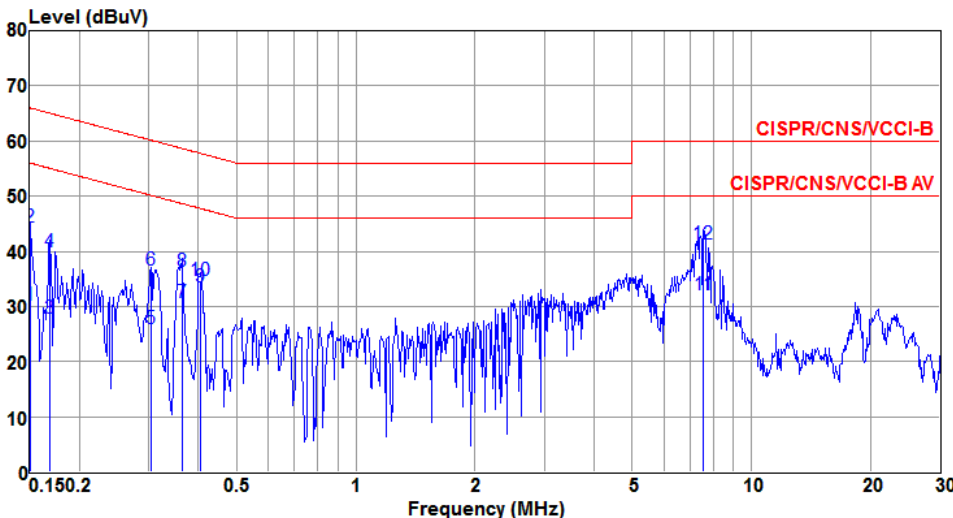
3.1.3 Test Setup



- Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

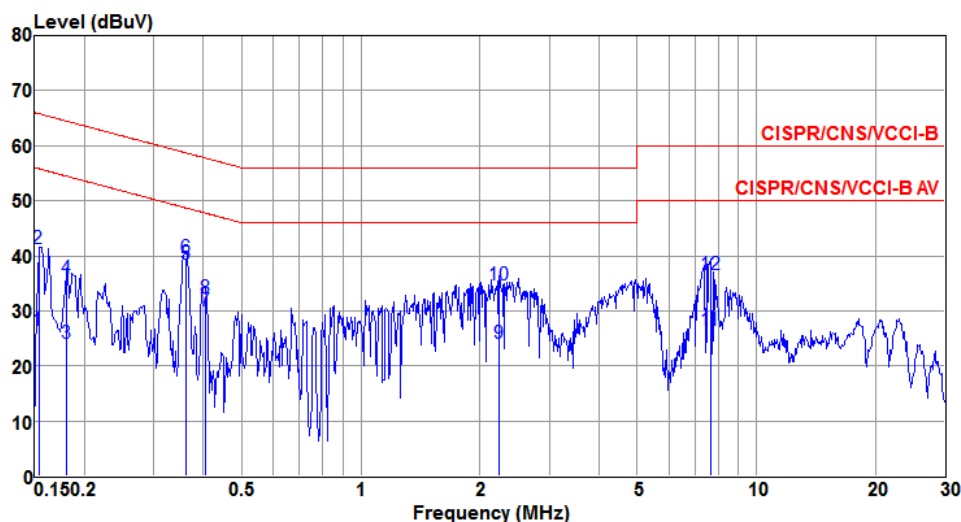
Modulation Mode	8DPSK	Test Freq. (MHz)	2480
Power Phase	Line	Test Configuration	1



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.150	30.16	56.00	-25.84	30.03	0.11	0.02	Average
2	0.150	44.38	66.00	-21.62	44.25	0.11	0.02	QP
3	0.169	27.77	55.03	-27.26	27.64	0.11	0.02	Average
4	0.169	39.89	65.03	-25.14	39.76	0.11	0.02	QP
5	0.303	25.92	50.15	-24.23	25.77	0.12	0.03	Average
6	0.303	36.61	60.15	-23.54	36.46	0.12	0.03	QP
7	0.363	30.58	48.65	-18.07	30.42	0.13	0.03	Average
8	0.363	36.28	58.65	-22.37	36.12	0.13	0.03	QP
9@	0.406	33.43	47.73	-14.30	33.27	0.13	0.03	Average
10	0.406	34.74	57.73	-22.99	34.58	0.13	0.03	QP
11	7.566	32.07	50.00	-17.93	31.70	0.22	0.15	Average
12	7.566	41.41	60.00	-18.59	41.04	0.22	0.15	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

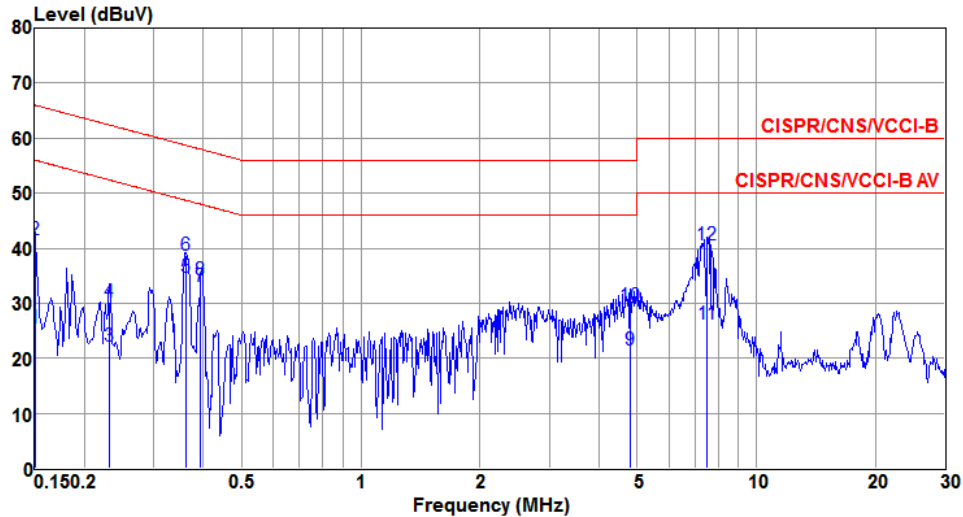
Modulation Mode	8DPSK	Test Freq. (MHz)	2480
Power Phase	Neutral	Test Configuration	1



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.153	26.52	55.82	-29.30	26.37	0.13	0.02	Average
2	0.153	41.36	65.82	-24.46	41.21	0.13	0.02	QP
3	0.181	24.10	54.46	-30.36	23.97	0.11	0.02	Average
4	0.181	35.87	64.46	-28.59	35.74	0.11	0.02	QP
5	0.361	38.52	48.69	-10.17	38.36	0.13	0.03	Average
6	0.361	39.65	58.69	-19.04	39.49	0.13	0.03	QP
7	0.404	30.06	47.77	-17.71	29.89	0.14	0.03	Average
8	0.404	32.25	57.77	-25.52	32.08	0.14	0.03	QP
9	2.237	24.14	46.00	-21.86	23.88	0.17	0.09	Average
10	2.237	34.75	56.00	-21.25	34.49	0.17	0.09	QP
11	7.646	26.37	50.00	-23.63	25.98	0.24	0.15	Average
12	7.646	36.68	60.00	-23.32	36.29	0.24	0.15	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

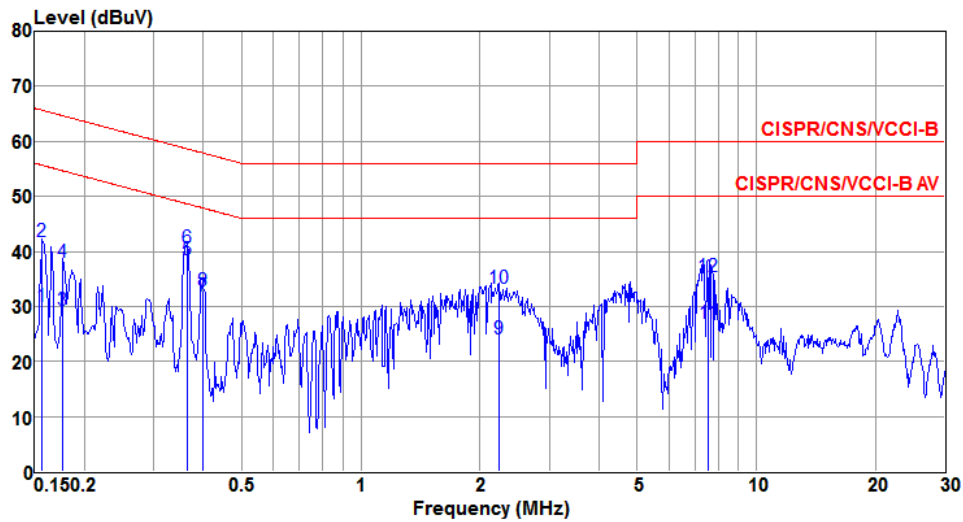
Modulation Mode	8DPSK	Test Freq. (MHz)	2480
Power Phase	Line	Test Configuration	2



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.150	25.44	56.00	-30.56	25.31	0.11	0.02	Average
2	0.150	41.46	66.00	-24.54	41.33	0.11	0.02	QP
3	0.232	22.22	52.39	-30.17	22.09	0.11	0.02	Average
4	0.232	30.32	62.39	-32.07	30.19	0.11	0.02	QP
5@	0.361	34.80	48.69	-13.89	34.64	0.13	0.03	Average
6	0.361	38.67	58.69	-20.02	38.51	0.13	0.03	QP
7	0.393	33.06	47.99	-14.93	32.90	0.13	0.03	Average
8	0.393	34.17	57.99	-23.82	34.01	0.13	0.03	QP
9	4.797	21.45	46.00	-24.55	21.12	0.20	0.13	Average
10	4.797	29.57	56.00	-26.43	29.24	0.20	0.13	QP
11	7.526	26.23	50.00	-23.77	25.86	0.22	0.15	Average
12	7.526	40.60	60.00	-19.40	40.23	0.22	0.15	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

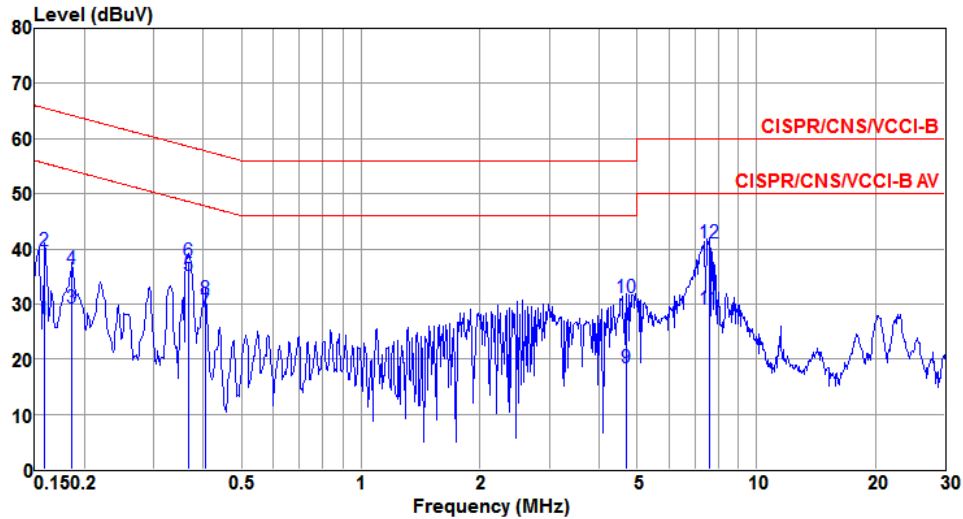
Modulation Mode	8DPSK	Test Freq. (MHz)	2480
Power Phase	Neutral	Test Configuration	2



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line dBuV	Limit dB	Level dBuV	factor dB	loss dB	Remark
1	0.156	29.91	55.65	-25.74	29.76	0.13	0.02	Average
2	0.156	41.70	65.65	-23.95	41.55	0.13	0.02	QP
3	0.177	29.32	54.64	-25.32	29.19	0.11	0.02	Average
4	0.177	38.01	64.64	-26.63	37.88	0.11	0.02	QP
5@	0.363	38.44	48.65	-10.21	38.28	0.13	0.03	Average
6	0.363	40.64	58.65	-18.01	40.48	0.13	0.03	QP
7	0.398	31.83	47.90	-16.07	31.66	0.14	0.03	Average
8	0.398	32.80	57.90	-25.10	32.63	0.14	0.03	QP
9	2.237	23.97	46.00	-22.03	23.71	0.17	0.09	Average
10	2.237	33.24	56.00	-22.76	32.98	0.17	0.09	QP
11	7.566	26.81	50.00	-23.19	26.42	0.24	0.15	Average
12	7.566	35.44	60.00	-24.56	35.05	0.24	0.15	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

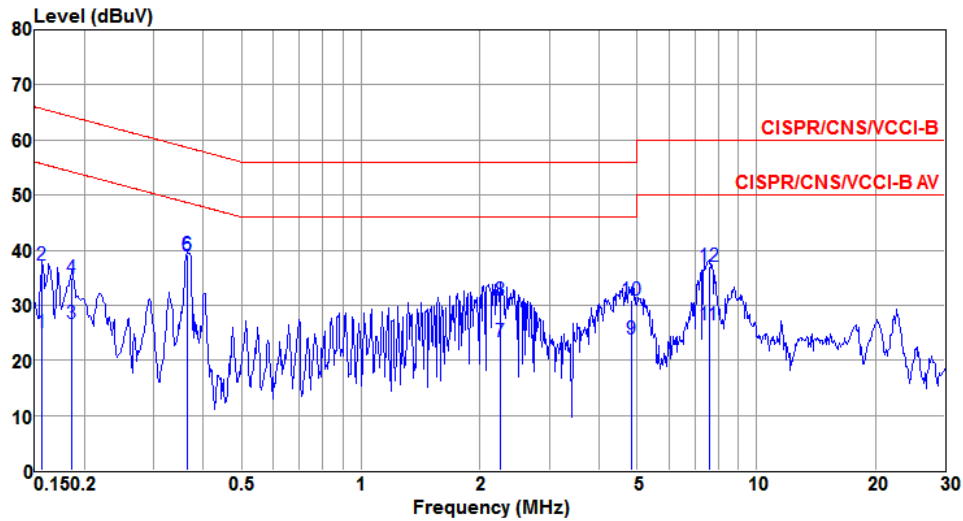
Modulation Mode	8DPSK	Test Freq. (MHz)	2480
Power Phase	Line	Test Configuration	3



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	27.15	55.52	-28.37	27.02	0.11	0.02	Average
2	0.159	39.71	65.52	-25.81	39.58	0.11	0.02	QP
3	0.186	29.20	54.20	-25.00	29.07	0.11	0.02	Average
4	0.186	36.29	64.20	-27.91	36.16	0.11	0.02	QP
5	0.367	35.06	48.56	-13.50	34.90	0.13	0.03	Average
6	0.367	37.69	58.56	-20.87	37.53	0.13	0.03	QP
7	0.404	28.46	47.77	-19.31	28.30	0.13	0.03	Average
8	0.404	31.02	57.77	-26.75	30.86	0.13	0.03	QP
9	4.696	18.35	46.00	-27.65	18.02	0.20	0.13	Average
10	4.696	31.21	56.00	-24.79	30.88	0.20	0.13	QP
11	7.606	29.08	50.00	-20.92	28.71	0.22	0.15	Average
12	7.606	41.03	60.00	-18.97	40.66	0.22	0.15	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

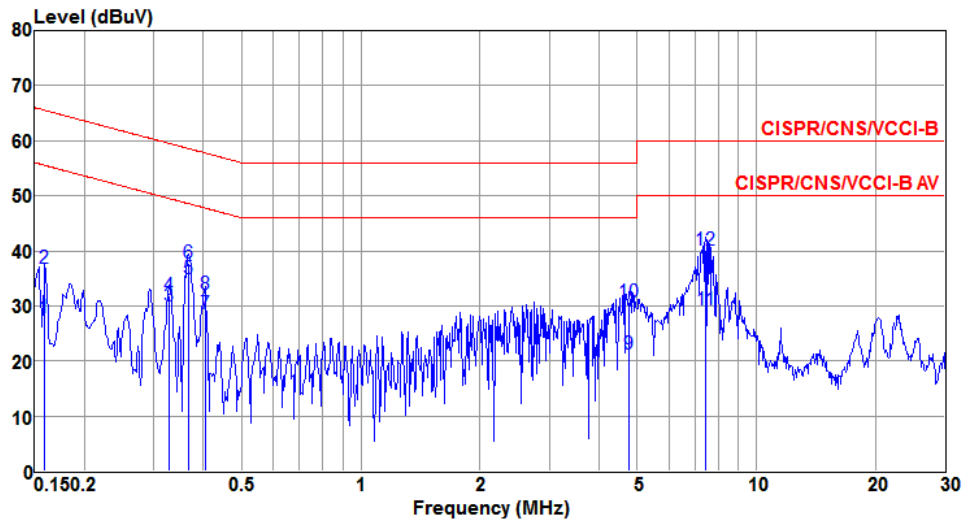
Modulation Mode	8DPSK	Test Freq. (MHz)	2480
Power Phase	Neutral	Test Configuration	3



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line	Limit	Level	factor	loss	Remark
			dBuV	dB	dBuV	dB	dB	
1	0.156	25.01	55.65	-30.64	24.86	0.13	0.02	Average
2	0.156	37.27	65.65	-28.38	37.12	0.13	0.02	QP
3	0.186	26.74	54.20	-27.46	26.61	0.11	0.02	Average
4	0.186	35.04	64.20	-29.16	34.91	0.11	0.02	QP
5@	0.363	38.99	48.65	-9.66	38.83	0.13	0.03	Average
6	0.363	39.29	58.65	-19.36	39.13	0.13	0.03	QP
7	2.261	23.39	46.00	-22.61	23.13	0.17	0.09	Average
8	2.261	30.96	56.00	-25.04	30.70	0.17	0.09	QP
9	4.822	23.95	46.00	-22.05	23.63	0.19	0.13	Average
10	4.822	30.81	56.00	-25.19	30.49	0.19	0.13	QP
11	7.606	26.56	50.00	-23.44	26.17	0.24	0.15	Average
12	7.606	37.03	60.00	-22.97	36.64	0.24	0.15	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBUV) – Limit Line (dBUV).

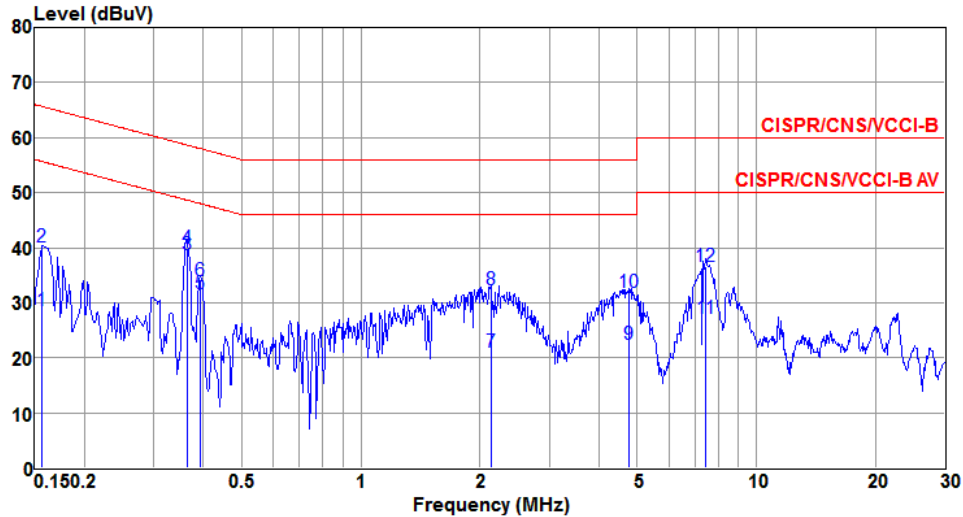
Modulation Mode	8DPSK	Test Freq. (MHz)	2480
Power Phase	Line	Test Configuration	4



	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	LISN factor dB	cable loss dB	Remark
1	0.159	27.96	55.52	-27.56	27.83	0.11	0.02	Average
2	0.159	36.73	65.52	-28.79	36.60	0.11	0.02	QP
3	0.327	29.90	49.53	-19.63	29.75	0.12	0.03	Average
4	0.327	31.96	59.53	-27.57	31.81	0.12	0.03	QP
5	0.367	35.01	48.56	-13.55	34.85	0.13	0.03	Average
6	0.367	37.69	58.56	-20.87	37.53	0.13	0.03	QP
7	0.404	28.52	47.77	-19.25	28.36	0.13	0.03	Average
8	0.404	32.18	57.77	-25.59	32.02	0.13	0.03	QP
9	4.772	21.14	46.00	-24.86	20.81	0.20	0.13	Average
10	4.772	30.61	56.00	-25.39	30.28	0.20	0.13	QP
11	7.446	29.22	50.00	-20.78	28.85	0.22	0.15	Average
12	7.446	40.20	60.00	-19.80	39.83	0.22	0.15	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBUV) – Limit Line (dBUV).

