



# FCC Test Report

APPLICANT : Bullitt Group  
EQUIPMENT : Rugged Smart Phone  
BRAND NAME : CAT  
MODEL NAME : BM1S1B  
FCC ID : ZL5BM1S1BE  
STANDARD : 47 CFR Part 15 Subpart B  
CLASSIFICATION : Certification  
TEST DATE(S) : Nov. 14, 2022 ~ Dec. 13, 2022

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.

Jason Jia



Approved by: Jason Jia

**Sporton International Inc. (ShenZhen)**

**1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055**

**People's Republic of China**



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### REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC2O1410-01	Rev. 01	Initial issue of report	Jan. 05, 2023



### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 5.70 dB at 0.15 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.40 dB at 63.95 MHz

**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. Applicant

**Bullitt Group**

One Valpy, Valpy Street, Reading, Berkshire, RG1 1AR, United Kingdom

## 1.2. Manufacturer

**Bullitt Mobile Limited**

One Valpy, Valpy Street, Reading, Berkshire, RG1 1AR, United Kingdom

## 1.3. Product Feature of Equipment Under Test

Product Feature	
<b>Equipment</b>	Rugged Smart Phone
<b>Brand Name</b>	CAT
<b>Model Name</b>	BM1S1B
<b>FCC ID</b>	ZL5BM1S1BE
<b>EUT supports Radios application</b>	GSM/WCDMA/LTE/5G NR WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC / WPT / FM / GNSS NTN (Non-Terrestrial Network)
<b>IMEI Code</b>	Conduction: 352089780018861/352089780022343 for Sample 1 352089780000581/352089780002082 for Sample 2 Radiation: 352089780000300/352089780001803 for Sample 1 352089780000664/352089780002165 for Sample 2
<b>EUT Stage</b>	Identical Prototype

**Remark:**

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two samples under test, sample 1 is 1<sup>st</sup> source and sample 2 is 2<sup>nd</sup> source, the detailed differences could be referred to the BM1S1B\_Operational Description of Product Equality Declaration which is exhibit separately. According to the difference, sample 1 perform full test and sample 2 verify the worst case.
3. Dual SIM to Single SIM choose by writing different parameter values to the protection partition of the phone during production.



### 1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
<b>Tx Frequency</b>	<p>GSM850: 824 MHz ~ 849 MHz  GSM1900: 1850MHz ~ 1910MHz  WCDMA Band II: 1850 MHz ~ 1910 MHz  WCDMA Band IV : 1710 MHz ~ 1755 MHz  WCDMA Band V: 824 MHz ~ 849 MHz  LTE Band 2 : 1850 MHz ~ 1910 MHz  LTE Band 4 : 1710 MHz ~ 1755 MHz  LTE Band 5 : 824 MHz ~ 849 MHz  LTE Band 7 : 2500 MHz ~ 2570 MHz  LTE Band 38 : 2570 MHz ~ 2620 MHz  LTE Band 41 : 2496 MHz ~ 2690 MHz  5G NR n2 : 1850 MHz ~ 1910 MHz  5G NR n5 : 824 MHz ~ 849 MHz  5G NR n7 : 2500 MHz ~ 2570 MHz  5G NR n38 : 2570 MHz ~ 2620 MHz  5G NR n41 : 2496 MHz ~ 2690 MHz  5G NR n77 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3980 MHz;  5G NR n78 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3800 MHz;  802.11b/g/n: 2400 MHz ~ 2483.5 MHz  802.11a/n/ac: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz;  5470 MHz ~ 5725 MHz; 5725 MHz ~ 5850 MHz  Bluetooth: 2400 MHz ~ 2483.5 MHz  NFC : 13.56 MHz  NTN Band 23 : 2000 MHz ~ 2020 MHz  NTN Band 255 : 1626.6 MHz ~ 1660 MHz</p>
<b>Rx Frequency</b>	<p>GSM850: 869 MHz ~ 894 MHz  GSM1900: 1930 MHz ~ 1990 MHz  WCDMA Band II: 1930 MHz ~ 1990 MHz  WCDMA Band IV : 2110 MHz ~ 2155 MHz  WCDMA Band V: 869 MHz ~ 894 MHz  LTE Band 2 : 1930 MHz ~ 1990 MHz  LTE Band 4 : 2110 MHz ~ 2155 MHz  LTE Band 5 : 869 MHz ~ 894 MHz  LTE Band 7 : 2620 MHz ~ 2690 MHz  LTE Band 38: 2570 MHz ~ 2620 MHz  LTE Band 41 : 2496 MHz ~ 2690 MHz  5G NR n2 : 1930 MHz ~ 1990 MHz  5G NR n5 : 869 MHz ~ 894 MHz  5G NR n7 : 2620 MHz ~ 2690 MHz  5G NR n38: 2570 MHz ~ 2620 MHz  5G NR n41 : 2496 MHz ~ 2690 MHz  5G NR n77 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3980 MHz;  5G NR n78 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3800 MHz;  802.11b/g/n: 2400 MHz ~ 2483.5 MHz  802.11a/n/ac: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz;  5470 MHz ~ 5725 MHz; 5725 MHz ~ 5850 MHz  Bluetooth: 2400 MHz ~ 2483.5 MHz  NFC : 13.56 MHz  WPT: 110 kHz ~ 148.5 kHz  GNSS : 1559 MHz ~ 1610 MHz  FM : 88 MHz ~ 108 MHz</p>



