ACCREDITED
Certificate #7130.01

FCC Radio Test Report

FCC ID: 2BKXC419-YD02

This report concerns: Original Grant

Project No.	:	2407C122
Equipment	:	Remote
Brand Name	:	gats
Test Model	:	419-YD02
Series Model	:	419-YD04
Applicant	:	ChongQing GATS Technology Co.,Ltd.
Address	:	1 Block, No.21, Fengsheng Road, Jinfeng Town, High-Tech District, Chongqing, China
Manufacturer	:	ChongQing GATS Technology Co.,Ltd.
Address	:	1 Block, No.21, Fengsheng Road, Jinfeng Town, High-Tech District, Chongqing, China
Factory	:	SHENZHEN QUALSENSE TECHNOLOGIES CO.,LTD
Address	:	Rm 201, Building A, YuYi Smart Innovation Park, No.9 of TongFu Rd, FuHai Street, FuYong Town, BaoAn District, ShenZhen. China
Date of Receipt	:	Aug. 01, 2024
Date of Test	:	Aug. 01, 2024 ~ Aug. 20, 2024
Issued Date	:	Nov. 15, 2024
Report Version	:	R01
Test Sample	:	Engineering Sample No.: DG2024080120 for radiated, DG2024080121 for conducted
Standard(s)	:	FCC CFR Title 47, Part 15, Subpart C

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

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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.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-1-2407C122	R00	Original Report.	Nov. 07, 2024	Invalid
BTL-FCCP-1-2407C122	R01	Updated the antenna gain which does not affect the test results.	Nov. 15, 2024	Valid

1. APPLICABLE STANDARDS

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:
ANSI C63.10-2013
The following reference test guidance is not within the scope of accreditation of A2LA:
KDB 558074 D01 15.247 Meas Guidance v05r02

2. 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.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report :
DG-CB01/DG-CB03/TR13: 1-2/F, 4/F, Building A, 1-2/F, Building B, 3/F, Building C, No.3, Jinshagang 1st Road, Dalang Town, Dongguan City, Guangdong People's Republic of China.
DG-CB18: Room 108-116, 309-310, Building 2, No.1, Yile Road, Songshan Lake Zone, Dongguan City, Guangdong, People's Republic of China
BTL's Registration Number for FCC: 747969
BTL's Designation Number for FCC: CN1377

2.2 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 95.45% confidence level (based on a coverage factor (k=2))
The BTL measurement uncertainty as below table:

A. Radiated emissions Measurement:

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DG-CB01	CISPR	9kHz ~ 30MHz	2.70

Test Site	Method	Measurement Frequency Range	Ant. H / V	*U*,(dB)
DG-CB03 (3m)	CISPR	30MHz ~ 200MHz	V	4.40
		30MHz ~ 200MHz	H	3.62
		200MHz ~ 1,000MHz	V	4.58
		200MHz ~ 1,000MHz	H	3.98

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DG-CB18 (3m)	CISPR	1GHz ~ 6GHz	4.48
		6GHz ~ 18GHz	3.88

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DG-CB03 (1m)	CISPR	18 ~ 26.5 GHz	3.36
		26.5 ~ 40 GHz	3.58

B. Other Measurement:

Test Item	Uncertainty
Bandwidth	0.90 %
Maximum Output Power	1.3 dB
Conducted Spurious Emission	1.9 dB
Power Spectral Density	1.4 dB
Temperature	0.8 °C
Humidity	2.2 %

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

2.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By	Test Date
Radiated Emissions- 9 kHz to 30 MHz	23°C	46%	DC 5V	Hayden Chen	Aug. 09, 2024
Radiated Emissions- 30 MHz to 1000 MHz	24°C	55%	DC 5V	Chen Mo	Aug. 12, 2024
Radiated Emissions- Above 1000 MHz	24-25°C	41-55%	DC 5V	Allen Tong Berton Luo	Aug. 13, 2024 Aug. 18, 2024
Bandwidth	23°C	57%	DC 5V	Parker Yang	Aug. 18, 2024
Maximum Output Power	23°C	57%	DC 5V	Parker Yang	Aug. 18, 2024
Conducted Spurious Emission	23°C	57%	DC 5V	Parker Yang	Aug. 18, 2024
Power Spectral Density	23°C	57%	DC 5V	Parker Yang	Aug. 18, 2024

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Remote
Brand Name	gats
Test Model	419-YD02
Series Model	419-YD04
Model Difference(s)	The two remote control models only have one button pattern that is different, the rest are the same.
Software Version	QS23100.FST16B.YD02.SM.240724
Hardware Version	425-LY02-016E-MBV-MS521Q32 V0.0
Power Source	DC power supply.
Power Rating	DC 2.2-3V
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	1Mbps, 2Mbps
Max. Output Power	1Mbps: 0.18 dBm (0.0010 W) 2Mbps: 0.18 dBm (0.0010 W)

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. Table for Filed Antenna:

Ant.	Manufacturer	Model Name	Antenna Type	Connector	Gain (dBi)
1	Shenzhen Qualrun Technology Co., Ltd	QS330-CAR0-BT RCU	PCB	N/A	-0.93

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	TX Mode_1Mbps Channel 00/19/39
Mode 2	TX Mode_2Mbps Channel 00/19/39
Mode 3	TX Mode_1Mbps Channel 19

Following mode(s) was (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	TX Mode_1Mbps Channel 19

Radiated emissions test - Below 1GHz	
Final Test Mode	Description
Mode 3	TX Mode_1Mbps Channel 19

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 AC power line conducted emissions and radiated emissions below 1 GHz test, the 1Mbps Channel 19 is found to be the worst case and recorded.

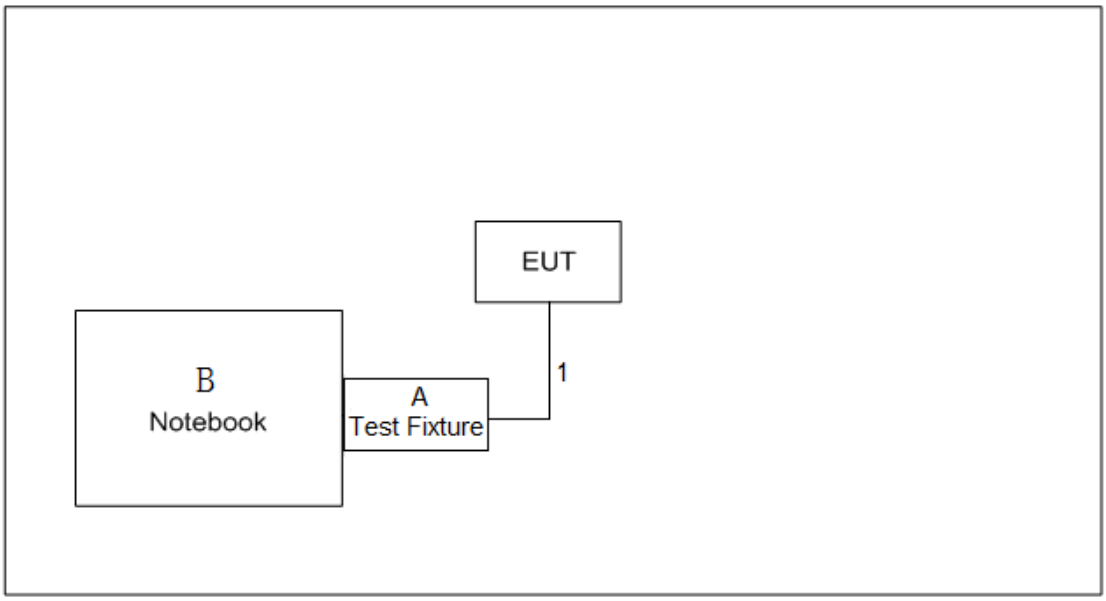
(3) For radiated emission Harmonic 18-26.5GHz test, only tested the worst case and recorded.

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.

Test Software Version	serialportutility-5.2.1		
Frequency (MHz)	2402	2440	2480
1Mbps	6	6	6
2Mbps	6	6	6

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
A	Test Fixture	N/A	N/A	N/A
B	Notebook	HUAWEI	WFH9	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	Data Cable	NO	NO	0.4m

3.6 CUSTOMER INFORMATION DESCRIPTION

1) The antenna gain is provided by the manufacturer.
2) Except for radiated spurious emissions, the results of all test items include cable losses. Part of the cable losses (1dB) are provided by the manufacturer, while the other parts of the cable losses are provided by the testing laboratory.

4. RADIATED EMISSIONS

4.1 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

Frequency (MHz)	Band edge/ Harmonic at 3m (dBμV/m)		Harmonic at 1m (dBμV/m)	
	Peak	Average	Peak	Average
Above 1000	74	54	83.5 (Note 4)	63.5 (Note 4)

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).

(4)

$$FS_{\text{limit}} = FS_{\max} - 20\log\left(\frac{d_{\text{limit}}}{d_{\text{measure}}}\right)$$

20log ($d_{limit}/d_{measure}$)=20log (3/1)=9.5 dB.

FS_{limit}: Harmonic at 3m Peak and Average limit.

FS_{max}: Harmonic at 1m Peak and Average Maximum value.

d_{limit}: Harmonic at 3m test distance.

$d_{measure}$: Harmonic Actual test distance.

4.2 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 or 1m 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 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

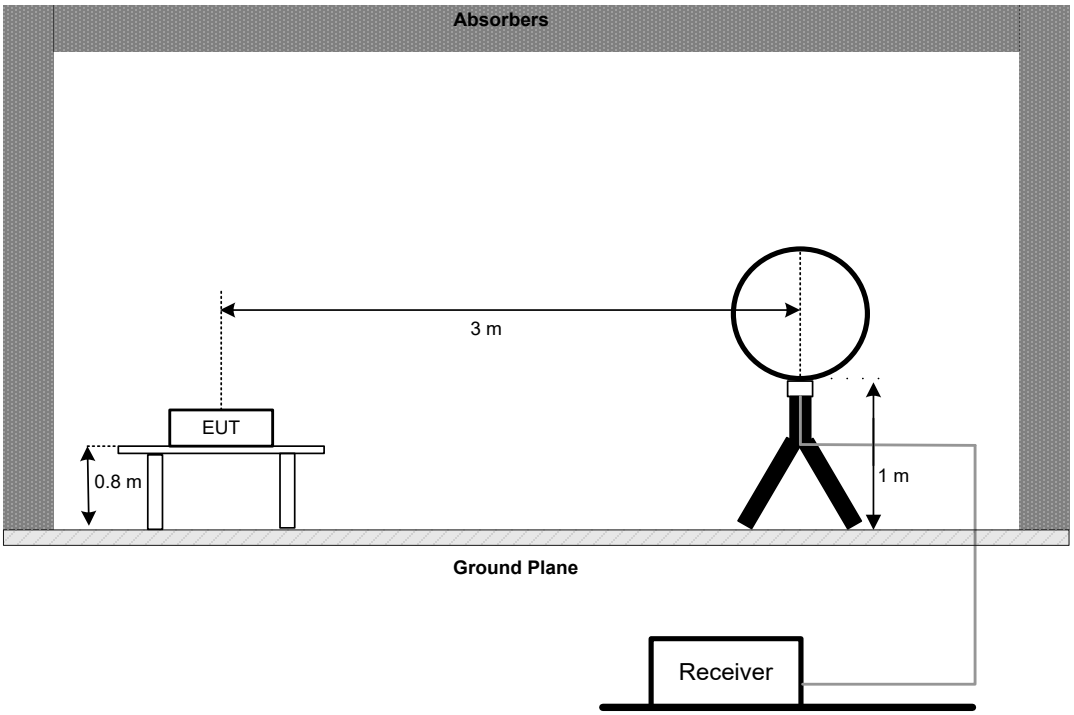
Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector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

4.3 DEVIATION FROM TEST STANDARD

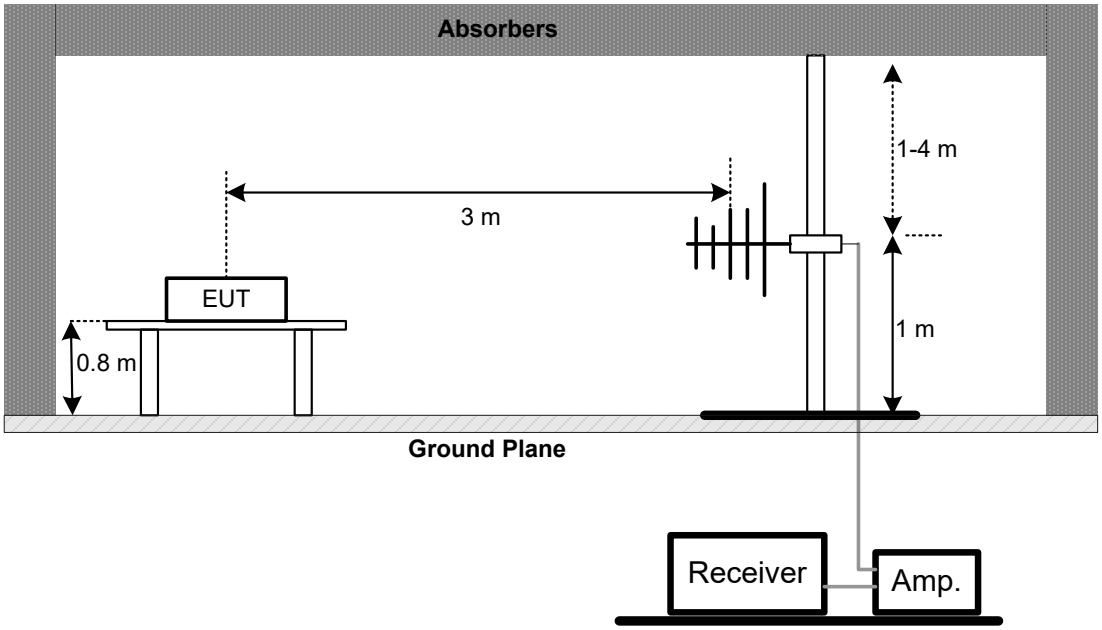
No deviation.