Modulation Mode	8DPSK	Test Freq. (MHz)	2480
Power Phase	Neutral	Test Configuration	4



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	28.62	55.65	-27.03	28.47	0.13	0.02	Average
2	0.156	40.18	65.65	-25.47	40.03	0.13	0.02	QP
3	0.365	38.82	48.63	-9.81	38.66	0.13	0.03	Average
4	0.365	39.98	58.63	-18.65	39.82	0.13	0.03	QP
5	0.391	31.68	48.03	-16.35	31.51	0.14	0.03	Average
6	0.391	34.05	58.03	-23.98	33.88	0.14	0.03	QP
7	2.133	21.12	46.00	-24.88	20.87	0.17	0.08	Average
8	2.133	32.37	56.00	-23.63	32.12	0.17	0.08	QP
9	4.746	22.55	46.00	-23.45	22.23	0.19	0.13	Average
10	4.746	31.98	56.00	-24.02	31.66	0.19	0.13	QP
11	7.446	27.13	50.00	-22.87	26.74	0.24	0.15	Average
12	7.446	36.50	60.00	-23.50	36.11	0.24	0.15	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 Unwanted Emissions into Restricted Frequency Bands

3.2.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Quasi-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.2.2 Test Procedures

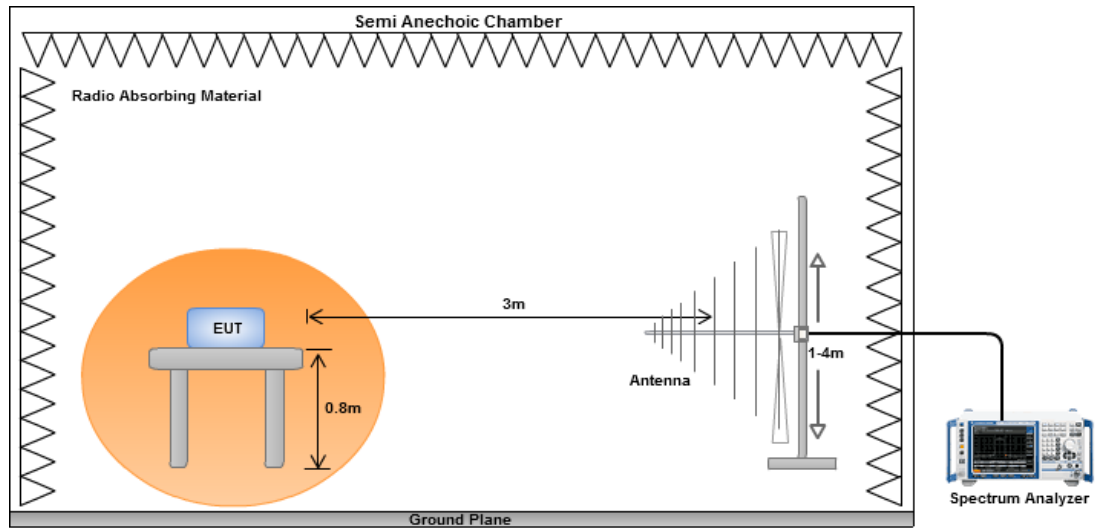
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

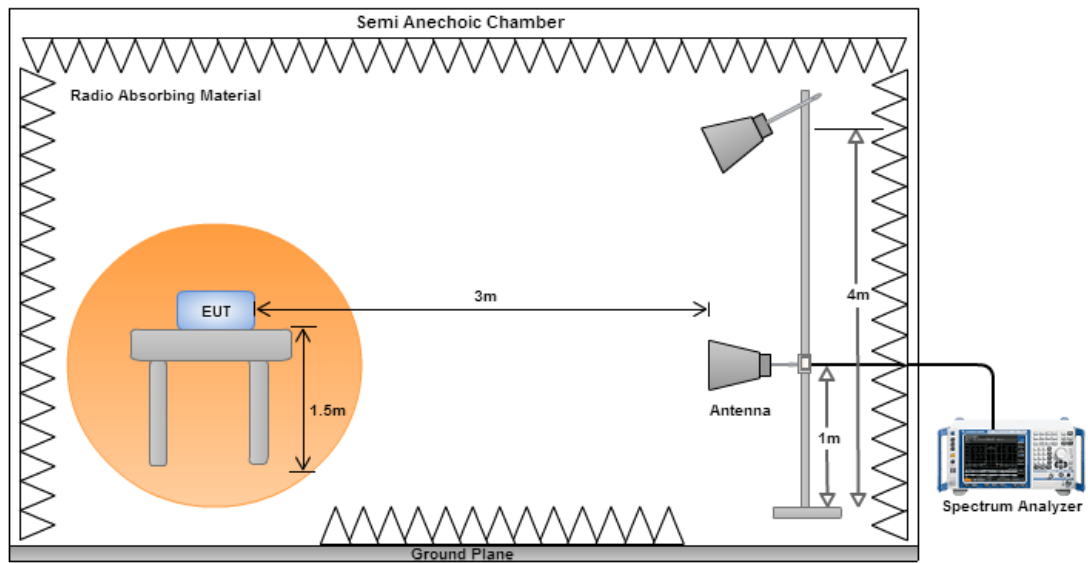
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. Radiated emission above 1GHz / Peak value
RBW=1MHz, VBW=3MHz and Peak detector
Radiated emission above 1GHz / Average value for harmonics
The average value is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula for DH5 packet type which has worst duty factor:
3.
$$20\log (\text{Duty cycle}) = 20\log \frac{1\text{s} / 1600 * 5}{100 \text{ ms}} = -30.1\text{dB}$$
4. Radiated emission above 1GHz / Average value for other emissions
RBW=1MHz, VBW=1/T and Peak detector

3.2.3 Test Setup

Radiated Emissions below 1 GHz

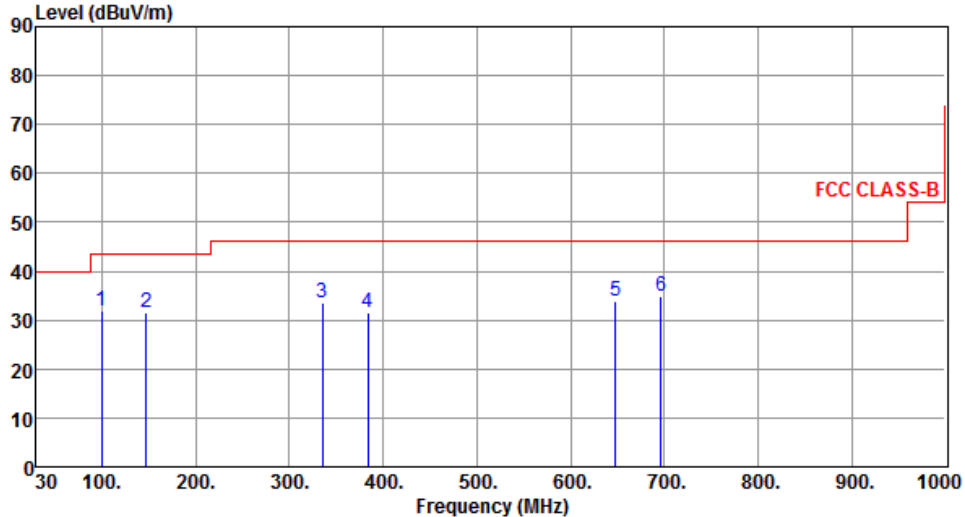


Radiated Emissions above 1 GHz



3.2.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	1

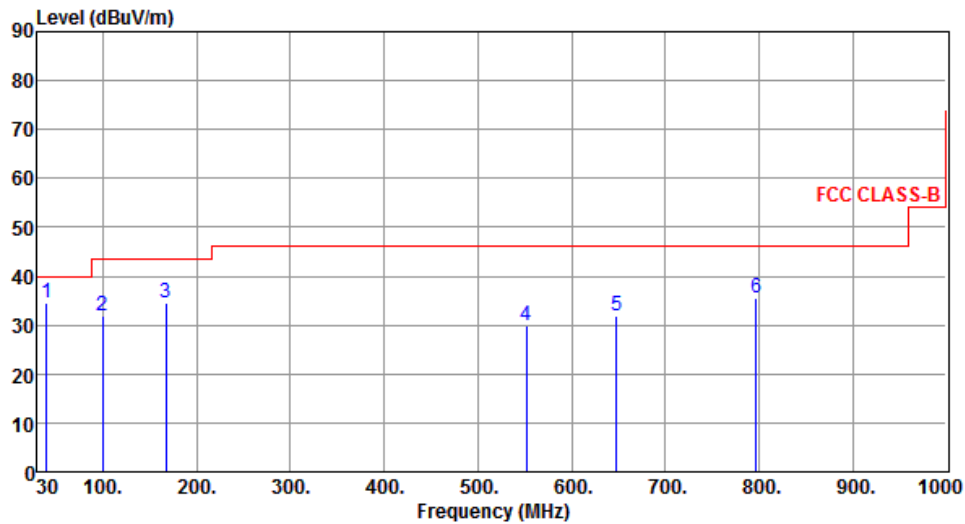


The graph displays the radiated unwanted emissions of a transmitter. The y-axis represents the Level in dBuV/m, ranging from 0 to 90. The x-axis represents the Frequency in MHz, ranging from 30 to 1000. A red line indicates the FCC CLASS-B limit, which is 40 dBuV/m from 30 to 100 MHz, 45 dBuV/m from 100 to 1000 MHz, and 55 dBuV/m from 1000 to 10000 MHz. Six emission peaks are identified and labeled with numbers 1 through 6. The data for these peaks is provided in the table below.

	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	99.84	31.75	43.50	-11.75	45.02	-13.27	Peak	---	---
2	147.37	31.39	43.50	-12.11	39.61	-8.22	Peak	---	---
3	335.55	33.44	46.00	-12.56	40.19	-6.75	Peak	---	---
4	384.05	31.51	46.00	-14.49	36.93	-5.42	Peak	---	---
5	647.89	33.94	46.00	-12.06	34.09	-0.15	Peak	---	---
6	696.39	35.03	46.00	-10.97	34.41	0.62	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
 Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	39.70	34.63	40.00	-5.37	42.98	-8.35	Peak	---	---
2	99.84	31.89	43.50	-11.61	45.16	-13.27	Peak	---	---
3	166.77	34.49	43.50	-9.01	42.75	-8.26	Peak	---	---
4	551.86	30.02	46.00	-15.98	31.98	-1.96	Peak	---	---
5	647.89	31.72	46.00	-14.28	31.87	-0.15	Peak	---	---
6	797.27	35.55	46.00	-10.45	33.01	2.54	Peak	---	---

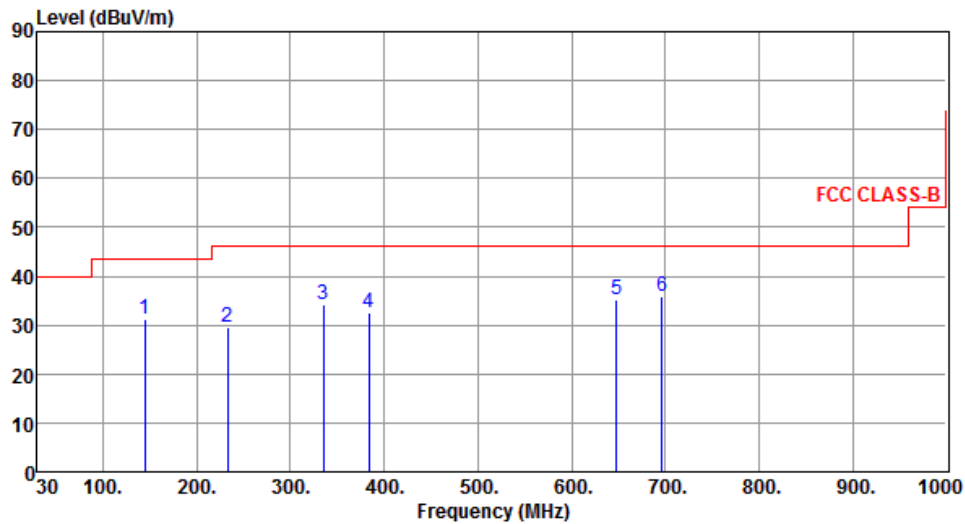
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	144.46	31.09	43.50	-12.41	39.41	-8.32	Peak	---	---
2	232.73	29.68	46.00	-16.32	39.74	-10.06	Peak	---	---
3	335.55	34.19	46.00	-11.81	40.94	-6.75	Peak	---	---
4	384.05	32.52	46.00	-13.48	37.94	-5.42	Peak	---	---
5	647.89	35.34	46.00	-10.66	35.49	-0.15	Peak	---	---
6	696.39	35.83	46.00	-10.17	35.21	0.62	Peak	---	---

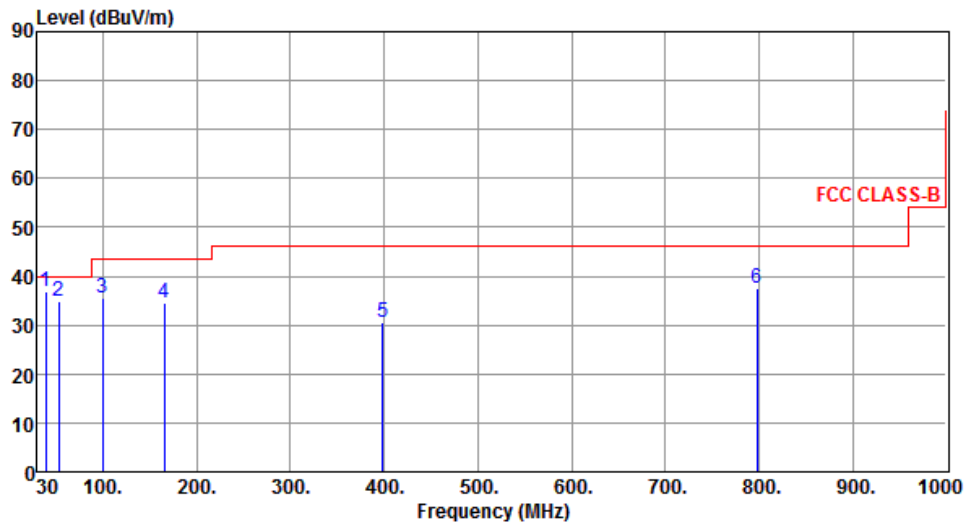
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	38.73	36.87	40.00	-3.13	45.33	-8.46	Peak	---	---
2	53.28	34.84	40.00	-5.16	42.87	-8.03	Peak	---	---
3	99.84	35.56	43.50	-7.94	48.83	-13.27	Peak	---	---
4	165.80	34.45	43.50	-9.05	42.67	-8.22	Peak	---	---
5	398.60	30.60	46.00	-15.40	35.61	-5.01	Peak	---	---
6	798.24	37.47	46.00	-8.53	34.91	2.56	Peak	---	---

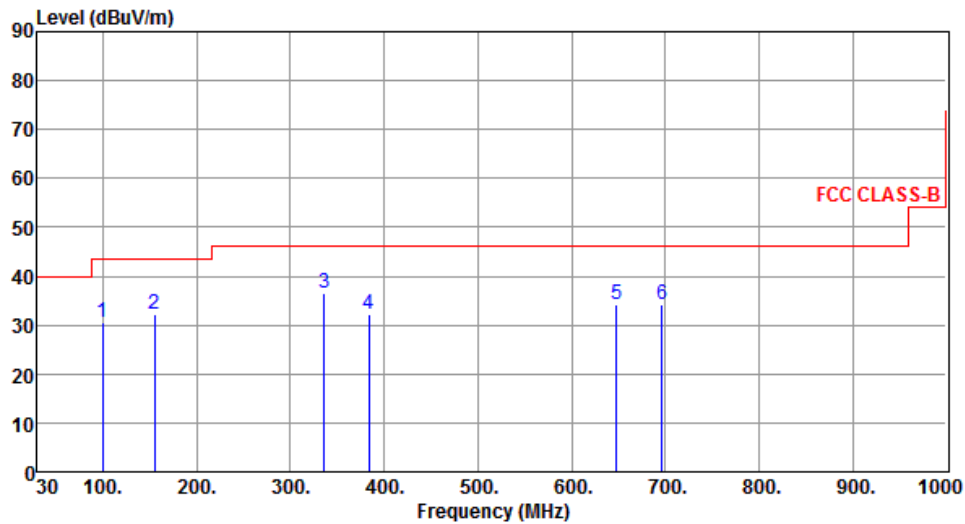
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	3



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	99.84	30.42	43.50	-13.08	43.69	-13.27	Peak	---	---
2	155.13	32.37	43.50	-11.13	40.43	-8.06	Peak	---	---
3	336.52	36.67	46.00	-9.33	43.39	-6.72	Peak	---	---
4	384.05	32.19	46.00	-13.81	37.61	-5.42	Peak	---	---
5	647.89	34.19	46.00	-11.81	34.34	-0.15	Peak	---	---
6	696.39	34.30	46.00	-11.70	33.68	0.62	Peak	---	---

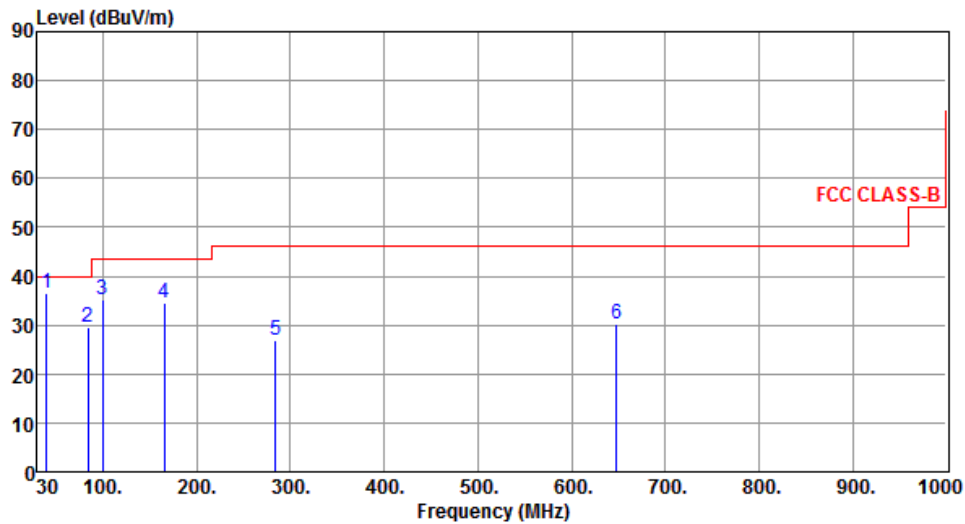
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	3



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	39.70	36.69	40.00	-3.31	45.04	-8.35	Peak	---	---
2	84.32	29.69	40.00	-10.31	43.17	-13.48	Peak	---	---
3	99.84	35.16	43.50	-8.34	48.43	-13.27	Peak	---	---
4	165.80	34.53	43.50	-8.97	42.75	-8.22	Peak	---	---
5	284.14	26.74	46.00	-19.26	34.82	-8.08	Peak	---	---
6	647.89	30.17	46.00	-15.83	30.32	-0.15	Peak	---	---

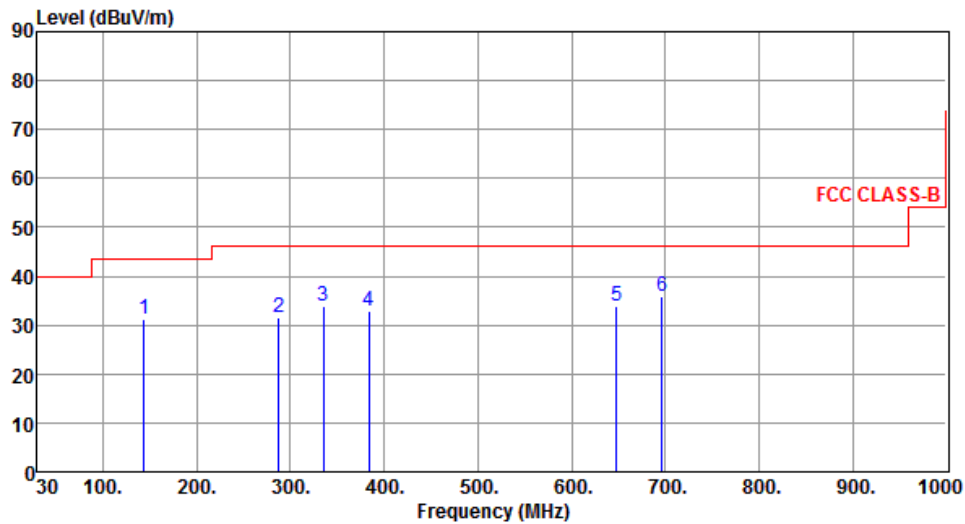
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	4



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	143.49	31.15	43.50	-12.35	39.50	-8.35	Peak	---	---
2	288.02	31.52	46.00	-14.48	39.51	-7.99	Peak	---	---
3	335.55	33.76	46.00	-12.24	40.51	-6.75	Peak	---	---
4	384.05	32.76	46.00	-13.24	38.18	-5.42	Peak	---	---
5	647.89	33.76	46.00	-12.24	33.91	-0.15	Peak	---	---
6	696.39	35.94	46.00	-10.06	35.32	0.62	Peak	---	---

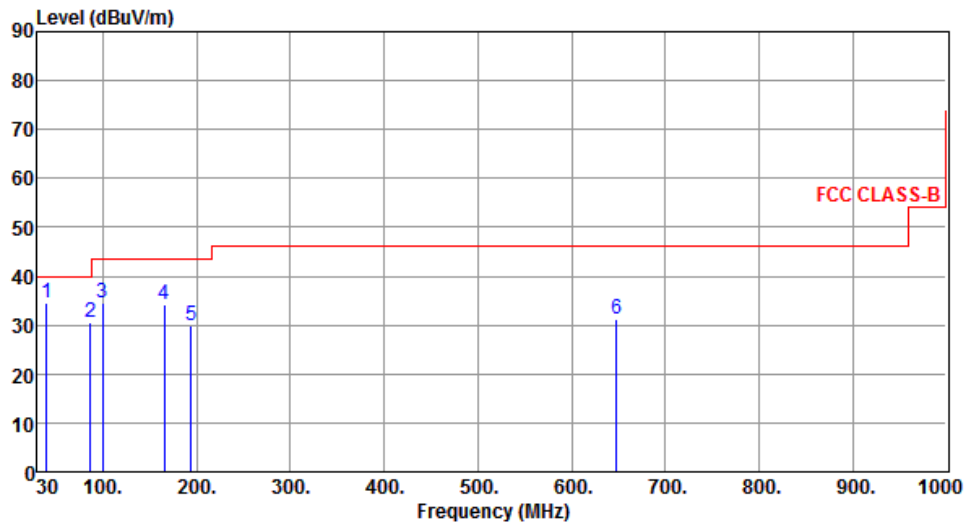
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	4



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	39.70	34.42	40.00	-5.58	42.77	-8.35	Peak	---	---
2	86.26	30.55	40.00	-9.45	44.31	-13.76	Peak	---	---
3	99.84	34.40	43.50	-9.10	47.67	-13.27	Peak	---	---
4	165.80	34.35	43.50	-9.15	42.57	-8.22	Peak	---	---
5	193.93	29.97	43.50	-13.53	40.73	-10.76	Peak	---	---
6	647.89	31.34	46.00	-14.66	31.49	-0.15	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

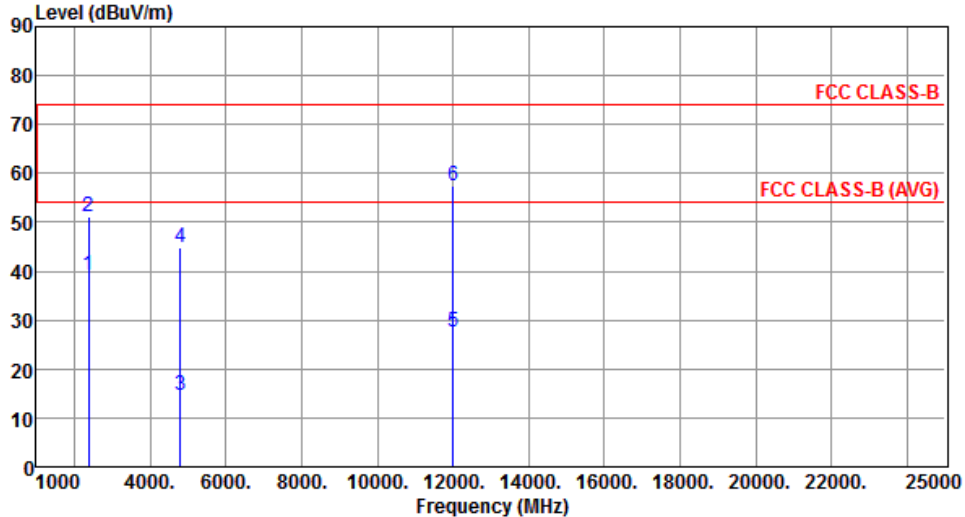
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.2.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for GFSK

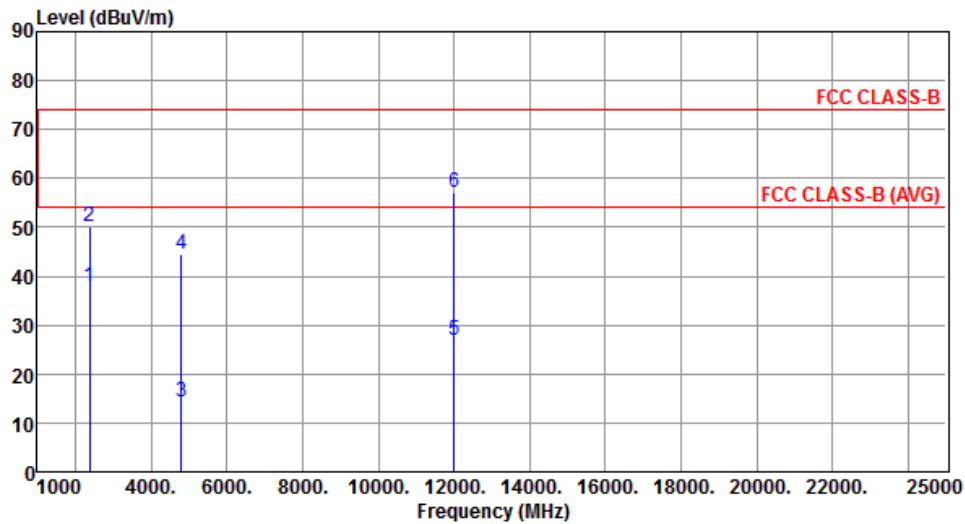
Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.14	54.00	-14.86	40.24	-1.10	Average	100	137
2	2390.00	51.27	74.00	-22.73	52.37	-1.10	Peak	100	137
3	4804.00	14.57	54.00	-39.43	9.32	5.25	Average	100	314
4	4804.00	44.67	74.00	-29.33	39.42	5.25	Peak	100	314
5	12010.00	27.46	54.00	-26.54	12.39	15.07	Average	100	317
6	12010.00	57.56	74.00	-16.44	42.49	15.07	Peak	100	317

