



# FCC Test Report

**APPLICANT** : Motorola Mobility LLC  
**EQUIPMENT** : Mobile Cellular Phone  
**BRAND NAME** : Motorola  
**MODEL NAME** : XT2133-1  
**FCC ID** : IHDT56ZV2  
**STANDARD** : 47 CFR Part 15 Subpart B  
**CLASSIFICATION** : Certification  
**TEST DATE(S)** : Mar. 26, 2021 ~ Apr. 30, 2021

We, Sporton International (Kunshan) 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 (Kunshan) Inc., the test report shall not be reproduced except in full.

*Jason Jia*

Reviewed by: Jason Jia / Supervisor

*Alex Wang*

Approved by: Alex Wang / Manager



**Sporton International (Kunshan) Inc.**

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300  
People's Republic of China**



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### REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC131712	Rev. 01	Initial issue of report	May 10, 2021



### 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 7.92 dB at 9.913 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.71 dB at 40.67 MHz for Quasi-Peak

<b>Declaration of Conformity:</b>
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
<b>Comments and Explanations:</b>
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

Motorola Mobility LLC  
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

## 1.2. Manufacturer

Motorola Mobility LLC  
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

## 1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2133-1
FCC ID	IHDT56ZV2
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 FM Receiver and GNSS
IMEI Code	Conduction: 354911550005870/354911550005888 for Sample1 356991520006891 for Sample 2 Radiation: 354911550005870/354911550005888 for Sample1 356991520006883 for Sample2
HW Version	DVT1B
SW Version	RRL31.Q2-24
EUT Stage	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 types of EUT, please refer to the product equality declaration exhibit submitted. According to the difference, we choose the sample 1 to full test and the sample 2 is verified the difference.



### 1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
<b>Tx Frequency</b>	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 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 17 : 704 MHz ~ 716 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz 802.11b/g/n: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 MHz 5745 MHz ~ 5825 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz
<b>Rx Frequency</b>	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 12 : 729 MHz ~ 746 MHz LTE Band 13 : 746 MHz ~ 756 MHz LTE Band 17 : 734 MHz ~ 746 MHz LTE Band 66 : 2110 MHz~ 2200 MHz 802.11b/g/n: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 MHz 5745 MHz ~ 5825 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz GNSS : 1559 MHz ~ 1610 MHz FM : 88 MHz ~ 108 MHz
<b>Antenna Type</b>	WWAN : PIFA Antenna WLAN : PIFA Antenna Bluetooth : PIFA Antenna GNSS: PIFA Antenna NFC : FPC Coil Antenna FM : External Earphone Antenna
<b>Type of Modulation</b>	GSM/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
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### 1.5. Modification of EUT

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



### 1.6. Test Location

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

<b>Test Firm</b>	Sporton International (Kunshan) Inc.		
<b>Test Site Location</b>	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	CO01-KS 03CH02-KS	CN1257	314309

### 1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH02-KS	AUDIX	E3	6.2009-8-24a
2.	CO01-KS	AUDIX	E3	6.2009-8-24

### 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
- ANSI C63.4a-2017

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



### 1.9. Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	Brand Name	Motorola (Salom)	Model Name	MC-501
AC Adapter 1(EU)	Brand Name	Motorola (Salom)	Model Name	MC-502
AC Adapter 1(UK)	Brand Name	Motorola (Salom)	Model Name	MC-503
AC Adapter 1(AR)	Brand Name	Motorola (Salom)	Model Name	MC-506
AC Adapter 1(BR)	Brand Name	Motorola (Salom)	Model Name	MC-507
AC Adapter 2(US)	Brand Name	Motorola (Chenyang)	Model Name	MC-501
AC Adapter 2(EU)	Brand Name	Motorola (Chenyang)	Model Name	MC-502
AC Adapter 2(AR)	Brand Name	Motorola (Chenyang)	Model Name	MC-506
AC Adapter 2(BR)	Brand Name	Motorola (Chenyang)	Model Name	MC-507
AC Adapter 3(IN)	Brand Name	Motorola (Acbel)	Model Name	MC-304
Battery 1	Brand Name	Motorola (ATL)	Model Name	LK50
Battery 2	Brand Name	Motorola (SCUD)	Model Name	LK50
Earphone 1	Brand Name	Motorola (Lyand)	Model Name	MH191(SH38C81577)
Earphone 2	Brand Name	Motorola(LCHSE)	Model Name	MH191(SH38C81576)
Earphone 3	Brand Name	Motorola (New Leader)	Model Name	MH202(S928D09678 )
Earphone 4	Brand Name	Motorola (Binatone Telecom Plc)	Model Name	Motobuds charge (SH067)
USB Cable 1	Brand Name	Motorola (Saibao)	Model Name	SC18C81416
USB Cable 2	Brand Name	Motorola (Luxshare)	Model Name	SC18C81417
USB Cable 3	Brand Name	Motorola (Cabletech)	Model Name	SC18C37155
USB Cable 4	Brand Name	Motorola (Saibao)	Model Name	SC18C37157



