FCC Radio Test Report

FCC ID: 2BSTS-MC450

This report concerns: Original Grant

Project No.	:	2511C569
Equipment	:	Projector
Brand Name	:	hp
Model Name	:	MC450, X1FA, MC450PRO, MC450A, X1F Max, X1F Ultra
Applicant	:	Global Aiptek Inc.
Address	:	2911 N Cicero Ave., Chicago, IL, 60641, US
Manufacturer	:	Global Aiptek Inc.
Address	:	2911 N Cicero Ave., Chicago, IL, 60641, US
Factory1	:	BO CHENG RUBBER PHILIPPINES INC.
Address	:	BLOCK 5 LOT 3 PHASE 3 LIMA TECHNOLOGY CENTER-SEZ SAN FERNANDO MALVAR BATANGAS, 4233 Philippines
Factory2	:	Chengdu Hotack Technology Co., Ltd.
Address	:	501-502, Unit 3, Building 13, No. 666 Jinfenghuang Avenue, High-tech Industry Park, Jinniu District, Chengdu City, Si Chuan Province,China.
Date of Receipt	:	Dec. 01, 2025
Date of Test	:	Dec. 02, 2025 ~ Jan. 14, 2026
Issued Date	:	Jan. 21, 2026
Test Sample	:	Engineering Sample No.: DG920251201202 for conducted, DG920251201203 for others.
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. (Dongguan)

Prepared by : Chella Zheng

Chella Zheng

Steven Lu

Approved by : Steven Lu

No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong People's Republic of China.
Tel: +86-769-8318-3000 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

REVISION HISTORY 6
1 . APPLICABLE STANDARDS 7
2 . SUMMARY OF TEST RESULTS 7
2.1 TEST FACILITY 8
2.2 MEASUREMENT UNCERTAINTY 8
2.3 TEST ENVIRONMENT CONDITIONS 9
3 . GENERAL INFORMATION 10
3.1 GENERAL DESCRIPTION OF EUT 10
3.2 DESCRIPTION OF TEST MODES 12
3.3 PARAMETERS OF TEST SOFTWARE 12
3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 13
3.5 SUPPORT UNITS 13
3.6 CUSTOMER INFORMATION DESCRIPTION 13
4 . AC POWER LINE CONDUCTED EMISSIONS 14
4.1 LIMIT 14
4.2 TEST PROCEDURE 14
4.3 DEVIATION FROM TEST STANDARD 14
4.4 TEST SETUP 15
4.5 EUT OPERATING CONDITIONS 15
4.6 TEST RESULTS 15
5 . RADIATED EMISSIONS 16
5.1 LIMIT 16
5.2 TEST PROCEDURE 17
5.3 DEVIATION FROM TEST STANDARD 18
5.4 TEST SETUP 18
5.5 EUT OPERATING CONDITIONS 20
5.6 TEST RESULT - 9 KHZ TO 30 MHZ 20
5.7 TEST RESULT - 30 MHZ TO 1000 MHZ 20
5.8 TEST RESULT - ABOVE 1000 MHZ 20
6 . BANDWIDTH 21
6.1 LIMIT 21

Table of Contents Page

6.2 TEST PROCEDURE 21
6.3 DEVIATION FROM STANDARD 21
6.4 TEST SETUP 21
6.5 EUT OPERATION CONDITIONS 21
6.6 TEST RESULTS 21
7 . MAXIMUM OUTPUT POWER 22
7.1 LIMIT 22
7.2 TEST PROCEDURE 22
7.3 DEVIATION FROM STANDARD 22
7.4 TEST SETUP 22
7.5 EUT OPERATION CONDITIONS 22
7.6 TEST RESULTS 22
8 . CONDUCTED SPURIOUS EMISSION 23
8.1 LIMIT 23
8.2 TEST PROCEDURE 23
8.3 DEVIATION FROM STANDARD 24
8.4 TEST SETUP 24
8.5 EUT OPERATION CONDITIONS 24
8.6 TEST RESULTS 24
9 . POWER SPECTRAL DENSITY 25
9.1 LIMIT 25
9.2 TEST PROCEDURE 25
9.3 DEVIATION FROM STANDARD 25
9.4 TEST SETUP 25
9.5 EUT OPERATION CONDITIONS 25
9.6 TEST RESULTS 25
10 . MEASUREMENT INSTRUMENTS LIST 26
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS 34
APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ 37
APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ 42
APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ 45
APPENDIX E - BANDWIDTH 53

Table of Contents Page

APPENDIX F - MAXIMUM OUTPUT POWER 55
APPENDIX G - CONDUCTED SPURIOUS EMISSION 57
APPENDIX H - POWER SPECTRAL DENSITY 59

REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-2-2511C569	R00	Original Report.	Jan. 21, 2026	Valid

1. APPLICABLE STANDARDS

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standard:
ANSI C63.10-2020
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 is at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan, 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. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DGDLC02	CISPR	150kHz ~ 30MHz	2.66

B. Radiated emissions Measurement:

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DGDLCB03	CISPR	9kHz ~ 30MHz	2.26

Test Site	Method	Measurement Frequency Range	Ant. H / V	*U*,(dB)
DGDLCB03 (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)
DGDLCB03 (3m)	CISPR	1GHz ~ 6GHz	4.16
		6GHz ~ 18GHz	4.74

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DGDLCB03 (1m)	CISPR	18 ~ 26.5 GHz	4.30

C. Other Measurement:

Test Item	Uncertainty
Bandwidth	0.75 %
Maximum Output Power	1.3 dB
Conducted Spurious Emission	2.1 dB
Conducted Bandedge Emission	1.7 dB
Power Spectral Density	1.8 dB
Temperature	0.7 °C
Humidity	1.7 %

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
AC Power Line Conducted Emissions	25°C	53%	AC 120V/60Hz	Hayden Chen
Radiated Emissions -9 kHz to 30 MHz	22°C	50%	AC 120V/60Hz	Hayden Chen
Radiated Emissions -30 MHz to 1000 MHz	22°C	50%	AC 120V/60Hz	Calvin Wen
Radiated Emissions -Above 1000 MHz	24°C	51%	AC 120V/60Hz	Calvin Wen
	22°C	50%	AC 120V/60Hz	Calvin Wen
	23°C	48%	AC 120V/60Hz	Torin Long
Bandwidth	25°C	47%	AC 120V/60Hz	Jay Wei
Maximum Output Power	°C	%	AC 120V/60Hz	Jay Wei
Conducted Spurious Emission	°C	%	AC 120V/60Hz	Jay Wei
Power Spectral Density	°C	%	AC 120V/60Hz	Jay Wei

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Projector
Brand Name	hp
Test Model	MC450
Model Name	MC450, X1FA, MC450PRO, MC450A, X1F Max, X1F Ultra
Model Difference(s)	Model name and colors are different.
Hardware Version	Android 13
Software Version	STM950-HTC-X3T
Power Source	DC Voltage supplied from AC adapter. Model: TPN-LA35
Power Rating	20V ⎓ 2.25A
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	1Mbps
Max. Output Power	1Mbps: 0.33 dBm (0.0011 W)

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or 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.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1		WIFI/BT	FPC	N/A	4.76

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_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 2	TX Mode_1Mbps Channel 19

Radiated emissions test - Below 1GHz & Above 18 GHz	
Final Test Mode	Description
Mode 2	TX Mode_1Mbps Channel 19

Radiated emissions test - 1 GHz - 18 GHz	
Final Test Mode	Description
Mode 1	TX Mode_1Mbps Channel 00/19/39

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

Note:

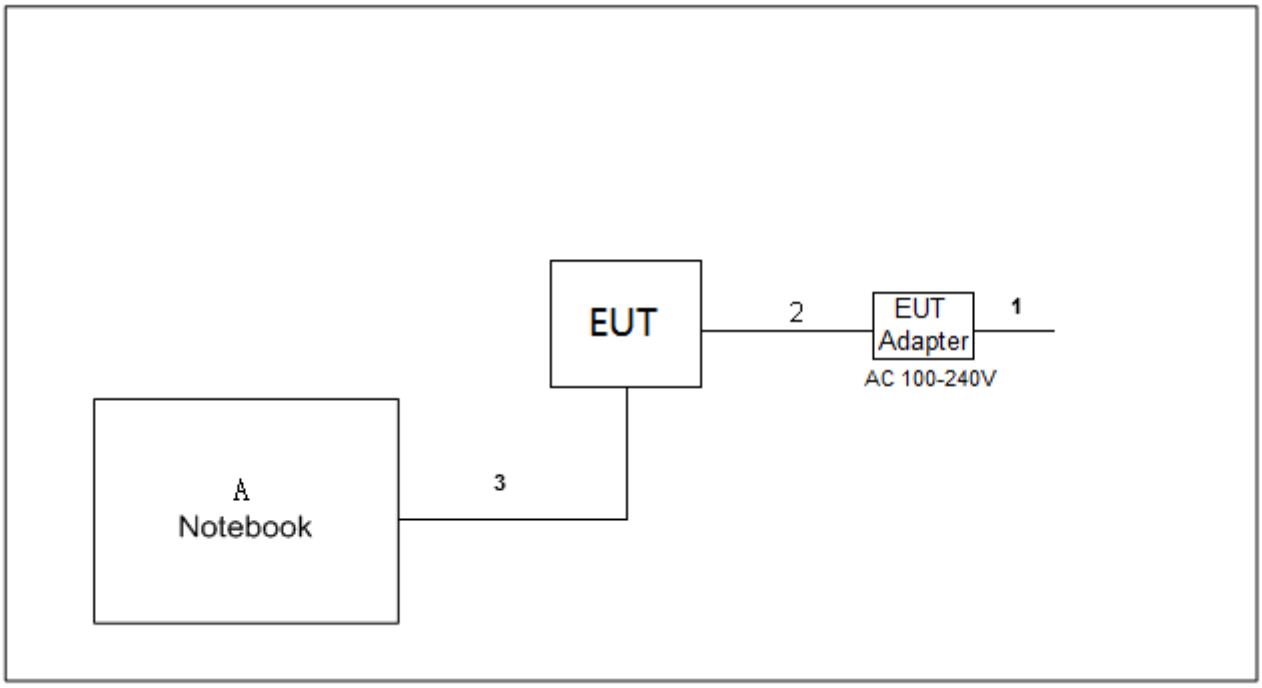
(1) For radiated emission above 1 GHz test, the spurious points of 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.
(2) For AC power line conducted emissions and radiated emissions below 1 GHz test, 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.
(4) For radiated emission 1 GHz - 18GHz test, the polarization of Vertical and Horizontal are evaluated, the worst case is Vertical for Band edge, Horizontal for Harmonic. In this report only recorded the worst case.

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	ADB		
Frequency (MHz)	2402	2440	2480
1Mbps	Default	Default	Default

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
A	Notebook	HUAWEI	KLVG-16	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	AC Cable	NO	NO	1m
2	DC Cable	NO	NO	1.2m
3	USB Cable	NO	NO	1.2m

3.6 CUSTOMER INFORMATION DESCRIPTION

1) The antenna gain is provided by the manufacturer.
2) Except for AC power line conducted emissions and radiated emissions, the results of all test items include cable losses. All cable losses are provided by the testing laboratory.

4. AC POWER LINE CONDUCTED EMISSIONS

4.1 LIMIT

Frequency of Emission (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56*	56 to 46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

Note:

(1) The tighter limit applies at the band edges.
(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
(3) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)
Margin Level = Measurement Value - Limit Value

4.2 TEST PROCEDURE

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

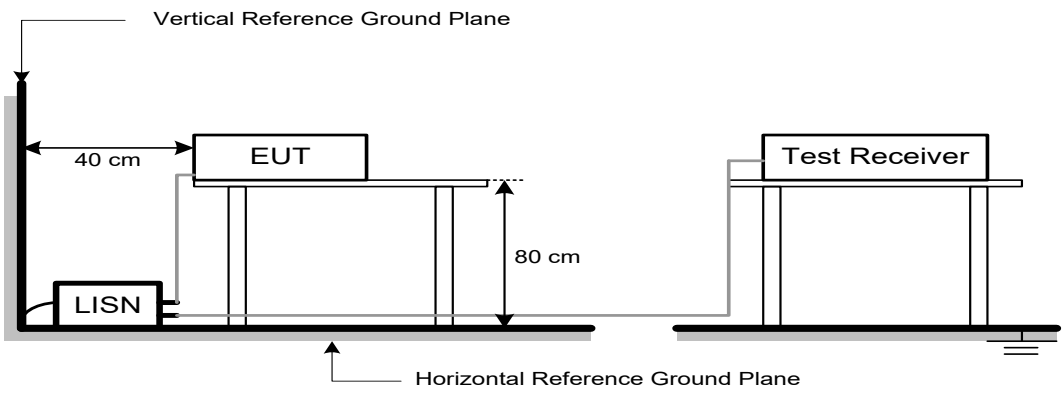
The following table is the setting of the receiver:

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

4.3 DEVIATION FROM TEST STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATING CONDITIONS

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

4.6 TEST RESULTS

Please refer to the APPENDIX A.

Remark:

(1) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform.In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.

(2) Measuring frequency range from 150 kHz to 30 MHz.

5. RADIATED EMISSIONS

5.1 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)	Band edge/ Harmonic at 3m (dBµV/m)		Harmonic at 1m (dBµV/m)	
	Peak	Average	Peak	Average
Above 1000	74	54	83.5 (Note 5)	63.5 (Note 5)

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) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

(5)

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

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.

