

## Report on the RF Testing of:

JRC Mobility Inc.  
Control Unit, Model: JRN-360T  
FCC ID: 2AX5HJRN-360T

## In accordance with FCC Part 24 Subpart E

Prepared for: JRC Mobility Inc.  
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## COMMERCIAL-IN-CONFIDENCE

Document Number: JPD-TR-22019-0

### SIGNATURE

| NAME           | JOB TITLE                  | RESPONSIBLE FOR    | ISSUE DATE |
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| Hiroaki Suzuki | Deputy Manager of RF Group | Approved Signatory | 2022.03.24 |

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### EXECUTIVE SUMMARY - Result: Complied

A sample(s) of this product was tested and the result above was confirmed in accordance with FCC Part 24 Subpart E.



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## 1 Summary of Test

### 1.1 Modification history of the test report

| Document Number | Modification History | Issue Date              |
|-----------------|----------------------|-------------------------|
| JPD-TR-22019-0  | First Issue          | Refer to the cover page |

### 1.2 Standards

CFR47 FCC Part 24 Subpart E

### 1.3 Test methods

KDB 971168 D01 Power Meas License Digital Systems v03r01  
ANSI/TIA/EIA-603-E-2016  
ANSI C63.26-2015

### 1.4 Deviation from standards

None

### 1.5 List of applied test(s) of the EUT

| Test item section   | Test item                                           | Condition | Result | Remark |
|---------------------|-----------------------------------------------------|-----------|--------|--------|
| 2.1046              | Conducted Output Power                              | Conducted | N/A    | *1     |
| 24.232(c)           | Equivalent Isotropic Radiated Power                 | Radiated  | PASS   | -      |
| 24.232(d)           | Peak to Average Ratio                               | Conducted | N/A    | *1     |
| 24.238(a)<br>2.1049 | Occupied Bandwidth                                  | Conducted | N/A    | *1     |
| 24.238(a)<br>2.1051 | Band Edge Spurious and Harmonic at Antenna Terminal | Conducted | N/A    | *1     |
| 24.238(a)<br>2.1053 | Radiated emissions and Harmonic Emissions           | Radiated  | PASS   | -      |
| 24.235<br>2.1055    | Frequency Stability                                 | Conducted | N/A    | *1     |

\*1: This product has a certified module inside it. (FCC ID: QIPPLS63-W)  
Therefore, it was only measured radiated test.

### 1.6 Test information

None

### 1.7 Test set up

Table-top

### 1.8 Test period

31-January-2020 - 9-February-2022

## 2 Equipment Under Test

All information in this chapter was provided by the applicant.

### 2.1 EUT information

|                            |                                                                                                                                                                                                                                                                                                           |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant                  | JRC Mobility Inc.<br><br>NAKANO CENTRAL PARK EAST,10-1, Nakano 4-chome,<br>Nakano-ku, Tokyo 164-8570, Japan<br><br>Phone: +81-26-214-0267 Fax: +81-26-214-5779                                                                                                                                            |
| Equipment Under Test (EUT) | Control Unit                                                                                                                                                                                                                                                                                              |
| Model number               | JRN-360T                                                                                                                                                                                                                                                                                                  |
| Serial number              | JR0000005503                                                                                                                                                                                                                                                                                              |
| Trade name                 | JRC Mobility                                                                                                                                                                                                                                                                                              |
| Number of sample(s)        | 1                                                                                                                                                                                                                                                                                                         |
| EUT condition              | Pre-Production                                                                                                                                                                                                                                                                                            |
| Power rating               | Battery: DC 12 V                                                                                                                                                                                                                                                                                          |
| Size                       | (W) 130 × (D) 60 × (H) 30 mm                                                                                                                                                                                                                                                                              |
| Environment                | Indoor use                                                                                                                                                                                                                                                                                                |
| Terminal limitation        | -30°C to 70°C                                                                                                                                                                                                                                                                                             |
| Hardware version           | JRN-360T                                                                                                                                                                                                                                                                                                  |
| Software version           | 1.00                                                                                                                                                                                                                                                                                                      |
| Firmware version           | Not applicable                                                                                                                                                                                                                                                                                            |
| RF Specification           |                                                                                                                                                                                                                                                                                                           |
| Frequency of Operation     | Up Link<br>GSM1900: 1850.2-1909.8 MHz<br>WCDMA Band II: 1852.4-1907.6MHz<br>LTE Band II: 1850.0-1910.0MHz<br><br>Down Link<br>GSM1900: 1930.2-1989.8 MHz<br>WCDMA Band II: 1932.4-1987.6MHz<br>LTE Band II: 1930.0-1990.0MHz                                                                              |
| Modulation type            | GSM1900: GMSK<br>WCDMA Band II: QPSK, 16QAM<br>LTE Band II: QPSK, 16QAM                                                                                                                                                                                                                                   |
| Emission designator        | GSM1900: 244KGXW<br>WCDMA Band II: 4M14F9W<br>LTE Band II:<br>BW 1.4M QPSK: 1M10G7D, 16QAM: 1M10W7D<br>BW 3M QPSK: 2M71G7D, 16QAM: 2M70W7D<br>BW 5M QPSK: 4M54G7D, 16QAM: 4M53W7D<br>BW 10M QPSK: 8M97G7D, 16QAM: 8M97W7D<br>BW 15M QPSK: 13M4G7D, 16QAM: 13M4W7D<br>BW 20M QPSK: 17M9G7D, 16QAM: 18M0W7D |

