# EMI TEST REPORT

## Test Report No.: 13384109S-C-R2

| | | |
|---|---|---|
| **Applicant** | : | **ALPS ALPINE CO., LTD.** |
| **Type of EUT** | : | **WEARABLE EYEWEAR** |
| **Model Number of EUT** | : | **JINS MEME CORE** |
| **FCC ID** | | **CWTCVASW0A** |
| **Test regulation** | : | **FCC Part 15 Subpart B: 2020, Class B**<br>**ICES-003 Issue 6: 2016 (SMSE-005-19) . Class B** |
| **Test result** | : | **Complied (Refer to Section 3.2)** |

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
6. This test report covers EMC technical requirements.
   It does not cover administrative issues such as Manual or non-EMC test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. This report is a revised version of 13384109S-C-R1. 13384109S-C-R1 is replaced with this report.

**Date of test:** August 12, 2020

**Representative test engineer:**
Koki Yamada
Engineer
Consumer Technology Division

**Approved by:**
Hikaru Shirasawa
Engineer
Consumer Technology Division

Testing LAB
RTL02610

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

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# REVISION HISTORY

## Original Test Report No.: 13384109S-C

| Revision | Test report No. | Date | Page revised | Contents |
|---|---|---|---|---|
| - (Original) | 13384109S-C | September 16, 2020 | - | - |
| 1 | 13384109S-C-R1 | September 18, 2020 | P.1, P.5<br>P13 to P.17 | Modification of "Type of EUT"<br>from JINS MEME CORE<br>to WEARABLE EYEWEAR |
| | | | P.1, P.5<br>P13 to P.17 | Modification of "Model Number of EUT"<br>from CVASW0A001B<br>to JINS MEME CORE |
| | | | P.5 | Addition of Rating: DC 5 V (USB) |
| 2 | 13384109S-C-R2 | September 23, 2020 | P.1 and P.6 | Modification of "Test regulation"<br>from ICES-003 Issue 6:<br>2016+Amendment 1: 2017, Class B<br>to ICES-003 Issue 6:<br>2016 (SMSE-005-19) , Class B |
| | | | P.8 | Modification of "Type of EUT"<br>from JINS MEME CORE<br>to WEARABLE EYEWEAR |
| | | | | Modification of "Model Number of EUT"<br>from CVASW0A001B<br>to JINS MEME CORE |
| | | | P.12 | Modification of "Distance Factor"<br>from (3.98.75 m*/3.0 m)<br>to (3.9875 m*/3.0 m) |

## Reference: Abbreviations (Including words undescribed in this report)

| | |
|---|---|
| AAN | Asymmetric Artificial Network |
| AC | Alternating Current |
| AM | Amplitude Modulation |
| AMN | Artificial Mains Network |
| Amp, AMP | Amplifier |
| ANSI | American National Standards Institute |
| Ant, ANT | Antenna |
| AP | Access Point |
| ASK | Amplitude Shift Keying |
| Atten., ATT | Attenuator |
| AV | Average |
| BPSK | Binary Phase-Shift Keying |
| BR | Bluetooth Basic Rate |
| BT | Bluetooth |
| BT LE | Bluetooth Low Energy |
| BW | BandWidth |
| C.F | Correction Factor |
| Cal Int | Calibration Interval |
| CAV | CISPR AV |
| CCK | Complementary Code Keying |
| CDN | Coupling Decoupling Network |
| Ch., CH | Channel |
| CISPR | Comite International Special des Perturbations Radioelectriques |
| Corr. | Correction |
| CPE | Customer premise equipment |
| CW | Continuous Wave |
| DBPSK | Differential BPSK |
| DC | Direct Current |
| DET | Detector |
| Dmax | maximum absolute voltage change during an observation period |
| DQPSK | Differential QPSK |
| DSSS | Direct Sequence Spread Spectrum |
| EDR | Enhanced Data Rate |
| e.i.r.p., EIRP | Equivalent Isotropically Radiated Power |
| EM clamp | Electromagnetic clamp |
| EMC | ElectroMagnetic Compatibility |
| EMI | ElectroMagnetic Interference |
| EMS | ElectroMagnetic Susceptibility |
| EN | European Norm |
| e.r.p., ERP | Effective Radiated Power |
| EU | European Union |
| EUT | Equipment Under Test |
| Fac. | Factor |
| FCC | Federal Communications Commission |
| FHSS | Frequency Hopping Spread Spectrum |
| FM | Frequency Modulation |
| Freq. | Frequency |
| FSK | Frequency Shift Keying |
| Fund | Fundamental |
| FWD | Forward |
| GFSK | Gaussian Frequency-Shift Keying |
| GNSS | Global Navigation Satellite System |
| GPS | Global Positioning System |
| Hori. | Horizontal |
| ICES | Interference-Causing Equipment Standard |
| I/O | Input/Output |
| IEC | International Electrotechnical Commission |
| IEEE | Institute of Electrical and Electronics Engineers |
| IF | Intermediate Frequency |
| ILAC | International Laboratory Accreditation Conference |
| ISED | Innovation, Science and Economic Development Canada |
| ISN | Impedance Stabilization Network |
| ISO | International Organization for Standardization |
| JAB | Japan Accreditation Board |
| LAN | Local Area Network |
| LCL | Longitudinal Conversion Loss |
| LIMS | Laboratory Information Management System |
| LISN | Line Impedance Stabilization Network |
| MRA | Mutual Recognition Arrangement |
| NIST | National Institute of Standards and Technology |
| NS | No signal detect. |
| NSA | Normalized Site Attenuation |
| NVLAP | National Voluntary Laboratory Accreditation Program |
| OBW | Occupied Band Width |
| OFDM | Orthogonal Frequency Division Multiplexing |
| PK | Peak |
| $P_{LT}$ | long-term flicker severity |
| POHC(A) | Partial Odd Harmonic Current |
| Pol., Pola. | Polarization |
| PR-ASK | Phase Reversal ASK |
| $P_{ST}$ | short-term flicker severity |
| QAM | Quadrature Amplitude Modulation |
| QP | Quasi-Peak |
| QPSK | Quadri-Phase Shift Keying |
| r.m.s., RMS | Root Mean Square |
| RBW | Resolution Band Width |
| RE | Radio Equipment |
| REV | Reverse |
| RF | Radio Frequency |
| RFID | Radio Frequency Identifier |
| RSS | Radio Standards Specifications |
| Rx | Receiving |
| SINAD | Ratio of (Signal + Noise + Distortion) to (Noise + Distortion) |
| S/N | Signal to Noise ratio |
| SA, S/A | Spectrum Analyzer |
| SG | Signal Generator |
| SVSWR | Site-Voltage Standing Wave Ratio |
| THC(A) | Total Harmonic Current |
| THD(%) | Total Harmonic Distortion |
| TR | Test Receiver |
| Tx | Transmitting |
| VBW | Video BandWidth |
| Vert. | Vertical |
| WLAN | Wireless LAN |
| xDSL | Generic term for all types of DSL technology (DSL: Digital Subscriber Line) |

**CONTENTS**

# SECTION 1: Customer information

| | | |
|---|---|---|
| Company Name | : | ALPS ALPINE CO., LTD. |
| Address | : | 6-3-36, Nakazato, Furukawa, Osaki-city, Miyagi-pref., JAPAN 989-6181 |
| Telephone Number | : | +81-229-23-5111 |
| Facsimile Number | : | +81-229-23-5129 |
| Contact Person | : | Yuji Ouchi |

The information provided from the customer is as follows;
- Applicant, Type of Equipment, Model No. FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT) other than the Receipt Date
- SECTION 4: Operation of E.U.T. during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

# SECTION 2: Equipment under test (EUT)

## 2.1 Identification of EUT

| | | |
|---|---|---|
| Type | : | WEARABLE EYEWEAR |
| Model No. | : | JINS MEME CORE |
| Serial No. | : | Refer to SECTION 4.2 |
| Rating | : | DC 3.7 V (battery)<br>DC 5 V (USB) |
| Country of Mass-production | : | Japan |
| Condition | : | Production model |
| Modification | : | No modification by the test lab. |
| Receipt Date | : | July 6, 2020 |

## 2.2 Product Description

Model: JINS MEME CORE (referred to as the EUT in this report) is a WEARABLE EYEWEAR.

