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Test Report

Applicant	:	Felion Technologies Company Limited
Address	:	Room 304 3F Fuxing Building No.6 Binglang Road Fubao Community Futian District Shenzhen
Product Name	:	SLIM TAG
Brand Mark	:	ATUVOS/VOCOLINC/ISOOCO
Model	:	AT2203
Series model	:	VT2202,AT2204,IS2402,AT2403,VT2403, IS2403,IS2202
Report Number	:	BLA-EMC-202406-A0502
FCC ID	:	2AXT8-VT2202
Date of Receipt	:	2024.06.04
Date of Test	:	2024.06.05 to 2024.07.13
Test Standard	:	47 CFR Part 15, Subpart C 15.247
Test Result	:	Pass

Compiled by: charlie **Review by:** Sweely **Approved by:** Blue Zheng

Issued Date: 2024.07.14

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.
Address: Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China

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Revise Record

Version No.	Date	Description
01	2024.07.14	Original

1 General information

1.1 General information

Applicant	Felion Technologies Company Limited
Address	Room 304 3F Fuxing Building No.6 Binglang Road Fubao Community Futian District Shenzhen
Manufacturer	Felion Technologies Company Limited
Address	Room 304 3F Fuxing Building No.6 Binglang Road Fubao Community Futian District Shenzhen
Factory	N/A
Address	N/A

1.2 General description of EUT

Product Name	SLIM TAG
Model No.	AT2203
Series model	VT2202,AT2204,IS2402,AT2403,VT2403, IS2403,IS2202
Differences of Series model	We declare that all models are electrically identical , only model no. and color is different.
Operation Frequency:	2402MHz-2480MHz
Modulation Type:	GFSK
Channel Spacing:	2MHz
Number of Channels:	40
Antenna Type:	PCB Antenna
Antenna Gain:	1.23dBi(Provided by customer)
Power supply or adapter information	Battery:DC3.7V
Hardware Version	VT2202T-V01
Software Version	1.2.0
Engineer sample no	BLA-EMC-202406-A05
Note: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.	

2 Test summary

No.	Test item	Result	Remark
1	Antenna Requirement	Pass	
2	Conducted Emissions at AC Power Line (150kHz-30MHz)	Pass	
3	Conducted Peak Output Power	Pass	
4	Minimum 6dB Bandwidth	Pass	
5	Power Spectrum Density	Pass	
6	Conducted Band Edges Measurement	Pass	
7	Conducted Spurious Emissions	Pass	
8	Radiated Spurious Emissions	Pass	
9	Radiated Emissions which fall in the restricted bands	Pass	

