

FCC & ISED Radio Test Report

FCC ID: XGB-CWBB0063**IC: 3879A-CWBB0063****The report concerns: Original Grant**

Report Reference No.....: 26EFSB07004 04311
Date Sample(s) Received.....: 2026-07-07
Date of Tested.....: From 2026-07-12 to 2026-07-31
Date of issue.....: 2026-08-14
Testing Laboratory: DongGuanShuoXin Electronic Technology Co., Ltd.
Address: Zone A, 1F, No. 6, XinGang Road YuanGang Street,
XinAn District, ChangAn Town, DongGuan City,
GuangDong, China

Applicant's name: Voyetra Turtle Beach, Inc.
Address: 15822 Bernardo Center Drive, Suite 105, San Diego,
CA 92127, USA

Equipment.....: Wireless Controller
Trade Mark: N/A
Model: CWBB0063
Ratings: I/P: 5VDC 500mA (Provided by USB-C)
3.7VDC 900mAh (Provided by the battery)

Test Engineer:

Jelena OuYang

Responsible Engineer :

Leo Chen

Authorized Signatory:

Smile Wang

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1 TEST REPORT DECLARE

Applicant for FCC	Voyetra Turtle Beach, Inc.
Address for FCC	15822 Bernardo Center Drive, Suite 105, San Diego, CA 92127, USA
Manufacturer	Voyetra Turtle Beach, Inc.
Address	15822 Bernardo Center Drive, Suite 105, San Diego, CA 92127, USA
Equipment	Wireless Controller
Model No.	CWBB0063
Trade Mark	N/A
Standard	FCC Part15, Subpart C (15.247) RSS-247 Issue 4 July 2025 RSS-Gen Issue 6 July 2026 ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 +Errata to C63.10a-2024

We Declare:

The equipment described above is tested by DongGuanShuoXin Electronic Technology Co., Ltd(ATT). and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and DongGuanShuoXin Electronic Technology Co., Ltd.(ATT) is assumed of full responsibility for the accuracy and completeness of these tests.

ATT is not responsible for the sampling stage, so the results only apply to the sample as received.

ATT's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. ATT shall have no liability for any declarations, inferences or generalizations drawn by the client or others from ATT issued reports.

2 SUMMARY OF TEST RESULTS

The EUT have been tested according to the applicable standards as referenced below:

Standard(s) Section		Test Item	Judgment	Remark
FCC	ISED			
15.207	RSS-Gen 7.4.2	AC Power Line Conducted Emissions	PASS	-----
15.247(d) 15.205(a) 15.209(a)	RSS-247 6.6 RSS-Gen 7.4.3 RSS-Gen 7.5	Radiated Emissions	PASS	-----
15.247(a)(2)	RSS-247 6.3.1 (a) RSS-Gen 5.1	Bandwidth	PASS	-----
15.247(b)(3)	RSS-247 6.3.2	Maximum Output Power	PASS	-----
15.247(d)	RSS-247 6.6	Conducted Spurious Emission	PASS	-----
15.247(e)	RSS-247 6.3.1 (b)	Power Spectral Density	PASS	-----
-	RSS-Gen 5.3	Frequency Stability	PASS	-----
15.203	RSS-Gen 5.2	Antenna Requirement	PASS	Note(2)

Note:

- (1) "N/A" denotes test is not applicable to this device.
- (2) For FCC, the device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.

2.1 MEASUREMENT UNCERTAINTY

Test Item	Uncertainty
Uncertainty for Conduction emission test (9kHz-150kHz)	3.7 dB
Uncertainty for Conduction emission test (150kHz-30MHz)	3.3 dB
Uncertainty for Radiation Emission test (30MHz-200MHz)	4.60 dB (Polarize: V)
	4.60 dB (Polarize: H)
Uncertainty for Radiation Emission test (200MHz-1GHz)	6.10 dB (Polarize: V)
	5.08 dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz-6GHz)	5.01 dB (Polarize: V)
	5.01 dB (Polarize: H)
Uncertainty for Radiation Emission test (6GHz-18GHz)	5.26 dB (Polarize: V)
	5.26 dB (Polarize: H)
Uncertainty for Radiation Emission test (18GHz-40GHz)	5.06 dB (Polarize: V)
	5.06 dB (Polarize: H)
Uncertainty for radio frequency	$\pm 0.048\text{kHz}$
Uncertainty for conducted RF Power	$\pm 0.32\text{dB}$

Note:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test Facility:

The Test site used by DongGuanShuoXin Electronic Technology Co., Ltd. to collect test data is located on the Zone A, 1F, No. 6, XinGang Road YuanGang Street, XinAn District, ChangAn Town, DongGuan City, GuangDong, China

The test facility is recognized, certified, or accredited by the following organizations:

Item	Registration No.	Expiration Date
CNAS	L3098	2030-08-27
A2LA	4893.01	2028-06-30
Innovation, Science and Economic Development Canada (ISED)	11033A CAB identifier: CN0083	2028-06-30
Federal Communications Commission (FCC)	171688 Designation No.: CN1235	2028-04-30

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Controller	
Brand Name	N/A	
Test Model	CWBB0063	
Series Model	N/A	
Model Difference(s)	N/A	
Hardware Version	V1.40	
Software Version	V1.19	
Power Source	Supplied from USB-C or Battery	
Power Rating	5VDC 500mA (Provided by USB-C) 3.7VDC 900mAh (Provided by the battery)	
Operation Frequency	2402 MHz ~ 2480 MHz	
Modulation Technology	GFSK	
Bit Rate of Transmitter	1Mbps / 2Mbps	
Antenna Information	Antenna Type: PCB	Maximum Peak Gain: 2.49dBi (Provide by manufacturer)
Max. Output power	1Mbps: 1.964dBm (0.001572W) 2Mbps: 2.045dBm (0.001601W)	
Max. EIRP	1Mbps: 4.454dBm (0.002789W) 2Mbps: 4.535dBm (0.002841W)	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

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

3.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

Pretest Mode	Description
Mode 1	BLE 1M TX ModeNOTE (1)
Mode 2	BLE 2M TX ModeNOTE (1)
Mode 3	BLE 1M TX Mode Channel 39

Following mode(s) as (were) found to be the worst case(s) and selected for the final test.

AC power line conducted emissions test	
Final Test Mode	Description
Mode 3	BLE 1M TX Mode Channel 39

Radiated emissions test - Below 1GHz	
Final Test Mode	Description
Mode 3	BLE 1M TX Mode Channel 39

Radiated emissions test - Above 1GHz	
Final Test Mode	Description
Mode 1	BLE 1M TX ModeNOTE (1)
Mode 2	BLE 2M TX ModeNOTE (1)

Conducted test	
Final Test Mode	Description
Mode 1	BLE 1M TX ModeNOTE (1)
Mode 2	BLE 2M TX ModeNOTE (1)

Note:

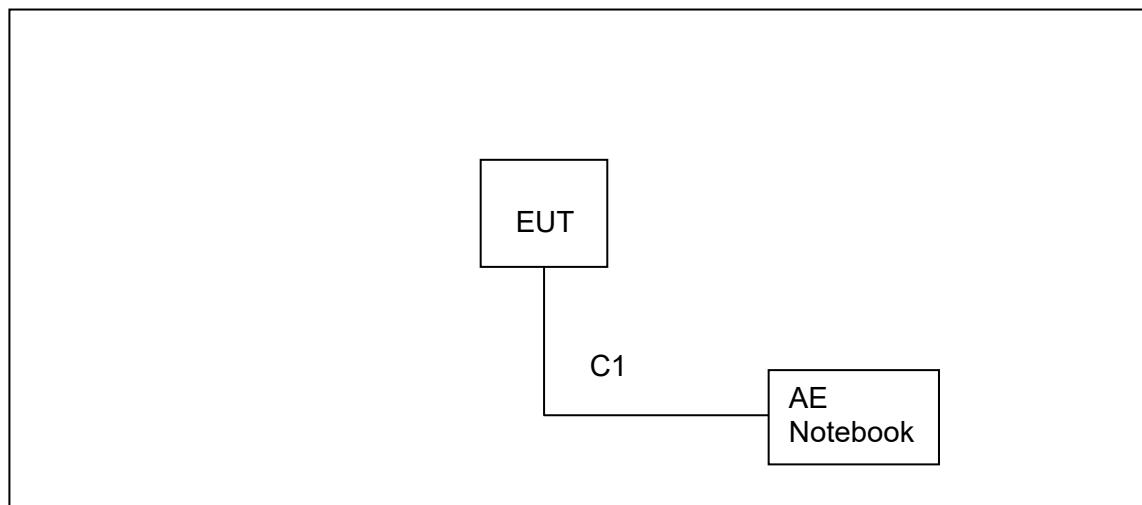
(1) The measurements are performed at the high, middle, low available channels.

3.3 PARAMETERS OF TEST SOFTWARE

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of BT LE

Test Software	Non_Signaling_Test_Tool.exe		
Frequency (MHz)	2402	2440	2480
Parameters-1Mbps	1.3	1.3	1.3
Parameters-2Mbps	1.3	1.3	1.3

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
AE	Notebook	Lenovo	/	/

Item	Cable Type	Shielded Type	Ferrite Core	Length
C1	DC Cable	NO	NO	0.8m

3.6 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage
AC Power Line Conducted Emissions	24.8°C	66.3%	DC 5V (AC 120V/60Hz)
Radiated Emissions-9K-30MHz	24°C	50%	DC 5V
Radiated Emissions-30 MHz to 1GHz	23.8°C	52.2%	DC 5V
Radiated Emissions-Above 1000 MHz	26.1°C	63.2%	DC 5V
Bandwidth	25°C	54%	DC 5V
Maximum Output Power	25°C	54%	DC 5V
Conducted Spurious Emission	25°C	54%	DC 5V
Power Spectral Density	25°C	54%	DC 5V

4 AC POWER LINE CONDUCTED EMISSIONS TEST

4.1 LIMIT

Frequency of Emission (MHz)	Limit (dB μ V)	
	Quasi-peak	Average
0.15 -0.50	66 to 56*	56 to 46*
0.50 -5.0	56	46
5.0 -30.0	60	50

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

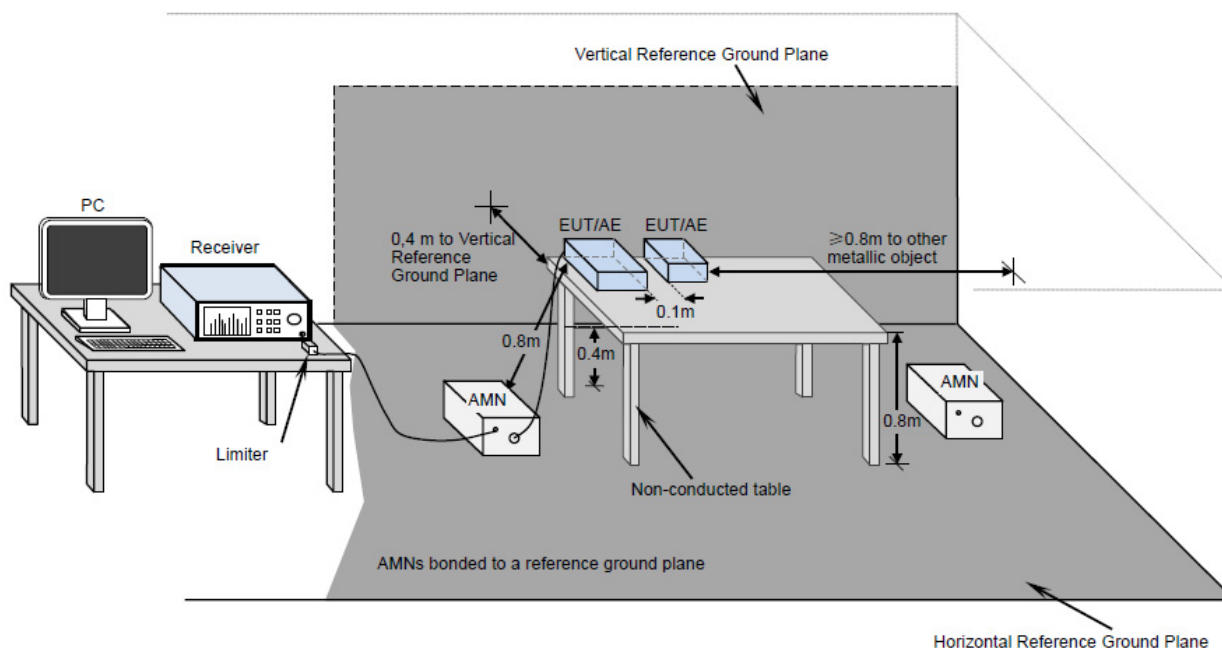
4.2 TEST PROCEDURE

- a. 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 equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the groundplane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. 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.
- d. LISN at least 80 cm from nearest part of EUT chassis.

4.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pulse Limiter	MTS-systemtechnik	MTS-IMP-136	261115-010-0024	11/12/2026
2	EMI Test Receiver	R&S	ESCI	101308	05/08/2027
3	LISN	AFJ	LS16	16011103219	03/24/2027
4	LISN	Schwarzbeck	NSLK8127	8127432	05/08/2027
5	Measurement Software	Farad	EZ-EMC (Ver.ATT-03A)	N/A	N/A

4.4 TEST SETUP

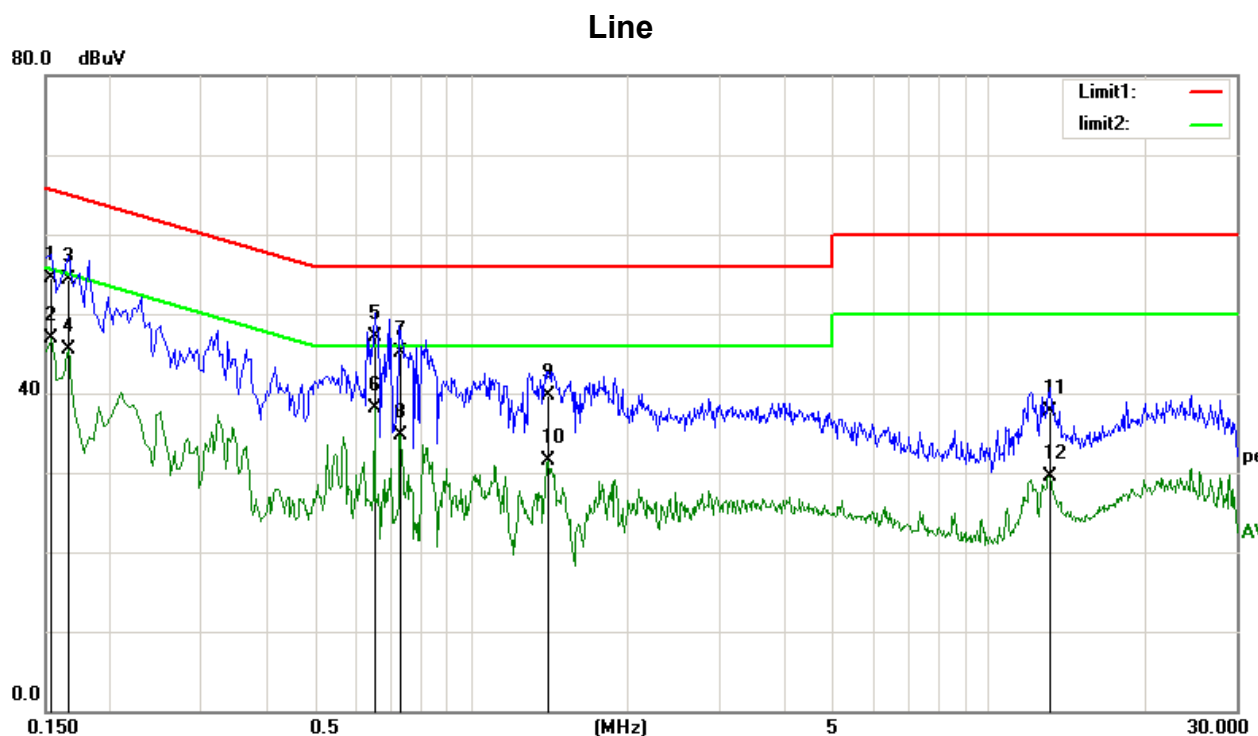


4.5 EUT OPERATING CONDITIONS

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.

