





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 Cheld/ Assistant Manager Gary Chang / Ma

Report No.: FR1D2104-01-1AH Page: 1 of 21



Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information	5
1.2	Local Support Equipment List	7
1.3	Test Setup Chart	7
1.4	The Equipment List	8
1.5	Test Standards	9
1.6	Reference Guidance	9
1.7	Deviation from Test Standard and Measurement Procedure	g
1.8	Measurement Uncertainty	g
2	TEST CONFIGURATION	10
2.1	Testing Facility	1C
2.2	The Worst Test Modes and Channel Details	10
3	TRANSMITTER TEST RESULTS	11
3.1	Unwanted Emissions into Restricted Frequency Bands	11
3.2	Unwanted Emissions into Non-Restricted Frequency Bands	13
3.3	Conducted Output Power	14
3.4	Number of Hopping Frequency	15
3.5	20dB and Occupied Bandwidth	16
3.6	Channel Separation	17
3.7	Number of Dwell Time	18
3.8	Power Spectral Density	19
3.9	AC Power Line Conducted Emissions	20
4	TEST I ABORATORY INFORMATION	21

- **Appendix A. Unwanted Emissions into Restricted Frequency Bands**
- **Appendix B. Unwanted Emissions into Non-Restricted Frequency Bands**
- **Appendix C. Conducted Output Power**
- **Appendix D. Number of Hopping Frequency**
- Appendix E. 20dB and Occupied Bandwidth
- **Appendix F. Channel Separation**
- Appendix G. Number of Dwell Time
- **Appendix H. Power Spectral Density**
- **Appendix I. AC Power Line Conducted Emissions**



Release Record

Report No.	Version	Description	Issued Date
FR1D2104-01-1AH	Rev. 01	Initial issue	Apr. 27, 2022

Report No.: FR1D2104-01-1AH Page: 3 of 21



Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 0.410MHz 39.98 (Margin -7.66dB) - AV	Pass
15.247(d)	Unwanted Emissions	[dBuV/m at 3m]: 48.61MHz	Pass
15.209	Offwarited Effilssions	36.55 (Margin -3.45dB) - PK	r ass
15.247(d)	Band Edge	Meet the requirement of limit	Pass
15.247(b)(2)(3)	Conducted Output Power	Power [dBm]: 22.22	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
15.247(f)	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.

Report No.: FR1D2104-01-1AH Page: 4 of 21



1 General Description

1.1 Information

This report is issued as a FCC Class II Permissive Change. The modification is only concerned with adding $902.3 \sim 914.9$ MHz band by software setting.

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information								
Frequency Range (MHz)	Range Ch. Freq. Channel List Data Rate Spread Factor Bandwidth							
902 ~ 928	902.3 ~ 914.9	64 channels	980-5.47k bps	7 ~ 10	125			

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.

Note 2: The device uses LoRa modulation. Note 3: The device supports hybrid mode

1.1.2 Antenna Details

Ant. No.	Туре	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				

Report No.: FR1D2104-01-1AH Page : 5 of 21



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	Putty, Version: V0.060		
Mode	Duty Cycle (%) Duty Factor (dB)		
LoRa (125kHz)	100.00%	0.00	

1.1.7 Power Index of Test Tool

Channel Bandwidth: 125KHz					
Test Frequency (MHz) Power Index					
902.3	pa 1pwid 4				
908.5	pa 1pwid 3				
914.9	pa 1pwid 4				

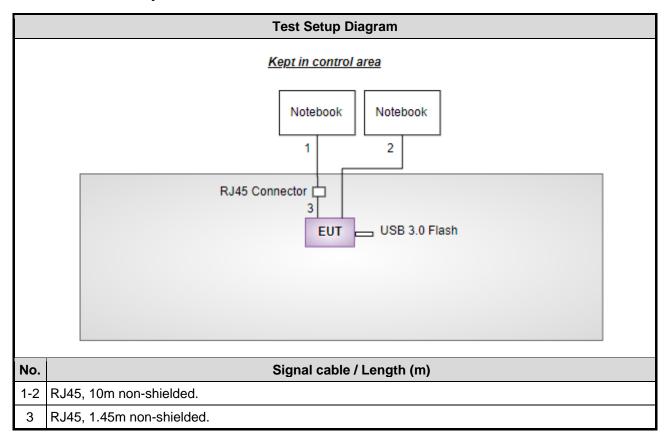
Report No.: FR1D2104-01-1AH Page: 6 of 21



1.2 Local Support Equipment List

Support Equipment List									
No.	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



Report No.: FR1D2104-01-1AH Page: 7 of 21



1.4 The Equipment List

Test Item	Conducted Emission									
Test Site	Conduction room 1 / (CO01-WS)									
Tested Date	Apr. 18, 2022									
Instrument	Brand	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)	1 NA I 50 I 04 I May 25 2021 I May 24 2022									
Measurement Software	ALIDIX I AS I 6.120210k I NA I NA									

Test Item	Radiated Emission				
Test Site	966 chamber3 / (03Cl	H03-WS)			
Tested Date	Apr. 13 ~ Apr. 14, 202	22			
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-300 0	131103	Sep. 24, 2021	Sep. 23, 2022
LF cable-13M	EMC	EMC8D-NM-NM-130 00	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-80 00	181107	Sep. 24, 2021	Sep. 23, 2022
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Inter	val of instruments liste	d above is one year.			

Report No.: FR1D2104-01-1AH Page: 8 of 21



RF Conducted				
(TH01-WS)				
Apr. 18, 2022				
Brand	Model No.	Serial No.	Calibration Date	Calibration Until
R&S	FSV40	101498	Nov. 29, 2021	Nov. 28, 2022
Anritsu	ML2495A	1241002	Nov. 07, 2021	Nov. 06, 2022
Anritsu	MA2411B	1207366	Nov. 07, 2021	Nov. 06, 2022
Sporton	SENSE-15247_FS	V5.10.7.11	NA	NA
	(TH01-WS) Apr. 18, 2022 Brand R&S Anritsu Anritsu	(TH01-WS) Apr. 18, 2022 Brand Model No. R&S FSV40 Anritsu ML2495A Anritsu MA2411B	(TH01-WS) Apr. 18, 2022 Brand Model No. Serial No. R&S FSV40 101498 Anritsu ML2495A 1241002 Anritsu MA2411B 1207366	(TH01-WS) Apr. 18, 2022 Brand Model No. Serial No. Calibration Date R&S FSV40 101498 Nov. 29, 2021 Anritsu ML2495A 1241002 Nov. 07, 2021 Anritsu MA2411B 1207366 Nov. 07, 2021

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			
Unwanted Emission ≤ 1GHz	±3.96 dB			
Unwanted Emission > 1GHz	±4.51 dB			

Report No.: FR1D2104-01-1AH Page: 9 of 21



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.: TW0009FCC site registration No.: 207696

➤ ISED#: 10807C

➤ 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 / 908.5 / 914.9	SF10	2
Unwanted Emissions Conducted Output Power Hopping Channel Separation 20dB and Occupied bandwidth Power Spectral Density	125	902.3 / 908.5 / 914.9	SF10	1
Number of Hopping Channels	125	902.3 ~ 914.9	SF10	1
Dwell Time	125	902.3	SF10, 9, 8, 7	1

NOTE:

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 Unwanted
Emissions test item.

2. Test configurations are as below

Configuration 1: Leader adapter for Unwanted Emissions and antenna port conducted test

Configuration 2: Sercomm adapter for AC Power Line Conducted Emissions

Report No.: FR1D2104-01-1AH Page: 10 of 21



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

- 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.

