

Product Name: K610w Wireless Mechanical Keyboard	Report No: FCC022022-5383RF1
Product Model: K610w	Security Classification: Open
Version: V1.0	Total Page:47

# TIRT Testing Report



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<i>Stone Tang</i>	<i>Randy Lv</i>	<i>Daniel chen</i>	

# FCC Radio Test Report

## FCC ID: 2AXCA-K610W

This report concerns: Original Grant

**Project No.** : 022022-5383  
**Equipment** : K610w Wireless Mechanical Keyboard  
**Brand Name** : DURGOD  
**Test Model** : K610w  
**Series Model** : N/A  
**Applicant** : Zhuhai Hoksi Technology CO.,LTD  
**Address** : Room803, No.3 BLDG, No.6, Pingbei 1 Rd., Nanping Technology & Industry Park, Xiangzhou St., ZhuHai,China  
**Manufacturer** : Zhuhai Hoksi Technology CO.,LTD  
**Address** : Room803, No.3 BLDG, No.6, Pingbei 1 Rd., Nanping Technology & Industry Park, Xiangzhou St., ZhuHai,China  
**Factory** : Zhuhai Hengcang Electronic Technology Co.,Ltd  
**Address** : 3rd floor, A building, No. 7 of 3rd pingxi Road, Nanping Technical industry park, Zhuhai, China  
**Date of Test** : 2022.09.05-2022.10.19  
**Issued Date** : 2022.10.20  
**Report Version** : V1.0  
**Test Sample** : Engineering Sample No.: 20220713018147  
**Standard(s)** : FCC CFR Title 47, Part 15, Subpart C  
FCC KDB 558074 D01 15.247 Meas Guidance v05r02  
ANSI C63.10-2013

- The test result referred exclusively to the presented test model /sample.
- Without written approval of TIRT Inc. the test report shall not reproduced except in full.

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**REPORT ISSUED HISTORY**

Report No.	Version	Description	Issued Date	Note
FCC022022-5383RF1	V1.0	Original Report.	2022.10.20	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 Emissions	APPENDIX G	PASS	-----
15.247(e)	Power Spectral Density	APPENDIX H	PASS	-----
15.203	Antenna Requirement	-----	PASS	Note(2)

Note:

- (1) "N/A" denotes test is not applicable in this test report.
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.

## 1.1 TEST LOCATION

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan District, Shenzhen, China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Accredited Lab. Designation Number:	CN1309
FCC Test Firm Registration Number:	825524
Telephone:	+86-0755-27087573

## 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 TIRT measurement uncertainty as below table:

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	±142.12kHz
RF power conducted	±0.74dB
RF power radiated	±3.25dB
Spurious emissions, conducted	±1.78dB
Spurious emissions, radiated (30MHz~1GHz)	±4.6dB
Spurious emissions, radiated (1GHz ~ 18GHz)	±4.9dB
Conduction Emissions(150kHz~30MHz)	±3.1dB
Humidity	±4.6%
Temperature	±0.7°C
Time	±1.25%

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	26°C	56%	AC 120V/60Hz	Stone Tang
Radiated Emissions-9kHz to 30 MHz	25°C	55%	DC 5V	Stone Tang
Radiated Emissions-30MHz to 1000MHz	23°C	53%	DC 5V	Stone Tang
Radiated Emissions-Above 1000MHz	23°C	53%	DC 5V	Stone Tang
Bandwidth	23°C	54%	DC 5V	Stone Tang
Maximum Output Power	23°C	54%	DC 5V	Stone Tang
Conducted Spurious Emissions	23°C	54%	DC 5V	Stone Tang
Power Spectral Density	23°C	54%	DC 5V	Stone Tang

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	K610w Wireless Mechanical Keyboard
Brand Name	DURGOD
Test Model	K610w
Series Model	N/A
Model Difference(s)	N/A
Software Version	N/A
Hardware Version	N/A
Power Source	1# Supplied from PC USB port. 2# Supplied from battery. Model: 5830132-3600mAh-1S1P
Power Rating	1# 5V 1.5A 2# DC 3.8V, 3600mAh, 13.68Wh
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	2Mbps
Maximum Output Power	2Mbps: -2.76 dBm (0.0005 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)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

## 3. Antenna Specification:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1		RFPCA430816IMAB301	PCB	IPEX Compatible (Gold)	3.12

Note:

- 1) The antenna gain is provided by the manufacturer.

## 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_2Mbps Channel 00/39/78
Mode2	TX Modde_2Mbps Channel 00/78
Mode2	TX Modde_2Mbps Channel 00

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

<b>AC power line conducted emissions test</b>	
Final Test Mode	Description
Mode 2	TX Mode_2Mbps Channel 00

<b>Radiated emissions test - Below 1GHz</b>	
Final Test Mode	Description
Mode 2	TX Mode_2Mbps Channel 00

<b>Radiated emissions test - Above 1GHz (Bandedge)</b>	
Final Test Mode	Description
Mode 1	TX Mode_2Mbps Channel 00/78

<b>Radiated emissions test - Above 1GHz (Harmonic)</b>	
Final Test Mode	Description
Mode 1	TX Mode_2Mbps Channel 00/39/78

<b>Conducted test</b>	
Final Test Mode	Description
Mode 1	TX Mode_2Mbps Channel 00/39/78

**NOTE:**

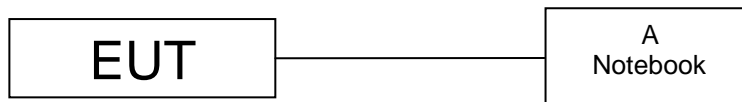
- (1) For radiated emission above 1 GHz test, the spurious points of 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.
- (2) For AC power line conducted emissions and radiated emissions below 1 GHz test, the 1Mbps Channel 00 is found to be the worst case and recorded.
- (3) For radiated emission above 1 GHz test: The polarization of vertical and horizontal are evaluated, the worst case is vertical and recorded.

### 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	IPOP_V4.0		
Frequency (MHz)	2402	2441	2480
2Mbps	20	20	20

### 2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



### 2.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
A	Notebook	ThinkPad	L450	N/A

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

### 3. AC POWER LINE CONDUCTED EMISSIONS

#### 3.1 LIMIT

Frequency of Emission (MHz)	Limit (dB $\mu$ V)	
	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.

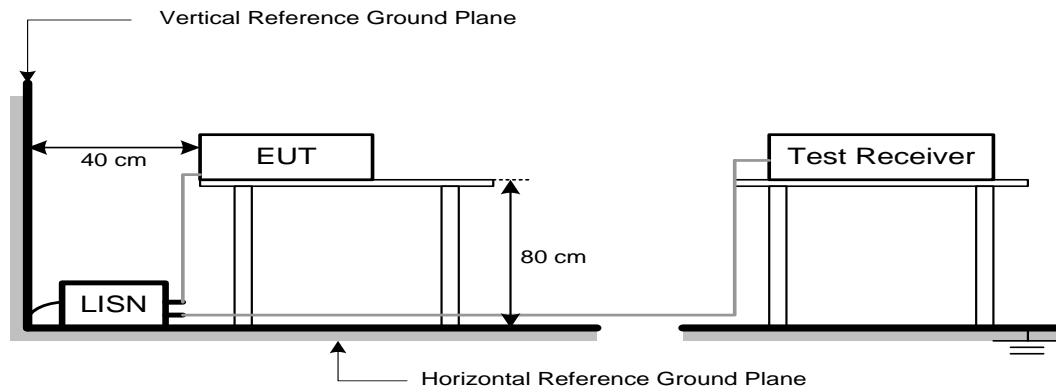
The following table is the setting of the receiver:

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 OPERATION CONDITIONS

EUT was programmed to be in continuously transmitting mode.

