



FCC- TEST REPORT

Report Number	: 6871025006401	Date of Issue: <u>2025-06-20</u>
Model	: XZ-T810	
Product Type	: Floor treatment/cleaning machines (Titan 810 Robotic Scrubber)	
Applicant	: ROSIWIT Technology Co., Ltd.	
Address	: Building C17, Zidong International Creative Park, Qixia District, 210000 Nanjing, China	
Manufacturer	: ROSIWIT Technology Co., Ltd.	
Address	: Building C17, Zidong International Creative Park, Qixia District, 210000 Nanjing, China	
Test Result	: ■ Positive <input type="checkbox"/> Negative	
Total pages including Appendices	: 20	

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production. For further details, please see testing and certification regulation chapter A-3.4.

1 Table of Contents

1	Table of Contents	2
2	Details about the Test Laboratory	3
3	Description of the Equipment Under Test	4
4	Summary of Test Standards.....	5
5	Summary of Test Results	6
6	General Remarks	7
7	Test Setups.....	8
8	Test Methodology	10
8.1	Conducted Emission	10
8.2	Radiated Emission	13
8.3	Bandwidth Measurement	16
8.4	Deactivation Time.....	17
9	Test Equipment List.....	18
10	System Measurement Uncertainty	20

2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong, China

Telephone: 86 755 8828 6998

Fax: 86 755 8828 5299

FCC Registration No.: 514049

FCC Designation Number: CN5009

3 Description of the Equipment Under Test

Product:	Floor treatment/cleaning machines (Titan 810 Robotic Scrubber)
Model no.:	XZ-T810
FCC ID:	2BNHQ-TITAN810
Options and accessories:	Titan 810 Workstation Rated input for its attached Titan 810 Workstation: 100-240VAC, 50-60Hz, 2000W Rated output for its attached Titan 810 Workstation 43.8VDC, 40A
Ratings:	Input: 38.4VDC, 40A
RF Transmission Frequency:	433MHz for LoRa
No. of Operated Channel:	Single channel
Modulation:	FSK
Antenna Type:	Rod antenna
Description of the EUT:	The EUT is Floor treatment/cleaning machines with 433MHz LoRa, 13.56MHz RFID functions and contain transmitter module FCC ID: 2APJ4-SLM750VSA.
Remark:	This report is only for 433MHz LoRa.

NOTE 1: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2024 Edition	RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to ANSI C63.10-2020.

5 Summary of Test Results

Technical Requirements					
FCC Part 15.231 Subpart C					
Test Condition		Pages	Test Result	Test Environment (See note 2)	Test Site
§15.207	Conducted emission AC power port	10	Pass	T: 22.3°C H: 53.2%	Site 1
§15.205, §15.209, 15.35 (c)§15.231(b)	The Field strength of Emissions	13	Pass	T: 23.1°C H: 49.3%	Site 1
§15.231(c)	Bandwidth Measurement	16	Pass	T: 22.4°C H: 51.3%	Site 1
§15.231(a)(1)	Deactivation Time	17	Pass	T: 22.4°C H: 51.3%	Site 1
§15.203	Antenna requirement	--	See note 1	--	Site 1

Note 1: N/A=Not Applicable.

Note 1: The EUT uses a Rod antenna. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.

Note 2: T means Temperature, H means Humidity.

6 General Remarks

Remarks

The conducted emissions of XZ-T810 were tested with Titan 810 Workstation, and the input voltage is 120VAC/60Hz; The RF tests of XZ-T810 were tested with a battery pack, the battery voltage is 38.4VDC.

This submittal(s) (test report) is intended for FCC ID: 2BNHQ-TITAN810, complies with Section 15.205, 15.207, 15.209, 15.231 of the FCC Part 15, Subpart C Rules.

SUMMARY:

All tests according to the regulations cited on page 5 were.

- Performed

- Not Performed

The Equipment Under Test

- **Fulfills** the general approval requirements.

- **Does not** fulfill the general approval requirements.

