FCC Radio Test Report

FCC ID: 2ARWD-500WHRX

This report concerns: Original Grant

Project No.	:	2112C154
Equipment	:	OMNES Essential Gaming Headset
Brand Name	:	COUGAR
Test Model	:	CGR-G53B-500WH, CGR-G53E-500WH
Series Model	:	CGR-G53X-500WH (X can be A~Z)
Applicant	:	Compucase Enterprise Co.,Ltd.
Address	:	No.225,Lane 54,AN HO Road,Sec.2,Tainan,Taiwan
Manufacturer	:	Compucase Enterprise Co.,Ltd.
Address	:	No.225,Lane 54,AN HO Road,Sec.2,Tainan,Taiwan
Factory	:	Pan Chang Enterprise Co.,Ltd.
Address	:	HeWuJi Industrial District, SiJia Village, ShiJie Town, DongGuan City, GuanDong Province, China
Date of Receipt	:	Jan. 04, 2022
Date of Test	:	Apr. 02, 2022 ~ May 06, 2022
Issued Date	:	Jun. 22, 2022
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG2022010672 for conducted, DG2022010674 for radiated.
Standard(s)	:	FCC CFR Title 47, Part 15, Subpart C FCC KDB 558074 D01 15.247 Meas Guidance v05r02 ANSI C63.10-2013

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

Nick Chen

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TESTING CERT #5123.02

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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** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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

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

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

Limitation

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

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-1-2112C154	R00	Original Report.	Jun. 22, 2022	Valid

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C				
Standard(s) Section	**Test Item**	**Test Result**	**Judgment**	**Remark**
15.207	AC Power Line Conducted Emissions	APPENDIX A	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 Emission	APPENDIX G	PASS	------
15.247(e)	Power Spectral Density	APPENDIX H	PASS	------
15.203	Antenna Requirement	------	PASS	Note(2)

Note:

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

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

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town Dongguan City, Guangdong 523792 People's Republic of China.
BTL's Registration Number for FCC: 357015
BTL's Designation Number for FCC: CN1240

1.2 MEASUREMENT UNCERTAINTY

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

A. AC power line conducted emissions Measurement:

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-C02	CISPR	150kHz ~ 30MHz	2.60

B. Radiated emissions Measurement:

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	4.36
		30MHz ~ 200MHz	H	3.32
		200MHz ~ 1,000MHz	V	4.08
		200MHz ~ 1,000MHz	H	3.96

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (3m)	CISPR	1GHz ~ 6GHz	3.80
		6GHz ~ 18GHz	4.82

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (1m)	CISPR	18 ~ 26.5 GHz	3.62
		26.5 ~ 40 GHz	4.00

C. Other Measurement:

Test Item	Uncertainty
Bandwidth	±3.8 %
Maximum Output Power	±0.95 dB
Conducted Spurious Emission	±2.71 dB
Power Spectral Density	±0.86 dB
Temperature	±0.08 °C
Humidity	±1.5%

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

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
AC Power Line Conducted Emissions	22°C	58%	AC 120V/60Hz	Rod Tang
Radiated Emissions-9 kHz to 30 MHz	22°C	50%	DC 5V	Torocat Yuan
Radiated Emissions-30 MHz to 1000 MHz	21°C	51%	DC 5V	Jakyri Wen
Radiated Emissions-Above 1000 MHz	21°C	51%	DC 5V	Jakyri Wen
Bandwidth	21°C	55%	DC 5V	Nicole Chen
Maximum Output Power	21°C	55%	DC 5V	Nicole Chen
Conducted Spurious Emission	21°C	55%	DC 5V	Nicole Chen
Power Spectral Density	21°C	55%	DC 5V	Nicole Chen

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	OMNES Essential Gaming Headset
Brand Name	COUGAR
Test Model	CGR-G53B-500WH, CGR-G53E-500WH
Series Model	CGR-G53X-500WH (X can be A~Z)
Model Difference(s)	Model:CGR-G53B-500WH with LED lamp, Model: CGR-G53E-500WH without LED lamp. Only differ in whether if had LED lamps or not and the appearance of the color.
Power Source	1# Supplied from battery. 2# Supplied from PC USB port.
Power Rating	1# DC 3.7V, 1300mAh, 4.81Wh 2# DC 5V
Operation Frequency	2403 MHz ~ 2478 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	3Mbps
Max. Average Output Power	3Mbps: 5.04 dBm (0.0032 W)
Max. Peak Output Power	3Mbps: 7.00 dBm (0.0050 W)

Note:

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

2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2403	10	2430	19	2457
02	2406	11	2433	20	2460
03	2409	12	2436	21	2463
04	2412	13	2439	22	2466
05	2415	14	2442	23	2469
06	2418	15	2445	24	2472
07	2421	16	2448	25	2475
08	2424	17	2451	26	2478
09	2427	18	2454		

3. Table for Filed Antenna:

Ant.	Manufacturer	P/N	Antenna Type	Connector	Gain (dBi)
1	N/A	HSDZ-2458	FPC	IPEX	3

Note:

1) The antenna gain is provided by the manufacturer.
2) Only the FPC antenna worked in this EUT.

2.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

Pretest Mode	Description
Mode 1	TX Mode_3Mbps Channel 01/13/26
Mode 2	TX Mode_3Mbps Channel 26

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

AC power line conducted emissions test	
Final Test Mode	Description
Mode 2	TX Mode_3Mbps Channel 26

Radiated emissions test - Below 1GHz	
Final Test Mode	Description
Mode 2	TX Mode_3Mbps Channel 26

Radiated emissions test - Above 1GHz	
Final Test Mode	Description
Mode 1	TX Mode_3Mbps Channel 01/13/26

Conducted test	
Final Test Mode	Description
Mode 1	TX Mode_3Mbps Channel 01/13/26

Note:

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

(2) For AC power line conducted emissions and radiated emissions below 1 GHz test, the 3Mbps Channel 26 is found to be the worst case and recorded.

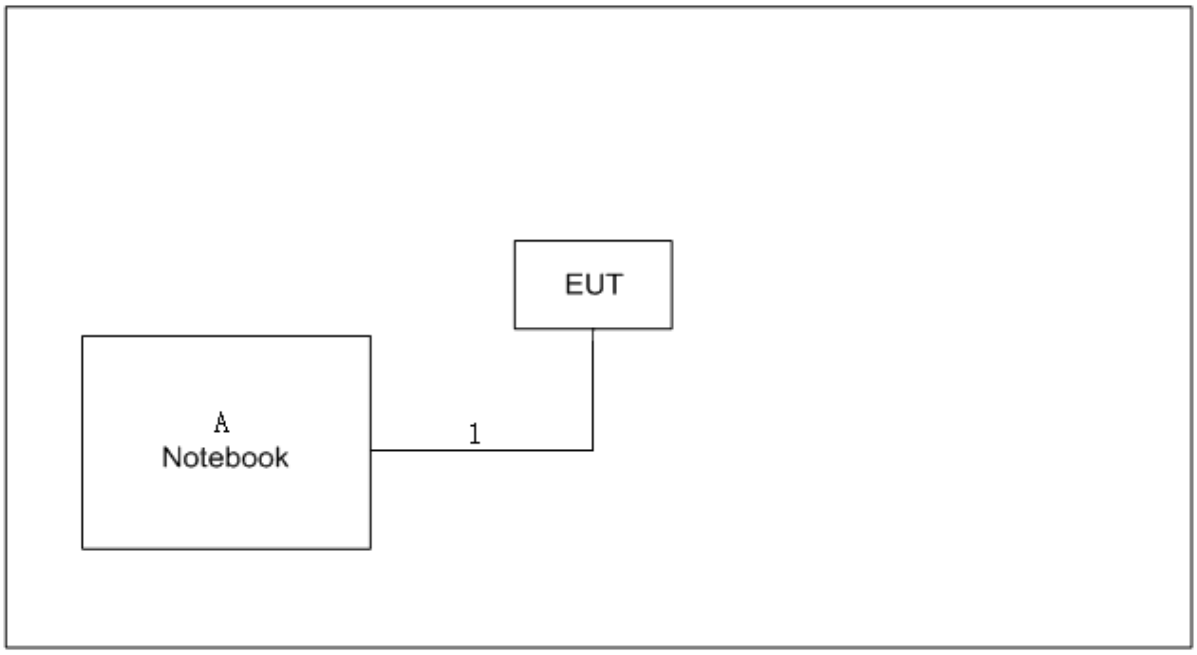
(3) Both model CGR-G53B-500WH and CGR-G53E-500WH are tested, in this report only recorded the worst case(Model CGR-G53B-500WH).

2.3 PARAMETERS OF TEST SOFTWARE

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test Software Version	N/A		
Frequency (MHz)	2403	2439	2478
3Mbps	Default	Default	Default

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
A	Notebook	HONOR	NBLK-WAX9X	NA

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	USB Cable	NO	NO	0.8m

3. AC POWER LINE CONDUCTED EMISSIONS

3.1 LIMIT

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

Note:

(1) The tighter limit applies at the band edges.
(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.2 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.

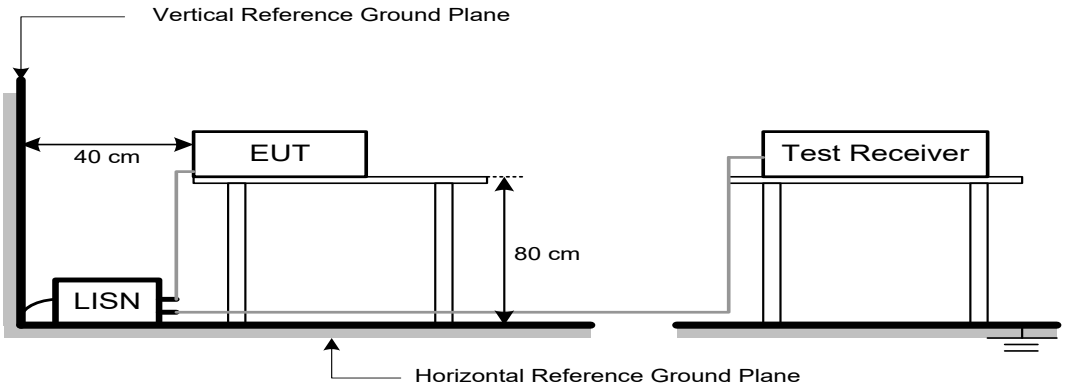
The following table is the setting of the receiver:

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

3.3 DEVIATION FROM TEST STANDARD

No deviation.

3.4 TEST SETUP



3.5 EUT OPERATING CONDITIONS

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

3.6 TEST RESULTS

Please refer to the APPENDIX A.

Remark:

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

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

4. RADIATED EMISSIONS

4.1 LIMIT

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

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

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

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).

4.2 TEST PROCEDURE

a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1 GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1 GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1 GHz)
i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

The following table is the setting of the receiver:

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

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

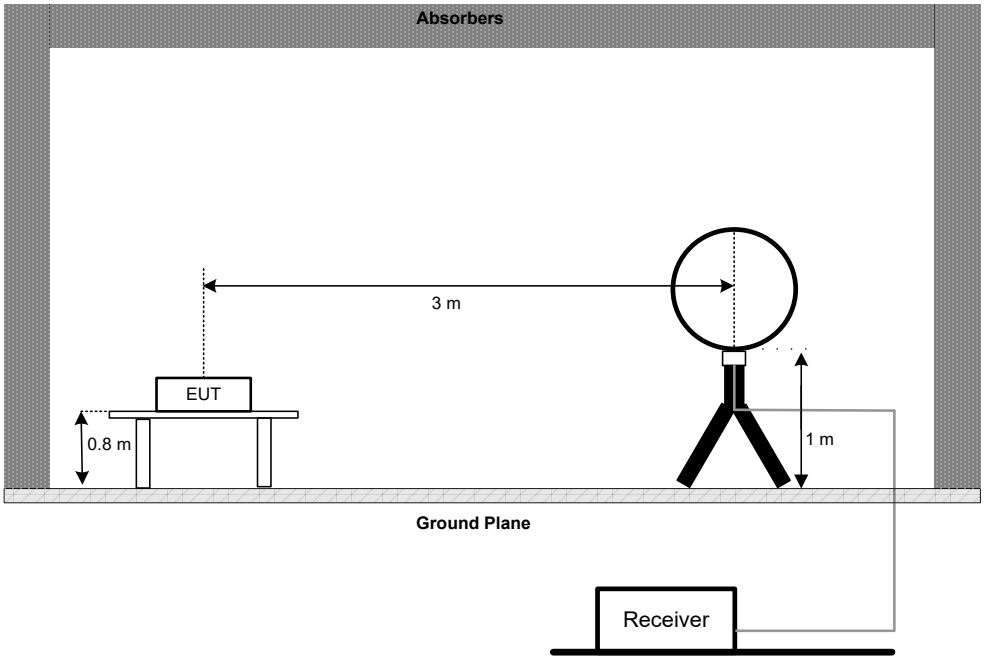
Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector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

