Report No.: ET-23070831E01

TEST REPORT

Applicant:	Shenzhen Youdisi E-Commerce Co., Ltd.
Address of Applicant:	Room 402, Building A, Jiewei Industrial Zone, Pingxin North Road 53, Pinghu Street, Longgang, Shenzhen, Guangdong, China
Manufacturer/Factory:	Shenzhen Youdisi E-Commerce Co., Ltd.
Address of Manufacturer	Room 402, Building A, Jiewei Industrial Zone, Pingxin North Road 53, Pinghu Street, Longgang, Shenzhen, Guangdong, China
Product Name:	Laptop
Model No.:	YEPBOOK,XBOOK-2,XBOOK-3,FLEXONE,A6,T1,YEPBOOK-2, YEPBOOK-3,YEPBOOK-4,XBOOK-4,A1
Trade Mark:	KUU
FCC ID:	2BCD7-YEPBOOK
IC:	31109-YEPBOOK
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247 RSS-Gen Issue 5,RSS-247 Issue 2
Date of Test:	Jul.17, 2023-Aug.03, 2023
Date of report issued:	Aug.24, 2023
Test Result :	PASS *

Remark:
* In the configuration tested, the EUT complied with the standards specified above.

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver

Prepared By

Shenzhen ETR Standard Technology Co., Ltd.

Address: No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Compiled by:	Reviewed by:	Approved by:
Carr Kang	Smith chen	Smith chen
Project Engineer	Project Manager	Authorized Signature

This test report is valid for the tested samples only. It cannot be reproduced except in full without prior written consent of Shenzhen ETR Standard Technology Co., Ltd.

Report Revision History		
Report No.	Description	Issue Date
ET-23070831E01	Original	Aug.24, 2023

Contents

Page

1. TEST SUMMARY 4

2. GENERAL INFORMATION 5

2.1 GENERAL DESCRIPTION OF EUT 5
2.2 TEST MODE 7
2.3 DESCRIPTION OF SUPPORT UNITS 7
2.4 DEVIATION FROM STANDARDS 7
2.5 ABNORMALITIES FROM STANDARD CONDITIONS 7
2.6 TEST FACILITY 7
2.7 TEST LOCATION 7
2.8 ADDITIONAL INSTRUCTIONS 7

3. TEST INSTRUMENTS LIST 8

4. TEST RESULTS AND MEASUREMENT DATA 9

4.1 ANTENNA REQUIREMENT 9
4.2 CONDUCTED EMISSIONS 10
4.3 CONDUCTED OUTPUT POWER& EIRP 13
4.4CHANNEL BANDWIDTH &99% BANDWIDTH 14
4.5 POWER SPECTRAL DENSITY 17
4.6 BAND EDGES 19
Conducted Emission Method 19
Radiated Emission Method 20
4.7 SPURIOUS EMISSION 22
Conducted Emission Method 22
Radiated Emission Method 24

5. TEST SETUP PHOTO 32

6. EUT CONSTRUCTIONAL DETAILS 32

1. Test Summary

Test Item	Section	Result	Test by
Antenna requirement	FCC part 15.203/15.247 (c) RSS-Gen §6.8	Pass	/
AC Power Line Conducted Emission	FCC part 15.207 RSS-Gen §8.8	Pass	Qiao Li
Conducted Output Power&eirp	FCC part 15.247 (b)(3) RSS-247 §5.4.d	Pass	Yvan Fan
Channel Bandwidth & 99% OCB	FCC part 15.247 (a)(2) RSS-247 §5.2.a RSS-Gen § 6.7	Pass	Yvan Fan
Power Spectral Density	FCC part 15.247 (e) RSS-247 §5.2.b	Pass	Yvan Fan
Band Edge	FCC part 15.247(d) RSS-247 §5.5	Pass	Yvan Fan
Spurious Emission	FCC part 15.205/15.209 RSS-Gen §8.9 §8.10	Pass	Qiao Li

Remark: Test according to ANSI C63.10:2013 and RSS-Gen

Pass: The EUT complies with the essential requirements in the standard.

Measurement Uncertainty

Test Item	Uncertainty Criterion	Measurement Uncertainty	Notes
Occupied Channel Bandwidth	±5%	±0.55%	(1)
RF output power, conducted	±1.5dB	±0.99dB	(1)
Power Spectral Density, conducted	±3dB	±0.61dB	(1)
Unwanted Emissions, conducted	±3dB	±0.64dB	(1)
AC Power Line Conducted Emission	±6dB	± 3.02 dB	(1)
Radiated emissions Below 1GHz	±6dB	±4.30 dB	(1)
Radiated emissions Above 1GHz	±6dB	±4.35 dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

2. General Information

2.1 General Description of EUT

Product Name:	Laptop
Model No.:	XBOOK-2,XBOOK-3,FLEXONE,A6,T1,YEPBOOK-2,YEPBOOK-3, YEPBOOK-4,XBOOK-4,A1
Test Model:	YEPBOOK
Difference of model(s)	All the model are the same circuit and RF module, except the model names.
Hardware version:	V2.1
Software version:	V2.1
Sample(s) Status	Engineer sample
Operation Frequency:	2402MHz~2480MHz
Channel Numbers:	40
Channel separation:	2MHz
Modulation technology:	GFSK
Battery:	7.6V 5000mAh
Antenna Type:	Integrated antenna
Antenna gain:	3.55 dBi(Declare by applicant) Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.
Power supply:	DC 7.6V

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402 MHz	11	2422 MHz	21	2442 MHz	31	2462 MHz
2	2404 MHz	12	2424 MHz	22	2444 MHz	32	2464 MHz
3	2406 MHz	13	2426 MHz	23	2446 MHz	33	2466 MHz
4	2408 MHz	14	2428 MHz	24	2448 MHz	34	2468 MHz
5	2410 MHz	15	2430 MHz	25	2450 MHz	35	2470 MHz
6	2412 MHz	16	2432 MHz	26	2452 MHz	36	2472 MHz
7	2414 MHz	17	2434 MHz	27	2454 MHz	37	2474 MHz
8	2416 MHz	18	2436 MHz	28	2456 MHz	38	2476 MHz
9	2418 MHz	19	2438 MHz	29	2458 MHz	39	2478 MHz
10	2420 MHz	20	2440 MHz	30	2460 MHz	40	2480 MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	**Frequency (MHz)**
Lowest channel	2402MHz
Middle channel	2440MHz
Highest channel	2480MHz

2.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode EUT was test with ＞98% duty cycle at its maximum power control level.
Remark: For battery operated equipment, the EUT was performed using a new DC 7.6V battery.	

2.3 Description of Support Units

No.	Description	Manufacturer	Model	Serial Number
1	Power supply	Shen Zhen Shi Yingyuan Electronics Co.,Ltd	ICP36-120-3000	/

2.4 Deviation from Standards

None.

2.5 Abnormalities from Standard Conditions

None.

