

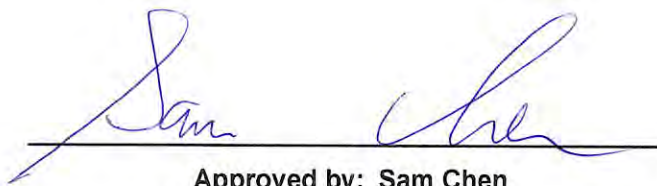


RADIO TEST REPORT

FCC ID : MSQ-RTAX5X00
Equipment : ROG Rapture AX10000 Tri-band Gaming Mesh Router
Brand Name : ASUS
Model Name : GT6
Applicant : ASUSTeK COMPUTER INC.
1F., No. 15, Lide Rd., Beitou, Taipei City 112, Taiwan
Standard : 47 CFR FCC Part 15.247

The product was received on Oct. 30, 2023, and testing was started from Apr. 09, 2024 and completed on Apr. 09, 2024. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A10 10 Ver1.3

Page Number : 3 of 17
Issued Date : May 13, 2024
Report Version : 01



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sam Chen

Report Producer: Sophia Shiung



1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
2400-2483.5	b, g, n (HT20), VHT20, ax (HEW20)	2412-2462	1-11 [11]
2400-2483.5	n (HT40), VHT40, ax (HEW40)	2422-2452	3-9 [7]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	2TX
2.4-2.4835GHz	802.11g	20	2TX
2.4-2.4835GHz	802.11n HT20	20	2TX
2.4-2.4835GHz	802.11n HT20-BF	20	2TX
2.4-2.4835GHz	VHT20	20	2TX
2.4-2.4835GHz	VHT20-BF	20	2TX
2.4-2.4835GHz	802.11ax HEW20	20	2TX
2.4-2.4835GHz	802.11ax HEW20-BF	20	2TX
2.4-2.4835GHz	802.11n HT40	40	2TX
2.4-2.4835GHz	802.11n HT40-BF	40	2TX
2.4-2.4835GHz	VHT40	40	2TX
2.4-2.4835GHz	VHT40-BF	40	2TX
2.4-2.4835GHz	802.11ax HEW40	40	2TX
2.4-2.4835GHz	802.11ax HEW40-BF	40	2TX

Note:

- ♦ 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- ♦ 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ VHT20, VHT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- ♦ HEW20, HEW40 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- ♦ BWch is the nominal channel bandwidth.

**1.1.2 Antenna Information**

Ant.	Port				Brand Name	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz UNII 1~2A	WLAN 5GHz UNII 2C~4 (Mode 1)	WLAN 5GHz UNII 2C~4 (Mode 2)					
1	2	4	-	-	LYNwave	MLX22M-121AA1-A / MLX22M-121AA1-B	Dipole	I-PEX	Note 1
2	1	3	-	-	LYNwave	MLX22M-121AA1-A / MLX22M-121AA1-B	Dipole	I-PEX	
3	-	2	-	-	LYNwave	MLX22M-121AA1-A / MLX22M-121AA1-B	Dipole	I-PEX	
4	-	1	-	-	LYNwave	MLX22M-121AA1-A / MLX22M-121AA1-B	Dipole	I-PEX	
5	-	-	4	4	LYNwave	MLX22M-121AA1-A / MLX22M-121AA1-B	Dipole	I-PEX	
6	-	-	1	1	LYNwave	MLX22M-121AA1-A / MLX22M-121AA1-B	Dipole	I-PEX	
7	-	-	3	3	LYNwave	MLX22M-121AA1-A / MLX22M-121AA1-B	Dipole	I-PEX	
8	-	-	2	-	LYNwave	MLX22M-121AA1-A / MLX22M-121AA1-B	Dipole	I-PEX	
9	-	-	-	2	LYNwave	MLX22M-121AA1-A / MLX22M-121AA1-B	Dipole	I-PEX	

Note 1:

<Antenna gain>

Ant.	Port				Gain(dBi)								
	WLAN 2.4GHz	WLAN 5GHz UNII 1~2A	WLAN 5GHz UNII 2C~4 (Mode 1)	WLAN 5GHz UNII 2C~4 (Mode 2)	WLAN 2.4GHz	WLAN 5GHz							
						UNII 1	UNII 2A	UNII 2C		UNII 3		UNII 4	
								Mode1	Mode2	Mode1	Mode2	Mode1	Mode2
1	2	4	-	-	4.1	3.53	3.81	-	-	-	-	-	-
2	1	3	-	-	3.39	3.26	4.32	-	-	-	-	-	-
3	-	2	-	-	-	2.32	2.96	-	-	-	-	-	-
4	-	1	-	-	-	2.31	2.44	-	-	-	-	-	-
5	-	-	4	4	-	-	-	1.43	1.43	2.08	2.08	2.5	2.5
6	-	-	1	1	-	-	-	1.66	1.66	1.91	1.91	2.89	2.89
7	-	-	3	3	-	-	-	2.8	2.8	3.51	3.51	3.79	3.79
8	-	-	2	-	-	-	-	2.55	-	3.36	-	3.65	-
9	-	-	-	2	-	-	-	-	3.64	-	3.64	-	3.29

**<Directional Gain>**

Directional Gain(dBi)									
Item	WLAN 2.4GHz	WLAN 5GHz							
		UNII 1	UNII 2A	UNII 2C		UNII 3		UNII 4	
				Mode1	Mode2	Mode1	Mode2	Mode1	Mode2
2T1S	6.01	-	-	-	-	-	-	-	-
2T2S	4.1	-	-	-	-	-	-	-	-
4T1S	-	6.24	6.43	6.13	4.83	7.23	5.25	6.76	4.95
4T2S	-	-	4.32	-	-	4.23	3.64	3.79	3.79

Note 2: The above information (except gain) was declared by manufacturer.

The directional gain is measured which follows the procedure of KDB 662911 D03.

Note 3: Mode1 was Ant.5~7+Ant.8 and Mode 2 was Ant. 5~7+Ant.9.

Note 4: The EUT support the antenna with TX/RX diversity functions. The Ant.8 and Ant.9 can be used as transmitting and receiving antennas, but only one of them will be used at one time.

Ant. 8 generated be the worst case, so it was selected to test and recorded in the report.

Note 5: The antennas' model: "MLX22M-121AA1-A" and "MLX22M-121AA1-B" are same type of antennas. Model "MLX22M-121AA1-A" is for black outer case use; model "MLX22M-121AA1-B" is for white outer case use.

Note 6: **For 2.4GHz function:**

For IEEE 802.11b/g/n/VHT/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac/ax (4TX/4RX):

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

**1.1.3 EUT Operational Condition**

EUT Power Type	From Power Adapter			
Beamforming Function	☒	With beamforming	☐	Without beamforming
	The product has beamforming function for 11n/VHT/ax in 2.4GHz and 11n/ac/ax in 5GHz.			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	accessMtool v3.2.1.5			

Note: The above information was declared by manufacturer.

1.1.4 Table for EUT supports functions

Function	Support Type
AP Router	Master
Bridge	Slave without radar detection
Repeater	Master
Mesh	Master

Note: The above information was declared by manufacturer.

1.1.5 Table for EUT Information

EUT	PCB board Version	Color of outer case and heatsink	
		Black outer case	White outer case
1	R1.20	With silver heatsink	With silver heatsink
2	R2.00		
3	R2.00	With black heatsink	With silver heatsink

EUT	Source	
	MLCC - SMD/SMT MLCC 1PF/25V (0201) NPO 0.1PF (Location: CB293, CB296, CB299, CB302)	Resistance - SMD/SMT RES 0 OHM 1/20W (0201) JUMP (Location: RB58, RB75, RB91, RB107)
1	Brand : MURATA Model : GRM0335C1E1R0BA01D	Brand : TA-I Brand : RM02JTN0
2		
3	Brand : DARFON Model : C0603NP0109BFT	Brand : WALSIN Brand : WR02X000PAL

Note 1: The EUT 3 (Black outer case) was selected to test all the test items.

Note 2: The above information was declared by manufacturer.



1.1.6 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR221807-01AA.

