



FCC TEST REPORT

FCC ID:XUJOADDPD1303A

Report Number..... : ZKT-260805L0254E-2

Date of Test..... : Feb. 05, 2026 to Aug. 28, 2026

Date of issue..... : Aug. 28, 2026

Total number of pages..... : 97

Test Result : PASS

Testing Laboratory..... : Shenzhen ZKT Technology Co., Ltd.

Address : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name : Launch Tech Co., Ltd.

Address : No.4012, Launch Industrial Park, North Wuhe Rd, Bantian Street, Longgang District, Shenzhen, China

Manufacturer's name : Launch Tech Co., Ltd.

Address : No.4012, Launch Industrial Park, North Wuhe Rd, Bantian Street, Longgang District, Shenzhen, China

Test specification:

Standard..... : FCC CFR Title 47 Part 15 Subpart C Section 15.247
ANSI C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Erratato
C63.10a-2024

Test procedure..... : /

Non-standard test method : N/A

Test Report Form No..... : TRF-EL-111_V0

Test Report Form(s) Originator..... : ZKT Testing

Master TRF : Dated: 2020-01-06

This device described above has been tested by ZKT, and 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.

This report shall not be reproduced except in full, without the written approval of ZKT, this document may be altered or revised by ZKT, personal only, and shall be noted in the revision of the document.

Product name..... : Automotive Diagnostic Tool

Trademark : LAUNCH

Model/Type reference..... : OADD-PD1303A, X-431 PAD9 ULTRA V2, X-431 PAD9 MAX V2,
OADD-PD1303x (x=A-Z, representing different configurations)

Ratings..... :
Input: 20VDC, 3.25A



Testing procedure and testing location:

Testing Laboratory.....: Shenzhen ZKT Technology Co., Ltd.

Address.....: 1/F, No. 101, Building B, No. 6, Tangwei Community
Industrial Avenue, Fuhai Street, Bao'an District,
Shenzhen, China

Tested by (name + signature).....: Jim Liu

Reviewer (name + signature).....: Jackson Fang

Approved (name + signature).....: Lake Xie





Table of Contents	Page
1. VERSION	5
2. SUMMARY OF TEST RESULTS	6
2.1 TEST FACILITY	7
2.2 MEASUREMENT UNCERTAINTY	7
3. GENERAL INFORMATION	8
3.1 GENERAL DESCRIPTION OF EUT	8
3.2 DESCRIPTION OF TEST MODES	9
3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	10
3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	11
3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	12
4. EMC EMISSION TEST	14
4.1 CONDUCTED EMISSION MEASUREMENT	14
4.1.1 POWER LINE CONDUCTED EMISSION LIMITS	14
4.1.2 TEST PROCEDURE	14
4.1.3 DEVIATION FROM TEST STANDARD	14
4.1.4 TEST SETUP	15
4.1.5 EUT OPERATING CONDITIONS	15
4.1.6 TEST RESULT	16
4.2 RADIATED EMISSION MEASUREMENT	18
4.2.1 RADIATED EMISSION LIMITS	18
4.2.2 TEST PROCEDURE	19
4.2.3 DEVIATION FROM TEST STANDARD	19
4.2.4 TEST SETUP	19
4.2.5 EUT OPERATING CONDITIONS	20
4.2.6 TEST RESULTS	20
5. EMISSIONS AT RESTRICTED BAND	57
5.3 DEVIATION FROM TEST STANDARD	58
5.4 TEST SETUP	59
5.5 EUT OPERATING CONDITIONS	59
5.6 TEST RESULTS	59
6. POWER SPECTRAL DENSITY TEST	60
6.1 APPLIED PROCEDURES / LIMIT	60
6.2 TEST PROCEDURE	60
6.3 DEVIATION FROM STANDARD	60
6.4 TEST SETUP	60
6.5 EUT OPERATION CONDITIONS	60



Table of Contents	Page
6.6 TEST RESULT	60
7. 6DB OCCUPIED BANDWIDTH	61
7.1 APPLIED PROCEDURES / LIMIT	61
7.2 TEST PROCEDURE	61
7.3 DEVIATION FROM STANDARD	61
7.4 TEST SETUP	61
7.5 EUT OPERATION CONDITIONS	61
7.6 TEST RESULT	61
8. PEAK OUTPUT POWER TEST	62
8.1 APPLIED PROCEDURES / LIMIT	62
8.2 TEST PROCEDURE	62
8.3 DEVIATION FROM STANDARD	62
8.4 TEST SETUP	62
8.5 EUT OPERATION CONDITIONS	62
8.6 TEST RESULT	62
9. CONDUCTED BAND EDGE AND SPURIOUS EMISSION	63
9.1 APPLICABLE STANDARD	63
9.2 TEST PROCEDURE	63
9.3 DEVIATION FROM STANDARD	64
9.4 TEST SETUP	64
9.5 EUT OPERATION CONDITIONS	64
9.6 TEST RESULTS	64
10. DUTY CYCLE	65
10.1 APPLIED PROCEDURES / LIMIT	65
10.2 DEVIATION FROM STANDARD	65
10.3 TEST SETUP	65
10.4 EUT OPERATION CONDITIONS	65
10.5 TEST RESULTS	65
11. ANTENNA REQUIREMENT	66
12. APPENDIX 1-TEST DATA	67
13. TEST SETUP PHOTO	97
14. EUT CONSTRUCTIONAL DETAILS	97



1. VERSION

Report No.	Version	Description	Approved
ZKT-260805L0254E-2	Rev.01	Initial issue of report	Aug. 28, 2026



2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
FCC part 15.203/15.247(c)	Antenna requirement	PASS	
FCC part 15.207	AC Power Line Conducted Emission	PASS	
FCC part 15.247 (b)(3)	Conducted Peak Output Power	PASS	
FCC part 15.247 (a)(2)	6DB Occupied Bandwidth	PASS	
FCC part 15.247 (e)	Power Spectral Density	PASS	
FCC part 15.247 (d)	Conducted Band Edge & Unwanted Spurious Emission	PASS	
FCC part 15.205/15.209	Radiated Band Edge & Unwanted Spurious Emission	PASS	
ANSI C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Erratato C63.10a-2024	Duty Cycle	PASS	

NOTE:
1) “N/A” denotes test is not applicable in this Test Report



2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.

Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 927491

Designation Number: CN1431

IC Registered No.: 27033

CAB identifier: CN0110

Designation Number: CN0110

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded 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	3m chamber Radiated spurious emission (9KHz-30MHz)	U=4.5dB
2	3m chamber Radiated spurious emission (30MHz-1GHz)	U=4.8dB
3	3m chamber Radiated spurious emission (1GHz-6GHz)	U=4.9dB
4	3m chamber Radiated spurious emission (6GHz-40GHz)	U=5.0dB
5	Conducted Disturbance	U=3.2dB
6	RF Band Edge	U=1.68dB
7	RF Power Conducted	U=1.86dB
8	RF Conducted Spurious Emission	U=2.2dB
9	RF Occupied Bandwidth	U=1.8MHz
10	RF Power Spectral Density	U=1.75dB
11	Humidity Uncertainty	U=5.3%
12	Temperature Uncertainty	U=0.59°C



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Product Name:	Automotive Diagnostic Tool
Trade Mark:	LAUNCH
Model No.:	OADD-PD1303A
Module number:	MT6637X
Serial No.:	X-431 PAD9 ULTRA V2, X-431 PAD9 MAX V2, OADD-PD1303x (x=A-Z, representing different configurations)
Model Different.:	The color of the rubber sleeve or shell is different. OADD-PD1303A: red and black rubber sleeve, black shell; X-431 PAD9 ULTRA V2: all black; X-431 PAD9 MAX V2: black rubber sleeve, red shell
Hardware Version:	V2.0
Software Version:	V2.1.01
Sample Number.:	260805L0254-1
Sample(s) Status:	Engineer sample
Operation Frequency:	2402MHz~2480MHz
Channel Numbers:	40 Channels
Channel Spacing:	2MHz
Modulation Technology:	GFSK
Antenna Type:	FPC Antenna
Antenna Gain:	1.64dBi
Power Supply:	Input: 20VDC, 3.25A
Adapter	Model: XDJG651R-PD Brand: XINDEJIA Input: 100-240V~ 50/60Hz 1.8A Output: 5.0VDC 3.0A 15.0W / 9.0VDC 3.0A 27.0W / 12.0VDC 3.0A 36.0W / 15.0VDC 3.0A 45.0W / 20.0VDC 3.25A 65.0W
Battery	Model: PAD9 V2 Rated Voltage: 7.6V Charge Limit Voltage: 8.7V Capacity: 9360mAh Manufacturer: Shenzhen Cholipower Technology Co., LTD.

Note1: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

Note2: The EUT's all information provided by client.



Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402 MHz	11	2422 MHz	21	2442 MHz	31	2462 MHz
2	2404 MHz	12	2424 MHz	22	2444 MHz	32	2464 MHz
3	2406 MHz	13	2426 MHz	23	2446 MHz	33	2466 MHz
4	2408 MHz	14	2428 MHz	24	2448 MHz	34	2468 MHz
5	2410 MHz	15	2430 MHz	25	2450 MHz	35	2470 MHz
6	2412 MHz	16	2432 MHz	26	2452 MHz	36	2472 MHz
7	2414 MHz	17	2434 MHz	27	2454 MHz	37	2474 MHz
8	2416 MHz	18	2436 MHz	28	2456 MHz	38	2476 MHz
9	2418 MHz	19	2438 MHz	29	2458 MHz	39	2478 MHz
10	2420 MHz	20	2440 MHz	30	2460 MHz	40	2480 MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2440MHz
The Highest channel	2480MHz

3.2 DESCRIPTION OF TEST MODES

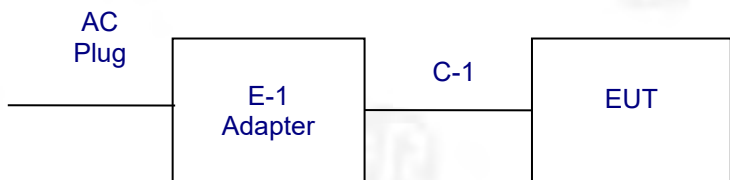
Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data. For battery operated equipment, the equipment tests shall be performed using a new battery.	

Test Software & Version	Engineering mode
Mode	Power setting
BLE 2M - GFSK	7



3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

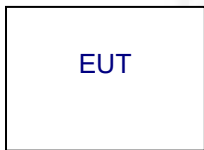
Conducted Emission



Radiated Emission



Conducted Spurious





3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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	Adapter	XINDEJIA	XDJG651R-PD	N/A
C-1	USB Cable	LAUNCH	N/A	N/A

Item	Equipment	Mfr/Brand	Length	Note
C-1	Shielded	NO	150cm	N/A

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conduction Emissions Test

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	N/A	Sep. 23, 2025	Sep. 22, 2026
2	LISN	CYBERTEK	EM5040A	E1850400149	N/A	Sep. 19, 2025	Sep. 18, 2026
3	Test Cable	N/A	C-01	N/A	N/A	May 25, 2025 May 25, 2026	May 24, 2026 May 24, 2027
4	EMI Test Receiver	R&S	ESCI3	101393	4.42 SP3	Oct. 24, 2025	Oct. 23, 2026
5	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	N/A	\	\

Radiation Emissions & Radiation Spurious Emissions Test

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	N9020A	MY55370835	A.17.05	Sep. 20, 2025	Sep. 19, 2026
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Sep. 20, 2025	Sep. 19, 2026
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	100969	4.32	Oct. 24, 2025	Oct. 23, 2026
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	00877	N/A	Sep. 20, 2025	Sep. 19, 2026
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	N/A	Sep. 20, 2025	Sep. 19, 2026
6	Horn Antenna (15GHz-40GHz)	A.H.System	SAS-574	588	N/A	Sep. 30, 2025	Sep. 29, 2026
7	Loop Antenna	TESEQ	HLA6121	58357	N/A	Sep. 20, 2025	Sep. 19, 2026
8	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	60747	N/A	Sep. 19, 2025	Sep. 18, 2026
9	Amplifier (1GHz-26.5GHz)	HuiPu	8449B	3008A00315	N/A	Sep. 19, 2025	Sep. 18, 2026
10	Amplifier (500MHz-40GHz)	QuanJuDa	DLE-161	097	N/A	Oct. 24, 2025	Oct. 23, 2026
11	Test Cable	N/A	R-01	N/A	N/A	May 25, 2025 May 25, 2026	May 24, 2026 May 24, 2027
12	Test Cable	N/A	R-02	N/A	N/A	May 25, 2025 May 25, 2026	May 24, 2026 May 24, 2027
13	Test Cable	N/A	R-03	N/A	N/A	May 25, 2025 May 25, 2026	May 24, 2026 May 24, 2027
14	D.C. Power Supply	LongWei	TPR-6405D	N/A	N/A	\	\
15	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	N/A	\	\
16	Turntable	MF	MF-7802BS	N/A	N/A	\	\
17	Antenna tower	MF	MF-7802BS	N/A	N/A	\	\



RF Conducted Test

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	N9020A	MY55370835	A.17.05	Sep. 20, 2025	Sep. 19, 2026
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Sep. 20, 2025	Sep. 19, 2026
3	Test Cable	N/A	RF-01	N/A	N/A	May 25, 2025 May 25, 2026	May 24, 2026 May 24, 2027
4	Test Cable	N/A	RF-02	N/A	N/A	May 25, 2025 May 25, 2026	May 24, 2026 May 24, 2027
5	Test Cable	N/A	RF-03	N/A	N/A	May 25, 2025 May 25, 2026	May 24, 2026 May 24, 2027
6	ESG Signal Generator	Agilent	E4421B	GB40051203	B.03.84	Sep. 19, 2025	Sep. 18, 2026
7	Signal Generator	Agilent	N5182A	MY47420215	A.01.87	Sep. 20, 2025	Sep. 19, 2026
8	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	N/A	Sep. 25, 2025	Sep. 24, 2026
9	SHIELD BOX	TESCOM	TC-5970C	5970C015553	N/A	Dec. 18, 2025	Dec. 17, 2026
10	Wideband Radio Communication Test	R&S	CMW500	106504	V 3.7.22	Sep. 28, 2025	Sep. 27, 2026
11	MWRF Power Meter Test system	MW	MW100-R FCB	10371	N/A	Sep. 19, 2025	Sep. 18, 2026
12	MWRF Power Sensor	MW	MW100-P SB	10371	N/A	Sep. 19, 2025	Sep. 18, 2026
13	Power Meter	KEYSIGHT	N1912AP	926431	A.05.00	Sep. 19, 2025	Sep. 18, 2026
14	D.C. Power Supply	LongWei	TPR-6405 D	GQ7516	N/A	Sep. 19, 2025	Sep. 18, 2026
15	Attenuators	XINQY	XQY-SMAJ KS-12-2W	N/A	N/A	Sep. 19, 2025	Sep. 18, 2026
16	RF Software	MW	MTS8310	V2.0.0.0	N/A	\	\



4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Erratato C63.10a-2024
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quas-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) *Decreases with the logarithm of the frequency.

4.1.2 TEST PROCEDURE

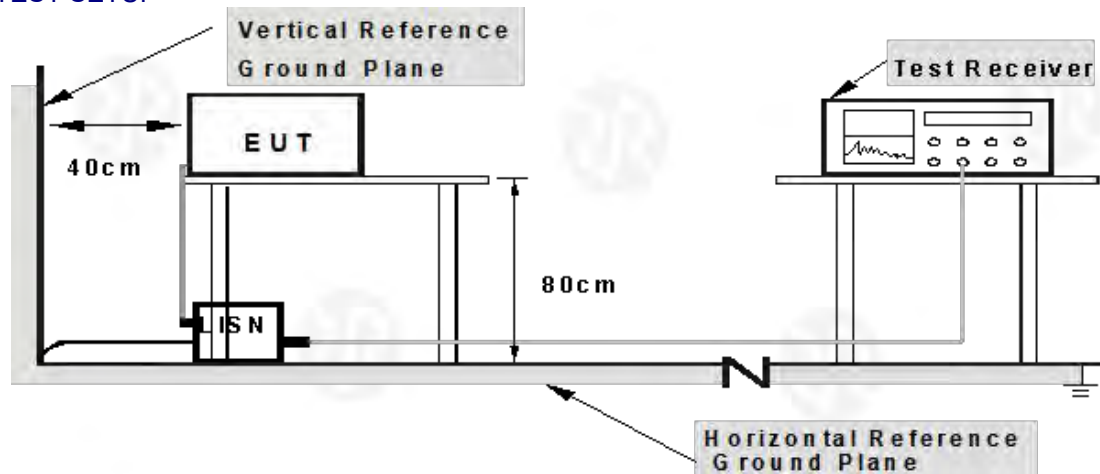
- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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 at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation



4.1.4 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 from other units and other metal planes

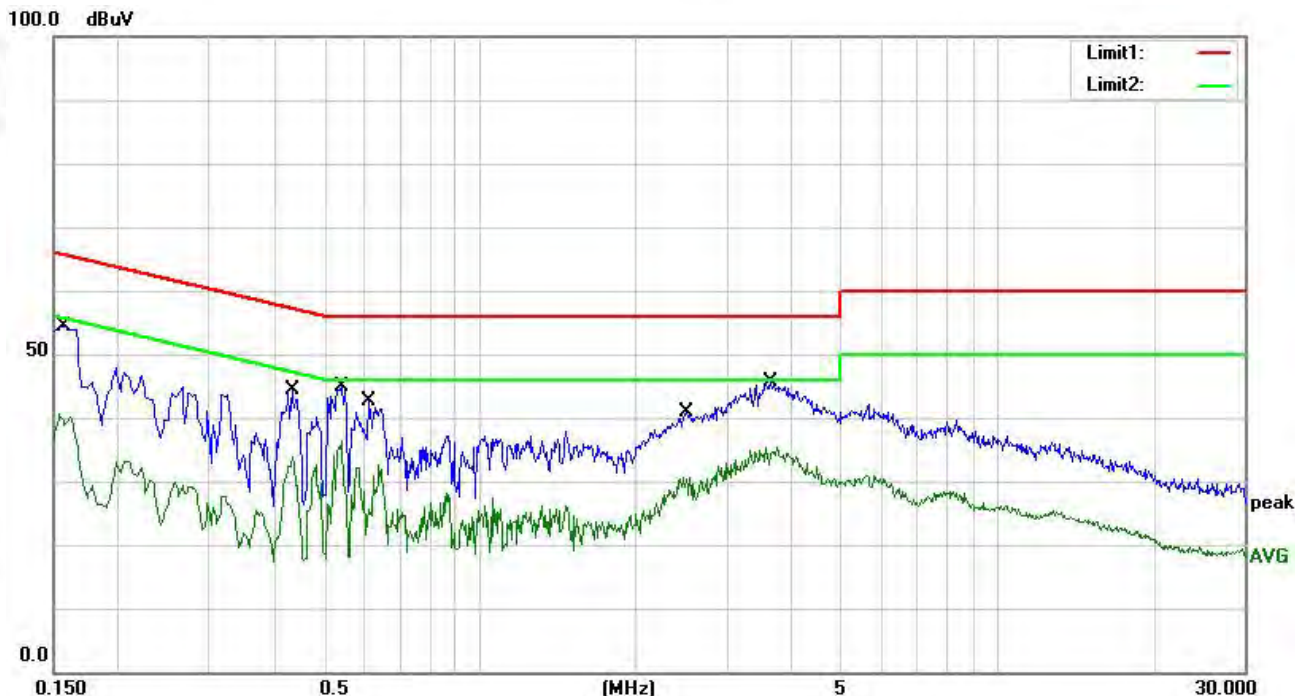
4.1.5 EUT OPERATING CONDITIONS

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.



4.1.6 TEST RESULT

Temperature:	25.1°C	Relative Humidity:	59%
Pressure:	101 kPa	Polarization:	L
Test Voltage:	AC 120V/60Hz	Test Mode:	TX GFSK - 2440MHz



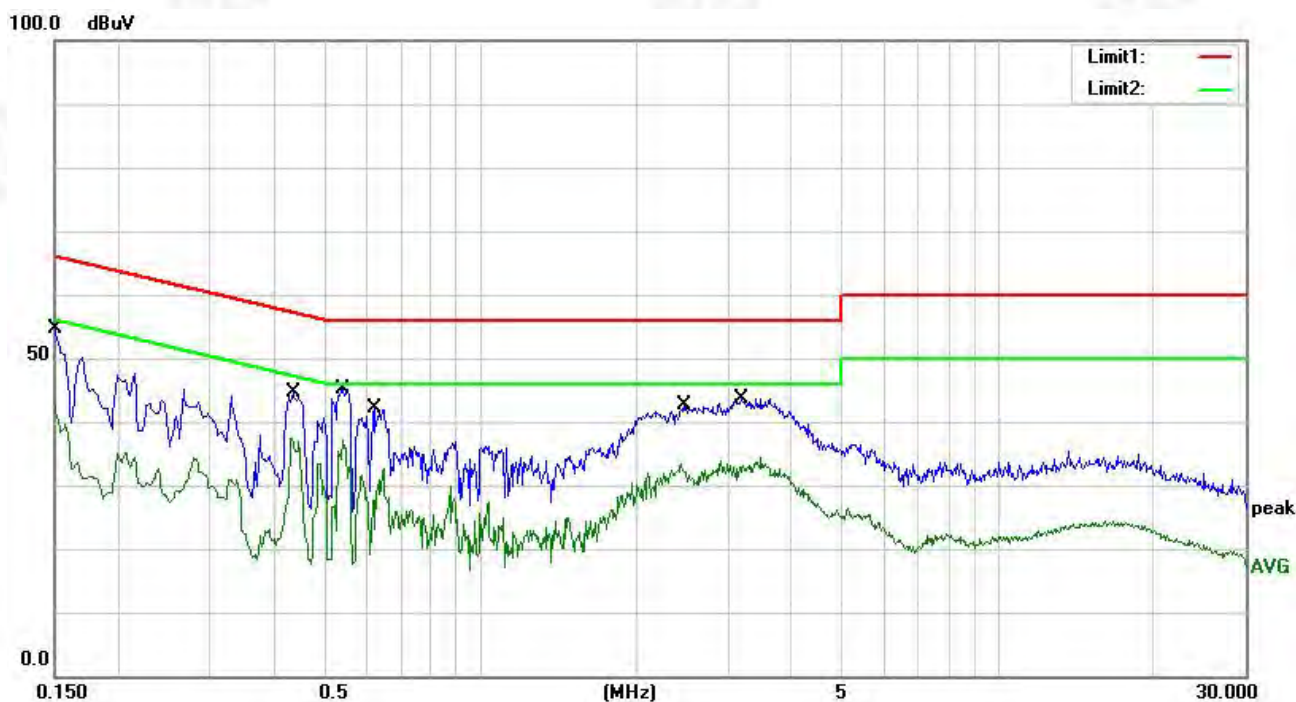
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1580	35.10	19.37	54.47	65.57	-11.10	QP
2	0.1580	21.18	19.37	40.55	55.57	-15.02	AVG
3	0.4340	24.94	19.39	44.33	57.18	-12.85	QP
4	0.4340	14.53	19.39	33.92	47.18	-13.26	AVG
5	0.5420	25.58	19.39	44.97	56.00	-11.03	QP
6	0.5420	16.96	19.39	36.35	46.00	-9.65	AVG
7	0.6100	23.13	19.38	42.51	56.00	-13.49	QP
8	0.6100	13.25	19.38	32.63	46.00	-13.37	AVG
9	2.5100	21.45	19.38	40.83	56.00	-15.17	QP
10	2.5100	11.26	19.38	30.64	46.00	-15.36	AVG
11	3.6500	26.19	19.41	45.60	56.00	-10.40	QP
12	3.6500	15.93	19.41	35.34	46.00	-10.66	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Reading level + Correct Factor.
4. Correct Factor= Liscn factor+ Cable loss factor + limiter factor.
5. Margin= Measurement Level-Limit.
6. The test data shows only the worst case GFSK 2440MHz.



Temperature:	25.1°C	Relative Humidity:	59%
Pressure:	101 kPa	Polarization:	N
Test Voltage:	AC 120V/60Hz	Test Mode:	TX GFSK - 2440MHz



	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1500	35.18	19.42	54.60	66.00	-11.40	QP
2	0.1500	23.14	19.42	42.56	56.00	-13.44	AVG
3	0.4340	25.20	19.35	44.55	57.18	-12.63	QP
4	0.4340	18.10	19.35	37.45	47.18	-9.73	AVG
5	0.5420	25.87	19.35	45.22	56.00	-10.78	QP
6	0.5420	17.82	19.35	37.17	46.00	-8.83	AVG
7	0.6220	22.74	19.38	42.12	56.00	-13.88	QP
8	0.6220	13.24	19.38	32.62	46.00	-13.38	AVG
9	2.4660	23.11	19.42	42.53	56.00	-13.47	QP
10	2.4660	13.86	19.42	33.28	46.00	-12.72	AVG
11	3.1740	24.24	19.46	43.70	56.00	-12.30	QP
12	3.1740	14.81	19.46	34.27	46.00	-11.73	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Reading level + Correct Factor.
4. Correct Factor= Lish factor+ Cable loss factor + limiter factor.
5. Margin= Measurement Level-Limit.
6. The test data shows only the worst case GFSK 2440MHz.



4.2 RADIATED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Erratato C63.10a-2024				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Average	1MHz	3MHz	Average

4.2.1 RADIATED EMISSION LIMITS

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT

Frequency (MHz)	Limit (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).



4.2.2 TEST PROCEDURE

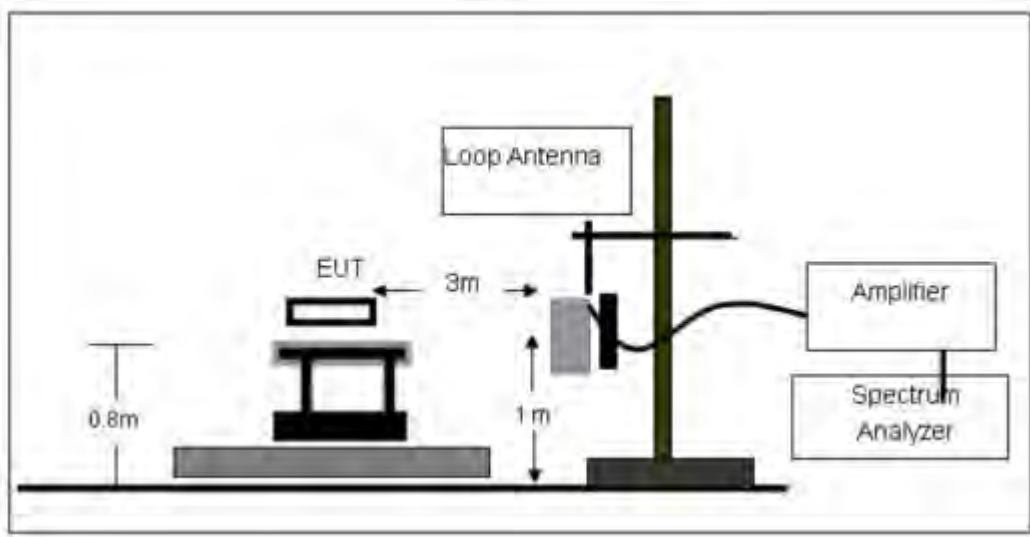
- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8m; above 1GHz, the height was 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.
- g. For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
Note:
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

4.2.3 DEVIATION FROM TEST STANDARD

No deviation

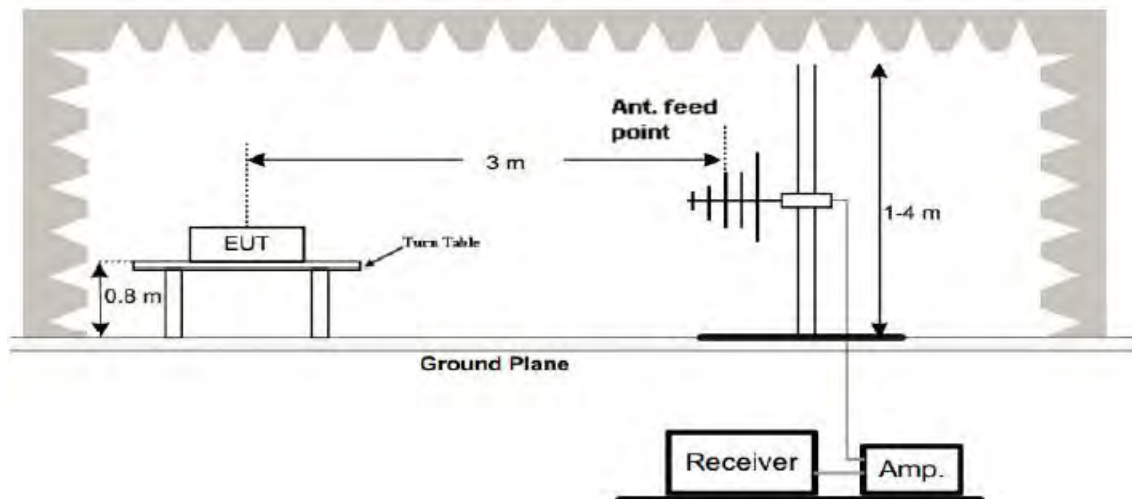
4.2.4 TEST SETUP

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

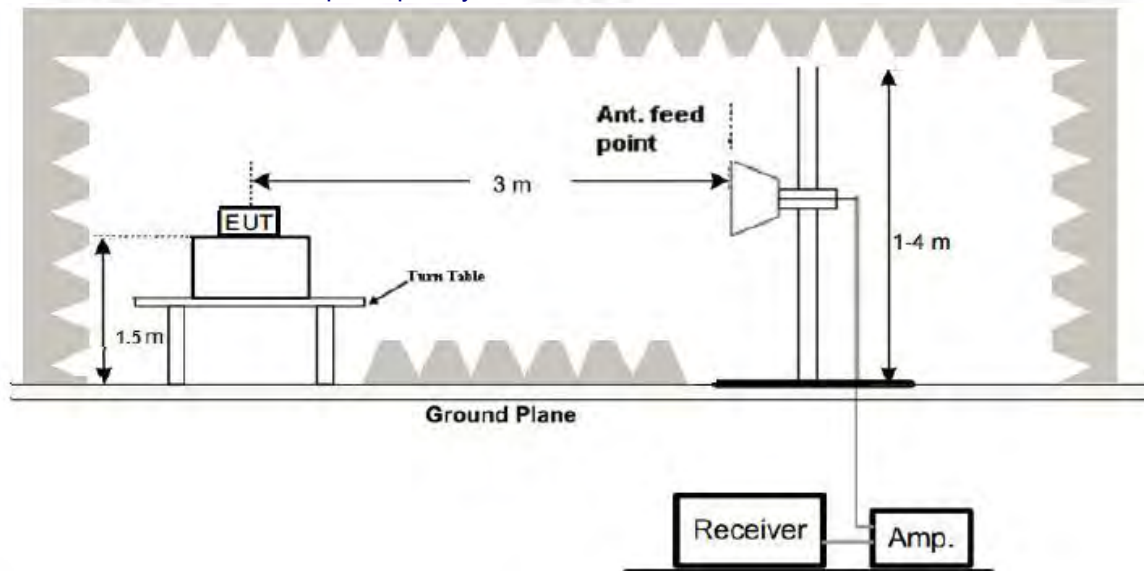




(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



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



4.2.5 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.

