



Información sobre el producto, el fabricante y el importador

Fecha: 25 de febrero de 2026

Nombre del producto: SWITCH ASSY,ENGINE START

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	SWITCH ASSY,ENGINE START	Test report Pág. 5
Marca	MARELLI	Documento adjunto 1
Modelo	P55T0	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.	2.09 μV/m @300m	Test report Pág.13
Módulos	LF 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. 14214945H

Customer	Marelli Corporation
Description of EUT	SWITCH ASSY, ENGINE START / SWITCH ASSY, POWER
Model Number of EUT	P55T0
FCC ID	KBRP55T0
Test Regulation	FCC Part 15 Subpart C: 2021
Test Result	Complied (Refer to SECTION 3)
Issue Date	March 29, 2022
Remarks	-

Representative Test Engineer

Shinya Watanabe
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, Inc.
 There is no testing item of "Non-accreditation".

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 20.0

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- The information provided from the applicant for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No.: 14214945H

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14214945H	March 29, 2022	-

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer Information

Company Name	Marelli Corporation
Address	2-1917 Nisshin-cho kita-ku,Saitama-city, Saitama 331-8501 Japan
Telephone Number	+81-48-661-0580
Contact Person	Takaichiro Ishida

The information provided from the customer is as follows;

- Customer, Description 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) other than the Receipt Date and Test 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

Description	SWITCH ASSY, ENGINE START / SWITCH ASSY, POWER
Model Number	P55T0
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	March 11, 2022
Test Date	March 20, 2022

2.2 Product Description

General Specification

Rating	DC 12 V
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Radio Specification

Equipment Type	Transceiver
Frequency of Operation	125 kHz
Type of Modulation	ASK

<Contents of the change from original model>

Original test report number of this report is 13735873H-R1.

The EUT is changed the specification from original model as below.

- Design surface difference..

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 <ISED> RSS-Gen 8.8	<FCC> Section 15.207 <ISED> RSS-Gen 8.8	-	N/A	N/A	N/A *1)
Electric Field Strength of Fundamental Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> RSS-Gen 6.5, 6.12	<FCC> Section 15.209 <ISED> RSS-210 7.2 RSS-Gen 8.9	Radiated	N/A	19.1 dB 125 kHz, 0 deg. Peak with Duty factor	Complied a)
Electric Field Strength of Spurious Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> RSS-Gen 6.5, 6.6, 6.13	<FCC> Section 15.209 <ISED> RSS-210 7.3 RSS-Gen 8.9	Radiated	N/A	22.4 dB 62.238 MHz, Vertical, QP	Complied a)
-20 dB Bandwidth	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> -	<FCC> Reference data <ISED> -	Radiated	N/A	N/A	Complied b)

Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.

*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 -20 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 EUT.

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% emission bandwidth	RSS-Gen 6.7	-	Radiated	N/A	N/A	-

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 $k=2$.

Test Item		Frequency range		Uncertainty (+/-)
Radiated emission	3 m	9 kHz to 30 MHz		3.2 dB
				10 m
	3 m	30 MHz to 200 MHz	Horizontal	4.8 dB
			Vertical	5.0 dB
		200 MHz to 1000 MHz	Horizontal	5.1 dB
			Vertical	6.2 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		5.4 dB
		26.5 GHz to 40 GHz		5.4 dB
10 m	1 GHz to 18 GHz		5.4 dB	
-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: 884919

ISED Lab Company Number: 2973C / CAB identifier: JP0002

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

Telephone: +81-596-24-8999

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	-	-
Large Chamber	16.9 x 22.1 x 10.17	16.9 x 22.1	-	10 m
Small Chamber	5.3 x 6.69 x 3.59	5.3 x 6.69	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

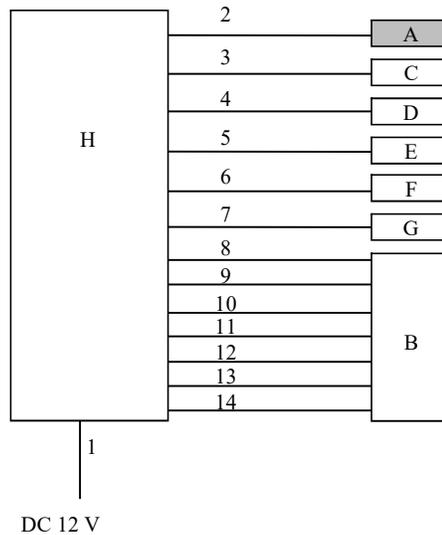
SECTION 4: Operation of EUT during testing

