# 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)

Japan

Add value.
Inspire trust.

Prepared for: KYOCERA Corporation
Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku
Yokohama-shi, Kanagawa, Japan
Phone: +81-45-943-6253 Fax: +81-45-943-6314

## COMMERCIAL-IN-CONFIDENCE

Document Number: JPD-TR-21189-0

| SIGNATURE | | | |
|---|---|---|---|
| Hiroaki Suzuki | | | |
| **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).

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

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# Contents

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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<br>RSS-Gen 6.7 | Occupied Bandwidth | Radiated | PASS | - |
| 15.209<br>RSS-Gen 8.9 | Transmitter Radiated Spurious Emissions | Radiated | PASS | - |
| 15.207<br>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

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# 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 |

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## 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.

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# 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.

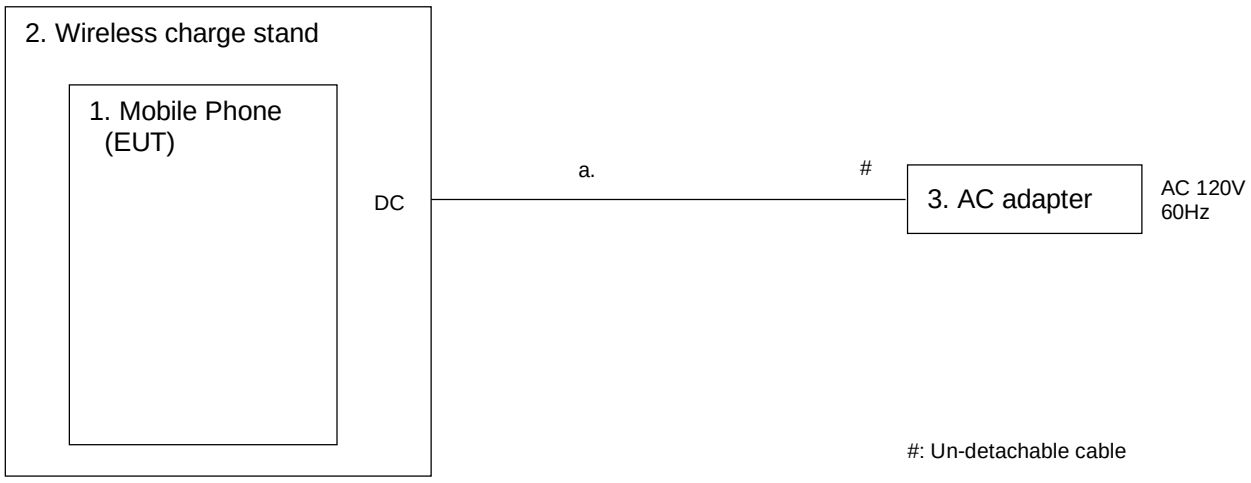
## 3.1 Equipment used

| 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



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# 4 Test Result

## 4.1 Occupied Bandwidth

### 4.1.1 Measurement procedure

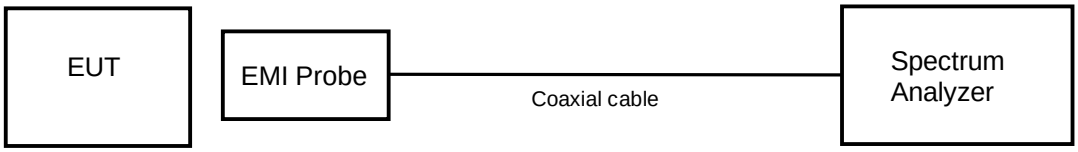
**[FCC 2.1049, RSS-Gen 6.7]**

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 |

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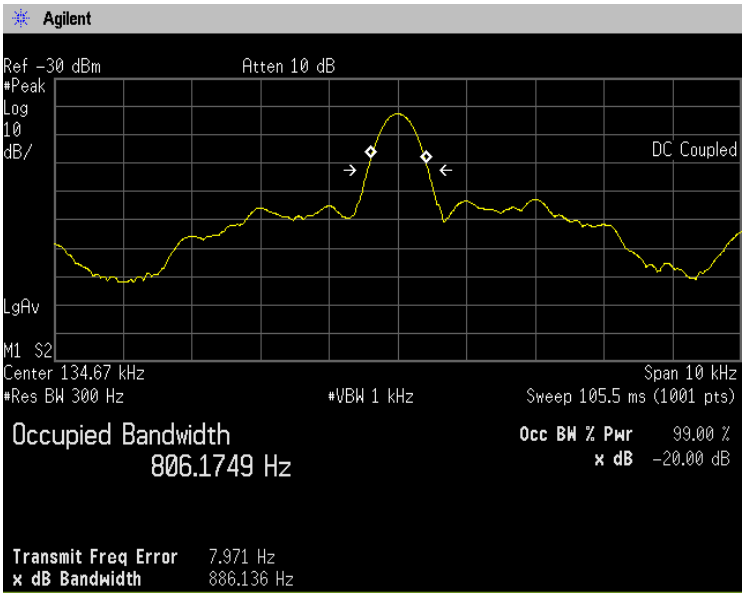
### 4.1.4 Trace data