|                                               |                                                                                                      |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------|
| Equivalent Isotropic Radiated Power (E.I.R.P) | GSM1900: 1.6218 W (32.1 dBm)<br>WCDMA Band II: 0.3631W (25.6 dBm)<br>LTE Band II: 0.3388W (25.3 dBm) |
| Antenna type                                  | Internal antenna                                                                                     |
| Antenna gain                                  | GSM1900: 0.1 dBi<br>WCDMA Band II: 0.1 dBi<br>LTE Band II: 0.1 dBi                                   |

## 2.2 Modification to the EUT

The table below details modifications made to the EUT during the test project.

| Modification State                           | Description of Modification  | Modification fitted by | Date of Modification |
|----------------------------------------------|------------------------------|------------------------|----------------------|
| Model: JRN-360T, Serial Number: JR0000005503 |                              |                        |                      |
| 0                                            | As supplied by the applicant | Not Applicable         | Not Applicable       |

## 2.3 Variation of family model(s)

### 2.3.1 List of family model(s)

Not applicable

### 2.3.2 Reason for selection of EUT

Not applicable

## 2.4 Description of test mode

The EUT had been tested under operating condition.  
There are three channels have been tested as following:

| Band          | Modulation  | Bandwidth [MHz] | Channel             | Frequency [MHz]        |
|---------------|-------------|-----------------|---------------------|------------------------|
| GSM1900       | GMSK        | -               | 512, 661, 810       | 1850.2, 1880.0, 1909.8 |
| WCDMA Band II | QPSK, 16QAM | -               | 9262, 9400, 9538    | 1852.4, 1880.0, 1907.6 |
| LTE Band II   | QPSK, 16QAM | 1.4             | 18607, 18900, 19193 | 1850.7, 1880.0, 1909.3 |
|               |             | 3               | 18615, 18900, 19185 | 1851.5, 1880.0, 1908.5 |
|               |             | 5               | 18625, 18900, 19175 | 1852.5, 1880.0, 1907.5 |
|               |             | 10              | 18650, 18900, 19150 | 1855.0, 1880.0, 1905.0 |
|               |             | 15              | 18675, 18900, 19125 | 1857.5, 1880.0, 1902.5 |
|               |             | 20              | 18700, 18900, 19100 | 1860.0, 1880.0, 1900.0 |

The field strength of spurious emissions was measured at each position of all three axis X, Y and Z to compare the level, and the maximum noise.

The worst emission was found in X-axis (All Bands) and the worst case recorded.

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.

### 3 Configuration of Equipment

Numbers assigned to equipment on the diagram in “3.2 System configuration” correspond to the list in “3.1 Equipment used”.

This test configuration is based on the manufacture’s instruction.

Cabling and setup(s) were taken into consideration and test data was taken under worse case condition.

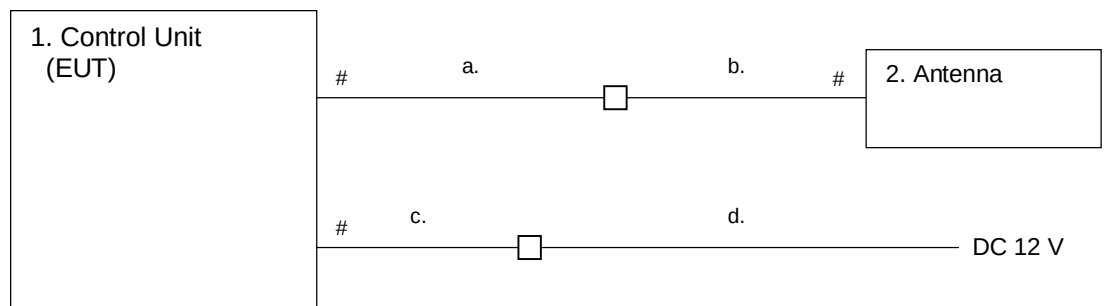
#### 3.1 Equipment used

| No. | Equipment    | Company      | Model No. | Serial No.      | FCC ID/DoC    | Comment   |
|-----|--------------|--------------|-----------|-----------------|---------------|-----------|
| 1   | Control Unit | JRC Mobility | JRN-360T  | JR0000005503    | 2AX5HJRN-360T | EUT       |
| 2   | Antenna      | GLEAD        | 7ABLE0008 | 36-210408-00038 | -             | Accessory |

