RADIO TEST REPORT

Test Report No. : 12166394H-A-R2

Applicant	:	**DENSO CORPORATION**
Type of Equipment	:	**Passive Entry Passive Start System (LF Transmitter and LF Transceiver)**
Model No.	:	**B1NA0**
FCC ID	:	**HYQB1NA0**
Test regulation	:	**FCC Part 15 Subpart C: 2018**
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
7. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
8. This report is a revised version of 12166394H-A-R1. 12166394H-A-R1 is replaced with this report.

Date of test: March 12 to 16, 2018

Representative test engineer: K. Yamamoto
Koji Yamamoto
Engineer
Consumer Technology Division

Approved by: M. Imura
Motoya Imura
Leader
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NVLAP TESTING
NVLAP LAB CODE: 200572-0

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

REVISION HISTORY

Original Test Report No.: 12166394H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	12166394H-A	July 25, 2018	-	-
1	12166394H-A-R1	October 30, 2018	P.8	Correction of note sentences in Clause 4.1.
1	12166394H-A-R1	October 30, 2018	P.10	Correction of Test Antennas table in SECTION 5.
1	12166394H-A-R1	October 30, 2018	P.10	Correction of KDB No. of SECTION 5; From KDB 937606 to KDB 414788
1	12166394H-A-R1	October 30, 2018	P.10	Inserting test setup diagram in SECTION 5.
1	12166394H-A-R1	October 30, 2018	P.13 to 17	Correction of erroneous description “ithout” → “without”
1	12166394H-A-R1	October 30, 2018	P.13 to 17	Correction of the data of 3m without distance factor
2	12166394H-A-R2	October 31, 2018	P.8	Addition of the following sentence in Clause 4.1; *2) Refer to “Theory of Operation-Tx_Timing of Transmission”.

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SECTION 1: Customer information

Company Name	:	DENSO CORPORATION
Address	:	1-1 Showa-cho, Kariya-shi, Aichi-ken, 448-8661 Japan
Telephone Number	:	+81-566-61-2524
Facsimile Number	:	+81-566-25-4837
Contact Person	:	TAKESHI KUMAZAKI

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Passive Entry Passive Start System (LF Transmitter and LF Transceiver)
Model No.	:	B1NA0
Serial No.	:	Refer to Section 4, Clause 4.2
Receipt Date of Sample	:	February 23, 2018
Country of Mass-production	:	United States of America and China
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: B1NA0 (referred to as the EUT in this report) is a Passive Entry Passive Start System (LF Transmitter and LF Transceiver).

Radio Specification

[Transmitter part]

Radio Type	:	LF Transmitter		
Frequency of Operation	:	125 kHz		
Oscillation circuit	:	Crystal		
Oscillator frequency	:	16 MHz		
Modulation	:	OOK / ASK		
Antenna type	:	LF Antenna	:	Type1: Rocker Driver Antenna Rocker Passenger Antenna Trunk Antenna Bracket Antenna Type2: Rear(Front) Bumper/Frunk Antenna Interior Antenna
		LF/Immo Combo Antenna	:	Type3: Immo Combo Antenna
Antenna Specification	:	Ferrite antenna coil		
Clock Frequency (maximum)	:	128 MHz		

[Receiver part]

Frequency of Operation	:	125 kHz
Oscillator frequency	:	16 MHz
Type of receiving system	:	Direct conversion
Antenna Specification	:	Ferrite antenna coil

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted Emission Section 15.209 Radiated emission limits, general requirements

* The revision on March 12, 2018, does not affect the test specification applied to the EUT.

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <IC> RSS-Gen 8.8	<FCC> Section 15.207 <IC> RSS-Gen 8.8	-	N/A *1)	N/A	N/A
2	Electric Field Strength of Fundamental Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <IC> RSS-Gen 6.4, 6.12	<FCC> Section 15.209 <IC> RSS-210 4.4 RSS-Gen 8.9	Radiated	N/A	0.4 dB 0.12500 MHz 0 deg. PK with Duty factor (Rear(Front) Bumper/ Frunk Antenna) / (Trunk Antenna + Interior Antenna)	Complied#
3	Electric Field Strength of Spurious Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <IC> RSS-Gen 6.4, 6.13	<FCC> Section 15.209 <IC> RSS-210 4.4 RSS-Gen 8.9	Radiated	N/A	10.1 dB 49.875 MHz, Vertical, QP (Immo Combo Antenna)	Complied
4	-26dB Bandwidth	<FCC> ANSI C63.10:2013 6 Standard test methods <IC> -	<FCC> Reference data <IC> -	Radiated	N/A	N/A	N/A

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.

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 15.31 (e)
The test was performed with the New Battery (DC 12.0 V) and the EUT constantly provides the stable voltage to RF part through the regulator regardless of input voltage from New Battery. Therefore, this 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

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 6.6	-	Radiated	N/A	N/A	N/A

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.

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

3.4 Uncertainty

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

Test distance	Radiated emission (+/-)
	9 kHz to 30 MHz
3 m	3.8 dB
10 m	3.6 dB

*Measurement distance

Polarity	Radiated emission (Below 1 GHz)			
	(3 m*)(+/-)		(10 m*)(+/-)	
	30 MHz to 200 MHz	200 MHz to 1000 MHz	30 MHz to 200 MHz	200 MHz to 1000 MHz
Horizontal	4.8 dB	5.2 dB	4.8 dB	5.0 dB
Vertical	5.0 dB	6.3 dB	4.9 dB	5.0 dB

Radiated emission (Above 1 GHz)				
(3 m*)(+/-)		(1 m*)(+/-)		(10 m*)(+/-)
1 GHz to 6 GHz	6 GHz to 18 GHz	10 GHz to 26.5 GHz	26.5 GHz to 40 GHz	1 GHz to 18 GHz
5.2 dB	5.5 dB	5.9 dB	5.9 dB	5.5 dB

* Measurement distance

3.5 Test Location

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NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967

Test site	IC Registration Number	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	2973C-1	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	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	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	2973C-4	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.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	N/A	-	-
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 2.0m 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.

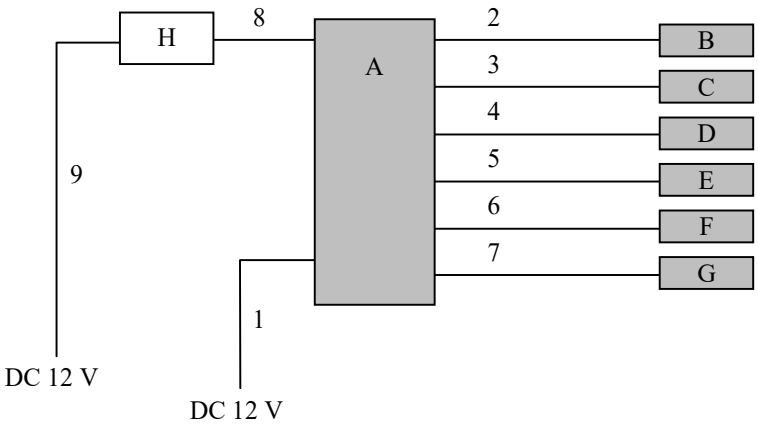
SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

Mode	Timing of transmission *2)	Remarks
(1)Transmitting mode (Tx) Rear(Front) Bumper/Frunk Antenna	Pattern #0	*1)
(2)Transmitting mode (Tx) Trunk Antenna	Pattern #0	*1)
(3)Transmitting mode (Tx) Trunk Antenna + Interior Antenna	Pattern #1	*1)
(4)Transmitting mode (Tx) Rear(Front) Bumper/Frunk Antenna + Trunk Antenna + Trunk Antenna	Pattern #2	*1)
(5)Transmitting mode (Tx) Immo Combo Antenna	-	-

*1) The time division transmission was performed with one representative antenna for each type(Trunk,Interior...) in transmission mode.
For trasnmitting modes of more than one antenna typs, the respective number of representative anttenas was used.
This transmission timing was worse than the one using six antennas of normal use.
*2) Refer to "Theory of Operation-Tx_Timing of Transmission".

