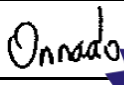


TEST REPORT

FCC ID.	2A85Y-KB21	
Test Report No.	TCT221027E009	
Date of issue	Nov. 01, 2022	
Testing laboratory	SHENZHEN TONGCE TESTING LAB	
Testing location/ address:	2101 & 2201, Zhenchang Factory Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China	
Applicant's name	DONGGUAN ESWN TECHNOLOGY CO., LTD	
Address	Room106, No.15 chukeng Industrial Road, Dongkeng Town, Dongguan City, Guangdong Province, China	
Manufacturer's name ...	DONGGUAN ESWN TECHNOLOGY CO., LTD	
Address	Room106, No.15 chukeng Industrial Road, Dongkeng Town, Dongguan City, Guangdong Province, China	
Standard(s)	FCC CFR Title 47 Part 15 Subpart C Section 15.249 ANSI C63.10:2013	
Product Name	KB21 mechanical numpad	
Trade Mark	N/A	
Model/Type reference	KB21	
Rating(s)	Rechargeable Li-ion Battery DC 3.7V	
Date of receipt of test item	Oct. 27, 2022	
Date (s) of performance of test	Oct. 27, 2022 - Nov. 01, 2022	
Tested by (+signature) ...	Onnado YE	
Check by (+signature)	Beryl ZHAO	
Approved by (+signature):	Tomsin	

General disclaimer:

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1. General Product Information

1.1. EUT description

Product Name.....:	KB21 mechanical numpad
Model/Type reference.....:	KB21
Sample Number.....:	TCT221027E008-0101
Operation Frequency	2402MHz~2480MHz
Number of Channel	79
Modulation Technology	GFSK
Antenna Type.....:	PCB Antenna
Antenna Gain.....:	-1.52dBi
Rating(s).....:	Rechargeable Li-ion Battery DC 3.7V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

None.

1.3. Operation Frequency

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
6	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
7	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
8	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
9	2411MHz	29	2431MHz	49	2451MHz	69	2471MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
12	2414MHz	32	2434MHz	52	2454MHz	72	2474MHz
13	2415MHz	33	2435MHz	53	2455MHz	73	2475MHz
14	2416MHz	34	2436MHz	54	2456MHz	74	2476MHz
15	2417MHz	35	2437MHz	55	2457MHz	75	2477MHz
16	2418MHz	36	2438MHz	56	2458MHz	76	2478MHz
17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		

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:

Channel	Frequency
The Lowest channel	2402MHz
The Middle channel	2441MHz
The Highest channel	2480MHz

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Field Strength of Fundamental	§15.249 (a)	PASS
Spurious Emissions	§15.249 (a) (d)/ §15.209	PASS
Band Edge	§15.249 (d)/ §15.205	PASS
20dB Occupied Bandwidth	§15.215 (c)	PASS

Note:

1. Pass: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. General Information

3.1. Test Environment and Mode

Operating Environment:		
Condition	Conducted Emission	Radiated Emission
Temperature:	23.4 °C	25.1 °C
Humidity:	49 % RH	51 % RH
Atmospheric Pressure:	1010 mbar	1010 mbar
Test Mode:		
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations with Fully-charged battery	
The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages.		

3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Notebook Computer	G3 3500	00342-36088-99832 -AAOEM	/	DELL
Power Supply	HA130PM190	CN-0CY0JM-CH200 -0B6-7405-A01	/	DELL

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4. Facilities and Accreditations

4.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: 2101 & 2201, Zhenchang Factory Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB

5. Test Results and Measurement Data

5.1. Antenna Requirement

Standard requirement:

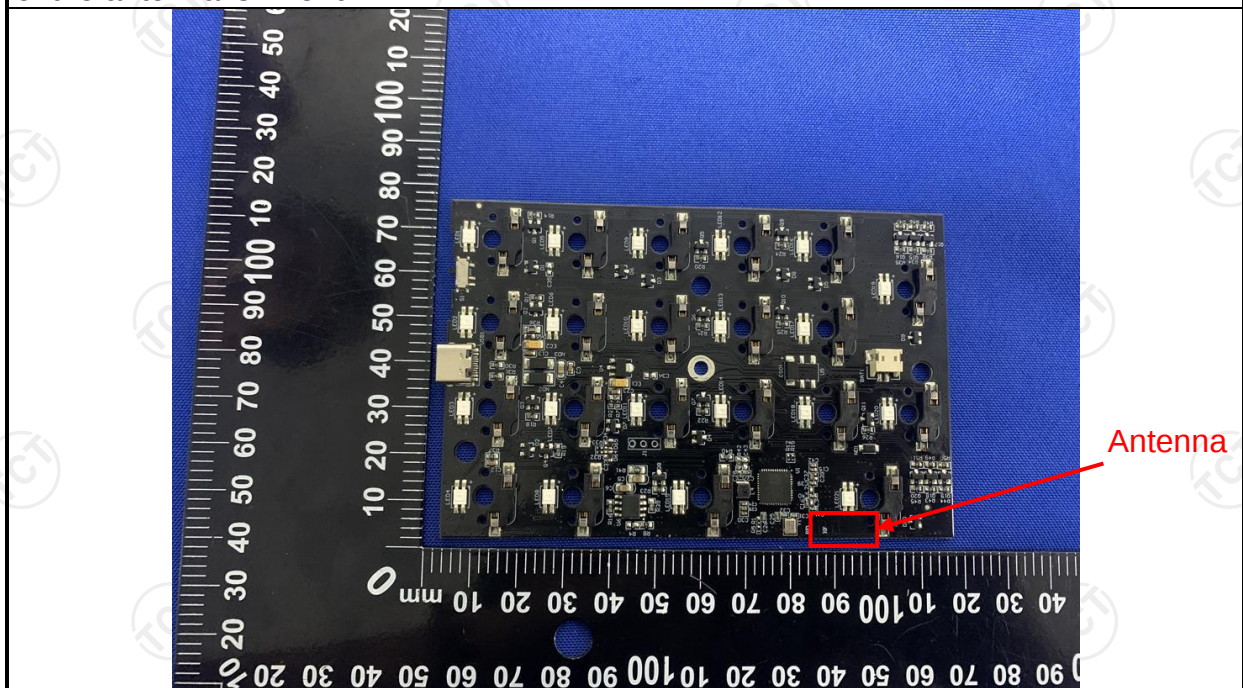
FCC Part15 C Section 15.203

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.

