FCC RADIO TEST REPORT

FCC ID	:	MSQ-RTAXJ300
Equipment	:	AX3000 Dual Band Wi-Fi Router, AX5400 Dual Band Wi-Fi Router, Dual Band Wi-Fi Router
Brand Name	:	ASUS
Model Name	:	RT-AX58U, RT-AX82U, RT-AX3000, RT-AX5400, TUF-AX3000
Applicant	:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou, Taipei 112, Taiwan
Manufacturer (1)	:	Datamax Electronics (DongGuan) Co., Ltd. Niu Shan Foreign Economic Industrial Park, Dong Cheng District, Dong Guan City, Guang Dong, China
Manufacturer (2)	:	Compal Networking (KunShan) Co., LTD. No. 520, Nabbang Rd., Economic & Technical Development Zone Kunshan, Jiangsu Province China
Manufacturer (3)	:	ARCADYAN TECHNOLOGY (VIETNAM) CO., LTD. Ba Thien Industrial Park, Ba Hien commune, Binh Xuyen district, Vinh Phuc Province
Standard	:	47 CFR FCC Part 15.247

The product was received on Dec. 25, 2019, and testing was started from Dec. 25, 2019 and completed on May 06, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR952922-06AA	01	Initial issue of report	Jun. 10, 2020

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	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-
Reference to Sporton Project No.: 952922-05				

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen
Report Producer: Cindy Peng

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

Set	Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	1	PSA	RFDPA161314IMLB701	Dipole Antenna	I-PEX	Note 1
	2	PSA	RFDPA161311IM5B702	Dipole Antenna	I-PEX	
	3	PSA	RFDPA161310IM5B701	Dipole Antenna	I-PEX	
	4	PSA	RFDPA161316IMLB701	Dipole Antenna	I-PEX	
2	1	M.gear	C660-510468-A	Dipole Antenna	I-PEX	
	2	M.gear	C660-510469-A	Dipole Antenna	I-PEX	
	3	M.gear	C660-510470-A	Dipole Antenna	I-PEX	
	4	M.gear	C660-510471-A	Dipole Antenna	I-PEX	
3	1	M.gear	C660-510472-A	Dipole Antenna	I-PEX	
	2	M.gear	C660-510473-A	Dipole Antenna	I-PEX	
	3	M.gear	C660-510474-A	Dipole Antenna	I-PEX	
	4	M.gear	C660-510475-A	Dipole Antenna	I-PEX	
4	1	PSA	RFDPA171314IMLB701	Dipole Antenna	I-PEX	
	2	PSA	RFDPA171311IM5B702	Dipole Antenna	I-PEX	
	3	PSA	RFDPA171310IM5B702	Dipole Antenna	I-PEX	
	4	PSA	RFDPA171316IMLB701	Dipole Antenna	I-PEX	

Note 1:

Set	Ant.	Port			2.4GHz	5GHz Band 1	5GHz Band 2	5GHz Band 3	5GHz Band 4
		2.4G 2TX	5G 2TX	5G 4TX					
1	1	2	-	2	1.71	1.75	1.89	1.88	1.70
	2	-	1	1	-	1.93	1.93	1.92	1.95
	3	-	2	4	-	1.75	1.85	1.83	1.89
	4	1	-	3	1.63	1.92	1.88	1.90	1.87
2	1	2	-	2	1.61	1.74	1.84	1.86	1.67
	2	-	1	1	-	1.76	1.80	1.87	1.87
	3	-	2	4	-	1.66	1.72	1.69	1.84
	4	1	-	3	1.60	1.88	1.82	1.85	1.86
3	1	2	-	2	1.70	1.71	1.85	1.85	1.68
	2	-	1	1	-	1.68	1.73	1.80	1.85
	3	-	2	4	-	1.63	1.74	1.76	1.77
	4	1	-	3	1.62	1.67	1.74	1.79	1.85
4	1	2	-	2	1.7	1.74	1.74	1.82	1.68
	2	-	1	1	-	1.86	1.90	1.64	1.90
	3	-	2	4	-	1.48	1.60	1.46	1.88
	4	1	-	3	1.61	1.63	1.71	1.81	1.86

Note 2: The above information was declared by manufacturer.

Note 3: The EUT has four sets of antennas and there are four antennas for each set.

