



FCC Test Report

APPLICANT : Bullitt Group
EQUIPMENT : Rugged Smart Phone
BRAND NAME : CAT
MODEL NAME : S42
FCC ID : ZL5S42E
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on Dec. 23, 2019 and testing was completed on Feb. 16, 2020. We, Sporton International (Shenzhen) Inc., 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 (Shenzhen) Inc., the test report shall not be reproduced except in full.

Reviewed by: Derreck Chen / Supervisor

Approved by: Eric Shih / Manager



Sporton International (Shenzhen) Inc.

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen, 518055
People's Republic of China



TABLE OF CONTENTS

REVISION HISTORY..... 3

SUMMARY OF TEST RESULT 4

1. GENERAL DESCRIPTION 5

 1.1. Applicant..... 5

 1.2. Manufacturer 5

 1.3. Product Feature of Equipment Under Test 5

 1.4. Product Specification of Equipment Under Test 6

 1.5. Modification of EUT 7

 1.6. Test Location 7

 1.7. Test Software 7

 1.8. Applicable Standards 8

2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST 9

 2.1. Test Mode 9

 2.2. Connection Diagram of Test System 11

 2.3. Support Unit used in test configuration and system 12

 2.4. EUT Operation Test Setup 13

3. TEST RESULT 14

 3.1. Test of AC Conducted Emission Measurement 14

 3.2. Test of Radiated Emission Measurement 18

4. LIST OF MEASURING EQUIPMENT 23

5. UNCERTAINTY OF EVALUATION 24

APPENDIX A. SETUP PHOTOGRAPHS



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC9D2309-01	Rev. 01	Initial issue of report	Apr. 30, 2020



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 3.83 dB at 0.500 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.30 dB at 256.010 MHz for Quasi-Peak

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, England RG1 1AR

1.2. Manufacturer

Bullitt Group

One Valpy, Valpy Street, Reading, Berkshire, England RG1 1AR

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Rugged Smart Phone
Brand Name	CAT
Model Name	S42
FCC ID	ZL5S42E
EUT supports Radios application	GSM/WCDMA/LTE/NFC WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE GNSS/ FM Receiver
IMEI Code	Conduction: 354401110003003/354401110010008 Radiation: 354401110002591/354401110009596
EUT Stage	Production Unit

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 type of EUT, the difference is the SIM slot, the others are the same, so we choose the dual sim slots for full test.



1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 7 : 2622.5 MHz ~ 2687.5 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz GNSS : 1559 MHz ~ 1610 MHz NFC : 13.56 MHz FM : 88 MHz ~ 108 MHz
Antenna Type	WWAN : LDS Antenna WLAN : IFA Antenna Bluetooth : IFA Antenna GNSS: IFA Antenna NFC : LOOP Antenna FM : External Earphone Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : BPSK HSDPA/DC-HSDPA : QPSK HSUPA : QPSK HSPA+ : 16QAM DC-HSDPA : 64QAM LTE: QPSK / 16QAM / 64QAM 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 FM: FM
--	--

1.5. Modification of EUT

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

1.6. Test Location

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

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	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		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-SZ	CN1256	421272

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan Shenzhen, 518055 People's Republic of China TEL: +86-755-33202398		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH01-SZ	CN1256	421272

1.7. Test Software

Item	Site	Manufacture	Name	Version
1.	03CH01-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.

