

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 1 of 93

Applicant : Shenzhen UniStrong Science & Technology Co.,Ltd.
Address of Applicant : B,4-4Factory, Zhengcheng Road, Fuyong Baoan District, Shenzhen, China

Product Name : Rugged Smart Tablet
Model No. : UT30P
Sample No. : E19020010-05#01
FCC ID : 2AOPD-UT30P
ISED Number : 11546A-UT30P

Standards : FCC CFR47 Part 15, Subpart C
RSS-Gen (Issue 5, March 2019)
RSS-247 (Issue 2, February 2017)

Date of Receipt : 2020-2-10
Date of Test : 2020-2-10 ~ 2020-5-7
Date of Issue : 2020-5-7

Remark:

This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

Prepared by: Jennifer Zhou
(Jennifer Zhou)

Reviewed by: Jesse
(Jesse)

Approved by: Guoyou Chi
(Authorized signatory: Guoyou Chi)

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 2 of 93

Revision Record			
Version	Date	Revisions	Revised By
1.0	2019-11-05	Original	--

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 3 of 93

Contents

1	GENERAL INFORMATION.....	4
1.1	TESTING LABORATORY	4
1.2	DETAILS OF APPLICATION	4
1.3	DETAILS OF EUT	4
1.4	TEST METHODOLOGY	4
2	TEST CONDITION.....	5
2.1	ENVIRONMENTAL CONDITIONS	5
2.2	EQUIPMENT LIST.....	5
2.3	MEASUREMENT UNCERTAINTY	5
3	TEST SET-UP AND OPERATION MODES.....	6
3.1	DETAILS OF TEST MODE	6
3.2	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	6
3.3	SUPPORT SOFTWARE	6
3.4	TEST SETUP DIAGRAM.....	7
4	TEST RESULTS.....	9
4.1	TRANSMITTER REQUIREMENT & TEST SUITES	9
4.1.1	<i>Antenna Requirement</i>	<i>9</i>
4.1.2	<i>Maximum Conducted Output Power and E.I.R.P.....</i>	<i>10</i>
4.1.3	<i>20dB Bandwidth and 99% Bandwidth</i>	<i>16</i>
4.1.4	<i>Conducted Spurious Emission & Authorized-band band-edge.....</i>	<i>20</i>
4.1.5	<i>Spurious Emission.....</i>	<i>35</i>
4.1.6	<i>Band Edge (Restricted-band band-edge)</i>	<i>70</i>
4.1.7	<i>Hopping Frequency Separation.....</i>	<i>83</i>
4.1.8	<i>Number of Hopping Frequency</i>	<i>85</i>
4.1.9	<i>Time of Occupancy.....</i>	<i>87</i>
4.2	MAINS EMISSIONS.....	91
4.2.1	<i>Conducted Emission on AC Mains.....</i>	<i>91</i>

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 4 of 93

1 General Information

1.1 Testing Laboratory

Company Name	ICAS Testing Technology Services (Shanghai) Co., Ltd.
Address	155 Pingbei Rd, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

1.2 Details of Application

Company Name	Shenzhen UniStrong Science & Technology Co.,Ltd.
Address	B,4-4Factory, Zhengcheng Road, Fuyong Baoan District, Shenzhen, China
Contact Person	Lili Zheng
Telephone	+86-21-54467182
Email	ll.zheng@unistrong.com

1.3 Details of EUT

Product Name	Rugged Smart Tablet
Brand Name	Unistrong
Model No.	UT30P
FCC ID	2AOPD-UT30P
ISED Number	11546A-UT30P
Mode of Operation	Bluetooth BR/EDR
Frequency Range	2400MHz ~ 2483.5MHz
Number of Channels	79 (at intervals of 1 MHz)
Modulation Type	GFSK, $\pi/4$ -DQPSK, 8-DPSK
Antenna Type	Internal Antenna
Antenna Gain	2.84 dBi
Extreme Temperature Range	-20°C ~ +55°C
Test Voltage	DC 3.8V

1.4 Test Methodology

47 CFR Part 15, Subpart C (10-1-16 Edition)	Miscellaneous Wireless Communications Services
FCC PUBLIC NOTICE DA 00-705 (Mar.30, 2000)	Filling and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
RSS-Gen (Issue 5, March 2019)	General Requirements for Compliance of Radio Apparatus

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 5 of 93

RSS-247 (Issue 2, February 2017)	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Note(s):

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test.

2 Test Condition

2.1 Environmental conditions

Temperature (°C)	18-25
Humidity (%RH)	40-65
Barometric Pressure (mbar)	960-1060

2.2 Equipment List

Name of Equipment	Manufacturer	Model	Serial No.	Cal. Due Date
Spectrum Analyzer	Keysight	N9020B	MY59260184	2020-07-28
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2020-06-24
EMI Test Receiver	Rohde & Schwarz	ESPI3	100173	2020-06-19
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2020-06-19
V-network	SCHWARZBECK	NSLK 8127	8127-902	2021-02-20
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	100687	2020-08-22
Broadband Antenna	SCHWARZBECK	VULB9163	9163-1037	2020-06-06
Horn Antenna-18G	SCHWARZBECK	BBHA9120D	9120D-1775	2020-06-06
Loop Antenna	SCHWARZBECK	FMZB 1513	N/A	2021-03-19
Horn Antenna-40G	YINGLIAN	LB-180400-KF	N/A	2020-07-26
EMC chamber 9*6*6 (L*W*H)	CHANGNING	966	N/A	2020-06-26
Shielded Enclosure 8*5*4 (L*W*H)	CHANGNING	854	N/A	2020-08-28
Test Software	BL	BL410_E	N/A	N/A

2.3 Measurement Uncertainty

Parameter	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	± 1.5 dB
	> 1GHz	± 1.5 dB
Radiated Emission	30 MHz – 1 GHz	± 3 dB
	> 1GHz	± 3 dB

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 6 of 93

3 Test Set-up and Operation Modes

3.1 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver mode. Select test channel as below:

Channel	Frequency
The lowest channel(CH0)	2402MHz
The middle channel(CH39)	2441MHz
The Highest channel(CH78)	2480MHz

The basic operation modes are:

- A. On
 - 1. BR/EDR mode
 - a. Transmitting
 - i. Low Channel
 - ii. Middle Channel
 - iii. High Channel
 - iv. Hopping mode
 - b. Receiving
 - 2. Normal working with Bluetooth on
- B. Standby
- C. Off

3.2 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	TP00083A	N/A

3.3 Support Software

Description	Manufacturer	Software Name
Software	Qualcomm	QRCT

TEST REPORT

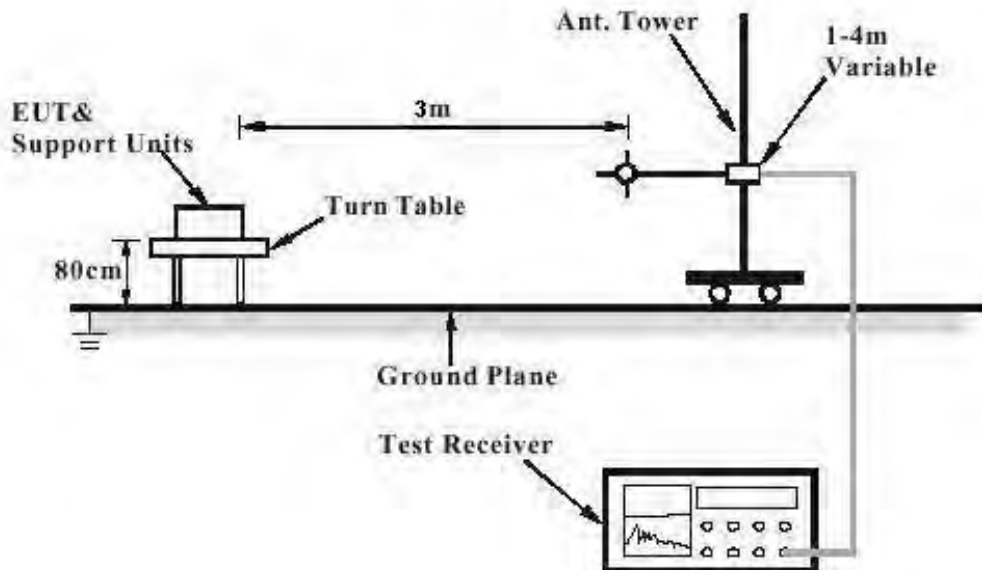
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 7 of 93

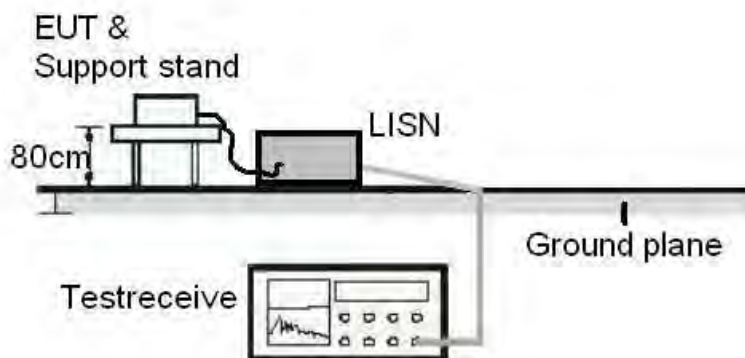
3.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Conduction Measurement



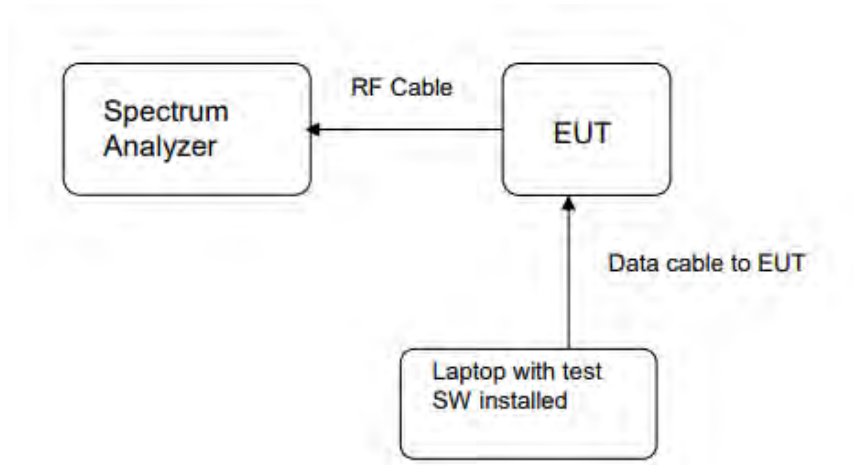
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 8 of 93

Diagram of Measurement Equipment Configuration for Transmitter Measurement



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 9 of 93

4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

RESULT: **PASS**

Test standard : FCC Part 15.247(b)(4), Part 15.203
RSS-247 5.4(6)

Requirement : The use of approved antennas only with directional
gains that do not exceed 6 dBi

According to the manufacturer declaration, the EUT has an antenna with a gain of 2.84 dBi. The antenna is an antenna with no possibility of replacement with a non-approved antenna by the end-user.

Therefore, the EUT is considered to comply with this provision.

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 10 of 93

4.1.2 Maximum Conducted Output Power and E.I.R.P

RESULT:

PASS

Test standard : FCC Part 15.247(b)(1)
RSS-247 5.4(2)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 25°C
Relative humidity : 52%

Table 1: Maximum Conducted Output Power

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(mW)	
GFSK	2402	9.45	8.81	< 1
	2441	9.93	9.84	
	2480	9.86	9.68	
$\pi/4$ -DQPSK	2402	9.44	8.79	< 0.125
	2441	9.90	9.77	
	2480	9.88	9.73	
8-DPSK	2402	9.83	9.62	< 0.125
	2441	10.30	10.72	
	2480	10.25	10.59	

Table 2: E.I.R.P

Test Mode	Test Channel (MHz)	E.I.R.P		Limit (W)
		(dBm)	(mW)	
GFSK	2402	12.29	16.94	< 4
	2441	12.77	18.92	
	2480	12.70	18.62	
$\pi/4$ -DQPSK	2402	12.28	16.90	
	2441	12.74	18.79	
	2480	12.72	18.71	
8-DPSK	2402	12.67	18.49	
	2441	13.14	20.61	
	2480	13.09	20.37	

Note: BT BDR and EDR antenna peak gain is 2.84

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 11 of 93

Figure 1: Maximum Conducted Output Power, 2402MHz, GFSK



Figure 2: Maximum Conducted Output Power, 2441MHz, GFSK



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 12 of 93

Figure 3: Maximum Conducted Output Power, 2480MHz, GFSK



Figure 4: Maximum Conducted Output Power, 2402MHz, $\pi/4$ -DQPSK



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 13 of 93

Figure 5: Maximum Conducted Output Power, 2441MHz, $\pi/4$ -DQPSK



Figure 6: Maximum Conducted Output Power, 2480MHz, $\pi/4$ -DQPSK



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 14 of 93

Figure 7: Maximum Conducted Output Power, 2402MHz, 8-DPSK



Figure 8: Maximum Conducted Output Power, 2441MHz, 8-DPSK



Figure 9: Maximum Conducted Output Power, 2480MHz, 8-DPSK

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 15 of 93



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 16 of 93

4.1.3 20dB Bandwidth and 99% Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)
RSS-247 5.1(1)
RSS-Gen 6.7
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 25°C
Relative humidity : 52%

Table 3: 20dB Bandwidth and 99% Bandwidth

Test Mode	Test Channel (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
GFSK	2402	0.555	0.785
	2441	0.556	0.787
	2480	0.555	0.788
8-DPSK	2402	1.134	1.133
	2441	1.134	1.148
	2480	1.135	1.148

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 17 of 93

Figure 10: 20dB Bandwidth and 99% Bandwidth, 2402MHz, GFSK



Figure 11: 20dB Bandwidth and 99% Bandwidth, 2441MHz, GFSK



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 18 of 93

Figure 12: 20dB Bandwidth and 99% Bandwidth, 2480MHz, GFSK



Figure 13: 20dB Bandwidth and 99% Bandwidth, 2402MHz, 8-DPSK



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 19 of 93

Figure 14: 20dB Bandwidth and 99% Bandwidth, 2441MHz, 8-DPSK

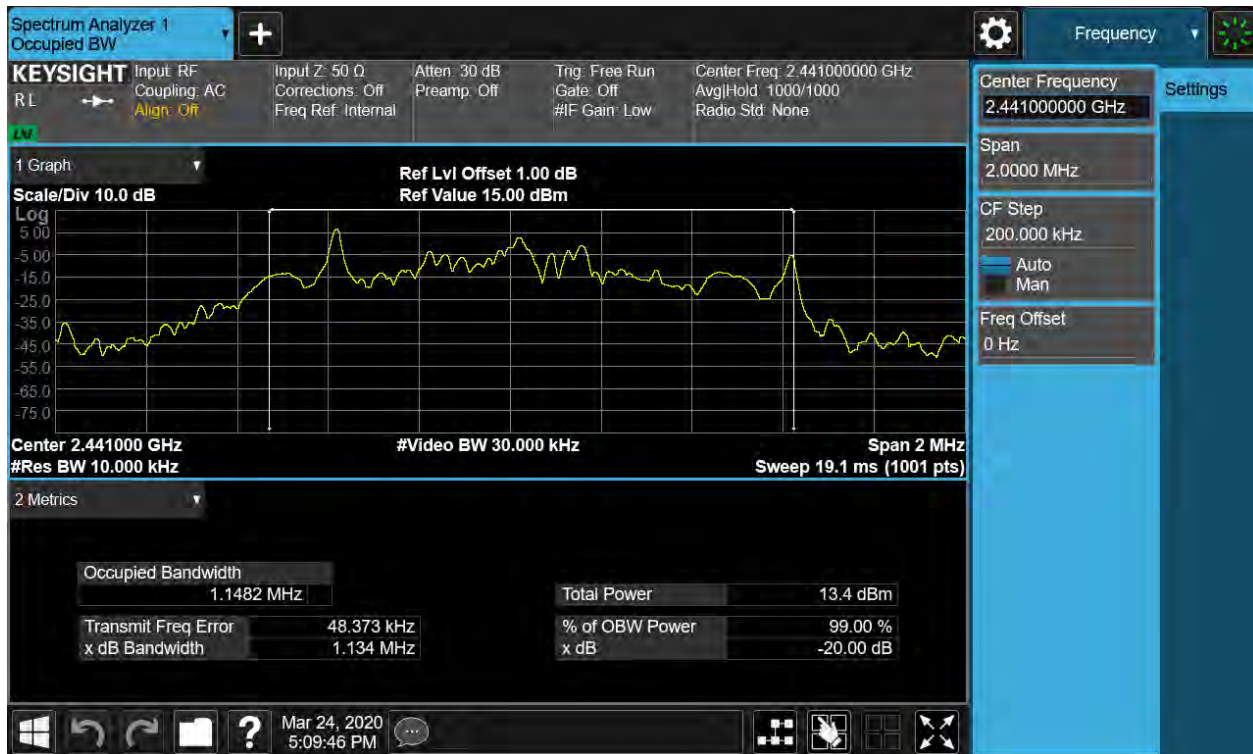


Figure 15: 20dB Bandwidth and 99% Bandwidth, 2480MHz, 8-DPSK



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 20 of 93

4.1.4 Conducted Spurious Emission & Authorized-band band-edge

RESULT:

PASS

Test standard	: FCC Part 15.247(d) RSS-247 5.5
Requirement	: ANSI C63.10-2013
Kind of test site	: Shielded room

Test setup

Test Channel	: Low/Middle/High for spurious, Low/High for Band Edge
Operation Mode	: A.1.a
Ambient temperature	: 25°C
Relative humidity	: 52%

For details refer to following test plot.

TEST REPORT

Report No.: SHE19020010-03FE

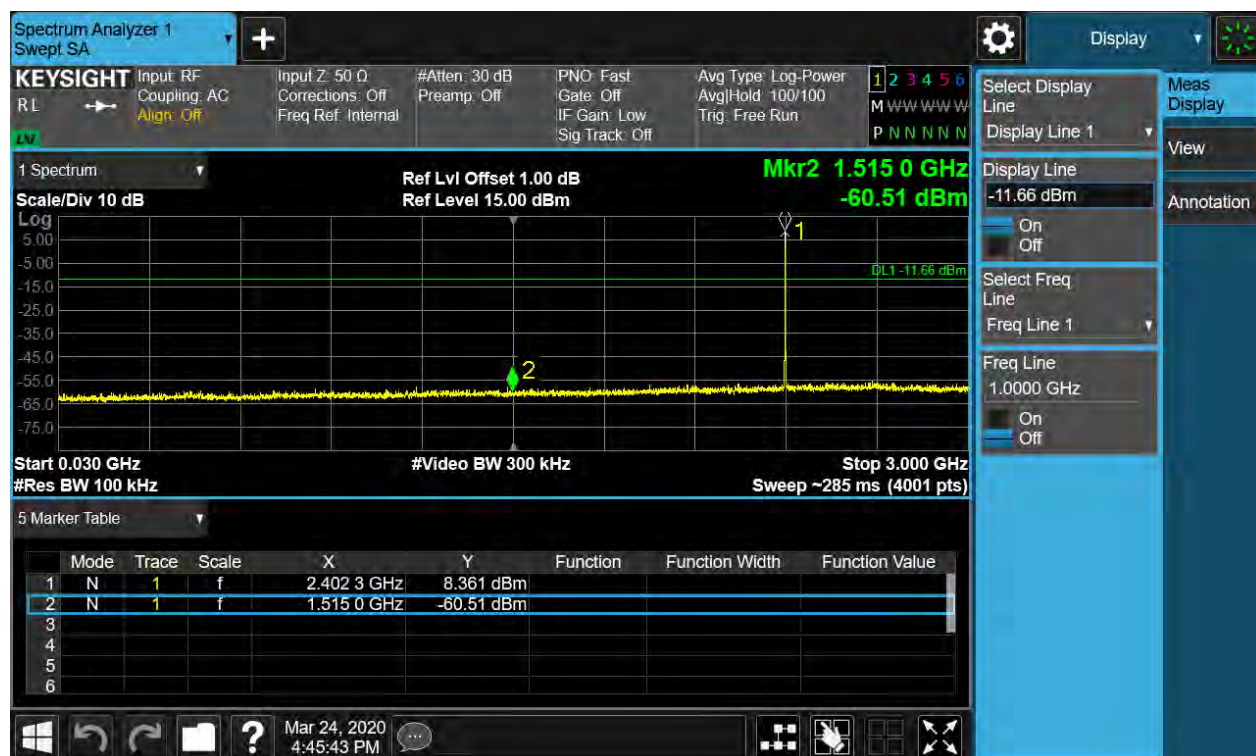
Date: 2020-5-7

Page 21 of 93

Figure 16: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, GFSK Carrier Level



Band Edge



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 22 of 93

Conducted spurious emissions 30MHz-25GHz

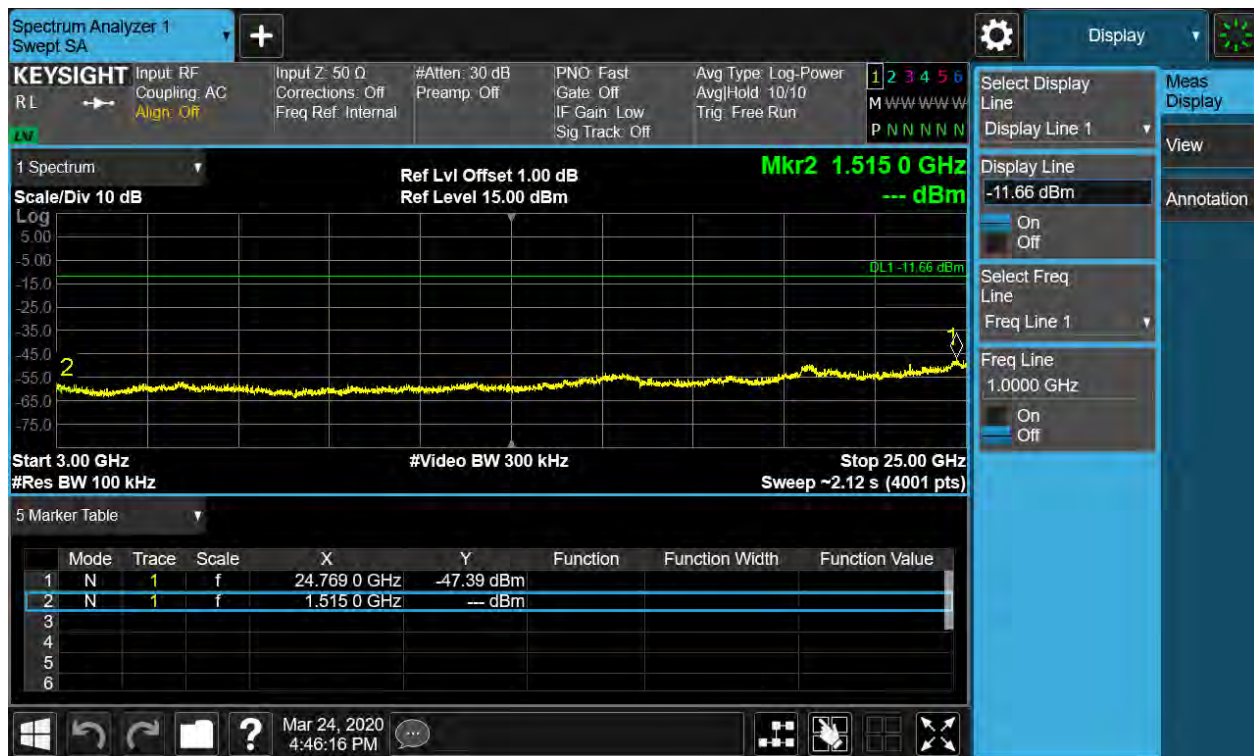


Figure 17: Conducted Spurious Emission & Authorized-band band-edge, 2441MHz, GFSK Carrier Level



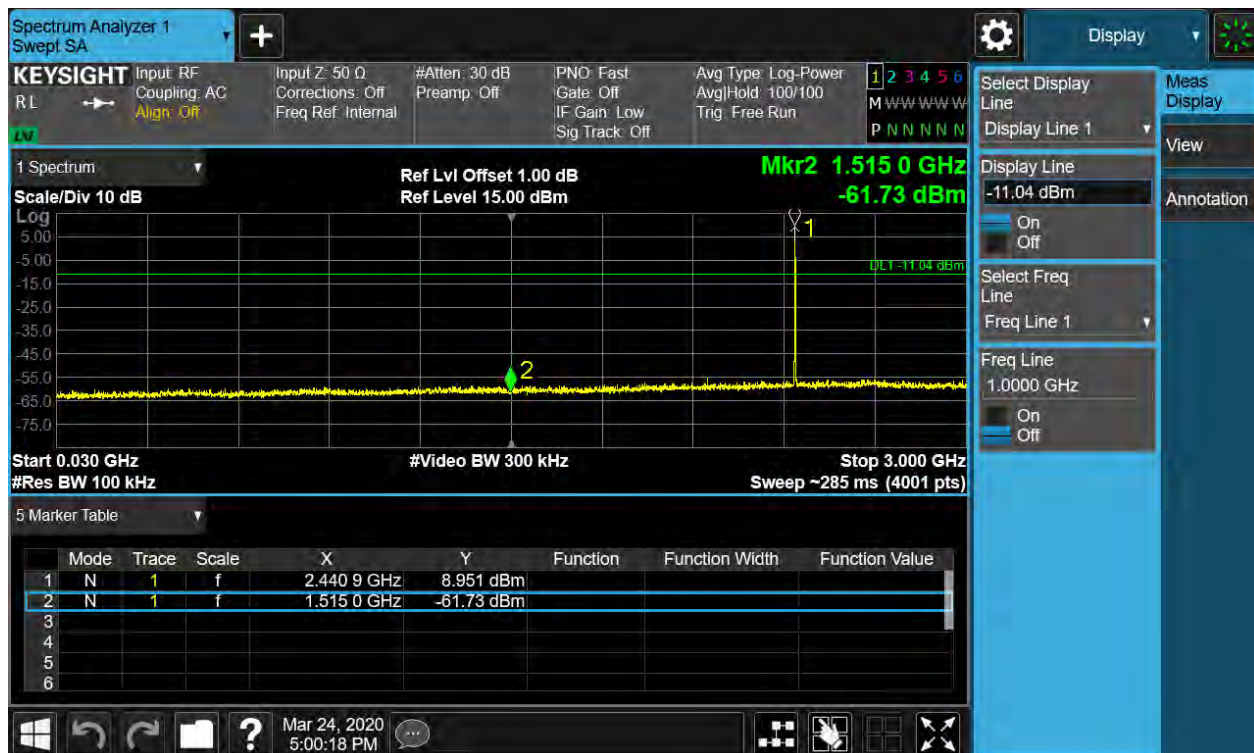
TEST REPORT

Report No.: SHE19020010-03FE

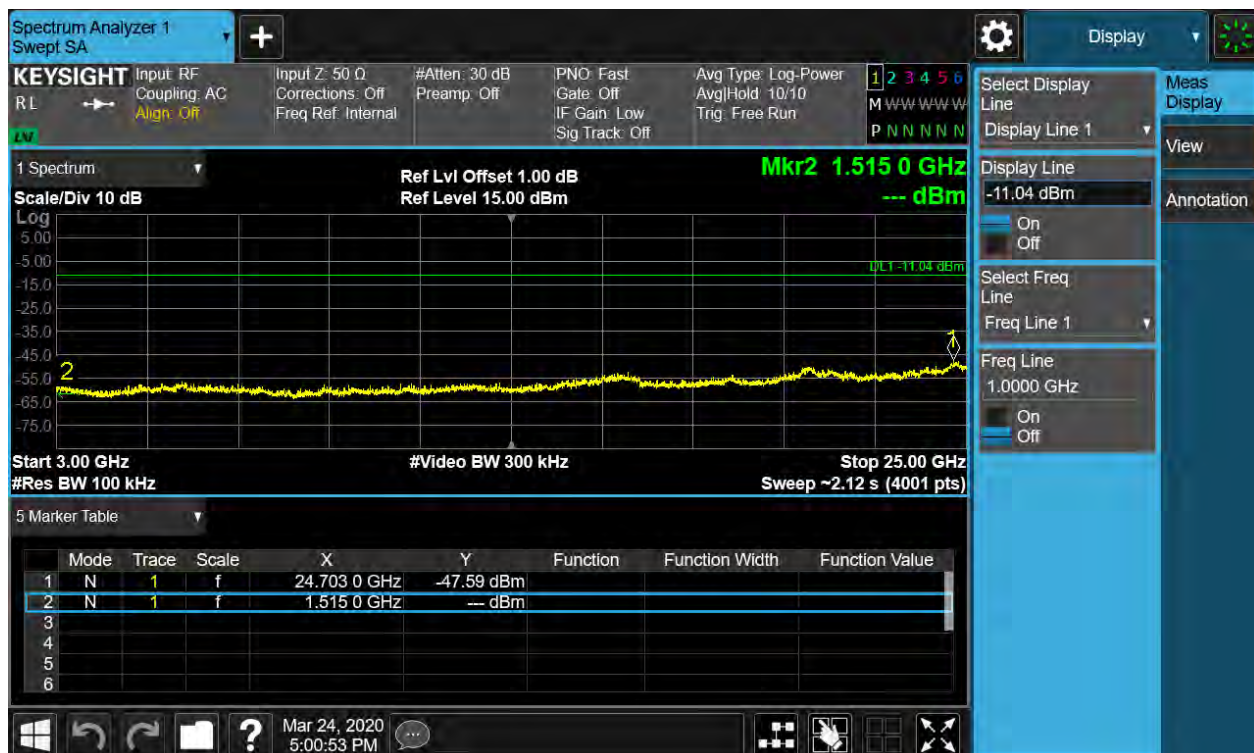
Date: 2020-5-7

Page 23 of 93

Band Edge



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE19020010-03FE

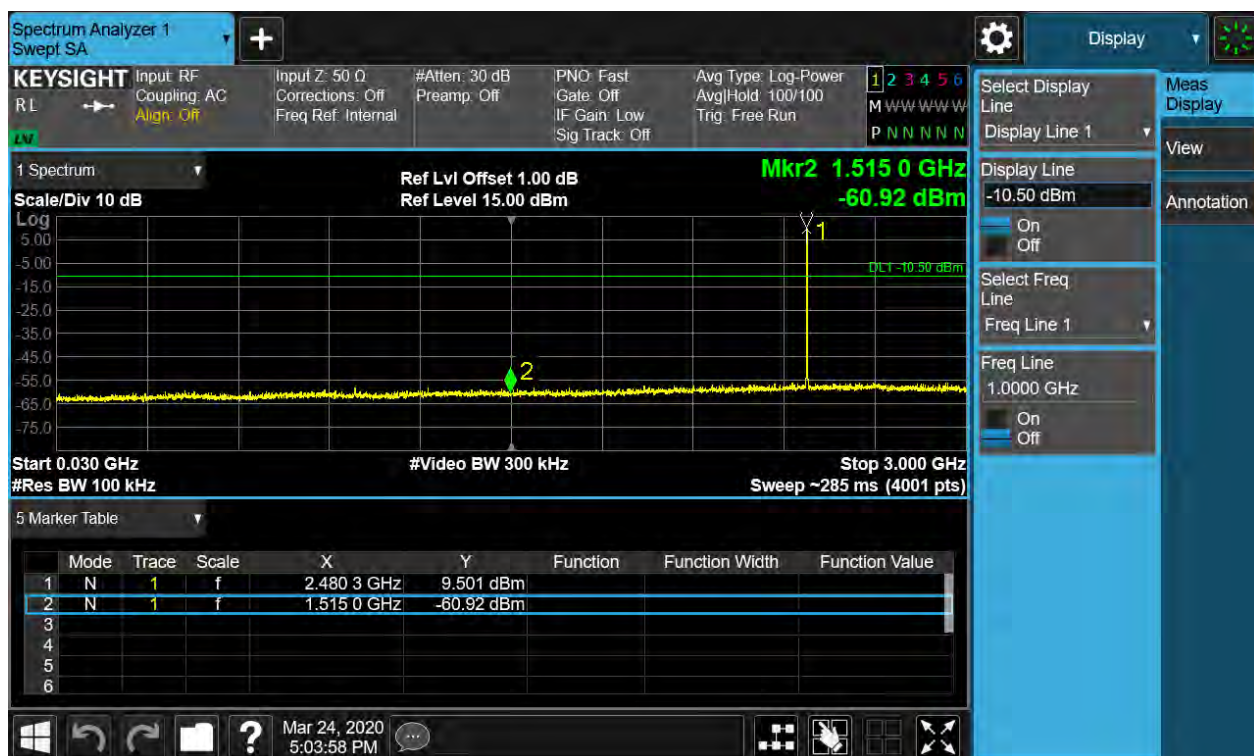
Date: 2020-5-7

Page 24 of 93

Figure 18: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, GFSK Carrier Level