3 Test Configuration

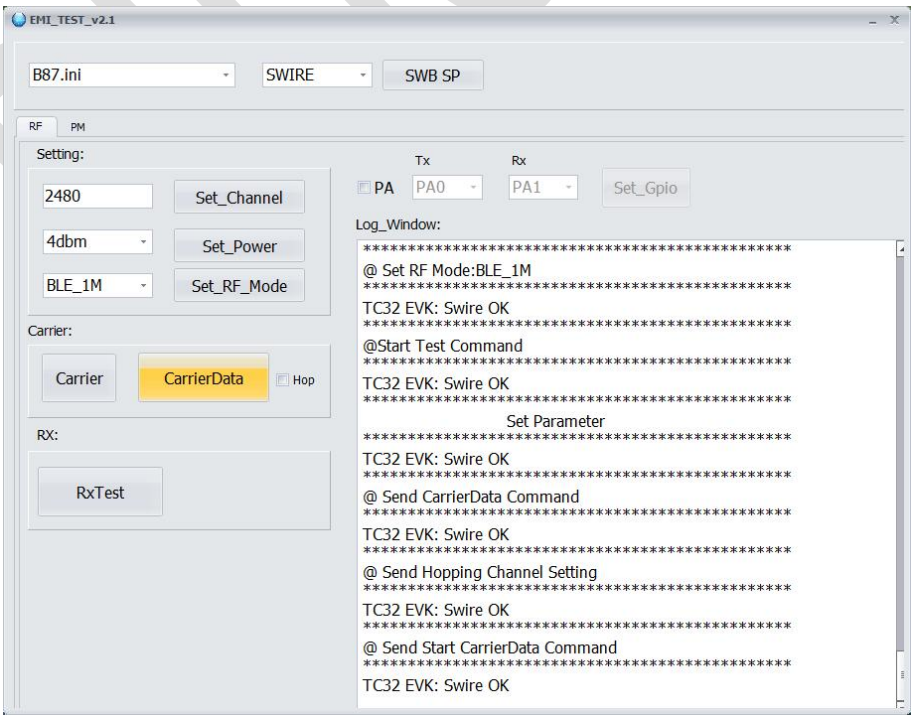
3.1 Test mode

Test Mode Note 1	Description
TX	Keep the EUT in continuously transmitting with modulation mode.
RX	Keep the EUT in receiving mode
TX Low channel	Keep the EUT in continuously transmitting mode in low channel
TX middle channel	Keep the EUT in continuously transmitting mode in middle channel
TX high channel	Keep the EUT in continuously transmitting mode in high channel

Note 1: The EUT was configured to measure its highest possible emission and/or immunity level. The test modes were adapted according to the operation manual for use; the EUT was operated in the engineering mode Note 2 to fix the TX or Rx frequency that was for the purpose of the measurements.
Note 2: Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

Power level setup in software			
Test Software Name	EMI TEST V2.1		
Mode	Channel	Frequency (MHz)	Soft Set
GFSK	CH0	2402	TX level : 4
	CH20	2442	
	CH39	2480	

Run Software



3.2 Operation Frequency each of channel

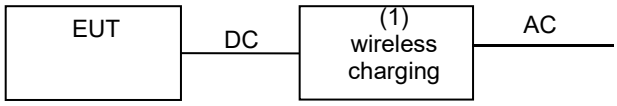
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
…	…	…	…	…	…	…	…
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

3.3 Test channel

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2442MHz
The Highest channel	2480MHz

3.4 Configuration diagram of EUT

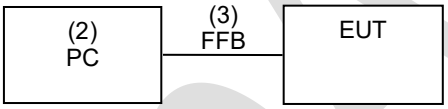
AC conducted emission:



Radiated emission:

Note: see test photographs attached in APPENDIX A for the actual connections between Product and support equipment.

RF Test:



Support equipment:

Name	Device type	Brand	Mode	Series No	Remark
(1)	wireless charging	N/A	N/A	N/A	N/A
(2)	PC	lenovo	E460C	N/A	N/A
(3)	Fixed frequency board	N/A	N/A	N/A	N/A

3.5 Auxiliary equipment

Device Type	Manufacturer	Model Name	Serial No.	Remark
PC	Lenovo	E460C	N/A	From lab (No.BLA-ZC-BS-2022005)

Note:
"--" mean no any auxiliary device during testing.

3.6 Test environment

Environment	Temperature	Voltage
Normal	25°C	DC 3.7V

4 Laboratory information

4.1 Laboratory and accreditations

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

Company name:	BlueAsia of Technical Services(Shenzhen) Co., Ltd.
Address:	Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China
CNAS accredited No.:	L9788
A2LA Cert. No.:	5071.01
FCC Designation No.:	CN1252
ISED CAB identifier No.:	CN0028
Telephone:	+86-755-28682673
FAX:	+86-755-28682673

4.2 Measurement uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

Parameter	Expanded Uncertainty
Radiated Emission(9kHz-30MHz)	±4.34dB
Radiated Emission(30Mz-1000MHz)	±4.24dB
Radiated Emission(1GHz-18GHz)	±4.68dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3.0 dB
Unwanted Emissions, conducted	±3.0 dB
Temperature	±3 °C
Supply voltages	±3 %
Time	±5 %