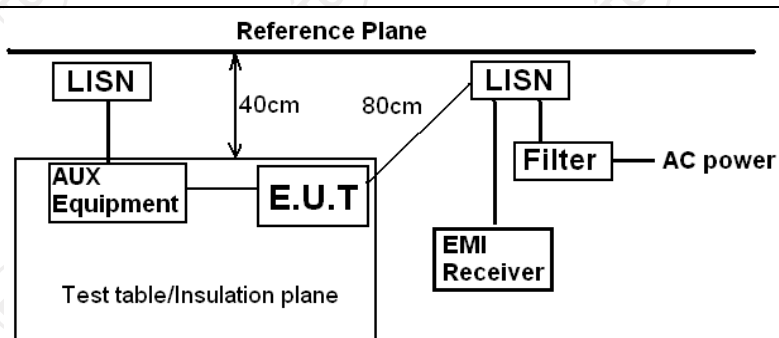
E.U.T Antenna:

The EUT antenna is PCB antenna which permanently attached, and the best case gain of the antenna is -1.52dBi.



5.2. Conducted Emission

5.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>	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
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													
Test Setup:	Reference Plane  Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m														
Test Mode:	Charging + Transmitting Mode														
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 on conducted measurement.														
Test Result:	PASS														

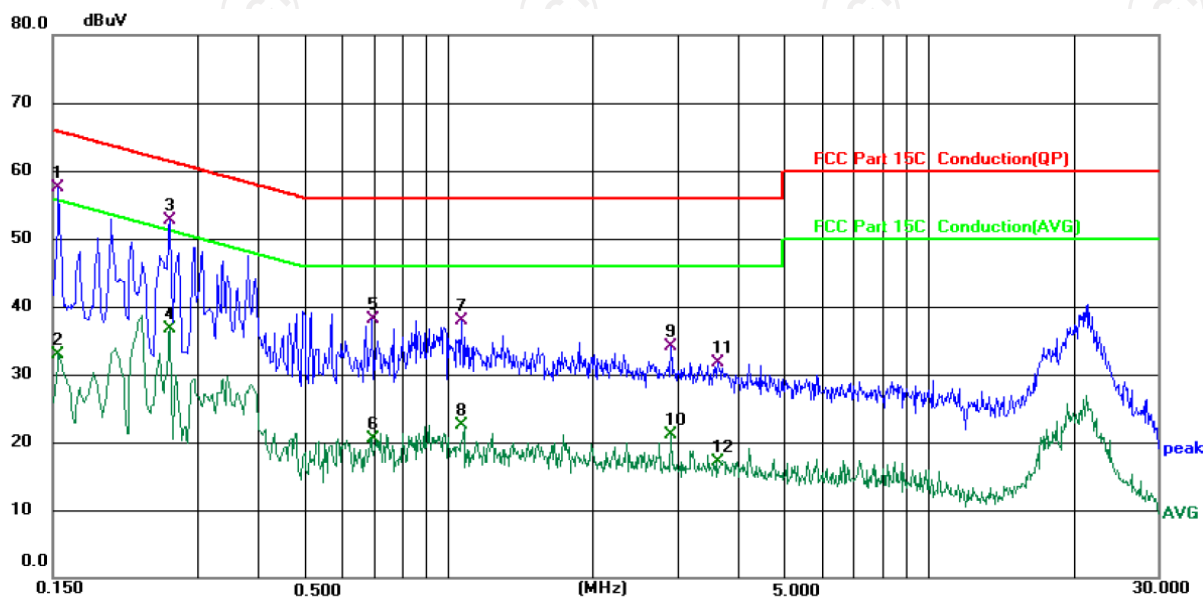
5.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI3	100898	Jul. 03, 2023
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	Feb. 24, 2023
Line-5	TCT	CE-05	/	Jul. 03, 2024
EMI Test Software	Shurple Technology	EZ-EMC	/	/

5.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: L1

Temperature: 23.4 (°C)

Humidity: 49 %

Limit: FCC Part 15C Conduction(QP)

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Mk.	Freq. MHz	Reading Level dBμV	Correct Factor dB	Measure- ment dBμV	Limit dBμV	Over dB	Detector	Comment
1	*	0.1539	47.91	9.59	57.50	65.79	-8.29	QP	
2		0.1539	23.41	9.59	33.00	55.79	-22.79	AVG	
3		0.2620	43.04	9.57	52.61	61.37	-8.76	QP	
4		0.2620	27.10	9.57	36.67	51.37	-14.70	AVG	
5		0.6939	28.42	9.74	38.16	56.00	-17.84	QP	
6		0.6939	10.85	9.74	20.59	46.00	-25.41	AVG	
7		1.0700	28.21	9.75	37.96	56.00	-18.04	QP	
8		1.0700	12.69	9.75	22.44	46.00	-23.56	AVG	
9		2.9100	24.22	9.88	34.10	56.00	-21.90	QP	
10		2.9100	11.17	9.88	21.05	46.00	-24.95	AVG	
11		3.6579	21.85	9.89	31.74	56.00	-24.26	QP	
12		3.6579	7.22	9.89	17.11	46.00	-28.89	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

