FCC Radio Test Report

FCC ID: 2BHQS-PSM803

This report concerns: Original Grant

Project No.	:	2405H020
Equipment	:	Smart Module
Brand Name	:	N/A
Test Model	:	PSM803
Series Model	:	N/A
Applicant	:	Phoenix Season LLC
Address	:	113 Cruiser Irvine, California 92618 United States
Manufacturer	:	Phoenix Season LLC
Address	:	113 Cruiser Irvine, California 92618 United States
Date of Receipt	:	May 16, 2024
Date of Test	:	May 20, 2024~Jul. 31, 2024
Issued Date	:	Sep. 25, 2024
Report Version	:	R01
Test Sample	:	Engineering Sample No.: SH202406256 for radiated, SH2024051641 for conducted, SH20240517566 for adapter.
Standard(s)	:	FCC CFR Title 47, Part 15, Subpart C FCC KDB 558074 D01 15.247 Meas Guidance v05r02 ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc. (Shanghai)

Louis Li

Prepared by : Louis Li

Riley Wei

Approved by : Riley Wei

Add: No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.
Tel: +86-021-61765666 Web: www.newbtl.com Service mail: btl_qa@newbtl.com

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL'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. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

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

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

Table of Contents Page

REPORT ISSUED HISTORY 5

1 . SUMMARY OF TEST RESULTS 6

1.1 TEST FACILITY 7

1.2 MEASUREMENT UNCERTAINTY 7

1.3 TEST ENVIRONMENT CONDITIONS 7

2 . GENERAL INFORMATION 8

2.1 GENERAL DESCRIPTION OF EUT 8

2.2 DESCRIPTION OF TEST MODES 10

2.3 PARAMETERS OF TEST SOFTWARE 11

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 12

2.5 SUPPORT UNITS 12

3 . RADIATED EMISSIONS 13

3.1 LIMIT 13

3.2 TEST PROCEDURE 14

3.3 DEVIATION FROM TEST STANDARD 15

3.4 TEST SETUP 15

3.5 EUT OPERATING CONDITIONS 17

3.6 TEST RESULT - 9 KHZ TO 30 MHZ 17

3.7 TEST RESULT - 30 MHZ TO 1000 MHZ 17

3.8 TEST RESULT - ABOVE 1000 MHZ 17

4 . BANDWIDTH 18

4.1 LIMIT 18

4.2 TEST PROCEDURE 18

4.3 DEVIATION FROM STANDARD 18

4.4 TEST SETUP 18

4.5 EUT OPERATION CONDITIONS 18

4.6 TEST RESULTS 18

5 . MAXIMUM OUTPUT POWER 19

5.1 LIMIT 19

5.2 TEST PROCEDURE 19

5.3 DEVIATION FROM STANDARD 19

5.4 TEST SETUP 19

Table of Contents Page

5.5 EUT OPERATION CONDITIONS 19
5.6 TEST RESULTS 19
6 . CONDUCTED SPURIOUS EMISSION 20
6.1 LIMIT 20
6.2 TEST PROCEDURE 20
6.3 DEVIATION FROM STANDARD 20
6.4 TEST SETUP 20
6.5 EUT OPERATION CONDITIONS 20
6.6 TEST RESULTS 20
7 . POWER SPECTRAL DENSITY 21
7.1 LIMIT 21
7.2 TEST PROCEDURE 21
7.3 DEVIATION FROM STANDARD 21
7.4 TEST SETUP 21
7.5 EUT OPERATION CONDITIONS 21
7.6 TEST RESULTS 21
8 . MEASUREMENT INSTRUMENTS LIST 22
9 . EUT TEST PHOTO 25
APPENDIX A - RADIATED EMISSION - 9 KHZ TO 30 MHZ 30
APPENDIX B - RADIATED EMISSION - 30 MHZ TO 1000 MHZ 35
APPENDIX C - RADIATED EMISSION - ABOVE 1000 MHZ 38
APPENDIX D - BANDWIDTH 55
APPENDIX E - MAXIMUM OUTPUT POWER 58
APPENDIX F - CONDUCTED SPURIOUS EMISSION 61
APPENDIX G - POWER SPECTRAL DENSITY 64

REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-6-2405H020	R00	Original Report.	Sep. 13, 2024	Invalid
BTL-FCCP-6-2405H020	R01	Revised report to address TCB's comments.	Sep. 25, 2024	Valid

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C				
Standard(s) Section	**Test Item**	**Test Result**	**Judgment**	**Remark**
15.207	AC Power Line Conducted Emissions	APPENDIX A	N/A	------
15.247(d) 15.205(a) 15.209(a)	Radiated Emissions	APPENDIX B APPENDIX C APPENDIX D	PASS	------
15.247(a)(2)	Bandwidth	APPENDIX E	PASS	------
15.247(b)(3)	Maximum Output Power	APPENDIX F	PASS	------
15.247(d)	Conducted Spurious Emission	APPENDIX G	PASS	------
15.247(e)	Power Spectral Density	APPENDIX H	PASS	------
15.203	Antenna Requirement	------	PASS	Note(2)

Note:

(1) “N/A” denotes test is not applicable to this device.

(2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210,China
BTL's Registration Number for FCC: 964234
BTL's Designation Number for FCC: CN1374

1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))
The BTL measurement uncertainty as below table:

A. Radiated emissions test:

Test Site	Measurement Frequency Range	Ant. H / V	U, (dB)
SH-CB02	9 KHz~30 MHz	-	2.72
	30 MHz~200 MHz	V	4.4
	30 MHz~200 MHz	H	3.16
	200 MHz~1,000 MHz	V	4.6
	200 MHz~1,000 MHz	H	4.2
	1GHz ~ 6GHz	-	4.56
	6GHz ~ 18GHz	-	5.14
	18 ~ 26.5 GHz	-	1.68
	26.5~40 GHz		1.71

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
Radiated Emissions-9 kHz to 30 MHz	26.1°C	49%	AC 120V/60Hz	Yahya Fang
Radiated Emissions-30 MHz to 1000 MHz	27°C	54%	AC 120V/60Hz	Yahya Fang
Radiated Emissions-Above 1000 MHz	23.8°C~26.1°C	41%~49%	AC 120V/60Hz	Yahya Fang
Bandwidth	24.3°C	55%	AC 120V/60Hz	Thacker Tang
Maximum Output Power	24.3°C	55%	AC 120V/60Hz	Thacker Tang
Conducted Spurious Emission	24.3°C	55%	AC 120V/60Hz	Thacker Tang
Power Spectral Density	24.3°C	55%	AC 120V/60Hz	Thacker Tang

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Module
Brand Name	N/A
Test Model	PSM803
Series Model	N/A
Model Difference(s)	N/A
Software Version	QCS8550_LE.1.0_AP
Hardware Version	PSM803
Power Source	DC Voltage supplied from AC/DC adapter
Power Rating	I/P: 100-240V~50/60Hz 1.5A O/P: 12.0V⎓5.0A 60.0W
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	1Mbps, 2Mbps
Max. Output Power	1Mbps: 11.34 dBm (0.0136W)

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the user's manual.
2. Test according to the manufacturer's declared power.

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. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	External Antenna	R-SMA	5.82

Note:
The antenna gain is provided by the manufacturer.

2.2 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	TX Mode_1Mbps Channel 00/19/39
Mode 2	TX Mode_2Mbps Channel 00/19/39

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

Radiated emissions test - Below 1GHz	
Final Test Mode	Description
Mode 1	TX Mode_1Mbps Channel 00

Radiated emissions test - Above 1GHz	
Final Test Mode	Description
Mode 1	TX Mode_1Mbps Channel 00/19/39
Mode 2	TX Mode_2Mbps Channel 00/19/39

Conducted test	
Final Test Mode	Description
Mode 1	TX Mode_1Mbps Channel 00/19/39
Mode 2	TX Mode_2Mbps Channel 00/19/39

Note:

(1) For radiated emission above 1 GHz test, the spurious points of 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

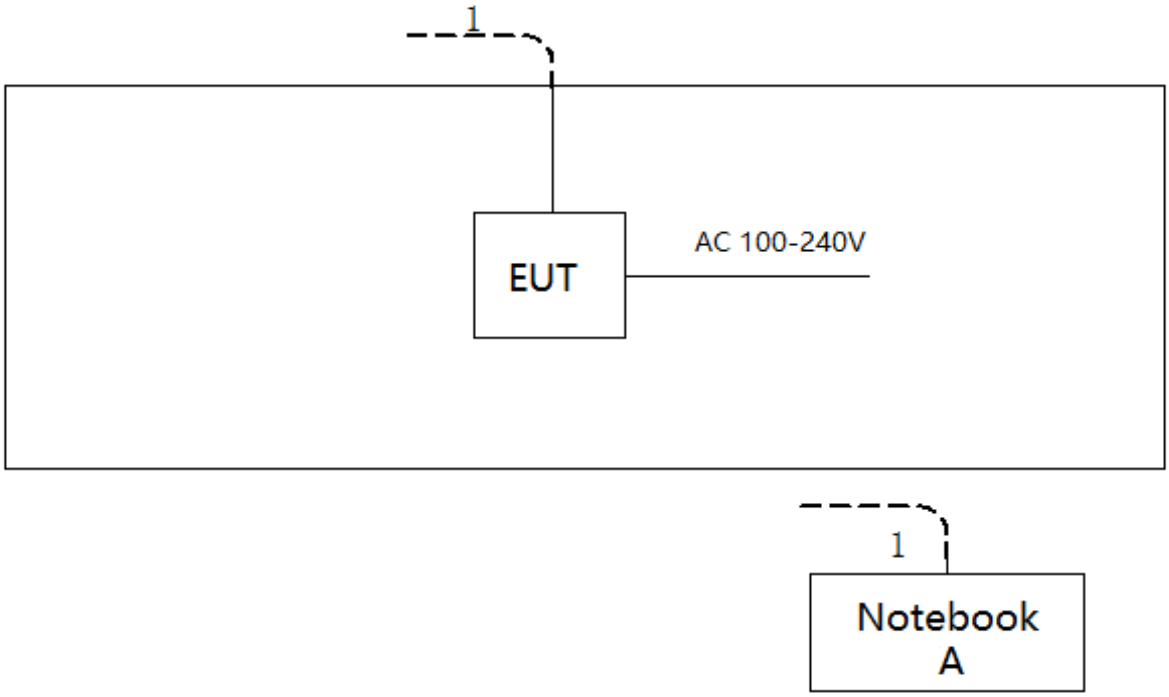
(2) For Radiated emissions below 1 GHz test, the 1Mbps Channel 00 is found to be the worst case and recorded.

2.3 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.

Test Software Version	QRCT		
Frequency (MHz)	2402	2440	2480
1Mbps	Default	Default	Default
2Mbps	Default	Default	Default

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
A	Notebook	Dell	Inspiron 15-7559	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	USB Cable	NO	NO	10m

3. RADIATED EMISSIONS

3.1 LIMIT

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

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

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 (Above 1000 MHz)

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 CFR Title 47, Part 15, Subpart C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2 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 1 GHz)
b. The measuring distance of 3 m 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 1 GHz)
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 1 GHz.
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 1 GHz)
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 1 GHz)
i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

The following table is the setting of the receiver:

Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz

Spectrum Parameters	Setting
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1 MHz / 3 MHz for PK value 1 MHz / 1/T Hz for AVG value

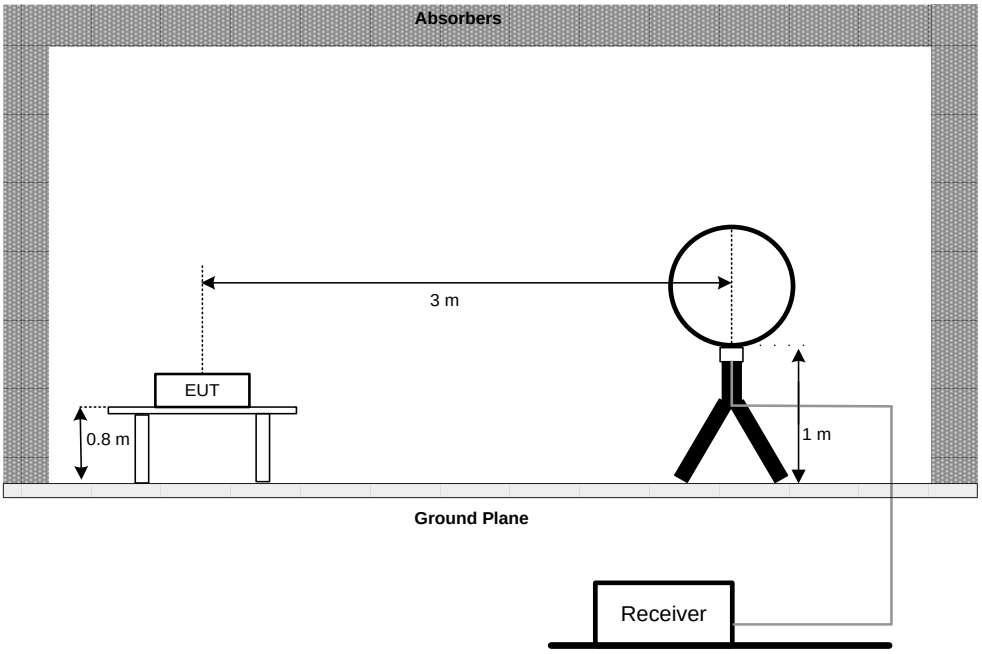
Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector
Start ~ Stop Frequency	1 GHz~26.5 GHz for PK/AVG detector

3.3 DEVIATION FROM TEST STANDARD

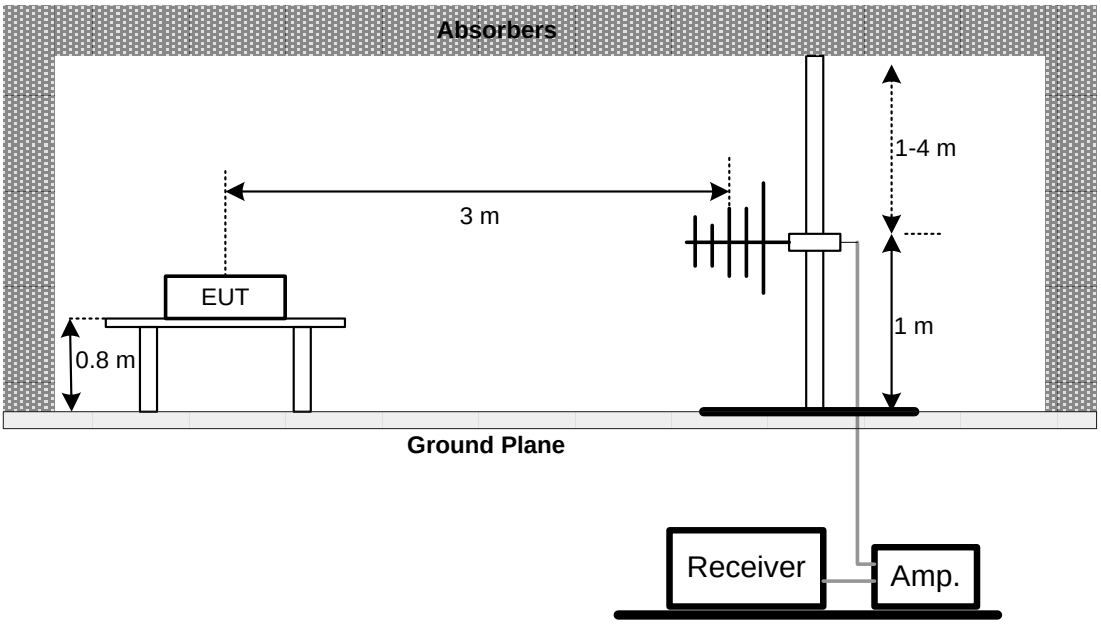
No deviation.