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## 4.2 Radiated Emissions

### 4.2.1 Measurement procedure

**[FCC 15.209, RSS-Gen 8.9]**

Test was applied by following conditions.

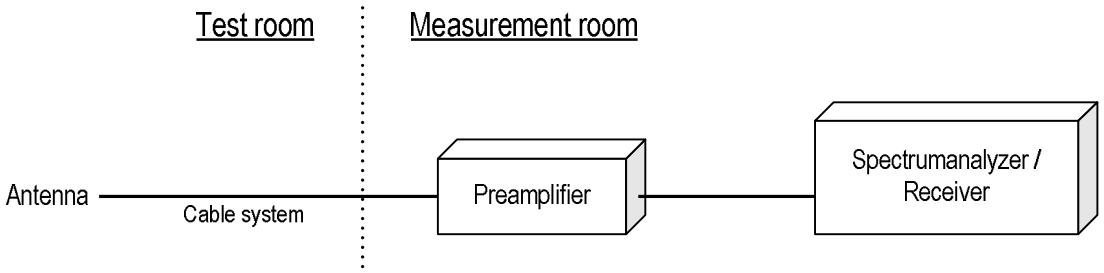
| | | |
|---|---|---|
| Test method | : | ANSI C63.10 |
| Frequency range | : | 9kHz to 30MHz |
| Test place | : | 3m Semi-anechoic chamber |
| EUT was placed on | : | Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m |
| Antenna distance | : | 3m |

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.

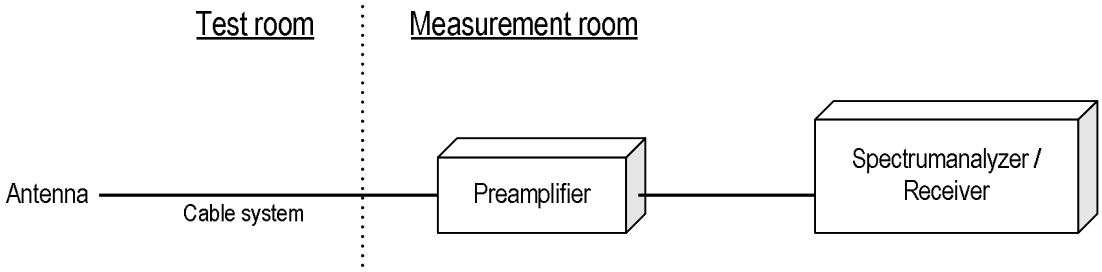
| | | |
|---|---|---|
| Test method | : | ANSI C63.10 |
| Frequency range | : | 30MHz to 1000MHz |
| Test place | : | 3m Semi-anechoic chamber |
| EUT was placed on | : | Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m |
| Antenna distance | : | 3m |

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

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### 4.2.3 Limit

| Frequency [MHz] | Field strength | | Distance [m] |
|---|---|---|---|
| | [uV/m] | [dBuV/m] | |
| 0.009-0.490 | 2400 / F [kHz] | 20logE [uV/m] | 300 |
| 0.490-1.705 | 24000 / F [kHz] | 20logE [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] = 20log Emission [uV/m]
3. Measurements were corrected to 300m using 40log (3/300) = -80.0dB
   Measurements were corrected to 30m using 40log (3/30) = -40.0dB