4.2 Configuration and peripherals



* Cabling and setup were taken into consideration and test data was taken under worse case conditions.
* Although eight antennas (maximum) are connected to Global B BCM, there were no affect with or without two ports out of those ports.
Therefore the tests was performed with six antennas connected.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Passive Entry Passive Start System (LF Transmitter and LF Transceiver)	B1NA0	810014E5	DENSO CORPORATION	EUT
B	Interior Antenna	-	4-9	DENSO CORPORATION	EUT
C	Interior Antenna	-	4-16	DENSO CORPORATION	EUT
D	Trunk Antenna	-	3-2	DENSO CORPORATION	EUT
E	Trunk Antenna	-	3-4	DENSO CORPORATION	EUT
F	Rear(Front) Bumper/Frunk Antenna	-	5-3	DENSO CORPORATION	EUT
G	Immo Combo Antenna	-	8-15	DENSO CORPORATION	EUT
H	Checker bench	-	No.1	-	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	3.0	Unshielded	Unshielded	-
2	Antenna Cable	1.0	Unshielded	Unshielded	-
3	Antenna Cable	1.0	Unshielded	Unshielded	-
4	Antenna Cable	1.0	Unshielded	Unshielded	-
5	Antenna Cable	1.0	Unshielded	Unshielded	-
6	Antenna Cable	1.0	Unshielded	Unshielded	-
7	Antenna Cable	1.0	Unshielded	Unshielded	-
8	Signal Cable	1.5	Unshielded	Unshielded	-
9	DC 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, 0.5 m by 1.0 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

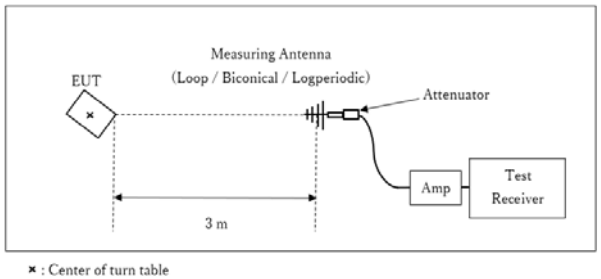
Frequency	From 9 kHz to 90 kHz and From 110 kHz to 150 kHz	From 90 kHz to 110 kHz	From 150 kHz to 490 kHz	From 490 kHz to 30 MHz	From 30 MHz to 1 GHz
Instrument used	Test Receiver				
Detector	PK / AV	QP	PK / AV	QP	QP
IF Bandwidth	200 Hz	200 Hz	9 kHz	9 kHz	120 kHz
Test Distance	3 m *1)	3 m *1)	3 m *1)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

[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.

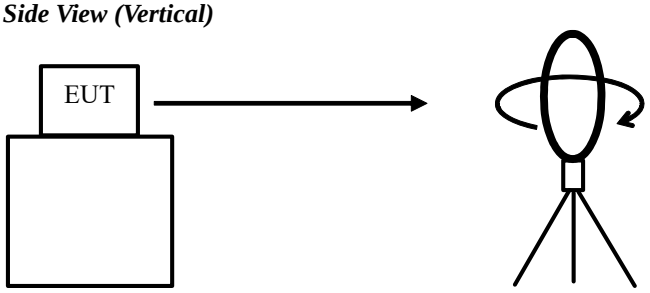
The test results and limit are rounded off to one decimal place, so some differences might be observed.

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

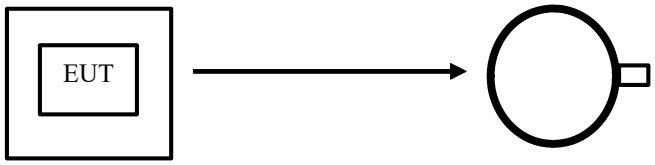
Date: March 12 and 13, 2018 Test engineer: Koji Yamamoto

Figure 1: Direction of the Loop Antenna

Side View (Vertical)

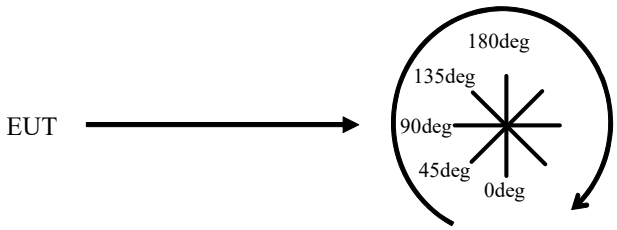


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



Front side: 0 deg.
Forward direction: clockwise

SECTION 6: -26dB Bandwidth

Test Procedure

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

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
-26 dB Bandwidth	50 kHz	1 kHz	3 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

Test data : APPENDIX 1
Test result : Pass

SECTION 7: 99% Occupied 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
Peak hold was applied as Worst-case measurement.							

Test data : APPENDIX 1
Test result : Pass

APPENDIX 1: Test data

Radiated Emission below 30 MHz (Fundamental and Spurious Emission)

Rear(Front) Bumper/Frunk Antenna

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Order No.	12166394H
Date	03/12/2018
Temperature/ Humidity	23 deg. C / 37 % RH
Engineer	Koji Yamamoto
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
0	0.12500	PK	106.5	19.8	-64.2	32.3	-	29.8	45.6	15.8	Fundamental
0	0.25000	PK	34.4	19.7	-64.3	32.3	-	-42.5	39.6	82.1	
0	0.37500	PK	64.3	19.7	-64.3	32.3	-	-12.6	36.1	48.7	
0	0.50000	QP	38.3	19.7	-24.2	32.3	-	1.5	33.6	32.1	
0	0.62500	QP	23.6	19.7	-24.3	32.2	-	-13.2	31.0	44.2	
0	0.75000	QP	22.0	19.7	-24.3	32.2	-	-14.8	30.1	44.9	
0	0.87500	QP	49.5	19.7	-24.3	32.2	-	12.7	28.7	16.0	
0	1.00000	QP	25.5	19.7	-24.3	32.2	-	-11.3	27.6	38.9	
0	1.12500	QP	44.2	19.7	-24.3	32.2	-	7.4	26.5	19.1	
0	1.25000	QP	21.5	19.7	-24.3	32.2	-	-15.3	25.6	40.9	

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

PK with Duty 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
0	0.12500	PK	106.5	19.8	-64.2	32.3	-4.6	25.2	25.6	0.4	Fundamental
0	0.25000	PK	34.4	19.7	-64.3	32.3	-4.6	-47.1	19.6	66.7	
0	0.37500	PK	64.3	19.7	-64.3	32.3	-4.6	-17.2	16.1	33.3	

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

PK (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
0	0.12500	PK	106.5	19.8	15.8	32.3	-	109.8	-	-	Fundamental

* All spurious emissions lower than this result.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission below 30 MHz (Fundamental and Spurious Emission)

Trunk Antenna

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Order No.	12166394H
Date	03/12/2018
Temperature/ Humidity	23 deg. C / 37 % RH
Engineer	Koji Yamamoto
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
0	0.12500	PK	105.9	19.8	-64.2	32.3	-	29.2	45.6	16.4	Fundamental
0	0.25000	PK	42.2	19.7	-64.3	32.3	-	-34.7	39.6	74.3	
0	0.37500	PK	43.9	19.7	-64.3	32.3	-	-33.0	36.1	69.1	
0	0.50000	QP	37.6	19.7	-24.2	32.3	-	0.8	33.6	32.8	
0	0.62500	QP	54.3	19.7	-24.3	32.3	-	17.4	31.7	14.3	
0	0.75000	QP	21.9	19.7	-24.3	32.2	-	-14.9	30.1	45.0	
0	0.87500	QP	49.7	19.7	-24.3	32.2	-	12.9	28.7	15.8	
0	1.00000	QP	23.8	19.7	-24.3	32.2	-	-13.0	27.6	40.6	
0	1.12500	QP	40.0	19.7	-24.3	32.2	-	3.2	26.5	23.3	
0	1.25000	QP	21.4	19.7	-24.3	32.2	-	-15.4	25.6	41.0	