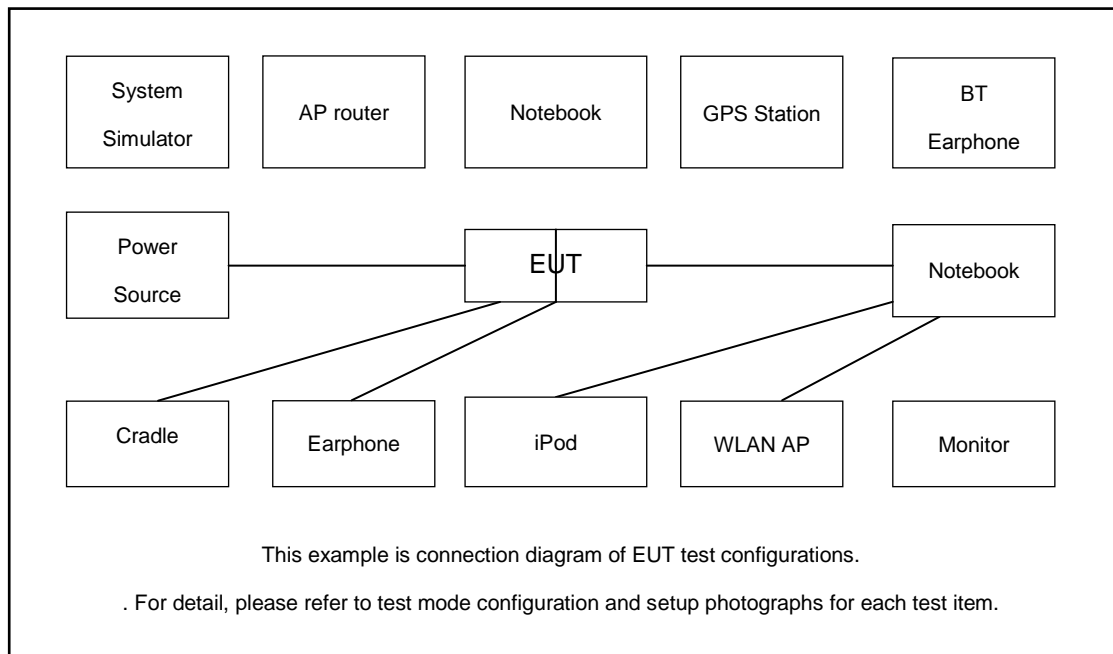
Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1 : GSM 850 Idle(Middle CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + Camera(Rear) + SD Card Load for SIM 1
	Mode 2 : GSM 1900 Idle(Middle CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + Camera(Front) + SD Card Load for SIM 2
	Mode 3 : WCDMA Band II Idle(Low CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + MPEG4(Colour bar) + SD Card Link for SIM 1
	Mode 4 : WCDMA Band IV Idle(Low CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + NFC On + SD Card Load for SIM 2
	Mode 5 : LTE Band 2 Idle(High CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + GNSS RX + SD Card Load for SIM 1
	Mode 6 : LTE Band 4 Idle(Middle CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + H-Pattern + SD Card Load for SIM 2
	Mode 7 : LTE Band 5 Idle(High CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + FM Rx(98MHz) + SD Card Load for SIM 1
	Mode 8 : LTE Band 7 Idle(Low CH) + USB Cable 1(Charging from Adapter) + Earphone 2 + Battery + BT Idle + WLAN Idle(5G) + FM Rx(98MHz) + SD Card Load for SIM 2
	Mode 9 : WCDMA Band IV Idle(Low CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + NFC On + SD Card Load for SIM 1
	Mode 10 : GSM 850 Idle(Middle CH) + USB Cable 1(Data Link with Notebook) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + SD Card Link for SIM 1
	Mode 11 : GSM 850 Idle(Middle CH) + USB Cable 2(Data Link with Notebook) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + SD Card Link for SIM 1



