



EMI TEST REPORT

Test Report No.: 14033198S-C-R1

Customer	Panasonic Automotive Systems Co., Ltd.
Description of EUT	Car Navigation
Model Number of EUT	AT2107
FCC ID	ACJ932AT2107
Test Regulation	FCC Part 15 Subpart B, Class B
Test Result	Complied (Refer to SECTION 3)
Issue Date	January 18, 2024
Remarks	-

Representative test engineer

T. Suzuki

Takahiro Suzuki
Engineer

Approved by

S. Takano

Shinichi Takano
Engineer



CERTIFICATE 1266.03

- 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.: 14033198S-C

This report is a revised version of 14033198S-C. 14033198S-C is replaced with this report.

Revision	Test report No.	Date	Revised Contents
- (Original)	14033198S-C	April 22, 2022	-
1	14033198S-C-R1	January 18, 2024	Cover page: Addition of FCC ID Update of Regulation (Deletion of “2022”) SECTION 1 Customer Information Addition of ‘*1) The Grantee name in the FCC application is “Panasonic Corporation of North America”.’ 3.1 Test Specification: Revised from “FCC Part 15 final revised on April 1, 2022 and effective May 2, 2022” to “The latest version on the first day of the testing period”. Deleted “* The revision does not affect the test result conducted before its effective date.” Appendix 4 Signature of an official of the responsible party: Deleted page (Total page is changed from 37 to 36)

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation	IEEE	Institute of Electrical and Electronics Engineers
AAN	Asymmetric Artificial Network	IF	Intermediate Frequency
AC	Alternating Current	ILAC	International Laboratory Accreditation Conference
AM	Amplitude Modulation	ISED	Innovation, Science and Economic Development Canada
AMN	Artificial Mains Network	ISN	Impedance Stabilization Network
Amp, AMP	Amplifier	ISO	International Organization for Standardization
ANSI	American National Standards Institute	JAB	Japan Accreditation Board
Ant, ANT	Antenna	LAN	Local Area Network
AP	Access Point	LCL	Longitudinal Conversion Loss
ASK	Amplitude Shift Keying	LIMS	Laboratory Information Management System
Atten., ATT	Attenuator	LISN	Line Impedance Stabilization Network
AV	Average	MRA	Mutual Recognition Arrangement
BPSK	Binary Phase-Shift Keying	N/A	Not Applicable
BR	Bluetooth Basic Rate	NIST	National Institute of Standards and Technology
BT	Bluetooth	NS	No signal detect.
BT LE	Bluetooth Low Energy	NSA	Normalized Site Attenuation
BW	BandWidth	OBW	Occupied BandWidth
C.F	Correction Factor	OFDM	Orthogonal Frequency Division Multiplexing
Cal Int	Calibration Interval	PER	Packet Error Rate
CAV	CISPR AV	PK	Peak
CCK	Complementary Code Keying	P _{LT}	long-term flicker severity
CDN	Coupling Decoupling Network	POHC(A)	Partial Odd Harmonic Current
Ch., CH	Channel	Pol., Pola.	Polarization
CISPR	Comite International Special des Perturbations Radioelectriques	PR-ASK	Phase Reversal ASK
Corr.	Correction	P _{ST}	short-term flicker severity
CPE	Customer premise equipment	QAM	Quadrature Amplitude Modulation
CW	Continuous Wave	QP	Quasi-Peak
DBPSK	Differential BPSK	QPSK	Quadrature Phase Shift Keying
DC	Direct Current	r.m.s., RMS	Root Mean Square
DET	Detector	RBW	Resolution BandWidth
D-factor	Distance factor	RE	Radio Equipment
Dmax	maximum absolute voltage change during an observation period	REV	Reverse
DQPSK	Differential QPSK	RF	Radio Frequency
DSSS	Direct Sequence Spread Spectrum	RFID	Radio Frequency Identifier
DUT	Device Under Test	RNSS	Radio Navigation Satellite Service
EDR	Enhanced Data Rate	RSS	Radio Standards Specifications
e.i.r.p., EIRP	Equivalent Isotropically Radiated Power	Rx	Receiving
EM clamp	Electromagnetic clamp	SINAD	Ratio of (Signal + Noise + Distortion) to (Noise + Distortion)
EMC	ElectroMagnetic Compatibility	S/N	Signal to Noise ratio
EMI	ElectroMagnetic Interference	SA, S/A	Spectrum Analyzer
EMS	ElectroMagnetic Susceptibility	SABS	South African Bureau of Standards
EN	European Norm	SANS	South African National Standards
e.r.p., ERP	Effective Radiated Power	SG	Signal Generator
ETSI	European Telecommunications Standards Institute	SVSWR	Site-Voltage Standing Wave Ratio
EU	European Union	THC(A)	Total Harmonic Current
EUT	Equipment Under Test	THD(%)	Total Harmonic Distortion
Fac.	Factor	TR, T/R	Test Receiver
FCC	Federal Communications Commission	Tx	Transmitting
FHSS	Frequency Hopping Spread Spectrum	VBW	Video BandWidth
FM	Frequency Modulation	Vert.	Vertical
Freq.	Frequency	WLAN	Wireless LAN
FSK	Frequency Shift Keying	xDSL	Generic term for all types of DSL technology (DSL: Digital Subscriber Line)
Fund	Fundamental		
FWD	Forward		
GFSK	Gaussian Frequency-Shift Keying		
GNSS	Global Navigation Satellite System		
GPS	Global Positioning System		
Hori.	Horizontal		
ICES	Interference-Causing Equipment Standard		
I/O	Input/Output		
IEC	International Electrotechnical Commission		