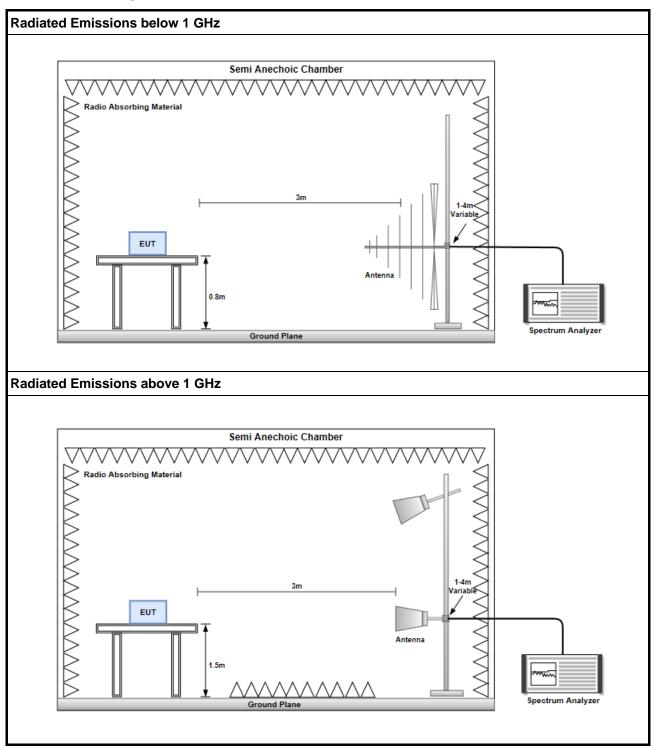
Note:

- 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.

Report No.: FR1D2104-01-1AH Page: 11 of 21



3.1.3 Test Setup



3.1.4 Test Results

Refer to Appendix A.

Report No.: FR1D2104-01-1AH Page: 12 of 21



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 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.2.2 Test Procedures

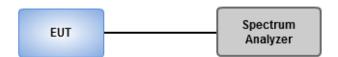
Reference Level Measurement

- 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.
- 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

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

Report No.: FR1D2104-01-1AH Page: 13 of 21



3.3 Conducted Output Power

3.3.1 Limit of Conducted Output Power

1W

3.3.2 Test Procedures

- A wideband power meter is used for power measurement. Bandwidth of power senor 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

Ambient Condition	22°C / 67%	Tested By	Aska Huang

Refer to Appendix C.

Report No.: FR1D2104-01-1AH Page: 14 of 21



3.4 Number of Hopping Frequency

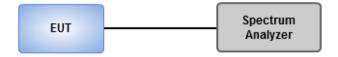
3.4.1 Limit of Number of Hopping Frequency

	Number of Hopping Frequencies Limit for Frequency Hopping Systems				
	☑ 902-928 MHz Band:				
		N ≥ 25, 20 dB bandwidth of the hopping channel is 250 kHz or greater			
N: 1	N: 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

Ambient Condition	22°C / 67%	Tested By	Aska Huang

Refer to Appendix D.

Report No.: FR1D2104-01-1AH Page: 15 of 21



3.5 20dB and Occupied Bandwidth

3.5.1 Test Procedures

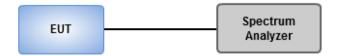
20dB Bandwidth

- 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

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

Report No.: FR1D2104-01-1AH Page: 16 of 21



3.6 Channel Separation

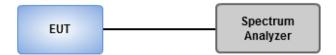
3.6.1 Limit of Channel Separation

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

Ambient Condition	22°C / 67%	Tested By	Aska Huang

Refer to Appendix F.

Report No.: FR1D2104-01-1AH Page: 17 of 21



3.7 Number of Dwell Time

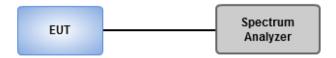
3.7.1 Limit of Dwell time

	Time of Occupancy (Dwell Time) Limit for Frequency Hopping Systems				
\boxtimes	902	002-928 MHz Band:			
		\leq 0.4 second within a 20 second period, 20 dB bandwidth of the hopping channel is less than 250 kHz			
		\leq 0.4 second within a 10 second period, 20 dB bandwidth of the hopping channel is 250 kHz or greater			
		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	22°C / 67%	Tested By	Aska Huang

Refer to Appendix G.

Report No.: FR1D2104-01-1AH Page: 18 of 21



3.8 Power Spectral Density

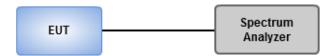
3.8.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band. This item is for Hybrid mode.

3.8.2 Test Procedures

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

3.8.3 Test Setup



3.8.4 Test Results

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

Report No.: FR1D2104-01-1AH Page: 19 of 21



3.9 AC Power Line Conducted Emissions

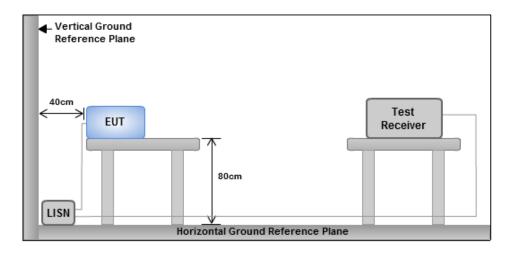
3.9.1 Limit of AC Power Line Conducted Emissions

Conducted Emissions Limit						
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.						

3.9.2 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.
- 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.

3.9.3 Test Setup



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

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

3.9.4 Test Result of Conducted Emissions

Refer to Appendix I.

Report No.: FR1D2104-01-1AH Page: 20 of 21



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

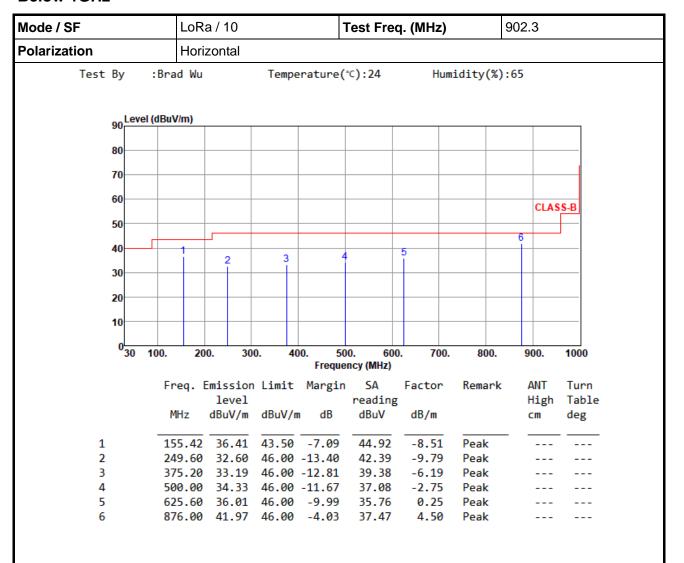
Email: ICC Service@icertifi.com.tw

==END==

Report No.: FR1D2104-01-1AH Page: 21 of 21



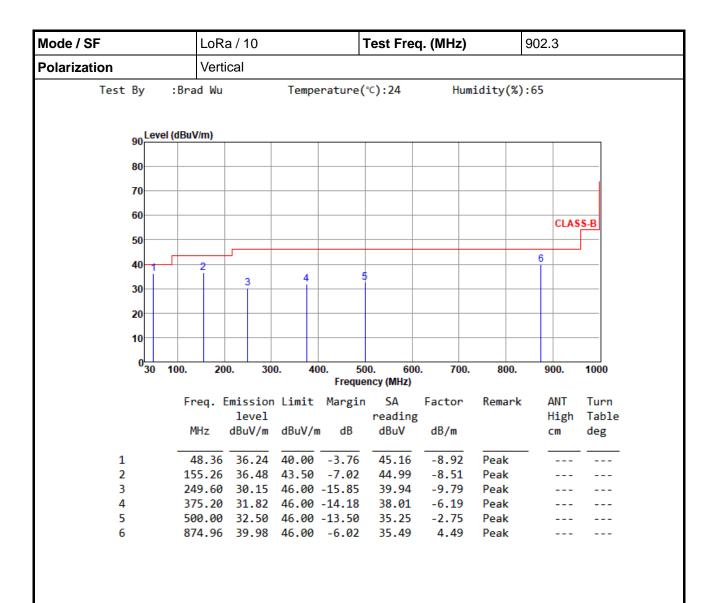
Below 1GHz



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

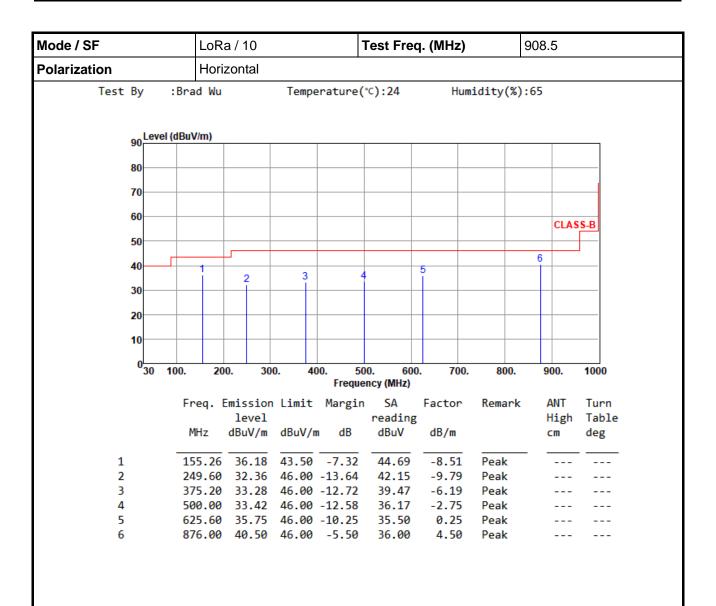
*Factor includes antenna factor, cable loss and amplifier gain





