NVLAP TESTING
NVLAP LAB CODE 600354-0

ISED Radio Test Report

IC: 31152-C425V1

This report concerns: Original Grant

Project No.	:	2311G133
Equipment	:	Smart Wire-Free Security Camera
Brand Name	:	tp-link
Test Model	:	Tapo C425
Series Model	:	TC85
Applicant	:	TP-LINK CORPORATION PTE. LTD.
Address	:	7 Temasek Boulevard #29-03 Suntec Tower One, Singapore 038987
Manufacturer	:	TP-LINK CORPORATION PTE. LTD.
Address	:	7 Temasek Boulevard #29-03 Suntec Tower One, Singapore 038987
Date of Receipt	:	Jan. 03, 2024
Date of Test	:	Jan. 04, 2024 ~ Feb. 06, 2024
Issued Date	:	Mar. 12, 2024
Report Version	:	R01
Test Sample	:	Engineering Sample No.: SSL2024010340 for radiated, SSL2024010341 for conducted.
Standard(s)	:	RSS-247,Issue 3, Aug. 2023 RSS-Gen,Issue 5, Amendment 2, Feb. 2021

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

Prepared by : Grani Zhou
Grani Zhou

Approved by : Welly Zhou
Welly Zhou

Room 108, Building 2, No. 1, Yile Road, Songshan Lake Zone, Dongguan City, Guangdong 523000 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** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, 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

Table of Contents Page

Table of Contents Page

REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-ISEDR-1-2311G133	R00	Original Report.	Feb. 21, 2024	Invalid
BTL-ISEDR-1-2311G133	R01	Added the PMN and HVIN.	Mar. 12, 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

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

RSS-247,Issue 3, Aug. 2023 RSS-Gen,Issue 5, Amendment 2, Feb. 2021				
Standard(s) Section	**Test Item**	**Test Result**	**Judgment**	**Remark**
RSS-Gen 8.8	AC Power Line Conducted Emissions	APPENDIX A	PASS	------
RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	Radiated Emissions	APPENDIX B APPENDIX C APPENDIX D	PASS	------
RSS-247 5.2 (a) RSS-Gen 6.7	Bandwidth	APPENDIX E	PASS	------
RSS-247 5.4 (d)	Maximum Output Power & e.i.r.p.	APPENDIX F	PASS	------
RSS-247 5.5	Conducted Spurious Emissions	APPENDIX G	PASS	------
RSS-247 5.2 (b)	Power Spectral Density	APPENDIX H	PASS	------

Note:

(1) “N/A” denotes test is not applicable in this test report.

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 Rd. Shixia, Dalang Town, Dongguan City, Guangdong 523792.
BTL's Company Number for ISED: 4428B
BTL's CAB Identifier for ISED: CN0042

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
		26.5 ~ 40 GHz	3.58

C. Other Measurement:

Test Item	Uncertainty
Bandwidth	0.90 %
Maximum Output Power & e.i.r.p.	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
AC Power Line Conducted Emissions	22°C	42%	AC 120V/60Hz	Hayden Chen
Radiated Emissions-9kHz to 30 MHz	21°C	53%	AC 120V/60Hz	Hayden Chen
Radiated Emissions-30MHz to 1000MHz	25°C	42%	AC 120V/60Hz	Allen Tong
Radiated Emissions-Above 1000MHz	24°C	42%	AC 120V/60Hz	Berton Luo
Bandwidth	24-25°C	48-49 %	AC 120V/60Hz	Steve Zhou
Maximum Output Power & e.i.r.p.	22°C	54-56 %	AC 120V/60Hz	Oliver Wang
Conducted Spurious Emissions	24-25°C	48-49 %	AC 120V/60Hz	Steve Zhou
Power Spectral Density	24-25°C	48-49 %	AC 120V/60Hz	Steve Zhou

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Wire-Free Security Camera
Brand Name	tp-link
Test Model	Tapo C425
Series Model	TC85
Model Difference(s)	Only differ in model name.
Hardware Version	1.20
Software Version	1.X
PMN	Smart Wire-Free Security Camera
HVIN	Tapo C425V1
Power Source	1# DC voltage supplied from AC adapter. Model: DSA-10PF06-05 FUS 050200 2# Supplied from battery. Model: Tapo A111-INT
Power Rating	1# I/P: 100-240V~ 50/60Hz 0.3A O/P: +5.0V⎓2.0A 2# 3.6V 10000mAh 36Wh
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 72.2 Mbps
Maximum Output Power	Ant.1: IEEE 802.11n(HT20): 23.18 dBm (0.2080 W) Ant.2: IEEE 802.11n(HT20): 22.97 dBm (0.1982 W)
Maximum e.i.r.p.	Ant.1: IEEE 802.11n(HT20): 23.18 dBm (0.2080 W) Ant.2: IEEE 802.11n(HT20): 22.97 dBm (0.1982 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)							
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. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	tp-link	N/A	Dipole	N/A	0
2	tp-link	N/A	Dipole	N/A	0

Note:

1) The antenna gain is provided by the manufacturer.
2) The Ant.2 is the reserve antenna.

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 B Mode Channel 01/02/06/10/11
Mode 5	TX G Mode Channel 01/02/06/10/11
Mode 6	TX N(HT20) Mode Channel 01/02/06/10/11
Mode 7	TX N(HT20) 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 7	TX N(HT20) Mode Channel 06

Radiated emissions test - Below 1GHz	
Final Test Mode	Description
Mode 7	TX N(HT20) Mode Channel 06

Radiated emissions test- Above 1GHz	
Final Test Mode	Description
Mode 4	TX B Mode Channel 01/02/06/10/11
Mode 5	TX G Mode Channel 01/02/06/10/11
Mode 6	TX N(HT20) Mode Channel 01/02/06/10/11

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

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 N(HT20) 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 above 1 GHz test: The polarization of vertical and horizontal are evaluated, the worst case is vertical and recorded.
(5) The Output Power for Ant.1 and Ant.2 are tested are recorded in the report. The worst case is Ant.1 and only the worst case is documented for other test items

3.3 PARAMETERS OF TEST SOFTWARE

Ant.1

Test Software Version	IPOP V4.0		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	85	85	93
IEEE 802.11g	62	122	75
IEEE 802.11n(HT20)	55	118	68

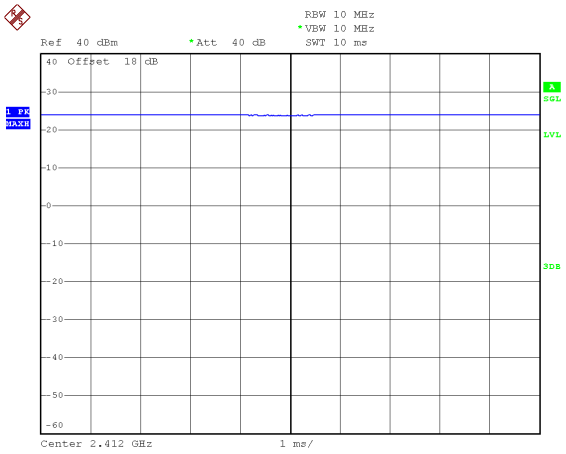
Ant.2

Test Software Version	IPOP V4.0		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	80	80	90
IEEE 802.11g	61	100	75
IEEE 802.11n(HT20)	50	110	68

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.

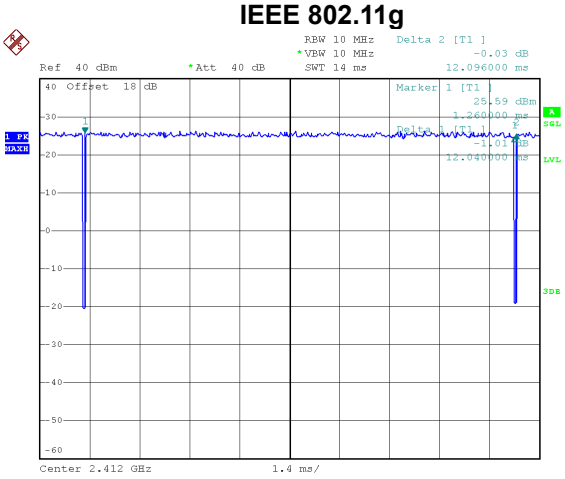
IEEE 802.11b



Date: 11.JAN.2024 05:22:04

Duty cycle = 1000.000 ms / 1000.000 ms = 100%
Duty Factor = 10 log(1/Duty cycle) = 0.00

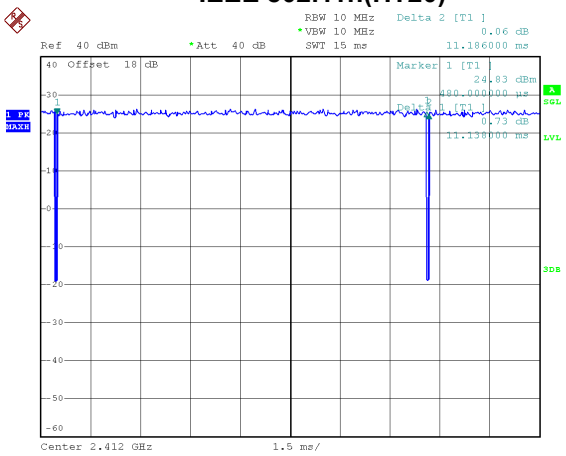
IEEE 802.11g



Date: 11.JAN.2024 05:18:00

Duty cycle = 12.040 ms / 12.096 ms = 99.54%
Duty Factor = 10 log(1/Duty cycle) = 0.00

IEEE 802.11n(HT20)



Date: 11.JAN.2024 05:21:22

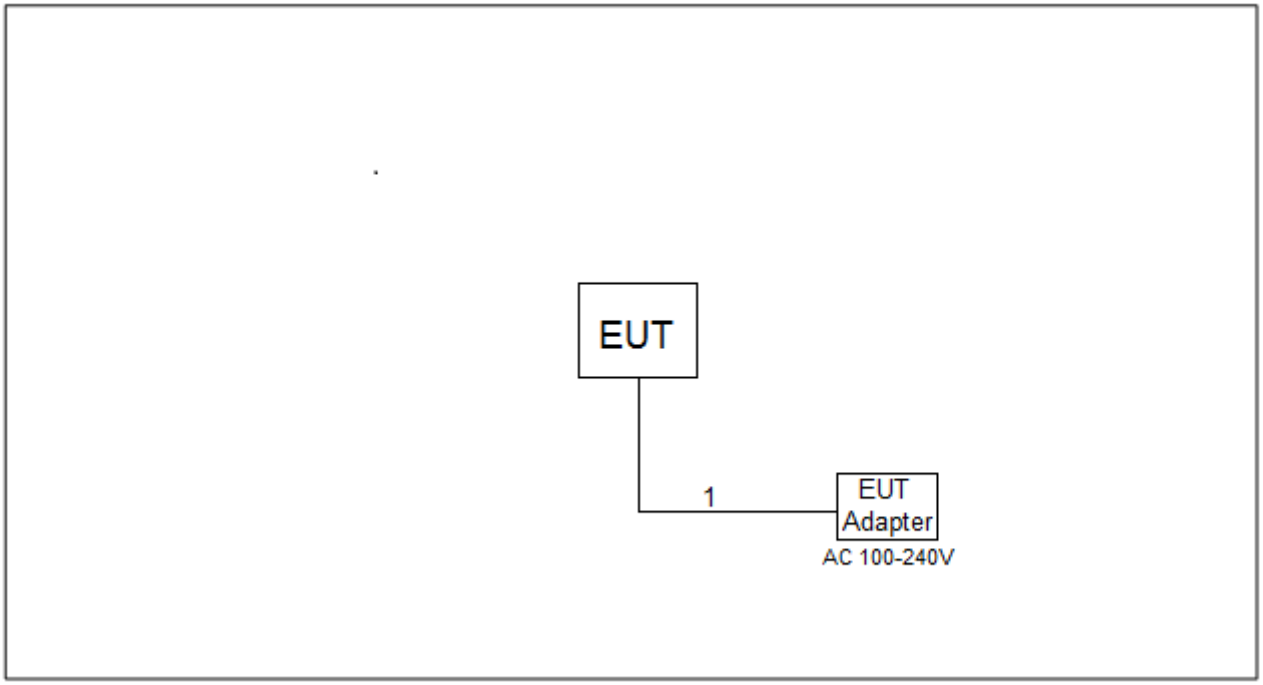
Duty cycle = 11.138 ms / 11.186 ms = 99.57%
Duty Factor = 10 log(1/Duty cycle) = 0.00

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.

3.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.6 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
-	-	-	-	-

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	Micro USB Cable	NO	NO	0.5m

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.

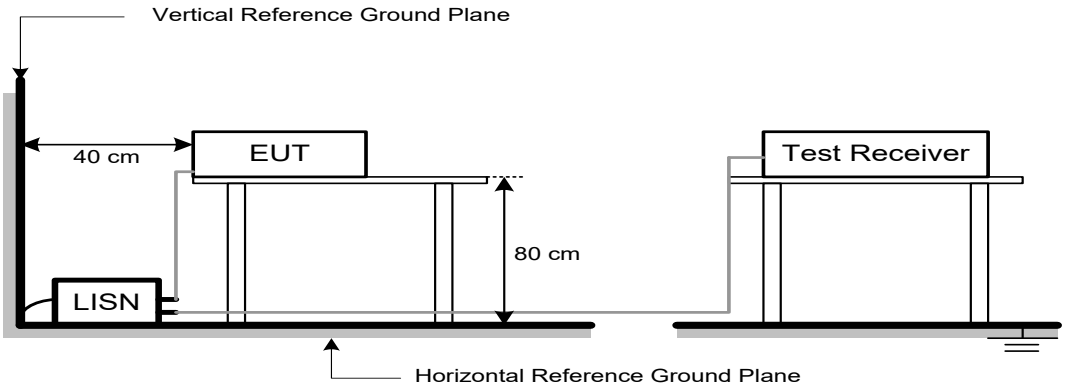
The following table is the setting of the receiver:

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 RSS-Gen 8.10, then the RSS-Gen 8.9 limit in the table below has to be followed.

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

Frequency (MHz)	Magnetic field strength (H-Field) (μA/m)	Measurement Distance (meters)
0.009-0.490	6.37/F(F in kHz)	300
0.490-1.705	63.7/F(F in kHz)	30
1.705-30.0	0.08	30

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

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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

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

NOTE:

(1) The limit for radiated test was performed according to RSS-Gen.
(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

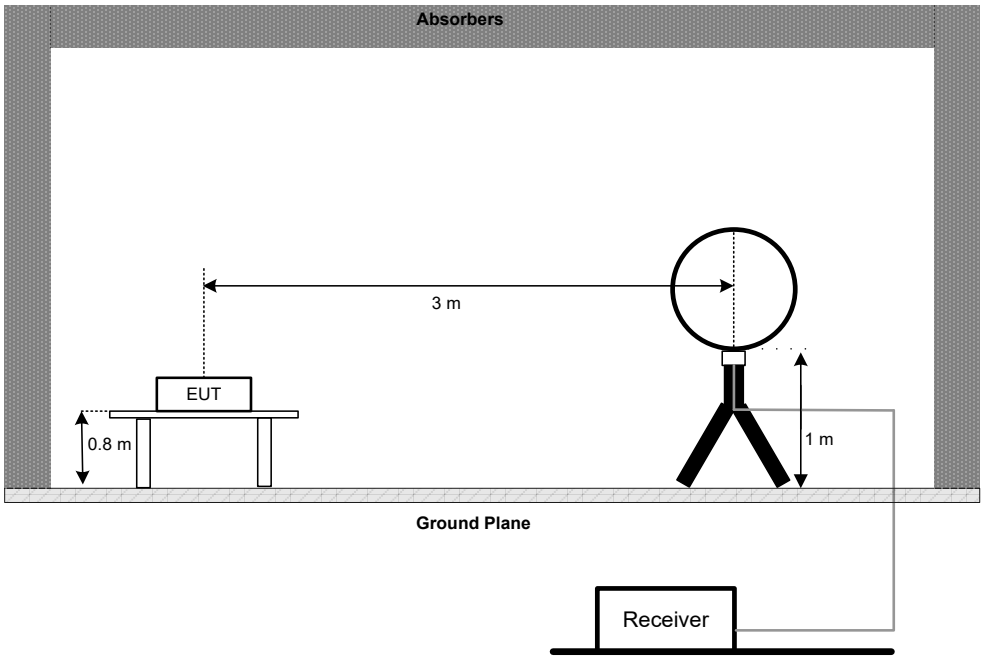
Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector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

5.3 DEVIATION FROM TEST STANDARD

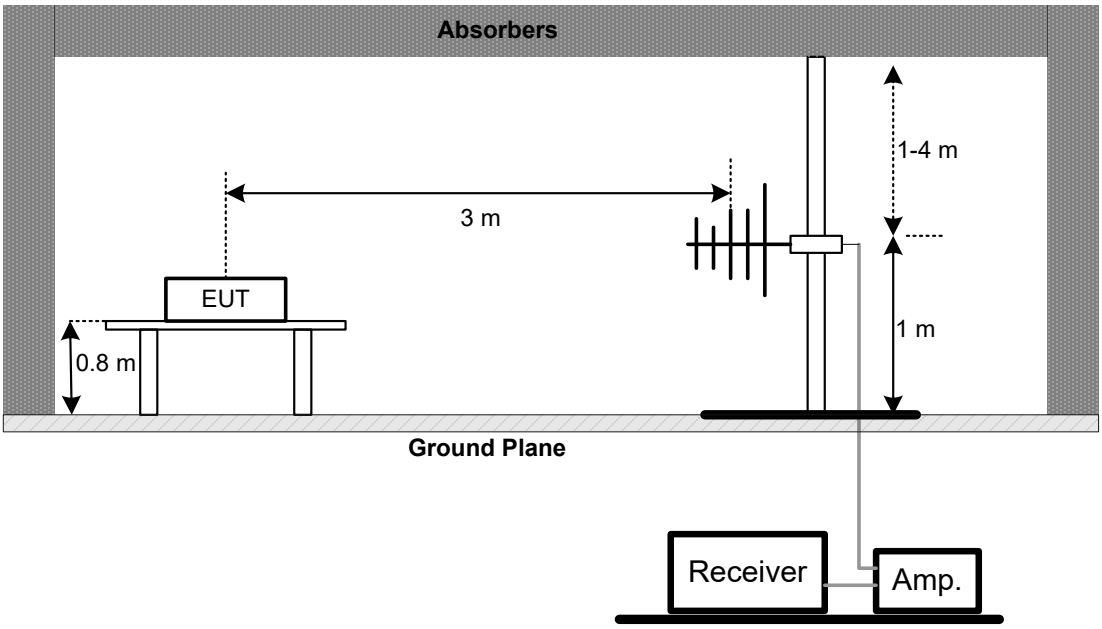
No deviation.

5.4 TEST SETUP

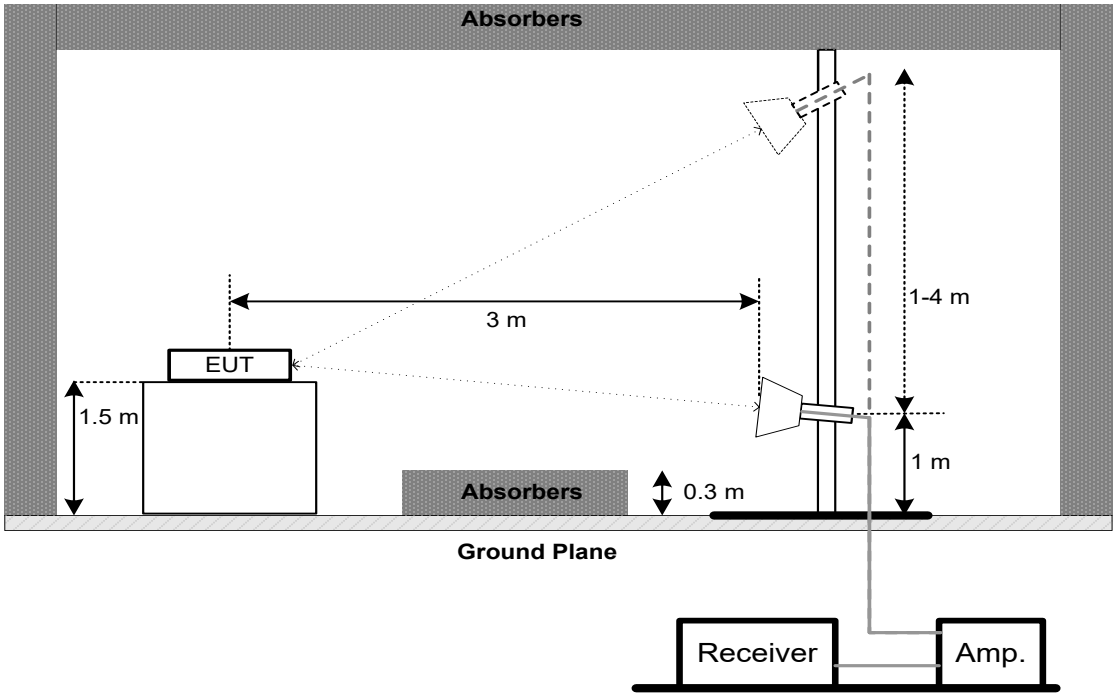
9 kHz to 30 MHz



30 MHz to 1 GHz



Above 1 GHz



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
RSS-Gen 6.7 RSS-247 5.2 (a)	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

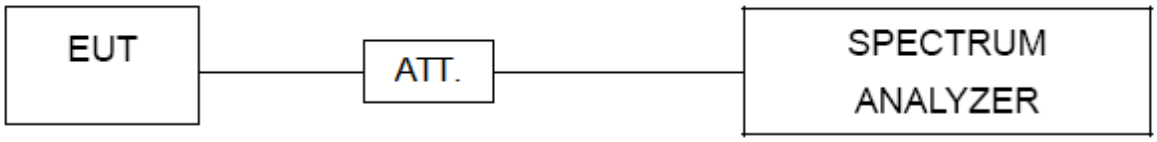
For 99% Emission Bandwidth:

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 & E.I.R.P.

