



Información sobre el producto, el fabricante y el importador

Fecha: 25 de febrero de 2026

Nombre del producto: **SW ASSY-SMART KEYLESS**

Nombre del fabricante: Marelli corporation

Representante local: Derco SpA

Dirección: Americo Vespucio 1842 Santiago Chile

Dirección de correo electrónico de contacto: marcialssandoval@derco.cl

Sitio web: <https://www.suzuki.cl/>

Características técnicas del producto

| | Información | Pág. |
|--------------------------------|------------------------------|----------------------------|
| Tipo de equipo | SW ASSY-SMART KEYLESS | Test report Pág. 5 |
| Marca | MARELLI | Documento adjunto 1 |
| Modelo | R55T0 | Test report Pág. 5 |
| Tecnología o modulación | FSK | Test report Pág. 5 |
| Frecuencias | 125 KHz | Test report Pág. 5 |
| Ganancia de antena(dBi) | — | — |
| P.i.r.e. | 7.2 μW | Test report Pág.13 |
| Módulos | LF&RF IC | Documento adjunto 2 |

Declaración de conformidad

el equipo previamente individualizado cumple con las disposiciones establecidas en la Norma Técnica de Equipos de alcance reducido, aprobada por la resolución exenta N° 1.985, de 2017, de la Subsecretaría de Telecomunicaciones.



RADIO TEST REPORT

Test Report No. : 13708997H-A

Applicant : **Marelli Corporation**
Type of EUT : **SW ASSY-SMART KEYLESS**
Model Number of EUT : **R55T0**
Test standard : **ETSI EN 300 220-1 V3.1.1**
ETSI EN 300 220-2 V3.1.1
Test Result : **Complied (Refer to SECTION 3)**

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2. The results in this report apply only to the sample tested.
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7. The all test items in this test report are conducted by UL Japan, Inc. Ise 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. The information provided from the customer for this report is identified in Section 1.

Date of test: February 21, 2021 to April 1, 2021

Representative test engineer:

Ken Fujita

Ken Fujita
Engineer

Consumer Technology Division

Approved by :

Shinichi Miyazono

Shinichi Miyazono
Engineer

Consumer Technology Division



CERTIFICATE 5107.02

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

UL Japan, Inc.
Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

REVISION HISTORY

Original Test Report No.: 13708997H-A

| Revision | Test report No. | Date | Page revised | Contents |
|-----------------|-----------------|----------------|--------------|----------|
| - (Original) | 13708997H-A | April 12, 2021 | - | - |

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Reference: Abbreviations (Including words undescribed in this report)

| | | | |
|----------------|---|---------|---|
| A2LA | The American Association for Laboratory Accreditation | LIMS | Laboratory Information Management System |
| AC | Alternating Current | MCS | Modulation and Coding Scheme |
| AFH | Adaptive Frequency Hopping | MRA | Mutual Recognition Arrangement |
| AM | Amplitude Modulation | N/A | Not Applicable |
| Amp, AMP | Amplifier | NIST | National Institute of Standards and Technology |
| ANSI | American National Standards Institute | NS | No signal detect. |
| Ant, ANT | Antenna | NSA | Normalized Site Attenuation |
| AP | Access Point | NVLAP | National Voluntary Laboratory Accreditation Program |
| ASK | Amplitude Shift Keying | OBW | Occupied Band Width |
| Atten., ATT | Attenuator | OFDM | Orthogonal Frequency Division Multiplexing |
| AV | Average | P/M | Power meter |
| BPSK | Binary Phase-Shift Keying | PCB | Printed Circuit Board |
| BR | Bluetooth Basic Rate | PER | Packet Error Rate |
| BT | Bluetooth | PHY | Physical Layer |
| BT LE | Bluetooth Low Energy | PK | Peak |
| BW | BandWidth | PN | Pseudo random Noise |
| Cal Int | Calibration Interval | PRBS | Pseudo-Random Bit Sequence |
| CCK | Complementary Code Keying | PSD | Power Spectral Density |
| Ch., CH | Channel | QAM | Quadrature Amplitude Modulation |
| CISPR | Comite International Special des Perturbations Radioelectriques | QP | Quasi-Peak |
| CW | Continuous Wave | QPSK | Quadrature Phase Shift Keying |
| DBPSK | Differential BPSK | RBW | Resolution Band Width |
| DC | Direct Current | RDS | Radio Data System |
| D-factor | Distance factor | RE | Radio Equipment |
| DFS | Dynamic Frequency Selection | RF | Radio Frequency |
| DQPSK | Differential QPSK | RMS | Root Mean Square |
| DSSS | Direct Sequence Spread Spectrum | RSS | Radio Standards Specifications |
| DUT | Device Under Test | Rx | Receiving |
| EDR | Enhanced Data Rate | SA, S/A | Spectrum Analyzer |
| EIRP, e.i.r.p. | Equivalent Isotropically Radiated Power | SG | Signal Generator |
| EMC | ElectroMagnetic Compatibility | SVSWR | Site-Voltage Standing Wave Ratio |
| EMI | ElectroMagnetic Interference | TR | Test Receiver |
| EN | European Norm | Tx | Transmitting |
| ERP, e.r.p. | Effective Radiated Power | VBW | Video BandWidth |
| ETSI | European Telecommunications Standards Institute | Vert. | Vertical |
| EU | European Union | WLAN | Wireless LAN |
| EUT | Equipment Under Test | | |
| Fac. | Factor | | |
| FCC | Federal Communications Commission | | |
| FHSS | Frequency Hopping Spread Spectrum | | |
| FM | Frequency Modulation | | |
| Freq. | Frequency | | |
| FSK | Frequency Shift Keying | | |
| GFSK | Gaussian Frequency-Shift Keying | | |
| GNSS | Global Navigation Satellite System | | |
| GPS | Global Positioning System | | |
| Hori. | Horizontal | | |
| ICES | Interference-Causing Equipment Standard | | |
| 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 | | |
| ISO | International Organization for Standardization | | |
| JAB | Japan Accreditation Board | | |
| LAN | Local Area Network | | |

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SECTION 1: Customer information

Company Name : Marelli Corporation
Address : 2-1917 Nisshin-cho,Kita-ku,Saitama-shi, Saitama 331-8501 JAPAN
Telephone Number : +81-48-660-2111
Contact Person : DAISUKE MORI

The information provided from the customer is as follows;

- Applicant, Type of EUT, Model Number of EUT 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 EUT 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 : SW ASSY-SMART KEYLESS
Model Number : R55T0
Serial Number : Refer to SECTION 4.2
Rating : DC 3.0 V
Receipt Date : March 8, 2021
Country of Mass-production : India
Condition : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification : No Modification by the test lab

2.2 Product description

Model No: R55T0 (referred to as the EUT in this report) is the SW ASSY-SMART KEYLESS.

Radio Specification

[Transmitter part]

Radio Type : Transmitter
Frequency of Operation : 433.92 MHz
Operating Channel Width (OCW) : 433.92 MHz \pm 0.1 MHz
Modulation : FSK
Power Supply : DC 2.5 V to 3.2 V
Operating temperature range : -10 deg. C to +60 deg. C
Clock frequency (maximum) : 27.6 MHz

[Receiver part]

Type of Receiver : Receiver
Frequency of Operation : 125 kHz

*R55T0 has variant models.

In this report, R55T0 is described as variation 1 (2SW), the variant model as variation 2 (3SW), the variant model as variation 3 (4SW).

The differences of these variations are number of switch only.

There is not influence for RF characteristics.

All tests were conducted by using the variation 1 (2SW).

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Radio : ETSI EN 300 220-1 V3.1.1
ETSI EN 300 220-2 V3.1.1

Title : Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz
Part 1 : Technical characteristics and methods of measurement
Part 2 : Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU for non specific radio equipment

3.2 Procedures and results

For Test Procedure and Limit, refer to the following clauses of ETSI EN 300 220-1 V3.1.1 or ETSI EN 300 220-2 V3.1.1.