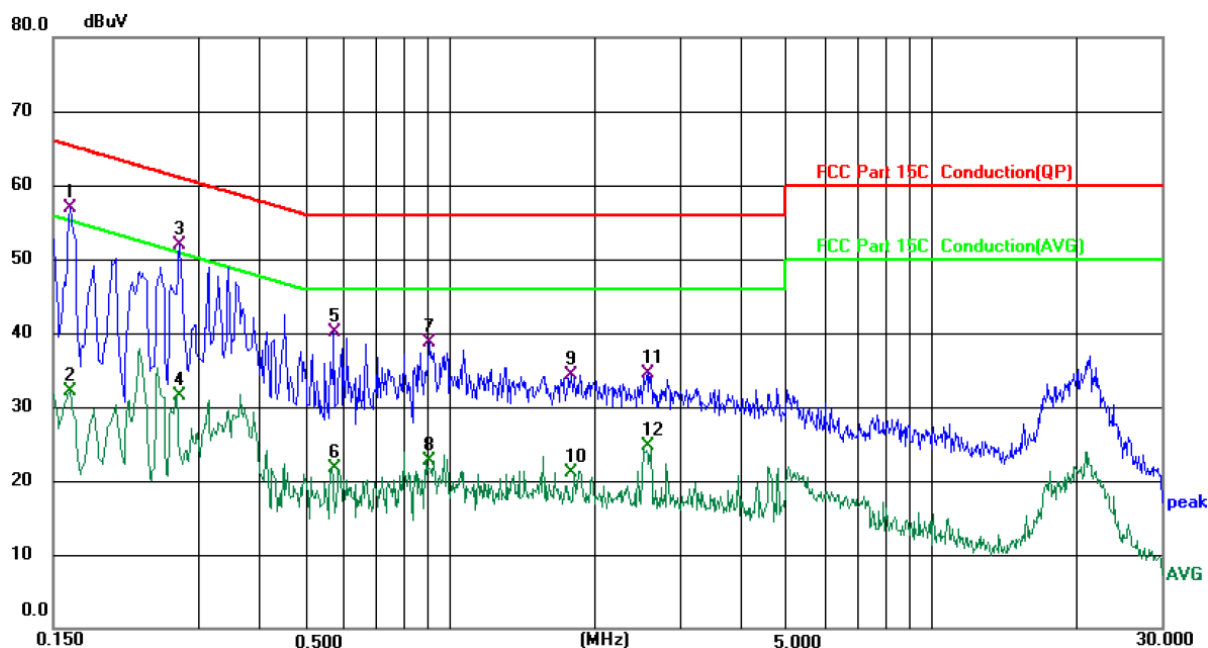
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak

AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: **N**

Temperature: 23.4 (°C)

Humidity: 49 %

Limit: FCC Part 15C Conduction(QP)

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Mk.	Freq. MHz	Reading Level dBμV	Correct Factor dB	Measure- ment dBμV	Limit dBμV	Over dB	Detector	Comment
1	*	0.1620	47.28	9.69	56.97	65.36	-8.39	QP	
2		0.1620	22.41	9.69	32.10	55.36	-23.26	AVG	
3		0.2740	42.40	9.58	51.98	61.00	-9.02	QP	
4		0.2740	21.97	9.58	31.55	51.00	-19.45	AVG	
5		0.5738	30.31	9.73	40.04	56.00	-15.96	QP	
6		0.5738	12.05	9.73	21.78	46.00	-24.22	AVG	
7		0.9060	29.00	9.74	38.74	56.00	-17.26	QP	
8		0.9060	12.93	9.74	22.67	46.00	-23.33	AVG	
9		1.7900	24.60	9.76	34.36	56.00	-21.64	QP	
10		1.7900	11.27	9.76	21.03	46.00	-24.97	AVG	
11		2.5739	24.68	9.78	34.46	56.00	-21.54	QP	
12		2.5739	14.94	9.78	24.72	46.00	-21.28	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

5.3. Radiated Emission Measurement

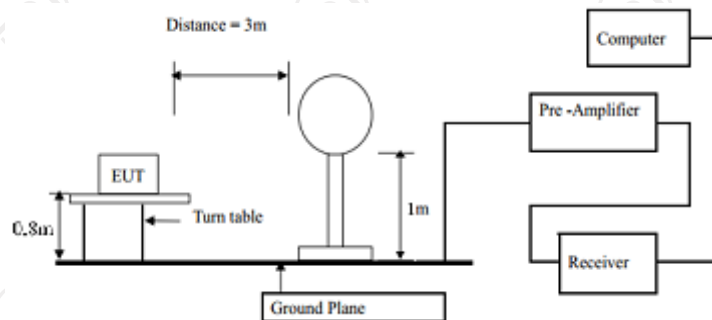
5.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Frequency Range:	9 kHz to 25 GHz				
Measurement Distance:	3 m				
Antenna Polarization:	Horizontal & Vertical				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit(Field strength of the fundamental signal):					
	Frequency		Limit (dBuV/m @3m)		Remark
	2400MHz-2483.5MHz		94.00		Average Value
Limit(Spurious Emissions):					
	Frequency		Limit (dBuV/m @3m)		Remark
	0.009-0.490		2400/F(KHz)		Quasi-peak Value
	0.490-1.705		24000/F(KHz)		Quasi-peak Value
	1.705-30		30		Quasi-peak Value
	30MHz-88MHz		40.0		Quasi-peak Value
	88MHz-216MHz		43.5		Quasi-peak Value
	216MHz-960MHz		46.0		Quasi-peak Value
	960MHz-1GHz		54.0		Quasi-peak Value
Limit (band edge) :	Above 1GHz		54.0		Average Value
			74.0		Peak Value
Limit (band edge) :	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.				
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber in below 1GHz, 1.5m above the ground in above 1GHz. 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.				