4.3 DEVIATION FROM TEST STANDARD

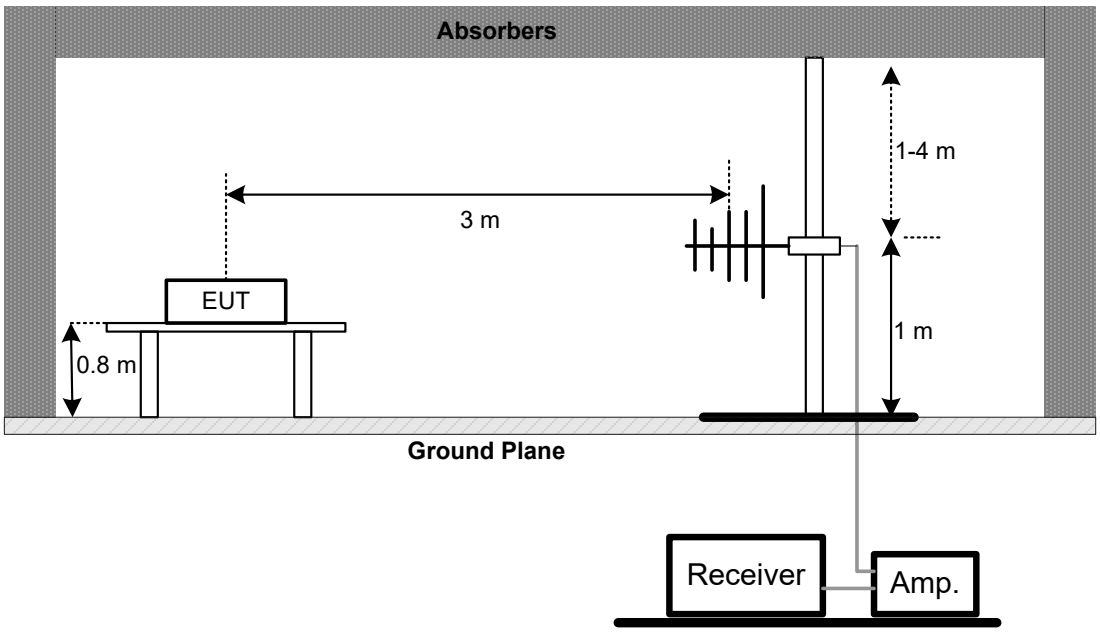
No deviation.

4.4 TEST SETUP

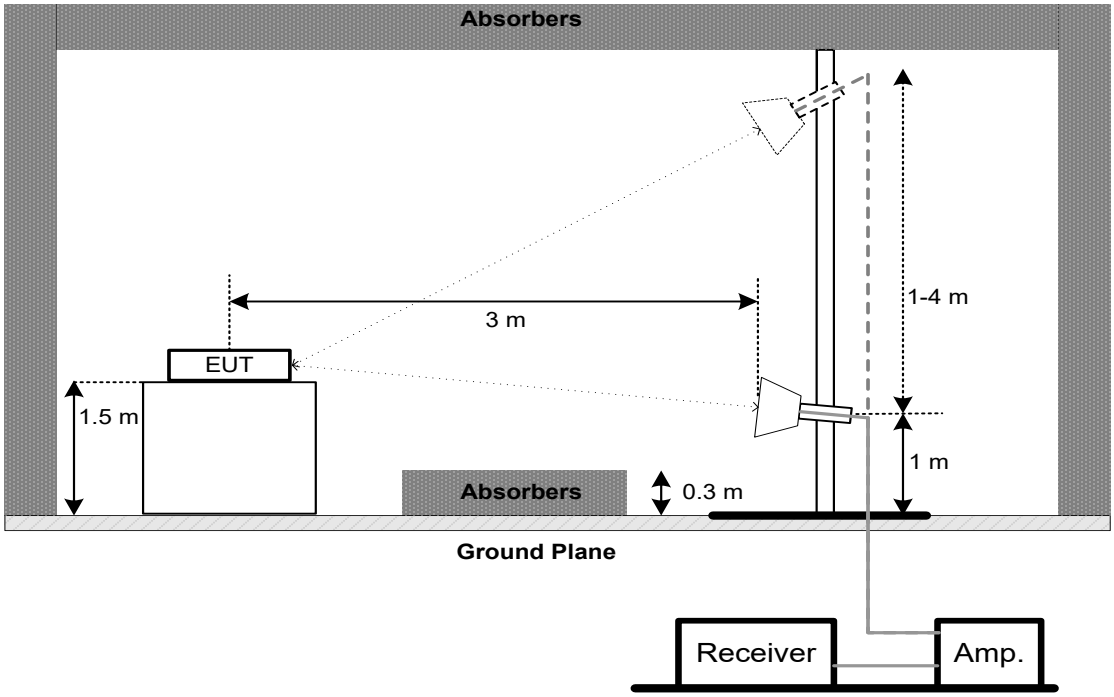
9 kHz to 30 MHz



30 MHz to 1 GHz



Above 1 GHz



4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.6 TEST RESULT - 9 kHz TO 30 MHz

Please refer to the APPENDIX B.

Remark:

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

4.7 TEST RESULT - 30 MHz TO 1000 MHz

Please refer to the APPENDIX C.

4.8 TEST RESULT - ABOVE 1000 MHz

Please refer to the APPENDIX D.

Remark:

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

5. BANDWIDTH

5.1 LIMIT

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

5.2 TEST PROCEDURE

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

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

For 6 dB Bandwidth:

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

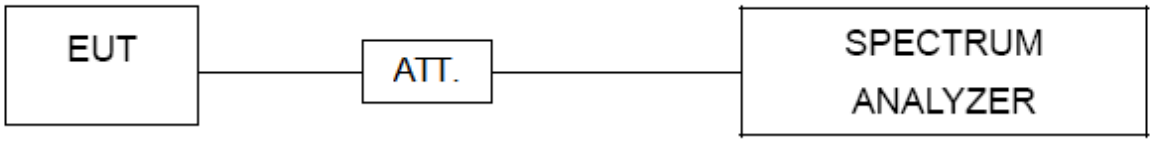
For 99% Emission Bandwidth:

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

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULTS

Please refer to the APPENDIX E.

6. MAXIMUM OUTPUT POWER

6.1 LIMIT

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

6.2 TEST PROCEDURE

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

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

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

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP

6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.6 TEST RESULTS

Please refer to the APPENDIX F.

7. CONDUCTED SPURIOUS EMISSION

7.1 LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

7.2 TEST PROCEDURE

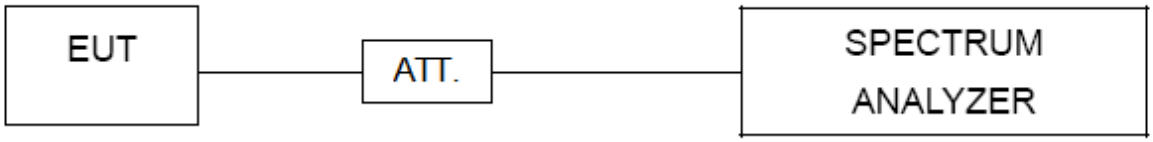
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

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

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULTS

Please refer to the APPENDIX G.

8. POWER SPECTRAL DENSITY

8.1 LIMIT

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

8.2 TEST PROCEDURE

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

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

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP

8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

8.6 TEST RESULTS

Please refer to the APPENDIX H.

9. 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	Jan. 22, 2023
2	LISN	EMCO	3816/2	52765	Jan. 22, 2023
3	TWO-LINE V-NETWORK	R&S	ENV216	101447	Jan. 22, 2023
4	50Ω Terminator	SHX	TF5-3	15041305	N/A
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
6	Cable	N/A	RG223	12m	Mar. 08, 2023
7	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	MXE EMI Receiver	Keysight	N9038A	MY56400091	Jan. 22, 2023
2*	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Aug. 23, 2024
3	Cable	N/A	RG 213/U(9kHz~1GHz)	N/A	May 27, 2022
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. 17, 2022

Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 03, 2023
2	Amplifier	HP	8447D	2944A08742	Jan. 22, 2023
3	Cable	emci	LMR-400	N/A	Nov. 30, 2022
4	Controller	CT	SC100	N/A	N/A
5	Controller	MF	MF-7802	MF780208416	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	Receiver	Agilent	N9038A	MY52130039	Jan. 22, 2023
8	966 Chamber Room	RM	9*6*6	N/A	Jul. 24, 2022

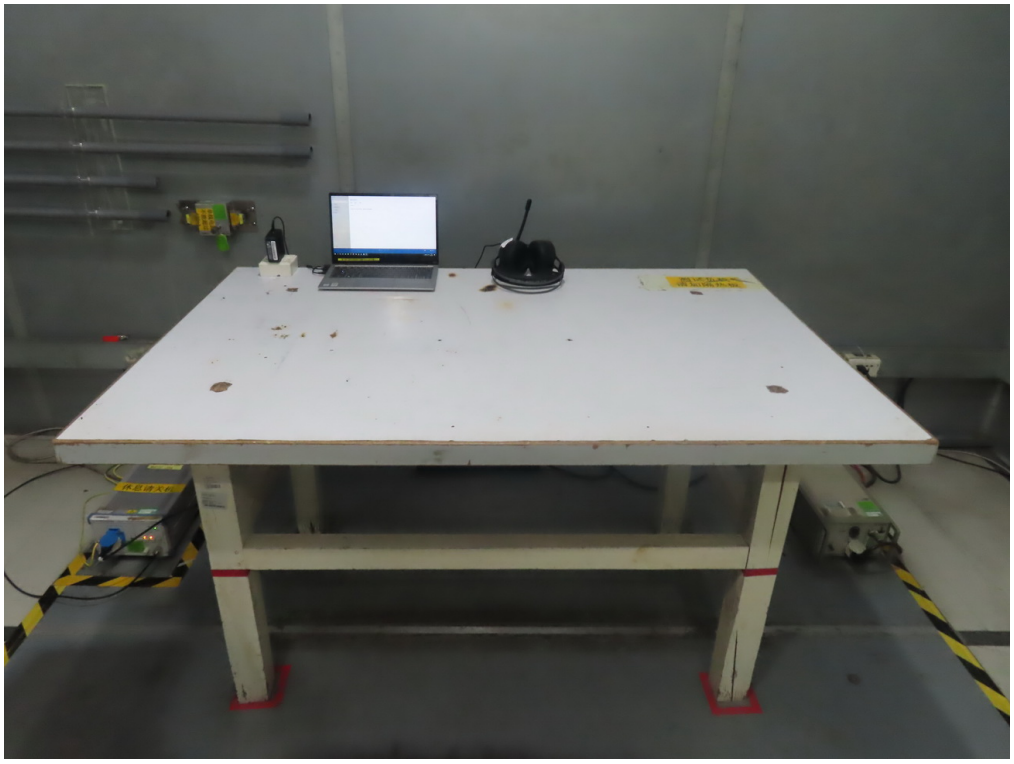
Radiated Emissions - Above 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Horn Antenna	ARA	DRG-118A	16554	Apr. 21, 2022
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 30, 2022
3	Amplifier	Agilent	8449B	3008A02584	Jul. 10, 2022
4	Controller	CT	SC100	N/A	N/A
5	Controller	MF	MF-7802	MF780208416	N/A
6	Receiver	Agilent	N9038A	MY52130039	Jan. 22, 2023
7	EXA Spectrum Analyzer	Keysight	N9010A	MY56480488	Jan. 22, 2023
8	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330-K	619413	Jul. 16, 2022
9	Cable	N/A	A81-SMAMSMAM-12.5M	N/A	Oct. 15, 2022
10	Cable	Talent microwave	A40-2.92M2.92M-2.5M	N/A	Nov. 30, 2022
11	Filter	STI	STI15-9912	N/A	Jul. 10, 2022
12	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
13	966 Chamber Room	RM	9*6*6	N/A	Jul. 24, 2022

Bandwidth & Maximum Output Power & Power Spectral Density & Conducted Spurious Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Jul. 10, 2022
2	Attenuator	WOKEN	6SM3502	VAS1214NL	N/A
3	RF Cable	Tongkaichuan	N/A	N/A	N/A
4	DC Block	Mini	N/A	N/A	N/A