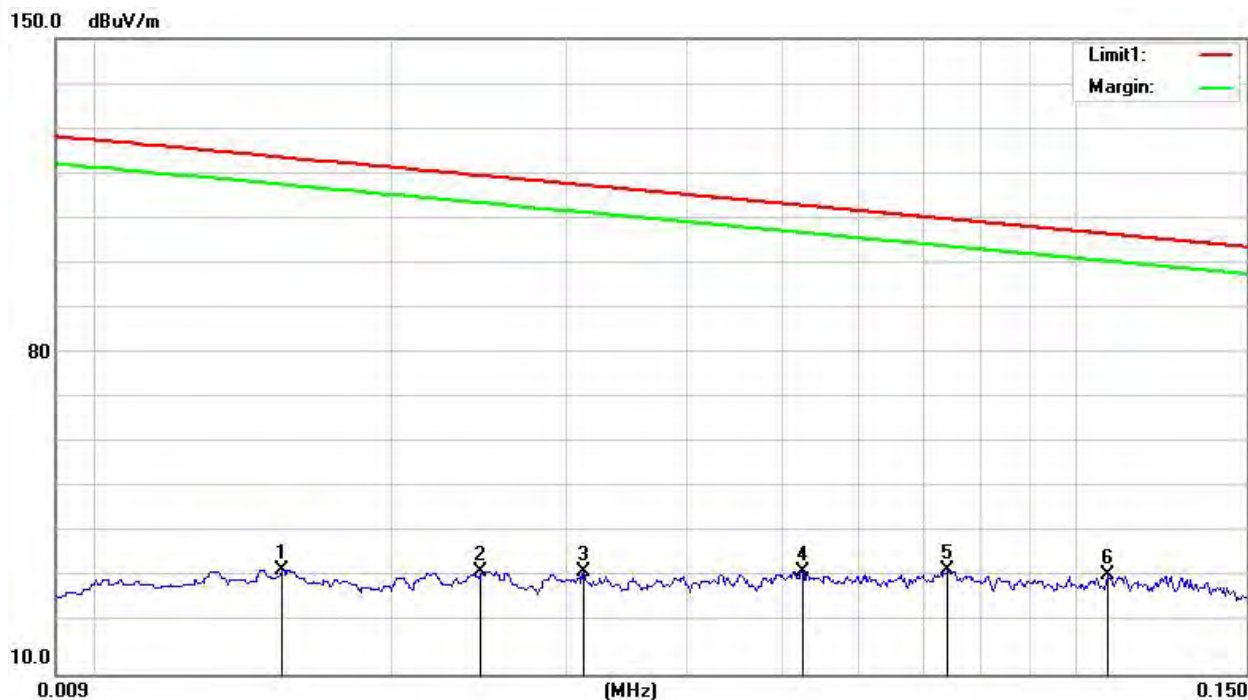
4.2.6 TEST RESULTS



a, Between 9KHz – 30 MHz

BLE 1M
9KHz-150KHz

Temperature	23.4°C	Relative Humidity:	60%RH
Test Voltage	DC 7.6V	Polarization:	Coxial
Test Mode	GFSK - 2440MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0154	13.10	19.77	32.87	123.85	-90.98	AVG
2	0.0246	12.68	20.01	32.69	119.79	-87.10	AVG
3	0.0313	12.86	19.87	32.73	117.69	-84.96	AVG
4	0.0526	13.28	19.43	32.71	113.18	-80.47	AVG
5	0.0740	14.02	18.83	32.85	110.22	-77.37	AVG
6	0.1080	14.18	17.58	31.76	106.94	-75.18	QP

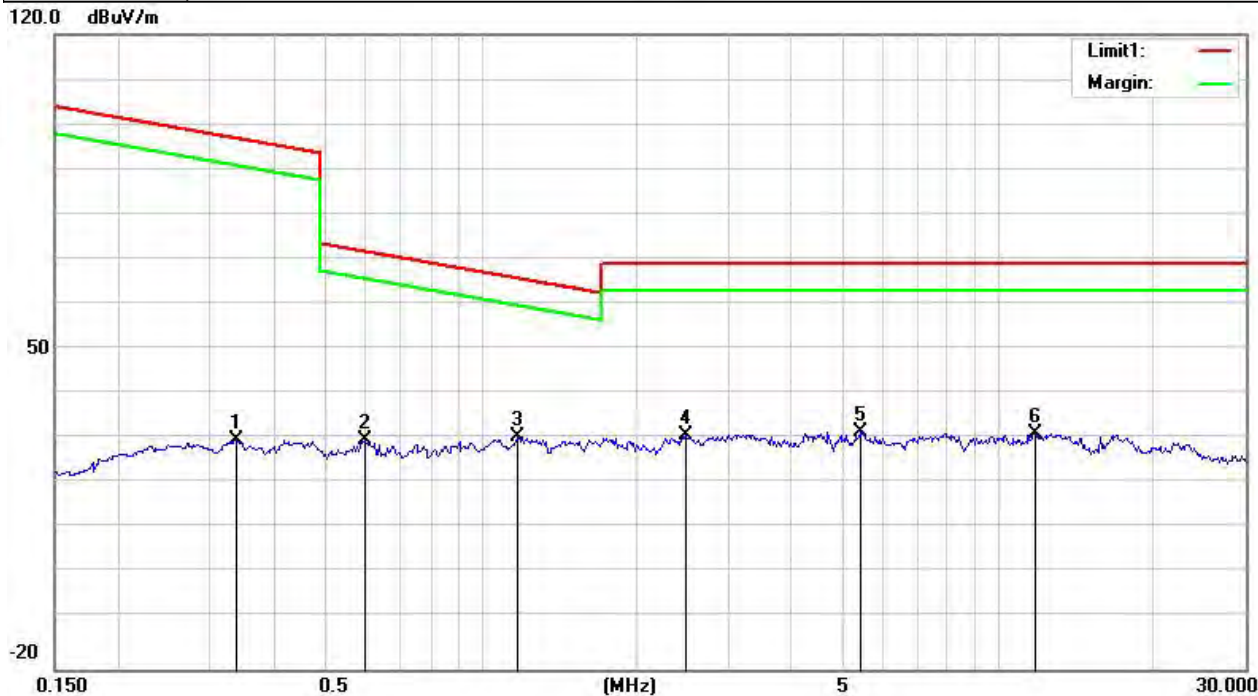
Notes:

1. Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);
2. Limit line = specific limits (dBuV) + distance extrapolation factor.
3. Mode of BLE 1Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 1Mbps.



150KHz-30MHz

Temperature	23.4°C	Relative Humidity:	60%RH
Test Voltage	DC 7.6V	Polarization:	Coxial
Test Mode	GFSK - 2440MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.3356	10.40	20.13	30.53	97.09	-66.56	AVG
2	0.5977	10.17	20.24	30.41	72.07	-41.66	QP
3	1.1713	11.04	20.23	31.27	66.23	-34.96	QP
4	2.4868	11.24	20.25	31.49	69.50	-38.01	QP
5	5.4035	11.93	20.48	32.41	69.50	-37.09	QP
6	11.7614	11.41	20.59	32.00	69.50	-37.50	QP

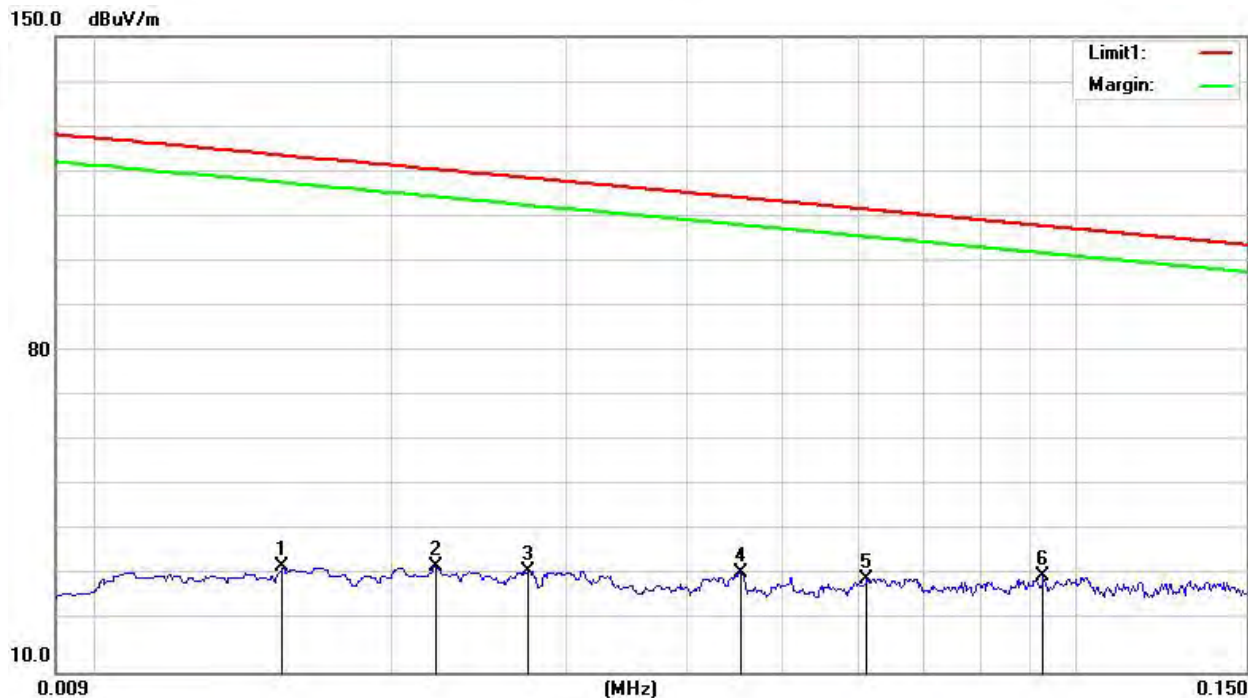
Notes:

1. Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);
2. Limit line = specific limits (dBuV) + distance extrapolation factor.
3. Mode of BLE 1Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 1Mbps.



9KHz-150KHz

Temperature	23.4°C	Relative Humidity:	60%RH
Test Voltage	DC 7.6V	Polarization:	Coplanar
Test Mode	GFSK - 2440MHz		



No.	Frequency (KHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0154	13.60	19.77	33.37	123.85	-90.48	AVG
2	0.0221	13.21	20.06	33.27	120.72	-87.45	AVG
3	0.0275	12.38	19.95	32.33	118.82	-86.49	AVG
4	0.0454	12.19	19.59	31.78	114.46	-82.68	AVG
5	0.0611	11.43	19.19	30.62	111.88	-81.26	AVG
6	0.0926	13.37	17.96	31.33	108.27	-76.94	QP

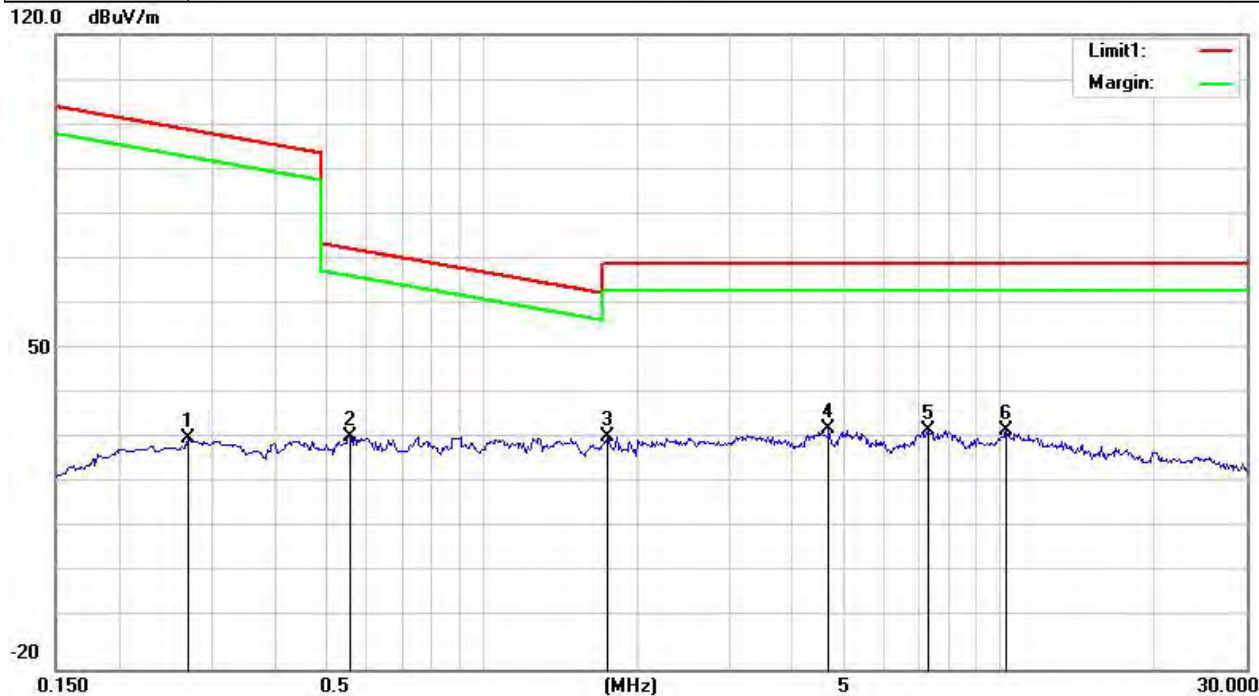
Notes:

1. Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);
2. Limit line = specific limits (dBuV) + distance extrapolation factor.
3. Mode of BLE 1Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 1Mbps.



150KHz-30MHz

Temperature	23.4°C	Relative Humidity:	60%RH
Test Voltage	DC 7.6V	Polarization:	Coplanar
Test Mode	GFSK - 2440MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.2701	10.72	20.11	30.83	98.97	-68.14	AVG
2	0.5552	11.07	20.22	31.29	72.71	-41.42	QP
3	1.7437	11.02	20.35	31.37	69.50	-38.13	QP
4	4.6870	12.40	20.47	32.87	69.50	-36.63	QP
5	7.3140	12.47	20.36	32.83	69.50	-36.67	QP
6	10.2990	12.27	20.27	32.54	69.50	-36.96	QP

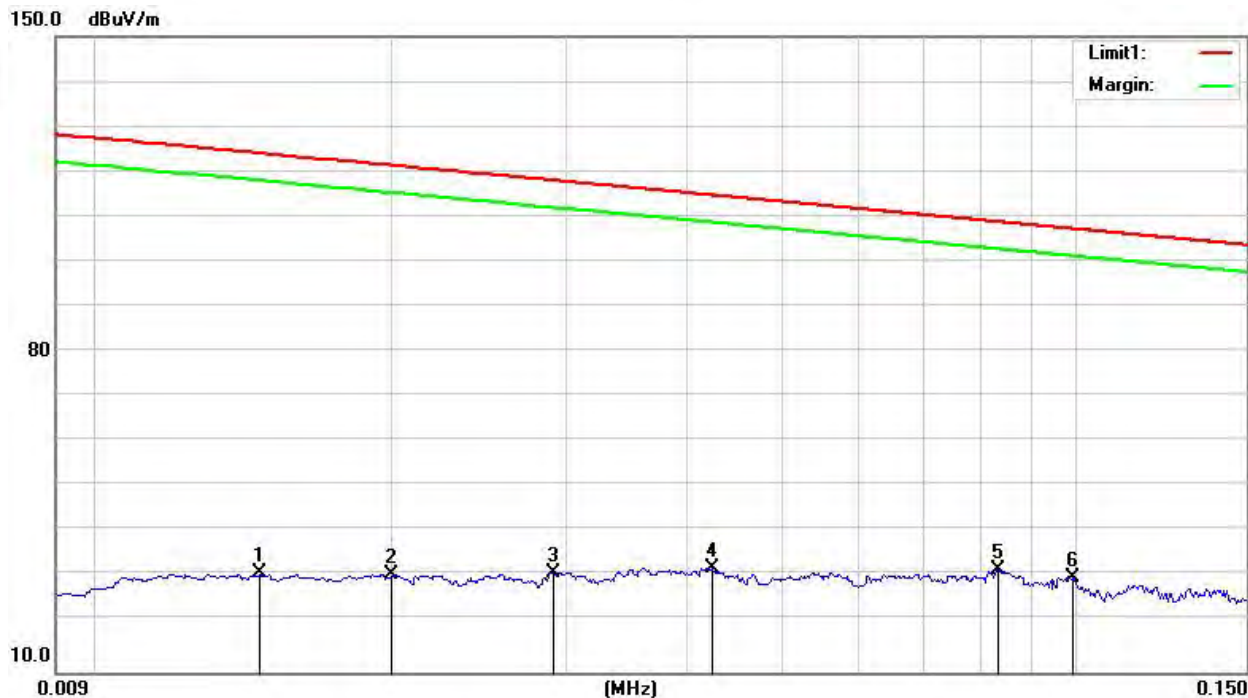
Notes:

1. Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);
2. Limit line = specific limits (dBuV) + distance extrapolation factor.
3. Mode of BLE 1Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 1Mbps.



BLE 2M
9KHz-150KHz

Temperature	23.4°C	Relative Humidity:	60%RH
Test Voltage	DC 7.6V	Polarization:	Coxial
Test Mode	GFSK - 2440MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0146	12.04	19.71	31.75	124.32	-92.57	AVG
2	0.0200	11.52	20.10	31.62	121.58	-89.96	AVG
3	0.0292	11.99	19.92	31.91	118.30	-86.39	AVG
4	0.0424	13.31	19.65	32.96	115.06	-82.10	AVG
5	0.0834	14.33	18.40	32.73	109.18	-76.45	AVG
6	0.0995	13.06	17.62	30.68	107.65	-76.97	QP

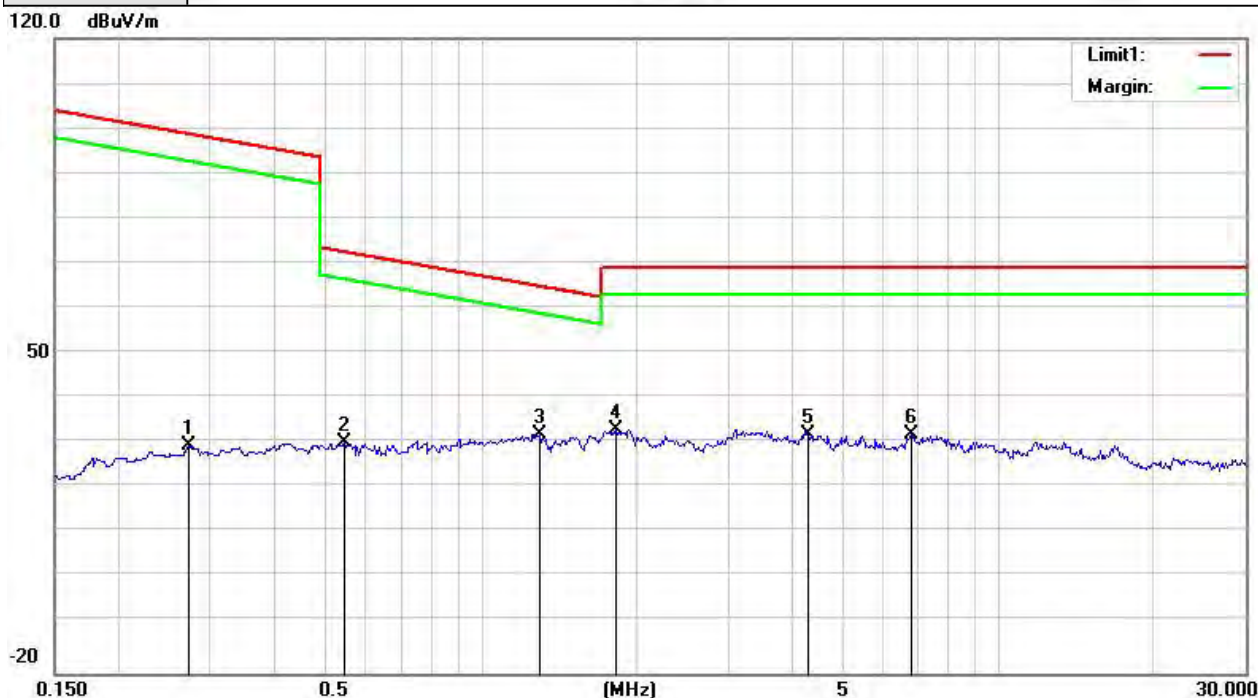
Notes:

1. Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);
2. Limit line = specific limits (dBuV) + distance extrapolation factor.
3. Mode of BLE 2Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 2Mbps.



150KHz-30MHz

Temperature	23.4°C	Relative Humidity:	60%RH
Test Voltage	DC 7.6V	Polarization:	Coxial
Test Mode	GFSK - 2440MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.2730	10.03	20.11	30.14	98.88	-68.74	AVG
2	0.5433	10.64	20.22	30.86	72.90	-42.04	QP
3	1.2960	12.43	20.26	32.69	65.35	-32.66	QP
4	1.8216	13.50	20.36	33.86	69.50	-35.64	QP
5	4.2991	12.37	20.43	32.80	69.50	-36.70	QP
6	6.7766	12.24	20.39	32.63	69.50	-36.87	QP

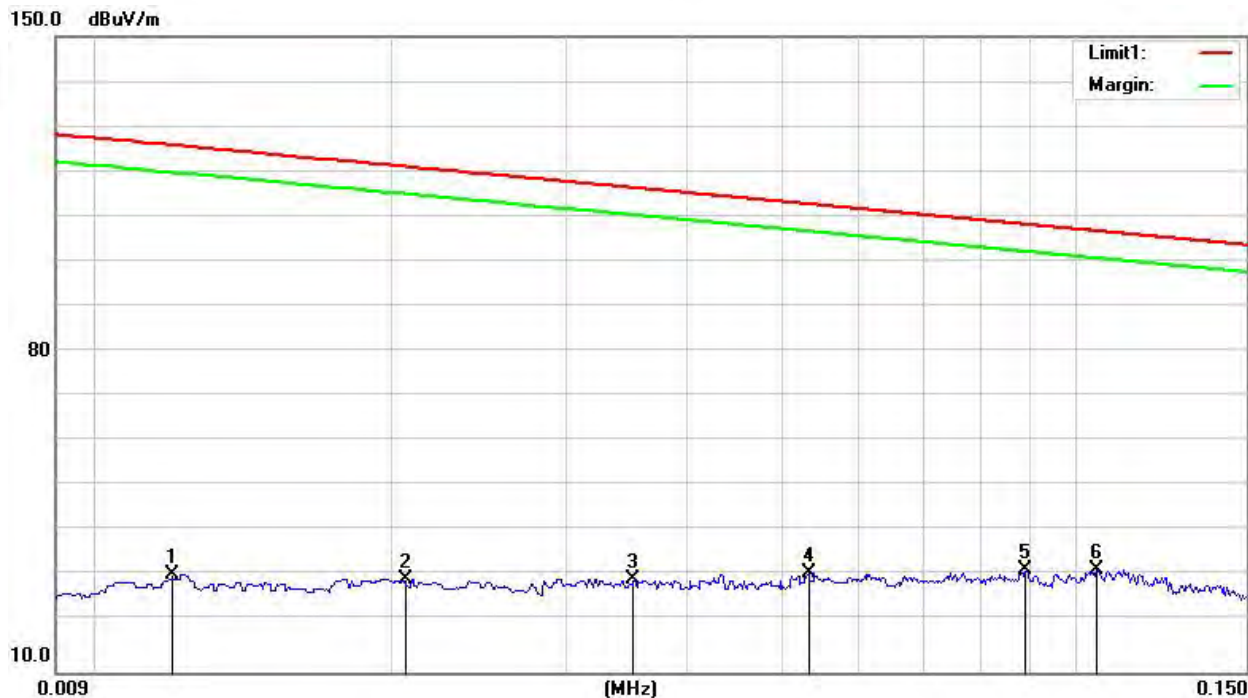
Notes:

1. Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);
2. Limit line = specific limits (dBuV) + distance extrapolation factor.
3. Mode of BLE 2Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 2Mbps.



9KHz-150KHz

Temperature	23.4°C	Relative Humidity:	60%RH
Test Voltage	DC 7.6V	Polarization:	Coplanar
Test Mode	GFSK - 2440MHz		



No.	Frequency (KHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0120	12.00	19.52	31.52	126.02	-94.50	AVG
2	0.0206	10.48	20.09	30.57	121.33	-90.76	AVG
3	0.0352	10.75	19.80	30.55	116.67	-86.12	AVG
4	0.0533	12.58	19.41	31.99	113.07	-81.08	AVG
5	0.0890	14.38	18.13	32.51	108.62	-76.11	AVG
6	0.1053	15.05	17.59	32.64	107.16	-74.52	QP

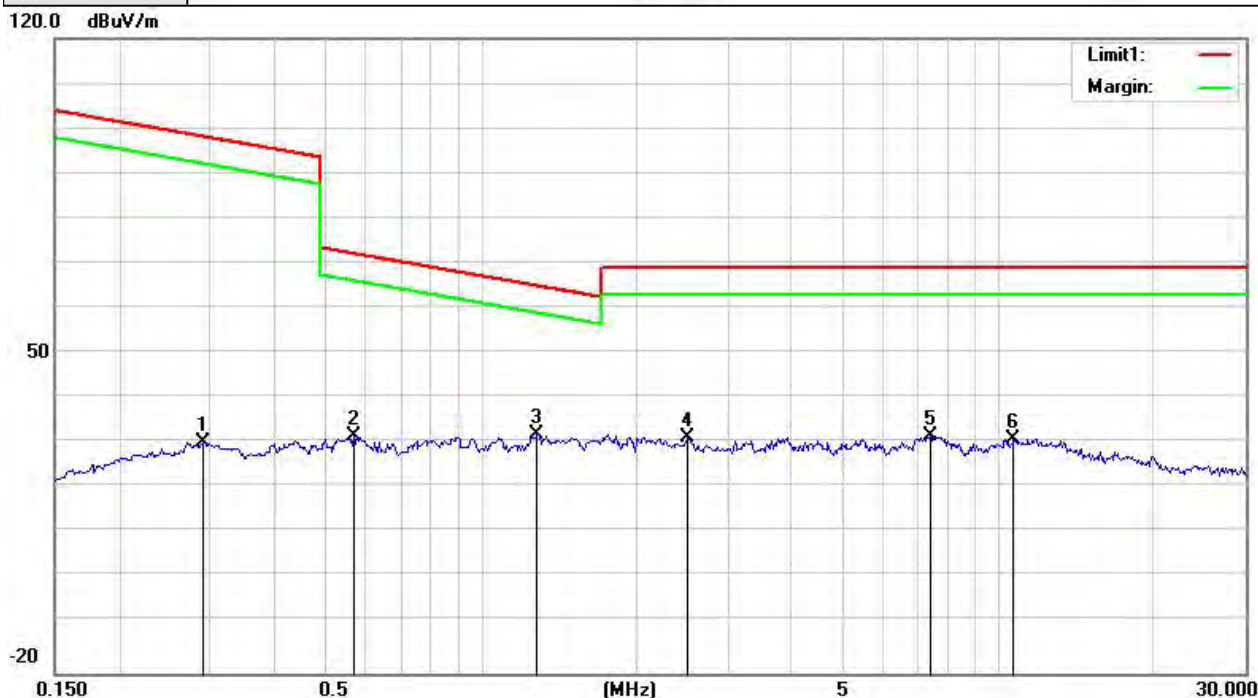
Notes:

1. Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);
2. Limit line = specific limits (dBuV) + distance extrapolation factor.
3. Mode of BLE 2Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 2Mbps.