#### 3.2 Cable(s) used

| No. | Equipment     | Length[m] | Shield | Connector | Comment |
|-----|---------------|-----------|--------|-----------|---------|
| a   | Antenna cable | 0.13      | Yes    | Plastic   | -       |
| b   | Antenna cable | 0.4       | Yes    | Plastic   | -       |
| c   | DC cable      | 0.2       | No     | Plastic   | -       |
| d   | DC cable      | 1.5       | No     | Plastic   | -       |

#### 3.3 System configuration



□ : Connector  
# : Un-detachable cable

## 4 Test Result

### 4.1 Equivalent Isotropic Radiated Power

#### 4.1.1 Measurement procedure

##### [FCC 24.232(c)]

##### <Step 1>

The EUT and support equipment are placed on 0.6 meter x 0.6 meter surface, 1.5 meter height (Above 1GHz) styrene foam table. Radiated emission measurements are performed at 3 meter distance with the broadband antenna (double ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1 to 4 meters and stopped at height producing the maximum emission.

The bandwidth of the spectrum analyzer is set to 1 MHz. The turntable is rotated by 360 degrees and stopped at azimuth of producing the maximum emission.

##### <Step 2>

The substitution antenna is replaced by the transmitter antenna (EUT).

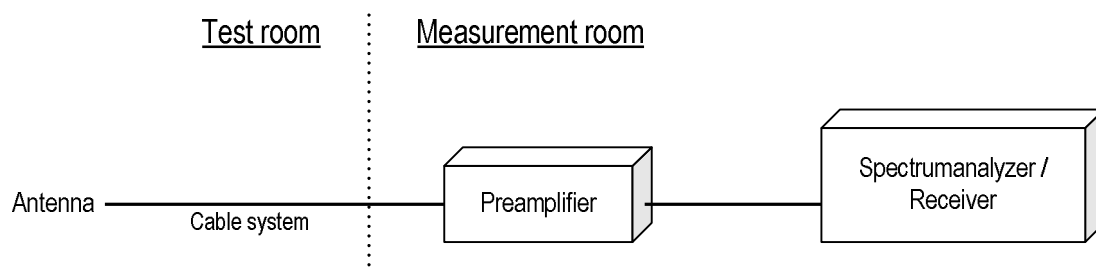
The frequency of the signal generator is adjusted to the measurement frequency.

Level of the signal generator is adjusted to the level that is obtained from step 1, and record the emission level of signal generator.

The spectrum analyzer is set to;

- a) Span = 1.5 times the OBW
- b) RBW = 1-5% of the expected OBW, not to exceed 1 MHz
- c) VBW  $\geq 3 \times$  RBW
- d) Number of sweep points  $\geq 2 \times$  span / RBW
- e) Sweep time = auto-couple
- f) Detector = RMS (power averaging)
- g) If the EUT can be configured to transmit continuously (i.e., burst duty cycle  $\geq 98\%$ ), then set the trigger to free run.
- h) If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle  $< 98\%$ ), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.
- i) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

- Test configuration



#### **4.1.2 Calculation method**

$\text{Result(EIRP)} = \text{Ant. Input} - \text{Cable loss} + \text{Antenna Gain}$

$\text{Margin} = \text{Limit} - \text{Result (EIRP)}$

Example:

Limit @ 1880 MHz : 33.0 dBm

Ant. Input = 25.0 dBm Cable loss = 1.1dB Ant. Gain = 4.8 dBi

Result =  $25.0 - 1.1 + 4.8 = 28.7$  dBm

Margin =  $33.0 - 28.7 = 4.3$  dB

#### **4.1.3 Limit**

2 W (33 dBm)



**4.1.4 Test data**

Date : 31-January-2020  
 Temperature : 18.3 [°C]  
 Humidity : 30.6 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Tadahiro Seino

Date : 1~2-February-2022  
 Temperature : 18.4 [°C]  
 Humidity : 27.9 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno

Date : 2-February-2022  
 Temperature : 18.0 [°C]  
 Humidity : 29.3 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Tadahiro Seino

Date : 7~8-February-2022  
 Temperature : 22.3 [°C]  
 Humidity : 22.1 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno

**[GSM1900]**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1850.2          | -48.7             | 28.4             | 1.1             | 4.9            | 32.1         | 33.0        | 0.9         |
| H   | 1880.0          | -48.6             | 27.3             | 1.1             | 4.8            | 30.9         | 33.0        | 2.1         |
| H   | 1909.8          | -48.0             | 28.4             | 1.2             | 4.6            | 31.8         | 33.0        | 1.2         |

**[WCDMA Band II]**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1852.4          | -46.3             | 21.8             | 1.1             | 4.9            | 25.6         | 33.0        | 7.4         |
| H   | 1880.0          | -46.1             | 21.4             | 1.1             | 4.8            | 25.0         | 33.0        | 8.0         |
| H   | 1907.6          | -46.3             | 21.5             | 1.2             | 4.6            | 25.0         | 33.0        | 8.0         |

