TEST REPORT

Applicant Name:	Dragino Technology Co., Limited.
Address:	Room 202,BaoChengTai industrial park,No.8 CaiYun LongCheng Street,LongGang District,Shenzhen China
Report Number:	2401Y38761E-RF-00B
FCC ID:	ZHZPB01

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	LoRaWAN Push Button
Model No.:	PB01
Multiple Model(s) No.:	N/A
Trade Mark:	DRAGINO
Date Received:	2024/10/11
Issue Date:	2025/01/15

Test Result:	Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Ekko Wu
RF Engineer

Approved By:

Michelle Zeng
RF Supervisor

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401Y38761E-RF-00B	Original Report	2025/01/15

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	LoRaWAN Push Button
Tested Model	PB01
Multiple Model(s)	N/A
Frequency Range	903-914.2 MHz
Maximum Conducted Peak Output Power	11.05 dBm
Technique	LoRa
Antenna Specification#	-2.3dBi (provided by the applicant)
Voltage Range	DC 3V from battery
Sample serial number	2SLN-1 for Radiated Emissions Test 2SLN-2 for RF Conducted Test (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	N/A
.	

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.

Test Methodology

All measurements contained in this report were conducted with 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. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		109.2kHz(k=2, 95% level of confidence)
RF Frequency		56.6Hz(k=2, 95% level of confidence)
RF output power, conducted		0.86dB(k=2, 95% level of confidence)
Unwanted Emission, conducted		1.60dB(k=2, 95% level of confidence)
AC Power Lines Conducted Emissions	9kHz~150 kHz	3.63dB(k=2, 95% level of confidence)
	150 kHz ~30MHz	3.66dB(k=2, 95% level of confidence)
Radiated Emissions	0.009MHz~30MHz	3.60dB(k=2, 95% level of confidence)
	30MHz~200MHz (Horizontal)	5.32dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	5.43dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	5.77dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.73dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.34dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.40dB(k=2, 95% level of confidence)
	18GHz - 40GHz	5.64dB(k=2, 95% level of confidence)
Temperature		±1℃
Humidity		±1%
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. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 715558, the FCC Designation No. : CN5045.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in engineering mode.

Channel List[#]

Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	**903**	6	911
2	904.6	7	912.6
3	906.2	**8**	**914.2**
4	**907.8**	/	/
5	909.4	/	/

EUT was test with channel 1/4/8.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

"EspRFTestTool_v3.6_manual.exe [#]" exercise software was used and the power level is 10[#]. The software and power level was provided by the manufacturer.

Support Equipment List and Details

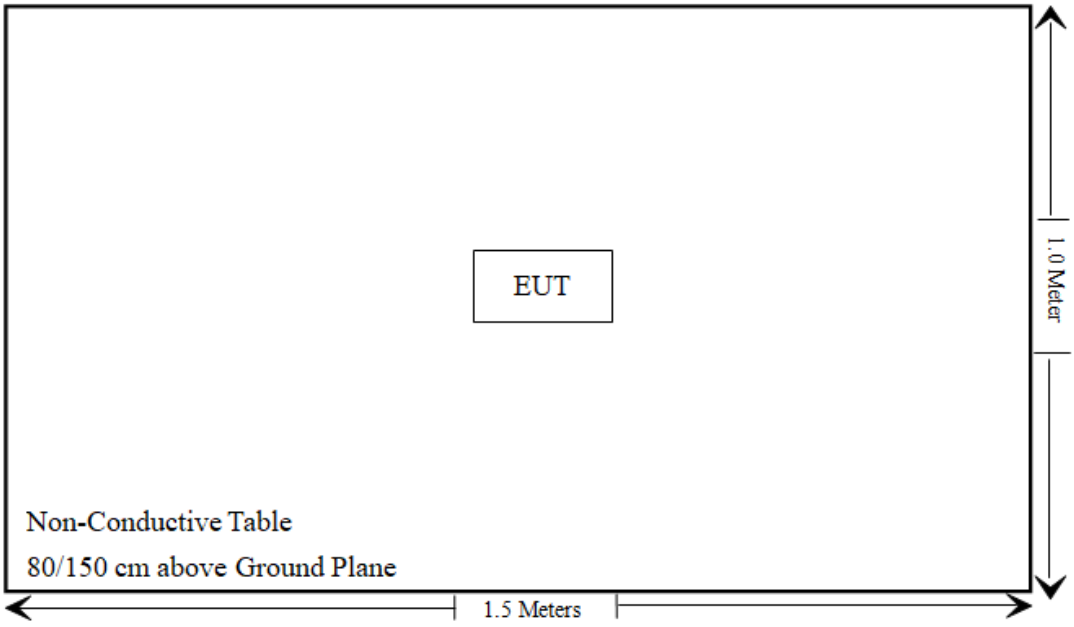
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup

For Radiated Emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§2.1091	MPE-Based Exemption	Compliant
FCC §15.203	Antenna Requirement	Compliant
FCC §15.207(a)	AC Line Conducted Emissions	Not Applicable
FCC §15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
FCC §15.247 (a)(2)	6 dB Emission Bandwidth & Occupied Bandwidth	Compliant
FCC §15.247(b)(3)	Maximum Conducted Output Power	Compliant
FCC §15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
FCC §15.247(e)	Power Spectral Density	Compliant
C63.10 §11.6	Duty Cycle	/

Not Applicable: The EUT is powered by battery only (the type C port is just used for product debugging), so this test item was not required.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310 N	186238	2024/05/21	2025/05/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Unknown	Cable	Chamber A Cable 1	N/A	2024/06/18	2025/06/17
Unknown	Cable	XH500C	J-10M-A	2024/06/18	2025/06/17
BACL	Active Loop Antenna	1313-1A	4031911	2024/05/14	2027/05/13
Unknown	Cable	2Y194	0735	2024/05/21	2025/05/20
Unknown	Cable	PNG214	1354	2024/05/21	2025/05/20
Audix	EMI Test software	E3	19821b(V9)	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2024/03/27	2025/03/26
COM-POWER	Pre-amplifier	PA-122	181919	2024/06/18	2025/06/17
Schwarzbeck	Horn Antenna	BBHA9120D(1201)	1143	2023/07/26	2026/07/25
The Electro-Mechanics Co.	Horn Antenna	3115	9107-3694	2024/06/06	2027/06/05
Unknown	RF Cable	KMSE	735	2024/06/18	2025/06/17
Unknown	RF Cable	UFA147	219661	2024/06/18	2025/06/17
Unknown	RF Cable	XH750A-N	J-10M	2024/06/18	2025/06/17
JD	Filter Switch Unit	DT7220FSU	DS79906	2024/09/09	2025/09/08
JD	Multiplex Switch Test Control Set	DT7220FSU	DQ77926	2024/06/18	2025/06/17
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
RF Conducted Test					
R&S	Spectrum Analyzer	FSV40-N	102259	2024/01/16	2025/01/15
Unknown	10dB Attenuator	Unknown	F-03-EM065	2024/06/27	2025/06/26

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

FCC 1.1307 (B) & §2.1091- MPE-BASED EXEMPTION

Applicable Standard

According to subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(3)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

Ris the minimum separation distance in meters
f = frequency in MHz

Result

Mode	Frequency (MHz)	Tune up conducted power# (dBm)	Antenna Gain#		ERP		Evaluation Distance (m)	ERP Limit (W)
			(dBi)	(dBd)	(dBm)	(W)		
Lora- Hybrid	902.3-914.9	12	-2.3	-4.45	7.55	0.006	0.2	0.462
Lora-DTS	903-914.2	11.5	-2.3	-4.45	7.05	0.005	0.2	0.462

Note: The tune up conducted power and antenna gain was declared by the applicant.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant.

