FCC PART 15.247

RSS-GEN ISSUE 5, FEBRUARY 2021 AMENDMENT2
RSS-247 ISSUE 3, AUGUST 2023

TEST REPORT

For

FCC: Xiamen Milesight IoT Co., Ltd.

Building C09, Software Park Phase III, Xiamen 361024, Fujian, China

IC: Xiamen Milesight IoT Co., Ltd.

Building C09, Software Park Phase III, Xiamen Fujian 361024 China

FCC ID: 2AYHY-WT201V2
IC: 27737-WT201V2

Report Type:	**Product Name:**
Original Report	Smart Thermostat

Report Number:	2507P40548E-RF-02
Report Date:	2025-03-04
Reviewed By:	Ash Lin
Approved By:	Miles Chen
Prepared By:	Bay Area Compliance Laboratories Corp. (Xiamen) Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone XiaMen Tel: + 86-592-3200111 www.baclcorp.com.cn

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	2507P40548E-RF-02	R1V1	2025-03-04	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test

Product Name:	Smart Thermostat
Tested Model:	WT201-868M/915M
Multiple Model(s):	NN201-868M/915M
Trade mark:	Milesight
HVIN:	WT201-868M/915M, NN201-868M/915M
Power Supply:	AC 24V
Operating Band/Frequency:	902-928MHz
Maximum Conducted Output Peak Power:	6.62 dBm
Modulation Type:	Chirp Spread Spectrum (CSS)
Antenna Type:	PCB
★Maximum Antenna Gain:	1.46dBi
EUT Receive Status:	Good
Note: *1. The Maximum Antenna Gain was declared by manufacturer.* *2. The difference between tested model and series model is outer packaging and appearance logo, please refer to declaration letter for more detail.* *3. All measurement and test data in this report was gathered from production sample serial number: 2X29-2 (Assigned by the BACL (Xiamen). The EUT supplied by the applicant was received on 2025-01-06)*	

Objective

This type approval report is prepared for *Xiamen Milesight IoT Co., Ltd.* in accordance with:
RSS-247 Issue 3, August 2023 and RSS-Gen, Issue 5, February 2021 Amendment 2 of the Innovation, Science and Economic Development Canada.

And Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.
The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with RSS-247 Issue 3, August 2023 of the Innovation, Science and Economic Development Canada & RSS-Gen, Issue 5, February 2021 Amendment 2: General Requirements for Compliance of Radio Apparatus & ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. And KDB 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Xiamen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		U_{lab}
Radiated Emission	9kHz-30MHz	2.59 dB
	30MHz~200MHz	4.38dB
	200MHz~1GHz	4.50 dB
	1GHz~6GHz	4.58dB
	6GHz-18GHz	5.43 dB
AC Power Lines Conducted Emissions	150kHz-30MHz	2.33 dB
Occupied Channel Bandwidth		0.053 kHz
Transmitter Conducted Power(Conducted RF power)		±0.624 dB
Power Spectral Density		±0.61dB
Duty Cycle		1%
Temperature		±1℃
Humidity		±5%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Xiamen) to collect test data is located on the Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone XiaMen.

Bay Area Compliance Laboratories Corp. (Xiamen) Lab is accredited to ISO/IEC 17025 by A2LA (Certificate Number: 7134.01) and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No. : CN1384.

Bay Area Compliance Laboratories Corp. (Xiamen) Lab is accredited to ISO/IEC 17025 by A2LA (Certificate Number: 7134.01) and the lab has been recognized as the IC accredited lab under the KDB 974614 D01, the IC Designation No. : CN0176.

SYSTEM TEST CONFIGURATION

Test Mode and Voltage

The system was configured for testing in a typical mode (as normally used by a typical user).	
Test mode:	Test mode 1: Transmitting
Test voltage:	Test mode 1: AC 24V from adapter (AC 120V/60Hz)
Remark:	During all emission tests, the EUT was configured to measure its highest possible emission level and the worst case's test data was presented in this test report.

Description of Test Configuration

Test channel list is as below:

EUT was tested with channel 1, 8 and 15.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	903	9	923.3
2	904.6	10	923.9
3	906.2	11	924.5
4	907.8	12	925.1
5	909.4	13	925.7
6	911	14	926.3
7	912.6	15	926.9
8	914.2	/	/

Equipment Modifications

No modification was made to the EUT tested.

★EUT Exercise Software

RF Test Tool: certificationTools

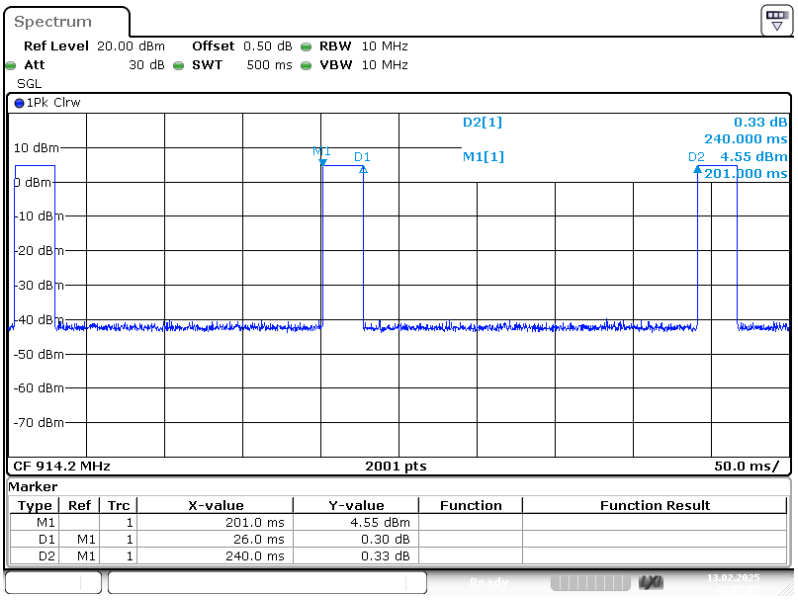
Test Modes	Power Level Setting		
	Lowest Channel	Middle Channel	Highest Channel
LoRa 500K	**12**	**12**	**12**

Note: The power level was declared by the applicant.

Duty Cycle

Mode	Test Frequency (MHz)	Ton (ms)	Ton+off (ms)	Duty cycle (%)	1/T (Hz)	VBW Setting(kHz)
LoRa	914.2	26	240	10.83	38	0.05

Middle Channel



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Support Equipment List and Details

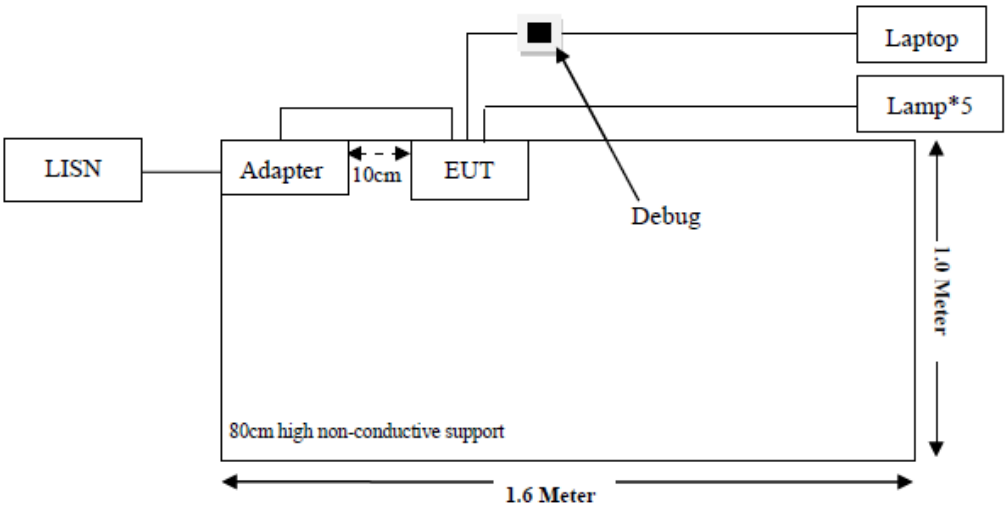
Manufacturer	Description	Model	Serial Number
Lenovo	Laptop	T480	PF1P5K4F
Unknown	Debug	Unknown	Unknown
MaCable	AC ADAPTOR	MKAC-66-243000U	Unknown
Unknow	signal indicator lamp	AD16-22DS	Unknown

External I/O Cable

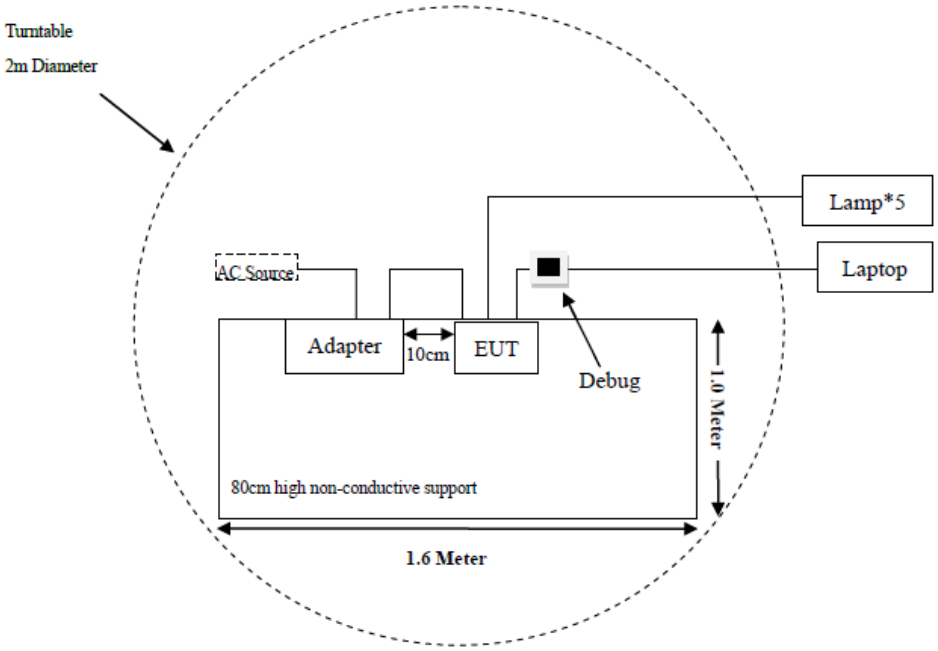
Cable Description	Length (m)	From Port	To
Cable	0.5	EUT	Debug
USB Cable	10	Debug	Laptop
Cable	10	EUT	Signal indicator lamp
Power Cable	1.5	EUT	Adapter

Block Diagram of Test Setup

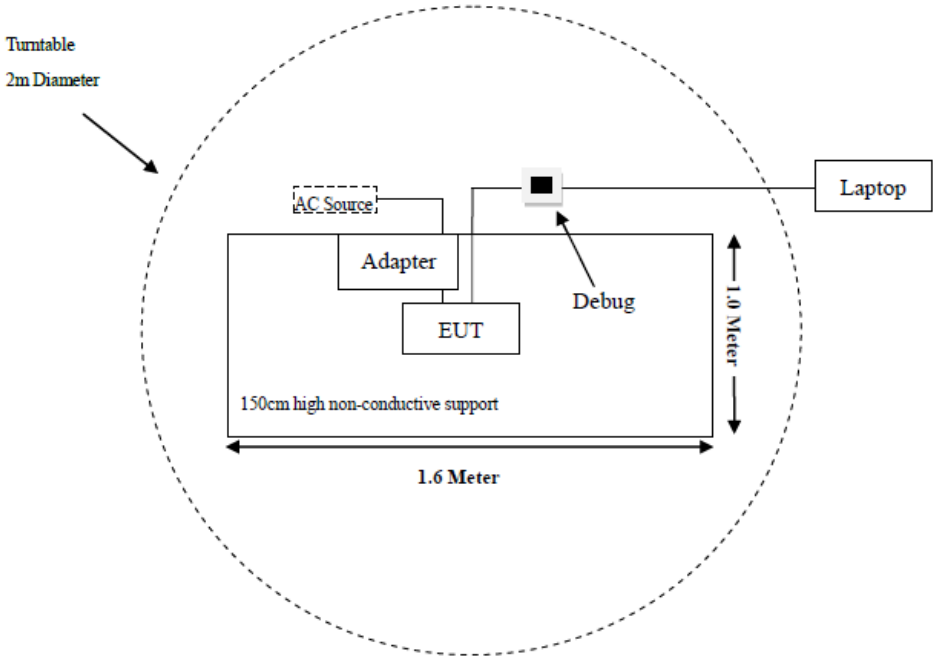
For Conducted Emissions:



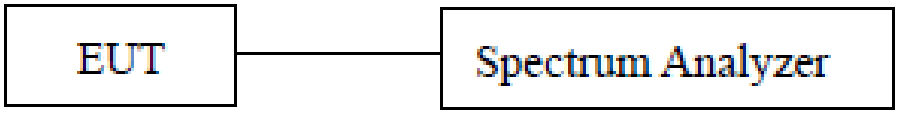
For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



RF Conduction:



Note: The cable assembly insertion loss of 0.5dB was entered as an offset in the spectrum analyzer. (Actual cable loss was unavailable at the time of testing, therefore loss of 0.5dB was assumed as worst case.) This was later verified to be true by laboratory.