7.1 LIMIT

Section	Test Item	Limit
RSS-247 5.4 (d)	Maximum Output Power	1.0000 Watt or 30.00 dBm
	Maximum e.i.r.p.	4.0000 Watt or 36.02 dBm

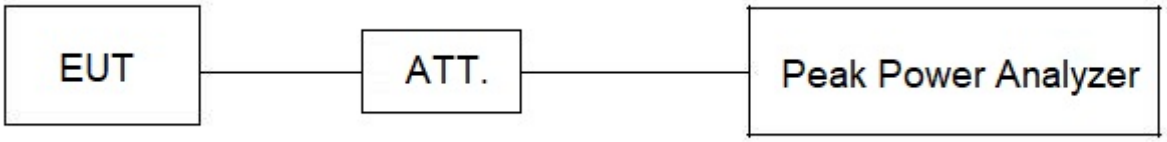
7.2 TEST PROCEDURE

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

8.2 TEST PROCEDURE

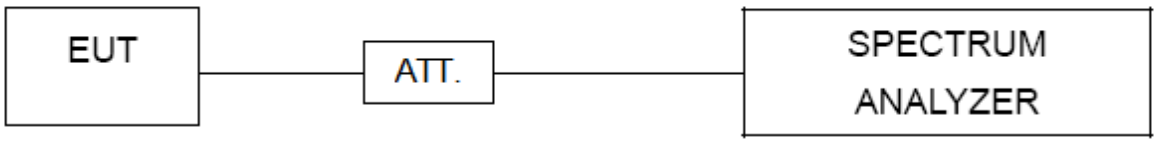
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

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
RSS-247 5.2 (b)	Power Spectral Density	8 dBm (in any 3 kHz)

9.2 TEST PROCEDURE

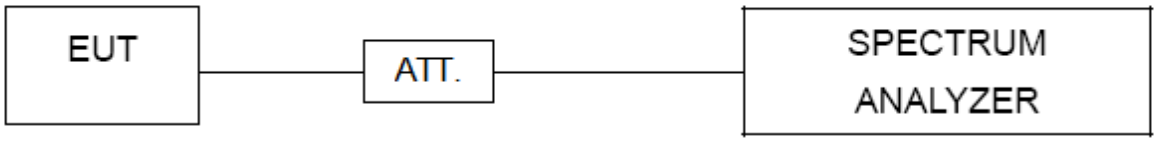
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

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	ESR3	103027	Jun. 16, 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	Apr. 01, 2024
2	MXE EMI Receiver	Keysight	N9038A	MY56400091	Dec. 22, 2024
3	Cable	N/A	RW2350-3.8A-NMB M-1.5M	N/A	Jun. 10, 2024
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
5	966 Chamber room	ETS	9*6*6	N/A	Jul. 11, 2024

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	980863	Nov. 17, 2024
4	Cable	RegalWay	LMR400-NMNM-12.5m	N/A	Jul. 04, 2024
5	Cable	RegalWay	LMR400-NMNM-3m	N/A	Jul. 04, 2024
6	Cable	RegalWay	LMR400-NMNM-0.5m	N/A	Jul. 04, 2024
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 17, 2024

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	Jun. 16, 2024
4	Double Ridged Guide Antenna	ETS	3115	75789	May 31, 2024
5	Cable	RegalWay	A81-SMAMSMAM-12.5 M	N/A	Aug. 08, 2024
6	Cable	RegalWay	RWLP50-4.0A-NMRAS M-2.5M	N/A	Aug. 08, 2024
7	Cable	RegalWay	RWLP50-4.0A-NMRAS MRA-0.8M	N/A	Aug. 08, 2024
8	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330-K	619413	Jul. 06, 2024
9	Cable	RegalWay	RWLP50-2.6A-2.92M2. 92M-1.1M	N/A	Jul. 26, 2024
10	Cable	Tonscend	HF160-KMKM-3M	N/A	Jul. 26, 2024
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA9170(3m)	9170-319	Jun. 20, 2024
12	966 Chamber room	CM	9*6*6	N/A	May 17, 2024
13	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A
14	Filter	STI	STI15-9912	N/A	Jun. 16, 2024
15	Positioning Controller	MF	MF-7802	N/A	N/A

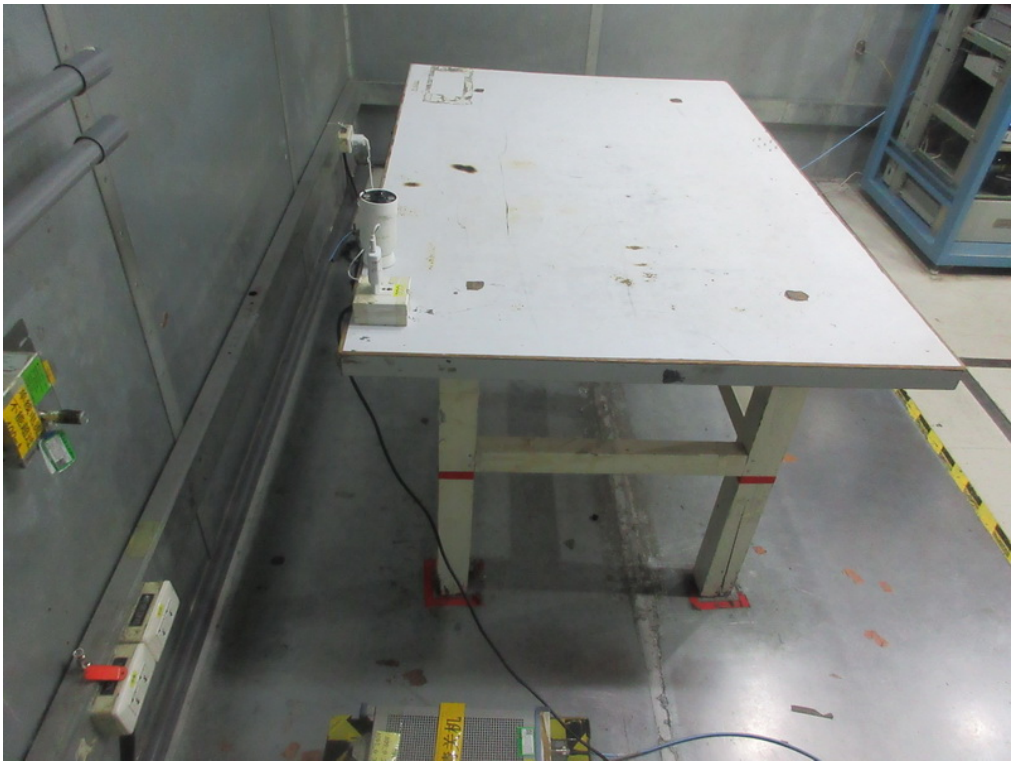
Bandwidth & Conducted Spurious Emissions & Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Jun. 16, 2024
2	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A
3	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A
4	DC Block	N/A	N/A	N/A	N/A
5	EXA Spectrum Analyzer	Keysight	N9010A	MY55150209	Jun. 16, 2024
6	Measurement Software	BTL	BTL Conducted Test	N/A	N/A

Maximum Output Power & e.i.r.p.					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Table top type high and low temperature test chamber	CEPREI	CEEC-M64T-40	15-008	Dec. 22, 2024
2	X-series USB Peak and Average Power Sensor	Keysight	U2021XA	MY55190003	Jun. 17, 2024
3	Cable	Woke	20210802 001	RWP50-402-SMSM-1M	N/A
4	Measurement Software	BTL	EN300328	N/A	N/A
5	Attenuator	Talent Microwave	TA10A2-S-18	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.

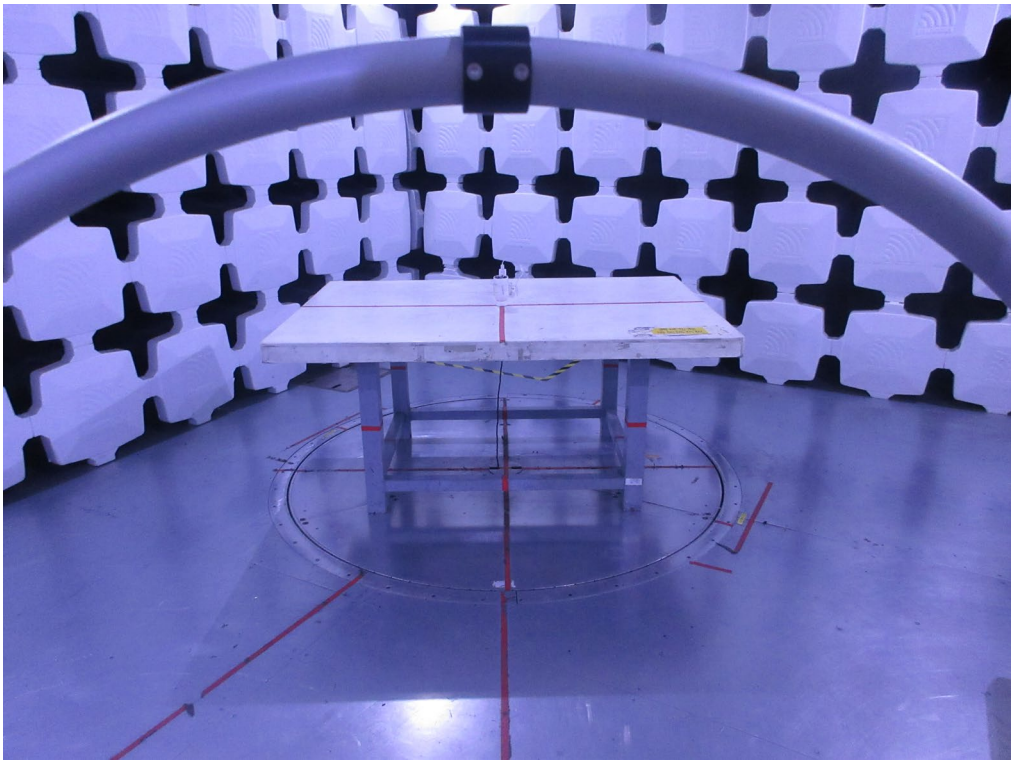
11. EUT TEST PHOTO

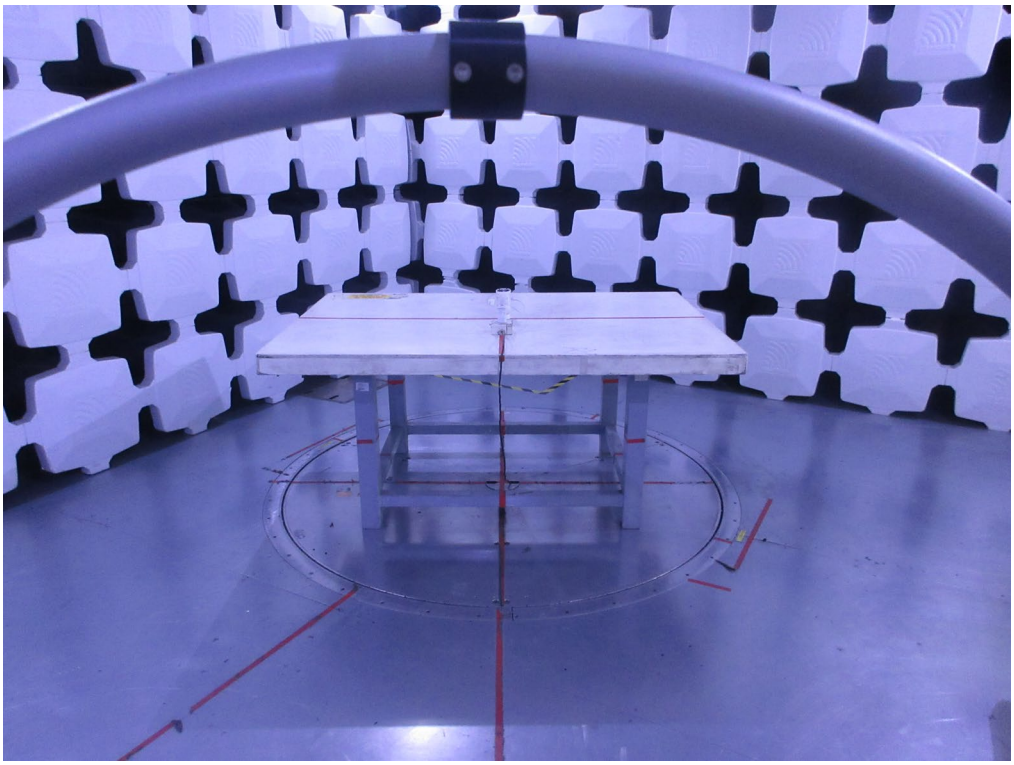
AC Power Line Conducted Emissions Test Photos



