

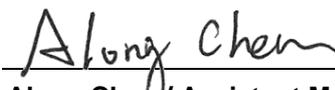
# FCC Test Report

**FCC ID** : P27MQIO  
**Equipment** : Mqio 9W  
**Model No.** : MIO-JU-B  
**Brand Name** : Sercomm, Comcast, MachineQ  
**Applicant** : Sercomm Corporation  
**Address** : 8F, 3-1, YuanQu St., NanKang, Taipei 115,  
Taiwan  
**Standard** : 47 CFR FCC Part 15.247  
**Received Date** : Aug. 01, 2025  
**Tested Date** : Aug. 11 ~ Aug. 25, 2025

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Approved by:

  
\_\_\_\_\_  
Along Chen / Assistant Manager

  
\_\_\_\_\_  
Gary Chang / Manager

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## Release Record

Report No.	Version	Description	Issued Date
FR580106LR	Rev. 01	Initial issue	Sep. 10, 2025

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 0.195MHz 46.08 (Margin -17.72dB) - QP	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 2.7255MHz 45.55 (Margin -8.45dB) - AV	Pass
15.247(d)	Band Edge	Meet the requirement of limit	Pass
15.247(b)(2)(3)	Conducted Output Power	Power [dBm]: 19.28	Pass
15.247(a)(1)(i)	Number of Hopping Channels	Meet the requirement of limit	Pass
15.247(a)(1)	Hopping Channel Separation	Meet the requirement of limit	Pass
15.247(f)	Dwell Time	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

### Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

### Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

# 1 General Description

## 1.1 Information

### 1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	Ch. Freq. (MHz)	Channel List	Data Rate (bit/sec)	Spread Factor	Channel Bandwidth (kHz)
902 ~ 928	902.3 ~ 914.9	64 channels	980-5.47k bps	10 ~ 7	125
Note 1: RF output power specifies that Maximum Peak Conducted Output Power.					
Note 2: The device uses LoRa modulation.					

### 1.1.2 Antenna Details

Ant. No.	Brand	Model	Type	Connector	Gain (dBi)
1	Sercomm	MQio	PIFA	No	2.62

### 1.1.3 Power Supply Type of Equipment under Test (EUT)

<b>Power Supply Type</b>	12Vdc from adapter
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Note: The above adapter power supply is not bundled in market.

### 1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	RS232	0.45m non-shielded without core
2	Magnetic Mounting Bracket 0	Brand: MachineQ Model: AIO-BA-B

### 1.1.5 Channel List

Channel Bandwidth: 125KHz							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	902.3	16	905.5	32	908.7	48	911.9
1	902.5	17	905.7	33	908.9	49	912.1
2	902.7	18	905.9	34	909.1	50	912.3
3	902.9	19	906.1	35	909.3	51	912.5
4	903.1	20	906.3	36	909.5	52	912.7
5	903.3	21	906.5	37	909.7	53	912.9
6	903.5	22	906.7	38	909.9	54	913.1
7	903.7	23	906.9	39	910.1	55	913.3
8	903.9	24	907.1	40	910.3	56	913.5
9	904.1	25	907.3	41	910.5	57	913.7
10	904.3	26	907.5	42	910.7	58	913.9
11	904.5	27	907.7	43	910.9	59	914.1
12	904.7	28	907.9	44	911.1	60	914.3
13	904.9	29	908.1	45	911.3	61	914.5
14	905.1	30	908.3	46	911.5	62	914.7
15	905.3	31	908.5	47	911.7	63	914.9

### 1.1.6 Test Tool and Duty Cycle

Test Tool	tera term, v4.105	
Mode	Duty Cycle (%)	Duty Factor (dB)
LoRa (125kHz)	100.00%	0

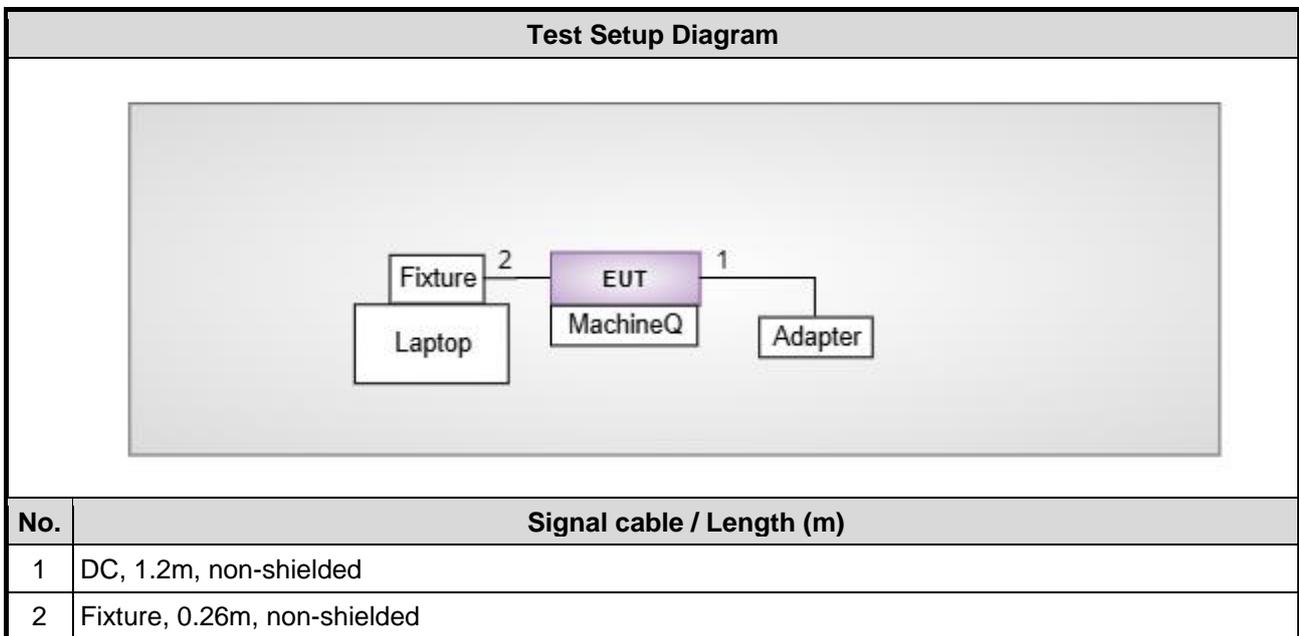
### 1.1.7 Power Index of Test Tool

Channel Bandwidth: 125KHz	
Test Frequency (MHz)	Power Index
902.3	22
908.5	22
914.9	22

## 1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Laptop	DELL	Latitude 5400	DoC	---
2	Fixture	---	---	---	Provided by applicant.
3	Adapter	LEI	MU24D1120200 -A1	---	Provided by applicant.

## 1.3 Test Setup Chart



## 1.4 The Equipment List

<b>Test Item</b>	Conducted Emission				
<b>Test Site</b>	Conduction room 1 / (CO01-WS)				
<b>Tested Date</b>	Aug. 25, 2025				
<b>Instrument</b>	<b>Brand</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Receiver	R&S	ESR3	101658	Feb. 25, 2025	Feb. 24, 2026
LISN	R&S	ENV216	101579	May 07, 2025	May 06, 2026
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127-666	Mar. 21, 2025	Mar. 20, 2026
RF Cable-CON	EMC	EMCCFD300-BM-B M-6000	50821	Oct. 09, 2024	Oct. 08, 2025
50 ohm terminal	NA	50	3	Jul. 30, 2025	Jul. 29, 2026
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	RF Conducted				
<b>Test Site</b>	(TH01-WS)				
<b>Tested Date</b>	Aug. 20, 2025				
<b>Instrument</b>	<b>Brand</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Spectrum Analyzer	R&S	FSV40	101498	Nov. 12, 2024	Nov. 11, 2025
Power Meter	Anritsu	ML2495A	1241002	Nov. 26, 2024	Nov. 25, 2025
Power Sensor	Anritsu	MA2411B	1207366	Nov. 26, 2024	Nov. 25, 2025
Attenuator	Pasternack	PE7005-10	10-2	Oct. 04, 2024	Oct. 03, 2025
Measurement Software	Sporton	SENSE-15247_FS	V5.11	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	Radiated Emission				
<b>Test Site</b>	966 chamber1 / (03CH01-WS)				
<b>Tested Date</b>	Aug. 11 ~ Aug. 14, 2025				
<b>Instrument</b>	<b>Brand</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Receiver	R&S	ESR3	101657	Mar. 11, 2025	Mar. 10, 2026
Spectrum Analyzer	R&S	FSV40	101498	Nov. 12, 2024	Nov. 11, 2025
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 05, 2024	Nov. 04, 2025
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Jul. 04, 2025	Jul. 03, 2026
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Nov. 28, 2024	Nov. 27, 2025
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 18, 2024	Nov. 17, 2025
Preamplifier	EMC	EMC02325	980225	Jun. 13, 2025	Jun. 12, 2026
Preamplifier	EMC	EMC118A45SE	980898	Jun. 24, 2025	Jun. 23, 2026
Preamplifier	EMC	EMC184045SE	980903	Aug. 08, 2025	Aug. 07, 2026
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 02, 2024	Oct. 01, 2025
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 02, 2024	Oct. 01, 2025
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 02, 2024	Oct. 01, 2025
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 02, 2024	Oct. 01, 2025
RF Cable	EMC	EMC104-35M-35M- 8000	210920	Oct. 02, 2024	Oct. 01, 2025
RF Cable	EMC	EMC104-35M-35M- 3000	210922	Oct. 02, 2024	Oct. 01, 2025
Attenuator	Pasternack	PE7005-10	10-1	Oct. 02, 2024	Oct. 01, 2025
HIGHPASS FILTER 1.5-15G	WHK	WHK1.5/15G-10ST	21	Oct. 02, 2024	Oct. 01, 2025
Measurement Software	Sporton	SENSE-EMI	V5.11	NA	NA
Measurement Software	Sporton	SENSE-15247_FS	V5.11	NA	NA
Measurement Software	AUDIX	e3	6.120210g	NA	NA

Note: Calibration Interval of instruments listed above is one year.

## 1.5 Test Standards

47 CFR FCC Part 15.247  
ANSI C63.10-2020  
ANSI C63.4-2014 + C63.4a-2017

## 1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

## 1.7 Deviation from Test Standard and Measurement Procedure

None

## 1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±34.130 Hz
Conducted power	±0.808 dB
Power density	±0.583 dB
Unwanted Emission ≤ 1GHz	±3.41 dB
Unwanted Emission > 1GHz	±4.59 dB

## 2 Test Configuration

### 2.1 Testing Facility

<b>Test Laboratory</b>	International Certification Corporation
<b>Test Site</b>	CO01-WS, 03CH01-WS, TH01-WS
<b>Address of Test Site</b>	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

### 2.2 The Worst Test Modes and Channel Details

Test item	Channel Bandwidth (kHz)	Test Frequency (MHz)	Separating Factor	Test Configuration
AC Power Line Conducted Emission	125	902.3	SF10	--
Unwanted Emissions Conducted Output Power Hopping Channel Separation 20dB and Occupied bandwidth	125	902.3 / 908.5 / 914.9	SF10	--
Number of Hopping Channels	125	902.3	SF10	--
Dwell Time	125	902.3	SF10, 9, 8, 7	--

**NOTE:**

- The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** result was found as the worst case and was shown in this report.