2.6 Test Facility

Test laboratory:	Shenzhen ETR Standard Technology Co., Ltd.
CNAS Registration Number:	L11864
A2LA Certificate Number:	6640.01
FCC Designation Number:	CN1326
FCC Test Firm Registration:	183064
IC Company Number:	28440
CAB identifier:	CN0132

2.7 Test Location

All tests were performed at:	
Laboratory location:	No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	+86 755 85259392
Fax:	+86 755 27219460

2.8 Additional Instructions

Test Software	DRTU
Power level setup	Default

3. Test Instruments list

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	100605	2023.3.02	2024.3.01
2	EMI Test Receiver	Rohde&schwarz	ESCI3	102696	2023.3.02	2024.3.01
3	Loop Antenna	schwarabeck	FMZB 1519 B	FMZB 1519 B	2022.3.11	2024.3.10
4	Broadband antenna	schwarabeck	VULB9168	1064	2022.3.11	2024.3.10
5	Horn antenna	schwarabeck	BBHA9120D	9120D-1145	2022.3.11	2024.3.10
6	amplifier	EMtrace	RP01A	50117	2023.3.02	2024.3.01
7	Artificial power network	schwarabeck	NSLK8127	8127483	2023.3.02	2024.3.01
8	Artificial power network	ETS	3186/2NM	1132	2023.3.02	2024.3.01
9	10dB attenuator	HUBER+SUHNER	10dB	/	2023.3.02	2024.3.01
10	amplifier	Space-Dtronics	EWLAN0118 G-P40	19113001	2023.3.02	2024.3.01
11	Filter	Xingbo	XBLBQ-GTA19	210410-3-1	2023.3.06	2024.3.05
12	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2023.3.02	2024.3.01
13	Power detector box	MWRFtest	MW100-PSB	MW201020JYT	2022.11.18	2023.11.17
14	Power meter	Rohde&Schwarz	NRP-Z11	1138.3004.02-117725-vh	2023.03.30	2024.03.29

Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).

Software Name	Manufacturer	Model	Version
RF test software	MWRFtest	MTS 8310	V2.0.0.0
Conducted test software	EZ-EMC	Farad	Ver.EMC-CON 3A1.1
Radiated test software	EZ-EMC	Farad	Ver.FA-03A2 RE

4. Test results and Measurement Data

4.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c) ,RSS-Gen §6.8

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

RSS-Gen 6.8:

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

EUT Antenna:

The antenna is Integrated antenna, the best case gain of the antenna is 3.55 dBi, reference to the appendix II for details.

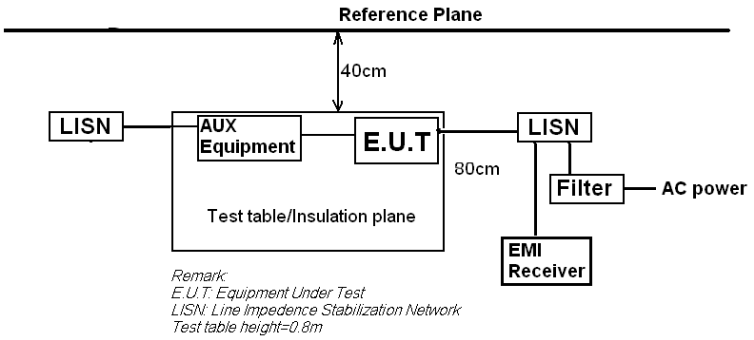
4.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207, RSS-Gen §8.8
Test Method:	ANSI C63.10:2013 and RSS-Gen
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test setup:



Test procedure:

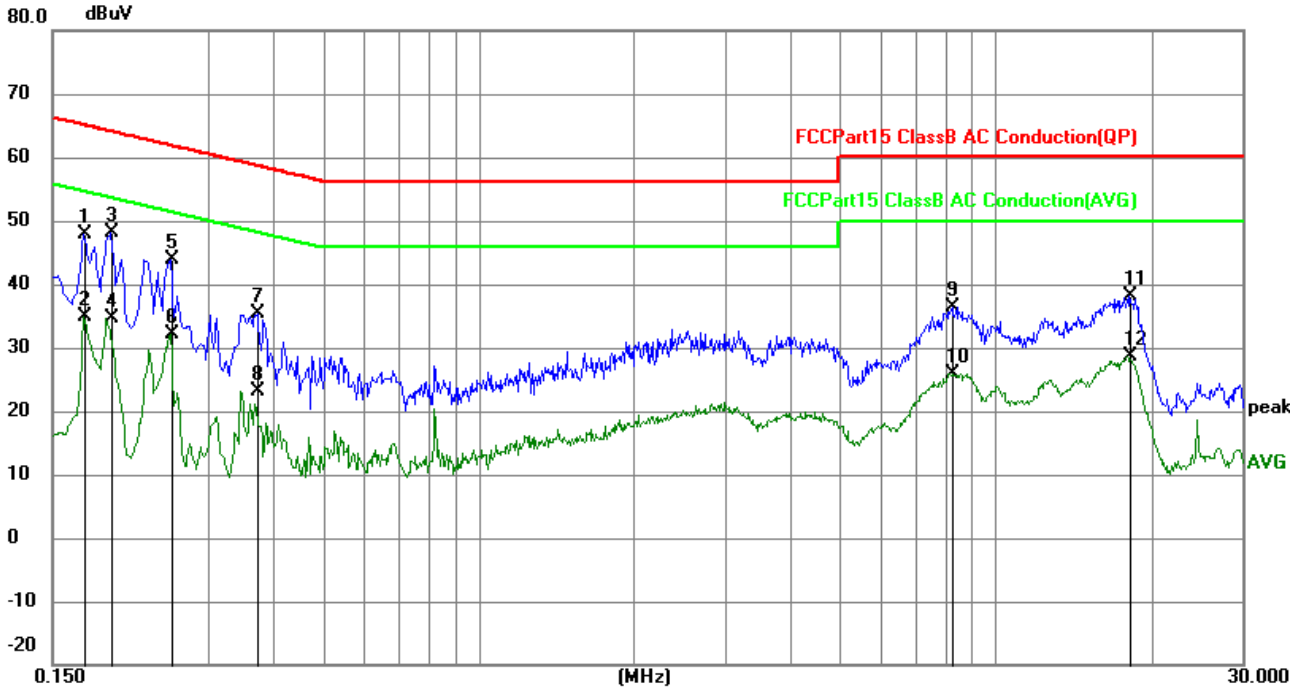
1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 and RSS-Gen on conducted measurement.

Test Instruments:	Refer to section 3.0 for details					
Test mode:	Refer to section 2.2 for details					
Test environment:	Temp.:	26.2°C	Humid.:	41%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

1. Both high voltage and low voltage have been tested, and the report only shows the worst case data with AC 120V/60Hz.
2. All mode have been tested, the report only shows the worst mode (2440MHz) data.