4.4 TEST SETUP

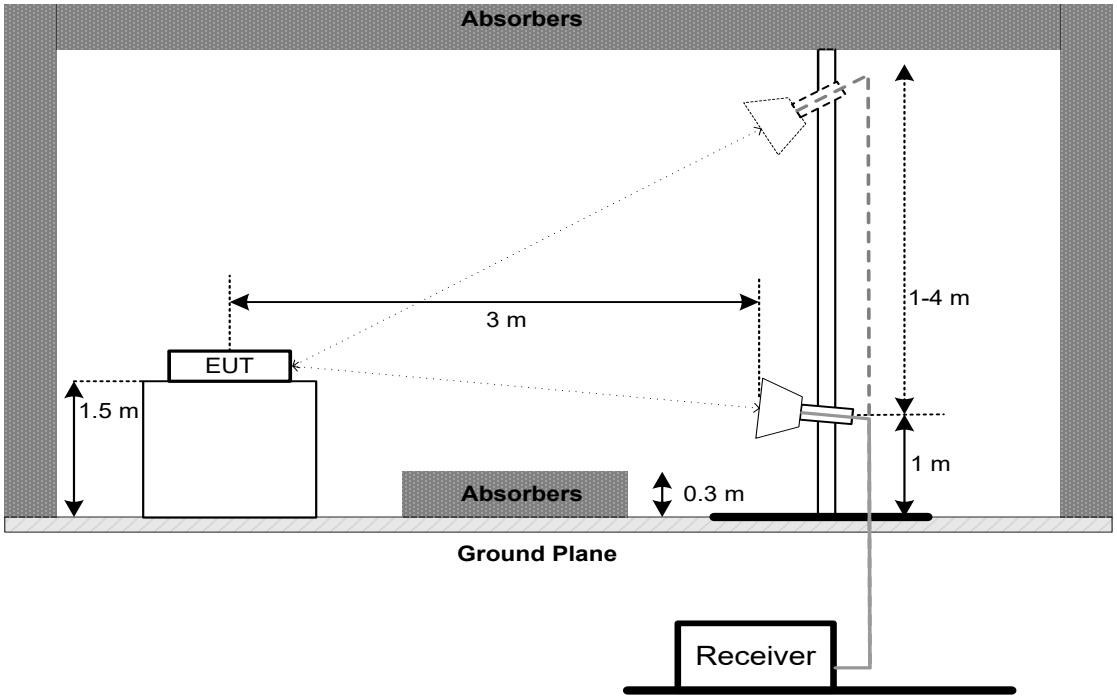
9 kHz to 30 MHz



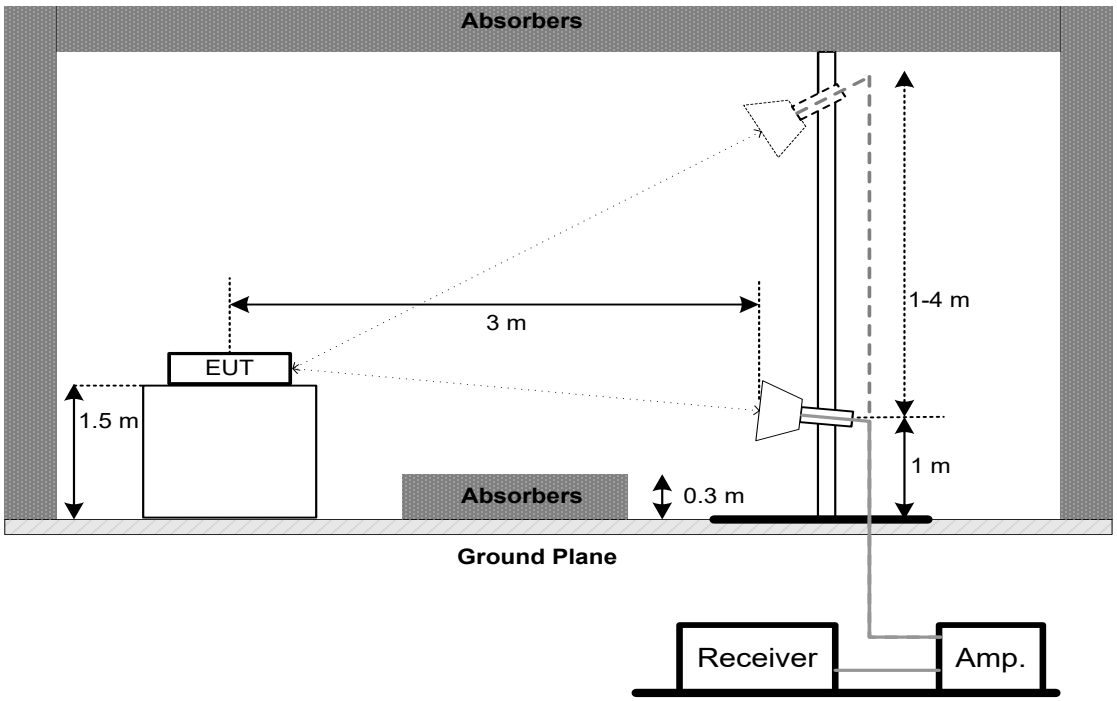
30 MHz to 1 GHz



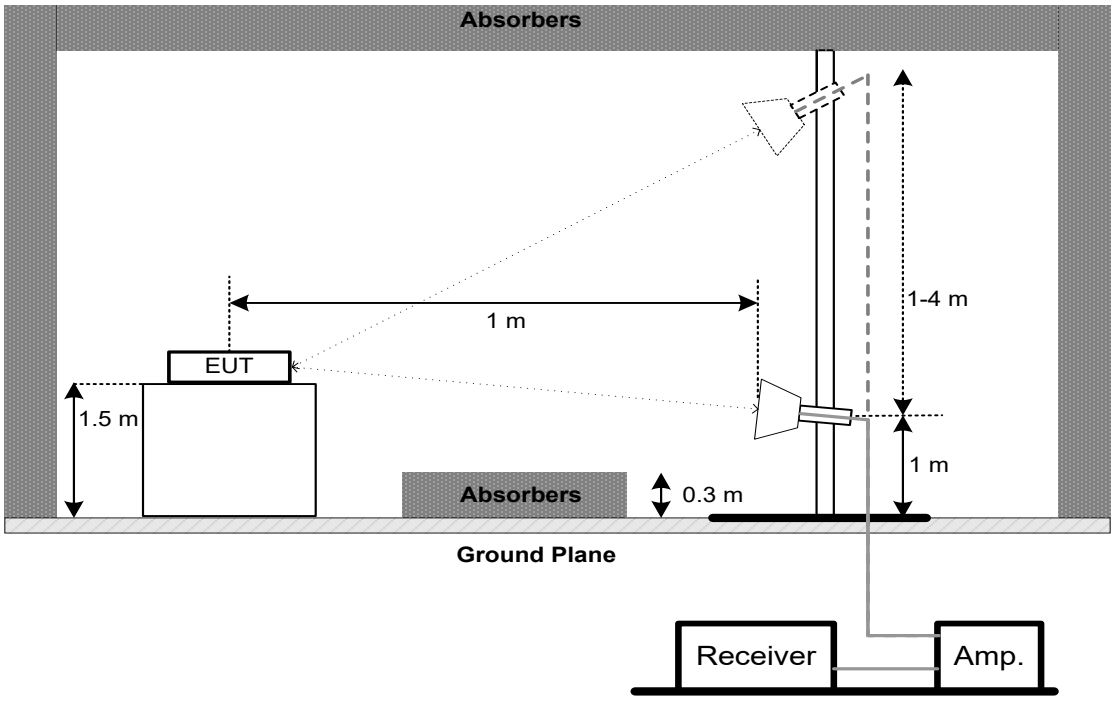
Above 1 GHz
Band edge



Harmonic(1 GHz to 18 GHz)



Harmonic(18 GHz to 26.5 GHz)



4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.6 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.

4.7 TEST RESULT - 30 MHz TO 1000 MHz

Please refer to the APPENDIX B.

4.8 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.

5. BANDWIDTH

5.1 LIMIT

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

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:

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

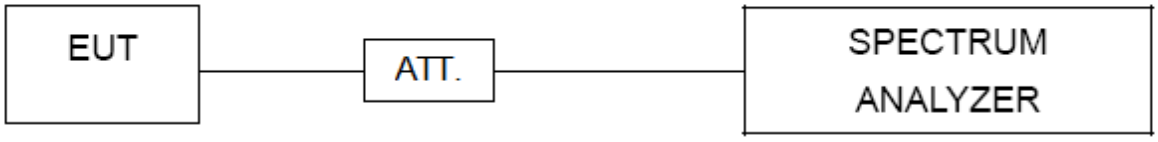
For 99% Emission Bandwidth:

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

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 D.

6. MAXIMUM OUTPUT POWER

6.1 LIMIT

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

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.

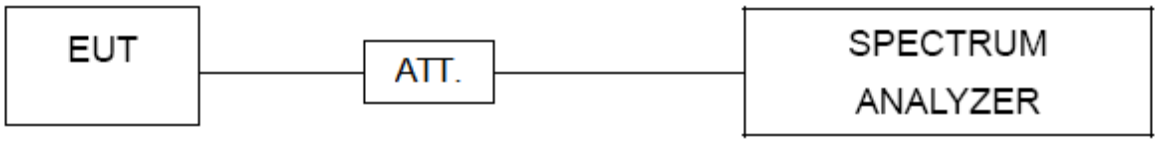
b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	⩾ 3×RBW
RBW	3 MHz
VBW	3 MHz
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 E.

7. CONDUCTED SPURIOUS EMISSION

7.1 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.

7.2 TEST PROCEDURE

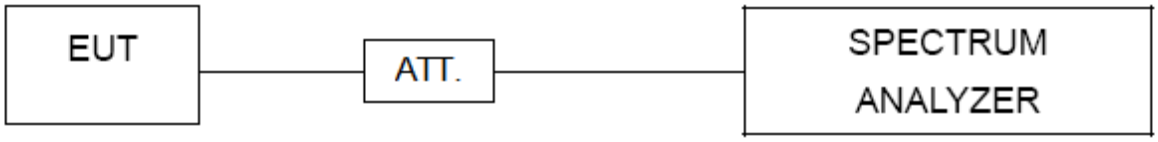
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Start Frequency	30 MHz
Stop Frequency	26.5 GHz
RBW	100 kHz
VBW	300 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 F.

8. POWER SPECTRAL DENSITY

8.1 LIMIT

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

8.2 TEST PROCEDURE

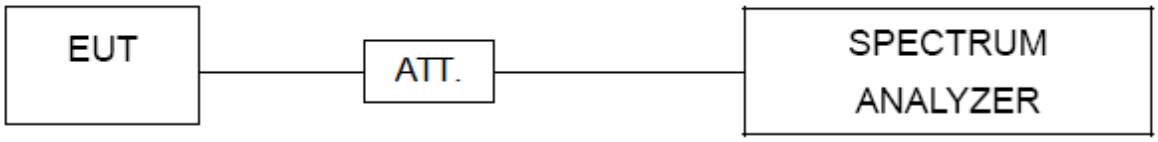
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

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

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

8.6 TEST RESULTS

Please refer to the APPENDIX G.

9. MEASUREMENT INSTRUMENTS LIST

Radiated Emissions - 9 kHz to 30 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Active Loop Antenna	Schwarzbeck	FMZB 1513-60B	1513-60 B-034	Mar. 30, 2025
2	MXE EMI Receiver	Keysight	N9038A	MY56400091	Dec. 22, 2024
3	Cable	N/A	RW2350-3.8A-NMBM -1.5M	N/A	Jun. 09, 2025
4	Cable	N/A	RG 213/U	N/A	Jun. 09, 2025
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
6	966 Chamber room	ETS	9*6*6	N/A	May 16, 2025

Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	1462	Dec.13,2024
2	Attenuator	EMC INSTRUMENT	EMCI-N-6-06	AT-06009	Dec. 13, 2024
3	Preamplifier	EMC INSTRUMENT	EMC001330	980998	Nov. 17, 2024
4	Cable	RegalWay	LMR400-NMNM-12.5 m	N/A	Jun. 06, 2025
5	Cable	RegalWay	LMR400-NMNM-3m	N/A	Jun. 06, 2025
6	Cable	RegalWay	LMR400-NMNM-0.5m	N/A	Jun. 06, 2025
7	Receiver	Agilent	N9038A	MY52130039	Dec. 22, 2024
8	Positioning Controller	MF	MF-7802	N/A	N/A
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
10	966 Chamber room	CM	9*6*6	N/A	May 16, 2025

Radiated Emissions - 1 GHz-18 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Multi-Device Controller	ETS-Lindgren	N/A	N/A	N/A
2	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
3	MXA Signal Analyzer	KEYSIGHT	N9020B	MY63380204	Nov. 17, 2024
4	Cable	RegalWay	RWLP50-4.0A-SMS M-1.3M	N/A	Jan. 09, 2025
5	Cable	RegalWay	RWLP50-2.6A-3.5 M2.92MRA-3M	N/A	Jan. 09, 2025
6	Cable	RegalWay	RWLP50-4.0A-SMS M-9M	N/A	Jan. 09, 2025
7	966 Chamber room	ETS	RFD-100（SVSWR）	Q2179	Jan. 09, 2025
8	Preamplifier	EMC INSTRUMENT	EMC118A45SE	981001	May 31, 2025
9	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A
10	Filter	STI	STI15-9912	N/A	Nov. 17, 2024
11	Double Ridged Guide Antenna	ETS	3115	75846	Mar. 20,2025

Radiated Emissions - 18 GHz-26.5 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Signal Analyzer	Keysight	N9010A	MY56480488	Dec. 22, 2024
2	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330-K	619413	Jul. 17, 2025
3	Cable	RegalWay	RWLP50-2.6A-2.92M 2.92M-1.1M	N/A	Jul. 25, 2025
4	Cable	Tonscend	HF160-KMKM-3M	N/A	Jul. 25, 2025
5	Broad-Band Horn Antenna	Schwarzbeck	BBHA9170(3m)	9170-319	Jun. 16, 2025
6	966 Chamber room	CM	9*6*6	N/A	May 19, 2025
7	Filter	STI	STI15-9912	N/A	May 31, 2025
8	Positioning Controller	MF	MF-7802	N/A	N/A
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

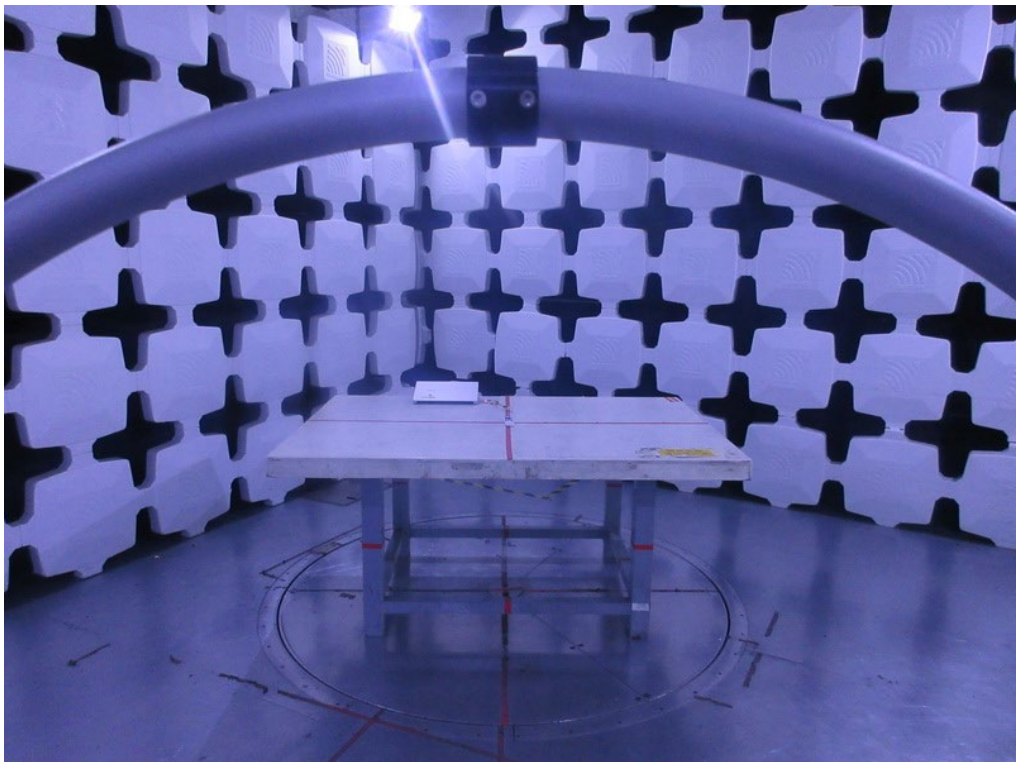
Bandwidth & Maximum Output Power & Power Spectral Density & Conducted Spurious Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP38	100852	May 31, 2025
2	Measurement Software	BTL	BTL Conducted Test	N/A	N/A
3	Isolation attenuator	Z-Link	ASMA-16-18-2W	N/A	N/A