Radiated Emissions Test Photos

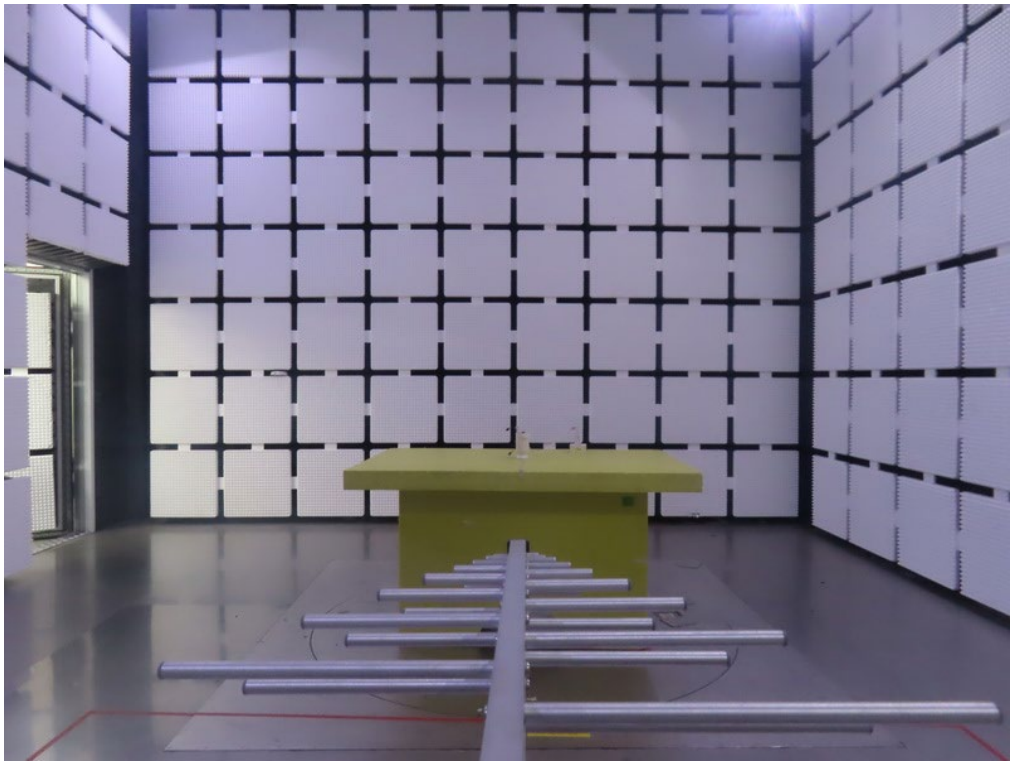
9 kHz to 30 MHz

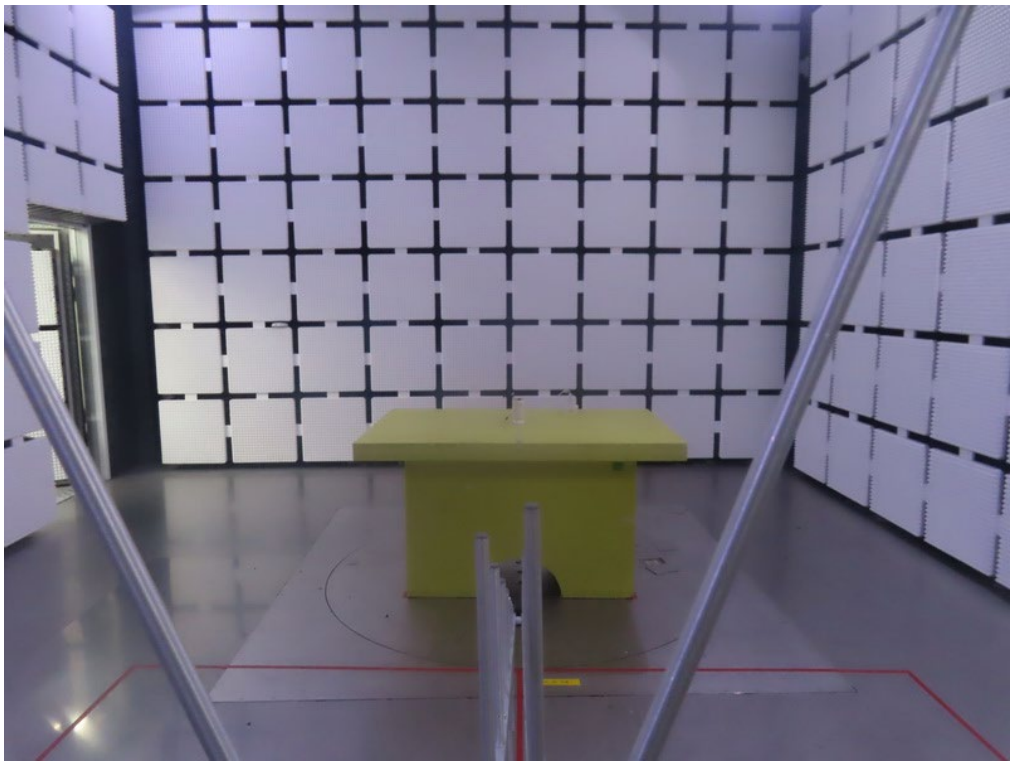




Radiated Emissions Test Photos

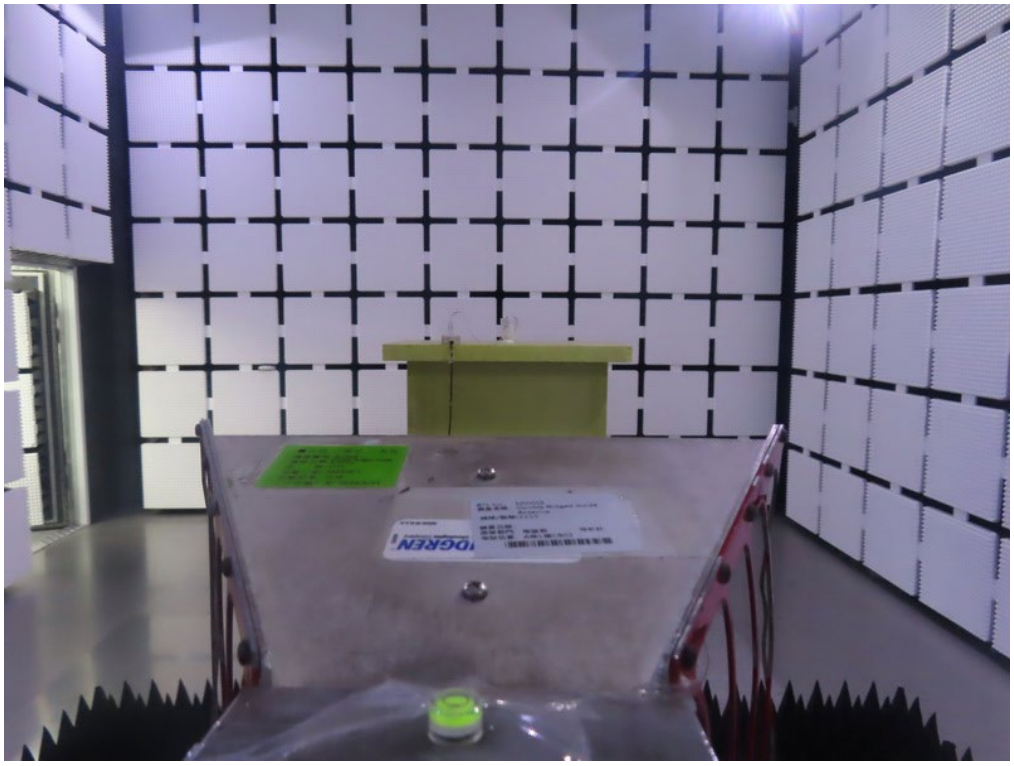
30 MHz to 1 GHz

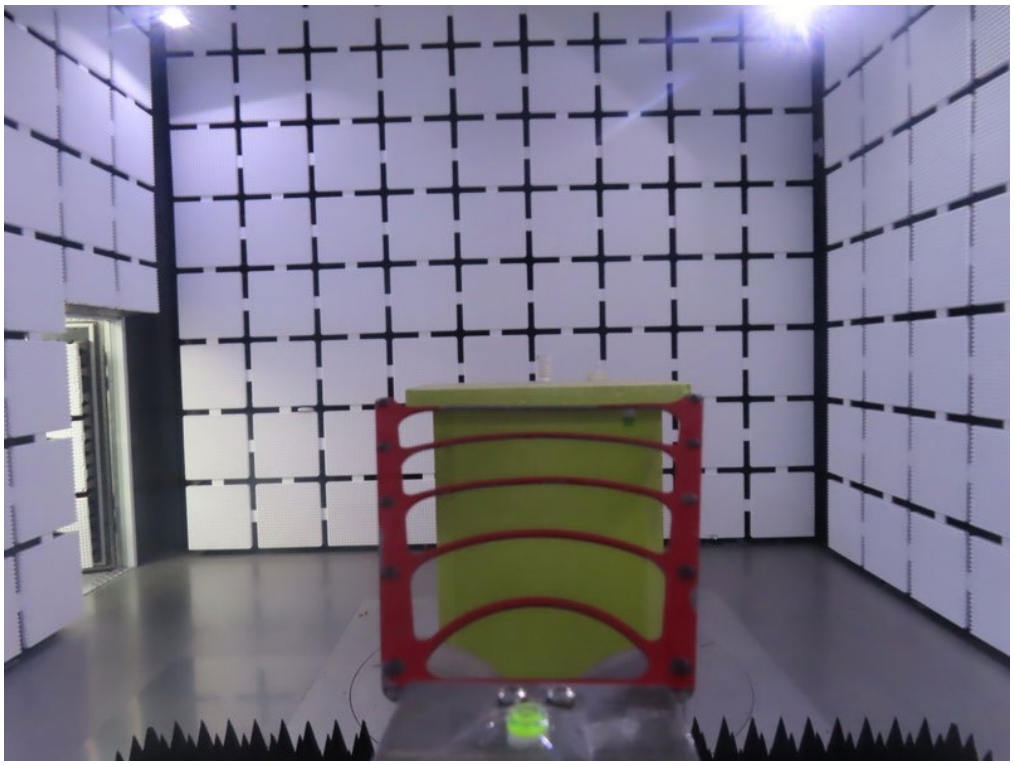




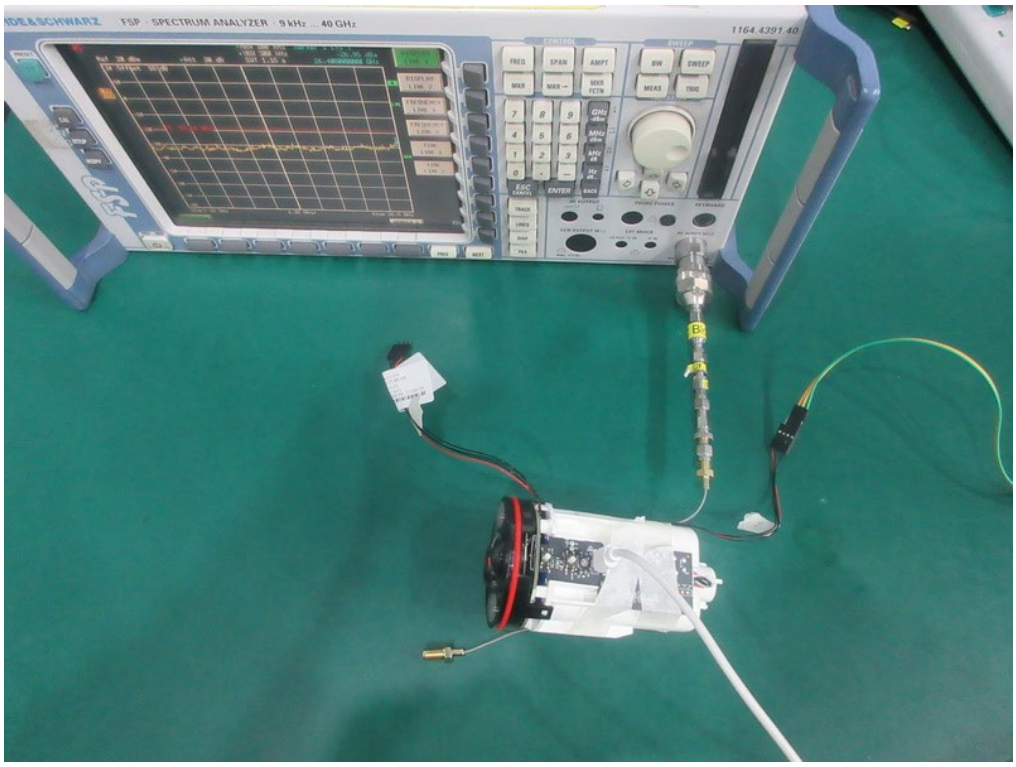
Radiated Emissions Test Photos

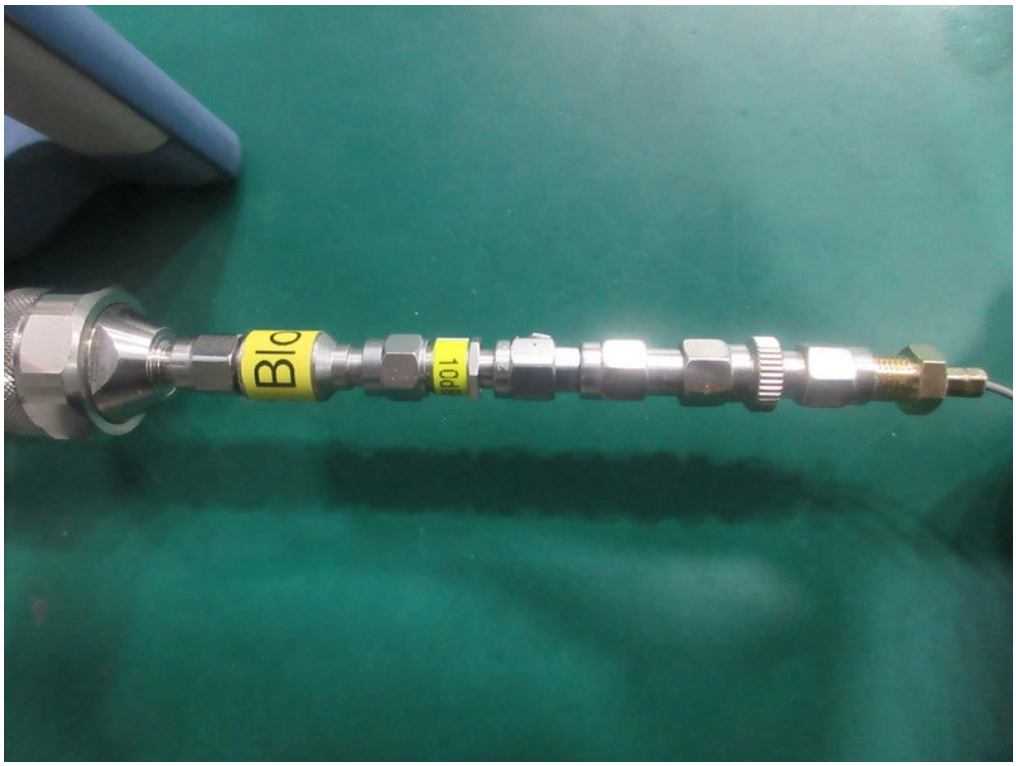
Above 1 GHz





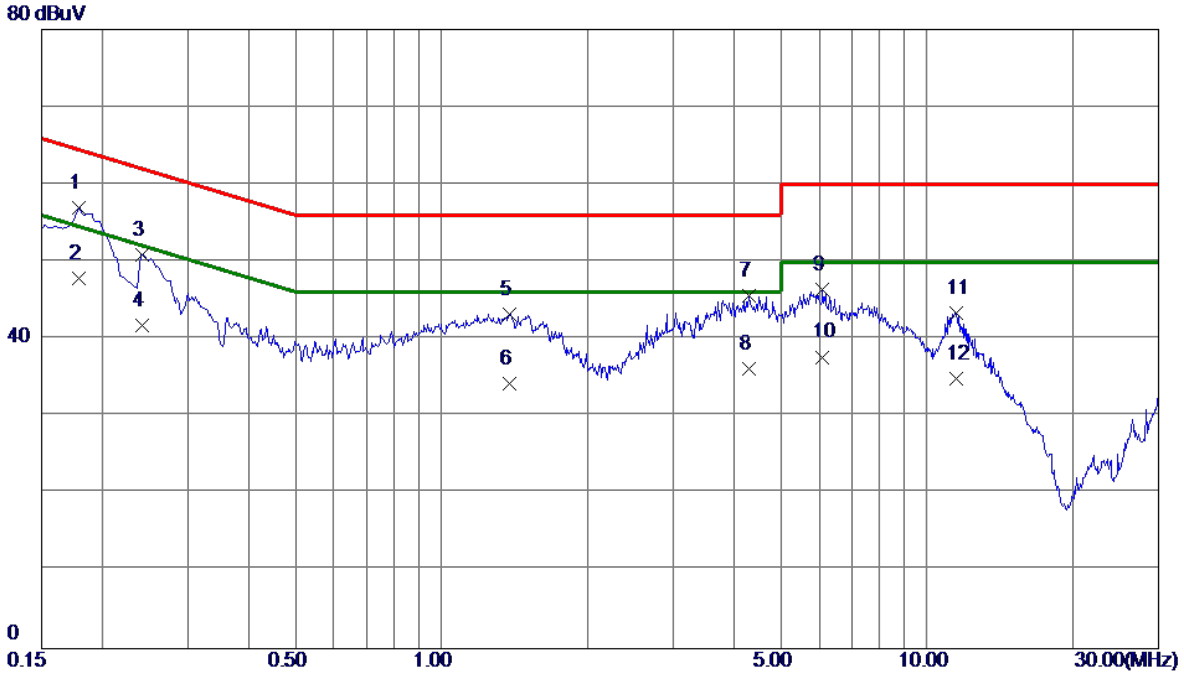
Conducted Test Photos





APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

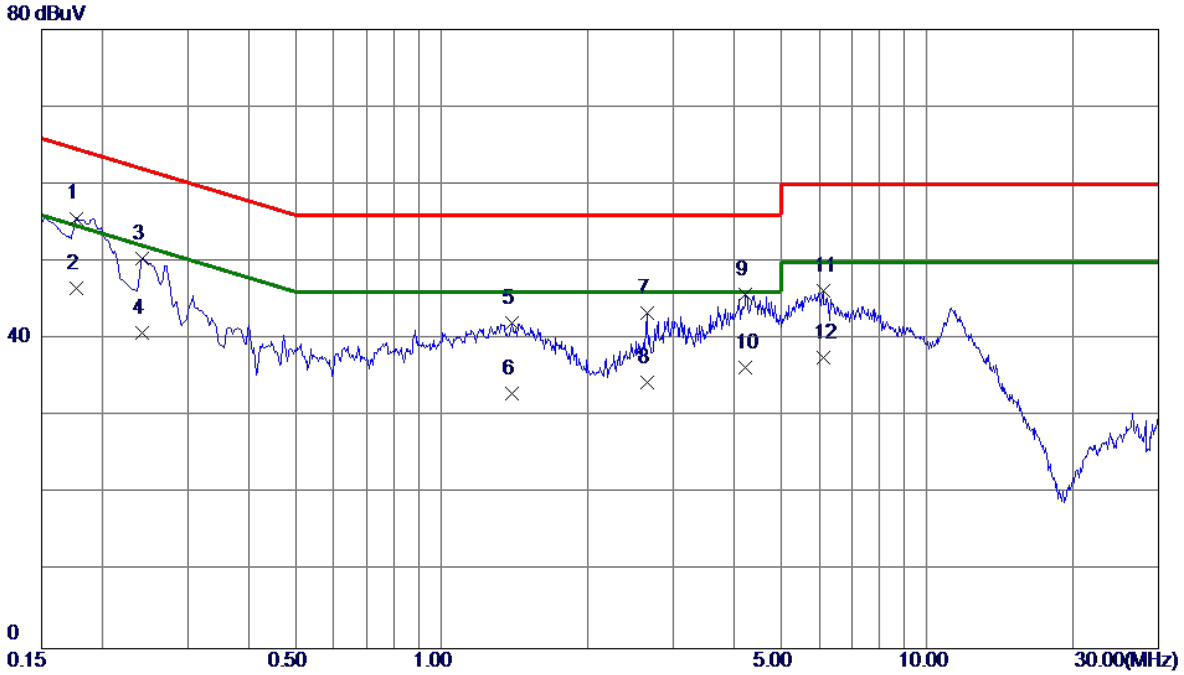
Test Mode	TX N(HT20) Mode Channel 06	Phase	Line



No.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1793	47.34	9.68	57.02	64.52	-7.50	QP	
2 *	0.1793	38.20	9.68	47.88	54.52	-6.64	AVG	
3	0.2423	41.19	9.68	50.87	62.02	-11.15	QP	
4	0.2423	32.09	9.68	41.77	52.02	-10.25	AVG	
5	1.3808	33.42	9.74	43.16	56.00	-12.84	QP	
6	1.3808	24.50	9.74	34.24	46.00	-11.76	AVG	
7	4.3034	35.79	9.83	45.62	56.00	-10.38	QP	
8	4.3034	26.39	9.83	36.22	46.00	-9.78	AVG	
9	6.0923	36.54	9.88	46.42	60.00	-13.58	QP	
10	6.0923	27.80	9.88	37.68	50.00	-12.32	AVG	
11	11.4945	33.42	10.01	43.43	60.00	-16.57	QP	
12	11.4945	24.90	10.01	34.91	50.00	-15.09	AVG	

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

Test Mode	TX N(HT20) Mode Channel 06	Phase	Neutral

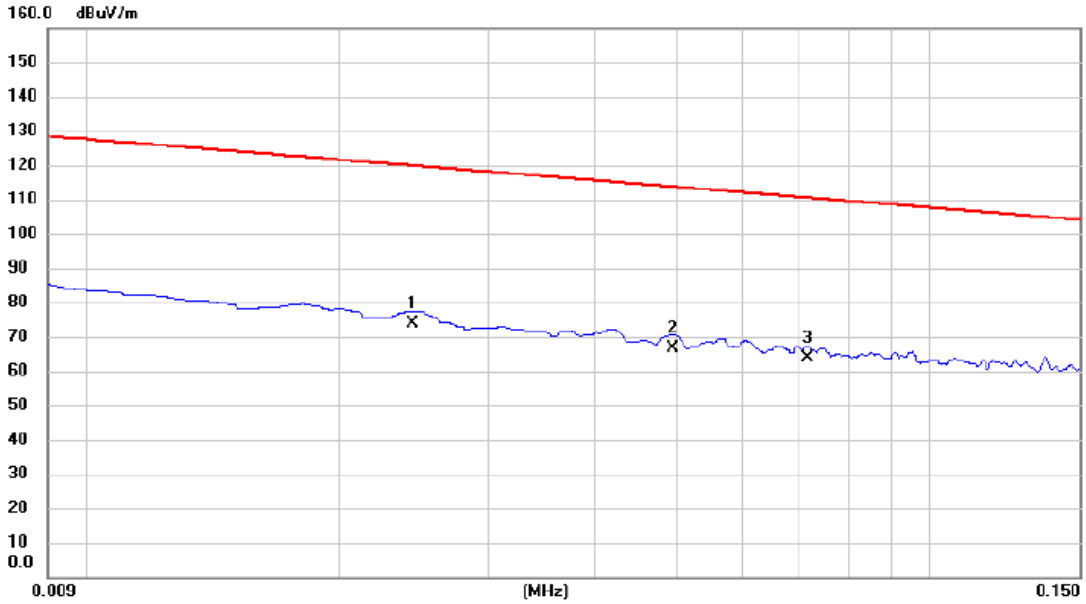


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1770	45.94	9.66	55.60	64.63	-9.03	QP	
2 *	0.1770	36.90	9.66	46.56	54.63	-8.07	AVG	
3	0.2423	40.81	9.65	50.46	62.02	-11.56	QP	
4	0.2423	31.20	9.65	40.85	52.02	-11.17	AVG	
5	1.3965	32.36	9.71	42.07	56.00	-13.93	QP	
6	1.3965	23.30	9.71	33.01	46.00	-12.99	AVG	
7	2.6475	33.61	9.75	43.36	56.00	-12.64	QP	
8	2.6475	24.60	9.75	34.35	46.00	-11.65	AVG	
9	4.2248	35.98	9.79	45.77	56.00	-10.23	QP	
10	4.2248	26.50	9.79	36.29	46.00	-9.71	AVG	
11	6.1170	36.35	9.86	46.21	60.00	-13.79	QP	
12	6.1170	27.80	9.86	37.66	50.00	-12.34	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

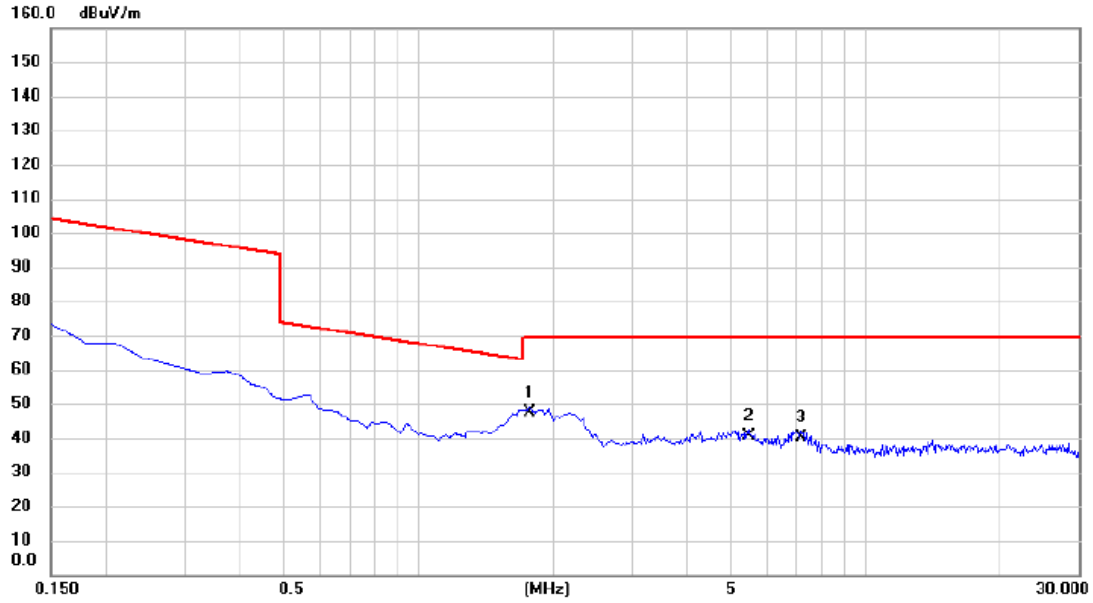
Test Mode	TX N(HT20) Mode Channel 06	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0244	53.61	20.11	73.72	119.86	-46.14	AVG	
2		0.0495	46.84	19.80	66.64	113.71	-47.07	AVG	
3		0.0715	43.91	19.87	63.78	110.52	-46.74	AVG	

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

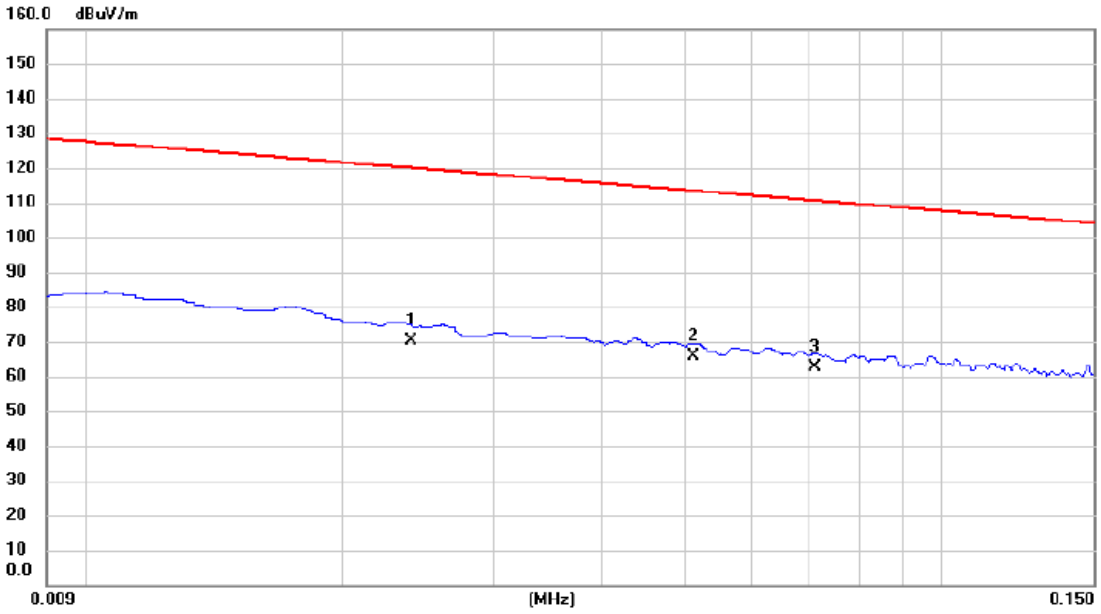
Test Mode	TX N(HT20) Mode Channel 06	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	1.7768	27.43	19.81	47.24	69.54	-22.30	QP	
2		5.4782	20.61	19.95	40.56	69.54	-28.98	QP	
3		7.1647	20.31	20.03	40.34	69.54	-29.20	QP	

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

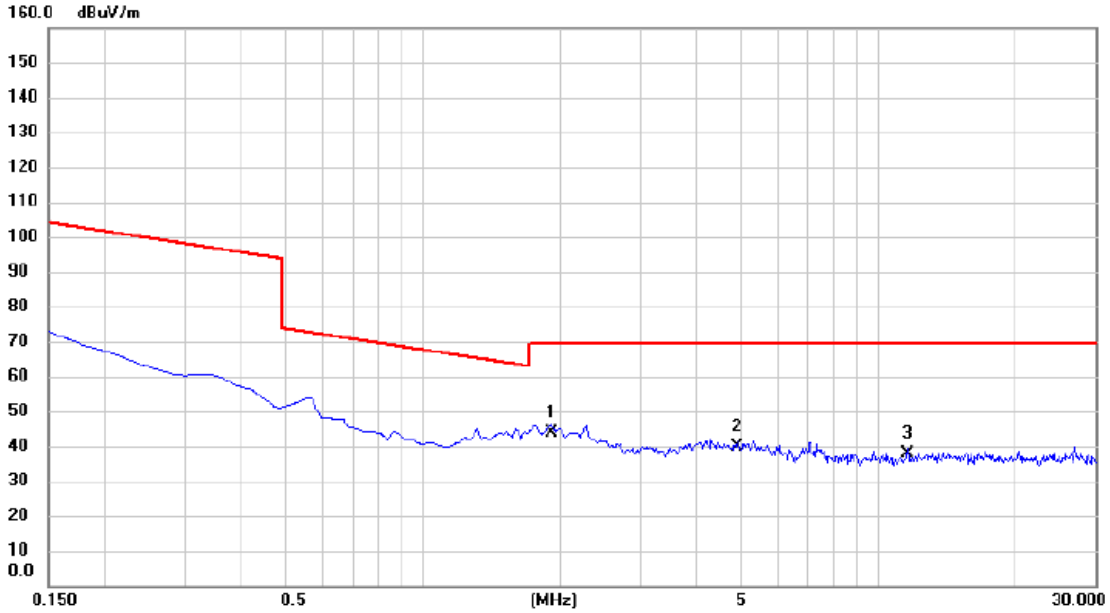
Test Mode	TX N(HT20) Mode Channel 06	Polarization	Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0240	50.16	20.13	70.29	120.00	-49.71	AVG	
2	*	0.0513	45.84	19.80	65.64	113.40	-47.76	AVG	
3		0.0711	42.59	19.87	62.46	110.57	-48.11	AVG	

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

Test Mode	TX N(HT20) Mode Channel 06	Polarization	Ant 90°

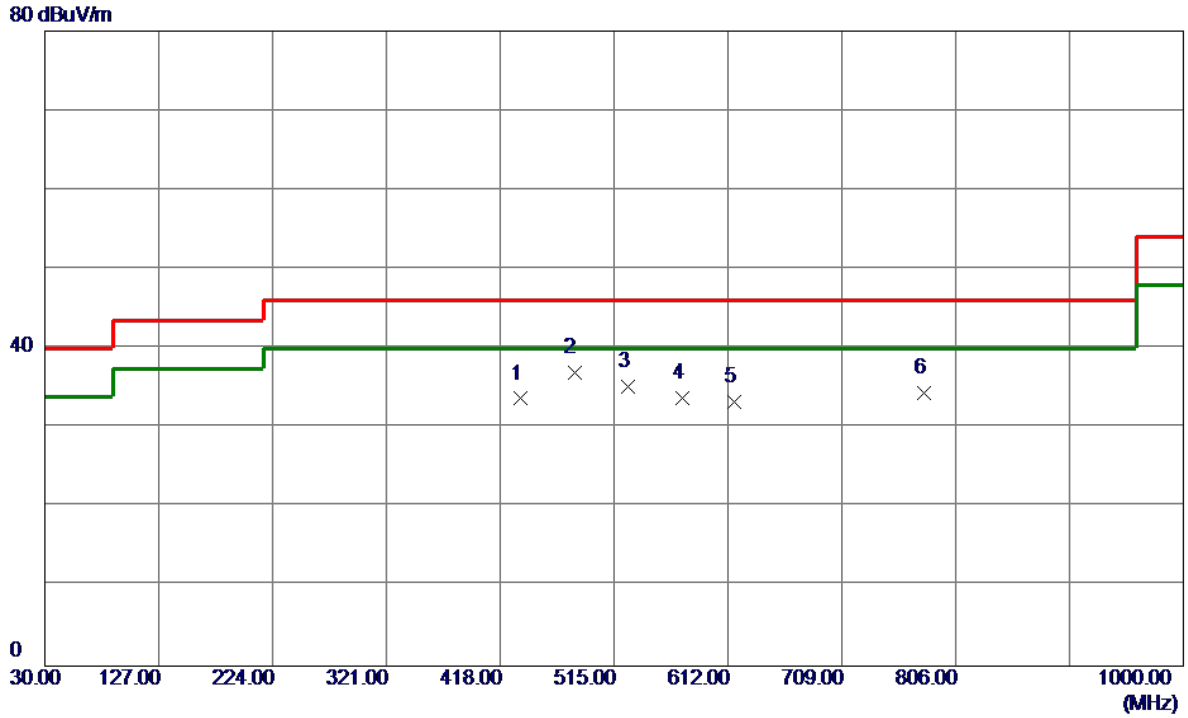


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	1.9111	24.20	19.80	44.00	69.54	-25.54	QP	
2		4.8961	19.84	19.95	39.79	69.54	-29.75	QP	
3		11.5975	17.43	20.23	37.66	69.54	-31.88	QP	

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

APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

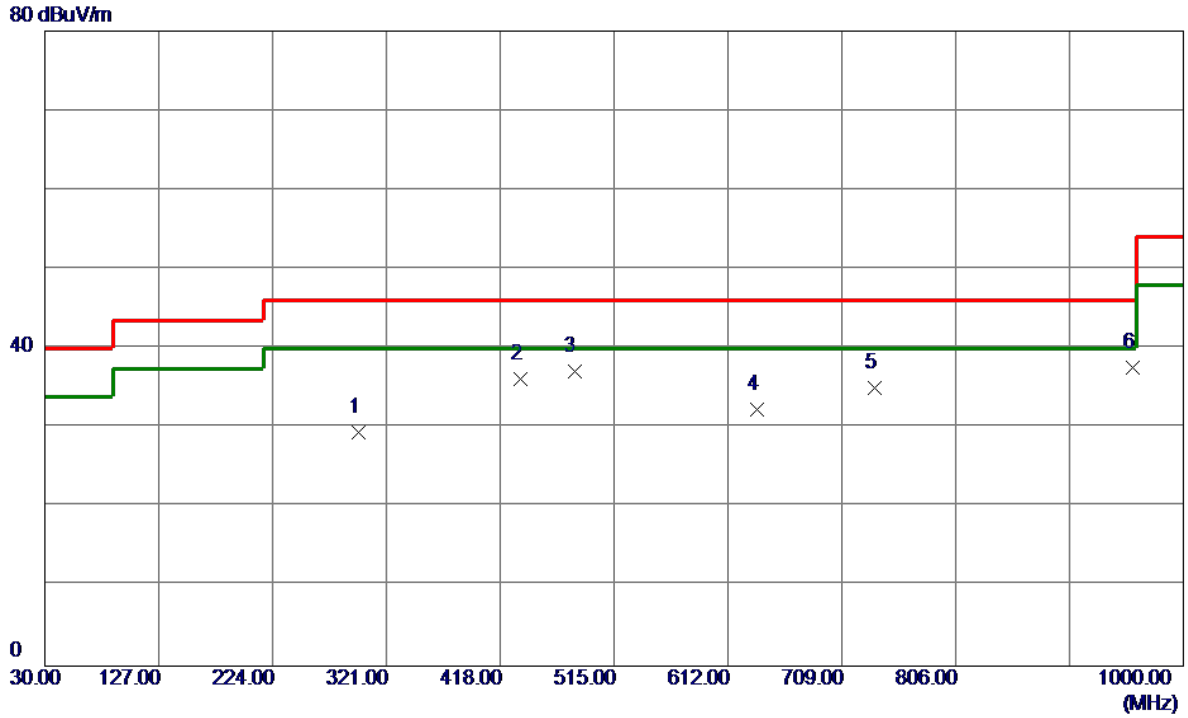
Test Mode	TX N(HT20) Mode Channel 06	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	435.4600	40.85	-7.17	33.68	46.00	-12.32	Peak	
2 *	481.0500	43.31	-6.33	36.98	46.00	-9.02	Peak	
3	527.1250	40.63	-5.50	35.13	46.00	-10.87	Peak	
4	572.7150	38.24	-4.42	33.82	46.00	-12.18	Peak	
5	617.3350	36.69	-3.41	33.28	46.00	-12.72	Peak	
6	779.3250	35.64	-1.30	34.34	46.00	-11.66	Peak	