Sample Received Date: 2024-10-30

Testing Start Date: 2025-05-12

Testing End Date: 2025-06-09

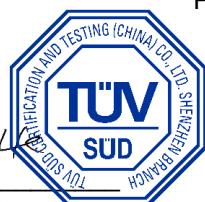
TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Reviewed by:



Jessie He
Project Manager

Prepared by:



Myron Yu
Project Engineer

Tested by:

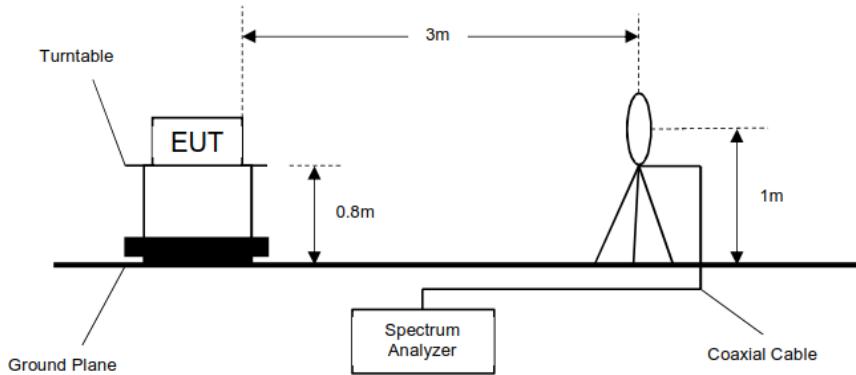


Carry Cai
Test Engineer

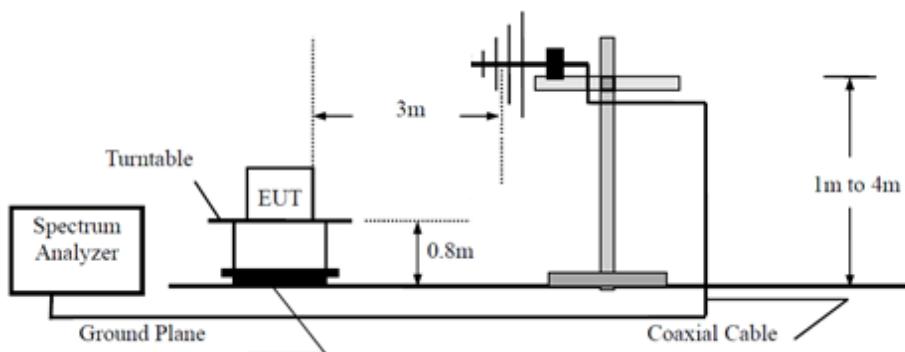
7 Test Setups

8.1 Radiated test setups

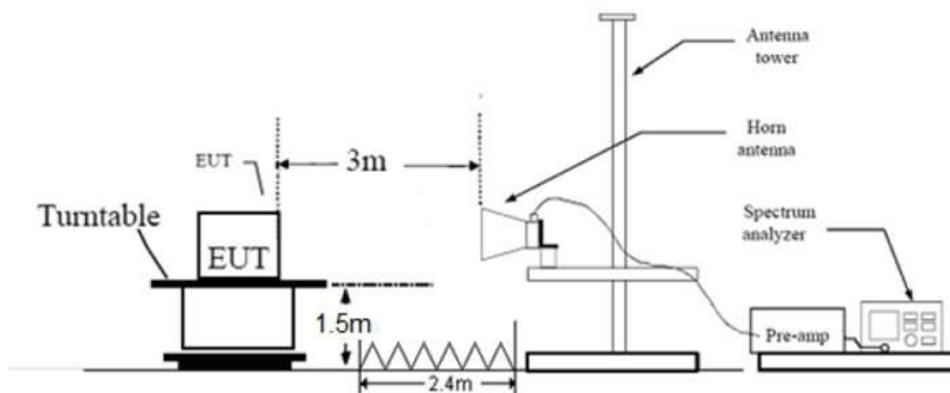
9KHz - 30MHz



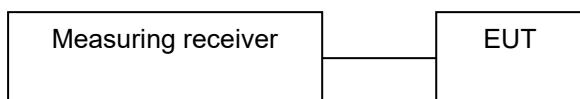
Below 1GHz



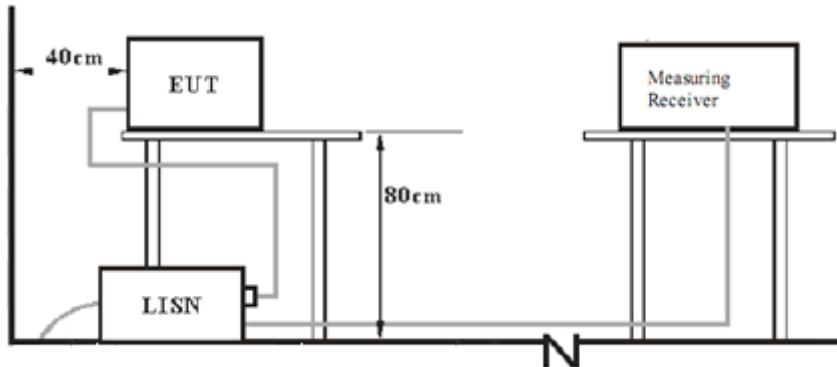
Above 1GHz



8.2 Conducted RF test setups



8.3 AC Power Line Conducted Emission test setups



8 Test Methodology

8.1 Conducted Emission

Test Method

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. Both sides of AC line were checked for maximum conducted interference.
