

TEST REPORT

Applicant Name: M5Stack Technology Co.,Ltd
Address: Block A10, Expo Bay South Coast, Fuhai Street, Bao'an District, Shenzhen, China
Report Number: 2504A01367E-RF-00A
FCC ID: 2AN3WM5CAPLORA1262

Test Standard (s)

FCC PART 15.247

Sample Description

Product Name: M5Cap LoRa-1262
Model No.: Cap LoRa-1262
Trade Mark: 
Date Received: 2025-12-17
Report Date: 2026-01-16

Test Result:	The EUT complied with the standards above.
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Prepared and Checked By:

Amanda Wei

Amanda Wei
EMC Engineer

Approved By:

Bob Liao

Bob Liao
EMC Engineer

Note: This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA, or any agency of the Federal Government. The information marked “#” is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included but no need marked. This report cannot be reproduced except in full, without prior written approval of the Company. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. 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.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
Rev.00	2504A01367E-RF-00A	Original Report	2026-01-16

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Name	M5Cap LoRa-1262
Tested Model	Cap LoRa-1262
Voltage Range [#]	DC 5V

Frequency Range	LoRa: 903-914.9MHz
Maximum Conducted Output Power(Peak) (actual test result)	8.92dBm
Modulation Technique	Lora: Chirp Spread Spectrum
Antenna Specification [#]	External Antenna, Gain: 3.08dBi(It is provided by the applicant.)
Sample Serial Number	3ELP-1(Assigned by ATC, Shenzhen)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with 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, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2020, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. And KDB 558074 D01 15.247 Meas Guidance v05r02.

Unless otherwise stated there are no any additions to, deviations, or exclusions from the method.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China.

Accredited by American Association for Laboratory Accreditation (A2LA).The Certificate Number is 4297.01.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5 %
RF Frequency		0.064×10^{-7}
RF output power, conducted		0.3 dB
Unwanted Emission, conducted		1.2 dB
Radiated Spurious Emissions	9kHz - 30MHz	2.1 dB
	30MHz - 1GHz	4.3 dB
	1GHz - 18GHz	4.9 dB
Temperature		1 °C
Humidity		7 %
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.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in engineering mode.

Channel List[#]

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	903.0	1	908.7	2	909.4	3	914.2
4	914.9	/	/	/	/	/	/

EUT was tested with Channel 0, 1 and 4. (It is provided by the applicant.)

EUT Exercise Software and Power Level[#]

Exercise Software:	Engineering mode
Power Level:	9

Note: The information in the above table is provided by the applicant.

Special Accessories and Equipment Modifications

No special accessories or modifications were used on the device under test (EUT) during the test.

Support Equipment List and Details

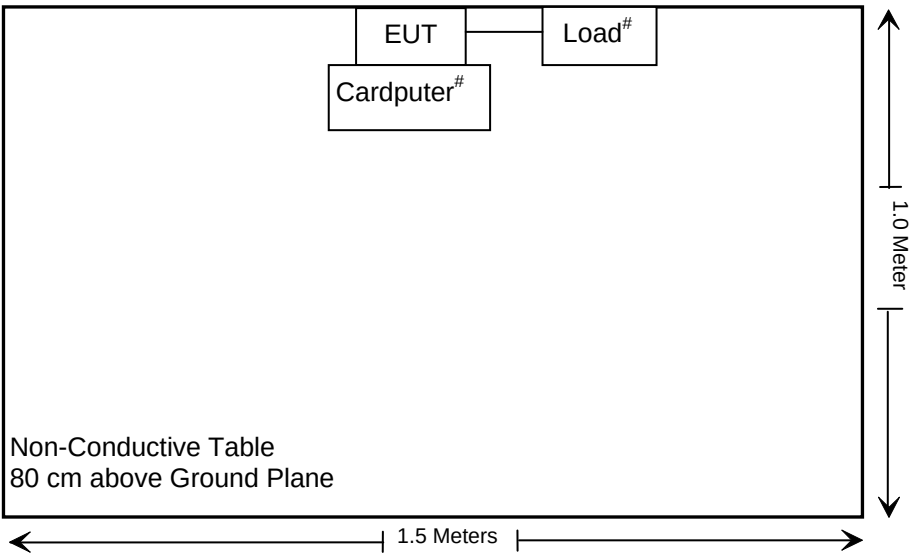
Manufacturer	Description	Model	Serial Number
Unknown	load [#]	Unknown	Unknown
Unknown	Cardputer [#]	ADV	Unknown

External I/O Cable

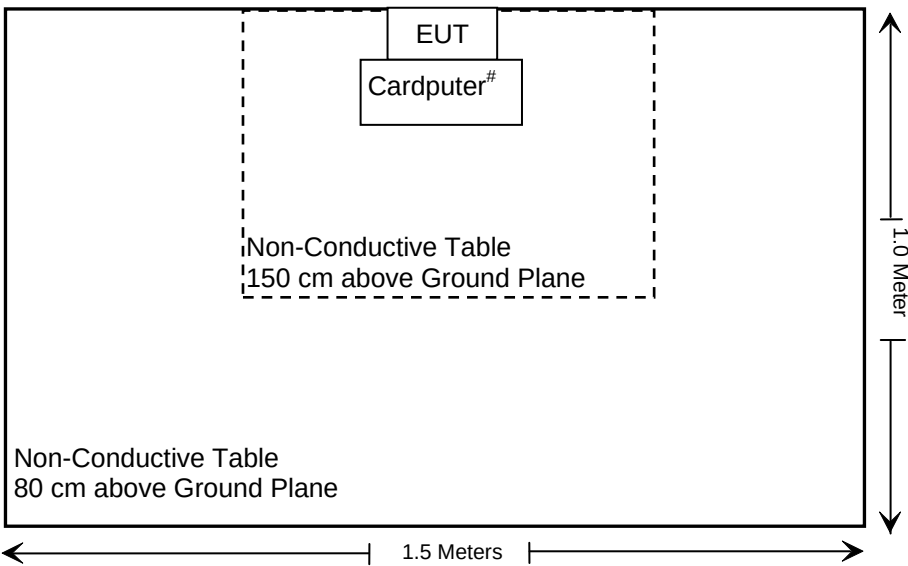
Cable Description	Shielding Type	Length (m)	From Port	To
Dupont cable [#]	No	0.1	EUT	Load [#]

Block Diagram of Test Setup

For Radiated Emission Below 1GHz:



For Radiated Emission Above 1GHz:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Not Applicable
§15.205, §15.209 §15.247(d)	Radiated Spurious Emissions	Compliance
§15.247(a)(2)	6 dB Emission Bandwidth & Occupied Bandwidth	Compliance
§15.247(b)(3)	Maximum Conducted Output Power	Compliance
§15.247(d)	Conducted Spurious Emissions	Compliance
§15.247(e)	Power Spectral Density	Compliance

Not Applicable: The EUT is powered by a portable device.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Spurious Emission Test(Below 1GHz)					
Rohde & Schwarz	Test Receiver	ESR	102725	2025/09/18	2026/09/17
Agilent	10dB Attenuator	8491B	A5825	2025/09/18	2026/09/17
SONOMA INSTRUMENT	Amplifier	310N	186131	2025/03/26	2026/03/25
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2024/08/08	2027/08/07
Unknown	RF Coaxial Cable	No.12	N040	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.13	N300	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.14	N800	2025/05/30	2026/05/29
BACL	LOOP ANTENNA	1313-1A	3110711	2024/01/16	2027/01/15
Test Software: e3 191218 (V9)					
Radiated Spurious Emission Test(Above 1GHz)					
Rohde & Schwarz	Spectrum Analyzer	FSV40	101949	2025/09/17	2026/09/16
HEWLETT PACKARD	20dB Attenuator	8491A	53857	2025/09/18	2026/09/17
Decentest	Filter Switch Unit	DT7220FSU	DQ77927	2025/09/18	2026/09/17
Decentest	Multiplex Switch Test Control Set	DT7220CSU	DQ77924	2025/09/18	2026/09/17
A.H. Systems, inc.	Preamplifier	PAM-0118	226	2025/03/20	2026/03/19
Schwarzbeck	Horn Antenna	BBHA9120D	837	2023/02/22	2026/02/21
Unknown	RF Coaxial Cable	No.10	N050	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.11	N1000	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.19	N500	2025/05/30	2026/05/29
Test Software: e3 191218 (V9)					
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101948	2025/09/18	2026/09/17
WEINSCHEL	10dB Attenuator	5324	AU 3842	2025/03/26	2026/03/25

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

ANTENNA REQUIREMENT

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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.
- c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one external antenna arrangement, which with a RP-SMA connector and the antenna gain is 3.08dBi[#], fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

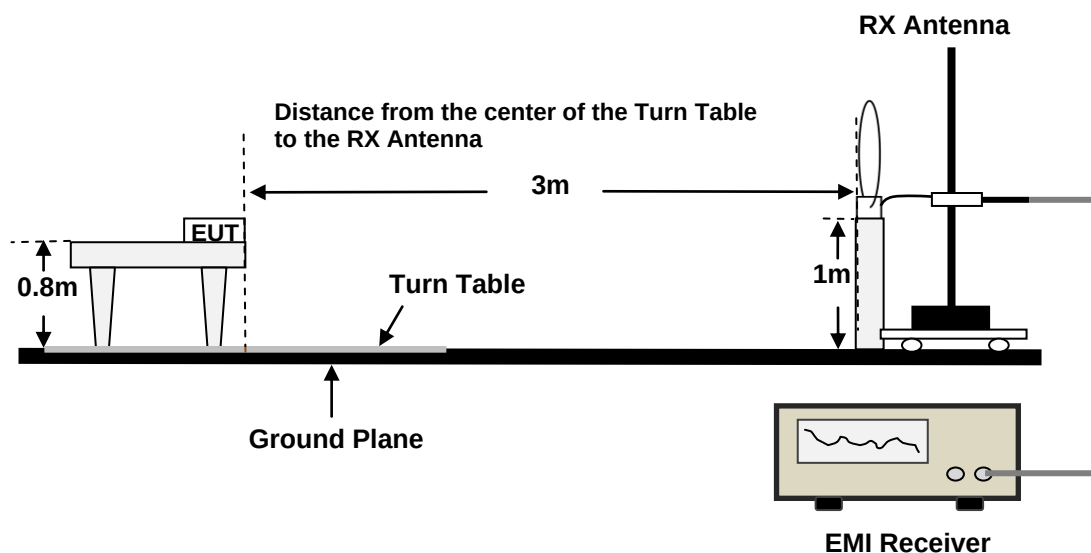
RADIATED SPURIOUS EMISSIONS

Applicable Standard

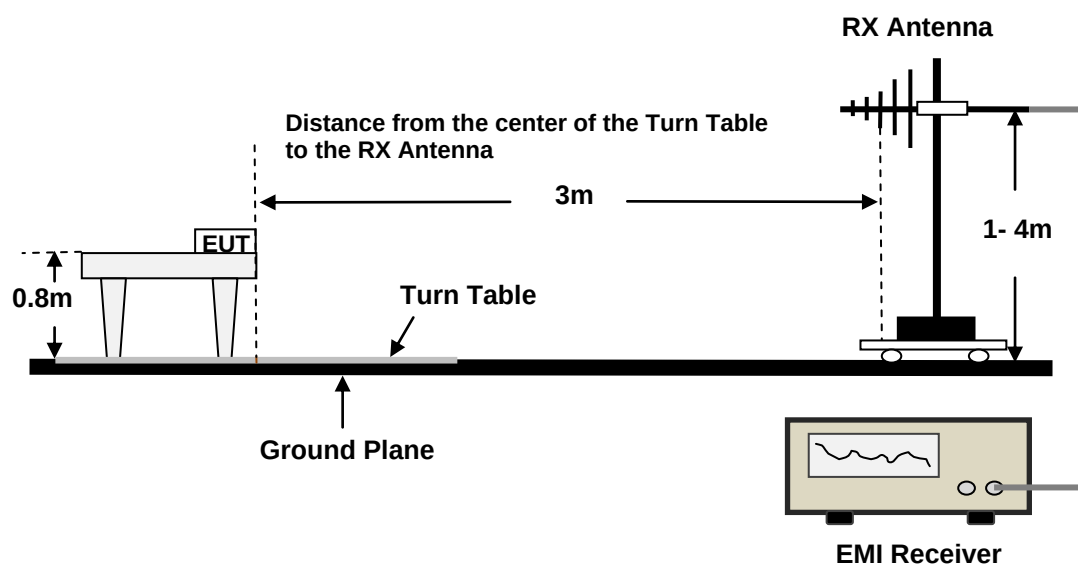
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

