



FCC Test Report

APPLICANT : OnePlus Technology (Shenzhen) Co.,
Ltd
EQUIPMENT : Smart Phone
BRAND NAME : ONEPLUS
MODEL NAME : IN2025
FCC ID : 2ABZ2-EE007
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on Nov. 20, 2019 and testing was completed on Jan. 17, 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.

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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	8
1.6. Test Location	8
1.7. Test Software	8
1.8. Applicable Standards	9
2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST	10
2.1. Test Mode	10
2.2. Connection Diagram of Test System	12
2.3. Support Unit used in test configuration and system	13
2.4. EUT Operation Test Setup	14
3. TEST RESULT	15
3.1. Test of AC Conducted Emission Measurement	15
3.2. Test of Radiated Emission Measurement	19
4. LIST OF MEASURING EQUIPMENT	24
5. UNCERTAINTY OF EVALUATION	25
APPENDIX A. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC9N2009-01	Rev. 01	Initial issue of report	Mar. 19, 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 12.90 dB at 11.870 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 10.79 dB at 30.000 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

OnePlus Technology (Shenzhen) Co., Ltd

18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen

1.2. Manufacturer

OnePlus Technology (Shenzhen) Co., Ltd

18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Smart Phone
Brand Name	ONEPLUS
Model Name	IN2025
FCC ID	2ABZ2-EE007
EUT supports Radios application	CDMA/GSM/WCDMA/LTE/5G NR WLAN 2.4GHz 802.11b/g/n HT20 WLAN 2.4GHz 802.11ax HE20/HE40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 WLAN 5GHz 802.11ax HE20/HE40/HE80 Bluetooth BR/EDR/LE GNSS/NFC/WPC
IMEI Code	Conduction: 865422040025876/865422040025868 Radiation: 865422040025272/865422040025264
HW Version	15
SW Version	Oxygen OS 10.5.IN11AA
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 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 30 : 2307.5 MHz ~ 2312.5 MHz LTE Band 38 : 2572.5 MHz ~ 2617.5 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 48 : 3552.5 MHz ~ 3697.5 MHz LTE Band 66 : 1710.7 MHz ~ 1779.3 MHz LTE Band 71: 665.5 MHz ~ 695.5MHz 5G NR n2: 1852.5 MHz ~ 1907.5 MHz 5G NR n5: 826.5 MHz ~ 846.5 MHz 5G NR n41: 2506 MHz ~ 2680 MHz 5G NR n66: 1712.5 MHz ~ 1777.5 MHz 5G NR n71: 665.5 MHz ~ 695.5MHz CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz CDMA2000 BC10: 817.9 MHz ~ 823.1 MHz 802.11b/g/n/ax: 2412 MHz ~ 2462 MHz 802.11a/n/ac/ax: 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 WPC(QI): 100 kHz ~ 205 kHz
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 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 29 : 718.5 MHz ~ 726.5 MHz LTE Band 30 : 2352.5 MHz ~ 2357.5 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 46 : 5150 MHz ~ 5350 MHz; 5470 MHz ~5725 MHz LTE Band 48 : 3552.5 MHz ~ 3697.5 MHz LTE Band 66 : 2110.7 MHz~ 2199.3 MHz LTE Band 71: 619.5 MHz ~ 649.5MHz 5G NR n2: 1932.5 MHz ~ 1987.5 MHz 5G NR n5: 871.5 MHz ~ 891.5 MHz 5G NR n41: 2506 MHz ~ 2680 MHz 5G NR n66: 2112.5 MHz~ 2197.5 MHz 5G NR n71: 619.5 MHz ~ 649.5MHz CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz CDMA2000 BC10: 862.9 MHz ~ 868.1 MHz 802.11b/g/n/ax: 2412 MHz ~ 2462 MHz 802.11a/n/ac/ax: 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; 1164 MHz ~ 1215 MHz NFC : 13.56 MHz WPC(QI): 100 kHz ~ 205 kHz
Antenna Type	WWAN : PIFA Antenna WLAN : PIFA Antenna Bluetooth : PIFA Antenna GNSS: PIFA Antenna NFC : Loop Antenna WPC: Coil Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : BPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM DC-HSDPA : 64QAM LTE: QPSK / 16QAM / 64QAM / 256QAM 5G NR: DFT-s-OFDM ($\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM) CP-OFDM (QPSK / 16QAM / 64QAM / 256QAM) CDMA2000 1xRTT: QPSK CDMA2000 1xEV-DO: QPSK/8PSK 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n/ac/ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM/1024QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GNSS : BPSK



	NFC: ASK WPC: ASK
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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 (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.
	03CH03-SZ	CN1256	421272

1.7. Test Software

Item	Site	Manufacture	Name	Version
1.	03CH03-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).