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

PK with Duty 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
0	0.12500	PK	105.9	19.8	-64.2	32.3	-4.6	24.6	25.6	1.0	Fundamental
0	0.25000	PK	42.2	19.7	-64.3	32.3	-4.6	-39.3	19.6	58.9	
0	0.37500	PK	43.9	19.7	-64.3	32.3	-4.6	-37.6	16.1	53.7	

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

PK **(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
0	0.12500	PK	105.9	19.8	15.8	32.3	-	109.2	-	-	Fundamental

* All spurious emissions lower than this result.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission below 30 MHz (Fundamental and Spurious Emission)

Trunk Antenna + Interior Antenna

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Order No.	12166394H
Date	03/12/2018
Temperature/ Humidity	23 deg. C / 37 % RH
Engineer	Koji Yamamoto
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
0	0.12500	PK	111.8	19.8	-64.2	32.3	-	35.1	45.6	10.5	Fundamental
0	0.25000	PK	47.1	19.7	-64.3	32.3	-	-29.8	39.6	69.4	
0	0.37500	PK	60.1	19.7	-64.3	32.3	-	-16.8	36.1	52.9	
0	0.50000	QP	38.4	19.7	-24.2	32.3	-	1.6	33.6	32.0	
0	0.62500	QP	58.0	19.7	-24.3	32.3	-	21.1	31.7	10.6	
0	0.75000	QP	22.0	19.7	-24.3	32.2	-	-14.8	30.1	44.9	
0	0.87500	QP	52.7	19.7	-24.3	32.2	-	15.9	28.7	12.8	
0	1.00000	QP	25.4	19.7	-24.3	32.2	-	-11.4	27.6	39.0	
0	1.12500	QP	44.5	19.7	-24.3	32.2	-	7.7	26.5	18.8	
0	1.25000	QP	21.4	19.7	-24.3	32.2	-	-15.4	25.6	41.0	

Result = 2 Simultaneous Reading + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg]	Frequency [MHz]	Detector	Result1 log [dBuV/m]	Result1 anti-log [uV]	Result2 log [dBuV/m]	Result2 anti-log [uV]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0	0.12500	PK	24.5	16.8	2.4	1.3	25.2	25.6	0.4	Fundamental
0	0.25000	PK	-40.4	0.01	-62.5	0.001	-39.7	19.6	59.3	
0	0.37500	PK	-27.4	0.04	-49.5	0.003	-26.7	16.1	42.8	

Result = 20 * log10(Result 1(anti-log) + Result 2(anti-log))

Based on § 15.35 (c), the Duty Factor for the average field strength is shown below.

This mode is a simultaneous transmission mode using two antennas (Trunk Antenna and Interior Antenna).
The duty factor was calculated at the time of transmission for each antenna, and the average was calculated.

Pulse type 1_PK with Duty factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result 1 [dBuV/m]
0	0.125	PK	105.8	19.8	-64.2	32.3	-4.6	24.5
0	0.250	PK	41.1	19.7	-64.3	32.3	-4.6	-40.4
0	0.375	PK	54.1	19.7	-64.3	32.3	-4.6	-27.4

Pulse type 2_PK with Duty factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result 2 [dBuV/m]
0	0.125	PK	105.8	19.8	-64.2	32.3	-26.7	2.4
0	0.250	PK	41.1	19.7	-64.3	32.3	-26.7	-62.5
0	0.375	PK	54.1	19.7	-64.3	32.3	-26.7	-49.5

Result = Caluculation + Ant Factor + Loss (Cable + Attenuator + Filter + D.Factor) - Gain(Amprifier) + Duty factor
*The test result is rounded off to one or two decimal places, so some differences might be observed.

The transmission timing chart for each antenna individually (pulse type1 and pulse type2) is shown in P26.

PK (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
0	0.12500	PK	111.8	19.8	15.8	32.3	-	115.1	-	-	Fundamental

* All spurious emissions lower than this result.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission below 30 MHz (Fundamental and Spurious Emission)

Rear(Front) Bumper/Frunk Antenna + Trunk Antenna + Trunk Antenna

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Order No.	12166394H
Date	03/12/2018
Temperature/ Humidity	23 deg. C / 37 % RH
Engineer	Koji Yamamoto
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
0	0.12500	PK	109.4	19.8	-64.2	32.3	-	32.7	45.6	12.9	Fundamental
0	0.25000	PK	52.3	19.7	-64.3	32.3	-	-24.6	39.6	64.2	
0	0.37500	PK	65.2	19.7	-64.3	32.3	-	-11.7	36.1	47.8	
0	0.50000	QP	28.0	19.7	-24.2	32.3	-	-8.8	33.6	42.4	
0	0.62500	QP	53.0	19.7	-24.3	32.3	-	16.1	31.7	15.6	
0	0.75000	QP	22.0	19.7	-24.3	32.2	-	-14.8	30.1	44.9	
0	0.87500	QP	41.2	19.7	-24.3	32.2	-	4.4	28.7	24.3	
0	1.00000	QP	21.7	19.7	-24.3	32.2	-	-15.1	27.6	42.7	
0	1.12500	QP	37.7	19.7	-24.3	32.2	-	0.9	26.5	25.6	
0	1.25000	QP	21.4	19.7	-24.3	32.2	-	-15.4	25.6	41.0	

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

PK with Duty 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
0	0.12500	PK	109.4	19.8	-64.2	32.3	-17.9	14.8	25.6	10.8	Fundamental
0	0.25000	PK	52.3	19.7	-64.3	32.3	-17.9	-42.5	19.6	62.1	
0	0.37500	PK	65.2	19.7	-64.3	32.3	-17.9	-29.6	16.1	45.7	

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

PK (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
0	0.12500	PK	109.4	19.8	15.8	32.3	-	112.7	-	-	Fundamental

* All spurious emissions lower than this result.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission below 30 MHz (Fundamental and Spurious Emission)

Immo Combo Antenna

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Order No.	12166394H
Date	03/12/2018
Temperature/ Humidity	23 deg. C / 37 % RH
Engineer	Koji Yamamoto
Mode	(5)

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
0	0.12500	PK	101.4	19.8	-64.2	32.3	-	24.7	45.6	20.9	Fundamental
0	0.25000	PK	44.6	19.7	-64.3	32.3	-	-32.3	39.6	71.9	
0	0.37500	PK	64.0	19.7	-64.3	32.3	-	-12.9	36.1	49.0	
0	0.50000	QP	26.0	19.7	-24.2	32.3	-	-10.8	33.6	44.4	
0	0.62500	QP	22.0	19.7	-24.3	32.3	-	-14.9	31.7	46.6	
0	0.75000	QP	21.9	19.7	-24.3	32.2	-	-14.9	30.1	45.0	
0	0.87500	QP	41.6	19.7	-24.3	32.2	-	4.8	28.7	23.9	
0	1.00000	QP	22.6	19.7	-24.3	32.2	-	-14.2	27.6	41.8	
0	1.12500	QP	33.6	19.7	-24.3	32.2	-	-3.2	26.5	29.7	
0	1.25000	QP	21.3	19.7	-24.3	32.2	-	-15.5	25.6	41.1	

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

PK with Duty 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
0	0.12500	PK	101.4	19.8	-64.2	32.3	0.0	24.7	25.6	0.9	Fundamental
0	0.25000	PK	44.6	19.7	-64.3	32.3	0.0	-32.3	19.6	51.9	
0	0.37500	PK	64.0	19.7	-64.3	32.3	0.0	-12.9	16.1	29.0	

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.