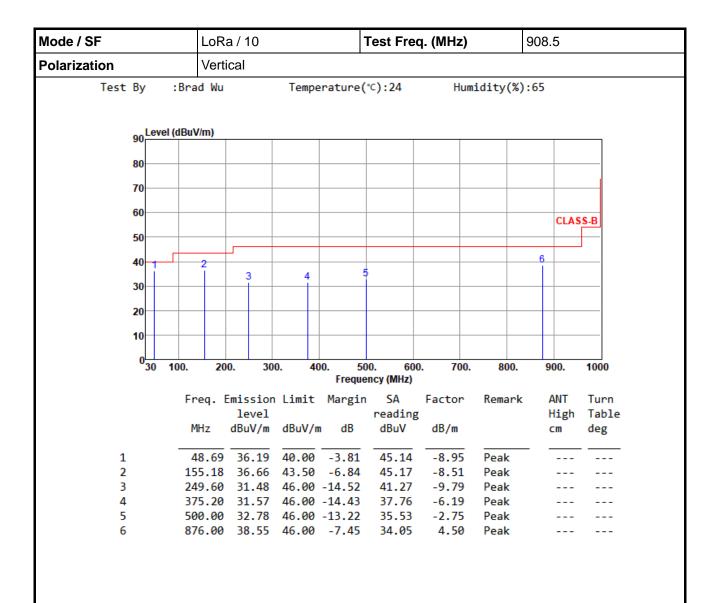
*Factor includes antenna factor , cable loss and amplifier gain





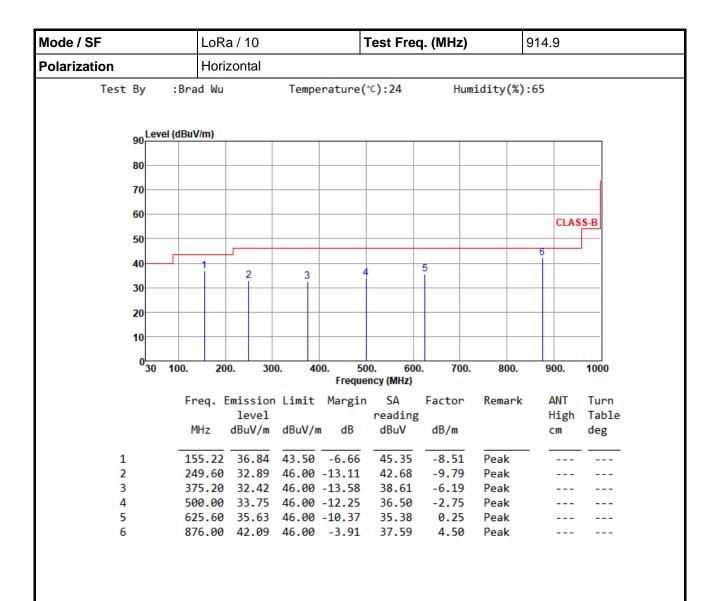
*Factor includes antenna factor , cable loss and amplifier gain





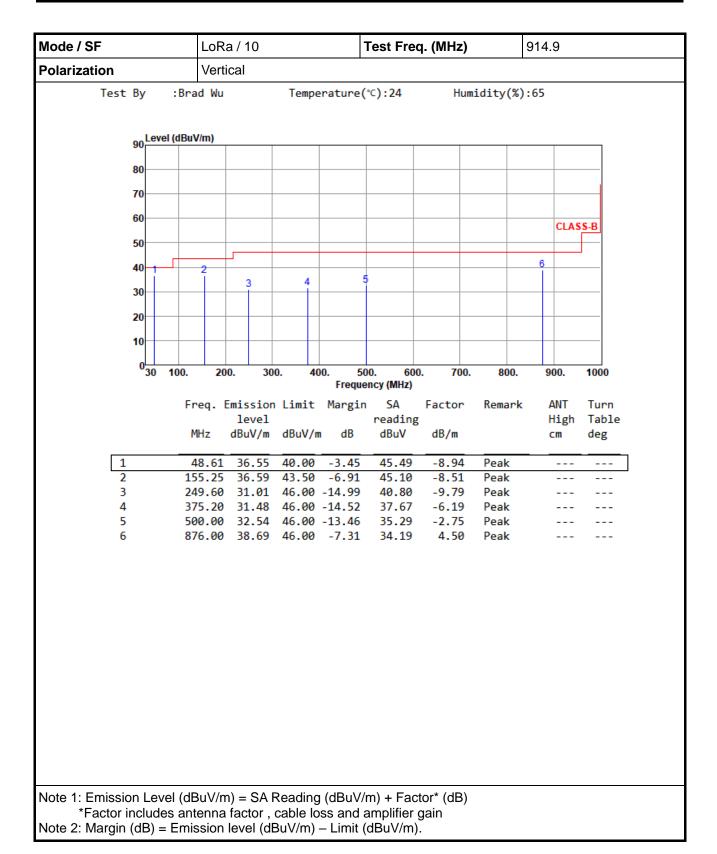
*Factor includes antenna factor, cable loss and amplifier gain





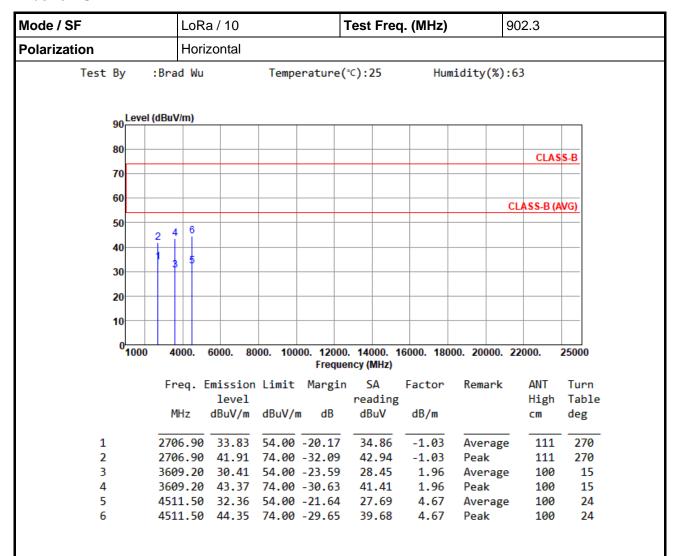
*Factor includes antenna factor, cable loss and amplifier gain







