



Radio Test Report

Report No.:STS2603084W14

Issued for

Par Breaker LLC

10817 Renner Blvd, Lenexa, KS 66219, United States

Product Name: Swing Pulse

Brand Name: N/A

Model Name: X10

Series Model(s): N/A

FCC ID: 2BUUX-X10

Test Standards: FCC Part15.247

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

**TEST REPORT****Applicant's Name**..... : Par Breaker LLC

Address : 10817 Renner Blvd, Lenexa, KS 66219, United States

Manufacturer's Name : Muniu Technology (Shanghai) Co., Ltd.Address : Floor 2, Building 12, No. 14, Lane 258, Yinlong Road, Jiading District,
Shanghai City, 201814, China**Product Description**

Product Name : Swing Pulse

Brand Name : N/A

Model Name : X10

Series Model(s) : N/A

Standards : FCC Part 15.247

Test Procedure : ANSI C63.10-2020

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test..... :

Date of receipt of test item : 11 Mar. 2026

Date (s) of performance of tests : 11 Mar. 2026 ~ 20 Apr. 2026

Date of Issue : 20 Apr. 2026

Test Result : **Pass**

Testing Engineer : _____

(Aaron Bu)

Technical Manager : _____

(Skylar Li)

Authorized Signatory : _____

(Bovey Yang)





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	20 Apr. 2026	STS2603084W14	ALL	Initial Issue



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
KDB 558074 D01 15.247 Meas Guidance v05r02.

FCC Part 15.247, Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	--
15.247 (a)(2)	6dB Bandwidth	PASS	--
15.247 (b)(3)	Output Power	PASS	--
15.209	Radiated Spurious Emission	PASS	--
15.247 (d)	Conducted Spurious & Band Edge Emission	PASS	--
15.247 (e)	Power Spectral Density	PASS	--
15.205	Restricted bands of operation	PASS	--
Part 15.247(d)/ Part 15.209(a)	Band Edge Emission	PASS	--
15.203	Antenna Requirement	PASS	--

Note:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2020.



1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.751\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.888\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 2.48\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 2.52\text{dB}$
5	All emissions, radiated 1G-18GHz	$\pm 3.48\text{dB}$
6	All emissions, radiated >18GHz	$\pm 4.18\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.48\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.52\text{dB}$
9	Occupied Channel Bandwidth	$\pm 3.6\%$
10	Power Spectral Density, conducted	$\pm 1.214\text{dB}$
11	Duty Cycle	$\pm 3.2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Swing Pulse	
Brand Name	N/A	
Model Name	X10	
Series Model(s)	N/A	
Model Difference	N/A	
Product Description	The EUT is a Swing Pulse	
	Operation Frequency:	2402~2480 MHz
	Modulation Type:	GFSK
	Radio Technology:	BLE
	Bluetooth Configuration:	LE(Support 1M PHY)
	Number Of Channel:	40
	Antenna Type:	Multilayer Chip
	Antenna Gain (dBi)	1.42
Channel List	Please refer to the Note 3.	
Power Rating	Input: DC 5V 2A	
Adapter	N/A	
Battery	Model: SL30S Brand: N/A Rated Voltage: 3.6V Charge Limit Voltage: 4.2 V Capacity: 9.5Ah	
Hardware version number	N/A	
Software version number	N/A	
Connecting I/O Port(s)	Please refer to the Note 1.	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
2. The antenna details in this report are based on the manufacturer provided antenna specification documents and apply only to the tested sample identified herein.
Any discrepancies in the antenna information may affect the accuracy of the test results, and the customer assumes responsibility for any related issues.



3.

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480

2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions

Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

Worst Mode	Description	Data/Modulation
Mode 1	TX CH00(2402MHz)	1 Mbps/GFSK
Mode 2	TX CH19(2440MHz)	1 Mbps/GFSK
Mode 3	TX CH39(2480MHz)	1 Mbps/GFSK

Note:

(1) We tested for all available U.S. voltage and frequencies (For 120V, 50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V/ 60Hz is shown in the report.

For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 4 : Keeping BT TX



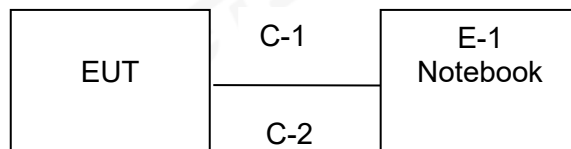
2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

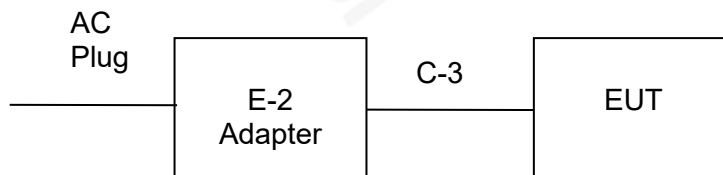
RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	Power Class	Software For Testing
BLE	BLE	GFSK	1.42	Default	sscom5.13.1

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

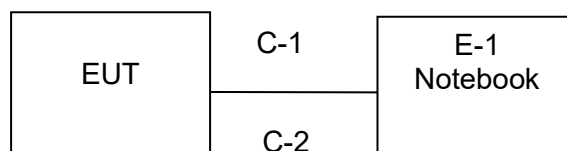
Radiated Spurious Emission Test



Conducted Emission Test



RF Conducted Test





2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Note
E-1	Notebook	DELL	Inspiron 3501	N/A
E-2	Adapter	ZTC	NB-A515A	N/A
C-1	Serial port board	XES	WTYZK	N/A
C-2	USB Cable	MI	RYEW3A	N/A

Item	Equipment	Mfr/Brand	Length	Note
C-2	Shielded	NO	150cm	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (2) “YES” is means “with core”; “NO” is means “without core”.



2.6 EQUIPMENTS LIST

RF Radiation Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2026.02.04	2027.02.03
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2026.02.04	2027.02.03
Pre-Amplifier(1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2025.09.25	2026.09.24
Pre-Amplifier(18G-40GHz)	SKET	LNPA_1840-50	SK2018101801	2026.03.04	2027.03.03
Active loop Antenna	ZHINAN	ZN30900C	16035	2025.02.25	2027.02.24
Bilog Antenna	TESEQ	CBL6111D	34678	2025.09.27	2027.09.26
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2025.09.27	2027.09.26
Horn Antenna	A-INFOMW	LB-180400-KF	J211020657	2025.09.27	2027.09.26
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A
Signal Analyzer	R&S	FSV 40-N	101823	2025.09.26	2026.09.25
Switch Control Box	N/A	N/A	N/A	N/A	N/A
Band 2.4G-2.5G Filter	HX MICROWAVE	HXLBQ-DZA61	N/A	2025.09.23	2026.09.22
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A
Turn Table	MF	SC100_1	60531	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A
DC power supply	HONGSHENGFE NG	DPS-305AF	17064939	2025.09.22	2026.09.21
Test SW	EZ-EMC	Ver.STSLAB-03A1 RE			
Conduction Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2025.09.25	2026.09.24
Limiter	CYBERTEK	EM5010	N/A	2025.09.25	2026.09.24
LISN	R&S	ENV216	101242	2025.09.25	2026.09.24
LISN	EMCO	3810/2NM	23625	2025.09.25	2026.09.24
Temperature & Humidity	SW-108	SuWei	N/A	2026.02.04	2027.02.03
Test SW	EZ-EMC	Ver.STSLAB-03A1 CE			
RF Connected Test					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Analyzer	Agilent	N9020A	MY51510623	2026.02.04	2027.02.03
Switch control box	MW	MW100-RFCB	N/A	N/A	N/A
Temperature & Humidity test chamber	Safety test	AG80L	171200018	2026.02.04	2027.02.03
Temperature & Humidity	SW-108	SuWei	N/A	2026.02.04	2027.02.03
Test SW	MW	MTS 8310_2.0.0.0			



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

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

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of “ * ” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

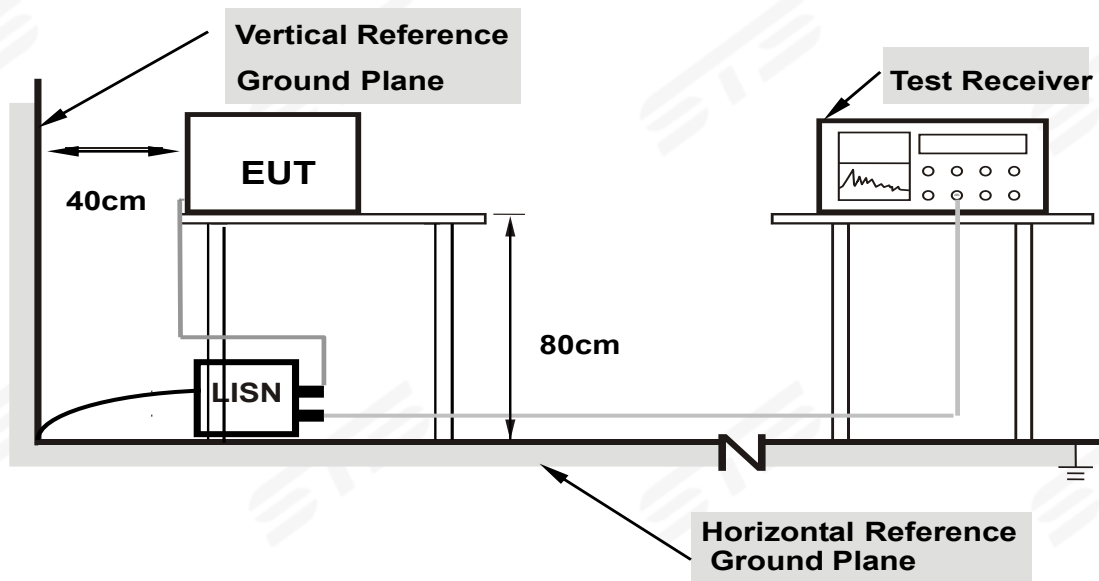
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN is at least 80 cm from the nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.5 TEST RESULTS

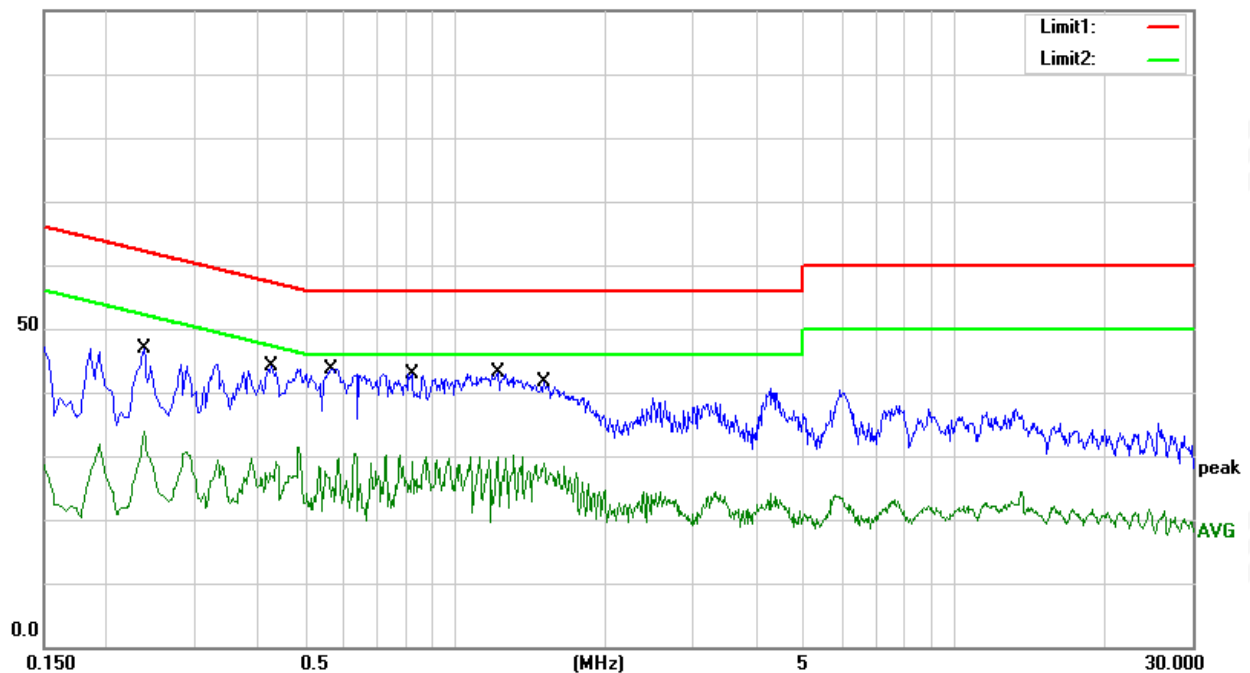
Temperature:	25.1°C	Relative Humidity:	59%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 4		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2380	27.50	19.39	46.89	62.17	-15.28	QP
2	0.2380	14.51	19.39	33.90	52.17	-18.27	AVG
3	0.4300	24.75	19.39	44.14	57.25	-13.11	QP
4	0.4300	12.04	19.39	31.43	47.25	-15.82	AVG
5	0.5660	24.28	19.39	43.67	56.00	-12.33	QP
6	0.5660	11.07	19.39	30.46	46.00	-15.54	AVG
7	0.8180	23.54	19.36	42.90	56.00	-13.10	QP
8	0.8180	10.69	19.36	30.05	46.00	-15.95	AVG
9	1.2180	23.78	19.35	43.13	56.00	-12.87	QP
10	1.2180	10.77	19.35	30.12	46.00	-15.88	AVG
11	1.5060	22.22	19.35	41.57	56.00	-14.43	QP
12	1.5060	10.49	19.35	29.84	46.00	-16.16	AVG

Remark:

1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result = Reading + Factor)-Limit
3. Factor=LISN factor+Cable loss+Limiter (10dB)