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical	Test Configuration	1



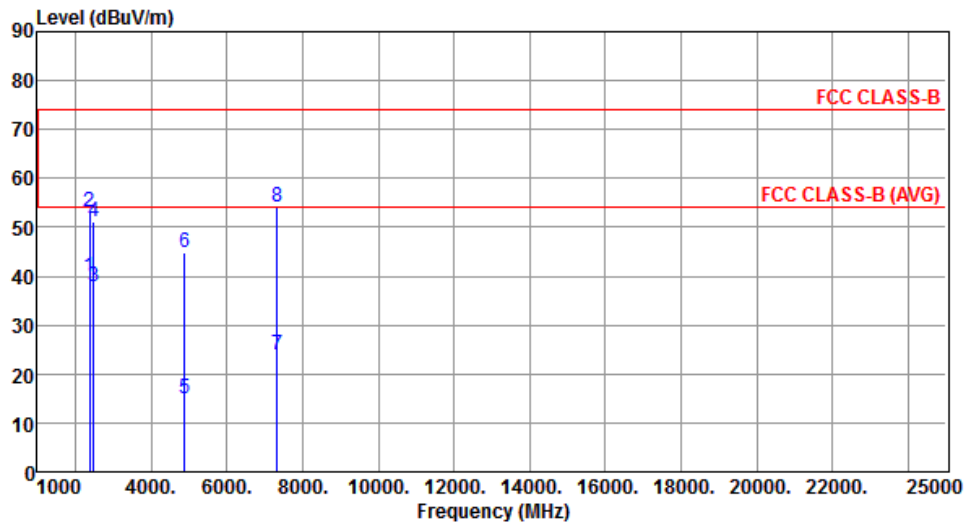
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.82	54.00	-16.18	38.92	-1.10	Average	373	40
2	2390.00	50.29	74.00	-23.71	51.39	-1.10	Peak	373	40
3	4804.00	14.28	54.00	-39.72	9.03	5.25	Average	100	197
4	4804.00	44.38	74.00	-29.62	39.13	5.25	Peak	100	197
5	12010.00	26.89	54.00	-27.11	11.82	15.07	Average	100	0
6	12010.00	56.99	74.00	-17.01	41.92	15.07	Peak	100	0

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal	Test Configuration	1



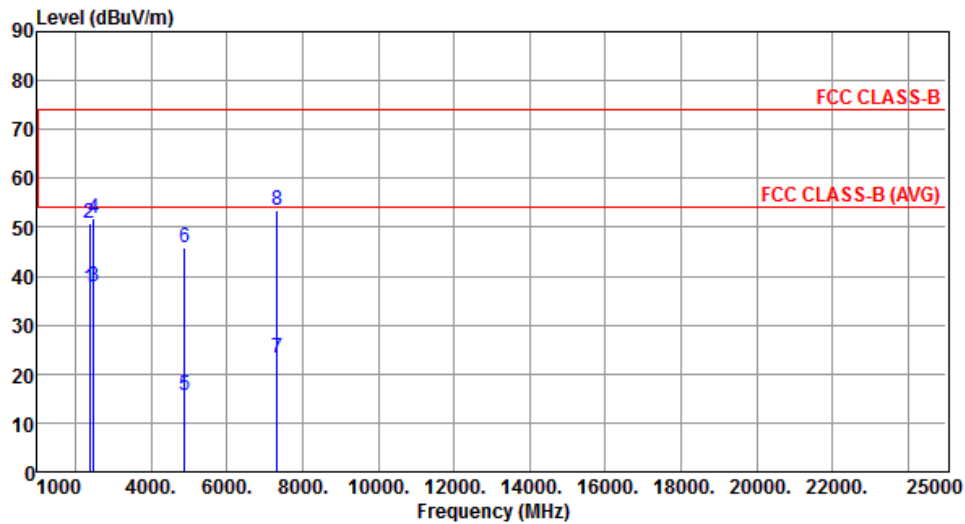
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.83	54.00	-14.17	40.93	-1.10	Average	111	134
2	2390.00	53.09	74.00	-20.91	54.19	-1.10	Peak	111	134
3	2483.50	37.83	54.00	-16.17	38.44	-0.61	Average	100	313
4	2483.50	51.12	74.00	-22.88	51.73	-0.61	Peak	100	313
5	4882.00	14.78	54.00	-39.22	9.34	5.44	Average	100	296
6	4882.00	44.88	74.00	-29.12	39.44	5.44	Peak	100	296
7	7323.00	23.92	54.00	-30.08	13.64	10.28	Average	100	313
8	7323.00	54.02	74.00	-19.98	43.74	10.28	Peak	100	313

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical	Test Configuration	1



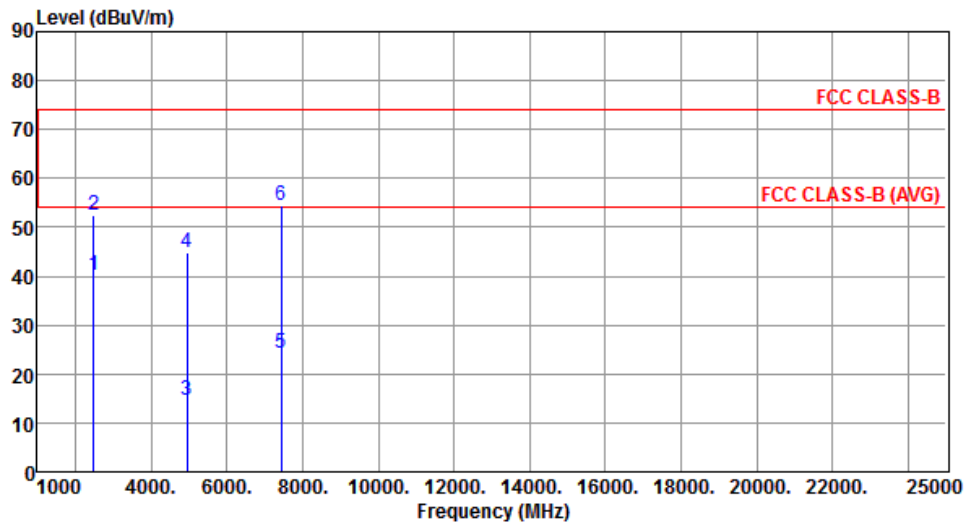
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.66	54.00	-16.34	38.76	-1.10	Average	400	161
2	2390.00	50.92	74.00	-23.08	52.02	-1.10	Peak	400	161
3	2483.50	37.71	54.00	-16.29	38.32	-0.61	Average	400	161
4	2483.50	51.74	74.00	-22.26	52.35	-0.61	Peak	400	161
5	4882.00	15.60	54.00	-38.40	10.16	5.44	Average	100	190
6	4882.00	45.70	74.00	-28.30	40.26	5.44	Peak	100	190
7	7323.00	23.31	54.00	-30.69	13.03	10.28	Average	117	304
8	7323.00	53.41	74.00	-20.59	43.13	10.28	Peak	117	304

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	1



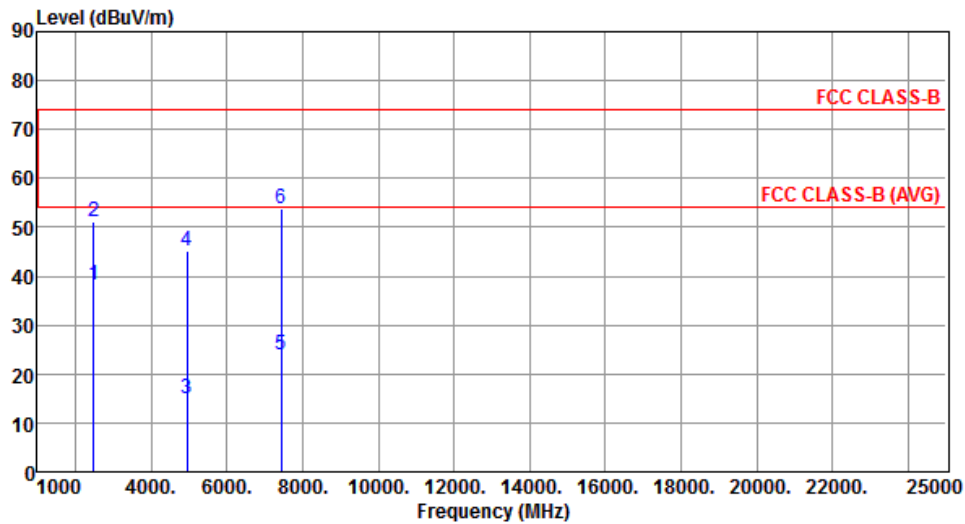
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	40.34	54.00	-13.66	40.95	-0.61	Average	106	132
2	2483.50	52.39	74.00	-21.61	53.00	-0.61	Peak	106	132
3	4960.00	14.65	54.00	-39.35	9.03	5.62	Average	100	296
4	4960.00	44.75	74.00	-29.25	39.13	5.62	Peak	100	296
5	7440.00	24.40	54.00	-29.60	13.84	10.56	Average	100	316
6	7440.00	54.50	74.00	-19.50	43.94	10.56	Peak	100	316

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	1



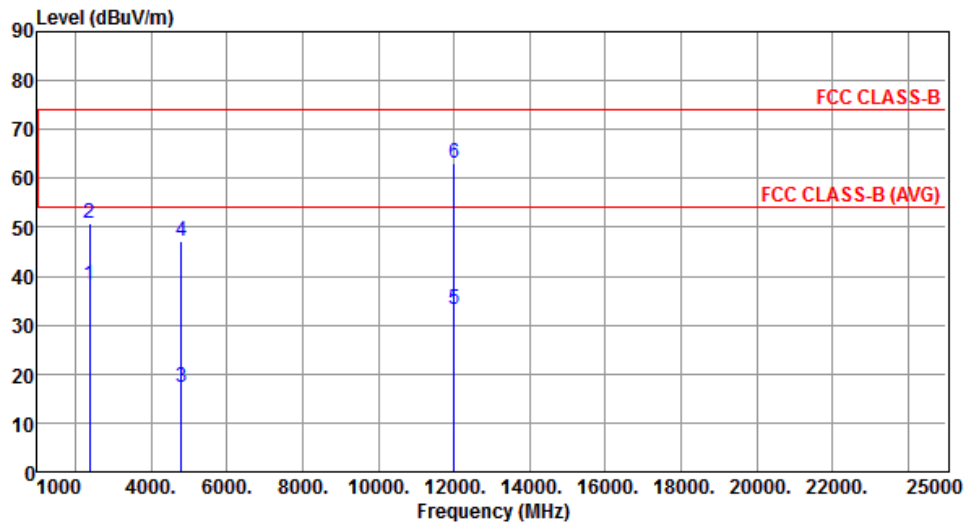
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	38.33	54.00	-15.67	38.94	-0.61	Average	344	40
2	2483.50	51.26	74.00	-22.74	51.87	-0.61	Peak	344	40
3	4960.00	14.90	54.00	-39.10	9.28	5.62	Average	100	129
4	4960.00	45.00	74.00	-29.00	39.38	5.62	Peak	100	129
5	7440.00	23.76	54.00	-30.24	13.20	10.56	Average	100	309
6	7440.00	53.86	74.00	-20.14	43.30	10.56	Peak	100	309

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Horizontal	Test Configuration	2



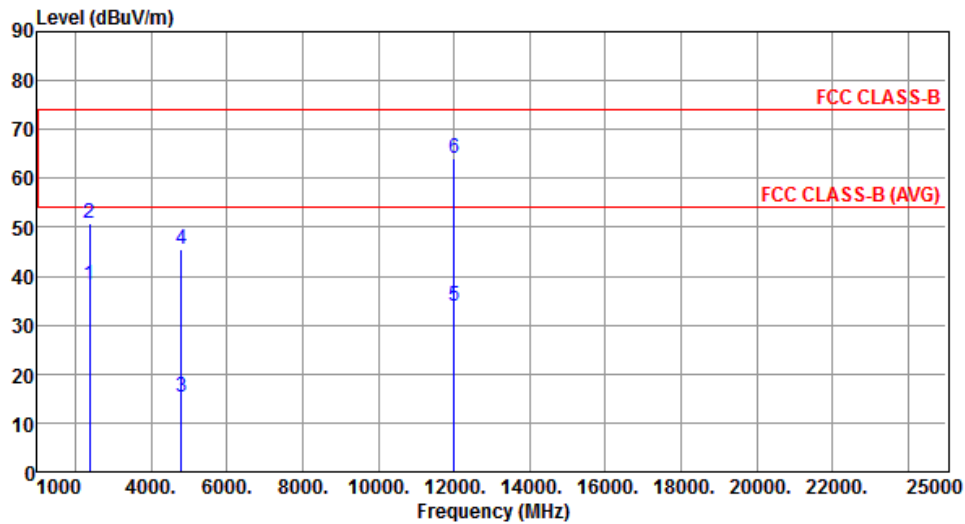
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.29	54.00	-15.71	39.39	-1.10	Average	167	89
2	2390.00	50.76	74.00	-23.24	51.86	-1.10	Peak	167	89
3	4804.00	17.21	54.00	-36.79	11.96	5.25	Average	282	220
4	4804.00	47.31	74.00	-26.69	42.06	5.25	Peak	282	220
5	12010.00	33.05	54.00	-20.95	17.98	15.07	Average	213	222
6	12010.00	63.15	74.00	-10.85	48.08	15.07	Peak	213	222

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical	Test Configuration	2



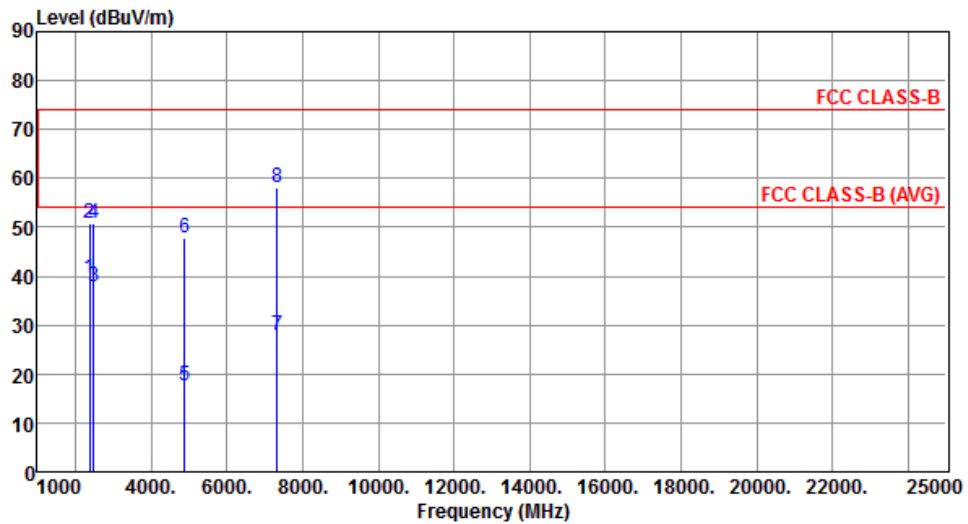
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.29	54.00	-15.71	39.39	-1.10	Average	365	16
2	2390.00	50.76	74.00	-23.24	51.86	-1.10	Peak	365	16
3	4804.00	15.28	54.00	-38.72	10.03	5.25	Average	315	139
4	4804.00	45.38	74.00	-28.62	40.13	5.25	Peak	315	139
5	12010.00	33.87	54.00	-20.13	18.80	15.07	Average	348	159
6	12010.00	63.97	74.00	-10.03	48.90	15.07	Peak	348	159

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal	Test Configuration	2



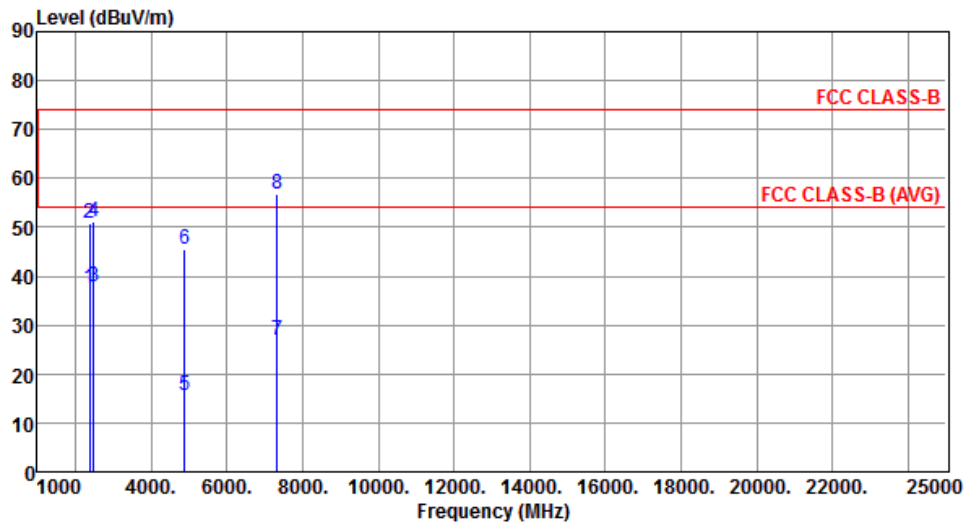
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.46	54.00	-14.54	40.56	-1.10	Average	131	99
2	2390.00	50.96	74.00	-23.04	52.06	-1.10	Peak	131	99
3	2483.50	37.84	54.00	-16.16	38.45	-0.61	Average	131	99
4	2483.50	50.71	74.00	-23.29	51.32	-0.61	Peak	131	99
5	4882.00	17.57	54.00	-36.43	12.13	5.44	Average	275	213
6	4882.00	47.67	74.00	-26.33	42.23	5.44	Peak	275	213
7	7323.00	27.96	54.00	-26.04	17.68	10.28	Average	231	32
8	7323.00	58.06	74.00	-15.94	47.78	10.28	Peak	231	32

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical	Test Configuration	2



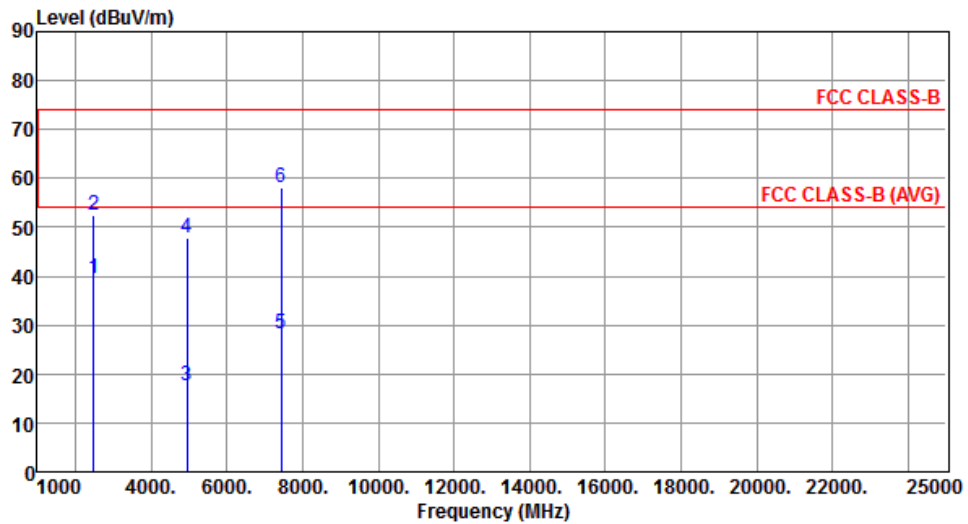
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.63	54.00	-16.37	38.73	-1.10	Average	308	359
2	2390.00	50.71	74.00	-23.29	51.81	-1.10	Peak	308	359
3	2483.50	37.84	54.00	-16.16	38.45	-0.61	Average	308	359
4	2483.50	51.00	74.00	-23.00	51.61	-0.61	Peak	308	359
5	4882.00	15.52	54.00	-38.48	10.08	5.44	Average	311	135
6	4882.00	45.62	74.00	-28.38	40.18	5.44	Peak	311	135
7	7323.00	26.85	54.00	-27.15	16.57	10.28	Average	312	159
8	7323.00	56.95	74.00	-17.05	46.67	10.28	Peak	312	159

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	2



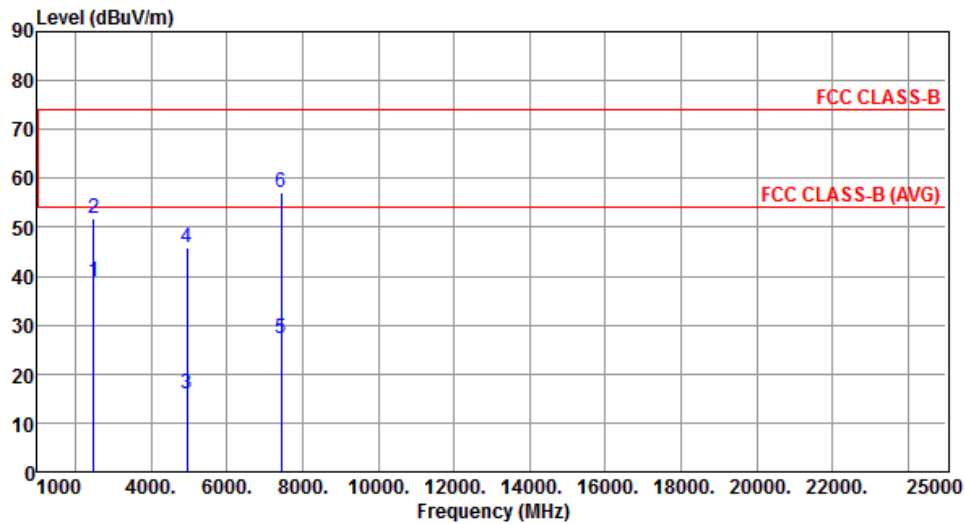
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.68	54.00	-14.32	40.29	-0.61	Average	127	100
2	2483.50	52.40	74.00	-21.60	53.01	-0.61	Peak	127	100
3	4960.00	17.66	54.00	-36.34	12.04	5.62	Average	269	220
4	4960.00	47.76	74.00	-26.24	42.14	5.62	Peak	269	220
5	7440.00	28.13	54.00	-25.87	17.57	10.56	Average	225	28
6	7440.00	58.23	74.00	-15.77	47.67	10.56	Peak	225	28

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	2



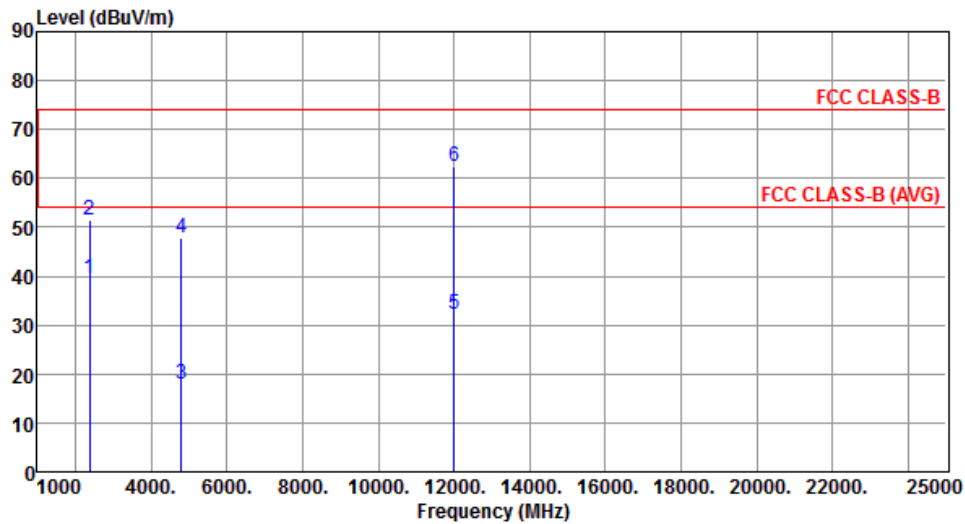
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	38.76	54.00	-15.24	39.37	-0.61	Average	344	3
2	2483.50	51.97	74.00	-22.03	52.58	-0.61	Peak	344	3
3	4960.00	15.78	54.00	-38.22	10.16	5.62	Average	305	137
4	4960.00	45.88	74.00	-28.12	40.26	5.62	Peak	305	137
5	7440.00	27.12	54.00	-26.88	16.56	10.56	Average	289	153
6	7440.00	57.22	74.00	-16.78	46.66	10.56	Peak	289	153