[Transmitter]

| Item | Test Procedure | Limit | Remarks | Worst margin | Exclusions | Results | Remarks |
|---|------------------|--------------------------|-----------------------|-----------------------------------|------------|-------------|---------|
| Effective Radiated Power (conducted measurement) | Clause 5.2.2.1.2 | Part 2 Clause 4.3.1.2 | Conducted | - | N/A | N/A | *1) |
| Effective Radiated Power (radiated measurement) | Clause 5.2.2.2.2 | Part 2 Clause 4.3.1.2 | Radiated | 33.6 dB 433.92 MHz Vertical | N/A | Complied a) | - |
| Maximum Effective Radiated Power spectral density | Clause 5.3.2.1.2 | Part 2 Clause 4.3.2.2 | Conducted or Radiated | - | N/A | N/A | *2) |
| Occupied Bandwidth | Clause 5.6.3.4 | Part 1 Clause 5.6.2 | Conducted or Radiated | - | N/A | Complied b) | - |
| Frequency error | Clause 5.7.2.4 | - | Conducted or Radiated | - | N/A | Complied b) | - |
| Tx Out Of Band Emissions | Clause 5.8.3.4 | Part 1 Clause 5.8.2 | Conducted or Radiated | - | N/A | Complied c) | - |
| Unwanted emissions in the spurious domain | Clause 5.9.3.3 | Part 1 Clause 5.9.2 | Conducted or Radiated | No signal detected | N/A | Complied a) | - |
| Transient power | Clause 5.10.3.2 | Part 1 Clause 5.10.2 | Conducted | 53.77 dB 433.42 MHz | N/A | Complied d) | - |
| Adjacent Channel Power | Clause 5.11.3.4 | Part 1 Clause 5.11.2 | Conducted or Radiated | - | N/A | N/A | *3) |
| TX behaviour under Low Voltage Conditions | Clause 5.12.3.2 | Part 1 Clause 5.12.2 | - | - | N/A | Complied e) | - |
| Adaptive Power Control | Clause 5.14.3.4 | Part 1 Clause 5.14.2 | Conducted or Radiated | - | N/A | N/A | *4) |

* Note: UL Japan, Inc.'s EMI Work Procedure 13-EM-W0420.

*1) The EUT does not have a permanent external antenna connector.

*2) The test is not applicable since the EUT is not under the category of bands required power spectral density limits.

*3) The test is not applicable since the EUT is not with $OCW \leq 25kHz$

*4) The test is not applicable since the EUT does not have APC function.

a) Refer to APPENDIX 1 (data of Effective radiated power (ERP) and Unwanted emissions in the spurious domain)

b) Refer to APPENDIX 1 (data of 99% Occupied Bandwidth and Frequency error)

c) Refer to APPENDIX 1 (data of Tx Out Of Band Emissions(for Operating Channel) and Tx Out Of Band Emissions(for Operational Frequency Band))

d) Refer to APPENDIX 1 (data of Transient power)

e) Refer to APPENDIX 1 (data of TX behaviour under Low Voltage Conditions)

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

3.3 Additions or deviations to standards

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

3.4 Uncertainty

Although this standard determines only the limit value of uncertainty, there is no applicable rule of uncertainty in this. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

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

| Item | Unit | Required Uncertainty (+/-) | Calculated Uncertainty (+/-) |
|---|--------|----------------------------|------------------------------|
| Radio frequency | ppm | 0.5 | 0.02 |
| RF power, conducted | dB | 1.5 | 1.4 |
| Conducted spurious emission of transmitter, valid up to 6 GHz | dB | 3 | 2.4 |
| Conducted emission of receivers | dB | 3 | 2.4 |
| Radiated emission of transmitter, valid up to 6 GHz | dB | 6 | 5.6 |
| Radiated emission of receiver, valid up to 6 GHz | dB | 6 | 5.6 |
| RF level uncertainty for a given BER | dB | 1.5 | 1.4 |
| Occupied BandWidth | % | 5 | 0.96 |
| Temperature | deg. C | 2.5 | 0.95 |
| Humidity | % | 10 | 1.72 |
| Blocking and Adaptivity (from EUT(Tx) to SA) | dB | Not Defined | 1.5 |
| Blocking and Adaptivity (from SG to SA) | dB | Not Defined | 1.4 |
| Sensitivity | dB | Not Defined | 1.5 |

*Measurement uncertainties of UL Japan, Inc. do not exceed the uncertainties required in the standard.

These uncertainties were calculated based on UL Japan, Inc.'s Uncertainty Calculation Procedure 13-EM-W0444.

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124
A2LA Certificate Number: 5107.02

| Test site | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms | Maximum measurement distance |
|----------------------------|----------------------------|--|------------------------|------------------------------|
| No.1 semi-anechoic chamber | 19.2 x 11.2 x 7.7 | 7.0 x 6.0 | No.1 Power source room | 10 m |
| No.2 semi-anechoic chamber | 7.5 x 5.8 x 5.2 | 4.0 x 4.0 | - | 3 m |
| No.3 semi-anechoic chamber | 12.0 x 8.5 x 5.9 | 6.8 x 5.75 | No.3 Preparation room | 3 m |
| No.3 shielded room | 4.0 x 6.0 x 2.7 | N/A | - | - |
| No.4 semi-anechoic chamber | 12.0 x 8.5 x 5.9 | 6.8 x 5.75 | No.4 Preparation room | 3 m |
| No.4 shielded room | 4.0 x 6.0 x 2.7 | N/A | - | - |
| No.5 semi-anechoic chamber | 6.0 x 6.0 x 3.9 | 6.0 x 6.0 | - | - |
| No.5 measurement room | 6.4 x 6.4 x 3.0 | 6.4 x 6.4 | - | - |
| No.6 shielded room | 4.0 x 4.5 x 2.7 | 4.0 x 4.5 | - | - |
| No.6 measurement room | 4.75 x 5.4 x 3.0 | 4.75 x 4.15 | - | - |
| No.7 shielded room | 4.7 x 7.5 x 2.7 | 4.7 x 7.5 | - | - |
| No.8 measurement room | 3.1 x 5.0 x 2.7 | 3.1 x 5.0 | - | - |
| No.9 measurement room | 8.8 x 4.6 x 2.8 | 2.4 x 2.4 | - | - |
| No.11 measurement room | 6.2 x 4.7 x 3.0 | 4.8 x 4.6 | - | - |

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 m x 2.0 m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating mode(s)

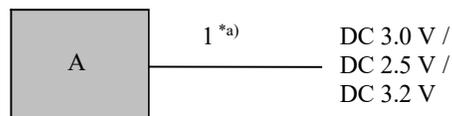
| Mode | Test Item |
|---|---|
| Normal Transmitting mode (Tx) 433.92 MHz Modulated (Mod) on | Transient power |
| Continuous Transmitting mode (Tx) 433.92 MHz Modulated (Mod) on | Effective radiated power Unwanted emissions in the spurious domain 99% Occupied Bandwidth and Frequency error Tx Out Of Band Emissions Frequency stability under low voltage conditions |
| Standby mode | Unwanted emissions in the spurious domain |
| Justification : The system was configured in a typical fashion (as a customer would normally use it) for testing. | |

Extreme test condition*

Temperature: -10 deg. C to +60 deg. C
Voltage: Vnom: DC 3.0 V, Vmin: DC 2.5 V, Vmax: DC 3.2 V

* declared by the manufacturer

4.2 Configuration and peripherals



*a) This cable was attached only for Extreme condition test, and it is not installed the end product.
Also, the attachment of this cable does not affect the RF characteristics.

*Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT

| No. | Item | Model number | Serial number | Manufacturer | Remark |
|-----|--------------------------|--------------|----------------------|---------------------|--------|
| A | SW ASSY-SMART KEYLESS | R55T0 | 0061 *1) 0083 *2) | Marelli Corporation | EUT |

*1) Used for other tests except for Transient power test.

*2) Used for Transient power test only.

List of cables used

| No. | Name | Length (m) | Shield | | Remark |
|-----|----------|------------|------------|------------|--------|
| | | | Cable | Connector | |
| 1 | DC Cable | 1.0 | Unshielded | Unshielded | - |

SECTION 5: Effective radiated power (ERP) and Unwanted emissions in the spurious domain

Test Procedure

Ambient temperature : See data.
Relative humidity : See data.

- 1) EUT was placed on a platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength has been measured in semi anechoic chamber at a distance of 3 m. The measuring antenna height was varied between 1 m to 4 m and the turn table was rotated a full revolution in order to obtain the maximum value of the electric field strength. The measurements were performed for both vertical and horizontal antenna polarization.
- 2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height 1.5 m as the EUT. The frequency below 1 GHz of the Substitution Antenna was used the Half wave dipole Antenna, which was tuned the measured frequency in 1). The frequency above 1 GHz of the Substitution Antenna was used Horn Antenna. The Substitution Antenna was connected to the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field strength is equal to the measured value in 1) by means of varying the measuring antenna height between 1 m to 4 m to obtain maximum receiving level. Its Output power of Signal Generator was recorded.
- 3) Effective radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2). For the usage of the Antenna except for the Half wave dipole Antenna for the Substitution Antenna, the Effective radiated power was calculated by compensating the finite difference in the Antenna gain of the Half wave dipole Antenna, and Substitution Antenna.

| | | |
|-----------------|---------------|-----------------------------|
| Frequency | Below 1 GHz | Above 1 GHz |
| Instrument used | Test Receiver | Spectrum Analyzer |
| IF Bandwidth | BW: 120 kHz | PK: RBW: 1 MHz / VBW: 3 MHz |

- The carrier level and 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.

This EUT has two modes which a mechanical key is inserted or not. The worst case was confirmed with and without a mechanical key, as a result, the test without a mechanical key was the worst case. Therefore the test without a mechanical key was performed only.

Test data : **APPENDIX 1**
Test result : **Pass**

SECTION 6: Occupied Bandwidth

Test Procedure

Occupied Bandwidth was measured with a spectrum analyzer. The measurement was performed under both normal and extreme test conditions.

Test data : **APPENDIX 1**
Test result : **Pass**

SECTION 7: Frequency error

Test Procedure

The Frequency error was measured with a spectrum analyzer. The measurement was performed under both normal and extreme test conditions.

Test data : **APPENDIX 1**
Test result : **Pass**

SECTION 8: Tx Out Of Band Emissions

Test Procedure

Tx Out Of Band Emissions was measured with a spectrum analyzer. The measurement was performed under both normal and extreme test conditions.

Test data : **APPENDIX 1**
Test result : **Pass**

SECTION 9: Transient power

Transient power was measured with a spectrum analyzer. The measurement was performed under both normal and extreme test conditions.

Test data : **APPENDIX 1**
Test result : **Pass**

SECTION 10: Tx behavior under low voltage conditions

Test Procedure

The Tx behavior under low voltage conditions was measured with a spectrum analyzer.

Test data : **APPENDIX 1**
Test result : **Pass**

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

APPENDIX 1: Test data

Effective radiated power (ERP) and Unwanted emissions in the spurious domain

Report No. 13708997H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date March 20, 2021
Temperature / Humidity 21 deg. C / 38 % RH
Engineer Ken Fujita
Mode Continuous Transmitting (Tx) 433.92 MHz, Mod on

| Frequency [MHz] | Rx SA/TR Reading [dBuV] | | Tx SG Reading [dBm] | | Tx Cable Loss [dB] | Tx Ant. Gain [dBi] | Result (ERP) [dBm] | | Limit (ERP) [dBm] | Margin [dB] | | Horizontal | | Vertical | | Remarks | | |
|--------------------|-------------------------------|-------|---------------------------|-------|-----------------------------|-----------------------------|--------------------------|-------|-------------------------|----------------|-------|------------|-------|---------------------------|-------------------------|---------|---------------------------|-------------------------|
| | Hori. | Vert. | Hori. | Vert. | | | Hori. | Vert. | | Hori. | Vert. | Hori. | Vert. | Rx Ant. Height [cm] | Turn Table [deg.] | | Rx Ant. Height [cm] | Turn Table [deg.] |
| | | | | | | | | | | | | | | | | | | |
| 433.92 | 82.50 | 80.50 | -11.9 | -10.4 | 3.5 | -7.5 | -25.1 | -23.6 | 10.0 | 35.1 | 33.6 | 127 | 147 | 167 | 278 | | | |
| 867.84 | NS | NS | NS | NS | 5.1 | -8.7 | - | - | -36.0 | - | - | - | - | - | - | - | | |
| 1301.76 | NS | NS | NS | NS | 4.6 | 6.3 | - | - | -30.0 | - | - | - | - | - | - | - | | |
| 1735.68 | NS | NS | NS | NS | 3.5 | 9.8 | - | - | -30.0 | - | - | - | - | - | - | - | | |
| 2169.60 | NS | NS | NS | NS | 3.2 | 8.9 | - | - | -30.0 | - | - | - | - | - | - | - | | |
| 2603.52 | NS | NS | NS | NS | 3.5 | 10.9 | - | - | -30.0 | - | - | - | - | - | - | - | | |
| 3037.44 | NS | NS | NS | NS | 3.7 | 11.3 | - | - | -30.0 | - | - | - | - | - | - | - | | |
| 3471.36 | NS | NS | NS | NS | 4.0 | 12.5 | - | - | -30.0 | - | - | - | - | - | - | - | | |
| 3905.28 | NS | NS | NS | NS | 4.3 | 12.3 | - | - | -30.0 | - | - | - | - | - | - | - | | |

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - 2.15
Rx-ANTENNA : Biconical Antenna(25M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(25M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
NS : No signal detect.
Detector : Below 1 GHz: Test Receiver QP (BW: 120 kHz), Above 1 GHz: Spectrum Analyzer Peak (RBW: 1 MHz / VBW: 3 MHz)
* If the worst margin of 1.5 GHz to 4 GHz is more than 10 dB, the test was performed until 4 GHz, otherwise, test was performed until 6 GHz

Data of Spectrum Mask

| Frequency [MHz] | Rx SA/TR Reading [dBuV] | | Tx SG Reading [dBm] | | Tx Cable Loss [dB] | Tx Ant. Gain [dBi] | Result (ERP) [dBm] | | Limit (ERP) [dBm] | Margin [dB] | | Horizontal | | Vertical | | Remarks | | |
|--------------------|-------------------------------|------|---------------------------|-------|-----------------------------|-----------------------------|--------------------------|-------|-------------------------|----------------|------|------------|-----|---------------------------|-------------------------|---------|---------------------------|-------------------------|
| | HOR | VER | HOR | VER | | | HOR | VER | | HOR | VER | HOR | VER | Rx Ant. Height [cm] | Turn Table [deg.] | | Rx Ant. Height [cm] | Turn Table [deg.] |
| | | | | | | | | | | | | | | | | | | |
| 433.12 | 38.0 | 37.1 | -55.4 | -54.0 | 3.6 | -7.5 | -68.6 | -67.3 | -36.0 | 32.6 | 31.3 | 128 | 80 | 164 | 85 | *1) | | |
| 433.37 | 25.8 | 25.0 | -67.6 | -66.1 | 3.6 | -7.5 | -80.8 | -79.3 | -36.0 | 44.8 | 43.3 | 100 | 302 | 117 | 224 | *2) | | |
| 434.42 | 25.6 | 24.6 | -67.8 | -66.5 | 3.6 | -7.5 | -81.1 | -79.7 | -36.0 | 45.1 | 43.7 | 153 | 151 | 161 | 264 | *3) | | |
| 434.70 | 37.2 | 36.4 | -56.2 | -54.7 | 3.6 | -7.5 | -69.5 | -68.0 | -36.0 | 33.5 | 32.0 | 184 | 74 | 188 | 248 | *4) | | |

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(25M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(25M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detected.

| | Frequency Range | RBW |
|-----|----------------------------|-------|
| *1) | $f_c - m < f < f_c - n$ | 10kHz |
| *2) | $f_c - n \leq f < f_c - p$ | 1kHz |
| *3) | $f_c + p < f < f_c + n$ | 1kHz |
| *4) | $f_c + n < f \leq f_c + m$ | 10kHz |

f is the measurement frequency.
f_c is the Operating Frequency.
m is 10 x OCW or 500 kHz, whichever is the greater.
n is 4 x OCW or 100 kHz, whichever is the greater.
p is 2.5 x OCW.