**[LTE Band II]  
QPSK, BW 1.4MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1850.7          | -46.5             | 21.3             | 1.1             | 4.9            | 25.1         | 33.0        | 7.9         |
| H   | 1880.0          | -47.9             | 19.4             | 1.1             | 4.8            | 23.0         | 33.0        | 10.0        |
| H   | 1909.3          | -48.0             | 19.6             | 1.2             | 4.6            | 23.1         | 33.0        | 9.9         |

**[LTE Band II]  
16QAM, BW 1.4MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1850.7          | -47.7             | 20.1             | 1.1             | 4.9            | 23.9         | 33.0        | 9.1         |
| H   | 1880.0          | -48.8             | 18.5             | 1.1             | 4.8            | 22.1         | 33.0        | 10.9        |
| H   | 1909.3          | -49.0             | 18.6             | 1.2             | 4.6            | 22.1         | 33.0        | 10.9        |

**[LTE Band II]  
QPSK, BW 3MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1851.5          | -46.6             | 21.5             | 1.1             | 4.9            | 25.3         | 33.0        | 7.7         |
| H   | 1880.0          | -47.9             | 19.4             | 1.1             | 4.8            | 23.0         | 33.0        | 10.0        |
| H   | 1908.5          | -47.6             | 20.1             | 1.2             | 4.6            | 23.6         | 33.0        | 9.4         |

**[LTE Band II]  
16QAM, BW 3MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1851.5          | -47.9             | 20.2             | 1.1             | 4.9            | 24.0         | 33.0        | 9.0         |
| H   | 1880.0          | -49.0             | 18.3             | 1.1             | 4.8            | 21.9         | 33.0        | 11.1        |
| H   | 1908.5          | -48.6             | 19.1             | 1.2             | 4.6            | 22.6         | 33.0        | 10.4        |

**[LTE Band II]  
QPSK, BW 5MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1852.5          | -47.4             | 20.6             | 1.1             | 4.9            | 24.4         | 33.0        | 8.6         |
| H   | 1880.0          | -48.1             | 19.2             | 1.1             | 4.8            | 22.8         | 33.0        | 10.2        |
| H   | 1907.5          | -48.9             | 18.7             | 1.2             | 4.6            | 22.2         | 33.0        | 10.8        |

**[LTE Band II]  
16QAM, BW 5MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1852.5          | -48.0             | 20.0             | 1.1             | 4.9            | 23.8         | 33.0        | 9.2         |
| H   | 1880.0          | -49.1             | 18.2             | 1.1             | 4.8            | 21.8         | 33.0        | 11.2        |
| H   | 1907.5          | -49.8             | 17.8             | 1.2             | 4.6            | 21.3         | 33.0        | 11.7        |

**[LTE Band II]  
QPSK, BW 10MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1855.0          | -47.4             | 20.6             | 1.1             | 4.9            | 24.4         | 33.0        | 8.6         |
| H   | 1880.0          | -48.0             | 19.3             | 1.1             | 4.8            | 22.9         | 33.0        | 10.1        |
| H   | 1905.0          | -48.4             | 19.5             | 1.2             | 4.6            | 22.9         | 33.0        | 10.1        |

**[LTE Band II]  
16QAM, BW 10MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1855.0          | -48.4             | 19.6             | 1.1             | 4.9            | 23.4         | 33.0        | 9.6         |
| H   | 1880.0          | -49.1             | 18.2             | 1.1             | 4.8            | 21.8         | 33.0        | 11.2        |
| H   | 1905.0          | -49.3             | 18.6             | 1.2             | 4.6            | 22.0         | 33.0        | 11.0        |

**[LTE Band II]  
QPSK, BW 15MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1857.5          | -47.7             | 19.9             | 1.1             | 4.9            | 23.7         | 33.0        | 9.3         |
| H   | 1880.0          | -48.8             | 18.5             | 1.1             | 4.8            | 22.1         | 33.0        | 10.9        |
| H   | 1902.5          | -49.5             | 18.5             | 1.2             | 4.6            | 21.9         | 33.0        | 11.1        |

**[LTE Band II]  
16QAM, BW 15MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1857.5          | -49.3             | 18.3             | 1.1             | 4.9            | 22.1         | 33.0        | 10.9        |
| H   | 1880.0          | -50.4             | 16.9             | 1.1             | 4.8            | 20.5         | 33.0        | 12.5        |
| H   | 1902.5          | -52.2             | 15.8             | 1.2             | 4.6            | 19.2         | 33.0        | 13.8        |

**[LTE Band II]  
QPSK, BW 20MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1860.0          | -48.1             | 19.2             | 1.1             | 4.9            | 22.9         | 33.0        | 10.1        |
| H   | 1880.0          | -48.7             | 18.6             | 1.1             | 4.8            | 22.2         | 33.0        | 10.8        |
| H   | 1900.0          | -49.6             | 18.8             | 1.2             | 4.7            | 22.3         | 33.0        | 10.7        |

