RADIO TEST REPORT

Product	:	Wi-Fi 6E BT M.2 Module
Model Name	:	WNFQ-268AXI(BT)
Series Model	:	WNFQ-268AX(BT)
FCC ID	:	RYK-WNFQ268AXBT
Test Regulation	:	FCC 47 CFR Part 15 Subpart C (Section 15.247)
Received Date	:	2021/9/3
Test Date	:	2021/9/6 ~ 2021/11/10
Issued Date	:	2022/1/21
Applicant	:	SparkLAN Communications, Inc. 8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan (R.O.C.)
Issued By	:	Underwriters Laboratories Taiwan Co., Ltd. Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Testing Laboratory
3398

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REVISION HISTORY

Original Test Report No.: 4790042400-US-R4-V0

Rev.	Test report No.	Date	Page revised	Contents
Original	4790042400-US-R4-V0	2022/1/21	-	Initial issue

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1. Attestation of Test Results

APPLICANT:	SparkLAN Communications, Inc. 8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan (R.O.C.)
MANUFACTURER:	SparkLAN Communications, Inc. 8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan (R.O.C.)
EUT DESCRIPTION:	Wi-Fi 6E BT M.2 Module
BRAND:	SparkLAN
MODEL:	WNFQ-268AXI(BT)
SERIES MODEL:	WNFQ-268AX(BT)
SAMPLE STAGE:	Engineering Verification Test sample
DATE of TESTED:	2021/9/6 ~ 2021/11/10

APPLICABLE STANDARDS	
STANDARD	**Test Results**
FCC 47 CFR PART 15 Subpart C (Section 15.247)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Sally Lu

Sally Lu Date : 2022/1/21
Project Handler

Approved and Authorized By:

WaterNil.Guan

Waternil Guan Date : 2022/1/21
Engineer

2. Summary of Test Results

Summary of Test Results		
FCC Clause	**Test Items**	**Result**
15.247(a)(1) (iii)	Number of Hopping Frequency Used	PASS
15.247(a)(1) (iii)	Dwell Time on Each Channel	PASS
15.247(a)(1)	1. Hopping Channel Separation 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	PASS
15.247(b)	Conducted Output Power	PASS
15.247(d)	Antenna Port Emission	PASS
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS
15.207	AC Power Conducted Emission	PASS
15.203	Antenna Requirement	PASS

3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB558074 D01 Meas Guidance v05r02, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	±3.1 dB
RF Conducted	9 kHz - 40GHz	±1.9 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	±1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	±5.4 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	±4.7 dB

6. Equipment under Test

6.1. Description of EUT

Product	Wi-Fi 6E BT M.2 Module
Brand Name	SparkLAN
Model Name	WNFQ-268AXI(BT)
Series Model	WNFQ-268AX(BT)
Operating Frequency	2402MHz ~ 2480MHz
Modulation	GFSK, π/4-DQPSK and 8DPSK
Transfer Rate	Up to 3 Mbps
Number of Channel	79
Maximum Output Power	9.26 dBm
Normal Voltage	3.3 Vdc
S/N	21765J2100036
Sample ID	4158081

Note:

1. The models difference table as below:

Model	Difference
WNFQ-268AXI(BT)	WNFQ-268AXI(BT) Operating Temp -40~+75; WNFQ-268AX(BT) Operating Temp -10~+65 In addition, the sample has A-E key and E key versions. Only the golden finger is different.
WNFQ-268AX(BT)	

*Except above change, there is no change to technical construction that is included circuit diagram, PCB Layout, components and component layout, all electrical construction, and mechanical construction.

2. The EUT contains following accessory devices:

Product	Brand	Model	Description
Antenna 1	SparkLAN	AD-500AX	-
Antenna 2	SparkLAN	AD-501AX	-
Antenna 3	SparkLAN	AD-502AX	-
Antenna 4	SparkLAN	AD-503AX	-
Antenna 5	JOHANSON	2450AD18A6050	-
Antenna 6	SparkLAN	AD-504AX	-
Antenna 7	SparkLAN	AD-505AX	-

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.

6.2. Channel List

79 channels are provided for BT-EDR mode:

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	-	-

6.3. Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	23~26℃/ 60~65%RH	3.3Vdc	2021/09/06~ 2021/11/10	Mike Cai
Radiated Spurious Emission	966-2	23~26℃/ 60~65%RH	3.3Vdc	2021/09/06~ 2021/11/10	Mike Cai
AC power Line Conducted Emission	SR1	23~26℃/ 60~65%RH	3.3Vdc	2021/09/16~ 2021/11/10	Mike Cai

FCC Test Firm Registration Number: 498077

6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Frequency Band (MHz)	Maximum Gain (dBi)	Remark
1	Chain (0)+(1)	SparkLAN	AD-500AX	Dipole	2400~2483	2.65	RP-SMA
					5150~5250	4.35	
					5250~5350	4.35	
					5470~5725	4.35	
					5725~5850	4.81	
					5925~6425	4.98	
					6425~6525	4.85	
					6525~6875	4.79	
					6875~7125	4.82	
2	Chain (0)+(1)	SparkLAN	AD-501AX	Dipole	2400~2483	3.7	RP-SMA
					5150~5850	5	
					5925~7125	5	
3	Chain (0)+(1)	SparkLAN	AD-502AX	PIFA	2400~2483	3.5	IPEX
					5150~5850	5	
					5925~7125	3.9	
4	Chain (0)+(1)	SparkLAN	AD-503AX	Dipole	2400~2483	3.7	RP-SMA
					5150~5850	5	
					5925~7125	5	
5	Chain (0)+(1)	JOHANSON	2450AD18A6050	CHIP	2400~2483	2	NA
					5150~5850	1.5	
					5925~7125	2.7	
6	Chain (0)+(1)	SparkLAN	AD-504AX	Dipole	2400~2483	2.67	I-PEX
					5150~5250	4.35	
					5250~5350	3.83	
					5470~5725	4.7	
					5725~5850	4.87	
					5925~6425	4.91	
					6425~6525	4.85	
					6525~6875	4.94	
					6875~7125	4.94	
7	Chain (0)+(1)	SparkLAN	AD-505AX	Dipole	2400~2483	2.67	I-PEX
					5150~5250	4.35	
					5250~5350	3.83	
					5470~5725	4.7	
					5725~5850	4.87	
					5925~6425	4.91	
					6425~6525	4.85	
					6525~6875	4.94	
					6875~7125	4.94	

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual.

6.5. Test Mode Applicability and Tested Channel Detail

- The fundamental of the dipole antenna was investigated in two orthogonal (lay and stand), it was determined that stand mode was worst-case. Therefore, all final radiated testing was performed with the dipole antenna in stand mode.
- For AC power line conducted emissions, the pre-scan has been determined by AC power 120Vac/60Hz (worst case)
- The antennas AD-501AX, AD-503AX has the highest gain, the following conducted tests are all carried out using this antenna gain.
- The antennas AD-501AX/ AD-503AX has the same type with same gain, therefore, the highest fundamental was determined antenna AD-501AX worst-case, the Antenna AD-501AX was selected for the final radiated testing.
- The fundamental of the Antenna AD-501AX, AD-502AX and 2450AD18A6050 was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that Y-Z axis were worst-case. Therefore, Antenna AD-501AX(Dipole), AD-502AX(PIFA) and 2450AD18A6050(CHIP) all final radiated tests were performed with the Y-Z axis.
- The Packet Type for DH1, DH3, and DH5 have all been pre-tested, the fundamental worst case of the Packet Type was found in the DH5. Therefore, only DH5 Packet Type is recorded in the report. (Except Dwell Time).
- The modulation and bandwidth are similar for π/4-DQPSK mode and 8DPSK mode, therefore investigated 8DPSK mode to representative mode in test report.
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Since the DUT is a Bluetooth device, the AFH mode and non-AFH mode follow the Bluetooth timing protocol, and the same timing level has the same time interval, but the non-AFH mode has worse results, therefore only the test data of this type were recorded in this report.

Test Item	Modulation Type	Available Channel	Test Channel	Packet Type
Radiated Emissions (Above 1GHz)	GFSK	0 to 78	0,39,78	DH5
	8DPSK	0 to 78	0,39,78	3DH5
Radiated Emissions (Below 1GHz)	GFSK	0 to 78	78	DH5
AC Power Line Conducted Emission	GFSK	0 to 78	78	DH5
Antenna Port Conducted Measurement	GFSK	0 to 78	0,39,78	DH1*,DH3*,DH5
	8DPSK	0 to 78	0,39,78	3DH1*,3DH3*, 3DH5
Conducted Emissions (Above 1GHz)	GFSK	0 to 78	0,39,78	DH5
	8DPSK	0 to 78	0,39,78	3DH5
Conducted Emissions (Below 1GHz)	GFSK	0 to 78	78	DH5

* Only for Dwell Time on Each Channel test

Simultaneously transmission condition:

Condition	Technology	
1	BT-GFSK	WLAN (5GHz)
2	BT-GFSK	WLAN (6GHz)

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

7. Test Equipment

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070827	2020/11/11	2021/11/10
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2020/12/11	2021/12/10
Loop Antenna	ETS lindgren	6502	00213440	2020/12/25	2021/12/24
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2021/1/13	2022/1/12
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2020/12/30	2021/12/29
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2020/12/30	2021/12/29
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2021/6/8	2022/6/7
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2021/2/3	2022/2/2
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2021/5/19	2022/5/18
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2021/1/22	2022/1/21
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2021/1/22	2022/1/21

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Antenna Port Conducted Measurement					
Spectrum Analyzer	Rohde & Schwarz	FSV40	101490	2021/9/7	2022/9/6
Pulse Power Sensor	Anritsu	MA2411B	1531202	2020/12/21	2021/12/20
Power Meter	Anritsu	ML2495A	1645002	2020/12/21	2021/12/20
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2020/11/17	2021/11/16
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2021/8/30	2022/8/29
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2021/8/26	2022/8/25
Cables	TITAN	CFD200	T0732ACFD20 020A300-1	2021/3/2	2022/3/1

UL Software		
Description	**Name**	**Version**
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF Conducted Test Tools	ver 2.4.0.620b
AC power Line Conducted Emission	EZ_EMC	UL-3A1.2

8. Description of Test Setup

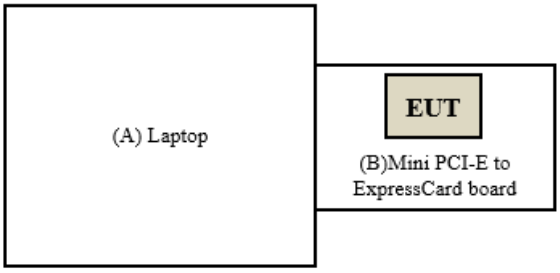
Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Laptop	Lenovo	E6430	2MMN3X1	Provide by lab
B	Mini PCI-E to ExpressCard board	SparkLAN	Card-01	001	N/A

Test Setup

Controlled using a bespoke application (QRCT_Version 4.0.00185.0) on a test Notebook. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

Setup Diagram for Test



Under Table

Remote Site

9. Test Results

9.1. Channel Bandwidth

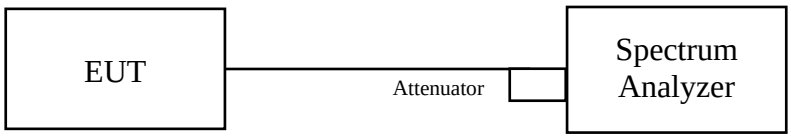
Requirements

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, two-thirds 20dBbandwidth of hopping channel shall be a minimum limit for the hopping channel separation.

Test procedure

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
d. Repeat above procedures until all frequencies measured were complete.

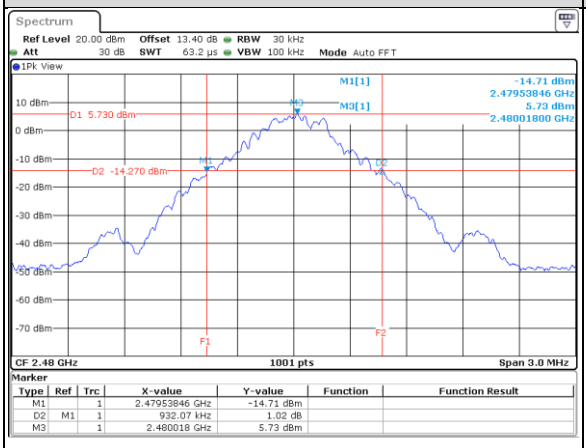
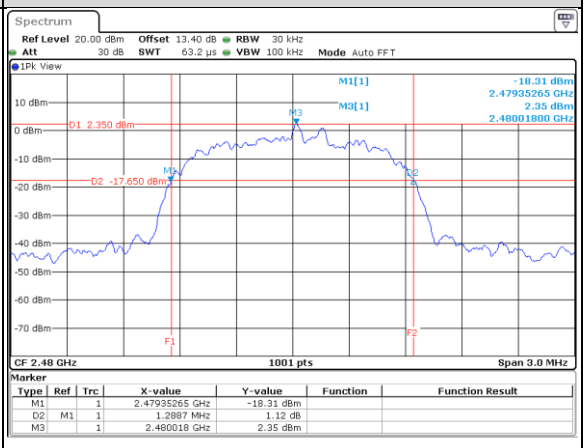
Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	
		GFSK	8DPSK
0	2402	0.93	1.29
39	2441	0.93	1.29
78	2480	0.93	1.29

Spectrum Plot of Worst Value	
GFSK / CH 78	8DPSK / CH 78
	

9.2. Conducted Output Power

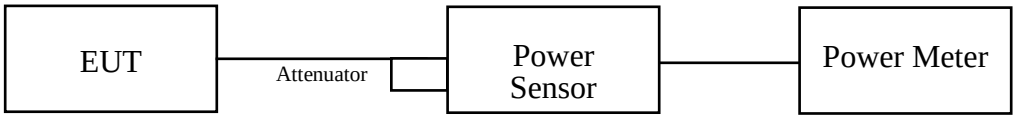
Requirements

The Maximum Output Power Measurement is 125mW.

Test Procedure

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Test Setup



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.

Test Data

Peak Power

BT GFSK

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	7.464	8.73	20.97	PASS
39	2441	8.414	9.25	20.97	PASS
78	2480	8.433	9.26	20.97	PASS

BT 8DPSK

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	5.408	7.33	20.97	PASS
39	2441	6.194	7.92	20.97	PASS
78	2480	5.984	7.77	20.97	PASS

Average Power (Reference Only)

BT GFSK

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	7.129	8.53
39	2441	7.998	9.03
78	2480	8.035	9.05

BT 8DPSK

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	2.825	4.51
39	2441	3.733	5.72
78	2480	3.802	5.80

9.3. Hopping Channel Separation

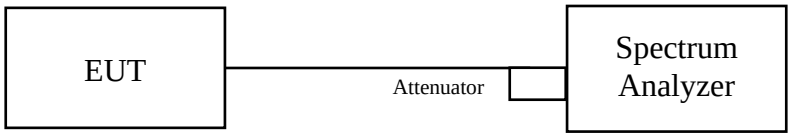
Requirements

At least 25kHz or two-third of 20dB hopping channel bandwidth (whichever is greater).

