





# **FCC Radio Test Report**

**FCC ID: RWO-RC810435** 

This report concerns: Original Grant

2406C269 Project No.

: Head Cushion Speaker Equipment

**Brand Name** : RAZER Test Model : RC81-0435

: RC81-0435XXXX-XXXX(X can be 0-9 or A-Z) Series Model

: Razer Inc. Applicant

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Date of Receipt : Jul. 18, 2024

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Issued Date : Apr. 10, 2025

Report Version : R01

: Sample No.: DG2024071821 for conducted, DG2024073175 for others. Test Sample

Standard(s) : FCC CFR Title 47, Part 15, Subpart C

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

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#### Declaration

**B**TL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL**'s reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government.

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**BTL**'s laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

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

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

#### Limitation

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



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# **REPORT ISSUED HISTORY**

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-2-2406C269	R00	Original Report.	Sep. 13, 2024	Invalid
BTL-FCCP-2-2406C269	R01	Only updated the address of applicant.	Apr. 10, 2025	Valid



## 1. APPLICABLE STANDARDS

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of A2LA: KDB 558074 D01 15.247 Meas Guidance v05r02

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C				
Standard(s) Section	Test Item	Test Result	Judgment	Remark
15.207	AC Power Line Conducted Emissions	APPENDIX A	PASS	
15.247(d) 15.205(a) 15.209(a)	Radiated Emissions	APPENDIX B APPENDIX C APPENDIX D	PASS	
15.247(a)(2)	Bandwidth	APPENDIX E	PASS	
15.247(b)(3)	Maximum Output Power	APPENDIX F	PASS	
15.247(d)	Conducted Spurious Emission	APPENDIX G	PASS	
15.247(e)	Power Spectral Density	APPENDIX H	PASS	
15.203	Antenna Requirement		PASS	Note(2)

#### Note:

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



#### 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of 1-2/F, 4/F, Building A, 1-2/F, Building B, 3/F, Building C, No.3, Jinshagang 1st Road, Dalang Town, Dongguan City, Guangdong People's Republic of China.

BTL's Registration Number for FCC: 747969 BTL's Designation Number for FCC: CN1377

## 2.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95.45% confidence level (based on a coverage factor (k=2))

The BTL measurement uncertainty as below table:

## A. AC power line conducted emissions Measurement:

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

#### B. Radiated emissions Measurement:

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB01	CISPR	9kHz ~ 30MHz	2.70

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m) CISF	CISPR	30MHz ~ 200MHz	V	4.40
		30MHz ~ 200MHz	Н	3.62
		200MHz ~ 1,000MHz	V	4.58
		200MHz ~ 1,000MHz	Н	3.98

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03	CICDD	1GHz ~ 6GHz	4.08
(3m)	CISPR	6GHz ~ 18GHz	4.62

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



## C. Other Measurement:

Test Item	Uncertainty
Bandwidth	0.90 %
Maximum Output Power	1.3 dB
Conducted Spurious Emission	1.9 dB
Power Spectral Density	1.4 dB
Temperature	0.8 °C
Humidity	2.2 %

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

## 2.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By	Test Date
AC Power Line Conducted Emissions	25°C	50%	AC 120V/60Hz	Hayden Chen	Aug. 01, 2024
Radiated Emissions-9 kHz to 30 MHz	25°C	51%	DC 5V	Hayden Chen	Aug. 01, 2024
Radiated Emissions-30 MHz to 1000 MHz	25°C	53%	DC 5V	Jensen Zhou	Jul. 25, 2024
Dedicted Emissions Above	25°C	53%	DC 5V	Jensen Zhou	Aug. 01, 2024
Radiated Emissions-Above 1000 MHz	24°C	55%	DC 5V	Chen Mo	Aug. 07, 2024
1000 WII 12	24°C	55%	DC 5V	Jensen Zhou	Aug. 24, 2024
Bandwidth	21-22°C	48-53%	DC 5V	Steve Zhou	Jul. 29, 2024~ Aug. 22, 2024
Maximum Output Power	21-22°C	48-53%	DC 5V	Steve Zhou	Jul. 29, 2024~ Aug. 22, 2024
Conducted Spurious Emission	21-22°C	48-53%	DC 5V	Steve Zhou	Jul. 29, 2024~ Aug. 22, 2024
Power Spectral Density	21-22°C	48-53%	DC 5V	Steve Zhou	Jul. 29, 2024~ Aug. 22, 2024



## 3. GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Head Cushion Speaker	
Brand Name	RAZER	
Test Model	RC81-0435	
Series Model	RC81-0435XXXX-XXXX(X can be 0-9 or A-Z)	
Model Difference(s)	Only differ in the model name.	
Software Version	V1.0.0.2	
Hardware Version	EVT	
Power Source	1# Supplied from Type-C port. 2# Battery supplied. Model: INR18650	
Power Rating	1# 5V=== 3A 2# DC 3.7V 5400mAh 19.98Wh	
Operation Frequency	2402 MHz ~ 2480 MHz	
Modulation Type	GFSK	
Bit Rate of Transmitter	1Mbps, 2Mbps	
Max. Output Power	2Mbps: 10.42 dBm (0.0110 W)	

#### Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- 2. The system model number is RC81-0435XXXX-XXXX. This system consists of Head Cushion Speaker (Model: RC81-0435) and WIRELESS DONGLE (Model: RC30-0435), X can be 0-9 or A-Z.



# 3. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

## 4. Table for Filed Antenna:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	нек	20240314002	PCB	N/A	2.02



#### 3.2 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description		
Mode 1	TX Mode_1Mbps Channel 00/19/39		
Mode 2	TX Mode_2Mbps Channel 00/19/39		
Mode 3	TX Mode_2Mbps Channel 00		

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 3	TX Mode_2Mbps Channel 00		

Radiated emissions test - Below 1GHz			
Final Test Mode Description			
Mode 3	TX Mode_2Mbps Channel 00		

Radiated emissions test - Above 1GHz			
Final Test Mode Description			
Mode 1	TX Mode_1Mbps Channel 00/19/39		
Mode 2	TX Mode_2Mbps Channel 00/19/39		

Conducted test			
Final Test Mode Description			
Mode 1	TX Mode_1Mbps Channel 00/19/39		
Mode 2	TX Mode_2Mbps Channel 00/19/39		

#### Note:

- (1) For radiated emission above 1 GHz test, the spurious points of 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.
- (2) For AC power line conducted emissions and radiated emissions below 1 GHz test, the 2Mbps Channel 00 is found to be the worst case and recorded.
- (3) For radiated emission Harmonic 18-26.5GHz test, only tested the worst case and recorded.
- (4) For radiated emission of above 1GHz of Band edge, the Vertical antennas and Horizontal antennas are evaluated, the worst case is Vertical antennas and recorded.
- (5) For radiated emission of above 1GHz of Harmonic, the Vertical antennas and Horizontal antennas are evaluated, the worst case is Horizontal antennas and recorded.