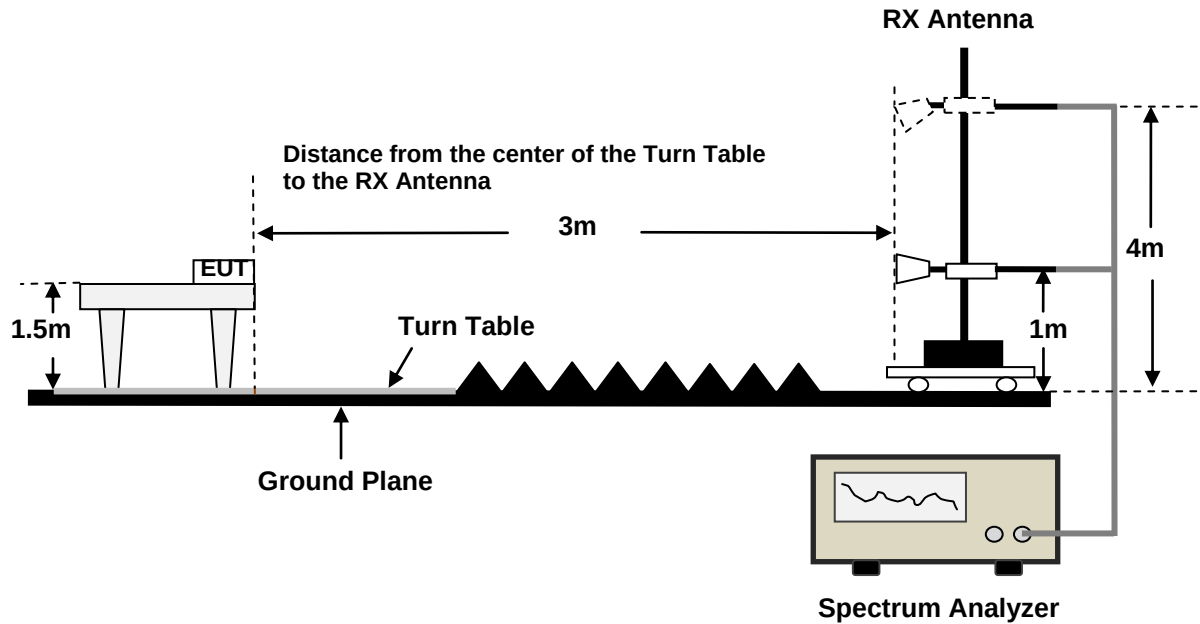
9kHz - 30MHz:



30MHz - 1GHz:



Above 1GHz:



The radiated emission performed in the 3 meters, using the setup accordance with the ANSI C63.10-2020. The specification used was the FCC 15.209, FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9kHz to 10GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

9kHz - 1000MHz:

Frequency Range	Measurement	RBW	Video B/W	IF B/W	Detector
9kHz - 150kHz	PK	0.3kHz	1kHz	/	PK
	QP/AV	/	/	200Hz	QP/AV
150kHz - 30MHz	PK	10kHz	30kHz	/	PK
	QP/AV	/	/	9kHz	QP/AV
30MHz - 1000MHz	PK	100kHz	300kHz	/	PK
	QP	/	/	120kHz	QP

1GHz - 10GHz:

Pre-scan:

Measurement	Detector	Duty cycle	RBW	Video B/W
PK	Peak	Any	1MHz	3MHz
Ave.	Peak	>98%	1MHz	3kHz / 5kHz
		<98%	1MHz	≥1/T, no less than 3kHz

Final measurement for emission identified during the pre-scan:

Measurement	Detector	Duty cycle	RBW	Video B/W
PK	Peak	Any	1MHz	3MHz
Ave.	Peak	>98%	1MHz	10Hz
		<98%	1MHz	≥1/T

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.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

According to ANSI C63.10-2020, 9.2: For field strength measurements made at other than the distance specified by the limit, extrapolate the measured field strength to the field strength at the distance specified by the limit using an inverse distance correction factor (20 dB/decade of distance).

$$E_{SpecLimit} = E_{Meas} + 20 \log \left(\frac{D_{Meas}}{D_{SpecLimit}} \right)$$

where

$E_{SpecLimit}$	is the field strength of the emission at the distance specified by the limit, in dBuV/m
E_{Meas}	is the field strength of the emission at the measurement distance, in dBuV/m
D_{Meas}	is the measurement distance, in m
$D_{SpecLimit}$	is the distance specified by the limit, in m

Note 1: If the maximized peak measured value is under the QP/Average limit by more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Note 2: For above 1GHz, the test result of peak was 20dB below to the limit of peak, which can be compliant to the average limit, so just peak value was recorded.

Calculation

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

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Over Limit/Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

$$\begin{aligned} \text{Over Limit/Margin} &= \text{Level / Corrected Amplitude} - \text{Limit} \\ \text{Level / Corrected Amplitude} &= \text{Read Level} + \text{Factor} \end{aligned}$$

Test Data

For Radiated Spurious Emissions, after pre-scan testing in the X, Y and Z axes of orientation, the worst case as setup photos was recorded.

9kHz-1GHz

Environmental Conditions

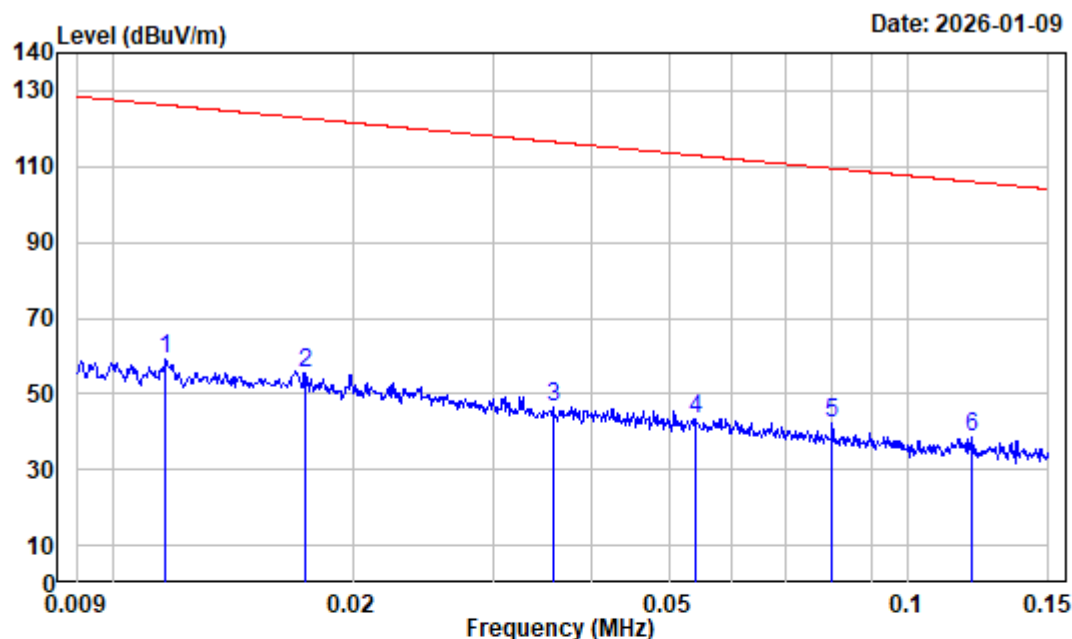
Temperature:	17.3 °C
Relative Humidity:	36 %
ATM Pressure:	101.8 kPa
Test Engineer:	Jayden Luo
Test Date:	2026-01-09
EUT Operation Mode:	LoRa Transmitting

Test Result: Compliance, please refer to the below data.

Note 1: The Loop Antenna were tested in parallel, perpendicular, and ground-parallel. The worst orientation was parallel and the data was recorded in report.

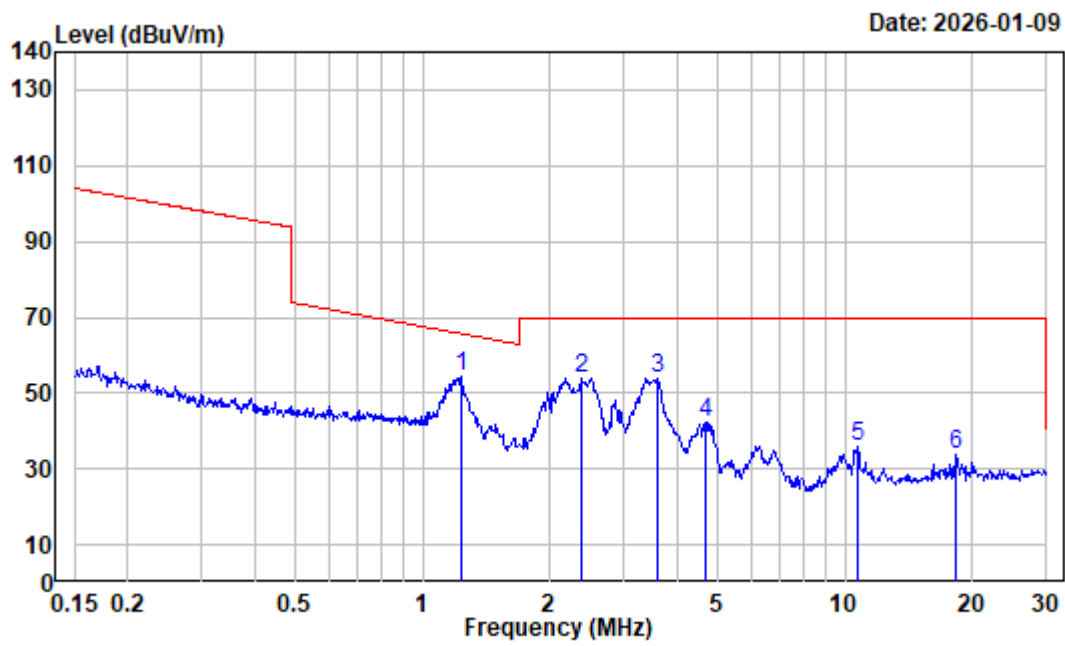
Note 2: The maximum output power mode and channel: Low Channel was tested.

