



FCC Radio Test Report

FCC ID: RWO-RZ040517

This report concerns: Original Grant

Project No. : 2403C174

Equipment : Gaming Headset

Brand Name :

RAZER,

Test Model : RZ04-0517

Series Model : RZ04-0517XXXX-XXXX (X can be 0-9 or A-Z)

Applicant: Razer Inc.

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Park Keji South Road, Hi-Tech Industrial Park, Shenzhen 518057, China

Date of Receipt : Mar. 26, 2024

Date of Test : Mar. 28, 2024 ~ Apr. 21, 2024

Issued Date : May 22, 2024

Report Version : R00

Test Sample : Sample No.: DG2024032686 for conducted, DG2024032687 for others.

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

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

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

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

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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-2-2403C174	R00	Original Report.	May 22, 2024	Valid



1. APPLICABLE STANDARDS

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

ANSI C63.10-2013

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

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C				
Standard(s) Section Test Item Test Result Ju				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 No.3, Jinshagang 1st Road, Dalang, Dongguan City, Guangdong People's Republic of China.

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

2.2 MEASUREMENT UNCERTAINTY

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

The BTL measurement uncertainty as below table:

A. AC power line conducted emissions 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	<i>U</i> ,(dB)
DG-CB01	CISPR	9kHz ~ 30MHz	2.70

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

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

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



C. Other Measurement:

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

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

2.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By	Test Date
AC Power Line Conducted Emissions	26°C	70%	AC 120V/60Hz	Hayden Chen	Apr. 01, 2024
Radiated Emissions-9 kHz to 30 MHz	24°C	54%	DC 5V	Hayden Chen	Apr. 03, 2024
Radiated Emissions-30 MHz to 1000 MHz	26°C	51%	DC 5V	Allen Tong	Apr. 01, 2024
Radiated Emissions-Above 1000 MHz	25°C	50%	DC 5V	Allen Tong	Apr. 07, 2024~ Apr. 08, 2024
Bandwidth	24°C	60%	DC 5V	Parker Yang	Apr. 16, 2024
Maximum Output Power	24°C	60%	DC 5V	Parker Yang	Apr. 16, 2024
Conducted Spurious Emission	24°C	60%	DC 5V	Parker Yang	Apr. 16, 2024
Power Spectral Density	24°C	60%	DC 5V	Parker Yang	Apr. 16, 2024



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Gaming Headset
Brand Name	RAZER,
Test Model	RZ04-0517
Series Model	RZ04-0517XXXX-XXXX (X can be 0-9 or A-Z)
Model Difference(s)	Only differ in the model name.
Hardware Version	V1
Software Version	v1.0.2.2
Power Source	1# Supplied from USB port. 2# Supplied from battery. Model: 553450PN2
Power Rating	1# 5V===500mA 2# 3.7V 1200mAh/4.44Wh
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	1Mbps, 2Mbps
Max. Output Power	1Mbps: 8.99 dBm (0.0079 W)

Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the user's
- 2. The system model number is RZ04-0517XXXX-XXXX, this system consists of Gaming Headset (Model: RZ04-0517) and Wireless Dongle (Model: RC30-0517), 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	Model Name	Antenna Type	Connector	Gain (dBi)
1	RAZER	RZ04-0517	FPC	N/A	2.3



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_1Mbps 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_1Mbps Channel 00		

Radiated emissions test - Below 1GHz		
Final Test Mode	Description	
Mode 3	TX Mode_1Mbps 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 1Mbps 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 above 1 GHz of Harmonic test: The polarization of Vertical and Horizontal are evaluated, the worst case is Vertical and recorded.
- (5) For radiated emission above 1 GHz of Bandedge test: The polarization of Vertical and Horizontal are evaluated, the worst case is Horizontal and recorded.



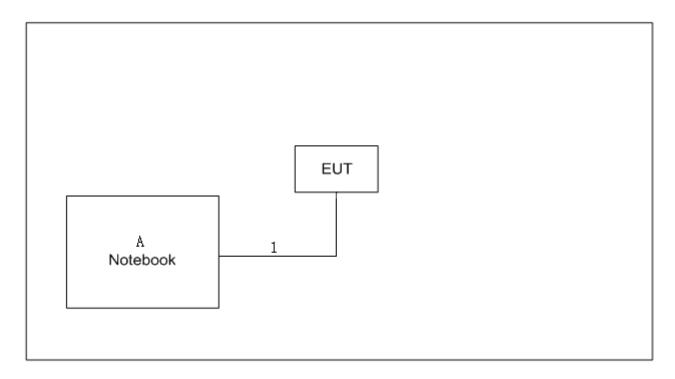
3.3 PARAMETERS OF TEST SOFTWARE

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	Airoha.Tool.Kit_V3.8.0.1		
Frequency (MHz)	2402	2440	2480
1Mbps	57	58	58
2Mbps	57	58	58



3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
Α	Notebook	Honor	14SER5 3500	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	USB Cable	NO	NO	1.5m

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 (1 dB) 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

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

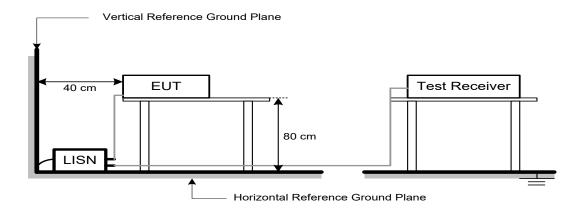
Receiver Parameters	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

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 requeries (minz)	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)