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### 4.2.4 Test data

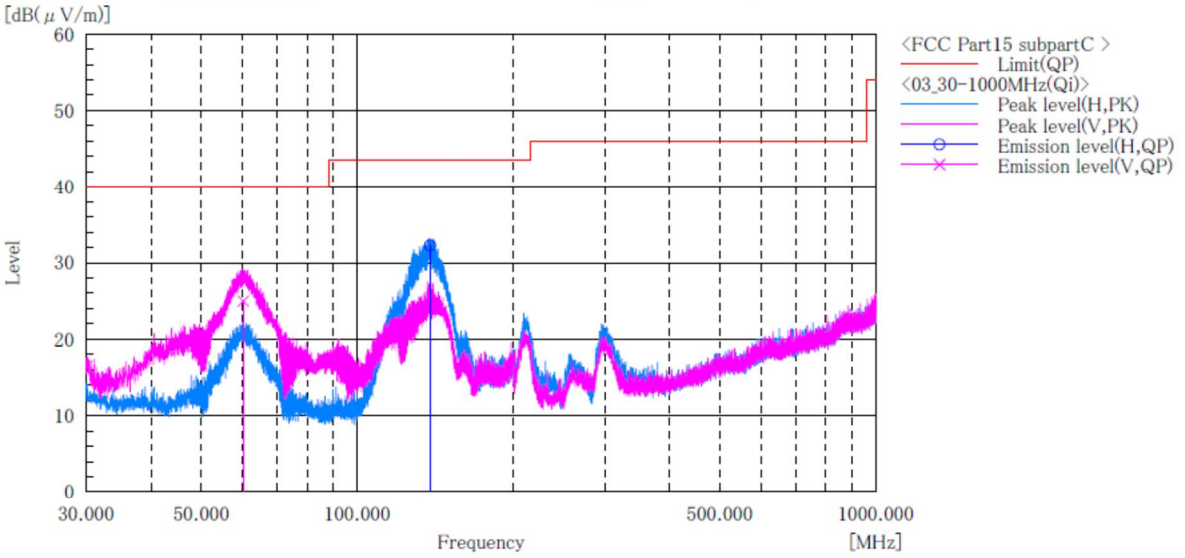
Date : 24-September-2021
Temperature : 22.4 [˚C]
Humidity : 61.5 [%] Test engineer :
Test place : 3m Semi-anechoic chamber Chiaki Kanno

**[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 |

**[30MHz to 1000MHz]**

| | | | |
|---|---|---|---|
| Company name | : KYOCERA Corporation | Standard | : FCC Part.15 subpartC |
| EUT | : Mobile Phone | Operator | : C.Kanno |
| Model No. | : EB1073 | Temp,Hum,Atm | : 22.4[℃] 61.5[%] |
| Serial No. | : N/A | Note1 | : |
| Test mode | : Qi Charge mode | Note2 | : |




Final Result

| No. | Frequency | (P) | Reading QP | c.f | Result QP | Limit QP | Margin QP | Height | Angle | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | | [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 | |

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## 4.3 AC Power Line Conducted Emissions

### 4.3.1 Measurement procedure

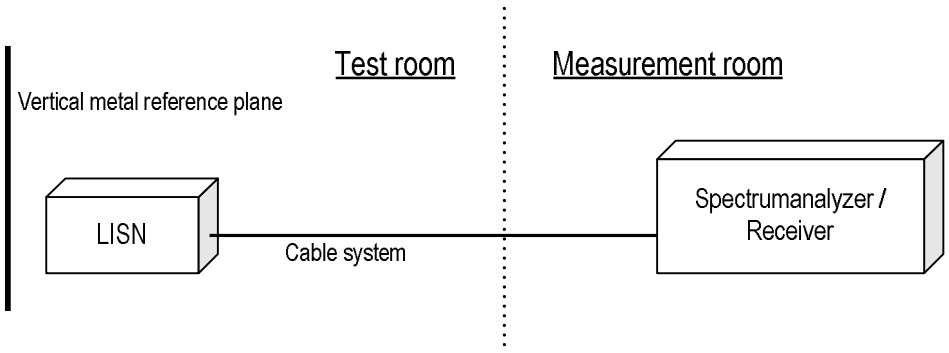
**[FCC 15.207, RSS-Gen 8.8]**

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



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### 4.3.2 Calculation method

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

Example:
Limit @ 6.770 MHz : 60.0 dBµV(Quasi-peak)
: 50.0 dBµV(Average)
(Quasi peak) Reading = 41.2 dBµV c.f = 10.3 dB
Emission level = 41.2 + 10.3 = 51.5 dBµV
Margin = 60.0 – 51.5 = 8.5 dB
(Average) Reading = 35.0 dBµV c.f = 10.3 dB
Emission level = 35.0 + 10.3 = 45.3 dBµV
Margin = 50.0 – 45.3 = 4.7 dB

### 4.3.3 Limit

| Frequency [MHz] | Limit | |
|---|---|---|
| | QP [dBuV] | AV [dBuV] |
| 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.