Test procedure

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
c. By using the MaxHold function record the separation of two adjacent channels.
d. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.

Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

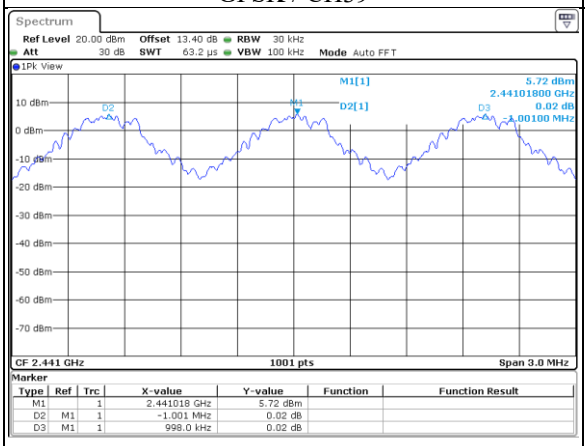
Test Data

Mode	Channel	Frequency (MHz)	Adjacent Hopping Channel Separation (MHz)	Limit (MHz)	Result
GFSK	00	2402	1.00	0.621	PASS
	39	2441	1.00	0.619	PASS
	78	2480	1.00	0.621	PASS
8DPSK	00	2402	1.00	0.857	PASS
	39	2441	1.00	0.859	PASS
	78	2480	1.00	0.859	PASS

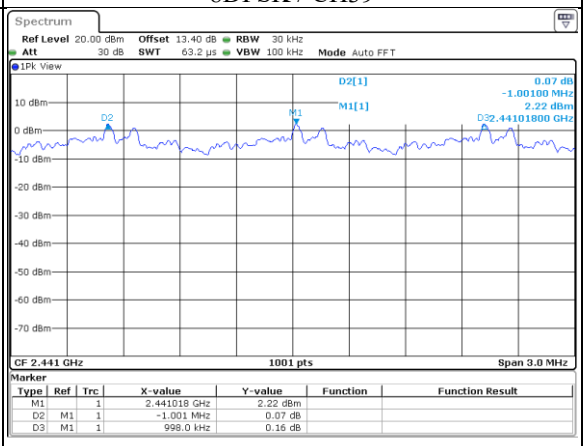
Note: Limit (MHz) = At least two/three of 20dB Bandwidth

Spectrum Plot of Worst Value

GFSK / CH39



8DPSK / CH39



9.4. Number of Hopping Frequency Used

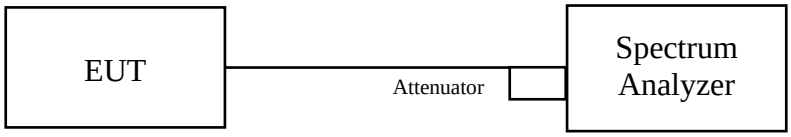
Requirements

At least 15 channels frequencies, and should be equally spaced.

Test procedure

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
d. Set the SA on View mode and then plot the result on SA screen.
e. Repeat above procedures until all frequencies measured were complete.

Test Setup

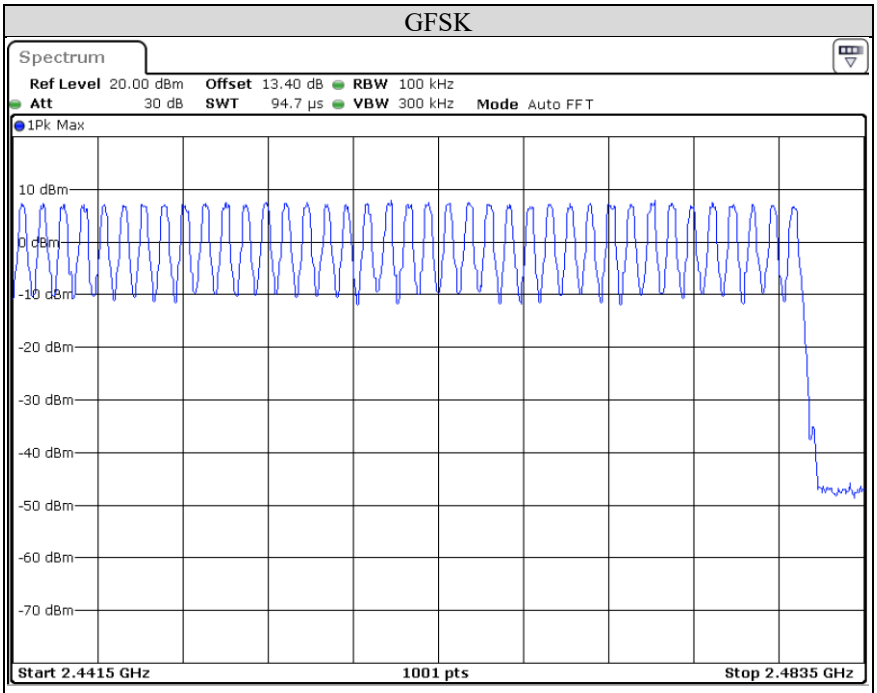


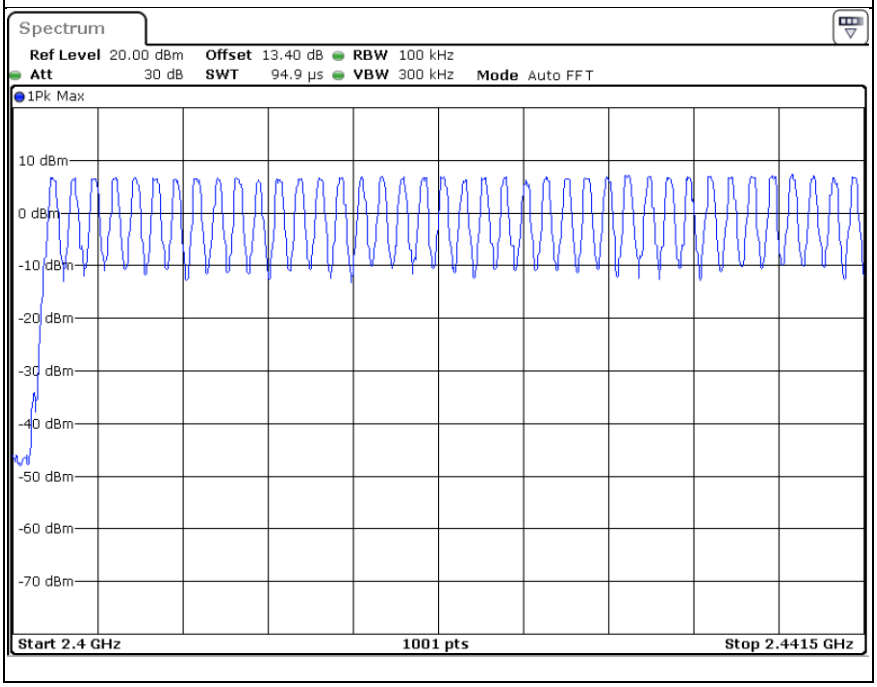
The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

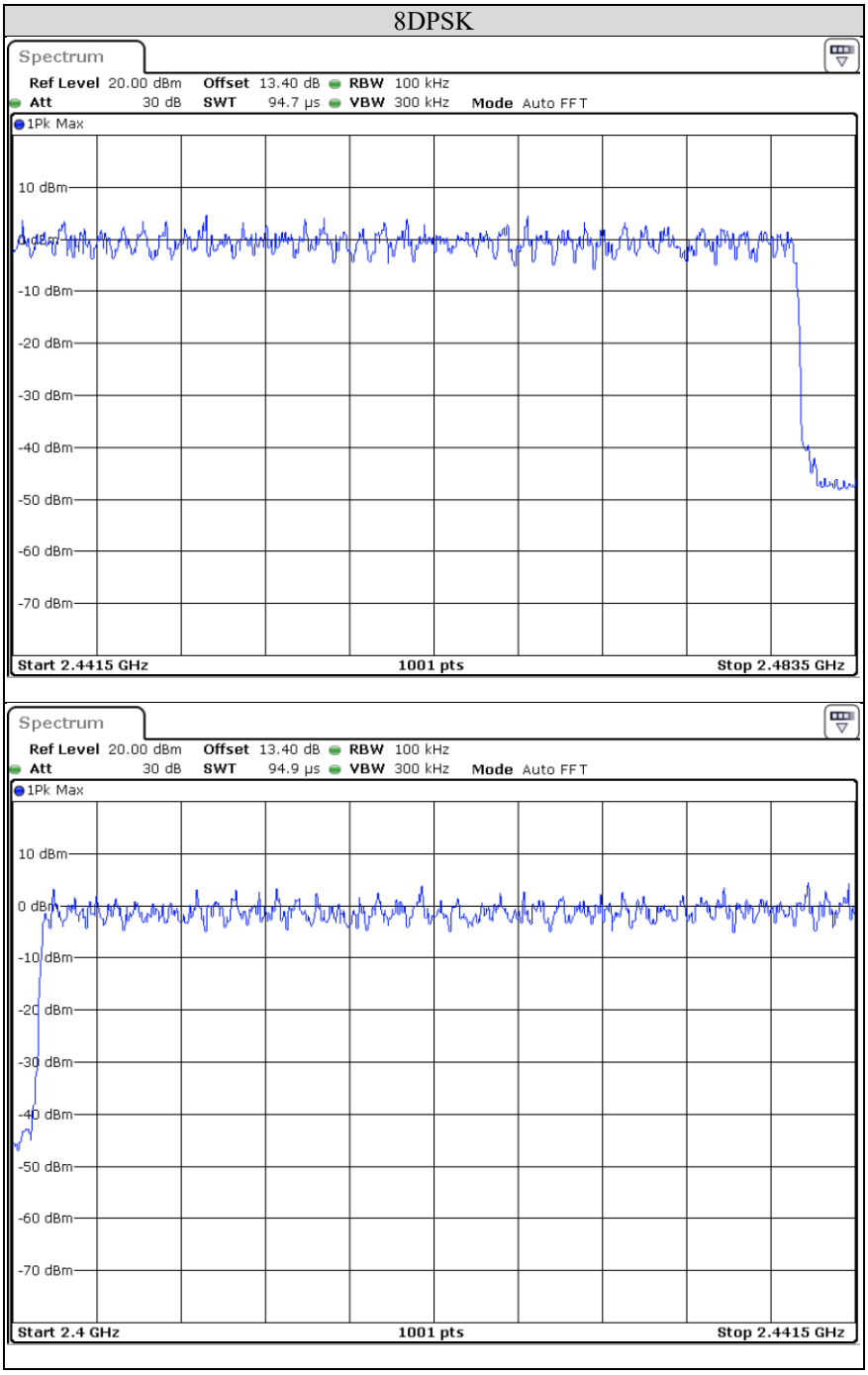
There are 79 hopping frequencies in the hopping mode. On the plots, it shows that the hopping frequencies are equally spaced.

GFSK





8DPSK


Spectrum
Ref Level 20.00 dBm Offset 13.40 dB RBW 100 kHz
Att 30 dB SWT 94.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.4415 GHz
1001 pts
Stop 2.4835 GHz
Spectrum
Ref Level 20.00 dBm Offset 13.40 dB RBW 100 kHz
Att 30 dB SWT 94.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.4 GHz
1001 pts
Stop 2.4415 GHz

9.5. Dwell Time on Each Channel

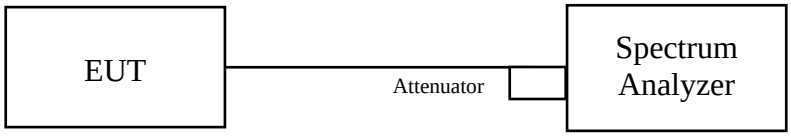
Requirements

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Test procedure

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
e. Repeat above procedures until all different time-slot modes have been completed.
f. Measure the maximum time duration of one single pulse.
   A Period Time = (channel number)*0.4
   For normal mode:
   DH1 Time Slot: Reading * (1600/2)*31.6/(channel number)
   DH3 Time Slot: Reading * (1600/4)*31.6/(channel number)
   DH5 Time Slot: Reading * (1600/6)*31.6/(channel number)
   For AFH mode:
   DH1 Time Slot: Reading * (800/2)*31.6/(channel number)
   DH3 Time Slot: Reading * (800/4)*31.6/(channel number)
   DH5 Time Slot: Reading * (800/6)*31.6/(channel number)

Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

GFSK

Modulation	Channel	Frequency (MHz)	Length of transmission time (msec)	Result (msec)	Limit (msec)	Result
DH1	39	2441	0.372	119.040	400	PASS
DH3	39	2441	1.625	260.000	400	PASS
DH5	39	2441	2.880	307.210	400	PASS

8DPSK

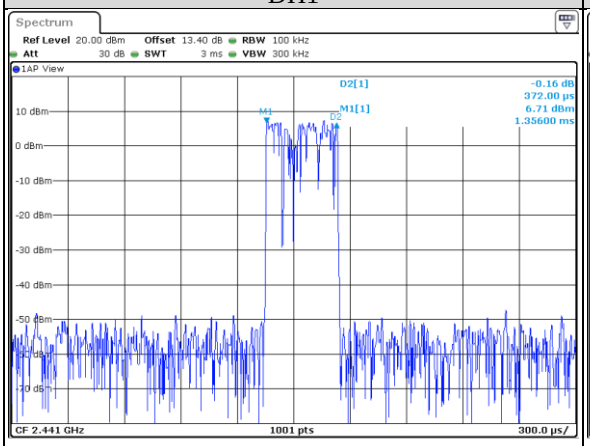
Modulation	Channel	Frequency (MHz)	Length of transmission time (msec)	Result (msec)	Limit (msec)	Result
3DH1	39	2441	0.384	122.880	400	PASS
3DH3	39	2441	1.630	260.800	400	PASS
3DH5	39	2441	2.880	307.210	400	PASS

Note：

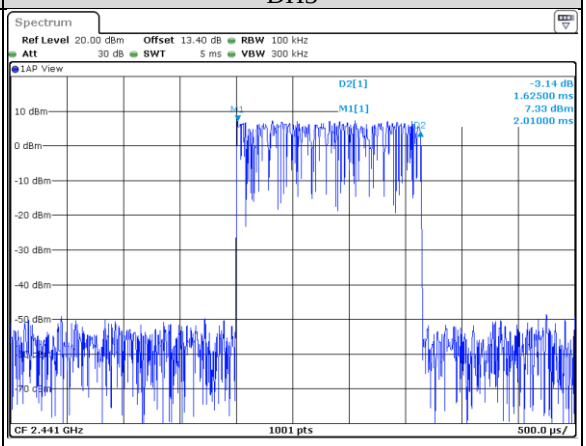
1. In normal mode:
   DH1 hopping rate is 1600 hops/s with 2 slots in 79 hopping channels. With channel hopping rate (1600 / 2 / 79) in Occupancy Time Limit (0.4 x 79) (s),Hops Over Occupancy Time comes to (1600 / 2 / 79) x (0.4 x 79) = 320 hops.
   DH3 hopping rate is 1600 hops/s with 4 slots in 79 hopping channels. With channel hopping rate (1600 / 4 / 79) in Occupancy Time Limit (0.4 x 79) (s),Hops Over Occupancy Time comes to (1600 / 4 / 79) x (0.4 x 79) = 160 hops.
   DH5 hopping rate is 1600 hops/s with 6 slots in 79 hopping channels. With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4 x 79) (s),Hops Over Occupancy Time comes to (1600 / 6 / 79) x (0.4 x 79) = 106.67 hops.
2. Dwell time (ms) = Hops Over Occupancy Time (hops) x Length of transmission time (ms).

