

# **FCC Test Report**

| APPLICANT      | : | Honeywell International Inc   |
|----------------|---|-------------------------------|
| EQUIPMENT      | : | mobile computer               |
| BRAND NAME     | : | Honeywell                     |
| MODEL NAME     | : | CT37X0N                       |
| FCC ID         | : | HD5-CT37X0N                   |
| STANDARD       | : | 47 CFR Part 15 Subpart B      |
| CLASSIFICATION | : | Certification                 |
| TEST DATE(S)   | : | Jul. 18, 2024 ~ Jul. 21, 2024 |

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

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

JasonJia

Approved by: Jason Jia



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



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### **APPENDIX A. SETUP PHOTOGRAPHS**



# **REVISION HISTORY**

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FC461913   | Rev. 01 | Initial issue of report | Jul. 26, 2024 |
|            |         |                         |               |
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|            |         |                         |               |



# SUMMARY OF TEST RESULT

| Report<br>Section | FCC Rule | Description           | Limit           | Result | Remark      |
|-------------------|----------|-----------------------|-----------------|--------|-------------|
|                   |          |                       |                 |        | Under limit |
| 3.1               | 15.107   | AC Conducted Emission | < 15.107 limits | PASS   | 10.79 dB at |
|                   |          |                       |                 |        | 11.080 MHz  |
|                   |          |                       |                 |        | Under limit |
| 3.2               | 15.109   | Radiated Emission     | < 15.109 limits | PASS   | 3.32 dB at  |
|                   |          |                       |                 |        | 480.08 MHz  |

#### Conformity Assessment Condition:

The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account. Please refer to each test results in the section "Measurement Uncertainty".

#### Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



# **1. General Description**

### 1.1. Applicant

#### **Honeywell International Inc**

9680 Old Bailes Rd, Fort Mill, SC 29707

### 1.2. Manufacturer

### Honeywell International Inc

9680 Old Bailes Rd, Fort Mill, SC 29707

### **1.3.** Product Feature of Equipment Under Test

|                                 | Product Feature  |
|---------------------------------|--|
| Equipment                       | mobile computer  |
| Brand Name                      | Honeywell  |
| Model Name                      | CT37X0N  |
| FCC ID                          | HD5-CT37X0N  |
| EUT supports Radios application | WLAN 2.4GHz 802.11b/g/n HT20/HT40<br>WLAN 2.4GHz 802.11ax HE20/HE40<br>WLAN 5GHz 802.11a/n HT20/HT40<br>WLAN 5GHz 802.11ac VHT20/VHT40/VHT80/VHT160<br>WLAN 5GHz 802.11ax HE20/HE40/HE80/HE160<br>WLAN 6GHz 802.11a<br>WLAN 6GHz 802.11ax (HE20/ HE40/ HE80/ HE160)<br>Bluetooth BR/EDR/LE<br>NFC              |
| IMEI / SN Code                  | Conduction:<br>24173001C4 Sample 1<br>2417300239 Sample 2<br>241730003C Sample 3<br>2417300220 Sample 4<br>24173002B1 Sample 5<br>Radiation:<br>24173001C4 for Sample 1<br>24173001C4 for Sample 1<br>241730003C for Sample 2<br>241730003C for Sample 3<br>241730021E for Sample 4<br>24173002BF for Sample 5 |
| HW Version                      | V1.0   |
| SW Version                      | 514.03.00.0273-N-DEBUG-FIMG  |
| 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 five types of EUT, the differences could be referred to the CT37X0N\_Operational

Sporton International Inc.(Kunshan) TEL : +86-512-57900158 FCC ID : HD5-CT37X0N



Description of Product Equality Declaration which is exhibit separately. According to the difference, we choose sample 1 to full test and the sample 2/3/4/5 is verified for the difference

# **1.4.** Product Specification of Equipment Under Test

| Standards-related Product Specification  |  |  |  |
|--|--|--|--|
| Tx Frequency   | 802.11b/g/n/ax: 2400 MHz ~ 2483.5 MHz<br>802.11a/n/ac/ax: 5150 MHz ~ 5250 MHz;<br>5250 MHz ~ 5350 MHz;<br>5470 MHz ~ 5725 MHz<br>5725 MHz ~ 5850 MHz<br>802.11a/ax: 5925 MHz ~ 7125 MHz<br>Bluetooth: 2400 MHz ~ 2483.5 MHz<br>NFC : 13.56 MHz |  |  |
| Rx Frequency   | 802.11b/g/n/ax: 2400 MHz ~ 2483.5 MHz<br>802.11a/n/ac/ax: 5150 MHz ~ 5250 MHz;<br>5250 MHz ~ 5350 MHz;<br>5470 MHz ~ 5725 MHz<br>5725 MHz ~ 5850 MHz<br>802.11a/ax: 5925 MHz ~ 7125 MHz<br>Bluetooth: 2400 MHz ~ 2483.5 MHz<br>NFC : 13.56 MHz |  |  |
| Antenna Type   | <ant 6=""> : WLAN : LDS Antenna<br/><ant 7=""> : WLAN : LDS Antenna<br/>Bluetooth module 1: LDS Antenna<br/>Bluetooth module 2: FPC Antenna<br/>NFC: FPC Antenna</ant></ant>   |  |  |
| Type of Modulation 802.11b: DSSS (DBPSK / DQPSK / CCK)<br>802.11a/g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)<br>802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 25<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 16<br>802.11ax: OFDM (BPSK / QPSK / 16QAM / 16<br>802.11ax: OFDM (BPSK / 16QAM / 16<br>802.11ax: OFDM ( |  |  |  |

