

Report on the RF Testing of:

KYOCERA Corporation
Mobile Phone, Model: EB1073
FCC ID: JOYEB1073

In accordance with FCC Part 15 Subpart C
(15.209)

Prepared for: KYOCERA Corporation
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Japan

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Document Number: JPD-TR-21189-0

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Hiroaki Suzuki	Deputy Manager of RF Group	Approved Signatory	2021.10.20

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 of this product was tested and the result above was confirmed in accordance with FCC Part 15 Subpart C (15.209).



Certificate #3686.03

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1 Summary of Test

1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-21189-0	First Issue	Refer to the cover page

1.2 Standards

CFR47 FCC Part 15 Subpart C (15.209)

1.3 Test methods

ANSI C63.10-2013

1.4 Deviation from standards

None

1.5 List of applied test(s) of the EUT

Test item section	Test item	Condition	Result	Remark
2.1049 RSS-Gen 6.7	Occupied Bandwidth	Radiated	PASS	-
15.209 RSS-Gen 8.9	Transmitter Radiated Spurious Emissions	Radiated	PASS	-
15.207 RSS-Gen 8.8	AC Power Line Conducted Emissions	Conducted	PASS	-

1.6 Test information

None

1.7 Test set up

Table-top

1.8 Test period

24-September-2021 - 8-October-2021

2 Equipment Under Test

All information in this chapter was provided by the applicant.

2.1 EUT information

Applicant	KYOCERA Corporation Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku Yokohama-shi, Kanagawa, Japan Phone: +81-45-943-6253 Fax: +81-45-943-6314
Equipment Under Test (EUT)	Mobile Phone
Model number	EB1073
Serial number	352886910002746
Trade name	Kyocera
Number of sample(s)	1
EUT condition	Pre-Production
Power rating	Battery: DC 3.87 V
Size	(W) 69.0 mm × (D) 13.7 mm × (H) 123.0 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20 °C to 60 °C
Hardware version	DMT
Software version	V0.101PO
Firmware version	Not applicable
RF Specification	
Frequency range	110-205kHz
Antenna type	Loop antenna

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: EB1073, Serial Number: 352886910002746			
0	As supplied by the applicant	Not Applicable	Not Applicable



Japan

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 Operating mode

[Normal Operation]

- i) EUT is setup on the wireless charge stand.

3 Configuration of Equipment

Numbers assigned to equipment on the diagram in “3.3 System configuration” correspond to the list in “3.1 Equipment used” and “3.2 Cable(s) 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.