3.4 TEST SETUP

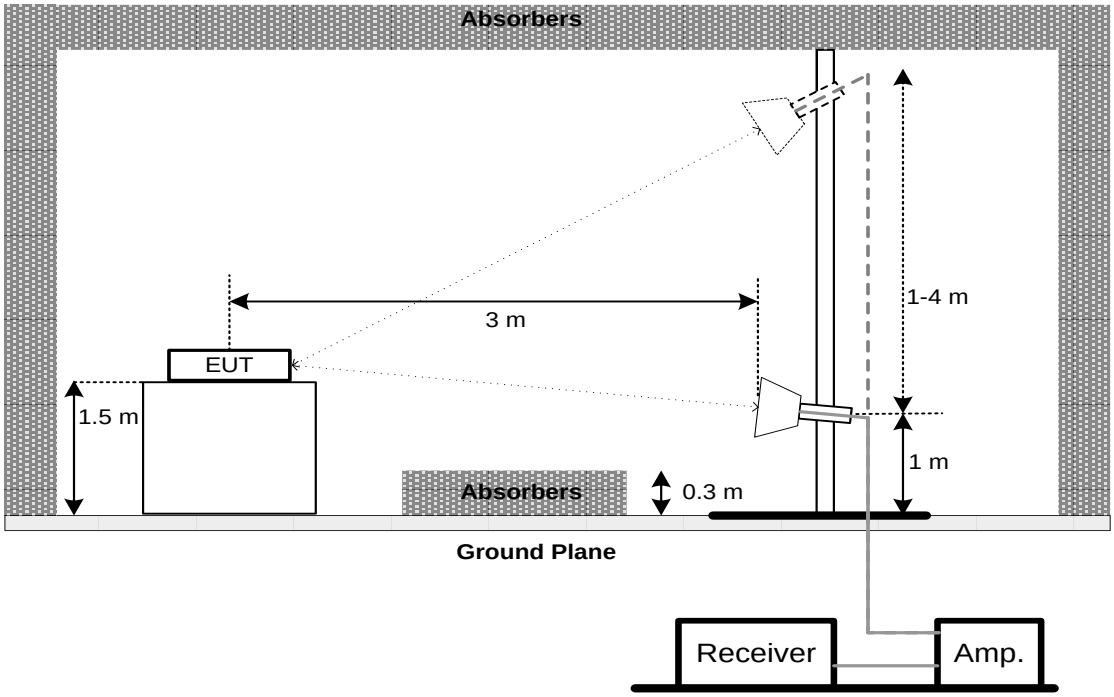
9 kHz to 30 MHz



30 MHz to 1 GHz



Above 1 GHz


Absorbers
3 m
1-4 m
EUT
1.5 m
1 m
Absorbers
0.3 m
Ground Plane
Receiver
Amp.

3.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

3.6 TEST RESULT - 9 kHz TO 30 MHz

Please refer to the Appendix A.

Remark:

(1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
(2) Limit line = specific limits (dBuV) + distance extrapolation factor.

3.7 TEST RESULT - 30 MHz TO 1000 MHz

Please refer to the Appendix B.

3.8 TEST RESULT - ABOVE 1000 MHz

Please refer to the Appendix C.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

4. BANDWIDTH

4.1 LIMIT

Section	Test Item	Limit
FCC 15.247(a)(2)	6 dB Bandwidth	>= 500 kHz
	99% Emission Bandwidth	-

4.2 TEST PROCEDURE

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

b. The following table is the setting of the spectrum analyzer:

For 6 dB Bandwidth:

Spectrum Parameters	Setting
Span Frequency	> Measurement Bandwidth
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

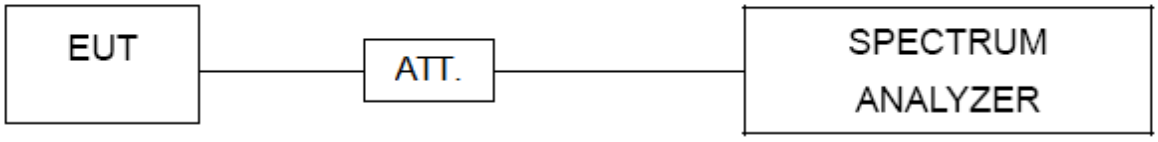
For 99% Emission Bandwidth:

Spectrum Parameters	Setting
Span Frequency	Between 1.5 times and 5.0 times the OBW
RBW	30 kHz
VBW	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.6 TEST RESULTS

Please refer to the Appendix D.

5. MAXIMUM OUTPUT POWER

5.1 LIMIT

Section	Test Item	Limit
FCC 15.247(b)(3)	Maximum Output Power	1.0000 watt or 30.00 dBm

5.2 TEST PROCEDURE

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

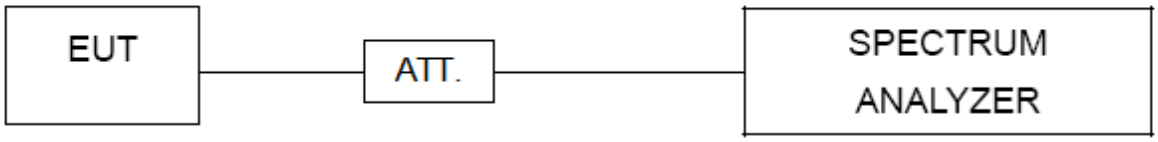
b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	⩾ 3×RBW
RBW	3 MHz
VBW	3 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULTS

Please refer to the Appendix E.

.

6. CONDUCTED SPURIOUS EMISSION

6.1 LIMIT

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.

6.2 TEST PROCEDURE

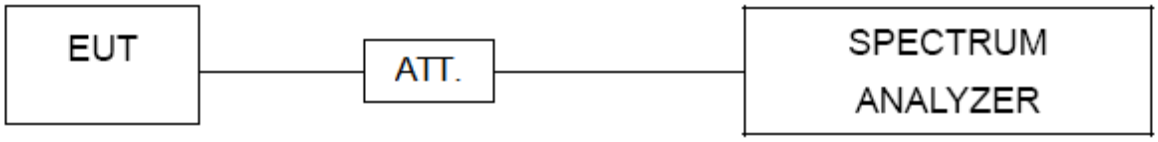
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Start Frequency	30 MHz
Stop Frequency	26.5 GHz
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.6 TEST RESULTS

Please refer to the Appendix F.

7. POWER SPECTRAL DENSITY

7.1 LIMIT

Section	Test Item	Limit
FCC 15.247(e)	Power Spectral Density	8 dBm (in any 3 kHz)

7.2 TEST PROCEDURE

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

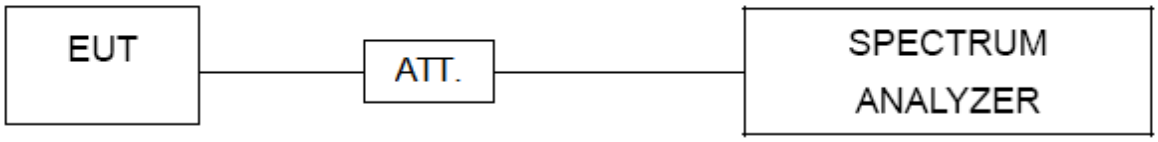
b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	2 MHz (1 Mbps) / 4 MHz (2 Mbps)
RBW	3 kHz
VBW	10 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULTS

Please refer to the Appendix G.

8. MEASUREMENT INSTRUMENTS LIST

Radiated Emissions - 9 kHz to 30 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Loop Antenna	EMCI	EMCI LPA600	275	Mar. 12, 2025
2	MXE EMI Receiver	Keysight	N9038A	MY56400088	Feb. 2, 2025
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1	N/A	N/A
4	Wideband Radio Communication Test	R&S	CMW500	129246	Jul. 12, 2025
5	Pre-Amplifier	emci	EMC9135	980401	Feb. 2, 2025

Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	emci	VULB 9168	1467	Mar. 12, 2025
2	Pre-Amplifier	emci	EMC9135	980401	Feb. 2, 2025
3	MXE EMI Receiver	Keysight	N9038A	MY56400088	Feb. 2, 2025
4	Test Cable	emci	EMC104-SM-SM-7000	181020	May 20, 2025
5	Test Cable	emci	RWP50-4.6A-SMSM-1M	20200928 002	May 20, 2025
6	Test Cable	emci	EMC104-SM-SM-2500	170618	May 20, 2025
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1	N/A	N/A
8	Wideband Radio Communication Test	R&S	CMW500	129246	Jul. 13, 2024 Jul. 12, 2025

Radiated Emissions - Above 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	BBHA 9120D	9120D-1817	Mar.12, 2025
2	Pre-Amplifier	emci	EMC051845SE	980725	Jul. 13, 2024 Jul. 12, 2025
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Feb. 2, 2025
4	Test Cable	emci	EMC104-SM-SM-7000	181020	May 20, 2025
5	Test Cable	emci	RWP50-4.6A-SMSM-1M	20200928 002	May 20, 2025
6	Test Cable	emci	EMC104-SM-SM-2500	170618	May 20, 2025
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1	N/A	N/A
8	Wideband Radio Communication Test	R&S	CMW500	129246	Jul. 13, 2024 Jul. 12, 2025
9	Antenna	Schwarzbeck	BBHA9170	9170-651	Mar. 15, 2025
10	Pre-Amplifier	EMC INSTRUMENT	EMC184045B	980265	Feb. 2, 2025
11	Test Cable	emci	100% S-Parameter Recorded	F02-150819-039	Oct. 21, 2024
12	Test Cable	emci	EMC104-SM-SM-2500	170616	Oct. 21, 2024
13	Test Cable	emci	EMC104-SM-SM-2500	170652	Oct. 21, 2024
14	EXA Spectrum Analyzer	Keysight	N9010A	MY56480559	Feb. 2, 2025

Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480545	Jul. 13, 2024 Jul. 12, 2025
2	BTL Conducted Test	BTL	20231123	N/A	N/A

Maximum Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480545	Jul. 13, 2024 Jul. 12, 2025
2	BTL Conducted Test	BTL	20231123	N/A	N/A

Antenna Conducted Spurious Emissions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480545	Jul. 13, 2024 Jul. 12, 2025
2	BTL Conducted Test	BTL	20231123	N/A	N/A

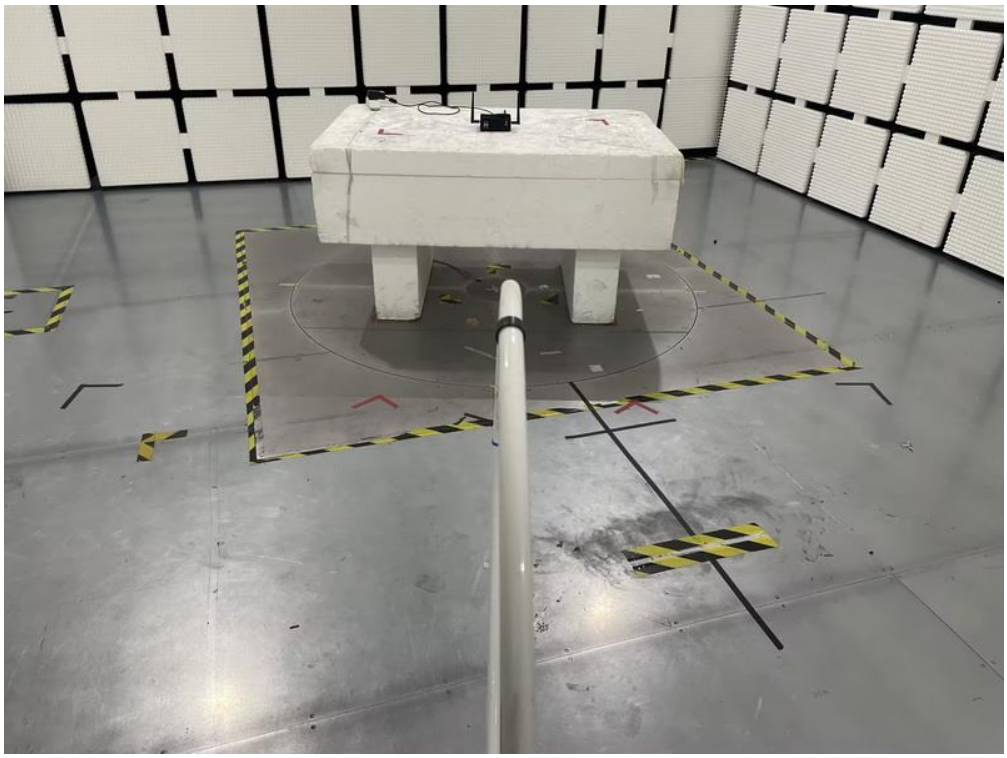
Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480545	Jul. 13, 2024 Jul. 12, 2025
2	BTL Conducted Test	BTL	20231123	N/A	N/A

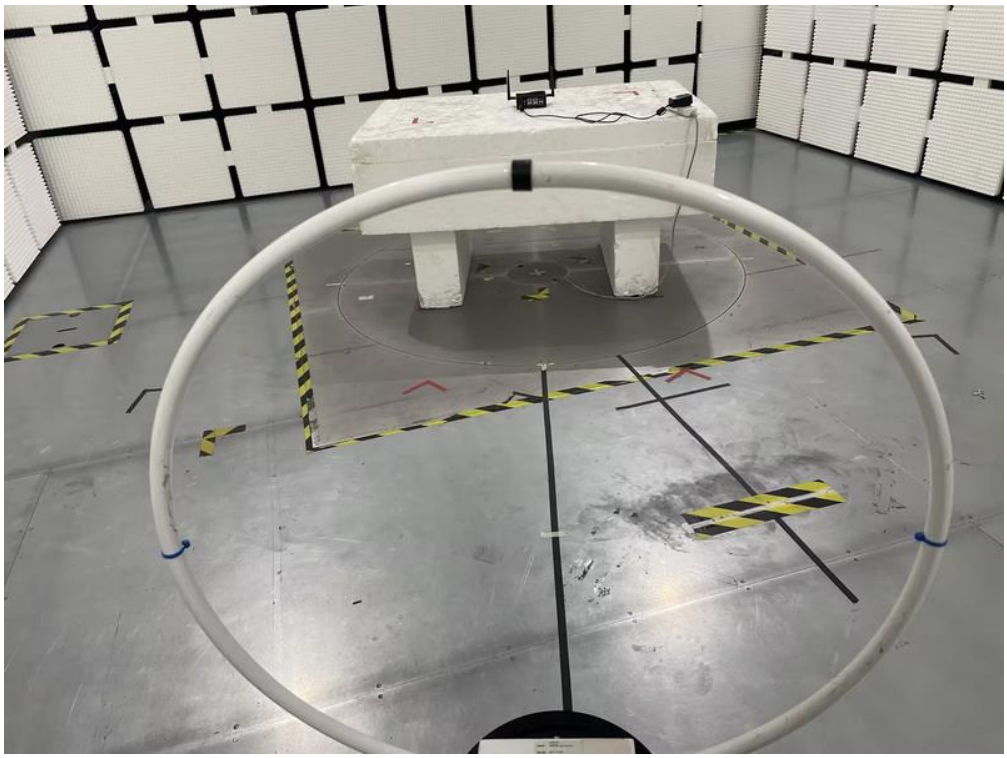
Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