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Section 1: Customer information

Company Name	Panasonic Automotive Systems Co., Ltd. *1)
Address	4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken 224-8520, Japan
Telephone Number	+81-70-1552-3093
Contact Person	Kouji Uchino

*1) The Grantee name in the FCC application is “Panasonic Corporation of North America”.

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	Car Navigation
Model Number	AT2107
Serial Number	Refer to 4.2.
Condition	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab.
Receipt Date	October 4, 2021
Test Date	October 26 to 27, 2021

2.2 Product description

General Specification

Rating	DC 13.2 V
Clock frequency (ies) in the system	40 MHz, 22.5792 MHz, 24 MHz, 24.576 MHz, 25 MHz, 32 MHz, 26 MHz, 50 MHz, 55.46667 MHz, 125 MHz, 16.6 MHz, 27 MHz, 20 MHz, 32.768 kHz, 36.4 MHz, 36.864 MHz

Radio Specification

Bluetooth (BR / EDR / Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	BT: FHSS (GFSK, $\pi/4$ DQPSK, 8 DPSK) BT LE: GFSK
Antenna Type	Inverted F type Antenna
Antenna Gain	2.08 dBi

WLAN (IEEE802.11b/11g/11n-20)

Equipment Type	Transceiver
Frequency of Operation	2412 MHz to 2462 MHz
Type of Modulation	DSSS, OFDM
Antenna Type	Inverted F type Antenna
Antenna Gain	4.04 dBi

FM tuner specification

Frequency of operation: 87.5 MHz - 108 MHz

Section 3 : Test specification, procedures and results

3.1 Test specification

Test Specification	FCC Part 15 Subpart B The latest version on the first day of the testing period
Title	FCC 47CFR Part15 Radio Frequency Device Subpart B Unintentional Radiators

3.2 Procedures & results

Item	Test procedure	Limits	Worst margin	Result	Remarks
Conducted emission	ANSI C 63.4:2014 /C 63.4a:2017 7. AC powerline conducted emission measurements	-	N/A	N/A	*1)
Radiated emission	ANSI C 63.4:2014 /C 63.4a:2017 8. Radiated emission measurements	Class B	5.2 dB Freq.: 3443.584 MHz Detector: Average Polarization: Vertical Mode: FM Receiving (108 MHz)	Complied a)	*2)
Antenna power conduction for receivers	ANSI C63.4:2014+A1:2017 IEEE 187:2003	FCC 15.111 (a)	6.2 dB Freq.: 3443.584 MHz Detector: Peak Mode: FM Receiving (108 MHz)	Complied b)	-

Note: UL Japan's EMI work procedure: Work Instructions-ULID-003591

*1) The test is not applicable since the EUT does not have AC Mains.

*2) Measurements have been performed up to 26.5 GHz since the highest frequency of internal source of the EUT is 2480 MHz.