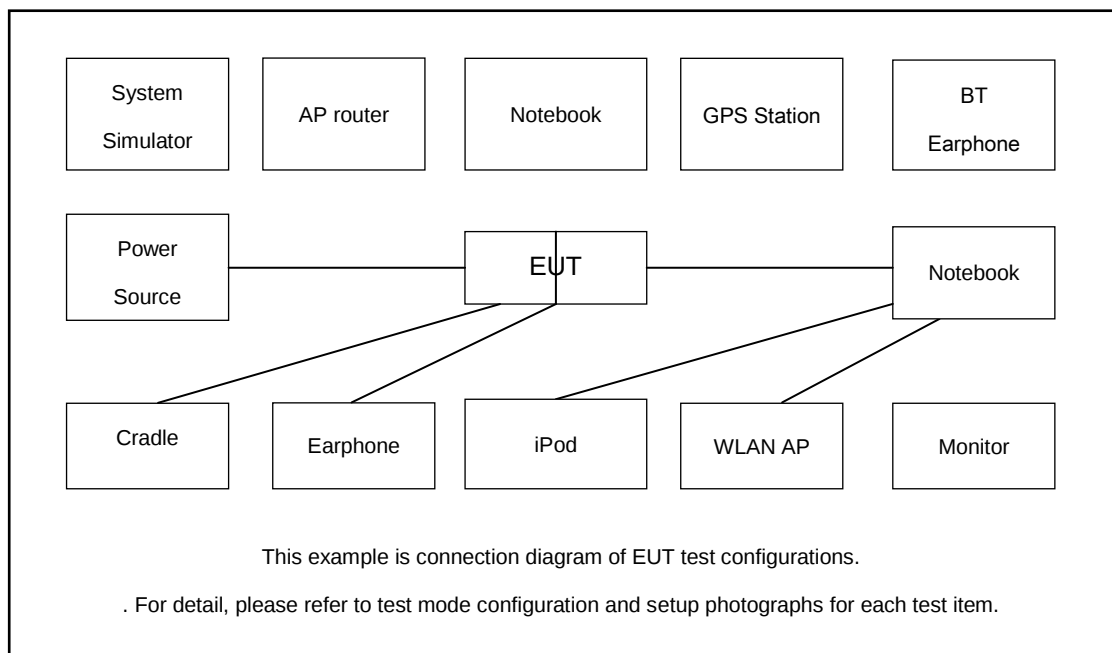
Test Items	Function Type
AC Conducted Emission	Mode 1: GSM 850 Idle(Middle CH) + USB Cable 1(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(2.4G) + Camera(Rear) for SIM 1
	Mode 2: CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2
	Mode 3: LTE Band 12 Idle(Low CH) + USB Cable 3(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(2.4G) + MPEG4(Colur bar) for SIM 1
	Mode 4: LTE Band 13 Idle(High CH) + USB Cable 2(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(5G) + NFC On for SIM 2
	Mode 5: LTE Band 17 Idle(Middle CH) + USB Cable 2(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(2.4G) + H-Pattern for SIM 1
	Mode 6: LTE Band 26 Idle(High CH) + USB Cable 2(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(5G) + GNSS RX for SIM 2
	Mode 7: LTE Band 71 Idle(Low CH) + USB Cable2(Data Link with Notebook) + Battery 1 + BT Idle + WLAN Idle(2.4G) for SIM 1
	Mode 8: LTE Band 29 Idle(Middle CH) + USB Cable 2(Charging from Adapter 2) + Battery 1 + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2
	Mode 9: NSA_2A_N5A Idle(Middle CH) + USB Cable 2(Charging from Adapter 3) + Battery 1 + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 1
	Mode 10 : NSA 2A_n71A Idle(Middle CH) + USB Cable 2(Charging from Adapter 1) + Battery 2 + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2
	Mode 11 : CDMA BC10 Idle(Middle CH) + Charging from wireless charging + Battery 1 + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2
	Mode 12 : CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 1) + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2
	Mode 13 : CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 1) + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2
	Mode 14 : CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 1) + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2
	Mode 15 : CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 2) + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2
	Mode 16 : CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 2) + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2

