



RF MEASUREMENT REPORT

FCC ID: 2A5WLTSB55

Applicant: Suzhou Unison Auto Electronic Co., Ltd.

Product: TPMS Sensor

Model No.: TSB55

Brand Name: Adachi
1 Sensor

FCC Classification: FCC Part 15 Security/Remote Control Transmitter
(DSC)

FCC Rule Part(s): Part 15.231

Result: Complies

Received Date: 2024-12-10

Test Date: 2024-12-14 ~ 2025-01-02

Reviewed By:

Denise Zhou

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2412RSU021-U2	V01	Initial Report	2025-02-18	Valid

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1. General Information

1.1. Applicant

Suzhou Unison Auto Electronic Co., Ltd.

No.35 building, Yangtai Rd., Suzhou Industrial Park, Suzhou, Jiangsu, P.R.China

1.2. Manufacturer

Suzhou Unison Auto Electronic Co., Ltd.

No.35 building, Yangtai Rd., Suzhou Industrial Park, Suzhou, Jiangsu, P.R.China

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory
	Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
	Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China
	Laboratory Location (Suzhou - Wujiang) Building 1, No.1 Xingdong Road, Wujiang, Suzhou, Jiangsu, People's Republic of China
	Laboratory Accreditations
	A2LA: 3628.01 FCC: CN1166 VCCI: ☐R-20025 ☐G-20034 ☐C-20020 ☐T-20020 ☐R-20141 ☐G-20134 ☐C-20103 ☐T-20104
☐	Test Site – MRT Shenzhen Laboratory
	Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China
	Laboratory Accreditations
	A2LA: 3628.02 FCC: CN1284 CNAS: L10551 ISED: CN0105
☐	Test Site – MRT Taiwan Laboratory
	Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
	Laboratory Accreditations
	TAF: 3261 FCC: 291082, TW3261 ISED: TW3261

1.4. Product Information

Product	TPMS Sensor
Model No.	TSB55
Brand Name	Adachi 1 Sensor
EUT Identification No.	20241210Sample07 (315MHz-ASK-Conducted) 20241210Sample08 (315MHz-FSK-Conducted) 20241210Sample04 & 20241210Sample01 (315MHz-ASK-Radiated) 20241210Sample02 & 20241210Sample06 (315MHz-FSK-Radiated) 20241210Sample13 (433.92MHz-ASK-Conducted) 20241210Sample14 (433.92MHz-FSK-Conducted) 20241210Sample05 & 20241210Sample09 (433.92MHz-ASK-Radiated) 20241210Sample03 & 20241210Sample10 (433.92MHz-FSK-Radiated)
SRD Specification	315MHz, 433.92MHz
Antenna Information	Refer to clause 1.5.
Operating Voltage	3.0Vdc (By internal lithium battery)
Operating Temperature	-40 ~ 105°C
Note: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification

Frequency Range	315MHz, 433.92MHz
Type of Modulation	ASK, FSK
Antenna Type	Internal Copper Antenna
Antenna Gain	0 dBi

Note: The antenna gain is provided by the manufacturer.

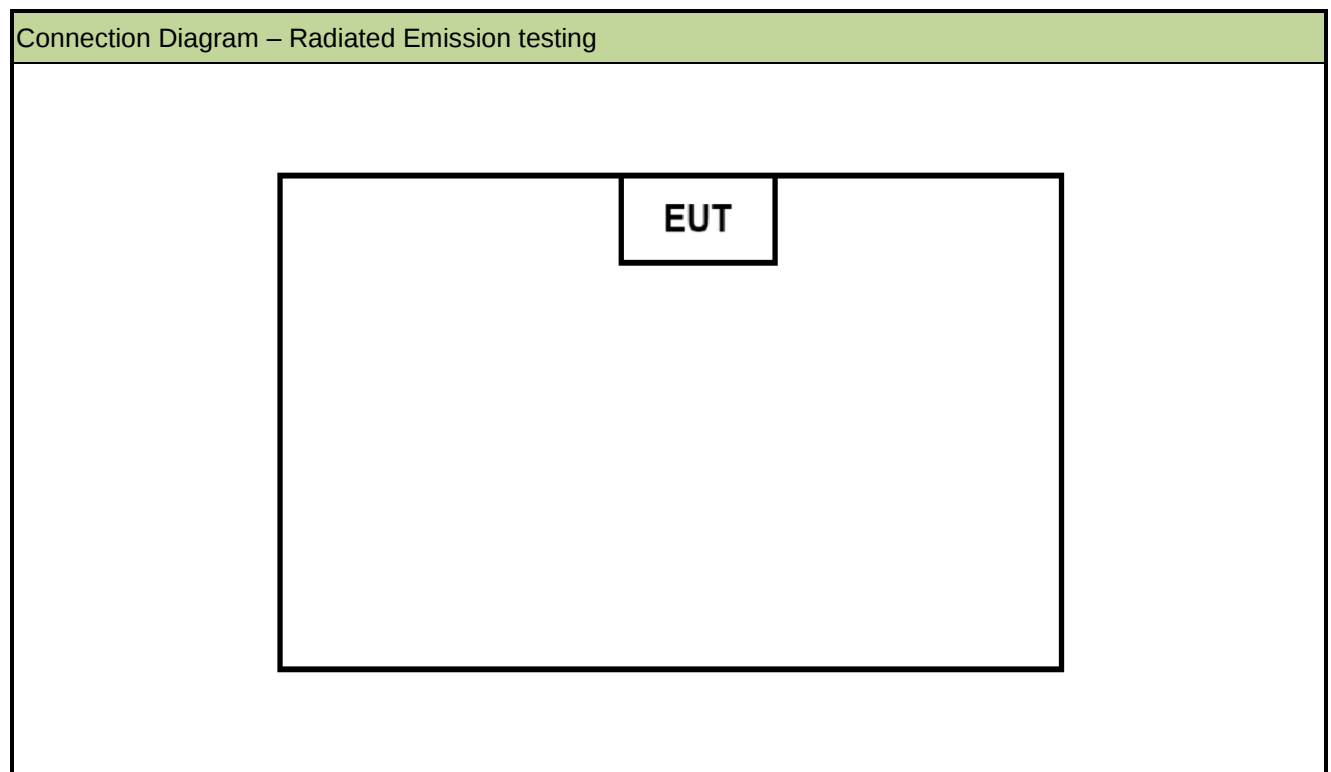
2. Test Configuration

2.1. Test Mode

Mode 1: Transmit at 315MHz by ASK
Mode 2: Transmit at 315MHz by FSK
Mode 3: Transmit at 433.92MHz by ASK
Mode 4: Transmit at 433.92MHz by FSK

2.2. Test System Connection Diagram

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing.



2.3. Test Software

N/A. The EUT could transmit automatically when power on.

