

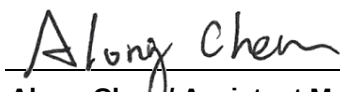
FCC C2PC Test Report

FCC ID : P27-IG502L
Equipment : Monitor Gateway
Model No. : IG-502L
Brand Name : OxTech, LLC
Applicant : Sercomm Corporation
Address : 8F, No. 3-1, YuanQu St., NanKang, Taipei 115,
Taiwan, R.O.C.
Standard : 47 CFR FCC Part 15.247
Received Date : Apr. 12, 2022
Tested Date : Apr. 13 ~ Apr. 18, 2022

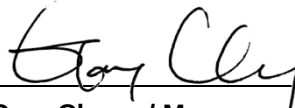
We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the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

Reviewed by:

Approved by:



Along Chen / Assistant Manager



Gary Chang / Manager

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Appendix A. 6dB and Occupied Bandwidth

Appendix B. Conducted Output Power

Appendix C. Power Spectral Density

Appendix D. Unwanted Emissions into Restricted Frequency Bands

Appendix E. Unwanted Emissions into Non-Restricted Frequency Bands

Appendix F. AC Power Line Conducted Emissions

Release Record

Report No.	Version	Description	Issued Date
FR1D2104-01AH	Rev. 01	Initial issue	Apr. 27, 2022

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 0.410MHz 40.00 (Margin -7.64dB) - AV	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 42.46MHz 36.55 (Margin -3.45dB) - PK	Pass
15.247(b)(3)	Conducted Output Power	Max Power [dBm]: 27.48	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	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

This report is issued as a FCC Class II Permissive Change. The modification is only concerned with adding 903~914.2MHz band by software setting.

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	Ch. Frequency (MHz)	Channel Number	Physical bit rate (bit/sec)	Spread Factor	Channel Bandwidth (kHz)
902 ~ 928	903 ~ 914.2	65 ~ 72 [8]	980 ~ 21900	7 ~ 12	500
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.					
Note 2: The device uses LoRa modulation.					

1.1.2 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remark
1	Dipole	R-SMA	2.1	---

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter
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1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	AC Adapter	Brand: Leader Model: MU18D1120150-A1 Power Rating: I/P: 100-240Vac, 50/60Hz, 0.6A O/P:12Vdc, 1.5A Power Line: 1.45m non-shielded without core
2	AC Adapter	Brand: Sercomm Model: PU18W120ULB15-DPX-00 Power Rating: I/P: 100-240Vac, 50/60Hz, 0.7A O/P:12Vdc, 1.5A, 18.0W
3	RJ45	1.45m non-shielded without core

1.1.5 Channel List

Frequency Band (MHz)		902 ~928	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
65	903	69	909.4
66	904.6	70	911
67	906.2	71	912.6
68	907.8	72	914.2

1.1.6 Test Tool and Duty Cycle

Test Tool	Putty, Version: V0.060		
Duty Cycle and Duty Factor	Duty Cycle (%)	Duty Factor (dB)	
	100.00%	0.00	

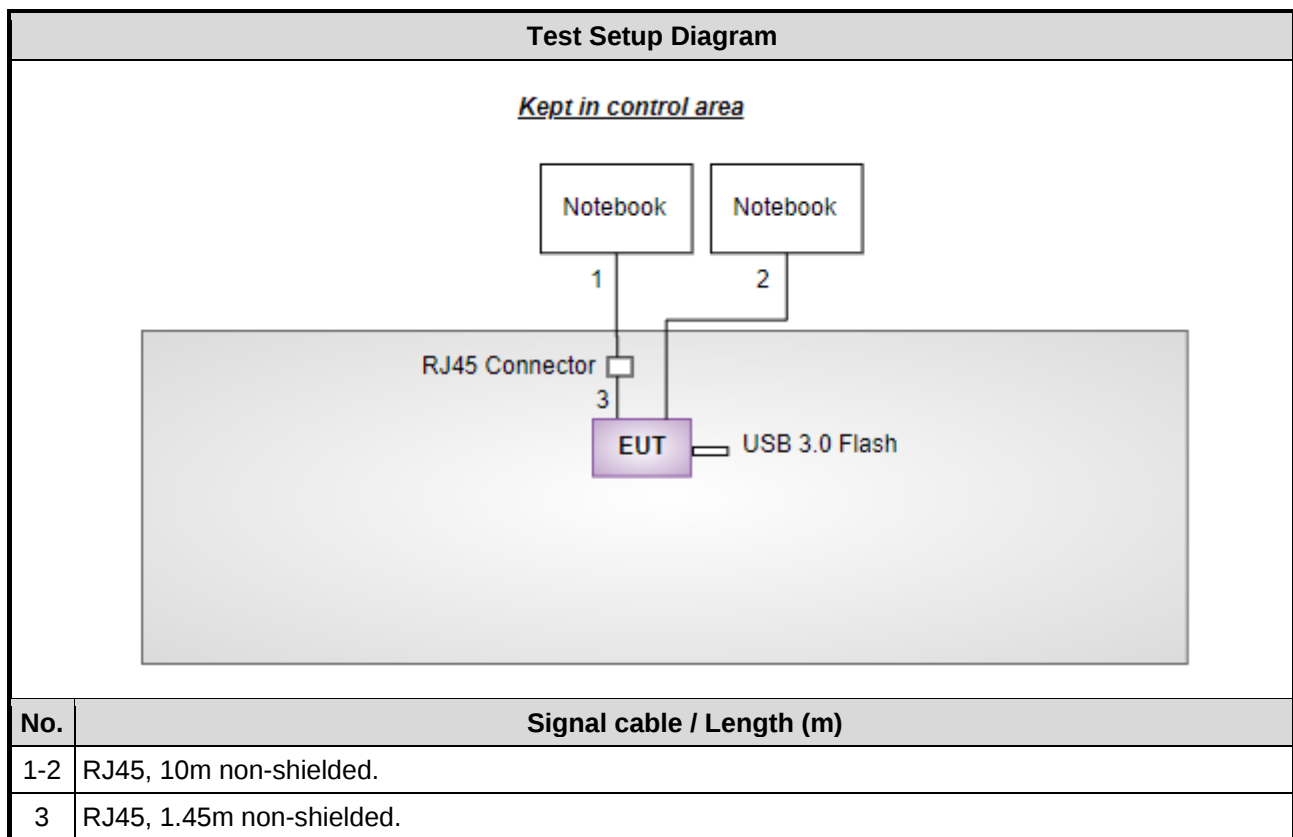
1.1.7 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index
LoRa	903	pa 1 --pwid 14
LoRa	907.8	pa 1 --pwid 14
LoRa	914.2	pa 1 --pwid 14

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5470	DoC	---
2	Notebook	DELL	Latitude E5470	DoC	---
3	USB 3.0 Flash	Transcend	JetFlash 700	---	---