5.2 TEST PROCEDURE

a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 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

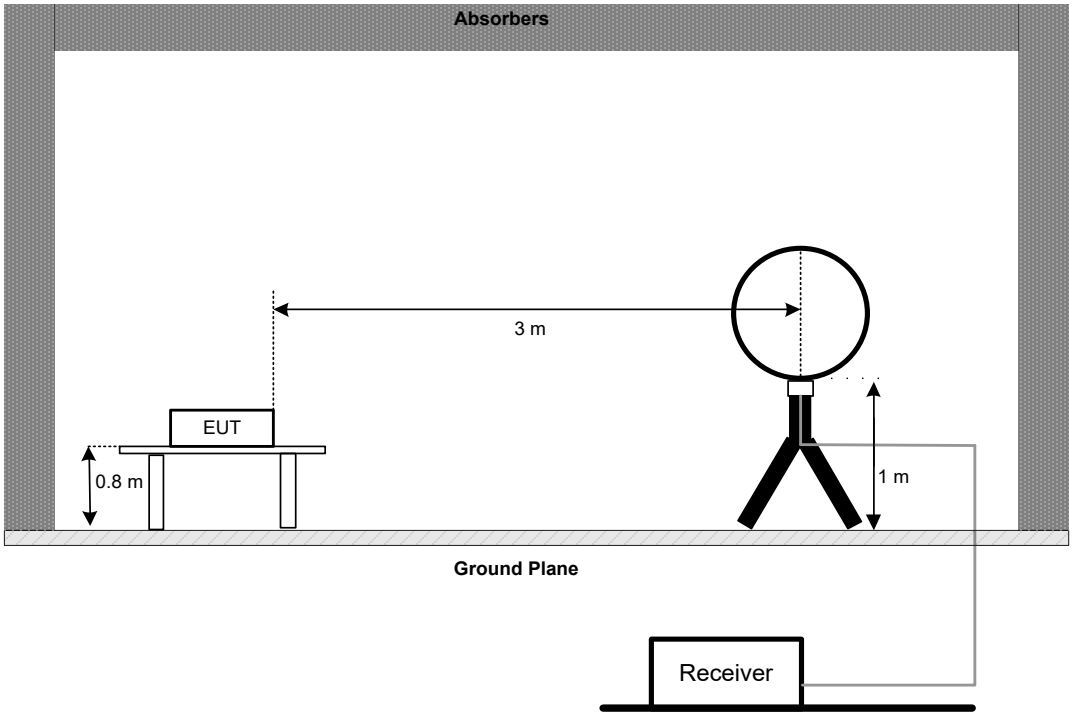
Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector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

5.3 DEVIATION FROM TEST STANDARD

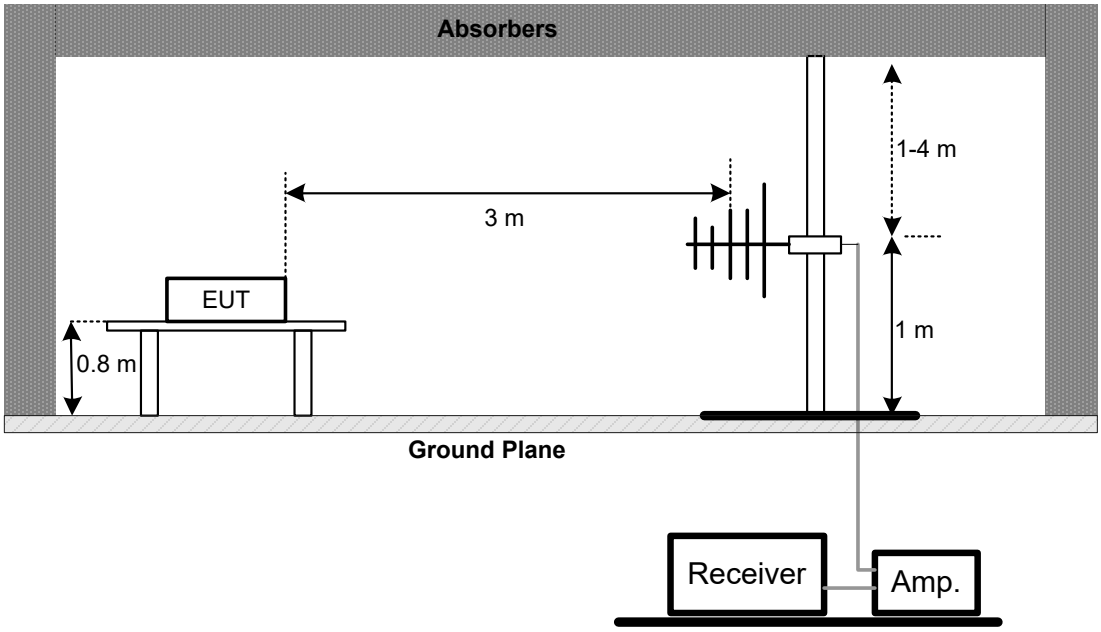
No deviation.

5.4 TEST SETUP

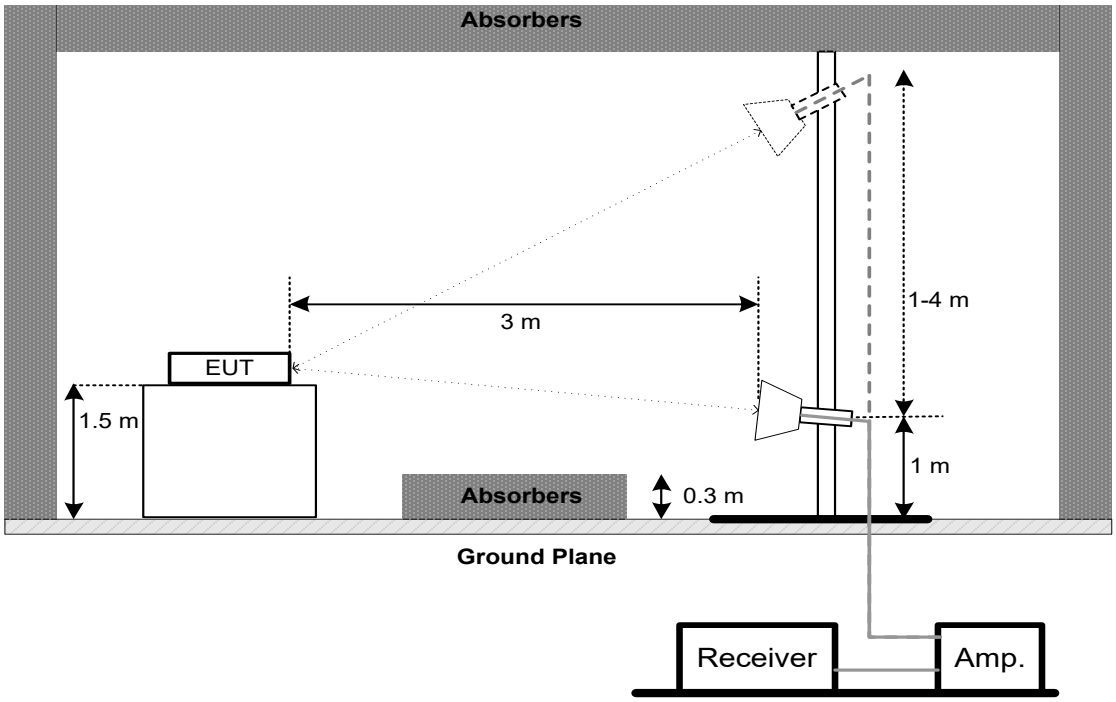
9 kHz to 30 MHz



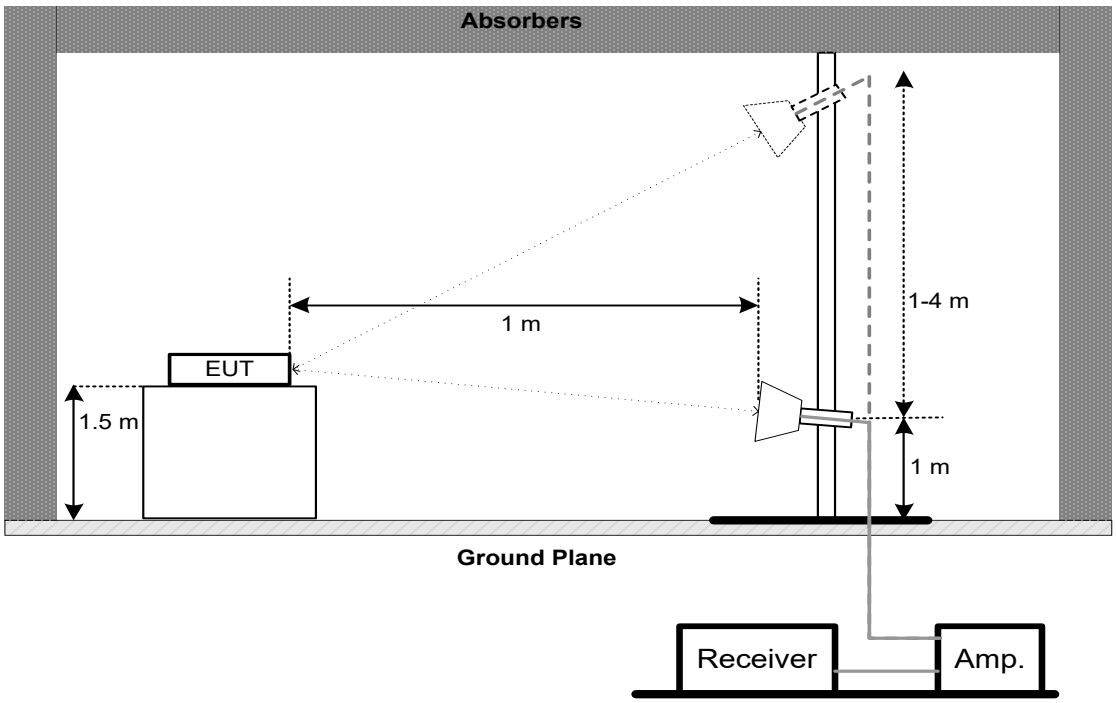
30 MHz to 1 GHz



Above 1 GHz
Band edge & Harmonic(1 GHz to 18 GHz)



Harmonic(18 GHz to 26.5 GHz)



5.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULT - 9 kHz TO 30 MHz

Please refer to the APPENDIX B.

Remark:

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

5.7 TEST RESULT - 30 MHz TO 1000 MHz

Please refer to the APPENDIX C.

5.8 TEST RESULT - ABOVE 1000 MHz

Please refer to the APPENDIX D.

Remark:

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

6. BANDWIDTH

6.1 LIMIT

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

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:

For 6 dB Bandwidth:

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

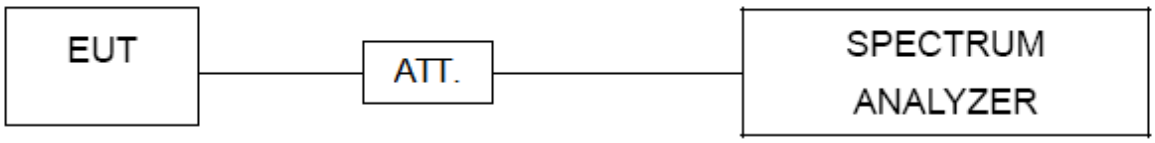
For 99% Emission Bandwidth:

Spectrum Parameters	Setting
Span	Between 1.5 times and 5.0 times the OBW
RBW	30 kHz
VBW	100 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 E.

7. MAXIMUM OUTPUT POWER

7.1 LIMIT

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

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.

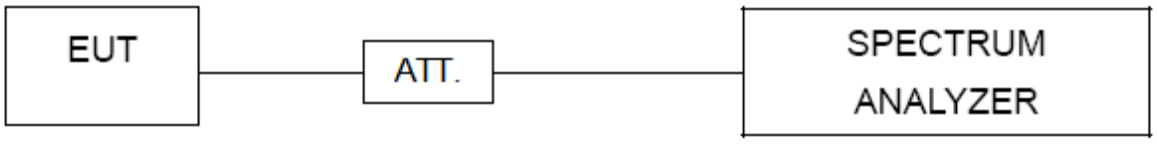
b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span	≥ 3×RBW
RBW	3 MHz
VBW	3 MHz
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. CONDUCTED SPURIOUS EMISSION

8.1 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.

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:

For Reference Level:

Spectrum Parameters	Setting
Span	≥ 1.5 times the bandwidth.
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

For Emission Level - Band edge:

Spectrum Parameters	Setting
Start Frequency	2300 MHz
Stop Frequency	2690 MHz
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

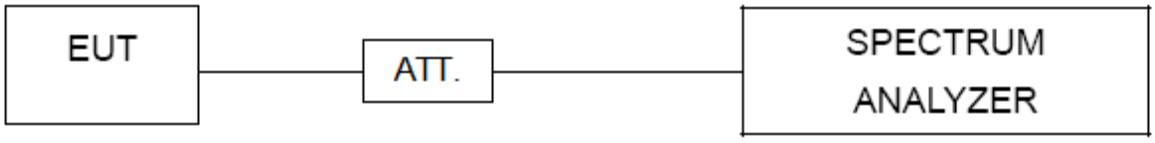
For Emission Level - Harmonic:

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

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. POWER SPECTRAL DENSITY

9.1 LIMIT

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

9.2 TEST PROCEDURE

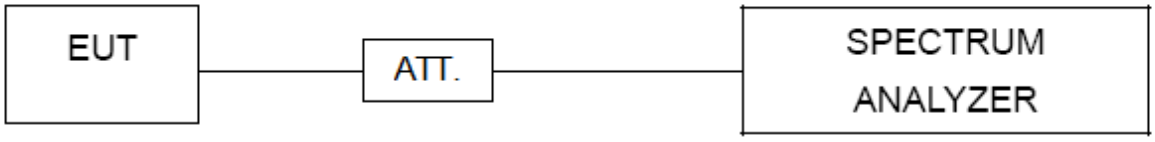
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span	1.5 times the DTS bandwidth
RBW	3 kHz
VBW	10 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



9.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

9.6 TEST RESULTS

Please refer to the APPENDIX H.