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

Test Mode	TX N(HT20) Mode Channel 06	Polarization	Horizontal

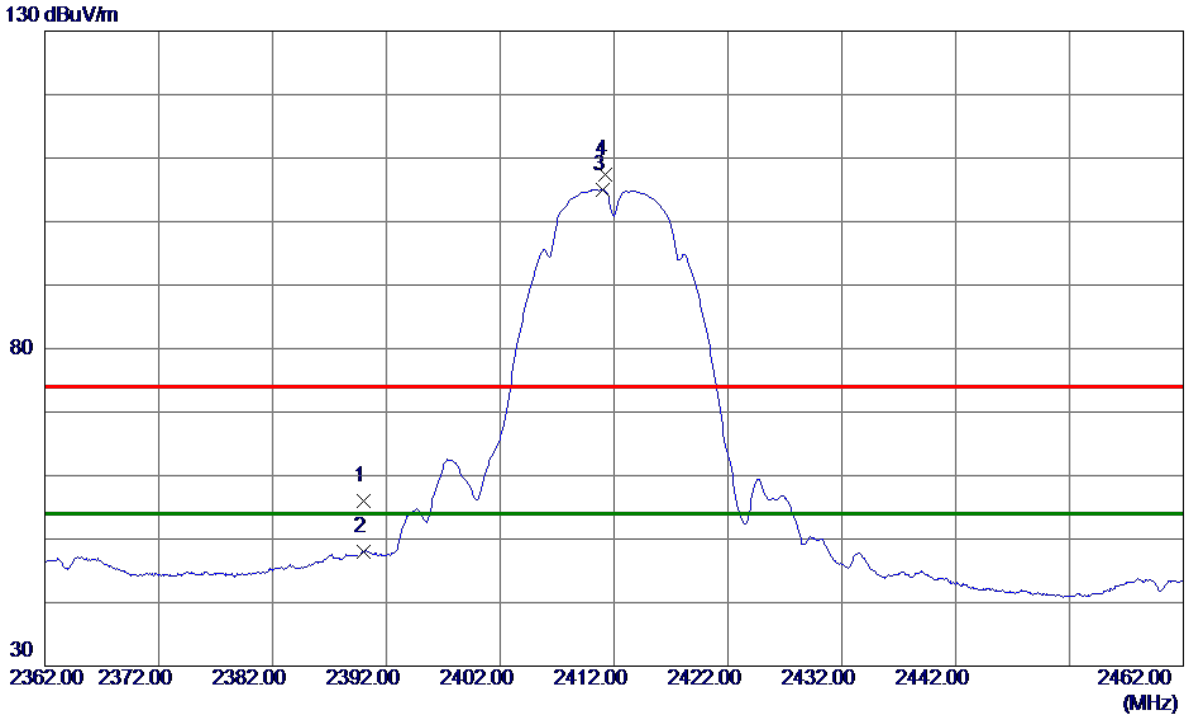


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	297.7200	40.08	-10.66	29.42	46.00	-16.58	Peak	
2	435.4600	43.39	-7.17	36.22	46.00	-9.78	Peak	
3	481.0500	43.41	-6.33	37.08	46.00	-8.92	Peak	
4	636.7350	35.42	-3.12	32.30	46.00	-13.70	Peak	
5	736.6450	36.56	-1.51	35.05	46.00	-10.95	Peak	
6 *	956.8350	37.18	0.44	37.62	46.00	-8.38	Peak	

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

APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ

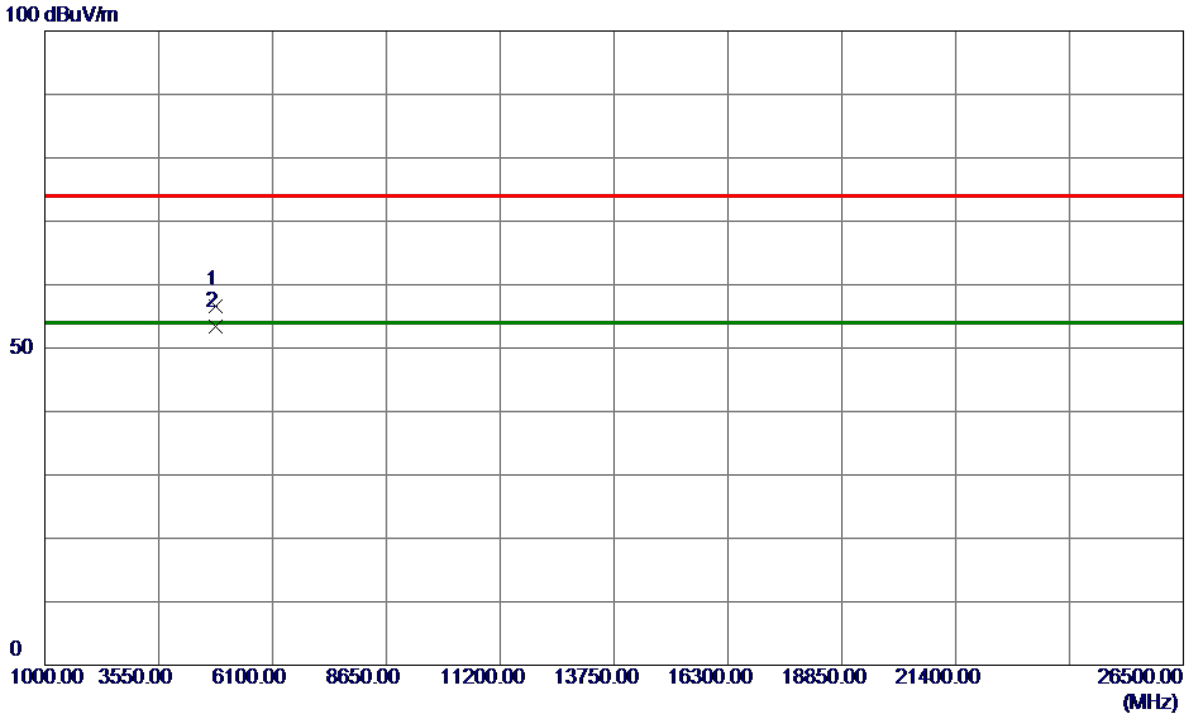
Test Mode	TX B Mode 2412 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	49.78	6.17	55.95	74.00	-18.05	Peak	
2	2390.0000	41.80	6.17	47.97	54.00	-6.03	AVG	
3 *	2411.0000	98.82	6.18	105.00	54.00	51.00	AVG	No Limit
4	2411.2000	101.20	6.18	107.38	74.00	33.38	Peak	No Limit

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

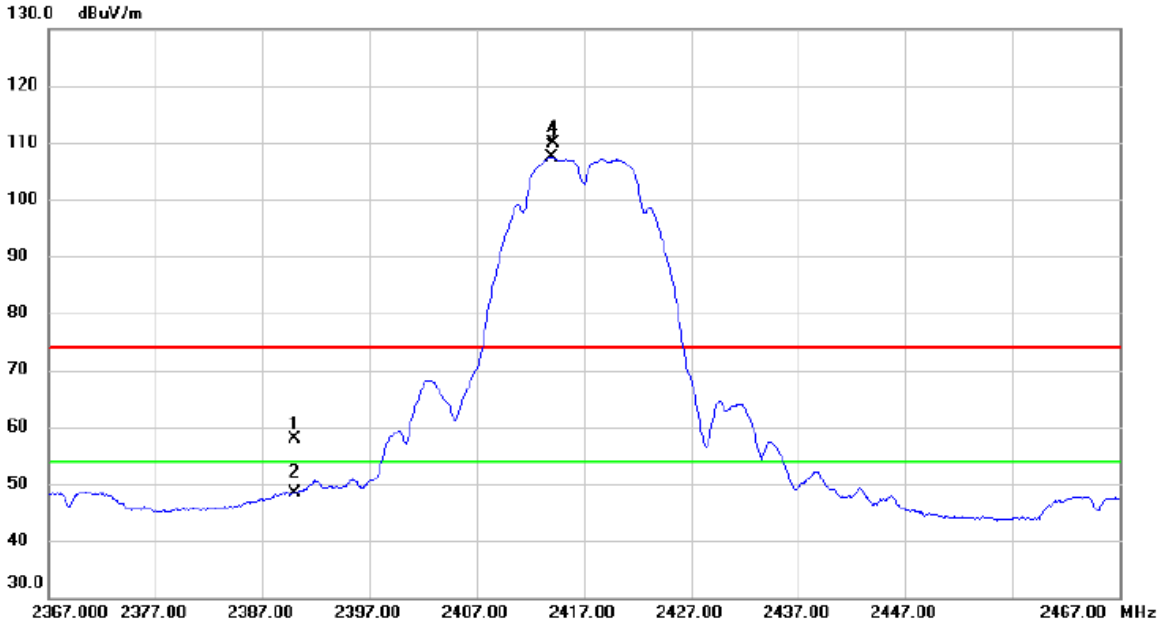
Test Mode	TX B Mode 2412 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4823.9300	55.75	0.95	56.70	74.00	-17.30	Peak	
2 *	4824.0250	52.45	0.95	53.40	54.00	-0.60	AVG	

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

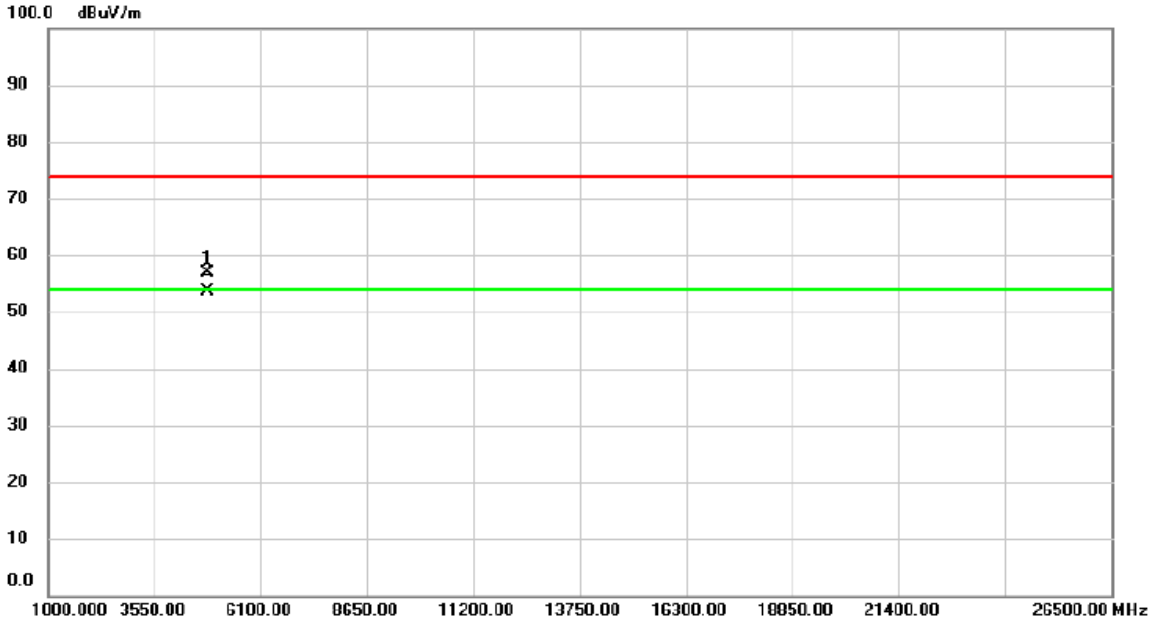
Test Mode	TX B Mode 2417 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	51.63	6.16	57.79	74.00	-16.21	peak	
2		2390.000	42.28	6.16	48.44	54.00	-5.56	AVG	
3	*	2414.000	101.2	6.19	107.42	54.00	53.42	AVG	No Limit
4	X	2414.100	103.7	6.19	109.93	74.00	35.93	peak	No Limit

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

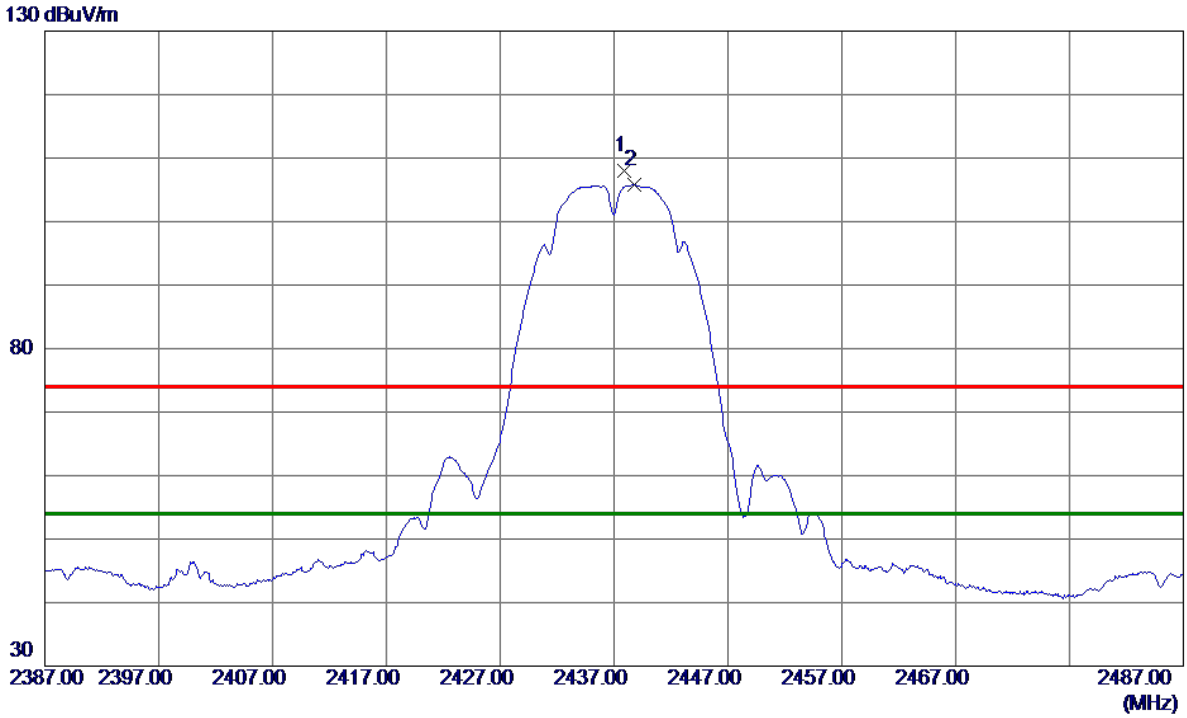
Test Mode	TX B Mode 2417 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4833.880	55.93	0.97	56.90	74.00	-17.10	peak	
2	*	4834.005	52.64	0.97	53.61	54.00	-0.39	AVG	

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

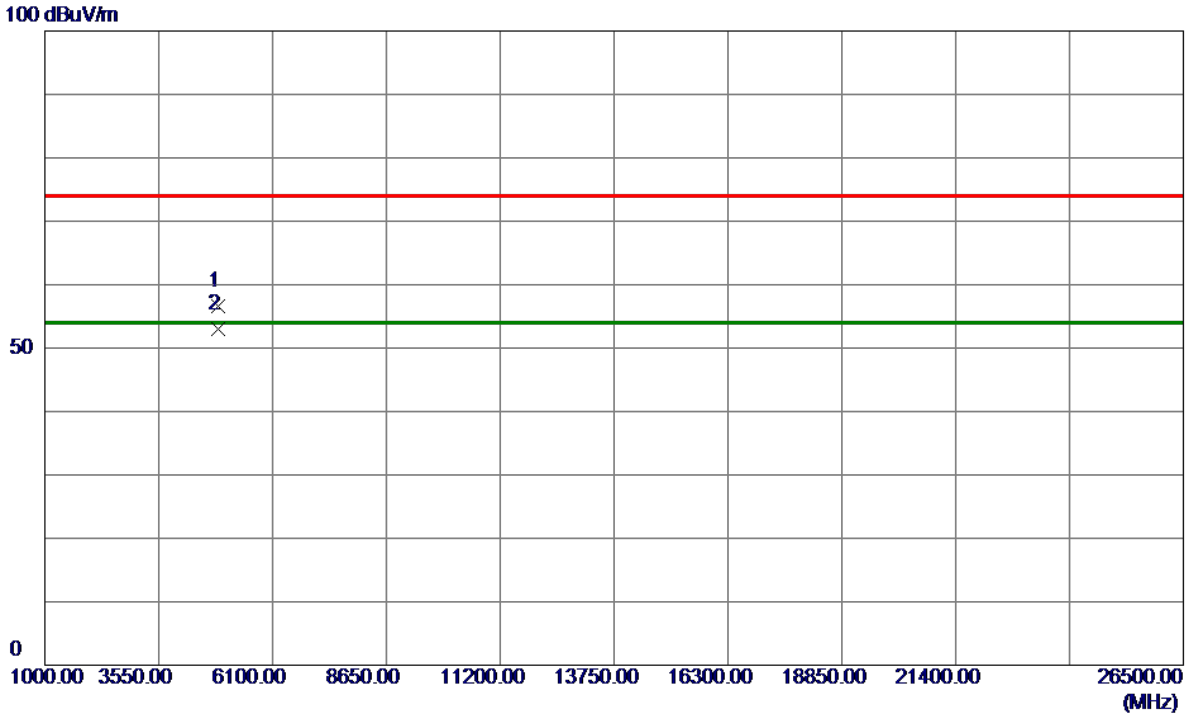
Test Mode	TX B Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2437.9000	101.86	6.20	108.06	74.00	34.06	Peak	No Limit
2 *	2438.8000	99.62	6.20	105.82	54.00	51.82	AVG	No Limit

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

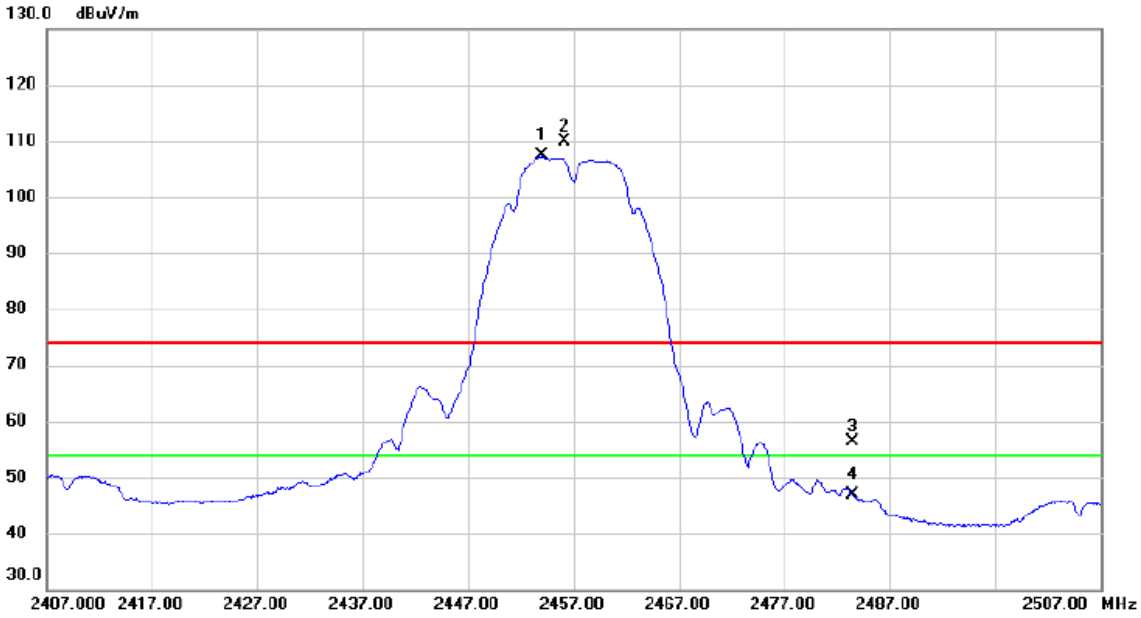
Test Mode	TX B Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4873.9250	55.46	1.08	56.54	74.00	-17.46	Peak	
2 *	4874.0299	51.98	1.08	53.06	54.00	-0.94	AVG	

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

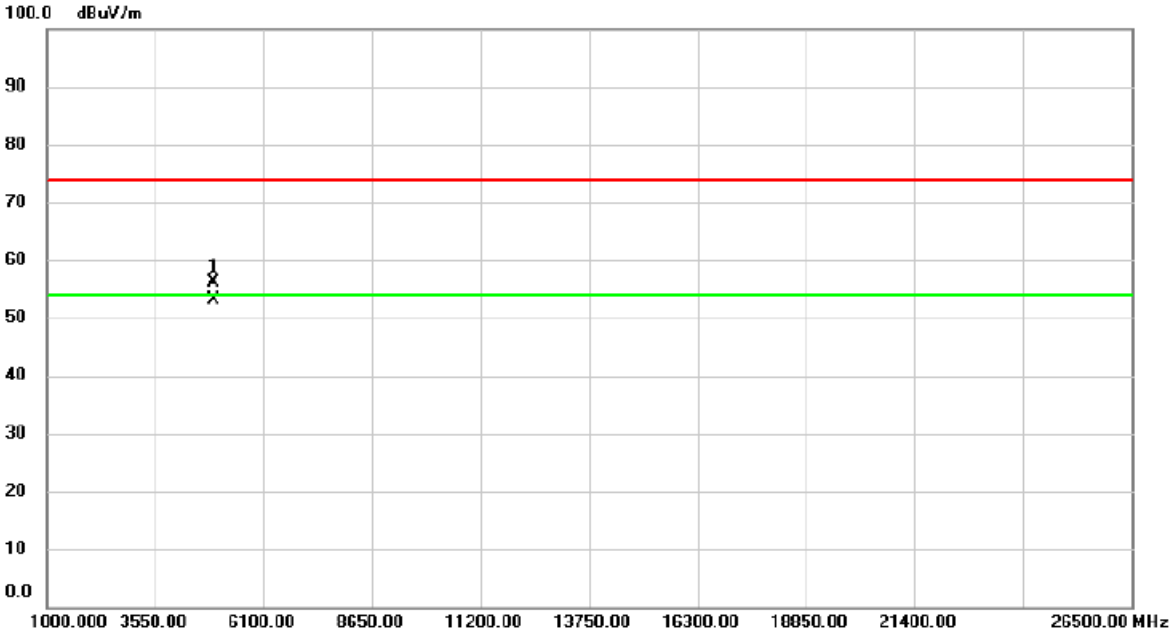
Test Mode	TX B Mode 2457 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2454.000	101.0	6.21	107.27	54.00	53.27	AVG	No Limit
2	X	2456.200	103.6	6.21	109.81	74.00	35.81	peak	No Limit
3		2483.500	50.11	6.22	56.33	74.00	-17.67	peak	
4		2483.500	40.55	6.22	46.77	54.00	-7.23	AVG	

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

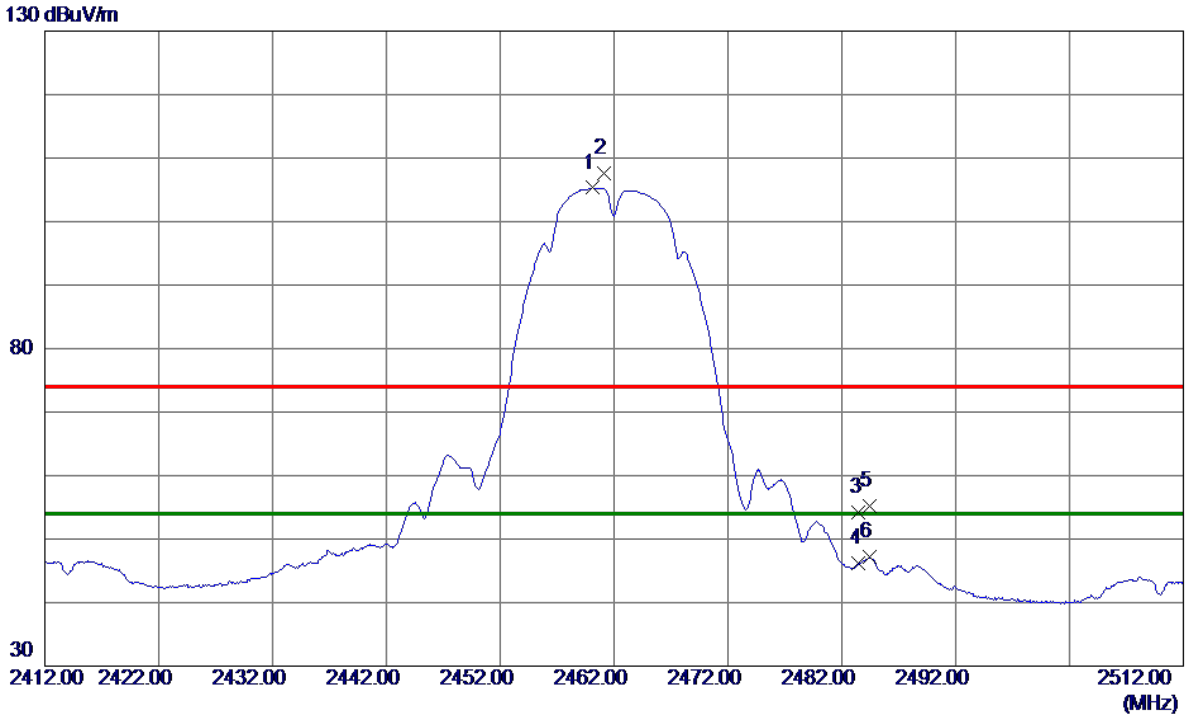
Test Mode	TX B Mode 2457 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4914.005	54.96	1.19	56.15	74.00	-17.85	peak	
2	*	4914.055	51.88	1.19	53.07	54.00	-0.93	AVG	