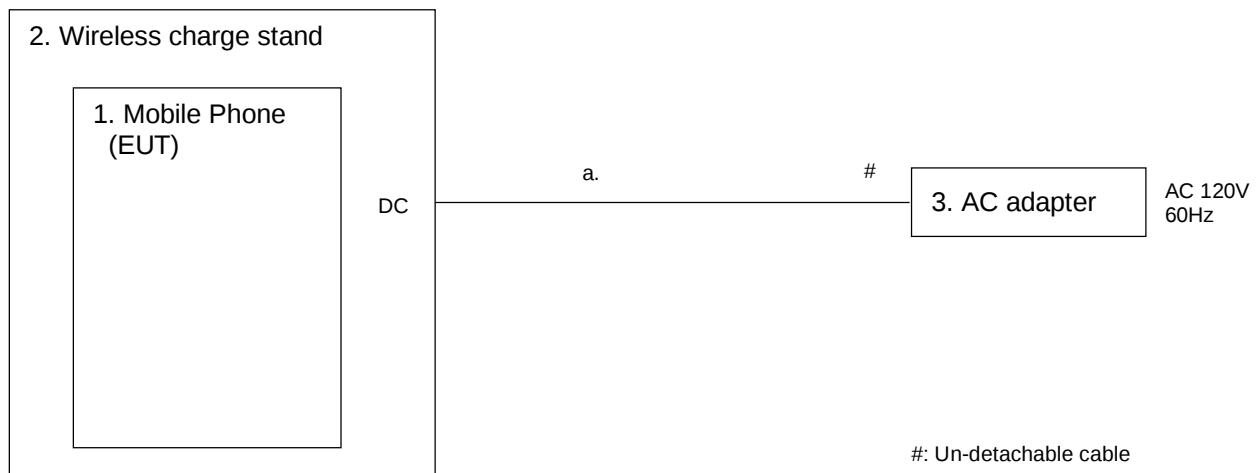
3.1 Equipment used

No.	Equipment	Company	Model No.	Serial No.	FCC ID/DoC	Comment
1	Mobile Phone	KYOCERA	EB1073	352886910002746	JOYEB1073	EUT
2	Wireless charge stand	KDDI	0102PUA	007217	N/A	-
3	AC Adapter	KDDI	0501PWA	N/A	N/A	-

3.2 Cable(s) used

No.	Equipment	Length[m]	Shield	Connector	Comment
a	DC cable	1.5	Yes	Metal	-

3.3 System configuration



4 Test Result

4.1 Occupied Bandwidth

4.1.1 Measurement procedure

[FCC 2.1049, RSS-Gen 6.7]

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99% bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

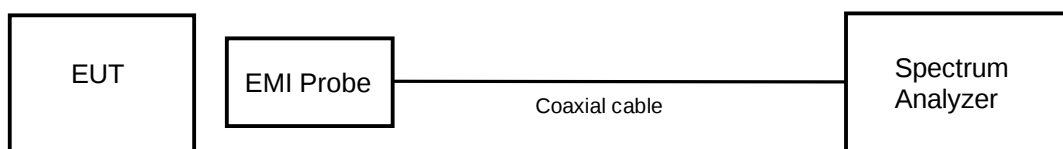
The spectrum analyzer is set to;

- RBW=300Hz, VBW=1kHz, Span=10kHz, Sweep=auto

The test mode of EUT is as follows.

- Normal Operation

- Test configuration



4.1.2 Limit

None

4.1.3 Measurement result

Date : 1-October-2021

Temperature : 23.3 [°C]

Humidity : 65.5 [%]

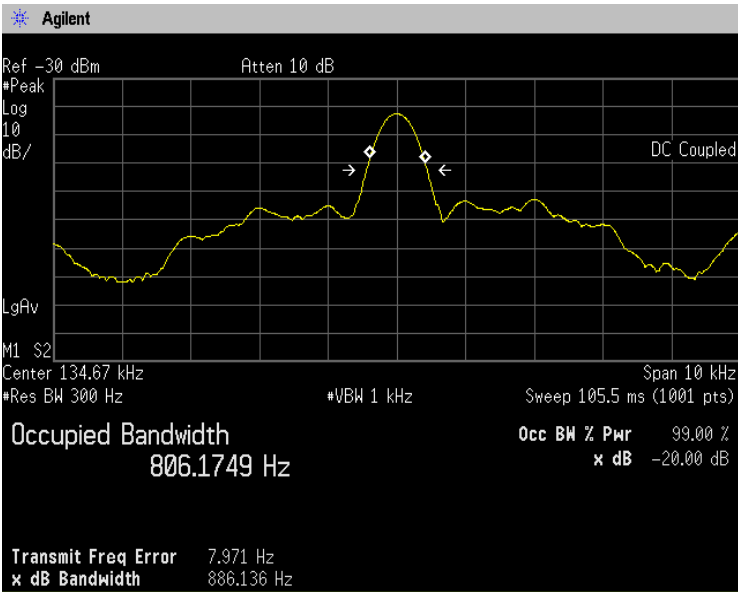
Test place : Shielded room No.4

Test engineer :

Kazunori Saito

Frequency (kHz)	Occupied Bandwidth (kHz)
134.67	0.8061749

4.1.4 Trace data



4.2 Radiated Emissions

4.2.1 Measurement procedure

[FCC 15.209, RSS-Gen 8.9]

Test was applied by following conditions.