9kHz~30MHz:



Site : chamber
Condition : 3m
Job No. : 2504A01367E-RF
Polarization : Parallel Tester: Jayden Luo
Test Mode : LoRa Transmitting
Note : 903MHz BW:500kHz
Receiver Setting: RBW:300Hz VBW:1kHz

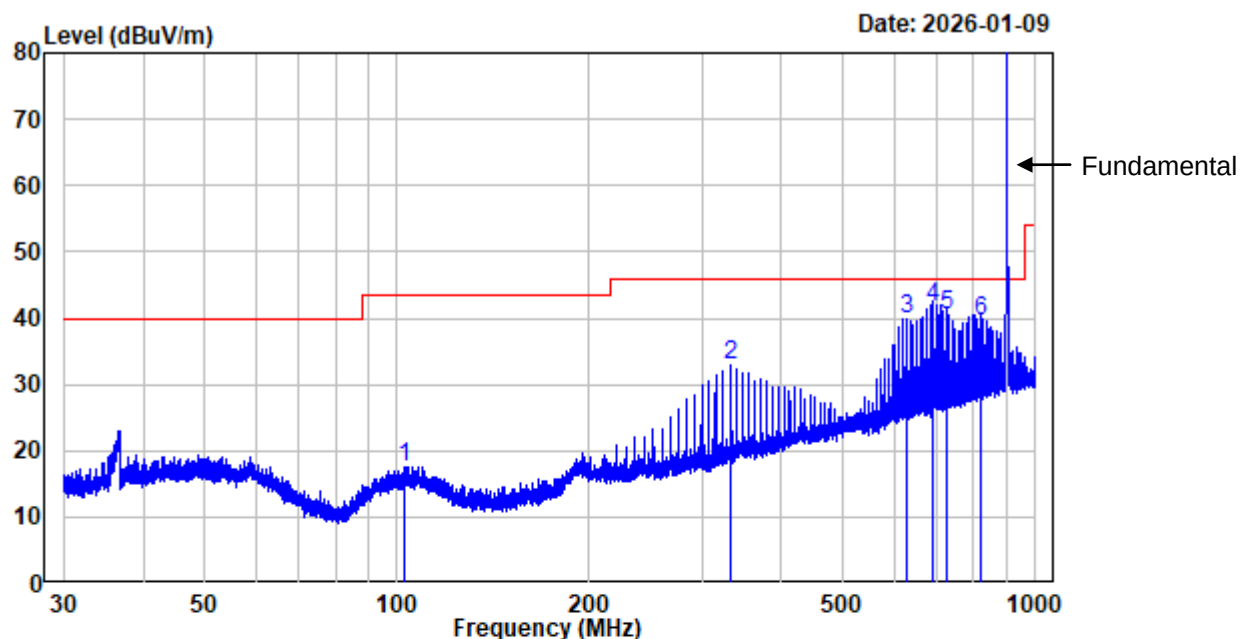
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.012	35.09	24.06	59.15	126.27	-67.12	Peak
2	0.017	32.53	23.02	55.55	122.78	-67.23	Peak
3	0.036	25.77	20.72	46.49	116.55	-70.06	Peak
4	0.054	22.23	21.17	43.40	112.95	-69.55	Peak
5	0.080	18.50	23.73	42.23	109.51	-67.28	Peak
6	0.120	15.53	23.21	38.74	106.01	-67.27	Peak



Site : chamber
Condition : 3m
Job No. : 2504A01367E-RF
Polarization : Parallel Tester: Jayden Luo
Test Mode : LoRa Transmitting
Note : 903MHz BW:500kHz
Receiver Setting: RBW:10kHz VBW:30kHz

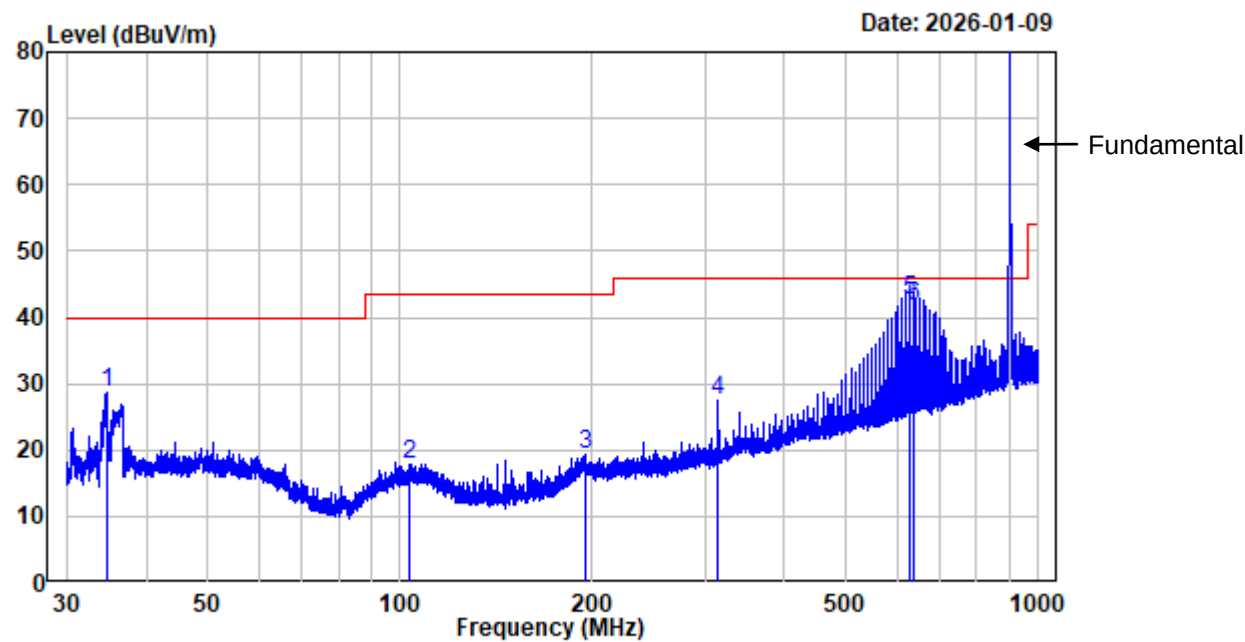
Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1.236	-2.67	56.95	54.28	65.60	-11.32 Peak
2	2.384	-5.55	59.60	54.05	69.54	-15.49 Peak
3	3.584	-6.11	59.74	53.63	69.54	-15.91 Peak
4	4.672	-6.30	48.76	42.46	69.54	-27.08 Peak
5	10.733	-5.17	41.15	35.98	69.54	-33.56 Peak
6	18.328	-3.73	37.78	34.05	69.54	-35.49 Peak

30MHz~1GHz:



Site : chamber
 Condition : 3m HORIZONTAL
 Job No. : 2504A01367E-RF Tester: Jayden Luo
 Test Mode : LoRa Transmitting
 Note : 903MHz BW:500kHz
 Receiver Setting: RBW:100kHz VBW:300kHz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	102.494	-11.25	28.76	17.51	43.50	-25.99	Peak
2	332.082	-7.61	40.57	32.96	46.00	-13.04	Peak
3	628.099	-1.71	41.47	39.76	46.00	-6.24	Peak
4	691.987	-1.12	42.67	41.55	46.00	-4.45	QP
5	724.261	-0.64	41.21	40.57	46.00	-5.43	QP
6	820.271	0.43	39.18	39.61	46.00	-6.39	QP



Site : chamber
Condition : 3m VERTICAL
Job No. : 2504A01367E-RF Tester: Jayden Luo
Test Mode : LoRa Transmitting
Note : 903MHz BW:500kHz
Receiver Setting: RBW:100kHz VBW:300kHz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	34.669	-11.64	40.20	28.56	40.00	-11.44	Peak
2	103.261	-11.22	29.17	17.95	43.50	-25.55	Peak
3	195.736	-9.86	29.10	19.24	43.50	-24.26	Peak
4	314.928	-8.62	36.07	27.45	46.00	-18.55	Peak
5	628.099	-1.71	44.40	42.69	46.00	-3.31	QP
6	636.134	-1.56	43.22	41.66	46.00	-4.34	QP

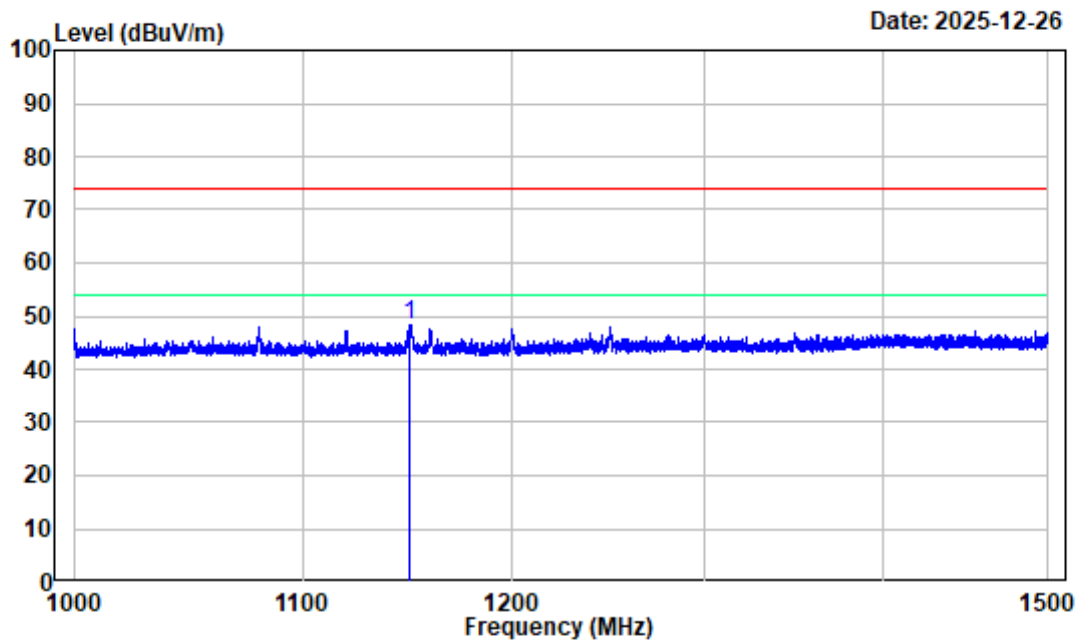
1GHz-10GHz

Environmental Conditions

Temperature:	23.3 °C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa
Test Engineer:	Angel Chen
Test Date:	2025-12-26
EUT Operation Mode:	Transmitting

Test Result: Compliance, please refer to the below data.

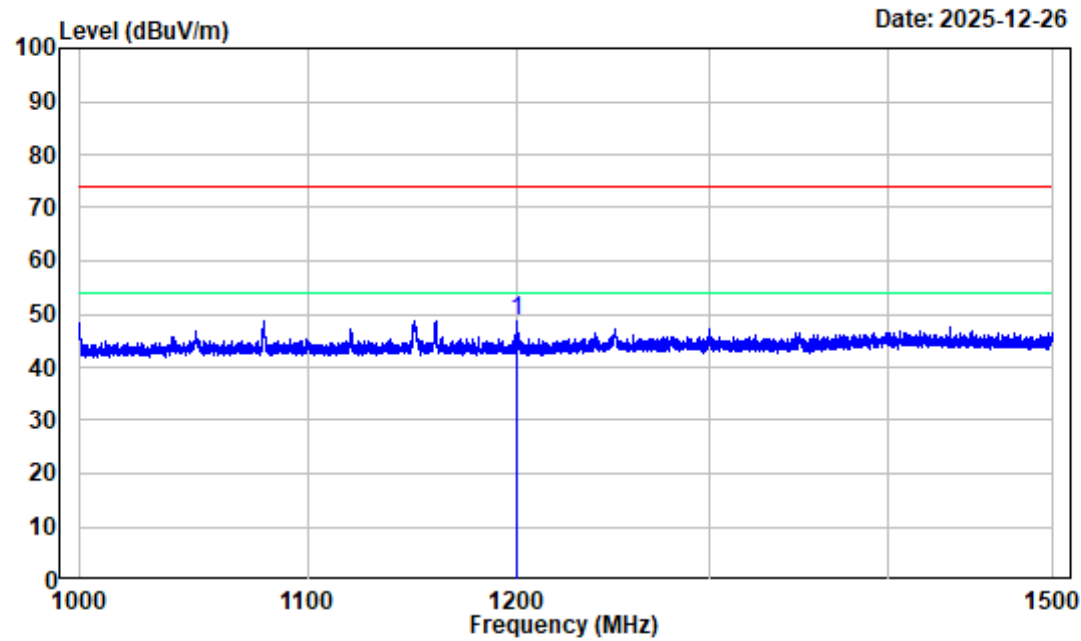
LORA Low Channel 1GHz-1.5GHz_HORTZONTAL



Site : chamber
Condition : 3m HORIZONTAL
Project No.: 2504A01367E-RF
Test Mode : Transmitting Tester:Angel Chen
Note : LORA Low Channel 903.0MHz 1GHz-1.5GHz
SA setting : Peak:RBW:1MHz,VBW:3MHz

Freq Factor		Read	Limit	Over	Remark	
MHz	dB/m	Level	Level	Line		
		dBuV	dBuV/m	dBuV/m	dB	
1	1150.250	-14.18	62.61	48.43	74.00	-25.57 Peak