## 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.

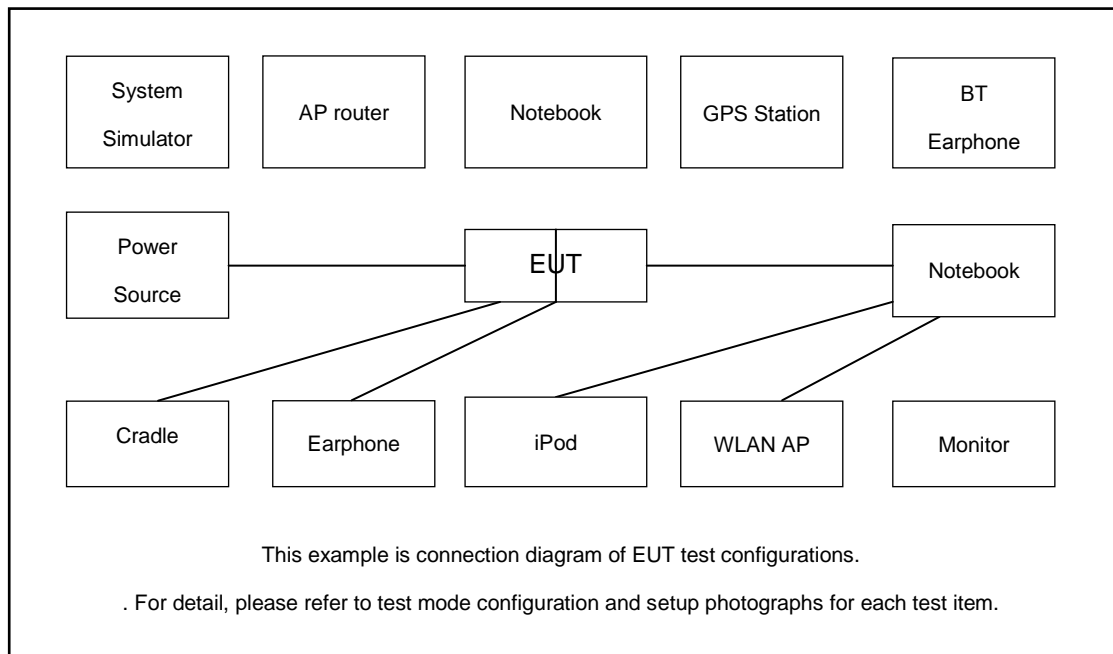
Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: GSM 850 Rx(Middle) + Earphone1 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + Camera(Rear) + USB Cable1(Charging from Adapter1(Port 1)) + Battery 1 for Sample 1
	Mode 2: WCDMA 1900 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + Camera(Front) + USB Cable2(Charging from Adapter2(Port 1)) + Battery 1 for Sample 1
	Mode 3: LTE Band 12 Rx(Middle) + Earphone3 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + MPEG4 + USB Cable3(Charging from Adapter3(Port 1)) + Battery 1 for Sample 1
	Mode 4: LTE Band 13 Rx(High) + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + NFC On + USB Cable4(Charging from Adapter2(Port 1)) + Battery 1 for Sample 1
	Mode 5: LTE Band 17 Rx(High) + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + FM Rx(98MHZ) + USB Cable5(Charging from Adapter2(Port 2)) + Battery 1 for Sample 1
	Mode 6: LTE Band 4 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + GNSS Rx + USB Cable2(Charging from Adapter2(Port 1)) + Battery 1 + USB Cable5(Charging from Adapter2(Port 2)) for Sample 1
	Mode 7: LTE Band 2 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + GNSS Rx + USB Cable1(Data Link with Notebook) + Battery 1 for Sample 1
	Mode 8: LTE Band 5 Rx(Middle) + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + GNSS Rx + USB Cable2(Data Link with Notebook) + Battery 1 for Sample 1
	Mode 9: LTE Band 7 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + GNSS Rx + USB Cable3(Data Link with Notebook) + Battery 1 for Sample 1
	Mode 10 :LTE Band 2 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + GNSS Rx + USB Cable4(Data Link with Notebook) + Battery 1 for Sample 1
	Mode 11 :LTE Band 4 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + Camera(Front) + USB Cable2(Charging from Adapter2(Port 1)) + Battery 2 + USB Cable5(Charging from Adapter2(Port 2)) for Sample 2
	Mode 12 :LTE Band 2 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN



	Idle(5G) + GNSS Rx + USB Cable4(Data Link with Notebook) + Battery 2 for Sample 2
Radiated Emissions	Mode 1: GSM 850 Rx(Middle) + Earphone1 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + Camera(Rear) + USB Cable1(Charging from Adapter1(Port 1)) + Battery 1 for Sample1
	Mode 2: WCDMA 1900 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + Camera(Front) + USB Cable2(Charging from Adapter2(Port 1)) + Battery 1 for Sample1
	Mode 3: LTE Band 12 Rx(Middle) + Earphone3 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + MPEG4 + USB Cable3(Charging from Adapter3(Port 1)) + Battery 1 for Sample1
	Mode 4: LTE Band 13 Rx(High) + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + NFC On + USB Cable4(Charging from Adapter2(Port 1)) + Battery 1 for Sample1
	Mode 5: LTE Band 17 Rx(High) + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + FM Rx(88MHz) + USB Cable5(Charging from Adapter2(Port 2)) + Battery 1 for Sample1
	Mode 6: LTE Band 4 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + GNSS Rx + USB Cable2(Charging from Adapter2(Port 1)) + Battery 1 + USB Cable5(Charging from Adapter2(Port 2)) for Sample1
	Mode 7: LTE Band 2 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + GNSS Rx + USB Cable1(Data Link with Notebook) + Battery 1 for Sample1
	Mode 8: LTE Band 5 Rx(Middle) + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + GNSS Rx + USB Cable2(Data Link with Notebook) + Battery 1 for Sample1
	Mode 9: LTE Band 7 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + GNSS Rx + USB Cable3(Data Link with Notebook) + Battery 1 for Sample1
	Mode 10 :LTE Band 2 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + GNSS Rx + USB Cable4(Data Link with Notebook) + Battery 1 for Sample1
	Mode 11 :LTE Band 4 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(5G) + GNSS Rx + USB Cable2(Charging from Adapter2(Port 1)) + Battery 2 + USB Cable5(Charging from Adapter2(Port 2)) for Sample2
	Mode 12 :LTE Band 2 Rx + Earphone2 + Bluetooth Idle With Earphone4 + WLAN Idle(2.4G) + GNSS Rx + USB Cable1(Data Link with Notebook) + Battery 2 for Sample2
<b>Remark:</b>	
<ol style="list-style-type: none"> <li>1. The worst case of AC is mode 6; only the test data of this mode is reported.</li> <li>2. The worst case of RE is mode 6; 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, 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.	Hard disk	KINGSHARE	KSP6120G	Fcc DoC	Shielded, 1.2m	N/A
2.	Hard Disk	Lenovo	F310	DoC	Shielded, 1.2m	N/A
3.	SD Card	Kingston	8GB	N/A	N/A	N/A
4.	Phone	N/A	N/A	N/A	N/A	N/A
5.	WLAN AP	TP-Link	TL-WDR5600	N/A	N/A	Unshielded,1.8m
6.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
7.	Signal Generator	R&S	SMBV100A	N/A	N/A	Unshielded,1.8m
8.	Notebook	Lenovo	S730-13IWL	N/A	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
9.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
10.	Base Station	R&S	CMU 200	N/A	N/A	Unshielded,1.8m
11.	Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded,1.8m
12.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
13.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded,1.8m
14.	USB cable 5	N/A	N/A	N/A	Shielded, 1.2m	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 camera to capture images.
3. Turn on MPEG4 function.
4. Turn on GNSS function to make the EUT receive continuous signals from GNSS station.
5. Turn on FM function to make the EUT receive continuous signals from FM station.
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.

