





FCC Radio Test Report

FCC ID: V2R-TN0630

This report concerns: Original Grant

Project No. : 2310C008

Equipment: True Wireless Earphones

Brand Name : PHIATON
Test Model : TN0630
Series Model : N/A

Applicant : Cresyn Co., Ltd

Address : 5 Gangnam-daero 107-gil, Seocho-gu, Seoul, South Korea

Manufacturer : Cresyn Co., Ltd

Address : 5 Gangnam-daero 107-gil, Seocho-gu, Seoul, South Korea

Factory : CRESYN HANOI CO., LTD.

Address : Dong Tho Industrial Complex, Yen Phong District, Bac Ninh Province,

Vietnam

Date of Receipt : Dec. 05, 2023

Date of Test : Dec. 06, 2023 ~ Feb. 06, 2024

Issued Date : Feb. 20, 2024

Report Version : R02

Test Sample : Engineering Sample No.: DG202312116 for radiated and AC Power

Line Conducted Emissions, DG2023120598 for conducted.

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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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).

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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-2-2310C008	R00	Original Report.	Jan. 22, 2024	Invalid
BTL-FCCP-2-2310C008	R01	Revised report to address comments.	Feb. 06, 2024	Invalid
BTL-FCCP-2-2310C008	R02	Updated the applicant and manufacturer address.	Feb. 20, 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 NVLAP: 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 No. 3 Jinshagang 1st Rd. Shixia, Dalang Town, Dongguan City, Guangdong 523792

BTL's Registration Number for FCC: 162128 BTL's Designation Number for FCC: CN5042

2.2 MEASUREMENT UNCERTAINTY

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

The BTL measurement uncertainty as below table:

A. AC power line conducted emissions test:

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

B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB01	CISPR	9kHz ~ 30MHz	2.36

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03	30MHz ~ 200MHz	٧	4.40	
	CISPR	30MHz ~ 200MHz	Н	3.62
(3m)	CIOPK	200MHz ~ 1,000MHz	٧	4.58
		200MHz ~ 1,000MHz	Н	3.98

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

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03	CISPR	18 ~ 26.5 GHz	3.36
(1m)	CIOPR	26.5 ~ 40 GHz	3.58



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
AC Power Line Conducted Emissions	25°C	70%	AC 120V/60Hz	Hayden Chen
Radiated Emissions-9 kHz to 30 MHz	20°C	54%	DC 3.7V	Hayden Chen
Radiated Emissions-30 MHz to 1000 MHz	23°C	42%	DC 3.7V	Allen Tong
Radiated Emissions-Above 1000 MHz	23°C	42%	DC 3.7V	Max Wang
Bandwidth	25°C	55%	DC 3.7V	Steve Zhou
Maximum Output Power	25°C	55%	DC 3.7V	Steve Zhou
Conducted Spurious Emission	25°C	55%	DC 3.7V	Steve Zhou
Power Spectral Density	25°C	55%	DC 3.7V	Steve Zhou



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	True Wireless Earphones			
Brand Name	PHIATON			
Test Model	TN0630	TN0630		
Series Model	N/A			
Model Difference(s)	N/A			
Software Version	1.0.0			
Hardware Version	1.0			
Power Source	Earphones: 1# Supplied from battery. Model: 1154RA 2# Supplied from Charging Case. Charging Case: 1# Supplied from battery. Model: 841538 2# Supplied from USB Port. 3# Supplied from wireless charging base.			
Power Rating	Earphones: 1# DC 3.7V 50mAh 0.185Wh 2# DC 5V Charging Case: 1# DC 3.7V 450mAh 1.665Wh 2# DC 5V 3# 3.5W			
Operation Frequency	1Mbps: 2402 MHz ~ 2480 MHz 2Mbps: 2404 MHz ~ 2478 MHz			
Modulation Type	GFSK			
Bit Rate of Transmitter	1Mbps, 2Mbps			
May Output Dower	Left Earphone	2Mbps: 12.31 dBm (0.0170 W)		
Max. Output Power	Right Earphone	2Mbps: 12.96 dBm (0.0198 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)
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

Note: The Bit Rate of Transmitter 2Mbps does not use the channel: CH00, CH12, CH39.

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
Left	AWAVE	PPU-TN0630(L)	PIFA	N/A	-2.43
Right	AWAVE	PPU-TN0630(R)	PIFA	N/A	-1.84

Note: The antenna gain is provided by the manufacturer.



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 01/19/38
Mode 3	TX Mode_2Mbps Channel 01

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 01

	Radiated emissions test - Below 1GHz
Final Test Mode	Description
Mode 3	TX Mode_2Mbps Channel 01

	Radiated emissions test - Above 1GHz	
Final Test Mode	Description	
Mode 1	TX Mode_1Mbps Channel 00/19/39	
Mode 2	TX Mode_2Mbps Channel 01/19/38	

	Conducted test
Final Test Mode	Description
Mode 1	TX Mode_1Mbps Channel 00/19/39
Mode 2	TX Mode_2Mbps Channel 01/19/38

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 01 is found to be the worst case and recorded.
- (3) The measurements for RF Output Power are tested, the left earphone and right earphone are recorded in the report. The worst case is right earphone and only the worst case is documented for other test items.
- (4) For radiated emission above 1GHz test, the vertical and horizontal are tested and only record the worst case.
- (5) For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case (Y) emissions.



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.