### 3.6 TEST RESULTS

Please refer to the APPENDIX A.

## 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) and 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

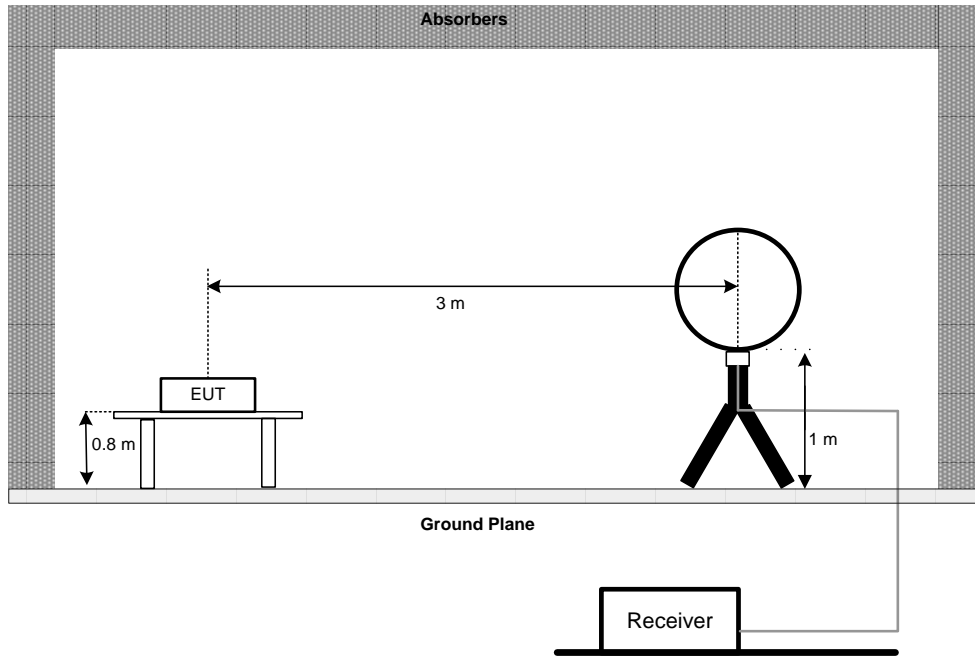
Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector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

### 4.3 DEVIATION FROM TEST STANDARD

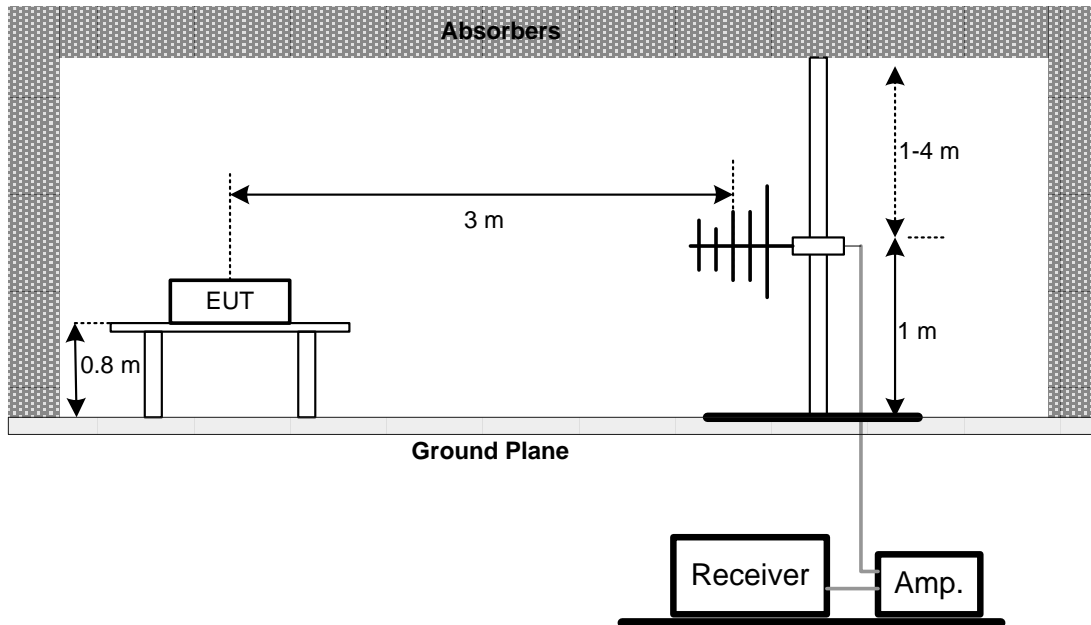
No deviation.