	Mode 17 : CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 2) + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2 Mode 18 : CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 3) + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2 Mode 19 : CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 3) + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2 Mode 20 : CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 3) + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2
Radiated Emissions	Mode 1: GSM 850 Idle(Middle CH) + USB Cable 1(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(2.4G) + Camera(Rear) for SIM 1 Mode 2: CDMA BC10 Idle(Middle CH) + USB Cable 2(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(5G) + Camera(Front) for SIM 2 Mode 3: LTE Band 12 Idle(Low CH) + USB Cable 3(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(2.4G) + MPEG4(Colour bar) for SIM 1 Mode 4: LTE Band 13 Idle(High CH) + USB Cable 1(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(5G) + NFC On for SIM 2 Mode 5: LTE Band 17 Idle(Middle CH) + USB Cable 1(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(2.4G) + H-Pattern for SIM 1 Mode 6: LTE Band 26 Idle(High CH) + USB Cable 1(Charging from Adapter 1) + Battery 1 + BT Idle + WLAN Idle(5G) + GNSS RX for SIM 2 Mode 7: NSA_2A_N5A Idle(Middle CH) + USB Cable 1(Charging from Adapter 2) + Battery 1 + (BT Idle) + WLAN Idle(2.4G) + Camera(Rear) for SIM 1 Mode 8: NSA 2A_n71A Idle(Middle CH) + USB Cable 1(Charging from Adapter 3) + Battery 1 + (BT Idle) + WLAN Idle(2.4G) + Camera(Rear) for SIM 2 Mode 9: LTE Band 71 Idle(Low CH) + USB Cable 1(Data Link with Notebook) + Battery 1 + BT Idle + WLAN Idle(2.4G) for SIM 1 Mode 10 : LTE Band 71 Idle(Low CH) + USB Cable 2(Data Link with Notebook) + Battery 1 + BT Idle + WLAN Idle(2.4G) for SIM 2 Mode 11 : LTE Band 71 Idle(Low CH) + USB Cable 3(Data Link with Notebook) + Battery 1 + BT Idle + WLAN Idle(2.4G) for SIM 1 Mode 12 : LTE Band 29 Idle(Middle CH) + Type C Earphone + Battery 1 + BT Idle + WLAN Idle(2.4G) + MP3 for SIM 1 Mode 13 : GSM 850 Idle(Middle CH) + USB Cable 1(Charging from Adapter 1) + Battery 2 + BT Idle + WLAN Idle(2.4G) + Camera(Rear) for SIM 1 Mode 14 : GSM 850 Idle(Middle CH) + Charging from wireless charging + Battery 1 + BT Idle + WLAN Idle(2.4G) + Camera(Rear) for SIM 1 Mode 15 : GSM 850 Idle(Middle CH) + Reverse charge + Battery 1 + BT Idle + WLAN Idle(2.4G) + Camera(Rear) for SIM 1

Remark:

1. The worst case of AC is mode 18; only the test data of this mode is reported.
2. The worst case of RE is mode 14; only the test data of this mode is reported.
3. Data Link with Notebook / PC means data application transferred mode between EUT and Notebook / PC.
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.	Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded,1.8m
2.	Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded,1.8m
3.	Base Station	Anritsu	MT8820C	N/A	N/A	Shielded, 1.5m
4.	Earphone	HUAWEI	N/A	N/A	Shielded, 1.2m	N/A
5.	Bluetooth Earphone	Samsung	EO-MG900	N/A	N/A	N/A
6.	WLAN AP	D-Link	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
7.	WLAN AP	ASUSTek	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,2.7m with Core
8.	GNSS Station	RACELOGIC	18645	N/A	N/A	Unshielded,1.8m
9.	Notebook	Lenovo	E540	Fcc DoC	N/A	shielded cable DC O/P 1.8m Unshielded AC I/P cable 1.8m
10.	iPod	Apple	MC525 ZP/A	Fcc DoC	Shielded, 1.0m	N/A
11.	GNSS Station	T&E	GS-50	N/A	N/A	Unshielded,1.8m
12.	wireless charger	ONEPLUS	C301ACN	N/A	Unshielded,1.0m	N/A



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.

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.