9. EUT TEST PHOTO

Radiated Emissions Test Photos

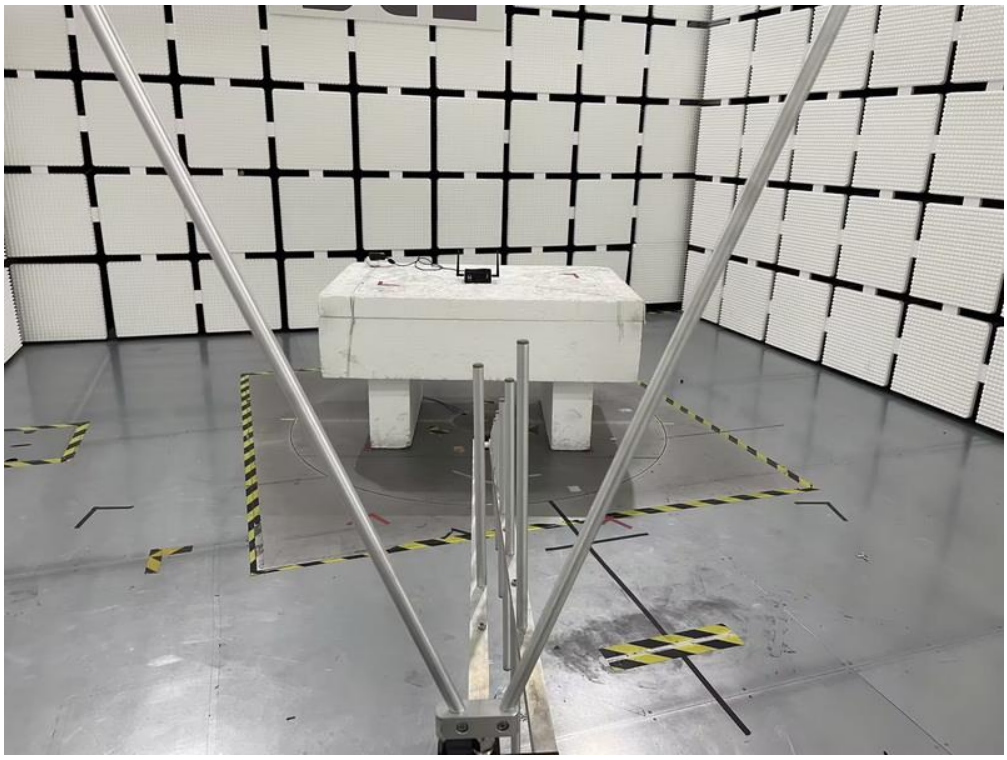
9 kHz to 30 MHz

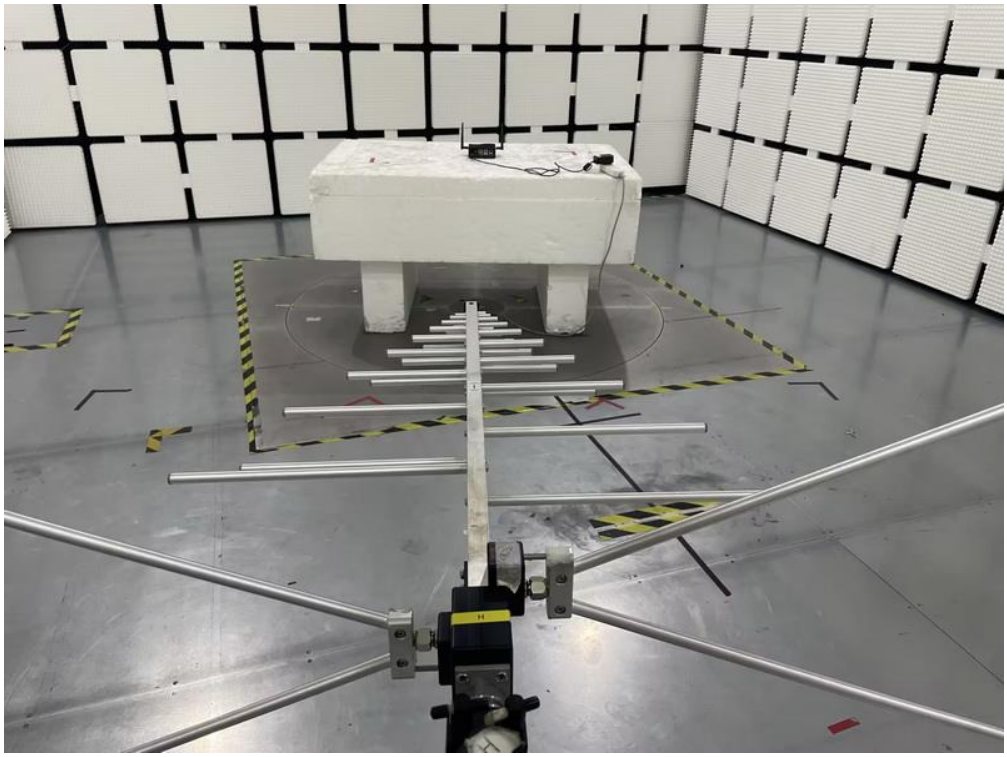




Radiated Emissions Test Photos

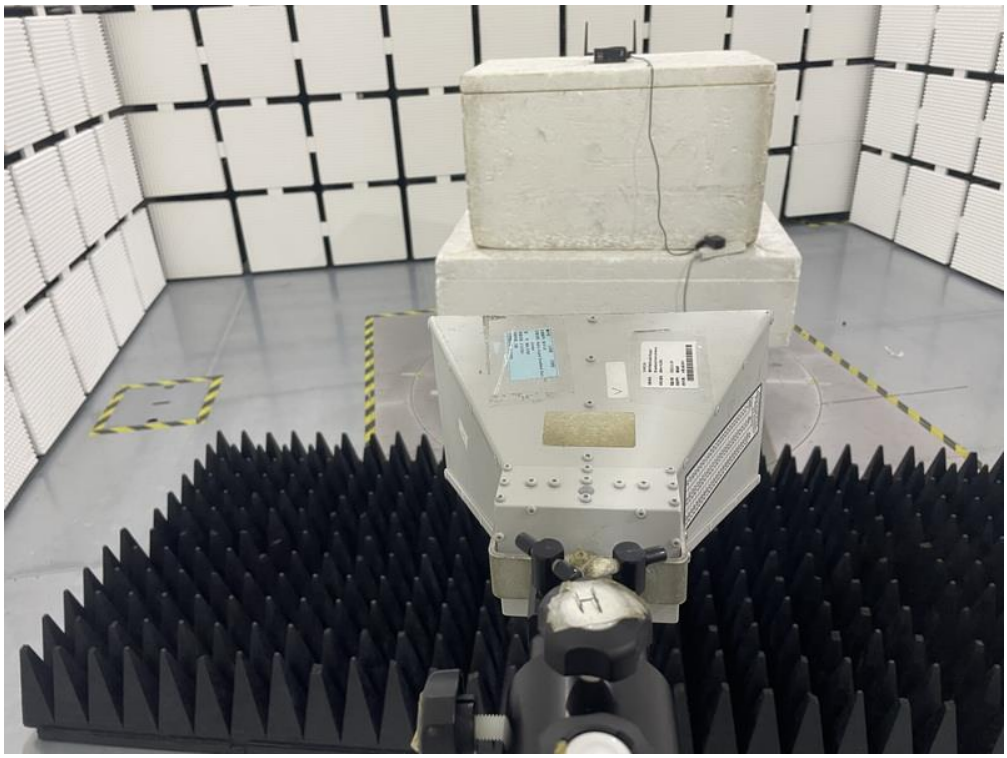
30 MHz to 1000 MHz

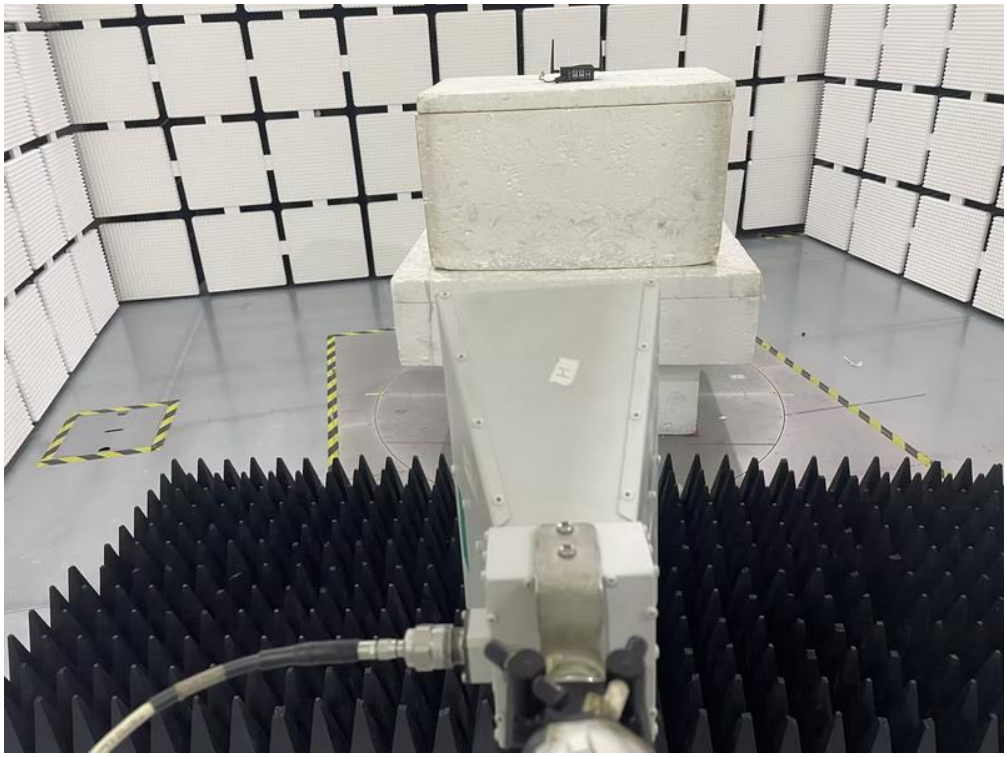




Radiated Emissions Test Photos

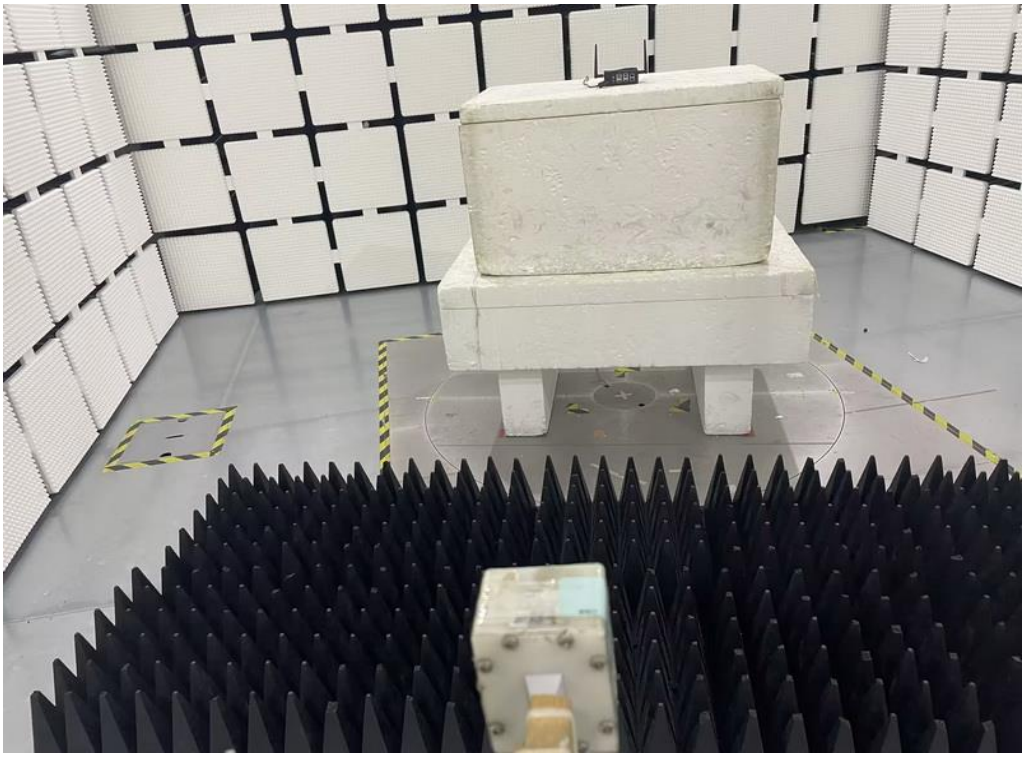
Above 1 GHz

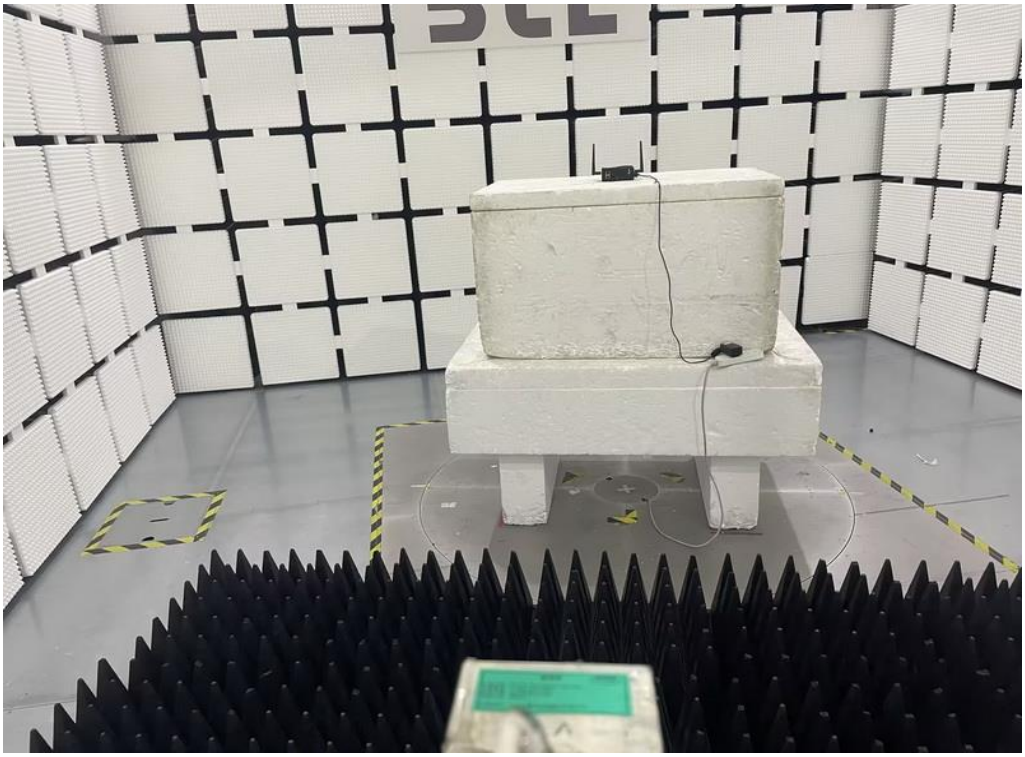




Radiated Emissions Test Photos

Above 18 GHz

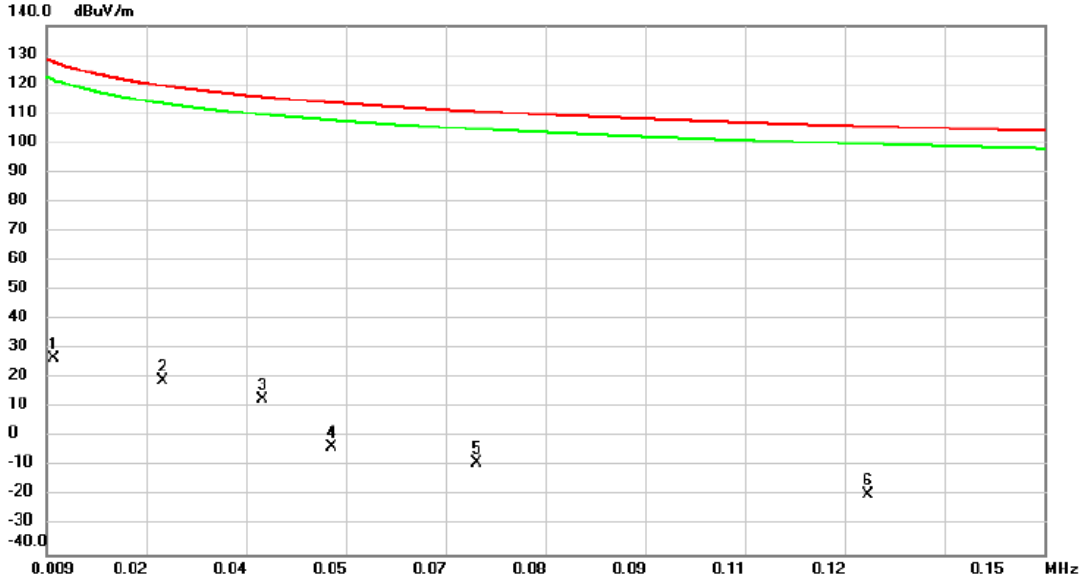




Close-up photo

APPENDIX A - RADIATED EMISSION - 9 KHZ TO 30 MHZ

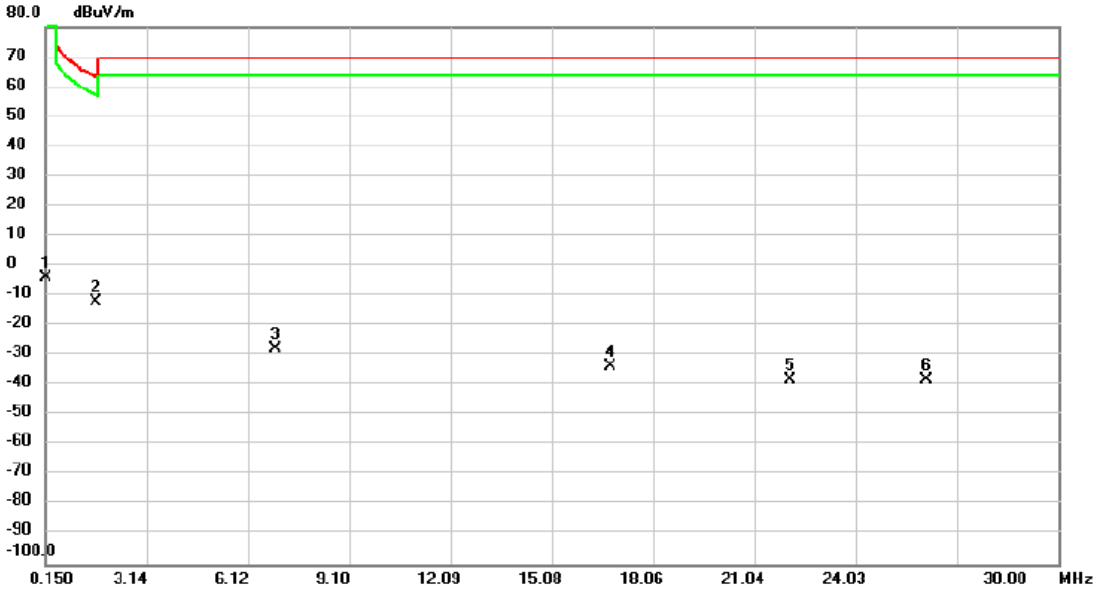
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		0.0101	10.71	16.32	27.03	127.52	-100.49	peak			
2	*	0.0255	18.27	0.94	19.21	119.47	-100.26	peak			
3		0.0396	19.25	-6.57	12.68	115.65	-102.97	peak			
4		0.0494	6.37	-9.72	-3.35	113.73	-117.08	peak			
5		0.0698	6.65	-15.29	-8.64	110.73	-119.37	peak			
6		0.1251	5.47	-25.18	-19.71	105.66	-125.37	peak			

