Certificate #7130.01

FCC Radio Test Report

FCC ID: 2AOHHTURBOXC2290

This report concerns: Original Grant

Project No.	:	2407C144
Equipment	:	Smart Module
Brand Name	:	TurboX
Test Model	:	TurboX C2290
Series Model	:	N/A
Applicant	:	Thundercomm Technology Co., Ltd
Address	:	No. 107, Middle Datagu Road, Xiantao Street, Yubei District, Chongqing, China, 401122
Manufacturer	:	Thundercomm Technology Co., Ltd
Address	:	No. 107, Middle Datagu Road, Xiantao Street, Yubei District, Chongqing, China, 401122
Factory	:	MIKI TECHNOLOGY HUIZHOU
Address	:	39 Guangtai Road, Huinan Science Park, Huizhou City
Date of Receipt	:	Jul. 22, 2024
Date of Test	:	Jul. 24, 2024 ~ Aug. 14, 2024
Issued Date	:	Aug. 28, 2024
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG20240722112 for radiated and AC Power Line Conducted, DG2024072344 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.

Prepared by : Sheldon Ou

Approved by : Chay Cai

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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-3-2407C144	R00	Original Report.	Aug. 28, 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	PASS	------
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 Emissions	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 in this test report.
(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 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. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DG-C02	CISPR	150kHz ~ 30MHz	2.88

B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DG-CB01	CISPR	9kHz ~ 30MHz	2.36

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-CB03 (3m)	CISPR	1GHz ~ 6GHz	4.08
		6GHz ~ 18GHz	4.62

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

C. 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
AC Power Line Conducted Emissions	26°C	54%	AC 120V/60Hz	Hayden Chen	Jul. 31, 2024
Radiated Emissions- 9kHz to 30 MHz	27°C	49%	AC 120V/60Hz	Hayden Chen	Jul. 31, 2024
Radiated Emissions- 30MHz to 1000MHz	24°C	55%	AC 120V/60Hz	Jensen Zhou	Aug. 06, 2024
Radiated Emissions- Above 1000MHz	23-24°C	53-55%	AC 120V/60Hz	Jensen Zhou	Jul. 30, 2024- Aug. 06, 2024
Bandwidth	24°C	51%	AC 120V/60Hz	Arvin Tong	Jul. 29, 2024
Maximum Output Power	22-23°C	48%	AC 120V/60Hz	Oliver Wang Steve Zhou	Jul. 29, 2024- Aug. 13, 2024
Conducted Spurious Emissions	24°C	51%	AC 120V/60Hz	Arvin Tong	Jul. 29, 2024
Power Spectral Density	24°C	51%	AC 120V/60Hz	Arvin Tong	Jul. 29, 2024

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Module
Brand Name	TurboX
Test Model	TurboX C2290
Series Model	N/A
Model Difference(s)	N/A
Software Version	FlatBuild_Turbox-C2290_c2290_la3.0.V.userdebug.20240719.1116.zip
Hardware Version	C2290 V03
Power Source	DC Voltage supplied from AC adapter (Support unit) or DC from Battery.
Power Rating	DC 3.9V
Operation Frequency	2412 MHz ~ 2462 MHz
Modulation Type	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n: OFDM
Bit Rate of Transmitter	IEEE 802.11b: 11/5.5/2/1 Mbps IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 150 Mbps
Maximum Output Power	IEEE 802.11g: 18.56 dBm (0.0718 W)

Note:

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

2. Channel List:

CH01 - CH11 for IEEE 802.11b, IEEE 802.11g, IEEE 802.11n(HT20) CH03 - CH09 for IEEE 802.11n(HT40)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

3. Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	TAOGLAS.	TG.55.8113	Monopole	N/A	1.69

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 B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N(HT20) Mode Channel 01/06/11
Mode 4	TX N(HT40) Mode Channel 03/06/09
Mode 5	TX G Mode Channel 06

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 5	TX G Mode Channel 06

Radiated emissions test - Below 1GHz	
Final Test Mode	Description
Mode 5	TX G Mode Channel 06

Radiated emissions test- Above 1GHz	
Final Test Mode	Description
Mode 1	TX B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N(HT20) Mode Channel 01/06/11
Mode 4	TX N(HT40) Mode Channel 03/06/09

Conducted test	
Final Test Mode	Description
Mode 1	TX B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N(HT20) Mode Channel 01/06/11
Mode 4	TX N(HT40) Mode Channel 03/06/09

NOTE:
(1) All the bit rate of transmitter have been tested and found the lowest rate is found to be the worst case and recorded.
(2) For AC power line conducted emissions and radiated emission below 1 GHz test, the TX G Mode Channel 06 is found to be the worst case and recorded.
(3) 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.
(4) For radiated emission Harmonic 18-26.5GHz test, only tested the worst case and recorded.
(5) For radiated emission above 1 GHz test, the polarization of Vertical and Horizontal are evaluated, the worst case is Vertical and recorded.

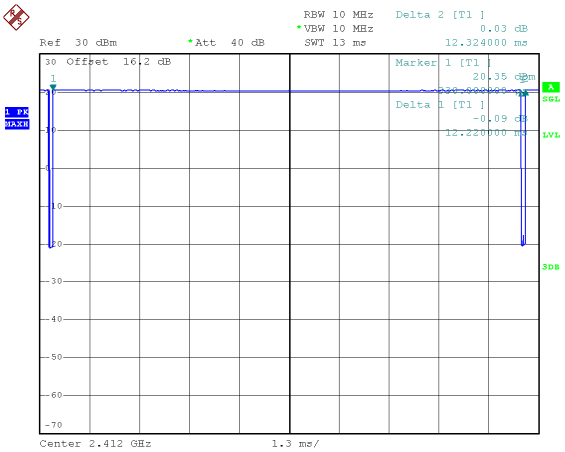
3.3 PARAMETERS OF TEST SOFTWARE

Test Software Version	ADB_V1.0		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	15	18	16
IEEE 802.11g	15.5	18	14.5
IEEE 802.11n(HT20)	15	18	14
Frequency (MHz)	2422	2437	2452
IEEE 802.11n(HT40)	13.5	15	13

3.4 DUTY CYCLE

If duty cycle is ≥ 98 %, duty factor is not required.
If duty cycle is < 98 %, duty factor shall be considered.
The output power = measured power + duty factor.

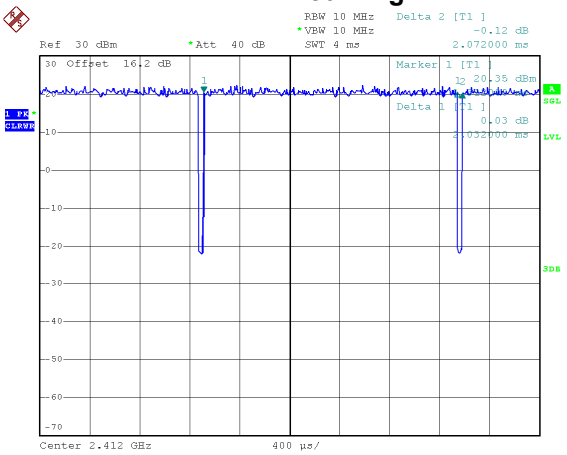
IEEE 802.11b



Date: 30.JUL.2024 10:41:29

Duty cycle = 12.220 ms / 12.324 ms = 99.16%
Duty Factor = 10 log(1/Duty cycle) = 0.00

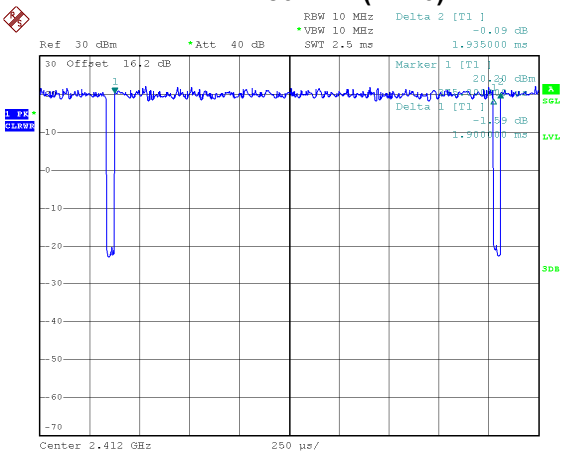
IEEE 802.11g



Date: 30.JUL.2024 10:45:49

Duty cycle = 2.032 ms / 2.072 ms = 98.07%
Duty Factor = 10 log(1/Duty cycle) = 0.00

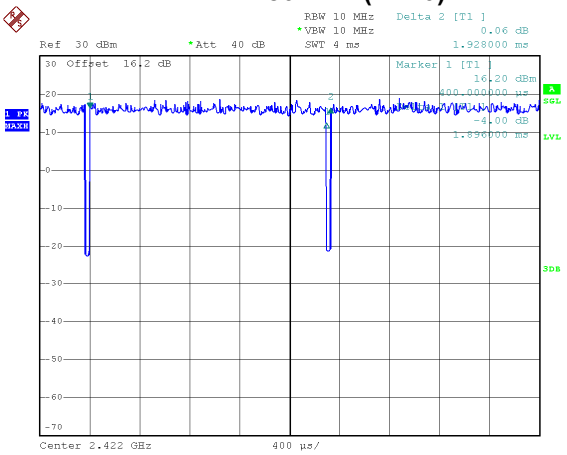
IEEE 802.11n(HT20)



Date: 30.JUL.2024 10:47:49

Duty cycle = 1.900 ms / 1.935 ms = 98.19%
Duty Factor = 10 log(1/Duty cycle) = 0.00

IEEE 802.11n(HT40)



Date: 30.JUL.2024 10:48:41

Duty cycle = 1.896 ms / 1.928 ms = 98.34%
Duty Factor = 10 log(1/Duty cycle) = 0.00

NOTE:
For IEEE 802.11b:
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz.

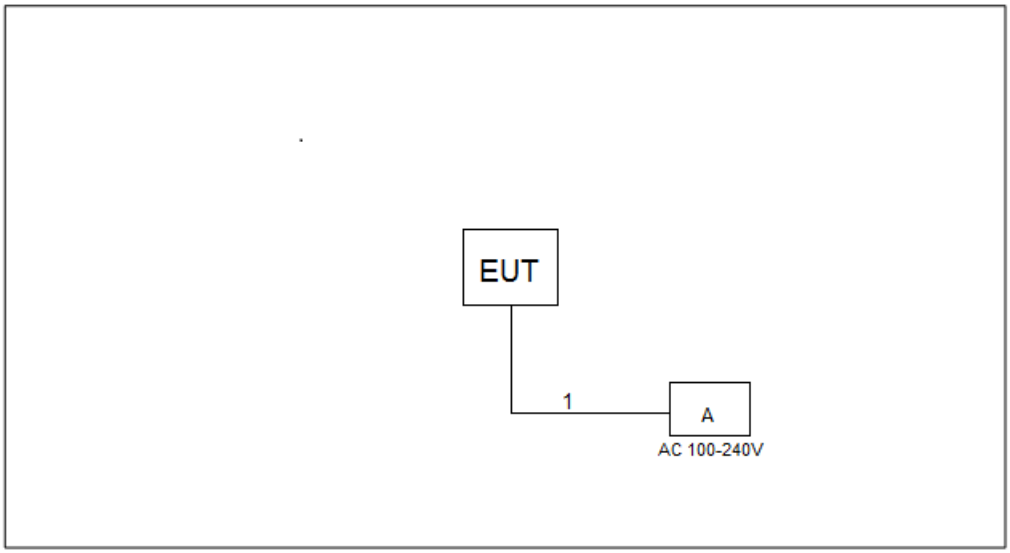
For IEEE 802.11g:
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz.

For IEEE 802.11n(HT20):
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz.

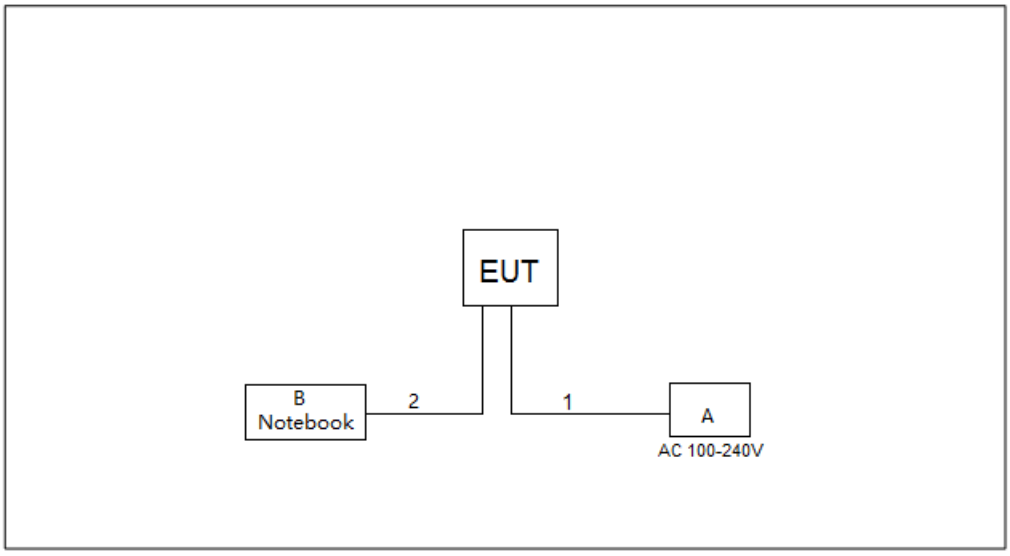
For IEEE 802.11n(HT40):
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 2 kHz.

3.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

AC Power Line Conducted Emissions&Radiated Emissions-9 kHz to 30 MHz



Radiated Emissions-30 MHz to 30-26.5GHz



3.6 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
A	SWITCHING POWER ADAPTER	LYD	LYD1202000B	-
B	Notebook	HuaWei	NbDE-WFH9	N/A

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

3.7 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. Part of the cable losses (0.5dB) are provided by the manufacturer, while the other parts of the 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.

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.

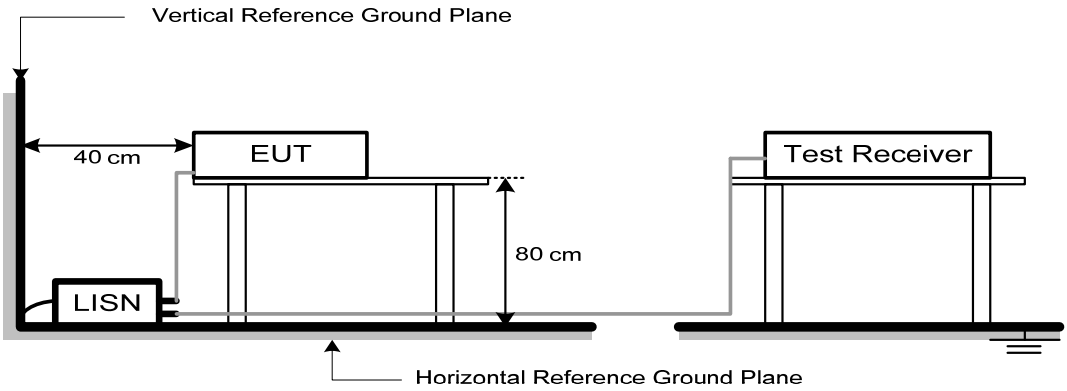
The following table is the setting of the receiver:

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 OPERATION CONDITIONS

EUT was programmed to be in continuously transmitting mode.

4.6 TEST RESULTS

Please refer to the APPENDIX A.

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)	(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 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)

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

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.

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).

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 shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1 GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1 GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1 GHz)
i. For the actual test configuration, please refer to the related Item -EUT Test Photos.

The following table is the setting of the receiver:

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

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

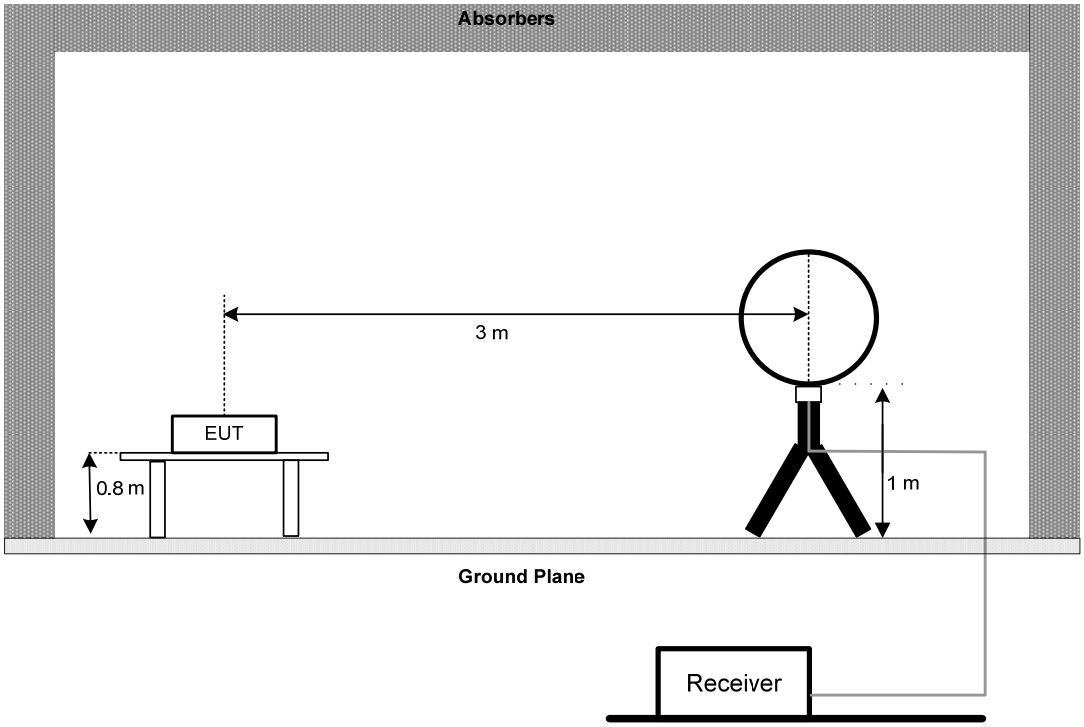
Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector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

5.3 DEVIATION FROM TEST STANDARD

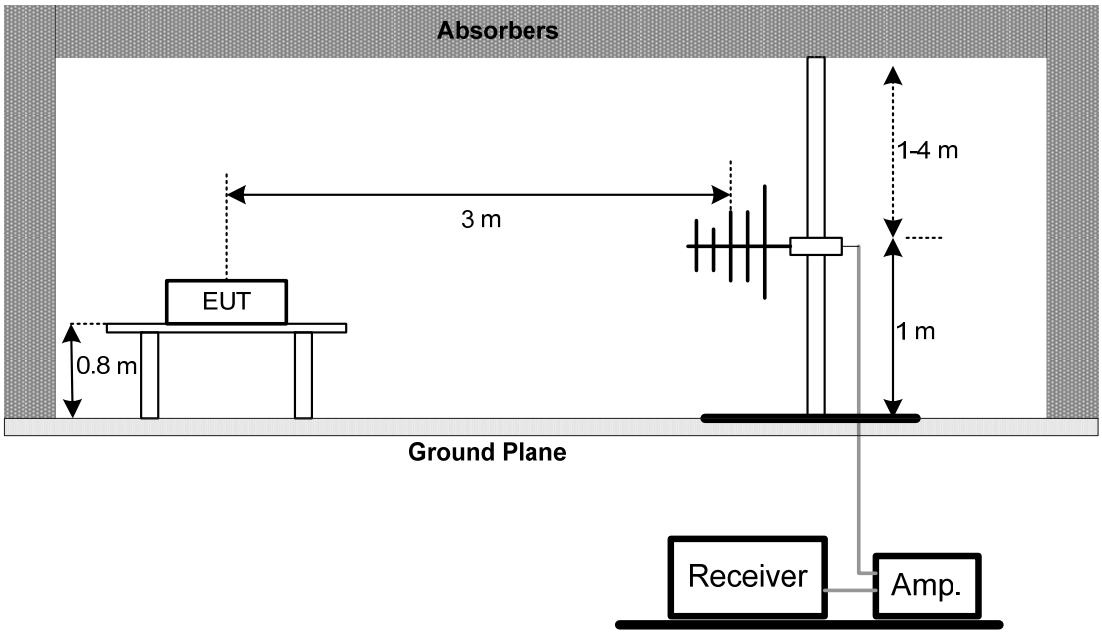
No deviation.

5.4 TEST SETUP

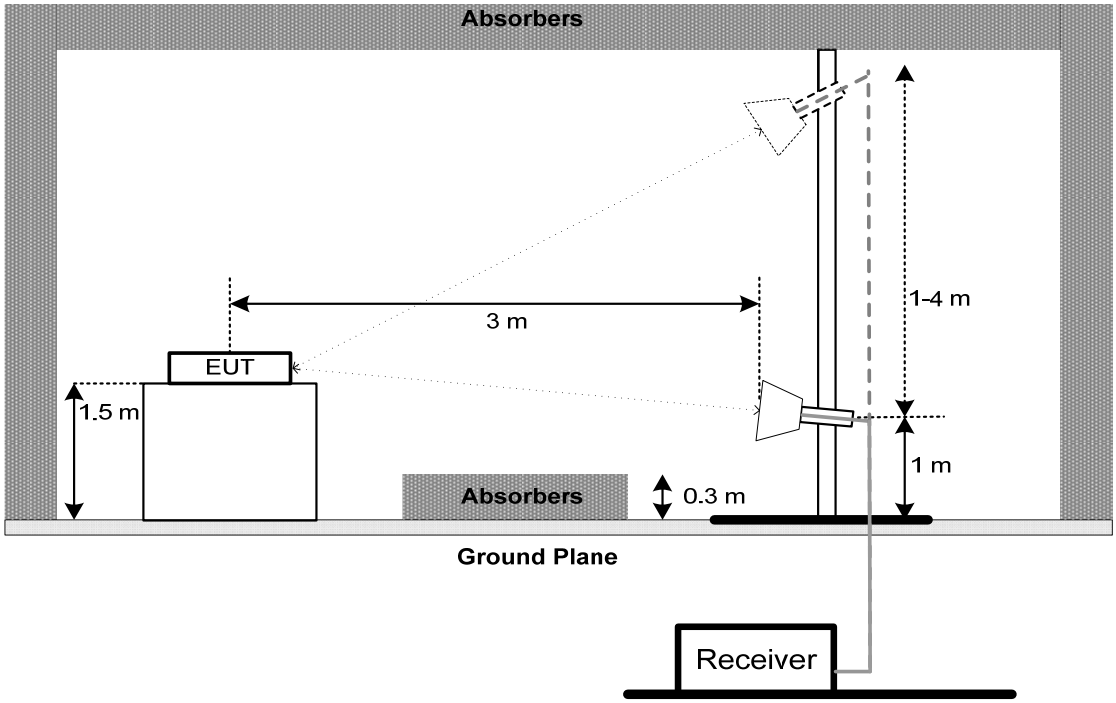
9 kHz to 30 MHz



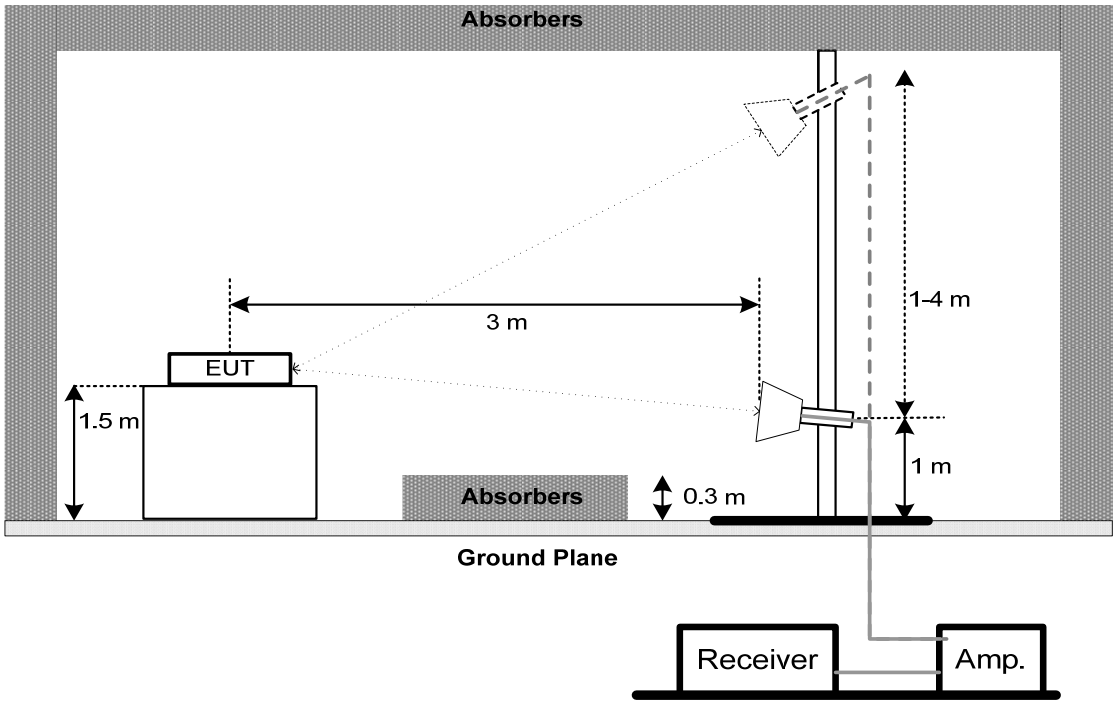
30 MHz to 1 GHz



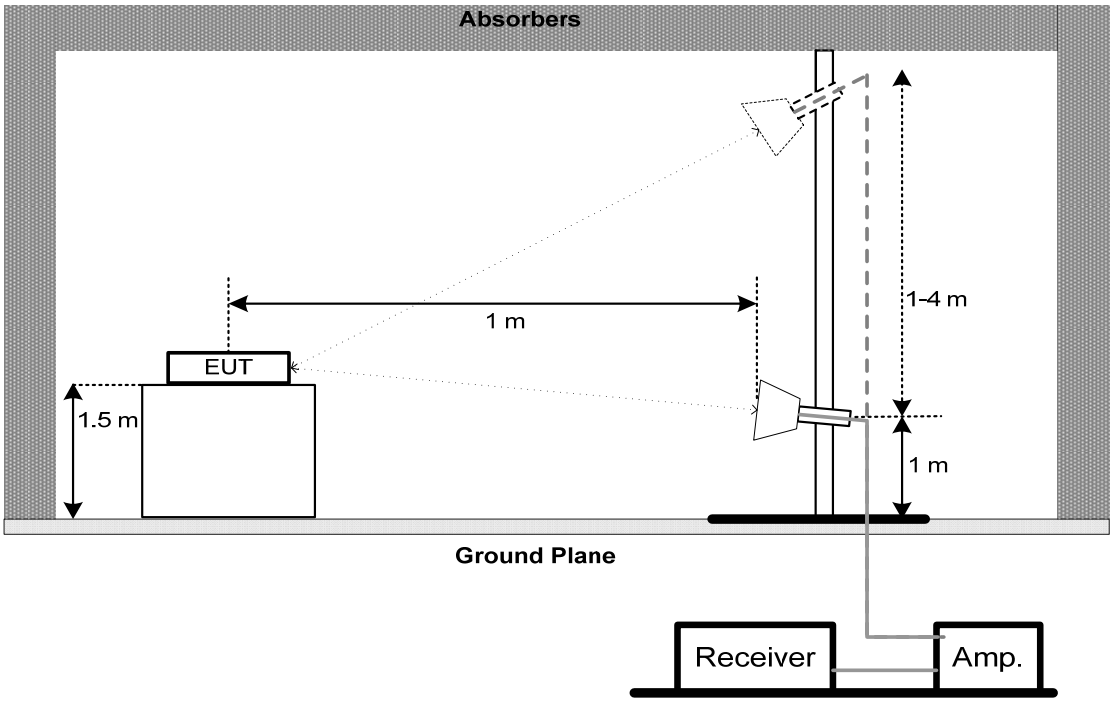
Above 1 GHz
Band edge



Harmonic (1 GHz to 18 GHz)



Harmonic (18 GHz to 26.5 GHz)



5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULTS - 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 RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX C.