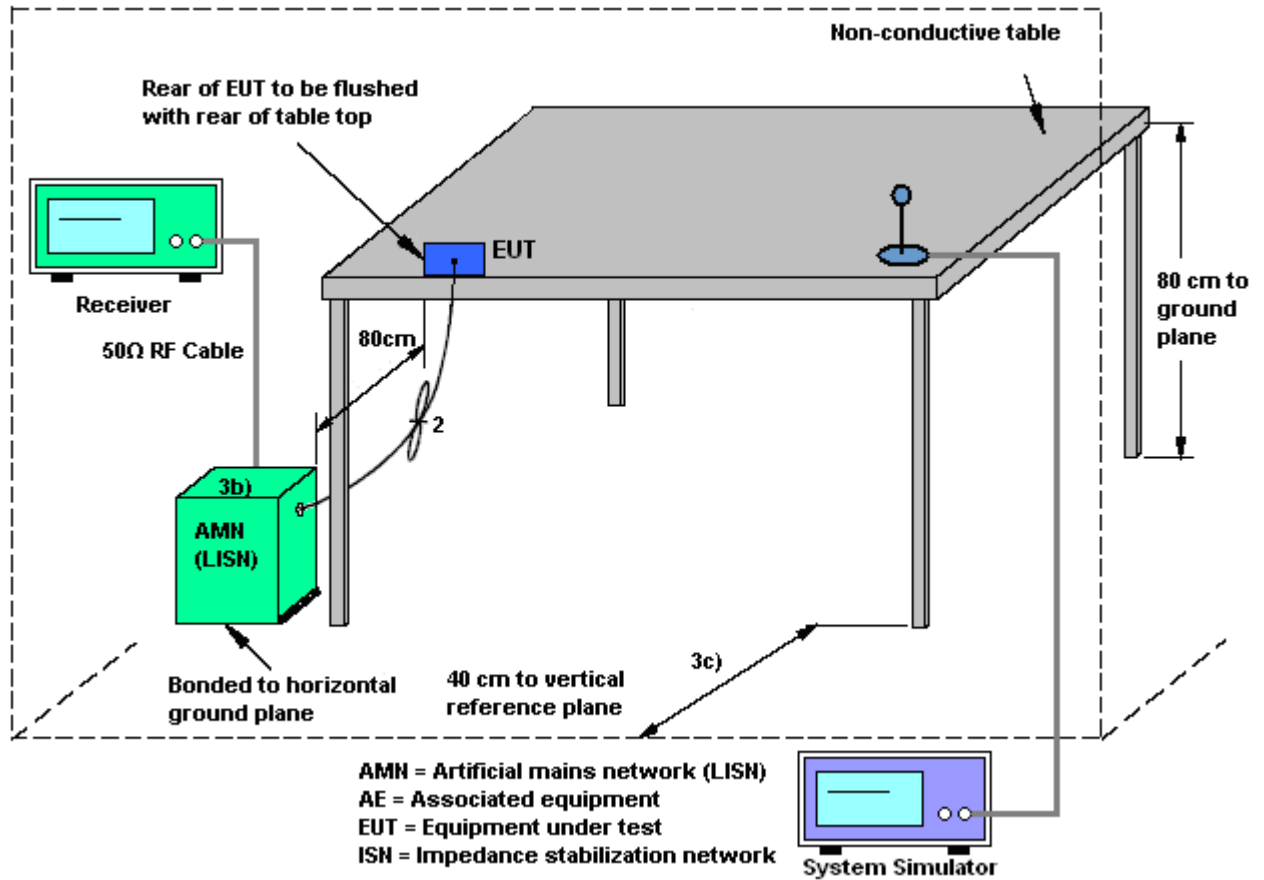
3.1.2 Measuring Instruments

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.

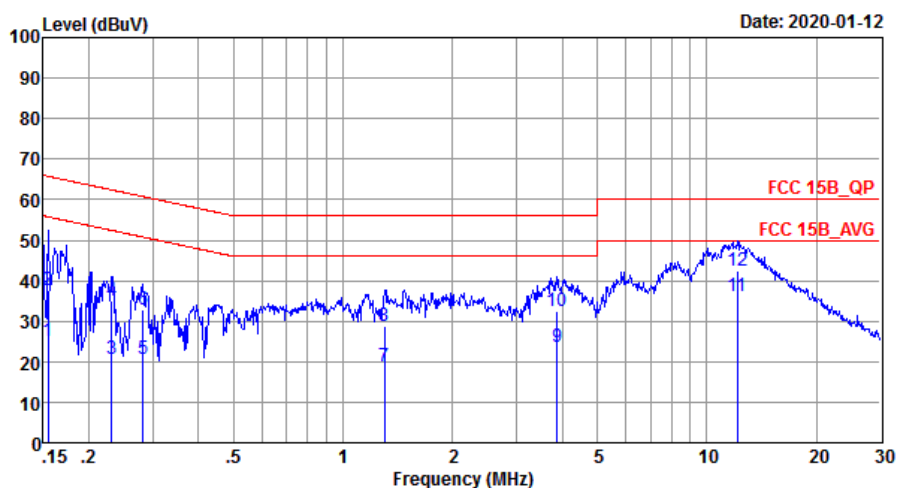
3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