For Left Earphone

Test Software Version	AB157x_Airoha_Tool_Kit(ATK)_v3.7.5		
Frequency (MHz)	2402	2440	2480
1Mbps	60	60	60
Frequency (MHz)	2404	2440	2478
2Mbps	63	63	63

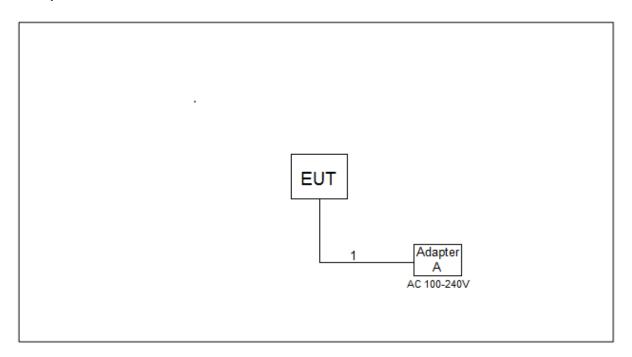
For Right Earphone

Test Software Version AB157x_Airoha_Tool_Kit(ATK)_v3.7.		ATK)_v3.7.5	
Frequency (MHz)	2402	2440	2480
1Mbps	60	60	60
Frequency (MHz)	2404	2440	2478
2Mbps	63	63	63

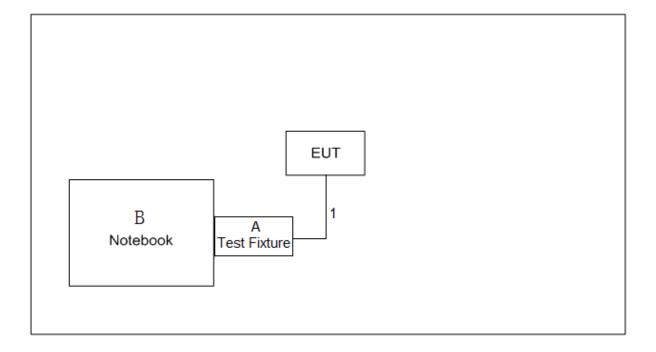


3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

For AC power line conducted emissions Radiated Emissions-9 kHz to 30 MHz:



For Radiated Emissions-Above 30 MHz:





3.5 SUPPORT UNITS

For AC power line conducted emissions Radiated Emissions-9 kHz to 30 MHz:

A Adapter Huawei N/A N/A	Item	Equipment	Brand	Model No.	Series No.
	Α	Adapter	Huawei	N/A	N/A

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

For Radiated Emissions-Above 30 MHz:

Item	Equipment	Brand	Model No.	Series No.
Α	Test Fixture	N/A	N/A	N/A
В	Notebook	HONOR	NBLK-WAX9X	N/A

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



4. AC POWER LINE CONDUCTED EMISSIONS

4.1 LIMIT

Frequency of Emission (MHz)	Limit (dBμV)		
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:

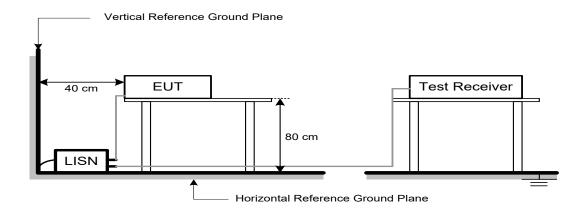
Receiver Parameters	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

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)	(dBuV/m at 3 m)	
Frequency (Wiriz)	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).



5.2 TEST PROCEDURE

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

The following table is the setting of the receiver:

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

Spectrum Parameters	Setting
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW	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

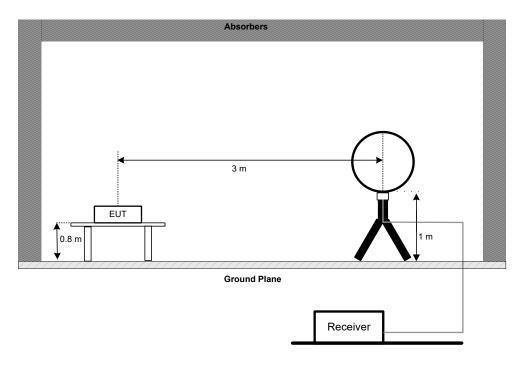


5.3 DEVIATION FROM TEST STANDARD

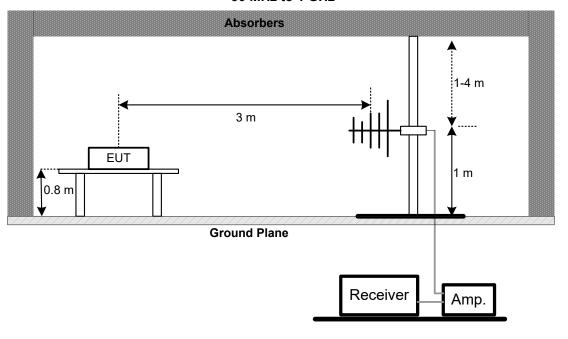
No deviation.