SUMMARY OF TEST RESULTS

Standard(s)	Description of Test	Result
FCC §15.203 RSS-GEN Clause 6.8	Transmit Antenna	Compliant
FCC §15.207(a) RSS-GEN Clause 8.8	AC Power-line Conducted Emissions Limits	Compliant
FCC §15.205, §15.209, §15.247(d) RSS-GEN Clause 8.10 RSS-247 Clause 5.5	Unwanted Emissions & Radiated Bands Emissions	Compliant
FCC §15.247(a)(2) RSS-247 Clause 5.2 a)	6 dB Emission Bandwidth	Compliant
RSS-GEN Clause 6.7	Occupied Bandwidth	Compliant
FCC §15.247(e) RSS-247 Clause 5.2 b)	Power Spectral Density	Compliant
FCC §15.247(b)(3) RSS-247 Clause 5.4 d)	Transmitter Output Power Measurement	Compliant
FCC §15.247(d) RSS-247 Clause 5.5	100 kHz Bandwidth of Frequency Band Edge	Compliant

TEST EQUIPMENT LIST

Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions					
EMI Test Receiver	Rohde & Schwarz	ESR	103105	2024/03/29	2025/03/28
LISN	Rohde & Schwarz	ENV216	100129	2024/03/29	2025/03/28
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	0357.8810.54	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC001	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Below 1 GHz					
EMI Test Receiver	Rohde & Schwarz	ESR	103103	2024/03/29	2025/03/28
Antenna	Sunol Sciences	JB6	A122022-5	2023/07/27	2026/07/26
Loop Antenna	Rohde & Schwarz	HFH2-Z2	830749/001	2023/07/27	2026/07/26
Amplifier	Sonoma	310B	120903	2024/03/29	2025/03/28
Band-Reject Filter	HX Microwave	HXLBQ-DZA05	24091101-1	2024/10/12	2025/10/11
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC002	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-2M	CC006	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-12M	CC007	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	HFH2-CC	335.3609	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Above 1 GHz					
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102051	2024/03/29	2025/03/28
Multiplex Switch Test Control Set	Decentest	DT7220SCU	DS79901	2024/02/23	2025/02/22
Filter Switch Unit	Decentest	DT7220FSU	DS79904	2024/02/23	2025/02/22
Band-Reject Filter	HX Microwave	HXLBQ-DZA05	24091101-1	2024/10/12	2025/10/11
Horn Aantenna	EMCO	3115	9002-3355	2024/11/19	2027/11/18
Preamplifier	A.H.Systems	PAM-0118P	489	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH800A-N-6M	CC003	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH800A-N-1M	CC005	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
RF Conducted Test					
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102051	2024/03/29	2025/03/28
Coaxial Cable	N/A	N/A	N/A	Each time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Xiamen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.203 & RSS-GEN Clause 6.8 - TRANSMITTER ANTENNA

Applicable Standard

According to FCC §15.203

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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, §15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

According to RSS-GEN Clause 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).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

Antenna Connector Construction

The EUT has one PCB antenna for Lora, which the antenna gain is 1.46 dBi and antenna impedance is 50Ω, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

FCC §15.207(a) & RSS-GEN Clause 8.8 – AC POWER-LINE CONDUCTED EMISSIONS LIMITS

Applicable Standard

According to FCC §15.207(a)

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

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

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.
(2) For all other carrier current systems: 1000 μV within the frequency band 535-1705 kHz, as measured using a 50 μH/50 ohms LISN.
(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtainig their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

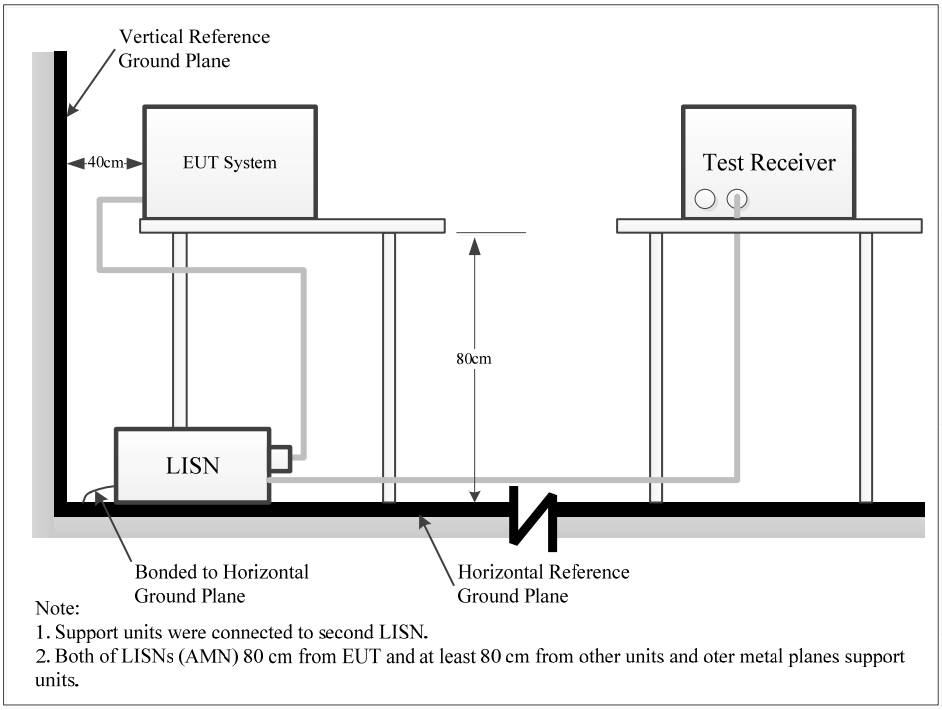
According to RSS-GEN Clause 8.8

Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50 μH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.
For a EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequencies ranges. The device used to power the EUT shall be representative of typical applications.

Table 4 - AC Power Line Conducted Emissions Limits		
Frequency range (MHz)	**Conducted limit (dBµV)**	
	Quasi-Peak	**Average**
0.15 – 0.5	66 to 56[1]	56 to 46[1]
0.5 – 5	56	46
5 – 30	60	50

Note 1: The level decreases linearly with the logarithm of the frequency.

Test System Setup



The setup of EUT is according with ANSI C63.10-2013.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Result &Margin Calculation

The Result is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
Result (dBμV) = Reading (dBμV) + Factor (dB)

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin (dB) = Limit (dBμV) –Result (dBμV)

Test Results Summary

According to the recorded data in following table, the EUT complied with the RSS-GEN Issue 5 and Part 15.207.

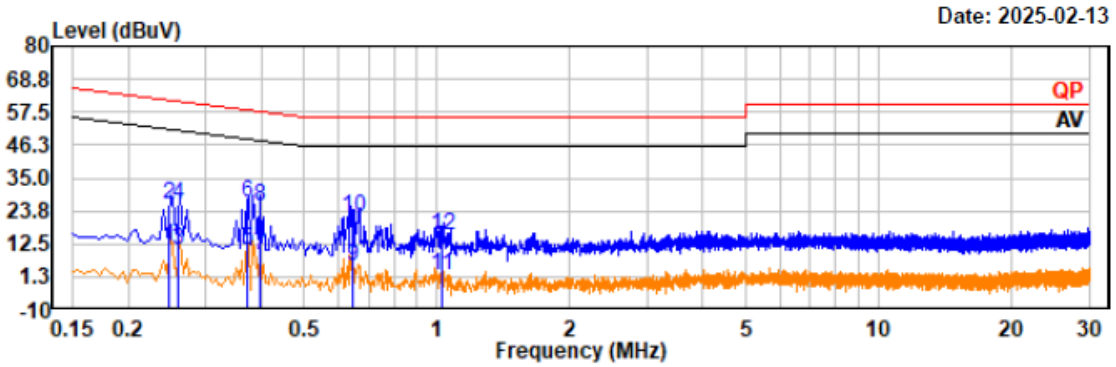
Test Data

Temperature:	23.7℃
Relative Humidity:	50%
ATM Pressure:	100.4kPa
Test Date:	2025-02-13
Test Engineer:	Spike Gao

EUT operation mode: Transmitting in high channel (926.9MHz) (worst case)

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M

Temp/Humi/ATM: 23.7℃/50%/100.4kPa
Tested by: Spike Gao
Power Source: AC 24V from adapter(AC 120V/60Hz)

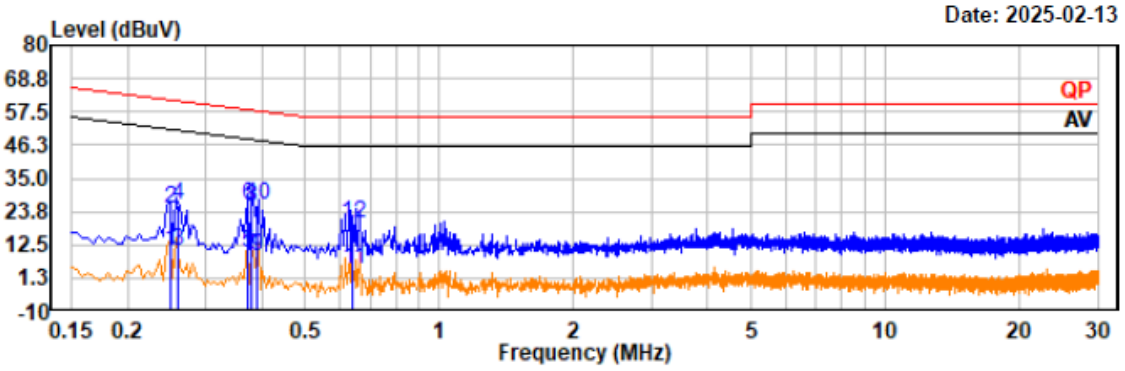


Trace: 1
Condition: QP RBW:9kHz
AV RBW:9kHz

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.25	-8.53	19.98	11.45	51.81	40.36	Line	Average
0.25	6.17	19.98	26.15	61.81	35.66	Line	QP
0.26	-9.49	19.96	10.47	51.43	40.96	Line	Average
0.26	6.06	19.96	26.02	61.43	35.41	Line	QP
0.37	-9.39	19.81	10.42	48.47	38.05	Line	Average
0.37	6.52	19.81	26.33	58.47	32.14	Line	QP
0.40	-11.24	19.78	8.54	47.93	39.39	Line	Average
0.40	5.87	19.78	25.65	57.93	32.28	Line	QP
0.65	-14.64	19.40	4.76	46.00	41.24	Line	Average
0.65	2.11	19.40	21.51	56.00	34.49	Line	QP
1.03	-17.83	19.51	1.68	46.00	44.32	Line	Average
1.03	-4.09	19.51	15.42	56.00	40.58	Line	QP

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M

Temp/Humi/ATM: 23.7℃/50%/100.4kPa
Tested by: Spike Gao
Power Source: AC 24V from adapter(AC 120V/60Hz)