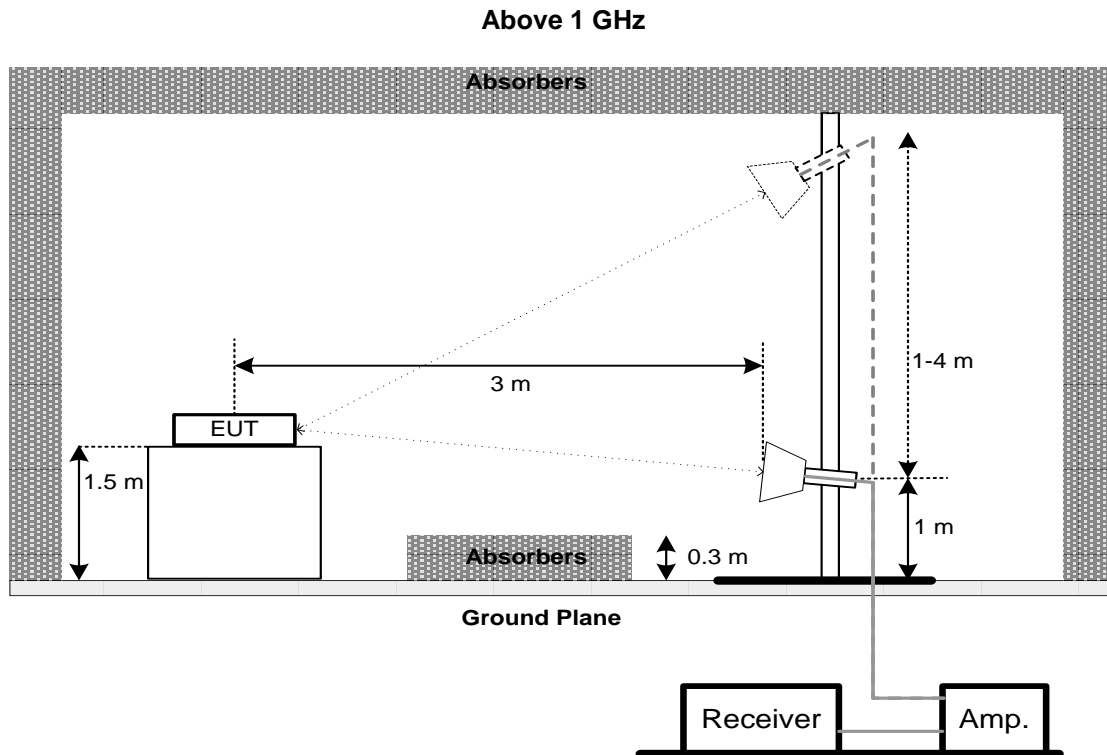
### 4.4 TEST SETUP

#### 9 kHz to 30 MHz



#### 30 MHz to 1 GHz





#### 4.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 4.6 TEST RESULTS - 9 KHZ TO 30 MHZ

Please refer to the APPENDIX B.

Remark:

- (1) Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 4.7 TEST RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX C.

#### 4.8 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.

## 5. BANDWIDTH

### 5.1 LIMIT

Section	Test Item	Limit
FCC 15.247(a)(2)	6 dB Bandwidth	$\geq 500$ kHz
	99% Emission Bandwidth	-

### 5.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- 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
VBW	100kHz
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

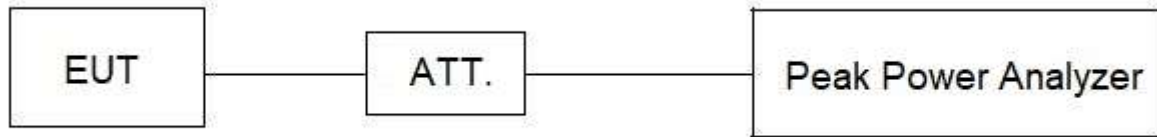
- The EUT was directly connected to the peak power analyzer and antenna output port as show in the block diagram below.
- The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	$\geq 3 \cdot \text{RBW}$
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 EMISSIONS

### 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:

For Emission Level:

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

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

Spectrum Parameters	Setting
Span Frequency	4 MHz (2 Mbps)
RBW	3 kHz
VBW	10 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

### 8.3 DEVIATION FROM STANDARD

No deviation.

### 8.4 TEST SETUP



### 8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 8.6 TEST RESULTS

Please refer to the APPENDIX H.

## 9. MEASUREMENT INSTRUMENTS LIST

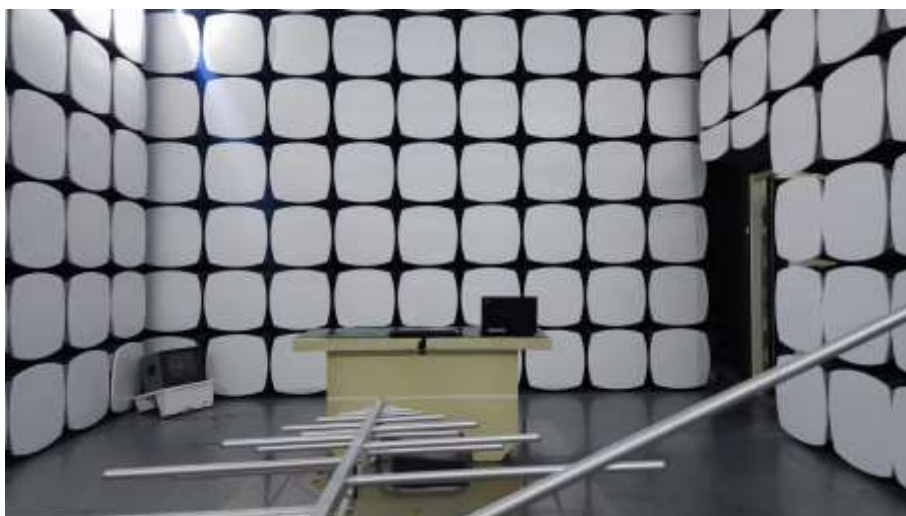
No.	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Receiver	Rohde&Schwarz	ESCI	1166.5950.03	2022/11/09
2	AMN	Rohde&Schwarz	ENV216	3560.6550.05	2022/11/09
3	AMN	Schwarzbeck	NSLK8127	#829	2022/11/09
4	ECSI RF IN RF Cable	Rohde&Schwarz	RP-X1	N/A	2022/11/09
5	ECSI RF IN RF Cable	Rohde&Schwarz	Sapre sm	N/A	2022/11/09
6	EMI Receiver	Rohde&Schwarz	ESR7	102013	2022/11/09
7	Spectrum analyzer	Rohde&Schwarz	FSV30	103741	2022/11/09
8	Spectrum analyzer	KEYSIGHT	N9010A-44	MY51440158	2022/11/09
9	Integral Antenna	Schwarzbeck	VULB 9163	VULB 9163-361	2022/11/20
10	Integral Antenna	Schwarzbeck	BBHA 9120D	BBHA 9120D 1201	2022/11/20
11	Integral Antenna	Schwarzbeck	BBHA 9170	9170#685	2022/11/20
12	Preamplifier	Schwarzbeck	BBV9745	#78	2022/11/09
13	Preamplifier	Schwarzbeck	BBV9721	9721-019	2022/11/09
14	Preamplifier	RF System/UK	TRLA-0101 80G50B	22062101	2023/07/20
15	ECSI RF IN RF Cable	Rohde&Schwarz	AP-X1	N/A	2022/11/09
16	ECSI RF IN RF Cable	HAOXUN	Z-108	N/A	2022/11/09
17	RF Cable	ZDECL	ZT40-2.92J -2.92J-6M	18124358	2023/07/20
18	Spectrum Analyzer	Agilent	N9010A	MY51440158	2022/11/09
19	Spectrum Analyzer	Agilent	N9010A	MY52221119	2022/11/09
20	EMI Receiver	Rohde&Schwarz	ESU	100184	2023/07/20
21	Temp&Humidity Recorder	Anymetre	JR900	N/A	2022/11/03
22	Temp&Humidity Chamber	ETOMA	NTH1100-3 0A	16080628	2022/11/03
23	Filter	STI	STI15-9845	N/A	N/A
24	Filter	STI	5.1G	N/A	N/A
25	Filter	STI	STI15-9845	N/A	N/A
26	Testing Software	EZ-EMC	TW-03A2	N/A	N/A