FCC §15.203 - 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 use of a standard antenna jack or electrical connector is prohibited.

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.

Antenna Connector Construction

The EUT has an internal antenna, and the maximum antenna gain[#] is -2.3dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

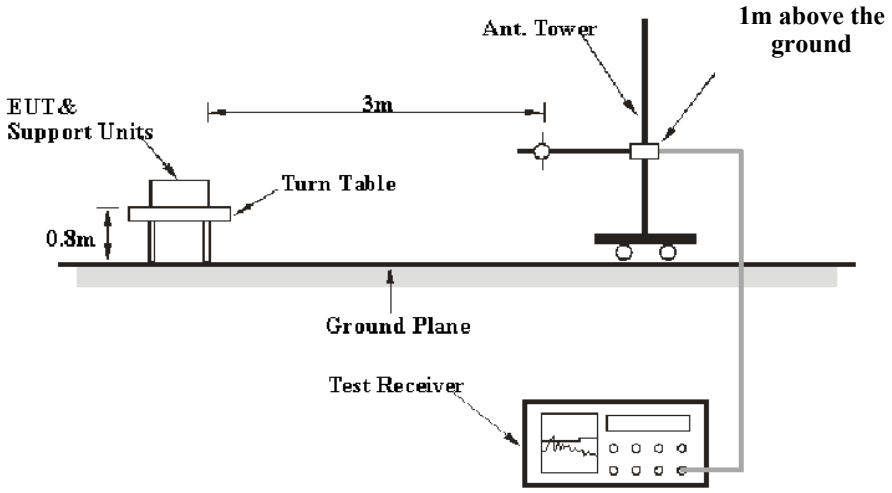
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

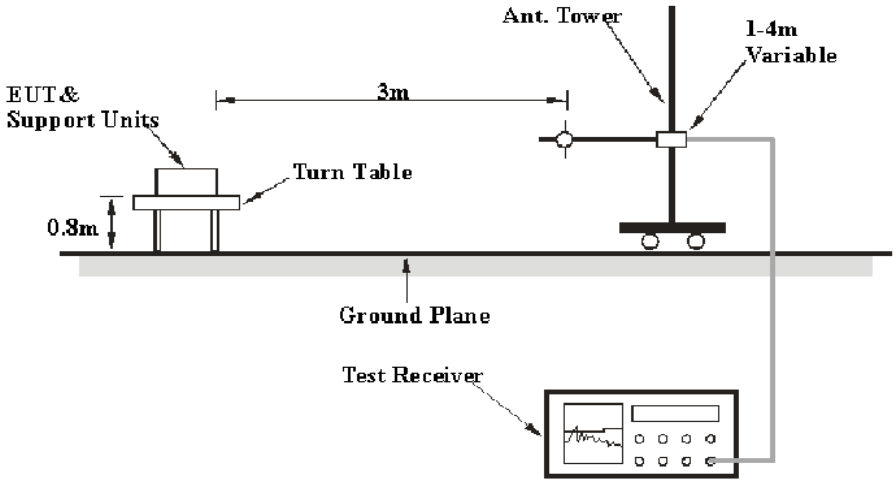
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

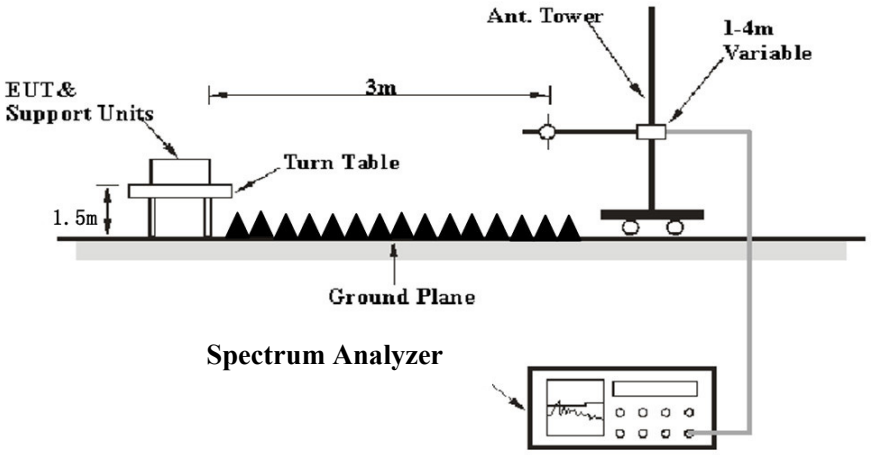
9 kHz-30MHz:



30MHz-1GHz:



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 FCC 15.209, and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:
9 kHz-1GHz:

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

Above 1 GHz:
Pre-scan

Measurement	Duty cycle	RBW	Video B/W	Detector
PK	Any	1MHz	3 MHz	PK
AV	>98%	1MHz	1 kHz	PK
	<98%	1MHz	≥1/Ton	PK

Final measurement for emission identified during pre-scan

Measurement	Duty cycle	RBW	Video B/W	Detector
PK	Any	1MHz	3 MHz	PK
AV	>98%	1MHz	10 Hz	PK
	<98%	1MHz	≥1/Ton	PK

Note: Ton is minimum transmission duration

Test Procedure

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

All final data was recorded in Quasi-peak detection mode except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, average detection modes for frequency bands 9–90 kHz and 110–490 kHz, peak and average detection modes for frequencies above 1 GHz.

For 9 kHz-30MHz, 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.

For 9 kHz-30MHz, if the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

All emissions under the average limit and under the noise floor have not recorded in the report.

Factor & Over Limit/Margin Calculation

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

Factor = Antenna Factor + Cable Loss - 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:

Over Limit/Margin = Level/Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

Temperature:	22~25.1 ℃
Relative Humidity:	40~58 %
ATM Pressure:	101.0 kPa

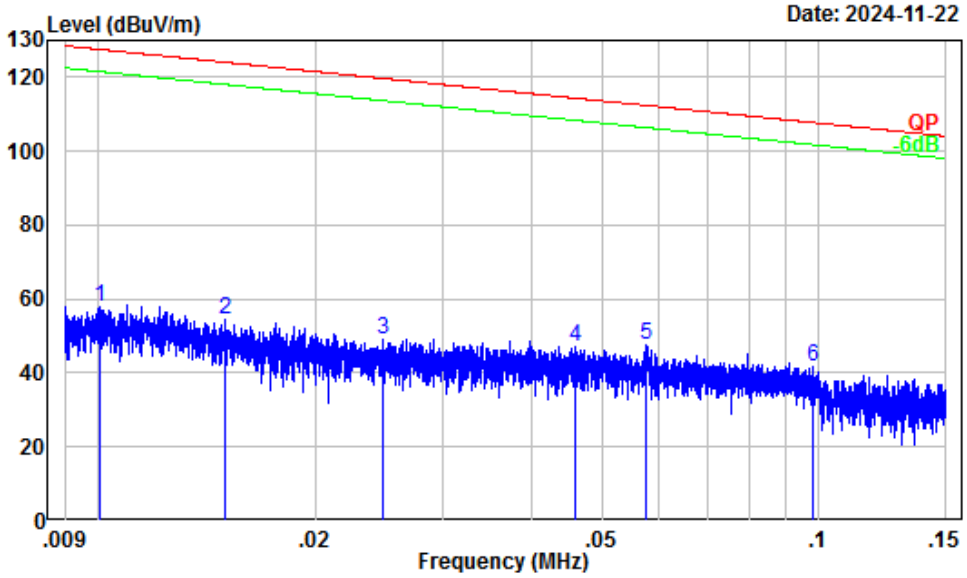
The testing was performed by Carl Zhu on 2024-11-22 for below 1GHz and Karl Xu on 2024-11-30 for above 1GHz.