**[LTE Band II]  
16QAM, BW 20MHz**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 1860.0          | -49.5             | 17.8             | 1.1             | 4.9            | 21.5         | 33.0        | 11.5        |
| H   | 1880.0          | -49.5             | 17.8             | 1.1             | 4.8            | 21.4         | 33.0        | 11.6        |
| H   | 1900.0          | -50.4             | 18.0             | 1.2             | 4.7            | 21.5         | 33.0        | 11.5        |

## 4.2 Radiated Emissions and Harmonic Emissions

### 4.2.1 Measurement procedure

#### [FCC 24.238(a), 2.1053]

##### <Step 1>

The EUT and support equipment are placed on 1.0 meter x 1.0 meter surface, 0.8 meter height (Below or equal 1GHz) or 0.6 meter x 0.6 meter surface, 1.5 meter height (Above 1GHz) styrene foam table. Radiated emission measurements are performed at 3 meter distance with the broadband antenna (Biconical antenna, Log periodic antenna and double ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1 to 4 meters and stopped at height producing the maximum emission.

The bandwidth of the spectrum analyzer is set to 1 MHz. The turntable is rotated by 360 degrees and stopped at azimuth of producing the maximum emission. The frequency is investigated up to 20 GHz.

##### <Step 2>

The substitution antenna is replaced by the transmitter antenna (EUT).

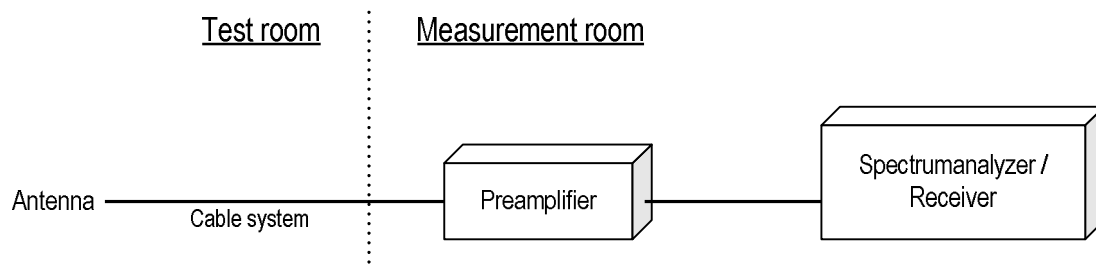
The frequency of the signal generator is adjusted to the measurement frequency.

Level of the signal generator is adjusted to the level that is obtained from step 1, and record the emission level of signal generator.

The spectrum analyzer is set to;

- a) RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW  $\geq 3 \times$  RBW
- b) Detector = Peak
- c) Trace mode = Max hold
- d) Sweep time = auto-couple

- Test configuration



#### 4.2.2 Calculation method

Result = Ant. Input - Cable loss + Antenna Gain

Margin = Limit – Result (EIRP)

Example:

Limit @ 3760 MHz : -13.0 dBm

Ant. Input = -55 dBm Cable loss = 1.6 dB Ant. Gain = 8.2 dBi

Result = -55 - 1.6 + 8.2 = -48.4 dBm

Margin = -13.0 - (-48.4) = 35.4 dB

#### 4.2.3 Limit

-13 dBm or less

#### 4.2.4 Test data

Date : 3-February-2022  
 Temperature : 21.3 [°C]  
 Humidity : 24.3 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Tadahiro Seino

Date : 3~4-February-2022  
 Temperature : 21.6 [°C]  
 Humidity : 24.3 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno

Date : 7~8-February-2022  
 Temperature : 22.3 [°C]  
 Humidity : 22.1 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno

Date : 8~9-February-2022  
 Temperature : 22.1 [°C]  
 Humidity : 22.6 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno

Date : 9-February-2022  
 Temperature : 21.6 [°C]  
 Humidity : 22.6 [%]  
 Test place : 3m Semi-anechoic chamber

Test engineer : Tadahiro Seino

**[GSM1900]****Channel: 512**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3700.4          | -54.7             | -52.7            | 1.6             | 8.1            | -46.2        | -13.0       | 33.2        |
| H   | 5551.0          | -56.7             | -54.5            | 2.0             | 10.7           | -45.8        | -13.0       | 32.8        |

**Channel: 661**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3760.0          | -53.0             | -46.8            | 1.6             | 8.2            | -40.2        | -13.0       | 27.2        |
| H   | 5640.0          | -51.7             | -41.0            | 2.0             | 10.8           | -32.2        | -13.0       | 19.2        |

**Channel: 810**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3819.6          | -51.7             | -41.7            | 1.7             | 8.2            | -35.1        | -13.0       | 22.1        |
| H   | 5729.0          | -56.7             | -53.2            | 2.0             | 10.8           | -44.4        | -13.0       | 31.4        |