4.1. Operating Mode(s)

Test mode	Remarks
1) Tx 125 kHz	-
* EUT was set by the software as follows; Software: 4SX034_31ImmobiContinue2.mot Version 34 (Date: December 8, 2020, 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.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	SWITCH ASSY, ENGINE START / SWITCH ASSY, POWER	P55T0	211228A	Marelli Corporation	EUT
B	BCM	K67T0	0001	Marelli Corporation	-
C	LF Antenna	MSAS0912-01	-	Murata Manufacturing Co.,Ltd	-
D	LF Antenna	MSAS0912-01	-	Murata Manufacturing Co.,Ltd	-
E	LF Antenna	MSAS0912-01	-	Murata Manufacturing Co.,Ltd	-
F	LF Antenna	MSAS0912-01	-	Murata Manufacturing Co.,Ltd	-
G	LF Antenna	MSAS0912-01	-	Murata Manufacturing Co.,Ltd	-
H	BCM SDX Checker	-	-	Marelli Corporation	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	2.0	Unshielded	Unshielded	-
2	Antenna Cable	1.8	Unshielded	Unshielded	-
3	Antenna Cable	2.2	Unshielded	Unshielded	-
4	Antenna Cable	2.2	Unshielded	Unshielded	-
5	Antenna Cable	2.2	Unshielded	Unshielded	-
6	Antenna Cable	2.2	Unshielded	Unshielded	-
7	Antenna Cable	2.2	Unshielded	Unshielded	-
8	Signal Cable	2.0	Unshielded	Unshielded	-
9	Signal Cable	2.0	Unshielded	Unshielded	-
10	Signal Cable	2.0	Unshielded	Unshielded	-
11	Signal Cable	2.0	Unshielded	Unshielded	-
12	Signal Cable	2.0	Unshielded	Unshielded	-
13	Signal Cable	2.0	Unshielded	Unshielded	-
14	Signal Cable	2.0	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: $40 \times \log(3 \text{ m} / 300 \text{ m}) = -80 \text{ dB}$

*2) Distance Factor: $40 \times \log(3 \text{ m} / 30 \text{ m}) = -40 \text{ dB}$

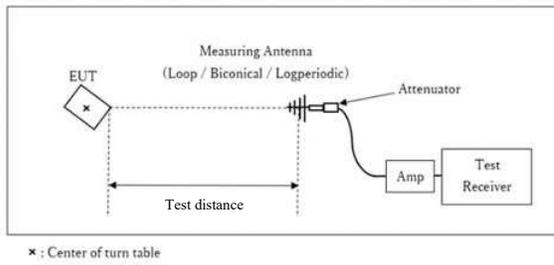
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open 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 Ohms. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to $45.5 - 51.5 = -6.0 \text{ dBuA/m}$, 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.

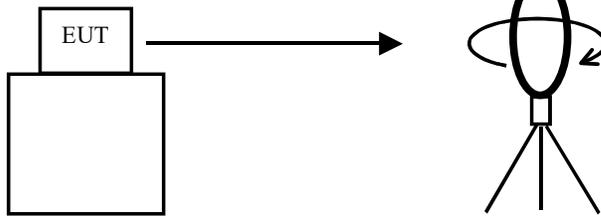
This EUT has two modes which transponder key is attached or not. The worst case was confirmed with and without transponder key attached, as a result, the test without transponder key attached was the worst case. Therefore the test without transponder key attached was performed only.

