

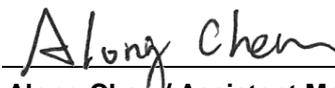
# FCC C2PC Test Report

**FCC ID** : MXF-WLRGFM100  
**Equipment** : IOT Femto Gateway  
**Model No.** : WLRGFM-100  
**Brand Name** : Browan  
**Applicant** : Gemtek Technology Co., Ltd.  
**Address** : No. 15-1 Zhonghua Road, Hsinchu Industrial  
Park, Hukou, Hsinchu, Taiwan, 30352.  
**Standard** : 47 CFR FCC Part 15.247  
**Received Date** : May 17, 2022  
**Tested Date** : May 30 ~ Jun. 09, 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. Unwanted Emissions into Restricted Frequency Bands**

**Appendix B. AC Power Line Conducted Emissions**

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## Release Record

Report No.	Version	Description	Issued Date
FR741001-04	Rev. 01	Initial issue	Jun. 29, 2022

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 0.573MHz 34.84 (Margin -11.16dB) - AV	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 58.69MHz 35.73 (Margin -4.27dB) - QP	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 is a Class II Permissive Change report (C2PC).

This report is issued as a supplementary report to original report no. FR741001-02. The modifications are listed as table below:

### Changing list

Report No.	Description of the change	Description
FR741001	V01	Original report.
FR741001-02	V02	C1PC
FR741001-04	V02A	C2PC

Item	V01	V02
Pin Direction of LED1,2,3,4	Same	LED 1 / 3: Horizontal LED 2 / 4: Vertical
Pad size for Antenna card	Original design	Modified to bigger size
Location of R116A, R105, R103, R116	Original design	Downward 2~3 mm Direction of R116A is rotated 90o
Lora RF cable connector	I-PEX	MMCX

Item	V02	V02A
MB-PCB version	V02	V02A
RF card connector	MMCX	lpex
RF cable	MMCX, 120mm	MMCX to lpex, 95mm

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

RF General Information					
Frequency Range (MHz)	Ch. Freq. (MHz)	Channel Number	Data Rate (bit/sec)	Spread Factor	Channel Bandwidth (kHz)
902 ~ 928	923.3 ~ 927.5	73 ~ 80 [8]	980 ~ 21900	12 ~ 7	500
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.					
Note 2: The device uses CSS modulation.					

### 1.1.2 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remark
1	Dipole	SMA	0.28	External antenna
2	Printed	MMCX	-0.39	Internal antenna

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

<b>Power Supply Type</b>	5Vdc from AC adapter
--------------------------	----------------------

### 1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	AC adapter 1	Brand: PHIHONG Model: PSAF10A-050Q Power Rating: I/P: 100-240Vac, 50/60Hz, 0.28A O/P: 5Vdc, 2A MAX
2	AC adapter 2	Brand: Tenbao Model: SO10WU0500200 Power Rating: I/P: 100-240Vac, 50/60Hz, 0.4A O/P: 5Vdc, 2A MAX
3	AC adapter 3	Brand: ChenYang Model: CC10-050200U Power Rating: I/P: 100-240Vac, 50/60Hz, 0.35A O/P: 5Vdc, 2A MAX
4	USB cable (for charging use)	1.5m non-shielded without core
5	RJ45 cable	0.95m non-shielded without core

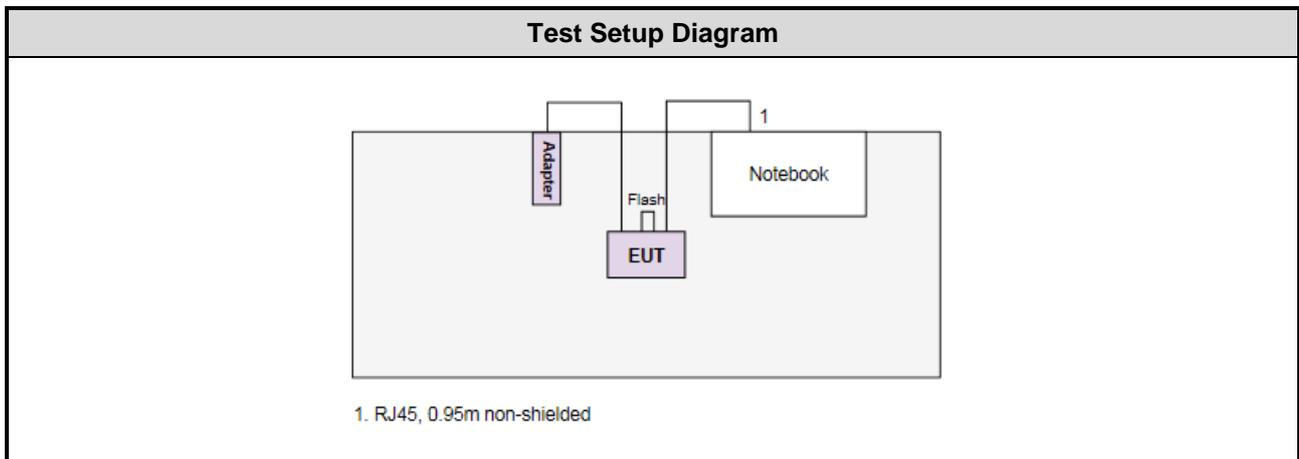
### 1.1.5 Channel List

Channel	Frequency(MHz)
73	923.3
74	923.9
75	924.5
76	925.1
77	925.7
78	926.3
79	926.9
80	927.5

## 1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E6430	DoC	RJ45, 0.95m non-shielded.
2	USB 3.0 Flash	Kingston	DTSE9G2	---	---

## 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>	Jun. 09, 2022				
<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. 16, 2022	Feb. 15, 2023
LISN	R&S	ENV216	101579	Apr. 21, 2022	Apr. 20, 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 10, 2022	May 09, 2023
Measurement Software	AUDIX	e3	6.120210k	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>	May 30 ~ May 31, 2022				
<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. 15, 2022	Mar. 14, 2023
Spectrum Analyzer	R&S	FSV40	101498	Nov. 29, 2021	Nov. 28, 2022
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 08, 2021	Nov. 07, 2022
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jun. 30, 2021	Jun. 29, 2022
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 03, 2021	Dec. 02, 2022
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170508	Jan. 11, 2022	Jan. 10, 2023
Preamplifier	EMC	EMC02325	980225	Jun. 29, 2021	Jun. 28, 2022
Preamplifier	Agilent	83017A	MY39501308	Sep. 28, 2021	Sep. 27, 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 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 05, 2021	Oct. 04, 2022
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 05, 2021	Oct. 04, 2022
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 05, 2021	Oct. 04, 2022
RF Cable	EMC	EMC104-35M-35M-8000	210920	Oct. 05, 2021	Oct. 04, 2022
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 05, 2021	Oct. 04, 2022
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 C63.10-2013

## 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
AC conducted emission	$\pm 2.92$ dB
Radiated emission $\leq 1$ GHz	$\pm 3.41$ dB
Radiated emission $> 1$ GHz	$\pm 4.59$ dB

## 2 Test Configuration

### 2.1 Testing Facility

<b>Test Laboratory</b>	International Certification Corporation
<b>Test Site</b>	CO01-WS, 03CH01-WS
<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

- ✧ The tests reported herein were performed according to the original worst case conditions in original report no. FR741001-02.