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

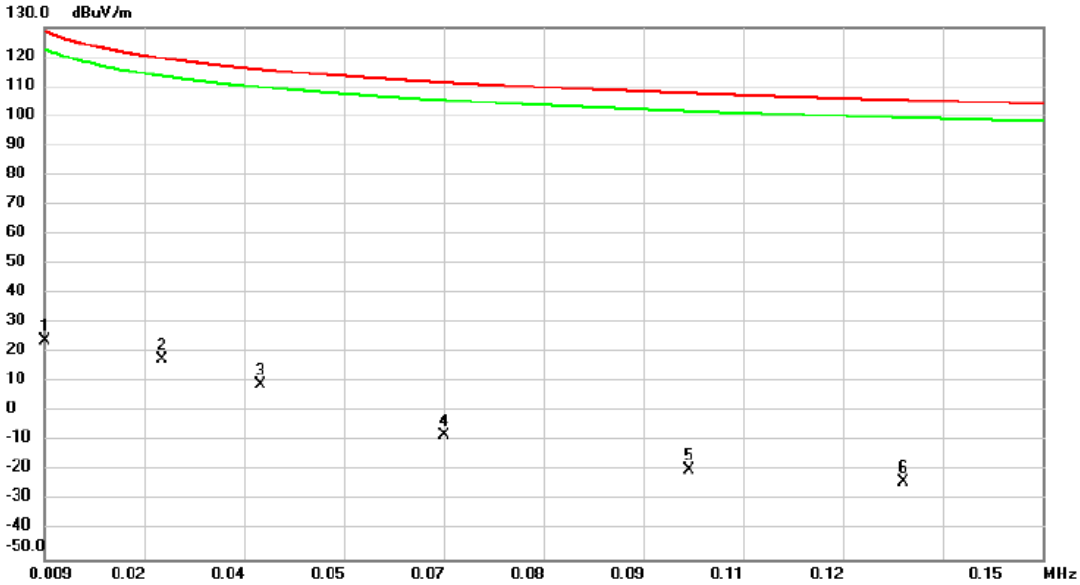
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		0.1500	23.53	-27.51	-3.98	104.09	-108.07	peak			
2	*	1.6276	37.26	-49.38	-12.12	63.37	-75.49	peak			
3		6.9410	24.91	-52.78	-27.87	69.54	-97.41	peak			
4		16.7914	20.98	-54.43	-33.45	69.54	-102.99	peak			
5		22.1047	17.50	-55.70	-38.20	69.54	-107.74	peak			
6		26.1046	19.10	-57.39	-38.29	69.54	-107.83	peak			

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		0.0090	5.43	18.49	23.92	128.52	-104.60	peak			
2	*	0.0256	16.92	0.85	17.77	119.44	-101.67	peak			
3		0.0396	15.53	-6.57	8.96	115.65	-106.69	peak			
4		0.0655	6.10	-14.17	-8.07	111.28	-119.35	peak			
5		0.1001	3.01	-22.51	-19.50	107.60	-127.10	peak			
6		0.1304	2.21	-25.69	-23.48	105.30	-128.78	peak			

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

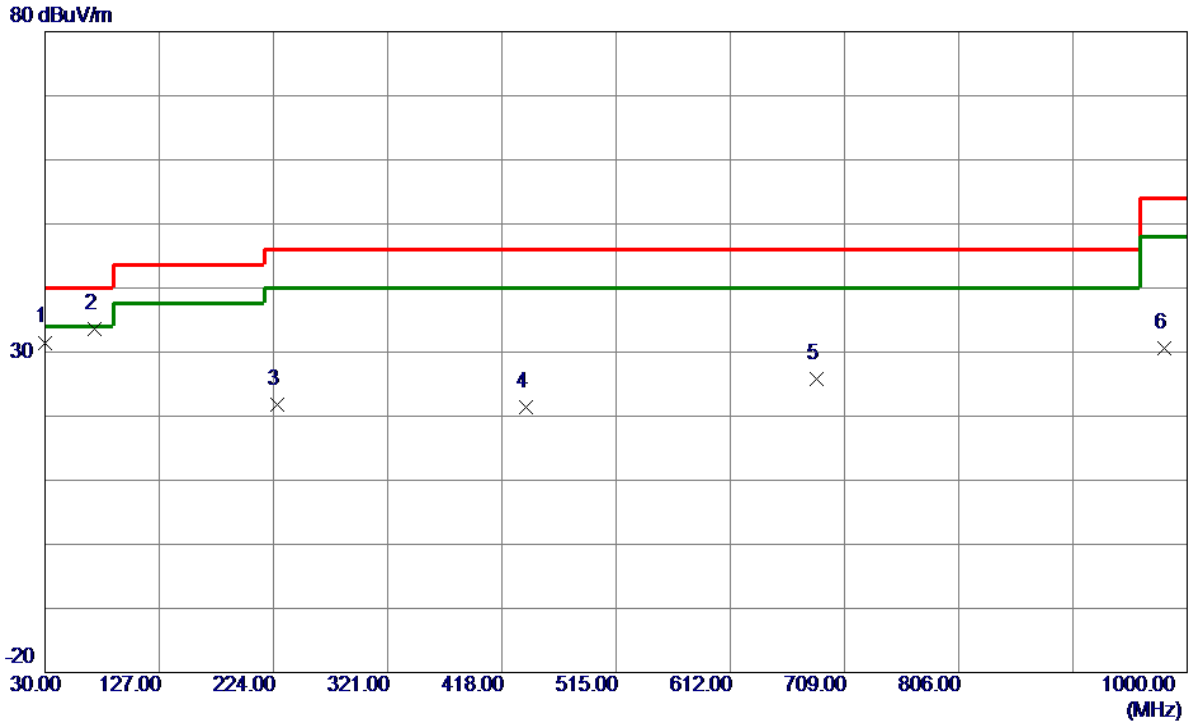
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Ant 90°

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		0.1500	24.56	-27.51	-2.95	104.09	-107.04	peak			
2	*	1.7171	31.98	-49.60	-17.62	69.54	-87.16	peak			
3		6.8215	25.71	-52.80	-27.09	69.54	-96.63	peak			
4		14.7020	25.19	-53.74	-28.55	69.54	-98.09	peak			
5		20.2241	21.88	-55.26	-33.38	69.54	-102.92	peak			
6		25.6568	25.10	-57.35	-32.25	69.54	-101.79	peak			

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX B - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

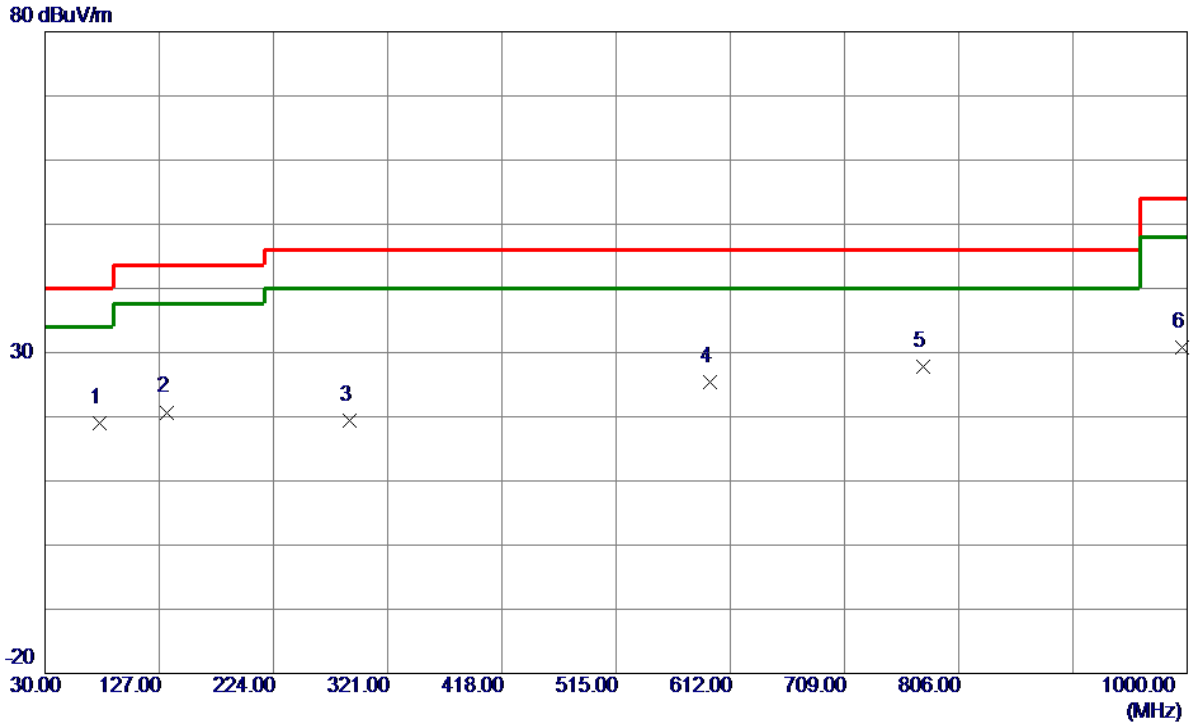
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	30.0000	49.02	-17.52	31.50	40.00	-8.50	Peak	
2 *	72.1950	52.23	-18.69	33.54	40.00	-6.46	Peak	
3	227.3950	39.26	-17.42	21.84	46.00	-24.16	Peak	
4	438.8550	32.54	-11.23	21.31	46.00	-24.69	Peak	
5	685.2350	32.80	-7.05	25.75	46.00	-20.25	Peak	
6	980.1150	33.82	-3.19	30.63	54.00	-23.37	Peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Horizontal

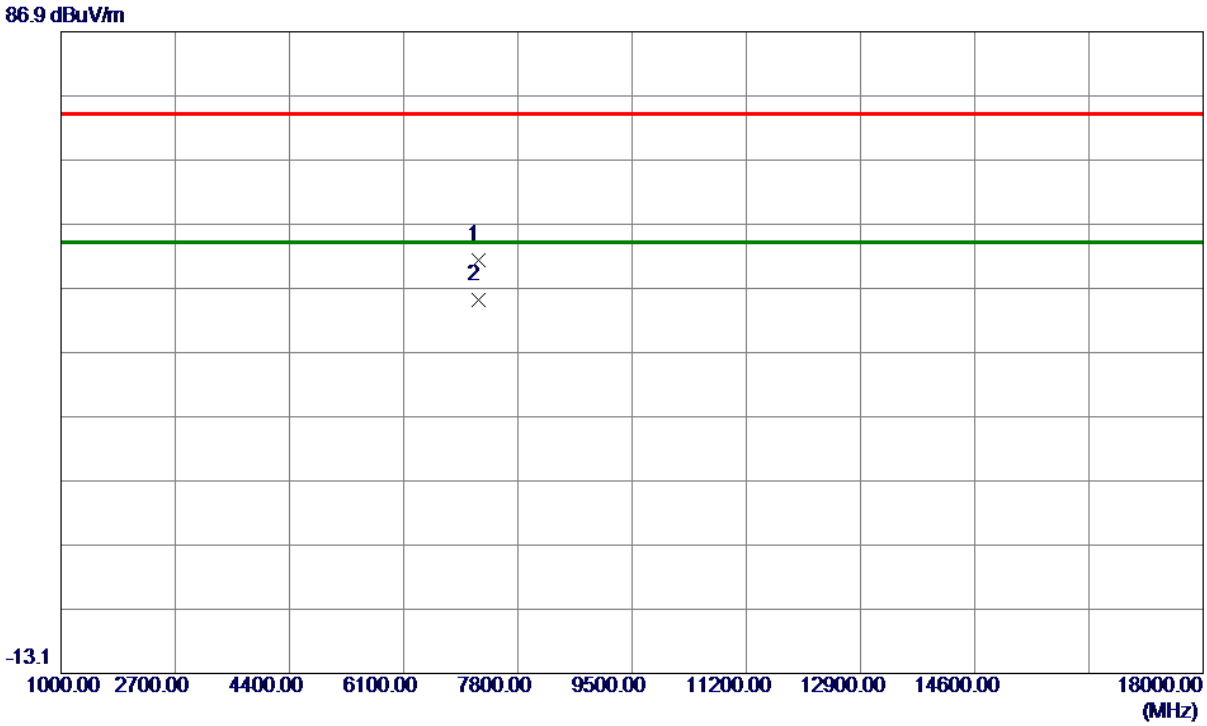


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	76.0750	38.70	-19.66	19.04	40.00	-20.96	Peak	
2	133.7899	37.30	-16.60	20.70	43.50	-22.80	Peak	
3	288.5050	34.03	-14.64	19.39	46.00	-26.61	Peak	
4	594.5400	32.93	-7.57	25.36	46.00	-20.64	Peak	
5 *	775.4450	33.25	-5.44	27.81	46.00	-18.19	Peak	
6	995.6350	33.83	-3.06	30.77	54.00	-23.23	Peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX C - RADIATED EMISSION - ABOVE 1000 MHZ