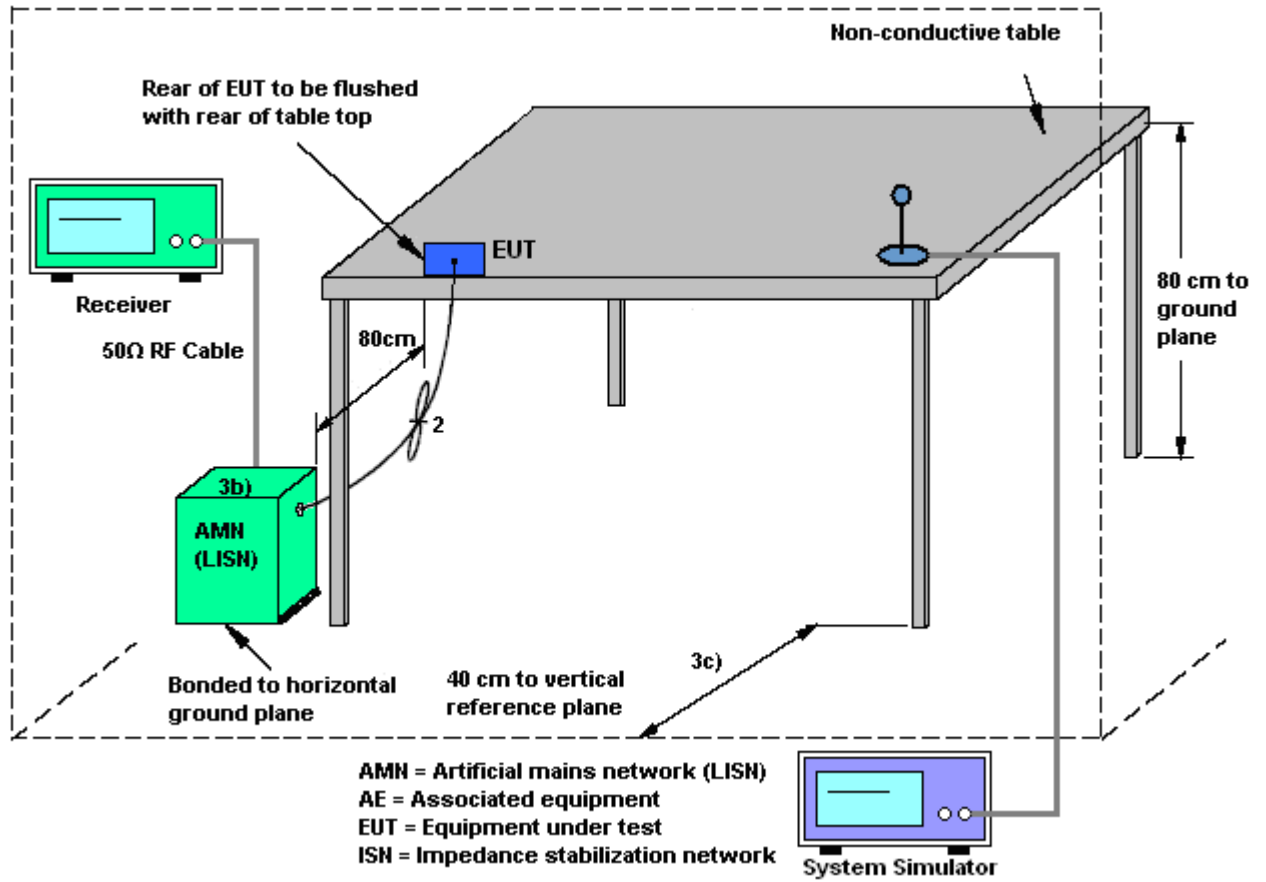
##### 3.1.2 Measuring Instruments

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.

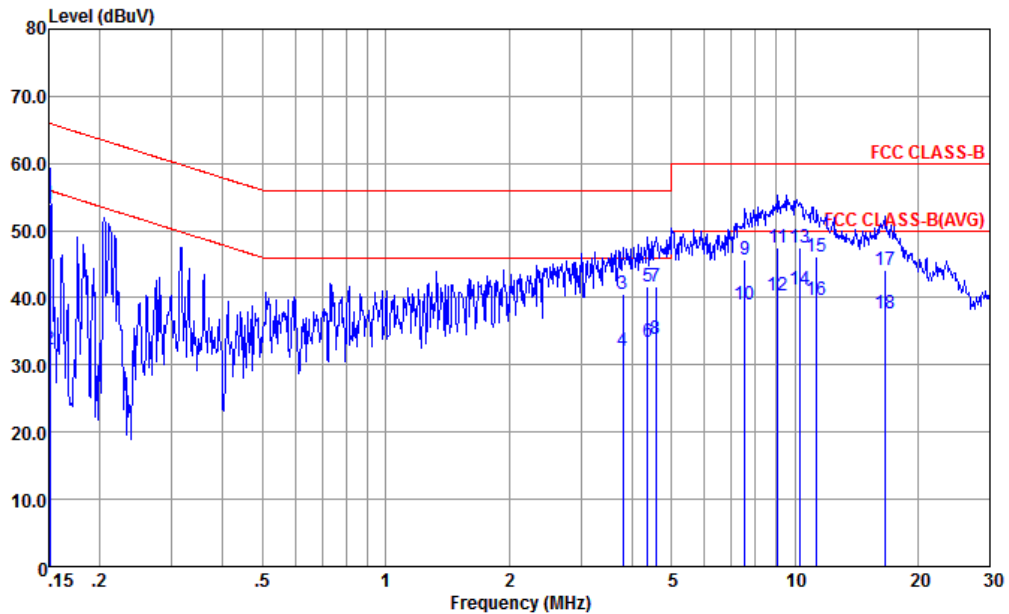
### 3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