## 3.3 PARAMETERS OF TEST SOFTWARE

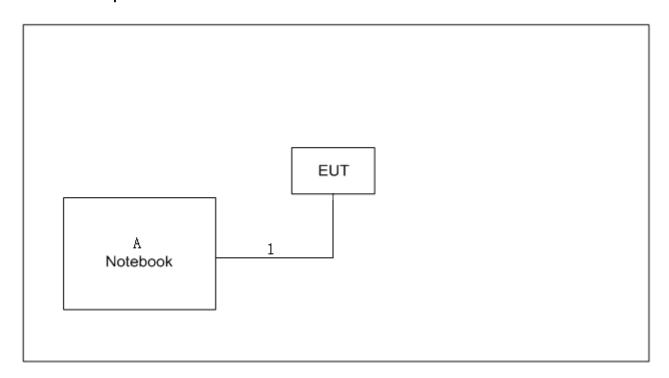
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test Software Version	ATS303X_FCC_V1.0		′1.0
Frequency (MHz)	2402	2440	2480
1Mbps	3	3	3
2Mbps	3	3	3

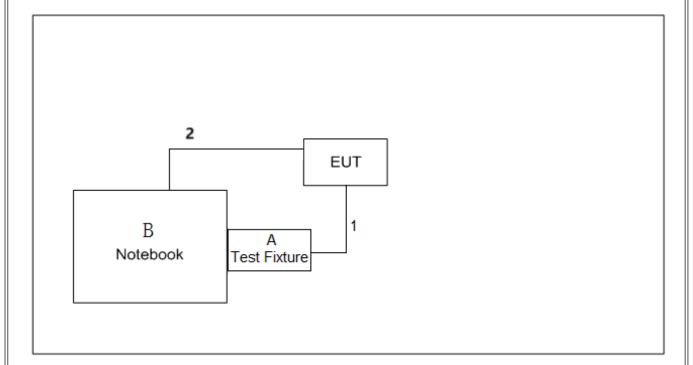


## 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

For AC power line conducted emissions test and Radiated Emissions-Below 1000 MHz



## For Radiated Emissions Above 1000 MHz





## 3.5 SUPPORT UNITS

## For AC power line conducted emissions test and Radiated Emissions-Below 1000 MHz

Item	Equipment	Brand	Model No.	Series No.
Α	Notebook	HUAWEI	WFH9	N/A
Item	Cable Type	Shielded Type	Ferrite Core	Length
1	LISB Cable	NO	NO	1 0m

#### For Radiated Emissions-Above 1000 MHz

Item	Equipment	Brand	Model No.	Series No.
Α	Test Fixture	N/A	N/A	N/A
В	Notebook	HUAWEI	magicBook2019	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	Data Cable	NO	NO	0.2m
2	USB Cable	NO	NO	1.0m

## 3.6 CUSTOMER INFORMATION DESCRIPTION

- 1) The antenna gain is provided by the manufacturer.
- 2) Except for AC power line conducted emissions and radiated emissions, the results of all test items include cable losses. Part of the cable losses (0.5dB) are provided by the manufacturer, while the other parts of the cable losses are provided by the testing laboratory.



#### 4. AC POWER LINE CONDUCTED EMISSIONS

#### **4.1 LIMIT**

Frequency of Emission (MHz)	Limit (dl	ΒμV)
	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:

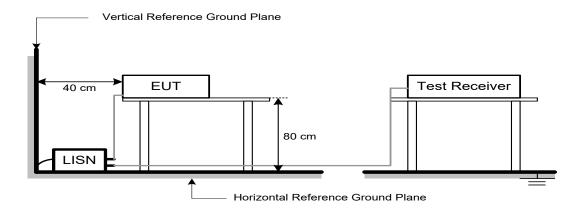
Receiver Parameters	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

#### 4.3 DEVIATION FROM TEST STANDARD

No deviation.



#### 4.4 TEST SETUP



## 4.5 EUT OPERATING CONDITIONS

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

#### 4.6 TEST RESULTS

Please refer to the APPENDIX A.

#### Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of <code>Note</code>. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " \* " marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150 kHz to 30 MHz.





#### 5. RADIATED EMISSIONS

#### **5.1 LIMIT**

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

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

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

## LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

Frequency (MHz)	Band edge/ Harmonic at 3m (dBµV/m)		Harmonic at	1m (dBµV/m)
r requestion (initiz)	Peak	Average	Peak	Average
Above 1000	74	54	83.5 (Note 4)	63.5 (Note 4)

#### Note:

- (1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

(4)

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

20log (d<sub>limit</sub>/d<sub>measure</sub>)=20log (3/1)=9.5 dB.

FS<sub>limit</sub>: Harmonic at 3m Peak and Average limit.

FS<sub>max</sub>: Harmonic at 1m Peak and Average Maximum value.

d<sub>limit</sub>: Harmonic at 3m test distance. d<sub>measure</sub>: Harmonic Actual test distance.



#### **5.2 TEST PROCEDURE**

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

The following table is the setting of the receiver:

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

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

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

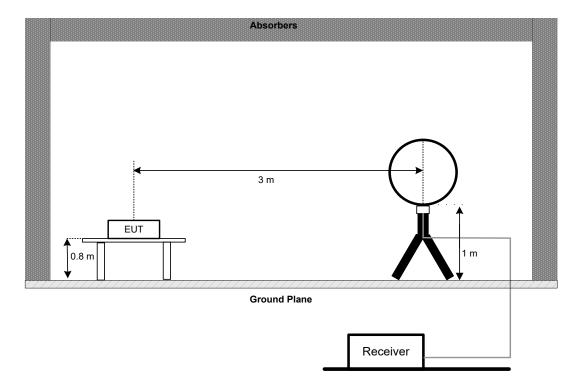


## **5.3 DEVIATION FROM TEST STANDARD**

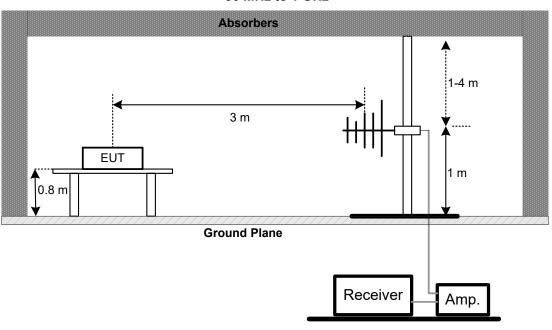
No deviation.