5.4 TEST SETUP

9 kHz to 30 MHz

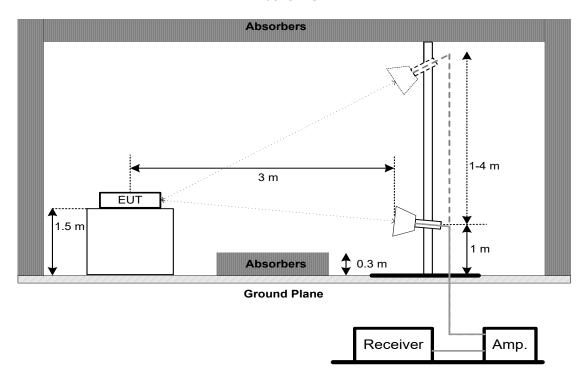


30 MHz to 1 GHz





Above 1 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
FCC 15.247(a)(2)	6 dB Bandwidth	>= 500 kHz
	99% Emission Bandwidth	-

6.2 TEST PROCEDURE

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

For 6 dB Bandwidth:

Setting
> Measurement Bandwidth
100 kHz
300 kHz
Peak
Max Hold
Auto

For 99% Emission Bandwidth:

1 00 00 /0 Emission Bandwidth.		
Spectrum Parameters	Setting	
Span Frequency	Between 1.5 times and 5.0 times the OBW	
RBW	30 kHz	
VBW	100 kHz	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

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	≥ 3xRBV		
RBW	3MHz		
VBW	3MHz		
Detector	Peak		
Trace	Max Hold		
Sweep Time	Auto		

Note: Where T is defined in 11.6 of ANSI C63.10-2013.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULTS

Please refer to the APPENDIX F.



8. CONDUCTED SPURIOUS 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	em Kind of Equipment Manufacturer		Type No.	Serial No.	Calibrated until			
1	Active Loop Antenna	Schwarzbeck	FMZB 1513-60B	1513-60 B-034	Apr. 01, 2024			
2	MXE EMI Receiver	Keysight	N9038A	MY56400091	Jan. 07, 2024			
3	Cable	N/A	RW2350-3.8A-NMB M-1.5M	N/A	Jun. 10, 2024			
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A			
5	966 Chamber room	ETS	9*6*6	N/A	Jul. 11, 2024			

	Radiated Emissions - 30 MHz to 1 GHz							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	1461	Nov. 28, 2024			
2	Attenuator	EMC INSTRUMENT	EMCI-N-6-06	AT-06010	Nov. 28, 2024			
3	Preamplifier	EMC INSTRUMENT	EMC001330	980863	Nov. 17, 2024			
4	Cable	RegalWay	LMR400-NMNM-12 .5m	N/A	Jul. 04, 2024			
5	Cable	RegalWay	LMR400-NMNM-3 m	N/A	Jul. 04, 2024			
6	Cable	RegalWay	LMR400-NMNM-0. 5m	N/A	Jul. 04, 2024			
7	Receiver	Agilent	N9038A	MY52130039	Jan. 07, 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	n 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	Jan. 07, 2024		
2	Preamplifier	EMC INSTRUMENT	EMC118A45SE	980888	Nov. 17, 2024		
3	EXA Spectrum Analyzer	Keysight	N9010A	MY55150209	Jun. 16, 2024		
4	Double Ridged Guide Antenna	ETS	3115	75789	May 31, 2024		
5	Cable	RegalWay	RegalWay A81-SMAMSMAM- 12.5M N/A		Aug. 08, 2024		
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	966 Chamber room	CM	9*6*6	N/A	May 17, 2024		
9	Positioning Controller	MF	MF-7802	N/A	N/A		
10	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A		
11	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330 -K	619413	Jul. 06, 2024		
12	Cable	RegalWay	RWLP50-2.6A-2.92 M2.92M-1.1M	N/A	Jul. 26, 2024		
13	Cable	Tonscend	HF160-KMKM-3M	N/A	Jul. 26, 2024		
14	Broad-Band Horn Antenna	Schwarzbeck	BBHA9170(3m)	9170-319	Jun. 20, 2024		

	Bandwidth & Maximum Output Power & Power Spectral Density & Conducted Spurious Emission							
Item	em Kind of Equipment Manufacturer Type No. Serial No. Calibrated unti							
1	Spectrum Analyzer	R&S	R&S FSP40 100185 Jun. 16, 20					
2	Attenuator	Talent Microwave	Talent Microwave TA10A0-S-26.5 N/A N/A					
3	3 Multi-output DC Power Supply GW Instek GPC-3030DN EK880675 Jul. 07, 2024							
4	Measurement Software	BTL	BTL Conducted Test	N/A	N/A			

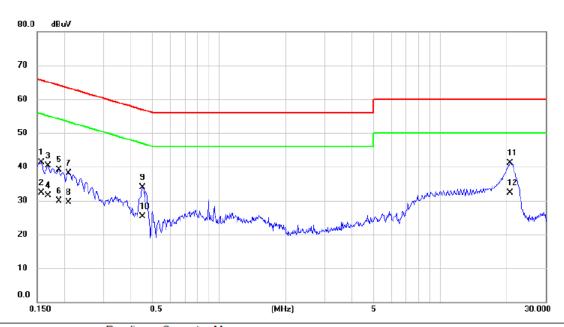
Remark: "N/A" denotes no model name, serial no. or calibration specified. All calibration period of equipment list is one year.



APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS





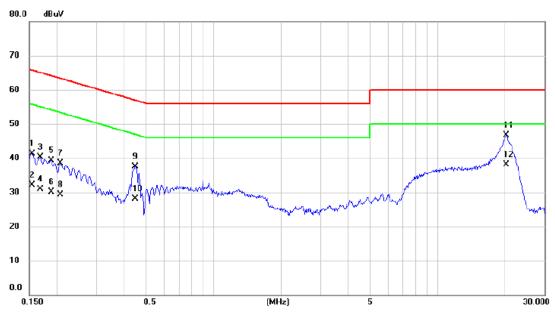


No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1568	31.57	9.74	41.31	65.63	-24.32	QP	
2	0.1568	22.50	9.74	32.24	55.63	-23.39	AVG	
3	0.1680	30.48	9.74	40.22	65.06	-24.84	QP	
4	0.1680	21.80	9.74	31.54	55.06	-23.52	AVG	
5	0.1883	29.31	9.74	39.05	64.11	-25.06	QP	
6	0.1883	20.20	9.74	29.94	54.11	-24.17	AVG	
7	0.2085	28.28	9.74	38.02	63.26	-25.24	QP	
8	0.2085	19.70	9.74	29.44	53.26	-23.82	AVG	
9	0.4515	24.12	9.79	33.91	56.85	-22.94	QP	
10	0.4515	15.60	9.79	25.39	46.85	-21.46	AVG	
11	20.7353	30.66	10.47	41.13	60.00	-18.87	QP	
12 *	20.7353	21.90	10.47	32.37	50.00	-17.63	AVG	

- (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	dBuV	dB	Detector	Comment
1	0.1545	31.65	9.59	41.24	65.75	-24.51	QP	
2	0.1545	22.60	9.59	32.19	55.75	-23.56	AVG	
3	0.1680	30.73	9.59	40.32	65.06	-24.74	QP	
4	0.1680	21.30	9.59	30.89	55.06	-24.17	AVG	
5	0.1883	29.61	9.60	39.21	64.11	-24.90	QP	
6	0.1883	20.50	9.60	30.10	54.11	-24.01	AVG	
7	0.2063	28.92	9.60	38.52	63.35	-24.83	QP	
8	0.2063	19.70	9.60	29.30	53.35	-24.05	AVG	
9	0.4470	27.94	9.64	37.58	56.93	-19.35	QP	
10	0.4470	18.40	9.64	28.04	46.93	-18.89	AVG	
11	20.2898	36.30	10.33	46.63	60.00	-13.37	QP	
12 *	20.2898	27.80	10.33	38.13	50.00	-11.87	AVG	

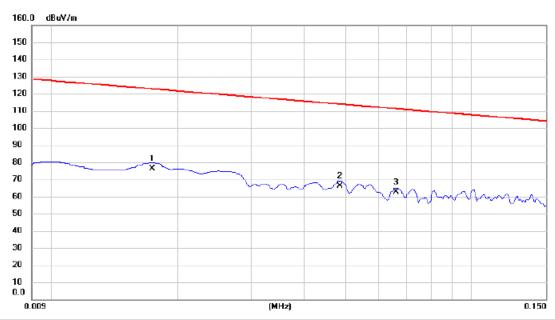
- (1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value Limit Value.



APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ





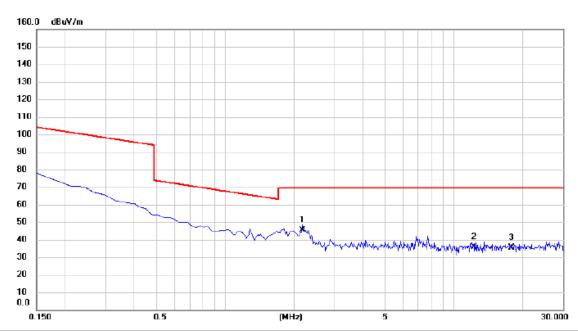


No. Mk.	Freq.	Reading Level		Measure ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	0.0174	55.68	20.49	76.17	122.79	-46.62	AVG	
2	0.0485	46.48	19.80	66.28	113.89	-47.61	AVG	
3	0.0662	42.69	19.85	62.54	111.19	-48.65	AVG	

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





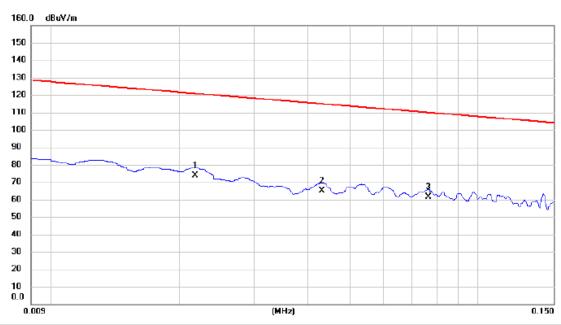


No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2.1798	25.68	19.81	45.49	69.54	-24.05	QP	
2	12.2393	15.64	20.23	35.87	69.54	-33.67	QP	
3	17.8511	14.84	20.48	35.32	69.54	-34.22	QP	

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





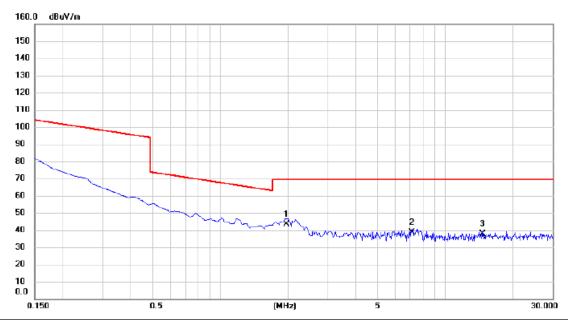


No. Mk.	Freq.	_	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	0.0218	53.64	20.25	73.89	120.84	-46.95	AVG	
2	0.0431	45.25	19.80	65.05	114.92	-49.87	AVG	
3	0.0765	41.69	19.89	61.58	109.93	-48.35	AVG	

