

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: 2401V57241E-RF-00C
FCC ID: ZHZSN50V3-CNG

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type: HELIX NODE
Model No.: SN50V3-LB
Multiple Model(s) No.: N/A
Trade Mark: Converge
Date Received: 2024/07/29
Issue Date: 2024/08/28

Test Result:	Pass [▲]
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▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

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Ekko Wu
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Approved By:

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Note: 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.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401V57241E-RF-00C	Original Report	2024/08/28

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	HELIX NODE
Tested Model	SN50V3-LB
Multiple Model(s)	N/A
Frequency Range	903-914.2MHz
Maximum Conducted Peak Output Power	13.96 dBm
Modulation Technique	LoRa
Antenna Specification [#]	-6.55dBi (provided by the applicant)
Voltage Range	DC 3.6V from battery
Sample serial number	2P51-1 (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		±5%
RF Frequency		213.55 Hz(k=2, 95% level of confidence)
RF output power, conducted		0.72 dB(k=2, 95% level of confidence)
Unwanted Emission, conducted		1.75 dB(k=2, 95% level of confidence)
AC Power Lines Conducted Emissions	9kHz~150 kHz	3.94dB(k=2, 95% level of confidence)
	150 kHz ~30MHz	3.84dB(k=2, 95% level of confidence)
Radiated Emissions	9kHz - 30MHz	3.30dB(k=2, 95% level of confidence)
	30MHz~200MHz (Horizontal)	4.48dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	4.55dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	4.85dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.05dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.35dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.44dB(k=2, 95% level of confidence)
	18GHz - 40GHz	5.16dB(k=2, 95% level of confidence)
Temperature		±1°C
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	5	909.4
2	904.6	6	911
3	906.2	7	912.6
4	907.8	8	914.2

EUT was tested with Channel 1, 4 and 8.

Equipment Modifications

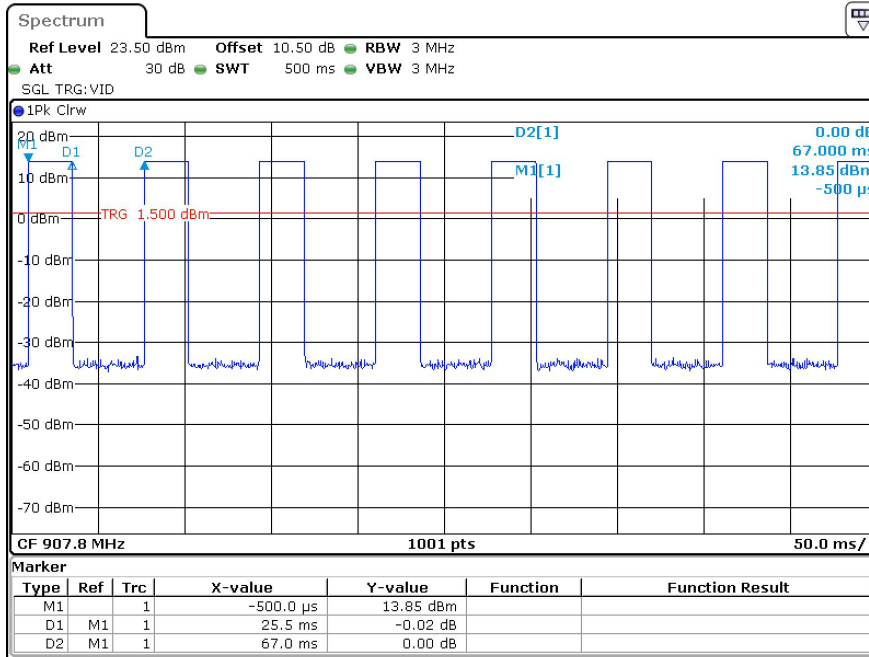
No modification was made to the EUT tested.

EUT Exercise Software

“EspRFTTestTool_v3.6_manual.exe[#]” exercise software was used and the power level is 8[#]. The software and power level was provided by the manufacturer.

Duty cycle

Test Band Width (kHz)	Ton (ms)	Ton+off (ms)	Duty cycle (%)	1/Ton (Hz)	VBW Setting (Hz)
500	25.5	67	38.06	39.22	100



ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
 Date: 14.AUG.2024 22:29:12

Support Equipment List and Details

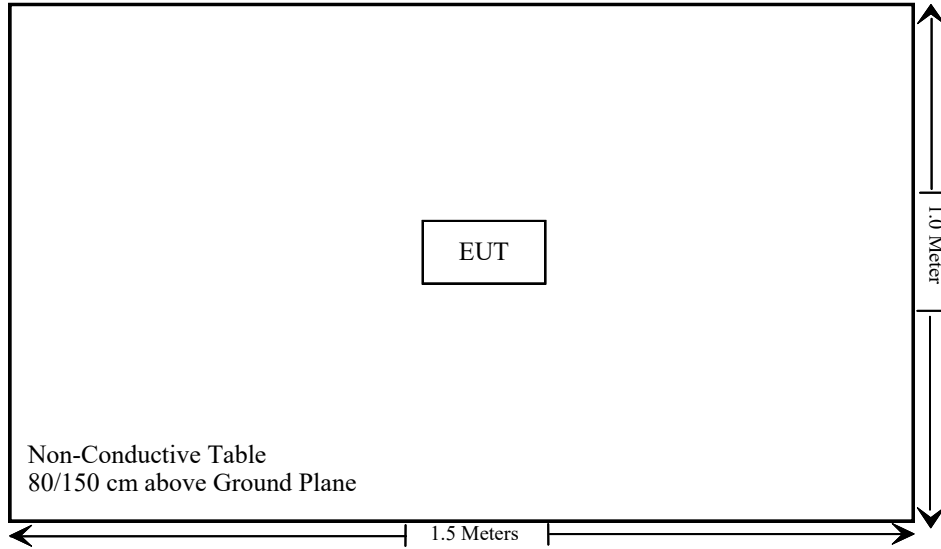
Manufacturer	Description	Model	Serial Number
/	/	/	/

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
FCC §15.247 (i) & §1.1307 (b) (3) & §2.1091	Maximum Permissible Exposure (MPE)	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	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

Not Applicable: The EUT is powered by battery, 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
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	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					
Rohde & Schwarz	Spectrum Analyzer	FSV40	101473	2024/01/16	2025/01/15
Unknown	10dB Attenuator	Unknown	F-03-EM190	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 §15.247 (i) & §1.1307 (b) (3) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and 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	$19.2R^2$.