5.8 TEST RESULTS - 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	Minimum 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 Frequency	> Measurement Bandwidth
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

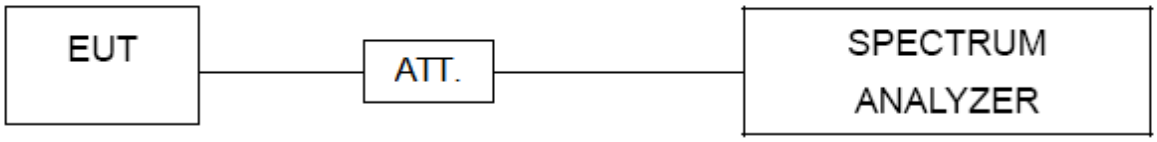
For 99% Emission Bandwidth:

Spectrum Parameters	Setting
Span Frequency	Between 1.5 times and 5.0 times the OBW
RBW	300 kHz For 20MHz 1 MHz For 40MHz
VBW	1 MHz For 20MHz 3 MHz For 40MHz
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

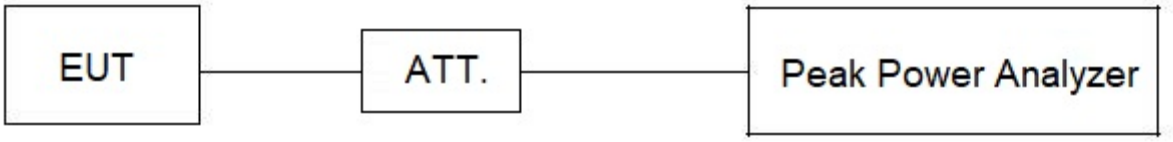
7.2 TEST PROCEDURE

a. The EUT was directly connected to the peak power analyzer and antenna output port as show in the block diagram below.
b. The maximum conducted output power was performed in accordance with method 11.9.2.3.1 (for AVG power) of ANSI C63.10-2013.

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 EMISSIONS

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

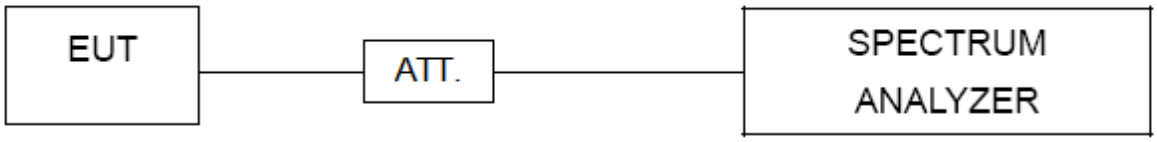
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

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.

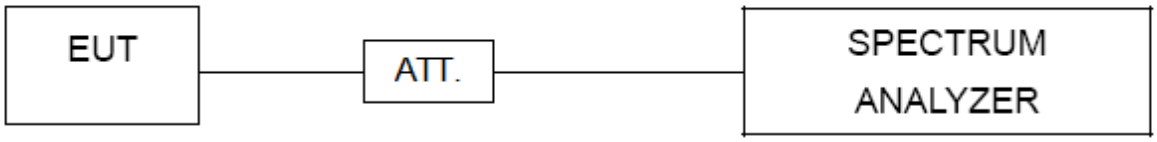
b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	25 MHz (20 MHz) / 60 MHz (40 MHz)
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					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI TEST RECEIVER	R&S	ESCI	100382	Dec. 22, 2024
2	TWO-LINE V-NETWORK	R&S	ENV216	101447	Dec. 22, 2024
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
4	Cable	N/A	SFT205-NMNM-9M -001	9M	Nov. 27, 2024
5	643 Shield Room	ETS	6*4*3	N/A	N/A

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-NMB M-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

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 .5m	N/A	Jun. 06, 2025
5	Cable	RegalWay	LMR400-NMNM-3 m	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 - Above 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Receiver	Agilent	N9038A	MY52130039	Dec. 22, 2024
2	Preamplifier	EMC INSTRUMENT	EMC118A45SE	980888	Nov. 17, 2024
3	EXA Spectrum Analyzer	Keysight	N9010A	MY55150209	May 31, 2025
4	Double Ridged Guide Antenna	ETS	3115	75789	Jun. 15, 2025
5	Cable	RegalWay	RWLP50-4.0A-SMSM -12.5M	N/A	Jul. 03, 2025
6	Cable	RegalWay	RWLP50-4.0A-NMRA SM-2.5M	N/A	Jul. 03, 2025
7	Cable	RegalWay	RWLP50-4.0A-NMRA SMRA-0.8M	N/A	Jul. 03, 2025
8	966 Chamber room	CM	9*6*6	N/A	May 19, 2025
9	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A
10	Filter	STI	STI15-9912	N/A	May 31, 2025
11	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
12	966 Chamber room	CM	9*6*6	N/A	May 16, 2025
13	Positioning Controller	MF	MF-7802	N/A	N/A
14	Filter	STI	STI15-9969	N/A	May 31, 2025

Bandwidth & Conducted Spurious Emissions & Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	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

Maximum Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Peak Power Analyzer	Keysight	8990B	MY51000506	May 31, 2025
2	Wideband power sensor	Keysight	N1923A	MY58310004	May 31, 2025
3	Isolation attenuator	Z-Link	ASMA-10-18-2W	N/A	N/A

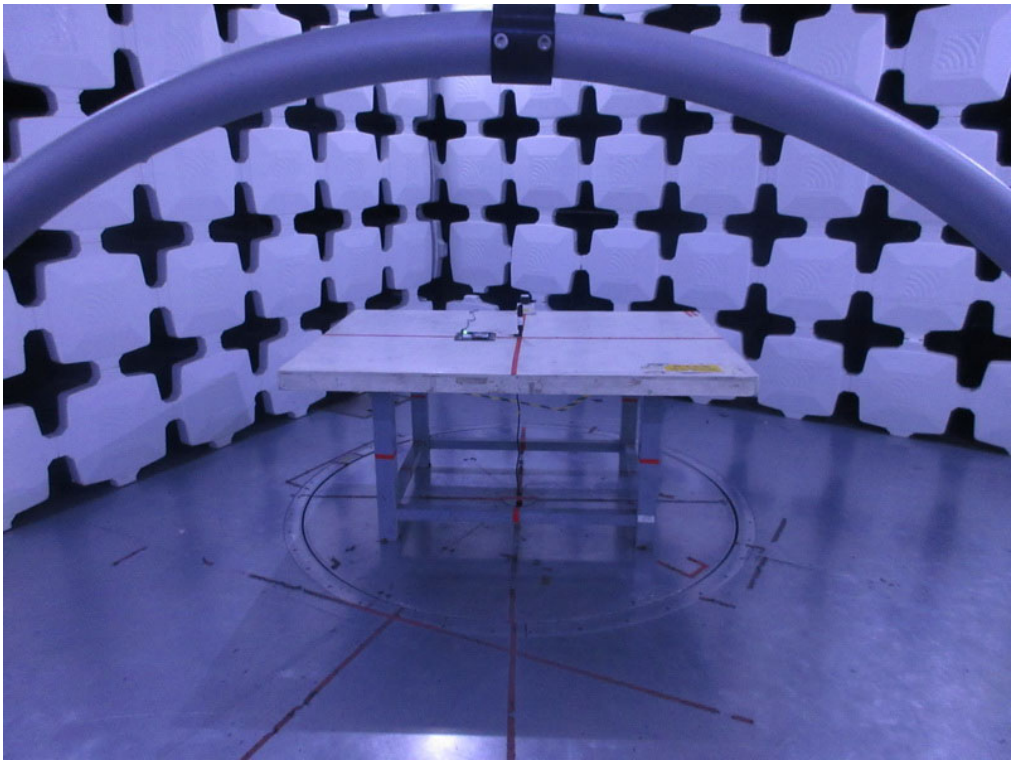
Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