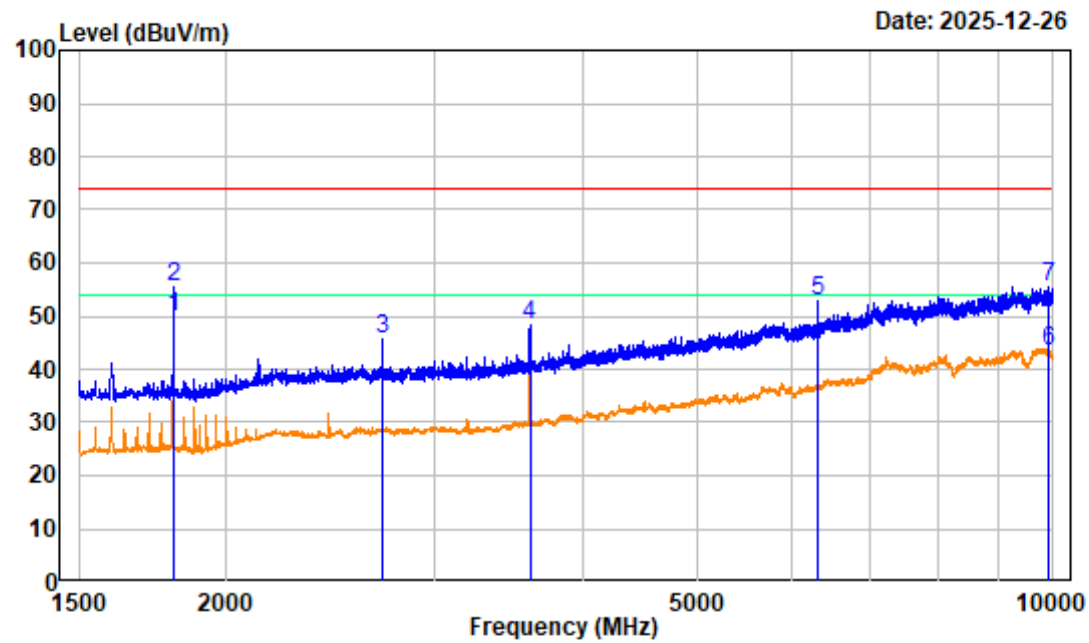
LORA Low Channel 1GHz-1.5GHz_VERTICAL



Site : chamber
Condition : 3m VERTICAL
Project No.: 2504A01367E-RF
Test Mode : Transmitting Tester:Angel Chen
Note : LORA Low Channel 903.0MHz 1GHz-1.5GHz
SA setting : Peak:RBW:1MHz,VBW:3MHz

Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1 1200.063	-14.49	63.34	48.85	74.00	-25.15	Peak

LORA Low Channel 1.5GHz-10GHz_HORIZONTAL



Site : chamber

Condition : 3m HORIZONTAL

Project No.: 2504A01367E-RF

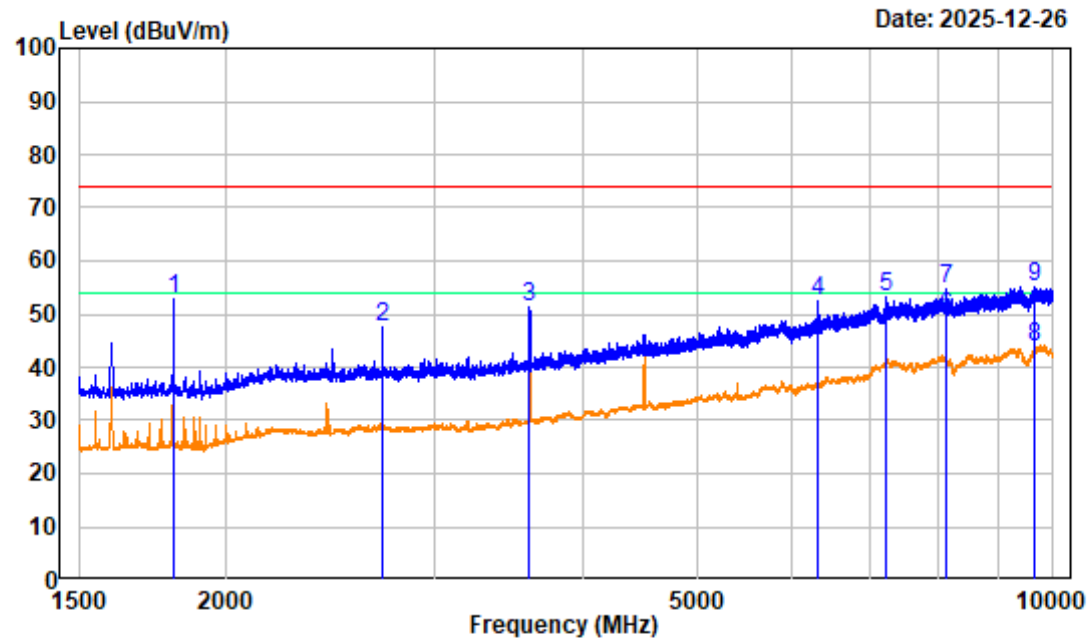
Test Mode : TransmittingTester:Angel Chen

Note : LORA Low Channel 903.0MHz 1.5GHz-10GHz

SA setting : Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz

Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1804.375	-12.80	62.56	49.76	54.00	-4.24 Average
2	1804.375	-12.80	68.13	55.33	74.00	-18.67 Peak
3	2706.625	-9.73	55.25	45.52	74.00	-28.48 Peak
4	3610.000	-9.23	57.36	48.13	74.00	-25.87 Peak
5	6314.500	-4.34	57.08	52.74	74.00	-21.26 Peak
6	9915.625	2.13	41.27	43.40	54.00	-10.60 Average
7	9915.625	2.13	53.32	55.45	74.00	-18.55 Peak

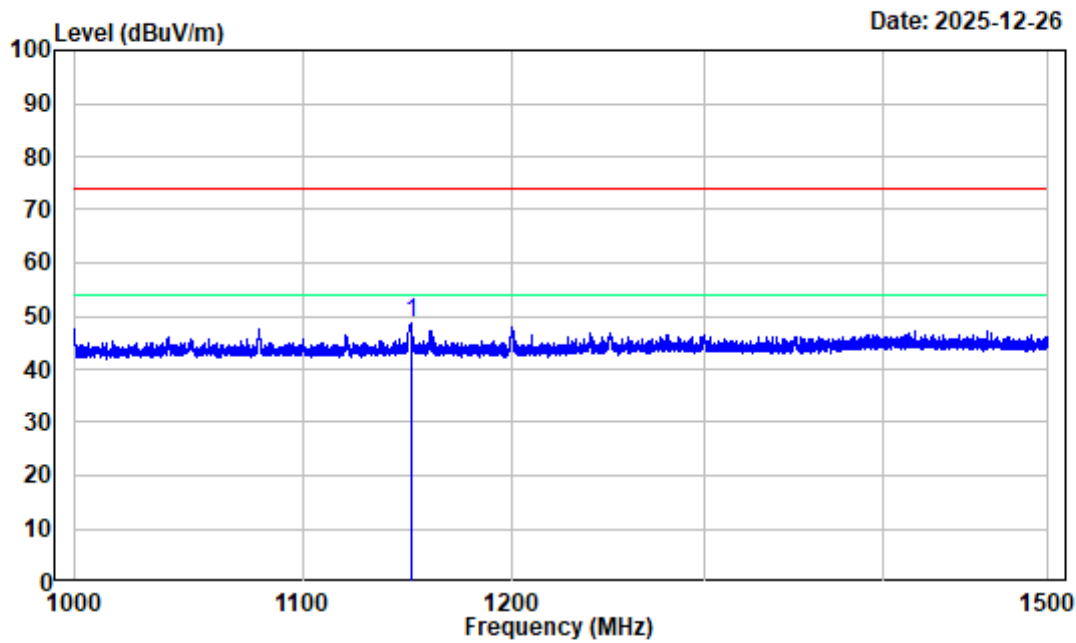
LORA Low Channel 1.5GHz-10GHz_VERTICAL



Site : chamber
Condition : 3m VERTICAL
Project No.: 2504A01367E-RF
Test Mode : Transmitting Tester:Angel Chen
Note : LORA Low Channel 903.0MHz 1.5GHz-10GHz
SA setting : Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz

Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1804.375	-12.80	65.47	52.67	74.00	-21.33 Peak
2	2705.500	-9.72	57.12	47.40	74.00	-26.60 Peak
3	3608.875	-9.23	60.56	51.33	74.00	-22.67 Peak
4	6316.750	-4.35	56.66	52.31	74.00	-21.69 Peak
5	7219.000	-1.35	54.63	53.28	74.00	-20.72 Peak
6	8120.125	-0.56	50.05	49.49	54.00	-4.51 Average
7	8120.125	-0.56	55.13	54.57	74.00	-19.43 Peak
8	9656.875	1.79	42.12	43.91	54.00	-10.09 Average
9	9656.875	1.79	53.47	55.26	74.00	-18.74 Peak

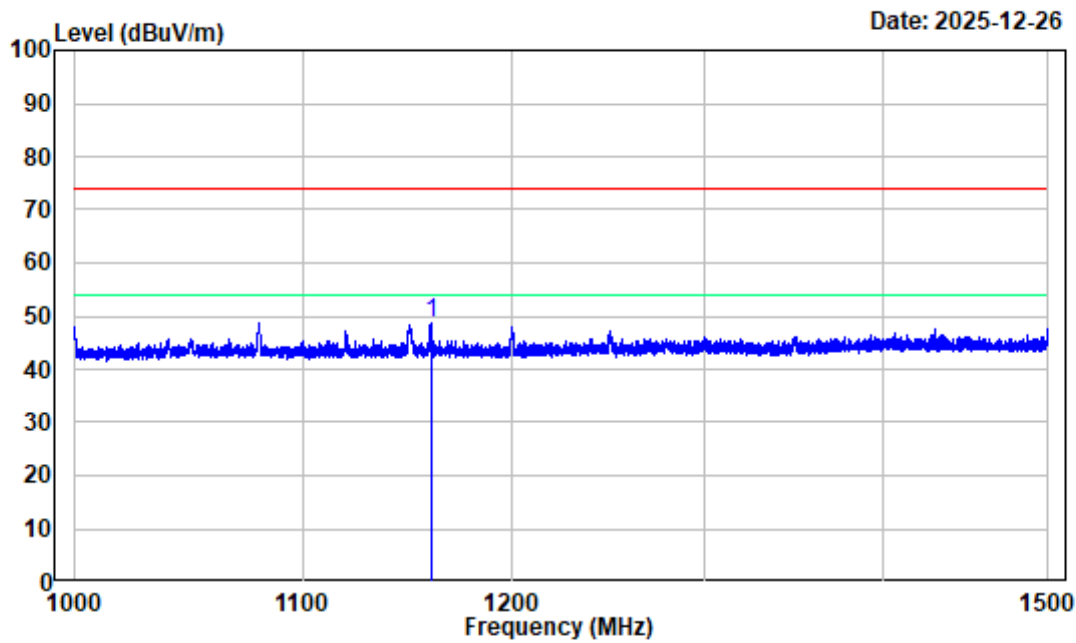
LORA Middle Channel 1GHz-1.5GHz_HORIZONTAL



Site : chamber
Condition : 3m HORIZONTAL
Project No.: 2504A01367E-RF
Test Mode : Transmitting Tester:Angel Chen
Note : LORA Middle Channel 908.7MHz 1GHz-1.5GHz
SA setting : Peak:RBW:1MHz,VBW:3MHz

Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1150.563	-14.18	62.72	48.54	74.00	-25.46 Peak

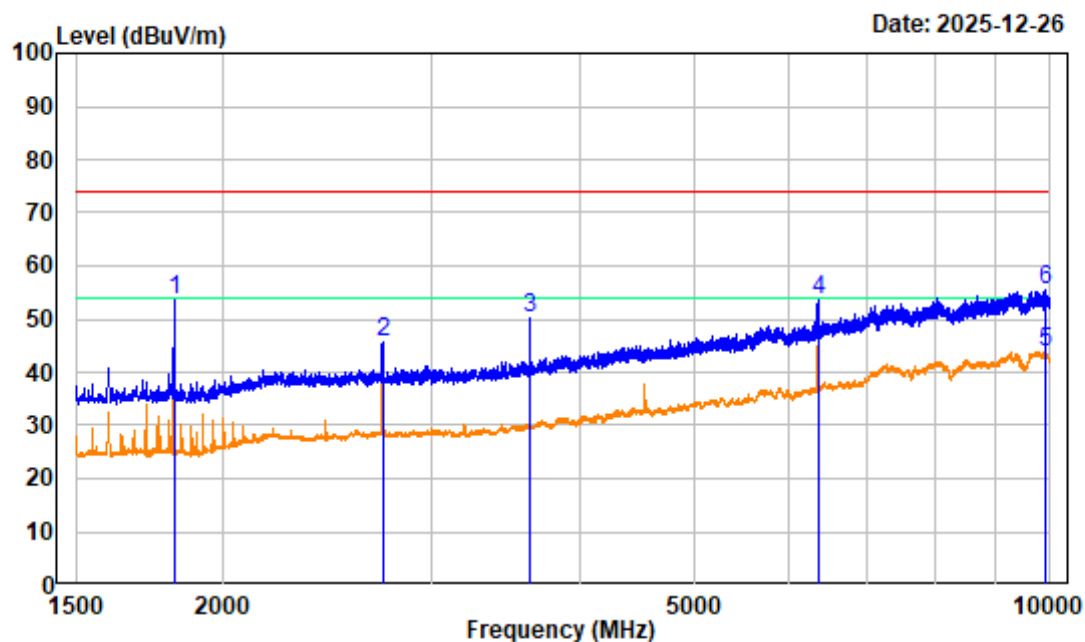
LORA Middle Channel 1GHz-1.5GHz_VERTICAL