100.0 dBuV





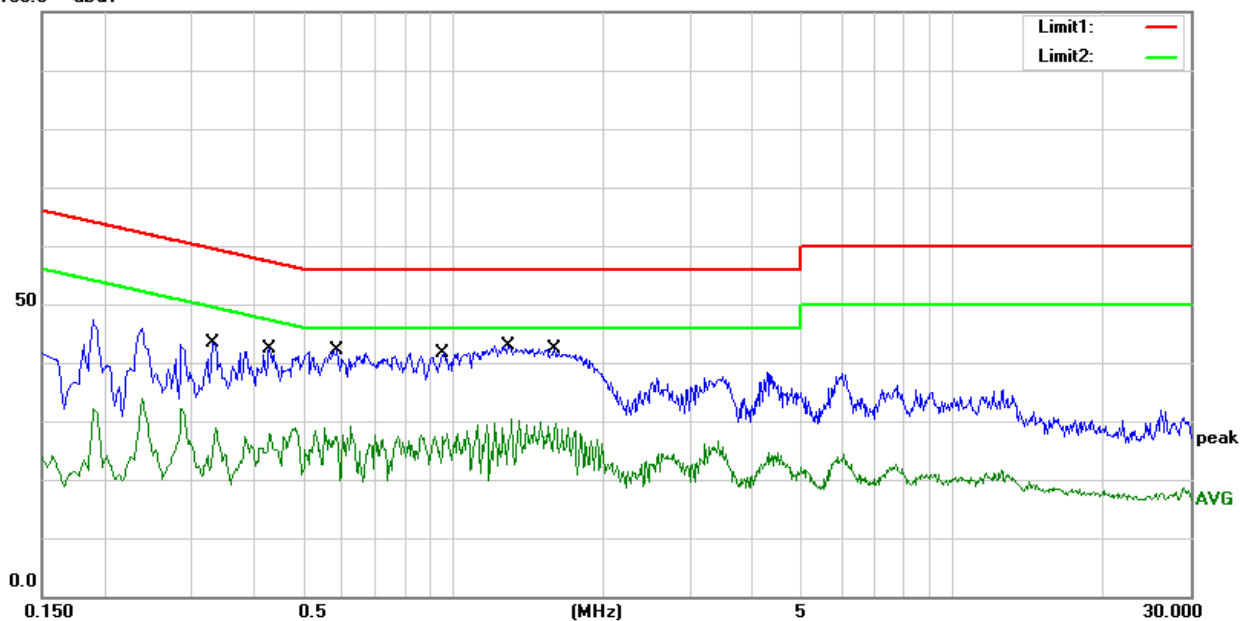
Temperature:	25.1°C	Relative Humidity:	59%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 4		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3300	24.01	19.37	43.38	59.45	-16.07	QP
2	0.3300	14.61	19.37	33.98	49.45	-15.47	AVG
3	0.4300	23.08	19.35	42.43	57.25	-14.82	QP
4	0.4300	9.49	19.35	28.84	47.25	-18.41	AVG
5	0.5860	22.70	19.37	42.07	56.00	-13.93	QP
6	0.5860	9.81	19.37	29.18	46.00	-16.82	AVG
7	0.9620	22.34	19.39	41.73	56.00	-14.27	QP
8	0.9620	8.60	19.39	27.99	46.00	-18.01	AVG
9	1.2900	23.61	19.39	43.00	56.00	-13.00	QP
10	1.2900	10.89	19.39	30.28	46.00	-15.72	AVG
11	1.5980	22.91	19.38	42.29	56.00	-13.71	QP
12	1.5980	10.42	19.38	29.80	46.00	-16.20	AVG

Remark:

1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result = Reading + Factor) – Limit
3. Factor=LISN factor+Cable loss+Limiter (10dB)

100.0 dBuV





4. RADIATED EMISSION MEASUREMENT

4.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2020 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (Frequency Range 9kHz-1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			



For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP/AV
Start Frequency	9 KHz/150KHz(Peak/QP/AV)
Stop Frequency	150KHz/30MHz(Peak/QP/AV)
RB / VB (emission in restricted band)	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz); 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz(Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted band)	120 KHz / 300 KHz

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 3 MHz(Peak) 1 MHz/1/T MHz(AVG)

For Restricted band

Spectrum Parameter	Setting
Detector	Peak/AV
Start/Stop Frequency	Lower Band Edge: 2310 to 2410 MHz Upper Band Edge: 2475 to 2500 MHz
RB / VB	1 MHz / 3 MHz(Peak) 1 MHz/1/T MHz(AVG)



Receiver Parameter	Setting
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2 TEST PROCEDURE

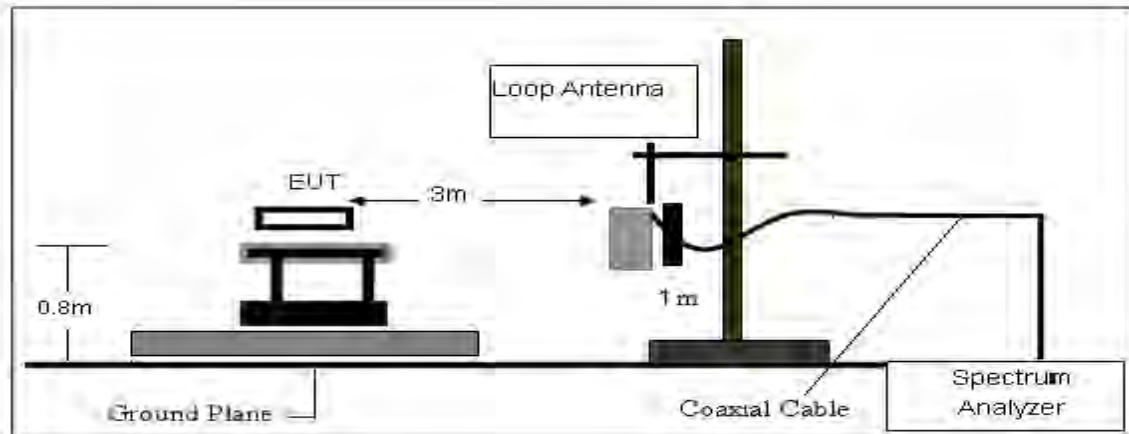
- The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- 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 QuasiPeak detector mode will be re-measured.
- If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

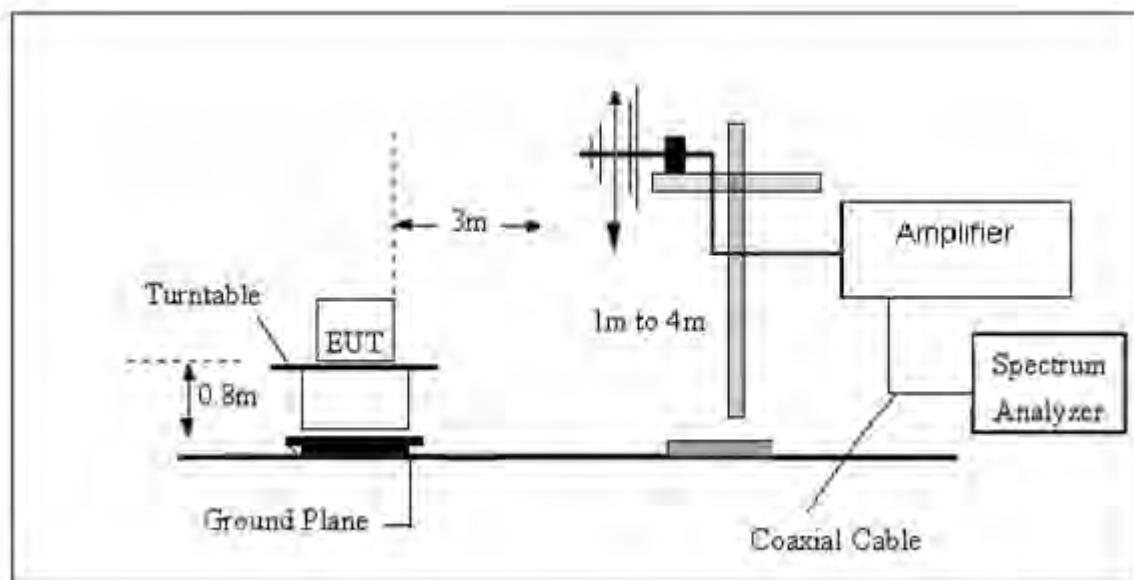
Both horizontal and vertical antenna polarities were tested with a band-stop filter and performed pretest to three orthogonal axis. The worst-case emissions were reported.

4.3 TEST SETUP

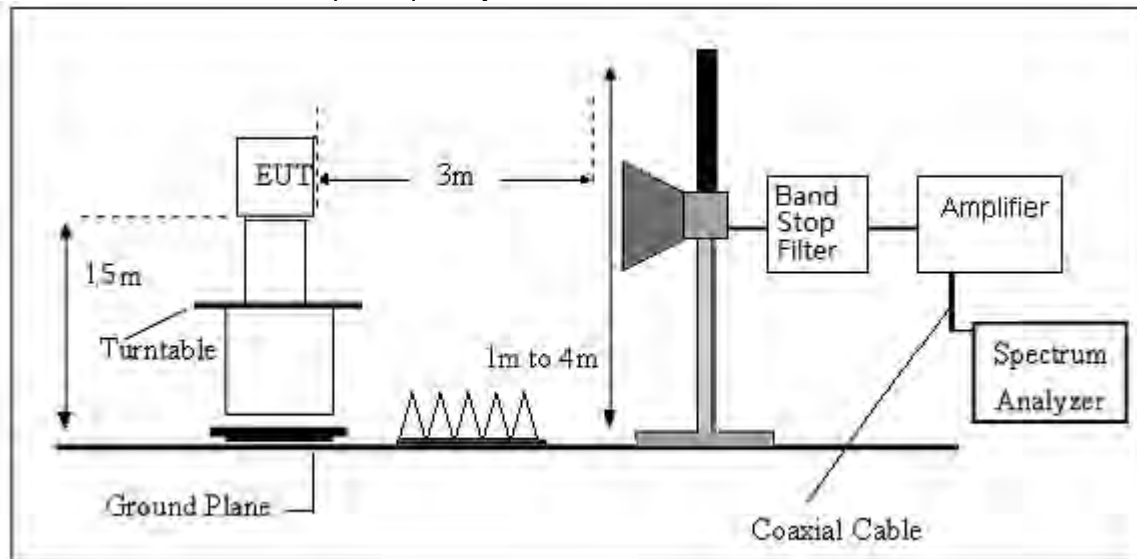
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



4.4 EUT OPERATING CONDITIONS

Please refer to section 3.4 of this report.



4.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$



4.6 TEST RESULTS

(Between 9KHz – 30 MHz)

Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.6V	Polarization:	--
Test Mode:	TX Mode		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



(30MHz -1000MHz)

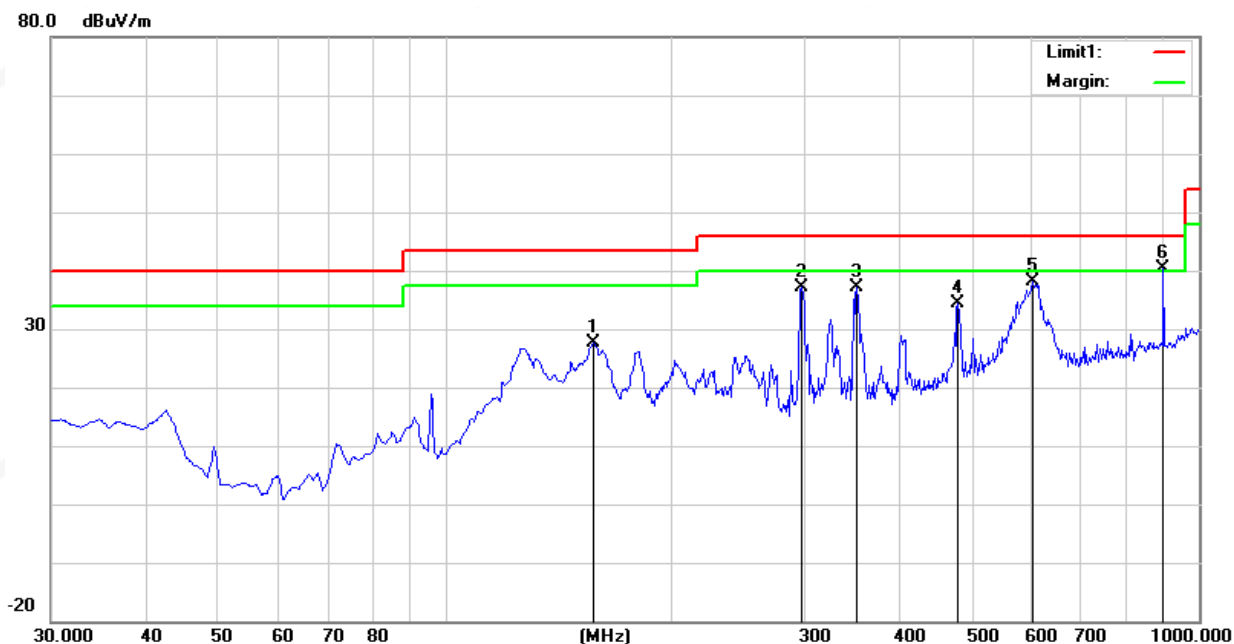
GFSK

Temperature:	23.4℃	Relative Humidity:	60%
Test Voltage:	DC 3.6V	Phase:	Horizontal
Test Mode:	Mode 1/2/3 (Mode 2 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	157.0700	46.31	-18.70	27.61	43.50	-15.89	peak
2	297.7200	52.06	-14.89	37.17	46.00	-8.83	peak
3	352.0400	50.04	-13.02	37.02	46.00	-8.98	peak
4	480.0800	43.11	-8.65	34.46	46.00	-11.54	peak
5	602.3000	43.97	-5.77	38.20	46.00	-7.80	peak
6	900.0900	40.71	-0.45	40.26	46.00	-5.74	peak

Remark:

1. $\text{Margin} = \text{Result} (\text{Result} = \text{Reading} + \text{Factor}) - \text{Limit}$
2. $\text{Factor} = \text{Antenna factor} + \text{Cable attenuation factor (cable loss)} - \text{Amplifier gain}$
3. All modes have been tested, only show the worst case.





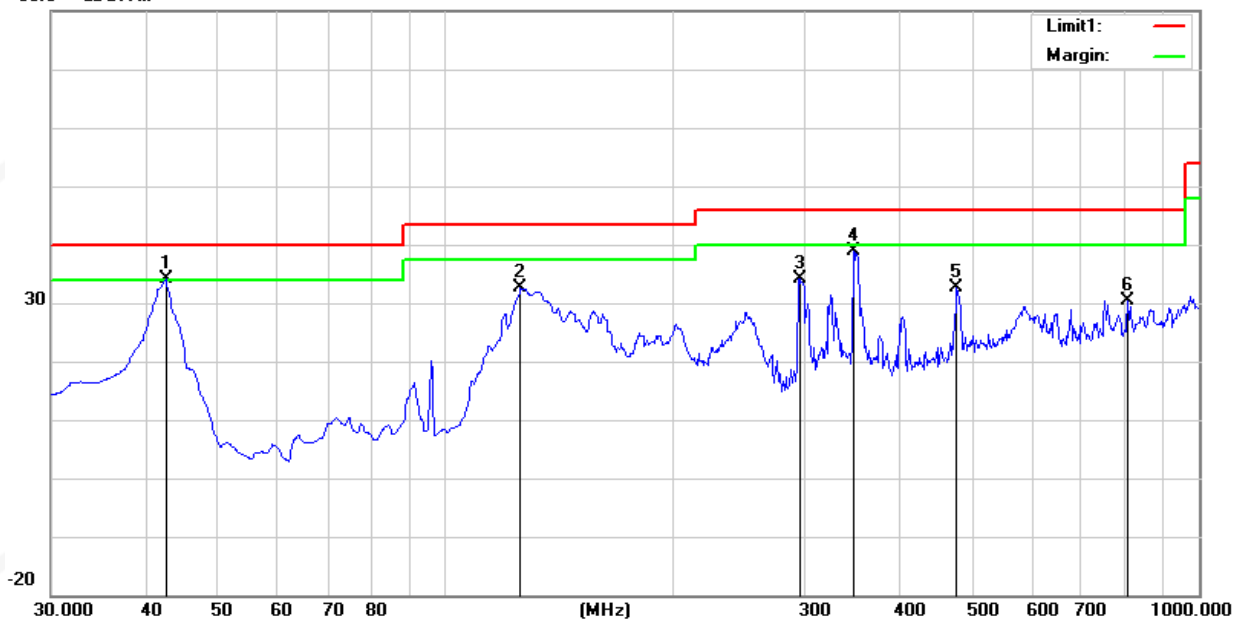
Temperature:	23.4℃	Relative Humidity:	60%
Test Voltage:	DC 3.6V	Phase:	Vertical
Test Mode:	Mode 1/2/3 (Mode 2 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	42.6100	53.49	-19.44	34.05	40.00	-5.95	peak
2	126.0300	50.73	-18.22	32.51	43.50	-10.99	peak
3	295.7800	49.05	-14.95	34.10	46.00	-11.90	peak
4	349.1300	51.85	-13.09	38.76	46.00	-7.24	peak
5	478.1400	41.42	-8.71	32.71	46.00	-13.29	peak
6	806.9700	32.31	-2.01	30.30	46.00	-15.70	peak

Remark:

1. Margin = Result (Result = Reading + Factor) – Limit
2. Factor = Antenna factor + Cable attenuation factor (cable loss) – Amplifier gain
3. All modes have been tested, only show the worst case.