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)

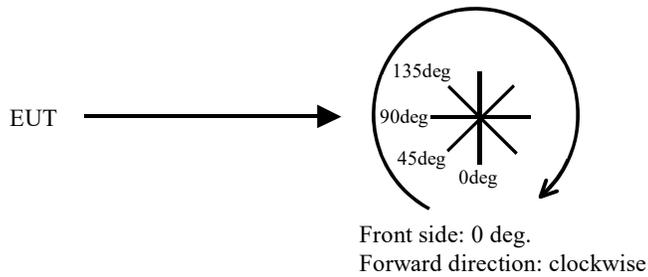


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



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	1 kHz	3 kHz	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 *1)	Max Hold *1)	Spectrum Analyzer

*1) 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)

Test place Ise EMC Lab.
Semi Anechoic Chamber No.1
Date March 20, 2022
Temperature / Humidity 19 deg. C / 38 % RH
Engineer Shinya Watanabe
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	93.9	18.9	-74.0	32.3	-	6.5	45.6	39.1	Fundamental
0deg	0.25000	PK	50.6	18.9	-74.0	32.3	-	-36.8	39.6	76.4	
0deg	0.37500	PK	56.1	18.8	-73.9	32.2	-	-31.2	36.1	67.3	
0deg	0.50000	QP	33.7	18.8	-33.9	32.2	-	-13.6	33.6	47.2	
0deg	0.62500	QP	46.2	18.8	-33.9	32.2	-	-1.1	31.7	32.8	
0deg	0.75000	QP	32.6	18.8	-33.9	32.2	-	-14.7	30.1	44.8	
0deg	0.87500	QP	41.3	18.8	-33.8	32.2	-	-5.9	28.7	34.6	
0deg	1.00000	QP	32.0	18.8	-33.8	32.2	-	-15.2	27.6	42.8	
0deg	1.12500	QP	38.0	18.8	-33.8	32.2	-	-9.2	26.5	35.7	
0deg	1.25000	QP	31.7	18.8	-33.8	32.2	-	-15.5	25.6	41.1	
Hori.	30.673	QP	22.4	18.2	7.2	32.2	-	15.6	40.0	24.4	
Hori.	53.988	QP	28.6	9.7	7.7	32.2	-	13.8	40.0	26.2	
Hori.	62.238	QP	30.1	7.4	7.8	32.2	-	13.1	40.0	26.9	
Hori.	82.817	QP	27.4	7.3	8.2	32.2	-	10.7	40.0	29.3	
Hori.	122.135	QP	22.0	12.9	8.7	32.1	-	11.5	43.5	32.0	
Hori.	280.000	QP	21.7	14.4	10.2	32.0	-	14.3	46.0	31.7	
Vert.	30.673	QP	22.8	18.2	7.2	32.2	-	16.0	40.0	24.0	
Vert.	53.988	QP	31.9	9.7	7.7	32.2	-	17.1	40.0	22.9	
Vert.	62.238	QP	34.6	7.4	7.8	32.2	-	17.6	40.0	22.4	
Vert.	82.817	QP	28.7	7.3	8.2	32.2	-	12.0	40.0	28.0	
Vert.	122.135	QP	22.2	12.9	8.7	32.1	-	11.7	43.5	31.8	
Vert.	280.000	QP	21.6	14.4	10.2	32.0	-	14.2	46.0	31.8	

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

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	93.9	18.9	-74.0	32.3	0.0	6.5	25.6	19.1	Fundamental
0deg	0.25000	PK	50.6	18.9	-74.0	32.3	0.0	-36.8	19.6	56.4	
0deg	0.37500	PK	56.1	18.8	-73.9	32.2	0.0	-31.2	16.1	47.3	

