



FCC Test Report

APPLICANT : Bullitt Group
EQUIPMENT : Rugged Smart Phone
BRAND NAME : CAT
MODEL NAME : S42
FCC ID : ZL5S42
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on May 22, 2020 and testing was completed on Jun. 04, 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 8

 1.7. Test Software 8

 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 12

3. TEST RESULT 13

 3.1. Test of AC Conducted Emission Measurement 13

 3.2. Test of Radiated Emission Measurement 17

4. LIST OF MEASURING EQUIPMENT 21

5. UNCERTAINTY OF EVALUATION 22

APPENDIX A. SETUP PHOTOGRAPHS



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 3.22 dB at 0.500 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 4.12 dB at 163.860 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	ZL5S42
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: 359145660001926/359145660005927 Radiation: 359145660002965/359145660006966
HW Version	V1.0
SW Version	LTE_C01091.10_NE_S42G_0.030.00
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



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 LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz LTE Band 14 : 790.5 MHz ~ 795.5 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz LTE Band 25 : 1850.7 MHz ~ 1914.3 MHz LTE Band 26 : 814.7 MHz ~ 848.3 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 1710.7 MHz ~ 1779.3 MHz LTE Band 71: 665.5 MHz ~ 695.5MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 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 LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz LTE Band 14 : 760.5 MHz ~ 765.5 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz LTE Band 25 : 1930.7 MHz ~ 1994.3 MHz LTE Band 26 : 859.7 MHz ~ 893.3 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 2110.7 MHz~ 2199.3 MHz LTE Band 71: 619.5 MHz ~ 649.5MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 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(16QAM uplink is not supported) 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

Note: GNSS Rx = BDS + GLONASS + GPS + Galileo + SBAS

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).

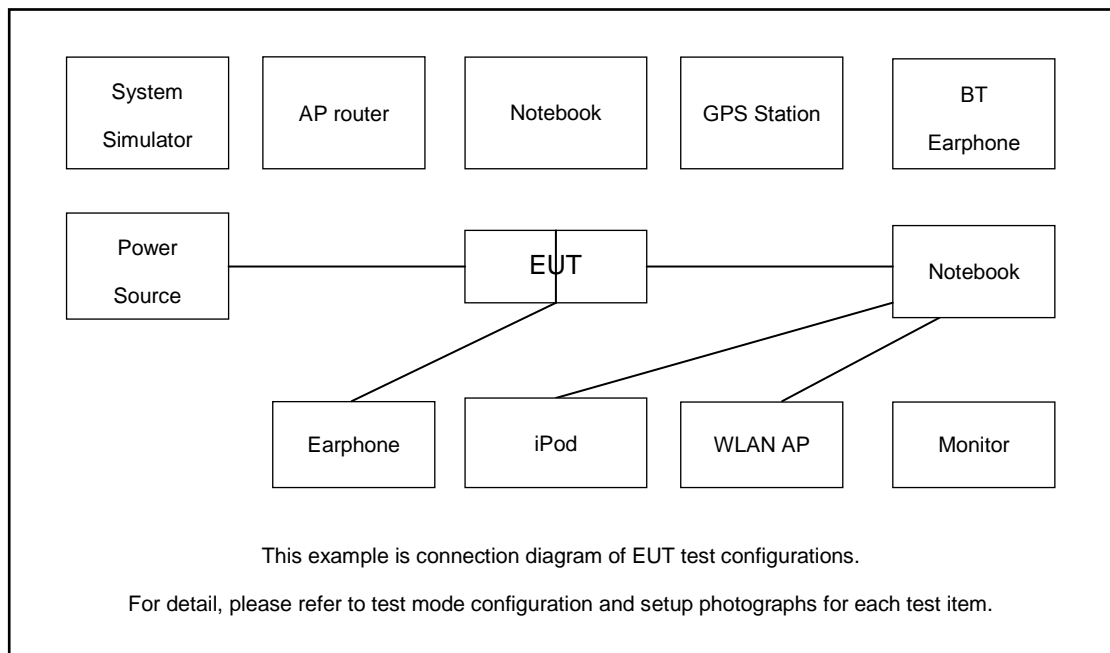
Test Items	Function Type
AC Conducted Emission	Mode 1: GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + Camera(Rear) + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 1
	Mode 2: PCS 1900 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(5G) + Camera(Front) + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 2
	Mode 3: WCDMA Band V Idle(Low CH) + Bluetooth Idle + WLAN Idle(2.4G) + MPEG4(Colur bar) + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Link + Battery + SIM 1
	Mode 4: LTE Band 14 Idle(High CH) + Bluetooth Idle + WLAN Idle(5G) + NFC On + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 2
	Mode 5: LTE Band 12 Idle(High CH) + Bluetooth Idle + WLAN Idle(5G) + H-Pattern + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 1
	Mode 6: LTE Band 13 Idle(High CH) + Bluetooth Idle + WLAN Idle(2.4G) + FM Rx(98MHz) + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 2
	Mode 7: LTE Band 17 Idle(Low CH) + Bluetooth Idle + WLAN Idle(5G) + FM Rx(98MHz) + Earphone 2 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 1
	Mode 8: LTE Band 71 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + FM Rx(98MHz) + Earphone 1 + USB Cable 2(Charging from Adapter) + SD Card Load + Battery + SIM 1
	Mode 9: LTE Band 26 Idle(Low CH) + Bluetooth Idle + WLAN Idle(2.4G) + FM Rx(98MHz) + Earphone 1 + USB Cable 3(Charging from Adapter) + SD Card Load + Battery + SIM 1
	Mode 10 :GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + GNSS RX + Earphone 1 + USB Cable 1(Data Link with Notebook) + SD Card Link + Battery + SIM 1
	Mode 11 :GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + GNSS RX + Earphone 1 + USB Cable 2(Data Link with Notebook) + SD Card Link + Battery + SIM 2