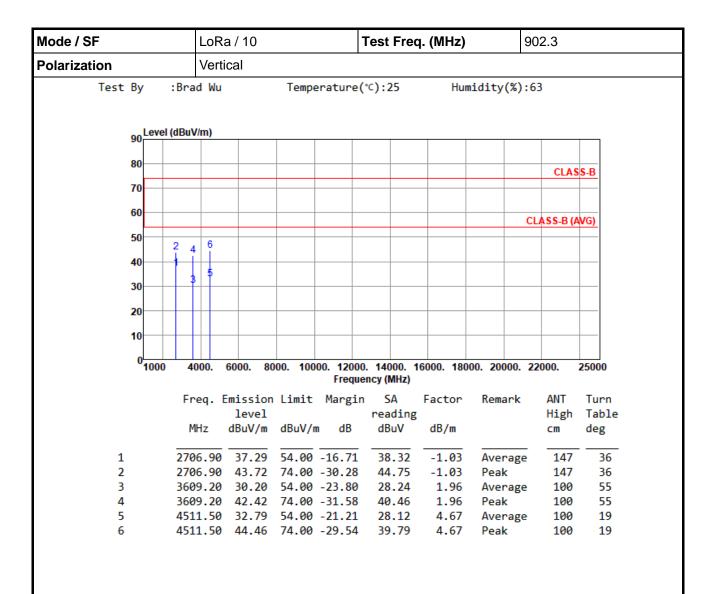
Above 1GHz



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

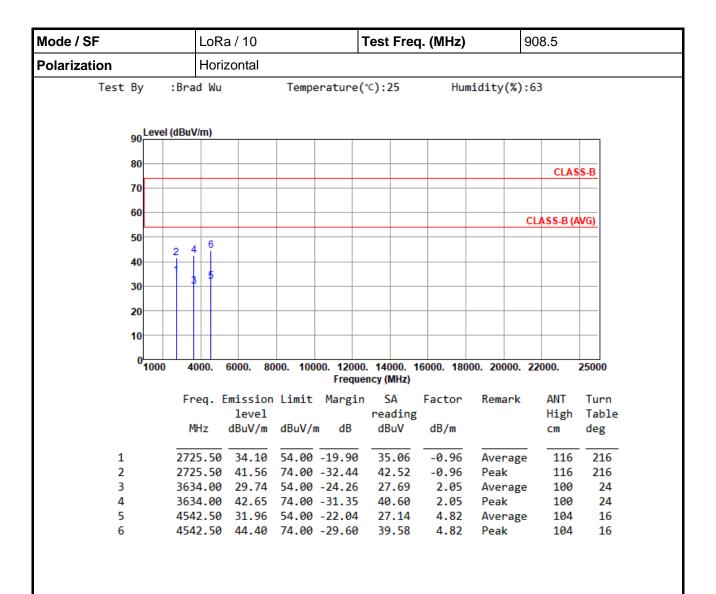
*Factor includes antenna factor, cable loss and amplifier gain





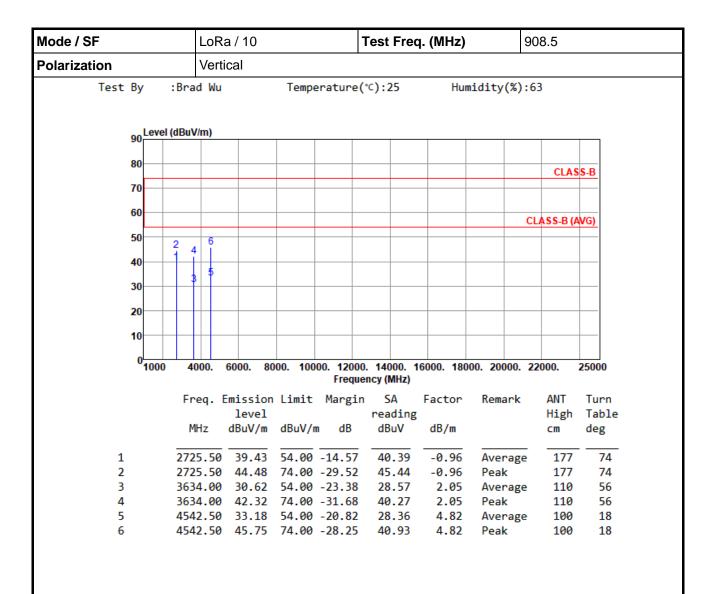
*Factor includes antenna factor, cable loss and amplifier gain





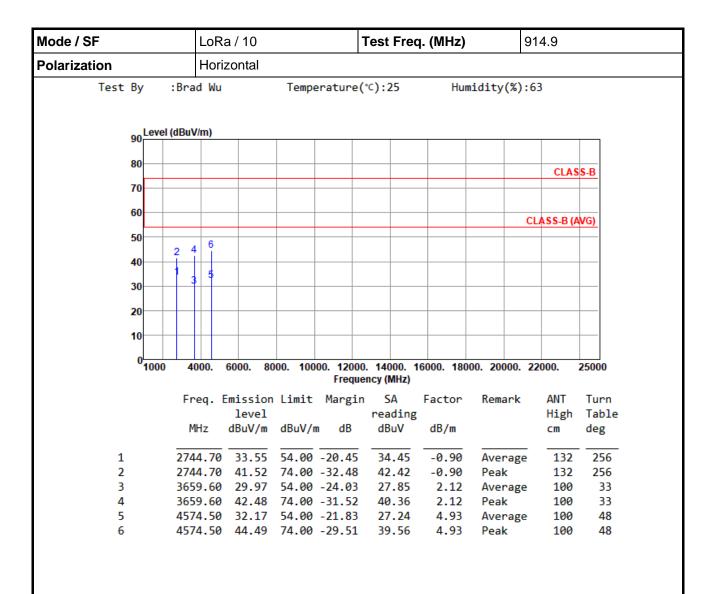
*Factor includes antenna factor, cable loss and amplifier gain





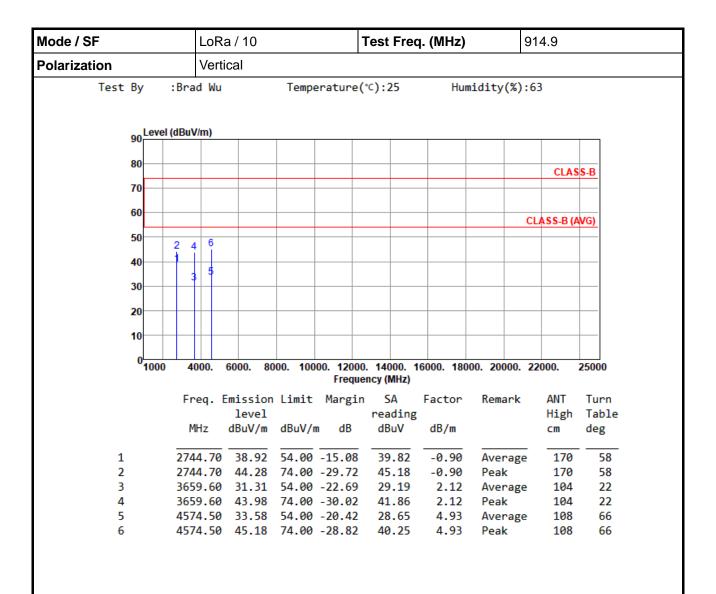
*Factor includes antenna factor, cable loss and amplifier gain





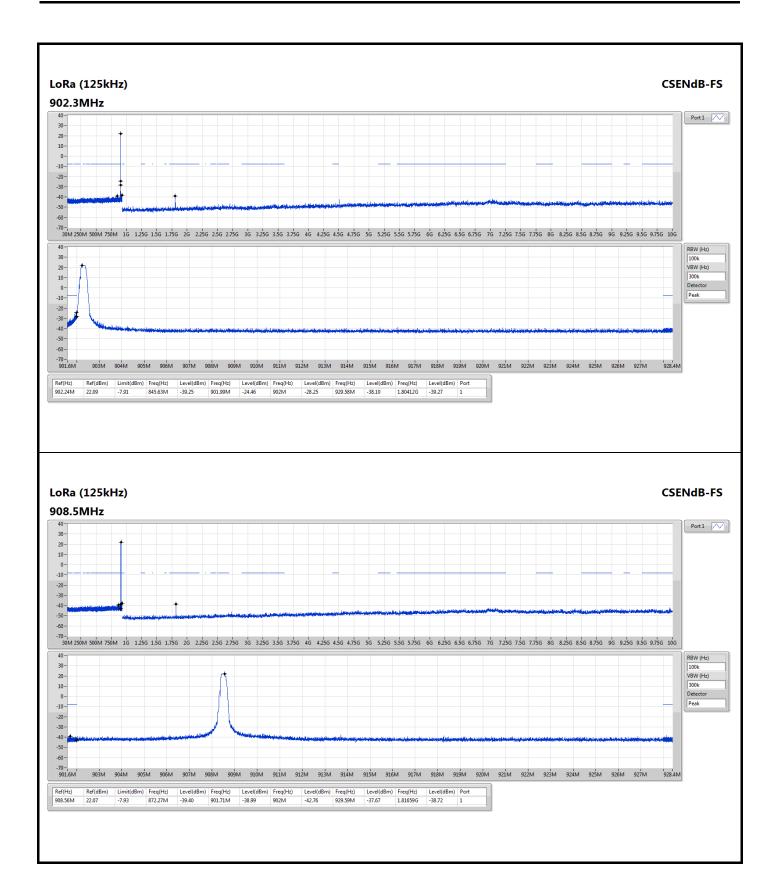
*Factor includes antenna factor, cable loss and amplifier gain