R is 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	5.00	-6.55	-8.70	-3.70	0.0004	0.2	0.462
Lora-DTS	903-914.2	14.50	-6.55	-8.70	5.8	0.0038	0.2	0.462
BLE	2402-2480	1.50	2	-0.15	1.35	0.0014	0.2	0.768

Note: The tune up conducted power and antenna gain was declared by the applicant.
 BLE, Lora- Hybrid and Lora-DTS can't transmit simultaneously.

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 a FPC antenna and the maximum antenna gain[#] is -6.55dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

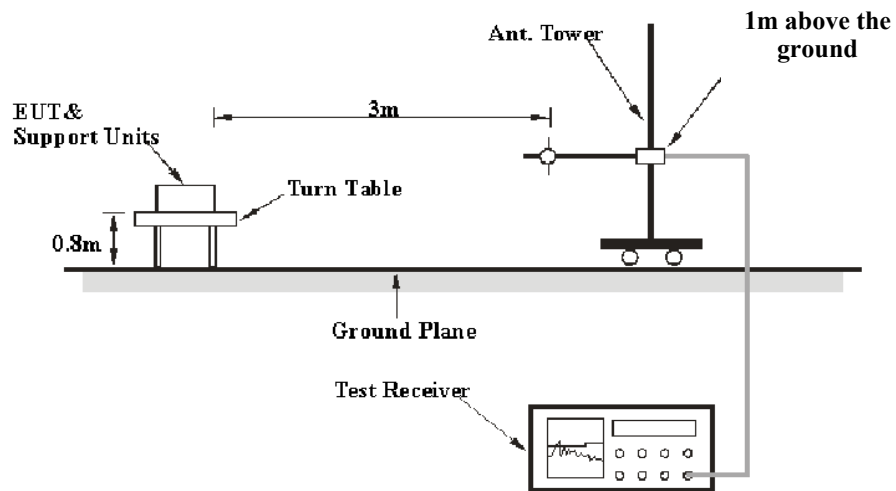
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

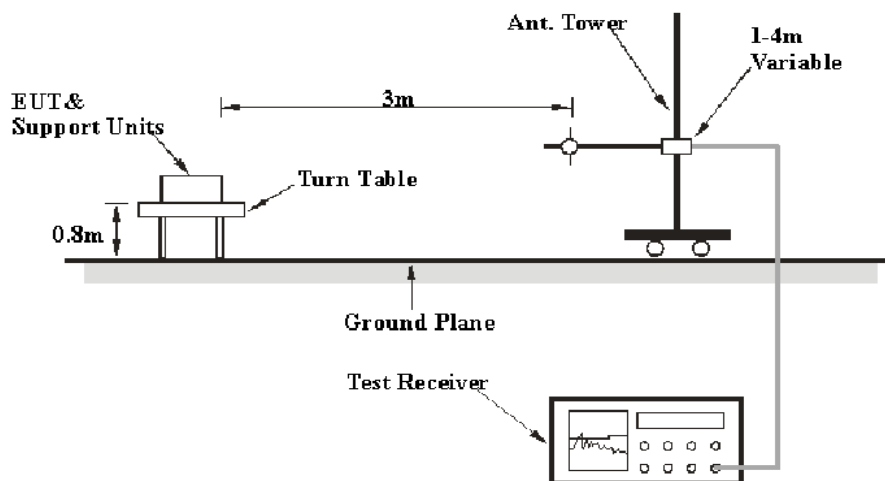
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

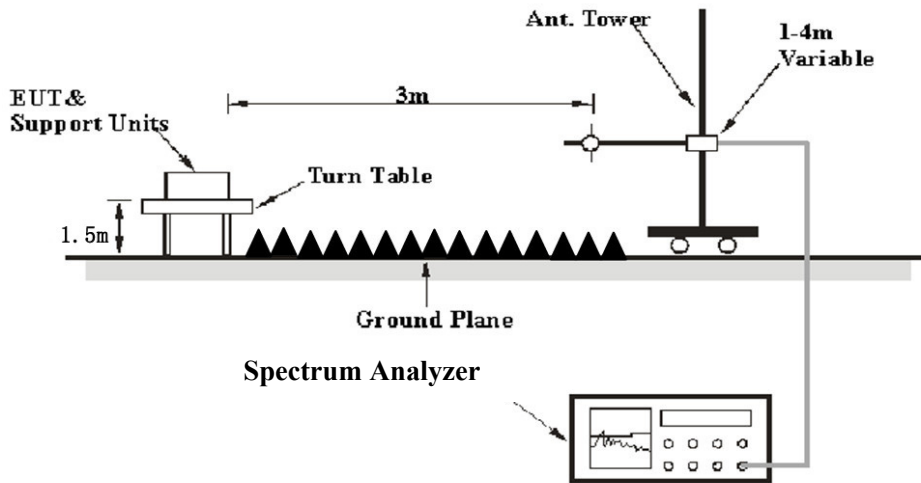
9 kHz-30MHz:



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:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz ^{Note 1}	/	Average
	1MHz	> 1/T ^{Note 2}	/	Average

Note 1: when duty cycle is no less than 98%

Note 2: when duty cycle is less than 98%

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.

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:

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

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

Environmental Conditions

Temperature:	23~25.4 °C
Relative Humidity:	49~53 %
ATM Pressure:	101 kPa

The testing was performed by Jack Liu on 2024-08-14 for below 1GHz and Sadow Tan on 2024-08-16 for above 1GHz.