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

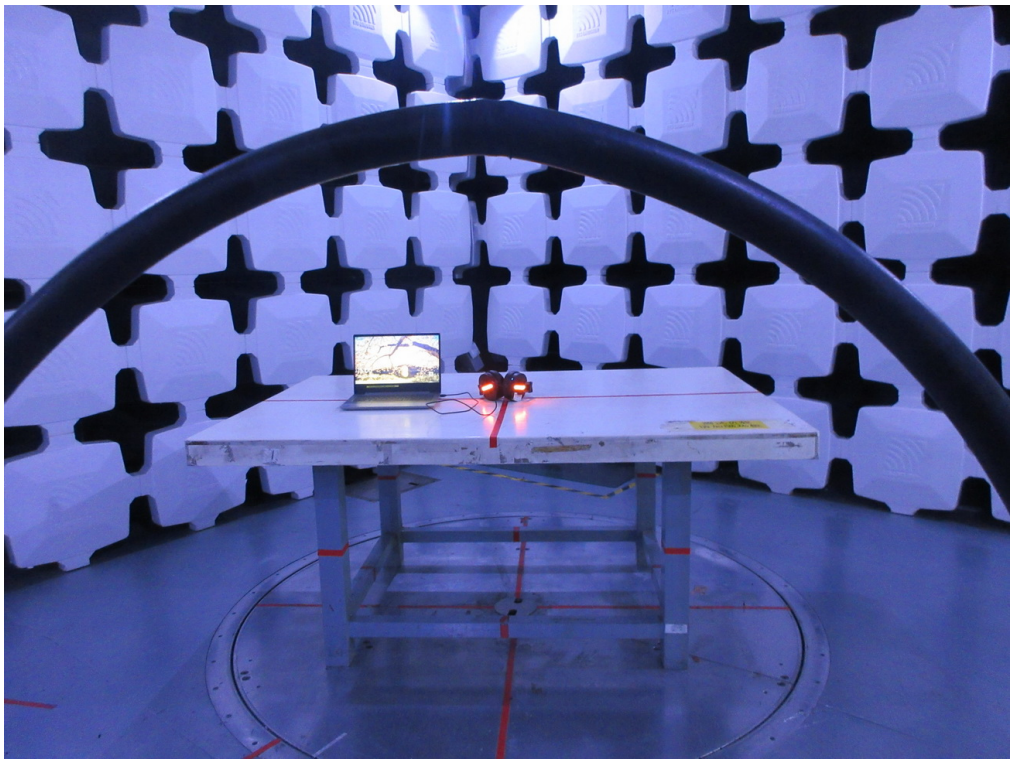
10. EUT TEST PHOTO

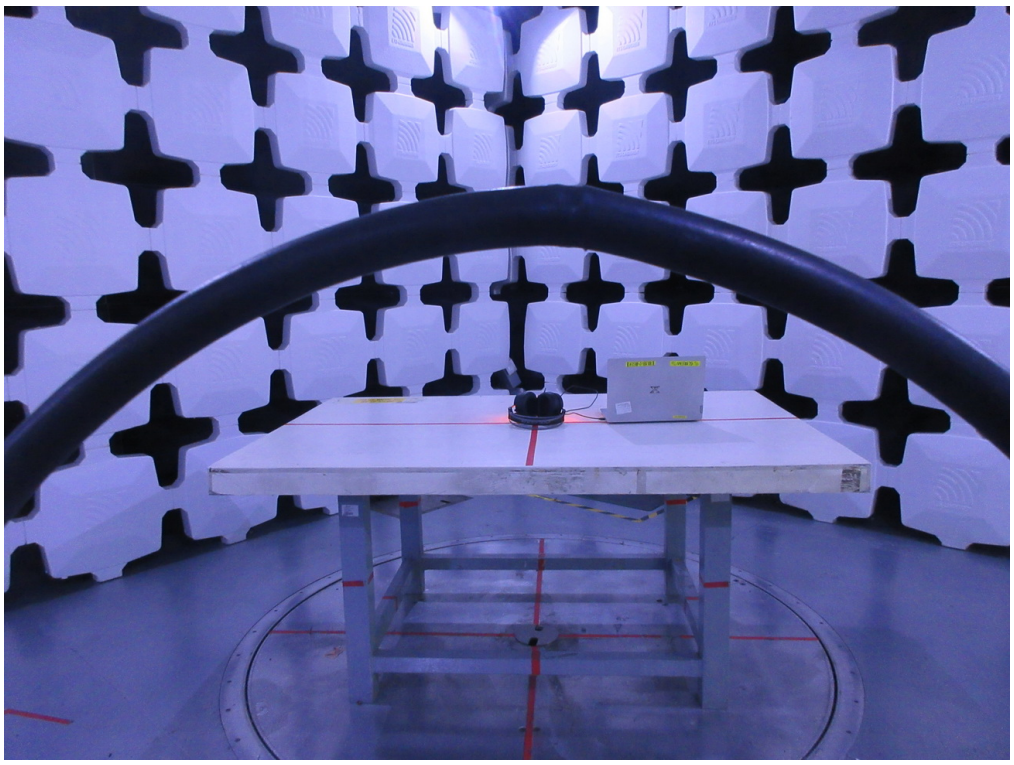
AC Power Line Conducted Emissions Test Photos