### 1.5. Modification of EUT

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



### 1.6. Test Location

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

| Test Firm          | Sporton International Inc. (Kunshan)   |                      |                  |  |
|--------------------|--|----------------------|------------------|--|
| Test Site Location | No. 1098, Pengxi North Road, Kunshan Economic Development Zone<br>Jiangsu Province 215300 People's Republic of China<br>TEL : +86-512-57900158 |                      |                  |  |
|                    | Sporton Site No.   | FCC Designation No.  | FCC Test Firm    |  |
| Test Site No.      | oporton one no.  | T CC Designation No. | Registration No. |  |
|                    | CO01-KS<br>03CH02-KS   | CN1257               | 314309           |  |

### 1.7. Test Software

| ltem | Site      | Manufacturer | Name | Version       |
|------|-----------|--------------|------|---------------|
| 1.   | 03CH02-KS | AUDIX        | E3   | 6.2009-8-24al |
| 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

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



# 2. Test Configuration of Equipment Under Test

### 2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz

to the 5th harmonic of the highest frequency or to 40 GHz, whichever is lower).

| Test Items   | Function Type   |
|--------------|---|
|              | Mode 1: Bluetooth Idle 1 + WLAN (2.4G) Idle + Camera(Rear) + Battery + USB  |
|              | Cable (Charging from Adapter ) + Lanyard for Sample 1   |
|              | Mode 2: Bluetooth Idle 1 + WLAN (5G) Idle + Camera(Front) + Battery + USB   |
|              | Cable (Charging from Adapter ) + Lanyard for Sample 1   |
|              | Mode 3: Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery +  |
|              | USB Cable (Data Link with Notebook) + EUT (eMMC) USB Data Link to   |
|              | PC/NB + Lanyard for Sample 1  |
|              | Mode 4: Bluetooth Idle 1 + WLAN (2.4G) Idle + NFC On + Battery + USB Cable<br>(Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC) + |
|              | Lanyard for Sample 1  |
|              | Mode 5: Bluetooth Idle 1 + WLAN (5G) Idle + scanning + Battery + USB Cable  |
|              | (Data Link with Notebook) + EUT (SD) USB Data Link to PC/NB +   |
|              | Lanyard for Sample 1  |
|              | Mode 6: Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery +  |
|              | USB Cable (Data Link with Notebook) + PC/NB USB Data Link to EUT  |
|              | (SD) + Lanyard for Sample 1   |
|              | Mode 7: Bluetooth Idle 1 + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Battery  |
| AC Conducted | + USB Cable (Data Link with Notebook) + EUT ((IPSM CARD) USB  |
| Emission     | Data Link to PC/NB + Lanyard for Sample 1   |
|              | Mode 8: Bluetooth Idle 1 + WLAN (5G) Idle + MPEG4(Run Color Bar) + Battery +  |
|              | USB Cable (Data Link with Notebook) + PC/NB USB Data Link to EUT  |
|              | (IPSM CARD) + Lanyard for Sample 1<br>Mode 9: Bluetooth Idle 1 + WLAN (5G) Idle + MPEG4(Run Color Bar) + Battery +                            |
|              | Charging from cradle+ Lanyard for Sample 1  |
|              | Mode 10 : Bluetooth Idle 1 + WLAN (5G) Idle + MPEG4(Run Color Bar) + Battery  |
|              | + Charging from cradle+ Lanyard for Sample 2  |
|              | Mode 11 : Bluetooth Idle 1 + WLAN 6E Idle+ scanning + Battery + USB Cable   |
|              | (Data Link with Notebook)+ EUT (eMMC) USB Data Link to PC/NB +  |
|              | Lanyard for Sample 3  |
|              | Mode 12 : Bluetooth Idle 1 + WLAN 6E Idle+ MPEG4(Run Color Bar) + Battery +   |
|              | USB Cable (Data Link with Notebook)+ EUT (eMMC) USB Data Link to  |
|              | PC/NB + Lanyard for Sample 4  |
|              | Mode 13 : Bluetooth Idle 1 + WLAN (5G) Idle+ scanning + Battery + Charging  |
|              | from cradle + Lanyard for Sample 5<br>Mode 14 : Bluetooth Idle 1 + WLAN (5G) Idle+ MPEG4(Run Color Bar) + Battery                             |
|              | + Stock With scanning + Lanyard for Sample 1  |
|              |   |