5 Test equipment

Equipment No.	Equipment Name	Model No.	Manufacture	S/N	Cal. Date	Next Cal. Date
BLA-EMC-008	Spectrum	FSP40	R&S	100817	2023/08/30	2024/08/29
BLA-EMC-009	EMI Receiver	ESR7	R&S	101199	2023/08/30	2024/08/29
BLA-EMC-012	broad band Antenna	VULB9168	Schwarz beck	00836 P:00227	2022/10/12	2025/10/11
BLA-EMC-013	Horn Antenna	BBHA9120D	Schwarz beck	01892	2022/09/13	2025/09/12
BLA-EMC-014	Amplifier	PA_000318G-45	SKET	PA2018043003	2023/08/30	2024/08/29
BLA-EMC-016	Signal Generator	N5182A	Agilent	MY52420567	2023/11/16	2024/11/15
BLA-EMC-028	Spectrum	N9020A	Agilent	MY53420839	2023/11/16	2024/11/15
BLA-EMC-038	Spectrum	N9020A	Agilent	MY49100060	2023/08/30	2024/08/29
BLA-EMC-042	Power sensor	RPR3006W	DARE	14I00889SN042	2023/09/01	2024/08/31
BLA-EMC-043	Loop antenna	FMZB1519B	SCHNARZBECK	00102	2022/09/14	2025/09/13
BLA-EMC-044	Wideband radio communication tester	CMW500	R&S	132429	2023/08/30	2024/08/29
BLA-EMC-046	Filter bank	2.4G/5G Filter bank	SKET	N/A	2023/07/07	2025/07/06
BLA-EMC-061	Receiver	ESPI7	R&S	101477	2023/07/07	2025/07/06
BLA-EMC-062	Signal Generator	N5181A	Agilent	MY46240904	2023/07/07	2025/07/06
BLA-EMC-064	Signal Generator	N5182B	KEYSIGHT	MY58108892	2023/07/07	2025/07/06
BLA-EMC-065	broadband Antenna	VULB9168	Schwarz beck	01065P	2022/12/12	2025/12/11
BLA-EMC-066	Amplifier	LNPA_30M01G-30	SKET	SK2021060801	2023/07/07	2025/07/06
BLA-EMC-079	Spectrum	N9020A	Agilent	MY54420161	2023/08/30	2024/08/29
BLA-EMC-080	Signal Generator	N5182A	Agilent	MY47420955	2023/08/30	2024/08/29
BLA-EMC-086	Amplifier	LNPA_18G40G-50dB	SKET	SK2022071301	2023/08/14	2024/08/13

6 Test result

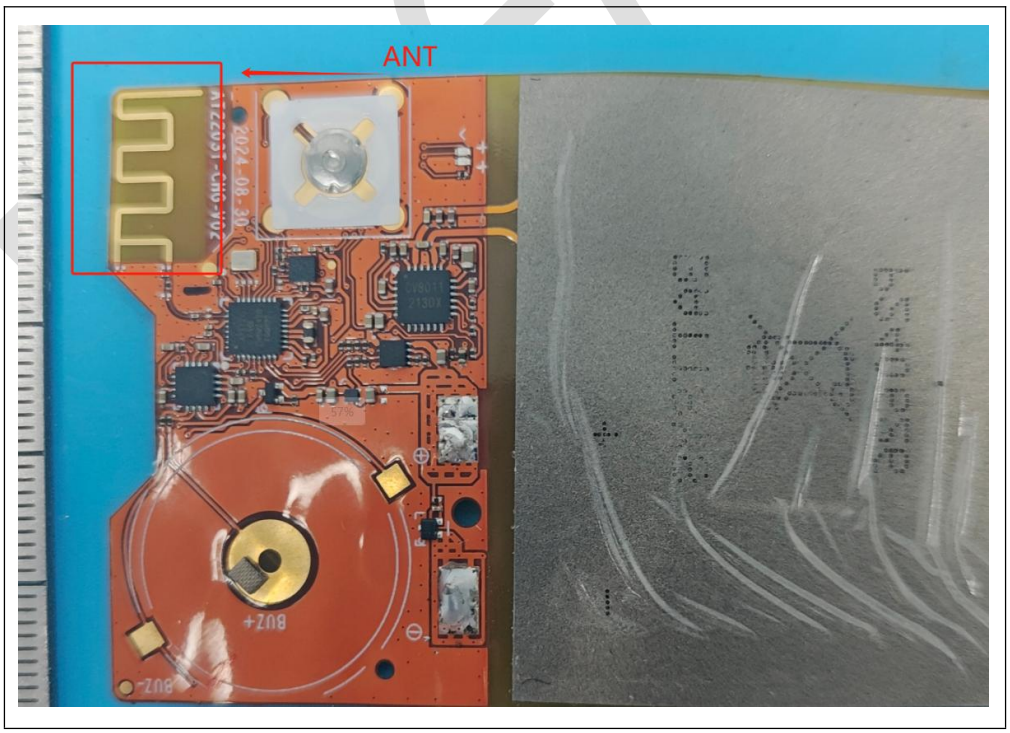
6.1 Antenna requirement

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

6.1.1 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 an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of a so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT antenna:
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.23 dBi.