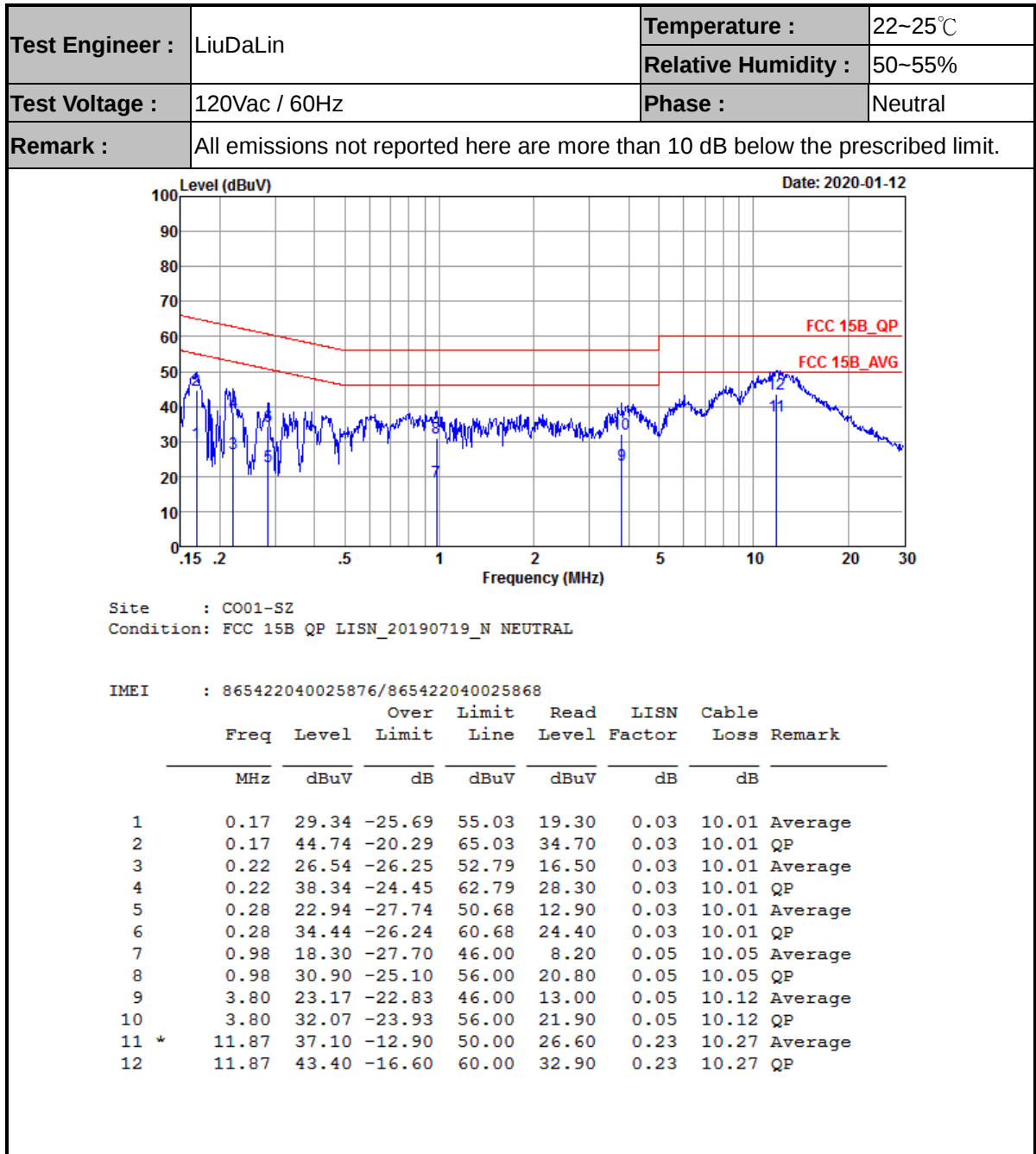
Test Engineer :	LiuDaLin	Temperature :	22~25℃
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15B_QP LISN_20190719_L LINE