Radiated Emissions	<p>Mode 1 : GSM 850 Idle(Middle CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + Camera(Rear) + SD Card Load for SIM 1</p> <p>Mode 2 : GSM 1900 Idle(Middle CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + Camera(Front) + SD Card Load for SIM 2</p> <p>Mode 3 : WCDMA Band II Idle(Low CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + MPEG4(Colour bar) + SD Card Link for SIM 1</p> <p>Mode 4 : WCDMA Band IV Idle(Low CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + NFC On + SD Card Load for SIM 2</p> <p>Mode 5 : LTE Band 2 Idle(High CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + GNSS RX + SD Card Load for SIM 1</p> <p>Mode 6 : LTE Band 4 Idle(Middle CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + H-Pattern + SD Card Load for SIM 2</p> <p>Mode 7 : LTE Band 5 Idle(High CH) + USB Cable 1(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + FM Rx(98MHz) + SD Card Load for SIM 1</p> <p>Mode 8 : LTE Band 7 Idle(Low CH) + USB Cable 1(Charging from Adapter) + Earphone 2 + Battery + BT Idle + WLAN Idle(5G) + FM Rx(98MHz) + SD Card Load for SIM 2</p> <p>Mode 9 : LTE Band 5 Idle(High CH) + USB Cable 2(Charging from Adapter) + Earphone 1 + Battery + BT Idle + WLAN Idle(5G) + NFC On + SD Card Load for SIM 1</p> <p>Mode 10 : GSM 850 Idle(Middle CH) + USB Cable 1(Data Link with Notebook) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + SD Card Link for SIM 1</p> <p>Mode 11 : GSM 850 Idle(Middle CH) + USB Cable 2(Data Link with Notebook) + Earphone 1 + Battery + BT Idle + WLAN Idle(2.4G) + SD Card Link for SIM 1</p>
Remark:	
<ol style="list-style-type: none"> 1. The worst case of AC is mode 4; only the test data of this mode is reported. 2. The worst case of RE is mode 11; only the test data of this mode is reported. 3. Data Link with Notebook means data application transferred mode between EUT and Notebook. 4. Pre-scanned Low/Middle/High channel for GSM 850/1900/WCDMA Band II/IV/LTE Band 2/4/5/7 and FM Rx, the worst channel was recorded in this report. 	

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	Anritsu	MT8820C	N/A	N/A	Shielded, 1.5m
2.	LABSAT GPS Simulator	RACELOGIC	RLLS03-2P	N/A	N/A	Unshielded,1.8m
3.	Labsat	RACELOGIC	18645	N/A	N/A	Unshielded,1.8m
4.	Bluetooth Earphone	Samsung	EO-MG900	N/A	N/A	N/A
5.	WLAN AP	D-Link	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
6.	FM Station	R&S	SMB100A	N/A	N/A	Unshielded,1.8m
7.	WLAN AP	ASUSTek	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,2.7m with Core
8.	Notebook	Lenovo	E540	Fcc DoC	N/A	shielded cable DC O/P 1.8m Unshielded AC I/P cable 1.8m
9.	IPod	apple	MC69029/A	Fcc DoC	Shielded, 1.0m	N/A
10.	Earphone	apple		DCAY1V-A9007ZJW3-000	N/A	N/A
11.	SD Card	N/A	MicroSD HC	FCC DoC	N/A	N/A
12.	SD Card	Kingston	3300-10000-078	Fcc DoC	N/A	SD Card



2.4. EUT Operation Test Setup

The EUT was in GSM or CDMA 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 Bluetooth earphone or 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 GNSS function to make the EUT receive continuous signals from GNSS station.
3. Turn on camera to capture images.
4. Turn on MPEG4 function.
5. Turn on FM function.
6. Turn on NFC function.



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.