4.6 TEST RESULTS

Test Mode: BLE 1M TX Mode Channel 39



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1539	43.28	11.24	54.52	65.78	-11.26	QP
2	0.1539	35.62	11.24	46.86	55.78	-8.92	AVG
3	0.1660	43.14	11.11	54.25	65.15	-10.90	QP
4	0.1660	34.44	11.11	45.55	55.15	-9.60	AVG
5	0.6500	35.80	11.21	47.01	56.00	-8.99	QP
6	0.6500	26.90	11.21	38.11	46.00	-7.89	AVG
7	0.7300	33.77	11.25	45.02	56.00	-10.98	QP
8	0.7300	23.42	11.25	34.67	46.00	-11.33	AVG
9	1.4100	28.62	11.12	39.74	56.00	-16.26	QP
10	1.4100	20.30	11.12	31.42	46.00	-14.58	AVG
11	13.0499	26.54	11.17	37.71	60.00	-22.29	QP
12	13.0499	18.31	11.17	29.48	50.00	-20.52	AVG

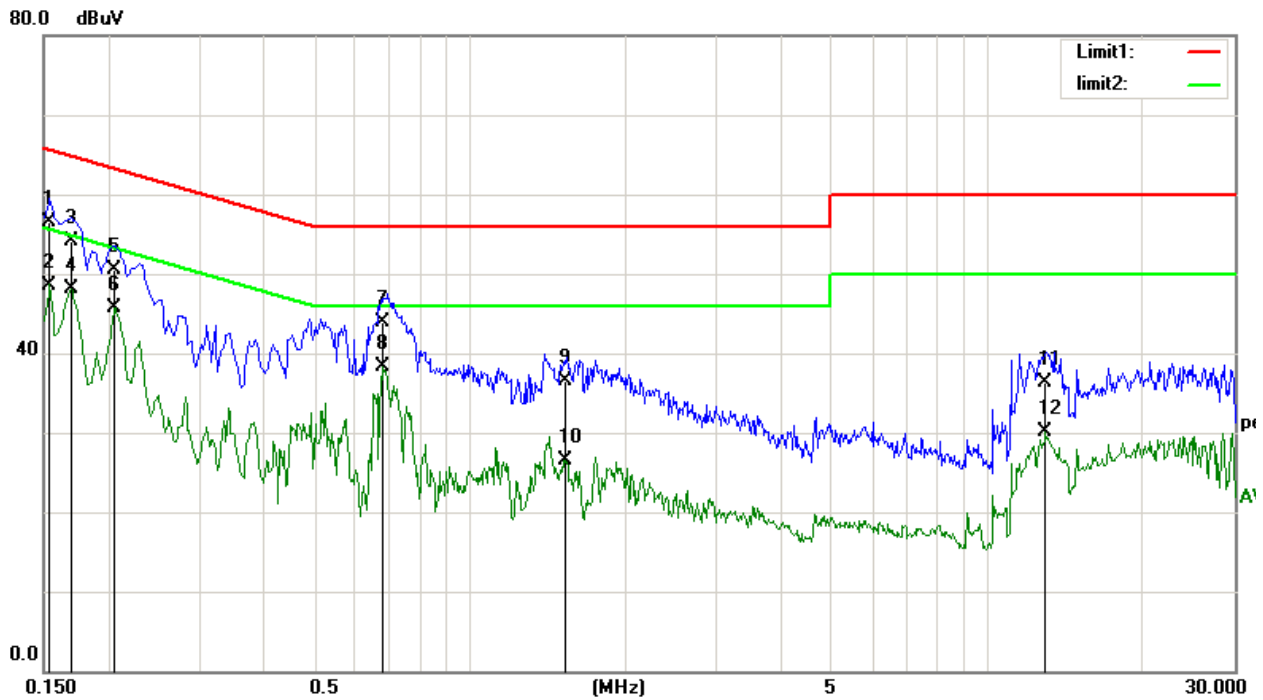
Remarks:

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode: BLE 1M TX Mode Channel 39

Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1539	45.26	11.24	56.50	65.78	-9.28	QP
2	0.1539	37.36	11.24	48.60	55.78	-7.18	AVG
3	0.1700	42.99	11.07	54.06	64.96	-10.90	QP
4	0.1700	37.03	11.07	48.10	54.96	-6.86	AVG
5	0.2060	39.32	11.25	50.57	63.36	-12.79	QP
6	0.2060	34.44	11.25	45.69	53.36	-7.67	AVG
7	0.6820	32.73	11.26	43.99	56.00	-12.01	QP
8	0.6820	27.14	11.26	38.40	46.00	-7.60	AVG
9	1.5300	25.25	11.16	36.41	56.00	-19.59	QP
10	1.5300	15.39	11.16	26.55	46.00	-19.45	AVG
11	12.9419	25.20	11.17	36.37	60.00	-23.63	QP
12	12.9419	19.01	11.17	30.18	50.00	-19.82	AVG

Remarks:

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

5 RADIATED EMISSION TEST

5.1 LIMIT

In case the emission fall within the restricted band specified on 15.205 (a) and RSS-Gen 7.5, then the 15.209 (a) and RSS-Gen 7.4.3 limit in the table below has to be followed.

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

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

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-30 MHz)

Frequency (MHz)	Magnetic field strength (H-Field) (μ A/m)	Measurement Distance (meters)
0.009-0.490	6.37/F(kHz)	300
0.490-1.705	6.37/F(kHz)	30
1.705-30.0	0.08	30

LIMITS OF RADIATED EMISSION MEASUREMENT (30 MHz-1000MHz)

Frequency (MHz)	Field Strength (μ V/m at 3m)
30-88	100
88-216	150
216-960	200
Above 960	500

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/m at 3 m)	
	Peak	Average
Above 1000	74	54

Note:

- (1) The limit for radiated test was performed according to FCC PART 15C and RSS-247.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

5.2 TEST PROCEDURE

- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. (below 1GHz)
- b. The measuring distance of 3 m or 1.5m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. (above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8m or 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. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- i. The test result is calculated as the following:
 - (1) Result = Reading + Correct Factor
 - (2) Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain + Attenuator
 - (3) Margin = Result - Limit

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	RBW 1MHz VBW 3MHz peak detector for Pk value RMS detector for AV value

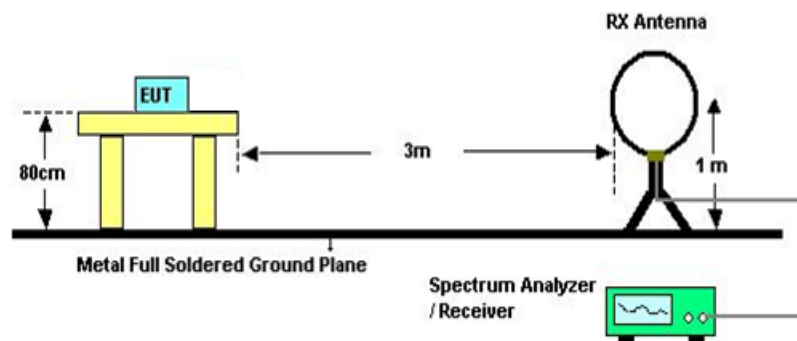
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

5.3 MEASUREMENT INSTRUMENTS LIST

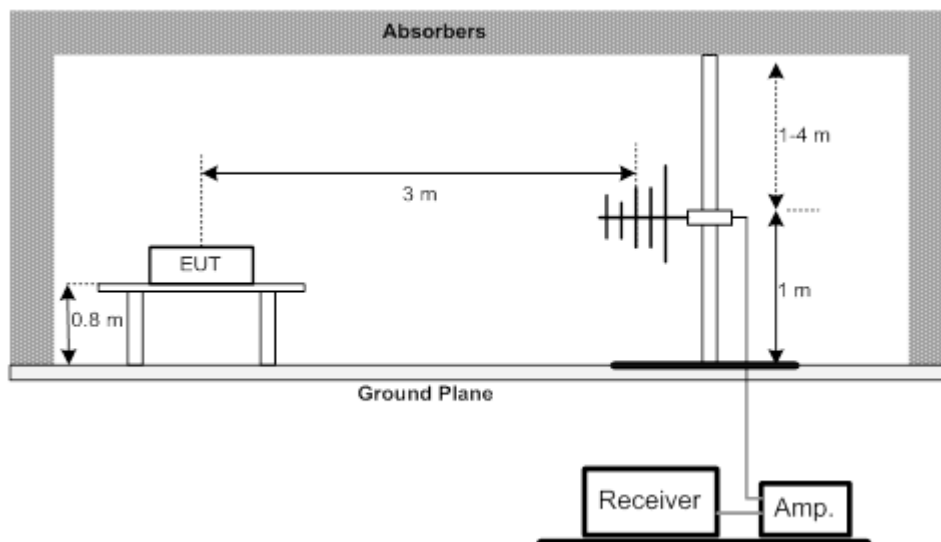
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	101307	05/08/2027
2	Spectrum Analyzer	Agilent	E4407B	US40240708	11/12/2026
3	Loop antenna	SCHWARZBECK	FMZB1519	1519-062	04/01/2028
4	Broadband antenna	SCHWARZBECK	VULB9168	VULB9168-192	03/31/2028
5	Horn antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D1065	04/11/2028
6	Preamplifier Amplifier	HP	8447F	3113A05680	11/12/2026
7	Pre-Amplifier	EMEC	EM01G26G	060679	05/10/2027
8	RF Cable	N/A	Test Cable 8	8	03/19/2027
9	RF Cable	N/A	Test Cable 9	9	03/19/2027
10	Measurement Software	Farad	EZ-EMC (Ver.ATT-03A)	N/A	N/A

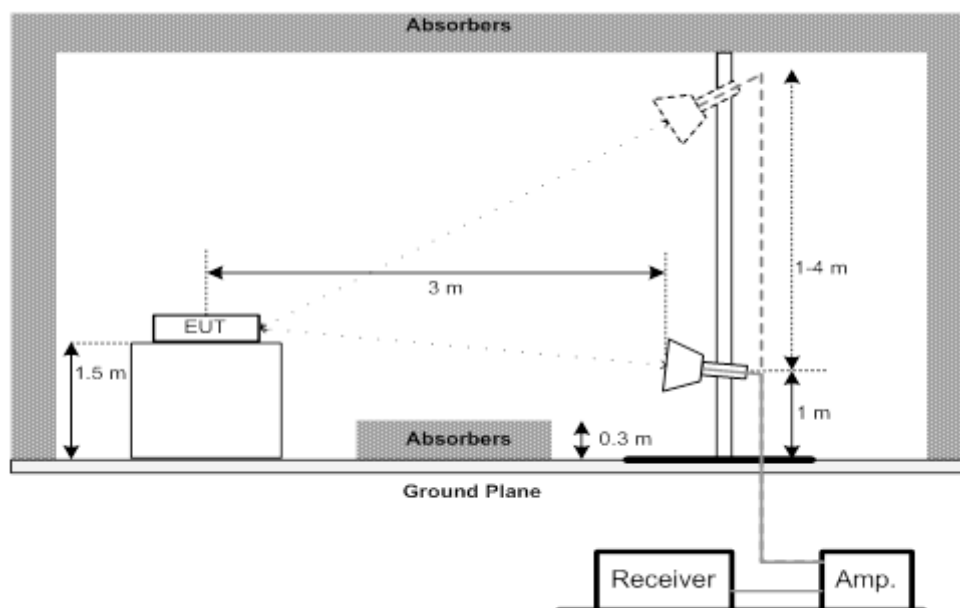
5.4 TEST SETUP

9 kHz-30 MHz



30 MHz to 1 GHz



Above 1 GHz**5.5 EUT OPERATING CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULT- 9kHz TO 30MHz

Test Mode:	BLE 1M TX Mode Channel 39
------------	---------------------------

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

Note:

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

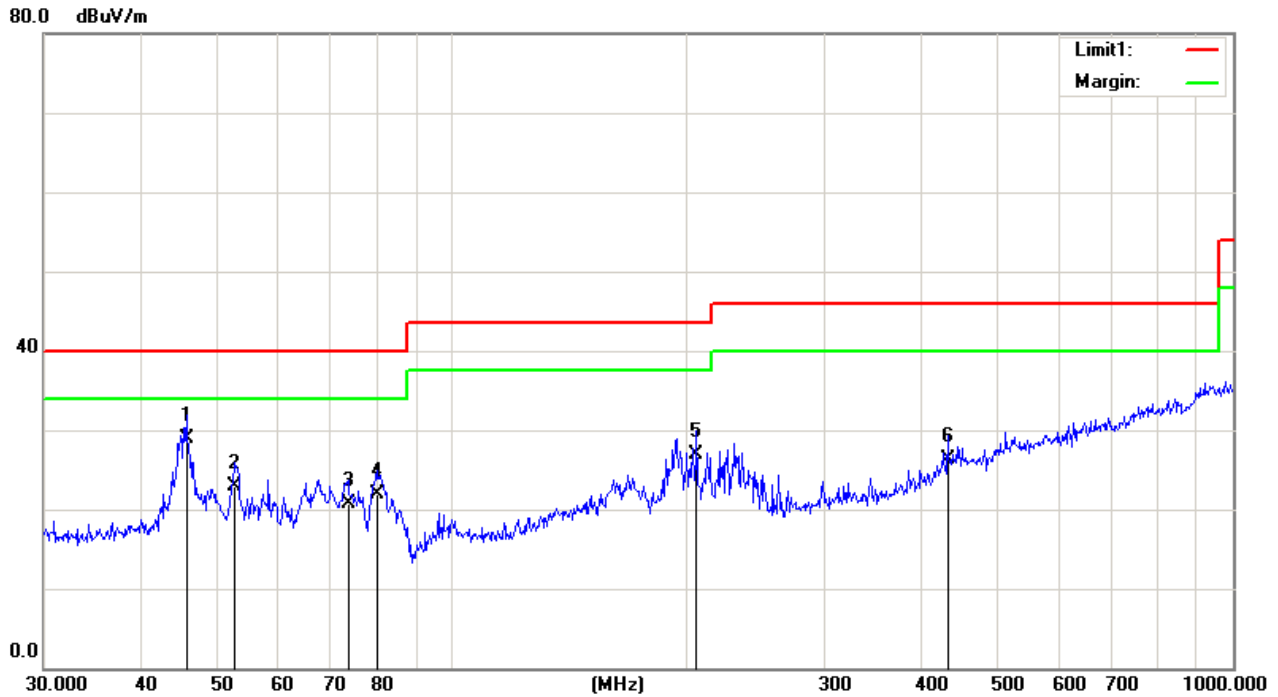
Distance extrapolation factor = $20 \log (\text{specific distance/test distance})(\text{dB})$;