80.0 dBuV/m

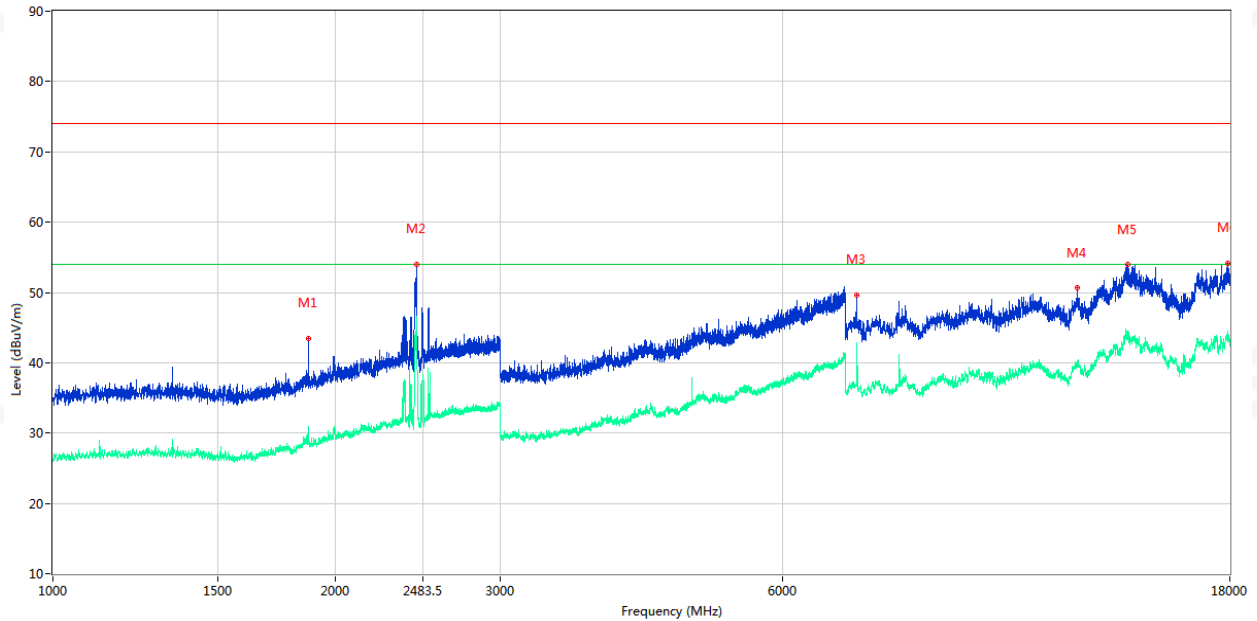




(1GHz-25GHz) Spurious emission Requirements

Low Channel
Horizontal

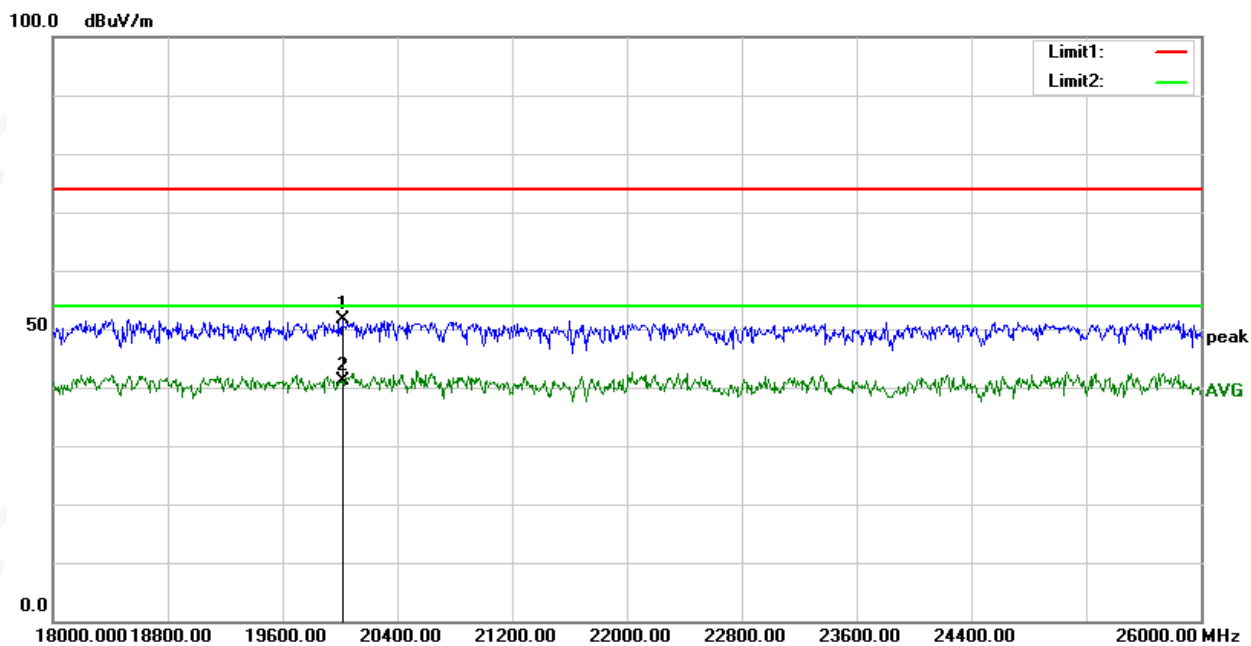
RE_FCC Test Case_FCC 15C-IC-RSS 1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	1872.500	43.52	-0.10	74.0	-30.48	Peak	214.20	Horizontal	Pass
1**	1872.500	28.82	-0.10	54.0	-25.18	AV	214.20	Horizontal	Pass
2	2443.000	54.06	3.22	74.0	-19.94	Peak	122.20	Horizontal	Pass
2**	2443.000	46.61	3.22	54.0	-7.39	AV	122.20	Horizontal	Pass
3	7206.250	49.60	-1.90	74.0	-24.40	Peak	55.60	Horizontal	Pass
3**	7206.250	36.95	-1.90	54.0	-17.05	AV	55.60	Horizontal	Pass
4	12387.250	50.69	3.16	74.0	-23.31	Peak	39.20	Horizontal	Pass
4**	12387.250	39.97	3.16	54.0	-14.03	AV	39.20	Horizontal	Pass
5	14001.500	53.92	8.43	74.0	-20.08	Peak	160.90	Horizontal	Pass
5**	14001.500	44.00	8.43	54.0	-10.00	AV	160.90	Horizontal	Pass
6	17925.751	54.20	7.04	74.0	-19.80	Peak	85.70	Horizontal	Pass
6**	17925.751	43.74	7.04	54.0	-10.26	AV	85.70	Horizontal	Pass



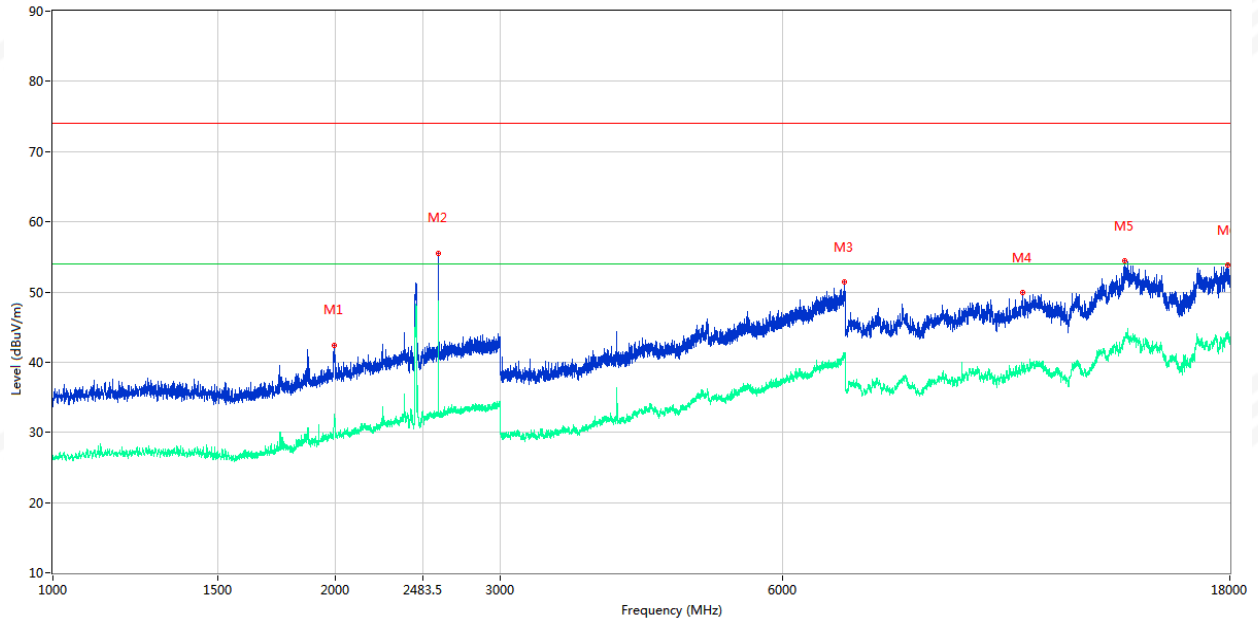
18GHz-26GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/ m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20016.000	49.74	1.81	51.55	74.00	-22.45	peak
2	20016.000	39.41	1.81	41.22	54.00	-12.78	AVG

Vertical
1GHz-18GHz

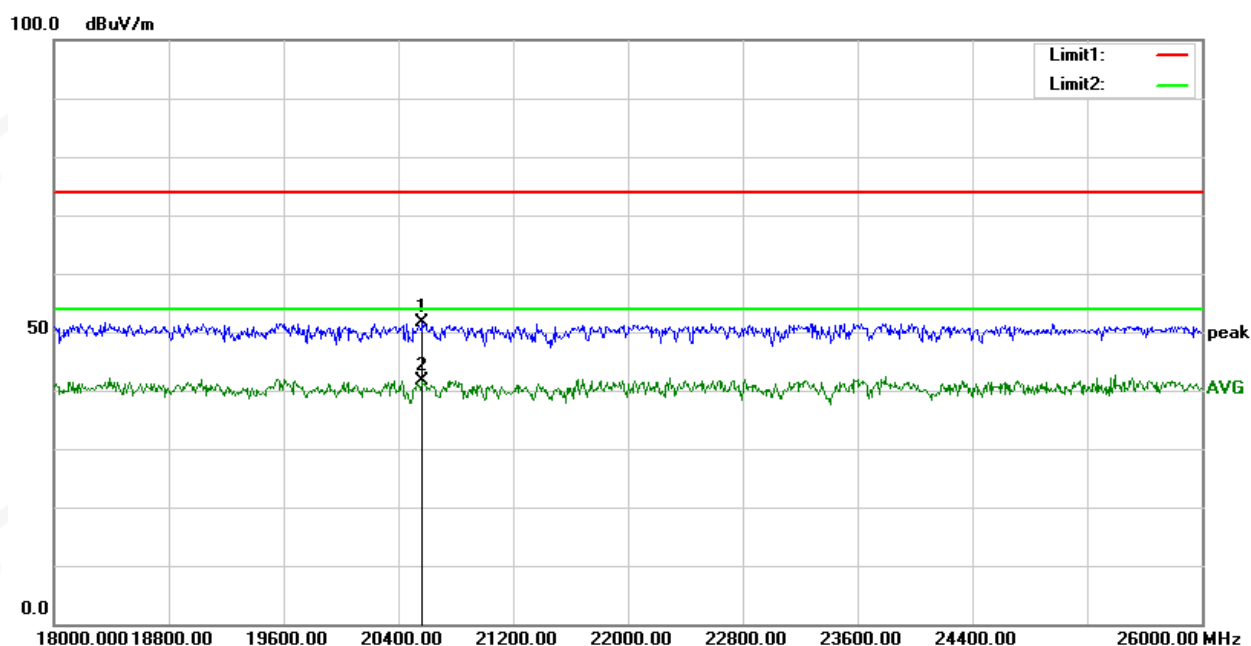
RE_FCC Test Case_FCC 15C-IC-RSS 1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	1994.500	42.44	0.35	74.0	-31.56	Peak	89.60	Vertical	Pass
1**	1994.500	32.08	0.35	54.0	-21.92	AV	89.60	Vertical	Pass
2	2578.500	55.57	3.49	74.0	-18.43	Peak	9.40	Vertical	Pass
2**	2578.500	48.72	3.49	54.0	-5.28	AV	9.40	Vertical	Pass
3	6987.000	51.44	1.21	74.0	-22.56	Peak	267.30	Vertical	Pass
3**	6987.000	40.98	1.21	54.0	-13.02	AV	267.30	Vertical	Pass
4	10814.250	49.95	2.00	74.0	-24.05	Peak	108.20	Vertical	Pass
4**	10814.250	39.18	2.00	54.0	-14.82	AV	108.20	Vertical	Pass
5	13888.750	54.48	7.03	74.0	-19.52	Peak	316.80	Vertical	Pass
5**	13888.750	43.33	7.03	54.0	-10.67	AV	316.80	Vertical	Pass
6	17903.749	53.79	7.21	74.0	-20.21	Peak	300.50	Vertical	Pass
6**	17903.749	44.11	7.21	54.0	-9.89	AV	300.50	Vertical	Pass



18GHz-26GHz

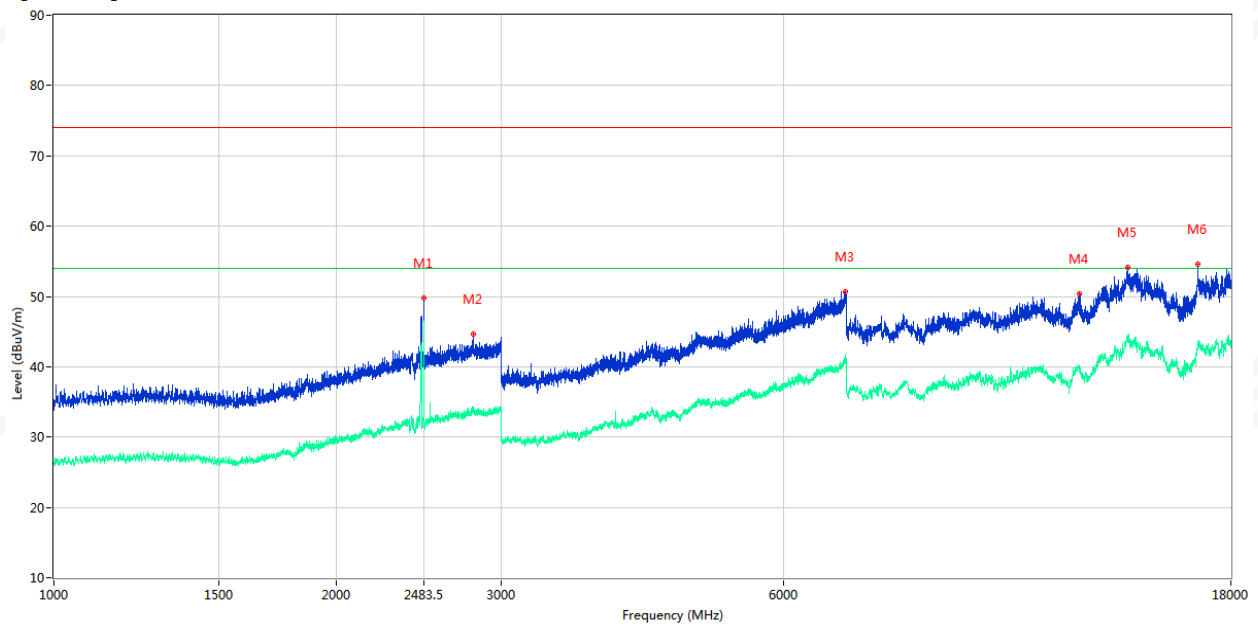


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20568.000	49.42	2.28	51.70	74.00	-22.30	peak
2	20568.000	39.24	2.28	41.52	54.00	-12.48	AVG