Test item	Test Frequency (MHz)	Channel Bandwidth (kHz)	Modulation / SF	Test Configuration
Conducted Emissions	923.3 / 927.5	500	CSS / 12	1
Radiated Emissions ≤1GHz Radiated Emissions >1GHz	923.3 / 927.5	500	CSS / 12	1, 2

Note:

1. Three adapters (PHIHONG, Tenbao and ChenYang) had been covered during the pre-test and found that PHIHONG adapter was the worst case for radiated emission and ChenYang adapter was the worst case for conducted emission test.
2. Two types antenna was selected to perform radiated emission test that listed as below configuration.  
Test Configuration 1: with external antenna  
Test Configuration 2: with internal antenna

## 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

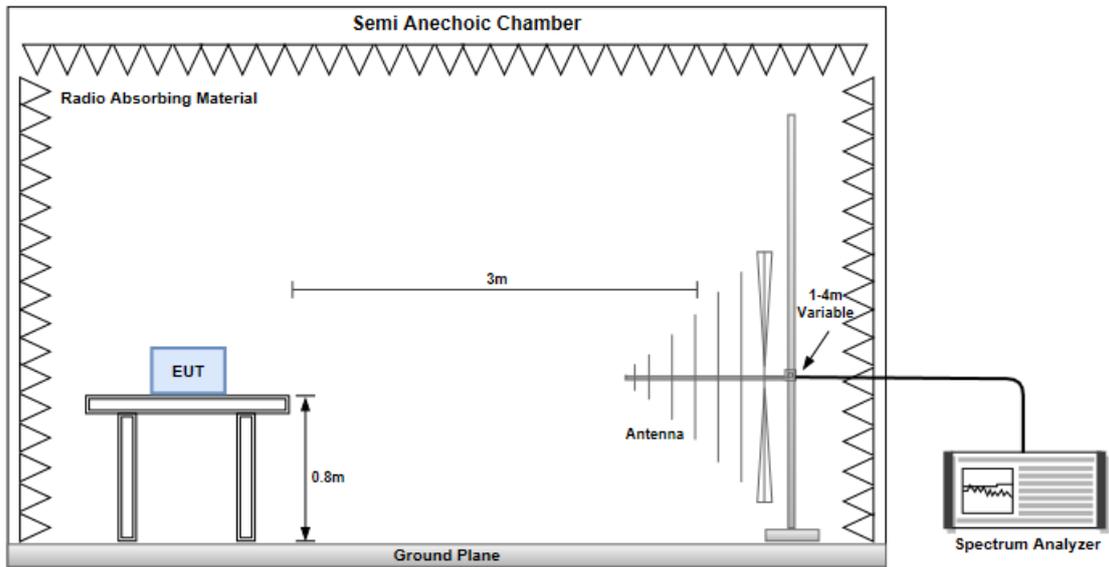
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

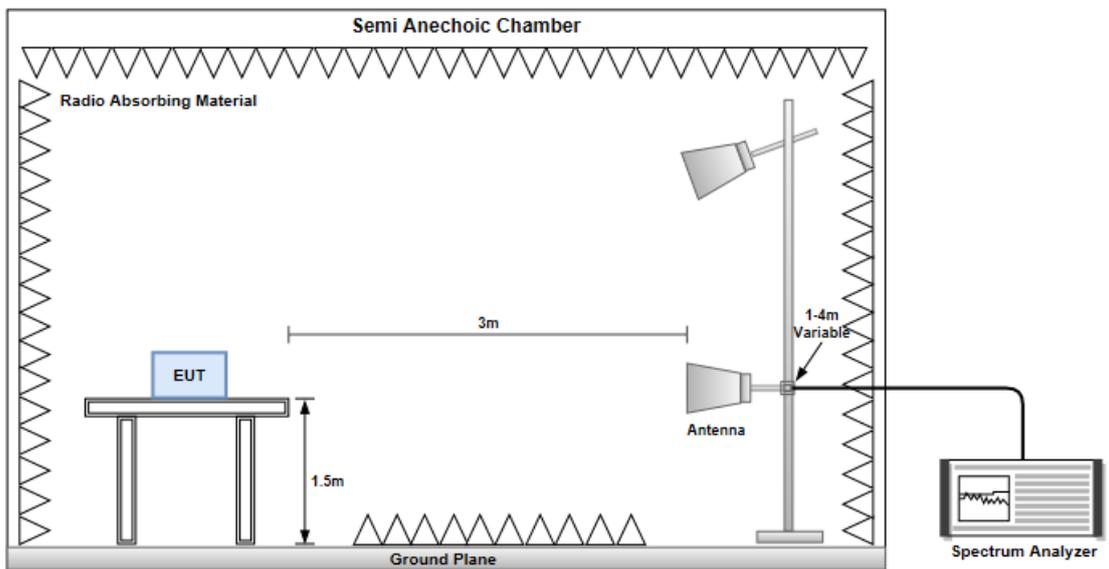
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

### 3.1.3 Test Setup

#### Radiated Emissions below 1 GHz



#### Radiated Emissions above 1 GHz



### 3.1.4 Test Results

Refer to Appendix A.

## 3.2 AC Power Line Conducted Emissions

### 3.2.1 Limit of AC Power Line Conducted Emissions

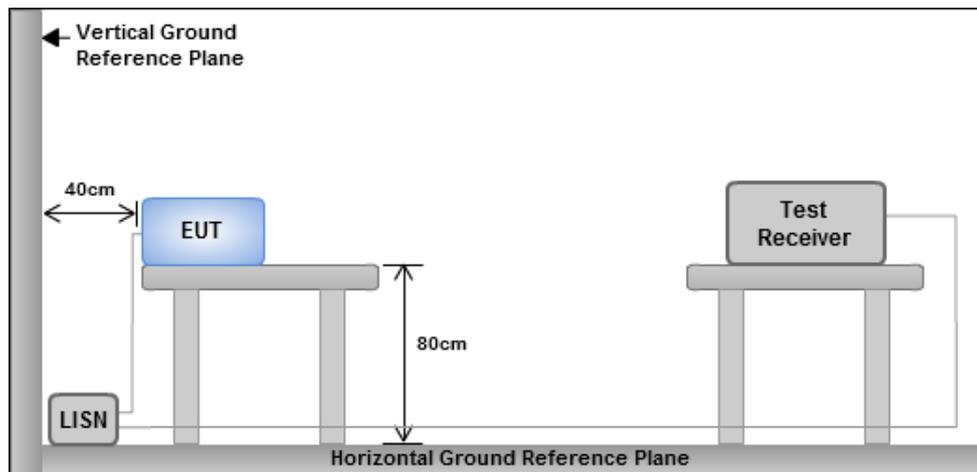
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

### 3.2.2 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.

### 3.2.3 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

### 3.2.4 Test Results

Refer to Appendix B.