Set 1~4 are the same type antenna. Only the highest gain Set 1 antenna was selected to test and record in this report.

For 2.4GHz WLAN function

IEEE 802.11b/g/n/VHT/ax mode (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 WLAN function

IEEE 802.11a/n/ac/ax mode (2TX, 4TX/4RX):

For 2TX

Port 1 and port 2 can be used as transmitting antenna.

Port 1 and port 2 could transmit simultaneously.

For 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
	For IEEE 802.11n/ax/VHT in 2.4GHz and IEEE 802.11n/ac/ax in 5GHz.			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	Mtool V3.1.0.3			

Note: The above information was declared by manufacturer.

1.1.4 Table for Multiple Listing

The Equipment and model names in the following table are all refer to the identical product.

Equipment	Model Name	Description
AX3000 Dual Band Wi-Fi Router, AX5400 Dual Band Wi-Fi Router, Dual Band Wi-Fi Router	RT-AX58U, RT-AX82U, RT-AX3000, RT-AX5400, TUF-AX3000	All the equipment and model names are identical, the different equipment and model names served as marketing strategy.

From the above table, equipment: AX3000 Dual Band Wi-Fi Router and model: RT-AX82U was selected as representative model for the test and its data was recorded in this report.

1.1.5 Table for SKU information

SKU	Material	5G PA	Housing Size	Brand	P/N
SKU 1	RJ-45 port was covered by plastic.	SKY85743	223.62mm x 129.48mm x 32.9mm	LAN port : NETSWAP / Mingtek WAN port : NETSWAP / Mingtek	LAN port : NS773602 / HN36201CG WAN port: NS771802 / HN18101CG
SKU 2	RJ-45 port was covered by metal.	SKY85743	264.82mm x 156.11mm x 54.97mm		
SKU 3	RJ-45 port was covered by metal.	SKY85743	265.00mm x 158.39mm x 54.99mm		
SKU 4	RJ-45 port was covered by metal.	SKY85743	275.50mm x 170.40mm x 65.00mm		
SKU 5	RJ-45 port was covered by plastic.	QPF4516B	223.62mm x 129.48mm x 32.9mm		

Note1: The SKU 3 is same as SKU 2 except for the logo of housing size and antenna appearance.

Note2: The SKU 4 is same as SKU 2 except for the logo of housing size, antenna appearance and design of light board.

Note3: The EUT 5 is same as SKU 1 except for 5G PA.

1.1.6 Table for EUT supports functions

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

1.1.7 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR952922AA

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

Modifications	Performance Checking
1. Adding three adapters (adapter 3~adapter 5).	1. Conducted Emissions 2. Radiated Emissions below 1GHz.
2. Adding the SKU 4 and SKU 5 (Refer to section 1.1.6 for detail information).	Radiated Emissions below 1GHz.
3. Adding 5GHz band 3 (5470~5725 MHz) for this device. 4. Adding Mesh function. 5. Adding Dynamic In-Service Monitoring Test (Zero-Wait CAC) of 160MHz. 6. Adding model name: RT-AX3000, RT-AX5400, TUF-AX3000 (Refer to section 1.1.5 for detail information) 7. Adding equipment name: Dual Band Wi-Fi Router (Refer to section 1.1.5 for detail information) 8. Adding the SKU 3 (Refer to section 1.1.6 for detail information). 9. Changing the applicant address to “1F., No. 15, Lide Rd., Beitou, Taipei 112, Taiwan” from “4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan”.	It is not necessary to re-test.

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
- 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 D01 v02r01
- FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location			
☐	HWA YA	ADD :	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)
		TEL :	886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD :	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
		TEL :	886-3-656-9065 FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated below 1GHz (For Mode 1~Mode 2)	03CH05-CB	Eason Chen	21.1~22.4°C / 52~55%	Dec. 26, 2019
Radiated below 1GHz (For Mode 3~Mode 5)	03CH05-CB	KJ Chang	21.9~22.6°C / 54~57%	Apr. 23, 2020~May 06, 2020
AC Conduction	CO02-CB	Rick Yeh	23~24.8°C / 56~59%	Dec. 25, 2019

Test site Designation No. TW0006 with FCC.
Test site registered number IC 4086D with Industry Canada.

