

TEST REPORT

For

Braille Labeler

In conformity with

FCC CFR 47 Part15 Subpart B

Model : BL-1000 LINK

FCC ID : 2AXGX-BL1KL

Test Item : Braille Labeler

Report No. : WE200713BB2-11

Issue Date : September 17, 2020

Prepared for

KGS CORPORATION
1004 OGAWA, OGAWA MACHI, SAITAMA 355-0321, JAPAN

Prepared by

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History

| Report No. | Date | Revisions | Issued By |
|----------------|--------------------|---------------|-----------|
| WE200713BB2-11 | September 17, 2020 | Initial Issue | K. Onishi |
| | | | |

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1 General information

1.1 Product information from applicant

| | |
|-------------------------------|--|
| Test item | : Braille Labeler |
| Manufacturer | : KGS CORPORATION |
| Address | : 1004 OGAWA, OGAWA MACHI, SAITAMA 355-0321, JAPAN |
| Model | : BL-1000 LINK |
| FCC ID | : 2AXGX-BL1KL |
| Serial number | : PP100005 |
| Highest operating frequency | : 48 MHz |
| Receipt date of EUT | : August 25, 2020 |
| Nominal power source voltages | : AC 120V, 60Hz (AC adapter) |

1.2 Test(s) performed/ Summary of test result

| | |
|-----------------------|--|
| Test specification(s) | : FCC CFR 47. Part 15 subpart B (01 Oct. 2019) |
| Test method(s) | : ANSI C63.4: 2014 |
| Test(s) started | : September 17, 2020 |
| Test(s) completed | : September 17, 2020 |

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.

The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.

Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer

: 
 K. Onishi
 RF Operation RF/EMC Lab

Reviewer

: 
 Y. Taki
 Manager
 RF Operation RF/EMC Lab

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1.3 Test facility

[Yokohama Laboratory]

Address: 472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan
TEL: +81-45-534-0645
FAX: +81-45-534-0646

Accredited by National Voluntary Laboratory Accreditation Program (NVLAP) for the emission tests stated in the scope of the certificate under Certificate Number 200780-0

Registered by Innovation, Science and Economic Development Canada (ISED):
The registered CAB identifier is JP0009.

Registered by Voluntary Control Council for Interference by Information Technology Equipment (VCCI)
Each registered facility number is as follows;
Test site A-0045

[Kitayamata laboratory]

Address: 3-5-23, Kitayamata, Tsuzuki-ku, Yokohama, 224-0021, Japan
TEL: +81-45-550-3520
FAX: +81-45-592-7506

Accredited by National Voluntary Laboratory Accreditation Program (NVLAP) for the emission tests stated in the scope of the certificate under Certificate Number 200780-0

Registered by Innovation, Science and Economic Development Canada (ISED):
The registered CAB identifier is JP0009.

Registered by Voluntary Control Council for Interference by Information Technology Equipment (VCCI)
Each registered facility number is as follows;
Test site A-0212

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the US Government.



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1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring UKAS Publication LAB34: 2002 “The Expression of Uncertainty in EMC Testing” and CISPR16-4-2: 2011 “Uncertainty in EMC Measurements”.

The uncertainty of the measurement result in the level of confidence of approximately 95% (k=2) is as follows;

Conducted emission : ± 3.3 dB (150 kHz - 30 MHz)
 Radiated emission : ± 6.1 dB (30 MHz - 1000 MHz)

1.5 Summary of test results

| Requirement | Section in FCC15B | Result | Section in this report |
|---|-------------------|----------|------------------------|
| Radiated emissions (30 to 2000 MHz) (*) | 15.109 | Complied | 2.1 |
| AC power line conducted emissions | 15.107 | Complied | 2.2 |

(*) The highest internal operating frequency is below 500 MHz

1.6 Setup of equipment under test (EUT)

1.6.1 Test configuration of EUT

The test configuration of the EUT refers to following Tables.