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Horizontal	Test Configuration	3



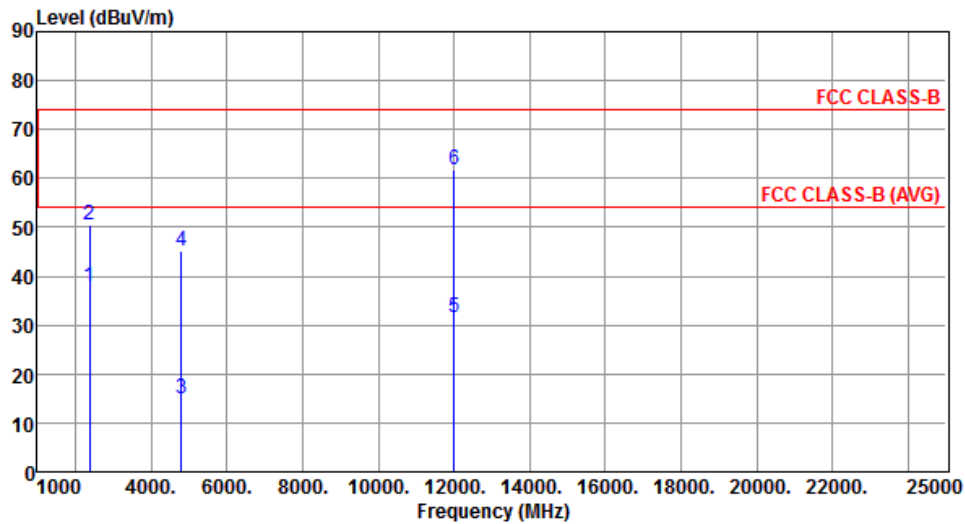
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.64	54.00	-14.36	40.74	-1.10	Average	119	130
2	2390.00	51.44	74.00	-22.56	52.54	-1.10	Peak	119	130
3	4804.00	17.82	54.00	-36.18	12.57	5.25	Average	293	265
4	4804.00	47.92	74.00	-26.08	42.67	5.25	Peak	293	265
5	12010.00	32.36	54.00	-21.64	17.29	15.07	Average	216	284
6	12010.00	62.46	74.00	-11.54	47.39	15.07	Peak	216	284

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical	Test Configuration	3



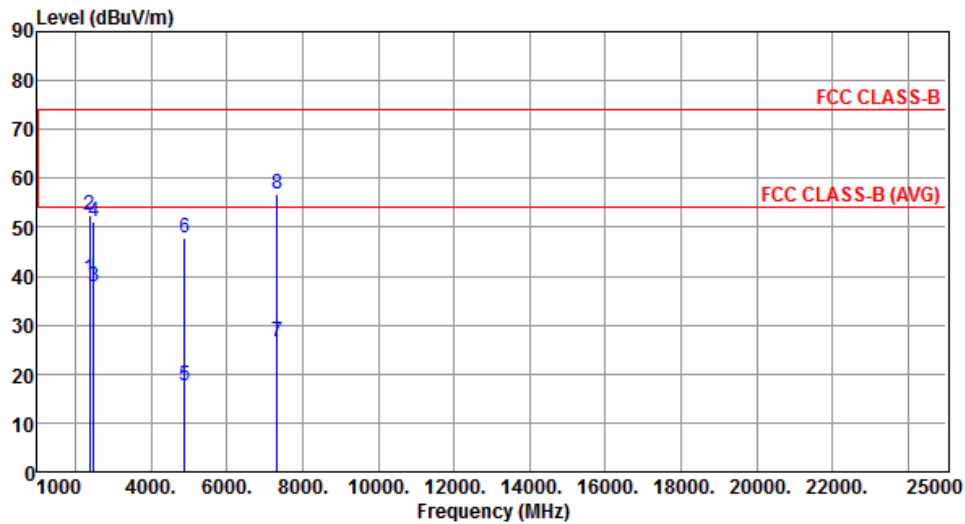
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.77	54.00	-16.23	38.87	-1.10	Average	287	198
2	2390.00	50.44	74.00	-23.56	51.54	-1.10	Peak	287	198
3	4804.00	15.10	54.00	-38.90	9.85	5.25	Average	203	221
4	4804.00	45.20	74.00	-28.80	39.95	5.25	Peak	203	221
5	12010.00	31.62	54.00	-22.38	16.55	15.07	Average	275	319
6	12010.00	61.72	74.00	-12.28	46.65	15.07	Peak	275	319

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal	Test Configuration	3



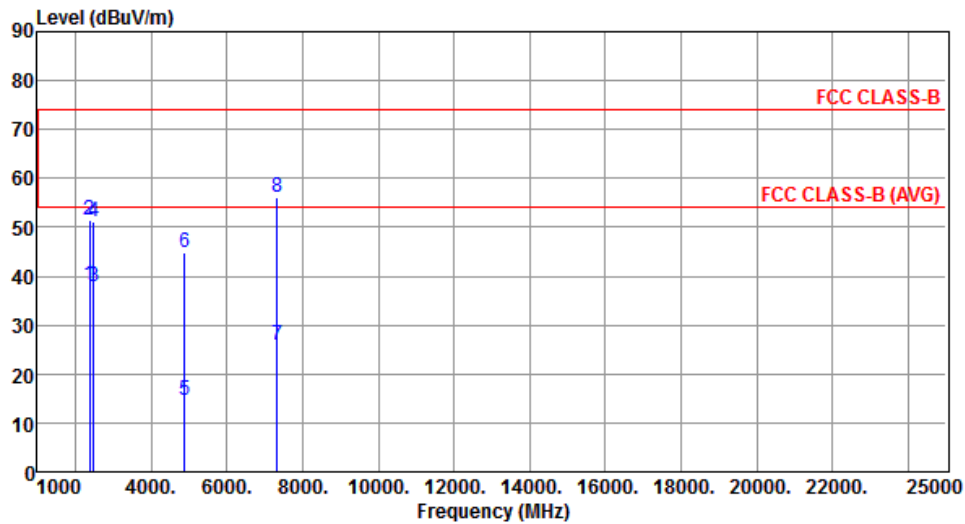
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.57	54.00	-14.43	40.67	-1.10	Average	109	136
2	2390.00	52.34	74.00	-21.66	53.44	-1.10	Peak	109	136
3	2483.50	37.92	54.00	-16.08	38.53	-0.61	Average	109	136
4	2483.50	51.14	74.00	-22.86	51.75	-0.61	Peak	109	136
5	4882.00	17.58	54.00	-36.42	12.14	5.44	Average	297	273
6	4882.00	47.68	74.00	-26.32	42.24	5.44	Peak	297	273
7	7323.00	26.66	54.00	-27.34	16.38	10.28	Average	350	91
8	7323.00	56.76	74.00	-17.24	46.48	10.28	Peak	350	91

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical	Test Configuration	3



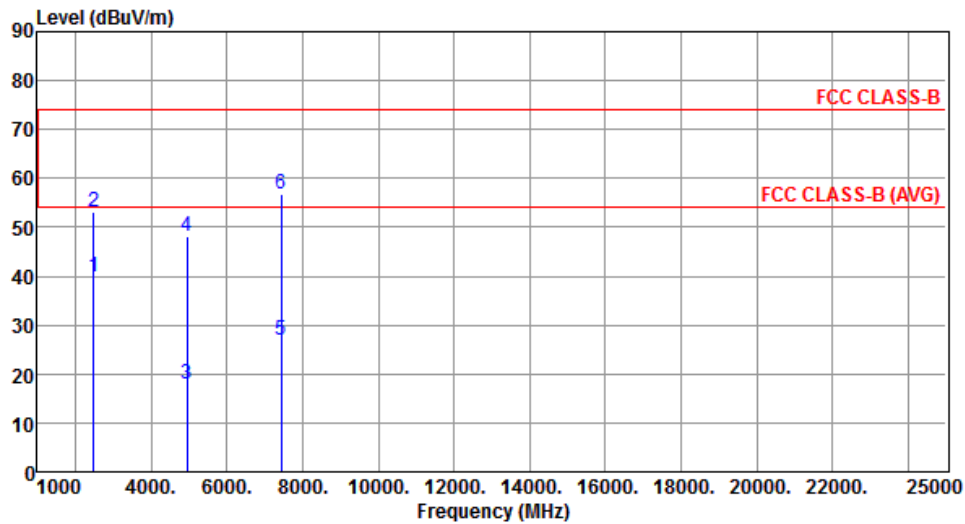
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.27	54.00	-15.73	39.37	-1.10	Average	309	194
2	2390.00	51.31	74.00	-22.69	52.41	-1.10	Peak	309	194
3	2483.50	37.86	54.00	-16.14	38.47	-0.61	Average	309	194
4	2483.50	51.07	74.00	-22.93	51.68	-0.61	Peak	309	194
5	4882.00	14.69	54.00	-39.31	9.25	5.44	Average	208	225
6	4882.00	44.79	74.00	-29.21	39.35	5.44	Peak	208	225
7	7323.00	25.87	54.00	-28.13	15.59	10.28	Average	306	304
8	7323.00	55.97	74.00	-18.03	45.69	10.28	Peak	306	304

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	3



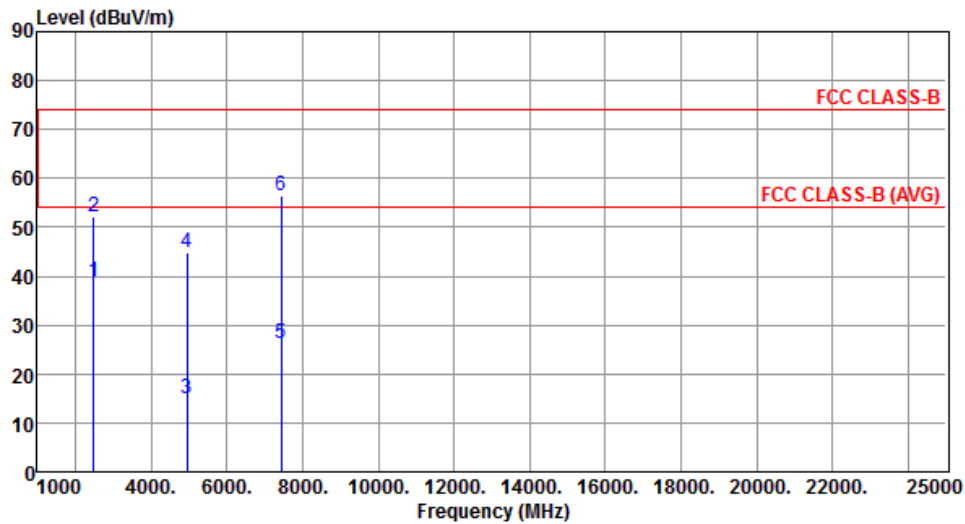
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.69	54.00	-14.31	40.30	-0.61	Average	110	130
2	2483.50	53.26	74.00	-20.74	53.87	-0.61	Peak	110	130
3	4960.00	17.94	54.00	-36.06	12.32	5.62	Average	293	268
4	4960.00	48.04	74.00	-25.96	42.42	5.62	Peak	293	268
5	7440.00	26.82	54.00	-27.18	16.26	10.56	Average	342	85
6	7440.00	56.92	74.00	-17.08	46.36	10.56	Peak	342	85

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	3



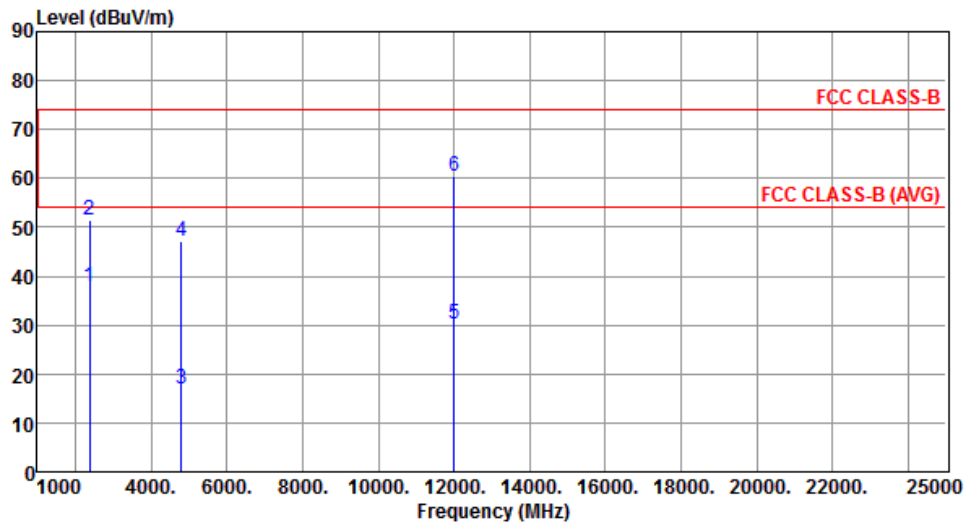
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.02	54.00	-14.98	39.63	-0.61	Average	343	194
2	2483.50	52.05	74.00	-21.95	52.66	-0.61	Peak	343	194
3	4960.00	14.87	54.00	-39.13	9.25	5.62	Average	205	221
4	4960.00	44.97	74.00	-29.03	39.35	5.62	Peak	205	221
5	7440.00	26.24	54.00	-27.76	15.68	10.56	Average	302	302
6	7440.00	56.34	74.00	-17.66	45.78	10.56	Peak	302	302

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Horizontal	Test Configuration	4



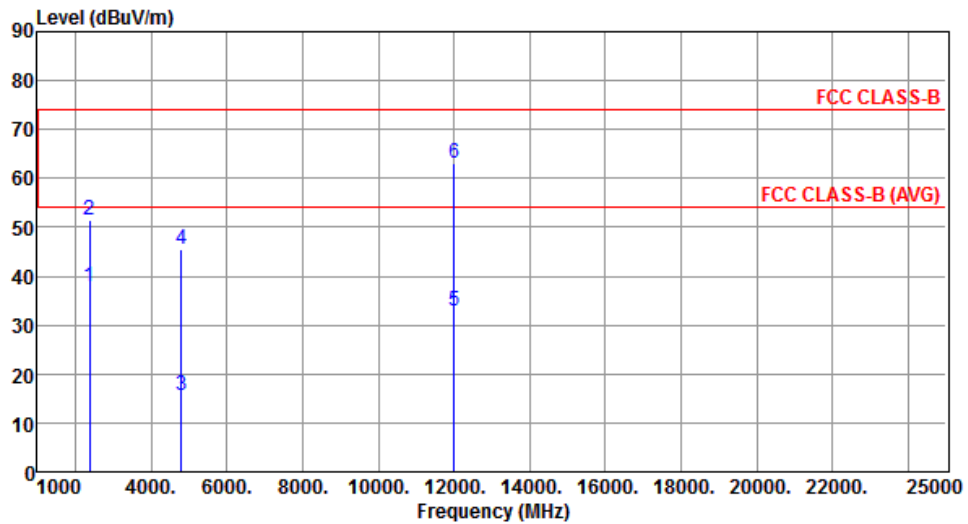
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.88	54.00	-16.12	38.98	-1.10	Average	281	254
2	2390.00	51.52	74.00	-22.48	52.62	-1.10	Peak	281	254
3	4804.00	16.99	54.00	-37.01	11.74	5.25	Average	263	217
4	4804.00	47.09	74.00	-26.91	41.84	5.25	Peak	263	217
5	12010.00	30.20	54.00	-23.80	15.13	15.07	Average	342	307
6	12010.00	60.30	74.00	-13.70	45.23	15.07	Peak	342	307

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2402
Polarization	Vertical	Test Configuration	4



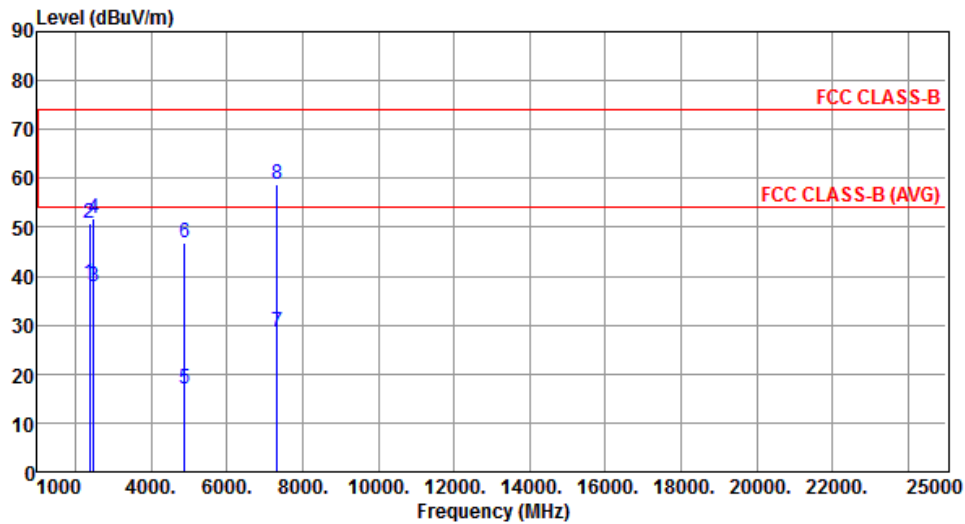
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.84	54.00	-16.16	38.94	-1.10	Average	326	1
2	2390.00	51.45	74.00	-22.55	52.55	-1.10	Peak	326	1
3	4804.00	15.55	54.00	-38.45	10.30	5.25	Average	168	182
4	4804.00	45.65	74.00	-28.35	40.40	5.25	Peak	168	182
5	12010.00	32.87	54.00	-21.13	17.80	15.07	Average	373	113
6	12010.00	62.97	74.00	-11.03	47.90	15.07	Peak	373	113

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Horizontal	Test Configuration	4



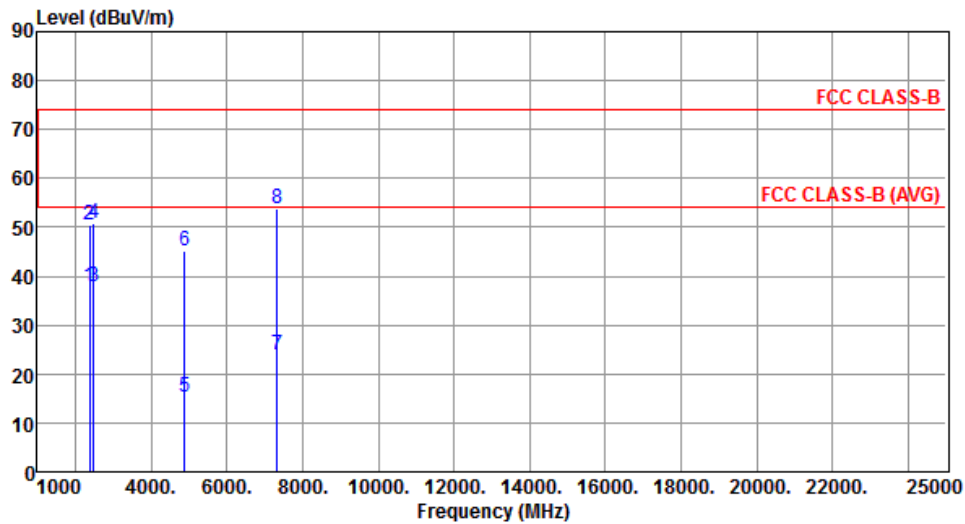
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.38	54.00	-15.62	39.48	-1.10	Average	313	253
2	2390.00	50.78	74.00	-23.22	51.88	-1.10	Peak	313	253
3	2483.50	37.93	54.00	-16.07	38.54	-0.61	Average	313	253
4	2483.50	51.71	74.00	-22.29	52.32	-0.61	Peak	313	253
5	4882.00	16.86	54.00	-37.14	11.42	5.44	Average	272	211
6	4882.00	46.96	74.00	-27.04	41.52	5.44	Peak	272	211
7	7323.00	28.69	54.00	-25.31	18.41	10.28	Average	234	33
8	7323.00	58.79	74.00	-15.21	48.51	10.28	Peak	234	33

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2441
Polarization	Vertical	Test Configuration	4



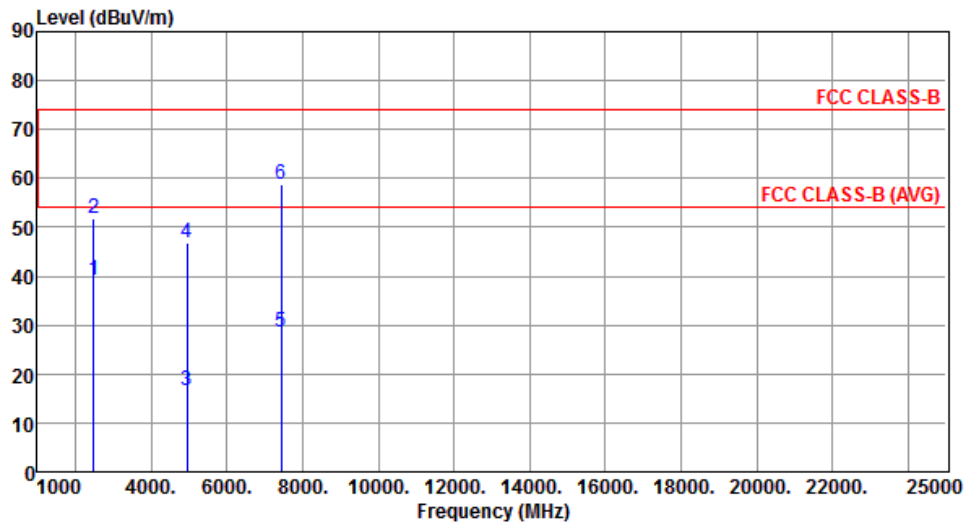
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.86	54.00	-16.14	38.96	-1.10	Average	311	1
2	2390.00	50.52	74.00	-23.48	51.62	-1.10	Peak	311	1
3	2483.50	37.81	54.00	-16.19	38.42	-0.61	Average	311	1
4	2483.50	50.81	74.00	-23.19	51.42	-0.61	Peak	311	1
5	4882.00	15.22	54.00	-38.78	9.78	5.44	Average	161	184
6	4882.00	45.32	74.00	-28.68	39.88	5.44	Peak	161	184
7	7323.00	23.75	54.00	-30.25	13.47	10.28	Average	106	18
8	7323.00	53.85	74.00	-20.15	43.57	10.28	Peak	106	18

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	4



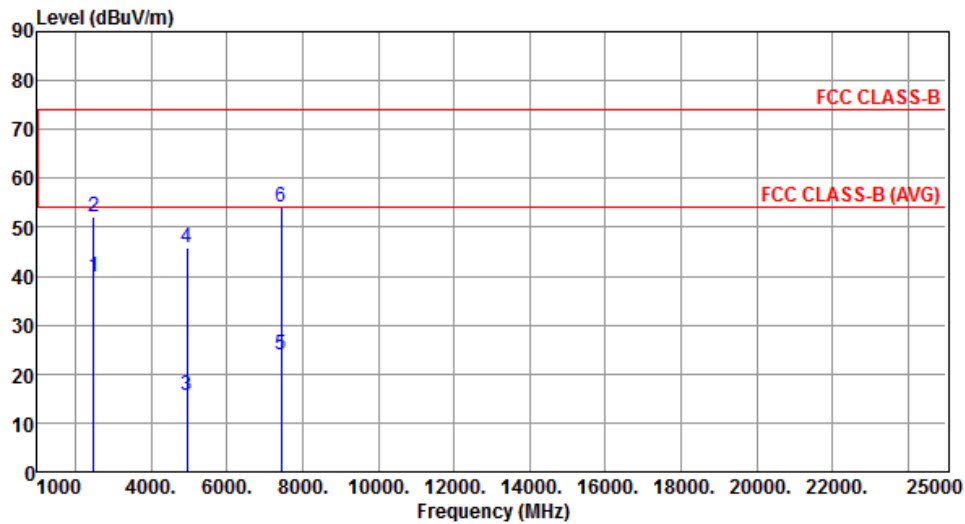
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.05	54.00	-14.95	39.66	-0.61	Average	304	252
2	2483.50	51.88	74.00	-22.12	52.49	-0.61	Peak	304	252
3	4960.00	16.75	54.00	-37.25	11.13	5.62	Average	275	213
4	4960.00	46.85	74.00	-27.15	41.23	5.62	Peak	275	213
5	7440.00	28.52	54.00	-25.48	17.96	10.56	Average	230	38
6	7440.00	58.62	74.00	-15.38	48.06	10.56	Peak	230	38