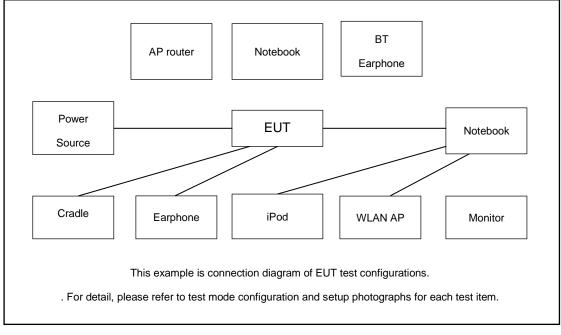


|              | Mode 1: Bluetooth Idle 1 + WLAN (2.4G) Idle + Camera(Rear) + Battery1 + US   |
|--------------|--|
|              | Cable (Charging from Adapter) + Lanyard for Sample 1                         |
|              | Mode 2: Bluetooth Idle 1 + WLAN (5G) Idle + Camera(Front) + Earphone         |
|              | Battery + Lanyard for Sample 1   |
|              | Mode 3: Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery     |
|              | USB Cable (Data Link with Notebook) + EUT (eMMC) USB Data Link               |
|              | PC/NB + Lanyard for Sample 1   |
|              |  |
|              | Mode 4: Bluetooth Idle 1 + WLAN (2.4G) Idle + NFC On + Battery + USB Cab     |
|              | (Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC)                |
|              | Lanyard for Sample 1   |
|              | Mode 5: Bluetooth Idle 1 + WLAN (5G) Idle + scanning + Battery + USB Cat     |
|              | (Data Link with Notebook) + EUT (SD) USB Data Link to PC/NB                  |
|              | Lanyard for Sample 1   |
|              | Mode 6: Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery     |
|              | USB Cable (Data Link with Notebook) + PC/NB USB Data Link to EL              |
|              | (SD) + Lanyard for Sample 1  |
|              | Mode 7: Bluetooth Idle 1 + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Batte   |
|              | + USB Cable (Data Link with Notebook) + EUT ((IPSM CARD) US                  |
|              | Data Link to PC/NB + Lanyard for Sample 1                                    |
| Radiated     | Mode 8: Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery     |
| Emissions    | USB Cable (Data Link with Notebook) + PC/NB USB Data Link to El              |
| LIIIISSIOIIS | (IPSM CARD) + Lanyard for Sample 1   |
|              |  |
|              | Mode 9: Bluetooth Idle 2 + Phone turn-off + Stand Alone + Lanyard for Sample |
|              | Mode 10 : Bluetooth Link 1 + WLAN (5G) Link + MPEG4(Run Color Bar)           |
|              | Charging from cradle + Lanyard for Sample1                                   |
|              | Mode 11 : Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery   |
|              | USB Cable (Data Link with Notebook) + PC/NB USB Data Link to EL              |
|              | (SD) + Lanyard for Sample2   |
|              | Mode 12 : Bluetooth Idle 1 + WLAN 6E Idle + scanning + Battery + USB Cat     |
|              | (Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB                |
|              | Lanyard for Sample3  |
|              | Mode 13 : Bluetooth Idle 1 + WLAN 6E Idle + scanning + Battery + USB Cat     |
|              | (Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB                |
|              | Lanyard for Sample4  |
|              | Mode 14 : Bluetooth Idle 1 + WLAN 6E Idle + scanning + Battery + USB Cab     |
|              | (Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB                |
|              | Lanyard for Sample5  |
|              | Mode 15 : Bluetooth Idle 1 + WLAN 6E Idle + Stock With scanning + Battery    |
|              |  |
|              | USB Cable (Data Link with Notebook) + EUT (eMMC) USB Data Link               |
|              | PC/NB + Lanyard for Sample3  |
| emark:       |  |
|              | st case of AC is mode 9; only the test data of this mode is reported.        |
|              | st case of RE is mode 12; only the test data of this mode is reported.       |
|              | k with Notebook / PC means data application transferred mode between EUT and |
| Noteboo      | ok / PC.   |
|              |  |

- 4. Bluetooth Idle 1 is a Bluetooth module 1 which could normal idle
- 5. Bluetooth Idle 2 is a Bluetooth module 2 which could work in switch OFF state



### 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.   | WLAN AP               | D-link     | DIR-655       | KA21R655B1    | N/A        | Unshielded,1.8m  |
| 2.   | WLAN AP               | TP-Link    | TL-WDR5600    | N/A           | N/A        | Unshielded,1.8m  |
| 3.   | Bluetooth Earphone    | Lenovo     | thinkplus-BH3 | N/A           | N/A        | N/A  |
| 4.   | Earphone              | moto       | LYEJ02LM      | N/A           | N/A        | N/A  |
| 5.   | Notebook              | Lenovo     | G480          | QDS-BRCM1050I | N/A        | shielded cable DC<br>O/P 1.8m ,<br>Unshielded AC I/P<br>cable 1.8m |
| 6.   | Notebook              | Lenovo     | V130-14IKB001 | N/A           | N/A        | N/A  |
| 7.   | SD Card               | SanDisk    | Uitra         | N/A           | N/A        | N/A  |
| 8.   | SD Card               | Kingston   | 8GB           | N/A           | N/A        | N/A  |
| 9.   | Hard Disk             | Lenovo     | F310          | DoC           | N/A        | Shielded, 1.2m   |
| 10.  | Hard disk             | Ultra      | WD            | N/A           | N/A        | N/A  |
| 11.  | USB Cable             | N/A        | N/A           | N/A           | N/A        | N/A  |
| 12.  | Adapter               | N/A        | N/A           | N/A           | N/A        | N/A  |
| 13.  | Cradle                | N/A        | N/A           | N/A           | N/A        | N/A  |
| 14.  | NFC Card              | N/A        | N/A           | N/A           | N/A        | N/A  |
| 15.  | Adapter for<br>Cradle | N/A        | N/A           | N/A           | N/A        | N/A  |

### 2.4. EUT Operation Test Setup

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 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 Conducted limit |            | limit (dBuV) |
|---------------------------------------|------------|--------------|
| (MHz)                                 | 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

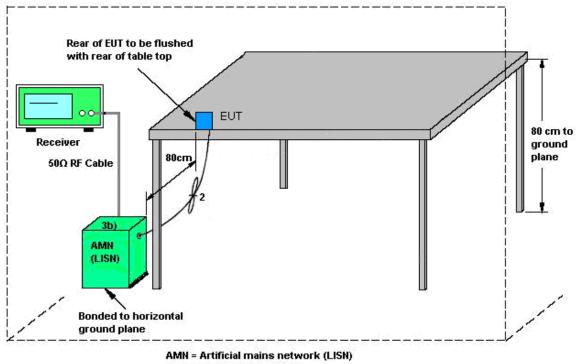
The measuring equipment is listed in the section 4 of this test report.