### 3 Transmitter Test Results

#### 3.1 Unwanted Emissions into Restricted Frequency Bands

##### 3.1.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

**Note 1:**  
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

**Note 2:**  
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

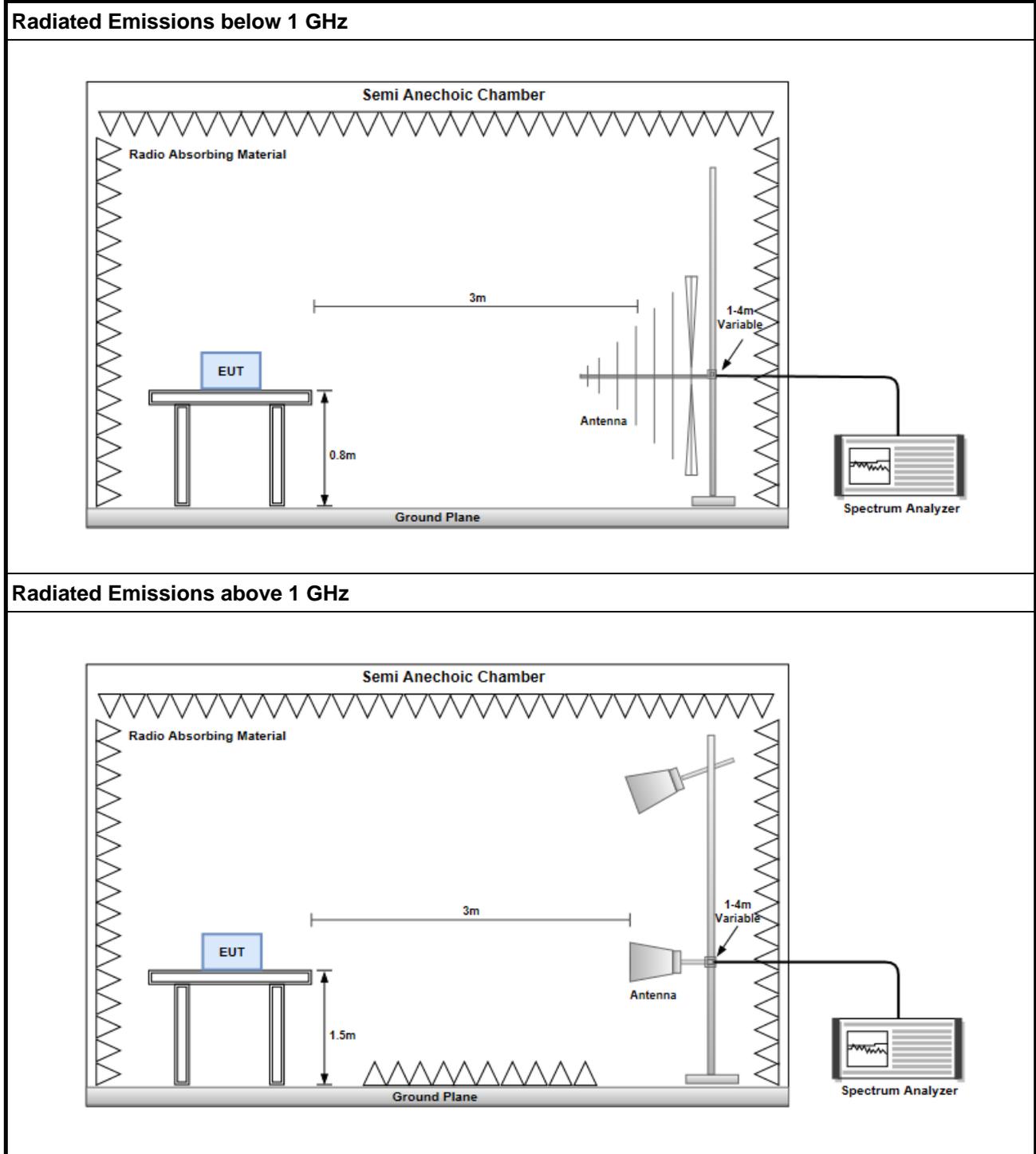
##### 3.1.2 Test Procedures

1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

**Note:**

1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

### 3.1.3 Test Setup



### 3.1.4 Test Results

<b>Ambient Condition</b>	24-25°C / 62-63%	<b>Tested By</b>	Akun Chung & Roger Lu
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Refer to Appendix A.

## 3.2 Unwanted Emissions into Non-Restricted Frequency Bands

### 3.2.1 Limit of Unwanted Emissions into Non-Restricted Frequency Bands

The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

### 3.2.2 Test Procedures

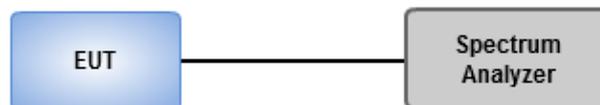
#### Reference Level Measurement

1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Set Sweep time = auto couple, Trace mode = max hold.
3. Allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

#### Unwanted Emissions Level Measurement

1. Set RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Trace Mode = max hold, Sweep = auto couple.
3. Allow the trace to stabilize.
4. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

### 3.2.3 Test Setup



### 3.2.4 Test Results

<b>Ambient Condition</b>	25°C / 65%	<b>Tested By</b>	Aska Huang
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Refer to Appendix B.

### 3.3 Conducted Output Power

#### 3.3.1 Limit of Conducted Output Power

1W

#### 3.3.2 Test Procedures

1. A wideband power meter is used for power measurement. Bandwidth of power sensor and meter is 50MHz
2. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power

#### 3.3.3 Test Setup



#### 3.3.4 Test Results

<b>Ambient Condition</b>	25°C / 65%	<b>Tested By</b>	Aska Huang
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Refer to Appendix C.

### 3.4 Number of Hopping Frequency

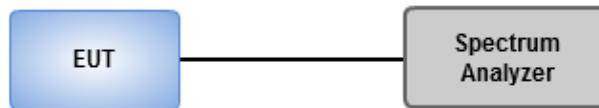
#### 3.4.1 Limit of Number of Hopping Frequency

Number of Hopping Frequencies Limit for Frequency Hopping Systems	
<input checked="" type="checkbox"/>	902-928 MHz Band:
<input checked="" type="checkbox"/>	$N \geq 50$ , 20 dB bandwidth of the hopping channel is less than 250 kHz
<input type="checkbox"/>	$N \geq 25$ , 20 dB bandwidth of the hopping channel is 250 kHz or greater
<input type="checkbox"/>	Hybrid mode, No minimum number of hopping channels associated with hybrid system.
<b>N:</b> Number of Hopping Frequencies	

#### 3.4.2 Test Procedures

1. Set RBW = 100kHz, VBW = 300kHz, Sweep time = Auto, Detector = Peak Trace max hold.
2. Allow trace to stabilize.

#### 3.4.3 Test Setup



#### 3.4.4 Test Results

<b>Ambient Condition</b>	25°C / 65%	<b>Tested By</b>	Aska Huang
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Refer to Appendix D.

### 3.5 20dB and Occupied Bandwidth

#### 3.5.1 Test Procedures

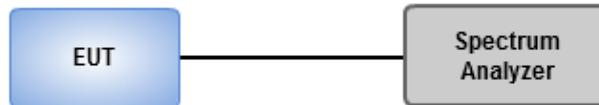
##### 20dB Bandwidth

1. Set RBW=3kHz, VBW=10kHz, Sweep time=Auto, Detector=Peak Trace max hold.
2. Allow trace to stabilize.
3. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

##### Occupied Bandwidth

1. Set RBW=3kHz, VBW=10kHz, Sweep time = Auto, Detector=Peak, Trace max hold
2. Allow trace to stabilize
3. Use Occupied bandwidth function of spectrum analyzer to measuring 99% occupied bandwidth

#### 3.5.2 Test Setup



#### 3.5.3 Test Results

<b>Ambient Condition</b>	25°C / 65%	<b>Tested By</b>	Aska Huang
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Refer to Appendix E.

## 3.6 Channel Separation

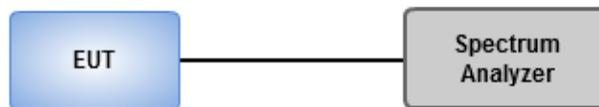
### 3.6.1 Limit of Channel Separation

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.

### 3.6.2 Test Procedures

1. Set RBW=10kHz, VBW=30kHz, Sweep time=Auto, Detector=Peak Trace max hold.
2. Allow trace to stabilize.
3. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The EUT shall show compliance with the appropriate regulatory limit

### 3.6.3 Test Setup



### 3.6.4 Test Results

<b>Ambient Condition</b>	25°C / 65%	<b>Tested By</b>	Aska Huang
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Refer to Appendix F.

### 3.7 Number of Dwell Time

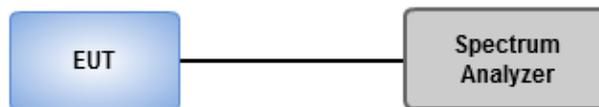
#### 3.7.1 Limit of Dwell time

Time of Occupancy (Dwell Time) Limit for Frequency Hopping Systems	
<input checked="" type="checkbox"/>	902-928 MHz Band:
<input checked="" type="checkbox"/>	≤ 0.4 second within a 20 second period, 20 dB bandwidth of the hopping channel is less than 250 kHz
<input type="checkbox"/>	≤ 0.4 second within a 10 second period, 20 dB bandwidth of the hopping channel is 250 kHz or greater
<input type="checkbox"/>	Hybrid mode ,an average time of occupancy on any frequency not to exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4

#### 3.7.2 Test Procedures

1. Set RBW=200kHz, VBW=1000kHz, Sweep time=3.2s / 500ms, Detector=Peak, Span=0Hz, Trace max hold for 8 hopping channels.
2. Set RBW=200kHz, VBW=1000kHz, Sweep time=6.4s / 500ms, Detector=Peak, Span=0Hz, Trace max hold for 16 hopping channels.
3. Set RBW=200kHz, VBW=1000kHz, Sweep time=25.6s / 500ms, Detector=Peak, Span=0Hz, Trace max hold for 64 hopping channels.
4. Measure and record the burst on time.

#### 3.7.3 Test Setup



#### 3.7.4 Test Results

Ambient Condition	25°C / 65%	Tested By	Aska Huang
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Refer to Appendix G.

## 3.8 AC Power Line Conducted Emissions

### 3.8.1 Limit of AC Power Line Conducted Emissions

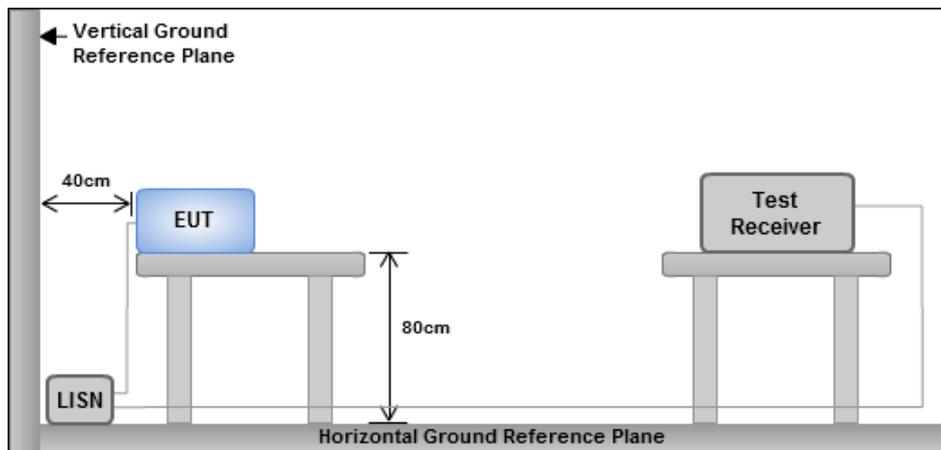
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: \* Decreases with the logarithm of the frequency.

### 3.8.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50  $\Omega$  LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V / 60Hz.

### 3.8.3 Test Setup



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

### 3.8.4 Test Result of Conducted Emissions

Refer to Appendix G.

## 4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <https://www.icertifi.com.tw>.

### **Linkou**

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou  
District, New Taipei City, Taiwan  
(R.O.C.)

### **Kwei Shan**

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd  
St., Kwei Shan Dist., Tao Yuan  
City 33381, Taiwan (R.O.C.)  
No.2-1, Lane 6, Wen San 3rd  
St., Kwei Shan Dist., Tao Yuan  
City 33381, Taiwan (R.O.C.)

### **Kwei Shan Site II**

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd  
St., Kwei Shan Dist., Tao Yuan  
City 33381, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

Fax: 886-3-318-0345

Email: ICC\_Service@icertifi.com.tw

==END==

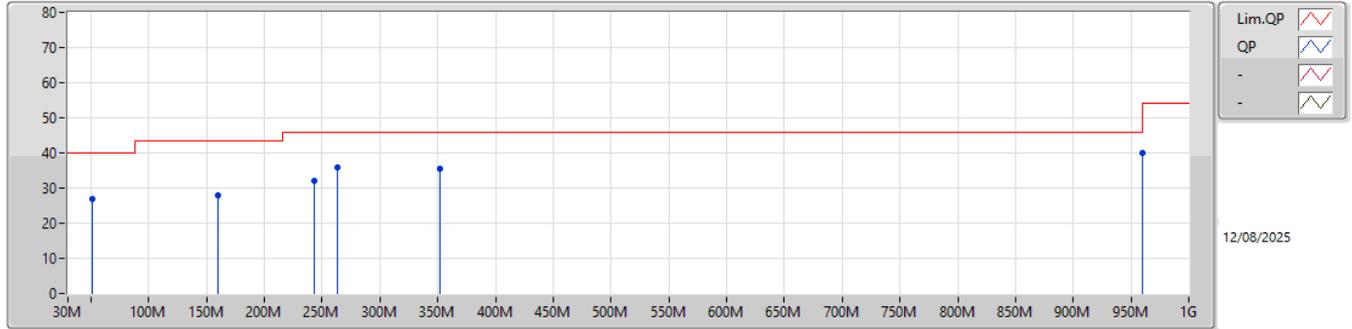


**Summary**

<b>Mode</b>	<b>Result</b>	<b>Type</b>	<b>Freq (Hz)</b>	<b>Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Condition</b>
Mode 1	Pass	PK	45.52M	31.49	40.00	-8.51	Vertical
Mode 2	Pass	PK	51.55M	30.45	40.00	-9.55	Vertical
Mode 3	Pass	PK	51.34M	30.67	40.00	-9.33	Vertical