Trace: 1
Condition: QP RBW:9kHz
AV RBW:9kHz

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.25	-9.17	19.49	10.32	51.73	41.41	Neutral	Average
0.25	5.22	19.49	24.71	61.73	37.02	Neutral	QP
0.26	-9.32	19.50	10.18	51.43	41.25	Neutral	Average
0.26	6.20	19.50	25.70	61.43	35.73	Neutral	QP
0.37	-9.64	19.55	9.91	48.47	38.56	Neutral	Average
0.37	6.30	19.55	25.85	58.47	32.62	Neutral	QP
0.38	-10.98	19.55	8.57	48.29	39.72	Neutral	Average
0.38	5.70	19.55	25.25	58.29	33.04	Neutral	QP
0.39	-10.69	19.55	8.86	48.07	39.21	Neutral	Average
0.39	6.19	19.55	25.74	58.07	32.33	Neutral	QP
0.64	-15.03	19.16	4.13	46.00	41.87	Neutral	Average
0.64	0.90	19.16	20.06	56.00	35.94	Neutral	QP

FCC §15.205, §15.209, §15.247(d) & RSS-247 Clause 8.1.0 & RSS-247 Clause 5.5 - UNWANTED EMISSIONS

Applicable Standard

According to FCC §15.247 (d)

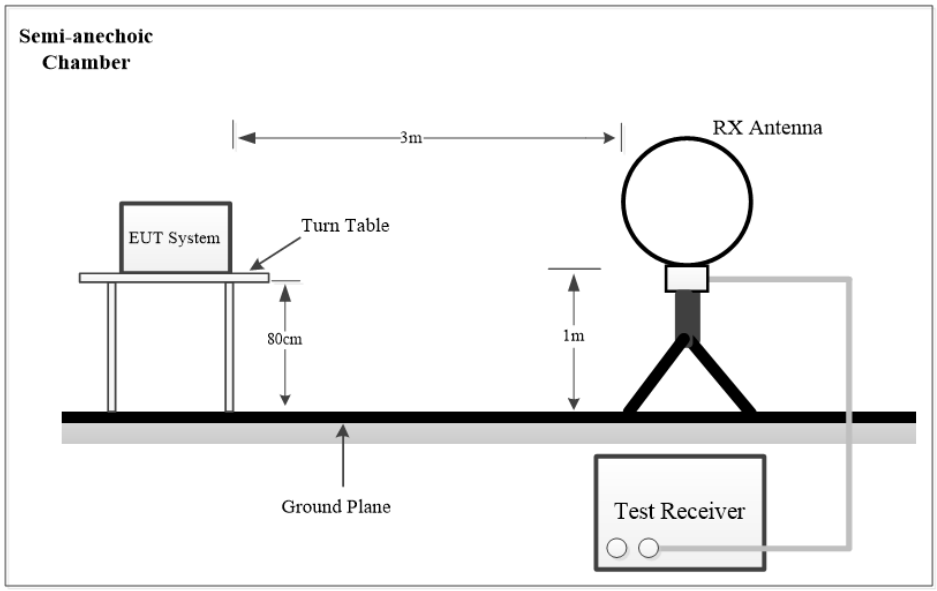
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to RSS-247 Clause 5.5

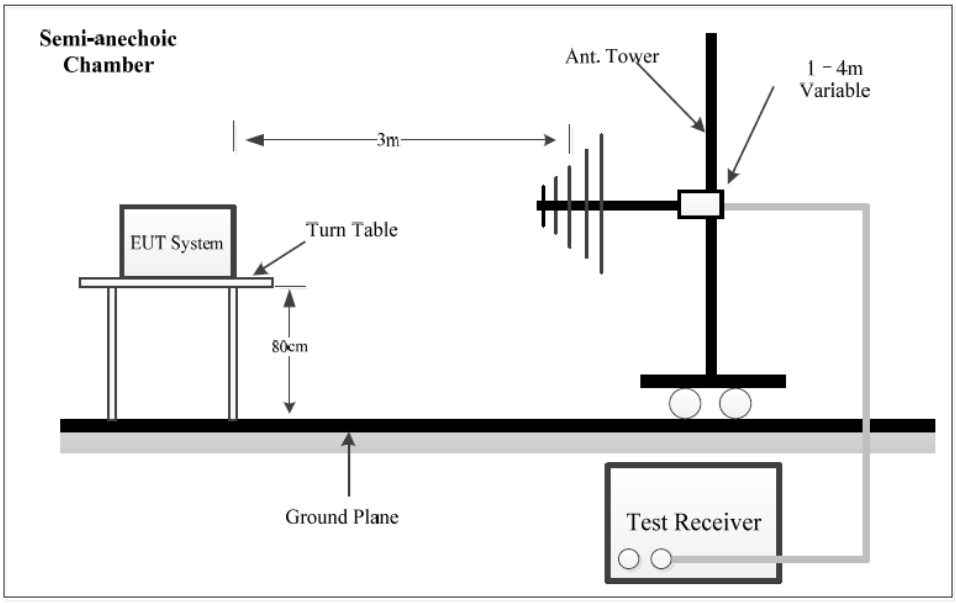
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-GEN is not required.

Test System Setup

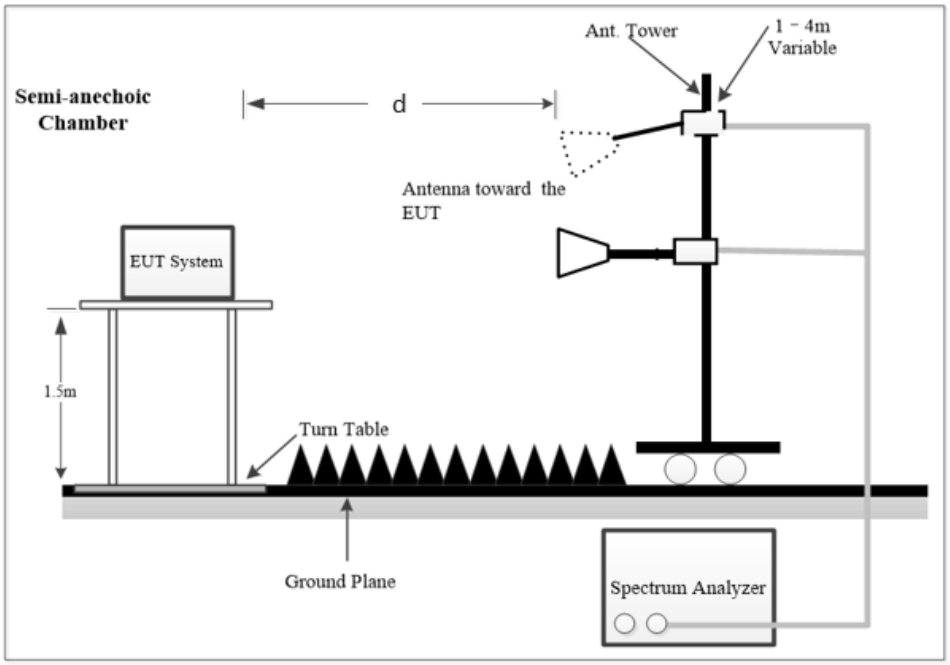
9kHz-30MHz:



Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the RSS-247 Issue3 Clause 5.5 and FCC 15.209, and FCC 15.247 limits.

NOTE: d is testing distance:

For Radiated Emission test (1GHz-10GHz), which was performed at 3 m distance.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 10 GHz.

During the radiated emission test, the EMI test receiver setup was set with the following configurations:

Below 1GHz:

Frequency Range	RBW	VBW	Measurement
9 kHz – 150 kHz	300Hz	1 kHz	PK
	200Hz	/	QP
150 kHz – 30 MHz	10 kHz	30 kHz	PK
	9kHz	/	QP
30 MHz – 1000 MHz	100 kHz	300 kHz	PK
	120kHz	/	QP

Above 1GHz:
Pre-scan:

Duty Cycle	RBW	VBW	Measurement
Any	1MHz	3MHz	PK
＞98%	1MHz	5kHz	AV
＜98%	1MHz	≥1/T, not less than 5kHz	AV

Final measurement for emission identified during the pre-scan:

Duty Cycle	RBW	VBW	Measurement
Any	1MHz	3MHz	PK
＞98%	1MHz	10Hz	AV
＜98%	1MHz	≥1/T	AV

Note: T is minimum transmission duration

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

For each measurement antenna alignment, the EUT shall be rotated through 0°to 360°on a turntable. The report shall list the six emissions with the smallest margin relative to the limit, for each of the three antenna orientations (parallel, perpendicular, and ground parallel) unless the margin is greater than 20 dB, then the following statement shall be made: “all emissions were greater than 20 dB below the limit.”

Below 1GHz, if the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 6 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

Above 1GHz, if the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is below the AV emission limit, there's no need to record the measured AV level of the emissions in the report.

Result &Margin Calculation

The Result is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

For 9 kHz to 10GHz Radiated emission test
Factor (dB/m) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

Result (dBμV/m) = Reading (dBμV) + Factor (dB/m)

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin (dB) = Limit (dBμV/m) –Result (dBμV/m)

Test Data

Please refer to the below table and plots.

Frequency Range:	Below 1 GHz	Above 1 GHz
Temperature:	23.1℃	23.1℃
Relative Humidity:	52 %	52 %
ATM Pressure:	100.2kPa	100.2kPa
Test Date:	2025-02-17	2025-02-17
Test Engineer:	Wlif Wu	Wlif Wu

After pre-scan in the X, Y and Z axes of orientation, the worst case is below:
Pre-scan in the X, Y and Z axes of orientation, the worst case Z-axis of orientation was recorded.

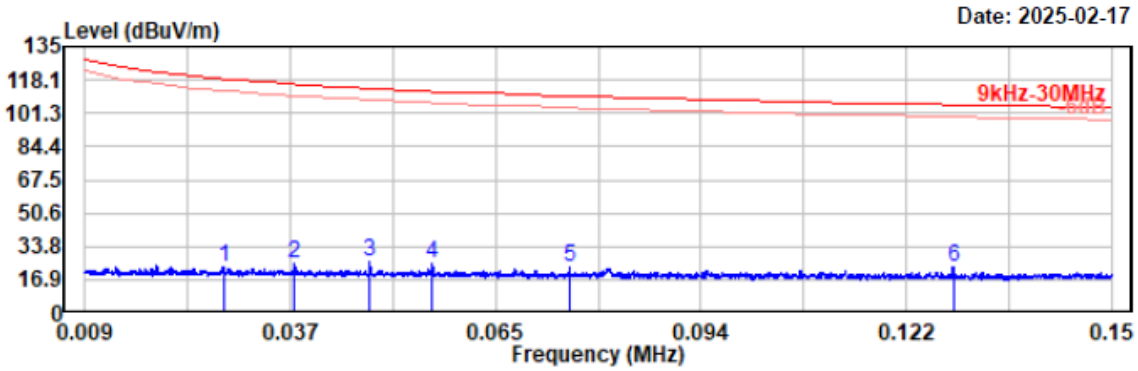
1) 9 kHz-30MHz

Pre-scan in parallel, ground-parallel and perpendicular of orientation of loop antenna, parallel is worst case.