*Calculation of the frequency range for Operating Channel

| Operating Frequency | Operating Channel Width | *1) | *2) | *3) | *4) |
|---------------------|-------------------------|--------|--------|--------|--------|
| [MHz] | [kHz] | [MHz] | [MHz] | [MHz] | [MHz] |
| 433.92 | 200.00 | 431.92 | 433.12 | 434.42 | 434.72 |
| | | 433.12 | 433.42 | 434.72 | 435.92 |

Unwanted emissions in the spurious domain

Report No. 13708997H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date March 20, 2021
Temperature / Humidity 21 deg. C / 41 % RH
Engineer Ken Fujita
Mode Standby

| Frequency [MHz] | Rx SA/TR Reading [dBuV] | | Tx SG Reading [dBm] | | Tx Cable Loss [dB] | Tx Ant. Gain [dBi] | Tx Ant. Atten. Loss [dB] | Result (ERP) [dBm] | | Limit (ERP) [dBm] | Margin [dB] | | Horizontal | | Vertical | | Remarks |
|--------------------|-------------------------------|-----|---------------------------|-----|-----------------------------|-----------------------------|-----------------------------------|--------------------------|-----|-------------------------|----------------|-----|---------------------------|-------------------------|---------------------------|-------------------------|---------|
| | HOR | VER | HOR | VER | | | | HOR | VER | | HOR | VER | Rx Ant. Height [cm] | Turn Table [deg.] | Rx Ant. Height [cm] | Turn Table [deg.] | |
| | | | | | | | | | | | | | | | | | |
| 433.92 | NS | NS | - | - | - | - | - | - | - | -57.0 | - | - | - | - | - | - | |

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(25M-200MHz), Logperiodic Antenna(200M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(25M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detected.
Detector : Below 1GHz : Test Receiver QP(BW:120kHz), Above 1GHz : Spectrum Analyzer PK(RBW:1MHz/VBW:3MHz)
* If the worst margin of 1.5 GHz to 4 GHz is more than 10 dB, the test was performed until 4 GHz, otherwise, test was performed until 6 GHz.

99% Occupied Bandwidth and Frequency error

Report No. 13708997H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4 No.8
Date March 13, 2021 April 01,2021
Temperature / Humidity 21 deg. C / 63 % RH 21 deg. C / 41 % RH
Engineer Akihiko Maeda Ken Fujita
Mode Continuous Transmitting (Tx) 433.92 MHz, Mod on

| Test Condition | | Center Freq. [MHz] | 99% OBW [kHz] | Freq. Error [kHz] | Result * | | Limit | Margin |
|----------------|-------|--------------------|---------------|-------------------|------------------|-------------|------------|-----------|
| Temp. | Volt. | | | | | | | |
| nom | nom | 433.9200 | 127.4086 | 4.172 | Lower edge | 433.860MHz | 433.820MHz | 0.040MHz |
| | | | | | Upper edge | 433.988MHz | 434.020MHz | 0.032MHz |
| | | | | | Center frequency | 433.924MHz | - | - |
| | | | | | 99% OBW | 127.409 kHz | 200.000kHz | 72.591kHz |
| min | min | 433.9200 | 155.5601 | -10.054 | Lower edge | 433.832MHz | 433.820MHz | 0.012MHz |
| | | | | | Upper edge | 433.988MHz | 434.020MHz | 0.032MHz |
| | | | | | Center frequency | 433.910MHz | - | - |
| | | | | | 99% OBW | 155.560 kHz | 200.000kHz | 44.440kHz |
| min | max | 433.9200 | 126.5576 | 0.320 | Lower edge | 433.857MHz | 433.820MHz | 0.037MHz |
| | | | | | Upper edge | 433.984MHz | 434.020MHz | 0.036MHz |
| | | | | | Center frequency | 433.920MHz | - | - |
| | | | | | 99% OBW | 126.558 kHz | 200.000kHz | 73.442kHz |
| max | min | 433.9200 | 137.4294 | -3.615 | Lower edge | 433.848MHz | 433.820MHz | 0.028MHz |
| | | | | | Upper edge | 433.985MHz | 434.020MHz | 0.035MHz |
| | | | | | Center frequency | 433.916MHz | - | - |
| | | | | | 99% OBW | 137.429 kHz | 200.000kHz | 62.571kHz |
| max | max | 433.9200 | 126.7867 | 1.065 | Lower edge | 433.858MHz | 433.820MHz | 0.038MHz |
| | | | | | Upper edge | 433.984MHz | 434.020MHz | 0.036MHz |
| | | | | | Center frequency | 433.921MHz | - | - |
| | | | | | 99% OBW | 126.787 kHz | 200.000kHz | 73.213kHz |