## **5.4 TEST SETUP**

## 9 kHz to 30 MHz

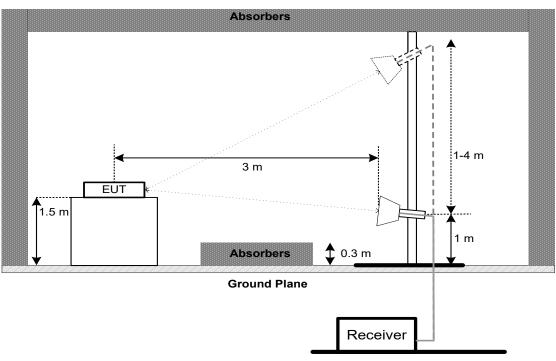


30 MHz to 1 GHz

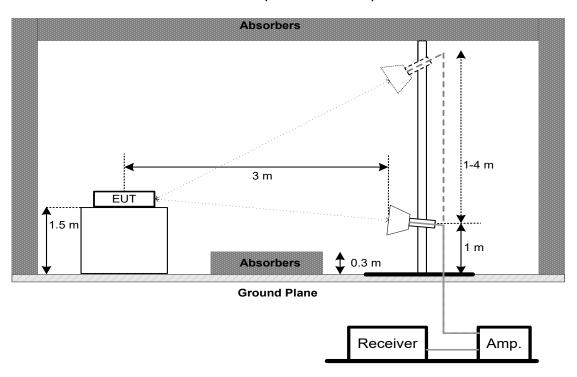






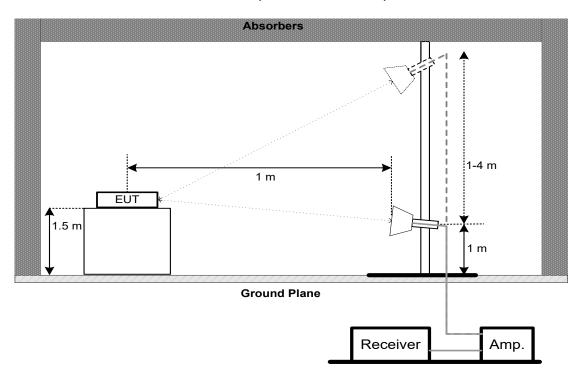


# Harmonic(1 GHz to 18 GHz)





#### Harmonic(18 GHz to 26.5 GHz)



## 5.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 5.6 TEST RESULT - 9 kHz TO 30 MHz

Please refer to the APPENDIX B.

#### Remark:

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

## 5.7 TEST RESULT - 30 MHz TO 1000 MHz

Please refer to the APPENDIX C.

## 5.8 TEST RESULT - ABOVE 1000 MHz

Please refer to the APPENDIX D.

#### Remark:

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



## 6. BANDWIDTH

## **6.1 LIMIT**

Section	Test Item	Limit
500 (5045( )(0)	6 dB Bandwidth	>= 500 kHz
FCC 15.247(a)(2)	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:

O 3370 Emission Dandwidt		
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	

#### **6.3 DEVIATION FROM STANDARD**

No deviation.

## **6.4 TEST SETUP**



## **6.5 EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

## **6.6 TEST RESULTS**

Please refer to the APPENDIX E.



## 7. MAXIMUM OUTPUT POWER

## **7.1 LIMIT**

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

## 7.2 TEST PROCEDURE

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

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

## 7.3 DEVIATION FROM STANDARD

No deviation.

## 7.4 TEST SETUP



## 7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 7.6 TEST RESULTS

Please refer to the APPENDIX F.



#### 8. CONDUCTED SPURIOUS EMISSION

#### **8.1 LIMIT**

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

#### **8.2 TEST PROCEDURE**

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

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

#### 8.3 DEVIATION FROM STANDARD

No deviation.

#### **8.4 TEST SETUP**



## **8.5 EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

## 8.6 TEST RESULTS

Please refer to the APPENDIX G.



## 9. POWER SPECTRAL DENSITY

## **9.1 LIMIT**

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

## 9.2 TEST PROCEDURE

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

Spectrum Parameters	Setting
Span Frequency	2 MHz (1 Mbps)
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	I RXS I ESCI I		100382	Dec. 22, 2024				
2	TWO-LINE V-NETWORK	R&S	ENV216	101447	Dec. 22, 2024				
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A				
4	Cable	N/A	SFT205-NMNM-9M -001	9M	Nov. 27, 2024				
5	643 Shield Room	ETS	6*4*3	N/A	N/A				

	Radiated Emissions - 9 kHz to 30 MHz								
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until				
1	Active Loop Antenna	Schwarzbeck	FMZB 1513-60B	1513-60 B-034	Mar. 30, 2025				
2	MXE EMI Receiver	Keysight	N9038A	MY56400091	Dec. 22, 2024				
3	Cable	N/A	RW2350-3.8A-NMB M-1.5M	N/A	Jun. 09, 2025				
4	Cable	N/A	RG 213/U	N/A	Jun. 09, 2025				
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A				
6	966 Chamber room	ETS	9*6*6	N/A	May 16, 2025				

	Radiated Emissions - 30 MHz to 1 GHz								
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until				
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	1462	Dec. 13, 2024				
2	Attenuator	EMC INSTRUMENT	EMCI-N-6-06	AT-06009	Dec. 13, 2024				
3	Preamplifier	EMC INSTRUMENT	EMC001330	980998	Nov. 17, 2024				
4	Cable	ble RegalWay LMR400-NMNM-12 .5m		N/A	Jun. 06, 2025				
5	Cable	RegalWay	LMR400-NMNM-3 m	N/A	Jun. 06, 2025				
6	Cable	RegalWay	LMR400-NMNM-0. 5m	N/A	Jun. 06, 2025				
7	Receiver	Agilent	N9038A	MY52130039	Dec. 22, 2024				
8	Positioning Controller	MF	MF-7802	N/A	N/A				
9	Measurement Software	Farad   ————		N/A	N/A				
10	966 Chamber room	CM	9*6*6	N/A	May 16,2025				