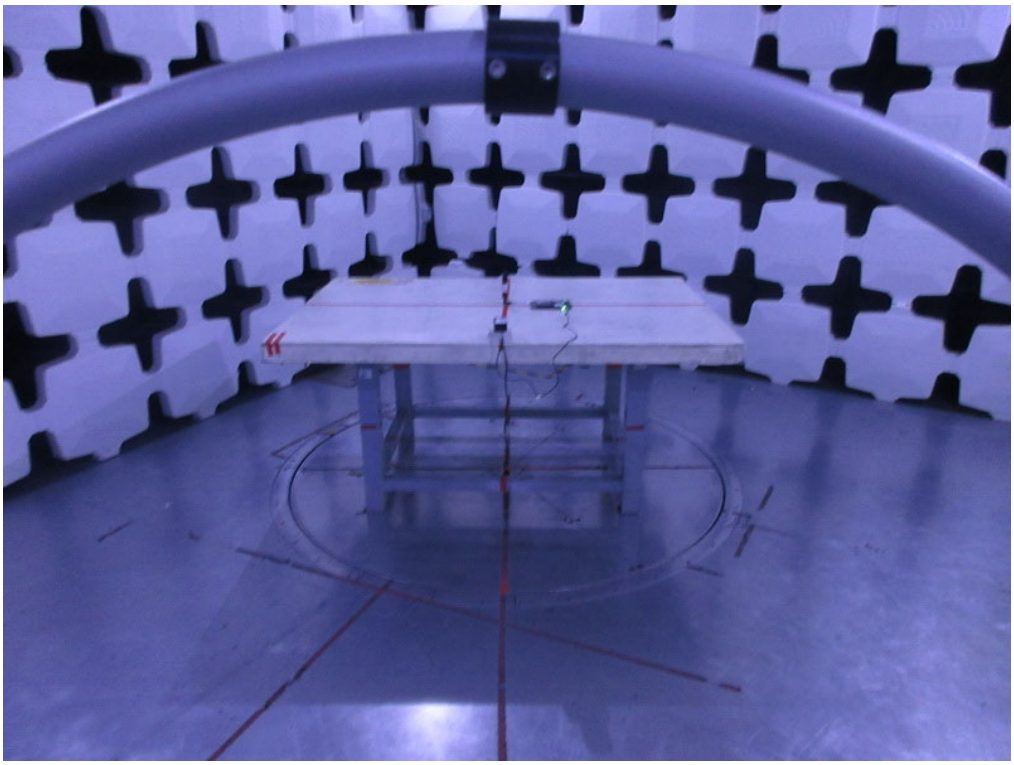
11. EUT TEST PHOTO

AC Power Line Conducted Emissions Test Photos

Radiated Emissions Test Photos

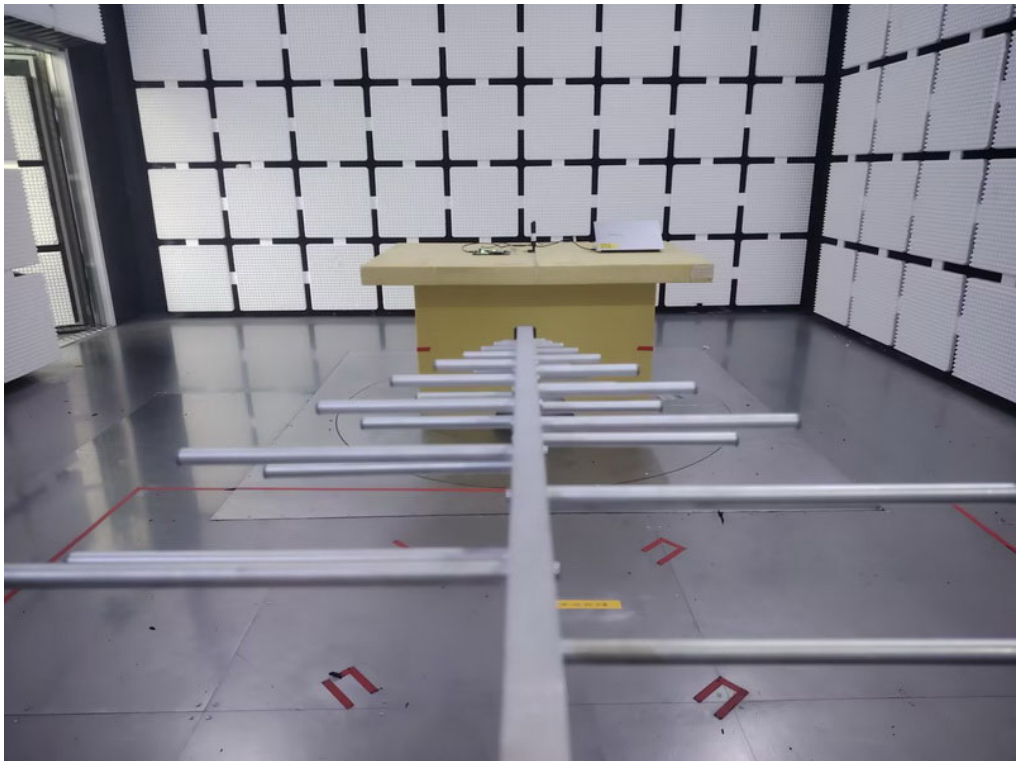
9 kHz to 30 MHz

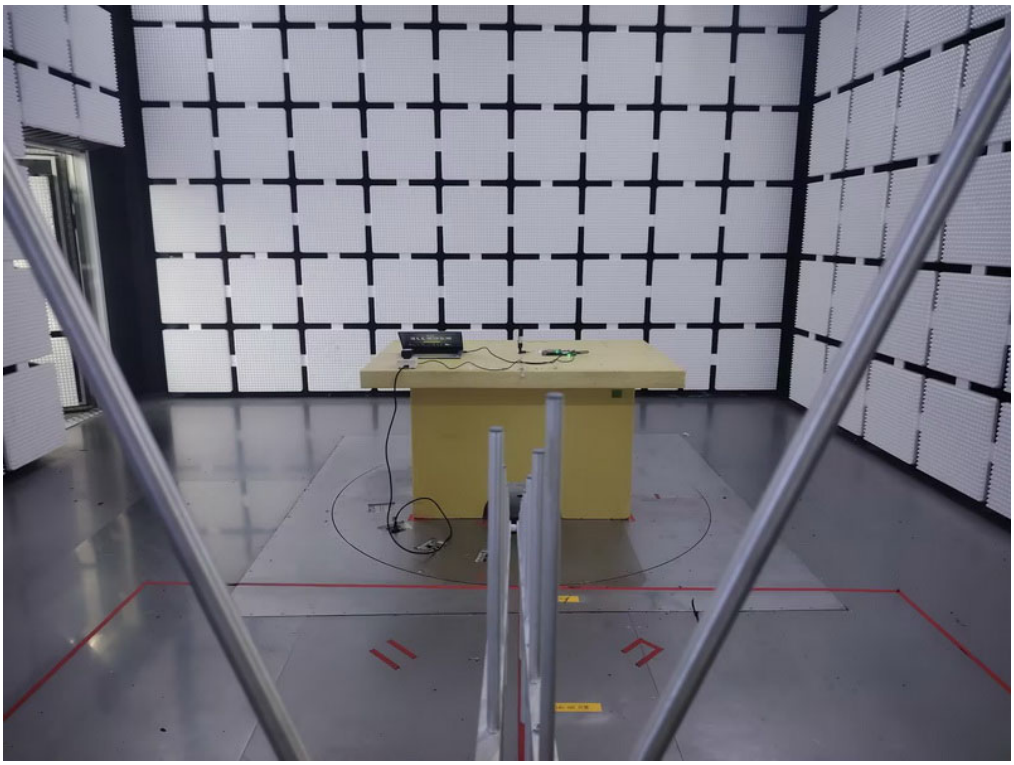




Radiated Emissions Test Photos

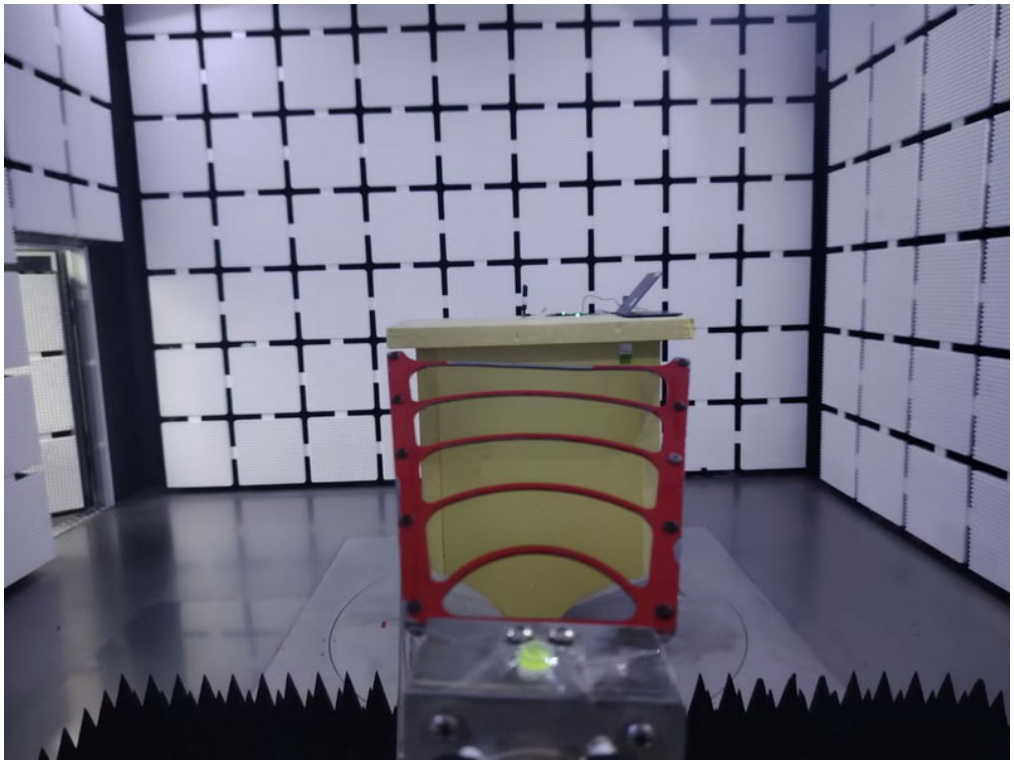
30 MHz to 1 GHz

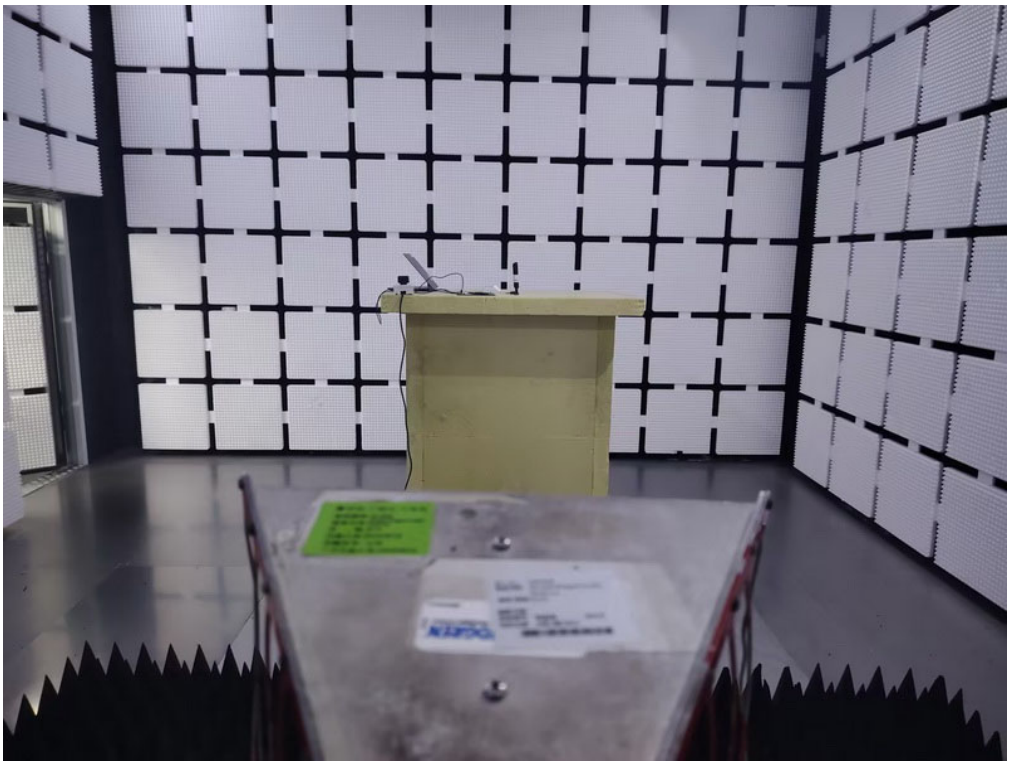




Radiated Emissions Test Photos

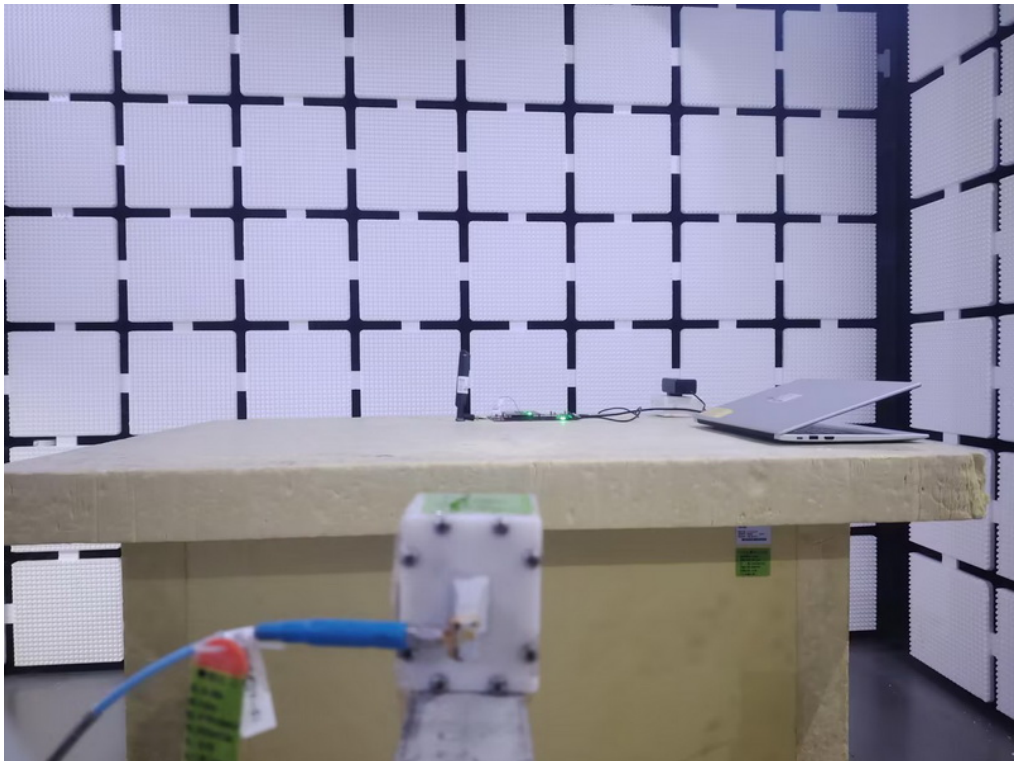
Band edge & Harmonic

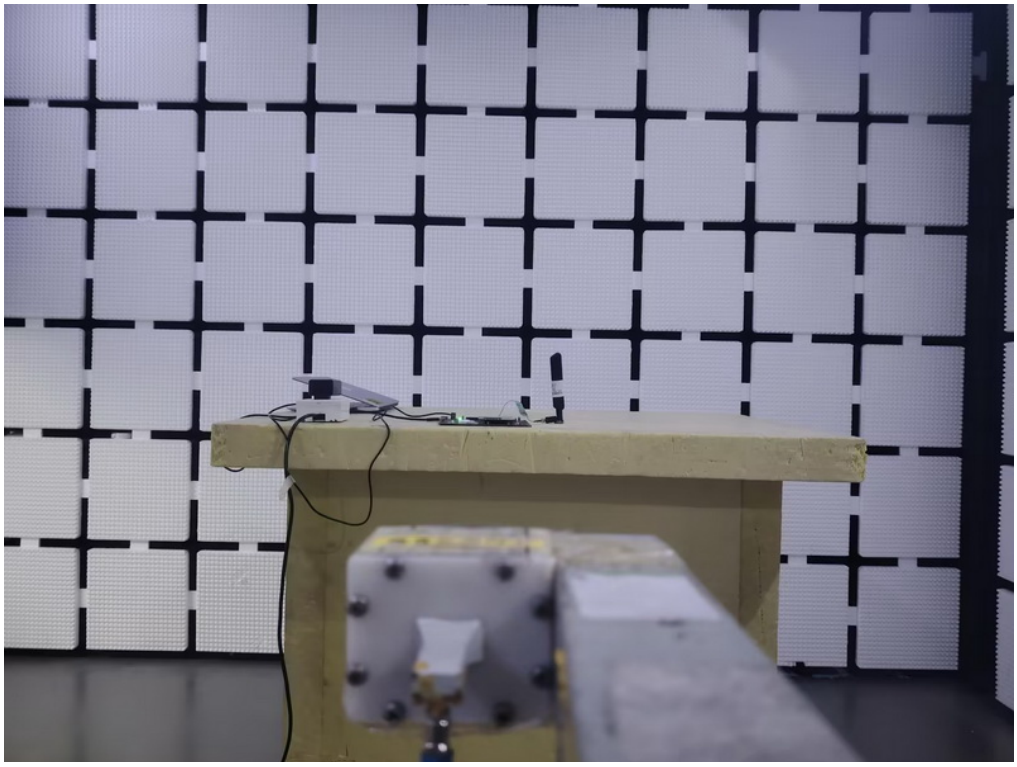




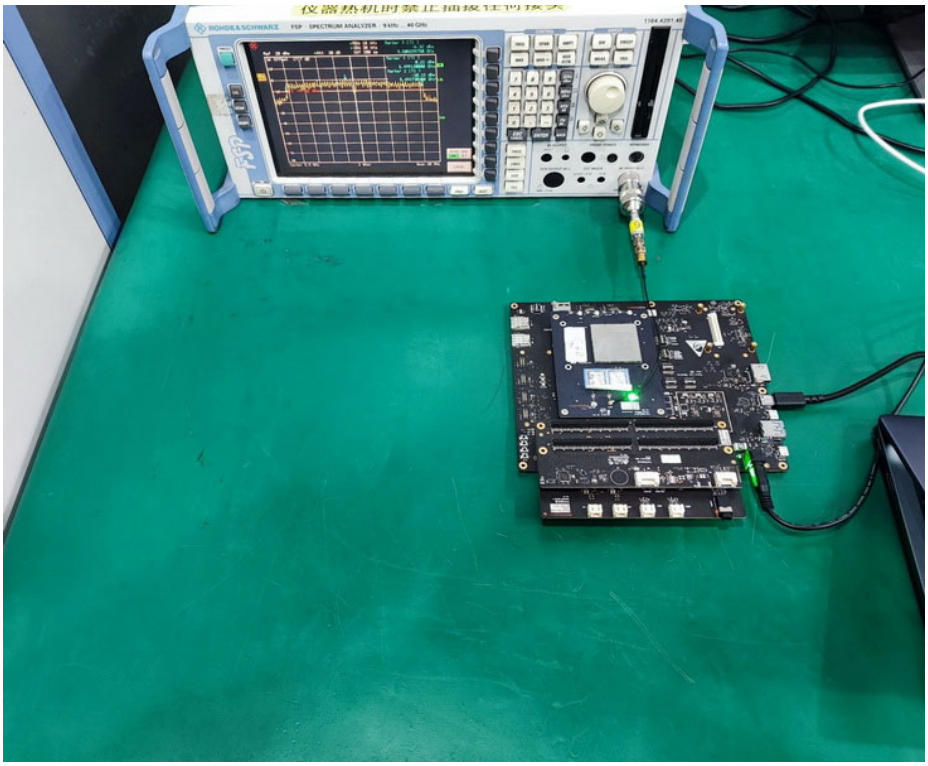
Radiated Emissions Test Photos

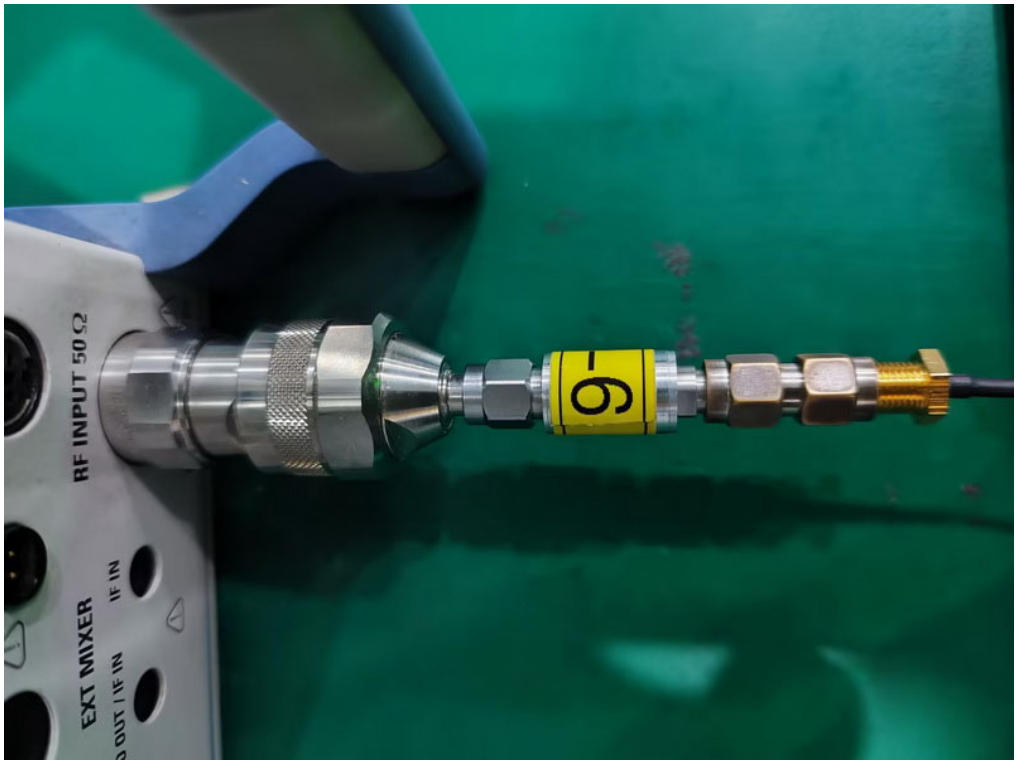
Harmonic (18 GHz to 26.5 GHz)





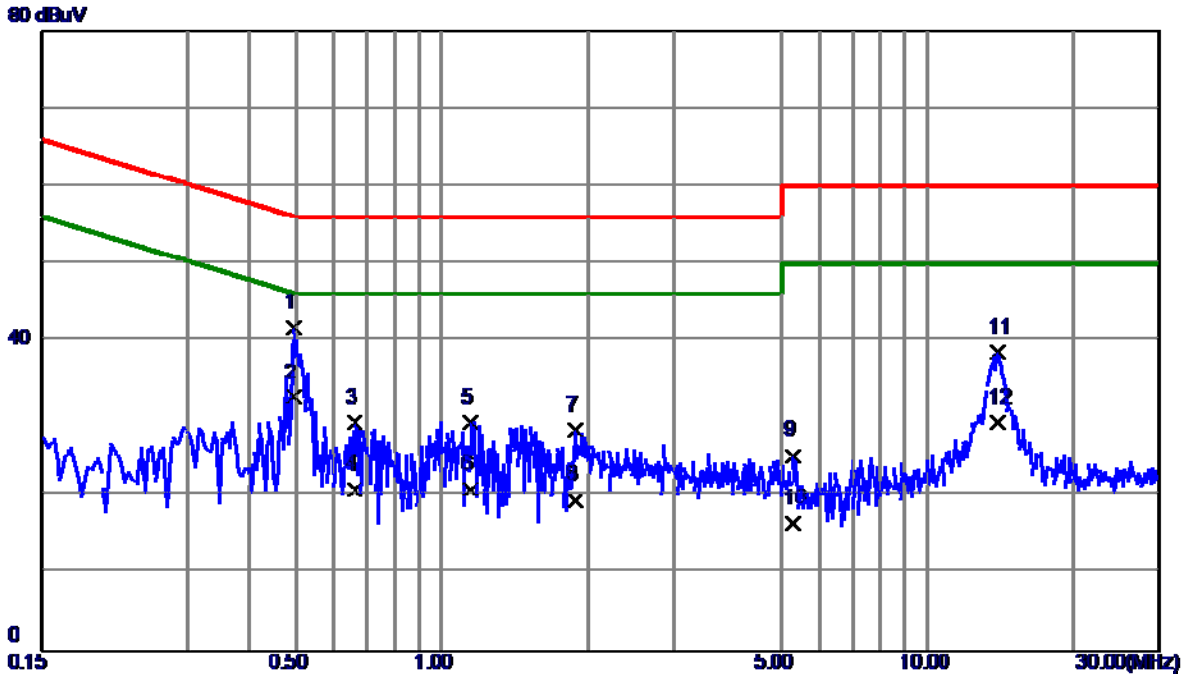
Conducted Test Photos





APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

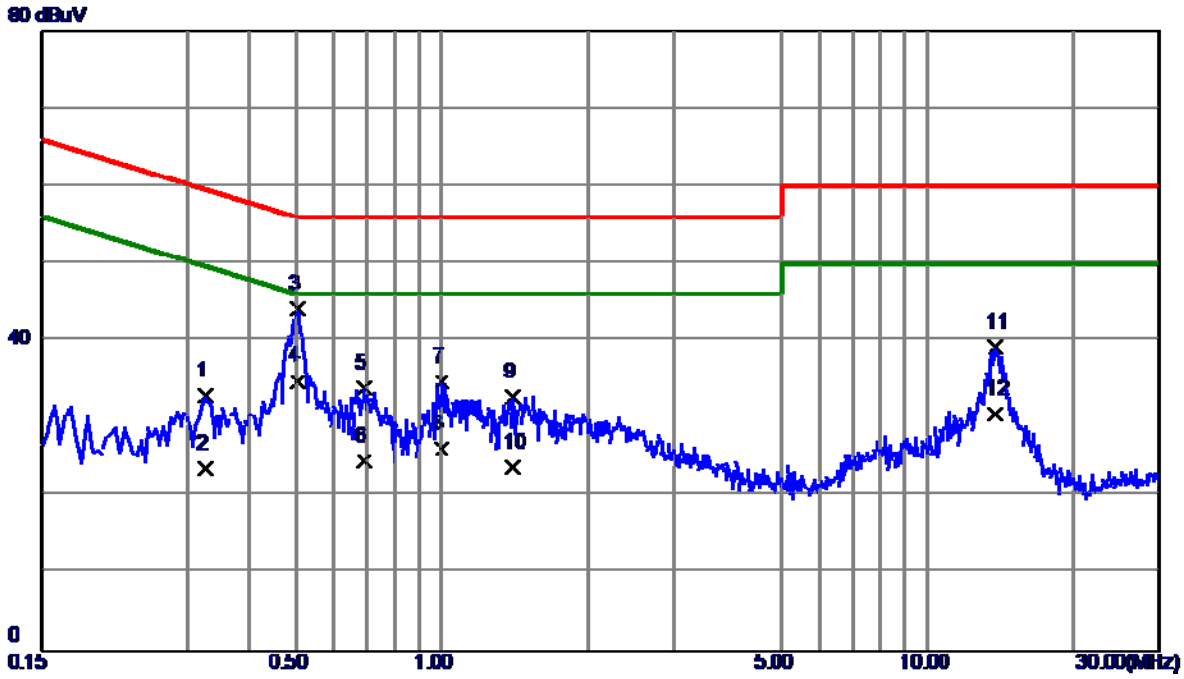
Test Mode	TX G Mode Channel 06	Phase	Line



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.4965	31.07	10.62	41.69	56.06	-14.37	QP	
2 *	0.4965	22.10	10.62	32.72	46.06	-13.34	AVG	
3	0.6630	18.55	10.94	29.49	56.00	-26.51	QP	
4	0.6630	9.90	10.94	20.84	46.00	-25.16	AVG	
5	1.1445	18.17	11.30	29.47	56.00	26.53	QP	
6	1.1445	9.50	11.30	20.80	46.00	-25.20	AVG	
7	1.8825	17.50	11.04	28.54	56.00	-27.46	QP	
8	1.8825	8.40	11.04	19.44	46.00	-26.56	AVG	
9	5.2800	14.38	10.82	25.20	60.00	-34.80	QP	
10	5.2800	5.61	10.82	16.43	50.00	-33.57	AVG	
11	13.9470	25.93	12.70	38.63	60.00	-21.37	QP	
12	13.9470	16.70	12.70	29.40	50.00	20.60	AVG	

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

Test Mode	TX G Mode Channel 06	Phase	Neutral

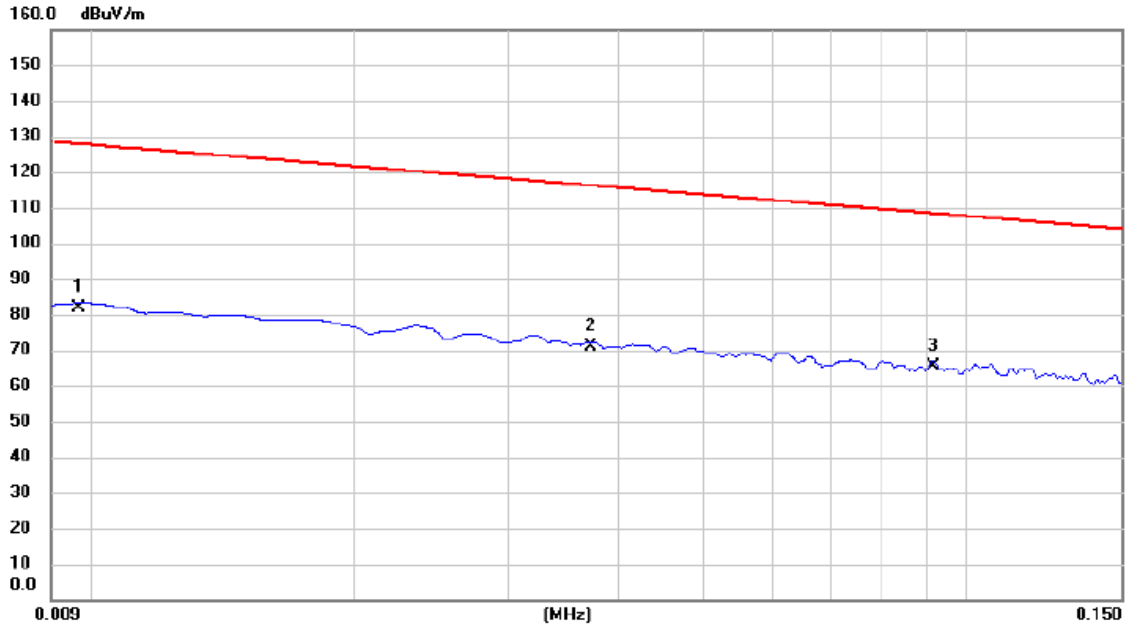


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.3255	22.82	10.19	33.01	59.57	-26.56	QP	
2	0.3255	13.30	10.19	23.49	49.57	-26.08	AVG	
3	0.5055	33.55	10.60	44.15	56.00	-11.85	QP	
4 *	0.5055	24.20	10.60	34.80	46.00	-11.20	AVG	
5	0.6945	22.91	10.94	33.85	56.00	22.15	QP	
6	0.6945	13.60	10.94	24.54	46.00	-21.46	AVG	
7	1.0005	23.54	11.21	34.75	56.00	-21.25	QP	
8	1.0005	14.80	11.21	26.01	46.00	-19.99	AVG	
9	1.3965	21.53	11.24	32.77	56.00	-23.23	QP	
10	1.3965	12.49	11.24	23.73	46.00	-22.27	AVG	
11	13.7985	26.62	12.62	39.24	60.00	-20.76	QP	
12	13.7985	17.91	12.62	30.53	50.00	19.47	AVG	

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

APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ

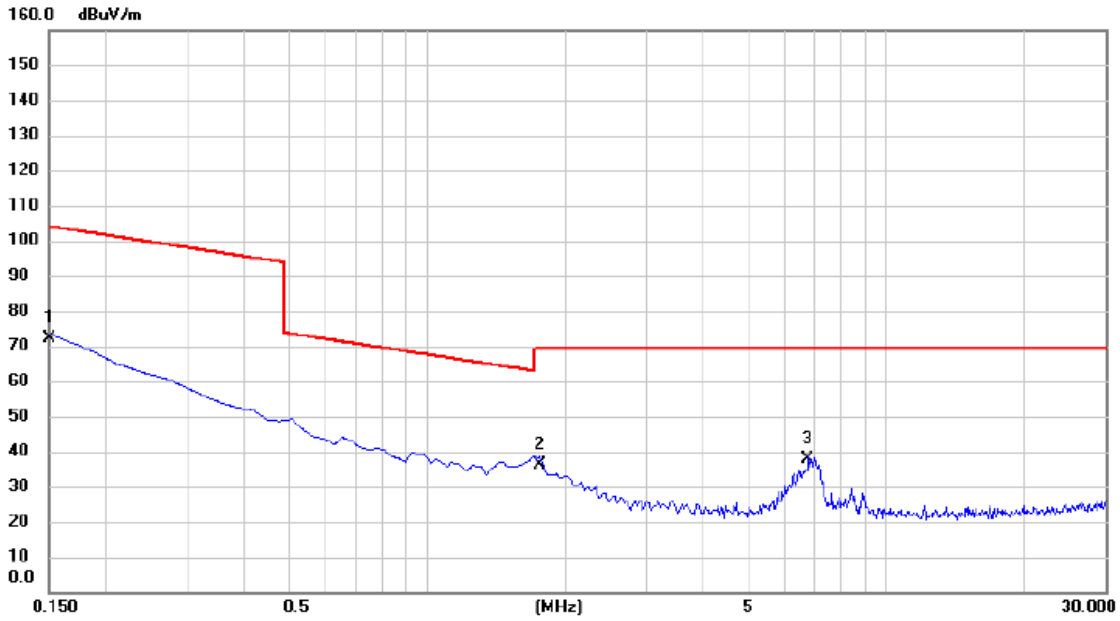
Test Mode	TX G Mode Channel 06	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0097	61.46	20.47	81.93	127.87	-45.94	AVG	
2		0.0372	50.03	21.14	71.17	116.19	-45.02	AVG	
3	*	0.0915	43.89	21.33	65.22	108.38	-43.16	QP	

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

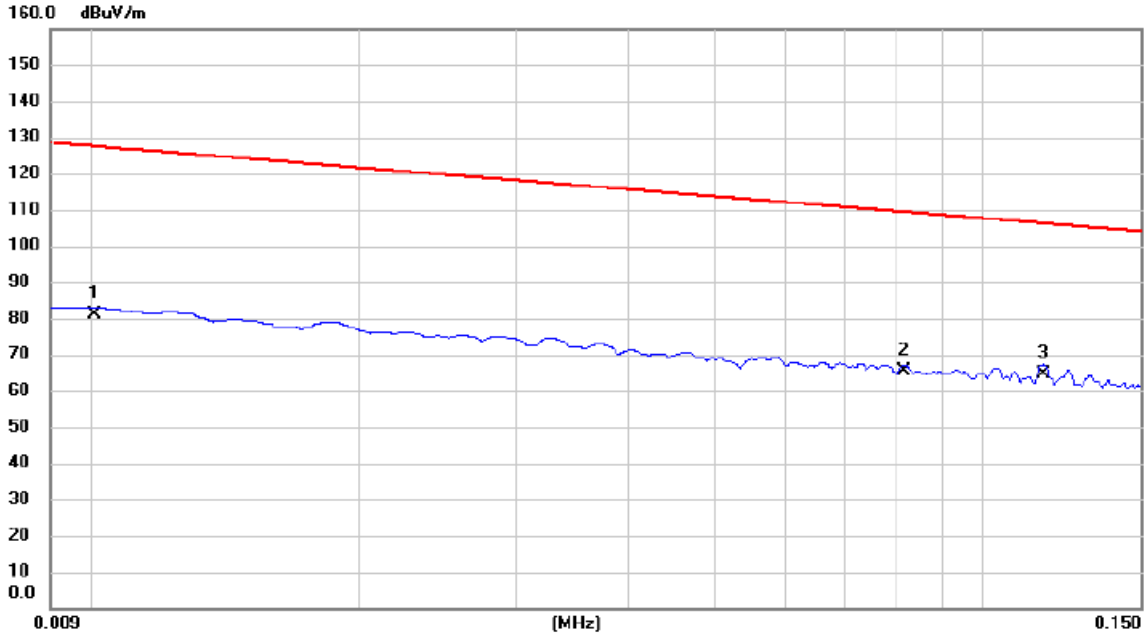
Test Mode	TX G Mode Channel 06	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.1500	51.12	21.27	72.39	104.09	-31.70	AVG	
2		1.7620	15.25	21.12	36.37	69.54	-33.17	QP	
3		6.7468	16.54	21.19	37.73	69.54	-31.81	QP	