150KHz-30MHz

Temperature	23.4°C	Relative Humidity:	60%RH
Test Voltage	DC 7.6V	Polarization:	Coplanar
Test Mode	GFSK - 2440MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.2893	10.95	20.12	31.07	98.38	-67.31	AVG
2	0.5675	12.04	20.23	32.27	72.52	-40.25	QP
3	1.2842	12.58	20.26	32.84	65.43	-32.59	QP
4	2.5081	11.70	20.25	31.95	69.50	-37.55	QP
5	7.3737	12.07	20.36	32.43	69.50	-37.07	QP
6	10.6870	11.24	20.35	31.59	69.50	-37.91	QP

Notes:

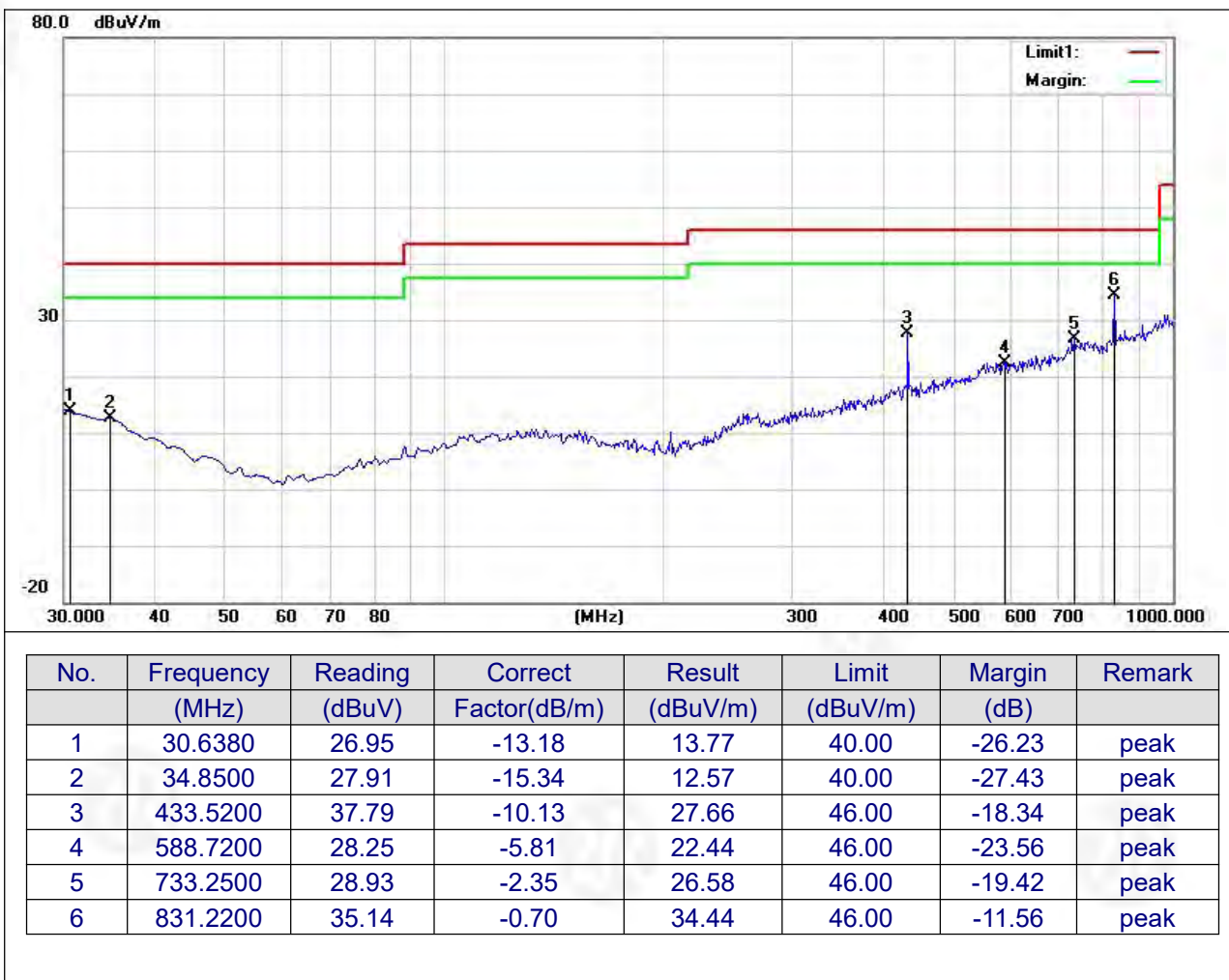
1. Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);
2. Limit line = specific limits (dBuV) + distance extrapolation factor.
3. Mode of BLE 2Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 2Mbps.



b. Between 30MHz – 1GHz

1M PHY

Temperature:	23.4℃	Relative Humidity:	60%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 7.6V	Test Mode :	TX GFSK - 2440MHz

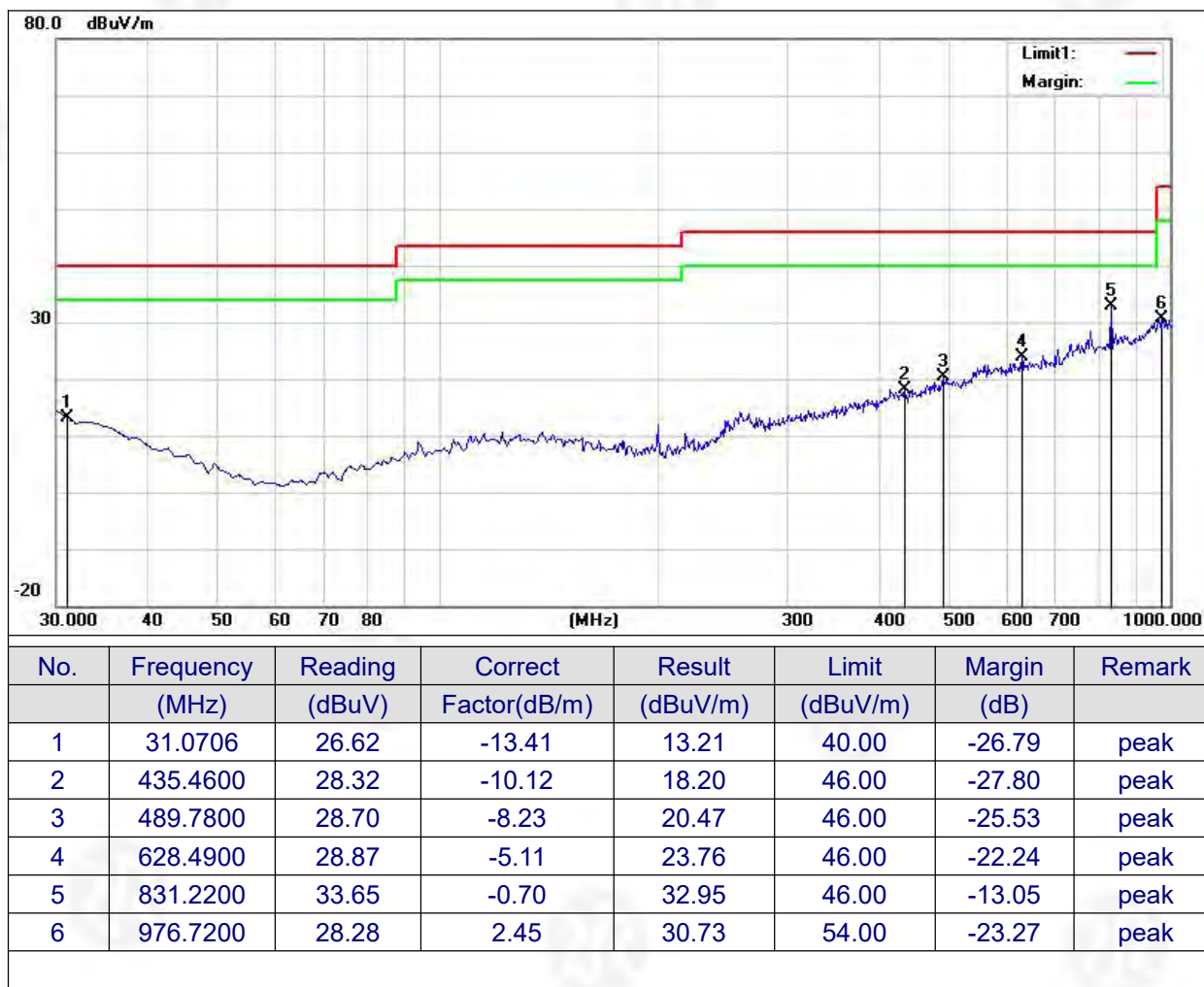


Remarks:

1. An initial pre-scan was performed on the peak detector.
2. Quasi - Peak measurement were performed at the frequencies with maximized peak emission.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Final Level = Reading level + Correct Factor.
5. Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
6. Margin = Measurement Level-Limit.
7. Mode of BLE 1Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 1Mbps.



Temperature:	23.4℃	Relative Humidity:	60%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 7.6V	Test Mode :	TX GFSK - 2440MHz



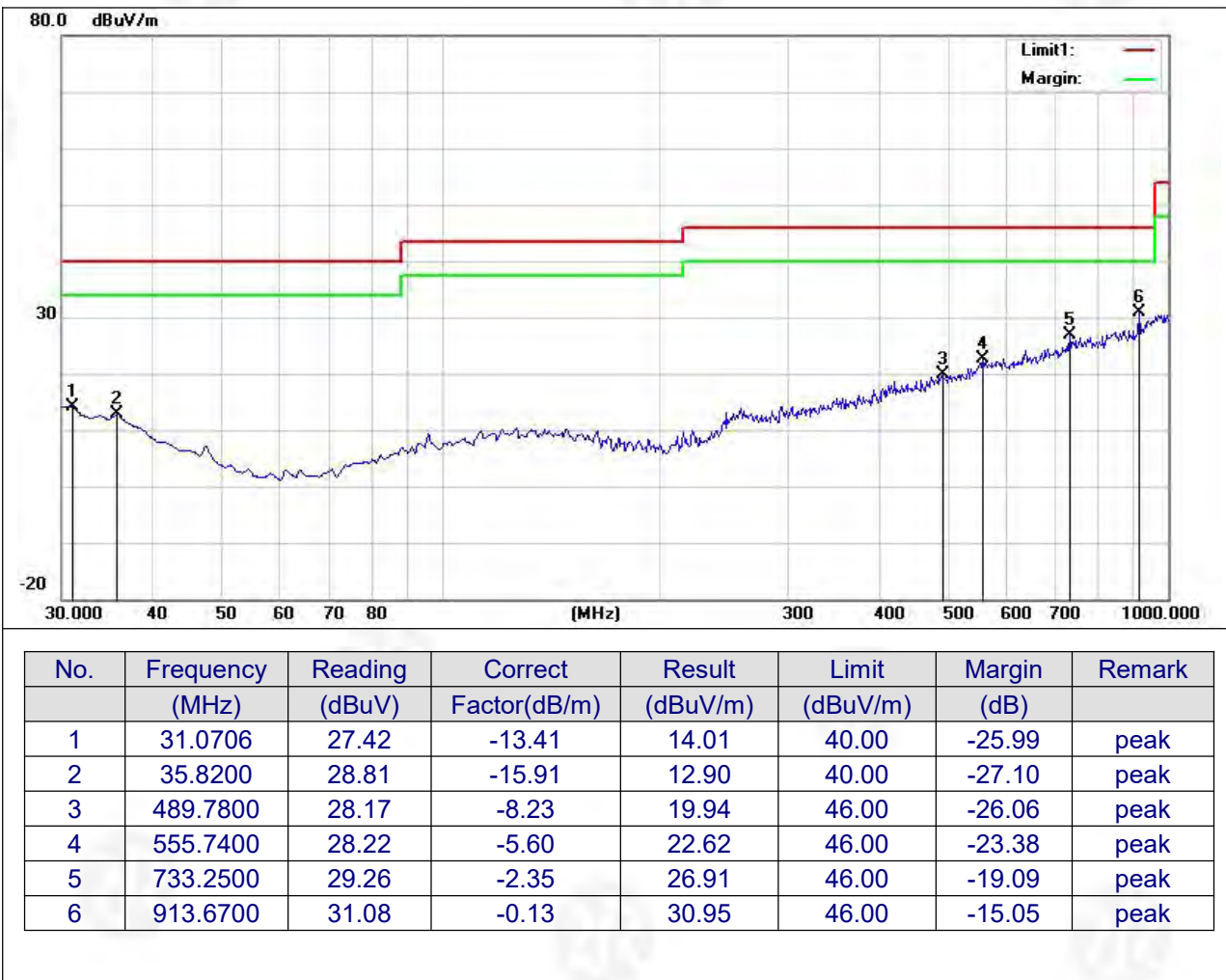
Notes:

1. An initial pre-scan was performed on the peak detector.
2. Quasi - Peak measurement were performed at the frequencies with maximized peak emission.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Final Level = Reading level + Correct Factor.
5. Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
6. Margin = Measurement Level-Limit.
7. Mode of BLE 1Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 1Mbps.



2M PHY

Temperature:	23.4℃	Relative Humidity:	60%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 7.6V	Test Mode :	TX GFSK - 2440MHz

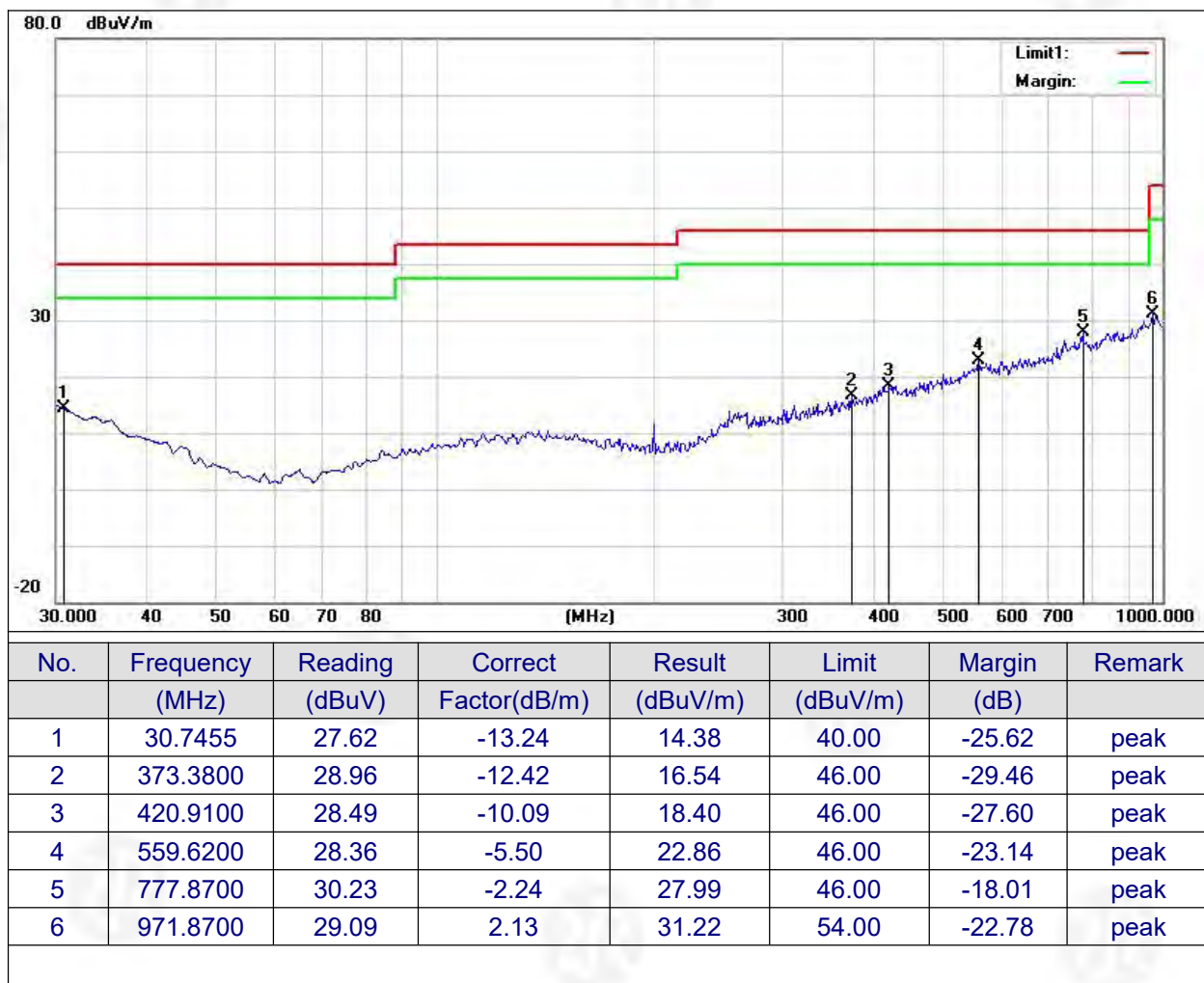


Notes:

1. An initial pre-scan was performed on the peak detector.
2. Quasi - Peak measurement were performed at the frequencies with maximized peak emission.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Final Level = Reading level + Correct Factor.
5. Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
6. Margin = Measurement Level-Limit.
7. Mode of BLE 2Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 2Mbps.



Temperature:	23.4℃	Relative Humidity:	60%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 7.6V	Test Mode :	TX GFSK - 2440MHz



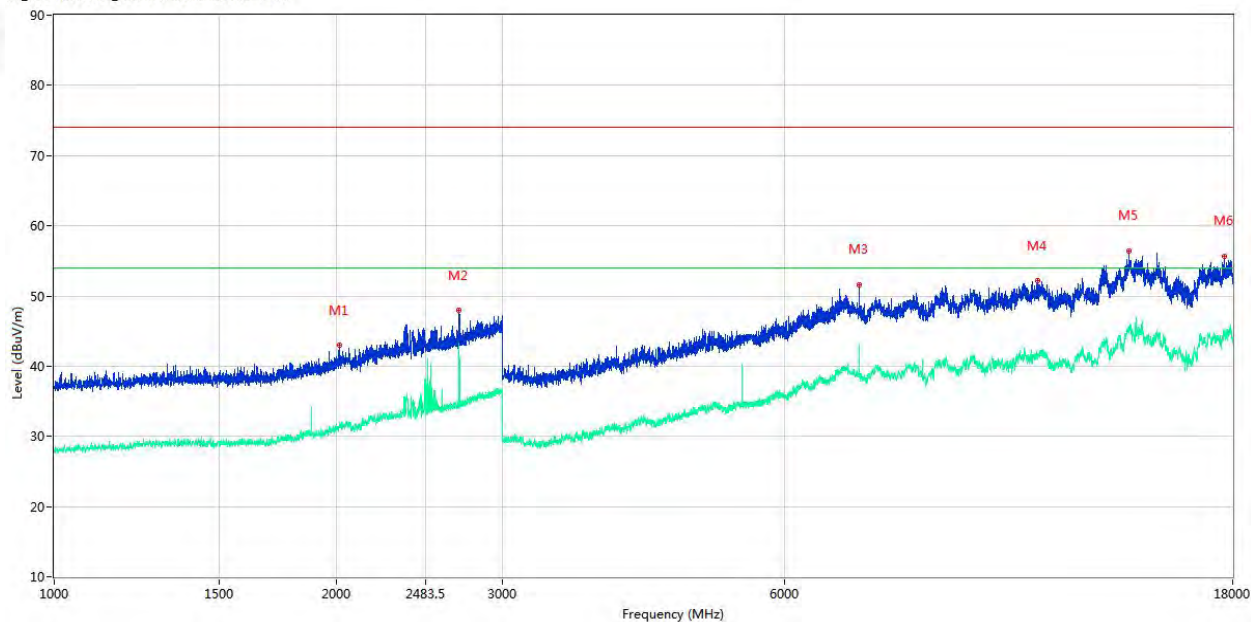
- Notes:
1. An initial pre-scan was performed on the peak detector.
 2. Quasi - Peak measurement were performed at the frequencies with maximized peak emission.
 3. The emission levels of other frequencies are very lower than the limit and not show in test report.
 4. Final Level = Reading level + Correct Factor.
 5. Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
 6. Margin = Measurement Level-Limit.
 7. Mode of BLE 2Mbps were tested at Low, Middle, and High channel and recorded worst mode at 2440MHz of BLE 2Mbps.



1GHz~25GHz

1M PHY- GFSK
Low Channel
Horizontal

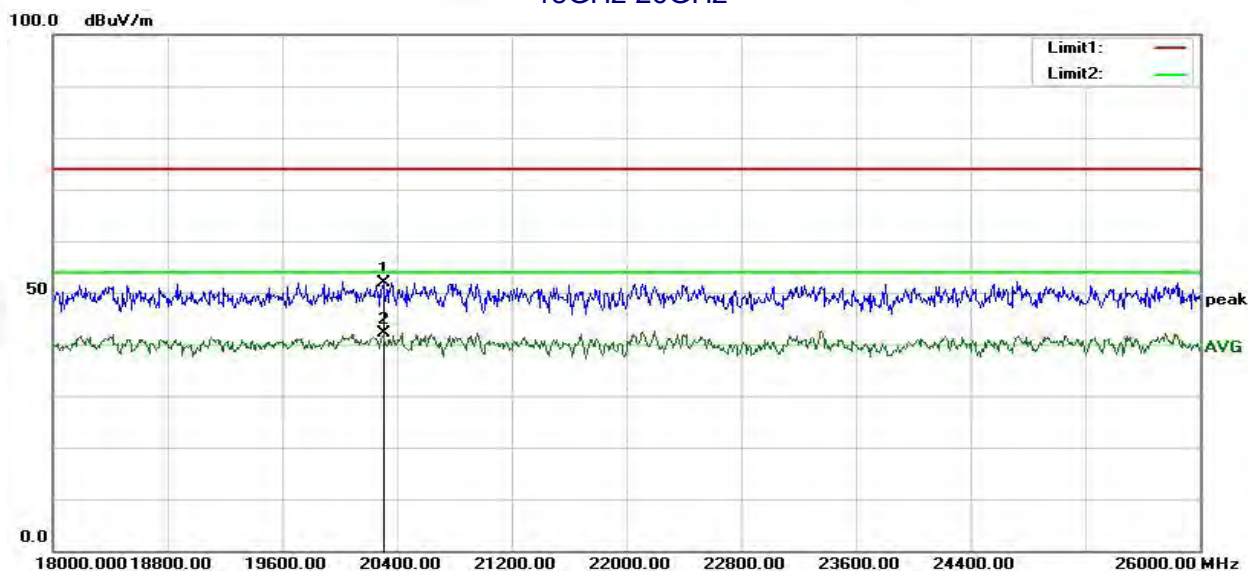
RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2011.000	43.04	0.48	74.0	30.96	Peak	255.40	Horizontal	Pass
1**	2011.000	31.22	0.48	54.0	22.78	AV	255.40	Horizontal	Pass
2	2700.500	47.95	3.99	74.0	26.05	Peak	336.10	Horizontal	Pass
2**	2700.500	43.26	3.99	54.0	10.74	AV	336.10	Horizontal	Pass
3	7203.500	51.56	-1.90	74.0	22.44	Peak	23.40	Horizontal	Pass
3**	7203.500	42.49	-1.90	54.0	11.51	AV	23.40	Horizontal	Pass
4	11160.750	52.25	2.41	74.0	21.75	Peak	106.70	Horizontal	Pass
4**	11160.750	41.30	2.41	54.0	12.70	AV	106.70	Horizontal	Pass
5	13971.250	56.48	8.09	74.0	17.52	Peak	89.60	Horizontal	Pass
5**	13971.250	45.45	8.09	54.0	8.55	AV	89.60	Horizontal	Pass
6	17623.251	55.72	6.45	74.0	18.28	Peak	268.90	Horizontal	Pass
6**	17623.251	45.07	6.45	54.0	8.93	AV	268.90	Horizontal	Pass



18GHz-26GHz

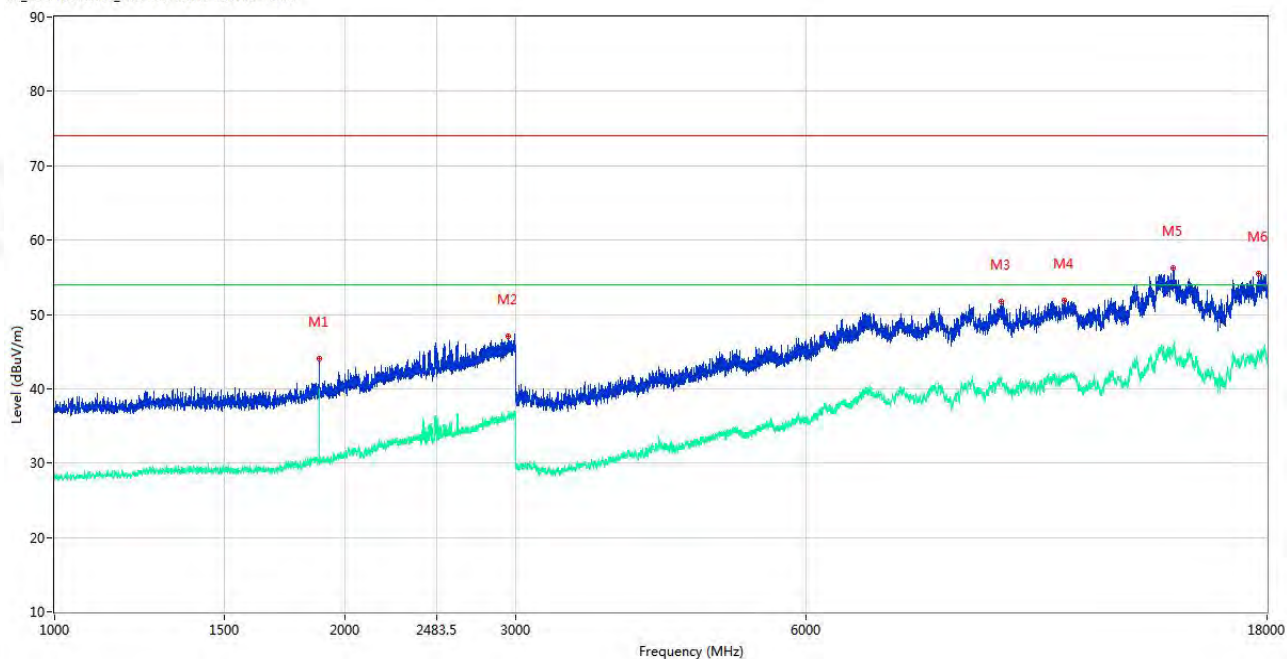


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20304.000	49.84	2.06	51.90	74.00	-22.10	peak
2	20304.000	40.12	2.06	42.18	54.00	-11.82	AVG



Vertical 1GHz-18GHz

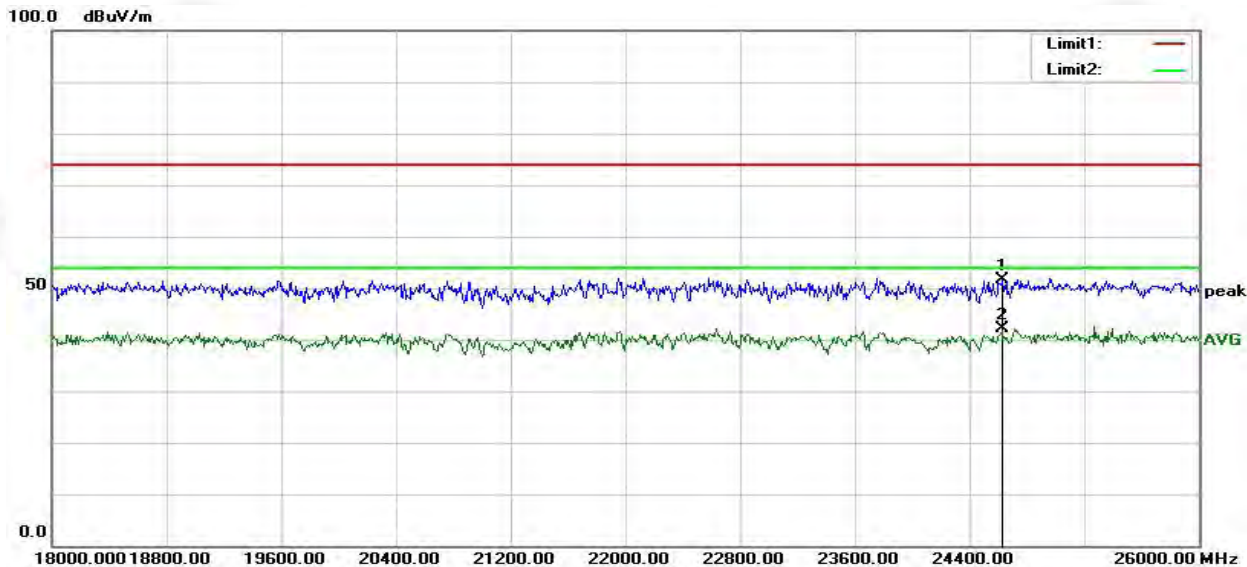
RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	1880.000	43.99	-0.12	74.0	30.01	Peak	310.50	Vertical	Pass
1**	1880.000	39.98	-0.12	54.0	14.02	AV	310.50	Vertical	Pass
2	2952.000	47.02	5.22	74.0	26.98	Peak	264.30	Vertical	Pass
2**	2952.000	36.15	5.22	54.0	17.85	AV	264.30	Vertical	Pass
3	9560.250	51.73	0.96	74.0	22.27	Peak	171.30	Vertical	Pass
3**	9560.250	40.83	0.96	54.0	13.17	AV	171.30	Vertical	Pass
4	11111.250	51.87	2.14	74.0	22.13	Peak	297.40	Vertical	Pass
4**	11111.250	41.73	2.14	54.0	12.27	AV	297.40	Vertical	Pass
5	14400.250	56.20	6.99	74.0	17.80	Peak	16.90	Vertical	Pass
5**	14400.250	45.68	6.99	54.0	8.32	AV	16.90	Vertical	Pass
6	17642.500	55.53	6.32	74.0	18.47	Peak	66.00	Vertical	Pass
6**	17642.500	44.54	6.32	54.0	9.46	AV	66.00	Vertical	Pass



18GHz-26GHz

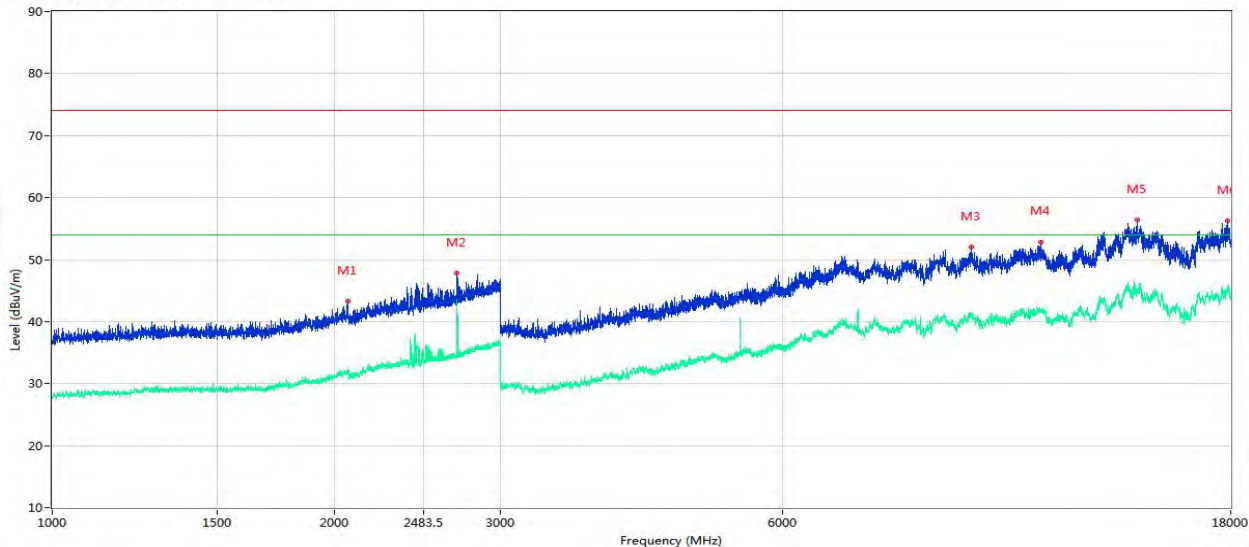


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	24632.000	46.88	4.87	51.75	74.00	-22.25	peak
2	24632.000	37.24	4.87	42.11	54.00	-11.89	AVG



Mid Channel
Horizontal
1GHz-18GHz

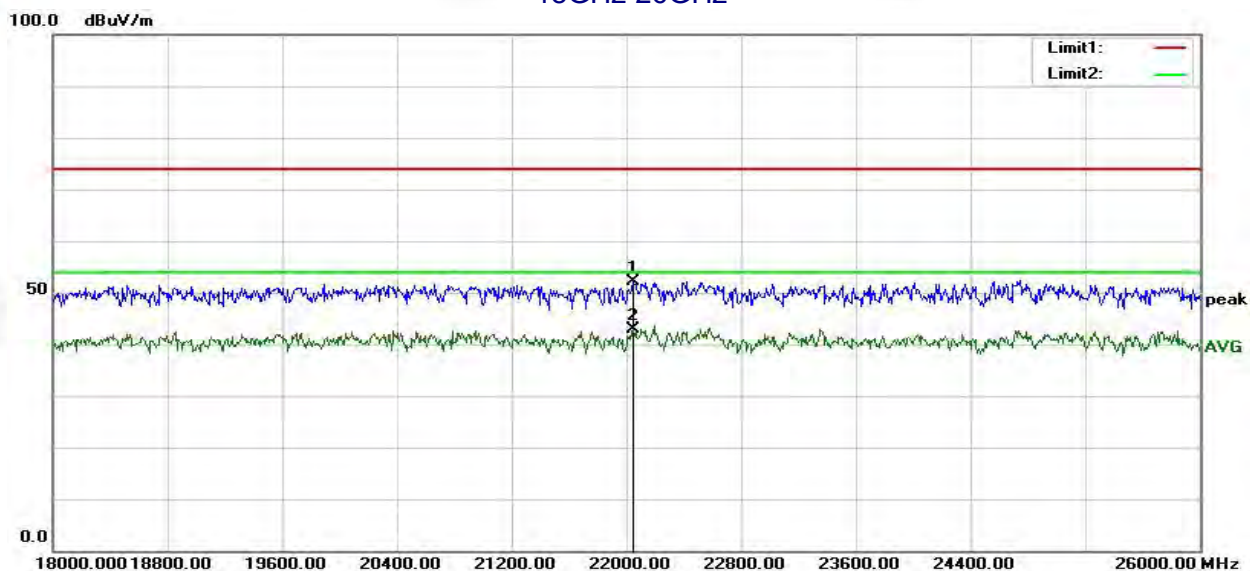
RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	1880.500	42.36	-0.12	74.0	31.64	Peak	142.60	Horizontal	Pass
1**	1880.500	35.36	-0.12	54.0	18.64	AV	142.60	Horizontal	Pass
2	2636.500	50.86	3.83	74.0	23.14	Peak	239.80	Horizontal	Pass
2**	2636.500	46.61	3.83	54.0	7.39	AV	239.80	Horizontal	Pass
3	7319.000	51.12	-2.07	74.0	22.88	Peak	11.70	Horizontal	Pass
3**	7319.000	44.16	-2.07	54.0	9.84	AV	11.70	Horizontal	Pass
4	10654.750	52.82	1.45	74.0	21.18	Peak	1.10	Horizontal	Pass
4**	10654.750	41.22	1.45	54.0	12.78	AV	1.10	Horizontal	Pass
5	14408.500	56.00	6.93	74.0	18.00	Peak	91.30	Horizontal	Pass
5**	14408.500	45.71	6.93	54.0	8.29	AV	91.30	Horizontal	Pass
6	17901.001	55.63	7.23	74.0	18.37	Peak	157.60	Horizontal	Pass
6**	17901.001	45.54	7.23	54.0	8.46	AV	157.60	Horizontal	Pass