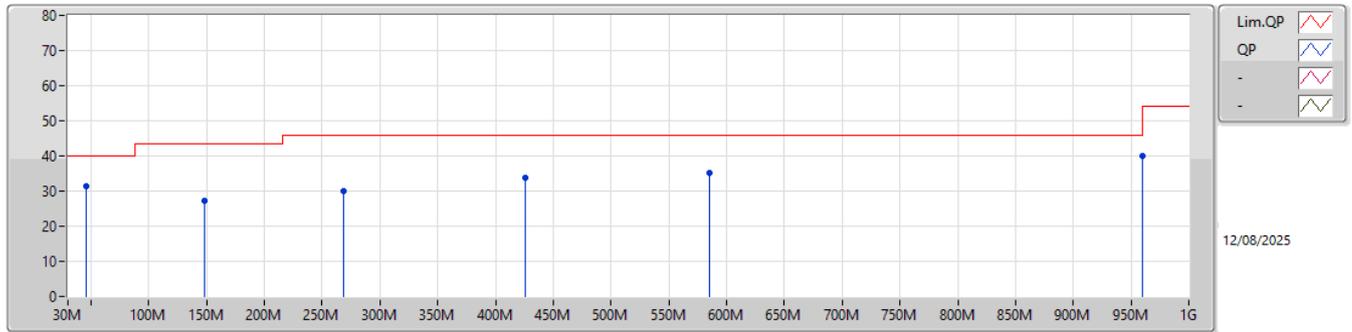
Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)
PK	51.34M	27.00	40.00	-13.00	-8.68	3	Horizontal	-	-	-	35.68	18.77	0.72	28.17
PK	159.98M	27.78	43.50	-15.72	-8.96	3	Horizontal	-	-	-	36.74	18.30	1.25	28.51
PK	243.4M	32.19	46.00	-13.81	-10.27	3	Horizontal	-	-	-	42.46	16.74	1.55	28.56
PK	262.8M	35.98	46.00	-10.02	-9.76	3	Horizontal	-	-	-	45.74	17.16	1.63	28.55
PK	352.04M	35.63	46.00	-10.37	-7.25	3	Horizontal	-	-	-	42.88	19.40	1.82	28.47
PK	960M	40.04	54.00	-13.96	4.42	3	Horizontal	-	-	-	35.62	28.80	3.21	27.59



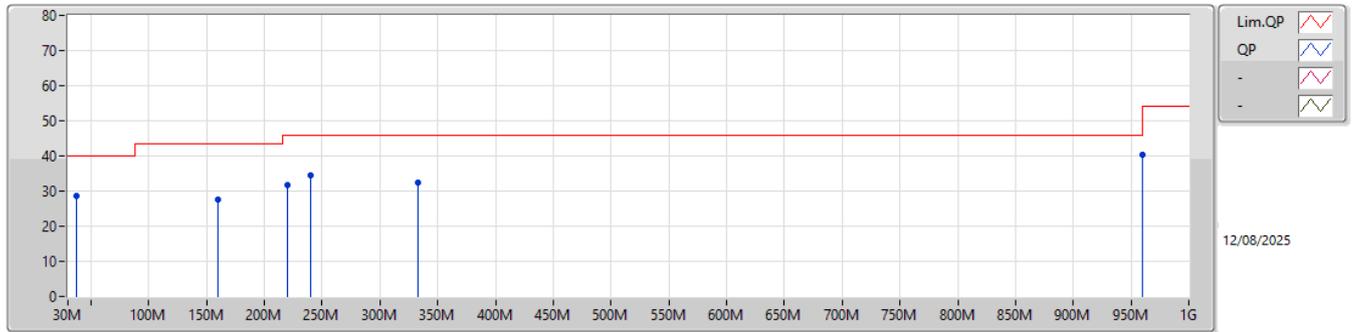
Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)
PK	45.52M	31.49	40.00	-8.51	-8.90	3	Vertical	-	-	-	40.39	18.65	0.62	28.17
PK	148.34M	27.34	43.50	-16.16	-8.90	3	Vertical	-	-	-	36.24	18.40	1.20	28.50
PK	268.62M	30.01	46.00	-15.99	-9.48	3	Vertical	-	-	-	39.49	17.42	1.65	28.55
PK	425.76M	33.82	46.00	-12.18	-5.13	3	Vertical	-	-	-	38.95	21.32	1.94	28.39
PK	584.84M	35.13	46.00	-10.87	-1.81	3	Vertical	-	-	-	36.94	24.20	2.34	28.35
PK	960M	40.16	54.00	-13.84	4.42	3	Vertical	-	-	-	35.74	28.80	3.21	27.59



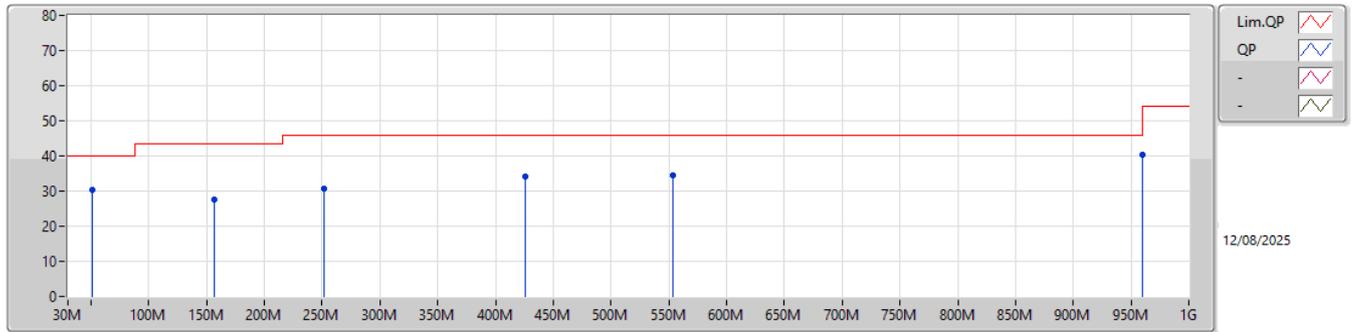
Mode 2



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)
PK	37.62M	28.54	40.00	-11.46	-9.83	3	Horizontal	-	-	-	38.37	17.79	0.57	28.19
PK	159.88M	27.45	43.50	-16.05	-8.95	3	Horizontal	-	-	-	36.40	18.31	1.25	28.51
PK	220.26M	31.66	46.00	-14.34	-12.29	3	Horizontal	-	-	-	43.95	14.80	1.47	28.56
PK	240.13M	34.59	46.00	-11.41	-10.41	3	Horizontal	-	-	-	45.00	16.61	1.54	28.56
PK	332.45M	32.36	46.00	-13.64	-7.39	3	Horizontal	-	-	-	39.75	19.30	1.81	28.50
PK	960M	40.25	54.00	-13.75	4.42	3	Horizontal	-	-	-	35.83	28.80	3.21	27.59



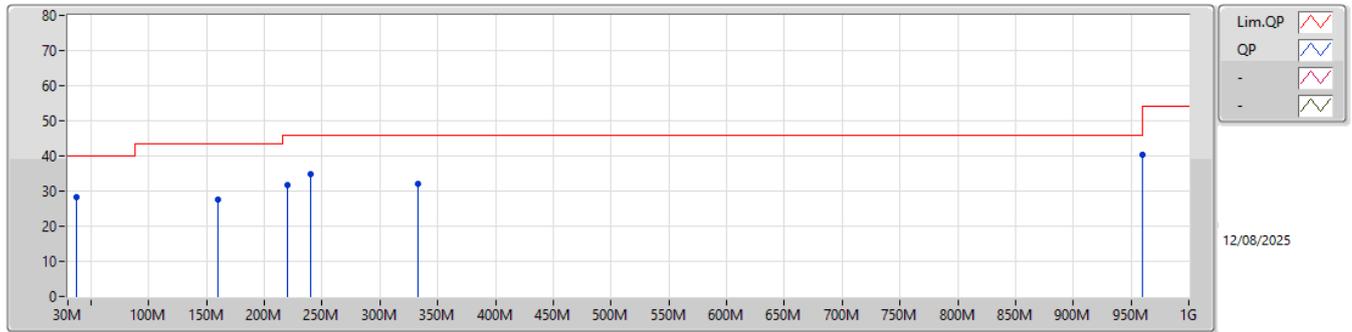
Mode 2



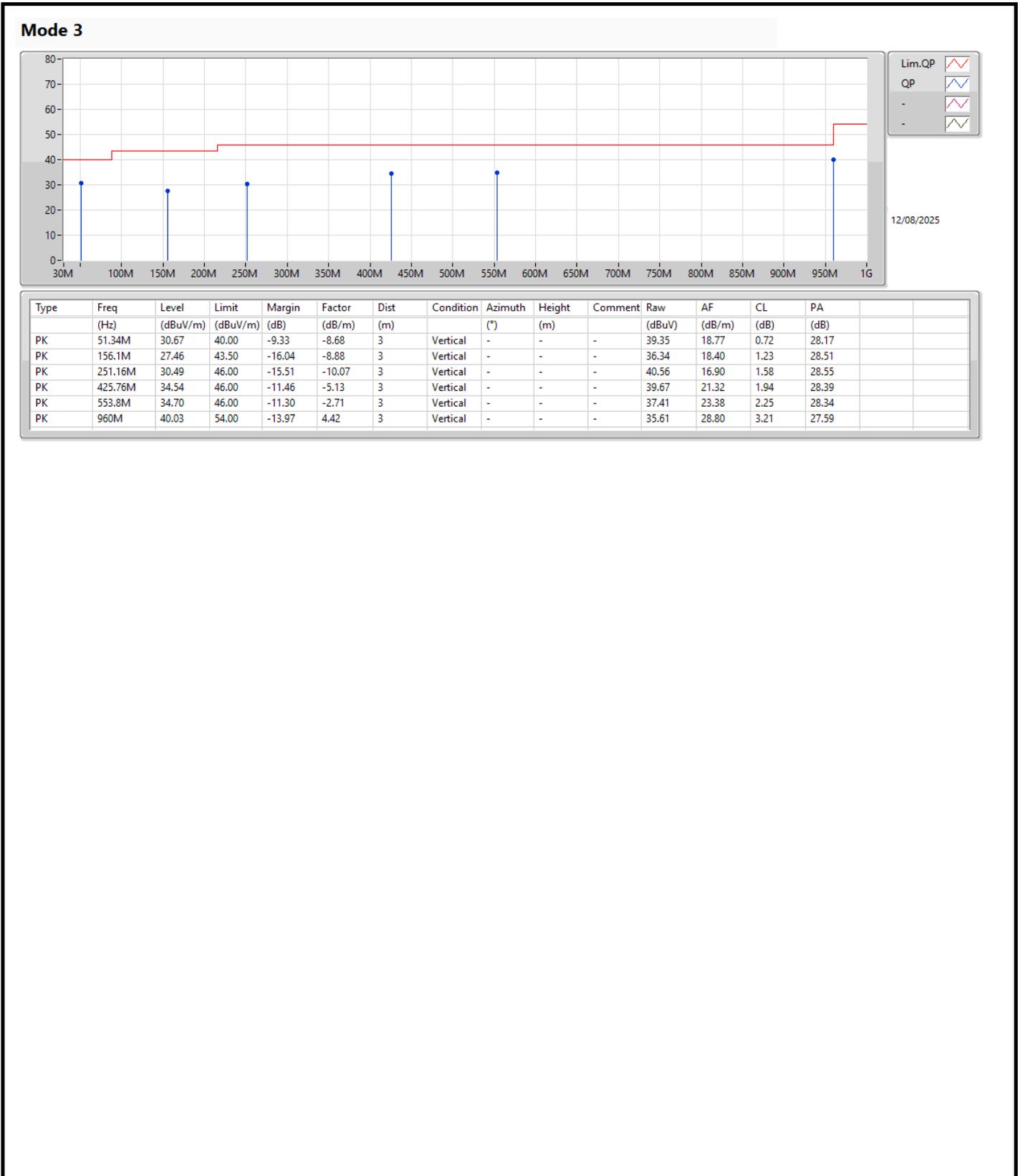
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)
PK	51.55M	30.45	40.00	-9.55	-8.70	3	Vertical	-	-	-	39.15	18.75	0.72	28.17
PK	156.22M	27.59	43.50	-15.91	-8.88	3	Vertical	-	-	-	36.47	18.40	1.23	28.51
PK	251.33M	30.76	46.00	-15.24	-10.07	3	Vertical	-	-	-	40.83	16.90	1.58	28.55
PK	425.42M	34.25	46.00	-11.75	-5.14	3	Vertical	-	-	-	39.39	21.31	1.94	28.39
PK	553.65M	34.53	46.00	-11.47	-2.72	3	Vertical	-	-	-	37.25	23.37	2.25	28.34
PK	960M	40.25	54.00	-13.75	4.42	3	Vertical	-	-	-	35.83	28.80	3.21	27.59