Table: EUT

| No. | Item | Model No. | Manufacture | Serial No. |
|-----|-----------------|--------------|-------------|------------|
| A | Braille Labeler | BL-1000 LINK | KGS | PP100005 |

Table: Support equipment

| No. | Item | Model No. | Manufacture | Serial No. |
|-----|------------|----------------|---------------|-----------------|
| B | AC Adaptor | ATS024T-P150 | ADAPTER TECH. | - |
| C | PC | R63/B | Toshiba | ZG081213H |
| D | AC Adaptor | PA5177U-1ACA | Toshiba | G71C000GX210 |
| E | Hub | PA-WR8700N-HP | NEC | 87N1111286973B0 |
| F | AC Adaptor | AL1-002292-002 | NEC | 07109A174499 |
| G | Mouse | MUS-UKT115BK | Nakabayashi | 190901791 |

Table: Cable connected to the EUT

| No. | Item | From | To | Length [m] | Shield | Ferrite Core |
|-----|-------------------|------|----|------------|--------|--------------|
| 1 | DC Output Cable 1 | A | B | 1.83 | No | No |
| 2 | AC Power Cable 1 | B | AC | 1.50 | No | No |
| 3 | USB Cable | A | C | 1.80 | Yes | No |
| 4 | DC Output Cable 2 | C | D | 1.80 | No | No |
| 5 | AC Power Cable 2 | D | AC | 0.90 | No | No |
| 6 | LAN Cable | C | E | 2.00 | No | No |
| 7 | DC Output Cable 3 | E | F | 1.30 | No | No |
| 8 | AC Power Cable 3 | F | AC | 0.70 | No | No |

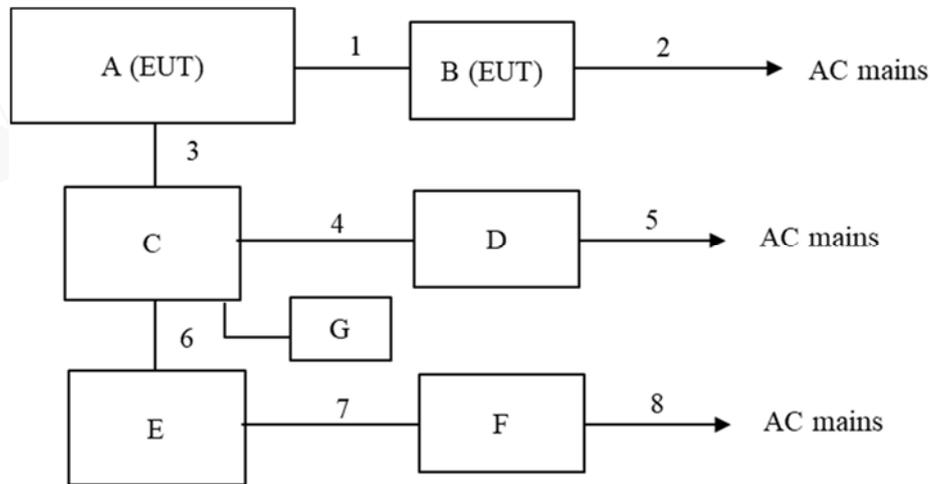
1.6.2 Operating condition:

- Normal Mode (Continuous Printing)

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1.6.3 Setup diagram of tested system



1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

1.8 Deviation from the standard

No deviations from the standards described in clause 1.2.