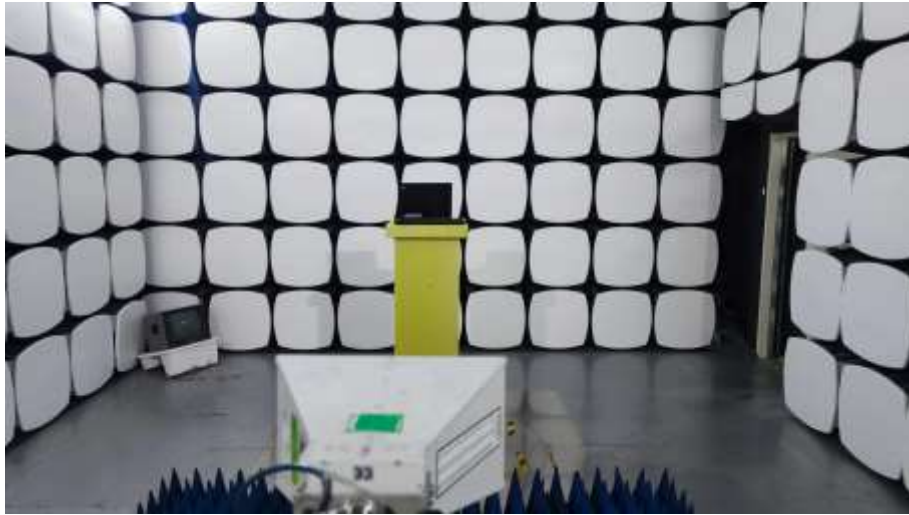
Remark: "N/A" denotes no model name, serial no. or calibration specified.

"\*\*" calibration period of equipment list is three year.

Except \* item, all calibration period of equipment list is one year.

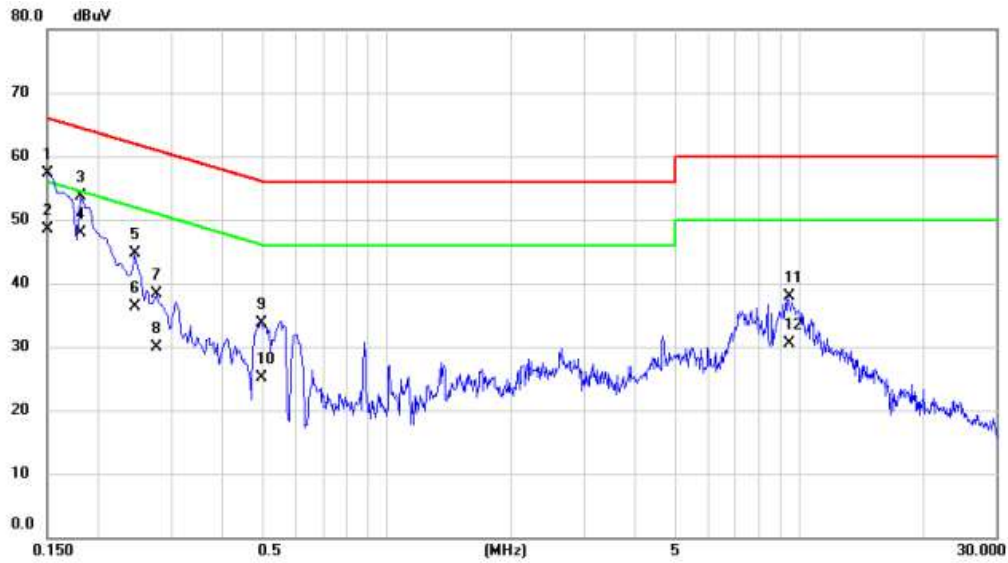


**10. EUT TEST PHOTO****AC Power Line Conducted Emissions Test Photos****Radiated Emissions Test Photos****30 MHz to 1 GHz**

**Radiated Emissions Test Photos****Above 1 GHz**

## APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

Test Mode	TX Mode_2Mbps Channel 00	Phase	Line
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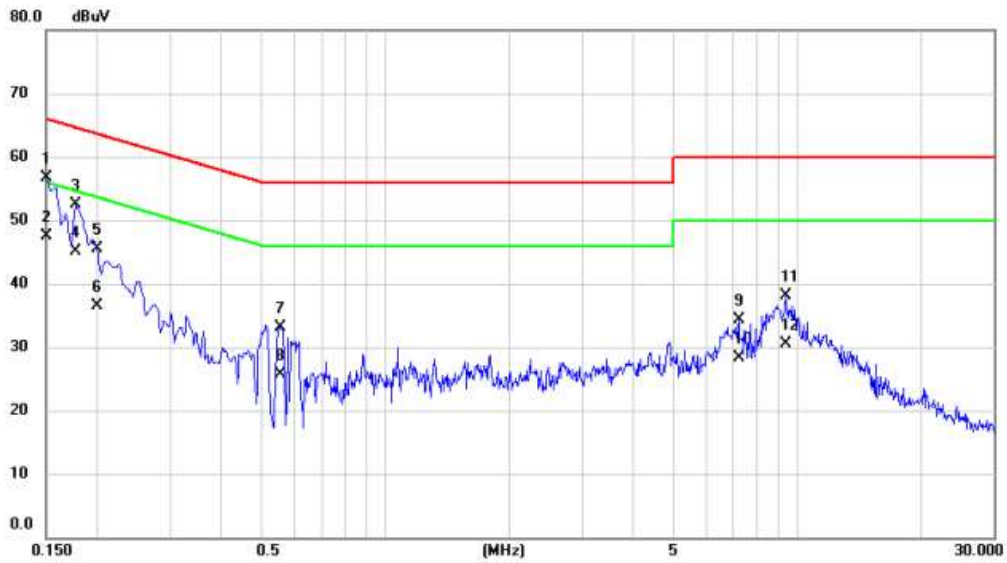


No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1500	38.07	19.27	57.34	66.00	-8.66	QP	
2	0.1500	29.29	19.27	48.56	56.00	-7.44	AVG	
3	0.1815	34.38	19.31	53.69	64.42	-10.73	QP	
4 *	0.1815	28.56	19.31	47.87	54.42	-6.55	AVG	
5	0.2445	25.31	19.32	44.63	61.94	-17.31	QP	
6	0.2445	17.08	19.32	36.40	51.94	-15.54	AVG	
7	0.2760	18.92	19.32	38.24	60.94	-22.70	QP	
8	0.2760	10.60	19.32	29.92	50.94	-21.02	AVG	
9	0.4965	14.27	19.35	33.62	56.06	-22.44	QP	
10	0.4965	5.81	19.35	25.16	46.06	-20.90	AVG	
11	9.4335	17.12	20.77	37.89	60.00	-22.11	QP	
12	9.4335	9.77	20.77	30.54	50.00	-19.46	AVG	

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.
- (3) The test result has included the cable loss.

Test Mode	TX Mode_2Mbps Channel 00	Phase	Neutral
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No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1500	37.13	19.48	56.61	66.00	-9.39	QP	
2 *	0.1500	28.03	19.48	47.51	56.00	-8.49	AVG	
3	0.1770	33.01	19.48	52.49	64.63	-12.14	QP	
4	0.1770	25.63	19.48	45.11	54.63	-9.52	AVG	
5	0.1997	26.09	19.48	45.57	63.62	-18.05	QP	
6	0.1997	17.05	19.48	36.53	53.62	-17.09	AVG	
7	0.5550	13.50	19.58	33.08	56.00	-22.92	QP	
8	0.5550	6.13	19.58	25.71	46.00	-20.29	AVG	
9	7.2465	13.55	20.84	34.39	60.00	-25.61	QP	
10	7.2465	7.40	20.84	28.24	50.00	-21.76	AVG	
11	9.4020	17.30	20.78	38.08	60.00	-21.92	QP	
12	9.4020	9.76	20.78	30.54	50.00	-19.46	AVG	

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.
- (3) The test result has included the cable loss.

## APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ

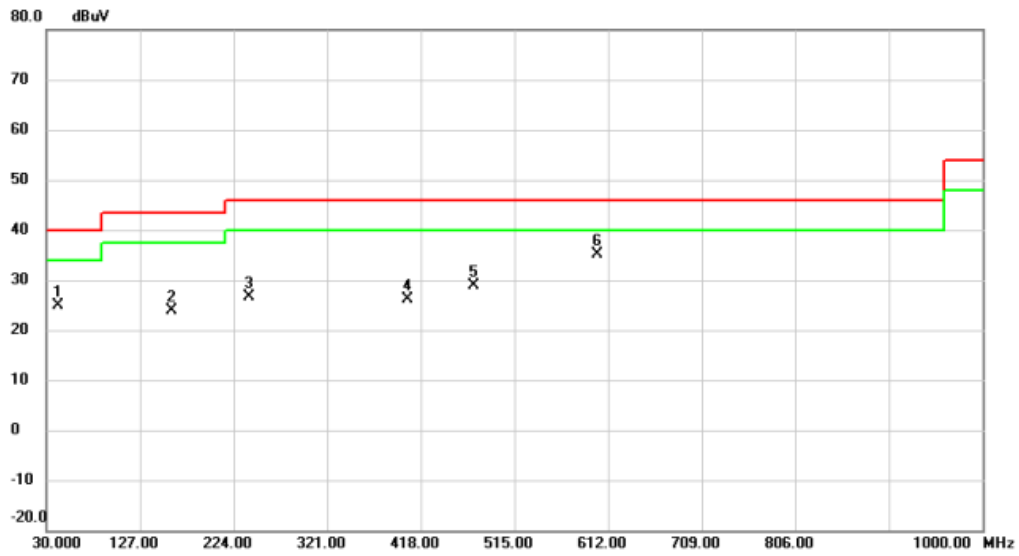
Radiated emission: 9KHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

**APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ**

Test Mode	TX Mode_2Mbps Channel 00	Polarization	Vertical
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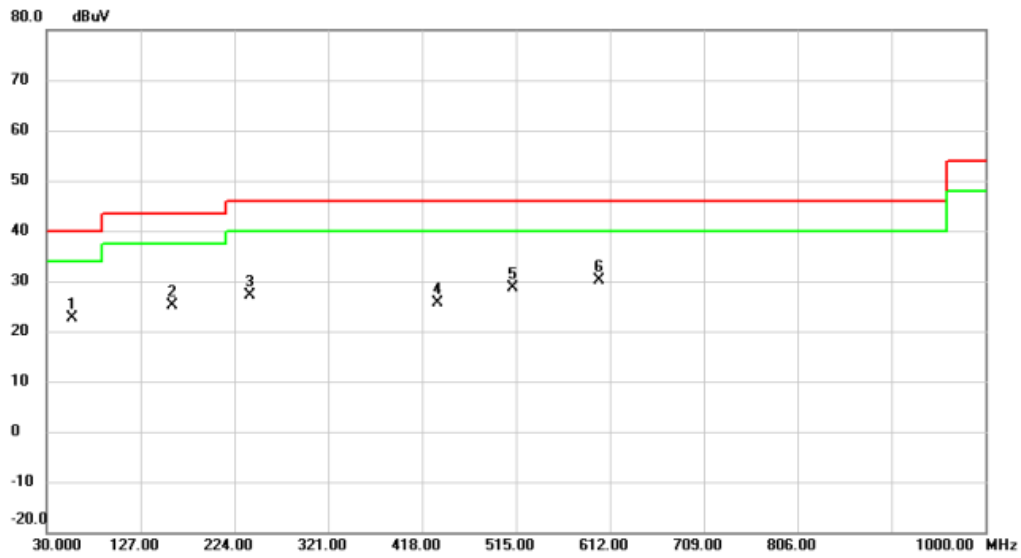
No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	42.610	10.34	14.57	24.91	40.00	-15.09	peak	
2	159.980	8.64	15.23	23.87	43.50	-19.63	peak	
3	239.520	10.34	16.36	26.70	46.00	-19.30	peak	
4	404.420	6.79	19.26	26.05	46.00	-19.95	peak	
5	472.320	8.24	20.75	28.99	46.00	-17.01	peak	
6 *	600.360	11.91	23.21	35.12	46.00	-10.88	peak	

**REMARKS:**

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



Test Mode	TX Mode_2Mbps Channel 00	Polarization	Horizontal
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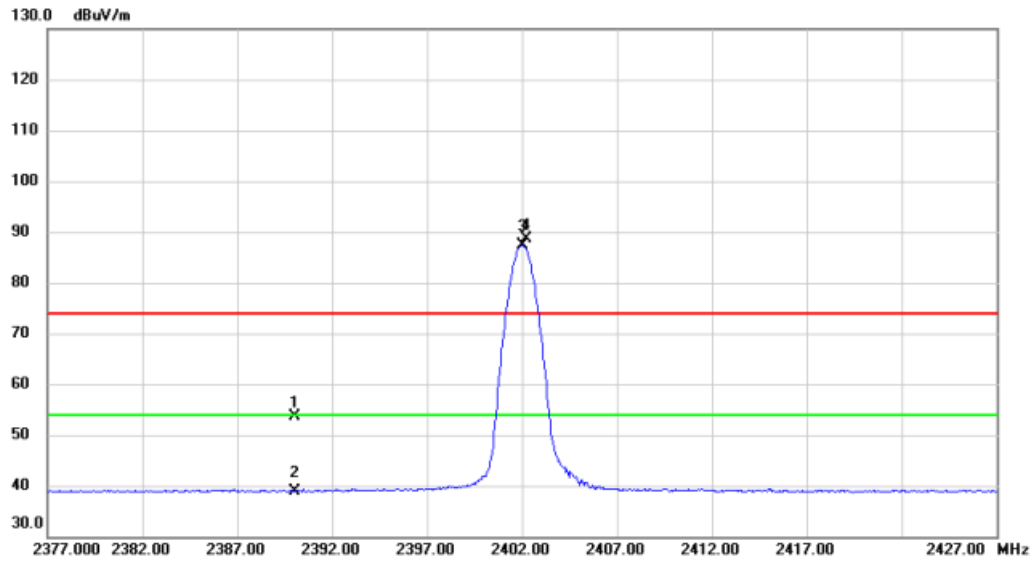
No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	56.190	10.74	11.83	22.57	40.00	-17.43	peak	
2	159.980	11.66	13.37	25.03	43.50	-18.47	peak	
3	239.520	10.82	16.36	27.18	46.00	-18.82	peak	
4	433.520	5.99	19.55	25.54	46.00	-20.46	peak	
5	512.090	7.25	21.49	28.74	46.00	-17.26	peak	
6 *	600.360	7.02	23.21	30.23	46.00	-15.77	peak	