Mid Channel
Horizontal
1GHz-18GHz

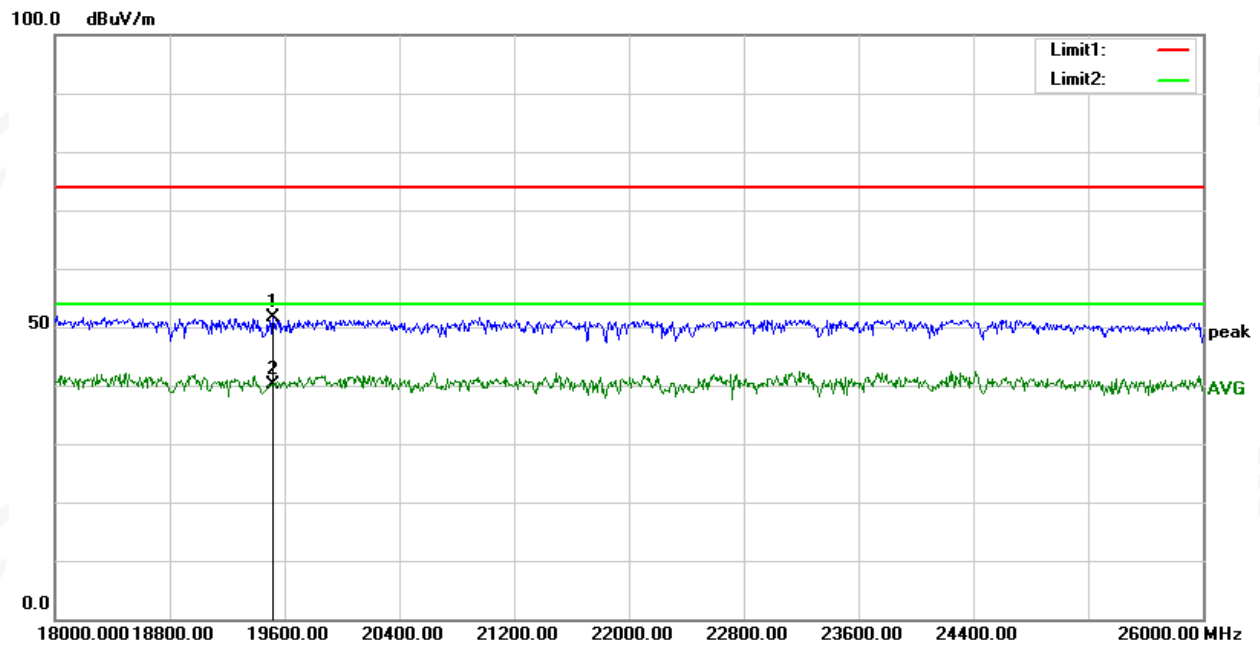
RE_FCC Test Case_FCC 15C-IC-RSS 1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2480.000	49.78	3.18	74.0	-24.22	Peak	105.70	Horizontal	Pass
1**	2480.000	45.31	3.18	54.0	-8.69	AV	105.70	Horizontal	Pass
2	2798.000	44.70	4.74	74.0	-29.30	Peak	89.30	Horizontal	Pass
2**	2798.000	34.05	4.74	54.0	-19.95	AV	89.30	Horizontal	Pass
3	6985.000	50.68	1.20	74.0	-23.32	Peak	9.10	Horizontal	Pass
3**	6985.000	40.59	1.20	54.0	-13.41	AV	9.10	Horizontal	Pass
4	12398.250	50.32	3.18	74.0	-23.68	Peak	359.90	Horizontal	Pass
4**	12398.250	40.12	3.18	54.0	-13.88	AV	359.90	Horizontal	Pass
5	13963.000	54.13	7.99	74.0	-19.87	Peak	2.90	Horizontal	Pass
5**	13963.000	43.79	7.99	54.0	-10.21	AV	2.90	Horizontal	Pass
6	16616.750	54.61	5.02	74.0	-19.39	Peak	20.80	Horizontal	Pass
6**	16616.750	43.42	5.02	54.0	-10.58	AV	20.80	Horizontal	Pass



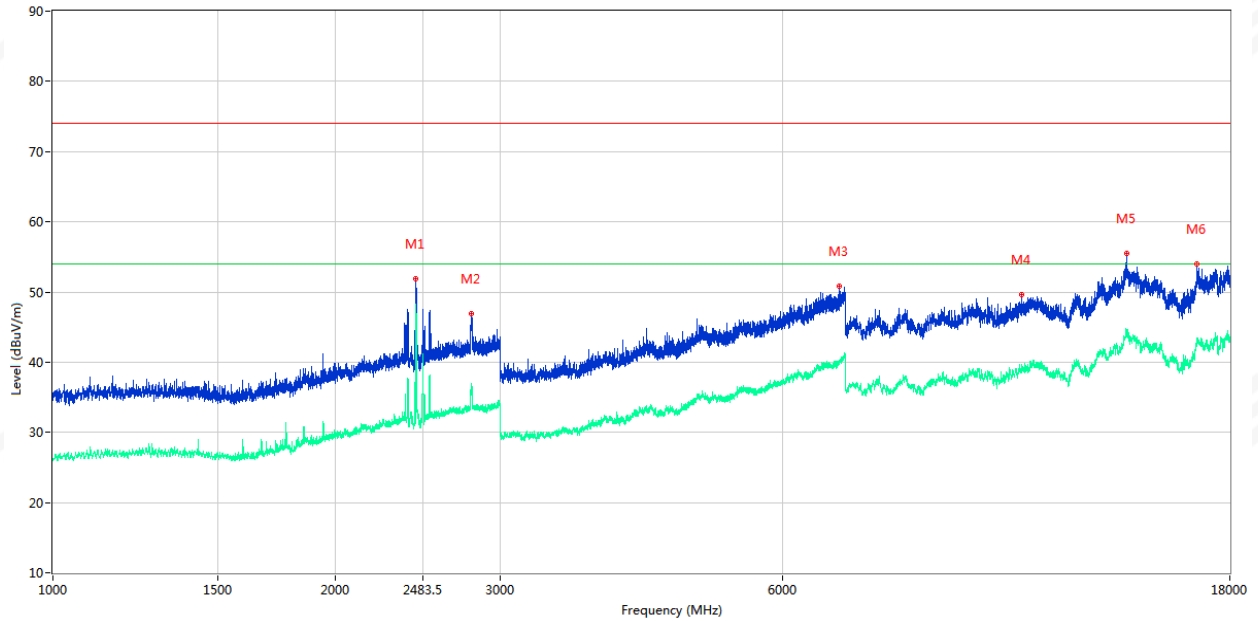
18GHz-26GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	19520.000	50.18	1.49	51.67	74.00	-22.33	peak
2	19520.000	38.57	1.49	40.06	54.00	-13.94	AVG

Vertical
1GHz-18GHz

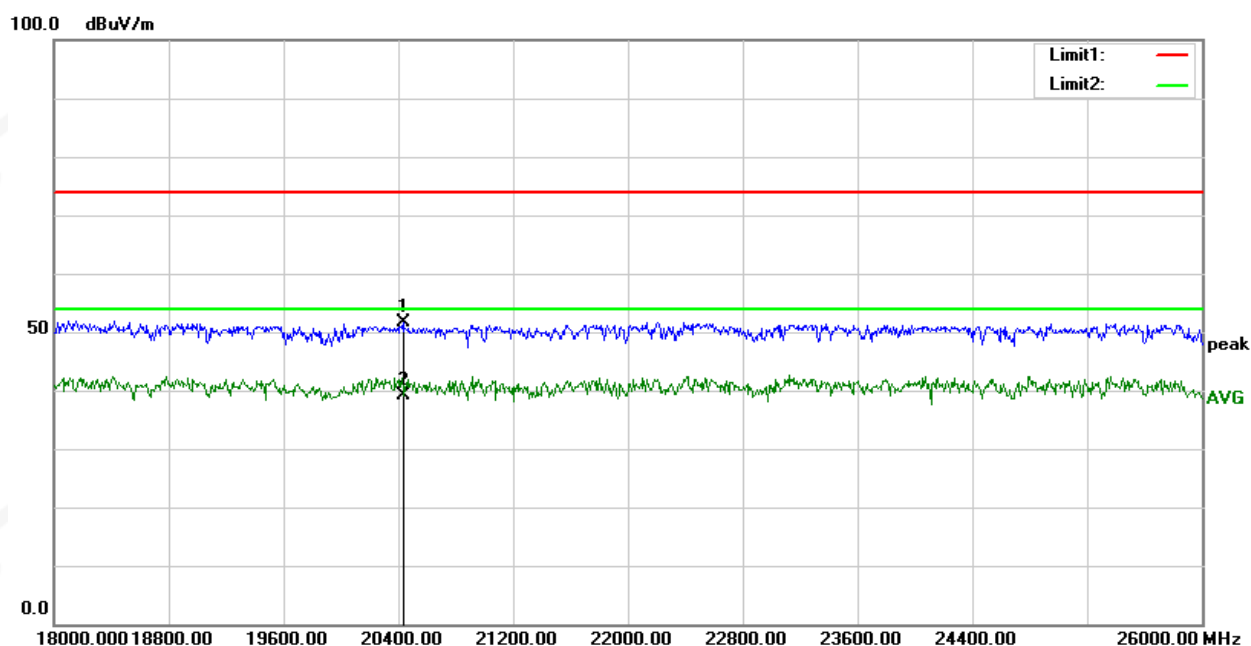
RE_FCC Test Case_FCC 15C-IC-RSS 1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2438.500	51.86	3.20	74.0	-22.14	Peak	360.00	Vertical	Pass
1**	2438.500	48.31	3.20	54.0	-5.69	AV	360.00	Vertical	Pass
2	2792.000	46.95	4.70	74.0	-27.05	Peak	83.50	Vertical	Pass
2**	2792.000	35.45	4.70	54.0	-18.55	AV	83.50	Vertical	Pass
3	6898.000	50.80	0.50	74.0	-23.20	Peak	143.90	Vertical	Pass
3**	6898.000	40.00	0.50	54.0	-14.00	AV	143.90	Vertical	Pass
4	10800.500	49.63	2.04	74.0	-24.37	Peak	188.90	Vertical	Pass
4**	10800.500	39.59	2.04	54.0	-14.41	AV	188.90	Vertical	Pass
5	13985.000	55.53	8.26	74.0	-18.47	Peak	14.00	Vertical	Pass
5**	13985.000	44.00	8.26	54.0	-10.00	AV	14.00	Vertical	Pass
6	16616.750	53.95	5.02	74.0	-20.05	Peak	200.80	Vertical	Pass
6**	16616.750	43.33	5.02	54.0	-10.67	AV	200.80	Vertical	Pass



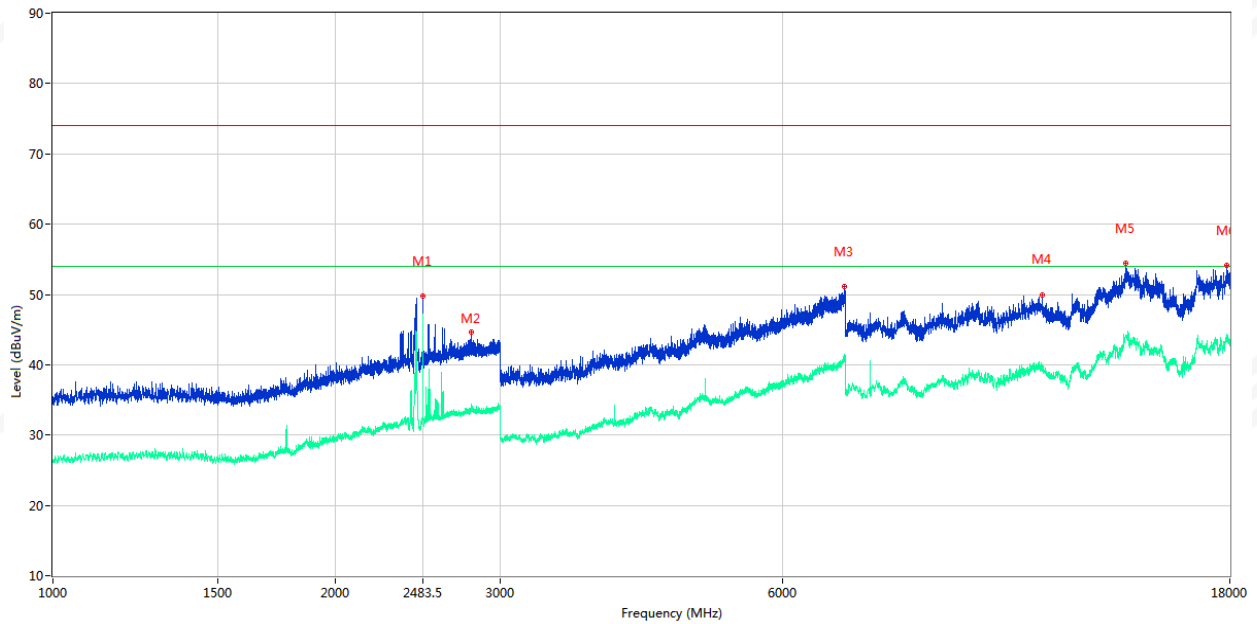
18GHz-26GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20432.000	49.57	2.18	51.75	74.00	-22.25	peak
2	20432.000	36.97	2.18	39.15	54.00	-14.85	AVG