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







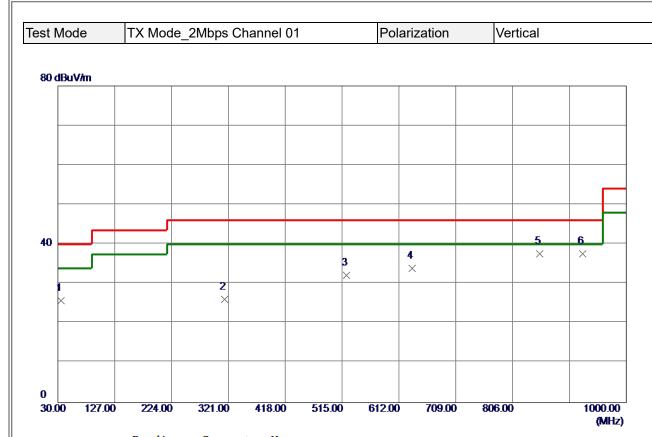
No.	Mk.	Freq.			Measure- ment		Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	1.9708	23.56	19.79	43.35	69.54	-26.19	QP	
2		7.1350	18.69	20.03	38.72	69.54	-30.82	QP	
3		14.6720	17.62	20.29	37.91	69.54	-31.63	QP	

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



APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ	<u> </u>



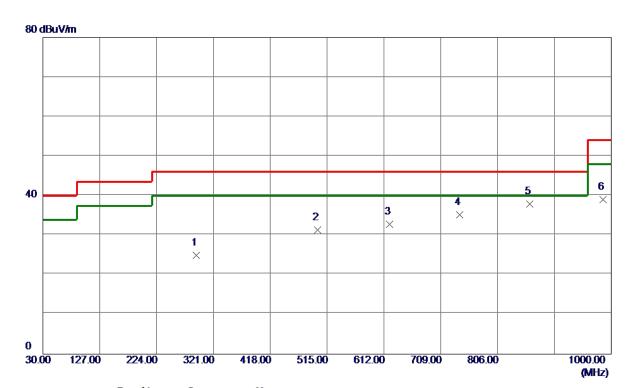


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	35. 3350	37. 76	-12.00	25. 76	40.00	-14. 24	Peak	
2	314. 6950	36. 21	-10. 14	26. 07	46.00	-19. 93	Peak	
3	522. 2750	37. 78	-5. 61	32. 17	46.00	-13. 83	Peak	
4	634. 3100	37. 30	-3. 31	33. 99	46.00	-12. 01	Peak	
5	852. 5600	37. 79	-0. 18	37. 61	46.00	-8. 39	Peak	
6 *	925. 3100	37. 56	0. 07	37. 63	46.00	-8. 37	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	291. 9000	35. 89	-10. 92	24. 97	46.00	-21. 03	Peak	
2	498. 9950	37. 40	-5. 99	31. 41	46.00	-14. 59	Peak	
3	621. 7000	36. 15	-3. 36	32. 79	46.00	-13. 21	Peak	
4	741. 0100	37. 03	-1. 78	35. 25	46.00	-10. 75	Peak	
5 *	861. 2900	38. 06	-0. 18	37. 88	46.00	-8. 12	Peak	
6	986. 4200	38. 14	0.85	38. 99	54. 00	-15. 01	Peak	

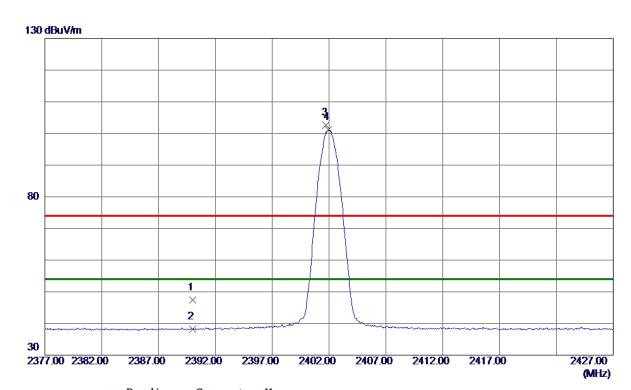
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ	



Test Mode	TX 2402 MHz CH00 1Mbps	Polarization	Vertical

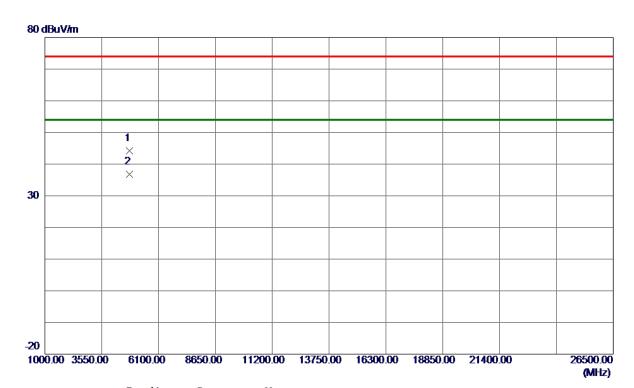


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390. 0000	41. 18	6. 17	47. 35	74.00	-26. 65	Peak	
2	2390. 0000	32. 12	6. 17	38. 29	54.00	-15. 71	AVG	
3	2401.7500	96. 44	6. 18	102.62	74.00	28. 62	Peak	No Limit
4 *	2401. 9250	94. 97	6. 18	101. 15	54.00	47. 15	AVG	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