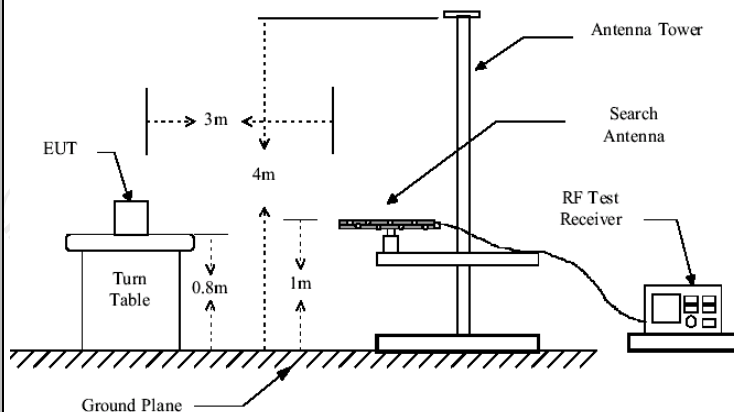
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified 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.

Test setup:

For radiated emissions below 30MHz

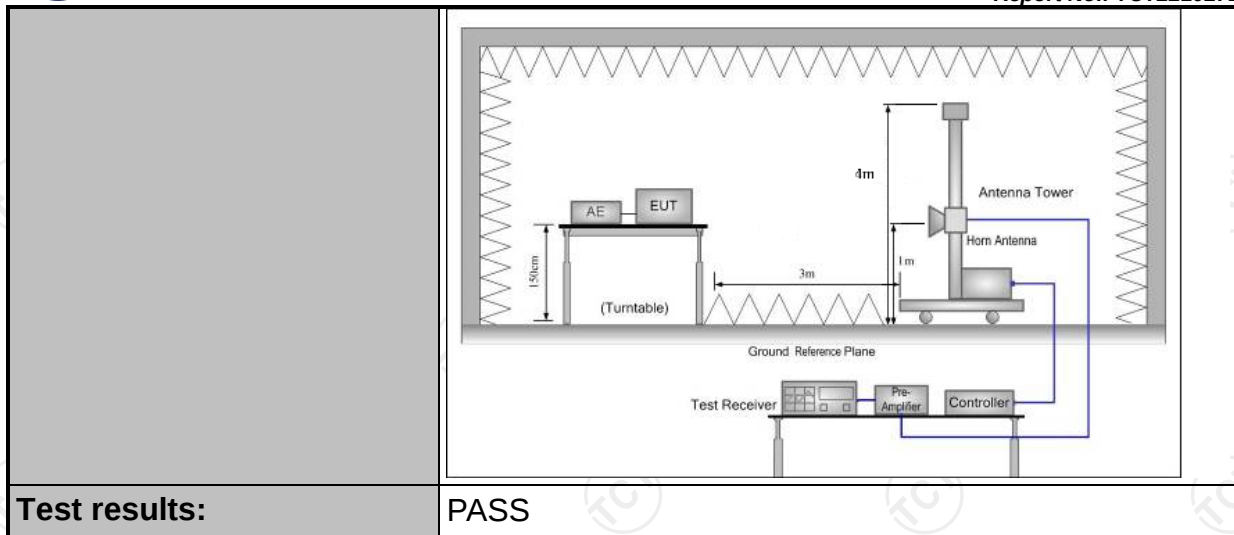


30MHz to 1GHz



Above 1GHz

(The diagram below shows the test setup that is utilized to make the measurements for emission from 1GHz to the tenth harmonic of the highest fundamental frequency or to 40GHz emissions, whichever is lower.)



5.3.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESIB7	100197	Jul. 03, 2023
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 03, 2023
Pre-amplifier	SKET	LNPA_0118G-45	SK2021012102	Feb. 24, 2023
Pre-amplifier	SKET	LNPA_1840G-50	SK202109203500	Feb. 24, 2023
Pre-amplifier	HP	8447D	2727A05017	Jul. 03, 2023
Loop antenna	Schwarzbeck	FMZB1519B	00191	Jun. 11, 2024
Broadband Antenna	Schwarzbeck	VULB9163	340	Jul. 05, 2024
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Jul. 05, 2024
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Apr. 10, 2023
Antenna Mast	Keleto	RE-AM	/	/
Coaxial cable	SKET	RC-18G-N-M	/	Feb. 24, 2024
Coaxial cable	SKET	RC_40G-K-M	/	Feb. 24, 2024
EMI Test Software	Shurple Technology	EZ-EMC	/	/

5.3.3. Test Data

Field Strength of Fundamental

Frequency (MHz)	Emission PK (dBuV/m)	Horizontal /Vertical	Limits PK (dBuV/m)	Margin (dB)
2402	84.74	H	114	-29.26
2402	84.35	V	114	-29.65
2441	88.88	H	114	-25.12
2441	88.87	V	114	-25.13
2480	90.02	H	114	-23.98
2480	83.43	V	114	-30.57

Frequency (MHz)	Emission AV (dBuV/m)	Horizontal /Vertical	Limits AV (dBuV/m)	Margin (dB)
2402	73.21	H	94	-20.79
2402	73.19	V	94	-20.81
2441	75.64	H	94	-18.36
2441	75.66	V	94	-18.34
2480	78.32	H	94	-15.68
2480	71.56	V	94	-22.44

Spurious Emissions

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBμV/m)	Limit@3m (dBμV/m)
--	--	--
--	--	--
--	--	--
--	--	--