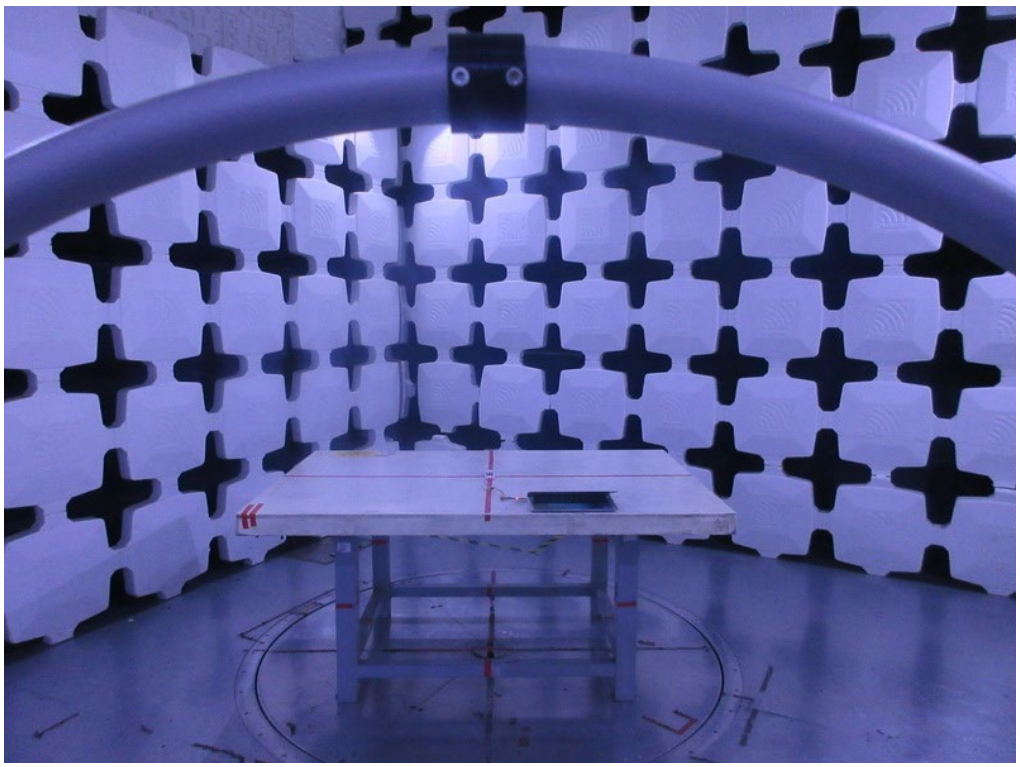
Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