IMEI : 865422040025876/865422040025868

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	24.94	-30.80	55.74	14.90	0.03	10.01	Average
2	0.15	37.64	-28.10	65.74	27.60	0.03	10.01	QP
3	0.23	20.64	-31.75	52.39	10.60	0.03	10.01	Average
4	0.23	35.14	-27.25	62.39	25.10	0.03	10.01	QP
5	0.28	20.74	-30.02	50.76	10.70	0.03	10.01	Average
6	0.28	32.84	-27.92	60.76	22.80	0.03	10.01	QP
7	1.30	18.84	-27.16	46.00	8.70	0.09	10.05	Average
8	1.30	28.94	-27.06	56.00	18.80	0.09	10.05	QP
9	3.88	23.70	-22.30	46.00	13.39	0.18	10.13	Average
10	3.88	32.40	-23.60	56.00	22.09	0.18	10.13	QP
11 *	12.12	36.30	-13.70	50.00	25.60	0.43	10.27	Average
12	12.12	42.30	-17.70	60.00	31.60	0.43	10.27	QP



Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. 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

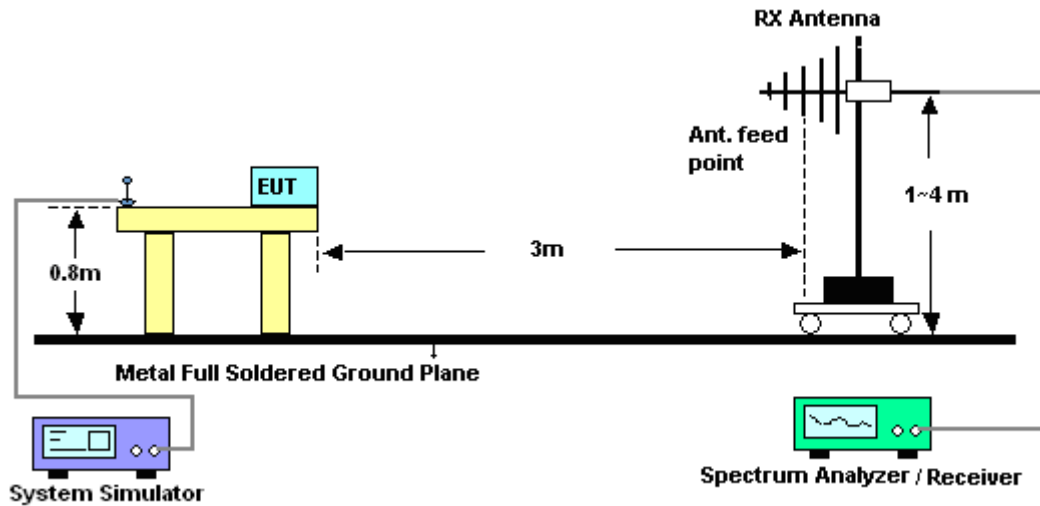
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

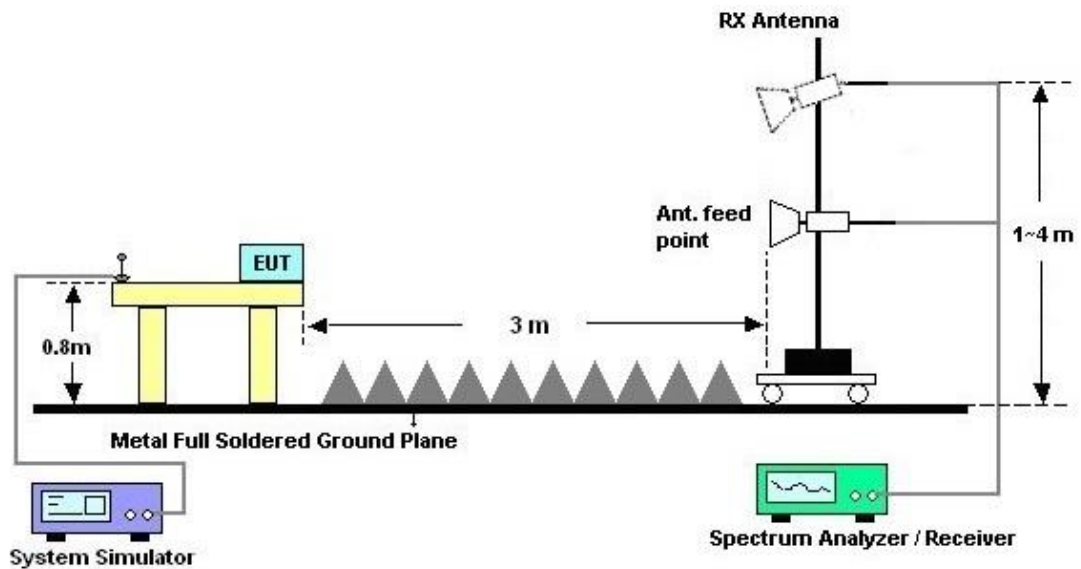
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna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