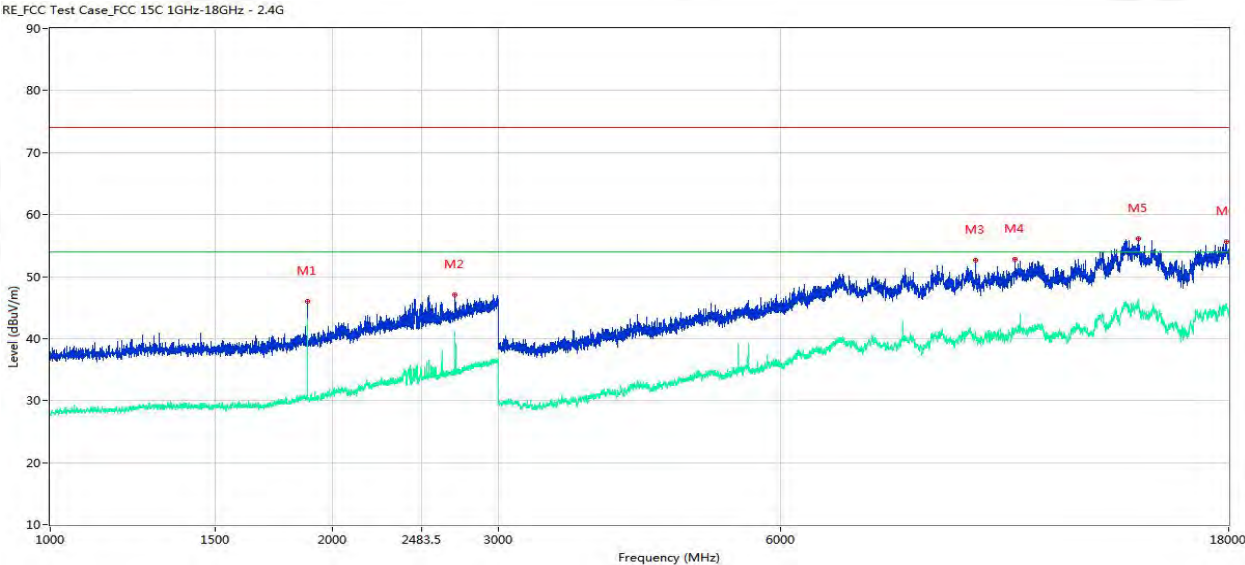
18GHz-26GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	22048.000	48.57	3.46	52.03	74.00	-21.97	peak
2	22048.000	39.50	3.46	42.96	54.00	-11.04	AVG



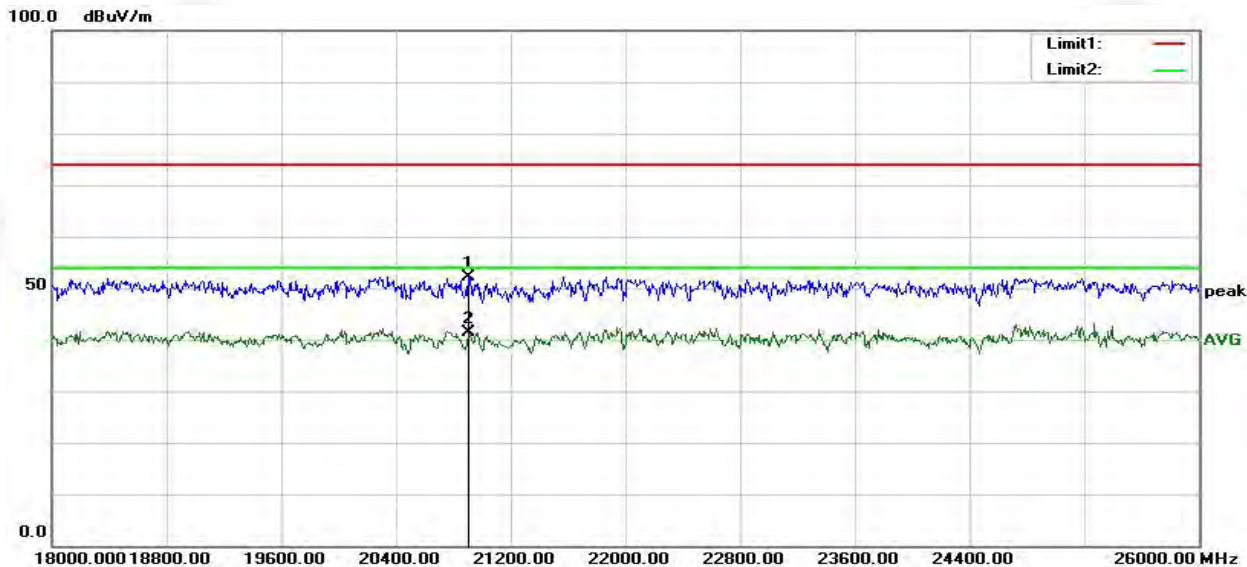
Vertical
1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	1880.000	45.98	-0.12	74.0	28.02	Peak	331.80	Vertical	Pass
1**	1880.000	43.08	-0.12	54.0	10.92	AV	331.80	Vertical	Pass
2	2700.500	47.07	3.99	74.0	26.93	Peak	0.60	Vertical	Pass
2**	2700.500	41.18	3.99	54.0	12.82	AV	0.60	Vertical	Pass
3	9684.000	52.56	0.59	74.0	21.44	Peak	0.00	Vertical	Pass
3**	9684.000	40.22	0.59	54.0	13.78	AV	0.00	Vertical	Pass
4	10663.000	52.75	1.40	74.0	21.25	Peak	242.00	Vertical	Pass
4**	10663.000	41.27	1.40	54.0	12.73	AV	242.00	Vertical	Pass
5	14427.750	56.12	6.79	74.0	17.88	Peak	84.70	Vertical	Pass
5**	14427.750	45.35	6.79	54.0	8.65	AV	84.70	Vertical	Pass
6	17914.751	55.66	7.13	74.0	18.34	Peak	319.80	Vertical	Pass
6**	17914.751	45.62	7.13	54.0	8.38	AV	319.80	Vertical	Pass



18GHz-26GHz

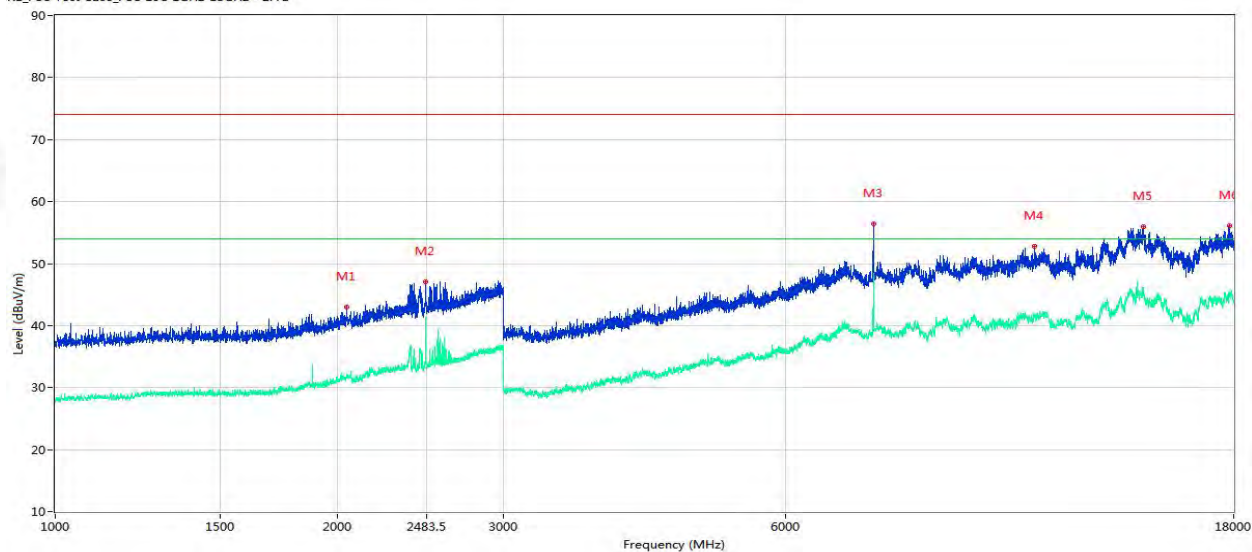


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20904.000	49.62	2.57	52.19	74.00	-21.81	peak
2	20904.000	38.72	2.57	41.29	54.00	-12.71	AVG



High Channel
Horizontal
1GHz-18GHz

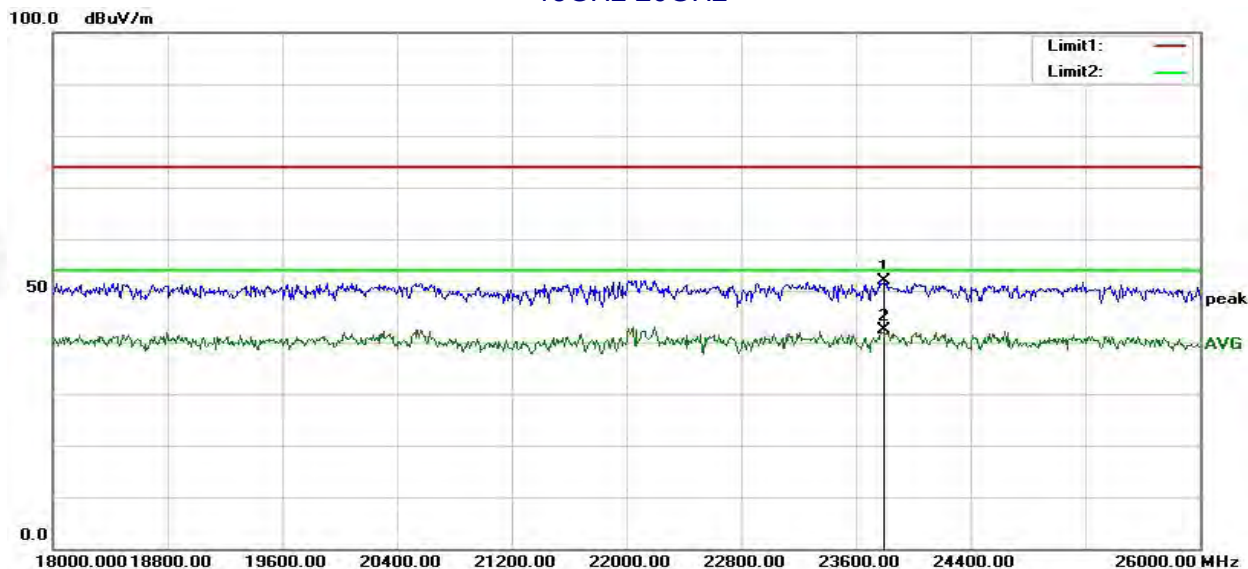
RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2046.000	43.00	0.78	74.0	31.00	Peak	17.70	Horizontal	Pass
1**	2046.000	32.13	0.78	54.0	21.87	AV	17.70	Horizontal	Pass
2	2480.000	47.02	3.18	74.0	26.98	Peak	297.90	Horizontal	Pass
2**	2480.000	41.35	3.18	54.0	12.65	AV	297.90	Horizontal	Pass
3	7440.000	56.38	-1.51	74.0	17.62	Peak	10.20	Horizontal	Pass
3**	7440.000	48.40	-1.51	54.0	5.60	AV	10.20	Horizontal	Pass
4	11056.250	52.73	1.94	74.0	21.27	Peak	108.00	Horizontal	Pass
4**	11056.250	41.69	1.94	54.0	12.31	AV	108.00	Horizontal	Pass
5	14433.250	55.93	6.75	74.0	18.07	Peak	69.00	Horizontal	Pass
5**	14433.250	45.32	6.75	54.0	8.68	AV	69.00	Horizontal	Pass
6	17796.499	56.13	6.36	74.0	17.87	Peak	255.40	Horizontal	Pass
6**	17796.499	45.37	6.36	54.0	8.63	AV	255.40	Horizontal	Pass



18GHz-26GHz

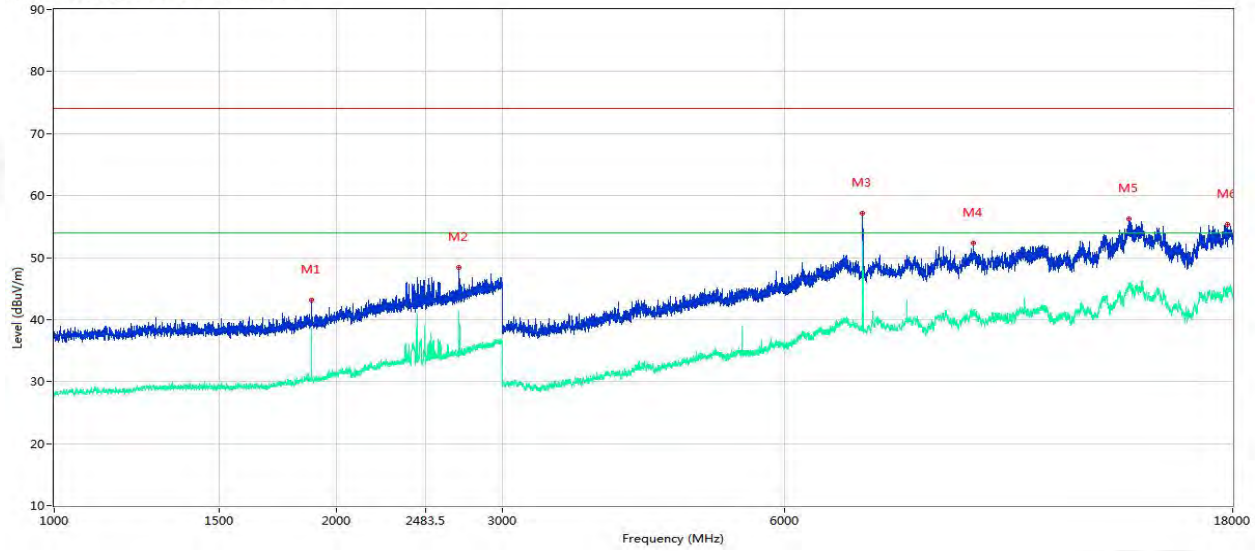


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	23800.000	47.51	4.43	51.94	74.00	-22.06	peak
2	23800.000	37.83	4.43	42.26	54.00	-11.74	AVG

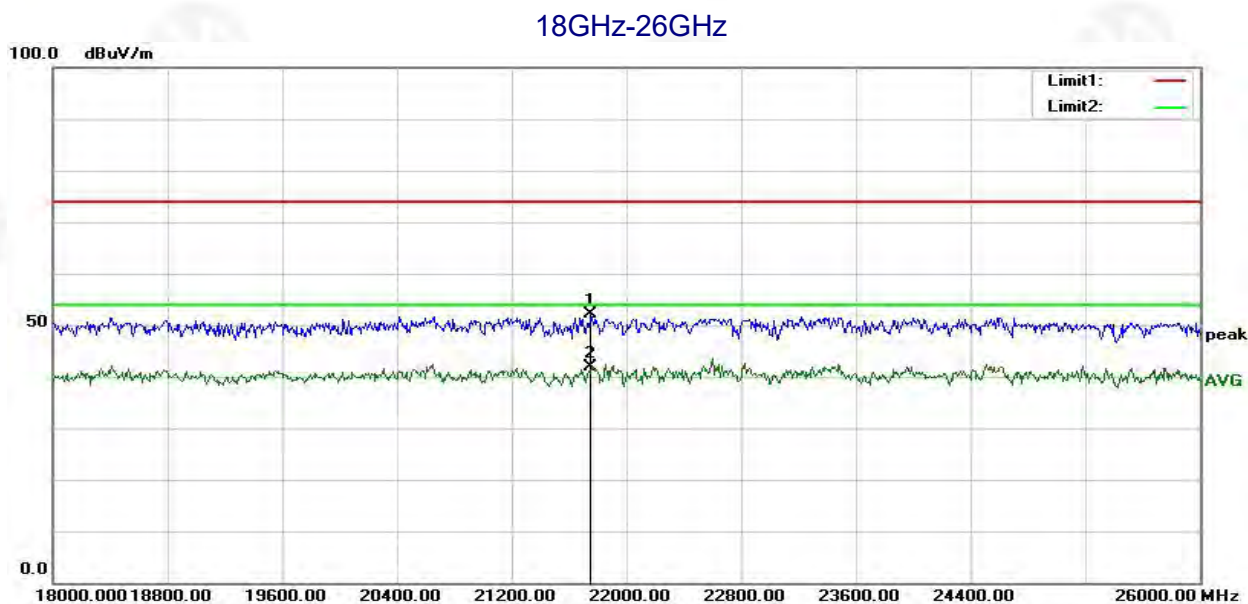


Vertical
1GHz-18GHz

RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	1880.000	43.09	-0.12	74.0	30.91	Peak	11.00	Vertical	Pass
1**	1880.000	38.55	-0.12	54.0	15.45	AV	11.00	Vertical	Pass
2	2700.500	48.37	3.99	74.0	25.63	Peak	355.50	Vertical	Pass
2**	2700.500	41.41	3.99	54.0	12.59	AV	355.50	Vertical	Pass
3	7264.000	57.16	-2.04	74.0	16.84	Peak	242.90	Vertical	Pass
3**	7264.000	52.64	-2.04	54.0	1.36	AV	242.90	Vertical	Pass
4	9532.750	52.34	1.23	74.0	21.66	Peak	289.70	Vertical	Pass
4**	9532.750	41.20	1.23	54.0	12.80	AV	289.70	Vertical	Pass
5	13974.000	56.29	8.12	74.0	17.71	Peak	354.50	Vertical	Pass
5**	13974.000	45.80	8.12	54.0	8.20	AV	354.50	Vertical	Pass
6	17793.749	55.28	6.35	74.0	18.72	Peak	29.00	Vertical	Pass
6**	17793.749	44.83	6.35	54.0	9.17	AV	29.00	Vertical	Pass

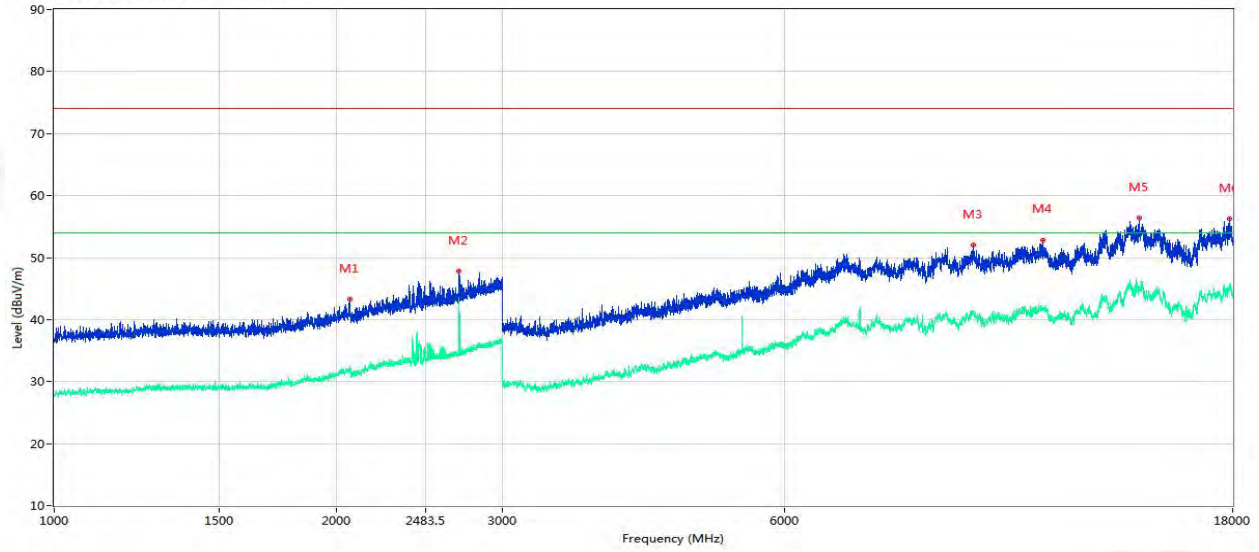


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	21752.000	48.88	3.17	52.05	74.00	-21.95	peak
2	21752.000	38.83	3.17	42.00	54.00	-12.00	AVG



2M PHY
Low Channel
Horizontal

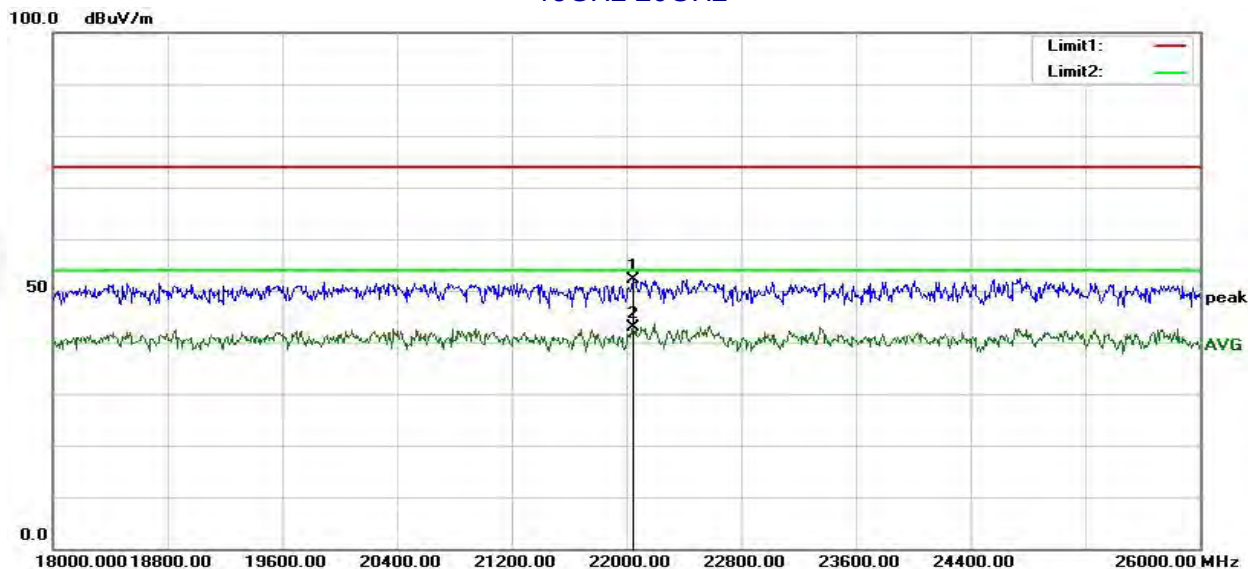
RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2067.000	43.32	0.83	74.0	30.68	Peak	217.80	Horizontal	Pass
1**	2067.000	31.59	0.83	54.0	22.41	AV	217.80	Horizontal	Pass
2	2700.000	47.81	3.99	74.0	26.19	Peak	335.00	Horizontal	Pass
2**	2700.000	43.44	3.99	54.0	10.56	AV	335.00	Horizontal	Pass
3	9519.000	52.08	1.36	74.0	21.92	Peak	296.00	Horizontal	Pass
3**	9519.000	41.48	1.36	54.0	12.52	AV	296.00	Horizontal	Pass
4	11301.000	52.85	2.28	74.0	21.15	Peak	270.70	Horizontal	Pass
4**	11301.000	41.74	2.28	54.0	12.26	AV	270.70	Horizontal	Pass
5	14320.500	56.36	6.90	74.0	17.64	Peak	320.50	Horizontal	Pass
5**	14320.500	45.17	6.90	54.0	8.83	AV	320.50	Horizontal	Pass
6	17876.251	56.20	7.04	74.0	17.80	Peak	47.80	Horizontal	Pass
6**	17876.251	45.16	7.04	54.0	8.84	AV	47.80	Horizontal	Pass



18GHz-26GHz

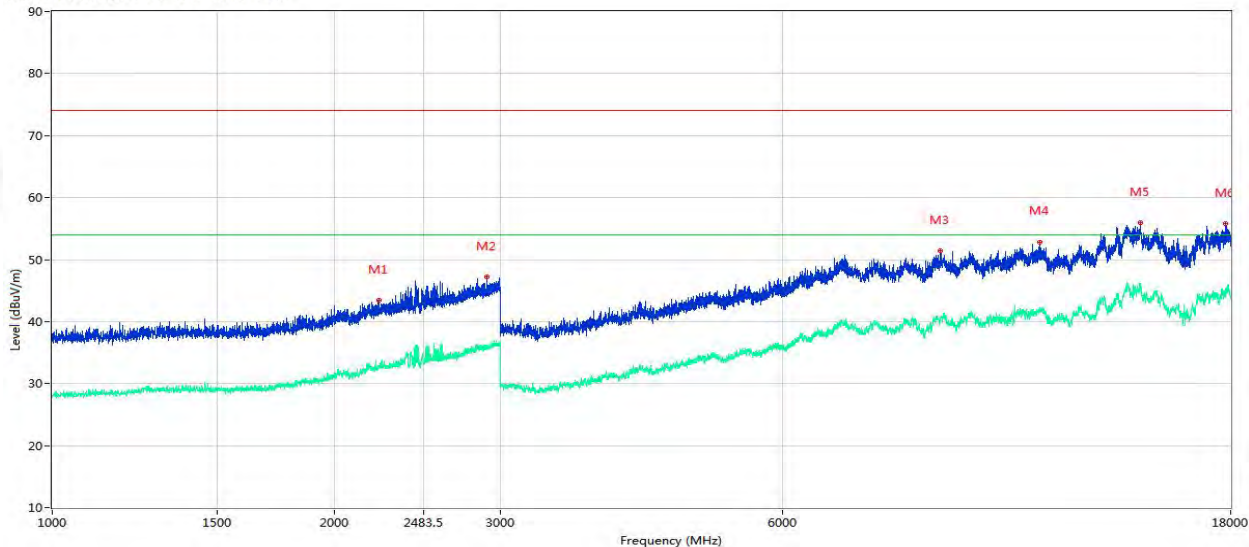


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	22048.000	48.57	3.46	52.03	74.00	-21.97	peak
2	22048.000	39.50	3.46	42.96	54.00	-11.04	AVG

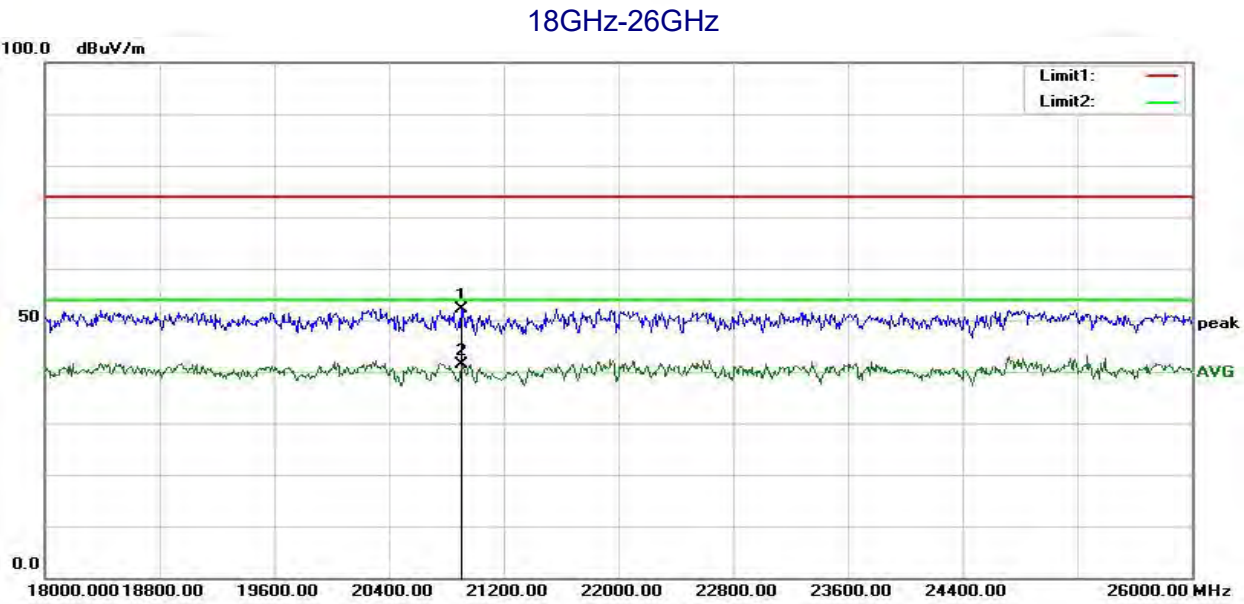


Vertical
1GHz-18GHz

RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2227.500	43.46	1.86	74.0	30.54	Peak	72.90	Vertical	Pass
1**	2227.500	32.54	1.86	54.0	21.46	AV	72.90	Vertical	Pass
2	2904.000	47.20	4.93	74.0	26.80	Peak	125.60	Vertical	Pass
2**	2904.000	35.82	4.93	54.0	18.18	AV	125.60	Vertical	Pass
3	8831.500	51.39	0.61	74.0	22.61	Peak	202.30	Vertical	Pass
3**	8831.500	40.72	0.61	54.0	13.28	AV	202.30	Vertical	Pass
4	11273.500	52.84	2.37	74.0	21.16	Peak	196.30	Vertical	Pass
4**	11273.500	41.66	2.37	54.0	12.34	AV	196.30	Vertical	Pass
5	14427.750	55.97	6.79	74.0	18.03	Peak	276.30	Vertical	Pass
5**	14427.750	45.48	6.79	54.0	8.52	AV	276.30	Vertical	Pass
6	17791.001	55.84	6.34	74.0	18.16	Peak	157.30	Vertical	Pass
6**	17791.001	45.34	6.34	54.0	8.66	AV	157.30	Vertical	Pass