Site : chamber
Condition : 3m VERTICAL
Project No.: 2504A01367E-RF
Test Mode : Transmitting Tester:Angel Chen
Note : LORA Middle Channel 908.7MHz 1GHz-1.5GHz
SA setting : Peak:RBW:1MHz,VBW:3MHz

Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1160.125	-14.24	62.92	48.68	74.00	-25.32 Peak

LORA Middle Channel 1.5GHz-10GHz_HORIZONTAL



Site : chamber

Condition : 3m HORIZONTAL

Project No.: 2504A01367E-RF

Test Mode : Transmitting

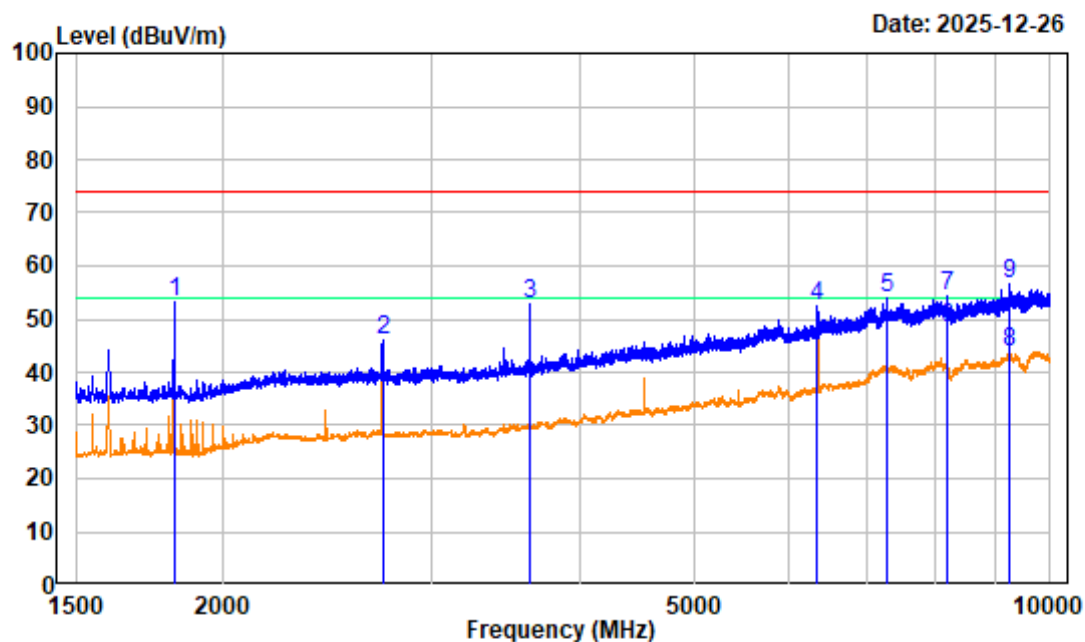
Tester: Angel Chen

Note : LORA Middle Channel 908.7MHz 1.5GHz-10GHz

SA setting : Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz

	Freq Factor		Read	Limit	Over	Remark
	MHz	dB/m	Level	Line	Limit	
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB
1	1817.875	-12.87	66.61	53.74	74.00	-20.26 Peak
2	2725.750	-9.84	55.38	45.54	74.00	-28.46 Peak
3	3634.750	-9.11	59.22	50.11	74.00	-23.89 Peak
4	6362.875	-4.27	57.68	53.41	74.00	-20.59 Peak
5	9897.625	2.04	41.74	43.78	54.00	-10.22 Average
6	9897.625	2.04	53.58	55.62	74.00	-18.38 Peak

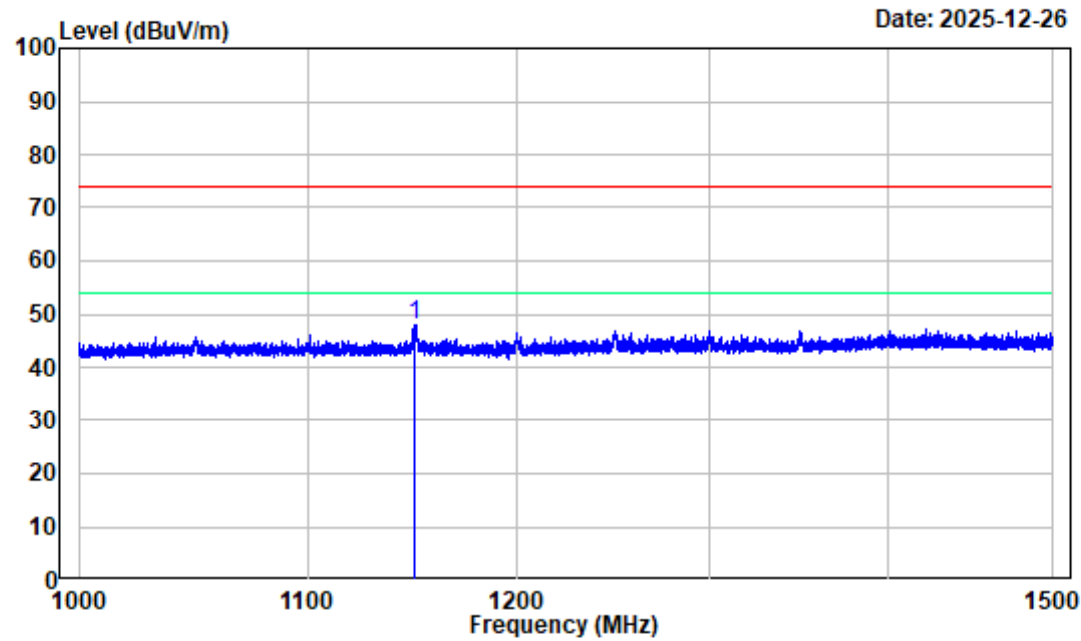
LORA Middle Channel 1.5GHz-10GHz_VERTICAL



Site : chamber
 Condition : 3m VERTICAL
 Project No.: 2504A01367E-RF
 Test Mode : Transmitting Tester:Angel Chen
 Note : LORA Middle Channel 908.7MHz 1.5GHz-10GHz
 SA setting : Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1817.875	-12.87	66.12	53.25	74.00	-20.75	Peak
2	2725.750	-9.84	55.90	46.06	74.00	-27.94	Peak
3	3634.750	-9.11	61.81	52.70	74.00	-21.30	Peak
4	6360.625	-4.31	56.83	52.52	74.00	-21.48	Peak
5	7268.500	-1.22	55.17	53.95	74.00	-20.05	Peak
6	8177.500	-0.60	49.00	48.40	54.00	-5.60	Average
7	8177.500	-0.60	54.79	54.19	74.00	-19.81	Peak
8	9228.250	1.48	42.36	43.84	54.00	-10.16	Average
9	9228.250	1.48	54.98	56.46	74.00	-17.54	Peak

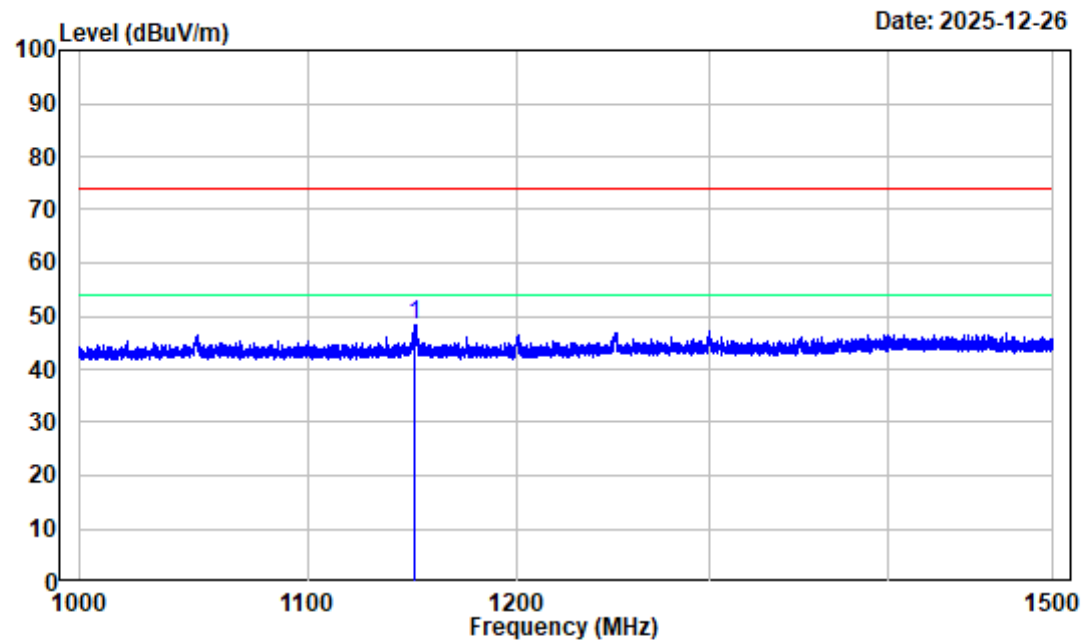
LORA High Channel 1GHz-1.5GHz_HORIZONTAL



Site : chamber
Condition : 3m HORIZONTAL
Project No.: 2504A01367E-RF
Test Mode : Transmitting Tester:Angel Chen
Note : LORA High Channel 914.9MHz 1GHz-1.5GHz
SA setting : Peak:RBW:1MHz,VBW:3MHz

Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1150.375	-14.18	62.14	47.96	74.00	-26.04 Peak

LORA High Channel 1GHz-1.5GHz_VERTICAL



Site : chamber

Condition : 3m VERTICAL

Project No.: 2504A01367E-RF

Test Mode : Transmitting

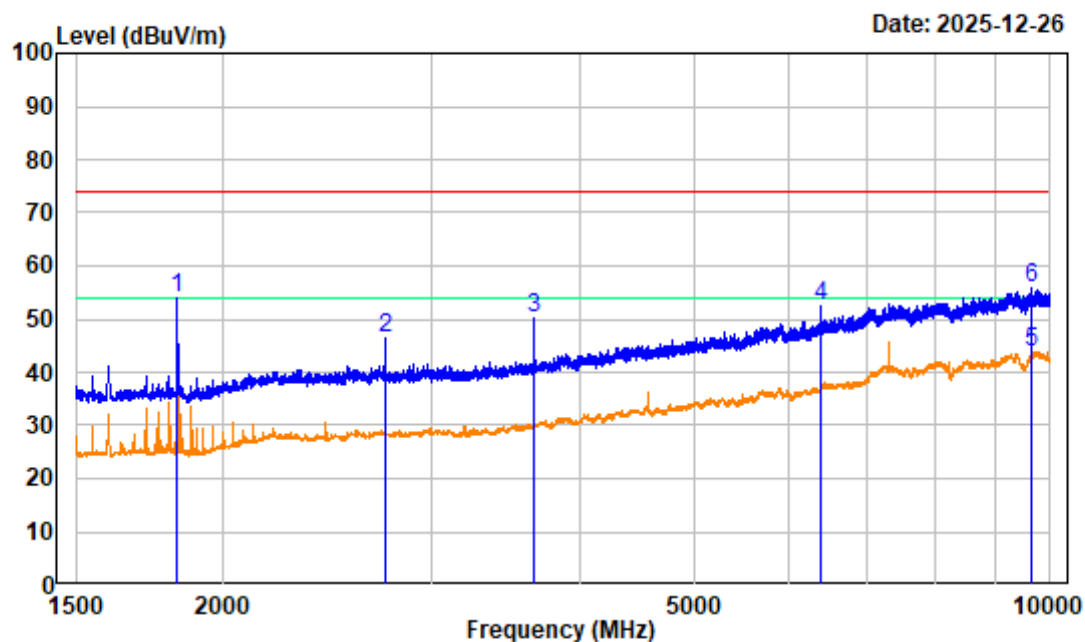
Tester:Angel Chen

Note : LORA High Channel 914.9MHz 1GHz-1.5GHz

SA setting : Peak:RBW:1MHz,VBW:3MHz

Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1150.125	-14.18	62.41	48.23	74.00	-25.77 Peak