	NTN Band 23 : 2180 MHz ~ 2200 MHz NTN Band 255 : 1525.1 MHz ~1558.5 MHz
<b>Antenna Type</b>	WWAN : LOOP / IFA Antenna WLAN : IFA Antenna Bluetooth : IFA Antenna GNSS: IFA Antenna NFC: FPC Antenna WPT: FPC Antenna FM : External Earphone Antenna NTN: IFA Antenna
<b>Type of Modulation</b>	GSM/GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : BPSK HSPA : QPSK HSPA+ : 16QAM DC-HSDPA : 64QAM LTE: QPSK / 16QAM / 64QAM 5G NR: DFT-s-OFDM (PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM) CP-OFDM (QPSK / 16QAM / 64QAM / 256QAM) 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n/ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GNSS : BPSK NFC: ASK WPT: ASK FM: FM NTN: BPSK/QPSK

**Note:** The WPT only support receiver function by manufacturer declared.

### 1.5. Modification of EUT

No modifications are made to the EUT during all test items.

### 1.6. Test Location

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

<b>Test Firm</b>	Sporton International Inc. (Shenzhen)		
<b>Test Site Location</b>	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	CO01-SZ	CN1256	421272

<b>Test Firm</b>	Sporton International Inc. (Shenzhen)		
<b>Test Site Location</b>	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103 TEL: +86-755-33202398		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	03CH04-SZ	CN1256	421272

### 1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-SZ	AUDIX	E3	6.2009-8-24
2.	CO01-SZ	AUDIX	E3	6.120613b

### 1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart B
- ANSI C63.4-2014

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.