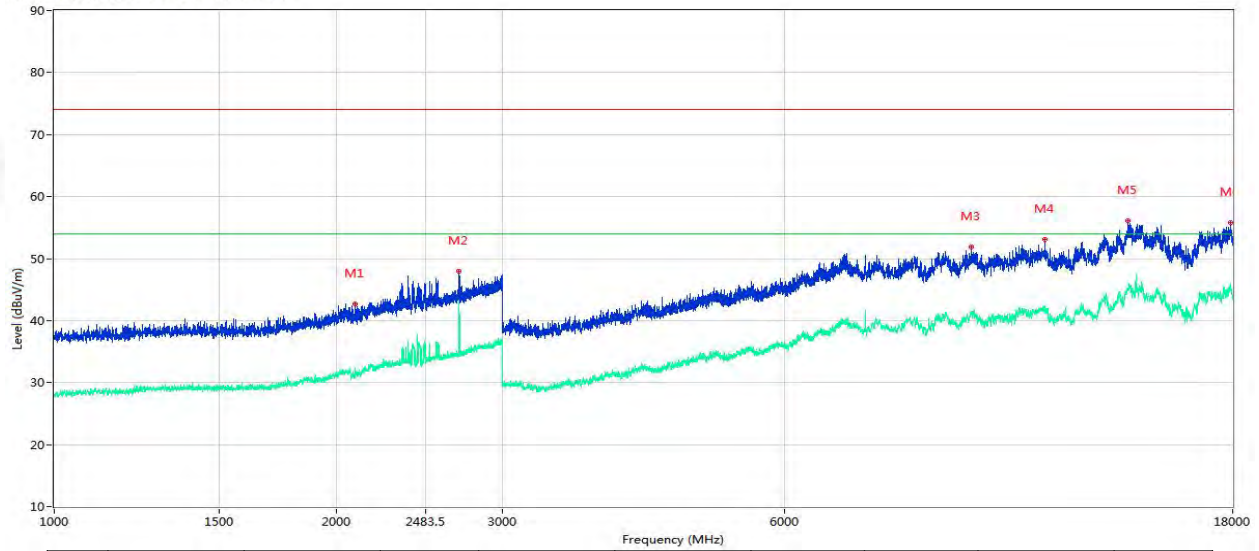


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	20904.000	49.62	2.57	52.19	74.00	-21.81	peak
2	20904.000	38.72	2.57	41.29	54.00	-12.71	AVG



Mid Channel
Horizontal
1GHz-18GHz

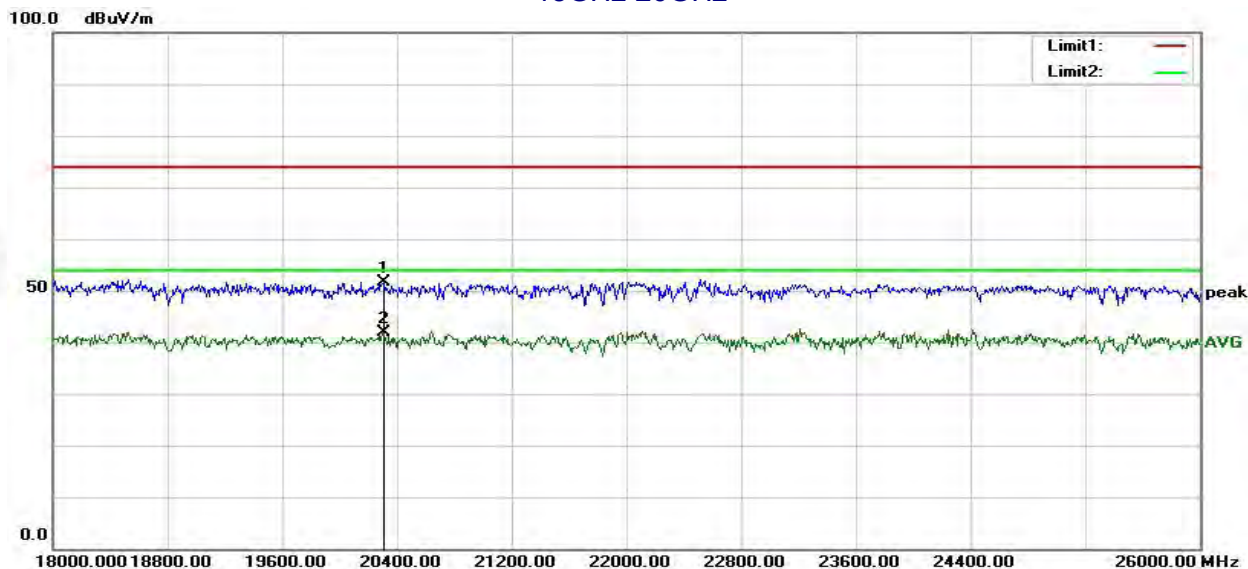
RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2093.500	42.69	0.86	74.0	31.31	Peak	129.60	Horizontal	Pass
1**	2093.500	31.67	0.86	54.0	22.33	AV	129.60	Horizontal	Pass
2	2700.000	47.95	3.99	74.0	26.05	Peak	332.40	Horizontal	Pass
2**	2700.000	43.10	3.99	54.0	10.90	AV	332.40	Horizontal	Pass
3	9480.500	51.86	1.43	74.0	22.14	Peak	123.80	Horizontal	Pass
3**	9480.500	41.22	1.43	54.0	12.78	AV	123.80	Horizontal	Pass
4	11350.500	53.03	2.11	74.0	20.97	Peak	40.80	Horizontal	Pass
4**	11350.500	42.40	2.11	54.0	11.60	AV	40.80	Horizontal	Pass
5	13932.750	56.05	7.61	74.0	17.95	Peak	272.60	Horizontal	Pass
5**	13932.750	45.11	7.61	54.0	8.89	AV	272.60	Horizontal	Pass
6	17909.250	55.75	7.17	74.0	18.25	Peak	196.00	Horizontal	Pass
6**	17909.250	45.02	7.17	54.0	8.98	AV	196.00	Horizontal	Pass



18GHz-26GHz

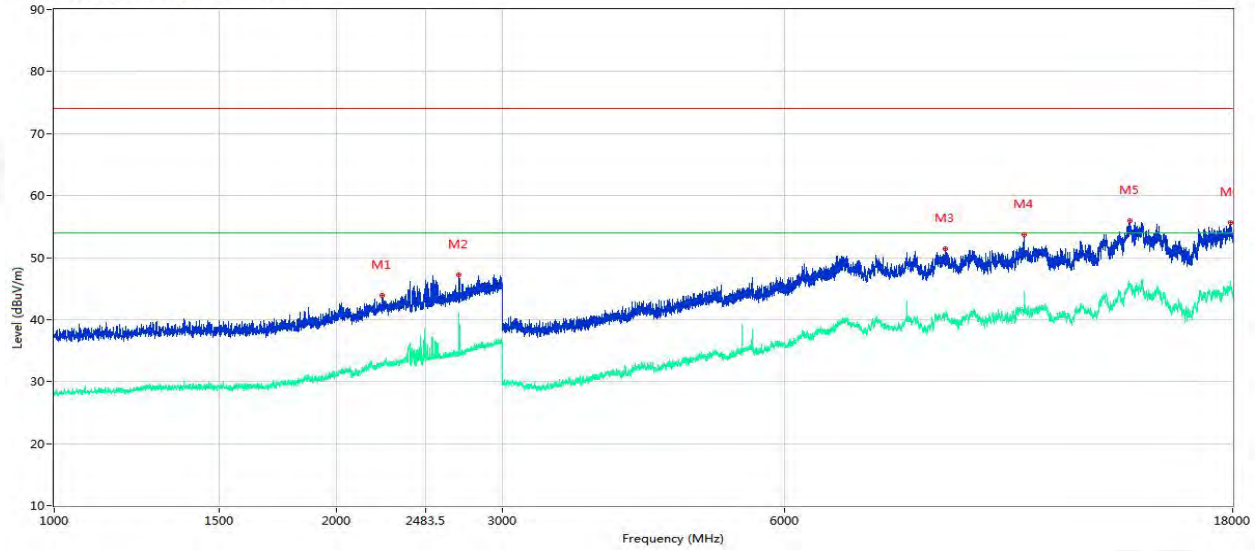


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	20312.000	49.62	2.06	51.68	74.00	-22.32	peak
2	20312.000	39.82	2.06	41.88	54.00	-12.12	AVG



Vertical
1GHz-18GHz

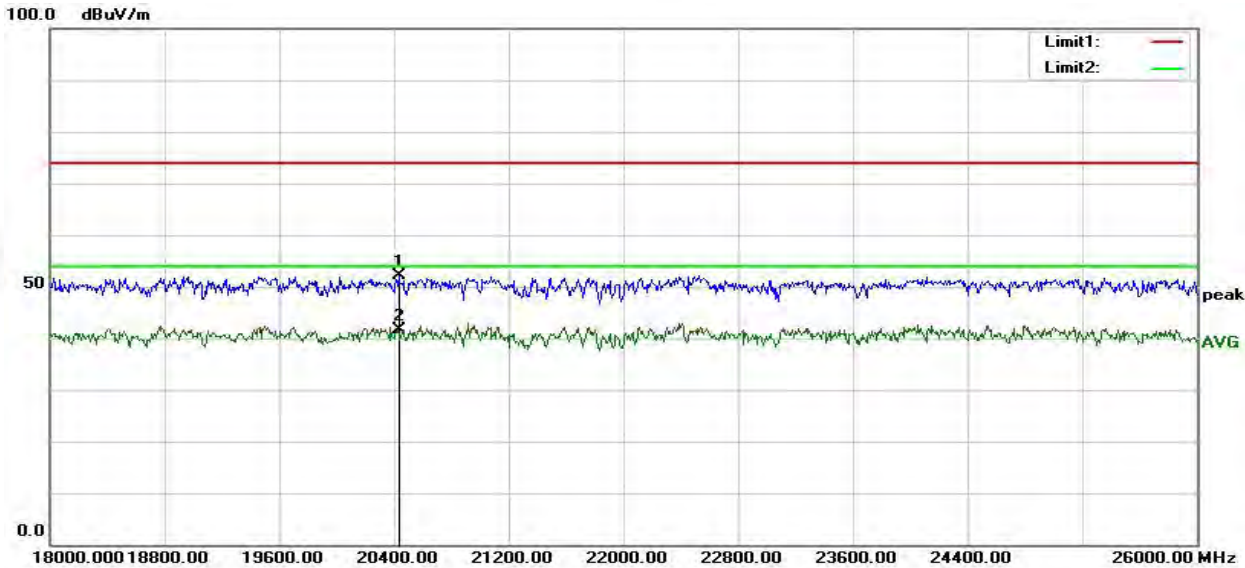
RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2237.000	43.90	1.99	74.0	30.10	Peak	152.50	Vertical	Pass
1**	2237.000	32.73	1.99	54.0	21.27	AV	152.50	Vertical	Pass
2	2700.000	47.21	3.99	74.0	26.79	Peak	359.90	Vertical	Pass
2**	2700.000	41.08	3.99	54.0	12.92	AV	359.90	Vertical	Pass
3	8892.000	51.47	1.54	74.0	22.53	Peak	355.90	Vertical	Pass
3**	8892.000	40.63	1.54	54.0	13.37	AV	355.90	Vertical	Pass
4	10800.500	53.71	2.04	74.0	20.29	Peak	0.00	Vertical	Pass
4**	10800.500	44.50	2.04	54.0	9.50	AV	0.00	Vertical	Pass
5	13982.250	55.90	8.23	74.0	18.10	Peak	38.50	Vertical	Pass
5**	13982.250	45.55	8.23	54.0	8.45	AV	38.50	Vertical	Pass
6	17901.001	55.60	7.23	74.0	18.40	Peak	200.20	Vertical	Pass
6**	17901.001	45.75	7.23	54.0	8.25	AV	200.20	Vertical	Pass



18GHz-26GHz

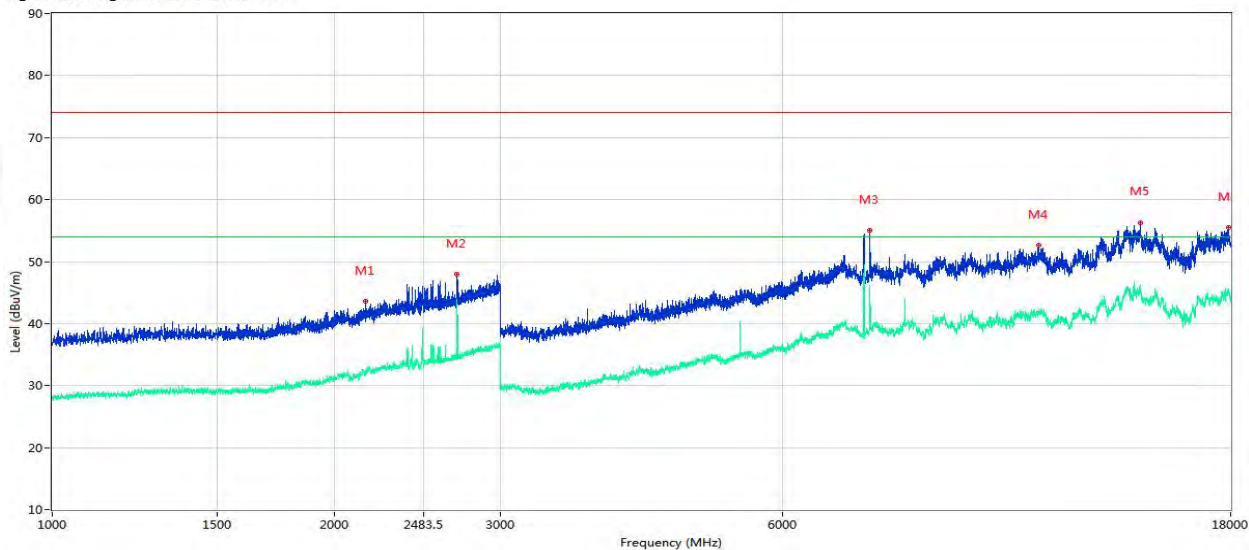


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	20432.000	50.07	2.18	52.25	74.00	-21.75	peak
2	20432.000	39.53	2.18	41.71	54.00	-12.29	AVG



High Channel
Horizontal
1GHz-18GHz

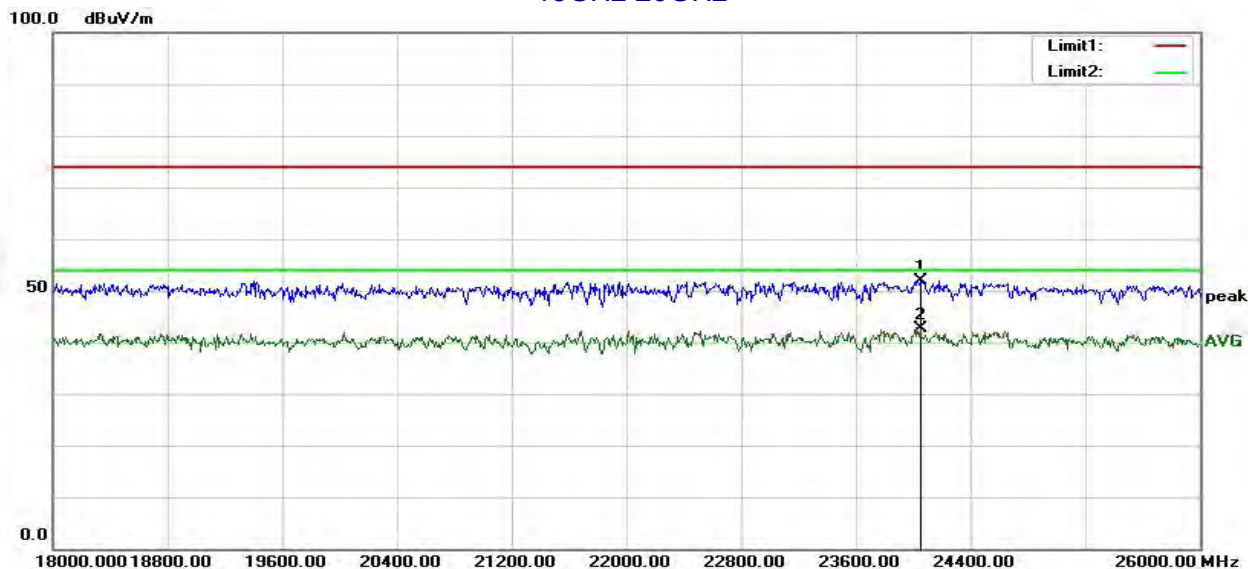
RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2157.500	43.60	1.81	74.0	30.40	Peak	98.60	Horizontal	Pass
1**	2157.500	32.18	1.81	54.0	21.82	AV	98.60	Horizontal	Pass
2	2700.000	47.98	3.99	74.0	26.02	Peak	85.20	Horizontal	Pass
2**	2700.000	43.81	3.99	54.0	10.19	AV	85.20	Horizontal	Pass
3	7434.500	55.07	-1.56	74.0	18.93	Peak	10.30	Horizontal	Pass
3**	7434.500	46.18	-1.56	54.0	7.82	AV	10.30	Horizontal	Pass
4	11243.250	52.57	2.47	74.0	21.43	Peak	360.00	Horizontal	Pass
4**	11243.250	41.66	2.47	54.0	12.34	AV	360.00	Horizontal	Pass
5	14422.250	56.32	6.83	74.0	17.68	Peak	65.20	Horizontal	Pass
5**	14422.250	46.20	6.83	54.0	7.80	AV	65.20	Horizontal	Pass
6	17887.250	55.51	7.13	74.0	18.49	Peak	342.20	Horizontal	Pass
6**	17887.250	45.47	7.13	54.0	8.53	AV	342.20	Horizontal	Pass



18GHz-26GHz

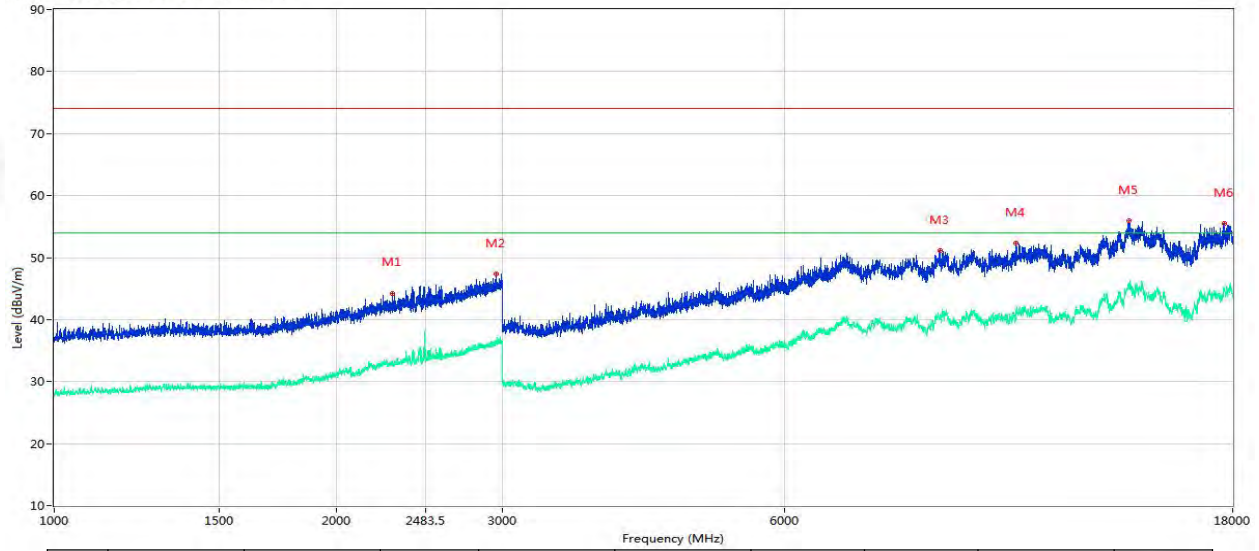


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	24048.000	47.34	4.64	51.98	74.00	-22.02	peak
2	24048.000	38.05	4.64	42.69	54.00	-11.31	AVG



Vertical
1GHz-18GHz

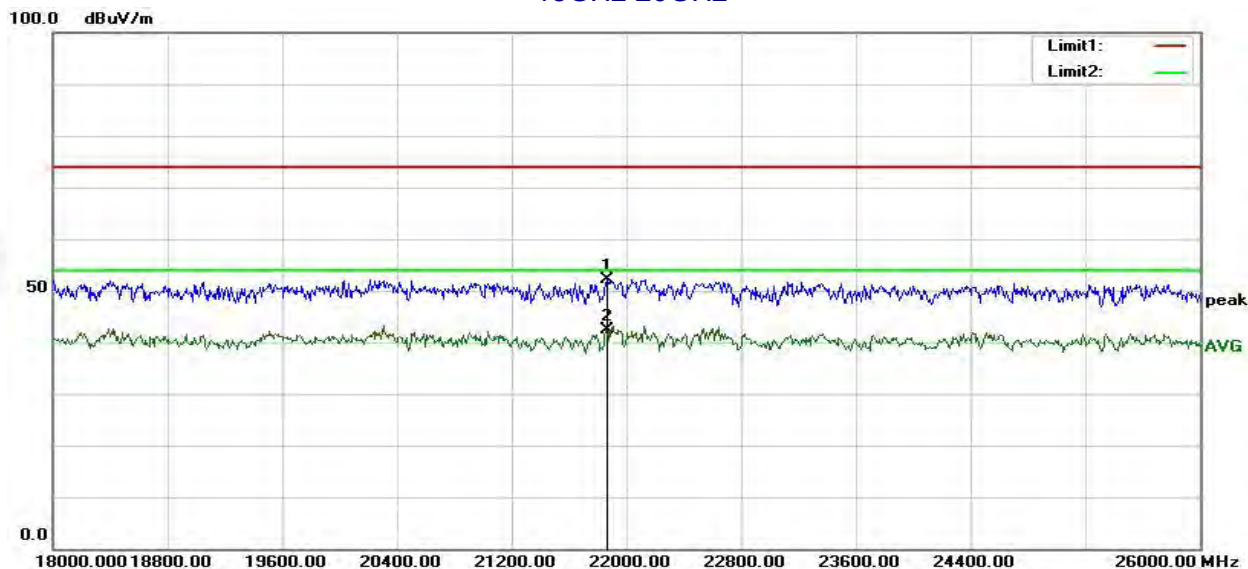
RE_FCC Test Case_FCC 15C 1GHz-18GHz - 2.4G



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Antenna	Verdict
1	2293.500	44.27	2.22	74.0	29.73	Peak	57.10	Vertical	Pass
1**	2293.500	33.33	2.22	54.0	20.67	AV	57.10	Vertical	Pass
2	2957.000	47.38	5.25	74.0	26.62	Peak	0.00	Vertical	Pass
2**	2957.000	36.16	5.25	54.0	17.84	AV	0.00	Vertical	Pass
3	8776.500	51.17	0.16	74.0	22.83	Peak	221.10	Vertical	Pass
3**	8776.500	40.45	0.16	54.0	13.55	AV	221.10	Vertical	Pass
4	10588.750	52.35	1.76	74.0	21.65	Peak	318.50	Vertical	Pass
4**	10588.750	41.56	1.76	54.0	12.44	AV	318.50	Vertical	Pass
5	13952.000	55.99	7.85	74.0	18.01	Peak	192.80	Vertical	Pass
5**	13952.000	45.31	7.85	54.0	8.69	AV	192.80	Vertical	Pass
6	17625.999	55.47	6.43	74.0	18.53	Peak	340.00	Vertical	Pass
6**	17625.999	44.76	6.43	54.0	9.24	AV	340.00	Vertical	Pass



18GHz-26GHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	21864.000	48.85	3.29	52.14	74.00	-21.86	peak
2	21864.000	39.07	3.29	42.36	54.00	-11.64	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.



5. EMISSIONS AT RESTRICTED BAND

5.1 TEST REQUIREMENT

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	12.57675-12.57725	399.9-410	7.25-7.75
0.495-0.505	13.36-13.41	608-614	8.025-8.5
2.1735-2.1905	16.42-16.423	960-1427	9.0-9.2
3.020-3.026	16.69475-16.69525	1435-1626.5	9.3-9.5
4.125-4.128	16.80425-16.80475	1645.5-1646.5	10.6-12.7
4.17725-4.17775	25.5-25.67	1660-1710	13.25-13.4
4.20725-4.20775	37.5-38.25	1718.8-1722.2	14.47-14.5
5.677-5.683	73-74.6	2200-2300	15.35-16.2
6.215-6.218	74.8-75.2	2310-2390	17.7-21.4
6.26775-6.26825	108-38	2483.5-2500	22.01-23.12
6.31175-6.31225	149.9-150.05	2655-2900	23.6-24.0
8.291-8.294	156.52475-156.52525	3260-3267	31.2-31.8
8.362-8.366	156.7-156.9	3332-3339	36.43-36.5
8.37625-8.38675	162.0125-167.17	3345.8-3358	Above 38.6
8.41425-8.41475	167.72-173.2	3500-4400	-
12.29-12.293	240-285	4500-5150	-
12.51975-12.52025	322-335.4	5350-5460	-

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	Limit (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).



5.2 TEST PROCEDURE

According to ANSI C63.10 Field Strength Approach (linear terms):

$$E = \text{EIRP} - 20 \log d + 104.8$$

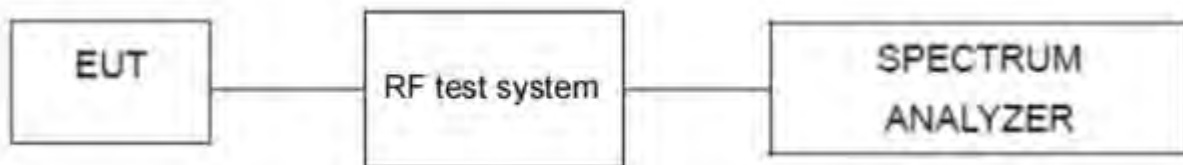
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to an EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=3 MHz for AVG detector, Max Hold=Average, Trace=100times for AV test.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.
6. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
7. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
8. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
9. For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
10. Compare the resultant electric field strength level to the applicable regulatory limit.
11. Perform radiated spurious emission test duress until all measured frequencies were complete.

5.3 DEVIATION FROM TEST STANDARD

No deviation



5.4 TEST SETUP



5.5 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.

5.6 TEST RESULTS

Notes: The test data please refer to APPENDIX 1.

Remark:

1. Test results including cable loss;
2. Measured at difference Packet Type for each mode and recorded worst case for each mode.
3. “---” means that the fundamental frequency not for RSS GEN limits requirement.
4. The other emission levels were very low against the limit.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. Detector AV is setting spectrum/receiver. RBW=1MHz/VBW=3MHz/Sweep time=Auto/Detector=RMS, Max Hold=Average, Trace=100times.
7. Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.



6. POWER SPECTRAL DENSITY TEST

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range	Result
15.247 (e)	Power Spectral Density	8dBm/3kHz	2400-2483.5(MHz)	PASS

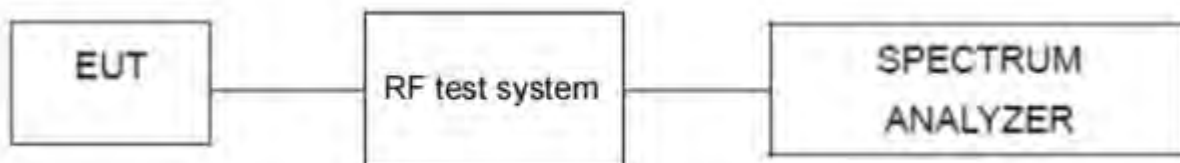
6.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$.
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 within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULT

Note: The test data please refer to APPENDIX 1.



7. 6DB OCCUPIED BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{kHz}$ (6dB Occupied Bandwidth)	2400-2483.5 (MHz)	PASS

7.2 TEST PROCEDURE

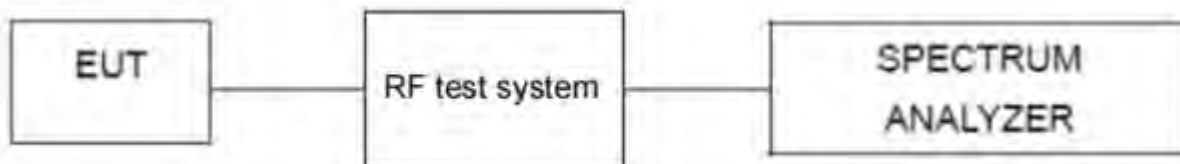
The steps for 6dB Bandwidth are as follows:

- Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
- Set the VBW $\geq [3 \times \text{RBW}]$.
- Detector = peak.
- Trace mode = max-hold.
- Sweep = No faster than coupled (auto) time.
- Allow the trace to stabilize.
- Measure the maximum width with SA automatic 6dB bandwidth down setting, Record the final DTS bandwidth (6dB down bandwidth) result.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TEST RESULT

Note: The test data please refer to APPENDIX 1.



8. PEAK OUTPUT POWER TEST

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5 (MHz)	PASS

8.2 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TEST RESULT

Note: The test data please refer to APPENDIX 1.



9. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02

9.1 APPLICABLE STANDARD

Typical regulatory requirements specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions⁸⁹:

The maximum peak conducted output power procedure was used to determine compliance as described in 11.9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

9.2 TEST PROCEDURE

A. Reference level measurement, establish a reference level by using the following procedure:

- Set instrument center frequency to DTS channel center frequency.
- Set the span to ≥ 1.5 times the DTS bandwidth.
- Set the RBW = 100 kHz.
- Set the VBW $\geq [3 \times \text{RBW}]$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

B. Emission level measurement, establish an emission level by using the following procedure:

- Set the center frequency and span to encompass frequency range to be measured.
- Set the RBW = 100 kHz.
- Set the VBW $\geq [3 \times \text{RBW}]$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

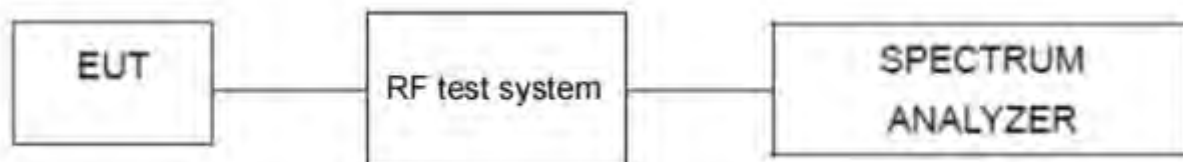
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.



9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



9.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

9.6 TEST RESULTS

Note: The test data please refer to APPENDIX 1.



10. DUTY CYCLE

Test Method:	ANSI C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Erratato C63.10a-2024
--------------	---

10.1 APPLIED PROCEDURES / LIMIT

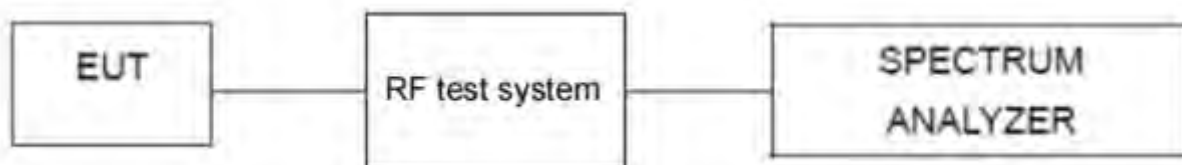
Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

- a) A diode detector and an oscilloscope that together have a sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.
- b) The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:
 - 1) Set the center frequency of the instrument to the center frequency of the transmission.
 - 2) Set $RBW \geq OBW$ if possible; otherwise, set RBW to the largest available value.
 - 3) Set $VBW \geq RBW$. Set detector = peak or average.
 - 4) The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if $T \leq 16.7 \mu s$.)

10.2 DEVIATION FROM STANDARD

No deviation.

10.3 TEST SETUP



10.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

10.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.



