

Project No: TM-2404000334P
Report No.: TMWK2404001328KR

FCC ID: 2BFR9-N743

Page: 1 / 49
Rev.: 02

RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C

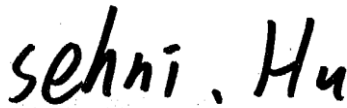
Test Standard	FCC Part 15.247
Product name	Smart Container Tracker
Brand Name	Net Feasa
Model No.	N743, N743G
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory)

Approved by:



Sehni Hu
Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	September 12, 2024	Initial Issue	ALL	Peggy Tsai
01	September 30, 2024	See the following Note Rev. (01)	P.4	Peggy Tsai
02	October 1, 2024	See the following Note Rev. (02)	P.4	Peggy Tsai

Note:

Rev. (01)

1. Modify Power Operation in section 1.1.

Rev. (02)

1. Modify Power Operation in section 1.1.

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Net Feasa Limited An Cooleen,Dingle,V92 P9NX, co. kerry, Ireland	
Manufacturer	Net Feasa Limited An Cooleen,Dingle,V92 P9NX, co. kerry, Ireland	
Equipment	Smart Container Tracker	
Model Name	N743, N743G	
Model Discrepancy	Difference of the model numbers (list on this report) is just for external color difference as below:	
	Model Number	External color
	N743	Black
	N743G	Gray
Trade name	Net Feasa	
Received Date	May 23, 2024	
Date of Test	July 9 ~ August 15, 2024	
Power Operation	1. Power by Power Battery-1 (MiTAC / 433051) (Main Use) Nominal Voltage: 3.2 Vdc Rated Capacity: 1900mAh, 6.08Wh 2. Power by Power Battery-2 (MiTAC / 433052) (Auxiliary use) Nominal Voltage: 3.0 Vdc Rated Capacity: 5100mAh Rated Power: 15.3Wh	
HW Version	R01A	
FW Version	1.0	

Remark:

- For more details, please refer to the User's manual of the EUT.
- Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
- Disclaimer: The variant model numbers are assessed as identical in hardware and software to each other, hence all variants are fully covered by the test results in this test report without further verification test.

1.2 EUT CHANNEL INFORMATION

Frequency Range	903.9 MHz-905.3 MHz
Modulation Type	LoRa
Number of channels	8 Channels

Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
<input type="checkbox"/> 1 MHz or less	1	Middle
<input type="checkbox"/> 1 MHz to 10 MHz	2	1 near top and 1 near bottom
<input checked="" type="checkbox"/> More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	<input type="checkbox"/> CHIP <input type="checkbox"/> PCB <input type="checkbox"/> Dipole <input checked="" type="checkbox"/> Dielectric Chip Antenna
Antenna Gain	Gain: 4.87 dBi
Antenna Connector	N/A

Remark:

1. The industrial epoxy adhesive is used making Antenna connection permanently prior to shipping. It complies with rule 15.203.

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	± 2.213 dB
Channel Bandwidth	± 2.7 %
Power Spectral density	± 2.739 dB
Conducted Bandedge	± 2.739 dB
Conducted Spurious Emission	± 2.742 dB
Radiated Emission_9kHz-30MHz	± 3.761 dB
Radiated Emission_30MHz-200MHz	± 3.473 dB
Radiated Emission_200MHz-1GHz	± 3.946 dB
Radiated Emission_1GHz-6GHz	± 4.797 dB
Radiated Emission_6GHz-18GHz	± 4.803 dB

Remark:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	-	Not applicable, because EUT doesn't connect to AC Main Source direct.
Radiation	Tony Chao 、 Ray Li	-
RF Conducted	Jerry Chang	-

Remark: The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC pubic Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

1.6 INSTRUMENT CALIBRATION

Conducted_FCC_Lora					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power Supply	GWINSTEK	GPC-3030D	8070184	2023-10-02	2024-10-01
Power Sensor	Anritsu	MA2411B	1726104	2024-04-16	2025-04-15
Power Meter	Anritsu	ML2496A	1804001	2024-04-16	2025-04-15
EXA Signal Analyzer	Keysight	N9010B	MY55460167	2024-01-03	2025-01-02
Attenuator	Marvelous Microwave Inc	MVE2213-10	08	2023-11-07	2024-11-06
Software	Radio Test Software Ver. 21				

966A_Radiated 900MHz					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Analyzer	KEYSIGHT	N9010A	MY52220817	2024-03-15	2025-03-14
Thermo-Hygro Meter	WISEWIND	1206	D07	2023-12-08	2024-12-07
Active Loop Antenna	SCHWARZBECK	FMZB 1513-60	1513-60-028	2023-12-13	2024-12-12
Bi-Log Antenna	Sunol Sciences	JB3	A030105	2024-07-12	2025-07-11
Preamplifier	EMEC	EM330	060609	2024-02-21	2025-02-20
Cable	Huber+Suhner	104PEA	20995+21000+182330	2023-08-08	2024-08-07
				2024-08-07	2025-08-06
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2023-12-28	2024-12-27
Preamplifier	HP	8449B	3008A00965	2023-12-22	2024-12-21
Cable	EMCI	EMC101G	221213+221011+221012	2023-10-17	2024-10-16
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Software	e3 V9-210616c				

Remark:

- Each piece of equipment is scheduled for calibration once a year.
- N.C.R. = No Calibration Required.

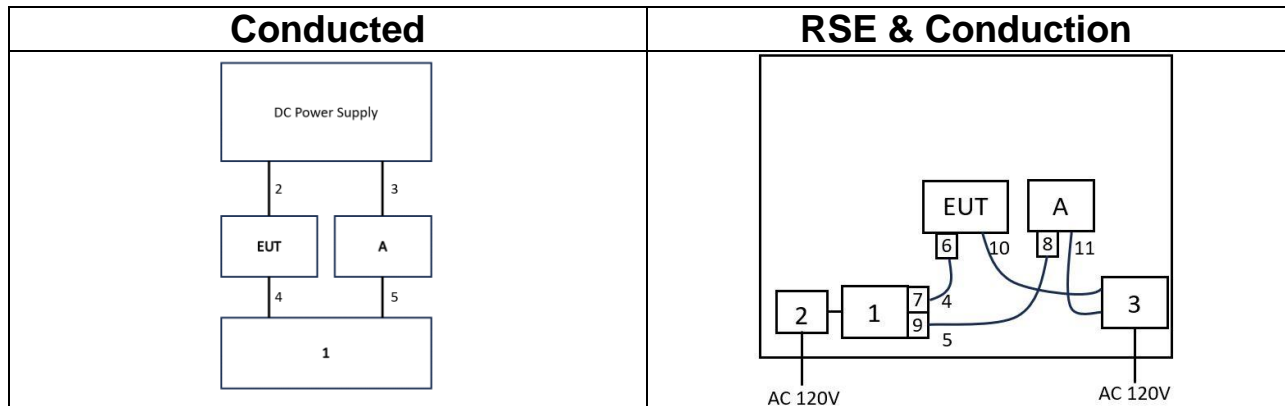
1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

Support Equipment (Conducted)					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(B)	Lenovo	T470	N/A	N/A
2	DC Power Cable	MISUMI	MCR3S-RE	N/A	N/A
3	DC Power Cable	MISUMI	MCR3S-RE	N/A	N/A
4	Micro USB	PHILIPS	DLC4562U	N/A	N/A
5	Micro USB	StarTech.	UUSBHAUB3M	N/A	N/A
A	Gateway	N/A	N/A	N/A	N/A

Support Equipment (Radiated)					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(D)	Lenovo	ThinkPad X260	N/A	N/A
2	Adapter	Lenovo	ADLX45DLC3A	N/A	N/A
3	DC Power Source	GWINSTEK	SPS-3610	GPE880163	N/A
4	Cable TypeA to MircoB	PHILIPS	A9009TT5F	SLPA2205002088	N/A
5	Cable TypeA to MircoB	PHILIPS	A9009TT5F	SLPA2205002088	N/A
6	Ferrite bead	Coremaster	LF-120	N/A	N/A
7	Ferrite bead	Coremaster	LF-120	N/A	N/A
8	Ferrite bead	Coremaster	LF-120	N/A	N/A
9	Ferrite bead	Coremaster	LF-120	N/A	N/A
10	DC Cable	Boyan	SB-10	N/A	N/A
11	DC Cable	Boyan	SB-10	N/A	N/A
A	Gateway	N/A	N/A	N/A	N/A

1.8 TEST SET UP DIAGRAM



1.9 TEST PROGRAM

The EUT connection corresponds to the surrounding fixture control board. This EUT uses "nRF Connect" software and set commands to set the frequency, modulation, and power to allow the sample to continuously transmit (including frequency hopping mode).

1.10 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247, KDB 558074 D01.

2. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	Pass
15.247(a)(1)	4.2	20 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)	4.3	Output Power Measurement	Pass
15.247(a)(1)	4.4	Frequency Separation	Pass
-	4.5	Number of Hopping	Pass
15.247(d)	4.6	Conducted Band Edge	Pass
15.247(d)	4.6	Conducted Spurious Emission	Pass
15.247(f)	4.7	Time of Occupancy	Pass
15.247(f)	4.8	Power Spectral Density	Pass
15.247(d), 15.205(a), 15.209(a)	4.9	Radiation Band Edge	Pass
15.247(d), 15.205(a), 15.209(a)	4.9	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	LoRa
Test Channel Frequencies	1.Lowest Channel: 903.9 MHz 2.Middle Channel: 904.7 MHz 3.Highest Channel: 905.3 MHz
Channel List	903.9 MHz, 904.1 MHz, 904.3 MHz, 904.5 MHz, 904.7 MHz, 904.9 MHz, 905.1 MHz, 905.3 MHz

Remark:

1. The device supports hybrid mode.

3.2 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Power supply
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4
Worst Position	<input type="checkbox"/> Placed in fixed position. <input checked="" type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane) <input type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane) <input type="checkbox"/> Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Power supply
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

Remark:

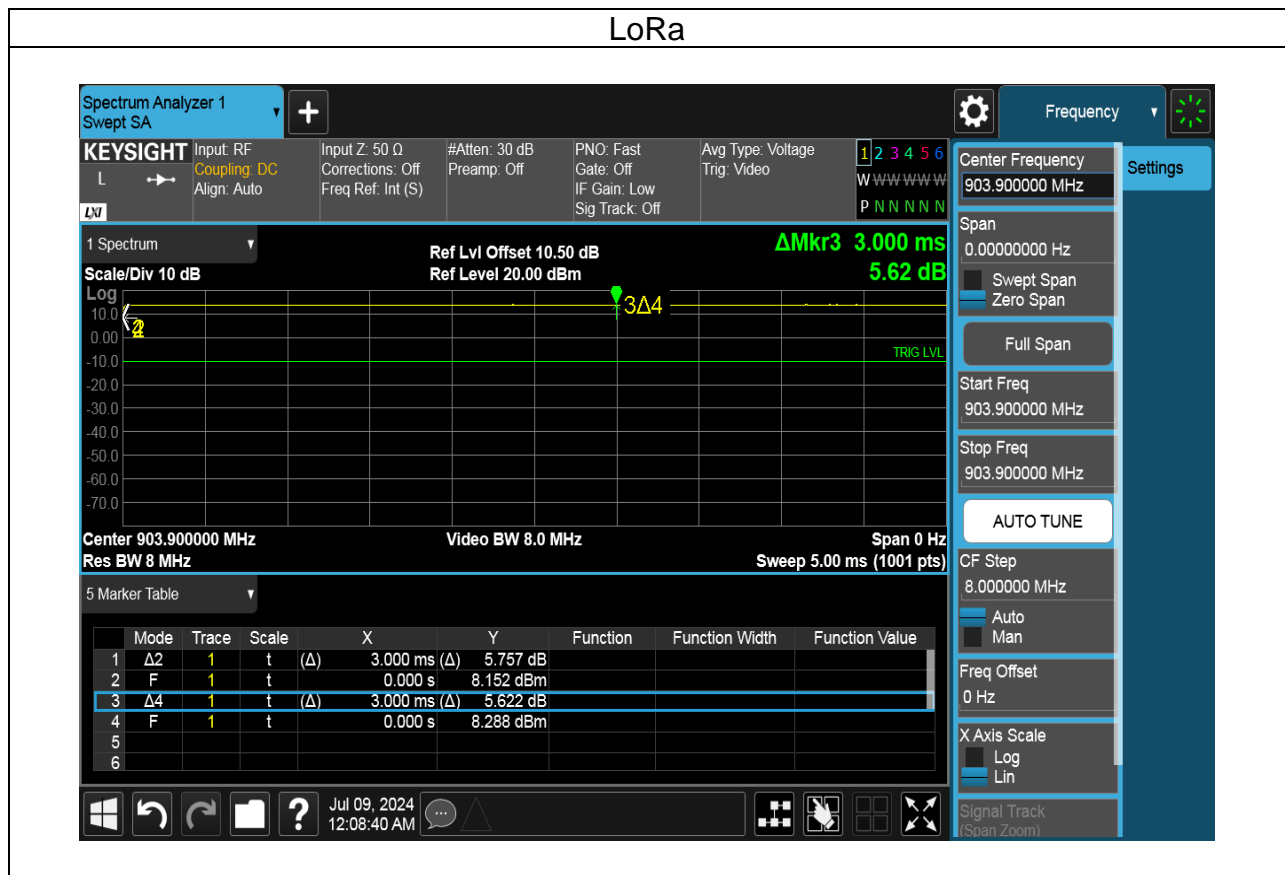
1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report

3.3 EUT DUTY CYCLE

Temperature: 21.8 ~ 25.2°C
Humidity: 50 ~ 61% RH

Test date: July 9 ~ August 15, 2024
Tested by: Jerry Chang

	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) = 10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
Lora	100.00	0.00	0.00	0.01



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

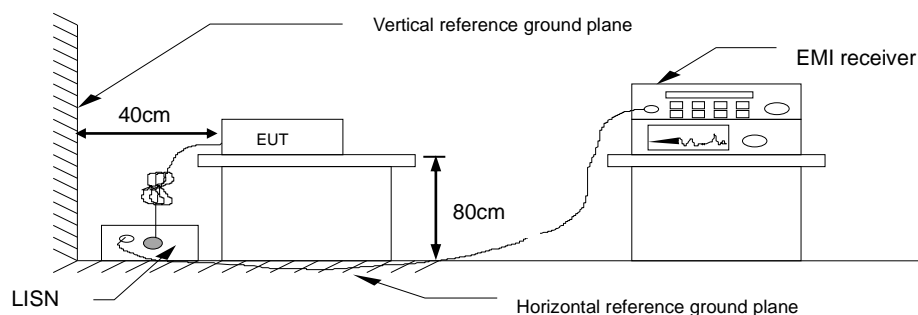
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

1. The EUT was placed above horizontal ground plane and 0.4m above vertical ground plane
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup



4.1.4 Test Result

Not applicable, because EUT not connect to AC Main Source direct.

4.2 20dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

4.2.1 Test Limit

According to §15.247(a) (1),

20 dB Bandwidth : For reporting purposes only.

Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 7.8.7,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 30kHz, VBW = 100kHz and Detector = Peak, to measurement 20 dB Bandwidth and 99% Bandwidth.
4. Measure and record the result of 20 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup

Refer to section 1.8.

4.2.4 Test Result

Temperature: 21.8 ~ 25.2°C
Humidity: 50 ~ 61% RH

Test date: July 9 ~ August 15, 2024
Tested by: Jerry Chang

20dB BANDWIDTH

CH	20 dB BW (MHz)
Low	0.147
Mid	0.1465
High	0.1408

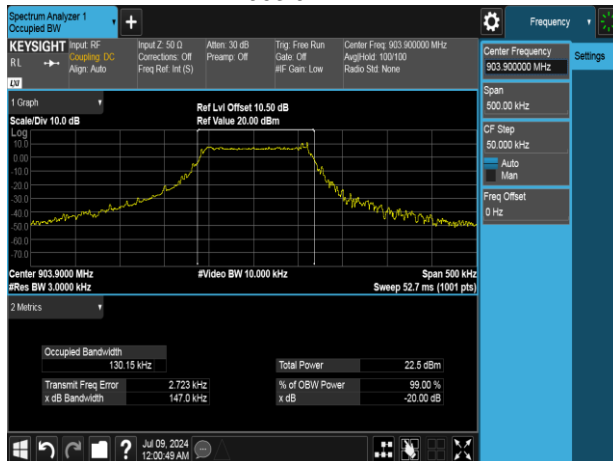
BANDWIDTH 99%

CH	99% BW (kHz)
Low	128.39
Mid	129.06
High	128.37

Test Data

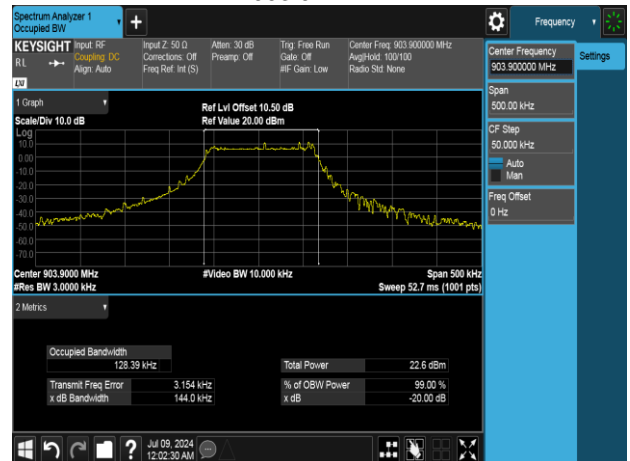
20dB BANDWIDTH

903.9 MHz

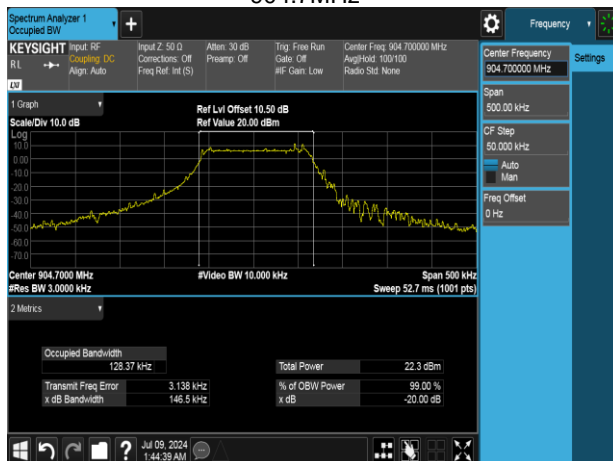


BANDWIDTH 99%

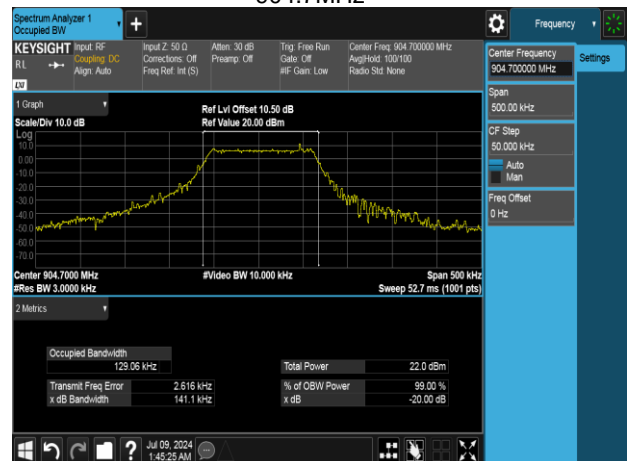
903.9 MHz



904.7MHz



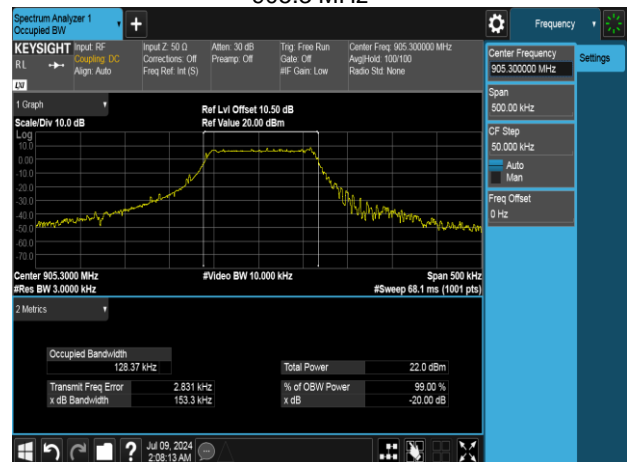
904.7MHz



905.3 MHz



905.3 MHz



4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b),

For frequency hopping systems operating in the 902-928 MHz band: 1 watt.

Limit	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 30dBm <input type="checkbox"/> Antenna with DG greater than 6 dBi [Limit = 30 – (DG – 6)] <input type="checkbox"/> Point-to-point operation
-------	---

4.3.2 Test Procedure

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power. in the test report.

4.3.3 Test Setup

Refer to section 1.8.

4.3.4 Test Result

Temperature: 21.8 ~ 25.2°C

Test date: July 9 ~ August 15, 2024

Humidity: 50 ~ 61% RH

Tested by: Jerry Chang

LORA	Power Setting	Peak Output Power (dBm)	Average Output Power (dBm)	Limit (dBm)
Frequency (MHz)				
903.9	16	14.1	14.06	<30dBm
904.7	16	14.09	14.05	
905.3	16	14.06	14.02	

4.4 FREQUENCY SEPARATION

4.4.1 Test Limit

According to §15.247(a)(1) ,

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Limit	> 20dB bandwidth
-------	------------------

4.4.2 Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. EUT RF output port connected to the SA by RF cable.
3. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Sweep = auto.
Max hold, mark 2 peaks of hopping channel and record the 2 peaks frequency

4.4.3 Test Setup

Refer to section 1.8.