### 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.
- 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.

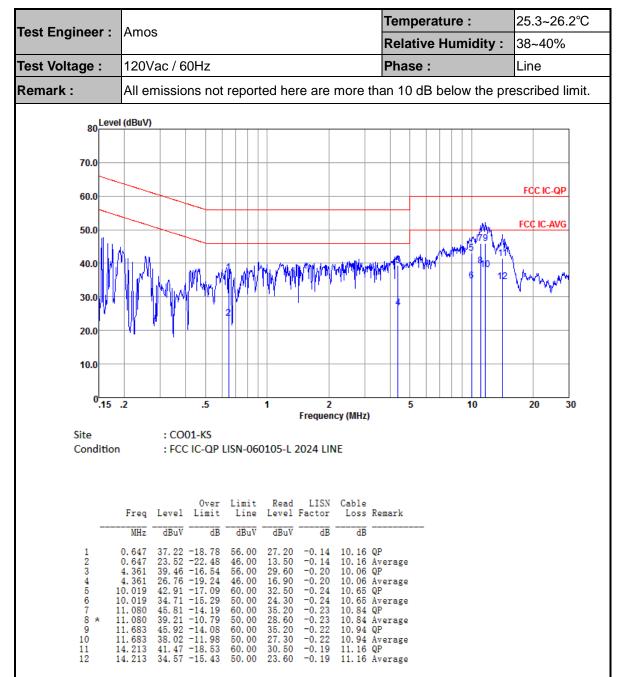


### 3.1.4 Test Setup



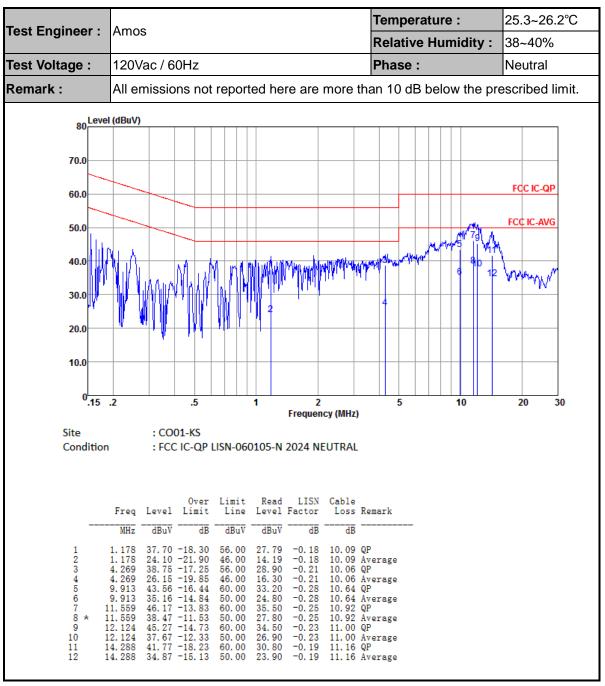
- AE = Associated equipment
- EUT = Equipment under test
- ISN = Impedance stabilization network





### 3.1.5 Test Result of AC Conducted Emission





Note:

- 1. Level(dB $\mu$ V) = Read Level(dB $\mu$ V) + LISN Factor(dB) + Cable Loss(dB)
- 2. Over  $Limit(dB) = Level(dB\mu V) Limit Line(dB\mu V)$



### 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 | Field Strength     | Measurement Distance |  |  |
|-----------|--------------------|----------------------|--|--|
| (MHz)     | (microvolts/meter) | (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.



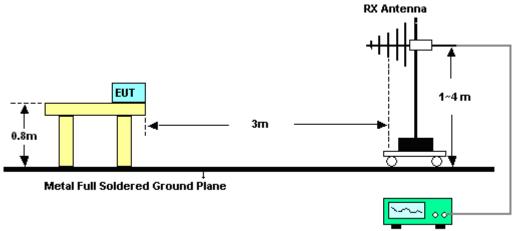
### 3.2.3. Test Procedures

- 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 EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 4. The table was rotated 360 degrees to determine the position of the highest radiation.
- 5. 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.
- 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.
- 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).
- 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.
- 9. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m)
- 10. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level
- 11. Exploratory radiated emissions testing of handheld and/or body-worn devices shall include rotation of the EUT through three orthogonal axes (X/Y/Z Plane) to determine the orientation (attitude) that maximizes the emissions.



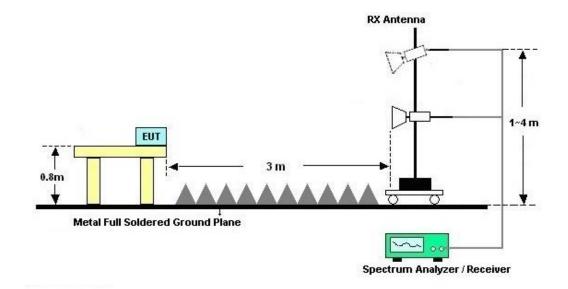
### 3.2.4. Test Setup of Radiated Emission

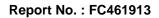
#### For radiated emissions from 30MHz to 1GHz