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

b) Refer to Appendix 2 (data of Antenna power conduction for receivers)

Symbols:

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

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

3.3 Deviation from standard

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

3.4 Uncertainty

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

There is no applicable rule of uncertainty in this applied standard. Therefore, the following results are derived depending on whether or not laboratory uncertainty is applied.

Item	Frequency range	No.1 SAC*1/SR*2 (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)	No.4 SAC/SR (±)
Radiated emission (Measurement distance: 3 m)	30 MHz to 200 MHz	4.6 dB	4.6 dB	4.6 dB	-
	200 MHz to 1 GHz	6.0 dB	6.1 dB	6.1 dB	-
	1 GHz to 6 GHz	4.7 dB	4.7 dB	4.7 dB	-
	6 GHz to 18 GHz	5.2 dB	5.3 dB	5.3 dB	-
	18 GHz to 40 GHz	5.4 dB	5.5 dB	5.5 dB	-
Radiated emission (Measurement distance: 1 m)	1 GHz to 18 GHz	5.6 dB	5.6 dB	5.6 dB	-
	18 GHz to 40 GHz	5.8 dB	5.8 dB	5.8 dB	-
Antenna Terminal Voltage*3	5 MHz-1000 MHz	2.9 dB			
	1 GHz-	2.8 dB			

*1: SAC=Semi-Anechoic Chamber

*2: SR= Shielded Room is applied besides radiated emission

*3: Value of Antenna Terminal Voltage measurement is also applies to the No.5 and No.6 Shielded Room.

3.5 Test location

UL Japan, Inc. Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 Japan

Telephone number : +81-463-50-6400

Facsimile number : +81-463-50-6401

A2LA Certificate Number : 1266.03

(FCC Test firm registration number: 839876, ISED lab company number: 2973D / CAB identifier: JP0001)

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

3.6 Test setup, test data & test instruments

Refer to Appendix 1 to 3.