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
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 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	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
The EUT supports 2.4GHz and 5GHz, the 2.4GHz has been evaluated to be the worst case. So the measurement will follow this same test configuration.	
1	SKU 1 (2.4GHz) + adapter 3
2	SKU 1 (2.4GHz) + adapter 5
For operating mode 2 is the worst case and it was record in this test report.	

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
1	SKU 2 (2.4GHz) + adapter 3
2	SKU 2 (2.4GHz) + adapter 5
For adapter 1, adapter 3 and adapter 5, after evaluating, adapter 1 has been evaluated to be the worst case. So the measurement will follow this same test configuration.	
3	SKU 4 (2.4GHz) + adapter 1
4	SKU 4 (5GHz) + adapter 1
Mode 3 has been evaluated to be the worst case among Mode 3~4, thus measurement for Mode 5 will follow this same test mode.	
5	SKU 5 (2.4GHz) + adapter 1
For operating mode 2 is the worst case and it was record in this test report.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + WLAN 5GHz
Refer to Sporton Test Report No.: FA952922-06 for Co-location RF Exposure Evaluation.	

Note: The EUT only use in Z axis.

2.2 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.3 Accessories

Accessories					
Equipment Name	**Brand Name**	**Model Name**	**Type**	**Country Code**	**Rating**
Adapter 1	PI	AD2088320	010LF	-	INPUT: 100-240V ~ 50/60Hz, 0.8A OUTPUT: 19V, 1.75A
Adapter 2	PI	AD2088320	010-5LF	-	INPUT: 100-240V ~ 50/60Hz, 0.8A OUTPUT: 19V, 1.75A
Adapter 3	Delta	ADP-33AW B	-	G	INPUT: 100-240V ~ 1A, 50-60Hz OUTPUT: 19V, 1.75A
Adapter 4	Delta	ADP-33AW B	-	L	INPUT: 100-240V ~ 1A, 50-60Hz OUTPUT: 19V, 1.75A
Adapter 5	Delta	ADP-33AW Y	-	-	INPUT: 100-240V ~ 1A, 50-60Hz OUTPUT: 19V, 1.75A
Other					
RJ-45 cable*1, Non-shielded, 1.5m					

Note:

1. The power adapter 1~ adapter 2 do not affect the test result of RF tests, so only adapter 1 was tested and recorded in this report.
2. The difference between adapter 3 ~ adapter 4 are only different country code, there are only adapter 3 tested and recorded in this report.

2.4 Support Equipment

For AC Conduction:

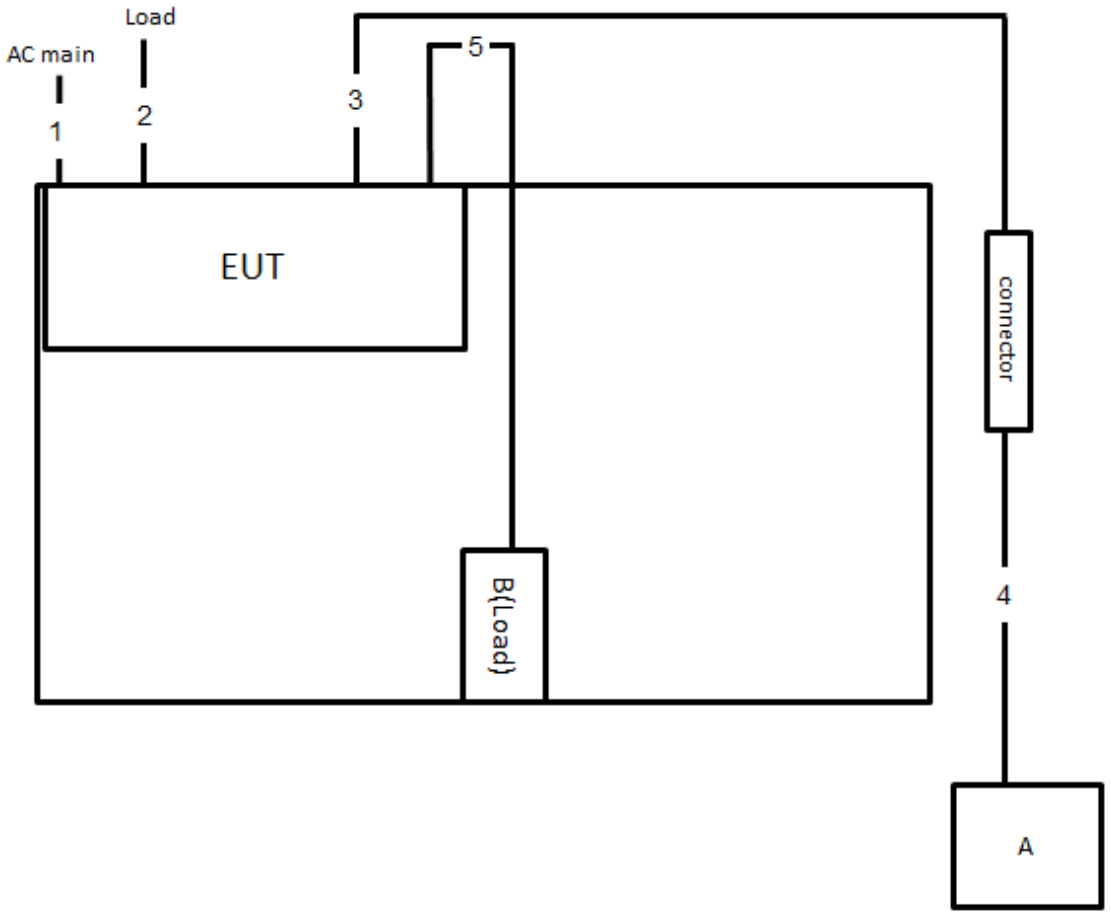
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	LAN NB	DELL	E6430	N/A
B	HDD3.0	WD	WDBACY5000AWT	N/A