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

5.7 TEST RESULT- 30MHz TO 1000MHz

Test Mode : BLE 1M TX Mode Channel 39

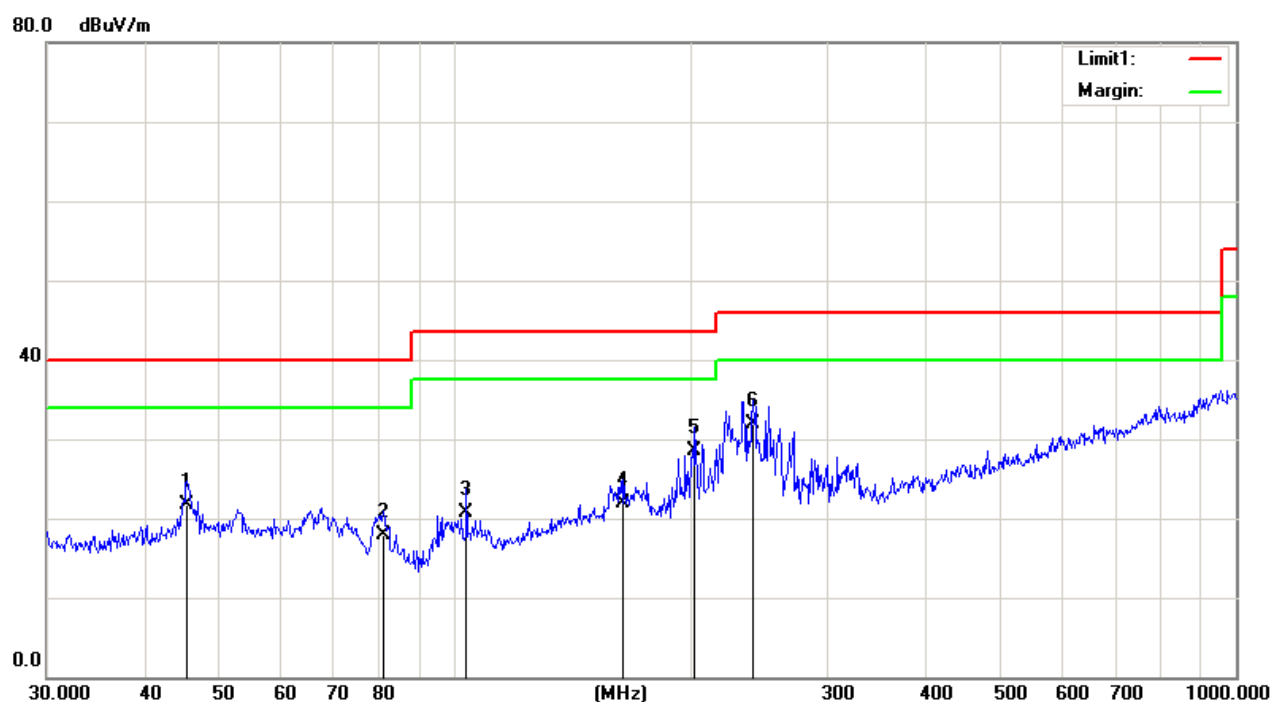
Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	Comment
			dBuV	dB	dBuV/m	dB/m	dB	cm	degree	
1	*	45.6948	36.06	-7.20	28.86	40.00	-11.14	QP	100	21
2		52.7599	30.00	-7.11	22.89	40.00	-17.11	QP	100	45
3		73.6170	29.66	-8.88	20.78	40.00	-19.22	QP	100	78
4		80.0806	32.22	-10.29	21.93	40.00	-18.07	QP	100	59
5		205.6750	34.92	-7.94	26.98	43.50	-16.52	QP	100	26
6		431.0316	26.98	-0.59	26.39	46.00	-19.61	QP	100	111

Test Mode : BLE 1M TX Mode Channel 39

Horizontal

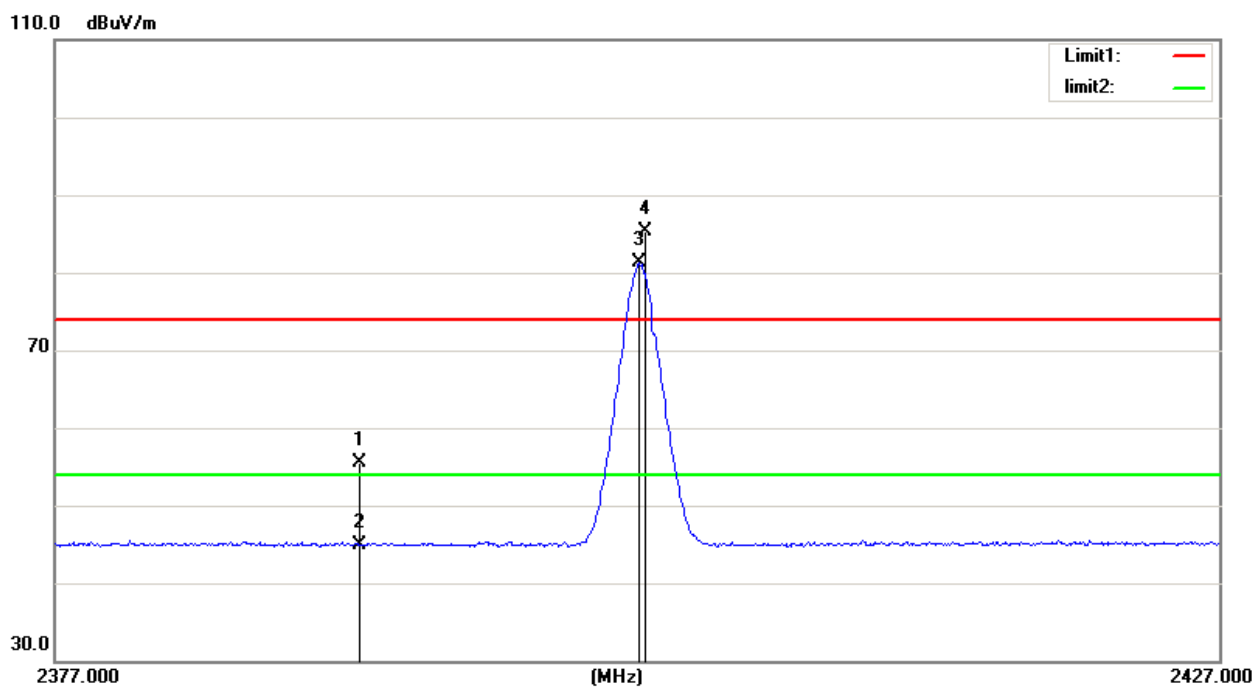


No. Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table		
	MHz	Level	Factor	ment			Height		Degree	Comment
		dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	
1	45.3755	28.89	-7.23	21.66	40.00	-18.34	QP	100	147	
2	80.9275	28.40	-10.44	17.96	40.00	-22.04	QP	100	135	
3	103.4421	30.70	-9.95	20.75	43.50	-22.75	QP	100	146	
4	164.3301	27.26	-5.37	21.89	43.50	-21.61	QP	100	48	
5	202.8104	36.59	-8.03	28.56	43.50	-14.94	QP	100	79	
6 *	240.8304	38.00	-6.13	31.87	46.00	-14.13	QP	100	122	

5.8 TEST RESULT- ABOVE 1000MHz (BAND EDGE)

Test Mode: TX 2402 MHz_CH00_1Mbps

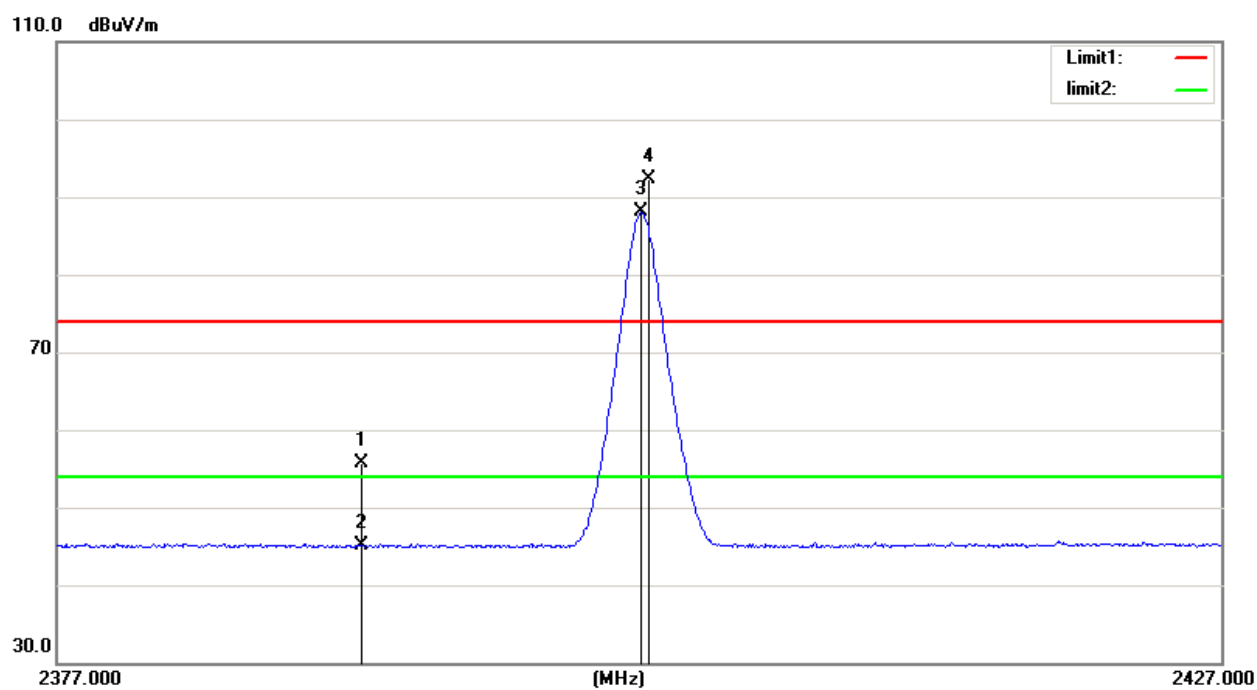
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		2390.000	21.57	34.01	55.58	74.00	-18.42	peak	150	126
2		2390.000	10.91	34.01	44.92	54.00	-9.08	AVG	150	126
3	*	2402.000	47.31	34.00	81.31	54.00	27.31	AVG	150	126 No Limit
4	X	2402.250	51.30	34.00	85.30	74.00	11.30	peak	150	126 No Limit

Test Mode: TX 2402 MHz_CH00_1Mbps

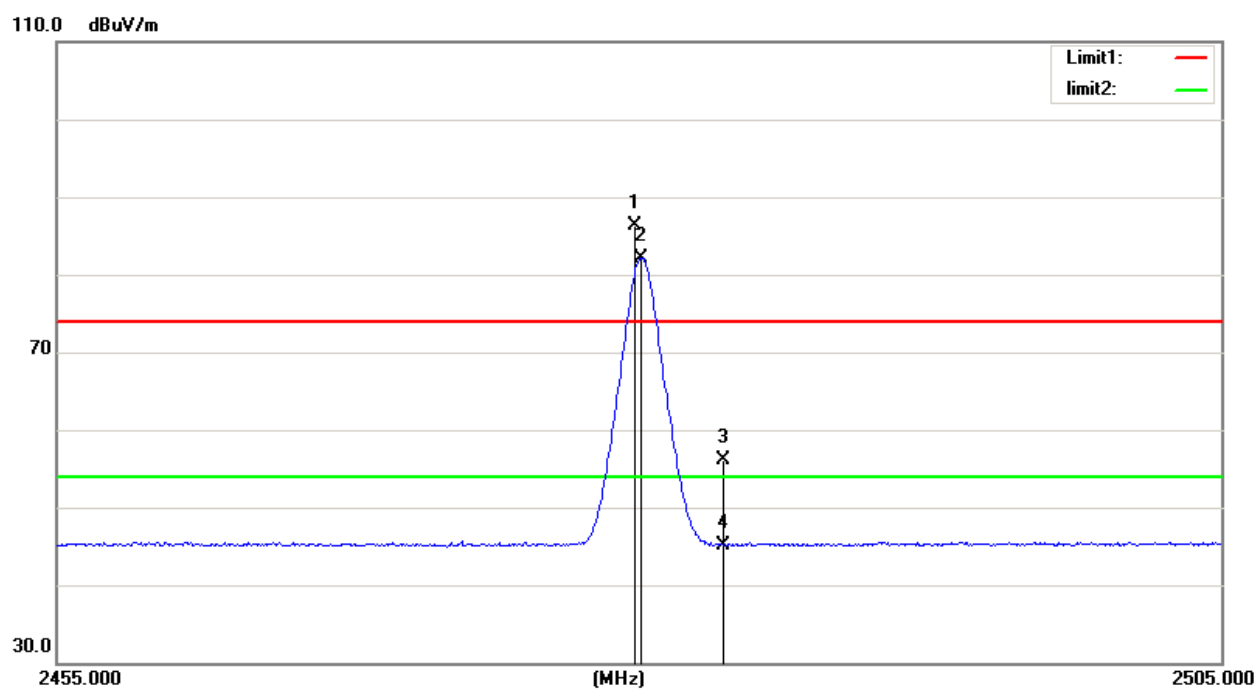
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		2390.000	21.78	34.01	55.79	74.00	-18.21	peak	150	360
2		2390.000	11.10	34.01	45.11	54.00	-8.89	AVG	150	360
3	*	2402.000	54.05	34.00	88.05	54.00	34.05	AVG	150	360 No Limit
4	X	2402.300	58.38	34.00	92.38	74.00	18.38	peak	150	360 No Limit

Test Mode: TX 2480 MHz_CH39_1Mbps

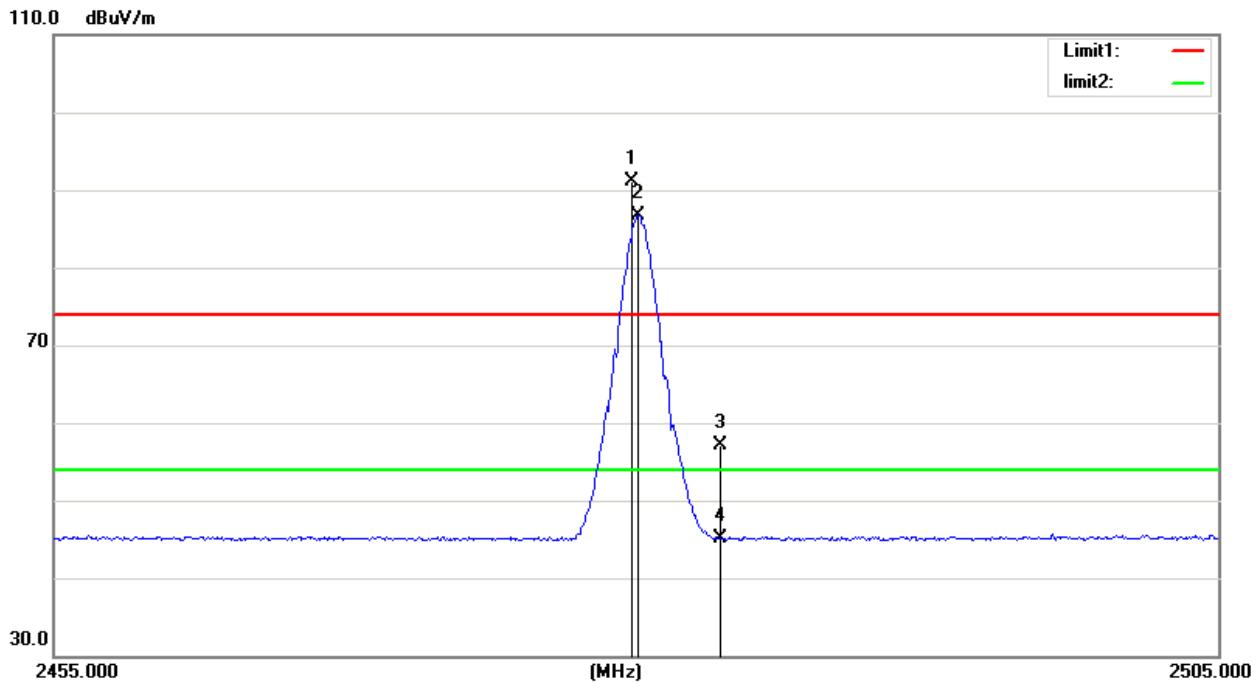
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree		
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1	X	2479.750	52.30	34.01	86.31	74.00	12.31	peak	150	128	No Limit
2	*	2480.000	48.12	34.01	82.13	54.00	28.13	AVG	150	128	No Limit
3		2483.500	22.19	34.01	56.20	74.00	-17.80	peak	150	128	
4		2483.500	11.09	34.01	45.10	54.00	-8.90	AVG	150	128	