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Adding EUT 3 for the device (Refer to section 1.1.5 for detailed information):	Emissions in Restricted Frequency Bands below 1GHz.
2. Removing the Manufacturers' information.	After evaluation, the test results don't be affected.



1.2 Applicable Standards

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

- ♦ 47 CFR FCC Part 15.247
- ♦ ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ FCC KDB 558074 D01 v05r02
- ♦ FCC KDB 662911 D03 v01
- ♦ FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location Information				
Test Lab. : Sporton International Inc. Hsinchu Laboratory				
Hsinchu ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)				
(TAF: 3787) TEL: 886-3-656-9065 FAX: 886-3-656-9085				
Test site Designation No. TW3787 with FCC.				
Conformity Assessment Body Identifier (CABID) TW3787 with ISED.				

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated < 1GHz	03CH05-CB	Roy Mai	21.9~22.4 / 55~58	Apr. 09, 2024

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Radiated Emission (9kHz ~ 30MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.1 dB	Confidence levels of 95%

2 Test Configuration of EUT

2.1 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	CTX
	According to the original test report, "EUT in Y axis + 2.4GHz + Adapter 1" has been evaluated to be the worst case, so the measurement will follow this same test configuration.
1	EUT 3 in Y axis + 2.4GHz + Adapter 1

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	EUT 3 - WLAN 2.4GHz + WLAN 5GHz UNII 1, 2A + WLAN 5GHz UNII 2C~4
Refer to Sporton Test Report No.: FA22187-05 for Co-location RF Exposure Evaluation.	

2.2 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.3 Accessories

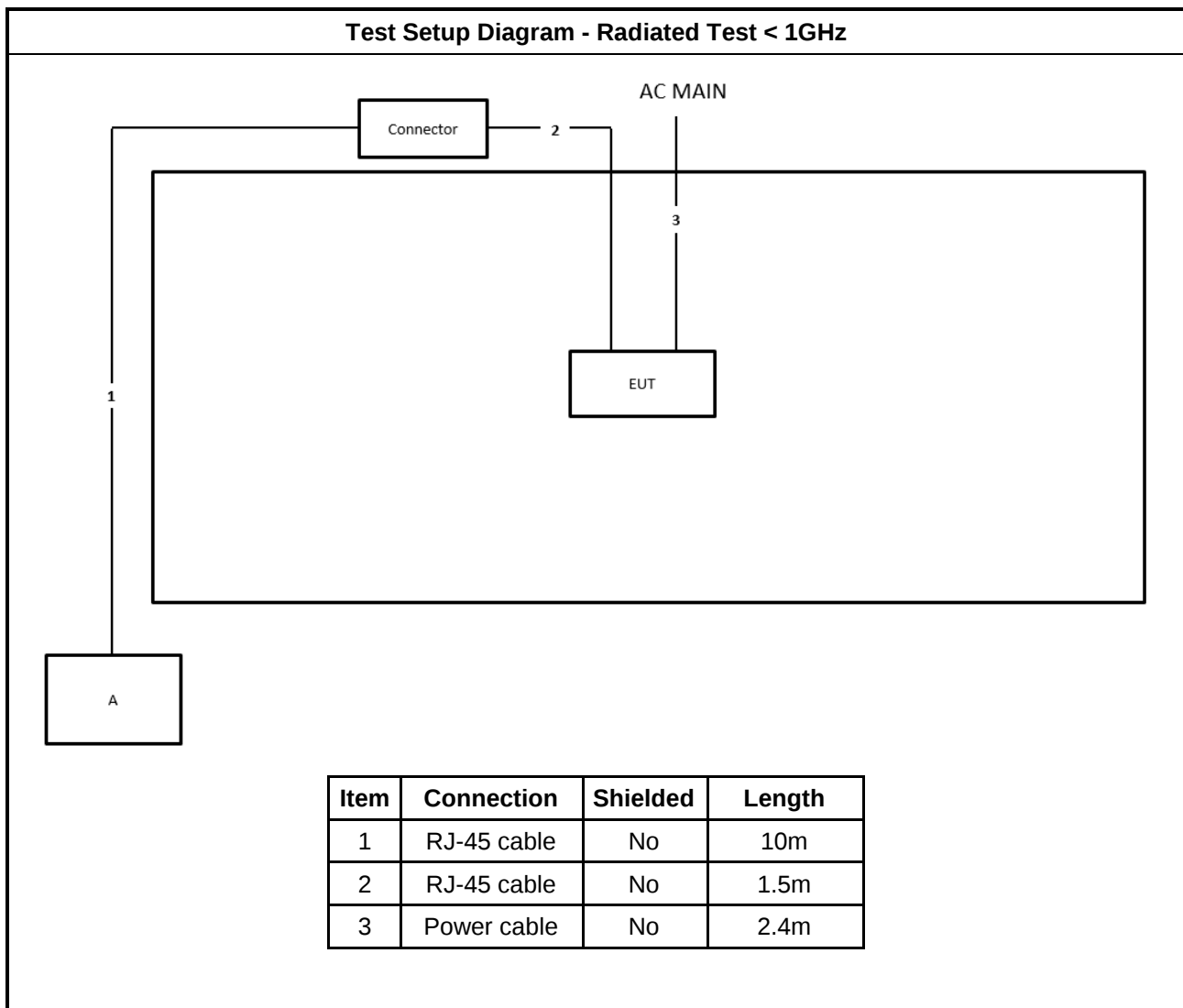
Accessories					
No.	Equipment Name	Brand Name	Model Name	Rating	Remark
1	Adapter 1	DELTA	ADP-45FE F	INPUT: 100-240V~1.2A, 50-60Hz OUTPUT: 19V, 2.37A	With the DC cable: Non-shielded, 1.6m
2	Adapter 2	AcBel	ADH011	INPUT: 100-240V~1.4A, 50-60Hz OUTPUT: 19.5V, 2.31A, 45W MAX	With the DC cable: Non-shielded, 1.6m
Others					
RJ-45 cable*1: Non-shielded, 1.5m Power cord*2: Non-shielded, 0.8m					