6. The frequency range from 150 kHz to 30 MHz was searched.
7. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

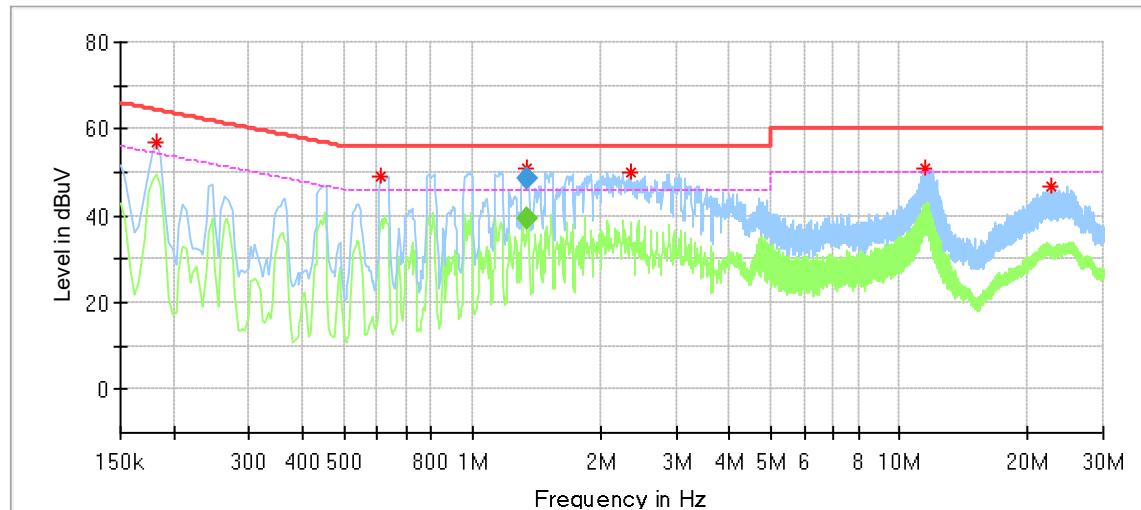
Limit

Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

*Decreasing linearly with logarithm of the frequency.

Conducted Emission Test 0.15MHz – 30MHz

Product Type : Floor treatment/cleaning machines (Titan 810 Robotic Scrubber)
 M/N : XZ-T810
 Operating Condition : Continuous transmitting, 433MHz
 Test Specification : Line
 Comment : AC 120V/60Hz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.182000	57.09	---	64.39	7.30	L1	10.30
0.610000	49.24	---	56.00	6.76	L1	10.31
1.345500	51.10	---	56.00	4.90	L1	10.33
2.338000	50.05	---	56.00	5.95	L1	10.37
11.538000	51.11	---	60.00	8.89	L1	10.72
22.618000	46.73	---	60.00	13.27	L1	12.13

Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
1.345500	48.76	---	56.00	7.24	L1	10.33
1.345500	---	39.24	46.00	6.76	L1	10.33

Remark:

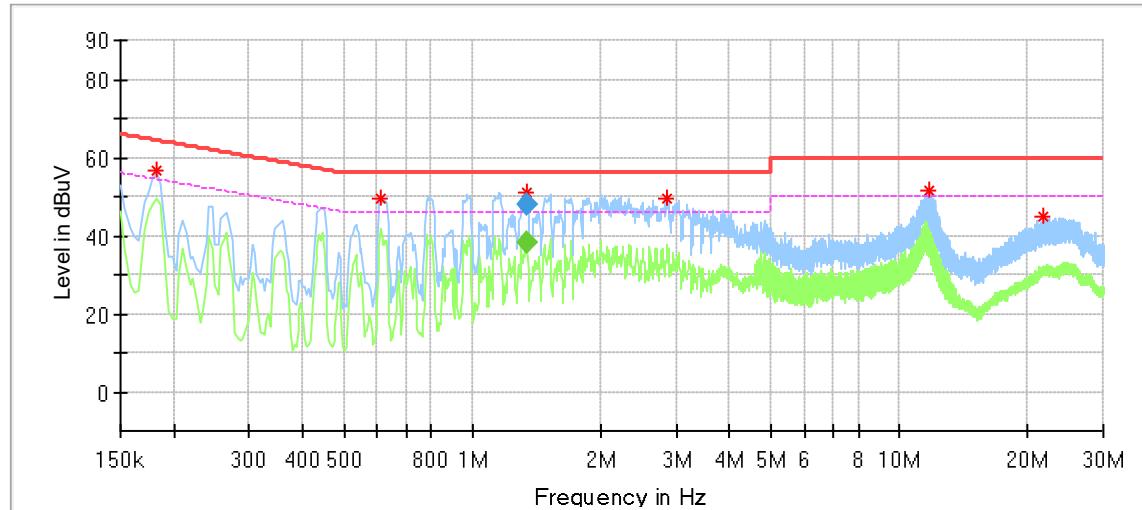
Level=Reading Level + Correction Factor

Correction Factor=Cable Loss + LISN Factor

(The Reading Level is recorded by software which is not shown in the sheet)

Conducted Emission Test 0.15MHz – 30MHz

Product Type : Floor treatment/cleaning machines (Titan 810 Robotic Scrubber)
 M/N : XZ-T810
 Operating Condition : Charging + Continuous transmitting, 433MHz
 Test Specification : Neutral
 Comment : AC 120V/60Hz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.182000	56.80	---	64.39	7.59	N	10.29
0.610000	49.34	---	56.00	6.66	N	10.31
1.341500	51.24	---	56.00	4.76	N	10.32
2.866000	49.38	---	56.00	6.62	N	10.38
11.706000	51.33	---	60.00	8.67	N	10.73
21.762000	45.12	---	60.00	14.88	N	11.07

Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
1.341500	48.15	---	56.00	7.85	N	10.32
1.341500	---	38.02	46.00	7.98	N	10.32

Remark:

Level=Reading Level + Correction Factor

Correction Factor=Cable Loss + LISN Factor

(The Reading Level is recorded by software which is not shown in the sheet)

8.2 Radiated Emission

Test Method

Test Method

- 1: The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. 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 height of antenna 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: Use the following spectrum analyzer settings According to C63.10:
9kHz -150kHz
RBW = 200Hz, VBW = 1kHz for peak measurement, Sweep = auto,
Detector function = peak, Trace = max hold.
150kHz - 30MHz
RBW = 10 kHz, VBW = 30 kHz for peak measurement, Sweep = auto,
Detector function = peak, Trace = max hold.
30MHz - 1GHz
RBW = 100 kHz, VBW = 300 kHz for peak measurement, Sweep = auto,
Detector function = peak, Trace = max hold.
For Above 1GHz
RBW = 1MHz, VBW \geq 3RBW for peak measurement, Sweep = auto, Detector function = peak,
Trace = max hold.