EUT operation mode: Transmitting in the high channel 926.9MHz (worst case)

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

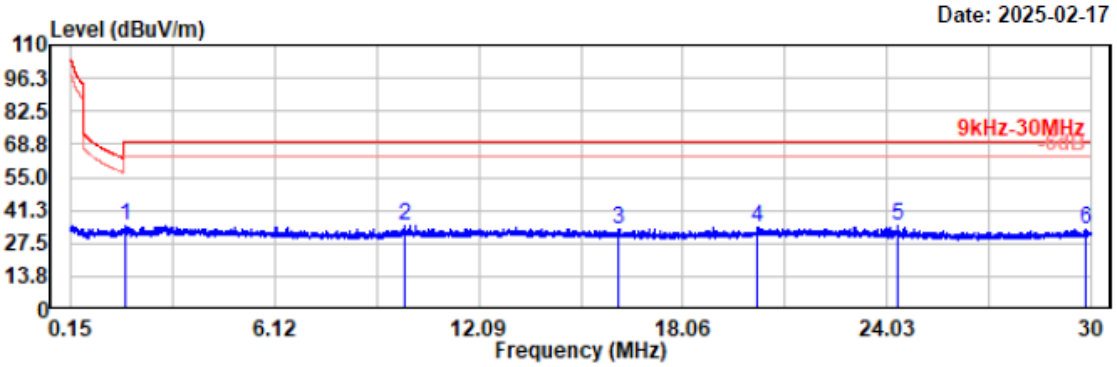


Condition: PK RBW:300Hz VBW:1kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.028	3.66	19.89	23.55	118.67	95.12	Peak
0.038	5.27	19.91	25.18	116.07	90.89	Peak
0.048	5.70	19.91	25.61	113.96	88.35	Peak
0.057	5.21	19.91	25.12	112.54	87.42	Peak
0.076	3.97	19.75	23.72	110.04	86.32	Peak
0.128	3.98	19.73	23.71	105.45	81.74	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)



Condition: PK RBW:10kHz VBW:30kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
1.726	15.33	19.62	34.95	69.54	34.59	Peak
9.938	15.08	19.70	34.78	69.54	34.76	Peak
16.194	13.66	19.84	33.50	69.54	36.04	Peak
20.257	14.15	20.10	34.25	69.54	35.29	Peak
24.349	14.39	20.21	34.60	69.54	34.94	Peak
29.848	13.57	19.97	33.54	69.54	36.00	Peak

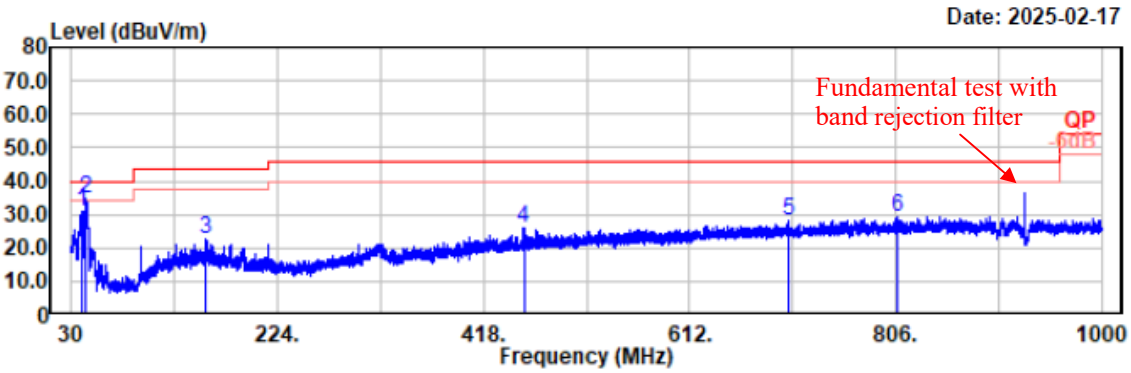
Note: dBuV/m=dBuA/m+51.5dB

2) 30MHz-1GHz

EUT operation mode: Transmitting in the high channel (926.9 MHz) (worst case)

Project No.: 2507P40548E RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

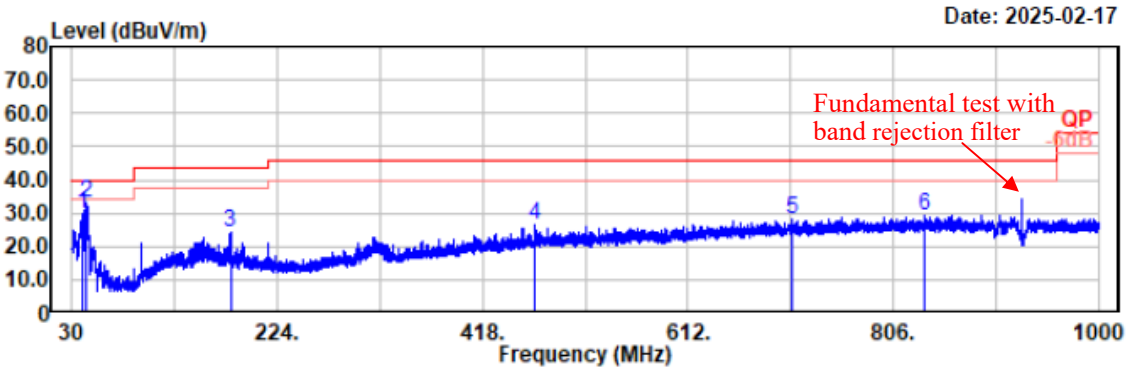


Condition: PK RBW:100kHz VBW:300kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
39.41	42.03	-11.21	30.82	40.00	9.18	Horizontal	QP
43.39	49.10	-14.17	34.93	40.00	5.07	Horizontal	QP
156.88	33.90	-11.47	22.43	43.50	21.07	Horizontal	QP
456.02	30.65	-4.69	25.96	46.00	20.04	Horizontal	QP
705.80	28.28	-0.18	28.10	46.00	17.90	Horizontal	QP
807.65	28.09	1.33	29.42	46.00	16.58	Horizontal	QP

Project No.: 2507P40548E RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)



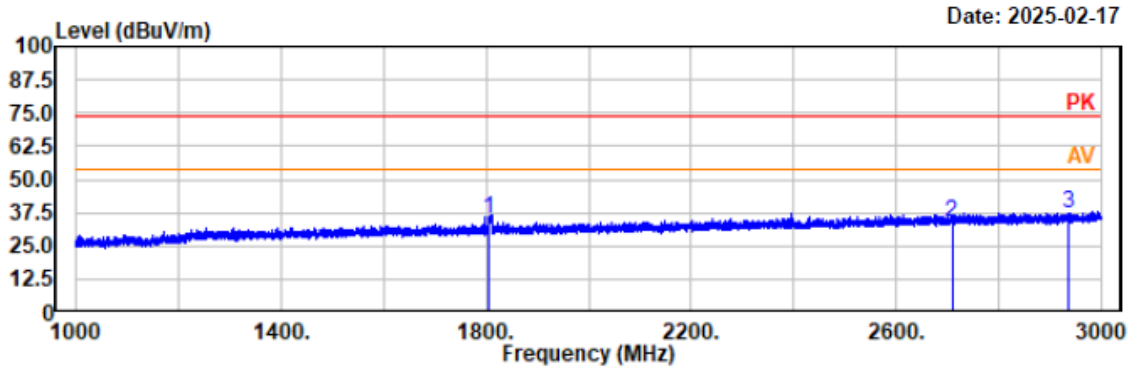
Condition: PK RBW:100kHz VBW:300kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
39.70	41.13	-11.47	29.66	40.00	10.34	Vertical	QP
43.29	47.34	-14.10	33.24	40.00	6.76	Vertical	QP
179.96	36.37	-12.36	24.01	43.50	19.49	Vertical	QP
467.96	30.57	-4.25	26.32	46.00	19.68	Vertical	QP
709.97	28.28	-0.09	28.19	46.00	17.81	Vertical	QP
834.81	27.42	1.79	29.21	46.00	16.79	Vertical	QP

3) 1GHz~10GHz

Project No.: 2507P40548E-RF
Test Mode: 500K 903MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

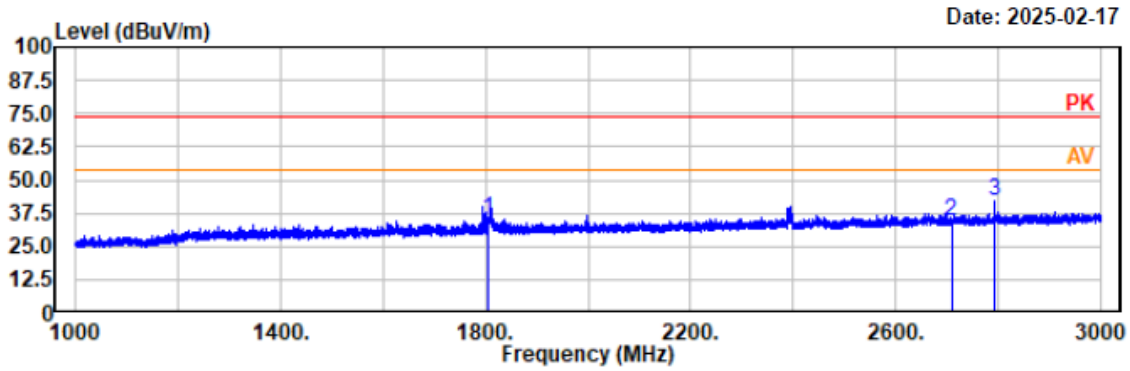


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1806.00	48.11	-13.21	34.90	74.00	39.10	horizontal	Peak
2709.00	43.73	-9.99	33.74	74.00	40.26	horizontal	Peak
2934.60	46.84	-9.31	37.53	74.00	36.47	horizontal	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 903MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

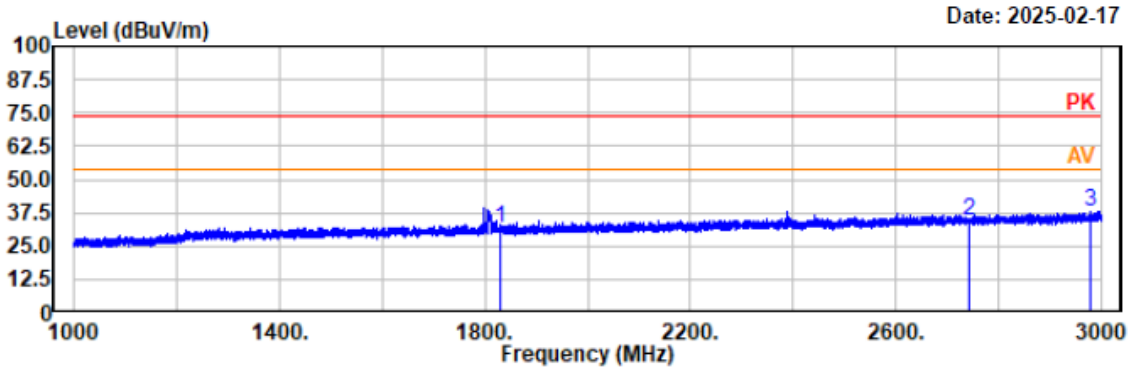


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1806.00	48.62	-13.21	35.41	74.00	38.59	vertical	Peak
2709.00	44.52	-9.99	34.53	74.00	39.47	vertical	Peak
2792.20	51.72	-9.81	41.91	74.00	32.09	vertical	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 914.2MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

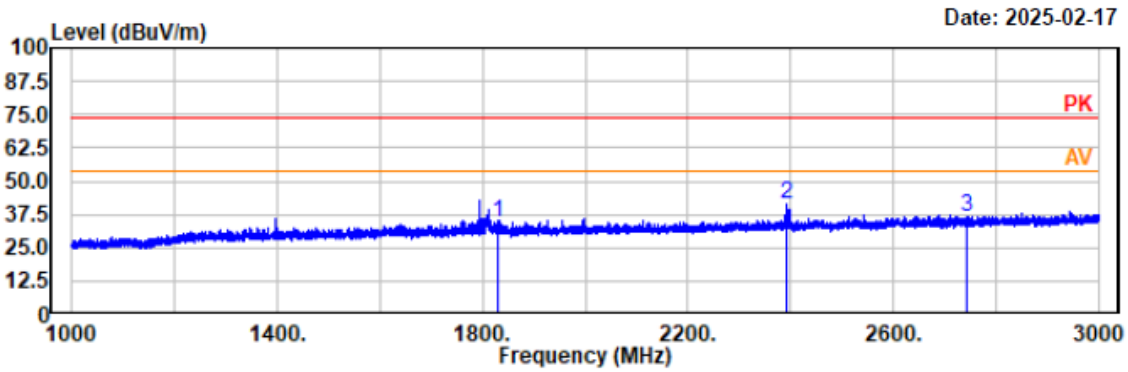


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1828.40	45.17	-13.14	32.03	74.00	41.97	horizontal	Peak
2742.60	44.56	-9.95	34.61	74.00	39.39	horizontal	Peak
2980.40	46.70	-9.05	37.65	74.00	36.35	horizontal	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 914.2MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