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

 $20\log (d_{limit}/d_{measure})=20\log (3/1)=9.5 dB.$



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

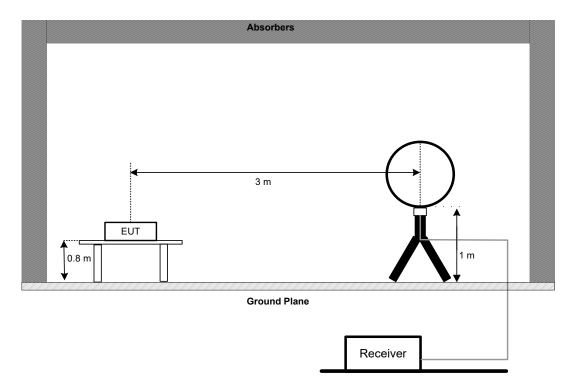


5.3 DEVIATION FROM TEST STANDARD

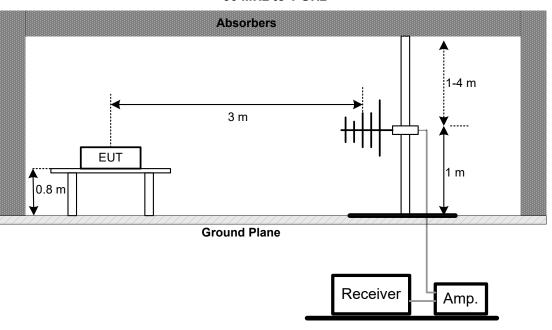
No deviation.

5.4 TEST SETUP

9 kHz to 30 MHz

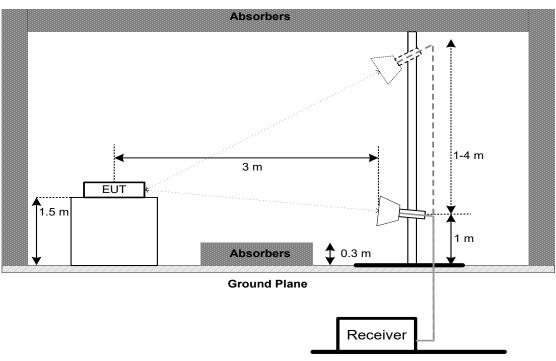


30 MHz to 1 GHz

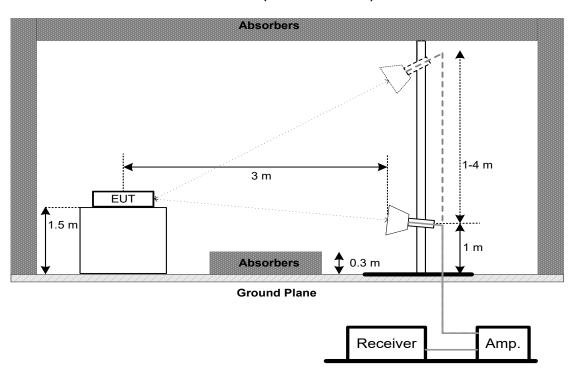






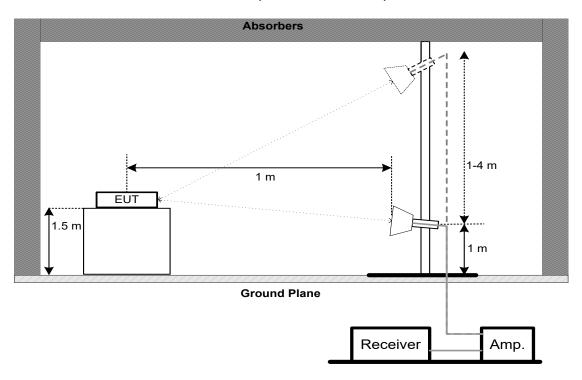


Harmonic(1 GHz to 18 GHz)





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:

I OI O GD Daildwidtii.		
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:

Of 3370 Efficación Danawidti	1.	
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

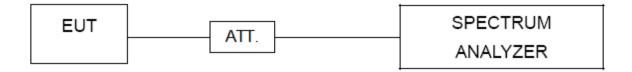
- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. The following table is the setting of the spectrum analyzer:

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) / 4 MHz (2 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	R&S	ESR3	103027	Jun. 16, 2024				
2	TWO-LINE V-NETWORK	R&S	ENV216	101447	Dec. 22, 2024				
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A				
4	Cable	N/A	SFT205-NMNM-9M -001	9M	Nov. 27, 2024				
5	643 Shield Room	ETS	6*4*3	N/A	N/A				

	Radiated Emissions - 9 kHz to 30 MHz								
Item	m Kind of Equipment Manufacturer		Type No.	Serial No.	Calibrated until				
1	Active Loop Antenna	Schwarzbeck	FMZB 1513-60	25	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. 10, 2024				
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A				
5	966 Chamber room	ETS	9*6*6	N/A	Jul. 11, 2024				

	Radiated Emissions - 30 MHz to 1 GHz								
Item	n Kind of Equipment Manufac		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. 13,2 024				
3	Preamplifier	er EMC EMC001330		980998	Nov. 17, 2024				
4	Cable	RegalWay	LMR400-NMNM-12 .5m	N/A	Jul. 04, 2024				
5	Cable	RegalWay	LMR400-NMNM-3 m	N/A	Jul. 04, 2024				
6	Cable	RegalWay	LMR400-NMNM-0. 5m	N/A	Jul. 04, 2024				
7	Receiver	Agilent	N9038A	MY52130039	Dec. 22, 2024				
8	Positioning Controller	MF	MF-7802	N/A	N/A				
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A				
10	966 Chamber room	CM	9*6*6	N/A	May 17, 2024				