## 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

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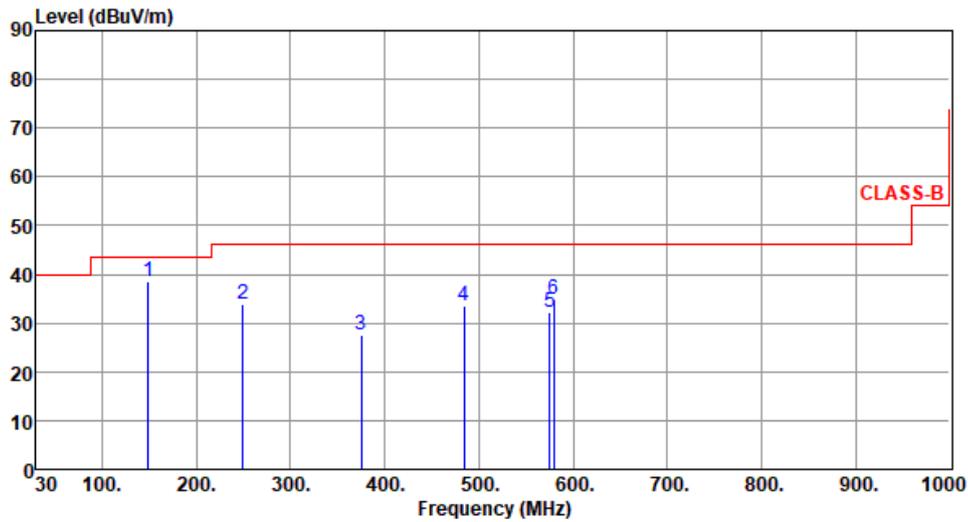


Test Configuration 1: with external antenna

Unwanted Emissions (Below 1GHz)

Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3
Polarization	Horizontal		

Test By :Roger Lu      Temperature(°C):25      Humidity(%):66



	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	148.81	38.45	43.50	-5.05	47.52	-9.07	Peak	---	---
2	249.42	33.97	46.00	-12.03	44.04	-10.07	Peak	---	---
3	374.89	27.45	46.00	-18.55	33.78	-6.33	Peak	---	---
4	484.19	33.64	46.00	-12.36	37.38	-3.74	Peak	---	---
5	575.18	32.15	46.00	-13.85	33.93	-1.78	Peak	---	---
6	579.65	34.89	46.00	-11.11	36.56	-1.67	Peak	---	---

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

\*Factor includes antenna factor , cable loss and amplifier gain

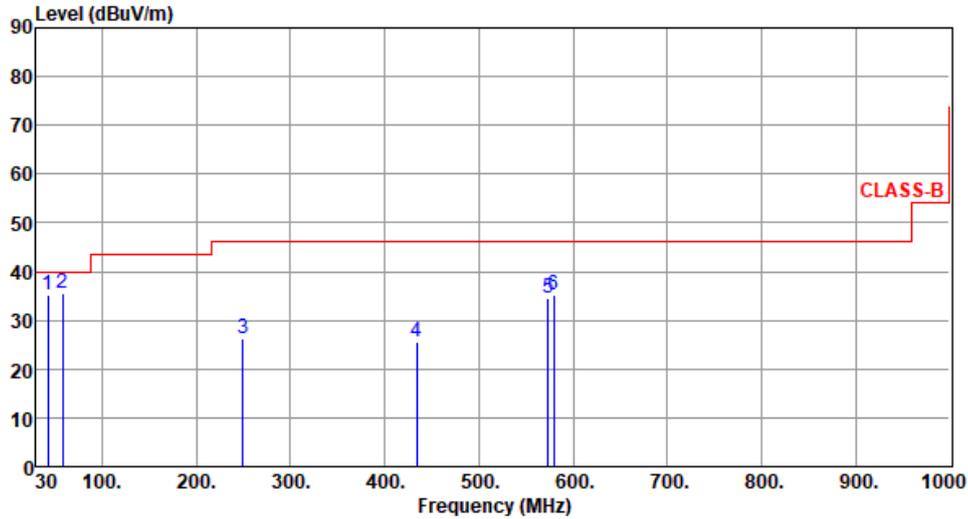
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3
Polarization	Vertical		

Test By :Roger Lu      Temperature(°C):25      Humidity(%):66



	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	42.46	35.29	40.00	-4.71	43.73	-8.44	Peak	---	---
2	58.45	35.69	40.00	-4.31	44.95	-9.26	QP	100	263
3	249.42	26.28	46.00	-19.72	36.35	-10.07	Peak	---	---
4	433.61	25.67	46.00	-20.33	30.39	-4.72	Peak	---	---
5	573.56	34.59	46.00	-11.41	36.41	-1.82	Peak	---	---
6	579.64	35.15	46.00	-10.85	36.82	-1.67	Peak	---	---

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).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

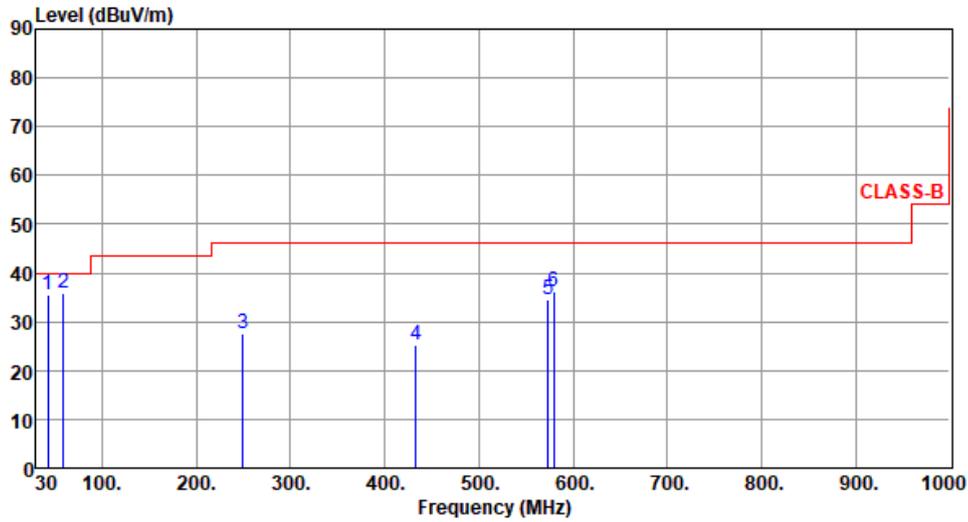


Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5																																																																				
Polarization	Horizontal																																																																						
Test By : Roger Lu      Temperature(°C):25      Humidity(%):66																																																																							
<p>The graph plots Level (dBuV/m) on the y-axis (0 to 90) against Frequency (MHz) on the x-axis (30 to 1000). A red step function represents the CLASS-B emission limit. Six peaks are identified with blue vertical lines and numbered 1 through 6. Peak 1 is at 148.19 MHz, peak 2 at 249.46 MHz, peak 3 at 375.19 MHz, peak 4 at 483.59 MHz, peak 5 at 575.61 MHz, and peak 6 at 579.66 MHz. All peaks are below the CLASS-B limit.</p>																																																																							
	<table border="1"> <thead> <tr> <th>Peak</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> </thead> <tbody> <tr> <td>1</td> <td>148.19</td> <td>38.31</td> <td>43.50</td> <td>-5.19</td> <td>47.27</td> <td>-8.96</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>2</td> <td>249.46</td> <td>33.59</td> <td>46.00</td> <td>-12.41</td> <td>43.66</td> <td>-10.07</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>3</td> <td>375.19</td> <td>25.81</td> <td>46.00</td> <td>-20.19</td> <td>32.14</td> <td>-6.33</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>4</td> <td>483.59</td> <td>33.54</td> <td>46.00</td> <td>-12.46</td> <td>37.28</td> <td>-3.74</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>5</td> <td>575.61</td> <td>33.58</td> <td>46.00</td> <td>-12.42</td> <td>35.35</td> <td>-1.77</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>6</td> <td>579.66</td> <td>35.68</td> <td>46.00</td> <td>-10.32</td> <td>37.35</td> <td>-1.67</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> </tbody> </table>	Peak	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	148.19	38.31	43.50	-5.19	47.27	-8.96	Peak	---	---	2	249.46	33.59	46.00	-12.41	43.66	-10.07	Peak	---	---	3	375.19	25.81	46.00	-20.19	32.14	-6.33	Peak	---	---	4	483.59	33.54	46.00	-12.46	37.28	-3.74	Peak	---	---	5	575.61	33.58	46.00	-12.42	35.35	-1.77	Peak	---	---	6	579.66	35.68	46.00	-10.32	37.35	-1.67	Peak	---	---
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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). Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.																																																																							



Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5
Polarization	Vertical		

Test By : Roger Lu      Temperature(°C): 25      Humidity(%): 66



	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	42.67	35.54	40.00	-4.46	44.01	-8.47	Peak	---	---
2	58.69	35.73	40.00	-4.27	45.04	-9.31	QP	100	265
3	249.45	27.68	46.00	-18.32	37.75	-10.07	Peak	---	---
4	433.31	25.19	46.00	-20.81	29.91	-4.72	Peak	---	---
5	573.56	34.58	46.00	-11.42	36.40	-1.82	Peak	---	---
6	579.65	36.18	46.00	-9.82	37.85	-1.67	Peak	---	---

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).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



Unwanted Emissions (Above 1GHz)

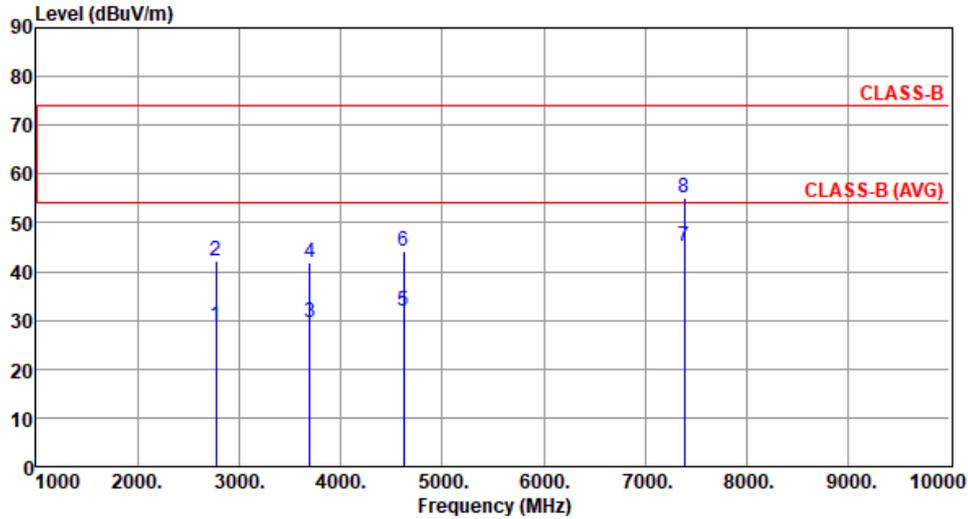
Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3						
Polarization	Horizontal								
Test By : Roger Lu      Temperature(°C):24      Humidity(%):63									
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2769.90	28.67	54.00	-25.33	30.15	-1.48	Average	100	235
2	2769.90	40.97	74.00	-33.03	42.45	-1.48	Peak	100	235
3	3693.20	29.32	54.00	-24.68	28.65	0.67	Average	100	351
4	3693.20	41.80	74.00	-32.20	41.13	0.67	Peak	100	351
5	4616.50	32.03	54.00	-21.97	28.55	3.48	Average	100	289
6	4616.50	43.98	74.00	-30.02	40.50	3.48	Peak	100	289
7	7386.40	43.79	54.00	-10.21	34.54	9.25	Average	261	266
8	7386.40	54.27	74.00	-19.73	45.02	9.25	Peak	261	266

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).



Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3
Polarization	Vertical		

Test By : Roger Lu      Temperature(°C):24      Humidity(%):63



	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	2769.90	28.77	54.00	-25.23	30.25	-1.48	Average	100	265
2	2769.90	42.08	74.00	-31.92	43.56	-1.48	Peak	100	265
3	3693.20	29.62	54.00	-24.38	28.95	0.67	Average	100	211
4	3693.20	41.88	74.00	-32.12	41.21	0.67	Peak	100	211
5	4616.50	32.02	54.00	-21.98	28.54	3.48	Average	100	355
6	4616.50	44.02	74.00	-29.98	40.54	3.48	Peak	100	355
7	7386.40	45.13	54.00	-8.87	35.88	9.25	Average	245	27
8	7386.40	55.26	74.00	-18.74	46.01	9.25	Peak	245	27

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

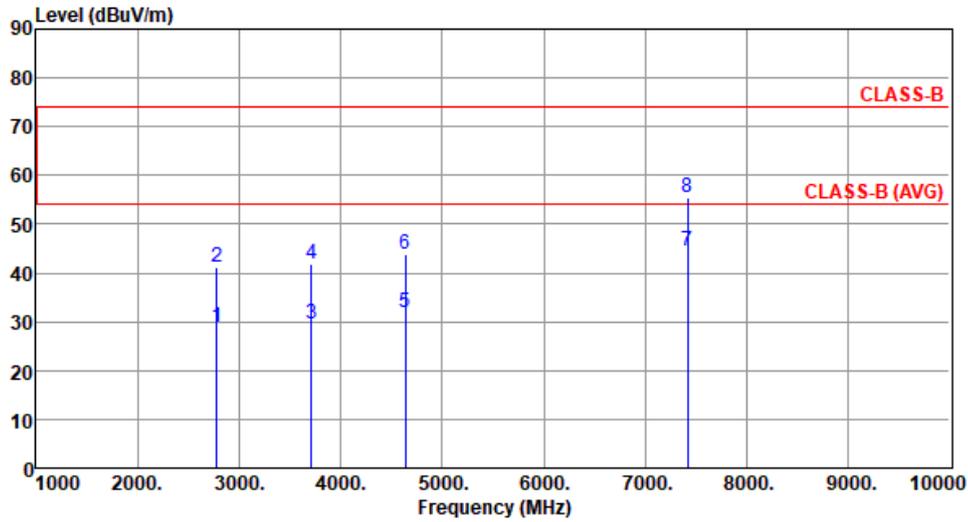
\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5
Polarization	Horizontal		

Test By : Roger Lu      Temperature(°C): 24      Humidity(%): 63



	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	2782.50	28.79	54.00	-25.21	30.23	-1.44	Average	100	233
2	2782.50	41.08	74.00	-32.92	42.52	-1.44	Peak	100	233
3	3710.00	29.59	54.00	-24.41	28.89	0.70	Average	100	349
4	3710.00	41.98	74.00	-32.02	41.28	0.70	Peak	100	349
5	4637.50	31.91	54.00	-22.09	28.31	3.60	Average	100	288
6	4637.50	43.96	74.00	-30.04	40.36	3.60	Peak	100	288
7	7420.00	44.51	54.00	-9.49	35.20	9.31	Average	262	265
8	7420.00	55.34	74.00	-18.66	46.03	9.31	Peak	262	265