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Apr. 18, 2022				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 16, 2022	Feb. 15, 2023
LISN	R&S	ENV216	101295	Jan. 12, 2022	Jan. 11, 2023
LISN (Support Unit)	SCHWARZBECK	NSLK 8127	8127667	Jan .07, 2022	Jan .06, 2023
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 19, 2021	Oct. 18, 2022
50 ohm terminal (Support Unit)	NA	50	04	May 25, 2021	May.24, 2022
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber3 / (03CH03-WS)				
Tested Date	Apr. 13 ~ Apr. 16, 2022				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 15, 2022	Mar. 14, 2023
Spectrum Analyzer	R&S	FSV40	101499	Mar. 08, 2022	Mar. 07, 2023
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 08, 2021	Nov. 07, 2022
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	May 06, 2021	May 05, 2022
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Dec. 20, 2021	Dec. 19, 2022
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170508	Jan. 11, 2022	Jan. 10, 2023
Preamplifier	EMC	EMC02325	980187	Jul. 26, 2021	Jul. 25, 2022
Preamplifier	Agilent	83017A	MY39501309	Sep. 06, 2021	Sep. 05, 2022
Preamplifier	EMC	EMC184045B	980192	Jul. 14, 2021	Jul. 13, 2022
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 05, 2021	Oct. 04, 2022
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Sep. 24, 2021	Sep. 23, 2022
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Sep. 24, 2021	Sep. 23, 2022
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Sep. 24, 2021	Sep. 23, 2022
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Sep. 24, 2021	Sep. 23, 2022
RF cable-8M	EMC	EMC104-SM-SM-8000	181107	Sep. 24, 2021	Sep. 23, 2022
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Apr. 18, 2022				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Nov. 29, 2021	Nov. 28, 2022
Power Meter	Anritsu	ML2495A	1241002	Nov. 07, 2021	Nov. 06, 2022
Power Sensor	Anritsu	MA2411B	1207366	Nov. 07, 2021	Nov. 06, 2022
Measurement Software	Sporton	SENSE-15247_FS	V5.10.7.11	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.247
ANSI C63.10-2013

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
Conducted emission	± 2.715 dB
AC conducted emission	± 2.92 dB
Radiated emission ≤ 1 GHz	± 3.96 dB
Radiated emission > 1 GHz	± 4.51 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)
Test Site	03CH03-WS
Address of Test Site	No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 333, Taiwan (R.O.C.)

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- ISSED#: 10807C
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Separating Factor	Test Configuration
AC Power Line Conducted Emissions	LoRa	903 / 907.8 / 914.2	SF 12	2
Conducted Output Power 6dB bandwidth Power spectral density	LoRa	903 / 907.8 / 914.2	SF 12	1
Unwanted Emissions ≤1GHz Unwanted Emissions >1GHz	LoRa	903 / 907.8 / 914.2	SF 12	1
NOTE: 1. Two adapters (Leader and Sercomm) had been covered during the pretest, and found that Sercomm adapter was the worst case of AC Power line conducted emission test item and Leader adapter was the worst case of Radiated Spurious emission test item. 2. Test configurations are as below Configuration 1: Leader adapter for Radiated emission and antenna port conducted test Configuration 2: Sercomm adapter for AC Power Line Conducted Emissions				

3 Transmitter Test Results

3.1 6dB and Occupied Bandwidth

3.1.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

3.1.2 Test Procedures

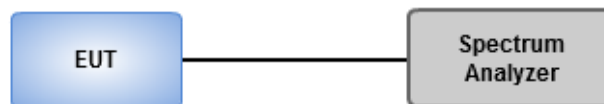
6dB Bandwidth

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. 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 6dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

1. Set resolution bandwidth (RBW) = 1% ~ 5 % of OBW, Video bandwidth = 3 x RBW
2. Detector = Sample, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

3.1.3 Test Setup



3.1.4 Test Result

Ambient Condition	22°C / 67%	Tested By	Aska Huang
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Refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Limit of Conducted Output Power

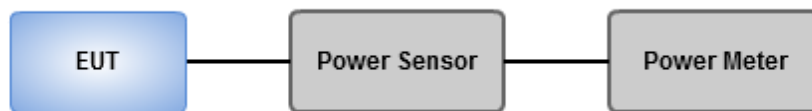
Conducted power shall not exceed 1Watt.

Antenna gain $\leq 6\text{dBi}$, no any corresponding reduction is in output power limit.

3.2.2 Test Procedures

A broadband RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. 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.

3.2.3 Test Setup



3.2.4 Test Result

Ambient Condition	22°C / 67%	Tested By	Aska Huang
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Refer to Appendix B.

3.3 Power Spectral Density

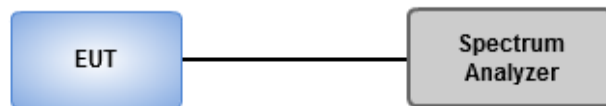
3.3.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.3.2 Test Procedures

1. Set the RBW = 3 kHz, VBW = 10 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Sweep time = auto couple.
4. Employ trace averaging (RMS) mode over a minimum of 100 traces.
5. Use the peak marker function to determine the maximum amplitude level.

3.3.3 Test Setup



3.3.4 Test Result

Ambient Condition	22°C / 67%	Tested By	Aska Huang
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Refer to Appendix C.

3.4 Unwanted Emissions into Restricted Frequency Bands

3.4.1 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:
Quasi-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.

3.4.2 Test Procedures

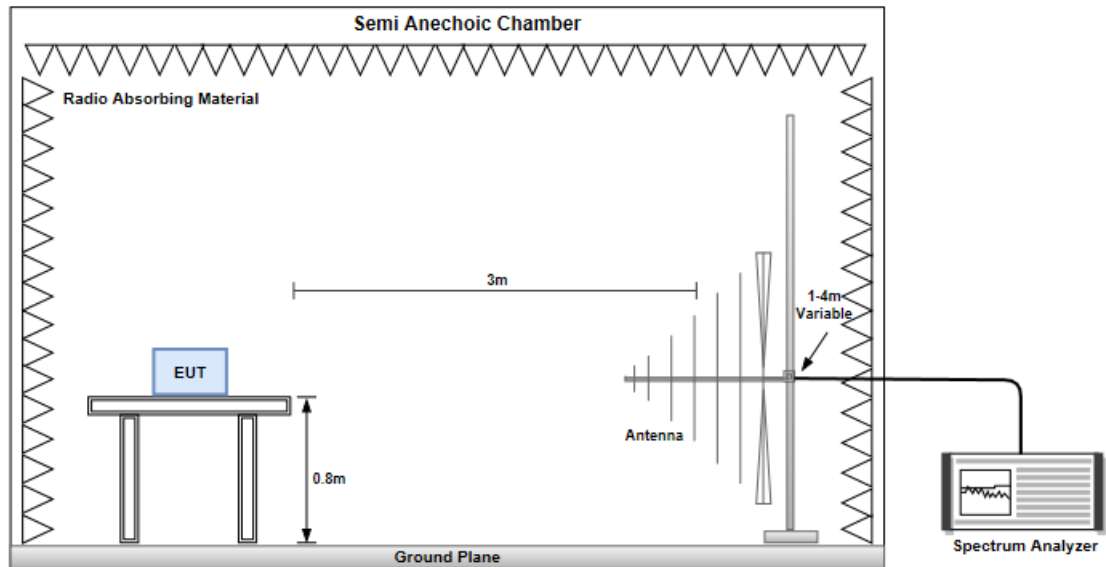
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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:

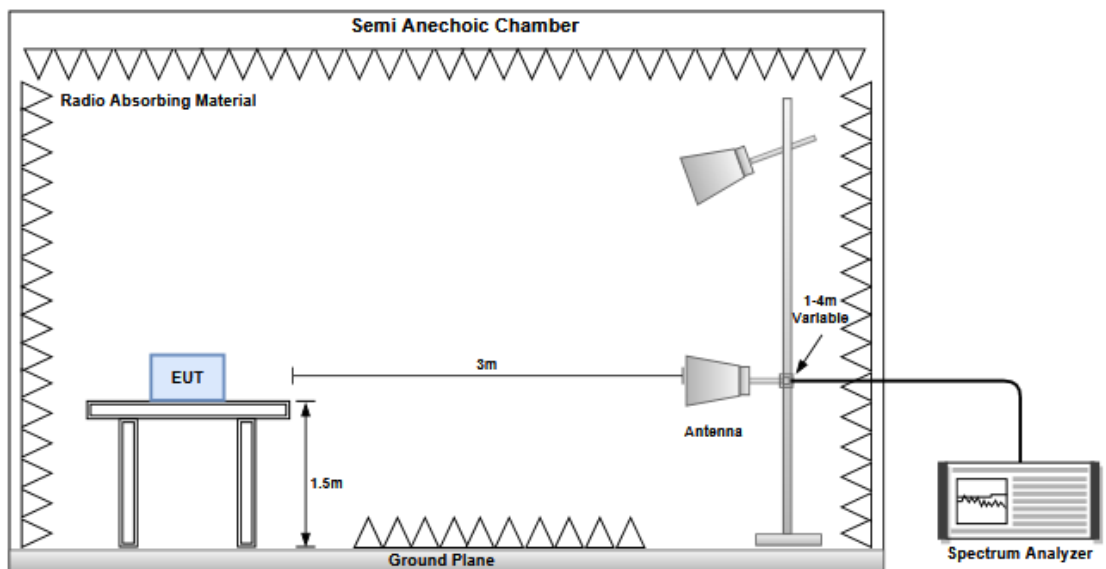
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.4.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.4.4 Test Results

Refer to Appendix D.

3.5 Unwanted Emissions into Non-Restricted Frequency Bands

3.5.1 Emissions in Unwanted Emissions into Non-Restricted Frequency Bands

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.5.2 Test Procedures

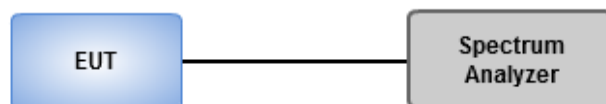
Reference level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.5.3 Test Setup



3.5.4 Test Results

Ambient Condition	22°C / 67%	Tested By	Aska Huang
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Refer to Appendix E.

3.6 AC Power Line Conducted Emissions

3.6.1 Limit of AC Power Line Conducted Emissions

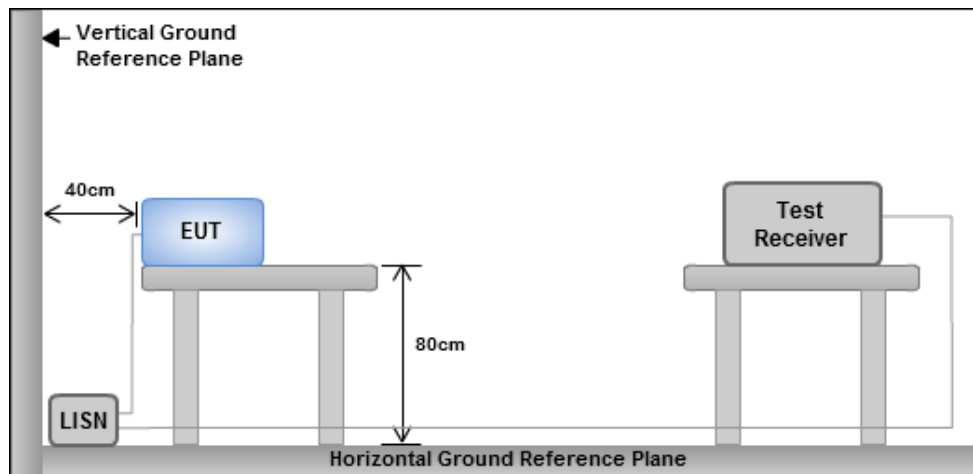
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

3.6.2 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 Ω 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.

3.6.3 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

3.6.4 Test Result

Ambient Condition	22°C / 67%	Tested By	Aska Huang
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Refer to Appendix F.

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 <http://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 333, 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**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
902-928MHz	-	-	-	-	-
LoRa (500kHz)	639.493k	501.085k	501KF1D	634.058k	499.276k

Max-N dB = Maximum 6dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 6dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
LoRa (500kHz)	-	-	-	-
903MHz	Pass	500k	639.493k	501.085k
907.8MHz	Pass	500k	637.681k	499.276k
914.2MHz	Pass	500k	634.058k	499.276k

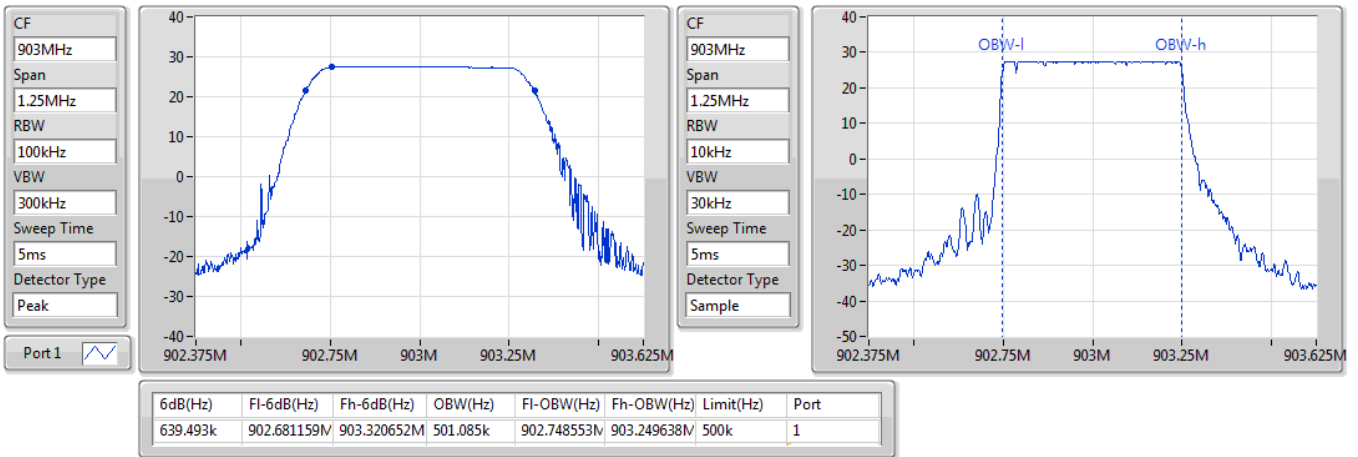
Port X-N dB = Port X 6dB down bandwidth;

Port X-OBW = Port X 99% occupied bandwidth

LoRa (500kHz)

EBW-DTS

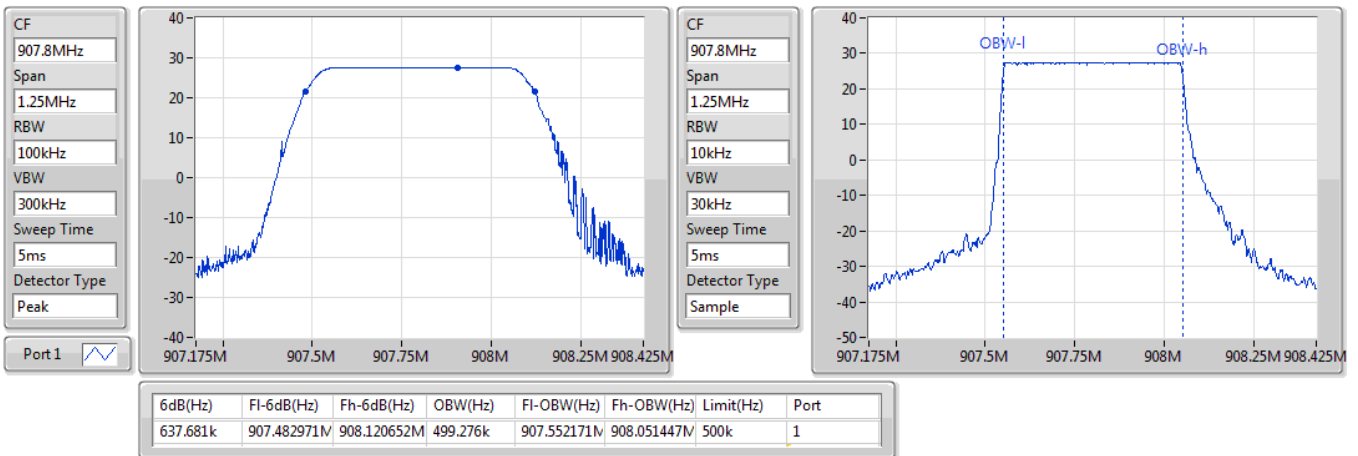
903MHz



LoRa (500kHz)