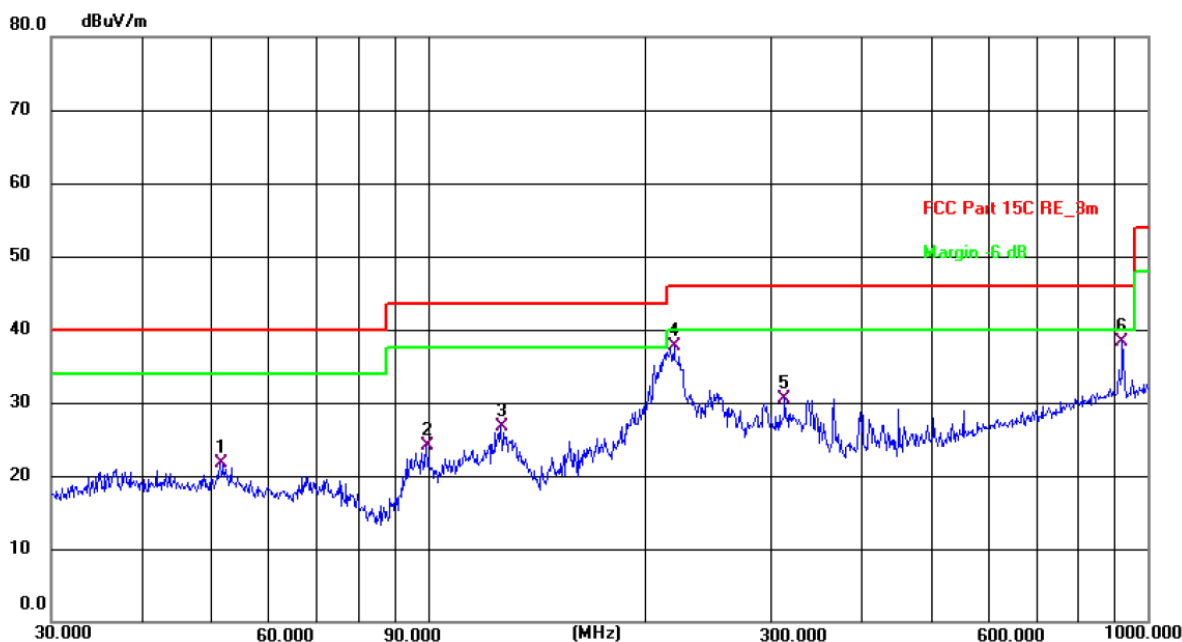
Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor.

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.

3. For fundamental frequency, RBW >20dB BW , VBW>=RBW, PK detector is for PK value, RMS detector is for AV value.

Frequency Range (30MHz-1GHz)

Horizontal:



Site: #1 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 25.1(C)

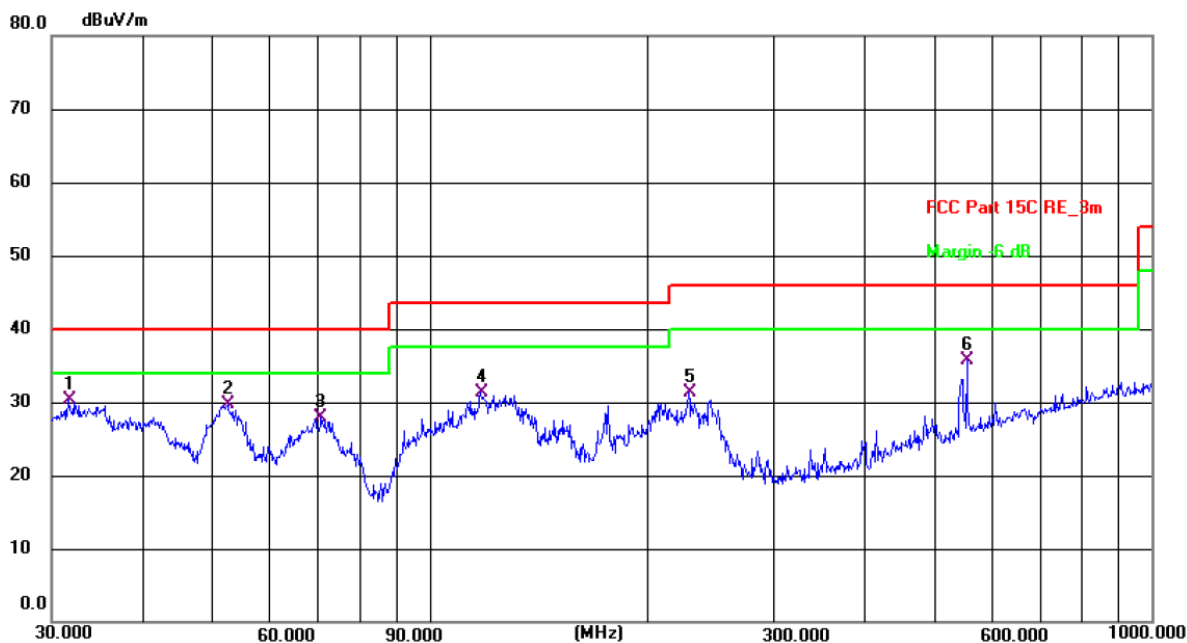
Humidity: 51 %

Limit: FCC Part 15C RE_3m

Power: DC 3.7V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	51.4807	8.46	13.27	21.73	40.00	-18.27	QP	P	
2	99.5281	14.24	9.81	24.05	43.50	-19.45	QP	P	
3	126.3286	14.72	11.94	26.66	43.50	-16.84	QP	P	
4	219.8449	26.80	10.88	37.68	46.00	-8.32	QP	P	
5	313.2760	16.72	13.85	30.57	46.00	-15.43	QP	P	
6 *	922.5157	13.15	25.15	38.30	46.00	-7.70	QP	P	

Vertical:



Site: #1 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 25.1(C)

Humidity: 51 %

Limit: FCC Part 15C RE_3m

Power: DC 3.7V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	31.6202	17.57	12.66	30.23	40.00	-9.77	QP	P	
2	52.5753	16.53	13.14	29.67	40.00	-10.33	QP	P	
3	70.8315	17.15	10.74	27.89	40.00	-12.11	QP	P	
4	117.7725	19.94	11.41	31.35	43.50	-12.15	QP	P	
5	228.4904	19.92	11.45	31.37	46.00	-14.63	QP	P	
6	554.8254	15.86	19.77	35.63	46.00	-10.37	QP	P	

Note: Measurements were conducted in all channels (high, middle, low), and the worst case (Middle channel) was submitted only.