2.4 Support Equipment

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A

2.5 Test Setup Diagram





3 Transmitter Test Result

3.1 Emissions in Restricted Frequency Bands

3.1.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

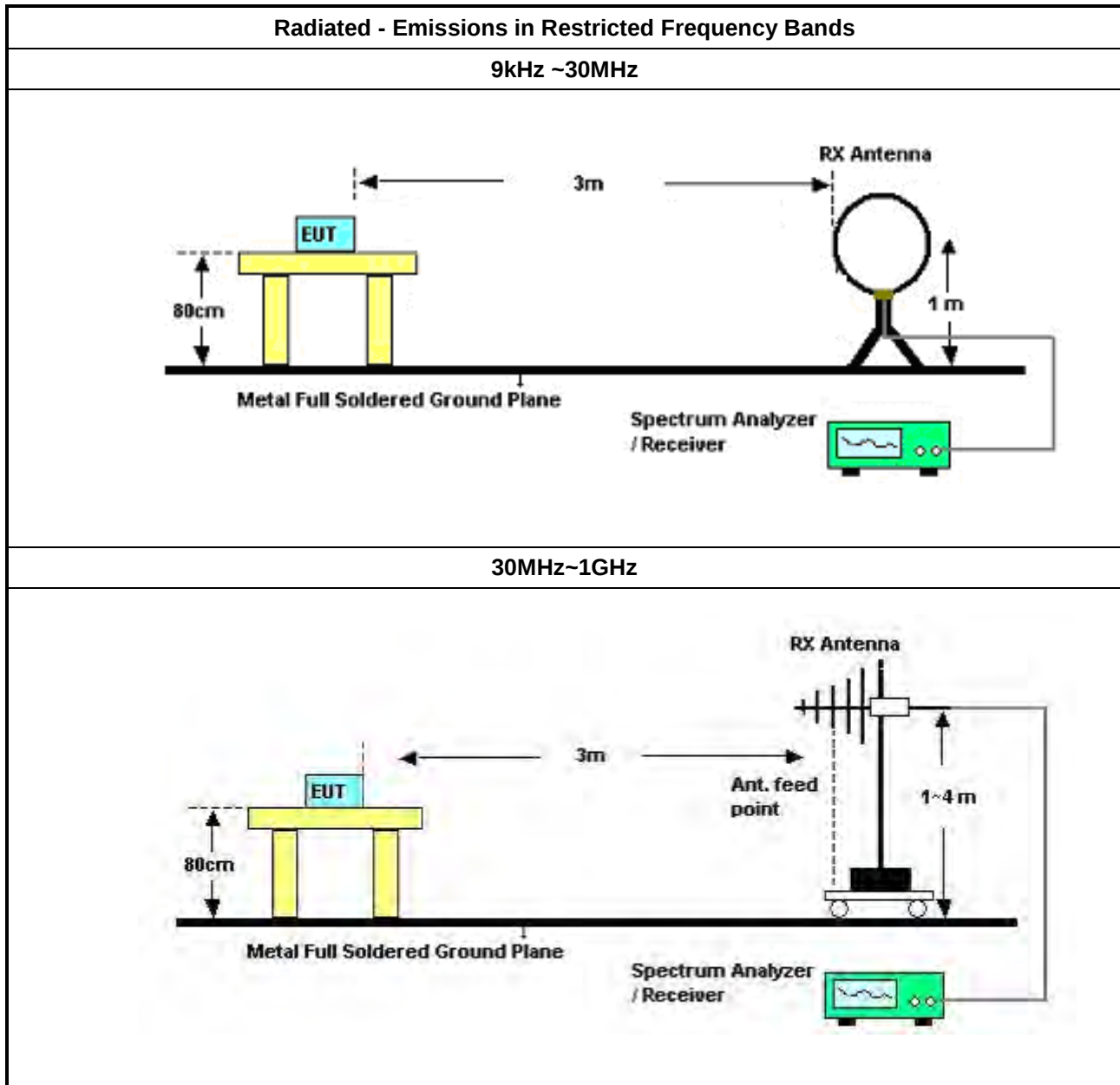
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