Section 4 : Operation of EUT during testing

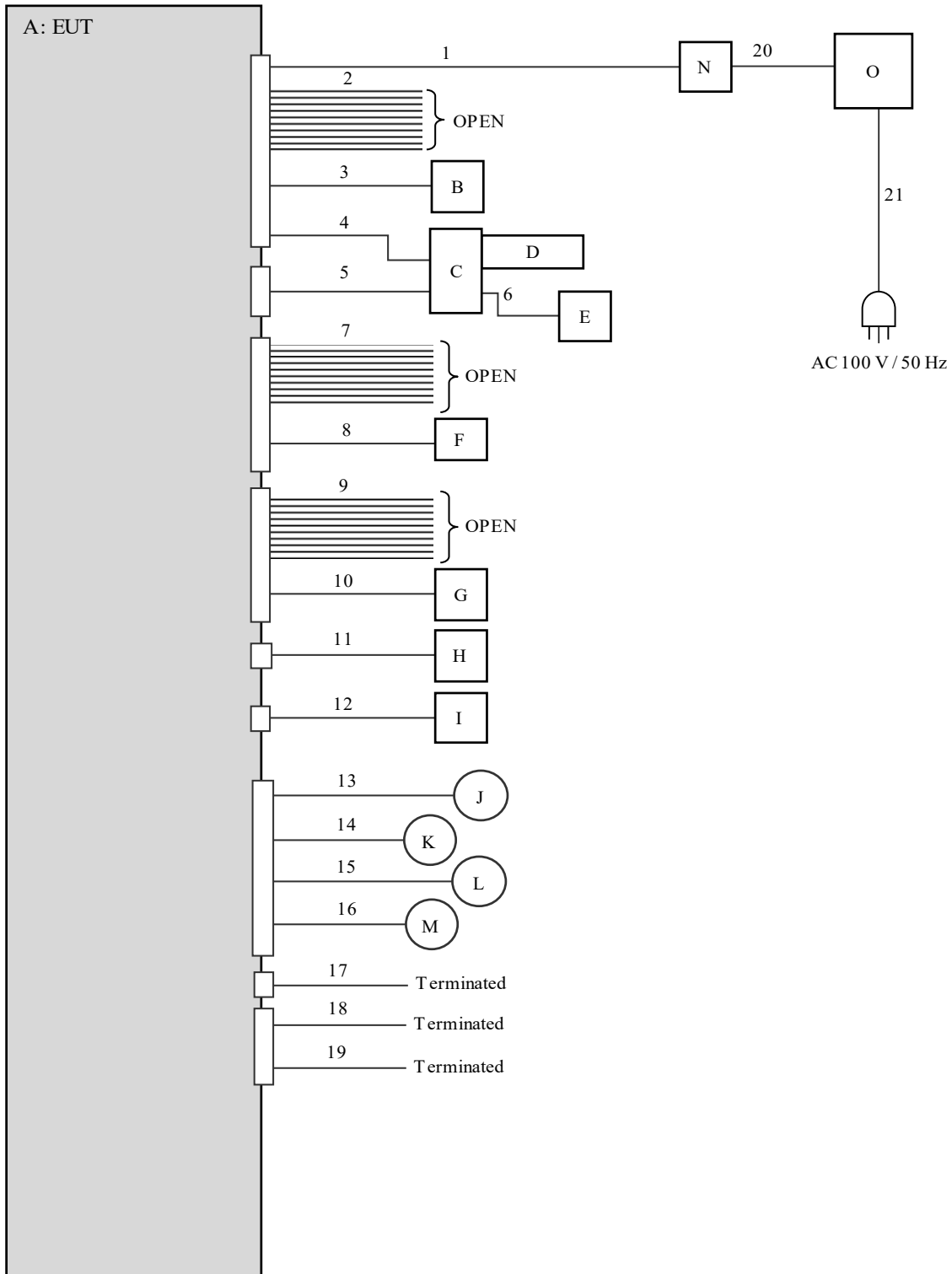
4.1 Operating modes

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

Operation mode(s)	FM Receiving (87.5 MHz / 97.8 MHz / 108 MHz) * Pre-checks were performed with Main port and Sub port, the final measurement was conducted with the worst Main port.
Software	YEP1RM07819 Ver.1.0
Justification	The system was configured in typical fashion (as a customer would normally use it) for testing.