## 2. Test Configuration of Equipment Under Test

### 2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

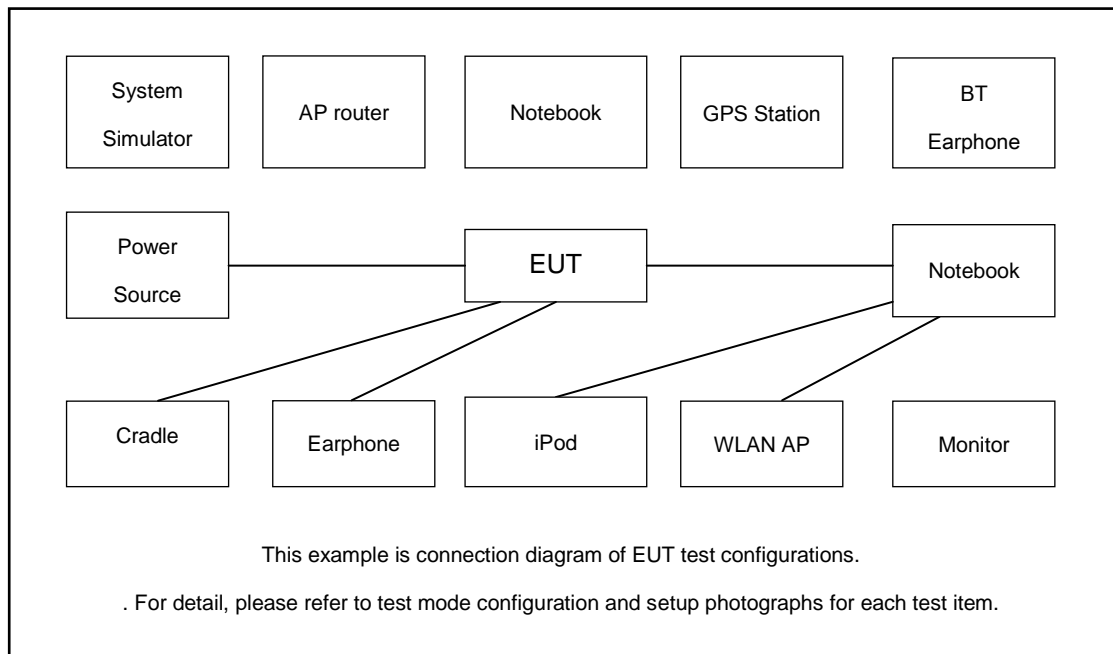
Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: GSM 850 Idle(Middle CH) + USB Cable 1(Charging from Adapter ) + Battery 1 + Camera(Rear) + (SD Card Load) + SIM 1 For Sample 1
	Mode 2: WCDMA Band V Idle(Low CH) + USB Cable 2(Charging from Adapter ) + Battery 1 + Camera(Front) + (SD Card Load) + SIM 1 For Sample 1
	Mode 3: LTE Band 5 Idle(Middle CH) + USB Cable 1 (Data Link with Notebook) EUT (eMMC) to NB)+ Battery 1 + MPEG4( Color Bar ) + (SD Card Load) + SIM 2 For Sample 1
	Mode 4: SA:N41 Idle(High CH) + USB Cable 1(Data Link with Notebook) + NB to EUT (eMMC) + Battery 1 + H-Pattern + (SD Card Load) + SIM 1 For Sample 1
	Mode 5: NSA :ENDC_7A_n5A Idle(Low CH) + USB Cable 1 (Data Link with Notebook) + EUT (SD Card)to NB + Battery 1 + MPEG4 ( Color Bar ) + SD Card Link + SIM 1 For Sample 1
	Mode 6: NTN Band 23 Idle(Middle CH) + USB Cable 1(Data Link with Notebook) NB to EUT (SD Card) + Battery 1 + MPEG4 ( Color Bar ) + SD Card Link + SIM 1 For Sample 1
	Mode 7: NTN Band 255 Idle(Middle CH) + USB Cable 2(Data Link with Notebook) + EUT (eMMC)to NB + Battery 1 + MPEG4 ( Color Bar ) + SD Card Load + SIM 1 For Sample 1
	Mode 8: LTE Band 5 Idle(Middle CH) + Charging from wireless charger + Battery 1 + MPEG4 ( Color Bar ) + SD Card Load + SIM 2 For Sample 1
	Mode 9: LTE Band 5 Idle(Middle CH) + USB Cable 1(Data Link with Notebook) + EUT (eMMC)to NB + Battery 1 + MPEG4 ( Color Bar ) + SD Card Load + SIM 2 For Sample 2



Radiated Emissions	<p>Mode 1: GSM 850 Idle(Middle CH) + USB Cable 1(Charging from Adapter ) + Battery 1 + Camera(Rear) + (SD Card Load) + SIM 1 For Sample 1</p> <p>Mode 2: WCDMA Band V Idle(Low CH) + USB Cable 2(Charging from Adapter ) + Battery 1 + Camera(Front) + (SD Card Load) + SIM 1 For Sample 1</p> <p>Mode 3: LTE Band 5 Idle(Middle CH) + USB Cable 1 (Data Link with Notebook) EUT (eMMC) to NB)+ Battery 1 + MPEG4 ( Color Bar )+ (SD Card Load) + SIM 2 For Sample 1</p> <p>Mode 4: SA:N41 Idle(High CH) + USB Cable 1(Data Link with Notebook) + NB to EUT (eMMC) + Battery 1 + H-Pattern + (SD Card Load) + SIM 1 For Sample 1</p> <p>Mode 5: NSA :ENDC_7A_n5A Idle(Low CH) + USB Cable 1 (Data Link with Notebook) + EUT (SD Card)to NB + Battery 1 + MPEG4 ( Color Bar ) + SD Card Link + SIM 1 For Sample 1</p> <p>Mode 6: NTN Band 23 Idle(Middle CH) + USB Cable 1(Data Link with Notebook) NB to EUT (SD Card) + Battery 1 + MPEG4 ( Color Bar ) + SD Card Link + SIM 1 For Sample 1</p> <p>Mode 7: NTN Band 255 Idle(Middle CH) + USB Cable 2(Data Link with Notebook) + EUT (eMMC)to NB + Battery 1 + MPEG4 ( Color Bar ) + SD Card Load + SIM 1 For Sample 1</p> <p>Mode 8: GSM 850 Idle(Middle CH) + Type C Earphone + Battery 1 + MP3 + SIM 1 For Sample 1</p> <p>Mode 9: SA:N41 Idle(High CH) + Charging from wireless charger + Battery 1 + H-Pattern + SD Card Load + SIM 1 For Sample 1</p> <p>Mode 10 : SA:N41 Idle(High CH) + USB Cable 1(Data Link with Notebook) + NB to EUT (eMMC ) + Battery 1 + H-Pattern + SIM 1 For Sample 2</p> <p>Mode 11 : GSM 850 Idle(Middle CH) + Type C Earphone + Battery 1 + FM(98MHz) Rx + SIM 1 For Sample 1</p>
<p><b>Remark:</b></p> <ol style="list-style-type: none"> <li>1. The worst case of AC is mode 3; only the test data of this mode is reported.</li> <li>2. The worst case of RE is mode 4; only the test data of this mode is reported.</li> <li>3. Data Link with Notebook means data application transferred mode between EUT and Notebook</li> <li>4. Pre-scanned Low/Middle/High channel for GSM 850/WCDMA Band V and FM Rx, the worst channel was recorded in this report.</li> </ol>	