LORA High Channel 1.5GHz-10GHz_HORIZONTAL



Site : chamber

Condition : 3m HORIZONTAL

Project No.: 2504A01367E-RF

Test Mode : Transmitting

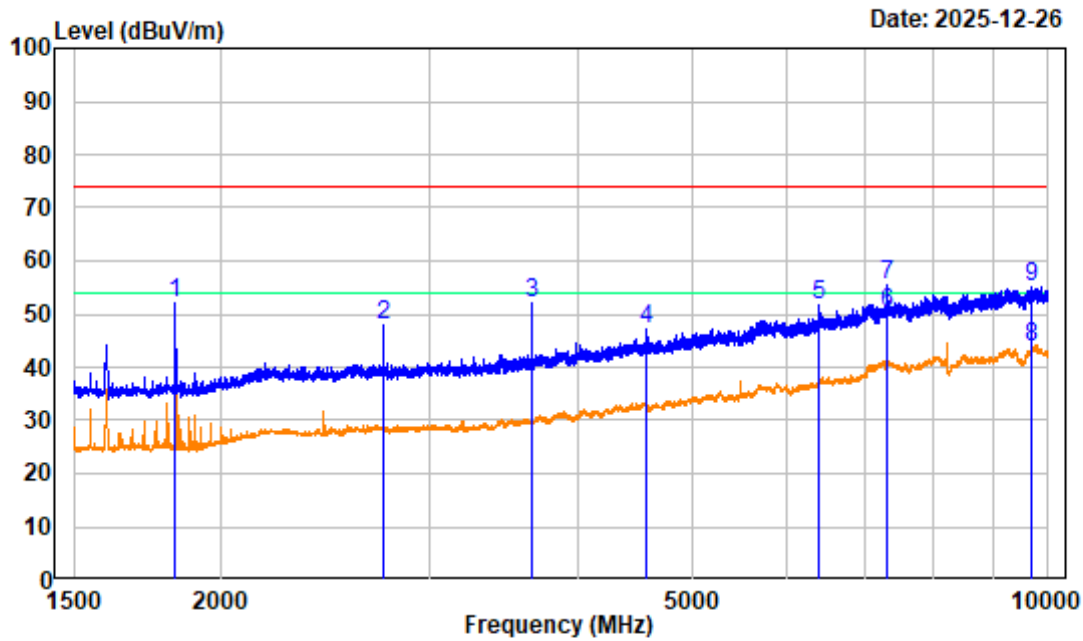
Tester: Angel Chen

Note : LORA High Channel 914.9MHz 1.5GHz-10GHz

SA setting : Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz

	Freq Factor		Read Level		Limit	Over	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1828.000	-12.93	66.81	53.88	74.00	-20.12	Peak
2	2742.625	-9.93	56.43	46.50	74.00	-27.50	Peak
3	3656.125	-9.03	59.27	50.24	74.00	-23.76	Peak
4	6400.000	-3.67	56.05	52.38	74.00	-21.62	Peak
5	9641.125	1.73	42.04	43.77	54.00	-10.23	Average
6	9641.125	1.73	54.08	55.81	74.00	-18.19	Peak

LORA High Channel 1.5GHz-10GHz_VERTICAL



Site : chamber

Condition : 3m VERTICAL

Project No.: 2504A01367E-RF

Test Mode : TransmittingTester:Angel Chen

Note : LORA High Channel 914.9MHz 1.5GHz-10GHz

SA setting : Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1828.000	-12.93	65.14	52.21	74.00	-21.79	Peak
2	2742.625	-9.93	57.79	47.86	74.00	-26.14	Peak
3	3657.250	-9.03	61.12	52.09	74.00	-21.91	Peak
4	4570.750	-6.75	53.79	47.04	74.00	-26.96	Peak
5	6398.875	-3.68	55.35	51.67	74.00	-22.33	Peak
6	7315.750	-1.15	51.44	50.29	54.00	-3.71	Average
7	7315.750	-1.15	56.58	55.43	74.00	-18.57	Peak
8	9689.500	1.99	41.82	43.81	54.00	-10.19	Average
9	9689.500	1.99	53.29	55.28	74.00	-18.72	Peak

6 dB EMISSION BANDWIDTH & OCCUPIED 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.

Test Procedure

According to ANSI C63.10-2020, section 11.8 and section 6.9

The steps for the first option are as follows:

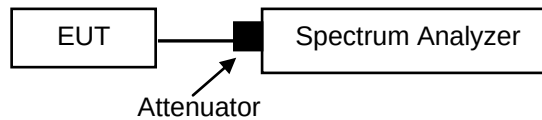
- a) Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
- b) Set the VBW $\geq [3 \times \text{RBW}]$.
- c) Detector = peak.
- d) Trace mode = max-hold.
- e) Sweep = No faster than coupled (auto) time.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “–6 dB down amplitude”. If a marker is below this “–6 dB down amplitude” value, then it shall be as close as possible to this value.

According to ANSI C63.10-2020, section 7.8.6 and section 6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

- a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be at least three times the RBW, unless otherwise specified by the applicable requirement.
- c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (\text{OBW}/\text{RBW})]$ below the reference level. Specific guidance is given in 4.1.6.2.
- d) Step a) through step c) might require iteration to adjust within the specified range.
- e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max-hold mode (until the trace stabilizes) shall be used.
- f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

- g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power 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; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
- h) The occupied bandwidth shall be reported by providing spectral plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).



Note: Offset = RF cable loss(0.5dB[#]) + Attenuator(10dB)

Test Data

Test Result: Compliance. Please refer to the Appendix.

MAXIMUM CONDUCTED OUTPUT POWER

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.

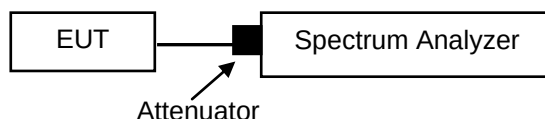
Test Procedure

According to ANSI C63.10-2020, section 11.9.1.1

- Measurement using a spectrum analyzer (SA)

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:

- Set the RBW $\geq$ DTS bandwidth.
- Set VBW $\geq [3 \times \text{RBW}]$.
- Set span $\geq [3 \times \text{RBW}]$.
- Sweep time = No faster than coupled (auto) time.
- Detector = peak.
- Trace mode = max-hold.
- Allow trace to fully stabilize.
- Use peak marker function to determine the peak amplitude level.



Note: Offset = RF cable loss(0.5dB[#]) + Attenuator(10dB)

Test Data

Test Result: Compliance. Please refer to the Appendix.

CONDUCTED SPURIOUS EMISSION

Applicable Standard

According to FCC §15.247(d):

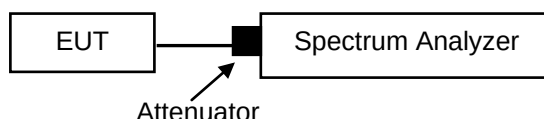
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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)).

Test Procedure

According to ANSI C63.10-2020, section 11.11

- Set the center frequency and span to encompass frequency range to be measured. Note that the frequency range might need to be divided into multiple frequency ranges to retain frequency resolution. NOTE—the number of points can also be increased for large spans to retain frequency resolution
- Set the RBW: 100 kHz
- Set the VBW $\geq [3 \times \text{RBW}]$.
- Detector = peak.
- Sweep time = No faster than coupled (auto) time.
- Trace mode = max-hold.
- Allow trace to fully stabilize.
- 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.



Note: Offset = RF cable loss(0.5dB[#]/2.0dB[#]) + Attenuator(10dB)

The cable loss of 0.5dB[#] has been added into test result, except for test result of frequencies from 30 MHz to 10 GHz, where a maximum cable loss of 2.0dB[#] has been added.

Test Data

Test Result: Compliance. Please refer to the Appendix.

POWER SPECTRAL DENSITY

Applicable Standard

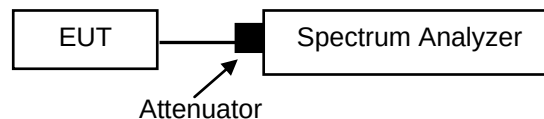
According to FCC §15.247(e):

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.

Test Procedure

According to ANSI C63.10-2020, section 11.10.2

- Set analyzer center frequency to DTS channel center frequency.
- Set the span >1.5 times the DTS bandwidth.
- Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq [3 \times \text{RBW}]$.
- Detector = peak.
- Sweep time = No faster than coupled (auto) time.
- Trace mode = max-hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.



Note: Offset = RF cable loss($0.5\text{dB}^{\#}$) + Attenuator(10dB)

Test Data

Test Result: Compliance. Please refer to the Appendix.

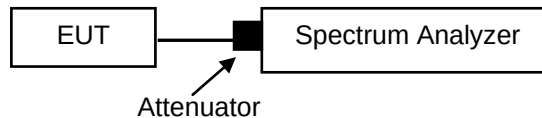
DUTY CYCLE

Test Procedure

According to ANSI C63.10-2020 Section 11.6

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

- a) A diode detector and an oscilloscope that together have a sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.
- b) The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:
 - 1) Set the center frequency of the instrument to the center frequency of the transmission.
 - 2) Set $RBW \geq OBW$ if possible; otherwise, set RBW to the largest available value.
 - 3) Set $VBW \geq RBW$. Set detector = peak or average.
 - 4) The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if $T \leq 16.7 \mu s$.)



Note: Offset = RF cable loss(0.5dB[#]) + Attenuator(10dB)

Test Data

Test Result: Compliance. Please refer to the Appendix.