2.4. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15.231
- ANSI C63.10-2013

2.5. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~75%RH

3. Antenna Requirements

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

4. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
Signal Analyzer	Keysight	N9020B	MRTSUE07037	1 year	2025-09-03	WJ-SR3
Shielding Room	TDK	WJ-SR3	MRTSUE07125	N/A	N/A	WJ-SR3
Thermohygrometer	testo	608-H1	MRTSUE11331	1 year	2025-06-24	WJ-SR3
EMI Test Receiver	R&S	ESR3	MRTSUE07111	1 year	2025-04-18	WJ-AC2
EXA Signal Analyzer	Keysight	N9010B	MRTSUE07147	1 year	2025-04-28	WJ-AC2
Active Loop Antenna	Schwarzbeck	FMZB 1519-60 D	MRTSUE07076	1 year	2025-11-19	WJ-AC2
TRILOG Broad Band Antenna	Schwarzbeck	VULB 9163	MRTSUE07097	1 year	2025-04-24	WJ-AC2
Horn Antenna	EMCI	DRH18-E	MRTSUE07105	1 year	2025-05-12	WJ-AC2
Preamplifier	EMCI	EMC118A45SE	MRTSUE07102	1 year	2025-04-11	WJ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11315	1 year	2025-06-24	WJ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11332	1 year	2025-06-24	WJ-AC2
Anechoic Chamber	TDK	WJ-AC2	MRTSUE07117	1 year	2025-05-14	WJ-AC2
EMI Test Receiver	R&S	ESR3	MRTSUE07110	1 year	2025-04-24	WJ-AC1
EXA Signal Analyzer	Keysight	N9010B	MRTSUE07148	1 year	2025-05-11	WJ-AC1
TRILOG Broad Band Antenna	Schwarzbeck	VULB 9163	MRTSUE07099	1 year	2025-04-24	WJ-AC1
Horn Antenna	ETS	3117	MRTSUE06257	1 year	2025-09-08	WJ-AC1
Preamplifier	EMCI	EMC001330	MRTSUE06643	1 year	2025-05-14	WJ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11314	1 year	2025-06-24	WJ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11333	1 year	2025-06-24	WJ-AC1
Anechoic Chamber	TDK	WJ-AC1	MRTSUE07115	1 year	2025-05-17	WJ-AC1

Software	Version	Function
e3	230711	RE & CE
CONTROLLER CO3000	V1.03.02	RE Antenna & Turntable

5. Decision Rules and Measurement Uncertainty

5.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2.
(Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Conducted Emission Measurement	
The maximum measurement uncertainty is evaluated as:	
9kHz~150kHz: 3.58dB	
150kHz~30MHz: 3.20dB	
Radiated Emission Measurement	
The maximum measurement uncertainty is evaluated as:	
Coaxial:	9kHz~30MHz: 2.61dB
Coplanar:	9kHz~30MHz: 2.62dB
Horizontal:	30MHz~200MHz: 3.79dB
	200MHz~1GHz: 3.91dB
	1GHz~40GHz: 4.99dB
Vertical:	30MHz~200MHz: 4.06dB
	200MHz~1GHz: 5.21dB
	1GHz~40GHz: 4.90dB

6. Test Result

6.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Verdict
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	N/A
15.205,15.231(e)	Radiated Spurious Emissions	Radiated	Pass
15.231(c)	20dB Bandwidth	Conducted	Pass
15.231(e)	Transmission Time	Radiated	Pass

Notes:

1. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
2. "N/A" means this item is not applicable, and the details refer to relevant section.

6.2. Conducted Emission

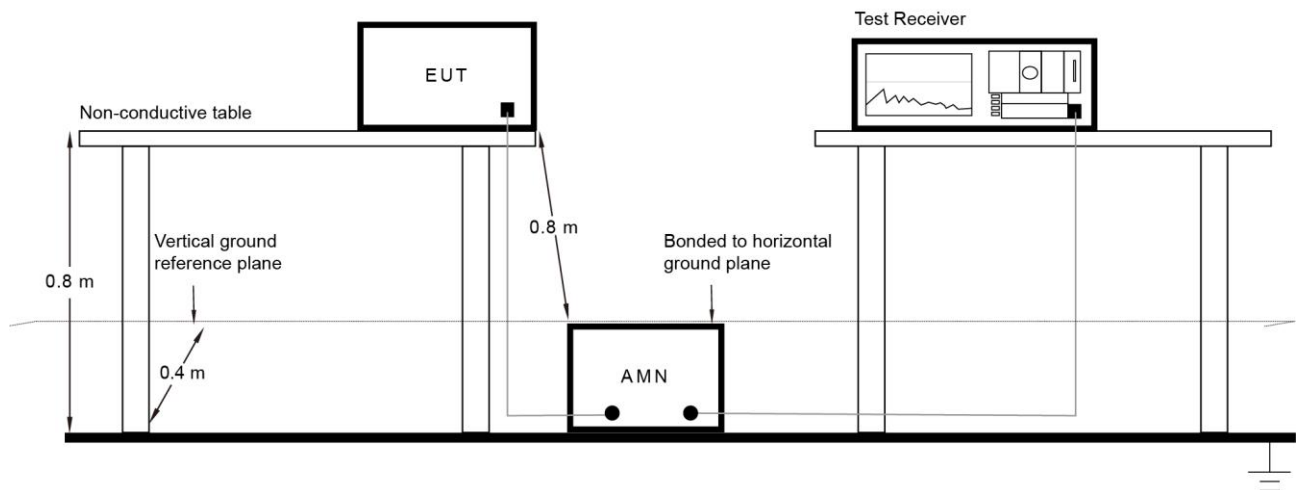
6.2.1. Test Limit

FCC Part 15.207 Limits		
Frequency (MHz)	QP (dB μ V)	AV (dB μ V)
0.15 ~ 0.50	66 ~ 56	56 ~ 46
0.50 ~ 5.0	56	46
5.0 ~ 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.2.2. Test Setup



6.2.3. Test Result

The device is powered by internal battery, so this requirement is not applicable.

6.3. Radiated Emissions

6.3.1. Test Limit

According to §15.231(e), 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 emission (microvolts/meter)
40.66 - 40.70	1000	100
70 - 130	500	50
130 - 174	500 to 1500	50 to 150
174 - 260	1500	150
260 - 470	1500 to 5000	150 to 500
Above 470	5000	500

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.

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements start below or at the lowest crystal frequency.