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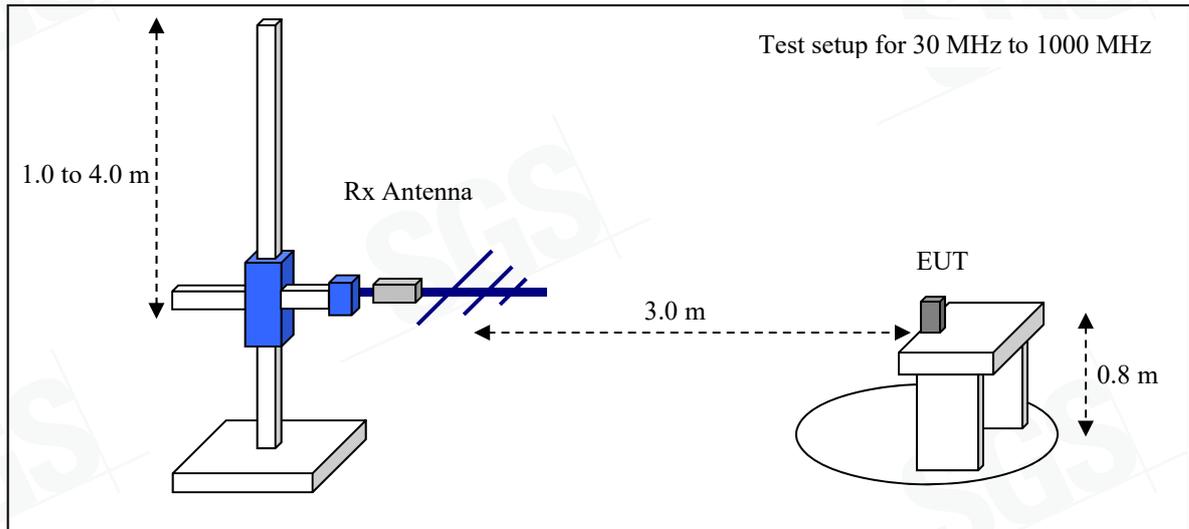
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2 Test procedure and test data

2.1 Radiated emissions

Test setup

Test setup was implemented according to the method of ANSI C63.4: 2014 clause 6 “General requirements for EUT arrangements, configuration, and operation”, and clause 8 “Radiated emission measurements”.



Test procedure

Measurement procedures were implemented according to the method of ANSI C63.4: 2014 clauses 8.3. The EUT is placed on a non-conducted table which is 0.8 m height from a ground plane and the measurement antenna to EUT distance is 3 meters. The turn table is rotated for 360 degrees to determine the maximum emission level.

The antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

The spectrum analyzer and receiver are set to the followings;

Between 30 - 1000 MHz: RBW=100 kHz, VBW= 300 kHz (Final measurement: RBW=120 kHz (QP))

Above 1000 MHz: RBW=1 MHz, VBW= 1 MHz (Final measurement: RBW=1 MHz (PK/AV))

Applicable rule and limitation

§15.109 (b) Radiated emission limits

| Frequency [MHz] | Field Strength [μ V/m] | Measurement Distance [m] | Field Strength [dB μ V/m] @3m |
|-----------------|-----------------------------|--------------------------|-----------------------------------|
| 30 – 88 | 100 | 3 | 40.0 |
| 88 – 216 | 150 | 3 | 43.5 |
| 216 – 960 | 200 | 3 | 46.0 |
| Above 960 | 500 | 3 | 53.9 |

In the emission table above, the tighter limit applies at the band edges

Test results - Complied with requirement

Test equipment used (refer to List of utilized test equipment)

| | | | | | | | |
|------|------|------|------|------|------|------|------|
| AC01 | BA07 | CL11 | CL38 | CL39 | DH06 | PR12 | PR21 |
| TR06 | - | - | - | - | - | - | - |

Test software used

EMI1 Ver. 6.1

Calculation method

The Correction Factor and Result are calculated as followings.

$$\text{Correction Factor [dB/m]} = \text{Ant. Factor [dB/m]} + \text{Loss [dB]} - \text{Gain [dB]}$$

$$\text{Result [dB}\mu\text{V/m]} = \text{Reading [dB}\mu\text{V]} + \text{Correction Factor [dB/m]}$$