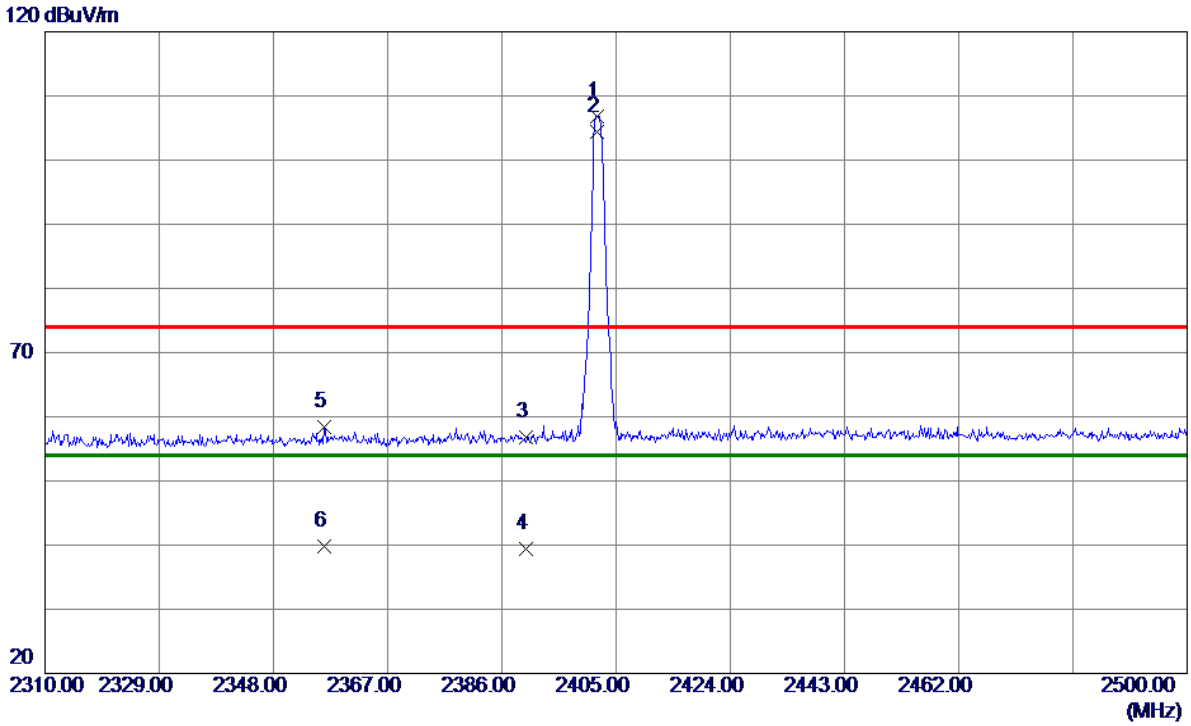
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7205.0000	63.21	-11.99	51.22	74.00	-22.78	Peak	
2 *	7205.0000	57.16	-11.99	45.17	54.00	-8.83	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

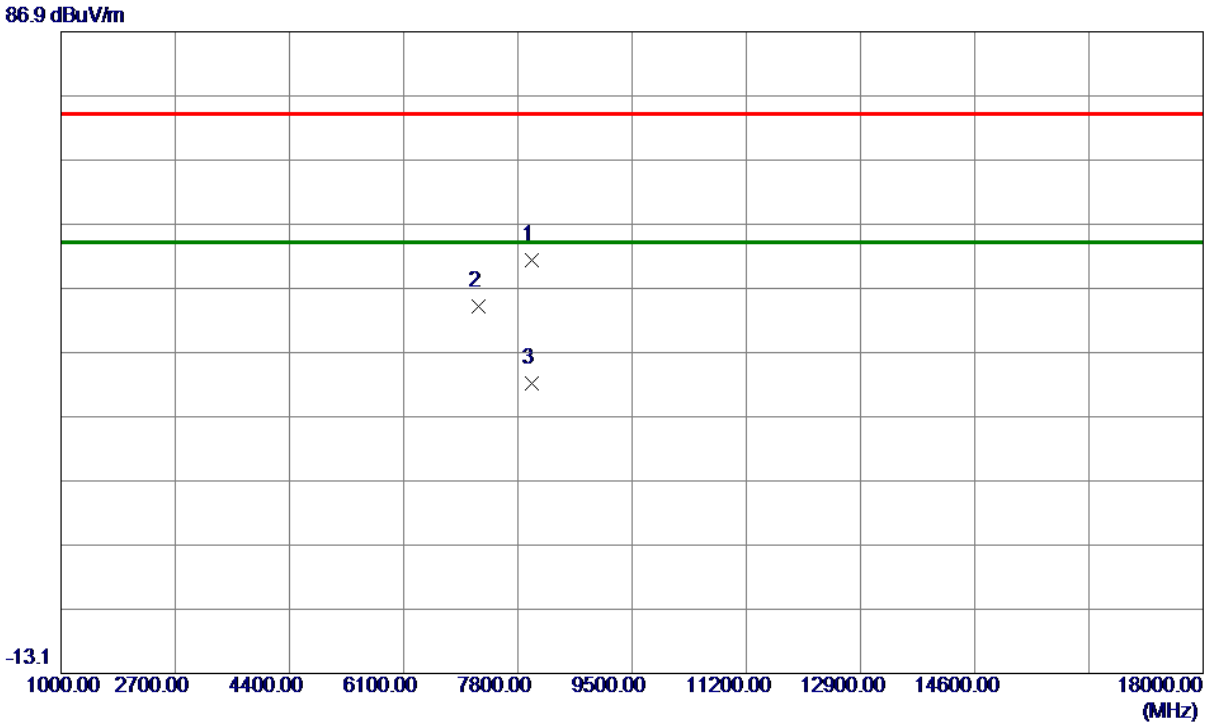
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2401.7700	75.20	31.63	106.83	74.00	32.83	Peak	
2 *	2401.7700	72.84	31.63	104.47	54.00	50.47	AVG	
3	2390.0000	25.29	31.59	56.88	74.00	-17.12	Peak	
4	2390.0000	7.90	31.59	39.49	54.00	-14.51	AVG	
5	2356.4550	26.85	31.46	58.31	74.00	-15.69	Peak	
6	2356.4550	8.43	31.46	39.89	54.00	-14.11	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

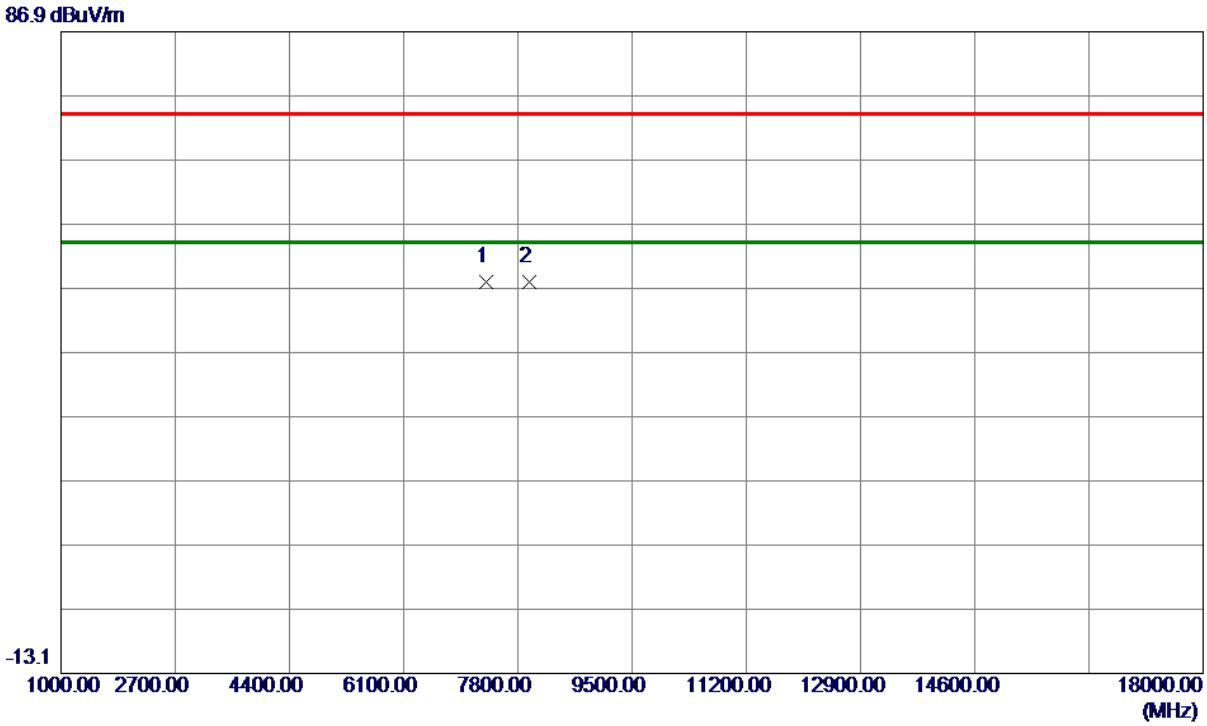
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	8000.6000	61.96	-10.68	51.28	74.00	-22.72	Peak	
2	7206.7000	55.99	-11.98	44.01	74.00	-29.99	Peak	
3 *	8000.6000	42.85	-10.68	32.17	54.00	-21.83	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

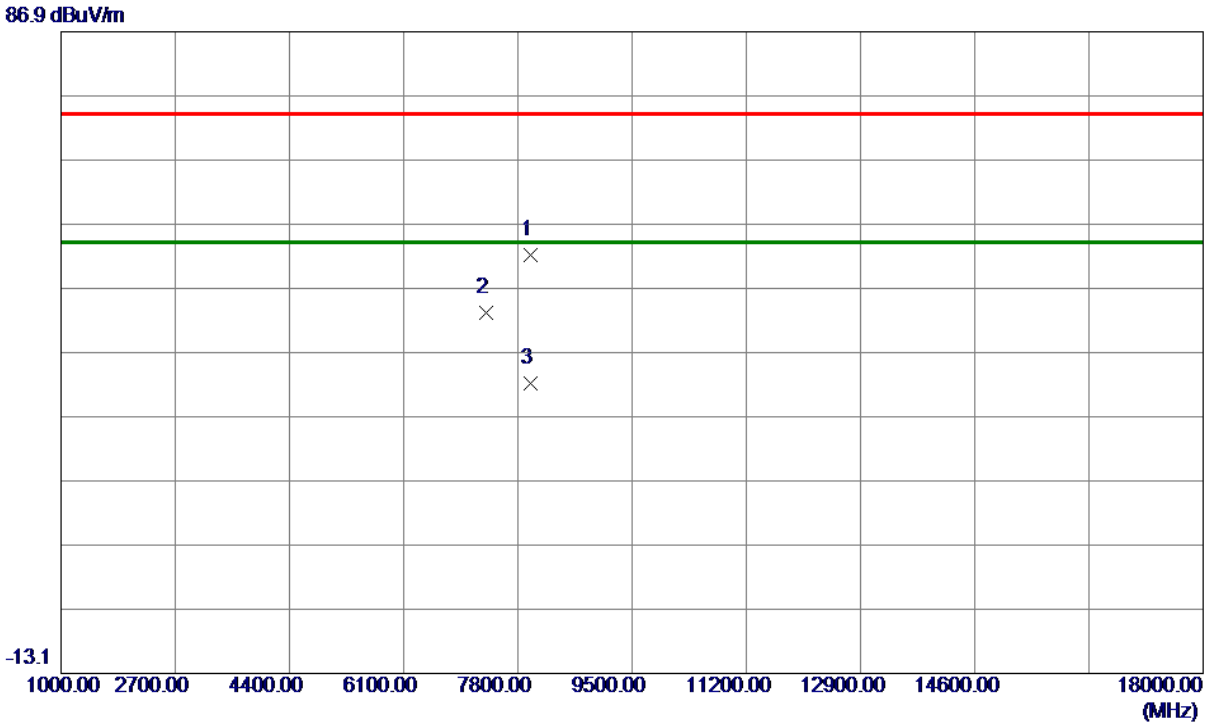
Test Mode	TX 2440 MHz _CH19_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7320.6000	59.68	-11.76	47.92	74.00	-26.08	Peak	
2	7965.7500	58.58	-10.73	47.85	74.00	-26.15	Peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

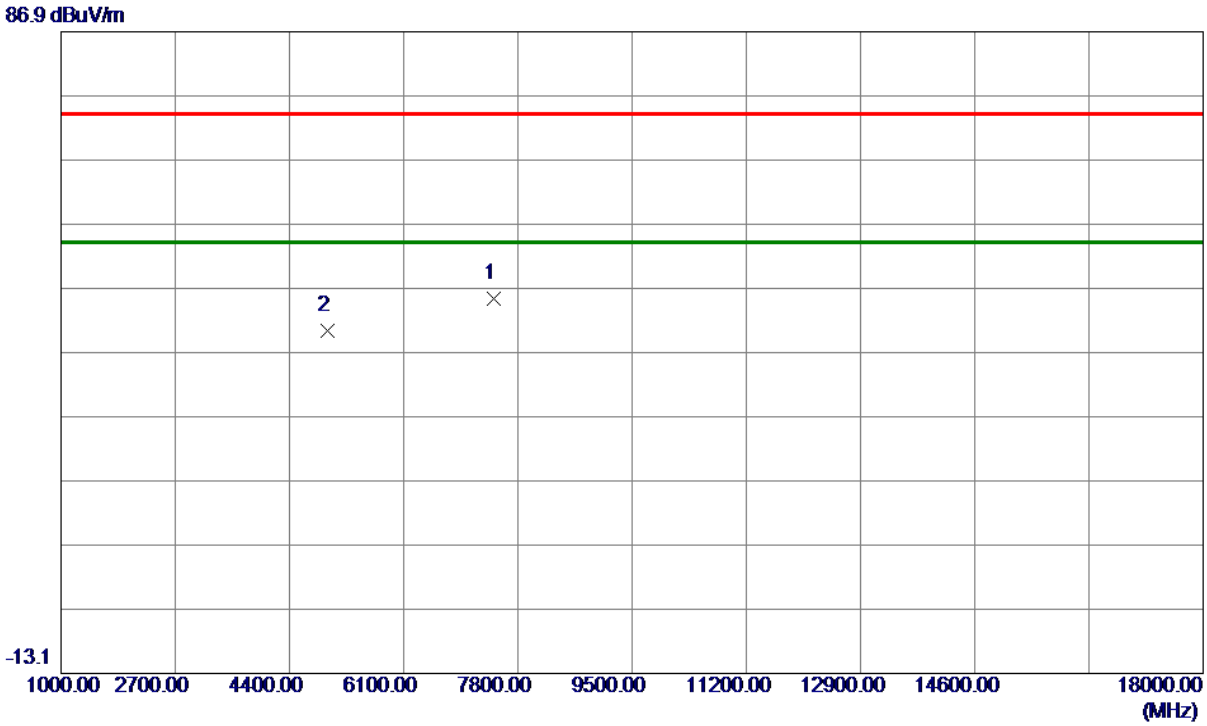
Test Mode	TX 2440 MHz _CH19_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7997.2000	62.75	-10.68	52.07	74.00	-21.93	Peak	
2	7320.6000	54.78	-11.76	43.02	74.00	-30.98	Peak	
3 *	7997.2000	42.84	-10.68	32.16	54.00	-21.84	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

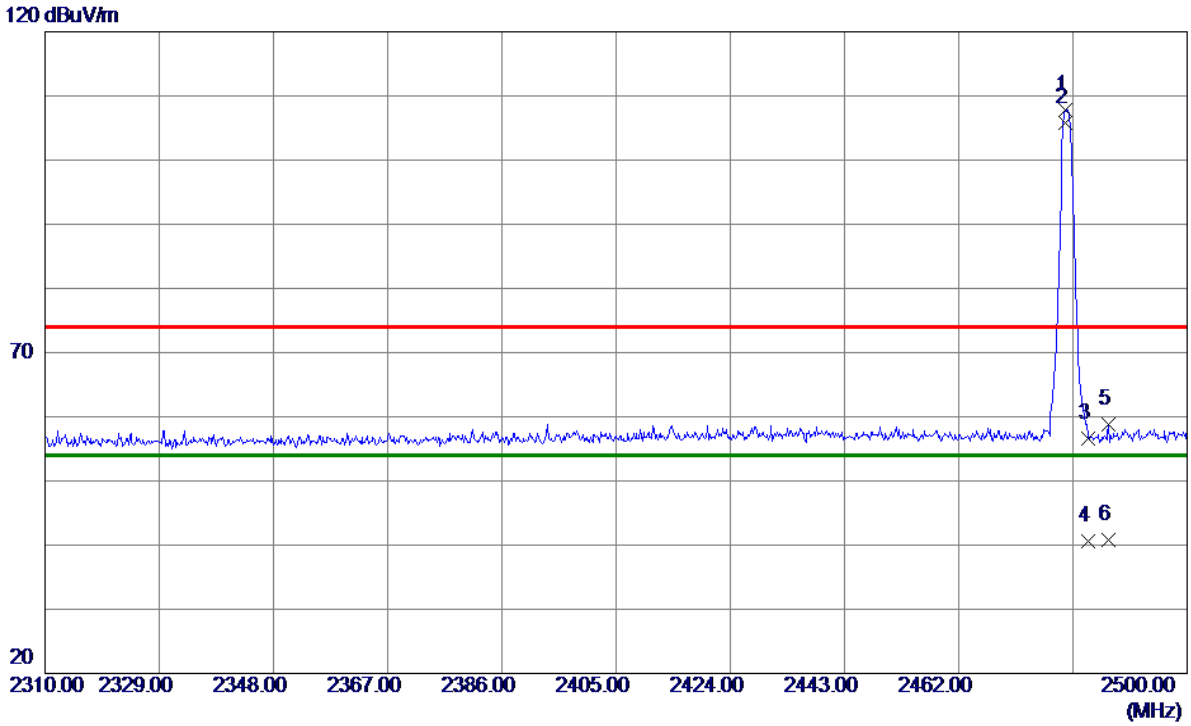
Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7439.6000	56.88	-11.52	45.36	74.00	-28.64	Peak	
2	4960.1500	55.54	-15.20	40.34	74.00	-33.66	Peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