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

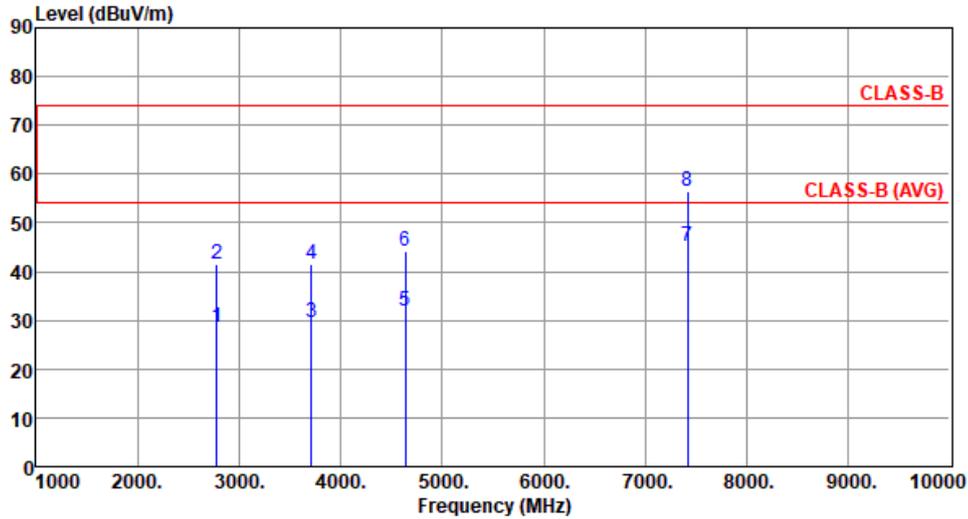
\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5
Polarization	Vertical		

Test By : Roger Lu      Temperature(°C):24      Humidity(%):63



	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	2782.50	28.68	54.00	-25.32	30.12	-1.44	Average	100	263
2	2782.50	41.67	74.00	-32.33	43.11	-1.44	Peak	100	263
3	3710.00	29.44	54.00	-24.56	28.74	0.70	Average	100	210
4	3710.00	41.61	74.00	-32.39	40.91	0.70	Peak	100	210
5	4637.50	32.02	54.00	-21.98	28.42	3.60	Average	100	352
6	4637.50	44.28	74.00	-29.72	40.68	3.60	Peak	100	352
7	7420.00	45.27	54.00	-8.73	35.96	9.31	Average	258	27
8	7420.00	56.45	74.00	-17.55	47.14	9.31	Peak	258	27

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).

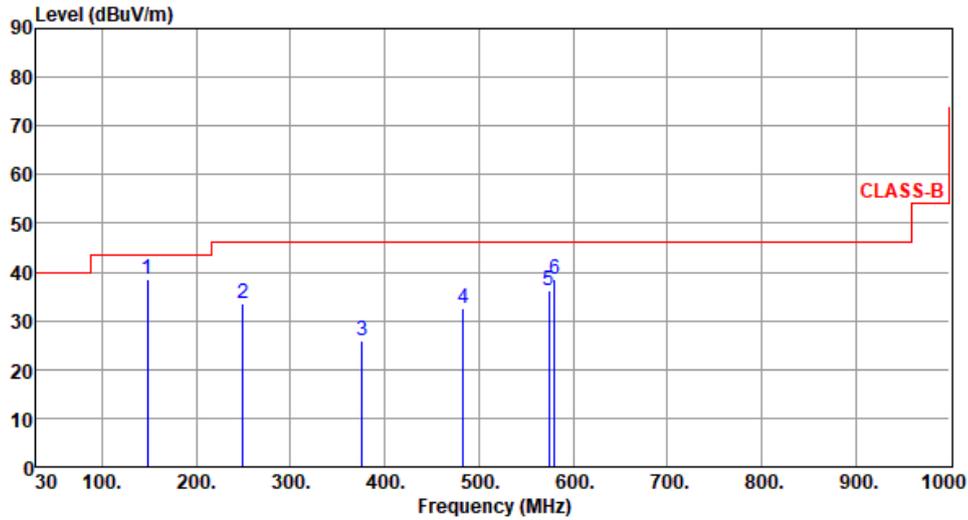


Test Configuration 2: with internal antenna

Unwanted Emissions (Below 1GHz)

Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3
Polarization	Horizontal		

Test By :Roger Lu      Temperature(°C):25      Humidity(%):66



	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	148.46	38.48	43.50	-5.02	47.48	-9.00	Peak	---	---
2	249.45	33.58	46.00	-12.42	43.65	-10.07	Peak	---	---
3	375.61	25.91	46.00	-20.09	32.23	-6.32	Peak	---	---
4	483.59	32.67	46.00	-13.33	36.41	-3.74	Peak	---	---
5	574.59	36.28	46.00	-9.72	38.08	-1.80	Peak	---	---
6	580.19	38.67	46.00	-7.33	40.32	-1.65	Peak	---	---

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

\*Factor includes antenna factor , cable loss and amplifier gain

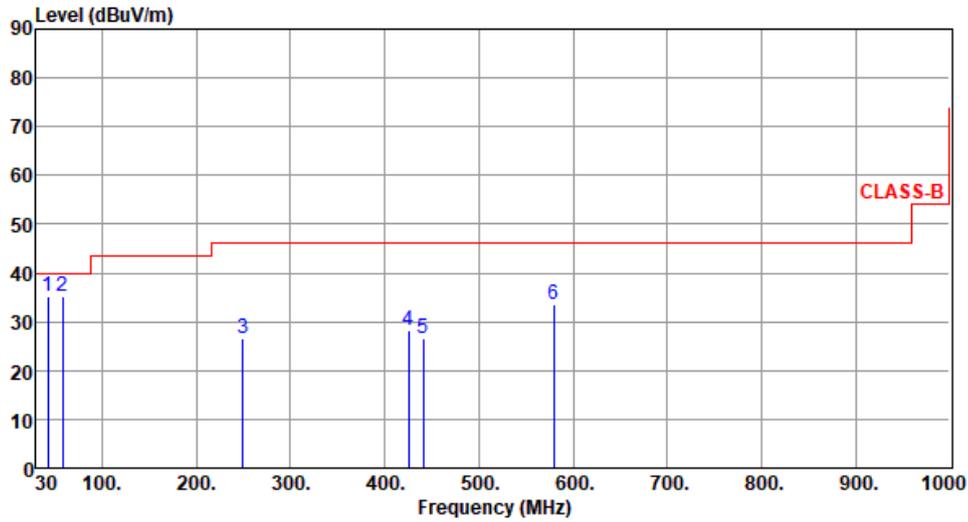
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3
Polarization	Vertical		

Test By : Roger Lu      Temperature(°C): 25      Humidity(%): 66



	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	42.76	35.15	40.00	-4.85	43.63	-8.48	Peak	---	---
2	58.45	35.29	40.00	-4.71	44.55	-9.26	QP	100	266
3	249.45	26.58	46.00	-19.42	36.65	-10.07	Peak	---	---
4	425.59	28.32	46.00	-17.68	33.31	-4.99	Peak	---	---
5	441.26	26.48	46.00	-19.52	31.00	-4.52	Peak	---	---
6	579.68	33.45	46.00	-12.55	35.12	-1.67	Peak	---	---

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).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

