Información sobre el producto, el fabricante y el importador

Fecha: 25 de febrero de 2026
Nombre del producto: CONTROLLER ASSY,BCM
Nombre del fabricante: Marelli corporation
Representante local: Derco SpA
Dirección: Americo Vespucio 1842 Santiago Chile
Dirección de correo electrónico de contacto: marcialsandoval@derco.cl
Sitio web: https://www.suzuki.cl/

Características técnicas del producto

	Información	Pág.
Tipo de equipo	CONTROLLER ASSY,BCM	**Test report** Pág. **5**
Marca	**MARELLI**	**Documento adjunto 1**
Modelo	**K67T0**	**Test report** Pág. **5**
Tecnología o modulación	**ASK**	**Test report** Pág. **5**
Frecuencias	**125 KHz**	**Test report** Pág. **5**
Ganancia de antena(dBi)	**—**	**—**
P.i.r.e.	**9.12 µV/m @300m**	**Test report** Pág.**15**
Módulos	**LF IC / 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. : 13760081H-A-R2

Applicant	:	**Marelli Corporation**
Type of EUT	:	**CONTROLLER ASSY, BCM**
Model Number of EUT	:	**K67T0**
FCC ID	:	**KBRK67T0**
Test regulation	:	**FCC Part 15 Subpart C: 2021**
Test Result	:	**Complied (Refer to SECTION 3)**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
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 the A2LA accreditation body.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
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.
10. This report is a revised version of 13760081H-A-R1. 13760081H-A-R1 is replaced with this report.

Date of test: August 27 and October 20, 2021

Representative test engineer:
Kiyoshiro Okazaki
Engineer

Approved by:
Shinichi Miyazono
Engineer

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.: 13760081H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13760081H-A	September 10, 2021	-	-
1	13760081H-A-R1	October 29, 2021	P.1	Correction of the test date in cover page
1	13760081H-A-R1	October 29, 2021	P.5	Correction of Local Oscillator Frequency in Receiver part for Radio Specification of Clause 2.2; From 24.305 MHz to 433.669 MHz
1	13760081H-A-R1	October 29, 2021	P.9	Addition of the description of simultaneous transmission in Clause 4.2
1	13760081H-A-R1	October 29, 2021	P.14	Addition of the test date
2	13760081H-A-R2	November 9, 2021	P.24	Addition of test equipment used for October 20, 2021 test.
2	13760081H-A-R2	November 9, 2021	all	Change the total number of pages

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation
AC	Alternating Current
AFH	Adaptive Frequency Hopping
AM	Amplitude Modulation
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
Cal Int	Calibration Interval
CCK	Complementary Code Keying
Ch., CH	Channel
CISPR	Comite International Special des Perturbations Radioelectriques
CW	Continuous Wave
DBPSK	Differential BPSK
DC	Direct Current
D-factor	Distance factor
DFS	Dynamic Frequency Selection
DQPSK	Differential QPSK
DSSS	Direct Sequence Spread Spectrum
EDR	Enhanced Data Rate
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
EN	European Norm
ERP, e.r.p.	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
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
LIMS	Laboratory Information Management System
MCS	Modulation and Coding Scheme
MRA	Mutual Recognition Arrangement
N/A	Not Applicable
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
P/M	Power meter
PCB	Printed Circuit Board
PER	Packet Error Rate
PHY	Physical Layer
PK	Peak
PN	Pseudo random Noise
PRBS	Pseudo-Random Bit Sequence
PSD	Power Spectral Density
QAM	Quadrature Amplitude Modulation
QP	Quasi-Peak
QPSK	Quadri-Phase Shift Keying
RBW	Resolution Band Width
RDS	Radio Data System
RE	Radio Equipment
RF	Radio Frequency
RMS	Root Mean Square
RSS	Radio Standards Specifications
Rx	Receiving
SA, S/A	Spectrum Analyzer
SG	Signal Generator
SVSWR	Site-Voltage Standing Wave Ratio
TR	Test Receiver
Tx	Transmitting
VBW	Video BandWidth
Vert.	Vertical
WLAN	Wireless LAN

CONTENTS **PAGE**

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, 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)
- 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	:	CONTROLLER ASSY, BCM
Model Number	:	K67T0
Serial Number	:	Refer to SECTION 4.2
Rating	:	DC 12.0 V
Receipt Date	:	August 16, 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: K67T0 (referred to as the EUT in this report) is a CONTROLLER ASSY, BCM.

Radio Specification

[Transmitter part]

Radio Type	:	Transmitter
Frequency of Operation	:	125 kHz
Modulation	:	ASK
Antenna type	:	Ferrite bar Antenna
Clock frequency (Maximum)	:	8 MHz

[Receiver part]

Type of Receiver	:	Super Heterodyne
Receiving Frequency	:	433.92 MHz
Local Oscillator Frequency	:	433.669 MHz
Intermediate Frequency	:	0.251 MHz
Antenna Type	:	Internal antenna (Independent antenna)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits; general requirements.

3.2 Procedures and results

Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
Conducted Emission	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Section 15.207	-	N/A	N/A	N/A *1)
Electric Field Strength of Fundamental Emission	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Section 15.209	Radiated	N/A	6.4 dB 125 kHz, 0 deg. Peak with Duty factor <Mode 2>	Complied a)
Electric Field Strength of Spurious Emission	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Section 15.209	Radiated	N/A	9.6 dB 31.726 MHz, Vertical, QP <Mode 1>	Complied a)
-20 dB Bandwidth	<FCC> ANSI C63.10:2013 6 Standard test methods	<FCC> Reference data	Radiated	N/A	N/A	Complied b)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

a) Refer to APPENDIX 1 (data of Radiated emission)
b) Refer to APPENDIX 1 (data of -26 dB Bandwidth / 99 % Occupied Bandwidth)

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.

FCC Part 15.31 (e)
The EUT provides stable voltage constantly to the wireless transmitter regardless of input voltage.
Instead of a new battery, DC power supply was used for the test.
That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the vehicle.
Therefore, the equipment complies with the antenna requirement of Section 15.203 .

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
99 % Occupied Band Width	RSS-Gen 6.7	-	Radiated	N/A	N/A	-
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.						

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. 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.
Ise EMC Lab.

Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	5.0 dB
	200 MHz to 1000 MHz (Horizontal)	5.2 dB
	(Vertical)	6.3 dB
10 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	4.8 dB
	200 MHz to 1000 MHz (Horizontal)	5.0 dB
	(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz	4.9 dB
	6 GHz to 18 GHz	5.2 dB
1 m	10 GHz to 26.5 GHz	5.5 dB
	26.5 GHz to 40 GHz	5.5 dB
10 m	1 GHz to 18 GHz	5.2 dB

Antenna Terminal test

Test Item	Uncertainty (+/-)
-20 dB Bandwidth / 99 % Occupied Bandwidth	0.96 %

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 199967
ISED Lab Company Number: 2973C / CAB identifier: JP0002
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

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.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 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.

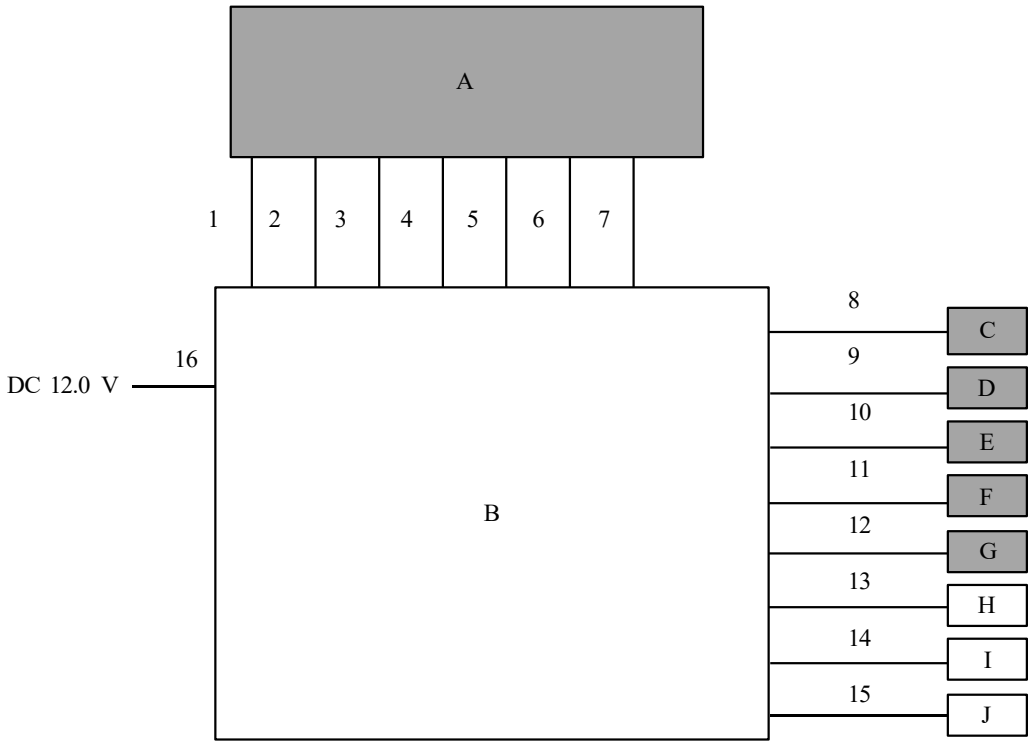
SECTION 4: Operation of EUT during testing

4.1. Operating Mode(s)

Test mode	Remarks
1) Mode 1	Tx 125kHz ANT ASSY-KLS, BACK
2) Mode 2	Tx 125kHz ANT ASSY-KLS, INNER FRONT
3) Mode 3	Tx 125kHz ANT ASSY-KLS, INNER BACK
4) Mode 4	Tx 125kHz ANT ASSY-KLS, DR DOOR
* EUT was set by the software as follows; Software: 4SX Version LF003 (Date: 2021.08.26, Storage location: EUT memory) *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

Justification : The system was configured in typical fashion (as a user would normally use it) for testing.

4.2. Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
* As a result of comparing DR DOOR Antenna and AS DOOR Antenna at pre-check, there was no difference in Radio characteristics.
Therefore the test was performed with DR DOOR Antenna as representative.
* EUT has the simultaneous transmission specifications of DR DOOR Antenna and AS DOOR Antenna.
After the test results between this simultaneous transmission and the DR DOOR Antenna single transmission were compared, it was confirmed that the single transmission was the worst.
Therefore, the test was performed with the DR DOOR Antenna.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	CONTROLLER ASSY, BCM	K67T0	045	Marelli Corporation	EUT
B	Checker Box	-	-	Marelli Corporation	-
C	ANT ASSY-KLS, DR DOOR	MSAS0913-01	0010	Murata Manufacturing Co.,Ltd.	EUT
D	ANT ASSY-KLS, AS DOOR	MSAS0913-01	0009	Murata Manufacturing Co.,Ltd.	EUT
E	ANT ASSY-KLS, INNER FRONT	MSAS0909-01	0198	Murata Manufacturing Co.,Ltd.	EUT
F	ANT ASSY-KLS, INNER BACK	MSAS0909-01	0113	Murata Manufacturing Co.,Ltd.	EUT
G	ANT ASSY-KLS, BACK	MSAS0912-01	0026	Murata Manufacturing Co.,Ltd.	EUT
H	SWITCH ASSY, ENGINE START	P55T0	0054	Marelli Corporation	-
I	Jig	-	-	-	-
J	Steering lock	-	-	-	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal Cable	1.7	Unshielded	Unshielded	-
2	Signal Cable	1.7	Unshielded	Unshielded	-
3	Signal Cable	1.7	Unshielded	Unshielded	-
4	Signal Cable	1.7	Unshielded	Unshielded	-
5	Signal Cable	1.7	Unshielded	Unshielded	-
6	Signal Cable	1.7	Unshielded	Unshielded	-
7	Signal Cable	1.7	Unshielded	Unshielded	-
8	Antenna Cable	5.6	Unshielded	Unshielded	-
9	Antenna Cable	5.6	Unshielded	Unshielded	-
10	Antenna Cable	2.0	Unshielded	Unshielded	-
11	Antenna Cable	2.0	Unshielded	Unshielded	-
12	Antenna Cable	2.0	Unshielded	Unshielded	-
13	Signal and DC Cable	1.5	Unshielded	Unshielded	-
14	Signal Cable	0.4	Unshielded	Unshielded	-
15	Signal Cable	1.5	Unshielded	Unshielded	-
16	DC Cable	1.0	Unshielded	Unshielded	-

SECTION 5: Radiated emission (Fundamental and Spurious Emission)

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

Frequency: From 9 kHz to 30 MHz
The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for vertical polarization (antenna angle: 0 deg., 45 deg., 90 deg., and 135 deg.) and horizontal polarization.
*Refer to Figure 1 about Direction of the Loop Antenna.