EUT operation mode: Transmitting

Note: Pre-scan in the X, Y and Z axes of orientation, the worst case z-axis of orientation was recorded.

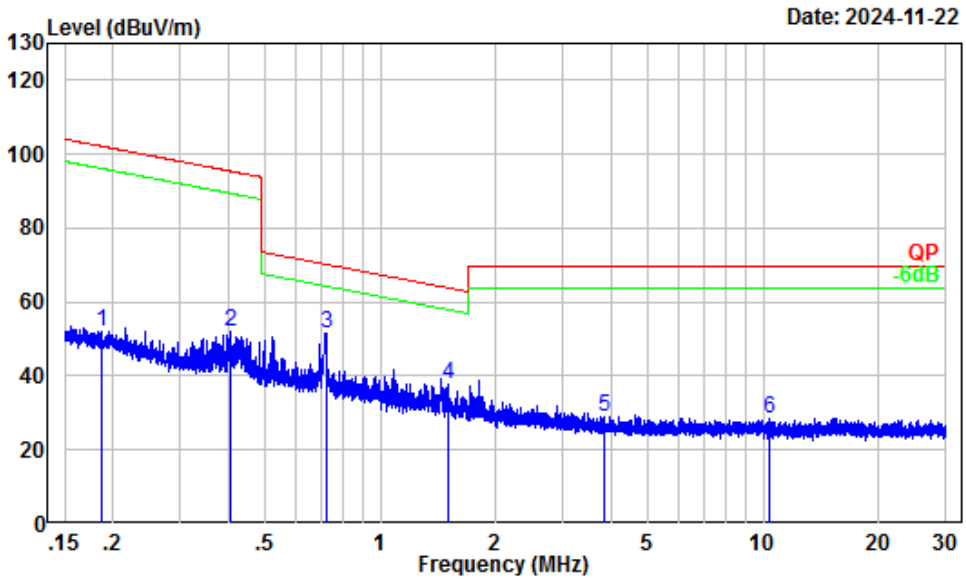
9 kHz-30 MHz: (Maximum output power mode, middle channel)

Parallel (worst case)



Site : Chamber A
Condition : 3m
Project Number: 2401Y38761E-RF
Test Mode : Transmitting
Tester : Carl Zhu

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.01	32.28	25.65	57.93	127.53	-69.60	Peak
2	0.02	31.34	22.87	54.21	124.06	-69.85	Peak
3	0.02	29.47	19.66	49.13	119.69	-70.56	Peak
4	0.05	26.81	20.04	46.85	114.34	-67.49	Peak
5	0.06	25.63	21.83	47.46	112.38	-64.92	Peak
6	0.10	22.15	19.50	41.65	107.79	-66.14	Peak

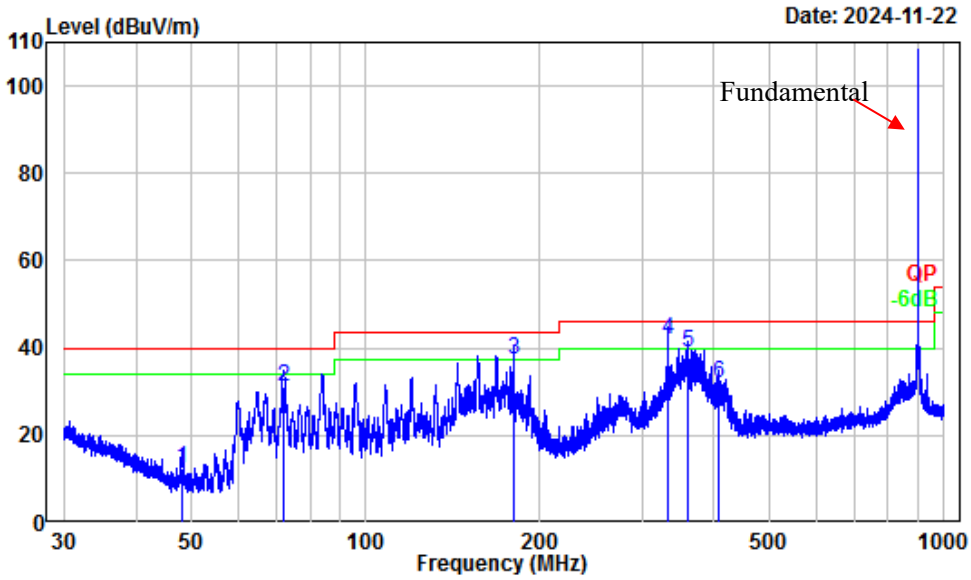


Site : Chamber A
Condition : 3m
Project Number: 2401Y38761E-RF
Test Mode : Transmitting
Tester : Carl Zhu

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.19	16.90	34.91	51.81	102.20	-50.39	Peak
2	0.40	8.21	43.84	52.05	95.46	-43.41	Peak
3	0.72	3.63	48.03	51.66	70.33	-18.67	Peak
4	1.50	-0.20	37.80	37.60	63.87	-26.27	Peak
5	3.84	-2.61	31.67	29.06	69.54	-40.48	Peak
6	10.33	-2.80	31.44	28.64	69.54	-40.90	Peak

30 MHz~1 GHz: (Maximum output power mode, middle channel)

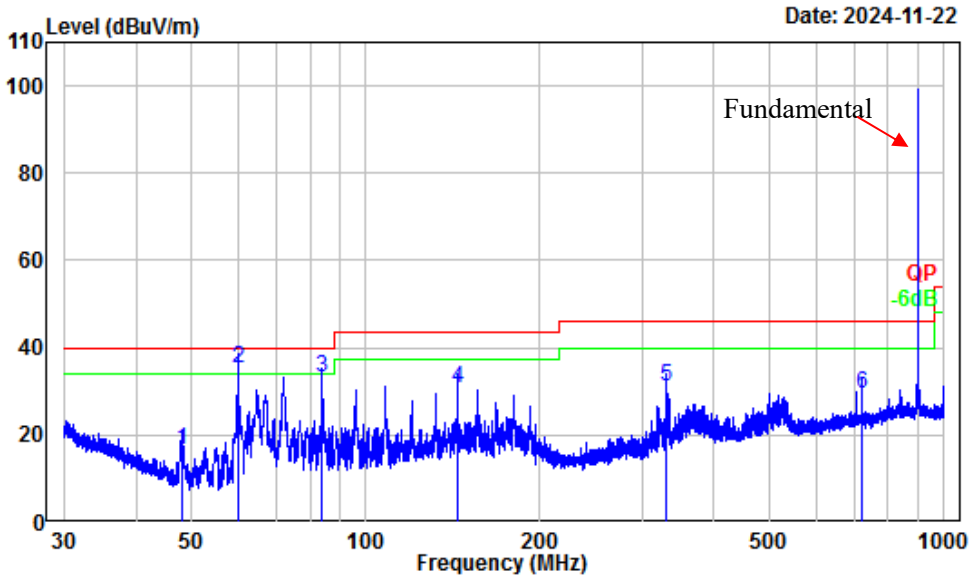
Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: 2401Y38761E-RF
Test Mode : Transmitting
Tester : Carl Zhu

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	47.93	-17.31	29.95	12.64	40.00	-27.36	QP
2	71.90	-17.85	49.01	31.16	40.00	-8.84	QP
3	180.17	-13.66	50.92	37.26	43.50	-6.24	QP
4	332.66	-10.60	52.48	41.88	46.00	-4.12	QP
5	359.97	-9.89	49.10	39.21	46.00	-6.79	QP
6	408.95	-8.19	40.04	31.85	46.00	-14.15	QP

Vertical



Site : Chamber A
Condition : 3m Vertical
Project Number: 2401Y38761E-RF
Test Mode : Transmitting
Tester : Carl Zhu