Radiated Emissions Test Photos

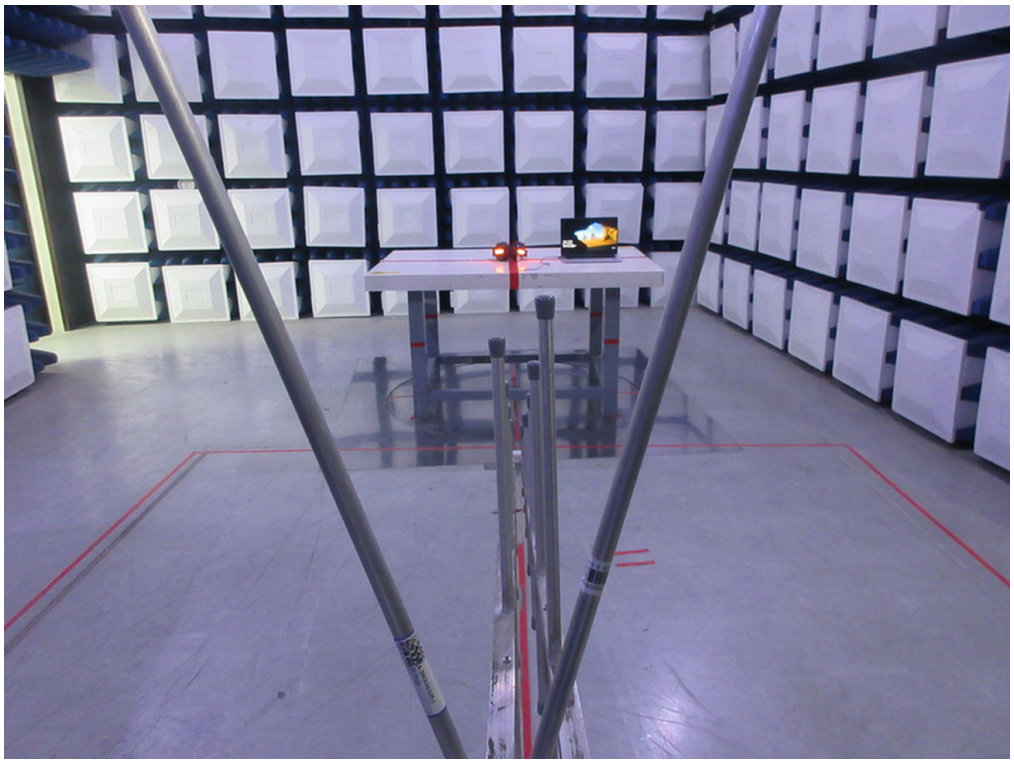
9 kHz to 30 MHz

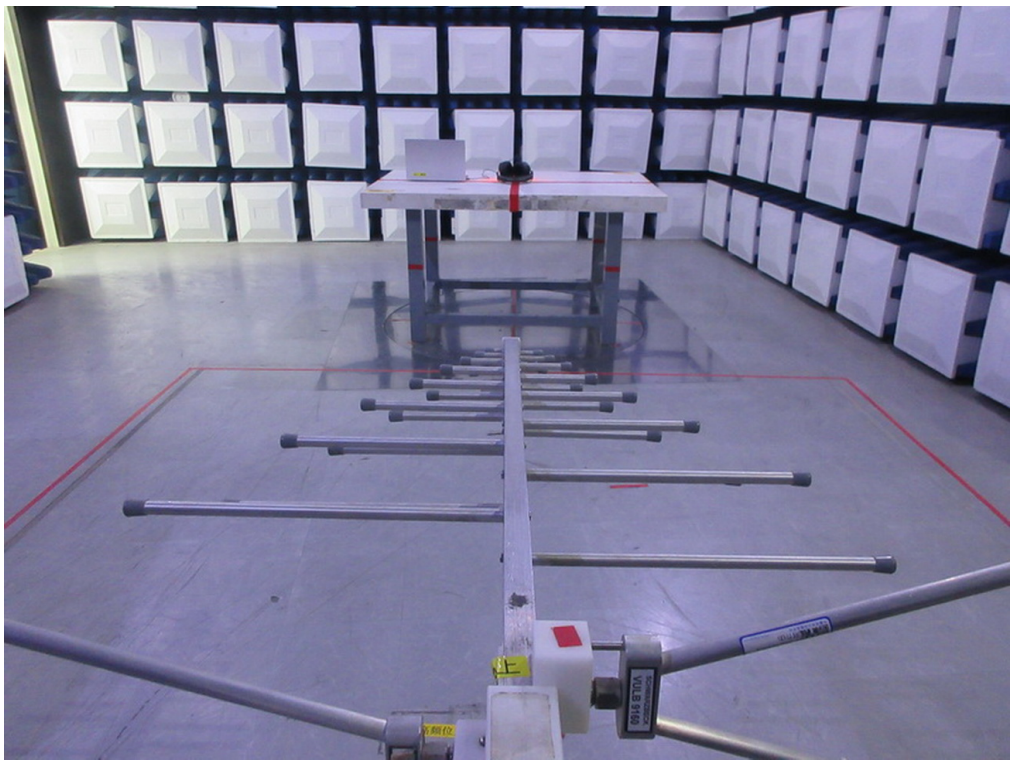




Radiated Emissions Test Photos

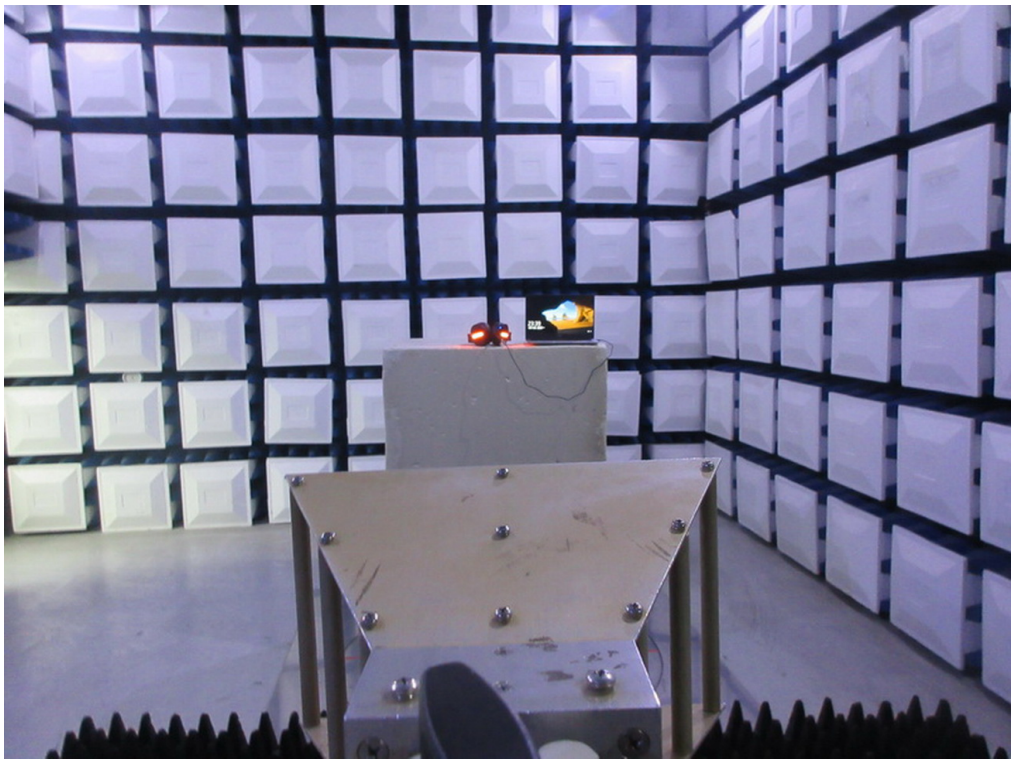
30 MHz to 1000 MHz





Radiated Emissions Test Photos

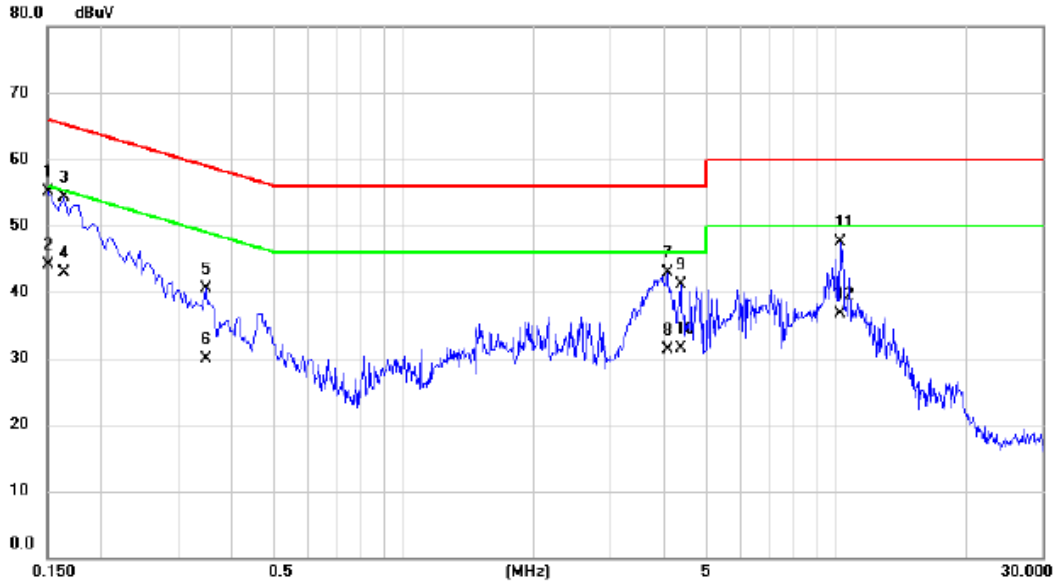
Above 1 GHz



Conducted Test Photos

APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

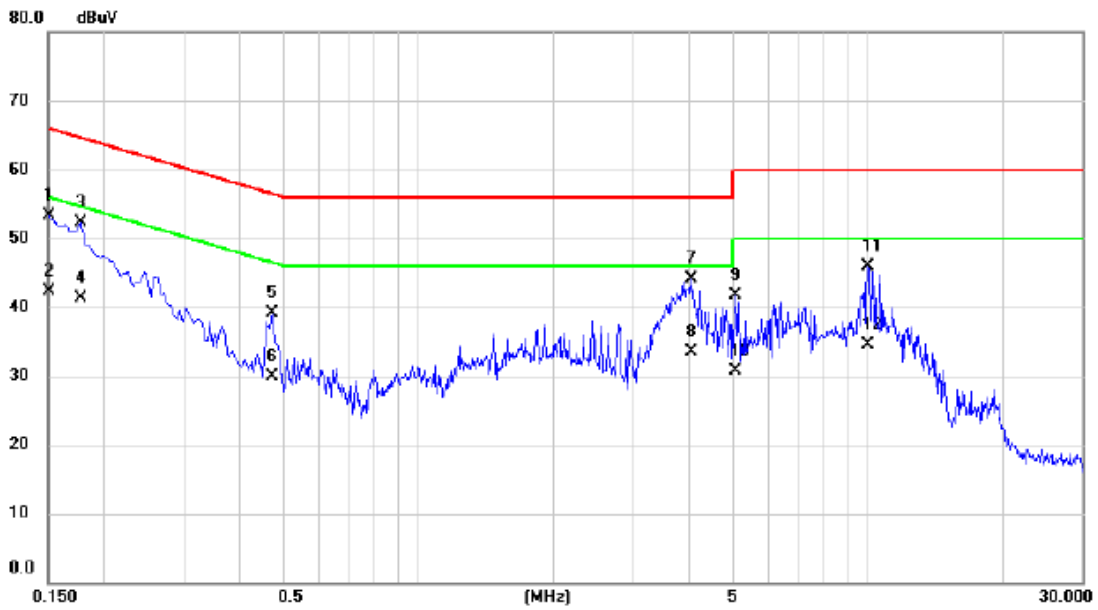
Test Mode	TX Mode_3Mbps Channel 26	Phase	Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	45.46	9.66	55.12	66.00	-10.88	QP	
2		0.1500	34.50	9.66	44.16	56.00	-11.84	AVG	
3		0.1635	44.62	9.67	54.29	65.28	-10.99	QP	
4		0.1635	33.20	9.67	42.87	55.28	-12.41	AVG	
5		0.3480	30.71	9.73	40.44	59.01	-18.57	QP	
6		0.3480	20.10	9.73	29.83	49.01	-19.18	AVG	
7		4.0695	32.93	10.05	42.98	56.00	-13.02	QP	
8		4.0695	21.20	10.05	31.25	46.00	-14.75	AVG	
9		4.3665	31.00	10.07	41.07	56.00	-14.93	QP	
10		4.3665	21.40	10.07	31.47	46.00	-14.53	AVG	
11		10.2075	37.02	10.48	47.50	60.00	-12.50	QP	
12		10.2075	26.30	10.48	36.78	50.00	-13.22	AVG	

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

Test Mode	TX Mode_3Mbps Channel 26	Phase	Neutral

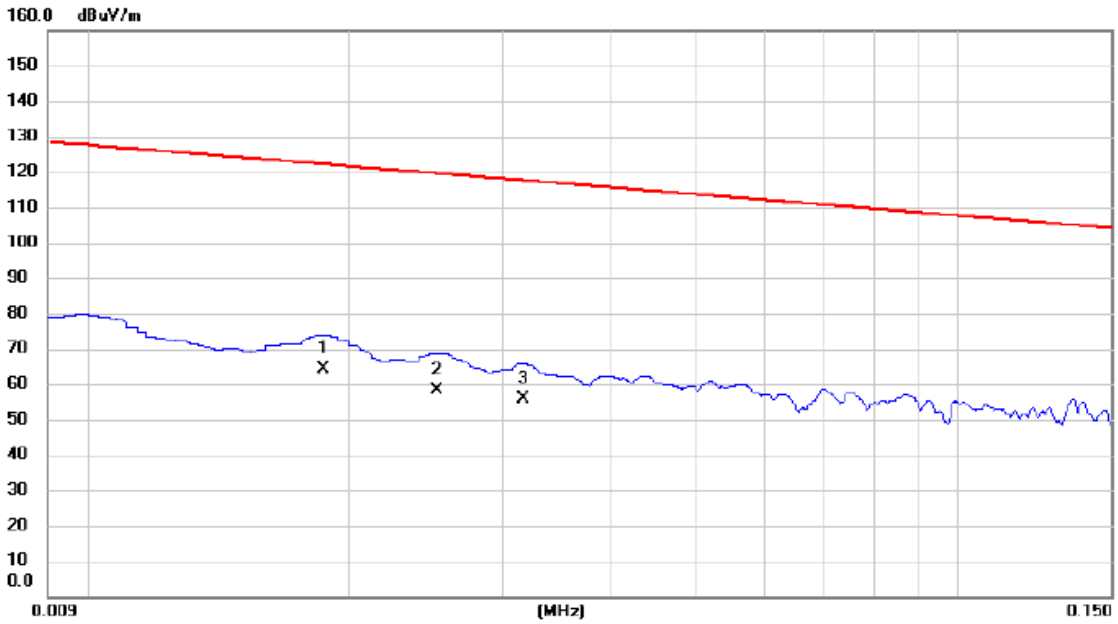


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	43.56	9.71	53.27	66.00	-12.73	QP	
2		0.1500	32.50	9.71	42.21	56.00	-13.79	AVG	
3		0.1770	42.63	9.71	52.34	64.63	-12.29	QP	
4		0.1770	31.60	9.71	41.31	54.63	-13.32	AVG	
5		0.4740	29.26	9.79	39.05	56.44	-17.39	QP	
6		0.4740	20.20	9.79	29.99	46.44	-16.45	AVG	
7	*	4.0380	34.01	10.08	44.09	56.00	-11.91	QP	
8		4.0380	23.50	10.08	33.58	46.00	-12.42	AVG	
9		5.0595	31.49	10.15	41.64	60.00	-18.36	QP	
10		5.0595	20.60	10.15	30.75	50.00	-19.25	AVG	
11		10.0275	35.52	10.47	45.99	60.00	-14.01	QP	
12		10.0275	24.10	10.47	34.57	50.00	-15.43	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

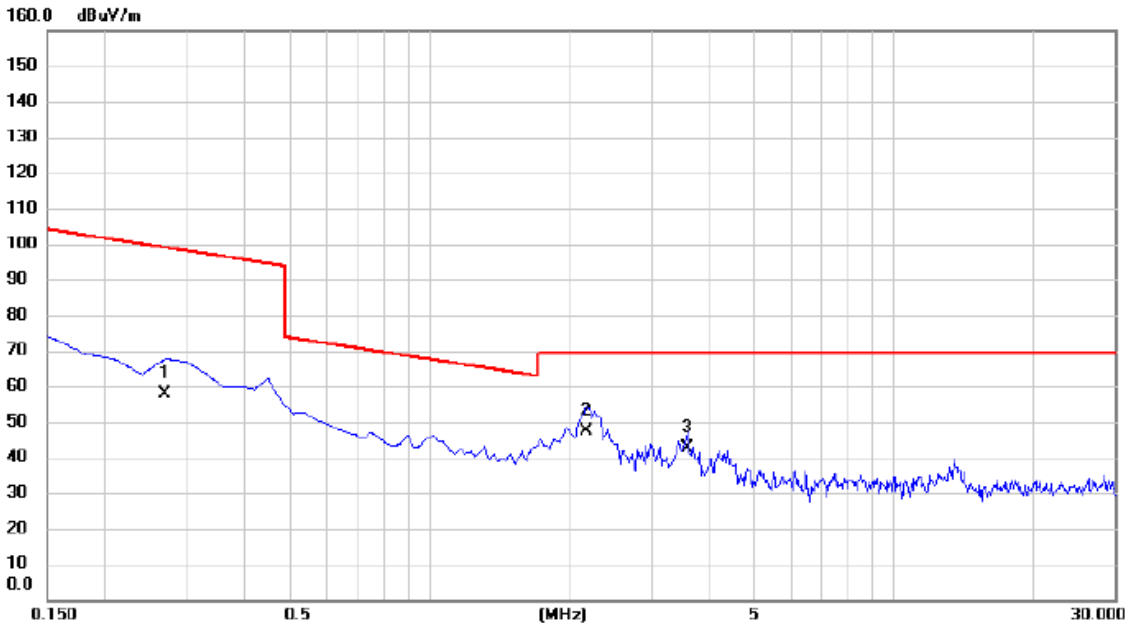
Test Mode	TX Mode_3Mbps Channel 26	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0187	49.32	14.70	64.02	122.17	-58.15	AVG	
2		0.0252	44.21	14.17	58.38	119.58	-61.20	AVG	
3		0.0317	41.96	14.02	55.98	117.58	-61.60	AVG	

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

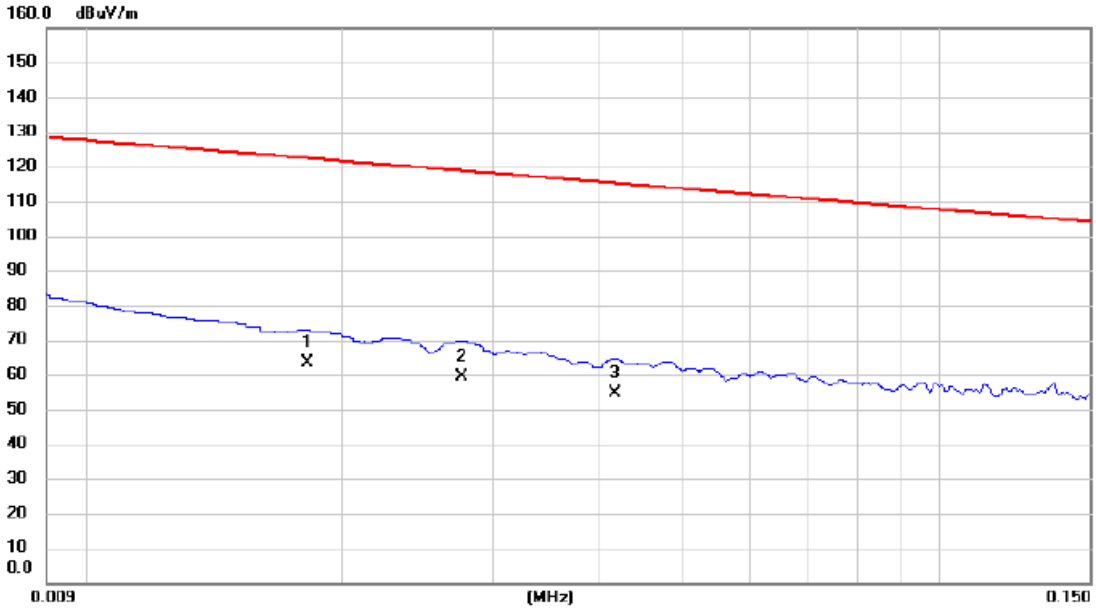
Test Mode	TX Mode_3Mbps Channel 26	Polarization	Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.2694	44.40	13.58	57.98	99.00	-41.02	AVG	
2	*	2.1798	35.28	12.02	47.30	69.54	-22.24	QP	
3		3.5827	30.96	11.72	42.68	69.54	-26.86	QP	