Spectrum Analyzer / Receiver

#### For radiated emissions above 1GHz



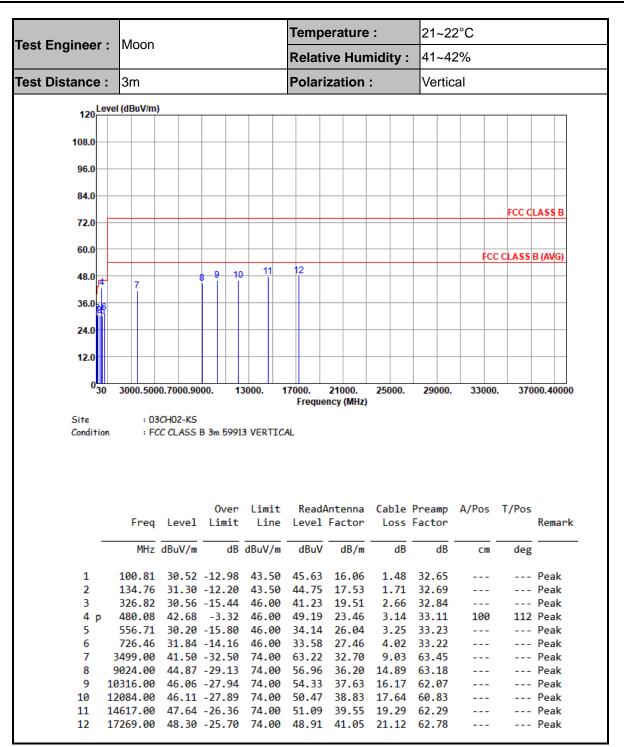




| est Engineer · Moon   |  |   |   |   | Temp  | erature   | :  | 21~2  | 2°C                                |   |   |
|---|--|---|---|---|---|---|--|---|------------------------------------|---|---|
| est Engineer :  | Moon   |   |   |   | Relative Humidity :<br>Polarization :   |   |  | 41~42%<br>Horizontal  |                                    |   |   |
| est Distance :  | 3m   |   |   |   |   |   |  |   |                                    |   |   |
| 120   | el (dBuV/m)  | )   |   |   |   |   |  |   |                                    |   |   |
|   |  |   |   |   |   |   |  |   |                                    |   |   |
| 108.0   |  |   |   |   |   |   |  |   |                                    |   |   |
| 96.0  |  |   |   |   |   |   |  |   |                                    |   |   |
| 84.0  |  |   |   |   |   |   |  |   |                                    |   |   |
|   |  |   |   |   |   |   |  |   |                                    | FCC C                                   | LASS B  |
| 72.0  |  |   |   |   |   |   |  |   |                                    |   |   |
| 60.0  |  |   |   |   |   |   |  |   | FC                                 | C CLASS                                 | B (AVG)   |
| 48.0  |  |   | 9   | 10 11   | 12  |   |  |   |                                    |   |   |
| 24  | 7 8  |   |   |   |   |   |  |   |                                    |   |   |
| 36.0 <sub>36</sub>  |  |   |   |   |   |   |  |   |                                    |   |   |
| 24.0  |  |   |   |   |   |   |  |   |                                    |   |   |
| 12.0  |  |   |   |   |   |   |  |   |                                    |   |   |
| 12.0  |  |   |   |   |   |   |  |   |                                    |   |   |
|   |  |   |   |   |   |   |  |   |                                    |   |   |
| 0 <sub>30</sub><br>Site   |  | 0.7000.90   | 00. 1   | 3000.   | 17000.<br>Freque  | 21000.<br>ncy (MHz)   | 25000.   | 29000.  | 3300                               | 0. 370                                  | 00.40000  |
| 0 <mark>30</mark><br>Site<br>Condition  | : 03   | 0.7000.90<br>0CH02-K5<br>CC CLASS   |   |   | Freque  |   |  | 29000.  | 3300                               | 0. 370                                  | 00.40000  |
| -30<br>Site   | : 03   | CH02-KS   | B 3m 5991   |   | Freque  | ncy (MHz)   |  |   |                                    |   |   |
| -30<br>Site   | : 03<br>: FC   | CH02-KS   | 8 3m 5991<br>Over   | 3 HORIZ(<br>Limit   | Freque<br>ONTAL<br>ReadA  | ncy (MHz)<br>Antenna  |  | Preamp  |                                    |   |   |
| -30<br>Site   | : 03<br>: FC<br>Freq   | CH02-K5   | B 3m 5991<br>Over<br>Limit  | 3 HORIZ(<br>Limit   | Freque<br>ONTAL<br>ReadA<br>Level   | ncy (MHz)<br>Antenna<br>Factor  | Cable<br>Loss  | Preamp<br>Factor  |                                    |   | Remark  |
| -30<br>Site   | : 03<br>: FC<br>Freq<br>MHz  | CH02-KS<br>C CLASS<br>Level<br>dBuV/m   | B 3m 5991<br>Over<br>Limit<br>dB  | 3 HORIZO  | Freque<br>ONTAL<br>ReadA<br>Level   | ncy (MHz)<br>Intenna<br>Factor<br>dB/m  | Cable<br>Loss<br>dB  | Preamp<br>Factor  | A/Pos<br>cm                        | T/Pos<br>deg                            | Remark  |
| Site<br>Condition   | : 03<br>: FC<br>Freq<br>MHz<br>31.94<br>233.70   | Level<br>dBuV/m<br>21.21<br>39.75   | 0ver<br>Limit<br>-18.79<br>-6.25  | 3 HORIZO<br>Limit<br>Line<br>dBuV/m<br>40.00<br>46.00   | Freque<br>ONTAL<br>ReadA<br>Level<br>dBuV<br>29.52<br>54.06   | ncy (MHz)<br>Intenna<br>Factor<br>dB/m<br>23.72<br>16.45  | Cable<br>Loss<br>dB<br>0.76<br>2.09  | Preamp<br>Factor<br>dB<br>32.79<br>32.85  | A/Pos<br>                          | T/Pos<br>deg                            | Remark<br>Peak<br>Peak  |