## 2.2. Connection Diagram of Test System



The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application

## 2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station(LTE)	Anritsu	MT8000C	N/A	N/A	Unshielded,1.8m
2.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
3.	Notebook	Honor	Inspiron 15-7570	Fcc DoC	N/A	shielded cable DC O/P 1.8m Unshielded AC I/P cable 1.8m
4.	NOTE BOOK	Lenovo	E540	FCC DoC	N/A	AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m
5.	SD Card	Kingston	3300-10000-078	Fcc DoC	N/A	N/A
6.	lopd	apple	MC69029/A	N/A	N/A	lopd
7.	IPod	Apple	MC525 ZP/A	Fcc DoC	N/A	Shielded, 1.0m
8.	Base Station(LTE)	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
9.	Base Station(LTE)	Anritsu	MT8821C	N/A	N/A	Unshielded,1.8m
10.	Base Station(5G)	Anritsu	MT8000A	N/A	N/A	Unshielded,1.8m
11	WLAN AP	ASUSTek	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,2.7m
12	WPT Charger	Xiaomi	N/A	N/A	N/A	N/A



## **2.4. EUT Operation Test Setup**

The EUT was in GSM or WCDMA or LTE or 5G NR idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Data application is transferred between notebook and EUT via USB cable.
2. Turn on camera to capture images.
3. Turn on MPEG4 function.
4. Execute "Music Player" to play MP3 file.
5. Execute "H Pattern" to show H Pattern via USB Cable on the Notebook.
6. Turn on FM function to make the EUT receive continuous signals from FM station.
7. Wireless charging from the WPT Charger.
8. NTN band Idle with base-station.

### 3. Test Result

#### 3.1. Test of AC Conducted Emission Measurement

##### 3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

<Class B Limit>

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

##### 3.1.3 Test Procedure

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

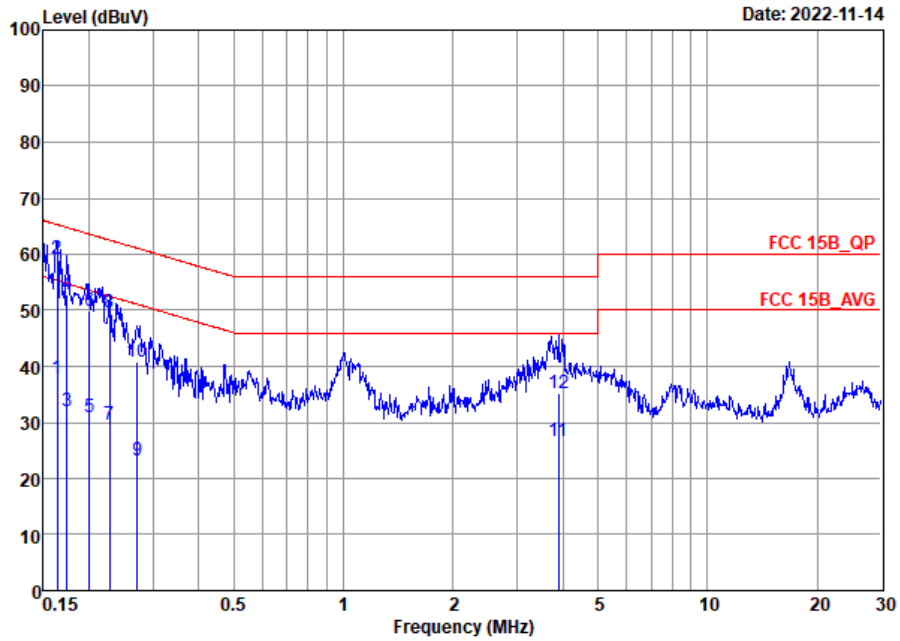
### 3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Engineer :	Lily Qiu	Temperature :	21~24°C
		Relative Humidity :	39~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