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

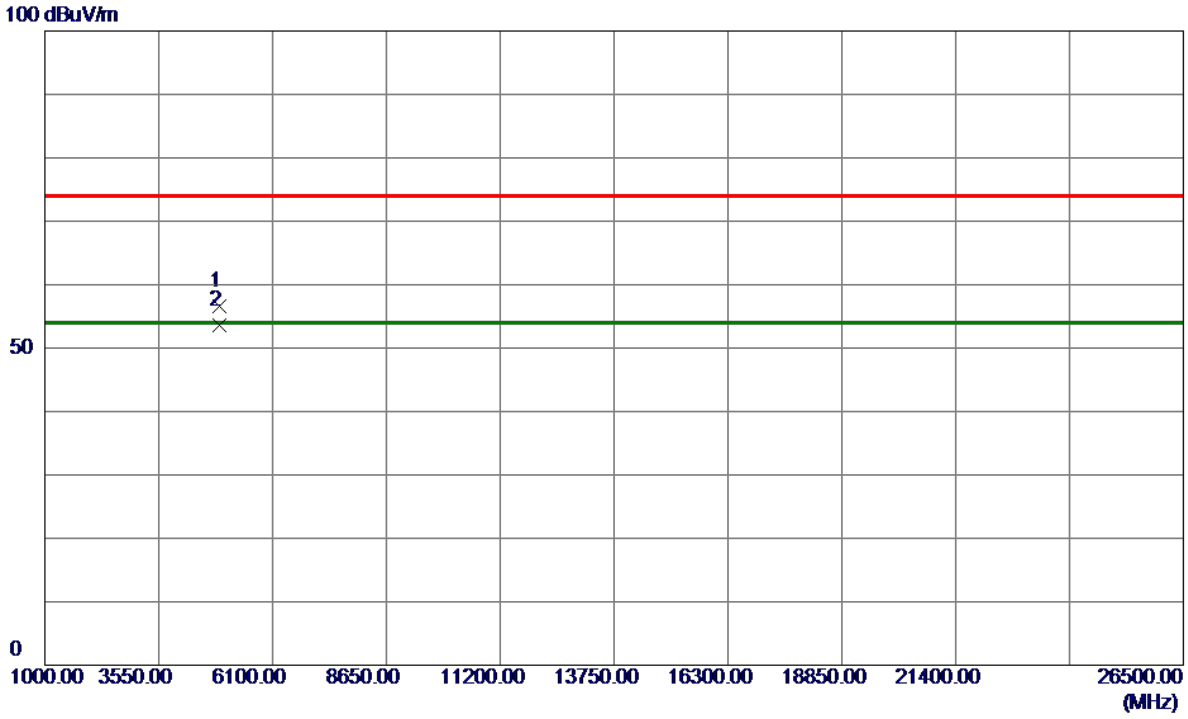
Test Mode	TX B Mode 2462 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2460.1000	99.09	6.21	105.30	54.00	51.30	AVG	No Limit
2	2461.1000	101.39	6.21	107.60	74.00	33.60	Peak	No Limit
3	2483.5000	47.88	6.23	54.11	74.00	-19.89	Peak	
4	2483.5000	40.05	6.23	46.28	54.00	-7.72	AVG	
5	2484.4000	48.98	6.23	55.21	74.00	-18.79	Peak	
6	2484.4000	40.93	6.23	47.16	54.00	-6.84	AVG	

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

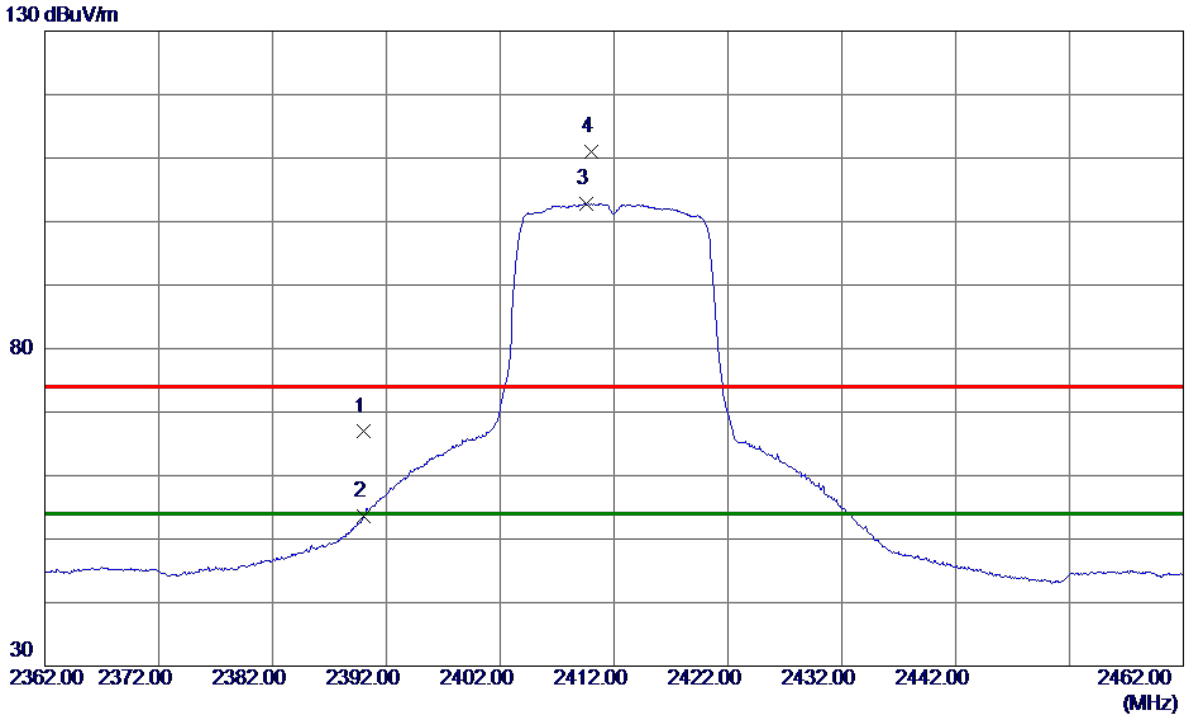
Test Mode	TX B Mode 2462 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4924.0050	55.42	1.21	56.63	74.00	-17.37	Peak	
2 *	4924.0700	52.41	1.21	53.62	54.00	-0.38	AVG	

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

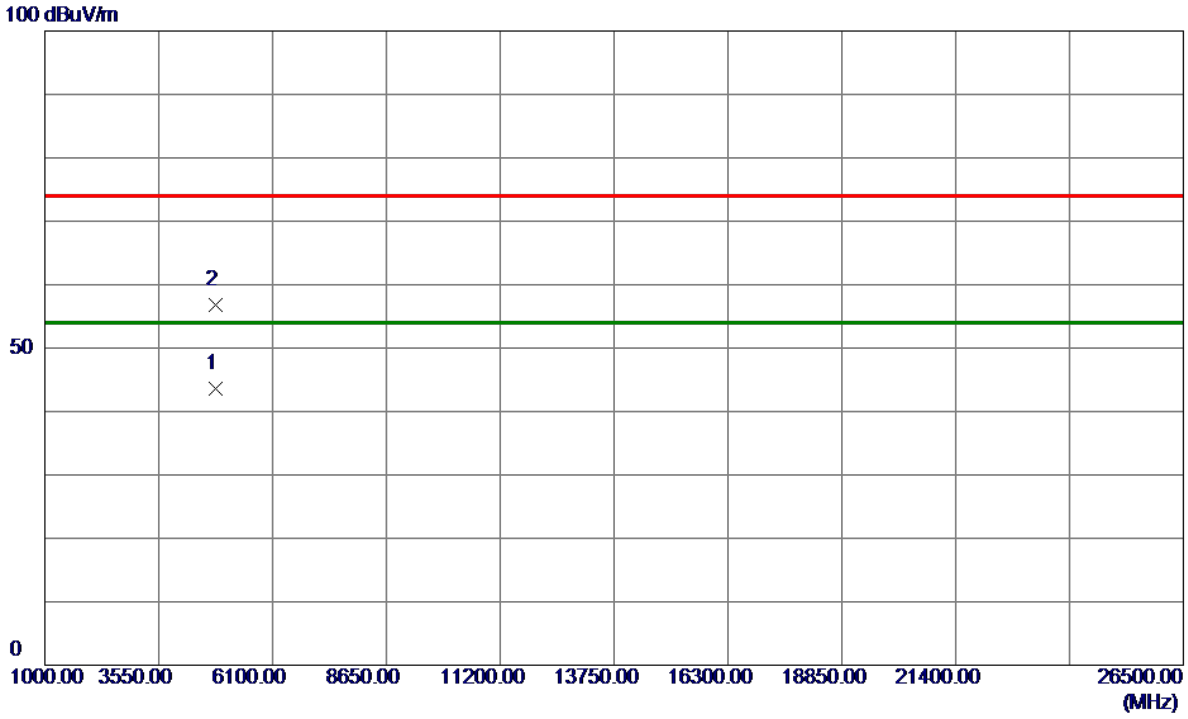
Test Mode	TX G Mode 2412 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	60.73	6.17	66.90	74.00	-7.10	Peak	
2	2390.0000	47.36	6.17	53.53	54.00	-0.47	AVG	
3 *	2409.5500	96.61	6.18	102.79	54.00	48.79	AVG	No Limit
4	2409.9500	104.85	6.18	111.03	74.00	37.03	Peak	No Limit

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

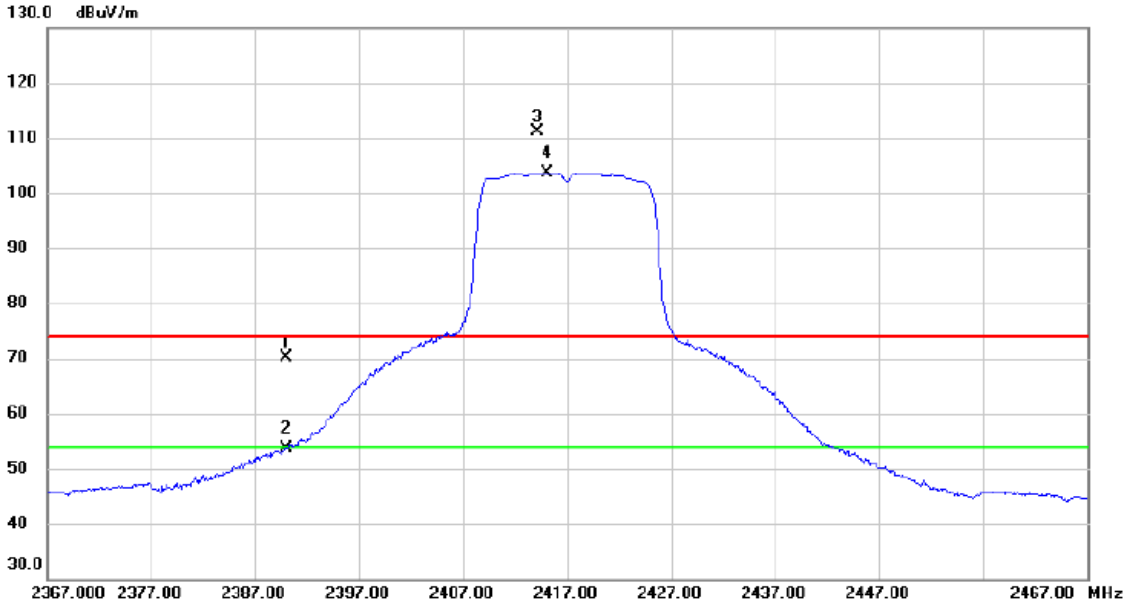
Test Mode	TX G Mode 2412 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4825.2050	42.57	0.95	43.52	54.00	-10.48	AVG	
2	4825.8350	55.88	0.96	56.84	74.00	-17.16	Peak	

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

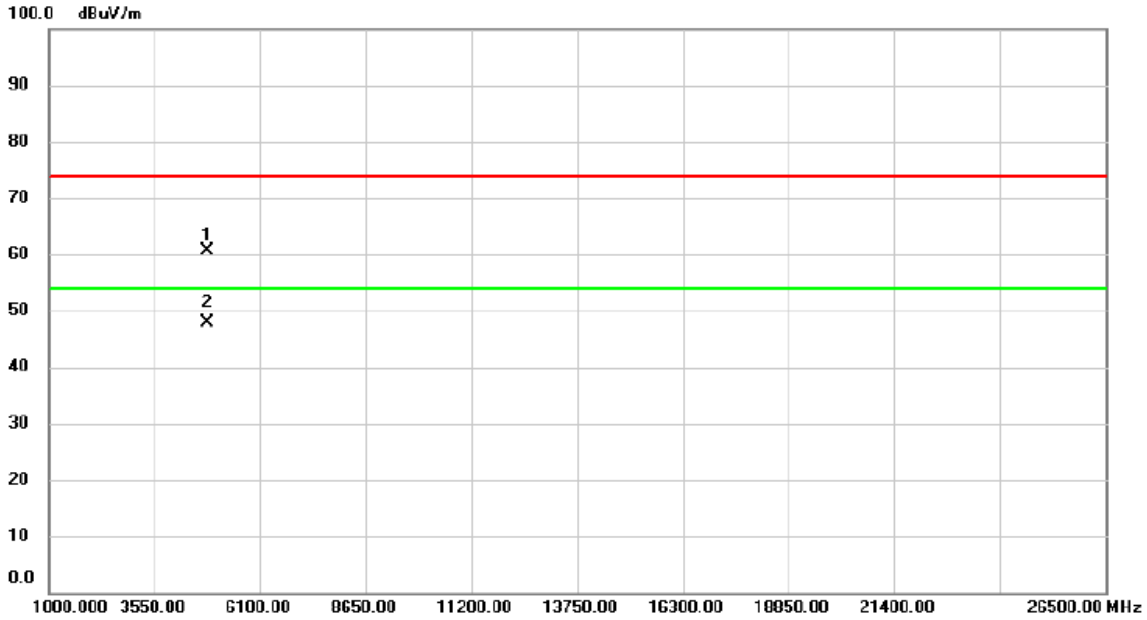
Test Mode	TX G Mode 2417 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	64.06	6.16	70.22	74.00	-3.78	peak	
2		2390.000	47.50	6.16	53.66	54.00	-0.34	AVG	
3	X	2414.100	104.9	6.19	111.18	74.00	37.18	peak	No Limit
4	*	2415.050	97.48	6.19	103.67	54.00	49.67	AVG	No Limit

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

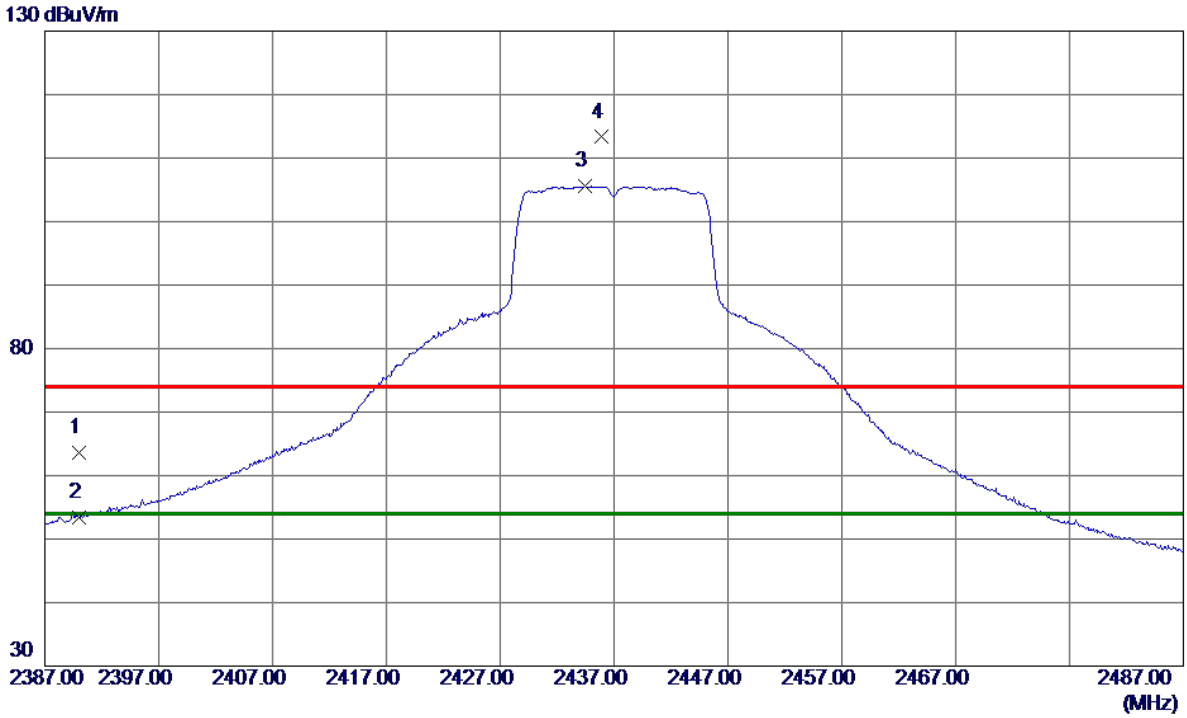
Test Mode	TX G Mode 2417 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4830.715	59.67	0.97	60.64	74.00	-13.36	peak	
2	*	4831.610	47.00	0.97	47.97	54.00	-6.03	AVG	

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

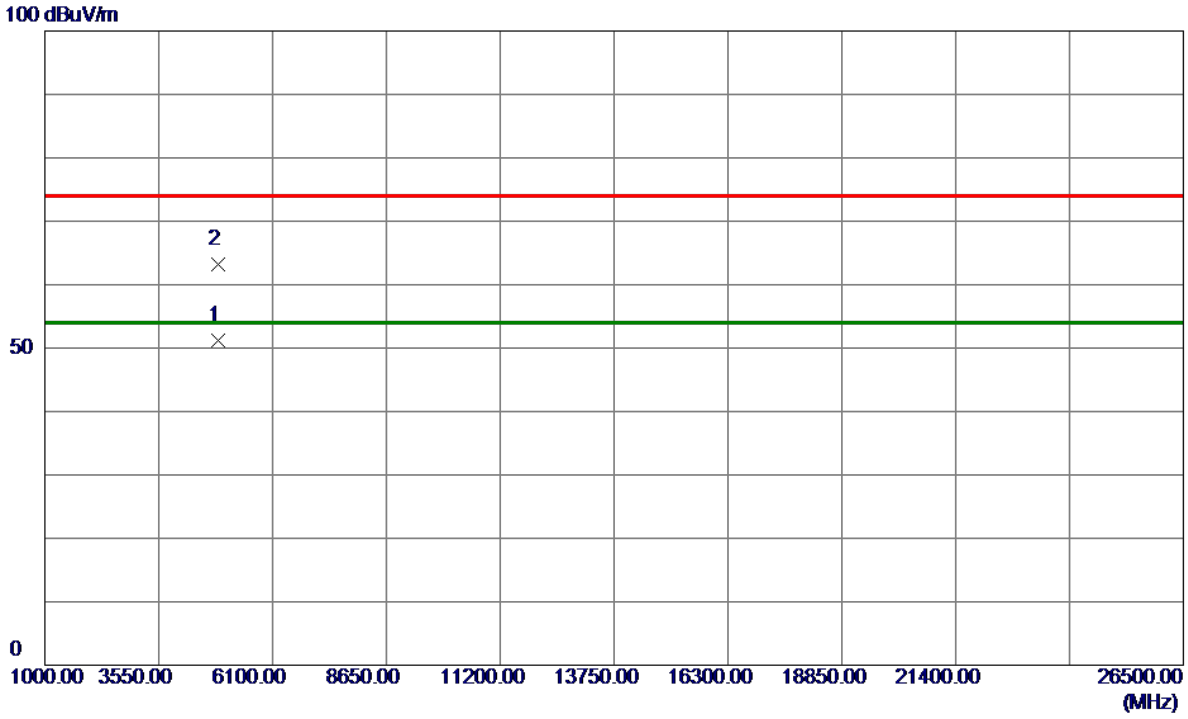
Test Mode	TX G Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	57.42	6.17	63.59	74.00	-10.41	Peak	
2	2390.0000	47.28	6.17	53.45	54.00	-0.55	AVG	
3 *	2434.4000	99.36	6.20	105.56	54.00	51.56	AVG	No Limit
4	2435.8500	107.10	6.20	113.30	74.00	39.30	Peak	No Limit

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

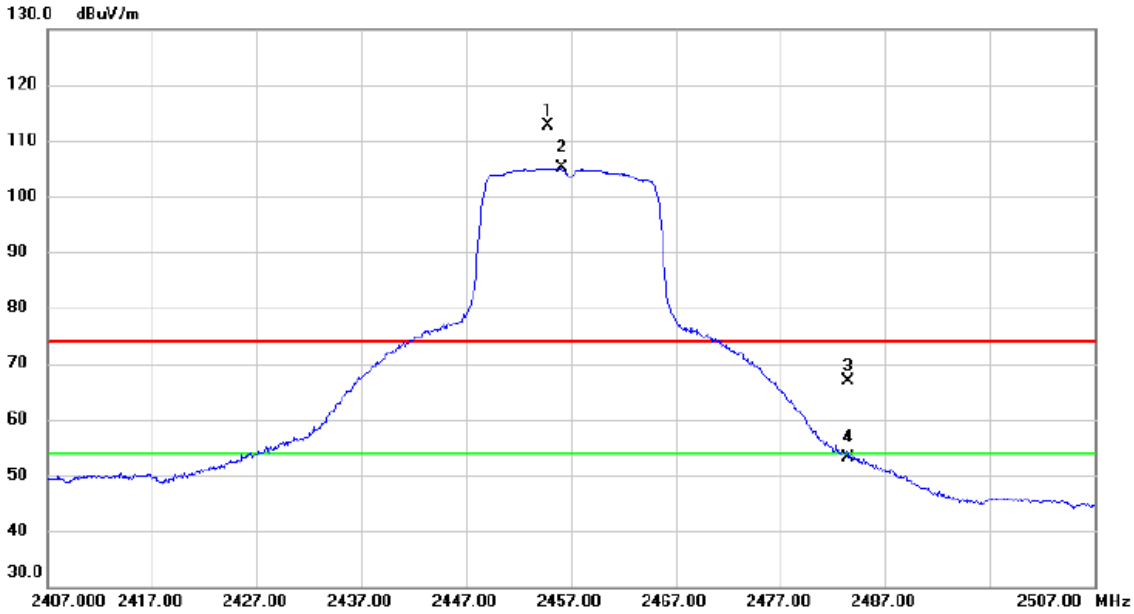
Test Mode	TX G Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4874.3000	50.17	1.08	51.25	54.00	-2.75	AVG	
2	4875.4000	62.04	1.08	63.12	74.00	-10.88	Peak	