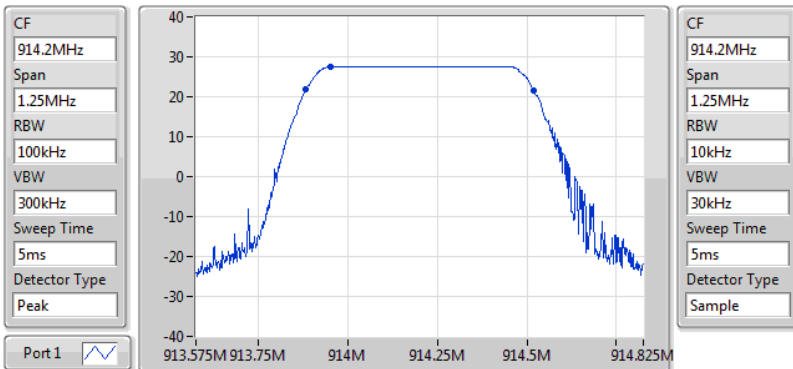
EBW-DTS

907.8MHz



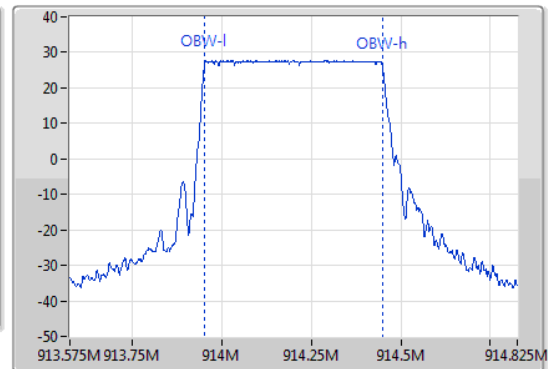
LoRa (500kHz)

914.2MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
634.058k	913.882971M	914.517029M	499.276k	913.950362M	914.449638M	500k	1

EBW-DTS





Conducted Output Power (Average)

Appendix B

Summary

Mode	Power (dBm)	Power (W)
902-928MHz	-	-
LoRa (500kHz)	27.48	0.55976

Result

Mode	Result	Antenna Gain (dBi)	Power (dBm)	Power Limit (dBm)
LoRa (500kHz)	-	-	-	-
903MHz	Pass	2.10	27.43	30.00
907.8MHz	Pass	2.10	27.45	30.00
914.2MHz	Pass	2.10	27.48	30.00

**Summary**

Mode	PD (dBm/3kHz)
902-928MHz	-
LoRa (500kHz)	7.14

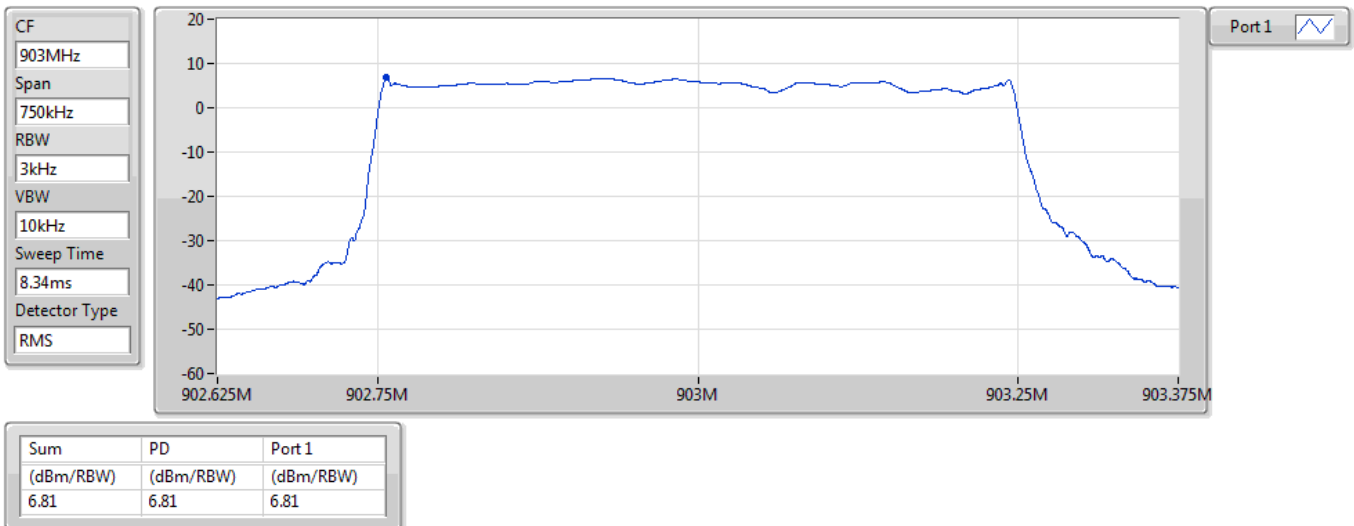
Result

Mode	Result	Antenna Gain (dBi)	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)
LoRa (500kHz)	-	-	-	-
903MHz	Pass	2.10	6.81	8.00
907.8MHz	Pass	2.10	6.87	8.00
914.2MHz	Pass	2.10	7.14	8.00

LoRa (500kHz)

PSD

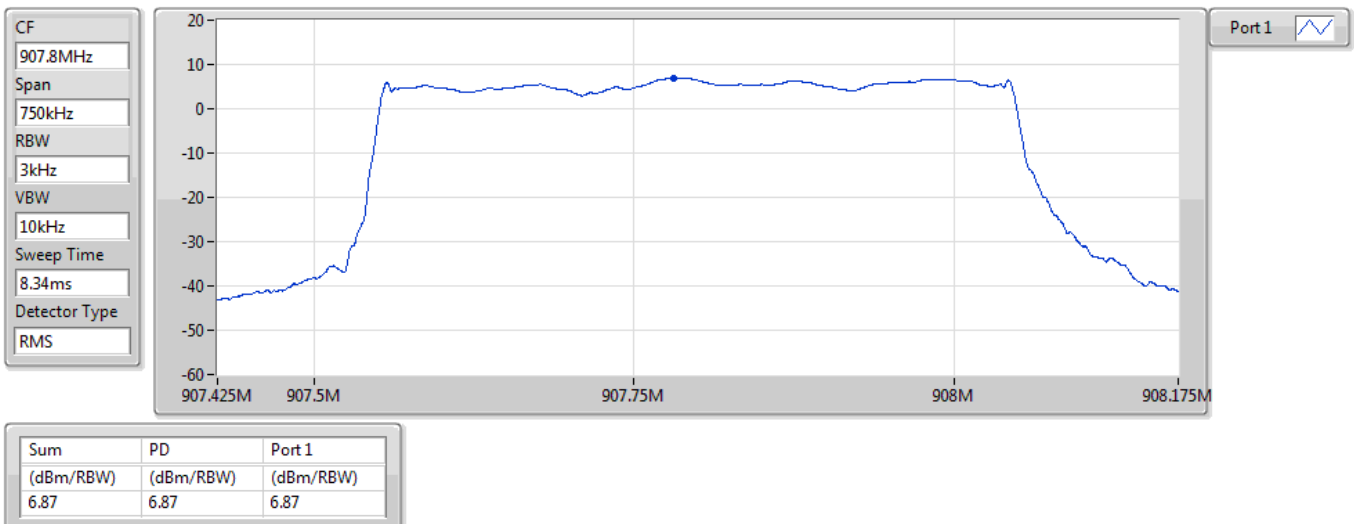
903MHz



LoRa (500kHz)