4.4.4 Test Result

Temperature: 21.8 ~ 25.2°C

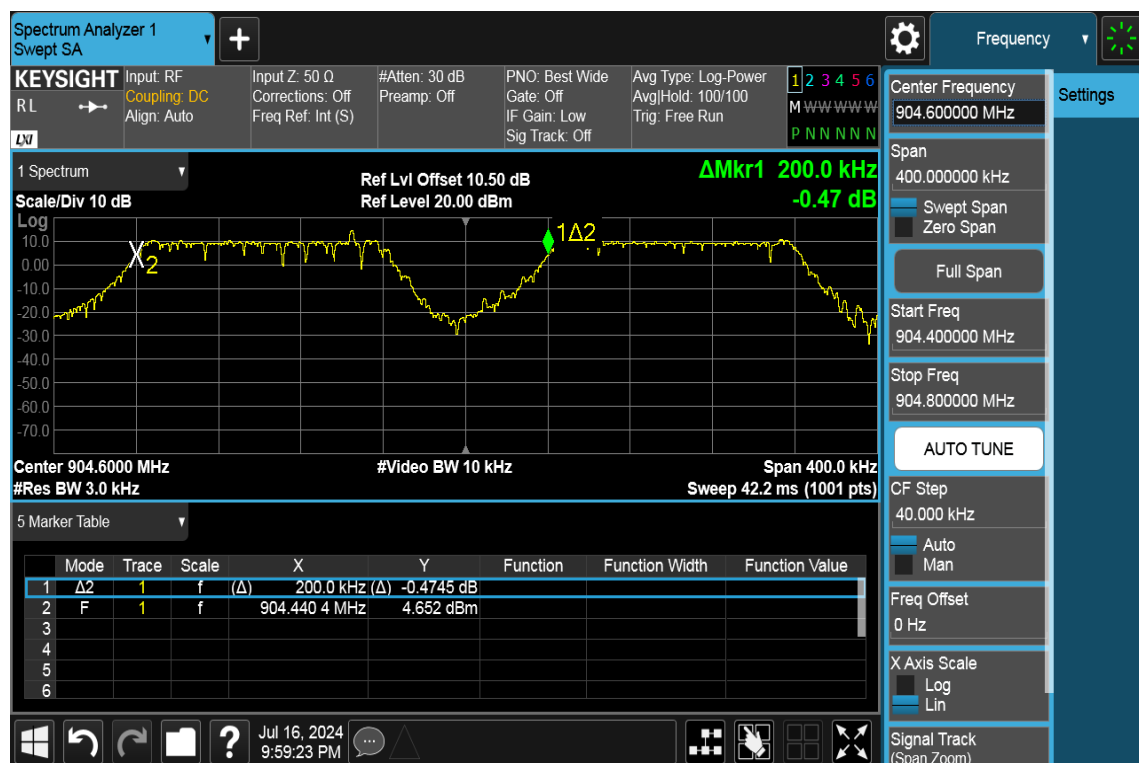
Test date: July 9 ~ August 15, 2024

Humidity: 50 ~ 61% RH

Tested by: Jerry Chang

Test mode: LoRa 125k / 903.9-905.3 MHz				
Channel	Frequency (MHz)	Channel Separation (MHz)	Channel Separation Limits (MHz)	Result
Low	903.9	0.2	0.1470	PASS
Mid	904.7	0.2	0.1465	PASS
High	905.3	0.2	0.1408	PASS

Mid



4.5 NUMBER OF HOPPING

4.5.1 Test Limit

Limit: N/A; Based on KDB 558074 D01, this result is recorded only.

4.5.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 7.8.3

1. Place the EUT on the table and set it in transmitting mode.
2. EUT RF output port connected to the SA by RF cable.
3. Set spectrum analyzer Start Freq. = 903.6 MHz, Stop Freq. = 905.6 MHz, RBW=30KHz, VBW =100kHz.
4. Max hold, view and count how many channel in the band.

4.5.3 Test Setup

Refer to section 1.8.

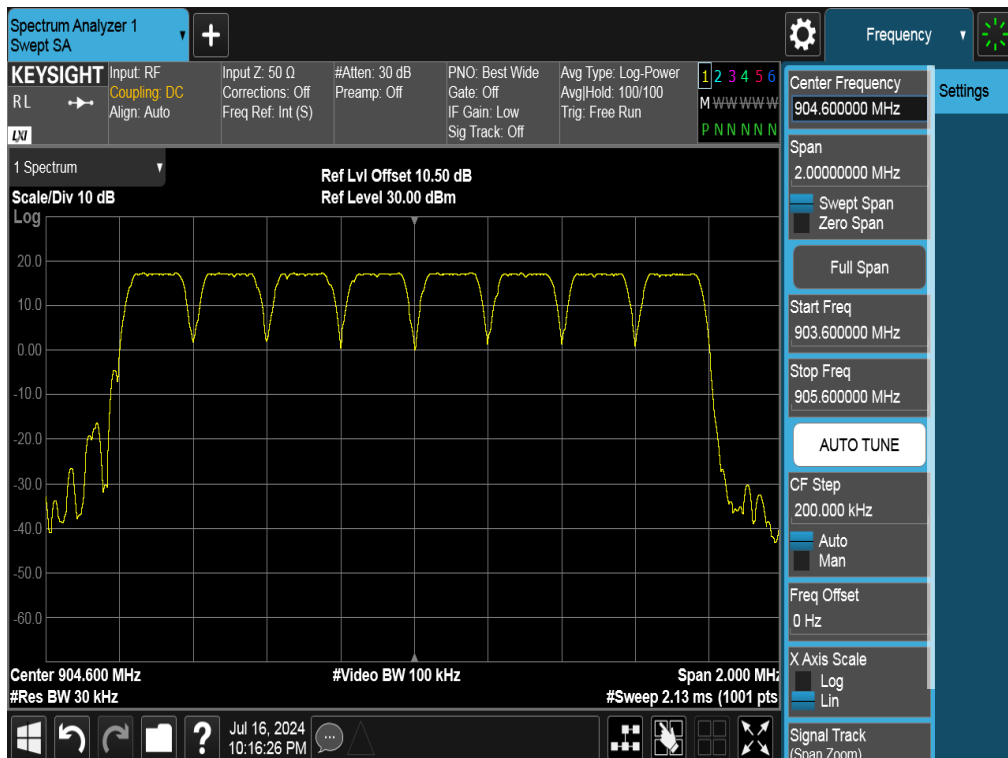
4.5.4 Test Result

Temperature: 21.8 ~ 25.2°C
Humidity: 50 ~ 61% RH

Test date: July 9 ~ August 15, 2024
Tested by: Jerry Chang

Number of Hopping				
Mode	Frequency (MHz)	Hopping Channel Number	Hopping Channel Number Limits	Result
LoRa	903.9-905.3	8	N/A	Pass

Test Data



4.6 CONDUCTED BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

According to §15.247(d),

Limit	-20 dBc
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4.6.2 Test Procedure

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.
2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.
3. The Band Edge at 902MHz and 928MHz are investigated with both hopping "ON" and "OFF" modes ".

4.6.3 Test Setup

Refer to section 1.8.

4.6.4 Test Result

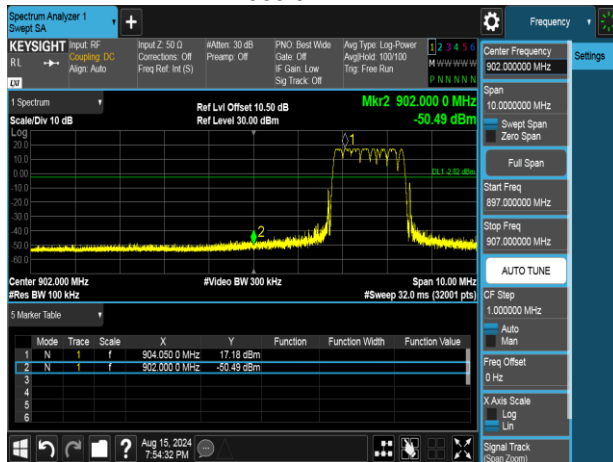
Temperature: 21.8 ~ 25.2°C
Humidity: 50 ~ 61% RH