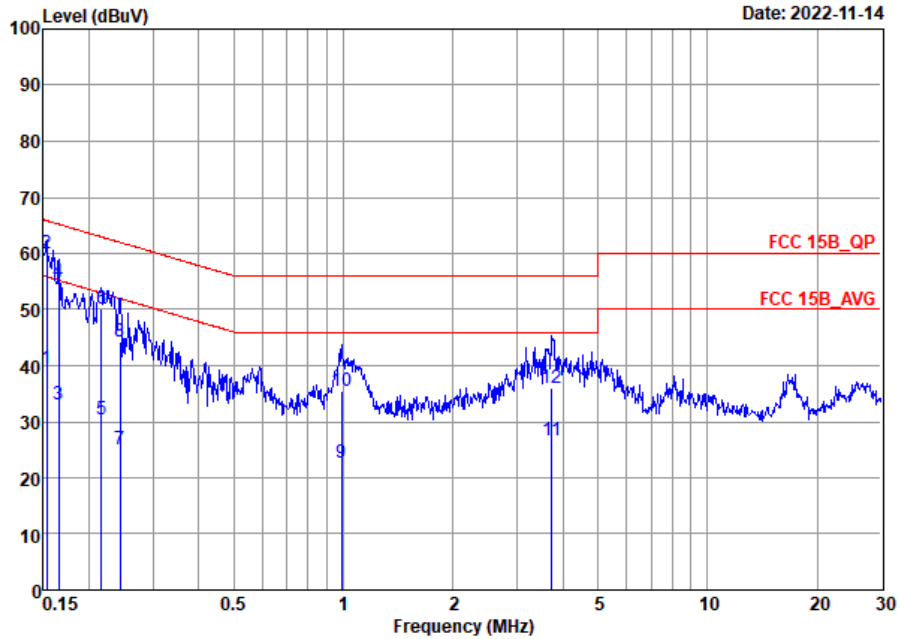


Site : CO01-SZ  
 Condition: FCC 15B\_QP LISN\_20220811\_ L LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	37.95	-17.35	55.30	17.10	10.20	10.65	Average
2 *	0.16	59.15	-6.15	65.30	38.30	10.20	10.65	QP
3	0.17	31.89	-22.88	54.77	11.20	10.20	10.49	Average
4	0.17	52.89	-11.88	64.77	32.20	10.20	10.49	QP
5	0.20	30.86	-22.72	53.58	10.49	10.20	10.17	Average
6	0.20	49.96	-13.62	63.58	29.59	10.20	10.17	QP
7	0.23	29.48	-23.04	52.52	8.90	10.19	10.39	Average
8	0.23	49.58	-12.94	62.52	29.00	10.19	10.39	QP
9	0.27	23.10	-27.97	51.07	2.20	10.17	10.73	Average
10	0.27	40.70	-20.37	61.07	19.80	10.17	10.73	QP
11	3.90	26.65	-19.35	46.00	6.40	10.01	10.24	Average
12	3.90	35.15	-20.85	56.00	14.90	10.01	10.24	QP



Test Engineer :	Lily Qiu	Temperature :	21~24°C
		Relative Humidity :	39~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ  
 Condition: FCC 15B\_QP LISN\_20220811\_ N NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	39.42	-16.40	55.82	18.30	10.31	10.81	Average
2 *	0.15	60.12	-5.70	65.82	39.00	10.31	10.81	QP
3	0.17	33.02	-22.19	55.21	12.10	10.31	10.61	Average
4	0.17	54.92	-10.29	65.21	34.00	10.31	10.61	QP
5	0.22	30.37	-22.59	52.96	9.80	10.27	10.30	Average
6	0.22	50.17	-12.79	62.96	29.60	10.27	10.30	QP
7	0.24	25.17	-26.83	52.00	4.41	10.25	10.51	Average
8	0.24	44.37	-17.63	62.00	23.61	10.25	10.51	QP
9	0.99	22.68	-23.32	46.00	2.20	10.21	10.27	Average
10	0.99	35.48	-20.52	56.00	15.00	10.21	10.27	QP
11	3.74	26.69	-19.31	46.00	6.30	10.15	10.24	Average
12	3.74	35.89	-20.11	56.00	15.50	10.15	10.24	QP