Mode 3



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)
PK	37.76M	28.16	40.00	-11.84	-9.79	3	Horizontal	-	-	-	37.95	17.83	0.57	28.19
PK	159.98M	27.60	43.50	-15.90	-8.96	3	Horizontal	-	-	-	36.56	18.30	1.25	28.51
PK	220.12M	31.89	46.00	-14.11	-12.29	3	Horizontal	-	-	-	44.18	14.80	1.47	28.56
PK	240M	34.77	46.00	-11.23	-10.42	3	Horizontal	-	-	-	45.19	16.60	1.54	28.56
PK	332.64M	32.21	46.00	-13.79	-7.39	3	Horizontal	-	-	-	39.60	19.30	1.81	28.50
PK	960M	40.18	54.00	-13.82	4.42	3	Horizontal	-	-	-	35.76	28.80	3.21	27.59





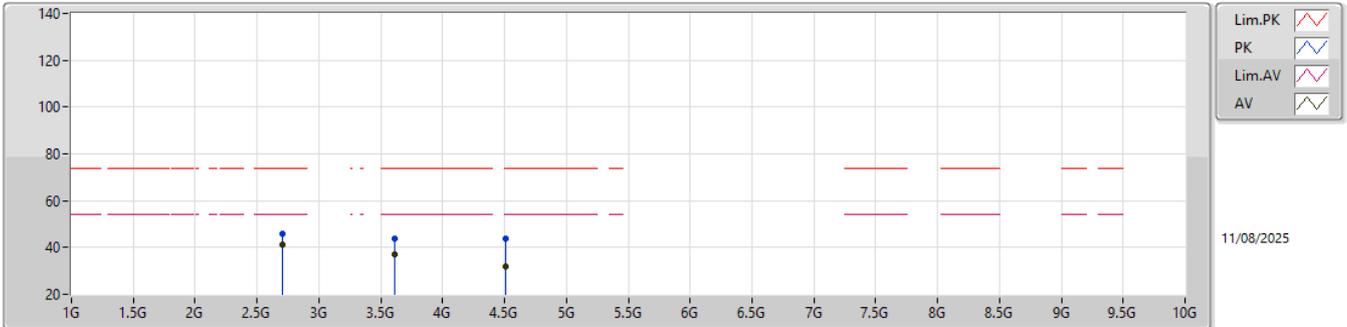
**Summary**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
902-928MHz	-	-	-	-	-	-	-	-	-	-	-
LoRa (125kHz)	Pass	AV	2.7255G	45.55	54.00	-8.45	3	Vertical	186	2.87	-



902-928MHz\_LoRa (125kHz)

902.3MHz\_TX

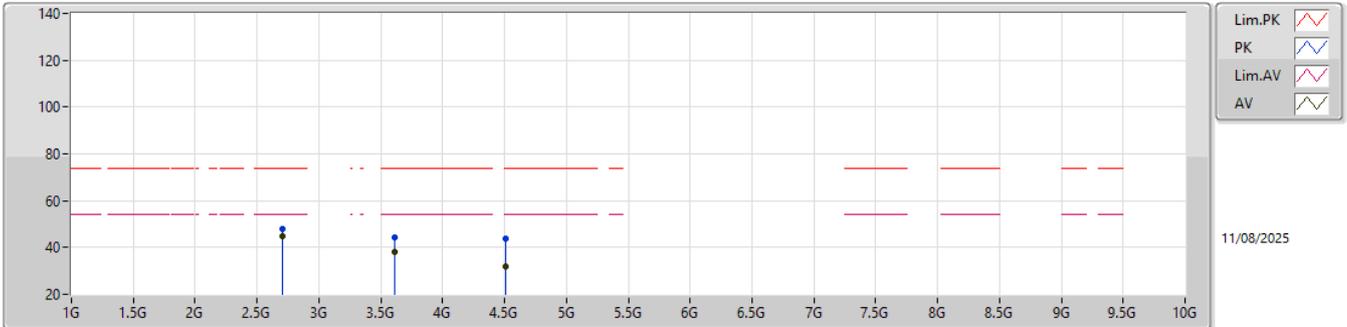


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)
AV	2.7069G	41.11	54.00	-12.89	45.25	3	Horizontal	152	1.86	-	27.70	5.08	36.92
PK	2.7069G	45.68	74.00	-28.32	49.82	3	Horizontal	152	1.86	-	27.70	5.08	36.92
AV	3.6092G	36.93	54.00	-17.07	39.14	3	Horizontal	147	2.08	-	29.24	5.88	37.33
PK	3.6092G	43.63	74.00	-30.37	45.84	3	Horizontal	147	2.08	-	29.24	5.88	37.33
AV	4.5115G	31.95	54.00	-22.05	32.87	3	Horizontal	149	1.00	-	30.92	6.41	38.25
PK	4.5115G	43.84	74.00	-30.16	44.76	3	Horizontal	149	1.00	-	30.92	6.41	38.25



902-928MHz\_LoRa (125kHz)

902.3MHz\_TX

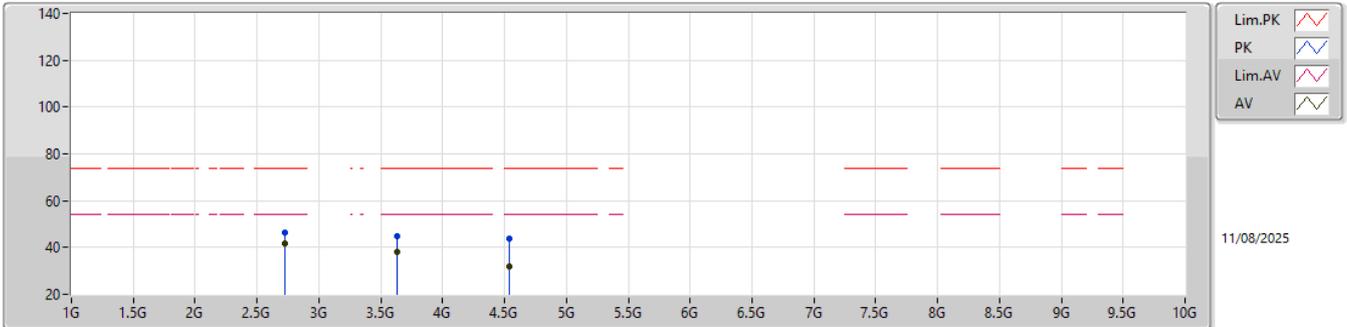


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)
AV	2.7069G	44.66	54.00	-9.34	48.80	3	Vertical	188	2.55	-	27.70	5.08	36.92
PK	2.7069G	47.75	74.00	-26.25	51.89	3	Vertical	188	2.55	-	27.70	5.08	36.92
AV	3.6092G	37.88	54.00	-16.12	40.09	3	Vertical	172	1.79	-	29.24	5.88	37.33
PK	3.6092G	44.33	74.00	-29.67	46.54	3	Vertical	172	1.79	-	29.24	5.88	37.33
AV	4.5115G	32.05	54.00	-21.95	32.97	3	Vertical	177	1.00	-	30.92	6.41	38.25
PK	4.5115G	43.88	74.00	-30.12	44.80	3	Vertical	177	1.00	-	30.92	6.41	38.25



902-928MHz\_LoRa (125kHz)

908.5MHz\_TX

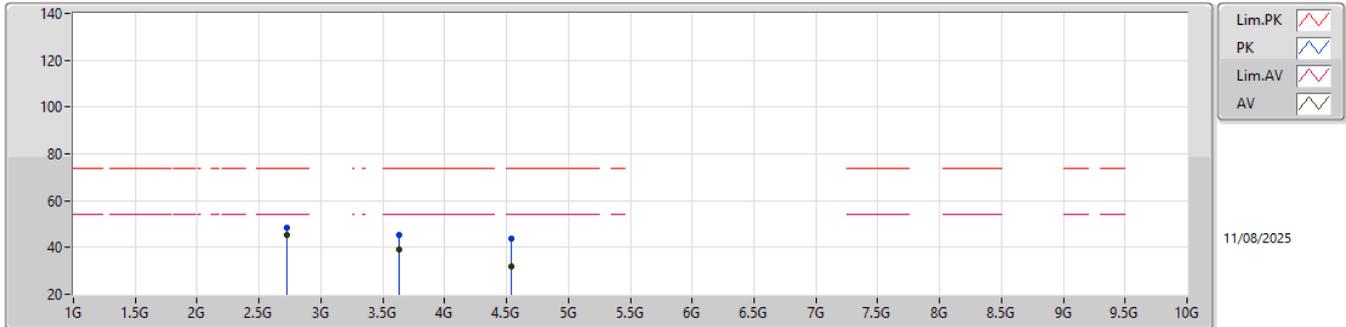


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)
AV	2.7255G	41.95	54.00	-12.05	45.86	3	Horizontal	149	1.81	-	27.90	5.10	36.91
PK	2.7255G	46.54	74.00	-27.46	50.45	3	Horizontal	149	1.81	-	27.90	5.10	36.91
AV	3.634G	37.89	54.00	-16.11	40.03	3	Horizontal	143	2.02	-	29.34	5.89	37.37
PK	3.634G	44.83	74.00	-29.17	46.97	3	Horizontal	143	2.02	-	29.34	5.89	37.37
AV	4.5425G	31.98	54.00	-22.02	32.82	3	Horizontal	144	1.00	-	30.98	6.45	38.27
PK	4.5425G	43.92	74.00	-30.08	44.76	3	Horizontal	144	1.00	-	30.98	6.45	38.27



902-928MHz\_LoRa (125kHz)

908.5MHz\_TX

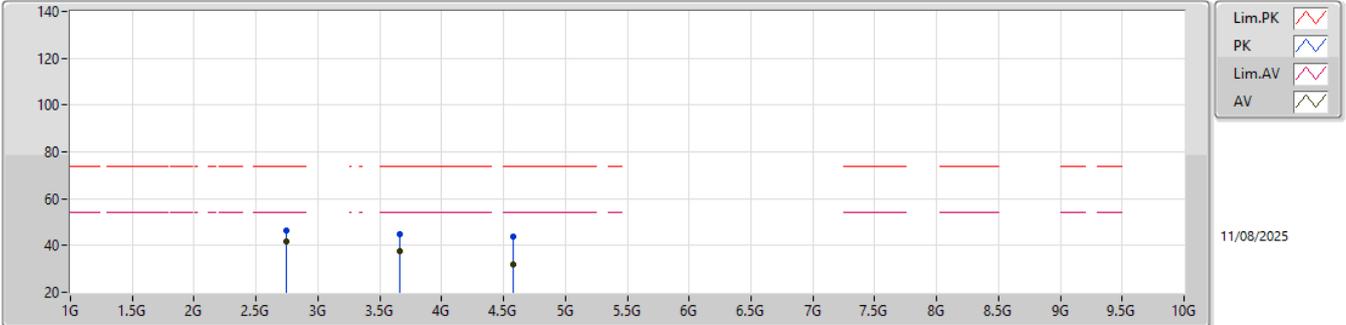


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)
AV	2.7255G	45.55	54.00	-8.45	49.46	3	Vertical	186	2.87	-	27.90	5.10	36.91
PK	2.7255G	48.68	74.00	-25.32	52.59	3	Vertical	186	2.87	-	27.90	5.10	36.91
AV	3.634G	38.96	54.00	-15.04	41.10	3	Vertical	170	1.76	-	29.34	5.89	37.37
PK	3.634G	45.42	74.00	-28.58	47.56	3	Vertical	170	1.76	-	29.34	5.89	37.37
AV	4.5425G	32.04	54.00	-21.96	32.88	3	Vertical	175	1.00	-	30.98	6.45	38.27
PK	4.5425G	43.91	74.00	-30.09	44.75	3	Vertical	175	1.00	-	30.98	6.45	38.27



902-928MHz\_LoRa (125kHz)

914.9MHz\_TX

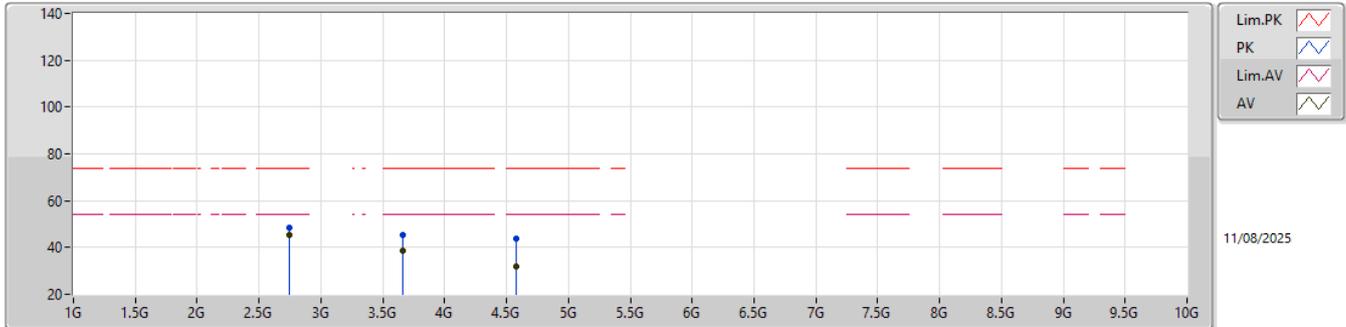


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)
AV	2.7447G	41.71	54.00	-12.29	45.60	3	Horizontal	149	1.81	-	27.90	5.12	36.91
PK	2.7447G	46.33	74.00	-27.67	50.22	3	Horizontal	149	1.81	-	27.90	5.12	36.91
AV	3.6596G	37.75	54.00	-16.25	39.88	3	Horizontal	143	2.02	-	29.38	5.90	37.41
PK	3.6596G	44.78	74.00	-29.22	46.91	3	Horizontal	143	2.02	-	29.38	5.90	37.41
AV	4.5745G	31.82	54.00	-22.18	32.62	3	Horizontal	144	1.00	-	31.00	6.49	38.29
PK	4.5745G	43.76	74.00	-30.24	44.56	3	Horizontal	144	1.00	-	31.00	6.49	38.29