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

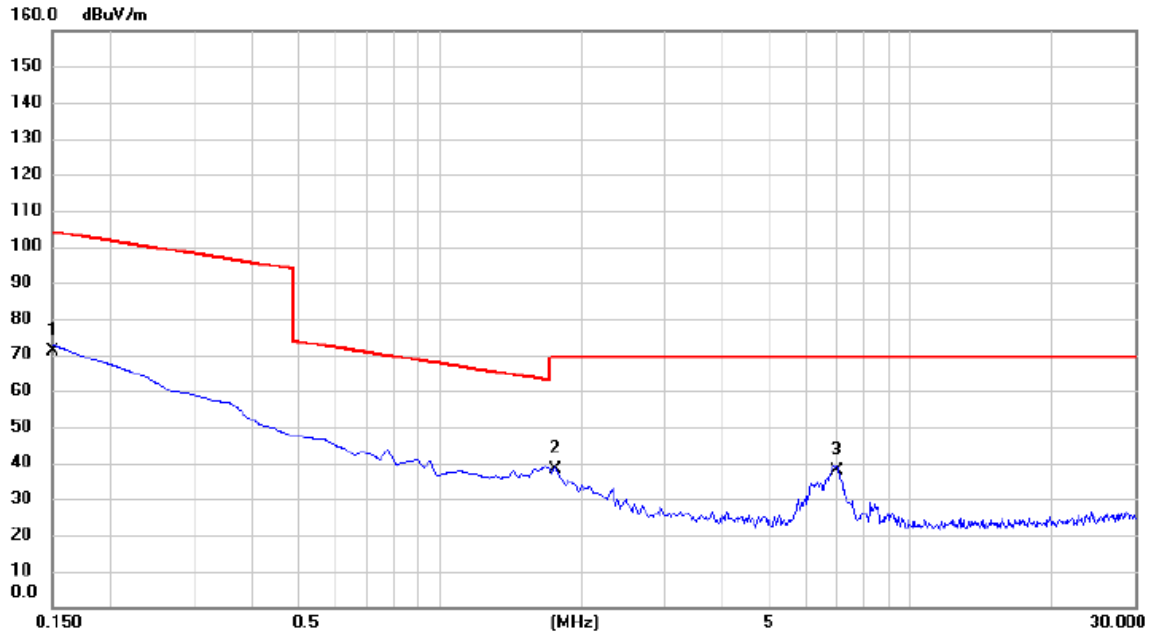
Test Mode	TX G Mode Channel 06	Polarization	Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0101	60.47	20.50	80.97	127.52	-46.55	AVG	
2		0.0816	44.23	21.30	65.53	109.37	-43.84	AVG	
3	*	0.1170	43.17	21.30	64.47	106.24	-41.77	QP	

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

Test Mode	TX G Mode Channel 06	Polarization	Ant 90°

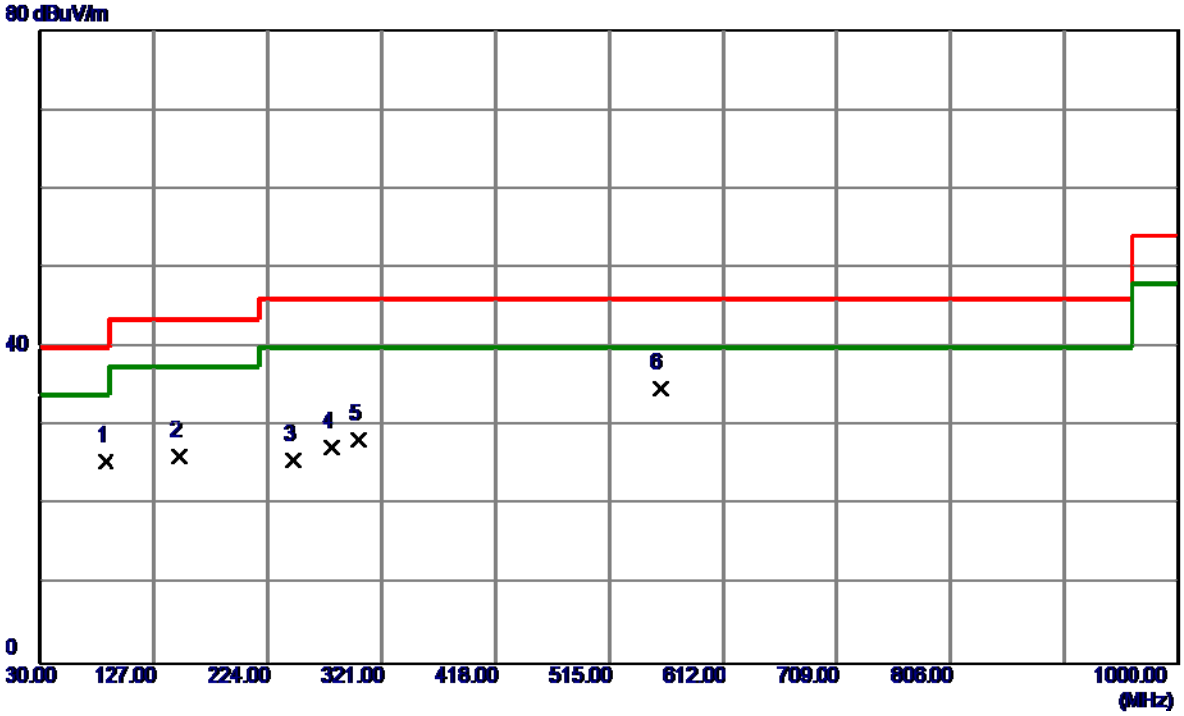


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.1500	49.86	21.27	71.13	104.09	-32.96	AVG	
2	*	1.7620	17.23	21.12	38.35	69.54	-31.19	QP	
3		6.9557	16.52	21.19	37.71	69.54	-31.83	QP	

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

APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

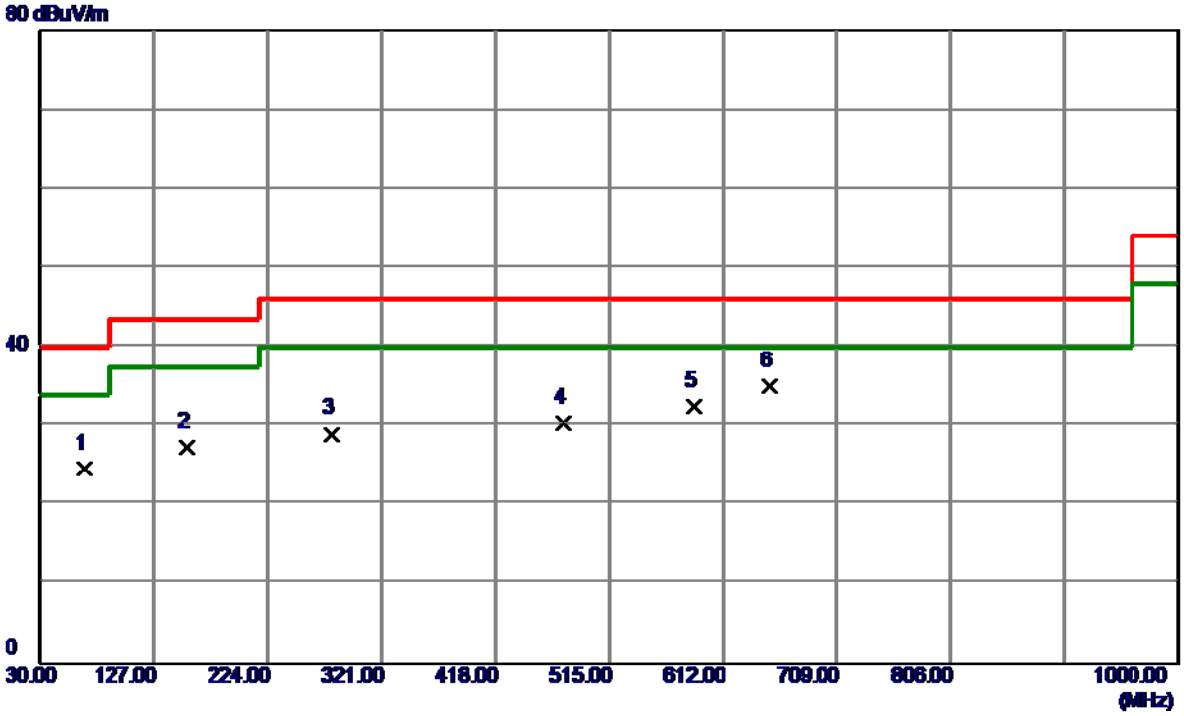
Test Mode	TX G Mode Channel 06	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	86.2600	42.22	-16.64	25.58	40.00	-14.42	Peak	
2	148.3400	37.52	-11.25	26.27	43.50	-17.23	Peak	
3	245.8250	38.25	-12.50	25.75	46.00	-20.25	Peak	
4	279.2900	38.48	-11.07	27.41	46.00	-18.59	Peak	
5	302.0850	38.90	-10.54	28.36	46.00	-17.64	Peak	
6 *	558.6500	39.53	-4.75	34.78	46.00	-11.22	Peak	

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

Test Mode	TX G Mode Channel 06	Polarization	Horizontal

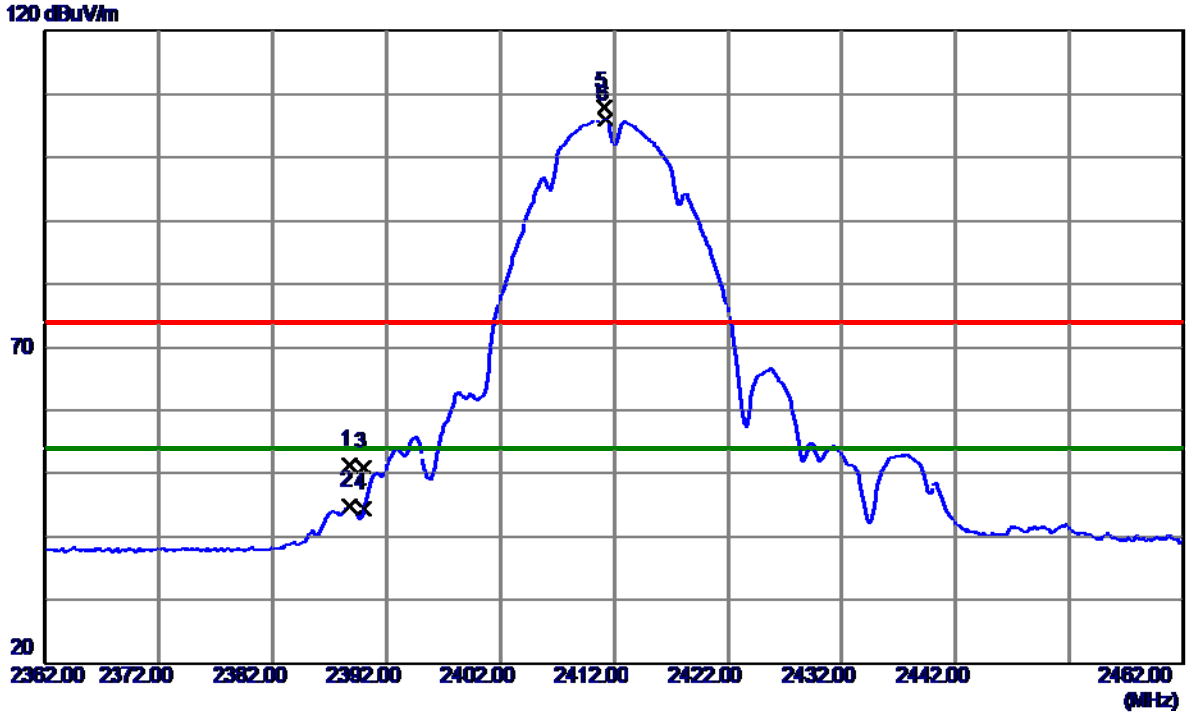


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	67.8300	37.84	-13.14	24.70	40.00	-15.30	Peak	
2	155.1300	38.30	-11.00	27.30	43.50	-16.20	Peak	
3	279.2900	40.11	-11.07	29.04	46.00	-16.96	Peak	
4	475.7150	36.77	-6.39	30.38	46.00	-15.62	Peak	
5	586.7800	36.50	-3.97	32.53	46.00	-13.47	Peak	
6 *	651.7700	37.79	-2.81	34.98	46.00	-11.02	Peak	

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

APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ

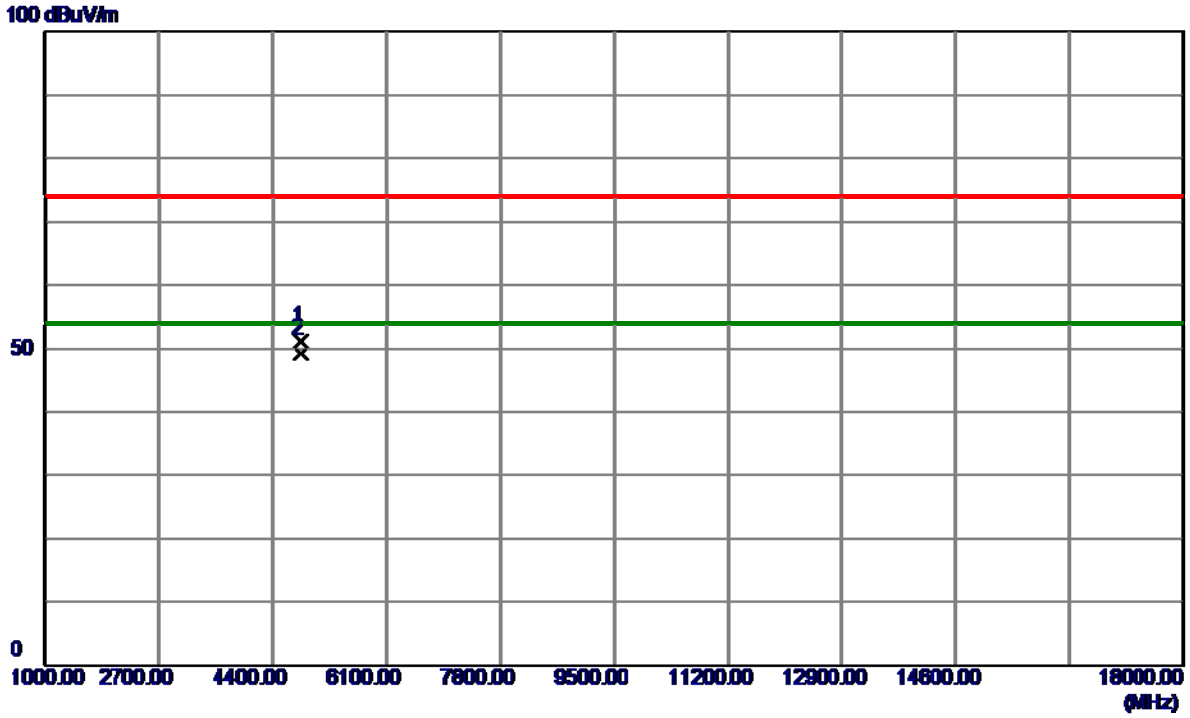
Test Mode	TX B Mode 2412 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2388.7500	43.74	7.70	51.44	74.00	-22.56	Peak	
2	2388.7500	37.17	7.70	44.87	54.00	-9.13	AVG	
3	2390.0000	43.29	7.70	50.99	74.00	-23.01	Peak	
4	2390.0000	36.72	7.70	44.42	54.00	-9.58	AVG	
5	2411.1500	100.36	7.72	108.08	74.00	34.08	Peak	No Limit
6 *	2411.2500	98.37	7.72	106.09	54.00	52.09	AVG	No Limit

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

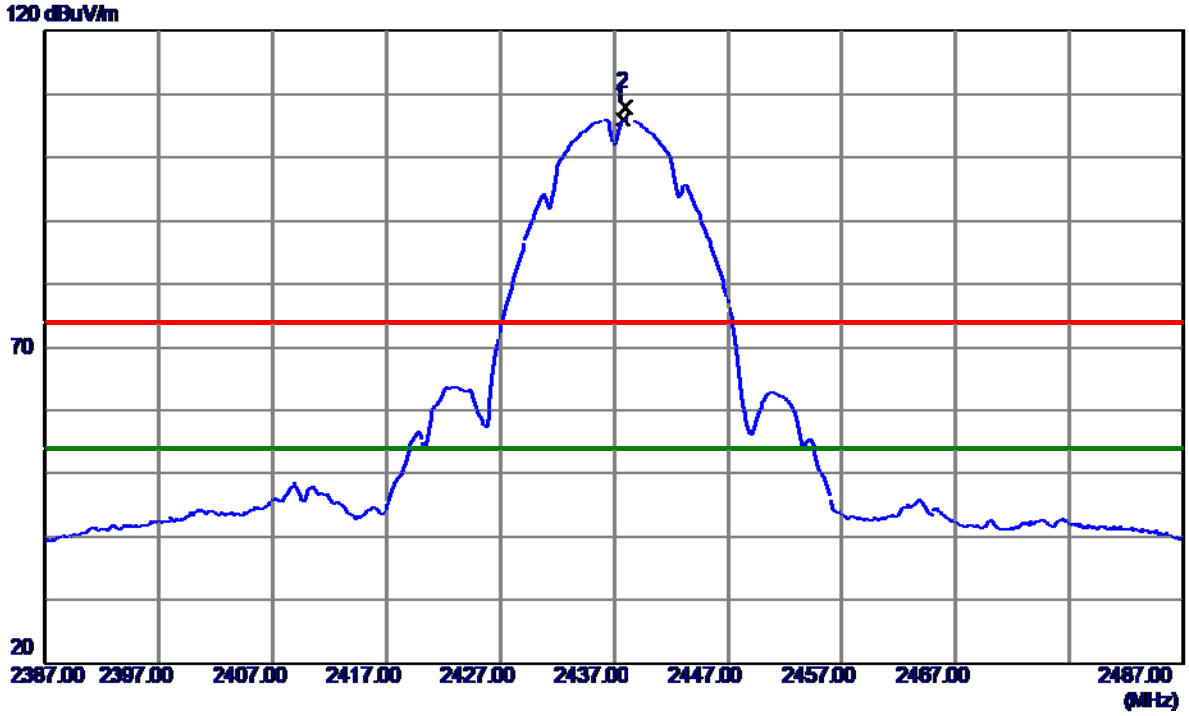
Test Mode	TX B Mode 2412 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4824.0250	48.27	2.84	51.11	74.00	-22.89	Peak	
2 *	4824.0250	46.39	2.84	49.23	54.00	-4.77	AVG	

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

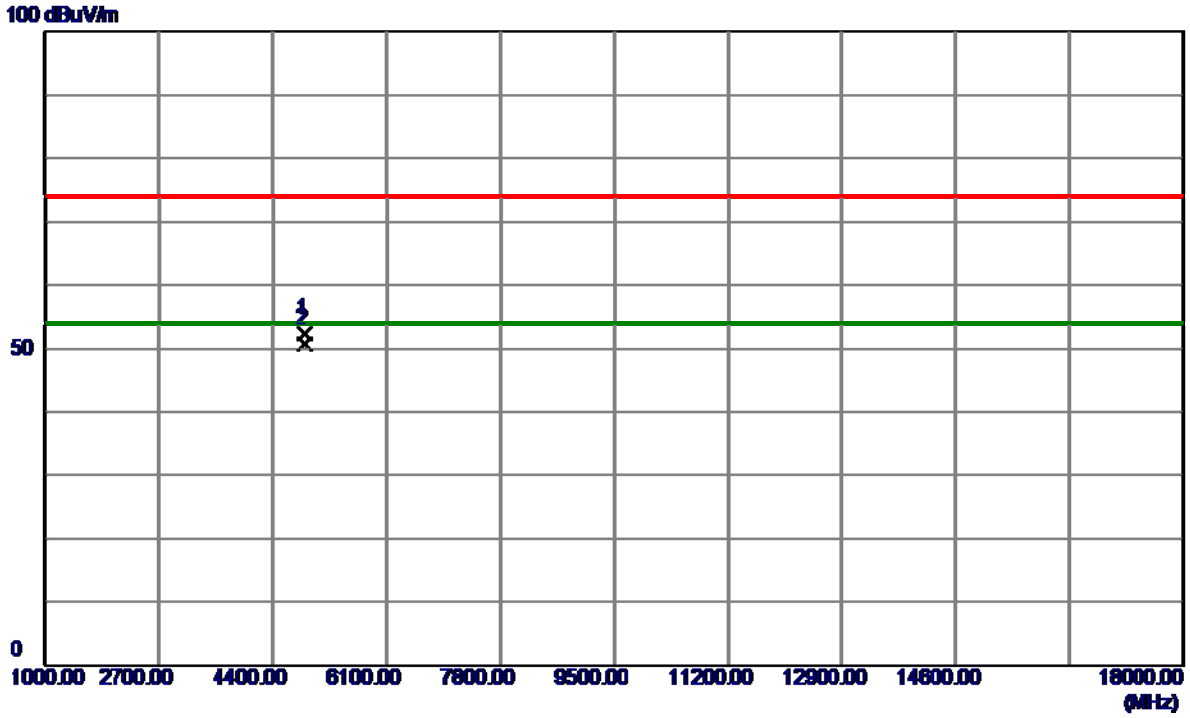
Test Mode	TX B Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2437.8000	98.31	7.76	106.07	54.00	52.07	AVG	No Limit
2	2437.9500	100.33	7.76	108.09	74.00	34.09	Peak	No Limit

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

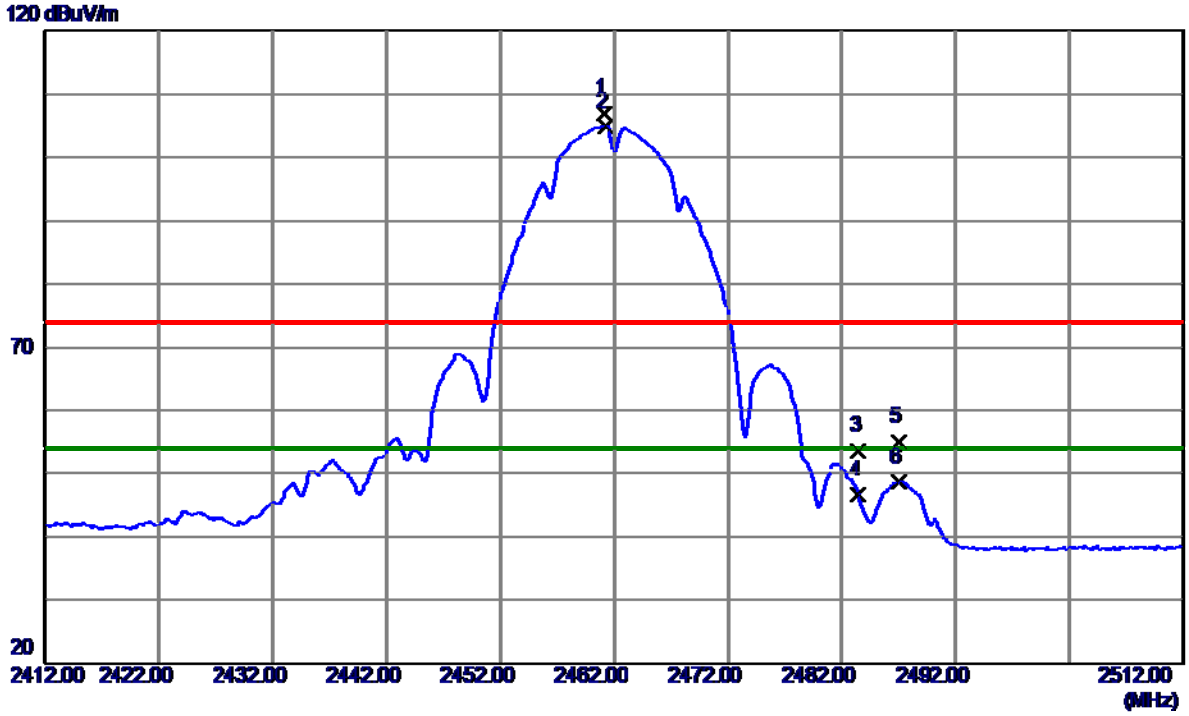
Test Mode	TX B Mode 2437 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4873.9750	49.41	2.96	52.37	74.00	-21.63	Peak	
2 *	4874.0500	47.93	2.96	50.89	54.00	-3.11	AVG	

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

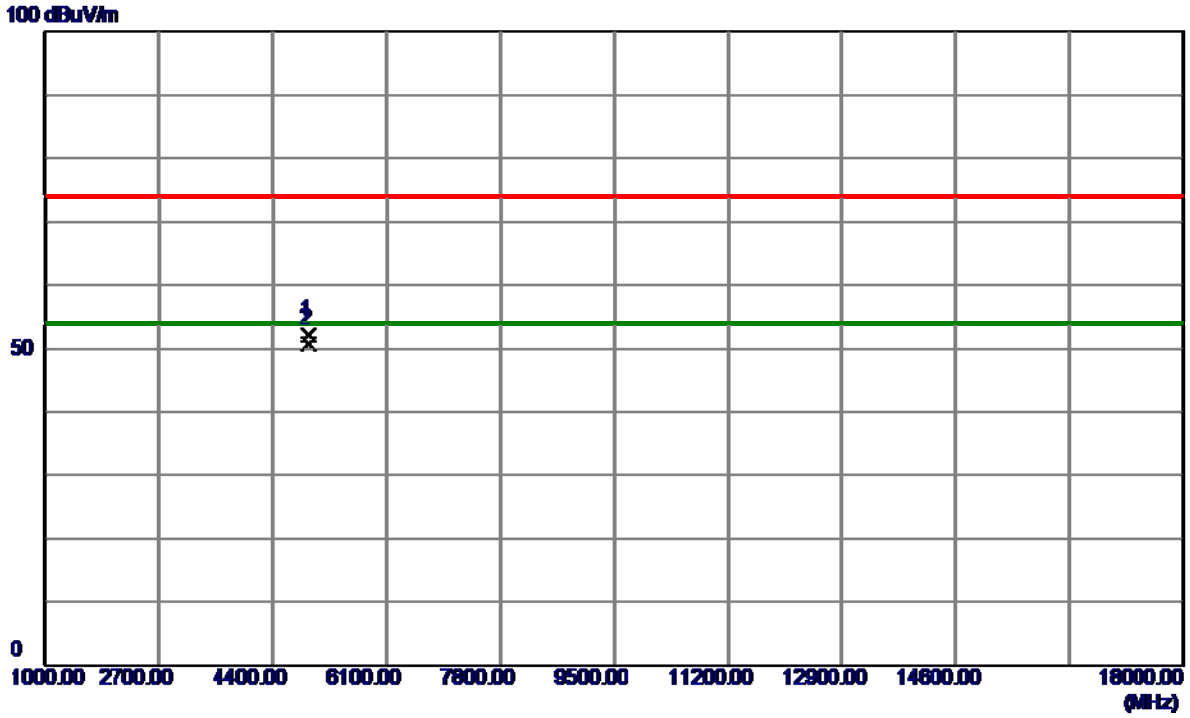
Test Mode	TX B Mode 2462 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2461.1500	99.16	7.78	106.94	74.00	32.94	Peak	No Limit
2 *	2461.2000	97.08	7.78	104.86	54.00	50.86	AVG	No Limit
3	2483.5000	45.70	7.81	53.51	74.00	-20.49	Peak	
4	2483.5000	38.76	7.81	46.57	54.00	-7.43	AVG	
5	2487.0500	47.13	7.81	54.94	74.00	-19.06	Peak	
6	2487.0500	40.80	7.81	48.61	54.00	-5.39	AVG	