High Channel
Horizontal
1GHz-18GHz

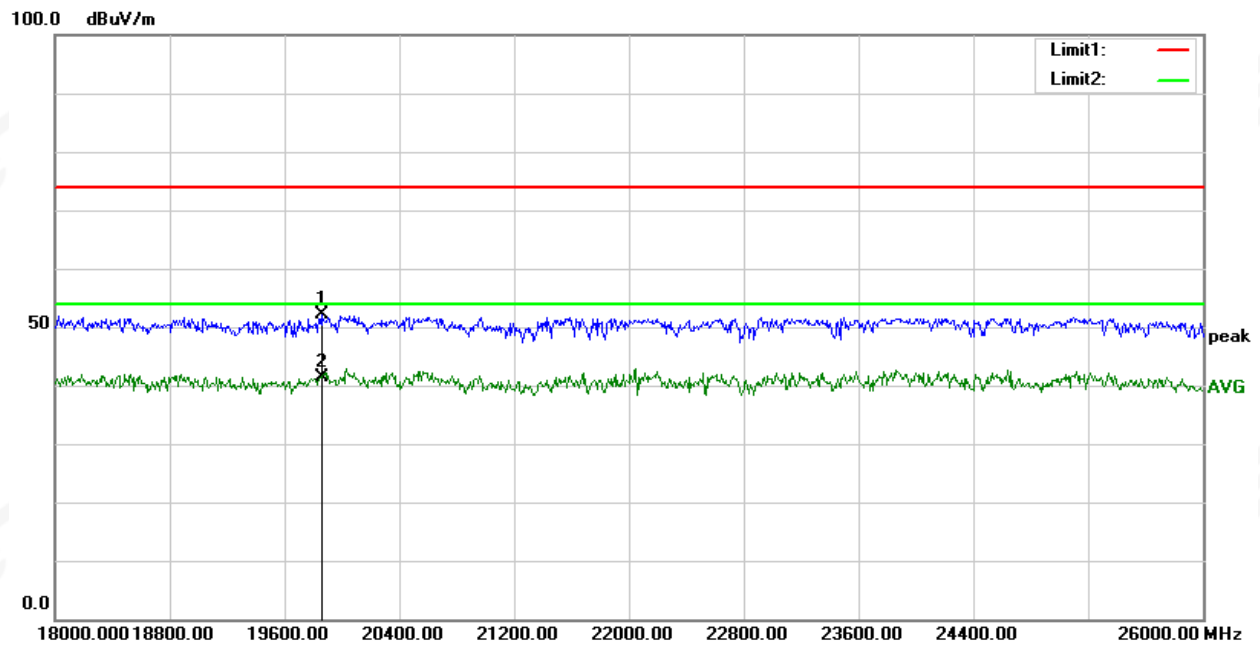
RE_FCC Test Case_FCC 15C-IC-RSS 1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2480.000	49.70	3.18	74.0	-24.30	Peak	104.70	Horizontal	Pass
1**	2480.000	44.81	3.18	54.0	-9.19	AV	104.70	Horizontal	Pass
2	2791.000	44.61	4.69	74.0	-29.39	Peak	68.60	Horizontal	Pass
2**	2791.000	33.81	4.69	54.0	-20.19	AV	68.60	Horizontal	Pass
3	6990.000	51.08	1.24	74.0	-22.92	Peak	237.40	Horizontal	Pass
3**	6990.000	41.13	1.24	54.0	-12.87	AV	237.40	Horizontal	Pass
4	11353.250	49.98	2.10	74.0	-24.02	Peak	173.90	Horizontal	Pass
4**	11353.250	39.46	2.10	54.0	-14.54	AV	173.90	Horizontal	Pass
5	13941.000	54.39	7.71	74.0	-19.61	Peak	257.70	Horizontal	Pass
5**	13941.000	43.90	7.71	54.0	-10.10	AV	257.70	Horizontal	Pass
6	17881.750	54.08	7.08	74.0	-19.92	Peak	182.10	Horizontal	Pass
6**	17881.750	44.30	7.08	54.0	-9.70	AV	182.10	Horizontal	Pass



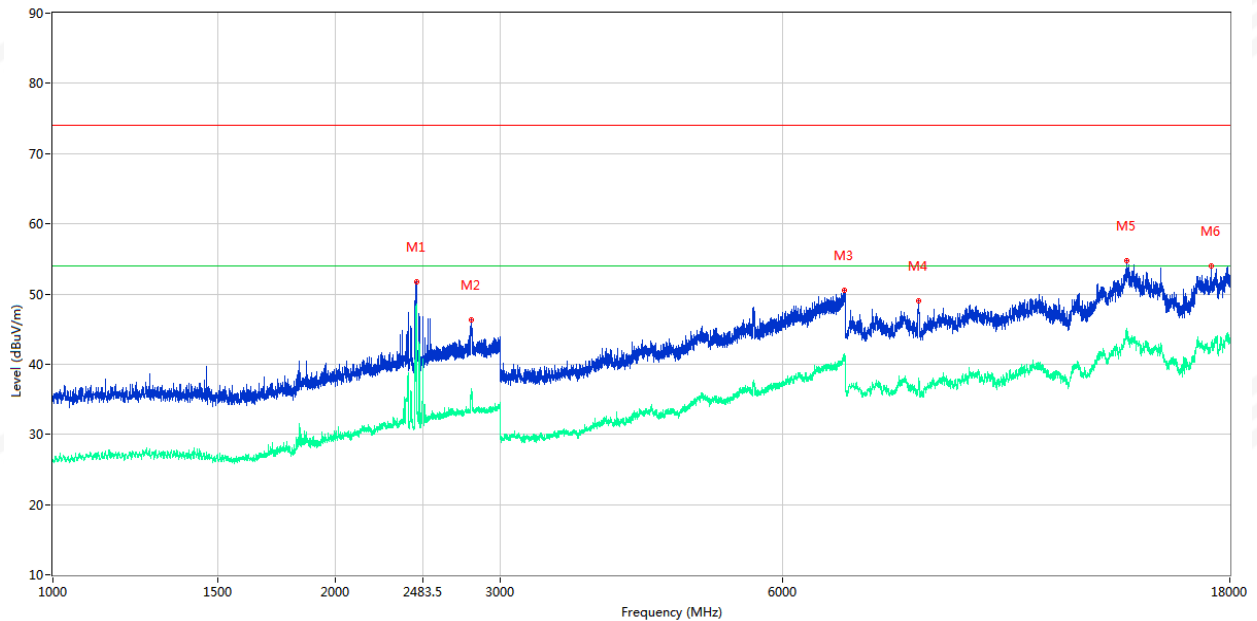
18GHz-26GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	19856.000	50.42	1.71	52.13	74.00	-21.87	peak
2	19856.000	39.56	1.71	41.27	54.00	-12.73	AVG

Vertical
1GHz-18GHz

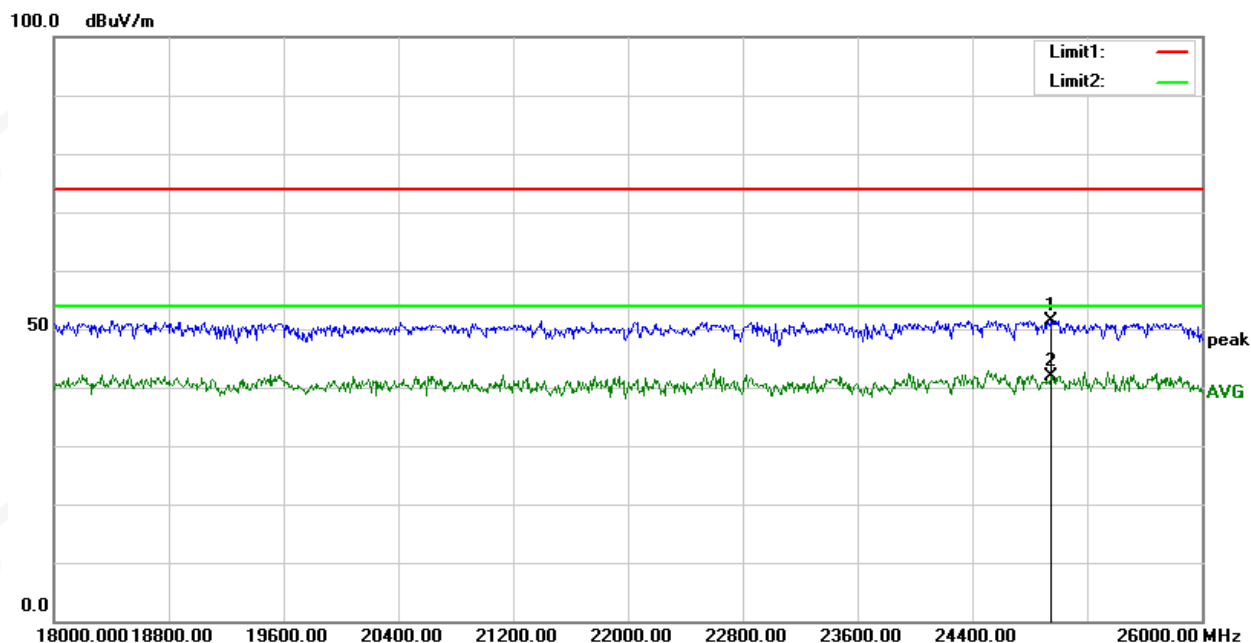
RE_FCC Test Case_FCC 15C-IC-RSS 1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2440.500	51.70	3.21	74.0	-22.30	Peak	277.10	Vertical	Pass
1**	2440.500	48.50	3.21	54.0	-5.50	AV	277.10	Vertical	Pass
2	2792.000	46.28	4.70	74.0	-27.72	Peak	91.90	Vertical	Pass
2**	2792.000	35.35	4.70	54.0	-18.65	AV	91.90	Vertical	Pass
3	6989.000	50.51	1.23	74.0	-23.49	Peak	336.50	Vertical	Pass
3**	6989.000	41.29	1.23	54.0	-12.71	AV	336.50	Vertical	Pass
4	8383.250	48.96	-1.22	74.0	-25.04	Peak	187.40	Vertical	Pass
4**	8383.250	37.15	-1.22	54.0	-16.85	AV	187.40	Vertical	Pass
5	13968.500	54.71	8.06	74.0	-19.29	Peak	359.90	Vertical	Pass
5**	13968.500	43.64	8.06	54.0	-10.36	AV	359.90	Vertical	Pass
6	17213.499	53.97	5.78	74.0	-20.03	Peak	187.40	Vertical	Pass
6**	17213.499	42.71	5.78	54.0	-11.29	AV	187.40	Vertical	Pass



18GHz-26GHz



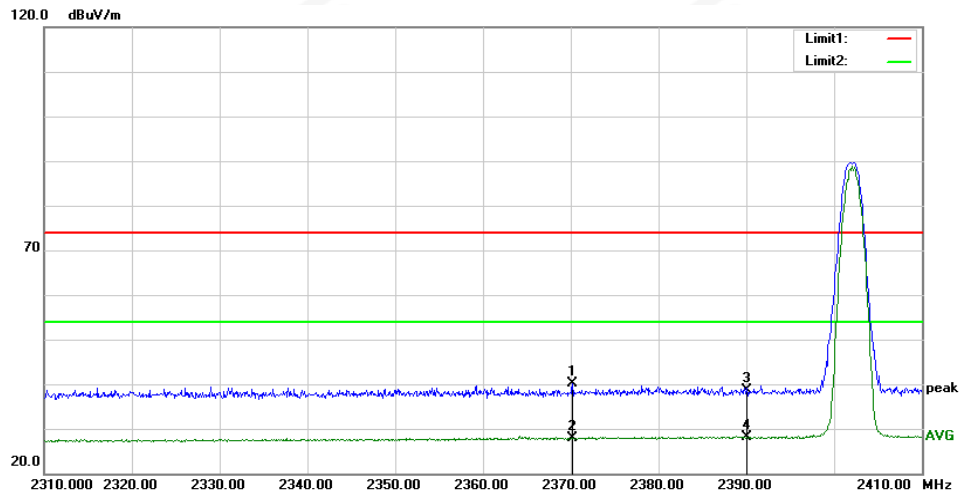
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	24944.000	46.26	5.23	51.49	74.00	-22.51	peak
2	24944.000	36.56	5.23	41.79	54.00	-12.21	AVG

Note:

- 1) Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor.
- 2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

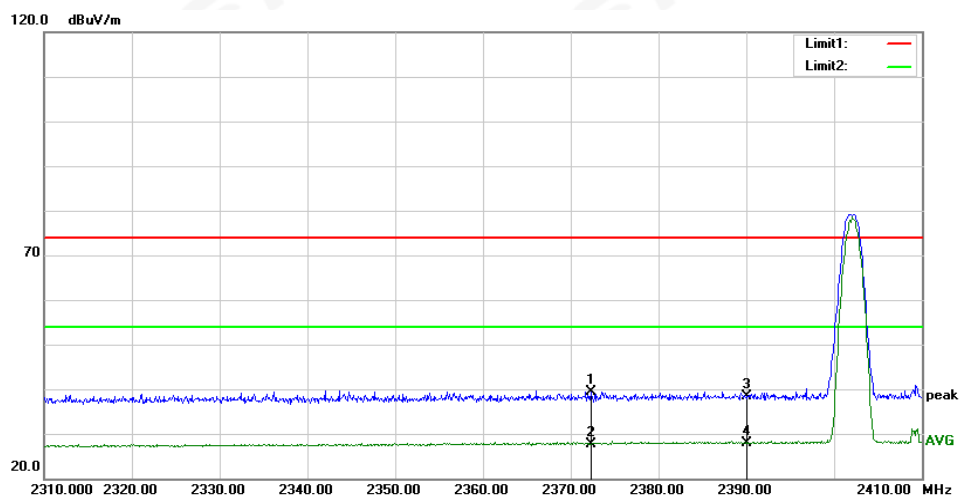


4.6 TEST RESULTS (Restricted Bands Requirements)

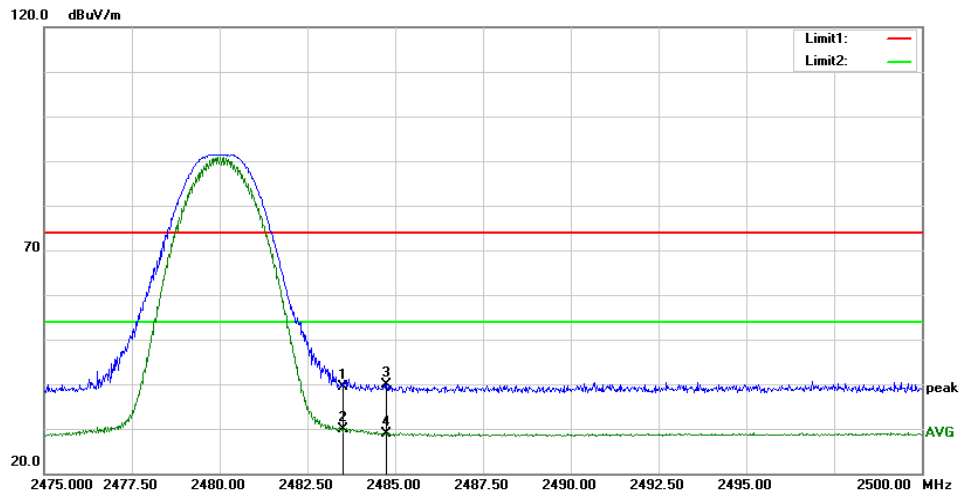
LOW
Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2370.200	39.43	0.66	40.09	74.00	-33.91	peak
2	2370.200	27.25	0.66	27.91	54.00	-26.09	AVG
3	2390.000	37.81	0.81	38.62	74.00	-35.38	peak
4	2390.000	27.20	0.81	28.01	54.00	-25.99	AVG