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)





### 3.2. Test of Radiated Emission Measurement

#### 3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

#### 3.2.2. Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

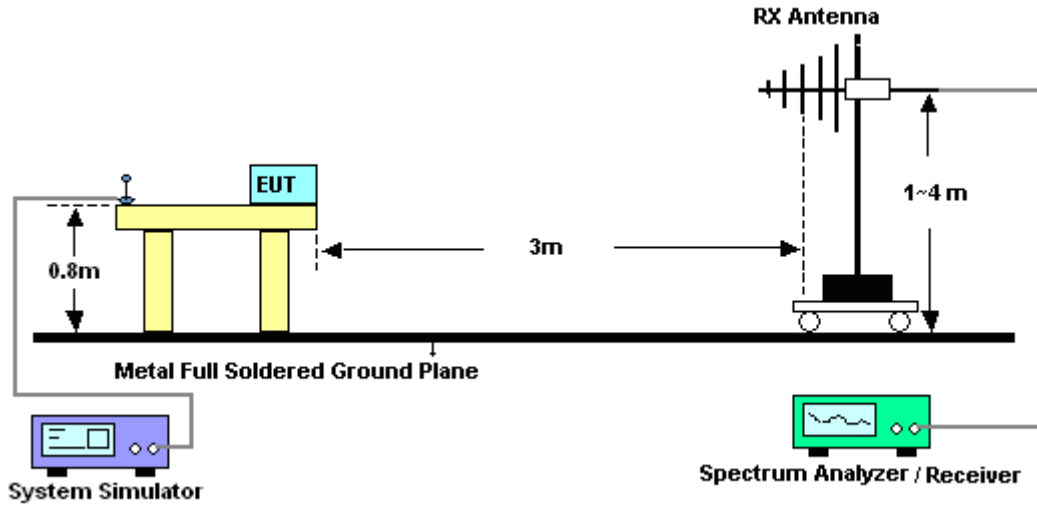


### **3.2.3. Test Procedures**

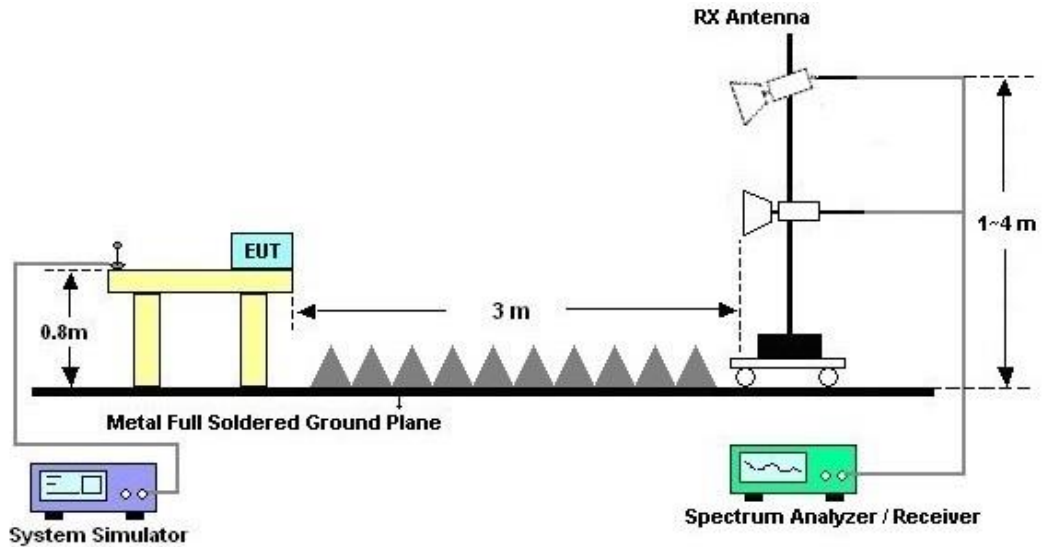
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
10. Exploratory radiated emissions testing of handheld and/or body-worn devices shall include rotation of the EUT through three orthogonal axes (X/Y/Z Plane) to determine the orientation (attitude) that maximizes the emissions.