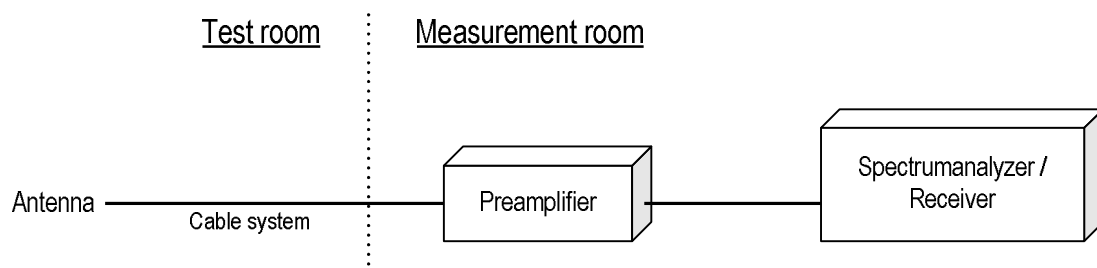
Test method	: ANSI C63.10
Frequency range	: 9kHz to 30MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m
Antenna distance	: 3m

Test receiver setting

- Detector	: Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak
- Bandwidth	: 200Hz, 9kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 30MHz were performed with test receiver in above setting. The turntable and the Loop antenna are rotated by 360 degrees and stopped at azimuth of producing the maximum emission. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



Test was applied by following conditions.

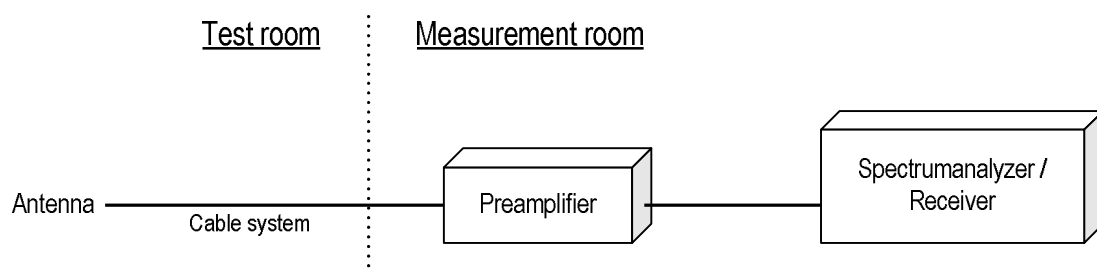
Test method	: ANSI C63.10
Frequency range	: 30MHz to 1000MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m
Antenna distance	: 3m

Test receiver setting

- Detector	: Quasi-peak
- Bandwidth	: 120kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 1000MHz were performed with test receiver in above setting. In order to find the maximum emissions, antenna is adjusted between 1m and 4m in height and varied its polarization (horizontal and vertical), and EUT azimuth was also varied by rotating turntable 0 to 360 degrees. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



4.2.2 Calculation method

[9kHz to 150kHz]

Emission level = Reading + (Ant. factor + Cable system loss)

Margin = Limit – Emission level

[150kHz to 1000MHz]

Emission level = Reading + (Ant. factor + Cable system loss – Amp. Gain)

Margin = Limit – Emission level

4.2.3 Limit

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	$2400 / F$ [kHz]	$20\log E$ [uV/m]	300
0.490-1.705	$24000 / F$ [kHz]	$20\log E$ [uV/m]	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = $20\log$ Emission [uV/m]
3. Measurements were corrected to 300m using $40\log (3/300) = -80.0\text{dB}$
Measurements were corrected to 30m using $40\log (3/30) = -40.0\text{dB}$

4.2.4 Test data

Date : 24-September-2021
 Temperature : 22.4 [°C]
 Humidity : 61.5 [%]
 Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno

[9kHz to 30MHz]