6.3.2. Test Procedure

ANSI C63.10 - 2013 - Section 7.5

ANSI C63.10 - 2013 - Section 6.3 (General Requirements)

ANSI C63.10 - 2013 - Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 - 2013 - Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 - 2013 - Section 6.6 (Standard test method above 1GHz)

6.3.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000MHz	1MHz

Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

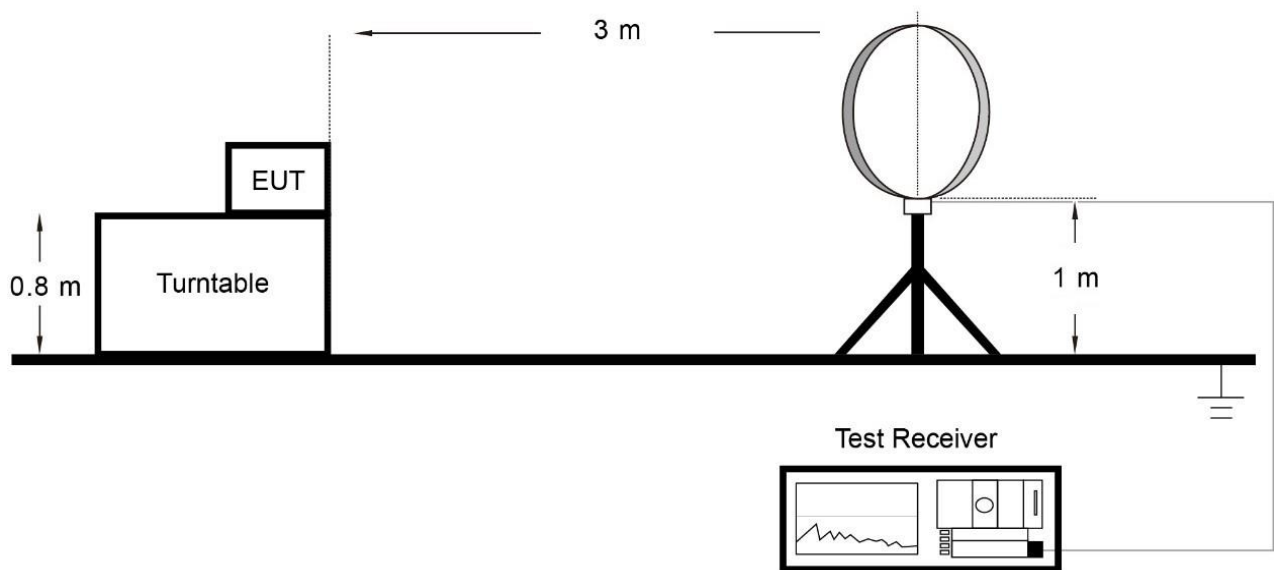
Average Measurement of pulsed emissions

1. Make EUT is transmitting to obtain the “worst-case” pulse ON time.
2. Couple the final radio frequency output signal to the input of a spectrum analyzer.
3. Adjust the center frequency of the spectrum analyzer to the center of the RF signal.
4. Set the spectrum analyzer for ZERO SPAN.

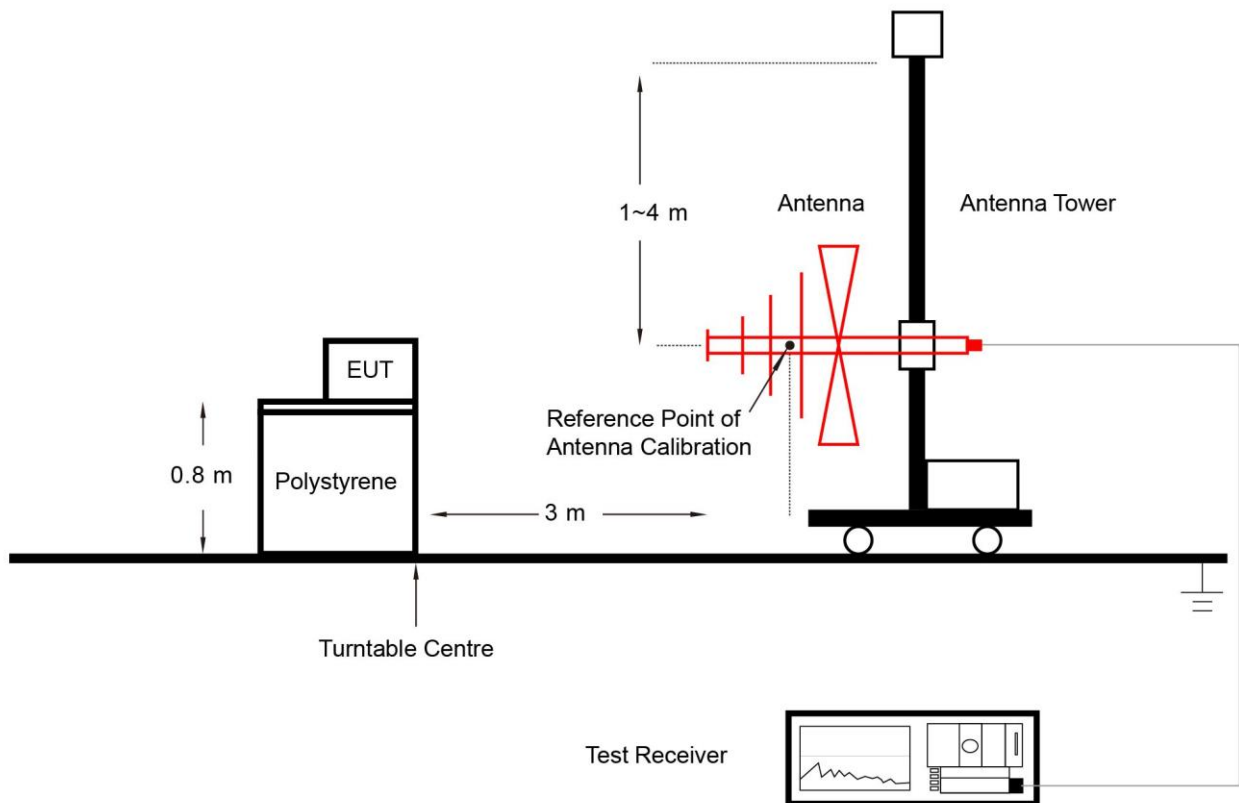
5. Sweep time = 100ms
6. Set the TRIGGER on the spectrum analyzer to capture at least one period of the pulse train, including any blanking intervals.
7. Determine the total maximum pulse "ON time" (t_{ON}) over one period of the pulse train.
8. The duty cycle is then determined by dividing the total maximum "ON time" by the period of the pulse train ($t_{ON}/100\text{ms}$).
9. Determine the duty cycle correction factor. Duty Cycle Factor = $20 \cdot \log(\text{Duty Cycle})$
This correction factor may then be subtracted from the peak pulse amplitude (in dB) to find the average emission.