For Radiated (below 1GHz):

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

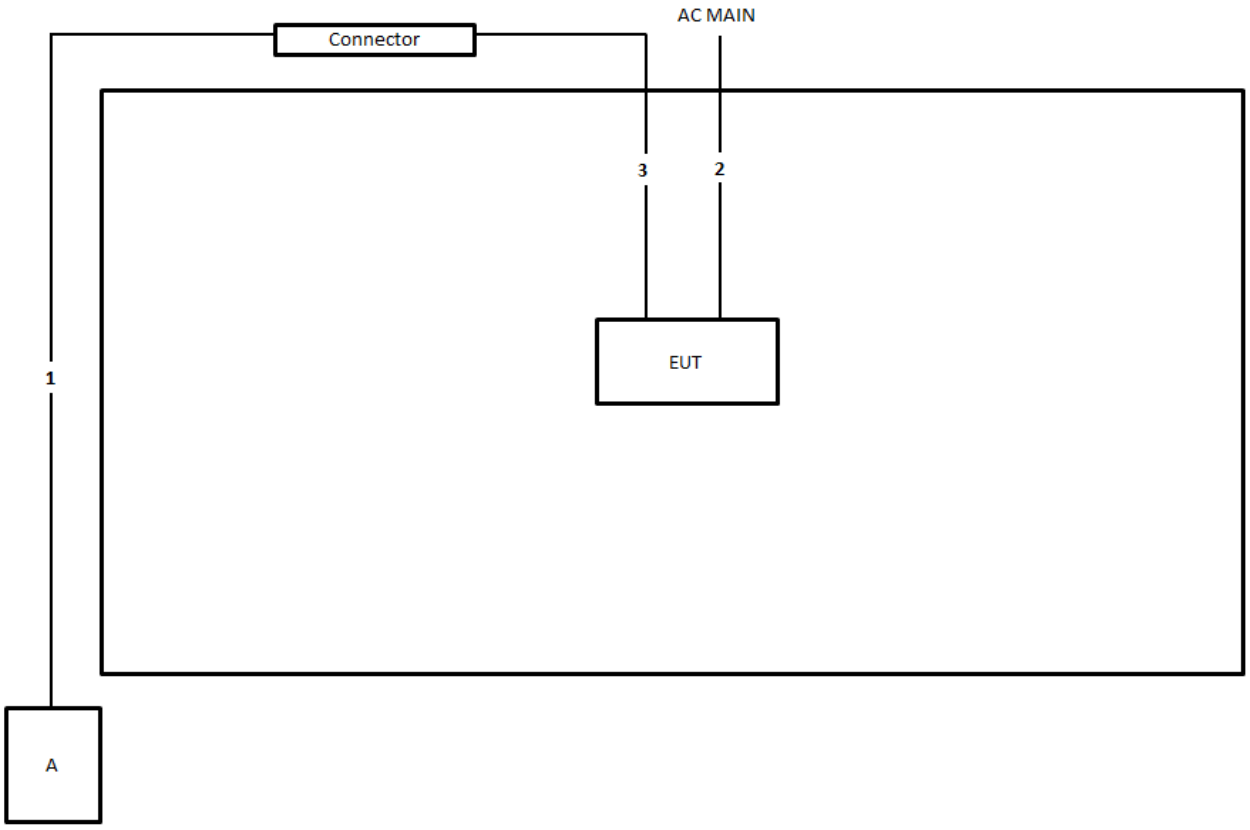
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length
1	Power cable	No	2.2m
2	RJ-45 cable*4	No	1.5m
3	RJ-45 cable	No	1.5m
4	RJ-45 cable	No	10m
5	USB cable	Yes	1.8m