10. MEASUREMENT INSTRUMENTS LIST

AC Power Line Conducted Emissions (Test Date: Dec. 11, 2025)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI TEST RECEIVER	R&S	ESCI	100382	Nov. 21, 2026
2	TWO-LINE V-NETWORK	R&S	ENV216	101447	Nov. 21, 2026
3	BTL_RE_System	BTL	BTL_RE_System	N/A	N/A
4	Cable	N/A	SFT205-NMNM-9M -001	9M	Jul. 08, 2026
5	643 Shield Room	ETS	6*4*3	N/A	N/A

Radiated Emissions - 9 kHz to 30 MHz (Test Date: Dec. 12, 2025)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Active Loop Antenna	Schwarzbeck	FMZB 1513-60	00025	Mar. 01, 2026
2	Receiver	Agilent	N9038A	MY52130039	Jan. 10, 2026
3	Cable	RegalWay	LMR400-NMNM-6 m	N/A	Apr. 26, 2026
4	Cable	RegalWay	LMR400-NMRANM -3.5m	N/A	Apr. 26, 2026
5	966 Chamber room	CM	9*6*6	N/A	May 09, 2026
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated Emissions - 30 MHz to 1 GHz (Test Date: Dec. 12, 2025)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	01462	Dec. 14, 2025
2	Attenuator	EMC INSTRUMENT	EMCI-N-6-06	AT-06009	Dec. 14, 2025
3	Preamplifier	EMC INSTRUMENT	EMC001330	980998	May 17, 2026
4	Cable	RegalWay	LMR400-NMNM-12 .5m	N/A	Jun. 04, 2026
5	Cable	RegalWay	LMR400-NMNM-3 m	N/A	Jun. 04, 2026
6	Cable	RegalWay	LMR400-NMNM-0. 5m	N/A	Jun. 04, 2026
7	Receiver	Agilent	N9038A	MY52130039	Jan. 10, 2026
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 15, 2026

Radiated Emissions - 1 GHz - 18 GHz (Test Date: Dec. 25, 2025 ~ Dec. 31, 2025)					
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	966 Chamber room	CM	9*6*6	N/A	May 15, 2026
4	Cable	RegalWay	RWLP50-4.0A-SMSM-12.5M	N/A	Jun. 29, 2026
5	Cable	RegalWay	RWLP50-4.0A-NMRASM-2.5M	N/A	Jun. 29, 2026
6	Cable	RegalWay	RWLP50-4.0A-NMRASMRA-0.8M	N/A	Jun. 29, 2026
7	Receiver	Agilent	N9038A	MY52130039	Jan. 10, 2026
8	Double Ridged Guide Antenna	ETS	3115	75846	Mar. 02, 2026
9	Preamplifier	EMC INSTRUMENT	EMC118A45SE	980888	Oct. 17, 2026
10	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A
11	Filter	STI	STI15-9912	N/A	May 27, 2026

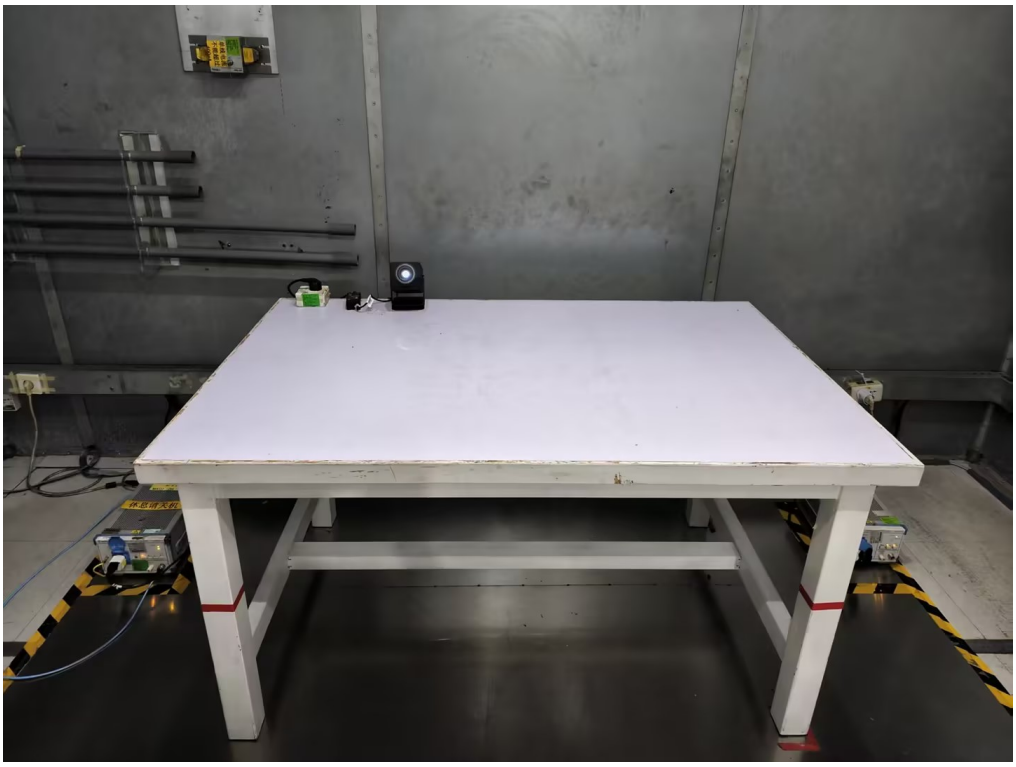
Radiated Emissions - Above 18 GHz (Test Date: Dec. 12, 2025)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Cable	Tonscend	HF160-KMKM-0.5M	N/A	Oct. 21, 2026
2	Cable	Tonscend	HF160-KMKM-5M	N/A	Oct. 21, 2026
3	Pre-Amplifier	EMC INSTRUMENT	EMC184045SE	980409	Nov. 21, 2026
4	DRG Horn Antenna	ETS	3116C	218942	Feb. 28, 2026
5	Positioning Controller	MF	MF-7802	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	MXA Signal Analyzer	KEYSIGHT	N9020B	MY63380204	Jul. 25, 2026

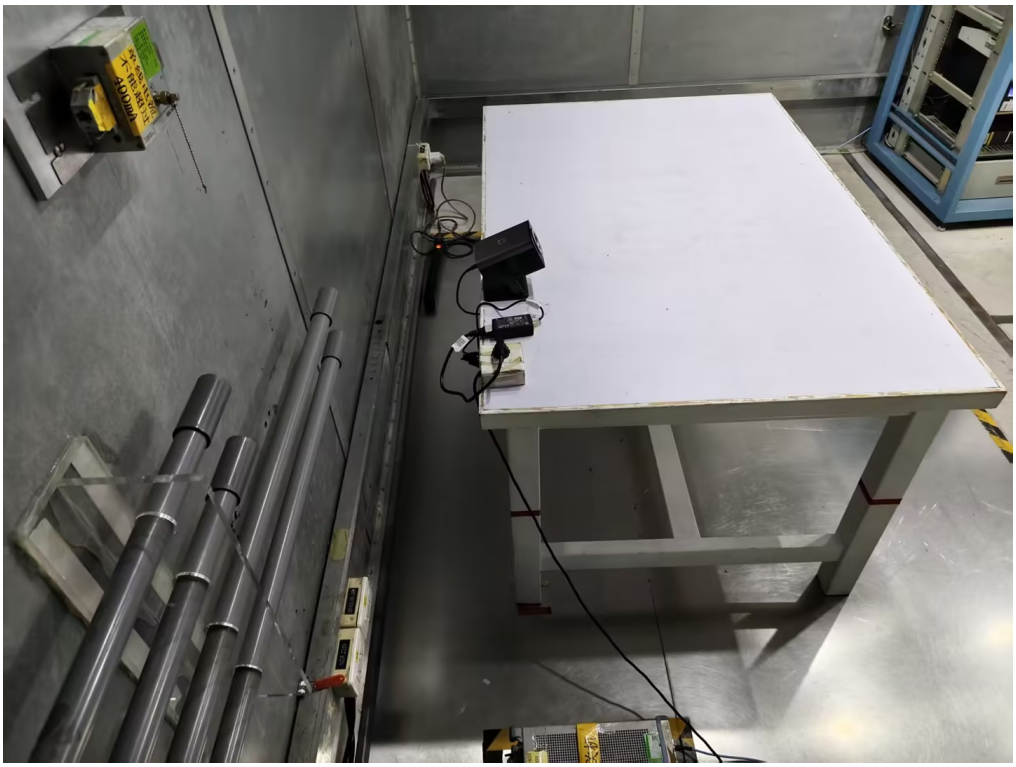
Bandwidth & Maximum Output Power & Power Spectral Density & Conducted Spurious Emission (Test Date: Jan. 06, 2026)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP38	100852	May 27, 2026
2	CTA	BTL	CTA	N/A	N/A
3	Isolation attenuator	Z-Link	ASMA-16-18-2W	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.

10.1. EUT TEST PHOTO

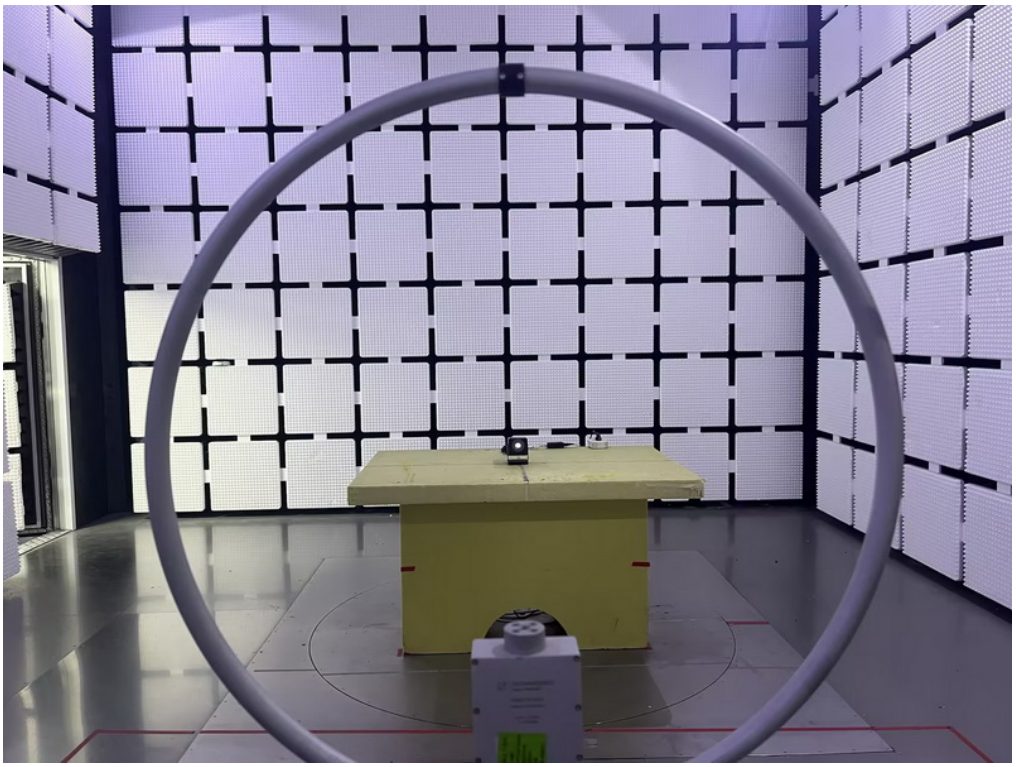
AC Power Line Conducted Emissions Test Photos