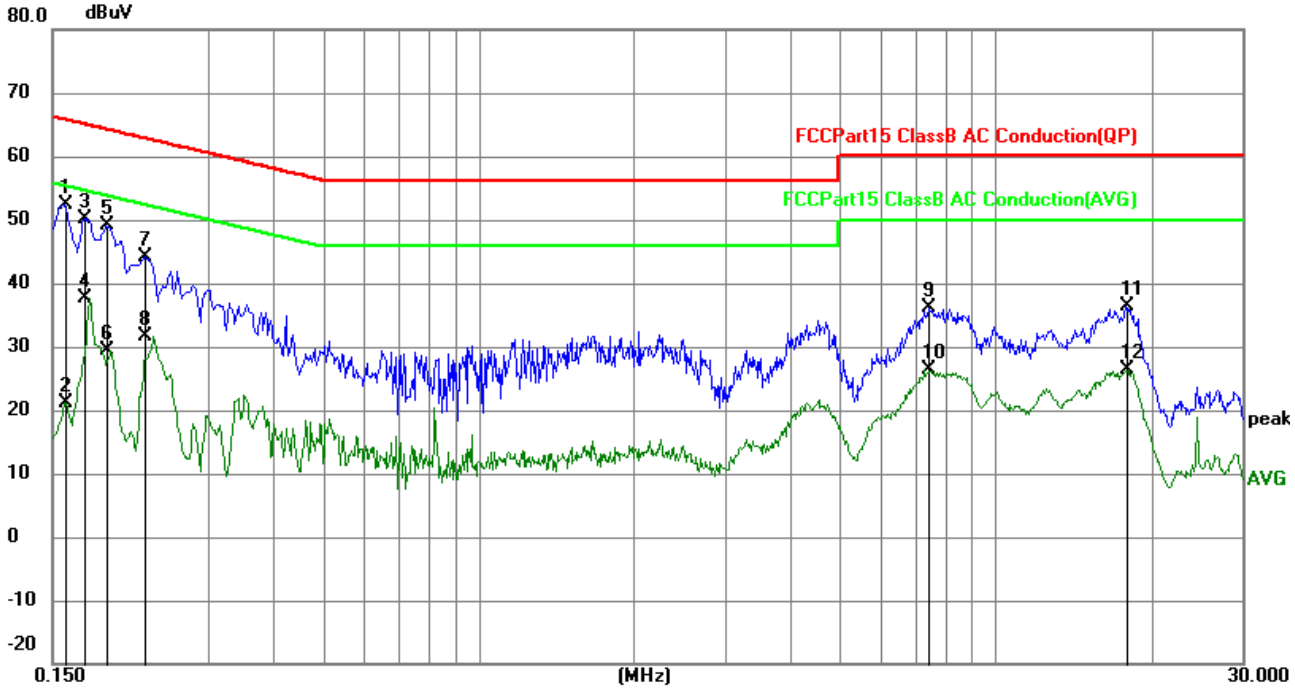
Measurement data

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1725	37.98	9.81	47.79	64.84	-17.05	QP
2	0.1725	24.97	9.81	34.78	54.84	-20.06	AVG
3	0.1949	38.31	9.81	48.12	63.83	-15.71	QP
4	0.1949	24.78	9.81	34.59	53.83	-19.24	AVG
5	0.2535	34.05	9.83	43.88	61.64	-17.76	QP
6	0.2535	22.40	9.83	32.23	51.64	-19.41	AVG
7	0.3750	25.50	9.89	35.39	58.39	-23.00	QP
8	0.3750	13.34	9.89	23.23	48.39	-25.16	AVG
9	8.2680	26.58	9.83	36.41	60.00	-23.59	QP
10	8.2680	16.03	9.83	25.86	50.00	-24.14	AVG
11	18.1995	28.42	9.70	38.12	60.00	-21.88	QP
12	18.1995	18.89	9.70	28.59	50.00	-21.41	AVG

Neutral:

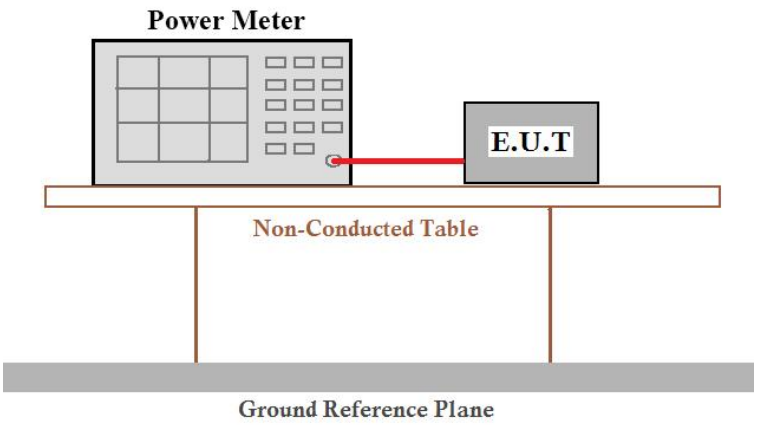


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1590	42.65	9.80	52.45	65.52	-13.07	QP
2	0.1590	11.41	9.80	21.21	55.52	-34.31	AVG
3	0.1725	40.43	9.81	50.24	64.84	-14.60	QP
4	0.1725	27.71	9.81	37.52	54.84	-17.32	AVG
5	0.1905	39.26	9.81	49.07	64.01	-14.94	QP
6	0.1905	19.53	9.81	29.34	54.01	-24.67	AVG
7	0.2265	34.34	9.82	44.16	62.58	-18.42	QP
8	0.2265	21.89	9.82	31.71	52.58	-20.87	AVG
9	7.4085	26.34	9.83	36.17	60.00	-23.83	QP
10	7.4085	16.44	9.83	26.27	50.00	-23.73	AVG
11	17.8620	26.78	9.70	36.48	60.00	-23.52	QP
12	17.8620	16.78	9.70	26.48	50.00	-23.52	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Level =Receiver Read level + Factor (Factor= LISN Factor + Cable Loss+ Attenuator Factor)
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

4.3 Conducted Output Power& eirp

Test Requirement :	FCC Part15 C Section 15.247 (b)(3) , RSS-247 §5.4.d	
Test Method :	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02 and RSS-Gen	
Limit:	Conducted power :30dBm, eirp power:36dBm	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.6°C	Humid.: 52%RH
Test voltage:	DC 7.6V	
Test results:	Pass	
Remark:	Measurement using a gated RF average power meter.	

Measurement Result

Test channel	Output Power(PK) (dBm)	Limit(dBm)	Result
Lowest	2.93	30.00	Pass
Middle	3.89		
Highest	3.18		

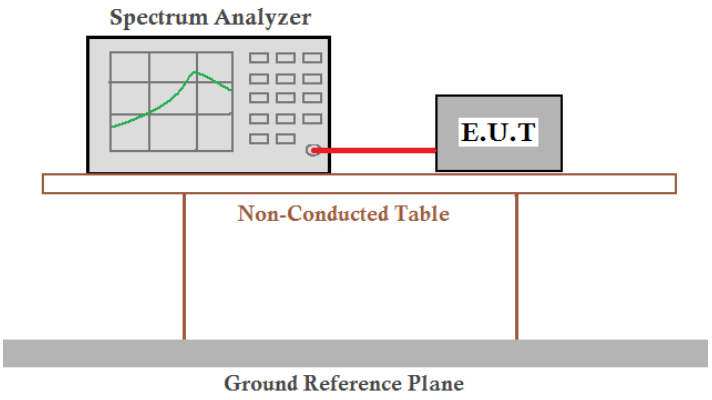
Test channel	Output Power(AV) (dBm)	Limit(dBm)	Result
Lowest	2.53	30.00	Pass
Middle	3.48		
Highest	2.96		

Remark: Measurement using a gated RF average power meter.

EIRP

Test channel	Output Power (PK) (dBm)	Antenna Gain(dBi)	E.I.R.P (dBm)	Limit(dBm)	Result
Lowest	2.93	3.55	6.48	36.00	Pass
Middle	3.89	3.55	7.44		
Highest	3.18	3.55	6.73		

4.4Channel Bandwidth &99% Bandwidth

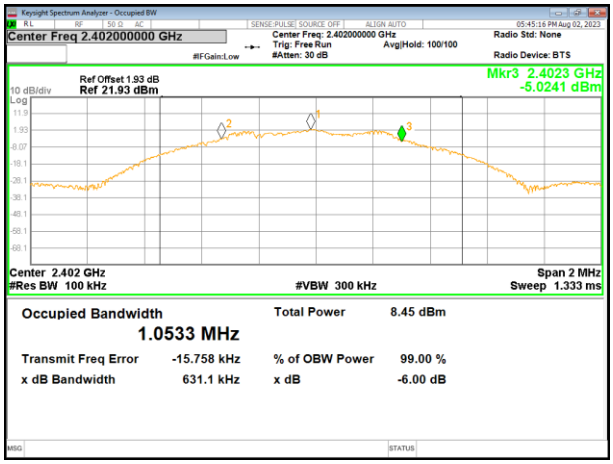
Test Requirement :	FCC Part15 C Section 15.247 (a)(2), RSS-247 §5.2.a	
Test Method :	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02 and RSS-Gen	
Limit:	>500KHz	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.6°C	Humid.: 52%RH
Test voltage:	DC 7.6V	
Test results:	Pass	