| Site<br>Condition   | : 03<br>: FC<br>Freq<br>MHz<br>31.94<br>233.70<br>332.64   | Level<br>dBuV/m<br>21.21<br>39.75<br>30.85  | Over<br>Limit<br>-18.79<br>-6.25<br>-15.15  | 3 HORIZO<br>Limit<br>Line<br>dBuV/m<br>40.00<br>46.00<br>46.00  | Freque<br>ONTAL<br>ReadA<br>Level<br>dBuV<br>29.52<br>54.06<br>41.33  | ncy (MHz)<br>Intenna<br>Factor<br>dB/m<br>23.72<br>16.45<br>19.67   | Cable<br>Loss<br>dB<br>0.76<br>2.09<br>2.69  | Preamp<br>Factor<br>dB<br>32.79<br>32.85<br>32.84   | A/Pos<br>                          | T/Pos<br>                               | Remark<br>Peak<br>Peak<br>Peak  |
| Site<br>Condition   | : 03<br>: FC<br>Freq<br>MHz<br>31.94<br>233.70<br>332.64<br>480.08   | Level<br>dBuV/m<br>21.21<br>39.75<br>30.85<br>41.39   | Over<br>Limit<br>-18.79<br>-6.25<br>-15.15<br>-4.61   | 3 HORIZO<br>Limit<br>Line<br>dBuV/m<br>40.00<br>46.00<br>46.00  | Freque<br>ONTAL<br>ReadA<br>Level<br>dBuV<br>29.52<br>54.06<br>41.33<br>47.90   | ncy (MHz)<br>Antenna<br>Factor<br>dB/m<br>23.72<br>16.45<br>19.67<br>23.46  | Cable<br>Loss<br>dB<br>0.76<br>2.09<br>2.69<br>3.14  | Preamp<br>Factor<br>dB<br>32.79<br>32.85<br>32.84<br>33.11  | A/Pos<br>                          | T/Pos<br>deg<br><br><br>166             | Remark<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak                        |
| Site<br>Condition   | : 03<br>: FC<br>Freq<br>MHz<br>31.94<br>233.70<br>332.64<br>480.08<br>540.22   | Level<br>dBuV/m<br>21.21<br>39.75<br>30.85<br>41.39<br>32.56  | Over<br>Limit<br>-18.79<br>-6.25<br>-15.15<br>-4.61<br>-13.44   | 3 HORIZO<br>Limit<br>Line<br>dBuV/m<br>40.00<br>46.00<br>46.00<br>46.00                                     | Freque<br>ONTAL<br>ReadA<br>Level<br>dBuV<br>29.52<br>54.06<br>41.33<br>47.90<br>38.19  | ncy (MHz)<br>Intenna<br>Factor<br>dB/m<br>23.72<br>16.45<br>19.67<br>23.46<br>24.40                                     | Cable<br>Loss<br>dB<br>0.76<br>2.09<br>2.69<br>3.14<br>3.18  | Preamp<br>Factor<br>dB<br>32.79<br>32.85<br>32.84<br>33.11<br>33.21                                     | A/Pos<br>cm<br><br>200             | T/Pos<br>deg<br><br>166<br>             | Remark<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak                |
| Site<br>Condition   | : 03<br>: FC<br>Freq<br>MHz<br>31.94<br>233.70<br>332.64<br>480.08<br>540.22<br>786.60                                   | Level<br>dBuV/m<br>21.21<br>39.75<br>30.85<br>41.39<br>32.56<br>31.15                                     | Over<br>Limit<br>-18.79<br>-6.25<br>-15.15<br>-4.61<br>-13.44<br>-14.85   | Limit<br>Line<br>dBuV/m<br>40.00<br>46.00<br>46.00<br>46.00<br>46.00  | Freque<br>ONTAL<br>ReadA<br>Level<br>dBuV<br>29.52<br>54.06<br>41.33<br>47.90<br>38.19<br>32.14                                     | ncy (MHz)<br>Intenna<br>Factor<br>dB/m<br>23.72<br>16.45<br>19.67<br>23.46<br>24.40<br>27.90                            | Cable<br>Loss<br>dB<br>0.76<br>2.09<br>2.69<br>3.14<br>3.18<br>4.18                                    | Preamp<br>Factor<br>dB<br>32.79<br>32.85<br>32.84<br>33.11<br>33.21<br>33.07                            | A/Pos<br>cm<br><br>200<br>         | T/Pos<br>deg<br><br>166<br>             | Remark<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak                |
| -30<br>Site<br>Condition<br>1<br>2<br>3<br>4 p<br>5<br>6<br>7                     | : 03<br>: FC<br>Freq<br>MHz<br>31.94<br>233.70<br>332.64<br>480.08<br>540.22<br>786.60<br>2768.00                        | Level<br>dBuV/m<br>21.21<br>39.75<br>30.85<br>41.39<br>32.56<br>31.15<br>40.82                            | Over<br>Limit<br>-18.79<br>-6.25<br>-15.15<br>-4.61<br>-13.44<br>-14.85<br>-33.18                               | 3 HORIZO<br>Limit<br>Line<br>dBuV/m<br>40.00<br>46.00<br>46.00<br>46.00<br>46.00<br>74.00                   | Freque<br>ONTAL<br>ReadA<br>Level<br>dBuV<br>29.52<br>54.06<br>41.33<br>47.90<br>38.19<br>32.14<br>63.66                            | ncy (MHz)<br>Intenna<br>Factor<br>dB/m<br>23.72<br>16.45<br>19.67<br>23.46<br>24.40<br>27.90<br>32.07                   | Cable<br>Loss<br>dB<br>0.76<br>2.09<br>2.69<br>3.14<br>3.18<br>4.18<br>7.99                            | Preamp<br>Factor<br>dB<br>32.79<br>32.85<br>32.84<br>33.11<br>33.21<br>33.07<br>62.90                   | A/Pos<br>cm<br><br>200<br>         | T/Pos<br>deg<br><br>166<br><br>         | Remark<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak        |