11. ANTENNA REQUIREMENT

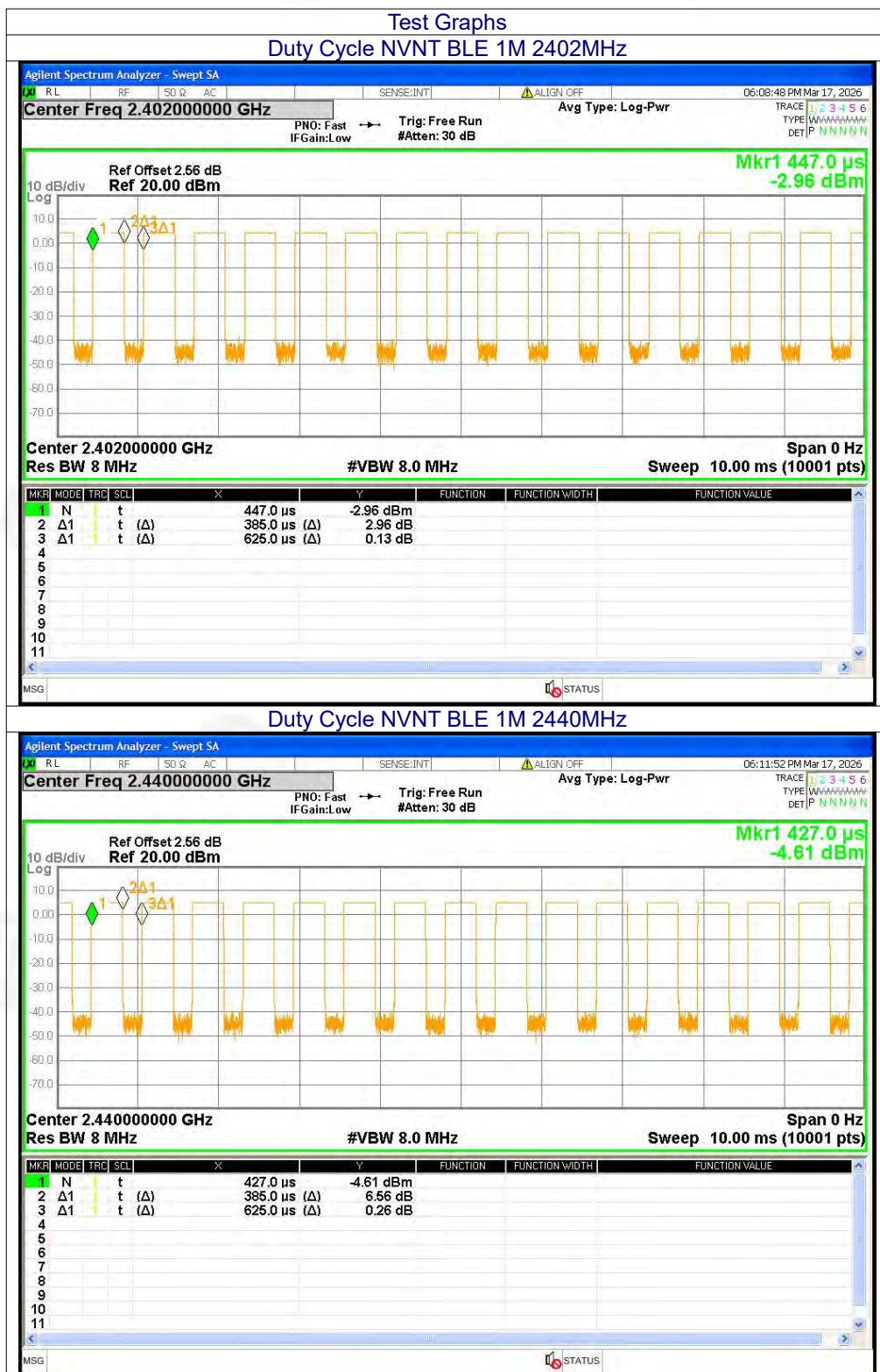
Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
EUT Antenna:	
The antenna is FPC antenna, the best case gain of the antennas is 1.64dBi, reference to the appendix II for details.	

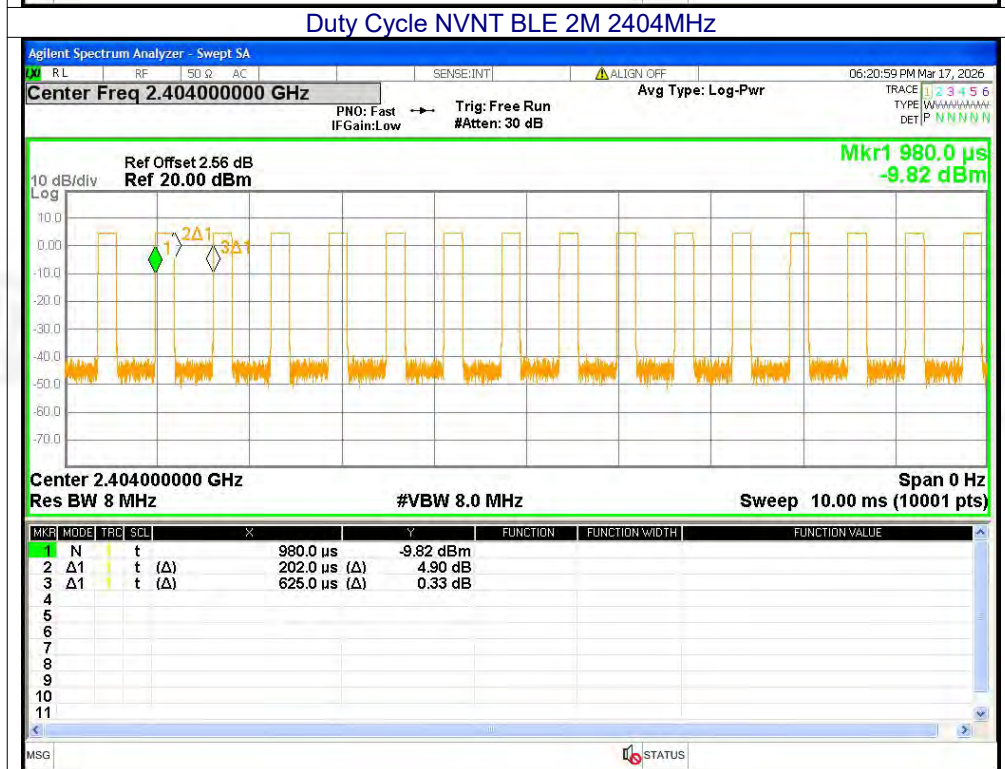
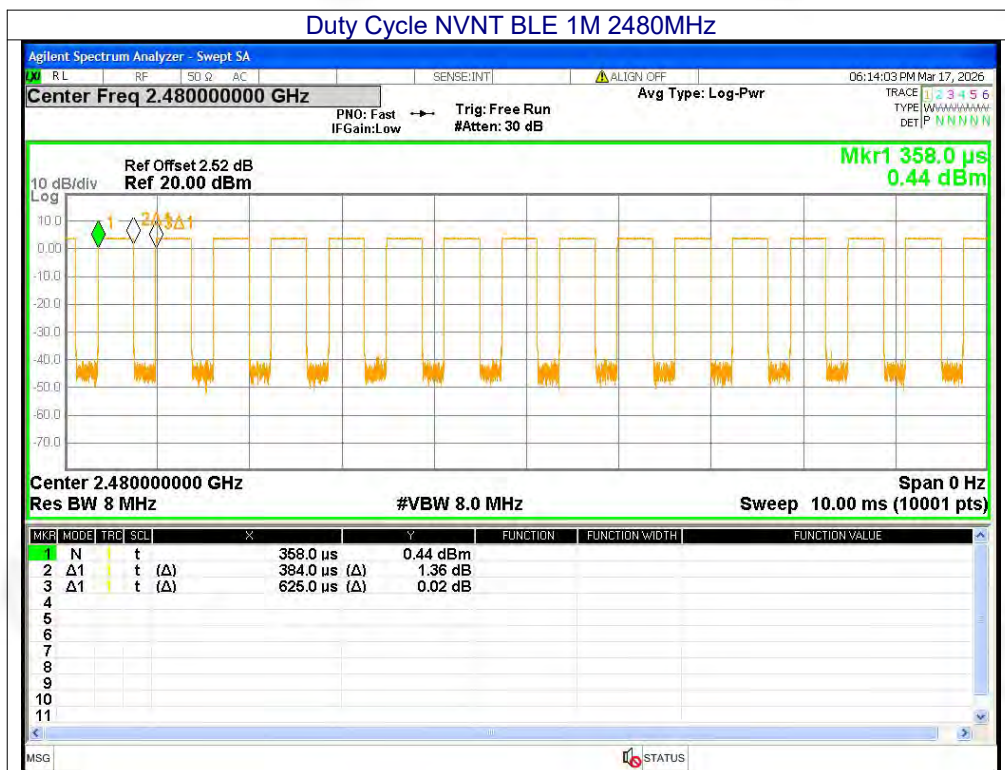


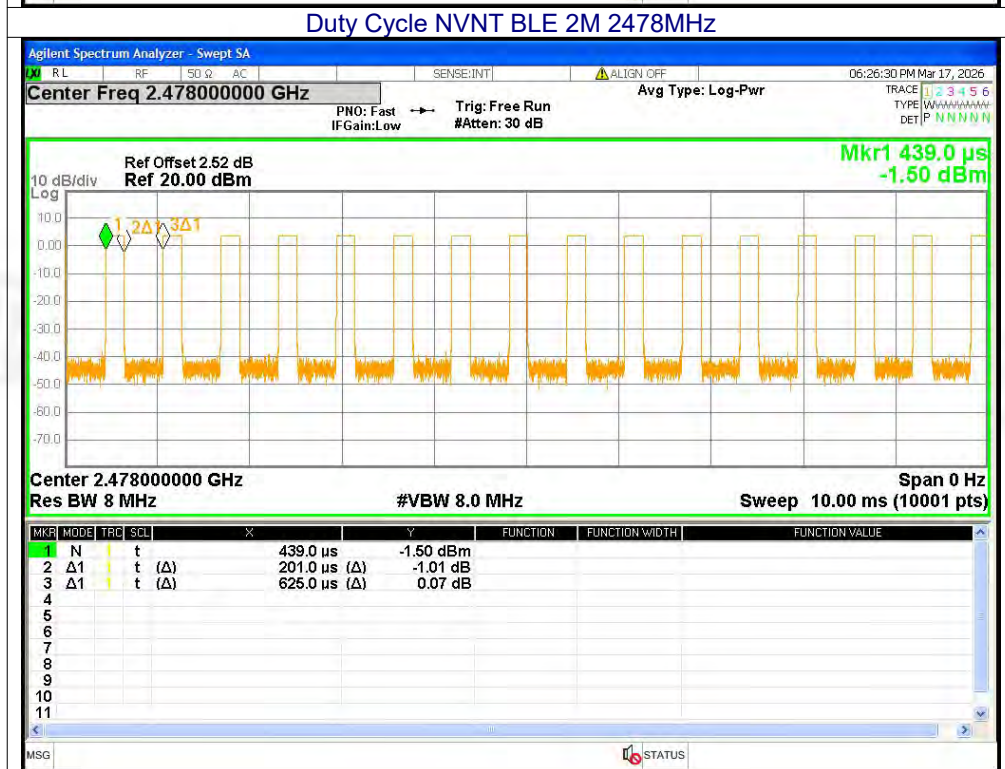
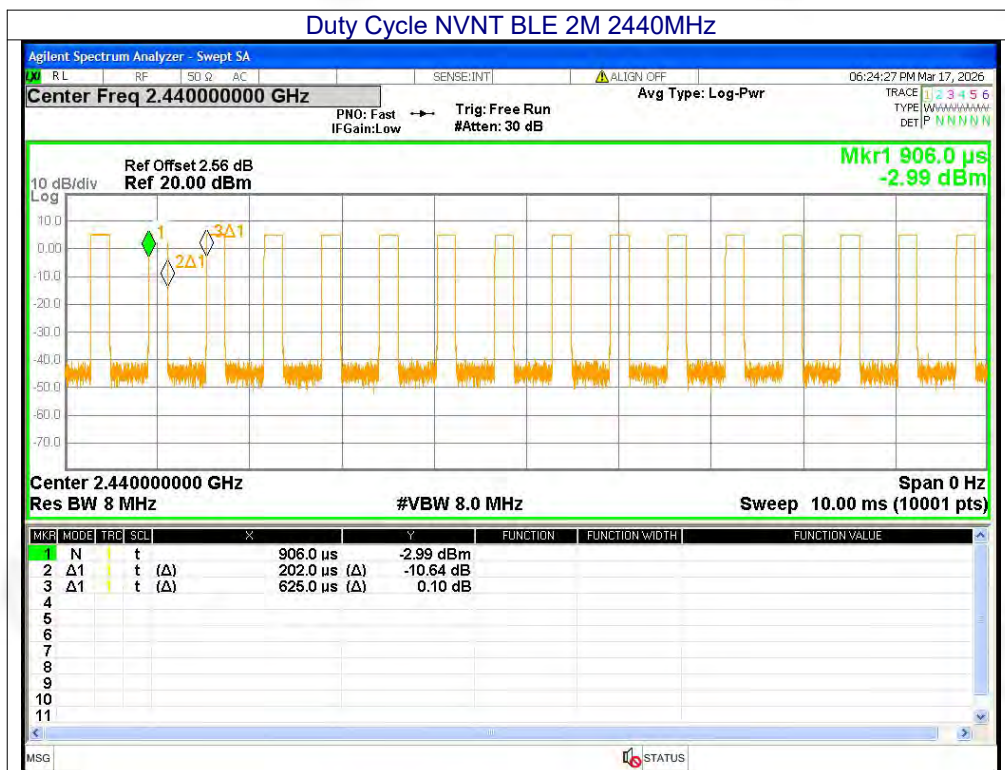
12. APPENDIX 1-TEST DATA

Duty Cycle

Condition	Mode	Frequency (MHz)	On Time (ms)	Period (ms)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	0.385	0.625	61.6	2.1	2.6
NVNT	BLE 1M	2440	0.385	0.625	61.6	2.1	2.6
NVNT	BLE 1M	2480	0.384	0.625	61.44	2.12	2.6
NVNT	BLE 2M	2404	0.202	0.625	32.32	4.91	4.95
NVNT	BLE 2M	2440	0.202	0.625	32.32	4.91	4.95
NVNT	BLE 2M	2478	0.201	0.625	32.16	4.93	4.98









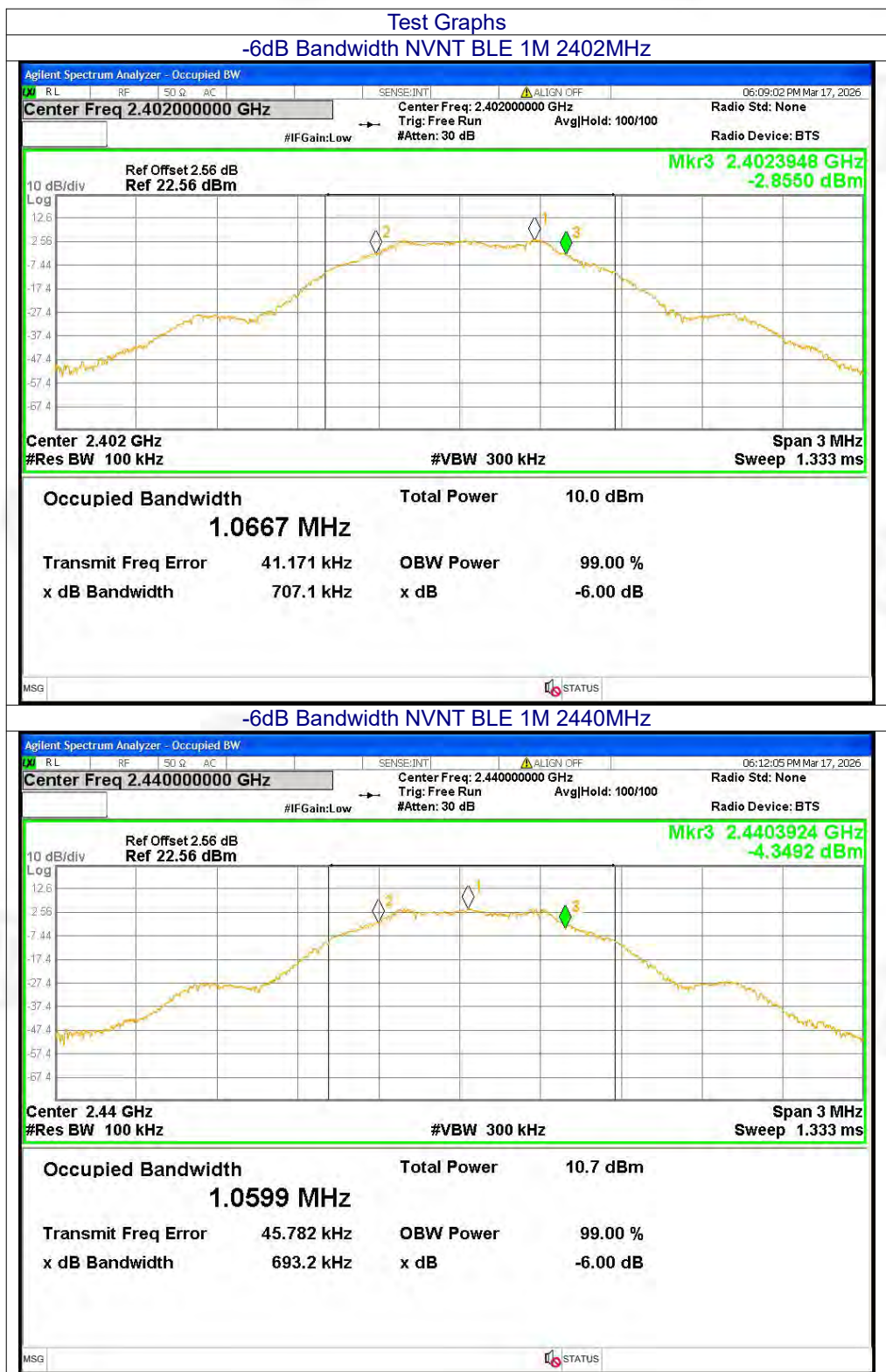
Maximum Peak Conducted Output Power

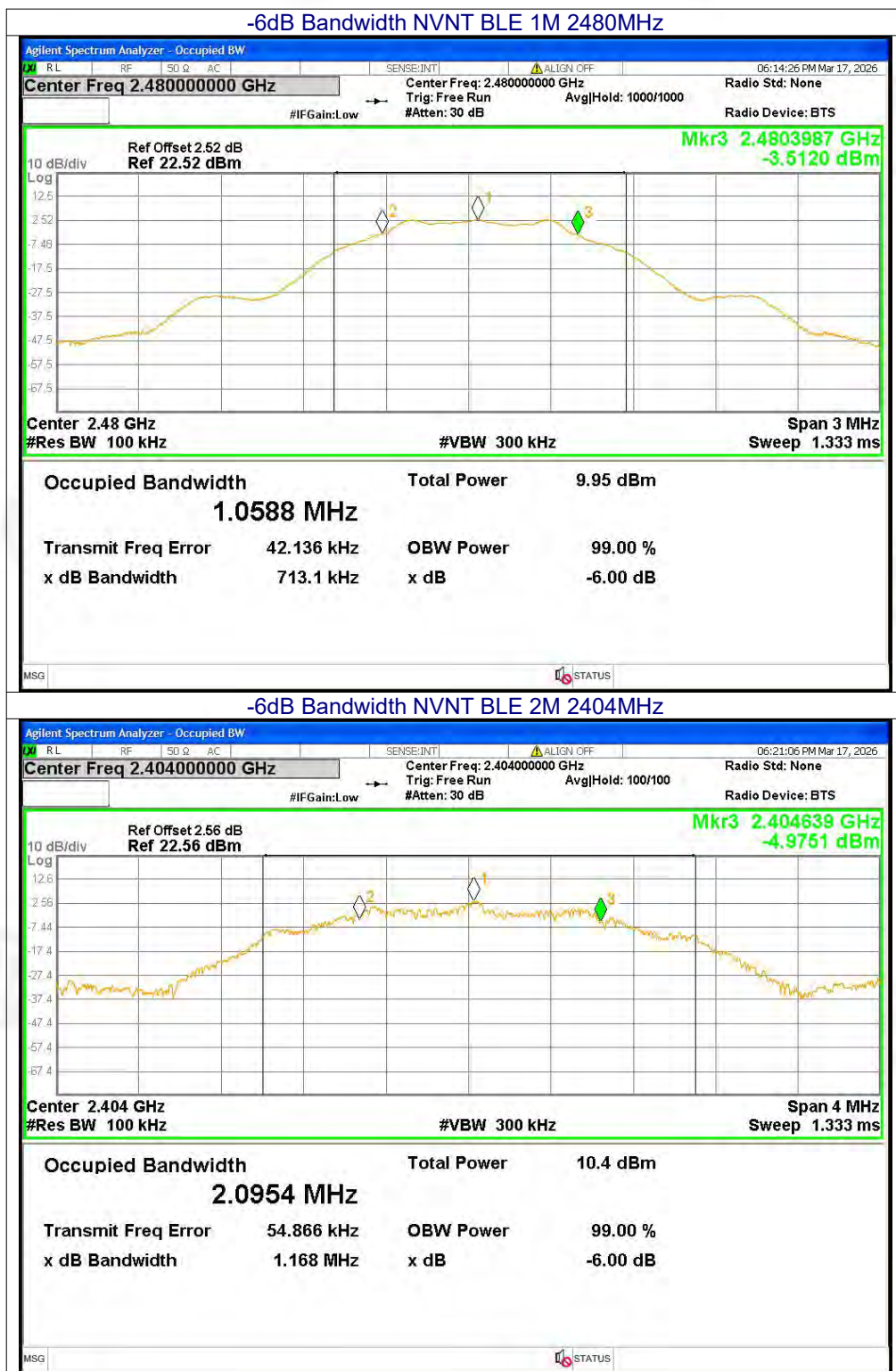
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	4.2	<=30	Pass
NVNT	BLE 1M	2440	5.04	<=30	Pass
NVNT	BLE 1M	2480	3.74	<=30	Pass
NVNT	BLE 2M	2404	4.51	<=30	Pass
NVNT	BLE 2M	2440	4.99	<=30	Pass
NVNT	BLE 2M	2478	3.66	<=30	Pass

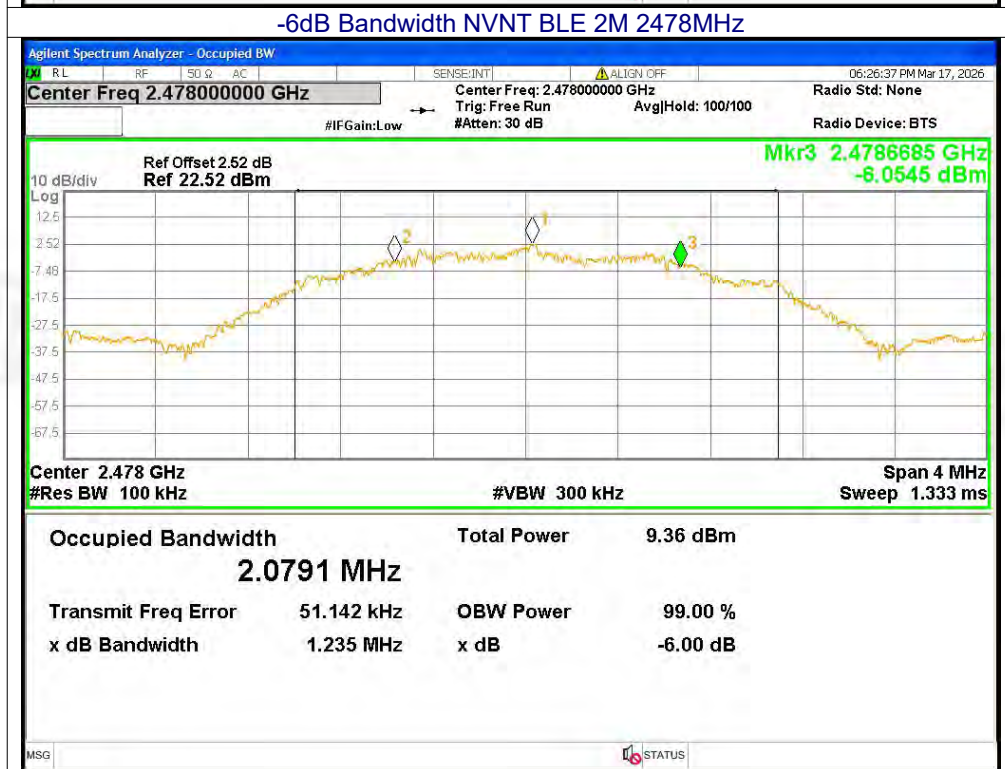
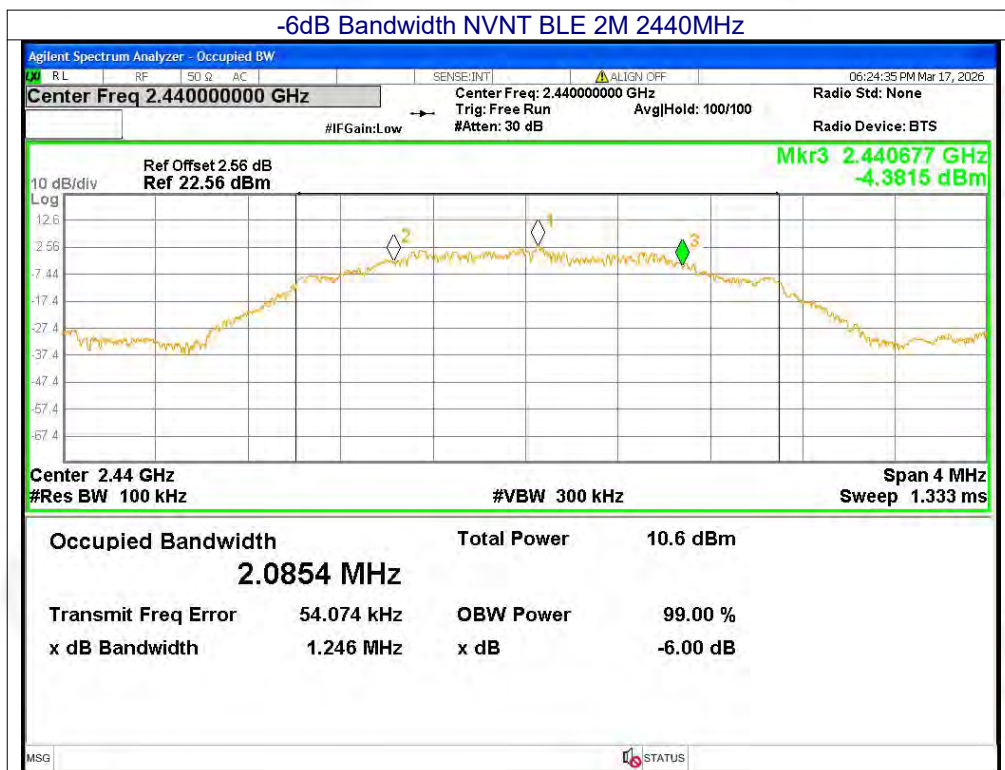


-6dB Bandwidth

Condition	Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	0.7071	≥ 0.5	Pass
NVNT	BLE 1M	2440	0.6932	≥ 0.5	Pass
NVNT	BLE 1M	2480	0.7131	≥ 0.5	Pass
NVNT	BLE 2M	2404	1.168	≥ 0.5	Pass
NVNT	BLE 2M	2440	1.246	≥ 0.5	Pass
NVNT	BLE 2M	2478	1.235	≥ 0.5	Pass