APPENDIX

Test Information:

Sample No.:	3ELP-1	Test Date:	2025/12/27-2026/01/06
Test Site:	RF	Test Mode:	Transmitting
Tester:	Benny Li	Test Result:	Pass

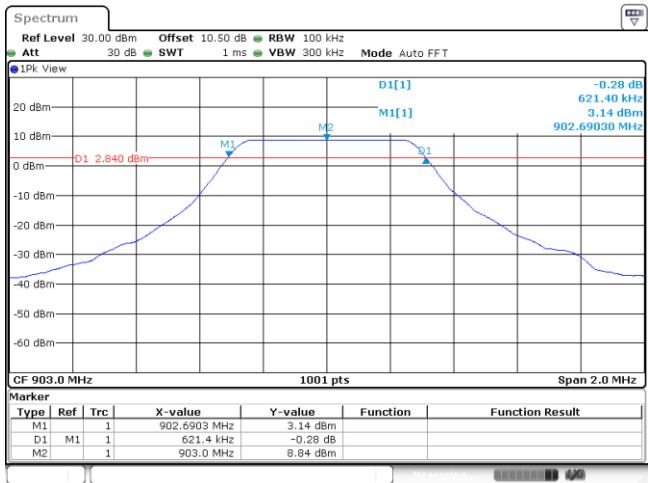
Environmental Conditions:

Temperature: (°C)	24.6-25.1	Relative Humidity: (%)	42-48	ATM Pressure: (kPa)	100.9-101.8
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6dB Emission Bandwidth

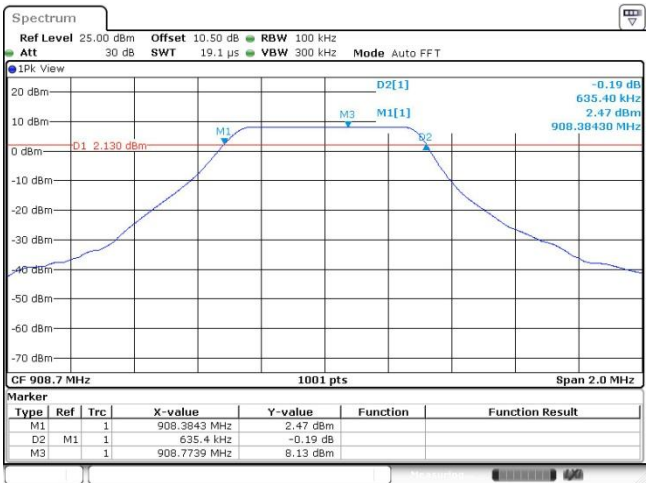
Channel	Result (MHz)	Limit (MHz)	Verdict
Low	0.6214	≥0.5	Pass
Middle	0.6354	≥0.5	Pass
High	0.6214	≥0.5	Pass

500K_Low_Channel



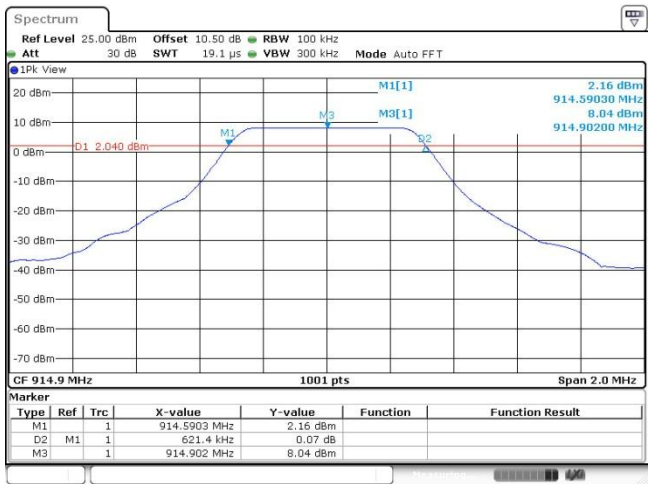
ProjectNo.:2504A01367E-RF Tester:Benny Li
Date: 6.JAN.2026 16:26:07

500K_Middle_Channel



ProjectNo.:2504A01367E-RF Tester:Benny Li
Date: 27.DEC.2025 15:58:07

500K_High_Channel

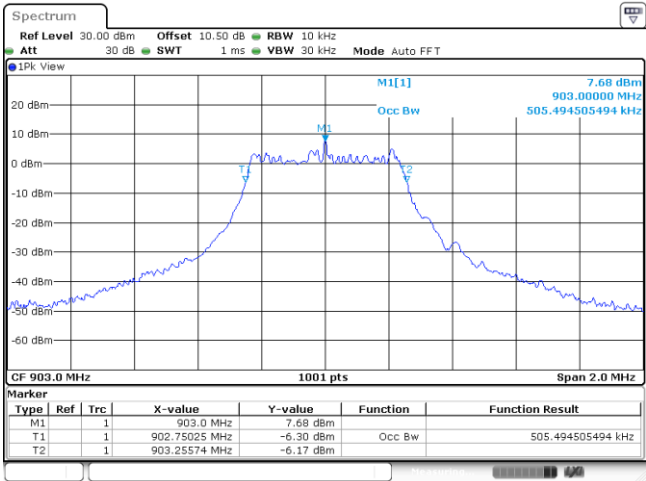


ProjectNo.:2504A01367E-RF Tester:Benny Li
Date: 27.DEC.2025 16:02:25

99% Occupied Bandwidth

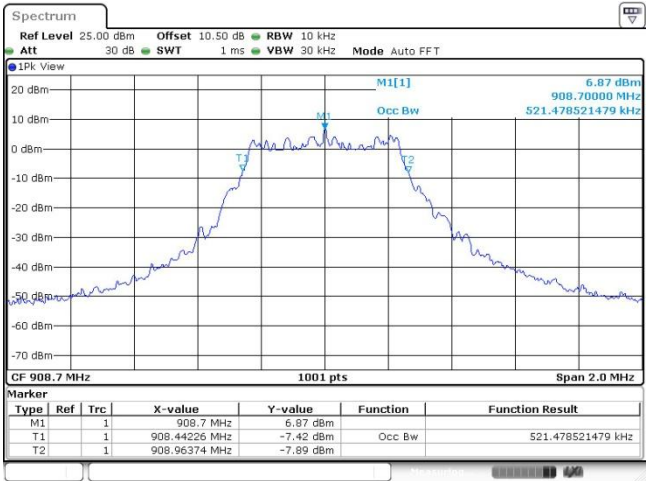
Channel	99% OBW (MHz)
Low	0.50549
Middle	0.52148
High	0.50350

500K_Low_Channel



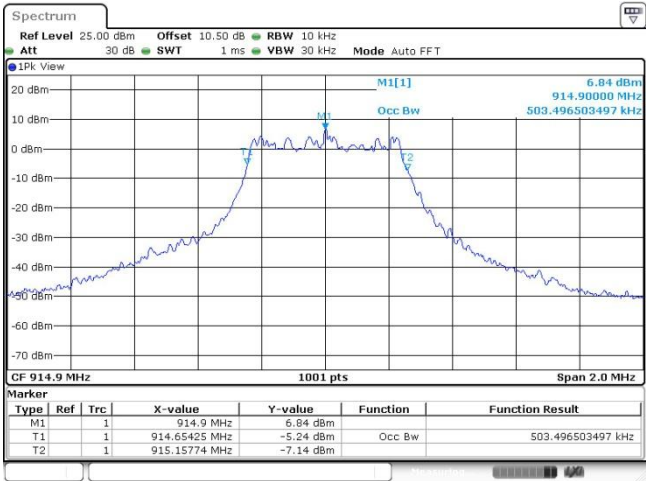
ProjectNo.:2504A01367E-RF Tester:Benny LI
Date: 6.JAN.2026 16:24:08

500K_Middle_Channel



ProjectNo.:2504A01367E-RF Tester:Benny LI
Date: 27.DEC.2025 16:11:07

500K_High_Channel

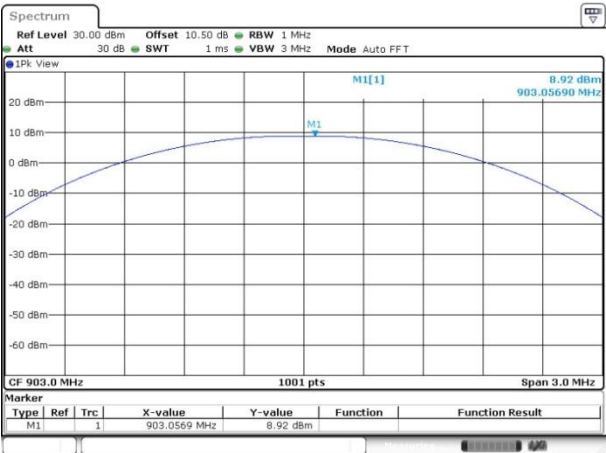


ProjectNo.:2504A01367E-RF Tester:Benny LI
Date: 27.DEC.2025 16:12:29

Maximum Conducted Output Power

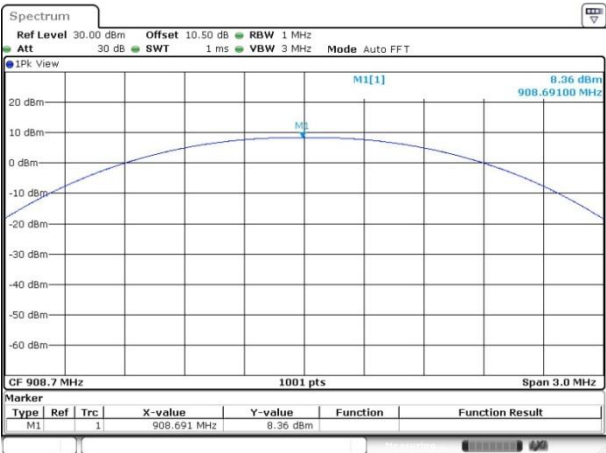
Channel	Peak Output Power (dBm)	Limit (dBm)	Verdict
Low	8.92	30.00	Pass
Middle	8.36	30.00	Pass
High	8.26	30.00	Pass

500K_Low_Channel



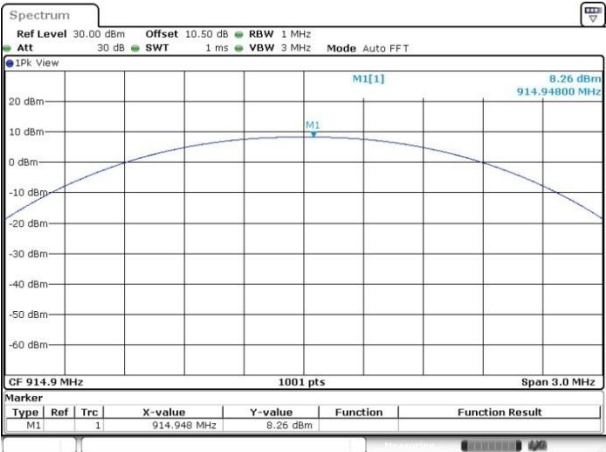
ProjectNo.:2504A01367E-RF Tester:Benny Li
Date: 6.JAN.2026 20:32:33

500K_Middle_Channel



ProjectNo.:2504A01367E-RF Tester:Benny Li
Date: 6.JAN.2026 20:26:40

500K_High_Channel

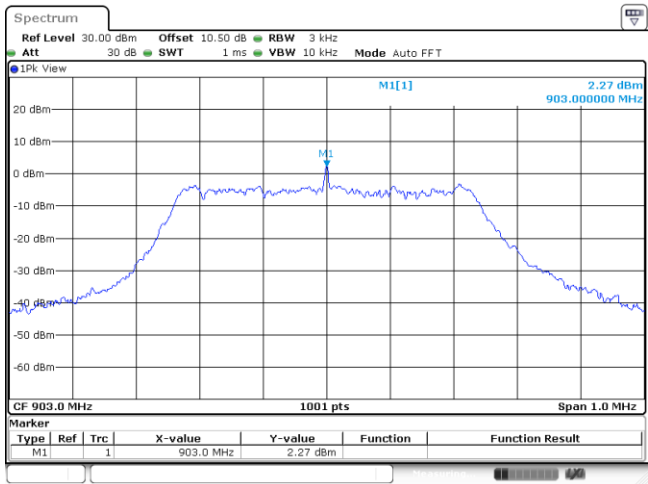


ProjectNo.:2504A01367E-RF Tester:Benny Li
Date: 6.JAN.2026 20:24:31

Power Spectral Density

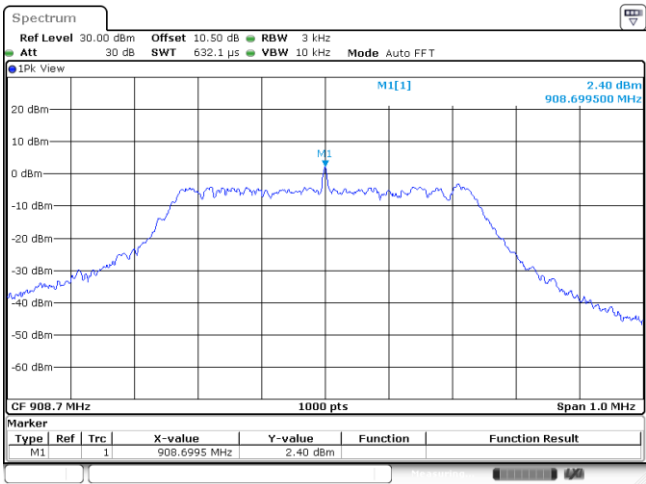
Channel	Result (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
Low	2.27	8	Pass
Middle	2.40	8	Pass
High	2.34	8	Pass