| Site<br>Condition   | : 03<br>: FC<br>Freq<br>MHz<br>31.94<br>233.70<br>332.64<br>480.08<br>540.22<br>786.60<br>2768.00<br>5131.00             | Level<br>dBuV/m<br>21.21<br>39.75<br>30.85<br>41.39<br>32.56<br>31.15<br>40.82<br>42.80                   | Over<br>Limit<br>-18.79<br>-6.25<br>-15.15<br>-4.61<br>-13.44<br>-14.85<br>-33.18<br>-31.20                     | 3 HORIZO<br>Limit<br>Line<br>dBuV/m<br>40.00<br>46.00<br>46.00<br>46.00<br>46.00<br>74.00<br>74.00          | Freque<br>ONTAL<br>ReadA<br>Level<br>dBuV<br>29.52<br>54.06<br>41.33<br>47.90<br>38.19<br>32.14<br>63.66<br>62.10                   | ncy (MHz)<br>Intenna<br>Factor<br>dB/m<br>23.72<br>16.45<br>19.67<br>23.46<br>24.40<br>27.90<br>32.07<br>34.10          | Cable<br>Loss<br>dB<br>0.76<br>2.09<br>2.69<br>3.14<br>3.18<br>4.18<br>7.99<br>11.09                   | Preamp<br>Factor<br>dB<br>32.79<br>32.85<br>32.84<br>33.11<br>33.21<br>33.07<br>62.90<br>64.49          | A/Pos<br>cm<br><br>200<br><br>     | T/Pos<br>deg<br><br>166<br><br>         | Remark<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Pea |
| Site<br>Condition   | : 03<br>: FC<br>Freq<br>MHz<br>31.94<br>233.70<br>332.64<br>480.08<br>540.22<br>786.60<br>2768.00<br>5131.00<br>10095.00 | Level<br>dBuV/m<br>21.21<br>39.75<br>30.85<br>41.39<br>32.56<br>31.15<br>40.82<br>42.80<br>45.81          | Over<br>Limit<br>-18.79<br>-6.25<br>-15.15<br>-4.61<br>-13.44<br>-14.85<br>-33.18<br>-31.20<br>-28.19           | 3 HORIZO<br>Limit<br>Line<br>dBuV/m<br>40.00<br>46.00<br>46.00<br>46.00<br>46.00<br>74.00<br>74.00<br>74.00 | Freque<br>ONTAL<br>ReadA<br>Level<br>dBuV<br>29.52<br>54.06<br>41.33<br>47.90<br>38.19<br>32.14<br>63.66<br>62.10<br>54.41          | ncy (MHz)<br>Intenna<br>Factor<br>dB/m<br>23.72<br>16.45<br>19.67<br>23.46<br>24.40<br>27.90<br>32.07<br>34.10<br>37.54 | Cable<br>Loss<br>dB<br>0.76<br>2.09<br>2.69<br>3.14<br>3.18<br>4.18<br>7.99<br>11.09<br>16.03          | Preamp<br>Factor<br>dB<br>32.79<br>32.85<br>32.84<br>33.11<br>33.21<br>33.07<br>62.90<br>64.49<br>62.17 | A/Pos<br>cm<br><br>200<br><br><br> | T/Pos<br>deg<br><br>166<br><br><br>     | Remark<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Pea |
| -30<br>Site<br>Condition<br>1<br>2<br>3<br>4 p<br>5<br>6<br>7<br>8<br>9 1<br>10 1 | : 03<br>: FC<br>Freq<br>MHz<br>31.94<br>233.70<br>332.64<br>480.08<br>540.22<br>786.60<br>2768.00<br>5131.00             | Level<br>dBuV/m<br>21.21<br>39.75<br>30.85<br>41.39<br>32.56<br>31.15<br>40.82<br>42.80<br>45.81<br>45.96 | Over<br>Limit<br>-18.79<br>-6.25<br>-15.15<br>-4.61<br>-13.44<br>-14.85<br>-33.18<br>-31.20<br>-28.19<br>-28.04 | 3 HORIZO<br>Limit<br>Line<br>dBuV/m<br>40.00<br>46.00<br>46.00<br>46.00<br>46.00<br>74.00<br>74.00<br>74.00 | Freque<br>ONTAL<br>ReadA<br>Level<br>dBuV<br>29.52<br>54.06<br>41.33<br>47.90<br>38.19<br>32.14<br>63.66<br>62.10<br>54.41<br>50.78 | ncy (MHz)<br>Intenna<br>Factor<br>dB/m<br>23.72<br>16.45<br>19.67<br>23.46<br>24.40<br>27.90<br>32.07<br>34.10          | Cable<br>Loss<br>dB<br>0.76<br>2.09<br>2.69<br>3.14<br>3.18<br>4.18<br>7.99<br>11.09<br>16.03<br>18.51 | Preamp<br>Factor<br>dB<br>32.79<br>32.85<br>32.84<br>33.11<br>33.21<br>33.07<br>62.90<br>64.49          | A/Pos<br>cm<br><br>200<br><br>     | T/Pos<br>deg<br><br>166<br><br><br><br> | Remark<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Peak<br>Pea |