		Radiated E	missions - Above 1	GHz	
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	MXA Signal Analyzer	KEYSIGHT	N9020B	MY63380204	Nov. 17, 2024
2	Receiver	Agilent	N9038A	MY52130039	Dec. 22, 2024
3	Preamplifier	EMC INSTRUMENT	EMC118A45SE	980888	Nov. 17, 2024
4	EXA Spectrum Analyzer	Keysight	N9010A	MY55150209	May 31, 2025
5	Double Ridged Guide Antenna	ETS	3115	75789	Jun. 15, 2025
6	Cable	RegalWay	RWLP50-4.0A-SMS M-12.5M	N/A	Jul. 03, 2025
7	Cable	RegalWay	RWLP50-4.0A-NM RASM-2.5M	N/A	Jul. 03, 2025
8	Cable	RegalWay	RWLP50-4.0A-NM RASMRA-0.8M	N/A	Jul. 03, 2025
9	Low Noise Amplifier	oise Amplifier CONNPHY CLN-18G40G-4330		619413	Jul. 17, 2025
10	Cable	RegalWay	RWLP50-2.6A-2.92 M2.92M-1.1M	N/A	Jul. 25, 2025
11	Cable	Tonscend	HF160-KMKM-3M	N/A	Jul. 25, 2025
12	Broad-Band Horn Antenna	Schwarzbeck	Schwarzbeck BBHA9170(3m)		Jun.16, 2025
13	966 Chamber room	CM	9*6*6	N/A	May 19, 2025
14	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A
15	Filter	STI	STI15-9912	N/A	May 31, 2025
16	Positioning Controller	MF	MF-7802	N/A	N/A
17	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

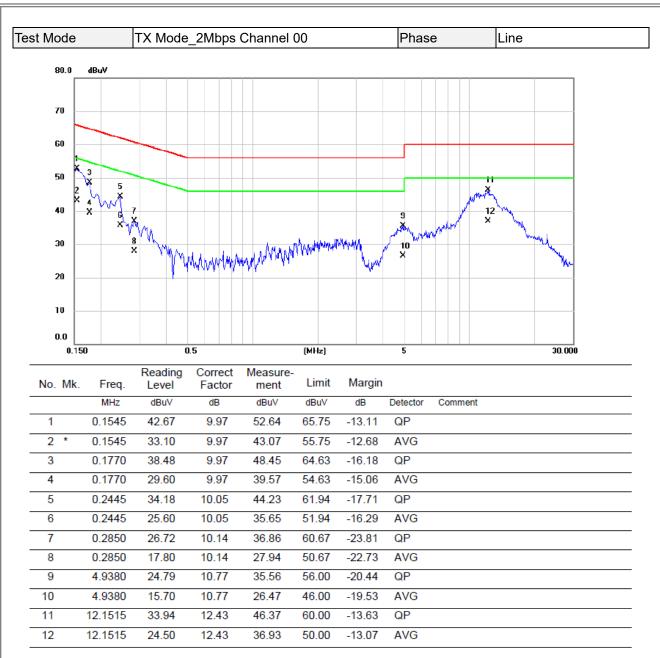
Bandwidth & Maximum Output Power & Power Spectral Density & Conducted Spurious Emission								
Item	Item Kind of Equipment Manufacturer Type No. Serial No. Calibrated until							
1	Spectrum Analyzer	R&S	FSP38	100852	May 31, 2025			
2	2 Measurement BTL BTL Conducted N/A N/A N/A							
3	Isolation attenuator	Z-Link	ASMA-16-18-2W	N/A	N/A			

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



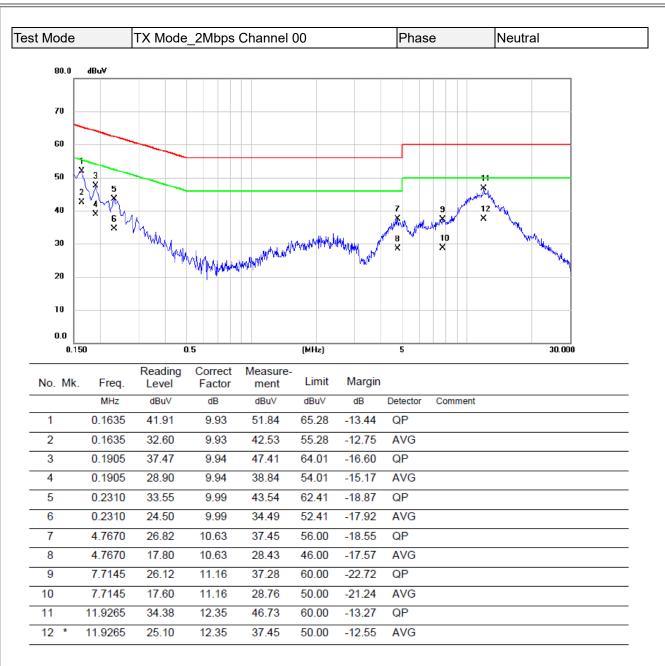
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS	





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



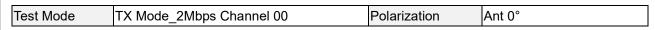


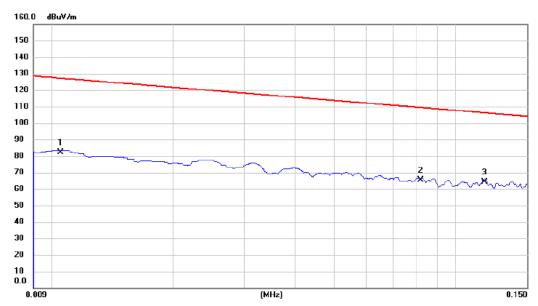
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ





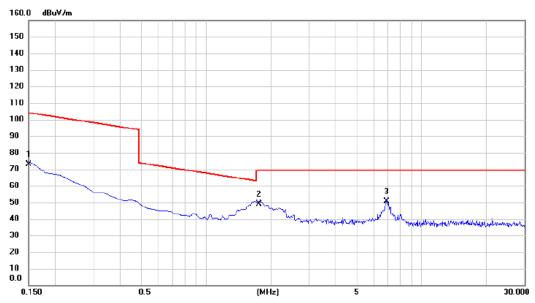


No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0105	61.51	20.52	82.03	127.18	-45.15	AVG	
2	0.0817	44.25	21.30	65.55	109.36	-43.81	AVG	
3 *	0.1178	42.84	21.30	64.14	106.18	-42.04	QP	

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



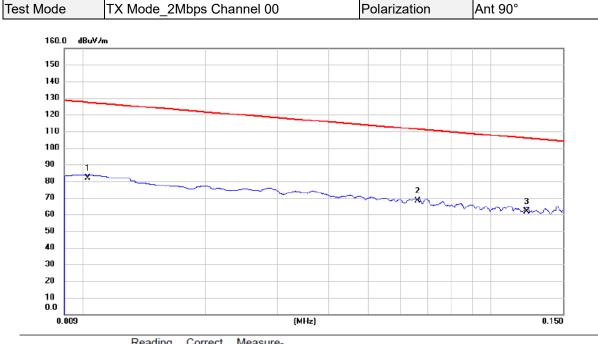




No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.1500	51.74	21.27	73.01	104.09	-31.08	AVG	
2	1.7620	28.05	21.12	49.17	69.54	-20.37	QP	
3 *	6.8662	29.34	21.19	50.53	69.54	-19.01	QP	