**REMARKS:**

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

**APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ**

Test Mode	TX 2402 MHz _CH00_2Mbps	Polarization	Horizontal
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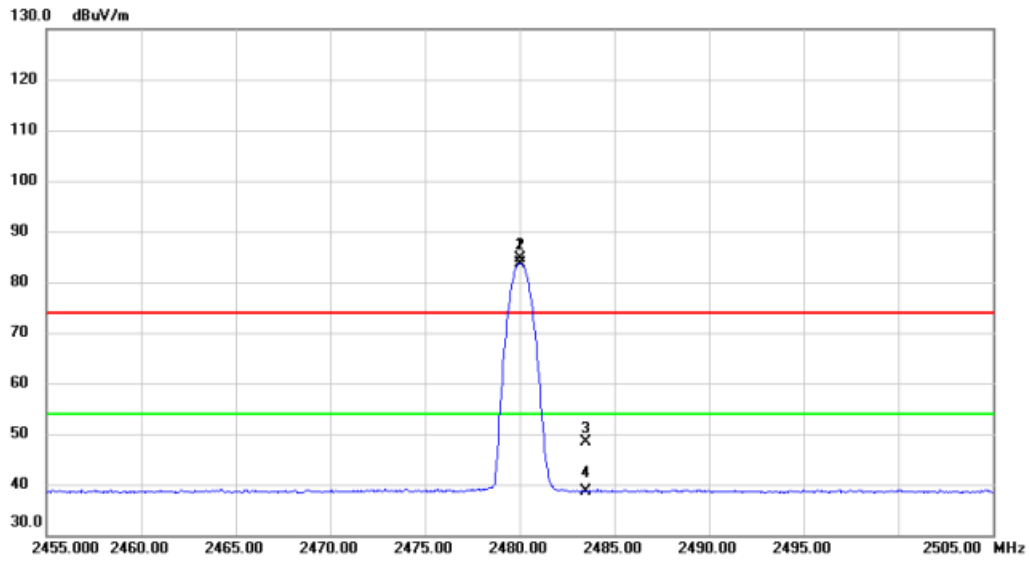


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2390.000	20.88	32.63	53.51	74.00	-20.49	peak	
2		2390.000	6.23	32.63	38.86	54.00	-15.14	AVG	
3	*	2402.000	54.64	32.67	87.31	54.00	33.31	AVG	No Limit
4	X	2402.250	55.85	32.67	88.52	74.00	14.52	peak	No Limit

**REMARKS:**

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

Test Mode	TX 2480 MHz _CH78_2Mbps	Polarization	Horizontal
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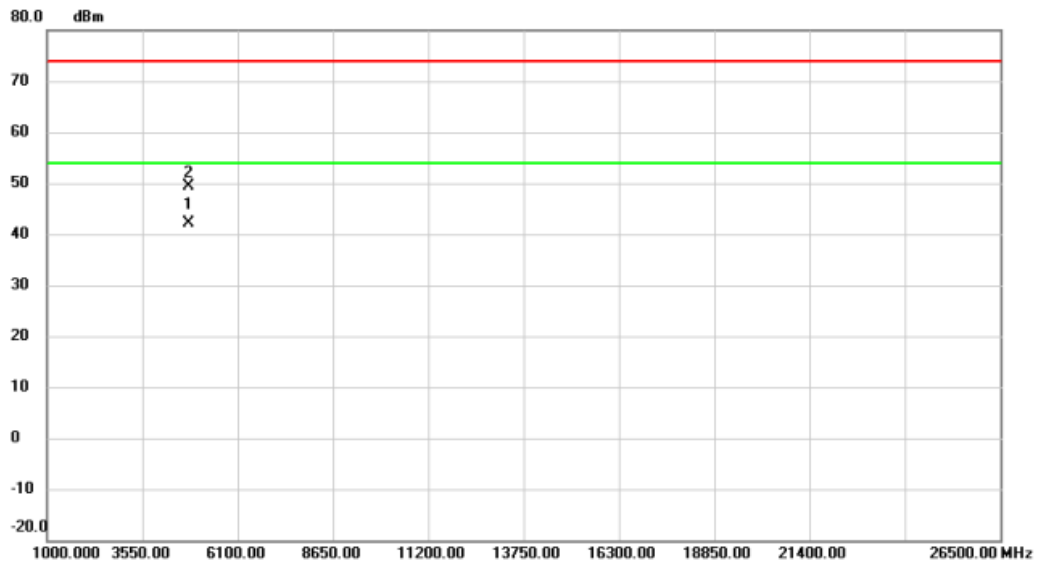


No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1 *	2480.000	50.78	32.96	83.74	54.00	29.74	AVG	No Limit
2 X	2480.050	51.78	32.96	84.74	74.00	10.74	peak	No Limit
3	2483.500	15.33	32.97	48.30	74.00	-25.70	peak	
4	2483.500	5.63	32.97	38.60	54.00	-15.40	AVG	

**REMARKS:**

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

Test Mode	TX 2402 MHz _CH00_2Mbps	Polarization	Vertical
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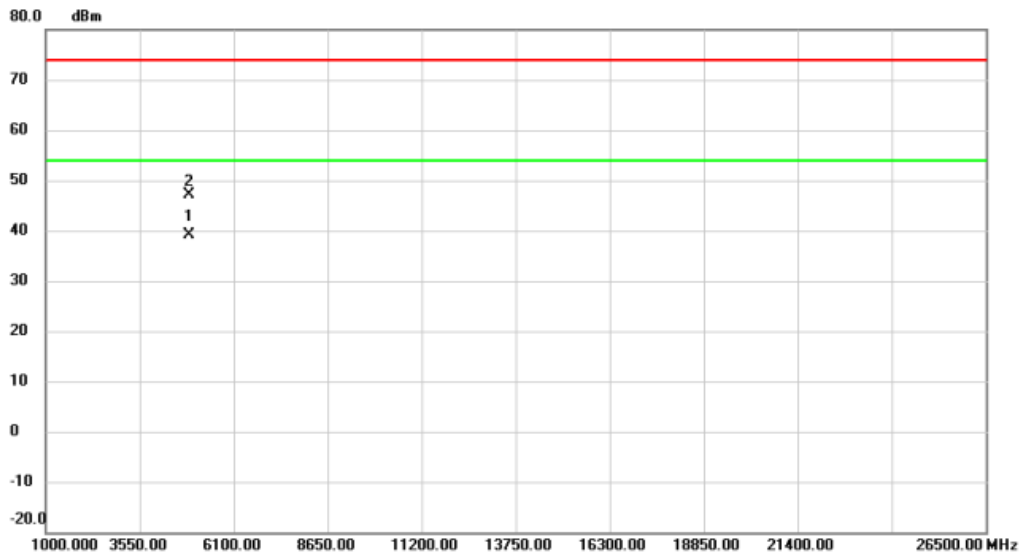