* Center Frequency(Result) = Center Frequency + Transmit Frequency Error

* Lower edge(Result) = Center Frequency - 99% OBW / 2

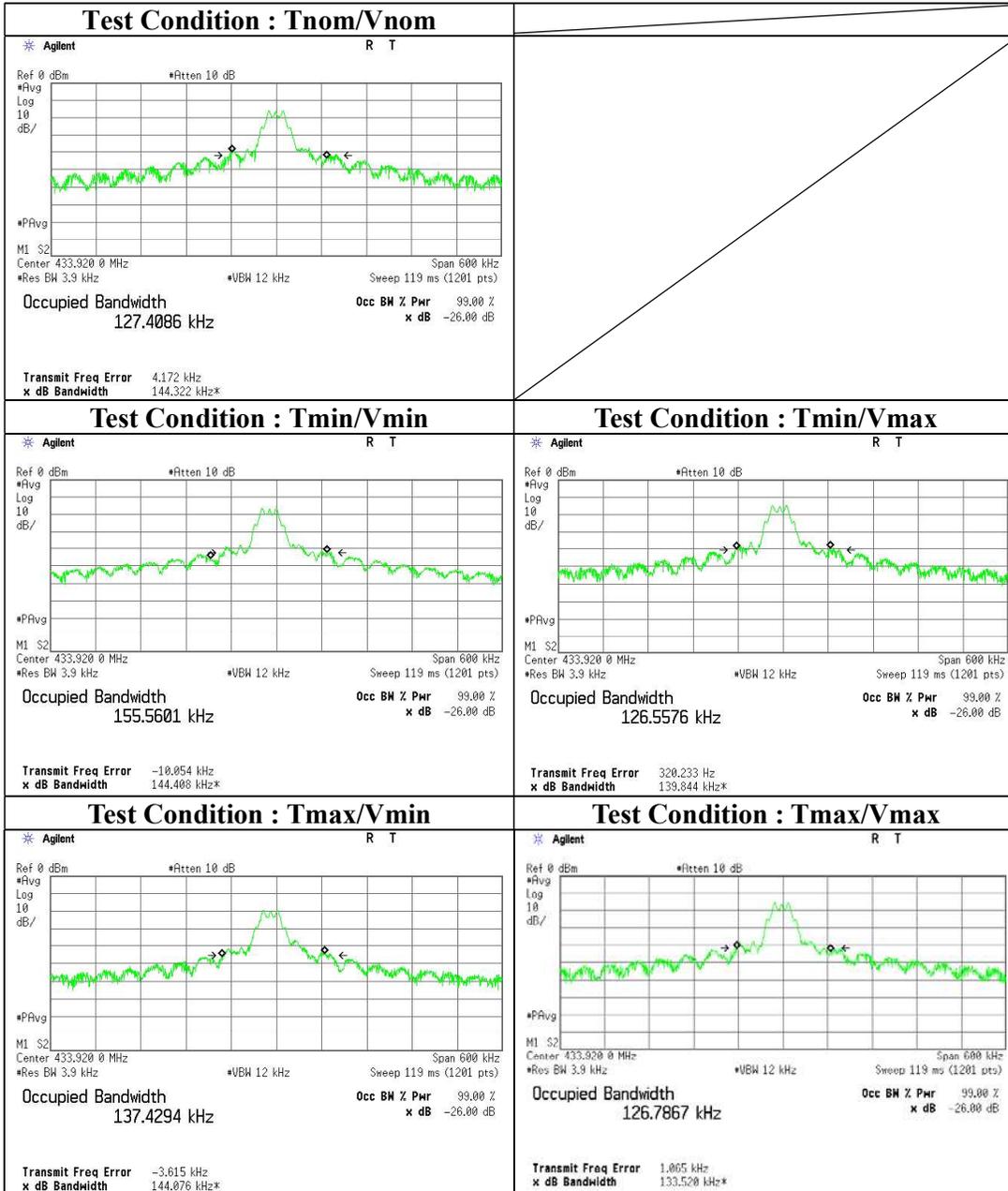
* Upper edge(Result) = Center Frequency + 99% OBW / 2

*Calculation of the frequency range for Operating Channel

| Operating Frequency [MHz] | Operating Channel width [kHz] | Lower edge of the Operating Channel [MHz] | Upper edge of the Operating Channel [MHz] |
|---------------------------|-------------------------------|---|---|
| 433.92 | 200.0 | 433.820 | 434.020 |

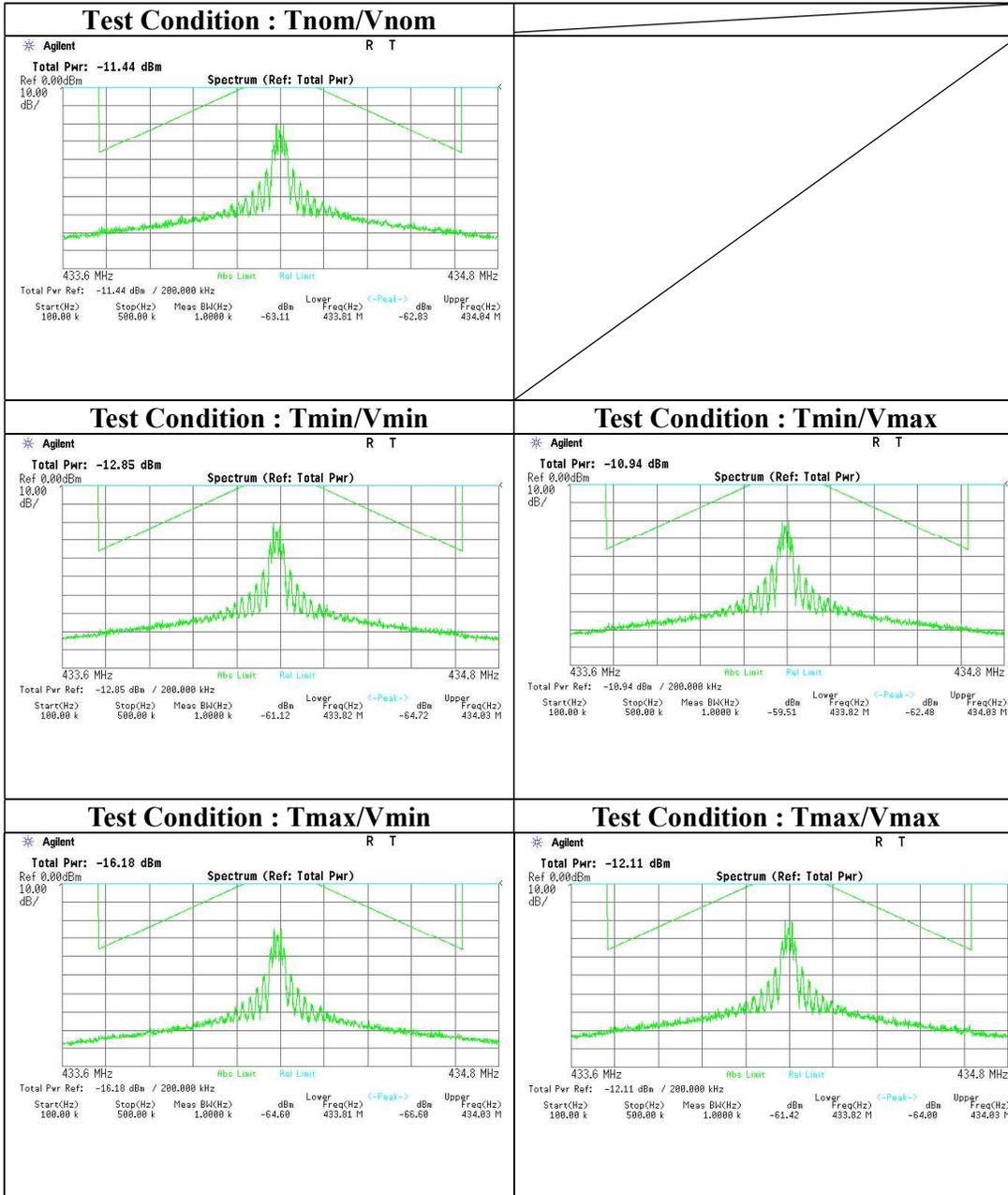
99% Occupied Bandwidth

| | | |
|------------------------|---|---------------------|
| Report No. | 13708997H | |
| Test place | Ise EMC Lab. | |
| Semi Anechoic Chamber | No.4 | No.8 |
| Date | March 13, 2021 | April 01,2021 |
| Temperature / Humidity | 21 deg. C / 63 % RH | 21 deg. C / 41 % RH |
| Engineer | Akihiko Maeda | Ken Fujita |
| Mode | Continuous Transmitting (Tx) 433.92 MHz, Mod on | |