Radiated Emissions - Above 1 GHz								
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Receiver	Agilent	N9038A	MY52130039	Dec. 22, 2024			
2	Preamplifier	EMC INSTRUMENT	EMC118A45SE	980888	Nov. 17, 2024			
3	Receiver	Keysight	N9038A	MY53220133	Oct. 09, 2024			
4	Double Ridged Guide Antenna	ETS	3115	75789	May 31, 2024			
5	Cable	RegalWay	RWLP50-4.0A-SMS M-12.5M	N/A	Feb. 19, 2025			
6	Cable	RegalWay	RWLP50-4.0A-NM RASM-2.5M	N/A	Aug. 08, 2024			
7	Cable	RegalWay	RWLP50-4.0A-NM RASMRA-0.8M	N/A	Aug. 08, 2024			
8	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330 -K	619413	Jul. 06, 2024			
9	Cable	RegalWay	RWLP50-2.6A-2.92 M2.92M-1.1M	N/A	Jul. 26, 2024			
10	Cable	Tonscend	HF160-KMKM-3M	N/A	Jul. 26, 2024			
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA9170(3m)	9170-319	Jun.20,2024			
12	966 Chamber room	CM	9*6*6	N/A	May 17, 2024			
13	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A			
14	Filter	STI	STI15-9912	N/A	Jun. 16, 2024			
15	Positioning Controller	MF	MF-7802	N/A	N/A			
16	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A			

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

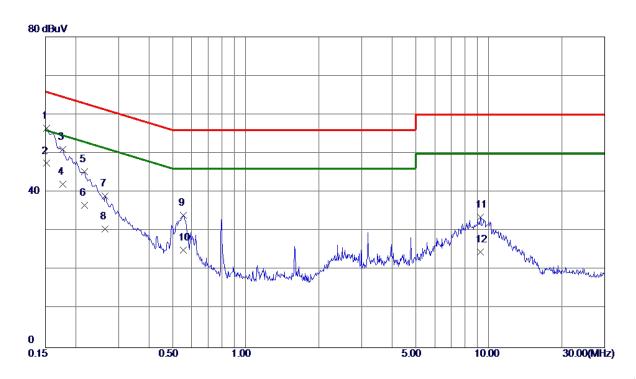
Remark: "N/A" denotes no model name, serial no. or calibration specified. All calibration period of equipment list is one year.



APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS





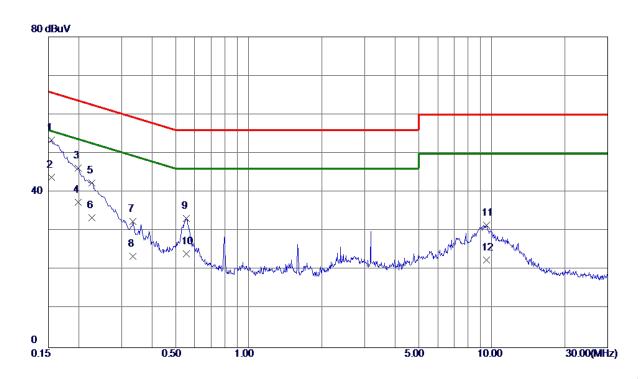


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0. 1522	46. 70	9. 74	56. 44	65. 88	-9.44	QP	
2 *	0. 1522	37. 70	9. 74	47. 44	55. 88	-8. 44	AVG	
3	0. 1770	41. 23	9. 74	50. 97	64. 63	-13. 66	Q P	
4	0. 1770	32. 30	9. 74	42. 04	54. 63	-12. 59	AVG	
5	0. 2175	35. 49	9. 75	45. 24	62. 91	-17. 67	QP	
6	0. 2175	26. 89	9. 75	36. 64	52. 91	-16. 27	AVG	
7	0. 2647	29. 28	9. 76	39. 04	61. 28	-22. 24	QP	
8	0. 2647	20.80	9. 76	30. 56	51. 28	-20. 72	AVG	
9	0. 5550	24. 30	9. 79	34. 09	56.00	-21. 91	QP	
10	0. 5550	15. 40	9. 79	25. 19	46.00	-20. 81	AVG	
11	9. 2220	23. 05	10. 48	33. 53	60.00	-26. 47	QP	
12	9. 2220	14. 10	10. 48	24. 58	50.00	-25. 42	AVG	

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







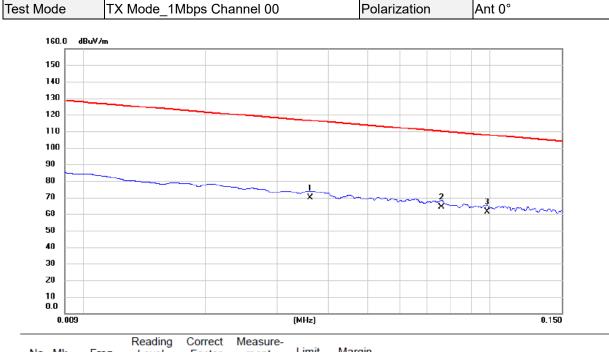
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0. 1545	43.86	9. 59	53. 45	65. 75	-12. 30	QP	
2 *	0. 1545	34. 30	9. 59	43.89	55. 75	-11. 86	AVG	
3	0. 1995	36. 71	9. 60	46. 31	63. 63	-17. 32	Q P	
4	0. 1995	27. 80	9. 60	37. 40	53.63	-16. 23	AVG	
5	0. 2265	32. 79	9. 61	42. 40	62. 58	-20. 18	QP	
6	0. 2265	23. 80	9. 61	33. 41	52. 58	-19. 17	AVG	
7	0. 3345	22. 77	9. 64	32. 41	59. 34	-26. 93	QP	
8	0. 3345	13. 90	9. 64	23. 54	49. 34	-25. 80	AVG	
9	0. 5527	23. 57	9. 65	33. 22	56.00	-22. 78	QP	
10	0. 5527	14. 50	9. 65	24. 15	46.00	-21.85	AVG	
11	9. 5190	21. 13	10. 38	31. 51	60.00	-28. 49	QP	
12	9. 5190	12. 11	10. 38	22. 49	50.00	-27. 51	AVG	