6.3.4. Test Setup

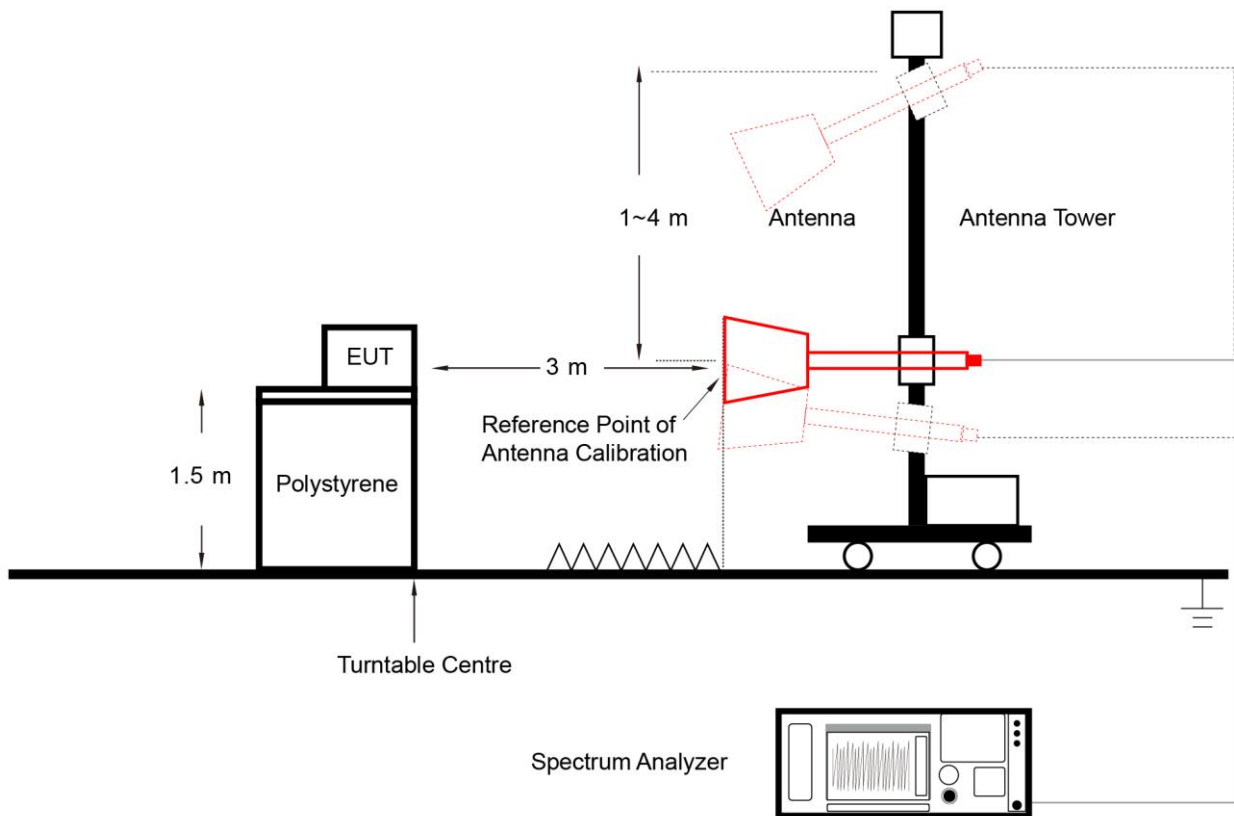
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.3.5. Test Result

Test Site	WJ-SR3	Test Engineer	Simon Lu
Test Date	2025-01-02		

Test Mode	Time On (ms)	One Period (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
Mode 1	38.00	100	38.00	-8.40
Mode 2	28.00	100	28.00	-11.06
Mode 3	38.00	100	38.00	-8.40
Mode 4	28.00	100	28.00	-11.06

Note 1: For Mode 1 & 3, Duty Cycle = (26ms + 12ms) / 100ms * 100% = 38.00%.

Note 2: For Mode 2 & 4, Duty Cycle = (14ms + 14ms) / 100ms * 100% = 28.00%.

Note 3: Duty Cycle Factor (dB) = 20*Log₁₀(Duty Cycle) (dB).



Test Site	WJ-AC1 & WJ-AC2	Test Engineer	Carl Jiang
Test Date	2024-12-14 ~ 2024-12-26	Remark	Fundamental Radiated Emission

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Mode 1								
315	54.87	20.36	N/A	75.23	87.66	-12.43	Peak	Horizontal
	54.87	20.36	-8.40	66.83	67.66	-0.83	Average	Horizontal
	49.07	20.36	N/A	69.43	87.66	-18.23	Peak	Vertical
	49.07	20.36	-8.40	61.03	67.66	-6.63	Average	Vertical
Mode 2								
315	54.61	20.36	N/A	74.97	87.66	-12.69	Peak	Horizontal
	54.61	20.36	-11.06	63.91	67.66	-3.75	Average	Horizontal
	49.15	20.36	N/A	69.51	87.66	-18.15	Peak	Vertical
	49.15	20.36	-11.06	58.45	67.66	-9.21	Average	Vertical
Mode 3								
433.92	53.81	23.80	N/A	77.61	92.87	-15.26	Peak	Horizontal
	53.81	23.80	-8.40	69.21	72.87	-3.66	Average	Horizontal
	56.08	23.80	N/A	79.88	92.87	-12.99	Peak	Vertical
	56.08	23.80	-8.40	71.48	72.87	-1.39	Average	Vertical
Mode 4								
433.92	54.49	23.06	N/A	77.55	92.87	-15.32	Peak	Horizontal
	54.49	23.06	-11.06	66.49	72.87	-6.38	Average	Horizontal
	59.23	23.06	N/A	82.29	92.87	-10.58	Peak	Vertical
	59.23	23.06	-11.06	71.23	72.87	-1.64	Average	Vertical
Note 1: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)								
Note 2: Average Measure Level = Peak Measure Level + Duty Cycle Factor								
Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)								

Test Site	WJ-AC1 & WJ-AC2	Test Engineer	Carl Jiang
Test Date	2024-12-14 ~ 2024-12-19	Remark	Radiated Spurious Emissions