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	47.97	-17.33	33.98	16.65	40.00	-23.35	QP
2	60.04	-18.12	53.28	35.16	40.00	-4.84	QP
3	83.96	-18.09	51.44	33.35	40.00	-6.65	QP
4	143.96	-12.18	43.02	30.84	43.50	-12.66	QP
5	331.65	-10.62	41.76	31.14	46.00	-14.86	QP
6	722.36	-3.21	32.77	29.56	46.00	-16.44	QP

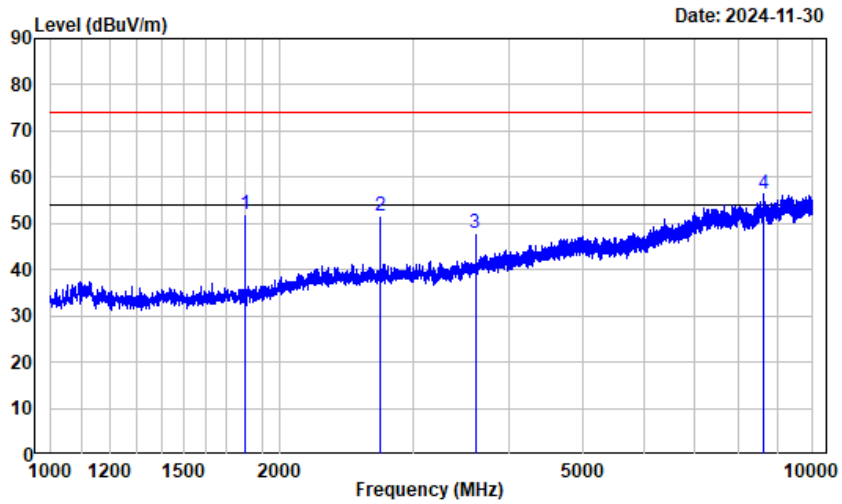
Above 1 GHz:

Frequency (MHz)	Reading (dBµV)	Measurement (PK/AV)	Polar (H/V)	Factor (dB/m)	Absolute Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low Channel 903MHz							
1806.00	58.16	PK	H	-6.36	51.80	74	-22.20
1806.00	55.61	AV	H	-6.36	49.25	54	-4.75
1806.00	56.26	PK	V	-6.36	49.90	74	-24.10
1806.00	53.51	AV	V	-6.36	47.15	54	-6.85
2709.00	54.16	PK	H	-2.67	51.49	74	-22.51
2709.00	49.32	AV	H	-2.67	46.65	54	-7.35
2709.00	54.01	PK	V	-2.67	51.34	74	-22.66
2709.00	49.53	AV	V	-2.67	46.86	54	-7.14
3612.00	49.71	PK	H	-1.69	48.02	74	-25.98
3612.00	39.80	AV	H	-1.69	38.11	54	-15.89
3612.00	52.80	PK	V	-1.69	51.11	74	-22.89
3612.00	44.85	AV	V	-1.69	43.16	54	-10.84
Middle Channel 907.8MHz							
1815.60	57.32	PK	H	-6.50	50.82	74	-23.18
1815.60	54.27	AV	H	-6.50	47.77	54	-6.23
1815.60	54.84	PK	V	-6.50	48.34	74	-25.66
1815.60	52.05	AV	V	-6.50	45.55	54	-8.45
2723.40	53.56	PK	H	-2.49	51.07	74	-22.93
2723.40	51.08	AV	H	-2.49	48.59	54	-5.41
2723.40	53.17	PK	V	-2.49	50.68	74	-23.32
2723.40	48.34	AV	V	-2.49	45.85	54	-8.15
3631.20	49.52	PK	H	-1.94	47.58	74	-26.42
3631.20	39.83	AV	H	-1.94	37.89	54	-16.11
3631.20	52.17	PK	V	-1.94	50.23	74	-23.77
3631.20	44.59	AV	V	-1.94	42.65	54	-11.35

Frequency (MHz)	Reading (dBµV)	Measurement (PK/AV)	Polar (H/V)	Factor (dB/m)	Absolute Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
High Channel 914.2MHz							
1828.40	56.69	PK	H	-6.40	50.29	74	-23.71
1828.40	54.12	AV	H	-6.40	47.72	54	-6.28
1828.40	53.83	PK	V	-6.40	47.43	74	-26.57
1828.40	50.03	AV	V	-6.40	43.63	54	-10.37
2742.60	53.05	PK	H	-2.49	50.56	74	-23.44
2742.60	47.48	AV	H	-2.49	44.99	54	-9.01
2742.60	52.96	PK	V	-2.49	50.47	74	-23.53
2742.60	46.55	AV	V	-2.49	44.06	54	-9.94
3656.80	49.38	PK	H	-1.84	47.54	74	-26.46
3656.80	39.85	AV	H	-1.84	38.01	54	-15.99
3656.80	51.90	PK	V	-1.84	50.06	74	-23.94
3656.80	44.25	AV	V	-1.84	42.41	54	-11.59

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude/Level = Corrected Factor + Reading
Margin = Corrected Amplitude/Level - Limit
The other spurious emission which is in the noise floor level was not recorded.

Listed with the worst harmonic margin test plot (low channel):

Horizontal-Peak	
1-10GHz	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Condition       : Horizontal
Project Number  : 2401Y38761E-RF
Tester          : Karl Xu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note            : LORA_500K_903
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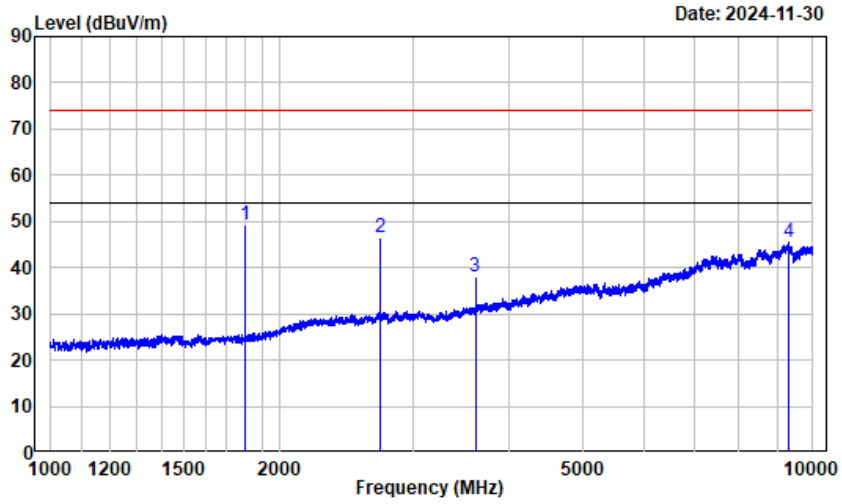
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1806.000	-6.36	58.16	51.80	74.00	-22.20	Peak
2	2709.000	-2.67	54.16	51.49	74.00	-22.51	Peak
3	3612.000	-1.69	49.71	48.02	74.00	-25.98	Peak
4	8636.329	10.60	45.85	56.45	74.00	-17.55	Peak