Test Setup Diagram - Radiated Test < 1GHz



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	2.2m
3	RJ-45 cable	No	1.5m

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

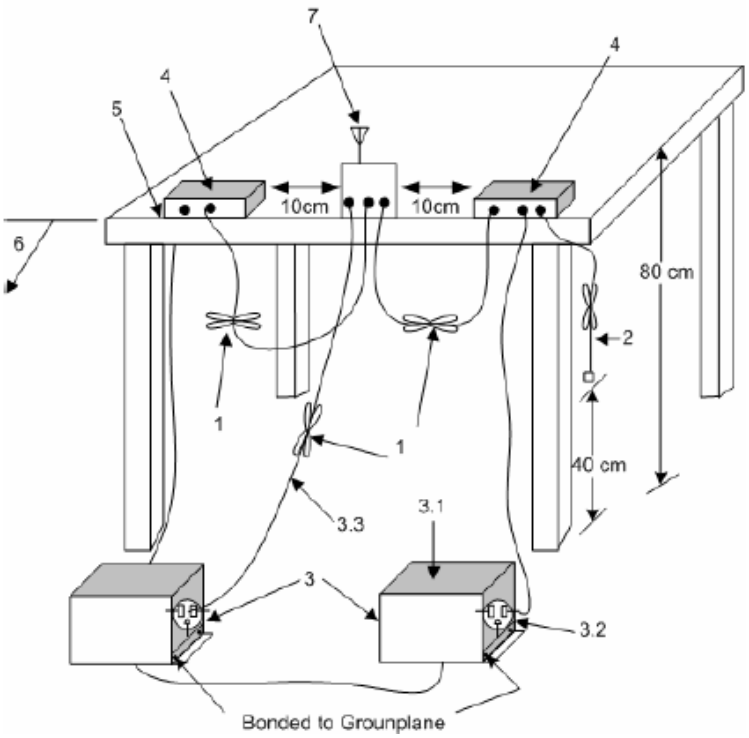
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup

AC Power-line Conducted Emissions



1—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 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory 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.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.5 Measurement Results Calculation

The measured Level is calculated using:

a. Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level

b. Margin = - Limit + (Read Level + LISN Factor + Cable Loss)

3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Emissions in Restricted Frequency Bands

3.2.1 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.