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

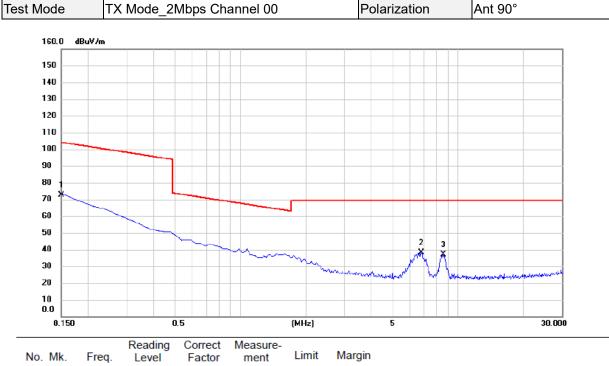




No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0103	61.27	20.51	81.78	127.35	-45.57	AVG	
2 *	0.0660	46.82	21.25	68.07	111.21	-43.14	AVG	
3	0.1224	40.65	21.30	61.95	105.85	-43.90	QP	

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





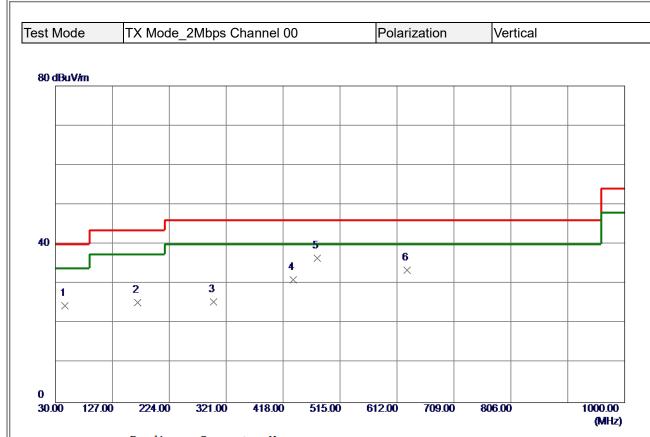
1 0.1500 51.37 21.27 72.64 104.09 -31.45 AVG 2 * 6.7766 16.94 21.19 38.13 69.54 -31.41 QP 3 8.5677 15.82 21.23 37.05 69.54 -32.49 QP		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
2 0.7700 10.07 21.10 00.10 00.07 01.11 01	1	0.1500	51.37	21.27	72.64	104.09	-31.45	AVG	
3 8.5677 15.82 21.23 37.05 69.54 -32.49 QP	2 *	6.7766	16.94	21.19	38.13	69.54	-31.41	QP	
	3	8.5677	15.82	21.23	37.05	69.54	-32.49	QP	

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



APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ



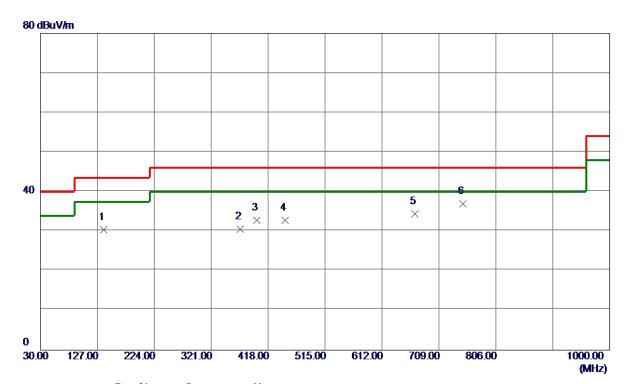


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	46. 4900	35. 79	-11. 30	24. 49	40.00	-15. 51	Peak	
2	169. 6799	36. 49	-11. 24	25. 25	43. 50	-18.25	Peak	
3	299. 1750	36. 00	-10. 60	25. 40	46.00	-20. 60	Peak	
4	434. 9750	38. 26	-7. 16	31. 10	46.00	-14. 90	Peak	
5 *	476. 2000	42.88	-6. 38	36. 50	46.00	-9. 50	Peak	
6	629. 4600	36. 64	-3. 14	33. 50	46.00	-12. 50	Peak	

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







No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	138. 1550	42. 26	-11.82	30. 44	43. 50	-13. 06	Peak	
2	370. 9549	39. 51	<b>-8. 95</b>	30. 56	46.00	-15. 44	Peak	
3	398. 6000	40. 90	-8. 07	32. 83	46.00	-13. 17	Peak	
4	447. 1000	39. 71	-6. 85	32. 86	46.00	-13. 14	Peak	
5	667. 7750	36. 97	-2. 64	34. 33	46.00	-11. 67	Peak	
6 *	750. 2250	38. 07	-1. 06	37. 01	46.00	-8. 99	Peak	

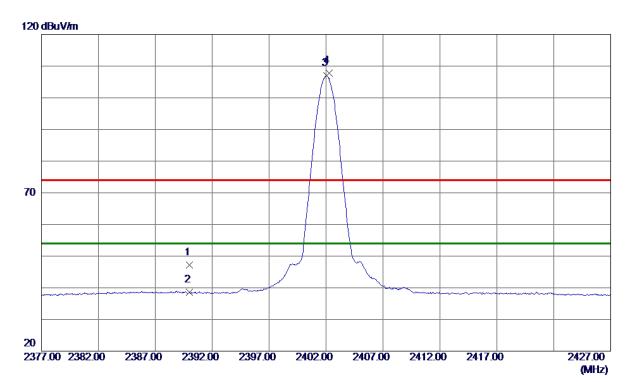
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ	



Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Vertical

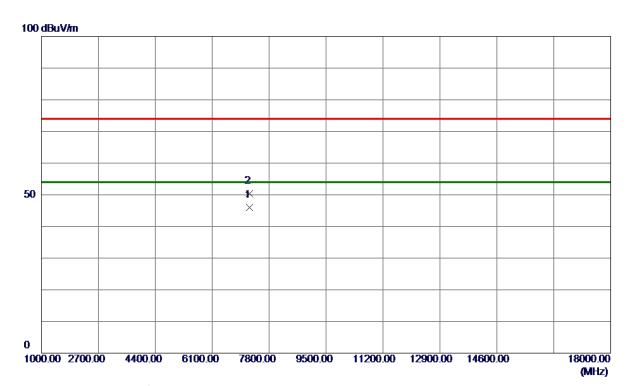


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390. 0000	39. 50	7. 70	47. 20	74.00	-26. 80	Peak	
2	2390. 0000	30. 84	7. 70	38. 54	54.00	-15. 46	AVG	
3 *	2402. 0500	99. 21	7. 71	106. 92	54.00	52. 92	AVG	No Limit
4	2402. 2500	100. 08	7. 71	107. 79	74. 00	33. 79	Peak	No Limit