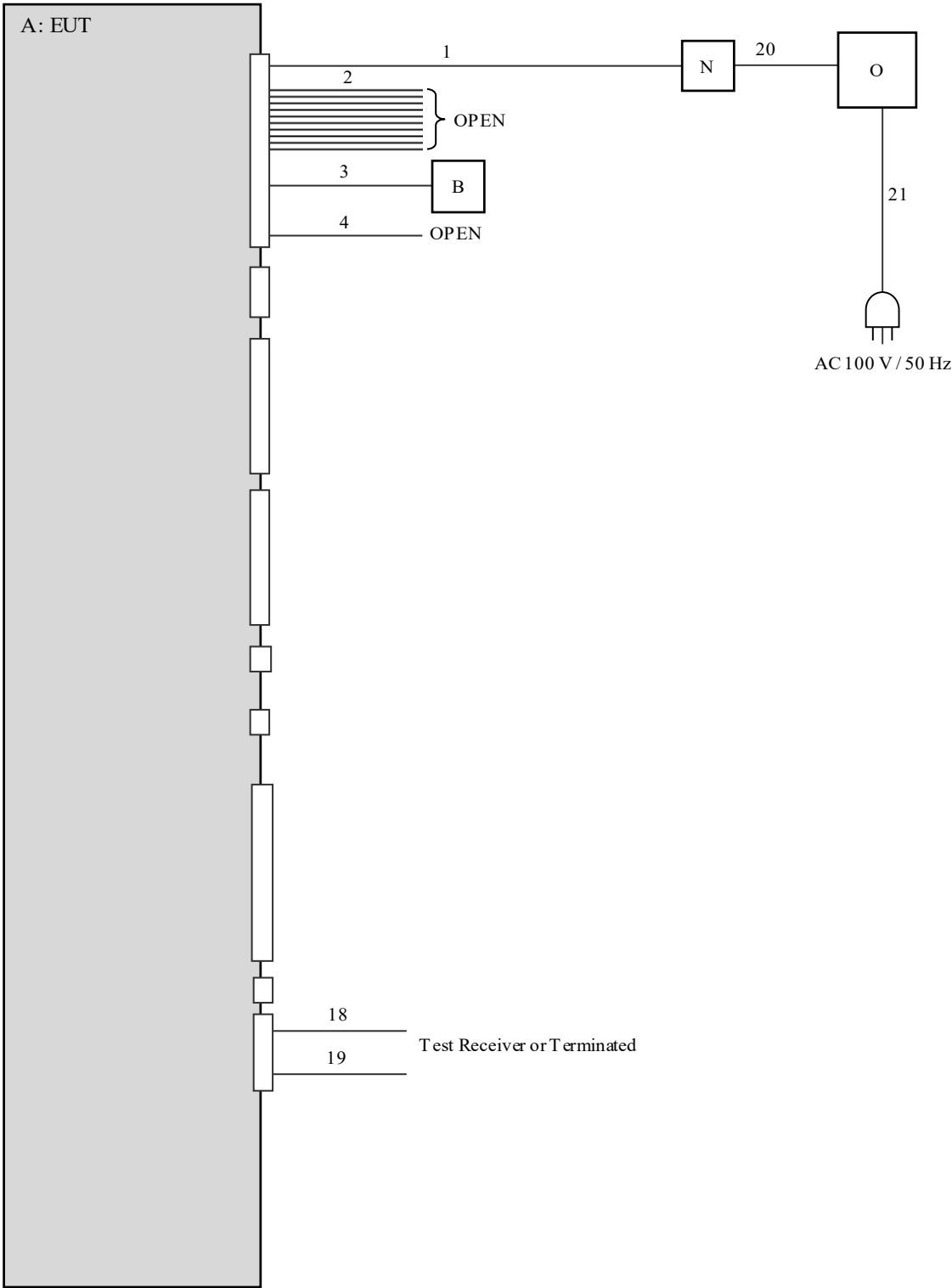
4.2 Configuration and peripherals

< Radiated Emission test >



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

Antenna Terminal test



Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Navigation	AT2107	No.1	Panasonic Automotive Systems Co., Ltd.	EUT
B	Steering Switch	ST-SW-IF	0011	Panasonic Automotive Systems Co., Ltd.	-
C	IF-Box	DEP32-10078	033	Panasonic Automotive Systems Co., Ltd.	-
D	USB Memory	USM4GU	-	Sony Corporation	-
E	Mobile Phone	SO-01F	CB5125QLDK	Sony Corporation	-
F	MIC	GP-SDA3510A	0DC062519	Panasonic Automotive Systems Co., Ltd.	-
G	MIC	GP-SDA3510A	0DC062856	Panasonic Automotive Systems Co., Ltd.	-
H	Rear Camera	GP-KDM301RC	92	Panasonic Automotive Systems Co., Ltd.	-
I	GPS Antenna	ANN-MS	-	U-Blox	-
J	Speaker	KFC-RS160	-	KENWOOD	-
K	Speaker	KFC-RS160	-	KENWOOD	-
L	Speaker	KFC-RS160	-	KENWOOD	-
M	Speaker	KFC-RS160	-	KENWOOD	-
N	Terminal Block	-	-	-	-
O	Power Supply (DC)	PAN35-10A	BP002287	KIKUSUI	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	2.5 + 0.2	Unshielded	Unshielded	-
2	Signal	2.5	Unshielded	Unshielded	-
3	Signal	2.5 + 0.1	Unshielded	Unshielded	-
4	IF Box Power	2.5 + 0.3	Unshielded	Unshielded	-
5	Signal	2.5	Shielded	Shielded	-
6	USB type C	0.9	Shielded	Shielded	-
7	Signal	2.5	Unshielded	Unshielded	-
8	MIC	2.5 + 0.5	Unshielded	Unshielded	-
9	Signal	2.5	Unshielded	Unshielded	-
10	MIC	2.5 + 0.5	Unshielded	Unshielded	-
11	Rear Camera	3.0 + 0.15	Unshielded	Unshielded	-
12	GPS	3.0 + 0.12	Shielded	Shielded	-
13	Speaker	1.0 + 1.9	Unshielded	Unshielded	-
14	Speaker	1.0 + 1.9	Unshielded	Unshielded	-
15	Speaker	1.0 + 1.9	Unshielded	Unshielded	-
16	Speaker	1.0 + 1.9	Unshielded	Unshielded	-
17	DCM	3.0	Shielded	Shielded	-
18	FM	2.5 *1) 0.15 *2)	Shielded	Shielded	-
19	FM	2.5 *1) 0.15 *2)	Shielded	Shielded	-
20	DC	2.4	Unshielded	Unshielded	-
21	AC	2.0	Unshielded	Unshielded	-

*1) Used for Radiated Emission test.

*2) Used for Antenna Terminal test.