PK (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
0	0.12500	PK	101.4	19.8	15.8	32.3	-	104.7	-	-	Fundamental

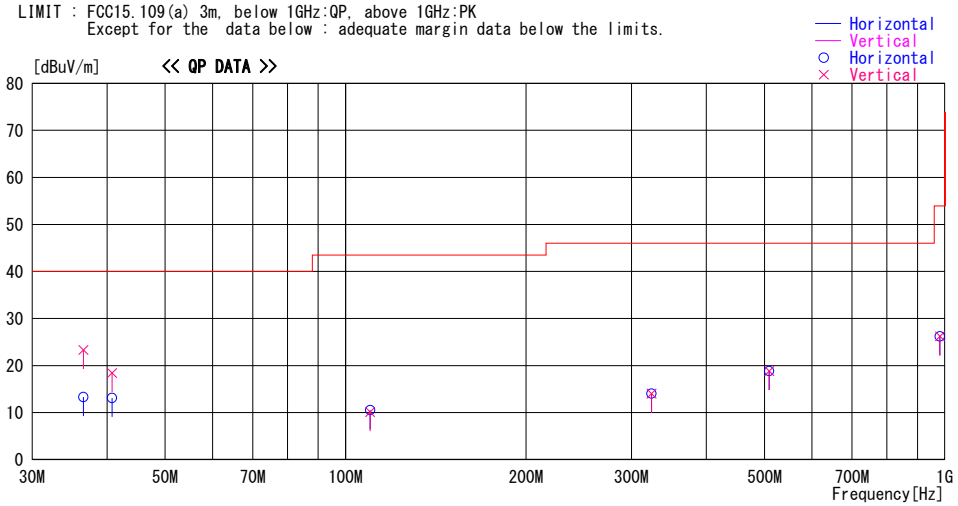
* All spurious emissions lower than this result.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission above 30 MHz (Spurious Emission)

Rear(Front) Bumper/Frunk Antenna

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Report No.	12166394H
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(1)



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
36.517	23.0	QP	15.3	-25.0	13.3	189	400	Hori.	40.0	26.7	
36.517	33.0	QP	15.3	-25.0	23.3	263	100	Vert.	40.0	16.7	
40.767	29.3	QP	14.0	-24.9	18.4	261	100	Vert.	40.0	21.6	
40.767	24.0	QP	14.0	-24.9	13.1	184	400	Hori.	40.0	26.9	
109.900	22.6	QP	11.4	-23.9	10.1	0	100	Vert.	43.5	33.4	
109.900	23.0	QP	11.4	-23.9	10.5	0	100	Hori.	43.5	33.0	
324.000	21.9	QP	13.9	-21.8	14.0	0	100	Vert.	46.0	32.0	
324.000	21.9	QP	13.9	-21.8	14.0	0	100	Hori.	46.0	32.0	
509.335	21.7	QP	17.7	-20.6	18.8	0	100	Vert.	46.0	27.2	
509.335	21.7	QP	17.7	-20.6	18.8	0	100	Hori.	46.0	27.2	
981.328	20.7	QP	22.2	-16.7	26.2	0	100	Hori.	53.9	27.7	
981.328	20.7	QP	22.2	-16.7	26.2	0	100	Vert.	53.9	27.7	

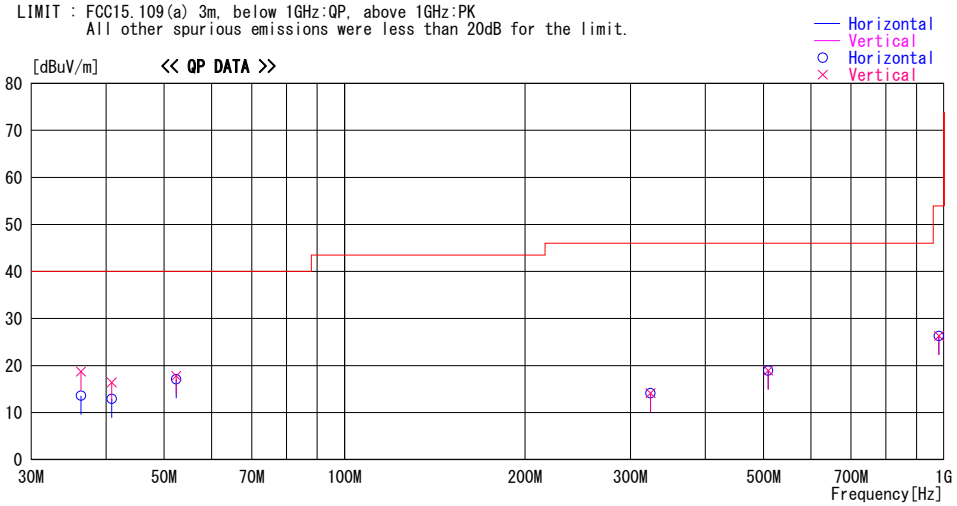
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission above 30 MHz (Spurious Emission)

Trunk Antenna

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Report No.	12166394H
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(2)



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
36.343	23.3	QP	15.3	-25.0	13.6	189	276	Hori.	40.0	26.4	
36.343	28.4	QP	15.3	-25.0	18.7	249	100	Vert.	40.0	21.3	
40.880	27.4	QP	13.9	-24.9	16.4	278	100	Vert.	40.0	23.6	
40.880	23.9	QP	13.9	-24.9	12.9	0	375	Hori.	40.0	27.1	
52.375	32.7	QP	9.8	-24.7	17.8	280	100	Vert.	40.0	22.2	
52.375	32.0	QP	9.8	-24.7	17.1	9	375	Hori.	40.0	22.9	
324.000	22.0	QP	13.9	-21.8	14.1	0	100	Vert.	46.0	31.9	
324.000	22.0	QP	13.9	-21.8	14.1	0	100	Hori.	46.0	31.9	
509.335	21.8	QP	17.7	-20.6	18.9	0	100	Vert.	46.0	27.1	
509.335	21.8	QP	17.7	-20.6	18.9	0	100	Hori.	46.0	27.1	
981.328	20.8	QP	22.2	-16.7	26.3	0	100	Hori.	53.9	27.6	
981.328	20.8	QP	22.2	-16.7	26.3	0	100	Vert.	53.9	27.6	

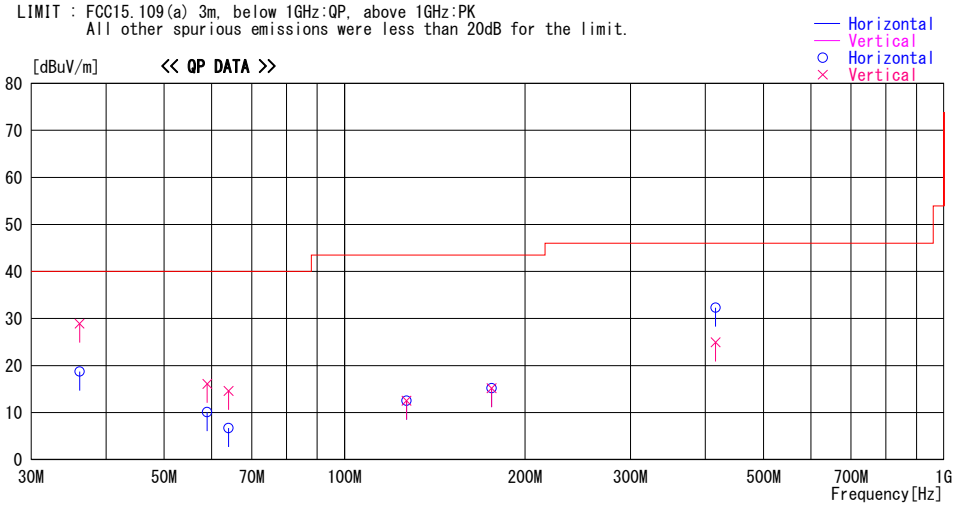
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission above 30 MHz (Spurious Emission)

Trunk Antenna + Interior Antenna

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Report No.	12166394H
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(3)