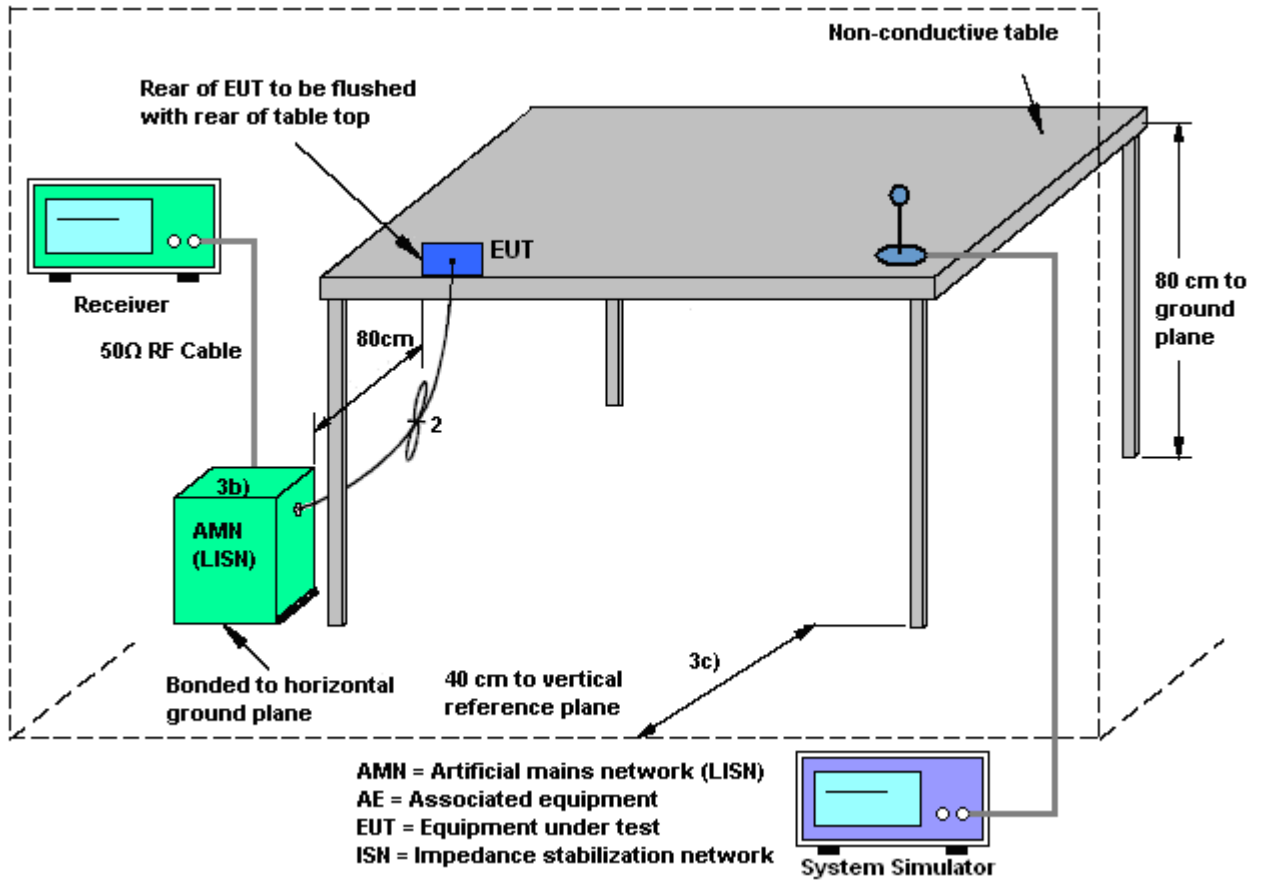
3.1.2 Measuring Instruments

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.

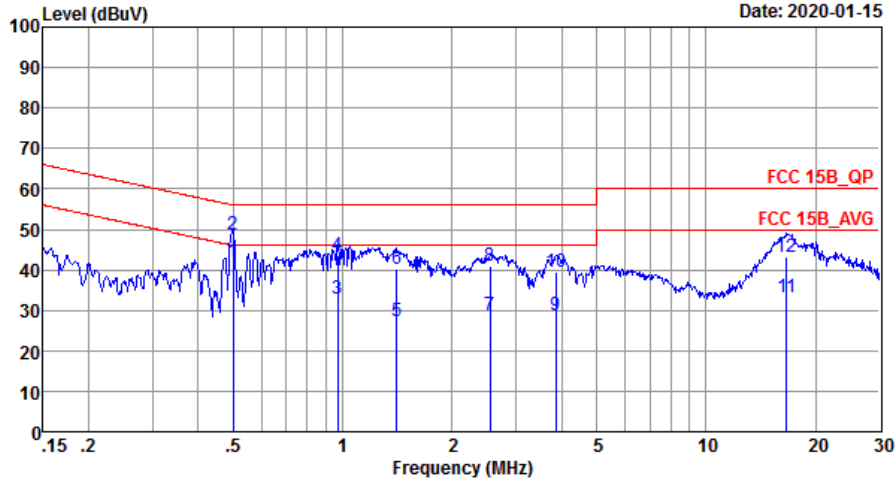
3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Engineer :	LiuDaLin	Temperature :	22~25°C
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