Test date: July 9 ~ August 15, 2024
Tested by: Jerry Chang

Test Data

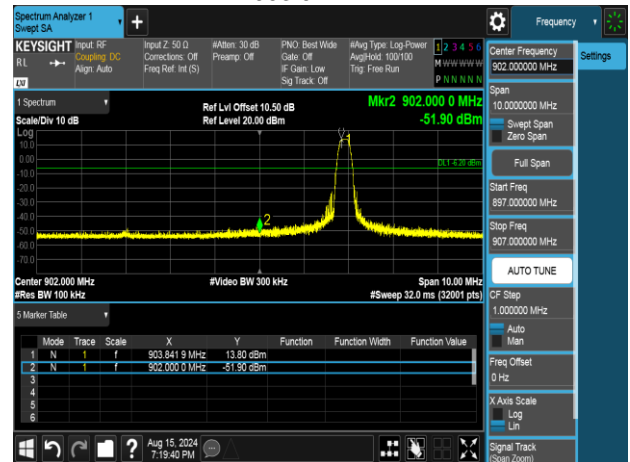
Hopping mode

903.9 MHz



Non-hopping mode

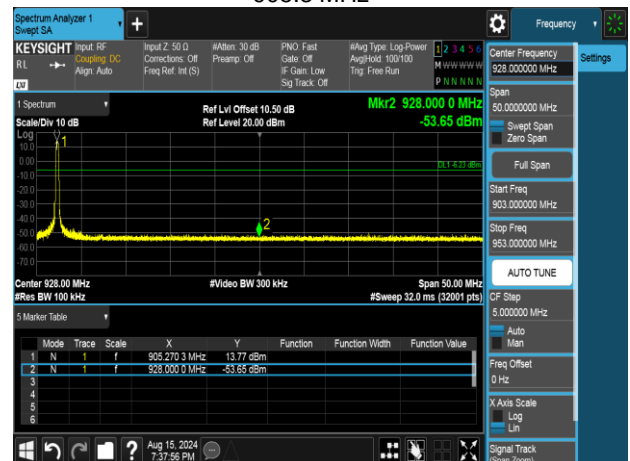
903.9 MHz



905.3 MHz

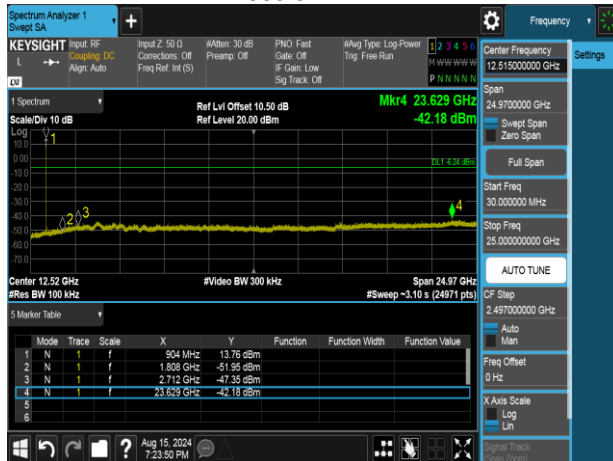


905.3 MHz

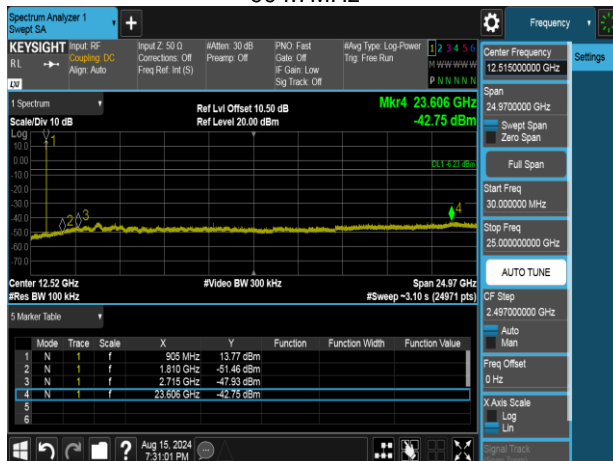


Spurious Emission

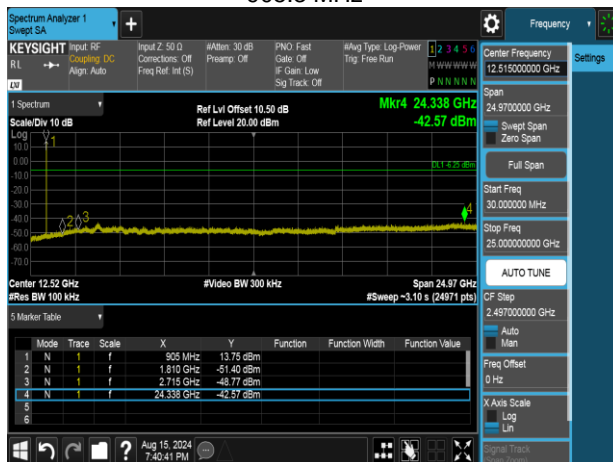
903.9 MHz



904.7MHz



905.3 MHz



4.7 TIME OF OCCUPANCY (DWELL TIME)

4.7.1 Test Limit

According to §15.247(f),

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

4.7.2 Test Procedure

1. EUT RF output port connected to the SA by RF cable.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW=30kHz, VBW=300kHz, Sweep = 3.2 s.

4.7.3 Test Setup

Refer to section 1.8.

4.7.4 Test Result

Temperature: 21.8 ~ 25.2°C

Test date: July 9 ~ August 15, 2024

Humidity: 50 ~ 61% RH

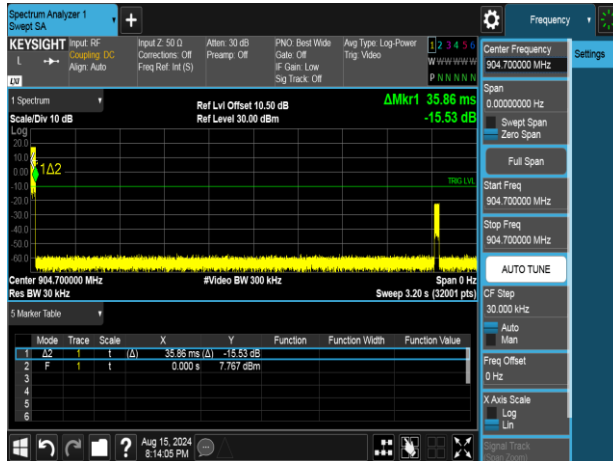
Tested by: Jerry Chang

Channel	Number of pulses per 3.2s period (1)	Length of 1 pulse (ms)	Average Time of occupancy (ms)	Limit (ms)
Mid	1	35.86	35.86	400

Note: Period of 3.2s (0.4s x 8 channels)

Test Data

904.7-1 MHz



904.7-2 MHz



4.8 POWER SPECTRAL DENSITY

4.8.1 Test Limit

According to §15.247(f),

The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Limit	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 8dBm <input type="checkbox"/> Antenna with DG greater than 6 dBi [Limit = 8 – (DG – 6)] <input type="checkbox"/> Point-to-point operation :
-------	---

4.8.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 3kHz, VBW = 10kHz, Span > 1.5 times DTS Bandwidth (6 dB BW), Detector = Peak, Sweep Time = Auto and Trace = Max hold.
4. The path loss were compensated to the results for each measurement by SA.
5. Mark the maximum level.
6. Measure and record the result of power spectral density. in the test report.

4.8.3 Test Setup

Refer to section 1.8.

4.8.4 Test Result

Temperature: 21.8 ~ 25.2°C

Test date: July 9 ~ August 15, 2024

Humidity: 50 ~ 61% RH

Tested by: Jerry Chang

Frequency (MHz)	RF Power Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)	Result
903.9	-9.477	8	PASS
904.7	-8.147	8	PASS
905.3	-10.665	8	PASS

Note:

- 1.Cable loss as 10.5dB that offsets in the spectrum
- 2.The parameters of span are much larger than the standard settings, so the results do not deviate from the standard definition.

Test Data

903.9 MHz



904.7MHz



905.3 MHz



4.9 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.9.1 Test Limit

FCC according to §15.247(d), §15.209(a) and §15.205(a),

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Remark:

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

4.9.2 Test Procedure

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10: 2013, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 9kHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

4. No emission found between lowest internal used/generated frequency to 30MHz (9KHz~30MHz).

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-ane choic chamber, the measurements correspond to those obtained at an open-field test site. There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

5. The SA setting following :

(1) Below 30MHz :

(1.1) 9KHz-490KHz : RBW=200Hz / VBW=1kHz / Sweep=AUTO

(1.2) 490KHz-30MHz : RBW=10kHz / VBW=30kHz / Sweep=AUTO

(2) 30MHz to 1GHz : RBW = 100kHz, VBW $\geq 3 \times$ RBW, Sweep = Auto,

Detector = Peak, Trace = Max hold.

(3) Above 1GHz :

(3.1) For Peak measurement : RBW = 1MHz, VBW $\geq 3 \times$ RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(3.2) For Average measurement : RBW = 1MHz, VBW

·If Duty Cycle $\geq 98\%$, VBW=10Hz.

·If Duty Cycle $< 98\%$, VBW=1/T.