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



APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ

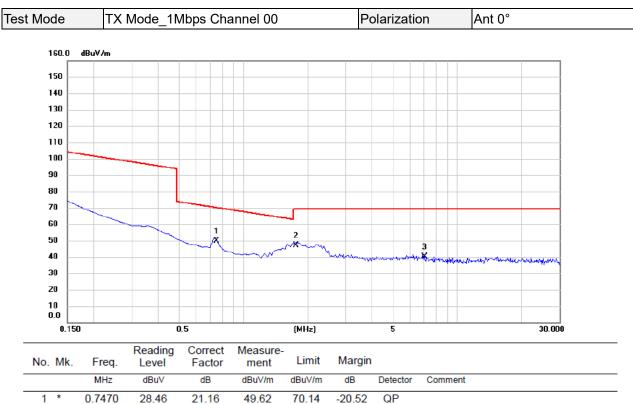




No. Mk	. Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0361	48.65	21.23	69.88	116.45	-46.57	AVG	
2 *	0.0760	42.97	21.30	64.27	109.99	-45.72	AVG	
3	0.0983	40.16	21.33	61.49	107.76	-46.27	QP	

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





-20.52

-22.52

-29.50

QΡ

QP

69.54

69.54

REMARKS:

1

2

3

1.7620

7.0006

(1) Measurement Value = Reading Level + Correct Factor.

21.16

21.19

21.52

47.02

40.04

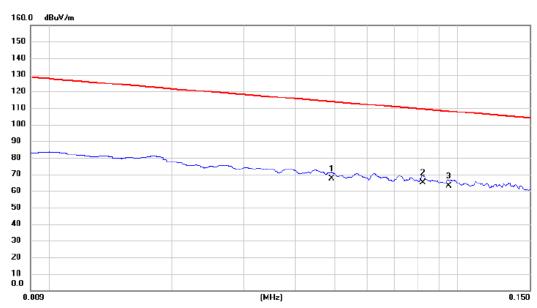
(2) Margin Level = Measurement Value - Limit Value.

25.83

18.52



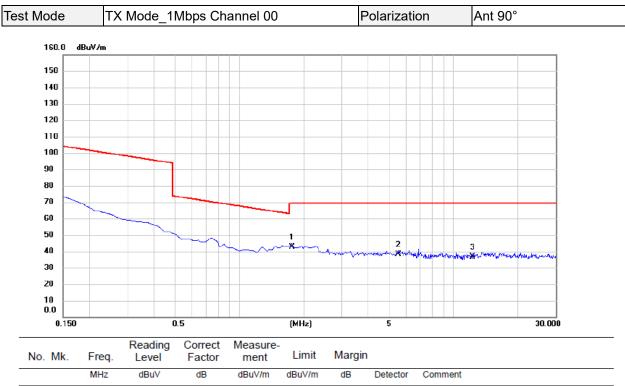




No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0491	45.98	21.30	67.28	113.78	-46.50	AVG	
2 *	0.0822	43.81	21.30	65.11	109.31	-44.20	AVG	
3	0.0950	41.84	21.33	63.17	108.05	-44.88	QP	