Measurement Result

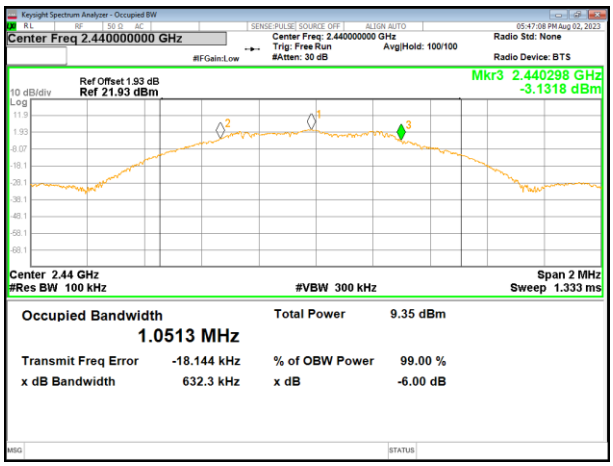
Test channel	Channel Bandwidth (MHz)	Limit(KHz)	Result
Lowest	0.6311	>500	Pass
Middle	0.6323		
Highest	0.6339		

Test channel	99% Bandwidth (MHz)	Limit(KHz)	Result
Lowest	1.0385	/	Pass
Middle	1.0385		
Highest	1.0231		

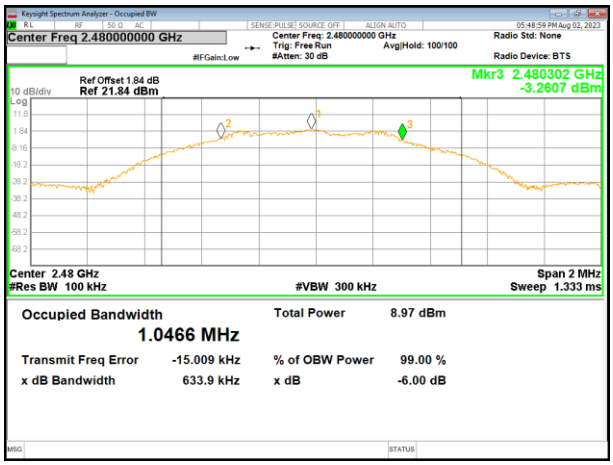
Test plot as follows:



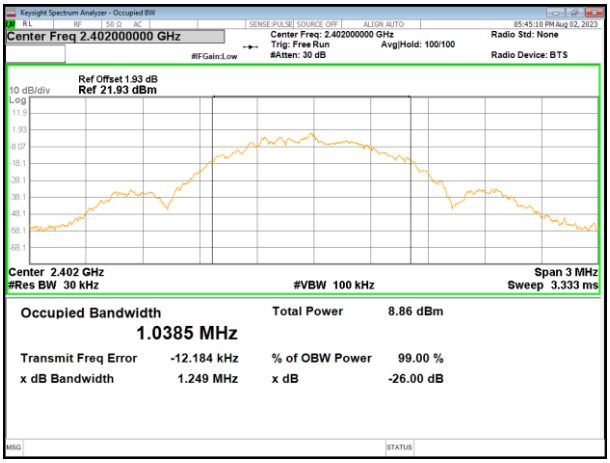
Lowest channel



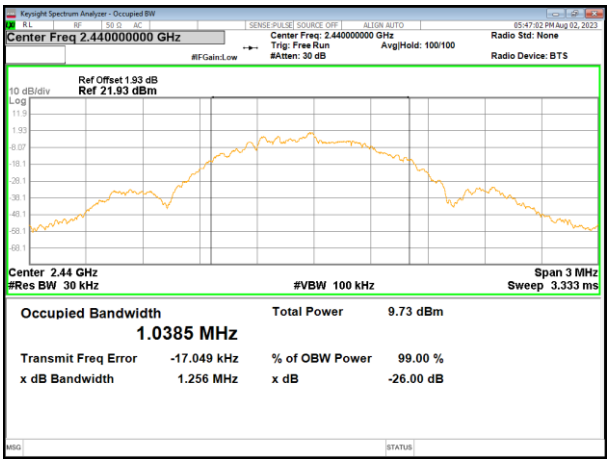
Middle channel



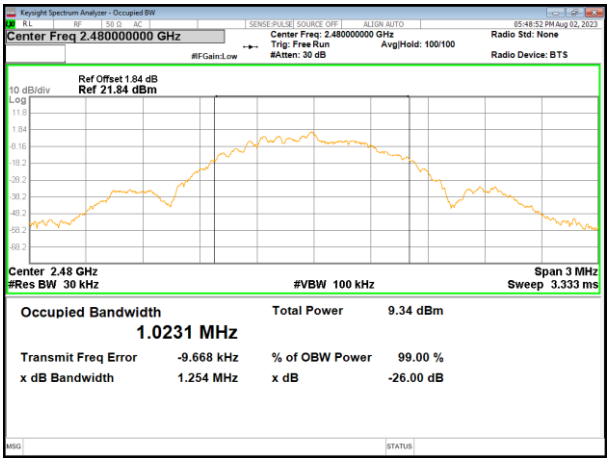
Highest channel



Lowest channel

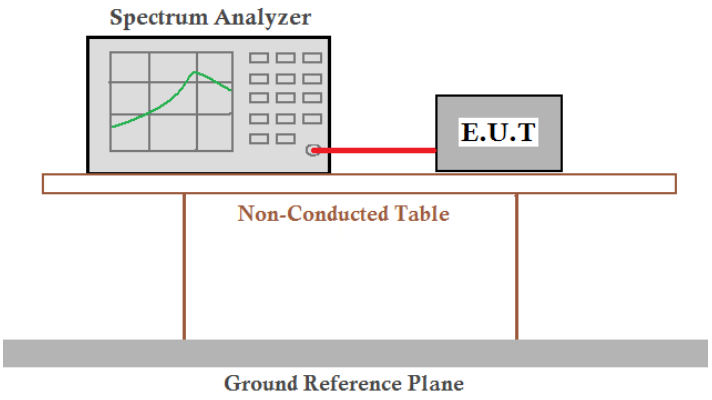


Middle channel



Highest channel

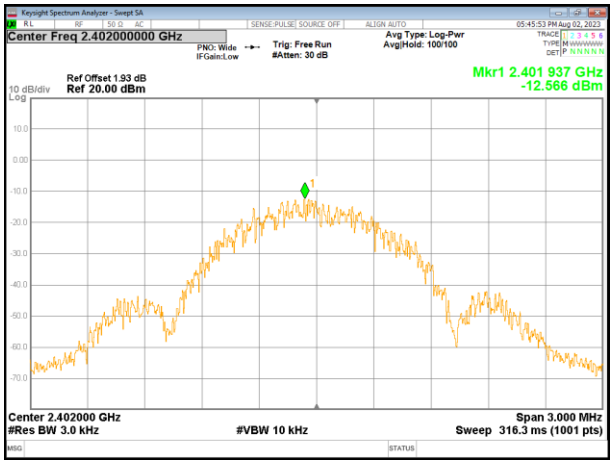
4.5 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e), RSS-247 §5.2.b	
Test Method:	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02 And RSS-Gen	
Limit:	8dBm/3kHz	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.6°C	Humid.: 52%RH
Test voltage:	DC 7.6V	
Test results:	Pass	