Test Mode: TX 2480 MHz_CH39_1Mbps

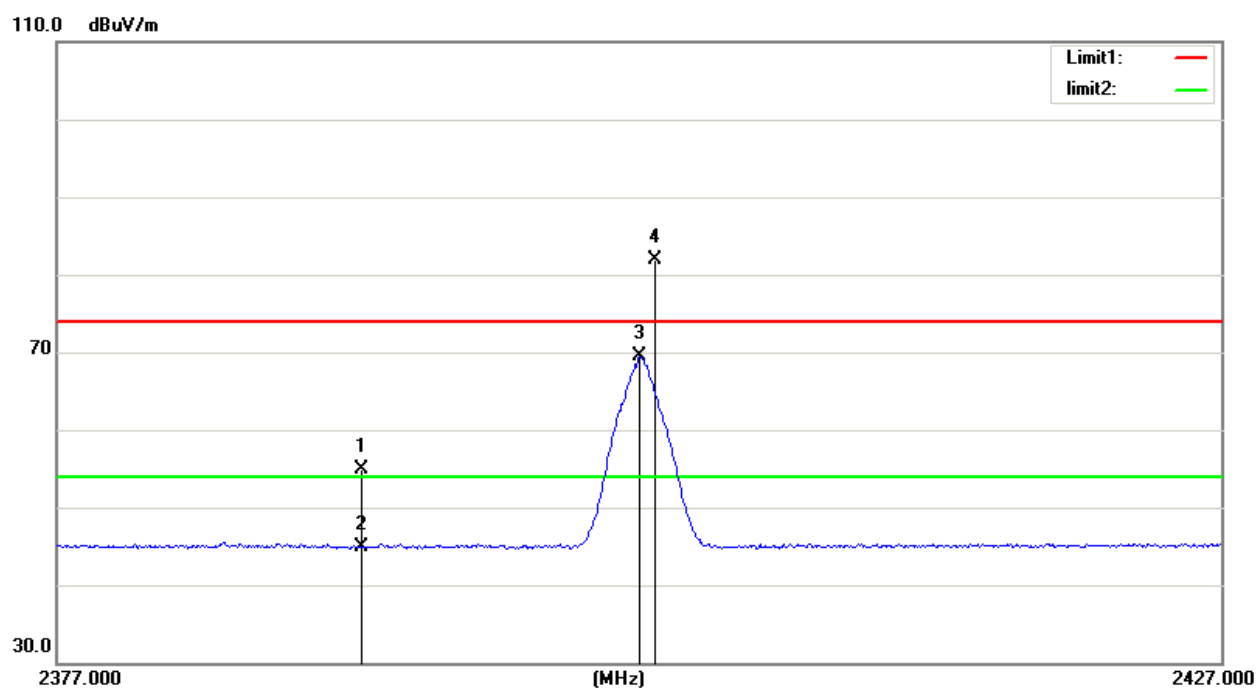
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree		
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1	X	2479.750	57.01	34.01	91.02	74.00	17.02	peak	150	343	No Limit
2	*	2480.000	52.70	34.01	86.71	54.00	32.71	AVG	150	343	No Limit
3		2483.500	23.11	34.01	57.12	74.00	-16.88	peak	150	343	
4		2483.500	11.02	34.01	45.03	54.00	-8.97	AVG	150	343	

Test Mode: TX 2402 MHz_CH00_2Mbps

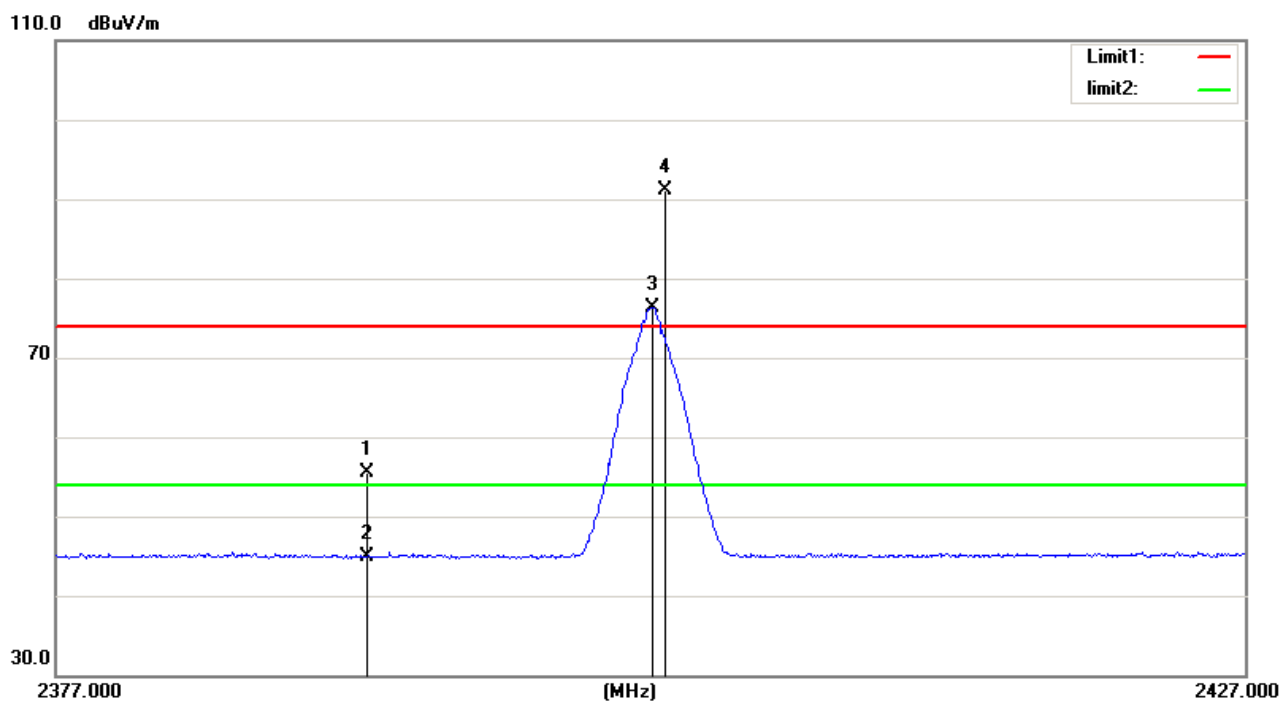
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		2390.000	20.80	34.01	54.81	74.00	-19.19	peak	150	268
2		2390.000	10.84	34.01	44.85	54.00	-9.15	AVG	150	268
3	*	2401.950	35.53	34.00	69.53	54.00	15.53	AVG	150	268 No Limit
4	X	2402.600	47.88	33.99	81.87	74.00	7.87	peak	150	268 No Limit

Test Mode: TX 2402 MHz_CH00_2Mbps

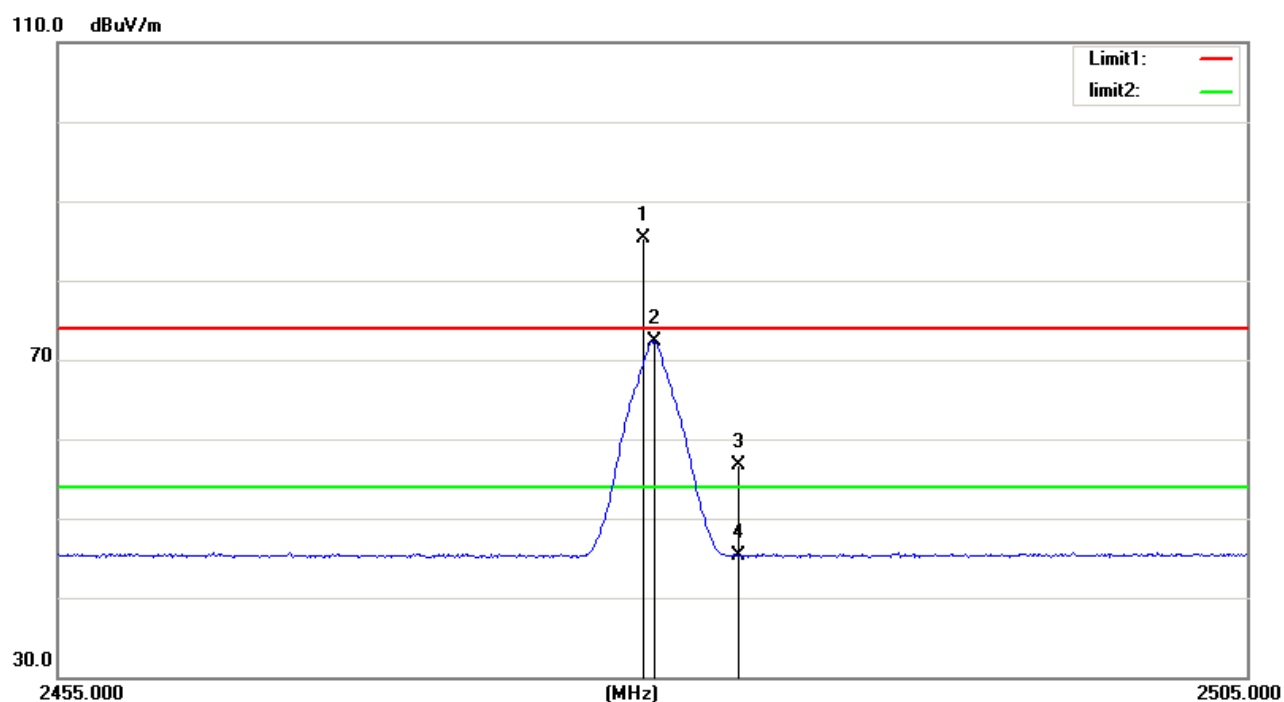
Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		2390.000	21.52	34.01	55.53	74.00	-18.47	peak	150	351
2		2390.000	10.87	34.01	44.88	54.00	-9.12	AVG	150	351
3	*	2402.000	42.39	34.00	76.39	54.00	22.39	AVG	150	351 No Limit
4	X	2402.500	57.18	33.99	91.17	74.00	17.17	peak	150	351 No Limit

Test Mode: TX 2480 MHz_CH39_2Mbps

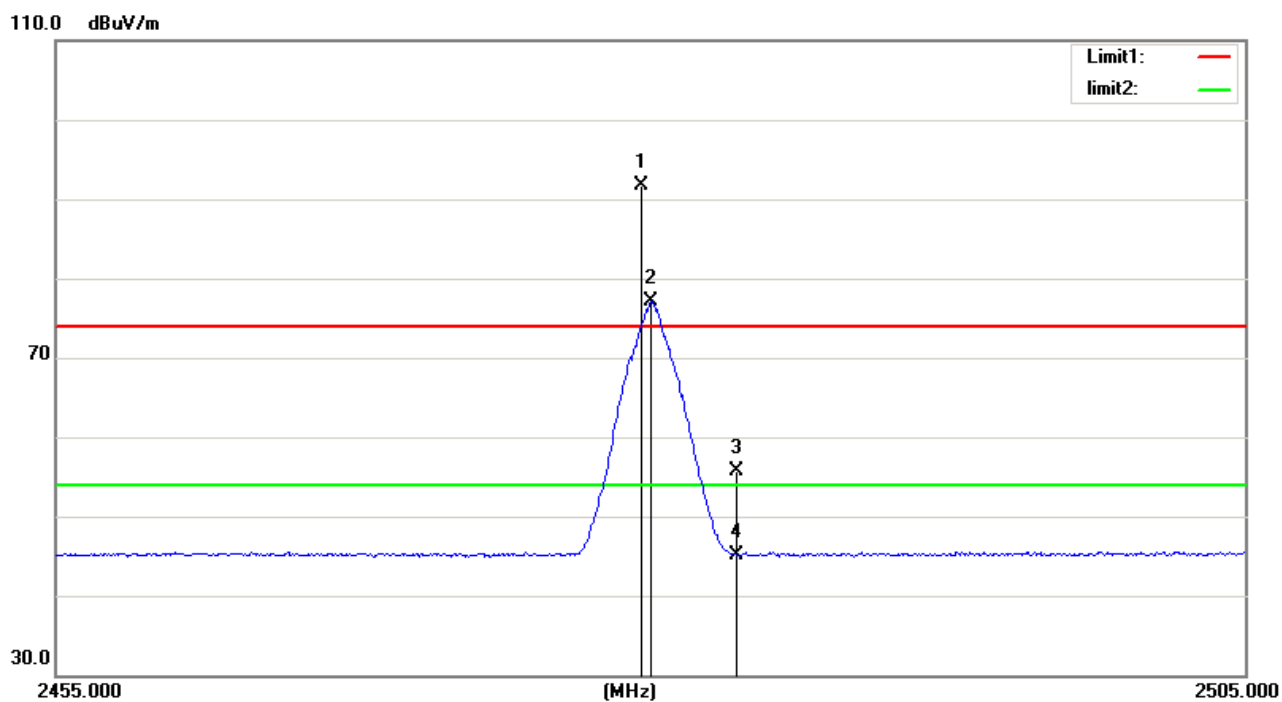
Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table		
		MHz	Level	Factor	ment			Height	Table		
			dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1	X	2479.500	51.36	34.01	85.37	74.00	11.37	peak	150	134	No Limit
2	*	2480.000	38.35	34.01	72.36	54.00	18.36	AVG	150	134	No Limit
3		2483.500	22.74	34.01	56.75	74.00	-17.25	peak	150	134	
4		2483.500	11.24	34.01	45.25	54.00	-8.75	AVG	150	134	

Test Mode: TX 2480 MHz_CH39_2Mbps

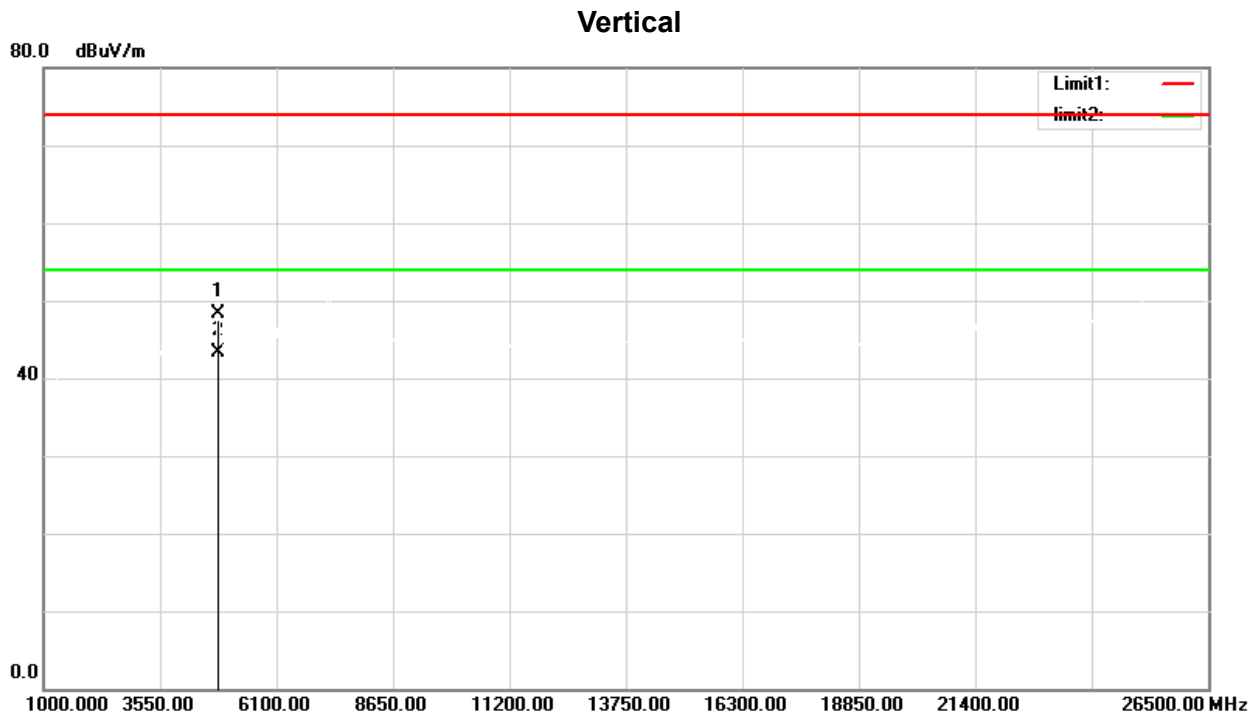
Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table		
		MHz	Level	Factor	ment			Height	Degree		
			dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1	X	2479.500	57.76	34.01	91.77	74.00	17.77	peak	150	0	No Limit
2	*	2479.950	43.04	34.01	77.05	54.00	23.05	AVG	150	0	No Limit
3		2483.500	21.61	34.01	55.62	74.00	-18.38	peak	150	0	
4		2483.500	11.15	34.01	45.16	54.00	-8.84	AVG	150	0	