Vertical

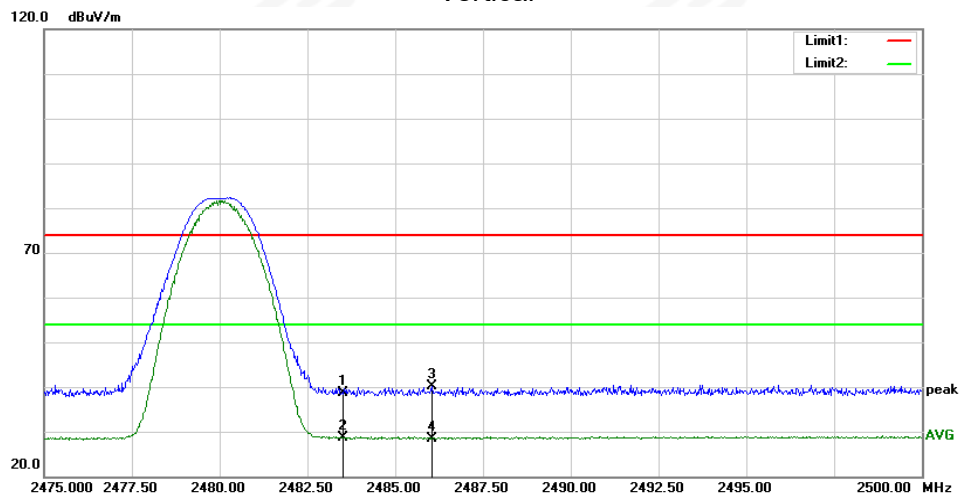


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2372.300	38.77	0.68	39.45	74.00	-34.55	peak
2	2372.300	26.99	0.68	27.67	54.00	-26.33	AVG
3	2390.000	37.47	0.81	38.28	74.00	-35.72	peak
4	2390.000	27.10	0.81	27.91	54.00	-26.09	AVG

HIGH
Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	38.30	1.02	39.32	74.00	-34.68	peak
2	2483.500	28.89	1.02	29.91	54.00	-24.09	AVG
3	2484.750	38.94	1.03	39.97	74.00	-34.03	peak
4	2484.750	27.95	1.03	28.98	54.00	-25.02	AVG

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	37.72	1.02	38.74	74.00	-35.26	peak
2	2483.500	27.52	1.02	28.54	54.00	-25.46	AVG
3	2486.050	39.14	1.02	40.16	74.00	-33.84	peak
4	2486.050	27.43	1.02	28.45	54.00	-25.55	AVG

5. DUTY CYCLE

5.1 TEST STANDARD

Please refer to ANSI C63.10-2020 Section 11.6

5.2 TEST PROCEDURE

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Zero
RB	set RBW to the largest available value
VB	$VBW \geq RBW$.
Detector	Peak
Trace	Clear Write
Sweep Time	Auto

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 5 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

Note: The test data please refer to APPENDIX 1.

6. CONDUCTED SPURIOUS & BAND EDGE EMISSION

6.1 LIMIT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

6.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

For Band edge

Spectrum Parameter	Setting
Detector	Peak
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

6.3 TEST SETUP



The EUT is connected to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth(RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

6.4 EUT OPERATION CONDITIONS

Please refer to section 3.4 of this report.

6.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.

7. POWER SPECTRAL DENSITY TEST

7.1 LIMIT

FCC Part 15.247, Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e)	Power Spectral Density	$\leq 8 \text{ dBm}$ (RBW $\geq 3 \text{ KHz}$)	2400-2483.5	PASS

7.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW to: $100 \text{ kHz} \geq \text{RBW} \geq 3 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

7.3 TEST SETUP



7.4 EUT OPERATION CONDITIONS

Please refer to section 3.4 of this report.

7.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.

8. BANDWIDTH TEST

8.1 LIMIT

FCC Part 15.247, Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

8.2 TEST PROCEDURE

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW $\geq$ 3RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

8.3 TEST SETUP



8.4 EUT OPERATION CONDITIONS

Please refer to section 3.4 of this report.

8.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.



9. PEAK OUTPUT POWER TEST

9.1 LIMIT

FCC Part 15.247, Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Output Power	1 watt or 30dBm	2400-2483.5	PASS

9.2 TEST PROCEDURE

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

$RBW \geq$ DTS bandwidth

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

- Set the $RBW \geq$ DTS bandwidth.
- Set $VBW \geq [3 \times RBW]$.
- Set span $\geq [3 \times RBW]$.
- Sweep time = auto couple.
- Detector = peak.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use peak marker function to determine the peak amplitude level.

9.3 TEST SETUP



9.4 EUT OPERATION CONDITIONS

Please refer to section 3.4 of this report.

9.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.



10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

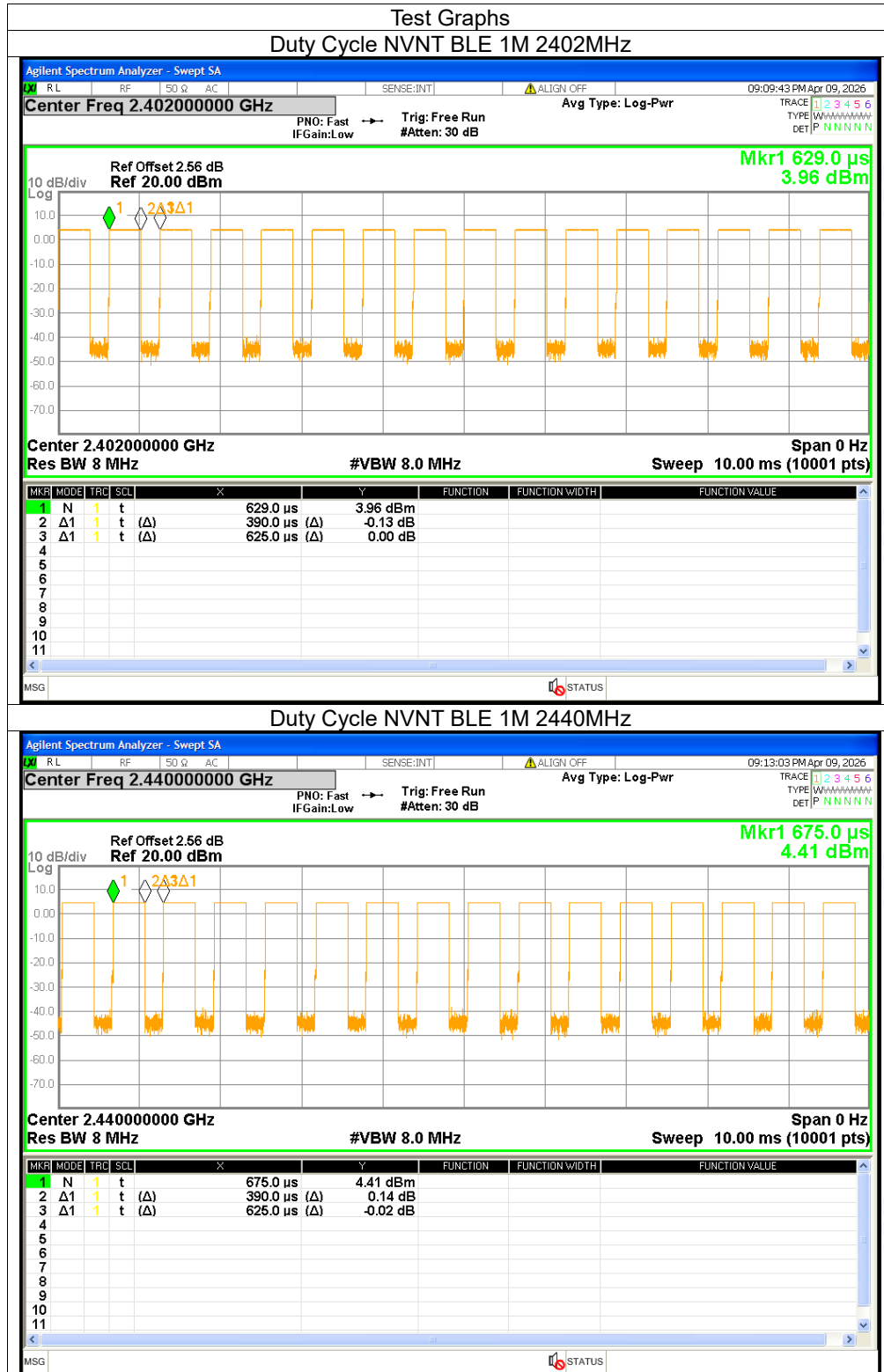
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

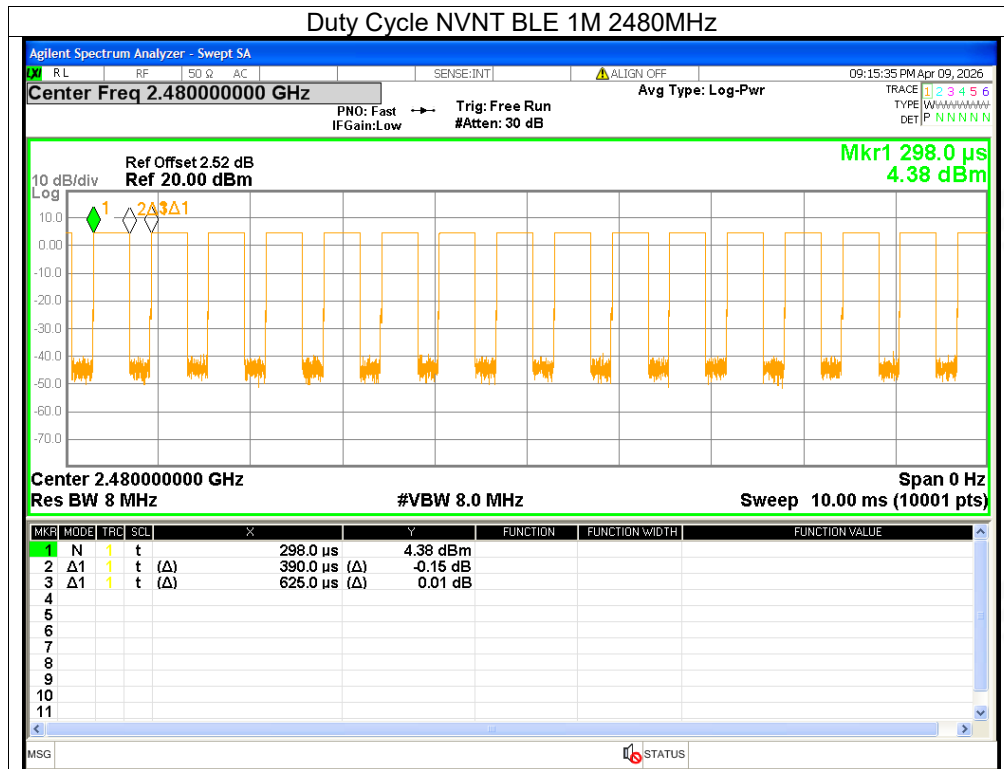
10.2 EUT ANTENNA

The EUT antenna is Multilayer Chip Antenna. It comply with the standard requirement.

**APPENDIX 1-TEST DATA****Duty Cycle**

Condition	Mode	Frequency (MHz)	On Time (ms)	Period (ms)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	0.39	0.625	62.4	2.05	2.56
NVNT	BLE 1M	2440	0.39	0.625	62.4	2.05	2.56
NVNT	BLE 1M	2480	0.39	0.625	62.4	2.05	2.56

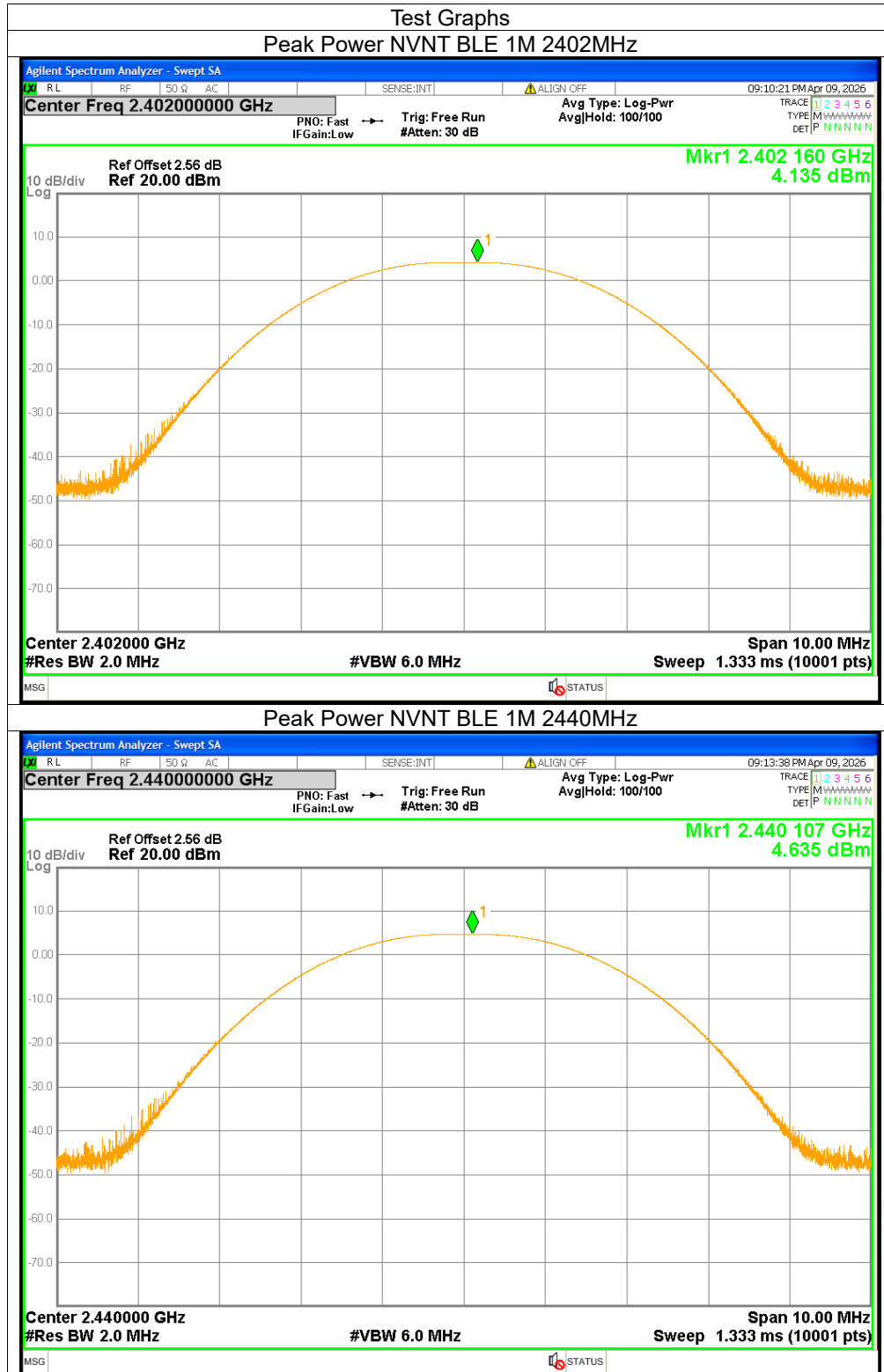


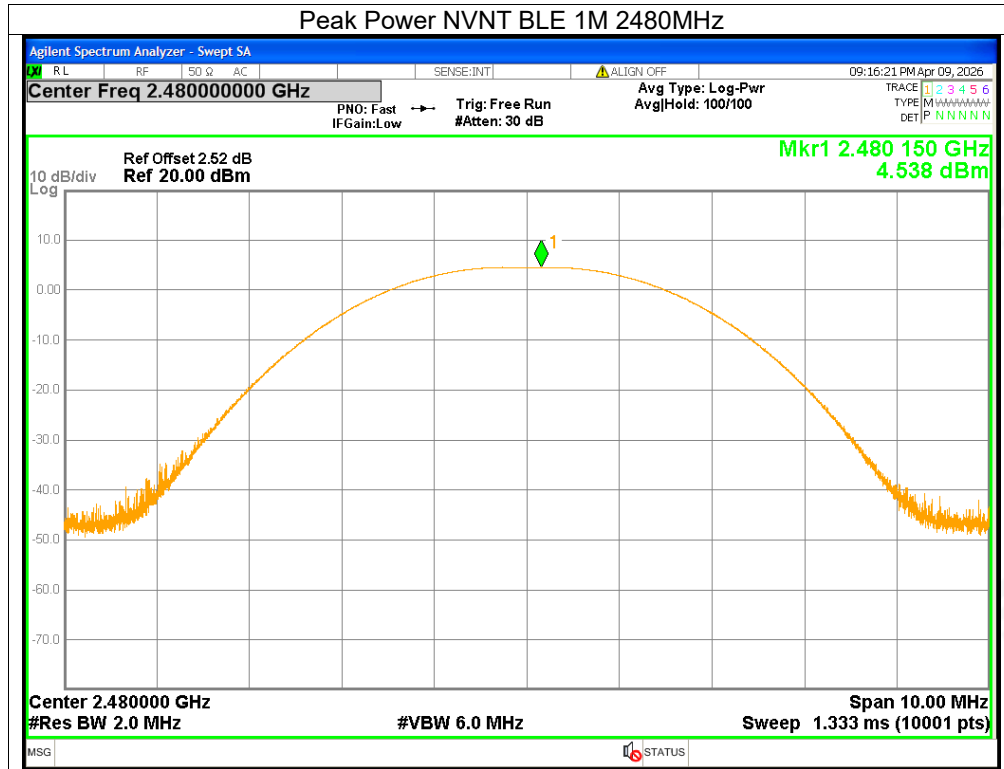




Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	4.14	<=30	Pass
NVNT	BLE 1M	2440	4.64	<=30	Pass
NVNT	BLE 1M	2480	4.54	<=30	Pass