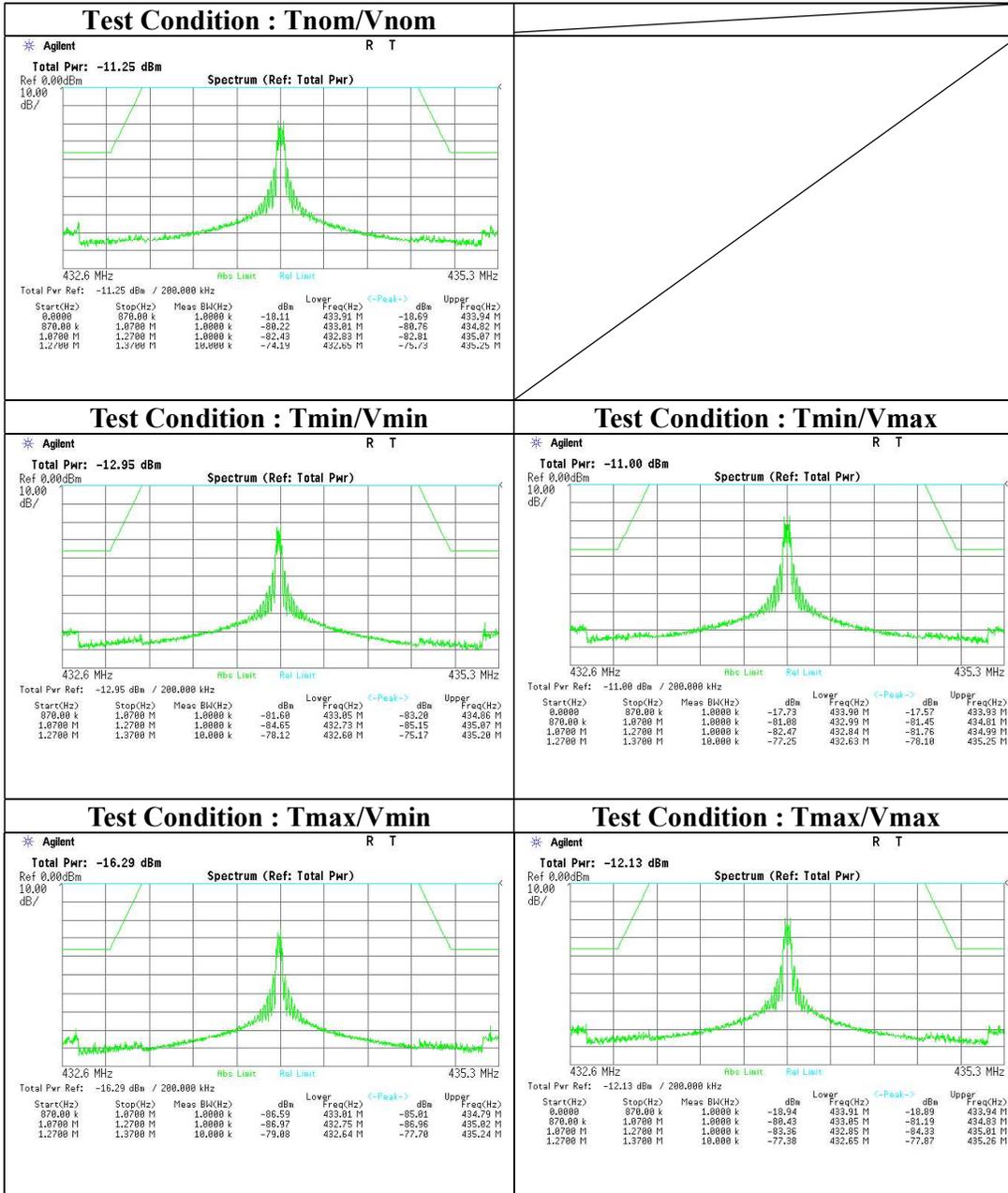
Tx Out Of Band Emissions (for Operating Channel)

Report No. 13708997H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4 No.8
Date March 13, 2021 April 01,2021
Temperature / Humidity 21 deg. C / 63 % RH 21 deg. C / 41 % RH
Engineer Akihiko Maeda Ken Fujita
Mode Continuous Transmitting (Tx) 433.92 MHz, Mod on



Tx Out Of Band Emissions(for Operational Frequency Band)

Report No. 13708997H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4 No.8
Date March 13, 2021 April 01,2021
Temperature / Humidity 21 deg. C / 63 % RH 21 deg. C / 41 % RH
Engineer Akihiko Maeda Ken Fujita
Mode Continuous Transmitting (Tx) 433.92 MHz, Mod on



Transient power

Report No. 13708997H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.8
Date April 01,2021
Temperature / Humidity 21 deg. C / 41 % RH
Engineer Ken Fujita
Mode Normal Transmitting (Tx) 433.92 MHz, Mod on

[-0.5*OCW-3kHz / 0.5*OCW+3kHz]

| Freq. [MHz] | Effective radiated power [dBm] | S/A Reading Carrier [dBm] | Measurement points [MHz] | S/A Reading Measurement points*1) [dBm] | Result A [dBm] | Result B [dBm] | Limit [dBm] | Margin [dB] | Remark |
|----------------|-----------------------------------|------------------------------|-----------------------------|--|-------------------|-------------------|----------------|----------------|--------|
| 433.92 | -23.60 | -16.83 | 433.82 | -56.16 | -56.16 | -62.93 | 0.0 | 62.93 | Lower |
| | | | 434.02 | -57.14 | -57.14 | -63.91 | 0.0 | 63.91 | Upper |

*1) Analyser RBW : 1 kHz

[±max(12.5kHz,OCW)]

| Freq. [MHz] | Effective radiated power [dBm] | S/A Reading Carrier [dBm] | Measurement points [MHz] | S/A Reading Measurement points*1) [dBm] | Result A [dBm] | Result B [dBm] | Limit [dBm] | Margin [dB] | Remark |
|----------------|-----------------------------------|------------------------------|-----------------------------|--|-------------------|-------------------|----------------|----------------|--------|
| 433.92 | -23.60 | -16.83 | 433.72 | -50.49 | -65.67 | -72.44 | 0.0 | 72.44 | Lower |
| | | | 434.12 | -50.06 | -65.25 | -72.02 | 0.0 | 72.02 | Upper |

*1) Analyser RBW : 33 kHz

[-0.5*OCW-400kHz / 0.5*OCW+400kHz]

| Freq. [MHz] | Effective radiated power [dBm] | S/A Reading Carrier [dBm] | Measurement points [MHz] | S/A Reading Measurement points*1) [dBm] | Result A [dBm] | Result B [dBm] | Limit [dBm] | Margin [dB] | Remark |
|----------------|-----------------------------------|------------------------------|-----------------------------|--|-------------------|-------------------|----------------|----------------|--------|
| 433.92 | -23.60 | -16.83 | 433.42 | -54.00 | -74.00 | -80.77 | -27.0 | 53.77 | Lower |
| | | | 434.42 | -54.18 | -74.18 | -80.95 | -27.0 | 53.95 | Upper |

*1) Analyser RBW : 100 kHz

[-0.5*OCW-1200kHz / 0.5*OCW+1200kHz]

| Freq. [MHz] | Effective radiated power [dBm] | S/A Reading Carrier [dBm] | Measurement points [MHz] | S/A Reading Measurement points*1) [dBm] | Result A [dBm] | Result B [dBm] | Limit [dBm] | Margin [dB] | Remark |
|----------------|-----------------------------------|------------------------------|-----------------------------|--|-------------------|-------------------|----------------|----------------|--------|
| 433.92 | -23.60 | -16.83 | 432.62 | -59.44 | -84.21 | -90.98 | -27.0 | 63.98 | Lower |
| | | | 435.22 | -59.25 | -84.02 | -90.79 | -27.0 | 63.79 | Upper |

*1) Analyser RBW : 300 kHz

Sample Calculation :

Result A [dBm] = S/A Reading Measurement points + 10 x log (Reference RBW / Analyser RBW)

Result B [dBm] = Result A [dBm] - (S/A Reading Carrier [dBm] - Effective radiated power [dBm])

| Operating Frequency [MHz] | Operating Channel width [kHz] |
|------------------------------|----------------------------------|
| 433.92 | 200.0 |