### 3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



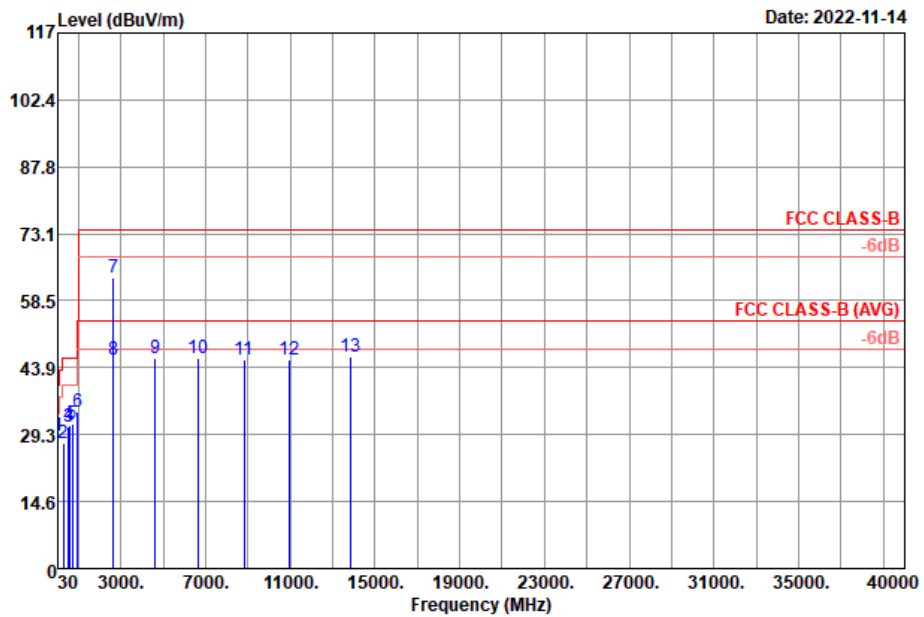
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Engineer :	Zhicheng Li	Temperature :	24~25°C
		Relative Humidity :	48~49%
Test Distance :	3m	Polarization :	Horizontal
Remark :	#7 is system simulator signal which can be ignored.		

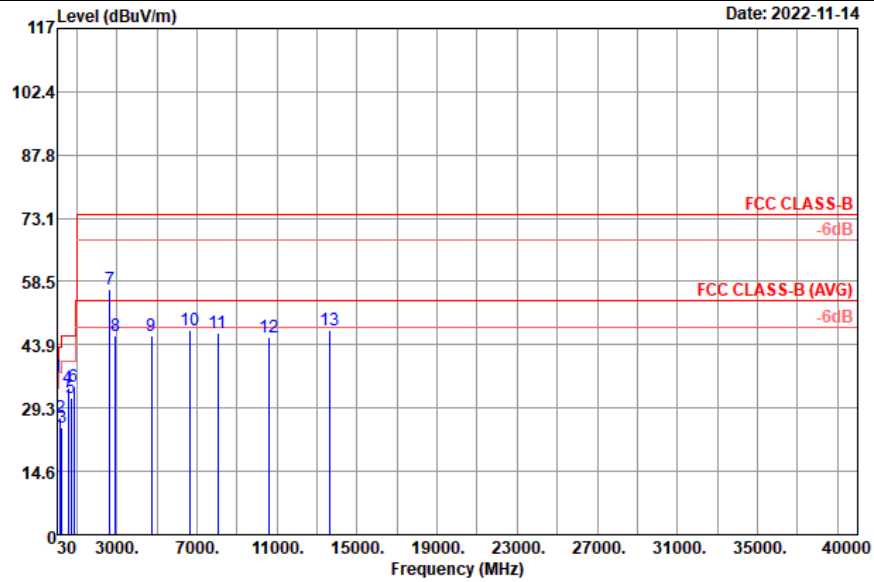


Site : 03CH04-SZ  
 Condition : FCC CLASS-B 3m LF\_ANT\_41909\_22 HORIZONTAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	63.95	29.11	-10.89	40.00	48.07	12.24	0.80	32.00	---	---	Peak
2	293.84	27.39	-18.61	46.00	36.94	19.78	1.78	31.11	---	---	Peak
3	529.55	31.05	-14.95	46.00	34.26	25.24	2.41	30.86	---	---	Peak
4	588.72	31.27	-14.73	46.00	33.42	26.29	2.54	30.98	---	---	Peak
5	728.40	31.67	-14.33	46.00	32.05	27.71	2.81	30.90	---	---	Peak
6	978.66	34.11	-19.89	54.00	30.91	30.55	3.28	30.63	---	---	Peak
7 *	2640.00	63.40			63.64	28.01	5.62	33.87	---	---	Peak
8	2658.00	45.73	-28.27	74.00	45.92	28.03	5.65	33.87	---	---	Peak
9	4646.00	46.01	-27.99	74.00	39.87	31.26	8.15	33.27	---	---	Peak
10	6674.00	45.90	-28.10	74.00	33.39	35.12	10.96	33.57	---	---	Peak
11	8820.00	45.71	-28.29	74.00	30.73	37.16	11.05	33.23	---	---	Peak
12	10944.00	45.60	-28.40	74.00	26.42	39.82	12.48	33.12	---	---	Peak
13	13877.00	46.34	-27.66	74.00	25.42	41.32	13.83	34.23	---	---	Peak