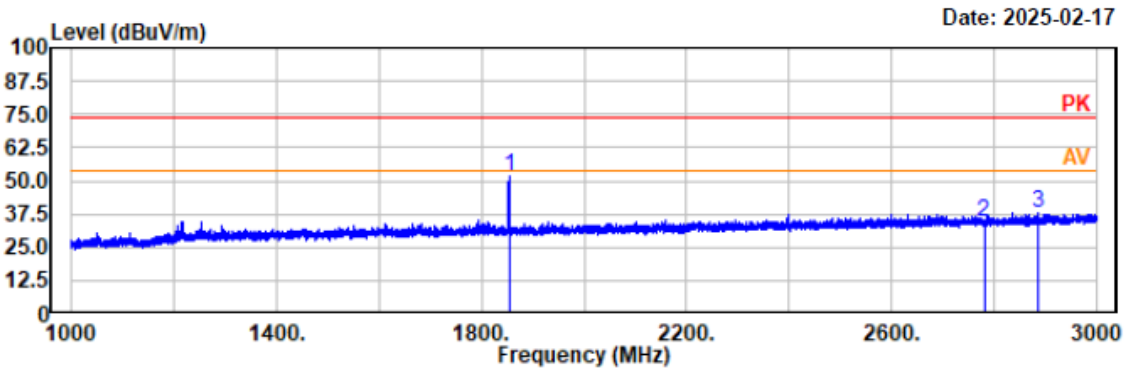


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1828.40	47.44	-13.14	34.30	74.00	39.70	vertical	Peak
2391.60	52.58	-11.15	41.43	74.00	32.57	vertical	Peak
2742.60	46.69	-9.95	36.74	74.00	37.26	vertical	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

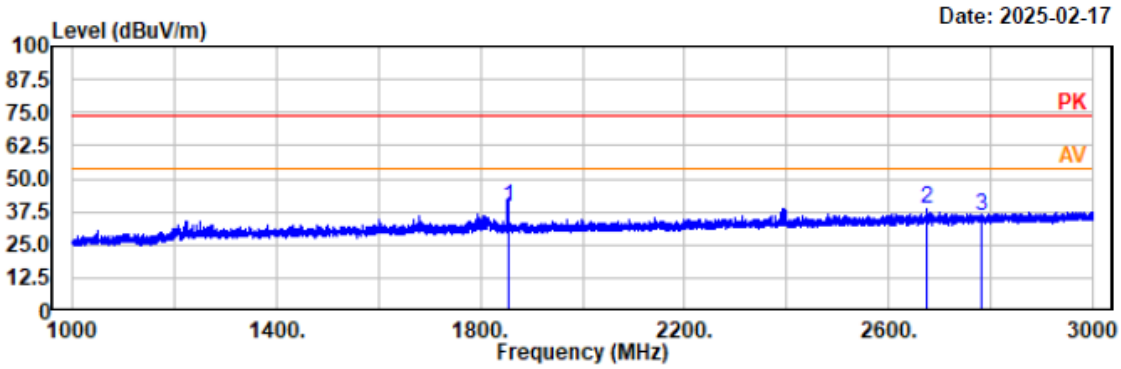


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1853.60	64.87	-13.08	51.79	74.00	22.21	horizontal	Peak
2780.60	44.15	-9.85	34.30	74.00	39.70	horizontal	Peak
2886.60	47.41	-9.58	37.83	74.00	36.17	horizontal	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

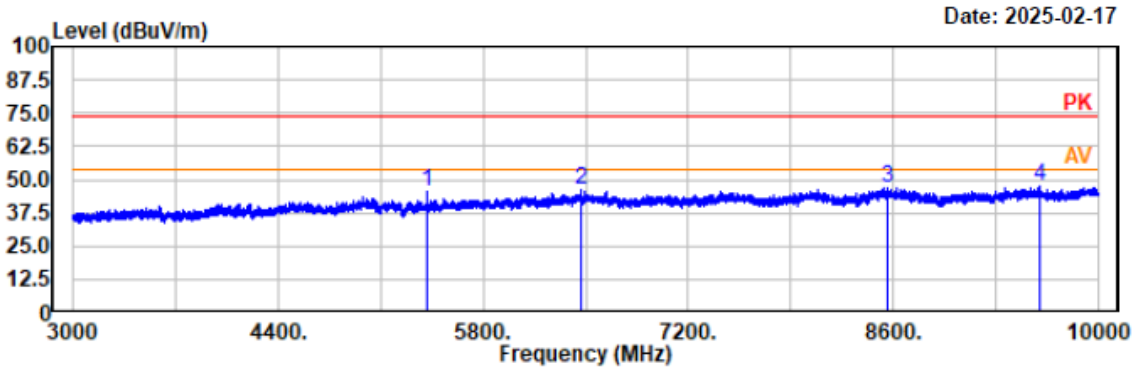


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1853.80	52.32	-13.08	39.24	74.00	34.76	vertical	Peak
2675.00	48.39	-10.11	38.28	74.00	35.72	vertical	Peak
2780.70	45.48	-9.85	35.63	74.00	38.37	vertical	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 903MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

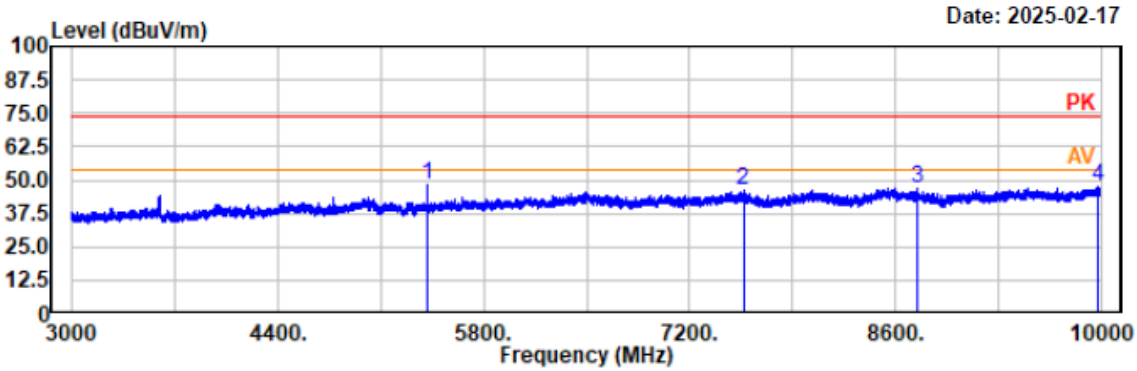


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
5417.80	49.74	-4.37	45.37	74.00	28.63	horizontal	Peak
6471.30	47.92	-1.92	46.00	74.00	28.00	horizontal	Peak
8558.00	47.20	-0.17	47.03	74.00	26.97	horizontal	Peak
9604.50	46.27	1.01	47.28	74.00	26.72	horizontal	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 903MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

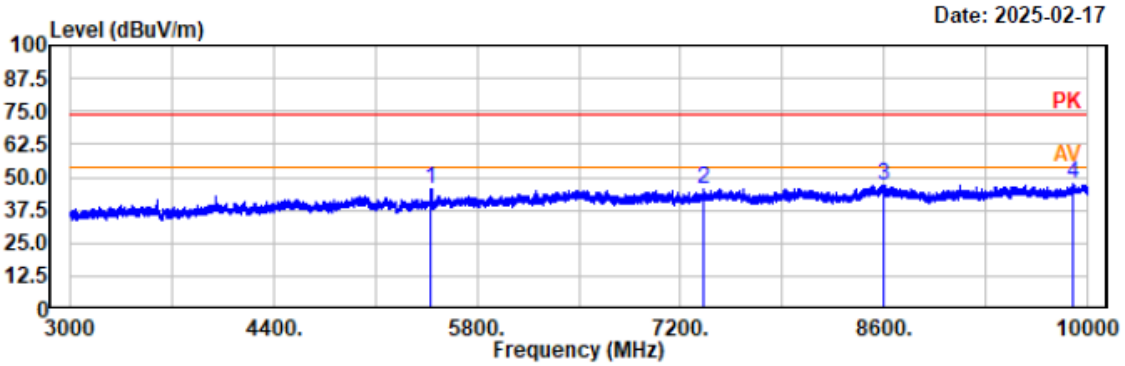


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
5418.50	52.44	-4.37	48.07	74.00	25.93	vertical	Peak
7565.40	47.77	-1.83	45.94	74.00	28.06	vertical	Peak
8753.30	47.60	-0.52	47.08	74.00	26.92	vertical	Peak
9976.90	45.94	1.46	47.40	74.00	26.60	vertical	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 914.2MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

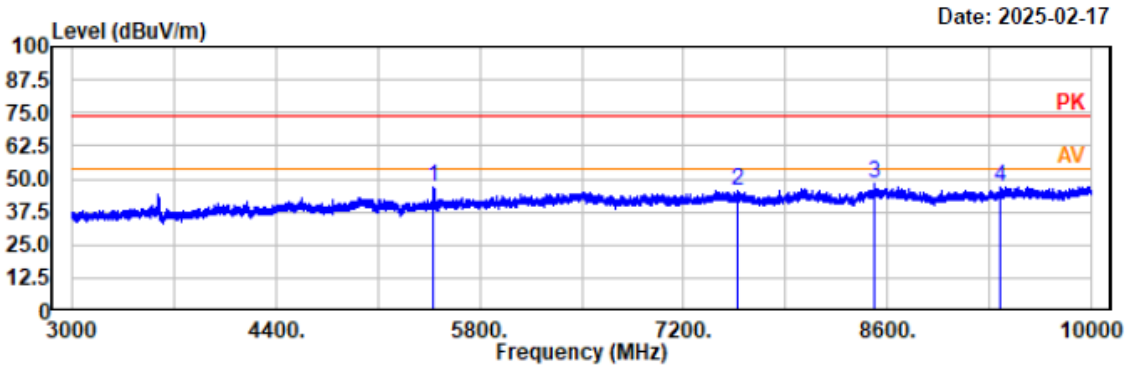


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
5485.00	49.79	-4.34	45.45	74.00	28.55	horizontal	Peak
7353.30	47.70	-2.17	45.53	74.00	28.47	horizontal	Peak
8602.10	47.19	-0.29	46.90	74.00	27.10	horizontal	Peak
9907.60	46.08	1.34	47.42	74.00	26.58	horizontal	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 914.2MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

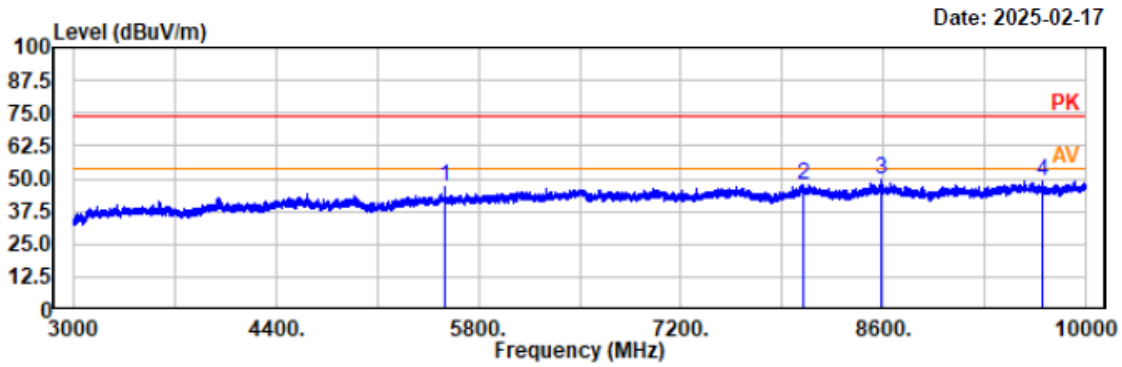


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
5485.00	51.20	-4.34	46.86	74.00	27.14	vertical	Peak
7576.60	47.62	-1.84	45.78	74.00	28.22	vertical	Peak
8515.30	48.10	-0.04	48.06	74.00	25.94	vertical	Peak
9375.60	46.80	0.37	47.17	74.00	26.83	vertical	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