GFSK

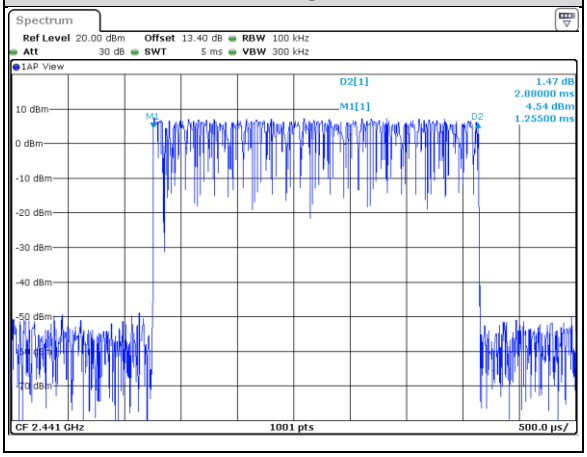
DH1



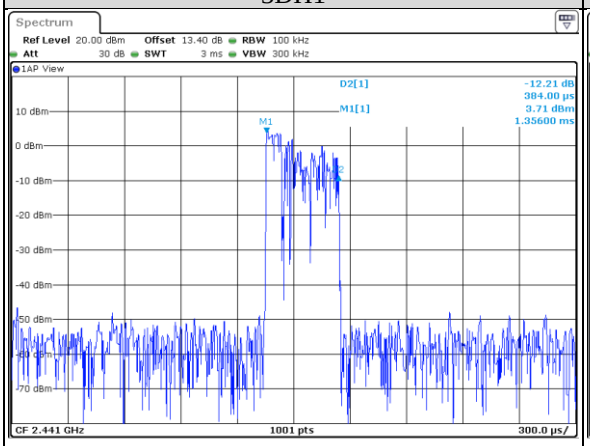
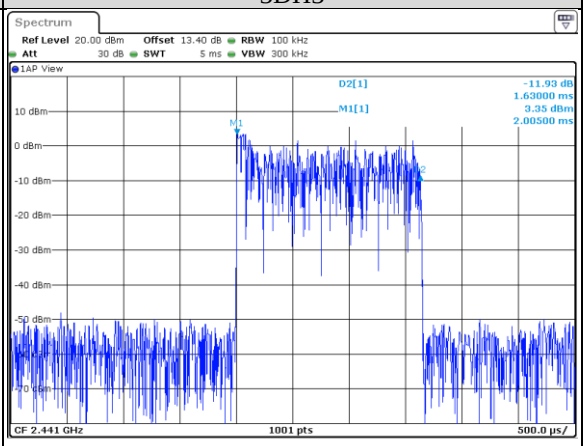
DH3

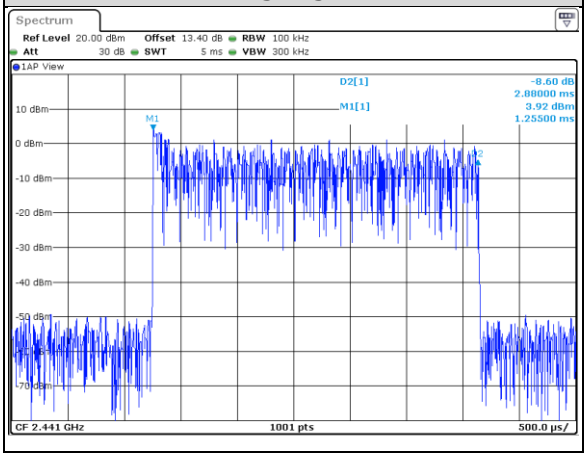


DH5



8DPSK

3DH1	3DH3
	

3DH5


9.6. Conducted Out of Band Emission

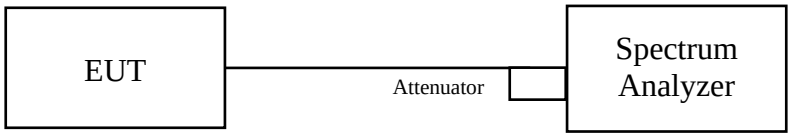
Requirements

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b) (3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209 (a) is not required.