10. EUT TEST PHOTO

Radiated Emissions Test Photos

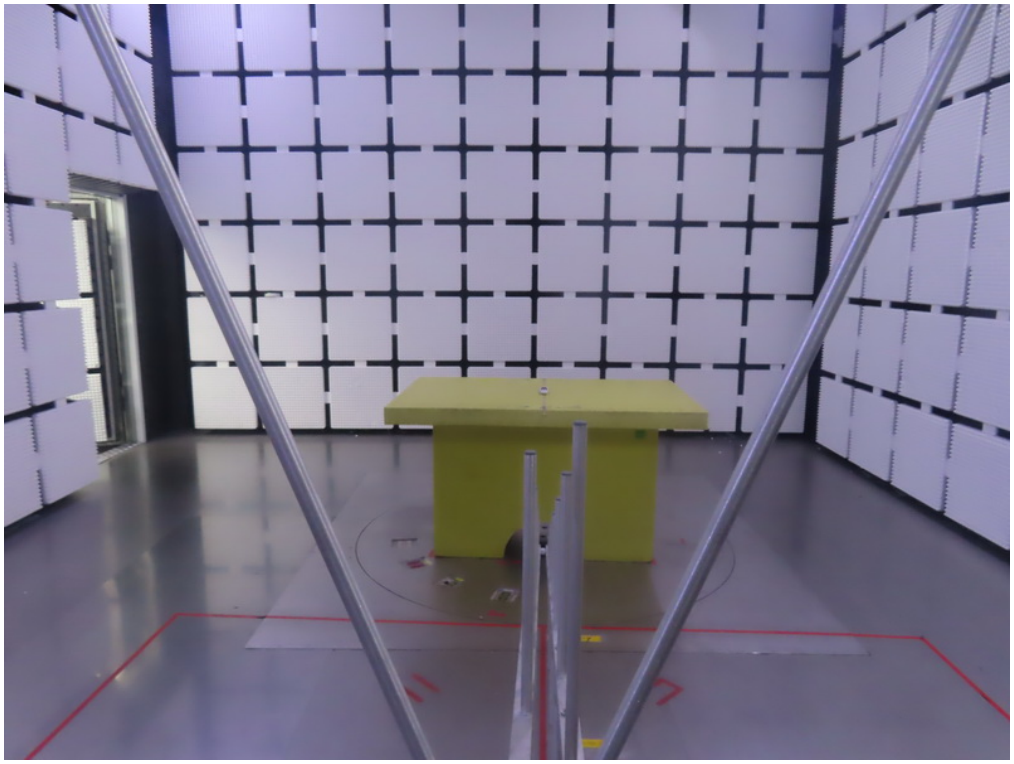
9 kHz to 30 MHz

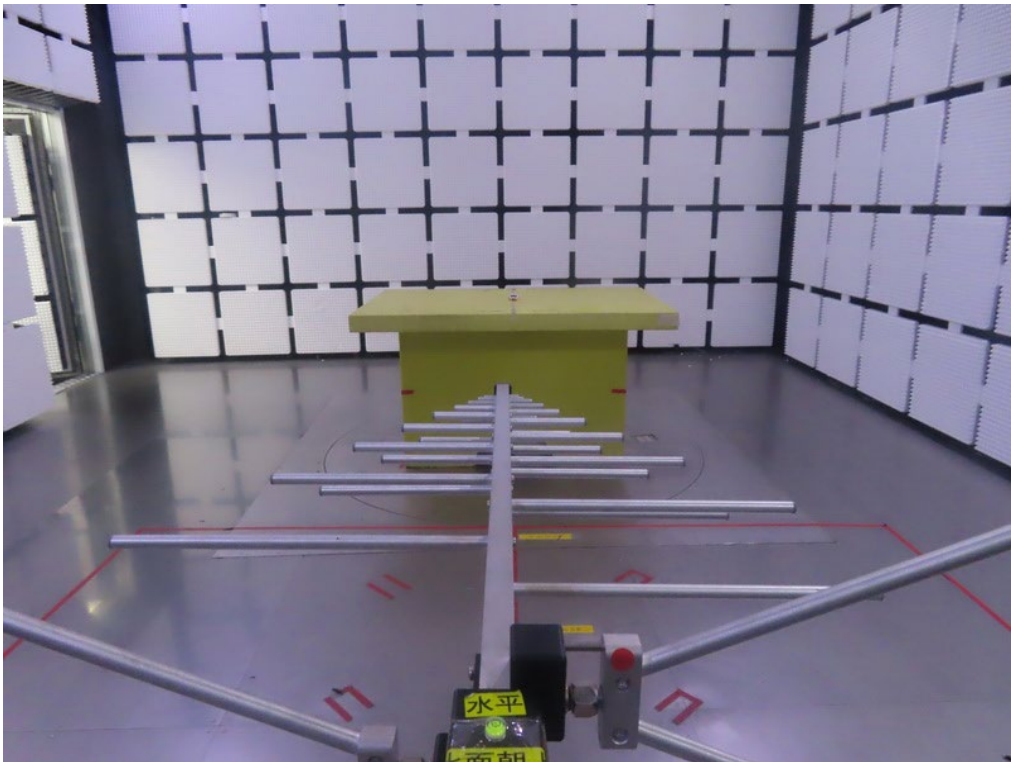




Radiated Emissions Test Photos

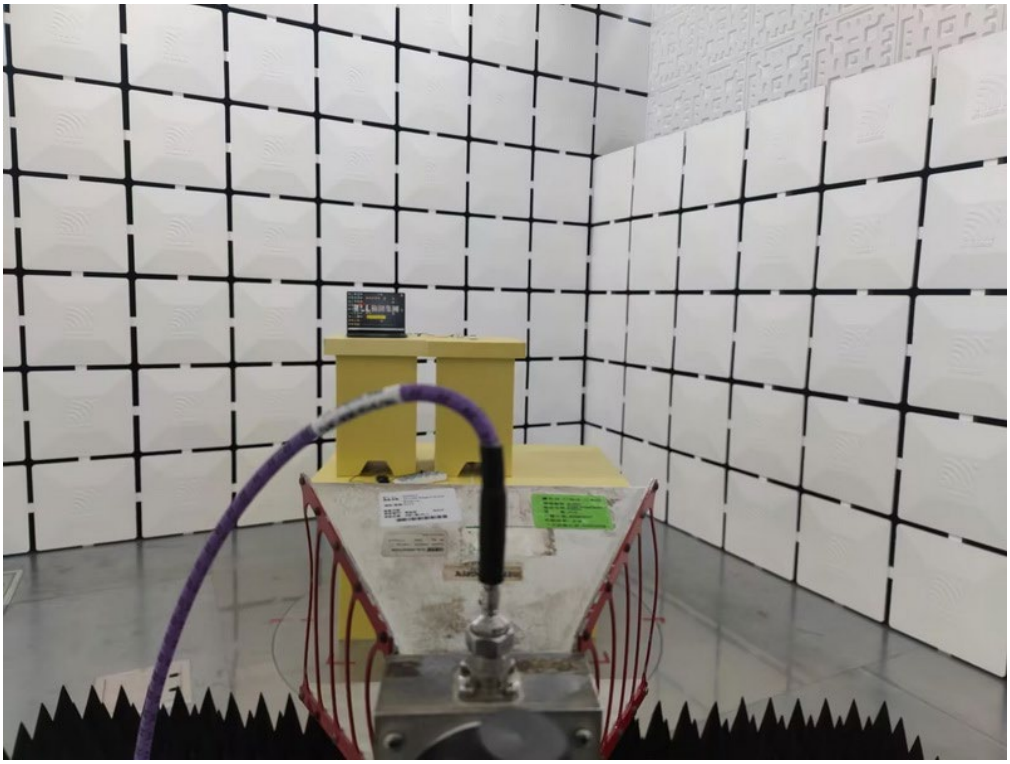
30 MHz to 1000 MHz

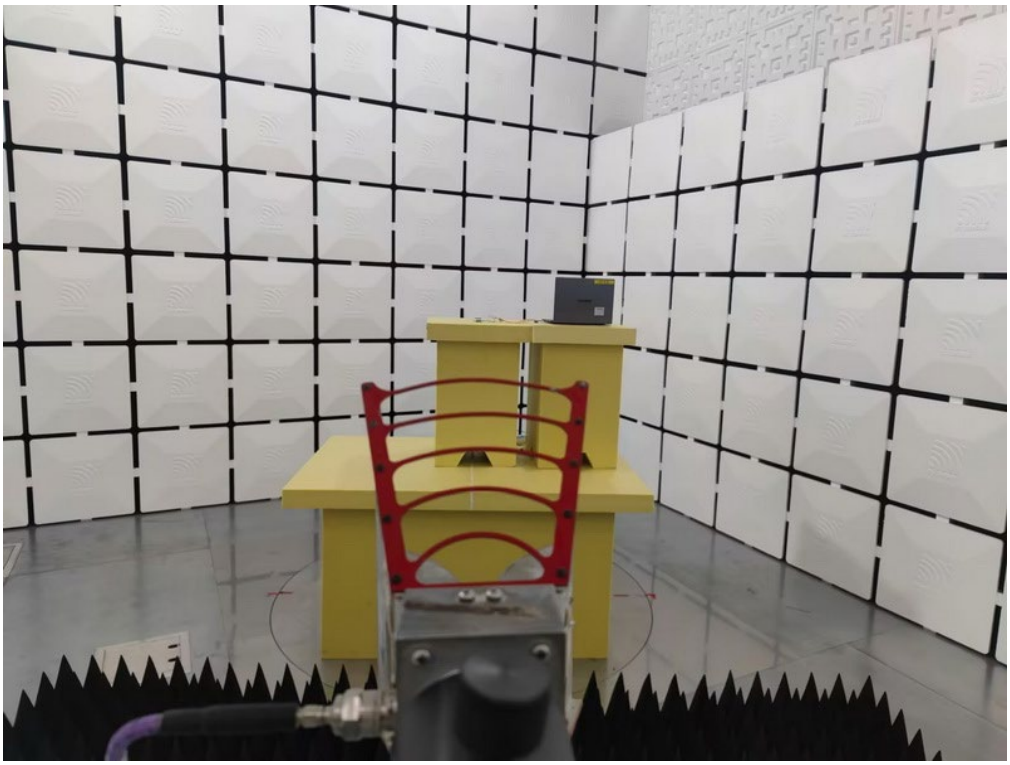




Radiated Emissions Test Photos

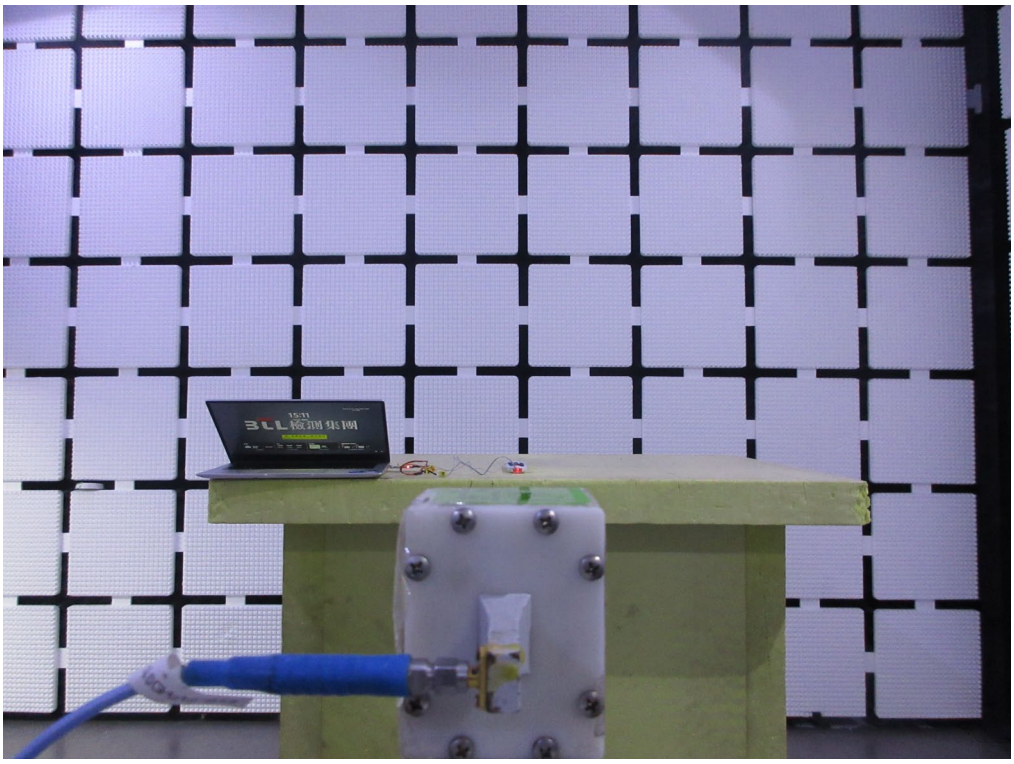
1 GHz to 18 GHz

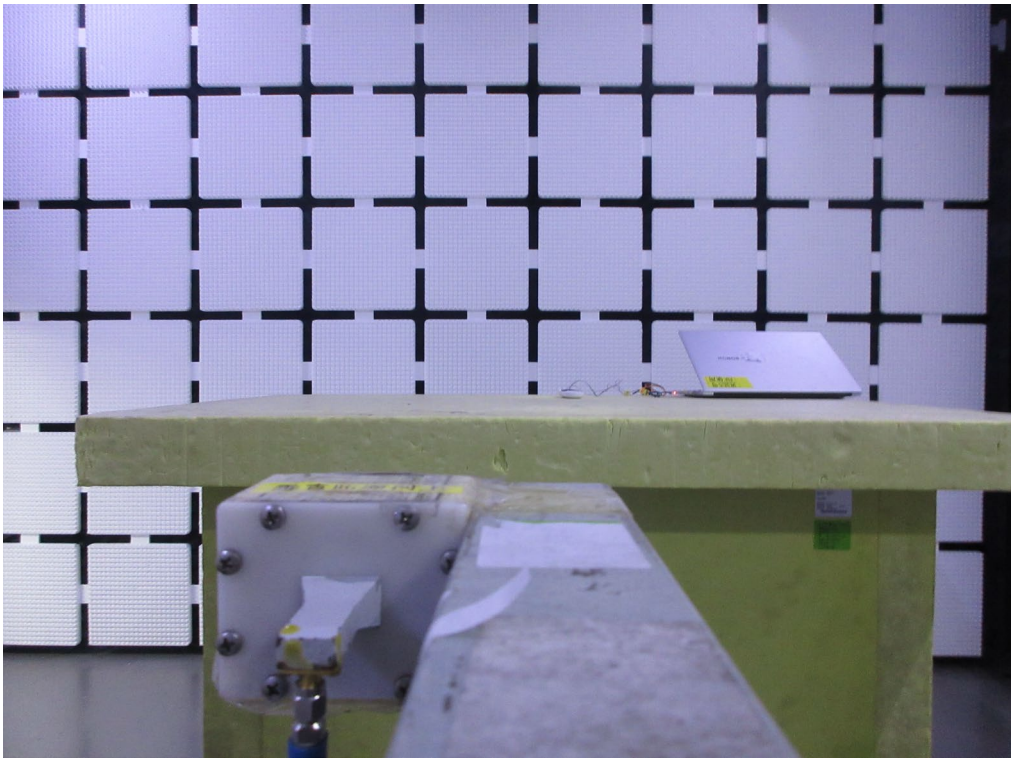




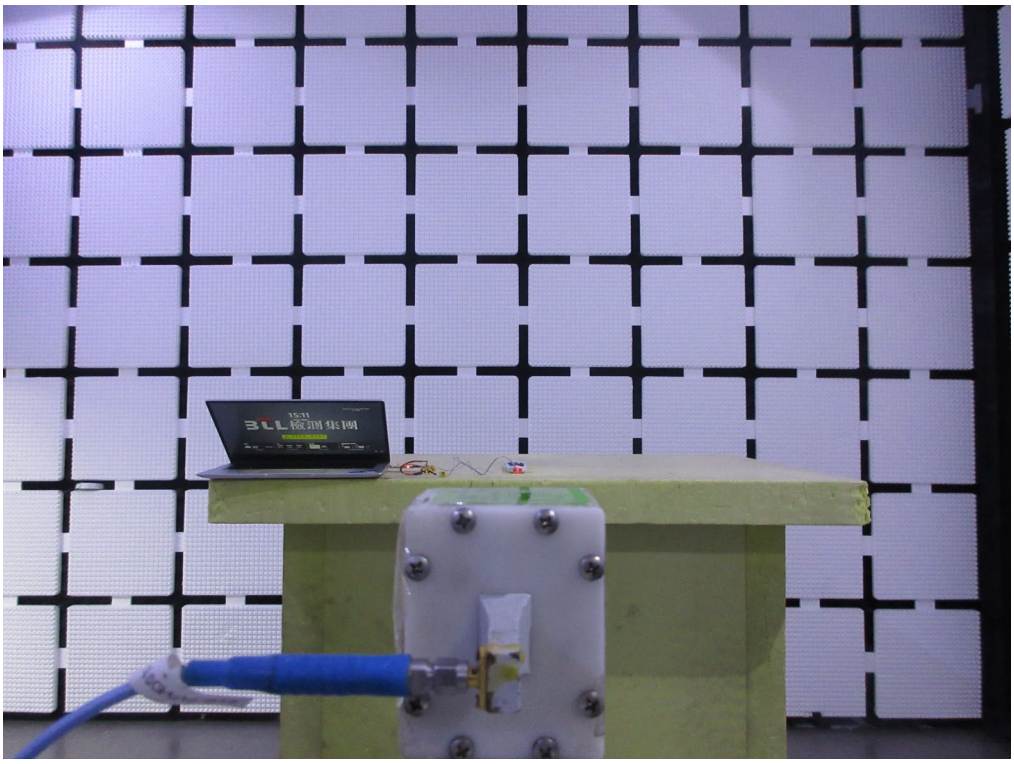
Radiated Emissions Test Photos

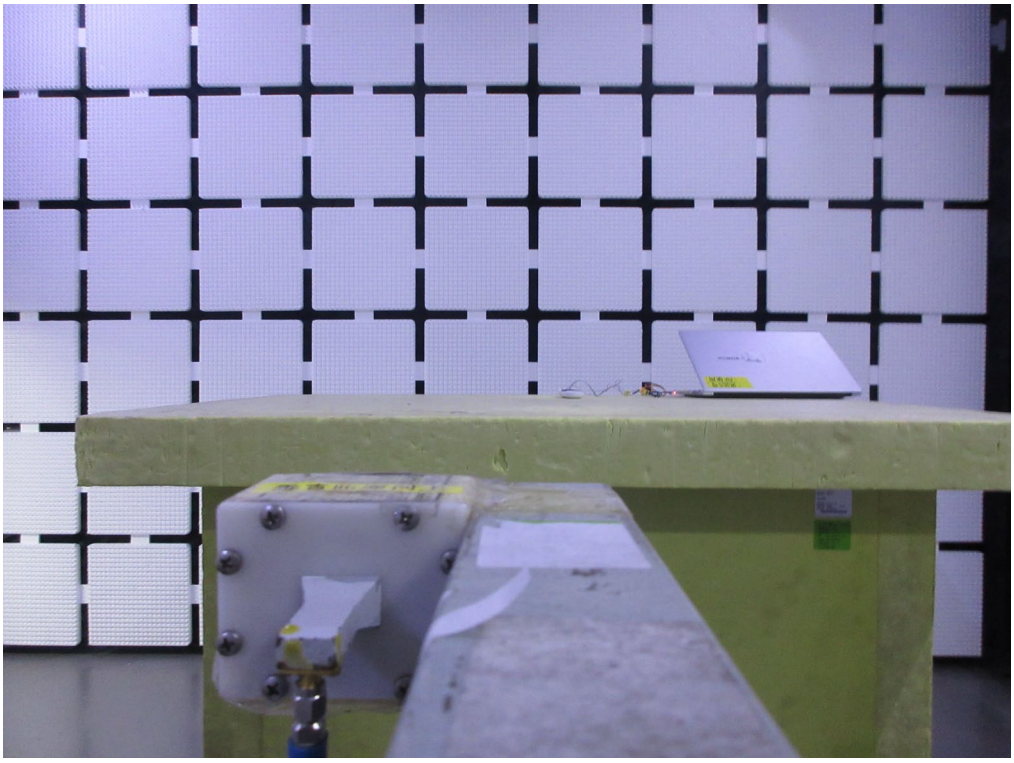
18 GHz to 40 GHz



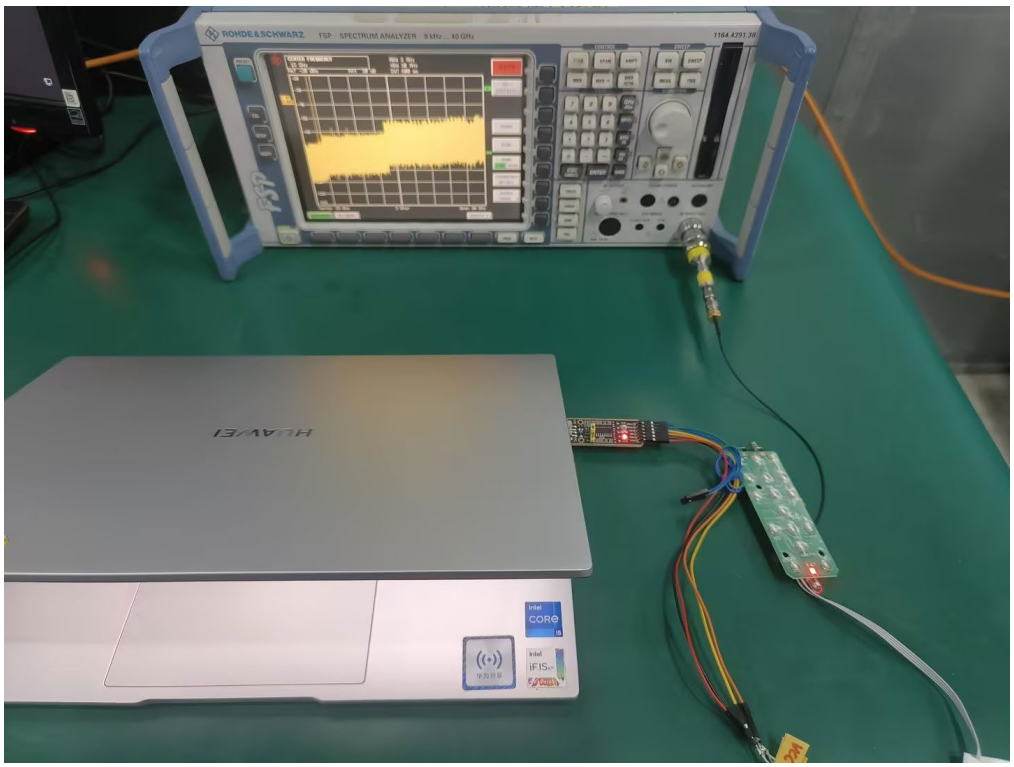


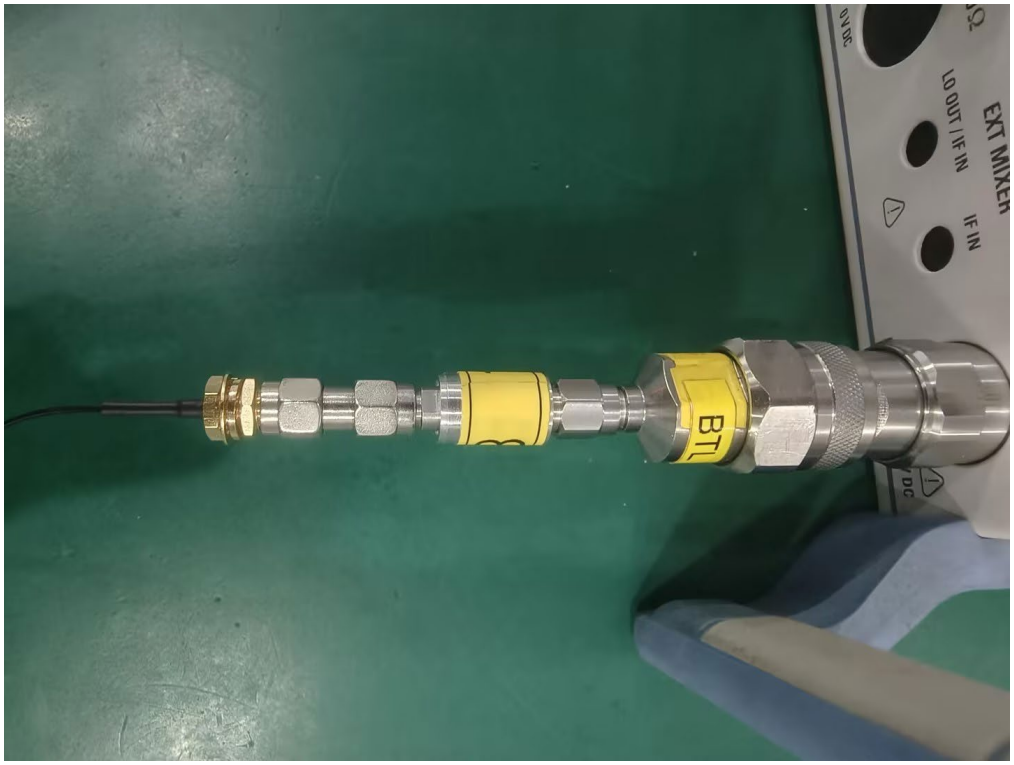
Band Edge Test Photos





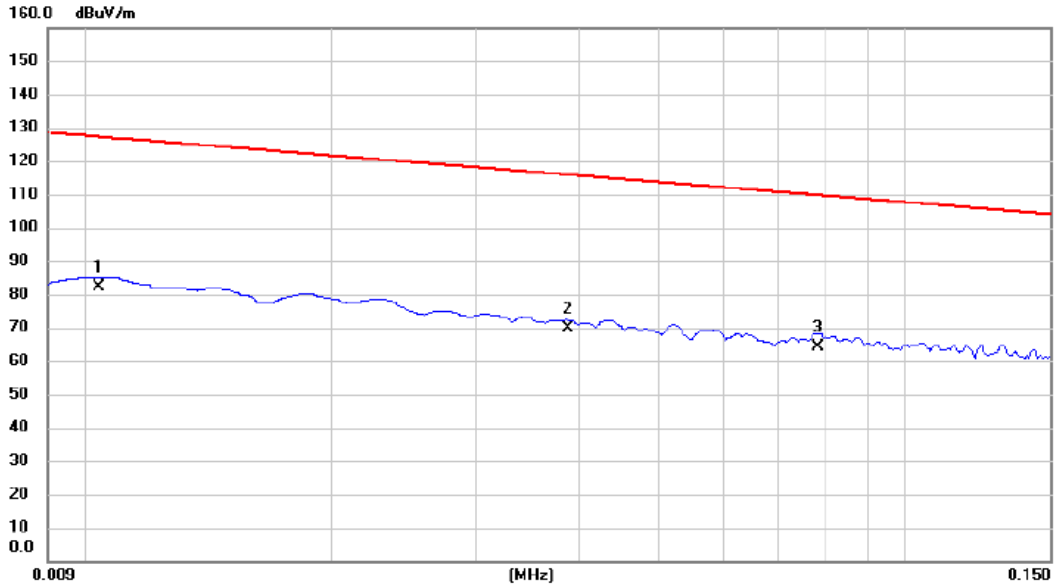
Conducted Test Photos





APPENDIX A - RADIATED EMISSION - 9 KHZ TO 30 MHZ

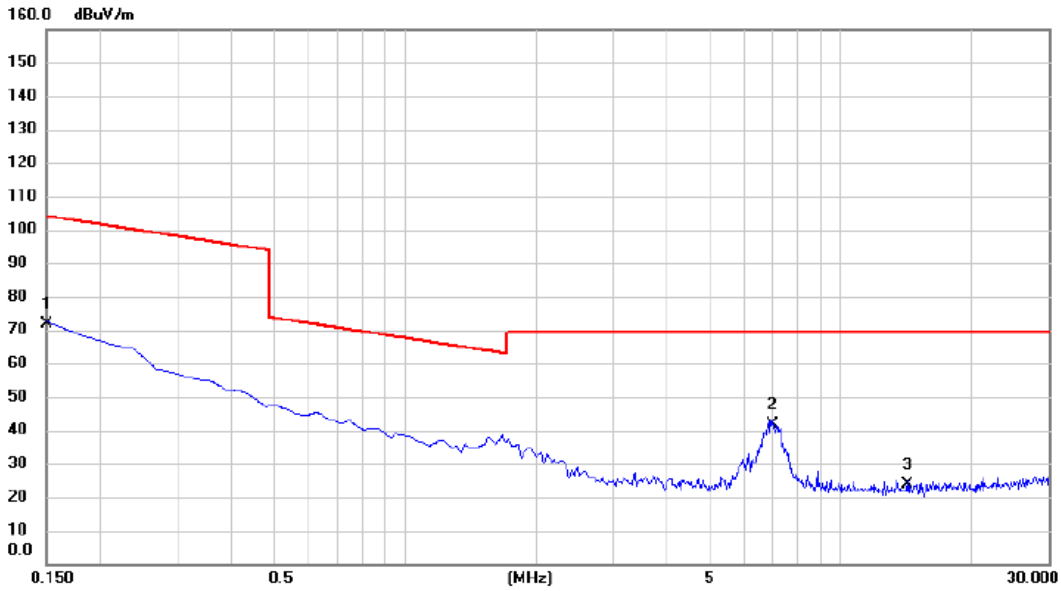
Test Mode	TX Mode_1Mbps Channel 19	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0104	61.84	20.51	82.35	127.26	-44.91	AVG	
2		0.0388	48.71	21.14	69.85	115.83	-45.98	AVG	
3		0.0781	43.09	21.29	64.38	109.75	-45.37	AVG	