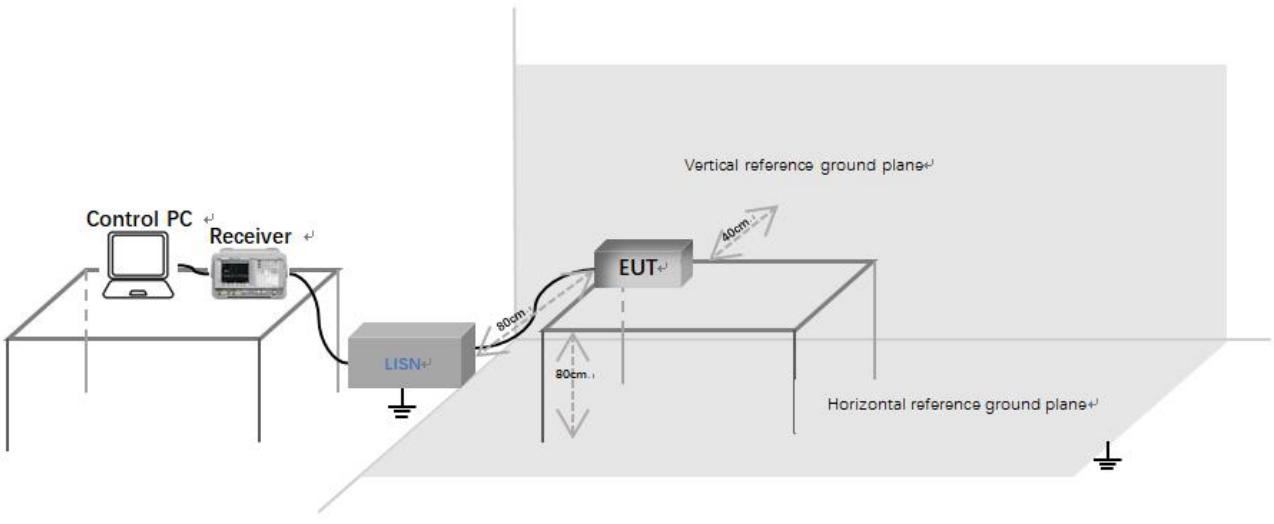
6.2 Conducted emissions at AC power line (150 kHz-30 MHz)

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX

6.2.1 Limit

Frequency of emission(MHz)	**Conducted limit(dBμV)**	
	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.		

6.2.2 Test setup



Description of test setup connection:

a) Connect the control PC to the receiver through a USB to GPIB cable;

b) The receiver is connected to the LISN through a coaxial line;

c) Connect the power port of LISN to the EUT.

6.2.3 Procedure

1) The mains terminal disturbance voltage test was conducted in a shielded room.

2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

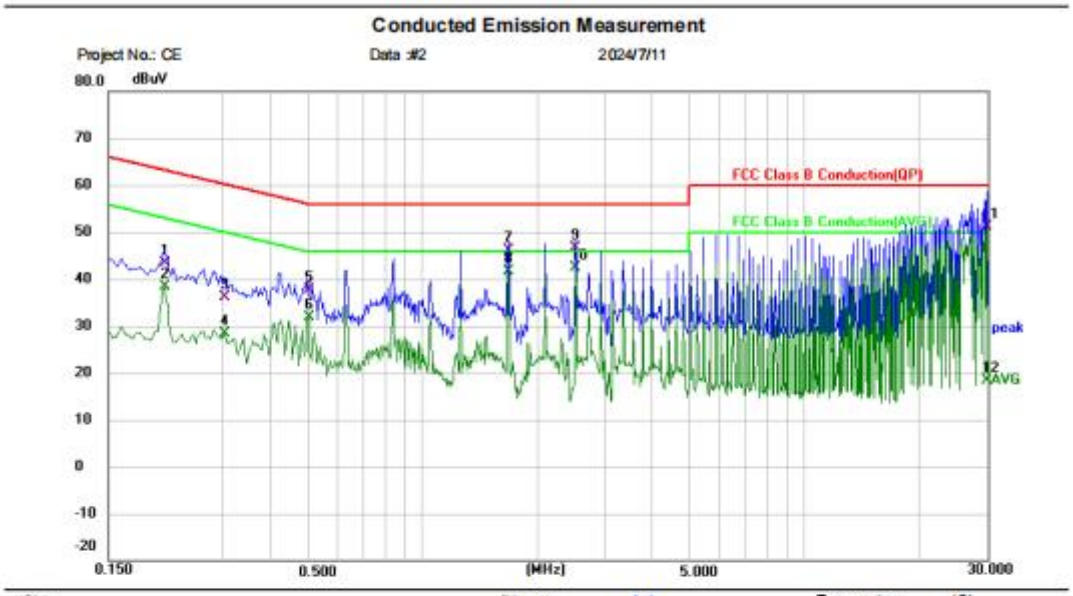
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

5) 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 on conducted measurement.