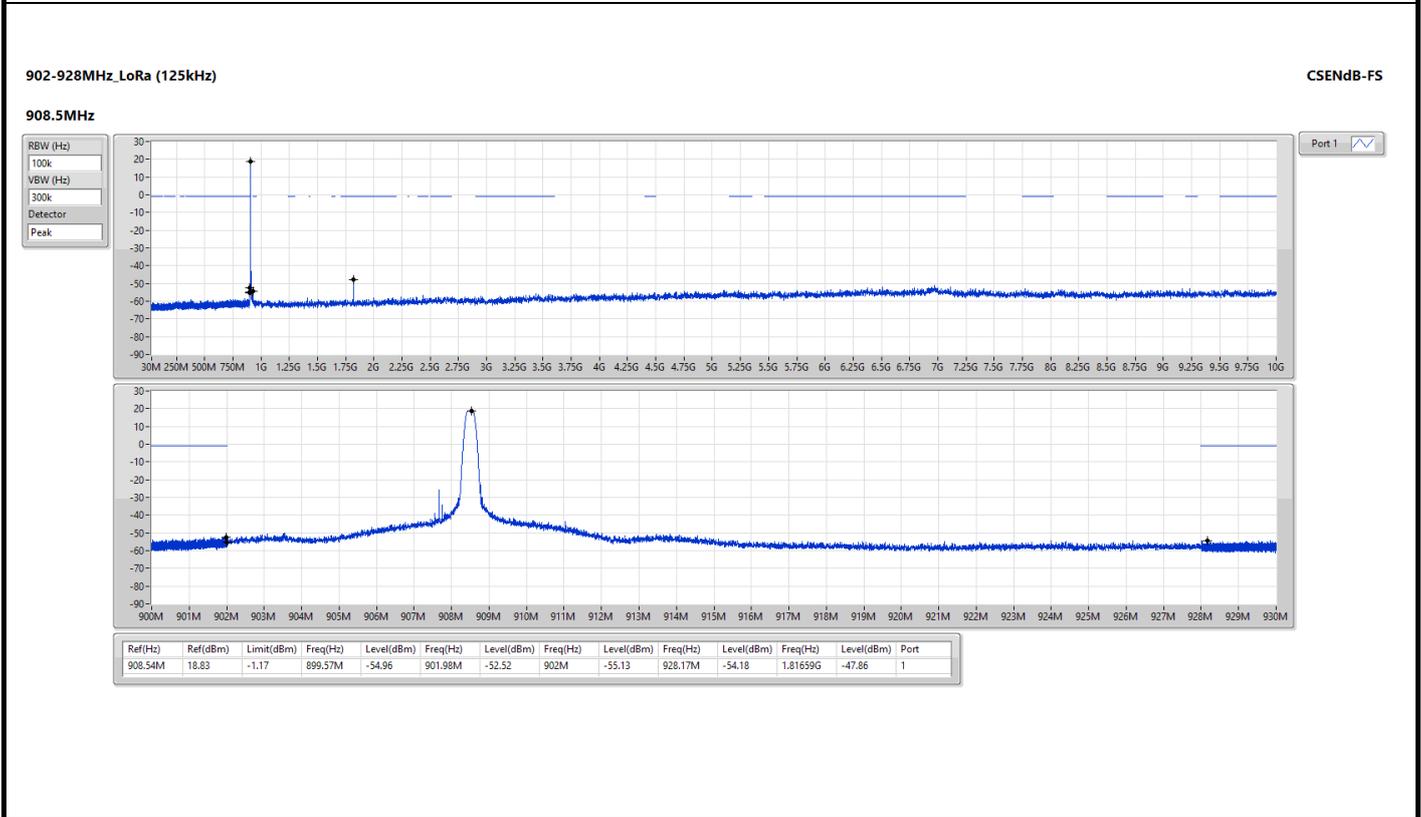
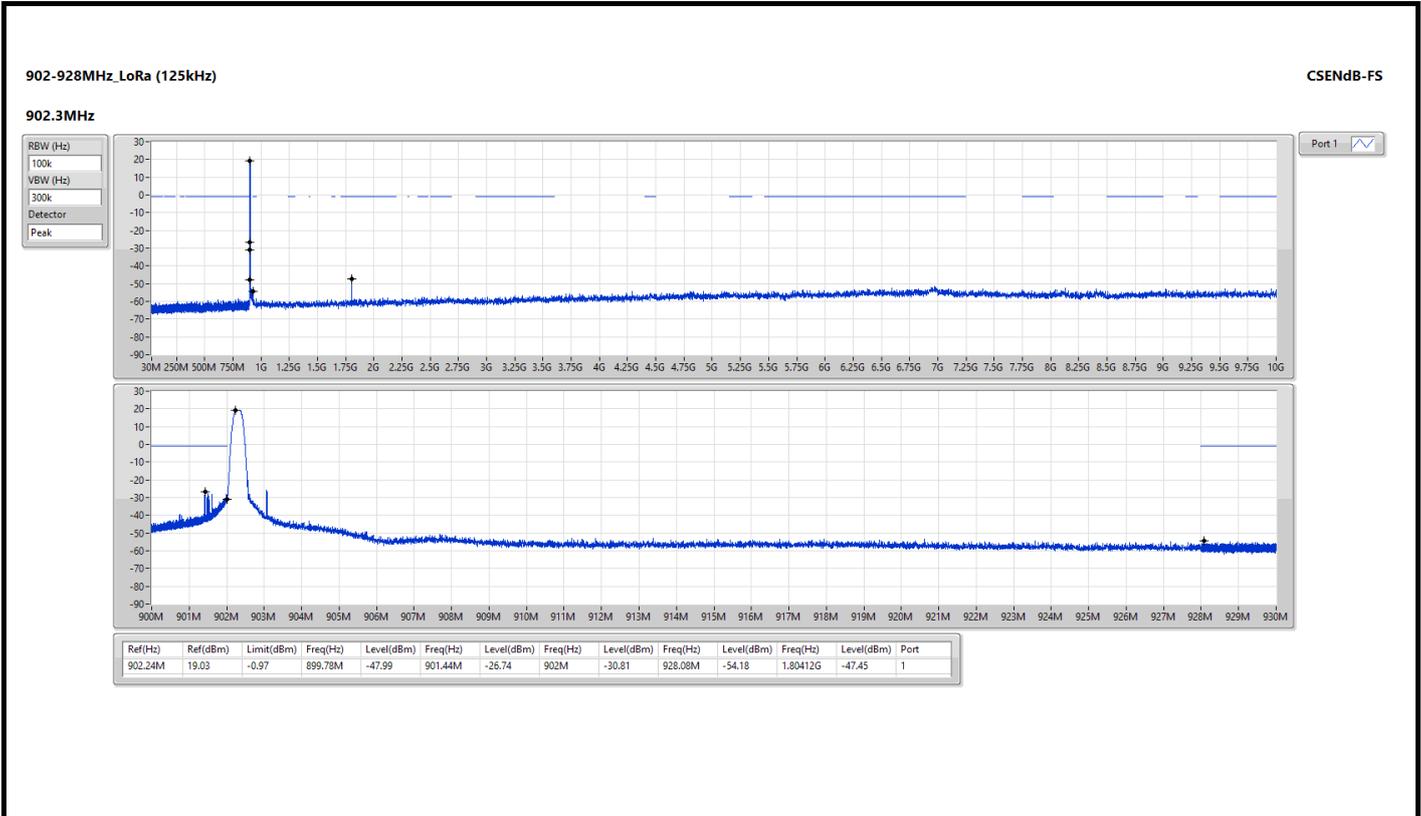


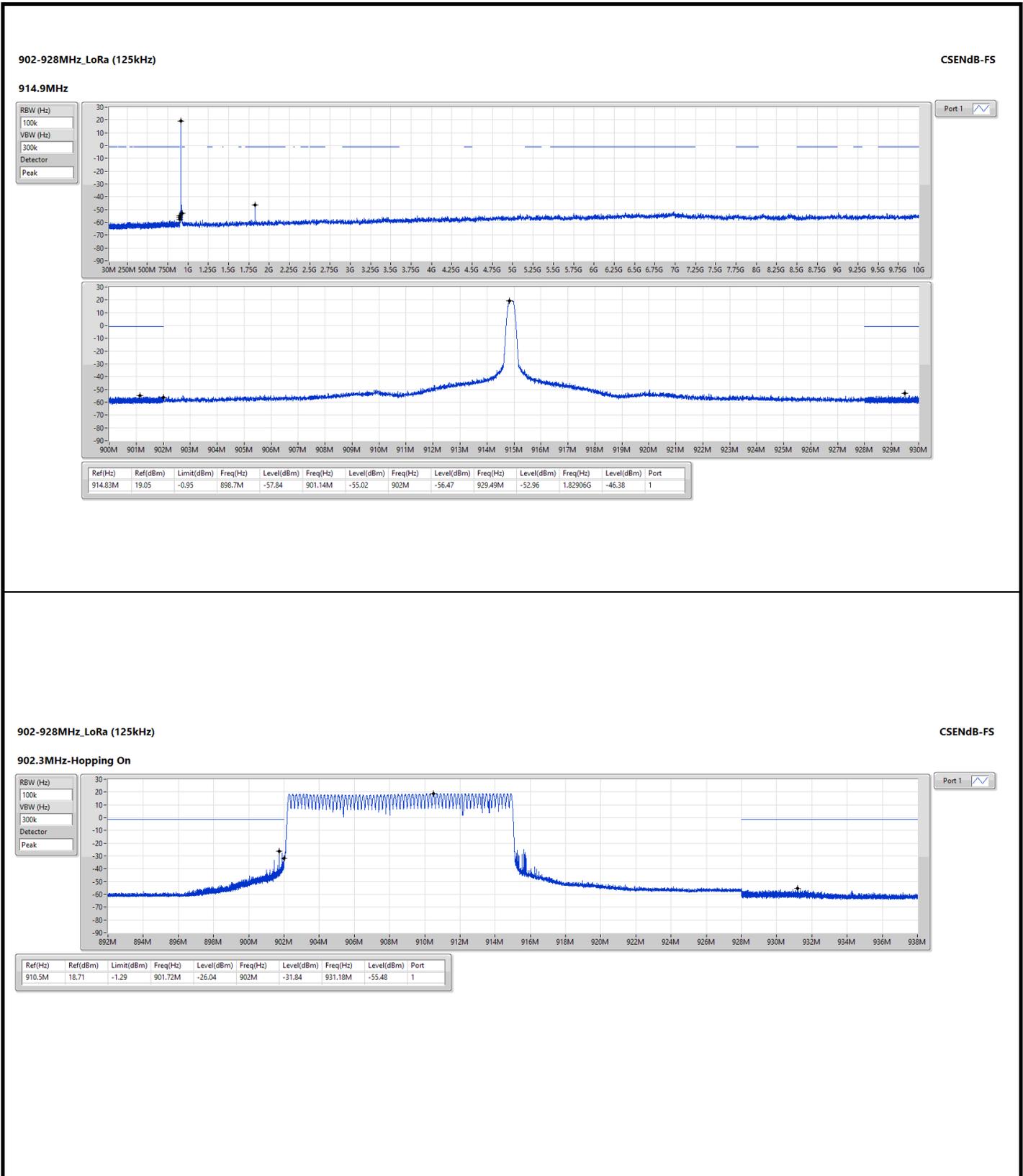
902-928MHz\_LoRa (125kHz)

914.9MHz\_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)
AV	2.7447G	45.33	54.00	-8.67	49.22	3	Vertical	185	2.82	-	27.90	5.12	36.91
PK	2.7447G	48.28	74.00	-25.72	52.17	3	Vertical	185	2.82	-	27.90	5.12	36.91
AV	3.6596G	38.56	54.00	-15.44	40.69	3	Vertical	172	1.71	-	29.38	5.90	37.41
PK	3.6596G	45.17	74.00	-28.83	47.30	3	Vertical	172	1.71	-	29.38	5.90	37.41
AV	4.5745G	31.99	54.00	-22.01	32.79	3	Vertical	176	1.00	-	31.00	6.49	38.29
PK	4.5745G	43.88	74.00	-30.12	44.68	3	Vertical	176	1.00	-	31.00	6.49	38.29







Summary

Mode	Total Power (dBm)	Total Power (W)
902-928MHz	-	-
LoRa (125kHz)	19.28	0.08472

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
LoRa (125kHz)	-	-	-	-	-	-
902.3MHz	Pass	2.62	19.28	30.00	21.90	36.00
908.5MHz	Pass	2.62	19.16	30.00	21.78	36.00
914.9MHz	Pass	2.62	19.28	30.00	21.90	36.00

DG = Directional Gain; Port X = Port X output power



Summary

Mode	Total Power (dBm)	Total Power (W)
902-928MHz	-	-
LoRa (125kHz)	19.23	0.08375

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
LoRa (125kHz)	-	-	-	-	-	-
902.3MHz	Pass	2.62	19.21	-	21.83	-
908.5MHz	Pass	2.62	19.08	-	21.70	-
914.9MHz	Pass	2.62	19.23	-	21.85	-

Note: Average power is for reference only.