Band Edge



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 25 of 93

Conducted spurious emissions 30MHz-25GHz



Figure 19: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, 8-DPSK Carrier Level



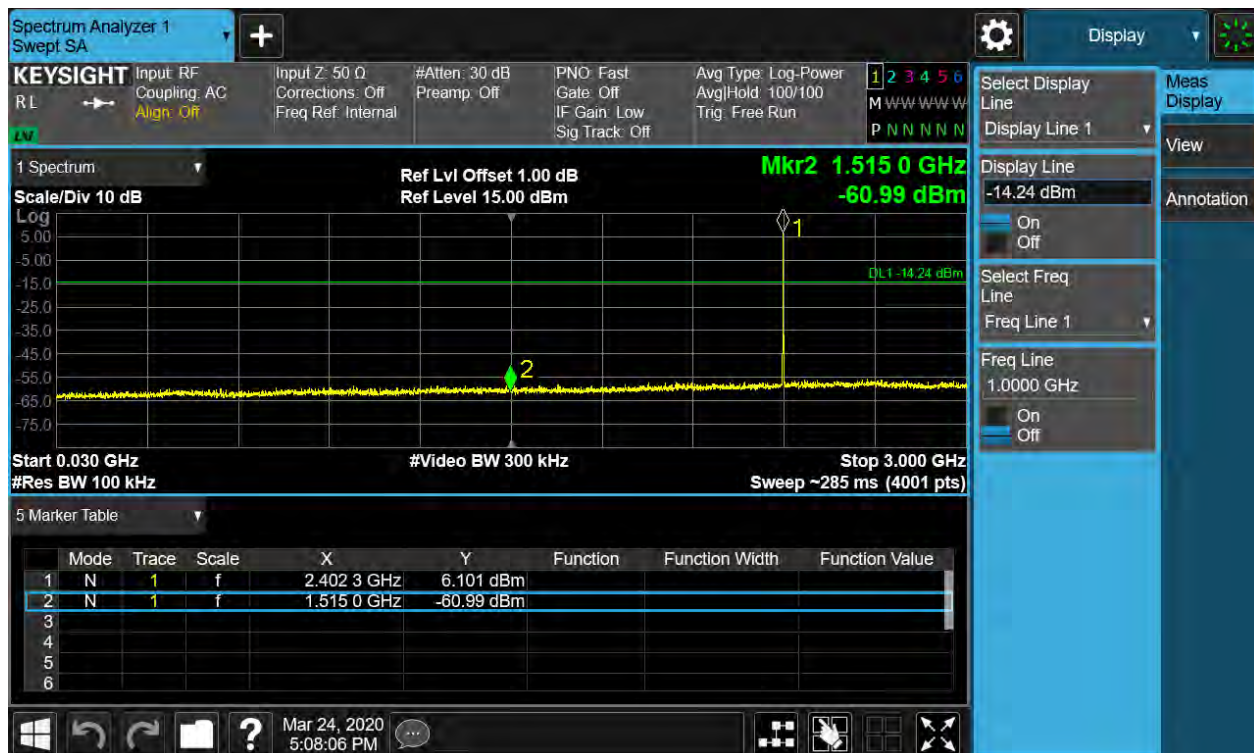
TEST REPORT

Report No.: SHE19020010-03FE

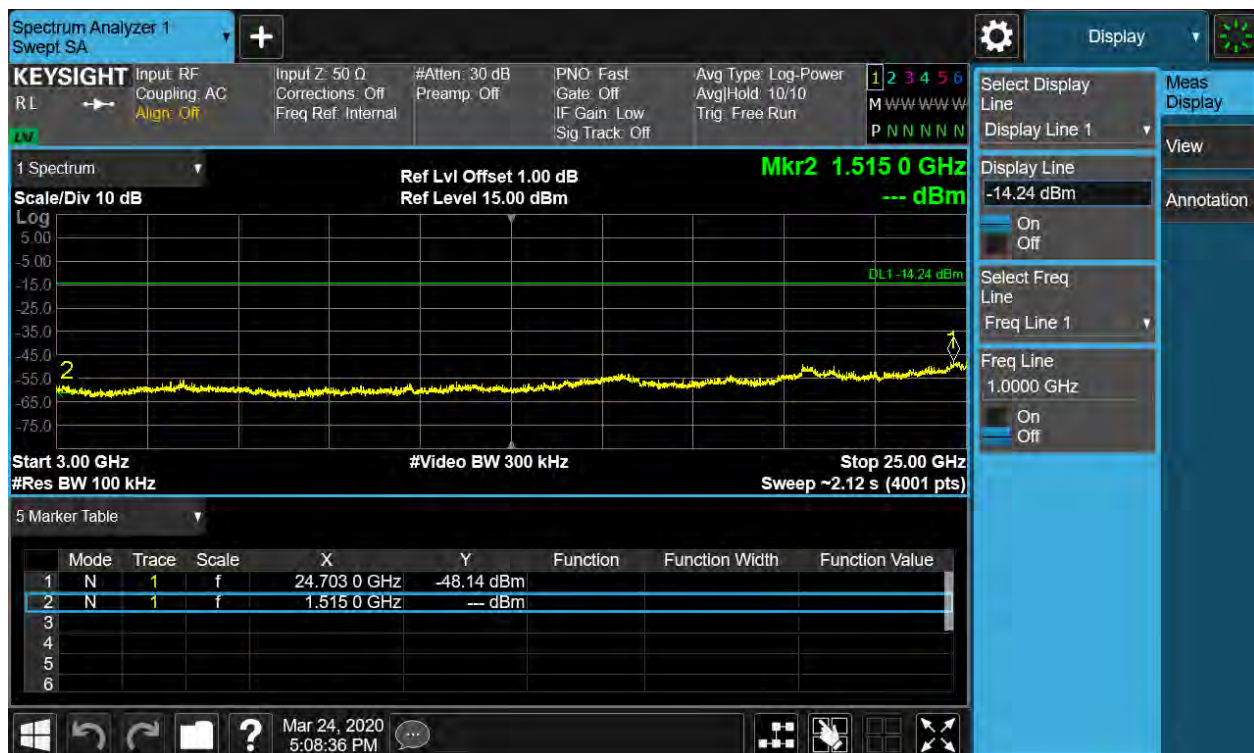
Date: 2020-5-7

Page 26 of 93

Band Edge



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE19020010-03FE

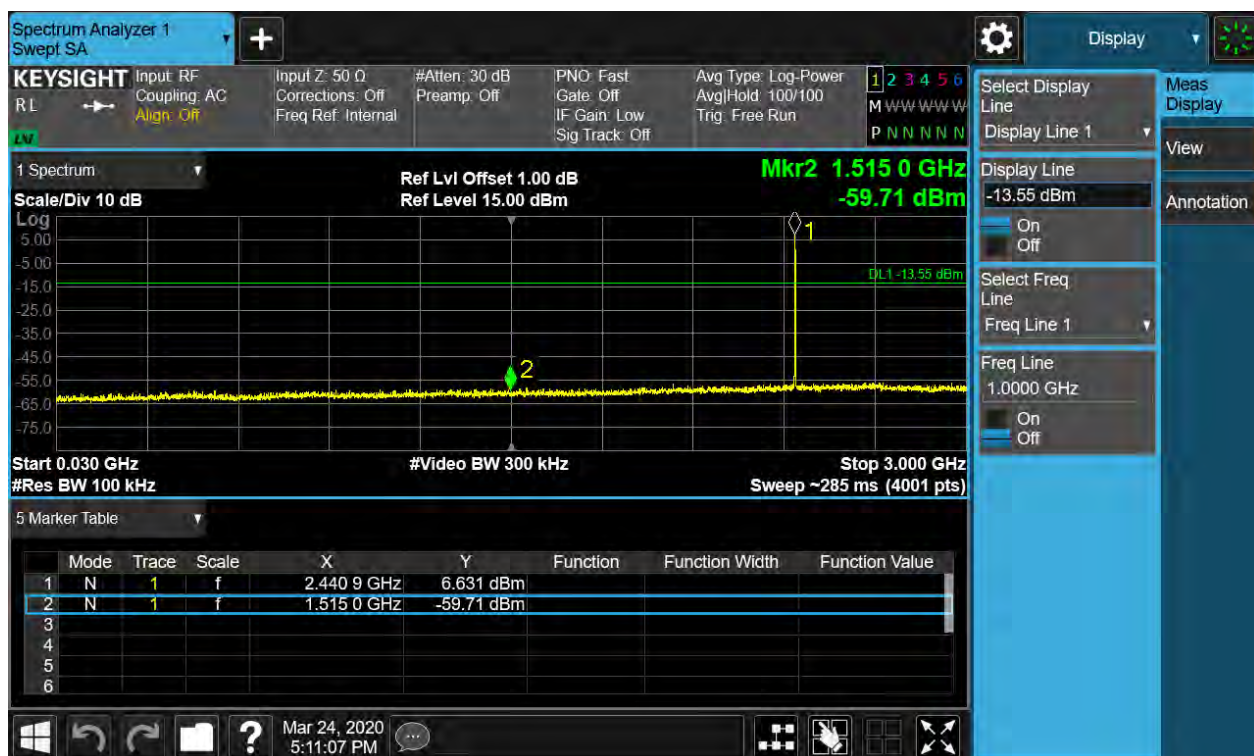
Date: 2020-5-7

Page 27 of 93

Figure 20: Conducted Spurious Emission & Authorized-band band-edge, 2441MHz, 8-DPSK Carrier Level



Band Edge



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 28 of 93

Conducted spurious emissions 30MHz-25GHz

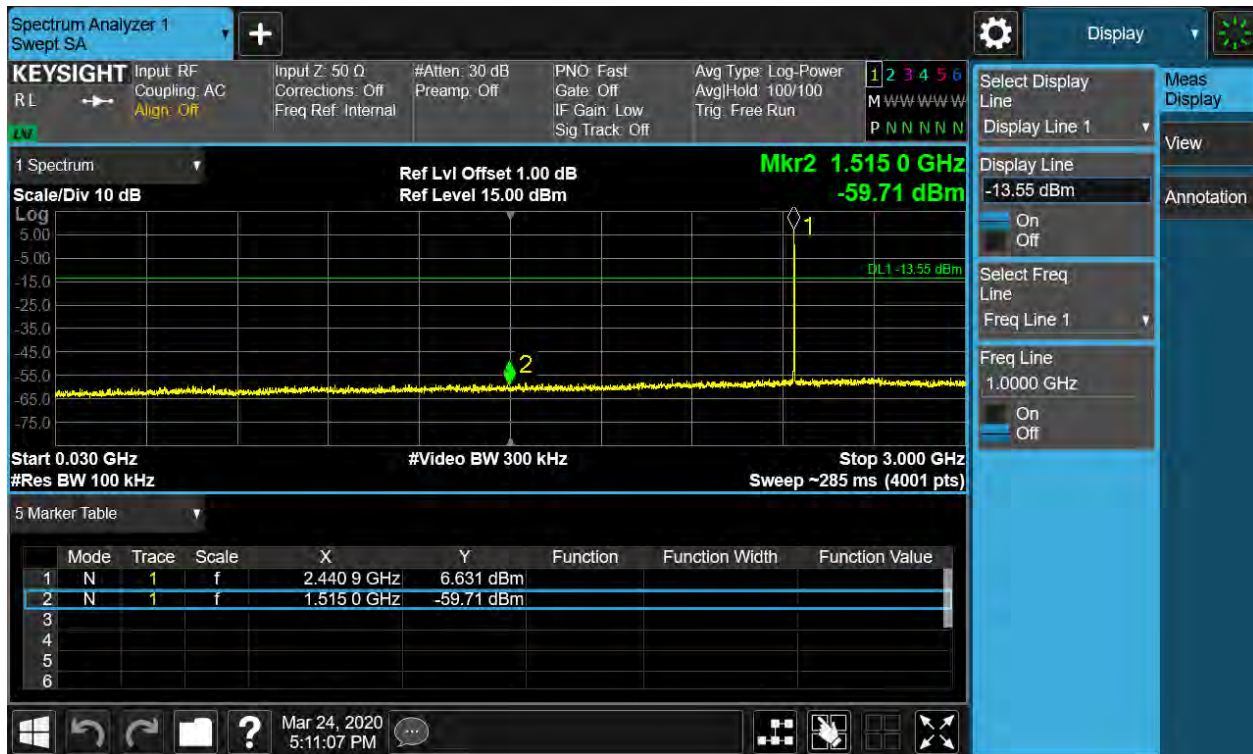


Figure 21: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, 8-DPSK Carrier Level



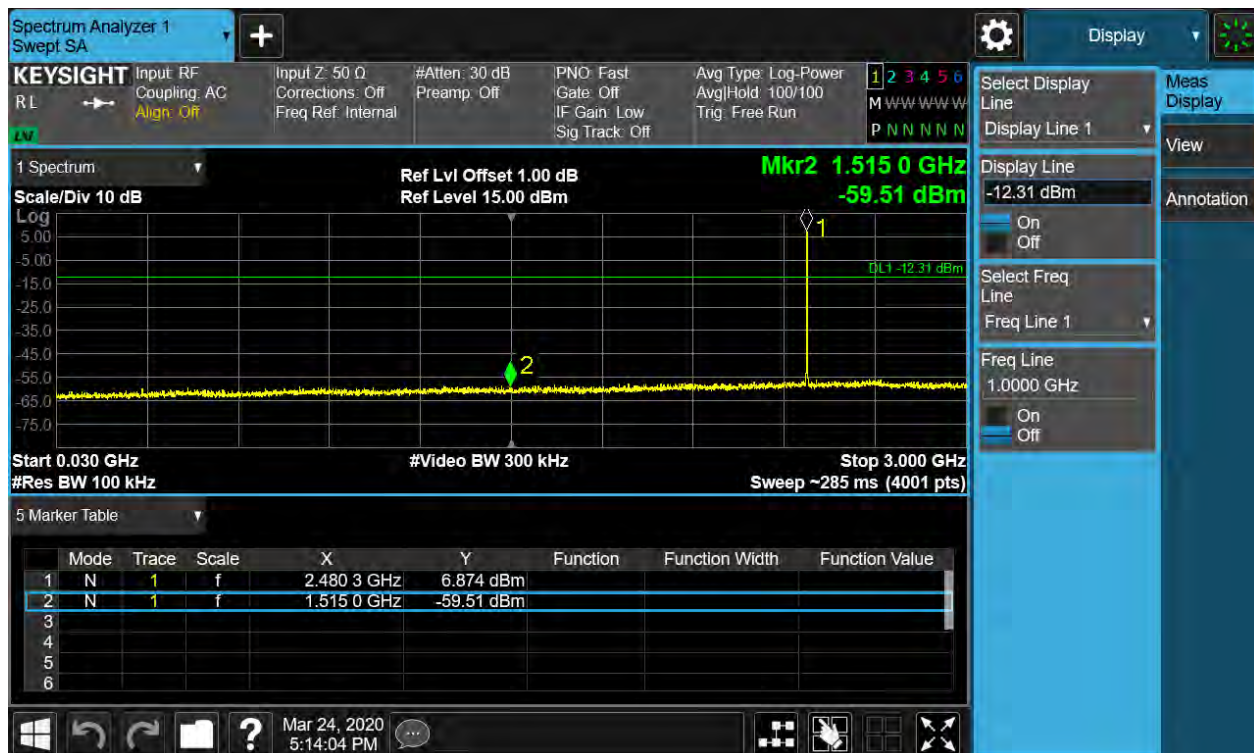
TEST REPORT

Report No.: SHE19020010-03FE

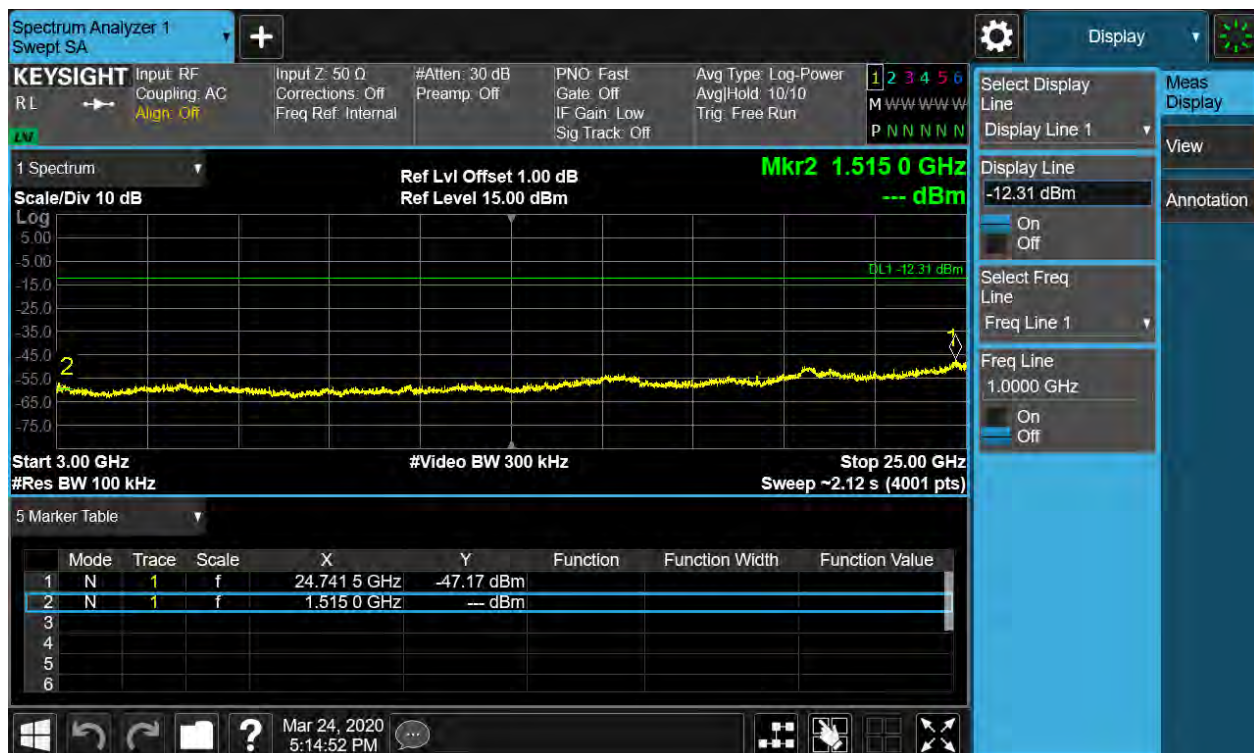
Date: 2020-5-7

Page 29 of 93

Band Edge



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 30 of 93

Figure 22: Conducted Spurious Emission & Authorized-band band-edge, TX Mode, GFSK

Band Edge(Low)



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 31 of 93

Band Edge(High)



Conducted spurious emissions 30MHz-25GHz

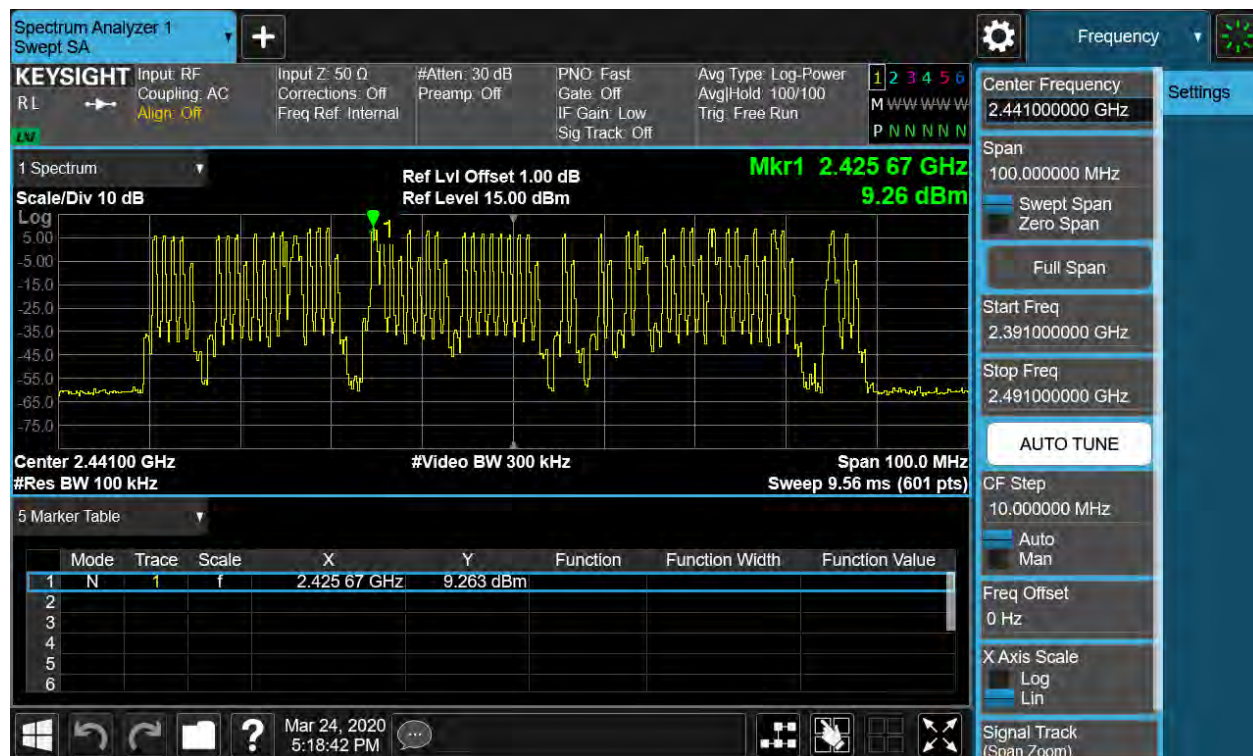
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 32 of 93

Figure 23: Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, 8-DPSK Carrier Level



Band Edge(Low)



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 33 of 93



Band Edge(High)

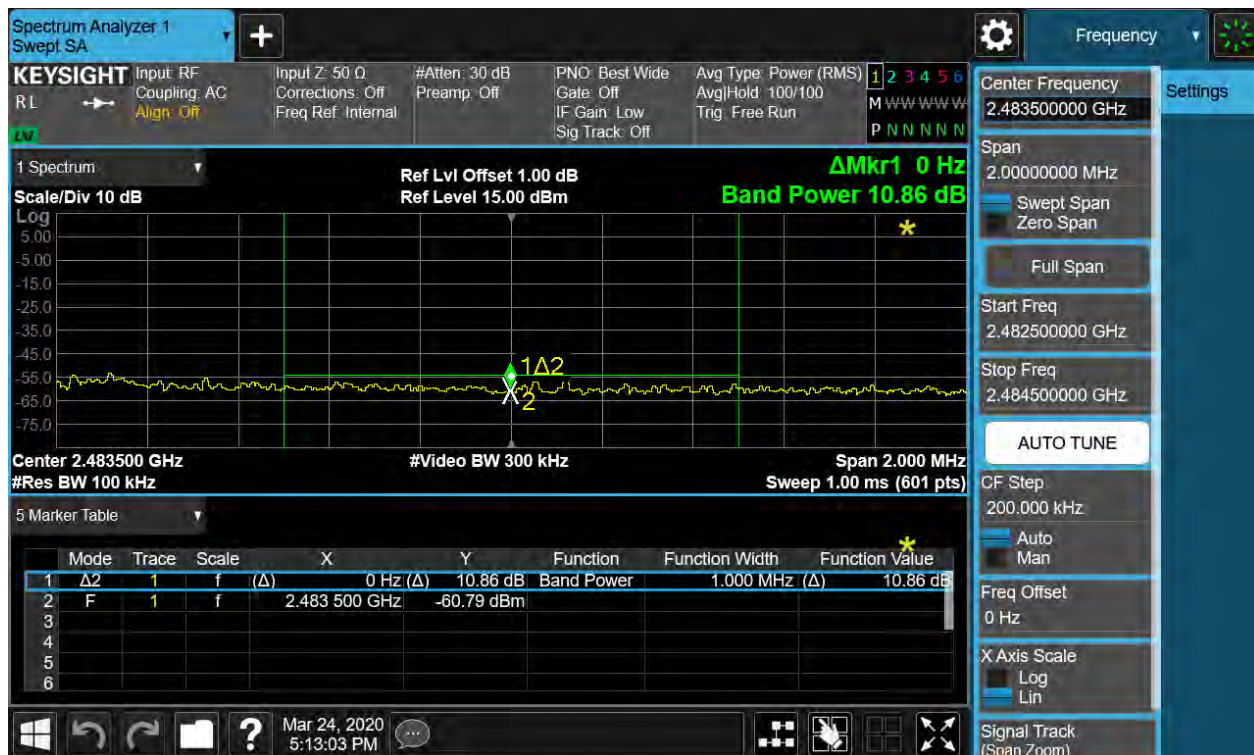


TEST REPORT

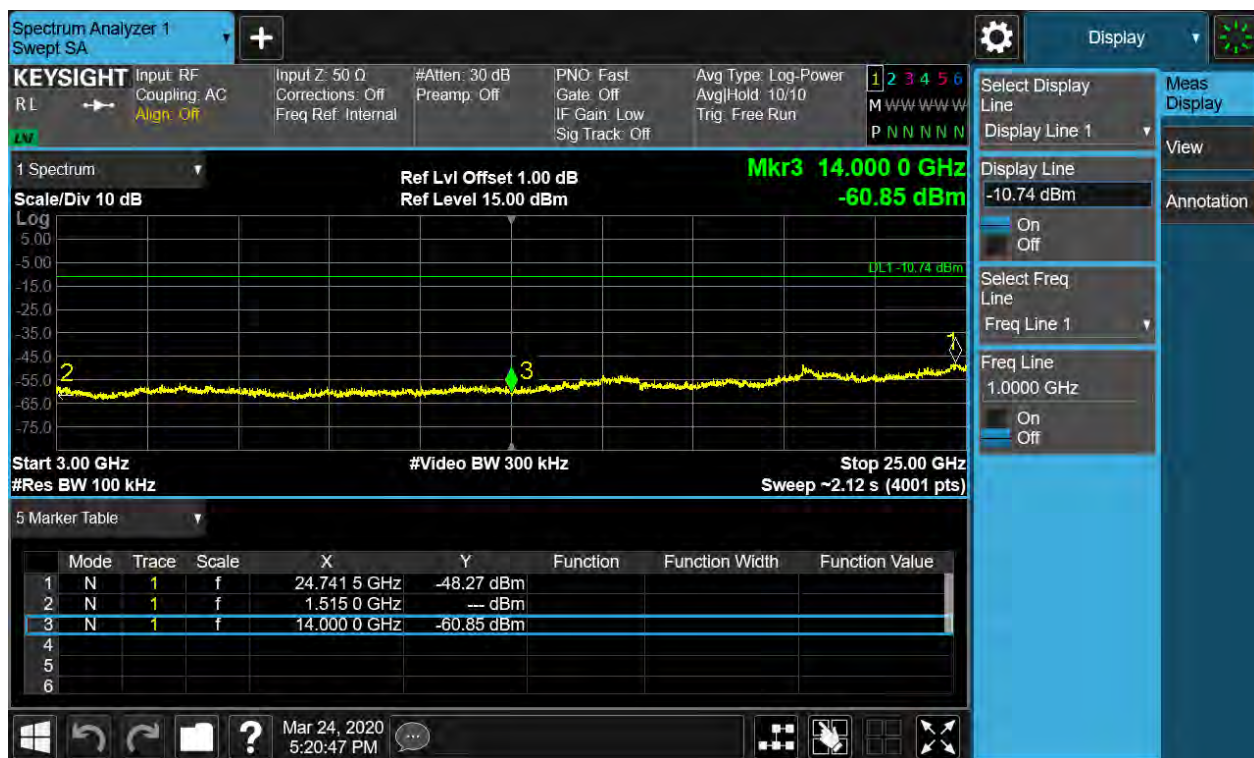
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 34 of 93



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 35 of 93

4.1.5 Spurious Emission

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209 RSS-247 5.5
Requirement	: ANSI C63.10-2013
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A
Ambient temperature	: 25°C
Relative humidity	: 52%

For details refer to following test plot.