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	GFSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	4



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.77	54.00	-14.23	40.38	-0.61	Average	342	3
2	2483.50	52.03	74.00	-21.97	52.64	-0.61	Peak	342	3
3	4960.00	15.58	54.00	-38.42	9.96	5.62	Average	169	180
4	4960.00	45.68	74.00	-28.32	40.06	5.62	Peak	169	180
5	7440.00	23.95	54.00	-30.05	13.39	10.56	Average	102	13
6	7440.00	54.05	74.00	-19.95	43.49	10.56	Peak	102	13

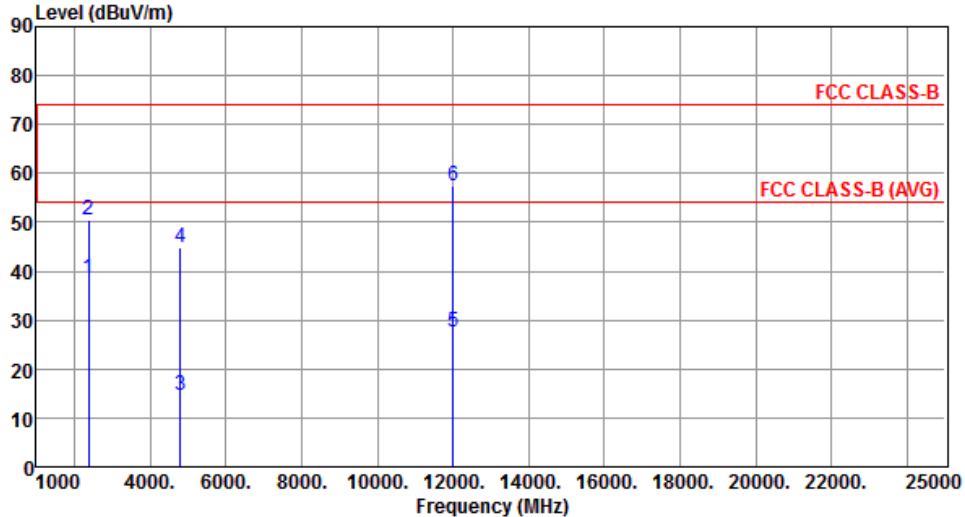
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

3.2.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 8DPSK

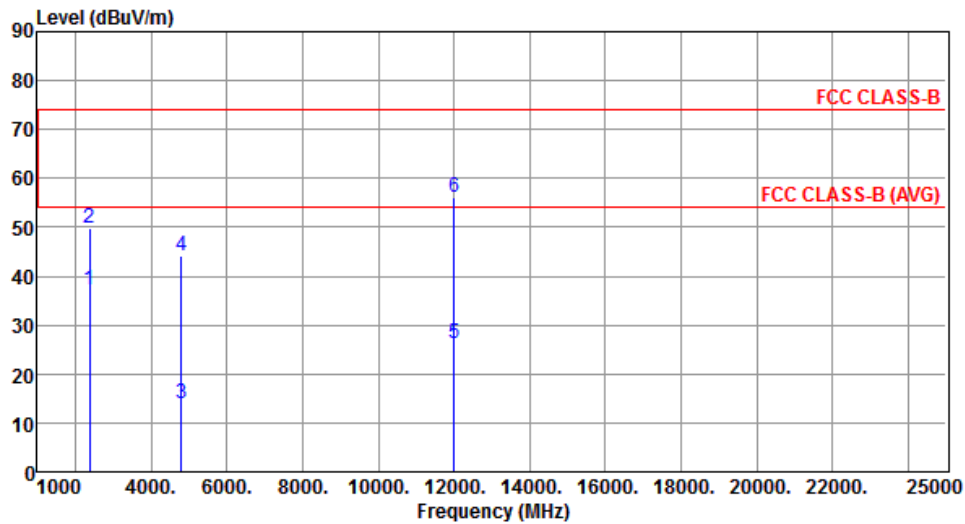
Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.44	54.00	-15.56	39.54	-1.10	Average	100	135
2	2390.00	50.57	74.00	-23.43	51.67	-1.10	Peak	100	135
3	4804.00	14.57	54.00	-39.43	9.32	5.25	Average	100	311
4	4804.00	44.67	74.00	-29.33	39.42	5.25	Peak	100	311
5	12010.00	27.46	54.00	-26.54	12.39	15.07	Average	100	314
6	12010.00	57.56	74.00	-16.44	42.49	15.07	Peak	100	314

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Vertical	Test Configuration	1



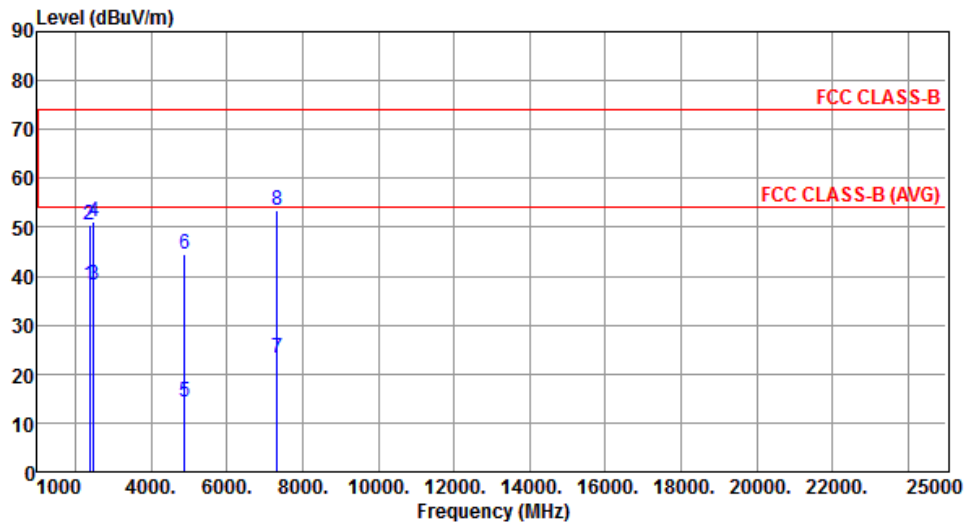
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.32	54.00	-16.68	38.42	-1.10	Average	370	38
2	2390.00	49.74	74.00	-24.26	50.84	-1.10	Peak	370	38
3	4804.00	13.95	54.00	-40.05	8.70	5.25	Average	100	196
4	4804.00	44.05	74.00	-29.95	38.80	5.25	Peak	100	196
5	12010.00	26.09	54.00	-27.91	11.02	15.07	Average	100	3
6	12010.00	56.19	74.00	-17.81	41.12	15.07	Peak	100	3

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Horizontal	Test Configuration	1



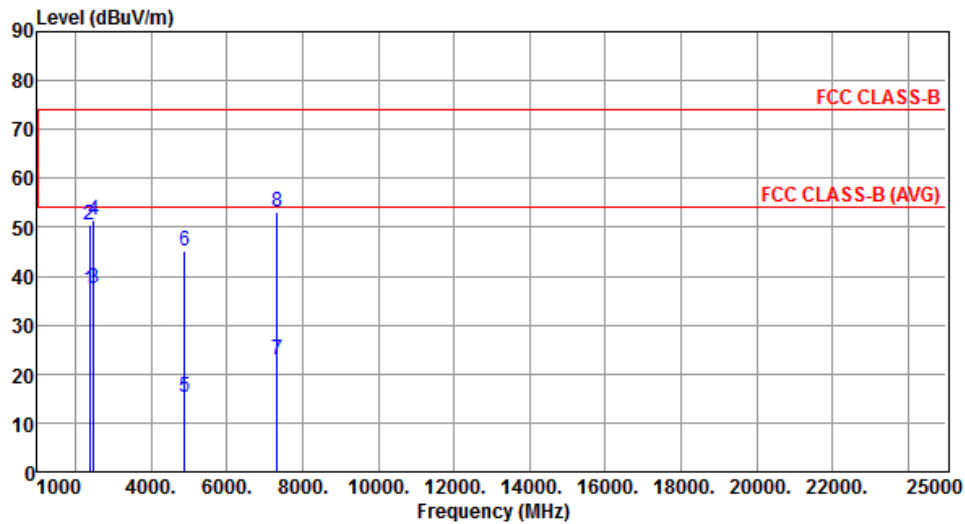
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.11	54.00	-15.89	39.21	-1.10	Average	100	134
2	2390.00	50.45	74.00	-23.55	51.55	-1.10	Peak	100	134
3	2483.50	38.20	54.00	-15.80	38.81	-0.61	Average	100	134
4	2483.50	51.20	74.00	-22.80	51.81	-0.61	Peak	100	134
5	4882.00	14.44	54.00	-39.56	9.00	5.44	Average	100	299
6	4882.00	44.54	74.00	-29.46	39.10	5.44	Peak	100	299
7	7323.00	23.35	54.00	-30.65	13.07	10.28	Average	100	315
8	7323.00	53.45	74.00	-20.55	43.17	10.28	Peak	100	315

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Vertical	Test Configuration	1



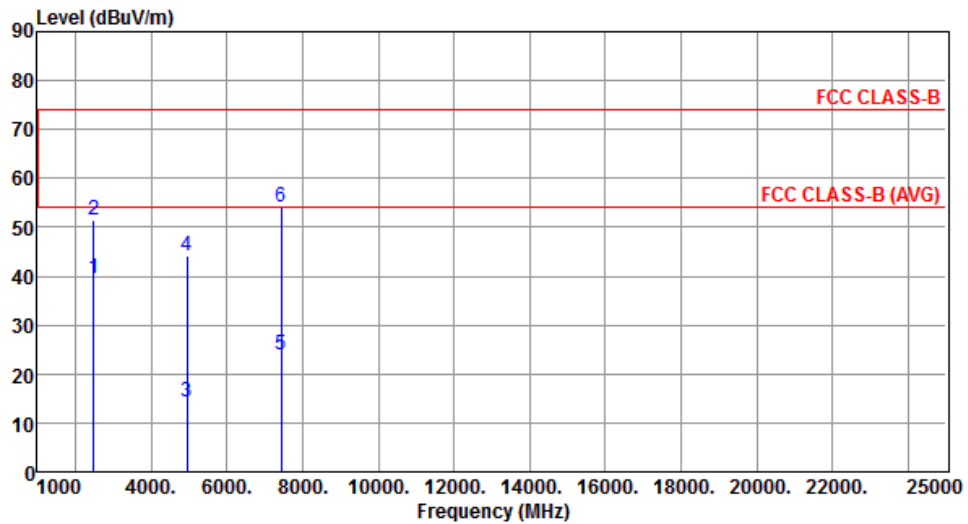
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.16	54.00	-16.84	38.26	-1.10	Average	397	159
2	2390.00	50.42	74.00	-23.58	51.52	-1.10	Peak	397	159
3	2483.50	37.41	54.00	-16.59	38.02	-0.61	Average	397	159
4	2483.50	51.34	74.00	-22.66	51.95	-0.61	Peak	397	159
5	4882.00	15.20	54.00	-38.80	9.76	5.44	Average	100	187
6	4882.00	45.30	74.00	-28.70	39.86	5.44	Peak	100	187
7	7323.00	22.98	54.00	-31.02	12.70	10.28	Average	115	302
8	7323.00	53.08	74.00	-20.92	42.80	10.28	Peak	115	302

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	1



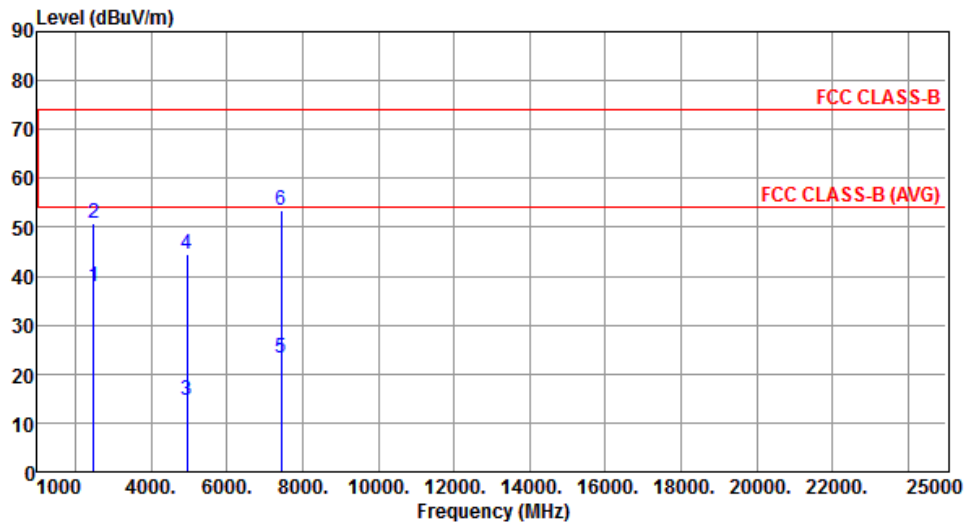
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.60	54.00	-14.40	40.21	-0.61	Average	104	130
2	2483.50	51.60	74.00	-22.40	52.21	-0.61	Peak	104	130
3	4960.00	14.15	54.00	-39.85	8.53	5.62	Average	100	299
4	4960.00	44.25	74.00	-29.75	38.63	5.62	Peak	100	299
5	7440.00	24.00	54.00	-30.00	13.44	10.56	Average	100	314
6	7440.00	54.10	74.00	-19.90	43.54	10.56	Peak	100	314

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	1



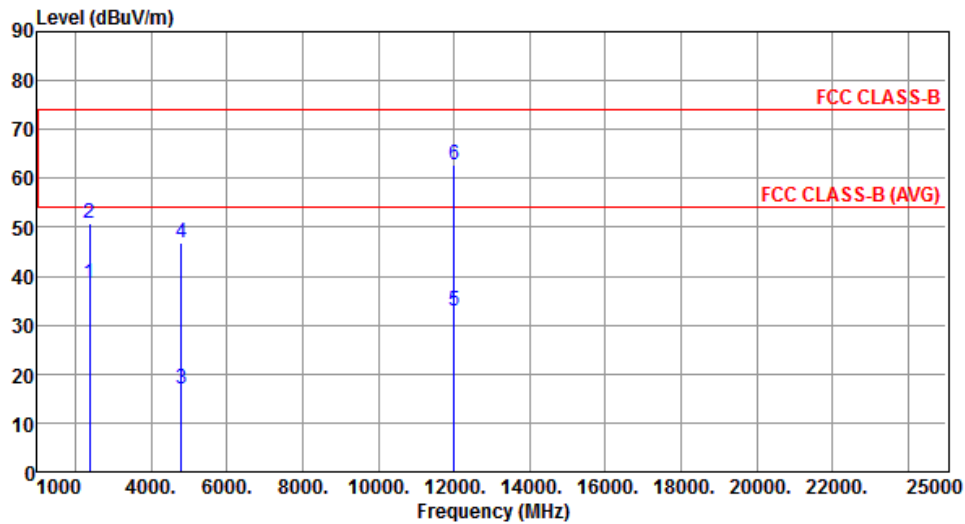
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	37.93	54.00	-16.07	38.54	-0.61	Average	343	43
2	2483.50	50.76	74.00	-23.24	51.37	-0.61	Peak	343	43
3	4960.00	14.50	54.00	-39.50	8.88	5.62	Average	100	131
4	4960.00	44.60	74.00	-29.40	38.98	5.62	Peak	100	131
5	7440.00	23.36	54.00	-30.64	12.80	10.56	Average	100	311
6	7440.00	53.46	74.00	-20.54	42.90	10.56	Peak	100	311

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Horizontal	Test Configuration	2



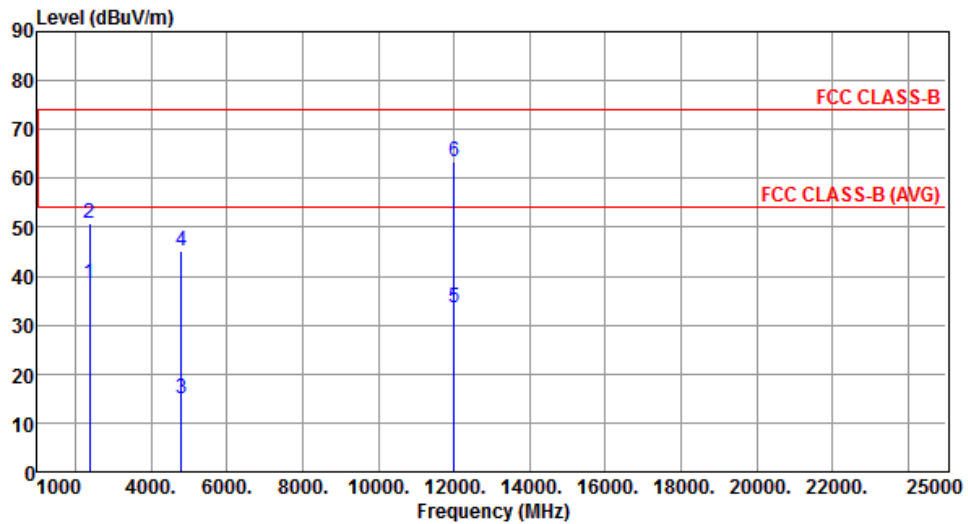
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.54	54.00	-15.46	39.64	-1.10	Average	162	83
2	2390.00	50.93	74.00	-23.07	52.03	-1.10	Peak	162	83
3	4804.00	16.86	54.00	-37.14	11.61	5.25	Average	276	225
4	4804.00	46.96	74.00	-27.04	41.71	5.25	Peak	276	225
5	12010.00	32.75	54.00	-21.25	17.68	15.07	Average	210	213
6	12010.00	62.85	74.00	-11.15	47.78	15.07	Peak	210	213

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Vertical	Test Configuration	2



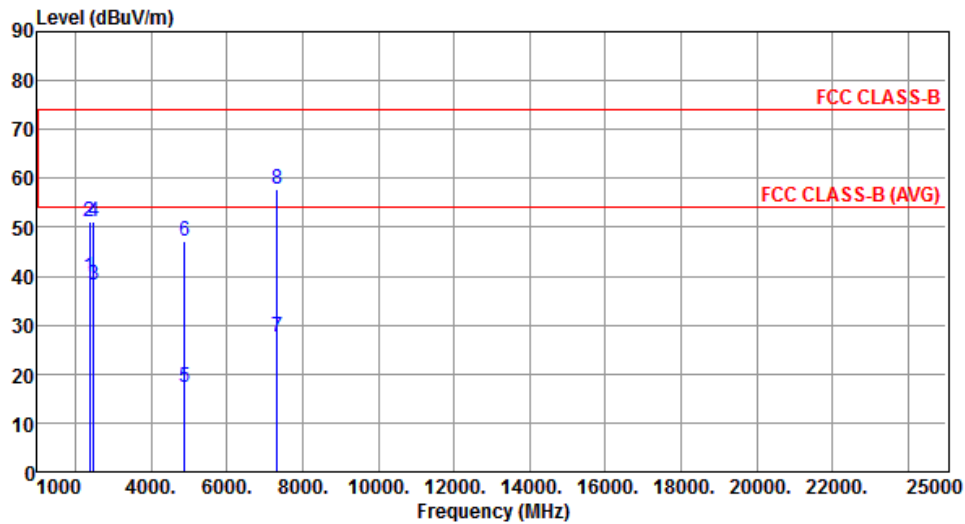
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.43	54.00	-15.57	39.53	-1.10	Average	347	13
2	2390.00	50.96	74.00	-23.04	52.06	-1.10	Peak	347	13
3	4804.00	15.06	54.00	-38.94	9.81	5.25	Average	308	132
4	4804.00	45.16	74.00	-28.84	39.91	5.25	Peak	308	132
5	12010.00	33.44	54.00	-20.56	18.37	15.07	Average	342	152
6	12010.00	63.54	74.00	-10.46	48.47	15.07	Peak	342	152

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Horizontal	Test Configuration	2



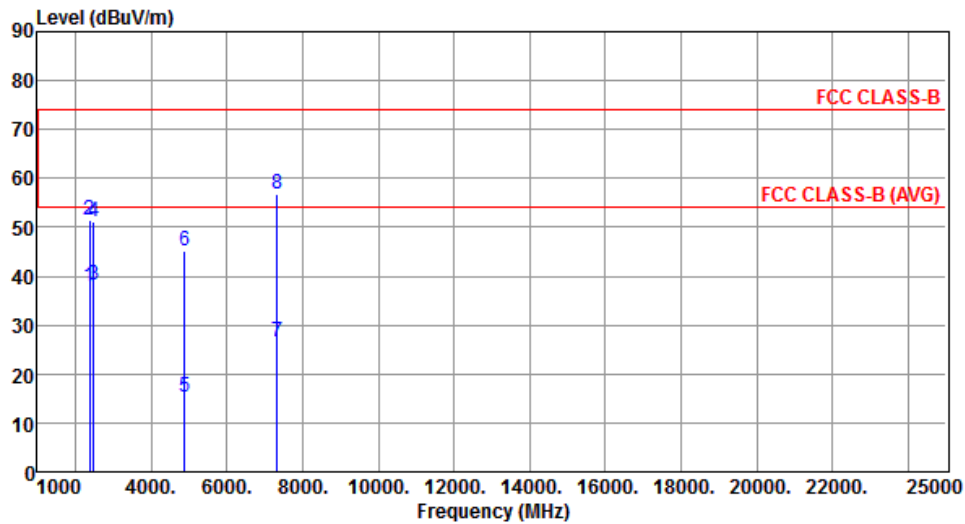
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.87	54.00	-14.13	40.97	-1.10	Average	135	92
2	2390.00	51.16	74.00	-22.84	52.26	-1.10	Peak	135	92
3	2483.50	38.11	54.00	-15.89	38.72	-0.61	Average	135	92
4	2483.50	51.08	74.00	-22.92	51.69	-0.61	Peak	135	92
5	4882.00	17.20	54.00	-36.80	11.76	5.44	Average	273	205
6	4882.00	47.30	74.00	-26.70	41.86	5.44	Peak	273	205
7	7323.00	27.65	54.00	-26.35	17.37	10.28	Average	239	25
8	7323.00	57.75	74.00	-16.25	47.47	10.28	Peak	239	25

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Vertical	Test Configuration	2