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

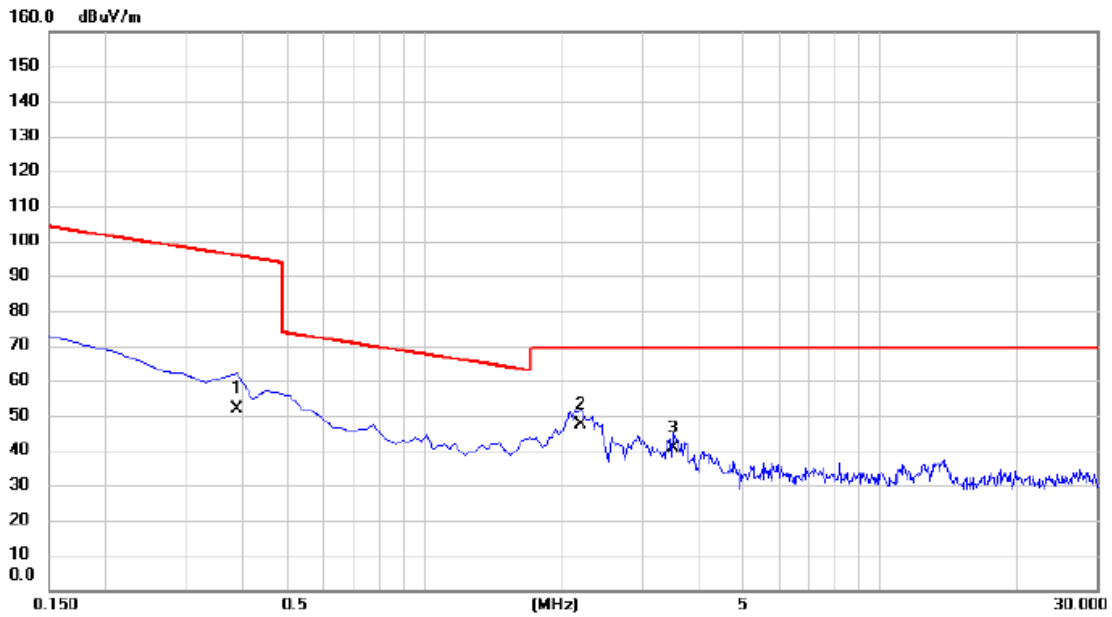
Test Mode	TX Mode_3Mbps Channel 26	Polarization	Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0182	48.36	14.86	63.22	122.40	-59.18	AVG	
2		0.0276	45.21	14.12	59.33	118.79	-59.46	AVG	
3		0.0416	40.96	13.79	54.75	115.22	-60.47	AVG	

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

Test Mode	TX Mode_3Mbps Channel 26	Polarization	Ant 90°

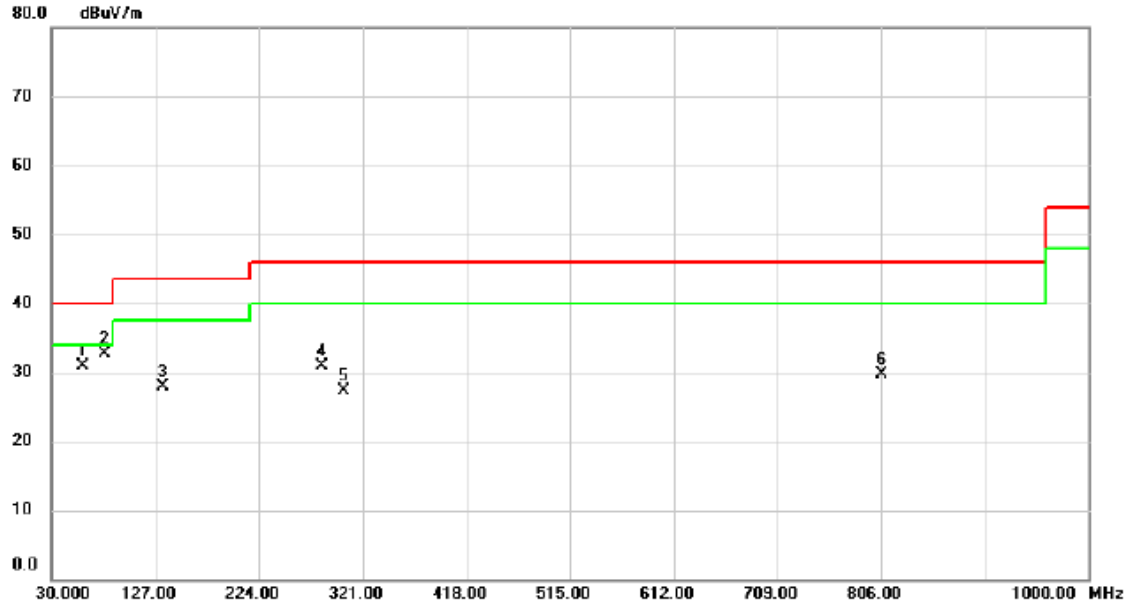


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.3887	38.21	13.47	51.68	95.81	-44.13	AVG	
2	*	2.2096	35.22	12.01	47.23	69.54	-22.31	QP	
3		3.5230	28.96	11.72	40.68	69.54	-28.86	QP	

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

APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

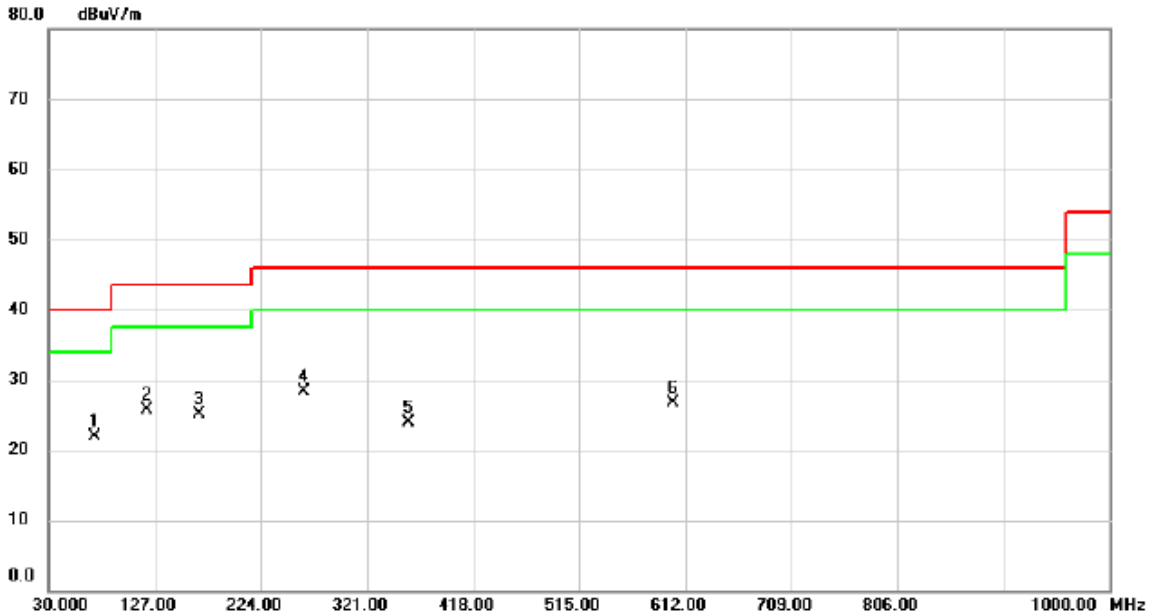
Test Mode	TX Mode_3Mbps Channel 26	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		59.100	45.19	-14.37	30.82	40.00	-9.18	peak	
2	*	79.470	50.98	-18.25	32.73	40.00	-7.27	peak	
3		133.790	41.20	-13.20	28.00	43.50	-15.50	peak	
4		282.200	42.49	-11.49	31.00	46.00	-15.00	peak	
5		303.540	38.20	-10.82	27.38	46.00	-18.62	peak	
6		806.970	30.40	-0.67	29.73	46.00	-16.27	peak	

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

Test Mode	TX Mode_3Mbps Channel 26	Polarization	Horizontal

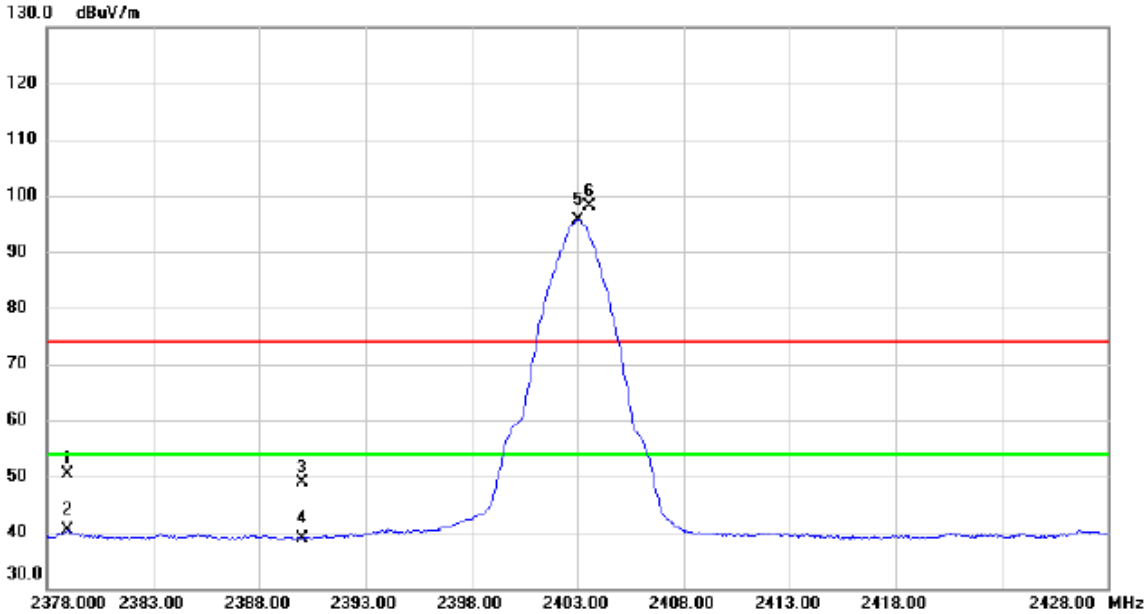


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		71.710	38.41	-16.60	21.81	40.00	-18.19	peak	
2	*	119.240	40.02	-14.22	25.80	43.50	-17.70	peak	
3		167.740	37.66	-12.53	25.13	43.50	-18.37	peak	
4		262.800	40.69	-12.45	28.24	46.00	-17.76	peak	
5		358.830	33.73	-9.76	23.97	46.00	-22.03	peak	
6		600.360	31.16	-4.55	26.61	46.00	-19.39	peak	

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

APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ

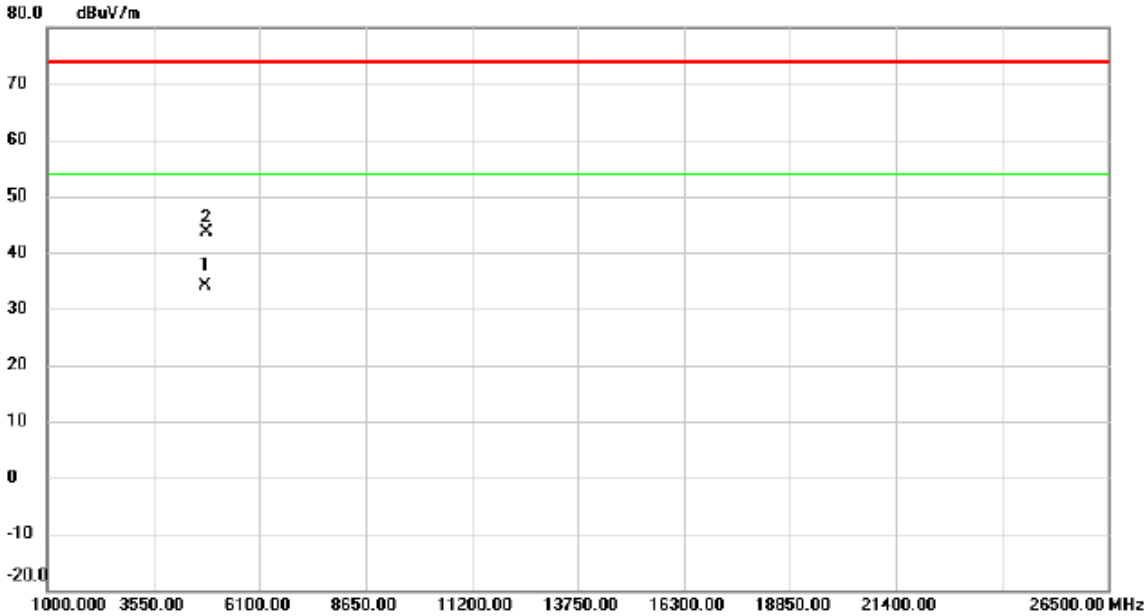
Test Mode	TX 2403 MHz _CH01_3Mbps	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2378.950	43.23	7.27	50.50	74.00	-23.50	peak	
2		2378.950	33.23	7.27	40.50	54.00	-13.50	AVG	
3		2390.000	41.52	7.27	48.79	74.00	-25.21	peak	
4		2390.000	31.66	7.27	38.93	54.00	-15.07	AVG	
5	*	2403.000	88.35	7.28	95.63	54.00	41.63	AVG	No Limit
6	X	2403.550	90.85	7.28	98.13	74.00	24.13	peak	No Limit

