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

Japan

Add value.
Inspire trust.

Prepared for: JRC Mobility Inc.
NAKANO CENTRAL PARK EAST,10-1, Nakano 4-chome, Nakano-ku, Tokyo 164-8570, Japan
Phone: +81-26-214-0267 Fax: +81-26-214-5779

COMMERCIAL-IN-CONFIDENCE

Document Number: JPD-TR-22019-0

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

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Japan Ltd. document control rules.

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.

ACCREDITED
Certificate #3686.03

TÜV SÜD Japan Ltd.
Yonezawa Testing Center
5-4149-7 Hachimanpara,
Yonezawa-shi, Yamagata,
992-1128 Japan

Phone: +81 (0) 238 28 2881
www.tuvsud.com/ja-jp

Japan

Contents

Japan

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) 2.1049	Occupied Bandwidth	Conducted	N/A	*1
24.238(a) 2.1051	Band Edge Spurious and Harmonic at Antenna Terminal	Conducted	N/A	*1
24.238(a) 2.1053	Radiated emissions and Harmonic Emissions	Radiated	PASS	-
24.235 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

Japan

2 Equipment Under Test

All information in this chapter was provided by the applicant.

2.1 EUT information

Applicant	JRC Mobility Inc. NAKANO CENTRAL PARK EAST,10-1, Nakano 4-chome, Nakano-ku, Tokyo 164-8570, Japan 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 GSM1900: 1850.2-1909.8 MHz WCDMA Band II: 1852.4-1907.6MHz LTE Band II: 1850.0-1910.0MHz Down Link GSM1900: 1930.2-1989.8 MHz WCDMA Band II: 1932.4-1987.6MHz LTE Band II: 1930.0-1990.0MHz
Modulation type	GSM1900: GMSK WCDMA Band II: QPSK, 16QAM LTE Band II: QPSK, 16QAM
Emission designator	GSM1900: 247KGXW WCDMA Band II: 4M14F9W LTE Band II: BW 1.4M QPSK: 1M10G7D, 16QAM: 1M10W7D BW 3M QPSK: 2M71G7D, 16QAM: 2M70W7D BW 5M QPSK: 4M54G7D, 16QAM: 4M53W7D BW 10M QPSK: 8M97G7D, 16QAM: 8M97W7D BW 15M QPSK: 13M4G7D, 16QAM: 13M4W7D BW 20M QPSK: 17M9G7D, 16QAM: 18M0W7D

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

Japan

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.

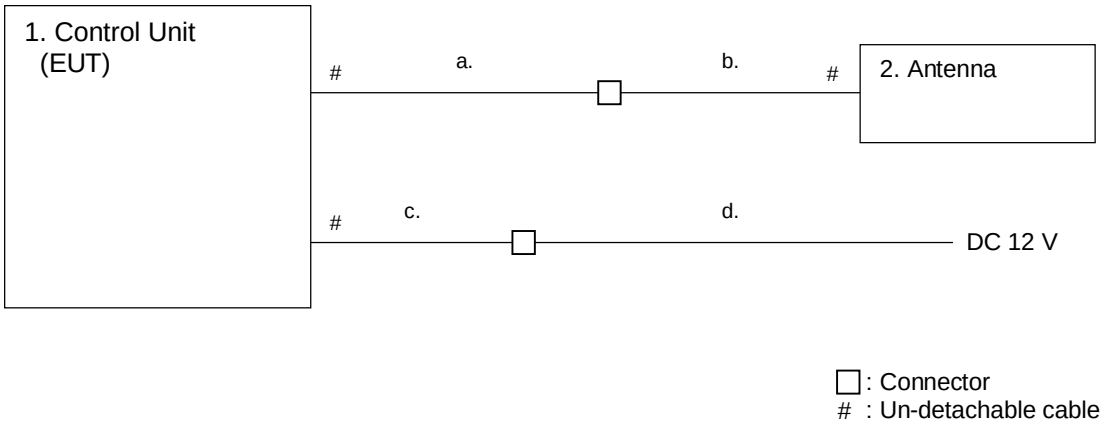
3.1 Equipment used

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



Japan

4 Test Result

4.1 Equivalent Isotropic Radiated Power

4.1.1 Measurement procedure

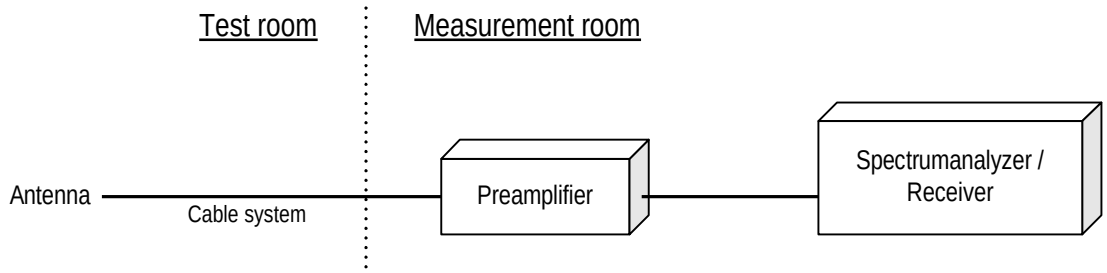
[FCC 24.232(c)]

<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 ≥ 3 x RBW
d) Number of sweep points ≥ 2 x 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 ≥ 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



Japan

4.1.2 Calculation method

Result(EIRP) = Ant. Input - Cable loss + Antenna Gain
Margin = Limit – 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)

Japan

4.1.4 Test data

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

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

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

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

Japan

4.2 Radiated Emissions and Harmonic Emissions

4.2.1 Measurement procedure

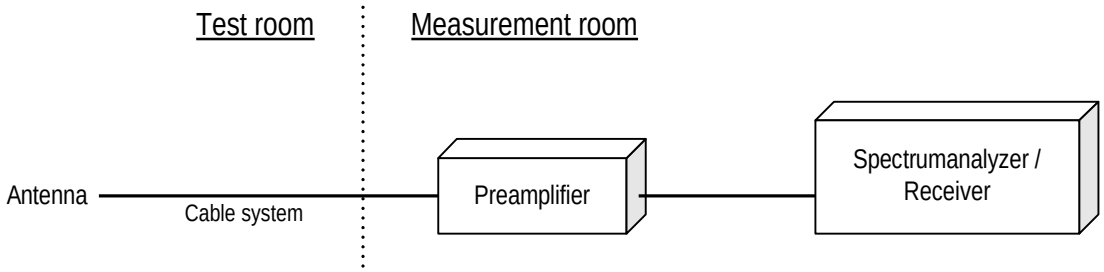
[FCC 24.238(a), 2.1053]

<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 ≥ 3 x RBW
b) Detector = Peak
c) Trace mode = Max hold
d) Sweep time = auto-couple

- Test configuration



Japan

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 engineer	:	
Test place	:	3m Semi-anechoic chamber			Tadahiro Seino

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

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

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

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

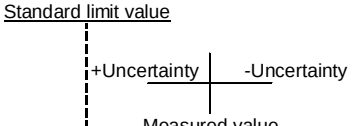
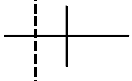
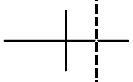
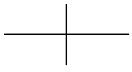
H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3782.2	-54.8	-48.5	1.6	8.2	-42.0	-13.0	29.0

Japan

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

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

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

Japan

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	VUSLP9111B	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	SUCOFELX102/2m	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.