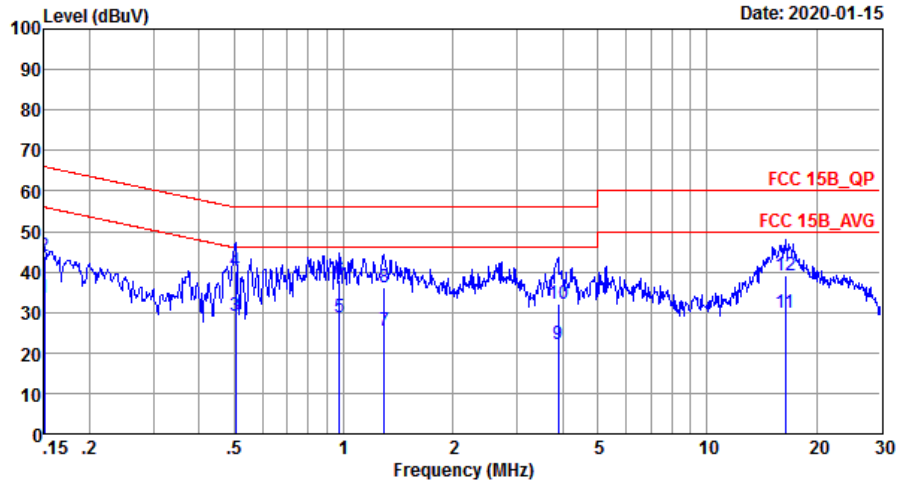


Site : CO01-SZ
 Condition: FCC 15B_QP LISN_20190719_L LINE
 Project : 9D2309-01
 Mode : mode 4
 IMEI : 354401110003003/354401110010008

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.50	42.18	-3.83	46.01	32.10	0.02	10.06	Average
2	0.50	48.88	-7.13	56.01	38.80	0.02	10.06	QP
3	0.97	32.82	-13.18	46.00	22.70	0.07	10.05	Average
4	0.97	43.62	-12.38	56.00	33.50	0.07	10.05	QP
5	1.41	27.14	-18.86	46.00	17.00	0.09	10.05	Average
6	1.41	40.14	-15.86	56.00	30.00	0.09	10.05	QP
7	2.54	28.81	-17.19	46.00	18.60	0.14	10.07	Average
8	2.54	41.01	-14.99	56.00	30.80	0.14	10.07	QP
9	3.86	28.80	-17.20	46.00	18.51	0.17	10.12	Average
10	3.86	39.30	-16.70	56.00	29.01	0.17	10.12	QP
11	16.66	33.27	-16.73	50.00	22.20	0.78	10.29	Average
12	16.66	43.17	-16.83	60.00	32.10	0.78	10.29	QP



Test Engineer :	LiuDaLin	Temperature :	22~25°C
		Relative Humidity :	50~55%
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_20190719_N NEUTRAL
 Project : 9D2309-01
 Mode : mode 4
 IMEI : 354401110003003/354401110010008

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	33.64	-22.36	56.00	23.60	0.03	10.01	Average
2	0.15	44.04	-21.96	66.00	34.00	0.03	10.01	QP
3	0.50	29.08	-16.92	46.00	19.00	0.02	10.06	Average
4 *	0.50	40.08	-15.92	56.00	30.00	0.02	10.06	QP
5	0.97	28.90	-17.10	46.00	18.80	0.05	10.05	Average
6	0.97	37.90	-18.10	56.00	27.80	0.05	10.05	QP
7	1.30	25.40	-20.60	46.00	15.30	0.05	10.05	Average
8	1.30	36.30	-19.70	56.00	26.20	0.05	10.05	QP
9	3.90	22.18	-23.82	46.00	12.00	0.05	10.13	Average
10	3.90	31.98	-24.02	56.00	21.80	0.05	10.13	QP
11	16.40	29.80	-20.20	50.00	19.10	0.41	10.29	Average
12	16.40	39.30	-20.70	60.00	28.60	0.41	10.29	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.