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

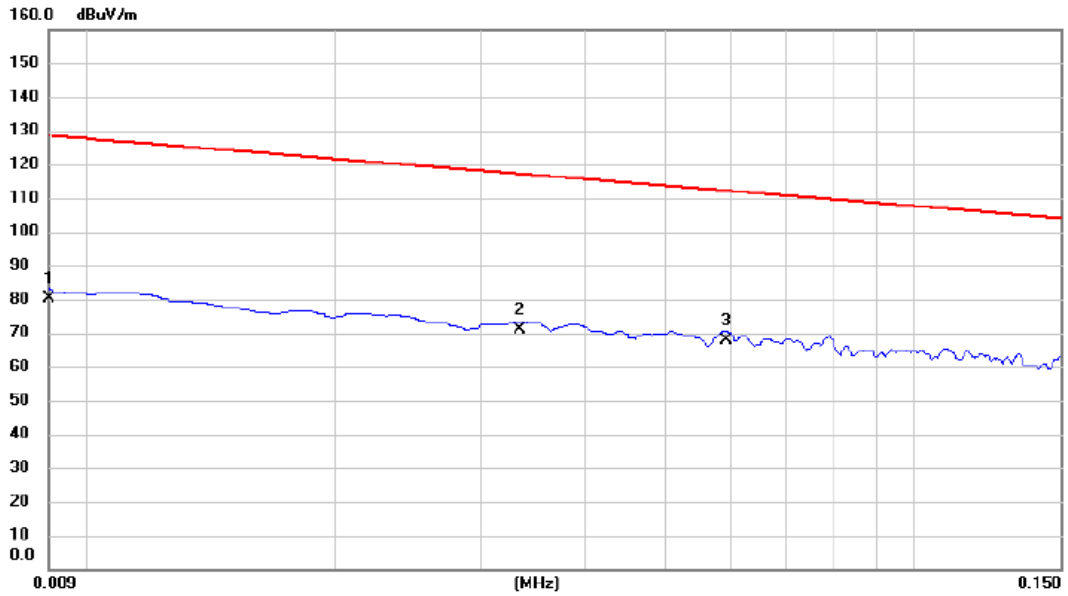
Test Mode	TX Mode_1Mbps Channel 19	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.1500	50.33	21.30	71.63	104.09	-32.46	AVG	
2	*	6.9558	20.45	21.30	41.75	69.54	-27.79	QP	
3		14.2094	2.46	21.46	23.92	69.54	-45.62	QP	

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

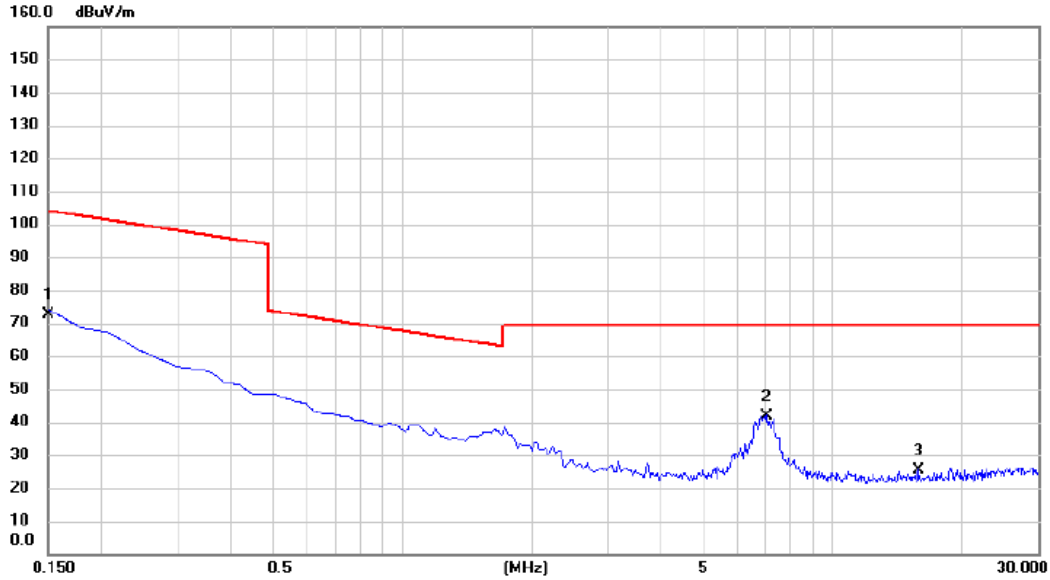
Test Mode	TX Mode_1Mbps Channel 19	Polarization	Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0090	59.63	20.40	80.03	128.52	-48.49	AVG	
2		0.0334	49.84	21.12	70.96	117.13	-46.17	AVG	
3	*	0.0592	46.51	21.23	67.74	112.16	-44.42	AVG	

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

Test Mode	TX Mode_1Mbps Channel 19	Polarization	Ant 90°

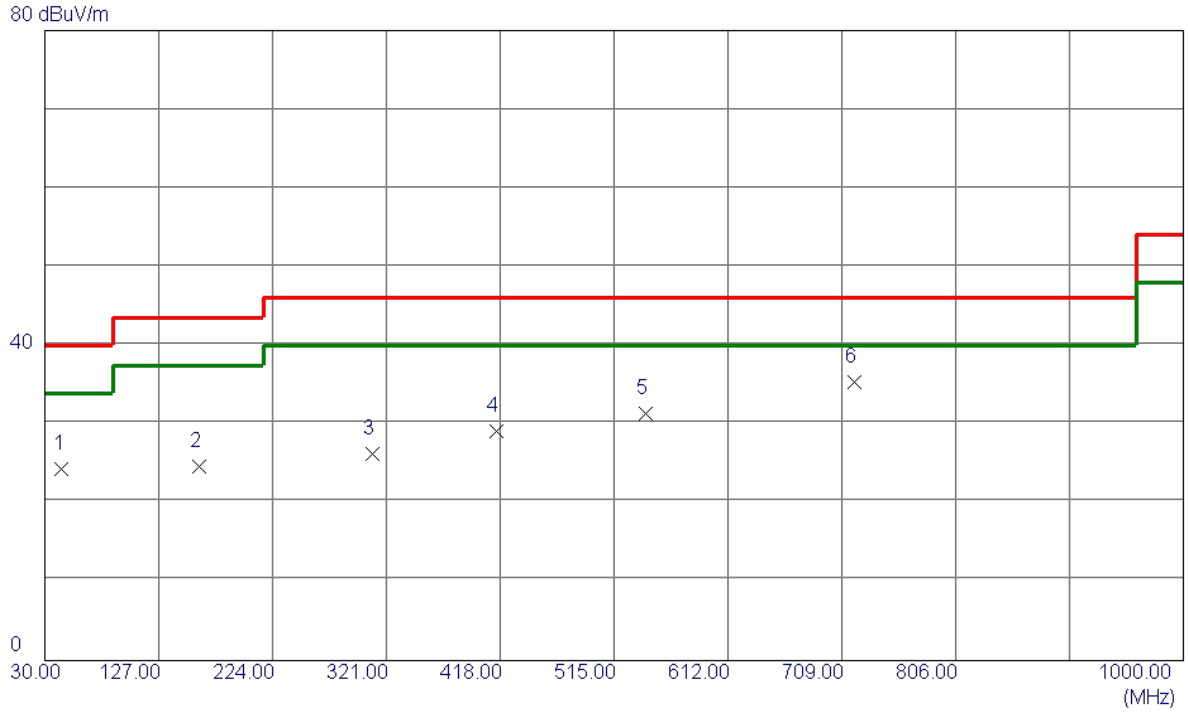


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.1500	51.20	21.30	72.50	104.09	-31.59	AVG	
2	*	7.0454	20.45	21.30	41.75	69.54	-27.79	QP	
3		15.7914	3.75	21.48	25.23	69.54	-44.31	QP	

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

APPENDIX B - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

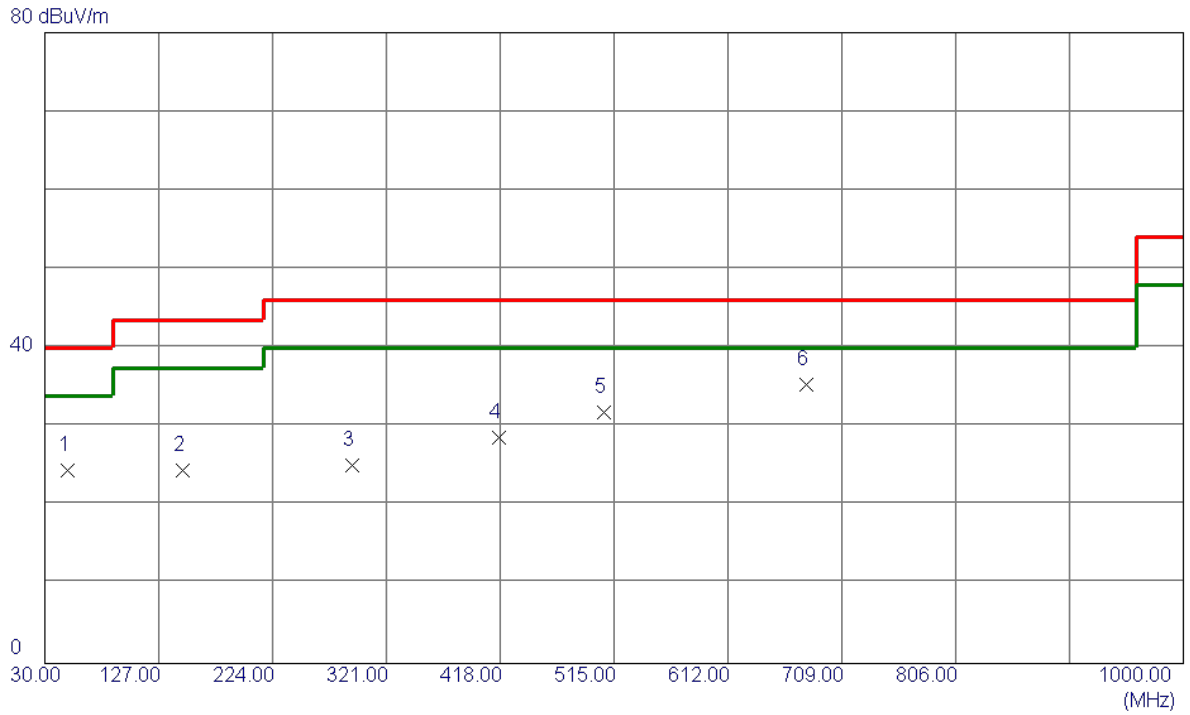
Test Mode	TX Mode_1Mbps Channel 19	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	44.5500	35.66	-11.38	24.28	40.00	-15.72	Peak	
2	161.4350	35.48	-10.90	24.58	43.50	-18.92	Peak	
3	309.3599	36.54	-10.35	26.19	46.00	-19.81	Peak	
4	414.6050	36.72	-7.67	29.05	46.00	-16.95	Peak	
5	541.6750	36.57	-5.16	31.41	46.00	-14.59	Peak	
6 *	719.6700	37.17	-1.81	35.36	46.00	-10.64	Peak	

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

Test Mode	TX Mode_1Mbps Channel 19	Polarization	Horizontal

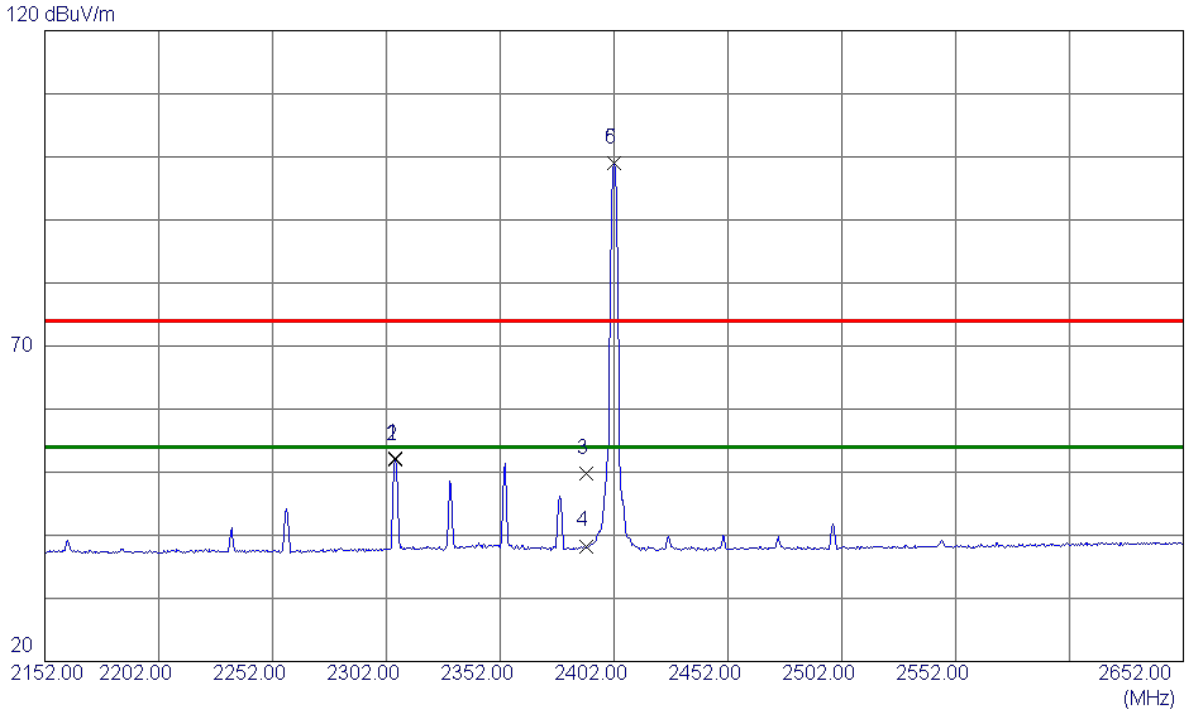


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	49.8849	35.69	-11.27	24.42	40.00	-15.58	Peak	
2	147.8550	35.81	-11.28	24.53	43.50	-18.97	Peak	
3	292.3850	35.82	-10.70	25.12	46.00	-20.88	Peak	
4	417.0300	36.26	-7.61	28.65	46.00	-17.35	Peak	
5	506.7550	37.76	-5.88	31.88	46.00	-14.12	Peak	
6 *	678.9300	37.83	-2.52	35.31	46.00	-10.69	Peak	

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

APPENDIX C - RADIATED EMISSION - ABOVE 1000 MHZ

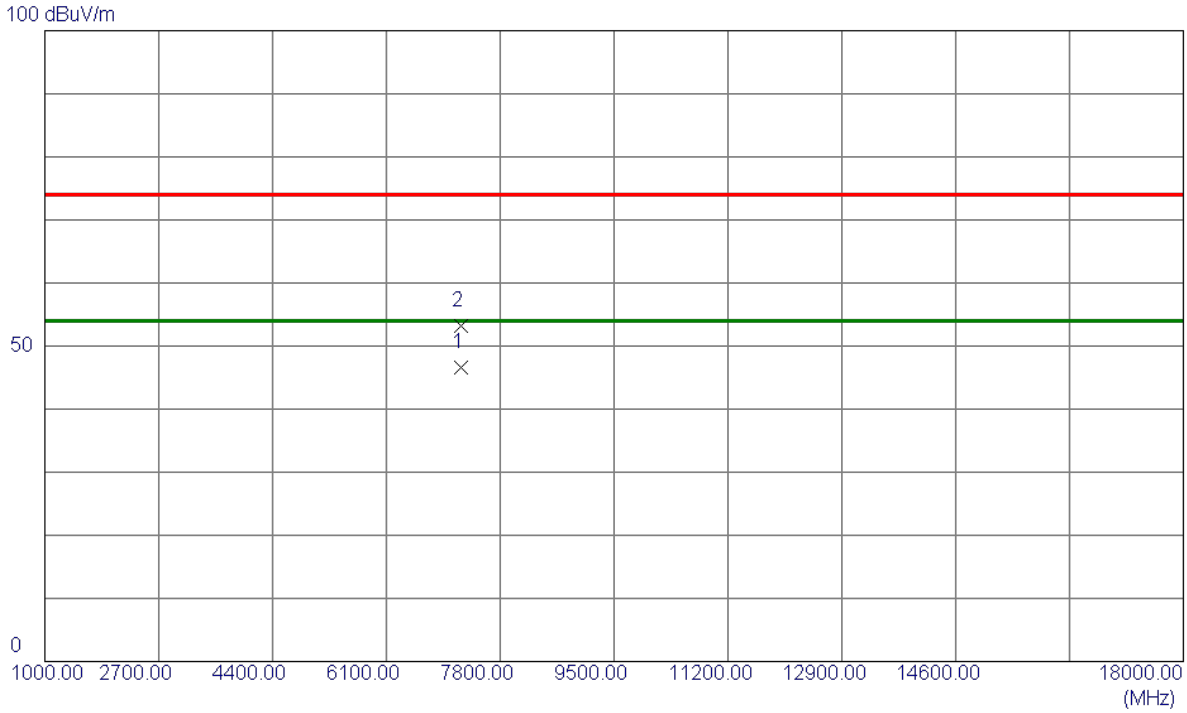
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2306.0000	42.83	9.42	52.25	74.00	-21.75	Peak	
2	2306.0000	42.57	9.42	51.99	54.00	-2.01	AVG	
3	2390.0000	40.42	9.44	49.86	74.00	-24.14	Peak	
4	2390.0000	28.86	9.44	38.30	54.00	-15.70	AVG	
5	2402.0000	89.54	9.45	98.99	74.00	24.99	Peak	No Limit
6 *	2402.0000	89.48	9.45	98.93	54.00	44.93	AVG	No Limit