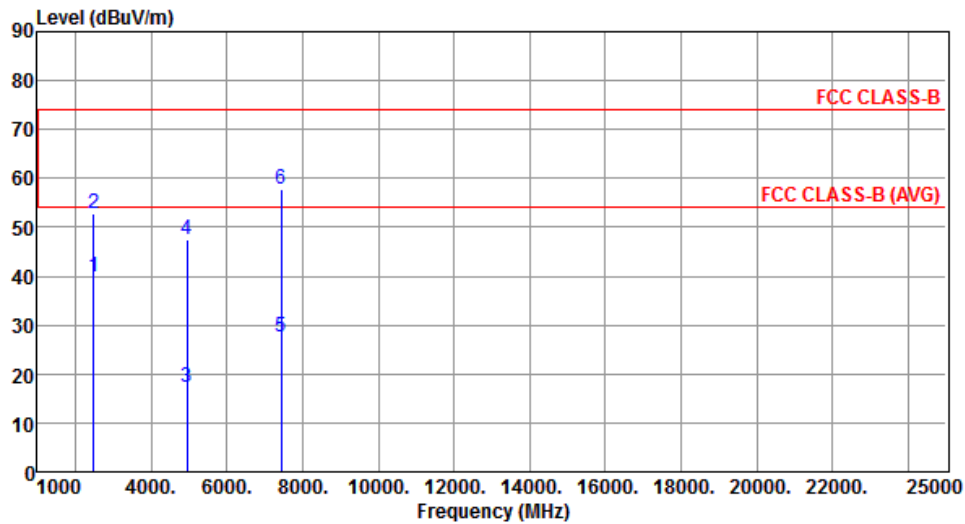
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.86	54.00	-16.14	38.96	-1.10	Average	302	355
2	2390.00	51.43	74.00	-22.57	52.53	-1.10	Peak	302	355
3	2483.50	38.12	54.00	-15.88	38.73	-0.61	Average	302	355
4	2483.50	51.28	74.00	-22.72	51.89	-0.61	Peak	302	355
5	4882.00	15.13	54.00	-38.87	9.69	5.44	Average	303	137
6	4882.00	45.23	74.00	-28.77	39.79	5.44	Peak	303	137
7	7323.00	26.58	54.00	-27.42	16.30	10.28	Average	319	152
8	7323.00	56.68	74.00	-17.32	46.40	10.28	Peak	319	152

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	2



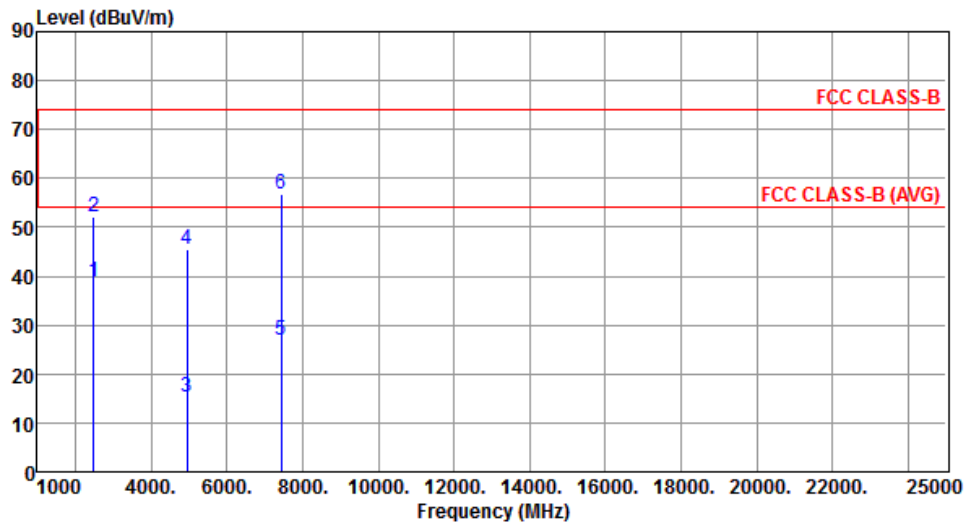
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.87	54.00	-14.13	40.48	-0.61	Average	123	108
2	2483.50	52.72	74.00	-21.28	53.33	-0.61	Peak	123	108
3	4960.00	17.38	54.00	-36.62	11.76	5.62	Average	263	214
4	4960.00	47.48	74.00	-26.52	41.86	5.62	Peak	263	214
5	7440.00	27.73	54.00	-26.27	17.17	10.56	Average	220	29
6	7440.00	57.83	74.00	-16.17	47.27	10.56	Peak	220	29

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	2



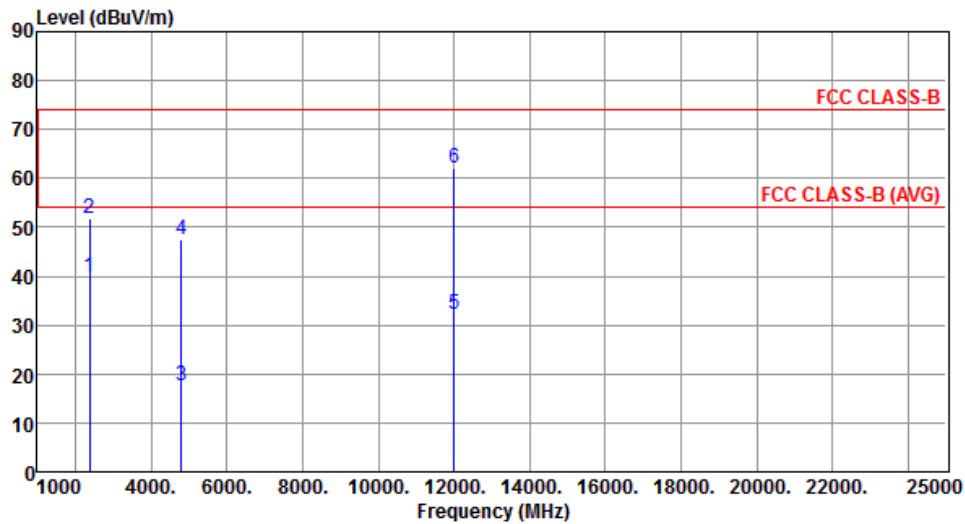
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	38.95	54.00	-15.05	39.56	-0.61	Average	339	1
2	2483.50	52.23	74.00	-21.77	52.84	-0.61	Peak	339	1
3	4960.00	15.43	54.00	-38.57	9.81	5.62	Average	299	136
4	4960.00	45.53	74.00	-28.47	39.91	5.62	Peak	299	136
5	7440.00	26.83	54.00	-27.17	16.27	10.56	Average	285	146
6	7440.00	56.93	74.00	-17.07	46.37	10.56	Peak	285	146

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Horizontal	Test Configuration	3



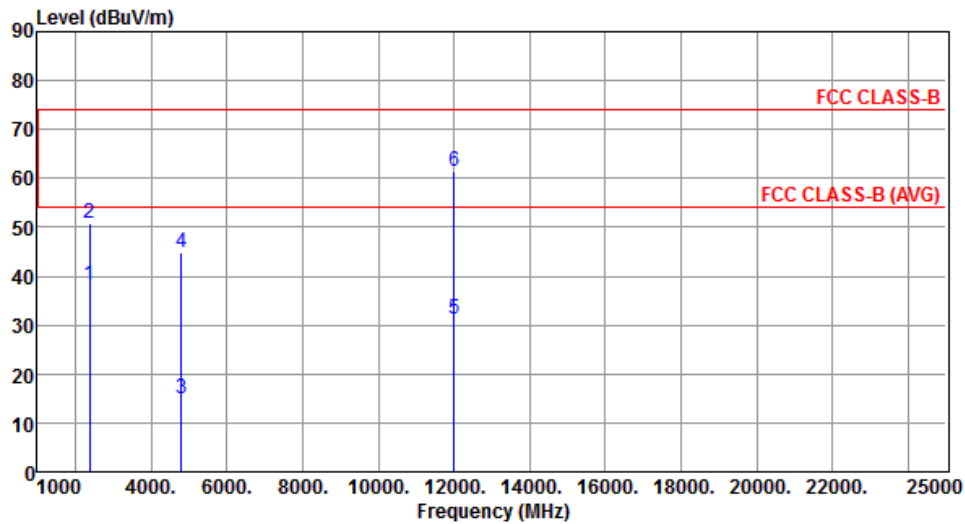
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.97	54.00	-14.03	41.07	-1.10	Average	115	137
2	2390.00	51.85	74.00	-22.15	52.95	-1.10	Peak	115	137
3	4804.00	17.54	54.00	-36.46	12.29	5.25	Average	286	258
4	4804.00	47.64	74.00	-26.36	42.39	5.25	Peak	286	258
5	12010.00	32.11	54.00	-21.89	17.04	15.07	Average	213	289
6	12010.00	62.21	74.00	-11.79	47.14	15.07	Peak	213	289

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Vertical	Test Configuration	3



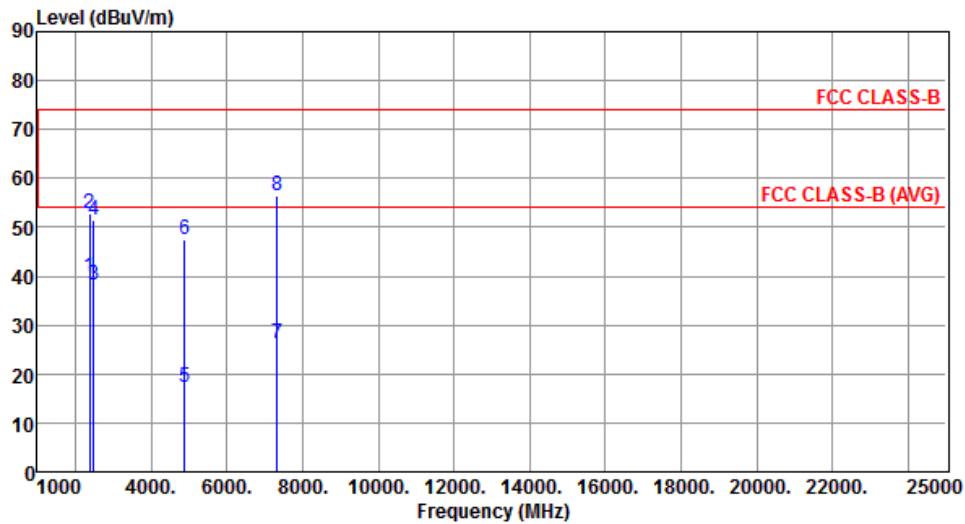
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.11	54.00	-15.89	39.21	-1.10	Average	285	193
2	2390.00	50.75	74.00	-23.25	51.85	-1.10	Peak	285	193
3	4804.00	14.78	54.00	-39.22	9.53	5.25	Average	209	228
4	4804.00	44.88	74.00	-29.12	39.63	5.25	Peak	209	228
5	12010.00	31.32	54.00	-22.68	16.25	15.07	Average	265	312
6	12010.00	61.42	74.00	-12.58	46.35	15.07	Peak	265	312

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Horizontal	Test Configuration	3



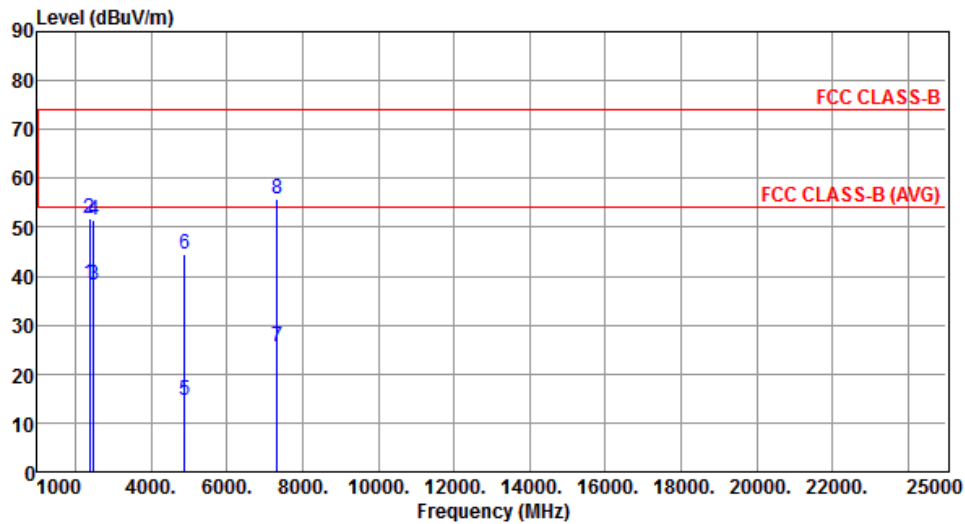
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.72	54.00	-14.28	40.82	-1.10	Average	105	132
2	2390.00	52.68	74.00	-21.32	53.78	-1.10	Peak	105	132
3	2483.50	38.19	54.00	-15.81	38.80	-0.61	Average	105	132
4	2483.50	51.32	74.00	-22.68	51.93	-0.61	Peak	105	132
5	4882.00	17.27	54.00	-36.73	11.83	5.44	Average	287	265
6	4882.00	47.37	74.00	-26.63	41.93	5.44	Peak	287	265
7	7323.00	26.38	54.00	-27.62	16.10	10.28	Average	358	86
8	7323.00	56.48	74.00	-17.52	46.20	10.28	Peak	358	86

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Vertical	Test Configuration	3



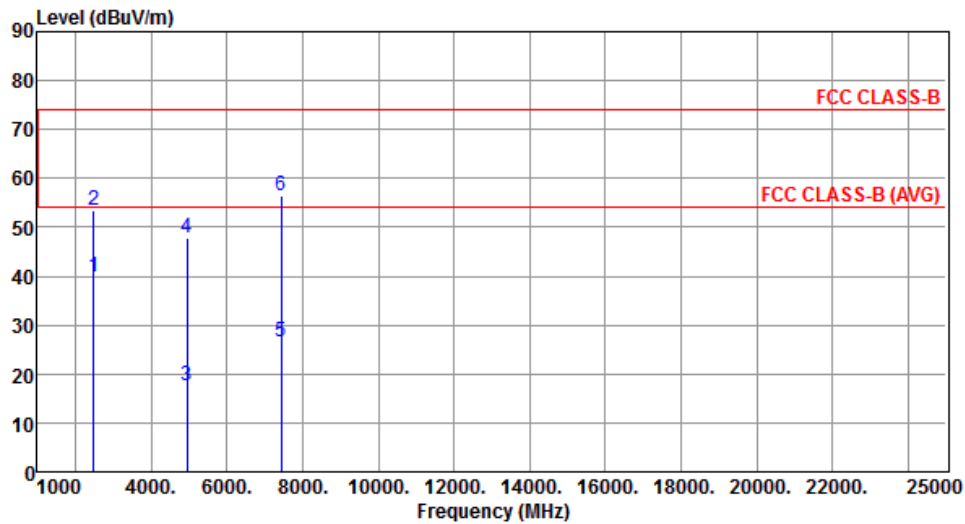
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.49	54.00	-15.51	39.59	-1.10	Average	302	185
2	2390.00	51.65	74.00	-22.35	52.75	-1.10	Peak	302	185
3	2483.50	38.11	54.00	-15.89	38.72	-0.61	Average	302	185
4	2483.50	51.36	74.00	-22.64	51.97	-0.61	Peak	302	185
5	4882.00	14.45	54.00	-39.55	9.01	5.44	Average	203	228
6	4882.00	44.55	74.00	-29.45	39.11	5.44	Peak	203	228
7	7323.00	25.62	54.00	-28.38	15.34	10.28	Average	302	309
8	7323.00	55.72	74.00	-18.28	45.44	10.28	Peak	302	309

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	3



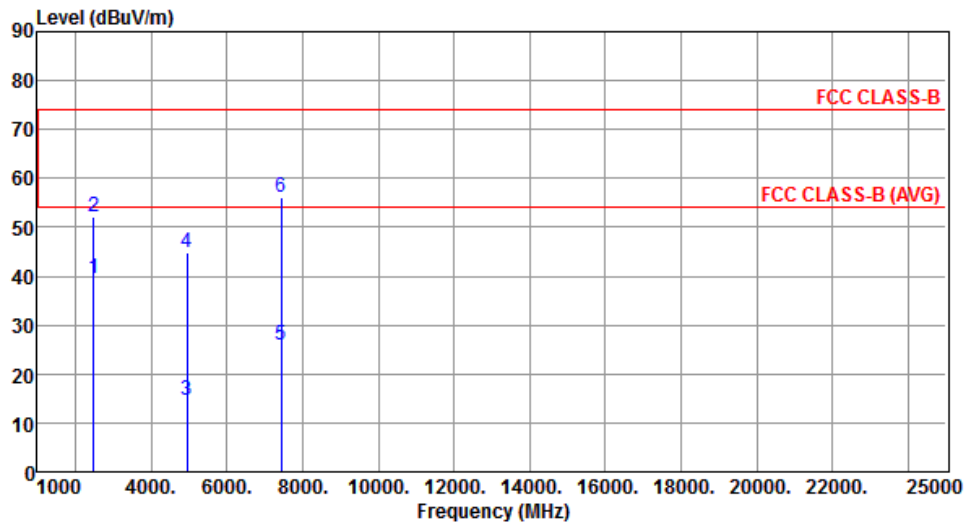
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.82	54.00	-14.18	40.43	-0.61	Average	114	125
2	2483.50	53.54	74.00	-20.46	54.15	-0.61	Peak	114	125
3	4960.00	17.76	54.00	-36.24	12.14	5.62	Average	286	263
4	4960.00	47.86	74.00	-26.14	42.24	5.62	Peak	286	263
5	7440.00	26.47	54.00	-27.53	15.91	10.56	Average	339	79
6	7440.00	56.57	74.00	-17.43	46.01	10.56	Peak	339	79

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	3



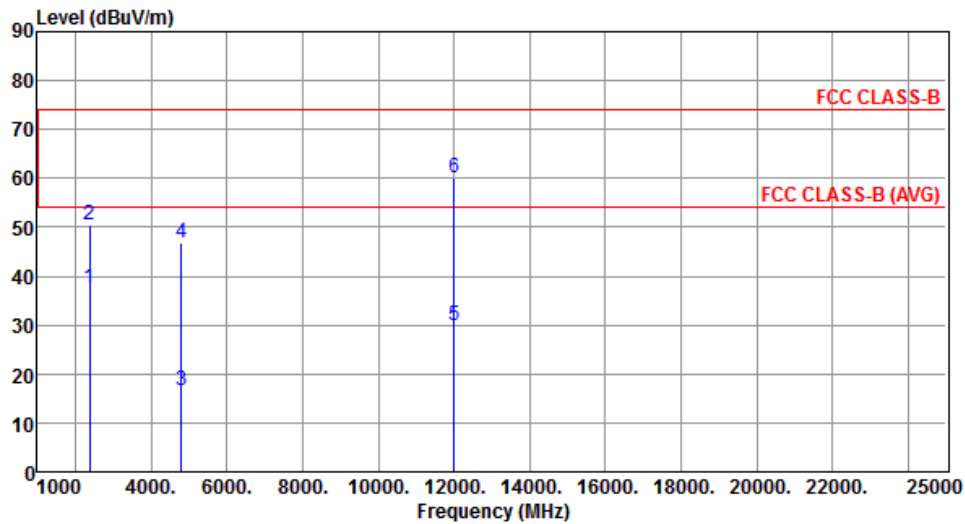
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.36	54.00	-14.64	39.97	-0.61	Average	335	186
2	2483.50	52.24	74.00	-21.76	52.85	-0.61	Peak	335	186
3	4960.00	14.62	54.00	-39.38	9.00	5.62	Average	202	229
4	4960.00	44.72	74.00	-29.28	39.10	5.62	Peak	202	229
5	7440.00	26.01	54.00	-27.99	15.45	10.56	Average	308	304
6	7440.00	56.11	74.00	-17.89	45.55	10.56	Peak	308	304

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Horizontal	Test Configuration	4



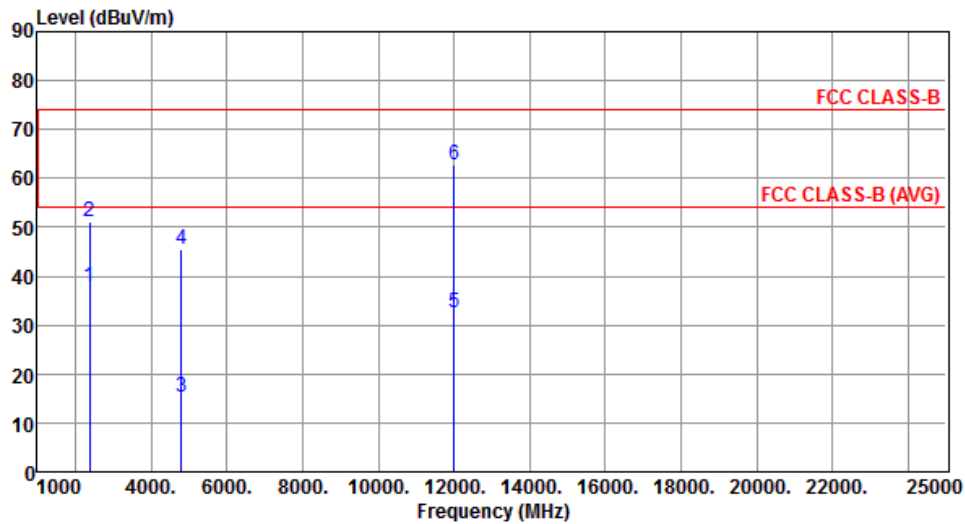
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.57	54.00	-16.43	38.67	-1.10	Average	175	88
2	2390.00	50.32	74.00	-23.68	51.42	-1.10	Peak	175	88
3	4804.00	16.75	54.00	-37.25	11.50	5.25	Average	268	211
4	4804.00	46.85	74.00	-27.15	41.60	5.25	Peak	268	211
5	12010.00	29.89	54.00	-24.11	14.82	15.07	Average	338	302
6	12010.00	59.99	74.00	-14.01	44.92	15.07	Peak	338	302

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2402
Polarization	Vertical	Test Configuration	4



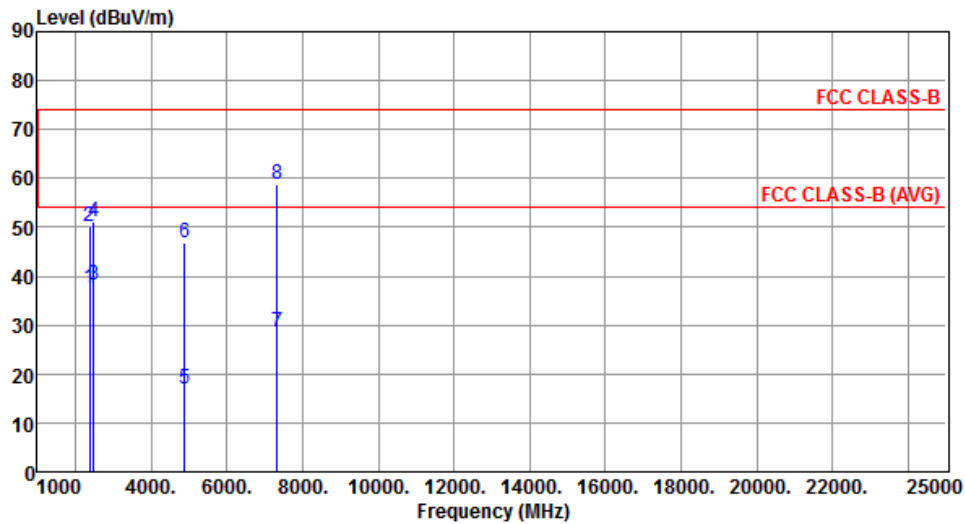
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.73	54.00	-16.27	38.83	-1.10	Average	326	0
2	2390.00	51.19	74.00	-22.81	52.29	-1.10	Peak	326	0
3	4804.00	15.24	54.00	-38.76	9.99	5.25	Average	163	175
4	4804.00	45.34	74.00	-28.66	40.09	5.25	Peak	163	175
5	12010.00	32.68	54.00	-21.32	17.61	15.07	Average	369	112
6	12010.00	62.78	74.00	-11.22	47.71	15.07	Peak	369	112

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Horizontal	Test Configuration	4