PSD

907.8MHz

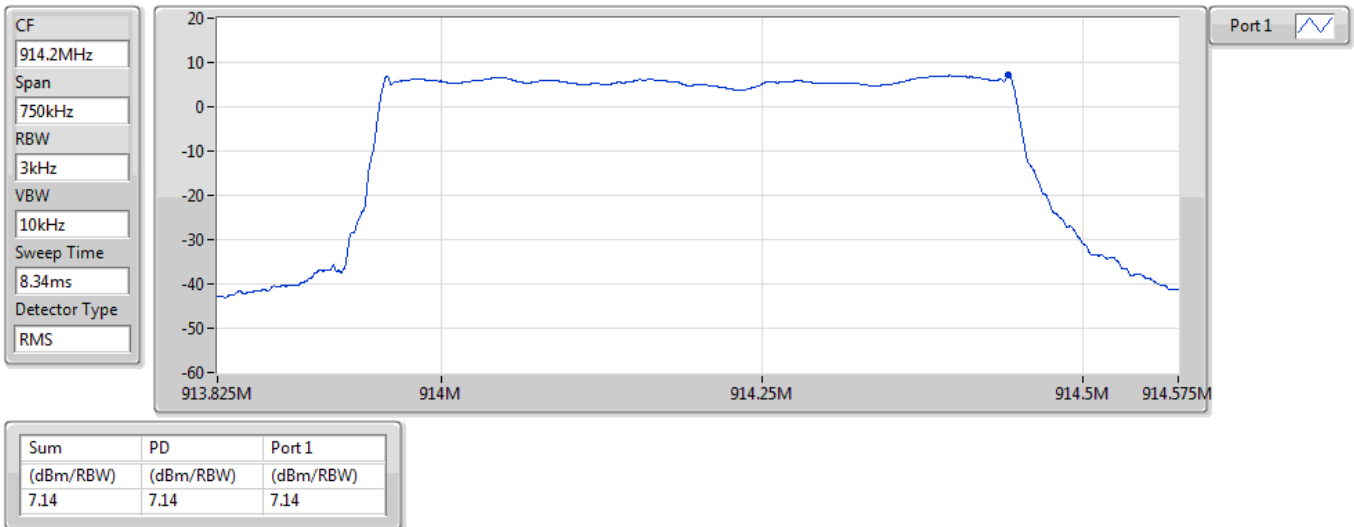




LoRa (500kHz)

PSD

914.2MHz





Below 1GHz

Mode / SF		LoRa / 7 ~ 12		Test Freq. (MHz)		903																																																																																													
Polarization		Horizontal																																																																																																	
Test By		:Brad Wu		Temperature(°C):24		Humidity(%):63																																																																																													
Level (dBuV/m) Frequency (MHz) <table><tr><th></th><th>Freq.</th><th>Emission</th><th>Limit</th><th>Margin</th><th>SA</th><th>Factor</th><th>Remark</th><th>ANT</th><th>Turn</th></tr><tr><th></th><th>MHz</th><th>level</th><th></th><th></th><th>reading</th><th></th><th></th><th>High</th><th>Table</th></tr><tr><th></th><th></th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th></th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>160.84</td><td>37.69</td><td>43.50</td><td>-5.81</td><td>46.25</td><td>-8.56</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>2</td><td>217.60</td><td>27.88</td><td>46.00</td><td>-18.12</td><td>39.69</td><td>-11.81</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>3</td><td>375.20</td><td>33.18</td><td>46.00</td><td>-12.82</td><td>39.37</td><td>-6.19</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>4</td><td>500.00</td><td>32.83</td><td>46.00</td><td>-13.17</td><td>35.58</td><td>-2.75</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>5</td><td>625.60</td><td>35.14</td><td>46.00</td><td>-10.86</td><td>34.89</td><td>0.25</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>6</td><td>875.26</td><td>40.37</td><td>46.00</td><td>-5.63</td><td>35.87</td><td>4.50</td><td>Peak</td><td>---</td><td>---</td></tr></table>											Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn		MHz	level			reading			High	Table			dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg	1	160.84	37.69	43.50	-5.81	46.25	-8.56	Peak	---	---	2	217.60	27.88	46.00	-18.12	39.69	-11.81	Peak	---	---	3	375.20	33.18	46.00	-12.82	39.37	-6.19	Peak	---	---	4	500.00	32.83	46.00	-13.17	35.58	-2.75	Peak	---	---	5	625.60	35.14	46.00	-10.86	34.89	0.25	Peak	---	---	6	875.26	40.37	46.00	-5.63	35.87	4.50	Peak	---	---
	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn																																																																																										
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Mode / SF	LoRa / 7 ~ 12		Test Freq. (MHz)		907.8	
Polarization	Vertical					
Test By :Brad Wu Temperature(°C):24 Humidity(%):63						
Level (dBUV/m)						

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Above 1GHz

Mode / SF		LoRa / 7 ~ 12		Test Freq. (MHz)		903																																																																									
Polarization		Horizontal																																																																													
Test By		:Brad Wu		Temperature(°C):25		Humidity(%):63																																																																									
Level (dBuV/m) Frequency (MHz) <table><tr><th></th><th>Freq. MHz</th><th>Emission level dBuV/m</th><th>Limit dBuV/m</th><th>Margin dB</th><th>SA reading dBuV</th><th>Factor dB/m</th><th>Remark</th><th>ANT High cm</th><th>Turn Table deg</th></tr><tr><td>1</td><td>2709.00</td><td>35.79</td><td>54.00</td><td>-18.21</td><td>36.81</td><td>-1.02</td><td>Average</td><td>127</td><td>262</td></tr><tr><td>2</td><td>2709.00</td><td>44.13</td><td>74.00</td><td>-29.87</td><td>45.15</td><td>-1.02</td><td>Peak</td><td>127</td><td>262</td></tr><tr><td>3</td><td>3612.00</td><td>30.37</td><td>54.00</td><td>-23.63</td><td>28.40</td><td>1.97</td><td>Average</td><td>115</td><td>44</td></tr><tr><td>4</td><td>3612.00</td><td>43.77</td><td>74.00</td><td>-30.23</td><td>41.80</td><td>1.97</td><td>Peak</td><td>115</td><td>44</td></tr><tr><td>5</td><td>4515.00</td><td>35.19</td><td>54.00</td><td>-18.81</td><td>30.50</td><td>4.69</td><td>Average</td><td>100</td><td>56</td></tr><tr><td>6</td><td>4515.00</td><td>47.30</td><td>74.00</td><td>-26.70</td><td>42.61</td><td>4.69</td><td>Peak</td><td>100</td><td>56</td></tr></table>											Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg	1	2709.00	35.79	54.00	-18.21	36.81	-1.02	Average	127	262	2	2709.00	44.13	74.00	-29.87	45.15	-1.02	Peak	127	262	3	3612.00	30.37	54.00	-23.63	28.40	1.97	Average	115	44	4	3612.00	43.77	74.00	-30.23	41.80	1.97	Peak	115	44	5	4515.00	35.19	54.00	-18.81	30.50	4.69	Average	100	56	6	4515.00	47.30	74.00	-26.70	42.61	4.69	Peak	100	56
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg																																																																						
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Mode / SF	LoRa / 7 ~ 12	Test Freq. (MHz)	903
Polarization	Vertical		
Test By :Brad Wu Temperature(°C):25 Humidity(%):63			
Level (dBuV/m) </			