TEST REPORT

Report No.: SHE19020010-03FE

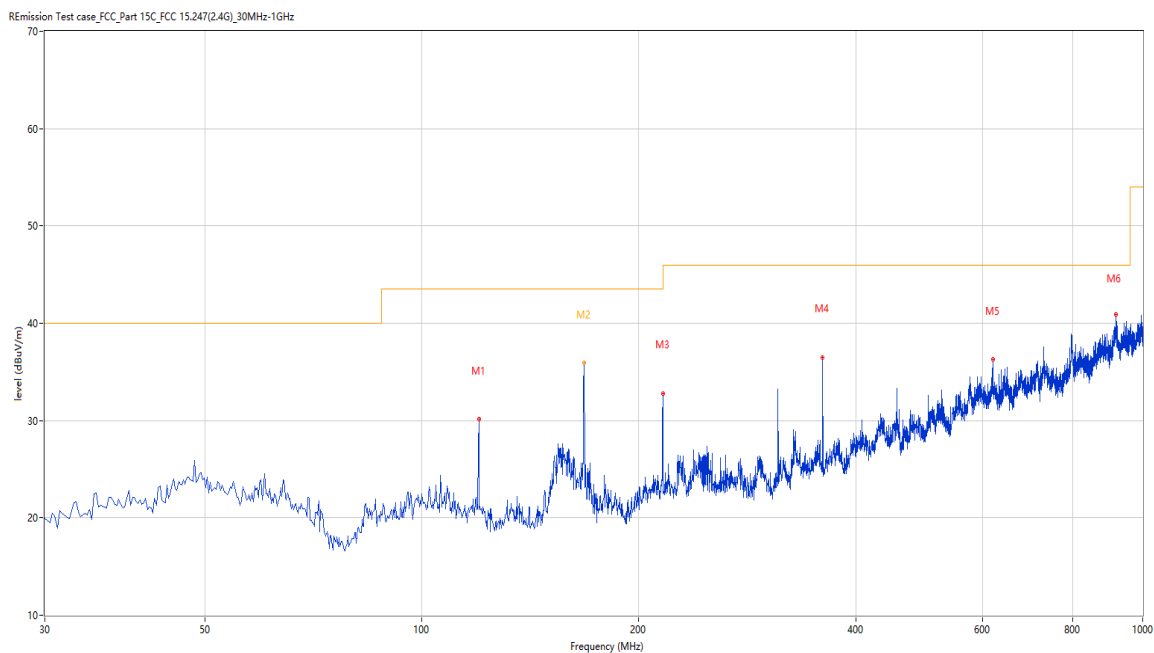
Date: 2020-5-7

Page 36 of 93

Notes:

1. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
2. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
3. The EUT is working in the Normal link mode below 1 GHz.

Figure 24: Spurious Emission, 30MHz – 1GHz, Normal Link Mode
30MHz-1GHz, Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	119.945	30.14	-27.10	43.5	-13.36	Peak	92.80	200	Horizontal	Pass
2	167.999	37.93	-29.04	43.5	-5.57	Peak	131.90	108	Horizontal	Pass
2*	167.999	35.94	-29.04	43.5	-7.56	QP	131.90	108	Horizontal	Pass
3	215.951	32.80	-26.37	43.5	-10.70	Peak	220.70	100	Horizontal	Pass
4	359.960	36.46	-23.76	46.0	-9.54	Peak	253.80	100	Horizontal	Pass
5	619.370	36.29	-15.62	46.0	-9.71	Peak	360.00	200	Horizontal	Pass
6	918.783	40.94	-10.22	46.0	-5.06	Peak	162.80	200	Horizontal	Pass

TEST REPORT

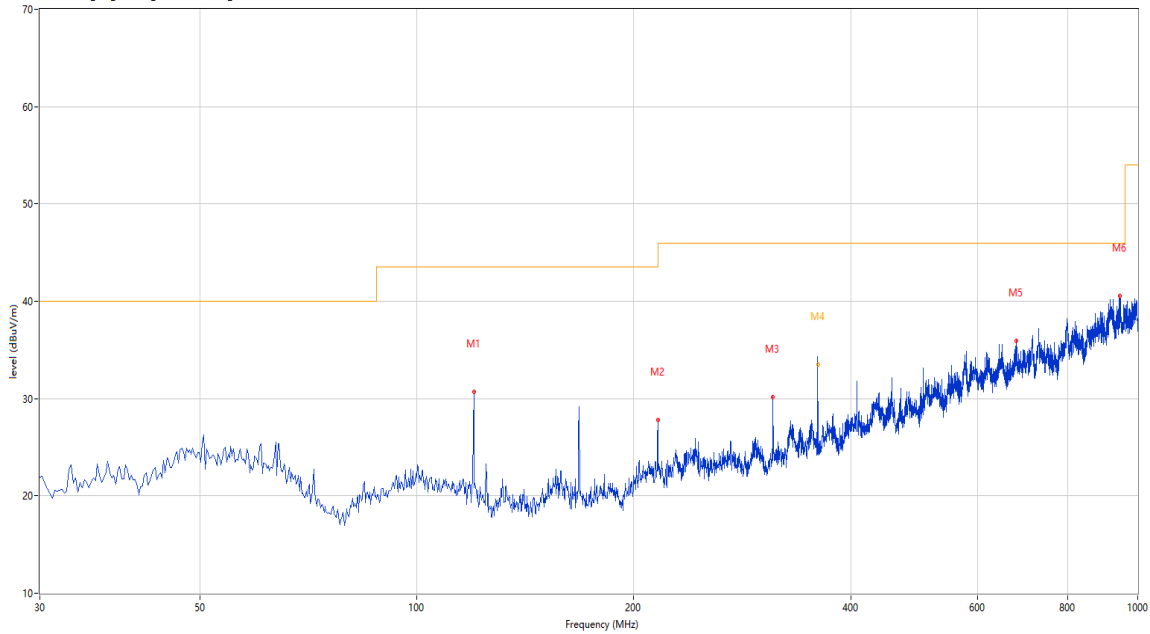
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 37 of 93

30MHz-1GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	119.945	30.68	-27.10	43.5	-12.82	Peak	108.60	100	Vertical	Pass
2	215.951	27.80	-26.37	43.5	-15.70	Peak	181.20	200	Vertical	Pass
3	311.957	30.11	-24.18	46.0	-15.89	Peak	126.40	100	Vertical	Pass
4	360.001	34.15	-23.76	46.0	-11.85	Peak	360.00	108	Vertical	Pass
4*	360.001	33.45	-23.76	46.0	-12.55	QP	360.00	108	Vertical	Pass
5	678.525	35.94	-14.75	46.0	-10.06	Peak	360.00	200	Vertical	Pass
6	945.209	40.50	-10.72	46.0	-5.50	Peak	239.50	100	Vertical	Pass

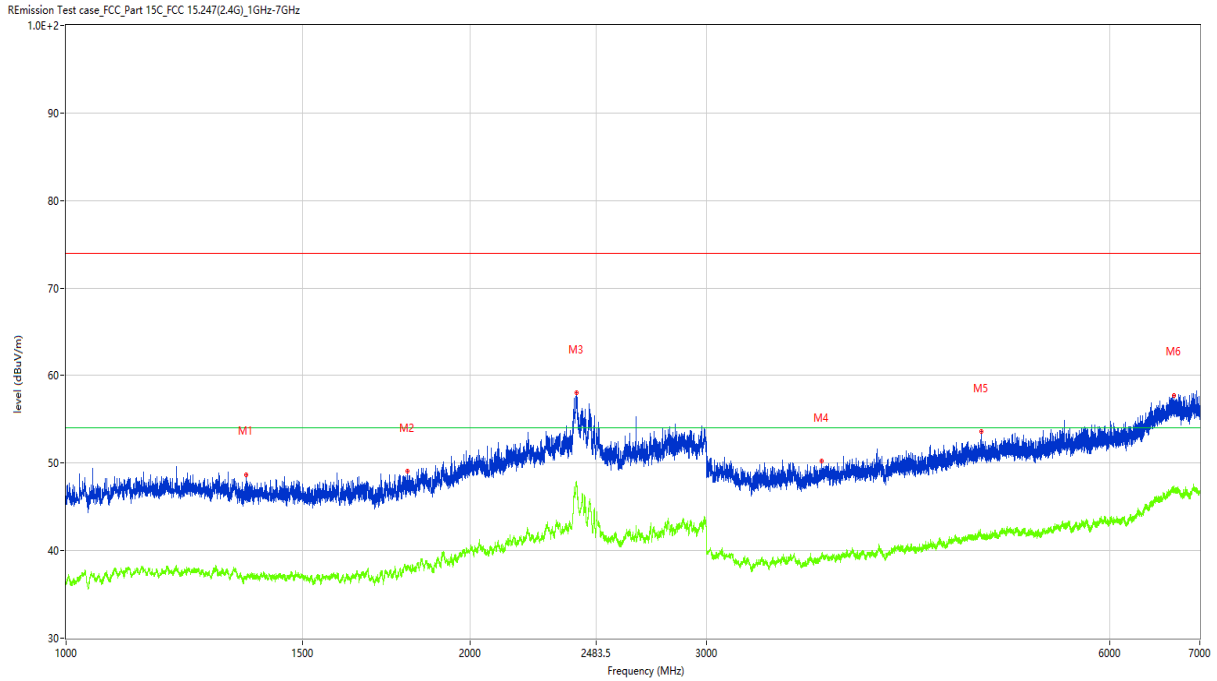
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 38 of 93

Figure 25: Spurious Emission, 1GHz – 10th Harmonic, 2402MHz, GFSK
1GHz-7GHz, Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1362.455	48.69	-5.08	74.0	-25.31	Peak	158.80	100	Horizontal	Pass
1**	1362.455	36.79	-5.08	54.0	-17.21	AV	158.80	100	Horizontal	Pass
2	1796.400	49.03	-4.42	74.0	-24.97	Peak	299.80	100	Horizontal	Pass
2**	1796.400	38.00	-4.42	54.0	-16.00	AV	299.80	100	Horizontal	Pass
3	2401.825	58.03	5.30	74.0	-15.97	Peak	206.10	100	Horizontal	Pass
3**	2401.825	47.91	5.30	54.0	-6.09	AV	206.10	100	Horizontal	Pass
4	3658.418	50.20	-0.82	74.0	-23.80	Peak	0.60	100	Horizontal	Pass
4**	3658.418	39.43	-0.82	54.0	-14.57	AV	0.60	100	Horizontal	Pass
5	4812.273	53.56	1.08	74.0	-20.44	Peak	249.20	100	Horizontal	Pass
5**	4812.273	41.80	1.08	54.0	-12.20	AV	249.20	100	Horizontal	Pass
6	6699.538	57.75	5.96	74.0	-16.25	Peak	92.90	100	Horizontal	Pass
6**	6699.538	46.94	5.96	54.0	-7.06	AV	92.90	100	Horizontal	Pass

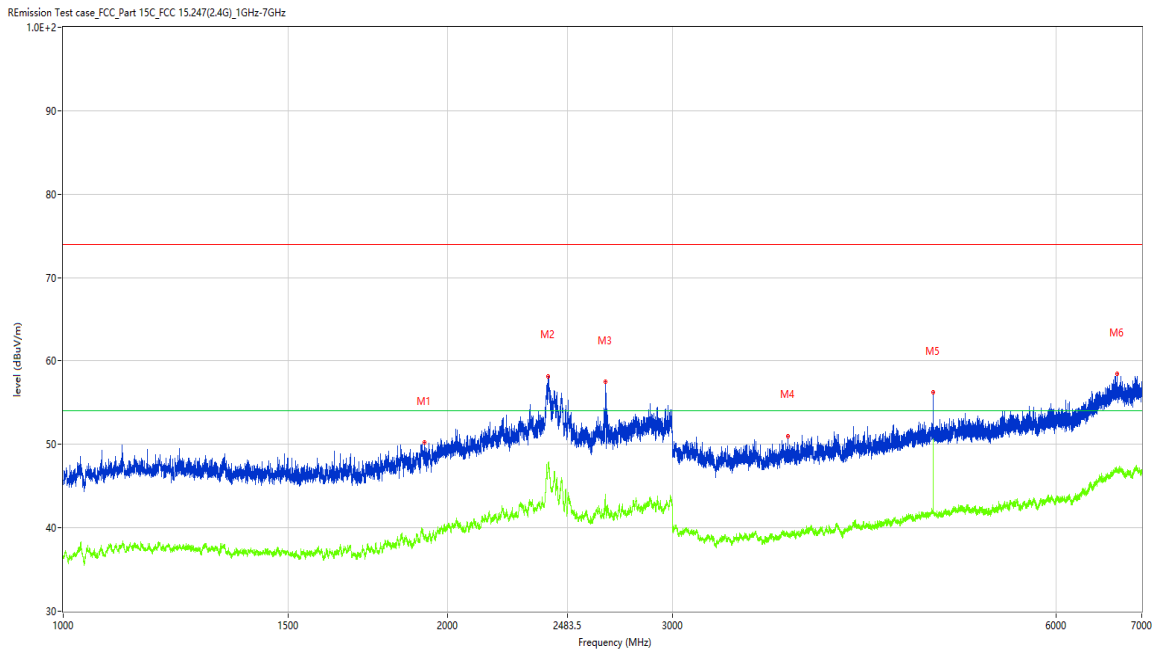
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 39 of 93

1GHz-7GHz, Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1920.135	50.25	-3.46	74.0	-23.75	Peak	265.30	100	Vertical	Pass
1**	1920.135	38.70	-3.46	54.0	-15.30	AV	265.30	100	Vertical	Pass
2	2399.575	58.11	5.39	74.0	-15.89	Peak	260.90	100	Vertical	Pass
2**	2399.575	47.83	5.39	54.0	-6.17	AV	260.90	100	Vertical	Pass
3	2659.043	57.52	0.19	74.0	-16.48	Peak	152.60	100	Vertical	Pass
3**	2659.043	43.62	0.19	54.0	-10.38	AV	152.60	100	Vertical	Pass
4	3696.413	51.02	-0.75	74.0	-22.98	Peak	35.90	100	Vertical	Pass
4**	3696.413	39.14	-0.75	54.0	-14.86	AV	35.90	100	Vertical	Pass
5	4803.775	56.24	1.07	74.0	-17.76	Peak	260.70	100	Vertical	Pass
5**	4803.775	50.65	1.07	54.0	-3.35	AV	260.70	100	Vertical	Pass
6	6700.037	58.51	5.97	74.0	-15.49	Peak	0.80	100	Vertical	Pass
6**	6700.037	46.71	5.97	54.0	-7.29	AV	0.80	100	Vertical	Pass

TEST REPORT

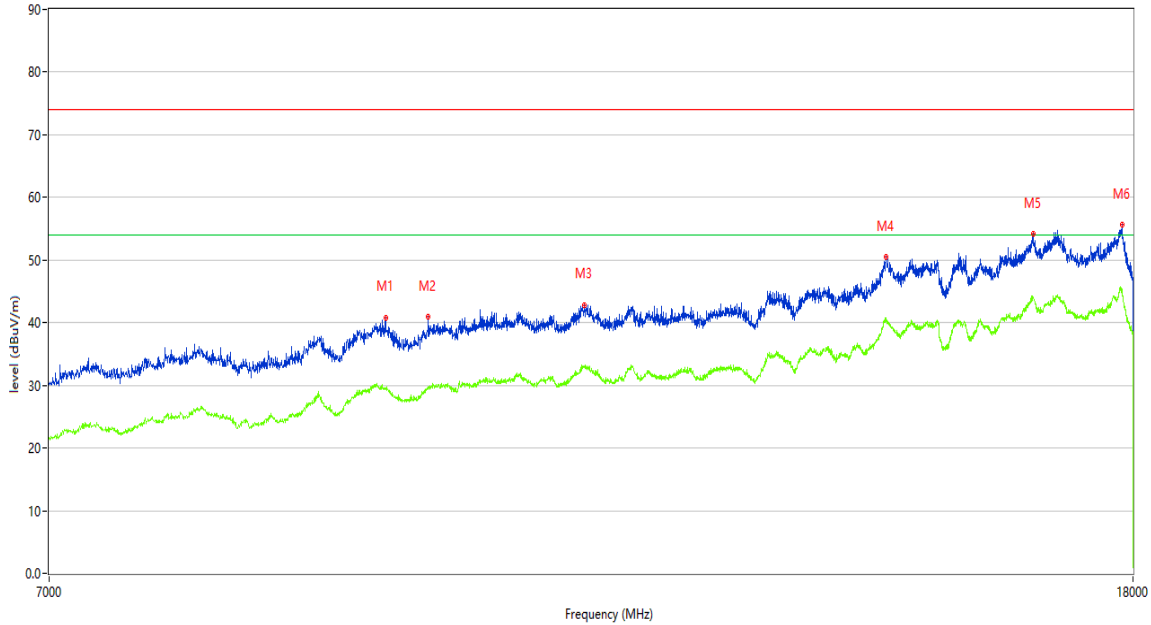
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 40 of 93

7GHz-18GHz, Horizontal

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9383.654	40.84	9.91	74.0	-33.16	Peak	196.20	100	Horizontal	Pass
1**	9383.654	29.36	9.91	54.0	-24.64	AV	196.20	100	Horizontal	Pass
2	9741.065	40.87	9.64	74.0	-33.13	Peak	205.50	100	Horizontal	Pass
2**	9741.065	29.64	9.64	54.0	-24.36	AV	205.50	100	Horizontal	Pass
3	11162.459	42.85	10.80	74.0	-31.15	Peak	309.30	100	Horizontal	Pass
3**	11162.459	32.88	10.80	54.0	-21.12	AV	309.30	100	Horizontal	Pass
4	14516.621	50.43	17.04	74.0	-23.57	Peak	304.90	100	Horizontal	Pass
4**	14516.621	40.79	17.04	54.0	-13.21	AV	304.90	100	Horizontal	Pass
5	16498.875	54.11	20.80	74.0	-19.89	Peak	49.60	100	Horizontal	Pass
5**	16498.875	44.09	20.80	54.0	-9.91	AV	49.60	100	Horizontal	Pass
6	17835.041	55.62	19.78	74.0	-18.38	Peak	80.80	100	Horizontal	Pass
6**	17835.041	44.46	19.78	54.0	-9.54	AV	80.80	100	Horizontal	Pass

TEST REPORT

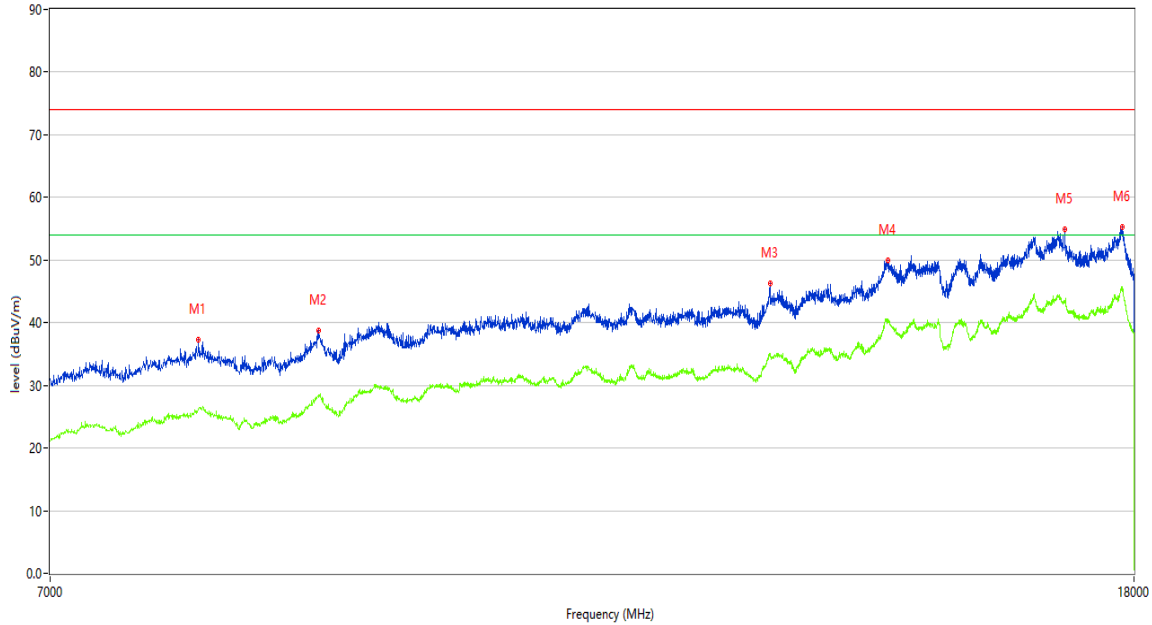
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 41 of 93

7GHz-18GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	7967.758	37.37	5.05	74.0	-36.63	Peak	325.60	100	Vertical	Pass
1**	7967.758	26.04	5.05	54.0	-27.96	AV	325.60	100	Vertical	Pass
2	8847.538	38.78	7.52	74.0	-35.22	Peak	279.80	100	Vertical	Pass
2**	8847.538	28.42	7.52	54.0	-25.58	AV	279.80	100	Vertical	Pass
3	13108.973	46.28	12.57	74.0	-27.72	Peak	45.00	100	Vertical	Pass
3**	13108.973	34.61	12.57	54.0	-19.39	AV	45.00	100	Vertical	Pass
4	14524.869	50.00	17.01	74.0	-24.00	Peak	99.40	100	Vertical	Pass
4**	14524.869	40.51	17.01	54.0	-13.49	AV	99.40	100	Vertical	Pass
5	16949.763	54.93	20.35	74.0	-19.07	Peak	103.80	100	Vertical	Pass
5**	16949.763	43.25	20.35	54.0	-10.75	AV	103.80	100	Vertical	Pass
6	17815.796	55.22	20.50	74.0	-18.78	Peak	180.90	100	Vertical	Pass
6**	17815.796	45.67	20.50	54.0	-8.33	AV	180.90	100	Vertical	Pass

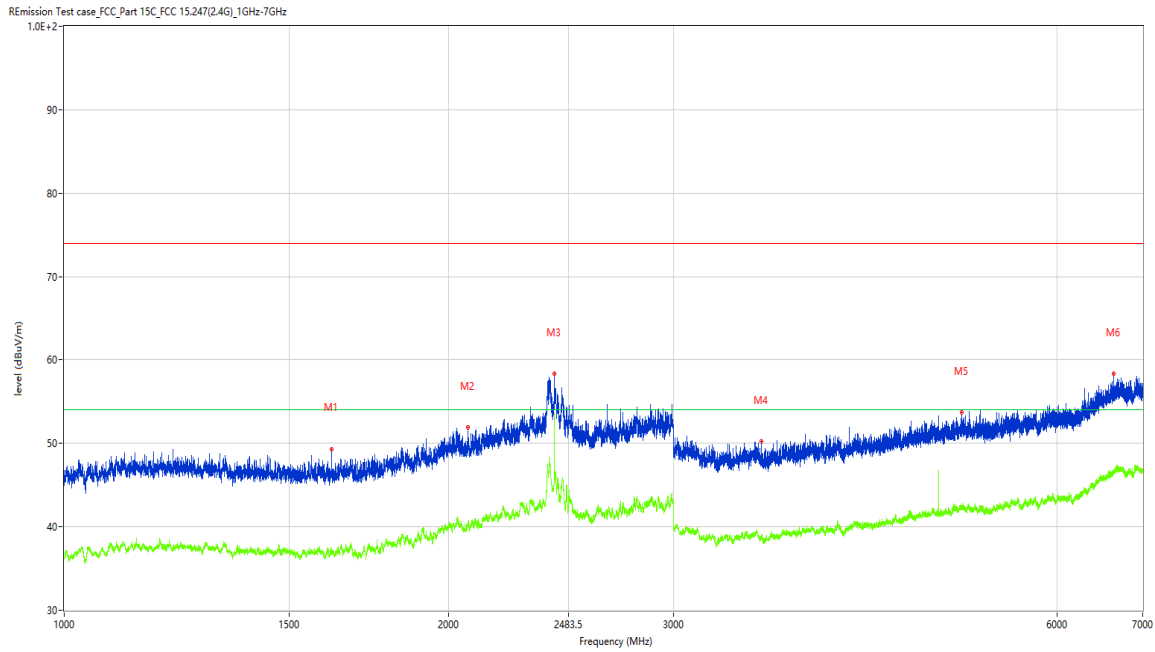
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 42 of 93

Figure 26: Spurious Emission, 1GHz – 10th Harmonic, 2441MHz, GFSK
1GHz-7GHz, Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1619.423	49.30	-5.28	74.0	-24.70	Peak	200.60	100	Horizontal	Pass
1**	1619.423	37.16	-5.28	54.0	-16.84	AV	200.60	100	Horizontal	Pass
2	2072.866	51.89	-1.25	74.0	-22.11	Peak	196.10	100	Horizontal	Pass
2**	2072.866	40.37	-1.25	54.0	-13.63	AV	196.10	100	Horizontal	Pass
3	2420.822	58.32	4.56	74.0	-15.68	Peak	346.40	100	Horizontal	Pass
3**	2420.822	53.56	4.56	54.0	-0.44	AV	346.40	100	Horizontal	Pass
4	3516.935	50.29	-1.19	74.0	-23.71	Peak	208.60	100	Horizontal	Pass
4**	3516.935	38.80	-1.19	54.0	-15.20	AV	208.60	100	Horizontal	Pass
5	5052.743	53.76	1.71	74.0	-20.24	Peak	325.10	100	Horizontal	Pass
5**	5052.743	42.48	1.71	54.0	-11.52	AV	325.10	100	Horizontal	Pass
6	6643.545	58.35	5.33	74.0	-15.65	Peak	273.70	100	Horizontal	Pass
6**	6643.545	46.32	5.33	54.0	-7.68	AV	273.70	100	Horizontal	Pass

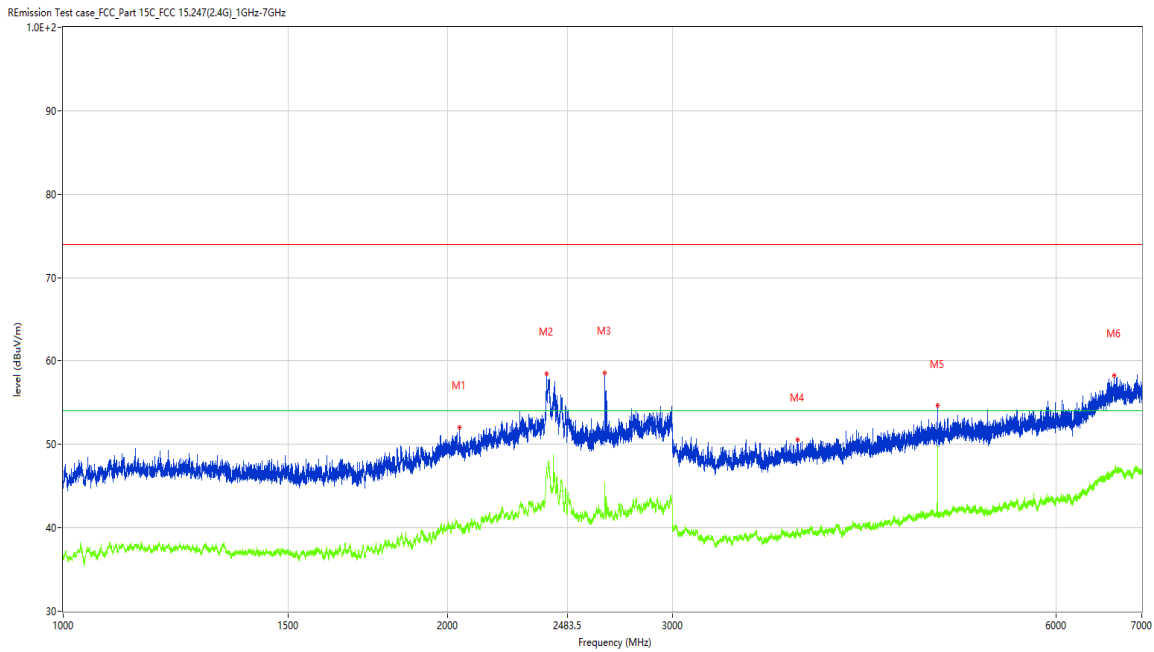
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 43 of 93

1GHz-7GHz, Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2044.119	52.07	-1.97	74.0	-21.93	Peak	359.90	100	Vertical	Pass
1**	2044.119	40.07	-1.97	54.0	-13.93	AV	359.90	100	Vertical	Pass
2	2392.826	58.48	5.65	74.0	-15.52	Peak	116.60	100	Vertical	Pass
2**	2392.826	46.89	5.65	54.0	-7.11	AV	116.60	100	Vertical	Pass
3	2657.793	58.62	0.33	74.0	-15.38	Peak	153.00	100	Vertical	Pass
3**	2657.793	45.43	0.33	54.0	-8.57	AV	153.00	100	Vertical	Pass
4	3760.405	50.52	-0.74	74.0	-23.48	Peak	177.00	100	Vertical	Pass
4**	3760.405	39.56	-0.74	54.0	-14.44	AV	177.00	100	Vertical	Pass
5	4841.770	54.72	1.14	74.0	-19.28	Peak	278.90	100	Vertical	Pass
5**	4841.770	49.79	1.14	54.0	-4.21	AV	278.90	100	Vertical	Pass
6	6661.042	58.27	5.53	74.0	-15.73	Peak	105.10	100	Vertical	Pass
6**	6661.042	46.60	5.53	54.0	-7.40	AV	105.10	100	Vertical	Pass