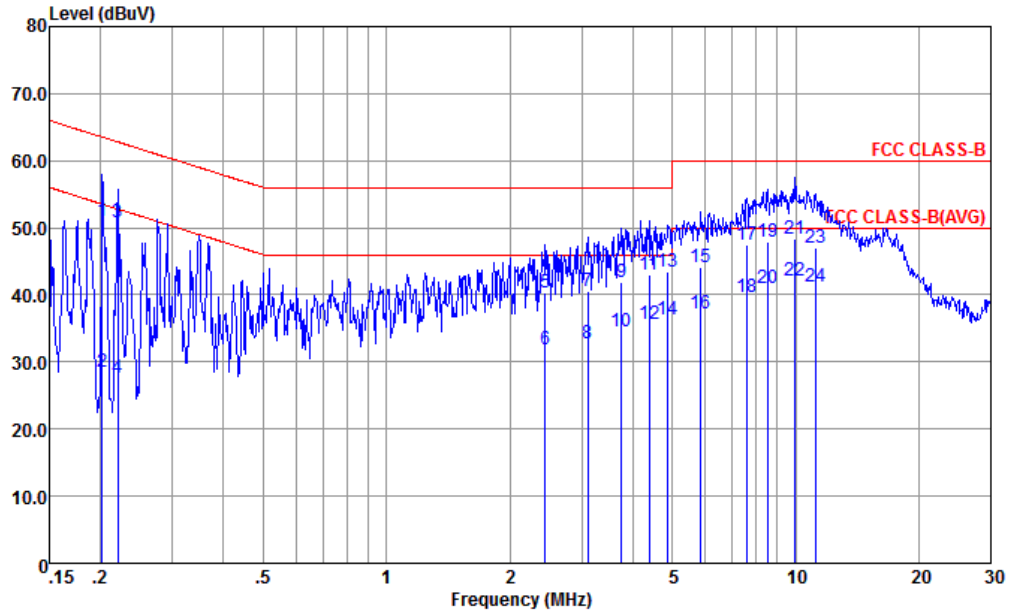
Site : CO01-KS  
 Condition : FCC CLASS-B TWO-LISN-CN02-L LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.151	54.01	-11.95	65.96	33.89	9.64	10.48	QP
2	0.151	32.32	-23.64	55.96	12.20	9.64	10.48	Average
3	3.799	40.59	-15.41	56.00	20.20	10.14	10.25	QP
4	3.799	31.99	-14.01	46.00	11.60	10.14	10.25	Average
5	4.361	41.65	-14.35	56.00	21.20	10.19	10.26	QP
6	4.361	33.35	-12.65	46.00	12.90	10.19	10.26	Average
7	4.574	41.67	-14.33	56.00	21.20	10.21	10.26	QP
8	4.574	33.77	-12.23	46.00	13.30	10.21	10.26	Average
9	7.566	45.62	-14.38	60.00	24.90	10.41	10.31	QP
10	7.566	38.92	-11.08	50.00	18.20	10.41	10.31	Average
11	9.107	47.40	-12.60	60.00	26.60	10.47	10.33	QP
12	9.107	40.40	-9.60	50.00	19.60	10.47	10.33	Average
13	10.288	47.47	-12.53	60.00	26.60	10.52	10.35	QP
14 *	10.288	41.17	-8.83	50.00	20.30	10.52	10.35	Average
15	11.317	46.08	-13.92	60.00	25.10	10.62	10.36	QP
16	11.317	39.58	-10.42	50.00	18.60	10.62	10.36	Average
17	16.573	44.02	-15.98	60.00	22.60	10.99	10.43	QP
18	16.573	37.72	-12.28	50.00	16.30	10.99	10.43	Average





Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS  
 Condition : FCC CLASS-B TWO-LISN-CN02-N NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.202	51.05	-12.49	63.54	30.80	9.89	10.36	QP
2	0.202	28.45	-25.09	53.54	8.20	9.89	10.36	Average
3	0.221	50.72	-12.07	62.79	30.50	9.87	10.35	QP
4	0.221	27.72	-25.07	52.79	7.50	9.87	10.35	Average
5	2.448	40.43	-15.57	56.00	20.20	10.00	10.23	QP
6	2.448	31.83	-14.17	46.00	11.60	10.00	10.23	Average
7	3.107	40.53	-15.47	56.00	20.21	10.08	10.24	QP
8	3.107	32.83	-13.17	46.00	12.51	10.08	10.24	Average
9	3.759	41.90	-14.10	56.00	21.50	10.15	10.25	QP
10	3.759	34.50	-11.50	46.00	14.10	10.15	10.25	Average
11	4.384	42.97	-13.03	56.00	22.50	10.21	10.26	QP
12	4.384	35.67	-10.33	46.00	15.20	10.21	10.26	Average
13	4.874	43.41	-12.59	56.00	22.90	10.24	10.27	QP
14	4.874	36.41	-9.59	46.00	15.90	10.24	10.27	Average
15	5.867	44.22	-15.78	60.00	23.61	10.33	10.28	QP
16	5.867	37.22	-12.78	50.00	16.61	10.33	10.28	Average
17	7.606	47.36	-12.64	60.00	26.60	10.45	10.31	QP
18	7.606	39.56	-10.44	50.00	18.80	10.45	10.31	Average
19	8.546	47.91	-12.09	60.00	27.10	10.49	10.32	QP
20	8.546	41.01	-8.99	50.00	20.20	10.49	10.32	Average
21	9.913	48.38	-11.62	60.00	27.50	10.54	10.34	QP
22 *	9.913	42.08	-7.92	50.00	21.20	10.54	10.34	Average
23	11.198	46.95	-13.05	60.00	25.90	10.69	10.36	QP
24	11.198	41.15	-8.85	50.00	20.10	10.69	10.36	Average

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.

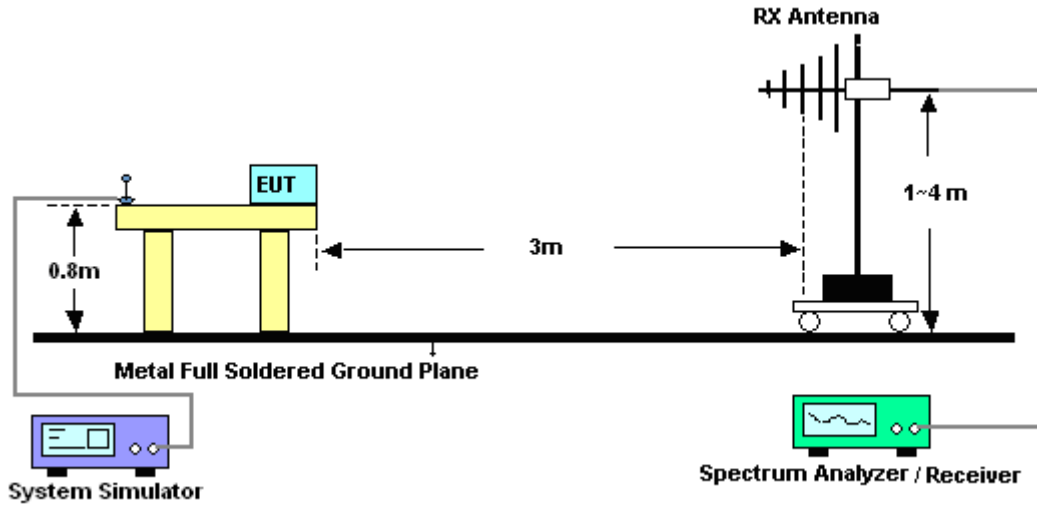


### **3.2.3. Test Procedures**

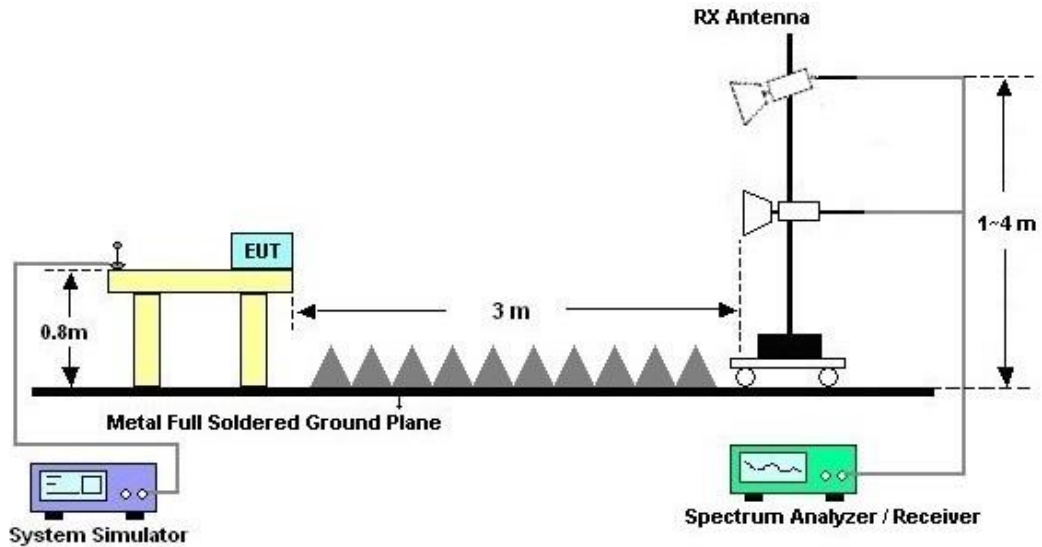
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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

