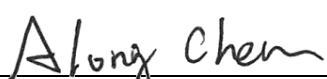


# FCC C2PC Test Report

**FCC ID** : YAISB52  
**Equipment** : Wireless SOM Module  
**Model No.** : SB52  
**Brand Name** : InnoComm  
**Applicant** : InnoComm Mobile Technology Corporation  
**Address** : 3F, No. 6, Hsin Ann Rd., Hsinchu Science Park,  
Hsinchu 30078, Taiwan  
**Standard** : 47 CFR FCC Part 15.247  
**Received Date** : Apr. 07, 2022  
**Tested Date** : Apr. 08, 2022

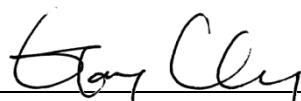
We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the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

Reviewed by:



Along Chen / Assistant Manager

Approved by:



Gary Chang / Manager

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### Appendix A. Unwanted Emissions into Restricted Frequency Bands

### Appendix B. AC Power Line Conducted Emissions

## Release Record

Report No.	Version	Description	Issued Date
FR031702-02AE	Rev. 01	Initial issue	May 10, 2022

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emissions	[dBuV]: 26.558MHz 26.43 (Margin -23.57dB) - AV	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 389.87MHz 39.15 (Margin -6.85dB) - PK	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.

This report is issued as a supplementary report to original ICC report no. FR031702AE. The difference is modifying DC voltage function by adding DC/DC converter, relative components and circuit of non-RF section.

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

RF General Information				
Frequency Range (MHz)	Bluetooth Mode	Ch. Freq. (MHz)	Channel Number	Data Rate
2400-2483.5	V5.0 LE	2402-2480	0-39 [40]	1 Mbps
				2 Mbps
Note 1: Bluetooth LE (Low energy) uses GFSK modulation.				