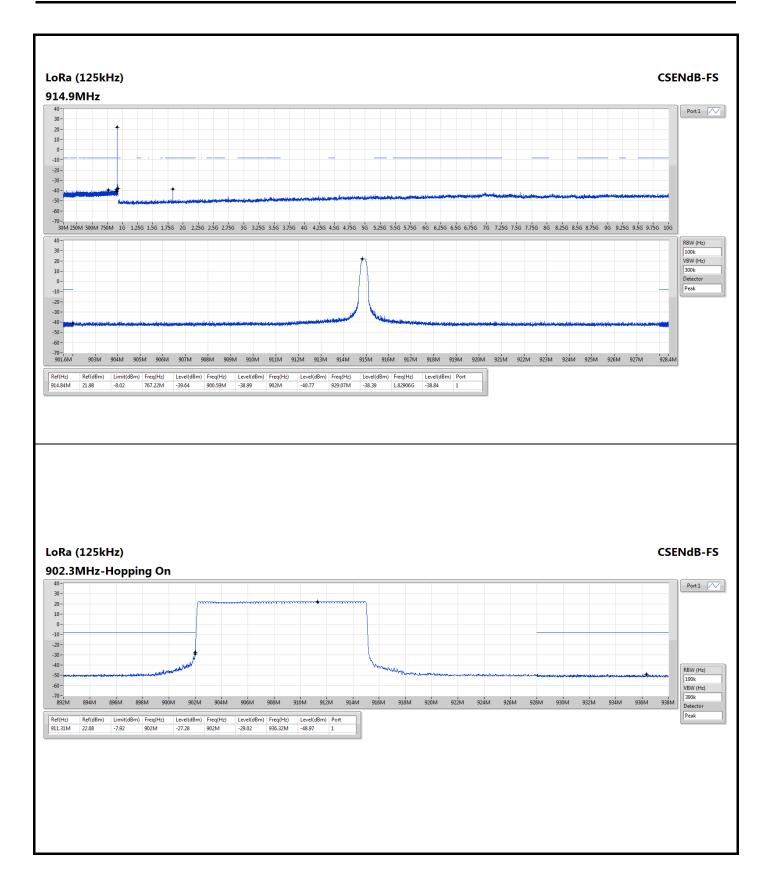


*Factor includes antenna factor, cable loss and amplifier gain

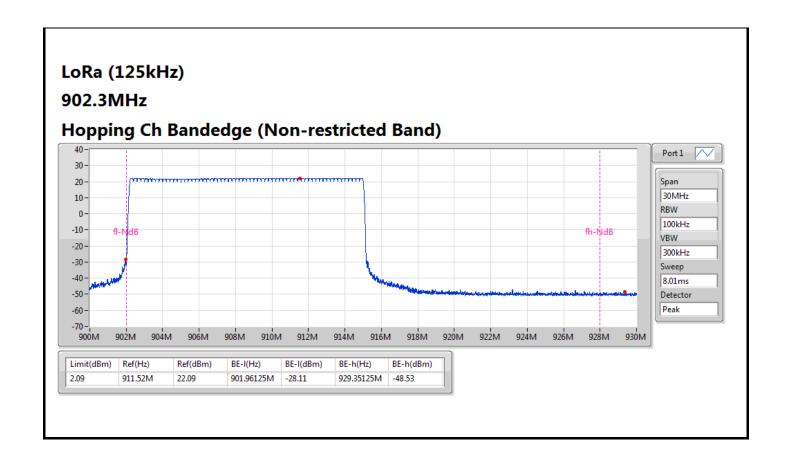














Conducted Output Power (Average)

Appendix C

Summary

Mode	Power (dBm)	Power (W)
902-928MHz	-	-
LoRa (125kHz)	22.22	0.16672

Result

Mode	Result	Antenna Gain (dBi)	Power (dBm)	Power Limit (dBm)
LoRa (125kHz)	-	-	-	-
902.3MHz	Pass	2.10	22.16	30.00
908.5MHz	Pass	2.10	22.22	30.00
914.9MHz	Pass	2.10	22.04	30.00



Number of Hopping Frequency

Appendix D

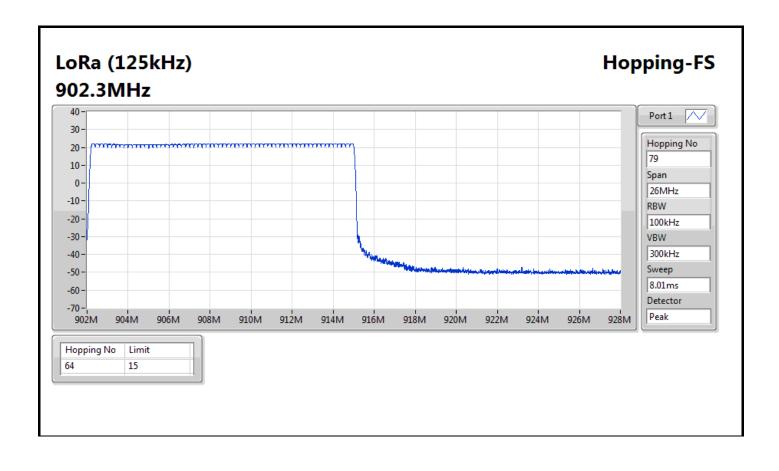
Summary

Mode	Max-Hop No
902-928MHz	-
LoRa (125kHz)	64

Result

Mode		Result	Hopping No	Limit
LoRa (125l	(Hz)	-	-	-
902.3MF	lz	Pass	64	-







20dB and Occupied Bandwidth

Appendix E

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
902-928MHz	-	-	-	-	-
LoRa (125kHz)	133.333k	123.01k	123KF1D	133.333k	123.01k

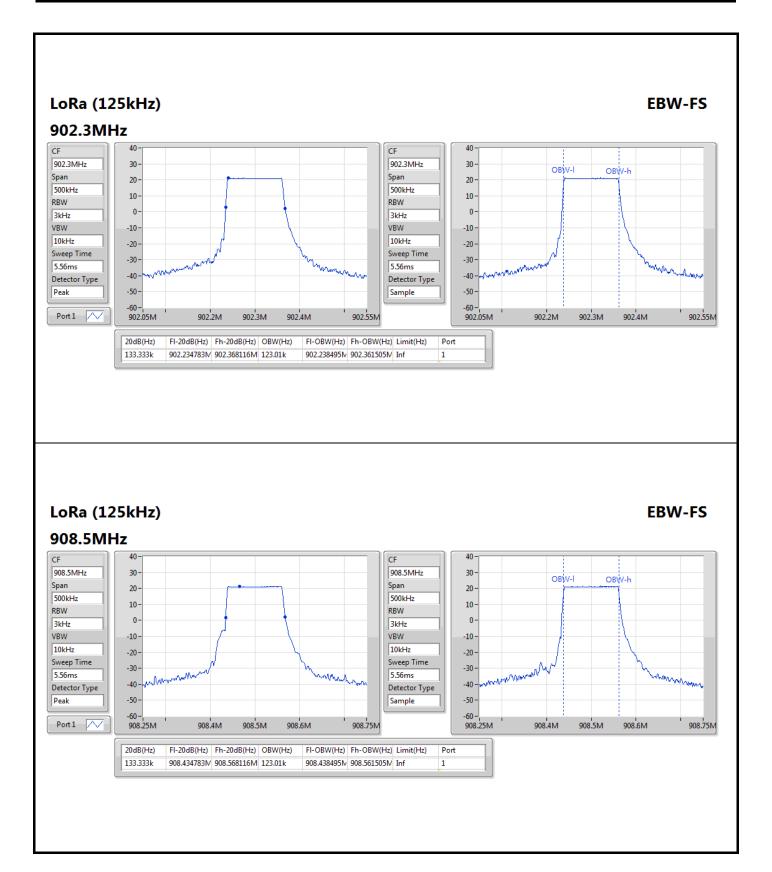
Max-N dB = Maximum 20dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth; Min-N dB = Minimum 20dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