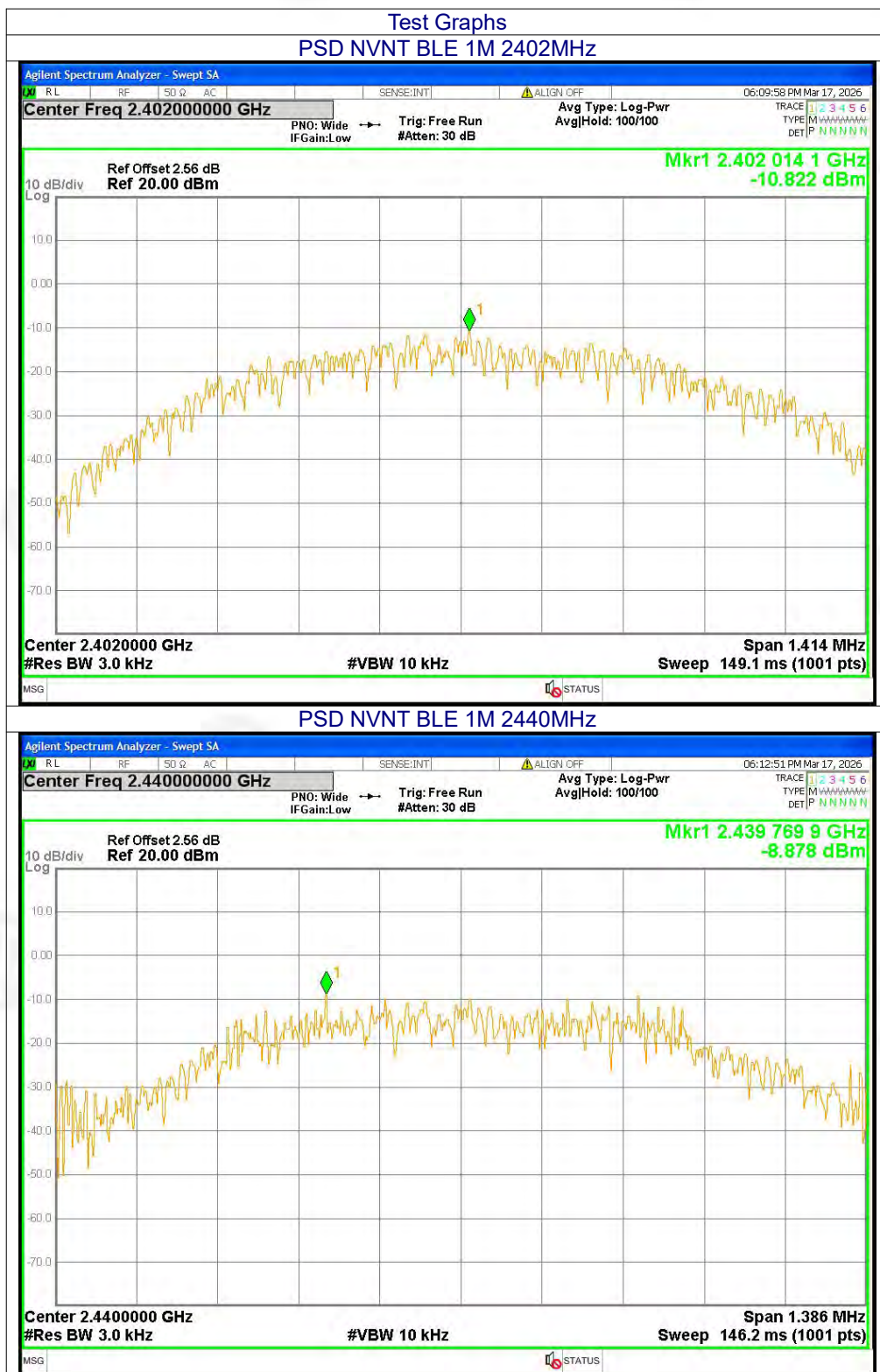


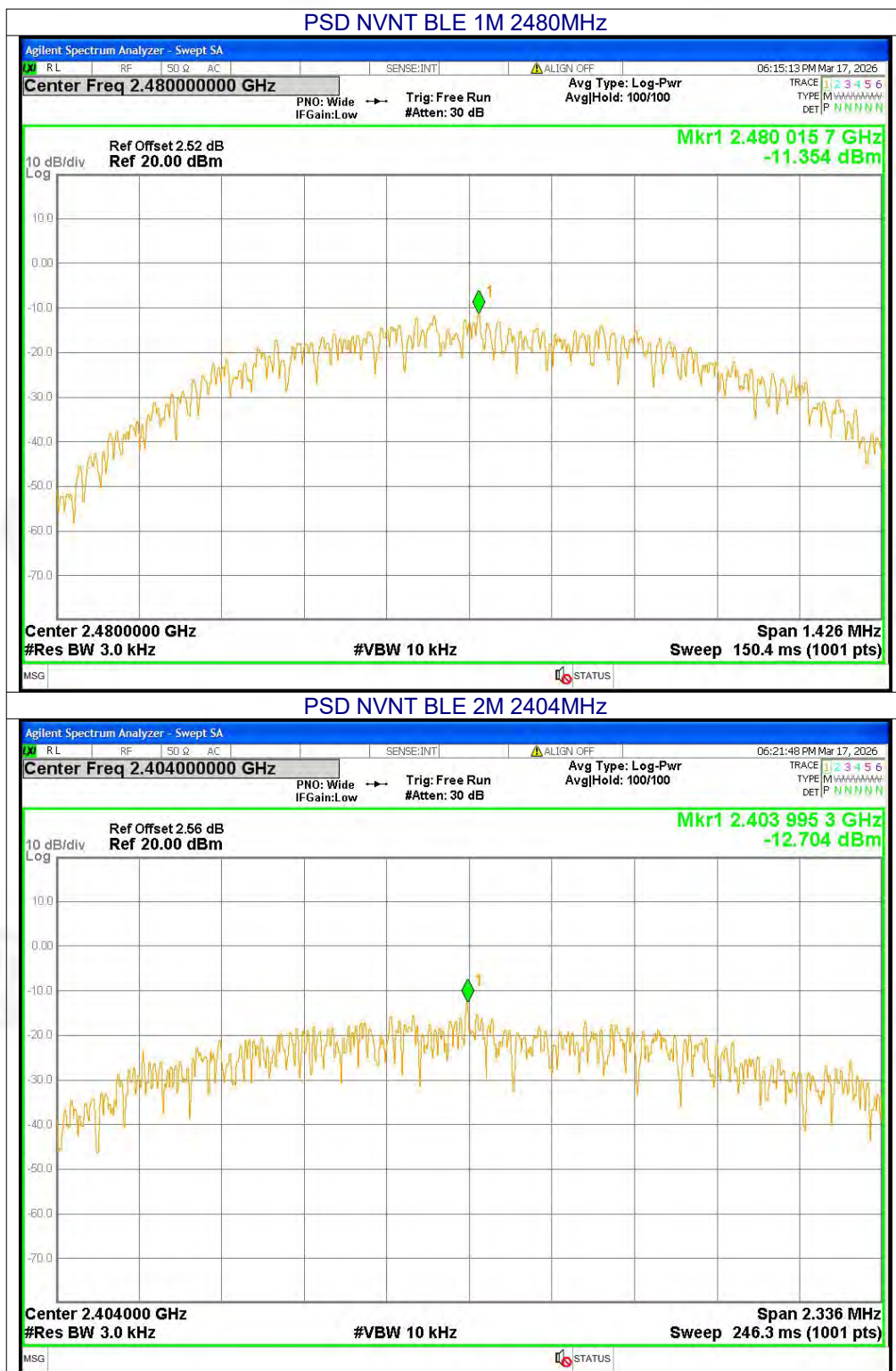


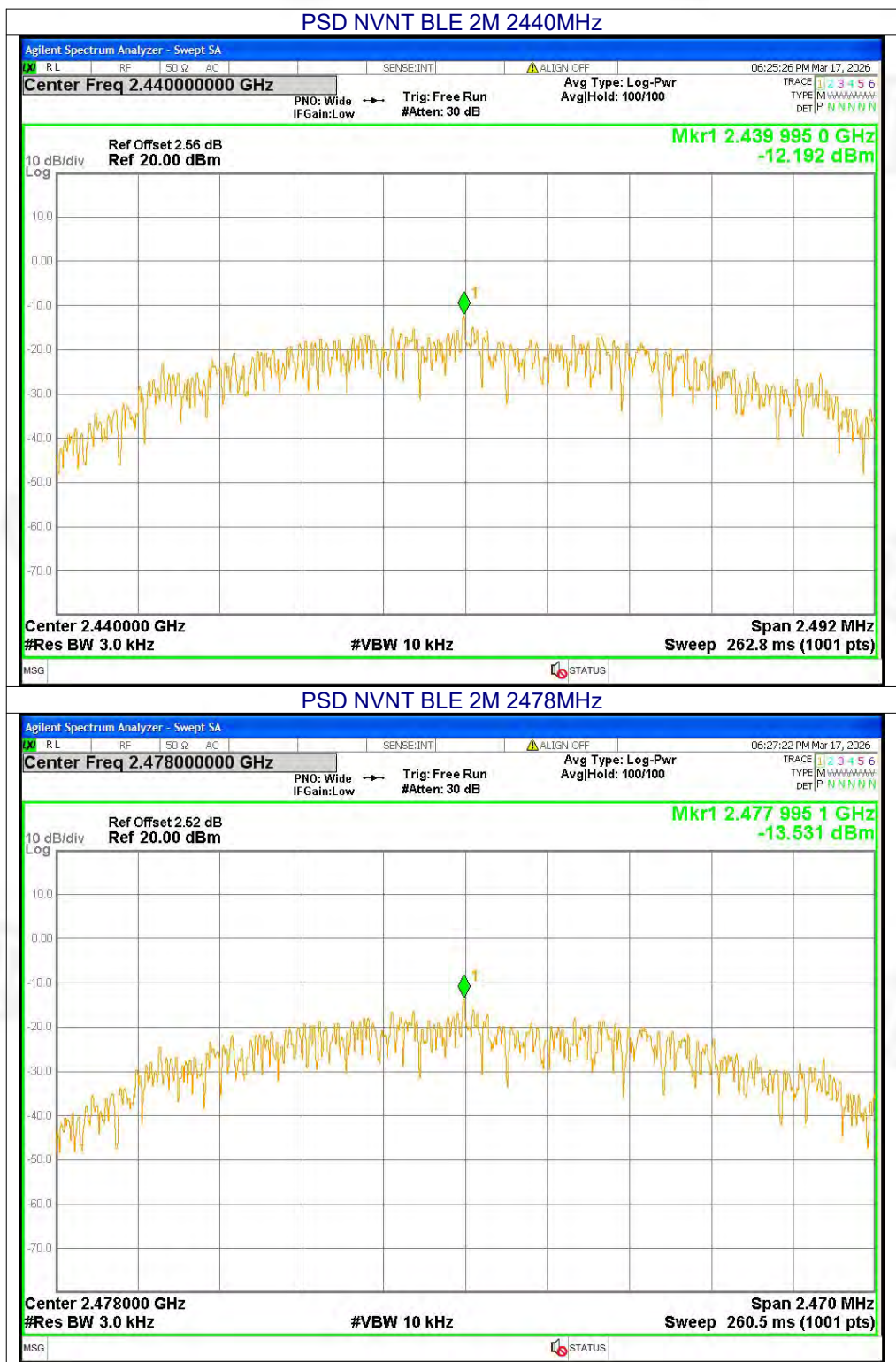


Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	-10.82	<=8	Pass
NVNT	BLE 1M	2440	-8.88	<=8	Pass
NVNT	BLE 1M	2480	-11.35	<=8	Pass
NVNT	BLE 2M	2404	-12.7	<=8	Pass
NVNT	BLE 2M	2440	-12.19	<=8	Pass
NVNT	BLE 2M	2478	-13.53	<=8	Pass



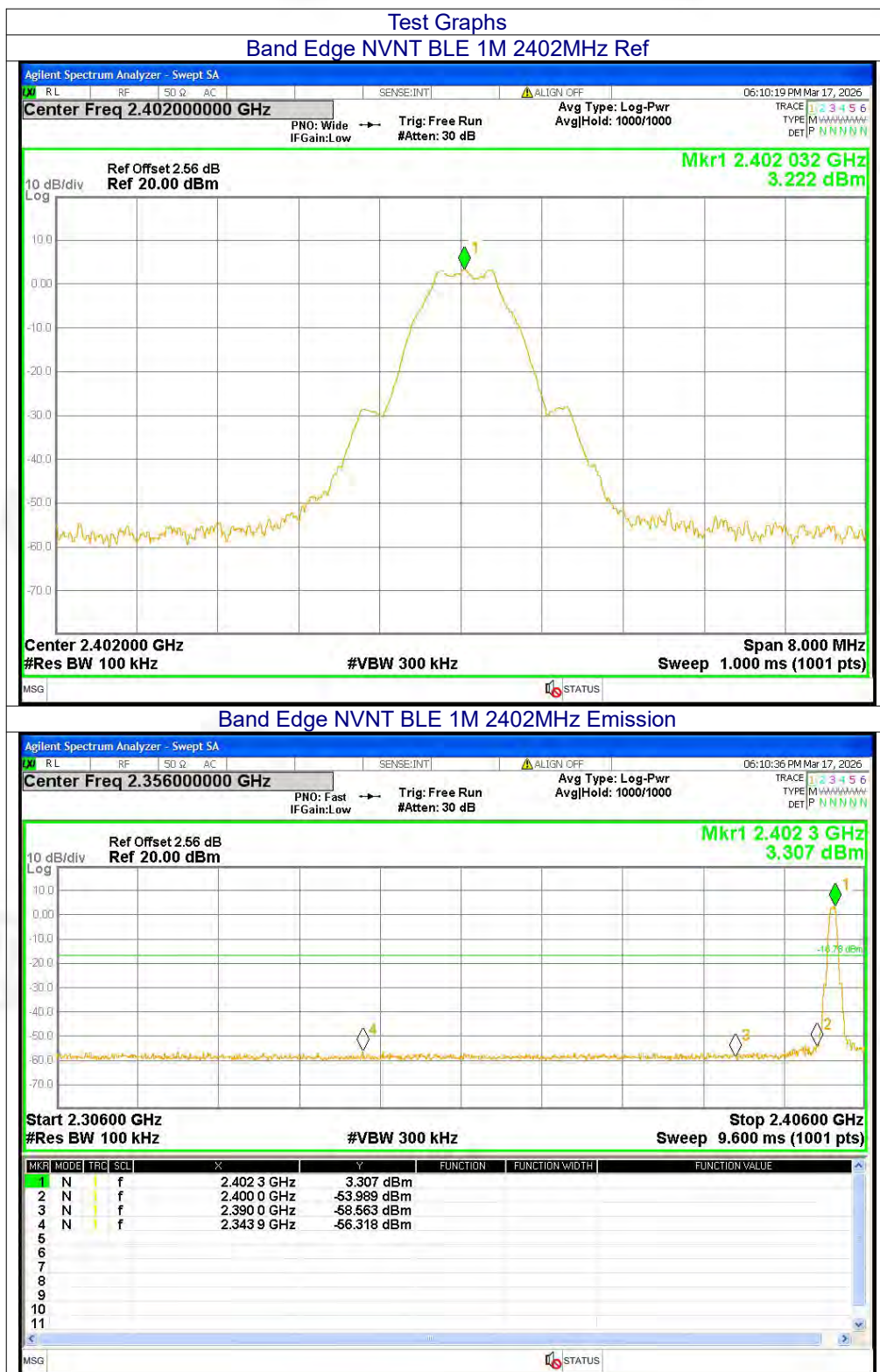


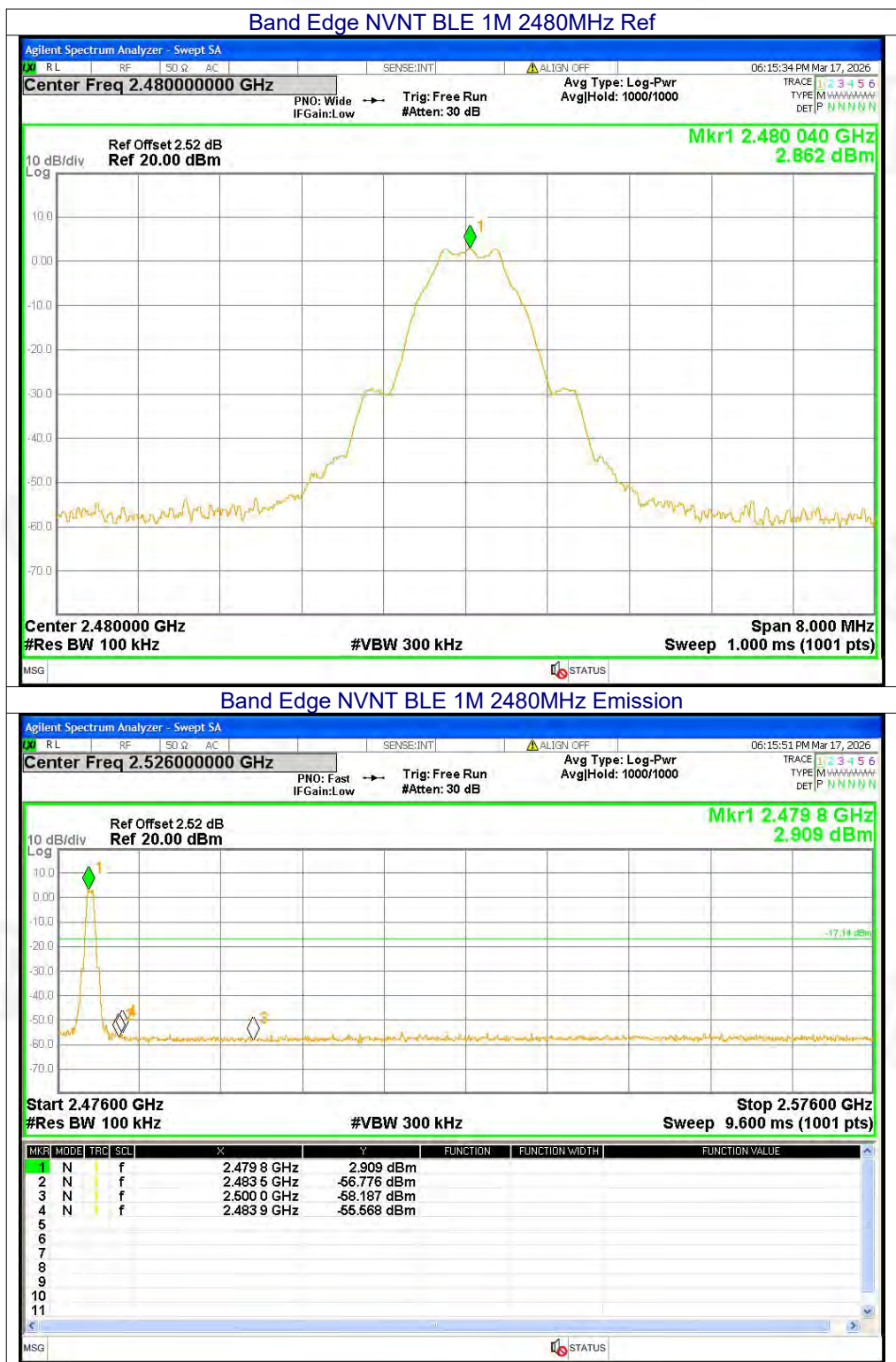


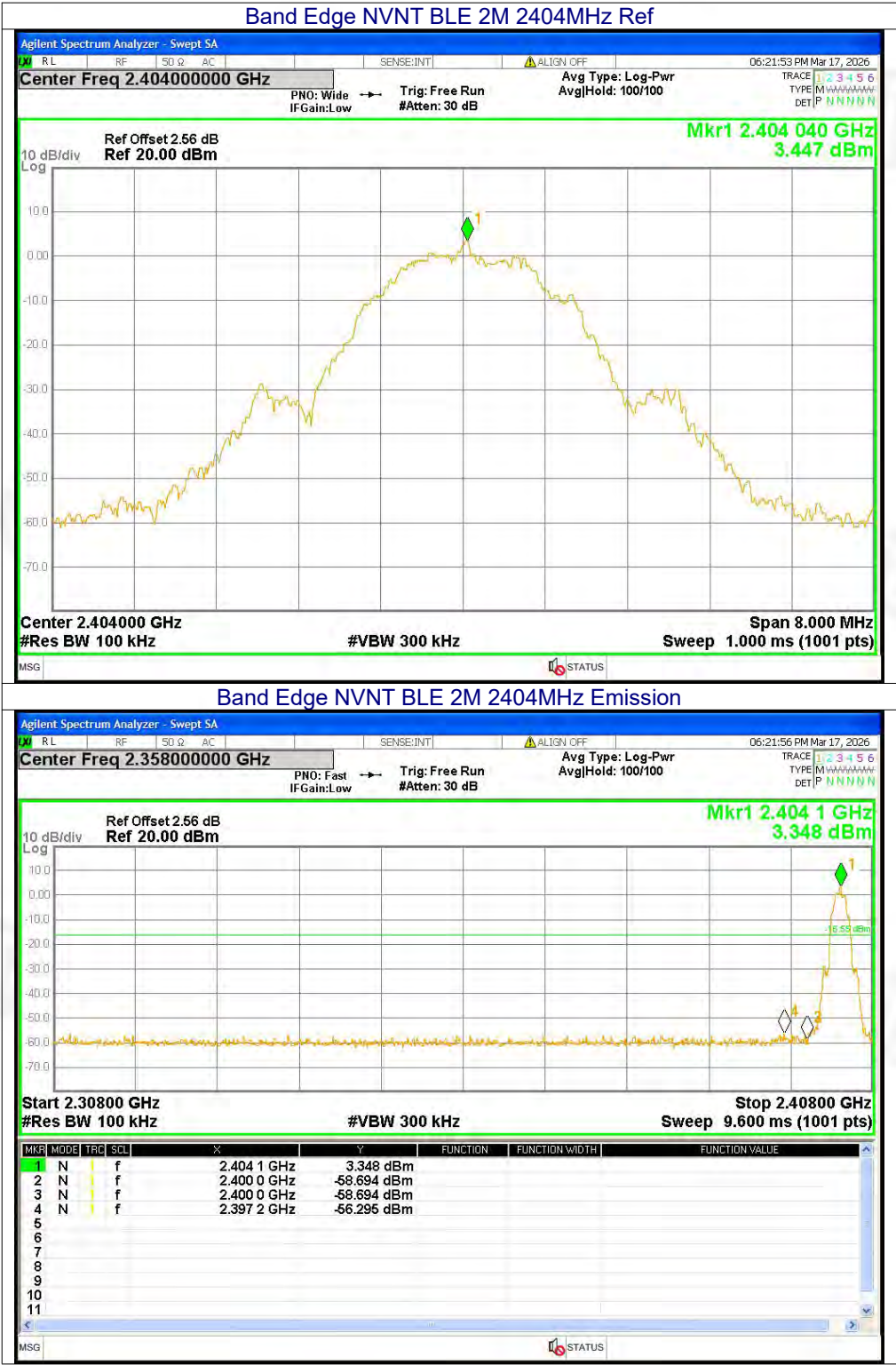


Band Edge

Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	-59.53	<=-20	Pass
NVNT	BLE 1M	2480	-58.42	<=-20	Pass
NVNT	BLE 2M	2404	-59.74	<=-20	Pass
NVNT	BLE 2M	2478	-58.94	<=-20	Pass





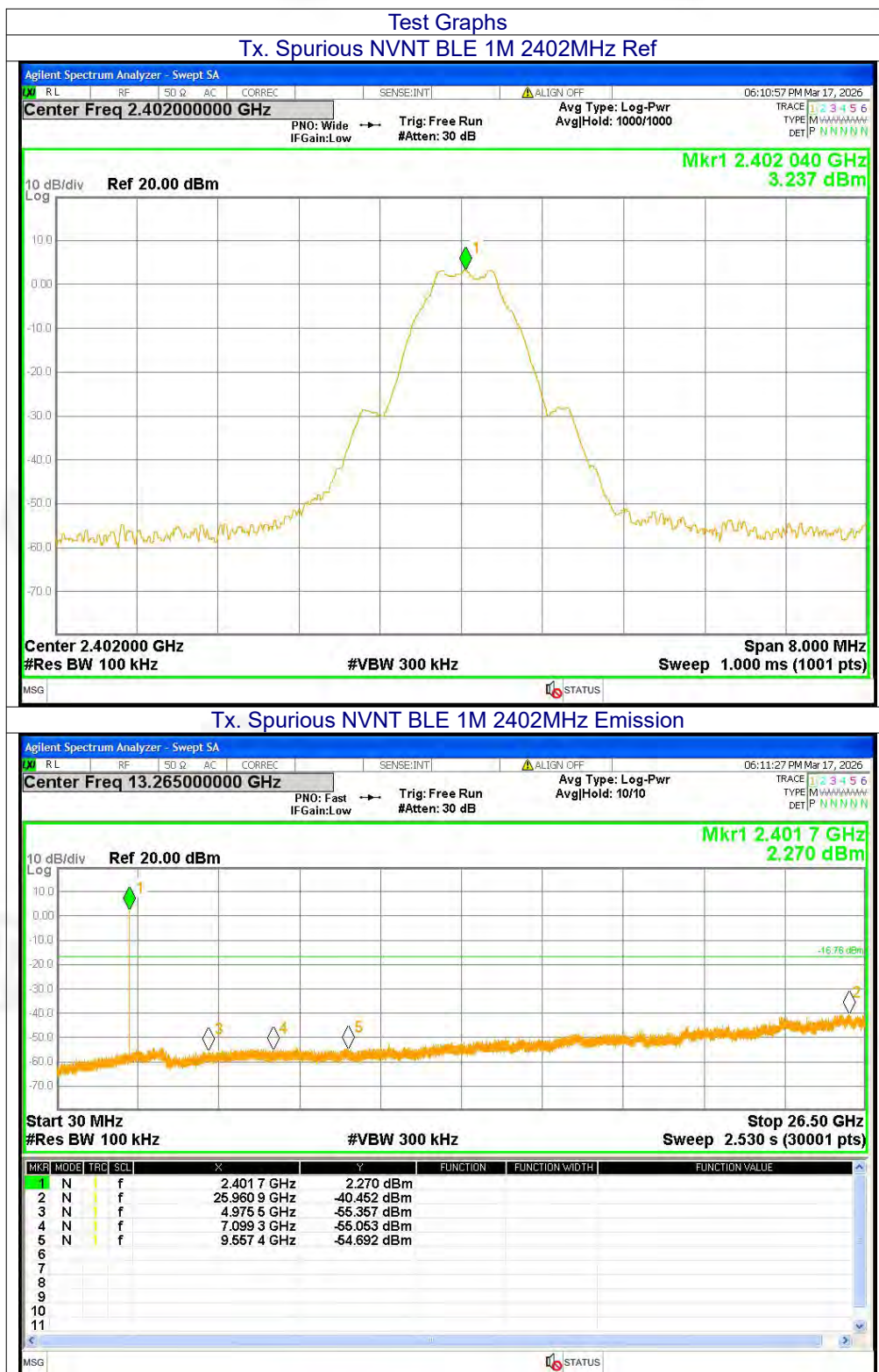


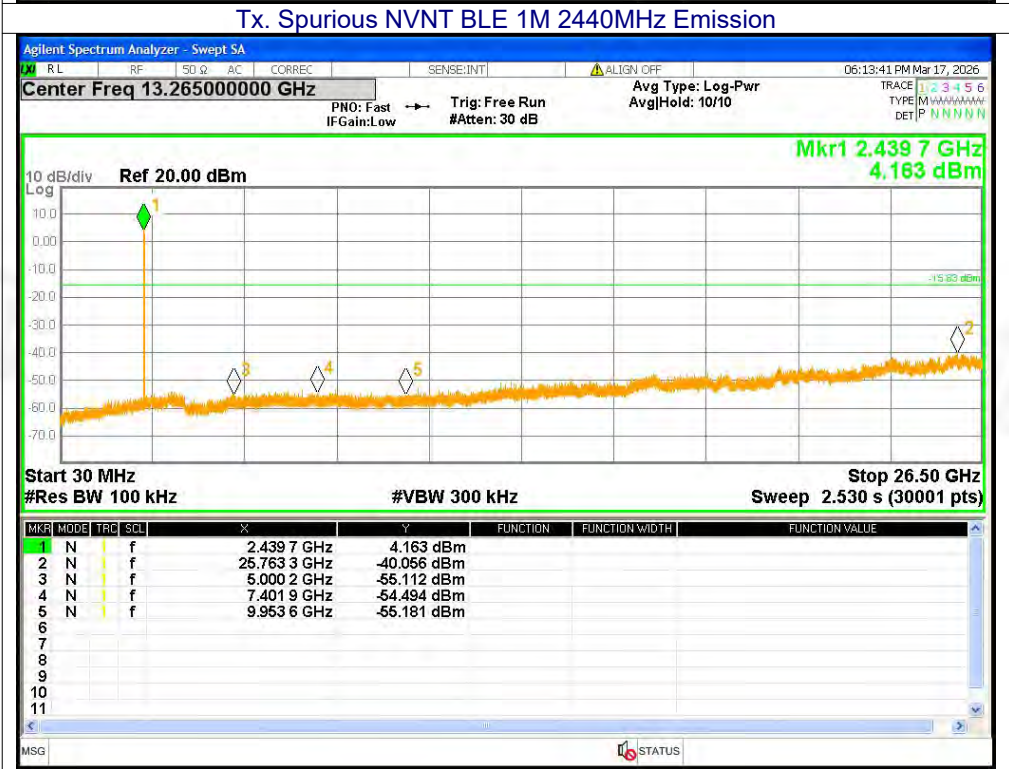
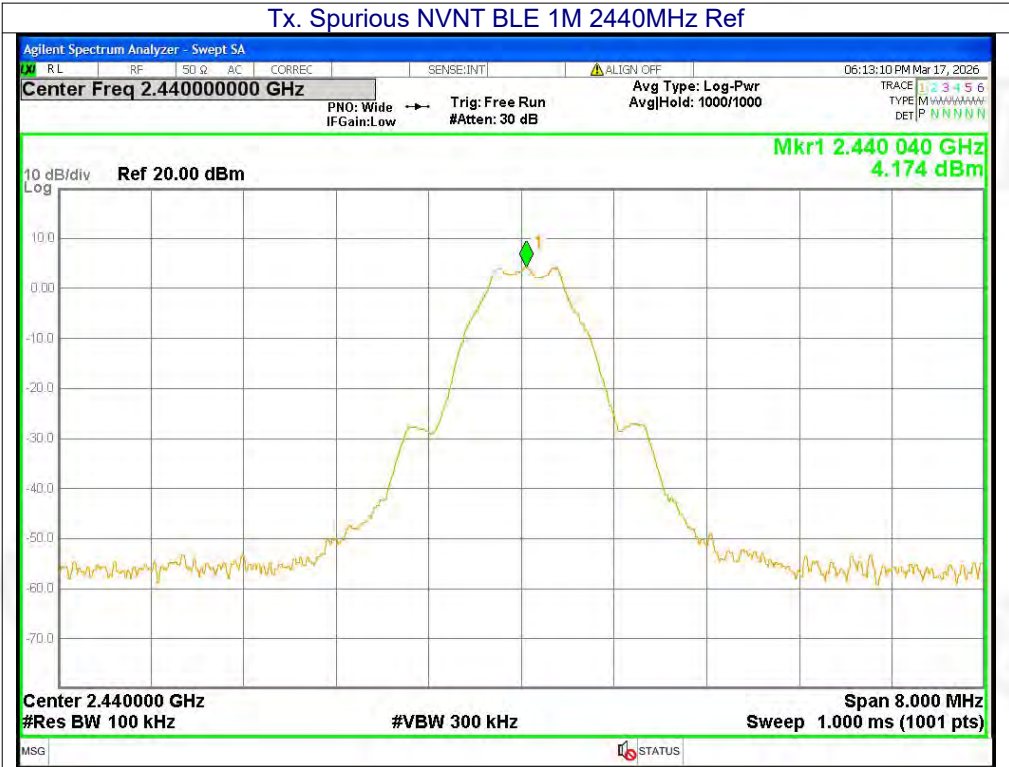


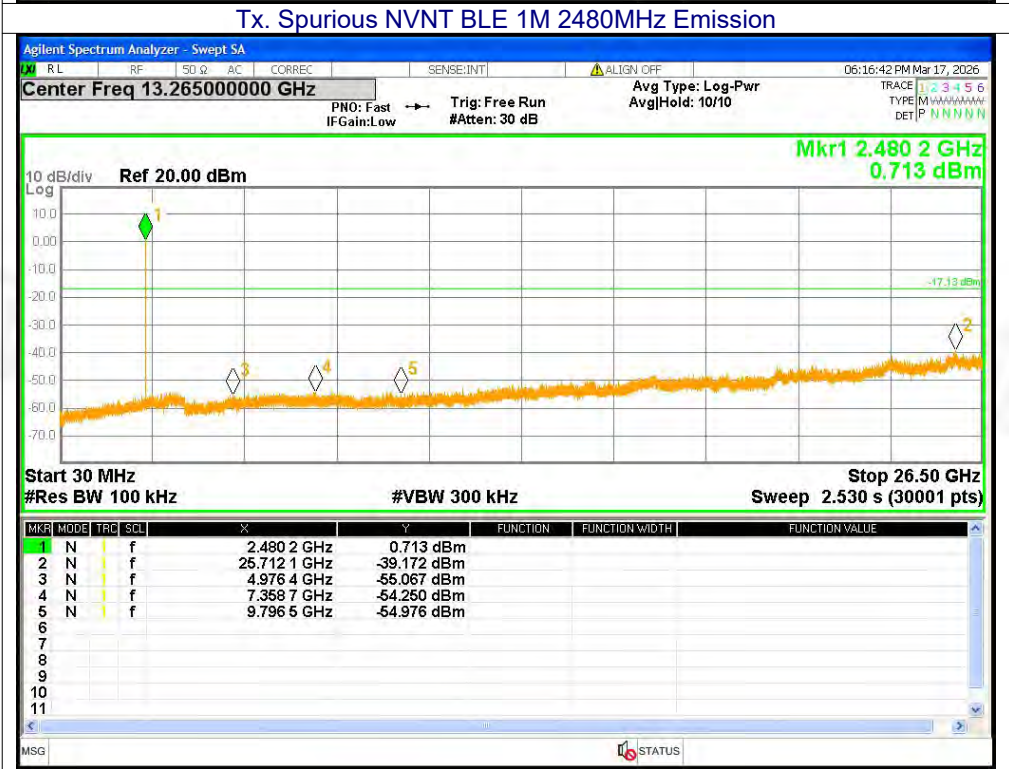
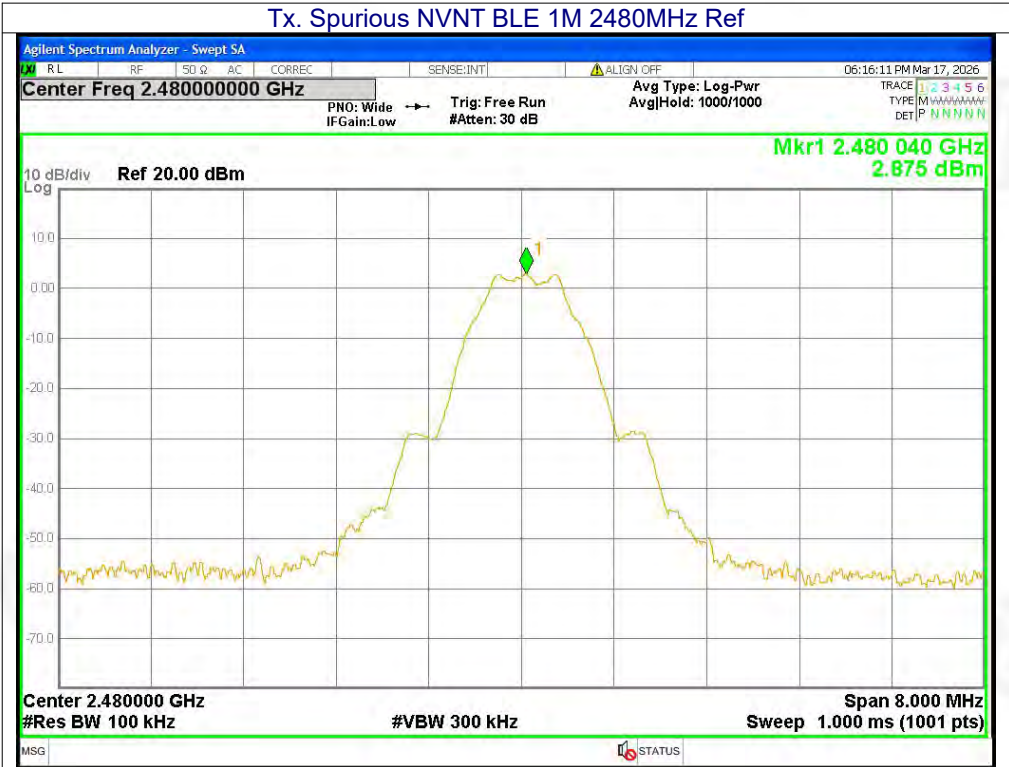