H/V	Frequency (MHz)	Reading [dBuV] At 3m	c.f [dB(1/m)]	Result [dBuV/m] At 3m	Result [dBuV/m] At 300/30m	Limit [dBuV/m] At 300/30m	Margin (dB)	Result
H	0.030	22.6	20.6	43.2	-36.8	38.1	74.9	PASS
H	0.061	15.2	19.8	35.0	-45.0	31.9	76.9	PASS
V	0.125	38.6	19.6	58.2	-21.8	25.7	47.5	PASS
H	0.125	42.8	19.6	62.4	-17.6	25.7	43.3	PASS
V	0.131	33.5	19.6	53.1	-26.9	25.3	52.2	PASS
H	0.250	58.5	-13.1	45.4	-34.6	19.6	54.2	PASS
H	0.503	50.7	-13.1	37.6	-2.4	33.6	36.0	PASS
H	0.629	46.6	-13.0	33.6	-6.4	31.6	38.0	PASS
H	0.755	43.6	-13.0	30.6	-9.4	30.0	39.4	PASS



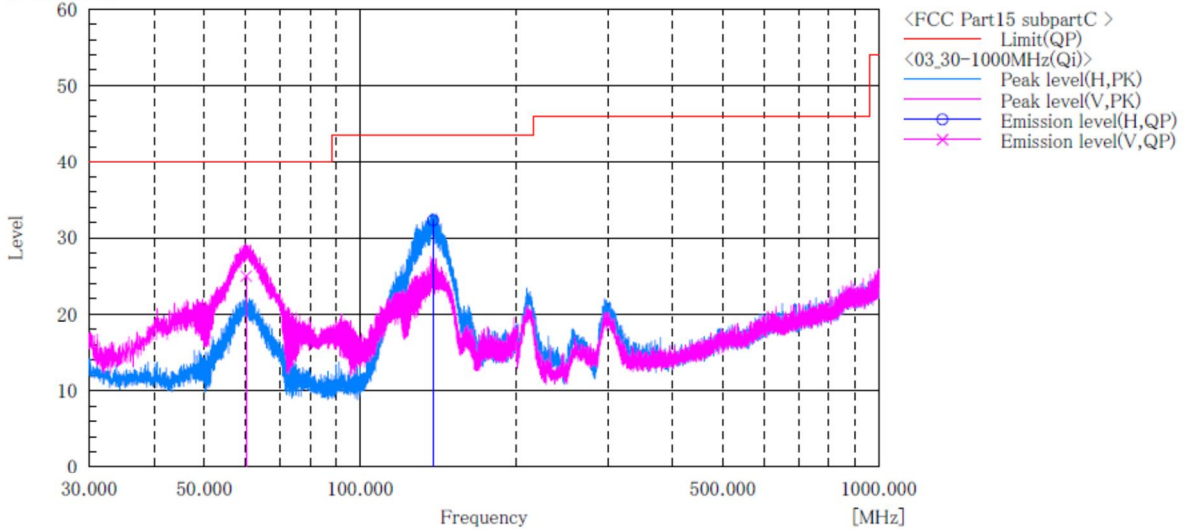
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[30MHz to 1000MHz]

Company name : KYOCERA Corporation
EUT : Mobile Phone
Model No. : EB1073
Serial No. : N/A
Test mode : Qi Charge mode

Standard : FCC Part.15 subpartC
Operator : C.Kanno
Temp,Hum,Atm : 22.4[°C] 61.5[%]
Note1 :
Note2 :

[dB(μV/m)]



Final Result

No.	Frequency	(P)	Reading	c. f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]		QP		QP	QP	QP			
			[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[cm]	[°]	
1	60.200	V	41.3	-16.3	25.0	40.0	15.0	100.0	334.0	
2	138.200	H	45.8	-13.5	32.3	43.5	11.2	317.0	262.0	

4.3 AC Power Line Conducted Emissions

4.3.1 Measurement procedure

[FCC 15.207, RSS-Gen 8.8]

Test was applied by following conditions.