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



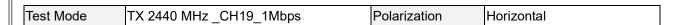
Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Horizontal

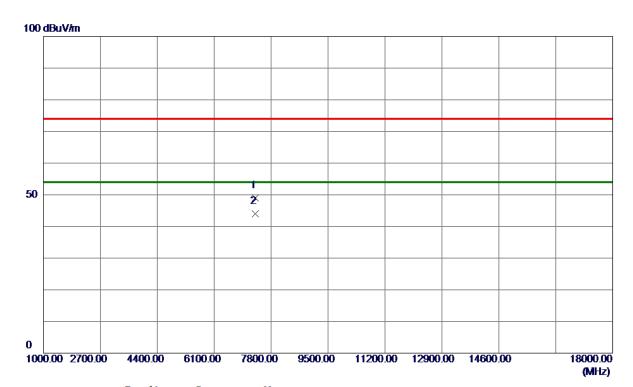


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7205. 9900	37. 75	8. 30	46. 05	54.00	-7. 95	AVG	
2	7206. 2200	42. 12	8. 30	<b>50.4</b> 2	74.00	-23. 58	Peak	

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



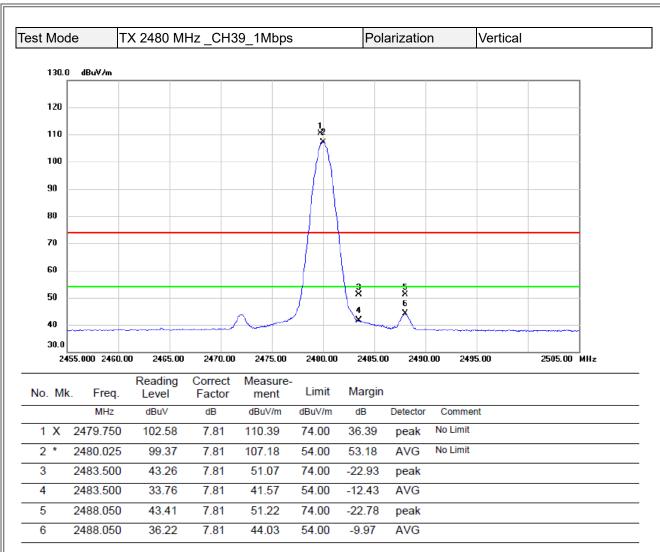




No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7319. 9000	40. 69	8. 31	49.00	74.00	-25.00	Peak	
2 *	7320. 0600	35. 60	8. 31	43. 91	54.00	-10. 09	AVG	

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

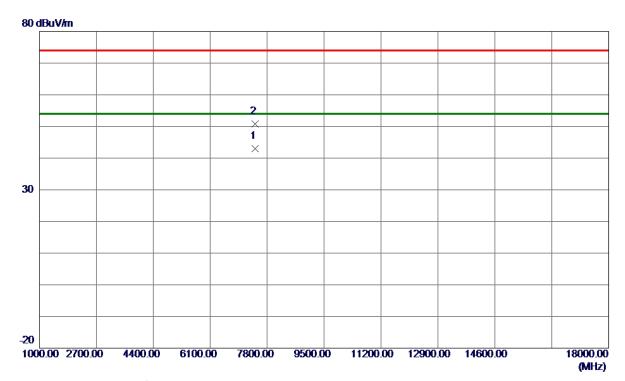




- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



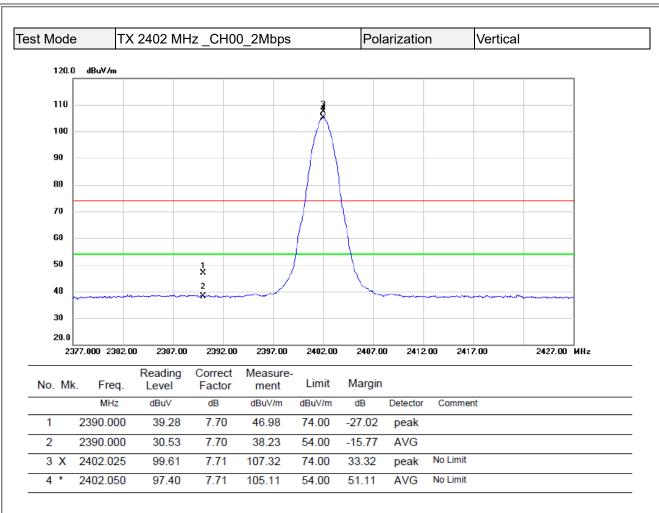
Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7439. 9250	34. 76	8. 32	43.08	54.00	-10. 92	AVG	
2	7440. 1000	42. 53	8. 32	50. 85	74.00	-23. 15	Peak	

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

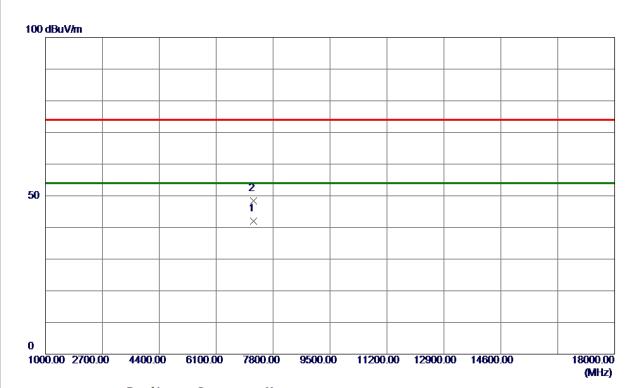




- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



Test Mode	TX 2402 MHz CH00 2Mb	ps Polarization	Horizontal

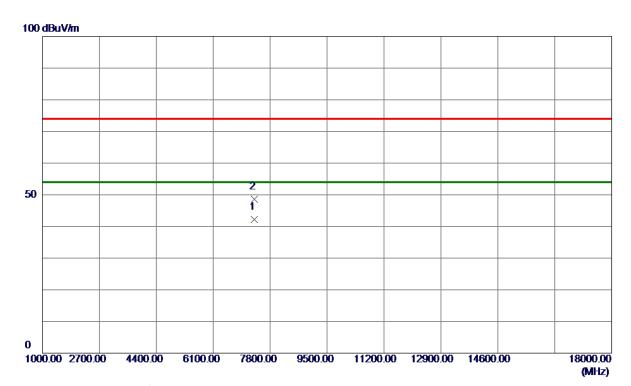


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7206. 0300	33. 70	8. 30	42.00	54.00	-12.00	AVG	
2	7206. 4300	40. 09	8. 30	48. 39	74.00	-25. 61	Peak	