5.9 TEST RESULTS - ABOVE 1000MHz (HARMONIC)

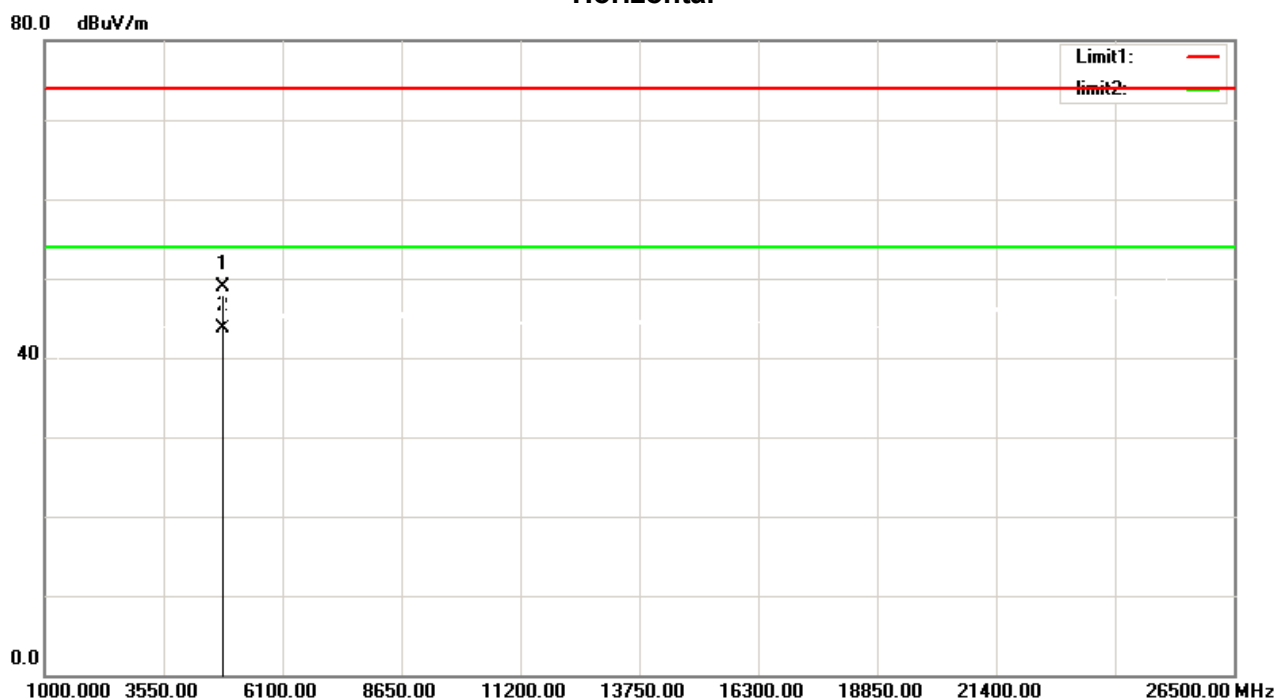
Test Mode: TX 2402 MHz_CH00_1Mbps



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		4825.000	46.12	2.25	48.37	74.00	-25.63	peak	150	301
2	*	4825.000	41.04	2.25	43.29	54.00	-10.71	AVG	150	301

Test Mode: TX 2402 MHz_CH00_1Mbps

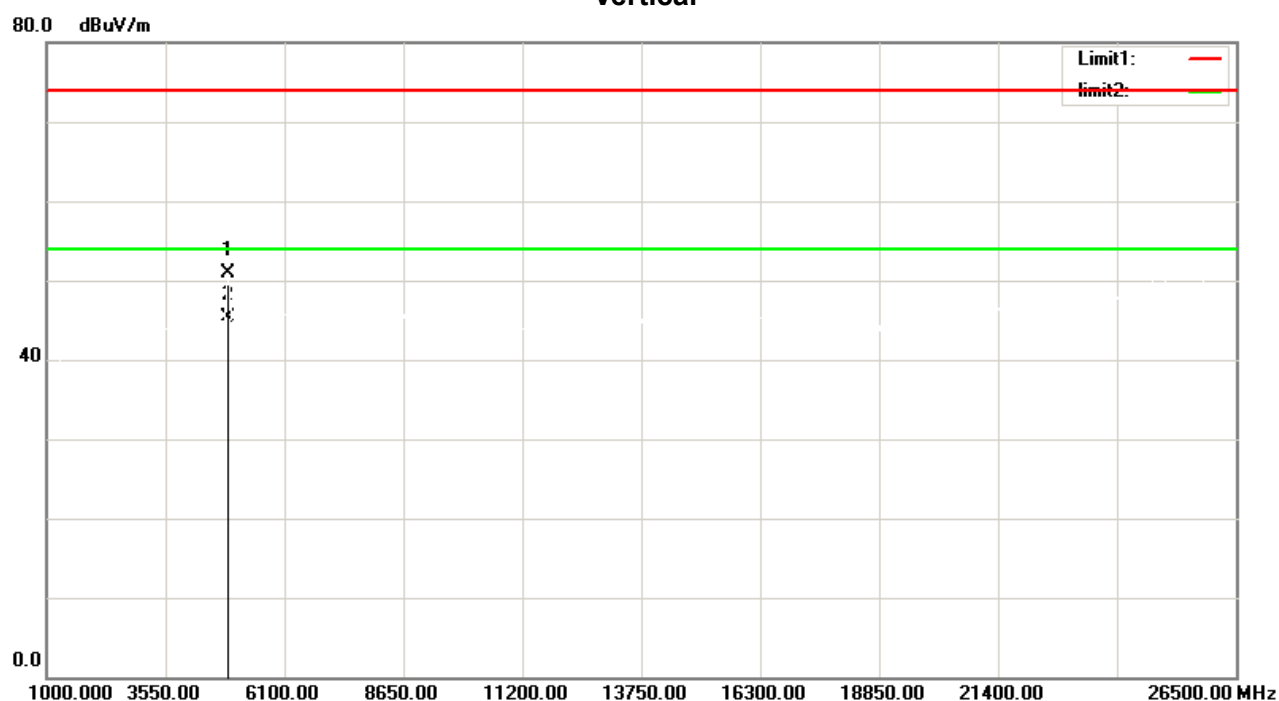
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree
1		4825.000	46.63	2.25	48.88	74.00	-25.12	peak	150	278
2	*	4825.000	41.46	2.25	43.71	54.00	-10.29	AVG	150	278

Test Mode: TX 2440 MHz_CH19_1Mbps

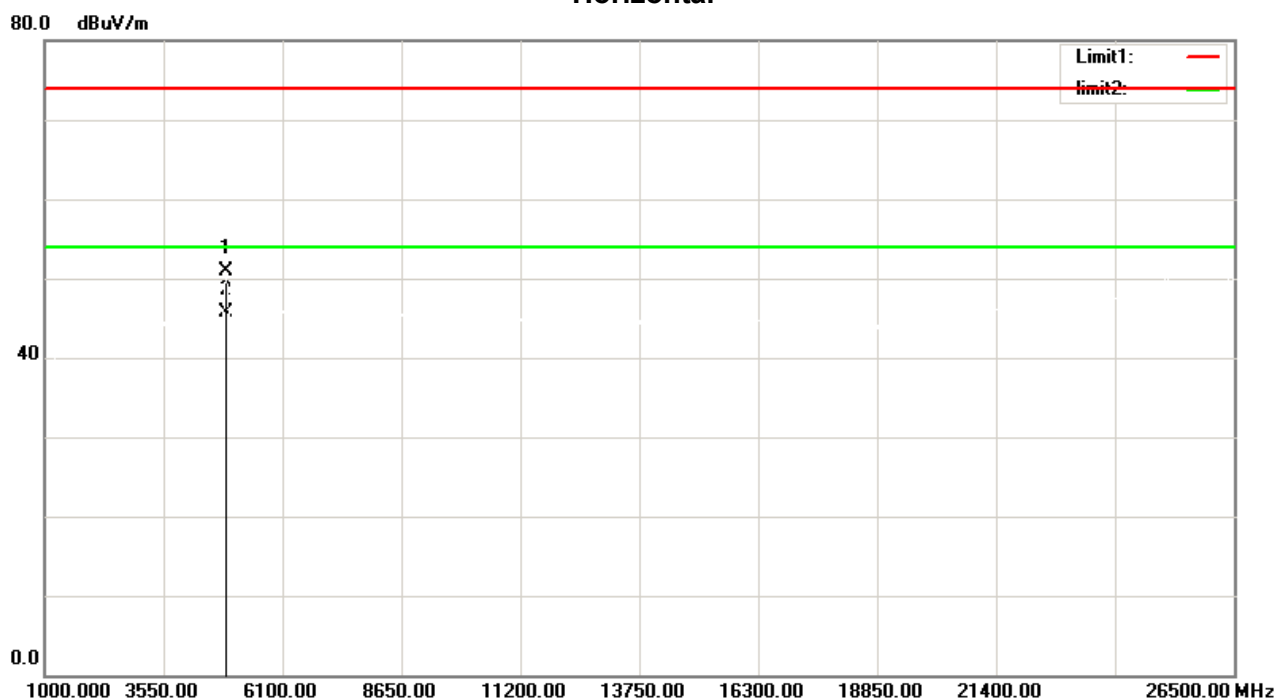
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		4888.750	48.45	2.50	50.95	74.00	-23.05	peak	150	64
2	*	4888.750	42.88	2.50	45.38	54.00	-8.62	AVG	150	64

Test Mode: TX 2440 MHz_CH19_1Mbps

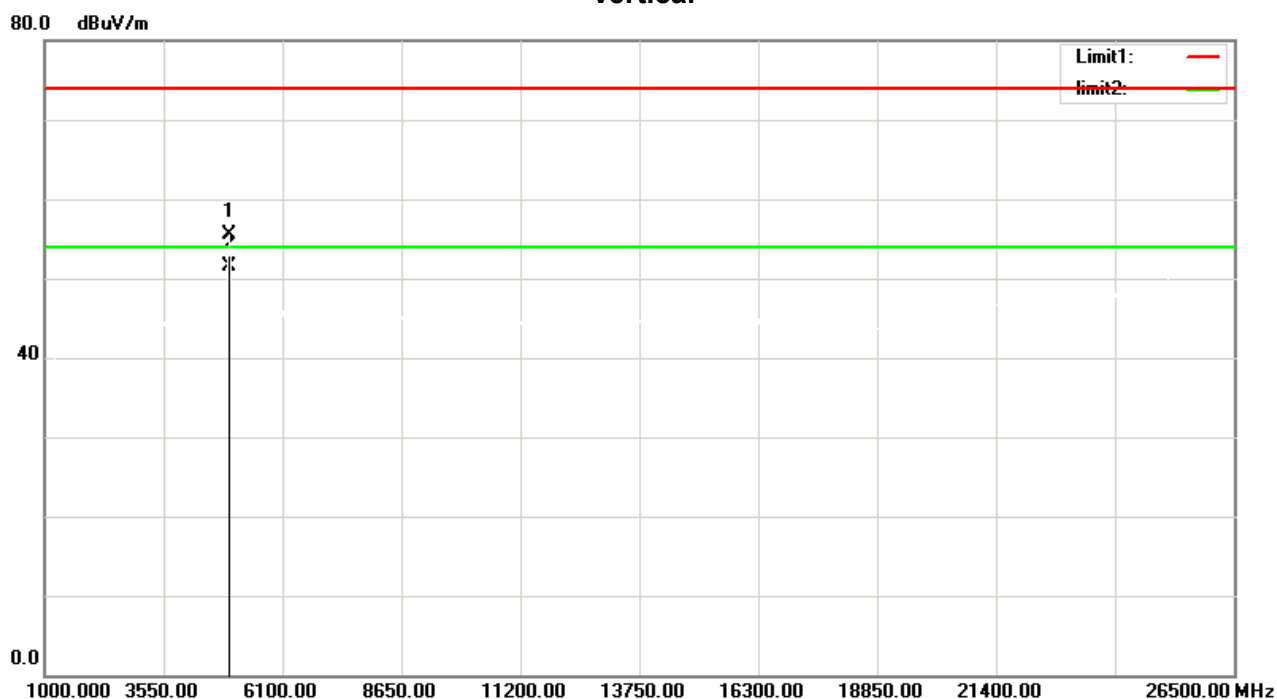
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		4888.750	48.48	2.50	50.98	74.00	-23.02	peak	150	360
2	*	4888.750	43.12	2.50	45.62	54.00	-8.38	AVG	150	360

Test Mode: TX 2480 MHz_CH39_1Mbps

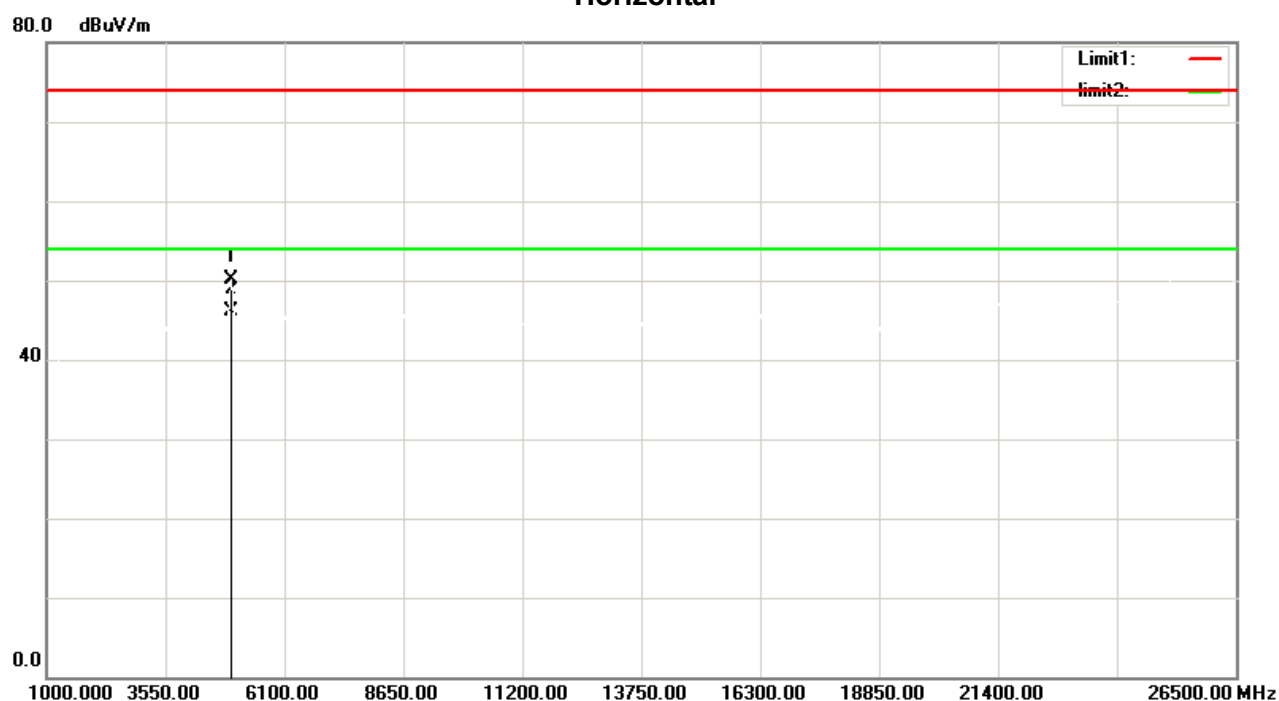
Vertical



No. Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
	MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree
1	4952.500	52.70	2.73	55.43	74.00	-18.57	peak	150	142
2 *	4952.500	48.72	2.73	51.45	54.00	-2.55	AVG	150	142