Test Engineer :	Zhicheng Li	Temperature :	24~25°C
		Relative Humidity :	48~49%
Test Distance :	3m	Polarization :	Vertical
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH04-SZ  
 Condition : FCC CLASS-B 3m LF\_ANT\_41909\_22 VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 *	63.95	36.60	-3.40	40.00	55.56	12.24	0.80	32.00	---	---	Peak
2	182.29	26.96	-16.54	43.50	41.13	15.79	1.38	31.34	---	---	Peak
3	263.77	24.79	-21.21	46.00	35.26	19.01	1.69	31.17	---	---	Peak
4	566.41	33.82	-12.18	46.00	36.16	26.10	2.49	30.93	---	---	Peak
5	720.64	31.65	-14.35	46.00	32.34	27.41	2.80	30.90	---	---	Peak
6	870.99	34.19	-11.81	46.00	33.10	29.03	3.10	31.04	---	---	Peak
7	2640.00	56.80			57.04	28.01	5.62	33.87	---	---	Peak
8	2952.00	46.01	-27.99	74.00	45.63	28.26	5.93	33.81	---	---	Peak
9	4730.00	46.05	-27.95	74.00	38.98	31.41	8.79	33.13	---	---	Peak
10	6654.00	47.15	-26.85	74.00	34.69	35.07	10.96	33.57	---	---	Peak
11	8062.00	46.60	-27.40	74.00	31.79	37.01	10.99	33.19	---	---	Peak
12	10588.00	45.48	-28.52	74.00	27.19	39.32	12.23	33.26	---	---	Peak
13	13604.00	47.26	-26.74	74.00	26.45	40.69	13.75	33.63	---	---	Peak

Note:

- Level(dBμV/m) = Read Level(dBμV) + Antenna Factor(dB/m) + Cable Loss(dB) - Preamp Factor(dB)
- Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)



## 4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Oct. 19,2022	Nov. 14, 2022~ Dec. 08, 2022	Oct. 18,2023	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 07. 2022	Nov. 14, 2022~ Dec. 08, 2022	Jul. 06, 2023	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	Apr. 27,2022	Nov. 14, 2022~ Dec. 08, 2022	Apr. 27,2023	Radiation (03CH04-SZ)
LF Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 19,2022	Nov. 14, 2022~ Dec. 08, 2022	Oct. 18,2023	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1474	1GHz~18GHz	Jul. 07. 2022	Nov. 14, 2022~ Dec. 08, 2022	Jul. 06, 2023	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1943528	1GHz~18GHz	Oct. 19,2022	Nov. 14, 2022~ Dec. 08, 2022	Oct. 18,2023	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-H G	1871923	18GHz~40GHz	Jul. 06,2022	Nov. 14, 2022~ Dec. 08, 2022	Jul. 05,2023	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Jul. 07. 2022	Nov. 14, 2022~ Dec. 08, 2022	Jul. 06, 2023	Radiation (03CH04-SZ)
AC Power Source	APC	AFV-S-600B	F119050019	N/A	Nov.10.2022	Nov. 14, 2022~ Dec. 08, 2022	Nov.10.2023	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Nov. 14, 2022~ Dec. 08, 2022	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Nov. 14, 2022~ Dec. 08, 2022	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 07, 2022	Nov. 14, 2022~ Dec. 13, 2022	Jul. 06 2023	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Sept. 15, 2022	Nov. 14, 2022~ Dec. 13, 2022	Sept. 14, 2023	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 17, 2022	Nov. 14, 2022~ Dec. 13, 2022	Oct. 16, 2023	Conduction (CO01-SZ)

NCR: No Calibration Required



## 5. Uncertainty of Evaluation

### Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.2dB
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.1dB
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.8dB
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### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.1dB
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