	<p>Mode 12 :GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + GNSS RX + Earphone 1 + USB Cable 3(Data Link with Notebook) + SD Card Link + Battery + SIM 1</p> <p>Mode 13 :LTE Band 13 Idle(High CH) + Bluetooth Idle + WLAN Idle(2.4G) + FM Rx(98MHz) + Earphone 1 + USB Cable 4(Charging from Adapter) + SD Card Load + Battery + SIM 1</p> <p>Mode 14 :GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + GNSS RX + Earphone 1 + USB Cable 4(Data Link with Notebook) + SD Card Link + Battery + SIM 1</p>
Radiated Emissions	<p>Mode 1: GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + Camera(Rear) + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 1</p> <p>Mode 2: PCS 1900 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(5G) + Camera(Front) + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 2</p> <p>Mode 3: WCDMA Band V Idle(Low CH) + Bluetooth Idle + WLAN Idle(2.4G) + MPEG4(Colur bar) + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Link + Battery + SIM 1</p> <p>Mode 4: LTE Band 14 Idle(High CH) + Bluetooth Idle + WLAN Idle(5G) + NFC On + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 2</p> <p>Mode 5: LTE Band 12 Idle(High CH) + Bluetooth Idle + WLAN Idle(5G) + H-Pattern + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 1</p> <p>Mode 6: LTE Band 13 Idle(High CH) + Bluetooth Idle + WLAN Idle(2.4G) + FM Rx(98MHz) + Earphone 1 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 2</p> <p>Mode 7: LTE Band 17 Idle(Low CH) + Bluetooth Idle + WLAN Idle(5G) + FM Rx(98MHz) + Earphone 2 + USB Cable 1(Charging from Adapter) + SD Card Load + Battery + SIM 1</p> <p>Mode 8: LTE Band 71 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + Camera(Rear) + Earphone 1 + USB Cable 2(Charging from Adapter) + SD Card Load + Battery + SIM 1</p> <p>Mode 9: LTE Band 26 Idle(Low CH) + Bluetooth Idle + WLAN Idle(2.4G) + Camera(Rear) + Earphone 1 + USB Cable 3(Charging from Adapter) + SD Card Load + Battery + SIM 1</p> <p>Mode 10 : GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + GNSS RX + Earphone 1 + USB Cable 1(Data Link with Notebook) + SD Card Link + Battery + SIM 1</p> <p>Mode 11 : GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + GNSS RX + Earphone 1 + USB Cable 2(Data Link with Notebook) + SD Card Link + Battery + SIM 2</p> <p>Mode 12 : GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + GNSS RX + Earphone 1 + USB Cable 3(Data Link with Notebook) + SD Card Link + Battery + SIM 1</p>