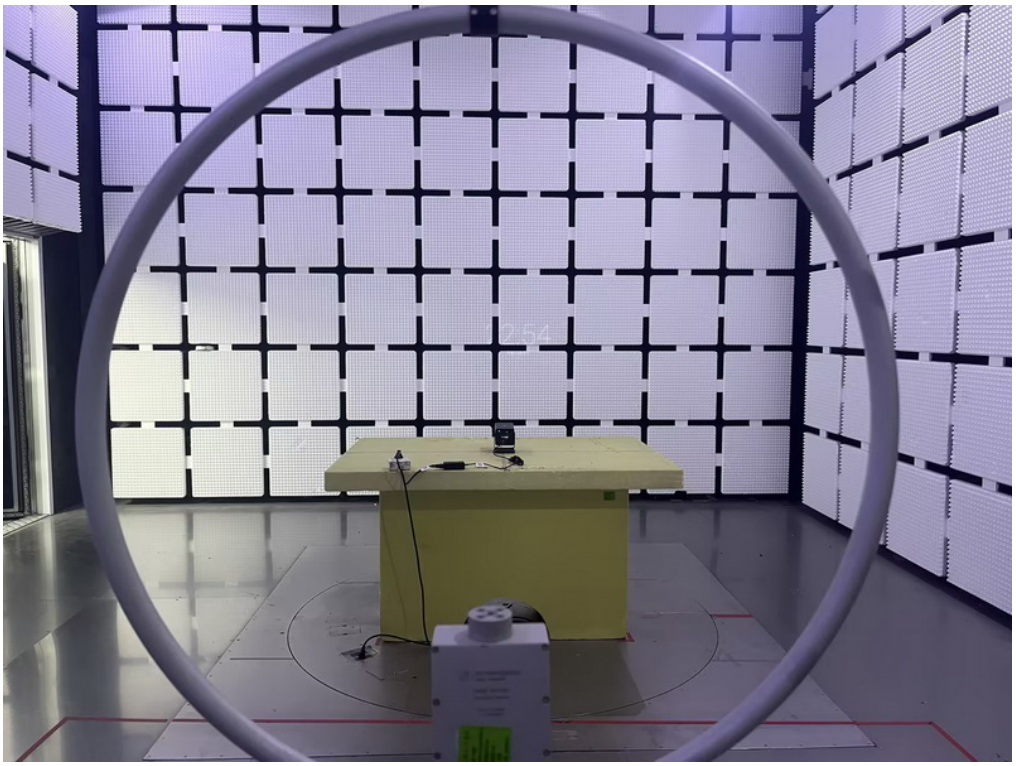




Radiated Emissions Test Photos

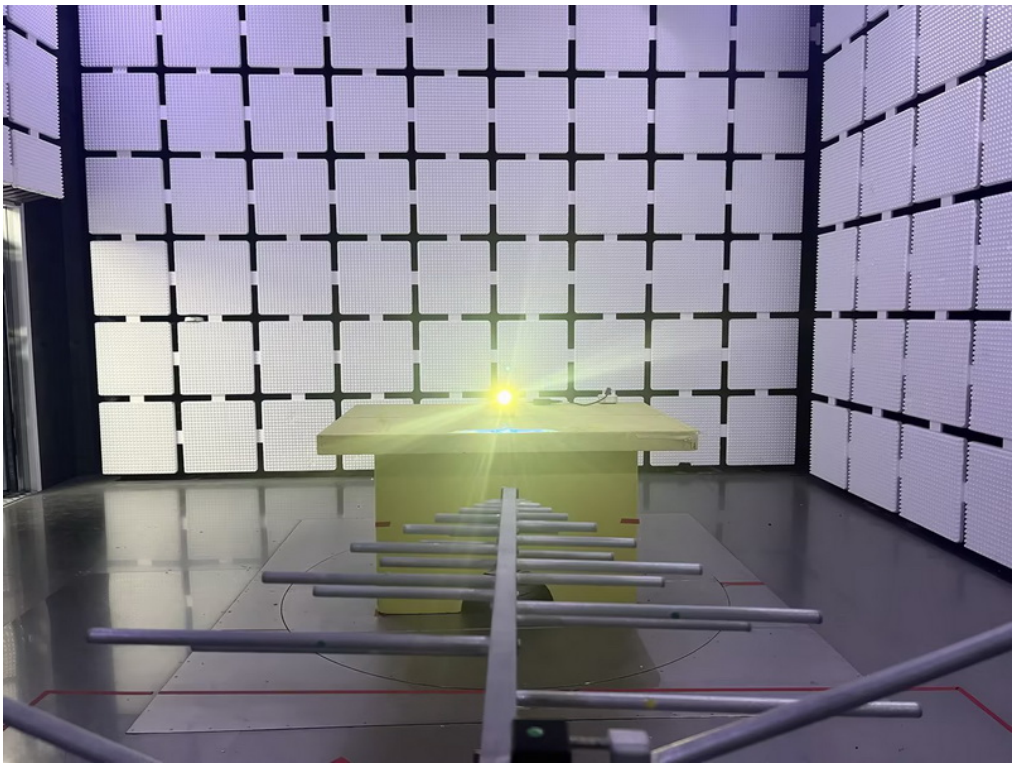
9 kHz to 30 MHz

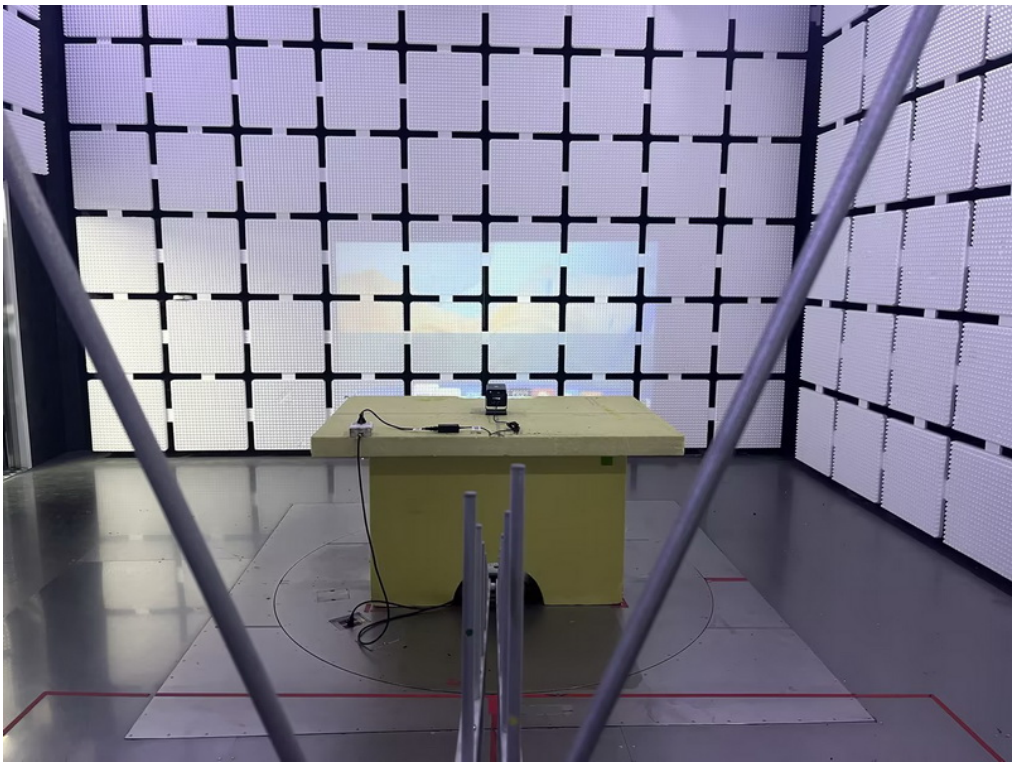




Radiated Emissions Test Photos

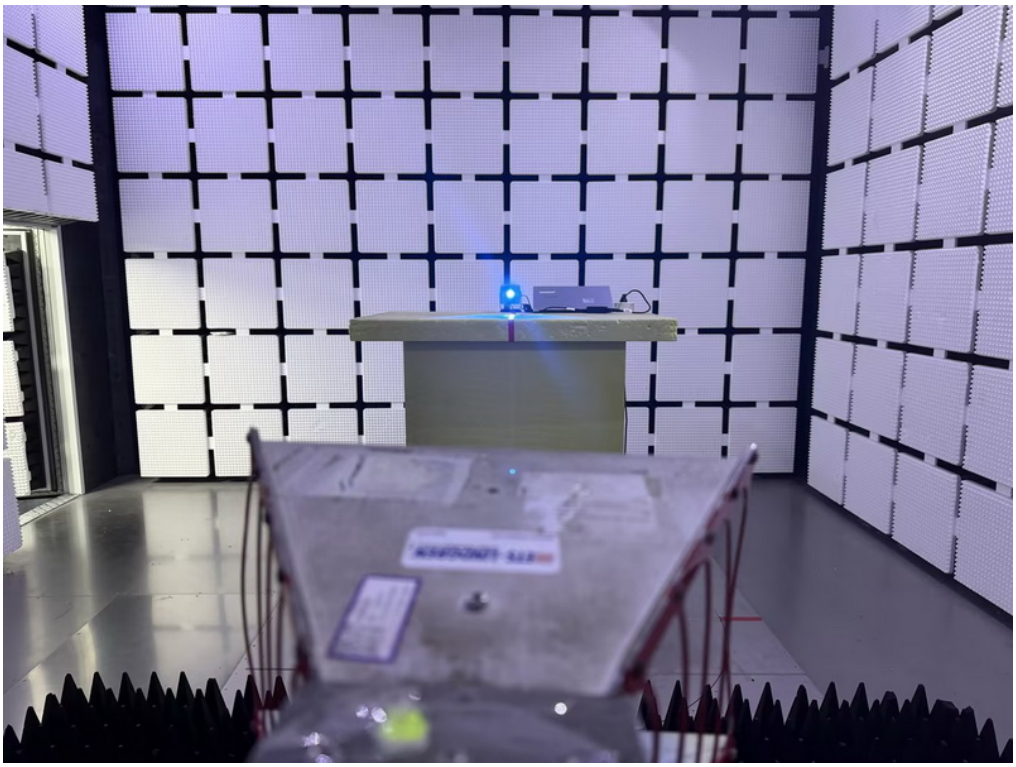
30 MHz to 1000 MHz

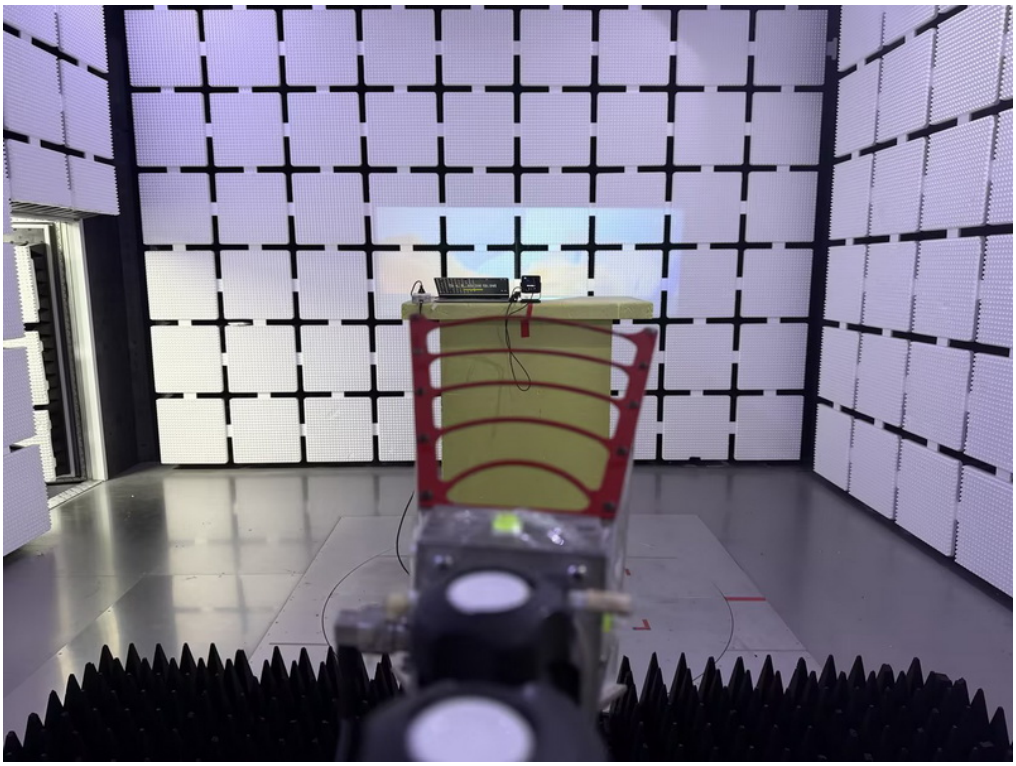




Radiated Emissions Test Photos

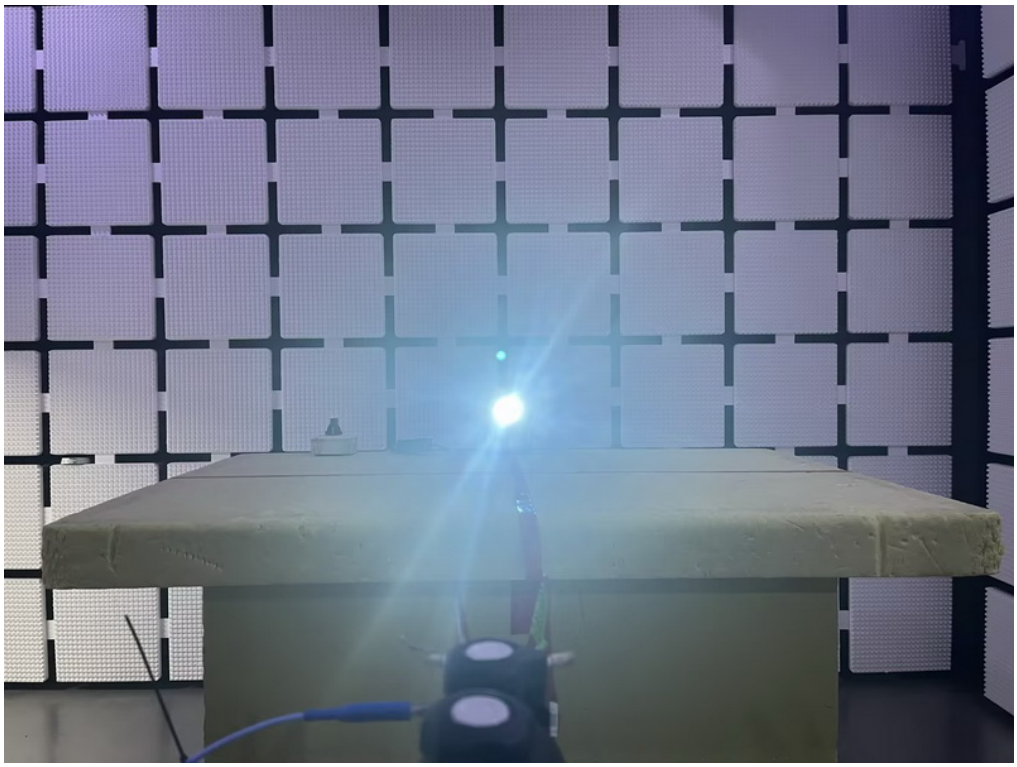
Band edge & Harmonic(1 GHz to 18 GHz)