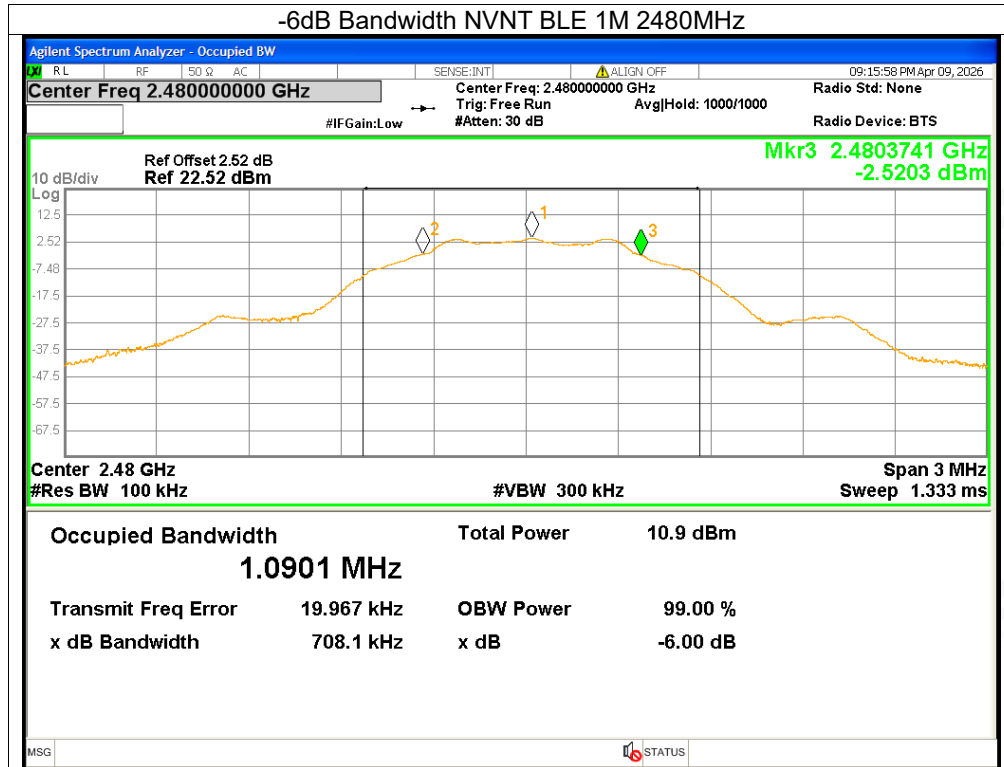




**-6dB Bandwidth**

Condition	Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	0.6784	≥ 0.5	Pass
NVNT	BLE 1M	2440	0.6948	≥ 0.5	Pass
NVNT	BLE 1M	2480	0.7081	≥ 0.5	Pass

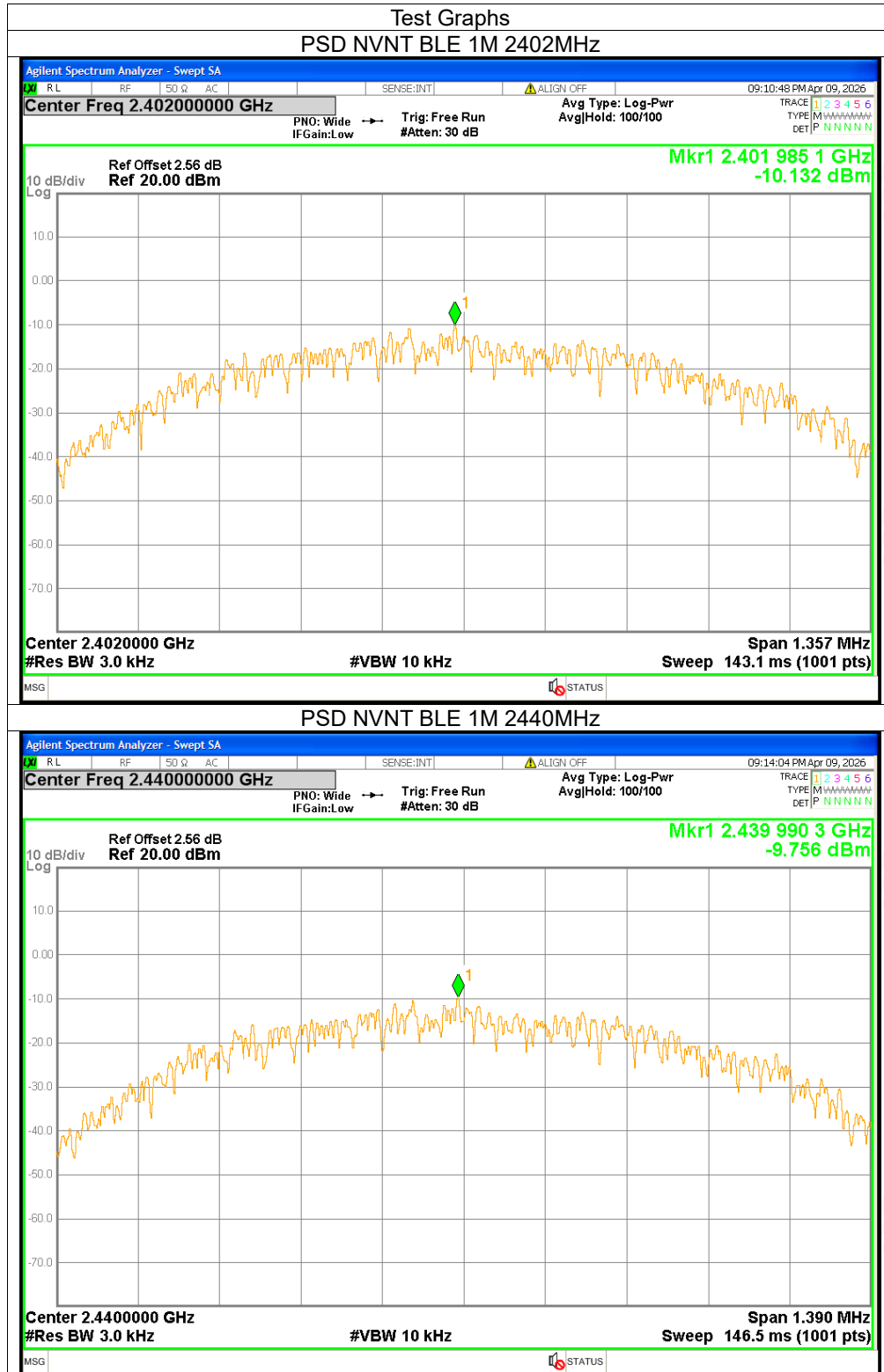


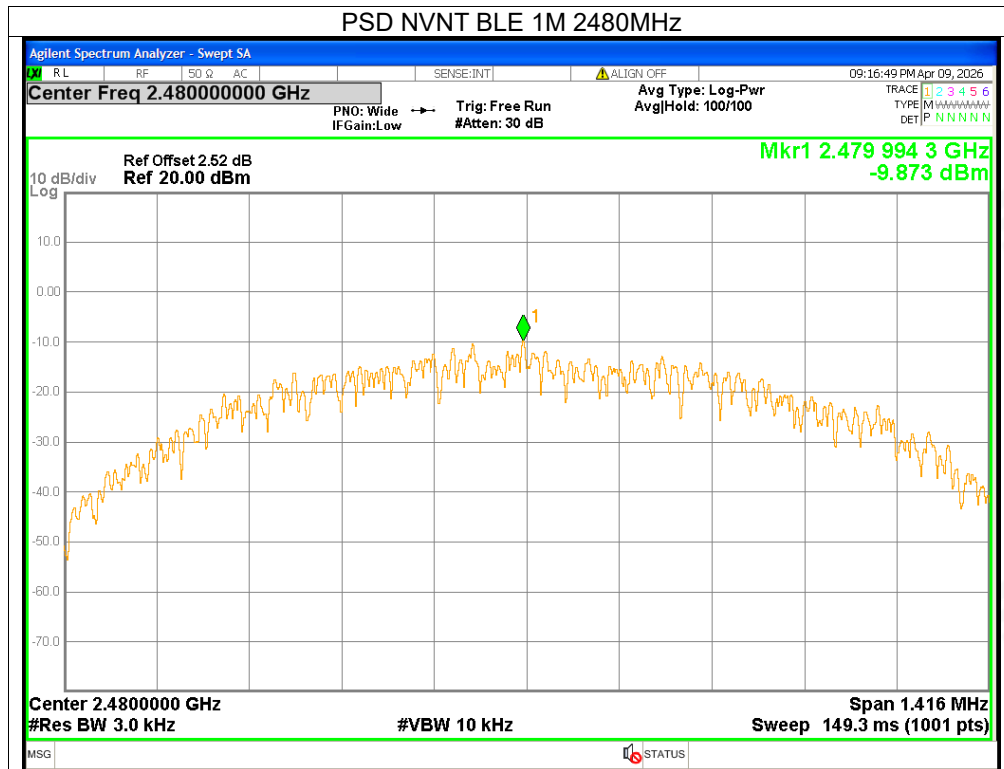




Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	-10.13	<=8	Pass
NVNT	BLE 1M	2440	-9.76	<=8	Pass
NVNT	BLE 1M	2480	-9.87	<=8	Pass