Mode / SF	LoRa / 7 ~ 12	Test Freq. (MHz)	907.8						
Polarization	Horizontal								
Test By :Brad Wu Temperature(°C):25 Humidity(%):63									
Level (dBuV/m) CLASS-B CLASS-B (AVG) Frequency (MHz)									
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2723.40	34.73	54.00	-19.27	35.70	-0.97	Average	124	231
2	2723.40	43.58	74.00	-30.42	44.55	-0.97	Peak	124	231
3	3631.20	29.73	54.00	-24.27	27.69	2.04	Average	100	48
4	3631.20	43.39	74.00	-30.61	41.35	2.04	Peak	100	48
5	4539.00	32.59	54.00	-21.41	27.78	4.81	Average	114	29
6	4539.00	45.63	74.00	-28.37	40.82	4.81	Peak	114	29
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).									



Mode / SF	LoRa / 7 ~ 12	Test Freq. (MHz)	907.8
Polarization	Vertical		
Test By :Brad Wu Temperature(°C):25 Humidity(%):63			
Level (dBUV/m) <			



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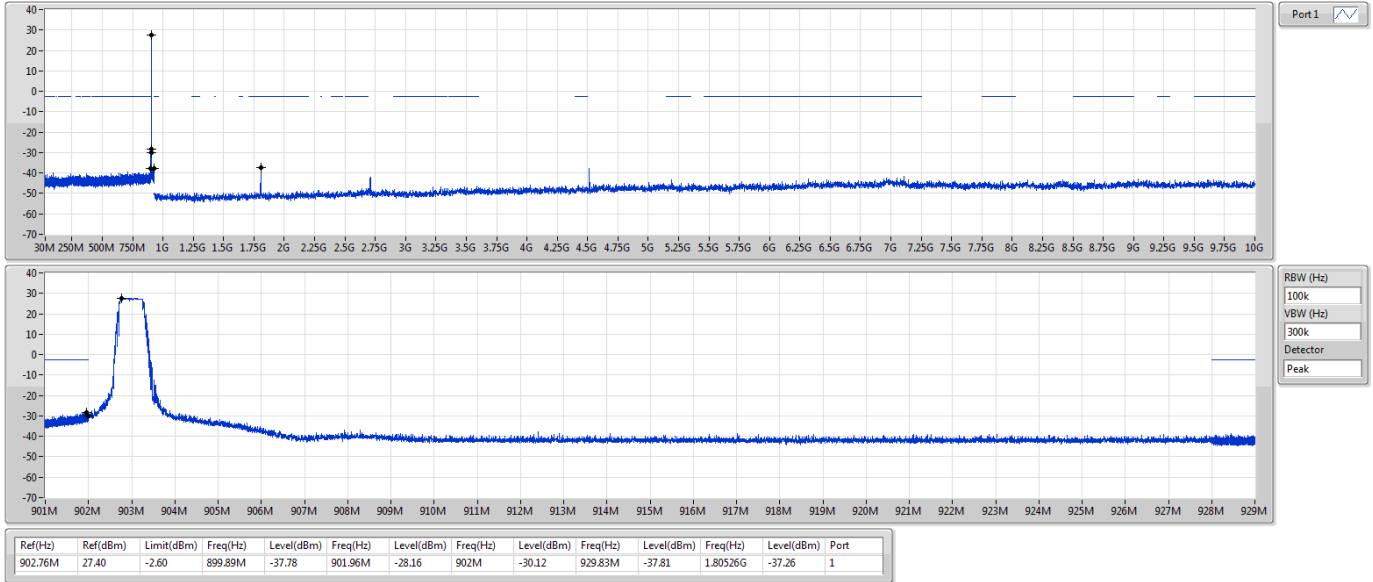
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LoRa (500kHz)

CSEndB-DTS

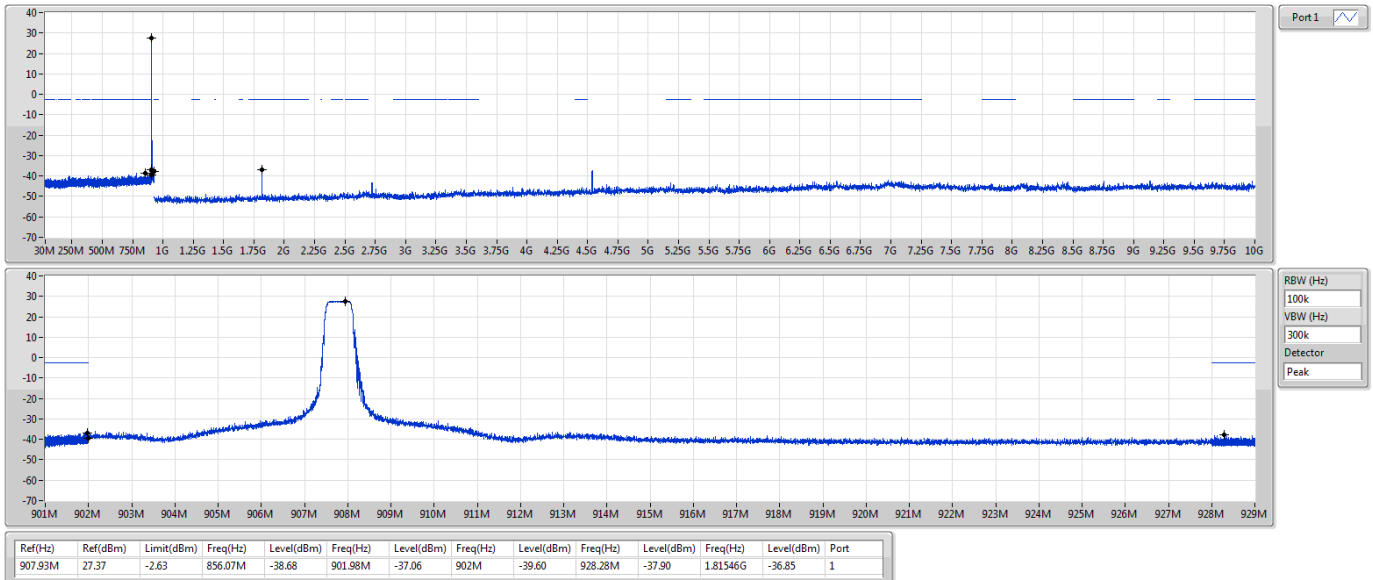
903MHz



LoRa (500kHz)