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





2

3

1.7620

5.5230

12.3140

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

21.41

16.88

15.00

21.19

21.44

21.56

42.60

38.32

36.56

69.54

69.54

69.54

-26.94

-31.22

-32.98

QP

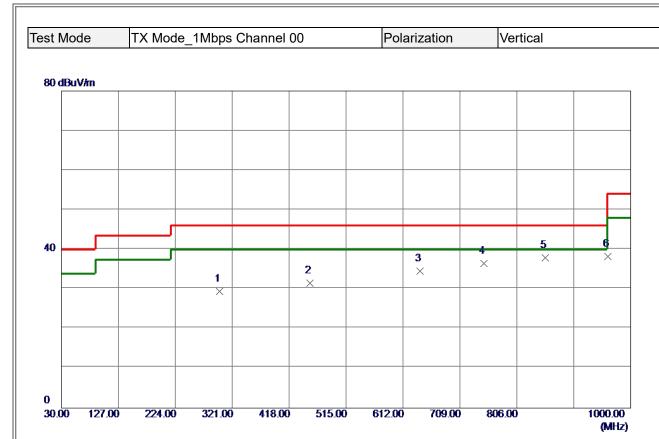
QP

QP



APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ



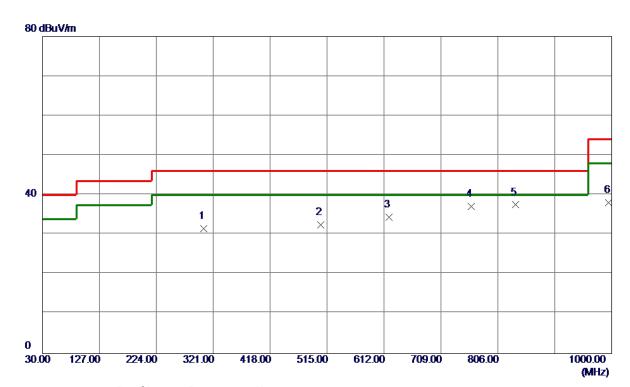


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	299. 6600	40. 15	-10. 68	29. 47	46.00	-16. 53	Peak	
2	453. 8900	38. 36	-6. 81	31. 55	46.00	-14. 45	Peak	
3	641. 5850	37. 71	-3. 11	34. 60	46.00	-11. 40	Peak	
4	749. 7400	37. 67	-1. 24	36. 43	46.00	-9. 57	Peak	
5 *	854. 5000	38. 49	-0. 51	37. 98	46. 00	-8. 02	Peak	
6	961. 2000	37. 74	0. 45	38. 19	54.00	-15. 81	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	304. 9950	41. 99	-10. 54	31. 45	46.00	-14. 55	Peak	
2	503. 8450	38. 52	-6. 04	32. 48	46.00	-13. 52	Peak	
3	620. 2450	37. 87	-3. 44	34. 43	46.00	-11. 57	Peak	
4	760. 8950	38. 47	-1. 28	37. 19	46.00	-8. 81	Peak	
5 *	836. 0700	38. 33	-0.81	37. 52	46.00	-8. 48	Peak	
6	995. 1500	37. 29	0. 73	38. 02	54. 00	-15. 98	Peak	

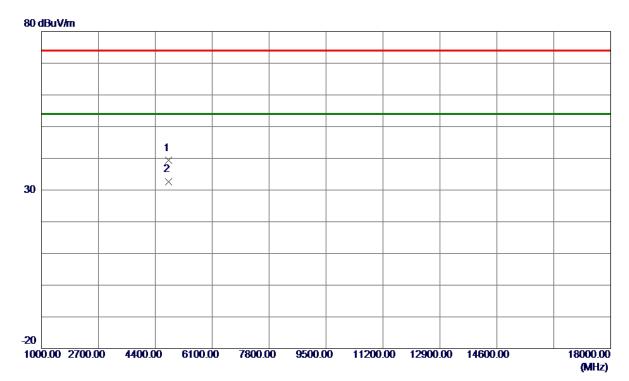
- (1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value Limit Value.



A	PPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ



Test Mode	TX 2402 MHz CH00 1Mbps	Polarization	Vertical

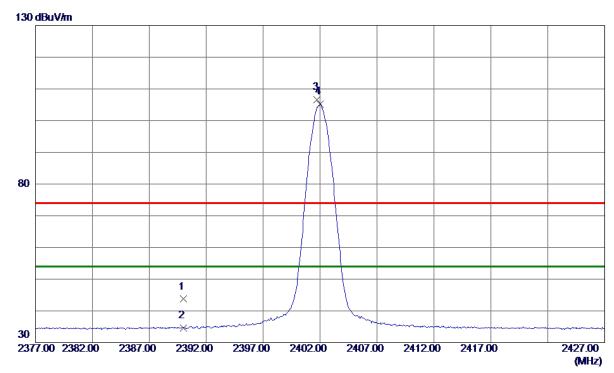


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4803. 8900	38. 64	0. 66	39. 30	74.00	-34. 70	Peak	
2 *	4804. 0500	31. 95	0. 66	32. 61	54.00	-21. 39	AVG	

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



Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Horizontal

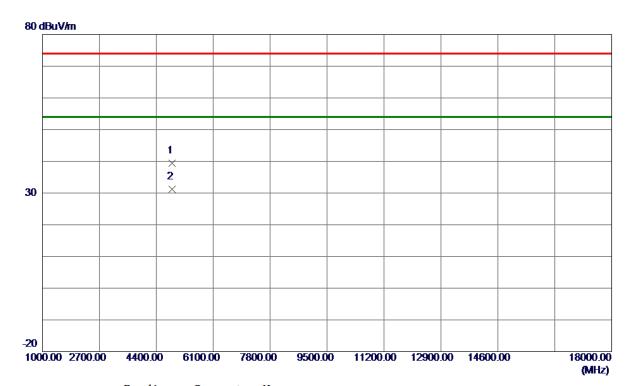


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390. 0000	37. 70	6. 00	43. 70	74.00	-30. 30	Peak	
2	2390. 0000	28. 68	6. 00	34. 68	54.00	-19. 32	AVG	
3	2401. 7500	100. 52	6. 00	106. 52	74.00	32. 52	Peak	No Limit
4 *	2402. 0000	99. 19	6. 00	105. 19	54. 00	51. 19	AVG	No Limit

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



Test Mode	TX 2440 MHz _CH19_1Mbps	Polarization	Vertical

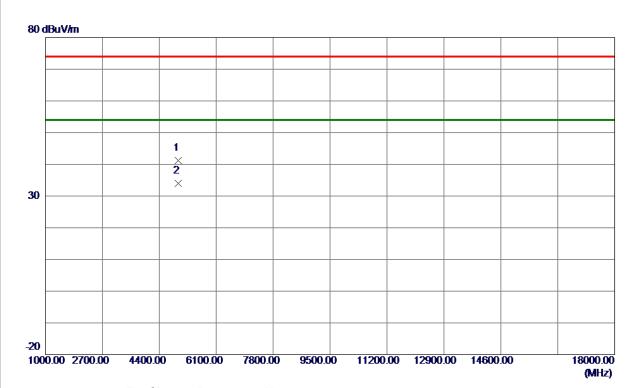


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4875. 8200	38. 58	0.87	39. 45	74.00	-34. 55	Peak	
2 *	4879. 9600	30. 36	0. 88	31. 24	54.00	-22. 76	AVG	