	<p>Mode 13 : LTE Band 26 Idle(Low CH) + Bluetooth Idle + WLAN Idle(2.4G) + Camera(Rear) + Earphone 1 + USB Cable 4(Charging from Adapter) + SD Card Load + Battery + SIM 1</p> <p>Mode 14 : GSM 850 Idle(Middle CH) + Bluetooth Idle + WLAN Idle(2.4G) + GNSS RX + Earphone 1 + USB Cable 4(Data Link with Notebook) + SD Card Link + Battery + SIM 1</p>
<p>Remark:</p> <ol style="list-style-type: none"> 1. The worst case of AC is mode 6; only the test data of this mode is reported. 2. The worst case of RE is mode 10; 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, 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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8m
2.	FM Station	R&S	SMB100A	N/A	N/A	Unshielded, 1.8m
3.	GNSS Station	RACELOGIC	18645	N/A	N/A	Unshielded, 1.8m
4.	WLAN AP	D-Link	DIR-820L	KA2IR820LA1	N/A	Unshielded, 1.8m
5.	Bluetooth Earphone	Samsung	EO-MG900	N/A	N/A	N/A
6.	Notebook	Lenovo	E540	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
7.	Ipod	apple	MC69029/A	N/A	N/A	N/A
8.	SD Card	N/A	MicroSD HC	FCC DoC	N/A	N/A

2.4. EUT Operation Test Setup

The EUT was in GSM or WCDMA or LTE 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 NFC Function.
6. Turn on FM receiver function to make the EUT receive continuous signals from FM 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

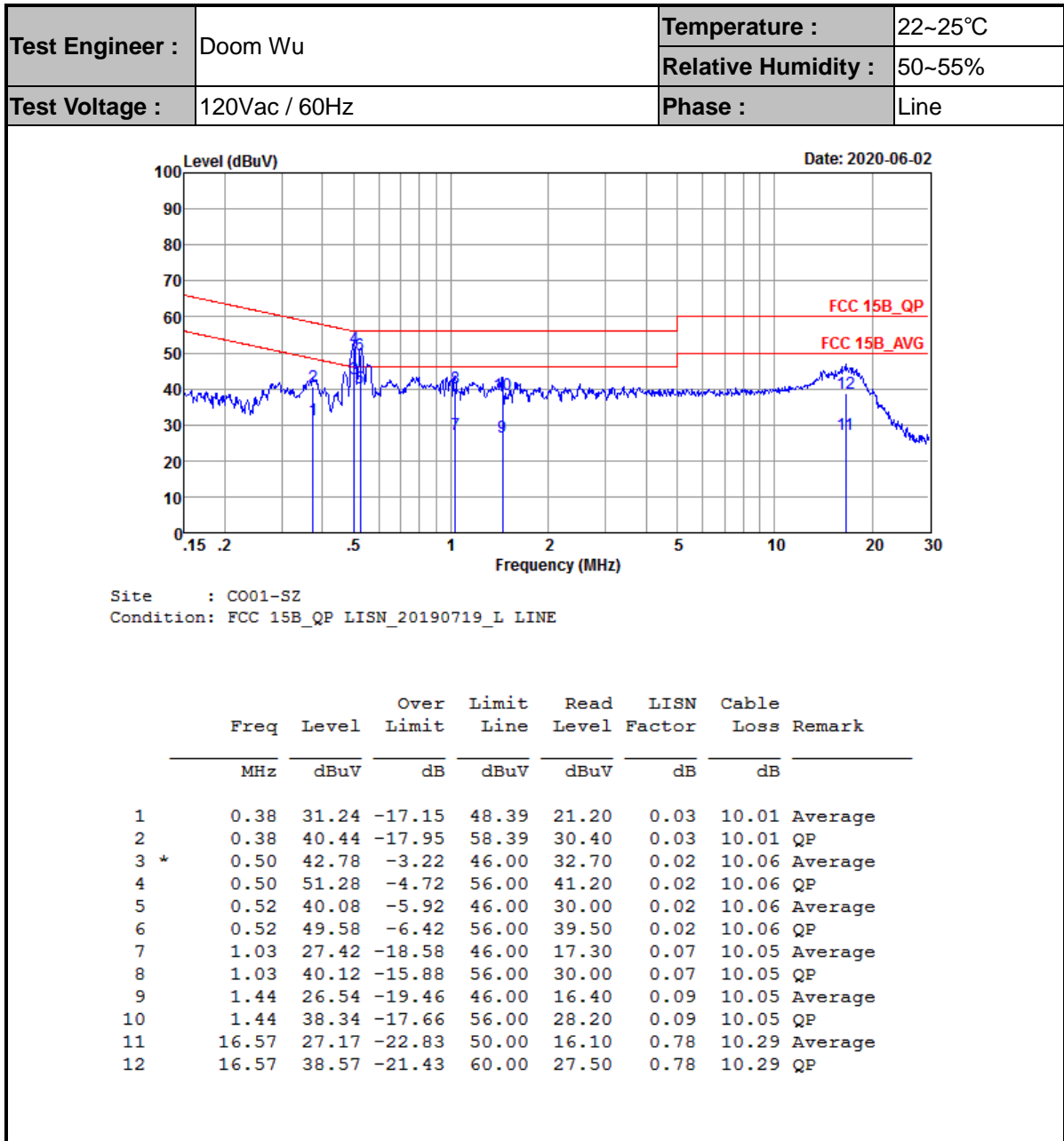
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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