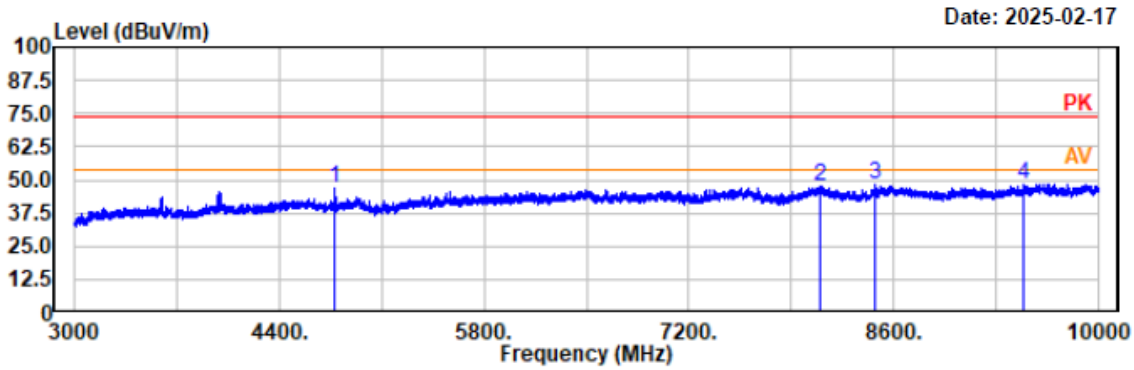


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
5565.50	51.36	-4.16	47.20	74.00	26.80	horizontal	Peak
8053.30	49.44	-1.79	47.65	74.00	26.35	horizontal	Peak
8586.00	49.75	-0.24	49.51	74.00	24.49	horizontal	Peak
9698.30	47.68	1.11	48.79	74.00	25.21	horizontal	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)



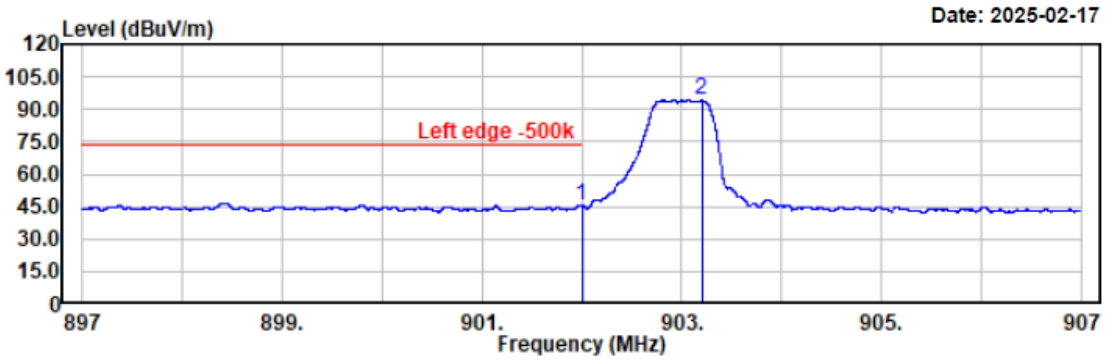
Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
4781.50	52.02	-5.23	46.79	74.00	27.21	vertical	Peak
8098.80	49.30	-1.56	47.74	74.00	26.26	vertical	Peak
8471.90	48.28	-0.15	48.13	74.00	25.87	vertical	Peak
9494.60	47.67	0.87	48.54	74.00	25.46	vertical	Peak

Radiated Bands Emissions:

Project No.: 2507P40548E-RF
Test Mode: 500K 903MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

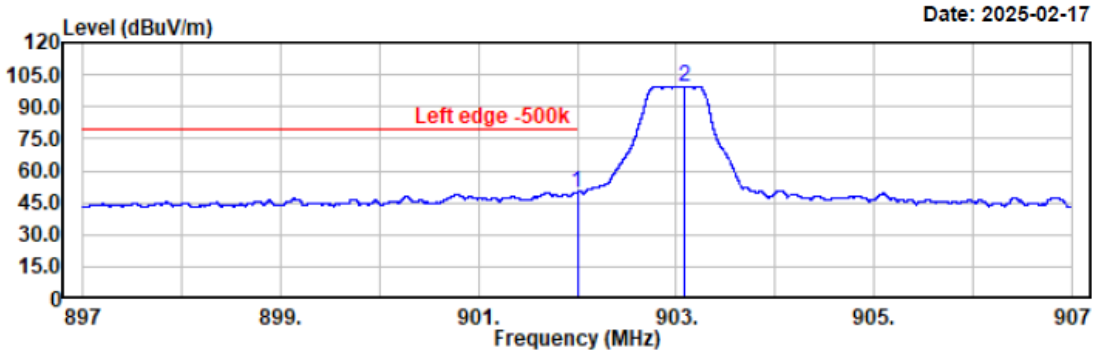


Condition: PK RBW:100kHz VBW:300kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
902.00	11.49	34.28	45.77	74.05	28.28	Horizontal	Peak
903.20	59.77	34.28	94.05	125.20	31.15	Horizontal	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 903MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

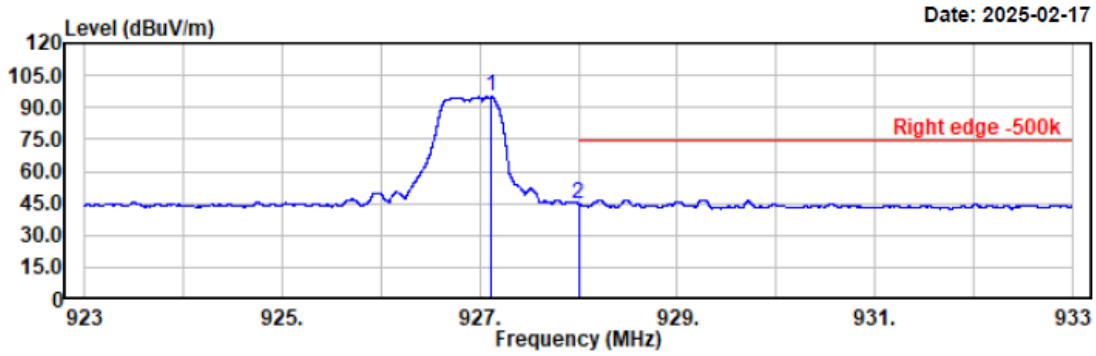


Condition: PK RBW:100kHz VBW:300kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
902.00	15.76	34.28	50.04	79.49	29.45	Vertical	Peak
903.09	65.21	34.28	99.49	125.20	25.71	Vertical	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)

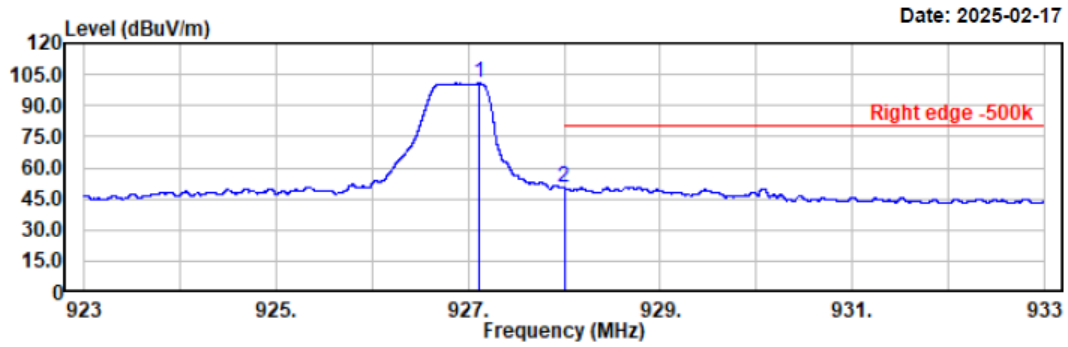


Condition: PK RBW:100kHz VBW:300kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
927.12	60.28	34.57	94.85	125.20	30.35	Horizontal	Peak
928.00	10.42	34.57	44.99	74.85	29.86	Horizontal	Peak

Project No.: 2507P40548E-RF
Test Mode: 500K 926.9MHz
EUT Model: WT201-868M/915M
Test distance: 3m

Temp/Humi/ATM: 23.1℃/52%/100.2kPa
Tested by: Wlif Wu
Power Source: AC 24V from adapter(AC 120V/60Hz)



Condition: PK RBW:100kHz VBW:300kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
927.12	66.05	34.57	100.62	125.20	24.58	Vertical	Peak
928.00	15.50	34.57	50.07	80.62	30.55	Vertical	Peak

FCC §15.247(a)(2) & RSS-247 Clause 5.2 a) – 6 dB EMISSION BANDWIDTH

Applicable Standard

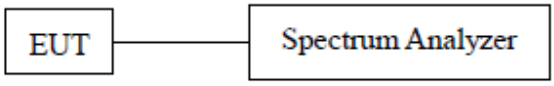
According to FCC §15.247 (a)(2)

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

According to RSS-247 Clause 5.2 a)

The minimum 6 dB bandwidth shall be 500 kHz.

EUT Setup



Test Procedure

According to ANSI C63.10-2013 Section 11.8

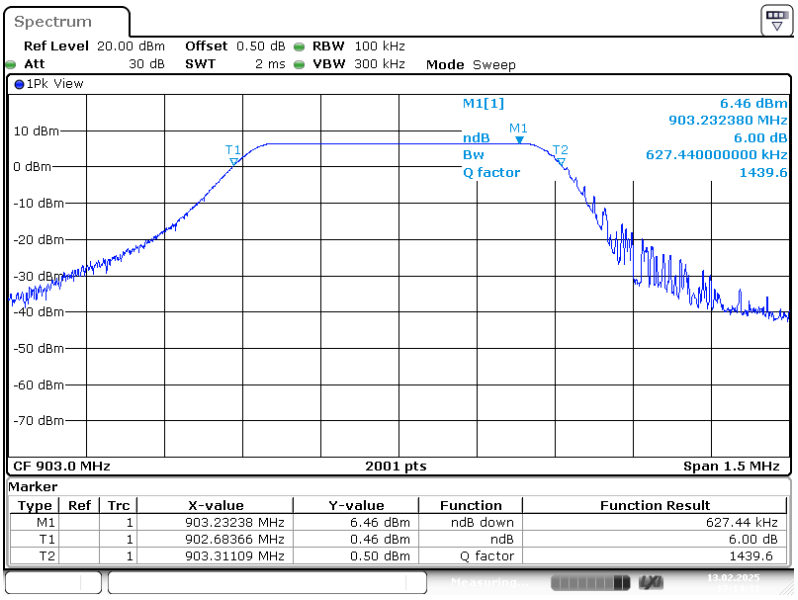
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Data

Test Mode:	Transmitting	**Test Engineer:**	Braylon Ma
Test Date:	2025-02-13	**Test Voltage:**	AC 24V/60Hz
Test Result:	Compliance	**Environment:**	Temp.: 20.8℃ Humi.: 52% Atm.:100.2kPa

Test Channel	**Test Frequency (MHz)**	**6 dB Bandwidth (MHz)**	**Limit (MHz)**
Lowest	903	0.627	≥0.5
Middle	914.2	0.630	≥0.5
Highest	926.9	0.627	≥0.5

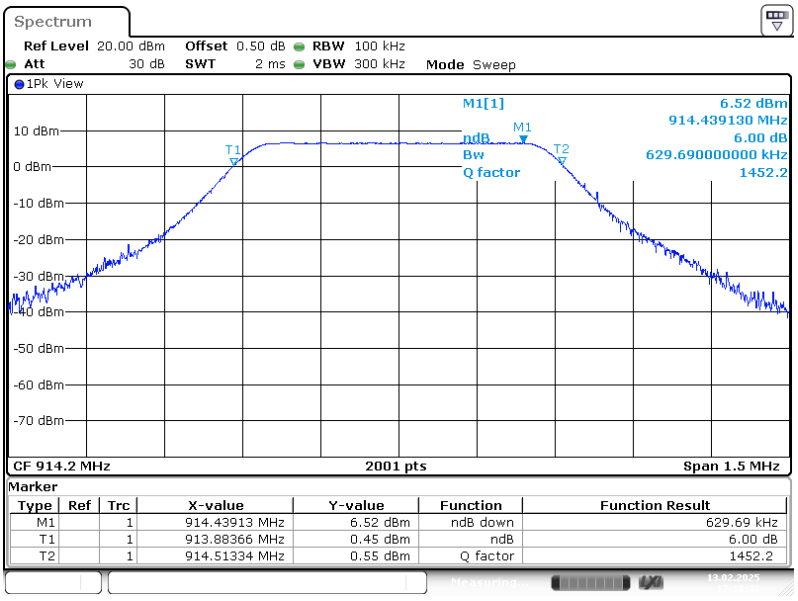
Lowest Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 17:14:31