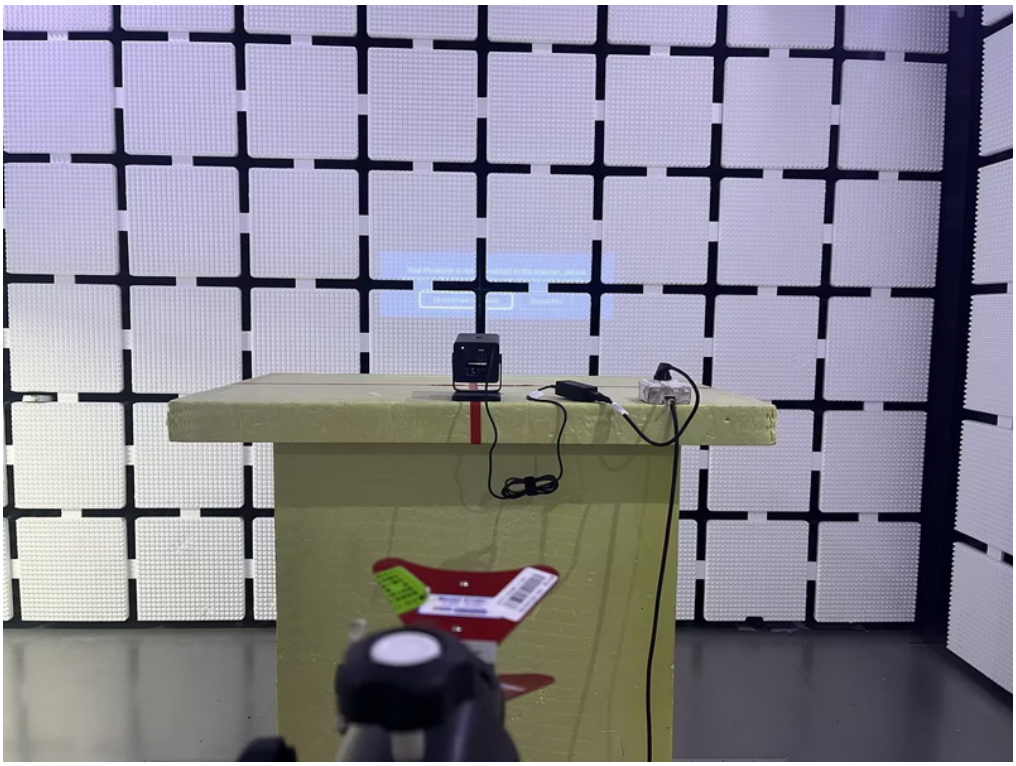




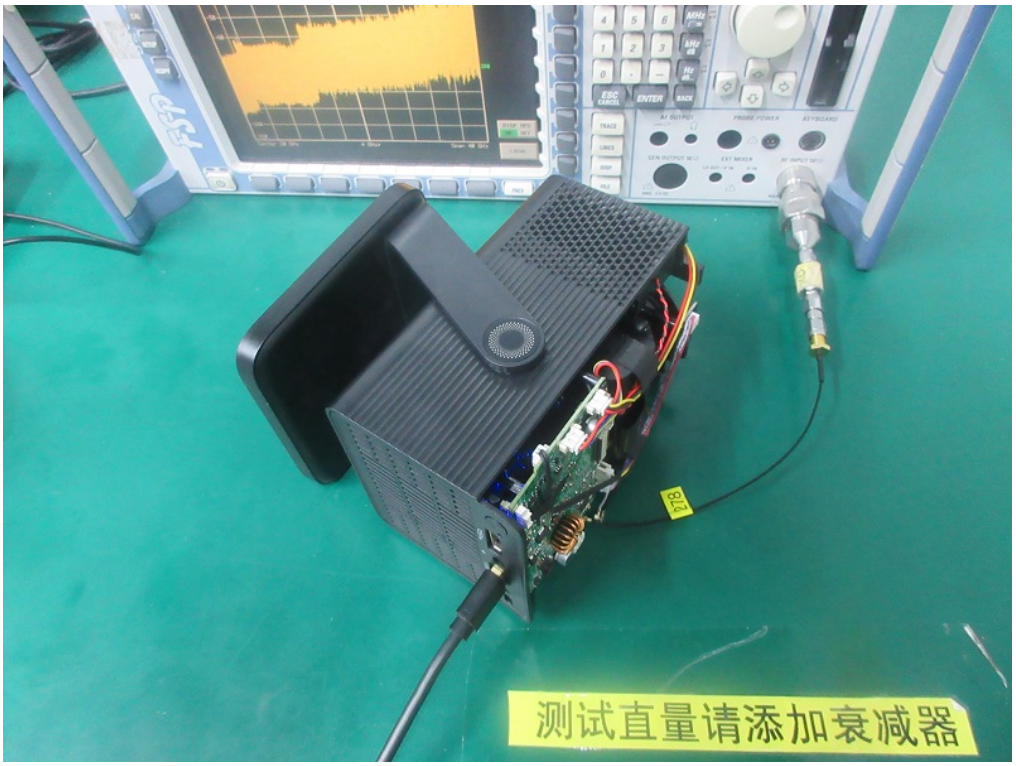
Radiated Emissions Test Photos

Harmonic(18 GHz to 26.5 GHz)



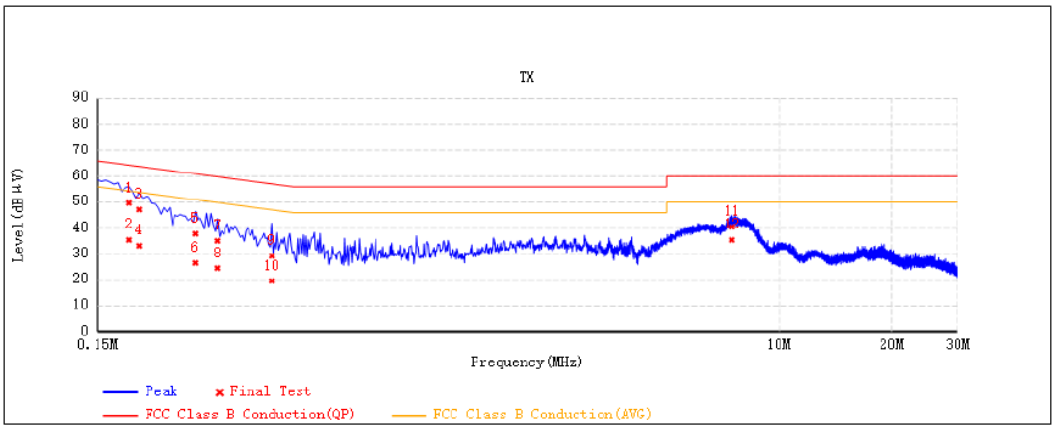


Conducted Test Photos



APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

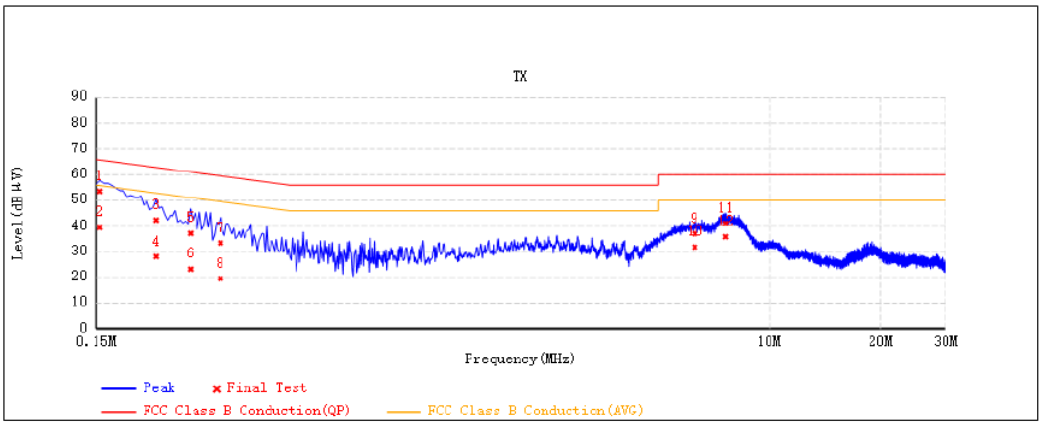
Test Mode	TX Mode Channel 19_1Mbps	Phase	Line



Suspected Note List									
	NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBμV]	Limit [dBμV]	Margin [dB]	Detector	Content
	1	0.1825	39.31	10.39	49.7	64.37	-14.68	QP	
	2	0.1825	25.06	10.39	35.44	54.37	-18.93	AVG	
	3	0.1938	36.81	10.4	47.2	63.87	-16.67	QP	
	4	0.1938	22.78	10.4	33.18	53.87	-20.69	AVG	
	5	0.2735	27.37	10.44	37.81	61.01	-23.2	QP	
	6	0.2735	16.06	10.44	26.5	51.01	-24.51	AVG	
	7	0.3135	24.63	10.45	35.08	59.88	-24.79	QP	
	8	0.3135	14.06	10.45	24.51	49.88	-25.36	AVG	
	9	0.4384	18.74	10.47	29.21	57.09	-27.88	QP	
	10	0.4384	9.09	10.47	19.56	47.09	-27.53	AVG	
	11	7.4778	29.21	11.27	40.48	60	-19.52	QP	
*	12	7.4778	24.16	11.27	35.43	50	-14.57	AVG	

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

Test Mode	TX Mode Channel 19_1Mbps	Phase	Neutral

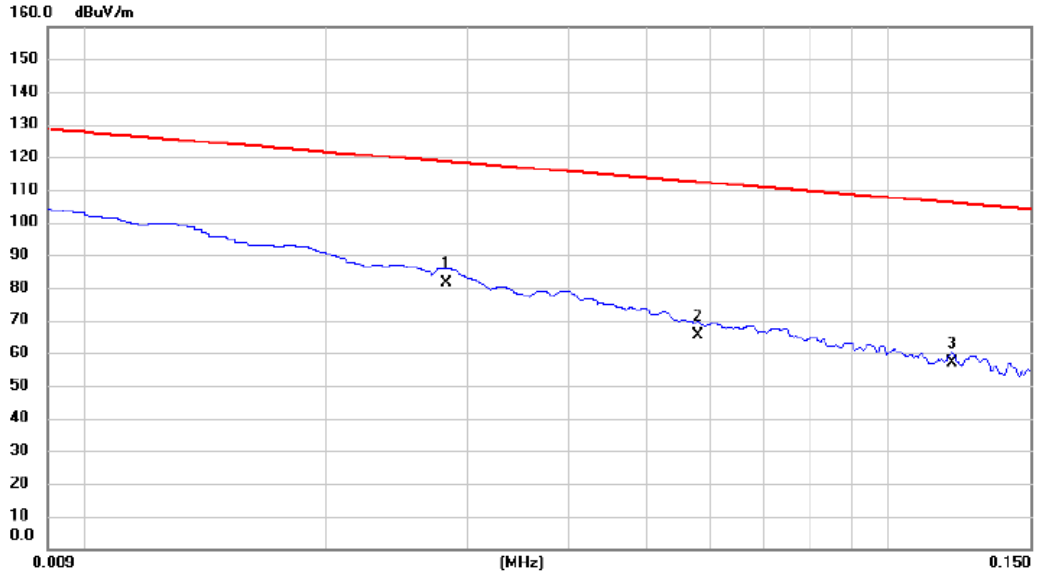


Suspected Note List									
	NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBμV]	Limit [dBμV]	Margin [dB]	Detector	Content
*	1	0.1537	43.15	10.42	53.57	65.8	-12.23	QP	
	2	0.1537	29.01	10.42	39.43	55.8	-16.37	AVG	
	3	0.2183	31.9	10.45	42.34	62.88	-20.54	QP	
	4	0.2183	17.64	10.45	28.08	52.88	-24.8	AVG	
	5	0.2703	26.68	10.46	37.15	61.11	-23.96	QP	
	6	0.2703	12.72	10.46	23.18	51.11	-27.92	AVG	
	7	0.326	22.94	10.49	33.42	59.55	-26.13	QP	
	8	0.326	9.01	10.49	19.5	49.55	-30.06	AVG	
	9	6.2777	25.74	11.27	37.01	60	-22.99	QP	
	10	6.2777	20.55	11.27	31.82	50	-18.18	AVG	
	11	7.618	29.64	11.41	41.05	60	-18.95	QP	
	12	7.618	24.44	11.41	35.84	50	-14.16	AVG	

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

APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ

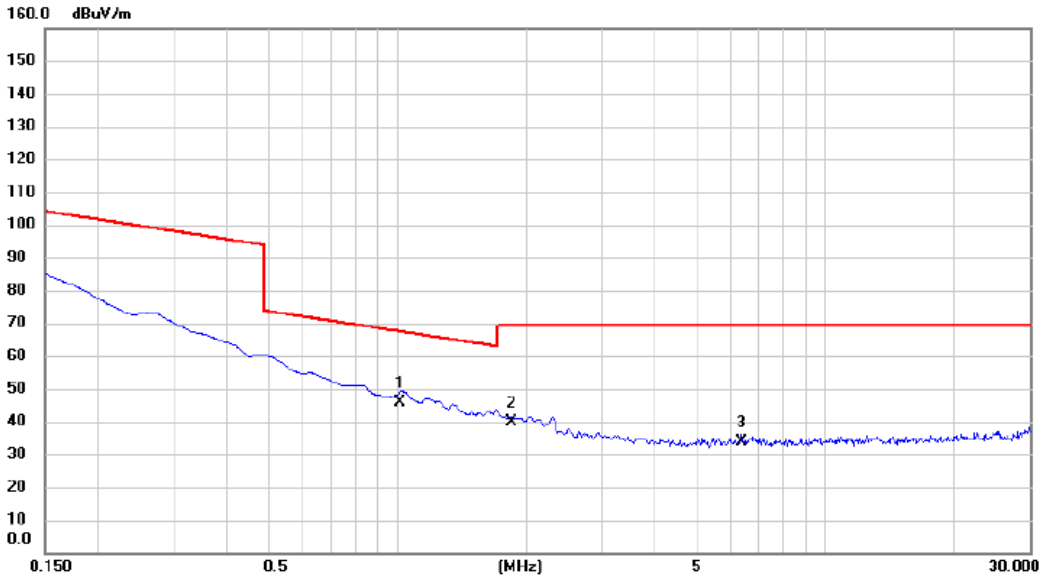
Test Mode	TX Mode Channel 19 _1Mbps	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.028	61.24	20.18	81.42	118.60	-37.18	AVG	
2		0.058	45.32	20.14	65.46	112.34	-46.88	AVG	
3		0.120	37.10	20.10	57.20	106.04	-48.84	AVG	