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
36.124	38.5	QP	15.4	-25.0	28.9	264	100	Vert.	40.0	11.1	
36.124	28.3	QP	15.4	-25.0	18.7	344	283	Hori.	40.0	21.3	
59.001	27.0	QP	7.7	-24.6	10.1	359	300	Hori.	40.0	29.9	
59.001	33.0	QP	7.7	-24.6	16.1	261	100	Vert.	40.0	23.9	
64.000	24.4	QP	6.8	-24.5	6.7	346	312	Hori.	40.0	33.3	
64.000	32.3	QP	6.8	-24.5	14.6	260	100	Vert.	40.0	25.4	
126.900	22.9	QP	13.3	-23.7	12.5	0	100	Vert.	43.5	31.0	
126.900	22.9	QP	13.3	-23.7	12.5	359	300	Hori.	43.5	31.0	
175.918	22.1	QP	16.2	-23.1	15.2	0	100	Vert.	43.5	28.3	
175.918	22.1	QP	16.2	-23.1	15.2	359	300	Hori.	43.5	28.3	
415.875	30.2	QP	15.9	-21.2	24.9	345	130	Vert.	46.0	21.1	
415.875	37.6	QP	15.9	-21.2	32.3	303	100	Hori.	46.0	13.7	

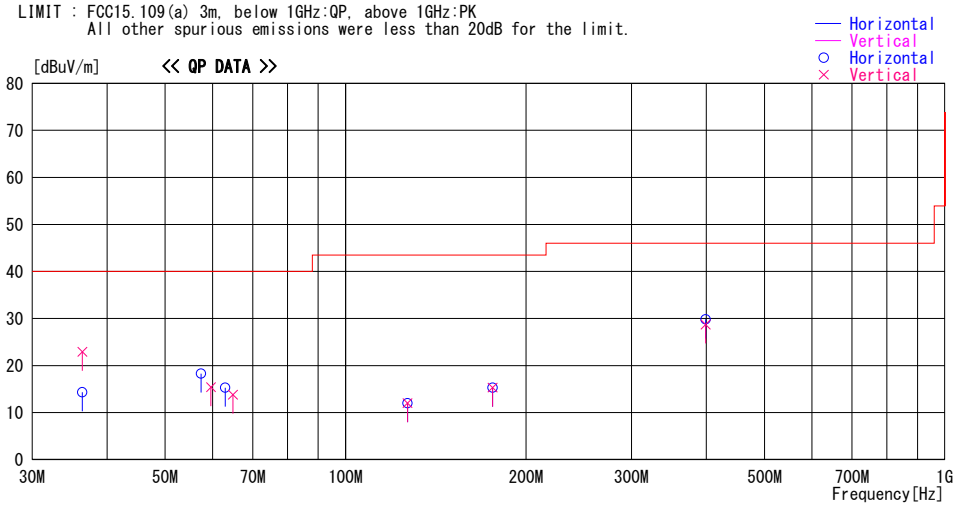
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission above 30 MHz (Spurious Emission)

Rear(Front) Bumper/Frunk Antenna + Trunk Antenna + Trunk Antenna

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Report No.	12166394H
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(4)



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
36.376	32.6	QP	15.3	-25.0	22.9	272	100	Vert.	40.0	17.1	
36.376	24.0	QP	15.3	-25.0	14.3	321	270	Hori.	40.0	25.7	
57.377	34.7	QP	8.2	-24.6	18.3	186	365	Hori.	40.0	21.7	
59.628	32.5	QP	7.5	-24.6	15.4	287	100	Vert.	40.0	24.6	
63.001	32.9	QP	6.9	-24.5	15.3	14	301	Hori.	40.0	24.7	
64.876	31.6	QP	6.7	-24.5	13.8	264	100	Vert.	40.0	26.2	
126.900	22.4	QP	13.3	-23.7	12.0	0	100	Vert.	43.5	31.5	
126.900	22.4	QP	13.3	-23.7	12.0	359	300	Hori.	43.5	31.5	
175.918	22.2	QP	16.2	-23.1	15.3	0	100	Vert.	43.5	28.2	
175.918	22.2	QP	16.2	-23.1	15.3	359	300	Hori.	43.5	28.2	
399.005	34.5	QP	15.5	-21.3	28.7	96	100	Vert.	46.0	17.3	
399.005	35.6	QP	15.5	-21.3	29.8	9	100	Hori.	46.0	16.2	

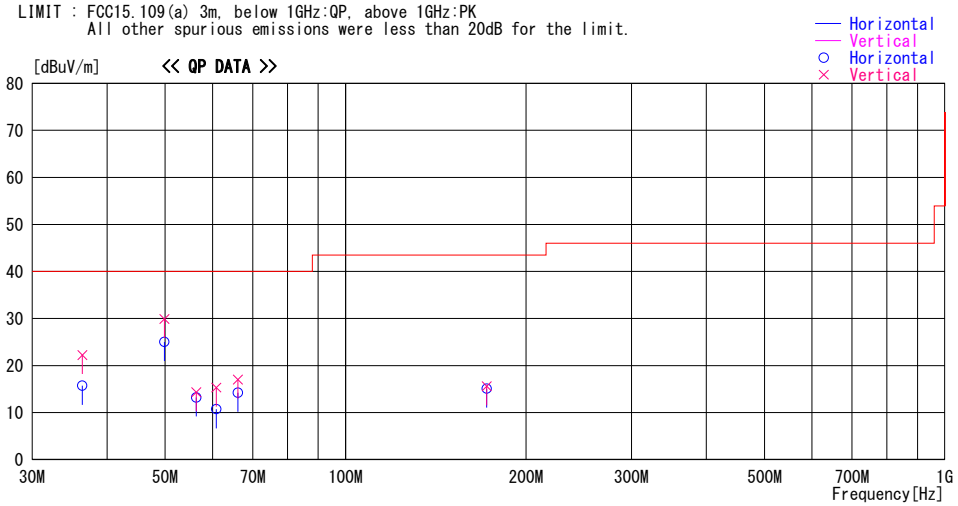
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission above 30 MHz (Spurious Emission)

Immo Combo Antenna

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Report No.	12166394H
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(5)



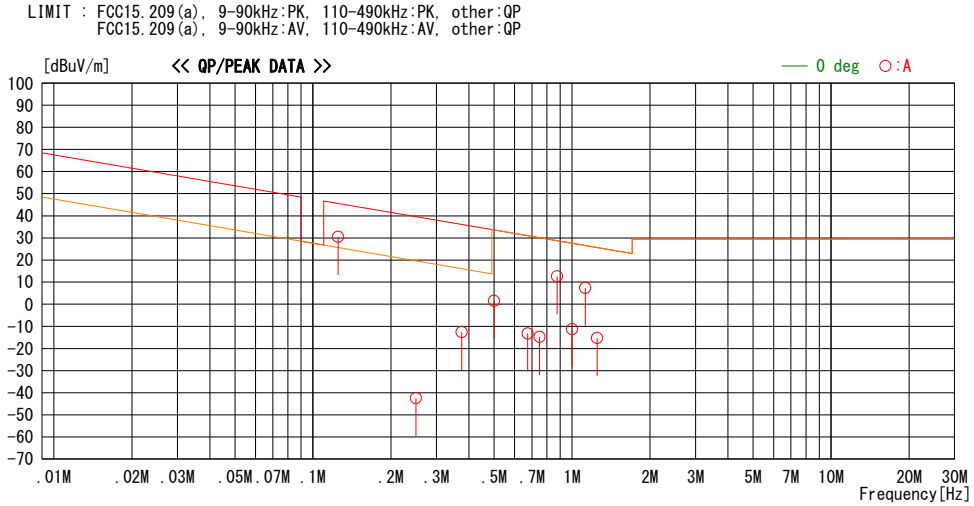
Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
36.379	25.4	QP	15.3	-25.0	15.7	180	307	Hori.	40.0	24.3	
36.379	31.9	QP	15.3	-25.0	22.2	269	100	Vert.	40.0	17.8	
49.875	43.9	QP	10.7	-24.7	29.9	278	100	Vert.	40.0	10.1	
49.875	39.0	QP	10.7	-24.7	25.0	12	400	Hori.	40.0	15.0	
56.375	30.4	QP	8.5	-24.6	14.3	276	100	Vert.	40.0	25.7	
56.375	29.3	QP	8.5	-24.6	13.2	210	337	Hori.	40.0	26.8	
60.877	28.1	QP	7.2	-24.6	10.7	8	331	Hori.	40.0	29.3	
60.877	32.7	QP	7.2	-24.6	15.3	237	100	Vert.	40.0	24.7	
66.126	32.2	QP	6.5	-24.5	14.2	359	309	Hori.	40.0	25.8	
66.126	35.0	QP	6.5	-24.5	17.0	265	100	Vert.	40.0	23.0	
171.951	22.8	QP	16.0	-23.2	15.6	0	100	Vert.	43.5	27.9	
171.951	22.3	QP	16.0	-23.2	15.1	0	100	Hori.	43.5	28.4	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS & GAIN (CABLE + ATT - GAIN(AMP))