Result

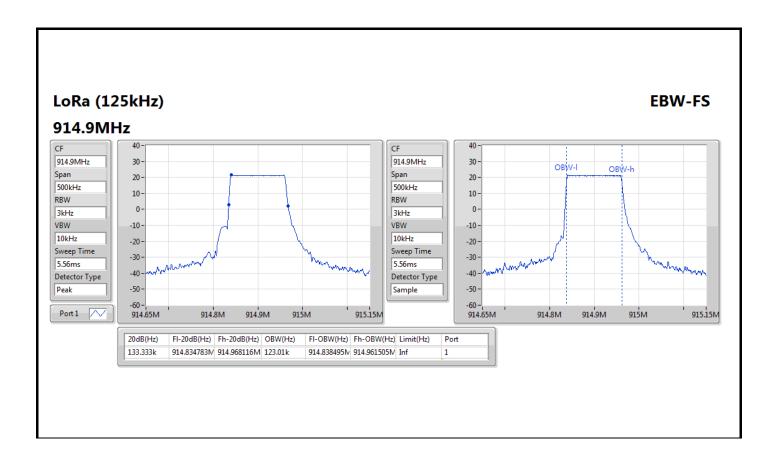
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
LoRa (125kHz)	-	-	-	-
902.3MHz	Pass	Inf	133.333k	123.01k
908.5MHz	Pass	Inf	133.333k	123.01k
914.9MHz	Pass	Inf	133.333k	123.01k

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











Channel Separation

Appendix F

Summary

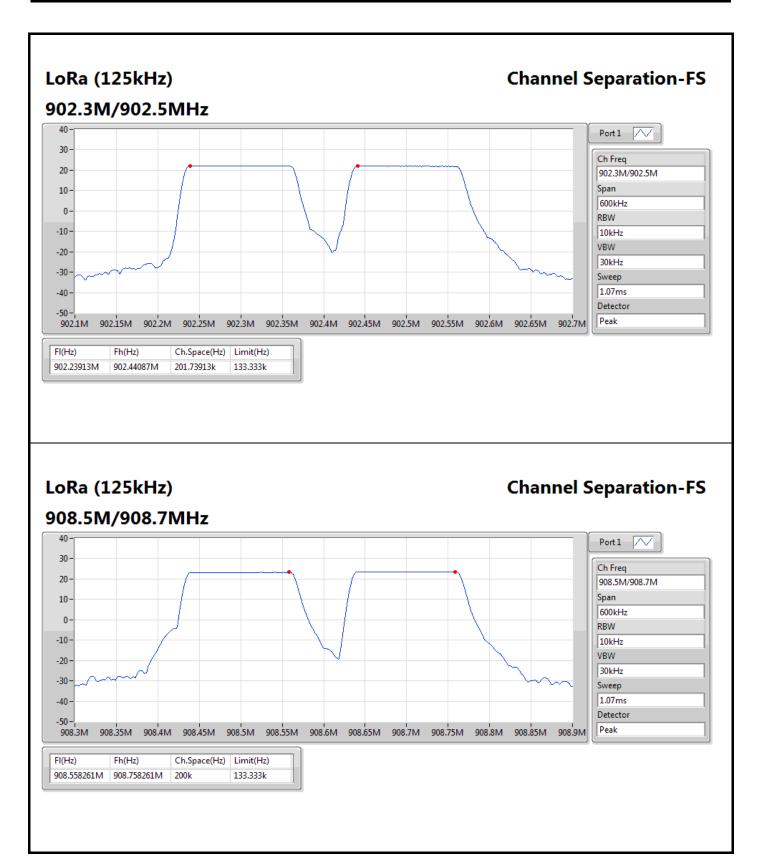
Mode	Max-Space	Min-Space
	(Hz)	(Hz)
902-928MHz	-	-
LoRa (125kHz)	201.73913k	200k

Result

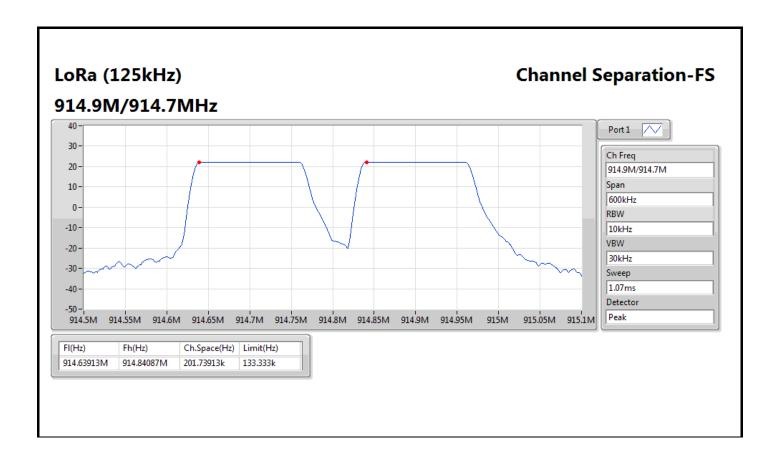
Mode	Result	FI (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
LoRa (125kHz)	-	-	-	-	-
902.3MHz	Pass	902.23913M	902.44087M	201.73913k	133.333k
908.5MHz	Pass	908.558261M	908.758261M	200k	133.333k
914.9MHz	Pass	914.63913M	914.84087M	201.73913k	133.333k