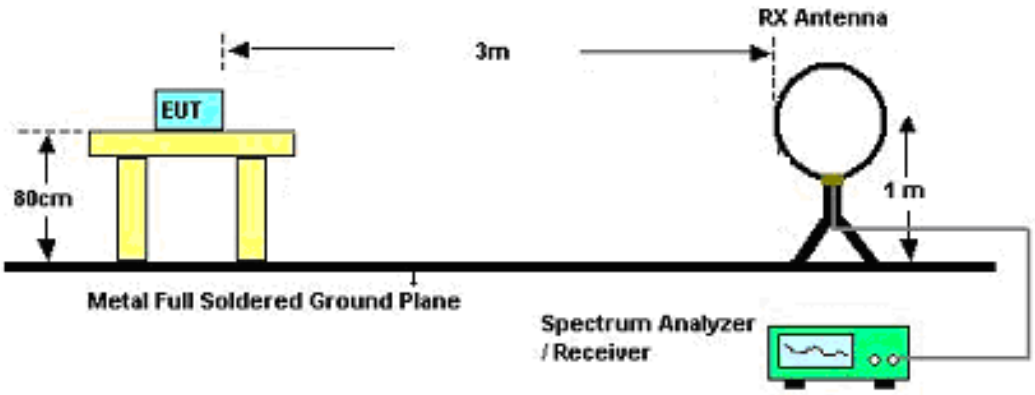
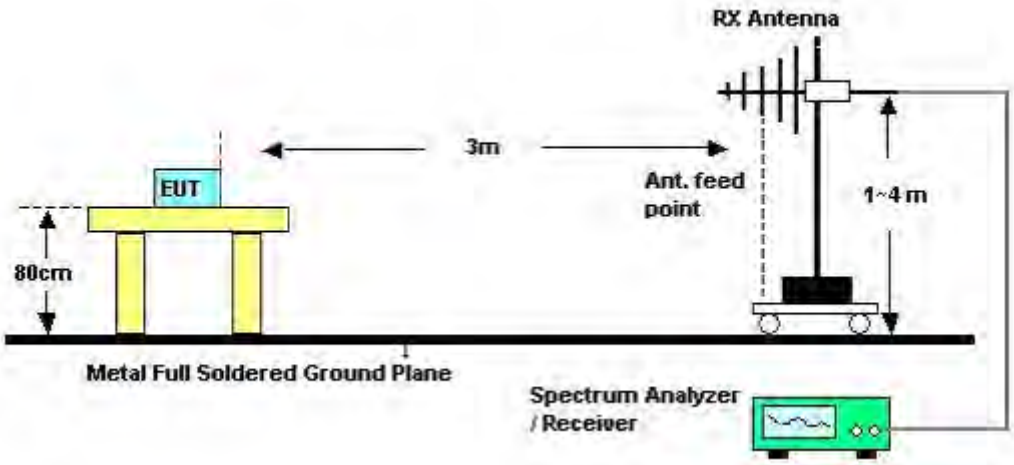
3.2.2 Measuring Instruments

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

3.2.3 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 ≥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≥1/T).
		☐	Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 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.		

3.2.4 Test Setup

Radiated - Emissions in Restricted Frequency Bands
9kHz ~30MHz

30MHz~1GHz


3.2.5 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor (if applicable) = Level.

3.2.6 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 10 harmonic or 40 GHz, whichever is appropriate.

3.2.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix B

4 Test Equipment and Calibration Data

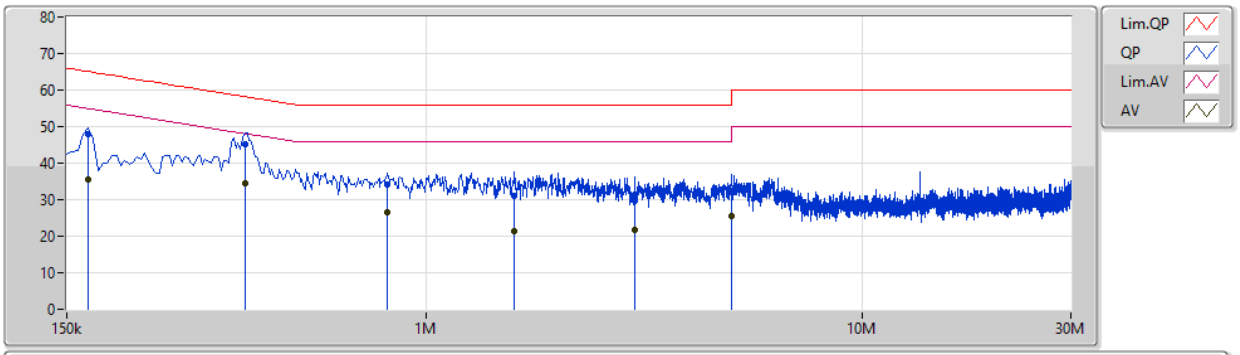
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2019	Nov. 20, 2020	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Oct. 30, 2019	Oct. 29, 2020	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 16, 2019	Jan. 15, 2020	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Oct. 21, 2019	Oct. 20, 2020	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
Bilog Antenna with 6dB Attenuator	TESE & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 27, 2020	Mar. 26, 2021	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 13, 2020	Apr. 12, 2021	Radiation (03CH05-CB)
.Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	Apr. 28, 2020	Apr. 27, 2021	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Aug. 15, 2019	Aug. 14, 2020	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)

Note: Calibration Interval of instruments listed above is one year.
N.C.R. means Non-Calibration required.