Limit

1. FCC Limit: In addition to the provisions of § 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental (Microvolts /meter)	Field Strength of spurious emissions ((Microvolts /meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,370 *	125 to 375 *
174-260	3,750	375
260-470	3,750 to 12, 500*	375 to 1,250*
Above 470	12,500	1,250

*Linear interpolation with frequency

(a) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.

(b) Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in § 15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of § 15.205 shall be demonstrated using the measurement instrumentation specified in that section.

(c) The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.

Limits for 15.209 Radiated emission limits

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note 1: Limit 3m(dB μ V/m)=Limit 300m(dB μ V/m)+40Log(300m/3m) (Below 30MHz)

Note 2: Limit 3m(dB μ V/m)=Limit 30m(dB μ V/m)+40Log(30m/3m) (Below 30MHz)

Note 3: dB μ V/m = 20log(μ V/m), dB μ A/m = 20log(μ A/m)

Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Radiated Emission									
Value	Emissions Frequency MHz	E-Field Polarity	PK Emission dBµV/m	Corr.	Average Factor dB	AV Emission dBµV/m	Limit dBµV/m	Margin	Emission Type
Below 1GHz									
PK	433.951	H	74.40	21.82	/	/	100.83	26.43	Fundamental
AV	433.951	H	74.40	/	0.00	74.40	80.83	6.43	Fundamental
PK	433.951	V	79.37	21.82	/	/	100.83	21.46	Fundamental
AV	433.951	V	79.37	/	0.00	79.37	80.83	1.46	Fundamental
PK	868.080	H	48.35	28.52	/	/	80.83	32.48	Spurious
AV	868.080	H	48.35	/	0.00	48.35	60.83	12.48	Spurious
PK	868.080	V	45.83	28.52	/	/	80.83	35.00	Spurious
AV	868.080	V	45.83	/	0.00	45.83	60.83	15.00	Spurious
Above 1GHz									
PK	2708.500	H	43.93	-2.04	/	/	74.00	30.07	Spurious
AV	2708.500	H	43.93	/	0.00	43.93	54.00	10.07	Spurious
PK	2319.000	H	44.37	-3.10	/	/	74.00	29.63	Spurious
AV	2319.000	H	44.37	/	0.00	44.37	54.00	9.63	Spurious

Remark:

1: AV Emission Level= PK Emission Level+20log(dutycycle)

2: Data of measurement within this frequency range shown “/” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

3: “*” means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

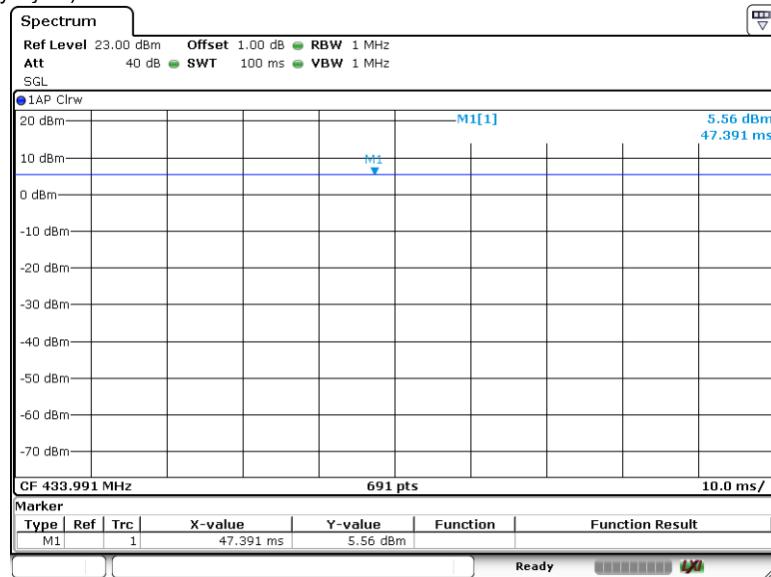
4: Level= Reading Level + Correction Factor

Correction Factor = Antenna Factor + Cable Loss- Amplifier Gain

(The Reading Level is recorded by software which is not shown in the sheet)