Frequency: From 30 MHz to 1 GHz
The measuring antenna height varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization.

The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	Below 30 MHz	30 MHz to 200 MHz	200 MHz to 1 GHz
Antenna Type	Loop	Biconical	Logperiodic

Frequency	From 9 kHz to 90 kHz and From 110 kHz to 150 kHz	From 90 kHz to 110 kHz	From 150 kHz to 490 kHz	From 490 kHz to 30 MHz	From 30 MHz to 1 GHz
Instrument used	Test Receiver				
Detector	PK / AV	QP	PK / AV	QP	QP
IF Bandwidth	200 Hz	200 Hz	9 kHz	9 kHz	120 kHz
Test Distance	3 m *1)	3 m *1)	3 m *1)	3 m *2)	3 m

*1) Distance Factor: 40 x log (3 m / 300 m) = -80 dB
*2) Distance Factor: 40 x log (3 m / 30 m) = -40 dB

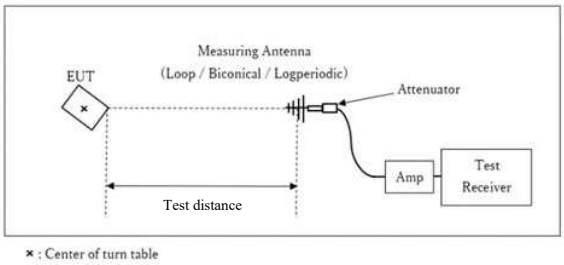
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

These tests were performed in semi anechoic chamber. Therefore, the measured level of emissions may be higher than if measurements were made without a ground plane.
However, test results were confirmed to pass against standard limit.

The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohmes. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to 45.5 - 51.5 = -6.0 dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

[Test Setup]

Below 1 GHz



Test Distance: 3 m

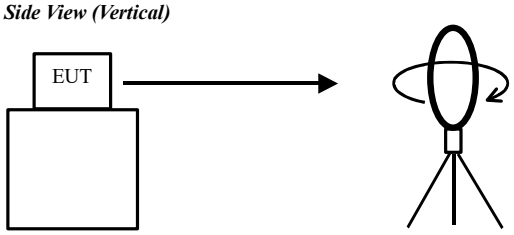
- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

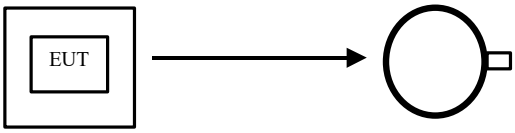
Measurement range : 9 kHz - 1 GHz
Test data : APPENDIX
Test result : Pass

Figure 1: Direction of the Loop Antenna

Side View (Vertical)

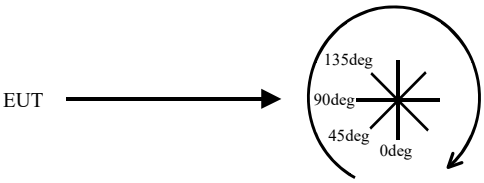


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



Front side: 0 deg.
Forward direction: clockwise

SECTION 6: -20 dB Bandwidth

Test Procedure
The test was measured with a spectrum analyzer using a test fixture.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
-20 dB Bandwidth	75 kHz	300 Hz	910 Hz	Auto	Peak	Max Hold	Spectrum Analyzer

Test data : APPENDIX 1
Test result : Pass

SECTION 7: 99% Bandwidth

Test Procedure
The test was measured with a spectrum analyzer using a test fixture.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
99 % Occupied Bandwidth	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak *)	Max Hold *)	Spectrum Analyzer
*) The measurement was performed with Peak detector, Max Hold since the duty cycle was not 100 %. Peak hold was applied as Worst-case measurement.							

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Radiated Emission (Fundamental and Spurious Emission)

Report No.	13760081H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	August 27, 2021	October 20. 2021
Temperature / Humidity	23 deg. C / 65 % RH	22 deg. C / 45 % RH
Engineer	Kiyoshiro Okazaki	Junya Okuno
Mode	Mode 1	