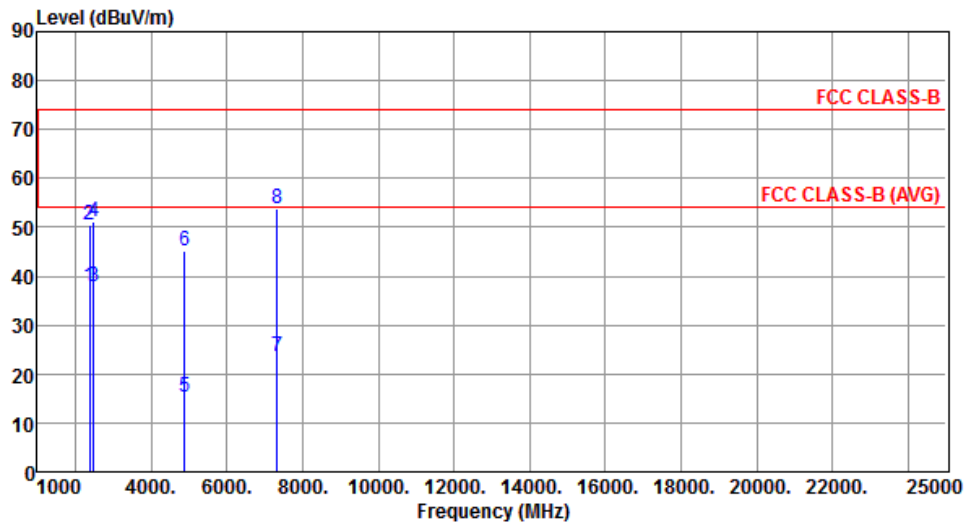
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.58	54.00	-16.42	38.68	-1.10	Average	195	88
2	2390.00	50.26	74.00	-23.74	51.36	-1.10	Peak	195	88
3	2483.50	38.07	54.00	-15.93	38.68	-0.61	Average	195	88
4	2483.50	51.13	74.00	-22.87	51.74	-0.61	Peak	195	88
5	4882.00	16.86	54.00	-37.14	11.42	5.44	Average	272	211
6	4882.00	46.96	74.00	-27.04	41.52	5.44	Peak	272	211
7	7323.00	28.69	54.00	-25.31	18.41	10.28	Average	234	33
8	7323.00	58.79	74.00	-15.21	48.51	10.28	Peak	234	33

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2441
Polarization	Vertical	Test Configuration	4



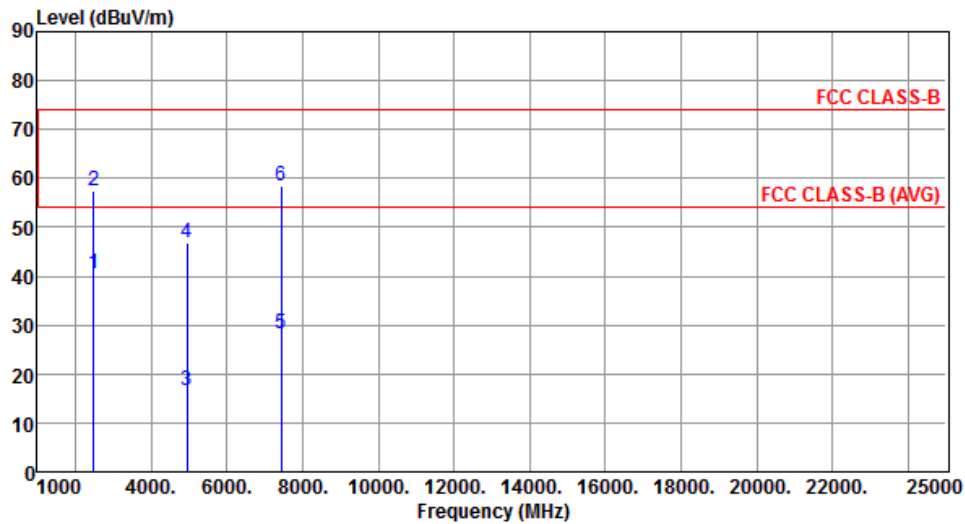
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.73	54.00	-16.27	38.83	-1.10	Average	313	2
2	2390.00	50.48	74.00	-23.52	51.58	-1.10	Peak	313	2
3	2483.50	37.84	54.00	-16.16	38.45	-0.61	Average	313	2
4	2483.50	51.08	74.00	-22.92	51.69	-0.61	Peak	313	2
5	4882.00	15.14	54.00	-38.86	9.70	5.44	Average	165	188
6	4882.00	45.24	74.00	-28.76	39.80	5.44	Peak	165	188
7	7323.00	23.62	54.00	-30.38	13.34	10.28	Average	103	25
8	7323.00	53.72	74.00	-20.28	43.44	10.28	Peak	103	25

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Horizontal	Test Configuration	4



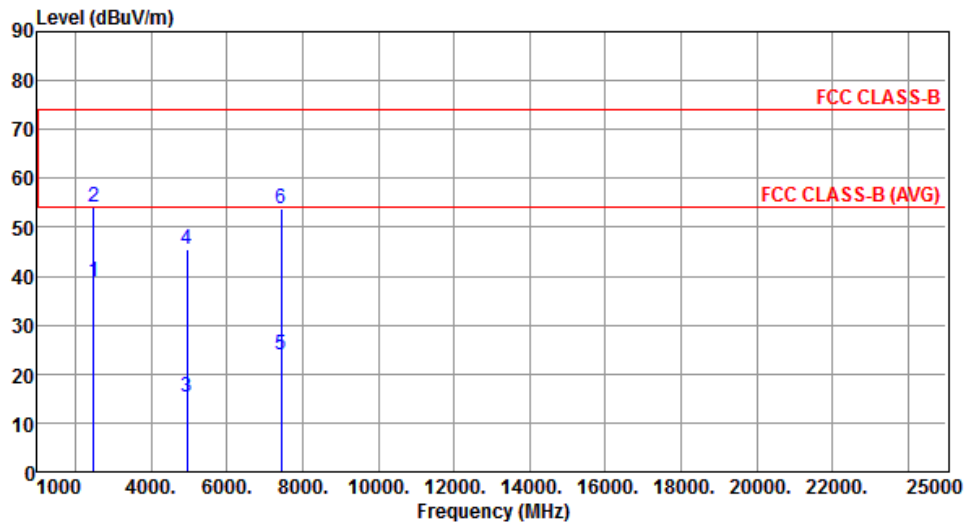
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	40.66	54.00	-13.34	41.27	-0.61	Average	214	91
2	2483.50	57.53	74.00	-16.47	58.14	-0.61	Peak	214	91
3	4960.00	16.62	54.00	-37.38	11.00	5.62	Average	278	219
4	4960.00	46.72	74.00	-27.28	41.10	5.62	Peak	278	219
5	7440.00	28.23	54.00	-25.77	17.67	10.56	Average	238	32
6	7440.00	58.33	74.00	-15.67	47.77	10.56	Peak	238	32

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	8DPSK	Test Freq. (MHz)	2480
Polarization	Vertical	Test Configuration	4



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	38.85	54.00	-15.15	39.46	-0.61	Average	303	4
2	2483.50	54.10	74.00	-19.90	54.71	-0.61	Peak	303	4
3	4960.00	15.34	54.00	-38.66	9.72	5.62	Average	163	172
4	4960.00	45.44	74.00	-28.56	39.82	5.62	Peak	163	172
5	7440.00	23.78	54.00	-30.22	13.22	10.56	Average	100	20
6	7440.00	53.88	74.00	-20.12	43.32	10.56	Peak	100	20

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

3.3 Unwanted Emissions into Non-Restricted Frequency Bands

3.3.1 Limit of Unwanted Emissions into Non-Restricted Frequency Bands

The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.3.2 Test Procedures

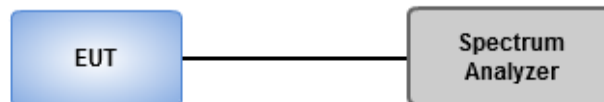
Reference Level Measurement

1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Set Sweep time = auto couple, Trace mode = max hold.
3. Allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

Unwanted Emissions Level Measurement

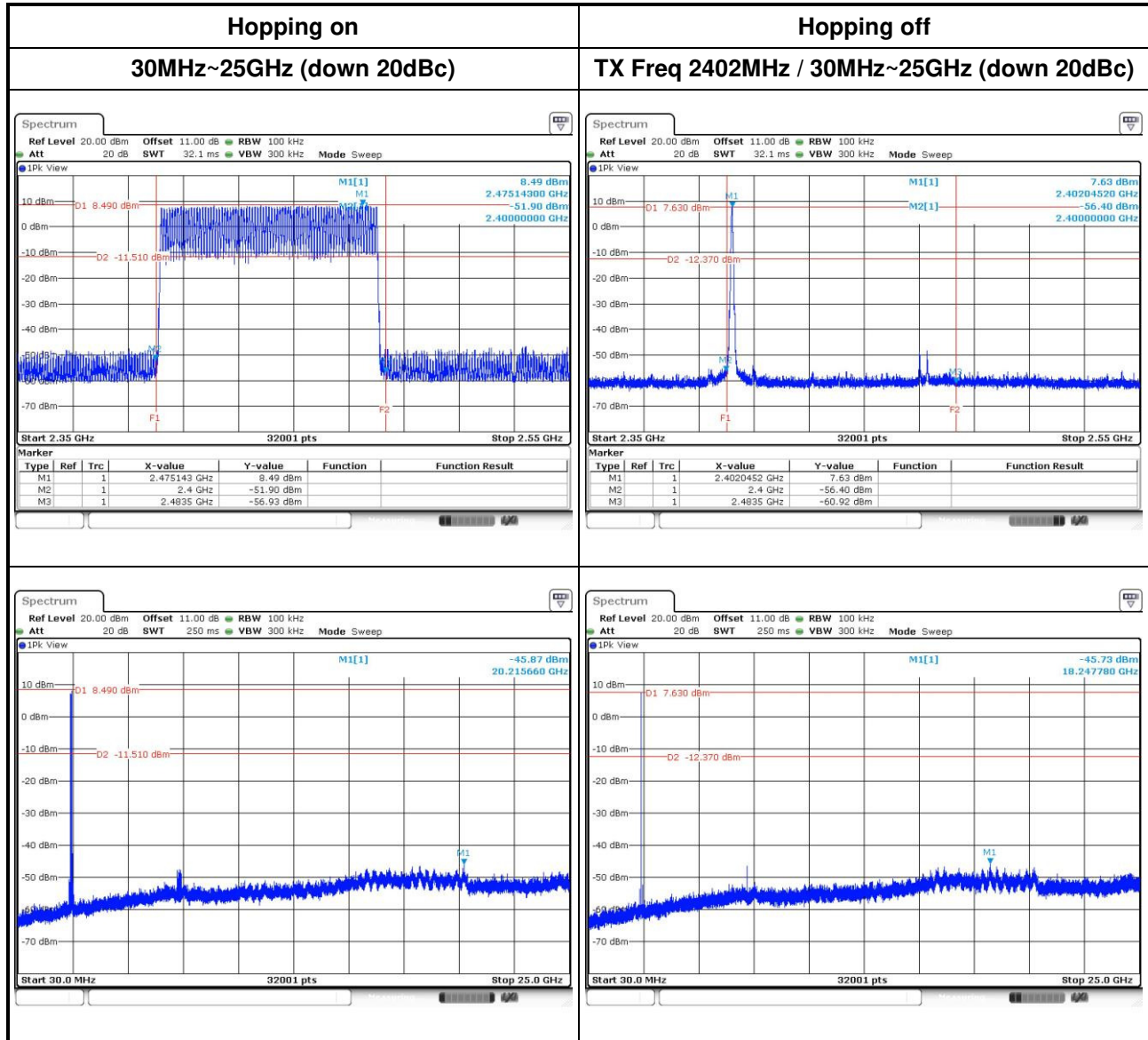
1. Set RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Trace Mode = max hold, Sweep = auto couple.
3. Allow the trace to stabilize.
4. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

3.3.3 Test Setup



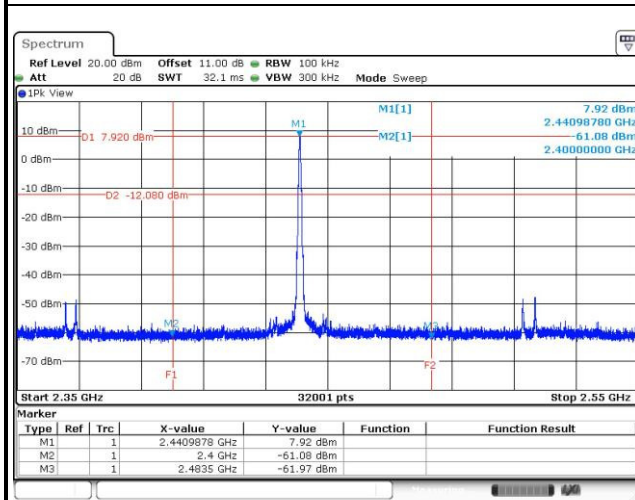
3.3.4 Unwanted Emissions into Non-Restricted Frequency Bands

GFSK



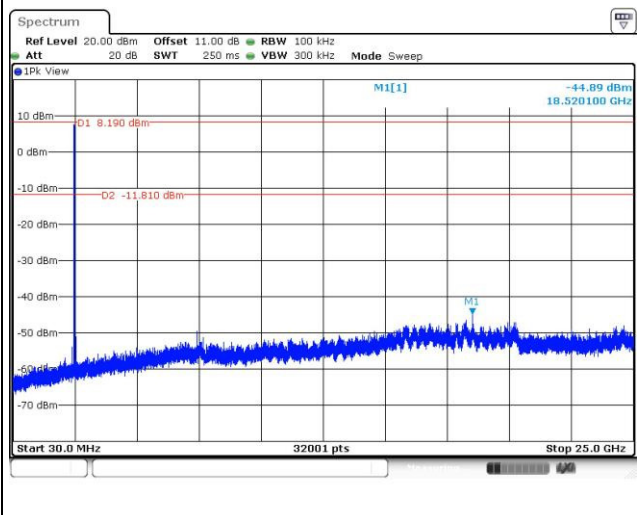
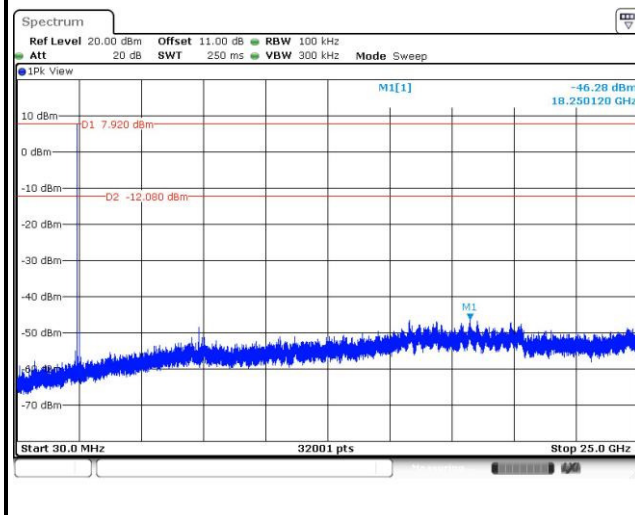
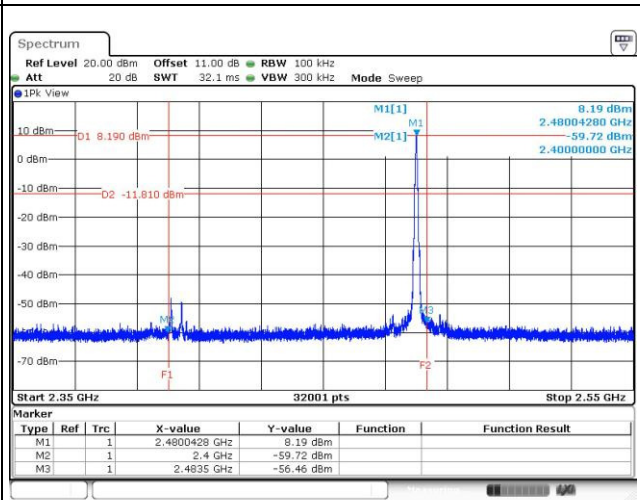
Hopping off

TX Freq 2441MHz / 30MHz~25GHz (down 20dBc)

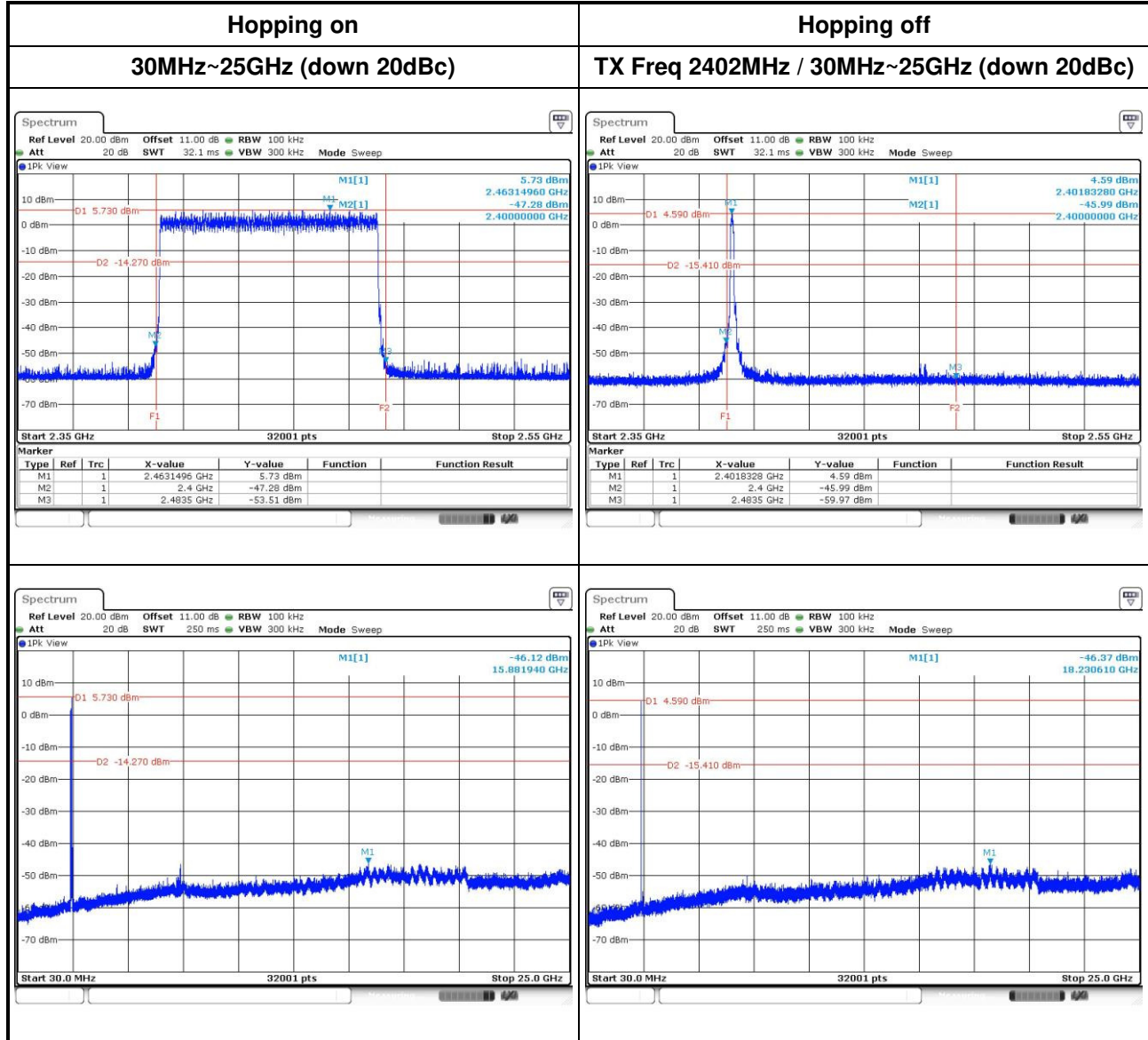


Hopping off

TX Freq 2480MHz / 30MHz~25GHz (down 20dBc)

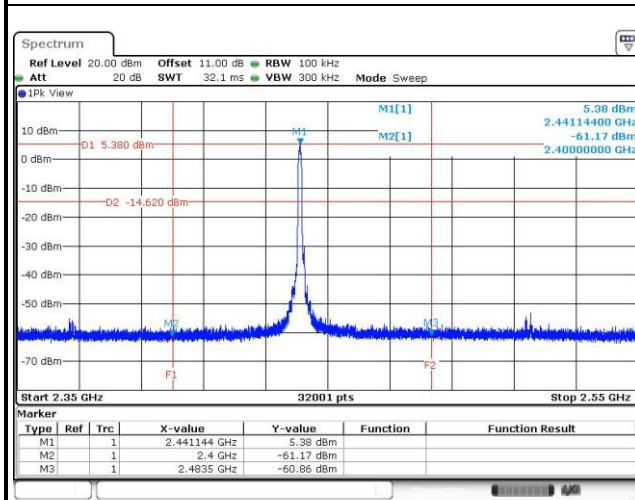


8DPSK



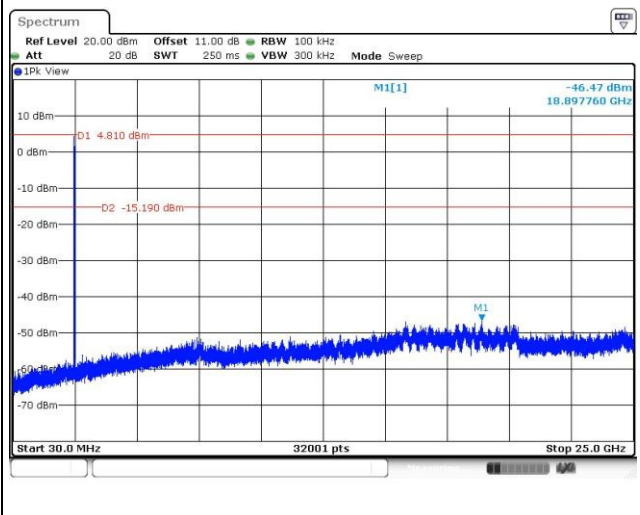
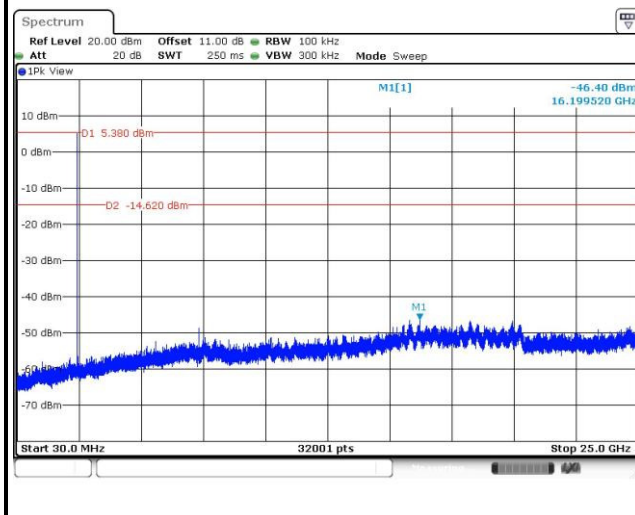
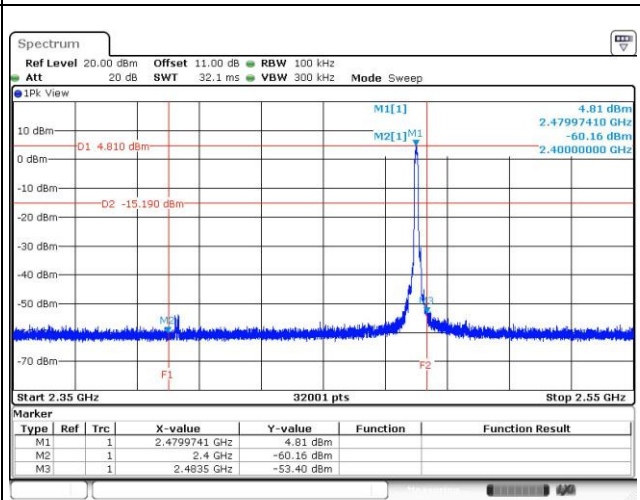
Hopping off

TX Freq 2441MHz / 30MHz~25GHz (down 20dBc)



Hopping off

TX Freq 2480MHz / 30MHz~25GHz (down 20dBc)



3.4 Conducted Output Power

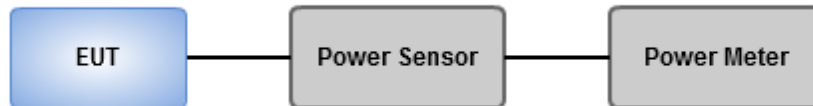
3.4.1 Limit of Conducted Output Power

- ☐ 1 Watt
For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band.
- ☒ 0.125 Watt
For all other frequency hopping systems in the 2400–2483.5 MHz band.
- ☐ 0.125 Watt
For Frequency hopping systems operating in the 2400–2483.5 MHz band have hopping channel carrier frequencies that are separated by two-thirds of the 20 dB bandwidth of the hopping channel.