**3.1.3 Test Procedures**

Test Method	
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].	
▪ Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
▪ For the transmitter unwanted emissions shall be measured using following options below:	
	▪ Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.
	☐ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle $\geq 98\%$).
	☐ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
	☒ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW $\geq 1/T$).
	☐ Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time.
	☐ Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
	☒ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
▪ For the transmitter band-edge emissions shall be measured using following options below:	
	▪ Refer as FCC KDB 558074 clause 8.7 & C63.10 clause 11.13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	▪ Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
	▪ Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
	▪ For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
	▪ For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

3.1.4 Test Setup





3.1.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

3.1.6 Emissions in Restricted Frequency Bands (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10th harmonic or 40 GHz, whichever is appropriate.

3.1.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix A



4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Loop Antenna	Teseq	HLA 6121	65417	9kHz - 30 MHz	Oct. 13, 2023	Oct. 12, 2024	Radiation (03CH05-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 02, 2023	Aug. 01, 2024	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 23, 2024	Mar. 22, 2025	Radiation (03CH05-CB)
Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 03, 2023	May 02, 2024	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Apr. 18, 2023	Apr. 17, 2024	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 13, 2023	Jun. 12, 2024	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Dec. 06, 2023	Dec. 05, 2024	Radiation (03CH05-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH05-CB)

Note: Calibration Interval of instruments listed above is one year.

NCR means Non-Calibration required.