**[WCDMA Band II]****Channel: 9262**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3704.8          | -56.7             | -55.6            | 1.6             | 8.1            | -49.1        | -13.0       | 36.1        |

**Channel: 9400**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3760.0          | -56.6             | -55.5            | 1.6             | 8.2            | -48.9        | -13.0       | 35.9        |

**Channel: 9538**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3815.2          | -56.8             | -55.2            | 1.7             | 8.2            | -48.6        | -13.0       | 35.6        |

**[LTE Band II]  
QPSK, BW 1.4MHz  
Channel: 18607**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3701.4          | -55.2             | -52.4            | 1.6             | 8.1            | -45.9        | -13.0       | 32.9        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3760.0          | -54.1             | -48.1            | 1.6             | 8.2            | -41.5        | -13.0       | 28.5        |

**Channel: 19193**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3818.6          | -54.5             | -47.7            | 1.7             | 8.2            | -41.1        | -13.0       | 28.1        |

**[LTE Band II]  
16QAM, BW 1.4MHz  
Channel: 18607**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3701.4          | -55.0             | -52.2            | 1.6             | 8.1            | -45.7        | -13.0       | 32.7        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3760.0          | -54.2             | -48.2            | 1.6             | 8.2            | -41.6        | -13.0       | 28.6        |

**Channel: 19193**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3818.6          | -54.7             | -47.9            | 1.7             | 8.2            | -41.3        | -13.0       | 28.3        |

**[LTE Band II]  
QPSK, BW 3MHz  
Channel: 18615**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3703.0          | -54.7             | -51.9            | 1.6             | 8.1            | -45.4        | -13.0       | 32.4        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3760.0          | -53.7             | -47.7            | 1.6             | 8.2            | -41.1        | -13.0       | 28.1        |

**Channel: 19185**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3817.0          | -54.4             | -47.5            | 1.7             | 8.2            | -40.9        | -13.0       | 27.9        |

**[LTE Band II]  
16QAM, BW 3MHz  
Channel: 18615**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3703.0          | -54.9             | -52.1            | 1.6             | 8.1            | -45.6        | -13.0       | 32.6        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3760.0          | -54.0             | -48.0            | 1.6             | 8.2            | -41.4        | -13.0       | 28.4        |

**Channel: 19185**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3817.0          | -54.6             | -47.7            | 1.7             | 8.2            | -41.1        | -13.0       | 28.1        |



**[LTE Band II]  
QPSK, BW 5MHz  
Channel: 18625**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3700.6          | -54.8             | -51.8            | 1.6             | 8.1            | -45.3        | -13.0       | 32.3        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3755.7          | -53.8             | -47.8            | 1.6             | 8.2            | -41.2        | -13.0       | 28.2        |

**Channel: 19175**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3810.7          | -53.8             | -46.7            | 1.7             | 8.2            | -40.2        | -13.0       | 27.2        |

**[LTE Band II]  
16QAM, BW 5MHz  
Channel: 18625**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3700.6          | -54.8             | -51.8            | 1.6             | 8.1            | -45.3        | -13.0       | 32.3        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3755.7          | -53.8             | -47.8            | 1.6             | 8.2            | -41.2        | -13.0       | 28.2        |

**Channel: 19175**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3810.7          | -53.6             | -46.5            | 1.7             | 8.2            | -40.0        | -13.0       | 27.0        |

**[LTE Band II]  
QPSK, BW 10MHz  
Channel: 18650**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3701.2          | -54.7             | -51.7            | 1.6             | 8.1            | -45.2        | -13.0       | 32.2        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3751.2          | -53.9             | -47.9            | 1.6             | 8.3            | -41.3        | -13.0       | 28.3        |

**Channel: 19150**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3801.2          | -53.7             | -47.1            | 1.7             | 8.1            | -40.6        | -13.0       | 27.6        |

**[LTE Band II]  
16QAM, BW 10MHz  
Channel: 18650**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3701.2          | -55.0             | -52.0            | 1.6             | 8.1            | -45.5        | -13.0       | 32.5        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3751.2          | -54.1             | -48.1            | 1.6             | 8.3            | -41.5        | -13.0       | 28.5        |

**Channel: 19150**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3801.2          | -53.8             | -47.2            | 1.7             | 8.1            | -40.7        | -13.0       | 27.7        |

**[LTE Band II]  
QPSK, BW 15MHz  
Channel: 18675**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3701.7          | -54.7             | -51.5            | 1.6             | 8.1            | -45.0        | -13.0       | 32.0        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3746.7          | -53.6             | -47.6            | 1.6             | 8.3            | -41.0        | -13.0       | 28.0        |

**Channel: 19125**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3791.7          | -54.4             | -48.0            | 1.6             | 8.1            | -41.5        | -13.0       | 28.5        |