**Radio Specification**

| | | |
|---|---|---|
| Radio Type | : | Transceiver |
| Frequency of Operation | : | 2402 MHz - 2480 MHz |
| Modulation | : | GFSK |
| Antenna type | : | Monopole Antenna |
| Antenna Gain | : | 0.3 dBi max |
| Clock frequency (Maximum) | : | 32 MHz |

# SECTION 3: Test specification, procedures & results

## 3.1 Test specification

Test Specification : FCC Part 15 Subpart B
FCC Part 15 final revised on June 26, 2020 and effective July 27, 2020
Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators

Test Specification : ICES-003 Issue 6: 2016 (SMSE-005-19)
Title : Spectrum Management and Telecommunications
Interference-Causing Equipment Standard
Information Technology Equipment (ITE)
– Limits and methods of measurement

## 3.2 Procedures & Results

| Item | Test procedure | Limits | Deviation | Worst margin | Result |
|---|---|---|---|---|---|
| Conducted emission | ANSI C63.4:2014 7. AC powerline conducted emission measurements | Class B | N/A | 24.9 dB<br>Freq.: 0.78802 MHz<br>Detector: Average<br>Phase: N | Complied a) |
| Radiated emission | ANSI C63.4:2014 8. Radiated emission measurements | Class B | N/A<br>*1) | 11.3 dB<br>Freq.: 7949.562 MHz<br>Detector: Average<br>Polarization: Vertical | Complied b) |
| Note: UL Japan's EMI work procedure No. 13-EM-W0420<br><br>*1) Measurements have been performed up to 13 GHz since the highest frequency of internal source of the EUT is 2480 MHz. | | | | | |
| Symbols:<br>Complied The data of this test item has enough margin, more than the measurement uncertainty.<br>Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration. | | | | | |

a) Refer to Appendix 2 (data of Conducted emission)
b) Refer to Appendix 2 (data of Radiated emission)

## 3. 3 Deviation from standard

No addition, exclusion nor deviation has been made from the standard.

## 3. 4 Confirmation

**UL Japan, Inc. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart B: 2020, Class B and ICES-003 Issue 6: 2016 (SMSE-005-19) , Class B.**

### 3.5 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor $k = 2$.

| Item | Frequency range | No.1 SAC*1/SR*2 (±) | No.2 SAC/SR (±) | No.3 SAC/SR (±) |
|---|---|---|---|---|
| **Conducted emission (AC Mains) AMN/LISN** | 150 kHz-30 MHz | 2.6 dB | 2.6 dB | 2.5 dB |
| **Radiated emission (Measurement distance: 3 m)** | 30 MHz-200 MHz | 4.6 dB | 4.6 dB | 4.6 dB |
| | 200 MHz-1 GHz | 6.0 dB | 6.0 dB | 6.0 dB |
| | 1 GHz-6 GHz | 4.9 dB | 4.9 dB | 4.9 dB |
| | 6 GHz-18 GHz | 5.5 dB | 5.5 dB | 5.5 dB |
| **Radiated emission (Measurement distance: 1 m)** | 1 GHz-18 GHz | 5.8 dB | 5.8 dB | 5.8 dB |

### 3.6 Test location

UL Japan, Inc. Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone number : +81 463 50 6400
Facsimile number : +81 463 50 6401
A2LA Certificate Number : 1266.03
FCC Test Firm Registration Number : 839876
ISED Lab Company Number : 2973D

| | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Maximum measurement distance |
|---|---|---|---|
| No.1 Semi-anechoic chamber | 20.6 x 11.3 x 7.65 | 20.6 x 11.3 | 10 m |
| No.2 Semi-anechoic chamber | 20.6 x 11.3 x 7.65 | 20.6 x 11.3 | 10 m |
| No.3 Semi-anechoic chamber | 12.7 x 7.7 x 5.35 | 12.7 x 7.7 | 5 m |
| No.4 Semi-anechoic chamber | 8.1 x 5.1 x 3.55 | 8.1 x 5.1 | - |
| No.1 Shielded room | 6.8 x 4.1 x 2.7 | 6.8 x 4.1 | - |
| No.2 Shielded room | 6.8 x 4.1 x 2.7 | 6.8 x 4.1 | - |
| No.3 Shielded room | 6.3 x 4.7 x 2.7 | 6.3 x 4.7 | - |
| No.4 Shielded room | 4.4 x 4.7 x 2.7 | 4.4 x 4.7 | - |
| No.5 Shielded room | 7.8 x 6.4 x 2.7 | 7.8 x 6.4 | - |
| No.6 Shielded room | 7.8 x 6.4 x 2.7 | 7.8 x 6.4 | - |
| No.7 Shielded room | 2.76 x 3.76 x 2.4 | 2.76 x 3.76 | - |
| No.8 Shielded room | 3.45 x 5.5 x 2.4 | 3.45 x 5.5 | - |
| No.1 Measurement room | 2.55 x 4.1 x 2.5 | 2.55 x 4.1 | - |

### 3.7 Test Setup, Data of EMI & Test instruments

Refer to Appendix 1 to 3.

# SECTION 4: Operation of E.U.T. during testing

### 4.1 Operating mode

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

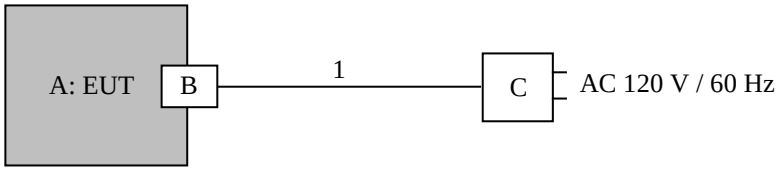
Test sequence is used: 1) Charge *
2) BLE Communication (Radiated emission only)

Software (Firmware): MEME Receiver
v0.3.3.0

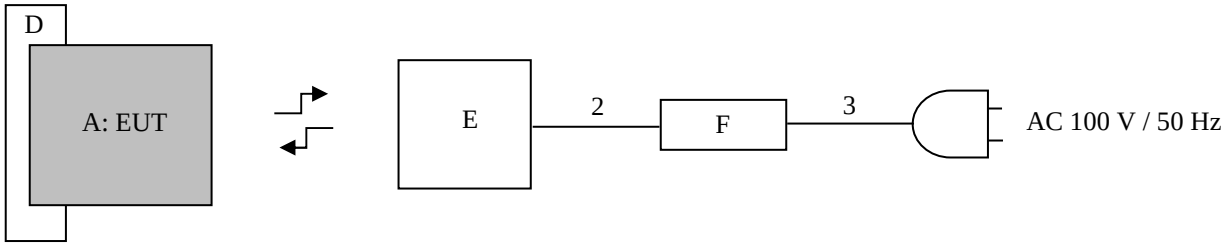
* BLE does not operate during charging.
Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

### 4.2 Configuration and peripherals

**Charge**




**BLE Communication**




*As a result of comparing AC 120 V and AC 240 V at pre-check, conducted emission test was performed with AC 120 V of the worst voltage as representative.