#### 1.1.2 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remarks
1	Monopole	IPEX	1.87	---

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

Power Supply Type	3.8 Vdc
-------------------	---------

#### 1.1.4 Accessories

N/A

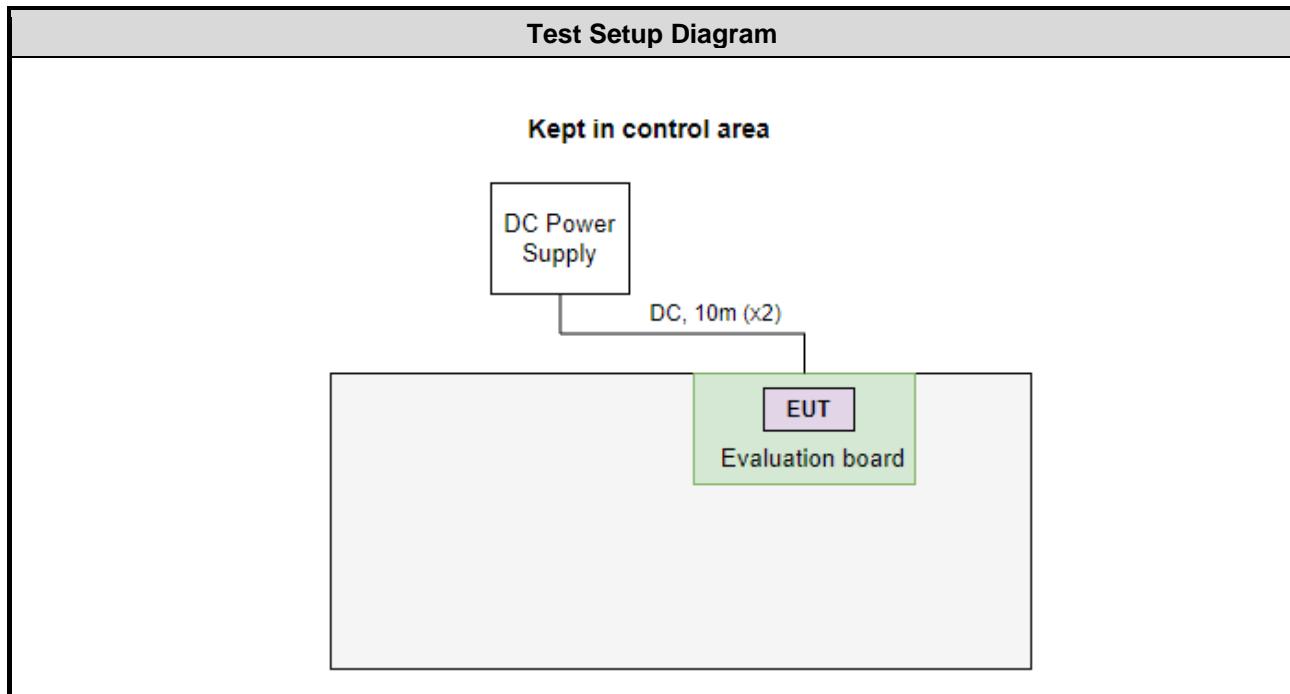
### 1.1.5 Channel List

Frequency band (MHz)				2400~2483.5			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

## 1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5470	DoC	---
2	DC Cable	ICC	DCC-10m-R	---	---
3	DC Cable	ICC	DCC-10m-B	---	---
4	DC Power Supply	GWINSTEK	GPC-60300	---	---
5	Evaluation board	---	---	---	Provided by applicant.

## 1.3 Test Setup Chart



Note: The notebook is disconnected from EUT and removed from test table when EUT is set to transmit continuously.

## 1.4 Test Equipment List and Calibration Data

<b>Test Item</b>	Conducted Emission				
<b>Test Site</b>	Conduction room 1 / (CO01-WS)				
<b>Tested Date</b>	Apr. 08, 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.

<b>Test Item</b>	Radiated Emission				
<b>Test Site</b>	966 chamber3 / (03CH03-WS)				
<b>Tested Date</b>	Apr. 08, 2022				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 15, 2022	Mar. 14, 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
Preamplifier	EMC	EMC02325	980187	Jul. 26, 2021	Jul. 25, 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
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	±2.92 dB
Unwanted Emission ≤ 1GHz	±3.96 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
- ISED#: 10807C
- CAB identifier: TW2732

### 2.2 The Worst Test Modes and Channel Details

Test item	Mode	Test Frequency (MHz)	Test Configuration
AC Power Line Conducted Emissions	BT-LE(2Mbps)	2402	---
Unwanted Emissions ≤ 1GHz	BT-LE(2Mbps)	2402	

**NOTE:**

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

### 3 Transmitter Test Results

#### 3.1 Unwanted Emissions in Restricted Frequency Bands

##### 3.1.1 Limit of Unwanted Emissions in 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

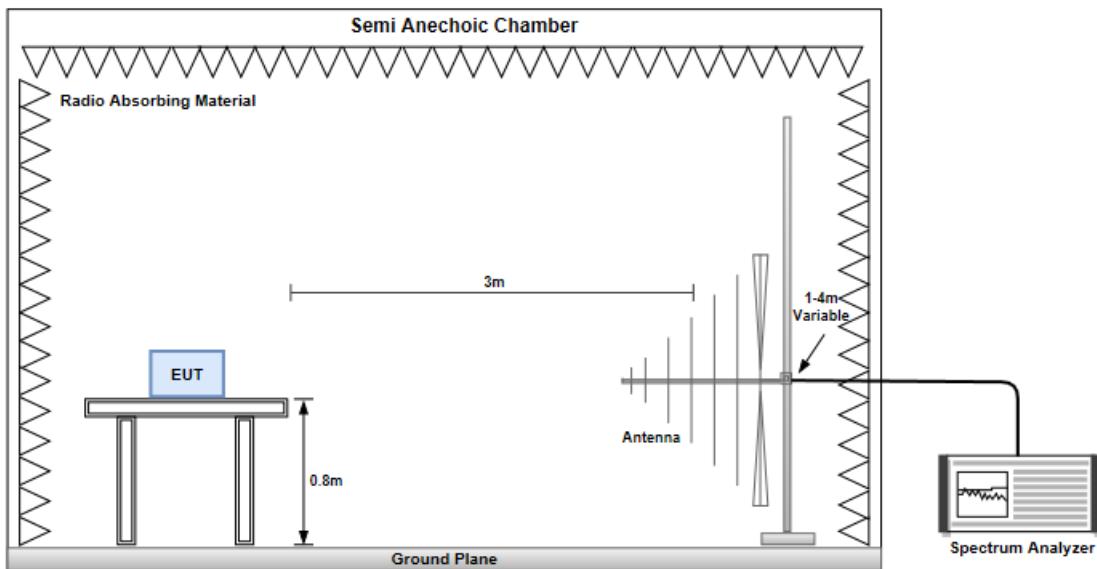
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