EUT operation mode: Transmitting

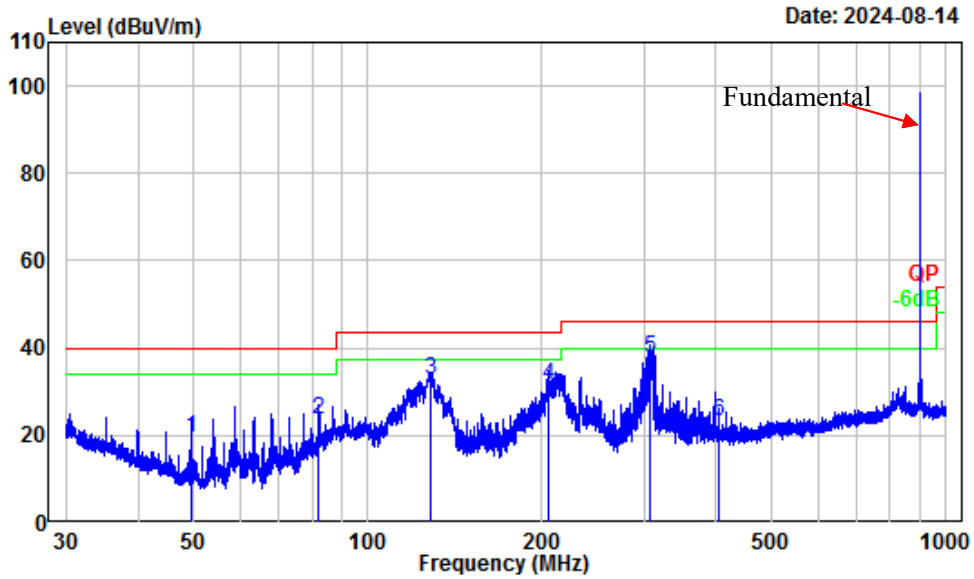
Pre-scan in the X, Y and Z axes of orientation, the worst case Z-axis of orientation was recorded.

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

The amplitude of spurious emissions attenuated more than 20 dB below the limit was not recorded.

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

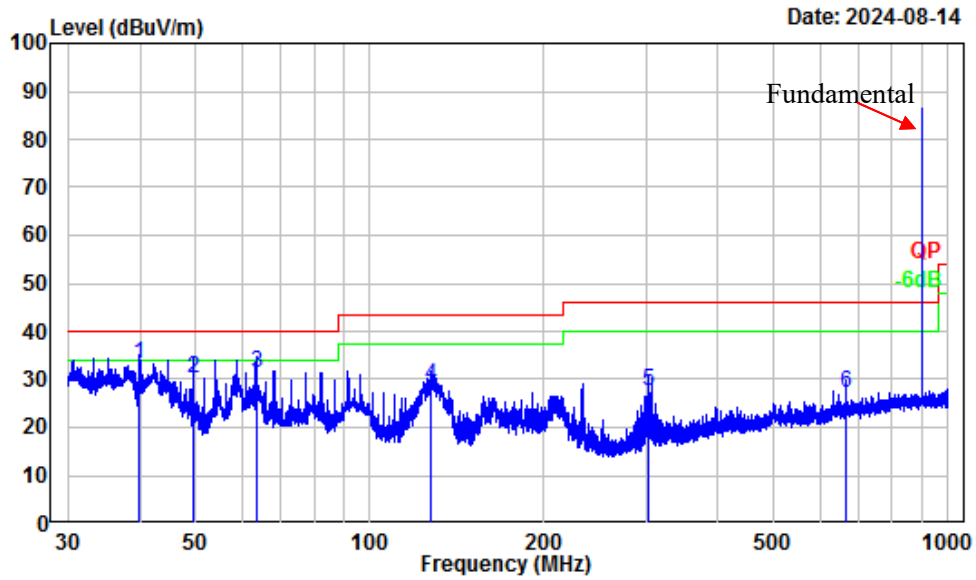
Horizontal



Site : Chamber A
 Condition : 3m Horizontal
 Project Number: 2401V57241E-RF
 Test Mode : Transmitting
 Tester : Jack Liu

	Freq Factor		Read Level	Limit Level	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB
1	49.38	-17.57	37.04	19.47	40.00	-20.53 QP
2	82.32	-17.91	41.42	23.51	40.00	-16.49 QP
3	128.11	-11.26	43.92	32.66	43.50	-10.84 QP
4	205.22	-13.06	44.64	31.58	43.50	-11.92 QP
5	308.24	-11.03	48.77	37.74	46.00	-8.26 QP
6	404.67	-8.33	31.45	23.12	46.00	-22.88 QP

Vertical



Site : Chamber A
 Condition : 3m Vertical
 Project Number: 2401V57241E-RF
 Test Mode : Transmitting
 Tester : Jack Liu

	Freq	Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	39.94	-12.33	45.44	33.11	40.00	-6.89	QP
2	49.42	-17.60	47.92	30.32	40.00	-9.68	QP
3	63.51	-18.04	49.24	31.20	40.00	-8.80	QP
4	127.83	-11.26	39.87	28.61	43.50	-14.89	QP
5	303.94	-11.12	38.71	27.59	46.00	-18.41	QP
6	666.68	-3.93	31.05	27.12	46.00	-18.88	QP