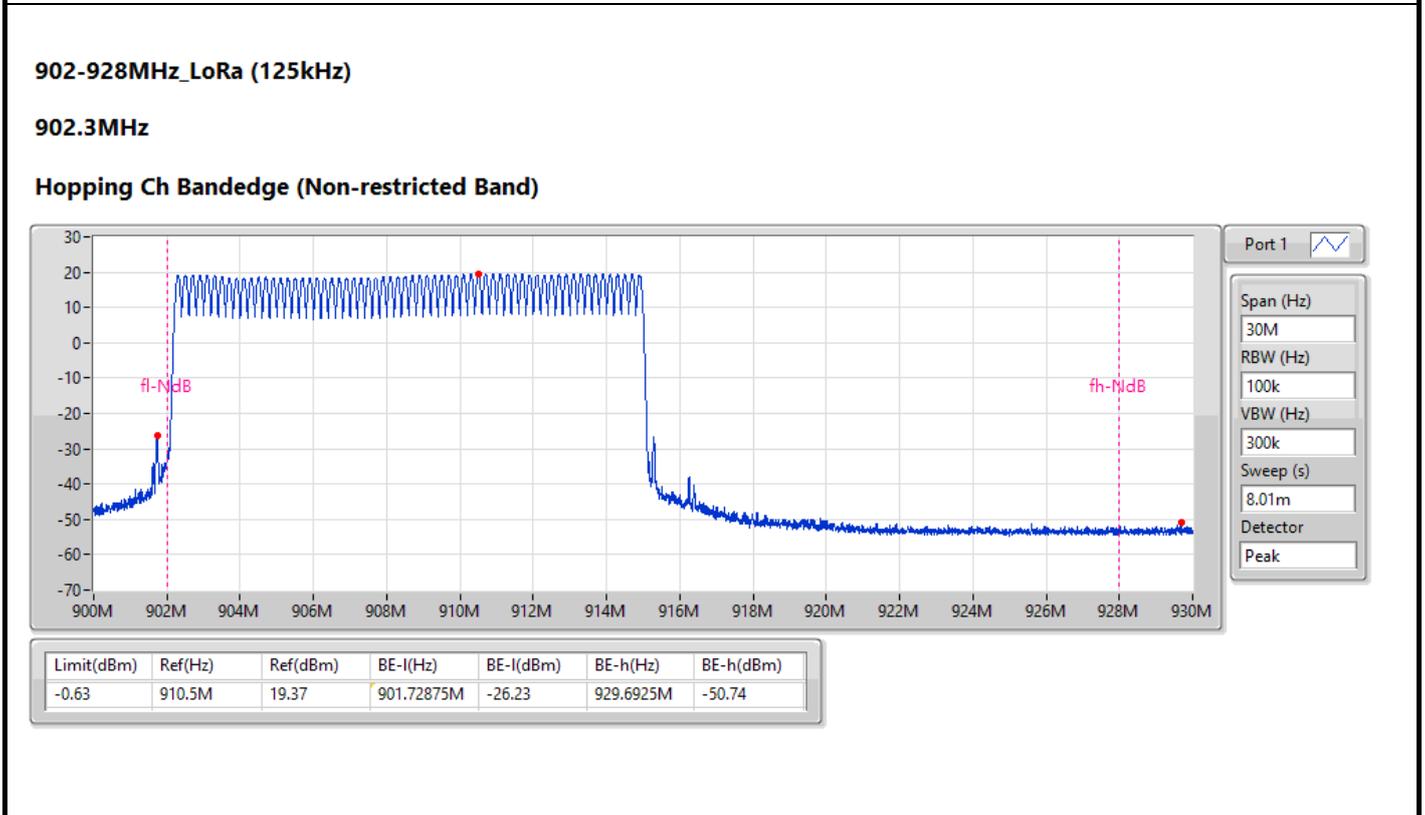
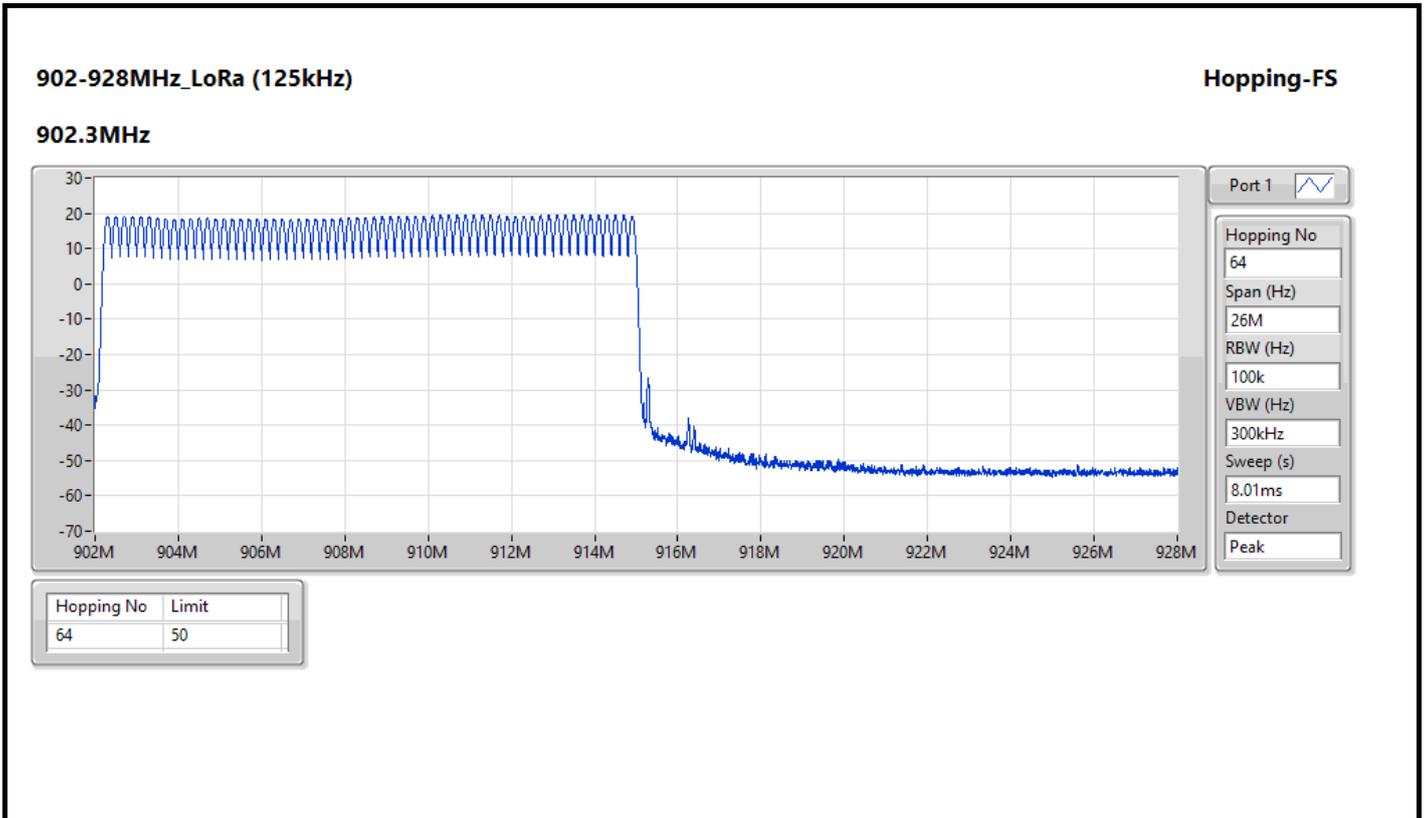


**Summary**

<b>Mode</b>	<b>Max-Hop No</b>
<b>902-928MHz</b>	-
LoRa (125kHz)	64

**Result**

<b>Mode</b>	<b>Result</b>	<b>Hopping No</b>	<b>Limit</b>
<b>LoRa (125kHz)</b>	-	-	-
902.3MHz	Pass	64	50





Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
902-928MHz	-	-	-	-	-
LoRa (125kHz)	139.25k	126.437k	126KF1D	138k	125.437k

Max-N dB = Maximum 20dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth;  
Min-N dB = Minimum 20dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
LoRa (125kHz)	-	-	-	-
902.3MHz	Pass	Inf	138.25k	125.437k
908.5MHz	Pass	Inf	139.25k	125.687k
914.9MHz	Pass	Inf	138k	126.437k

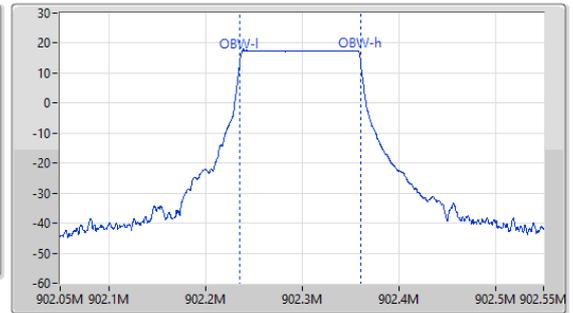
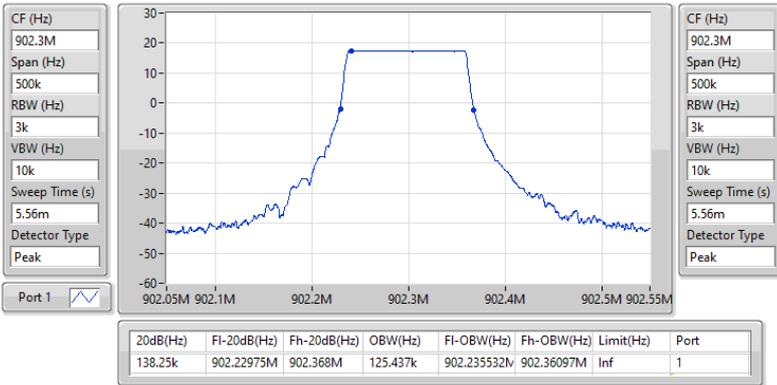
Port X-N dB = Port X 20dB down bandwidth;  
Port X-OBW = Port X 99% occupied bandwidth



902-928MHz\_LoRa (125kHz)

EBW-FS

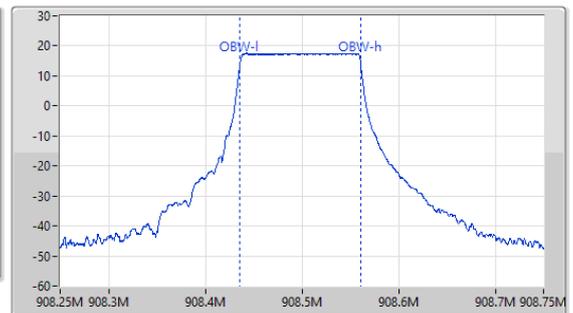
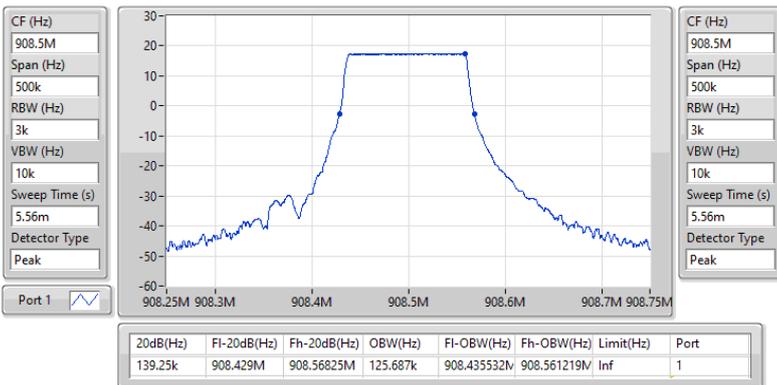
902.3MHz