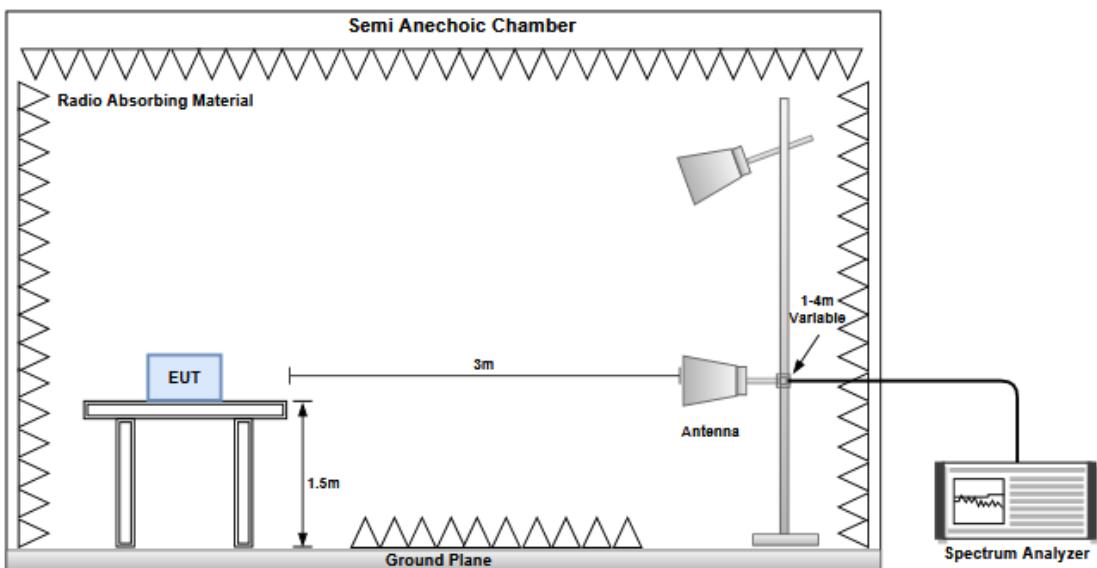
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

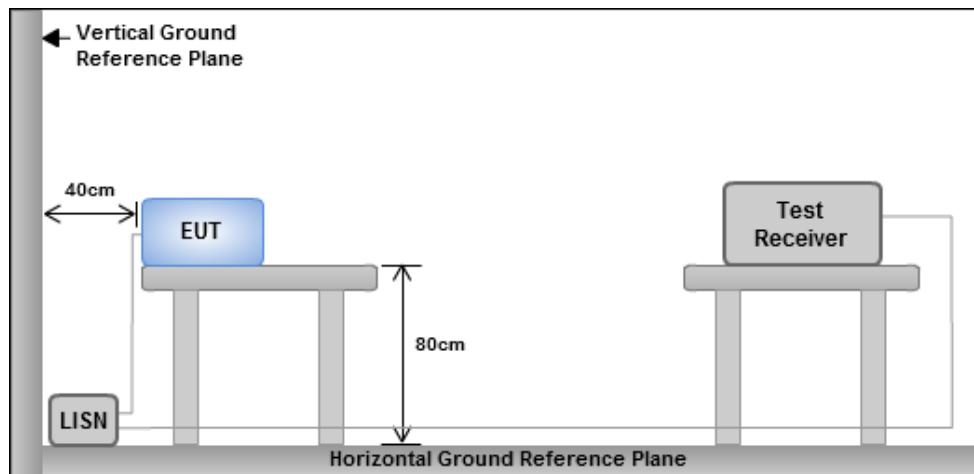
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