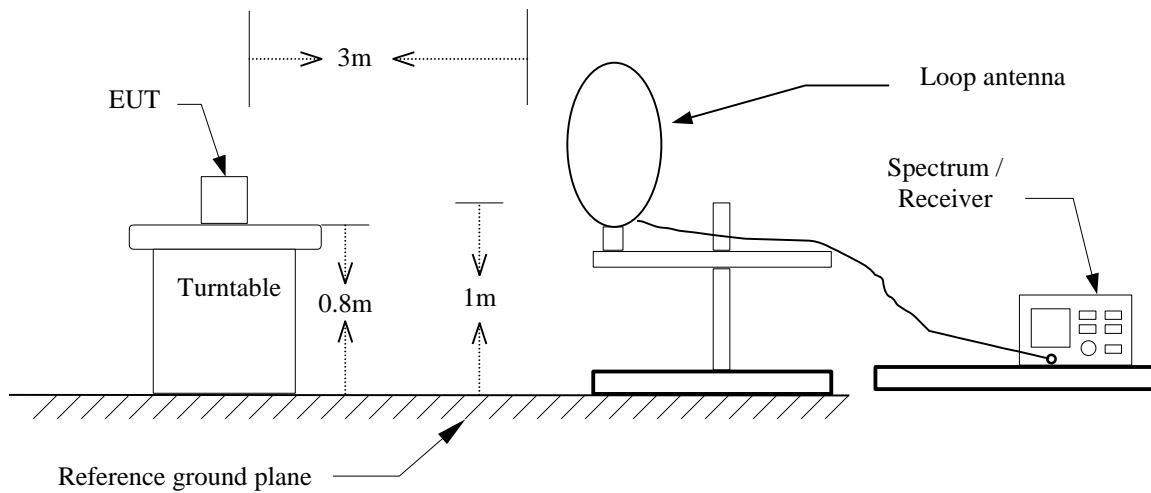
6. Data result

Actual FS=Spectrum Reading Level + Factor

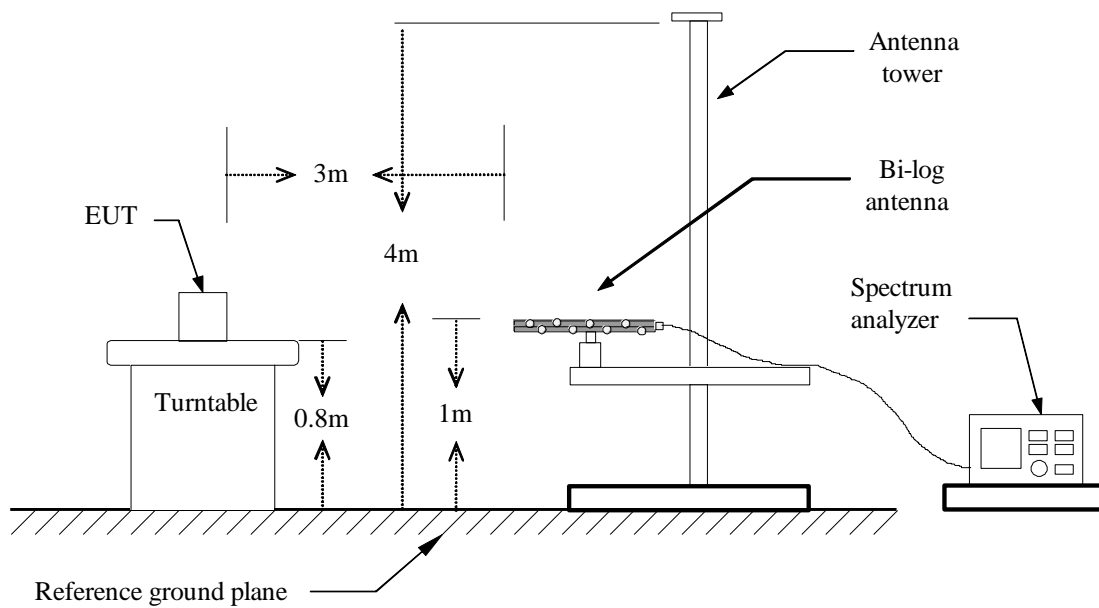
Margin=Actual FS- Limit

4.9.3 Test Setup

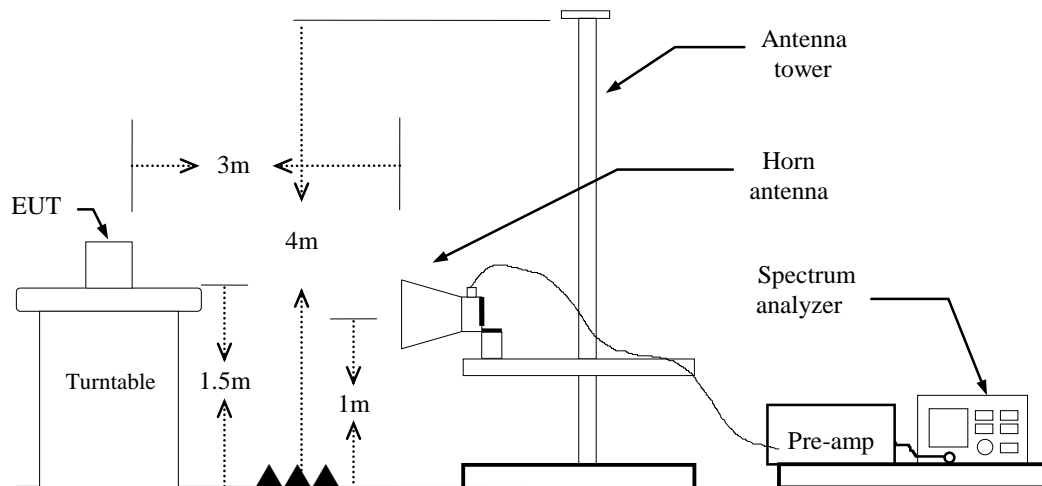
9kHz ~ 30MHz



30MHz ~ 1GHz



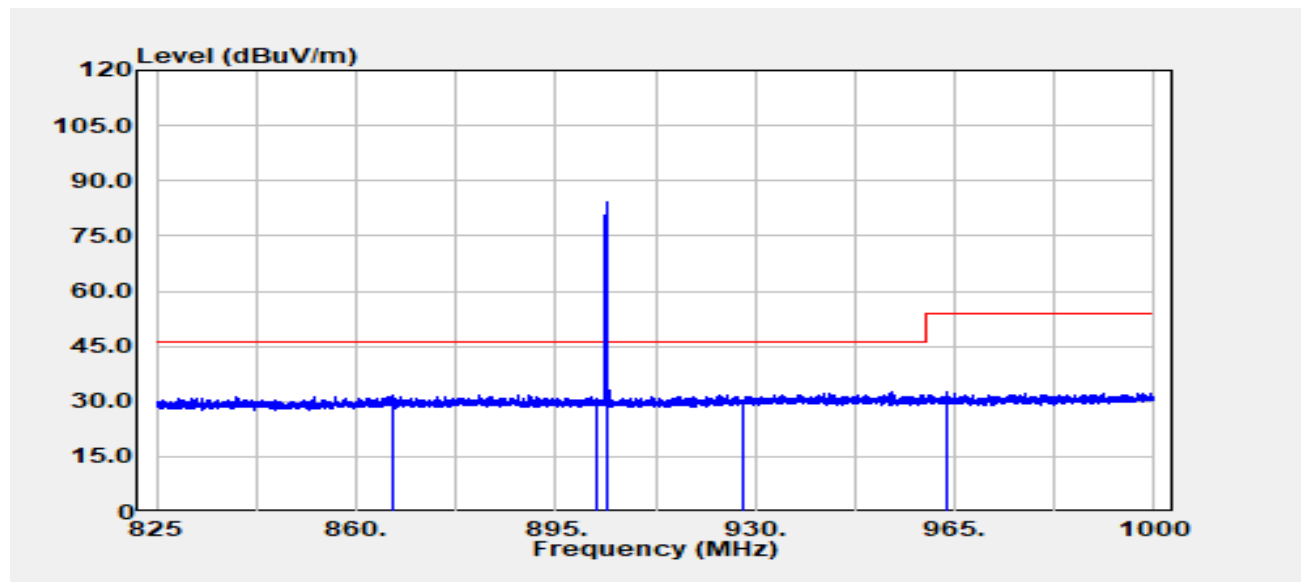
Above 1 GHz



4.9.4 Test Result

Band Edge Test Data

Project No	:TM-2404000334P	Test Date	:2024-08-09
Operation Band	:Lora	Temp./Humi.	:24.6/57
Frequency	:903.9 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:Bandedge	Engineer	:Ray Li
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



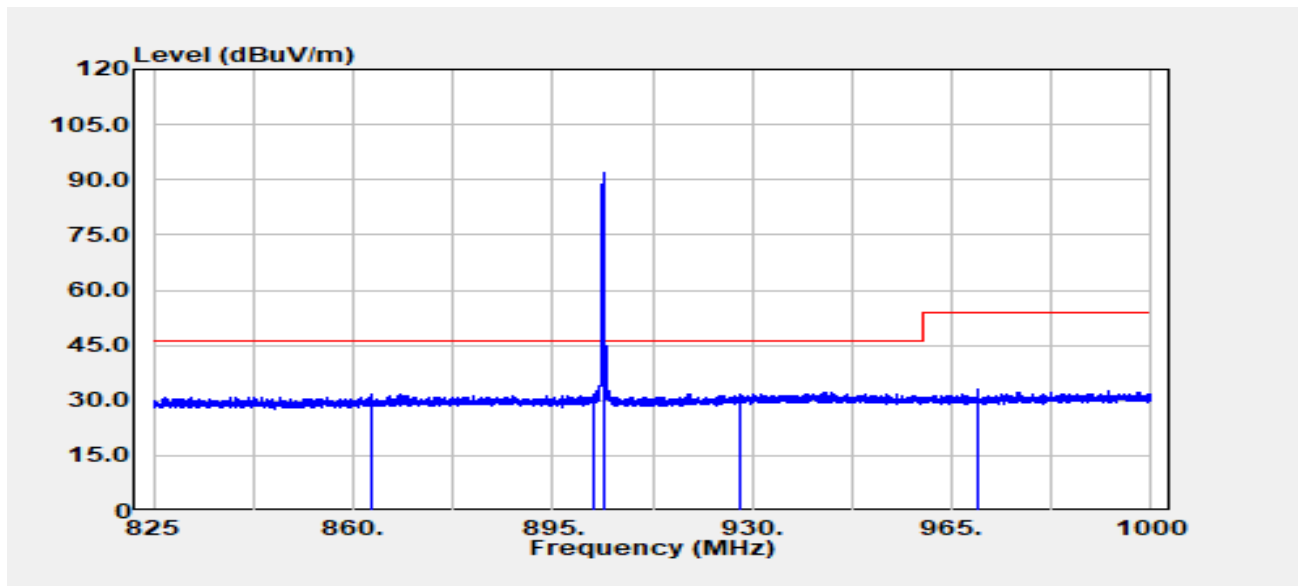
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
866.32	Peak	30.35	1.44	31.79	46.00	-14.21
902.00	Peak	28.01	1.57	29.58	46.00	-16.42
903.90	Peak	82.74	1.57	84.31	--	--
903.90	Average	81.39	1.57	82.96	--	--
928.00	Peak	27.33	2.20	29.53	46.00	-16.47
963.45	Peak	30.17	2.53	32.70	54.00	-21.30

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Project No :TM-2404000334P
Operation Band :Lora
Frequency :903.9 MHz
Operation Mode :Bandedge
EUT Pol :E2
Setting :

Test Date :2024-08-09
Temp./Humi. :24.6/57
Antenna Pol. :HORIZONTAL
Engineer :Ray Li
Test Chamber : 966A

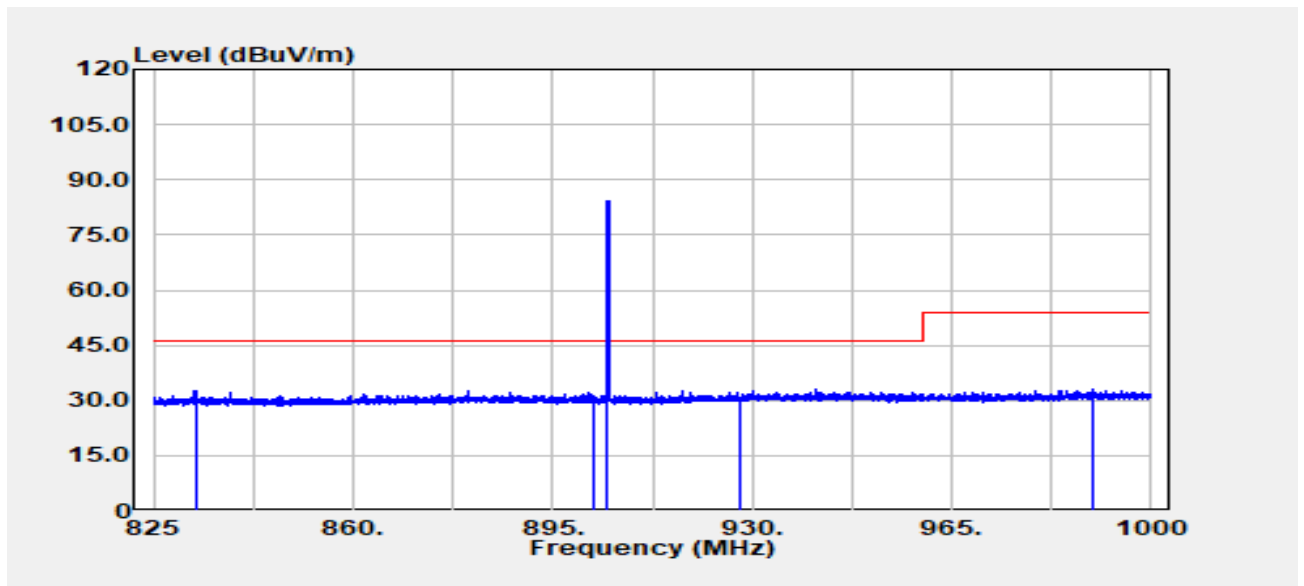


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
863.13	Peak	30.54	1.35	31.89	46.00	-14.11
902.00	Peak	28.97	1.57	30.54	46.00	-15.46
903.90	Peak	90.47	1.57	92.04	--	--
903.90	Average	89.53	1.57	91.10	--	--
928.00	Peak	28.96	2.20	31.16	46.00	-14.84
969.62	Peak	30.51	2.35	32.87	54.00	-21.13

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Project No	:TM-2404000334P	Test Date	:2024-08-09
Operation Band	:Lora	Temp./Humi.	:24.6/57
Frequency	:904.7 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:Bandedge	Engineer	:Ray Li
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



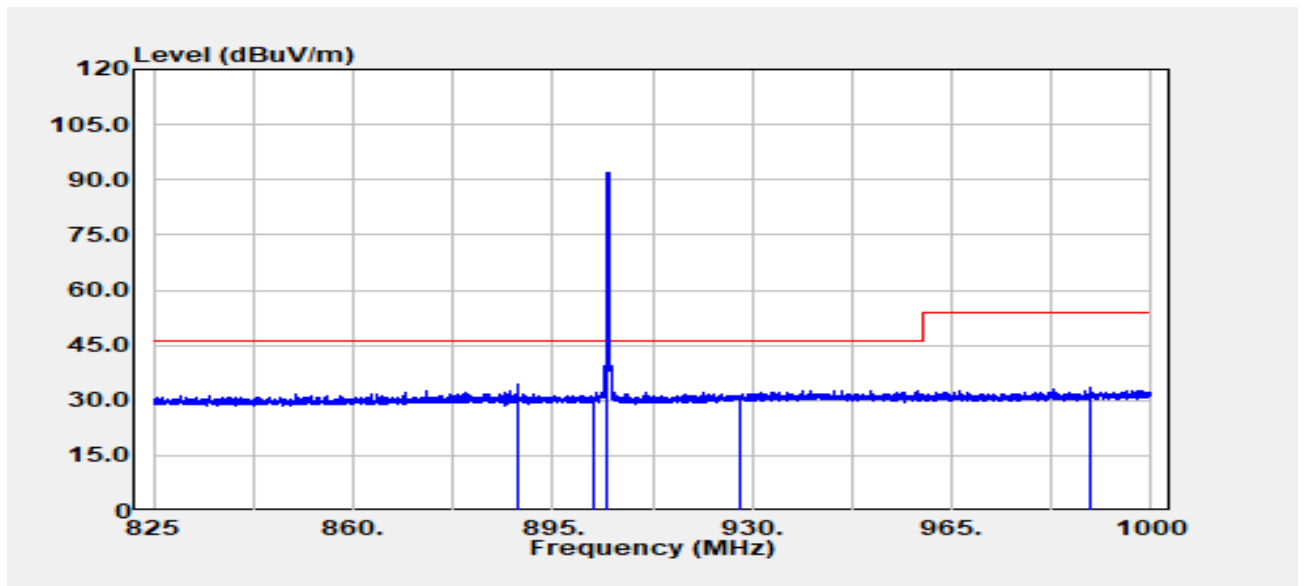
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
832.28	Peak	31.43	1.14	32.57	46.00	-13.43
902.00	Peak	28.79	1.57	30.36	46.00	-15.64
904.70	Peak	82.54	1.57	84.11	-	-
904.70	Average	81.74	1.57	83.31	-	-
928.00	Peak	28.57	2.20	30.77	46.00	-15.23
989.63	Peak	30.11	2.90	33.01	54.00	-20.99