Section 5: Radiated emission

5.1 Test conditions

Frequency range	30 MHz to 26.5 GHz
EUT position	Table top

5.2 Test configuration

The EUT was placed on a platform of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane. The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity. The rear of EUT, including its peripherals was aligned and flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. Photographs of the set up are shown in Appendix 1.

5.3 Test procedure

The Radiated Electric Field Strength intensity has been measured on a Semi-Anechoic Chamber with a ground plane at a distance of 3 m.

* Measuring distance (below 1 GHz)

The boundary of the EUT is defined by an imaginary circular periphery.

The measuring antenna height was varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.

The measurements were performed for both vertical and horizontal antenna polarization.

The radiated emission measurements were made with the following detector function.

	30 MHz to 1000 MHz (Test receiver)	1 GHz to 26.5 GHz (Spectrum analyzer)	
Detector Type	QP	AV *1)	PK
IF Bandwidth	120 kHz	RBW 1 MHz/ VBW 10 Hz	RBW 1 MHz/ VBW 3 MHz

*1) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

5.4 Results

Summary of the test results : Pass

Figure 1. Antenna angle

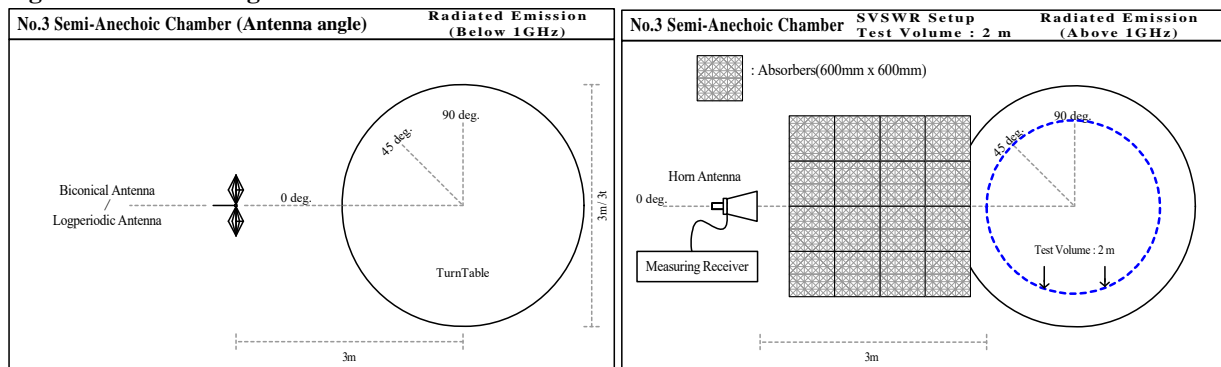
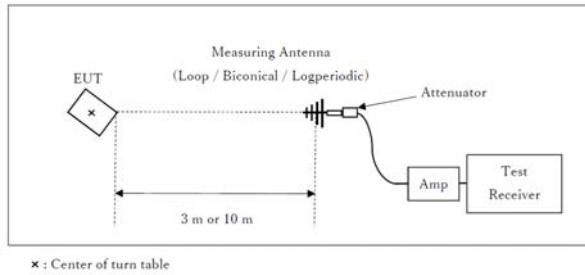


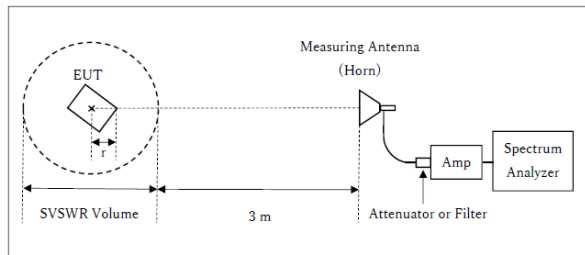
Figure 2. Test Setup

Below 1 GHz



Test Distance: 3 m

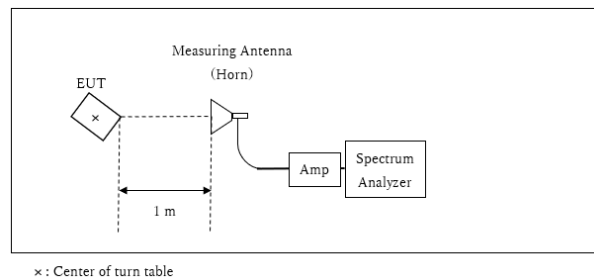
1 GHz to 13 GHz



Distance Factor: $20 \times \log(3.20 \text{ m} / 3.0 \text{ m}) = 0.57 \text{ dB}$
 * Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.20 \text{ m}$

SVSWR Volume: 2 m
 (SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 r = 0.8 m

13 GHz to 26.5 GHz



Distance Factor: $20 \times \log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$
 *Test Distance: 1 m

Distance Factor is based on FCC subpart A Section 15.31 (f).