3.4.2 Test Procedures

1. A wideband power meter is used for power measurement. Bandwidth of power sensor and meter is 50MHz
2. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power

3.4.3 Test Setup



3.4.4 Test Result of Conducted Output Power

Modulation Mode	Freq. (MHz)	Output Power (mW)	Output Power (dBm)	Limit (mW)
GFSK	2402	7.14	8.54	125
GFSK	2441	7.76	8.9	125
GFSK	2480	8.20	9.14	125
π/4 DQPSK	2402	6.47	8.11	125
π/4 DQPSK	2441	7.00	8.45	125
π/4 DQPSK	2480	7.29	8.63	125
8DPSK	2402	7.19	8.57	125
8DPSK	2441	7.85	8.95	125
8DPSK	2480	8.26	9.17	125

Modulation Mode	Freq. (MHz)	AV Output Power (mW)	AV Output Power (dBm)
GFSK	2402	6.64	8.22
GFSK	2441	7.26	8.61
GFSK	2480	7.71	8.87
π/4 DQPSK	2402	3.43	5.35
π/4 DQPSK	2441	3.74	5.73
π/4 DQPSK	2480	3.96	5.98
8DPSK	2402	3.43	5.35
8DPSK	2441	3.74	5.73
8DPSK	2480	3.96	5.98

Note: Average power is for reference only.

3.5 Number of Hopping Frequency

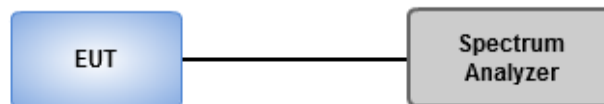
3.5.1 Limit of Number of Hopping Frequency

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

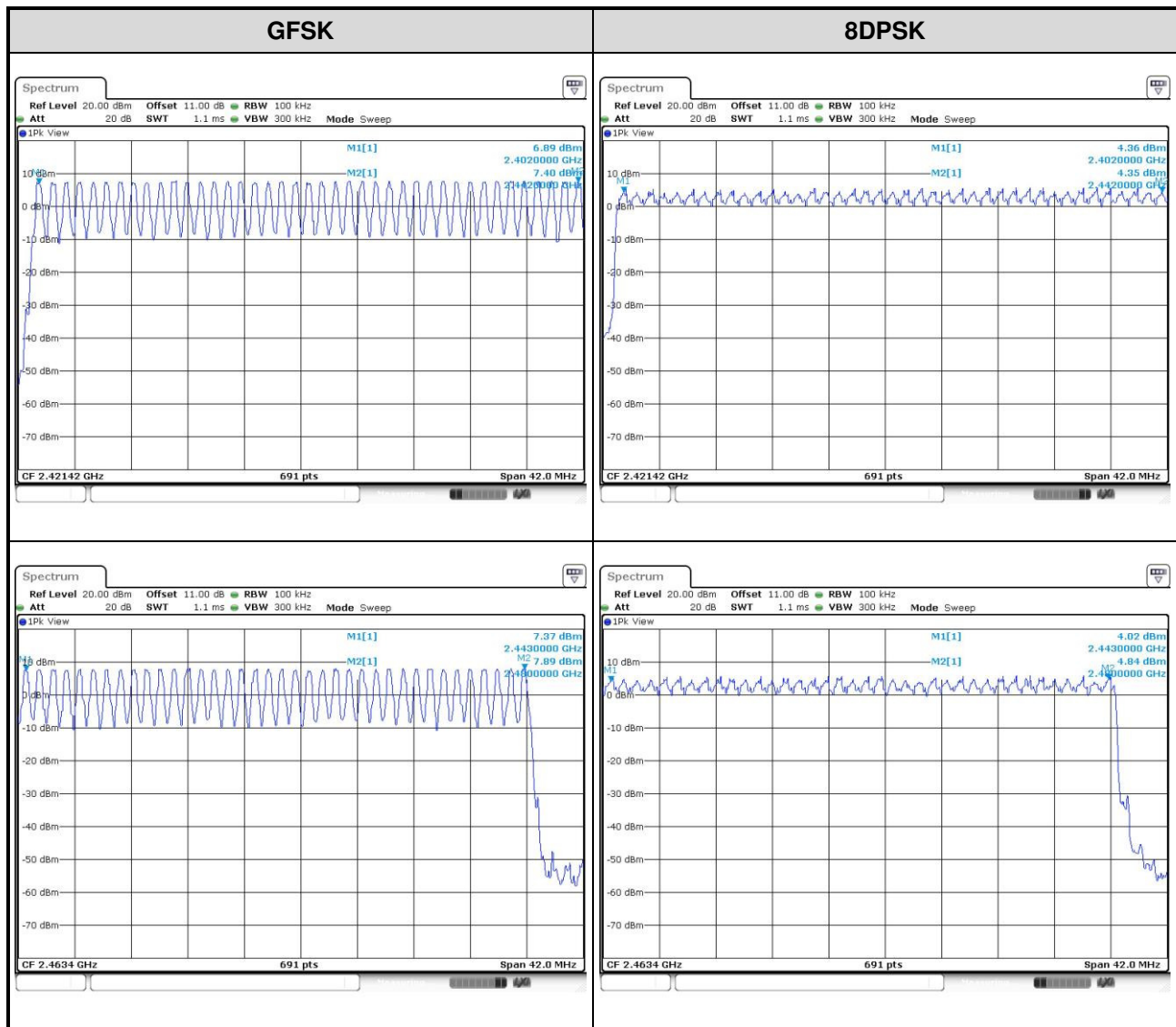
3.5.2 Test Procedures

1. Set RBW = 100kHz, VBW = 300kHz, Sweep time = Auto, Detector = Peak Trace max hold.
2. Allow trace to stabilize.

3.5.3 Test Setup



3.5.4 Test Result of Number of Hopping Frequency



3.6 20dB and Occupied Bandwidth

3.6.1 Test Procedures

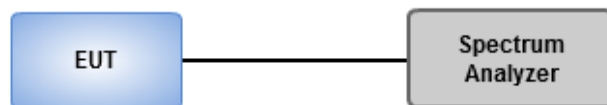
20dB Bandwidth

1. Set RBW=30kHz, VBW=100kHz, Sweep time = Auto, Detector=Peak, Trace max hold
2. Allow trace to stabilize
3. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

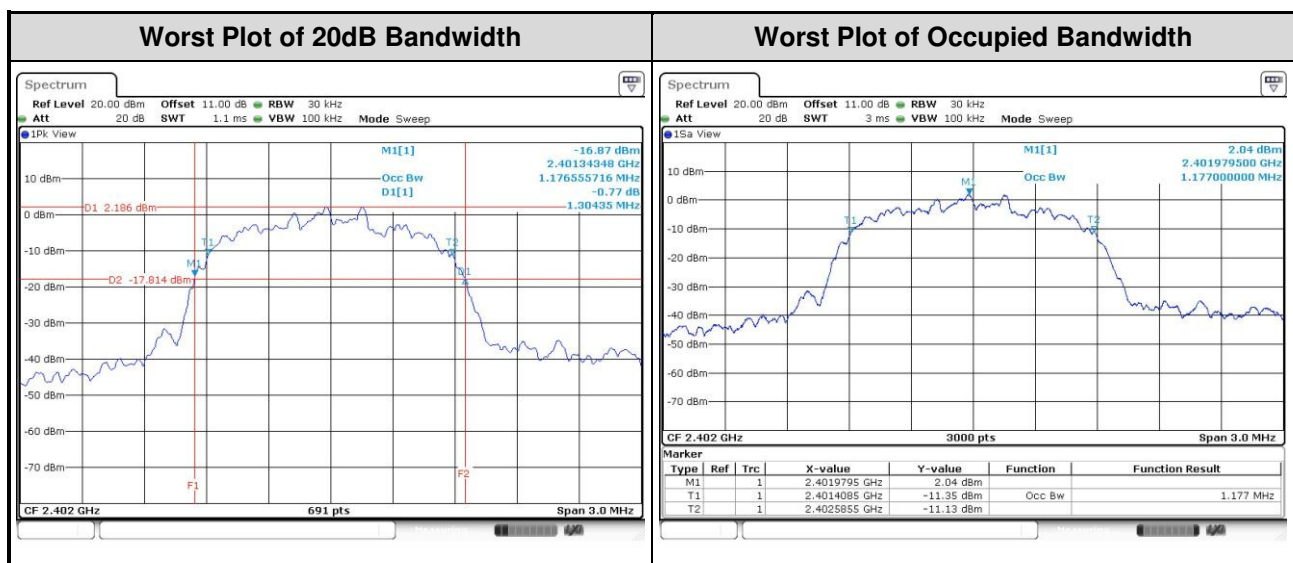
1. Set RBW=30kHz, VBW=100kHz, Sweep time = Auto, Detector=Sample, Trace max hold
2. Allow trace to stabilize
3. Use Occupied bandwidth function of spectrum analyzer to measuring 99% occupied bandwidth

3.6.2 Test Setup



3.6.3 Test result of 20dB and Occupied Bandwidth

Modulation Mode	Freq. (MHz)	20dB Bandwidth (MHz)	Occupied Bandwidth (MHz)
GFSK	2402	0.952	0.865
GFSK	2441	0.957	0.868
GFSK	2480	0.957	0.870
8DPSK	2402	1.304	1.177
8DPSK	2441	1.304	1.175
8DPSK	2480	1.300	1.175



3.7 Channel Separation

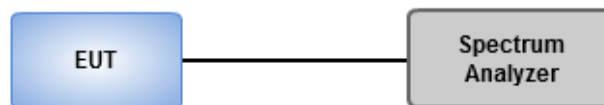
3.7.1 Limit of Channel Separation

- ☐ Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.
- ☒ Frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

3.7.2 Test Procedures

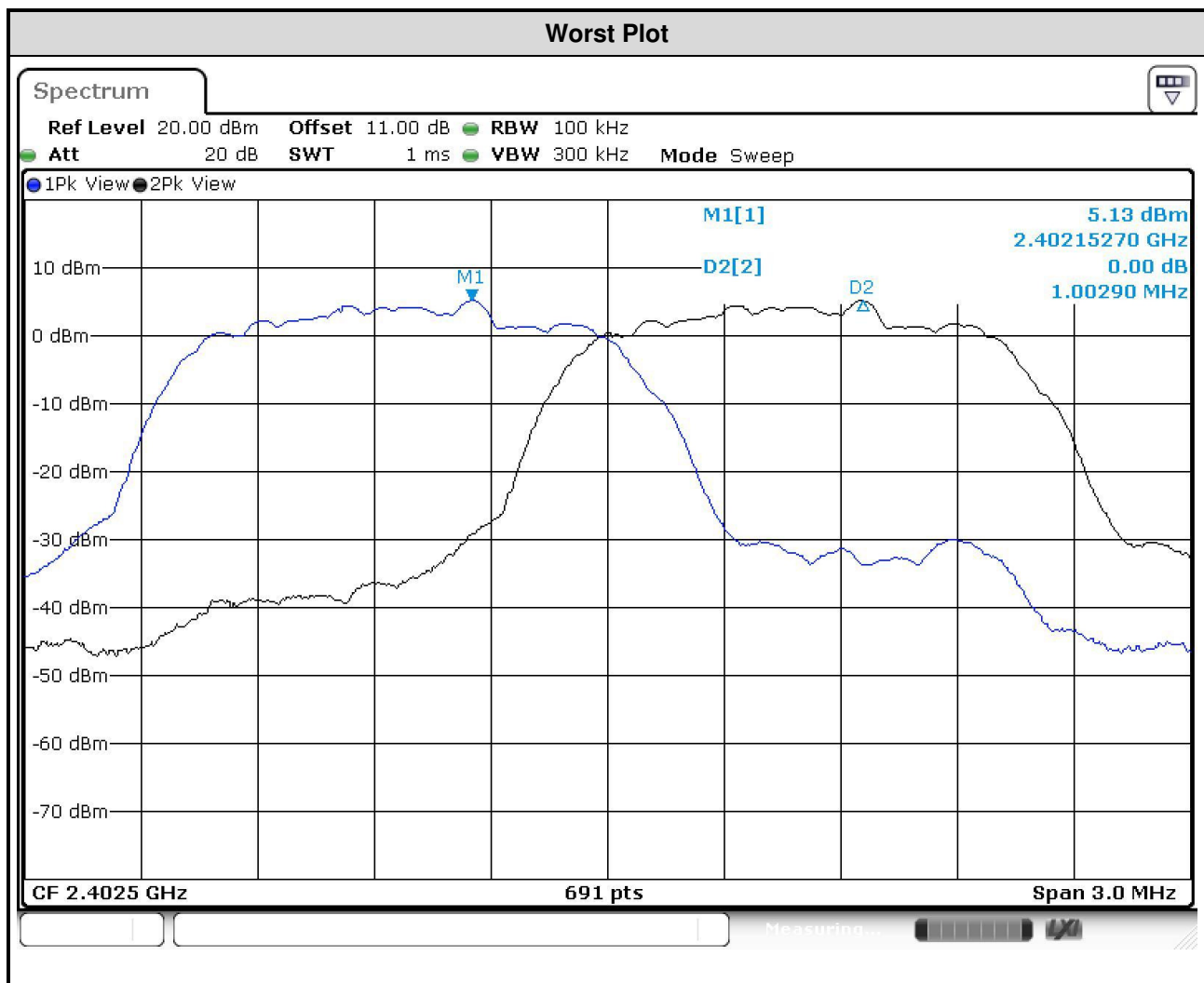
1. Set RBW=100kHz, VBW=300kHz, Sweep time = Auto, Detector=Peak Trace max hold
2. Allow trace to stabilize
3. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The EUT shall show compliance with the appropriate regulatory limit

3.7.3 Test Setup



3.7.4 Test result of Channel Separation

Modulation Mode	Freq. (MHz)	Channel Separation (MHz)	20dB Bandwidth (MHz)	Minimum Limit (MHz)
GFSK	2402	1.003	0.952	0.635
GFSK	2441	1.003	0.957	0.638
GFSK	2480	1.003	0.957	0.638
8DPSK	2402	1.003	1.304	0.869
8DPSK	2441	1.003	1.304	0.869
8DPSK	2480	1.003	1.300	0.867



3.8 Number of Dwell Time

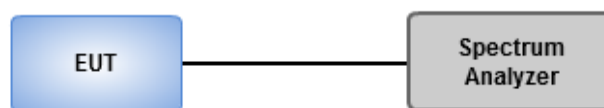
3.8.1 Limit of Dwell time

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.

3.8.2 Test Procedures

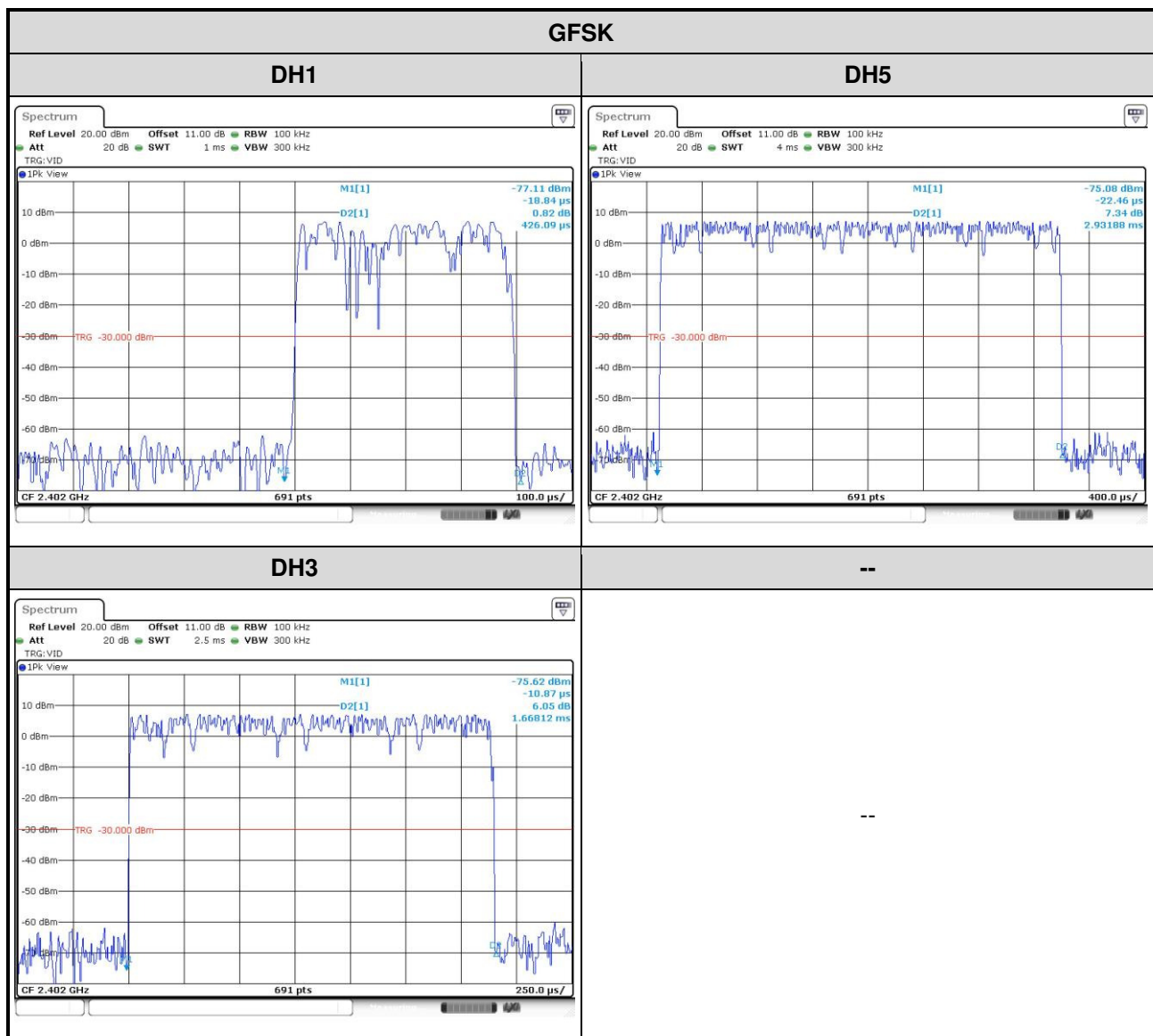
1. Set RBW=100kHz,VBW=300kHz,Sweep time = 500us(DH1),2ms(DH3),4ms(DH5), Detector=Peak, Span=0Hz,Trace max hold
2. Enable gating and trigger function of spectrum analyzer to measure burst on time.
3. The DH1 packet can cover a single time slot. A maximum length packet has duration of 1 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 1/1600 seconds, or 0.625ms. DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.
4. The DH3 packet can cover up to 3 time slots. A maximum length packet has duration of 3 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 3/1600 seconds, or 1.875ms. DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
5. The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum dwell time and maximum duty cycle. A maximum length packet has duration of 5 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms. DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds

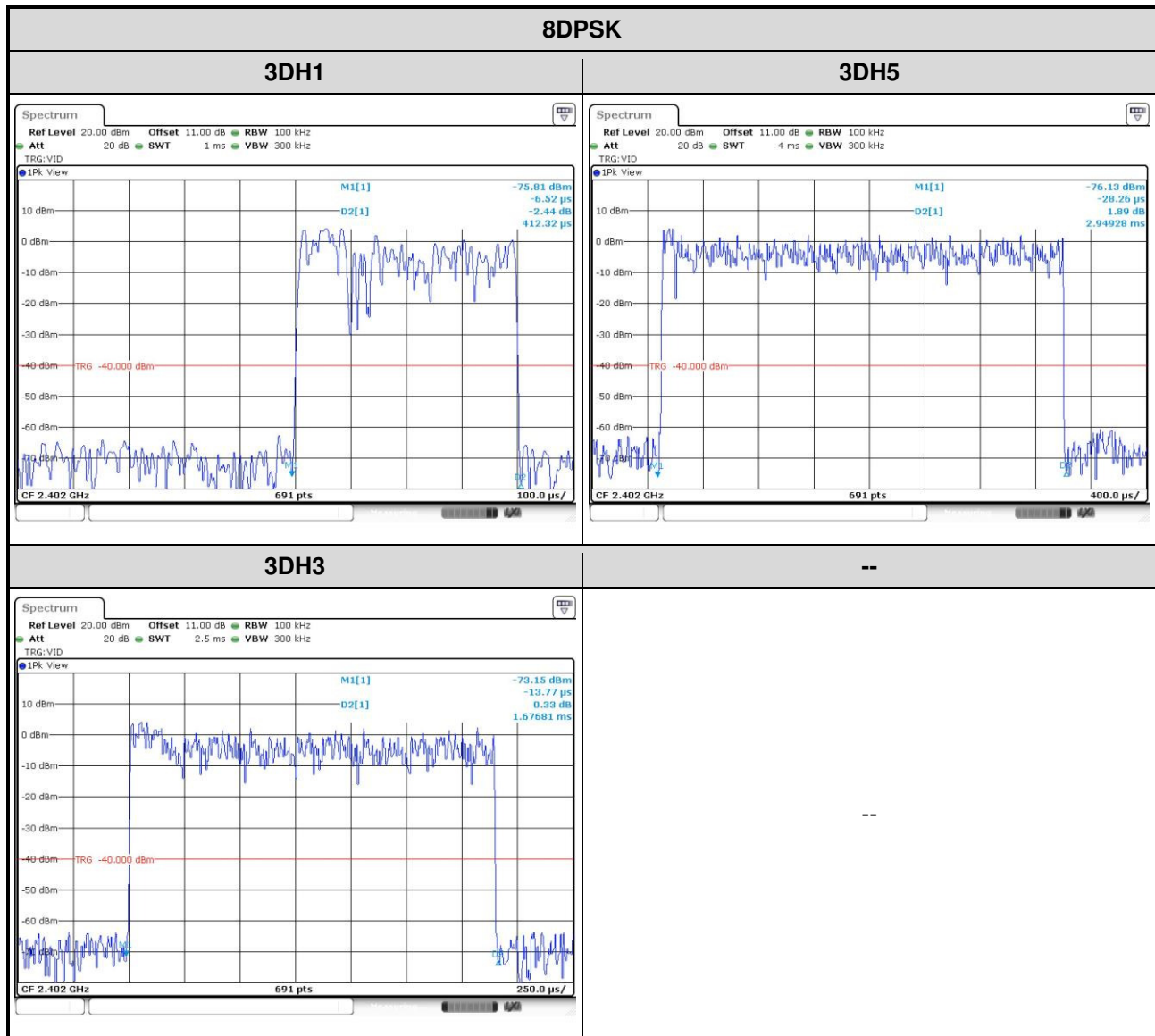
3.8.3 Test Setup



3.8.4 Test Result of Dwell Time

Modulation Mode	Freq. (MHz)	Length of Transmission Time (msec)	Number of Transmission in a 31.6 (79 Hopping*0.4)	Result (s)	Limit (s)
GFSK-DH1	2402	0.42609	320	0.136	0.4
GFSK-DH3	2402	1.66812	160	0.267	0.4
GFSK-DH5	2402	2.93188	106.6	0.313	0.4
8DPSK-DH1	2402	0.41232	320	0.132	0.4
8DPSK-DH3	2402	1.67681	160	0.268	0.4
8DPSK-DH5	2402	2.94928	106.6	0.314	0.4





4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website <http://www.icertifi.com.tw>.

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