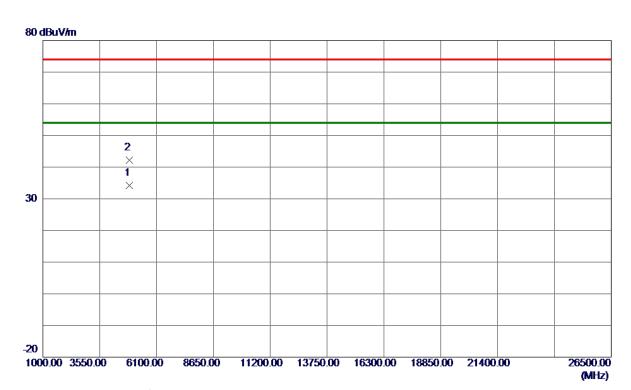


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4803. 3300	43. 26	0. 90	44. 16	74.00	-29. 84	Peak	
2 *	4803. 8300	35. 84	0. 90	36. 74	54. 00	-17. 26	AVG	

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



Test Mode	TX 2440 MHz _	CH19_1Mbps	Polarization	Horizontal

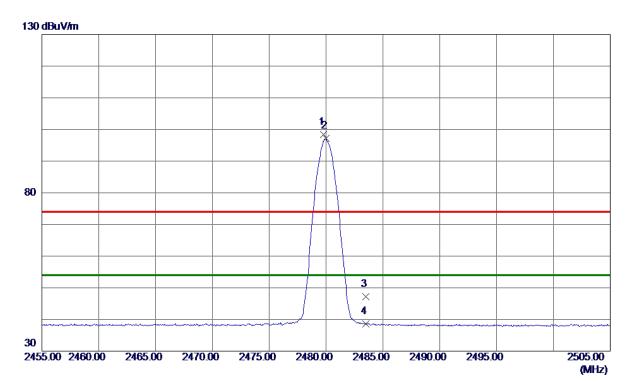


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4879. 7500	33. 05	1. 09	34. 14	54.00	-19. 86	AVG	
2	4880. 4700	41. 13	1. 10	42. 23	74.00	-31. 77	Peak	

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



Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Vertical

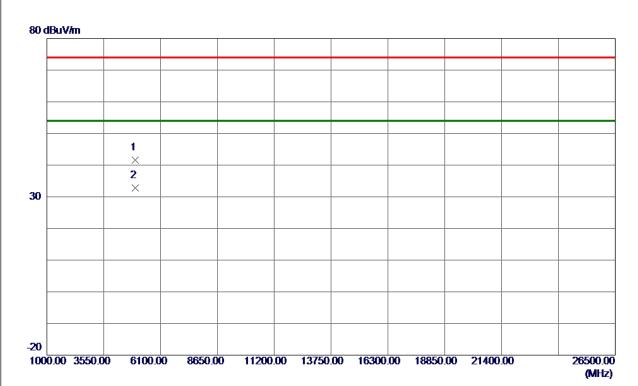


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479. 7750	92. 24	6. 23	98. 47	74.00	24. 47	Peak	No Limit
2 *	2480. 0000	90. 91	6. 23	97. 14	54.00	43. 14	AVG	No Limit
3	2483. 5000	41.02	6. 23	47. 25	74.00	-26. 75	Peak	
4	2483. 5000	32. 42	6. 23	38. 65	54. 00	-15. 35	AVG	

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



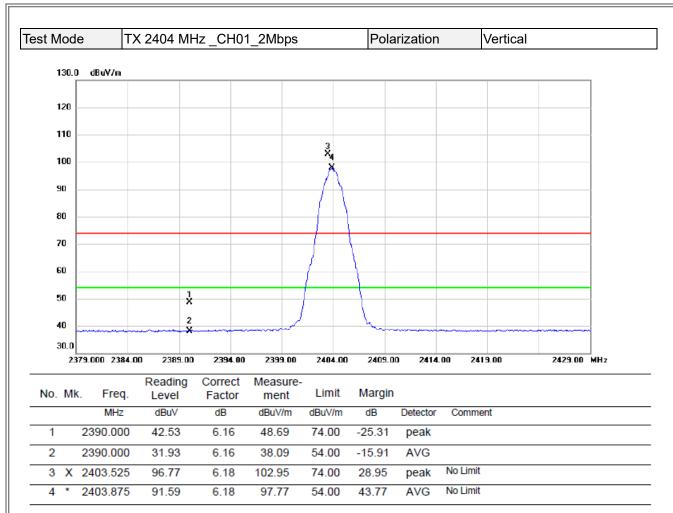
Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4959. 7200	40. 34	1. 30	41.64	74.00	-32. 36	Peak	
2 *	4959. 9200	31. 57	1. 30	32. 87	54.00	-21. 13	AVG	

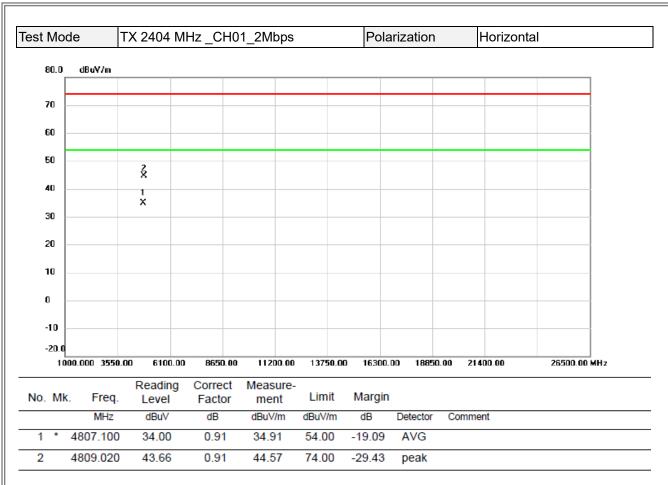
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





- (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.