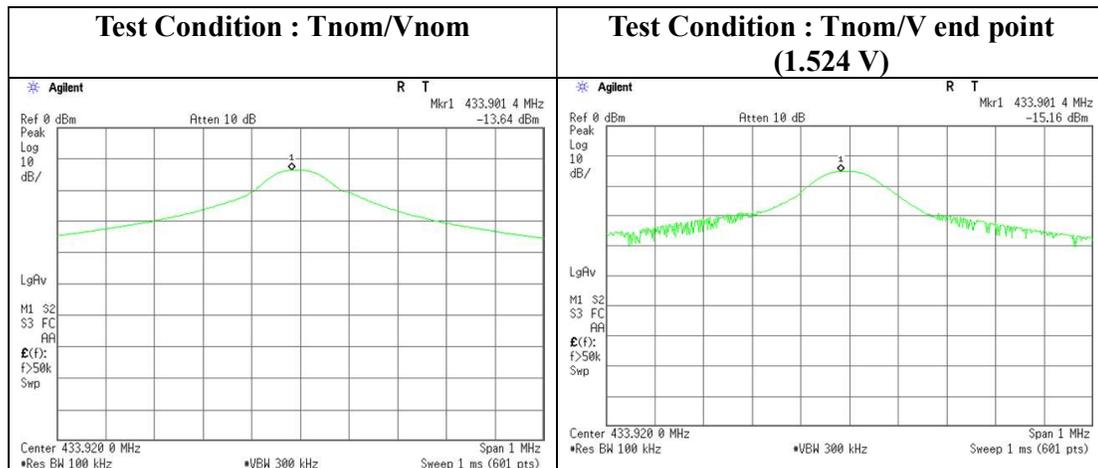
TX behaviour under Low Voltage Conditions

Report No. 13708997H
Test place Ise EMC Lab. No.4 Measurement Room
Date March 13, 2021
Temperature/ Humidity 21 deg. C / 63 % RH
Engineer Akihiko Maeda
Mode Continuous Transmitting (Tx) 433.92 MHz, Mod on

| Test Condition | | Side | Result [MHz] | Limit [MHz] | Margin [MHz] |
|----------------|-----------|-------|-----------------|----------------|-----------------|
| Temp. | Volt. | | | | |
| nom | nom | Lower | 433.90140 | 433.82 | 0.08140 |
| | | Upper | | 434.02 | 0.11860 |
| nom | end point | Lower | 433.90140 | 433.82 | 0.08140 |
| | | Upper | | 434.02 | 0.11860 |

*Calculation of the frequency range for Operating Channel

| Operating frequency [MHz] | Operating Channel width [kHz] | Lower edge of the Operating Channel [MHz] | Upper edge of the Operating Channel [MHz] |
|------------------------------|----------------------------------|--|--|
| 433.92 | 200.0 | 433.82 | 434.02 |



APPENDIX 2: Test instruments

Test equipment

| Test Item | Local ID | LIMS ID | Description | Manufacturer | Model | Serial | Last Calibration Date | Cal Int |
|-----------|--------------|---------|-----------------------------------|-------------------------------|--------------------------|---------------------------|-----------------------|---------|
| RE | MAEC-03 | 142008 | AC3_Semi Anechoic Chamber(NSA) | TDK | Semi Anechoic Chamber 3m | DA-10005 | 05/22/2020 | 24 |
| RE | MOS-13 | 141554 | Thermo-Hygrometer | CUSTOM. Inc | CTH-201 | 1301 | 01/15/2021 | 12 |
| RE | MMM-08 | 141532 | DIGITAL HiTESTER | HIOKI E.E. CORPORATION | 3805 | 51201197 | 01/07/2021 | 12 |
| RE | MJM-16 | 142183 | Measure | KOMELON | KMC-36 | - | - | - |
| RE | COTS-MEMI-02 | 178648 | EMI measurement program | TSJ (Techno Science Japan) | TEPTO-DV | - | - | - |
| RE | MBA-03 | 141424 | Biconical Antenna | Schwarzbeck Mess - Elektronik | VHA9103+BBA9106 | 1915 | 08/13/2020 | 12 |
| RE | MCC-51 | 141323 | Coaxial cable | UL Japan | - | - | 07/06/2020 | 12 |
| RE | MLA-22 | 141266 | Logperiodic Antenna (200-1000MHz) | Schwarzbeck Mess - Elektronik | VUSLP9111B | 9111B-191 | 08/13/2020 | 12 |
| RE | MPA-13 | 141582 | Pre Amplifier | SONOMA INSTRUMENT | 310 | 260834 | 02/18/2021 | 12 |
| RE | MTR-03 | 141942 | Test Receiver | Rohde & Schwarz | ESCI | 100300 | 08/18/2020 | 12 |
| RE | MSA-10 | 141899 | Spectrum Analyzer | Keysight Technologies Inc | E4448A | MY46180655 | 08/04/2020 | 12 |
| RE | MAT-07 | 141203 | Attenuator(6dB) | Weinschel Corp | 2 | BK7970 | 11/13/2020 | 12 |
| RE | MCC-126 | 141318 | Coaxial Cable | UL Japan | - | - | 07/06/2020 | 12 |
| RE | MDA-03 | 141454 | Dipole Antenna | Schwarzbeck Mess - Elektronik | UHAP | 991 | 11/30/2020 | 12 |
| RE | YTSSG03 | 141967 | Signal Generator | Rohde & Schwarz | SMT02 | 51400043 | 08/05/2020 | 12 |
| RE | MHA-20 | 141507 | Horn Antenna 1-18GHz | Schwarzbeck Mess - Elektronik | BBHA9120D | 258 | 10/01/2020 | 12 |
| RE | MPA-11 | 141580 | MicroWave System Amplifier | Keysight Technologies Inc | 83017A | MY39500779 | 03/03/2021 | 12 |
| RE | MCC-231 | 177964 | Microwave Cable | Junkosha INC. | MMX221 | 1901S329(1m)/1902S579(5m) | 03/04/2021 | 12 |
| RE | MOS-28 | 141567 | Thermo-Hygrometer | CUSTOM. Inc | CTH-201 | 0008 | 01/15/2021 | 12 |
| RE | MMM-17 | 141557 | DIGITAL HiTESTER | HIOKI E.E. CORPORATION | 3805 | 70900530 | 01/07/2021 | 12 |
| RE | MCH-05 | 141440 | Temperature and Humidity Chamber | Espec | PL-1KP | 14019569 | 04/09/2020 | 12 |
| RE | MSA-17 | 141904 | Spectrum Analyzer | Keysight Technologies Inc | N9030A | US51350215 | 09/23/2020 | 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:

RE: Radiated emission

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

APPENDIX 3: Photographs of test setup

Radiated emission



Photo 1



Photo 2

Worst Case Position

Below 1 GHz (Horizontal: X-axis / Vertical: Z-axis)
Above 1 GHz (Horizontal: Z-axis / Vertical: Y-axis)

X-axis



Y-axis



Z-axis



Worst Case Position



Mechanical Key (Not Inserted) Worst



Mechanical Key (Inserted)

End of Report



**Perbadanan Harta Intelek Malaysia
Intellectual Property Corporation of Malaysia**

**TRADE MARKS ACT 1976
TRADEMARKS REGULATIONS 1997**

**CERTIFICATE OF REGISTRATION
(REGULATION 56)**

MARELLI

**Trade Mark No : TM2019015541
To : MAGNETI MARELLI S.P.A.**

I HEREBY CERTIFY THAT under the provisions of the Trade Marks Act 1976 and the Trade Marks Regulation 1997, the above-numbered trade mark has been registered in your name as proprietor of the said trade mark in the Register for a period of ten (10) years from 29/04/2019 to 29/04/2029 in Class 9 in respect of the following goods:

(LIST OF GOODS/SERVICES : AS ATTACHED)

A handwritten signature in black ink, appearing to be 'Xm'.