Horizontal-Average

1-10GHz

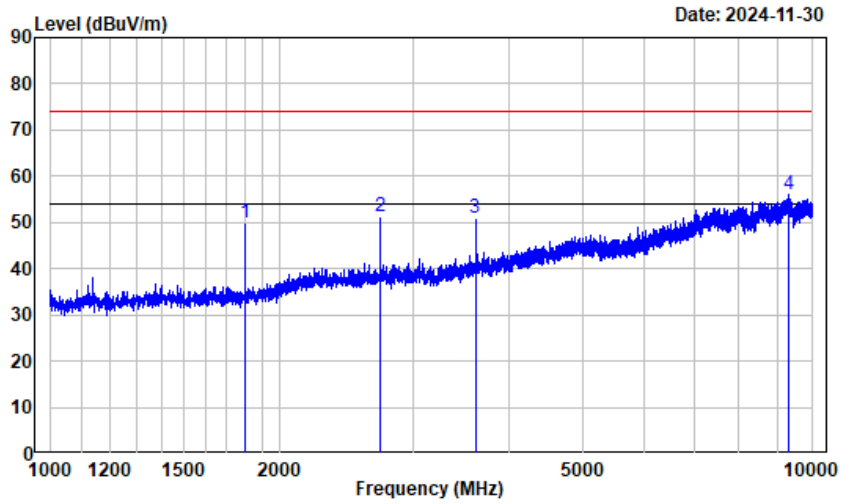


Site : chamber B
Condition : Horizontal
Project Number : 2401Y38761E-RF
Tester : Karl Xu
Spectrum setting: Average reading: RBW:1MHz VBW:1KHz Detector:Peak
Note : LORA_500K_903

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1806.000	-6.36	55.61	49.25	54.00	-4.75	Average
2	2709.000	-2.67	49.32	46.65	54.00	-7.35	Average
3	3612.000	-1.69	39.80	38.11	54.00	-15.89	Average
4	9286.661	11.80	33.79	45.59	54.00	-8.41	Average

Vertical-Peak

1-10GHz

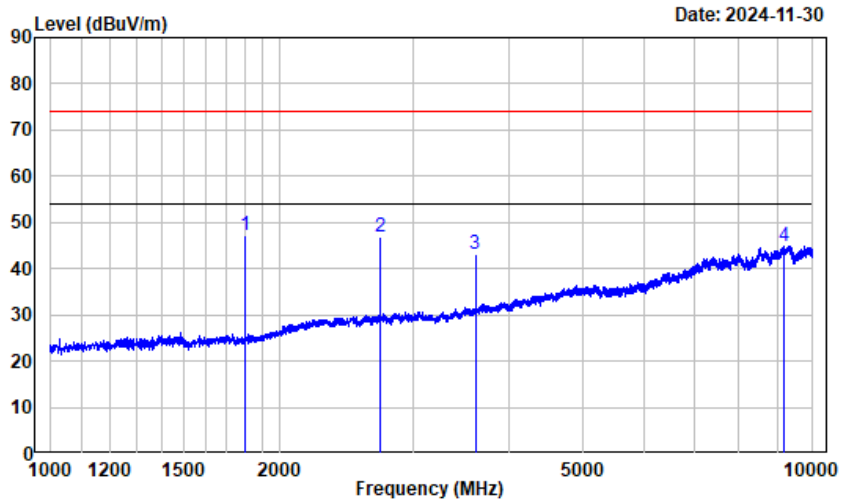


Condition : Vertical
Project Number : 2401Y38761E-RF
Tester : Karl Xu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : LORA_500K_903

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1806.000	-6.36	56.26	49.90	74.00	-24.10	Peak
2	2709.000	-2.67	54.01	51.34	74.00	-22.66	Peak
3	3612.000	-1.69	52.80	51.11	74.00	-22.89	Peak
4	9313.664	11.78	44.24	56.02	74.00	-17.98	Peak

Vertical-Average

1-10GHz



Site : chamber B
Condition : Vertical
Project Number : 2401Y38761E-RF
Tester : Karl Xu
Spectrum setting: Average reading: RBW:1MHz VBW:1KHz Detector:Peak
Note : LORA_500K_903

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1806.000	-6.36	53.51	47.15	54.00	-6.85	Average
2	2709.000	-2.67	49.53	46.86	54.00	-7.14	Average
3	3612.000	-1.69	44.85	43.16	54.00	-10.84	Average
4	9155.020	11.47	33.47	44.94	54.00	-9.06	Average

FCC §15.247(a) (2) - 6 dB EMISSION BANDWIDTH

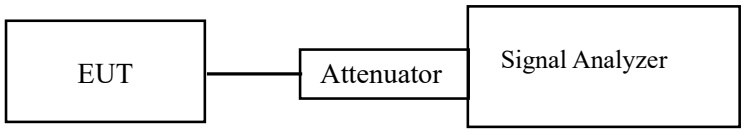
Applicable Standard

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

Test Method: ANSI C63.10-2013 Clause 11.8.1 & Clause 6.9.3

a. Set RBW = 100 kHz.
b. Set the VBW ≥ [3×RBW].
c. Detector = peak.
d. Trace mode = max hold.
e. Sweep = auto couple.
f. Allow the trace to stabilize.
g. 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 by6 dB relative to the maximum level measured in the fundamental emission.



Test Data

Environmental Conditions

Temperature:	23.1~25.7℃
Relative Humidity:	43~46 %
ATM Pressure:	101 kPa

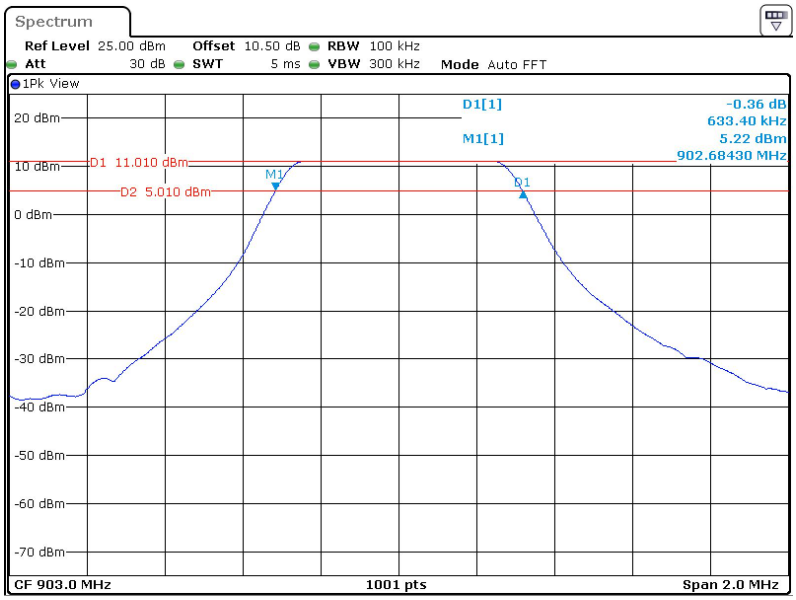
The testing was performed by Allen Bai on 2024-11-25 and 2024-11-26.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the following table and plots.

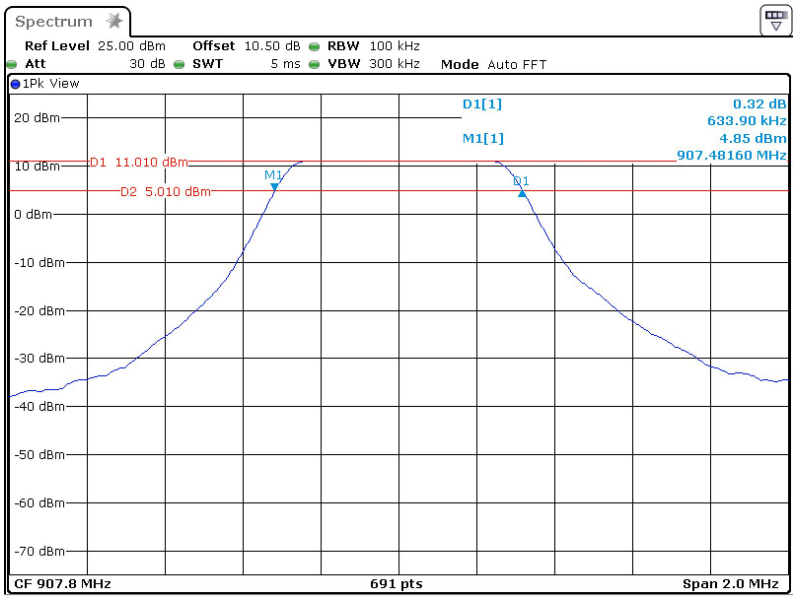
Test Channel	Test Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
Low	903	0.633	≥0.5
Middle	907.8	0.634	≥0.5
High	914.2	0.631	≥0.5