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

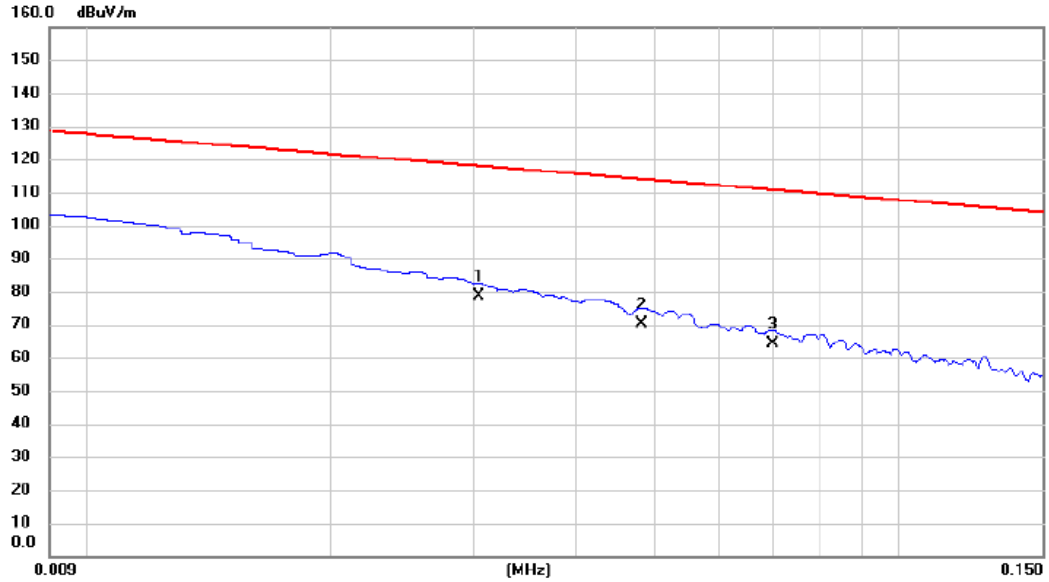
Test Mode	TX Mode Channel 19 _1Mbps	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	1.016	25.64	20.00	45.64	67.47	-21.83	QP	
2		1.851	19.64	20.01	39.65	69.54	-29.89	QP	
3		6.359	13.54	20.28	33.82	69.54	-35.72	QP	

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

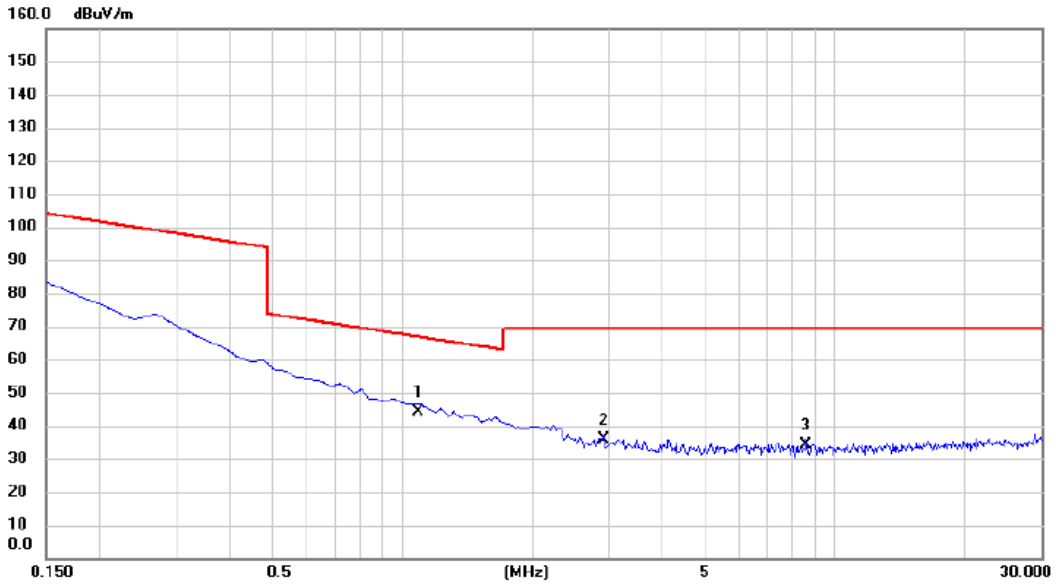
Test Mode	TX Mode Channel 19 _1Mbps	Polarization	Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.030	58.41	20.14	78.55	117.95	-39.40	AVG	
2		0.048	50.26	20.14	70.40	113.93	-43.53	AVG	
3		0.070	44.13	20.14	64.27	110.70	-46.43	AVG	

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

Test Mode	TX Mode Channel 19 _1Mbps	Polarization	Ant 90°

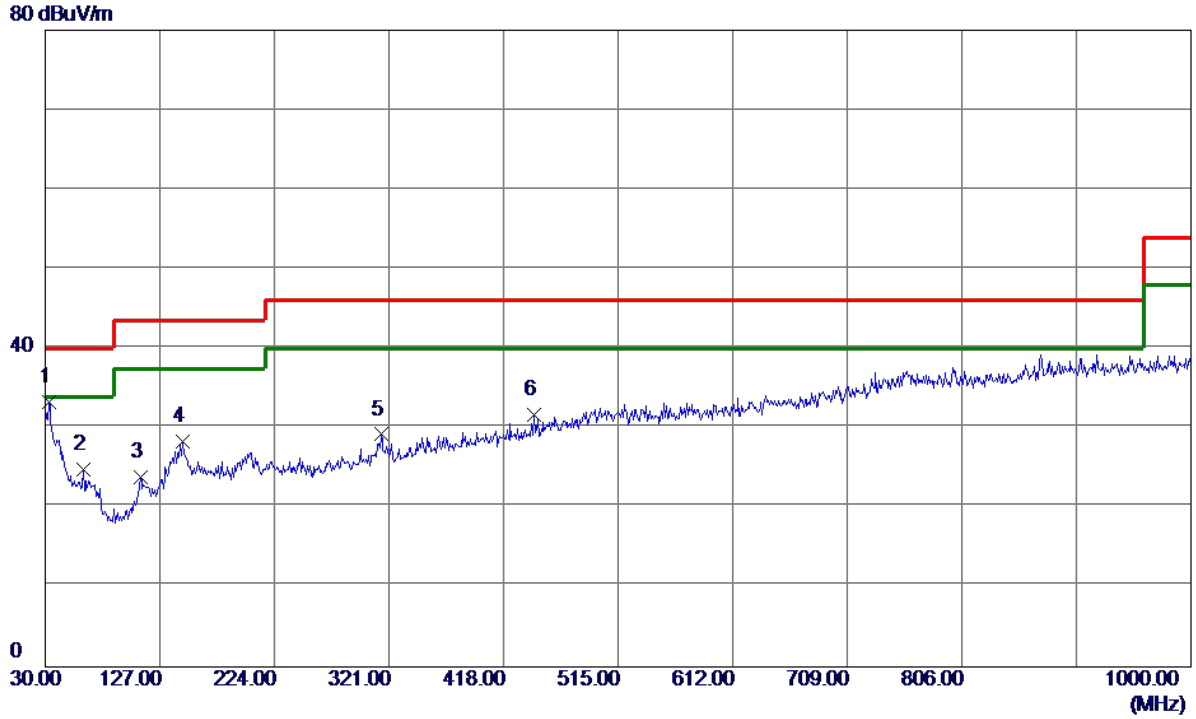


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	1.088	24.21	20.00	44.21	66.87	-22.66	QP	
2		2.926	15.64	20.07	35.71	69.54	-33.83	QP	
3		8.568	13.99	20.40	34.39	69.54	-35.15	QP	

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

APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

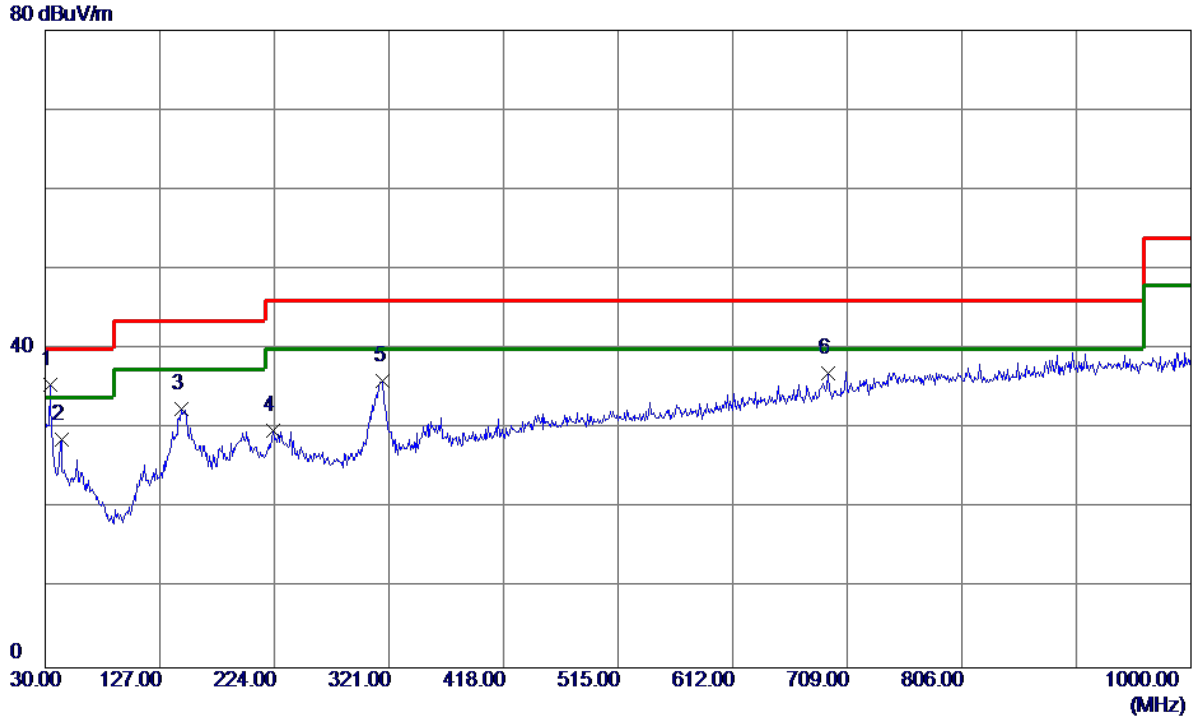
Test Mode	TX Mode Channel 19 _1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	32.9100	45.80	-12.53	33.27	40.00	-6.73	Peak	
2	62.0100	36.67	-11.84	24.83	40.00	-15.17	Peak	
3	110.5100	37.68	-13.82	23.86	43.52	-19.66	Peak	
4	146.4000	38.95	-10.66	28.29	43.52	-15.23	Peak	
5	314.2100	38.07	-8.87	29.20	46.02	-16.82	Peak	
6	444.1900	37.82	-6.19	31.63	46.02	-14.39	Peak	

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

Test Mode	TX Mode Channel 19 _1Mbps	Polarization	Horizontal

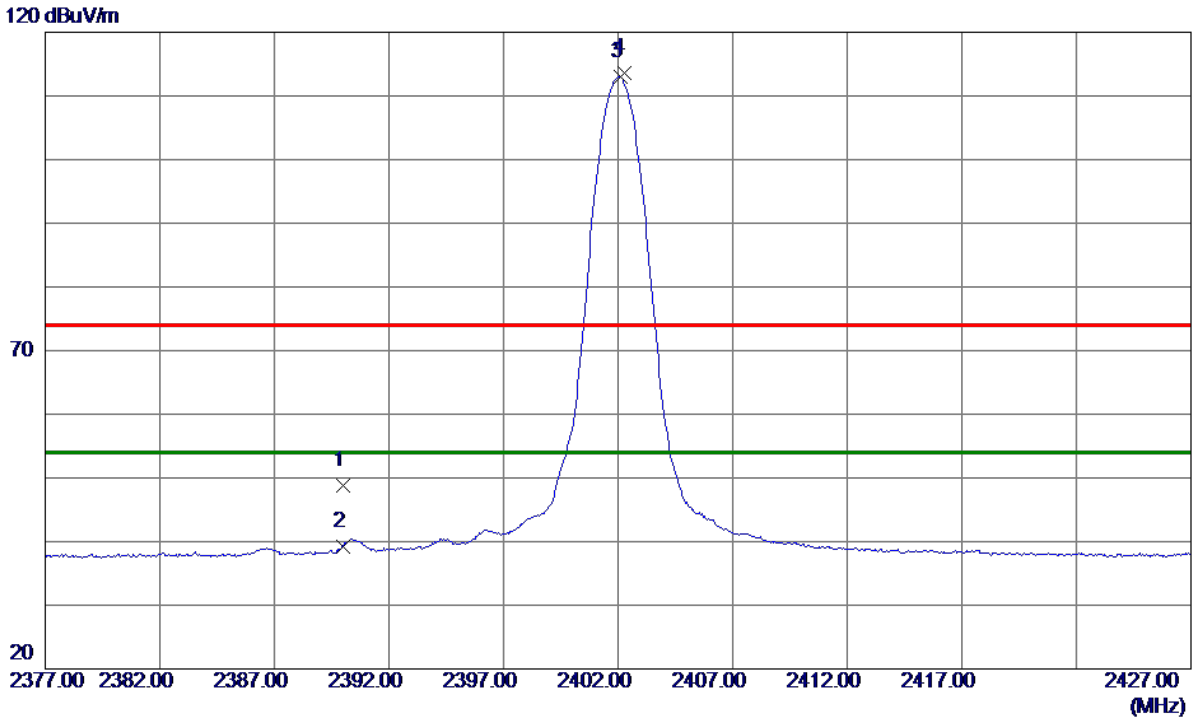


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	33.8800	47.93	-12.42	35.51	40.00	-4.49	Peak	
2	43.5800	39.90	-11.27	28.63	40.00	-11.37	Peak	
3	145.4299	43.16	-10.71	32.45	43.52	-11.07	Peak	
4	223.0300	42.27	-12.45	29.82	46.02	-16.20	Peak	
5	316.1500	44.87	-8.84	36.03	46.02	-9.99	Peak	
6	692.5100	39.12	-2.14	36.98	46.02	-9.04	Peak	