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Mode 1								
910.624	7.59	29.69	N/A	37.28	74.00	-36.72	Peak	Horizontal
910.624	7.59	29.69	-8.40	28.88	54.00	-25.12	Average	Horizontal
945.109	15.42	29.84	N/A	45.26	74.00	-28.74	Peak	Horizontal
945.109	15.42	29.84	-8.40	36.86	54.00	-17.14	Average	Horizontal
1575.200	52.89	-1.22	N/A	51.67	74.00	-22.33	Peak	Horizontal
1575.200	52.89	-1.22	-8.40	43.27	54.00	-10.73	Average	Horizontal
1890.000	47.83	1.72	N/A	49.55	74.00	-24.45	Peak	Horizontal
1890.000	47.83	1.72	-8.40	41.15	54.00	-12.85	Average	Horizontal
2520.000	50.34	3.88	N/A	54.22	74.00	-19.78	Peak	Horizontal
2520.000	50.34	3.88	-8.40	45.82	54.00	-8.18	Average	Horizontal
3150.000	45.29	5.57	N/A	50.86	74.00	-23.14	Peak	Horizontal
3150.000	45.29	5.57	-8.40	42.46	54.00	-11.54	Average	Horizontal
848.651	7.50	28.95	N/A	36.45	74.00	-37.55	Peak	Vertical
848.651	7.50	28.95	-8.40	28.05	54.00	-25.95	Average	Vertical
945.109	11.56	29.84	N/A	41.40	74.00	-32.60	Peak	Vertical
945.109	11.56	29.84	-8.40	33.00	54.00	-21.00	Average	Vertical
2520.000	42.12	3.88	N/A	46.00	74.00	-28.00	Peak	Vertical
2520.000	42.12	3.88	-8.40	37.60	54.00	-16.40	Average	Vertical
2834.800	42.12	4.60	N/A	46.72	74.00	-27.28	Peak	Vertical
2834.800	42.12	4.60	-8.40	38.32	54.00	-15.68	Average	Vertical
3150.000	42.68	5.57	N/A	48.25	74.00	-25.75	Peak	Vertical
3150.000	42.68	5.57	-8.40	39.85	54.00	-14.15	Average	Vertical
3780.000	42.17	6.84	N/A	49.01	74.00	-24.99	Peak	Vertical
3780.000	42.17	6.84	-8.40	40.61	54.00	-13.39	Average	Vertical

Note 1: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Note 2: Average Measure Level = Peak Measure Level + Duty Cycle Factor

Note 3: Below 1GHz, Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)

Above 1GHz, Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Note 4: The test trace is same as the ambient noise (the test frequency range: 9 kHz ~ 30 MHz), therefore no data appear in the report.

Test Site	WJ-AC1 & WJ-AC2	Test Engineer	Carl Jiang
Test Date	2024-12-14 ~ 2024-12-19	Remark	Radiated Spurious Emissions

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Mode 2								
629.919	9.59	26.48	N/A	36.07	74.00	-37.93	Peak	Horizontal
629.919	9.59	26.48	-11.06	25.01	54.00	-28.99	Average	Horizontal
945.109	16.88	29.84	N/A	46.72	74.00	-27.28	Peak	Horizontal
945.109	16.88	29.84	-11.06	35.66	54.00	-18.34	Average	Horizontal
1574.800	51.73	-1.23	N/A	50.50	74.00	-23.50	Peak	Horizontal
1574.800	51.73	-1.23	-11.06	39.44	54.00	-14.56	Average	Horizontal
1890.000	49.23	1.72	N/A	50.95	74.00	-23.05	Peak	Horizontal
1890.000	49.23	1.72	-11.06	39.89	54.00	-14.11	Average	Horizontal
2205.200	46.09	2.98	N/A	49.07	74.00	-24.93	Peak	Horizontal
2205.200	46.09	2.98	-11.06	38.01	54.00	-15.99	Average	Horizontal
2520.400	45.97	3.88	N/A	49.85	74.00	-24.15	Peak	Horizontal
2520.400	45.97	3.88	-11.06	38.79	54.00	-15.21	Average	Horizontal
872.795	7.49	29.34	N/A	36.83	74.00	-37.17	Peak	Vertical
872.795	7.49	29.34	-11.06	25.77	54.00	-28.23	Average	Vertical
945.109	9.06	29.84	N/A	38.90	74.00	-35.10	Peak	Vertical
945.109	9.06	29.84	-11.06	27.84	54.00	-26.16	Average	Vertical
1889.600	44.23	1.72	N/A	45.95	74.00	-28.05	Peak	Vertical
1889.600	44.23	1.72	-11.06	34.89	54.00	-19.11	Average	Vertical
2204.800	44.6	2.98	N/A	47.58	74.00	-26.42	Peak	Vertical
2204.800	44.6	2.98	-11.06	36.52	54.00	-17.48	Average	Vertical
2519.600	45.54	3.88	N/A	49.42	74.00	-24.58	Peak	Vertical
2519.600	45.54	3.88	-11.06	38.36	54.00	-15.64	Average	Vertical
3149.600	42.05	5.56	N/A	47.61	74.00	-26.39	Peak	Vertical
3149.600	42.05	5.56	-11.06	36.55	54.00	-17.45	Average	Vertical

Note 1: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Note 2: Average Measure Level = Peak Measure Level + Duty Cycle Factor

Note 3: Below 1GHz, Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)

Above 1GHz, Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Note 4: The test trace is same as the ambient noise (the test frequency range: 9 kHz ~ 30 MHz), therefore no data appear in the report.

Test Site	WJ-AC1 & WJ-AC2	Test Engineer	Carl Jiang
Test Date	2024-12-26 ~ 2024-12-30	Remark	Radiated Spurious Emissions

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Mode 3								
826.044	8.07	28.64	N/A	36.71	74.00	-37.29	Peak	Horizontal
826.044	8.07	28.64	-8.40	28.31	54.00	-25.69	Average	Horizontal
960.140	8.08	29.96	N/A	38.04	74.00	-35.96	Peak	Horizontal
960.140	8.08	29.96	-8.40	29.64	54.00	-24.36	Average	Horizontal
1736.000	43.66	0.49	N/A	44.15	74.00	-29.85	Peak	Horizontal
1736.000	43.66	0.49	-8.40	35.75	54.00	-18.25	Average	Horizontal
3169.600	37.00	5.68	N/A	42.68	74.00	-31.32	Peak	Horizontal
3169.600	37.00	5.68	-8.40	34.28	54.00	-19.72	Average	Horizontal
3750.800	38.54	6.86	N/A	45.40	74.00	-28.60	Peak	Horizontal
3750.800	38.54	6.86	-8.40	37.00	54.00	-17.00	Average	Horizontal
4735.600	37.21	8.26	N/A	45.47	74.00	-28.53	Peak	Horizontal
4735.600	37.21	8.26	-8.40	37.07	54.00	-16.93	Average	Horizontal
867.912	11.67	29.26	N/A	40.93	74.00	-33.07	Peak	Vertical
867.912	11.67	29.26	-8.40	32.53	54.00	-21.47	Average	Vertical
993.011	7.37	30.31	N/A	37.68	74.00	-36.32	Peak	Vertical
993.011	7.37	30.31	-8.40	29.28	54.00	-24.72	Average	Vertical
2169.600	49.51	3.01	N/A	52.52	74.00	-21.48	Peak	Vertical
2169.600	49.51	3.01	-8.40	44.12	54.00	-9.88	Average	Vertical
2603.600	50.61	4.04	N/A	54.65	74.00	-19.35	Peak	Vertical
2603.600	50.61	4.04	-8.40	46.25	54.00	-7.75	Average	Vertical
3471.600	45.07	5.82	N/A	50.89	74.00	-23.11	Peak	Vertical
3471.600	45.07	5.82	-8.40	42.49	54.00	-11.51	Average	Vertical
4339.200	44.35	7.63	N/A	51.98	74.00	-22.02	Peak	Vertical
4339.200	44.35	7.63	-8.40	43.58	54.00	-10.42	Average	Vertical

Note 1: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Note 2: Average Measure Level = Peak Measure Level + Duty Cycle Factor

Note 3: Below 1GHz, Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)

Above 1GHz, Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Note 4: The test trace is same as the ambient noise (the test frequency range: 9 kHz ~ 30 MHz), therefore no data appear in the report.