Low Channel



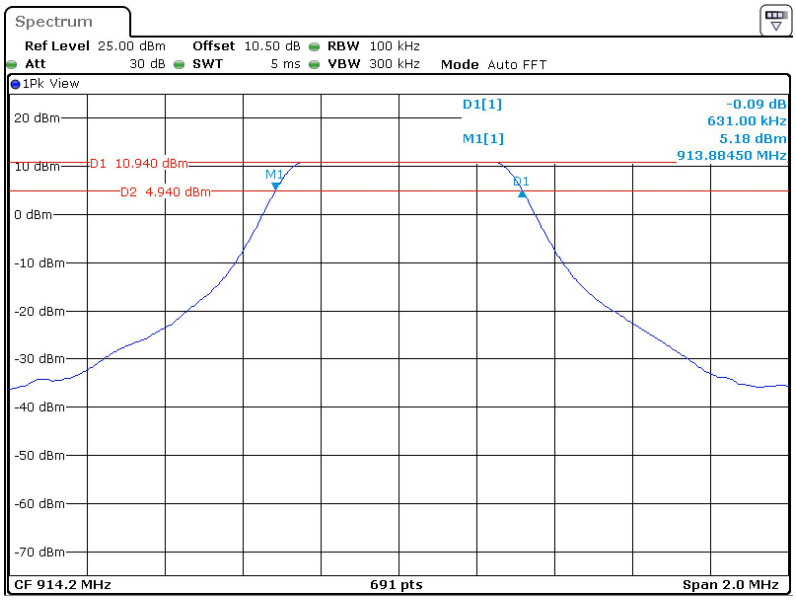
ProjectNo.:2401Y38761E-RF Tester:Allen Bai
Date: 26.NOV.2024 02:44:44

Middle Channel



ProjectNo.:2401Y38761E-RF Tester:Allen Bai
Date: 26.NOV.2024 03:07:43

High Channel



ProjectNo.:2401Y38761E-RF Tester:Allen Bai

Date: 25.NOV.2024 02:26:32

FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

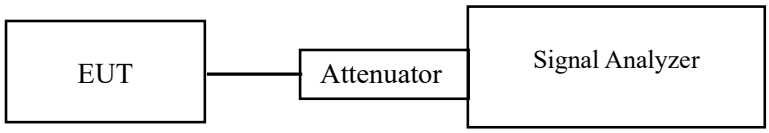
Applicable Standard

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

Test Method: ANSI C63.10-2013 Clause 11.9.1.1

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.
4. Set the RBW ≥ DTS bandwidth.
5. Set the VBW ≥ [3 × RBW].
6. Set span ≥ [3 × RBW].
7. Sweep time = auto couple.
8. Detector = peak.
9. Trace mode = max hold.
10. Allow the trace to stabilize.
11. Use peak marker function to determine the peak amplitude level.



Note: A short RF cable with low cable loss connected to the EUT antenna port, which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable loss

Test Data

Environmental Conditions

Temperature:	23.1℃
Relative Humidity:	46 %
ATM Pressure:	101 kPa

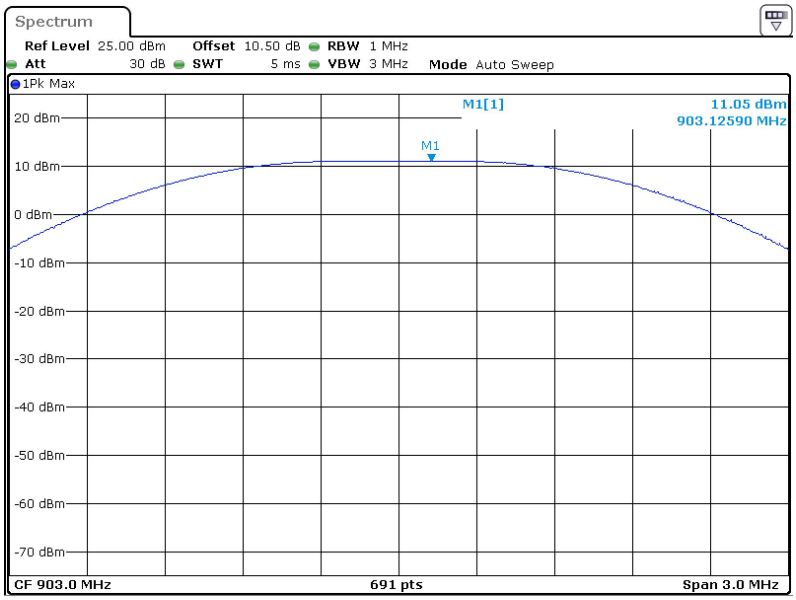
The testing was performed by Allen Bai on 2024-11-25.

EUT operation mode: Transmitting

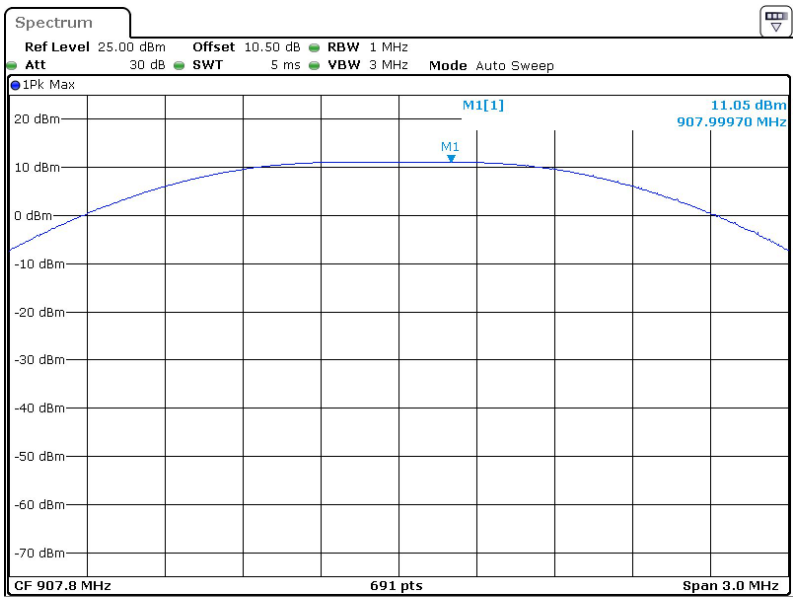
Test Result: Compliant. Please refer to the following table and plots.