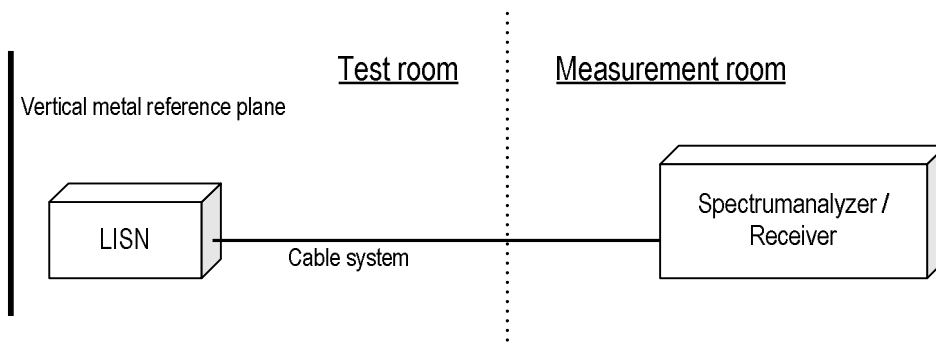
Test method	: ANSI C63.10
Frequency range	: 0.15 MHz to 30 MHz
Test place	: 3 m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0 m × (D)1.0 m × (H)0.8 m
Vertical Metal Reference Plane	: (W)2.0 m × (H)2.0 m 0.4 m away from EUT
Test receiver setting	
- Detector	: Quasi-peak, Average
- Bandwidth	: 9 kHz

EUT and peripherals are connected to 50Ω/50μH Line Impedance Stabilization Network (LISN) which are connected to reference ground plane, and are placed 80cm away from EUT. Excess of AC power cable is bundled in center.

LISN for peripheral is terminated in 50Ω.

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, peripherals, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits.

- Test configuration



4.3.2 Calculation method

Emission level = Reading + (LISN. Factor + Cable system loss)

Margin = Limit – Emission level

Example:

Limit @ 6.770 MHz : 60.0 dB μ V(Quasi-peak)

: 50.0 dB μ V(Average)

(Quasi peak) Reading = 41.2 dB μ V c.f = 10.3 dB

Emission level = 41.2 + 10.3 = 51.5 dB μ V

Margin = 60.0 – 51.5 = 8.5 dB

(Average) Reading = 35.0 dB μ V c.f = 10.3 dB

Emission level = 35.0 + 10.3 = 45.3 dB μ V

Margin = 50.0 – 45.3 = 4.7 dB

4.3.3 Limit

Frequency [MHz]	Limit	
	QP [dB μ V]	AV [dB μ V]
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

4.3.4 Test data

Date : 8-October-2021

Temperature : 21.6 [°C]

Humidity : 62.3 [%]

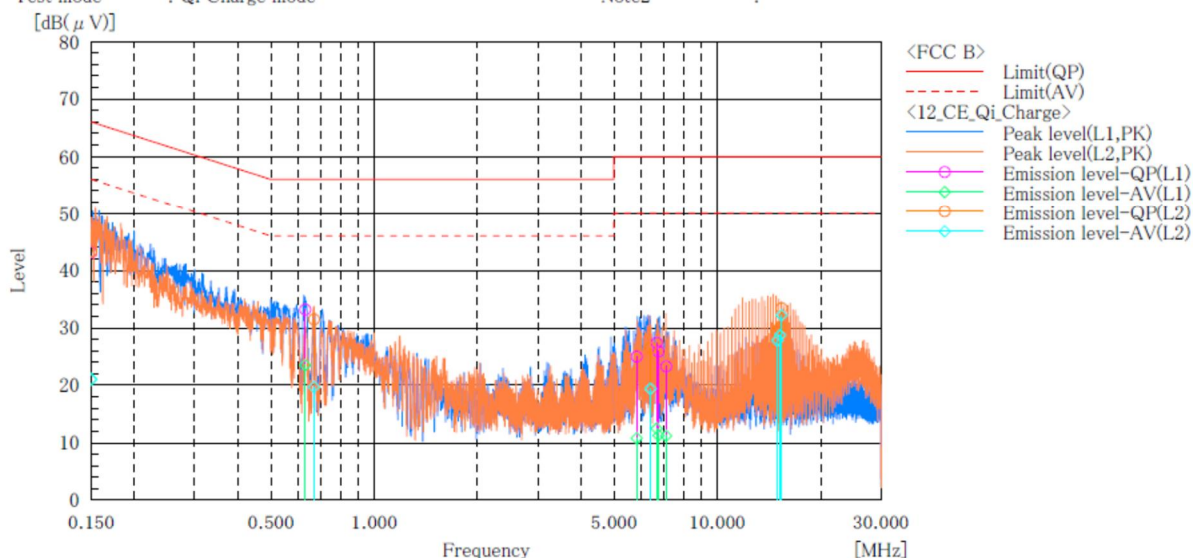
Test place : 3m Semi-anechoic chamber

Test engineer :