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

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

Result of the fundamental emission at 3 m without Distance factor

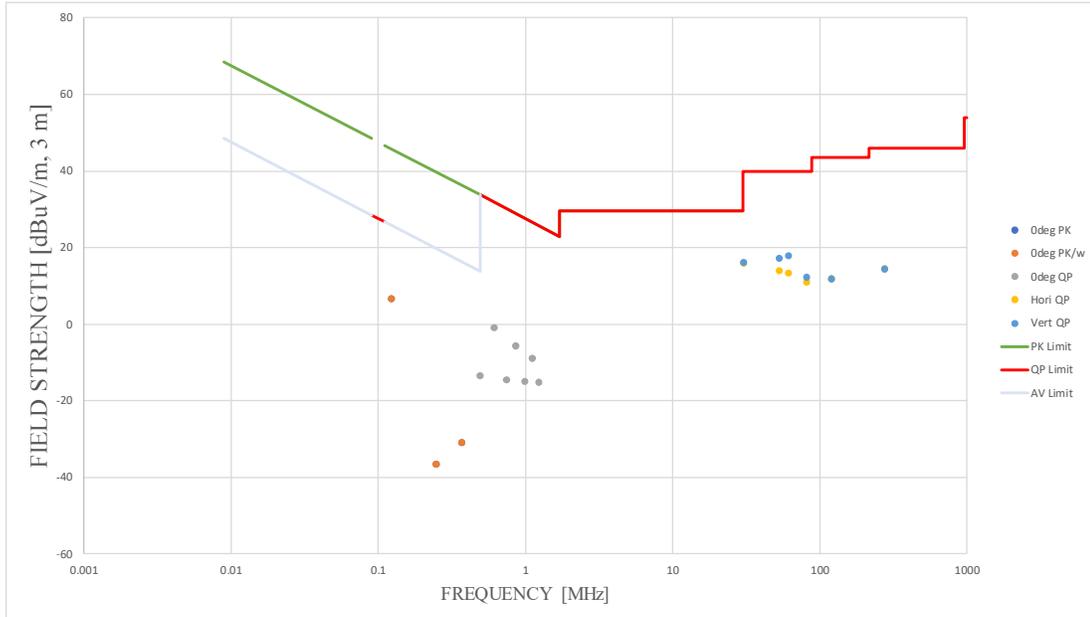
Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12500	PK	93.9	18.9	6.0	32.3	-	86.5	-	-	Fundamental

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

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power. The pre-amplifier used for carrier frequency measurement was not saturated.
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 for Fundamental Emission)

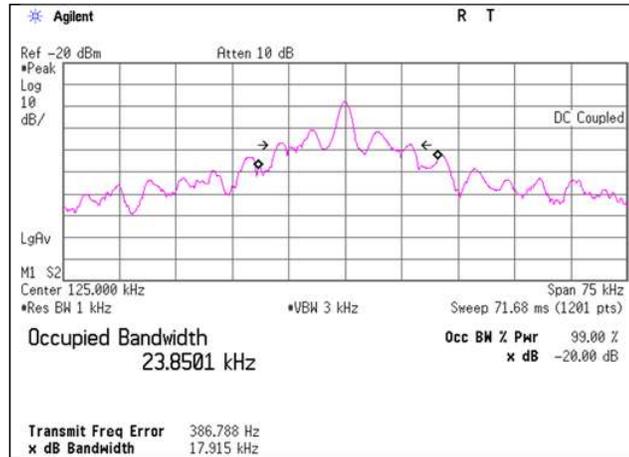
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.1
Date	March 20, 2022
Temperature / Humidity	19 deg. C / 38 % RH
Engineer	Shinya Watanabe
Mode	Mode 1



-20 dB Bandwidth / 99 % Occupied Bandwidth

Test place Ise EMC Lab.
Semi Anechoic Chamber No.1
Date March 20, 2022
Temperature / Humidity 19 deg. C / 38 % RH
Engineer Shinya Watanabe
Mode Mode 1

-20 dB Bandwidth [kHz]	99 % Occupied Bandwidth [kHz]
17.915	23.8501



APPENDIX 2: Test instruments

Test equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MAEC-01	141998	AC1_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	06/08/2020	24
RE	MOS-27	141566	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	A08Q26	01/10/2022	12
RE	MMM-09	141533	DIGITAL HITESTER	HIOKI E.E. CORPORATION	3805	51201195	01/16/2022	12
RE	MJM-25	142226	Measure	KOMELON	KMC-36	-	-	-
RE	MTR-09	141950	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	-	-
RE	MLPA-01	141254	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	04/17/2021	12
RE	MAT-08	141213	Attenuator(6dB)	Weinschel Corp	2	BK7971	11/09/2021	12
RE	MPA-13	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/25/2022	12
RE	MCC-03	141215	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W/3D-2W/ RG400u/ RFM-E421(SW)	-/01068 (Switcher)	06/02/2021	12
RE	MCC-255	207745	Coaxial Cable	UL Japan, Inc.	-	-	05/17/2021	12
RE	KBA-05	141198	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103+BBA9106	2513	04/10/2021	12
RE	MLA-20	141264	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	189	04/10/2021	12
RE	MCC-02	141350	Coaxial Cable	Suhner/storm/Agilent/TSJ	-	-	03/08/2022	12
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MSA-14	141901	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250080	01/10/2022	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