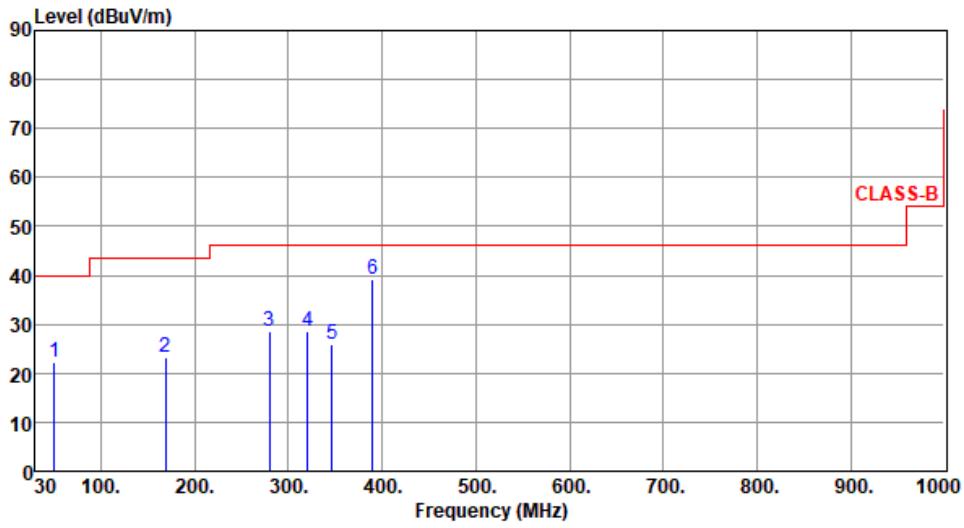
Tel: 886-3-271-8640  
No.14-1, Lane 19, Wen San 3rd  
St., Kwei Shan Dist., Tao Yuan  
City 333, Taiwan (R.O.C.)

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

Tel: 886-3-271-8666  
Fax: 886-3-318-0155  
Email: ICC\_Service@icertifi.com.tw

—END—

## Transmitter Radiated Unwanted Emissions (Below 1GHz)

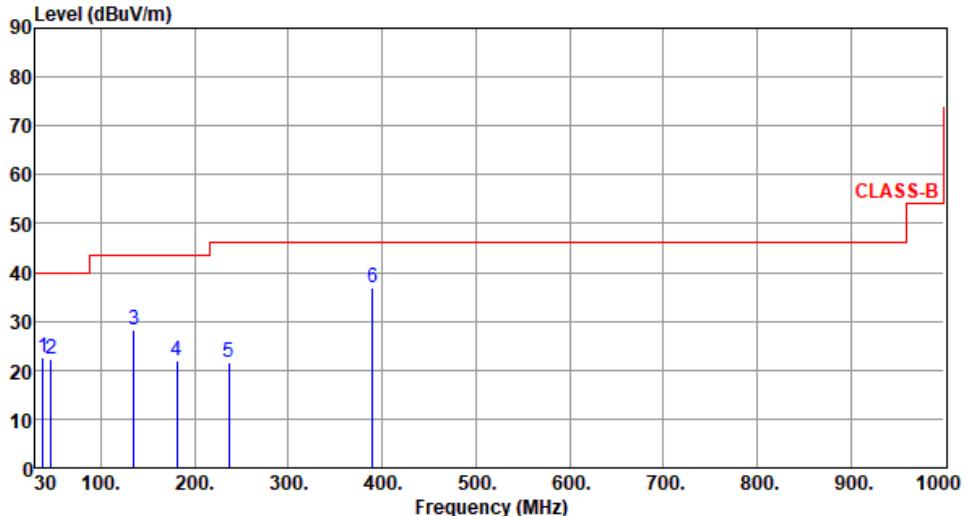
Modulation	BT-LE(2Mbps)	Test Freq. (MHz)	2402																																																															
Polarization	Horizontal																																																																	
Test By	:Akun Chung	Temperature (°C): 24	Humidity (%): 63																																																															
																																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Freq. (MHz)</th> <th style="text-align: left;">Emission level (dBuV/m)</th> <th style="text-align: left;">Limit (dBuV/m)</th> <th style="text-align: left;">Margin (dB)</th> <th style="text-align: left;">SA reading (dBuV)</th> <th style="text-align: left;">Factor (dB/m)</th> <th style="text-align: left;">Remark</th> <th style="text-align: left;">ANT High (cm)</th> <th style="text-align: left;">Turn Table deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>50.11</td> <td>22.41</td> <td>40.00</td> <td>-17.59</td> <td>31.21</td> <td>-8.80</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>2</td> <td>168.55</td> <td>23.15</td> <td>43.50</td> <td>-20.35</td> <td>32.01</td> <td>-8.86</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>3</td> <td>280.15</td> <td>28.45</td> <td>46.00</td> <td>-17.55</td> <td>37.04</td> <td>-8.59</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>4</td> <td>320.66</td> <td>28.42</td> <td>46.00</td> <td>-17.58</td> <td>35.92</td> <td>-7.50</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>5</td> <td>346.88</td> <td>25.93</td> <td>46.00</td> <td>-20.07</td> <td>32.94</td> <td>-7.01</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>6</td> <td>389.87</td> <td>39.15</td> <td>46.00</td> <td>-6.85</td> <td>44.89</td> <td>-5.74</td> <td>Peak</td> <td>---</td> </tr> </tbody> </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	50.11	22.41	40.00	-17.59	31.21	-8.80	Peak	---	2	168.55	23.15	43.50	-20.35	32.01	-8.86	Peak	---	3	280.15	28.45	46.00	-17.55	37.04	-8.59	Peak	---	4	320.66	28.42	46.00	-17.58	35.92	-7.50	Peak	---	5	346.88	25.93	46.00	-20.07	32.94	-7.01	Peak	---	6	389.87	39.15	46.00	-6.85	44.89	-5.74	Peak	---
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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor\* (dB/m)