Above 1 GHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Absolute Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
Low Channel 903MHz							
1806.00	49.97	PK	H	-6.60	43.37	74	-30.63
1806.00	40.30	AV	H	-6.60	33.70	54	-20.30
1806.00	51.43	PK	V	-6.60	44.83	74	-29.17
1806.00	46.05	AV	V	-6.60	39.45	54	-14.55
2709.00	45.56	PK	H	-2.49	43.07	74	-30.93
2709.00	33.11	AV	H	-2.49	30.62	54	-23.38
2709.00	46.89	PK	V	-2.49	44.40	74	-29.60
2709.00	34.71	AV	V	-2.49	32.22	54	-21.78
3612.00	48.86	PK	H	-2.04	46.82	74	-27.18
3612.00	39.37	AV	H	-2.04	37.33	54	-16.67
3612.00	49.48	PK	V	-2.04	47.44	74	-26.56
3612.00	38.61	AV	V	-2.04	36.57	54	-17.43
Middle Channel 907.8MHz							
1815.60	50.89	PK	H	-6.50	44.39	74	-29.61
1815.60	44.36	AV	H	-6.50	37.86	54	-16.14
1815.60	52.44	PK	V	-6.50	45.94	74	-28.06
1815.60	47.92	AV	V	-6.50	41.42	54	-12.58
2723.40	46.26	PK	H	-2.49	43.77	74	-30.23
2723.40	33.59	AV	H	-2.49	31.10	54	-22.90
2723.40	46.47	PK	V	-2.49	43.98	74	-30.02
2723.40	35.56	AV	V	-2.49	33.07	54	-20.93
3631.20	49.79	PK	H	-1.94	47.85	74	-26.15
3631.20	39.47	AV	H	-1.94	37.53	54	-16.47
3631.20	49.72	PK	V	-1.94	47.78	74	-26.22
3631.20	39.74	AV	V	-1.94	37.80	54	-16.20

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Absolute Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
High Channel 914.2MHz							
1828.40	51.55	PK	H	-6.40	45.15	74	-28.85
1828.40	45.63	AV	H	-6.40	39.23	54	-14.77
1828.40	55.01	PK	V	-6.40	48.61	74	-25.39
1828.40	51.10	AV	V	-6.40	44.70	54	-9.30
2742.60	45.66	PK	H	-2.49	43.17	74	-30.83
2742.60	34.18	AV	H	-2.49	31.69	54	-22.31
2742.60	46.34	PK	V	-2.49	43.85	74	-30.15
2742.60	35.45	AV	V	-2.49	32.96	54	-21.04
3656.80	49.40	PK	H	-1.84	47.56	74	-26.44
3656.80	40.42	AV	H	-1.84	38.58	54	-15.42
3656.80	50.77	PK	V	-1.84	48.93	74	-25.07
3656.80	41.54	AV	V	-1.84	39.70	54	-14.30

Note:

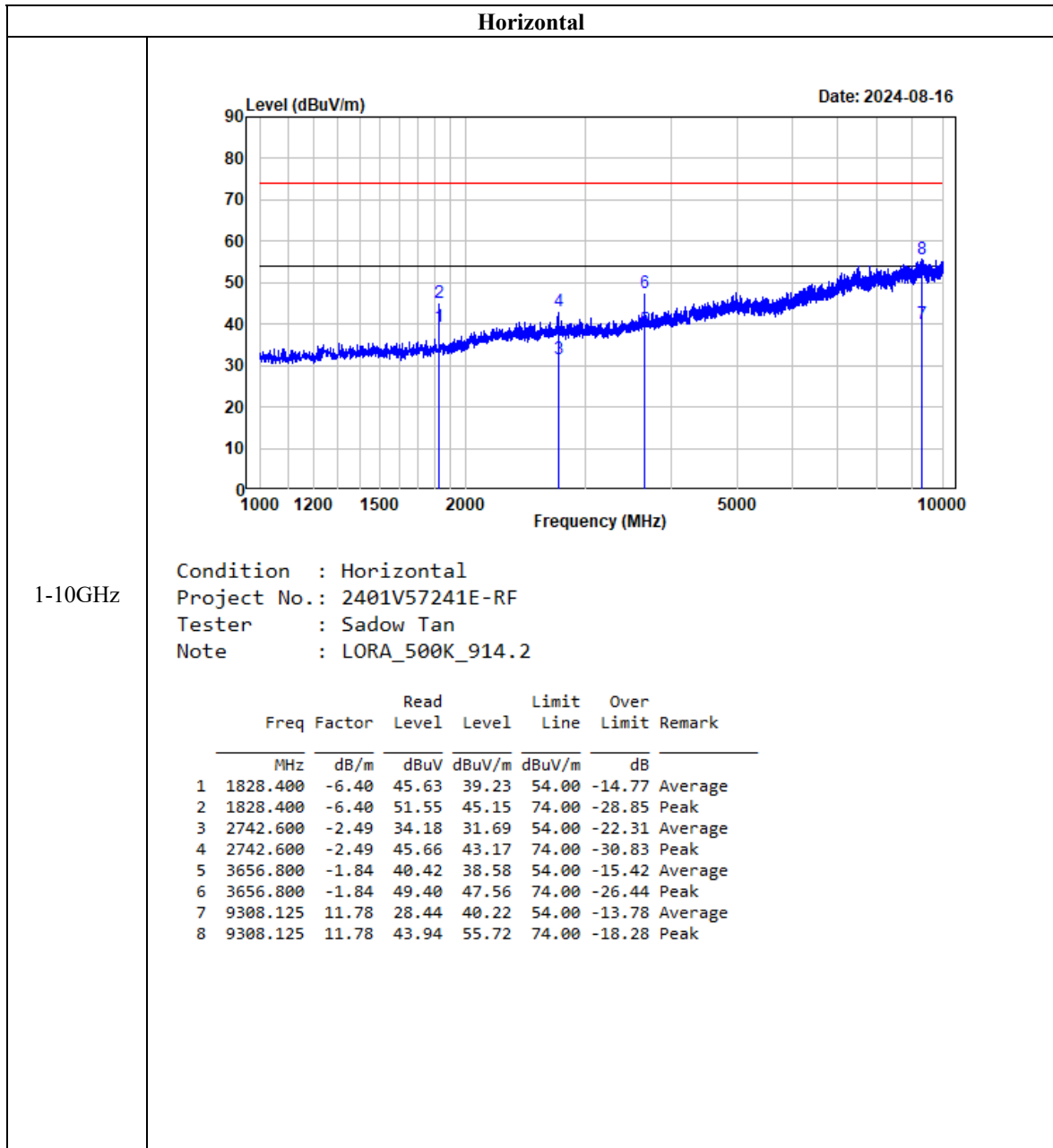
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Corrected Amplitude/Level = Corrected Factor + Reading