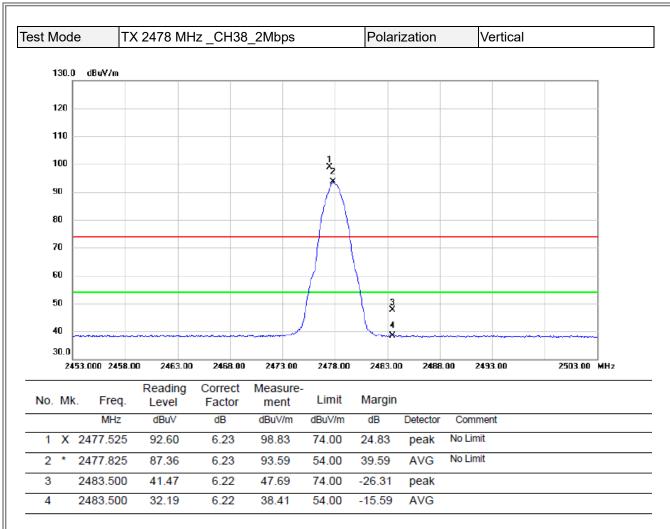
Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4879. 0200	31. 49	1. 09	32. 58	54.00	-21. 42	AVG	
2	4880. 0700	41. 55	1. 09	42.64	74.00	-31. 36	Peak	

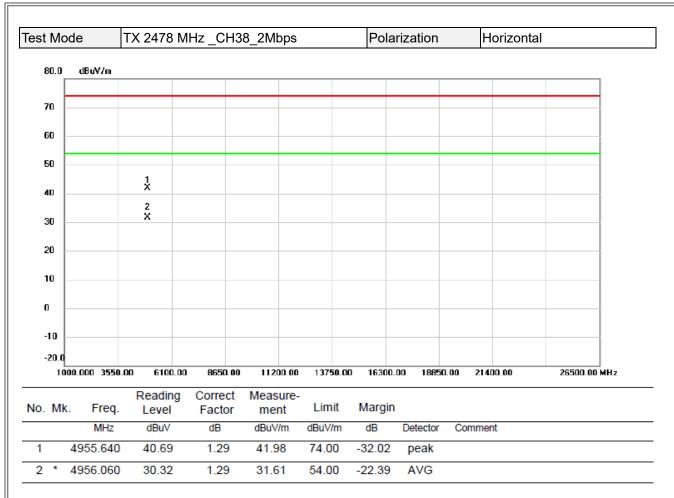
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





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





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

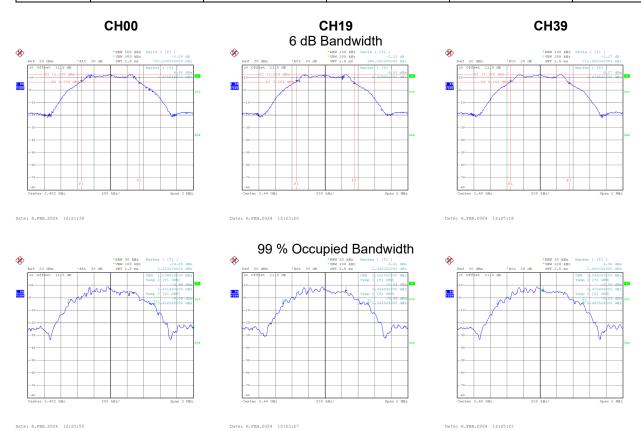


APPENDIX E - BANDWIDTH



Test Mode	TX Mode	1Mbps
1001111040	1711000	11112

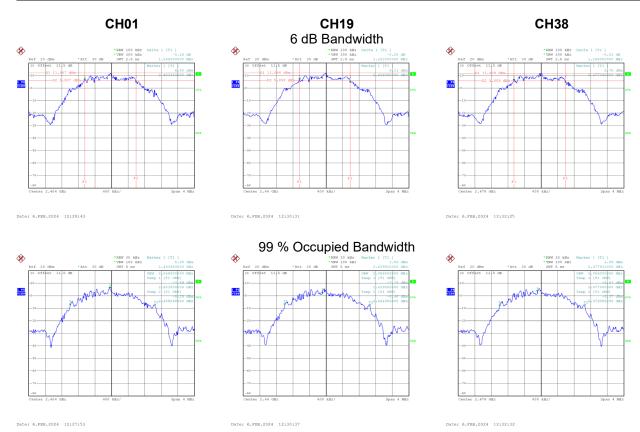
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	0.702	1.036	0.5	Pass
19	2440	0.698	1.032	0.5	Pass
39	2480	0.712	1.036	0.5	Pass





I	Test Mode	TX Mode	2Mbi	os

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
01	2404	1.240	2.048	0.5	Pass
19	2440	1.222	2.056	0.5	Pass
38	2478	1.248	2.056	0.5	Pass





APPENDIX F - MAXIMUM OUTPUT POWER



For Left Earphone:

Test Mode	TX Mode	_1Mbps
-----------	---------	--------

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	10.78	0.0120	30.00	1.0000	Pass
2440	10.74	0.0119	30.00	1.0000	Pass
2480	10.63	0.0116	30.00	1.0000	Pass



Test Mode ITX Mode 2Mbps	
Test vioue TX vioue Zivipps	

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2404	12.31	0.0170	30.00	1.0000	Pass
2440	12.23	0.0167	30.00	1.0000	Pass
2478	12.16	0.0164	30.00	1.0000	Pass





For Right Earphone:

Test Mode T	TX Mode	1Mbps
-------------	---------	-------

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	11.31	0.0135	30.00	1.0000	Pass
2440	11.23	0.0133	30.00	1.0000	Pass
2480	11.13	0.0130	30.00	1.0000	Pass



Task Masta	TV Maria OMissa	
lest Mode	TX Mode 2Mbps	
	1.27.1110-001110-00	

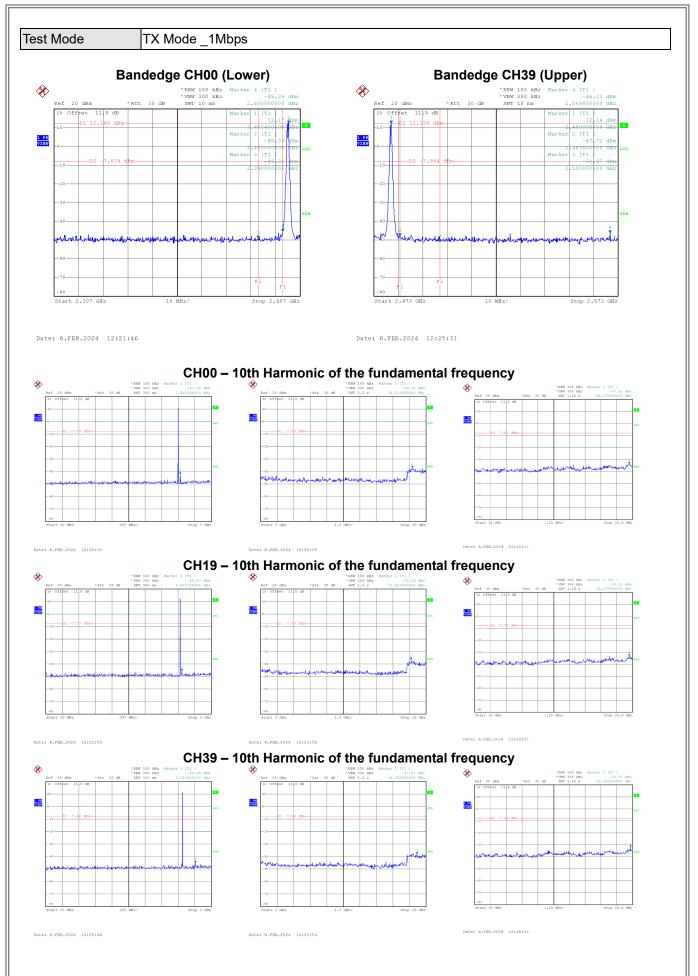
Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2404	12.96	0.0198	30.00	1.0000	Pass
2440	12.91	0.0195	30.00	1.0000	Pass
2478	12.82	0.0191	30.00	1.0000	Pass



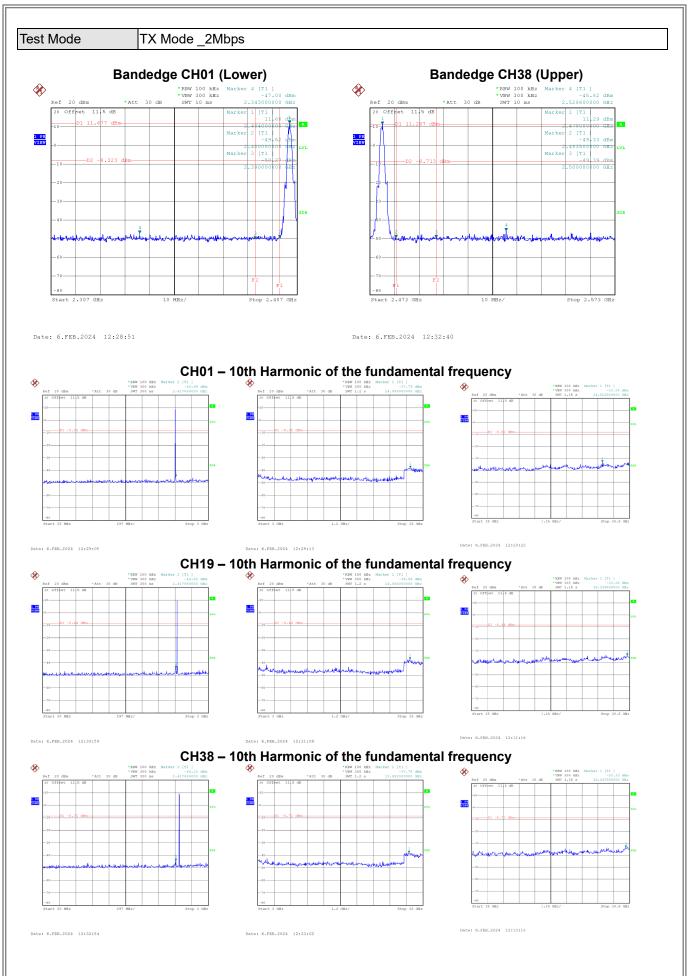


APPENDIX G - CONDUCTED SPURIOUS EMISSION











APPENDIX H - POWER SPECTRAL DENSITY



Test Mod	e	ΤX	Mode	_1Mb	os.
100111104	•		111040		~~

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-2.54	8.00	Pass
19	2440	-2.33	8.00	Pass
39	2480	-2.55	8.00	Pass



Test Mode	ITX Mode 2Mbps
103t Wode	TIX Wode _ZWbp3

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
01	2404	-4.97	8.00	Pass
19	2440	-4.91	8.00	Pass
38	2478	-4.91	8.00	Pass



End of Test Report