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission below 30 MHz (Fundamental and Spurious Emission)
(Plot data, Worst case)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Order No.	12166394H
Date	03/12/2018
Temperature/ Humidity	23 deg. C / 37 % RH
Engineer	Koji Yamamoto
Mode	(3)



*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Duty Cycle

(Total Calculation Timing of transmission Pattern #0)

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	12166394H
Date	March 16, 2018
Temperature/ Humidity	24 deg. C / 32 % RH
Engineer	Koji Yamamoto
Mode	(1)

(Total)

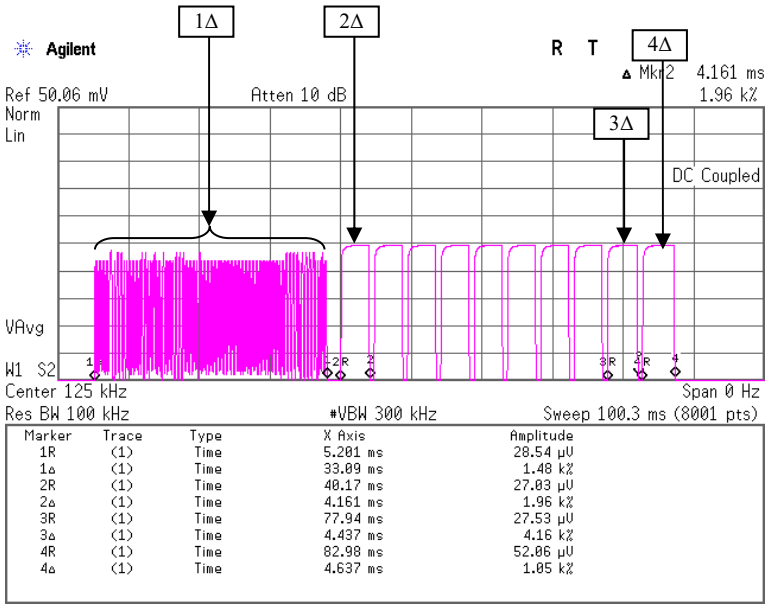
ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
58.907	100.00	0.5891	-4.597

ON time = Times * ON time(1Δ)/2 +Times * ON time(2Δ) +Times * ON time(3Δ)+Times * ON time(4Δ)
Duty = 20log10(ON time/Cycle)

*Pulse Type "1Δ" is Duty 50% (refer to "Technical document-Timing of transmission")

(pulse length(in X))

Type	Times	ON time(One pulse) [ms]	ON time [ms]
1Δ	1	33.09	33.09
2Δ	8	4.161	33.29
3Δ	1	4.437	4.44
4Δ	1	4.637	4.64



*mode(2)is same timing.

Duty Cycle

(Total Calculation Timing of transmission Pattern #1)

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	12166394H
Date	March 16, 2018
Temperature/ Humidity	24 deg. C / 32 % RH
Engineer	Koji Yamamoto
Mode	(3)

(Total)

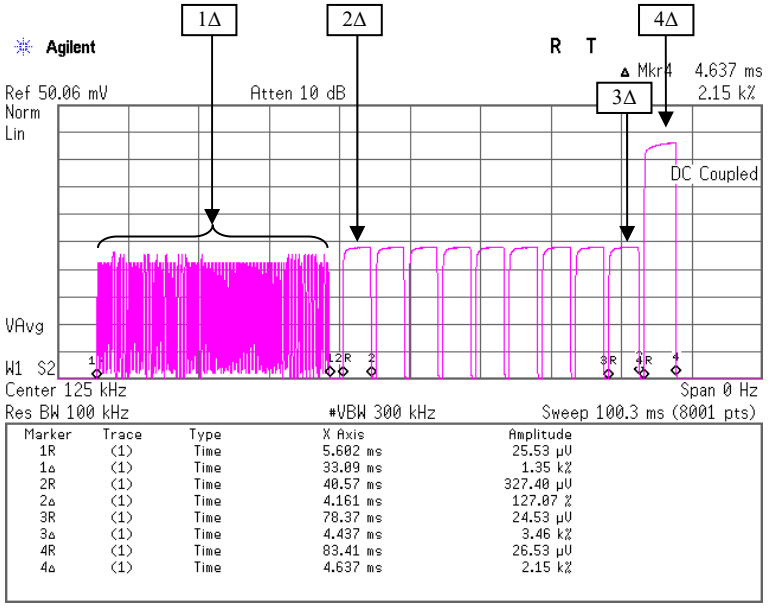
Pulse type	ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
1	58.907	100.00	0.5891	-4.597
2	4.637	100.00	0.0464	-26.675

ON time(Pulse type1) = (Times * ON time(1Δ) / 2) +Times * ON time(2Δ) +Times * ON time(3Δ)+Times * ON time(4
ON time(Pulse type2) =Times * ON time(4Δ)
Duty = 20log10(ON time/Cycle)

*Pulse Type ”1Δ” is Duty 50% (refer to “Technical document-Timing of transmission”)

(pulse length(in X))

Type	Times	ON time(One pulse) [ms]	ON time [ms]
1Δ	1	33.09	33.09
2Δ	8	4.161	33.29
3Δ	1	4.437	4.44
4Δ	1	4.637	4.64



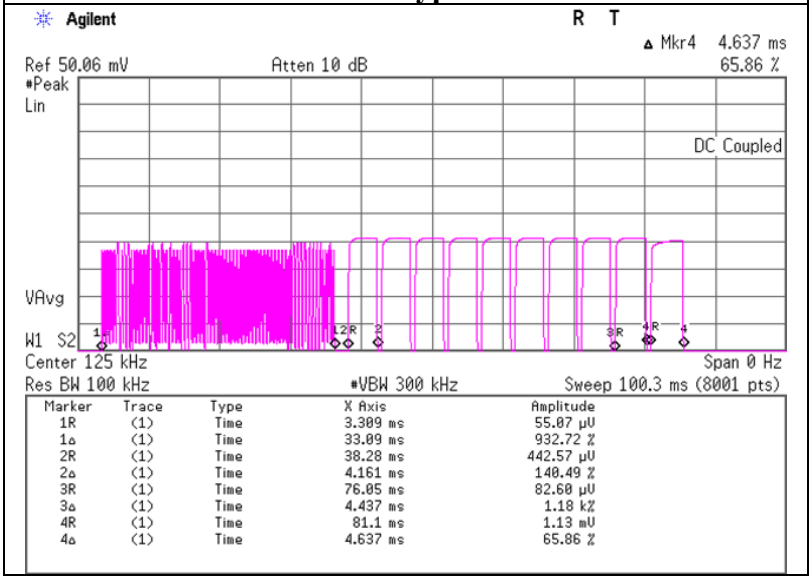
Only 4Δ is simultaneous transmission from two antennas.
The timing chart at the time of transmission for each antenna is shown on the next page.