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

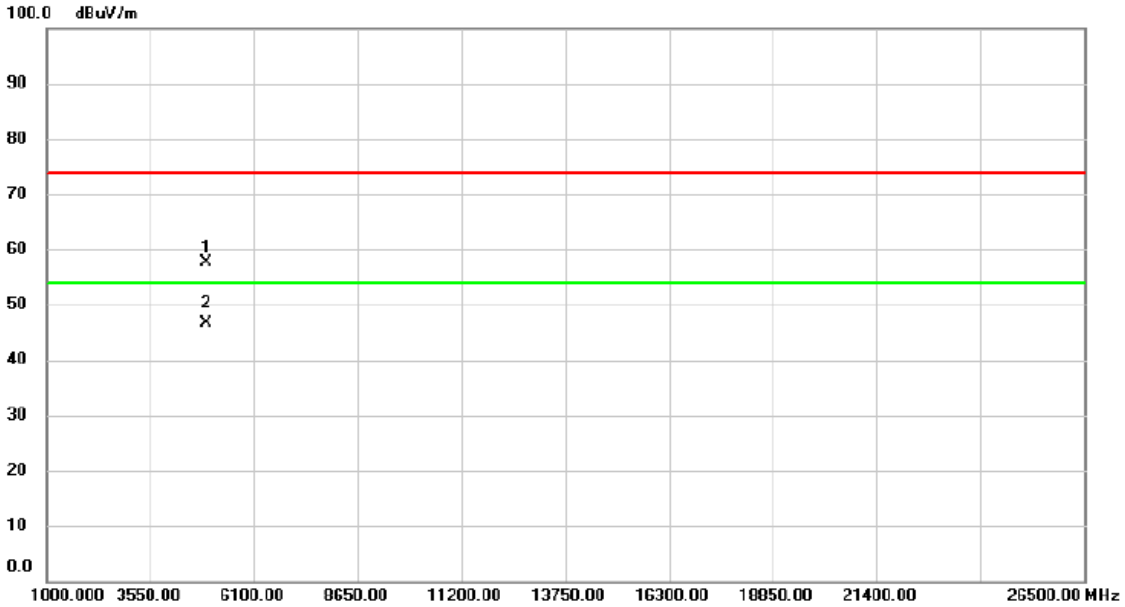
Test Mode	TX G Mode 2457 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2454.750	106.4	6.21	112.69	74.00	38.69	peak	No Limit
2	*	2456.150	98.89	6.21	105.10	54.00	51.10	AVG	No Limit
3		2483.500	60.68	6.22	66.90	74.00	-7.10	peak	
4		2483.500	46.94	6.22	53.16	54.00	-0.84	AVG	

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

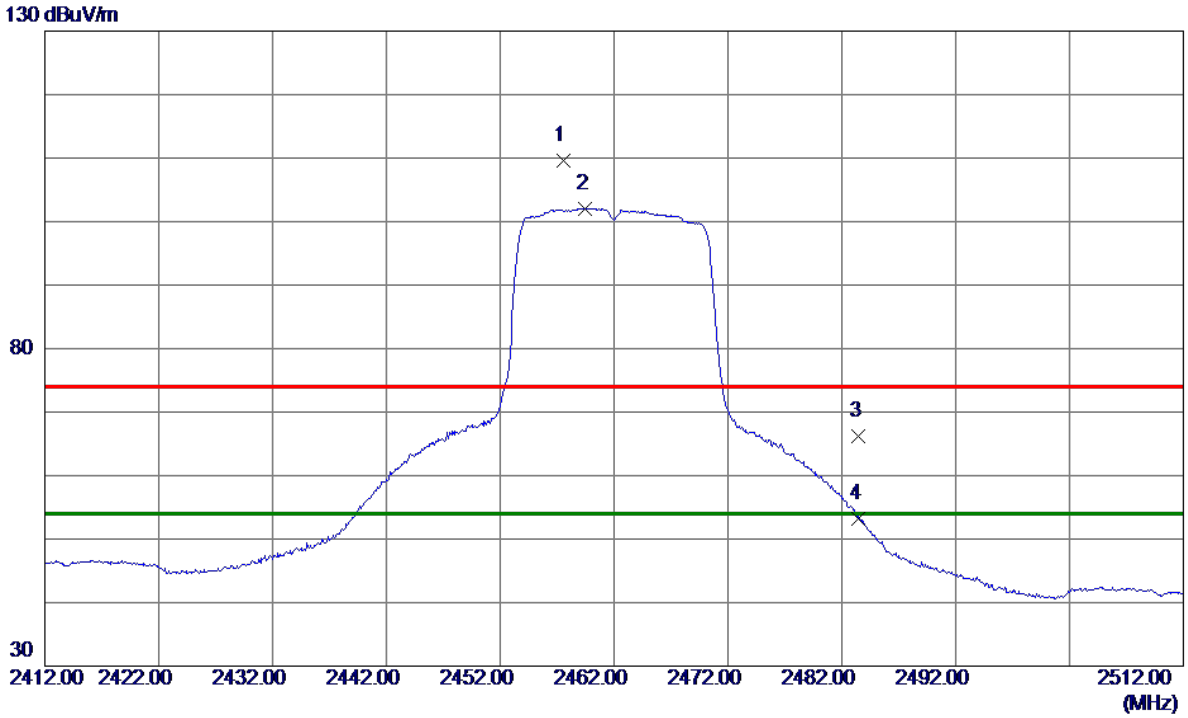
Test Mode	TX G Mode 2457 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4910.685	56.37	1.18	57.55	74.00	-16.45	peak	
2	*	4914.280	45.44	1.19	46.63	54.00	-7.37	AVG	

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

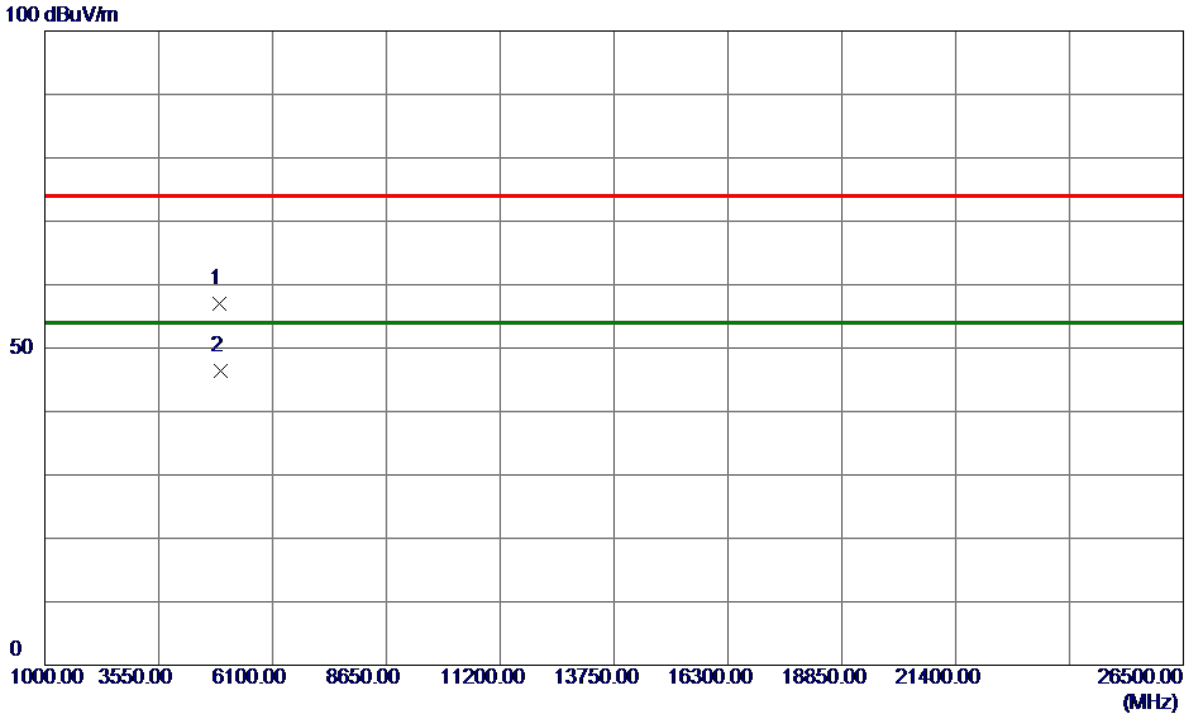
Test Mode	TX G Mode 2462 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2457.5500	103.31	6.21	109.52	74.00	35.52	Peak	No Limit
2 *	2459.5000	95.85	6.21	102.06	54.00	48.06	AVG	No Limit
3	2483.5000	60.02	6.23	66.25	74.00	-7.75	Peak	
4	2483.5000	46.97	6.23	53.20	54.00	-0.80	AVG	

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

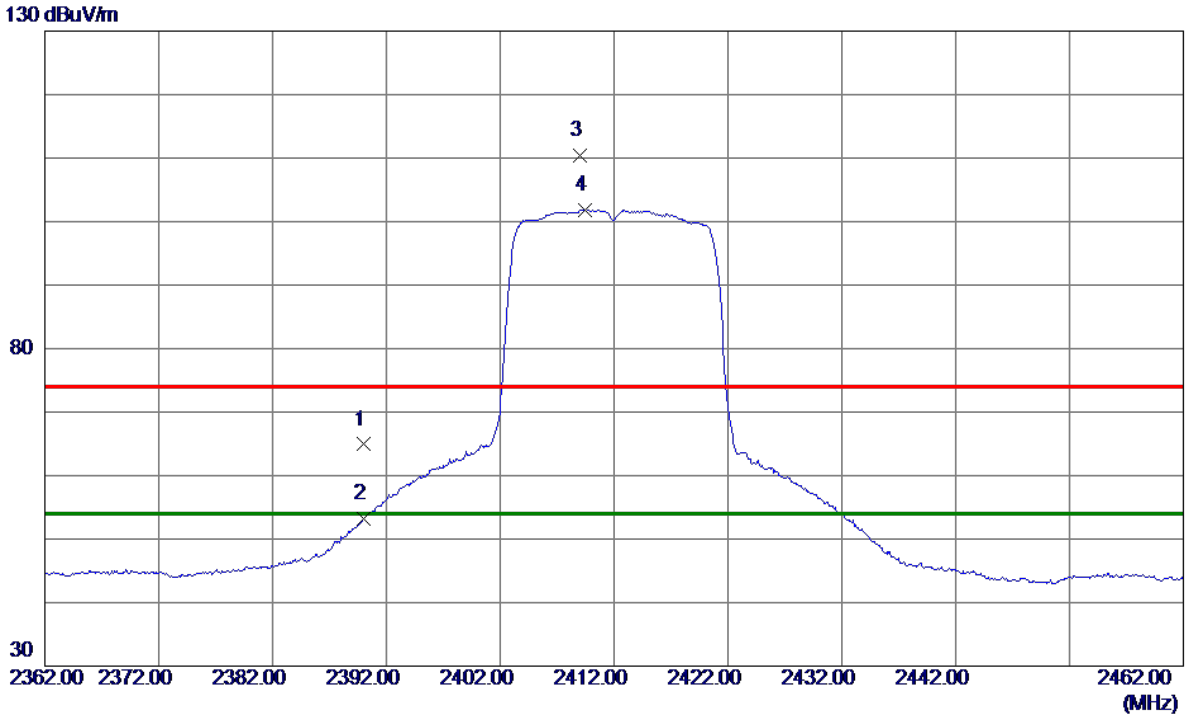
Test Mode	TX G Mode 2462 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4922.6950	55.78	1.20	56.98	74.00	-17.02	Peak	
2 *	4926.9600	45.18	1.21	46.39	54.00	-7.61	AVG	

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

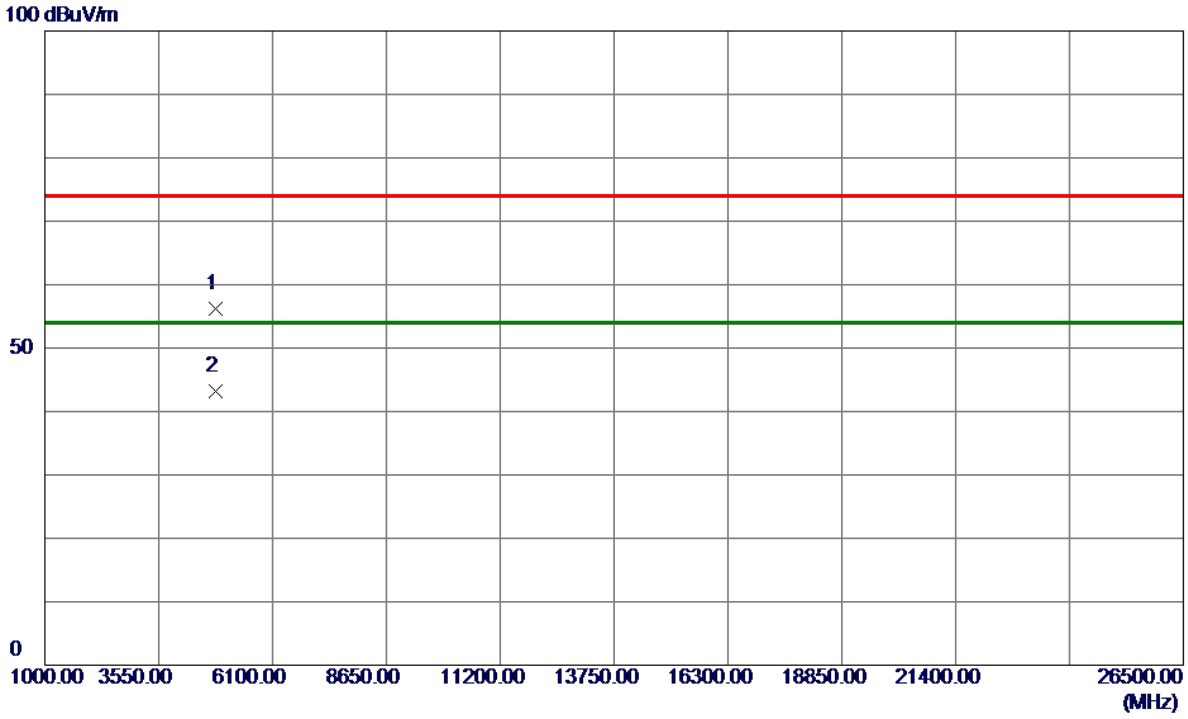
Test Mode	TX N(HT20) Mode 2412 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	58.73	6.17	64.90	74.00	-9.10	Peak	
2	2390.0000	47.08	6.17	53.25	54.00	-0.75	AVG	
3	2409.0500	104.14	6.18	110.32	74.00	36.32	Peak	No Limit
4 *	2409.4000	95.66	6.18	101.84	54.00	47.84	AVG	No Limit

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

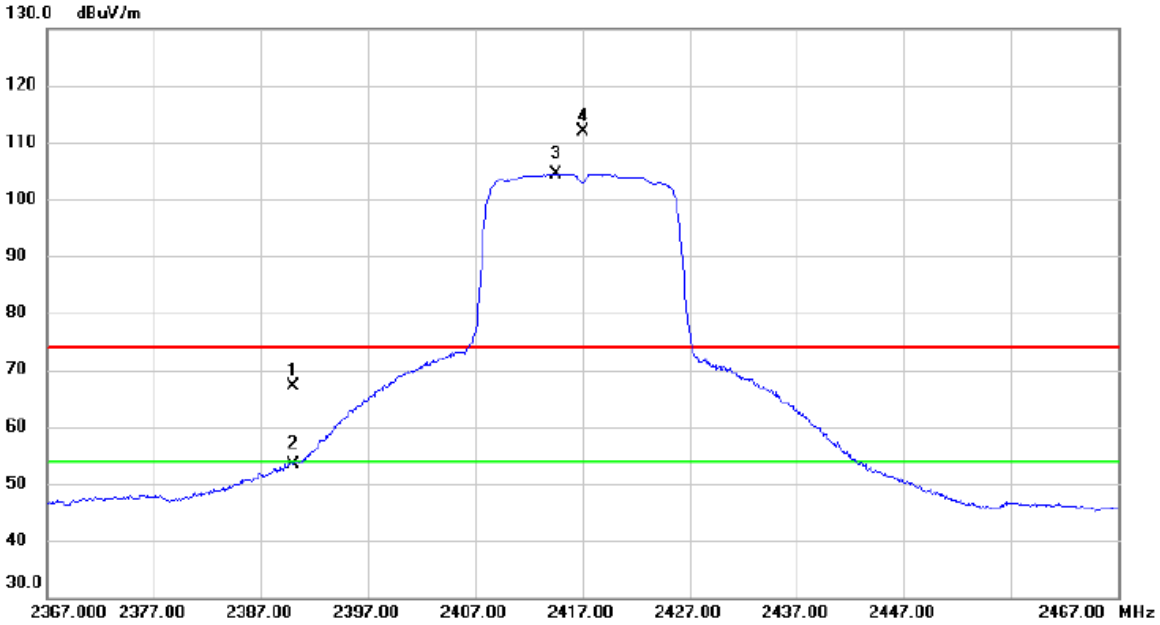
Test Mode	TX N(HT20) Mode 2412 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4824.0250	55.16	0.95	56.11	74.00	-17.89	Peak	
2 *	4828.0400	42.31	0.96	43.27	54.00	-10.73	AVG	

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

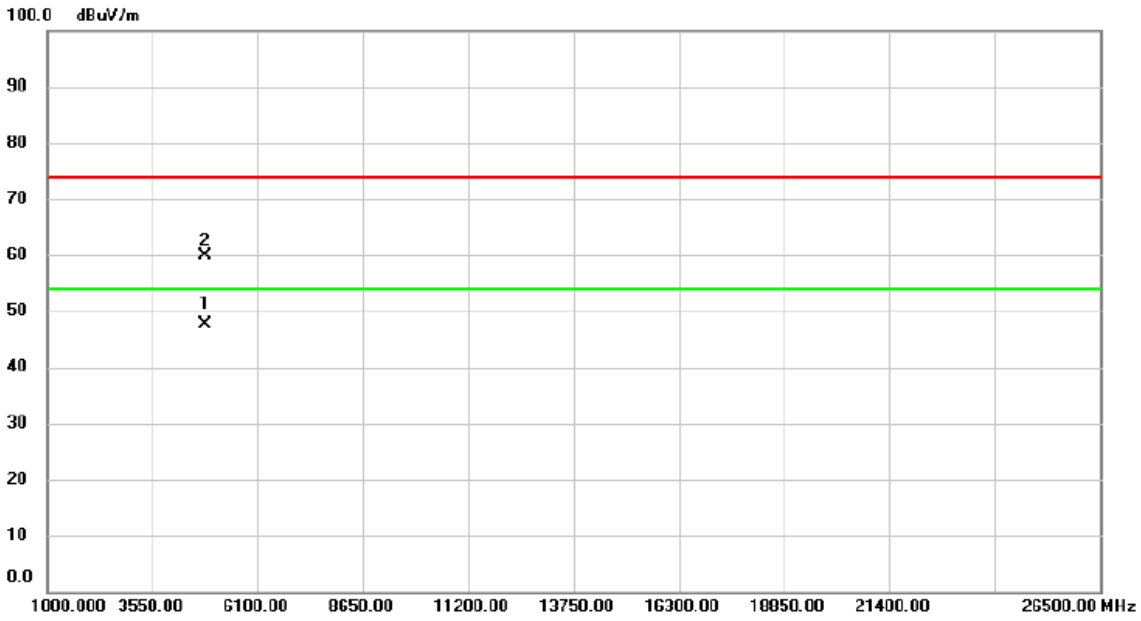
Test Mode	TX N(HT20) Mode 2417 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	60.97	6.16	67.13	74.00	-6.87	peak	
2		2390.000	47.20	6.16	53.36	54.00	-0.64	AVG	
3	*	2414.600	98.31	6.19	104.50	54.00	50.50	AVG	No Limit
4	X	2417.100	105.7	6.18	111.91	74.00	37.91	peak	No Limit

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

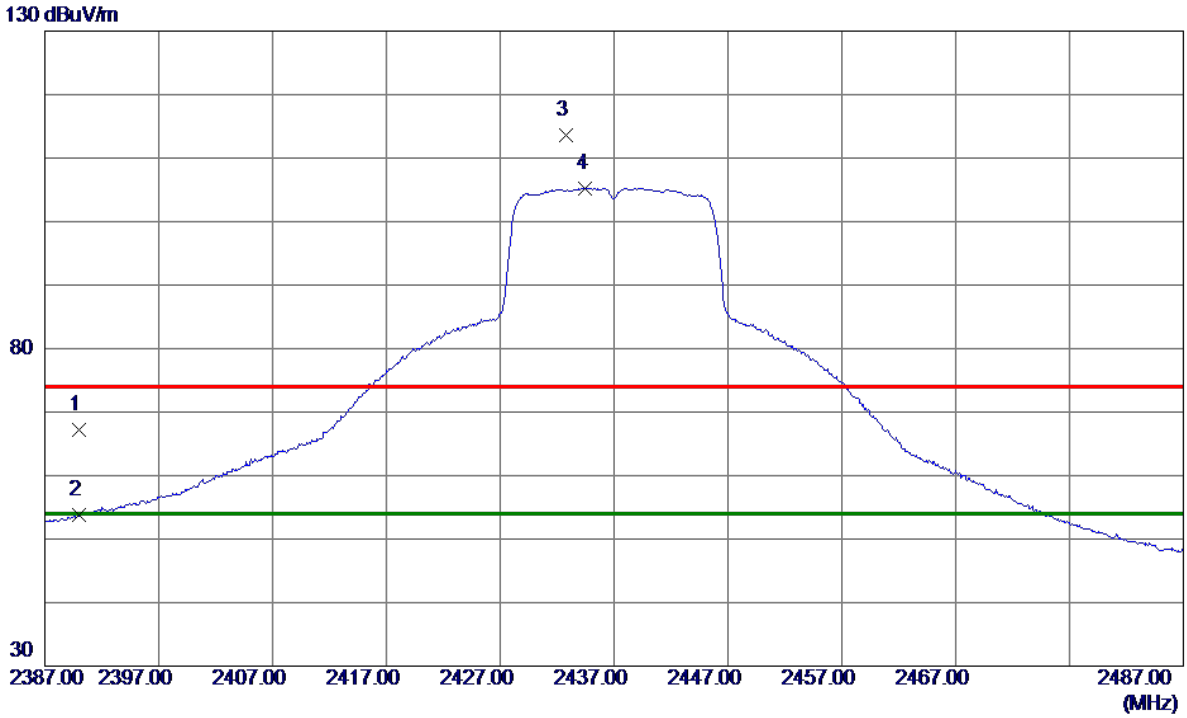
Test Mode	TX N(HT20) Mode 2417 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4833.420	46.75	0.97	47.72	54.00	-6.28	AVG	
2		4836.060	58.96	0.99	59.95	74.00	-14.05	peak	

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

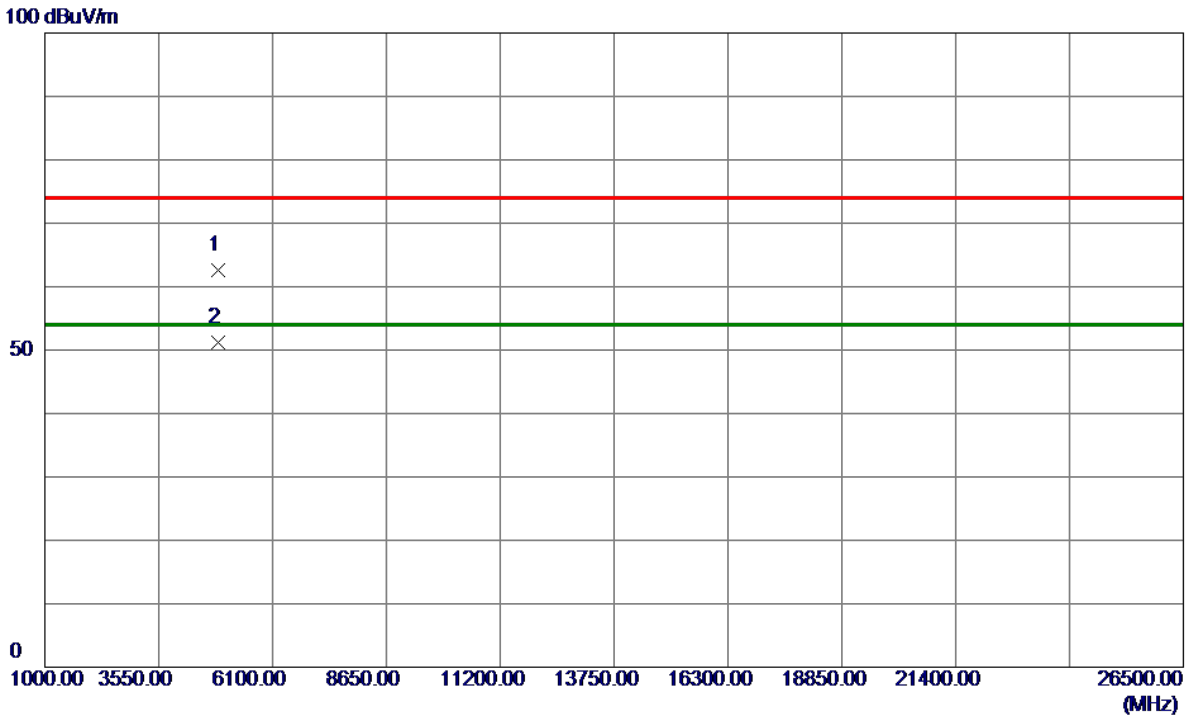
Test Mode	TX N(HT20) Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	61.00	6.17	67.17	74.00	-6.83	Peak	
2	2390.0000	47.71	6.17	53.88	54.00	-0.12	AVG	
3	2432.7500	107.37	6.20	113.57	74.00	39.57	Peak	No Limit
4 *	2434.5000	99.03	6.20	105.23	54.00	51.23	AVG	No Limit