TEST REPORT

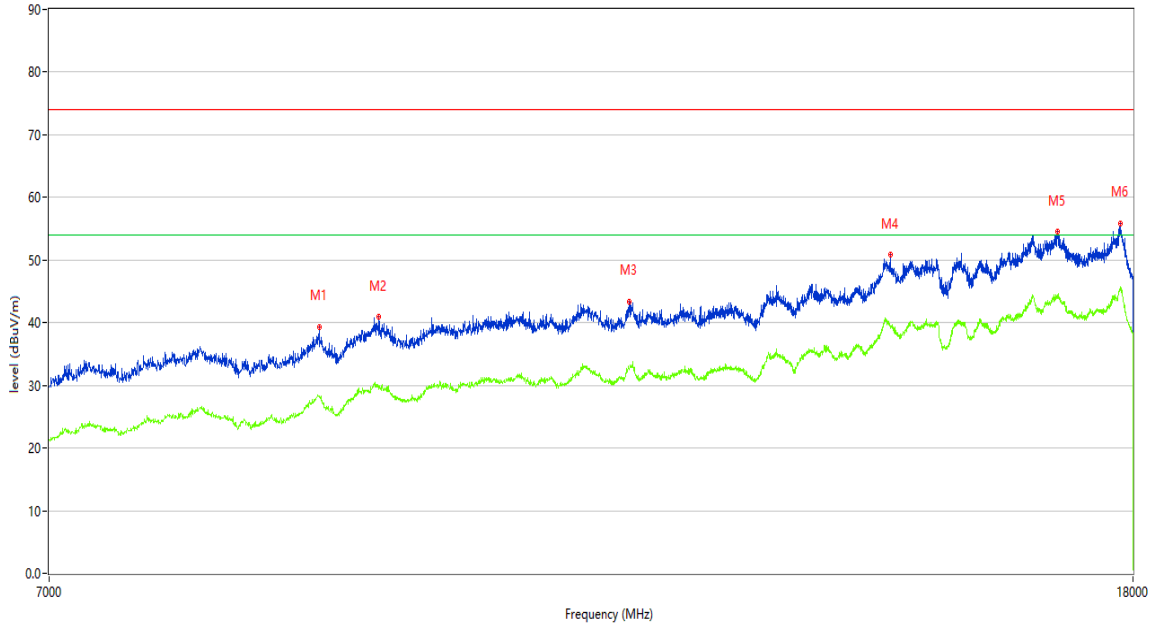
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 44 of 93

7GHz-18GHz, Horizontal

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	8855.786	39.38	7.44	74.0	-34.62	Peak	4.40	100	Horizontal	Pass
1**	8855.786	28.06	7.44	54.0	-25.94	AV	4.40	100	Horizontal	Pass
2	9328.668	40.96	9.52	74.0	-33.04	Peak	251.60	100	Horizontal	Pass
2**	9328.668	30.01	9.52	54.0	-23.99	AV	251.60	100	Horizontal	Pass
3	11602.349	43.42	11.55	74.0	-30.58	Peak	198.10	100	Horizontal	Pass
3**	11602.349	32.76	11.55	54.0	-21.24	AV	198.10	100	Horizontal	Pass
4	14568.858	50.86	16.97	74.0	-23.14	Peak	98.40	100	Horizontal	Pass
4**	14568.858	39.53	16.97	54.0	-14.47	AV	98.40	100	Horizontal	Pass
5	16859.035	54.57	20.41	74.0	-19.43	Peak	297.00	100	Horizontal	Pass
5**	16859.035	44.02	20.41	54.0	-9.98	AV	297.00	100	Horizontal	Pass
6	17804.799	55.90	20.92	74.0	-18.10	Peak	357.60	100	Horizontal	Pass
6**	17804.799	45.52	20.92	54.0	-8.48	AV	357.60	100	Horizontal	Pass

TEST REPORT

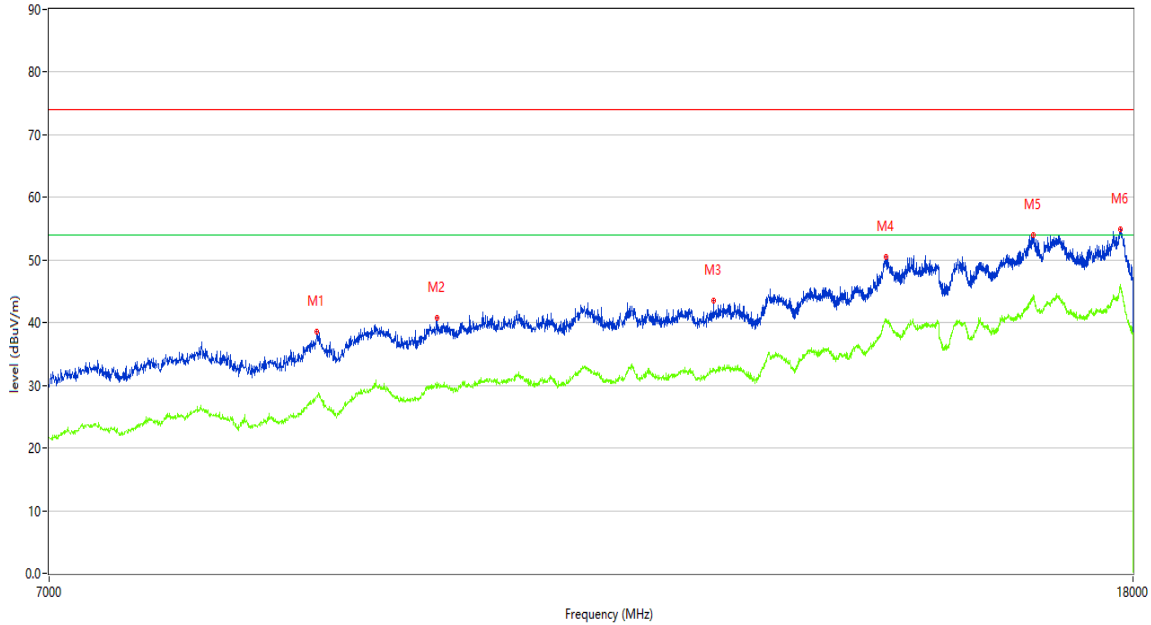
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 45 of 93

7GHz-18GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	8839.290	38.49	7.39	74.0	-35.51	Peak	0.00	100	Vertical	Pass
1**	8839.290	28.26	7.39	54.0	-25.74	AV	0.00	100	Vertical	Pass
2	9812.547	40.79	9.58	74.0	-33.21	Peak	211.00	100	Vertical	Pass
2**	9812.547	30.01	9.58	54.0	-23.99	AV	211.00	100	Vertical	Pass
3	12490.377	43.49	10.63	74.0	-30.51	Peak	74.80	100	Vertical	Pass
3**	12490.377	32.28	10.63	54.0	-21.72	AV	74.80	100	Vertical	Pass
4	14513.872	50.46	17.05	74.0	-23.54	Peak	0.00	100	Vertical	Pass
4**	14513.872	40.50	17.05	54.0	-13.50	AV	0.00	100	Vertical	Pass
5	16498.875	53.95	20.80	74.0	-20.05	Peak	347.90	100	Vertical	Pass
5**	16498.875	44.37	20.80	54.0	-9.63	AV	347.90	100	Vertical	Pass
6	17804.799	54.89	20.92	74.0	-19.11	Peak	360.00	100	Vertical	Pass
6**	17804.799	45.28	20.92	54.0	-8.72	AV	360.00	100	Vertical	Pass

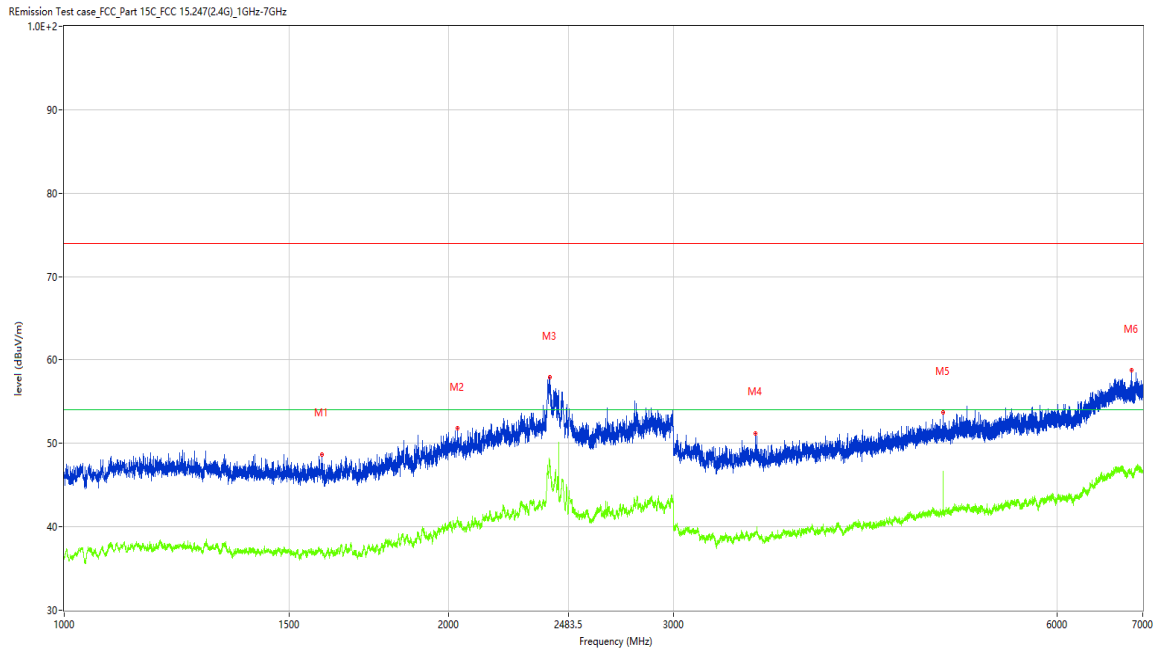
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 46 of 93

Figure 27: Spurious Emission, 1GHz – 10th Harmonic, 2480MHz, GFSK
1GHz-7GHz, Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1590.926	48.71	-5.40	74.0	-25.29	Peak	0.00	100	Horizontal	Pass
1**	1590.926	37.15	-5.40	54.0	-16.85	AV	0.00	100	Horizontal	Pass
2	2032.871	51.80	-1.46	74.0	-22.20	Peak	162.10	100	Horizontal	Pass
2**	2032.871	40.87	-1.46	54.0	-13.13	AV	162.10	100	Horizontal	Pass
3	2401.575	57.91	5.31	74.0	-16.09	Peak	87.50	100	Horizontal	Pass
3**	2401.575	47.71	5.31	54.0	-6.29	AV	87.50	100	Horizontal	Pass
4	3480.440	51.14	-1.28	74.0	-22.86	Peak	252.50	100	Horizontal	Pass
4**	3480.440	39.07	-1.28	54.0	-14.93	AV	252.50	100	Horizontal	Pass
5	4881.265	53.69	1.22	74.0	-20.31	Peak	83.20	100	Horizontal	Pass
5**	4881.265	45.58	1.22	54.0	-8.42	AV	83.20	100	Horizontal	Pass
6	6862.517	58.77	5.62	74.0	-15.23	Peak	110.30	100	Horizontal	Pass
6**	6862.517	46.78	5.62	54.0	-7.22	AV	110.30	100	Horizontal	Pass

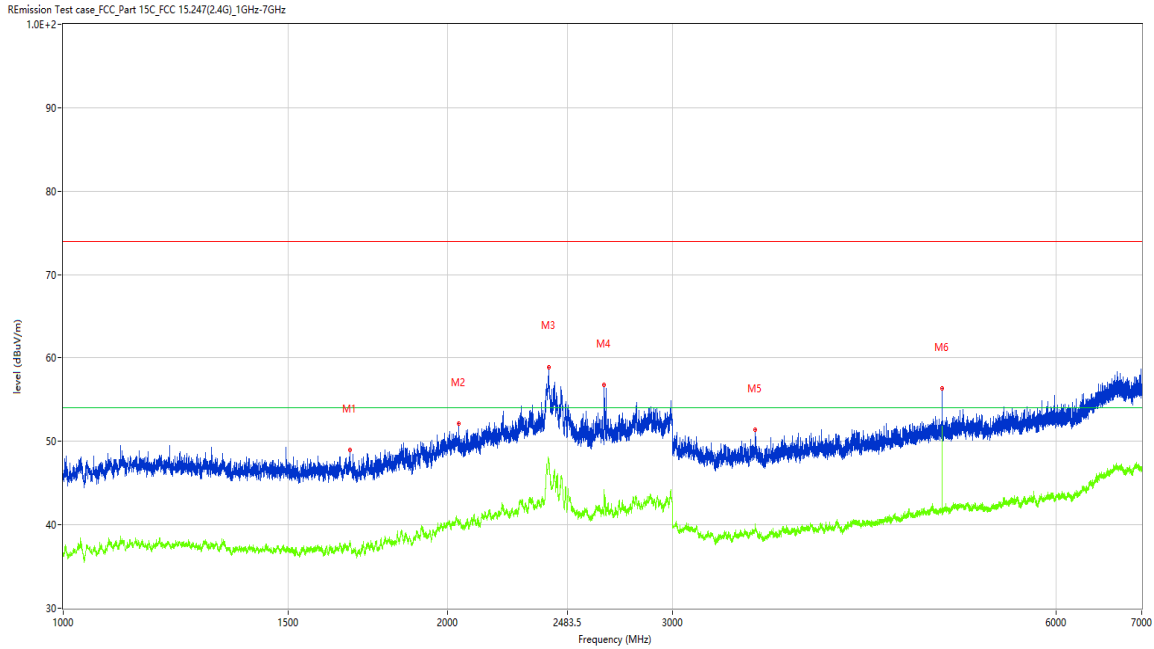
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 47 of 93

1GHz-7GHz, Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1678.165	48.93	-4.61	74.0	-25.07	Peak	157.80	100	Vertical	Pass
1**	1678.165	37.93	-4.61	54.0	-16.07	AV	157.80	100	Vertical	Pass
2	2041.870	52.14	-2.07	74.0	-21.86	Peak	247.10	100	Vertical	Pass
2**	2041.870	40.27	-2.07	54.0	-13.73	AV	247.10	100	Vertical	Pass
3	2401.325	58.90	5.32	74.0	-15.10	Peak	345.30	100	Vertical	Pass
3**	2401.325	47.87	5.32	54.0	-6.13	AV	345.30	100	Vertical	Pass
4	2654.543	56.78	0.24	74.0	-17.22	Peak	153.30	100	Vertical	Pass
4**	2654.543	44.24	0.24	54.0	-9.76	AV	153.30	100	Vertical	Pass
5	3486.439	51.38	-1.27	74.0	-22.62	Peak	229.80	100	Vertical	Pass
5**	3486.439	39.63	-1.27	54.0	-14.37	AV	229.80	100	Vertical	Pass
6	4881.765	56.33	1.22	74.0	-17.67	Peak	257.40	100	Vertical	Pass
6**	4881.765	51.83	1.22	54.0	-2.17	AV	257.40	100	Vertical	Pass

TEST REPORT

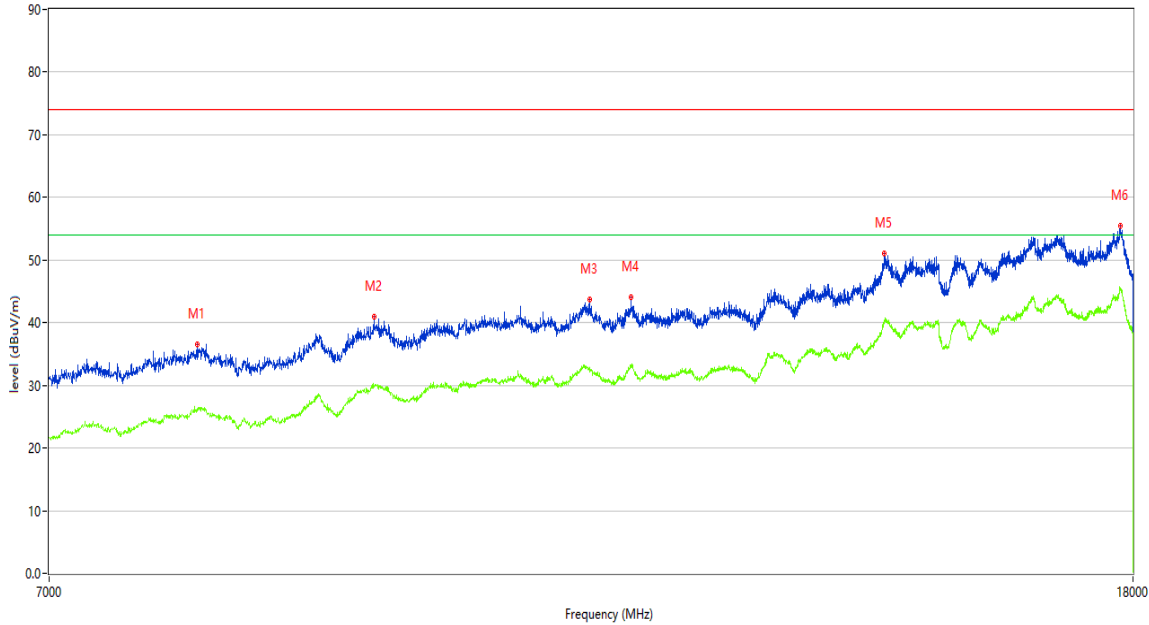
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 48 of 93

7GHz-18GHz, Horizontal

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	7967.758	36.55	5.05	74.0	-37.45	Peak	174.90	100	Horizontal	Pass
1**	7967.758	26.26	5.05	54.0	-27.74	AV	174.90	100	Horizontal	Pass
2	9292.927	41.00	9.04	74.0	-33.00	Peak	252.30	100	Horizontal	Pass
2**	9292.927	29.82	9.04	54.0	-24.18	AV	252.30	100	Horizontal	Pass
3	11214.696	43.65	10.69	74.0	-30.35	Peak	302.60	100	Horizontal	Pass
3**	11214.696	32.16	10.69	54.0	-21.84	AV	302.60	100	Horizontal	Pass
4	11624.344	44.05	11.20	74.0	-29.95	Peak	357.80	100	Horizontal	Pass
4**	11624.344	33.18	11.20	54.0	-20.82	AV	357.80	100	Horizontal	Pass
5	14491.877	50.97	16.87	74.0	-23.03	Peak	161.10	100	Horizontal	Pass
5**	14491.877	39.96	16.87	54.0	-14.04	AV	161.10	100	Horizontal	Pass
6	17799.300	55.39	21.10	74.0	-18.61	Peak	75.50	100	Horizontal	Pass
6**	17799.300	45.33	21.10	54.0	-8.67	AV	75.50	100	Horizontal	Pass

TEST REPORT

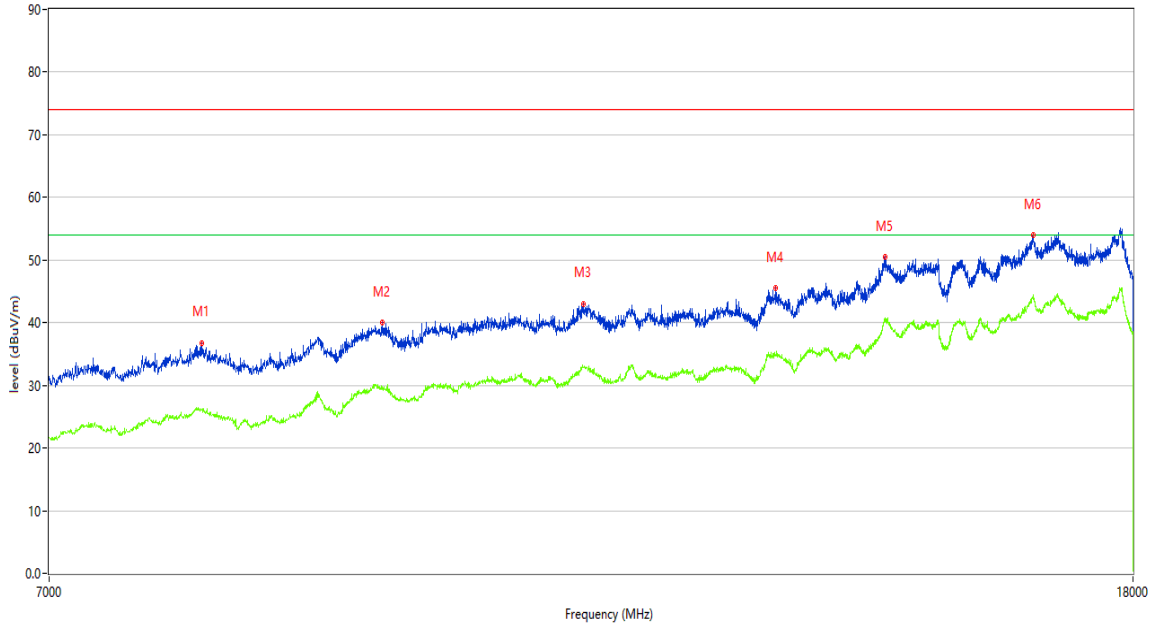
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 49 of 93

7GHz-18GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	7998.000	36.81	5.69	74.0	-37.19	Peak	359.50	100	Vertical	Pass
1**	7998.000	26.10	5.69	54.0	-27.90	AV	359.50	100	Vertical	Pass
2	9356.161	40.00	9.84	74.0	-34.00	Peak	271.30	100	Vertical	Pass
2**	9356.161	29.75	9.84	54.0	-24.25	AV	271.30	100	Vertical	Pass
3	11148.713	43.05	10.82	74.0	-30.95	Peak	262.00	100	Vertical	Pass
3**	11148.713	32.97	10.82	54.0	-21.03	AV	262.00	100	Vertical	Pass
4	13185.954	45.49	12.30	74.0	-28.51	Peak	140.30	100	Vertical	Pass
4**	13185.954	34.93	12.30	54.0	-19.07	AV	140.30	100	Vertical	Pass
5	14500.125	50.42	17.10	74.0	-23.58	Peak	212.10	100	Vertical	Pass
5**	14500.125	40.19	17.10	54.0	-13.81	AV	212.10	100	Vertical	Pass
6	16501.625	53.99	20.75	74.0	-20.01	Peak	271.30	100	Vertical	Pass
6**	16501.625	44.40	20.75	54.0	-9.60	AV	271.30	100	Vertical	Pass

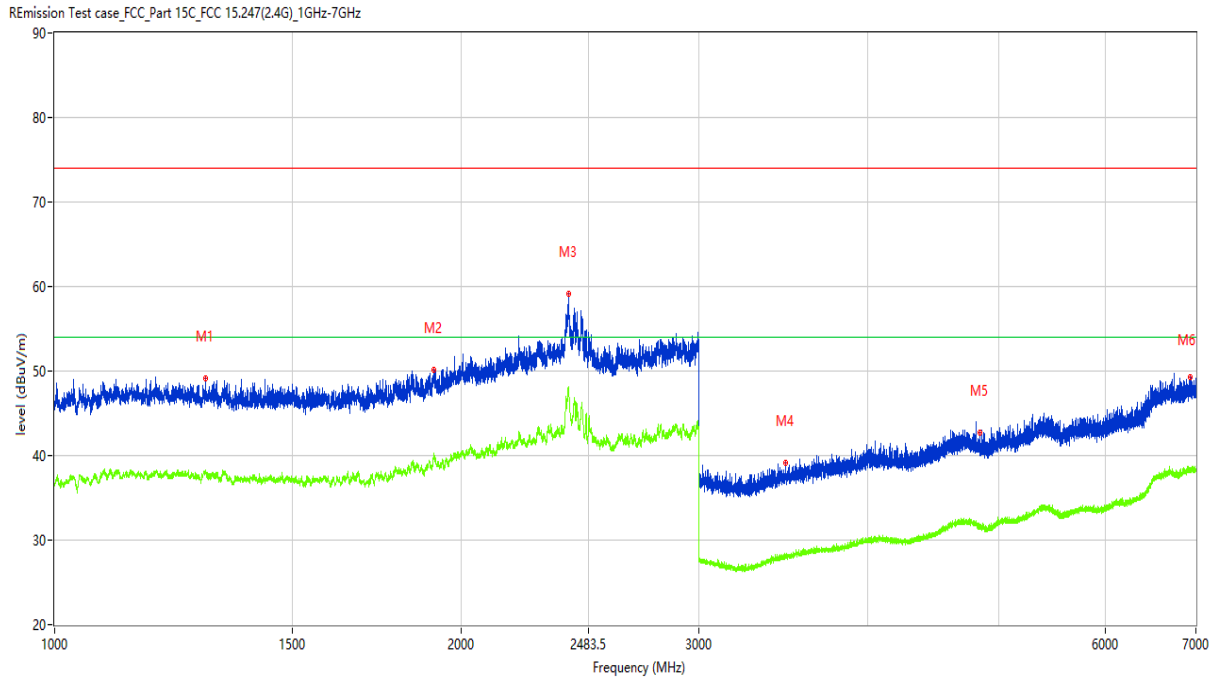
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 50 of 93

Figure 28: Spurious Emission, 1GHz – 10th Harmonic, 2402MHz, 8-DPSK
1GHz-7GHz, Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1294.10	50.96	-4.32	74.0	-23.04	Peak	342.40	100	Horizontal	Pass
1**	1294.51	38.43	-4.32	54.0	-15.57	AV	342.40	100	Horizontal	Pass
2	1913.24	51.09	-2.96	74.0	-22.91	Peak	239.60	100	Horizontal	Pass
2**	1911.65	39.76	-2.96	54.0	-14.24	AV	239.60	100	Horizontal	Pass
3	2405.99	59.73	5.33	74.0	-14.27	Peak	57.30	100	Horizontal	Pass
3**	2402.28	49.01	5.33	54.0	-4.99	AV	57.30	100	Horizontal	Pass
4	3479.09	39.64	-1.29	74.0	-34.36	Peak	359.80	100	Horizontal	Pass
4**	3478.64	29.18	-1.29	54.0	-24.82	AV	359.80	100	Horizontal	Pass
5	4844.46	43.30	1.14	74.0	-30.70	Peak	296.20	100	Horizontal	Pass
5**	4844.67	33.37	1.14	54.0	-20.63	AV	296.20	100	Horizontal	Pass
6	6938.42	50.42	5.71	74.0	-23.58	Peak	315.20	100	Horizontal	Pass
6**	6939.85	39.91	5.71	54.0	-14.09	AV	315.20	100	Horizontal	Pass

TEST REPORT

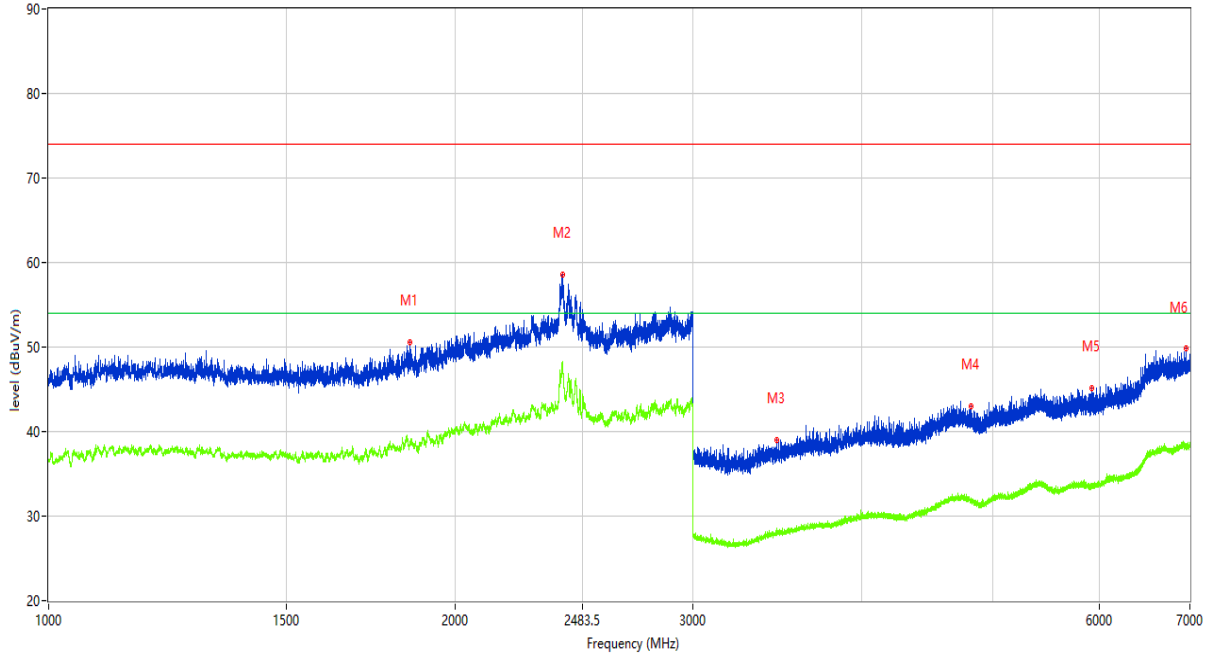
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 51 of 93

1GHz-7GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_1GHz-7GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1852.81	50.97	-3.71	74.0	-23.03	Peak	83.10	100	Vertical	Pass
1**	1854.07	40.08	-3.71	54.0	-13.92	AV	83.10	100	Vertical	Pass
2	2401.58	59.78	5.32	74.0	-14.22	Peak	360.00	100	Vertical	Pass
2**	2402.80	49.77	5.32	54.0	-4.23	AV	360.00	100	Vertical	Pass
3	3461.54	39.78	-1.32	74.0	-34.22	Peak	292.80	100	Vertical	Pass
3**	3463.16	28.32	-1.32	54.0	-25.68	AV	292.80	100	Vertical	Pass
4	4822.35	44.55	1.10	74.0	-29.45	Peak	14.10	100	Vertical	Pass
4**	4822.98	33.02	1.10	54.0	-20.98	AV	14.10	100	Vertical	Pass
5	5921.56	46.21	2.23	74.0	-27.79	Peak	106.00	100	Vertical	Pass
5**	5922.54	35.58	2.23	54.0	-18.42	AV	106.00	100	Vertical	Pass
6	6960.08	50.36	5.78	74.0	-23.64	Peak	160.70	100	Vertical	Pass
6**	6959.29	39.65	5.78	54.0	-14.35	AV	160.70	100	Vertical	Pass