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	105.8	18.9	-74.0	32.3	-	18.4	45.6	27.2	Fundamental
0deg	0.25000	PK	77.2	18.9	-73.9	32.3	-	-10.1	39.6	49.7	
0deg	0.37500	PK	80.6	18.8	-73.9	32.3	-	-6.8	36.1	42.9	
0deg	0.50000	QP	55.9	18.8	-33.9	32.3	-	8.5	33.6	25.1	
0deg	0.62500	QP	46.2	18.8	-33.9	32.4	-	-1.3	31.7	33.0	
0deg	0.75000	QP	39.9	18.8	-33.8	32.4	-	-7.5	30.1	37.6	
0deg	0.87500	QP	31.8	18.8	-33.8	32.4	-	-15.6	28.7	44.3	
0deg	1.00000	QP	34.3	18.8	-33.8	32.4	-	-13.1	27.6	40.7	
0deg	1.12500	QP	32.7	18.8	-33.8	32.4	-	-14.7	26.5	41.2	
0deg	1.25000	QP	31.3	18.8	-33.8	32.4	-	-16.1	25.6	41.7	
Hori.	34.816	QP	34.0	17.0	6.8	28.5	-	29.3	40.0	10.7	
Hori.	44.309	QP	24.9	13.5	6.9	28.4	-	16.9	40.0	23.1	
Hori.	75.194	QP	28.6	6.5	7.3	28.4	-	14.0	40.0	26.0	
Hori.	107.985	QP	23.3	11.5	7.5	28.3	-	14.0	43.5	29.5	
Hori.	187.959	QP	22.6	16.3	8.1	28.0	-	19.0	43.5	24.5	
Hori.	242.657	QP	41.7	12.4	8.5	27.7	-	34.9	46.0	11.1	
Hori.	358.637	QP	23.3	15.4	9.3	28.0	-	20.0	46.0	26.0	
Hori.	454.347	QP	22.5	16.9	9.7	28.8	-	20.3	46.0	25.7	
Vert.	31.726	QP	33.9	18.2	6.8	28.5	-	30.4	40.0	9.6	
Vert.	34.816	QP	29.9	17.0	6.8	28.5	-	25.2	40.0	14.8	
Vert.	37.476	QP	33.0	16.0	6.8	28.5	-	27.3	40.0	12.7	
Vert.	44.309	QP	30.1	13.5	6.9	28.4	-	22.1	40.0	17.9	
Vert.	75.194	QP	42.6	6.5	7.3	28.4	-	28.0	40.0	12.0	
Vert.	120.103	QP	28.5	12.9	7.6	28.3	-	20.7	43.5	22.8	
Vert.	187.959	QP	25.3	16.3	8.1	28.0	-	21.7	43.5	21.8	
Vert.	233.800	QP	37.8	12.5	8.4	27.7	-	31.0	46.0	15.0	
Vert.	454.347	QP	22.7	16.9	9.7	28.8	-	20.5	46.0	25.5	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	105.8	18.9	-74.0	32.3	0.0	18.4	25.6	7.2	Fundamental
0deg	0.25000	PK	77.2	18.9	-73.9	32.3	0.0	-10.1	19.6	29.7	
0deg	0.37500	PK	80.6	18.8	-73.9	32.3	0.0	-6.8	16.1	22.9	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	105.8	18.9	6.0	32.3	-	98.4	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Report No.	13760081H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	August 27, 2021
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Kiyoshiro Okazaki
Mode	Mode 2

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	106.6	18.9	-74.0	32.3	-	19.2	45.6	26.4	Fundamental
0deg	0.25000	PK	76.5	18.9	-73.9	32.3	-	-10.8	39.6	50.4	
0deg	0.37500	PK	82.6	18.8	-73.9	32.3	-	-4.8	36.1	40.9	
0deg	0.50000	QP	47.2	18.8	-33.9	32.3	-	-0.2	33.6	33.8	
0deg	0.62500	QP	41.0	18.8	-33.9	32.4	-	-6.5	31.7	38.2	
0deg	0.75000	QP	35.8	18.8	-33.8	32.4	-	-11.6	30.1	41.7	
0deg	0.87500	QP	32.4	18.8	-33.8	32.4	-	-15.0	28.7	43.7	
0deg	1.00000	QP	34.5	18.8	-33.8	32.4	-	-12.9	27.6	40.5	
0deg	1.12500	QP	31.4	18.8	-33.8	32.4	-	-16.0	26.5	42.5	
0deg	1.25000	QP	31.1	18.8	-33.8	32.4	-	-16.3	25.6	41.9	
Hori.	35.780	QP	33.6	16.6	6.8	28.5	-	28.5	40.0	11.5	
Hori.	73.012	QP	28.6	6.4	7.2	28.4	-	13.8	40.0	26.2	
Hori.	100.043	QP	23.4	10.3	7.5	28.3	-	12.9	43.5	30.6	
Hori.	119.425	QP	22.5	12.8	7.6	28.3	-	14.6	43.5	28.9	
Hori.	153.761	QP	22.6	15.2	7.9	28.1	-	17.6	43.5	25.9	
Hori.	233.601	QP	41.5	12.5	8.4	27.7	-	34.7	46.0	11.3	
Hori.	321.605	QP	23.5	14.9	9.0	27.8	-	19.6	46.0	26.4	
Vert.	31.871	QP	33.8	18.1	6.8	28.5	-	30.2	40.0	9.8	
Vert.	35.780	QP	28.9	16.6	6.8	28.5	-	23.8	40.0	16.2	
Vert.	73.012	QP	43.3	6.4	7.2	28.4	-	28.5	40.0	11.5	
Vert.	100.043	QP	27.9	10.3	7.5	28.3	-	17.4	43.5	26.1	
Vert.	119.425	QP	28.6	12.8	7.6	28.3	-	20.7	43.5	22.8	
Vert.	153.761	QP	24.6	15.2	7.9	28.1	-	19.6	43.5	23.9	
Vert.	233.601	QP	37.6	12.5	8.4	27.7	-	30.8	46.0	15.2	
Vert.	321.605	QP	22.5	14.9	9.0	27.8	-	18.6	46.0	27.4	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	106.6	18.9	-74.0	32.3	0.0	19.2	25.6	6.4	Fundamental
0deg	0.25000	PK	76.5	18.9	-73.9	32.3	0.0	-10.8	19.6	30.4	
0deg	0.37500	PK	82.6	18.8	-73.9	32.3	0.0	-4.8	16.1	20.9	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	106.6	18.9	6.0	32.3	-	99.2	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Report No.	13760081H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	August 27, 2021
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Kiyoshiro Okazaki
Mode	Mode 3