Test Site	WJ-AC1 & WJ-AC2	Test Engineer	Carl Jiang
Test Date	2024-12-14 ~ 2024-12-19	Remark	Radiated Spurious Emissions

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Mode 4								
709.680	8.26	27.34	N/A	35.60	74.00	-38.40	Peak	Horizontal
709.680	8.26	27.34	-11.06	24.54	54.00	-29.46	Average	Horizontal
913.823	7.98	29.70	N/A	37.68	74.00	-36.32	Peak	Horizontal
913.823	7.98	29.70	-11.06	26.62	54.00	-27.38	Average	Horizontal
1736.000	45.46	0.49	N/A	45.95	74.00	-28.05	Peak	Horizontal
1736.000	45.46	0.49	-11.06	34.89	54.00	-19.11	Average	Horizontal
3203.600	38.04	5.61	N/A	43.65	74.00	-30.35	Peak	Horizontal
3203.600	38.04	5.61	-11.06	32.59	54.00	-21.41	Average	Horizontal
3845.200	37.25	6.76	N/A	44.01	74.00	-29.99	Peak	Horizontal
3845.200	37.25	6.76	-11.06	32.95	54.00	-21.05	Average	Horizontal
4339.600	38.16	7.63	N/A	45.79	74.00	-28.21	Peak	Horizontal
4339.600	38.16	7.63	-11.06	34.73	54.00	-19.27	Average	Horizontal
867.912	9.39	29.26	N/A	38.65	74.00	-35.35	Peak	Vertical
867.912	9.39	29.26	-11.06	27.59	54.00	-26.41	Average	Vertical
964.865	7.63	30.01	N/A	37.64	74.00	-36.36	Peak	Vertical
964.865	7.63	30.01	-11.06	26.58	54.00	-27.42	Average	Vertical
2170.000	49.21	3.02	N/A	52.23	74.00	-21.77	Peak	Vertical
2170.000	49.21	3.02	-11.06	41.17	54.00	-12.83	Average	Vertical
2603.200	51.89	4.04	N/A	55.93	74.00	-18.07	Peak	Vertical
2603.200	51.89	4.04	-11.06	44.87	54.00	-9.13	Average	Vertical
3471.200	45.69	5.82	N/A	51.51	74.00	-22.49	Peak	Vertical
3471.200	45.69	5.82	-11.06	40.45	54.00	-13.55	Average	Vertical
4339.600	46.58	7.63	N/A	54.21	74.00	-19.79	Peak	Vertical
4339.600	46.58	7.63	-11.06	43.15	54.00	-10.85	Average	Vertical

Note 1: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Note 2: Average Measure Level = Peak Measure Level + Duty Cycle Factor

Note 3: Below 1GHz, Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)

Above 1GHz, Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Note 4: The test trace is same as the ambient noise (the test frequency range: 9 kHz ~ 30 MHz), therefore no data appear in the report.

6.4. 20dB Bandwidth

6.4.1. Test Limit

According to FCC Part 15.231(c), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

6.4.2. Test Procedure

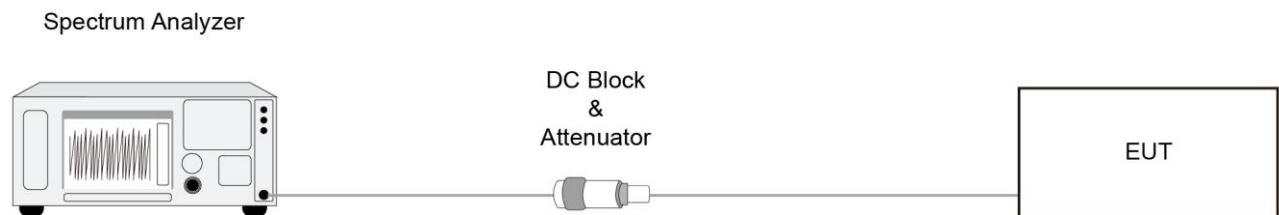
ANSI C63.10-2013 Clause 6.9.2

6.4.3. Test Setting

20dB Bandwidth:

1. Set the spectrum span shall be between 2 times and 5 times the OBW
2. Set RBW = 1% to 5% of the OBW
3. $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple

6.4.4. Test Setup



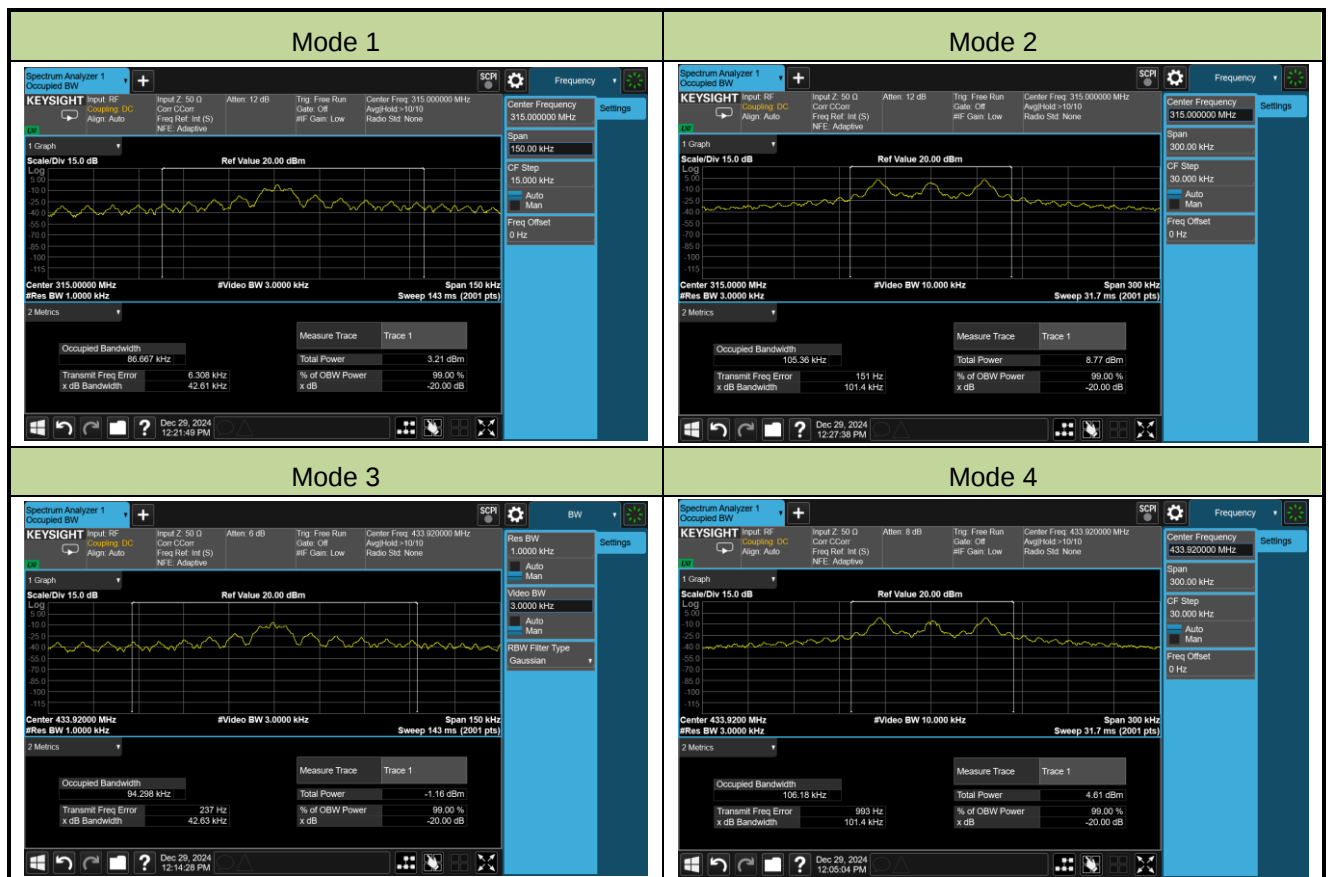
6.4.5. Test Result

Test Site	WJ-SR3	Test Engineer	Simon Lu
Test Date	2024-12-29		

Test Mode	20dB Bandwidth (kHz)	Limit (kHz)	Result
Mode 1	42.61	≤ 787.5	Pass
Mode 2	101.40	≤ 787.5	Pass
Mode 3	42.63	≤ 1084.8	Pass
Mode 4	101.40	≤ 1084.8	Pass

Note 1: For Mode 1 & 2: Limit = Fundamental Frequency * 0.25% = 315MHz * 0.25% = 787.5 kHz

Note 2: For Mode 3 & 4: Limit = Fundamental Frequency * 0.25% = 433.92MHz * 0.25% = 1084.8 kHz



6.5. Transmission Time

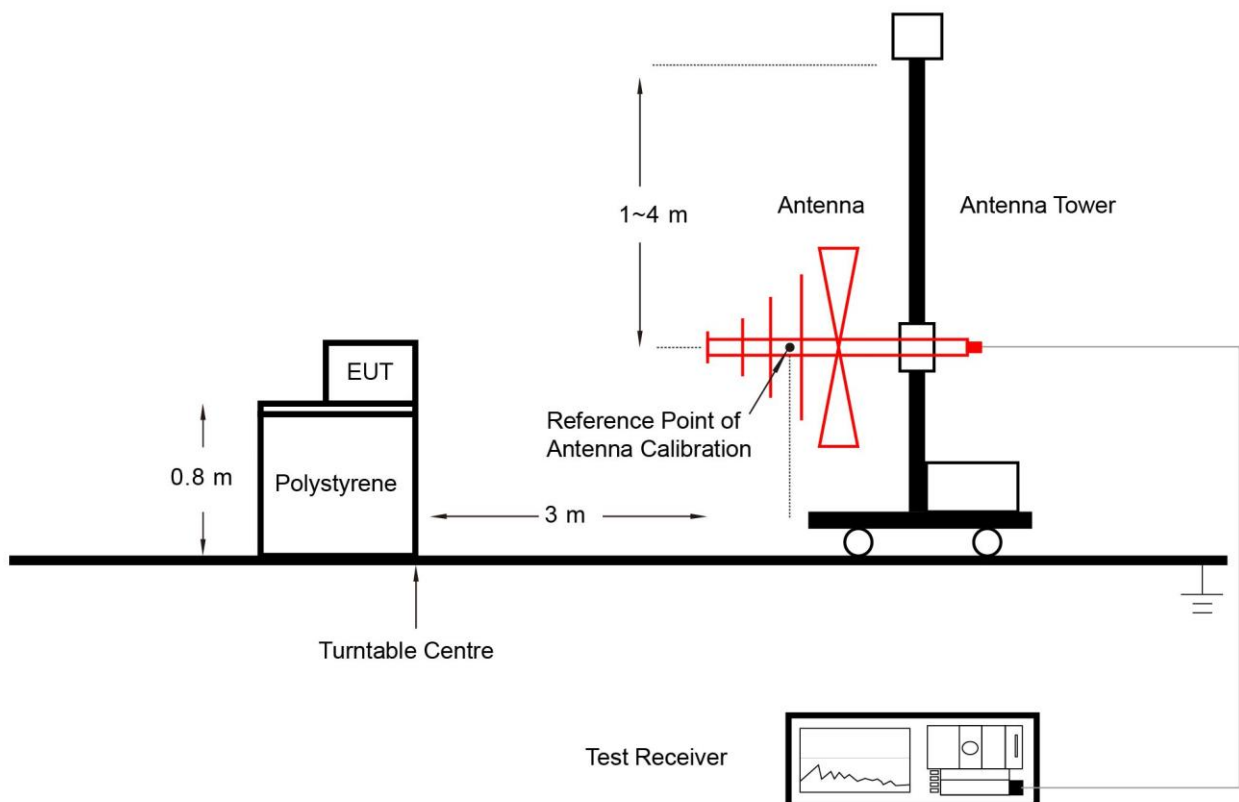
6.5.1. Test Limit

According to FCC 15.231(e), devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

6.5.2. Test Procedure

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency to fundamental frequency, then set the spectrum analyzer to Zero Span for the release time reading. During the testing, the switch was released then the EUT automatically deactivated.