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

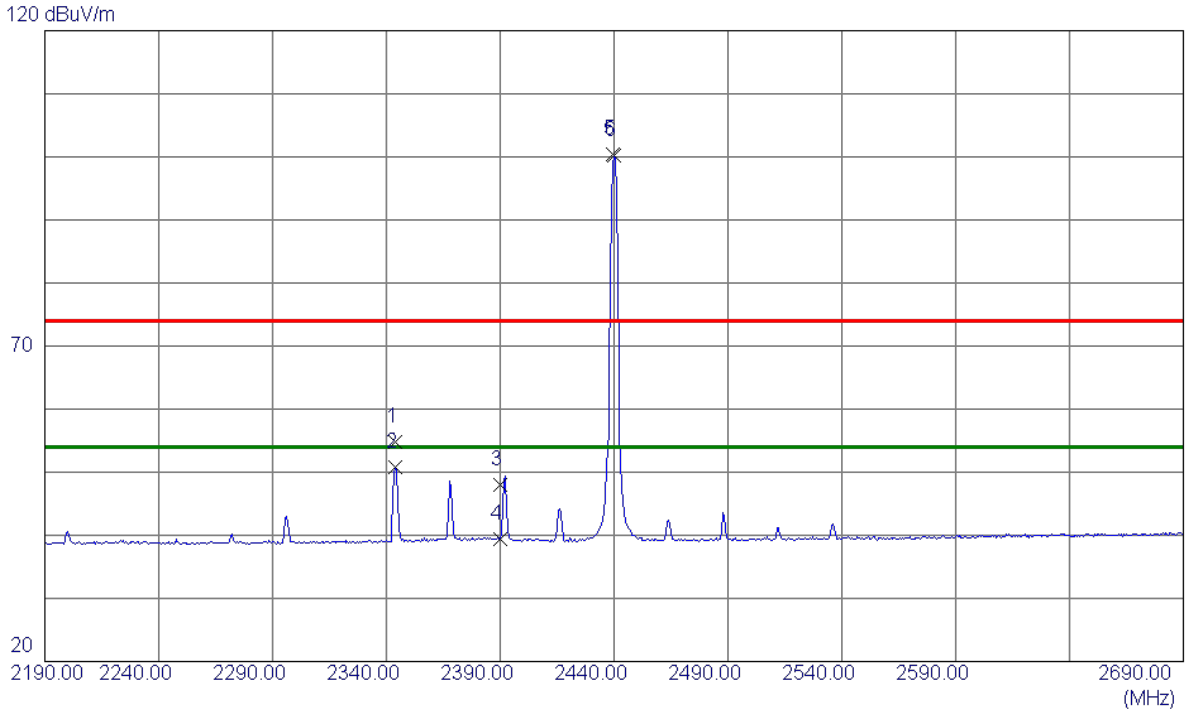
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7206.0000	38.25	8.39	46.64	54.00	-7.36	AVG	
2	7206.2000	44.87	8.39	53.26	74.00	-20.74	Peak	

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

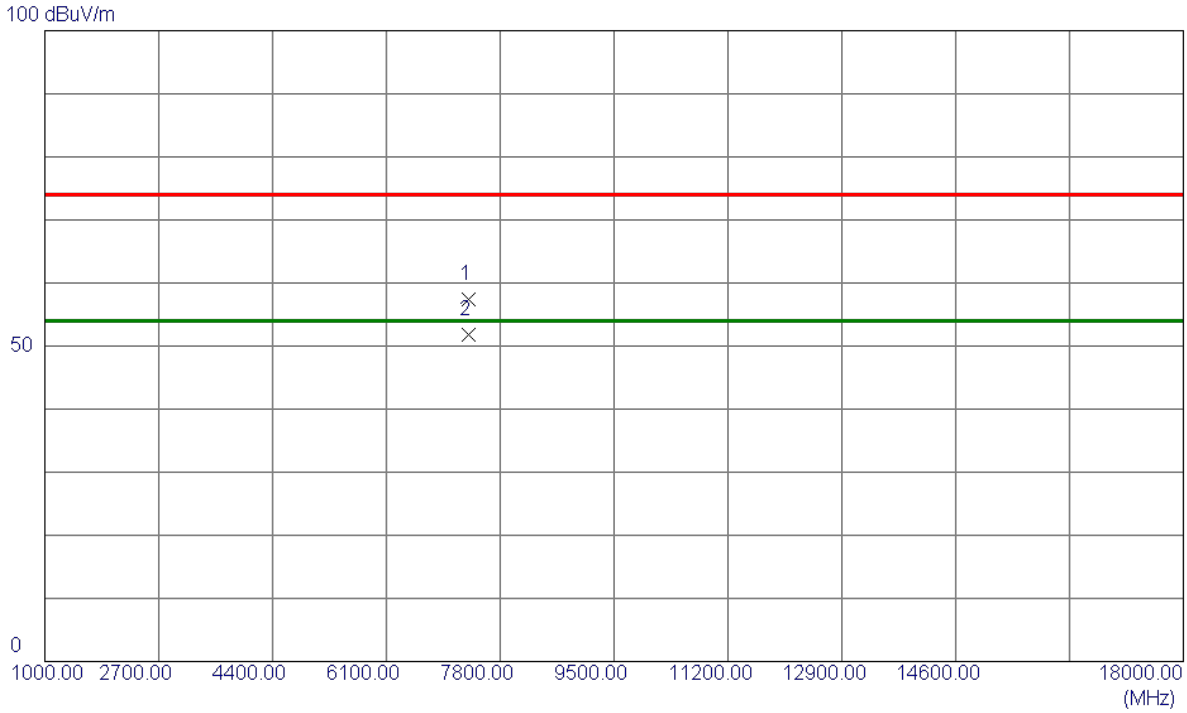
Test Mode	TX 2440 MHz _CH19_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2344.0000	45.36	9.43	54.79	74.00	-19.21	Peak	
2	2344.0000	41.36	9.43	50.79	54.00	-3.21	AVG	
3	2390.0000	38.61	9.44	48.05	74.00	-25.95	Peak	
4	2390.0000	29.89	9.44	39.33	54.00	-14.67	AVG	
5	2439.5000	91.00	9.46	100.46	74.00	26.46	Peak	No Limit
6 *	2440.0000	90.72	9.46	100.18	54.00	46.18	AVG	No Limit

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

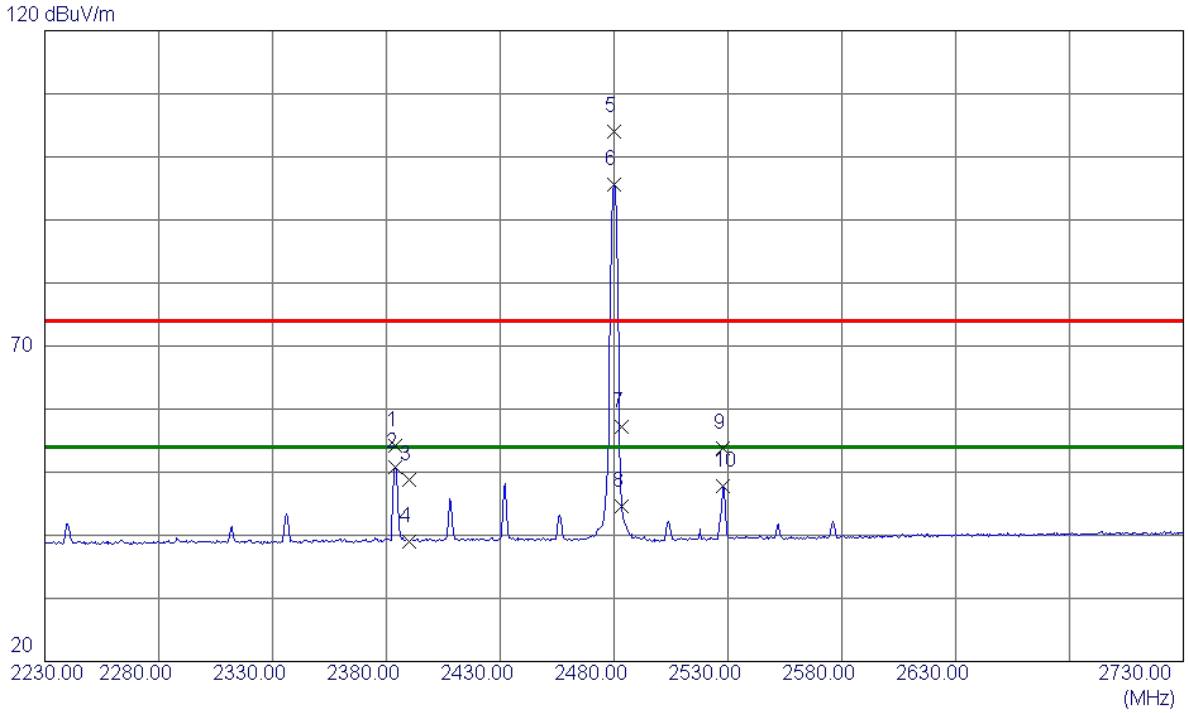
Test Mode	TX 2440 MHz _CH19_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7319.2000	48.81	8.65	57.46	74.00	-16.54	Peak	
2 *	7320.0000	43.06	8.66	51.72	54.00	-2.28	AVG	

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

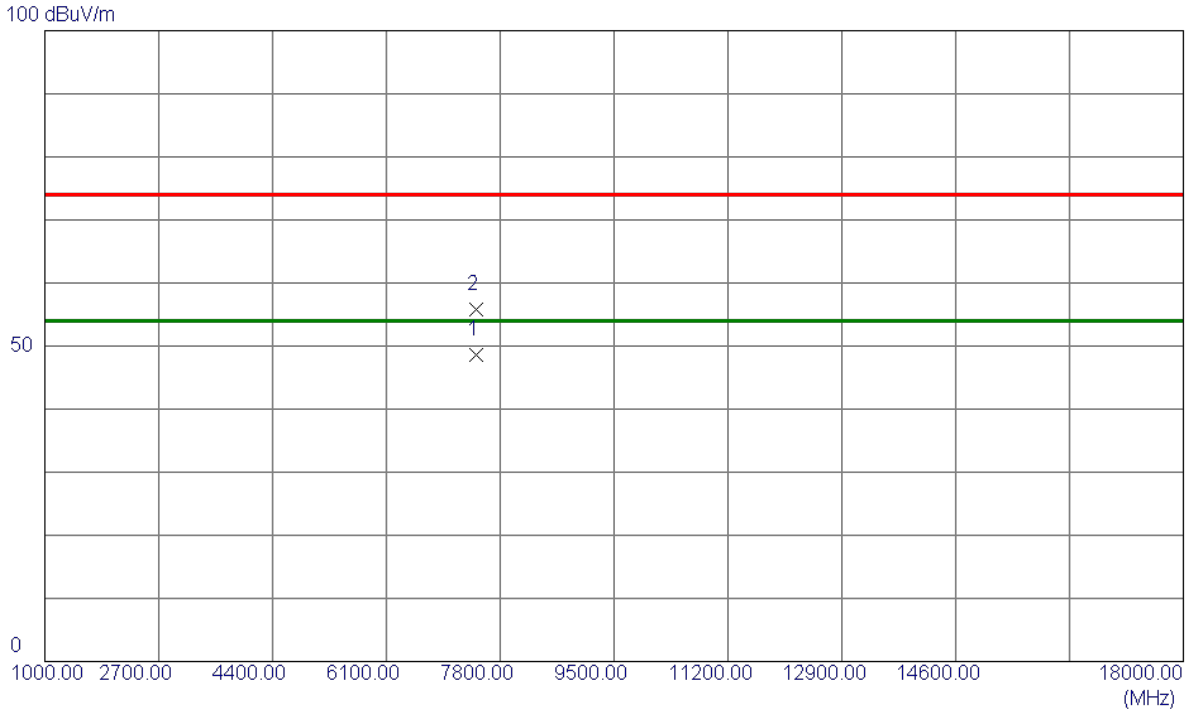
Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2384.0000	44.67	9.44	54.11	74.00	-19.89	Peak	
2	2384.0000	41.44	9.44	50.88	54.00	-3.12	AVG	
3	2390.0000	39.31	9.44	48.75	74.00	-25.25	Peak	
4	2390.0000	29.64	9.44	39.08	54.00	-14.92	AVG	
5	2480.0000	94.48	9.47	103.95	74.00	29.95	Peak	No Limit
6 *	2480.0000	86.16	9.47	95.63	54.00	41.63	AVG	No Limit
7	2483.5000	47.77	9.47	57.24	74.00	-16.76	Peak	
8	2483.5000	35.15	9.47	44.62	54.00	-9.38	AVG	
9	2528.0000	44.18	9.61	53.79	74.00	-20.21	Peak	
10	2528.0000	38.22	9.61	47.83	54.00	-6.17	AVG	

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

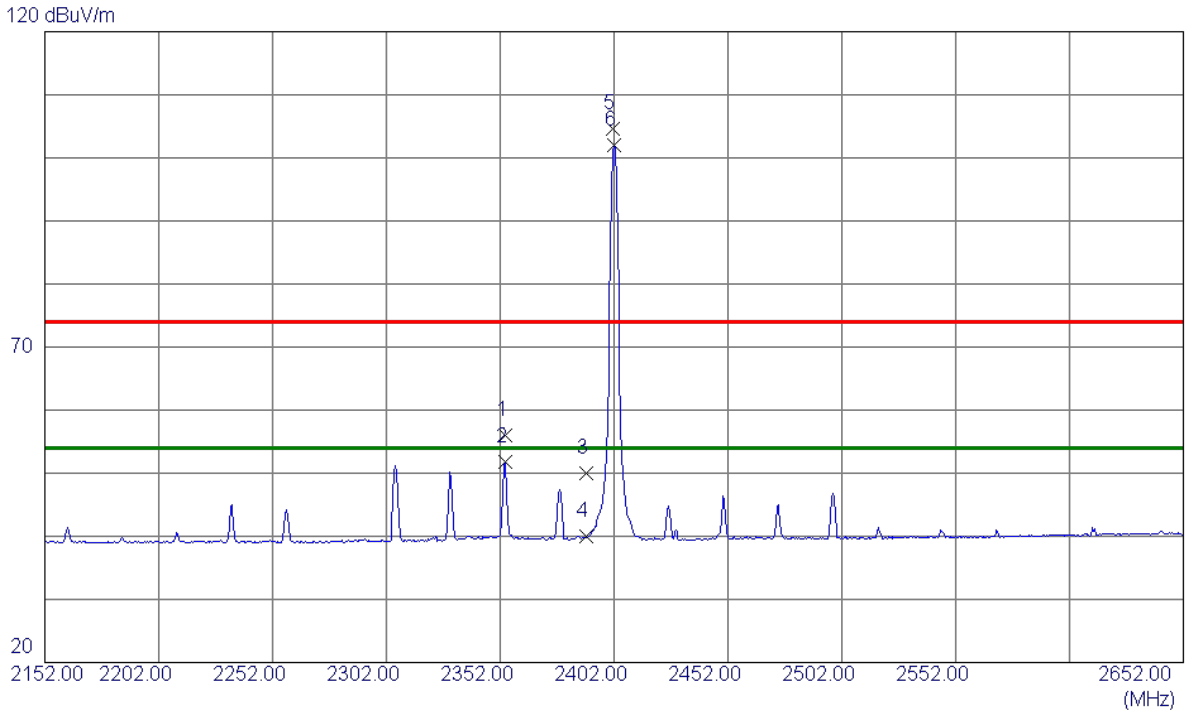
Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7439.9000	39.71	8.94	48.65	54.00	-5.35	AVG	
2	7439.1000	46.79	8.94	55.73	74.00	-18.27	Peak	