Duty Cycle =100(ms)/100(ms) =100%

Duty Cycle Factor = $20 \log_{10} (\text{Duty Cycle}) = 0$



8.3 Bandwidth Measurement

Test Method

1. The EUT was placed on 0.8m height table, the RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
Use the following test receiver settings:
RBW = 1% to 5% of the OBW, VBW \geq 3RBW, Sweep = auto, Detector function = peak, Trace = max hold
3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

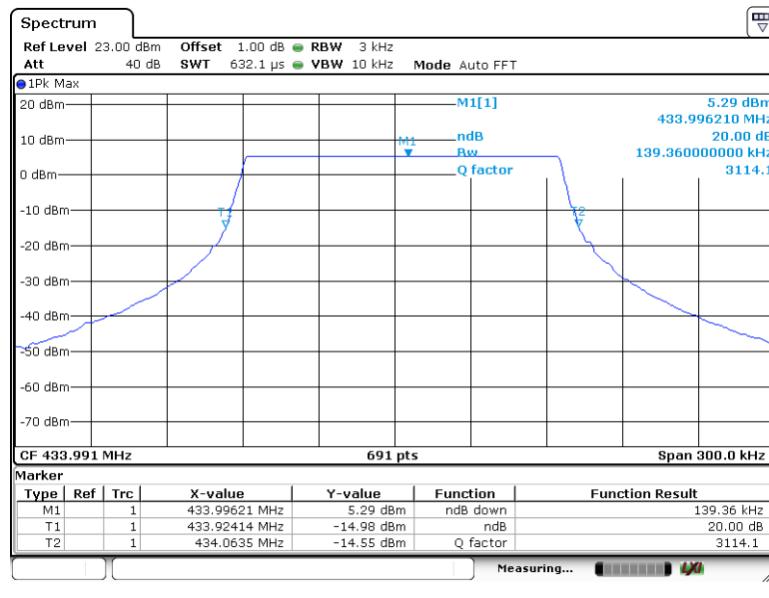
Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20dB down from the modulated carrier.

The limit for the EUT = 0.25% * 433 MHz = 1083 kHz

Test Result

Channel	20dB Bandwidth (KHz)	Limit (KHz)
1	139.36KHz	\leq 1083



20dB Bandwidth

8.4 Deactivation Time

Test Method

1. The EUT was placed on 0.8m height table, the RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT in transmitting mode.
3. Set center frequency of spectrum analyzer=operating frequency.
4. Set the spectrum analyzer as $RBW \geq OBW$, $VBW \geq RBW$, Span=0Hz, detector=peak.
5. Repeat above procedures until all frequency measured was complete.

Limit

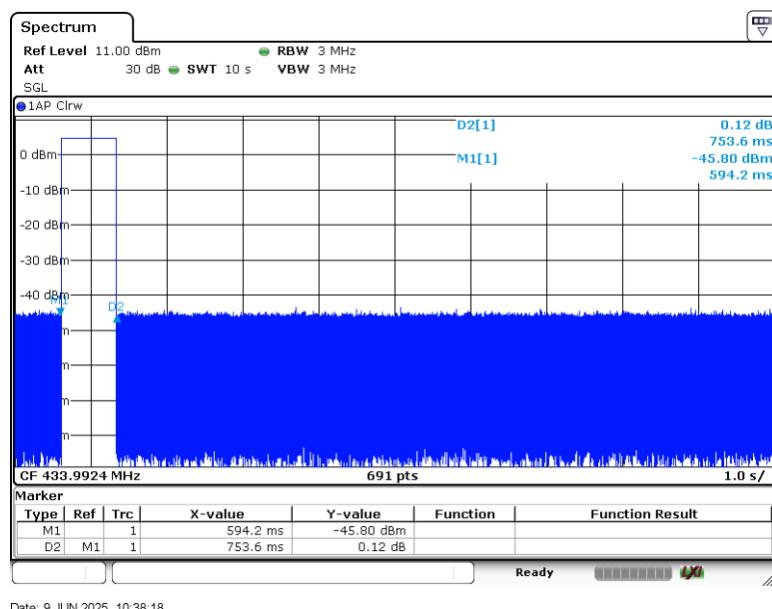
(✓) (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