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

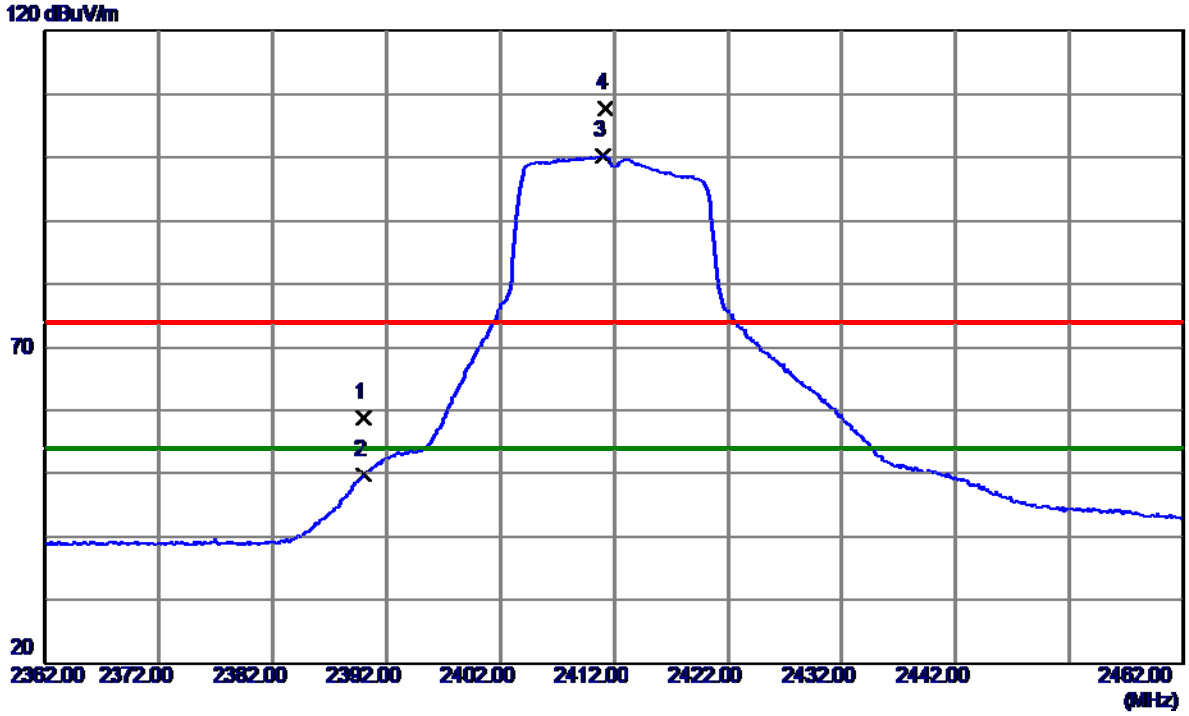
Test Mode	TX B Mode 2462 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4923.9750	49.13	3.07	52.20	74.00	-21.80	Peak	
2 *	4924.0000	47.66	3.07	50.73	54.00	-3.27	AVG	

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

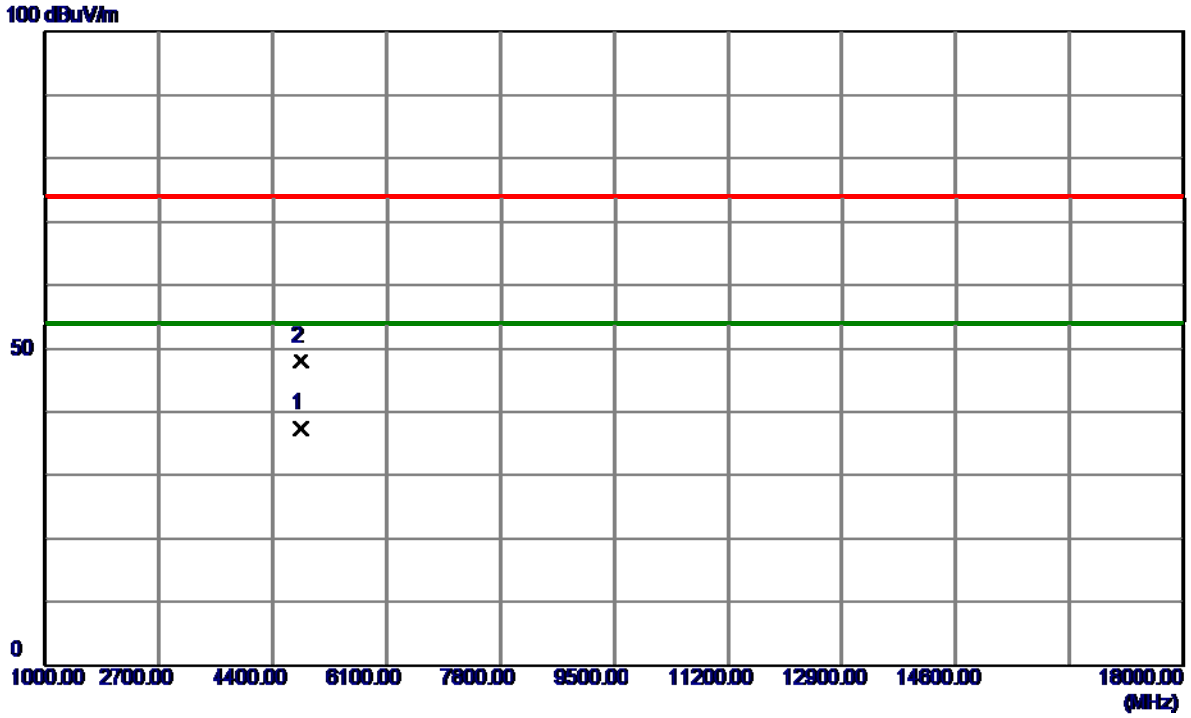
Test Mode	TX G Mode 2412 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	51.05	7.70	58.75	74.00	-15.25	Peak	
2	2390.0000	42.07	7.70	49.77	54.00	-4.23	AVG	
3 *	2411.0000	92.44	7.72	100.16	54.00	46.16	AVG	No Limit
4	2411.2000	100.06	7.72	107.78	74.00	33.78	Peak	No Limit

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

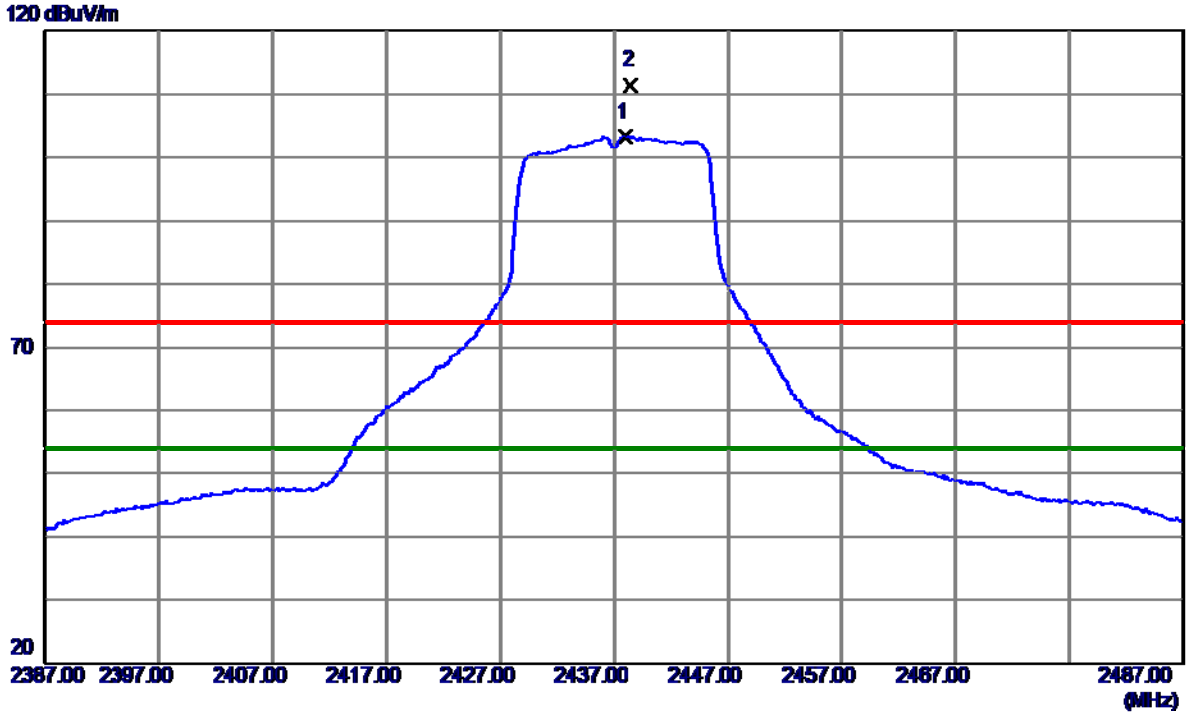
Test Mode	TX G Mode 2412 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4822.2250	34.49	2.84	37.33	54.00	-16.67	AVG	
2	4823.6250	45.20	2.84	48.04	74.00	-25.96	Peak	

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

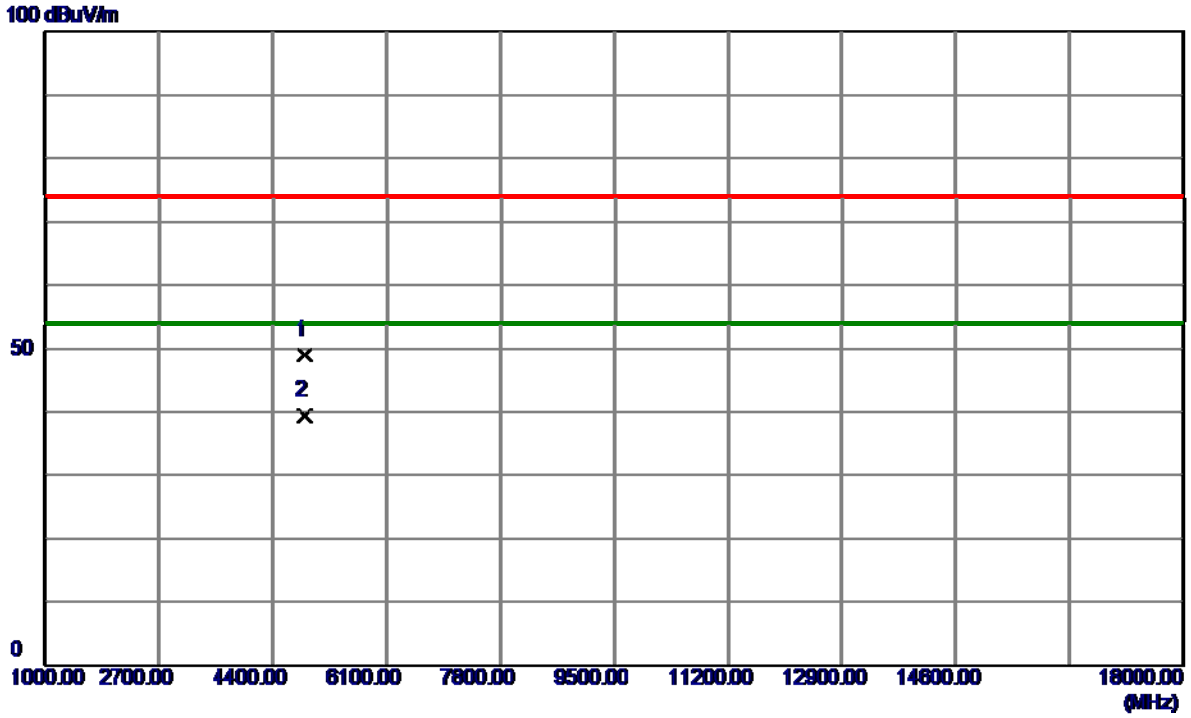
Test Mode	TX G Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2438.0000	95.47	7.76	103.23	54.00	49.23	AVG	No Limit
2	2438.5000	103.66	7.76	111.42	74.00	37.42	Peak	No Limit

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

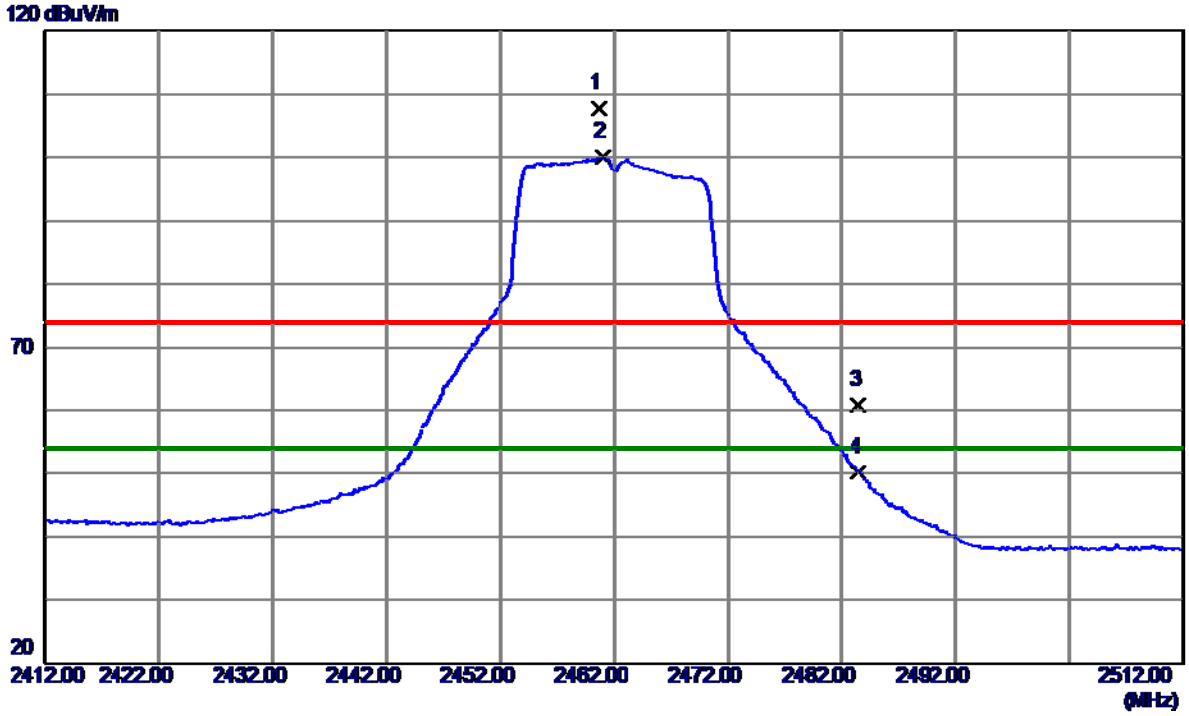
Test Mode	TX G Mode 2437 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4873.3750	46.14	2.95	49.09	74.00	-24.91	Peak	
2 *	4874.6250	36.35	2.96	39.31	54.00	-14.69	AVG	

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

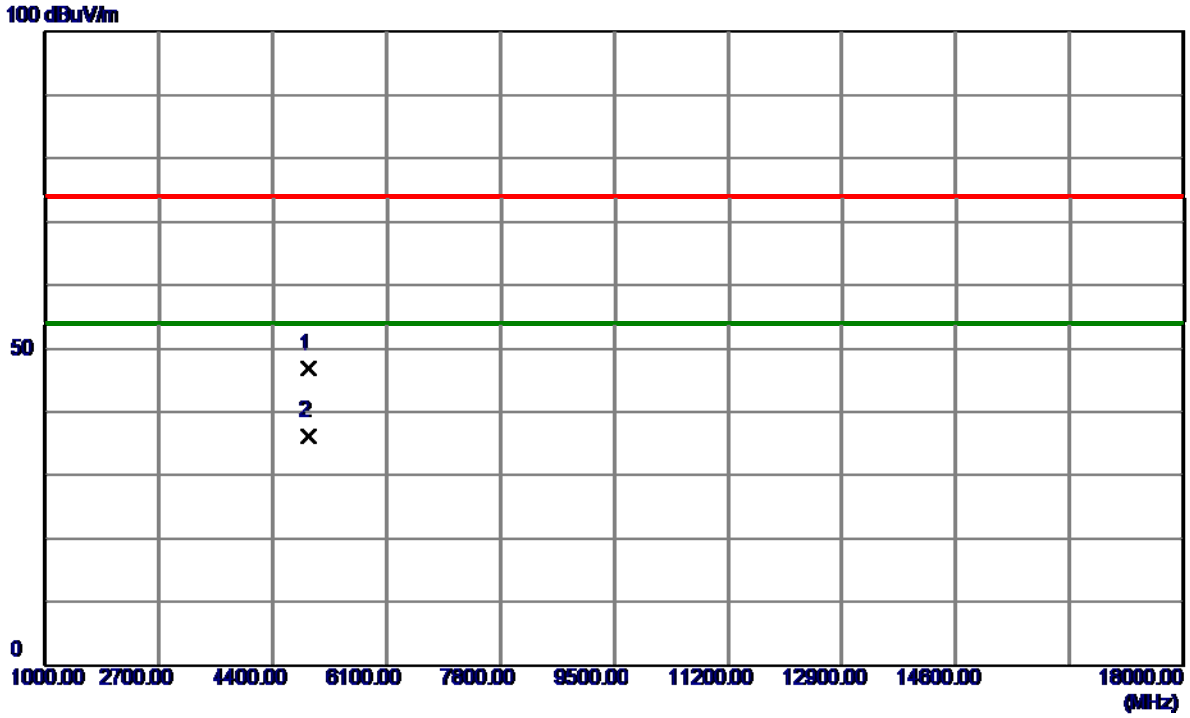
Test Mode	TX G Mode 2462 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2460.6500	100.08	7.78	107.86	74.00	33.86	Peak	No Limit
2 *	2461.0000	92.15	7.78	99.93	54.00	45.93	AVG	No Limit
3	2483.5000	53.05	7.81	60.86	74.00	-13.14	Peak	
4	2483.5000	42.47	7.81	50.28	54.00	-3.72	AVG	

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

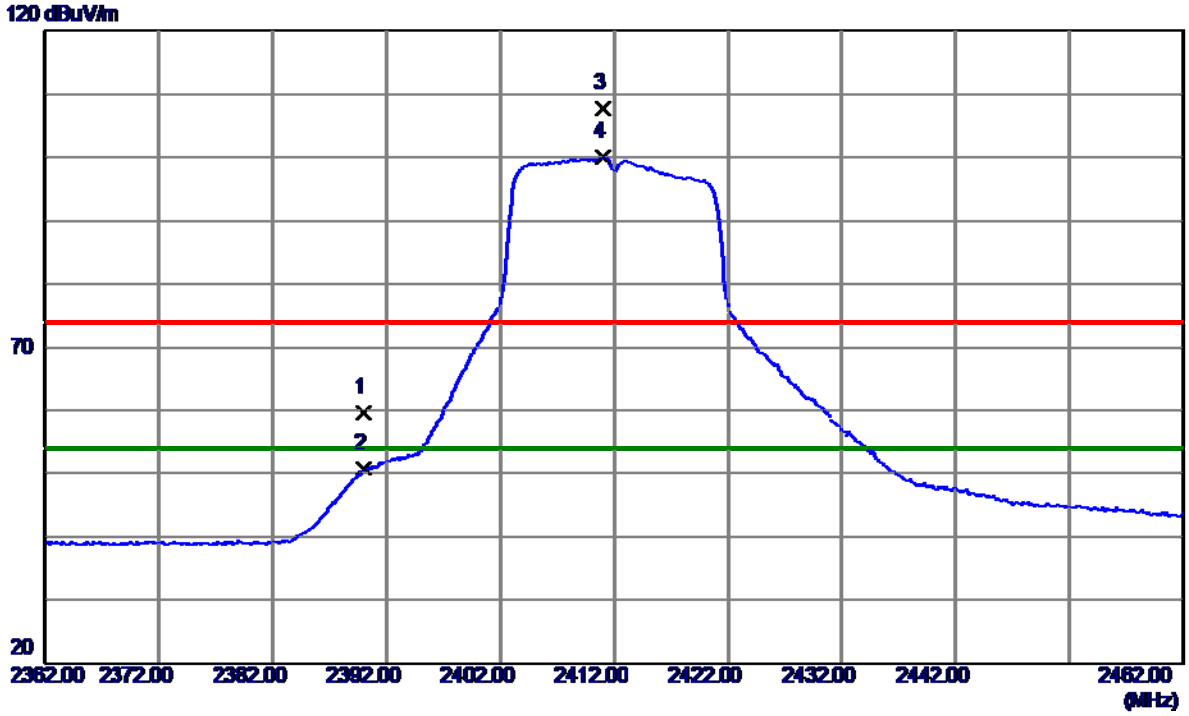
Test Mode	TX G Mode 2462 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4922.9250	43.67	3.07	46.74	74.00	-27.26	Peak	
2 *	4925.8000	33.12	3.08	36.20	54.00	-17.80	AVG	

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

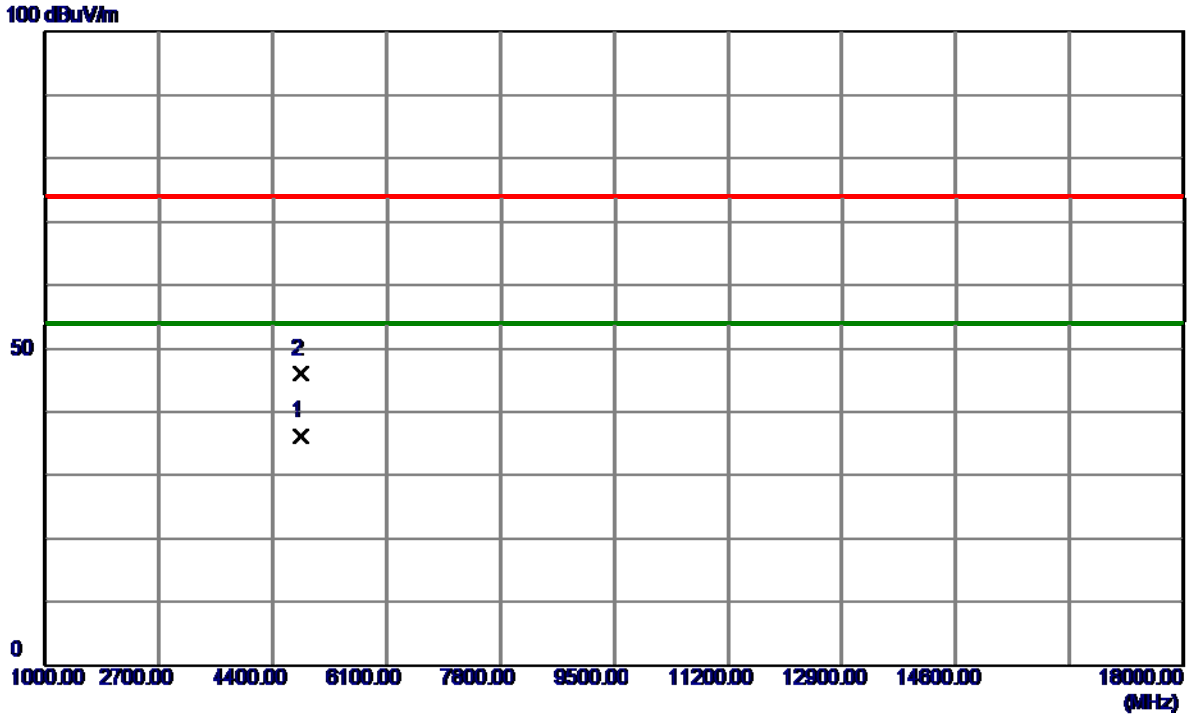
Test Mode	TX N(HT20) Mode 2412 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	51.94	7.70	59.64	74.00	-14.36	Peak	
2	2390.0000	43.01	7.70	50.71	54.00	-3.29	AVG	
3	2411.0000	100.11	7.72	107.83	74.00	33.83	Peak	No Limit
4 *	2411.0500	92.23	7.72	99.95	54.00	45.95	AVG	No Limit