\*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.

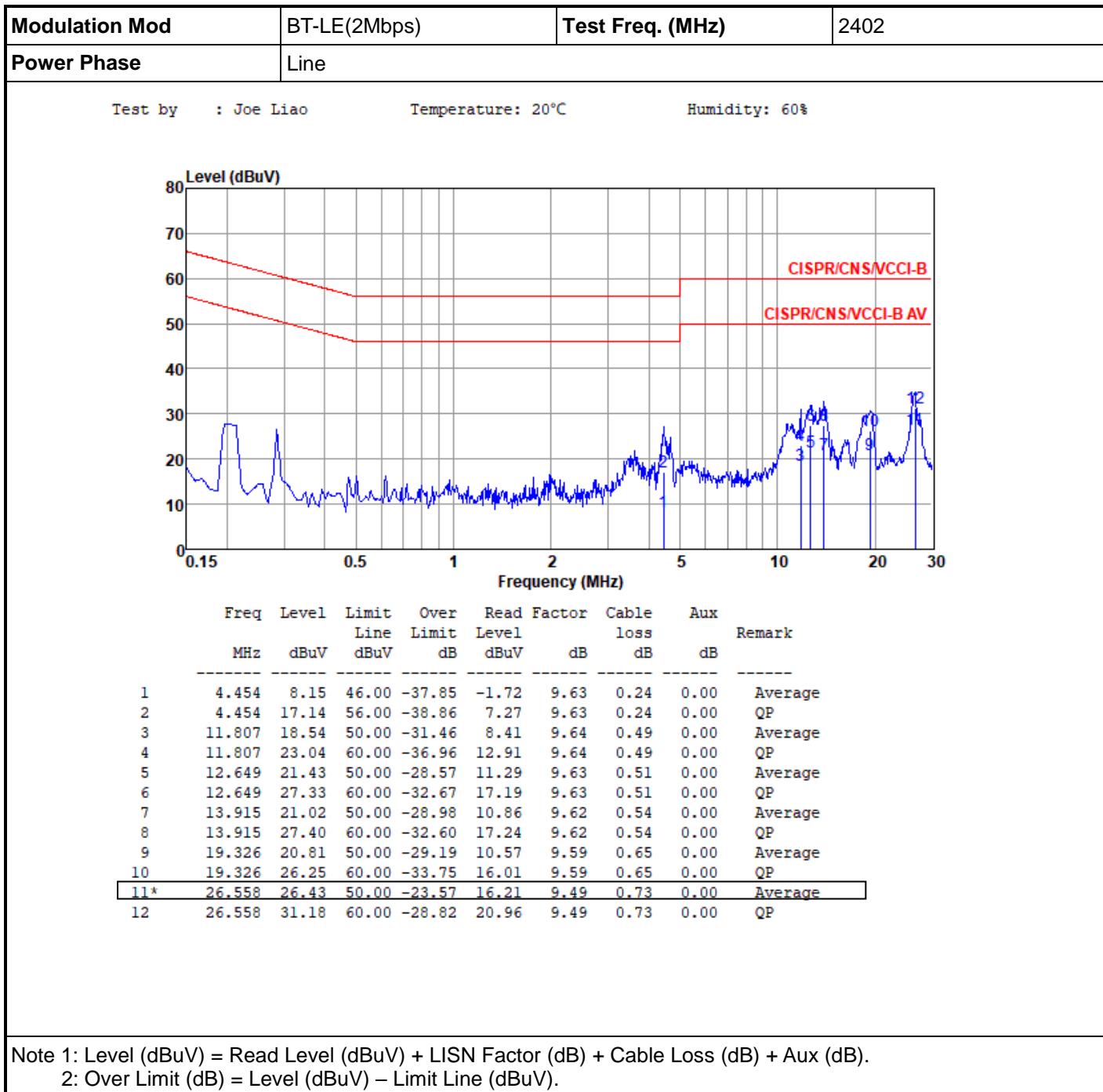
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4	180.66	22.01	43.50	-21.49	32.16	-10.15	Peak	---																																																										
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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor\* (dB/m)