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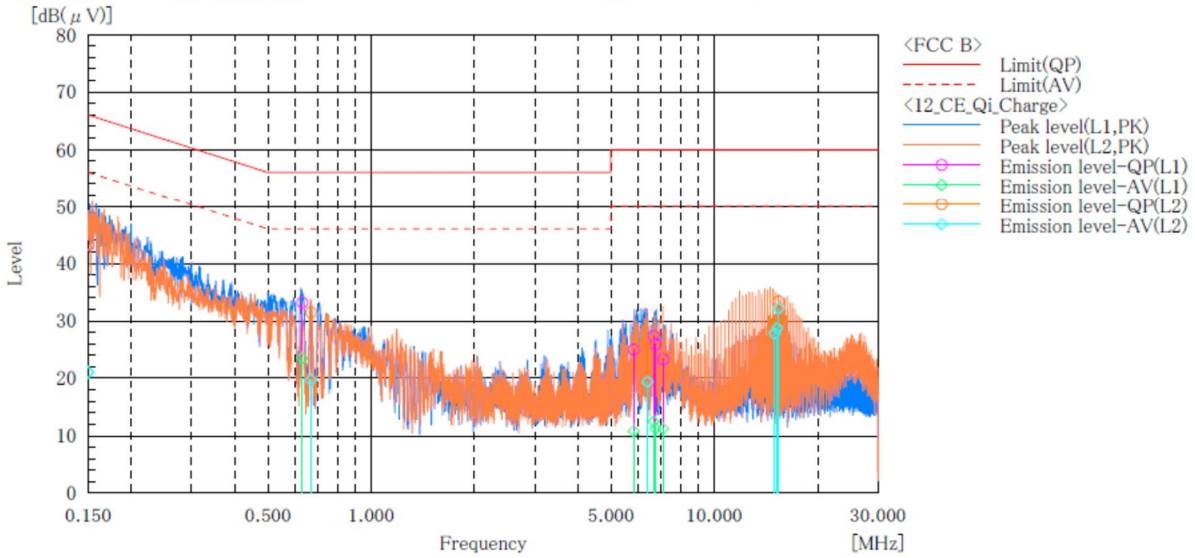
### 4.3.4 Test data

Date : 8-October-2021
Temperature : 21.6 [°C]
Humidity : 62.3 [%] Test engineer :
Test place : 3m Semi-anechoic chamber 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[℃] 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 |

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# 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.

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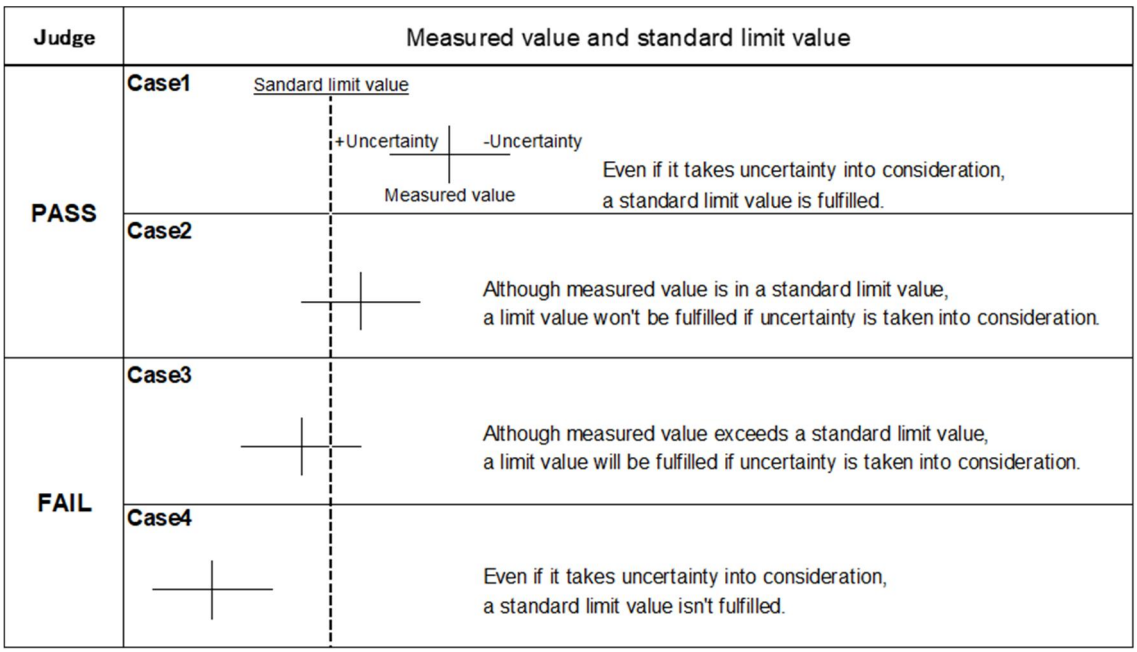
# 6 Measurement Uncertainty

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 | $\pm 1.4 * 10^{-8}$ |
| 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 % |



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# 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

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# 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.