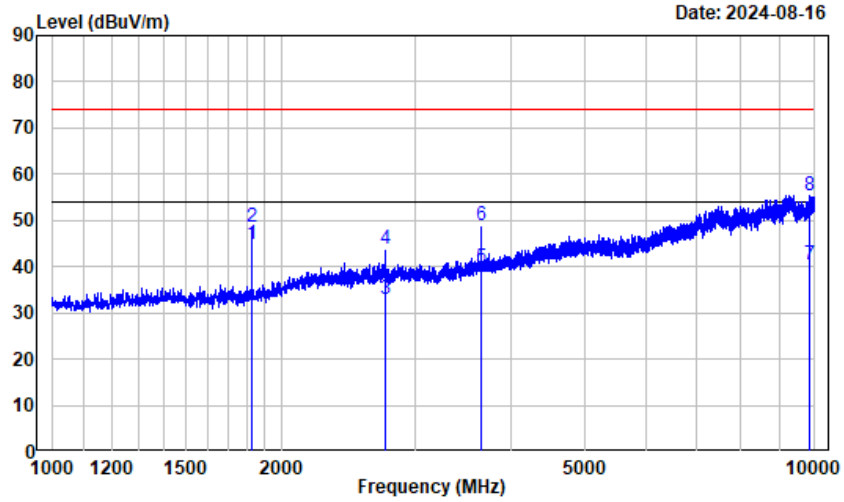
Margin = Corrected Amplitude/Level - Limit

The other spurious emission which is in the noise floor level was not recorded.

Listed with the harmonic margin test plot:



Vertical



1-10GHz

Condition : Vertical
 Project No.: 2401V57241E-RF
 Tester : Sadow Tan
 Note : LORA_500K_914.2

	Read	Limit	Over				
Freq	Factor	Level	Level	Line			
MHz	dB/m	dBuV	dBuV/m	dBuV/m			
1	1828.400	-6.40	51.10	44.70	54.00	-9.30	Average
2	1828.400	-6.40	55.01	48.61	74.00	-25.39	Peak
3	2742.600	-2.49	35.45	32.96	54.00	-21.04	Average
4	2742.600	-2.49	46.34	43.85	74.00	-30.15	Peak
5	3656.800	-1.84	41.54	39.70	54.00	-14.30	Average
6	3656.800	-1.84	50.77	48.93	74.00	-25.07	Peak
7	9836.875	12.08	28.46	40.54	54.00	-13.46	Average
8	9836.875	12.08	43.43	55.51	74.00	-18.49	Peak

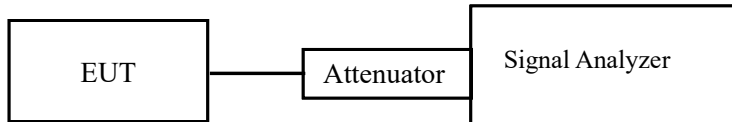
FCC §15.247(a) (2) - 6 dB EMISSION BANDWIDTH

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

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



Test Data

Environmental Conditions

Temperature:	25.5 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

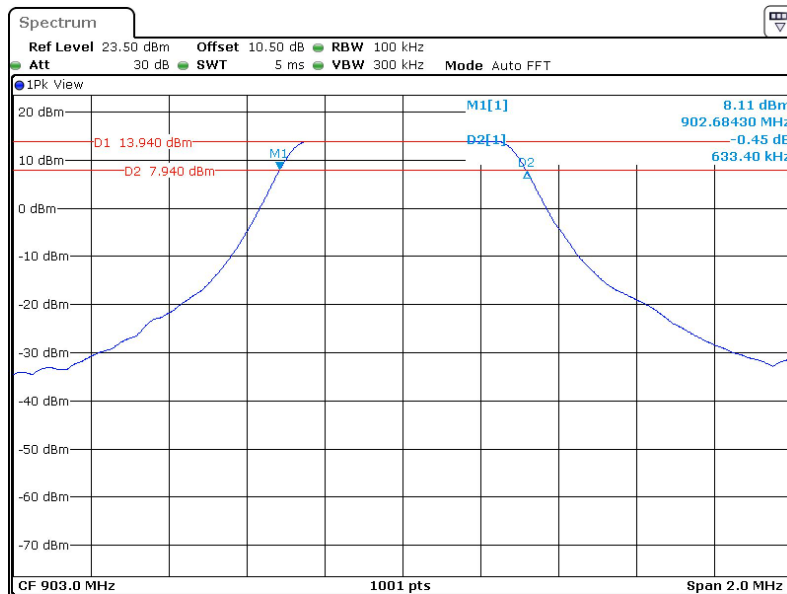
The testing was performed by KunfuMaster Liang on 2024-08-14.

EUT operation mode: Transmitting

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

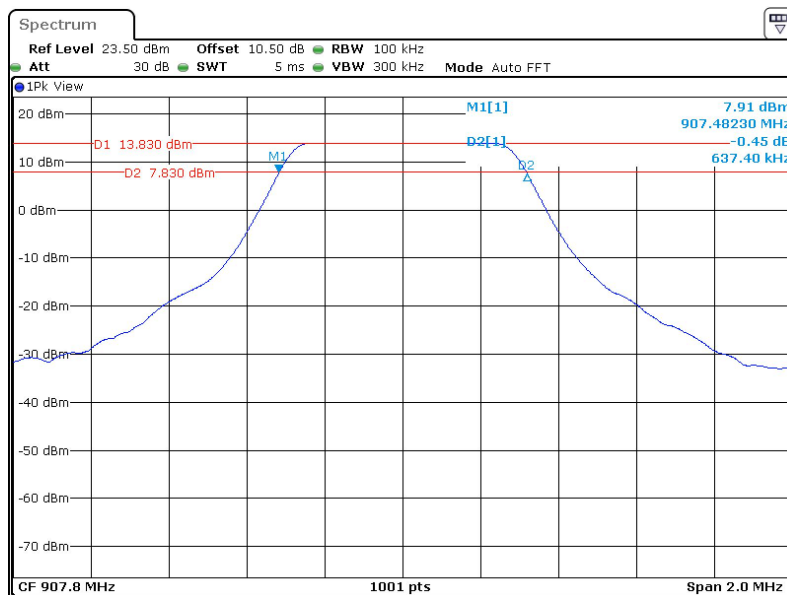
Test Channel	Test Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
Low	903	0.633	0.5
Middle	907.8	0.637	0.5
High	914.2	0.637	0.5