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



Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Vertical

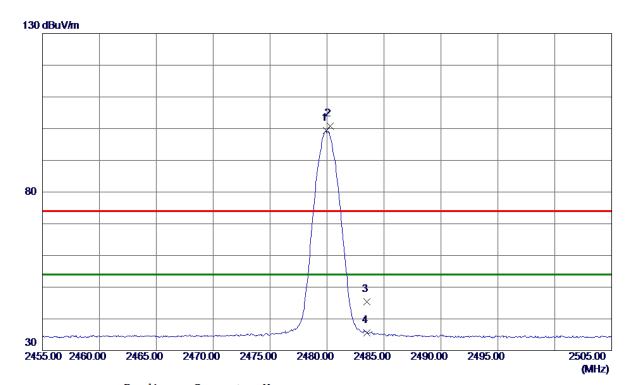


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4959. 6900	40. 03	1. 11	41. 14	74.00	-32.86	Peak	
2 *	4959. 9000	32. 87	1. 11	33. 98	54.00	-20. 02	AVG	

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



Test Mode	TX 2480 MHz	CH39 1Mbps	Polarization	Horizontal

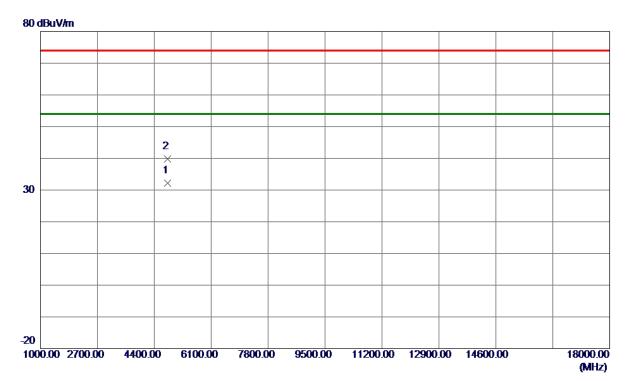


No. Freq. Reading Correct Measure Level Factor ment	Limit	Margin		
MHz dBuV/m dB dBuV/m	dBuV/m	dB	Detector	Comment
1 * 2479. 9250 93. 44 6. 00 99. 44	54.00	45. 44	AVG	No Limit
2 2480. 2500 94. 89 6. 00 100. 89	74.00	26. 89	Peak	No Limit
3 2483. 5000 39. 41 6. 00 45. 41	74.00	-28. 59	Peak	
4 2483. 5000 29. 60 6. 00 35. 60	54. 00	-18. 40	AVG	

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



Test Mode	TX 2402 MHz _CH00_2Mbps	Polarization	Vertical

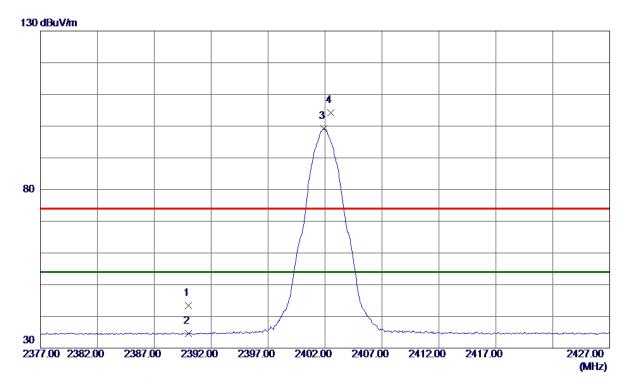


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4803. 8800	31. 58	0. 66	32. 24	54.00	-21. 76	AVG	
2	4803. 9000	39. 11	0. 66	39. 77	74.00	-34. 23	Peak	

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



Test Mode	TX 2402 MHz	CH00 2Mbps	Polarization	Horizontal

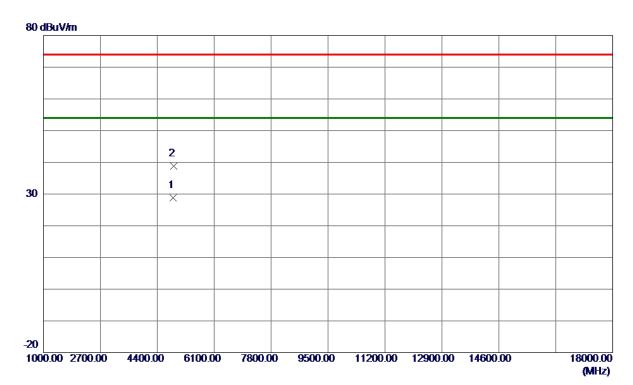


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390. 0000	37. 35	6. 00	43. 35	74.00	-30. 65	Peak	
2	2390. 0000	28. 55	6. 00	34. 55	54.00	-19. 45	AVG	
3 *	2401.8750	93. 17	6. 00	99. 17	54.00	45. 17	AVG	No Limit
4	2402. 5000	98. 27	6. 00	104. 27	74.00	30. 27	Peak	No Limit

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



Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Vertical

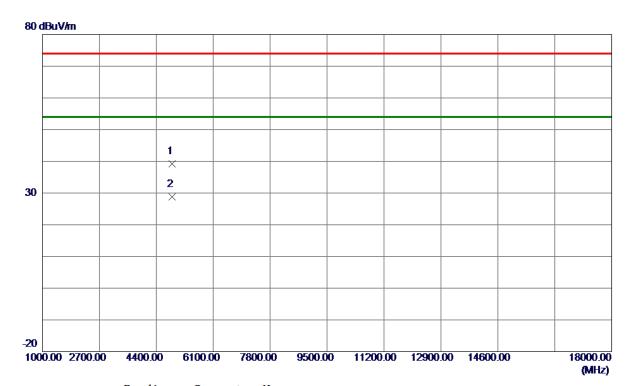


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4880. 1200	27. 97	0.88	28. 85	54.00	-25. 15	AVG	
2	4888. 6600	37. 95	0. 90	38. 85	74.00	-35. 15	Peak	