Test procedure

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

Test Setup

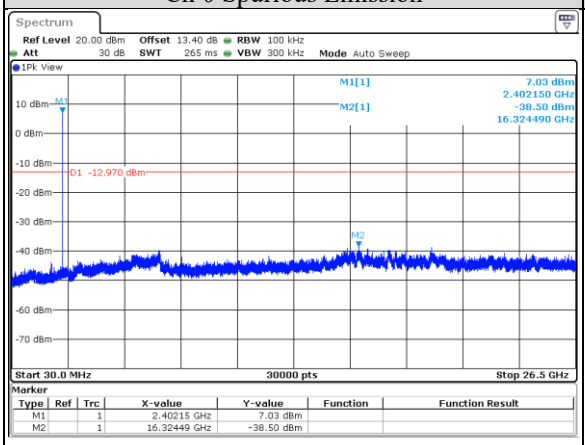


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

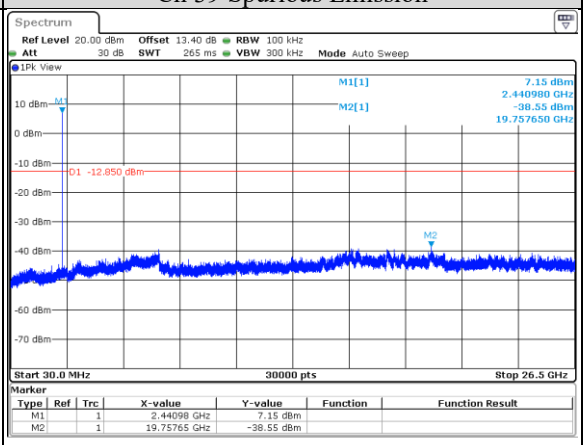
Test Data

GFSK

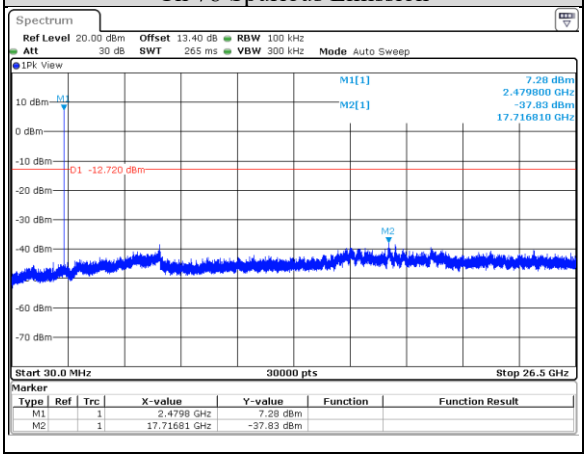
Ch 0 Spurious Emission



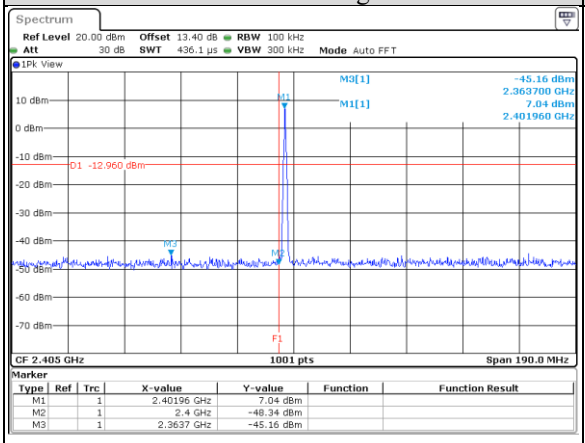
Ch 39 Spurious Emission



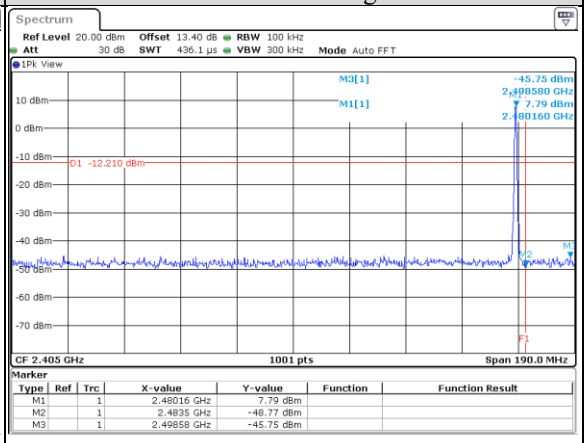
Ch 78 Spurious Emission



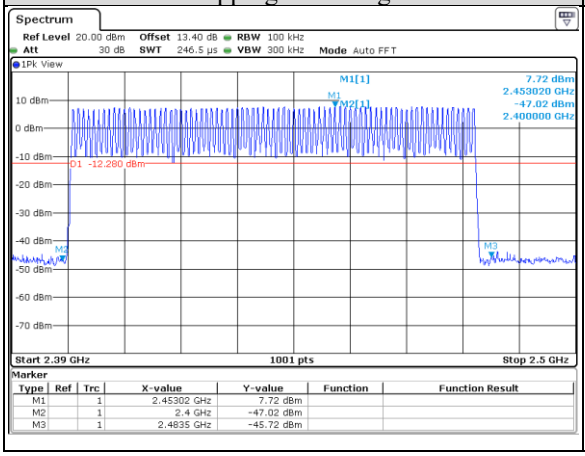
Ch 0 Band Edge



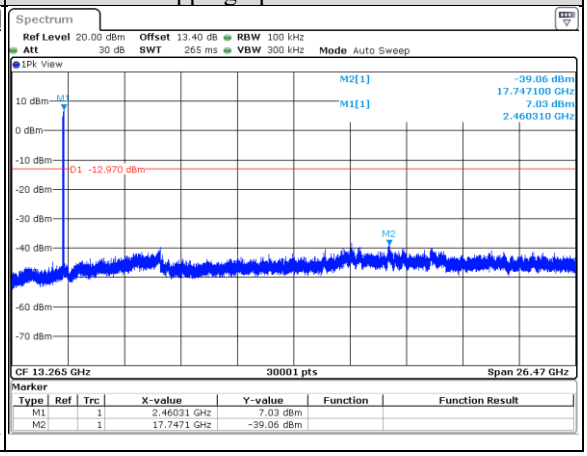
Ch 78 Band Edge



Hopping Band Edge

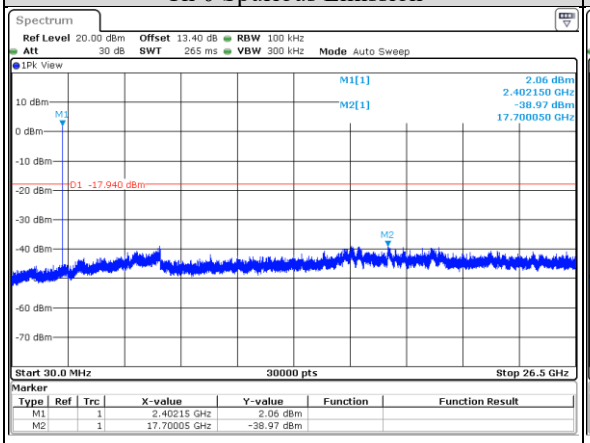


Hopping Spurious Emission

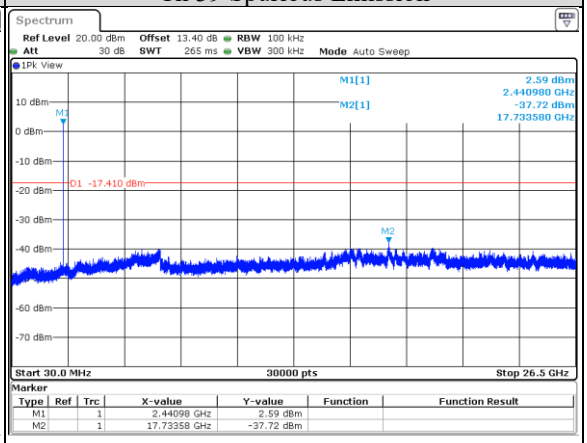


8DPSK

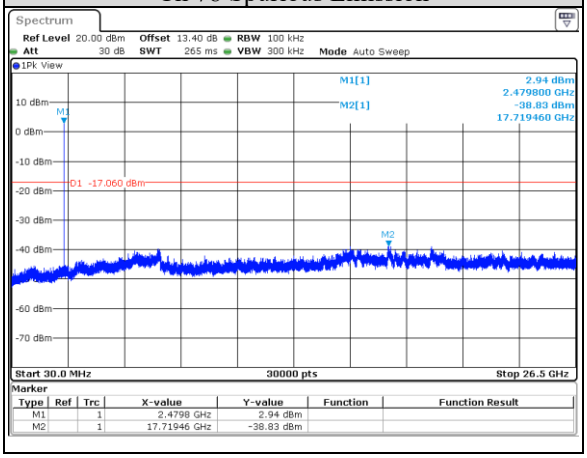
Ch 0 Spurious Emission



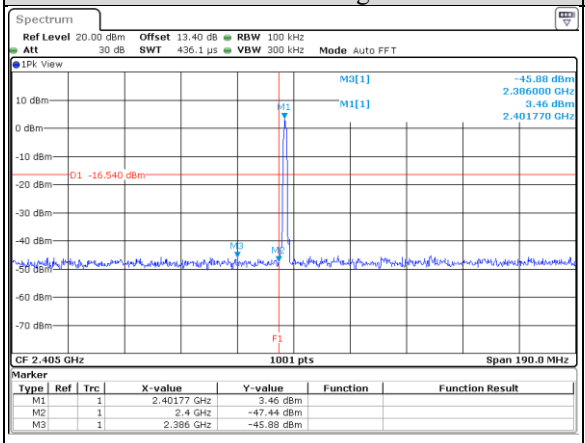
Ch 39 Spurious Emission



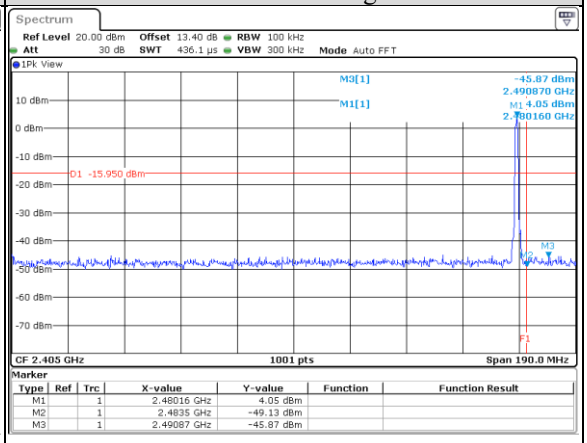
Ch 78 Spurious Emission



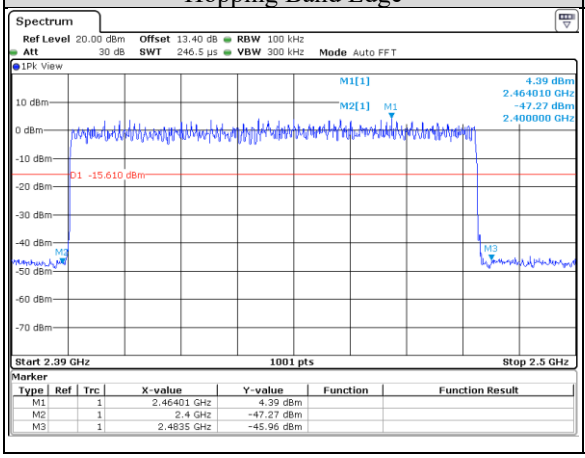
Ch 0 Band Edge



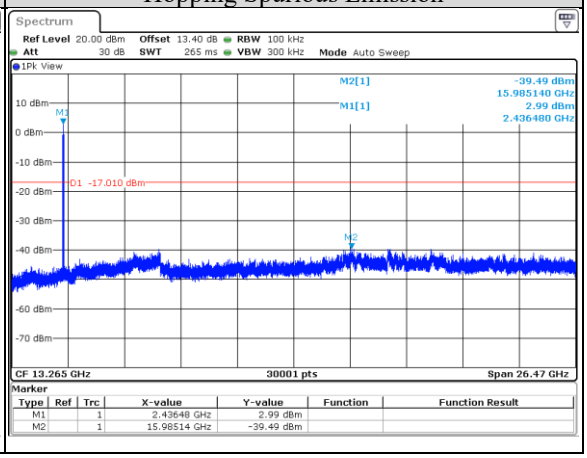
Ch 78 Band Edge



Hopping Band Edge



Hopping Spurious Emission



9.7. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

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
Above 960	500	3

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Test Procedures

[For 9 kHz ~ 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. For measurement below 30MHz, 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 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.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

[For above 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. 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 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.
f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

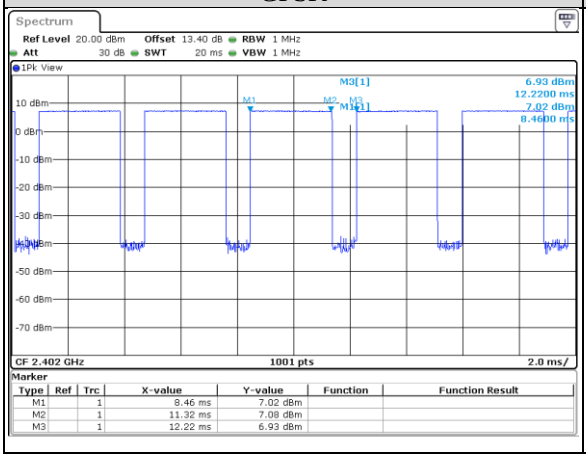
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.

Configuration	Average	
	RBW	VBW
Bluetooth	1MHz	510 Hz

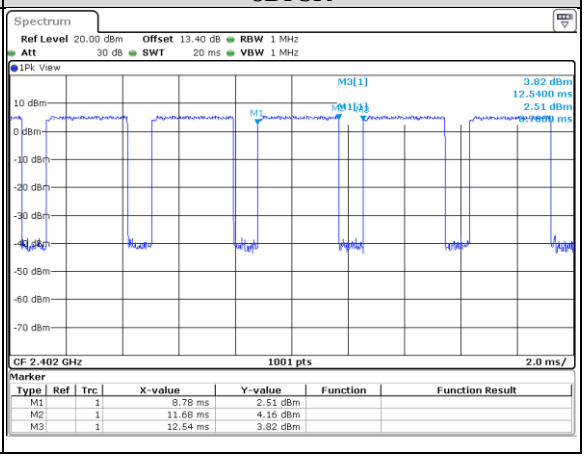
Note:

- The BT-GFSK Duty cycle = (2.86/3.76)*100% = 76.064 <98%, so video bandwidth is 1/2.86 = 0.35 kHz. Therefore VBW configuration is 510Hz for testing.
- The BT-8DPSK Duty cycle = (2.9/3.76)*100% = 77.128 <98%, so video bandwidth is 1/2.9 = 0.345 kHz. Therefore VBW configuration is 510Hz for testing.
- Refer to duty cycle plots as below:

GFSK



8DPSK

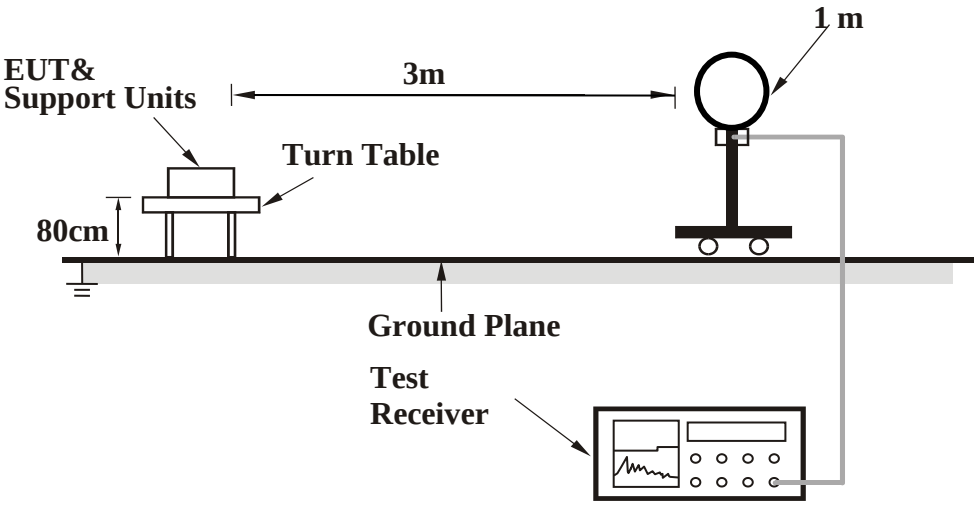


4. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
5. Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
6. Test data of Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
7. Test data of Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
8. Test data of Notation "@" = Fundamental Frequency
9. Test data of Notation " * " = The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.

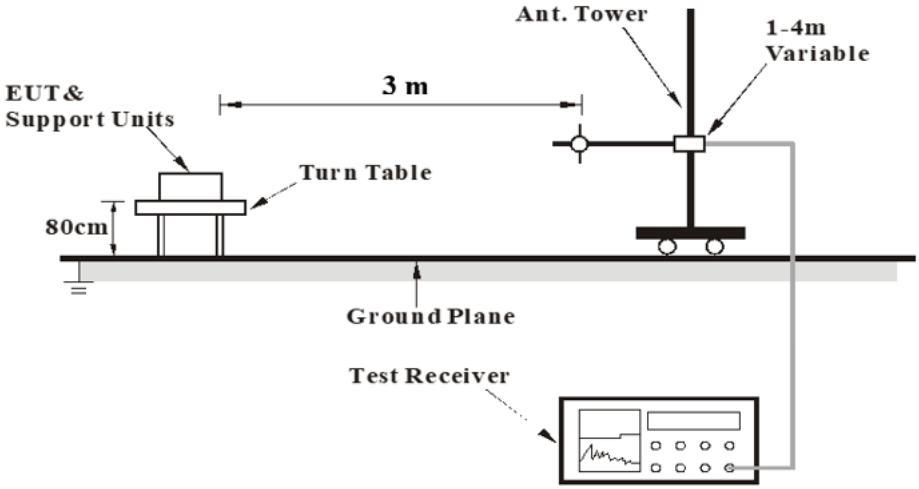
Test Setup

For Radiated Test Method:

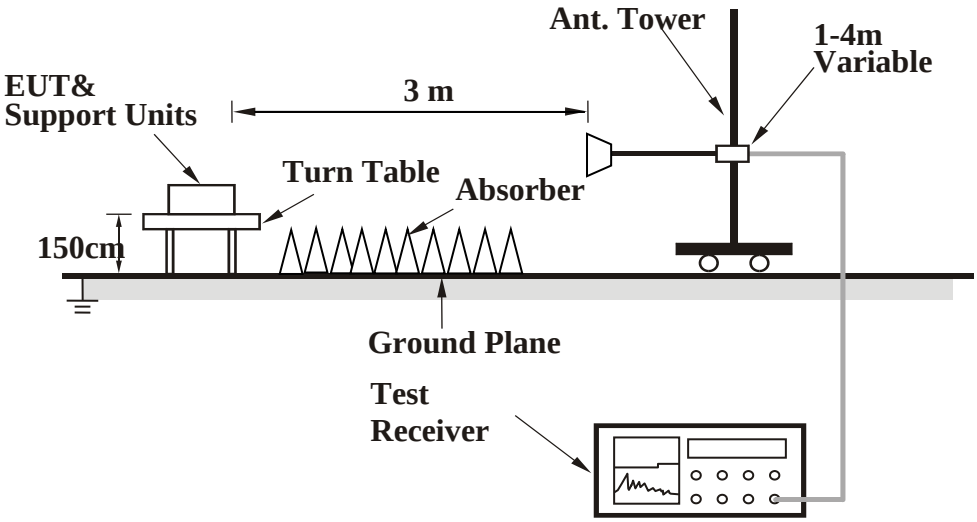
<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >



<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the Setup Configurations.

Test Data

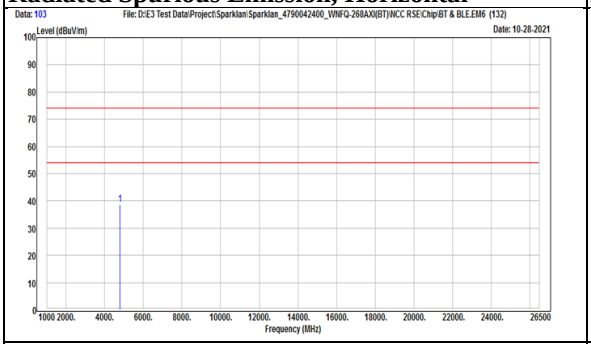
Chip (Model: 2450AD18A6050)

Above 1 GHz

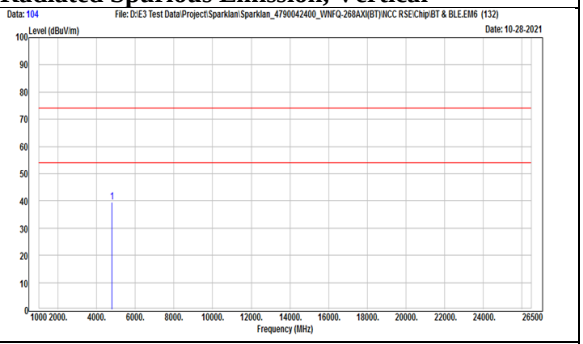
Mode	GFSK	Channel	0

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2325.2	31.35	6.13	37.48	54	-16.52	AVG
		2387.71	40.11	6.1	46.21	74	-27.79	PK
	@	2402	92.08	6.13	98.21	N/A	N/A	PK
	@	2402	91.81	6.13	97.94	N/A	N/A	AVG
	*	4804	36.2	2.46	38.66	74	-35.34	PK
Vertical		2325.2	40.41	6.13	46.54	74	-27.46	PK
		2325.2	34.01	6.13	40.14	54	-13.86	AVG
	@	2402	95.55	6.13	101.68	N/A	N/A	PK
	@	2402	95.31	6.13	101.44	N/A	N/A	AVG
	*	4804	37.14	2.46	39.6	74	-34.4	PK

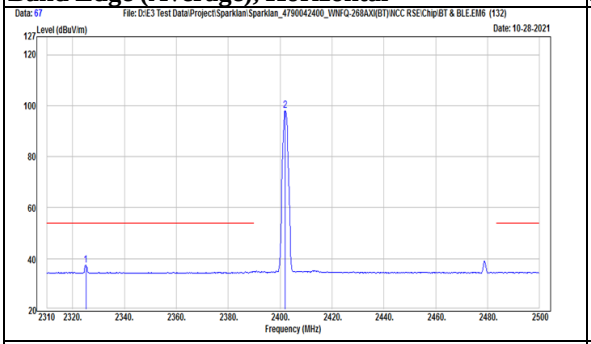
TX, GFSK (Ch 0)
Radiated Spurious Emission, Horizontal



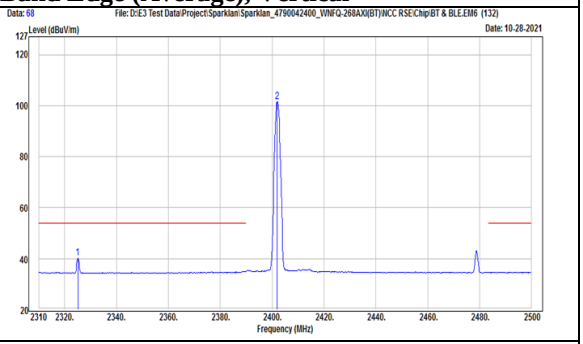
TX, GFSK (Ch 0)
Radiated Spurious Emission, Vertical