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

APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ

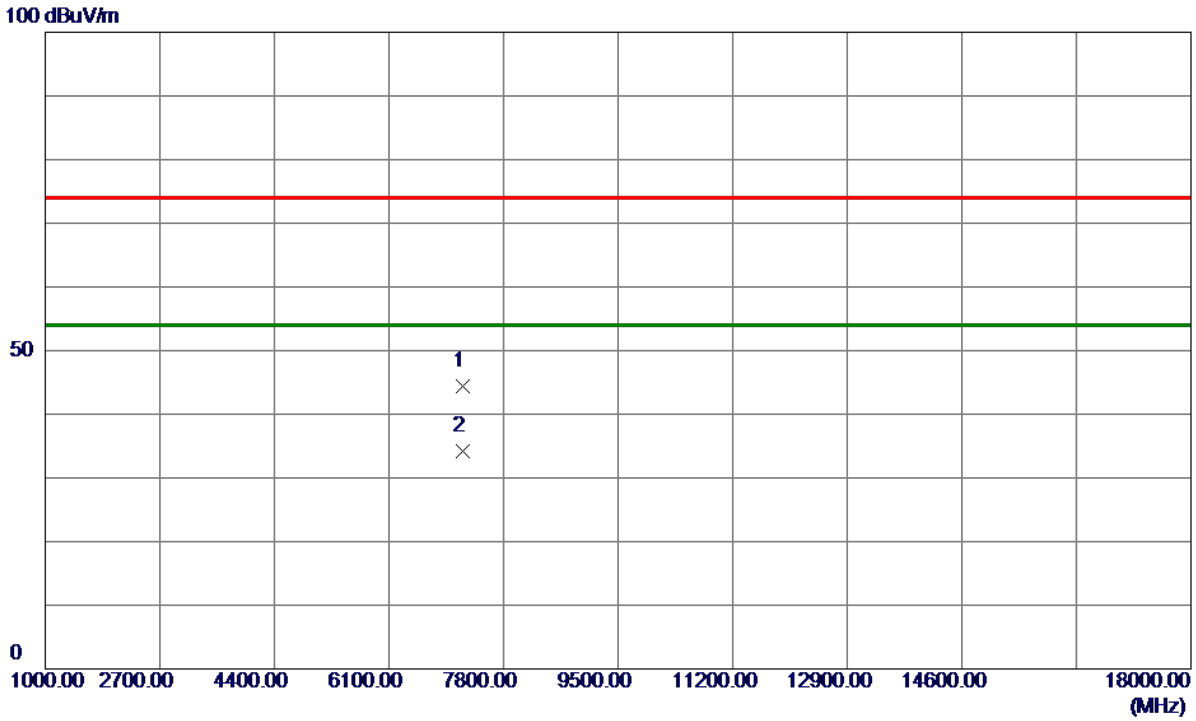
Test Mode	TX 2402 MHz_CH00_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	40.94	7.78	48.72	74.00	-25.28	Peak	
2	2390.0000	31.47	7.78	39.25	54.00	-14.75	AVG	
3 *	2402.1000	105.15	7.81	112.96	54.00	58.96	AVG	No Limit
4	2402.2500	105.74	7.81	113.55	74.00	39.55	Peak	No Limit

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

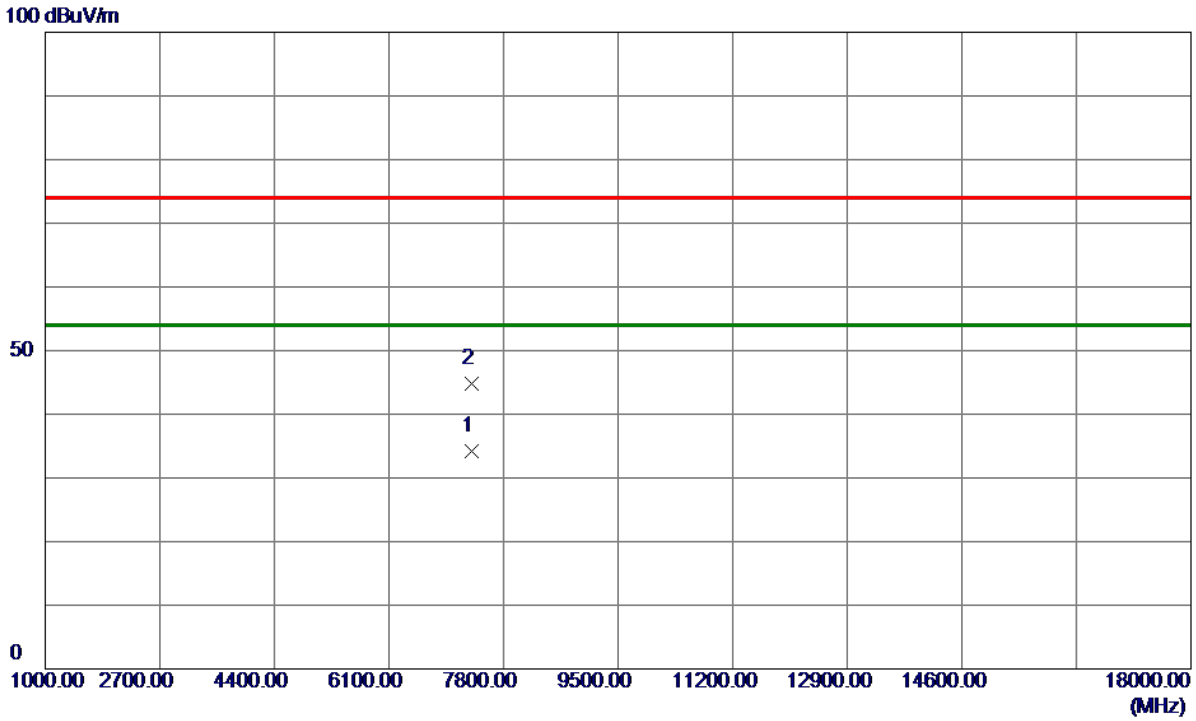
Test Mode	TX 2402 MHz_CH00_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7196.7000	34.85	9.63	44.48	74.00	-29.52	Peak	
2 *	7198.1200	24.48	9.63	34.11	54.00	-19.89	AVG	

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

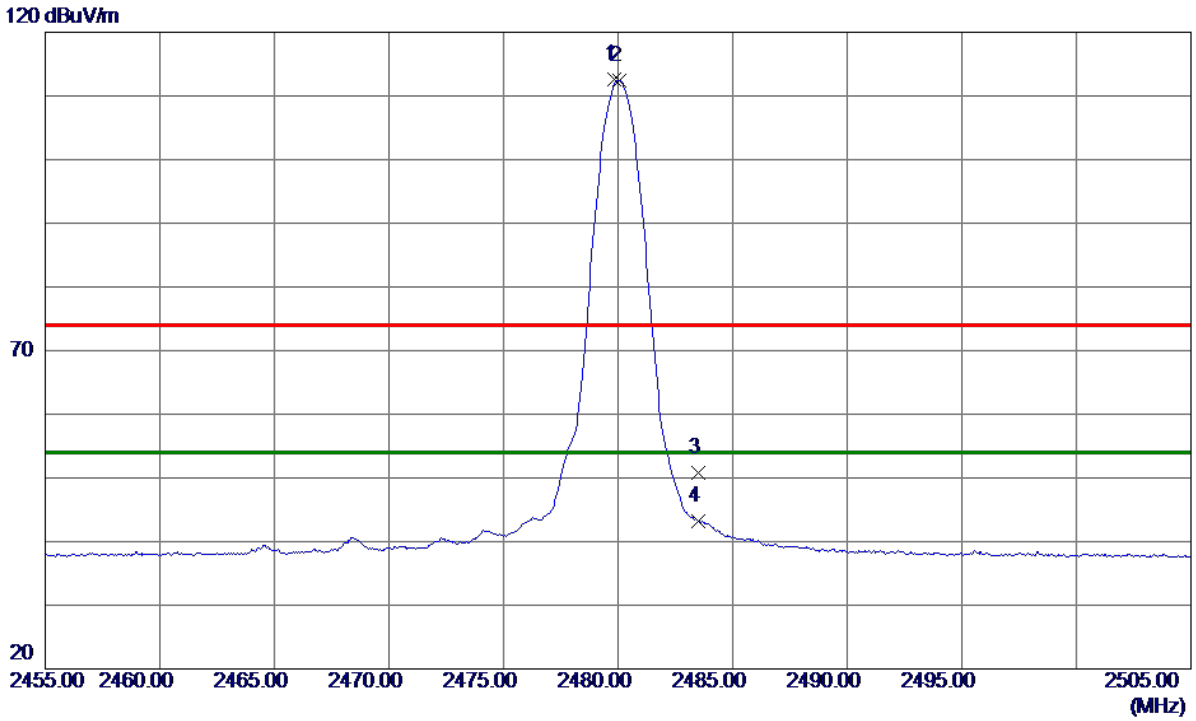
Test Mode	TX 2440 MHz_CH19_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7321.2000	24.65	9.54	34.19	54.00	-19.81	AVG	
2	7326.8000	35.23	9.53	44.76	74.00	-29.24	Peak	

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

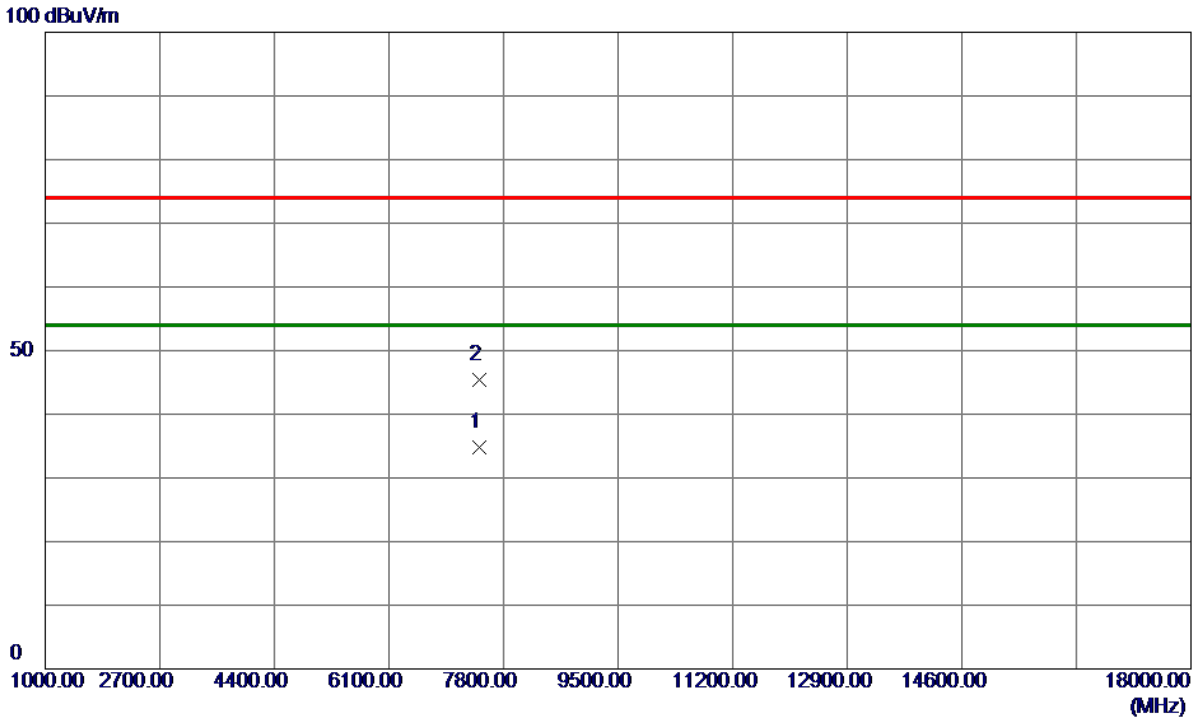
Test Mode	TX 2480 MHz_CH39_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479.8500	104.67	7.99	112.66	74.00	38.66	Peak	No Limit
2 *	2480.0500	104.43	7.99	112.42	54.00	58.42	AVG	No Limit
3	2483.5000	42.85	8.00	50.85	74.00	-23.15	Peak	
4	2483.5000	35.15	8.00	43.15	54.00	-10.85	AVG	

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

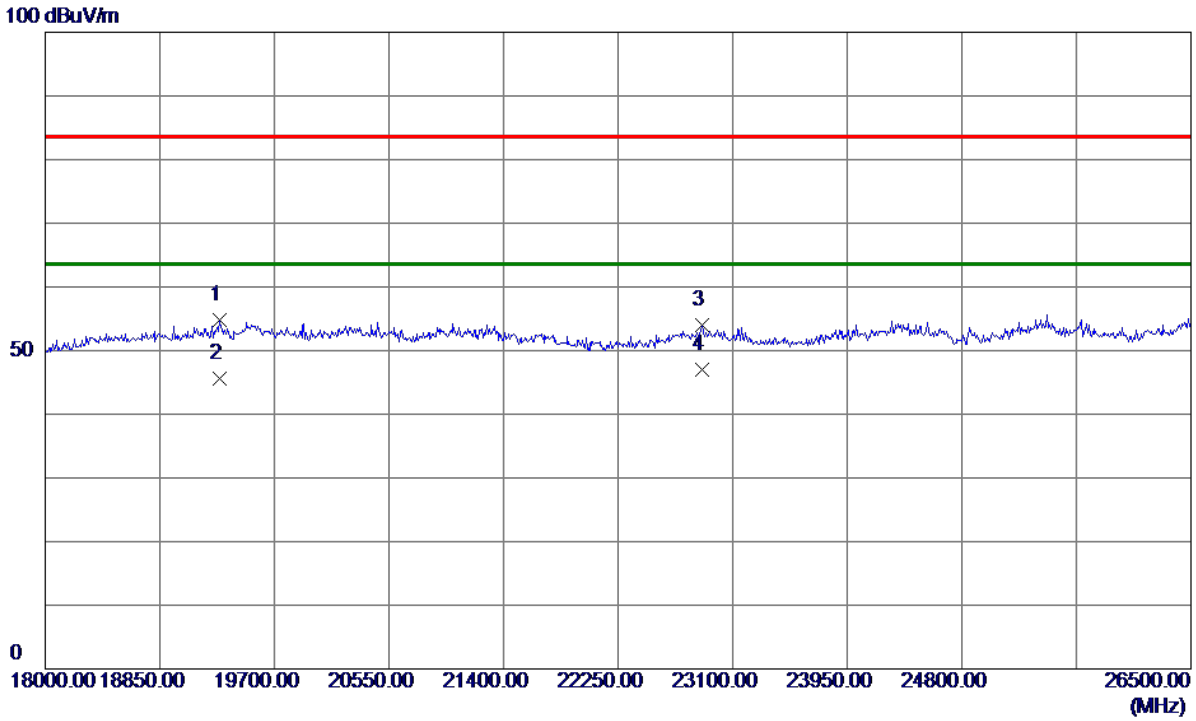
Test Mode	TX 2480 MHz_CH39_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7442.4200	25.38	9.45	34.83	54.00	-19.17	AVG	
2	7448.1200	35.93	9.44	45.37	74.00	-28.63	Peak	