CSEndB-DTS

907.8MHz

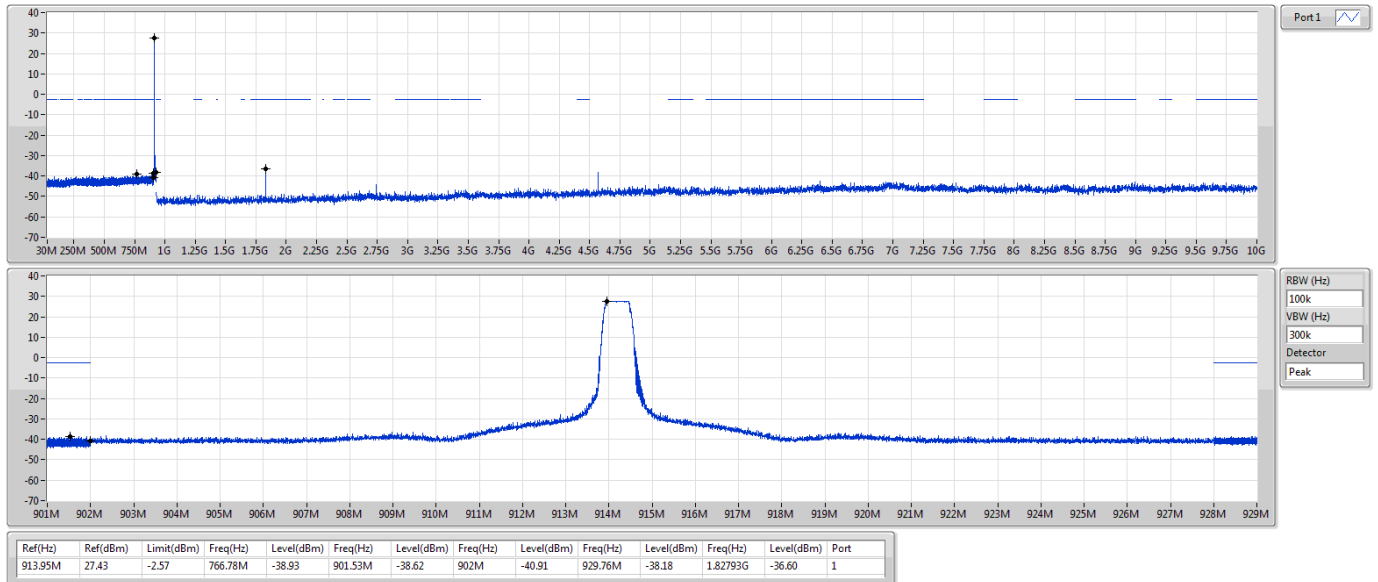




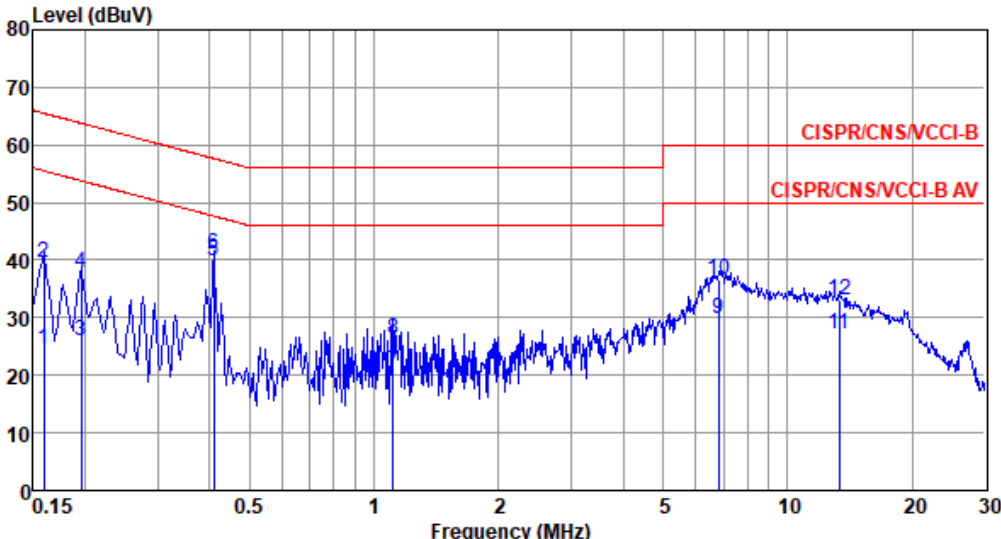
LoRa (500kHz)

CSEndB-DTS

914.2MHz





Power Phase	Line	Test Freq. (MHz)	903						
Test by : Joe Liao Temperature: 20°C Humidity: 60%									
Level (dBuV)  Frequency (MHz)									
Freq	Level	Limit	Over	Read	Factor	Cable	Aux	Remark	
MHz	dBuV	dBuV	dB	Level	dB	loss	dB		
1	0.159	24.51	55.52	-31.01	14.57	9.66	0.08	0.20	Average
2	0.159	39.69	65.52	-25.83	29.75	9.66	0.08	0.20	QP
3	0.195	26.12	53.80	-27.68	16.17	9.65	0.08	0.22	Average
4	0.195	37.80	63.80	-26.00	27.85	9.65	0.08	0.22	QP
5*	0.410	39.81	47.64	-7.83	29.73	9.64	0.08	0.36	Average
6	0.410	41.09	57.64	-16.55	31.01	9.64	0.08	0.36	QP
7	1.111	20.73	46.00	-25.27	10.54	9.65	0.17	0.37	Average
8	1.111	26.34	56.00	-29.66	16.15	9.65	0.17	0.37	QP
9	6.805	29.92	50.00	-20.08	19.45	9.69	0.35	0.43	Average
10	6.805	36.64	60.00	-23.36	26.17	9.69	0.35	0.43	QP
11	13.337	27.06	50.00	-22.94	16.33	9.70	0.53	0.50	Average
12	13.337	33.15	60.00	-26.85	22.42	9.70	0.53	0.50	QP