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

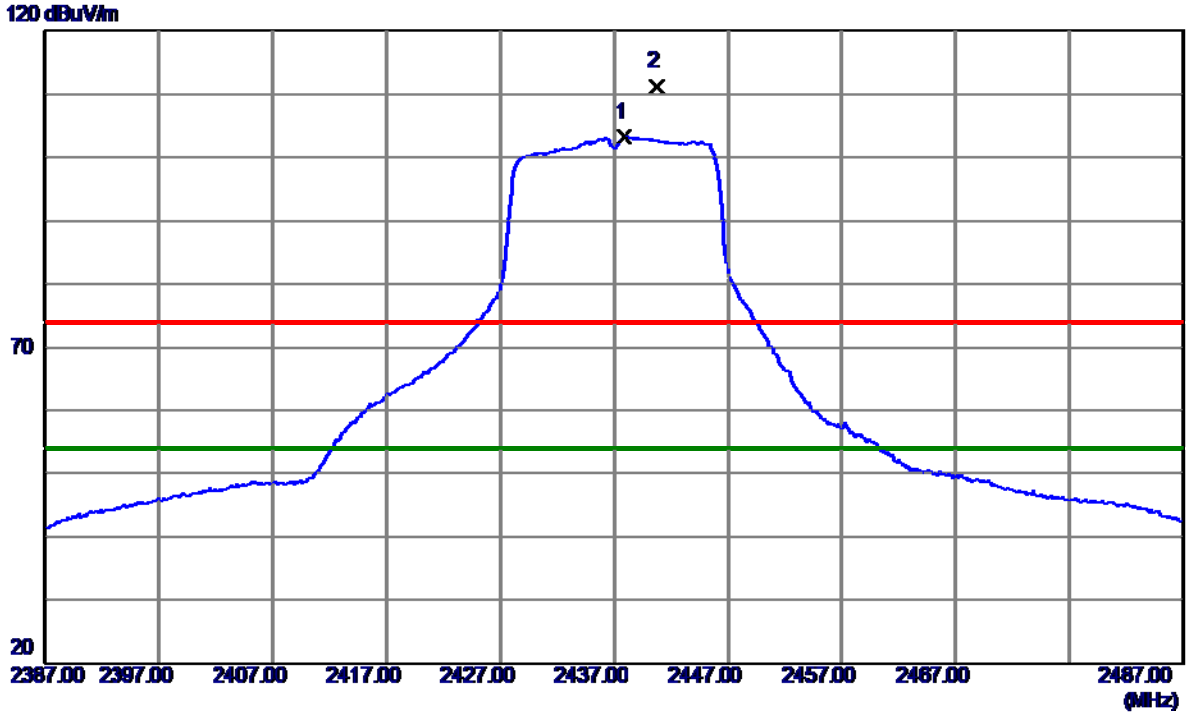
Test Mode	TX N(HT20) Mode 2412 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4822.6500	33.28	2.84	36.12	54.00	-17.88	AVG	
2	4823.8000	43.22	2.84	46.06	74.00	-27.94	Peak	

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

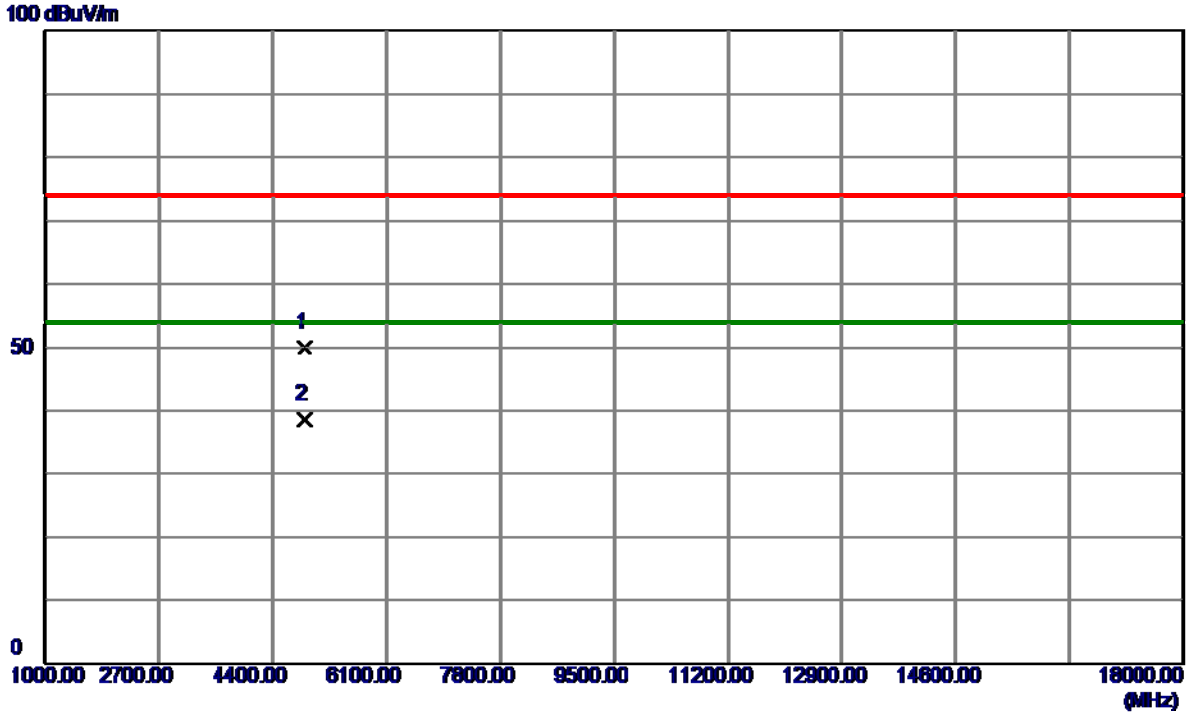
Test Mode	TX N(HT20) Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2437.8500	95.43	7.76	103.19	54.00	49.19	AVG	No Limit
2	2440.7500	103.42	7.76	111.18	74.00	37.18	Peak	No Limit

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

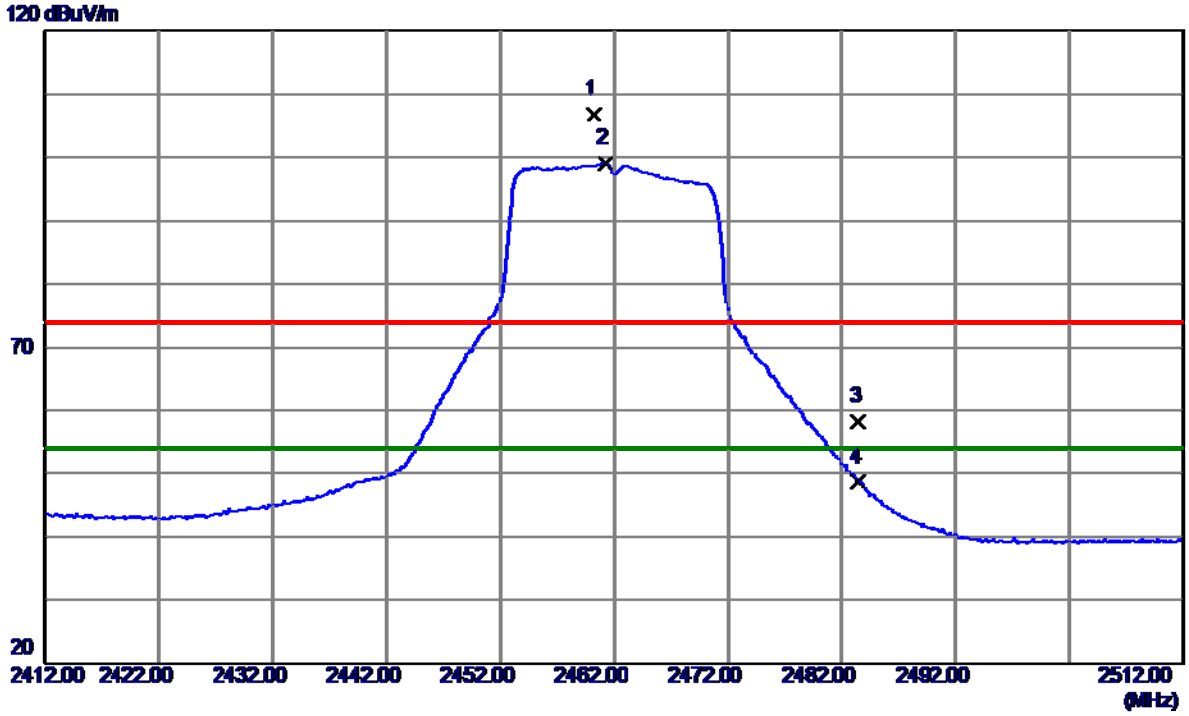
Test Mode	TX N(HT20) Mode 2437 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4873.6250	47.09	2.96	50.05	74.00	-23.95	Peak	
2 *	4874.8750	35.69	2.96	38.65	54.00	-15.35	AVG	

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

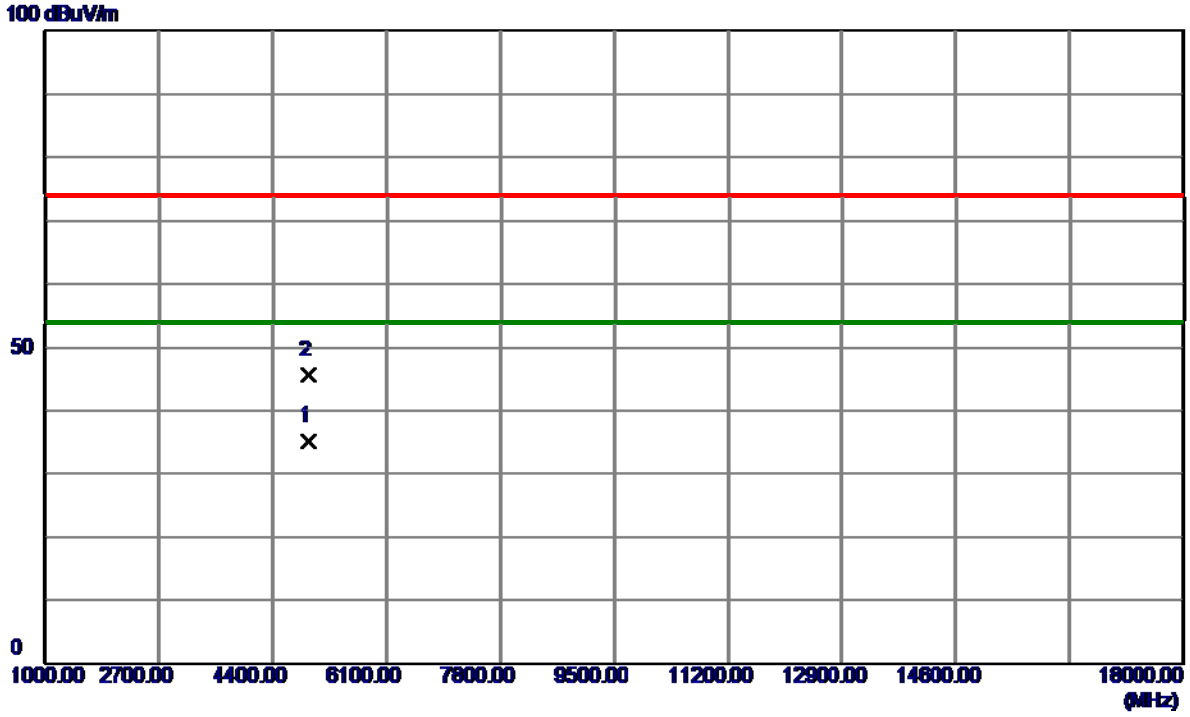
Test Mode	TX N(HT20) Mode 2462 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2460.2500	99.06	7.78	106.84	74.00	32.84	Peak	No Limit
2 *	2461.2000	91.22	7.78	99.00	54.00	45.00	AVG	No Limit
3	2483.5000	50.42	7.81	58.23	74.00	-15.77	Peak	
4	2483.5000	40.71	7.81	48.52	54.00	-5.48	AVG	

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

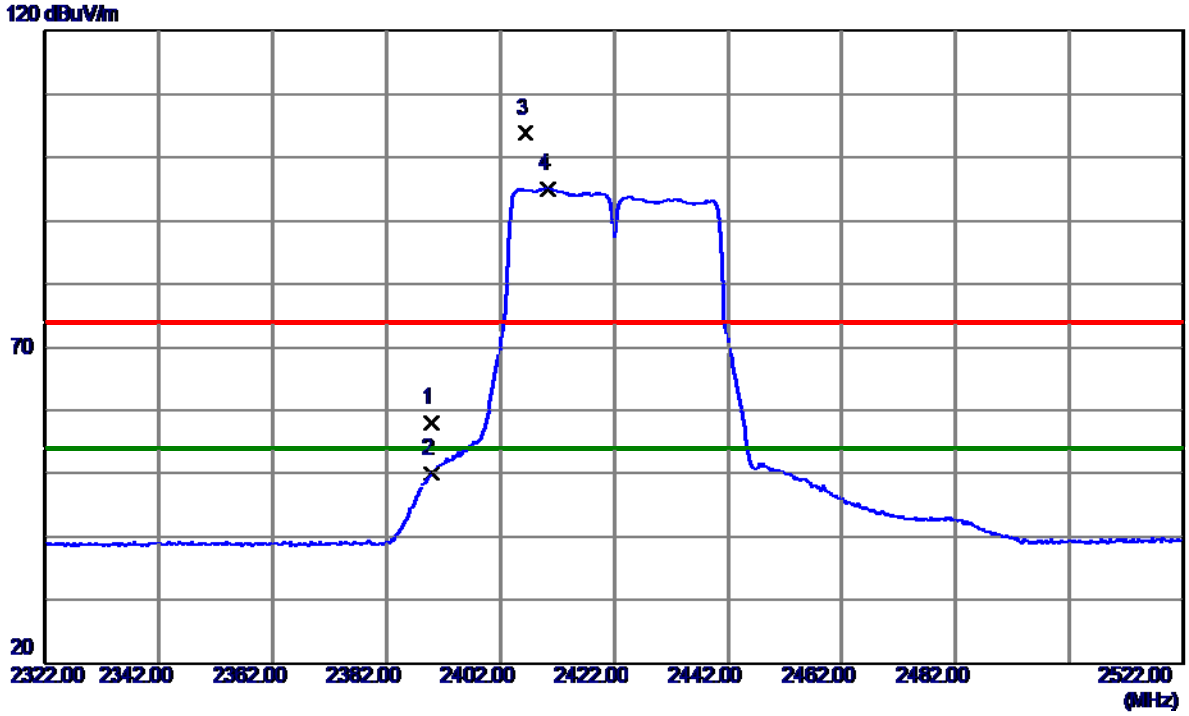
Test Mode	TX N(HT20) Mode 2462 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4922.6250	32.12	3.07	35.19	54.00	-18.81	AVG	
2	4925.2750	42.56	3.08	45.64	74.00	-28.36	Peak	

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

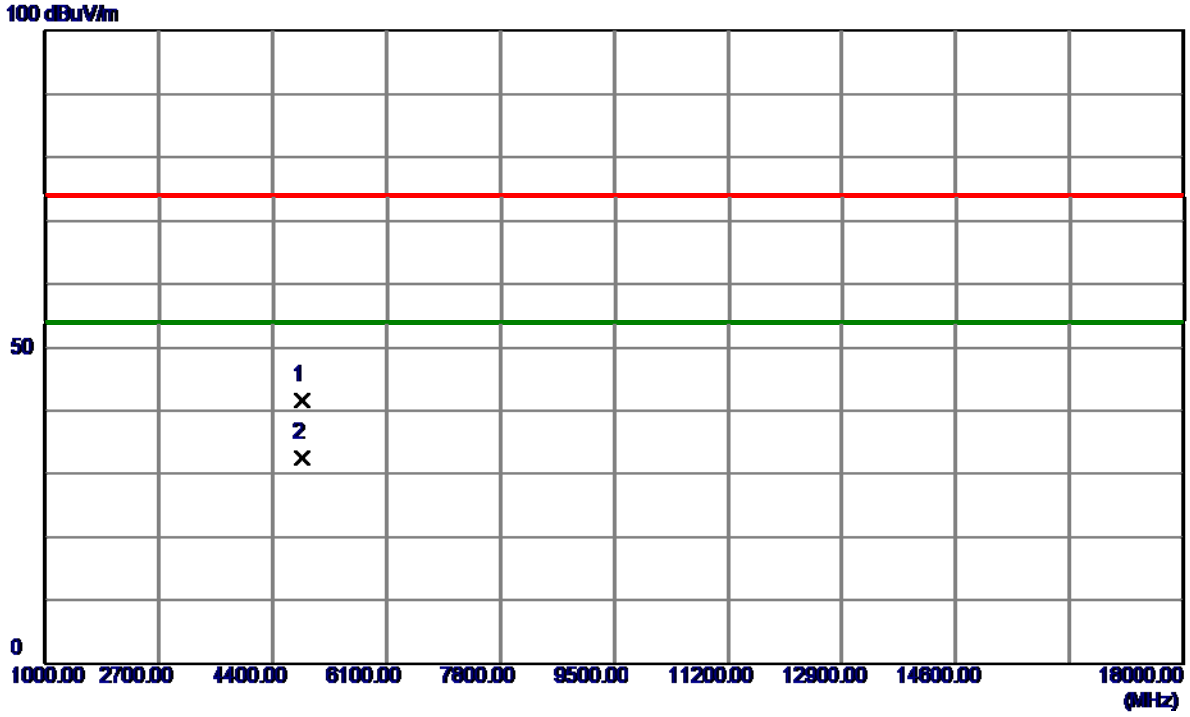
Test Mode	TX N(HT40) Mode 2422 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	50.26	7.70	57.96	74.00	-16.04	Peak	
2	2390.0000	42.22	7.70	49.92	54.00	-4.08	AVG	
3	2406.5000	95.99	7.72	103.71	74.00	29.71	Peak	No Limit
4 *	2410.4000	87.38	7.72	95.10	54.00	41.10	AVG	No Limit

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

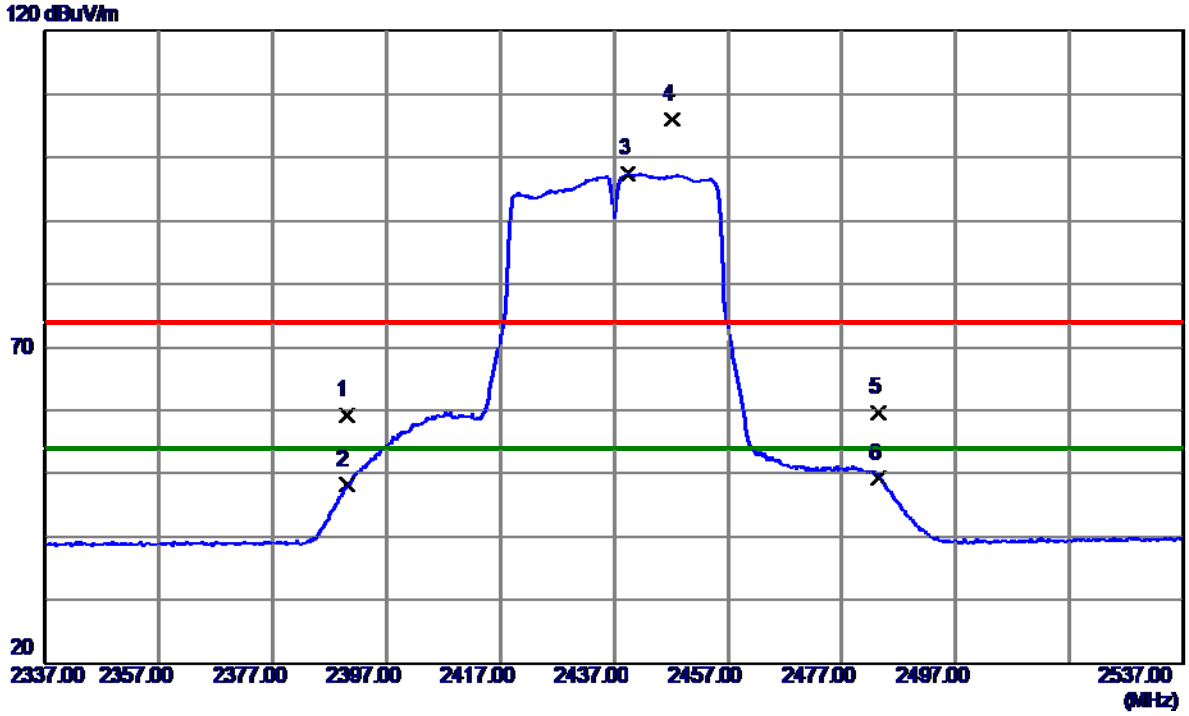
Test Mode	TX N(HT40) Mode 2422 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4840.1000	38.76	2.88	41.64	74.00	-32.36	Peak	
2 *	4840.5500	29.74	2.88	32.62	54.00	-21.38	AVG	

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

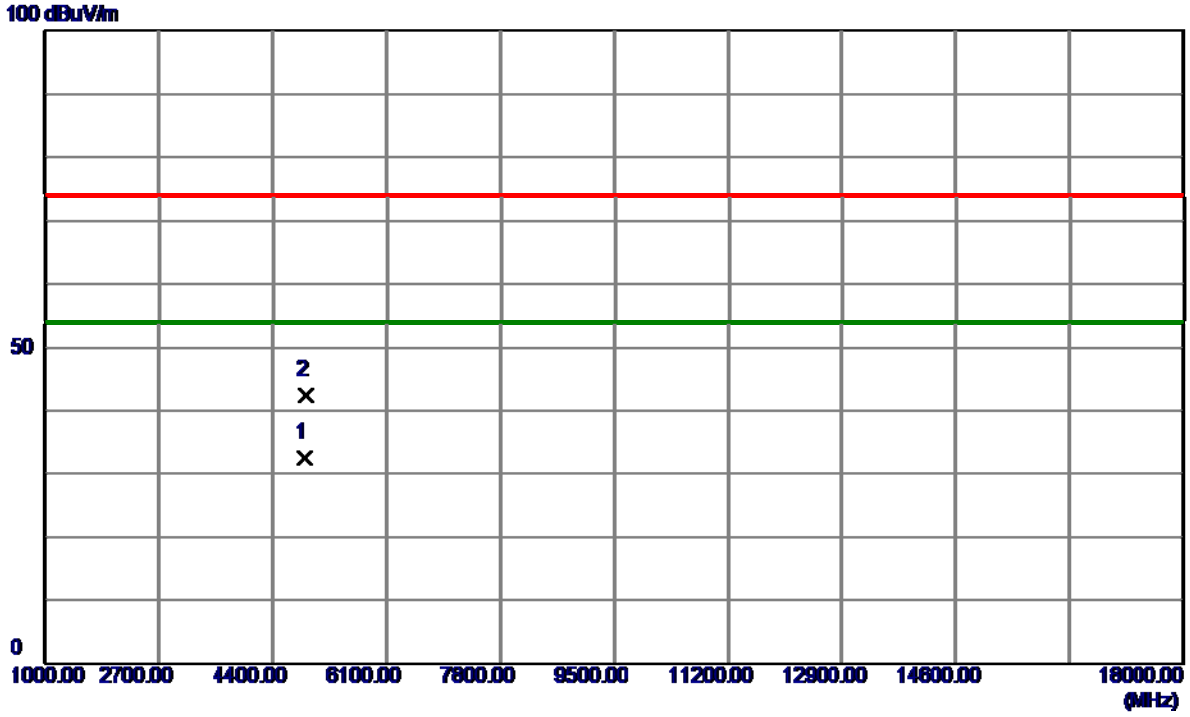
Test Mode	TX N(HT40) Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	51.48	7.70	59.18	74.00	-14.82	Peak	
2	2390.0000	40.55	7.70	48.25	54.00	-5.75	AVG	
3 *	2439.5000	89.64	7.76	97.40	54.00	43.40	AVG	No Limit
4	2447.2000	98.25	7.77	106.02	74.00	32.02	Peak	No Limit
5	2483.5000	51.85	7.81	59.66	74.00	-14.34	Peak	
6	2483.5000	41.39	7.81	49.20	54.00	-4.80	AVG	