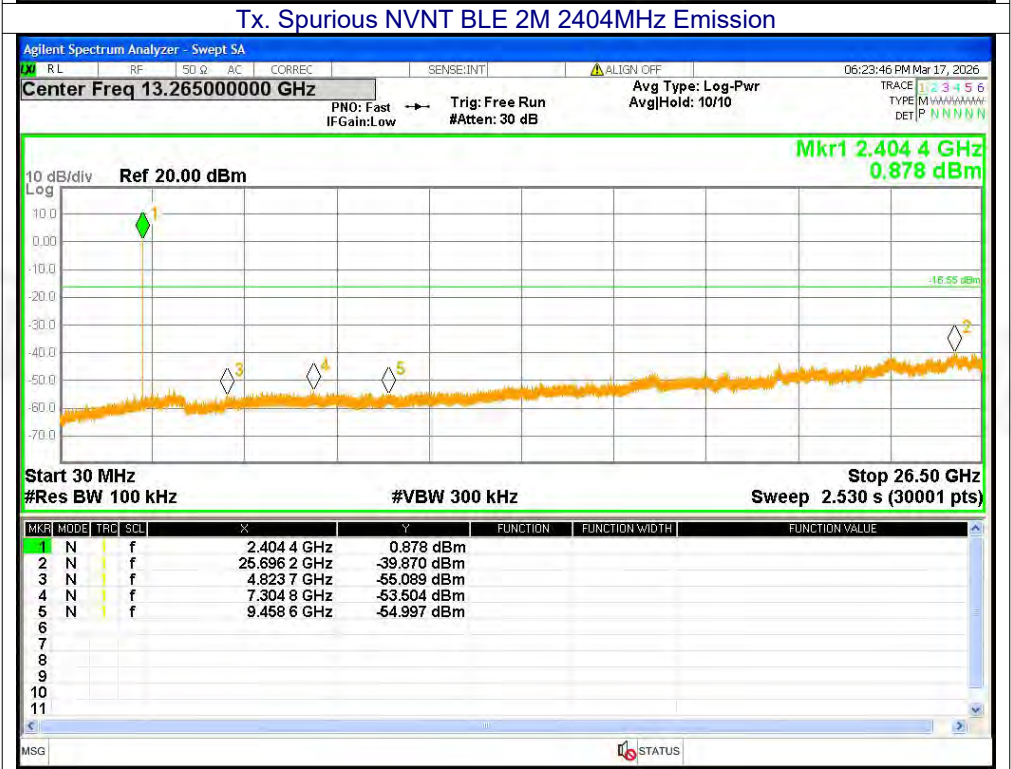
Conducted RF Spurious Emission

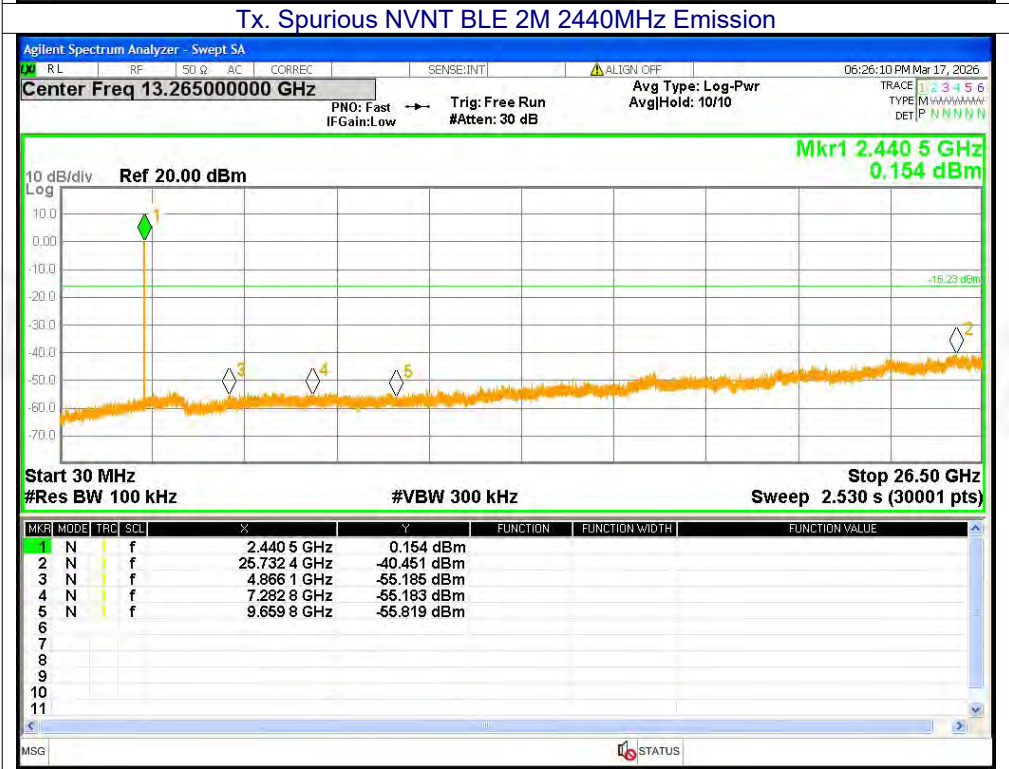
Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	-43.69	<=-20	Pass
NVNT	BLE 1M	2440	-44.22	<=-20	Pass
NVNT	BLE 1M	2480	-42.05	<=-20	Pass
NVNT	BLE 2M	2404	-43.33	<=-20	Pass
NVNT	BLE 2M	2440	-44.22	<=-20	Pass
NVNT	BLE 2M	2478	-42.48	<=-20	Pass

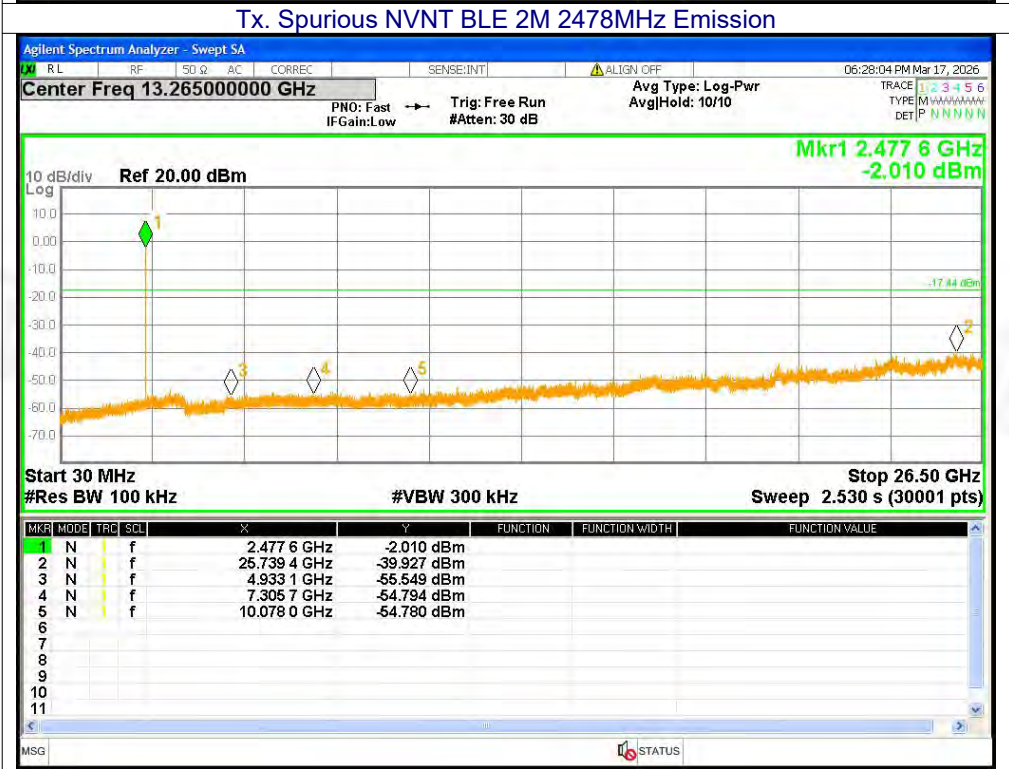








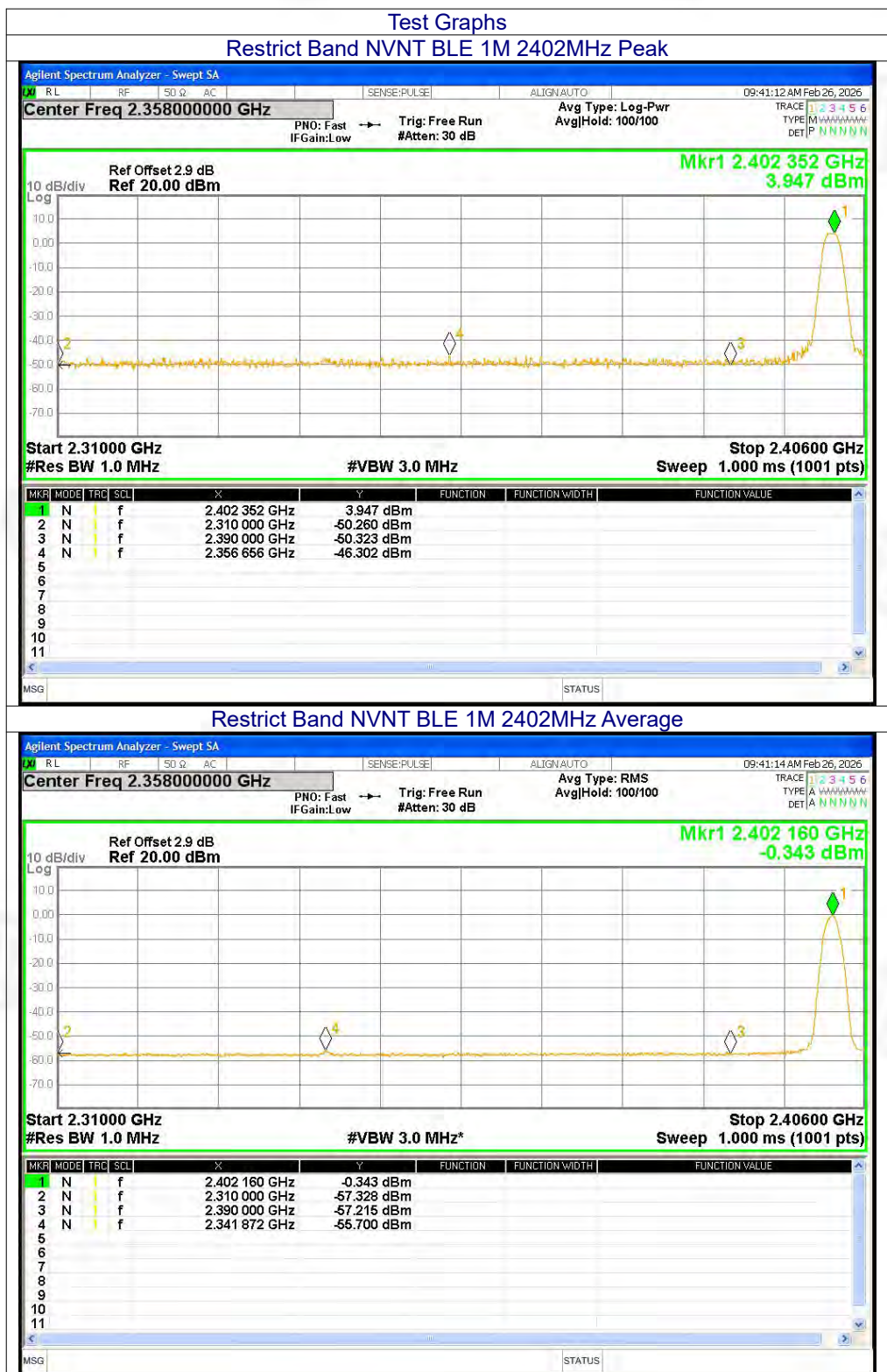


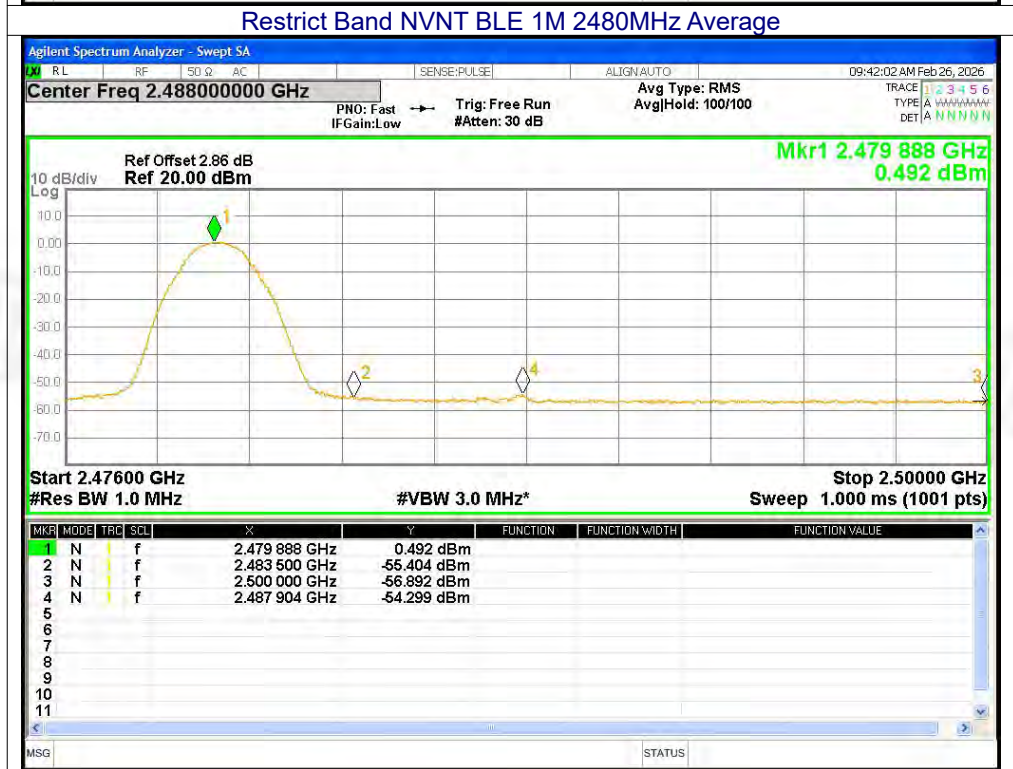
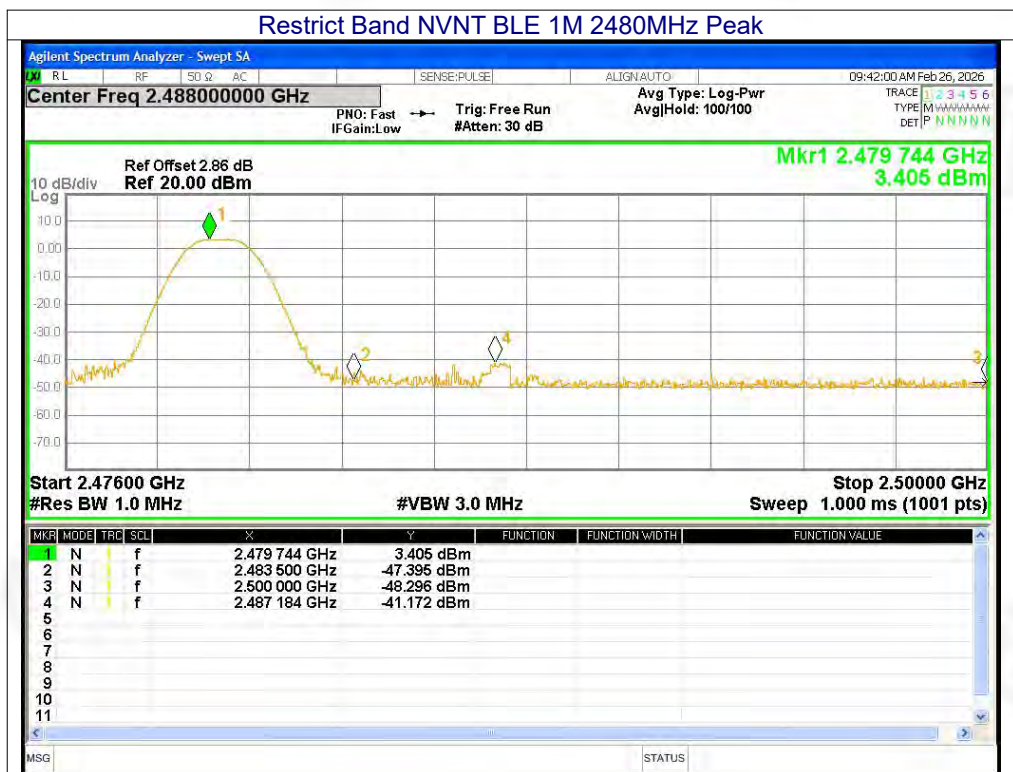


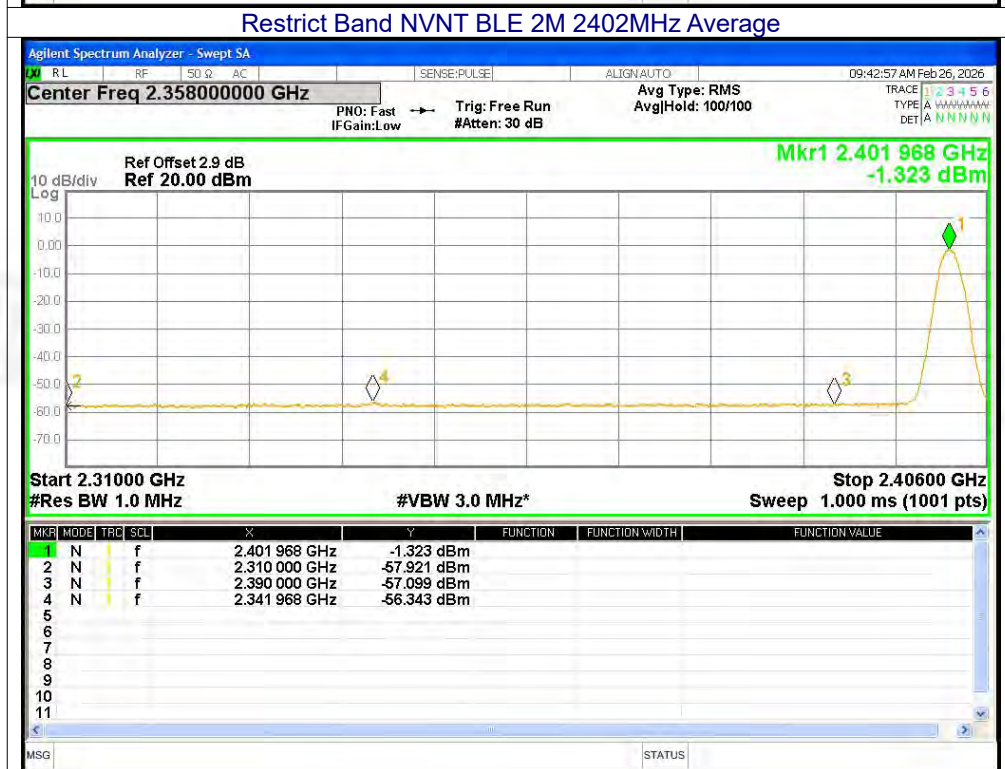
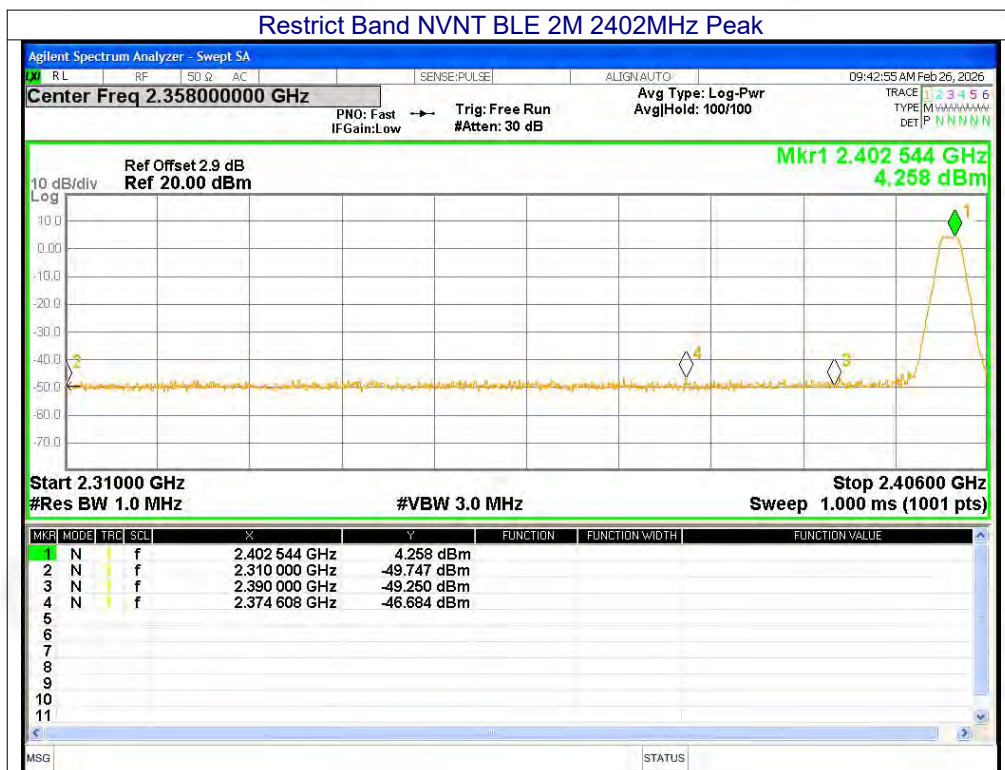


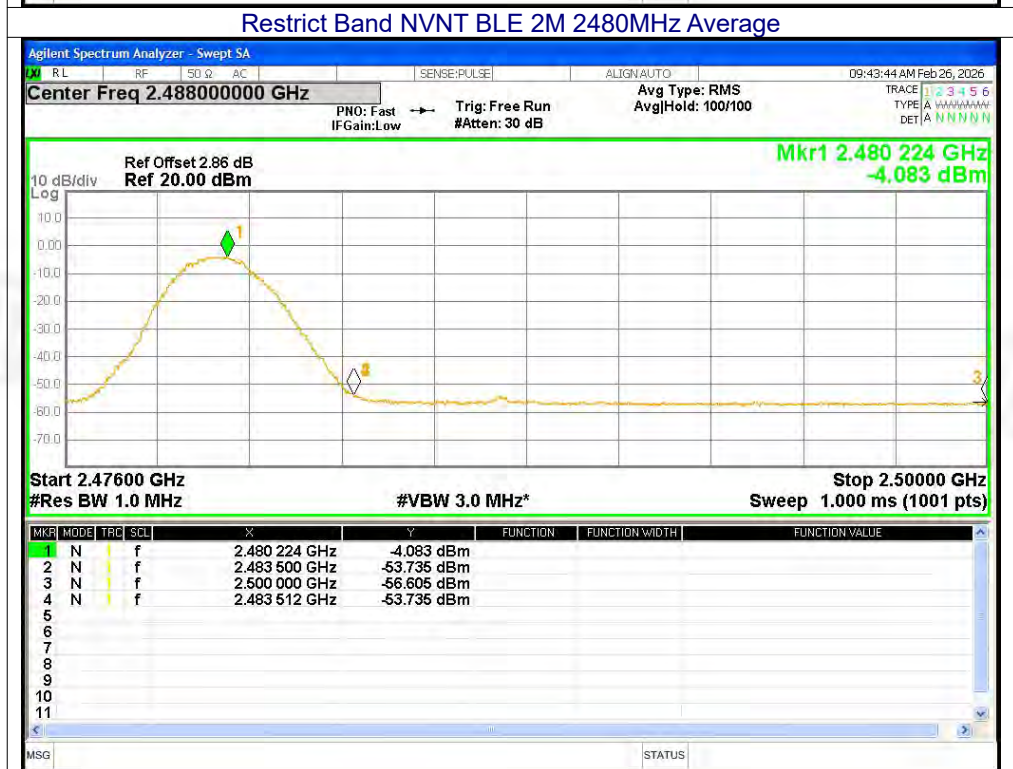
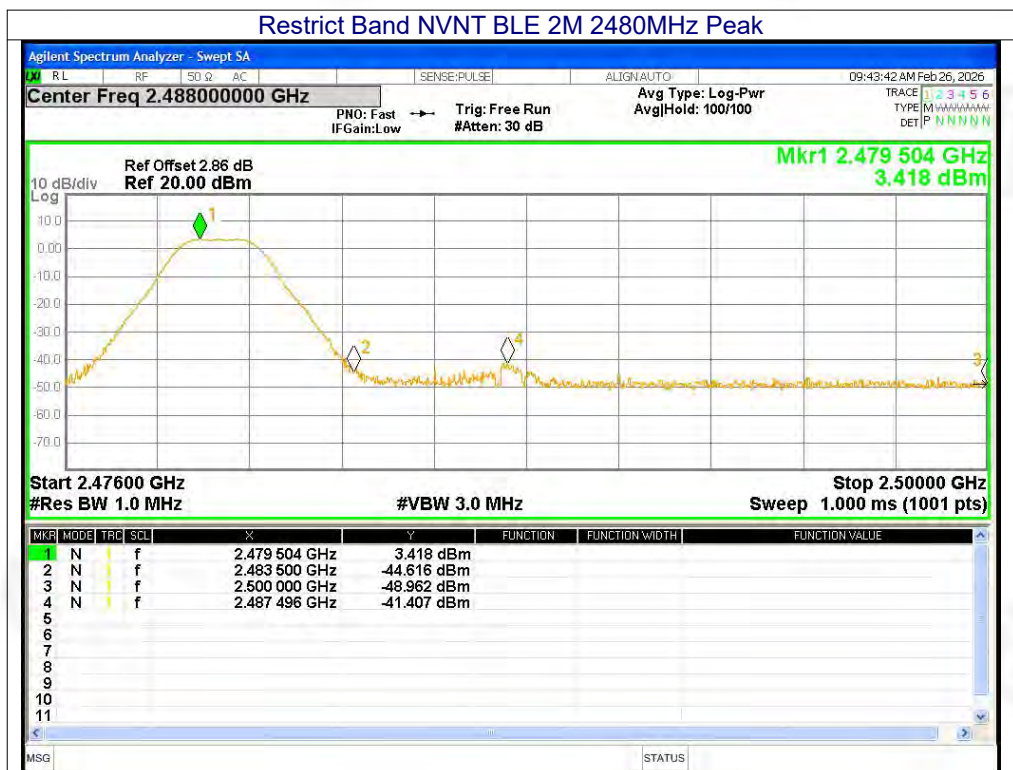
Restrict Band

Con dition	Mode	Freque ncy (MHz)	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NV NT	BLE 1M	2402	2310	-50.25	2	0	47.01	Peak	<=74	Pass
NV NT	BLE 1M	2402	2310	-57.32	2	2.1	42.04	Average	<=54	Pass
NV NT	BLE 1M	2402	2356.656	-46.3	2	0	50.96	Peak	<=74	Pass
NV NT	BLE 1M	2402	2341.872	-55.69	2	2.1	43.67	Average	<=54	Pass
NV NT	BLE 1M	2402	2390	-48.62	2	0	48.64	Peak	<=74	Pass
NV NT	BLE 1M	2402	2390	-57.38	2	2.1	41.98	Average	<=54	Pass
NV NT	BLE 1M	2480	2483.5	-47.39	2	0	49.87	Peak	<=74	Pass
NV NT	BLE 1M	2480	2483.5	-55.4	2	2.1	43.96	Average	<=54	Pass
NV NT	BLE 1M	2480	2487.184	-41.17	2	0	56.09	Peak	<=74	Pass
NV NT	BLE 1M	2480	2487.904	-54.29	2	2.1	45.07	Average	<=54	Pass
NV NT	BLE 1M	2480	2500	-48.29	2	0	48.97	Peak	<=74	Pass
NV NT	BLE 1M	2480	2500	-56.89	2	2.1	42.47	Average	<=54	Pass
NV NT	BLE 2M	2402	2310	-49.74	2	0	47.52	Peak	<=74	Pass
NV NT	BLE 2M	2402	2310	-57.92	2	4.91	44.25	Average	<=54	Pass
NV NT	BLE 2M	2402	2374.608	-46.68	2	0	50.58	Peak	<=74	Pass
NV NT	BLE 2M	2402	2341.968	-56.34	2	4.91	45.83	Average	<=54	Pass
NV NT	BLE 2M	2402	2390	-49.8	2	0	47.46	Peak	<=74	Pass
NV NT	BLE 2M	2402	2390	-57.17	2	4.91	45	Average	<=54	Pass
NV NT	BLE 2M	2480	2483.5	-44.61	2	0	52.65	Peak	<=74	Pass
NV NT	BLE 2M	2480	2483.5	-53.73	2	4.93	48.46	Average	<=54	Pass
NV NT	BLE 2M	2480	2487.496	-41.4	2	0	55.86	Peak	<=74	Pass
NV NT	BLE 2M	2480	2483.512	-53.73	2	4.93	48.46	Average	<=54	Pass
NV NT	BLE 2M	2480	2500	-48.96	2	0	48.3	Peak	<=74	Pass
NV NT	BLE 2M	2480	2500	-56.6	2	4.93	45.59	Average	<=54	Pass











13. TEST SETUP PHOTO

Reference to the appendix I for details.

14. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

***** END OF REPORT *****