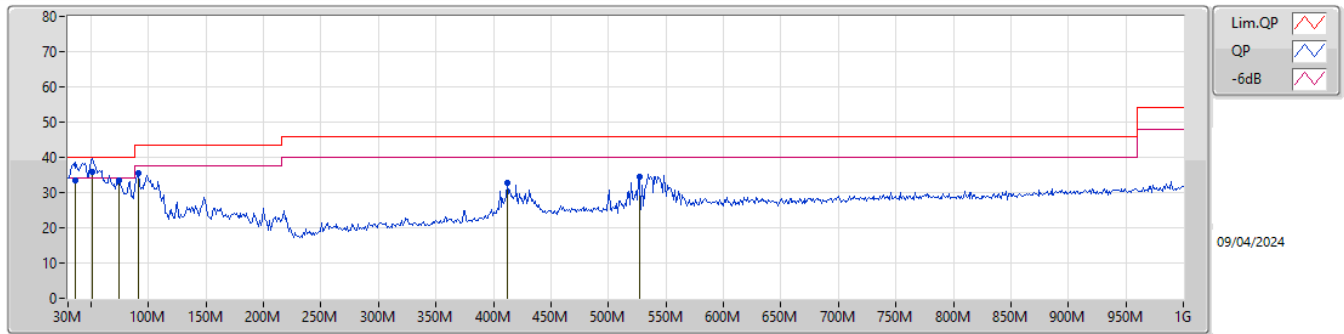
Radiated Emissions below 1GHz

Appendix A

Summary

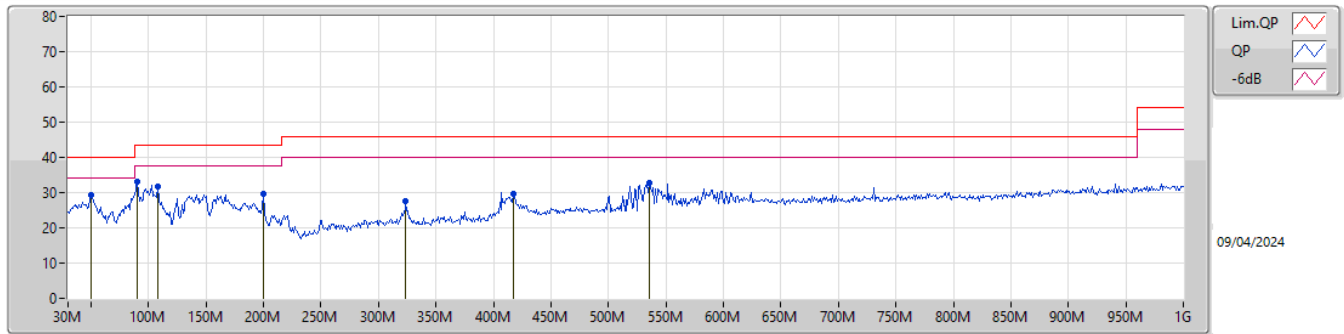
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	QP	51.34M	35.79	40.00	-4.21	Vertical

Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)		
QP	36.79M	33.60	40.00	-6.40	-9.76	3	Vertical	293	1.00	-	43.36	20.83	1.12	31.71		
QP	51.34M	35.79	40.00	-4.21	-16.71	3	Vertical	0	1.00	"Worst"	52.50	13.88	1.29	31.88		
PK	74.62M	33.45	40.00	-6.55	-17.65	3	Vertical	197	1.00	-	51.10	12.76	1.53	31.94		
PK	91.11M	35.52	43.50	-7.98	-15.05	3	Vertical	0	1.50	-	50.57	15.24	1.69	31.98		
PK	412.18M	32.83	46.00	-13.17	-6.27	3	Vertical	63	1.25	-	39.10	22.19	3.75	32.21		
PK	526.64M	34.38	46.00	-11.62	-4.75	3	Vertical	116	1.00	-	39.13	23.32	4.30	32.37		

Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)		
PK	50.37M	29.27	40.00	-10.73	-16.35	3	Horizontal	49	2.00	-	45.62	14.25	1.28	31.88		
PK	90.14M	32.94	43.50	-10.56	-15.24	3	Horizontal	85	2.00	"Worst"	48.18	15.06	1.68	31.98		
PK	107.6M	31.76	43.50	-11.74	-12.66	3	Horizontal	241	3.00	-	44.42	17.48	1.82	31.96		
PK	199.75M	29.68	43.50	-13.82	-14.26	3	Horizontal	102	1.50	-	43.94	15.25	2.50	32.01		
PK	323.91M	27.60	46.00	-18.40	-9.24	3	Horizontal	360	1.00	-	36.84	19.63	3.27	32.14		
PK	417.03M	29.75	46.00	-16.25	-6.11	3	Horizontal	359	1.00	-	35.86	22.33	3.78	32.22		
PK	535.37M	32.87	46.00	-13.13	-4.33	3	Horizontal	350	2.00	-	37.20	23.73	4.34	32.40		