### 3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



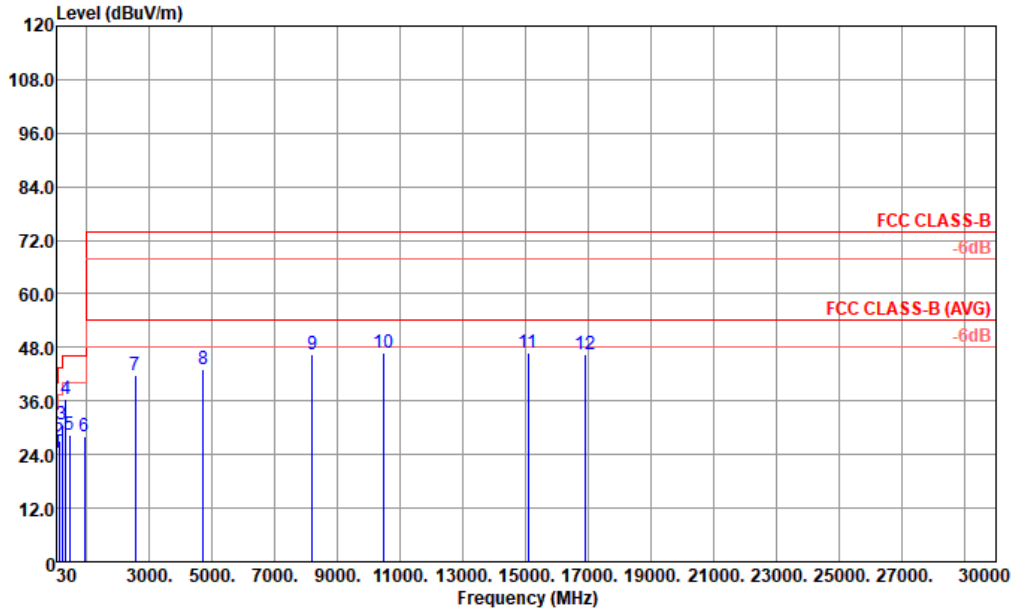
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Engineer :	Jack Fang	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal

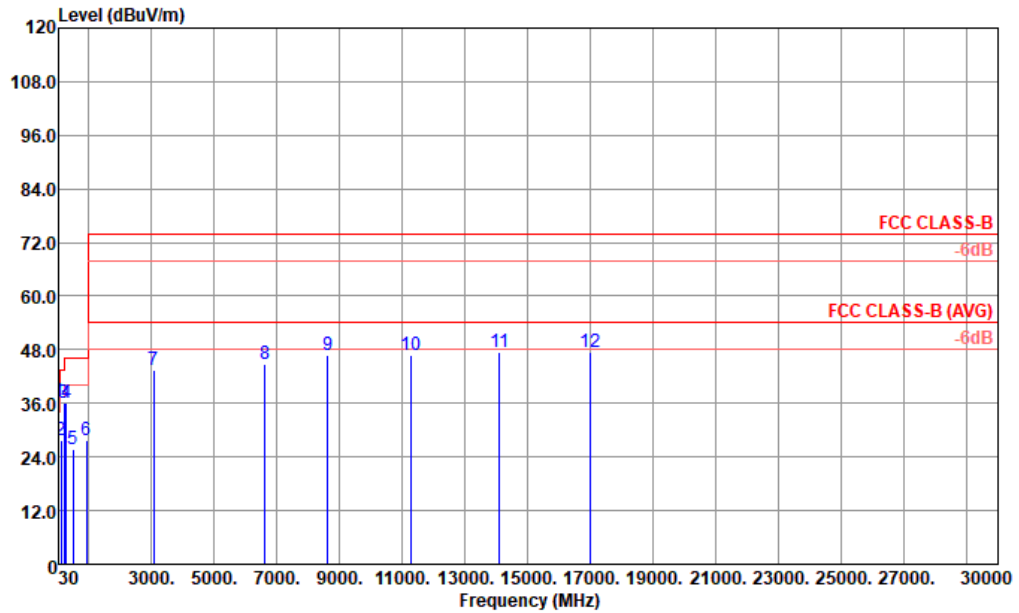


Site : 03CH02-KS  
 Condition : FCC CLASS-B 3m LF 49921 HORIZONTAL

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	cm	deg	
			dB	dBuV/m	dBuV	dB	dB			
1	39.70	24.56	-15.44	40.00	36.02	19.60	1.06	32.12	---	Peak
2	108.57	27.15	-16.35	43.50	41.21	16.31	1.81	32.18	---	Peak
3	217.21	30.84	-15.16	46.00	44.09	16.31	2.57	32.13	---	Peak
4	323.91	36.41	-9.59	46.00	45.49	19.93	3.14	32.15	100	Peak
5	456.80	28.37	-17.63	46.00	33.63	23.23	3.74	32.23	---	Peak
6	912.70	28.23	-17.77	46.00	25.72	29.46	5.25	32.20	---	Peak
7	2544.00	41.66	-32.34	74.00	33.81	33.49	8.88	34.52	---	Peak
8	4720.00	43.26	-30.74	74.00	28.23	35.52	12.06	32.55	---	Peak
9	8192.00	46.50	-27.50	74.00	27.55	37.38	16.11	34.54	---	Peak
10	10485.00	46.95	-27.05	74.00	24.41	39.30	18.35	35.11	---	Peak
11	15066.00	46.64	-27.36	74.00	18.32	41.23	22.19	35.10	---	Peak
12	16902.00	46.31	-27.69	74.00	14.56	43.24	23.53	35.02	---	Peak



Test Engineer :	Jack Fang	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical



Site : 03CH02-KS  
 Condition : FCC CLASS-B 3m LF 49921 VERTICAL

	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	40.67	36.29	-3.71	40.00	48.21	19.10	1.08	32.10	100	142 QP
2	107.60	27.64	-15.86	43.50	41.75	16.28	1.80	32.19	---	---
3	216.24	36.02	-9.98	46.00	49.35	16.24	2.56	32.13	---	---
4	288.02	36.06	-9.94	46.00	46.07	19.14	2.97	32.12	---	---
5	504.33	25.90	-20.10	46.00	30.19	24.19	3.91	32.39	---	---
6	920.46	27.73	-18.27	46.00	25.09	29.57	5.27	32.20	---	---
7	3064.00	43.40	-30.60	74.00	33.97	33.48	9.70	33.75	---	---
8	6624.00	44.80	-29.20	74.00	26.60	36.52	14.31	32.63	---	---
9	8608.00	46.76	-27.24	74.00	26.64	37.83	16.53	34.24	---	---
10	11286.00	46.69	-27.31	74.00	23.39	39.56	19.00	35.26	---	---
11	14094.00	47.37	-26.63	74.00	20.17	41.01	21.31	35.12	---	---
12	16992.00	47.56	-26.44	74.00	15.79	43.20	23.58	35.01	---	---

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	ESC17	100768	9kHz~7GHz;	Apr. 14, 2020	Mar. 26, 2021	Apr. 13, 2021	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 17, 2020	Mar. 26, 2021	Oct. 16, 2021	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 14, 2020	Mar. 26, 2021	Apr. 13, 2021	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	Oct. 17, 2020	Mar. 26, 2021	Oct. 16, 2021	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Ma x 30dBm	Oct. 17, 2020	Apr. 30, 2021	Oct. 16, 2021	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 17, 2020	Apr. 30, 2021	Oct. 16, 2021	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Jan. 26, 2021	Apr. 30, 2021	Jan. 25, 2022	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 01, 2020	Apr. 30, 2021	Oct. 31, 2021	Radiation (03CH02-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 06, 2020	Apr. 30, 2021	Nov. 05, 2021	Radiation (03CH02-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 06, 2021	Apr. 30, 2021	Jan. 05, 2022	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 06, 2021	Apr. 30, 2021	Jan. 05, 2022	Radiation (03CH02-KS)
Amplifier	Keysight	83017A	MY53270316	500MHz~26.5G Hz	Oct. 17, 2020	Apr. 30, 2021	Oct. 16, 2021	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	61601000247 3	N/A	NCR	Apr. 30, 2021	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Apr. 30, 2021	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Apr. 30, 2021	NCR	Radiation (03CH02-KS)

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% ( $U = 2Uc(y)$ )	2.94dB
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.9dB
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.0dB
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### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

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