Low Channel



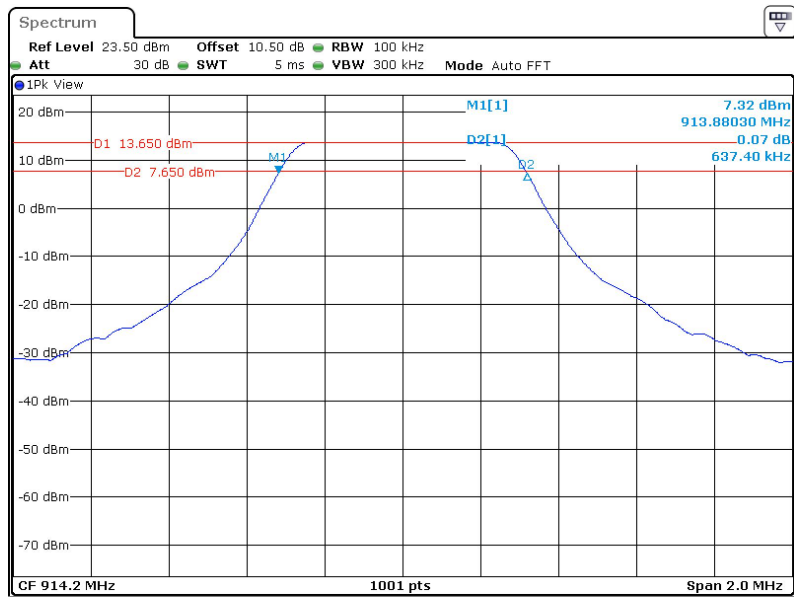
ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
 Date: 14.AUG.2024 22:23:44

Middle Channel



ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
 Date: 14.AUG.2024 22:26:21

High Channel



ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
Date: 14.AUG.2024 22:20:29

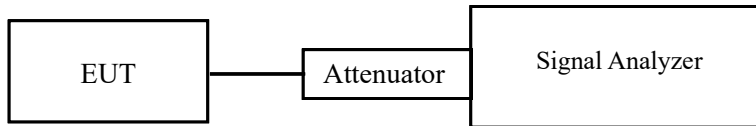
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

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

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.



Test Data

Environmental Conditions

Temperature:	25.5 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

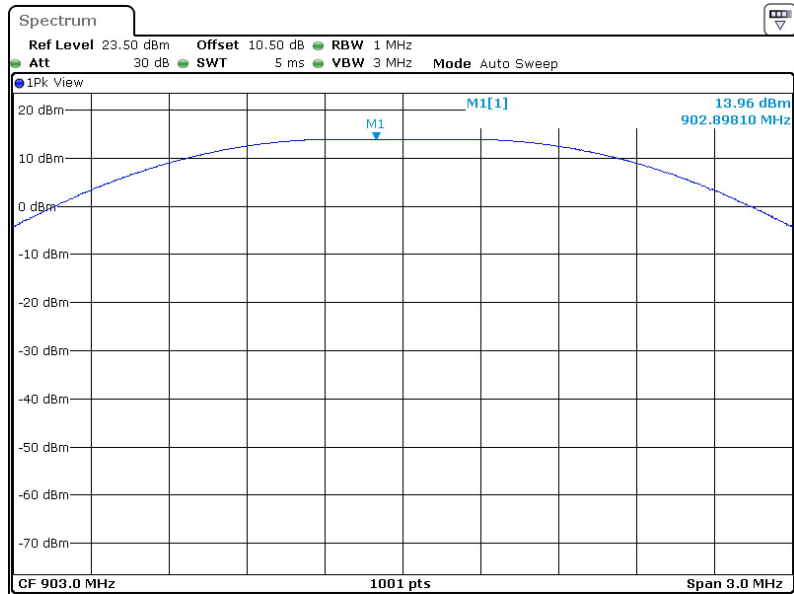
The testing was performed by KunfuMaster Liang on 2024-08-14.

EUT operation mode: Transmitting

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

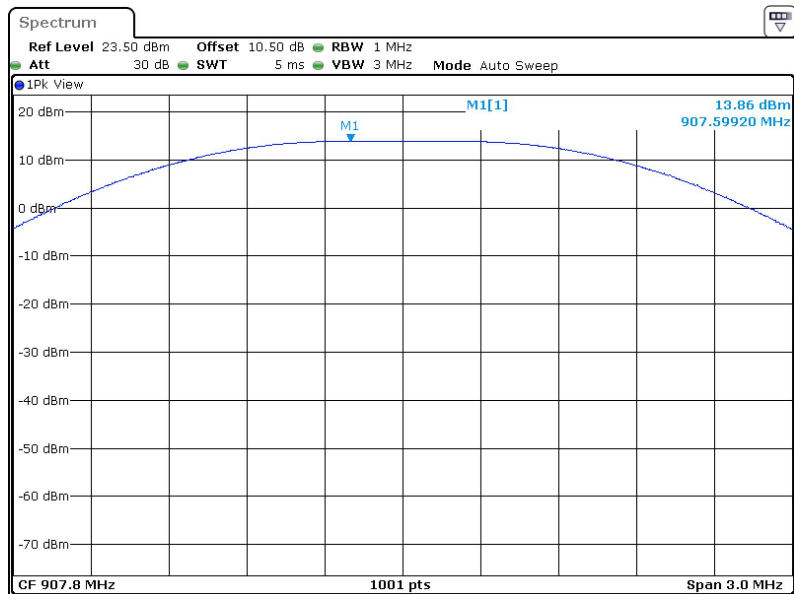
Test Channel	Test Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)	Limit (dBm)
Low	903	13.96	≤30
Middle	907.8	13.86	≤30
High	914.2	13.71	≤30