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

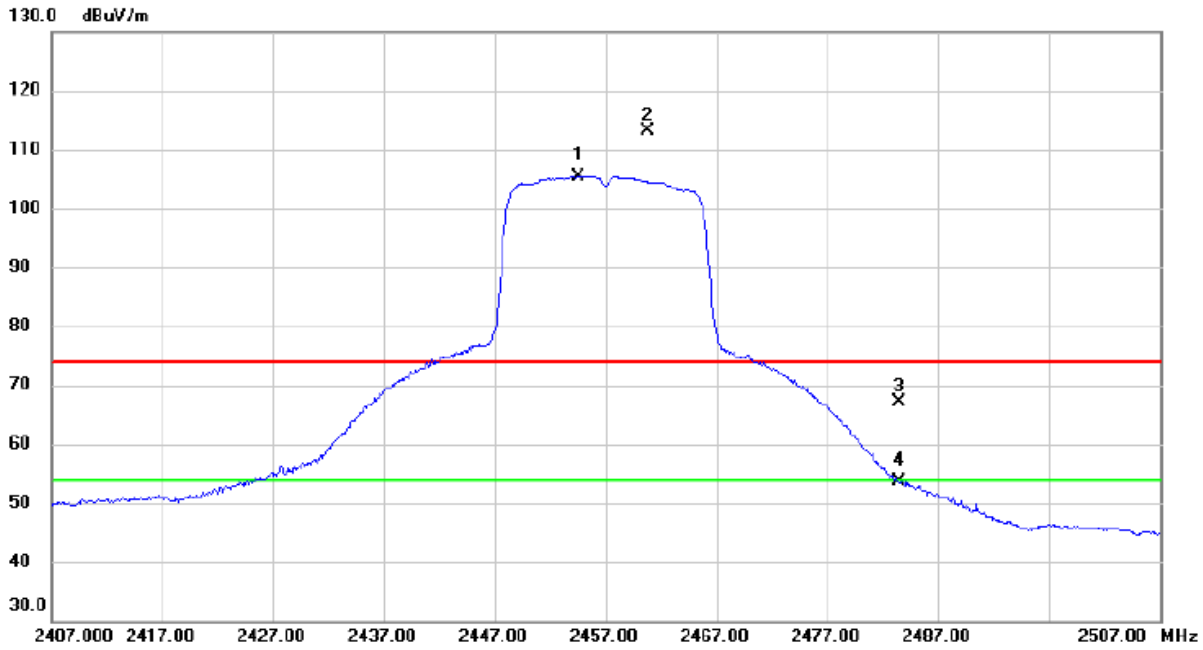
Test Mode	TX N(HT20) Mode 2437 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4874.1150	61.61	1.08	62.69	74.00	-11.31	Peak	
2 *	4874.1500	50.16	1.08	51.24	54.00	-2.76	AVG	

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

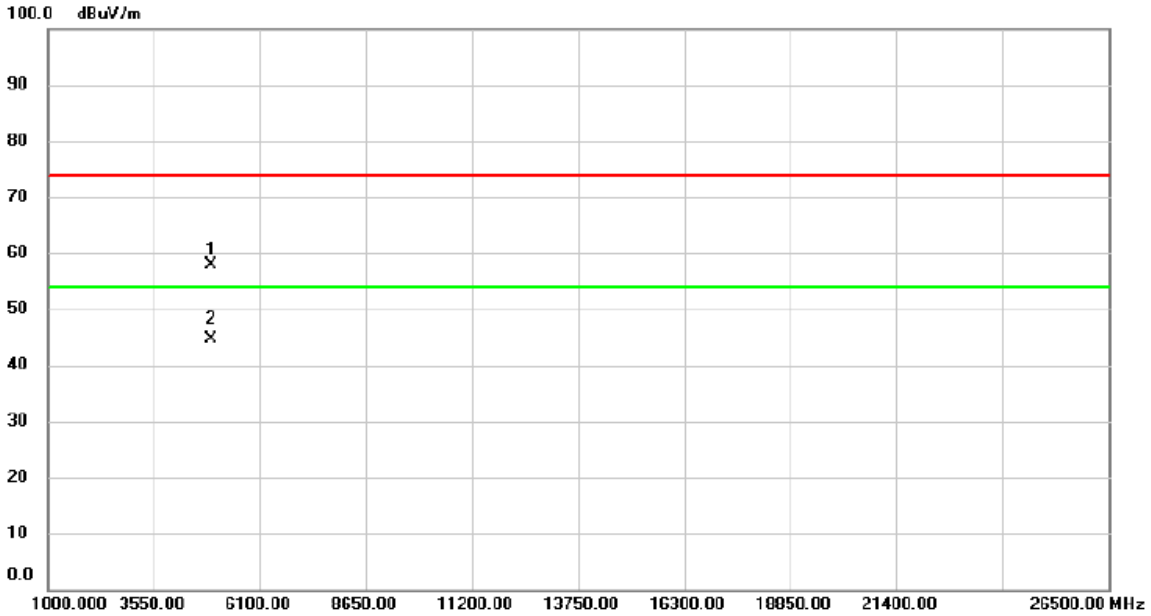
Test Mode	TX N(HT20) Mode 2457 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2454.500	99.26	6.21	105.47	54.00	51.47	AVG	No Limit
2	X	2460.800	106.9	6.21	113.18	74.00	39.18	peak	No Limit
3		2483.500	61.00	6.22	67.22	74.00	-6.78	peak	
4		2483.500	47.33	6.22	53.55	54.00	-0.45	AVG	

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

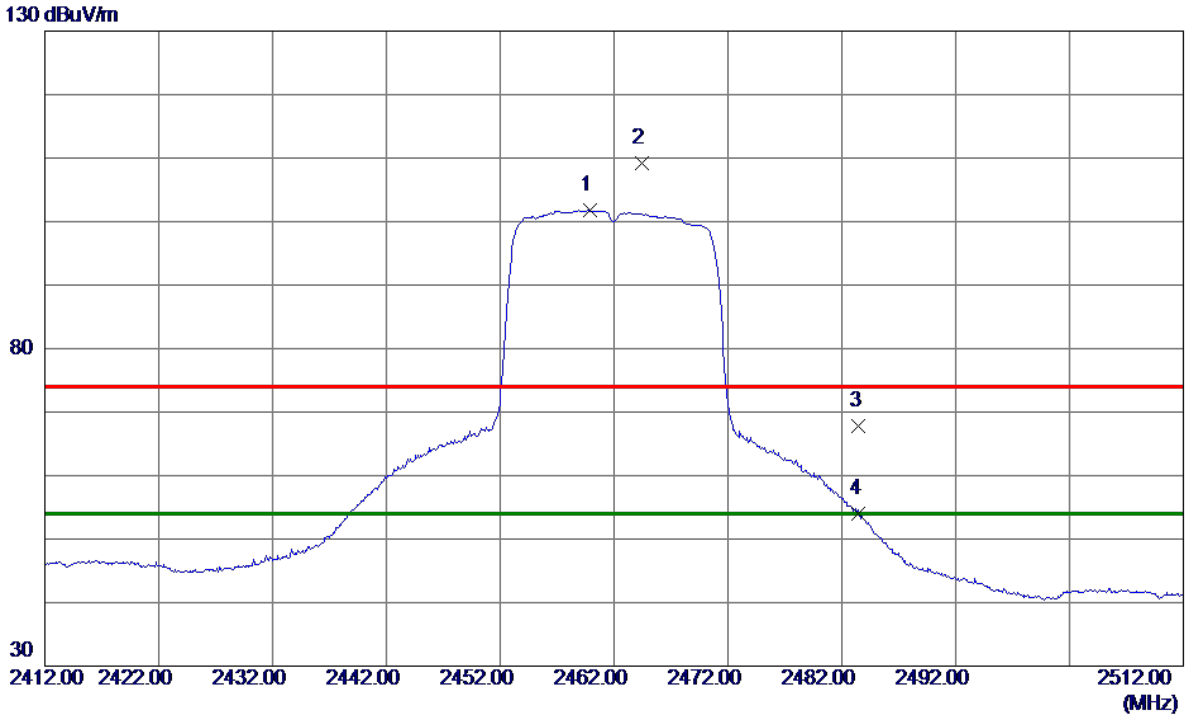
Test Mode	TX N(HT20) Mode 2457 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4913.100	56.78	1.18	57.96	74.00	-16.04	peak	
2	*	4914.490	43.36	1.19	44.55	54.00	-9.45	AVG	

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

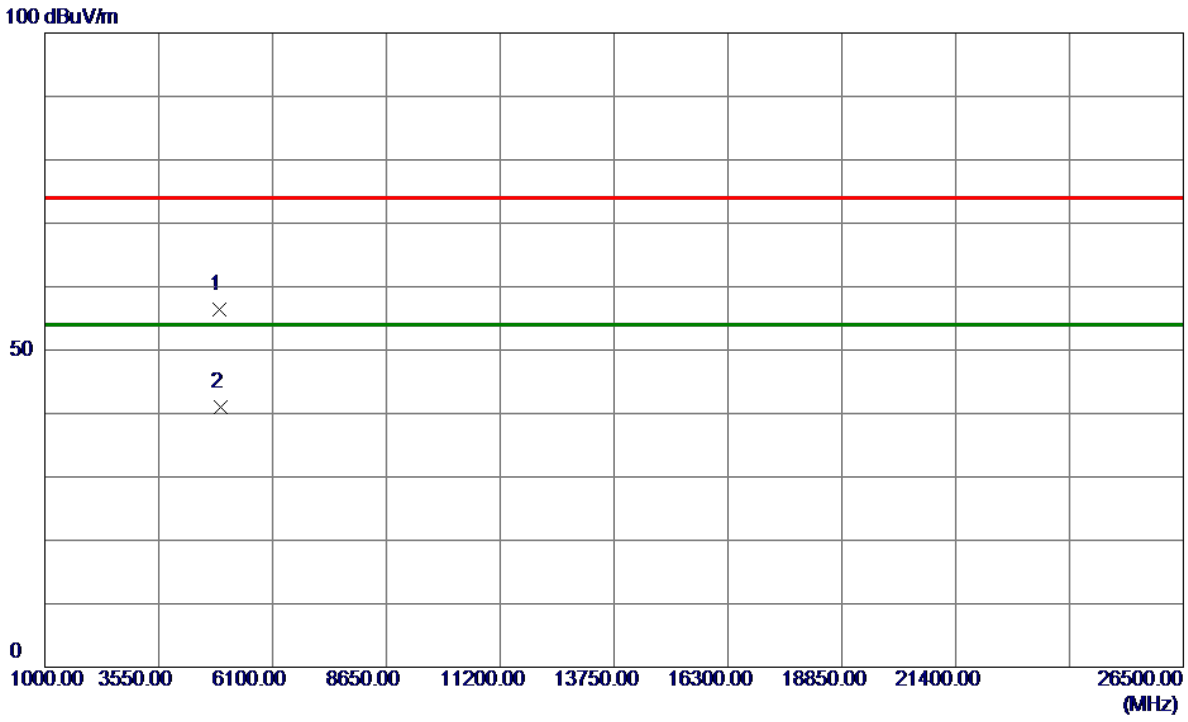
Test Mode	TX N(HT20) Mode 2462 MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2459.9000	95.57	6.21	101.78	54.00	47.78	AVG	No Limit
2	2464.4500	102.89	6.22	109.11	74.00	35.11	Peak	No Limit
3	2483.5000	61.62	6.23	67.85	74.00	-6.15	Peak	
4	2483.5000	47.68	6.23	53.91	54.00	-0.09	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	4921.8000	55.19	1.20	56.39	74.00	-17.61	Peak	
2 *	4924.5850	39.70	1.21	40.91	54.00	-13.09	AVG	

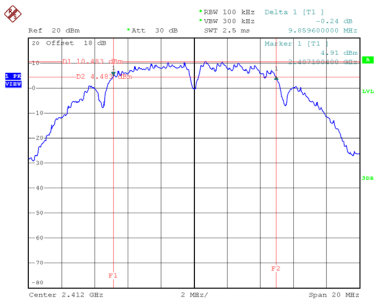
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

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	9.860	13.680	0.5	Complies
06	2437	9.900	13.840	0.5	Complies
11	2462	9.900	13.680	0.5	Complies

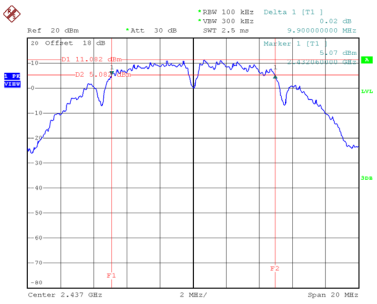
CH01



Date: 11.JAN.2024 03:19:25

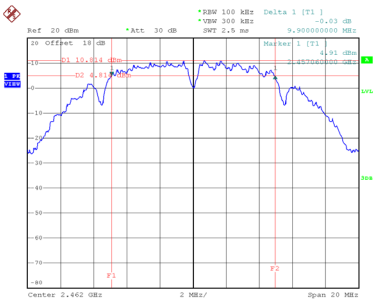
CH06

6 dB Bandwidth



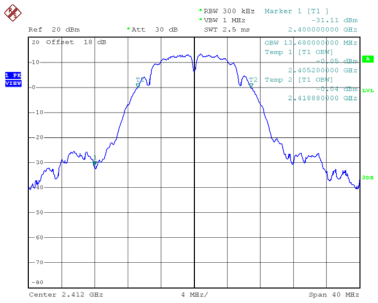
Date: 11.JAN.2024 03:20:12

CH11

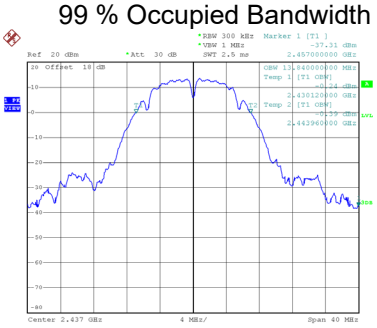


Date: 11.JAN.2024 03:21:14

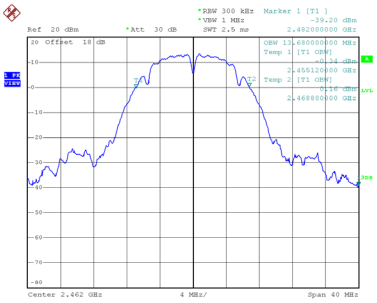
99 % Occupied Bandwidth



Date: 11.JAN.2024 04:36:22



Date: 11.JAN.2024 04:43:13

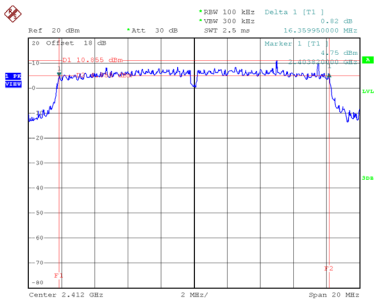


Date: 11.JAN.2024 04:47:14

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	16.360	20.560	0.5	Complies
06	2437	16.420	21.200	0.5	Complies
11	2462	16.340	18.640	0.5	Complies

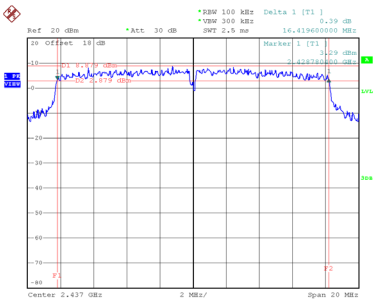
CH01



Date: 11.JAN.2024 03:21:43

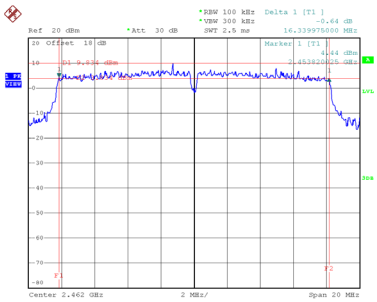
CH06

6 dB Bandwidth



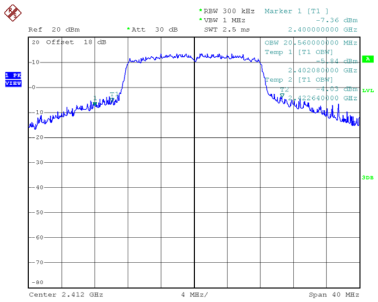
Date: 11.JAN.2024 03:22:08

CH11

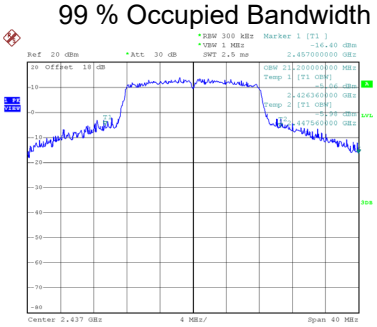


Date: 11.JAN.2024 03:22:35

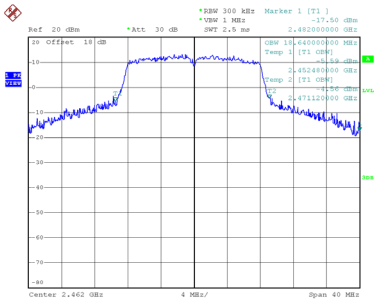
99 % Occupied Bandwidth



Date: 11.JAN.2024 04:51:44



Date: 11.JAN.2024 04:54:51

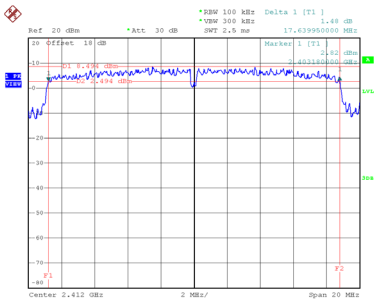


Date: 11.JAN.2024 04:58:24

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	17.640	22.800	0.5	Complies
06	2437	17.000	23.760	0.5	Complies
11	2462	17.620	22.960	0.5	Complies

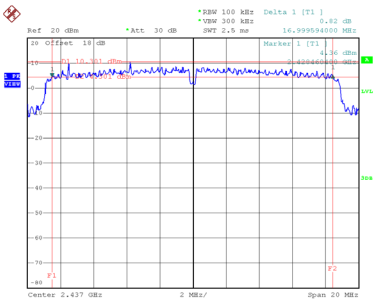
CH01



Date: 11.JAN.2024 03:23:10

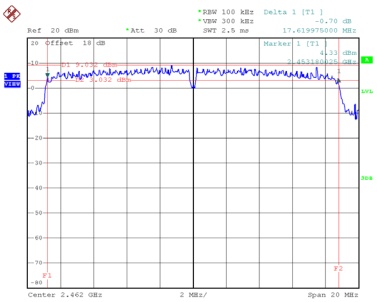
CH06

6 dB Bandwidth

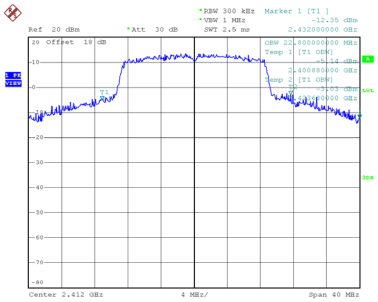


Date: 11.JAN.2024 03:23:38

CH11

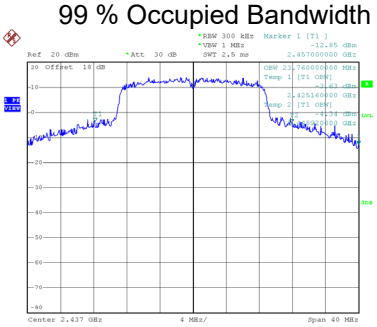


Date: 11.JAN.2024 03:23:57

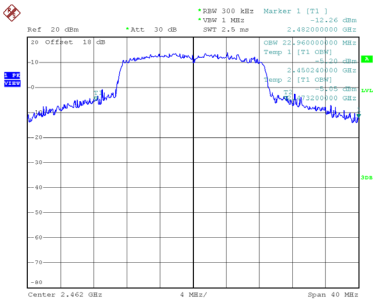


Date: 11.JAN.2024 05:01:53

99 % Occupied Bandwidth



Date: 11.JAN.2024 05:06:01



Date: 11.JAN.2024 05:09:38

APPENDIX F - MAXIMUM OUTPUT POWER & E.I.R.P.