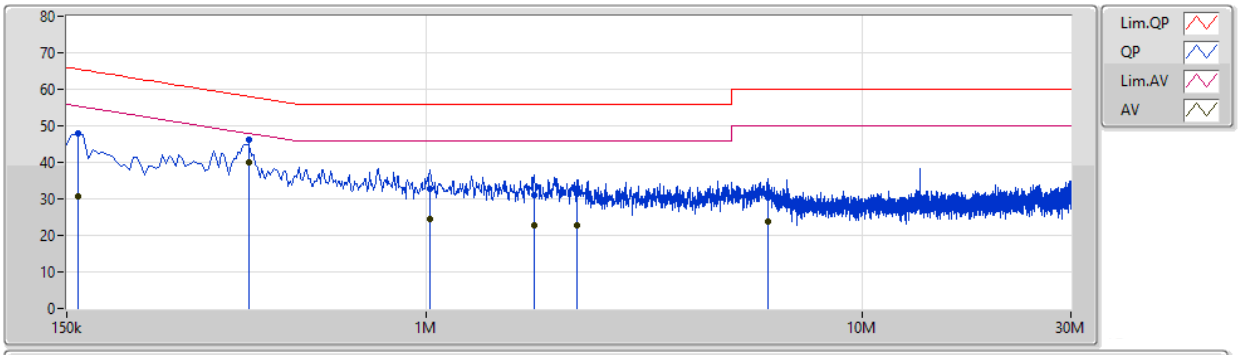
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition
Mode 2	Pass	AV	393k	39.85	48.01	-8.16	9.91	Neutral

Test Mode: Mode 2

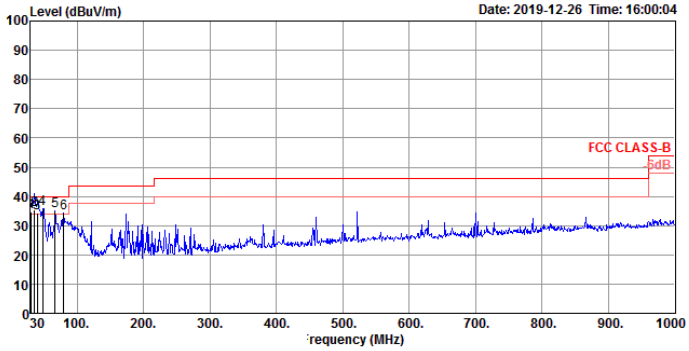


Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	AF	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	168k	47.93	65.06	-17.13	9.90	Line	-	38.03	0.05	0.06	9.79
AV	168k	35.60	55.06	-19.46	9.90	Line	-	25.70	0.05	0.06	9.79
QP	384k	45.32	58.20	-12.88	9.93	Line	"Worst"	35.39	0.06	0.06	9.81
AV	384k	34.34	48.20	-13.86	9.93	Line	-	24.41	0.06	0.06	9.81
QP	816k	34.21	56.00	-21.79	9.97	Line	-	24.24	0.07	0.08	9.82
AV	816k	26.46	46.00	-19.54	9.97	Line	-	16.49	0.07	0.08	9.82
QP	1.595M	30.89	56.00	-25.11	10.02	Line	-	20.87	0.08	0.11	9.83
AV	1.595M	21.25	46.00	-24.75	10.02	Line	-	11.23	0.08	0.11	9.83
QP	3.008M	29.80	56.00	-26.20	10.08	Line	-	19.72	0.11	0.15	9.82
AV	3.008M	21.63	46.00	-24.37	10.08	Line	-	11.55	0.11	0.15	9.82
QP	5M	32.38	60.00	-27.62	10.16	Line	-	22.22	0.14	0.18	9.84
AV	5M	25.63	50.00	-24.37	10.16	Line	-	15.47	0.14	0.18	9.84