**[LTE Band II]  
16QAM, BW 15MHz  
Channel: 18675**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3701.7          | -54.7             | -51.5            | 1.6             | 8.1            | -45.0        | -13.0       | 32.0        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3746.7          | -53.9             | -47.9            | 1.6             | 8.3            | -41.3        | -13.0       | 28.3        |

**Channel: 19125**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3791.7          | -54.5             | -48.1            | 1.6             | 8.1            | -41.6        | -13.0       | 28.6        |

**[LTE Band II]  
QPSK, BW 20MHz  
Channel: 18700**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3702.2          | -54.8             | -51.6            | 1.6             | 8.1            | -45.1        | -13.0       | 32.1        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3742.2          | -53.8             | -47.8            | 1.6             | 8.2            | -41.2        | -13.0       | 28.2        |

**Channel: 19100**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3782.2          | -54.9             | -48.6            | 1.6             | 8.2            | -42.1        | -13.0       | 29.1        |

**[LTE Band II]  
16QAM, BW 20MHz  
Channel: 18700**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3702.2          | -54.8             | -51.6            | 1.6             | 8.1            | -45.1        | -13.0       | 32.1        |

**Channel: 18900**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3742.2          | -53.8             | -47.8            | 1.6             | 8.2            | -41.2        | -13.0       | 28.2        |

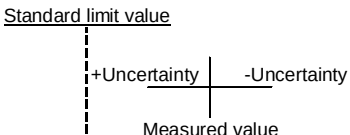
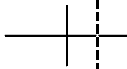
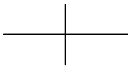
**Channel: 19100**

| H/V | Frequency [MHz] | S.A Reading [dBm] | Ant. Input [dBm] | Cable loss [dB] | Ant.Gain [dBi] | Result [dBm] | Limit [dBm] | Margin [dB] |
|-----|-----------------|-------------------|------------------|-----------------|----------------|--------------|-------------|-------------|
| H   | 3782.2          | -54.8             | -48.5            | 1.6             | 8.2            | -42.0        | -13.0       | 29.0        |

## 5 Measurement Uncertainty

Expanded uncertainties stated are calculated with a coverage Factor  $k=2$ .  
Please note that these results are not taken into account when measurement uncertainty considerations contained in ETSI TR 100 028 Parts 1 and 2 determining compliance or non-compliance with test result.

| Test item                                  | Measurement uncertainty  |
|--------------------------------------------|--------------------------|
| Conducted emission, AMN (9 kHz – 150 kHz)  | $\pm 3.7$ dB             |
| Conducted emission, AMN (150 kHz – 30 MHz) | $\pm 3.3$ dB             |
| Radiated emission ( 9kHz – 30 MHz)         | $\pm 3.2$ dB             |
| Radiated emission (30 MHz – 1000 MHz)      | $\pm 5.3$ dB             |
| Radiated emission (1 GHz – 6 GHz)          | $\pm 4.8$ dB             |
| Radiated emission (6 GHz – 18 GHz)         | $\pm 4.5$ dB             |
| Radiated emission (18 GHz – 40 GHz)        | $\pm 6.4$ dB             |
| Radio Frequency                            | $\pm 1.4 \times 10^{-8}$ |
| RF power, conducted                        | $\pm 0.8$ dB             |
| Adjacent channel power                     | $\pm 2.4$ dB             |
| Temperature                                | $\pm 0.6$ °C             |
| Humidity                                   | $\pm 1.2$ %              |
| Voltage (DC)                               | $\pm 0.4$ %              |
| Voltage (AC, <10kHz)                       | $\pm 0.2$ %              |

| Judge | Measured value and standard limit value                                                                                                                                                                                                            |  |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| PASS  | <p><b>Case1</b></p>  <p>Even if it takes uncertainty into consideration, a standard limit value is fulfilled.</p>                                               |  |
|       | <p><b>Case2</b></p>  <p>Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.</p>  |  |
| FAIL  | <p><b>Case3</b></p>  <p>Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.</p> |  |
|       | <p><b>Case4</b></p>  <p>Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.</p>                                            |  |



Japan

## 6 Laboratory Information

Testing was performed and the report was issued at:

**TÜV SÜD Japan Ltd. Yonezawa Testing Center**

Address: 5-4149-7 Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan  
Phone: +81-238-28-2881