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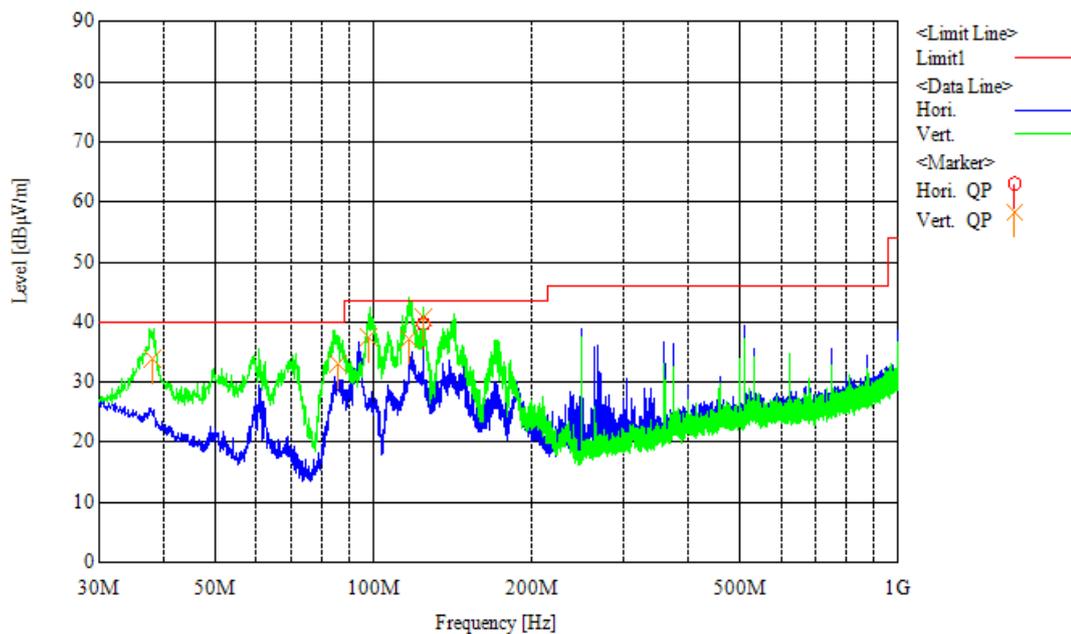
Test Data (30 - 1000 MHz)

Test site: Yokohama Laboratory
 Measurement distance: 3 m

[Emission level]

| No. | Frequency [MHz] | Reading [dBμV] | Factor [dB/m] | Loss [dB] | Gain [dB] | Result [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Ant. |
|-----|-----------------|----------------|---------------|-----------|-----------|-----------------|----------------|-------------|-------|
| 1 | 125.000 | 49.2 | 12.8 | 8.0 | 30.2 | 39.8 | 43.5 | 3.7 | Hori. |
| 2 | 37.903 | 38.7 | 18.7 | 6.9 | 30.4 | 33.9 | 40.0 | 6.1 | Vert. |
| 3 | 85.502 | 47.7 | 8.0 | 7.6 | 30.3 | 33.0 | 40.0 | 7.0 | Vert. |
| 4 | 98.353 | 49.9 | 10.2 | 7.7 | 30.2 | 37.6 | 43.5 | 5.9 | Vert. |
| 5 | 117.485 | 47.1 | 12.5 | 7.9 | 30.2 | 37.3 | 43.5 | 6.2 | Vert. |
| 6 | 124.999 | 50.3 | 12.8 | 8.0 | 30.2 | 40.9 | 43.5 | 2.6 | Vert. |

[Chart]



[Test condition]

Tested Date: September 17, 2020 Temperature: 21 degC
 Humidity: 65 % Atmos. Press: 1014 hPa