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

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

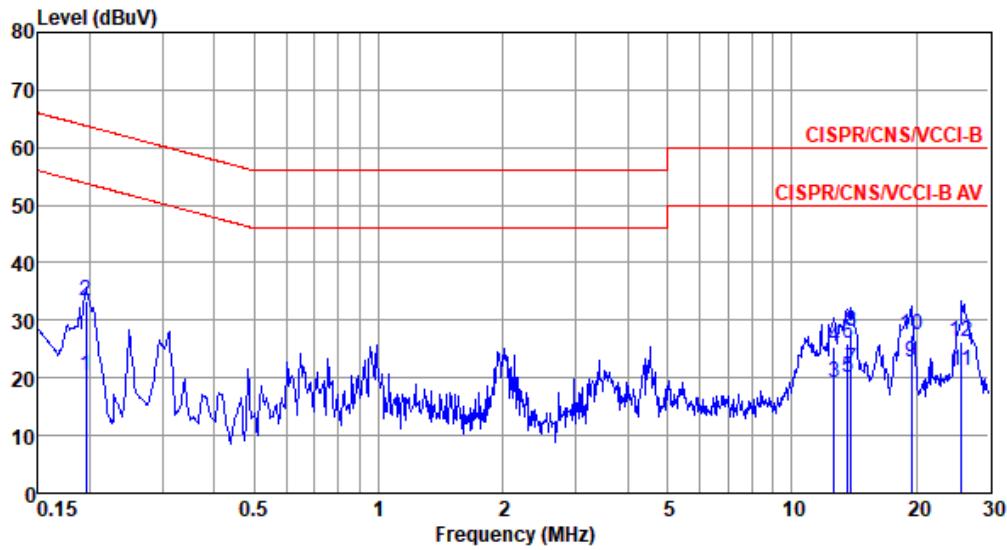
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.





Modulation Mod	BT-LE(2Mbps)	Test Freq. (MHz)	2402
Power Phase	Neutral		

Test by : Joe Liao Temperature: 20°C Humidity: 60%



	Freq	Level	Limit	Over	Read	Factor	Cable	Aux	Remark
	MHz	dBuV	dBuV	Line	Limit	Level	loss	dB	
1	0.195	20.45	53.80	-33.35	10.78	9.59	0.08	0.00	Average
2	0.195	33.45	63.80	-30.35	23.78	9.59	0.08	0.00	QP
3	12.649	19.22	50.00	-30.78	9.05	9.66	0.51	0.00	Average
4	12.649	25.29	60.00	-34.71	15.12	9.66	0.51	0.00	QP
5	13.623	20.13	50.00	-29.87	9.94	9.66	0.53	0.00	Average
6	13.623	26.06	60.00	-33.94	15.87	9.66	0.53	0.00	QP
7	13.915	21.62	50.00	-28.38	11.42	9.66	0.54	0.00	Average
8	13.915	28.06	60.00	-31.94	17.86	9.66	0.54	0.00	QP
9*	19.428	22.61	50.00	-27.39	12.28	9.68	0.65	0.00	Average
10	19.428	27.37	60.00	-32.63	17.04	9.68	0.65	0.00	QP
11	25.727	21.37	50.00	-28.63	11.01	9.66	0.70	0.00	Average
12	25.727	26.23	60.00	-33.77	15.87	9.66	0.70	0.00	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).