Test Channel	Test Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)	Limit (dBm)
Lowest	903	11.05	≤30
Middle	907.8	11.05	≤30
Highest	914.2	11.01	≤30

Low Channel

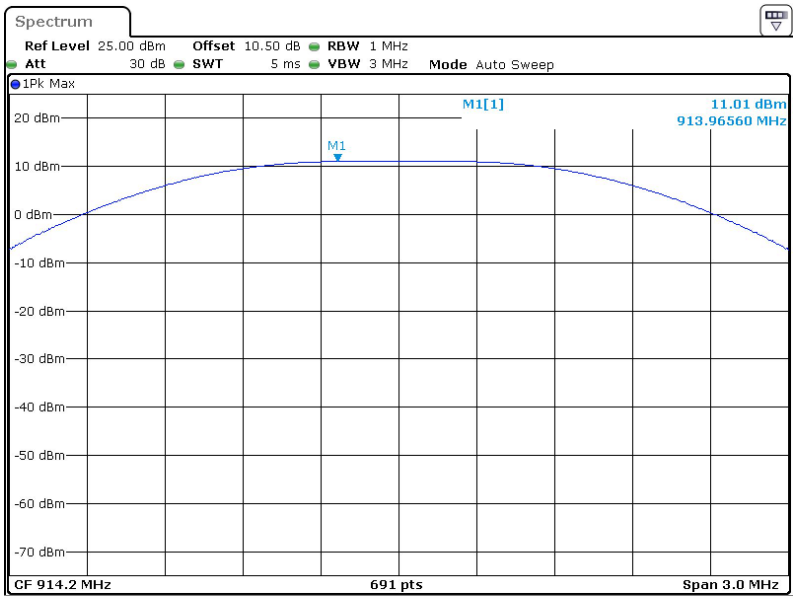


Middle Channel



ProjectNo.:2401Y38761E-RF Tester:Allen Bai
Date: 25.NOV.2024 02:04:56

High Channel



ProjectNo.:2401Y38761E-RF Tester:Allen Bai
Date: 25.NOV.2024 02:24:12

FCC §15.247(d) - 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

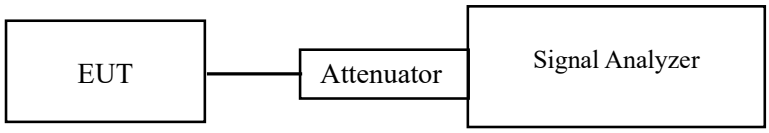
Applicable Standard

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

Test Method: ANSI C63.10-2013 Clause 11.11

1. Set the RBW =100 kHz.
2. Set the VBW ≥ 3×RBW.
3. Detector = peak
4. Sweep time = auto couple.
5. Trace mode=max hold
6. All trace to fully stabilize
7. Use the peak marker function to determine the maximum amplitude level.
   Ensure that amplitude of all unwanted emissions outside of the authorized frequency band(excluding restricted frequency bands) is attenuated by at least the minimum requirement specified in 11.11.
   Report the three highest emissions relative to the limit.



Test Data

Environmental Conditions

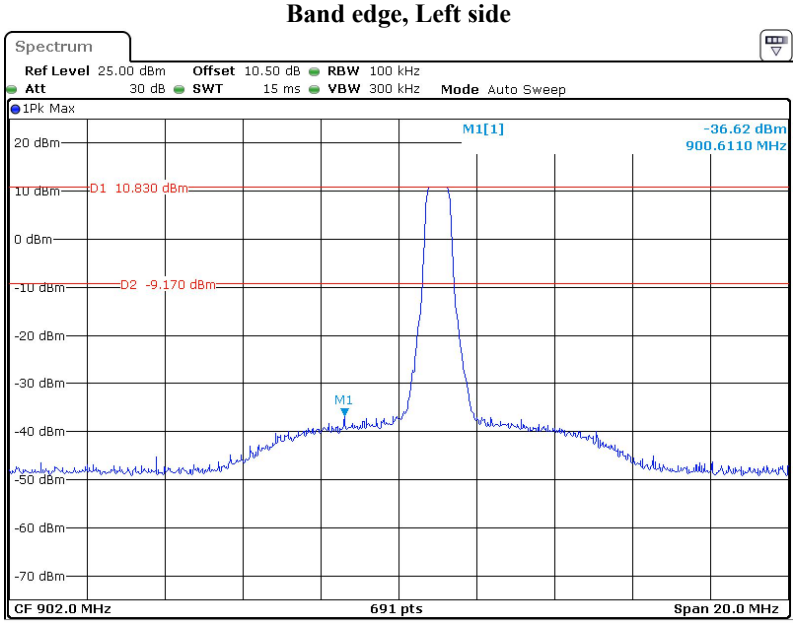
Temperature:	23.8 ℃
Relative Humidity:	39 %
ATM Pressure:	101 kPa

The testing was performed by Kungfumaster Liang on 2024-12-05.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the following plots.

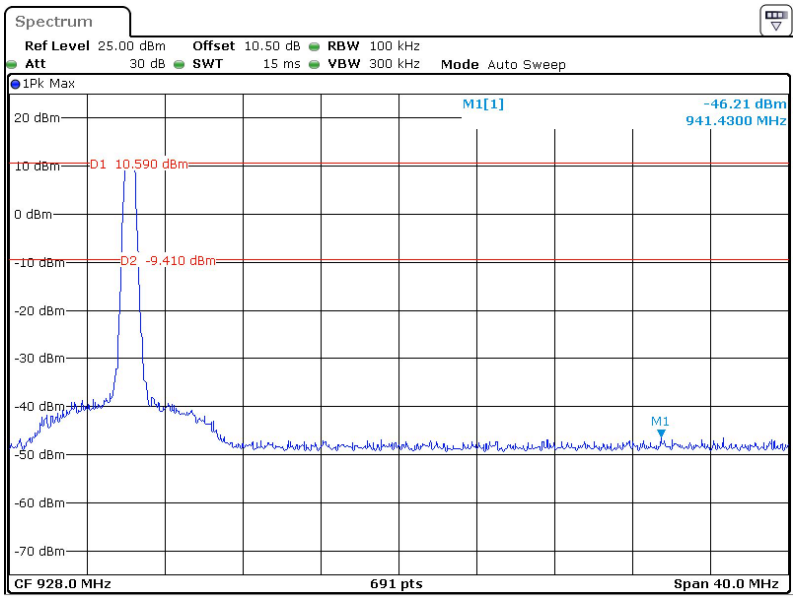
Band edge, Left side



ProjectNo.:2401Y38761E-RF Tester:Kungfumaster Liang

Date: 5.DEC.2024 17:44:00

Band edge, Right side



ProjectNo.:2401Y38761E-RF Tester:Kungfumaster Liang

Date: 5.DEC.2024 17:48:21

FCC §15.247(e) - POWER SPECTRAL DENSITY

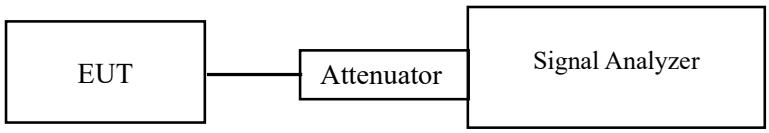
Applicable Standard

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

Test Method: ANSI C63.10-2013 Clause 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 analyzer center frequency to DTS channel center frequency
3. Set the span to 1.5 times the DTS bandwidth.
4. Set the RBW to: 3kHz≤ RBW≤100 kHz.
5. Set the VBW ≥ 3×RBW.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level within the RBW.
11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



Note: A short RF cable with low cable loss connected to the EUT antenna port, which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable loss

Test Data

Environmental Conditions

Temperature:	25.7℃
Relative Humidity:	43 %
ATM Pressure:	101 kPa

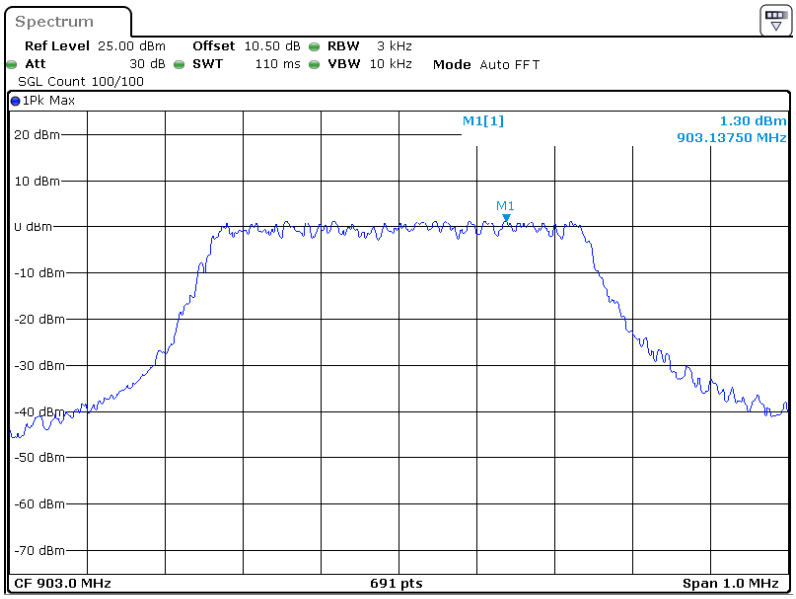
The testing was performed by Allen Bai on 2024-12-11.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the following table and plots.