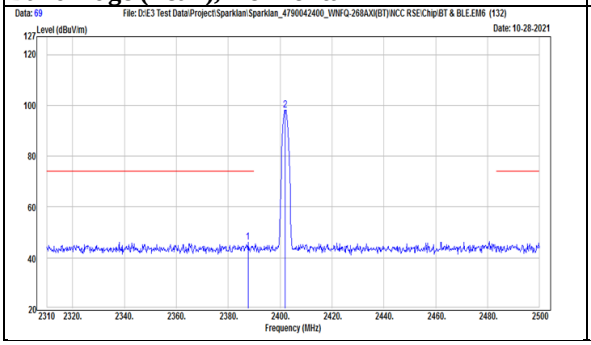
TX, GFSK (Ch 0)
Band Edge (Average), Horizontal



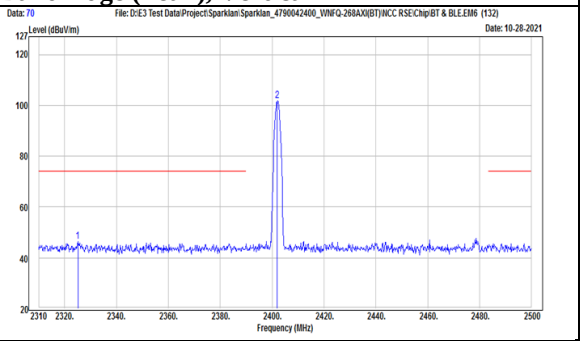
TX, GFSK (Ch 0)
Band Edge (Average), Vertical



TX, GFSK (Ch 0)
Band Edge (Peak), Horizontal



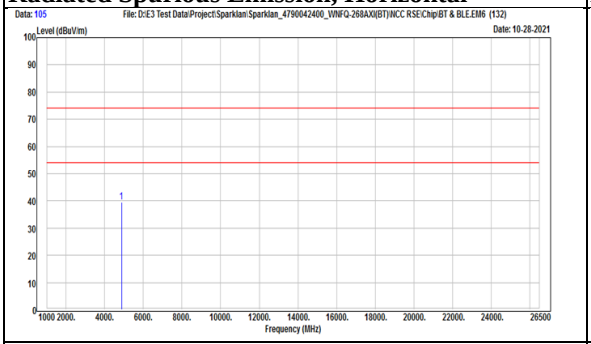
TX, GFSK (Ch 0)
Band Edge (Peak), Vertical



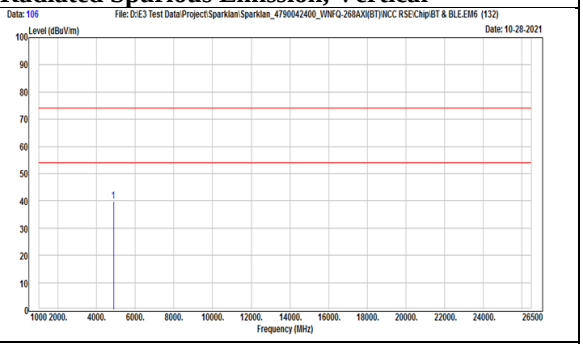
Mode	GFSK	Channel	39

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2364.15	31.85	6.06	37.91	54	-16.09	AVG
		2380.11	40.03	6.08	46.11	74	-27.89	PK
	@	2441	94.42	6.11	100.53	N/A	N/A	PK
	@	2441	94.1	6.11	100.21	N/A	N/A	AVG
		2488.79	28.66	6.1	34.76	54	-19.24	AVG
		2496.01	40.07	6.1	46.17	74	-27.83	PK
	*	4882	36.78	2.66	39.44	74	-34.56	PK
Vertical		2322.35	40.51	6.15	46.66	74	-27.34	PK
		2364.15	33.56	6.06	39.62	54	-14.38	AVG
	@	2441	97.8	6.11	103.91	N/A	N/A	PK
	@	2441	97.4	6.11	103.51	N/A	N/A	AVG
		2483.66	40.04	6.1	46.14	74	-27.86	PK
		2494.87	28.67	6.1	34.77	54	-19.23	AVG
	*	4882	37.15	2.66	39.81	74	-34.19	PK

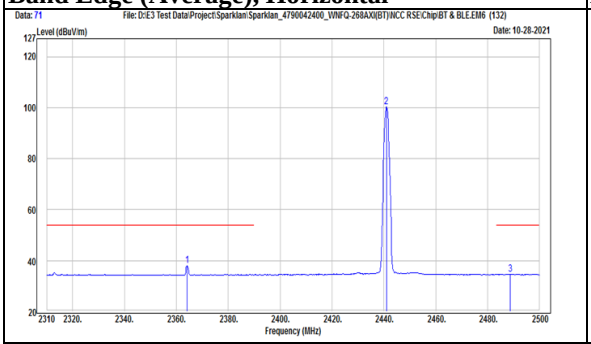
TX, GFSK (Ch 39)
Radiated Spurious Emission, Horizontal



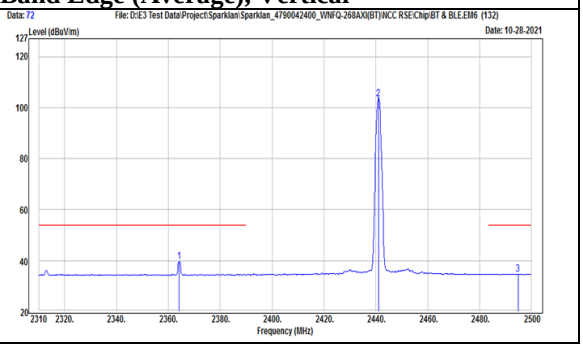
TX, GFSK (Ch 39)
Radiated Spurious Emission, Vertical



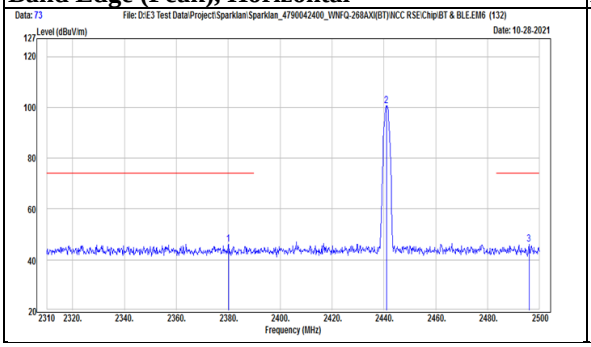
TX, GFSK (Ch 39)
Band Edge (Average), Horizontal



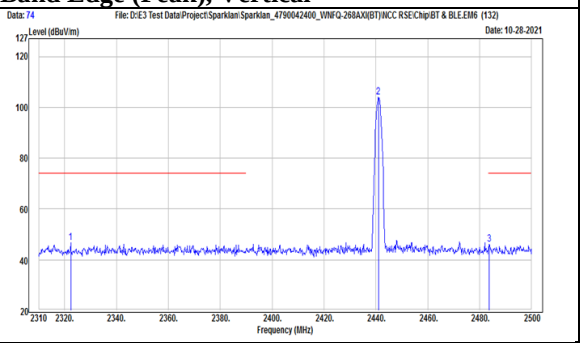
TX, GFSK (Ch 39)
Band Edge (Average), Vertical



TX, GFSK (Ch 39)
Band Edge (Peak), Horizontal



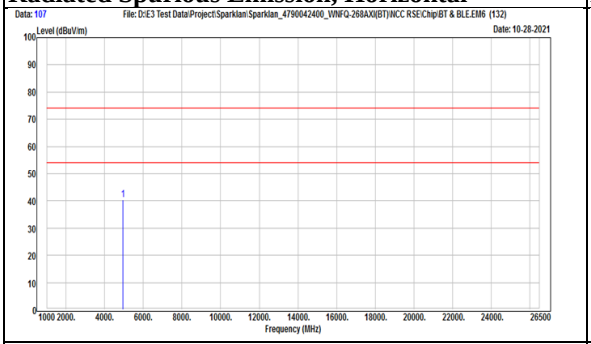
TX, GFSK (Ch 39)
Band Edge (Peak), Vertical



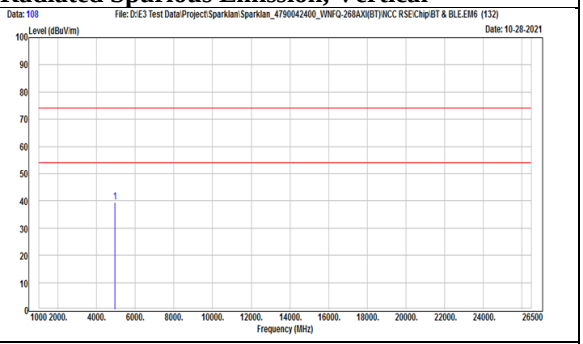
Mode	GFSK	Channel	78

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2480	93.57	6.1	99.67	N/A	N/A	PK
	@	2480	93.05	6.1	99.15	N/A	N/A	AVG
		2490.12	29.16	6.1	35.26	54	-18.74	AVG
		2496.58	40.71	6.1	46.81	74	-27.19	PK
	*	4960	37.86	2.62	40.48	74	-33.52	PK
Vertical	@	2480	98.05	6.1	104.15	N/A	N/A	PK
	@	2480	97.5	6.1	103.6	N/A	N/A	AVG
		2491.83	30.37	6.1	36.47	54	-17.53	AVG
		2493.35	40.3	6.1	46.4	74	-27.6	PK
	*	4960	36.94	2.62	39.56	74	-34.44	PK

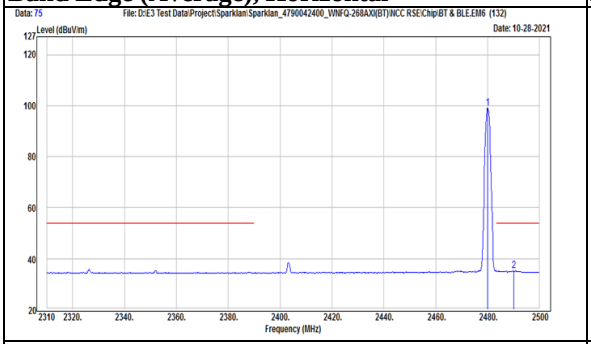
TX, GFSK (Ch 78)
Radiated Spurious Emission, Horizontal



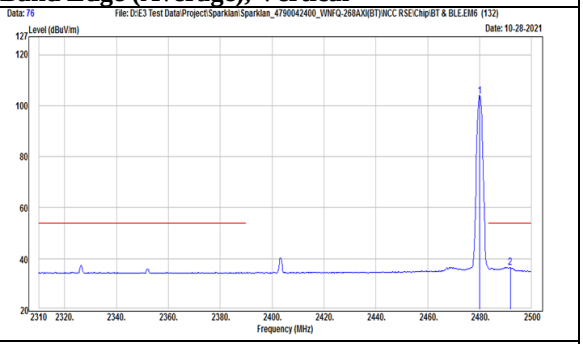
TX, GFSK (Ch 78)
Radiated Spurious Emission, Vertical



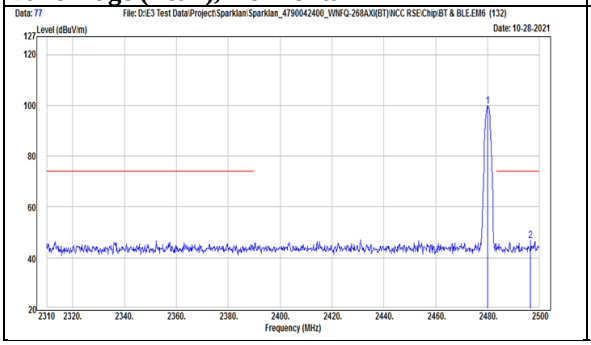
TX, GFSK (Ch 78)
Band Edge (Average), Horizontal



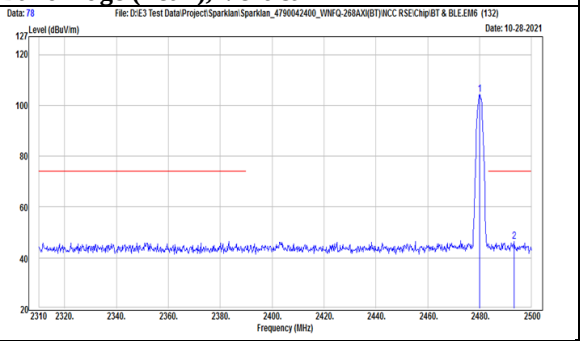
TX, GFSK (Ch 78)
Band Edge (Average), Vertical



TX, GFSK (Ch 78)
Band Edge (Peak), Horizontal



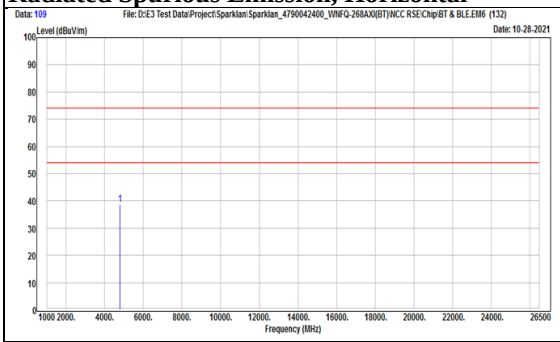
TX, GFSK (Ch 78)
Band Edge (Peak), Vertical



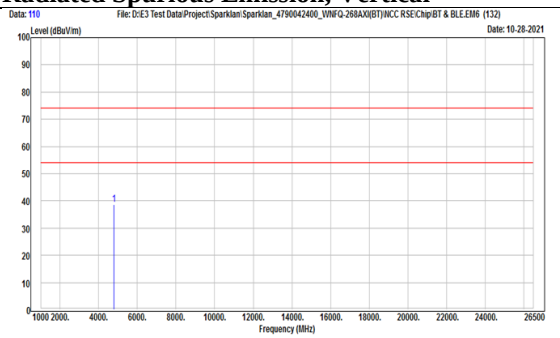
Mode	8DPSK	Channel	0

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2325.01	29.54	6.13	35.67	54	-18.33	AVG
		2367	40.17	6.07	46.24	74	-27.76	PK
	@	2402	89.95	6.13	96.08	N/A	N/A	PK
	@	2402	86.07	6.13	92.2	N/A	N/A	AVG
	*	4804	36.18	2.46	38.64	74	-35.36	PK
Vertical		2325.2	31.24	6.13	37.37	54	-16.63	AVG
		2364.34	40.01	6.06	46.07	74	-27.93	PK
	@	2402	91.57	6.13	97.7	N/A	N/A	PK
	@	2402	89.87	6.13	96	N/A	N/A	AVG
	*	4804	36.14	2.46	38.6	74	-35.4	PK