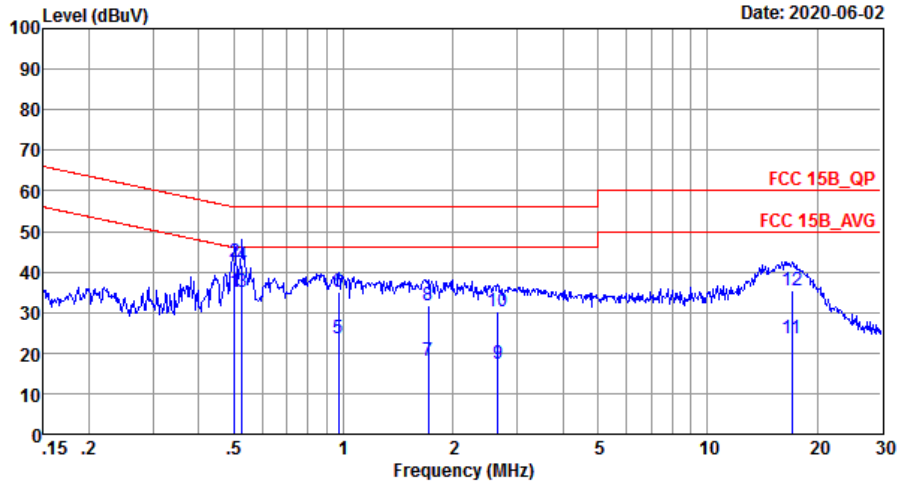


3.1.5 Test Result of AC Conducted Emission





Test Engineer :	Doom Wu	Temperature :	22~25°C
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Site : C001-SZ
 Condition: FCC 15B_QP LISN_20190719_N NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.50	35.08	-10.92	46.00	25.00	0.02	10.06	Average
2	0.50	42.38	-13.62	56.00	32.30	0.02	10.06	QP
3 *	0.53	35.08	-10.92	46.00	25.00	0.02	10.06	Average
4	0.53	41.88	-14.12	56.00	31.80	0.02	10.06	QP
5	0.97	23.60	-22.40	46.00	13.50	0.05	10.05	Average
6	0.97	35.10	-20.90	56.00	25.00	0.05	10.05	QP
7	1.71	18.20	-27.80	46.00	8.10	0.05	10.05	Average
8	1.71	31.80	-24.20	56.00	21.70	0.05	10.05	QP
9	2.65	17.51	-28.49	46.00	7.39	0.04	10.08	Average
10	2.65	30.31	-25.69	56.00	20.19	0.04	10.08	QP
11	17.02	23.73	-26.27	50.00	13.00	0.44	10.29	Average
12	17.02	35.33	-24.67	60.00	24.60	0.44	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