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

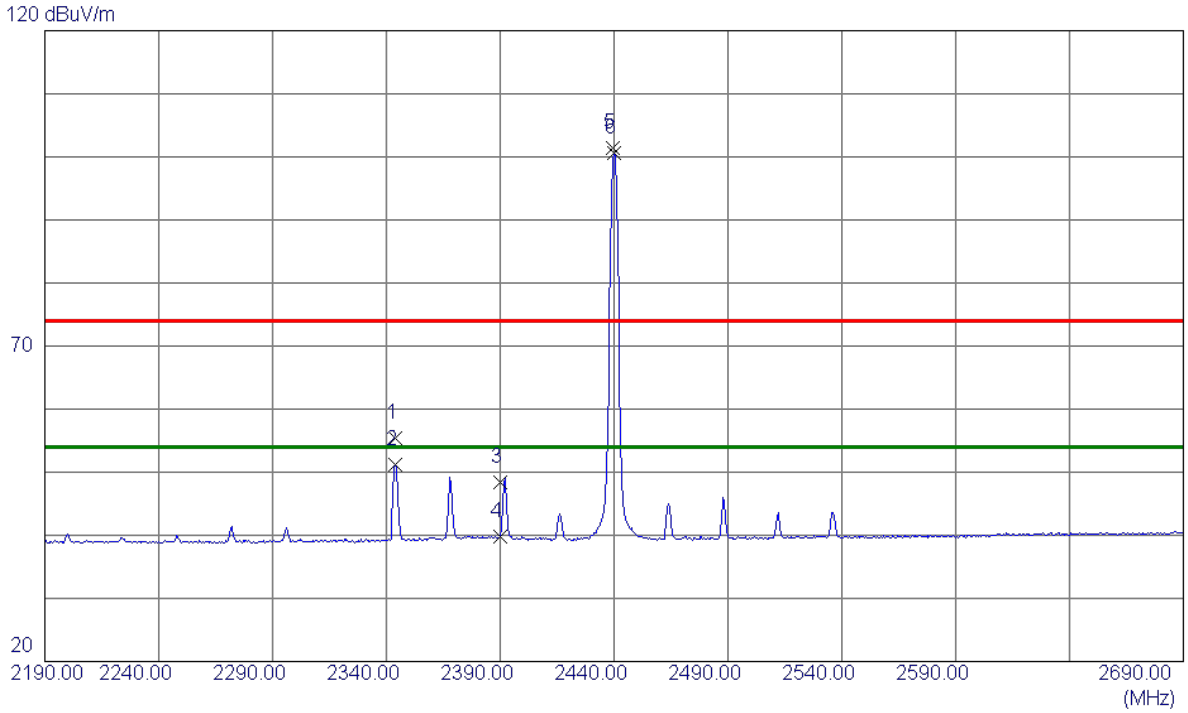
Test Mode	TX 2402 MHz _CH00_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2354.0000	46.62	9.43	56.05	74.00	-17.95	Peak	
2	2354.0000	42.45	9.43	51.88	54.00	-2.12	AVG	
3	2390.0000	40.59	9.44	50.03	74.00	-23.97	Peak	
4	2390.0000	30.64	9.44	40.08	54.00	-13.92	AVG	
5	2401.5000	95.11	9.45	104.56	74.00	30.56	Peak	No Limit
6 *	2402.0000	92.62	9.45	102.07	54.00	48.07	AVG	No Limit

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

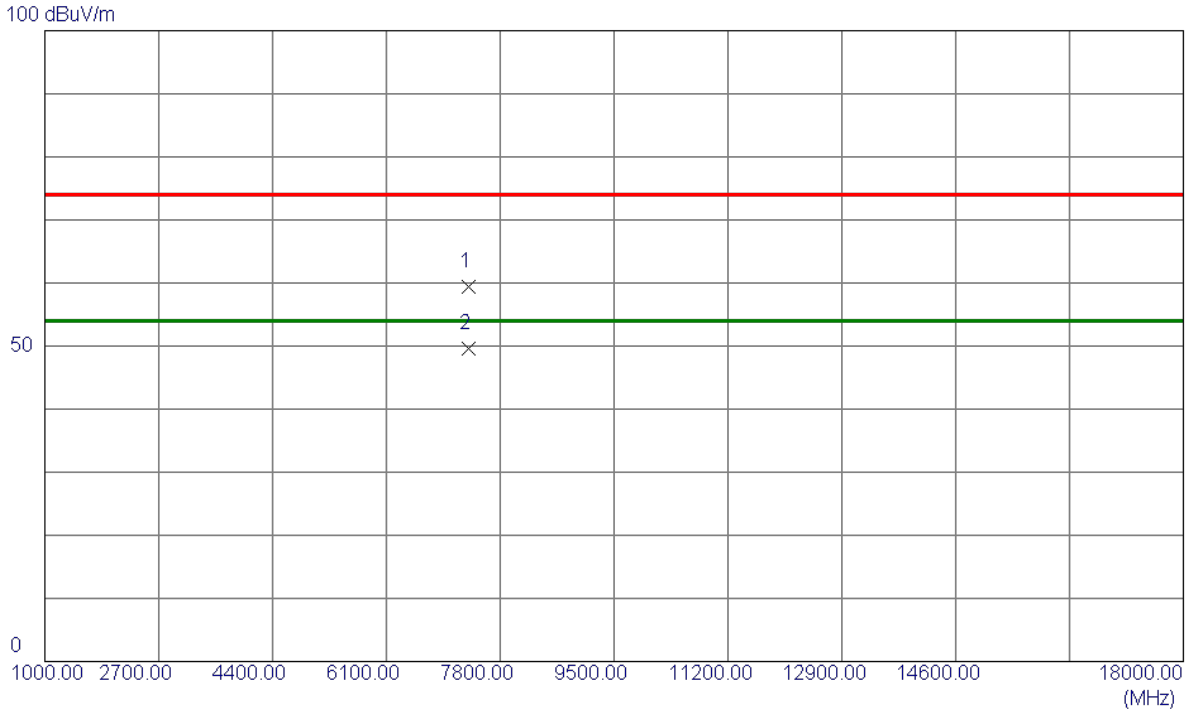
Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2344.0000	45.97	9.43	55.40	74.00	-18.60	Peak	
2	2344.0000	41.86	9.43	51.29	54.00	-2.71	AVG	
3	2390.0000	39.05	9.44	48.49	74.00	-25.51	Peak	
4	2390.0000	30.41	9.44	39.85	54.00	-14.15	AVG	
5	2439.5000	92.03	9.46	101.49	74.00	27.49	Peak	No Limit
6 *	2440.0000	91.09	9.46	100.55	54.00	46.55	AVG	No Limit

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

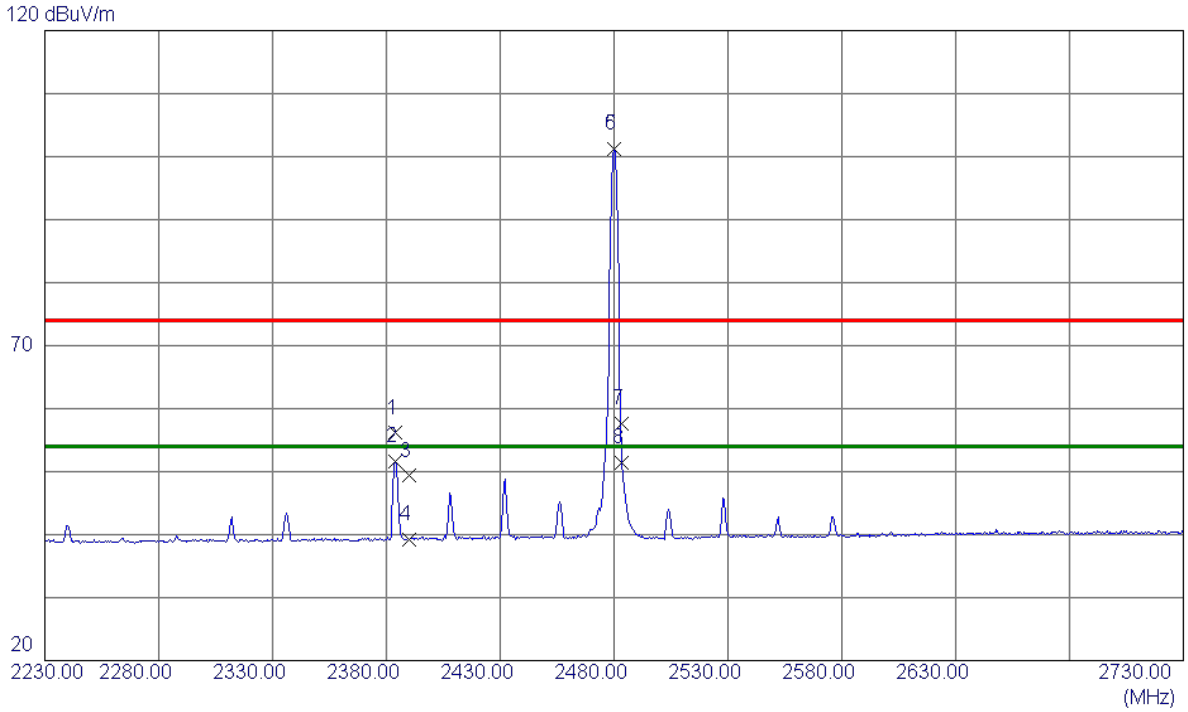
Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7318.6000	50.75	8.65	59.40	74.00	-14.60	Peak	
2 *	7321.0000	40.87	8.66	49.53	54.00	-4.47	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	2384.0000	46.66	9.44	56.10	74.00	-17.90	Peak	
2	2384.0000	42.21	9.44	51.65	54.00	-2.35	AVG	
3	2390.0000	39.86	9.44	49.30	74.00	-24.70	Peak	
4	2390.0000	29.74	9.44	39.18	54.00	-14.82	AVG	
5	2480.0000	91.70	9.47	101.17	74.00	27.17	Peak	No Limit
6 *	2480.0000	91.72	9.47	101.19	54.00	47.19	AVG	No Limit
7	2483.5000	48.04	9.47	57.51	74.00	-16.49	Peak	
8	2483.5000	42.02	9.47	51.49	54.00	-2.51	AVG	

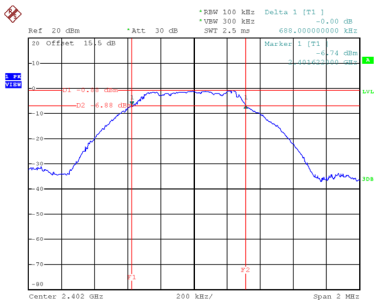
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

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	0.688	1.024	0.5	Pass
19	2440	0.702	1.040	0.5	Pass
39	2480	0.730	1.056	0.5	Pass

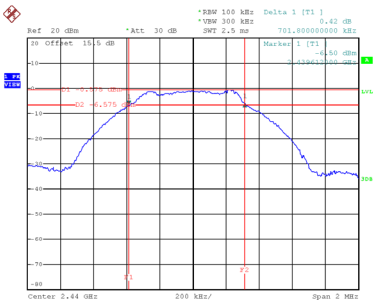
CH00



Date: 18.AUG.2024 09:23:34

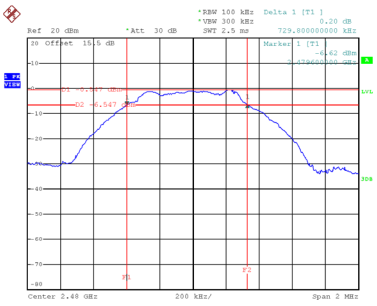
CH19

6 dB Bandwidth



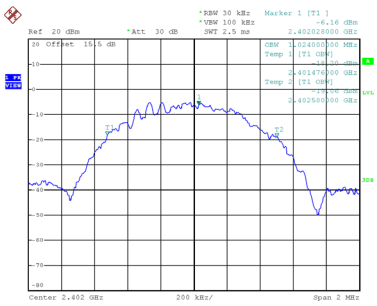
Date: 18.AUG.2024 09:29:14

CH39

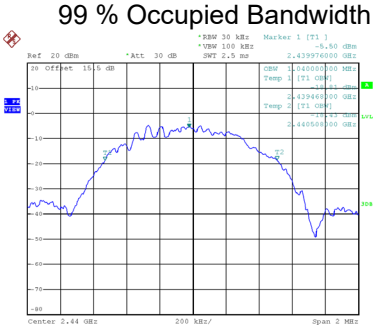


Date: 18.AUG.2024 09:48:36

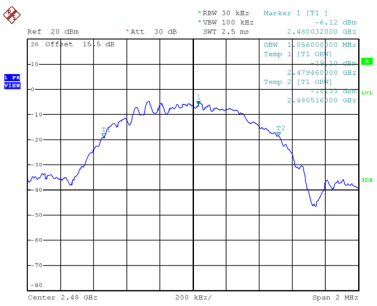
99 % Occupied Bandwidth



Date: 18.AUG.2024 09:22:54



Date: 18.AUG.2024 09:29:20



Date: 18.AUG.2024 09:48:41

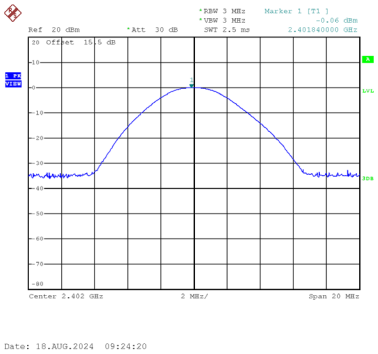
APPENDIX E - MAXIMUM OUTPUT POWER

Test Mode	TX Mode _1Mbps

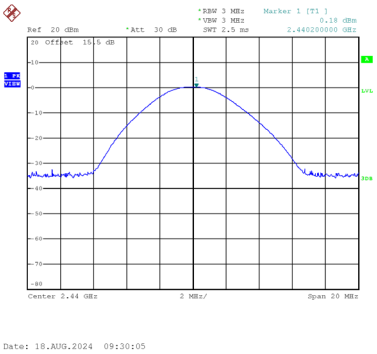
Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	-0.06	0.0010	30.00	1.0000	Pass
2440	0.18	0.0010	30.00	1.0000	Pass
2480	0.17	0.0010	30.00	1.0000	Pass

Note: Output power = Measure result + Cable loss

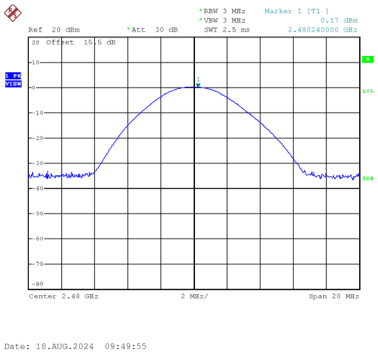
CH00



CH19



CH39

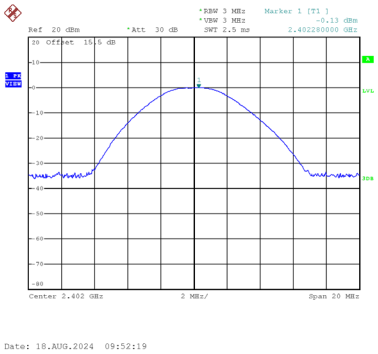


Test Mode	TX Mode _2Mbps

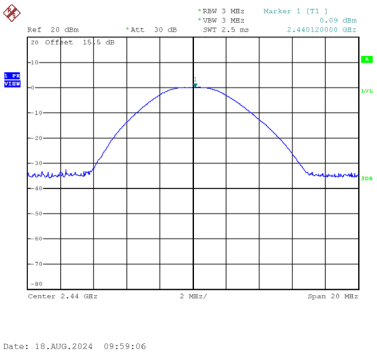
Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	-0.13	0.0010	30.00	1.0000	Pass
2440	0.09	0.0010	30.00	1.0000	Pass
2480	0.18	0.0010	30.00	1.0000	Pass