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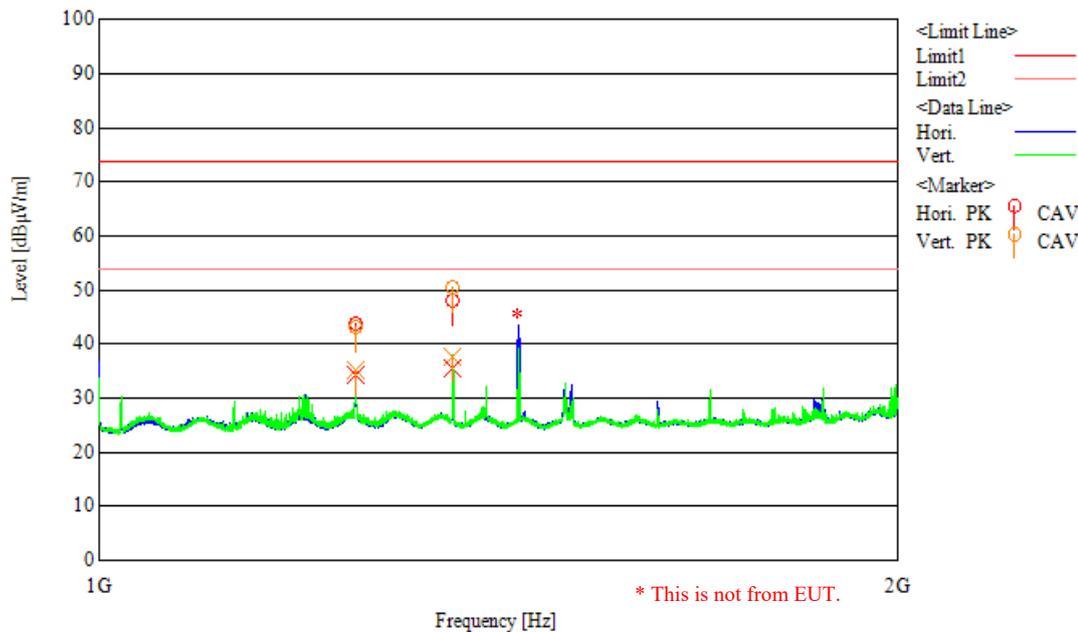
Test Data (above 1000 MHz)

Frequency range: 1000 - 2000 MHz (240MHz of USB 2.0 interface)
 Test site: Yokohama Laboratory
 Measurement distance: 3 m

[Emission level]

| No. | Frequency [MHz] | Reading PK [dBμV] | Reading Ave [dBμV] | C.Factor [dB] | Result PK [dBμV/m] | Result Ave [dBμV/m] | Limit PK [dBμV/m] | Limit Ave [dBμV/m] | Margin PK [dB] | Margin Ave [dB] | Ant. |
|-----|-----------------|-------------------|--------------------|---------------|--------------------|---------------------|-------------------|--------------------|----------------|-----------------|-------|
| 1 | 1249.999 | 53.3 | 43.9 | -9.5 | 43.8 | 34.4 | 73.9 | 53.9 | 30.1 | 19.5 | Hori. |
| 2 | 1359.891 | 57.3 | 44.7 | -9.1 | 48.2 | 35.6 | 73.9 | 53.9 | 25.7 | 18.3 | Hori. |
| 3 | 1249.999 | 52.8 | 44.7 | -9.5 | 43.3 | 35.2 | 73.9 | 53.9 | 30.6 | 18.7 | Vert. |
| 4 | 1359.891 | 59.6 | 46.7 | -9.1 | 50.5 | 37.6 | 73.9 | 53.9 | 23.4 | 16.3 | Vert. |

[Chart]



[Test condition]

Tested Date: September 17, 2020 Temperature: 21 degC
 Humidity: 65 % Atmos. Press: 1014 hPa

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2.2 AC power line conducted emissions

Test setup

Test setup was implemented according to the method of ANSI C63.4: 2014 clause 6 “General requirements for EUT arrangements, configuration and operation” and clause 7 “AC power-line conducted emission measurements”.

Test procedure

Measurement procedures were implemented according to the method of ANSI C63.4: 2014 clauses 7.3. Exploratory measurements were used the spectrum analyzer to identify the frequency of the emission that has the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable positions, and with a typical system equipment configuration and arrangement. Final ac power line conducted emission measurements were performed based on the exploratory tests. The EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit are selected for the final measurement. When the measurement value is greater than average limitation the average detection measurements were performed.