No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Detector	Comment
1 *	4803.865	56.65	-14.49	42.16	54.00	-11.84	AVG	
2	4804.000	63.97	-14.49	49.48	74.00	-24.52	peak	

**REMARKS:**

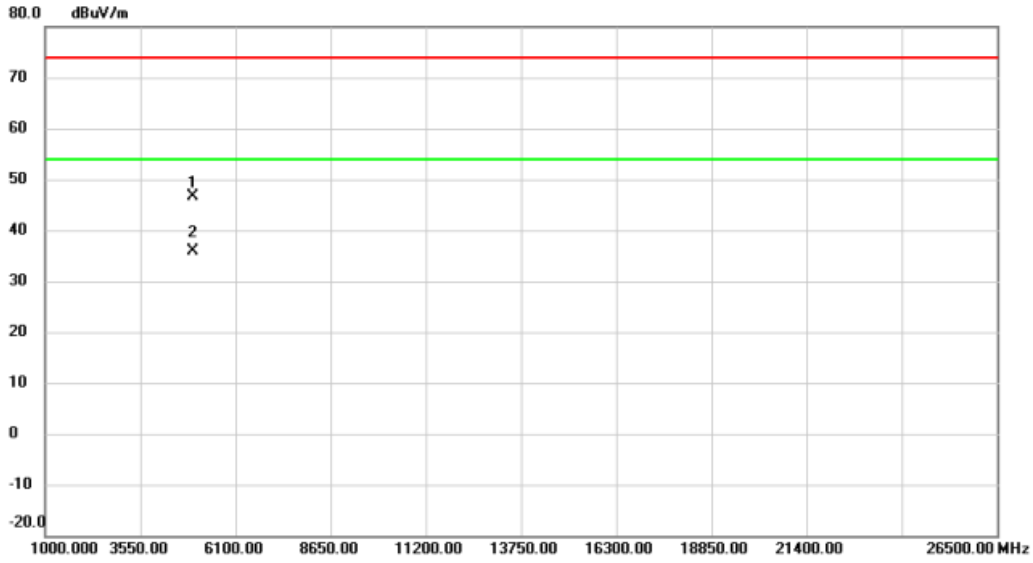
- (1) Measurement Value = Reading Level + Correct Factor.  
 (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 2440MHz _CH39_2Mbps	Polarization	Vertical
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBm	dB	dBm	dBm	dB		
1	*	4879.940	53.24	-14.23	39.01	54.00	-14.99	AVG	
2		4880.555	61.42	-14.23	47.19	74.00	-26.81	peak	

Test Mode	TX 2480 MHz _CH78_2Mbps	Polarization	Vertical
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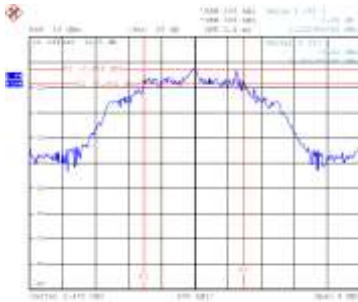
No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	4959.510	60.65	-13.95	46.70	74.00	-27.30	peak	
2 *	4959.980	49.91	-13.95	35.96	54.00	-18.04	AVG	

## APPENDIX E - BANDWIDTH



Test Mode	TX Mode _1Mbps
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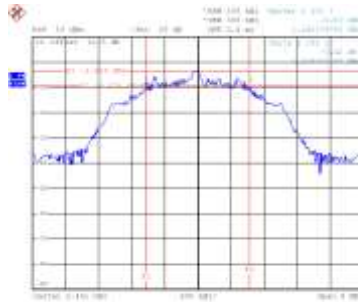
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result
00	2402	1.216	2.048	0.5	Complies
39	2441	1.248	2.056	0.5	Complies
78	2480	1.224	2.048	0.5	Complies

**CH00**


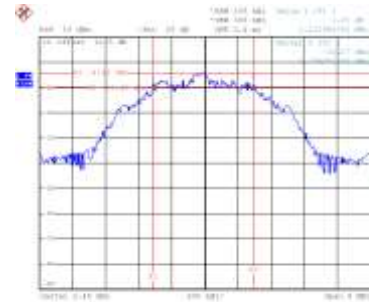
DATA: AT+RBLDSD: 0402200

**CH39**

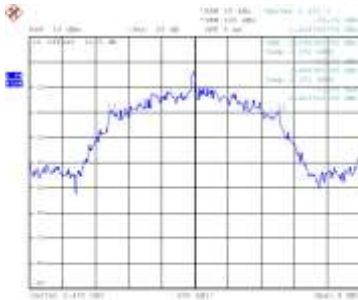
6 dB Bandwidth



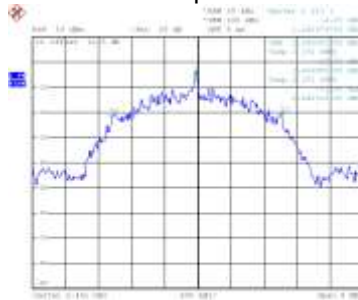
DATA: AT+RBLDSD: 0402200

**CH78**


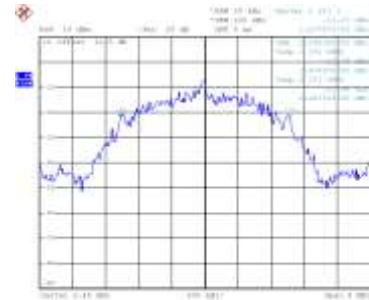
DATA: AT+RBLDSD: 0402200

**99 % Occupied Bandwidth**


DATA: AT+RBLDSD: 0402200



DATA: AT+RBLDSD: 0402200

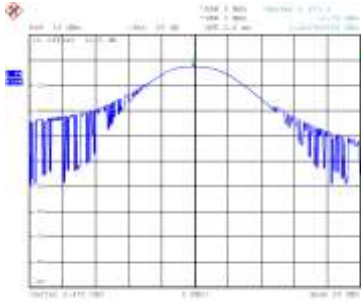


DATA: AT+RBLDSD: 0402200

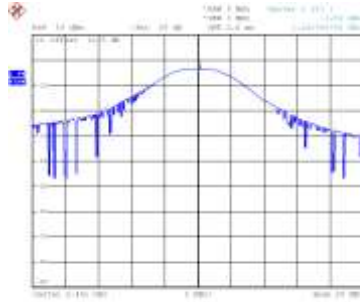
## APPENDIX F - MAXIMUM AVERAGE OUTPUT POWER

Test Mode	TX Mode _2Mbps
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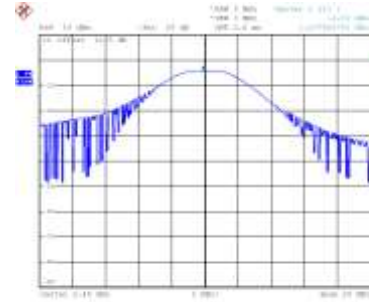
Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2402	-2.76	0.0005	30.00	1.0000	Complies
2441	-3.59	0.0004	30.00	1.0000	Complies
2480	-4.15	0.0004	30.00	1.0000	Complies