Low Channel



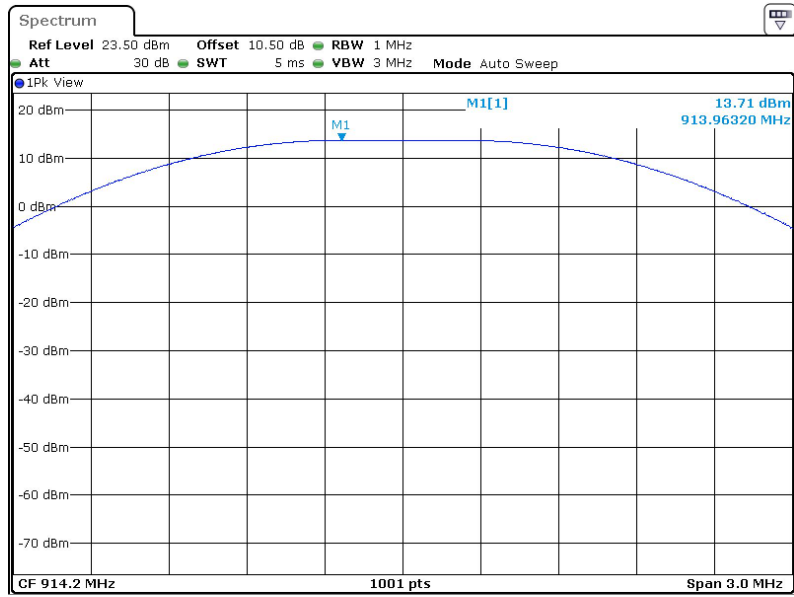
ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
Date: 14.AUG.2024 21:17:50

Middle Channel



ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
Date: 14.AUG.2024 21:20:02

High Channel



ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
 Date: 14.AUG.2024 21:22:00

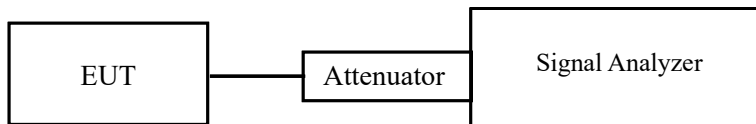
FCC §15.247(d) - 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

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

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.



Test Data

Environmental Conditions

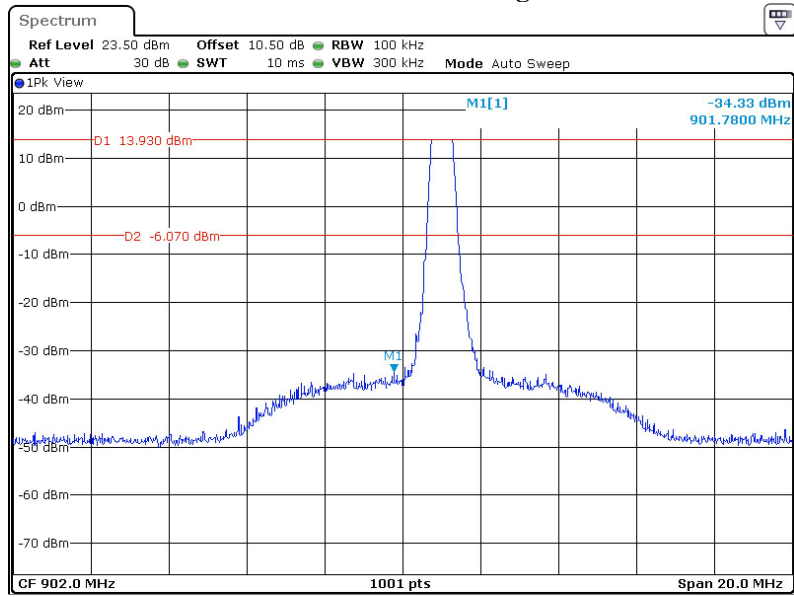
Temperature:	25.5°C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by KunfuMaster Liang on 2024-08-14.

EUT operation mode: Transmitting

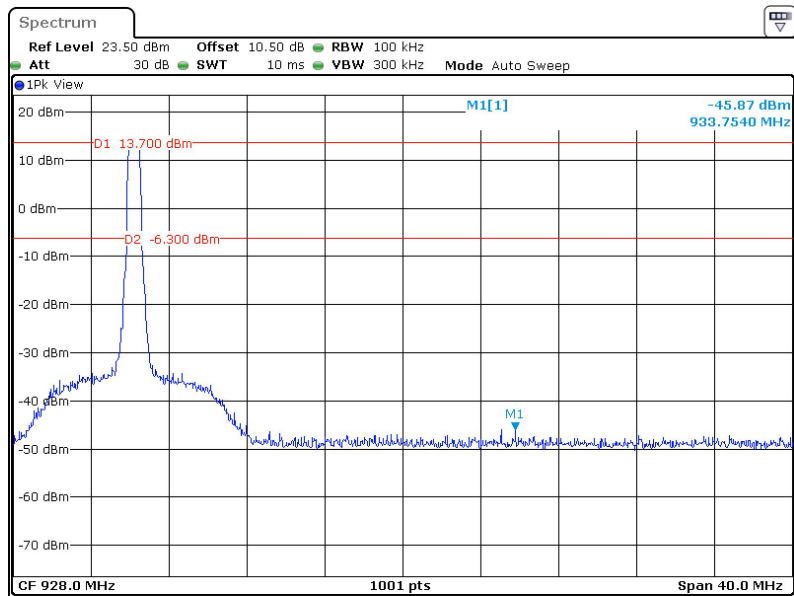
Test Result: Compliant. Please refer to the following plots.