**Description of EUT and support equipment**

| No. | Item | Model number | Serial number | Manufacturer | Remarks |
|---|---|---|---|---|---|
| **A** | WEARABLE EYEWEAR | JINS MEME CORE | JMC010 | ALPS ALPINE CO., LTD. | EUT |
| **B** | Cradle | CNPME | 001 | ALPS ALPINE CO., LTD. | - |
| **C** | AC Adapter | A1385 | E1862497H11 ITE | Apple | - |
| **D** | Glasses | CCDME | 001 | JINS | - |
| **E** | Laptop Computer | ThinkPad L580 | TP00097A | Lenovo | - |
| **F** | AC Adapter | ADLX45YCC2A | SA10E75844 | Lenovo | - |

**List of cable used**

| No. | Item | Length (m) | Shield | Remarks |
|---|---|---|---|---|
| 1 | USB | 0.9 | Shielded | Shielded |
| 2 | DC | 0.9 | Unshielded | Unshielded |
| 3 | AC | 1.8 | Unshielded | Unshielded |

# Section 5: Conducted emission

## 5. 1 Operating environment

Test room : Refer to data
Temperature : Refer to data
Humidity : Refer to data

## 5. 2 Test configuration

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and was flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. The EUT was located 0.8 m from Line Impedance Stabilization Network (LISN) They were folded back and forth forming a bundle 0.3 m to 0.4 m long. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through an LISN to the input power source. Photographs of the set up are shown in Appendix 1.

## 5. 3 Test conditions

Frequency range : 0.15 MHz - 30 MHz
EUT position : Table top

## 5. 4 Test procedure

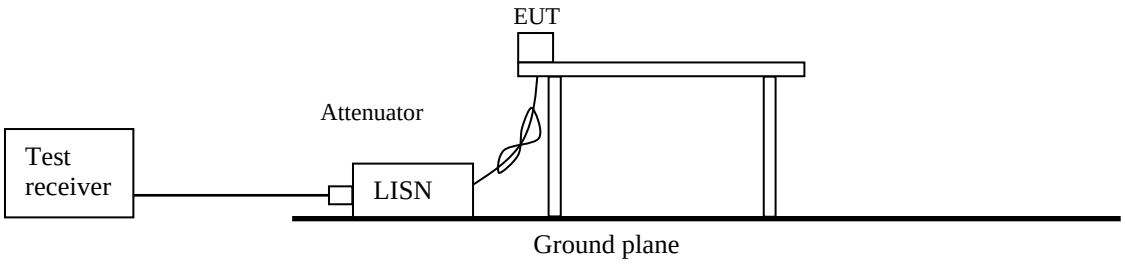
The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT in shielded room.
The EUT was connected to a LISN. An overview sweep with peak detection has been performed.
The measurements had been performed with a quasi-peak detector and if required, with a CISPR average detector (CAV).
The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type : QP / CAV
IF Bandwidth : 9 kHz / 9 kHz

## 5. 5 Results

Summary of the test results : Pass

**Figure 1. Test setup**



# SECTION 6: Radiated emission

## 6.1 Operating environment

Test room : Refer to data
Temperature : Refer to data
Humidity : Refer to data

## 6.2 Test configuration

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity. The rear of EUT, including its peripherals was aligned and flushed with rear of tabletop.
Photographs of the set up are shown in Appendix 3.

## 6.3 Test conditions

Frequency range : 30 MHz - 13 GHz
EUT position : Table top

## 6.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on a Semi-Anechoic Chamber with a ground plane at a distance of 3 m*(below 1 GHz), 3 m (1 GHz - 10 GHz), 1 m (10 GHz - 13 GHz)
* Measuring distance
The boundary of the EUT is defined by an imaginary circular periphery.
The measuring antenna height was varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.
The measurements were performed for both vertical and horizontal antenna polarization.
The radiated emission measurements were made with the following detector function of the test receiver and spectrum analyzer.

| | 30 MHz -1000 MHz (Test receiver) | 1 GHz – 13 GHz (Spectrum analyzer) *2) | |
|---|---|---|---|
| Detector Type : | QP | AV *1) | PK |
| IF Band width : | 120 kHz | RBW 1 MHz/ VBW 10 Hz | RBW 1 MHz/ VBW 3 MHz |

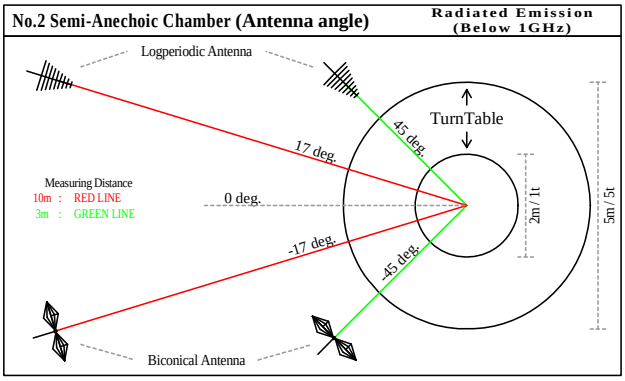
*1) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.
*2) The measurement data was adjusted to a 10 m distance using the following Distance Factor base on FCC subpart A Section 15.31 (f).
Distance Factor: (1 GHz – 10 GHz) 20 x log (3.9875 m / 3 m), (10 GHz – 13 GHz) 20 x log (1 m / 3 m)

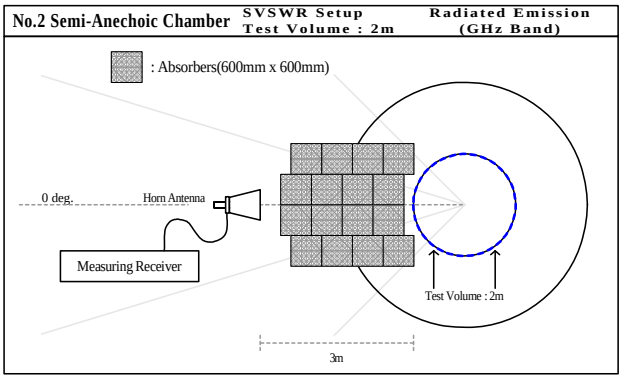
The noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