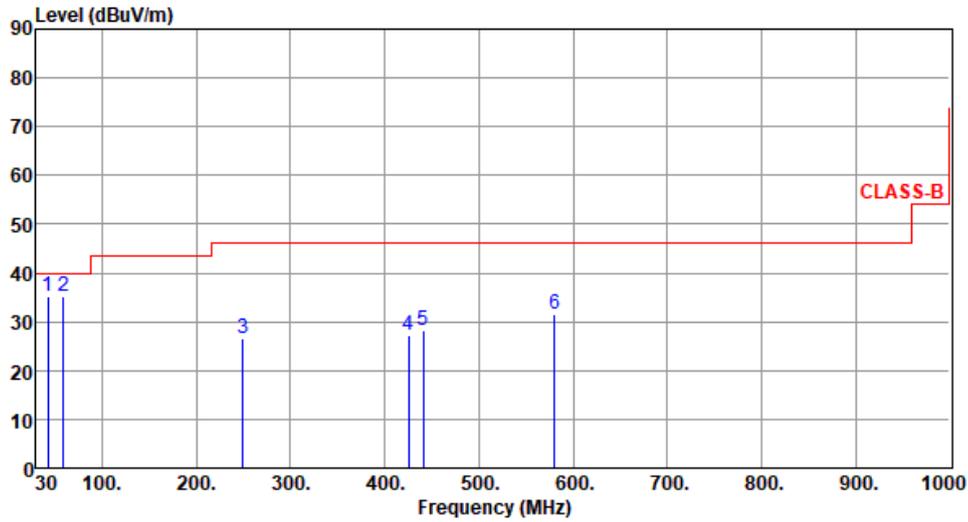


Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5						
Polarization	Horizontal								
Test By : Roger Lu		Temperature(°C):25			Humidity(%):66				
<p>The graph displays the emission level in dBuV/m across a frequency range from 30 MHz to 1000 MHz. A red step function represents the CLASS-B emission limit. Six specific peaks are identified and numbered 1 through 6. Peak 1 is at 148.46 MHz, peak 2 at 249.45 MHz, peak 3 at 375.64 MHz, peak 4 at 483.45 MHz, peak 5 at 575.67 MHz, and peak 6 at 580.56 MHz. The emission levels for these peaks are 38.46, 32.59, 27.48, 31.15, 36.45, and 38.56 dBuV/m respectively, all of which are below the 46.00 dBuV/m limit.</p>									
	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	148.46	38.46	46.00	-5.04	47.46	-9.00	Peak	---	---
2	249.45	32.59	46.00	-13.41	42.66	-10.07	Peak	---	---
3	375.64	27.48	46.00	-18.52	33.80	-6.32	Peak	---	---
4	483.45	31.15	46.00	-14.85	34.89	-3.74	Peak	---	---
5	575.67	36.45	46.00	-9.55	38.22	-1.77	Peak	---	---
6	580.56	38.56	46.00	-7.44	40.20	-1.64	Peak	---	---
<p>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).            Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.</p>									



Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5
Polarization	Vertical		

Test By : Roger Lu      Temperature(°C): 25      Humidity(%): 66



	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	42.46	35.13	40.00	-4.87	43.57	-8.44	Peak	---	---
2	58.78	35.31	40.00	-4.69	44.64	-9.33	QP	100	262
3	249.45	26.58	46.00	-19.42	36.65	-10.07	Peak	---	---
4	425.31	27.19	46.00	-18.81	32.19	-5.00	Peak	---	---
5	441.26	28.25	46.00	-17.75	32.77	-4.52	Peak	---	---
6	580.37	31.48	46.00	-14.52	33.13	-1.65	Peak	---	---

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).

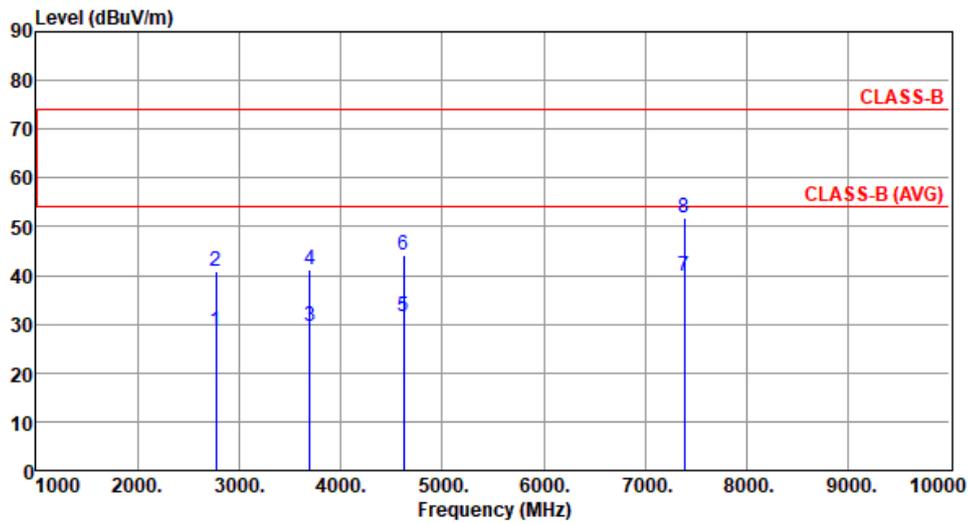
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



Unwanted Emissions (Above 1GHz)

Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3
Polarization	Horizontal		

Test By : Roger Lu      Temperature(°C):24      Humidity(%):63



	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	2769.90	28.41	54.00	-25.59	29.89	-1.48	Average	100	305
2	2769.90	40.97	74.00	-33.03	42.45	-1.48	Peak	100	305
3	3693.20	29.45	54.00	-24.55	28.78	0.67	Average	100	161
4	3693.20	41.34	74.00	-32.66	40.67	0.67	Peak	100	161
5	4616.50	31.63	54.00	-22.37	28.15	3.48	Average	100	157
6	4616.50	44.27	74.00	-29.73	40.79	3.48	Peak	100	157
7	7386.40	39.81	54.00	-14.19	30.56	9.25	Average	100	320
8	7386.40	51.84	74.00	-22.16	42.59	9.25	Peak	100	320

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).



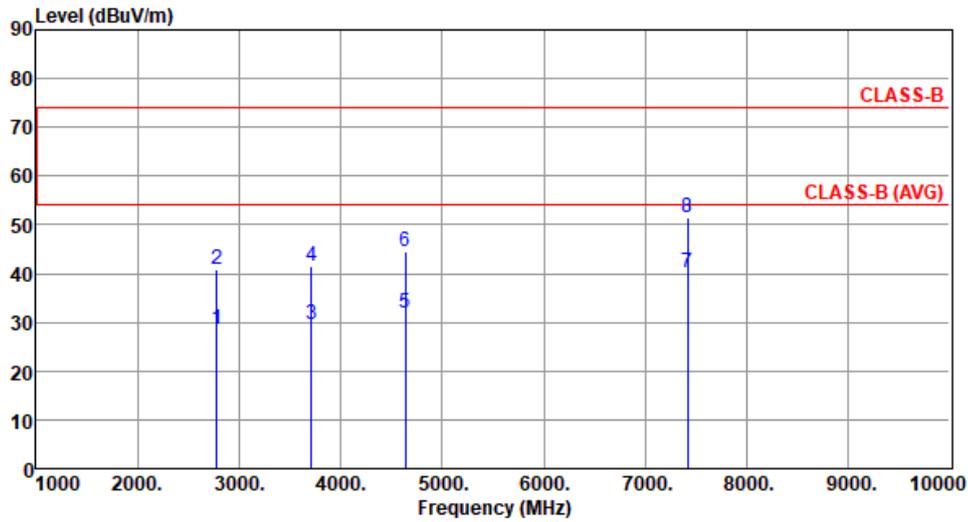
Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3						
Polarization	Vertical								
Test By : Roger Lu		Temperature(°C):24			Humidity(%):63				
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg
1	2769.90	29.08	54.00	-24.92	30.56	-1.48	Average	100	79
2	2769.90	41.06	74.00	-32.94	42.54	-1.48	Peak	100	79
3	3693.20	29.92	54.00	-24.08	29.25	0.67	Average	100	185
4	3693.20	42.35	74.00	-31.65	41.68	0.67	Peak	100	185
5	4616.50	31.93	54.00	-22.07	28.45	3.48	Average	100	131
6	4616.50	43.80	74.00	-30.20	40.32	3.48	Peak	100	131
7	7386.40	42.56	54.00	-11.44	33.31	9.25	Average	100	34
8	7386.40	52.88	74.00	-21.12	43.63	9.25	Peak	100	34

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).



Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5
Polarization	Horizontal		

Test By : Roger Lu      Temperature(°C):24      Humidity(%):63



	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	2782.50	28.71	54.00	-25.29	30.15	-1.44	Average	100	301
2	2782.50	40.89	74.00	-33.11	42.33	-1.44	Peak	100	301
3	3710.00	29.68	54.00	-24.32	28.98	0.70	Average	100	158
4	3710.00	41.63	74.00	-32.37	40.93	0.70	Peak	100	158
5	4637.50	31.98	54.00	-22.02	28.38	3.60	Average	100	155
6	4637.50	44.57	74.00	-29.43	40.97	3.60	Peak	100	155
7	7420.00	40.25	54.00	-13.75	30.94	9.31	Average	100	319
8	7420.00	51.59	74.00	-22.41	42.28	9.31	Peak	100	319

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).



Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5						
Polarization	Vertical								
Test By : Roger Lu      Temperature(°C):24      Humidity(%):63									
	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	2782.50	28.97	54.00	-25.03	30.41	-1.44	Average	100	85
2	2782.50	41.42	74.00	-32.58	42.86	-1.44	Peak	100	85
3	3710.00	29.87	54.00	-24.13	29.17	0.70	Average	100	181
4	3710.00	42.27	74.00	-31.73	41.57	0.70	Peak	100	181
5	4637.50	32.24	54.00	-21.76	28.64	3.60	Average	100	125
6	4637.50	44.05	74.00	-29.95	40.45	3.60	Peak	100	125
7	7420.00	43.91	54.00	-10.09	34.60	9.31	Average	100	30
8	7420.00	55.20	74.00	-18.80	45.89	9.31	Peak	100	30

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

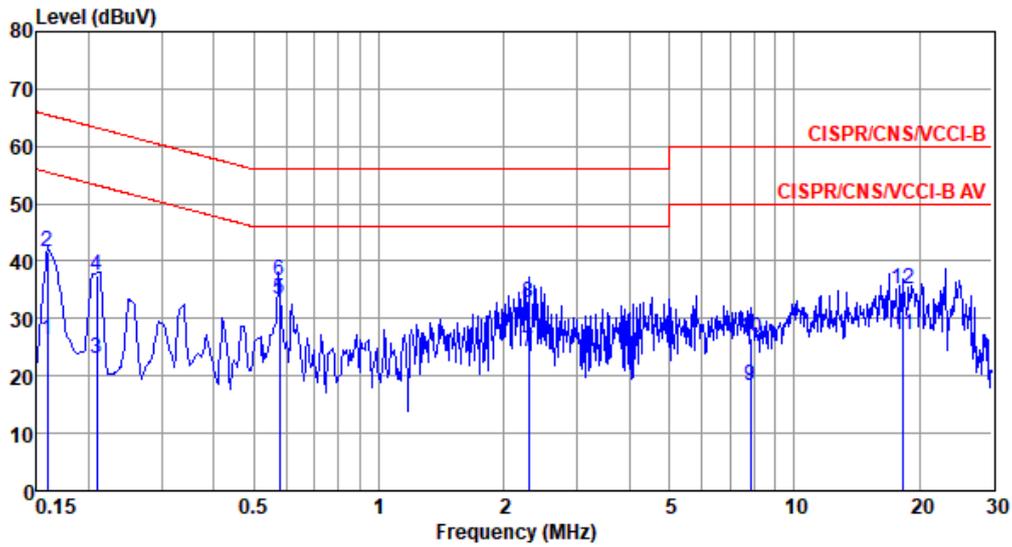
\*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3
Power Phase	Line		

Test by : Joe Liao      Temperature: 22°C      Humidity: 61%



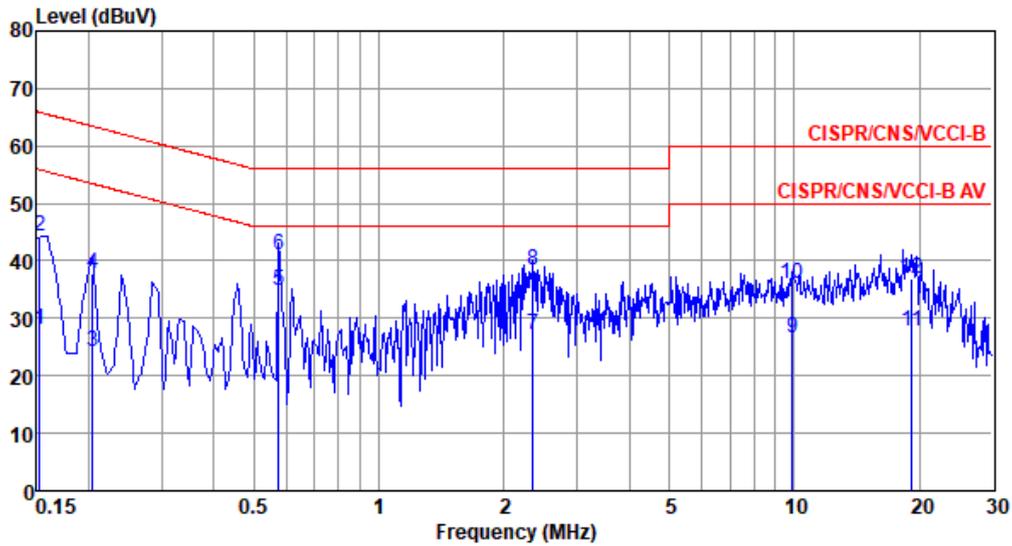
	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.159	26.22	55.52	-29.30	16.26	9.68	0.08	0.20	Average
2	0.159	41.75	65.52	-23.77	31.79	9.68	0.08	0.20	QP
3	0.209	22.97	53.23	-30.26	12.98	9.68	0.08	0.23	Average
4	0.209	37.56	63.23	-25.67	27.57	9.68	0.08	0.23	QP
5*	0.577	33.38	46.00	-12.62	23.24	9.67	0.11	0.36	Average
6	0.577	36.52	56.00	-19.48	26.38	9.67	0.11	0.36	QP
7	2.297	24.13	46.00	-21.87	13.84	9.69	0.20	0.40	Average
8	2.297	32.80	56.00	-23.20	22.51	9.69	0.20	0.40	QP
9	7.852	18.31	50.00	-31.69	7.76	9.73	0.39	0.43	Average
10	7.852	26.49	60.00	-33.51	15.94	9.73	0.39	0.43	QP
11	18.328	27.28	50.00	-22.72	16.31	9.73	0.63	0.61	Average
12	18.328	35.07	60.00	-24.93	24.10	9.73	0.63	0.61	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).