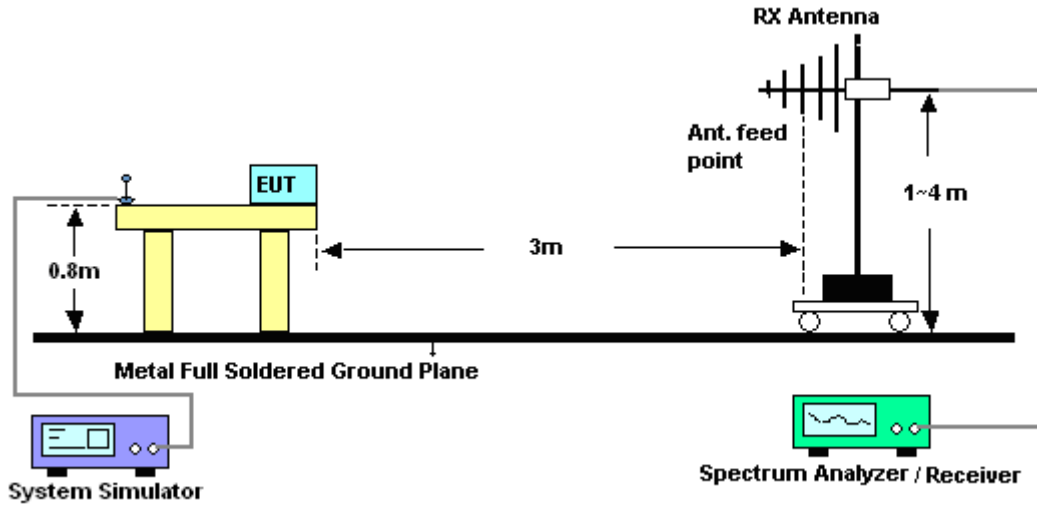
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

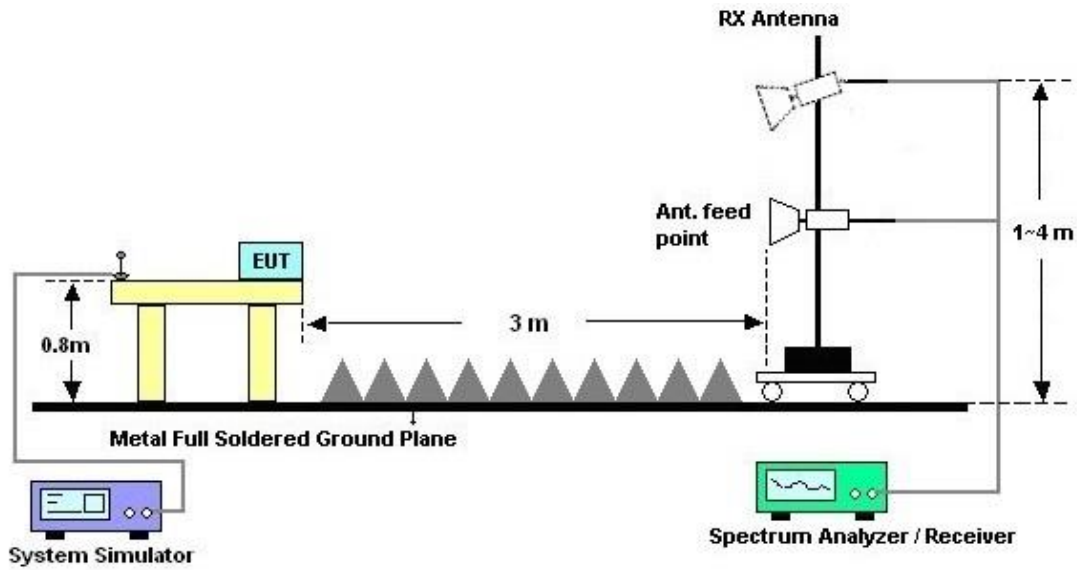
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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 (dBµV/m) = 20 log Emission level (µV/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