Lowest Band edge



ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
Date: 14.AUG.2024 22:07:25

Highest Band edge



ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
Date: 14.AUG.2024 22:12:03

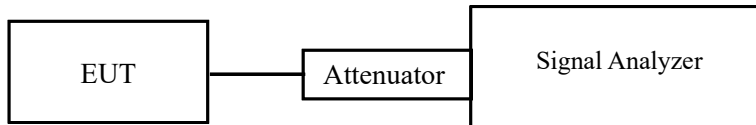
FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

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

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: $3\text{kHz} \leq \text{RBW} \leq 100\text{ kHz}$.
3. Set the VBW $\geq 3 \times \text{RBW}$.
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

Environmental Conditions

Temperature:	25.5 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

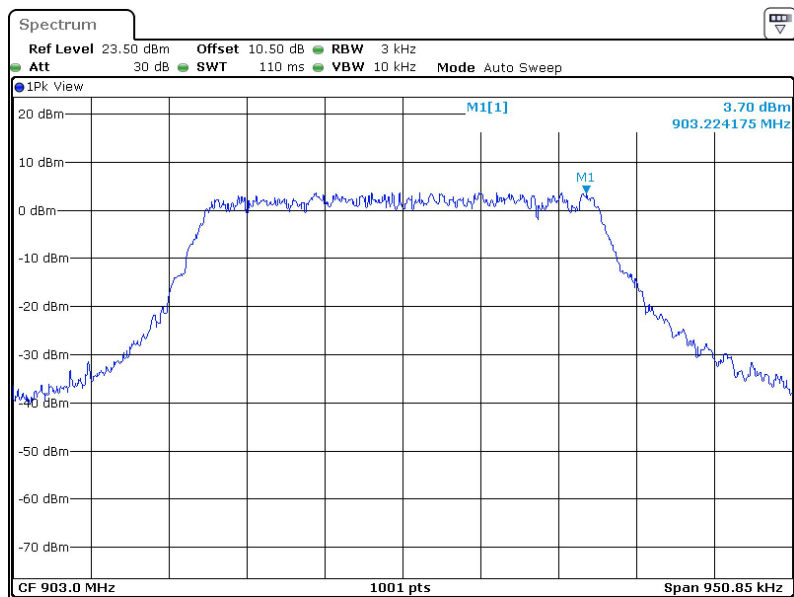
The testing was performed by KunfuMaster Liang on 2024-08-14.

EUT operation mode: Transmitting

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

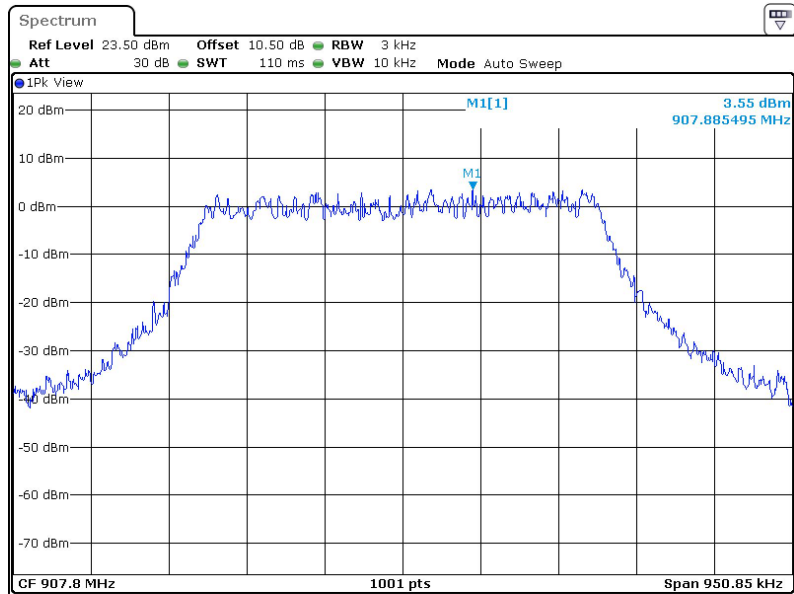
Test Channel	Test Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Low	903	3.70	≤8.00
Middle	907.8	3.55	≤8.00
High	914.2	3.45	≤8.00

Low Channel



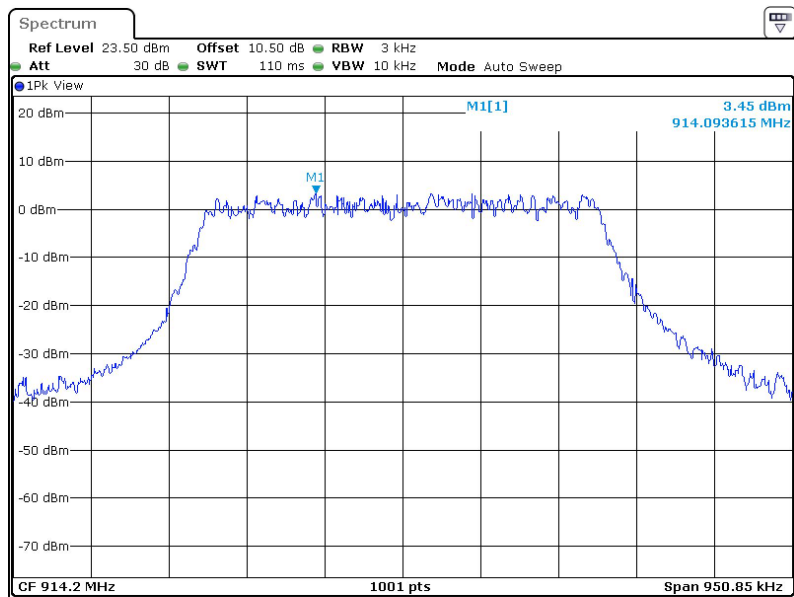
ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
 Date: 14.AUG.2024 21:59:51

Middle Channel



ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
Date: 14.AUG.2024 21:31:35

High Channel



ProjectNo.:2401V57241E-RF Tester:Kungfumaster Liang
Date: 14.AUG.2024 21:28:53

EUT PHOTOGRAPHS

Please refer to the attachment 2401V57241E-RF External photo and 2401V57241E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401V57241E-RF Test Setup photo.

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