Page No. : 1 of 3



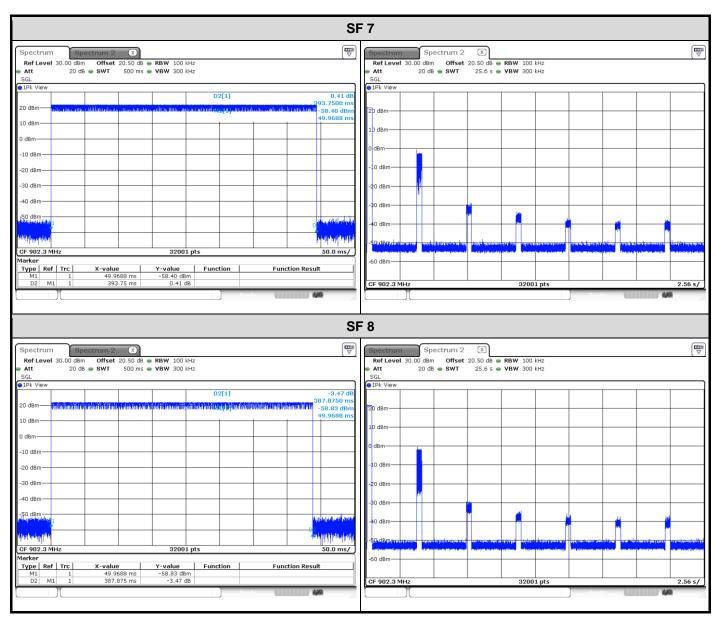




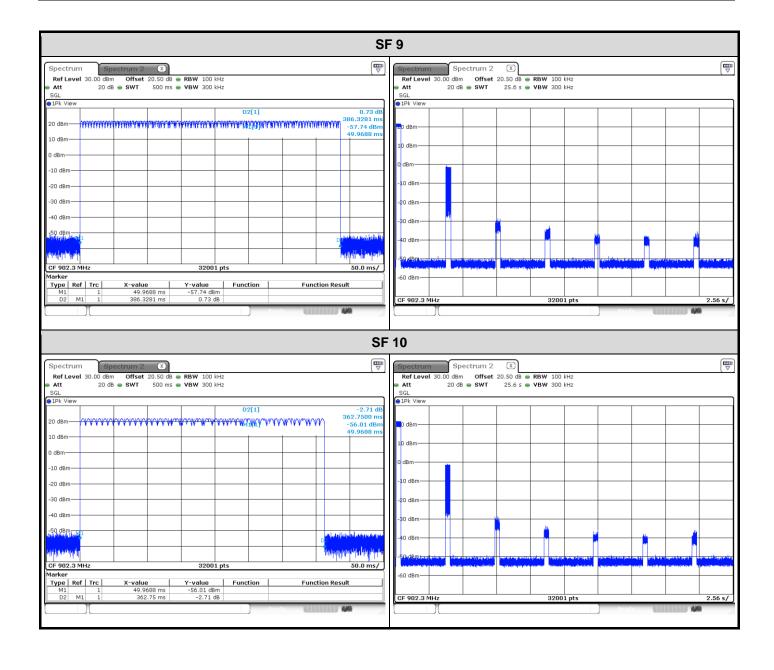




Mode / SF	Freq. (MHz)	Length of Transmission Time (sec)	Number of transmission in a 25.6 S (64 Hopping*0.4S)	Result (s)	Limit (s)
LoRa / 7	902.3	0.393750	1	0.393750	0.4
LoRa / 8	902.3	0.387875	1	0.387875	0.4
LoRa / 9	902.3	0.386328	1	0.386328	0.4
LoRa / 10	902.3	0.362750	1	0.362750	0.4









Power Spectral Density

Appendix H

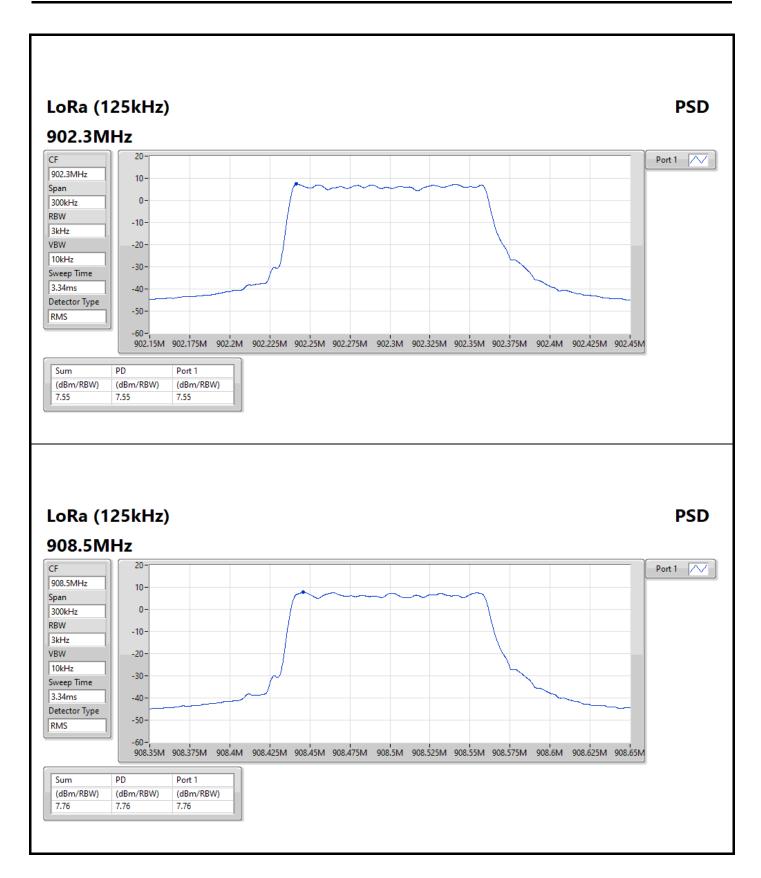
Summary

Mode	PD (dBm/3kHz)	
902-928MHz	-	
LoRa (125kHz)	7.76	

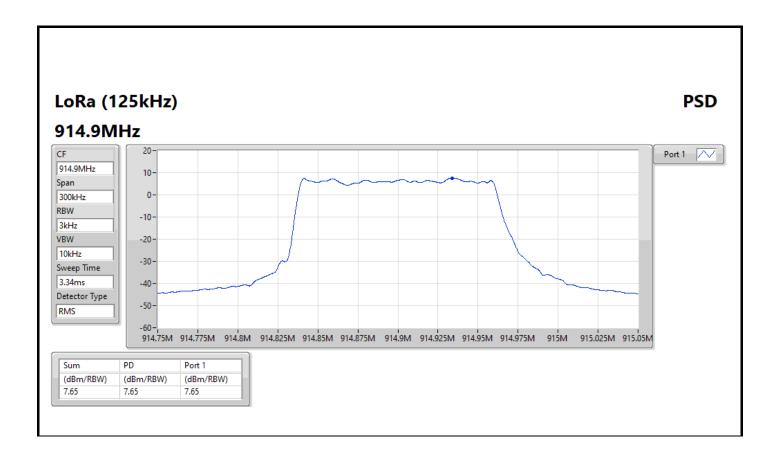
Result

Mode	Result	Antenna Gain	Power Density	Power Density Limit
		(dBi)	(dBm/3kHz)	(dBm/3kHz)
LoRa (125kHz)	-	-	-	-
902.3MHz	Pass	2.10	7.55	8.00
908.5MHz	Pass	2.10	7.76	8.00
914.9MHz	Pass	2.10	7.65	8.00