## 6. 5 Results

Summary of the test results : Pass

**Figure 1. Antenna angle**



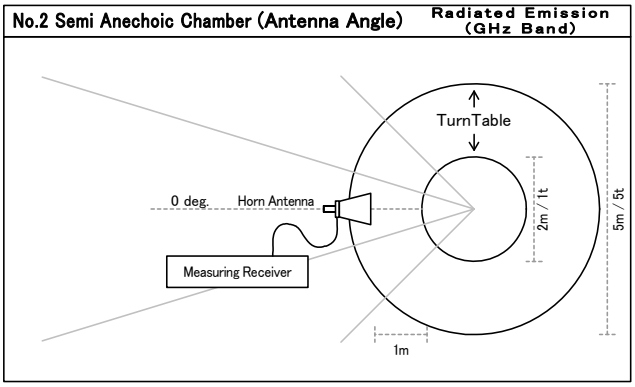
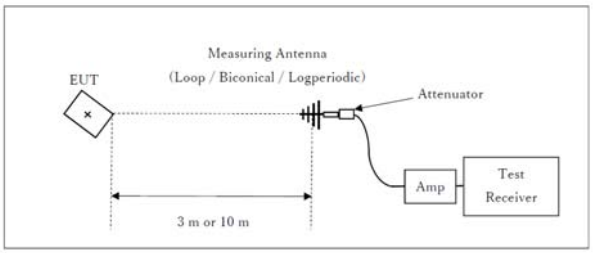



**Figure 2: Test Setup**

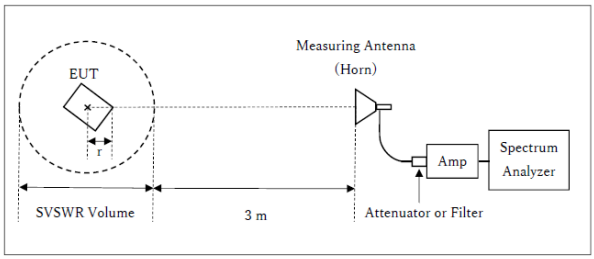
Below 1 GHz




× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

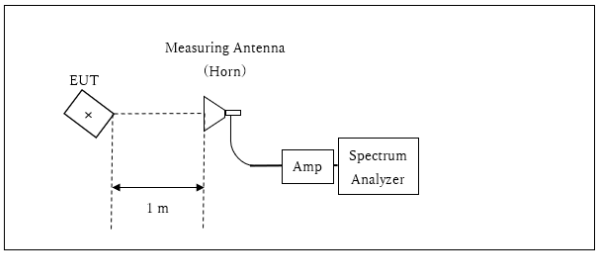



r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.9875 m*/3.0 m) = 2.48 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.9875 m

SVSWR Volume: 2 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.0125 m

10 GHz - 13 GHz




× : Center of turn table

Distance Factor: 20 x log (1.0 m* / 3.0 m) = 2.48 dB
*Test Distance: 1 m

## 5.5 Results

Summary of the test results : Pass

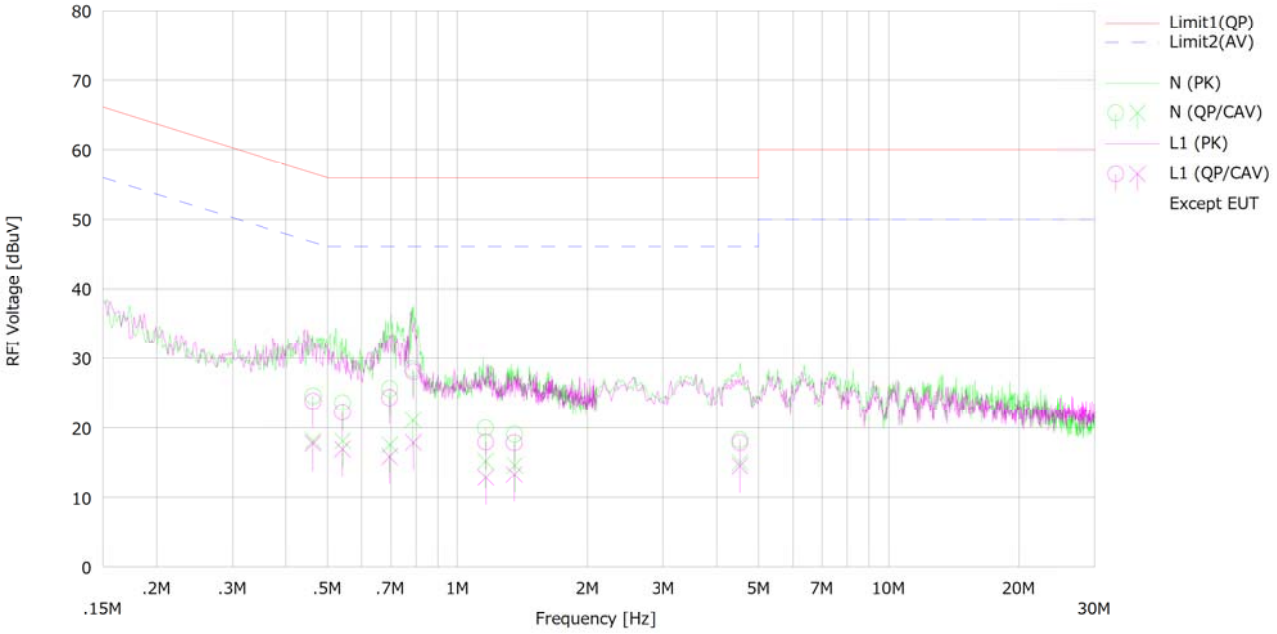
# DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.4 Shielded Room
Date : 2020/08/12

| | | | |
|---|---|---|---|
| Company | : ALPS ALPINE CO., LTD. | Mode | : Charge |
| Kind of EUT | : WEARABLE EYEWEAR | Order No. | : 13384109S |
| Model No. | : JINS MEME CORE | Power | : DC 5 V (from USB) |
| Serial No. | : JMC10 | Temp./Humi. | : 27 deg.C / 65 %RH |
| Remarks | : AC Adapter : AC 120 V / 60 Hz | | |

Limit : FCC_Part 15 Subpart B(15.107)_Class B

Engineer : Kouki Yamada




| No. | Freq. | Reading | | C.Fac | Results | | Limit | | Margin | | Phase | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 〈QP〉 | 〈CAV〉 | | 〈QP〉 | 〈CAV〉 | 〈QP〉 | 〈AV〉 | 〈QP〉 | 〈AV〉 | | |
| | [MHz] | [dBuV] | [dBuV] | [dB] | [dBuV] | [dBuV] | [dBuV] | [dBuV] | [dB] | [dB] | | |
| 1 | 0.46363 | 12.00 | 5.50 | 12.62 | 24.62 | 18.12 | 56.63 | 46.63 | 32.0 | 28.5 | N | |
| 2 | 0.54186 | 11.00 | 5.50 | 12.62 | 23.62 | 18.12 | 56.00 | 46.00 | 32.3 | 27.8 | N | |
| 3 | 0.69719 | 13.00 | 4.90 | 12.65 | 25.65 | 17.55 | 56.00 | 46.00 | 30.3 | 28.4 | N | |
| 4 | 0.78802 | 15.80 | 8.40 | 12.66 | 28.46 | 21.06 | 56.00 | 46.00 | 27.5 | 24.9 | N | |
| 5 | 1.16072 | 7.20 | 2.50 | 12.73 | 19.93 | 15.23 | 56.00 | 46.00 | 36.0 | 30.7 | N | |
| 6 | 1.35527 | 6.30 | 1.90 | 12.74 | 19.04 | 14.64 | 56.00 | 46.00 | 36.9 | 31.3 | N | |
| 7 | 4.52142 | 5.20 | 2.00 | 13.06 | 18.26 | 15.06 | 56.00 | 46.00 | 37.7 | 30.9 | N | |
| 8 | 0.46329 | 11.20 | 5.10 | 12.64 | 23.84 | 17.74 | 56.63 | 46.63 | 32.7 | 28.8 | L1 | |
| 9 | 0.54168 | 9.60 | 4.30 | 12.64 | 22.24 | 16.94 | 56.00 | 46.00 | 33.7 | 29.0 | L1 | |
| 10 | 0.69639 | 11.70 | 3.20 | 12.67 | 24.37 | 15.87 | 56.00 | 46.00 | 31.6 | 30.1 | L1 | |
| 11 | 0.78960 | 15.40 | 5.20 | 12.67 | 28.07 | 17.87 | 56.00 | 46.00 | 27.9 | 28.1 | L1 | |
| 12 | 1.16286 | 5.20 | 0.20 | 12.72 | 17.92 | 12.92 | 56.00 | 46.00 | 38.0 | 33.0 | L1 | |
| 13 | 1.35228 | 5.10 | 0.60 | 12.73 | 17.83 | 13.33 | 56.00 | 46.00 | 38.1 | 32.6 | L1 | |
| 14 | 4.52395 | 4.80 | 1.50 | 13.03 | 17.83 | 14.53 | 56.00 | 46.00 | 38.1 | 31.4 | L1 | |

Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(LISN(AMN)+Cable+ATT)[dB]
LISN(AMN): SLS-02

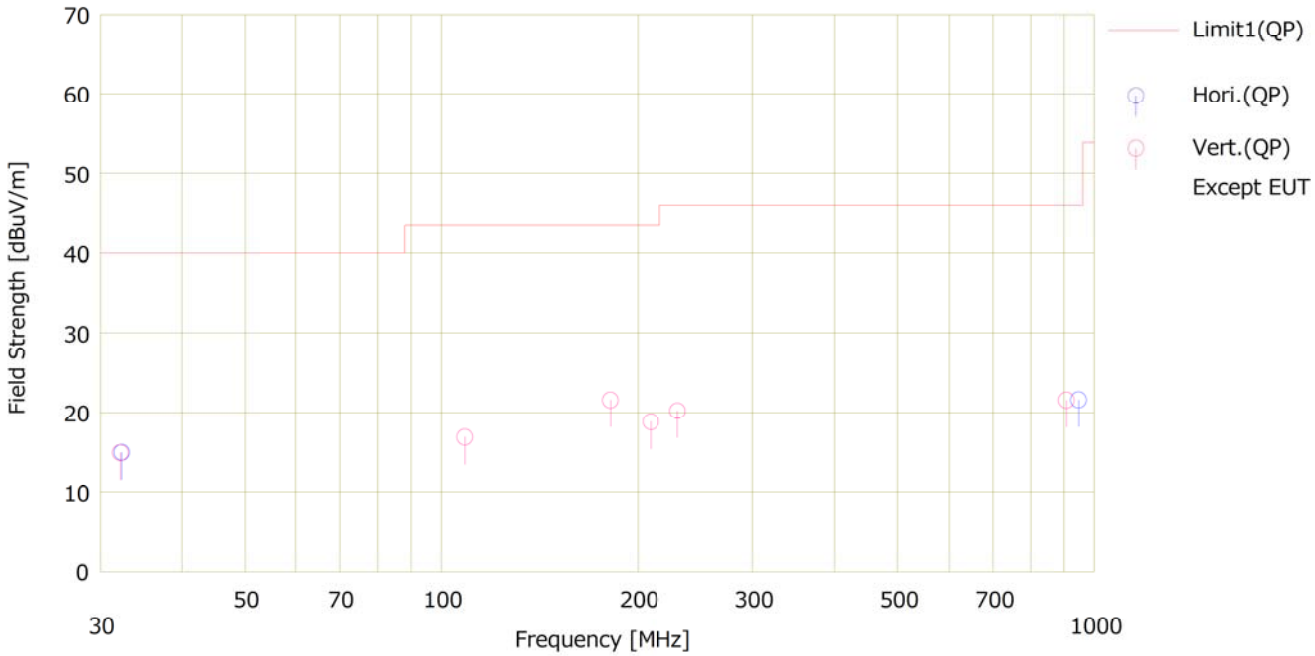
# DATA OF RADIATED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber
Date : 2020/08/12

| | | | |
|---|---|---|---|
| Company | : ALPS ALPINE CO., LTD. | Mode | : Charge |
| Kind of EUT | : WEARABLE EYEWEAR | Order No. | : 13384109S |
| Model No. | : JINS MEME CORE | Power | : DC 5 V (from USB) |
| Serial No. | : JMC10 | Temp./Humi. | : 27 deg.C / 65 %RH |
| Remarks | : EUT worst axis: H: X, V: X, AC Adapter : AC 120 V / 60 Hz | | |

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Kouki Yamada




| No. | Freq. | Reading ⟨QP⟩ | Ant.Fac | Loss | Gain | S.Fac | Result ⟨QP⟩ | Limit ⟨QP⟩ | Margin ⟨QP⟩ | Pola. | Height | Angle | Ant. Type | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | [dBuV] | [dB/m] | [dB] | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB] | [H/V] | [cm] | [deg] | | |
| 1 | 32.380 | 22.20 | 17.80 | 6.98 | 31.90 | -0.11 | 14.97 | 40.00 | 25.0 | Hori. | 100 | 34 | BC | |
| 2 | 948.019 | 20.50 | 21.93 | 9.67 | 30.52 | 0.00 | 21.58 | 46.00 | 24.4 | Hori. | 100 | 82 | LP | |
| 3 | 32.212 | 22.10 | 17.87 | 6.98 | 31.90 | -0.11 | 14.94 | 40.00 | 25.0 | Vert. | 100 | 12 | BC | |
| 4 | 108.683 | 29.10 | 11.70 | 8.05 | 31.85 | -0.11 | 16.89 | 43.50 | 26.6 | Vert. | 100 | 115 | BC | |
| 5 | 181.491 | 28.50 | 16.10 | 8.80 | 31.78 | -0.06 | 21.56 | 43.50 | 21.9 | Vert. | 100 | 174 | BC | |
| 6 | 209.556 | 33.60 | 11.25 | 5.72 | 31.75 | 0.00 | 18.82 | 43.50 | 24.6 | Vert. | 100 | 42 | LP | |
| 7 | 230.412 | 34.70 | 11.34 | 5.89 | 31.72 | 0.00 | 20.21 | 46.00 | 25.7 | Vert. | 185 | 42 | LP | |
| 8 | 908.007 | 20.70 | 22.15 | 9.50 | 30.81 | 0.00 | 21.54 | 46.00 | 24.4 | Vert. | 100 | 34 | LP | |

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+S.Fac(ΔAF)[dB]
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna **SH*: Horn Antenna