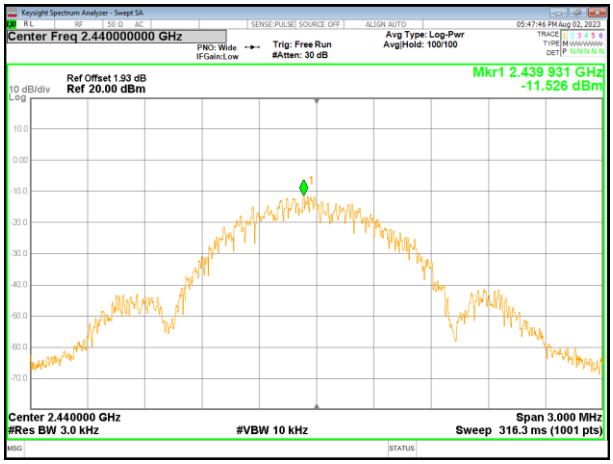
Measurement Result

Test channel	Power Spectral Density (dBm/3kHz)	Limit(dBm/3kHz)	Result
Lowest	-12.566	8.00	Pass
Middle	-11.526		
Highest	-11.952		

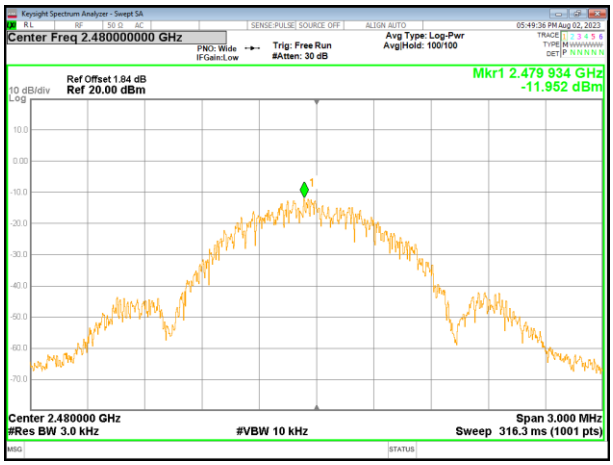
Test plot as follows:



Lowest channel



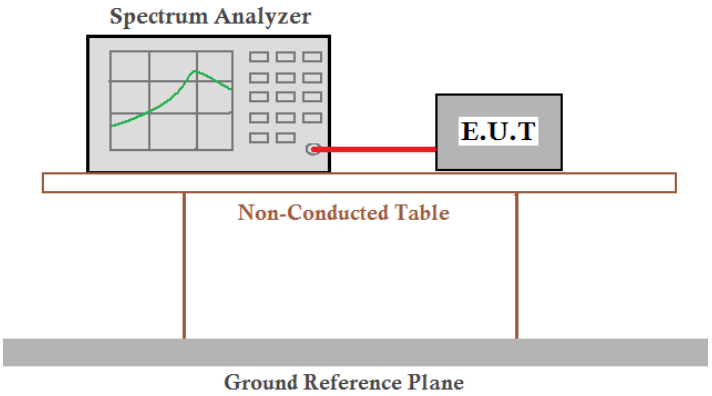
Middle channel



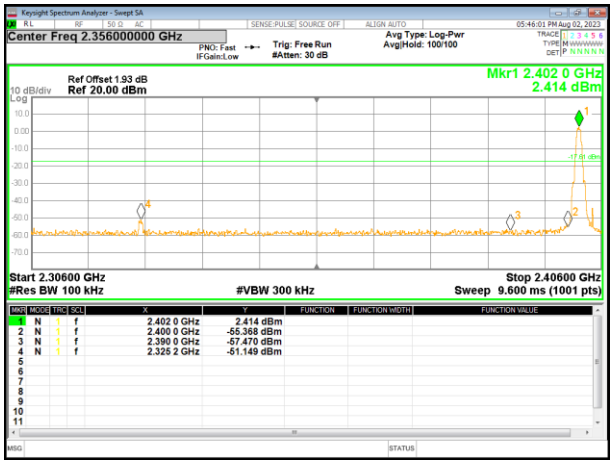
Highest channel

4.6 Band edges

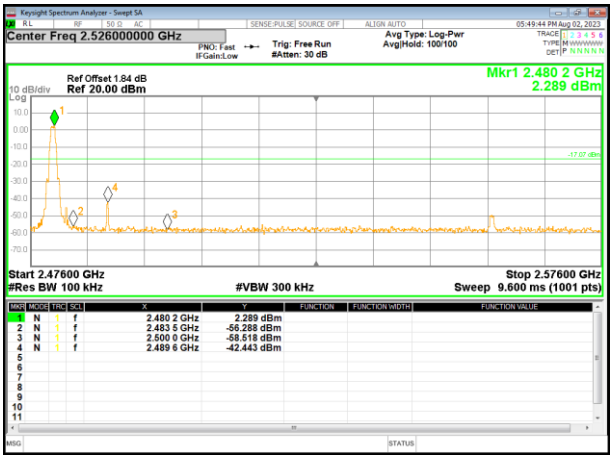
Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d), RSS-247 §5.5	
Test Method:	KDB558074 D01 DTS Meas Guidance v05or02 and RSS-Gen	
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.6°C	Humid.: 52%RH
Test voltage:	DC 7.6V	
Test results:	Pass	

Test plot as follows:



Lowest channel



Highest channel

Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205, RSS-Gen §8.9 §8.10
Test Method:	ANSI C63.10: 2013 and RSS-Gen
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.
Test site:	Measurement Distance: 3m

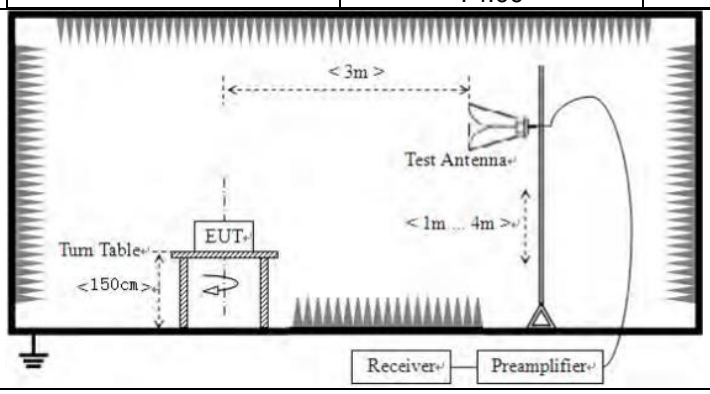
Receiver setup:

Frequency	Detector	RBW	VBW	Value
Above 1GHz	Peak	1MHz	3MHz	Peak
	Average	1MHz	3MHz	Average

Limit:

Frequency	Limit (dBuV/m @3m)	Value
Above 1GHz	54.00	Average
	74.00	Peak

Test setup:



Test Procedure:

1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.6°C	Humid.: 52%RH
Test voltage:	DC 7.6V	
Test results:	Pass	

Measurement data:

Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	69.56	27.40	3.43	45.40	54.99	74.00	-19.01	Horizontal
2390.00	65.45	27.10	3.43	45.40	50.58	74.00	-23.42	Horizontal
2310.00	68.06	27.40	3.43	45.40	53.49	74.00	-20.51	Vertical
2390.00	66.20	27.10	3.43	45.40	51.33	74.00	-22.67	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	42.08	27.40	3.43	45.40	27.51	54.00	-26.50	Horizontal
2390.00	46.85	27.10	3.43	45.40	31.98	54.00	-22.02	Horizontal
2310.00	42.83	27.40	3.43	45.40	28.26	54.00	-25.75	Vertical
2390.00	48.29	27.10	3.43	45.40	33.42	54.00	-20.58	Vertical

Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	68.78	27.80	3.56	45.40	54.74	74.00	-19.27	Horizontal
2500.00	65.94	27.80	3.56	45.40	51.90	74.00	-22.10	Horizontal
2483.50	67.65	27.80	3.56	45.40	53.61	74.00	-20.39	Vertical
2500.00	67.65	27.80	3.56	45.40	53.61	74.00	-20.39	Vertical

Average value:

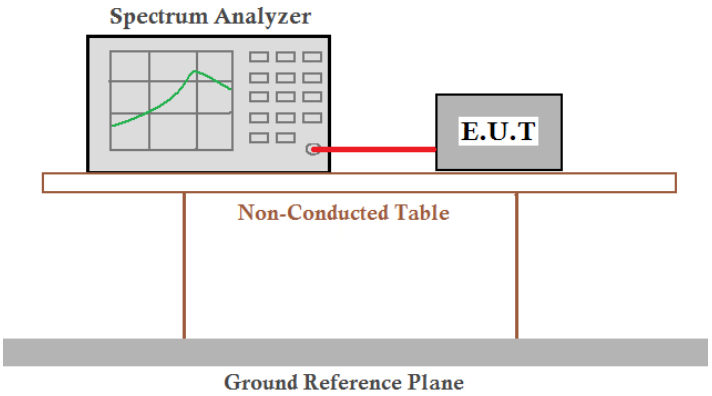
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	45.41	27.80	3.56	45.40	31.37	54.00	-22.63	Horizontal
2500.00	41.04	27.80	3.56	45.40	27.00	54.00	-27.00	Horizontal
2483.50	47.23	27.80	3.56	45.40	33.19	54.00	-20.82	Vertical
2500.00	41.60	27.80	3.56	45.40	27.56	54.00	-26.44	Vertical

Remarks:

1. *Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.*

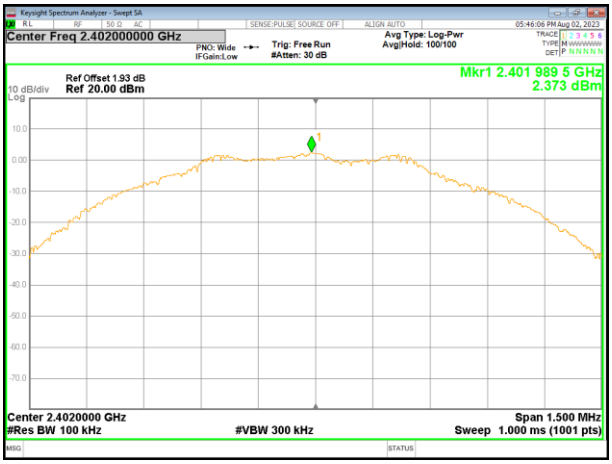
4.7 Spurious Emission

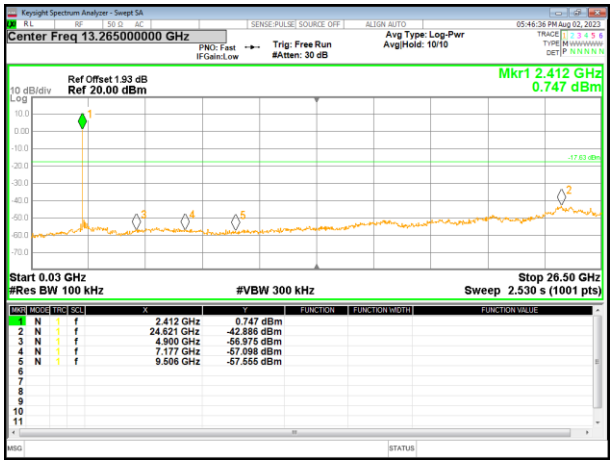
Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d), RSS-Gen §8.9 §8.10	
Test Method:	KDB558074 D01 DTS Meas Guidance v05or02 and RSS-Gen	
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.6°C	Humid.: 52%RH
Test voltage:	DC 7.6V	
Test results:	Pass	

Test plot as follows:

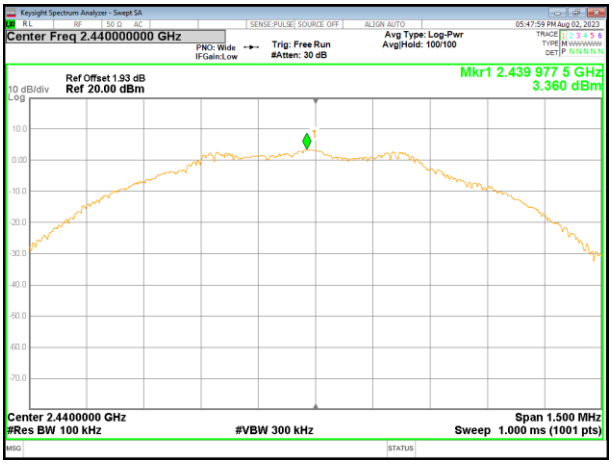
Lowest channel

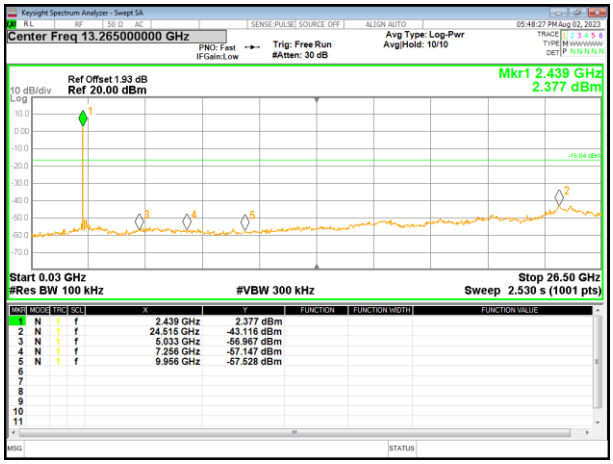




30MHz~26.5GHz

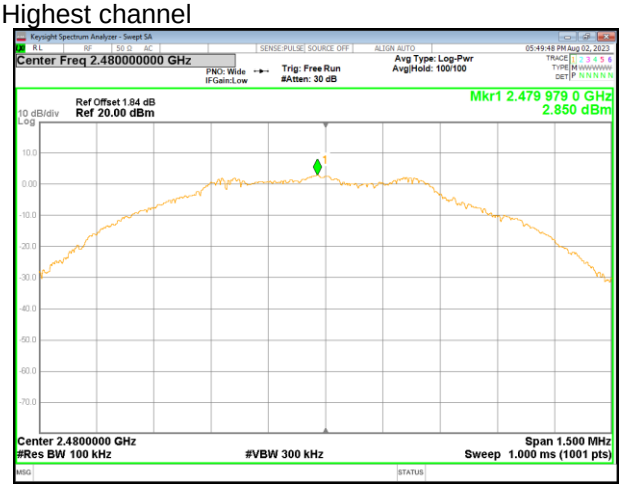
Middle channel

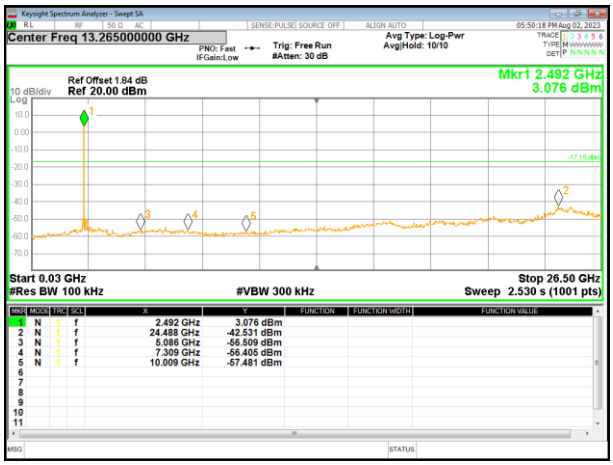




30MHz~26.5GHz

Highest channel





30MHz~26.5GHz

Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 , RSS-Gen §8.9 §8.10
Test Method:	ANSI C63.10: 2013 and RSS-Gen
Test Frequency Range:	9kHz to 25GHz
Test site:	Measurement Distance: 3m