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

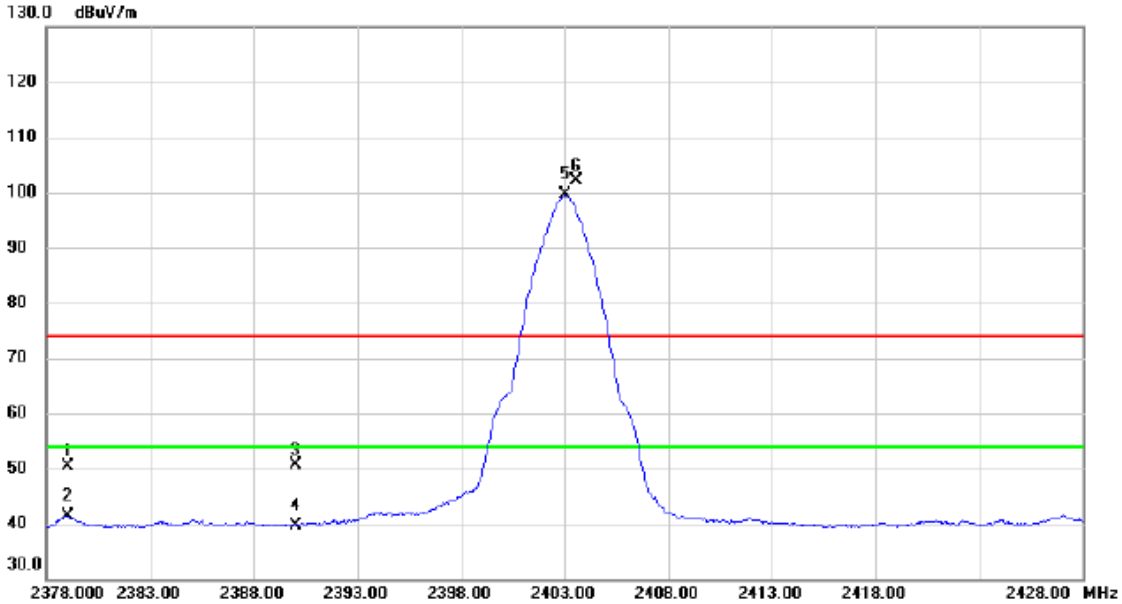
Test Mode	TX 2403 MHz _CH01_3Mbps	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4806.060	29.71	4.30	34.01	54.00	-19.99	AVG	
2		4809.300	39.41	4.30	43.71	74.00	-30.29	peak	

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

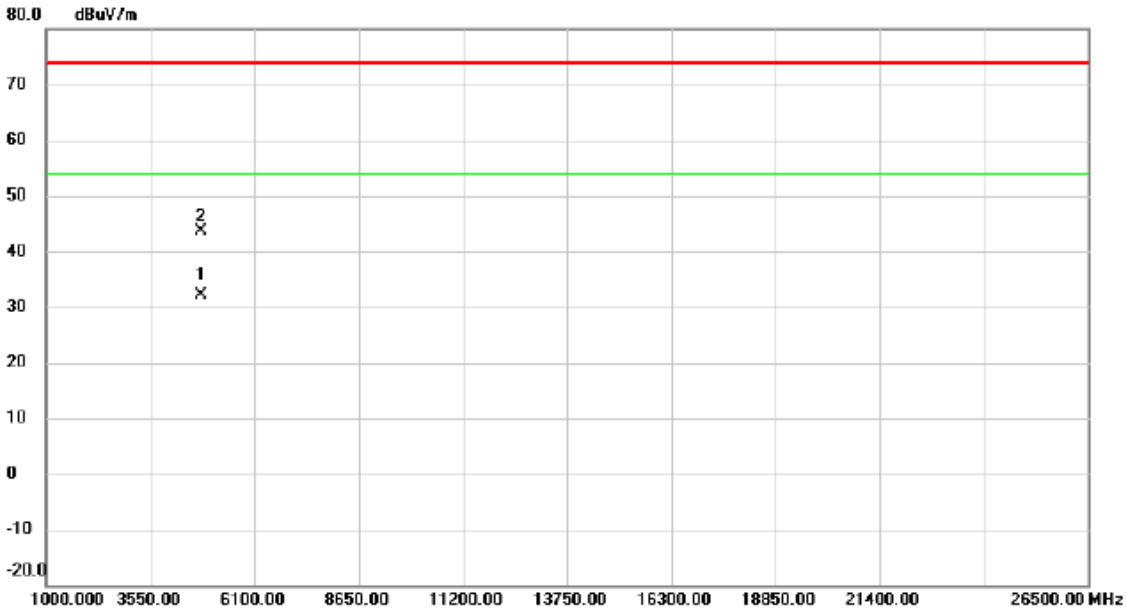
Test Mode	TX 2403 MHz _CH01_3Mbps	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2379.000	43.03	7.27	50.30	74.00	-23.70	peak	
2		2379.000	34.15	7.27	41.42	54.00	-12.58	AVG	
3		2390.000	43.27	7.27	50.54	74.00	-23.46	peak	
4		2390.000	32.47	7.27	39.74	54.00	-14.26	AVG	
5	*	2403.000	92.24	7.28	99.52	54.00	45.52	AVG	No Limit
6	X	2403.550	94.75	7.28	102.03	74.00	28.03	peak	No Limit

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

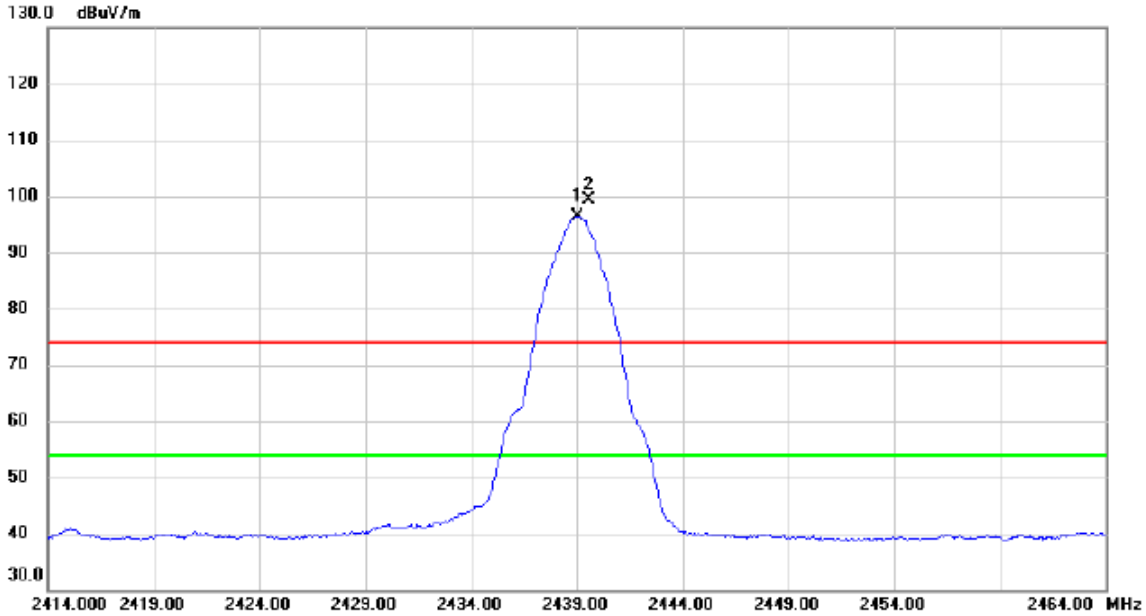
Test Mode	TX 2403 MHz _CH01_3Mbps	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4806.455	27.85	4.30	32.15	54.00	-21.85	AVG	
2		4806.490	39.31	4.30	43.61	74.00	-30.39	peak	

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

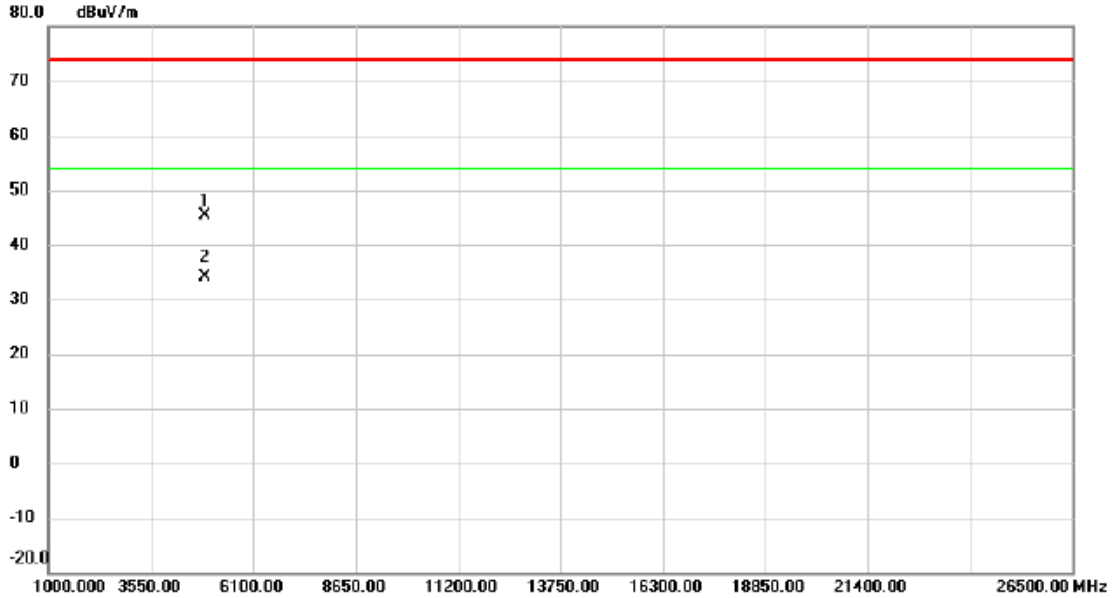
Test Mode	TX 2439 MHz _CH13_3Mbps	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2439.050	89.19	7.30	96.49	54.00	42.49	AVG	No Limit
2	X	2439.550	92.04	7.30	99.34	74.00	25.34	peak	No Limit

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

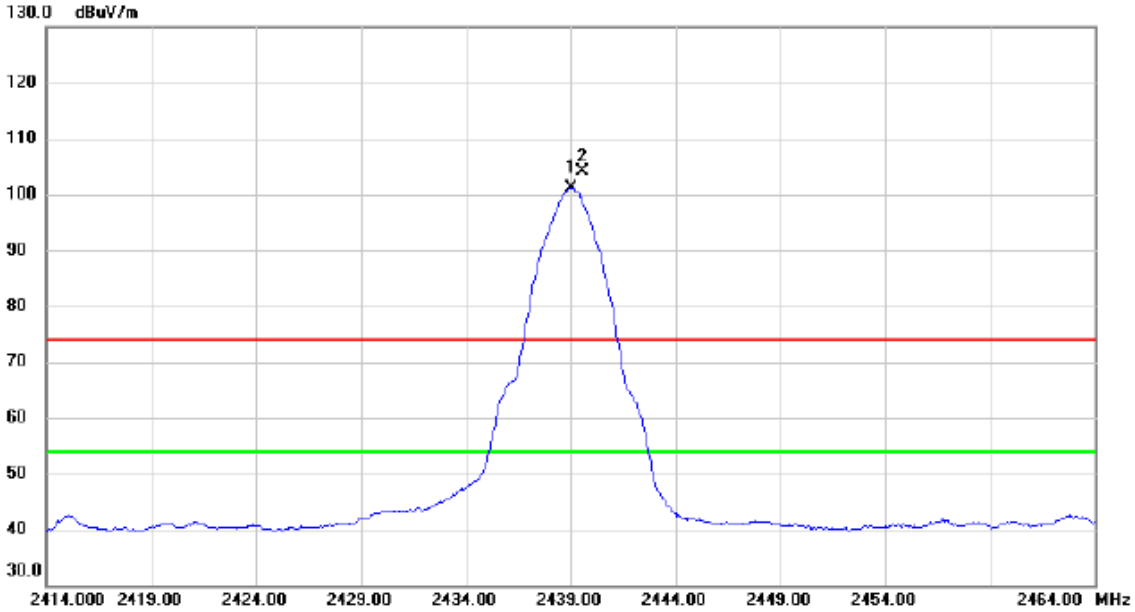
Test Mode	TX 2439 MHz _CH13_3Mbps	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4877.800	40.92	4.42	45.34	74.00	-28.66	peak	
2	*	4878.150	29.73	4.42	34.15	54.00	-19.85	AVG	