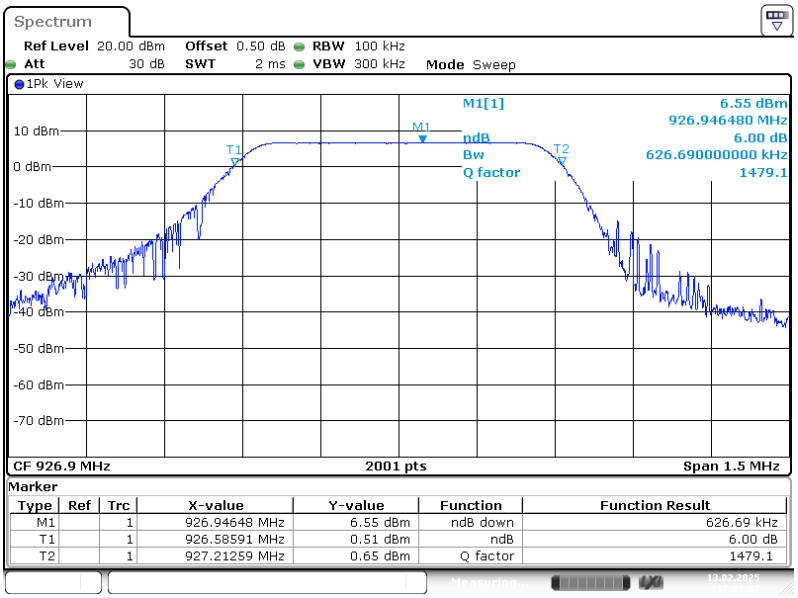
Middle Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 17:18:41

Highest Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 17:21:07

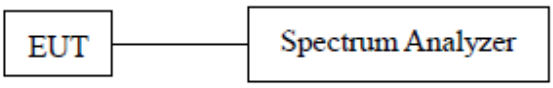
RSS-GEN Clause 6.7 – OCCUPIED BANDWIDTH

Applicable Standard

According to RSS-GEN Clause 6.7

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.
In some cases, the "x dB bandwidth" is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

EUT Setup



Test Procedure

RSS-Gen Clause 6.7

The following conditions shall be observed for measuring the occupied bandwidth:

1. The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
2. The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
3. The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied if the device is not transmitting continuously.
4. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.
Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

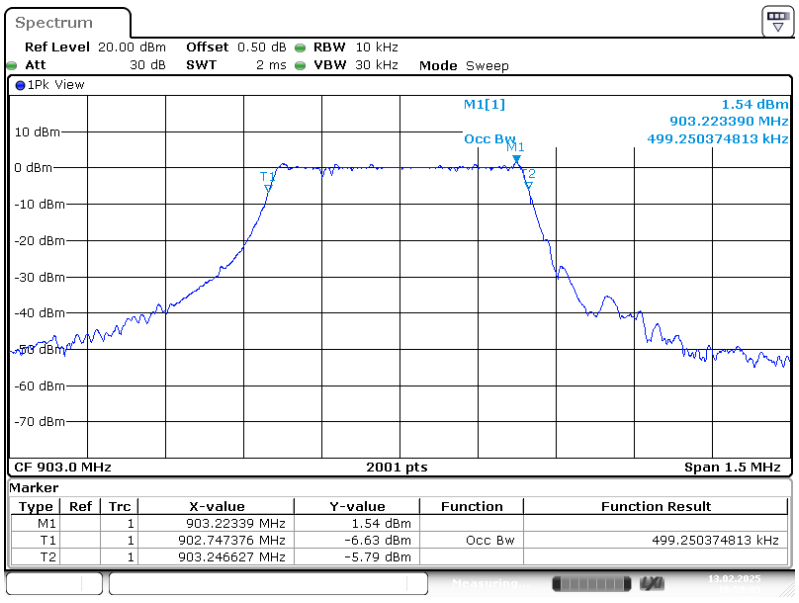
For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

Test Data

Test Mode:	Transmitting	Test Engineer:	Braylon Ma
Test Date:	2025-02-13	Test Voltage:	AC 24V/60Hz
Test Result:	Compliance	Environment:	Temp.: 20.8℃ Humi.: 52% Atm.:100.2kPa

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	903	0.499
Middle	914.2	0.501
High	926.9	0.501

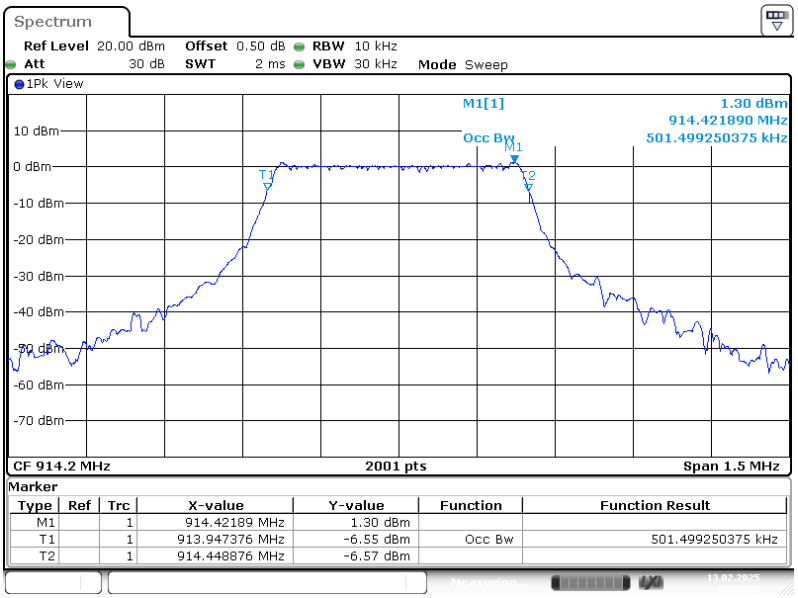
Lowest Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 18:59:04

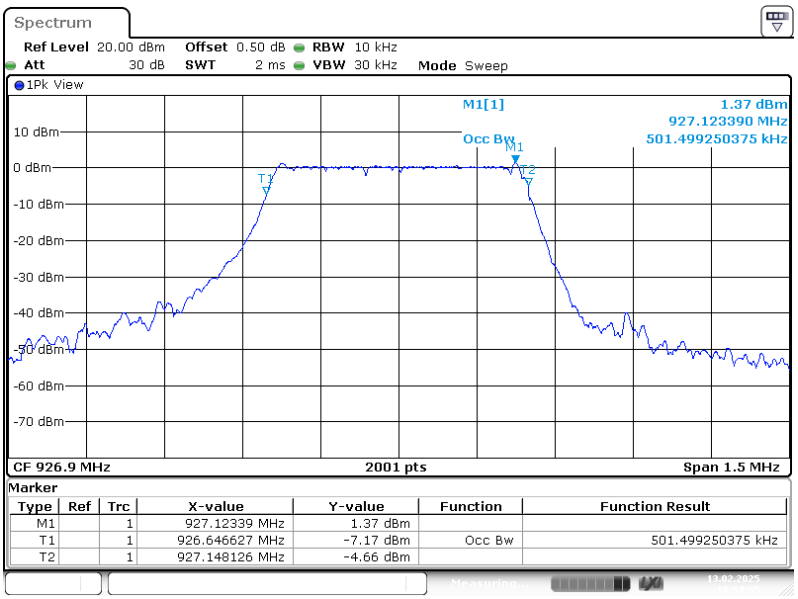
Middle Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 18:56:42

Highest Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 18:54:35

FCC §15.247(e) & RSS-247 Clause5.2 b) – POWER SPECTRAL DENSITY

Applicable Standard

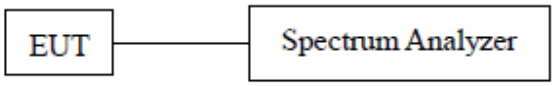
According to FCC §15.247 (e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

According to RSS-247 Clause5.2 b)

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of section 5.4(d), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

EUT Setup



Test Procedure

According to ANSI C63.10-2013 Section 11.10.2

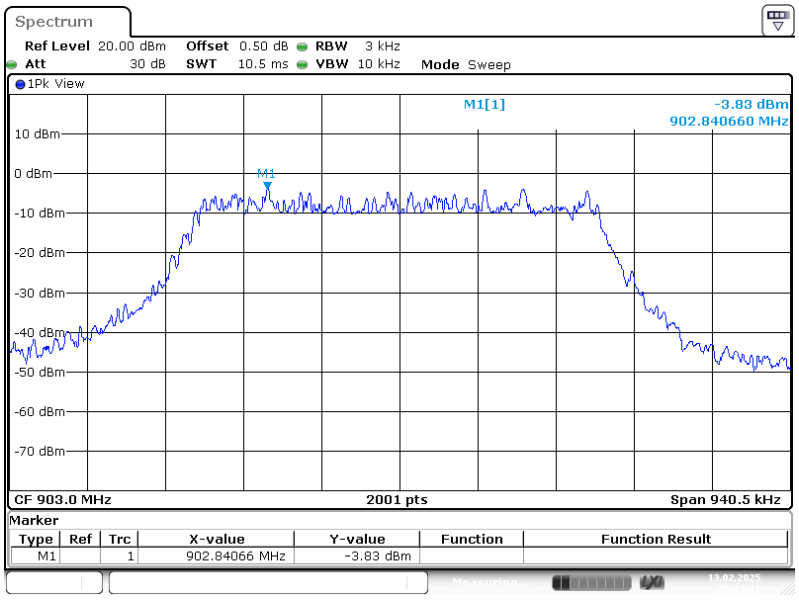
1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW to: 3kHz ≤ RBW ≤ 100 kHz.
3. Set the VBW ≥ 3×RBW.
4. Set the span to 1.5 times the DTS bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Data

Test Mode:	Transmitting	Test Engineer:	Braylon Ma
Test Date:	2025-02-13	Test Voltage:	AC 24V/60Hz
Test Result:	Compliance	Environment:	Temp.: 20.8℃ Humi.: 52% Atm.:100.2kPa

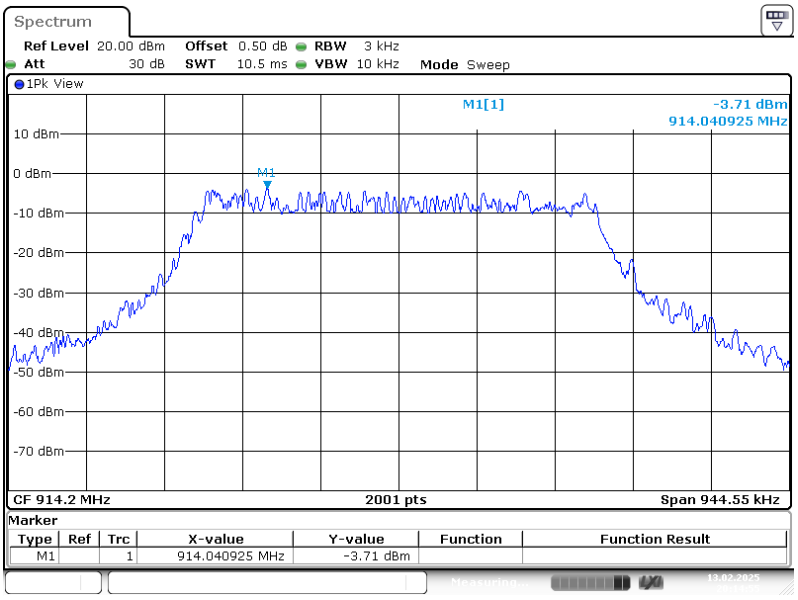
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
Lowest	903	-3.83	≤8.00
Middle	914.2	-3.71	≤8.00
Highest	926.9	-3.65	≤8.00

Lowest Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma
Date: 13.FEB.2025 20:13:17