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



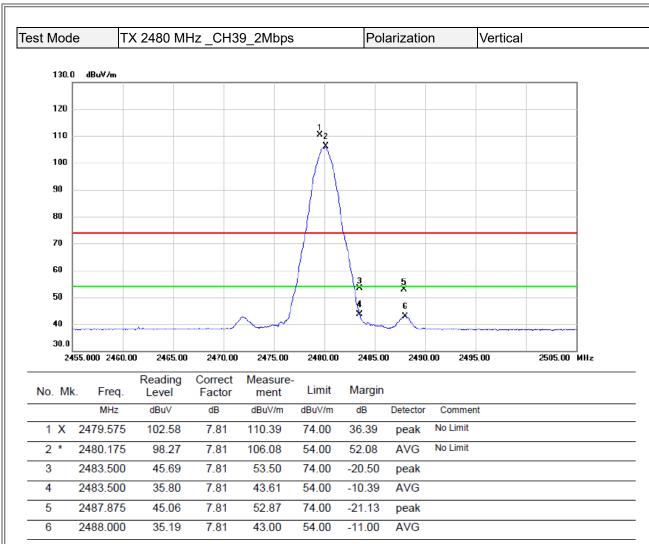
Test Mode	TX 2440 MHz CH19 2Mbp	os Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7320. 1100	33. 91	8. 31	42. 22	<b>54.00</b>	-11. 78	AVG	
2	7320. 5400	40. 25	8. 31	48. 56	74.00	-25. 44	Peak	

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

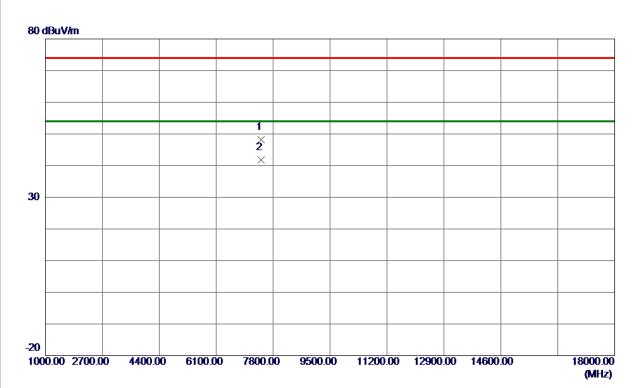




- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



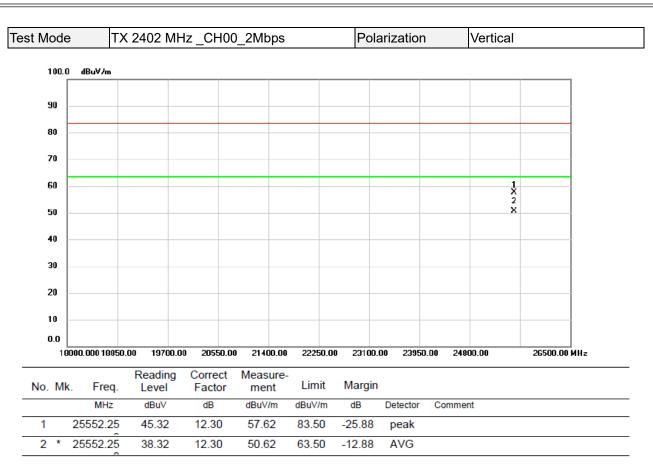
Test Mode	TX 2480 MHz	CH39 2Mbps	Р	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7440. 0250	39. 89	8. 32	48. 21	74.00	-25. 79	Peak	
2 *	7440. 0250	33. 50	8. 32	41.82	54.00	-12. 18	AVG	

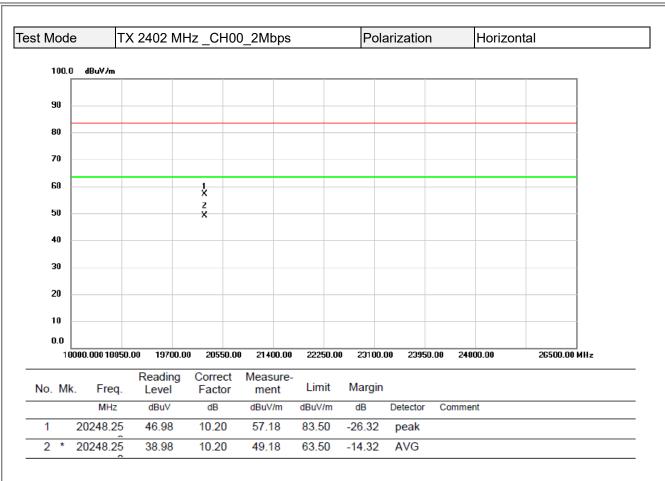
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





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





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

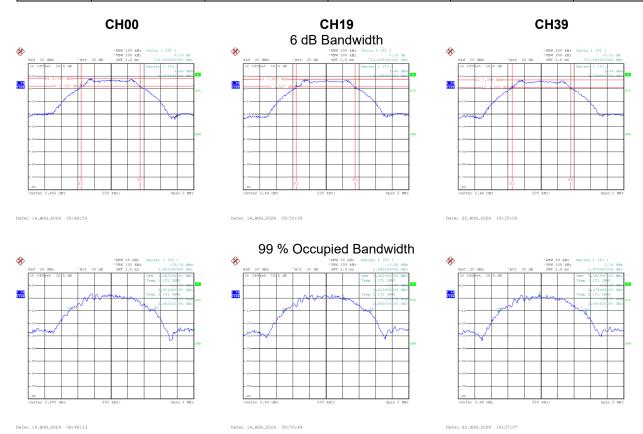


APPENDIX E - BANDWIDTH



Test Mode TX Mode _1Mbp
-------------------------

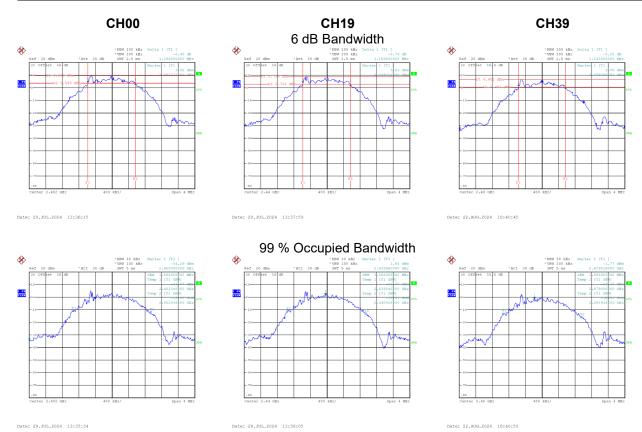
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	0.714	1.052	0.5	Pass
19	2440	0.714	1.052	0.5	Pass
39	2480	0.712	1.052	0.5	Pass