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

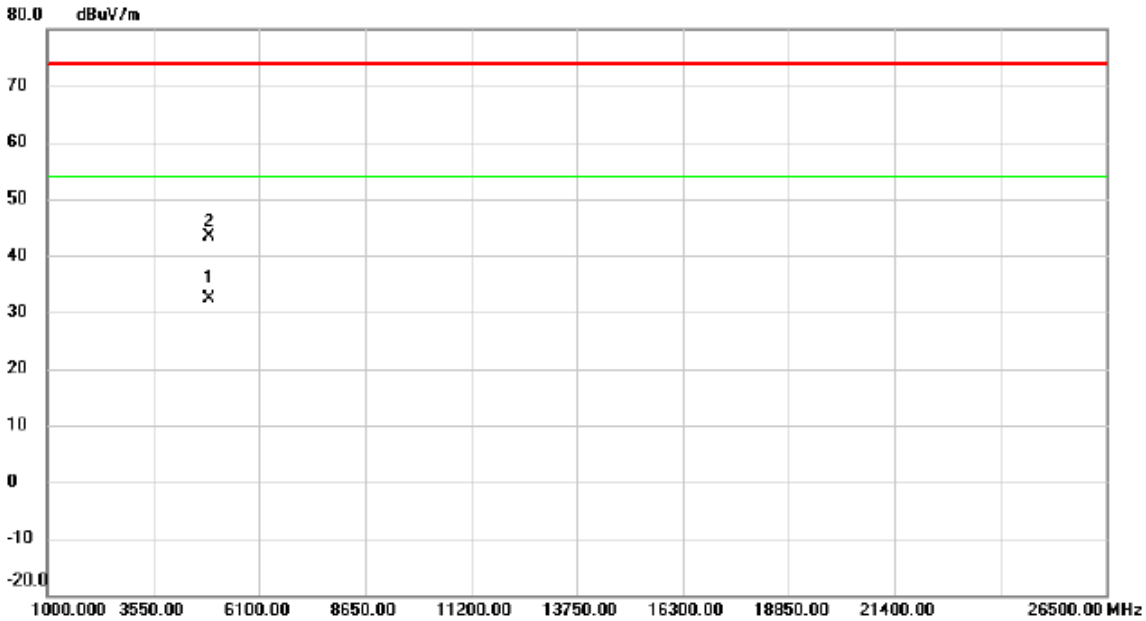
Test Mode	TX 2439 MHz _CH13_3Mbps	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2439.000	93.88	7.30	101.18	54.00	47.18	AVG	No Limit
2	X	2439.600	96.73	7.30	104.03	74.00	30.03	peak	No Limit

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

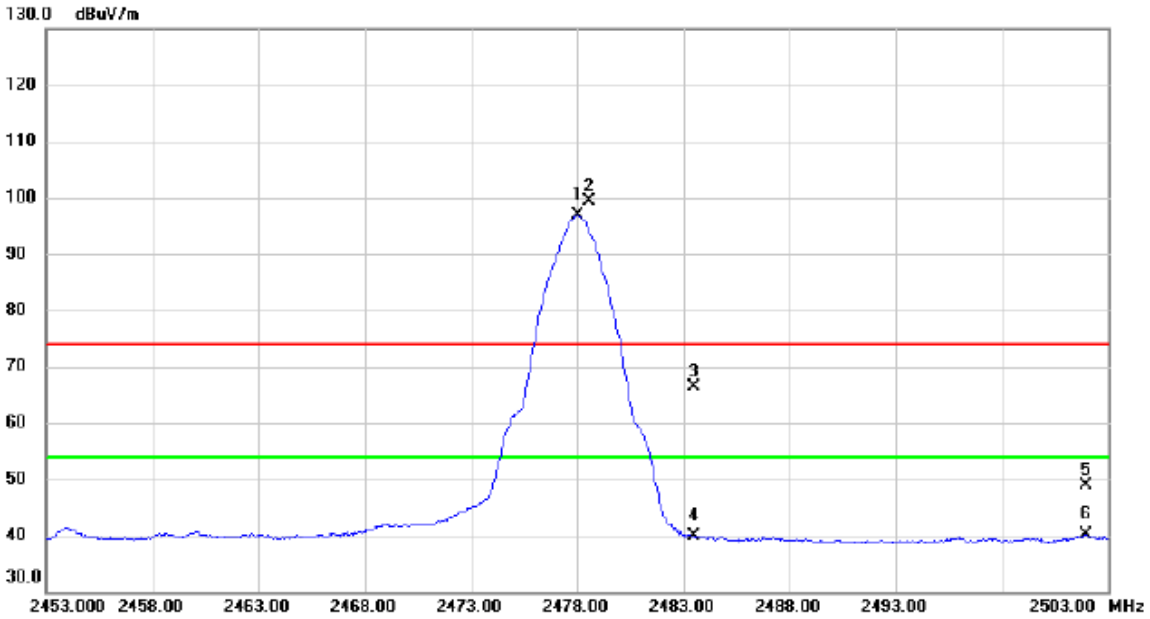
Test Mode	TX 2439 MHz _CH13_3Mbps	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4878.880	27.97	4.42	32.39	54.00	-21.61	AVG	
2		4880.160	39.00	4.43	43.43	74.00	-30.57	peak	

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

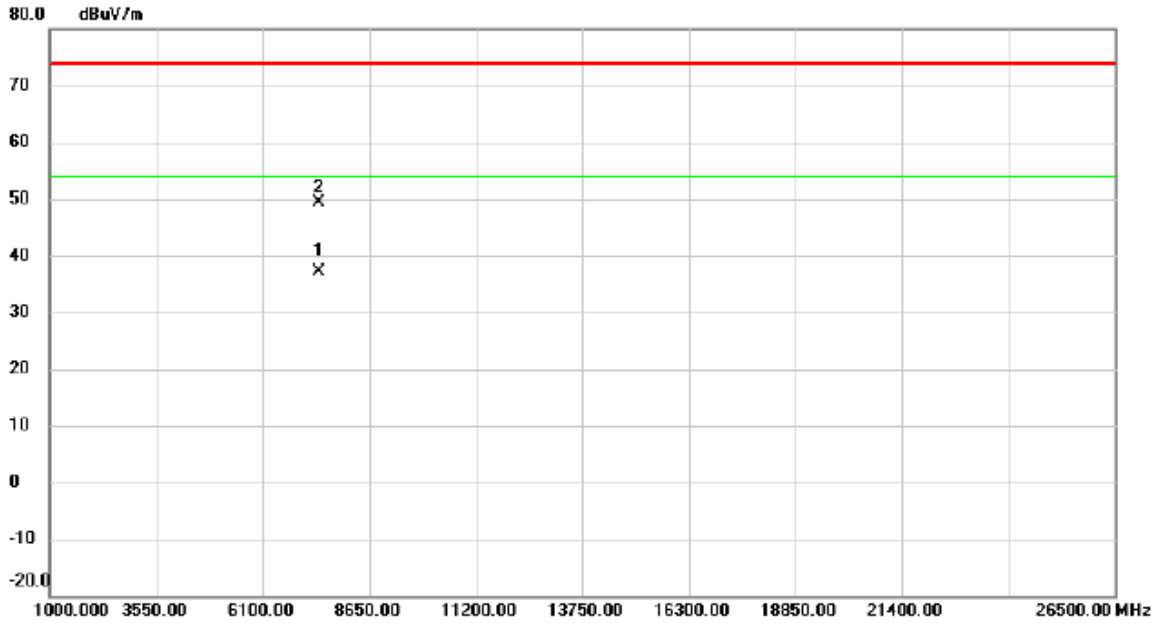
Test Mode	TX 2478 MHz _CH26_3Mbps	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2478.000	89.46	7.34	96.80	54.00	42.80	AVG	No Limit
2	X	2478.550	92.15	7.34	99.49	74.00	25.49	peak	No Limit
3		2483.500	58.97	7.34	66.31	74.00	-7.69	peak	
4		2483.500	32.48	7.34	39.82	54.00	-14.18	AVG	
5		2501.950	41.45	7.36	48.81	74.00	-25.19	peak	
6		2501.950	32.76	7.36	40.12	54.00	-13.88	AVG	

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

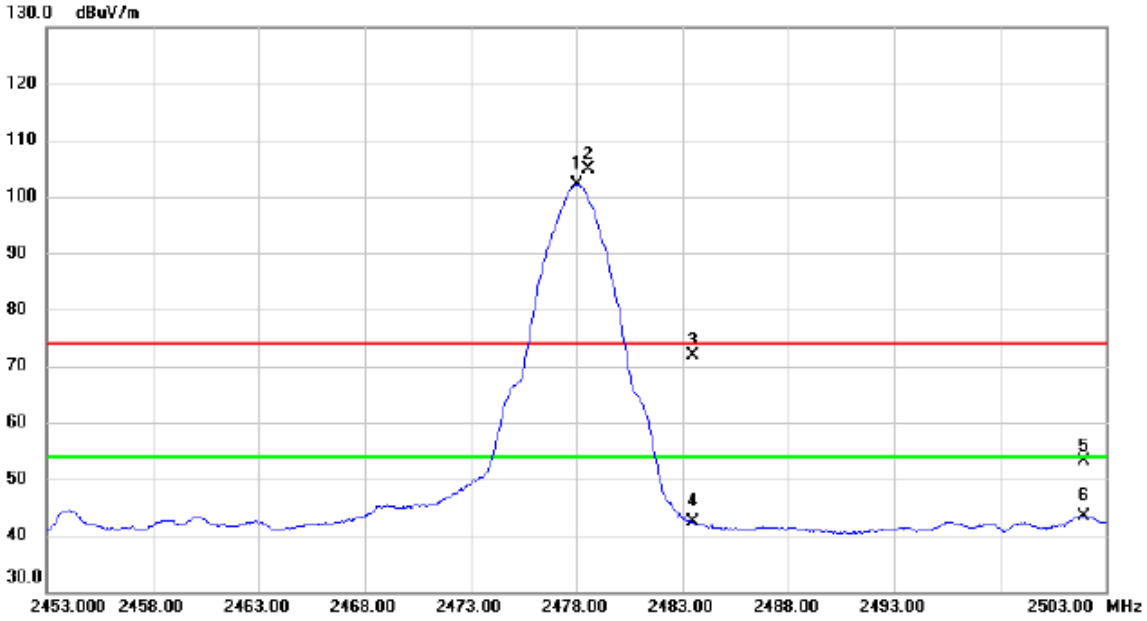
Test Mode	TX 2478 MHz _CH26_3Mbps	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	7435.500	26.82	10.27	37.09	54.00	-16.91	AVG	
2		7435.900	39.22	10.27	49.49	74.00	-24.51	peak	

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

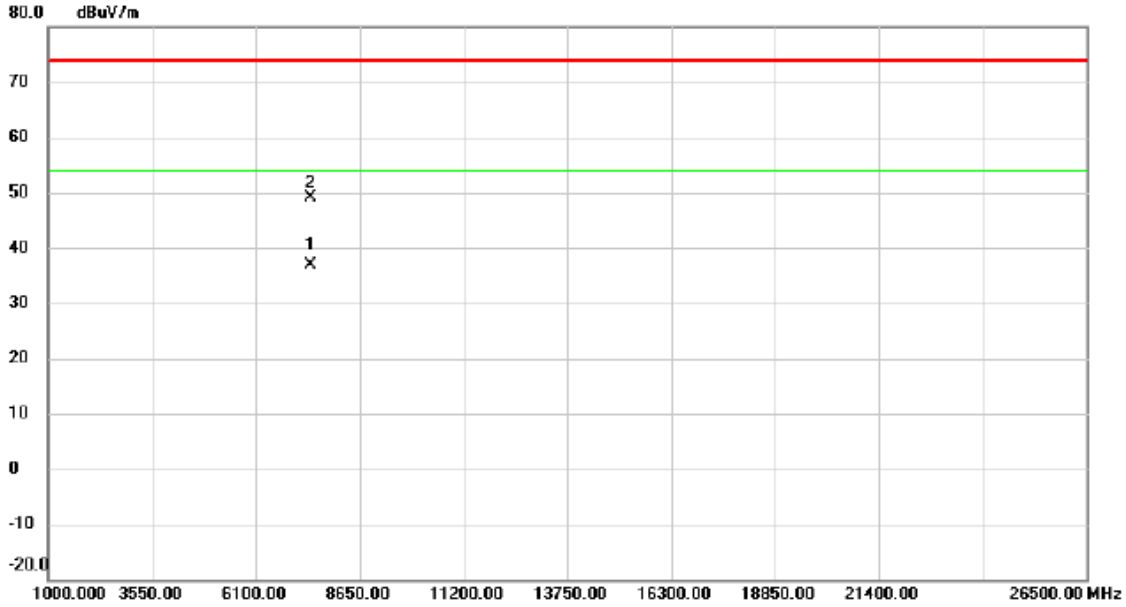
Test Mode	TX 2478 MHz _CH26_3Mbps	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2478.050	94.87	7.34	102.21	54.00	48.21	AVG	No Limit
2	X	2478.600	97.58	7.34	104.92	74.00	30.92	peak	No Limit
3		2483.500	64.57	7.34	71.91	74.00	-2.09	peak	
4		2483.500	34.93	7.34	42.27	54.00	-11.73	AVG	
5		2501.950	45.79	7.36	53.15	74.00	-20.85	peak	
6		2501.950	36.03	7.36	43.39	54.00	-10.61	AVG	

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

Test Mode	TX 2478 MHz _CH26_3Mbps	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	7435.845	26.72	10.27	36.99	54.00	-17.01	AVG	
2		7435.945	38.78	10.27	49.05	74.00	-24.95	peak	

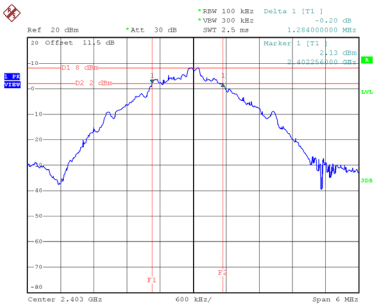
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX E - BANDWIDTH

Test Mode	TX Mode _3Mbps

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
01	2403	1.284	2.796	0.5	Pass
13	2439	1.308	2.820	0.5	Pass
26	2478	1.284	2.832	0.5	Pass