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	20.88	0.00	20.88	30.00	1.0000	Complies
06	2437	21.21	0.00	21.21	30.00	1.0000	Complies
11	2462	21.77	0.00	21.77	30.00	1.0000	Complies

Channel	Frequency (MHz)	e.i.r.p. (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	20.88	36.02	4.0000	Complies
06	2437	21.21	36.02	4.0000	Complies
11	2462	21.77	36.02	4.0000	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	20.73	0.00	20.73	30.00	1.0000	Complies
06	2437	23.07	0.00	23.07	30.00	1.0000	Complies
11	2462	20.42	0.00	20.42	30.00	1.0000	Complies

Channel	Frequency (MHz)	e.i.r.p. (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	20.73	36.02	4.0000	Complies
06	2437	23.07	36.02	4.0000	Complies
11	2462	20.42	36.02	4.0000	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	20.02	0.00	20.02	30.00	1.0000	Complies
06	2437	23.18	0.00	23.18	30.00	1.0000	Complies
11	2462	19.84	0.00	19.84	30.00	1.0000	Complies

Channel	Frequency (MHz)	e.i.r.p. (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	20.02	36.02	4.0000	Complies
06	2437	23.18	36.02	4.0000	Complies
11	2462	19.84	36.02	4.0000	Complies

Test Mode	TX B Mode_Ant. 2

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	20.74	0.00	20.74	30.00	1.0000	Complies
06	2437	20.94	0.00	20.94	30.00	1.0000	Complies
11	2462	21.21	0.00	21.21	30.00	1.0000	Complies

Channel	Frequency (MHz)	e.i.r.p. (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	20.74	36.02	4.0000	Complies
06	2437	20.94	36.02	4.0000	Complies
11	2462	21.21	36.02	4.0000	Complies

Test Mode	TX G Mode_Ant. 2

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	20.12	0.00	20.12	30.00	1.0000	Complies
06	2437	22.75	0.00	22.75	30.00	1.0000	Complies
11	2462	20.26	0.00	20.26	30.00	1.0000	Complies

Channel	Frequency (MHz)	e.i.r.p. (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	20.12	36.02	4.0000	Complies
06	2437	22.75	36.02	4.0000	Complies
11	2462	20.26	36.02	4.0000	Complies

Test Mode	TX N(HT20) Mode_Ant. 2

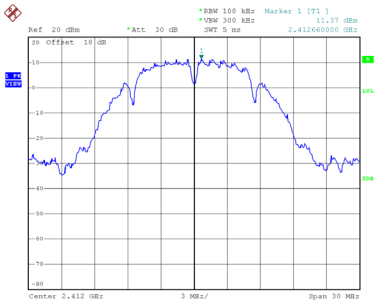
Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	19.12	0.00	19.12	30.00	1.0000	Complies
06	2437	22.97	0.00	22.97	30.00	1.0000	Complies
11	2462	19.33	0.00	19.33	30.00	1.0000	Complies

Channel	Frequency (MHz)	e.i.r.p. (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	19.12	36.02	4.0000	Complies
06	2437	22.97	36.02	4.0000	Complies
11	2462	19.33	36.02	4.0000	Complies

APPENDIX G - CONDUCTED SPURIOUS EMISSIONS

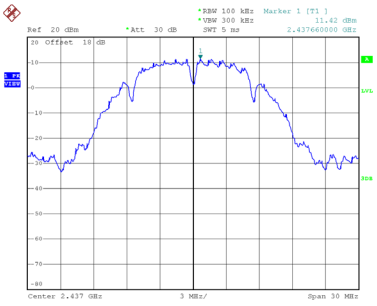
Test Mode	TX B Mode_Ant. 1

Reference Level-CH01



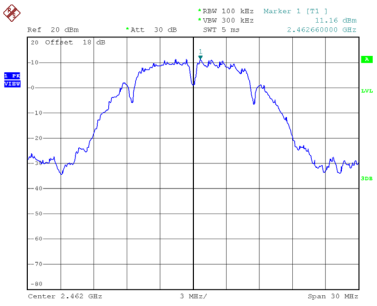
Date: 11.JAN.2024 04:19:56

Reference Level-CH06



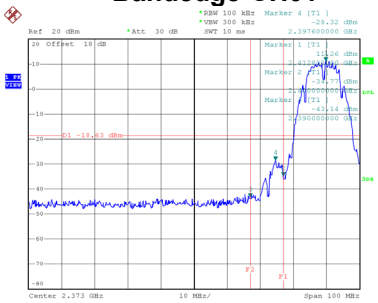
Date: 11.JAN.2024 04:21:05

Reference Level-CH11



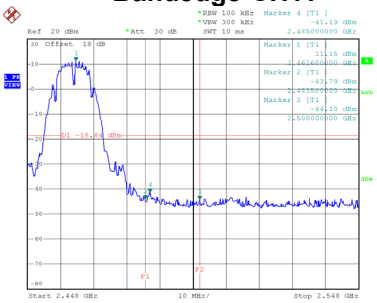
Date: 11.JAN.2024 04:22:26

Bandedge-CH01



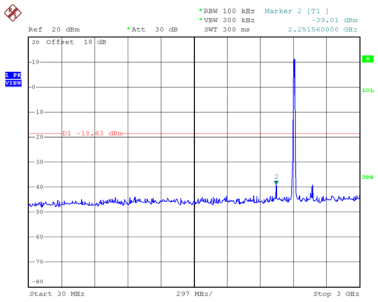
Date: 11.JAN.2024 04:38:31

Bandedge-CH11

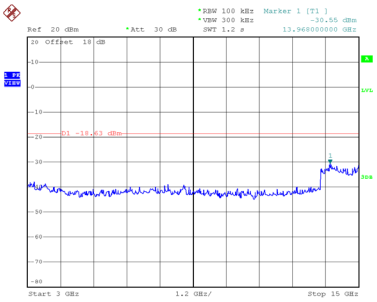


Date: 11.JAN.2024 04:47:50

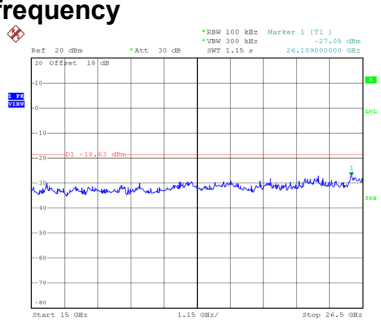
CH01 – 10th Harmonic of the fundamental frequency



Date: 11.JAN.2024 04:39:35

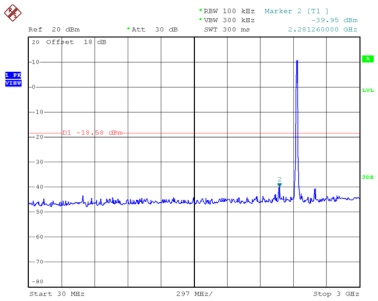


Date: 11.JAN.2024 04:40:02

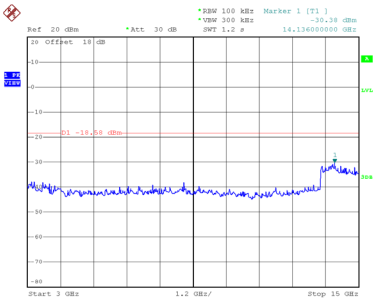


Date: 11.JAN.2024 04:40:29

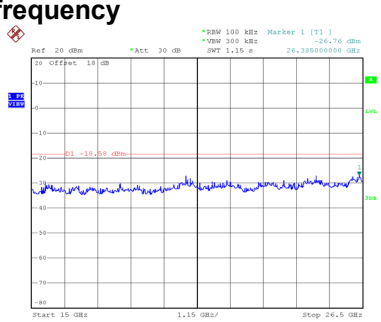
CH06 – 10th Harmonic of the fundamental frequency



Date: 11.JAN.2024 04:44:37

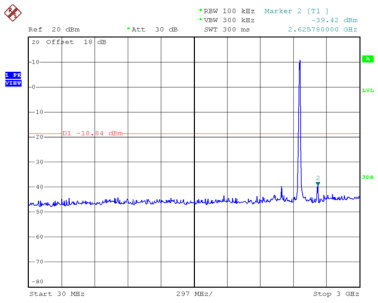


Date: 11.JAN.2024 04:45:07

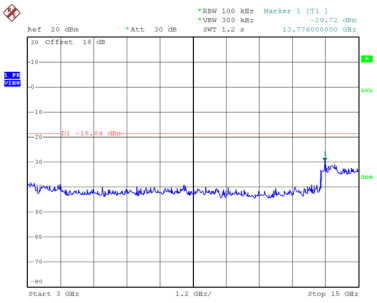


Date: 11.JAN.2024 04:45:35

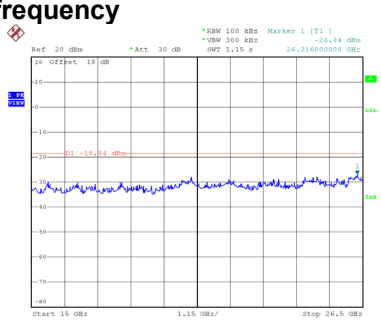
CH11 – 10th Harmonic of the fundamental frequency



Date: 11.JAN.2024 04:48:33



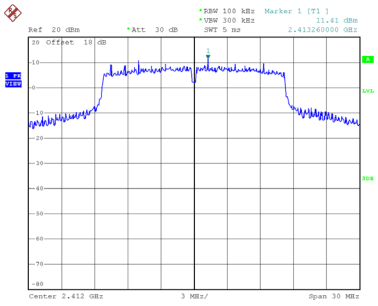
Date: 11.JAN.2024 04:49:15



Date: 11.JAN.2024 04:49:53

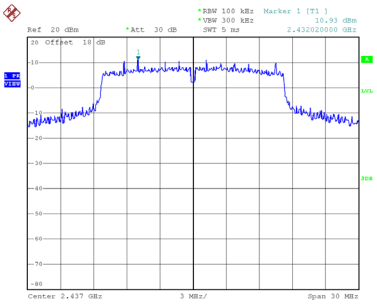
Test Mode	TX G Mode_Ant. 1

Reference Level-CH01



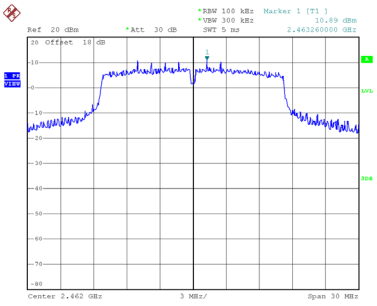
Date: 11.JAN.2024 04:23:19

Reference Level-CH06



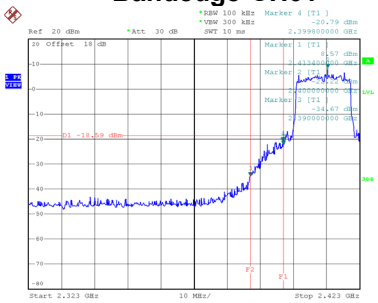
Date: 11.JAN.2024 04:24:08

Reference Level-CH11



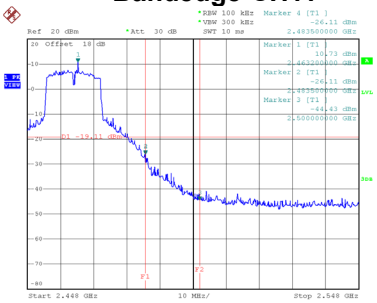
Date: 11.JAN.2024 04:25:47

Bandedge-CH01



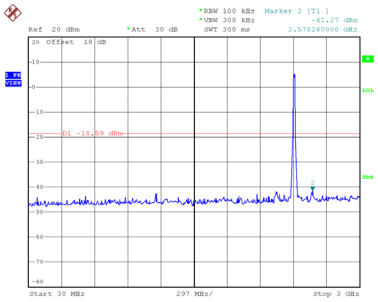
Date: 13.JAN.2024 05:36:28

Bandedge-CH11

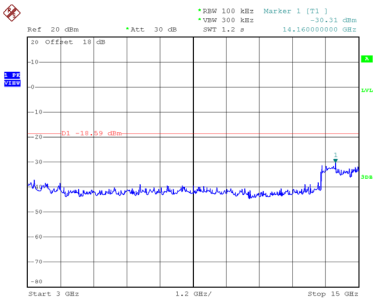


Date: 11.JAN.2024 04:59:07

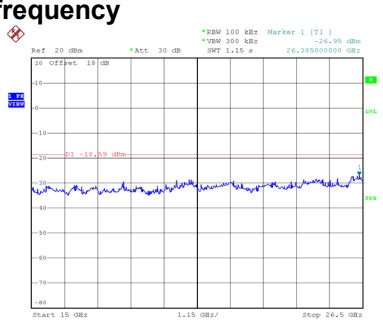
CH01 – 10th Harmonic of the fundamental frequency



Date: 13.JAN.2024 05:36:56

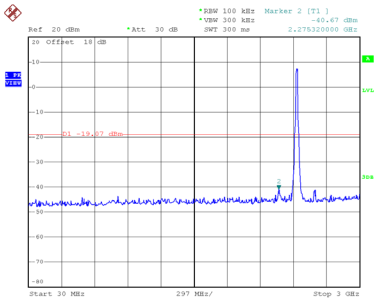


Date: 13.JAN.2024 05:37:23

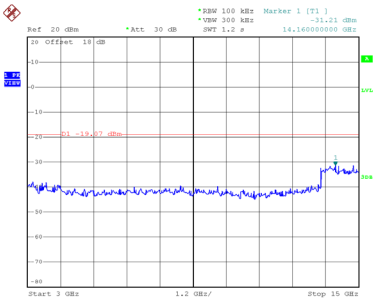


Date: 13.JAN.2024 05:37:45

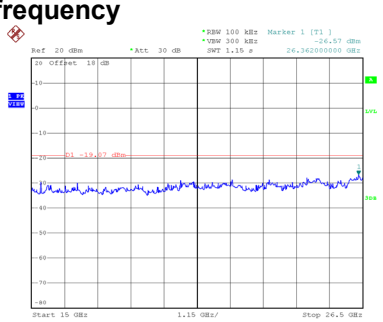
CH06 – 10th Harmonic of the fundamental frequency



Date: 11.JAN.2024 04:56:12

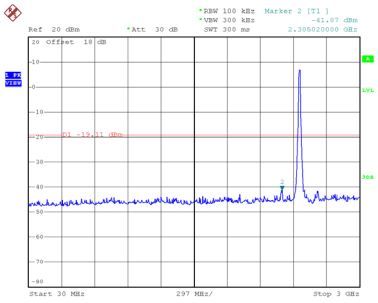


Date: 11.JAN.2024 04:56:37

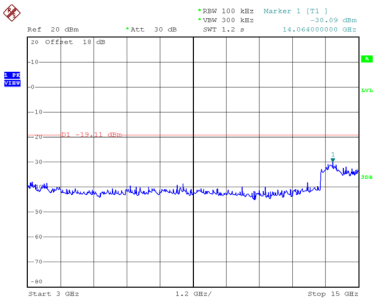


Date: 11.JAN.2024 04:57:01

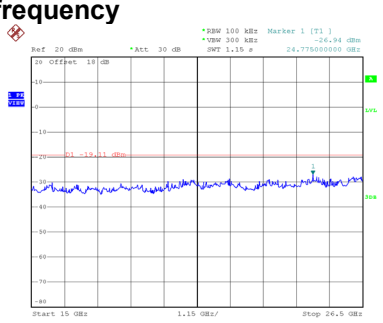
CH11 – 10th Harmonic of the fundamental frequency



Date: 11.JAN.2024 04:59:37



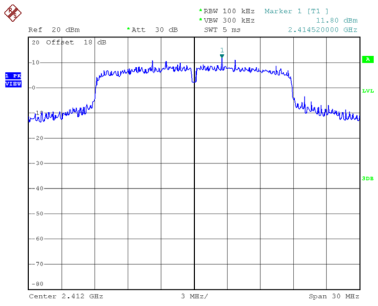
Date: 11.JAN.2024 05:00:05



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

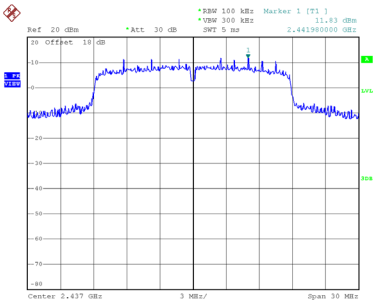
Test Mode	TX N(HT20) Mode_Ant. 1

Reference Level-CH01



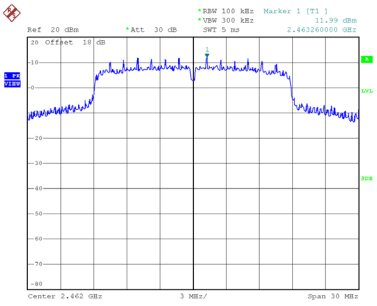
Date: 11.JAN.2024 04:26:41

Reference Level-CH06



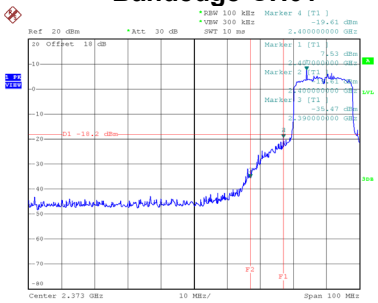
Date: 11.JAN.2024 04:28:13

Reference Level-CH11



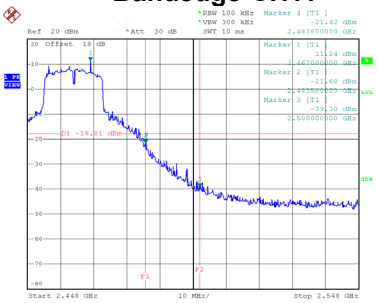
Date: 11.JAN.2024 04:29:40

Bandedge-CH01



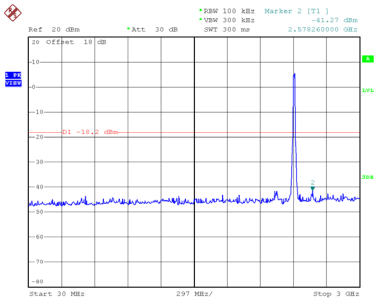
Date: 13.JAN.2024 04:48:56

Bandedge-CH11

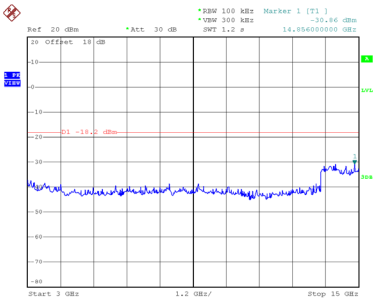


Date: 11.JAN.2024 05:10:27

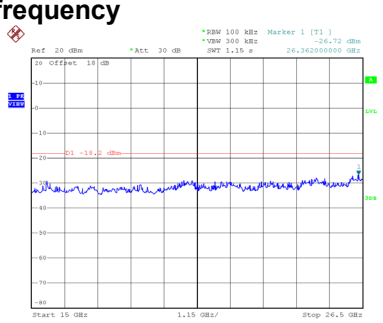
CH01 – 10th Harmonic of the fundamental frequency



Date: 13.JAN.2024 04:49:51

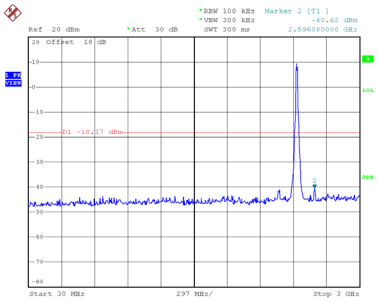


Date: 13.JAN.2024 04:50:12

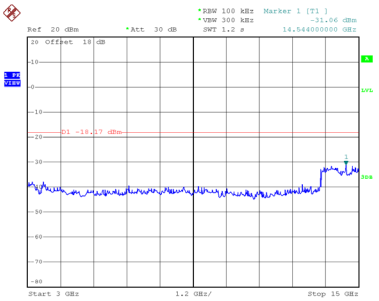


Date: 13.JAN.2024 04:50:42

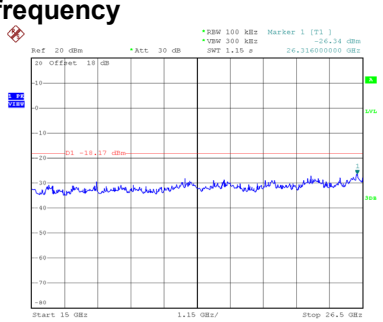
CH06 – 10th Harmonic of the fundamental frequency



Date: 11.JAN.2024 05:07:28

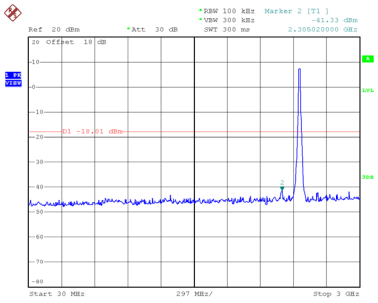


Date: 11.JAN.2024 05:07:51

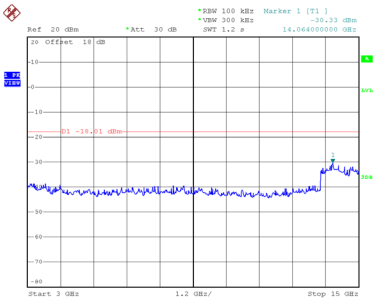


Date: 11.JAN.2024 05:08:14

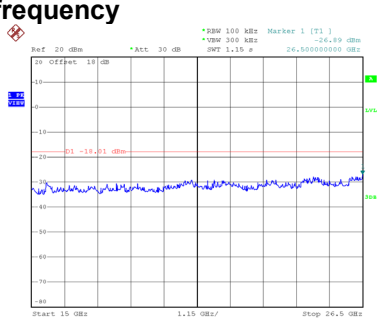
CH11 – 10th Harmonic of the fundamental frequency



Date: 11.JAN.2024 05:11:13



Date: 11.JAN.2024 05:11:41



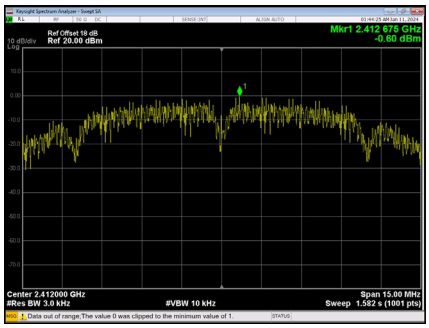
Date: 11.JAN.2024 05:12:05

APPENDIX H - POWER SPECTRAL DENSITY

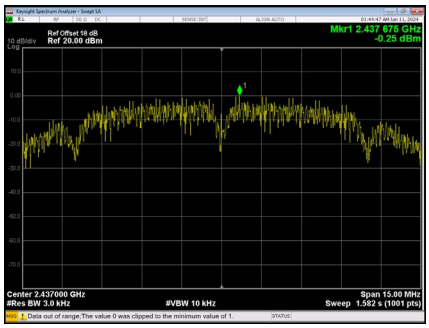
Test Mode	TX B Mode_Ant. 1

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
01	2412	-0.60	8.00	Complies
06	2437	-0.25	8.00	Complies
11	2462	-0.54	8.00	Complies

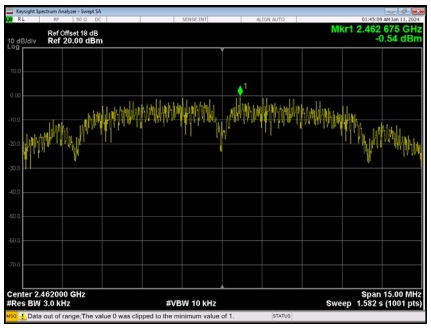
CH01



CH06



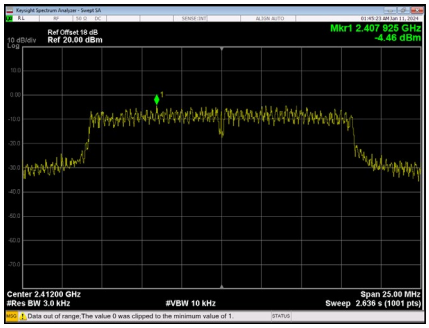
CH11



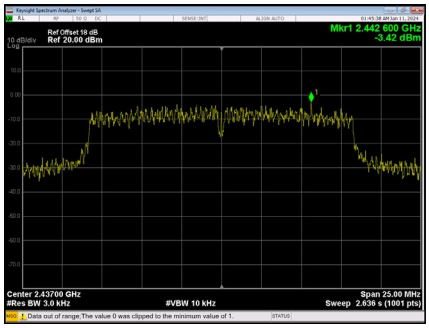
Test Mode	TX G Mode_Ant. 1

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
01	2412	-4.46	8.00	Complies
06	2437	-3.42	8.00	Complies
11	2462	-4.05	8.00	Complies

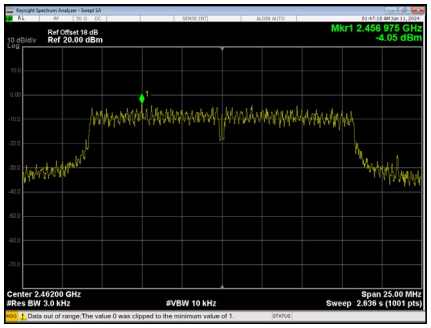
CH01



CH06



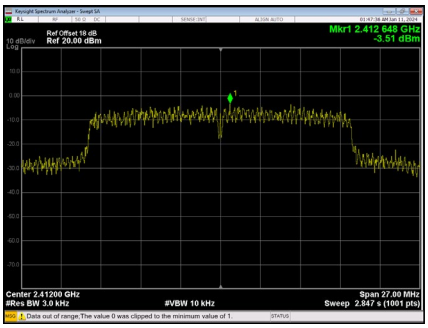
CH11



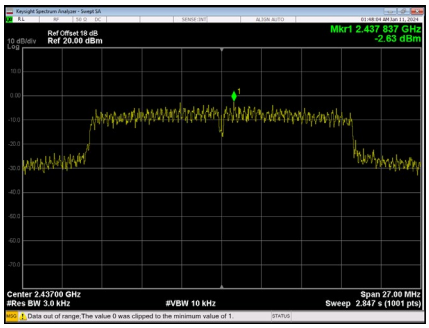
Test Mode	TX N(HT20) Mode_Ant. 1

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
01	2412	-3.51	8.00	Complies
06	2437	-2.64	8.00	Complies
11	2462	-2.89	8.00	Complies

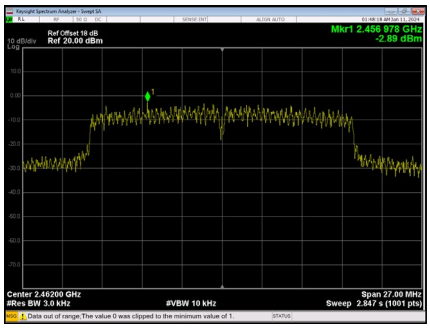
CH01



CH06



CH11



End of Test Report