Applicable rule and limitation

§15.107 (b) AC power line conducted limits

| Frequency of Emission [MHz] | Conducted emissions Limit [dBμV] | |
|--------------------------------|----------------------------------|------------|
| | Quasi-peak | Average |
| 0.15 - 0.5 | 66 to 56 * | 56 to 46 * |
| 0.5 - 5 | 56 | 46 |
| 5 - 30 | 60 | 50 |

* Decreases with the logarithm of the frequency. The lower limit applies at the band edges.

Test equipment used (refer to List of utilized test equipment)

| | | | |
|------|------|------|---|
| CL18 | LN05 | TR09 | - |
|------|------|------|---|

Test software used

EMI1 Ver. 6.1

Calculation method

The Correction Factor and Result are calculated as followings.

$$\begin{aligned} \text{Correction Factor [dB]} &= \text{LISN Factor [dB]} + \text{Loss [dB]} \\ \text{Result [dB}\mu\text{V]} &= \text{Reading [dB}\mu\text{V]} + \text{Correction Factor [dB]} \end{aligned}$$

Test results - Complied with requirement

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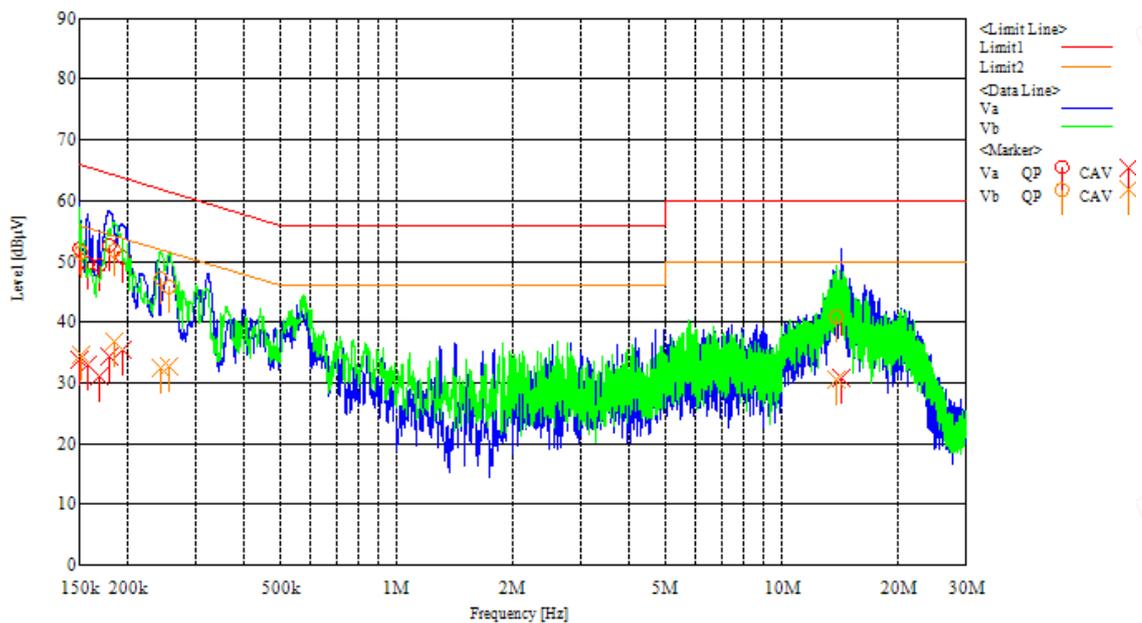
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Test Data