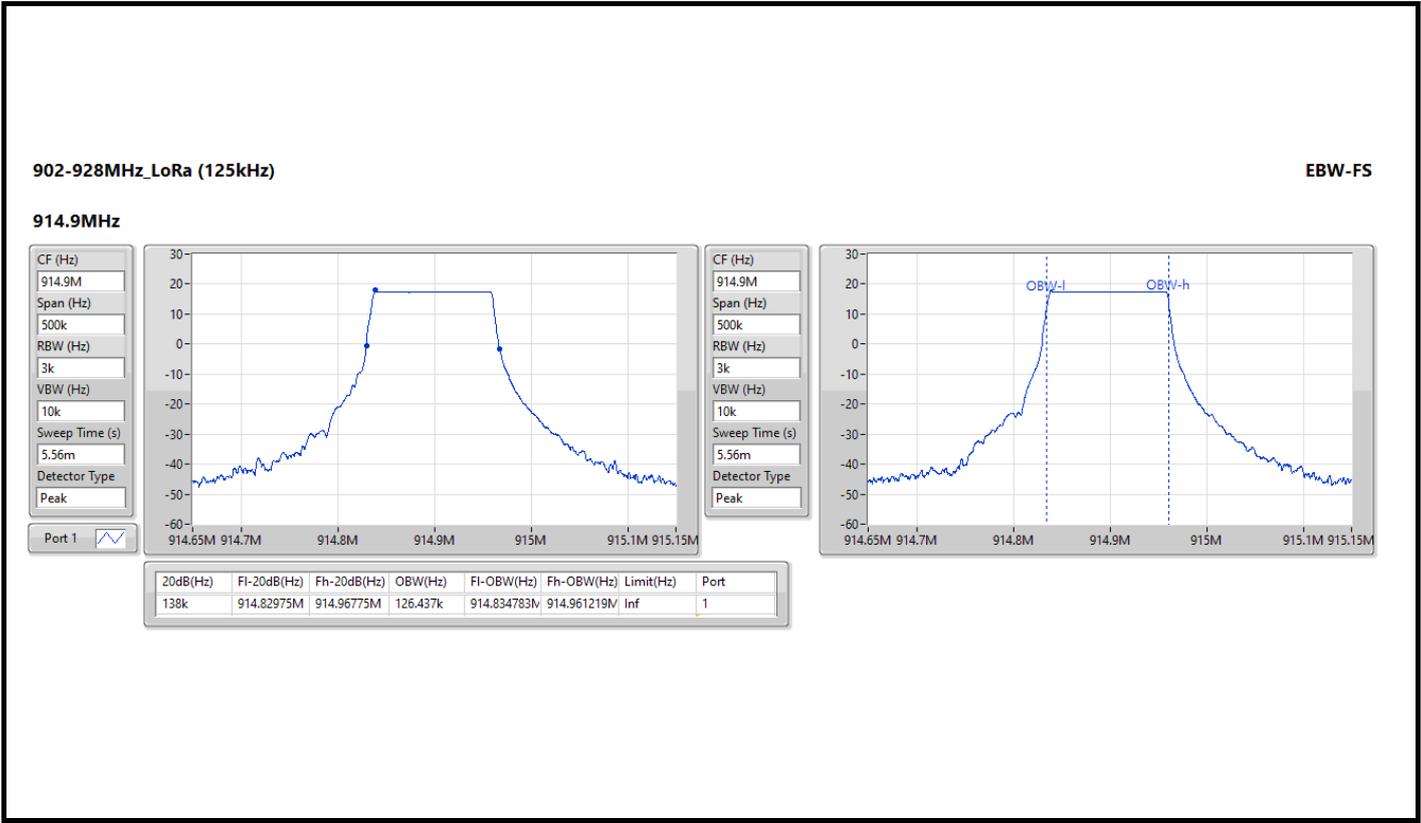


902-928MHz\_LoRa (125kHz)

EBW-FS

908.5MHz







Summary

Mode	Max-Space (Hz)	Min-Space (Hz)
902-928MHz	-	-
LoRa (125kHz)	203.1k	200.1k

Result

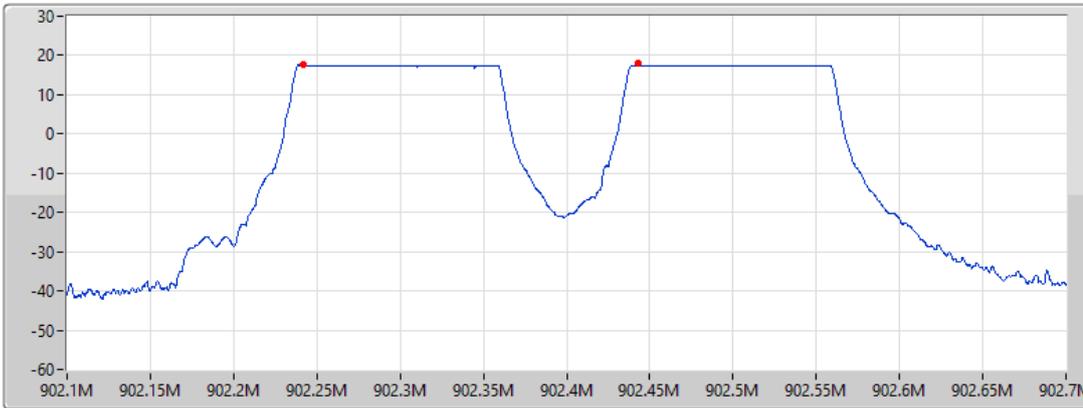
Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
LoRa (125kHz)	-	-	-	-	-
902.3MHz	Pass	902.2422M	902.4426M	200.4k	138.25k
908.5MHz	Pass	908.4395M	908.6426M	203.1k	139.25k
914.9MHz	Pass	914.6398M	914.8399M	200.1k	138k



902-928MHz\_LoRa (125kHz)

Channel Separation-FS

902.3M/902.5MHz



Port 1

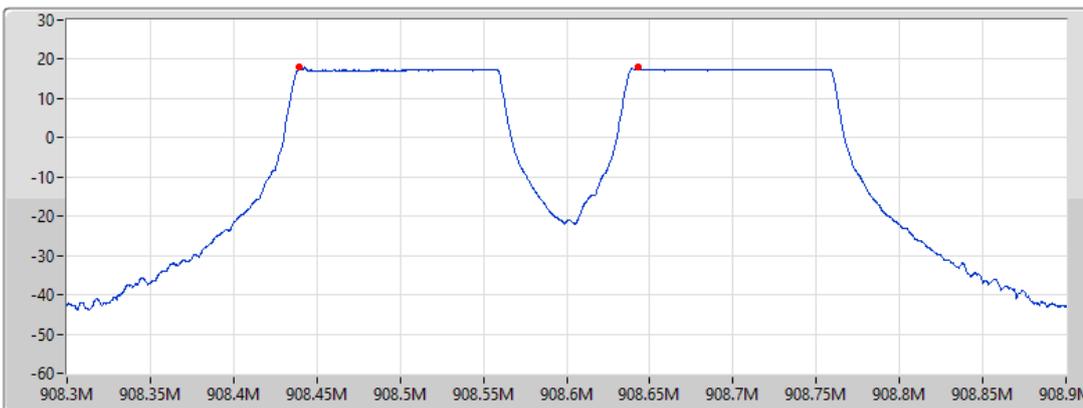
Ch Freq (Hz)	902.3M/902.5M
Span (Hz)	600k
RBW (Hz)	3k
VBW (Hz)	10k
Sweep (s)	6.67m
Detector	Peak

F1(Hz)	Fh(Hz)	Ch.Space(Hz)	Limit(Hz)
902.2422M	902.4426M	200.4k	138.25k

902-928MHz\_LoRa (125kHz)

Channel Separation-FS

908.5M/908.7MHz



Port 1

Ch Freq (Hz)	908.5M/908.7M
Span (Hz)	600k
RBW (Hz)	3k
VBW (Hz)	10k
Sweep (s)	6.67m
Detector	Peak

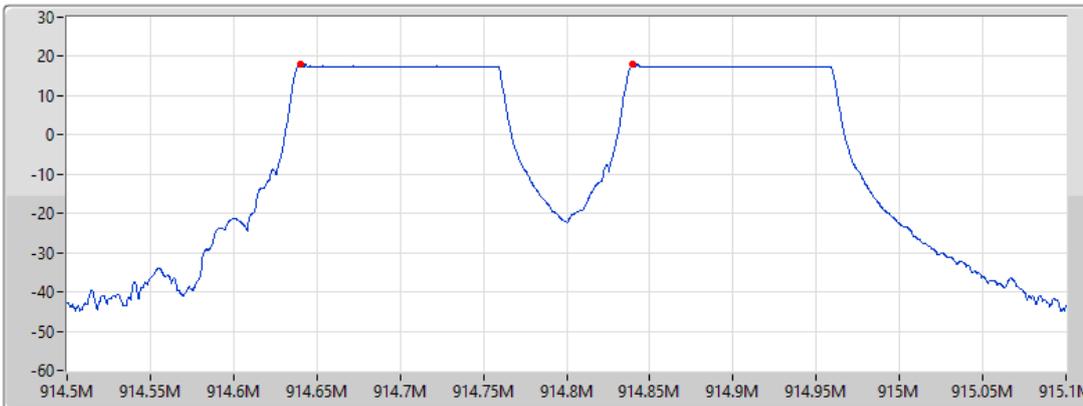
F1(Hz)	Fh(Hz)	Ch.Space(Hz)	Limit(Hz)
908.4395M	908.6426M	203.1k	139.25k



902-928MHz\_LoRa (125kHz)

Channel Separation-FS

914.9M/914.7MHz



Port 1

Ch Freq (Hz)  
914.9M/914.7M

Span (Hz)  
600k

RBW (Hz)  
3k

VBW (Hz)  
10k

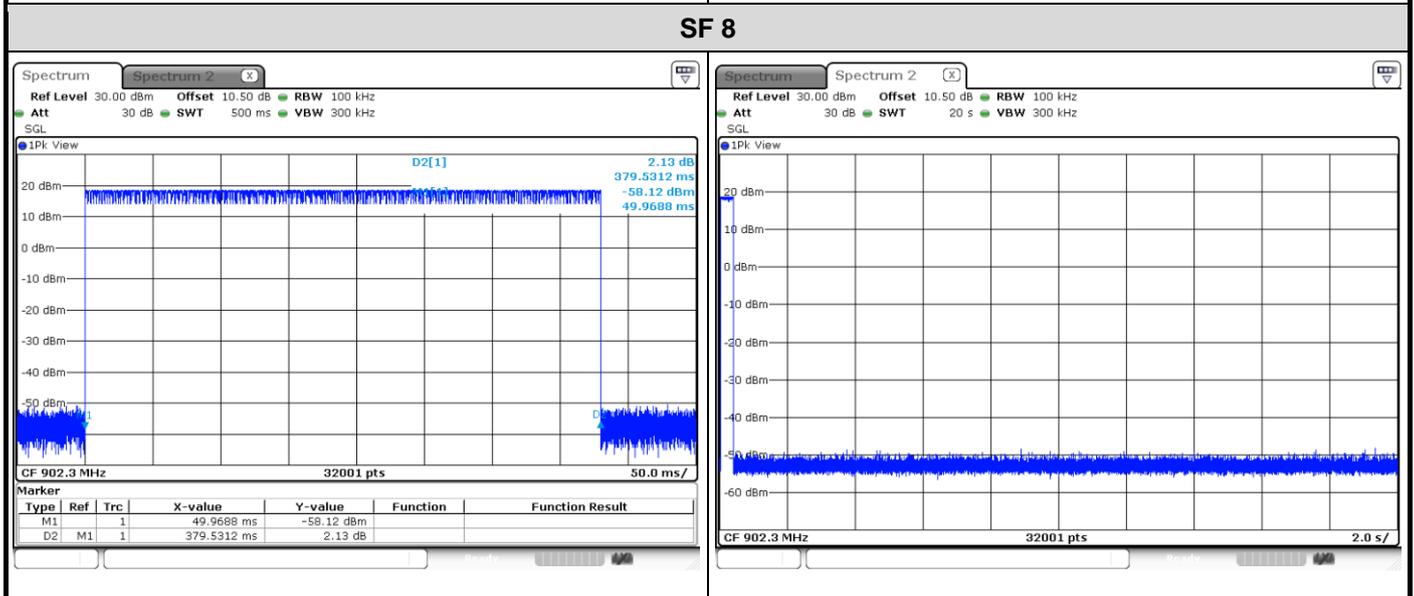
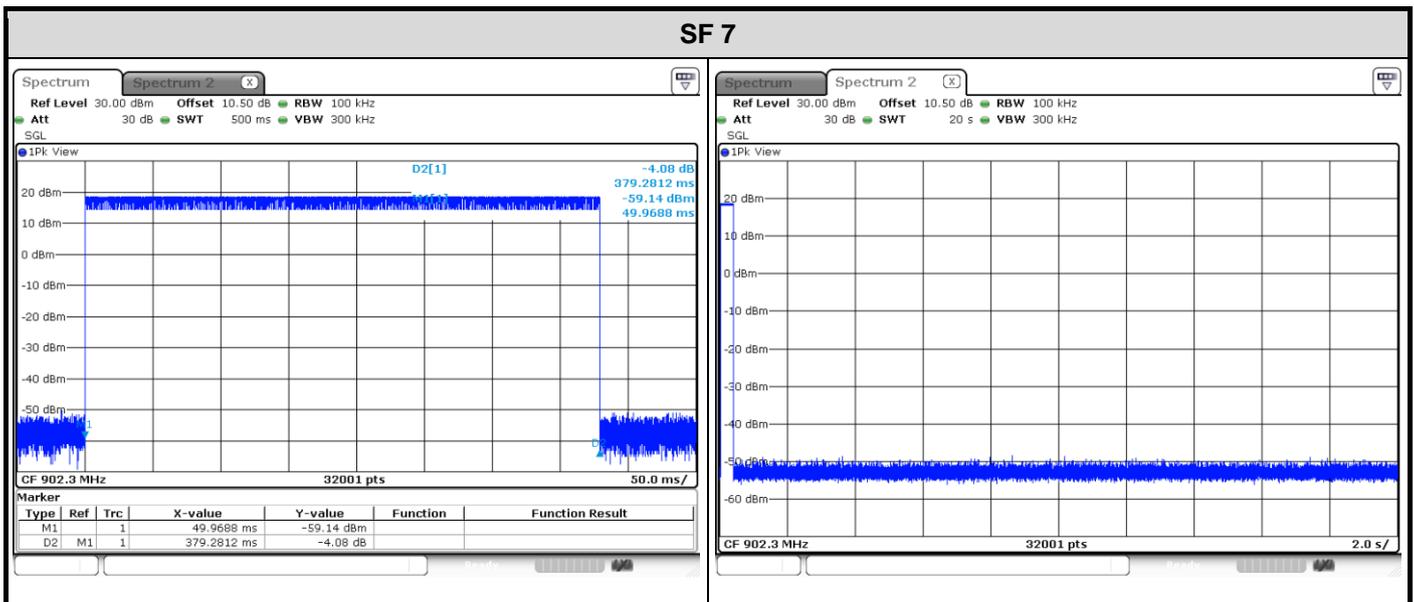
Sweep (s)  
6.67m