TEST REPORT

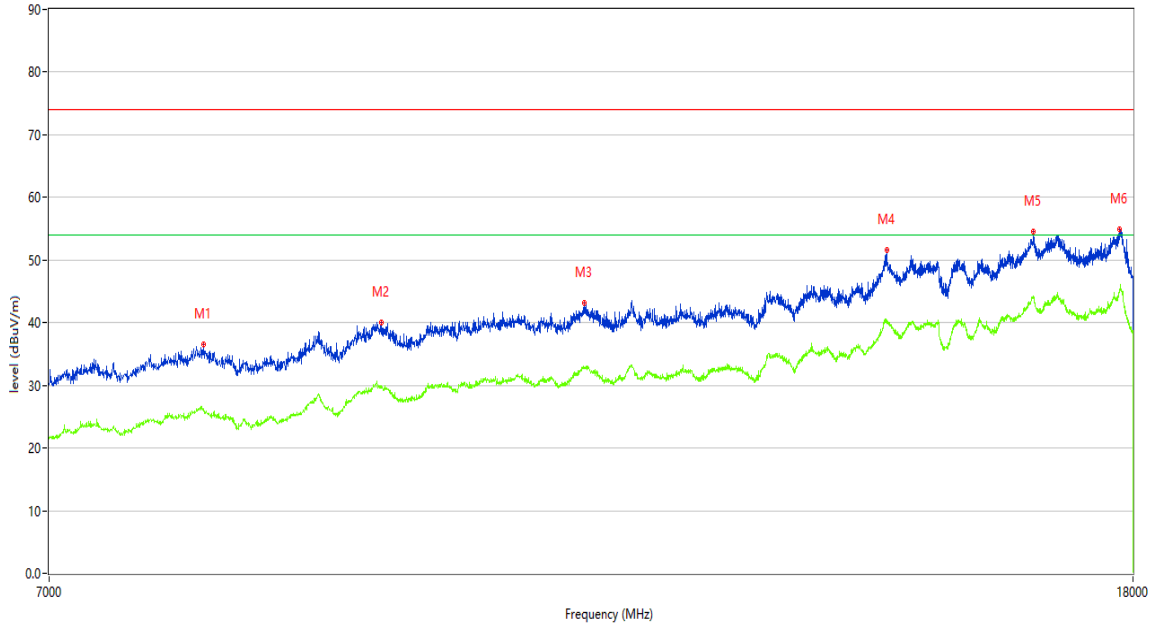
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 52 of 93

7GHz-18GHz, Horizontal

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	8006.248	36.60	5.67	74.0	-37.40	Peak	298.00	100	Horizontal	Pass
1**	8006.248	25.94	5.67	54.0	-28.06	AV	298.00	100	Horizontal	Pass
2	9353.412	40.04	9.83	74.0	-33.96	Peak	235.10	100	Horizontal	Pass
2**	9353.412	30.00	9.83	54.0	-24.00	AV	235.10	100	Horizontal	Pass
3	11156.961	43.17	10.81	74.0	-30.83	Peak	4.80	100	Horizontal	Pass
3**	11156.961	32.96	10.81	54.0	-21.04	AV	4.80	100	Horizontal	Pass
4	14527.618	51.53	17.00	74.0	-22.47	Peak	298.00	100	Horizontal	Pass
4**	14527.618	39.99	17.00	54.0	-14.01	AV	298.00	100	Horizontal	Pass
5	16501.625	54.55	20.75	74.0	-19.45	Peak	360.00	100	Horizontal	Pass
5**	16501.625	44.13	20.75	54.0	-9.87	AV	360.00	100	Horizontal	Pass
6	17796.551	54.92	21.12	74.0	-19.08	Peak	121.40	100	Horizontal	Pass
6**	17796.551	45.25	21.12	54.0	-8.75	AV	121.40	100	Horizontal	Pass

TEST REPORT

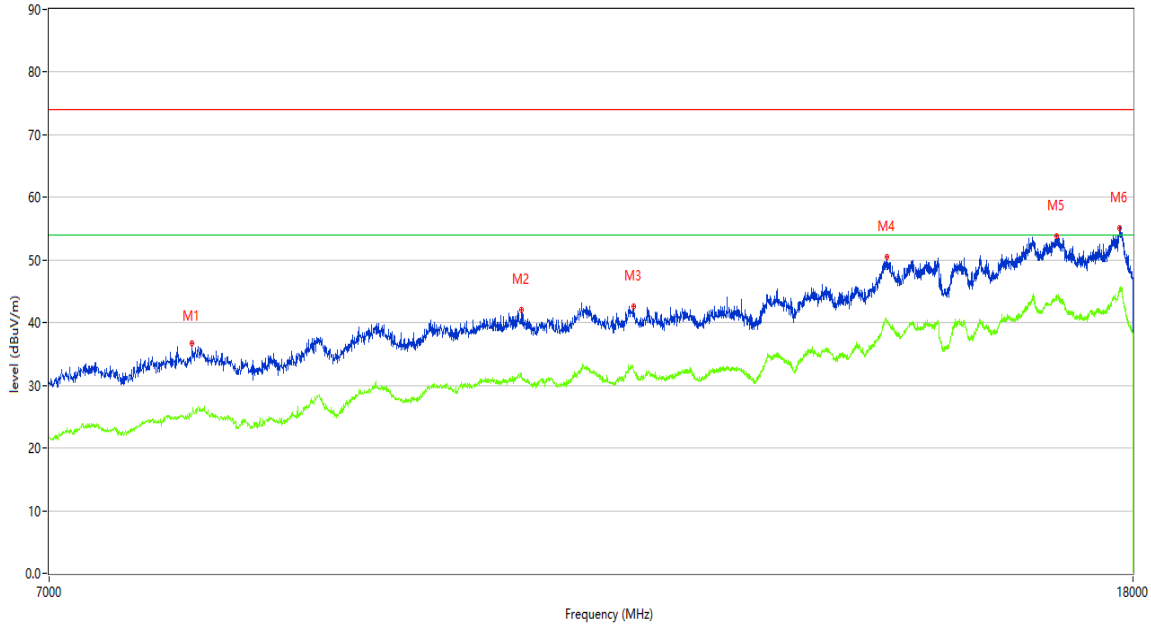
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 53 of 93

7GHz-18GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	7929.268	36.70	4.81	74.0	-37.30	Peak	357.90	100	Vertical	Pass
1**	7929.268	25.48	4.81	54.0	-28.52	AV	357.90	100	Vertical	Pass
2	10565.859	42.08	9.98	74.0	-31.92	Peak	359.00	100	Vertical	Pass
2**	10565.859	32.01	9.98	54.0	-21.99	AV	359.00	100	Vertical	Pass
3	11654.586	42.57	10.76	74.0	-31.43	Peak	352.80	100	Vertical	Pass
3**	11654.586	32.10	10.76	54.0	-21.90	AV	352.80	100	Vertical	Pass
4	14522.119	50.55	17.02	74.0	-23.45	Peak	326.00	100	Vertical	Pass
4**	14522.119	40.22	17.02	54.0	-13.78	AV	326.00	100	Vertical	Pass
5	16848.038	53.77	20.48	74.0	-20.23	Peak	360.00	100	Vertical	Pass
5**	16848.038	44.53	20.48	54.0	-9.47	AV	360.00	100	Vertical	Pass
6	17796.551	55.01	21.12	74.0	-18.99	Peak	312.30	100	Vertical	Pass
6**	17796.551	45.28	21.12	54.0	-8.72	AV	312.30	100	Vertical	Pass

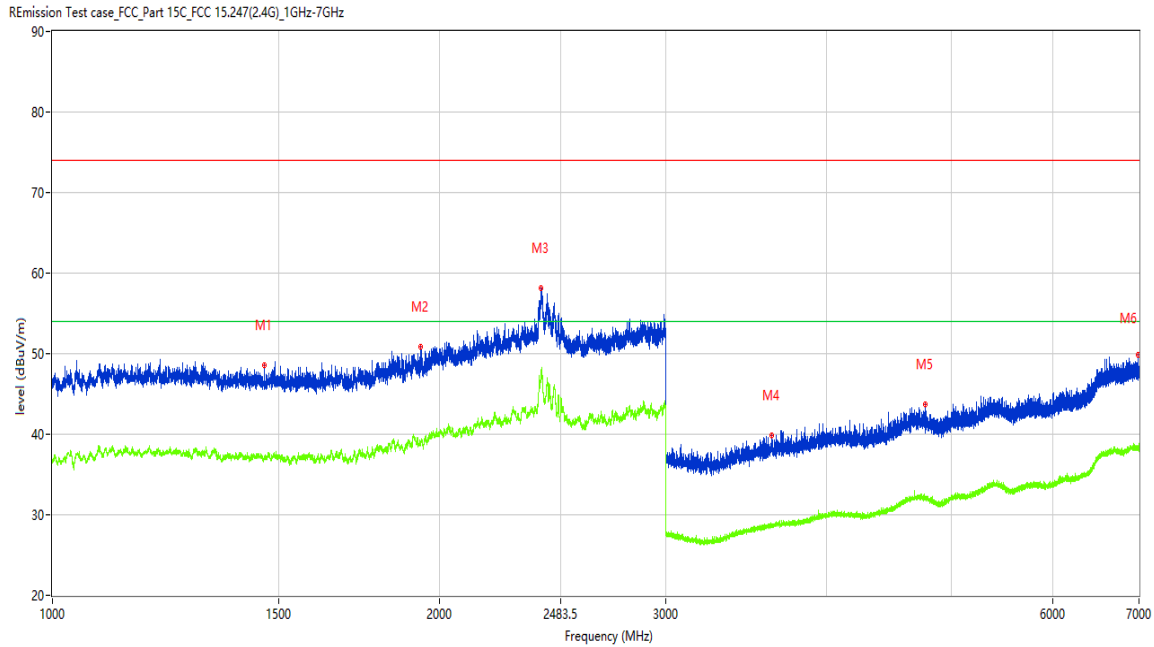
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 54 of 93

Figure 29: Spurious Emission, 1GHz – 10th Harmonic, 2441MHz, 8-DPSK
1GHz-7GHz, Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1461.06	50.46	-5.38	74.0	-23.54	Peak	7.00	100	Horizontal	Pass
1**	1462.63	38.95	-5.38	54.0	-15.05	AV	7.00	100	Horizontal	Pass
2	1937.99	52.02	-3.47	74.0	-21.98	Peak	155.50	100	Horizontal	Pass
2**	1935.92	39.79	-3.47	54.0	-14.21	AV	155.50	100	Horizontal	Pass
3	2403.38	58.38	5.36	74.0	-15.62	Peak	0.00	100	Horizontal	Pass
3**	2404.09	49.27	5.36	54.0	-4.73	AV	0.00	100	Horizontal	Pass
4	3630.05	40.57	-0.88	74.0	-33.43	Peak	162.20	100	Horizontal	Pass
4**	3630.46	30.08	-0.88	54.0	-23.92	AV	162.20	100	Horizontal	Pass
5	4780.31	45.47	1.04	74.0	-28.53	Peak	120.50	100	Horizontal	Pass
5**	4781.84	33.78	1.04	54.0	-20.22	AV	120.50	100	Horizontal	Pass
6	6990.10	50.51	5.87	74.0	-23.49	Peak	359.00	100	Horizontal	Pass
6**	6989.08	40.37	5.87	54.0	-13.63	AV	359.00	100	Horizontal	Pass

TEST REPORT

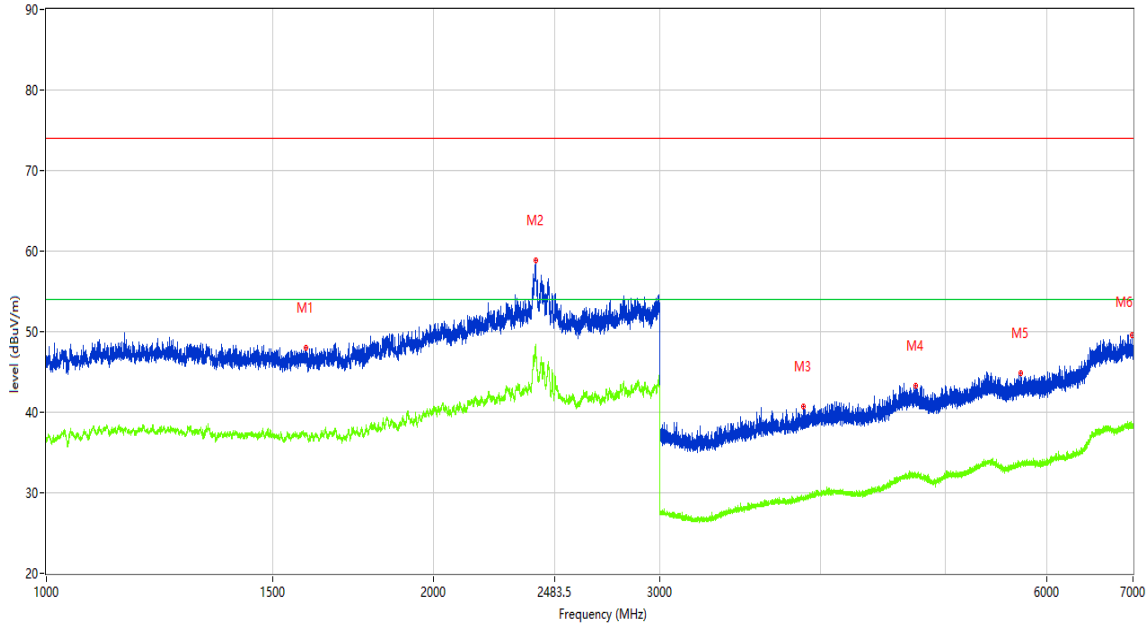
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 55 of 93

1GHz-7GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_1GHz-7GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1593.04	49.33	-5.30	74.0	-24.67	Peak	211.10	100	Vertical	Pass
1**	1596.58	37.23	-5.30	54.0	-16.77	AV	211.10	100	Vertical	Pass
2	2405.11	59.69	5.31	74.0	-14.31	Peak	48.10	100	Vertical	Pass
2**	2401.60	49.42	5.31	54.0	-4.58	AV	48.10	100	Vertical	Pass
3	3879.00	40.74	-0.43	74.0	-33.26	Peak	209.80	100	Vertical	Pass
3**	3880.50	29.80	-0.43	54.0	-24.20	AV	209.80	100	Vertical	Pass
4	4747.47	44.48	1.01	74.0	-29.52	Peak	296.90	100	Vertical	Pass
4**	4748.78	32.14	1.01	54.0	-21.86	AV	296.90	100	Vertical	Pass
5	5725.31	46.70	2.16	74.0	-27.30	Peak	178.60	100	Vertical	Pass
5**	5722.71	34.96	2.16	54.0	-19.04	AV	178.60	100	Vertical	Pass
6	6987.04	50.85	5.86	74.0	-23.15	Peak	10.00	100	Vertical	Pass
6**	6989.33	40.39	5.86	54.0	-13.61	AV	10.00	100	Vertical	Pass

TEST REPORT

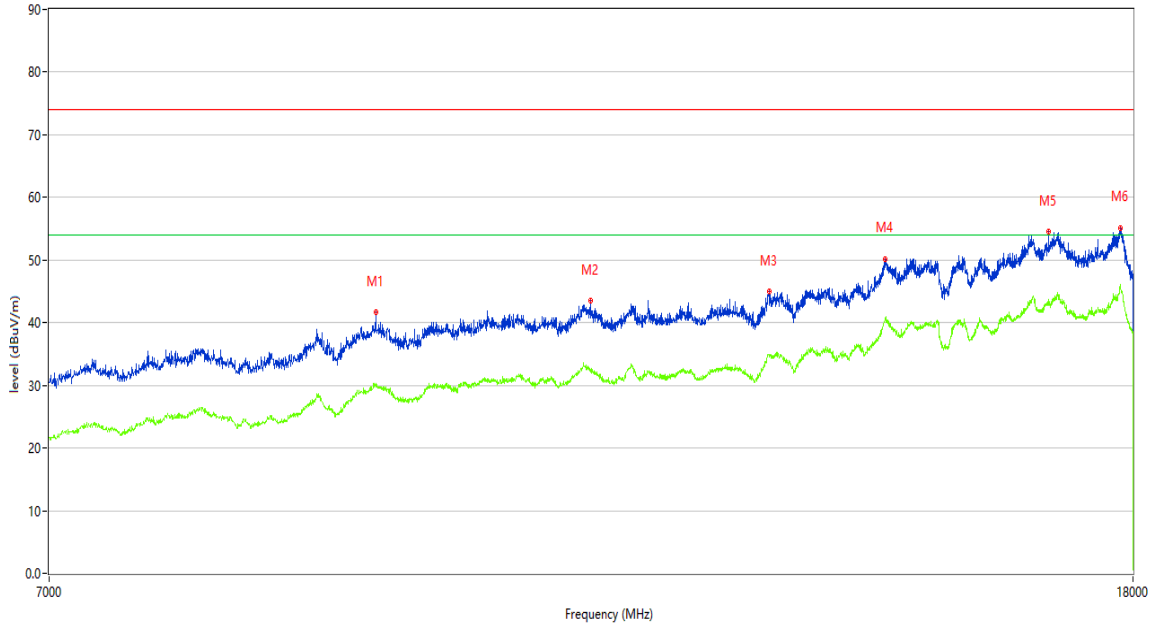
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 56 of 93

7GHz-18GHz, Horizontal

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9303.924	41.61	9.17	74.0	-32.39	Peak	358.20	100	Horizontal	Pass
1**	9303.924	30.07	9.17	54.0	-23.93	AV	358.20	100	Horizontal	Pass
2	11217.446	43.52	10.68	74.0	-30.48	Peak	11.60	100	Horizontal	Pass
2**	11217.446	32.13	10.68	54.0	-21.87	AV	11.60	100	Horizontal	Pass
3	13111.722	45.04	12.54	74.0	-28.96	Peak	261.70	100	Horizontal	Pass
3**	13111.722	34.92	12.54	54.0	-19.08	AV	261.70	100	Horizontal	Pass
4	14500.125	50.22	17.10	74.0	-23.78	Peak	29.50	100	Horizontal	Pass
4**	14500.125	40.44	17.10	54.0	-13.56	AV	29.50	100	Horizontal	Pass
5	16727.068	54.51	19.66	74.0	-19.49	Peak	61.10	100	Horizontal	Pass
5**	16727.068	42.83	19.66	54.0	-11.17	AV	61.10	100	Horizontal	Pass
6	17799.300	55.16	21.10	74.0	-18.84	Peak	194.00	100	Horizontal	Pass
6**	17799.300	45.76	21.10	54.0	-8.24	AV	194.00	100	Horizontal	Pass

TEST REPORT

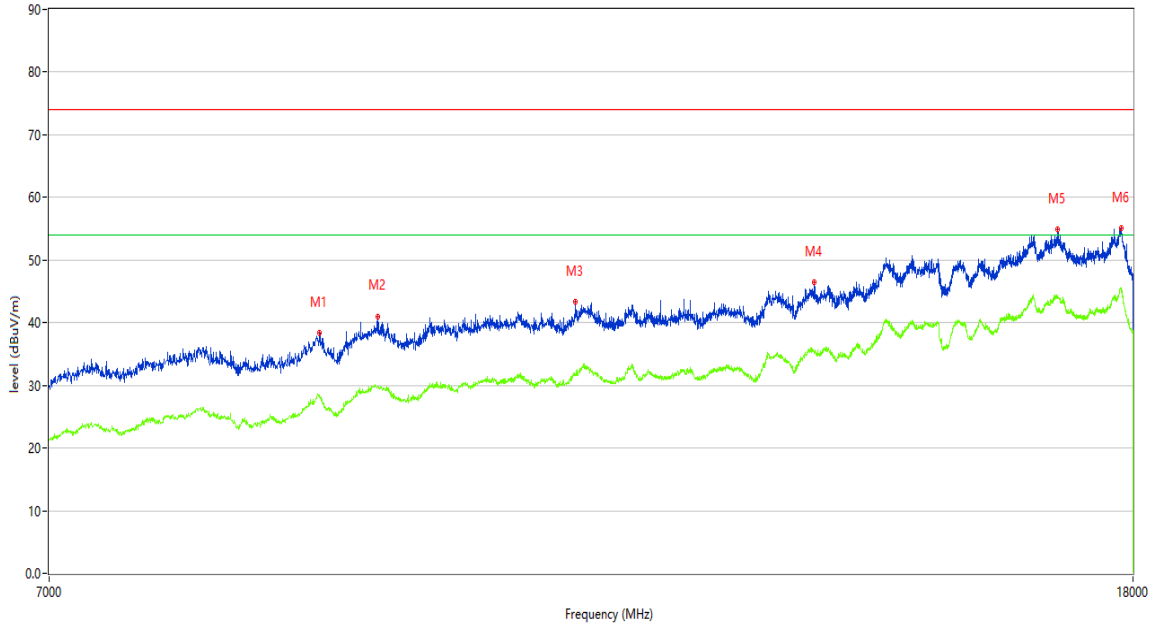
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 57 of 93

7GHz-18GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	8858.535	38.46	7.38	74.0	-35.54	Peak	4.00	100	Vertical	Pass
1**	8858.535	28.50	7.38	54.0	-25.50	AV	4.00	100	Vertical	Pass
2	9323.169	41.05	9.44	74.0	-32.95	Peak	88.60	100	Vertical	Pass
2**	9323.169	29.82	9.44	54.0	-24.18	AV	88.60	100	Vertical	Pass
3	11074.481	43.26	10.78	74.0	-30.74	Peak	196.90	100	Vertical	Pass
3**	11074.481	31.61	10.78	54.0	-22.39	AV	196.90	100	Vertical	Pass
4	13639.590	46.52	14.09	74.0	-27.48	Peak	165.30	100	Vertical	Pass
4**	13639.590	35.15	14.09	54.0	-18.85	AV	165.30	100	Vertical	Pass
5	16853.537	54.83	20.46	74.0	-19.17	Peak	65.90	100	Vertical	Pass
5**	16853.537	44.12	20.46	54.0	-9.88	AV	65.90	100	Vertical	Pass
6	17821.295	55.02	20.30	74.0	-18.98	Peak	134.00	100	Vertical	Pass
6**	17821.295	45.09	20.30	54.0	-8.91	AV	134.00	100	Vertical	Pass

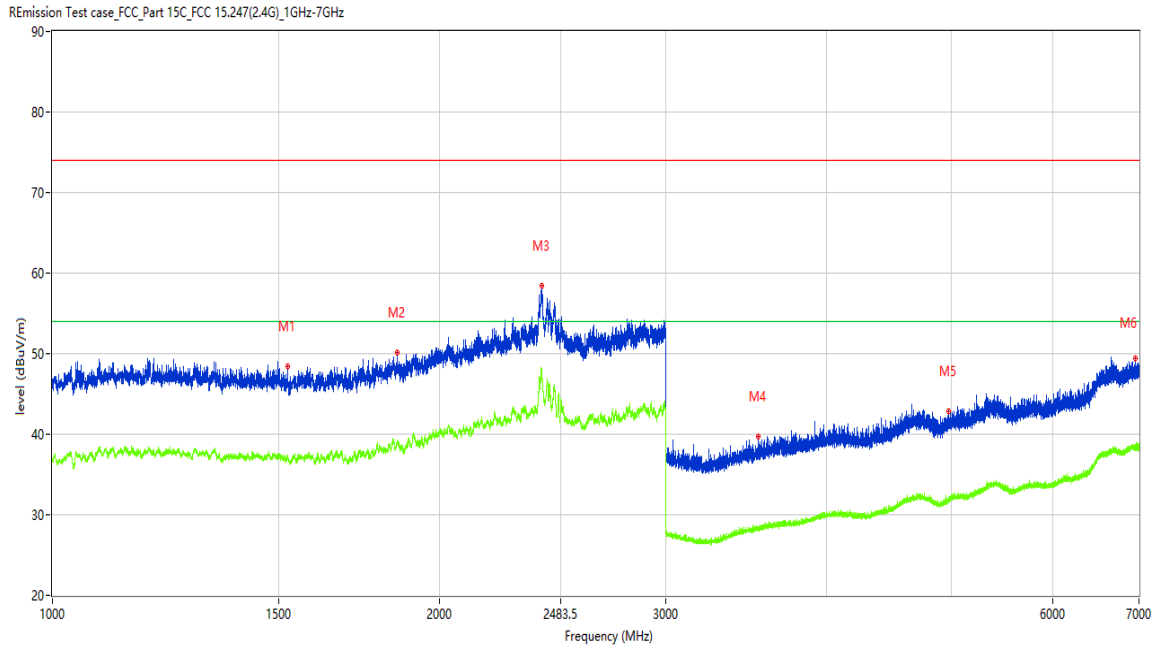
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 58 of 93

Figure 30: Spurious Emission, 1GHz – 10th Harmonic, 2480MHz, 8-DPSK
1GHz-7GHz, Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1524.69	48.78	-5.16	74.0	-25.22	Peak	276.50	100	Horizontal	Pass
1**	1526.66	38.96	-5.16	54.0	-15.04	AV	276.50	100	Horizontal	Pass
2	1855.39	51.33	-3.63	74.0	-22.67	Peak	220.30	100	Horizontal	Pass
2**	1855.31	40.63	-3.63	54.0	-13.37	AV	220.30	100	Horizontal	Pass
3	2401.80	59.58	5.33	74.0	-14.42	Peak	206.10	100	Horizontal	Pass
3**	2401.91	49.30	5.33	54.0	-4.70	AV	206.10	100	Horizontal	Pass
4	3539.02	40.47	-1.12	74.0	-33.53	Peak	312.20	100	Horizontal	Pass
4**	3540.60	29.56	-1.12	54.0	-24.44	AV	312.20	100	Horizontal	Pass
5	4979.31	43.08	1.56	74.0	-30.92	Peak	146.90	100	Horizontal	Pass
5**	4975.29	32.55	1.56	54.0	-21.45	AV	146.90	100	Horizontal	Pass
6	6962.19	51.42	5.78	74.0	-22.58	Peak	64.30	100	Horizontal	Pass
6**	6962.30	38.80	5.78	54.0	-15.20	AV	64.30	100	Horizontal	Pass

TEST REPORT

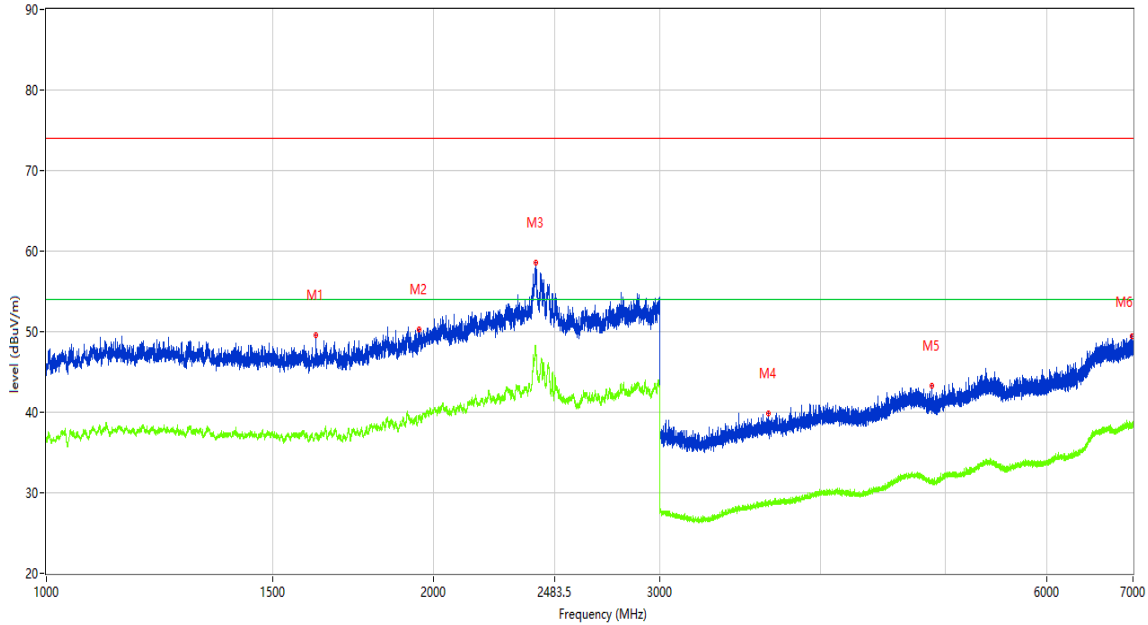
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 59 of 93

1GHz-7GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_1GHz-7GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1619.98	50.64	-5.30	74.0	-23.36	Peak	243.80	100	Vertical	Pass
1**	1624.04	38.96	-5.30	54.0	-15.04	AV	243.80	100	Vertical	Pass
2	1951.48	50.51	-2.86	74.0	-23.49	Peak	103.50	100	Vertical	Pass
2**	1950.36	40.50	-2.86	54.0	-13.50	AV	103.50	100	Vertical	Pass
3	2405.39	59.87	5.28	74.0	-14.13	Peak	281.40	100	Vertical	Pass
3**	2403.77	47.81	5.28	54.0	-6.19	AV	281.40	100	Vertical	Pass
4	3650.43	40.96	-0.85	74.0	-33.04	Peak	262.40	100	Vertical	Pass
4**	3650.09	29.19	-0.85	54.0	-24.81	AV	262.40	100	Vertical	Pass
5	4885.05	44.02	1.22	74.0	-29.98	Peak	230.40	100	Vertical	Pass
5**	4881.49	32.17	1.22	54.0	-21.83	AV	230.40	100	Vertical	Pass
6	6987.44	49.64	5.87	74.0	-24.36	Peak	170.40	100	Vertical	Pass
6**	6990.53	39.98	5.87	54.0	-14.02	AV	170.40	100	Vertical	Pass