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Project No :TM-2404000334P
Operation Band :Lora
Frequency :904.7 MHz
Operation Mode :Bandedge
EUT Pol :E2
Setting :

Test Date :2024-08-09
Temp./Humi. :24.6/57
Antenna Pol. :HORIZONTAL
Engineer :Ray Li
Test Chamber : 966A

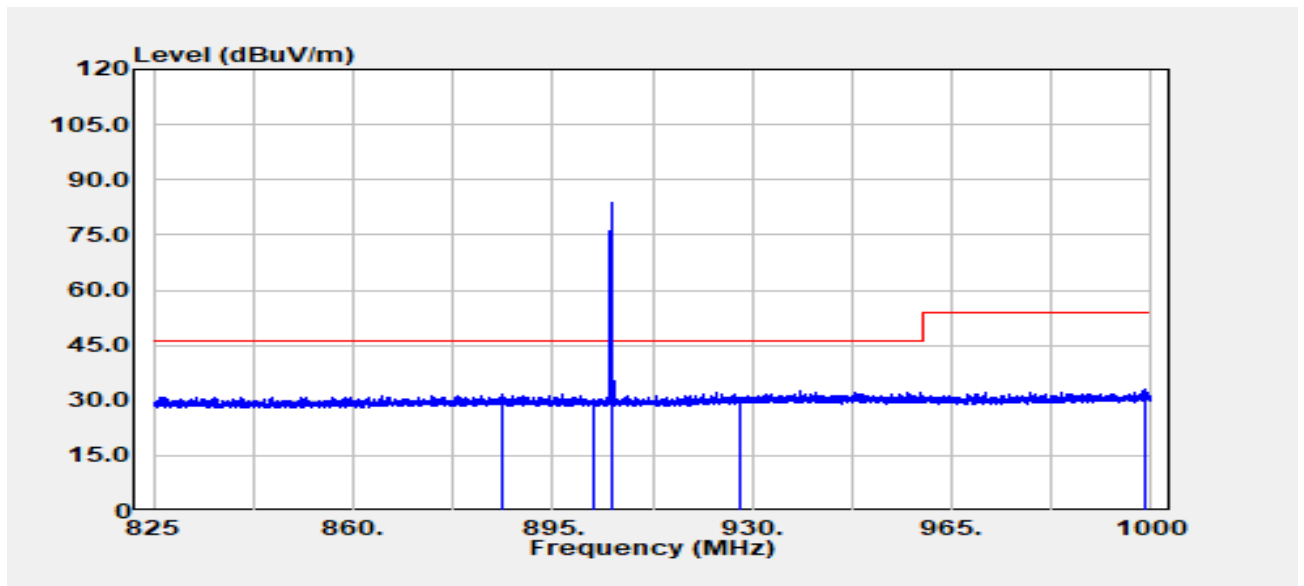


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
888.94	Peak	32.65	1.55	34.20	46.00	-11.80
902.00	Peak	29.09	1.57	30.66	46.00	-15.34
904.70	Peak	90.49	1.57	92.06	-	-
904.70	Average	89.74	1.57	91.31	-	-
928.00	Peak	28.60	2.20	30.80	46.00	-15.20
989.13	Peak	30.41	2.89	33.30	54.00	-20.70

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Project No	:TM-2404000334P	Test Date	:2024-08-09
Operation Band	:Lora	Temp./Humi.	:24.6/57
Frequency	:905.3 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:Bandedge	Engineer	:Ray Li
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



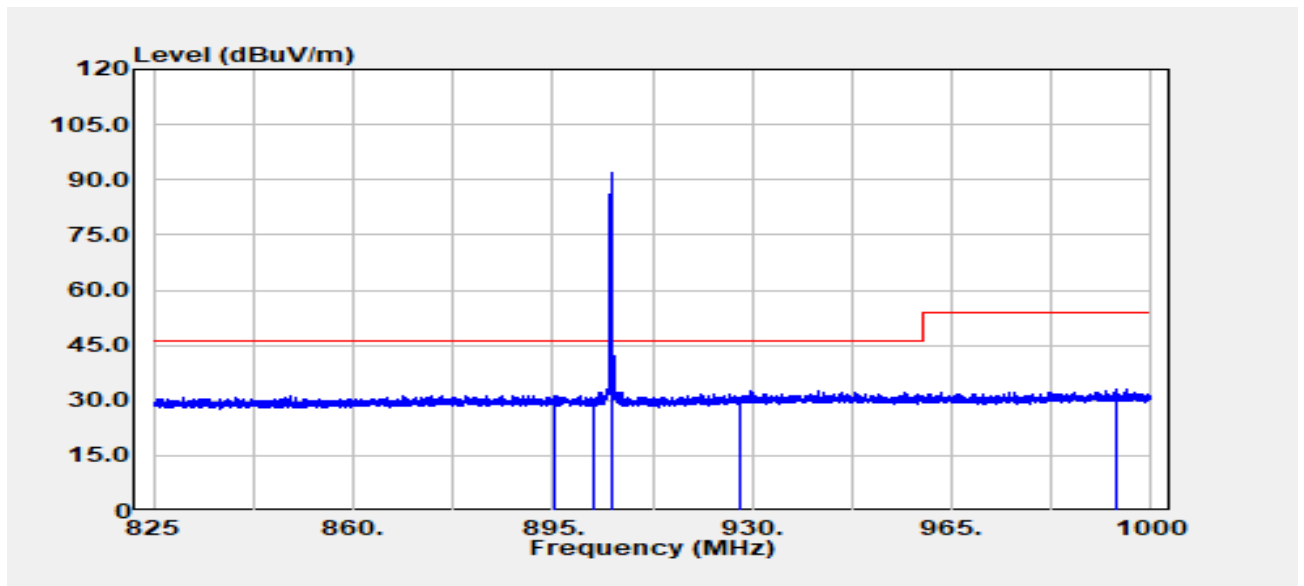
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
886.23	Peak	30.35	1.57	31.92	46.00	-14.08
902.00	Peak	28.40	1.57	29.97	46.00	-16.03
905.30	Peak	82.21	1.57	83.78	-	-
905.30	Average	81.08	1.57	82.65	-	-
928.00	Peak	27.59	2.20	29.79	46.00	-16.21
999.02	Peak	30.06	3.10	33.17	54.00	-20.83

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Project No :TM-2404000334P
Operation Band :Lora
Frequency :905.3 MHz
Operation Mode :Bandedge
EUT Pol :E2
Setting :

Test Date :2024-08-09
Temp./Humi. :24.6/57
Antenna Pol. :HORIZONTAL
Engineer :Ray Li
Test Chamber : 966A



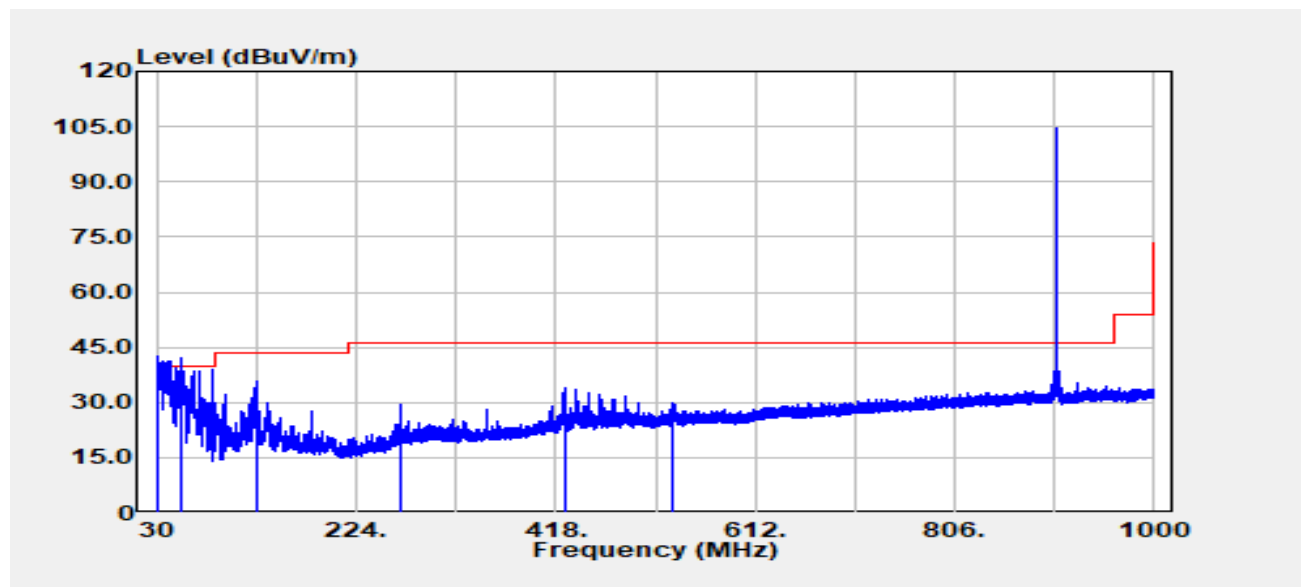
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
895.44	Peak	29.89	1.55	31.44	46.00	-14.56
902.00	Peak	28.53	1.57	30.10	46.00	-15.90
905.30	Peak	90.39	1.57	91.96	--	--
905.30	Average	89.54	1.57	91.11	--	--
928.00	Peak	28.58	2.20	30.78	46.00	-15.22
993.96	Peak	30.05	2.97	33.02	54.00	-20.98

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TX Data

Project No	:TM-2404000334P	Test Date	:2024-07-23
Operation Band	:Lora	Temp./Humi.	:24.6/57
Frequency	:903.9 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:TX	Engineer	:Tony Chao
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