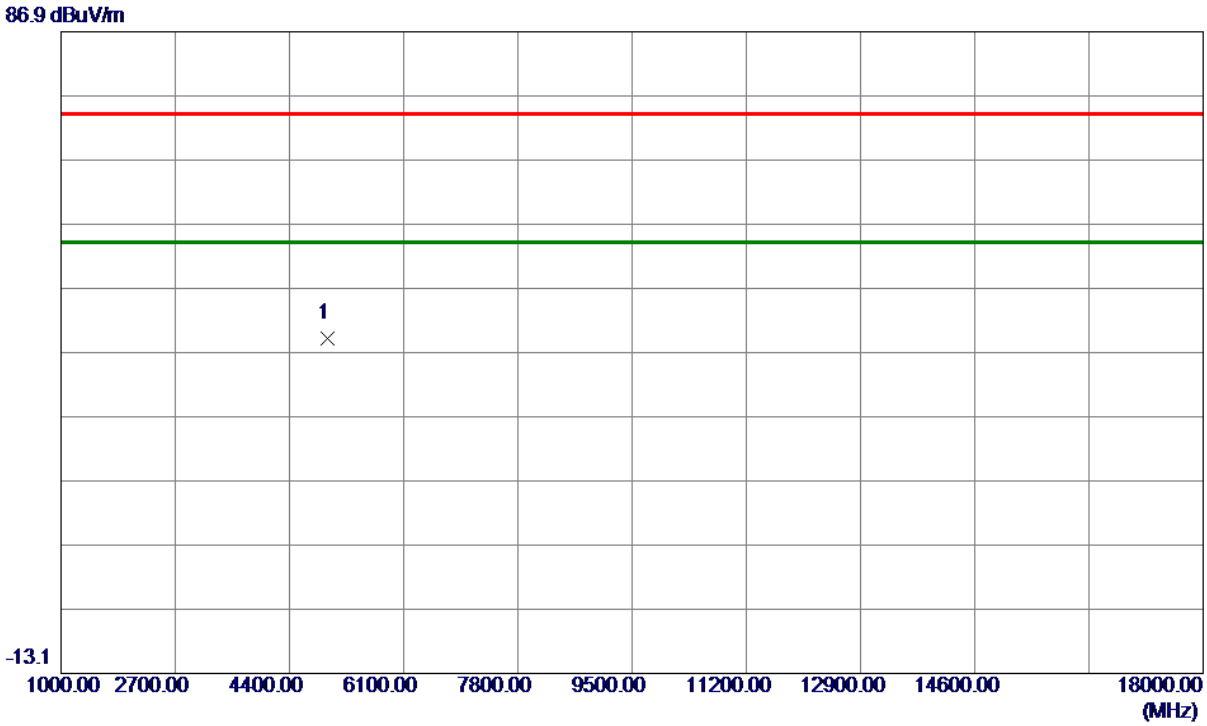
Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479.7649	75.88	31.93	107.81	74.00	33.81	Peak	
2 *	2479.7649	73.80	31.93	105.73	54.00	51.73	AVG	
3	2483.5000	24.68	31.95	56.63	74.00	-17.37	Peak	
4	2483.5000	8.69	31.95	40.64	54.00	-13.36	AVG	
5	2486.8899	26.82	31.96	58.78	74.00	-15.22	Peak	
6	2486.8899	8.82	31.96	40.78	54.00	-13.22	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

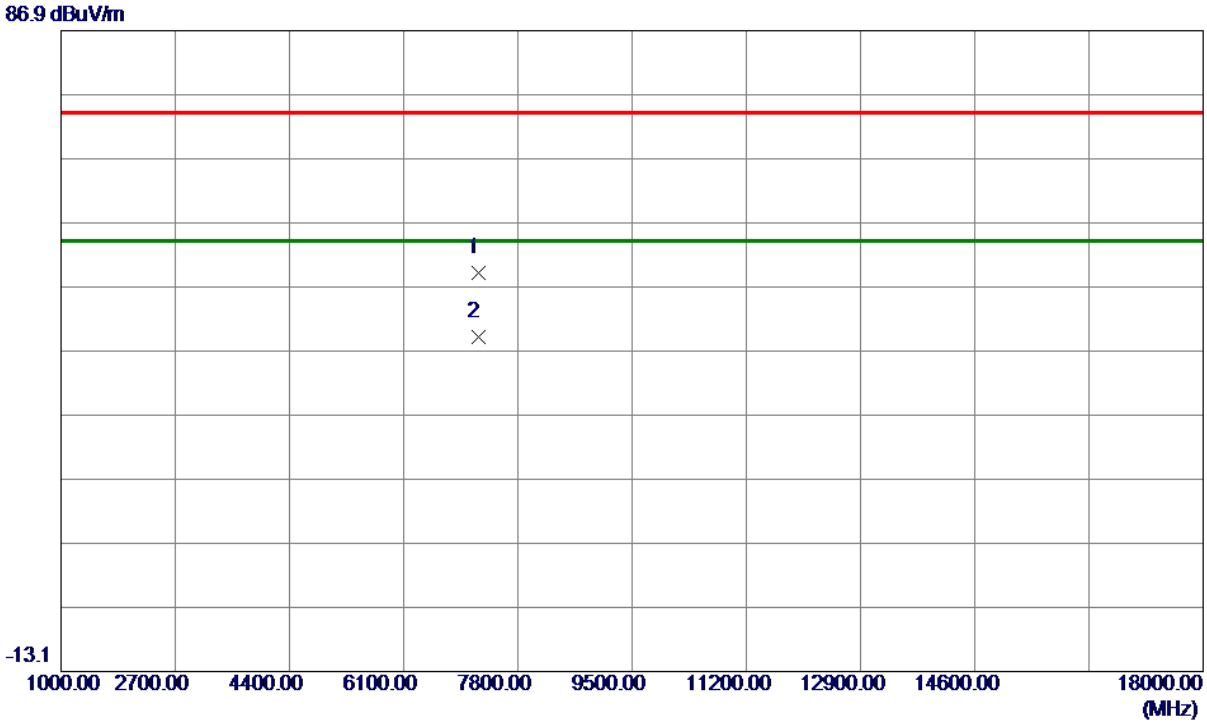
Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4960.0000	54.37	-15.20	39.17	74.00	-34.83	Peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

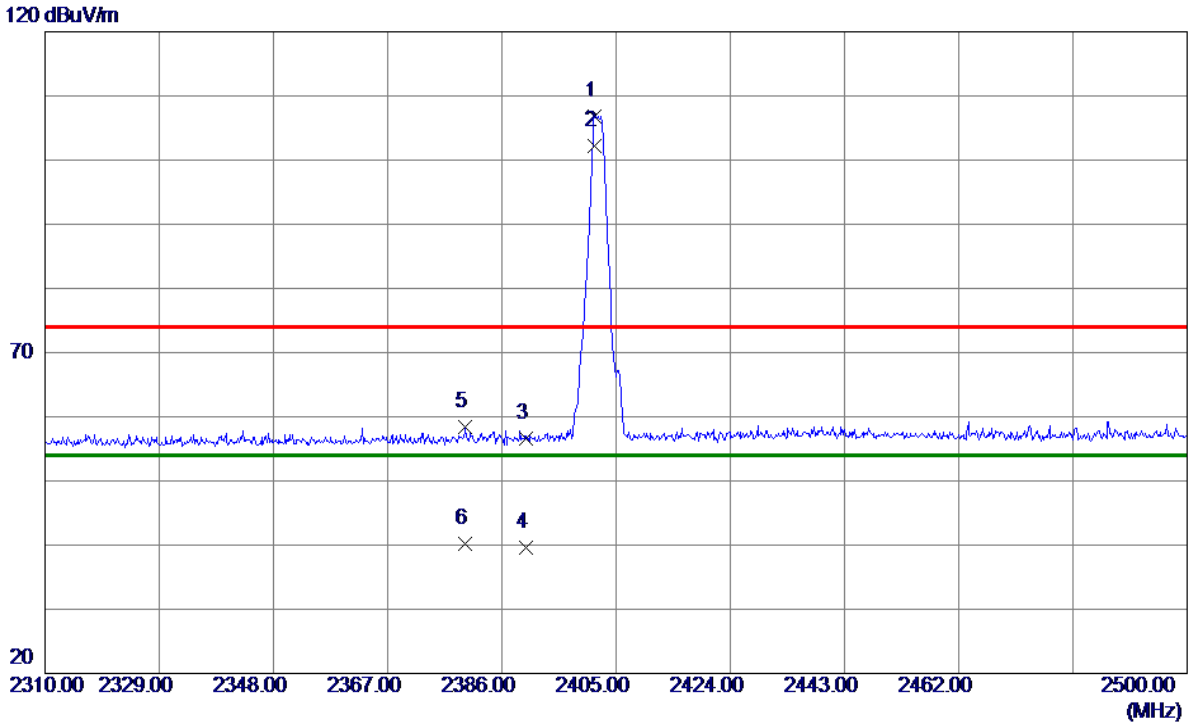
Test Mode	TX 2402 MHz _CH00_2Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7205.0000	61.02	-11.99	49.03	74.00	-24.97	Peak	
2 *	7205.0000	51.18	-11.99	39.19	54.00	-14.81	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

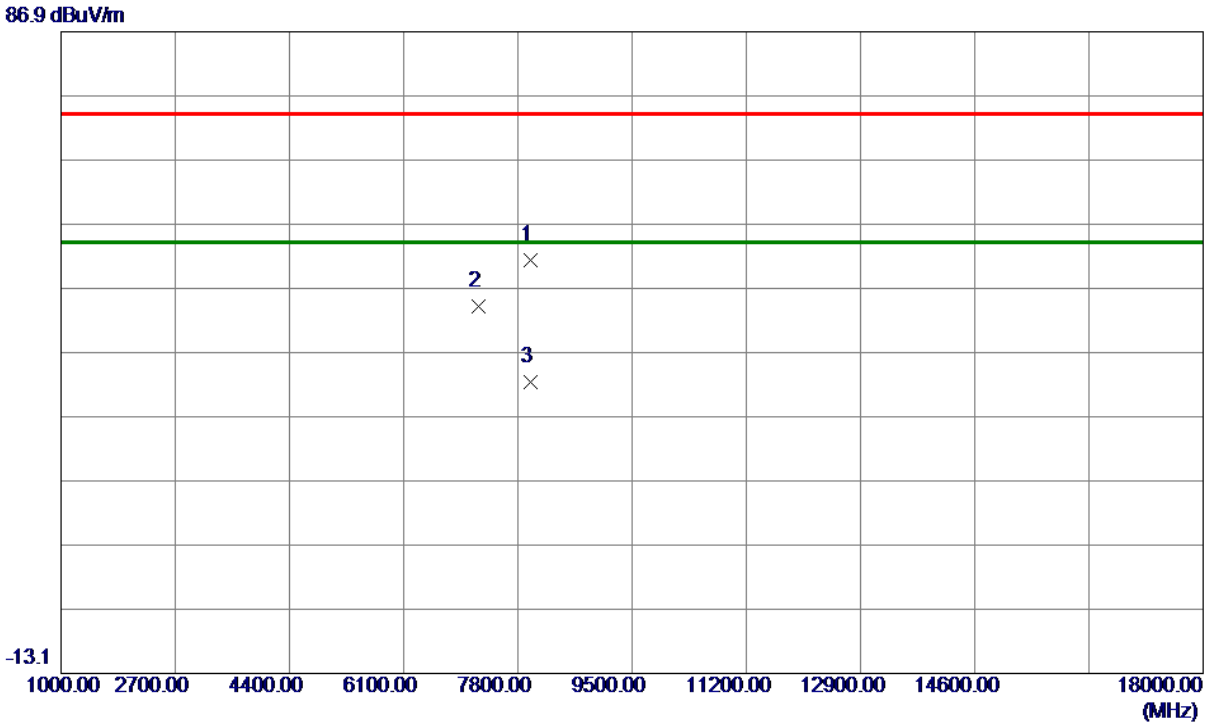
Test Mode	TX 2402 MHz _CH00_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2401.4850	75.17	31.63	106.80	74.00	32.80	Peak	
2 *	2401.4850	70.64	31.63	102.27	54.00	48.27	AVG	
3	2390.0000	24.95	31.59	56.54	74.00	-17.46	Peak	
4	2390.0000	7.93	31.59	39.52	54.00	-14.48	AVG	
5	2379.9200	26.93	31.55	58.48	74.00	-15.52	Peak	
6	2379.9200	8.60	31.55	40.16	54.00	-13.84	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

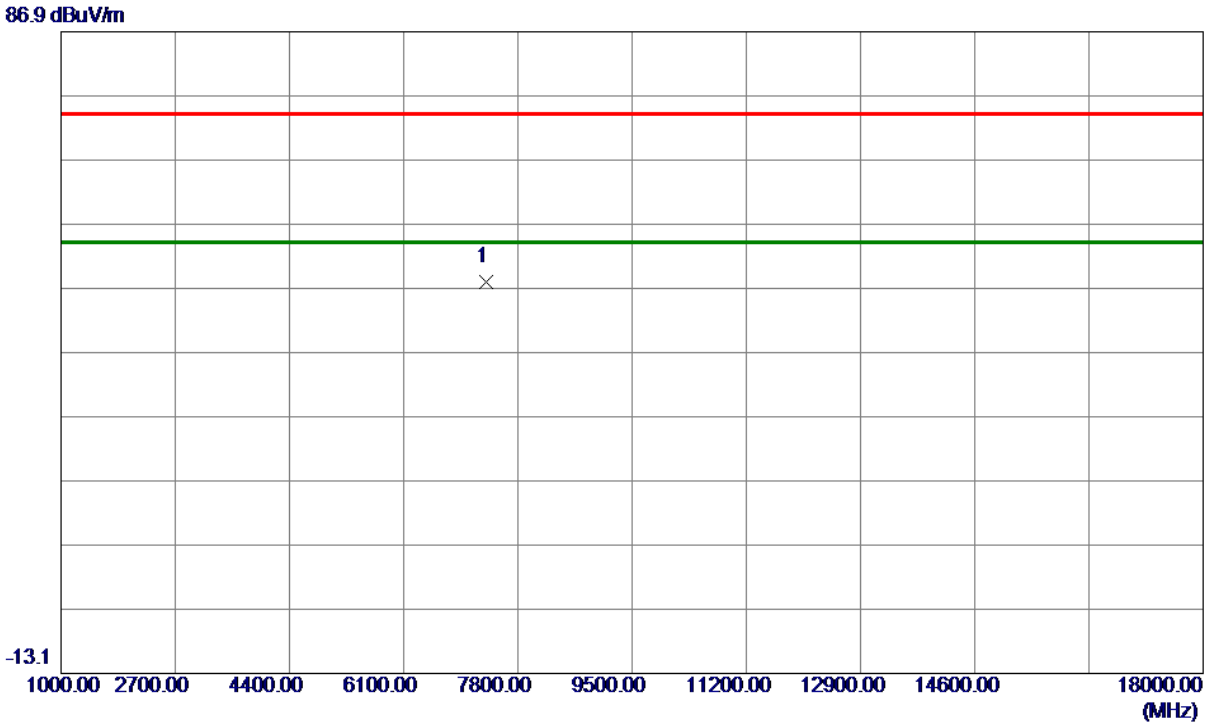
Test Mode	TX 2402 MHz _CH00_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7994.6500	61.94	-10.69	51.25	74.00	-22.75	Peak	
2	7208.4000	56.07	-11.98	44.09	74.00	-29.91	Peak	
3 *	7994.6500	42.96	-10.69	32.27	54.00	-21.73	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