500K_Low_Channel



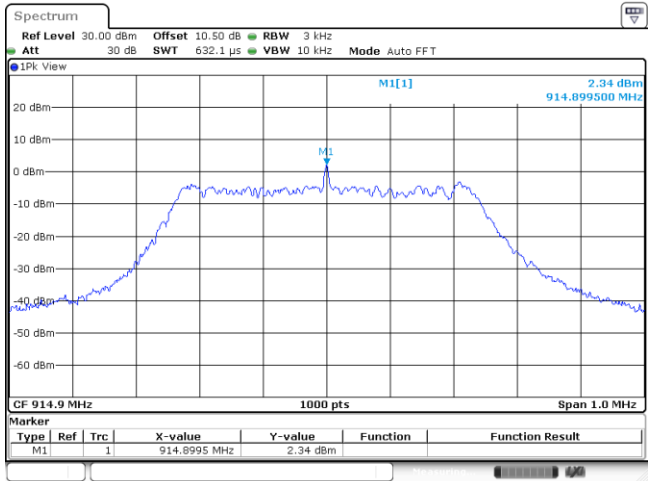
ProjectNo.:2504A01367E-RF Tester:Benny LI
Date: 6.JAN.2026 16:27:41

500K_Middle_Channel



ProjectNo.:2504A01367E-RF Tester:Benny LI
Date: 6.JAN.2026 15:44:20

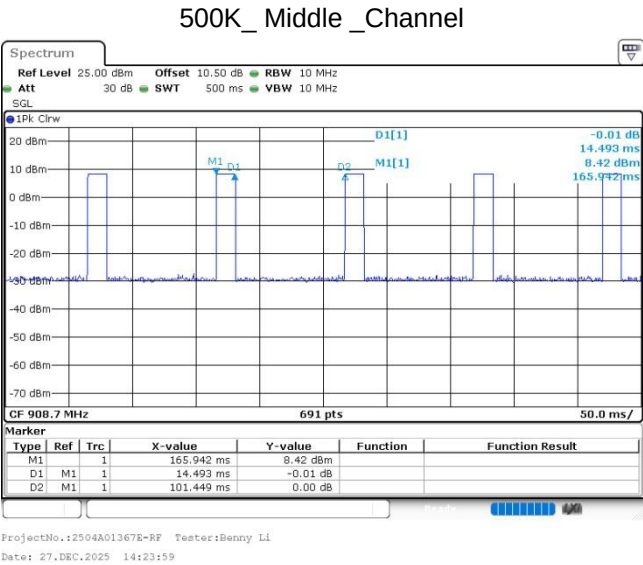
500K_High_Channel



ProjectNo.:2504A01367E-RF Tester:Benny LI
Date: 6.JAN.2026 15:45:33

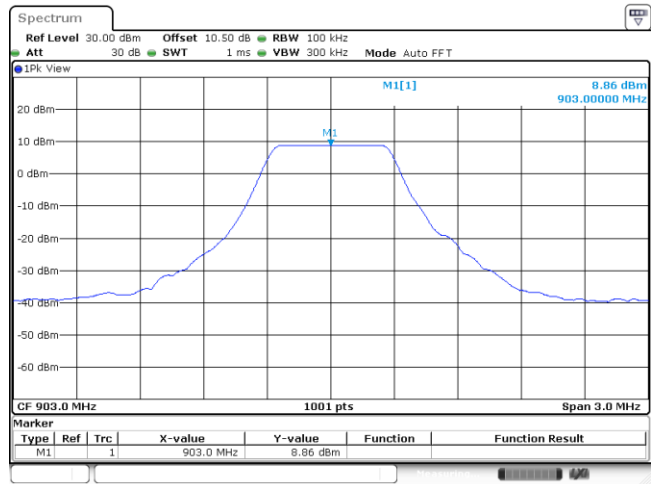
Duty Cycle

Channel	Ton (ms)	Ton+Toff (ms)	Duty Cycle (%)	Duty Cycle Factor(dB)	1/Ton (Hz)	VBW Setting (kHz)
Middle	14.493	101.449	14.29	8.45	68.999	0.100



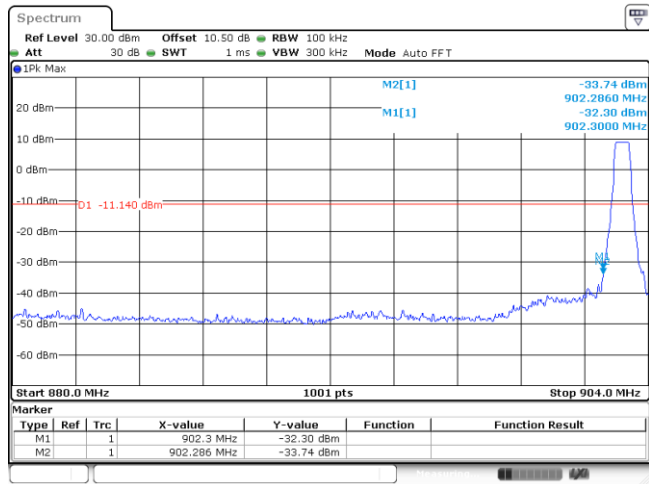
Conducted Spurious Emission

Low_Channel-1



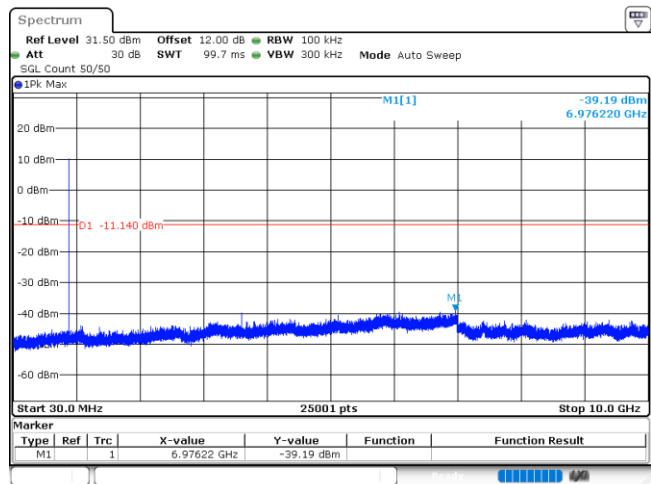
ProjectNo.:2504A01367E-RF Tester:Benny LI
Date: 6.JAN.2026 16:31:34

Low_Channel-2



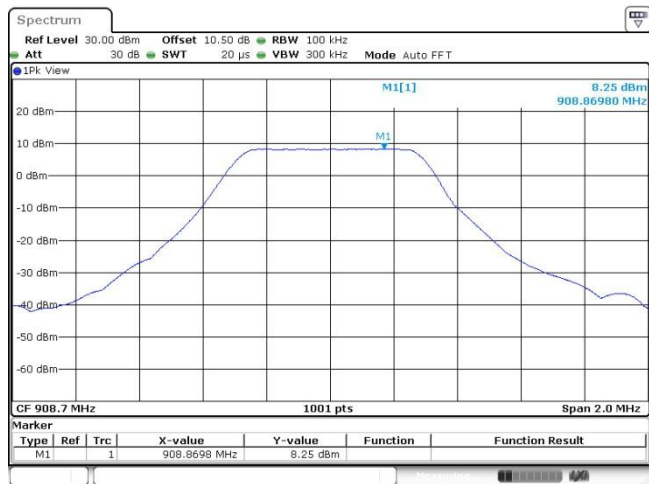
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Date: 6.JAN.2026 16:36:32

Low_Channel-3



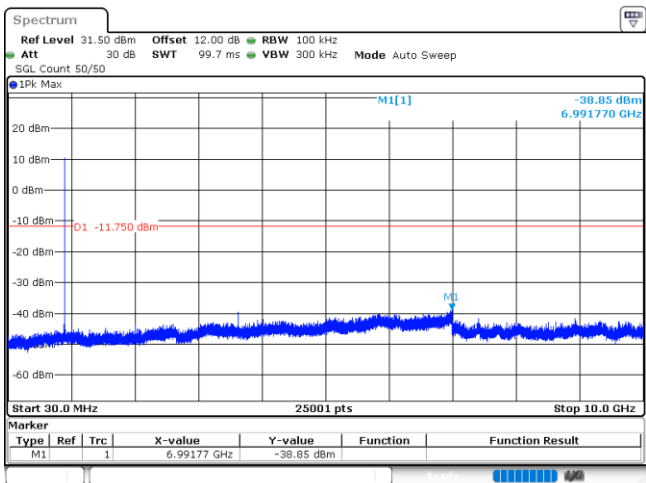
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Date: 6.JAN.2026 16:45:15

Middle_Channel-1



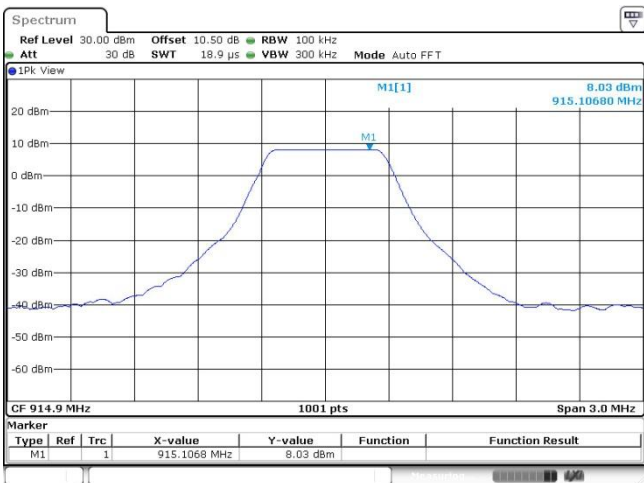
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Date: 27.DEC.2025 15:11:11

Middle_Channel-2



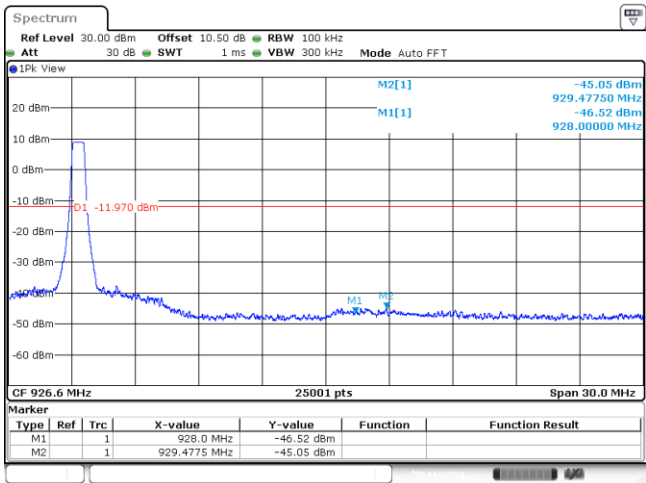
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Date: 6.JAN.2026 17:00:35

High_Channel-1



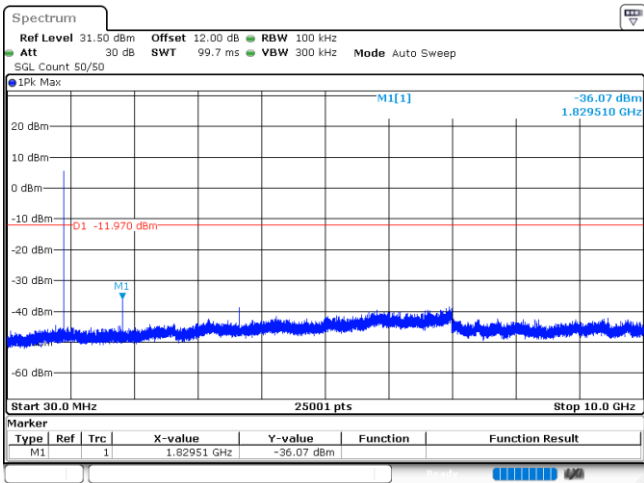
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Date: 27.DEC.2025 15:28:34

High_Channel-2



ProjectNo.:2504A01367E-RF Tester:Benny Li
Date: 6.JAN.2026 17:44:33

High_Channel-3



ProjectNo.:2504A01367E-RF Tester:Benny Li
Date: 6.JAN.2026 17:41:41

EXHIBIT A-EUT PHOTOGRAPHS

Please refer to the Attachment No.1 2504A01367E-RF EUT External Photos and Attachment No.2 2504A01367E-RF EUT Internal Photos.

EXHIBIT B-TEST SETUP PHOTOGRAPHS

Please refer to the Attachment No.3 2504A01367E-RF-00A Test Photos.

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