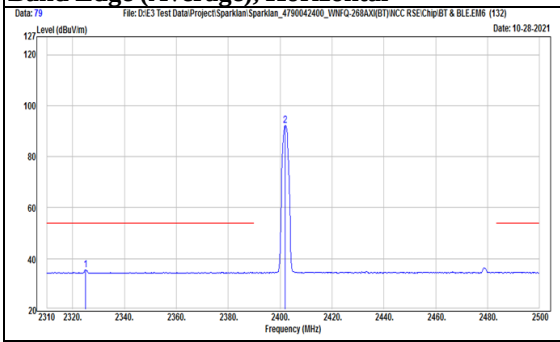
TX, 8DPSK (Ch 0)
Radiated Spurious Emission, Horizontal



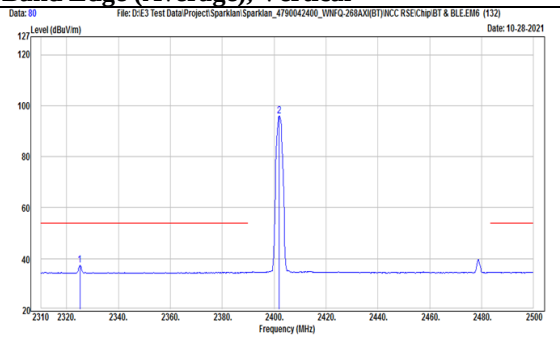
TX, 8DPSK (Ch 0)
Radiated Spurious Emission, Vertical



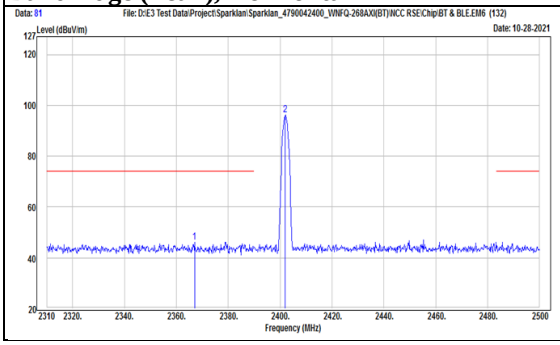
TX, 8DPSK (Ch 0)
Band Edge (Average), Horizontal



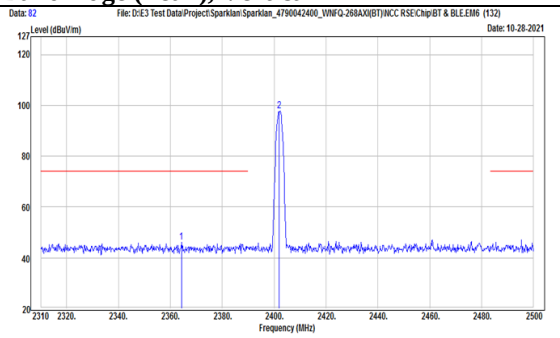
TX, 8DPSK (Ch 0)
Band Edge (Average), Vertical



TX, 8DPSK (Ch 0)
Band Edge (Peak), Horizontal

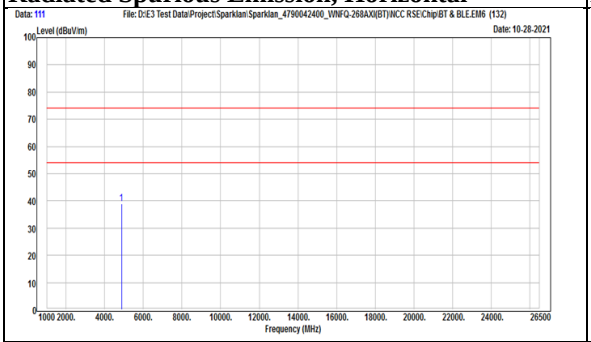
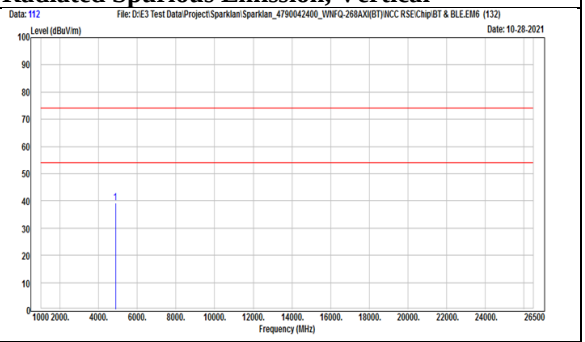
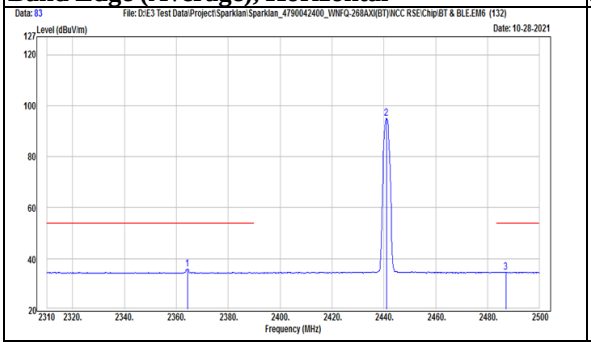
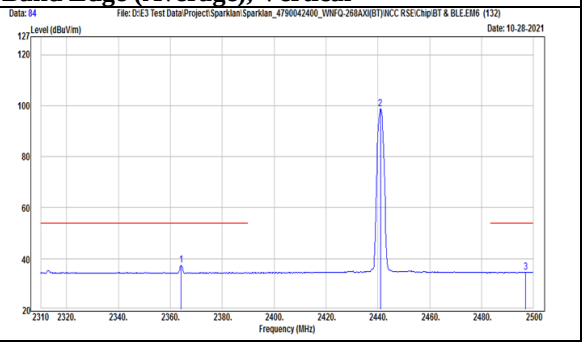
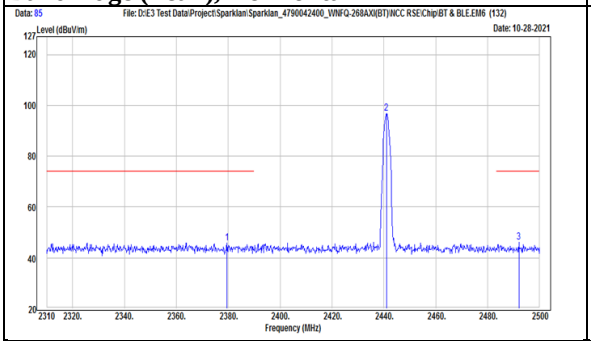
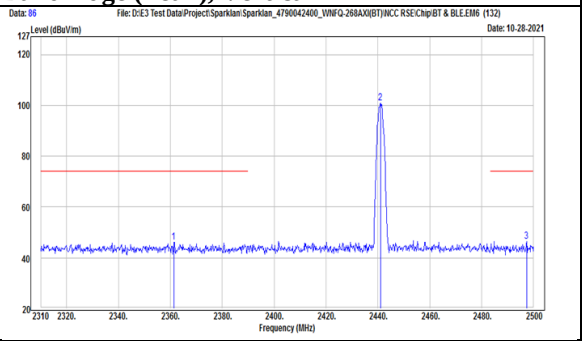


TX, 8DPSK (Ch 0)
Band Edge (Peak), Vertical



Mode	8DPSK	Channel	39

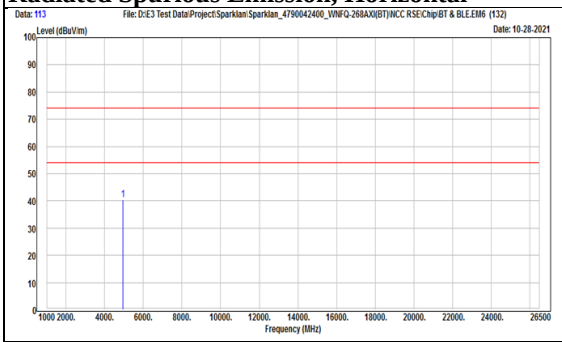
Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2364.34	29.95	6.06	36.01	54	-17.99	AVG
		2379.54	39.78	6.08	45.86	74	-28.14	PK
	@	2441	90.57	6.11	96.68	N/A	N/A	PK
	@	2441	88.92	6.11	95.03	N/A	N/A	AVG
		2487.08	28.56	6.1	34.66	54	-19.34	AVG
		2492.02	40.01	6.1	46.11	74	-27.89	PK
	*	4882	36.33	2.66	38.99	74	-35.01	PK
Vertical		2361.3	40.19	6.05	46.24	74	-27.76	PK
		2364.15	31.25	6.06	37.31	54	-16.69	AVG
	@	2441	94.62	6.11	100.73	N/A	N/A	PK
	@	2441	92.51	6.11	98.62	N/A	N/A	AVG
		2496.96	28.66	6.1	34.76	54	-19.24	AVG
		2497.34	40.35	6.1	46.45	74	-27.55	PK
	*	4882	36.55	2.66	39.21	74	-34.79	PK

TX, 8DPSK (Ch 39) **Radiated Spurious Emission, Horizontal**	**TX, 8DPSK (Ch 39)** **Radiated Spurious Emission, Vertical**
	
TX, 8DPSK (Ch 39) **Band Edge (Average), Horizontal**	**TX, 8DPSK (Ch 39)** **Band Edge (Average), Vertical**
	
TX, 8DPSK (Ch 39) **Band Edge (Peak), Horizontal**	**TX, 8DPSK (Ch 39)** **Band Edge (Peak), Vertical**
	

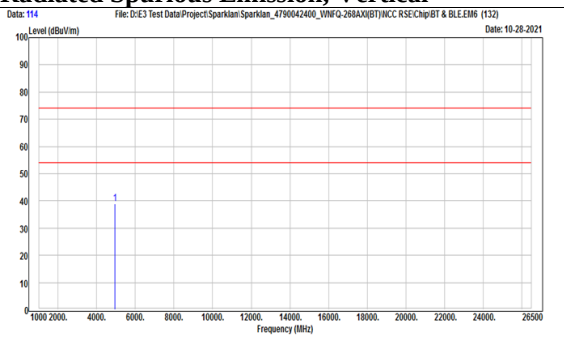
Mode	8DPSK	Channel	78

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2480	91.62	6.1	97.72	N/A	N/A	PK
	@	2480	87.81	6.1	93.91	N/A	N/A	AVG
		2483.66	28.71	6.1	34.81	54	-19.19	AVG
		2484.8	40.6	6.1	46.7	74	-27.3	PK
	*	4960	37.8	2.62	40.42	74	-33.58	PK
Vertical	@	2480	95.8	6.1	101.9	N/A	N/A	PK
	@	2480	93.1	6.1	99.2	N/A	N/A	AVG
		2483.66	29.53	6.1	35.63	54	-18.37	AVG
		2484.04	39.73	6.1	45.83	74	-28.17	PK
	*	4960	36.38	2.62	39	74	-35	PK

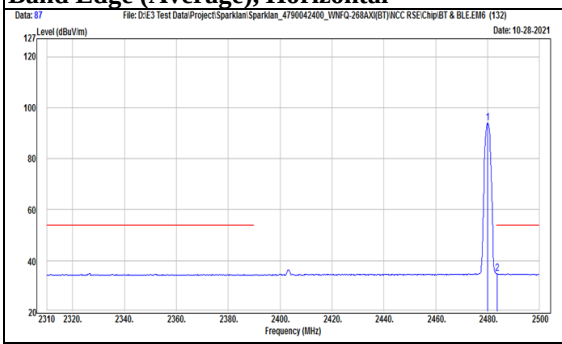
TX, 8DPSK (Ch 78)
Radiated Spurious Emission, Horizontal



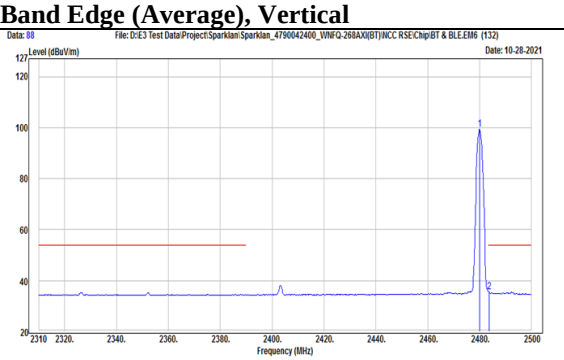
TX, 8DPSK (Ch 78)
Radiated Spurious Emission, Vertical



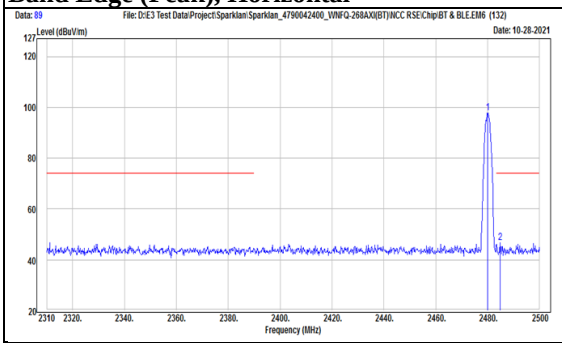
TX, 8DPSK (Ch 78)
Band Edge (Average), Horizontal



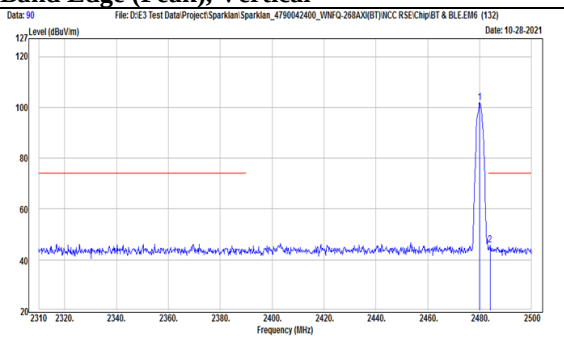
TX, 8DPSK (Ch 78)
Band Edge (Average), Vertical



TX, 8DPSK (Ch 78)
Band Edge (Peak), Horizontal



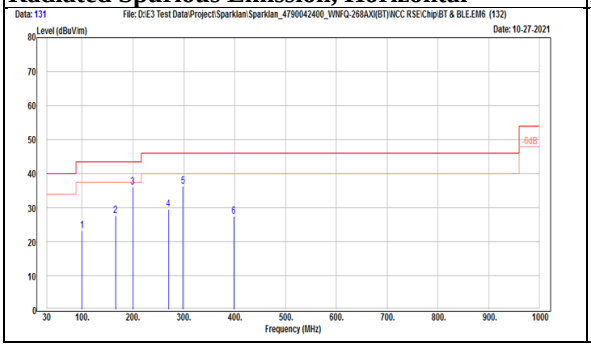
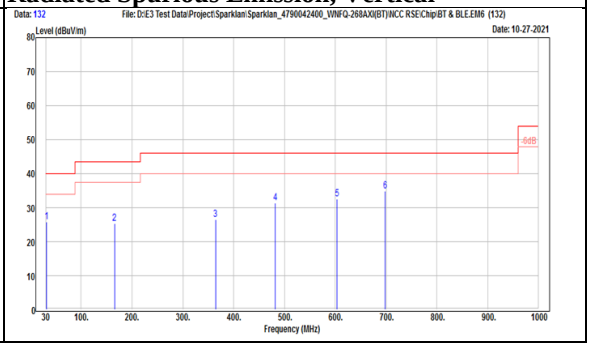
TX, 8DPSK (Ch 78)
Band Edge (Peak), Vertical