Test Mode: TX 2480 MHz_CH39_1Mbps

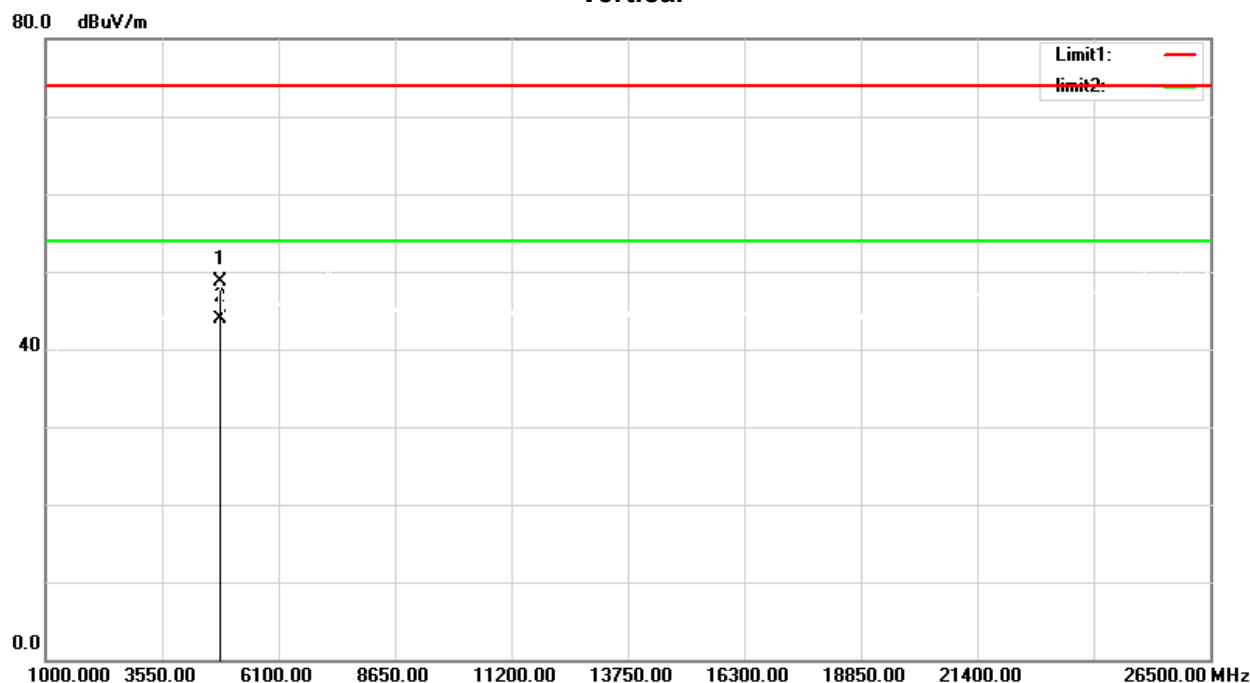
Horizontal



No. Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
	MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree
1	4952.500	47.40	2.73	50.13	74.00	-23.87	peak	150	94
2 *	4952.500	43.39	2.73	46.12	54.00	-7.88	AVG	150	94

Test Mode: TX 2402 MHz_CH00_2Mbps

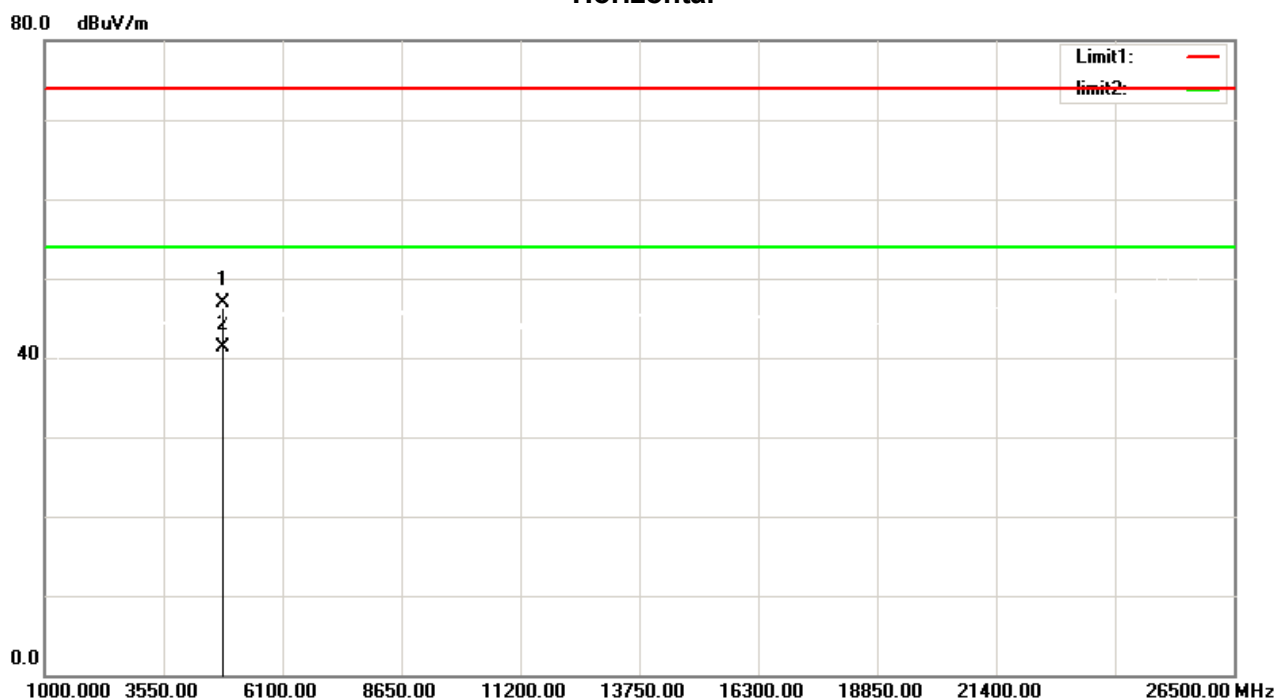
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree
1		4825.000	46.48	2.25	48.73	74.00	-25.27	peak	150	26
2	*	4825.000	41.64	2.25	43.89	54.00	-10.11	AVG	150	26

Test Mode: TX 2402 MHz_CH00_2Mbps

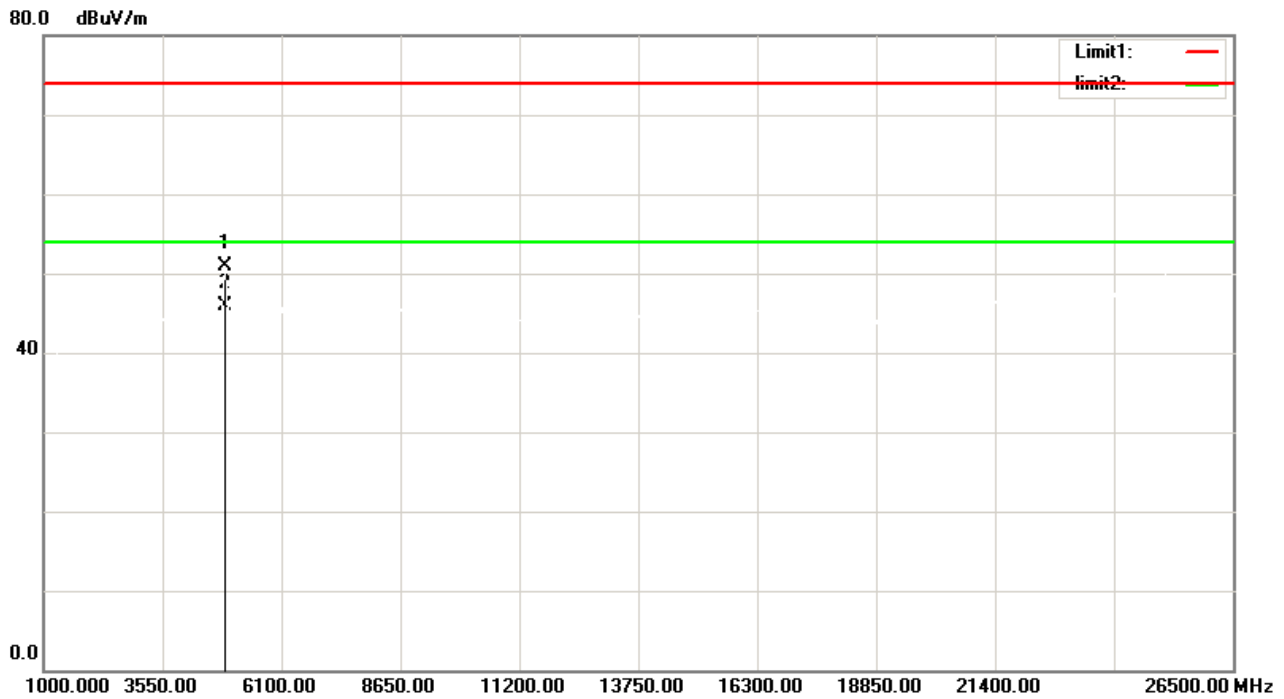
Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree
1		4825.000	44.61	2.25	46.86	74.00	-27.14	peak	150	59
2	*	4825.000	39.12	2.25	41.37	54.00	-12.63	AVG	150	59

Test Mode: TX 2440 MHz_CH19_2Mbps

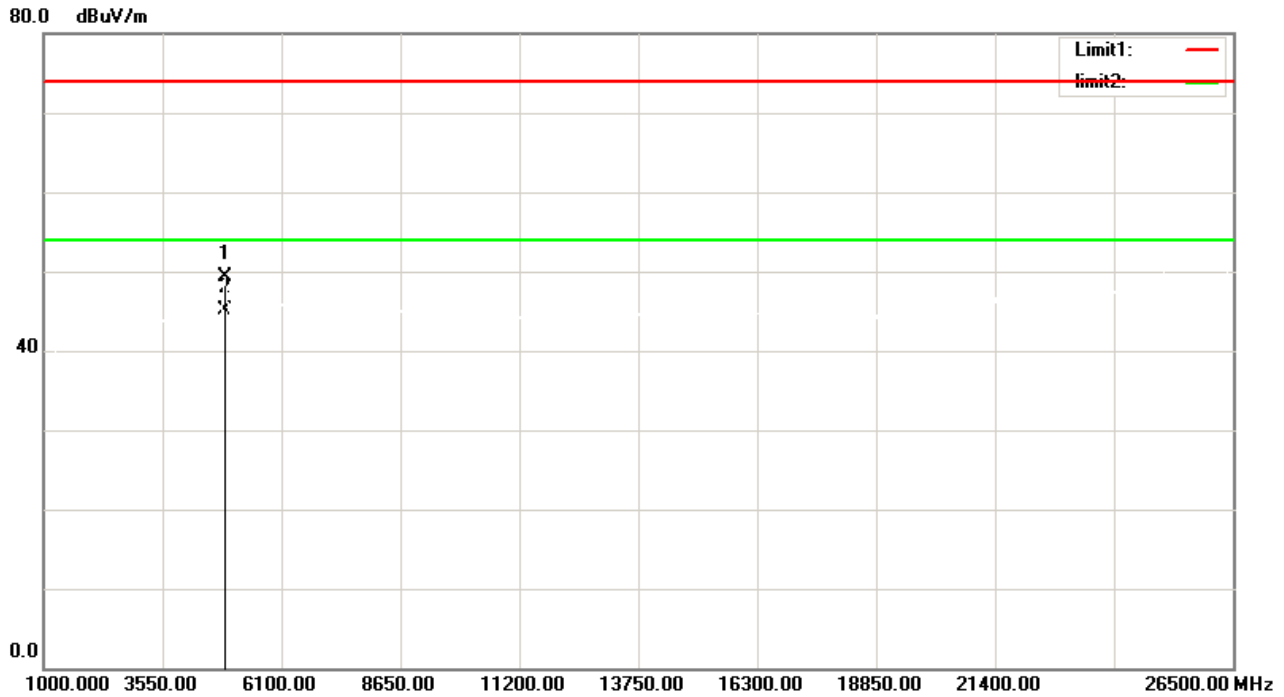
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		4888.750	48.40	2.50	50.90	74.00	-23.10	peak	150	110
2	*	4888.750	43.38	2.50	45.88	54.00	-8.12	AVG	150	110

Test Mode: TX 2440 MHz_CH19_2Mbps

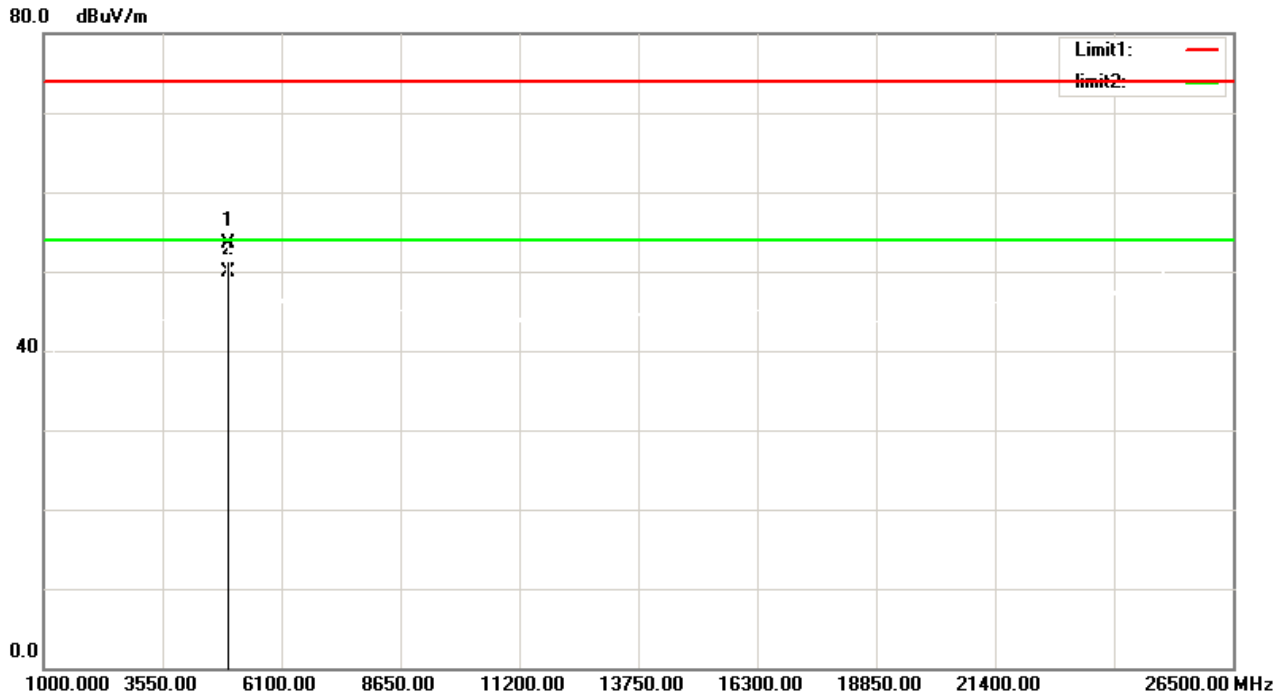
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree
1		4888.750	46.88	2.50	49.38	74.00	-24.62	peak	150	148
2	*	4888.750	42.66	2.50	45.16	54.00	-8.84	AVG	150	148