TEST REPORT

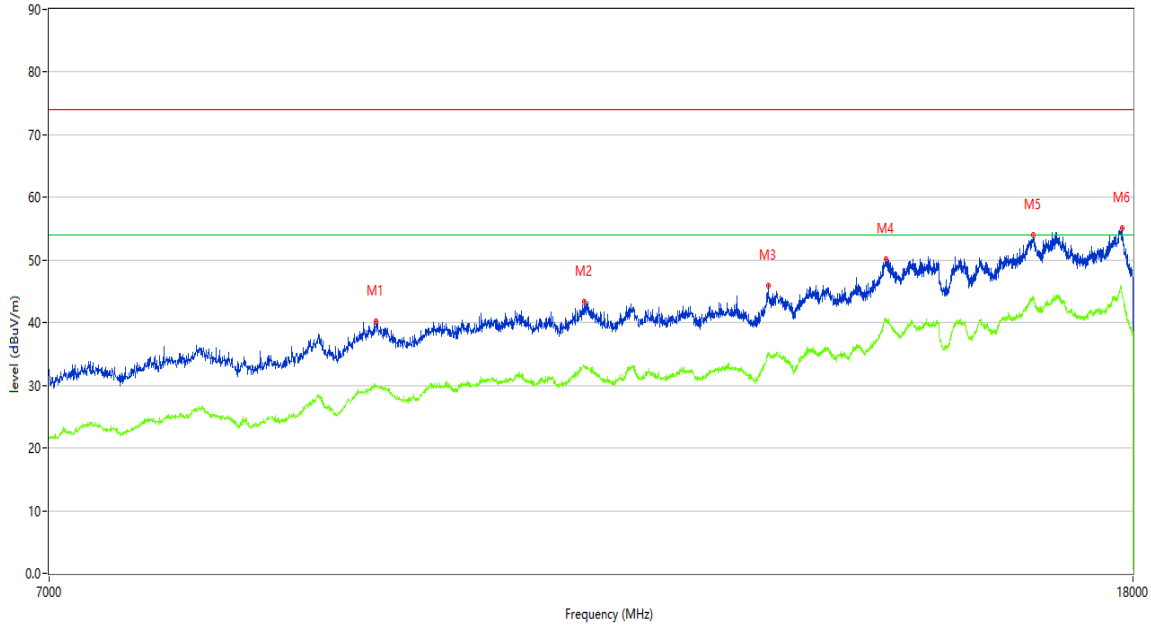
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 60 of 93

7GHz-18GHz, Horizontal

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9303.924	40.16	9.17	74.0	-33.84	Peak	275.40	100	Horizontal	Pass
1**	9303.924	29.68	9.17	54.0	-24.32	AV	275.40	100	Horizontal	Pass
2	11159.710	43.38	10.81	74.0	-30.62	Peak	0.00	100	Horizontal	Pass
2**	11159.710	33.06	10.81	54.0	-20.94	AV	0.00	100	Horizontal	Pass
3	13097.976	45.88	12.62	74.0	-28.12	Peak	122.40	100	Horizontal	Pass
3**	13097.976	35.30	12.62	54.0	-18.70	AV	122.40	100	Horizontal	Pass
4	14519.370	50.13	17.03	74.0	-23.87	Peak	79.90	100	Horizontal	Pass
4**	14519.370	40.07	17.03	54.0	-13.93	AV	79.90	100	Horizontal	Pass
5	16496.126	53.98	20.74	74.0	-20.02	Peak	171.10	100	Horizontal	Pass
5**	16496.126	44.08	20.74	54.0	-9.92	AV	171.10	100	Horizontal	Pass
6	17829.543	55.04	19.98	74.0	-18.96	Peak	130.90	100	Horizontal	Pass
6**	17829.543	44.76	19.98	54.0	-9.24	AV	130.90	100	Horizontal	Pass

TEST REPORT

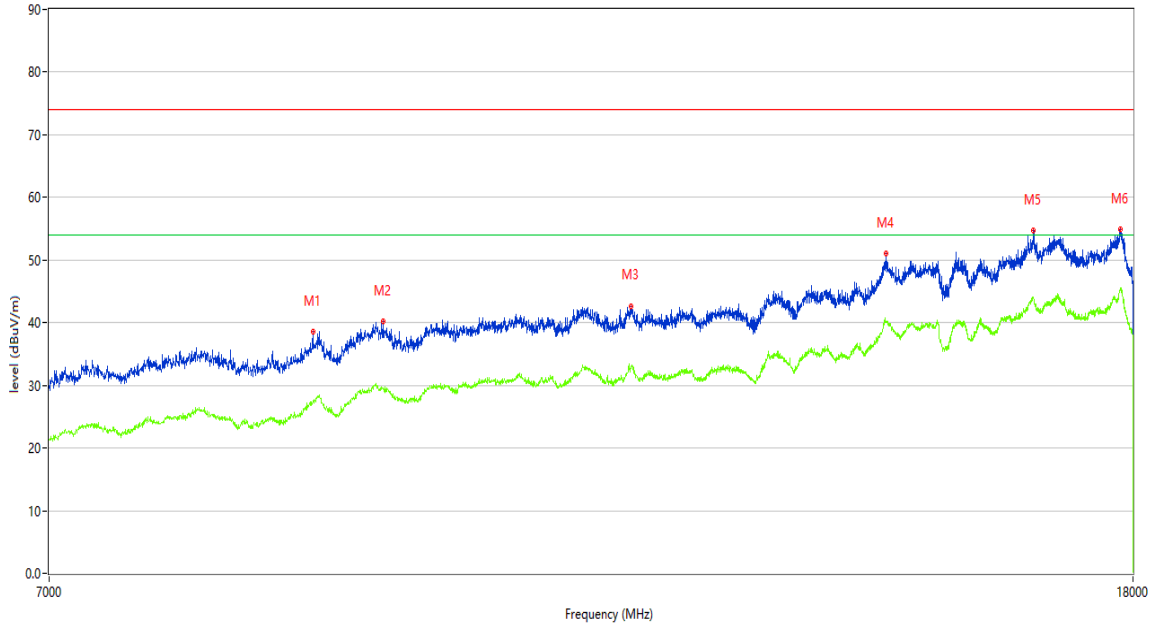
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 61 of 93

7GHz-18GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	8809.048	38.61	6.91	74.0	-35.39	Peak	244.30	100	Vertical	Pass
1**	8809.048	27.40	6.91	54.0	-26.60	AV	244.30	100	Vertical	Pass
2	9367.158	40.17	9.86	74.0	-33.83	Peak	239.90	100	Vertical	Pass
2**	9367.158	29.51	9.86	54.0	-24.49	AV	239.90	100	Vertical	Pass
3	11621.595	42.69	11.24	74.0	-31.31	Peak	330.40	100	Vertical	Pass
3**	11621.595	32.78	11.24	54.0	-21.22	AV	330.40	100	Vertical	Pass
4	14516.621	50.99	17.04	74.0	-23.01	Peak	175.50	100	Vertical	Pass
4**	14516.621	40.09	17.04	54.0	-13.91	AV	175.50	100	Vertical	Pass
5	16498.875	54.78	20.80	74.0	-19.22	Peak	234.70	100	Vertical	Pass
5**	16498.875	43.81	20.80	54.0	-10.19	AV	234.70	100	Vertical	Pass
6	17810.297	54.84	20.71	74.0	-19.16	Peak	299.10	100	Vertical	Pass
6**	17810.297	45.37	20.71	54.0	-8.63	AV	299.10	100	Vertical	Pass

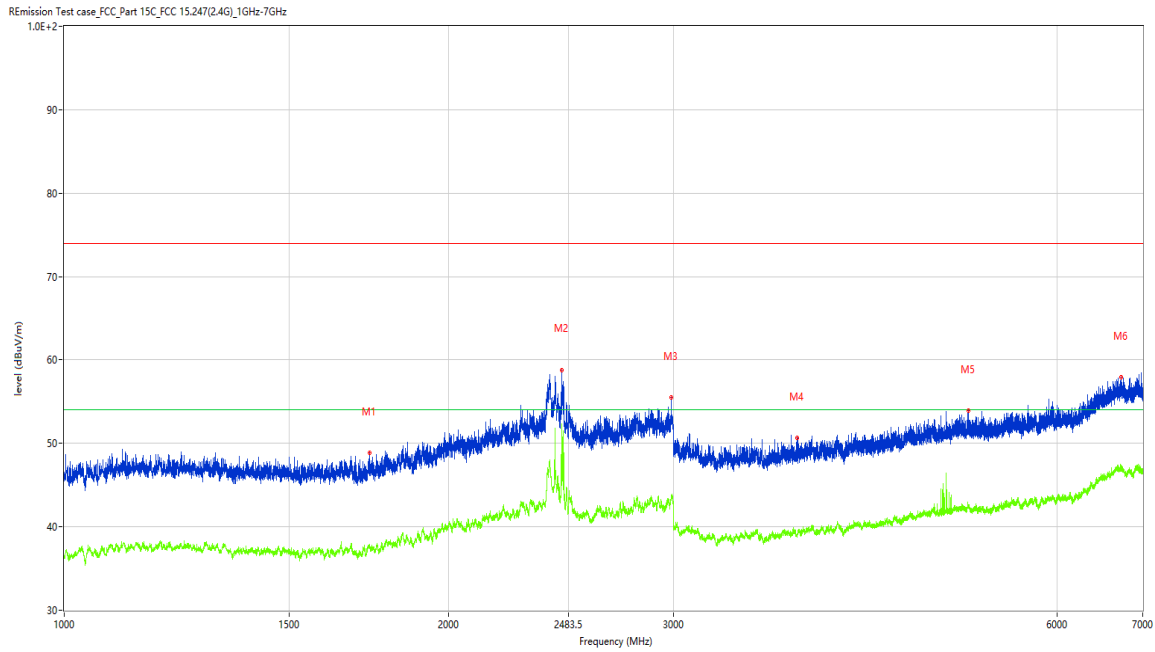
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 62 of 93

Figure 31: Spurious Emission, 1GHz – 10th Harmonic, Hopping Mode, GFSK
1GHz-7GHz, Horizontal



No.	Frequency (MHz)	Results (dBUV/m)	Factor (dB)	Limit (dBUV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1734.908	48.83	-4.76	74.0	-25.17	Peak	116.90	100	Horizontal	Pass
1**	1734.908	37.93	-4.76	54.0	-16.07	AV	116.90	100	Horizontal	Pass
2	2452.818	58.80	3.31	74.0	-15.20	Peak	302.90	100	Horizontal	Pass
2**	2452.818	52.34	3.31	54.0	-1.66	AV	302.90	100	Horizontal	Pass
3	2988.501	55.51	2.99	74.0	-18.49	Peak	359.60	100	Horizontal	Pass
3**	2988.501	43.32	2.99	54.0	-10.68	AV	359.60	100	Horizontal	Pass
4	3753.906	50.66	-0.74	74.0	-23.34	Peak	196.30	100	Horizontal	Pass
4**	3753.906	39.11	-0.74	54.0	-14.89	AV	196.30	100	Horizontal	Pass
5	5113.736	53.91	1.75	74.0	-20.09	Peak	270.00	100	Horizontal	Pass
5**	5113.736	42.42	1.75	54.0	-11.58	AV	270.00	100	Horizontal	Pass
6	6733.533	57.90	5.77	74.0	-16.10	Peak	297.90	100	Horizontal	Pass
6**	6733.533	47.11	5.77	54.0	-6.89	AV	297.90	100	Horizontal	Pass

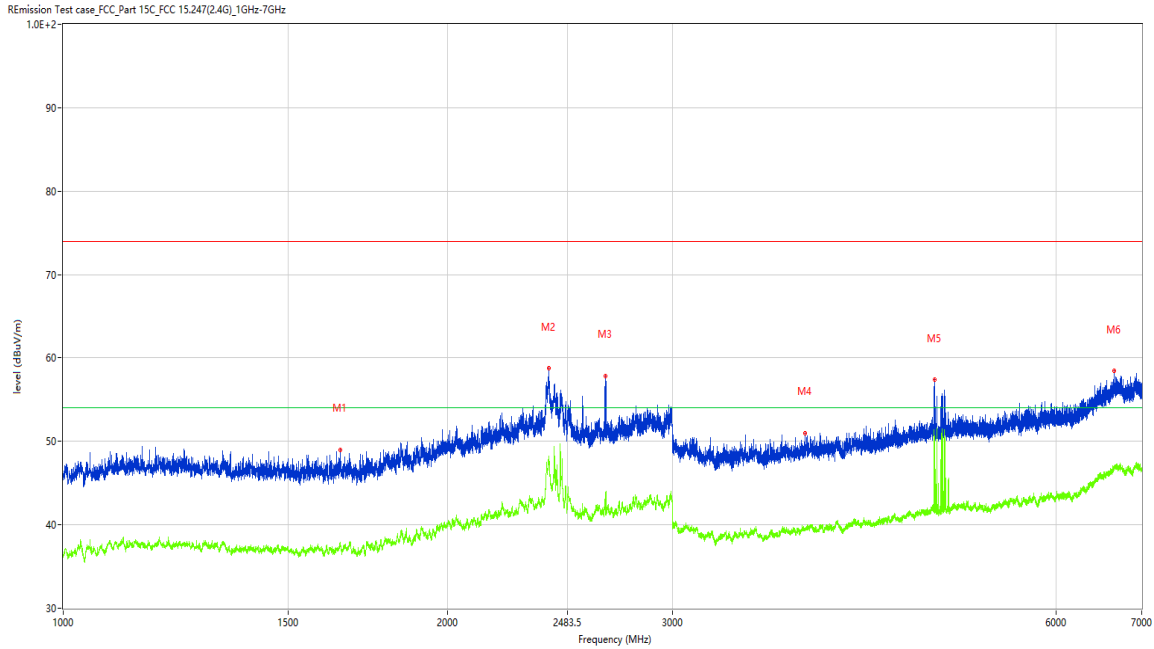
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 63 of 93

1GHz-7GHz, Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1648.169	48.99	-4.64	74.0	-25.01	Peak	124.90	100	Vertical	Pass
1**	1648.169	37.73	-4.64	54.0	-16.27	AV	124.90	100	Vertical	Pass
2	2401.075	58.78	5.33	74.0	-15.22	Peak	129.70	100	Vertical	Pass
2**	2401.075	47.99	5.33	54.0	-6.01	AV	129.70	100	Vertical	Pass
3	2658.543	57.87	0.24	74.0	-16.13	Peak	153.10	100	Vertical	Pass
3**	2658.543	43.93	0.24	54.0	-10.07	AV	153.10	100	Vertical	Pass
4	3814.898	51.02	-0.68	74.0	-22.98	Peak	328.40	100	Vertical	Pass
4**	3814.898	39.28	-0.68	54.0	-14.72	AV	328.40	100	Vertical	Pass
5	4820.272	57.37	1.10	74.0	-16.63	Peak	61.60	100	Vertical	Pass
5**	4820.272	48.77	1.10	54.0	-5.23	AV	61.60	100	Vertical	Pass
6	6658.543	58.45	5.50	74.0	-15.55	Peak	0.70	100	Vertical	Pass
6**	6658.543	46.75	5.50	54.0	-7.25	AV	0.70	100	Vertical	Pass

TEST REPORT

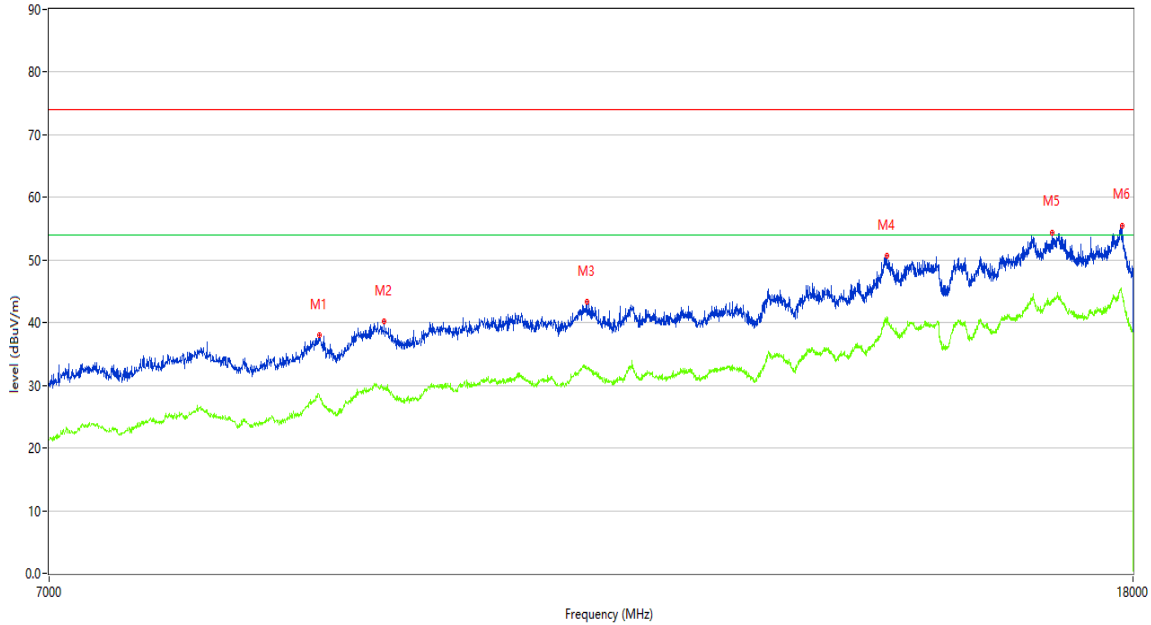
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 64 of 93

7GHz-18GHz, Horizontal

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	8861.285	38.01	7.32	74.0	-35.99	Peak	309.60	100	Horizontal	Pass
1**	8861.285	28.05	7.32	54.0	-25.95	AV	309.60	100	Horizontal	Pass
2	9372.657	40.27	9.88	74.0	-33.73	Peak	360.00	100	Horizontal	Pass
2**	9372.657	29.42	9.88	54.0	-24.58	AV	360.00	100	Horizontal	Pass
3	11181.705	43.40	10.75	74.0	-30.60	Peak	318.20	100	Horizontal	Pass
3**	11181.705	32.59	10.75	54.0	-21.41	AV	318.20	100	Horizontal	Pass
4	14522.119	50.62	17.02	74.0	-23.38	Peak	102.80	100	Horizontal	Pass
4**	14522.119	39.76	17.02	54.0	-14.24	AV	102.80	100	Horizontal	Pass
5	16782.054	54.45	19.72	74.0	-19.55	Peak	143.80	100	Horizontal	Pass
5**	16782.054	43.45	19.72	54.0	-10.55	AV	143.80	100	Horizontal	Pass
6	17832.292	55.55	19.88	74.0	-18.45	Peak	148.60	100	Horizontal	Pass
6**	17832.292	44.47	19.88	54.0	-9.53	AV	148.60	100	Horizontal	Pass

TEST REPORT

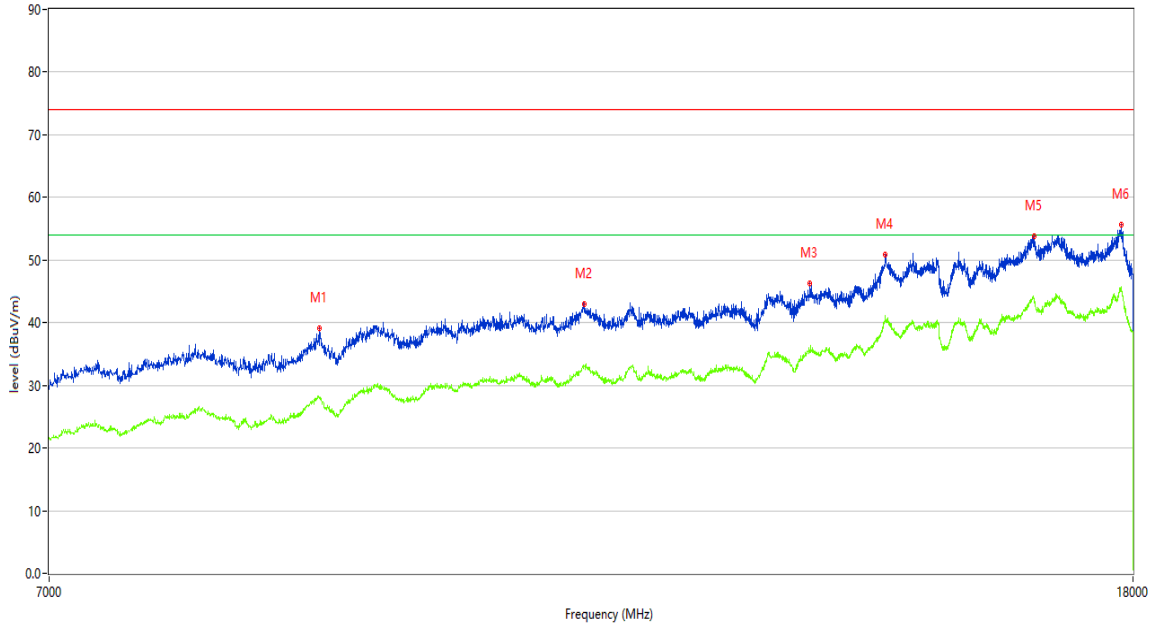
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 65 of 93

7GHz-18GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	8858.535	39.07	7.38	74.0	-34.93	Peak	79.70	100	Vertical	Pass
1**	8858.535	28.01	7.38	54.0	-25.99	AV	79.70	100	Vertical	Pass
2	11162.459	42.93	10.80	74.0	-31.07	Peak	247.10	100	Vertical	Pass
2**	11162.459	32.98	10.80	54.0	-21.02	AV	247.10	100	Vertical	Pass
3	13581.855	46.20	14.46	74.0	-27.80	Peak	202.40	100	Vertical	Pass
3**	13581.855	35.19	14.46	54.0	-18.81	AV	202.40	100	Vertical	Pass
4	14502.874	50.89	17.09	74.0	-23.11	Peak	25.00	100	Vertical	Pass
4**	14502.874	40.41	17.09	54.0	-13.59	AV	25.00	100	Vertical	Pass
5	16520.870	53.83	19.97	74.0	-20.17	Peak	157.40	100	Vertical	Pass
5**	16520.870	43.19	19.97	54.0	-10.81	AV	157.40	100	Vertical	Pass
6	17815.796	55.62	20.50	74.0	-18.38	Peak	211.30	100	Vertical	Pass
6**	17815.796	45.67	20.50	54.0	-8.33	AV	211.30	100	Vertical	Pass

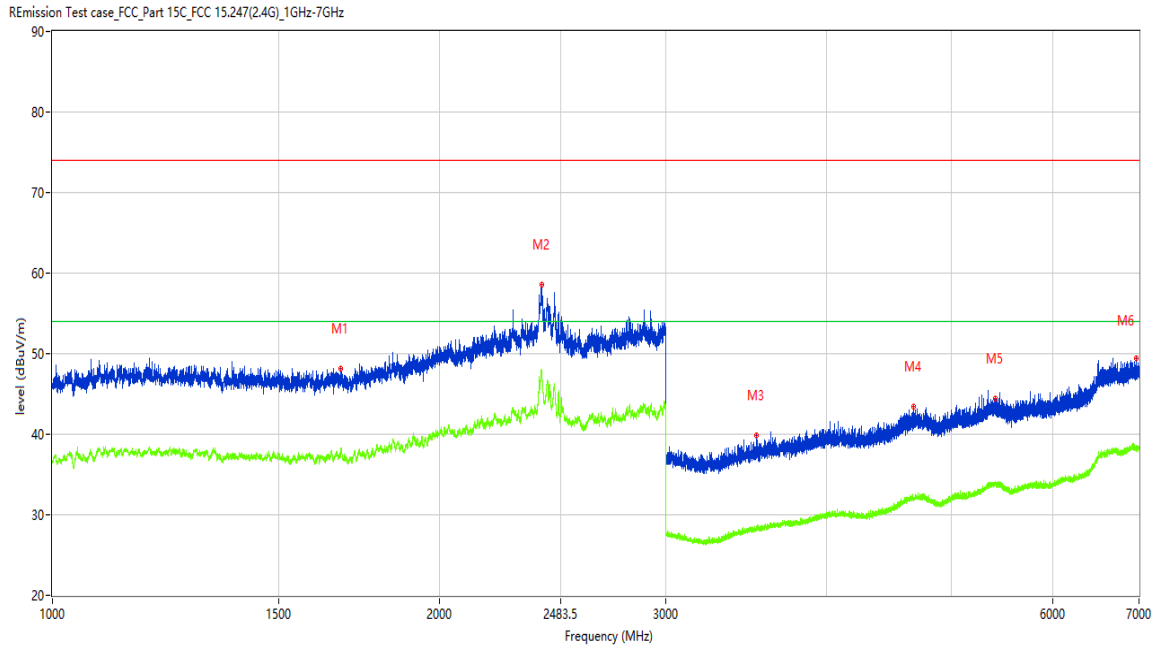
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 66 of 93

Figure 32: Spurious Emission, 1GHz – 10th Harmonic, Hopping Mode, 8-DPSK
1GHz-7GHz, Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1675.666	48.20	-4.89	74.0	-25.80	Peak	72.30	100	Horizontal	Pass
1**	1675.666	37.50	-4.89	54.0	-16.50	AV	72.30	100	Horizontal	Pass
2	2400.825	58.63	5.34	74.0	-15.37	Peak	0.50	100	Horizontal	Pass
2**	2400.825	47.79	5.34	54.0	-6.21	AV	0.50	100	Horizontal	Pass
3	3527.434	39.88	-1.16	74.0	-34.12	Peak	142.50	100	Horizontal	Pass
3**	3527.434	28.57	-1.16	54.0	-25.43	AV	142.50	100	Horizontal	Pass
4	4672.791	43.42	0.93	74.0	-30.58	Peak	222.10	100	Horizontal	Pass
4**	4672.791	31.91	0.93	54.0	-22.09	AV	222.10	100	Horizontal	Pass
5	5408.699	44.49	1.49	74.0	-29.51	Peak	358.80	100	Horizontal	Pass
5**	5408.699	33.90	1.49	54.0	-20.10	AV	358.80	100	Horizontal	Pass
6	6967.004	49.39	5.81	74.0	-24.61	Peak	2.80	100	Horizontal	Pass
6**	6967.004	38.20	5.81	54.0	-15.80	AV	2.80	100	Horizontal	Pass

TEST REPORT

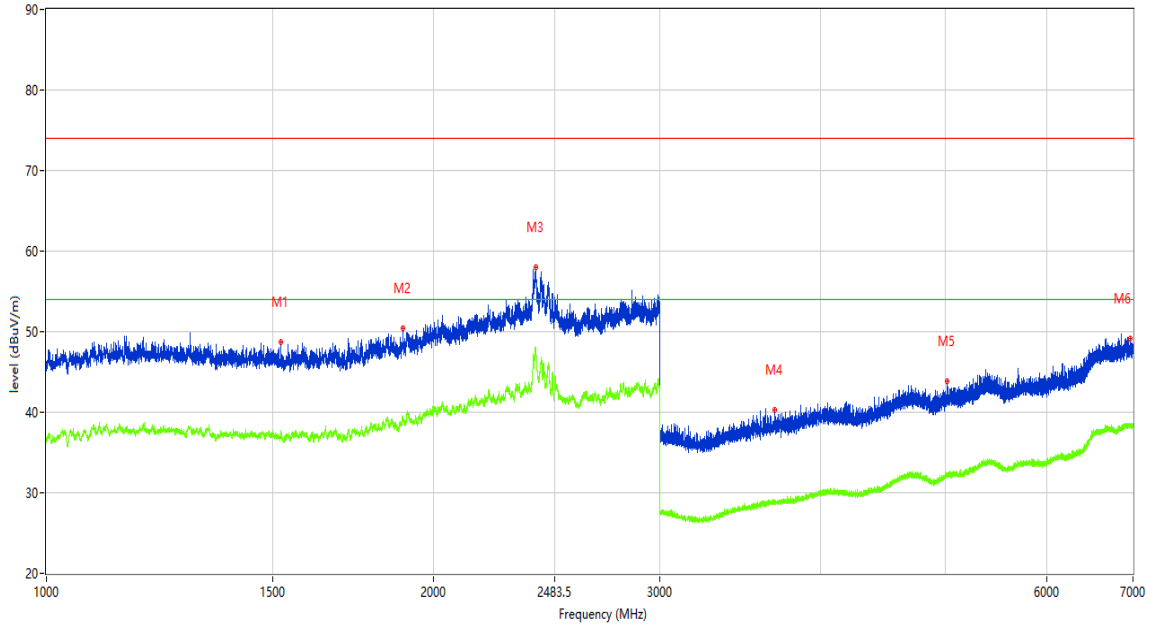
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 67 of 93

1GHz-7GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_1GHz-7GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1521.435	48.76	-5.29	74.0	-25.24	Peak	357.30	100	Vertical	Pass
1**	1521.435	36.81	-5.29	54.0	-17.19	AV	357.30	100	Vertical	Pass
2	1892.388	50.36	-3.35	74.0	-23.64	Peak	15.00	100	Vertical	Pass
2**	1892.388	39.45	-3.35	54.0	-14.55	AV	15.00	100	Vertical	Pass
3	2403.325	57.97	5.24	74.0	-16.03	Peak	346.50	100	Vertical	Pass
3**	2403.325	47.27	5.24	54.0	-6.73	AV	346.50	100	Vertical	Pass
4	3685.914	40.27	-0.77	74.0	-33.73	Peak	64.70	100	Vertical	Pass
4**	3685.914	28.96	-0.77	54.0	-25.04	AV	64.70	100	Vertical	Pass
5	5020.747	43.87	1.68	74.0	-30.13	Peak	121.30	100	Vertical	Pass
5**	5020.747	32.16	1.68	54.0	-21.84	AV	121.30	100	Vertical	Pass
6	6971.004	49.11	5.82	74.0	-24.89	Peak	116.80	100	Vertical	Pass
6**	6971.004	38.35	5.82	54.0	-15.65	AV	116.80	100	Vertical	Pass