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

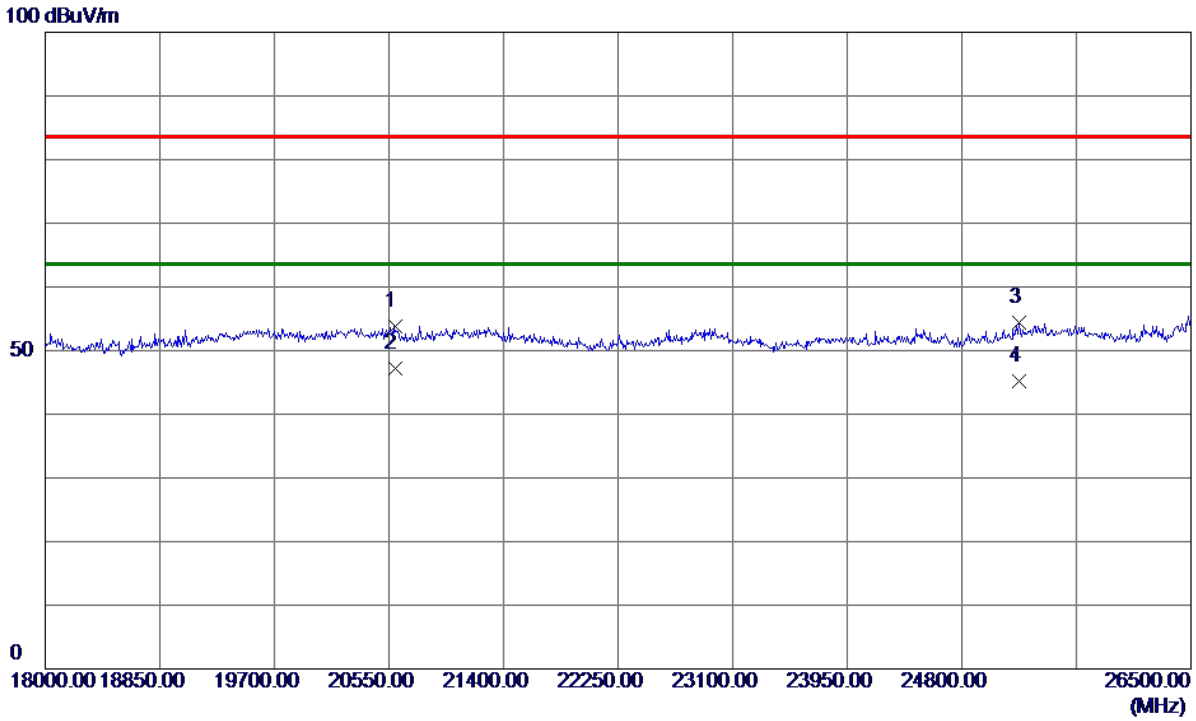
Test Mode	TX 2440 MHz_CH19_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	19292.0000	51.48	3.24	54.72	83.50	-28.78	Peak	
2	19292.0000	42.37	3.24	45.61	63.50	-17.89	AVG	
3	22870.5000	48.88	5.18	54.06	83.50	-29.44	Peak	
4 *	22870.5000	41.74	5.18	46.92	63.50	-16.58	AVG	

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	20592.5000	50.16	3.63	53.79	83.50	-29.71	Peak	
2 *	20592.5000	43.62	3.63	47.25	63.50	-16.25	AVG	
3	25225.0000	49.35	4.96	54.31	83.50	-29.19	Peak	
4	25225.0000	40.24	4.96	45.20	63.50	-18.30	AVG	

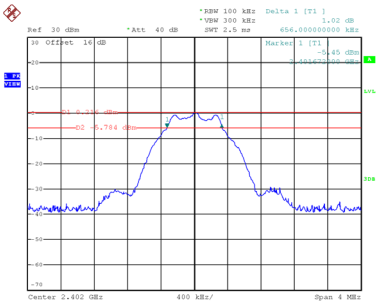
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX E - 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	0.656	1.040	0.5	Pass
19	2440	0.664	1.040	0.5	Pass
39	2480	0.648	1.040	0.5	Pass

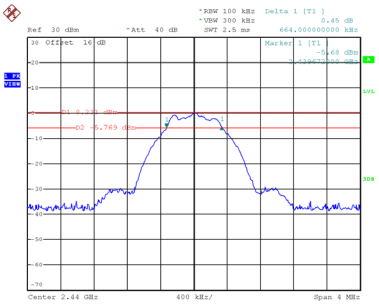
CH00



Date: 6.JAN.2026 17:51:13

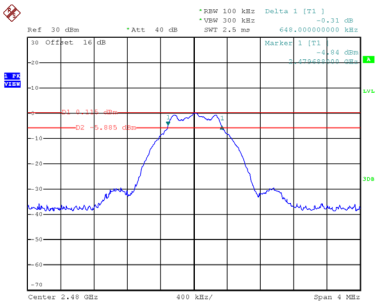
CH19

6 dB Bandwidth



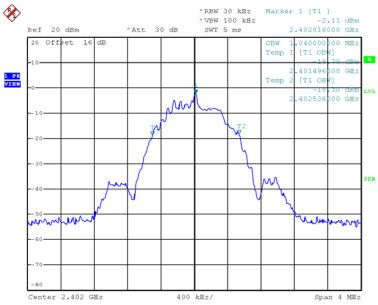
Date: 6.JAN.2026 17:54:03

CH39

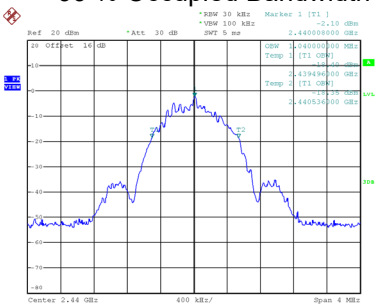


Date: 6.JAN.2026 18:33:21

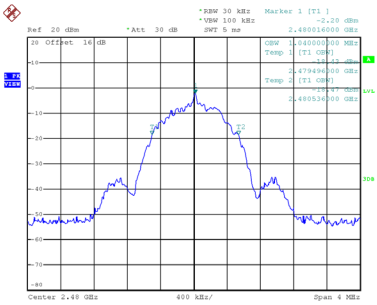
99 % Occupied Bandwidth



Date: 6.JAN.2026 17:51:24



Date: 6.JAN.2026 17:54:14



Date: 6.JAN.2026 18:33:32

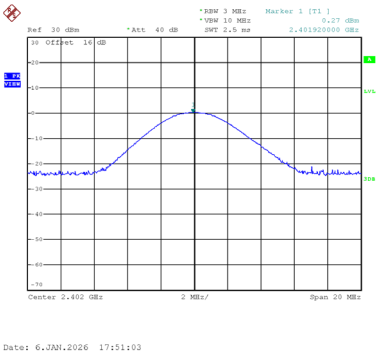
APPENDIX F - MAXIMUM OUTPUT POWER

Test Mode	TX Mode_1Mbps

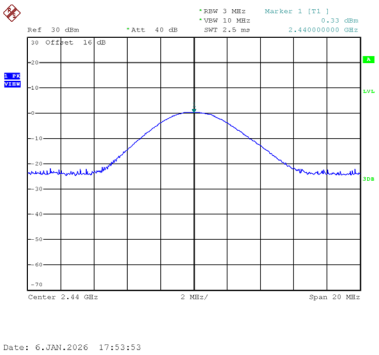
Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	0.27	0.0011	30.00	1.0000	Pass
2440	0.33	0.0011	30.00	1.0000	Pass
2480	0.27	0.0011	30.00	1.0000	Pass

Note: Output power = Measure result + Cable loss

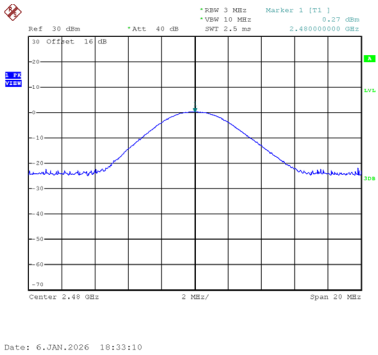
CH00



CH19



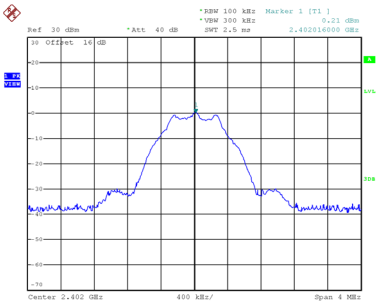
CH39



APPENDIX G - CONDUCTED SPURIOUS EMISSION

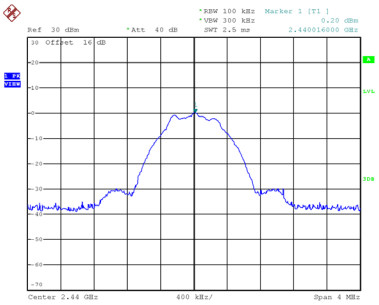
Test Mode	TX Mode_1Mbps

Reference Level-CH00



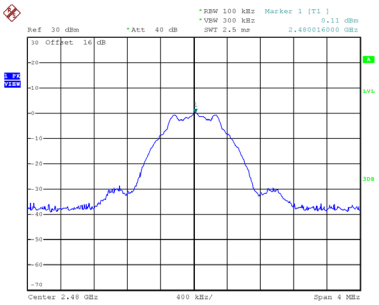
Date: 6.JAN.2026 17:51:44

Reference Level-CH19



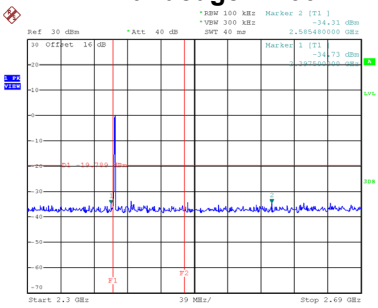
Date: 6.JAN.2026 17:54:34

Reference Level-CH39



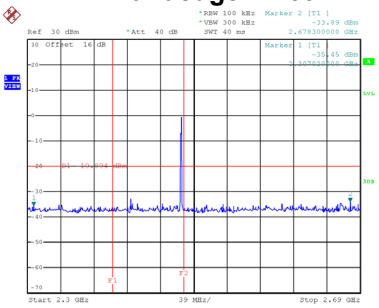
Date: 6.JAN.2026 18:33:52

Bandedge-CH00



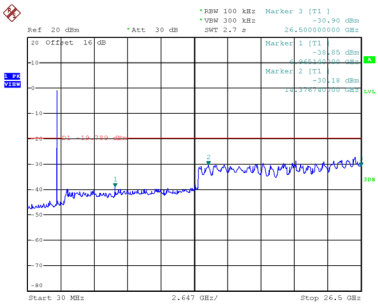
Date: 6.JAN.2026 17:51:55

Bandedge-CH39



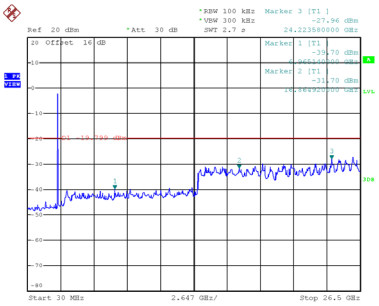
Date: 6.JAN.2026 18:36:01

Harmonic-CH00



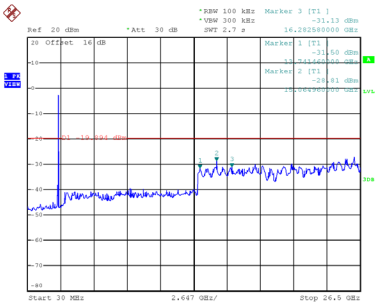
Date: 6.JAN.2026 17:53:01

Harmonic-CH19



Date: 6.JAN.2026 17:56:00

Harmonic-CH39



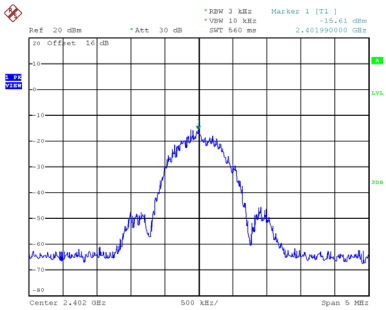
Date: 6.JAN.2026 18:35:22

APPENDIX H - POWER SPECTRAL DENSITY

Test Mode	TX Mode_1Mbps

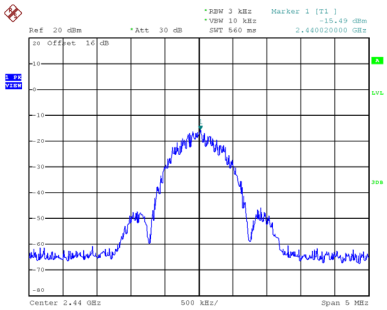
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-15.61	8.00	Pass
19	2440	-15.49	8.00	Pass
39	2480	-16.51	8.00	Pass

CH00



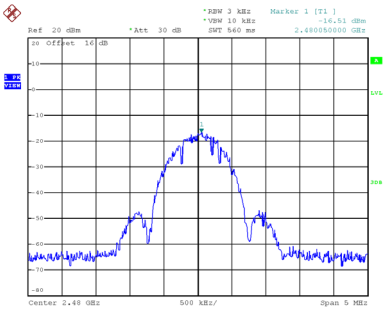
Date: 6.JAN.2026 17:51:34

CH19



Date: 6.JAN.2026 17:54:24

CH39



Date: 6.JAN.2026 18:35:01

End of Test Report