Test Mode: TX 2480 MHz_CH39_2Mbps

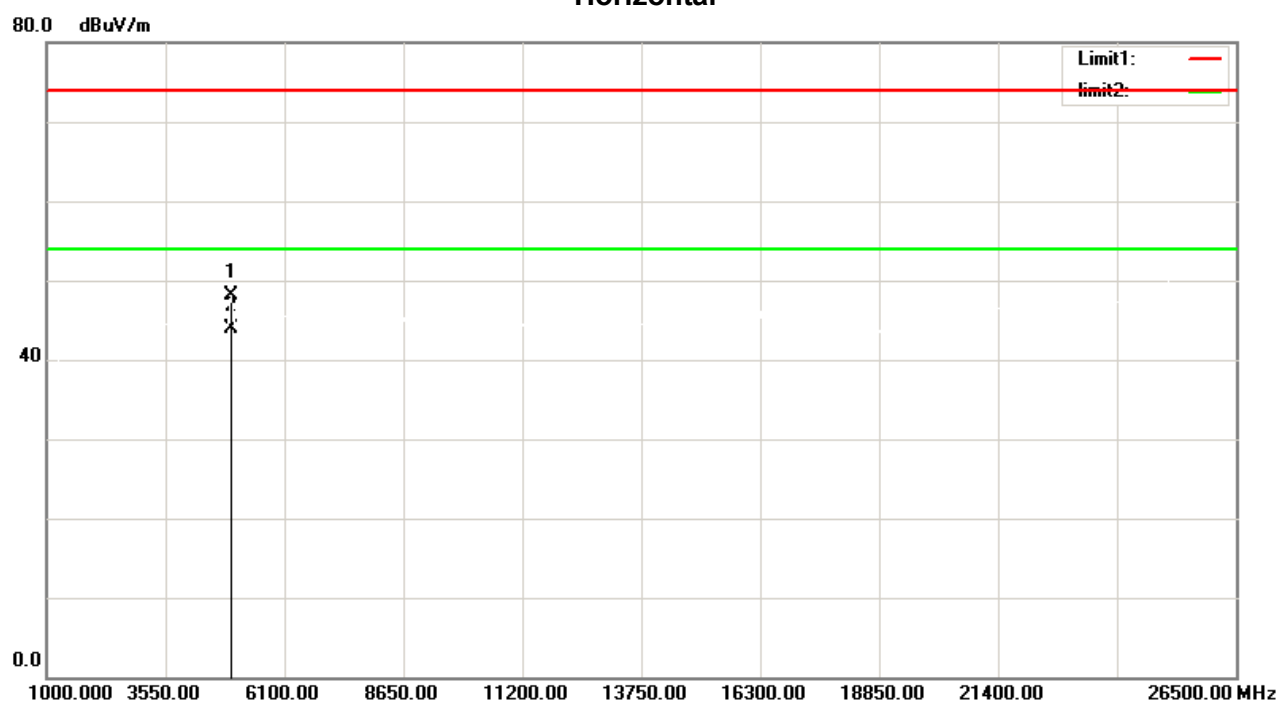
Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		4952.500	50.72	2.73	53.45	74.00	-20.55	peak	150	234
2	*	4952.500	47.10	2.73	49.83	54.00	-4.17	AVG	150	234

Test Mode: TX 2480 MHz_CH39_2Mbps

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		4952.500	45.43	2.73	48.16	74.00	-25.84	peak	150	62
2	*	4952.500	41.15	2.73	43.88	54.00	-10.12	AVG	150	62

6 BANDWIDTH TEST

6.1 LIMIT

FCC Part15, Subpart C (15.247) & RSS-247& RSS-Gen		
Section	Test Item	Limit
15.247(a)(2) RSS-Gen 5.1 RSS-247 6.3.1 (a)	Bandwidth	≥ 500 kHz (6dB bandwidth)

6.2 TEST PROCEDURE AND SETTING

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting:
 For 6dB Bandwidth:
 RBW= 100 kHz, VBW=300 kHz, Sweep time =Auto.
 For 99% Bandwidth:
 RBW=20kHz, VBW=62kHz, Sweep time =Auto. (For 1Mbps)
 RBW=30kHz, VBW=91kHz, Sweep time =Auto. (For 2Mbps)

6.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2027/05/10
2	RF Cable	Mi-cable	C10-01-01-1	100309	N/A

6.4 TEST SETUP



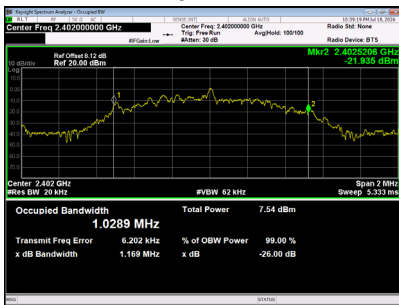
6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

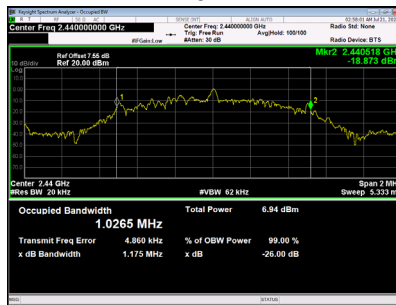
6.6 TEST RESULTS

TX Mode_1Mbps				
Channel	Frequency (MHz)	6 dB bandwidth (MHz)	99%OBW (MHz)	Result
CH00	2402	0.6740	1.0289	PASS
CH19	2440	0.6779	1.0265	PASS
CH39	2480	0.6514	1.0243	PASS

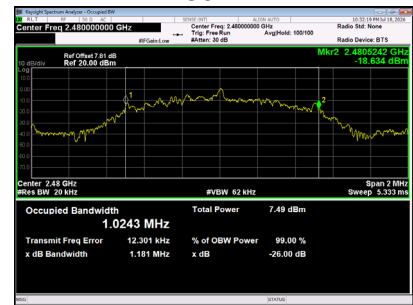
2402MHz



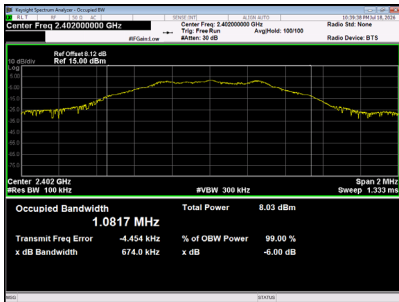
**99%
2440MHz**



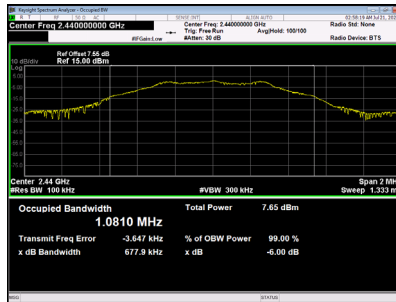
2480MHz



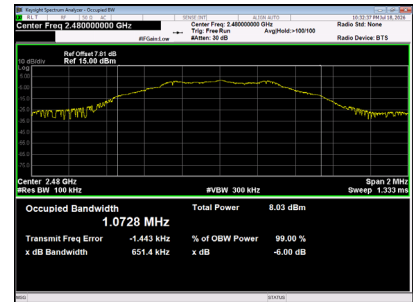
2402MHz



**6dB
2440MHz**

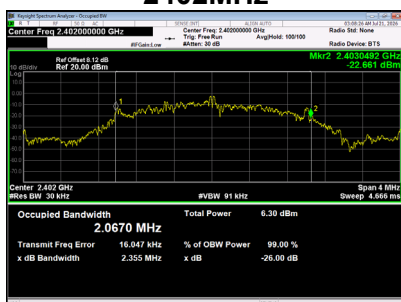


2480MHz

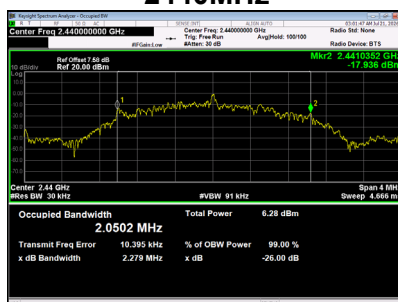


TX Mode 2Mbps				
Channel	Frequency (MHz)	6 dB bandwidth (MHz)	99%OBW (MHz)	Result
CH00	2402	1.117	2.0670	PASS
CH19	2440	1.106	2.0502	PASS
CH39	2480	1.126	2.0582	PASS

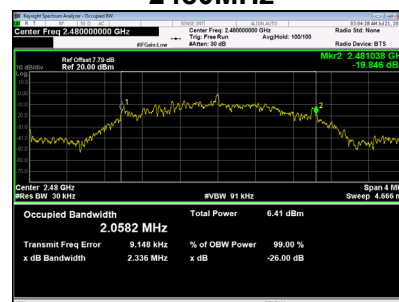
2402MHz



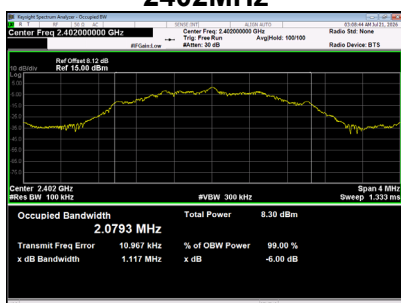
99%
2440MHz



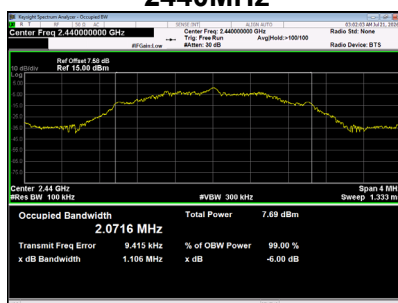
2480MHz



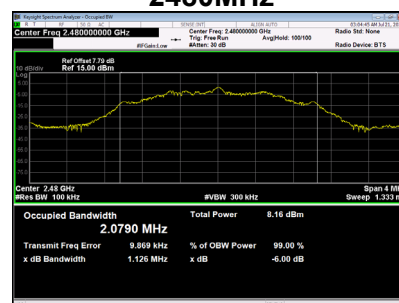
2402MHz



6dB
2440MHz



2480MHz



7 MAXIMUM OUTPUT POWER

7.1 LIMIT

FCC Part15, Subpart C (15.247) & RSS-247		
Section	Test Item	Limit
15.247 (b) (3) RSS-247 6.3.2	Maximum Output Power	1 watt or 30dBm

7.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- The maximum conducted output power was performed in accordance with method 11.9.1 (for peak power) of ANSI C63.10.

7.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2027/05/10
2	RF Cable	Mi-cable	C10-01-01-1	100309	N/A

7.4 TEST SETUP



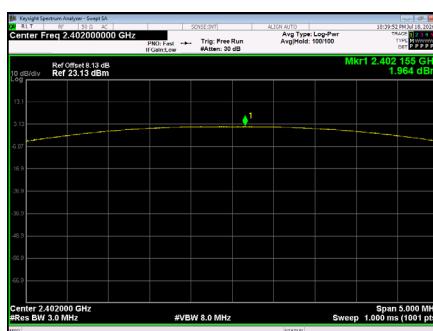
7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

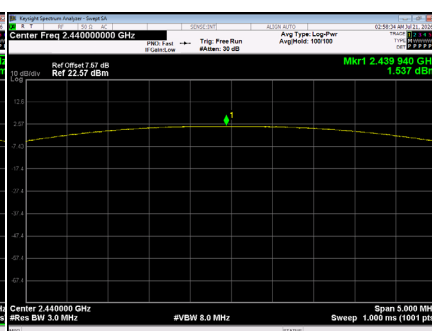
7.6 TEST RESULTS

TX Mode_1Mbps						
Gain	2.49dBi					
Channel	Frequency	Output Power	EIRP		Limit	Verdict
	(MHz)	(dBm)	(dBm)	(W)	(W)	
CH00	2402	1.964	4.454	0.002789	1.0	PASS
CH19	2440	1.537	4.027	0.002528	1.0	PASS
CH39	2480	1.899	4.389	0.002747	1.0	PASS

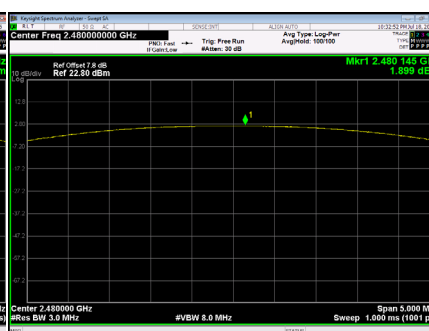
2402MHz



2440MHz

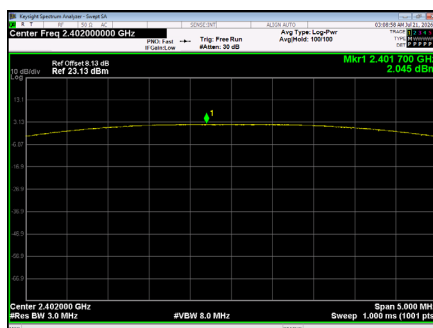


2480MHz

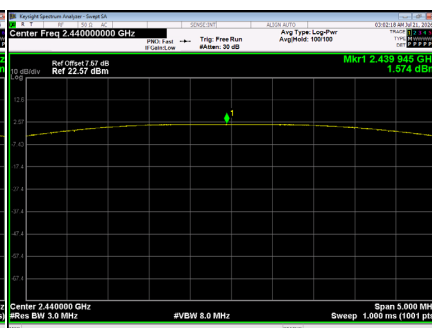


TX Mode_2Mbps						
Gain	2.49dBi					
Channel	Frequency	Output Power	EIRP		Limit	Verdict
	(MHz)	(dBm)	(dBm)	(W)	(W)	
CH00	2402	2.045	4.535	0.002841	1.0	PASS
CH19	2440	1.574	4.064	0.002549	1.0	PASS
CH39	2480	1.951	4.441	0.002780	1.0	PASS

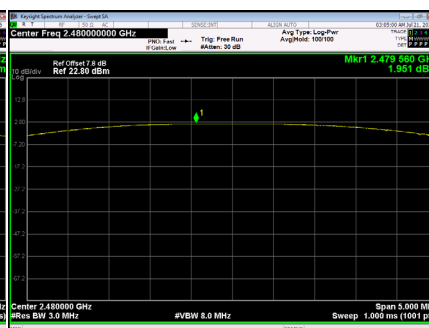
2402MHz



2440MHz



2480MHz



8 CONDUCTED SPURIOUS EMISSION

8.1 LIMIT

For FCC

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

For ISSED

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

8.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting: RBW= 100 kHz, VBW=300 kHz, Sweep time = Auto.