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	106.4	18.9	-74.0	32.3	-	19.0	45.6	26.6	Fundamental
0deg	0.25000	PK	76.3	18.9	-73.9	32.3	-	-11.0	39.6	50.6	
0deg	0.37500	PK	80.8	18.8	-73.9	32.3	-	-6.6	36.1	42.7	
0deg	0.50000	QP	49.5	18.8	-33.9	32.3	-	2.1	33.6	31.5	
0deg	0.62500	QP	40.0	18.8	-33.9	32.4	-	-7.5	31.7	39.2	
0deg	0.75000	QP	36.9	18.8	-33.8	32.4	-	-10.5	30.1	40.6	
0deg	0.87500	QP	33.4	18.8	-33.8	32.4	-	-14.0	28.7	42.7	
0deg	1.00000	QP	34.6	18.8	-33.8	32.4	-	-12.8	27.6	40.4	
0deg	1.12500	QP	31.0	18.8	-33.8	32.4	-	-16.4	26.5	42.9	
0deg	1.25000	QP	31.2	18.8	-33.8	32.4	-	-16.2	25.6	41.8	
Hori.	33.230	QP	33.7	17.6	6.8	28.5	-	29.6	40.0	10.4	
Hori.	44.109	QP	24.5	13.6	6.9	28.4	-	16.6	40.0	23.4	
Hori.	53.120	QP	25.5	10.2	7.0	28.4	-	14.3	40.0	25.7	
Hori.	82.529	QP	28.0	7.3	7.3	28.4	-	14.2	40.0	25.8	
Hori.	102.759	QP	23.1	10.7	7.5	28.3	-	13.0	43.5	30.5	
Hori.	126.771	QP	22.5	13.5	7.7	28.2	-	15.5	43.5	28.0	
Hori.	251.202	QP	42.2	12.3	8.5	27.7	-	35.3	46.0	10.7	
Hori.	432.017	QP	22.4	16.5	9.6	28.6	-	19.9	46.0	26.1	
Vert.	33.230	QP	33.9	17.6	6.8	28.5	-	29.8	40.0	10.2	
Vert.	44.109	QP	29.7	13.6	6.9	28.4	-	21.8	40.0	18.2	
Vert.	53.120	QP	29.8	10.2	7.0	28.4	-	18.6	40.0	21.4	
Vert.	82.529	QP	40.5	7.3	7.3	28.4	-	26.7	40.0	13.3	
Vert.	102.759	QP	27.6	10.7	7.5	28.3	-	17.5	43.5	26.0	
Vert.	126.771	QP	28.4	13.5	7.7	28.2	-	21.4	43.5	22.1	
Vert.	251.202	QP	38.4	12.3	8.5	27.7	-	31.5	46.0	14.5	
Vert.	432.017	QP	22.6	16.5	9.6	28.6	-	20.1	46.0	25.9	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	106.4	18.9	-74.0	32.3	0.0	19.0	25.6	6.6	Fundamental
0deg	0.25000	PK	76.3	18.9	-73.9	32.3	0.0	-11.0	19.6	30.6	
0deg	0.37500	PK	80.8	18.8	-73.9	32.3	0.0	-6.6	16.1	22.7	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	106.4	18.9	6.0	32.3	-	99.0	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Report No.	13760081H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	August 27, 2021
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Kiyoshiro Okazaki
Mode	Mode 4

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	104.6	18.9	-74.0	32.3	-	17.2	45.6	28.4	Fundamental
0deg	0.25000	PK	77.0	18.9	-73.9	32.3	-	-10.3	39.6	49.9	
0deg	0.37500	PK	71.5	18.8	-73.9	32.3	-	-15.9	36.1	52.0	
0deg	0.50000	QP	48.9	18.8	-33.9	32.3	-	1.5	33.6	32.1	
0deg	0.62500	QP	42.0	18.8	-33.9	32.4	-	-5.5	31.7	37.2	
0deg	0.75000	QP	36.6	18.8	-33.8	32.4	-	-10.8	30.1	40.9	
0deg	0.87500	QP	33.1	18.8	-33.8	32.4	-	-14.3	28.7	43.0	
0deg	1.00000	QP	33.9	18.8	-33.8	32.4	-	-13.5	27.6	41.1	
0deg	1.12500	QP	31.1	18.8	-33.8	32.4	-	-16.3	26.5	42.8	
0deg	1.25000	QP	30.9	18.8	-33.8	32.4	-	-16.5	25.6	42.1	
Hori.	34.081	QP	33.5	17.3	6.8	28.5	-	29.1	40.0	10.9	
Hori.	39.520	QP	24.3	15.2	6.9	28.5	-	17.9	40.0	22.1	
Hori.	44.111	QP	25.0	13.6	6.9	28.4	-	17.1	40.0	22.9	
Hori.	69.101	QP	27.8	6.4	7.2	28.4	-	13.0	40.0	27.0	
Hori.	125.713	QP	23.5	13.5	7.7	28.2	-	16.5	43.5	27.0	
Hori.	174.842	QP	22.4	15.8	8.0	28.0	-	18.2	43.5	25.3	
Hori.	233.608	QP	41.6	12.5	8.4	27.7	-	34.8	46.0	11.2	
Vert.	31.700	QP	33.7	18.2	6.8	28.5	-	30.2	40.0	9.8	
Vert.	34.081	QP	29.5	17.3	6.8	28.5	-	25.1	40.0	14.9	
Vert.	39.520	QP	33.2	15.2	6.9	28.5	-	26.8	40.0	13.2	
Vert.	44.111	QP	30.1	13.6	6.9	28.4	-	22.2	40.0	17.8	
Vert.	69.101	QP	41.6	6.4	7.2	28.4	-	26.8	40.0	13.2	
Vert.	125.713	QP	28.4	13.5	7.7	28.2	-	21.4	43.5	22.1	
Vert.	174.842	QP	25.4	15.8	8.0	28.0	-	21.2	43.5	22.3	
Vert.	233.608	QP	37.9	12.5	8.4	27.7	-	31.1	46.0	14.9	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	104.6	18.9	-74.0	32.3	0.0	17.2	25.6	8.4	Fundamental
0deg	0.25000	PK	77.0	18.9	-73.9	32.3	0.0	-10.3	19.6	29.9	
0deg	0.37500	PK	71.5	18.8	-73.9	32.3	0.0	-15.9	16.1	32.0	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3m without Distance factor