**Accreditation and Registration**

A2LA

Certificate #3686.03

VLAC

Accreditation No.: VLAC-013

BSMI

Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

Innovation, Science and Economic Development Canada

ISED#: 4224A

VCCI Council

Registration number: A-0166

## Appendix A. Test Equipment

### Radiated emission

| Equipment                       | Company              | Model No.         | Serial No.       | Cal. Due    | Cal. Date   |
|---------------------------------|----------------------|-------------------|------------------|-------------|-------------|
| EMI Receiver                    | ROHDE&SCHWARZ        | ESCI              | 100765           | 30-Sep-2022 | 15-Sep-2021 |
| Spectrum analyzer               | Agilent Technologies | E4447A            | MY46180188       | 31-Mar-2022 | 11-Mar-2021 |
| Preamplifier                    | SONOMA               | 310               | 372170           | 30-Sep-2022 | 15-Sep-2021 |
| Biconical antenna               | Schwarzbeck          | VHBB9124/BBA9106  | 1333             | 31-Dec-2022 | 15-Dec-2021 |
| Log periodic antenna            | Schwarzbeck          | VUJSLP9111B       | 346              | 31-Oct-2022 | 15-Oct-2021 |
| Attenuator                      | TOYO Connector       | NA-PJ-6/6dB       | N/A(S541)        | 30-Sep-2022 | 16-Sep-2021 |
| Attenuator                      | TAMAGAWA.ELEC        | CFA-10/3dB        | N/A(S503)        | 31-Jul-2022 | 20-Jul-2021 |
| Preamplifier                    | TSJ                  | MLA-100M18-B02-40 | 1929118          | 31-Dec-2022 | 22-Dec-2021 |
| Attenuator                      | AEROFLEX             | 26A-10            | 081217-08        | 31-Dec-2022 | 22-Dec-2021 |
| Double ridged guide antenna     | ETS LINDGREN         | 3117              | 00224193         | 31-Mar-2022 | 30-Mar-2021 |
| Attenuator                      | HUBER+SUHNER         | 6803.17.B         | N/A(2340)        | 31-Dec-2022 | 23-Dec-2021 |
| Double ridged guide antenna     | A.H.Systems Inc.     | SAS-574           | 469              | 31-Aug-2022 | 02-Aug-2021 |
| Preamplifier                    | TSJ                  | MLA-1840-B03-35   | 1240332          | 31-Aug-2022 | 02-Aug-2021 |
| High Pass Filter                | Wainwright           | WHKX2.8/18G-6SS   | 1                | 31-Jul-2022 | 19-Jul-2021 |
| Band rejection filter           | Micro-Tronics        | BRC50720          | 014              | 31-Dec-2022 | 20-Dec-2021 |
| Signal generator                | ROHDE&SCHWARZ        | SMB100A           | 177525           | 31-Dec-2022 | 08-Dec-2021 |
| RF power amplifier              | R&K                  | CGA020M602-2633R  | B40240           | 30-Jun-2022 | 02-Jun-2021 |
| Attenuator                      | HUBER+SUHNER         | 6820.19.A         | N/A(2399)        | 30-Sep-2022 | 15-Sep-2021 |
| Microwave cable                 | HUBER+SUHNER         | SUCOFLEX102/2m    | 31648            | 31-Mar-2022 | 10-Mar-2021 |
| Dipole antenna                  | Schwarzbeck          | VHAP              | 1021             | 31-Jul-2022 | 28-Jul-2021 |
| Dipole antenna                  | Schwarzbeck          | UHAP              | 993              | 31-Jul-2022 | 28-Jul-2021 |
| Double ridged guide antenna     | ETS LINDGREN         | 3117              | 00218815         | 31-Dec-2022 | 06-Dec-2021 |
| Wideband Radio Frequency Tester | ROHDE&SCHWARZ        | CMW500            | 126079           | 30-Nov-2022 | 15-Nov-2021 |
| Wideband Radio Frequency Tester | ROHDE&SCHWARZ        | CMW500            | 116338           | 31-Aug-2022 | 04-Aug-2021 |
| Microwave cable                 | HUBER+SUHNER         | SUCOFLEX104/9m    | MY30037/4        | 31-Dec-2022 | 22-Dec-2021 |
|                                 |                      | SUCOFLEX104/1m    | my24610/4        | 31-Dec-2022 | 22-Dec-2021 |
|                                 |                      | SUCOFLEX104/8m    | SN MY30033/4     | 31-Dec-2022 | 22-Dec-2021 |
|                                 |                      | SUCOFLEX104/1m    | MY32976/4        | 31-Dec-2022 | 22-Dec-2021 |
|                                 |                      | SUCOFLEX104/2m    | SN MY28404/4     | 31-Dec-2022 | 22-Dec-2021 |
|                                 |                      | SUCOFLEX104/7m    | 41625/6          | 31-Dec-2022 | 22-Dec-2021 |
| PC                              | DELL                 | DIMENSION E521    | 75465BX          | N/A         | N/A         |
| Software                        | TOYO Corporation     | EP5/RE-AJ         | 0611193/V6.0.140 | N/A         | N/A         |
| Absorber                        | RIKEN                | PFP30             | N/A              | N/A         | N/A         |
| 3m Semi an-echoic Chamber       | TOKIN                | N/A               | N/A(9002-NSA)    | 31-May-2022 | 20-May-2021 |
| 3m Semi an-echoic Chamber       | TOKIN                | N/A               | N/A(9002-SVSWR)  | 31-May-2022 | 20-May-2021 |

\*: The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.