8.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2027/05/10
2	RF Cable	Mi-cable	C10-01-01-1	100309	N/A

8.4 TEST SETUP

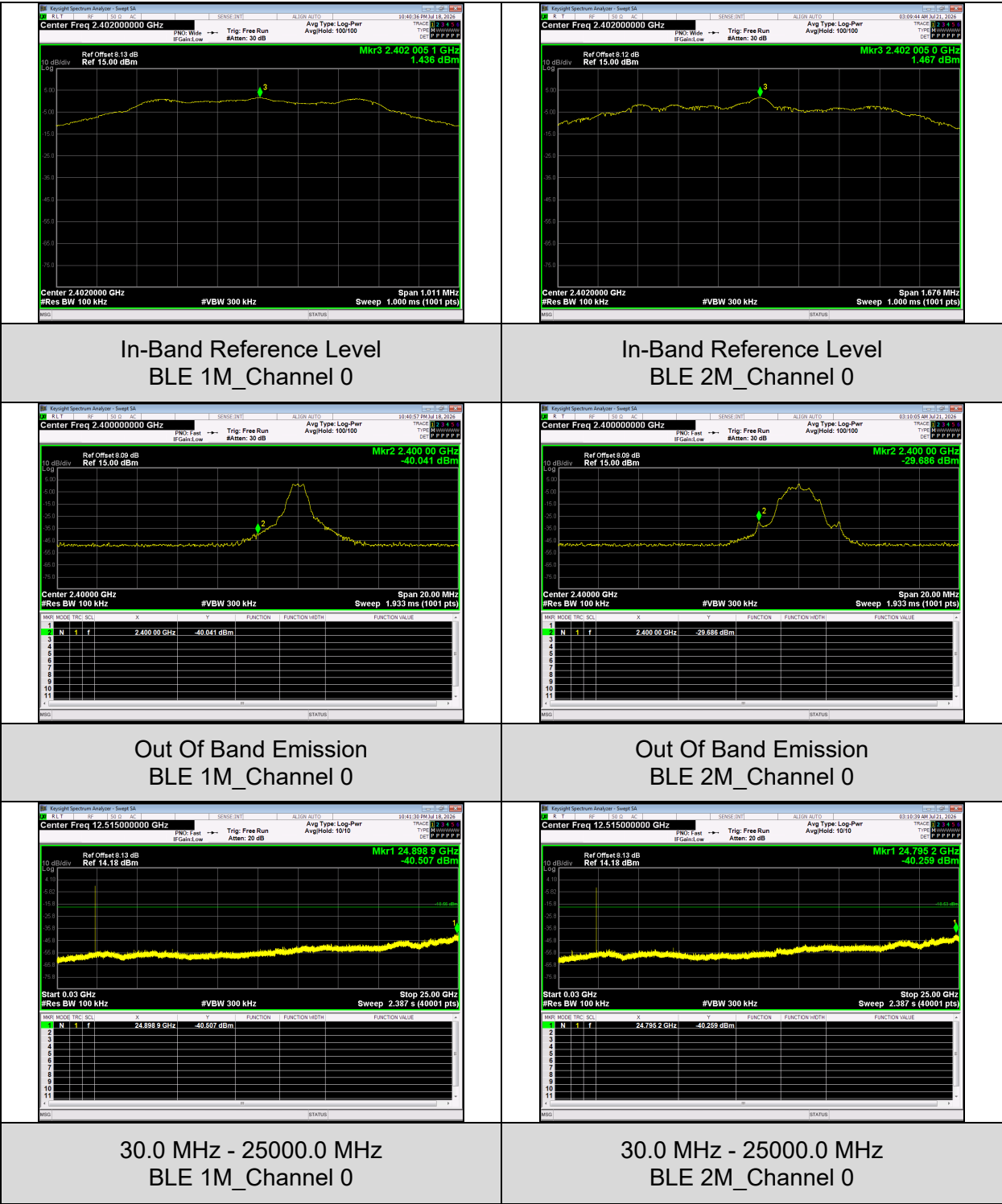


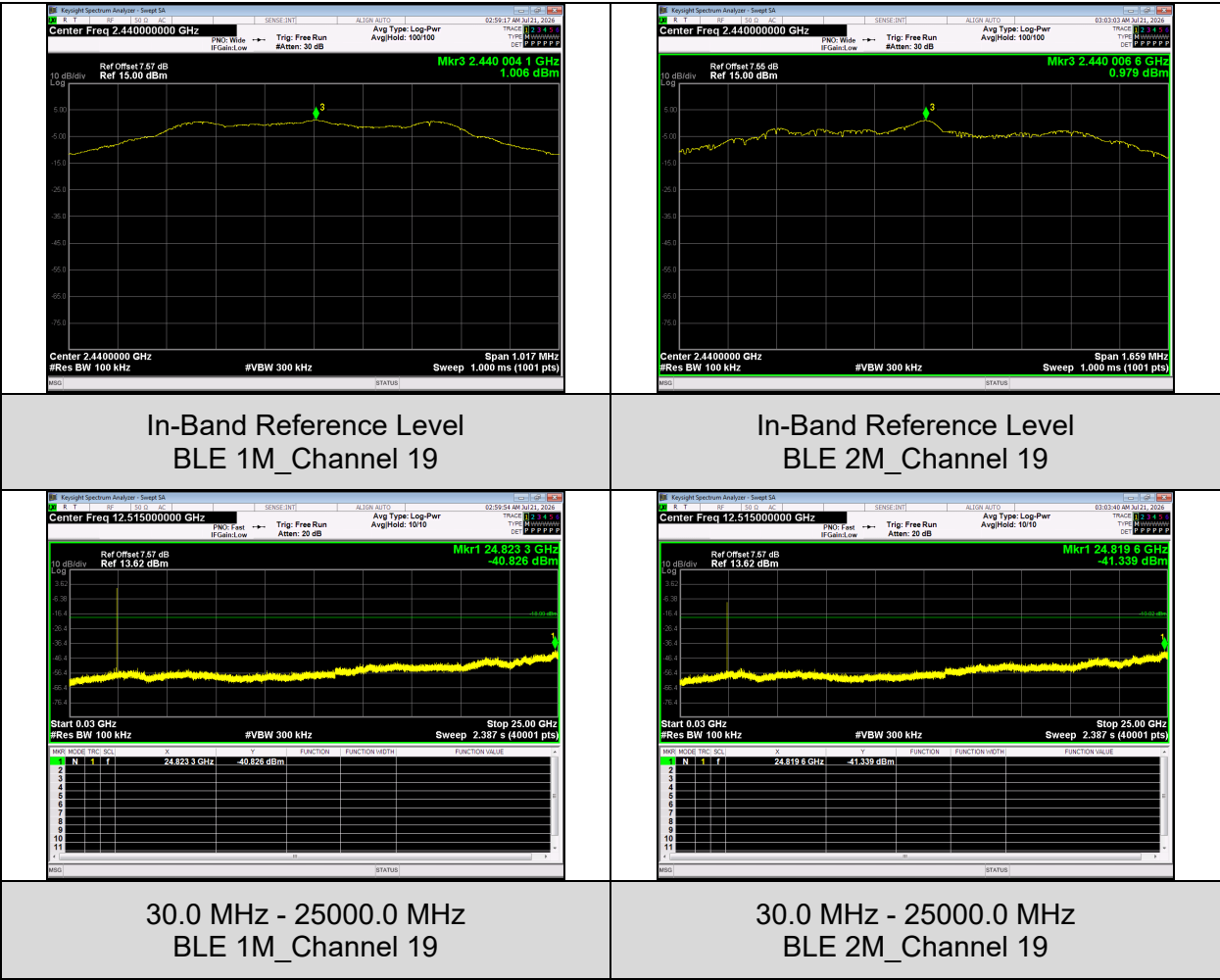
8.5 EUT OPERATION CONDITIONS

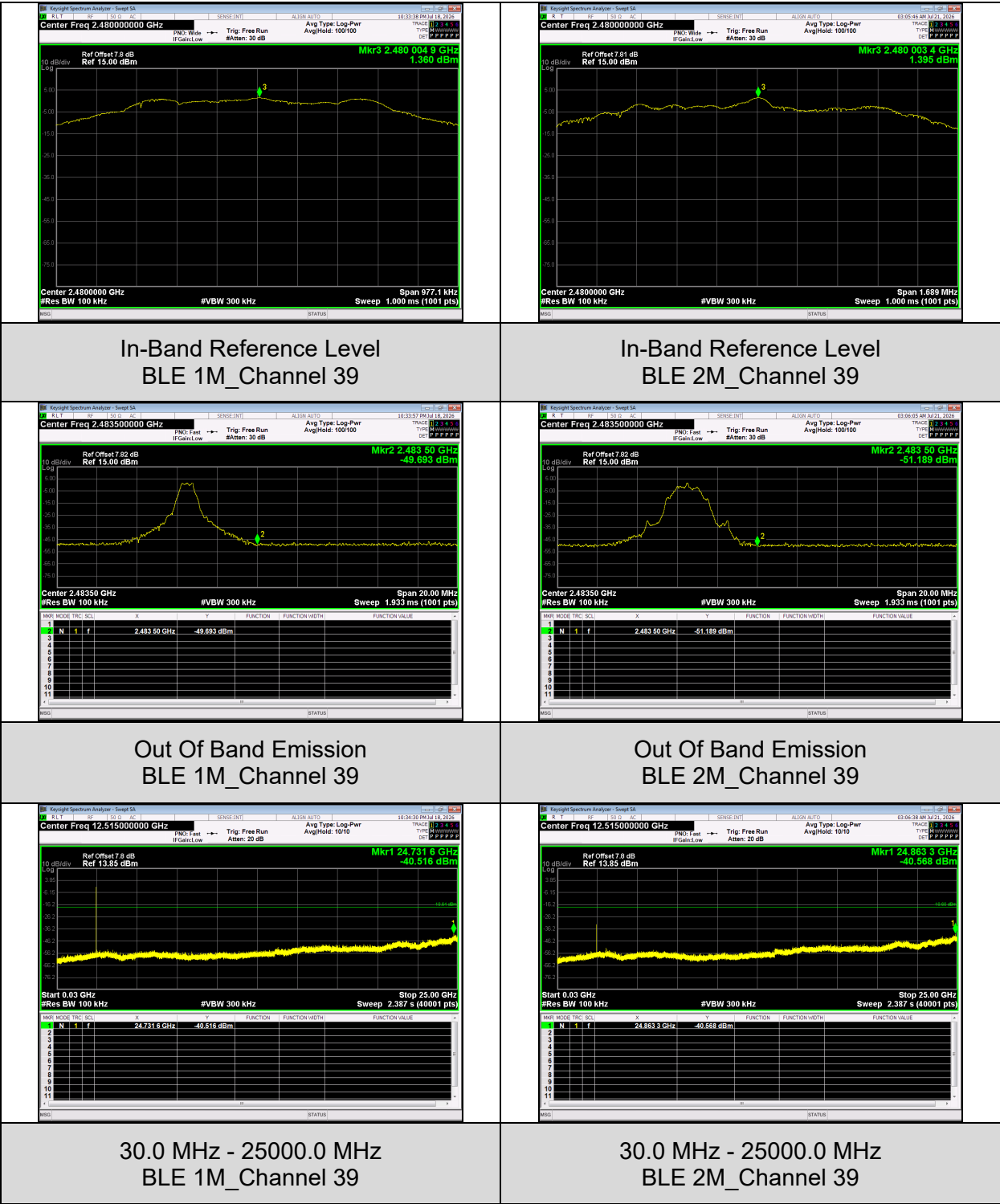
The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TEST RESULTS

Mode	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Verdict
BLE 1M	0	2400.00	-40.041	-18.56	PASS
		24898.9	-40.507	-18.56	PASS
	19	24823.3	-40.826	-18.99	PASS
	39	2483.50	-49.693	-18.64	PASS
		24731.6	-40.516	-18.64	PASS
BLE 2M	0	2400.00	-29.686	-18.53	PASS
		24795.2	-40.259	-18.53	PASS
	19	24819.6	-41.339	-19.02	PASS
	39	2483.50	-51.189	-18.60	PASS
		24863.3	-40.568	-18.60	PASS







9 POWER SPECTRAL DENSITY TEST

9.1 LIMIT

FCC Part15, Subpart C (15.247) & RSS-247		
Section	Test Item	Limit
15.247(e) RSS-247 6.3.1 (b)	Power Spectral Density	8 dBm (in any 3 kHz)

9.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting: RBW=3 kHz, VBW=9.1kHz, Sweep time = auto.

9.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2027/05/10
2	RF Cable	Mi-cable	C10-01-01-1	100309	N/A

9.4 TEST SETUP

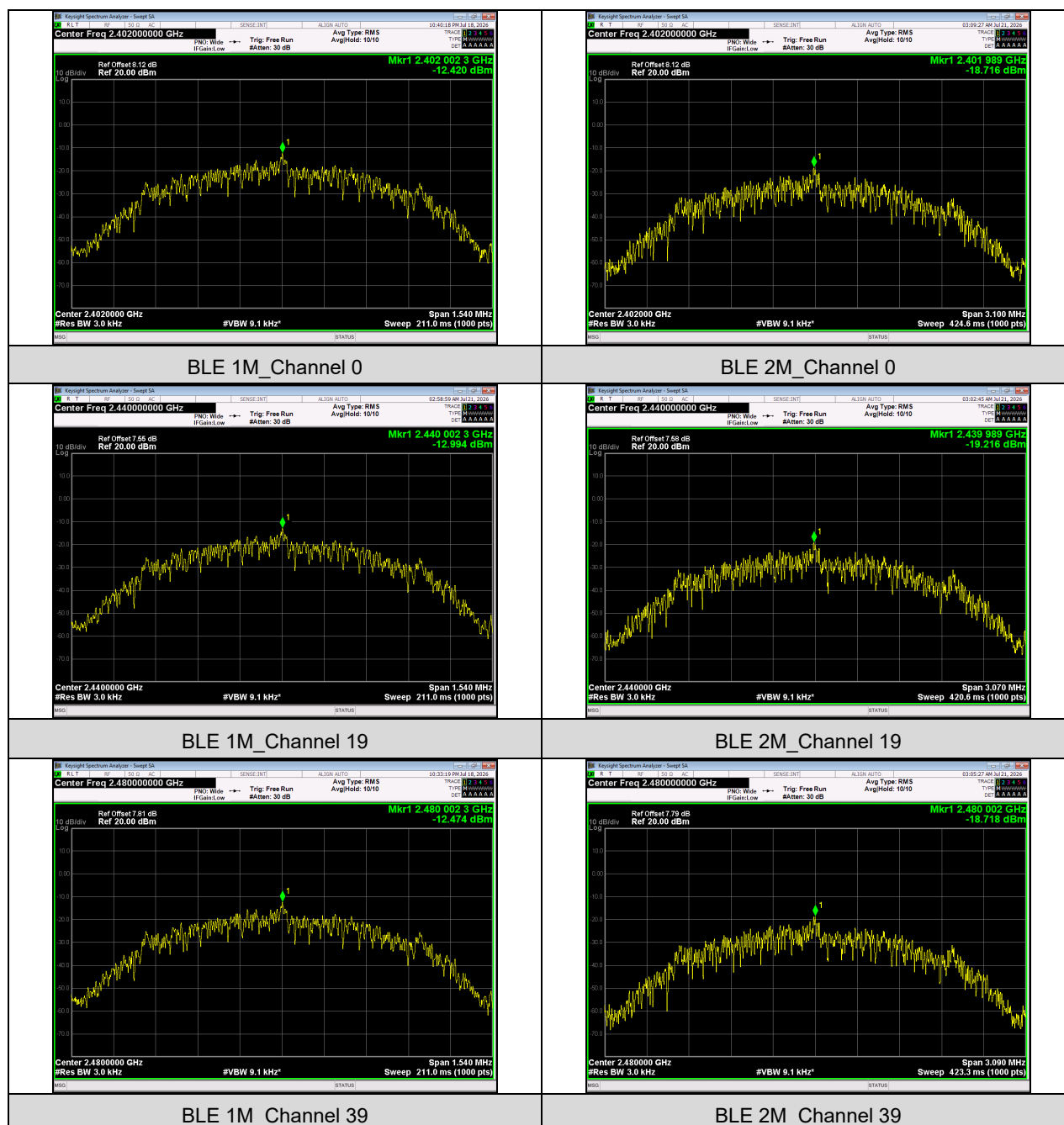


9.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

9.6 TEST RESULTS

Mode	Channel	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
BLE 1M	0	-12.420	≤8	PASS
BLE 1M	19	-12.990	≤8	PASS
BLE 1M	39	-12.470	≤8	PASS
BLE 2M	0	-18.720	≤8	PASS
BLE 2M	19	-19.220	≤8	PASS
BLE 2M	39	-18.720	≤8	PASS



10 FREQUENCY STABILITY MEASUREMENT

10.1 LIMIT

RSS-Gen			
Section	Test Item	Limit	Frequency Range (MHz)
RSS-Gen 5.3	Frequency Stability	Specified in the user's manual	2402-2480

10.2 TEST PROCEDURE

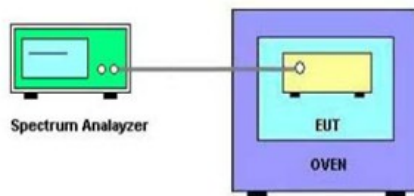
- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting:

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RBW	3 kHz
VBW	10 kHz
Sweep Time	Auto

10.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2027/05/10
2	RF Cable	Mi-cable	C10-01-01-1	100309	N/A
3	Temperature conditioning	Guan Jian.HTH1000	-20-130°C	GJ1000-10D001	N/A
4	DC Power Supply	G.KE	IPR-10010D	010931954	N/A

10.4 TEST SETUP



10.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

10.6 TEST RESULTS

	Temperature vs. Frequency Stability	
Voltage	Temperature	Measurement Frequency (MHz)
3.7Vdc	(°C)	2402
	-20	2402.0046
	+20	2402.0048
	+50	2402.0045
3.1Vdc	+20	2402.0048
Max. Deviation (MHz)		0.0048
Max. Deviation (ppm)		2.0

Note: 3.1Vdc is the end point voltage, and products below 3.1Vdc will cease working.

END OF TEST REPORT