Test Result

Channel	Frequency	Deactivation Time	Limit	Result
1	433MHz	753.6ms	≤5s	Pass



9 Test Equipment List

List of Test Instruments

Conducted Emission Test (AMN)(CSR #2)

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	68-4-74-14-001	101782	1	2026-4-25
LISN	Rohde & Schwarz	ENV432	68-4-87-16-001	101318	1	2026-4-25
LISN	Rohde & Schwarz	ENV4200	68-4-87-14-001	100249	1	2026-4-25
Attenuator	Shanghai Huaxiang	TS2-26-3	68-4-81-16-003	080928189	1	2026-4-19
Cable	OUQIAO	RG142	68-4-90-19-005-A20	----	----	----
Test software	Rohde & Schwarz	EMC32	68-4-90-19-005-A01	Version10.35.02	N/A	N/A
Shielding Room	TDK	CSR #2	68-4-90-19-005	----	3	2025-10-15

Radiated Emission Test (9kHz-30MHz) (SAC-3 #1)

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 7	68-4-74-19-001	102176	1	2026-4-25
Loop Antenna	Rohde & Schwarz	HFH2-Z2	68-4-80-14-006	100398	1	2025-7-24
Cable	HUBER-SUHNER	RG214	68-4-90-14-001-A21	----	----	----
CC	TDK	9X6X6	68-4-90-14-001	----	3	2026-10-25
Test software	Rohde & Schwarz	EMC32	68-4-90-14-001-A10	Version10.35.02	N/A	N/A

Radiated Emission Test (30MHz-1GHz) (SAC-3 #2)

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	68-4-74-14-002	101269	1	2026-4-25
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9162	68-4-80-19-003	284	1	2026-2-11
Attenuator	Mini-circuits	UNAT-6+	68-4-81-21-002	15542	1	2026-4-19
Cable	OUQIAO	18DLB5-NMNM-7000	68-4-90-19-006-A22	----	----	----
3m Semi-anechoic chamber	TDK	SAC-3 #2	68-4-90-19-006	----	3	2026-10-25
Test software	Rohde & Schwarz	EMC32	68-4-90-19-006-A01	Version10.35.02	N/A	N/A

Radiated Emission Test (1GHz-18GHz) (SAC-3 #2)

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	68-4-74-14-002	101269	1	2026-4-25
Wave Guide Antenna	ETS	3117	68-4-80-19-001	00218954	1	2026-3-10
Pre-amplifier	Rohde & Schwarz	SCU 18F	68-4-29-19-001	100745	1	2026-4-19
Pre-amplifier	Rohde & Schwarz	SCU 18F	68-4-29-19-003	100747	1	2026-4-19
Cable	OUQIAO	18DLB5-	68-4-90-19-006-	----	----	----



		NMNM-7000	A22			
3m Semi-anechoic chamber	TDK	SAC-3 #2	68-4-90-19-006	----	3	2026-10-25
Test software	Rohde & Schwarz	EMC32	68-4-90-19-006-A01	Version10.35.02	N/A	N/A

RF Test System

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	68-4-74-14-004	101030	1	2026-4-18
Shielding Room	TDK	TS8997	68-4-90-19-003	----	3	2025-10-15

10 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Conducted Emission in new shielding room (68-4-90-19-005) 150kHz-30MHz (for test using AMN ENV216)	3.15dB
Uncertainty for Radiated Emission in 3m chamber (68-4-90-14-001) 9kHz-30MHz	4.70dB
Uncertainty for Radiated Emission in new 3m chamber (68-4-90-19-006) 30MHz-1000MHz	Horizontal: 4.63dB; Vertical: 4.78dB
Uncertainty for Radiated Emission in new 3m chamber (68-4-90-19-006) 1000MHz-18000MHz	Horizontal: 5.38dB; Vertical: 5.38dB
Uncertainty for Conducted RF test with TS 8997	RF Power Conducted: 1.31dB Frequency test involved: 0.6×10^{-8} or 1%

Measurement Uncertainty Decision Rule:

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2023, clause 4.3.3 and 4.3.4.

---END OF REPORT---