Below 1 GHz

Mode	GFSK	Channel	78

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		99.84	39.73	-16.45	23.28	43.5	-20.22	PK
		165.8	38.72	-11.13	27.59	43.5	-15.91	PK
		199.75	49.84	-13.91	35.93	43.5	-7.57	PK
		269.59	40.62	-11.02	29.6	46	-16.4	PK
		298.69	46.37	-9.99	36.38	46	-9.62	PK
		398.6	34.54	-7.06	27.48	46	-18.52	PK
Vertical		31.94	38.19	-12.47	25.72	40	-14.28	PK
		165.8	36.53	-11.13	25.4	43.5	-18.1	PK
		364.65	34.45	-8.01	26.44	46	-19.56	PK
		482.02	36.55	-5.1	31.45	46	-14.55	PK
		603.27	34.55	-1.89	32.66	46	-13.34	PK
		698.33	35.29	-0.45	34.84	46	-11.16	PK

TX, GFSK (Ch 78) Radiated Spurious Emission, Horizontal	TX, GFSK (Ch 78) Radiated Spurious Emission, Vertical
	

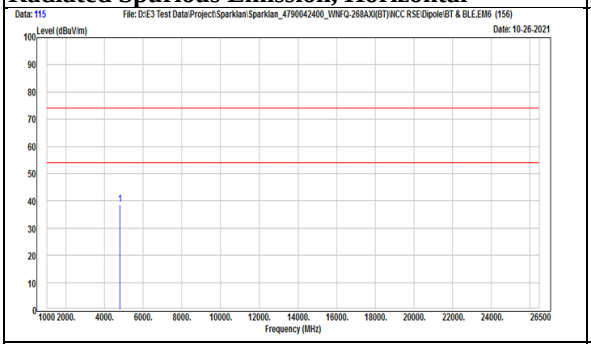
Dipole (Model: AD-501AX)

Above 1 GHz

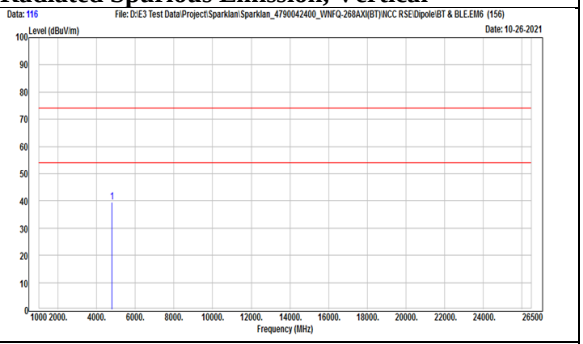
Mode	GFSK	Channel	0

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2325.2	30.96	6.13	37.09	54	-16.91	AVG
		2388.28	40.59	6.1	46.69	74	-27.31	PK
	@	2402	92.16	6.13	98.29	N/A	N/A	PK
	@	2402	91.42	6.13	97.55	N/A	N/A	AVG
	*	4804	36.09	2.46	38.55	74	-35.45	PK
Vertical		2325.2	41.23	6.13	47.36	74	-26.64	PK
		2325.2	36.48	6.13	42.61	54	-11.39	AVG
	@	2402	99.85	6.13	105.98	N/A	N/A	PK
	@	2402	99.68	6.13	105.81	N/A	N/A	AVG
	*	4804	37.01	2.46	39.47	74	-34.53	PK

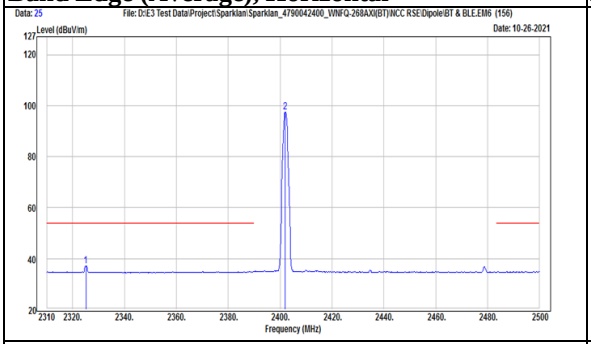
TX, GFSK (Ch 0)
Radiated Spurious Emission, Horizontal



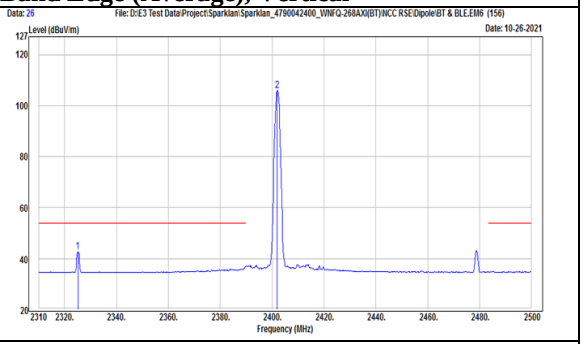
TX, GFSK (Ch 0)
Radiated Spurious Emission, Vertical



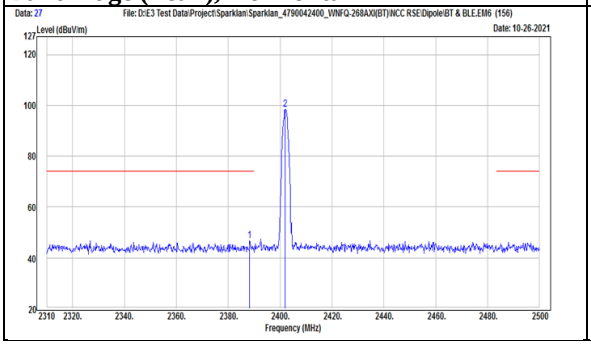
TX, GFSK (Ch 0)
Band Edge (Average), Horizontal



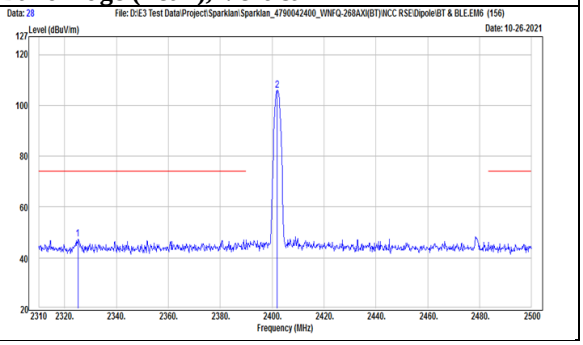
TX, GFSK (Ch 0)
Band Edge (Average), Vertical



TX, GFSK (Ch 0)
Band Edge (Peak), Horizontal



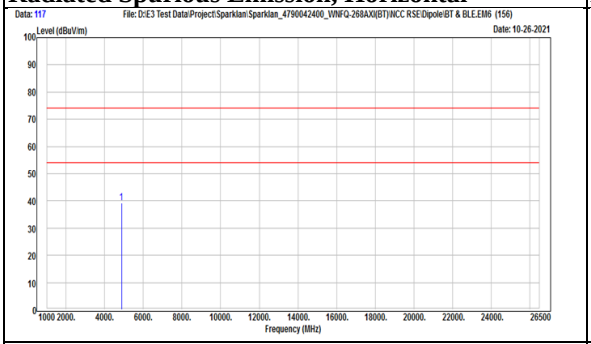
TX, GFSK (Ch 0)
Band Edge (Peak), Vertical



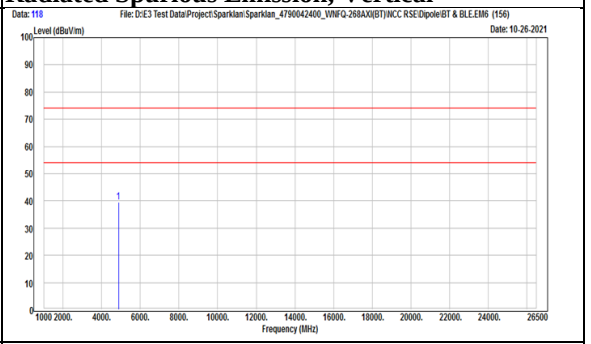
Mode	GFSK	Channel	39

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2364.15	33.12	6.06	39.18	54	-14.82	AVG
		2387.14	40.53	6.1	46.63	74	-27.37	PK
	@	2441	92.07	6.11	98.18	N/A	N/A	PK
	@	2441	91.85	6.11	97.96	N/A	N/A	AVG
		2486.51	40.11	6.1	46.21	74	-27.79	PK
		2490.12	28.82	6.1	34.92	54	-19.08	AVG
	*	4882	36.64	2.66	39.3	74	-34.7	PK
Vertical		2364.15	43.55	6.06	49.61	74	-24.39	PK
		2364.15	39.1	6.06	45.16	54	-8.84	AVG
	@	2441	100.71	6.11	106.82	N/A	N/A	PK
	@	2441	99.61	6.11	105.72	N/A	N/A	AVG
		2489.36	28.87	6.1	34.97	54	-19.03	AVG
		2496.58	39.24	6.1	45.34	74	-28.66	PK
	*	4882	36.99	2.66	39.65	74	-34.35	PK

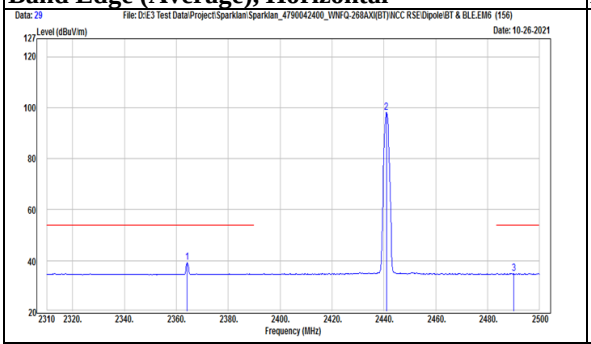
TX, GFSK (Ch 39)
Radiated Spurious Emission, Horizontal



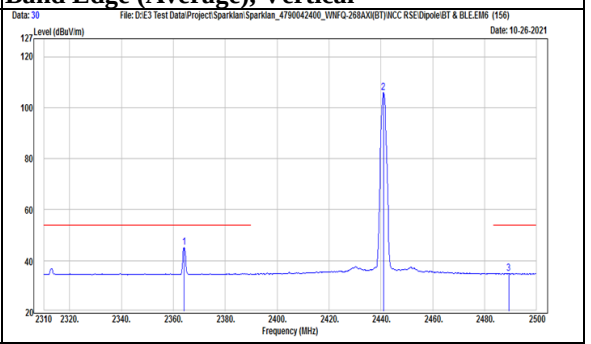
TX, GFSK (Ch 39)
Radiated Spurious Emission, Vertical



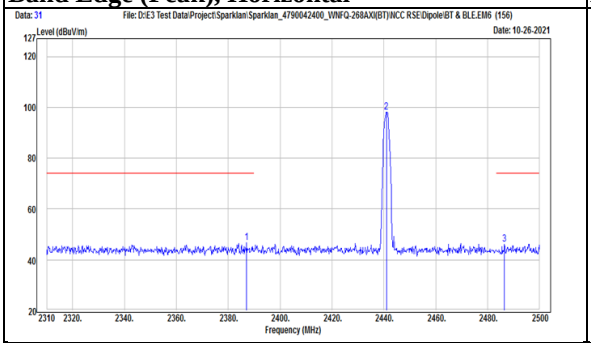
TX, GFSK (Ch 39)
Band Edge (Average), Horizontal



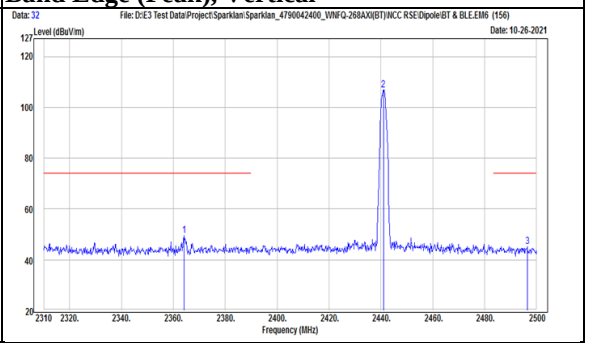
TX, GFSK (Ch 39)
Band Edge (Average), Vertical



TX, GFSK (Ch 39)
Band Edge (Peak), Horizontal

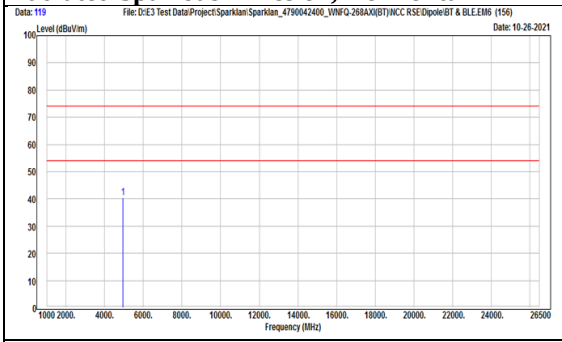
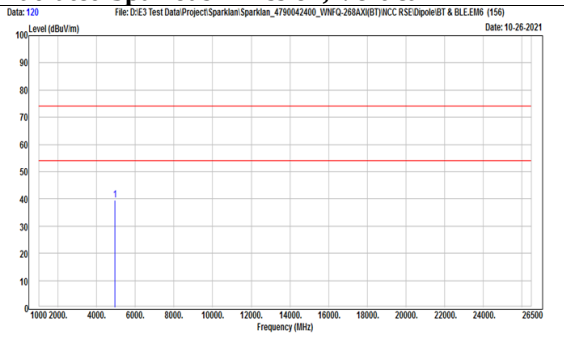
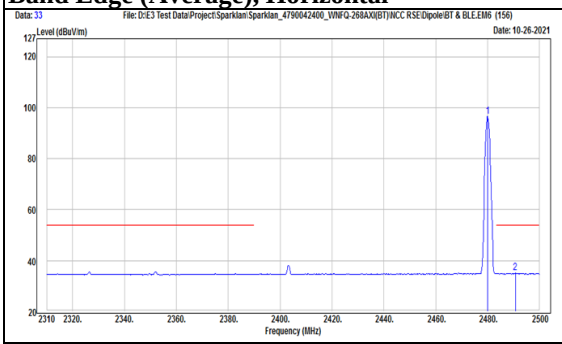
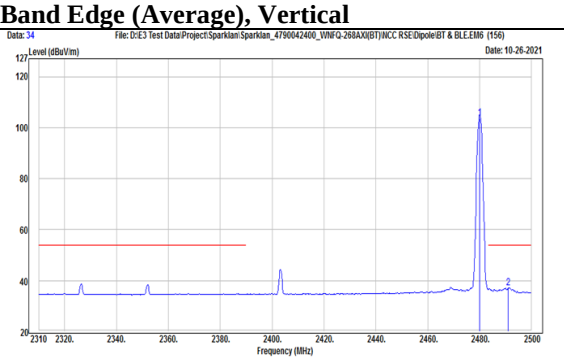
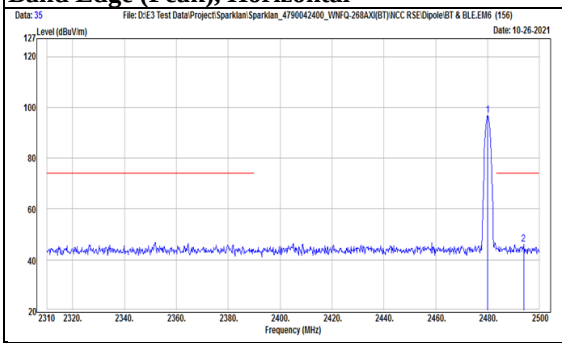
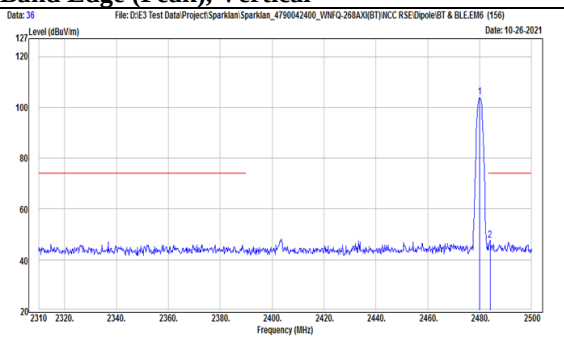