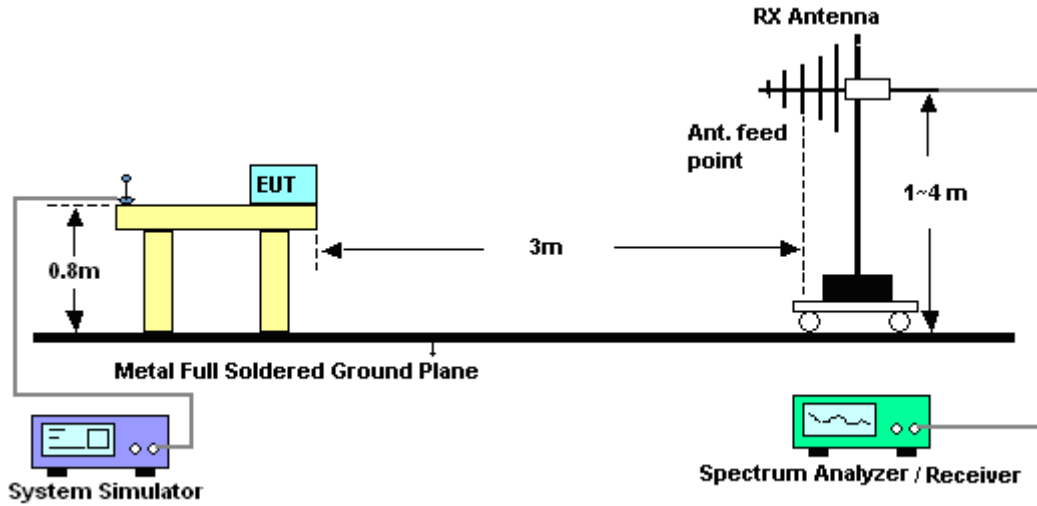


3.2.3. Test Procedures

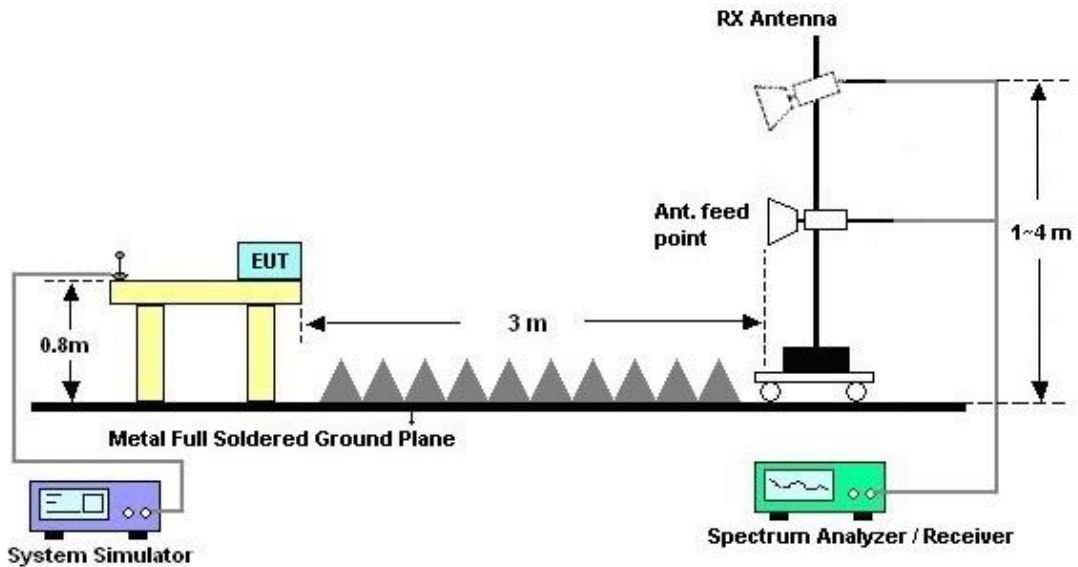
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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 μ V/m) = 20 log Emission level (μ V/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