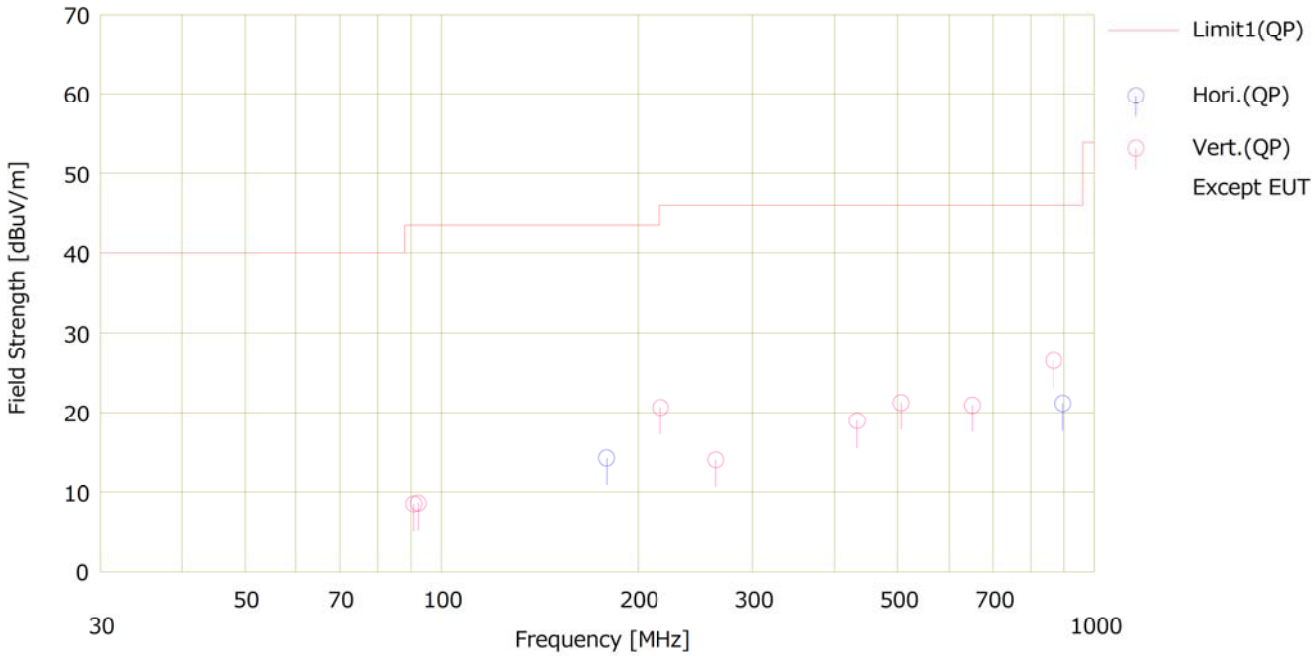
# DATA OF RADIATED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber
Date : 2020/08/12

| | | | |
|---|---|---|---|
| Company | : ALPS ALPINE CO., LTD. | Mode | : BLE Communication |
| Kind of EUT | : WEARABLE EYEWEAR | Order No. | : 13384109S |
| Model No. | : JINS MEME CORE | Power | : DC 3.7 V(battery) |
| Serial No. | : JMC10 | Temp./Humi. | : 27 deg.C / 65 %RH |
| Remarks | : EUT worst axis: H: X, V: X | | |

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Kouki Yamada




| No. | Freq. | Reading ⟨QP⟩ | Ant.Fac | Loss | Gain | S.Fac | Result ⟨QP⟩ | Limit ⟨QP⟩ | Margin ⟨QP⟩ | Pola. | Height | Angle | Ant. Type | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | [dBuV] | [dB/m] | [dB] | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB] | [H/V] | [cm] | [deg] | | |
| 1 | 179.084 | 21.40 | 15.92 | 8.77 | 31.78 | -0.04 | 14.27 | 43.50 | 29.2 | Hori. | 100 | 32 | BC | |
| 2 | 896.021 | 20.50 | 22.08 | 9.45 | 30.88 | 0.00 | 21.15 | 46.00 | 24.8 | Hori. | 100 | 11 | LP | |
| 3 | 90.868 | 23.80 | 8.42 | 7.83 | 31.87 | 0.32 | 8.50 | 43.50 | 35.0 | Vert. | 100 | 323 | BC | |
| 4 | 92.250 | 23.60 | 8.73 | 7.85 | 31.86 | 0.28 | 8.60 | 43.50 | 34.9 | Vert. | 100 | 74 | BC | |
| 5 | 216.900 | 35.40 | 11.18 | 5.78 | 31.74 | 0.00 | 20.62 | 46.00 | 25.3 | Vert. | 100 | 191 | LP | |
| 6 | 263.882 | 27.20 | 12.41 | 6.14 | 31.69 | 0.00 | 14.06 | 46.00 | 31.9 | Vert. | 100 | 271 | LP | |
| 7 | 433.809 | 27.20 | 16.11 | 7.26 | 31.63 | 0.00 | 18.94 | 46.00 | 27.0 | Vert. | 132 | 317 | LP | |
| 8 | 506.332 | 27.50 | 17.72 | 7.61 | 31.60 | 0.00 | 21.23 | 46.00 | 24.7 | Vert. | 188 | 17 | LP | |
| 9 | 650.702 | 25.00 | 19.20 | 8.34 | 31.62 | 0.00 | 20.92 | 46.00 | 25.0 | Vert. | 100 | 115 | LP | |
| 10 | 867.600 | 26.20 | 21.96 | 9.32 | 31.00 | 0.00 | 26.48 | 46.00 | 19.5 | Vert. | 100 | 144 | LP | |

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+S.Fac(ΔAF)[dB]
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna **SH*: Horn Antenna

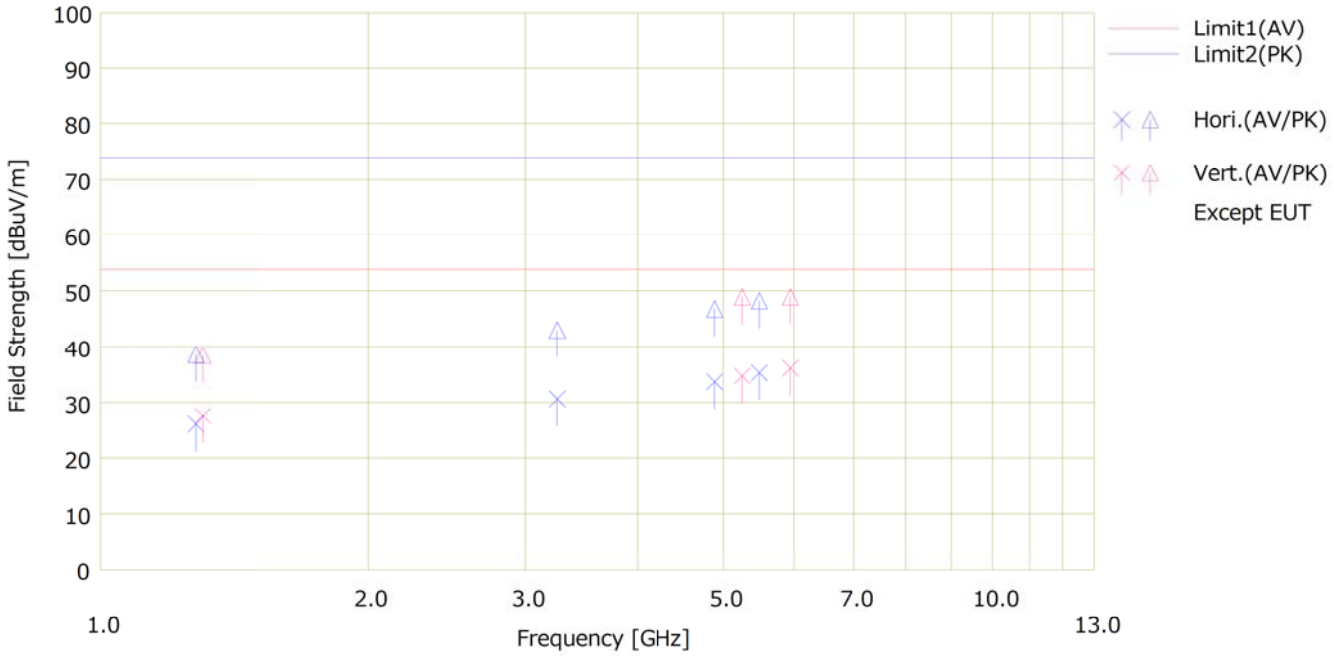
# DATA OF RADIATED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber
Date : 2020/08/12