Test location: Yokohama laboratory (Y2 shield room)

| No. | Frequency [MHz] | Reading | | C.F. [dB] | Result | | Limit | | Margin | | Phase |
|----------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|
| | | QP [dBuV] | AV [dBuV] | | QP [dBuV] | AV [dBuV] | QP [dBuV] | AV [dBuV] | QP [dB] | AV [dB] | |
| 1 | 0.15017 | 41.9 | 23.7 | 10.2 | 52.1 | 33.9 | 66.0 | 56.0 | 13.9 | 22.1 | Va |
| 2 | 0.15782 | 39.3 | 22.8 | 10.2 | 49.5 | 33.0 | 65.6 | 55.6 | 16.1 | 22.6 | Va |
| 3 | 0.16887 | 39.1 | 20.9 | 10.2 | 49.3 | 31.1 | 65.0 | 55.0 | 15.7 | 23.9 | Va |
| 4 | 0.17991 | 42.4 | 24.2 | 10.2 | 52.6 | 34.4 | 64.5 | 54.5 | 11.9 | 20.1 | Va |
| 5 | 0.19419 | 40.6 | 25.4 | 10.1 | 50.7 | 35.5 | 63.9 | 53.9 | 13.2 | 18.4 | Va |
| 6 | 14.31514 | 31.8 | 20.5 | 10.3 | 42.1 | 30.8 | 60.0 | 50.0 | 17.9 | 19.2 | Va |
| 7 | 0.15153 | 41.2 | 24.3 | 10.2 | 51.4 | 34.5 | 65.9 | 55.9 | 14.5 | 21.4 | Vb |
| 8 | 0.18552 | 41.6 | 26.7 | 10.2 | 51.8 | 36.9 | 64.2 | 54.2 | 12.4 | 17.3 | Vb |
| 9 | 0.24501 | 37.1 | 22.4 | 10.1 | 47.2 | 32.5 | 61.9 | 51.9 | 14.7 | 19.4 | Vb |
| 10 | 0.25725 | 35.8 | 22.6 | 10.1 | 45.9 | 32.7 | 61.5 | 51.5 | 15.6 | 18.8 | Vb |
| 11 | 13.94321 | 30.6 | 20.1 | 10.3 | 40.9 | 30.4 | 60.0 | 50.0 | 19.1 | 19.6 | Vb |

[Chart]



[Test condition]

Tested Date: September 17, 2020
 Humidity: 65 %

Temperature: 21 degC
 Atmos. Press: 1014 hPa

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4 List of utilized test equipment / calibration

| RFT ID No. | Kind of Equipment and Precision | Manufacturer | Model No. | Serial Number | Calibration Date | Calibrated until |
|------------|----------------------------------|----------------------|--------------|---------------|------------------|------------------|
| AC01(EM) | Anechoic Chamber (1st test room) | JSE | 203397C | - | 2020/04/17 | 2021/04/30 |
| AC01(EG) | Anechoic Chamber (1st test room) | JSE | 203397C | - | 2020/03/28 | 2021/03/31 |
| BA07 | Biological Antenna | TESEQ | CBL6143A | 26670 | 2019/12/09 | 2020/12/31 |
| CL11 | RF Cable for RE | RFT | - | - | 2020/03/25 | 2021/03/31 |
| CL18 | RF Cable for CE | RFT | - | - | 2020/03/25 | 2021/03/31 |
| CL38 | RF Cable 2 m | Junkosha | MWX221 | 1603S626 | 2020/01/30 | 2021/01/31 |
| CL39 | RF Cable 5 m | SUHNER | SUCOFLEX126E | 523222 | 2020/02/03 | 2021/02/28 |
| DH06 | DRG Horn Antenna | A.H. Systems | SAS-571 | 1339 | 2020/06/27 | 2022/06/30 |
| LN05 | LISN | Kyoritsu | KNW-407F | 8-1773-2 | 2020/05/19 | 2021/05/31 |
| PR12 | Pre. Amplifier (1-26G) | Agilent Technologies | 8449B | 3008A02513 | 2020/01/29 | 2021/01/31 |
| PR21 | Pre. Amplifier | Anritsu | MH648A | 6200467119 | 2019/12/03 | 2020/12/31 |
| TR06 | Test Receiver (F/W : 4.73 SP4) | Rohde & Schwarz | ESU26 | 100002 | 2019/10/07 | 2020/10/31 |
| TR09 | Test Receiver (F/W : 4.43 SP3) | Rohde & Schwarz | ESU8 | 100386 | 2020/06/23 | 2021/06/30 |

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

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