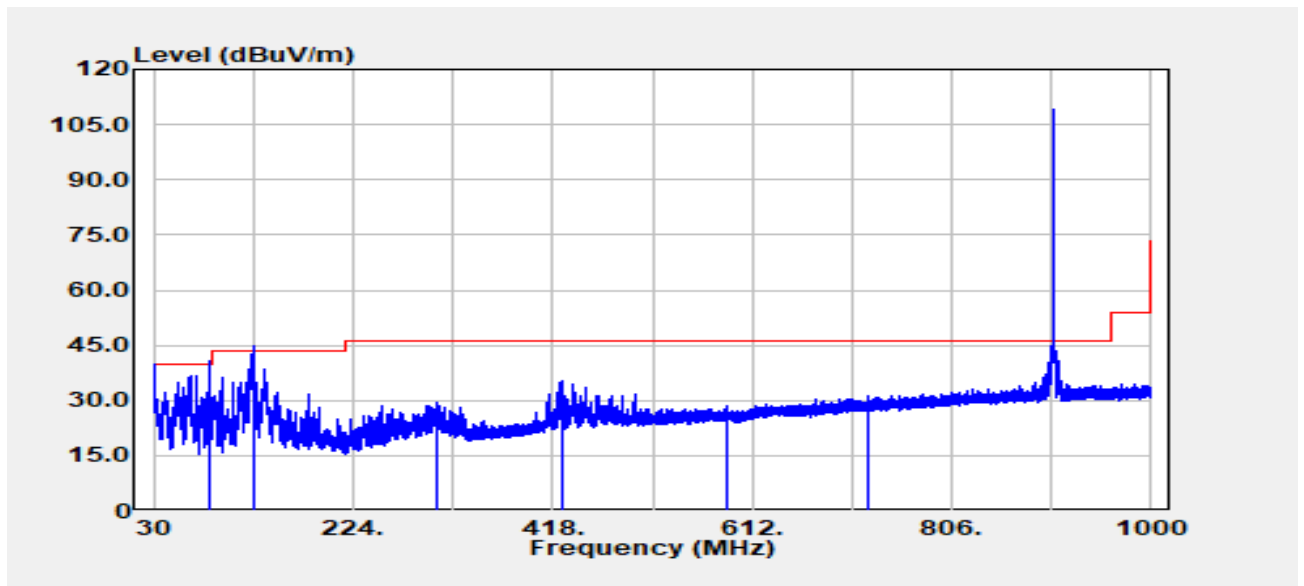
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
31.37	QP	42.80	-3.50	39.30	40.00	-0.70
53.54	QP	52.84	-16.01	36.83	40.00	-3.17
126.43	Peak	44.85	-9.01	35.83	43.50	-7.67
266.11	Peak	38.78	-9.13	29.64	46.00	-16.36
426.47	Peak	38.78	-4.94	33.84	46.00	-12.16
531.27	Peak	32.62	-2.76	29.86	46.00	-16.14

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Project No :TM-2404000334P
Operation Band :Lora
Frequency :903.9 MHz
Operation Mode :TX
EUT Pol :E2
Setting :

Test Date :2024-07-23
Temp./Humi. :24.6/57
Antenna Pol. :HORIZONTAL
Engineer :Tony Chao
Test Chamber : 966A

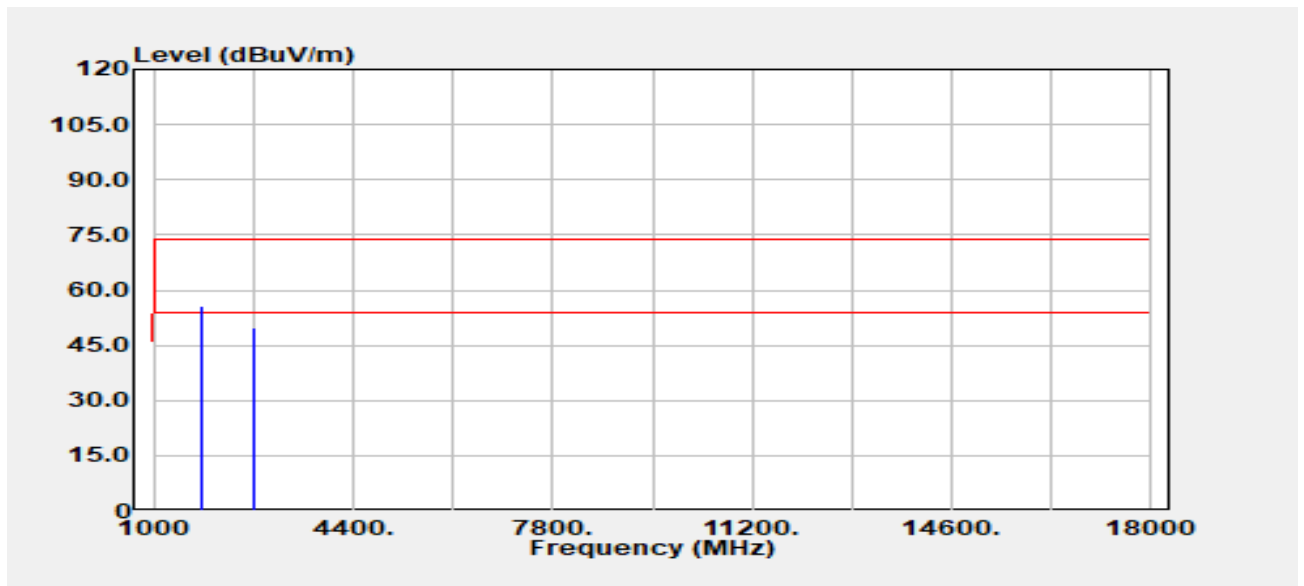


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
83.92	QP	53.98	-16.04	37.94	40.00	-2.06
126.43	QP	46.24	-9.01	37.23	43.50	-6.27
306.01	Peak	37.71	-8.34	29.37	46.00	-16.63
426.55	Peak	40.31	-4.94	35.37	46.00	-10.63
588.37	Peak	30.77	-2.13	28.64	46.00	-17.36
725.75	Peak	30.52	0.70	31.21	46.00	-14.79

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Project No	:TM-2404000334P	Test Date	:2024-08-08
Operation Band	:Lora	Temp./Humi.	:24.6/57
Frequency	:903.9 MHz	Antenna Pol.	:Vertical
Operation Mode	:TX	Engineer	:Ray Li
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		

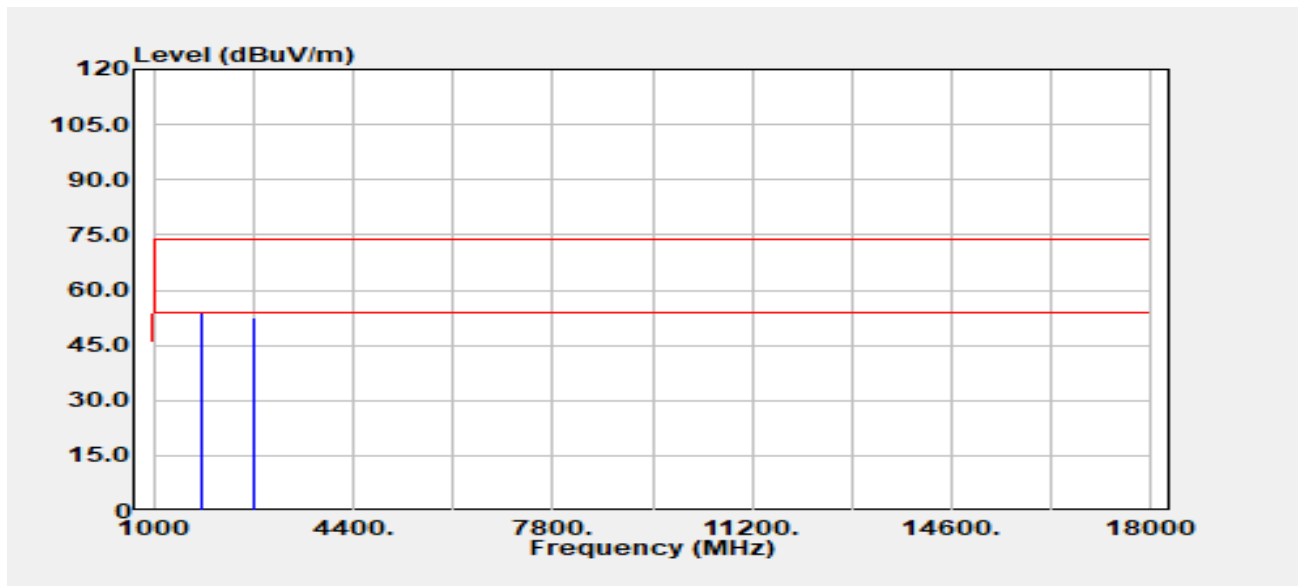


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit dB μ V/m	Margin dB
1807.80	Peak	61.52	-5.87	55.65	64.31	-8.66
1807.80	Average	61.51	-5.87	55.64	62.96	-7.32
2711.70	Peak	51.89	-2.13	49.76	74.00	-24.24
2711.70	Average	51.81	-2.13	49.68	54.00	-4.32

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Project No	:TM-2404000334P	Test Date	:2024-08-08
Operation Band	:Lora	Temp./Humi.	:24.6/57
Frequency	:903.9 MHz	Antenna Pol.	:Horizontal
Operation Mode	:TX	Engineer	:Ray Li
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		

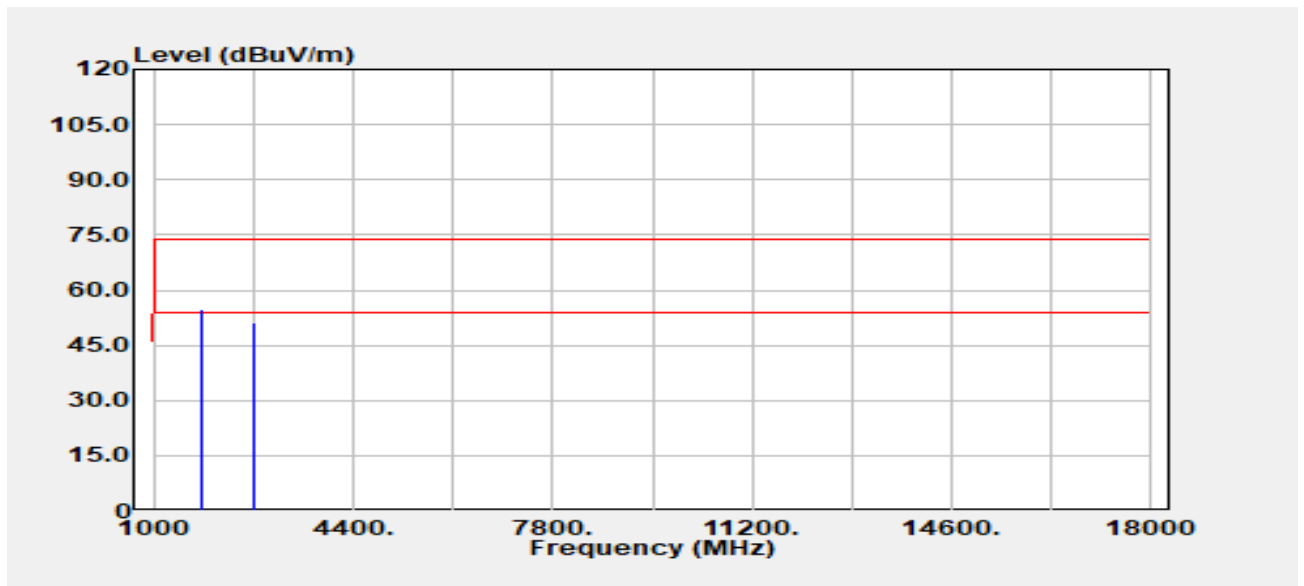


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
1807.80	Peak	59.65	-5.87	53.78	72.04	-18.26
1807.80	Average	58.02	-5.87	52.15	71.10	-18.95
2711.70	Peak	54.80	-2.13	52.67	74.00	-21.33
2711.70	Average	54.34	-2.13	52.21	54.00	-1.79