Above 1GHz

Low channel: 2402MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
4804	H	49.03	---	-3.94	45.09	---	74	54	-8.91
7206	H	44.59	---	0.52	45.11	---	74	54	-8.89
---	---	---	---	---	---	---	---	---	---
4804	V	50.77	---	-3.94	46.83	---	74	54	-7.17
7206	V	45.45	---	0.52	45.97	---	74	54	-8.03
---	---	---	---	---	---	---	---	---	---

Middle channel: 2441MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
4882	H	49.62	---	-3.98	45.64	---	74	54	-8.36
7323	H	44.16	---	0.57	44.73	---	74	54	-9.27
---	---	---	---	---	---	---	---	---	---
4882	V	49.19	---	-3.98	45.21	---	74	54	-8.79
7323	V	43.88	---	0.57	44.45	---	74	54	-9.55
---	---	---	---	---	---	---	---	---	---

High channel: 2480MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
4960	H	48.52	---	-3.98	44.54	---	74	54	-9.46
7440	H	43.91	---	0.57	44.48	---	74	54	-9.52
---	---	---	---	---	---	---	---	---	---
4960	V	51.21	---	-3.98	47.23	---	74	54	-6.77
7440	V	44.08	---	0.57	44.65	---	74	54	-9.35
---	---	---	---	---	---	---	---	---	---

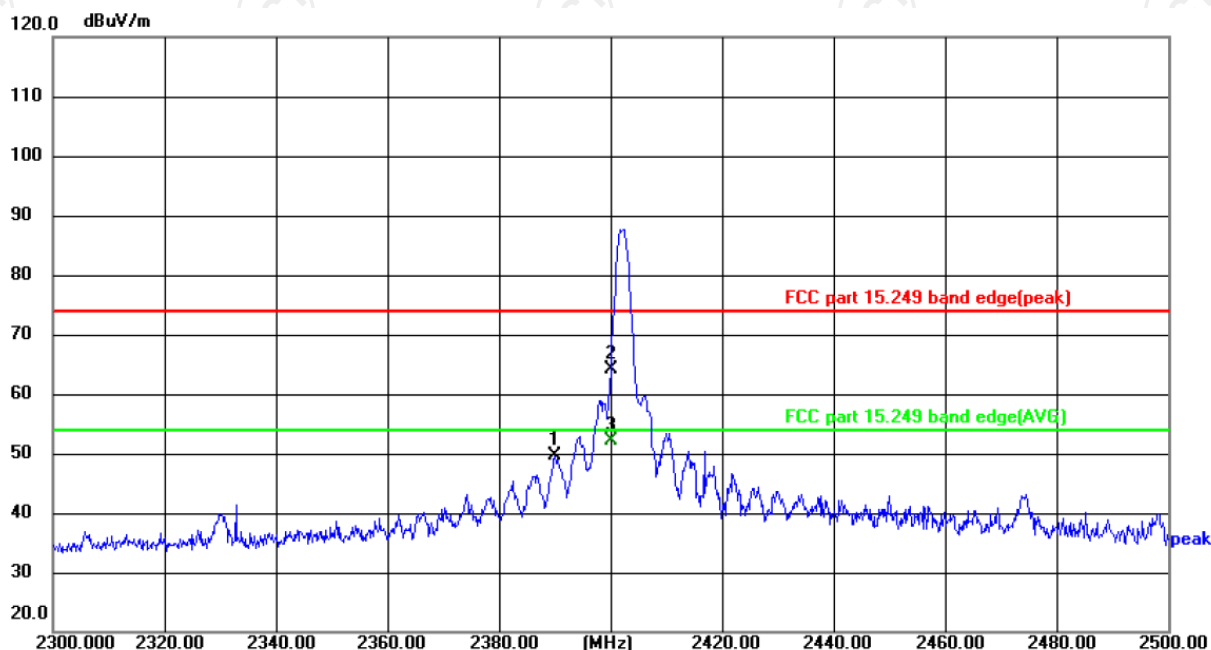
Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
5. Data of measurement shown “---“in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
6. All the restriction bands are compliance with the limit of 15.209.

Band Edge Requirement

Lowest channel 2402:

Horizontal:



Site: #3 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 24(°C)

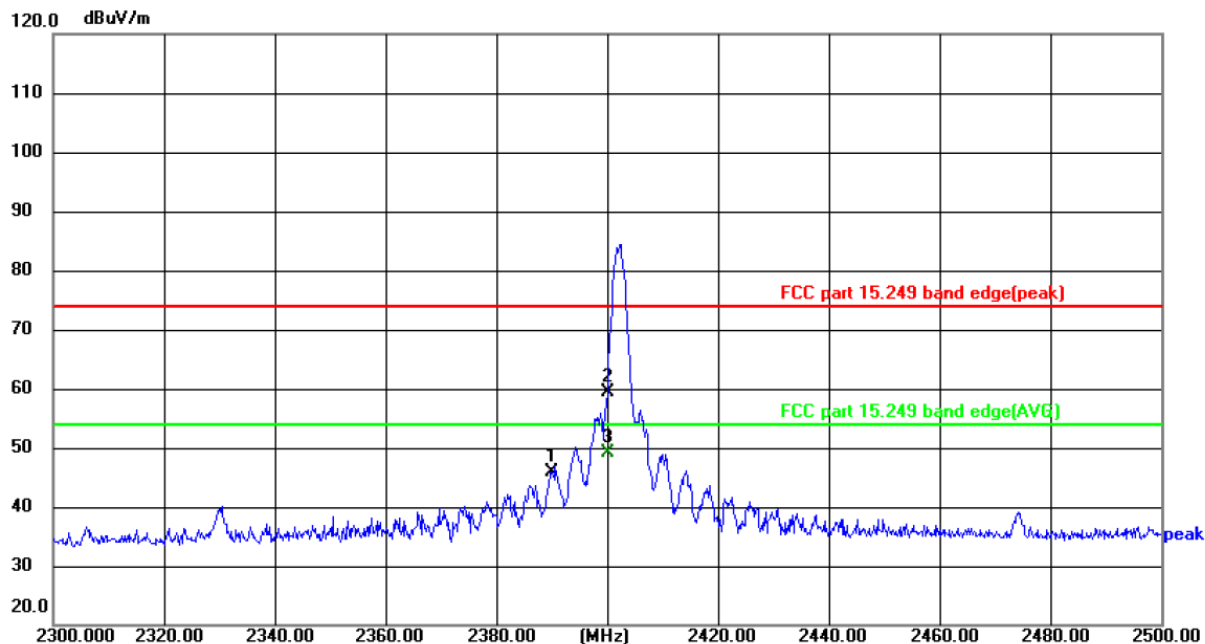
Humidity: 52 %

Limit: FCC part 15.249 band edge(peak)