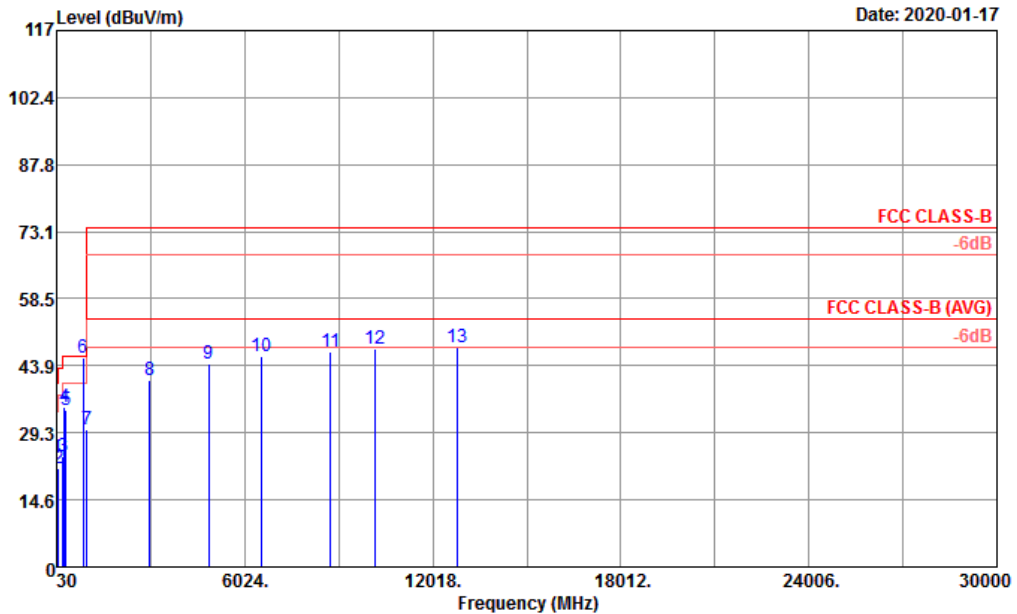


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

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



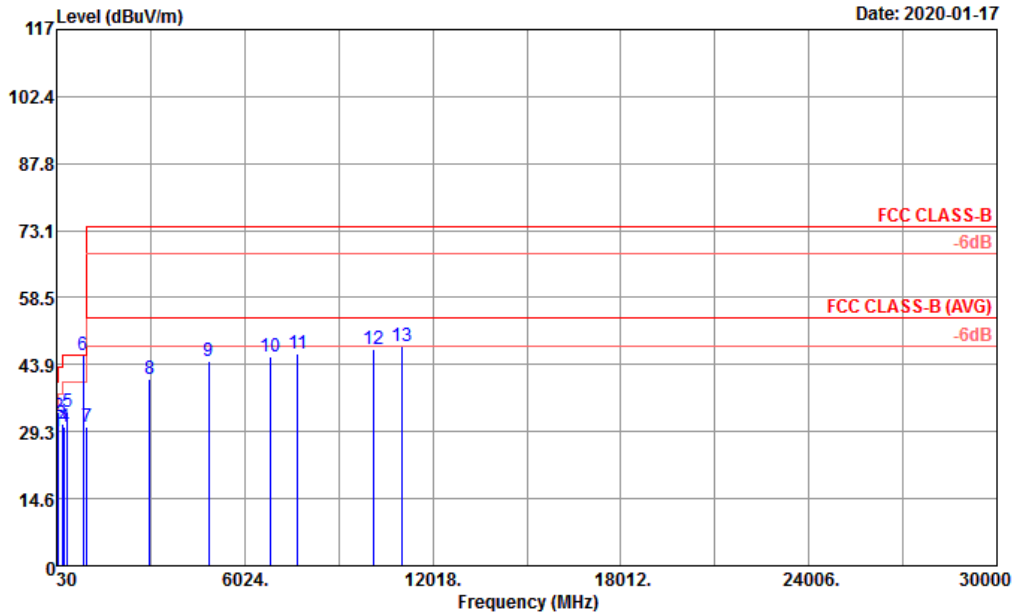
Site : 03CH03-SZ
Condition : FCC CLASS-B 3m LF47611_CBL6112D_6 HORIZONTAL