TEST REPORT

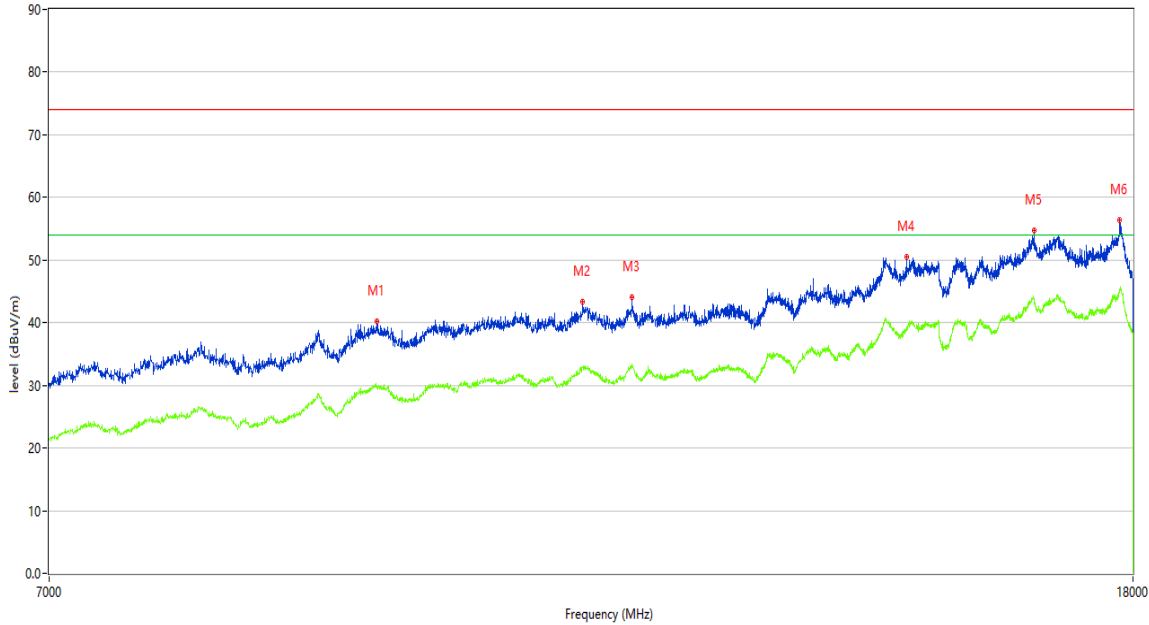
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 68 of 93

7GHz-18GHz, Horizontal

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9312.172	40.23	9.28	74.0	-33.77	Peak	294.40	100	Horizontal	Pass
1**	9312.172	29.65	9.28	54.0	-24.35	AV	294.40	100	Horizontal	Pass
2	11140.465	43.27	10.78	74.0	-30.73	Peak	123.20	100	Horizontal	Pass
2**	11140.465	32.86	10.78	54.0	-21.14	AV	123.20	100	Horizontal	Pass
3	11635.341	44.05	11.02	74.0	-29.95	Peak	294.40	100	Horizontal	Pass
3**	11635.341	32.90	11.02	54.0	-21.10	AV	294.40	100	Horizontal	Pass
4	14777.806	50.50	17.19	74.0	-23.50	Peak	253.50	100	Horizontal	Pass
4**	14777.806	39.32	17.19	54.0	-14.68	AV	253.50	100	Horizontal	Pass
5	16509.873	54.72	20.42	74.0	-19.28	Peak	316.30	100	Horizontal	Pass
5**	16509.873	43.84	20.42	54.0	-10.16	AV	316.30	100	Horizontal	Pass
6	17796.551	56.36	21.12	74.0	-17.64	Peak	360.00	100	Horizontal	Pass
6**	17796.551	45.40	21.12	54.0	-8.60	AV	360.00	100	Horizontal	Pass

TEST REPORT

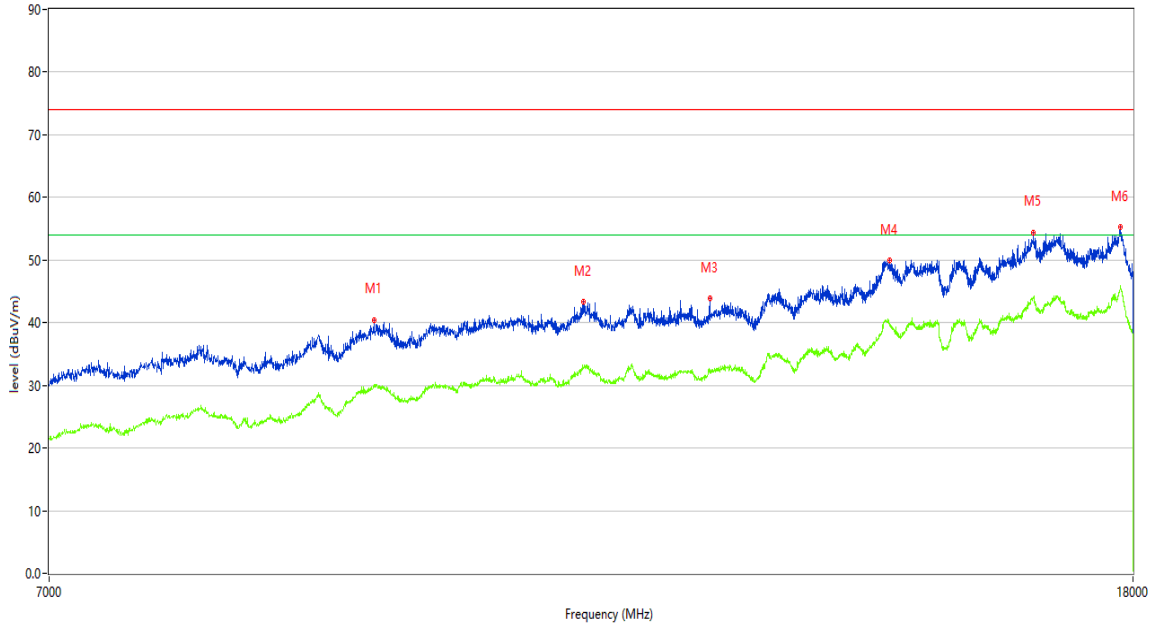
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 69 of 93

7GHz-18GHz, Vertical

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9290.177	40.47	9.01	74.0	-33.53	Peak	74.80	100	Vertical	Pass
1**	9290.177	29.70	9.01	54.0	-24.30	AV	74.80	100	Vertical	Pass
2	11154.211	43.31	10.82	74.0	-30.69	Peak	74.80	100	Vertical	Pass
2**	11154.211	32.70	10.82	54.0	-21.30	AV	74.80	100	Vertical	Pass
3	12446.388	43.94	10.41	74.0	-30.06	Peak	219.60	100	Vertical	Pass
3**	12446.388	31.98	10.41	54.0	-22.02	AV	219.60	100	Vertical	Pass
4	14563.359	49.89	16.96	74.0	-24.11	Peak	345.00	100	Vertical	Pass
4**	14563.359	39.75	16.96	54.0	-14.25	AV	345.00	100	Vertical	Pass
5	16504.374	54.43	20.64	74.0	-19.57	Peak	0.00	100	Vertical	Pass
5**	16504.374	43.93	20.64	54.0	-10.07	AV	0.00	100	Vertical	Pass
6	17807.548	55.32	20.81	74.0	-18.68	Peak	264.20	100	Vertical	Pass
6**	17807.548	45.53	20.81	54.0	-8.47	AV	264.20	100	Vertical	Pass

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 70 of 93

4.1.6 Band Edge (Restricted-band band-edge)

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209 RSS-247 5.5
Requirement	: ANSI C63.10-2013
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A.1
Ambient temperature	: 25°C
Relative humidity	: 52%

For details refer to following test plot.

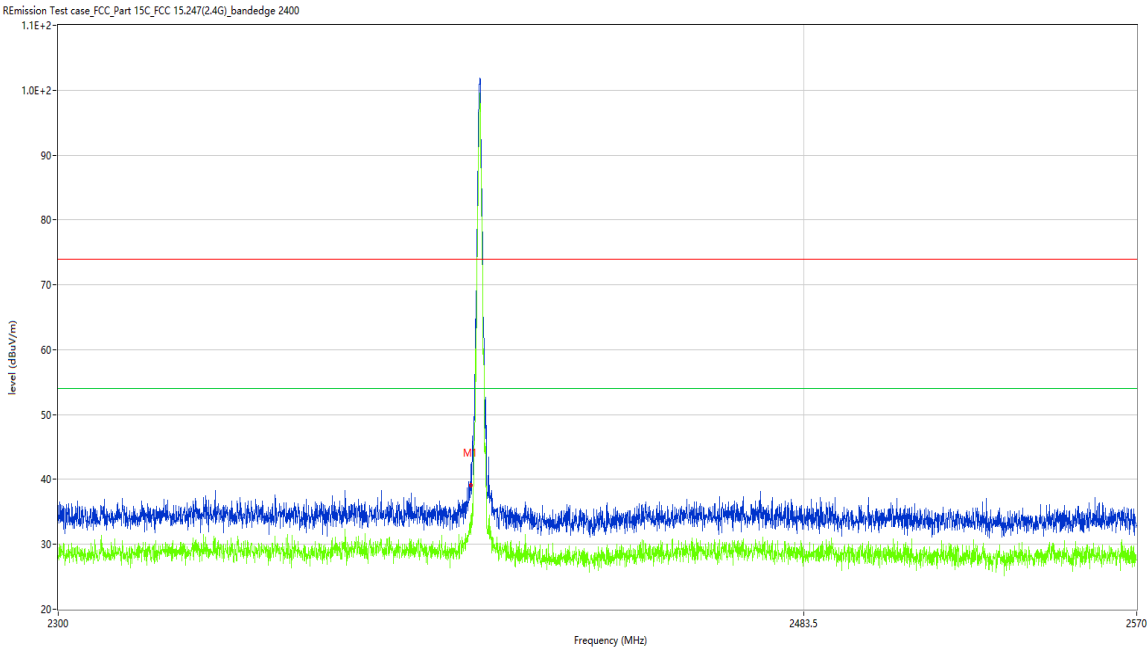
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 71 of 93

Figure 33: Band Edge (Restricted-band band-edge), 2402MHz, GFSK
Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2400.000	39.16	-4.18	74.0	-34.84	Peak	0.00	100	H	Pass
1**	2400.000	33.41	-4.18	54.0	-20.59	AV	0.00	100	H	Pass

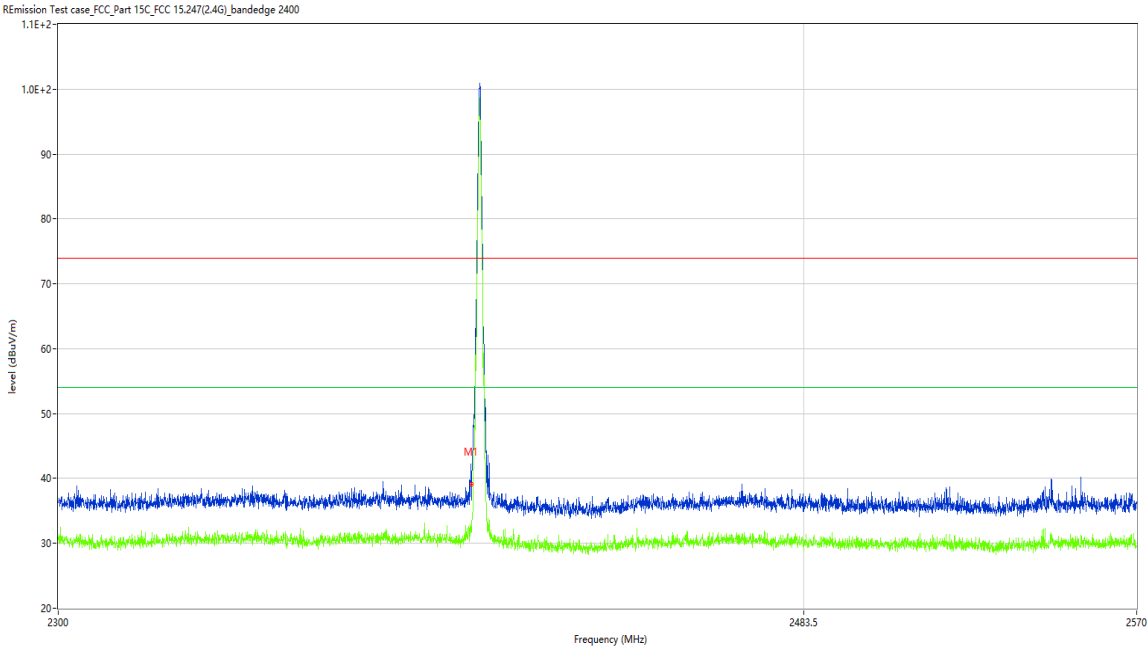
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 72 of 93

Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2400.000	39.39	-4.18	74.0	-34.61	Peak	256.88	100	V	Pass
1**	2400.000	33.40	-4.18	54.0	-20.60	AV	256.88	100	V	Pass

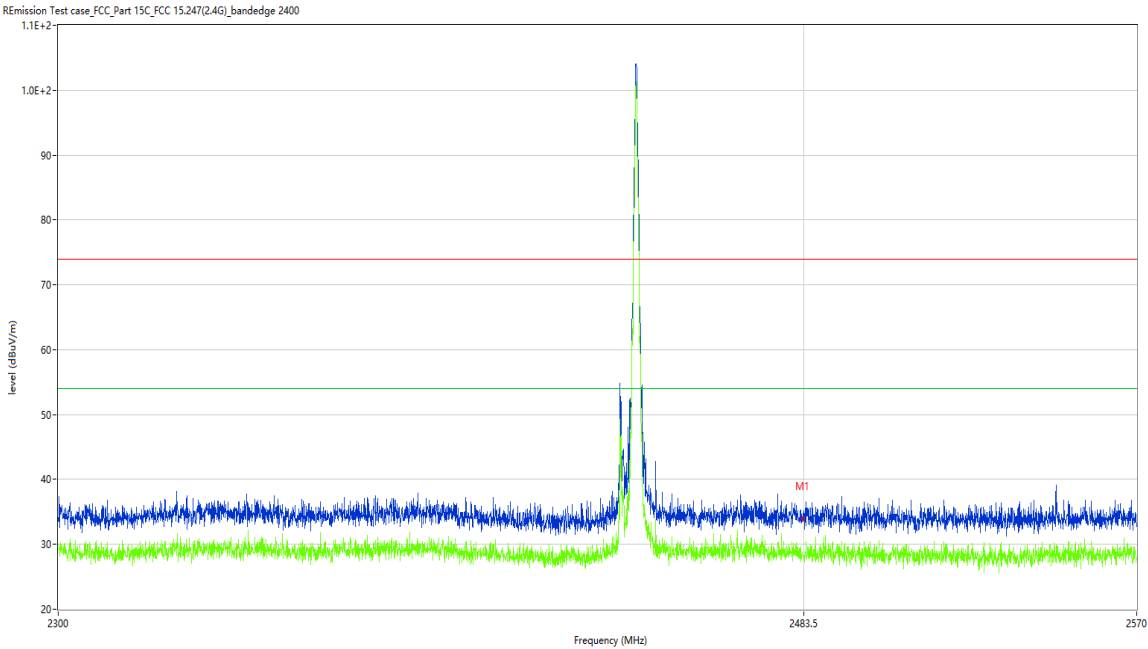
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 73 of 93

Figure 34: Band Edge (Restricted-band band-edge), 2480MHz, GFSK
Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	34.03	-3.87	74.0	-39.97	Peak	0.70	100	H	Pass
1**	2483.500	27.73	-3.87	54.0	-26.27	AV	0.70	100	H	Pass

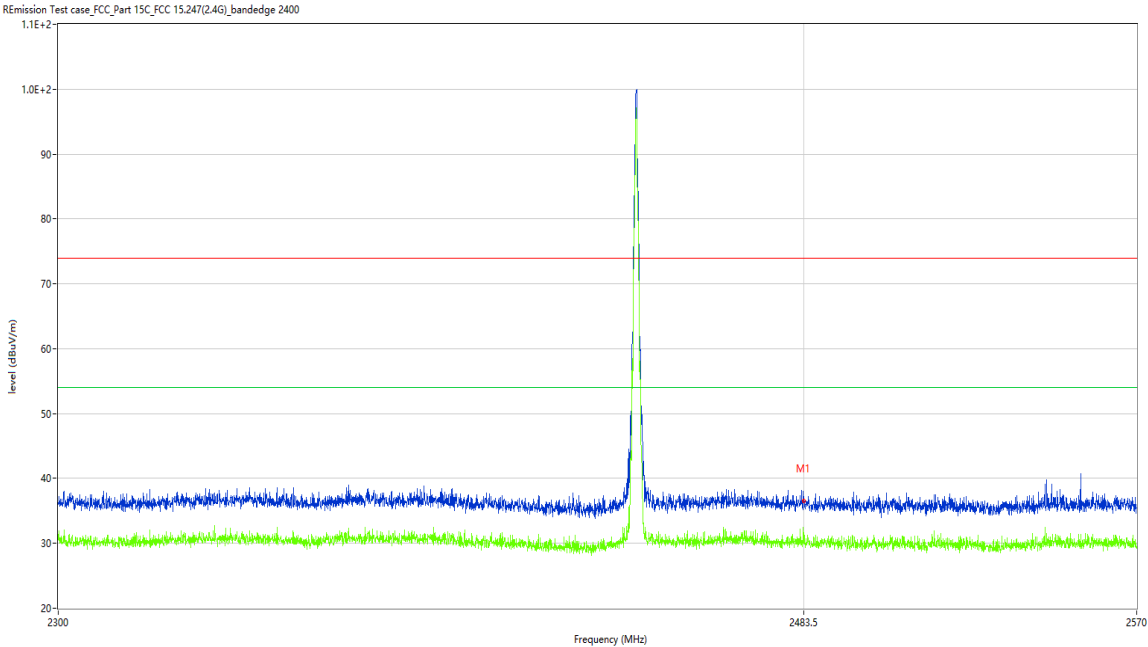
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 74 of 93

Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	36.65	-3.87	74.0	-37.35	Peak	193.33	100	V	Pass
1**	2483.500	30.16	-3.87	54.0	-23.84	AV	193.33	100	V	Pass

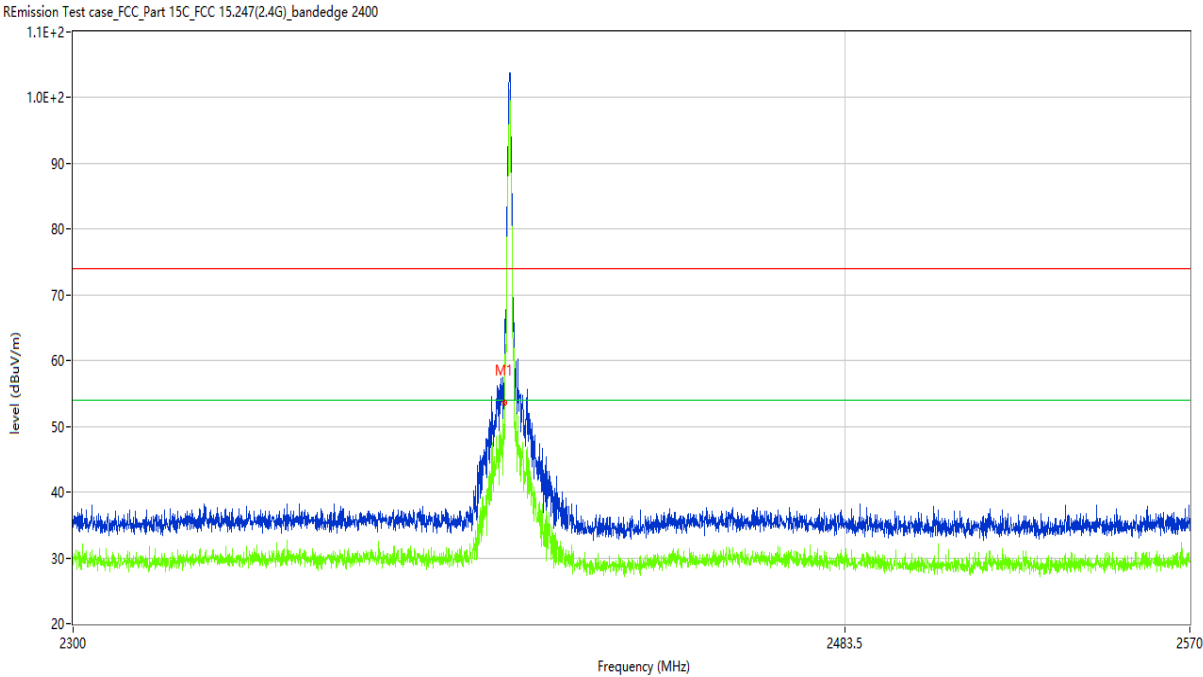
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 75 of 93

Figure 35: Band Edge (Restricted-band band-edge), 2402MHz, 8-DPSK
Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2400.000	52.16	-4.18	74.0	-21.84	Peak	302.64	100	H	Pass
1**	2400.000	46.16	-4.18	54.0	-7.84	AV	302.64	100	H	Pass

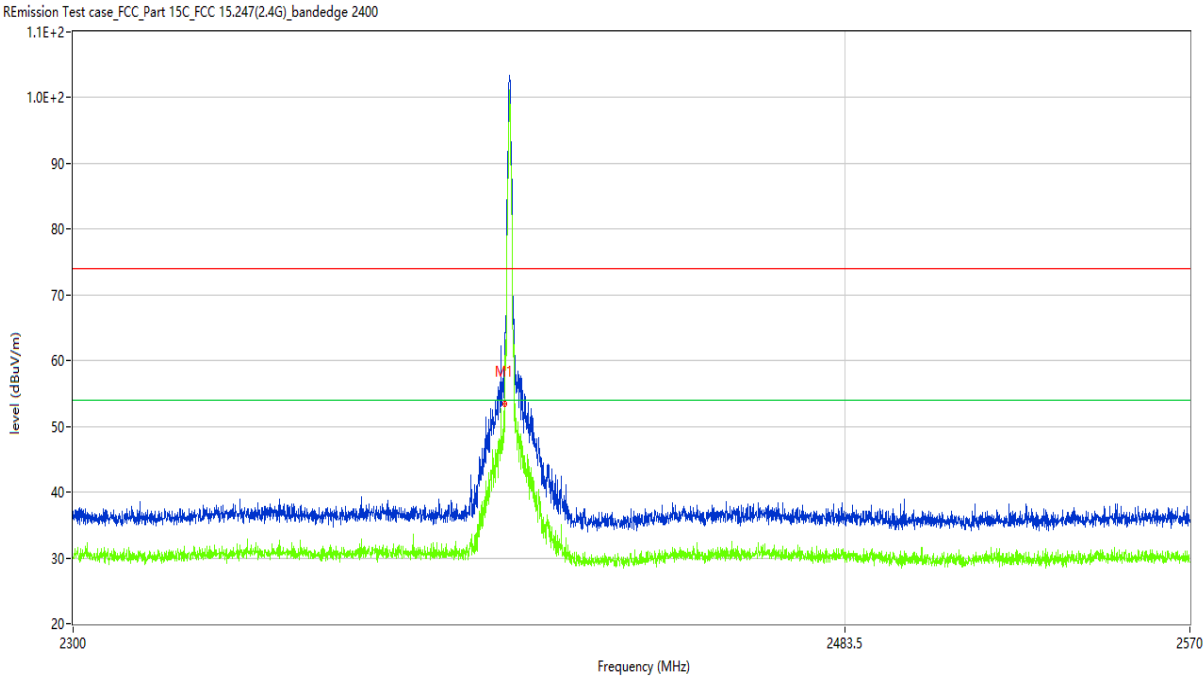
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 76 of 93

Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2400.000	54.39	-4.18	74.0	-19.61	Peak	249.16	100	V	Pass
1**	2400.000	44.69	-4.18	54.0	-9.31	AV	249.16	100	V	Pass

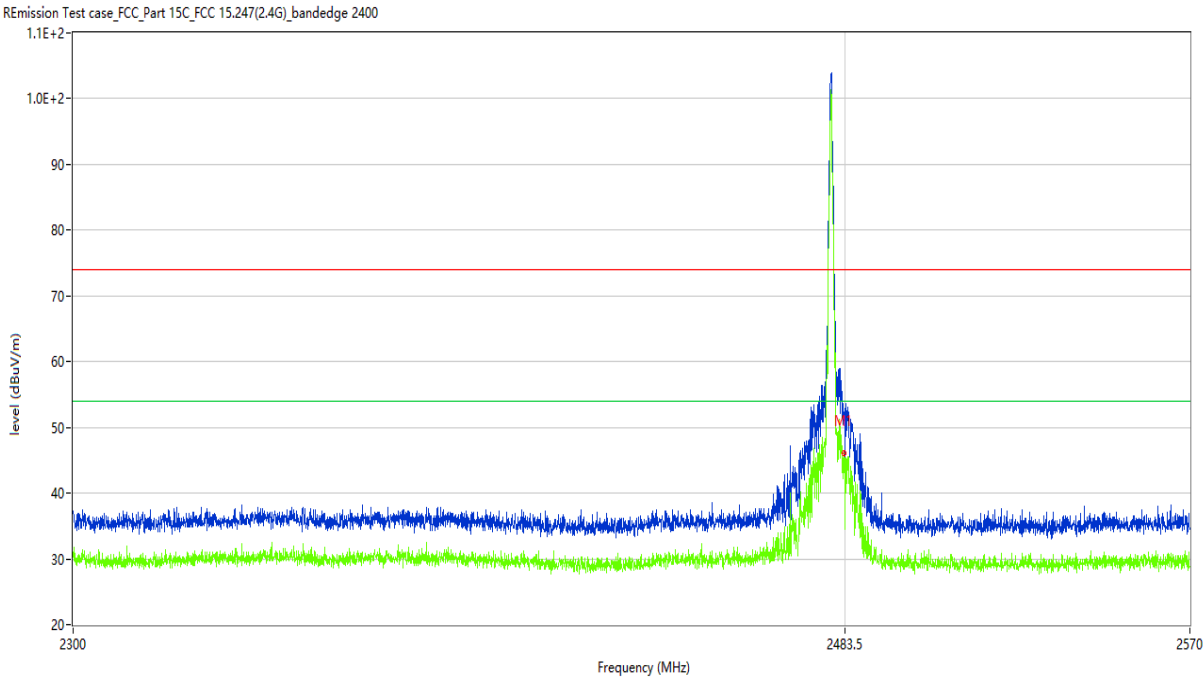
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 77 of 93

Figure 36: Band Edge (Restricted-band band-edge), 2480MHz, 8-DPSK
Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	45.62	-3.87	74.0	-28.38	Peak	40.69	100	H	Pass
1**	2483.500	38.45	-3.87	54.0	-15.55	AV	40.69	100	H	Pass

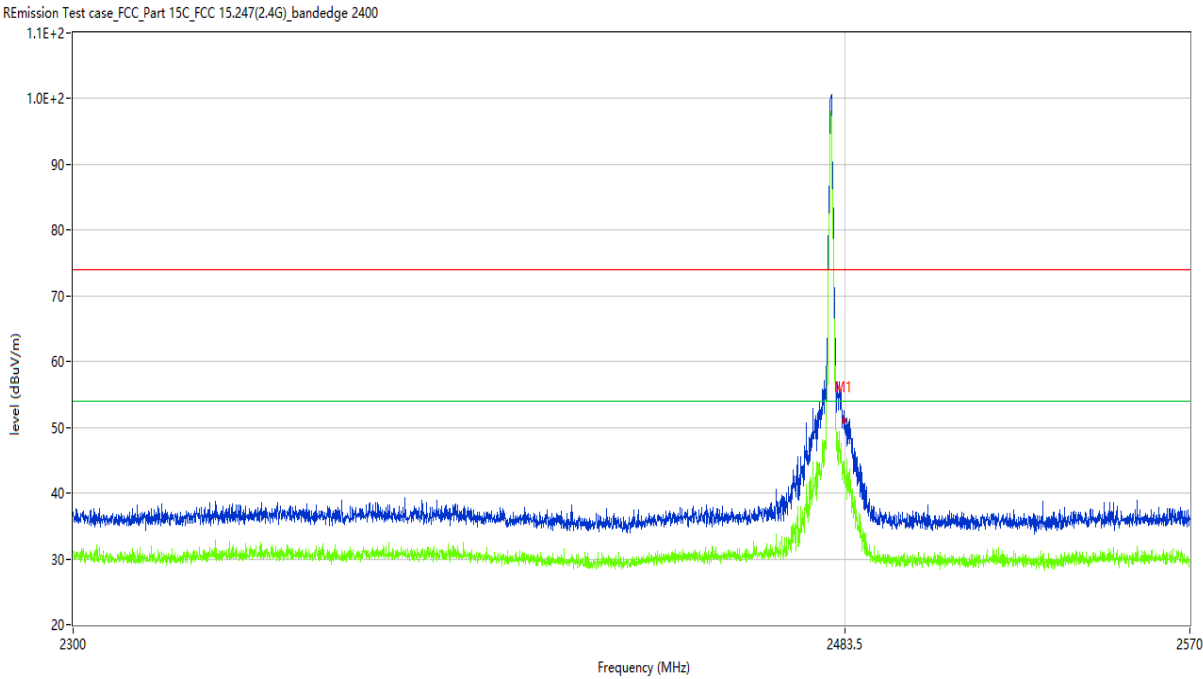
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 78 of 93

Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	50.96	-3.87	74.0	-23.04	Peak	122.46	100	V	Pass
1**	2483.500	43.78	-3.87	54.0	-10.22	AV	122.46	100	V	Pass