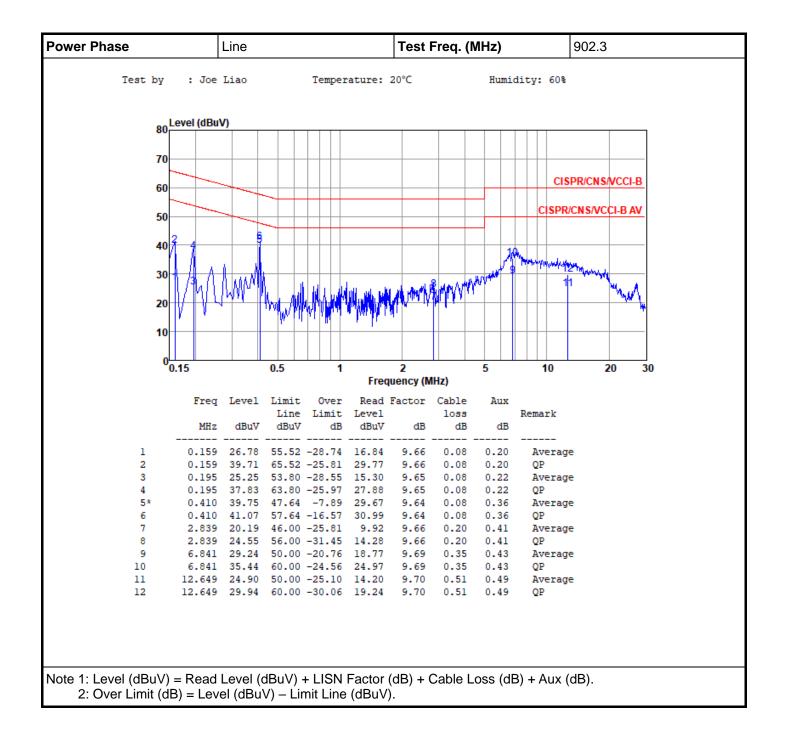






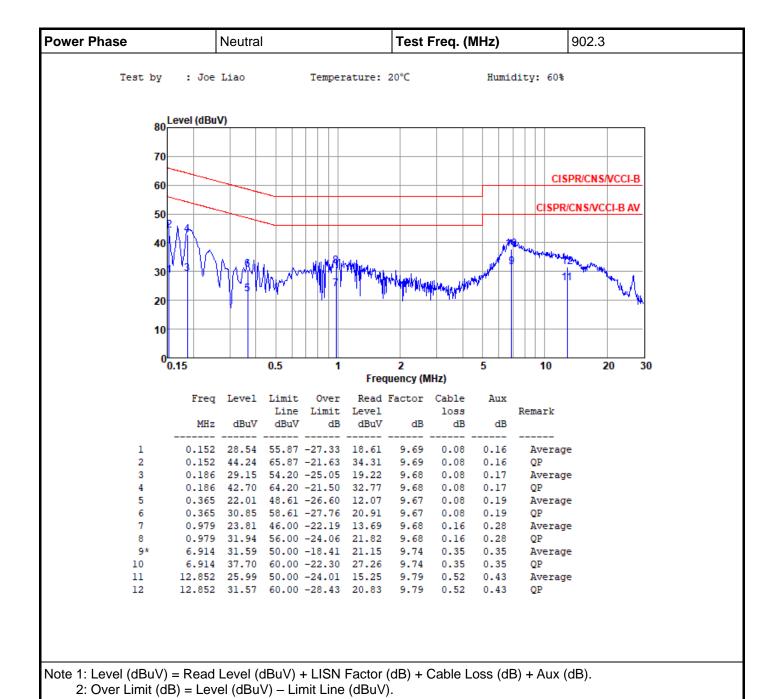






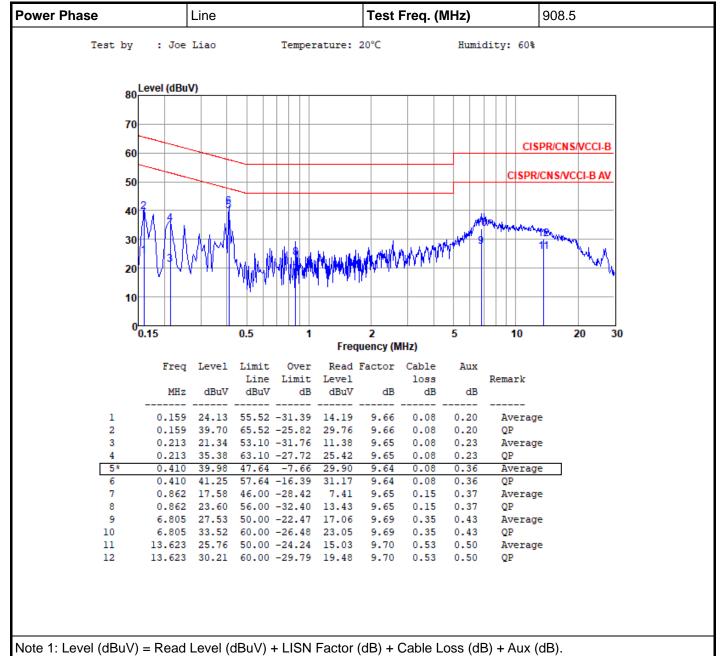
Page No. : 1 of 6





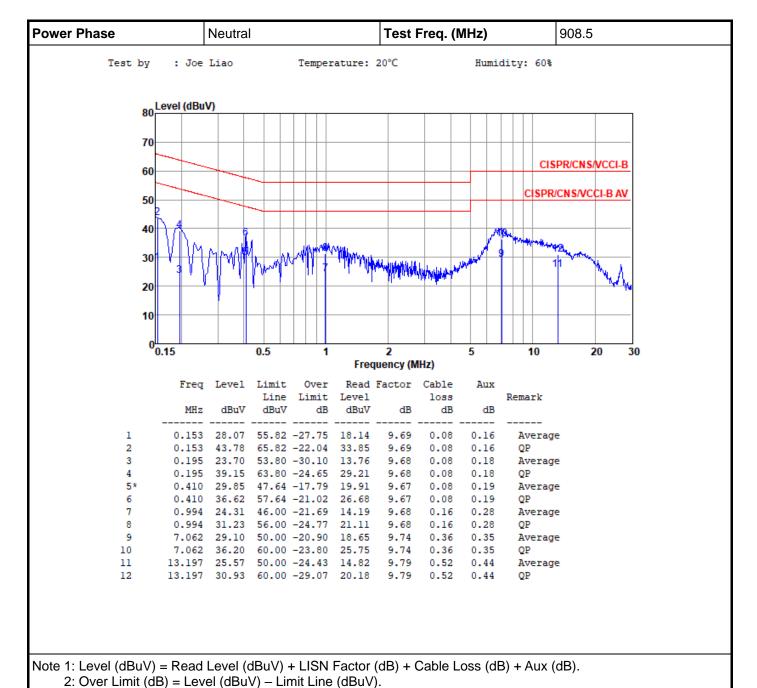
Page No. : 2 of 6



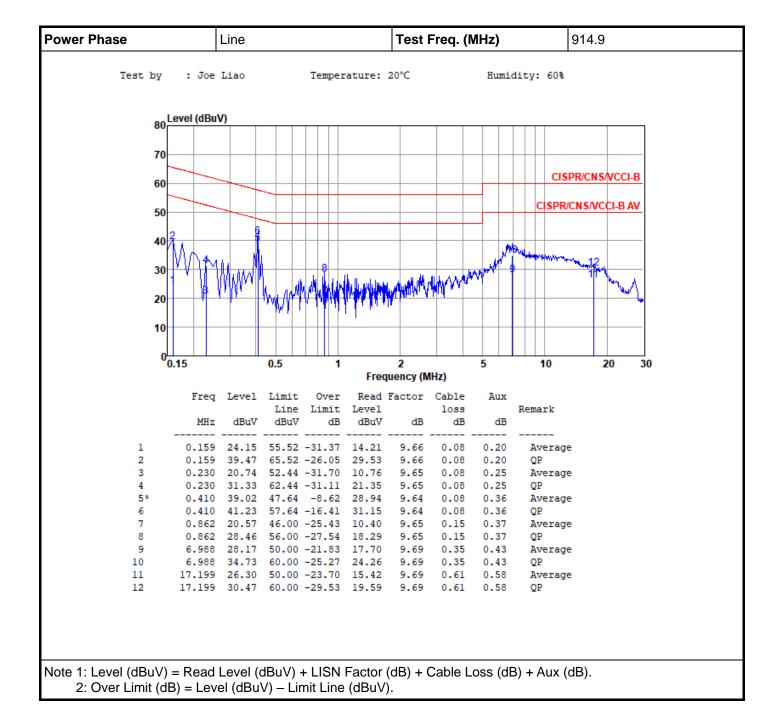


2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).



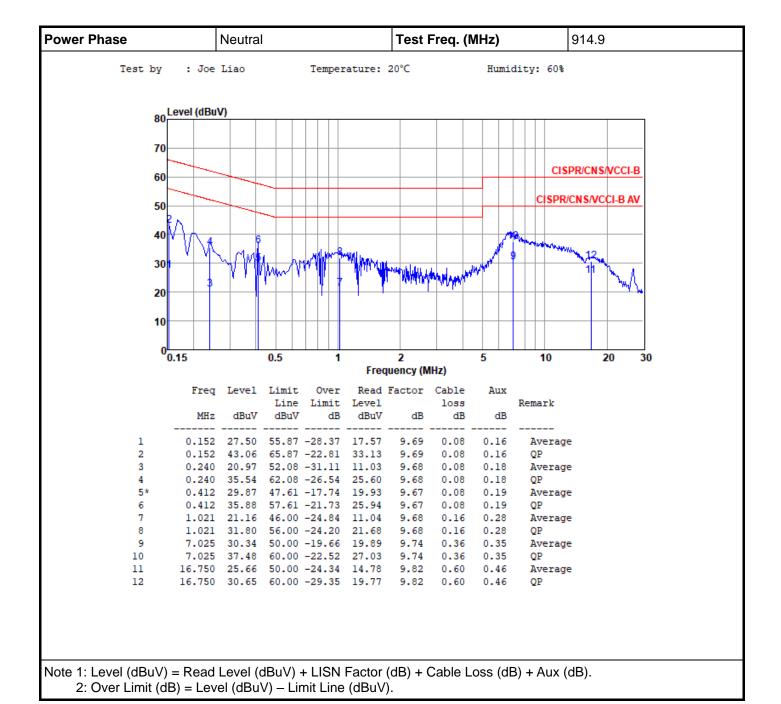






Page No. : 5 of 6





Page No. : 6 of 6