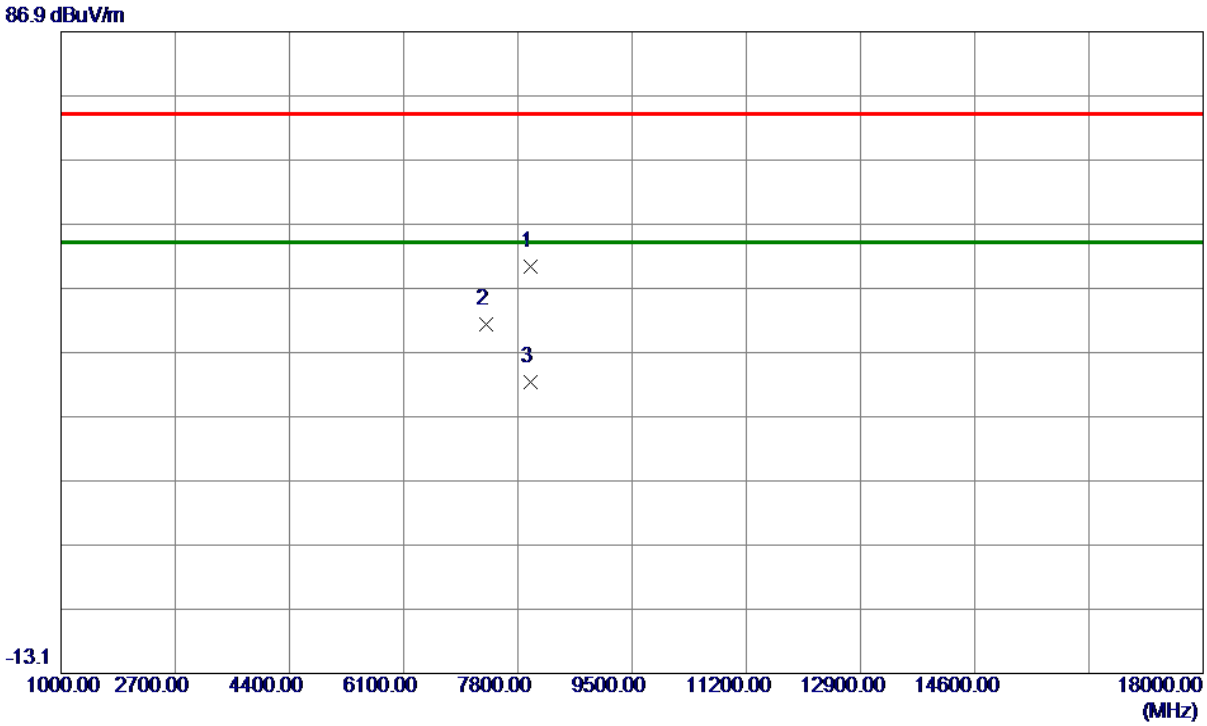
Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7321.4500	59.70	-11.76	47.94	74.00	-26.06	Peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

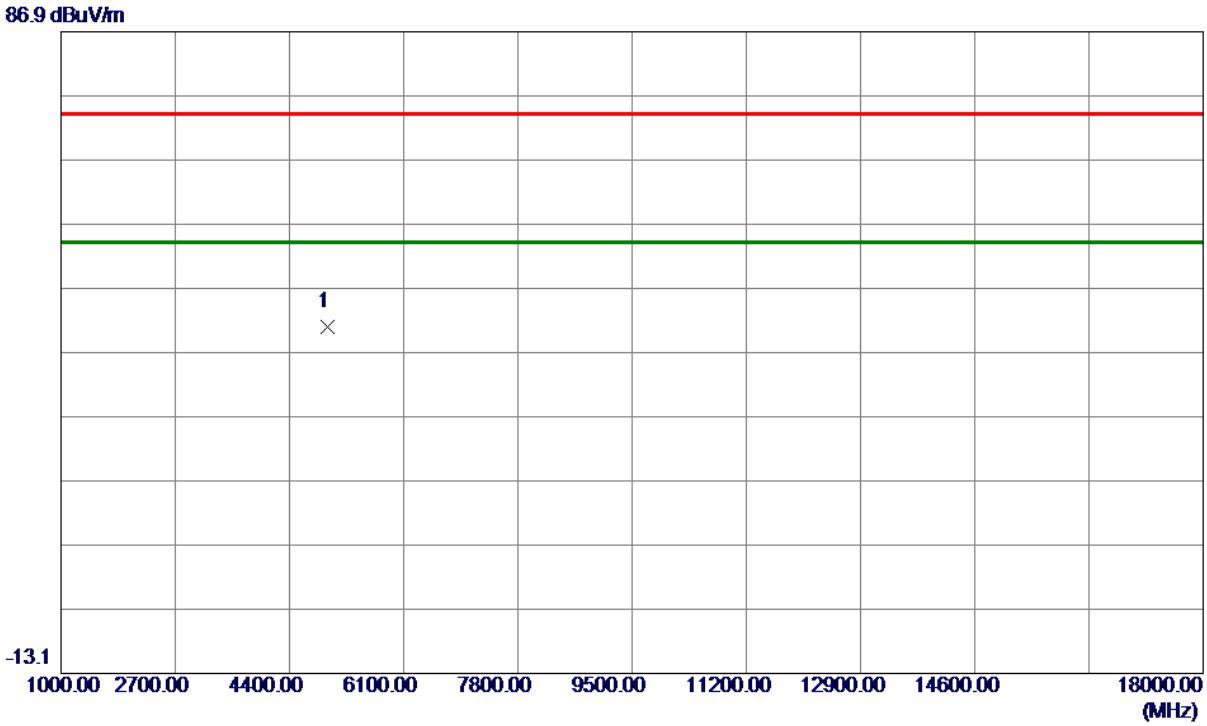
Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7988.7000	60.95	-10.70	50.25	74.00	-23.75	Peak	
2	7320.0000	53.05	-11.76	41.29	74.00	-32.71	Peak	
3 *	7988.7000	42.92	-10.70	32.22	54.00	-21.78	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

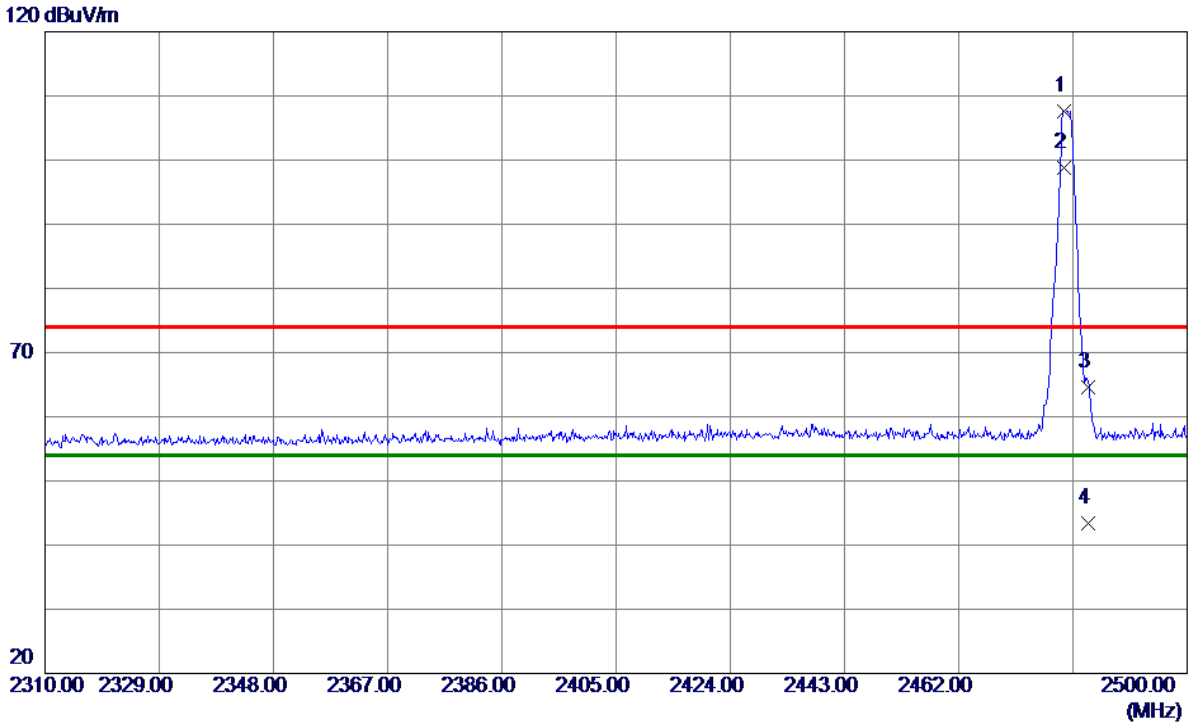
Test Mode	TX 2480 MHz _CH39_2Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4960.1500	56.01	-15.20	40.81	74.00	-33.19	Peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

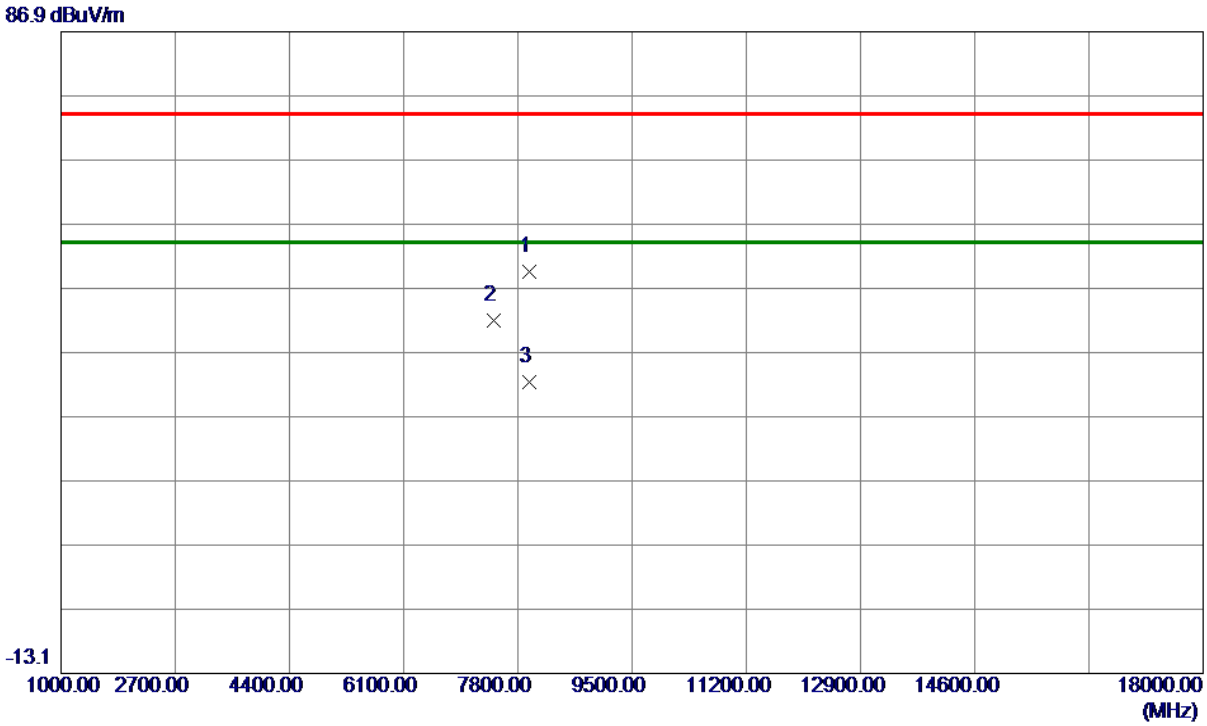
Test Mode	TX 2480 MHz _CH39_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479.4800	75.73	31.93	107.66	74.00	33.66	Peak	
2 *	2479.4800	66.79	31.93	98.72	54.00	44.72	AVG	
3	2483.5000	32.61	31.95	64.56	74.00	-9.44	Peak	
4	2483.5000	11.50	31.95	43.45	54.00	-10.55	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 2480 MHz _CH39_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7971.7000	60.23	-10.72	49.51	74.00	-24.49	Peak	
2	7440.0000	53.51	-11.52	41.99	74.00	-32.01	Peak	
3 *	7971.7000	43.07	-10.72	32.35	54.00	-21.65	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

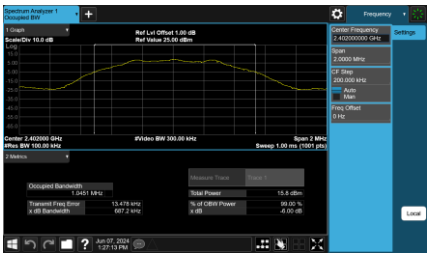
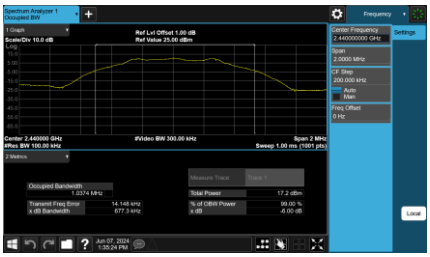
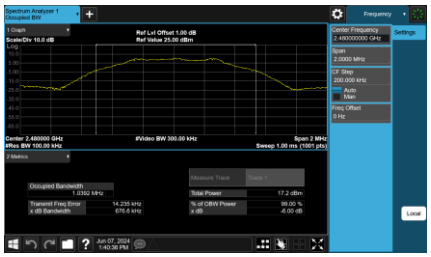
APPENDIX D - BANDWIDTH

Test Mode	TX Mode _1Mbps

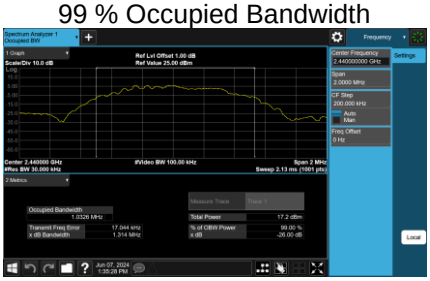
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	0.687	1.039	0.5	Pass
19	2440	0.677	1.033	0.5	Pass
39	2480	0.677	1.031	0.5	Pass

CH00 **CH19** **CH39**

6 dB Bandwidth

99 % Occupied Bandwidth

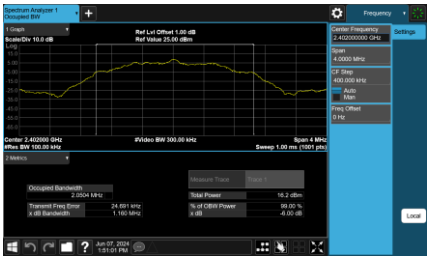
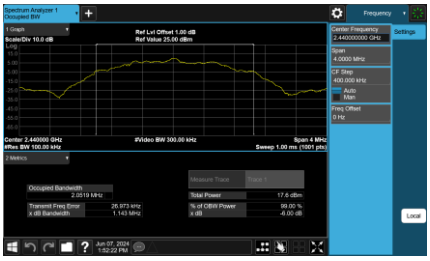
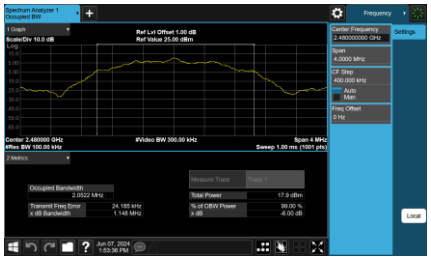


Test Mode	TX Mode _2Mbps

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	1.160	2.042	0.5	Pass
19	2440	1.143	2.042	0.5	Pass
39	2480	1.148	2.044	0.5	Pass

CH00 **CH19** **CH39**

6 dB Bandwidth

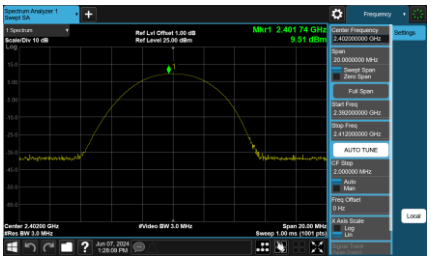
99 % Occupied Bandwidth

APPENDIX E - MAXIMUM OUTPUT POWER

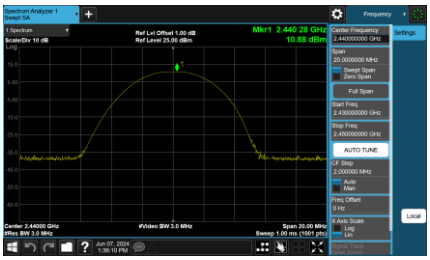
Test Mode	TX Mode _1Mbps

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	9.51	0.0089	30.00	1.0000	Pass
2440	10.88	0.0122	30.00	1.0000	Pass
2480	11.34	0.0136	30.00	1.0000	Pass