**CH00**


Date: 21/06/2022 14:18:18

**CH39**


Date: 21/06/2022 14:22:58

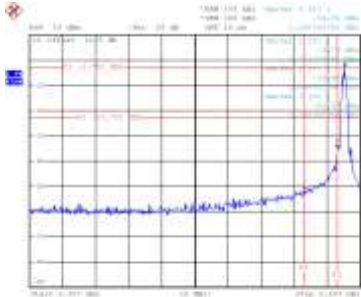
**CH78**


Date: 21/06/2022 14:22:22

## APPENDIX G - CONDUCTED SPURIOUS EMISSIONS

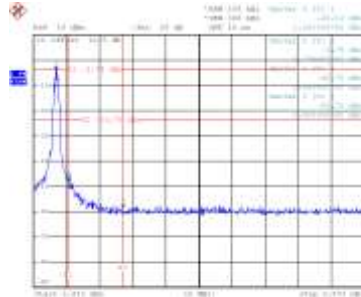
Test Mode TX Mode \_2Mbps

**Bandedge-CH00 (Lower)**



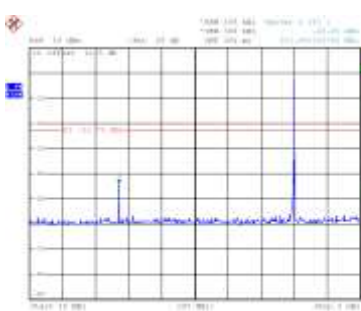
Defin: ET:RSL2020 04822107

**Bandedge-CH78 (Upper)**

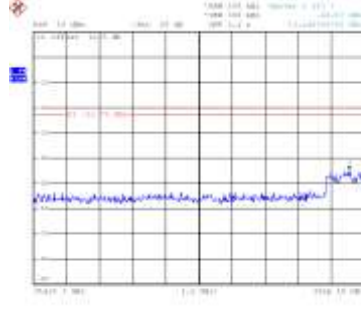


Defin: ET:RSL2020 04822108

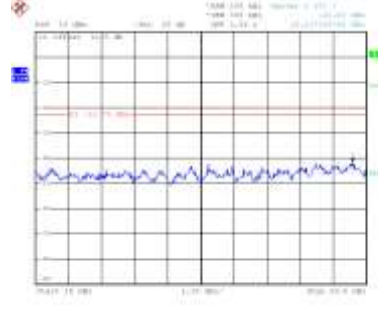
**CH00 – 10th Harmonic of the fundamental frequency**



Defin: ET:RSL2020 04822109

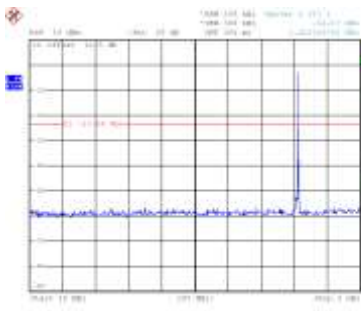


Defin: ET:RSL2020 04822110

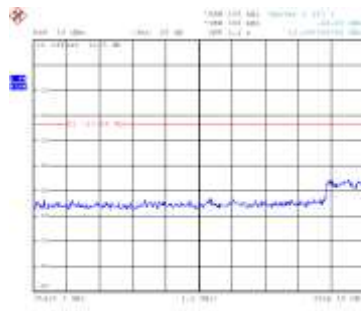


Defin: ET:RSL2020 04822111

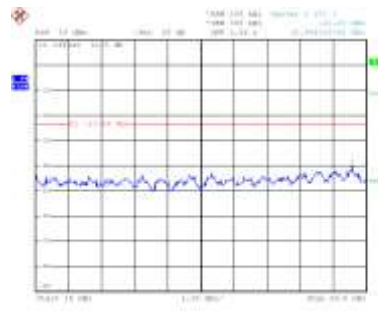
**CH39 – 10th Harmonic of the fundamental frequency**



Defin: ET:RSL2020 04822112

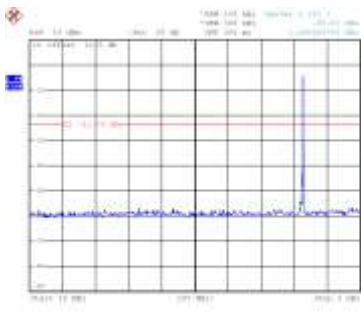


Defin: ET:RSL2020 04822113

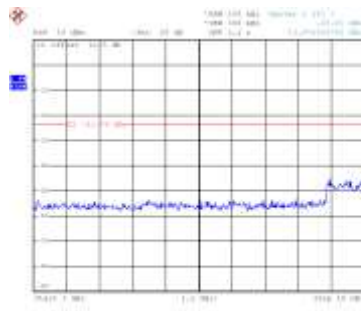


Defin: ET:RSL2020 04822114

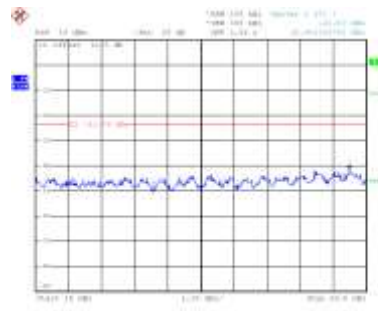
**CH78 – 10th Harmonic of the fundamental frequency**



Defin: ET:RSL2020 04822115



Defin: ET:RSL2020 04822116

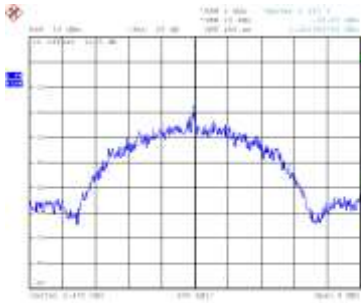


Defin: ET:RSL2020 04822117

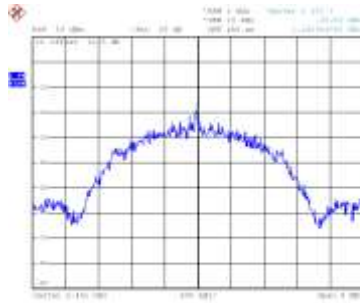
## APPENDIX H - POWER SPECTRAL DENSITY

Test Mode	TX Mode _2Mbps
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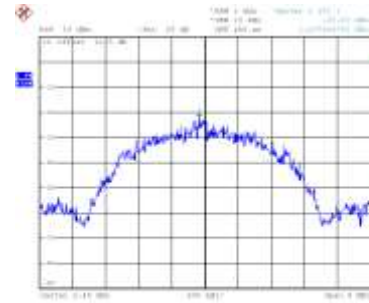
Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
00	2402	-18.87-	8.00	Complies
39	2441	-20.58	8.00	Complies
78	2480	-22.03	8.00	Complies

**CH00**


DATA: XT:06L0000: 04/29/2022

**CH39**


DATA: XT:06L0000: 04/29/2022

**CH78**


DATA: XT:06L0000: 04/29/2022

**End of Test Report**