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	AF	CL	AT			
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)			
QP	159k	47.94	65.52	-17.58	9.89	Neutral	-	38.05	0.04	0.06	9.79			
AV	159k	30.58	55.52	-24.94	9.89	Neutral	-	20.69	0.04	0.06	9.79			
QP	393k	46.24	58.01	-11.77	9.91	Neutral	-	36.33	0.04	0.06	9.81			
AV	393k	39.85	48.01	-8.16	9.91	Neutral	"Worst"	29.94	0.04	0.06	9.81			
QP	1.019M	32.82	56.00	-23.18	9.97	Neutral	-	22.85	0.06	0.09	9.82			
AV	1.019M	24.60	46.00	-21.40	9.97	Neutral	-	14.63	0.06	0.09	9.82			
QP	1.766M	31.14	56.00	-24.86	10.01	Neutral	-	21.13	0.07	0.11	9.83			
AV	1.766M	22.88	46.00	-23.12	10.01	Neutral	-	12.87	0.07	0.11	9.83			
QP	2.22M	31.28	56.00	-24.72	10.03	Neutral	-	21.25	0.07	0.13	9.83			
AV	2.22M	22.70	46.00	-23.30	10.03	Neutral	-	12.67	0.07	0.13	9.83			
QP	6.081M	30.38	60.00	-29.62	10.20	Neutral	-	20.18	0.14	0.20	9.86			
AV	6.081M	23.92	50.00	-26.08	10.20	Neutral	-	13.72	0.14	0.20	9.86			

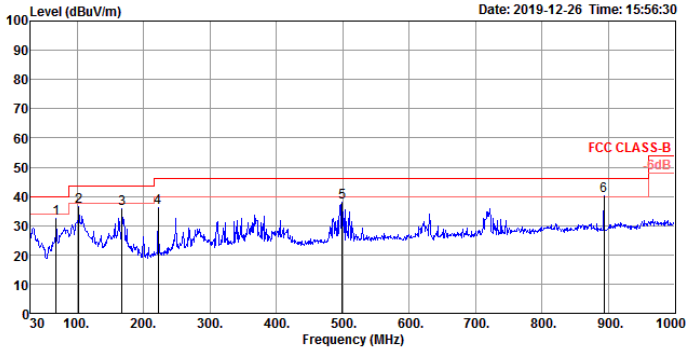
RSE below 1GHz Result			
Operating Mode	2	**Polarization**	Vertical
Operating Function	CTX - SKU 2 (2.4GHz) + adapter 5		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	30.97	34.74	40.00	-5.26	40.50	0.69	25.11	31.56	103	112	QP	VERTICAL
2	35.82	35.53	40.00	-4.47	44.00	0.77	22.25	31.49	103	130	QP	VERTICAL
3	39.70	34.28	40.00	-5.72	45.00	0.83	19.96	31.51	104	105	QP	VERTICAL
4	48.43	35.77	40.00	-4.23	51.09	0.92	15.46	31.70	150	22	Peak	VERTICAL
5	66.86	34.89	40.00	-5.11	53.15	1.01	12.60	31.87	150	332	Peak	VERTICAL
6	79.47	34.29	40.00	-5.71	51.74	1.15	13.26	31.86	150	306	Peak	VERTICAL

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

RSE below 1GHz Result			
Operating Mode	2	**Polarization**	Horizontal
Operating Function	CTX - SKU 2 (2.4GHz) + adapter 5		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	68.80	32.29	40.00	-7.71	50.55	1.02	12.60	31.88	300	313	Peak	HORIZONTAL
2	102.75	36.56	43.50	-6.94	49.79	1.32	17.41	31.96	200	12	Peak	HORIZONTAL
3	167.74	35.77	43.50	-7.73	49.90	1.65	16.11	31.89	200	359	Peak	HORIZONTAL
4	222.06	36.11	46.00	-9.89	49.66	1.87	16.56	31.98	300	137	Peak	HORIZONTAL
5	499.48	38.12	46.00	-7.88	43.87	2.93	23.80	32.48	200	220	Peak	HORIZONTAL
6	893.30	40.28	46.00	-5.72	40.99	4.05	27.65	32.41	300	285	Peak	HORIZONTAL

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)