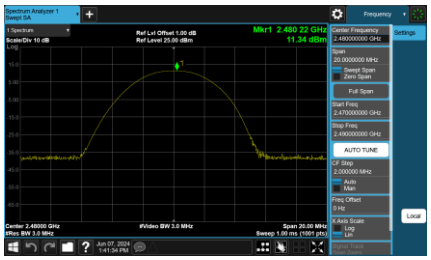
CH00



CH19



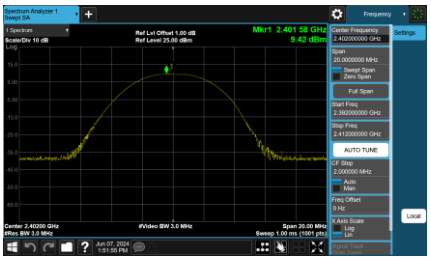
CH39



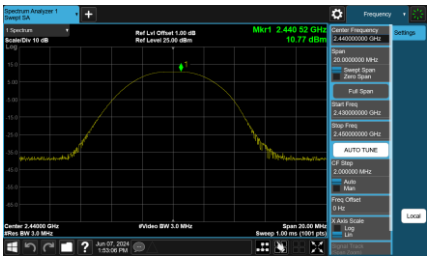
Test Mode	TX Mode _2Mbps

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	9.42	0.0087	30.00	1.0000	Pass
2440	10.77	0.0119	30.00	1.0000	Pass
2480	11.19	0.0132	30.00	1.0000	Pass

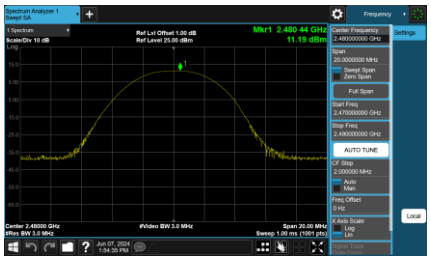
CH00



CH19



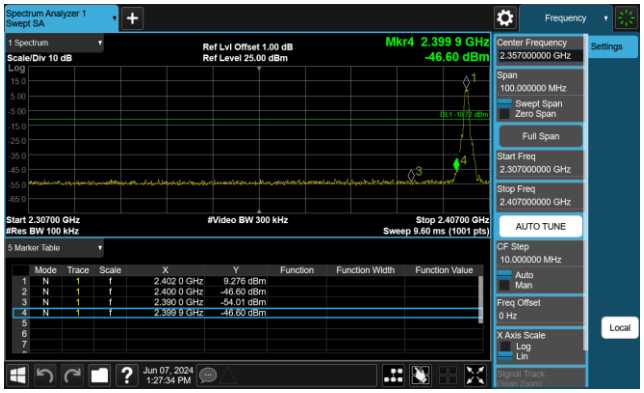
CH39



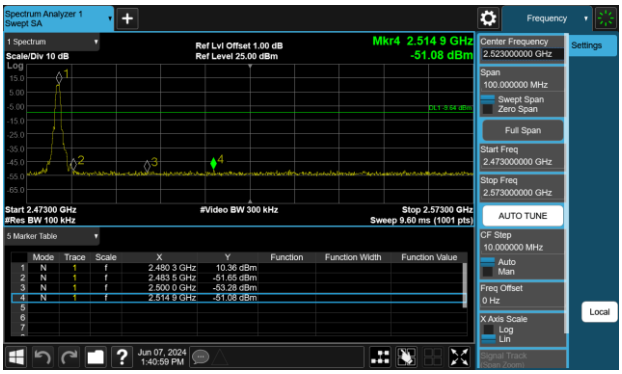
APPENDIX F - CONDUCTED SPURIOUS EMISSION

Test Mode	TX Mode _1Mbps

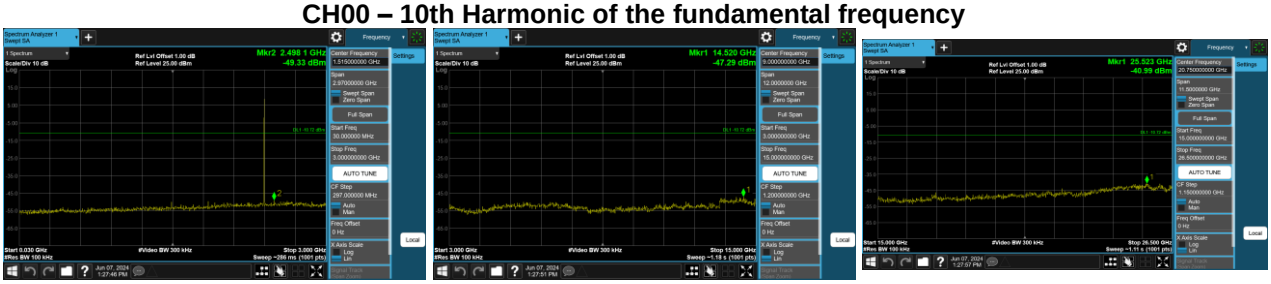
Bandedge CH00 (Lower)



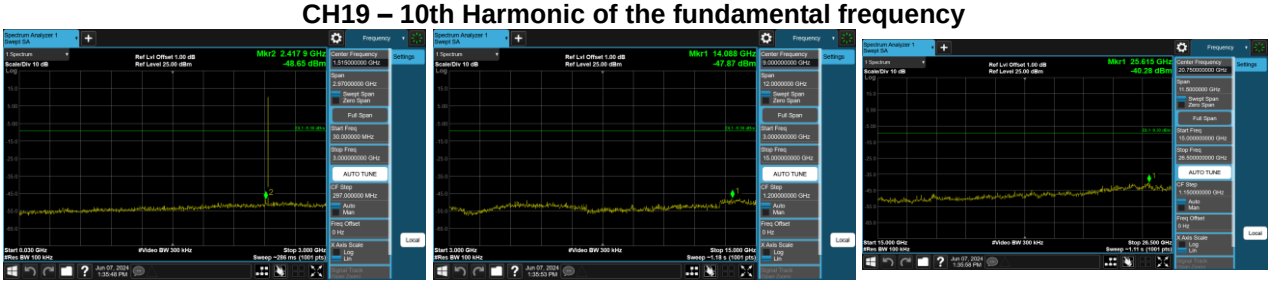
Bandedge CH39 (Upper)



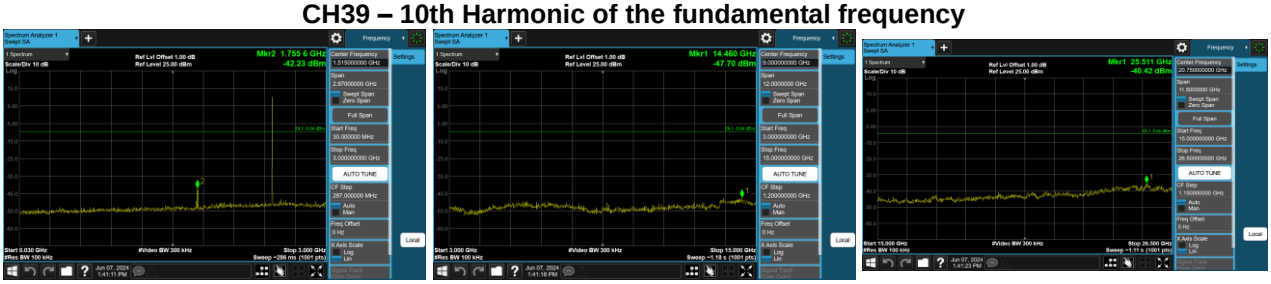
CH00 – 10th Harmonic of the fundamental frequency



CH19 – 10th Harmonic of the fundamental frequency

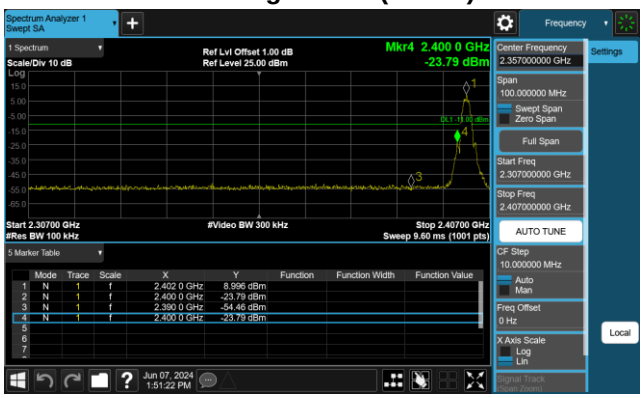


CH39 – 10th Harmonic of the fundamental frequency

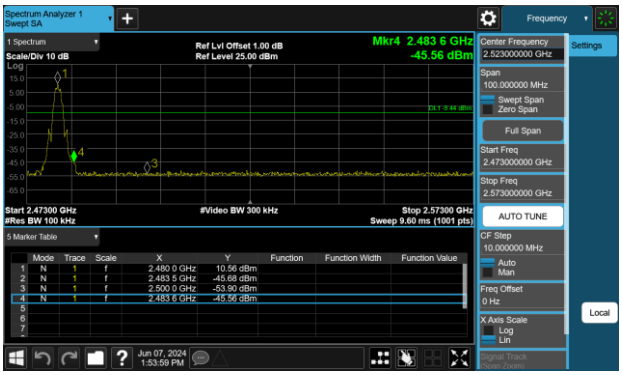


Test Mode	TX Mode _2Mbps

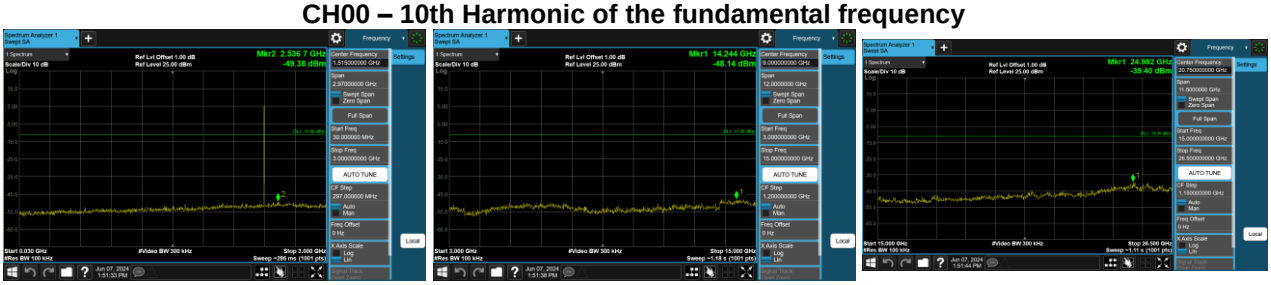
Bandedge CH00 (Lower)



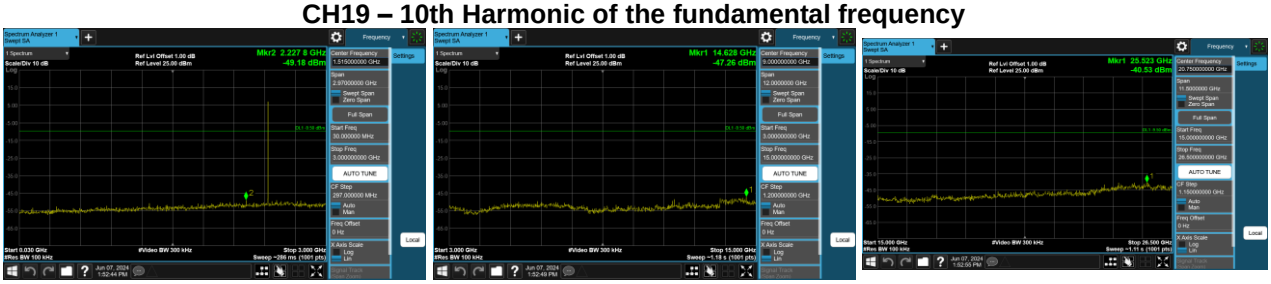
Bandedge CH39 (Upper)



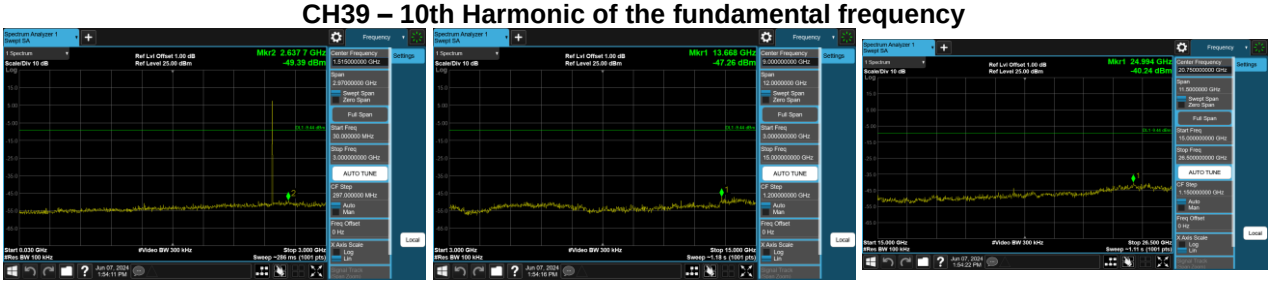
CH00 – 10th Harmonic of the fundamental frequency



CH19 – 10th Harmonic of the fundamental frequency



CH39 – 10th Harmonic of the fundamental frequency

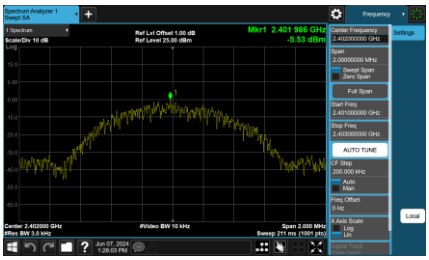


APPENDIX G - POWER SPECTRAL DENSITY

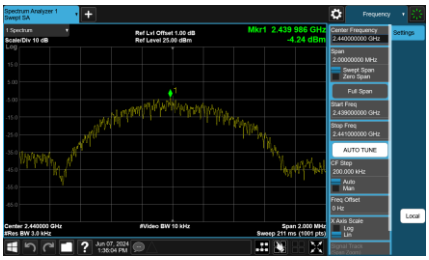
Test Mode	TX Mode _1Mbps

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-5.53	8.00	Pass
19	2440	-4.24	8.00	Pass
39	2480	-4.08	8.00	Pass

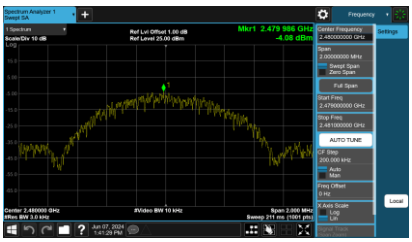
CH00



CH19



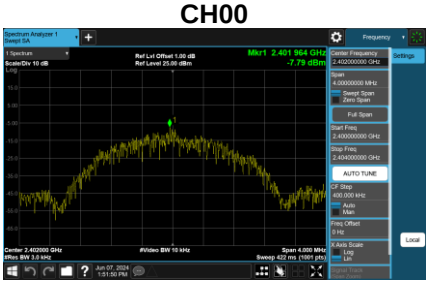
CH39



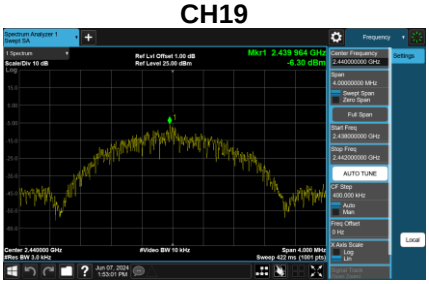
Test Mode	TX Mode _2Mbps

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-7.79	8.00	Pass
19	2440	-6.30	8.00	Pass
39	2480	-6.07	8.00	Pass

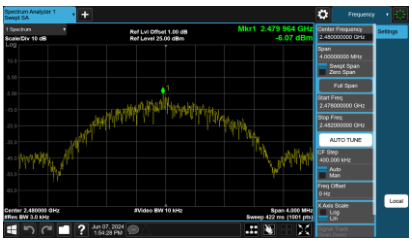
CH00



CH19



CH39



End of Test Report