TX, GFSK (Ch 39)
Band Edge (Peak), Vertical



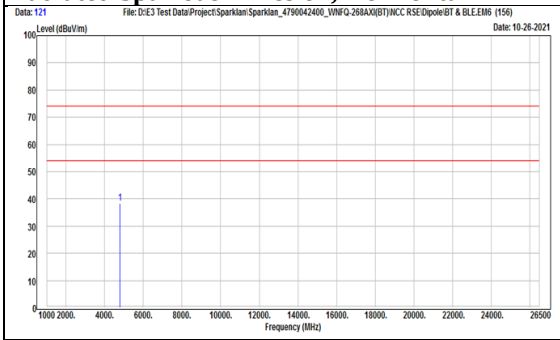
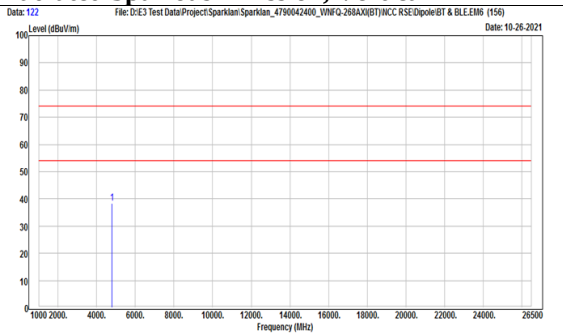
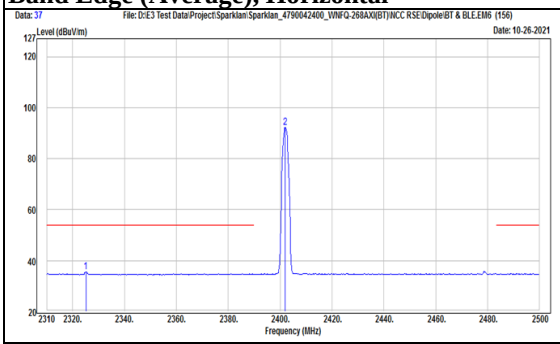
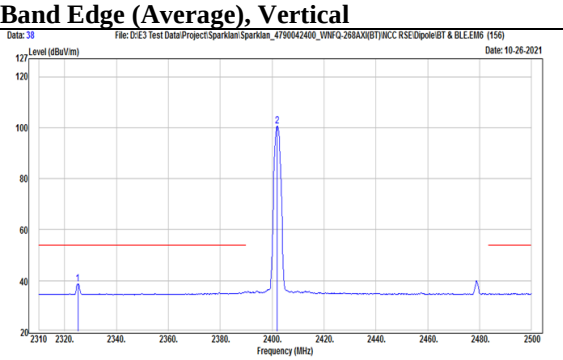
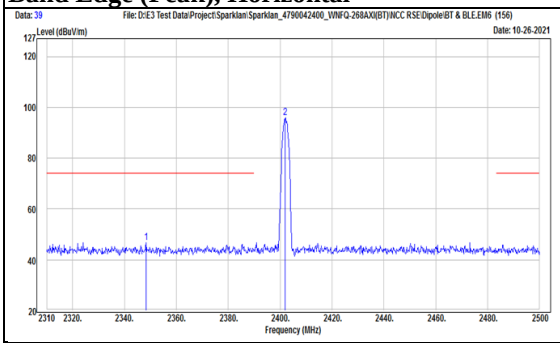
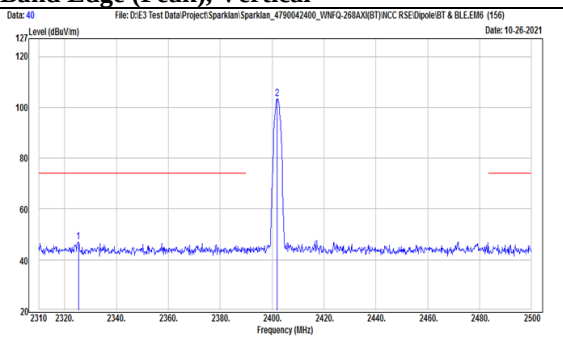
Mode	GFSK	Channel	78

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2480	90.58	6.1	96.68	N/A	N/A	PK
	@	2480	90.38	6.1	96.48	N/A	N/A	AVG
		2490.69	29.19	6.1	35.29	54	-18.71	AVG
		2493.92	39.96	6.1	46.06	74	-27.94	PK
	*	4960	37.68	2.62	40.3	74	-33.7	PK
Vertical	@	2480	97.9	6.1	104	N/A	N/A	PK
	@	2480	97.61	6.1	103.71	N/A	N/A	AVG
		2484.04	41.52	6.1	47.62	74	-26.38	PK
		2491.07	31.07	6.1	37.17	54	-16.83	AVG
	*	4960	36.83	2.62	39.45	74	-34.55	PK

TX, GFSK (Ch 78) **Radiated Spurious Emission, Horizontal**	**TX, GFSK (Ch 78)** **Radiated Spurious Emission, Vertical**
	
TX, GFSK (Ch 78) **Band Edge (Average), Horizontal**	**TX, GFSK (Ch 78)** **Band Edge (Average), Vertical**
	
TX, GFSK (Ch 78) **Band Edge (Peak), Horizontal**	**TX, GFSK (Ch 78)** **Band Edge (Peak), Vertical**
	

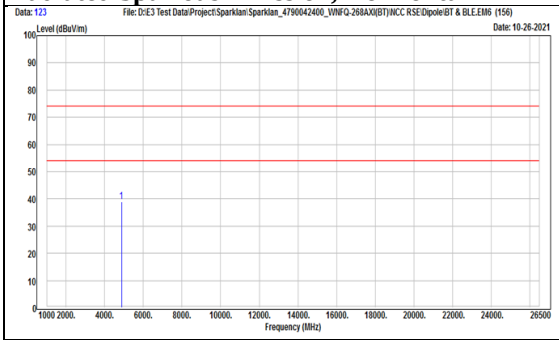
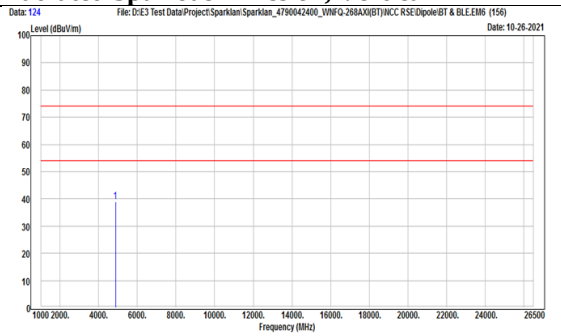
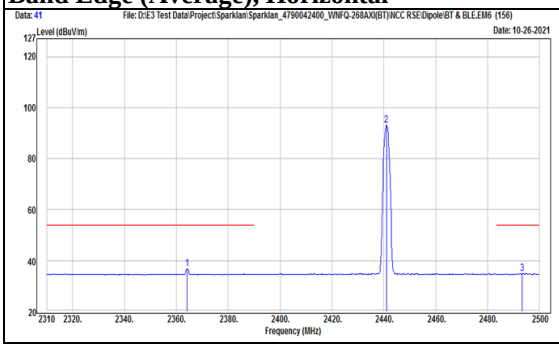
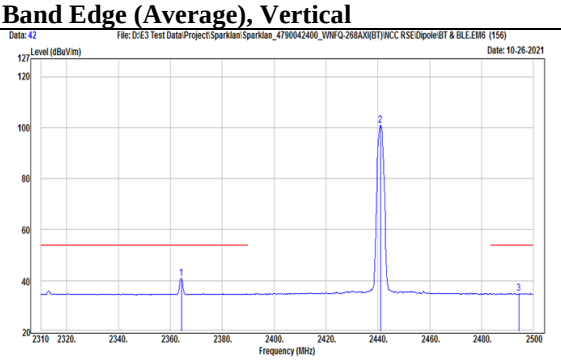
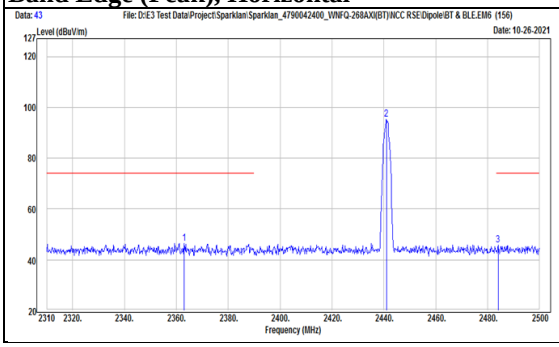
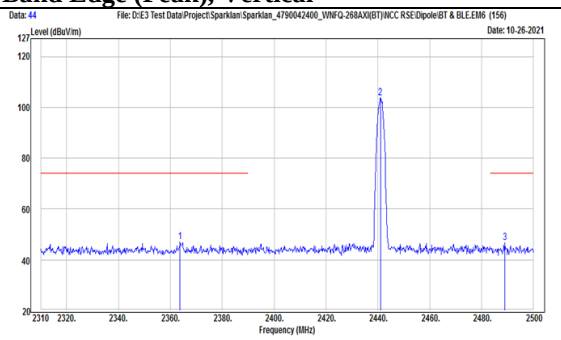
Mode	8DPSK	Channel	0

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2325.2	29.48	6.13	35.61	54	-18.39	AVG
		2348.38	40.72	6.04	46.76	74	-27.24	PK
	@	2402	89.73	6.13	95.86	N/A	N/A	PK
	@	2402	86.05	6.13	92.18	N/A	N/A	AVG
	*	4804	36.02	2.46	38.48	74	-35.52	PK
Vertical		2325.2	32.67	6.13	38.8	54	-15.2	AVG
		2325.39	40.95	6.13	47.08	74	-26.92	PK
	@	2402	97.28	6.13	103.41	N/A	N/A	PK
	@	2402	94.46	6.13	100.59	N/A	N/A	AVG
	*	4804	35.95	2.46	38.41	74	-35.59	PK

TX, 8DPSK (Ch 0) **Radiated Spurious Emission, Horizontal**	**TX, 8DPSK (Ch 0)** **Radiated Spurious Emission, Vertical**
	
TX, 8DPSK (Ch 0) **Band Edge (Average), Horizontal**	**TX, 8DPSK (Ch 0)** **Band Edge (Average), Vertical**
	
TX, 8DPSK (Ch 0) **Band Edge (Peak), Horizontal**	**TX, 8DPSK (Ch 0)** **Band Edge (Peak), Vertical**
	

Mode	8DPSK	Channel	39

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2363.01	40.46	6.06	46.52	74	-27.48	PK
		2364.15	30.89	6.06	36.95	54	-17.05	AVG
	@	2441	89.22	6.11	95.33	N/A	N/A	PK
	@	2441	86.89	6.11	93	N/A	N/A	AVG
		2484.04	39.72	6.1	45.82	74	-28.18	PK
		2493.35	28.8	6.1	34.9	54	-19.1	AVG
	*	4882	36.21	2.66	38.87	74	-35.13	PK
Vertical		2363.77	40.99	6.06	47.05	74	-26.95	PK
		2364.34	34.77	6.06	40.83	54	-13.17	AVG
	@	2441	97.55	6.11	103.66	N/A	N/A	PK
	@	2441	94.64	6.11	100.75	N/A	N/A	AVG
		2488.98	40.7	6.1	46.8	74	-27.2	PK
		2494.3	28.89	6.1	34.99	54	-19.01	AVG
	*	4882	36.42	2.66	39.08	74	-34.92	PK

TX, 8DPSK (Ch 39) **Radiated Spurious Emission, Horizontal**	**TX, 8DPSK (Ch 39)** **Radiated Spurious Emission, Vertical**
	
TX, 8DPSK (Ch 39) **Band Edge (Average), Horizontal**	**TX, 8DPSK (Ch 39)** **Band Edge (Average), Vertical**
	
TX, 8DPSK (Ch 39) **Band Edge (Peak), Horizontal**	**TX, 8DPSK (Ch 39)** **Band Edge (Peak), Vertical**
	

Mode	8DPSK	Channel	78

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2480	88.54	6.1	94.64	N/A	N/A	PK
	@	2480	84.83	6.1	90.93	N/A	N/A	AVG
		2484.42	39.8	6.1	45.9	74	-28.1	PK
		2490.31	28.86	6.1	34.96	54	-19.04	AVG
	*	4960	37.65	2.62	40.27	74	-33.73	PK
Vertical	@	2480	96.45	6.1	102.55	N/A	N/A	PK
	@	2480	94.15	6.1	100.25	N/A	N/A	AVG
		2483.66	29.94	6.1	36.04	54	-17.96	AVG
		2487.46	39.93	6.11	46.04	74	-27.96	PK
	*	4960	36.25	2.62	38.87	74	-35.13	PK