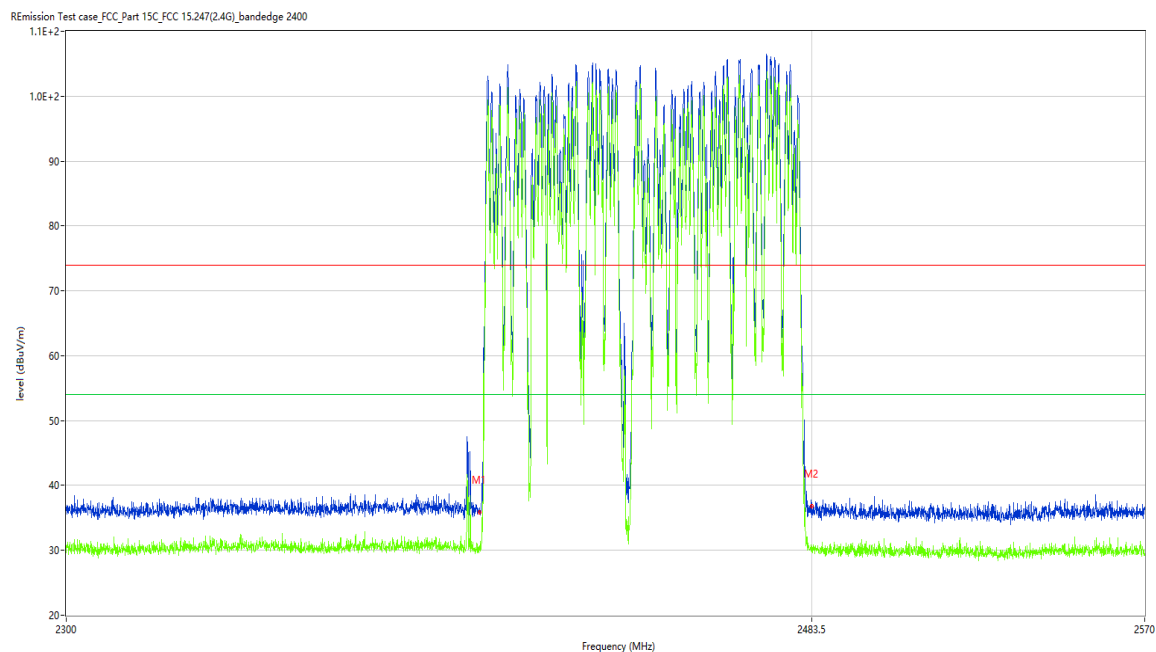
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 79 of 93

Figure 37: Band Edge (Restricted-band band-edge), Hopping Mode, GFSK
Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2400.000	35.68	-4.18	74.0	-38.32	Peak	252.24	100	H	Pass
1**	2400.000	30.67	-4.18	54.0	-23.33	AV	252.24	100	H	Pass
2	2483.500	36.68	-3.87	74.0	-37.32	Peak	172.32	100	H	Pass
2**	2483.500	29.88	-3.87	54.0	-24.12	AV	172.32	100	H	Pass

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 80 of 93

Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2400.000	36.04	-4.18	74.0	-37.96	Peak	325.08	100	V	Pass
1**	2400.000	30.74	-4.18	54.0	-23.26	AV	325.08	100	V	Pass
2	2483.500	36.74	-3.87	74.0	-37.26	Peak	210.35	100	V	Pass
2**	2483.500	30.53	-3.87	54.0	-23.47	AV	210.35	100	V	Pass

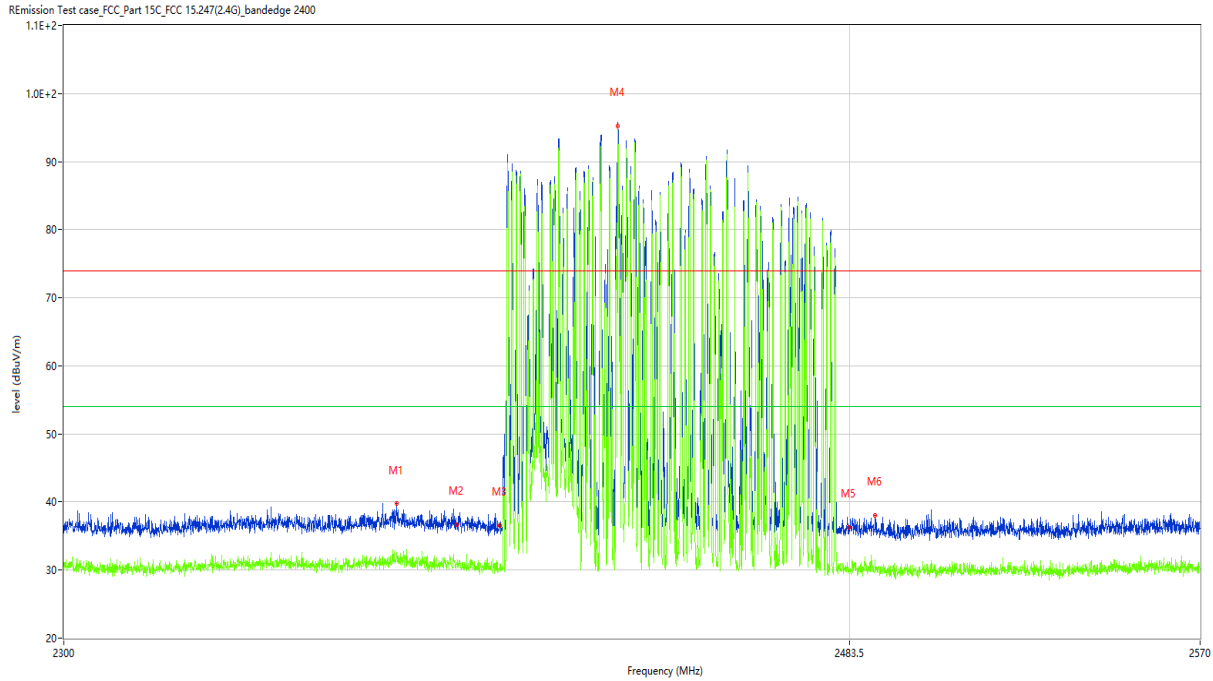
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 81 of 93

Figure 38: Band Edge (Restricted-band band-edge), Hopping Mode, 8-DPSK
Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2375.919	40.08	-3.88	74.0	-33.92	Peak	182.00	100	Horizontal	Pass
1**	2375.919	33.41	-3.88	54.0	-20.59	AV	182.00	100	Horizontal	Pass
2	2390.000	36.97	-3.76	74.0	-37.03	Peak	113.13	100	H	Pass
2**	2390.000	31.64	-3.76	54.0	-22.36	AV	113.13	100	H	Pass
3	2400.000	36.85	-4.18	74.0	-37.15	Peak	184.95	100	H	Pass
3**	2400.000	30.36	-4.18	54.0	-23.64	AV	184.95	100	H	Pass
4	2427.948	96.40	-4.57	74.0	22.40	Peak	195.10	100	Horizontal	N/A
4**	2427.948	97.02	-4.57	54.0	43.02	AV	195.10	100	Horizontal	N/A
5	2483.500	37.12	-3.87	74.0	-36.88	Peak	272.26	100	H	Pass
5**	2483.500	30.93	-3.87	54.0	-23.07	AV	272.26	100	H	Pass
6	2489.695	39.40	-4.07	74.0	-34.60	Peak	327.90	100	Horizontal	Pass
6**	2489.695	31.60	-4.07	54.0	-22.40	AV	327.90	100	Horizontal	Pass

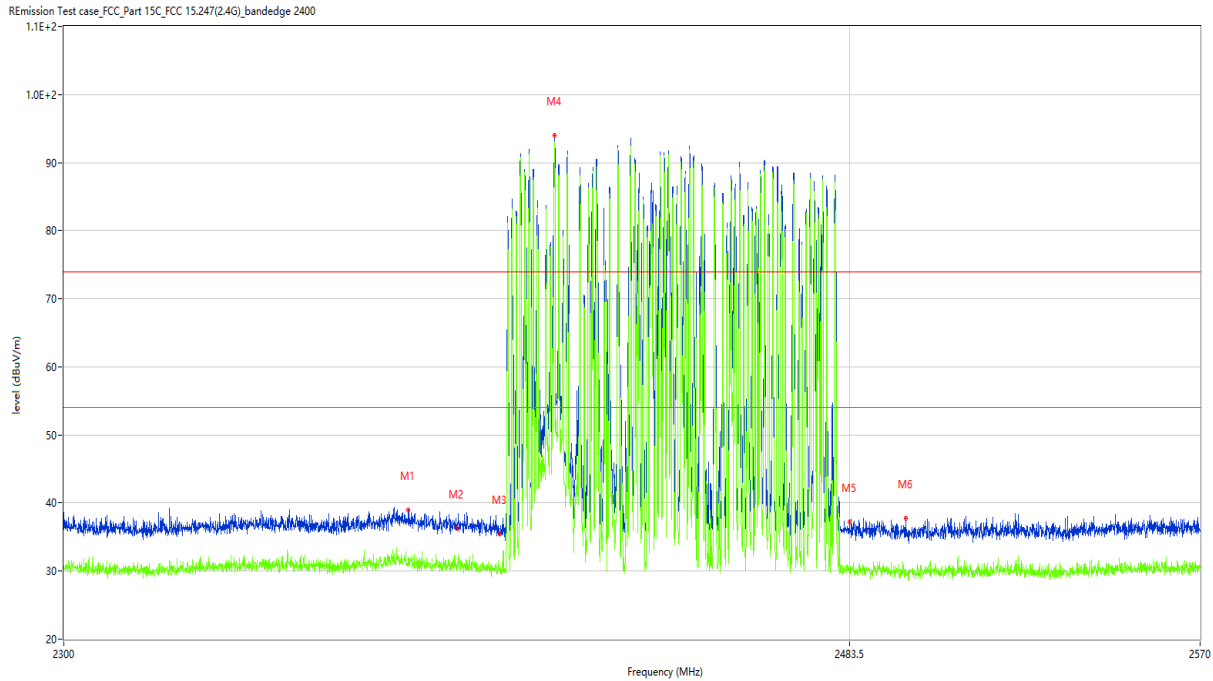
TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 82 of 93

Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2378.753	39.83	-3.83	74.0	-34.17	Peak	345.40	100	Vertical	Pass
1**	2378.753	32.13	-3.83	54.0	-21.87	AV	345.40	100	Vertical	Pass
2	2390.000	37.83	-3.76	74.0	-36.17	Peak	195.51	100	V	Pass
2**	2390.000	31.26	-3.76	54.0	-22.74	AV	195.51	100	V	Pass
3	2400.000	36.55	-4.18	74.0	-37.45	Peak	88.39	100	V	Pass
3**	2400.000	32.10	-4.18	54.0	-21.90	AV	88.39	100	V	Pass
4	2412.967	95.65	-4.15	74.0	21.65	Peak	27.60	100	Vertical	N/A
4**	2412.967	94.29	-4.15	54.0	40.29	AV	27.60	100	Vertical	Fail
5	2483.500	38.09	-3.87	74.0	-35.91	Peak	326.78	100	V	Pass
5**	2483.500	30.36	-3.87	54.0	-23.64	AV	326.78	100	V	Pass
6	2497.118	38.80	-4.33	74.0	-35.20	Peak	177.90	100	Vertical	Pass
6**	2497.118	30.11	-4.33	54.0	-23.89	AV	177.90	100	Vertical	Pass

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 83 of 93

4.1.7 Hopping Frequency Separation

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)
RSS-247 5.1(2)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Hopping
Operation Mode : A.1.a.iv
Ambient temperature : 25°C
Relative humidity : 52%

Table 4: Hopping Frequency Separation

Mode	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
GFSK	2441	0.999	≥ 25kHz or two-thirds of 20dB bandwidth
8-DPSK	2441	0.993	

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 84 of 93

Figure 39: Hopping Frequency Separation, Hopping Mode, GFSK

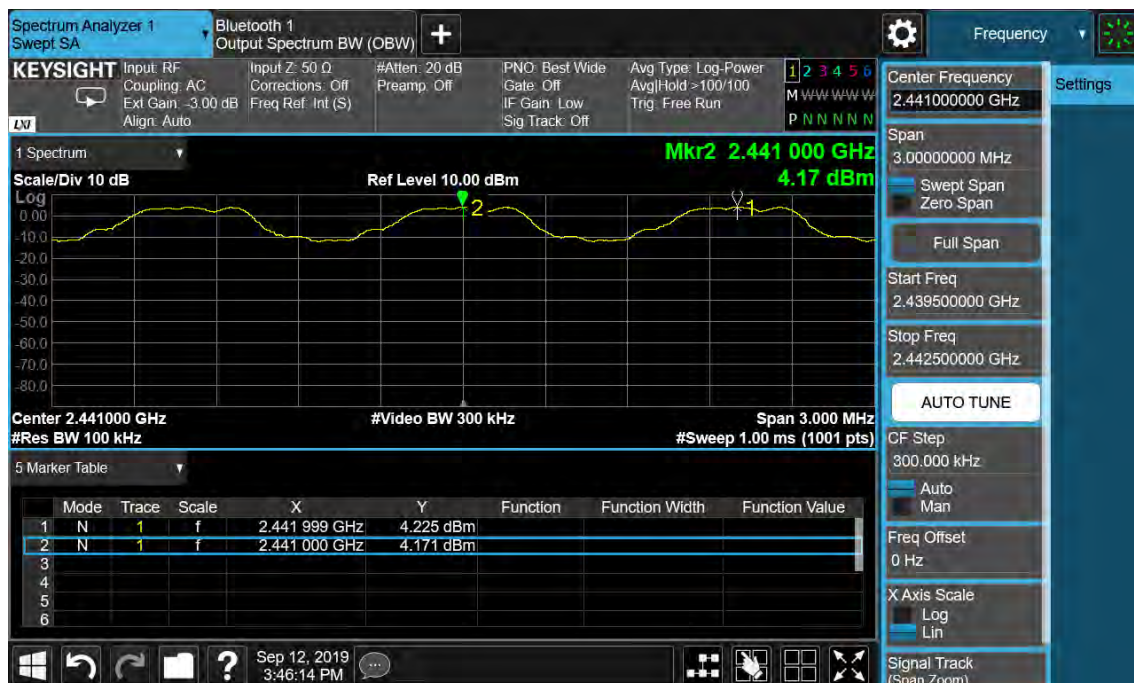


Figure 40: Hopping Frequency Separation, Hopping Mode, 8DPSK



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 85 of 93

4.1.8 Number of Hopping Frequency

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii)
RSS-247 5.1(4)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Hopping
Operation Mode : A.1.a.iv
Ambient temperature : 25°C
Relative humidity : 52%

Table 5: Number of Hopping Frequency

Mode	Frequency Range	Measured Quantity of Hopping Channel	Limit
GFSK	2400 – 2483.5	79	≥15
8-DPSK	2400 – 2483.5	79	≥15

TEST REPORT

Report No.: SHE19020010-03FE

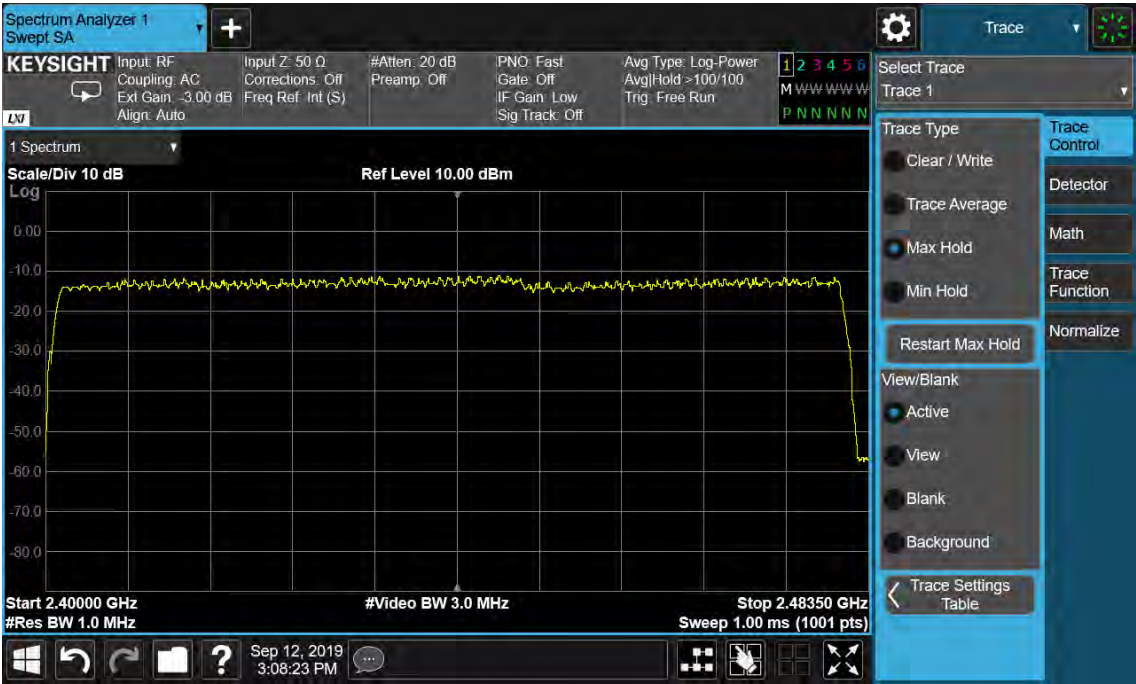
Date: 2020-5-7

Page 86 of 93

Figure 41: Number of Hopping Frequency, Hopping Mode, GFSK



Figure 42: Number of Hopping Frequency, Hopping Mode, 8-DPSK



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 87 of 93

4.1.9 Time of Occupancy

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii)
RSS-247 5.1(4)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Middle
Operation Mode : A.1.a
Ambient temperature : 25°C
Relative humidity : 52%

Table 6: Time of Occupancy

Mode	Packet Type	Pulse Time (ms)	Total of Dwell (ms)	Limit (s)
GFSK	DH1	0.383	122.656	0.4
	DH3	1.840	294.400	0.4
	DH5	3.093	329.920	0.4
8-DPSK	DH1	0.453	145.056	0.4
	DH3	1.840	294.400	0.4
	DH5	3.093	329.920	0.4

Note:

For DH1 package type:

Total of Dwell = Pulse Time*(1600/2)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

For DH3 package type:

Total of Dwell = Pulse Time*(1600/4)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

For DH5 package type:

Total of Dwell = Pulse Time*(1600/6)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 88 of 93

Figure 43: Time of Occupancy, 2441MHz, GFSK DH1

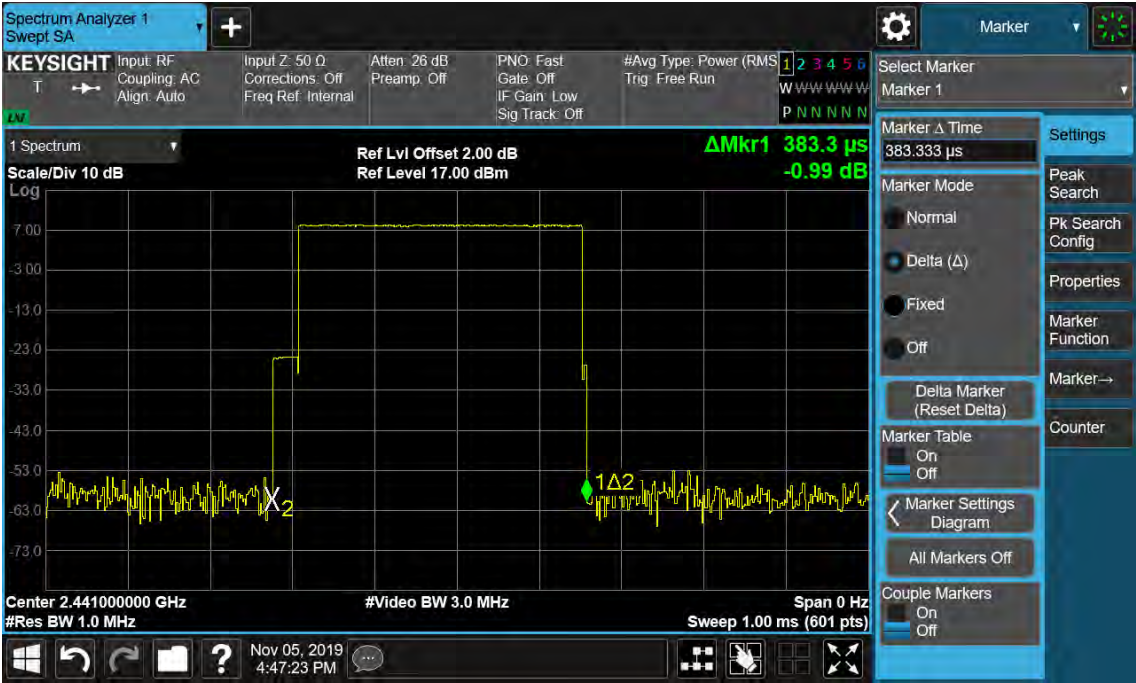


Figure 44: Time of Occupancy, 2441MHz, GFSK DH3



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 89 of 93

Figure 45: Time of Occupancy, 2441MHz, GFSK DH5



Figure 46: Time of Occupancy, 2441MHz, 8-DPSK DH1



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 90 of 93

Figure 47: Time of Occupancy, 2441MHz, 8-DPSK DH3



Figure 48: Time of Occupancy, 2441MHz, 8-DPSK DH5



TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 91 of 93

4.2 Mains Emissions

4.2.1 Conducted Emission on AC Mains

RESULT:

PASS

Test standard	: FCC Part 15.207(a) RSS-Gen 8.8
Requirement	: ANSI C63.10-2013
Kind of test site	: Shielded room

Test setup

Input Voltage	: AC 120V, 60Hz; AC 240V, 50Hz
Operation Mode	: A.1.a
Earthing	: Not Connected
Ambient temperature	: 25°C
Relative humidity	: 52%

For details refer to following test plot.

TEST REPORT

Report No.: SHE19020010-03FE

Date: 2020-5-7

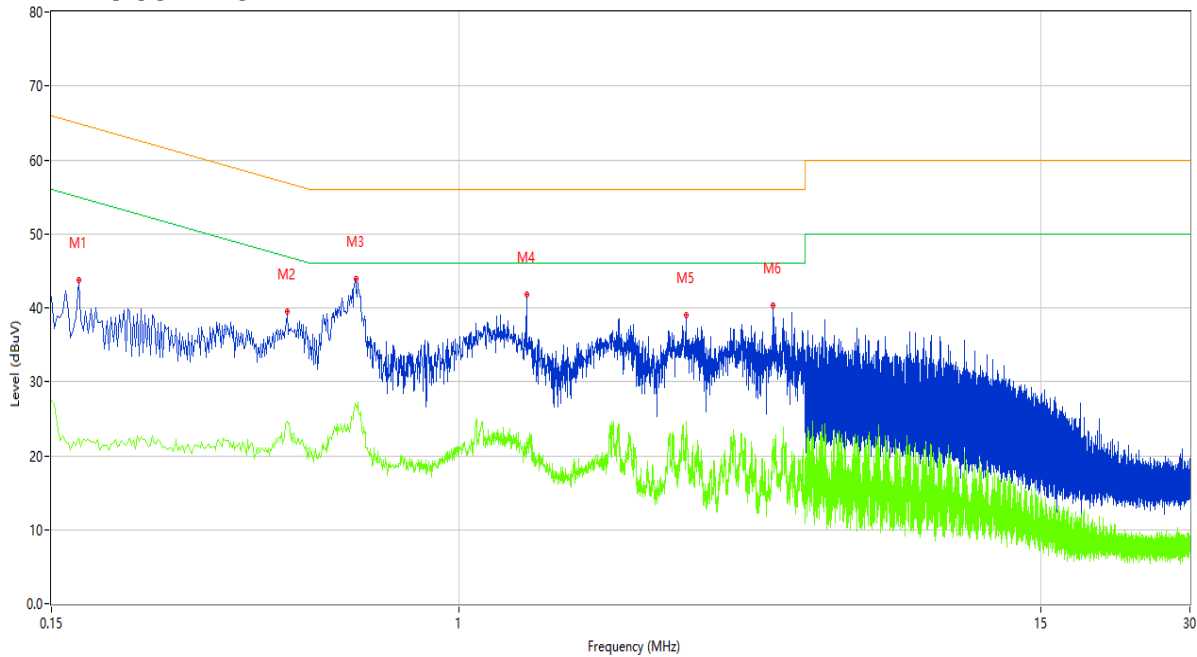
Page 92 of 93

Note:

The all configurations were tested respectively, but only the worst configuration shown here.

Figure 49: Conducted Emission on AC Mains, L Phase

CEmission Test case_FCC_CE_FCC PART 15B_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.170	51.38	10.15	64.96	-13.58	Peak	L	Pass
1*	0.170	34.91	10.15	64.96	-30.05	QP	L	Pass
1**	0.170	22.36	10.15	54.96	-32.60	AV	L	Pass
2	0.450	41.08	10.15	56.88	-15.80	Peak	L	Pass
2*	0.450	31.93	10.15	56.88	-24.95	QP	L	Pass
2**	0.450	24.71	10.15	46.88	-22.17	AV	L	Pass
3	0.618	46.48	10.15	56.00	-9.52	Peak	L	Pass
3*	0.618	39.35	10.15	56.00	-16.65	QP	L	Pass
3**	0.618	26.80	10.15	46.00	-19.20	AV	L	Pass
4	1.368	41.70	10.16	56.00	-14.30	Peak	L	Pass
4*	1.368	32.20	10.16	56.00	-23.80	QP	L	Pass
4**	1.368	22.33	10.16	46.00	-23.67	AV	L	Pass
5	2.872	42.66	10.21	56.00	-13.34	Peak	L	Pass
5*	2.872	32.58	10.21	56.00	-23.42	QP	L	Pass
5**	2.872	24.60	10.21	46.00	-21.40	AV	L	Pass
6	4.318	38.73	10.25	56.00	-17.27	Peak	L	Pass
6*	4.318	30.54	10.25	56.00	-25.46	QP	L	Pass
6**	4.318	22.27	10.25	46.00	-23.73	AV	L	Pass

TEST REPORT

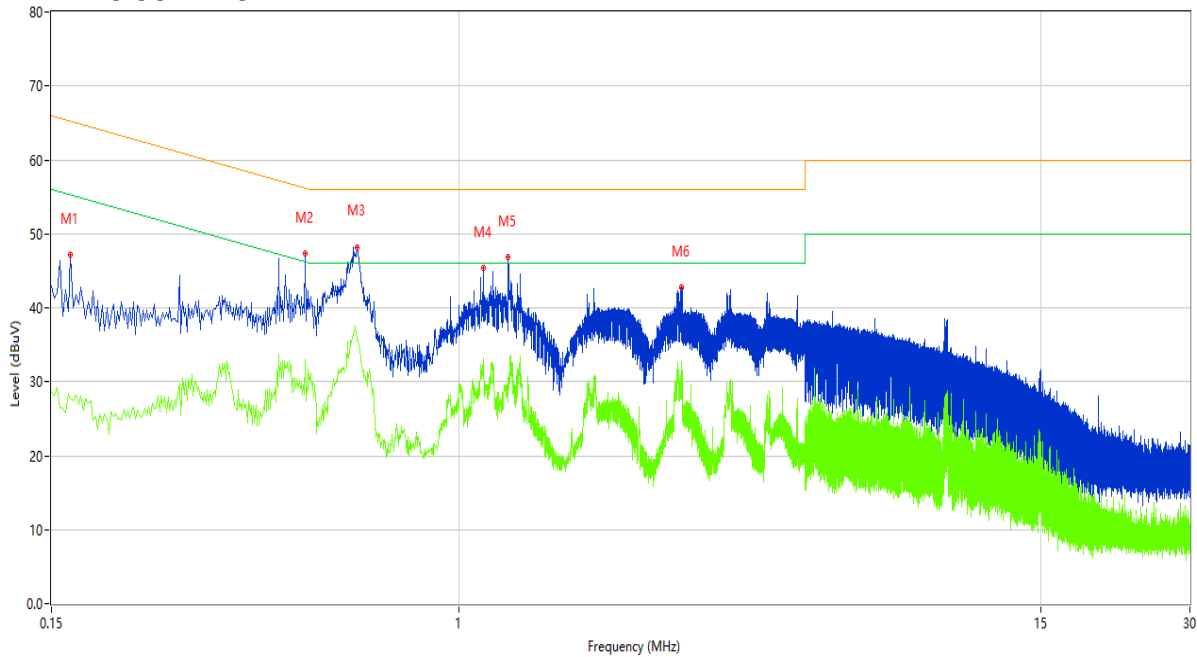
Report No.: SHE19020010-03FE

Date: 2020-5-7

Page 93 of 93

Figure 50: Conducted Emission on AC Mains, N Phase

CEmission Test case_FCC_CE_FCC PART 15B_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.164	54.70	10.15	65.26	-10.56	Peak	N	Pass
1*	0.164	38.51	10.15	65.26	-26.75	QP	N	Pass
1**	0.164	27.69	10.15	55.26	-27.57	AV	N	Pass
2	0.488	45.84	10.15	56.20	-10.36	Peak	N	Pass
2*	0.488	38.39	10.15	56.20	-17.81	QP	N	Pass
2**	0.488	32.94	10.15	46.20	-13.26	AV	N	Pass
3	0.622	51.24	10.15	56.00	-4.76	Peak	N	Pass
3*	0.622	44.25	10.15	56.00	-11.75	QP	N	Pass
3**	0.622	35.53	10.15	46.00	-10.47	AV	N	Pass
4	1.118	45.91	10.16	56.00	-10.09	Peak	N	Pass
4*	1.118	37.85	10.16	56.00	-18.15	QP	N	Pass
4**	1.118	33.13	10.16	46.00	-12.87	AV	N	Pass
5	1.258	42.17	10.16	56.00	-13.83	Peak	N	Pass
5*	1.258	35.50	10.16	56.00	-20.50	QP	N	Pass
5**	1.258	30.12	10.16	46.00	-15.88	AV	N	Pass
6	2.812	45.32	10.21	56.00	-10.68	Peak	N	Pass
6*	2.812	35.25	10.21	56.00	-20.75	QP	N	Pass
6**	2.812	32.70	10.21	46.00	-13.30	AV	N	Pass

***End of the report**