APPENDIX 3: Photographs of test setup

Radiated Spurious Emission

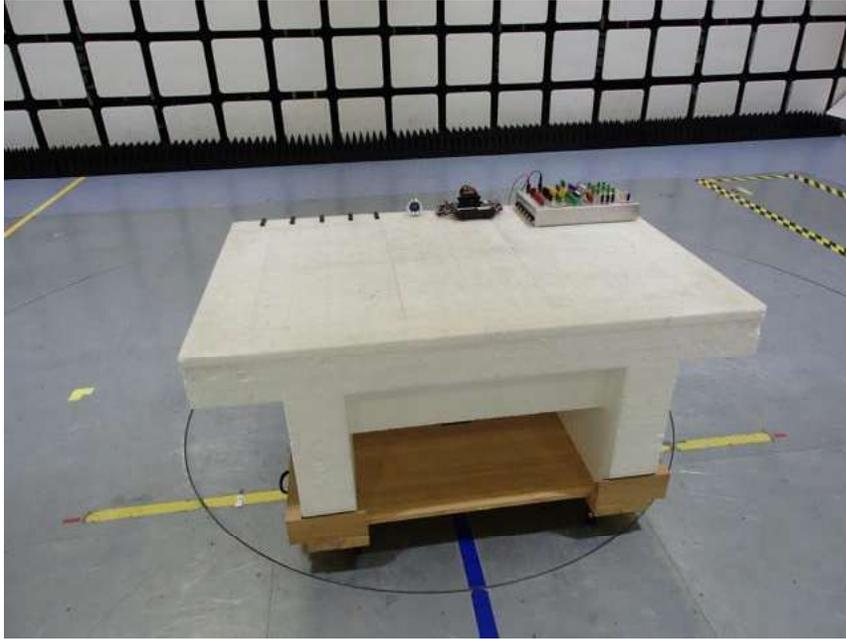


Photo 1

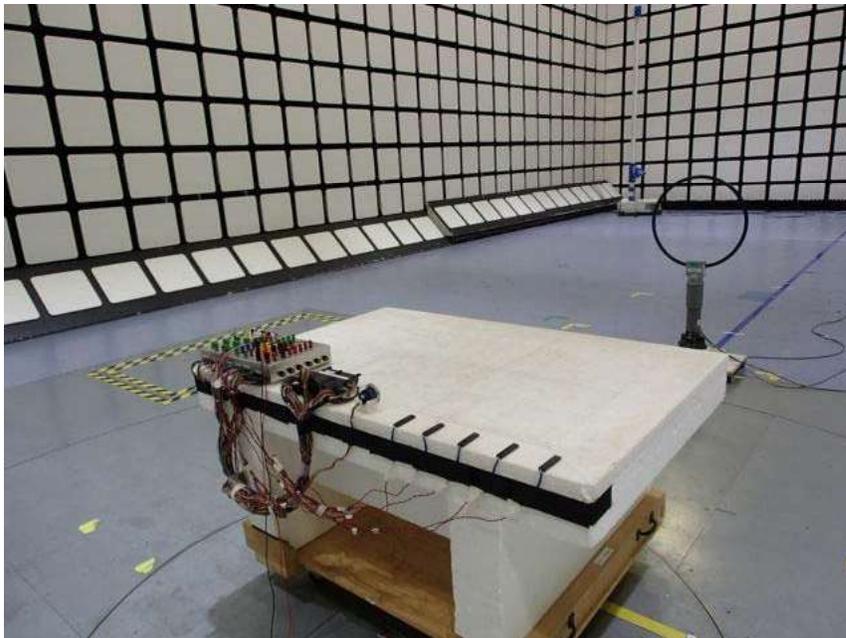


Photo 2

Worst Case Position

Below 30 MHz : (X-axis)

Above 30 MHz : (Horizontal: X-axis / Vertical: X-axis)

**SWITCH ASSY
ENGINE START
X-axis**



Y-axis



Z-axis



BCM

X-axis



Y-axis



Z-axis



Worst case position



Without Key (Worst)



With Key

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 read '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 (SWITCH ASSY, ENGINE START)