### 3.2.5. Test Result of Radiated Emission





Note:

- Level(dBµV/m) = Read Level(dBµV) + Antenna Factor(dB/m) + Cable Loss(dB) Preamp Factor(dB)
- 2. Over  $Limit(dB) = Level(dB\mu V/m) Limit Line(dB\mu V/m)$



# 4. List of Measuring Equipment

| Instrument                              | Manufacturer | Model No.  | Serial No.       | Characteristics            | Calibration<br>Date | Test Date     | Due Date      | Remark                   |
|---|--------------|------------|------------------|----------------------------|---------------------|---------------|---------------|--------------------------|
| EMI Test<br>Receiver                    | R&S          | ESR7       | 101403           | 9kHz~7GHz;Ma<br>x 30dBm    | Oct. 11, 2023       | Jul. 18, 2024 | Oct. 10, 2024 | Radiation<br>(03CH02-KS) |
| EXA Spectrum<br>Analyzer                | Keysight     | N9010A     | MY55370528       | 10Hz-44G,MAX<br>30dB       | Oct. 11, 2023       | Jul. 18, 2024 | Oct. 10, 2024 | Radiation<br>(03CH02-KS) |
| Bilog Antenna                           | TeseQ        | CBL6111D   | 44483            | 30MHz-1GHz                 | Dec. 06, 2023       | Jul. 18, 2024 | Dec. 05, 2024 | Radiation<br>(03CH02-KS) |
| Double Ridge<br>Horn Antenna            | ETS-Lindgren | 3117       | 75957            | 1GHz~18GHz                 | Oct. 23, 2023       | Jul. 18, 2024 | Oct. 22, 2024 | Radiation<br>(03CH02-KS) |
| SHF-EHF Horn                            | Com-power    | AH-840     | 101070           | 18GHz~40GHz                | Jan. 27, 2024       | Jul. 18, 2024 | Jan. 26, 2025 | Radiation<br>(03CH02-KS) |
| Amplifier                               | EM           | EM18G40GGA | 060852           | 18~40GHz                   | Jan. 02, 2024       | Jul. 18, 2024 | Jan. 01, 2025 | Radiation<br>(03CH02-KS) |
| Amplifier                               | SONOMA       | 310N       | 413740           | 9KHz-1GHz                  | Jan. 03, 2024       | Jul. 18, 2024 | Jan. 02, 2025 | Radiation<br>(03CH02-KS) |
| Amplifier                               | EM           | EM01G18G   | 060806           | 1GHz~18GHz                 | Oct. 11, 2023       | Jul. 18, 2024 | Oct. 10, 2024 | Radiation<br>(03CH02-KS) |
| AC Power<br>Source                      | Chroma       | 61601      | 61601000247<br>3 | N/A                        | NCR                 | Jul. 18, 2024 | NCR           | Radiation<br>(03CH02-KS) |
| Turn Table                              | MF           | MF7802     | N/A              | 0~360 degree               | NCR                 | Jul. 18, 2024 | NCR           | Radiation<br>(03CH02-KS) |
| Antenna Mast                            | MF           | MF7802     | N/A              | 1 m~4 m                    | NCR                 | Jul. 18, 2024 | NCR           | Radiation<br>(03CH02-KS) |
| EMI Receiver                            | R&S          | ESCI7      | 100768           | 9kHz~7GHz;                 | Apr. 18, 2024       | Jul. 21, 2024 | Apr. 17, 2025 | Conduction<br>(CO01-KS)  |
| AC LISN<br>(for auxiliary<br>equipment) | MessTec      | AN3016     | 060103           | 9kHz~30MHz                 | Oct. 11, 2023       | Jul. 21, 2024 | Oct. 10, 2024 | Conduction<br>(CO01-KS)  |
| AC LISN                                 | MessTec      | AN3016     | 060105           | 9kHz~30MHz                 | Apr. 18, 2024       | Jul. 21, 2024 | Apr. 17, 2025 | Conduction<br>(CO01-KS)  |
| AC Power<br>Source                      | Chroma       | 61602      | ABP0000008<br>11 | AC 0V~300V,<br>45Hz~1000Hz | Oct. 11, 2023       | Jul. 21, 2024 | Oct. 10, 2024 | Conduction<br>(CO01-KS)  |

NCR: No Calibration Required



# 5. Measurement Uncertainty

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

| Measuring Uncertainty for a Level of Confidence | 2.84 dB |
|---|---------|
| of 95% (U = 2Uc(y))                             | 2.04 UB |

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

| Measuring Uncertainty for a Level of Confidence<br>of 95% (U = 2Uc(y)) | 6.04 dB |
|--|---------|
|--|---------|

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

| Measuring Uncertainty for a Level of Confidence | 5.12 dB |
|---|---------|
| of 95% (U = 2Uc(y))                             | 5.12 UB |

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

| Measuring Uncertainty for a Level of Confidence | 5.30 dB  |
|---|----------|
| of 95% (U = 2Uc(y))                             | 5.50 0.5 |

----- THE END ------