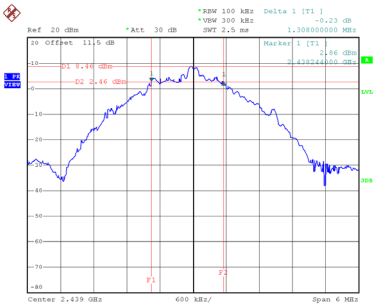
CH01



Date: 19.APR.2022 10:03:43

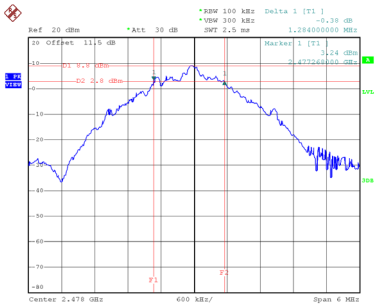
CH13

6 dB Bandwidth



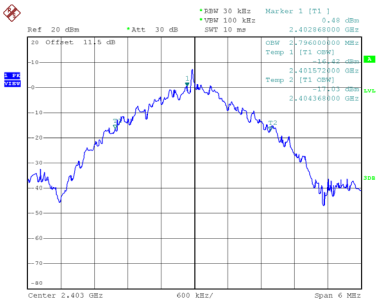
Date: 19.APR.2022 10:04:41

CH26

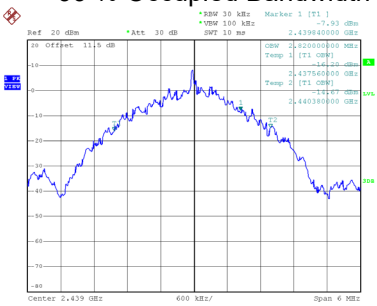


Date: 19.APR.2022 10:02:41

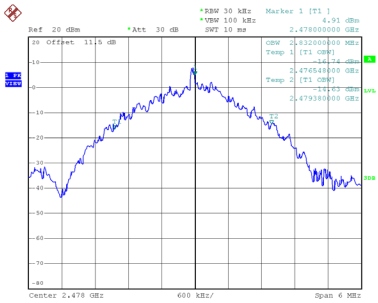
99 % Occupied Bandwidth



Date: 19.APR.2022 10:03:43



Date: 19.APR.2022 10:04:41



Date: 19.APR.2022 10:02:41

APPENDIX F - MAXIMUM OUTPUT POWER

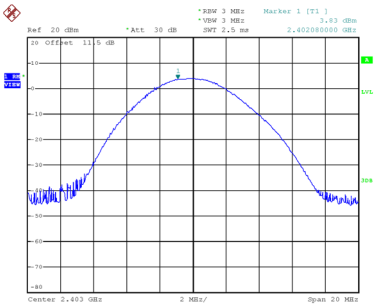
Test Mode	TX Mode _3Mbps

Frequency (MHz)	Average Output Power (dBm)	Average Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2403	3.83	0.0024	30.00	1.0000	Pass
2439	4.42	0.0028	30.00	1.0000	Pass
2478	5.04	0.0032	30.00	1.0000	Pass

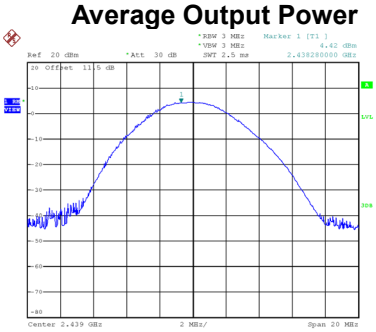
Frequency (MHz)	Peak Output Power (dBm)	Peak Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2403	5.96	0.0039	30.00	1.0000	Pass
2439	6.60	0.0046	30.00	1.0000	Pass
2478	7.00	0.0050	30.00	1.0000	Pass

CH01 **CH13** **CH26**

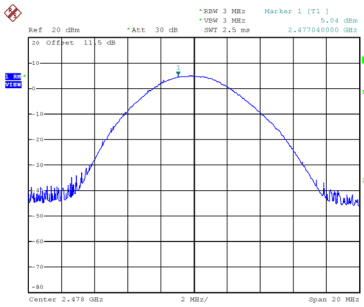
Average Output Power



Date: 27.APR.2022 14:35:23

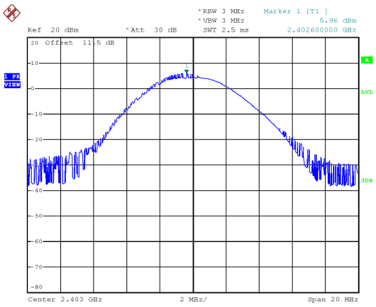


Date: 27.APR.2022 14:35:42

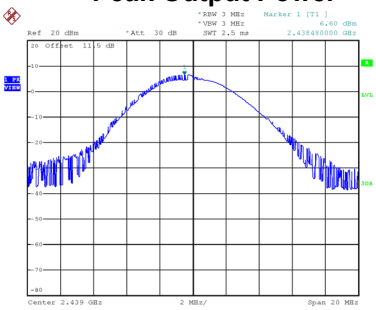


Date: 27.APR.2022 14:34:57

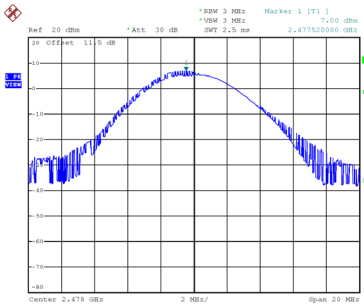
Peak Output Power



Date: 27.APR.2022 14:24:01



Date: 27.APR.2022 14:24:26

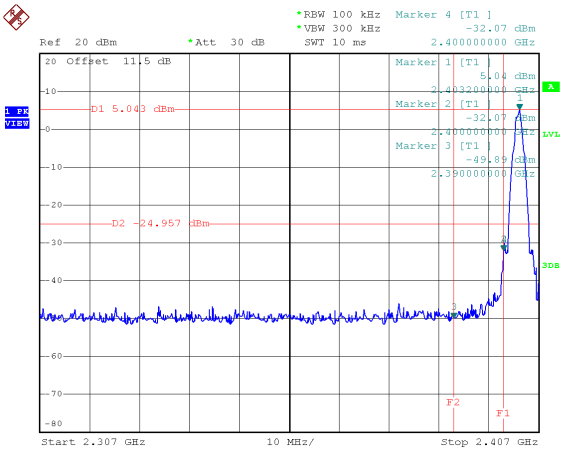


Date: 27.APR.2022 14:24:43

APPENDIX G - CONDUCTED SPURIOUS EMISSION

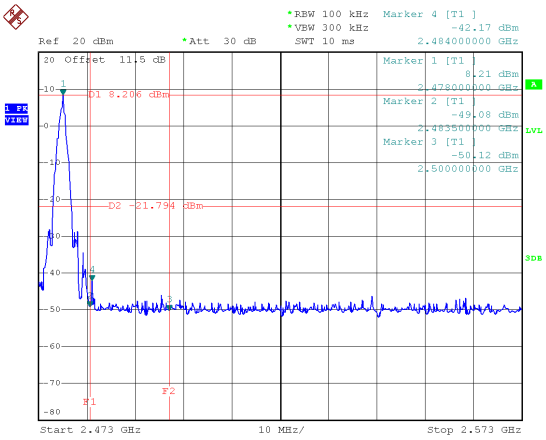
Test Mode	TX Mode _3Mbps

Bandedge CH01 (Lower)



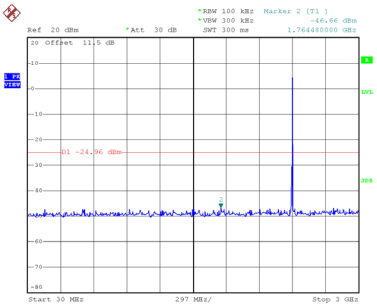
Date: 19.APR.2022 10:01:43

Bandedge CH26 (Upper)

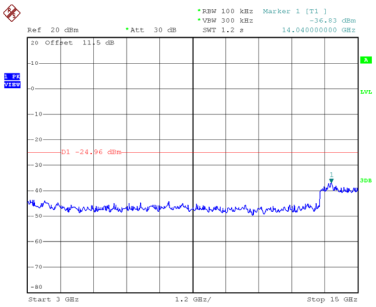


Date: 19.APR.2022 10:02:41

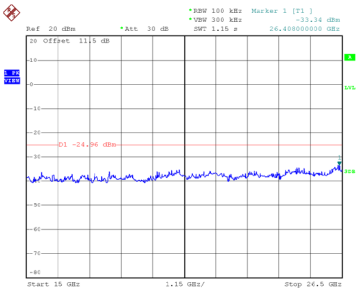
CH01 – 10th Harmonic of the fundamental frequency



Date: 19.APR.2022 10:01:43

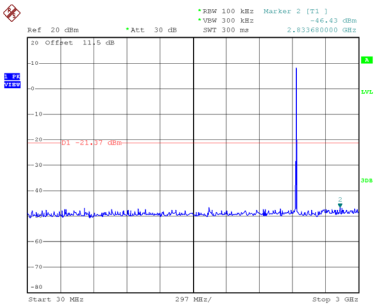


Date: 19.APR.2022 10:01:43

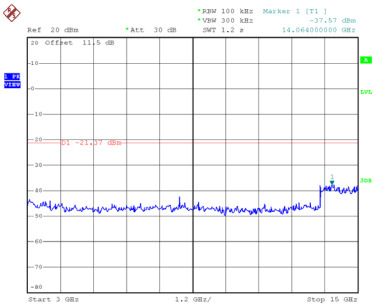


Date: 19.APR.2022 10:01:43

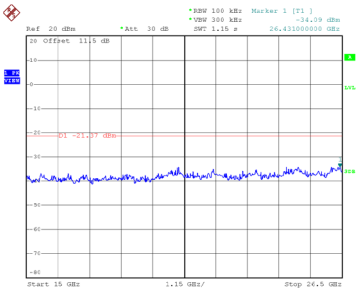
CH13 – 10th Harmonic of the fundamental frequency



Date: 19.APR.2022 10:04:41

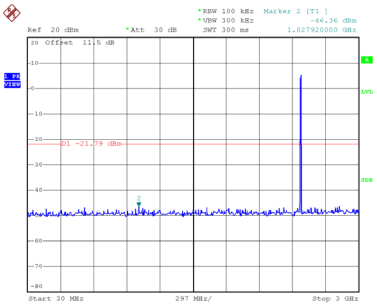


Date: 19.APR.2022 10:04:41

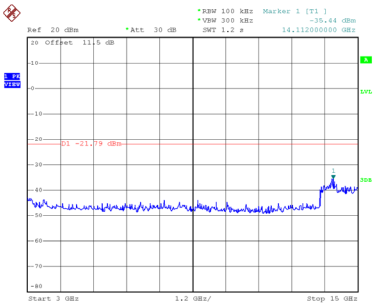


Date: 19.APR.2022 10:04:41

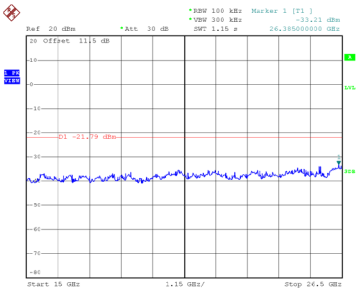
CH26 – 10th Harmonic of the fundamental frequency



Date: 19.APR.2022 10:02:41



Date: 19.APR.2022 10:02:41



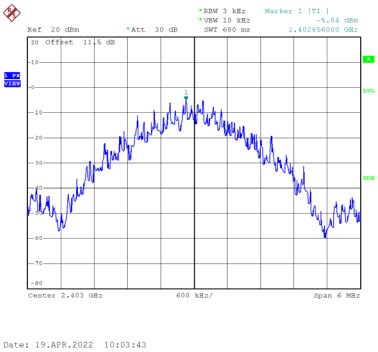
Date: 19.APR.2022 10:02:41

APPENDIX H - POWER SPECTRAL DENSITY

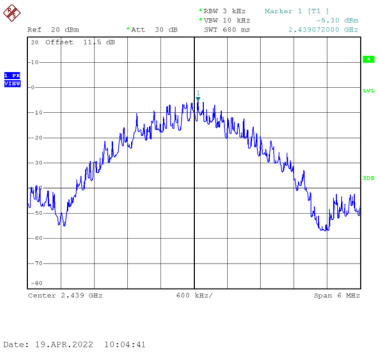
Test Mode	TX Mode _3Mbps

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
01	2403	-5.04	8.00	Pass
13	2439	-5.30	8.00	Pass
26	2478	-4.24	8.00	Pass

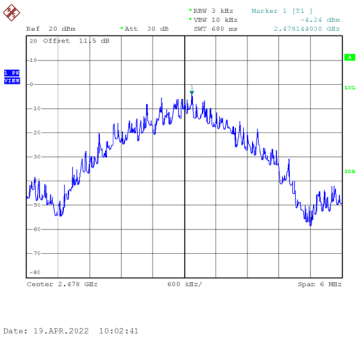
CH01



CH13



CH26



End of Test Report