| | | | |
|---|---|---|---|
| Company | : ALPS ALPINE CO., LTD. | Mode | : Charge |
| Kind of EUT | : WEARABLE EYEWEAR | Order No. | : 13384109S |
| Model No. | : JINS MEME CORE | Power | : DC 5 V (from USB) |
| Serial No. | : JMC10 | Temp./Humi. | : 27 deg.C / 65 %RH |
| Remarks | : EUT worst axis: H: X, V: X, AC Adapter : AC 120 V / 60 Hz, Test Distance=398.75 cm(1 GHz - 10 GHz), 100 cm(10 GHz - 13 GHz) | | |

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Kouki Yamada




| No. | Freq. | Reading | | Ant.Fac | Loss | Gain | D.Fac | Result | | Limit | | Margin | | Pola. | Height | Angle | Ant. Type | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 〈AV〉 | 〈PK〉 | | | | | 〈AV〉 | 〈PK〉 | 〈AV〉 | 〈PK〉 | 〈AV〉 | 〈PK〉 | | | | | |
| | [MHz] | [dBuV] | [dBuV] | [dB/m] | [dB] | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB] | [dB] | [H/V] | [cm] | [deg] | | |
| 1 | 1279.988 | 33.96 | 46.55 | 25.64 | 2.95 | 38.98 | 2.48 | 26.05 | 38.64 | 53.90 | 73.90 | 27.8 | 35.2 | Hori. | 100 | 280 | 31SH2 | |
| 2 | 3253.577 | 32.58 | 45.00 | 29.09 | 4.80 | 38.30 | 2.48 | 30.65 | 43.07 | 53.90 | 73.90 | 23.2 | 30.8 | Hori. | 100 | 23 | 31SH2 | |
| 3 | 4891.504 | 32.24 | 45.33 | 31.58 | 5.96 | 38.54 | 2.48 | 33.72 | 46.81 | 53.90 | 73.90 | 20.1 | 27.0 | Hori. | 100 | 311 | 31SH2 | |
| 4 | 5485.814 | 32.76 | 45.66 | 32.59 | 6.33 | 38.82 | 2.48 | 35.34 | 48.24 | 53.90 | 73.90 | 18.5 | 25.6 | Hori. | 100 | 127 | 31SH2 | |
| 5 | 1301.936 | 35.41 | 46.22 | 25.73 | 2.98 | 38.98 | 2.48 | 27.62 | 38.43 | 53.90 | 73.90 | 26.2 | 35.4 | Vert. | 100 | 223 | 31SH2 | |
| 6 | 5251.712 | 32.74 | 46.90 | 32.03 | 6.20 | 38.69 | 2.48 | 34.76 | 48.92 | 53.90 | 73.90 | 19.1 | 24.9 | Vert. | 100 | 86 | 31SH2 | |
| 7 | 5942.852 | 32.85 | 45.62 | 33.25 | 6.64 | 39.05 | 2.48 | 36.17 | 48.94 | 53.90 | 73.90 | 17.7 | 24.9 | Vert. | 100 | 12 | 31SH2 | |

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable)[dB]-Gain(AMP)[dB]+D.Fac[dB]
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna **SH*: Horn Antenna

# DATA OF RADIATED EMISSION TEST

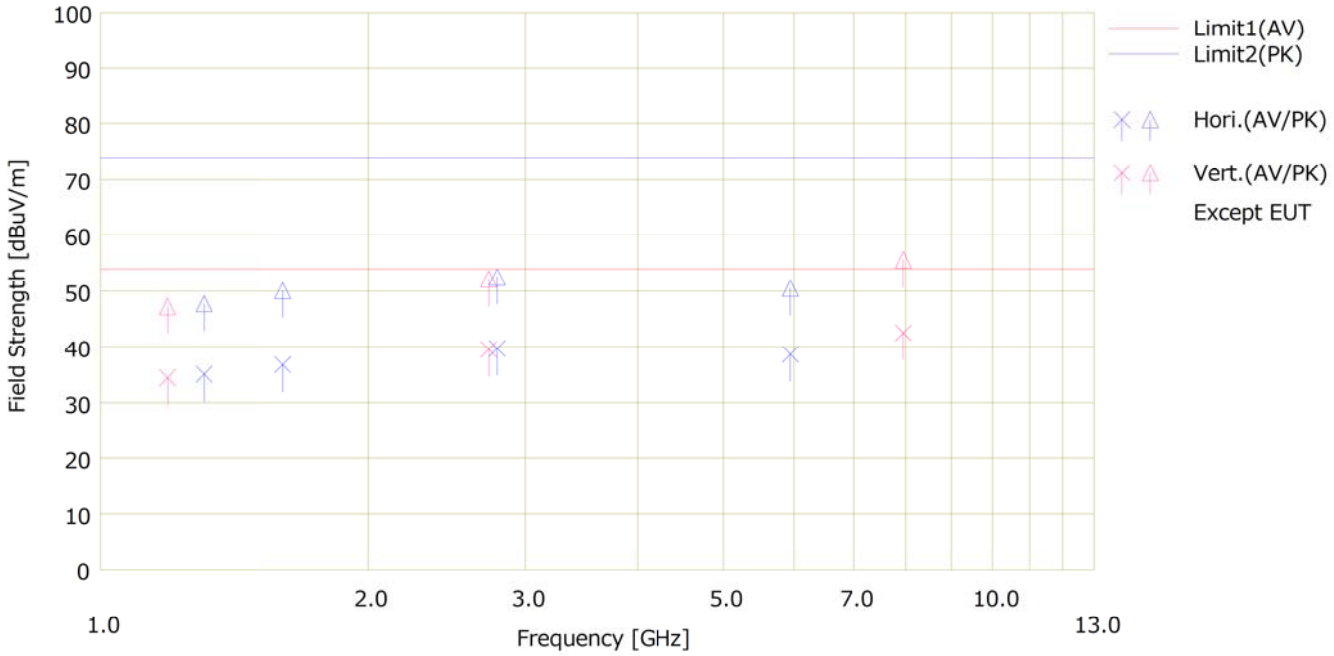
UL Japan,Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber
Date : 2020/08/12

| | | | |
|---|---|---|---|
| Company | : ALPS ALPINE CO., LTD. | Mode | : BLE Communication |
| Kind of EUT | : WEARABLE EYEWEAR | Order No. | : 13384109S |
| Model No. | : JINS MEME CORE | Power | : DC 3.7 V(battery) |
| Serial No. | : JMC10 | Temp./Humi. | : 27 deg.C / 65 %RH |
| Remarks | : EUT worst axis: H: X, V: X, Test Distance=398.75 cm(1 GHz - 10 GHz), 100 cm(10 GHz - 13 GHz) | | |