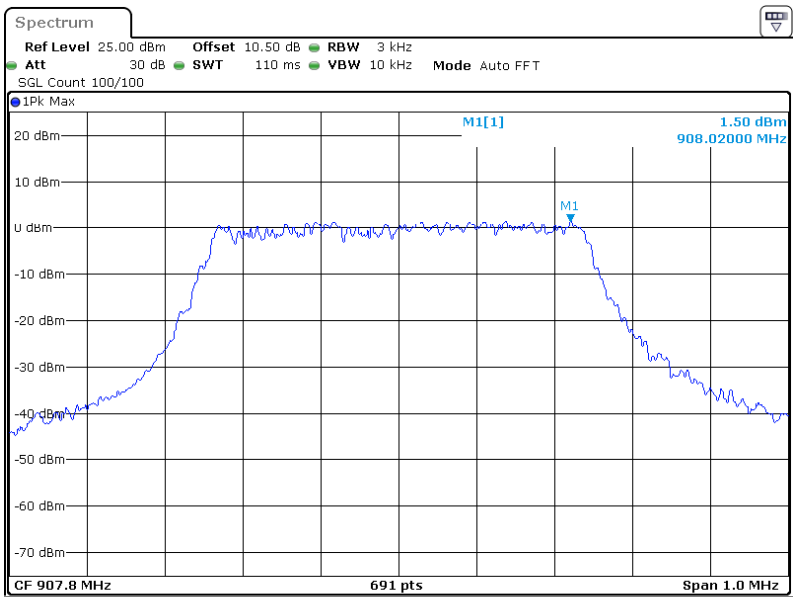
Test Channel	Test Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Low	903	1.3	≤8.00
Middle	907.8	1.5	≤8.00
High	914.2	1.4	≤8.00

Low Channel



ProjectNo.:2401Y38761E-RF Tester:Allen Bai
Date: 11.DEC.2024 23:38:50

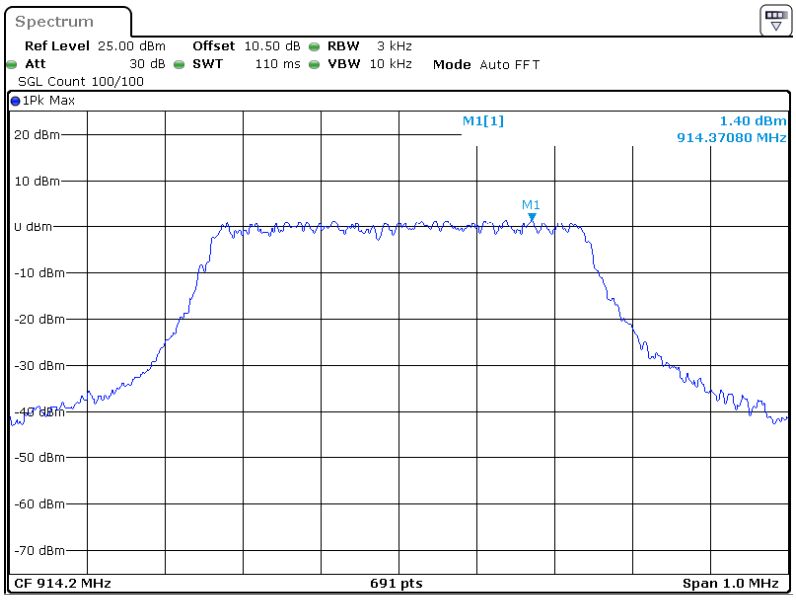
Middle Channel



ProjectNo.:2401Y38761E-RF Tester:Allen Bai

Date: 11.DEC.2024 23:46:50

High Channel



ProjectNo.:2401Y38761E-RF Tester:Allen Bai

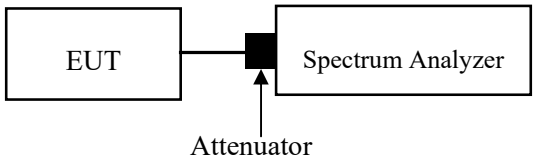
Date: 11.DEC.2024 23:49:53

C63.10 §11.6- DUTY CYCLE

Test Procedure

According to ANSI C63.10-2013 Section 11.6

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 ≥ OBW if possible; otherwise, set RBW to the largest available value.
3) Set VBW ≥ 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 ≤ 16.7 μs.)



Test Data

Environmental Conditions

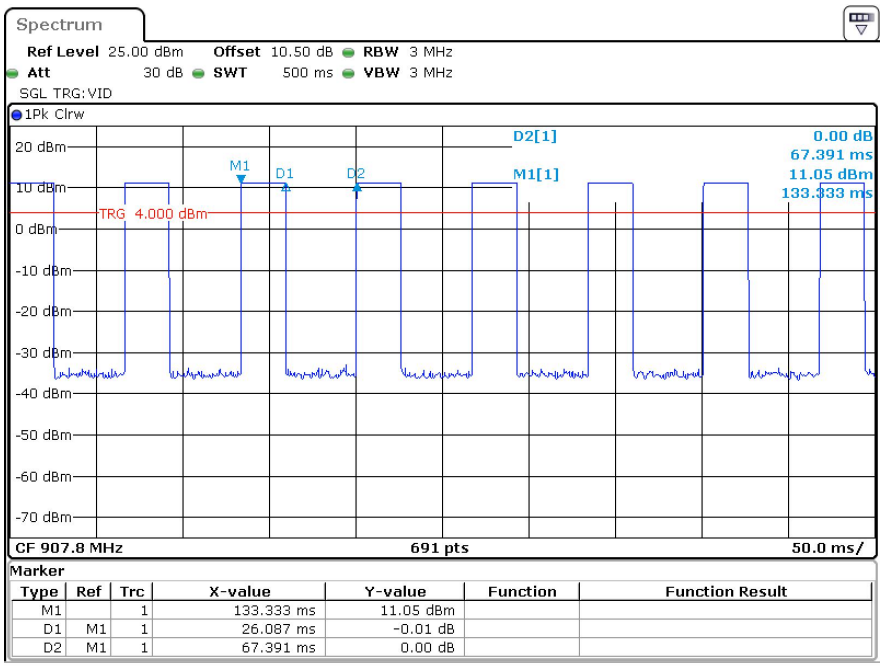
Temperature:	25.7℃
Relative Humidity:	43 %
ATM Pressure:	101 kPa

The testing was performed by Allen Bai on 2024-11-26.

EUT operation mode: Transmitting

Test Result: Compliant.

Test Band Width (kHz)	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)	$1/T_{on}$ (Hz)	VBW Setting (Hz)
500	26.087	67.391	38.71	38	100



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	133.333 ms	11.05 dBm		
D1	M1	1	26.087 ms	-0.01 dB		
D2	M1	1	67.391 ms	0.00 dB		

ProjectNo.:2401Y38761E-RF Tester:Allen Bai

Date: 26.NOV.2024 03:17:18

EUT PHOTOGRAPHS

Please refer to the attachment 2401Y38761E-RF External photo and 2401Y38761E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401Y38761E-RF Test Setup photo.

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