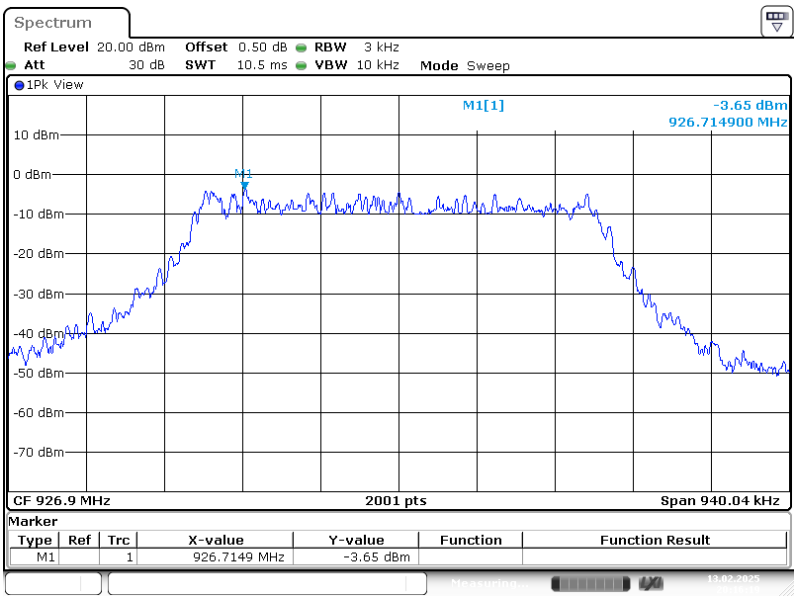
Middle Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 20:14:55

Highest Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 20:16:20

FCC §15.247(b)(3) & RSS-247 Clause 5.4 d) - TRANSMITTER OUTPUT POWER MEASUREMENT

Applicable Standard

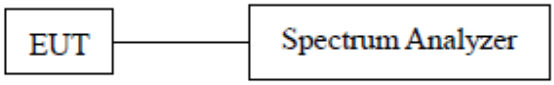
According to FCC §15.247 (b)(3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to RSS-247 Clause5.4 d)

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

EUT Setup



Test Procedure

According to ANSI C63.10-2020 Section 11.9.1.1

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:
a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ [3 × RBW].
c) Set span ≥ [3 × RBW].
d) Sweep time = No faster than coupled (auto) time.
e) Detector = peak.
f) Trace mode = max-hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

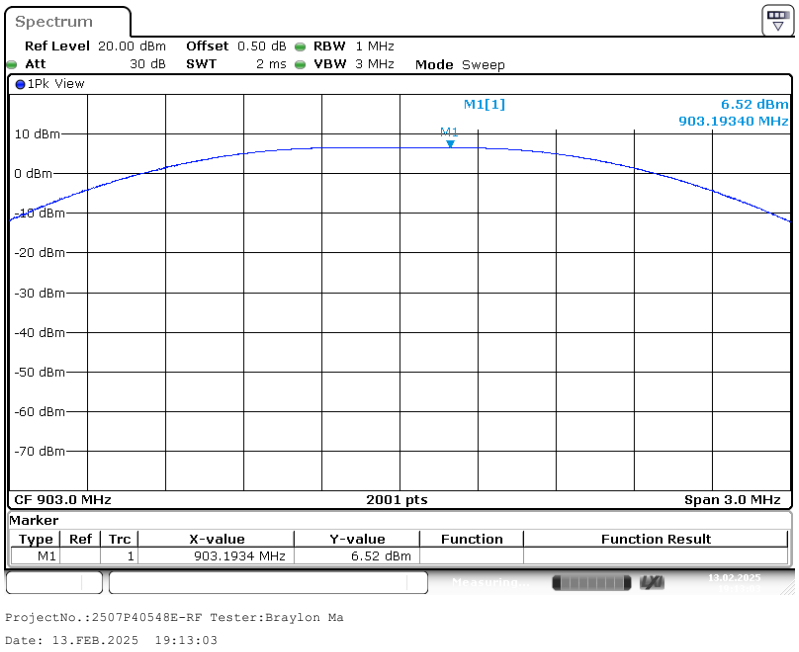
Test Data

Test Mode:	Transmitting	**Test Engineer:**	Braylon Ma
Test Date:	2025-02-13	**Test Voltage:**	AC 24V/60Hz
Test Result:	Compliance	**Environment:**	Temp.: 20.8℃ Humi.: 52% Atm.:100.2kPa

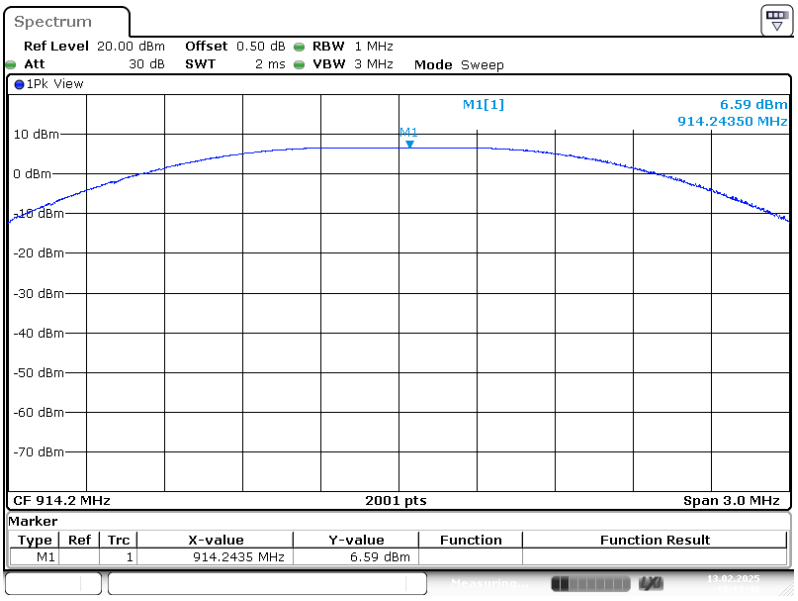
Test Channel	**Test Frequency (MHz)**	**Maximum Conducted Peak Output Power (dBm)**	**Limit (dBm)**
Lowest	903	6.52	⩽30
Middle	914.2	6.59	⩽30
Highest	926.9	6.62	⩽30
Max. EIRP(dBm):	8.08	EIRP Limit for RSS-247:36 dBm	

Note: The maximum antenna gain is 1.46 dBi.

Lowest Channel



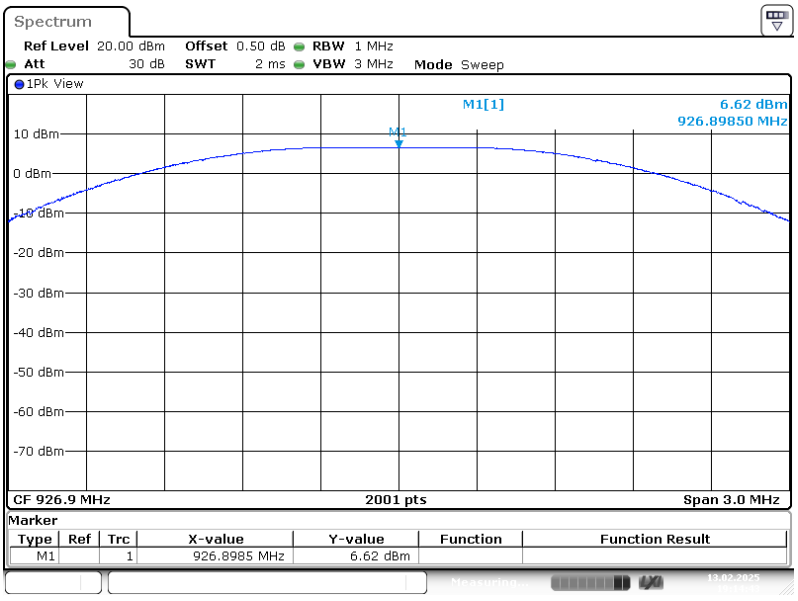
Middle Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 19:13:48

Highest Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 19:14:43

FCC §15.247(d) & RSS-247 Clause 5.5 - 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

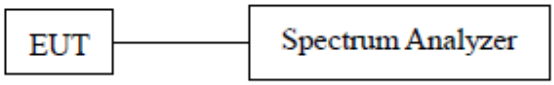
According to FCC §15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to RSS-247 Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

EUT Setup



Test Procedure

According to ANSI C63.10-2013 Section 11.11

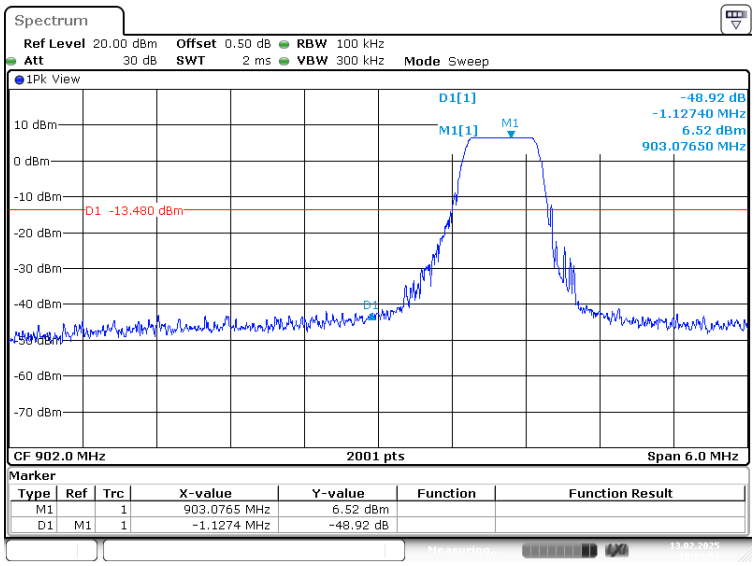
a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Test Data

Test Mode:	Transmitting	Test Engineer:	Braylon Ma
Test Date:	2025-02-13	Test Voltage:	AC 24V/60Hz
Test Result:	Compliance	Environment:	Temp.: 20.8℃ Humi.: 52% Atm.:100.2kPa

Please refer to the below plots:

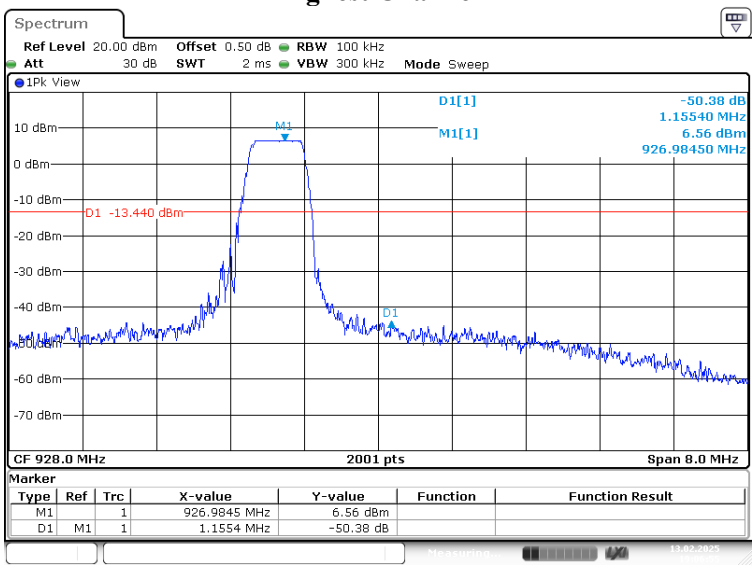
Lowest Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 19:03:58

Highest Channel



ProjectNo.:2507P40548E-RF Tester:Braylon Ma

Date: 13.FEB.2025 19:06:55

EUT PHOTOGRAPHS

Please refer to the attachment 2507P40548E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2507P40548E-RF-INP EUT INTERNAL PHOTOGRAPHS.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2507P40548E-RF-TSP TEST SETUP PHOTOGRAPHS.

Declarations

1. Bay Area Compliance Laboratories Corp. (Xiamen) is not responsible for authenticity of any information provided by the applicant. Information from the applicant that may affect test results are marked with an asterisk “★”.

2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.

3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.

4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor k=2 with the 95% confidence interval.

5. This report cannot be reproduced except in full, without prior written approval of Bay Area Compliance Laboratories Corp. (Xiamen).

6. This report is valid only with a valid digital signature. The digital signature may be available only under the adobe software above version 7.0.

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