Duty Cycle

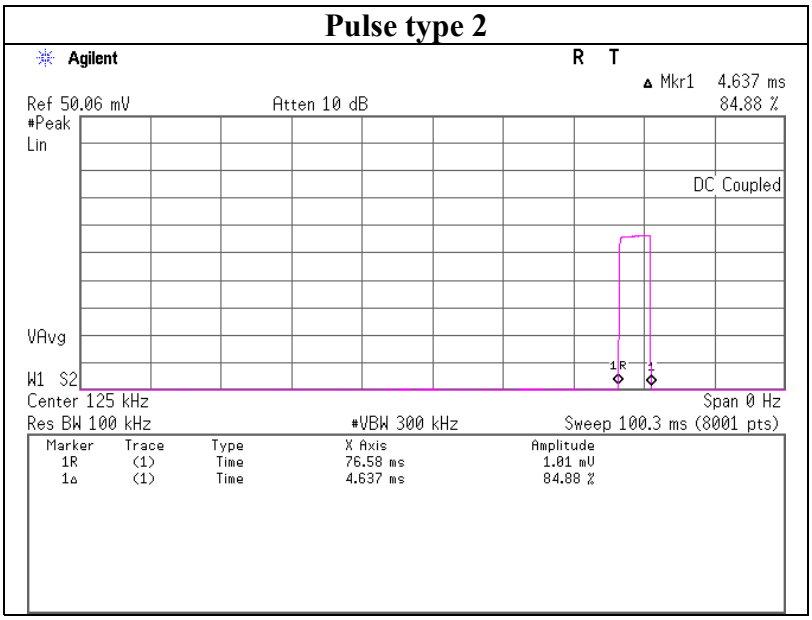
(Total Calculation Timing of transmission Pattern #1)

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	12166394H
Date	March 16, 2018
Temperature/ Humidity	24 deg. C / 32 % RH
Engineer	Koji Yamamoto
Mode	(3)

Pulse type 1



Pulse type 2



Duty Cycle

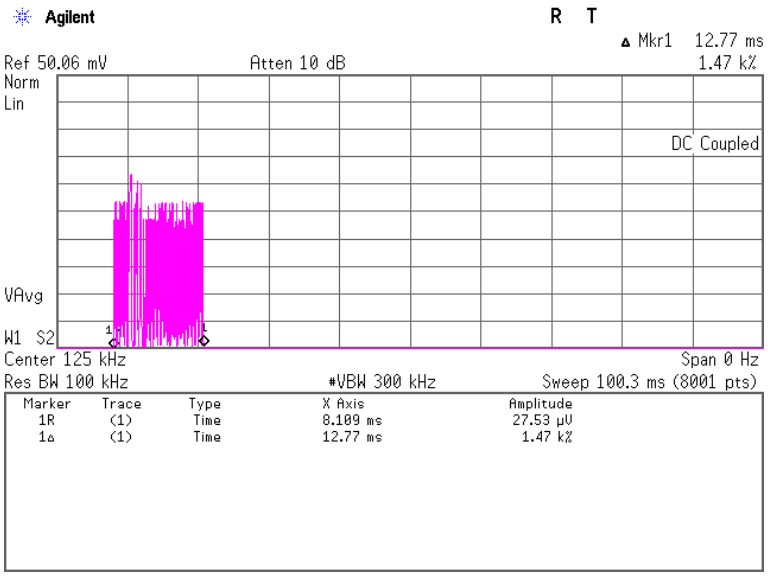
(Total Calculation Timing of transmission Pattern #2)

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	12166394H
Date	March 16, 2018
Temperature/ Humidity	24 deg. C / 32 % RH
Engineer	Koji Yamamoto
Mode	(4)

(Total)

ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
12.770	100.00	0.1277	-17.876

ON time = Times * ON time(Δ1)
Duty = 20log10(ON time/Cycle)



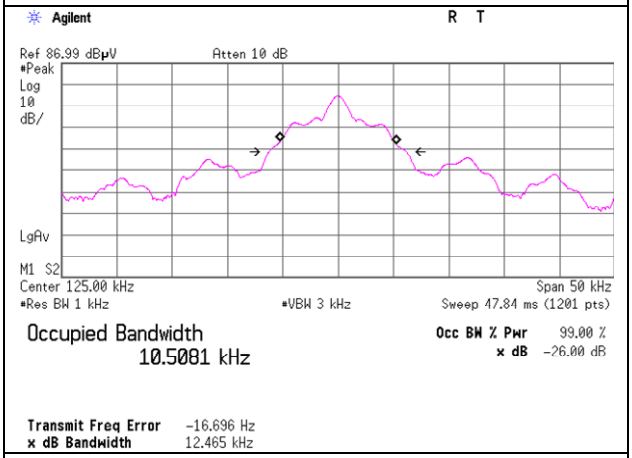
-26dB Bandwidth and 99% Occupied Bandwidth

Rear(Front) Bumper/Frunk Antenna

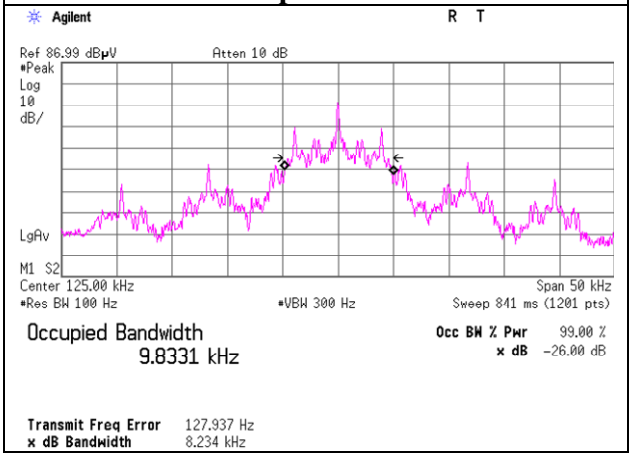
Report No.	12166394H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(1)

-26dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
12.465	9.8331

-26dB Bandwidth



99% Occupied Bandwidth



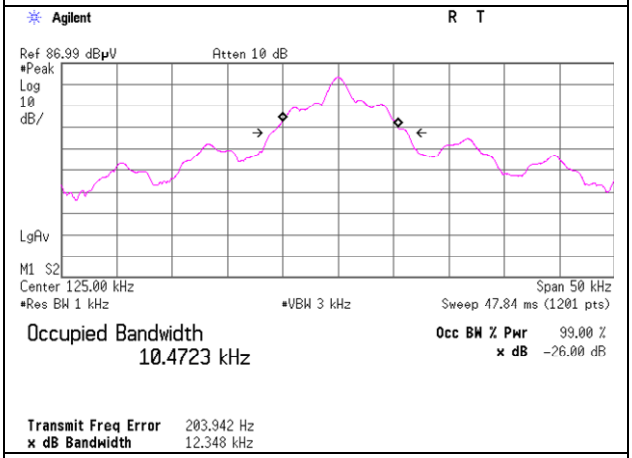
-26dB Bandwidth and 99% Occupied Bandwidth

Trunk Antenna

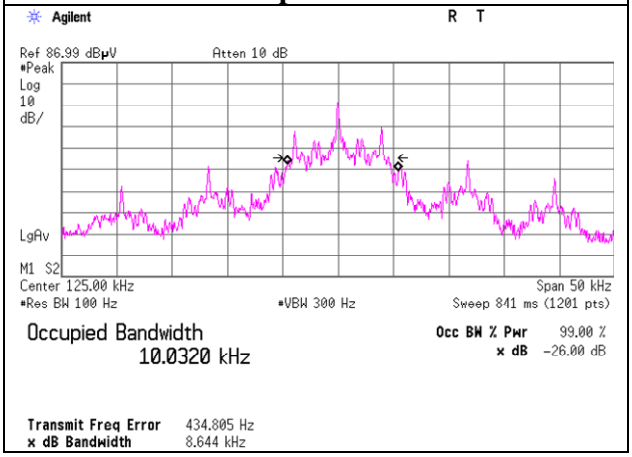
Report No.	12166394H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(2)