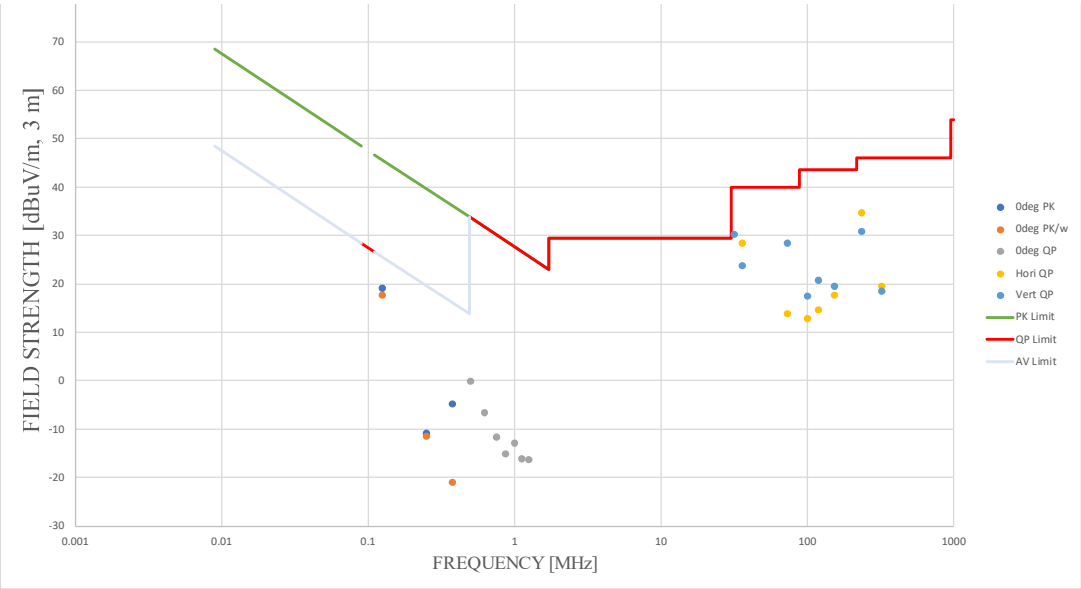
Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	104.6	18.9	6.0	32.3	-	97.2	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Spurious Emission
(Plot data, Worst case)

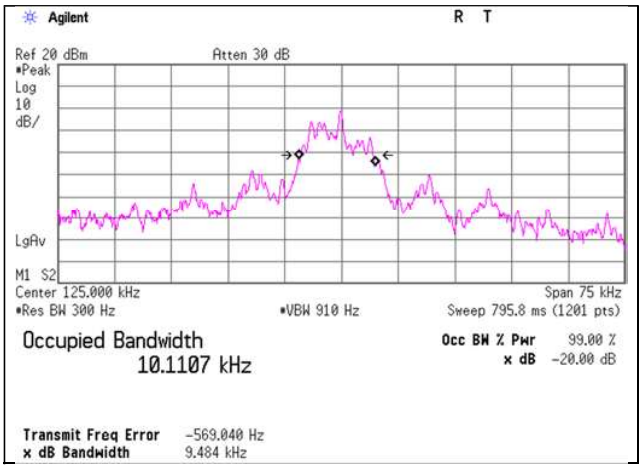
Report No.	13760081H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	August 27, 2021
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Kiyoshiro Okazaki
Mode	Mode 2



-20 dB Bandwidth / 99 % Occupied Bandwidth

Report No.	13760081H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	August 27, 2021
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Kiyoshiro Okazaki
Mode	Mode 1

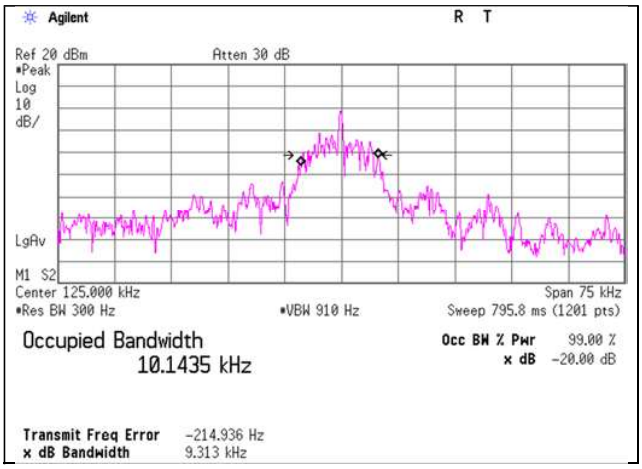
-20 dB Bandwidth [kHz]	99 % Occupied Bandwidth [kHz]
9.484	10.1107



-20 dB Bandwidth / 99 % Occupied Bandwidth

Report No.	13760081H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	August 27, 2021
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Kiyoshiro Okazaki
Mode	Mode 2

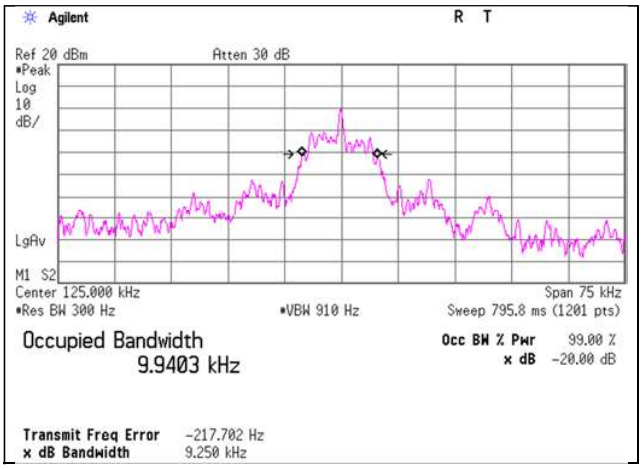
-20 dB Bandwidth [kHz]	99 % Occupied Bandwidth [kHz]
9.313	10.1435



-20 dB Bandwidth / 99 % Occupied Bandwidth

Report No.	13760081H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	August 27, 2021
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Kiyoshiro Okazaki
Mode	Mode 3

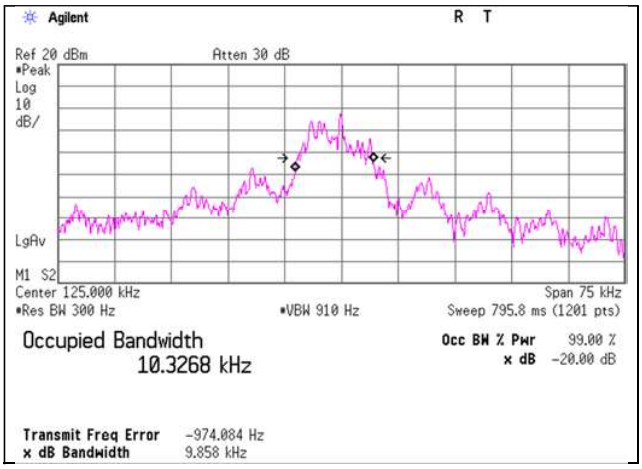
-20 dB Bandwidth [kHz]	99 % Occupied Bandwidth [kHz]
9.250	9.9403



-20 dB Bandwidth / 99 % Occupied Bandwidth

Report No.	13760081H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	August 27, 2021
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Kiyoshiro Okazaki
Mode	Mode 4