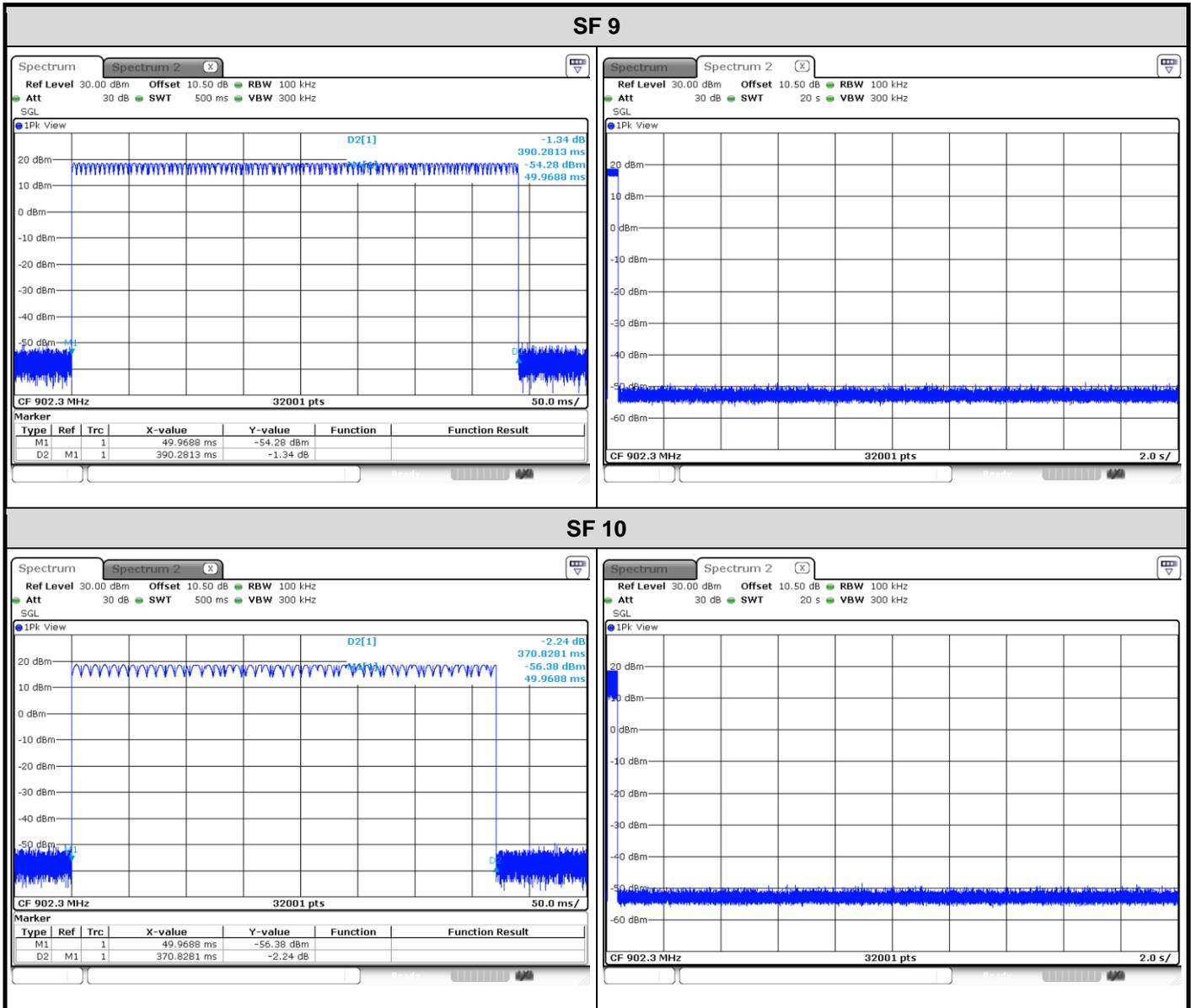
Detector  
Peak

F1(Hz)	Fh(Hz)	Ch.Space(Hz)	Limit(Hz)
914.6398M	914.8399M	200.1k	138k



Mode / SF	Freq. (MHz)	Length of Transmission Time (sec)	Number of Transmission in a 3.2 s (8 Hopping*0.4s)	Result (s)	Limit (s)
LoRa / 7	902.3	0.3792812	1	0.3792812	0.4
LoRa / 8	902.3	0.3795312	1	0.3795312	0.4
LoRa / 9	902.3	0.3902813	1	0.3902813	0.4
LoRa / 10	902.3	0.3708281	1	0.3708281	0.4

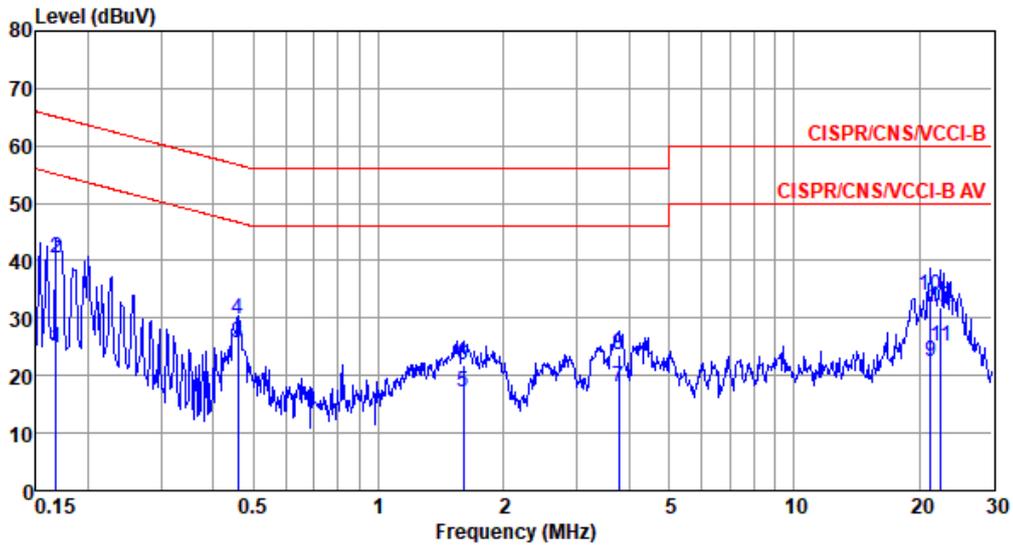






Power Phase	Line	Test Freq. (MHz)	902.3
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Test by : Joe Liao      Temperature: 25°C      Humidity: 64%



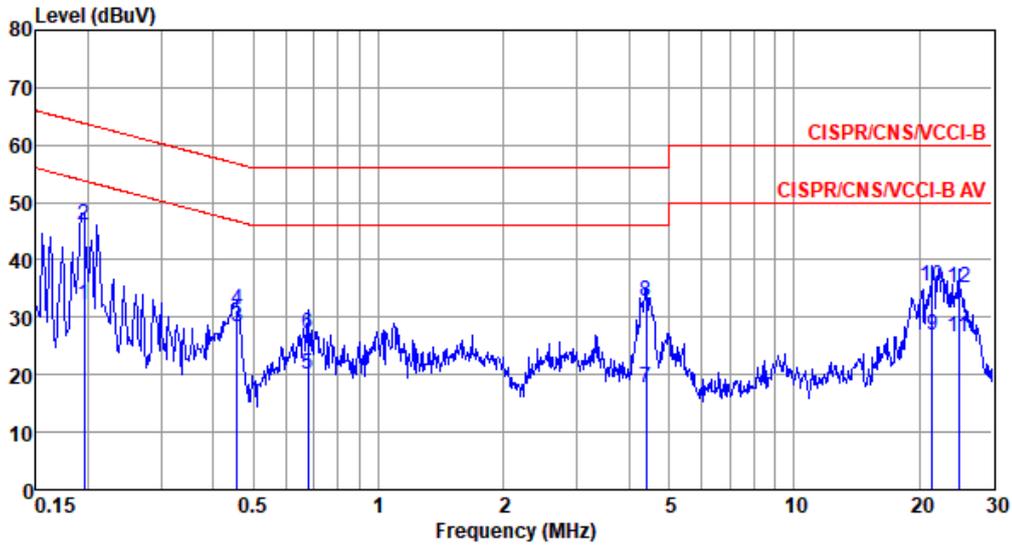
	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.168	24.67	55.08	-30.41	14.71	9.65	0.08	0.23	Average
2	0.168	40.45	65.08	-24.63	30.49	9.65	0.08	0.23	QP
3*	0.459	25.68	46.71	-21.03	15.62	9.64	0.09	0.33	Average
4	0.459	29.71	56.71	-27.00	19.65	9.64	0.09	0.33	QP
5	1.602	17.17	46.00	-28.83	6.95	9.65	0.15	0.42	Average
6	1.602	21.75	56.00	-34.25	11.53	9.65	0.15	0.42	QP
7	3.779	17.95	46.00	-28.05	7.58	9.67	0.22	0.48	Average
8	3.779	23.72	56.00	-32.28	13.35	9.67	0.22	0.48	QP
9	21.260	22.38	50.00	-27.62	11.43	9.68	0.59	0.68	Average
10	21.260	34.04	60.00	-25.96	23.09	9.68	0.59	0.68	QP
11	22.535	25.02	50.00	-24.98	14.04	9.68	0.60	0.70	Average
12	22.535	31.94	60.00	-28.06	20.96	9.68	0.60	0.70	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).  
 Note 2: Over Limit (dB) = Level (dBuV) - Limit Line (dBuV).



Power Phase	Neutral	Test Freq. (MHz)	902.3
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Test by : Joe Liao      Temperature: 25°C      Humidity: 64%



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.195	32.18	53.80	-21.62	22.27	9.64	0.08	0.19	Average
2*	0.195	46.08	63.80	-17.72	36.17	9.64	0.08	0.19	QP
3	0.456	28.43	46.76	-18.33	18.44	9.63	0.09	0.27	Average
4	0.456	31.29	56.76	-25.47	21.30	9.63	0.09	0.27	QP
5	0.675	20.04	46.00	-25.96	9.99	9.64	0.10	0.31	Average
6	0.675	27.11	56.00	-28.89	17.06	9.64	0.10	0.31	QP
7	4.407	17.57	46.00	-28.43	7.19	9.67	0.23	0.48	Average
8	4.407	32.79	56.00	-23.21	22.41	9.67	0.23	0.48	QP
9	21.486	26.88	50.00	-23.12	15.85	9.79	0.59	0.65	Average
10	21.486	35.40	60.00	-24.60	24.37	9.79	0.59	0.65	QP
11	24.922	26.65	50.00	-23.35	15.56	9.79	0.63	0.67	Average
12	24.922	35.22	60.00	-24.78	24.13	9.79	0.63	0.67	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

Note 2: Over Limit (dB) = Level (dBuV) - Limit Line (dBuV).