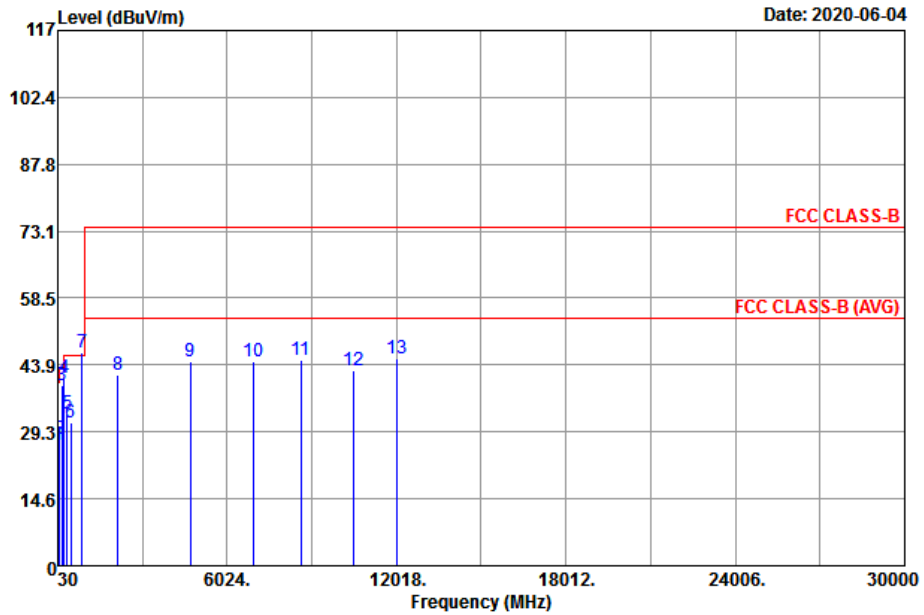
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

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

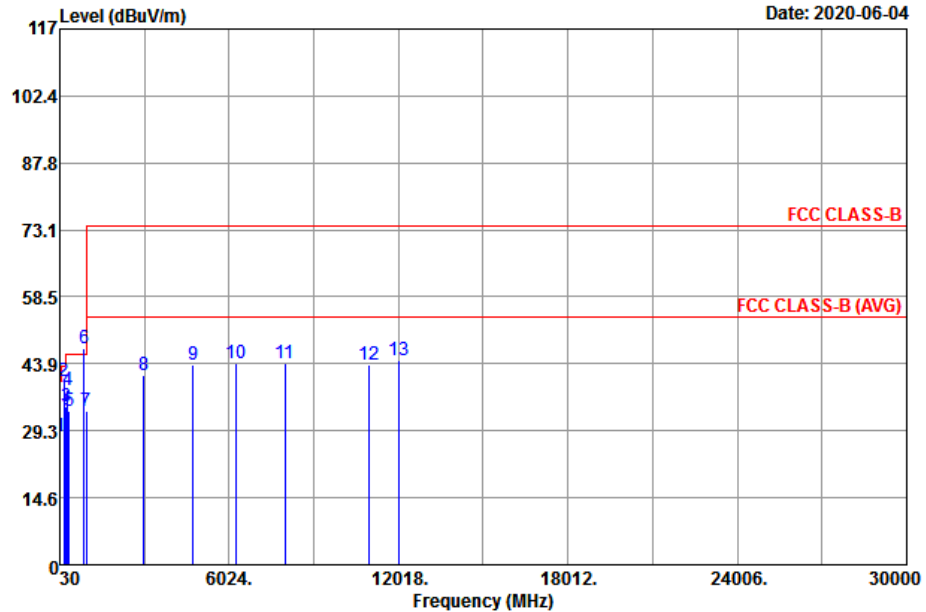


Site : 03CH01-SZ
 Condition : FCC CLASS-B 3m LF_ANT(35408)_2019 HORIZONTAL

	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	30.00	26.24	-13.76	40.00	31.63	24.90	1.01	31.30	---	---	Peak
2	99.84	27.84	-15.66	43.50	40.51	17.10	1.83	31.60	---	---	Peak
3	163.86	39.38	-4.12	43.50	52.34	16.08	2.33	31.37	100	165	QP
4	254.07	40.92	-5.08	46.00	50.62	19.10	2.88	31.68	---	---	Peak
5	347.19	33.27	-12.73	46.00	40.74	20.48	3.36	31.31	---	---	Peak
6	480.08	31.20	-14.80	46.00	34.96	23.60	3.95	31.31	---	---	Peak
7 *	881.66	46.65			46.08	26.70	5.33	31.46	---	---	Peak
8	2168.00	41.67	-32.33	74.00	61.63	31.58	6.34	57.88	---	---	Peak
9	4720.00	44.66	-29.34	74.00	57.49	33.81	10.77	57.41	---	---	Peak
10	6950.00	44.69	-29.31	74.00	53.69	34.92	14.82	58.74	---	---	Peak
11	8634.00	44.92	-29.08	74.00	55.59	35.83	12.57	59.07	---	---	Peak
12	10476.00	42.55	-31.45	74.00	49.71	37.08	14.64	58.88	---	---	Peak
13	12020.00	45.34	-28.66	74.00	49.04	38.50	15.01	57.21	100	165	Peak