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



Power Phase	Neutral	Test Freq. (MHz)	903																																																																																																																																		
Test by : Joe Liao		Temperature: 20°C	Humidity: 60%																																																																																																																																		
Level (dBUV) Frequency (MHz) <table><thead><tr><th></th><th>Freq MHz</th><th>Level dBUV</th><th>Limit Line dBUV</th><th>Over Limit dB</th><th>Read Level dBUV</th><th>Factor dB</th><th>Cable loss dB</th><th>Aux dB</th><th>Remark</th></tr></thead><tbody><tr><td>1</td><td>0.159</td><td>26.31</td><td>55.52</td><td>-29.21</td><td>16.38</td><td>9.69</td><td>0.08</td><td>0.16</td><td>Average</td></tr><tr><td>2</td><td>0.159</td><td>40.10</td><td>65.52</td><td>-25.42</td><td>30.17</td><td>9.69</td><td>0.08</td><td>0.16</td><td>QP</td></tr><tr><td>3</td><td>0.230</td><td>21.77</td><td>52.44</td><td>-30.67</td><td>11.83</td><td>9.68</td><td>0.08</td><td>0.18</td><td>Average</td></tr><tr><td>4</td><td>0.230</td><td>33.33</td><td>62.44</td><td>-29.11</td><td>23.39</td><td>9.68</td><td>0.08</td><td>0.18</td><td>QP</td></tr><tr><td>5*</td><td>0.412</td><td>30.22</td><td>47.61</td><td>-17.39</td><td>20.28</td><td>9.67</td><td>0.08</td><td>0.19</td><td>Average</td></tr><tr><td>6</td><td>0.412</td><td>35.83</td><td>57.61</td><td>-21.78</td><td>25.89</td><td>9.67</td><td>0.08</td><td>0.19</td><td>QP</td></tr><tr><td>7</td><td>1.043</td><td>20.62</td><td>46.00</td><td>-25.38</td><td>10.50</td><td>9.68</td><td>0.16</td><td>0.28</td><td>Average</td></tr><tr><td>8</td><td>1.043</td><td>30.02</td><td>56.00</td><td>-25.98</td><td>19.90</td><td>9.68</td><td>0.16</td><td>0.28</td><td>QP</td></tr><tr><td>9</td><td>7.062</td><td>29.22</td><td>50.00</td><td>-20.78</td><td>18.77</td><td>9.74</td><td>0.36</td><td>0.35</td><td>Average</td></tr><tr><td>10</td><td>7.062</td><td>36.21</td><td>60.00</td><td>-23.79</td><td>25.76</td><td>9.74</td><td>0.36</td><td>0.35</td><td>QP</td></tr><tr><td>11</td><td>16.839</td><td>23.59</td><td>50.00</td><td>-26.41</td><td>12.71</td><td>9.82</td><td>0.60</td><td>0.46</td><td>Average</td></tr><tr><td>12</td><td>16.839</td><td>28.76</td><td>60.00</td><td>-31.24</td><td>17.88</td><td>9.82</td><td>0.60</td><td>0.46</td><td>QP</td></tr></tbody></table>					Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Aux dB	Remark	1	0.159	26.31	55.52	-29.21	16.38	9.69	0.08	0.16	Average	2	0.159	40.10	65.52	-25.42	30.17	9.69	0.08	0.16	QP	3	0.230	21.77	52.44	-30.67	11.83	9.68	0.08	0.18	Average	4	0.230	33.33	62.44	-29.11	23.39	9.68	0.08	0.18	QP	5*	0.412	30.22	47.61	-17.39	20.28	9.67	0.08	0.19	Average	6	0.412	35.83	57.61	-21.78	25.89	9.67	0.08	0.19	QP	7	1.043	20.62	46.00	-25.38	10.50	9.68	0.16	0.28	Average	8	1.043	30.02	56.00	-25.98	19.90	9.68	0.16	0.28	QP	9	7.062	29.22	50.00	-20.78	18.77	9.74	0.36	0.35	Average	10	7.062	36.21	60.00	-23.79	25.76	9.74	0.36	0.35	QP	11	16.839	23.59	50.00	-26.41	12.71	9.82	0.60	0.46	Average	12	16.839	28.76	60.00	-31.24	17.88	9.82	0.60	0.46	QP
	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Aux dB	Remark																																																																																																																												
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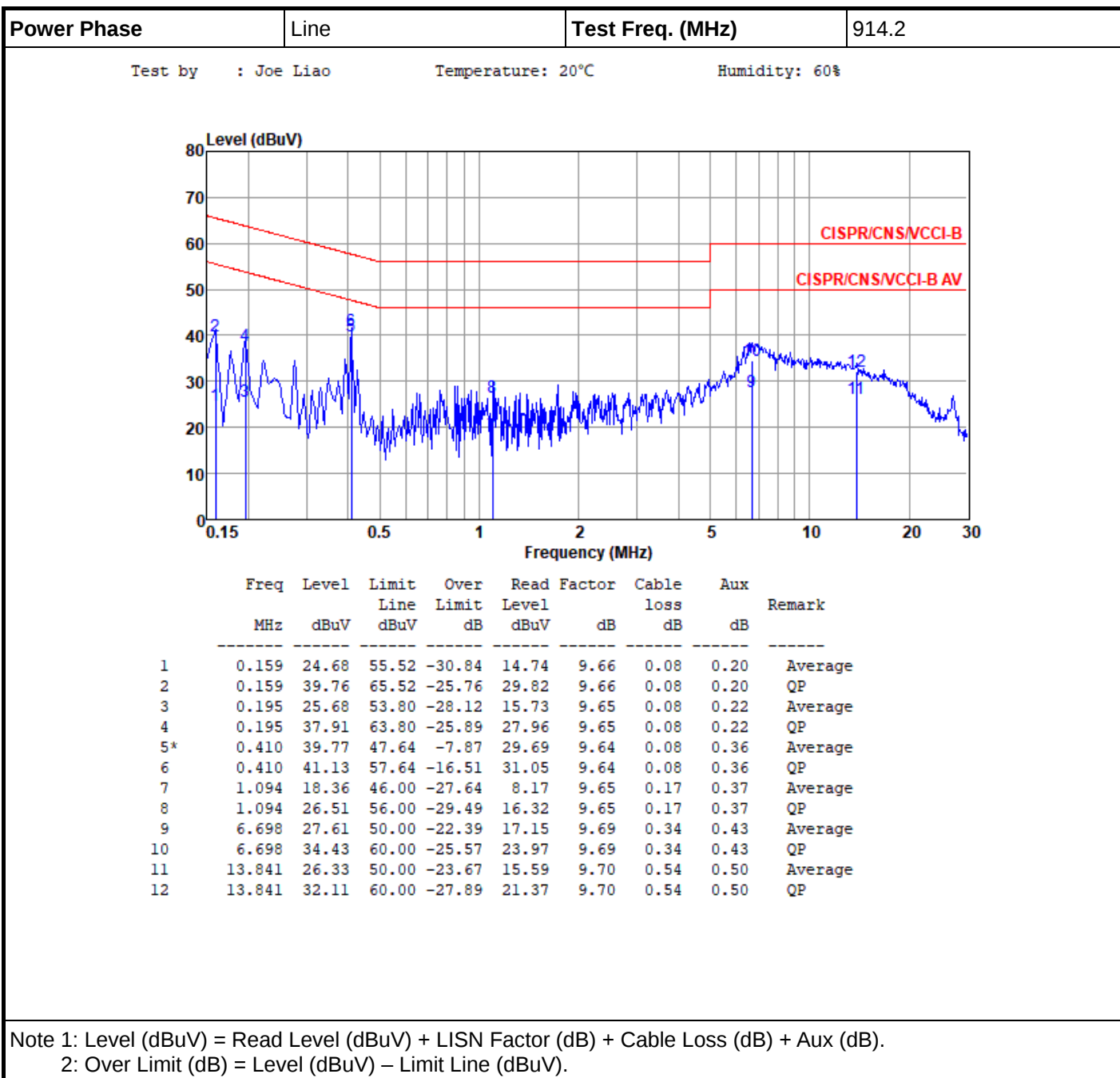
Power Phase	Line	Test Freq. (MHz)	907.8																																																																																																																																										
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Power Phase		Neutral		Test Freq. (MHz)		907.8			
Test by		: Joe Liao		Temperature: 20°C		Humidity: 60%			
Level (dBUV) Frequency (MHz)									
	Freq	Level	Limit	Over	Read	Factor	Cable	Aux	Remark
	MHz	dBuV	Line dBuV	Limit dB	Level dBuV	dB	loss dB	dB	
1	0.152	25.79	55.87	-30.08	15.86	9.69	0.08	0.16	Average
2	0.152	40.99	65.87	-24.88	31.06	9.69	0.08	0.16	QP
3	0.186	27.45	54.20	-26.75	17.52	9.68	0.08	0.17	Average
4	0.186	39.54	64.20	-24.66	29.61	9.68	0.08	0.17	QP
5*	0.412	30.96	47.61	-16.65	21.02	9.67	0.08	0.19	Average
6	0.412	35.83	57.61	-21.78	25.89	9.67	0.08	0.19	QP
7	1.005	24.48	46.00	-21.52	14.36	9.68	0.16	0.28	Average
8	1.005	31.88	56.00	-24.12	21.76	9.68	0.16	0.28	QP
9	6.988	30.08	50.00	-19.92	19.64	9.74	0.35	0.35	Average
10	6.988	37.35	60.00	-22.65	26.91	9.74	0.35	0.35	QP
11	17.383	23.15	50.00	-26.85	12.26	9.82	0.61	0.46	Average
12	17.383	28.07	60.00	-31.93	17.18	9.82	0.61	0.46	QP

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

2: Over Limit (dB) = Level (dBUV) – Limit Line (dBUV).





Power Phase	Neutral	Test Freq. (MHz)	914.2																																																																																																																																												
Test by : Joe Liao Temperature: 20°C Humidity: 60%																																																																																																																																															
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