-26dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
12.348	10.0320

-26dB Bandwidth



99% Occupied Bandwidth



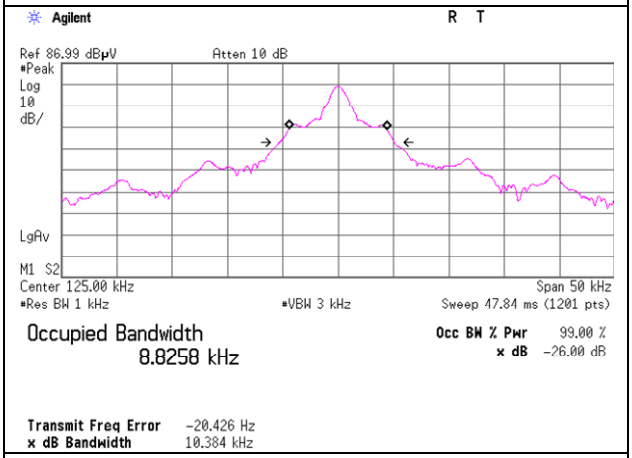
-26dB Bandwidth and 99% Occupied Bandwidth

Trunk Antenna + Interior Antenna

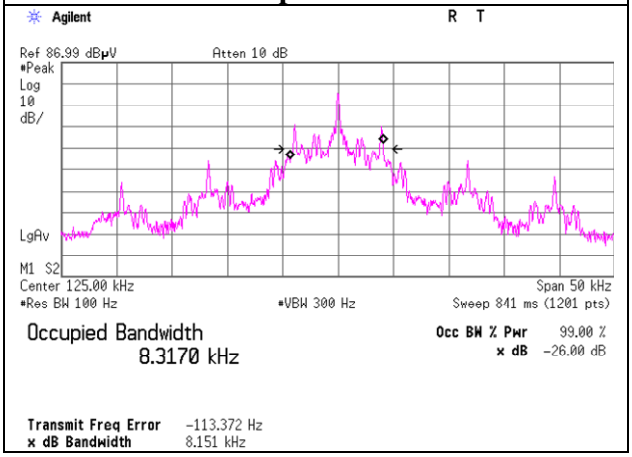
Report No.	12166394H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(3)

-26dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
10.384	8.3170

-26dB Bandwidth



99% Occupied Bandwidth



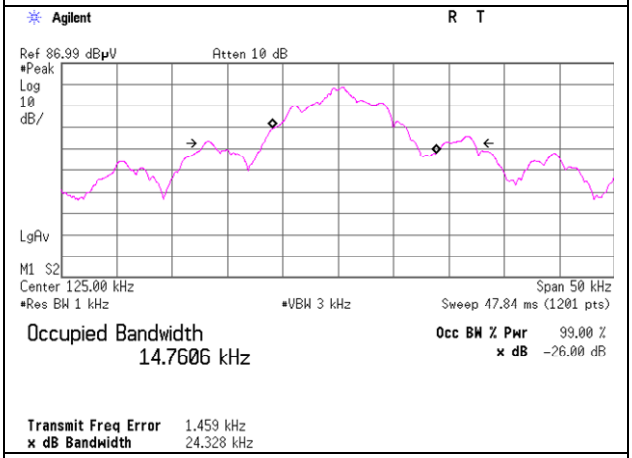
-26dB Bandwidth and 99% Occupied Bandwidth

Rear(Front) Bumper/Frunk Antenna + Trunk Antenna + Trunk Antenna

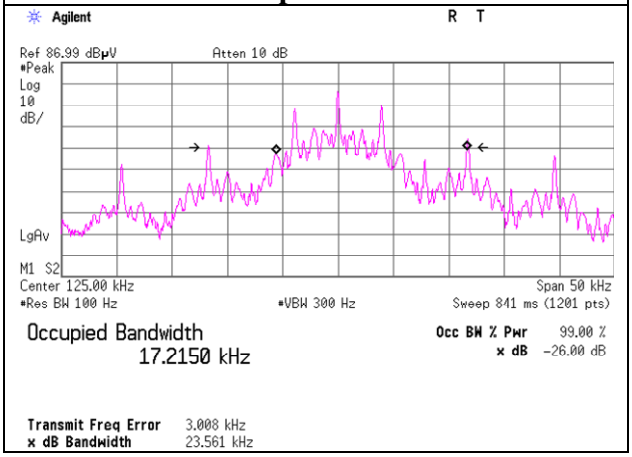
Report No.	12166394H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(4)

-26dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
24.328	17.2150

-26dB Bandwidth



99% Occupied Bandwidth



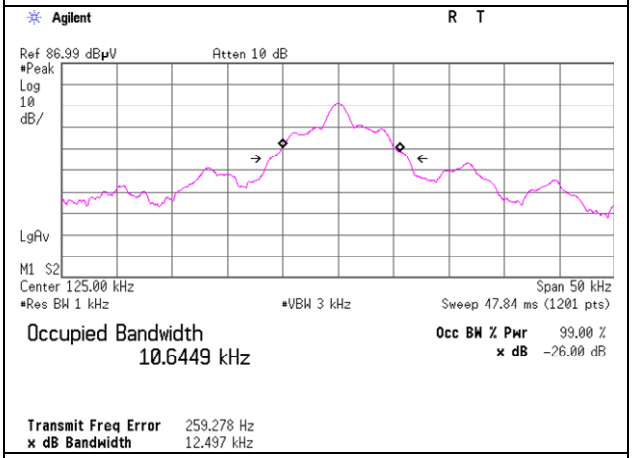
-26dB Bandwidth and 99% Occupied Bandwidth

Immo Combo Antenna

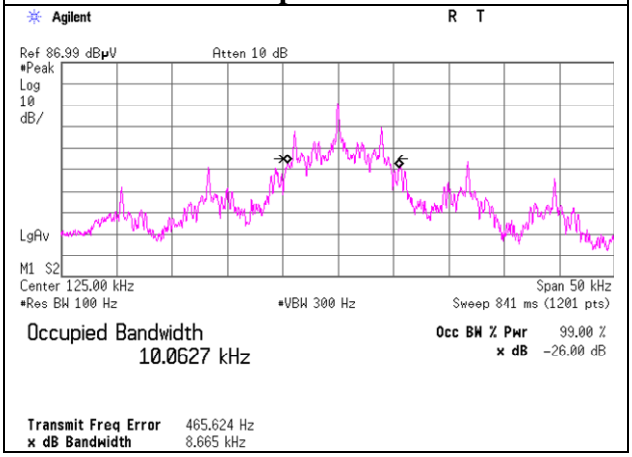
Report No.	12166394H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	March 13, 2018
Temperature / Humidity	26 deg. C / 30 % RH
Engineer	Koji Yamamoto
Mode	(5)

-26dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
12.497	10.0627

-26dB Bandwidth



99% Occupied Bandwidth



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2017/10/31 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2018/01/24 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2017/11/07 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2017/08/22 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	RE	2017/10/11 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(3m)/ sucoform141-PE(1m)/ 421-010(1.5m)/ RFM-E321(Switcher)	-/00640	RE	2017/07/12 * 12
MCC-143	Coaxial Cable	UL Japan	-	-	RE	2017/06/12 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2017/03/27 * 12
MAT-98	Attenuator	KEYSIGHT	8491A	MY52462349	RE	2017/12/14 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE	2018/01/09 * 12
MAT-10	Attenuator(10dB)	Weinschel Corp	2	BL1173	RE	2017/11/14 * 12
MHF-24	High Pass Filter 0.15-30MHz	Rohde & Schwarz	EZ-25/3	100041	RE	2018/02/20 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2017/10/02 * 12
MLA-22	Logperiodic Antenna (200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	RE	2018/01/30 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2017/07/12 * 12

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item:

RE: Radiated emission