IMEI : 865422040025272/865422040025264

	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	cm	deg	
1	30.00	23.66	-16.34	40.00	30.34	25.20	0.52	32.40	---	Peak
2	88.20	21.59	-21.91	43.50	38.06	14.74	0.89	32.10	---	Peak
3	224.00	24.14	-21.86	46.00	38.94	15.74	1.42	31.96	---	Peak
4	279.29	34.78	-11.22	46.00	45.70	19.22	1.60	31.74	115	Peak
5	327.79	34.19	-11.81	46.00	44.16	20.01	1.72	31.70	---	Peak
6 *	881.66	45.52			47.43	26.69	2.86	31.46	---	Peak
7	991.27	30.12	-23.88	54.00	30.67	27.51	3.03	31.09	---	Peak
8	3000.00	40.61	-33.39	74.00	62.76	28.60	6.55	57.30	---	Peak
9	4884.00	44.20	-29.80	74.00	61.93	31.17	8.62	57.52	---	Peak
10	6562.00	45.81	-28.19	74.00	60.45	33.74	9.89	58.27	---	Peak
11	8762.00	46.86	-27.14	74.00	57.23	37.82	10.86	59.05	---	Peak
12	10182.00	47.68	-26.32	74.00	55.69	39.62	11.56	59.19	---	Peak
13	12778.00	47.81	-26.19	74.00	52.51	40.49	12.56	57.75	100	Peak



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



Site : 03CH03-SZ
Condition : FCC CLASS-B 3m LF47611_CBL6112D_6 VERTICAL

IMEI : 865422040025272/865422040025264
Plane : Y

	Freq	Level	Over Limit	Limit Line	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	30.00	29.21	-10.79	40.00	35.89	25.20	0.52	32.40	100	221 Peak
2	88.20	32.45	-11.05	43.50	48.92	14.74	0.89	32.10	---	--- Peak
3	219.15	30.95	-15.05	46.00	46.20	15.32	1.41	31.98	---	--- Peak
4	279.29	30.34	-15.66	46.00	41.26	19.22	1.60	31.74	---	--- Peak
5	385.99	33.58	-12.42	46.00	41.67	21.52	1.88	31.49	---	--- Peak
6 *	881.66	46.02			47.93	26.69	2.86	31.46	---	--- Peak
7	985.45	30.44	-23.56	54.00	31.11	27.46	3.02	31.15	---	--- Peak
8	3000.00	40.66	-33.34	74.00	62.81	28.60	6.55	57.30	---	--- Peak
9	4870.00	44.53	-29.47	74.00	62.28	31.17	8.60	57.52	---	--- Peak
10	6866.00	45.61	-28.39	74.00	59.61	34.61	10.03	58.64	---	--- Peak
11	7710.00	46.29	-27.71	74.00	57.69	37.12	10.56	59.08	---	--- Peak
12	10128.00	47.35	-26.65	74.00	55.50	39.56	11.54	59.25	---	--- Peak
13	11052.00	47.76	-26.24	74.00	53.46	40.65	11.89	58.24	100	62 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. 12, 2020	Dec. 25, 2020	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Oct. 17, 2019	Jan. 12, 2020	Oct. 16, 2020	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Dec. 26, 2019	Jan. 12, 2020	Dec. 25, 2020	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 23, 2019	Jan. 12, 2020	Jul. 22, 2020	Conduction (CO01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 18, 2019	Jan. 17, 2020	Apr. 17, 2020	Radiation (03CH03-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 18, 2019	Jan. 17, 2020	Apr. 17, 2020	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz~2GHz	Apr. 19, 2019	Jan. 17, 2020	Apr. 18, 2020	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Apr. 01 2019	Jan. 17, 2020	Mar. 31, 2020	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz~40GHz	Apr. 18, 2019	Jan. 17, 2020	Apr. 17, 2020	Radiation (03CH03-SZ)
LF Amplifier	Burgeon	BPA-530	102210	0.01Hz~3000MHz	Oct. 18, 2019	Jan. 17, 2020	Oct. 17, 2020	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 18, 2019	Jan. 17, 2020	Oct. 17, 2020	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 22, 2019	Jan. 17, 2020	Jul. 21, 2020	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Jan. 17, 2020	NCR	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jan. 17, 2020	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jan. 17, 2020	NCR	Radiation (03CH03-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% ($U = 2Uc(y)$)	2.6 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.6dB
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