Receiver setup:

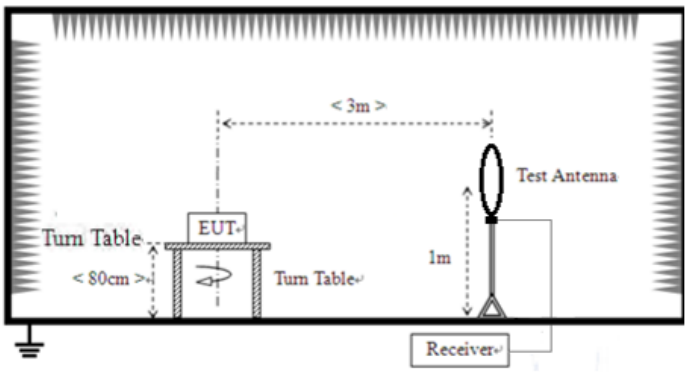
Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:

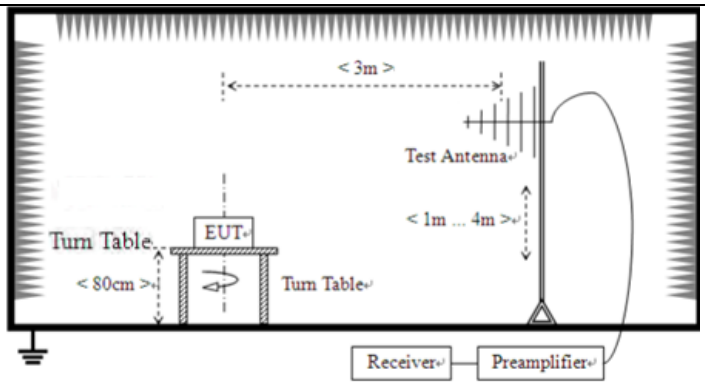
Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	300m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	
Above 1GHz	500	Average	
	5000	Peak	

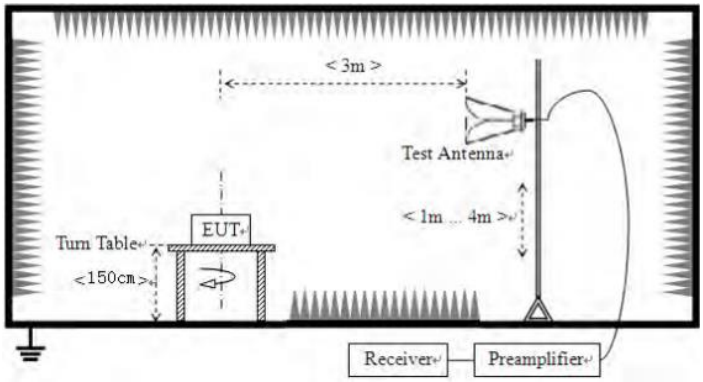
Test setup:

For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to1GHz

<table>
<tr><td></td><td>


For radiated emissions above 1GHz


</td></tr>
<tr><td>Test Procedure:</td><td>
1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 3.0 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 2.2 for details</td></tr>
</table>

Test voltage:	DC 7.6V					
Test environment:	24.6°C	24.6°C	Humid.:	52%	Press.:	1012mbar
Test results:	Pass					

Remarks:

1. *The report only shows the worst mode.*
2. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

Measurement data:

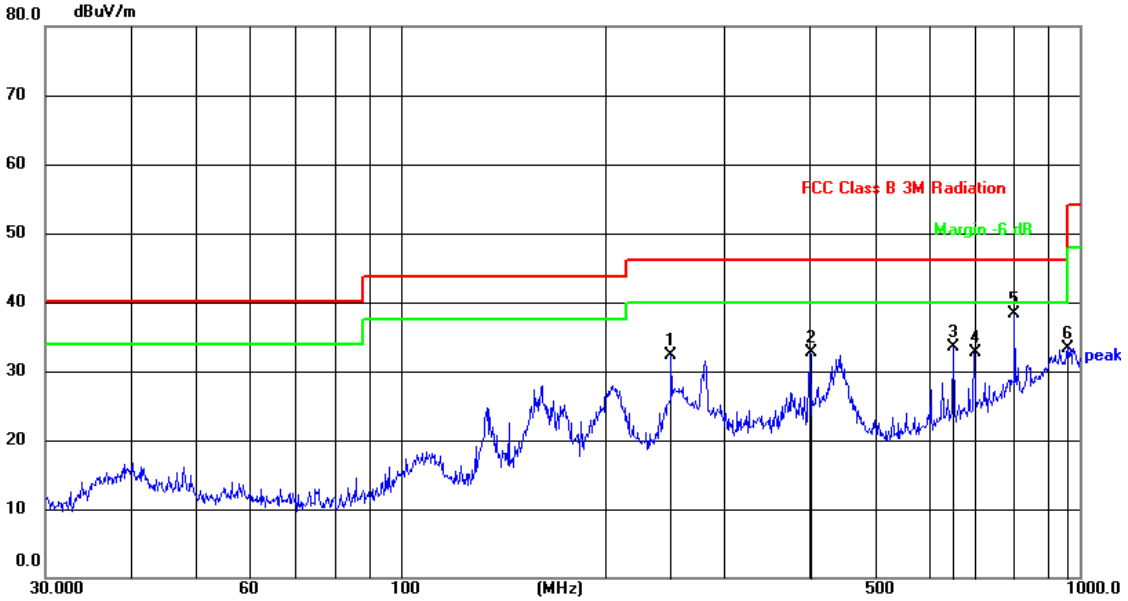
■ **9kHz~30MHz**

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

■ **Below 1GHz**

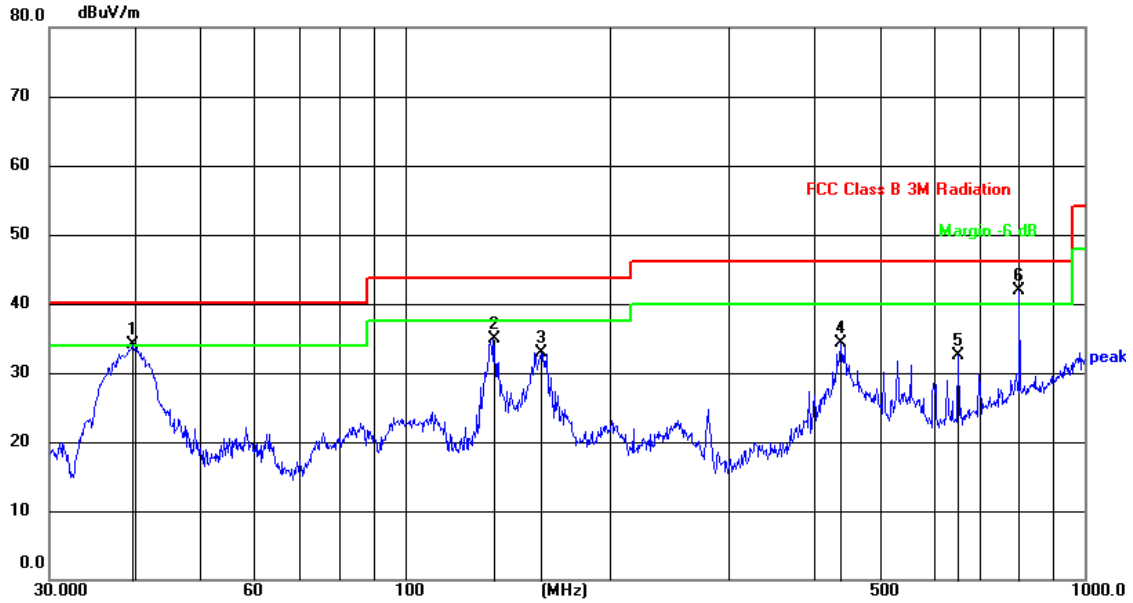
All mode has been tested , the report only shows the worst mode (2440MHz).