Modulation / SF	CSS / 12	Test Freq. (MHz)	923.3
Power Phase	Neutral		

Test by : Joe Liao      Temperature: 22°C      Humidity: 61%



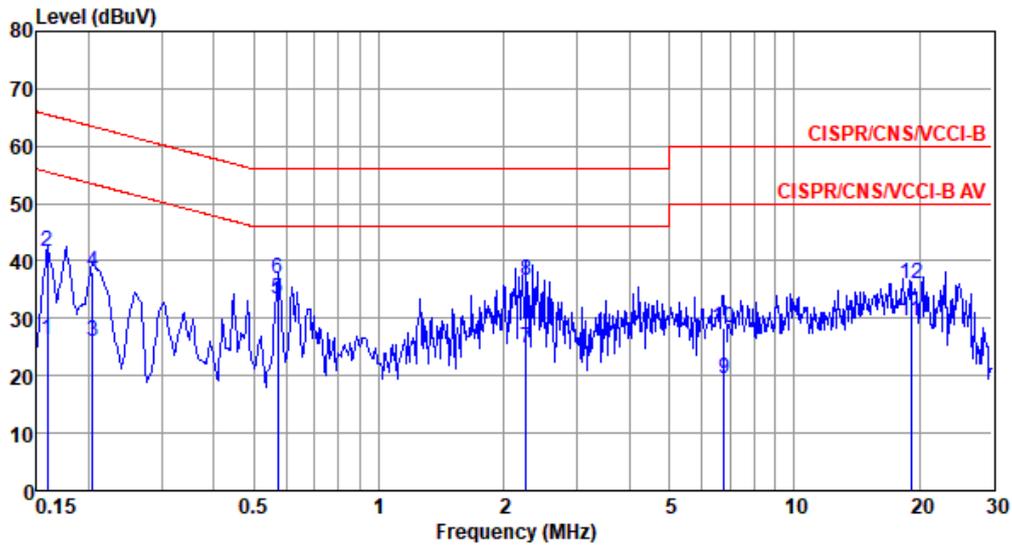
	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.152	28.08	55.87	-27.79	18.23	9.61	0.08	0.16	Average
2	0.152	44.14	65.87	-21.73	34.29	9.61	0.08	0.16	QP
3	0.204	24.23	53.45	-29.22	14.36	9.61	0.08	0.18	Average
4	0.204	37.77	63.45	-25.68	27.90	9.61	0.08	0.18	QP
5*	0.573	34.84	46.00	-11.16	24.89	9.61	0.11	0.23	Average
6	0.573	40.89	56.00	-15.11	30.94	9.61	0.11	0.23	QP
7	2.346	27.28	46.00	-18.72	17.15	9.62	0.20	0.31	Average
8	2.346	38.27	56.00	-17.73	28.14	9.62	0.20	0.31	QP
9	9.913	26.70	50.00	-23.30	16.19	9.69	0.45	0.37	Average
10	9.913	36.02	60.00	-23.98	25.51	9.69	0.45	0.37	QP
11	19.224	27.89	50.00	-22.11	17.01	9.78	0.65	0.45	Average
12	19.224	36.91	60.00	-23.09	26.03	9.78	0.65	0.45	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).



Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5
Power Phase	Line		

Test by : Joe Liao      Temperature: 22°C      Humidity: 61%



	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.159	26.18	55.52	-29.34	16.22	9.68	0.08	0.20	Average
2	0.159	41.64	65.52	-23.88	31.68	9.68	0.08	0.20	QP
3	0.204	26.05	53.45	-27.40	16.07	9.68	0.08	0.22	Average
4	0.204	38.21	63.45	-25.24	28.23	9.68	0.08	0.22	QP
5*	0.572	33.46	46.00	-12.54	23.32	9.67	0.11	0.36	Average
6	0.572	36.97	56.00	-19.03	26.83	9.67	0.11	0.36	QP
7	2.261	24.75	46.00	-21.25	14.46	9.69	0.20	0.40	Average
8	2.261	36.60	56.00	-19.40	26.31	9.69	0.20	0.40	QP
9	6.769	19.37	50.00	-30.63	8.87	9.72	0.35	0.43	Average
10	6.769	28.37	60.00	-31.63	17.87	9.72	0.35	0.43	QP
11	19.122	29.54	50.00	-20.46	18.54	9.73	0.64	0.63	Average
12	19.122	36.02	60.00	-23.98	25.02	9.73	0.64	0.63	QP

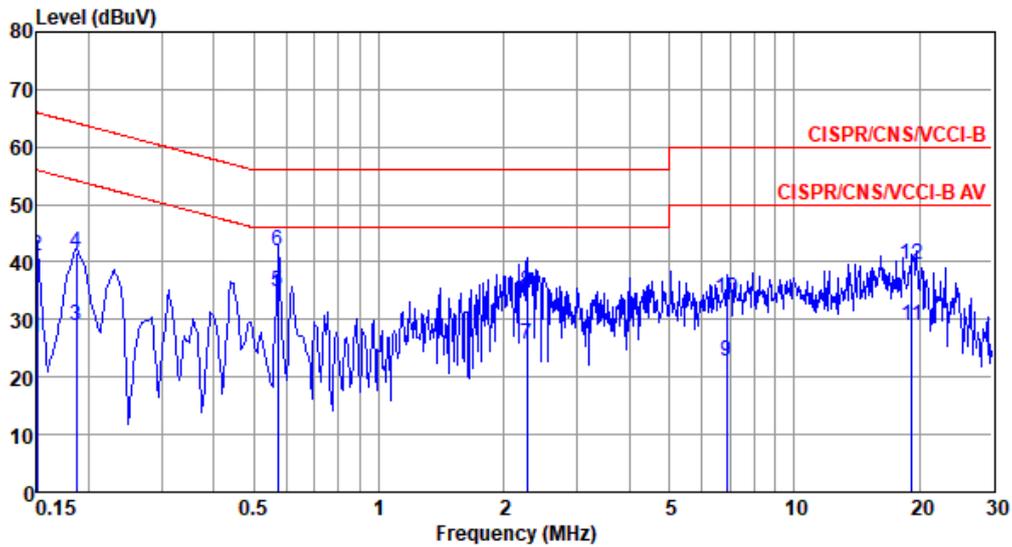
Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

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



Modulation / SF	CSS / 12	Test Freq. (MHz)	927.5
Power Phase	Neutral		

Test by : Joe Liao      Temperature: 22°C      Humidity: 61%



	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.150	26.78	56.00	-29.22	16.93	9.61	0.08	0.16	Average
2	0.150	40.99	66.00	-25.01	31.14	9.61	0.08	0.16	QP
3	0.186	28.99	54.20	-25.21	19.13	9.61	0.08	0.17	Average
4	0.186	41.62	64.20	-22.58	31.76	9.61	0.08	0.17	QP
5*	0.571	34.70	46.00	-11.30	24.76	9.61	0.11	0.22	Average
6	0.571	41.79	56.00	-14.21	31.85	9.61	0.11	0.22	QP
7	2.273	25.62	46.00	-20.38	15.49	9.62	0.20	0.31	Average
8	2.273	34.96	56.00	-21.04	24.83	9.62	0.20	0.31	QP
9	6.878	22.74	50.00	-27.26	12.37	9.67	0.35	0.35	Average
10	6.878	33.78	60.00	-26.22	23.41	9.67	0.35	0.35	QP
11	19.224	29.06	50.00	-20.94	18.18	9.78	0.65	0.45	Average
12	19.224	39.49	60.00	-20.51	28.61	9.78	0.65	0.45	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).