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

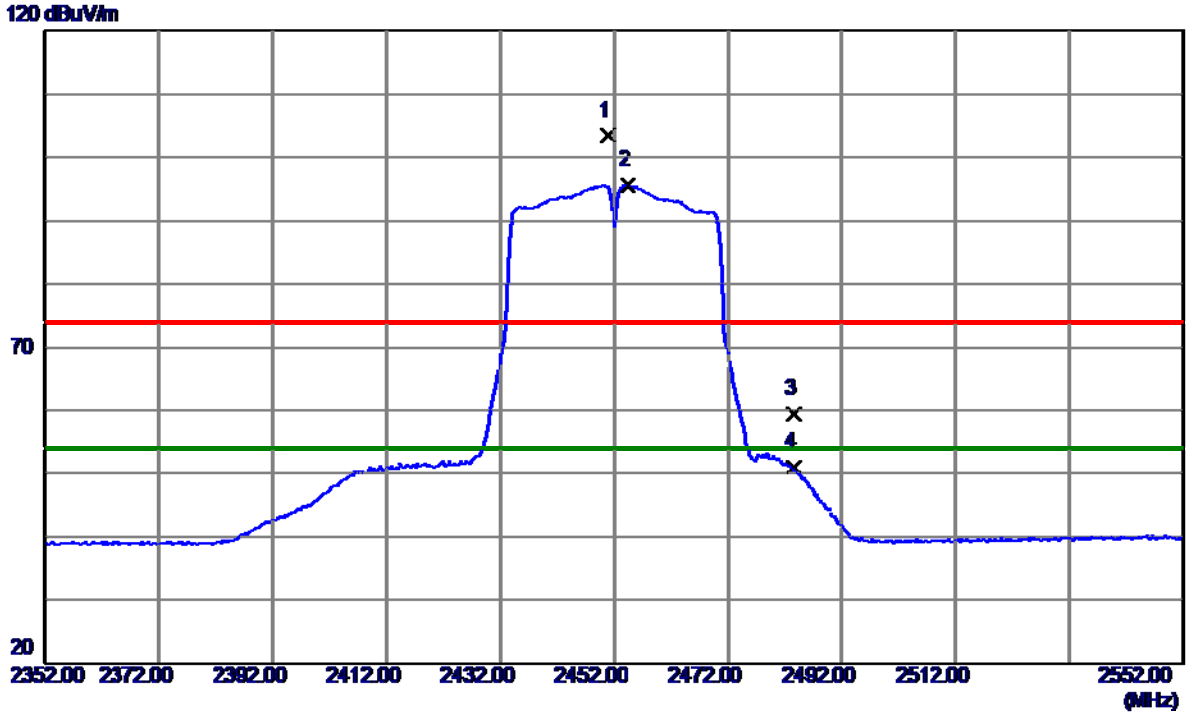
Test Mode	TX N(HT40) Mode 2437 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4875.7500	29.71	2.96	32.67	54.00	-21.33	AVG	
2	4884.7500	39.48	2.98	42.46	74.00	-31.54	Peak	

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

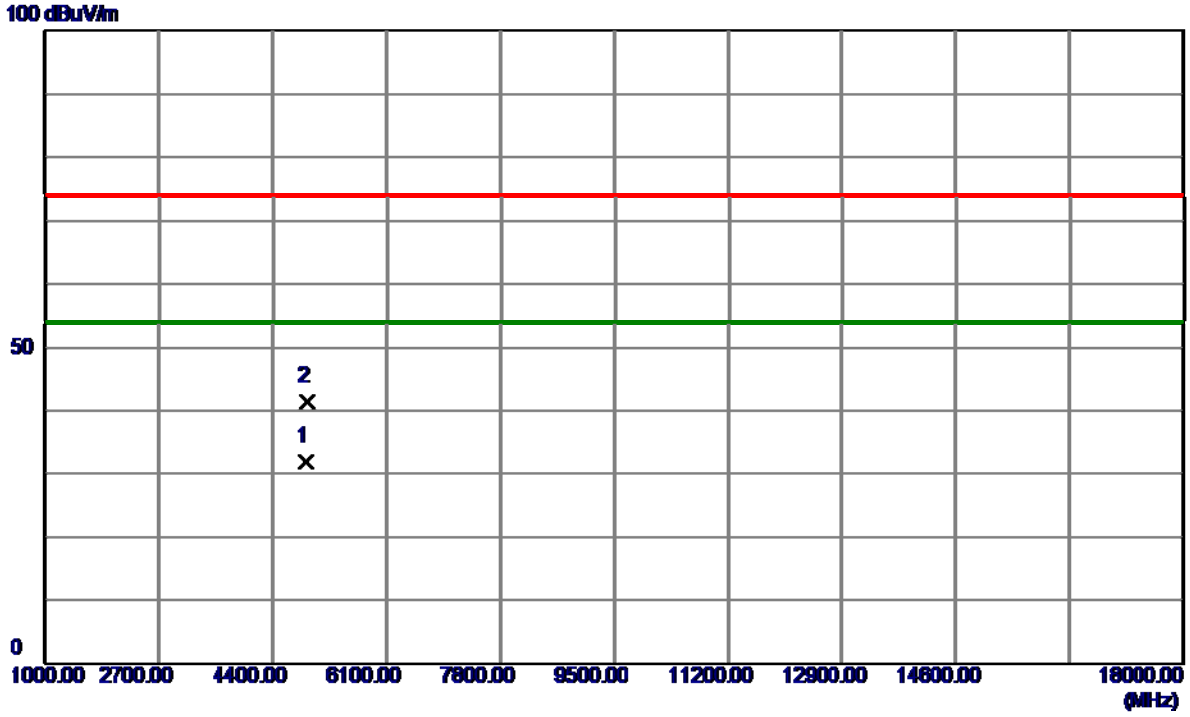
Test Mode	TX N(HT40) Mode 2452 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2450.8000	95.63	7.77	103.40	74.00	29.40	Peak	No Limit
2 *	2454.4000	87.84	7.78	95.62	54.00	41.62	AVG	No Limit
3	2483.5000	51.57	7.81	59.38	74.00	-14.62	Peak	
4	2483.5000	43.19	7.81	51.00	54.00	-3.00	AVG	

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

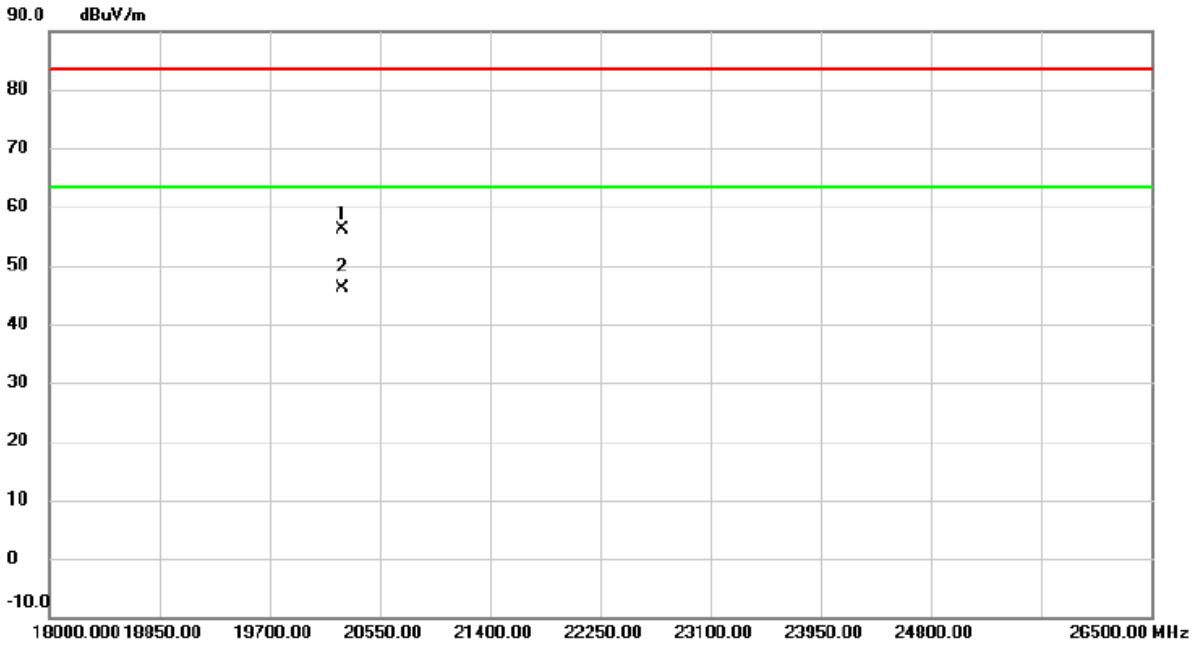
Test Mode	TX N(HT40) Mode 2452 MHz	Polarization	Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4898.3500	28.95	3.01	31.96	54.00	-22.04	AVG	
2	4900.7000	38.34	3.02	41.36	74.00	-32.64	Peak	

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

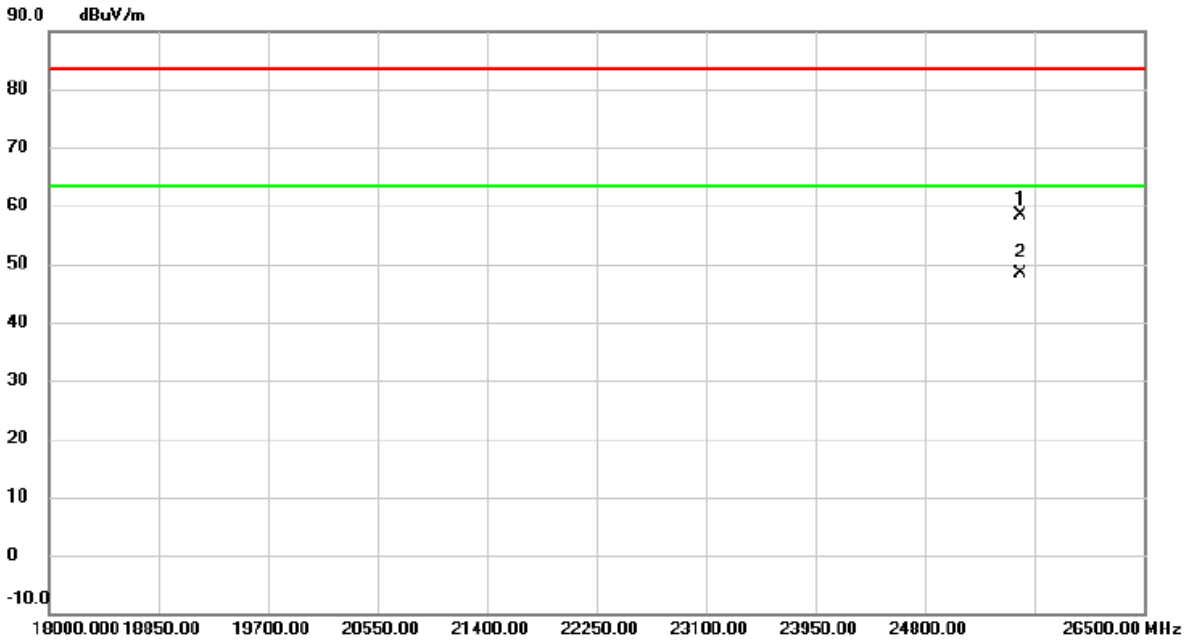
Test Mode	TX G Mode 2437 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		20256.75	46.01	10.21	56.22	83.50	-27.28	peak	
2	*	20256.75	35.89	10.21	46.10	63.50	-17.40	AVG	

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

Test Mode	TX G Mode 2437 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		25543.75	46.09	12.30	58.39	83.50	-25.11	peak	
2	*	25543.75	36.12	12.30	48.42	63.50	-15.08	AVG	

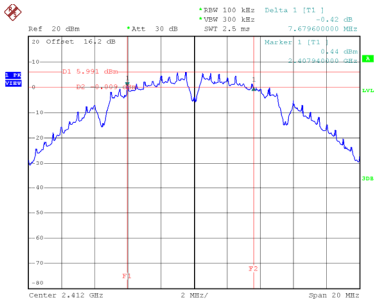
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX E - BANDWIDTH

Test Mode	TX B Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result
01	2412	7.680	13.520	0.5	Complies
06	2437	9.070	14.080	0.5	Complies
11	2462	8.160	13.760	0.5	Complies

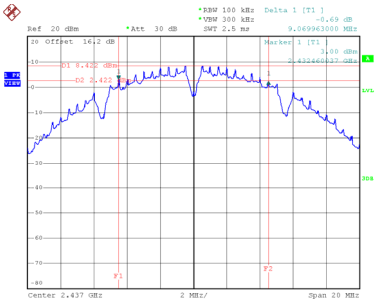
CH01



Date: 30.JUL.2024 10:55:23

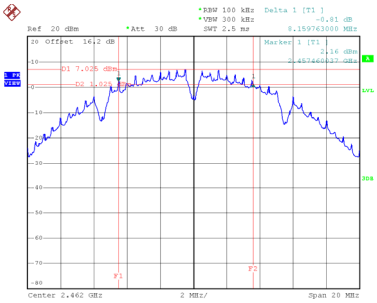
CH06

6 dB Bandwidth

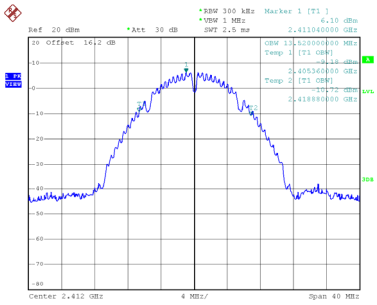


Date: 30.JUL.2024 10:57:51

CH11

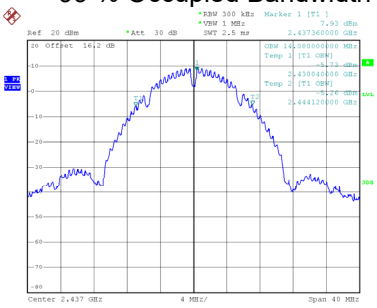


Date: 30.JUL.2024 11:31:57

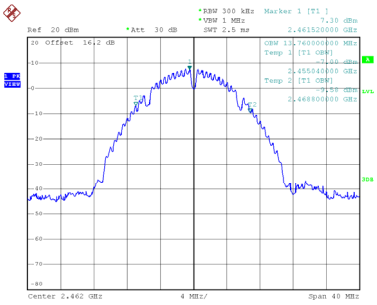


Date: 30.JUL.2024 10:55:30

99 % Occupied Bandwidth



Date: 30.JUL.2024 10:57:58

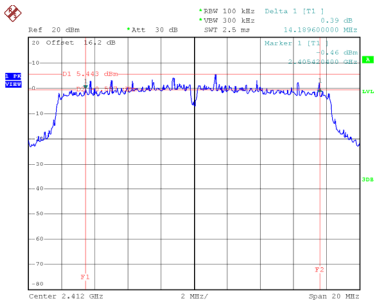


Date: 30.JUL.2024 11:32:05

Test Mode	TX G Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result
01	2412	14.190	16.640	0.5	Complies
06	2437	15.720	16.960	0.5	Complies
11	2462	16.380	16.720	0.5	Complies

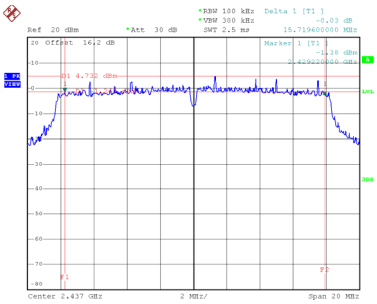
CH01



Date: 30.JUL.2024 11:04:15

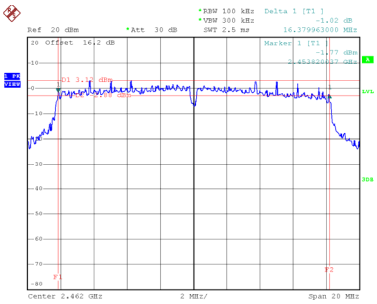
CH06

6 dB Bandwidth

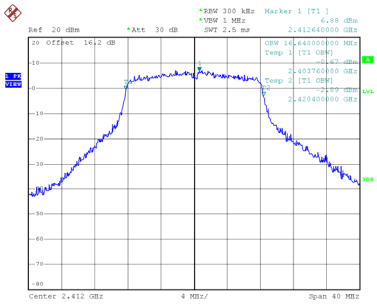


Date: 30.JUL.2024 11:05:58

CH11

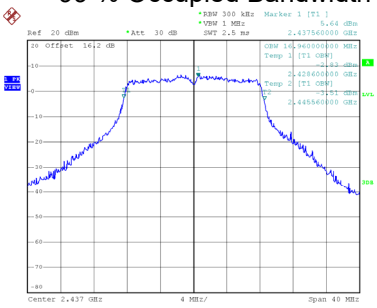


Date: 30.JUL.2024 11:07:49

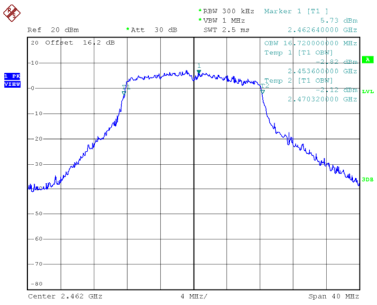


Date: 30.JUL.2024 11:04:22

99 % Occupied Bandwidth



Date: 30.JUL.2024 11:06:05

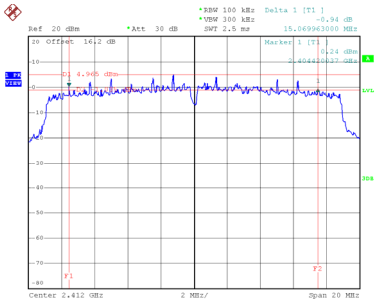


Date: 30.JUL.2024 11:07:56

Test Mode	TX N(HT20) Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result
01	2412	15.070	17.840	0.5	Complies
06	2437	16.460	18.160	0.5	Complies
11	2462	16.120	18.160	0.5	Complies

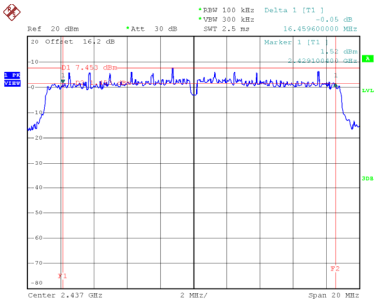
CH01



Date: 30.JUL.2024 11:11:39

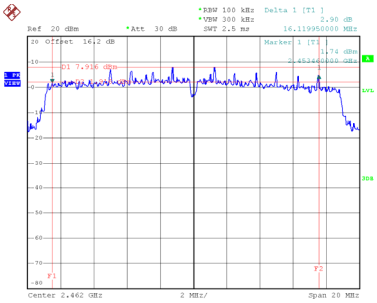
CH06

6 dB Bandwidth



Date: 30.JUL.2024 11:13:29

CH11



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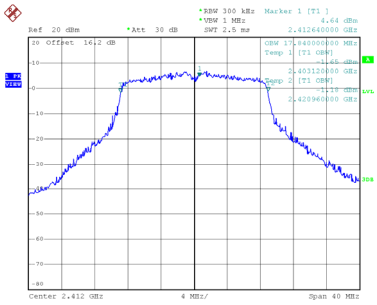
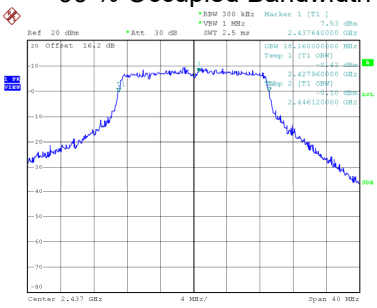
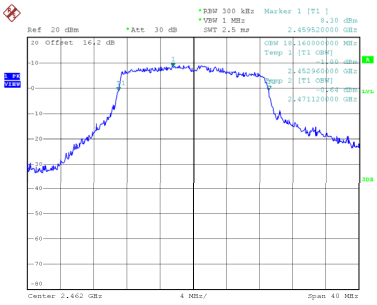


Date: 30.JUL.2024 11:11:47

99 % Occupied Bandwidth



Date: 30.JUL.2024 11:13:37



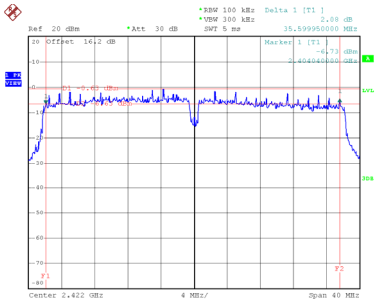
Date: 30.JUL.2024 11:15:05

Test Mode	TX N(HT40) Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result
03	2422	35.600	36.640	0.5	Complies
06	2437	36.400	36.960	0.5	Complies
09	2452	35.160	36.480	0.5	Complies

CH03 **CH06** **CH09**

6 dB Bandwidth



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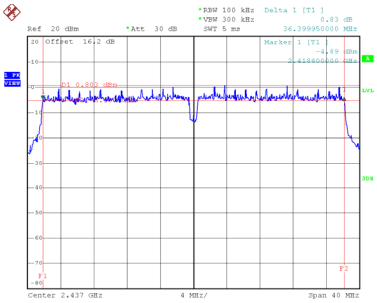
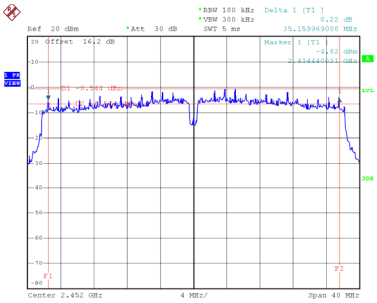
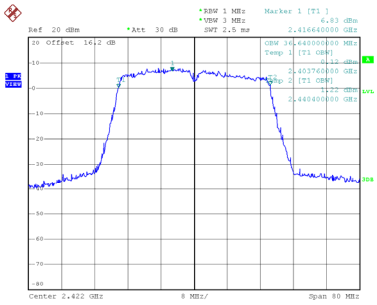


Date: 30.JUL.2024 11:26:08

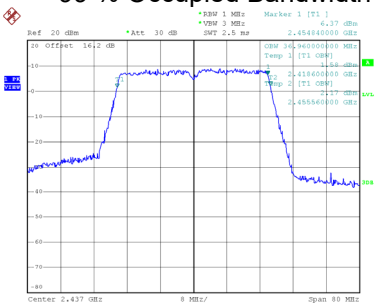


Date: 30.JUL.2024 11:28:07

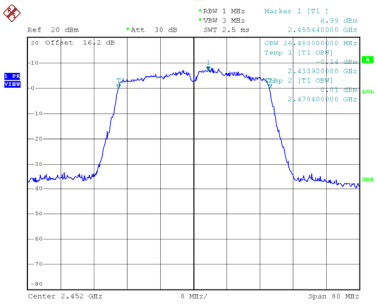
99 % Occupied Bandwidth



Date: 30.JUL.2024 11:24:30



Date: 30.JUL.2024 11:26:15



Date: 30.JUL.2024 11:28:14

APPENDIX F - MAXIMUM OUTPUT POWER

Test Mode	TX B Mode_Ant. 1

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	14.97	0.00	14.97	30.00	1.0000	Complies
06	2437	18.40	0.00	18.40	30.00	1.0000	Complies
11	2462	16.51	0.00	16.51	30.00	1.0000	Complies

Test Mode	TX G Mode_Ant. 1

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	15.82	0.00	15.82	30.00	1.0000	Complies
06	2437	18.56	0.00	18.56	30.00	1.0000	Complies
11	2462	15.07	0.00	15.07	30.00	1.0000	Complies

Test Mode	TX N(HT20) Mode_Ant. 1

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	15.12	0.00	15.12	30.00	1.0000	Complies
06	2437	18.35	0.00	18.35	30.00	1.0000	Complies
11	2462	14.26	0.00	14.26	30.00	1.0000	Complies

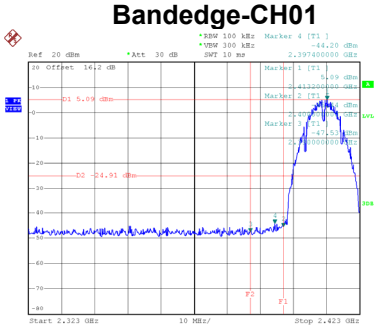
Test Mode	TX N(HT40) Mode_Ant. 1

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
03	2422	13.03	0.00	13.03	30.00	1.0000	Complies
06	2437	14.88	0.00	14.88	30.00	1.0000	Complies
09	2452	12.46	0.00	12.46	30.00	1.0000	Complies