Power:DC 3.7 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2390.000	65.33	-15.76	49.57	74.00	-24.43	peak	P	
2	2400.000	79.80	-15.72	64.08	74.00	-9.92	peak	P	
3 *	2400.000	67.85	-15.72	52.13	54.00	-1.87	AVG	P	

Vertical:



Site: #3 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 24(°C)

Humidity: 52 %

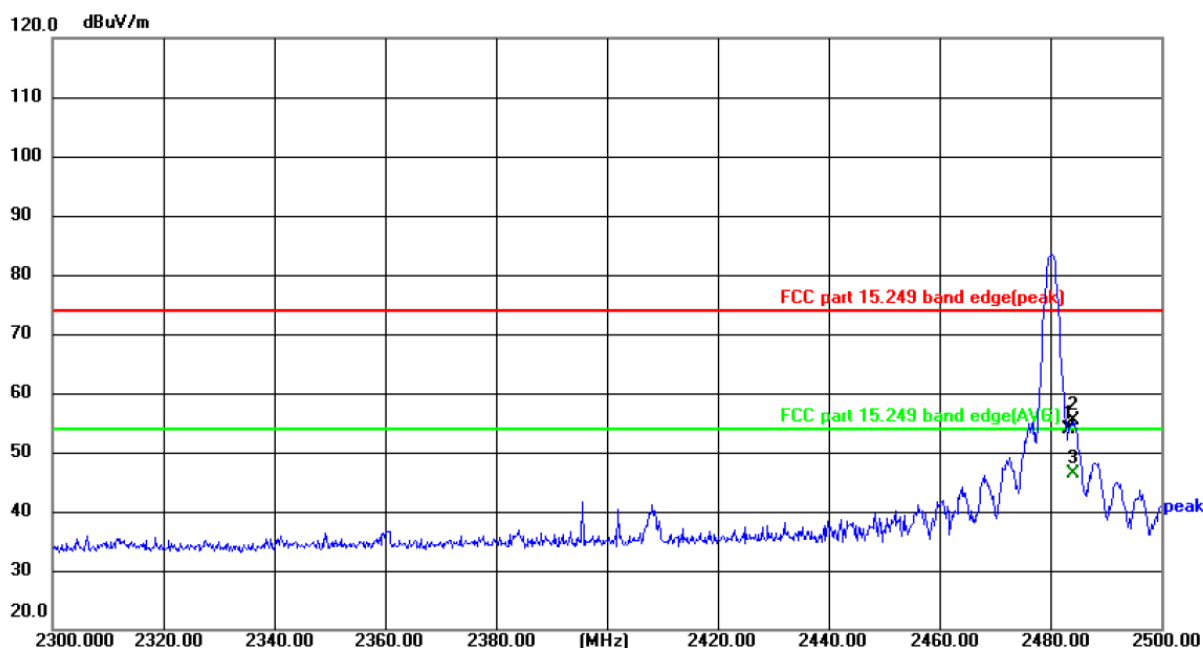
Limit: FCC part 15.249 band edge(peak)

Power:DC 3.7 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2390.000	61.76	-15.76	46.00	74.00	-28.00	peak	P	
2	2400.000	75.03	-15.72	59.31	74.00	-14.69	peak	P	
3 *	2400.000	64.93	-15.72	49.21	54.00	-4.79	AVG	P	

Highest channel 2480:

Horizontal:



Site: #3 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 24(°C)