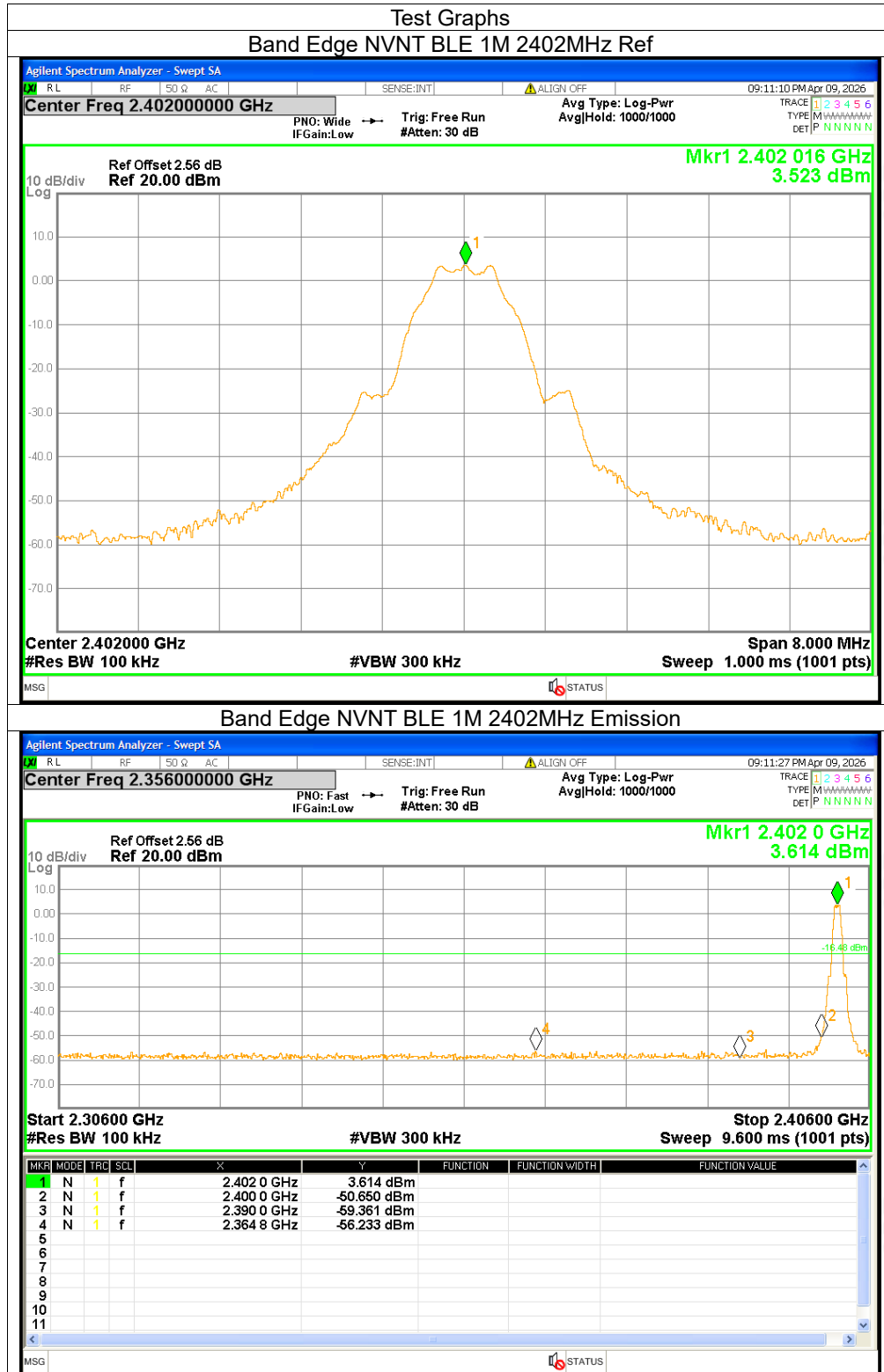


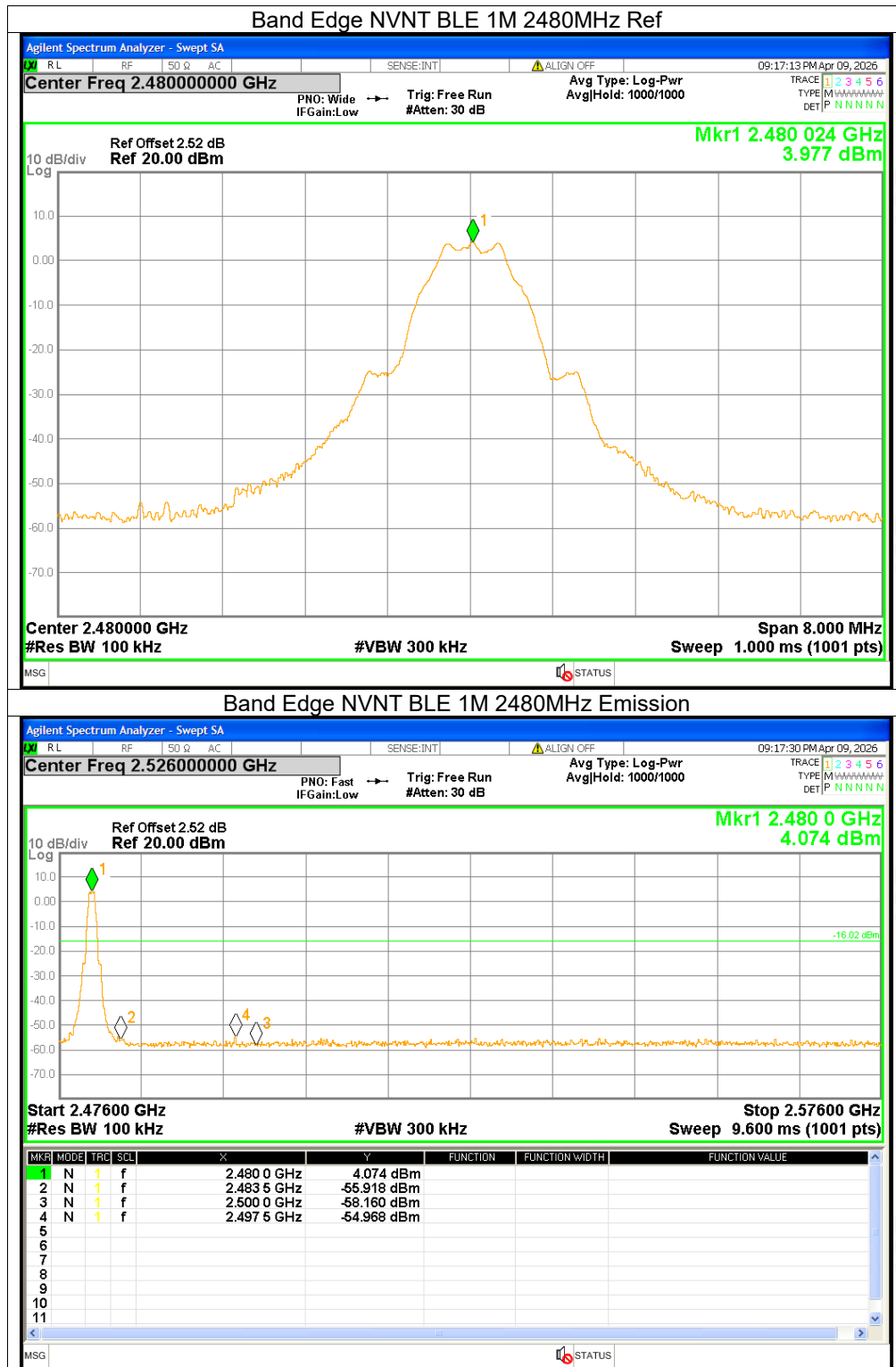




Band Edge

Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	-59.75	≤ -20	Pass
NVNT	BLE 1M	2480	-58.94	≤ -20	Pass

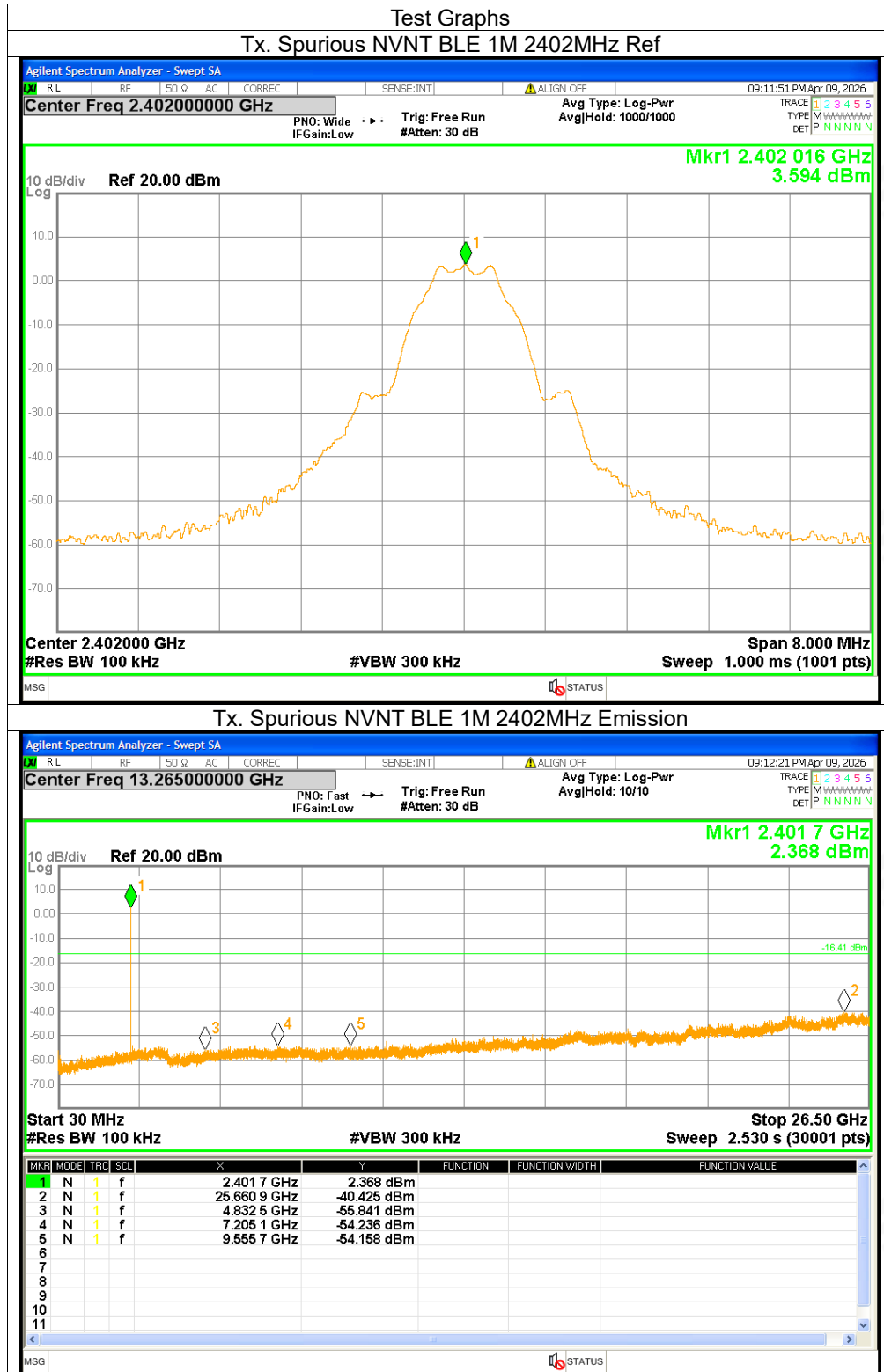


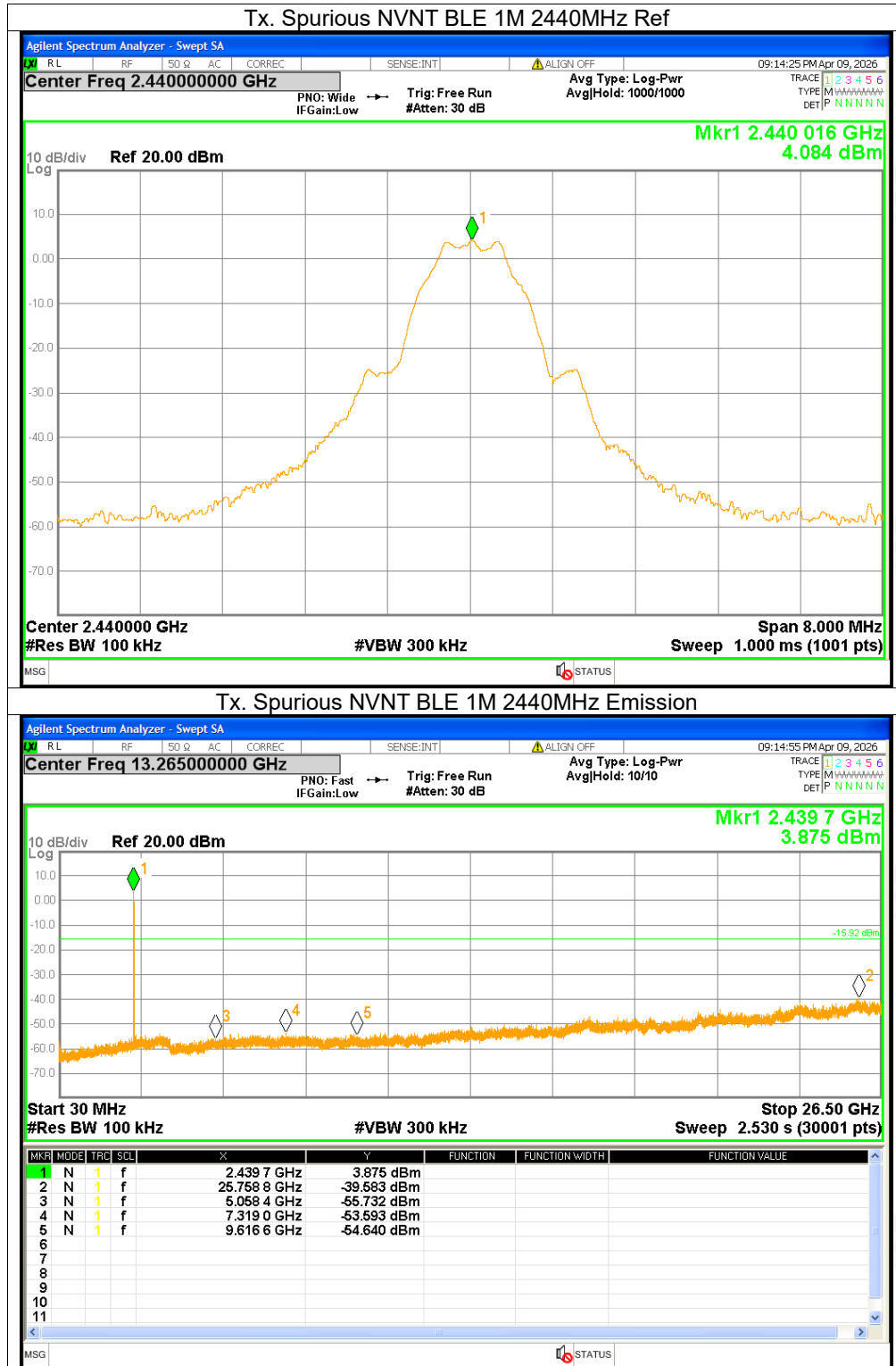


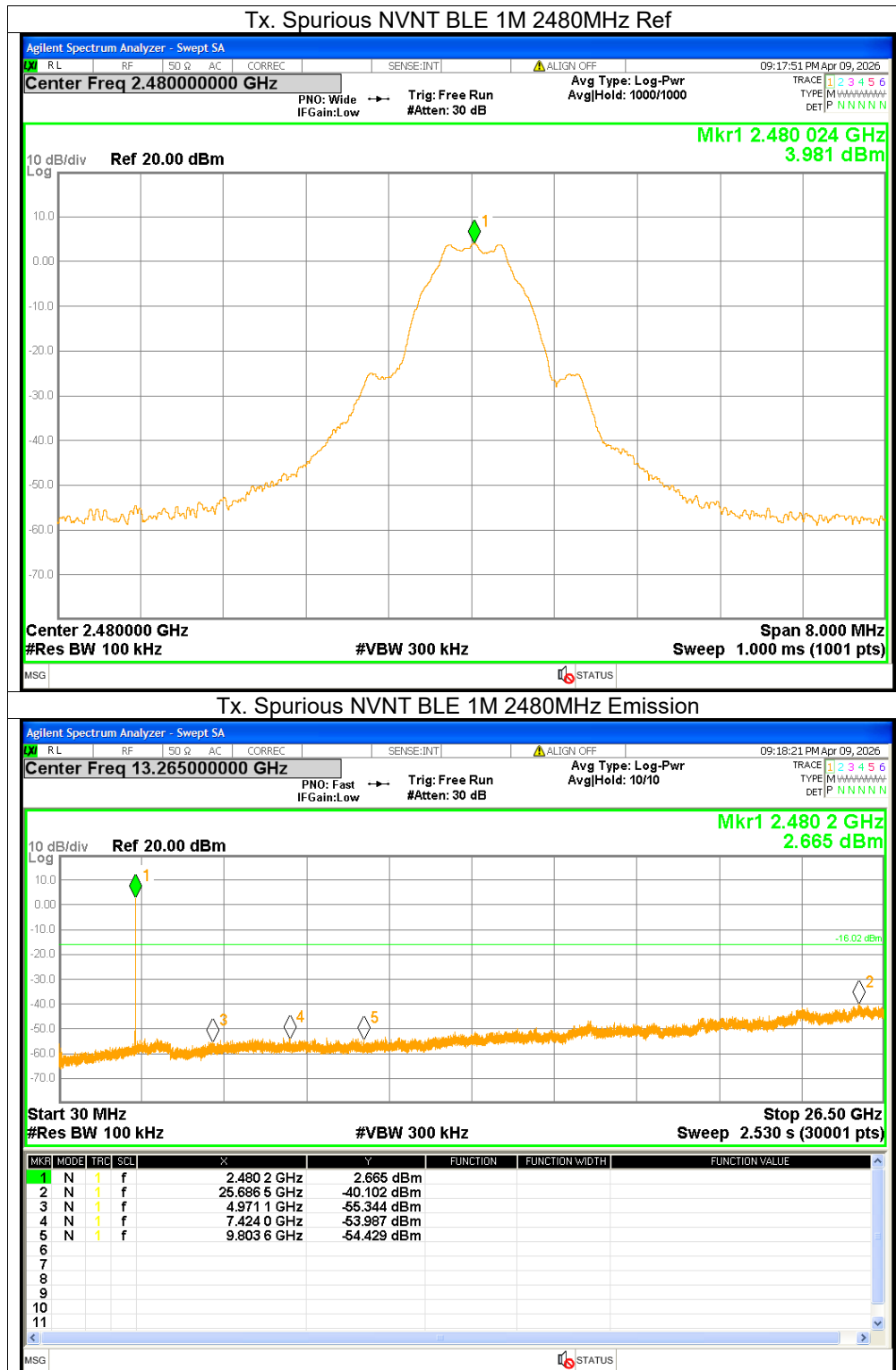


Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	-44.01	<=-20	Pass
NVNT	BLE 1M	2440	-43.66	<=-20	Pass
NVNT	BLE 1M	2480	-44.08	<=-20	Pass









APPENDIX 2- EUT TEST PHOTO

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※