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



Test Mode	TX 2480 MHz _CH39_2Mbps	Polarization	Vertical

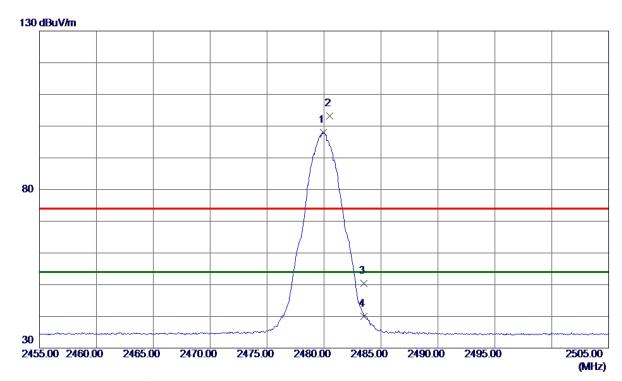


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4870. 8100	38. 42	0.85	39. 27	74.00	-34. 73	Peak	
2 *	4880. 0500	27. 98	0. 88	28. 86	54.00	-25. 14	AVG	

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





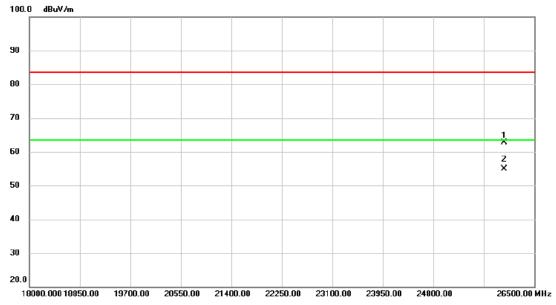


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2479. 9500	91. 96	6. 00	97. 96	54.00	43. 96	AVG	No Limit
2	2480. 5000	97. 18	6. 00	103. 18	74.00	29. 18	Peak	No Limit
3	2483. 5000	44. 33	6. 00	50. 33	74.00	-23. 67	Peak	
4	2483. 5000	33. 96	6. 00	39. 96	54.00	-14. 04	AVG	

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





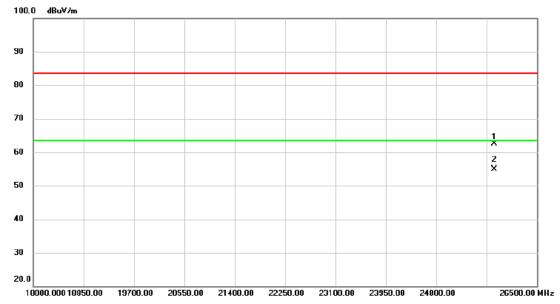


No.	Mk.	Freq.			Measure- ment		Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	25	990.000	52.21	10.48	62.69	83.50	-20.81	peak	
2	* 25	990.000	44.33	10.48	54.81	63.50	-8.69	AVG	

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







No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2	25781.750	52.38	10.12	62.50	83.50	-21.00	peak	
2	* 2	25781.750	44.69	10.12	54.81	63.50	-8.69	AVG	

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

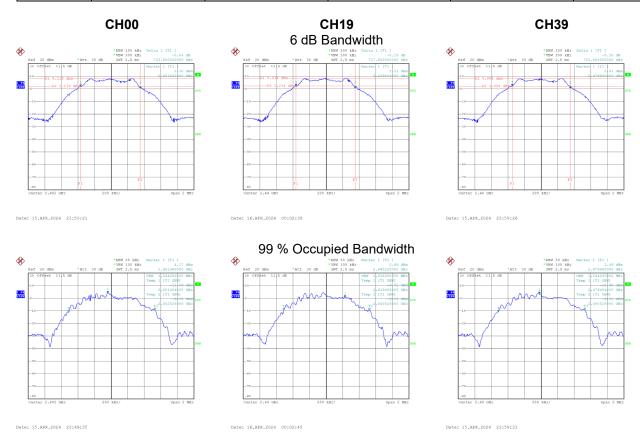


APPENDIX E - BANDWIDTH



Test Mode	TX Mode	1Mbps

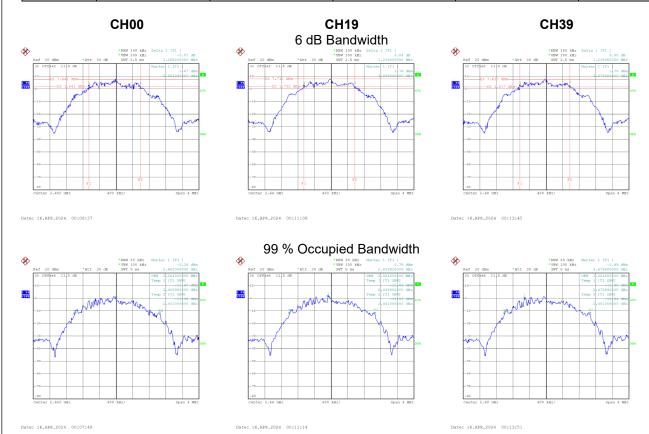
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	0.724	1.044	0.5	Pass
19	2440	0.718	1.036	0.5	Pass
39	2480	0.704	1.044	0.5	Pass





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	1.256	2.064	0.5	Pass
19	2440	1.239	2.064	0.5	Pass
39	2480	1.216	2.064	0.5	Pass