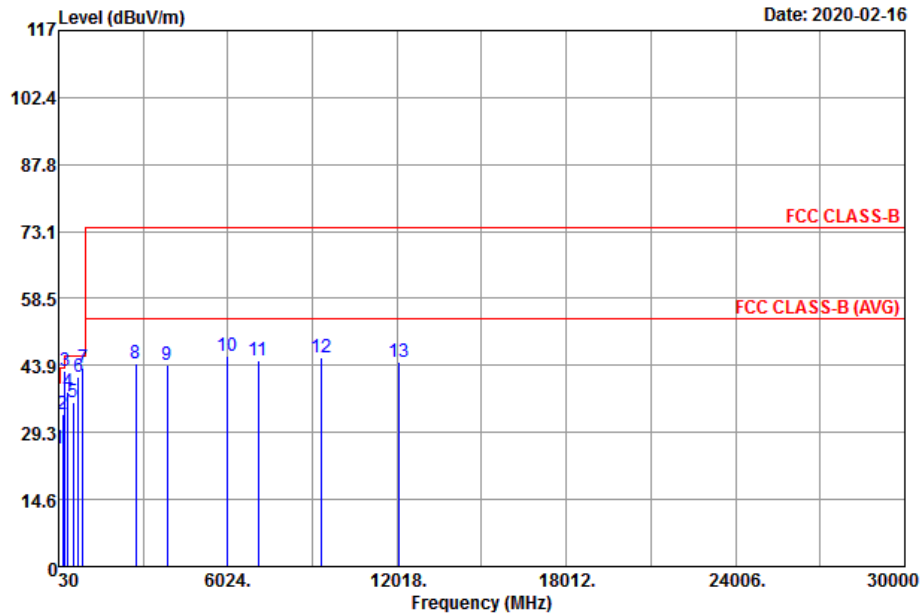
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

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

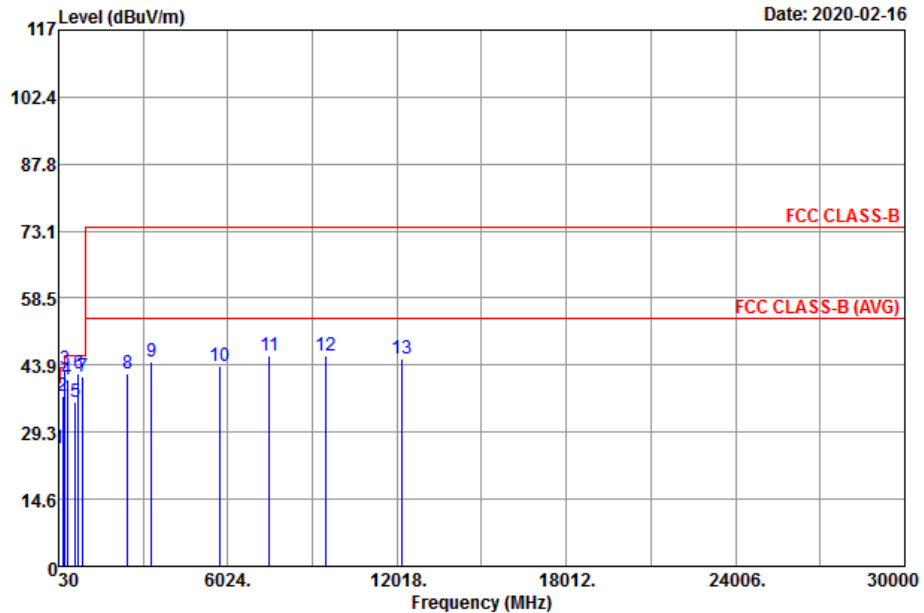


Site : 03CH01-SZ
 Condition : FCC CLASS-B 3m LF_ANT(35408)_2019 HORIZONTAL
 Project : 9D2309-01
 Mode : Mode 11
 IMEI : 354401110002591/354401110009596
 USB Cable 2 : #17
 : NB To EUT

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.97	25.62	-14.38	40.00	31.54	24.35	1.03	31.30	---	---	Peak
2	163.86	33.11	-10.39	43.50	46.07	16.08	2.33	31.37	---	---	Peak
3	256.01	42.70	-3.30	46.00	52.17	19.30	2.89	31.66	124	112	QP
4	347.19	37.98	-8.02	46.00	45.45	20.48	3.36	31.31	---	---	Peak
5	535.37	35.88	-10.12	46.00	38.80	24.19	4.16	31.27	---	---	Peak
6	719.67	41.24	-4.76	46.00	42.41	25.50	4.81	31.48	---	---	Peak
7	881.66	43.33			42.76	26.70	5.33	31.46	---	---	Peak
8	2776.00	44.28	-29.72	74.00	62.27	32.00	7.48	57.47	---	---	Peak
9	3876.00	44.00	-30.00	74.00	57.49	33.43	10.03	56.95	---	---	Peak
10	6008.00	46.10	-27.90	74.00	55.98	34.51	13.23	57.62	142	124	Peak
11	7100.00	44.87	-29.13	74.00	54.46	35.09	14.16	58.84	---	---	Peak
12	9344.00	45.63	-28.37	74.00	55.43	36.34	13.00	59.14	---	---	Peak
13	12078.00	44.63	-29.37	74.00	48.36	38.52	15.01	57.26	---	---	Peak