Test Engineer :	Xiangxiang Liang	Temperature :	24~25°C
		Relative Humidity :	48~49%
Test Distance :	3m	Polarization :	Vertical
Remark :	#6 is system simulator signal which can be ignored.		



Site : 03CH01-SZ
 Condition : FCC CLASS-B 3m LF_ANT(35408)_2019 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	50.37	27.94	-12.06	40.00	43.91	14.30	1.30	31.57	---	---	Peak
2	164.83	40.12	-3.38	43.50	53.11	16.05	2.33	31.37	100	146	Peak
3	255.04	34.42	-11.58	46.00	43.99	19.20	2.89	31.66	---	---	Peak
4	299.66	38.06	-7.94	46.00	47.04	19.30	3.12	31.40	---	---	Peak
5	347.19	33.63	-12.37	46.00	41.10	20.48	3.36	31.31	---	---	Peak
6 *	881.66	47.27			46.70	26.70	5.33	31.46	---	---	Peak
7	960.23	33.72	-20.28	54.00	32.31	27.10	5.59	31.28	---	---	Peak
8	2998.00	41.40	-32.60	74.00	57.09	32.70	8.91	57.30	---	---	Peak
9	4758.00	43.81	-30.19	74.00	56.62	33.80	10.82	57.43	---	---	Peak
10	6252.00	44.01	-29.99	74.00	52.93	34.68	14.31	57.91	---	---	Peak
11	8010.00	43.88	-30.12	74.00	54.82	35.70	12.56	59.20	---	---	Peak
12	10962.00	43.82	-30.18	74.00	50.03	37.38	14.75	58.34	---	---	Peak
13	12042.00	44.63	-29.37	74.00	48.35	38.51	15.01	57.24	100	154	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&SA	Agilent	N9038A	MY52260185	20Hz~26.5GHz	Jul. 22, 2019	Jun. 04, 2020	Jul. 21, 2020	Radiation (03CH01-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Apr. 17, 2020	Jun. 04, 2020	Apr. 16, 2021	Radiation (03CH01-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270104	0.5GHz~26.5GHz	Dec. 27, 2019	Jun. 04, 2020	Dec. 26, 2020	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz~2GHz	Jul. 19, 2019	Jun. 04, 2020	Jul. 18, 2020	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Apr. 01, 2020	Jun. 04, 2020	Mar. 31, 2021	Radiation (03CH01-SZ)
LF Amplifier	Burgeon	BPA-530	102209	0.01~3000Mhz	Apr. 17, 2020	Jun. 04, 2020	Apr. 16, 2021	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1943528	1GHz~18GHz	Oct. 18, 2019	Jun. 04, 2020	Oct. 17,2020	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	TTA1840-35-H G	1871923	18GHz~40GHz	Jul. 22, 2019	Jun. 04, 2020	Jul. 21, 2020	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 17, 2020	Jun. 04, 2020	Apr. 16, 2021	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	61601000198 5	N/A	NCR	Jun. 04, 2020	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jun. 04, 2020	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jun. 04, 2020	NCR	Radiation (03CH01-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 26, 2019	Jun. 02, 2020	Dec. 25, 2020	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Oct. 17, 2019	Jun. 02, 2020	Oct. 16, 2020	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 17, 2019	Jun. 02, 2020	Oct. 16, 2020	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	61602000089 1	100Vac~250Vac	Jul. 23, 2019	Jun. 02, 2020	Jul. 22, 2020	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% ($U = 2Uc(y)$)	2.7dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.7dB
---	-------

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
---	-------