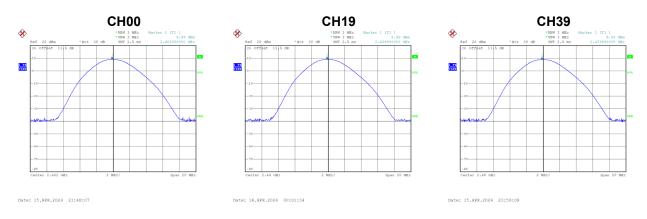
APPENDIX F - MAXIMUM OUTPUT POWER	



Test Mode	TX Mode	1Mbps

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	8.99	0.0079	30.00	1.0000	Pass
2440	8.99	0.0079	30.00	1.0000	Pass
2480	8.88	0.0077	30.00	1.0000	Pass

Note: Output power = Measure result + Cable loss





Test Mode	TX Mode	2Mbps

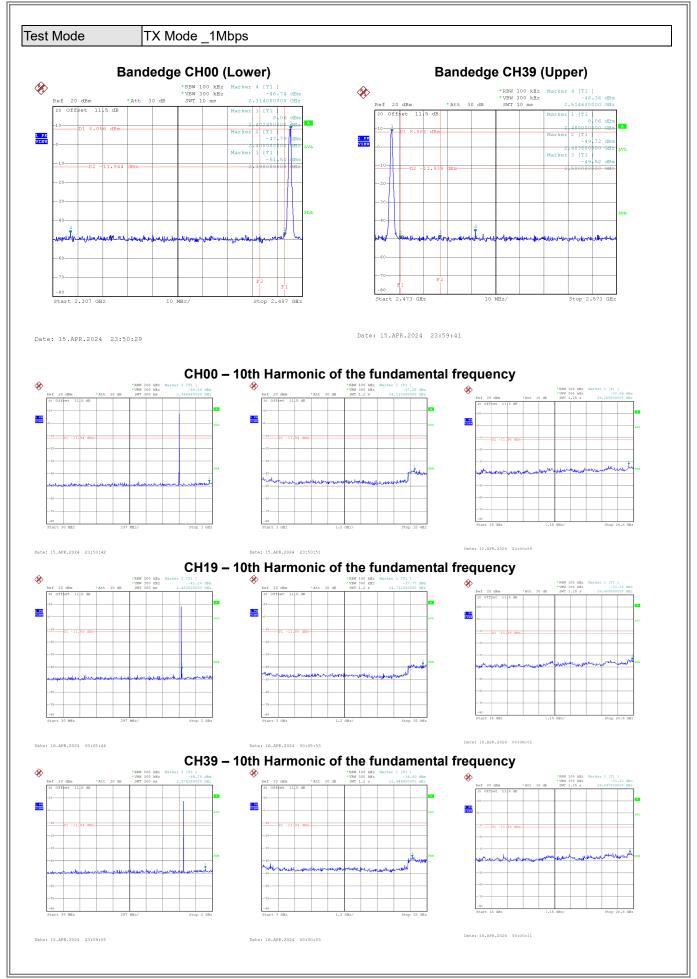
Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	8.83	0.0076	30.00	1.0000	Pass
2440	8.95	0.0079	30.00	1.0000	Pass
2480	8.76	0.0075	30.00	1.0000	Pass

Note: Output power = Measure result + Cable loss

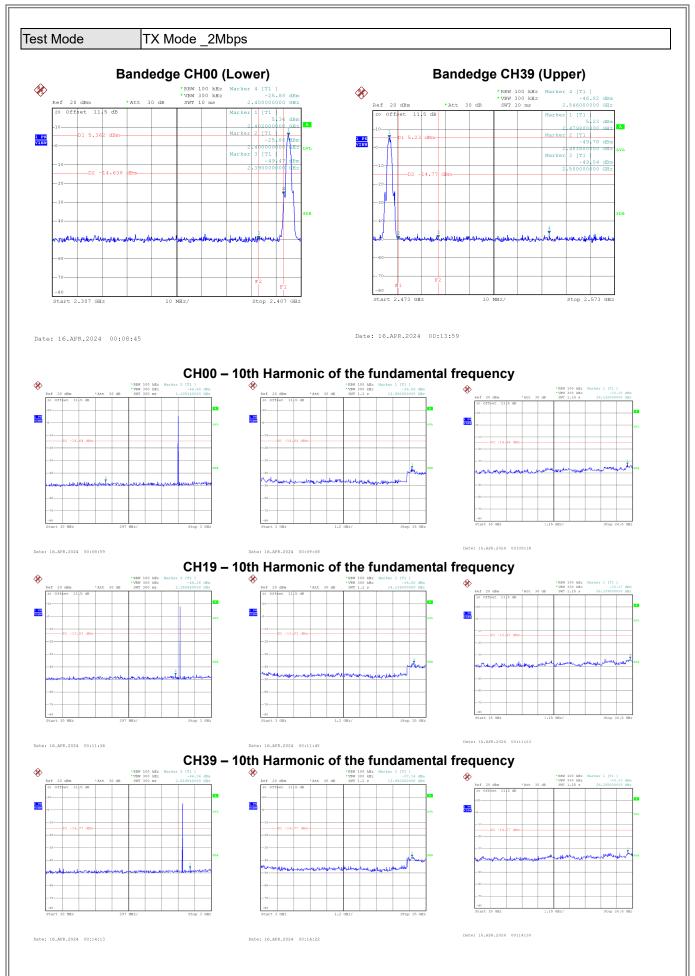














APPENDIX H - POWER SPECTRAL DENSITY



Test Mode	TX Mode	1Mbps

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-6.58	8.00	Pass
19	2440	-6.50	8.00	Pass
39	2480	-6.89	8.00	Pass



Test Mode	TX Mode 2Mbps
rest Mode	1 × Iviode _Zivibps

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-9.13	8.00	Pass
19	2440	-9.06	8.00	Pass
39	2480	-9.03	8.00	Pass



End of Test Report