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	250.3010	54.53	-22.25	32.28	46.00	-13.72	QP
2	400.4319	50.01	-17.28	32.73	46.00	-13.27	QP
3	651.9417	43.90	-10.32	33.58	46.00	-12.42	QP
4	699.3046	41.91	-9.14	32.77	46.00	-13.23	QP
5	801.7862	44.87	-6.49	38.38	46.00	-7.62	QP
6	958.7943	37.13	-3.73	33.40	46.00	-12.60	QP

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.8542	55.13	-20.97	34.16	40.00	-5.84	QP
2	135.0319	57.01	-22.09	34.92	43.50	-8.58	QP
3	158.6677	53.53	-20.56	32.97	43.50	-10.53	QP
4	437.1199	50.31	-15.92	34.39	46.00	-11.61	QP
5	651.9415	42.82	-10.32	32.50	46.00	-13.50	QP
6	801.7862	48.30	-6.49	41.81	46.00	-4.19	QP

Remarks:

Level =Receiver Reading + Factor

Factor= Antenna Factor + Cable Factor – Preamplifier Factor

■ **Above 1GHz**

■

Test channel:	Lowest

■ **Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4804.00	65.39	32.1	5.96	45.7	57.75	74.00	-16.25	Vertical
7206.00	60.23	36.1	6.86	45.5	57.69	74.00	-16.32	Vertical
9608.00	54.58	38.3	8.25	46.2	54.93	74.00	-19.08	Vertical
12010.00	*	--	--	--	--	74.00	--	Vertical
14412.00	*	--	--	--	--	74.00	--	Vertical
4804.00	67.95	32.1	5.96	45.7	60.31	74.00	-13.69	Horizontal
7206.00	59.75	36.1	6.86	45.5	57.21	74.00	-16.79	Horizontal
9608.00	57.44	38.3	8.25	46.2	57.79	74.00	-16.21	Horizontal
12010.00	*	--	--	--	--	74.00	--	Horizontal
14412.00	*	--	--	--	--	74.00	--	Horizontal

■ **Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4804.00	39.35	32.1	5.96	45.7	31.71	54.00	-22.29	Vertical
7206.00	32.63	36.1	6.86	45.5	30.09	54.00	-23.92	Vertical
9608.00	31.28	38.3	8.25	46.2	31.63	54.00	-22.38	Vertical
12010.00	*	--	--	--	--	54.00	--	Vertical
14412.00	*	--	--	--	--	54.00	--	Vertical
4804.00	39.44	32.1	5.96	45.7	31.80	54.00	-22.20	Horizontal
7206.00	32.90	36.1	6.86	45.5	30.36	54.00	-23.64	Horizontal
9608.00	30.60	38.3	8.25	46.2	30.95	54.00	-23.05	Horizontal
12010.00	*	--	--	--	--	54.00	--	Horizontal
14412.00	*	--	--	--	--	54.00	--	Horizontal

Remarks:

1. *Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *Emissions more than 20 dB below the limit do not need to be reported.*

Test channel:	Middle

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4880.00	64.20	32.1	5.96	45.7	56.56	74.00	-17.44	Vertical
7320.00	57.50	36.8	6.86	45.5	55.66	74.00	-18.34	Vertical
9760.00	54.84	38.4	8.25	46.2	55.29	74.00	-18.71	Vertical
12200.00	*	--	--	--	--	74.00	--	Vertical
14640.00	*	--	--	--	--	74.00	--	Vertical
4880.00	67.54	32.1	5.96	45.7	59.90	74.00	-14.10	Horizontal
7320.00	60.08	36.8	6.86	45.5	58.24	74.00	-15.77	Horizontal
9760.00	53.25	38.4	8.25	46.2	53.70	74.00	-20.30	Horizontal
12200.00	*	--	--	--	--	74.00	--	Horizontal
14640.00	*	--	--	--	--	74.00	--	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4880.00	39.53	32.1	5.96	45.7	31.89	54.00	-22.12	Vertical
7320.00	31.63	36.8	6.86	45.5	29.79	54.00	-24.22	Vertical
9760.00	29.68	38.4	8.25	46.2	30.13	54.00	-23.88	Vertical
12200.00	*	--	--	--	--	54.00	--	Vertical
14640.00	*	--	--	--	--	54.00	--	Vertical
4880.00	38.20	32.1	5.96	45.7	30.56	54.00	-23.44	Horizontal
7320.00	32.61	36.8	6.86	45.5	30.77	54.00	-23.23	Horizontal
9760.00	29.33	38.4	8.25	46.2	29.78	54.00	-24.23	Horizontal
12200.00	*	--	--	--	--	54.00	--	Horizontal
14640.00	*	--	--	--	--	54.00	--	Horizontal

Remarks:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *Emissions more than 20 dB below the limit do not need to be reported.*

Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	62.71	32.7	5.96	45.7	55.67	74.00	-18.33	Vertical
7440.00	57.01	36.4	6.86	45.5	54.77	74.00	-19.23	Vertical
9920.00	54.89	38	8.25	46.2	54.94	74.00	-19.06	Vertical
12400.00	*	--	--	--	--	74.00	--	Vertical
14880.00	*	--	--	--	--	74.00	--	Vertical
4960.00	63.25	32.7	5.96	45.7	56.21	74.00	-17.79	Horizontal
7440.00	57.36	36.4	6.86	45.5	55.12	74.00	-18.88	Horizontal
9920.00	55.99	38	8.25	46.2	56.04	74.00	-17.96	Horizontal
12400.00	*	--	--	--	--	74.00	--	Horizontal
14880.00	*	--	--	--	--	74.00	--	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	39.79	32.7	5.96	45.7	32.75	54.00	-21.25	Vertical
7440.00	35.75	36.4	6.86	45.5	33.51	54.00	-20.49	Vertical
9920.00	36.38	38	8.25	46.2	36.43	54.00	-17.58	Vertical
12400.00	*	--	--	--	--	54.00	--	Vertical
14880.00	*	--	--	--	--	54.00	--	Vertical
4960.00	41.14	32.7	5.96	45.7	34.10	54.00	-19.90	Horizontal
7440.00	36.23	36.4	6.86	45.5	33.99	54.00	-20.02	Horizontal
9920.00	35.10	38	8.25	46.2	35.15	54.00	-18.85	Horizontal
12400.00	*	--	--	--	--	54.00	--	Horizontal
14880.00	*	--	--	--	--	54.00	--	Horizontal

Remarks:

1. *Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *Emissions more than 20 dB below the limit do not need to be reported.*

5. Test Setup Photo

Reference to the **appendix I** for details.

6. EUT Constructional Details

Reference to the **appendix II** for details.

------End------