**(DATO' MOHD ROSLAN BIN MAHAYUDIN)
REGISTRAR OF TRADE MARKS
MALAYSIA**

DATE ISSUED: 26 AUGUST 2020



ACCUMULATORS [BATTERIES]; ACCUMULATORS, ELECTRIC; ACCUMULATORS, ELECTRIC, FOR VEHICLES; ELECTRONIC POWER SUPPLIES; RESIDUAL GAS ANALYZERS; CAR ANTENNAS; ELECTRICAL AND ELECTRONIC CONTROL APPARATUS AND INSTRUMENTS; ELECTRICAL AND ELECTRONIC CONTROL APPARATUS FOR USE WITH APPARATUS OR INSTALLATIONS FOR AIR-CONDITIONING; ELECTRICAL AND ELECTRONIC CONTROL APPARATUS FOR USE WITH APPARATUS OR INSTALLATIONS FOR HEATING; ELECTRICAL AND ELECTRONIC CONTROL APPARATUS FOR USE WITH APPARATUS OR INSTALLATIONS FOR VENTILATION; MEASURING AND CONTROL APPARATUS AND INSTRUMENTS; ELECTRONIC NAVIGATIONAL, TRACKING AND POSITIONING APPARATUS AND INSTRUMENTS; DATA COMMUNICATION APPARATUS AND INSTRUMENTS; APPARATUS AND INSTRUMENTS FOR RECORDING, TRANSMISSION OR REPRODUCTION OF SOUND OR IMAGES; SATELLITE BROADCAST RECEIVING AND DECODING APPARATUS AND INSTRUMENTS; APPARATUS AND INSTRUMENTS FOR TRANSFERRING, RECEIVING AND STORING SOUND, IMAGES AND DATA, BOTH IN DIGITAL AND ANALOG FORM; SPEED CHECKING APPARATUS FOR VEHICLES; NAVIGATION APPARATUS FOR VEHICLES [ON-BOARD COMPUTERS]; SATELLITE NAVIGATIONAL APPARATUS; SIGNAL TRANSMISSION APPARATUS; REGULATING APPARATUS, ELECTRIC; MEASURING DEVICES, ELECTRIC; SIGNALLING APPARATUS AND INSTRUMENTS; APPARATUS AND INSTRUMENTS FOR CONDUCTING, SWITCHING, TRANSFORMING, ACCUMULATING, REGULATING OR CONTROLLING THE DISTRIBUTION OR USE OF ELECTRICITY; GLOBAL POSITIONING SYSTEM [GPS] APPARATUS; DISTANCE RECORDING APPARATUS; DATA PROCESSING APPARATUS; DISTANCE MEASURING APPARATUS; APPARATUS FOR TESTING VEHICLE BRAKES; APPARATUS FOR TESTING VEHICLE TRANSMISSIONS; VEHICLE RADIOS; COMPUTER SOFTWARE APPLICATIONS, DOWNLOADABLE; AUDIO BOOKS; EMERGENCY LIGHT BARS FOR VEHICLES [LUMINOUS SIGNALS]; BATTERIES; BATTERIES FOR LIGHTING; BATTERIES, ELECTRIC; BATTERIES FOR VEHICLES; ELECTRIC WIRE HARNESSES FOR AUTOMOBILES; BATTERY CHARGERS; CABLES, ELECTRIC; STARTER CABLES FOR MOTORS; PHOTOVOLTAIC CELLS; ELECTRONIC CIRCUITS; INTEGRATED CIRCUITS; POWER CONNECTORS; ELECTRIC CABLE CONNECTORS; CONNECTORS [ELECTRICITY]; COUNTERS; CONTACTS, ELECTRIC; LIGHT-EMITTING DIODES [LED]; QUANTUM DOT LIGHT-EMITTING DIODES [QLED]; ORGANIC LIGHT-EMITTING DIODES [OLED]; VEHICLE TRACKING DEVICES; IGNITING APPARATUS, ELECTRIC, FOR IGNITING AT A DISTANCE; ELECTRONIC PERSONAL ALARM DEVICES; WIRES, ELECTRIC; SHEATHS FOR ELECTRIC CABLES; AUTOMATIC INDICATORS OF LOW PRESSURE IN VEHICLE TIRES; QUANTITY INDICATORS; TEMPERATURE INDICATORS; WATER LEVEL INDICATORS; FUEL GAUGES; GASOLINE GAUGES; ELECTRIC LOSS INDICATORS; PRESSURE INDICATORS; SPEED INDICATORS; INTERFACES FOR COMPUTERS; CIRCUIT CLOSERS; POWER SWITCHES;



CIRCUIT BREAKERS; INVERTERS [ELECTRICITY]; MEASURING AND TESTING MACHINES AND INSTRUMENTS; VEHICLE WHEEL ALIGNMENT MACHINES; TIRE BALANCING MACHINES FOR LAND VEHICLES; MAGNETS; JUNCTION SLEEVES FOR ELECTRIC CABLES; PRESSURE GAUGES; MEASURING APPARATUS; PRESSURE MEASURING APPARATUS; ELECTRICAL CELLS AND BATTERIES; PLATES FOR BATTERIES; ELECTRIC SOCKETS; DATA PROCESSORS; DIGITAL SIGNAL PROCESSORS; COMPUTER SOFTWARE PRODUCTS; COMPUTER PROGRAMS, DOWNLOADABLE; ELECTRONIC PUBLICATIONS, DOWNLOADABLE; CONTROL PANELS [ELECTRICITY]; SWITCHBOARDS; DISTRIBUTION BOARDS [ELECTRICITY]; RADIOS FOR VEHICLES; VOLTAGE REGULATORS FOR VEHICLES; RESISTANCES, ELECTRIC; AUDIO- AND VIDEO-RECEIVERS; CELL SWITCHES [ELECTRICITY]; COMBINATION CARBON MONOXIDE AND SMOKE DETECTORS; HEAT DETECTORS; SMOKE ALARMS; FIRE DETECTORS; BLACK BOXES [DATA RECORDERS]; SEMI-CONDUCTORS; INFRARED SENSORS; ACCELERATION SENSORS; DISTANCE SENSORS; LEVEL SENSORS; GAS SENSORS; MOTION SENSORS; MOTION SENSORS FOR SECURITY LIGHTS; POSITION SENSORS; PRESSURE SENSORS; PROXIMITY SENSORS; TIMING SENSORS; TEMPERATURE SENSORS; COOLANT-TEMPERATURE SENSORS; VIBRATION SENSORS; VELOCITY SENSORS; OPTICAL SENSORS; LOCKS, ELECTRIC; POWER LOCKS FOR MOTOR VEHICLES; LOCKS FOR VEHICLES, ELECTRIC; VEHICLE DRIVING SIMULATORS FOR TRAINING PURPOSES; SIRENS FOR VEHICLES; FIRE EXTINGUISHING SYSTEMS; SATELLITE NAVIGATION SYSTEMS; GLOBAL POSITIONING SYSTEMS; COMPUTER SOFTWARE FOR DATA PROCESSING; GRAPHICAL USER INTERFACE SOFTWARE; SOFTWARE FOR DIAGNOSTICS AND TROUBLESHOOTING; SOFTWARE FOR SATELLITE NAVIGATION SYSTEMS; COMPUTER SOFTWARE FOR GLOBAL POSITIONING SYSTEMS [GPS]; DOWNLOADABLE COMPUTER SOFTWARE FOR REMOTE MONITORING AND ANALYSIS; CHARGING STATIONS FOR ELECTRIC VEHICLES; ALARMS; MEASURING INSTRUMENTS; NAVIGATIONAL INSTRUMENTS; SPEEDOMETERS FOR VEHICLES; TACHOMETERS; PRESSURE INDICATOR PLUGS FOR VALVES; THERMOSTATS FOR VEHICLE ENGINES; THERMOSTATS FOR VEHICLES; BATTERY TESTERS; TRANSFORMERS [ELECTRICITY]; STEP-DOWN TRANSFORMERS; BACKUP DRIVES FOR COMPUTERS; VOLTAGE MONITORING UNITS; BATTERY JARS; ALL INCLUDED IN CLASS 9.

BLOCK diagram