Note: Output power = Measure result + Cable loss

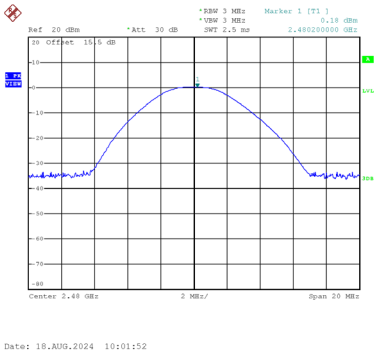
CH00



CH19



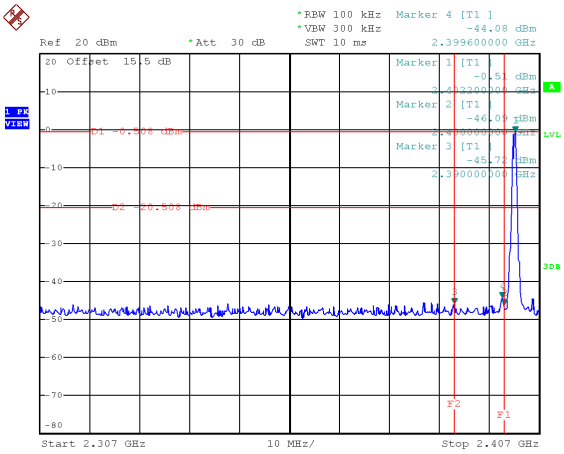
CH39



APPENDIX F - CONDUCTED SPURIOUS EMISSION

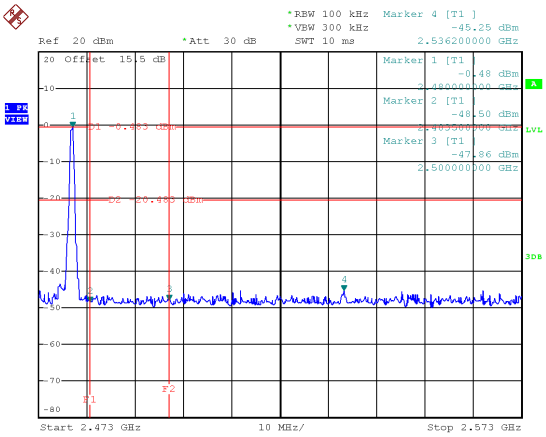
Test Mode	TX Mode _1Mbps

Bandedge CH00 (Lower)



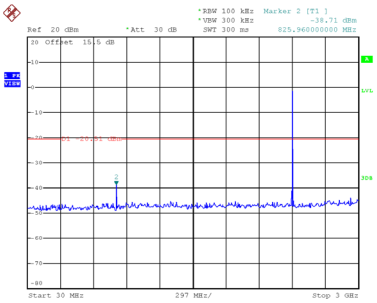
Date: 18.AUG.2024 09:23:41

Bandedge CH39 (Upper)

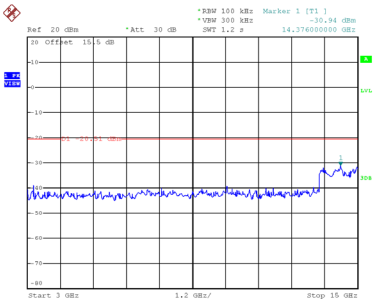


Date: 18.AUG.2024 09:48:49

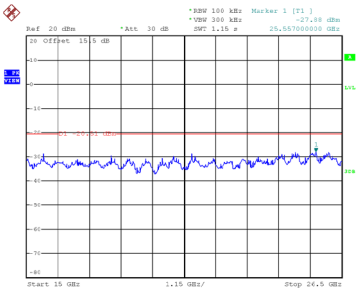
CH00 – 10th Harmonic of the fundamental frequency



Date: 18.AUG.2024 09:23:54

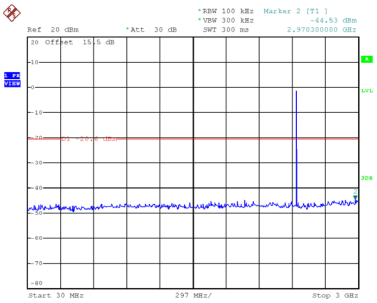


Date: 18.AUG.2024 09:24:01

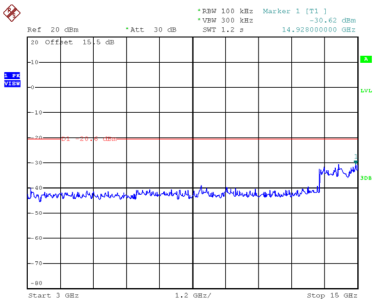


Date: 18.AUG.2024 09:24:09

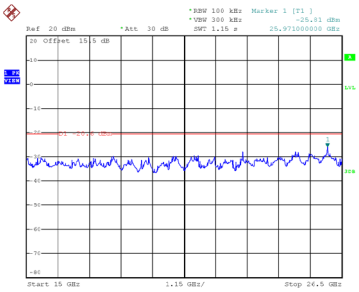
CH19 – 10th Harmonic of the fundamental frequency



Date: 18.AUG.2024 09:29:40

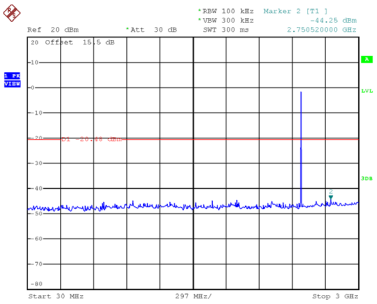


Date: 18.AUG.2024 09:29:47

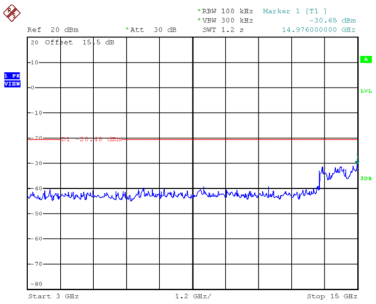


Date: 18.AUG.2024 09:29:54

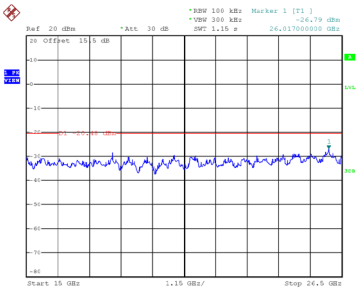
CH39 – 10th Harmonic of the fundamental frequency



Date: 18.AUG.2024 09:49:02



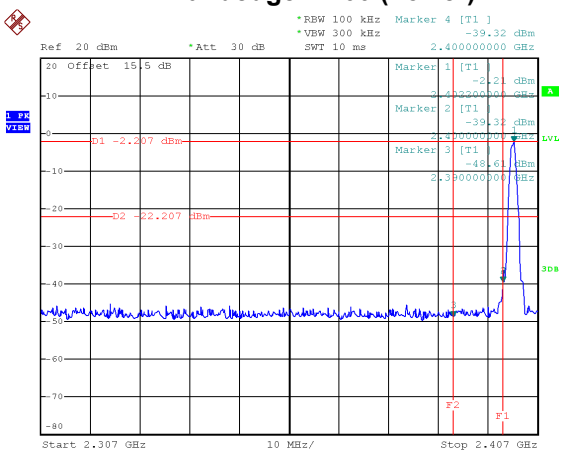
Date: 18.AUG.2024 09:49:09



Date: 18.AUG.2024 09:49:16

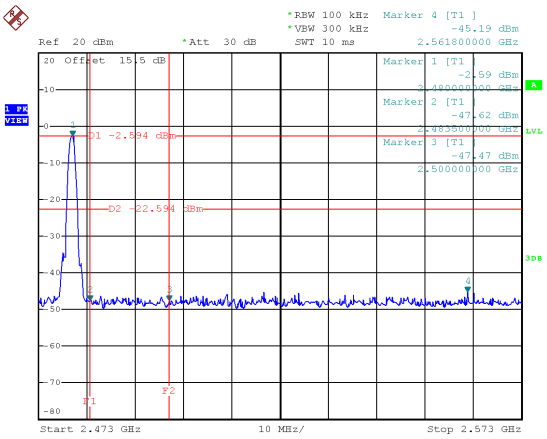
Test Mode	TX Mode _2Mbps

Bandedge CH00 (Lower)



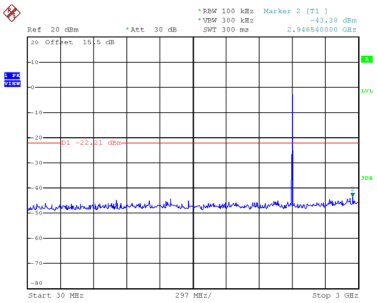
Date: 18.AUG.2024 09:51:40

Bandedge CH39 (Upper)

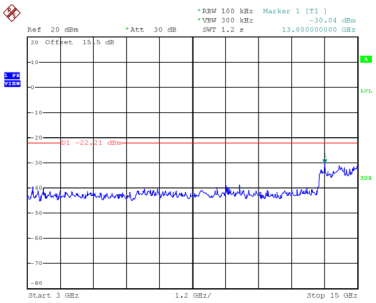


Date: 18.AUG.2024 10:01:14

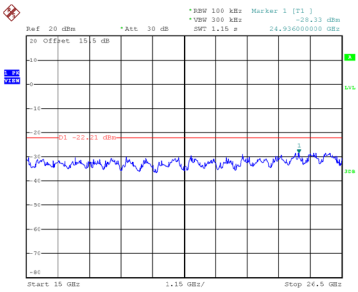
CH00 – 10th Harmonic of the fundamental frequency



Date: 18.AUG.2024 09:51:53

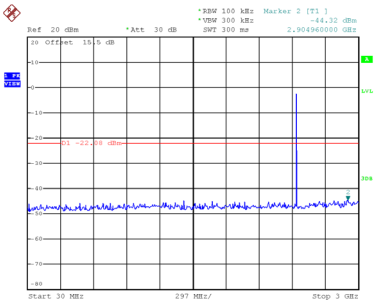


Date: 18.AUG.2024 09:52:00

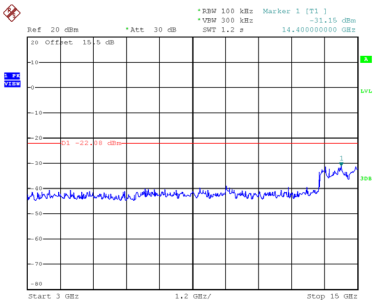


Date: 18.AUG.2024 09:52:08

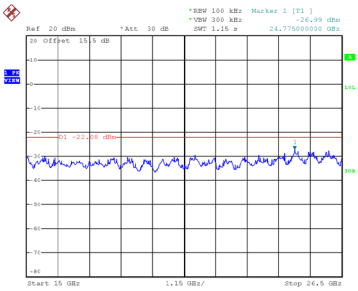
CH19 – 10th Harmonic of the fundamental frequency



Date: 18.AUG.2024 09:58:40

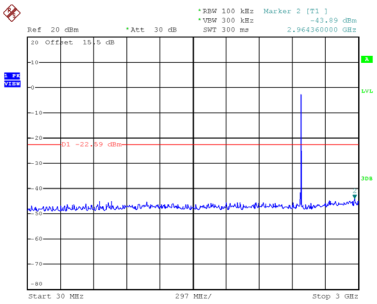


Date: 18.AUG.2024 09:58:48

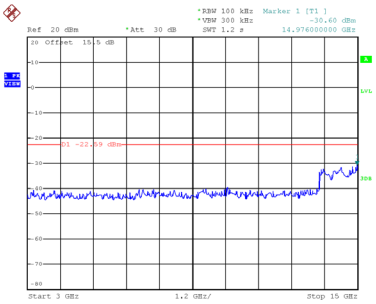


Date: 18.AUG.2024 09:58:55

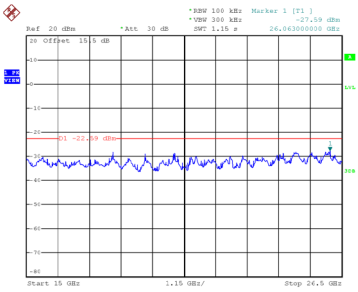
CH39 – 10th Harmonic of the fundamental frequency



Date: 18.AUG.2024 10:01:27



Date: 18.AUG.2024 10:01:34



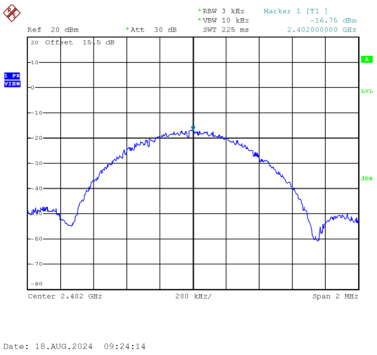
Date: 18.AUG.2024 10:01:41

APPENDIX G - POWER SPECTRAL DENSITY

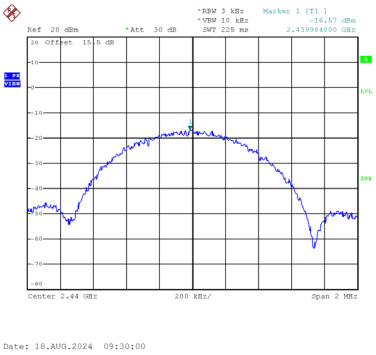
Test Mode	TX Mode _1Mbps

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-16.75	8.00	Pass
19	2440	-16.57	8.00	Pass
39	2480	-16.68	8.00	Pass

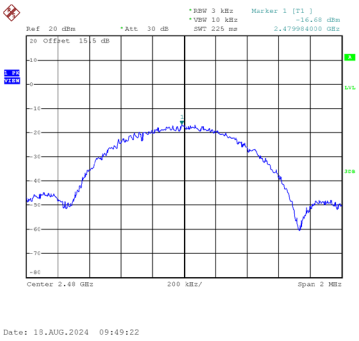
CH00



CH19



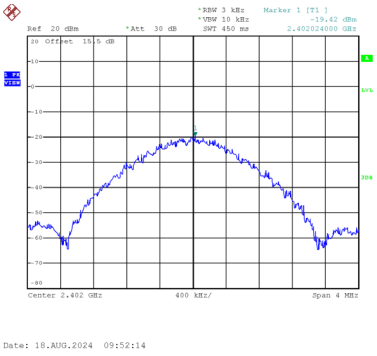
CH39



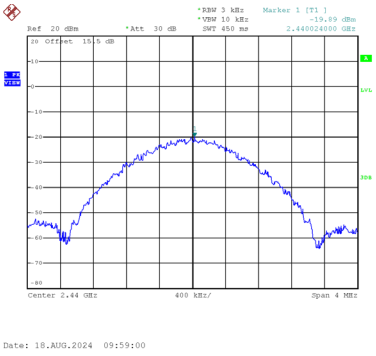
Test Mode	TX Mode _2Mbps

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-19.42	8.00	Pass
19	2440	-19.89	8.00	Pass
39	2480	-20.92	8.00	Pass

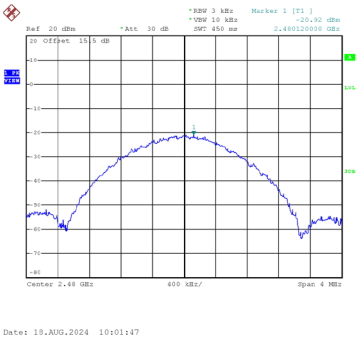
CH00



CH19



CH39



End of Test Report