-20 dB Bandwidth [kHz]	99 % Occupied Bandwidth [kHz]
9.858	10.3268



APPENDIX 2: Test instruments

Test equipment (Test date: August 27, 2021)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MAEC-02	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	05/26/2020	24
RE	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/06/2020	12
RE	MMM-01	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/10/2021	12
RE	MJM-27	142228	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MTR-10	141951	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	03/09/2021	12
RE	MSA-03	141884	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY44020357	03/10/2021	12
RE	MAT-07	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/13/2020	12
RE	MBA-08	141427	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103B+BBA9106	08031	07/10/2021	12
RE	MCC-12	141317	Coaxial Cable	UL Japan Inc.	-	-	09/25/2020	12
RE	MLA-21	141265	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-190	07/10/2021	12
RE	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/18/2021	12
RE	MPA-13	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/18/2021	12
RE	MLPA-02	142152	Loop Antenna	Rohde & Schwarz	HFH2-Z2	836553/009	12/04/2020	12
RE	MCC-219	159670	Coaxial Cable	UL Japan Inc.	-	-	11/17/2020	12
RE	MCC-13	141222	Coaxial Cable	Fujikura,HP,Mini-Circits,Fujikura	3D-2W(12m)/ 5D-2W(5m)/ 5D-2W(0.8m)/ 5D-2W(1m)	-	02/18/2021	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 test

Test equipment (Test date : October 20, 2021)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MAEC-02	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	05/26/2020	24
RE	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/06/2020	12
RE	MMM-01	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/10/2021	12
RE	MJM-27	142228	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MTR-10	141951	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	03/09/2021	12
RE	MSA-03	141884	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY44020357	03/10/2021	12
RE	MAT-07	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/13/2020	12
RE	MBA-08	141427	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103B+BBA9106	08031	07/10/2021	12
RE	MCC-12	141317	Coaxial Cable	UL Japan Inc.	-	-	09/06/2021	12
RE	MLA-21	141265	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-190	07/10/2021	12
RE	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/18/2021	12
RE	MPA-13	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/18/2021	12
RE	MLPA-02	142152	Loop Antenna	Rohde & Schwarz	HFH2-Z2	836553/009	12/04/2020	12
RE	MCC-219	159670	Coaxial Cable	UL Japan Inc.	-	-	11/17/2020	12
RE	MCC-13	141222	Coaxial Cable	Fujikura,HP,Mini-Circits,Fujikura	3D-2W(12m)/ 5D-2W(5m)/ 5D-2W(0.8m)/ 5D-2W(1m)	-	02/18/2021	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 test

APPENDIX 3: Photographs of test setup

Radiated Spurious Emission

Photo 1

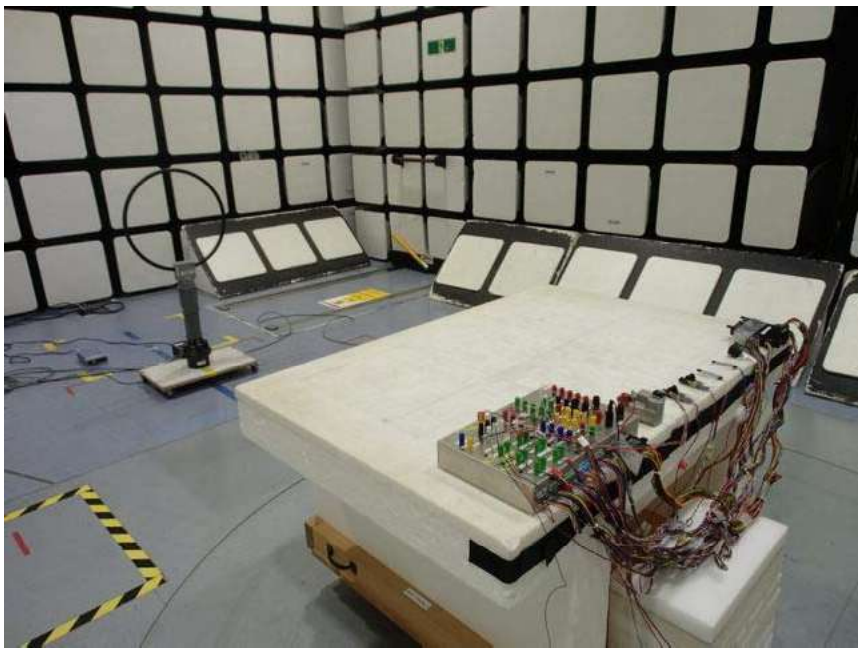
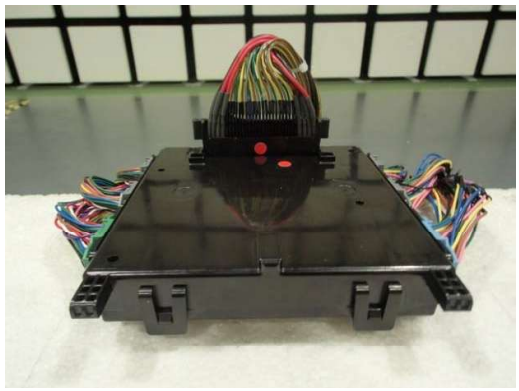


Photo 2

Worst Case Position

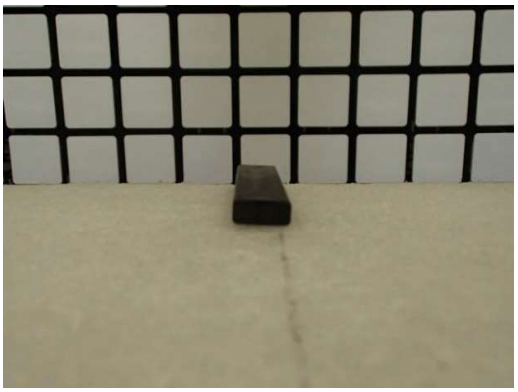
BCM
Below 30 MHz
X-axis
Above 30 MHz
Horizontal: X-axis / Vertical: X-axis
X-axis