LISN=Read Level+ Cable Loss+ LISN Factor

6.2.4 Test data

[Test mode: TX]; [Line: Line];[Power:AC120V/60Hz]



Site
Limit: FCC Class B Conduction(QP)
EUT: SLIM TAG
M/N: AT2203
Mode: TX
Note:

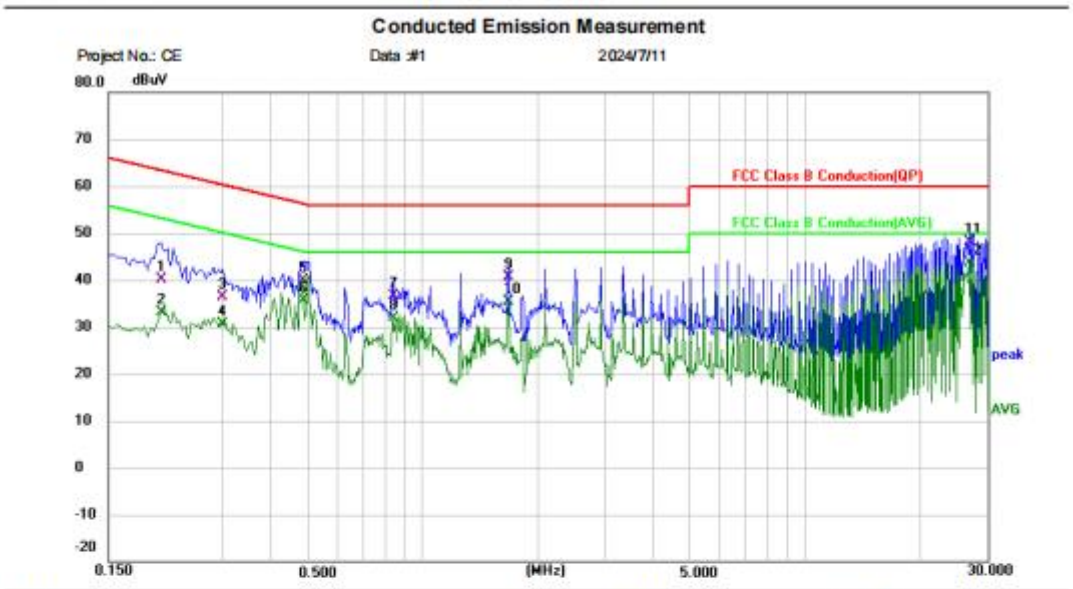
Phase: L1
Power:
Distance:
RBW: 9 KHz
VBW: 30 KHz

Temperature: (C)
Humidity: %RH
Sweep Time: 10 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		0.2100	32.96	10.39	43.35	63.21	-19.86	QP			
2		0.2100	28.08	10.39	38.47	53.21	-14.74	AVG			
3		0.3020	26.18	9.96	36.14	60.19	-24.05	QP			
4		0.3020	18.44	9.96	28.40	50.19	-21.79	AVG			
5		0.5020	27.82	9.81	37.63	56.00	-18.37	QP			
6		0.5020	22.04	9.81	31.85	46.00	-14.15	AVG			
7		1.6740	35.98	10.03	46.01	56.00	-9.99	QP			
8		1.6740	31.71	10.03	41.74	46.00	-4.26	AVG			
9		2.5100	36.57	10.11	46.68	56.00	-9.32	QP			
10	*	2.5100	32.27	10.11	42.38	46.00	-3.62	AVG			
11		29.9100	35.69	15.34	51.03	60.00	-8.97	QP			
12		29.9100	2.94	15.34	18.28	50.00	-31.72	AVG			

Test Result: Pass

[Test mode: TX]; [Line: Neutral];[Power:AC120V/60Hz]



Site
Limit: FCC Class B Conduction(QP)
EUT: SLIM TAG
M/N: AT2203
Mode: T X
Note:

Phase: N
Power:
Distance:
RBW: 9 KHz
VBW: 30 KHz

Temperature: (C)
Humidity: %RH
Sweep Time: 10 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		0.2060	30.04	10.21	40.25	63.37	-23.12	QP			
2		0.2060	22.88	10.21	33.09	53.37	-20.28	AVG			
3		0.2980	26.41	9.95	36.36	60.30	-23.94	QP			
4		0.2980	20.64	9.95	30.59	50.30	-19.71	AVG			
5		0.4860	30.02	9.81	39.83	56.24	-16.41	QP			
6		0.4860	25.86	9.81	35.67	46.24	-10.57	AVG			
7		0.8380	26.79	9.90	36.69	56.00	-19.31	QP			
8		0.8380	21.94	9.90	31.84	46.00	-14.16	AVG			
9		1.6740	30.69	9.97	40.66	56.00	-15.34	QP			
10		1.6740	25.52	9.97	35.49	46.00	-10.51	AVG			
11		26.9780	33.07	15.01	48.08	60.00	-11.92	QP			
12	*	26.9780	28.59	15.01	43.60	50.00	-6.40	AVG			

Test Result: Pass

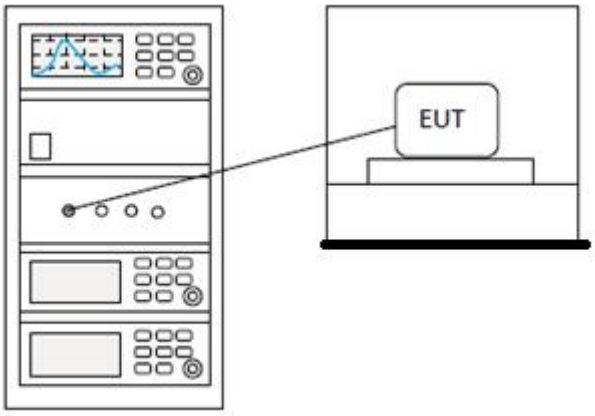
6.3 Conducted peak output Power

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX

6.3.1 Limit

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

6.3.2 Test setup



6.3.3 Test data

Pass: Please refer to appendix A for details

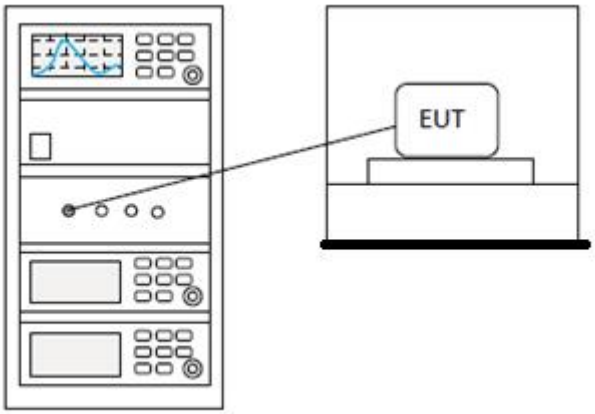
6.4 Minimum 6dB bandwidth

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 11.8.1
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX

6.4.1 Limit

≥500 kHz

6.4.2 Test setup



6.4.3 Test data

Pass: Please refer to appendix A for details

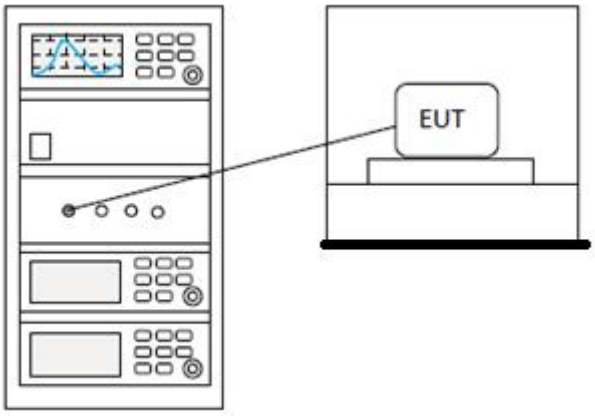
6.5 Power spectrum density

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 11.10.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX

6.5.1 Limit

≤8dBm in any 3 kHz band during any time interval of continuous transmission

6.5.2 Test setup



6.5.3 Test data

Pass: Please refer to appendix A for details