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Project No	:TM-2404000334P	Test Date	:2024-08-08
Operation Band	:Lora	Temp./Humi.	:24.6/57
Frequency	:904.7 MHz	Antenna Pol.	:Vertical
Operation Mode	:TX	Engineer	:Ray Li
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		

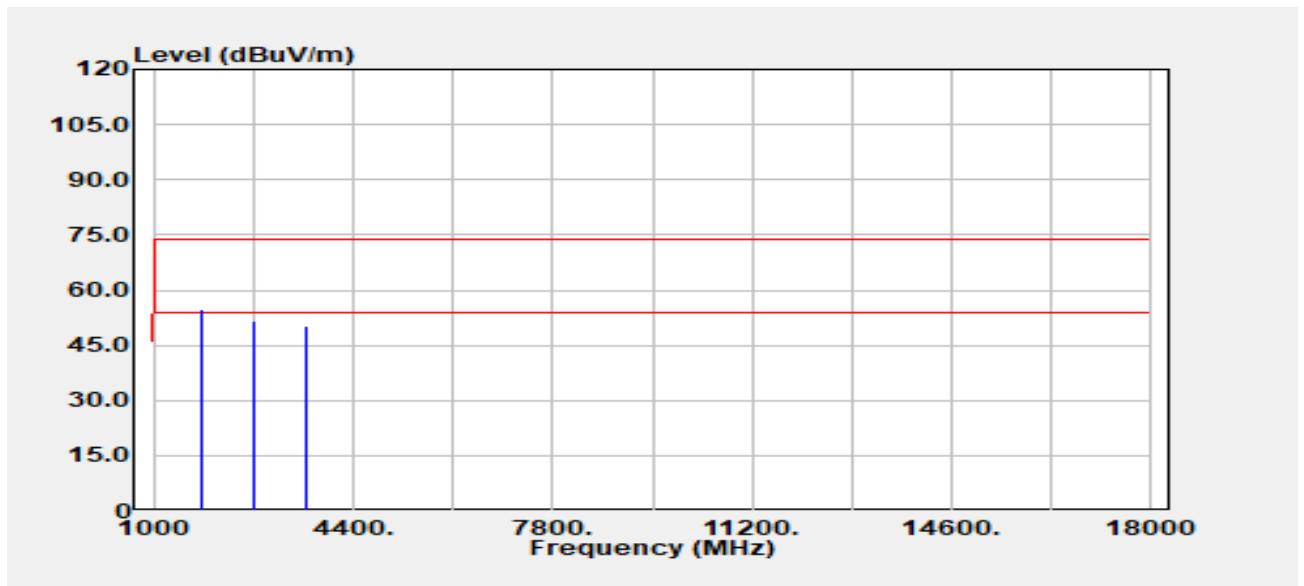


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
1809.40	Peak	60.71	-5.85	54.86	64.11	-9.24
1809.40	Average	60.62	-5.85	54.77	63.31	-8.54
2714.10	Peak	53.41	-2.13	51.27	74.00	-22.73
2714.10	Average	51.56	-2.13	49.43	54.00	-4.57

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Project No	:TM-2404000334P	Test Date	:2024-08-08
Operation Band	:Lora	Temp./Humi.	:24.6/57
Frequency	:904.7 MHz	Antenna Pol.	:Horizontal
Operation Mode	:TX	Engineer	:Ray Li
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		

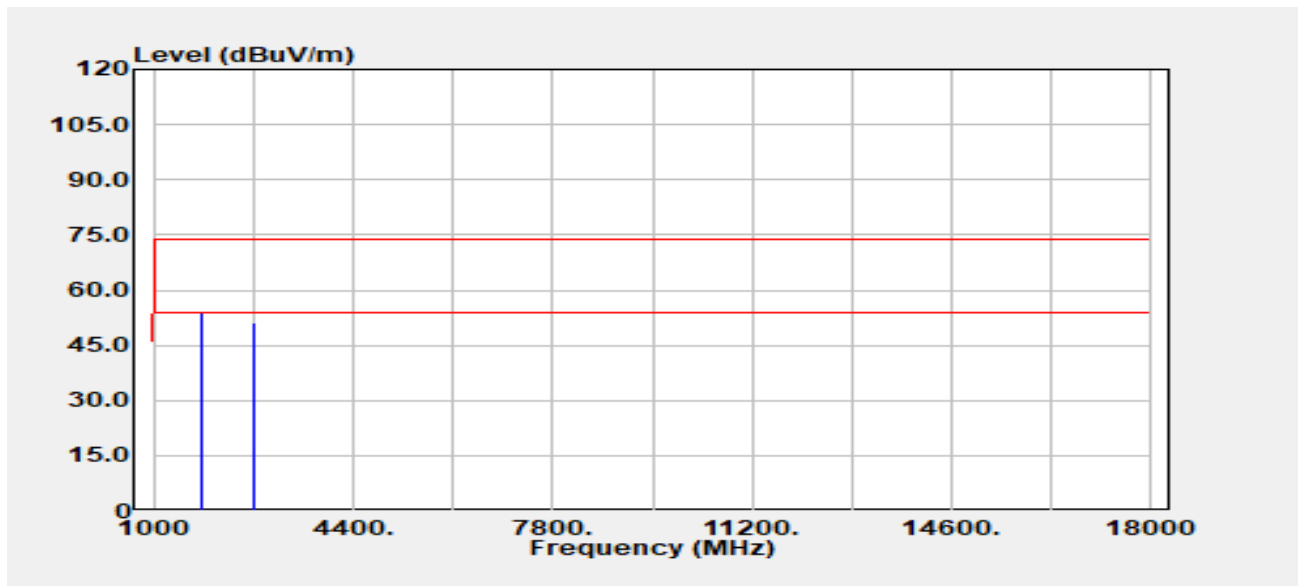


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
1809.40	Peak	60.86	-5.85	55.01	72.06	-17.04
1809.40	Average	59.97	-5.85	54.13	71.31	-17.18
2714.10	Peak	53.76	-2.13	51.63	74.00	-22.37
2714.10	Average	52.65	-2.13	50.52	54.00	-3.48
3618.80	Peak	50.86	-0.43	50.43	74.00	-23.57
3618.80	Average	49.42	-0.43	48.99	54.00	-5.01

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Project No	:TM-2404000334P	Test Date	:2024-08-09
Operation Band	:Lora	Temp./Humi.	:24.6/57
Frequency	:905.3 MHz	Antenna Pol.	:Vertical
Operation Mode	:TX	Engineer	:Ray Li
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



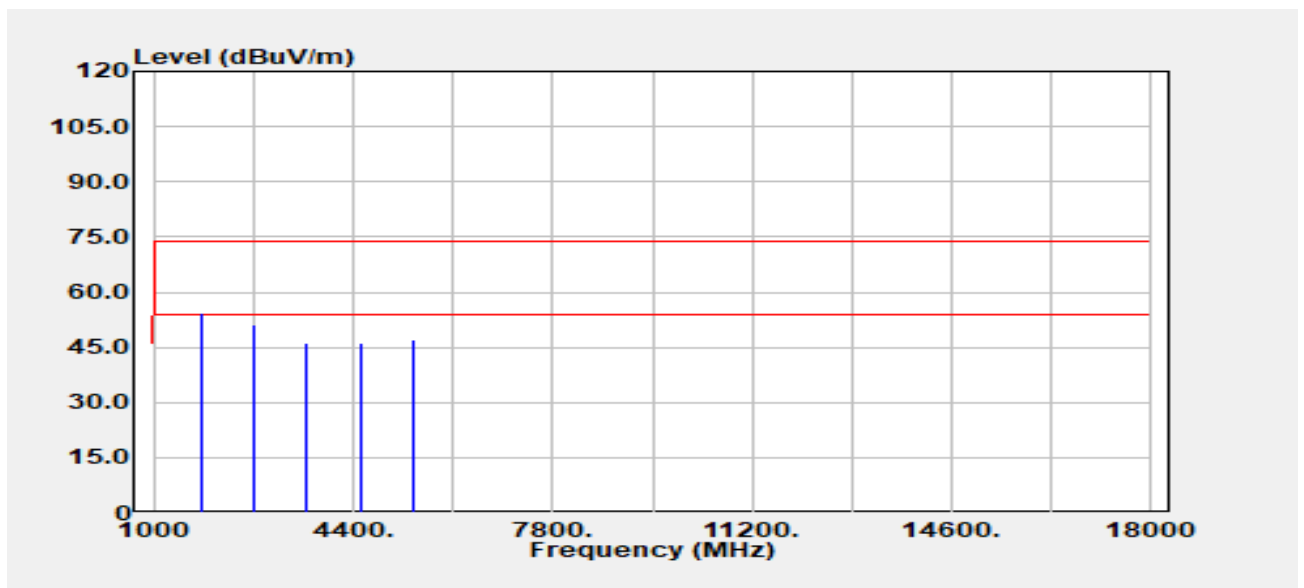
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
1810.60	Peak	59.69	-5.83	53.85	63.78	-9.92
1810.60	Average	59.28	-5.83	53.44	62.65	-9.21
2715.90	Peak	53.28	-2.13	51.15	74.00	-22.85
2715.90	Average	53.26	-2.13	51.12	54.00	-2.88

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Project No :TM-2404000334P
Operation Band :Lora
Frequency :905.3 MHz
Operation Mode :TX
EUT Pol :E2
Setting :

Test Date :2024-08-09
Temp./Humi. :24.6/57
Antenna Pol. :HORIZONTAL
Engineer :Ray Li
Test Chamber : 966A



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
1810.60	Peak	60.02	-5.83	54.18	71.96	-17.78
1810.60	Average	59.80	-5.83	53.96	71.11	-17.15
2715.90	Peak	53.32	-2.13	51.19	74.00	-22.81
2715.90	Average	52.76	-2.13	50.62	54.00	-3.38
3621.20	Peak	46.48	-0.42	46.07	74.00	-27.93
3621.20	Average	45.54	-0.42	45.12	54.00	-8.88
4526.50	Peak	43.58	2.73	46.31	74.00	-27.69
4526.50	Average	42.18	2.73	44.91	54.00	-9.09
5431.80	Peak	42.58	4.40	46.98	74.00	-27.02
5431.80	Average	41.57	4.40	45.97	54.00	-8.03

--End of Test Report--