Tadahiro Seino

Company name : KYOCERA Corporation
 EUT : Mobile Phone
 Model No. : EB1073
 Serial No. : N/A
 Test mode : Qi Charge mode

Standard : FCC Part.15 Class C
 Operator : T.Seino
 Temp,Hum,Atm : 21.6[°C] 62.3[%]
 Note1 :
 Note2 :



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.150	32.6	10.5	10.6	43.2	21.1	66.0	56.0	22.8	34.9
2	0.630	22.8	13.1	10.4	33.2	23.5	56.0	46.0	22.8	22.5
3	5.828	14.3	0.1	10.7	25.0	10.8	60.0	50.0	35.0	39.2
4	6.666	16.6	1.7	10.8	27.4	12.5	60.0	50.0	32.6	37.5
5	6.740	15.1	0.5	10.8	25.9	11.3	60.0	50.0	34.1	38.7
6	7.103	12.5	0.4	10.8	23.3	11.2	60.0	50.0	36.7	38.8

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.150	32.7	10.4	10.6	43.3	21.0	66.0	56.0	22.7	35.0
2	0.668	21.1	9.3	10.4	31.5	19.7	56.0	46.0	24.5	26.3
3	6.398	15.7	8.6	10.8	26.5	19.4	60.0	50.0	33.5	30.6
4	14.977	17.6	16.1	11.7	29.3	27.8	60.0	50.0	30.7	22.2
5	15.247	18.3	17.0	11.7	30.0	28.7	60.0	50.0	30.0	21.3
6	15.384	21.7	20.5	11.7	33.4	32.2	60.0	50.0	26.6	17.8



Japan

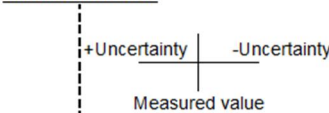
5 Antenna requirement

According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device. The antenna is a special antenna mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of FCC section 15.203.

6 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	$\pm 1.4 \times 10^{-8}$
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

7 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

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	30-Sep-2022	01-Sep-2021
Microwave cable	Junkosha Inc.	MWX221/1m	S400	31-Mar-2022	10-Mar-2021
EMI Probe	ANRITSU	MA2601C	N/A(1753)	31-Oct-2021	08-Oct-2020

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	E4440A	US40420937	31-Dec-2021	11-Dec-2020
Preamplifier	SONOMA	310	372170	30-Sep-2022	15-Sep-2021
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	30-Apr-2022	27-Apr-2021
Attenuator	TOYO Connector	NA-PJ-6	N/A(S507)	28-Feb-2022	03-Feb-2021
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1333	31-Dec-2021	15-Dec-2020
Log-periodic antenna	Schwarzbeck	VUSLP9111B	345	31-Oct-2021	19-Oct-2020
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
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/1m	my24610/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/1.5m	SN MY19309/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX106/7m	41625/6	31-Dec-2021	15-Dec-2020
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.6.0	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	31-May-2022	20-May-2021

Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2022	15-Sep-2021
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	31-Dec-2021	15-Dec-2020
Line impedance stabilization network	Kyoritsu Electrical Works, Ltd.	KNW-407F2	12-17-110-2	30-Jun-2022	17-Jun-2021
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	31-Dec-2021	15-Dec-2020
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	31-Dec-2021	15-Dec-2020
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A (S194)	31-Dec-2021	15-Dec-2020
PC	DELL	DIMENSION	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/CE-AJ	0611193/V5.4.11	N/A	N/A

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