APPENDIX G - CONDUCTED SPURIOUS EMISSIONS

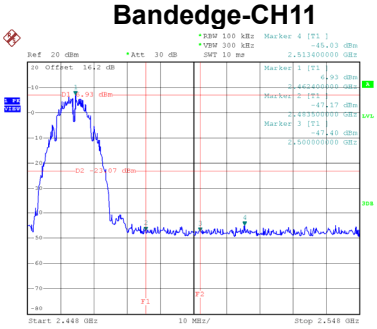
Test Mode	TX B Mode_Ant. 1

Bandedge-CH01



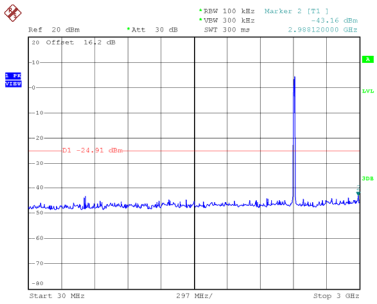
Date: 30.JUL.2024 10:55:38

Bandedge-CH11

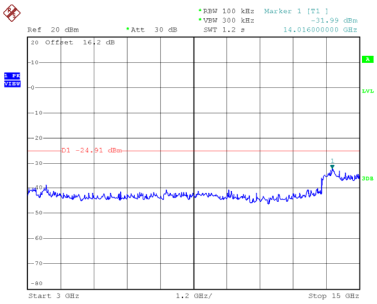


Date: 30.JUL.2024 11:32:12

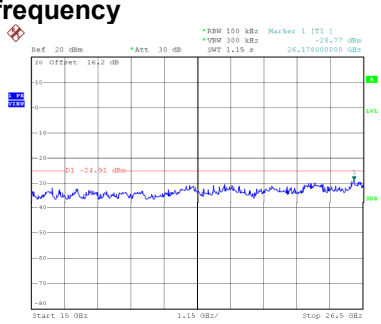
CH01 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 10:55:52

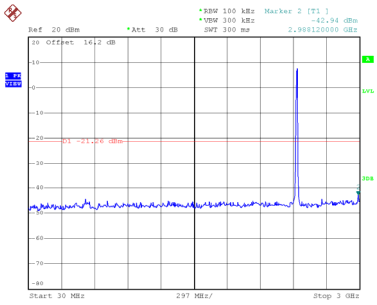


Date: 30.JUL.2024 10:56:00

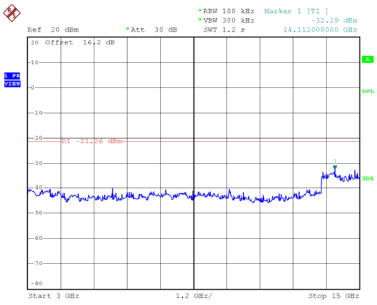


Date: 30.JUL.2024 10:56:08

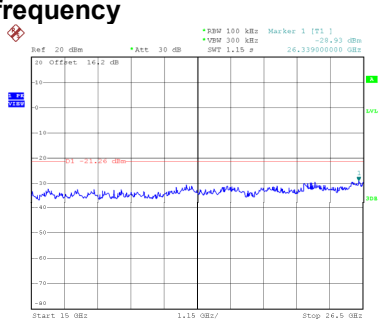
CH06 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 10:58:19

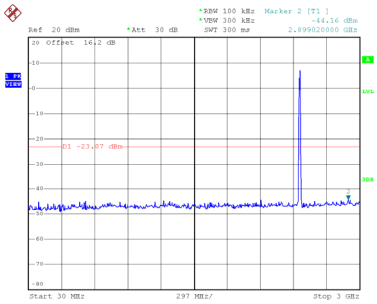


Date: 30.JUL.2024 10:58:28

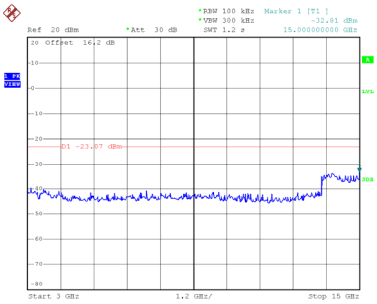


Date: 30.JUL.2024 10:58:36

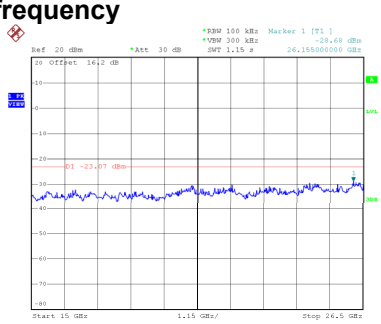
CH11 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:32:26



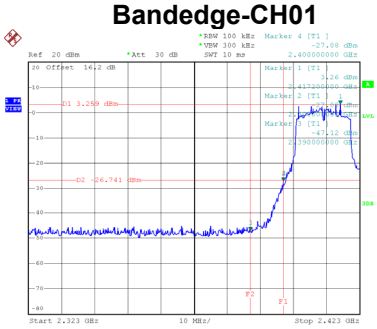
Date: 30.JUL.2024 11:32:34



Date: 30.JUL.2024 11:32:42

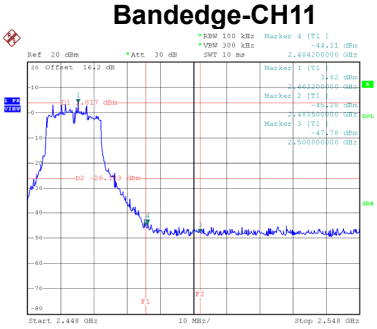
Test Mode	TX G Mode_Ant. 1

Bandedge-CH01



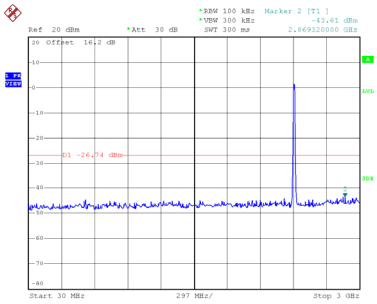
Date: 30.JUL.2024 11:04:30

Bandedge-CH11

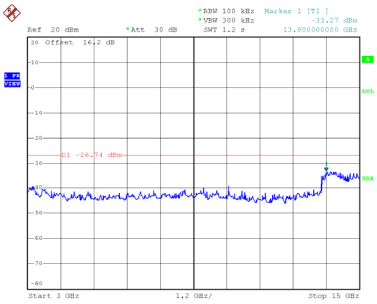


Date: 30.JUL.2024 11:08:04

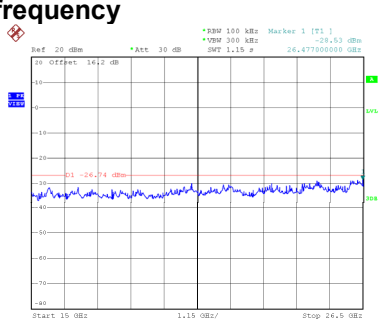
CH01 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:04:44

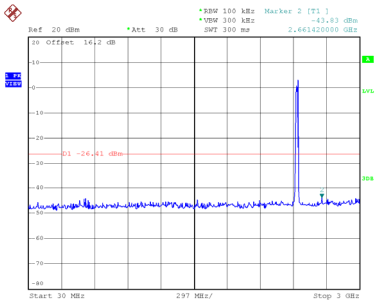


Date: 30.JUL.2024 11:04:52

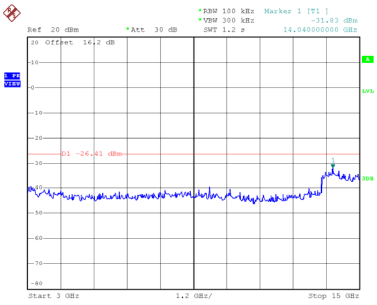


Date: 30.JUL.2024 11:05:00

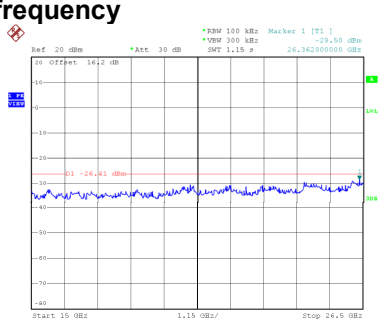
CH06 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:06:27

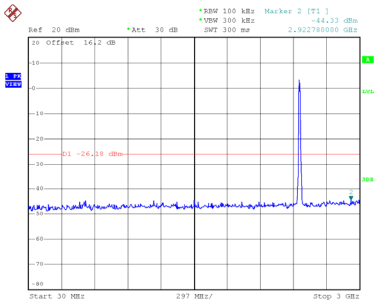


Date: 30.JUL.2024 11:06:35

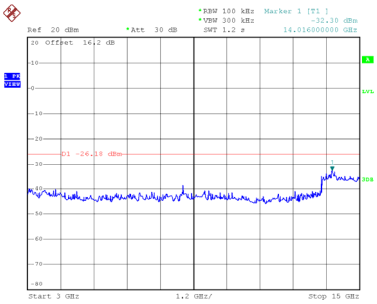


Date: 30.JUL.2024 11:06:43

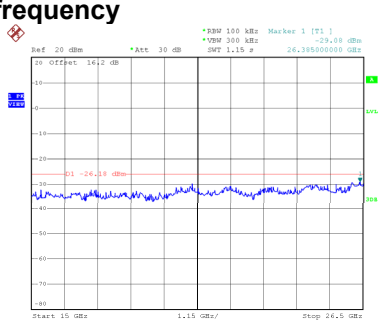
CH11 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:08:18



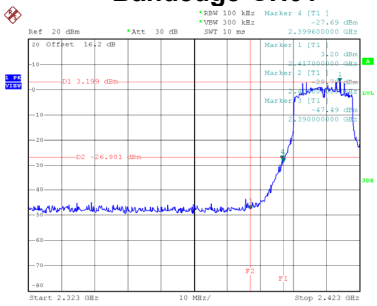
Date: 30.JUL.2024 11:08:26



Date: 30.JUL.2024 11:08:34

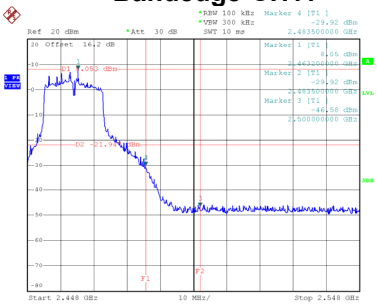
Test Mode	TX N(HT20) Mode_Ant. 1

Bandedge-CH01



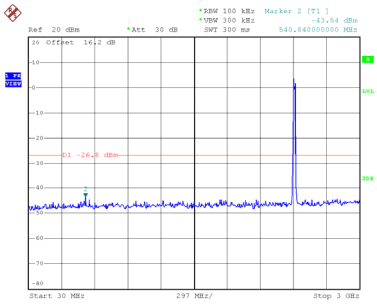
Date: 30.JUL.2024 11:11:54

Bandedge-CH11

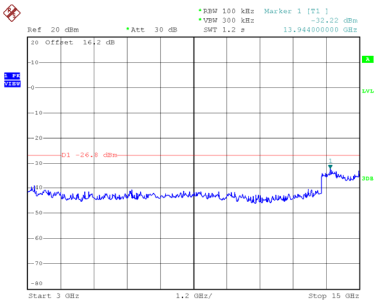


Date: 30.JUL.2024 11:15:13

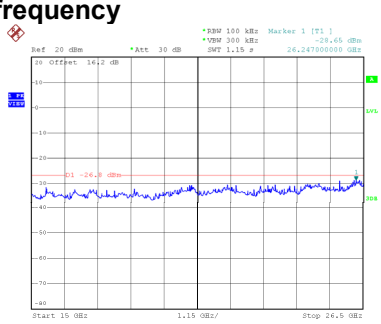
CH01 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:12:08

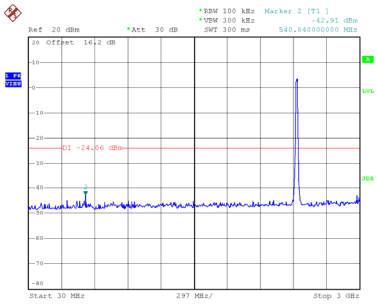


Date: 30.JUL.2024 11:12:16

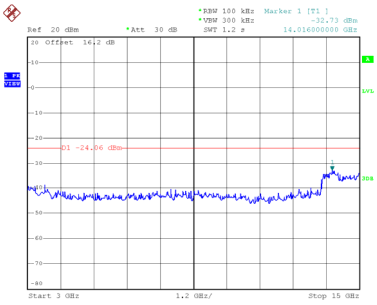


Date: 30.JUL.2024 11:12:24

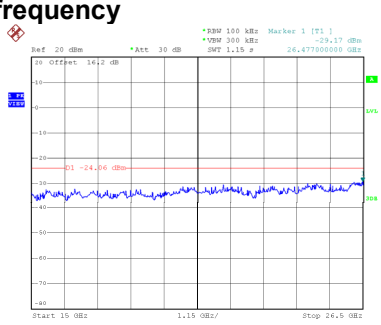
CH06 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:13:58

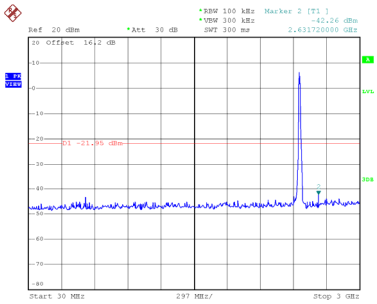


Date: 30.JUL.2024 11:14:06

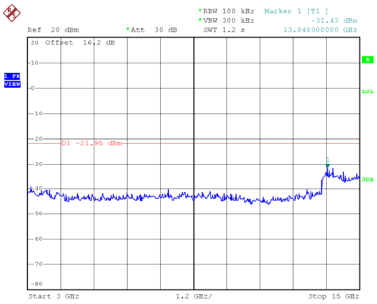


Date: 30.JUL.2024 11:14:15

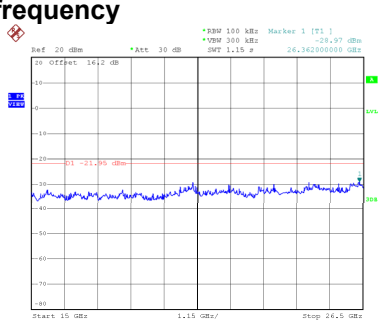
CH11 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:15:27



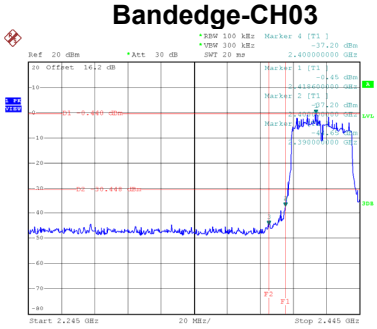
Date: 30.JUL.2024 11:15:35



Date: 30.JUL.2024 11:15:43

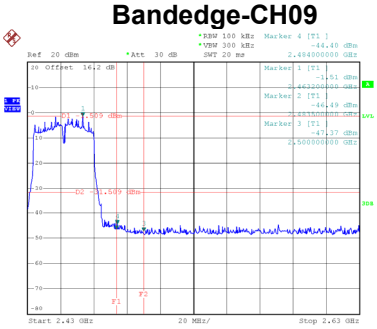
Test Mode	TX N(HT40) Mode_Ant. 1

Bandedge-CH03



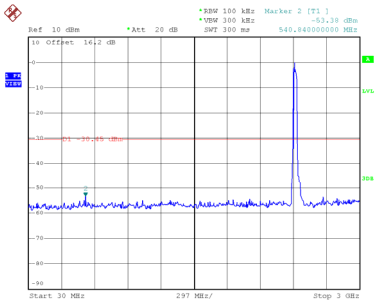
Date: 30.JUL.2024 11:24:37

Bandedge-CH09

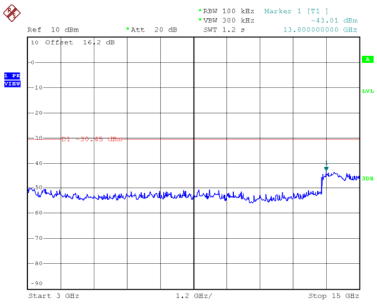


Date: 30.JUL.2024 11:28:22

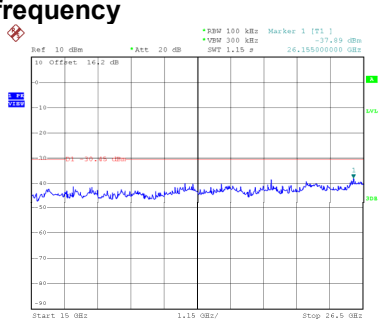
CH03 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:43:47

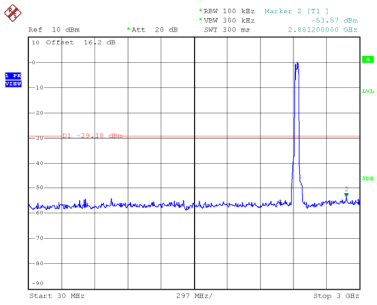


Date: 30.JUL.2024 11:43:55

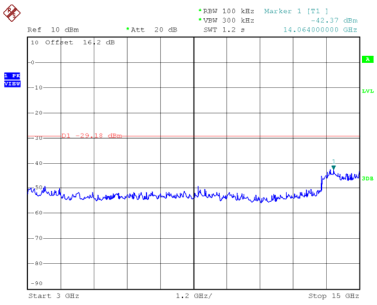


Date: 30.JUL.2024 11:44:03

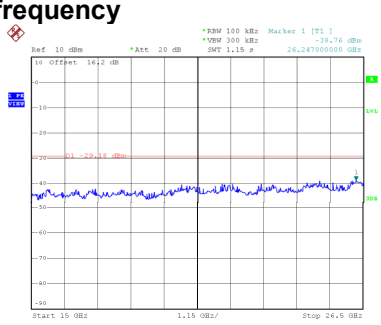
CH06 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:44:40

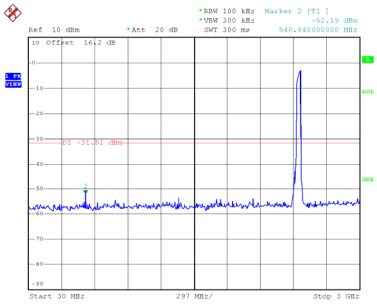


Date: 30.JUL.2024 11:44:49

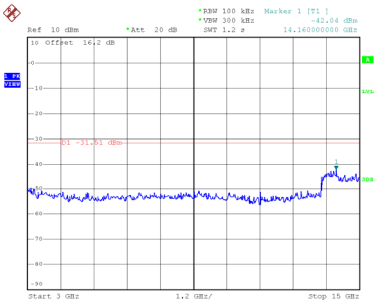


Date: 30.JUL.2024 11:44:57

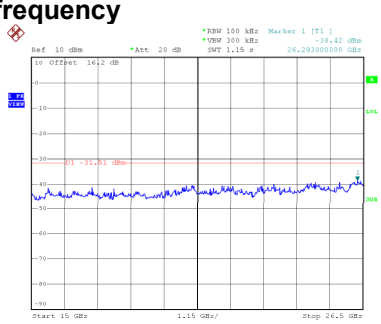
CH09 – 10th Harmonic of the fundamental frequency



Date: 30.JUL.2024 11:42:04



Date: 30.JUL.2024 11:42:12



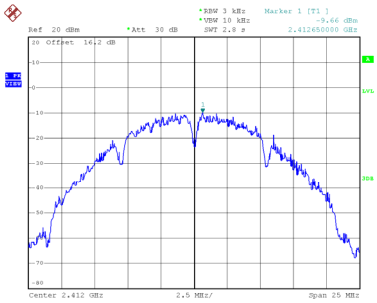
Date: 30.JUL.2024 11:42:21

APPENDIX H - POWER SPECTRAL DENSITY

Test Mode	TX B Mode_Ant. 1

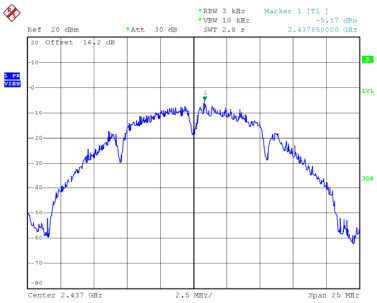
Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
01	2412	-9.66	8.00	Complies
06	2437	-5.17	8.00	Complies
11	2462	-7.65	8.00	Complies

CH01



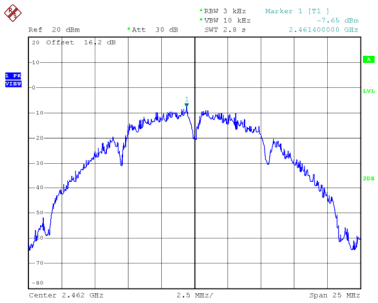
Date: 30.JUL.2024 10:56:17

CH06



Date: 30.JUL.2024 10:58:45

CH11

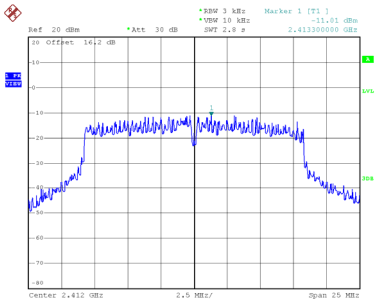


Date: 30.JUL.2024 11:32:51

Test Mode	TX G Mode_Ant. 1

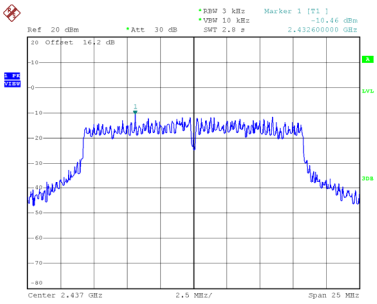
Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
01	2412	-11.01	8.00	Complies
06	2437	-10.46	8.00	Complies
11	2462	-11.07	8.00	Complies

CH01



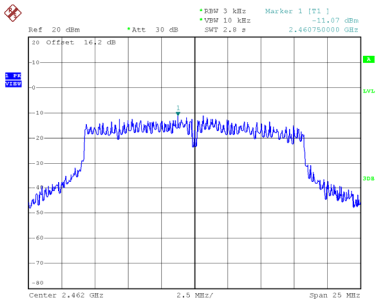
Date: 30.JUL.2024 11:05:09

CH06



Date: 30.JUL.2024 11:06:52

CH11

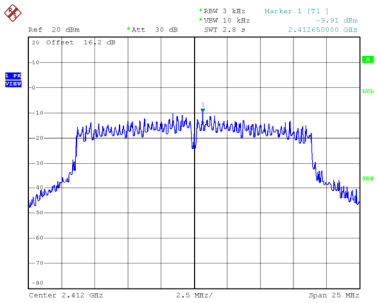


Date: 30.JUL.2024 11:08:43

Test Mode	TX N(HT20) Mode_Ant. 1

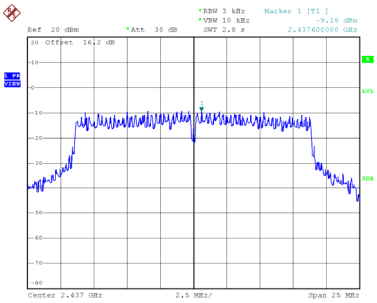
Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
01	2412	-9.91	8.00	Complies
06	2437	-9.18	8.00	Complies
11	2462	-8.17	8.00	Complies

CH01



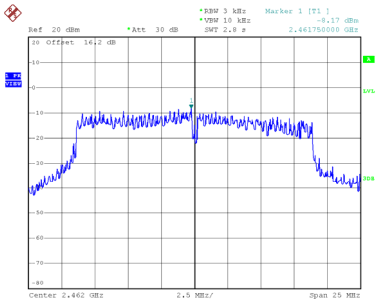
Date: 30.JUL.2024 11:12:33

CH06



Date: 30.JUL.2024 11:14:24

CH11

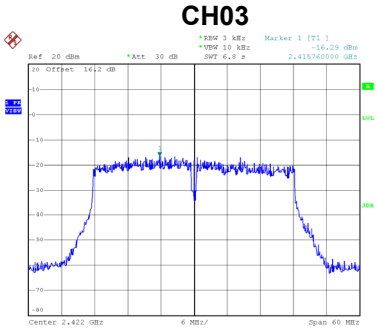


Date: 30.JUL.2024 11:15:52

Test Mode	TX N(HT40) Mode_Ant. 1

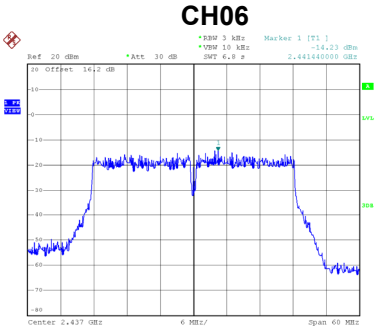
Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
03	2422	-16.29	8.00	Complies
06	2437	-14.23	8.00	Complies
09	2452	-15.79	8.00	Complies

CH03



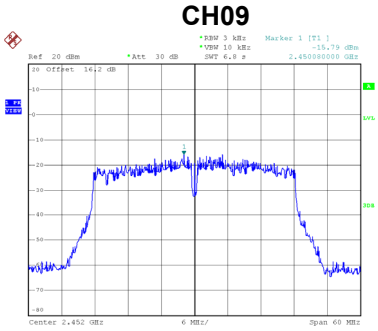
Date: 30.JUL.2024 11:25:19

CH06



Date: 30.JUL.2024 11:27:05

CH09



Date: 30.JUL.2024 11:29:04

End of Test Report