: BLE Communication

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Kouki Yamada




| No. | Freq. | Reading | | Ant.Fac | Loss | Gain | D.Fac | Result | | Limit | | Margin | | Pola. | Height | Angle | Ant. Type | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 〈AV〉 | 〈PK〉 | | | | | 〈AV〉 | 〈PK〉 | 〈AV〉 | 〈PK〉 | 〈AV〉 | 〈PK〉 | | | | | |
| | [MHz] | [dBuV] | [dBuV] | [dB/m] | [dB] | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB] | [dB] | [H/V] | [cm] | [deg] | | |
| 1 | 1307.815 | 32.92 | 45.57 | 25.75 | 12.93 | 38.99 | 2.48 | 35.09 | 47.74 | 53.90 | 73.90 | 18.8 | 26.1 | Hori. | 100 | 145 | 31SH2 | |
| 2 | 1604.745 | 34.69 | 48.00 | 25.35 | 13.27 | 39.00 | 2.48 | 36.79 | 50.10 | 53.90 | 73.90 | 17.1 | 23.8 | Hori. | 100 | 197 | 31SH2 | |
| 3 | 2787.346 | 32.75 | 45.54 | 28.63 | 14.38 | 38.51 | 2.48 | 39.73 | 52.52 | 53.90 | 73.90 | 14.1 | 21.3 | Hori. | 100 | 287 | 31SH2 | |
| 4 | 5946.383 | 34.79 | 46.67 | 33.26 | 7.15 | 39.05 | 2.48 | 38.63 | 50.51 | 53.90 | 73.90 | 15.2 | 23.3 | Hori. | 100 | 11 | 31SH2 | |
| 5 | 1188.996 | 32.89 | 45.70 | 25.25 | 12.78 | 38.96 | 2.48 | 34.44 | 47.25 | 53.90 | 73.90 | 19.4 | 26.6 | Vert. | 100 | 245 | 31SH2 | |
| 6 | 2726.240 | 32.86 | 45.45 | 28.43 | 14.33 | 38.53 | 2.48 | 39.57 | 52.16 | 53.90 | 73.90 | 14.3 | 21.7 | Vert. | 100 | 342 | 31SH2 | |
| 7 | 7949.562 | 33.04 | 46.06 | 38.09 | 8.25 | 39.29 | 2.48 | 42.57 | 55.59 | 53.90 | 73.90 | 11.3 | 18.3 | Vert. | 100 | 213 | 31SH2 | |

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT or HighPassFilter)[dB]-Gain(AMP)[dB]+D.Fac[dB]
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna **SH*: Horn Antenna

**APPENDIX 2**

Test Instruments

EMI test equipment

| Test Name | Local ID | LIMS ID | Description | Manufacturer | Model | Serial | Last Calibration Date | Calibration Interval (Month) |
|---|---|---|---|---|---|---|---|---|
| CE | SAT3-13 | 150923 | Attenuator | JFW | 50HF-003N | - | 2020/01/30 | 12 |
| CE | SCC-B12/B13/SRSE-02 | 144969 | Coaxial Cable&RF Selector | Suhner/Suhner/TOYO | RG223U/141PE/NS4906 | -/0901-270(RF Selector) | 2020/04/17 | 12 |
| CE | SLS-02 | 145539 | LISN | Rohde & Schwarz | ENV216 | 100512 | 2020/02/18 | 12 |
| CE | SOS-22 | 191839 | Humidity Indicator | CUSTOM. Inc | CTH-201 | - | 2019/12/12 | 12 |
| CE,RE | COTS-SEMI-5 | 170932 | EMI Software | TSJ (Techno Science Japan) | TEPTO-DV3(RE,CE,ME,PE) | - | - | - |
| CE,RE | KJM-10 | 146454 | Measure | KOMELON | KMC-36 | - | - | - |
| CE,RE | STR-01 | 145790 | Test Receiver | Rohde & Schwarz | ESU40 | 100093 | 2020/04/24 | 12 |
| CE,RE | STS-02 | 145793 | Digital Hitester | Hioki | 3805-50 | 80997819 | 2020/04/09 | 12 |
| RE | SAEC-02(NSA) | 145563 | Semi-Anechoic Chamber | TDK | SAEC-02(NSA) | 2 | 2020/03/20 | 12 |
| RE | SAEC-02(SVSWR) | 145598 | Semi-Anechoic Chamber | TDK | SAEC-02(SVSWR) | 2 | 2020/05/07 | 12 |
| RE | SAF-02 | 145004 | Pre Amplifier | SONOMA | 310N | 290212 | 2020/02/19 | 12 |
| RE | SAF-05 | 145128 | Pre Amplifier | Toyo Corporation | TPA0118-36 | 1440490 | 2020/06/03 | 12 |
| RE | SAT10-05 | 145136 | Attenuator(above1GHz) | Keysight Technologies Inc | 8493C-010 | 74864 | 2019/11/06 | 12 |
| RE | SAT3-11 | 150921 | Attenuator | JFW | 50HF-003N | - | 2020/01/30 | 12 |
| RE | SAT6-14 | 167095 | Attenuator | JFW | 50HF-006N | - | 2020/02/21 | 12 |
| RE | SBA-02 | 145022 | Biconical Antenna | Schwarzbeck Mess - Elektronik | BBA9106 | 91032665 | 2020/04/04 | 12 |
| RE | SCC-B1/B3/B5/B7/B8/B13/SRSE-02 | 144975 | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO | 8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906 | -/0901-270(RF Selector) | 2020/04/17 | 12 |
| RE | SCC-B2/B4/B6/B7/B8/B13/SRSE-02 | 144976 | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO | 8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906 | -/0901-270(RF Selector) | 2020/04/17 | 12 |
| RE | SCC-G41 | 151617 | Coaxial Cable | Junkosha | MWX221-01000NFSNMS/B | 1612S006 | 2020/01/08 | 12 |
| RE | SCC-G50 | 178573 | Coaxial Cable | HUBER+SUNER | SUCOFLEX_104_E | MY13407/4E | 2020/03/09 | 12 |
| RE | SCC-G51 | 178572 | Coaxial Cable | HUBER+SUNER | SUCOFLEX 104 | 800288 /4A | 2020/03/09 | 12 |
| RE | SCC-G69 | 200009 | Coaxial Cable | HUBER+SUNER | SUCOFLEX 104 | 575617/4 | 2020/07/07 | 12 |
| RE | SFL-18 | 145305 | Highpass Filter | MICRO-TRONICS | HPM50111 | 119 | 2020/04/03 | 12 |
| RE | SHA-02 | 145384 | Horn Antenna | Schwarzbeck Mess - Elektronik | BBHA9120D | 9120D-726 | 2020/06/15 | 12 |
| RE | SHA-09 | 194684 | Horn Antenna | Schwarzbeck Mess - Elektronik | BBHA 9120 C | 695 | 2020/02/17 | 12 |
| RE | SLA-06 | 145528 | Logperiodic Antenna | Schwarzbeck Mess - Elektronik | VUSLP9111B | 195 | 2020/04/04 | 12 |
| RE | SOS-21 | 191838 | Humidity Indicator | CUSTOM. Inc | CTH-201 | - | 2019/12/12 | 12 |
| RE | STR-07 | 146209 | Test Receiver | Rohde & Schwarz | ESU26 | 100484 | 2019/09/13 | 12 |

*Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations . Each measurement data is traceable to the national or international standards
Test Item:
CE: Conducted emission,
RE: Radiated emission