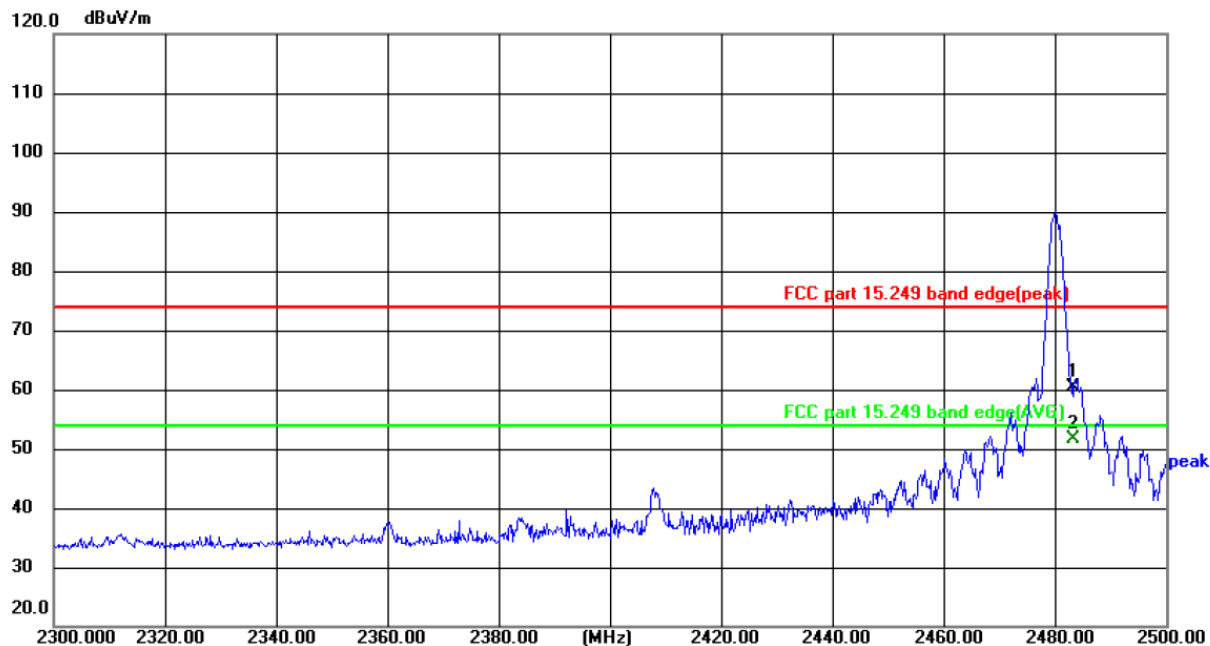
Humidity: 52 %

Limit: FCC part 15.249 band edge(peak)

Power: DC 3.7 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2483.500	69.39	-15.41	53.98	74.00	-20.02	peak	P	
2	2484.300	70.69	-15.40	55.29	74.00	-18.71	peak	P	
3 *	2484.300	61.72	-15.40	46.32	54.00	-7.68	AVG	P	

Vertical:



Site: #3 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 24(°C)

Humidity: 52 %

Limit: FCC part 15.249 band edge(peak)

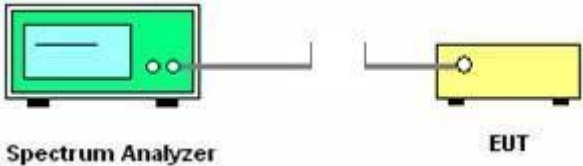
Power:DC 3.7 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2483.500	75.87	-15.41	60.46	74.00	-13.54	peak	P	
2 *	2483.500	67.01	-15.41	51.60	54.00	-2.40	AVG	P	

Note: Measurements were conducted in all channels (high, middle, low), and the worst case (Middle channel) was submitted only.

5.4. 20dB Occupied Bandwidth

5.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10: 2013
Limit:	N/A
	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW$\geq$1% of the 20 dB bandwidth; VBW$\geq$RBW; Sweep = auto; Detector function = peak; Trace = max hold. 4. Measure and record the results in the test report.
Test setup:	 The diagram illustrates the test setup. On the left is a green Spectrum Analyzer with a screen and two knobs. A cable connects it to a yellow rectangular box on the right labeled 'EUT'.
Test Mode:	Transmitting mode with modulation
Test results:	PASS

5.4.2. Test Instruments

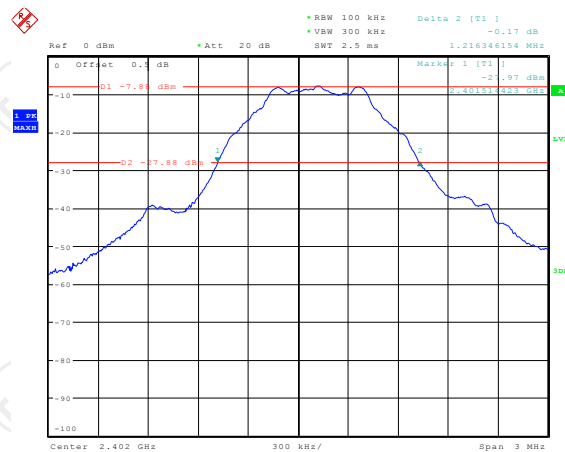
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Jul. 04, 2023

5.4.3. Test data

Test Channel	20dB Occupy Bandwidth (kHz)	Limit	Conclusion
Lowest	1216.35	---	PASS
Middle	1211.54	---	PASS
Highest	1216.35	---	PASS

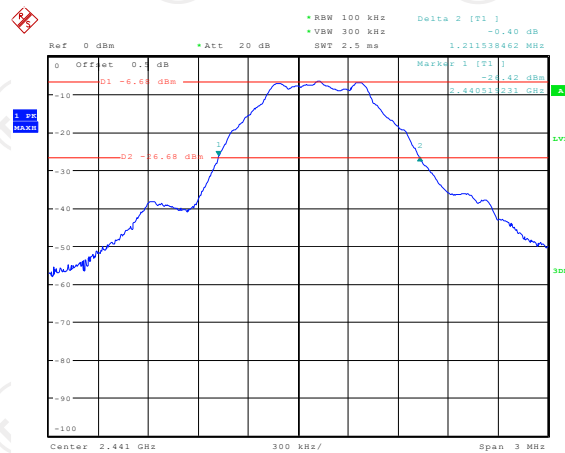
Test plots as follows:

Lowest channel



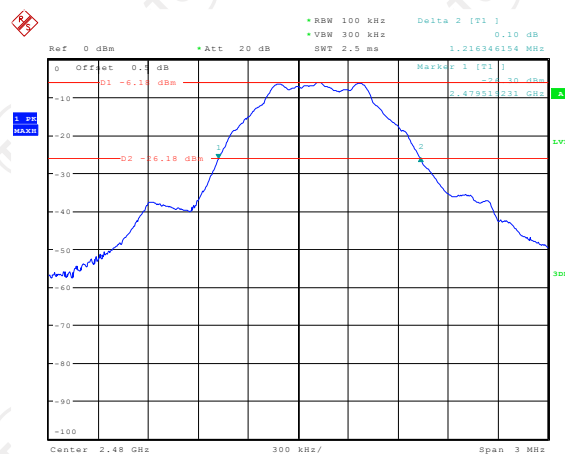
Date: 1.NOV.2022 10:14:10

Middle channel



Date: 1.NOV.2022 10:15:12

Highest channel



Date: 1.NOV.2022 10:17:02

Appendix A: Photographs of Test Setup

Refer to the test report No. TCT221027E008

Appendix B: Photographs of EUT

Refer to the test report No. TCT221027E008

*******END OF REPORT*******