Test Mode TX Mode \_2Mbps

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	1.154	1.888	0.5	Pass
19	2440	1.160	1.888	0.5	Pass
39	2480	1.144	1.888	0.5	Pass





APPENDIX F - MAXIMUM OUTPUT POWER



Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	9.43	0.0088	30.00	1.0000	Pass
2440	8.84	0.0077	30.00	1.0000	Pass
2480	7.26	0.0053	30.00	1.0000	Pass

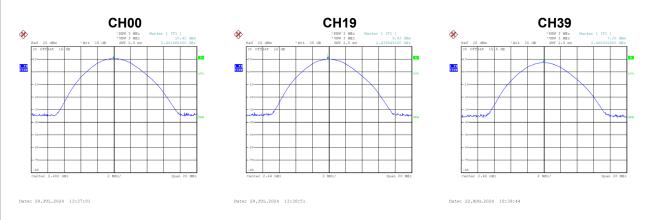
Note: Output power = Measure result + Cable loss



Test Mode	TX Mode _2Mbps	
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Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	10.42	0.0110	30.00	1.0000	Pass
2440	9.93	0.0098	30.00	1.0000	Pass
2480	7.20	0.0052	30.00	1.0000	Pass

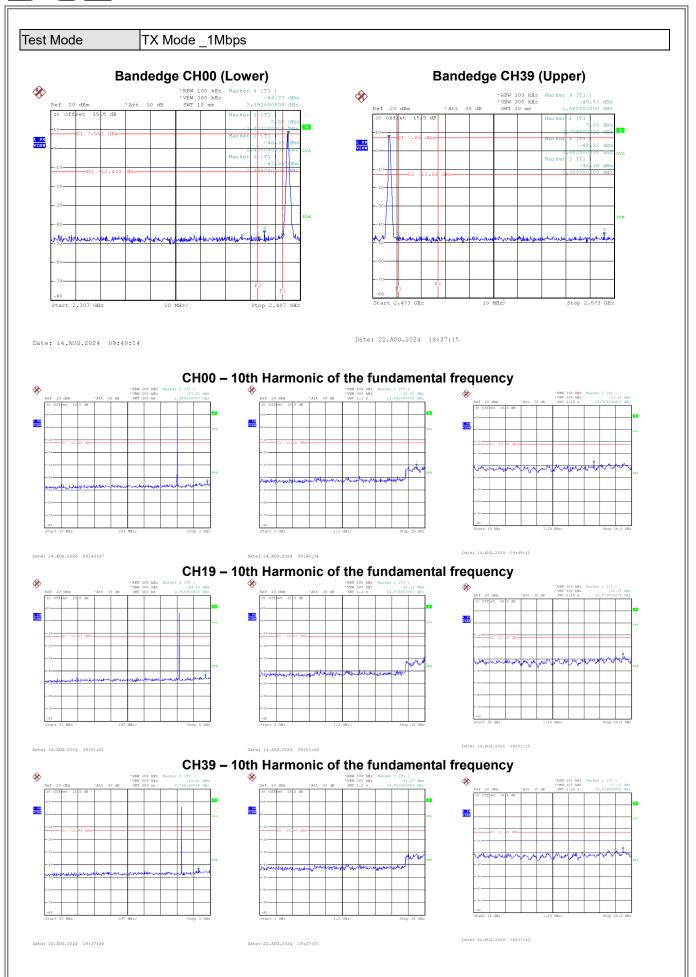
Note: Output power = Measure result + Cable loss



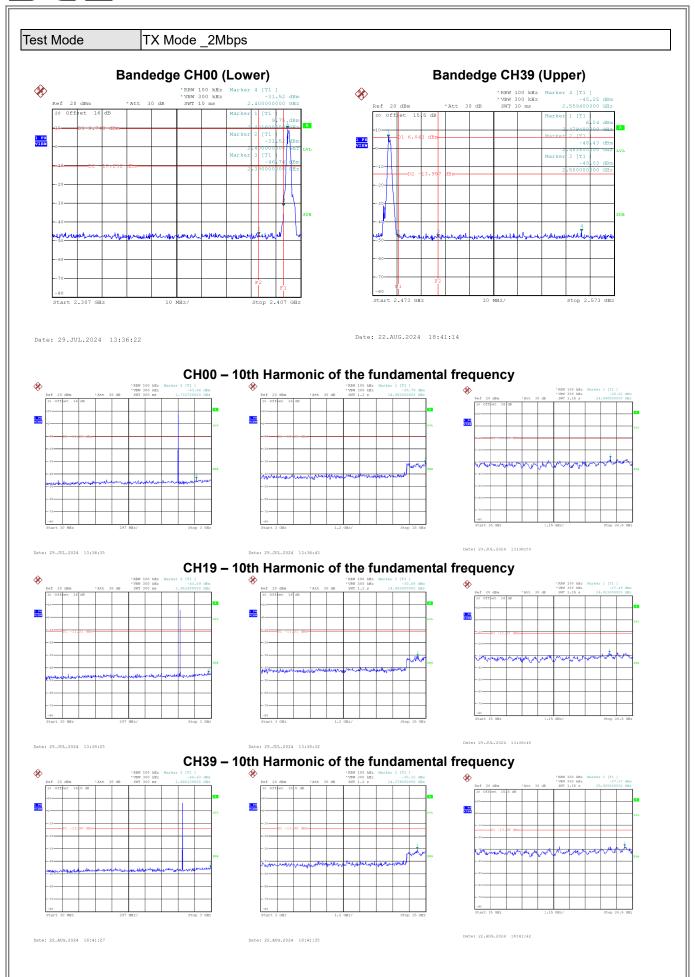


APPENDIX G - CONDUCTED SPURIOUS EMISSION			











# **APPENDIX H - POWER SPECTRAL DENSITY**



Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-6.72	8.00	Pass
19	2440	-6.95	8.00	Pass
39	2480	-7.28	8.00	Pass



Test Mode	TX Mode _2Mbps

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-9.90	8.00	Pass
19	2440	-9.41	8.00	Pass
39	2480	-12.62	8.00	Pass



**End of Test Report**