6.5.3. Test Setup

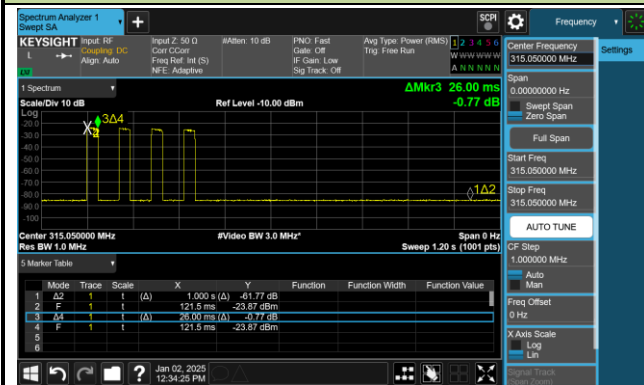


6.5.4. Test Result

Test Site	WJ-AC2	Test Engineer	Carl Jiang
Test Date	2025-01-02		

Test Mode	Item	Measured Value	Limit	Result
Mode 1	Transmission Time (T_{on})	104.00 ms	≤ 1 s	Pass
	Silent Time	12.30 s	≥ 10 s	Pass
	Silent Time/Transmission Time	118.27 times	≥ 30 times	Pass
Mode 2	Transmission Time (T_{on})	42.00 ms	≤ 1 s	Pass
	Silent Time	12.30 s	≥ 10 s	Pass
	Silent Time/Transmission Time	292.86 times	≥ 30 times	Pass
Mode 3	Transmission Time (T_{on})	105.60 ms	≤ 1 s	Pass
	Silent Time	12.24 s	≥ 10 s	Pass
	Silent Time/Transmission Time	115.91 times	≥ 30 times	Pass
Mode 4	Transmission Time (T_{on})	42.00 ms	≤ 1 s	Pass
	Silent Time	12.32 s	≥ 10 s	Pass
	Silent Time/Transmission Time	293.33 times	≥ 30 times	Pass

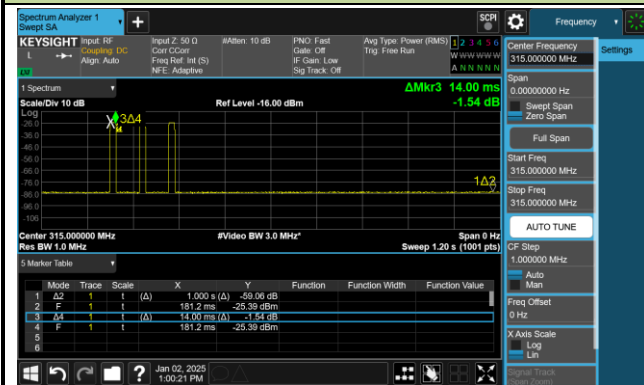
Mode 1

Transmission Time (T_{on})


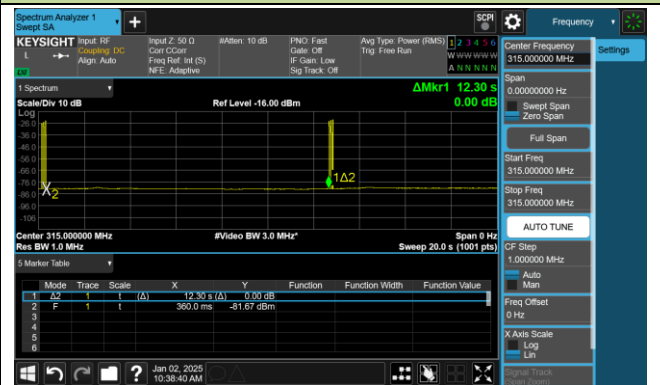
Silent Time



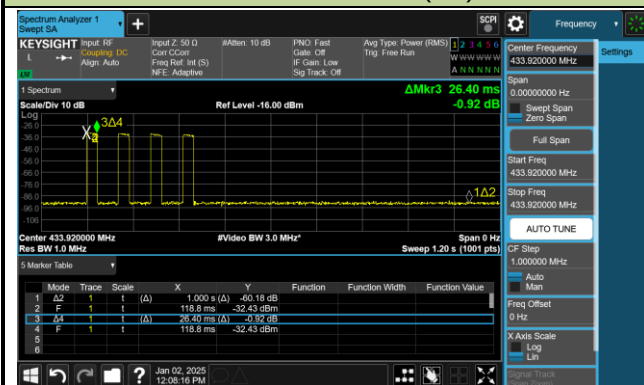
Mode 2

Transmission Time (T_{on})


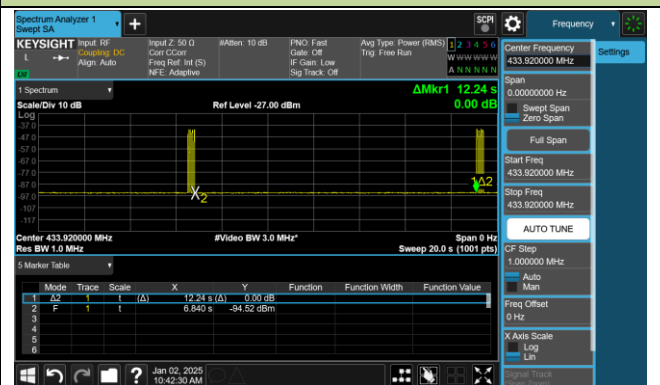
Silent Time

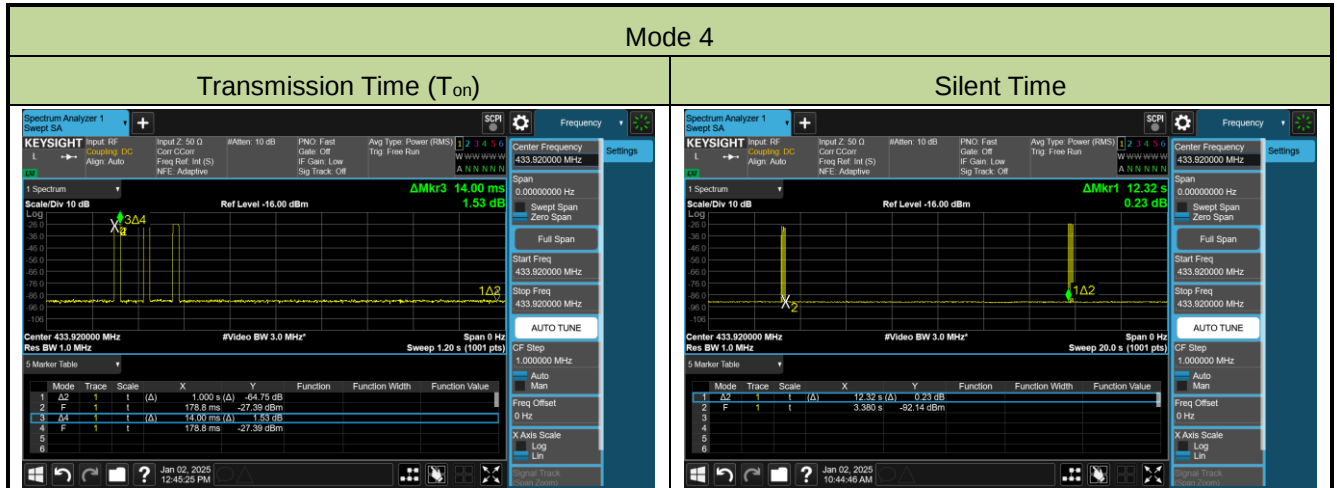


Mode 3

Transmission Time (T_{on})


Silent Time





Appendix A - Test Setup Photograph

Refer to “2412RSU021-UT” file.

Appendix B - EUT Photograph

Refer to "2412RSU021-UE" file.