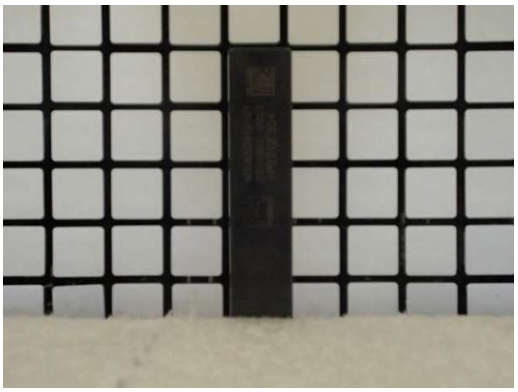
Y-axis

Z-axis

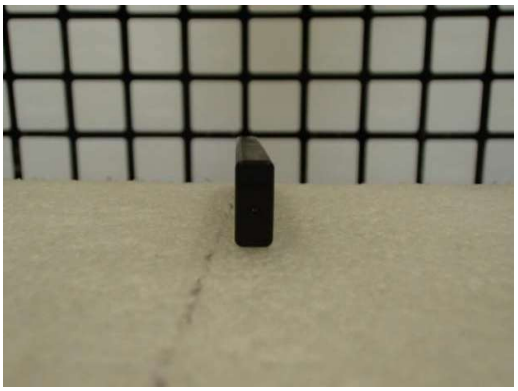
ANT ASSY-KLS, BACK
Below 30 MHz
X-axis
Above 30 MHz
Horizontal: X-axis / Vertical: X-axis
X-axis



Y-axis



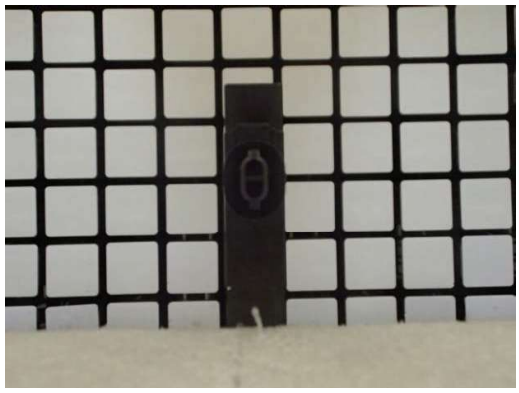
Z-axis



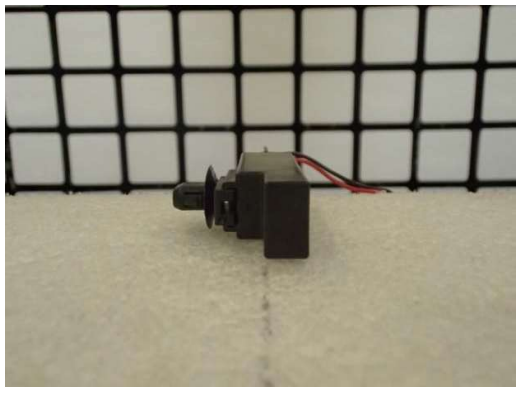
Worst Case Position

ANT ASSY-KLS, INNER FRONT
Below 30 MHz
X-axis
Above 30 MHz
Horizontal: X-axis / Vertical: X-axis
X-axis

Y-axis



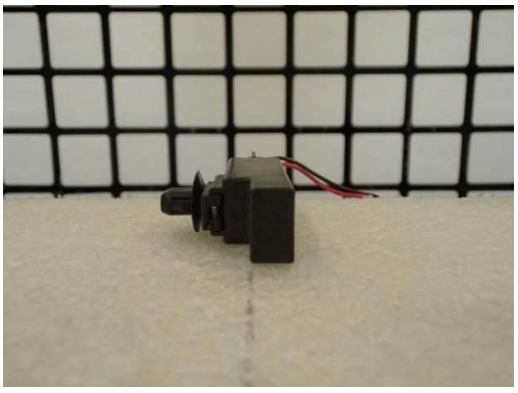
Z-axis



ANT ASSY-KLS, INNER BACK
Below 30 MHz
X-axis
Above 30 MHz
Horizontal: X-axis / Vertical: X-axis
X-axis

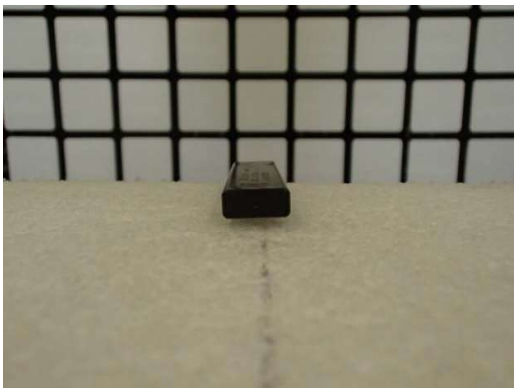
Y-axis

Z-axis

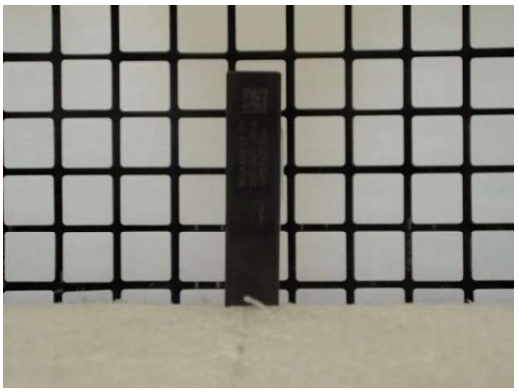


Worst Case Position

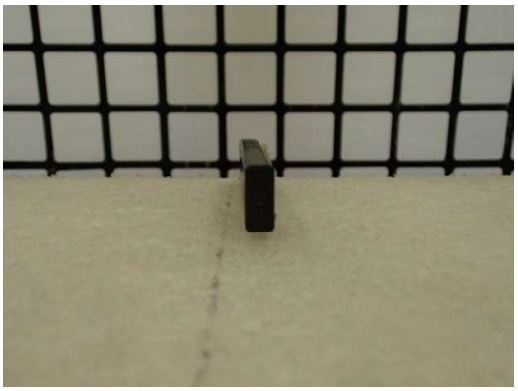
ANT ASSY-KLS, AS/DR DOOR
Below 30 MHz
X-axis
Above 30 MHz
Horizontal: X-axis / Vertical: X-axis
X-axis



Y-axis



Z-axis



End of Report

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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)

(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 (CONTROLLER ASSY,BCM)