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



Site : 03CH01-SZ
 Condition : FCC CLASS-B 3m LF_ANT(35408)_2019 VERTICAL
 Project : 9D2309-01
 Mode : Mode 11
 IMEI : 354401110002591/354401110009596
 USB Cable 2 : #17
 : NB To EUT

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	cm	deg	
			dB	dBuV/m	dBuV	dB/m	dB	dB			
1	30.00	25.75	-14.25	40.00	31.14	24.90	1.01	31.30	---	---	Peak
2	163.86	37.18	-6.32	43.50	50.14	16.08	2.33	31.37	---	---	Peak
3	257.95	42.97	-3.03	46.00	52.22	19.50	2.90	31.65	---	---	Peak
4	346.22	40.67	-5.33	46.00	48.19	20.44	3.35	31.31	---	---	Peak
5	627.52	35.97	-10.03	46.00	37.67	25.27	4.52	31.49	---	---	Peak
6	719.67	42.11	-3.89	46.00	43.28	25.50	4.81	31.48	263	315	QP
7	881.66	41.38			40.81	26.70	5.33	31.46	---	---	Peak
8	2478.00	41.91	-32.09	74.00	60.81	31.86	6.91	57.67	---	---	Peak
9	3312.00	44.61	-29.39	74.00	59.77	32.84	9.18	57.18	---	---	Peak
10	5752.00	43.59	-30.41	74.00	54.09	34.45	12.65	57.60	---	---	Peak
11	7504.00	46.05	-27.95	74.00	56.32	35.80	12.93	59.00	100	142	Peak
12	9510.00	45.89	-28.11	74.00	55.63	36.41	13.06	59.21	---	---	Peak
13	12184.00	45.41	-28.59	74.00	49.17	38.54	15.03	57.33	---	---	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 Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 26, 2019	Jan. 15, 2020	Dec. 25, 2020	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Oct. 17, 2019	Jan. 15, 2020	Oct. 16, 2020	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Dec. 26, 2019	Jan. 15, 2020	Dec. 25, 2020	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 23, 2019	Jan. 15, 2020	Jul. 22, 2020	Conduction (CO01-SZ)
EMI Test Receiver&SA	Agilent	N9038A	MY52260185	20Hz~26.5GHz	Jul. 22, 2019	Feb. 16, 2020	Jul. 21, 2020	Radiation (03CH01-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Apr. 18, 2019	Feb. 16, 2020	Apr. 17, 2020	Radiation (03CH01-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270104	0.5GHz~26.5GHz	Dec. 27, 2019	Feb. 16, 2020	Dec. 26, 2020	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz~2GHz	Jul. 19, 2019	Feb. 16, 2020	Jul. 18, 2020	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Aug. 27, 2019	Feb. 16, 2020	Aug. 26, 2020	Radiation (03CH01-SZ)
LF Amplifier	Burgeon	BPA-530	102209	0.01~3000Mhz	Apr. 19, 2019	Feb. 16, 2020	Apr. 18, 2020	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 18,2019	Feb. 16, 2020	Oct. 17,2020	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 22. 2019	Feb. 16, 2020	Jul. 21. 2020	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz~40GHz	Apr.18, 2019	Feb. 16, 2020	Apr. 17, 2020	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Feb. 16, 2020	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Feb. 16, 2020	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Feb. 16, 2020	NCR	Radiation (03CH01-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% ($U = 2Uc(y)$)	2.8dB
---	-------

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.8dB
---	-------

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0dB
---	-------

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.3dB
---	-------