SECTION 6: Antenna power conduction for receivers

6.1 Operating environment

Frequency range	30 MHz to 26.5 GHz
EUT position	Table top

6.2 Test configuration

The EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane. Photographs of the set up are shown in Appendix 1.

6.3 Test procedure

The antenna power conduction for receivers was made with the following detector function of the test receiver.

	30 MHz to 1000 MHz (Test receiver)	1 GHz to 26.5 GHz (Spectrum analyzer)
Detector Type	QP	PK
IF Bandwidth	120 kHz	RBW 1 MHz/ VBW 3 MHz

6.4 Results

Summary of the test results : Pass

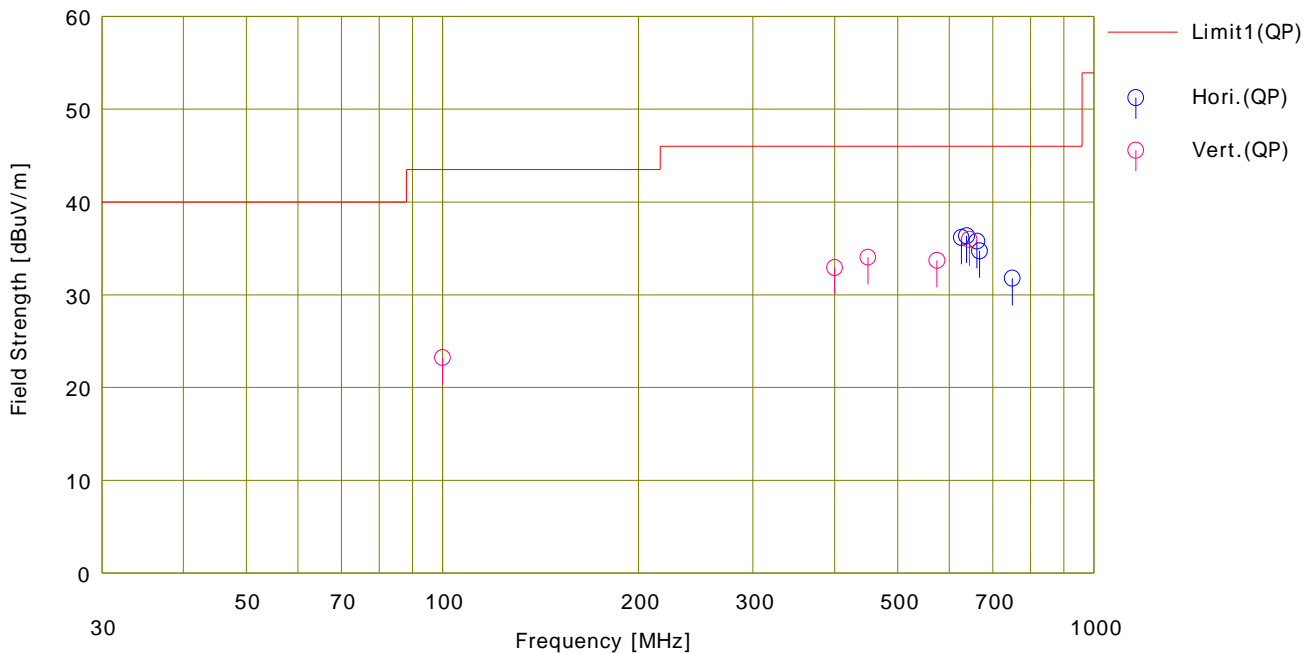
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date :2021/10/26

Company : Panasonic Automotive Systems Co., Ltd.	Mode : FM Receiving (97.8 MHz)
Kind of EUT : Car Navigation	Order No. : 14033198
Model No. : AT2107	Power : DC 13.2 V
Serial No. : No.1	Temp./Humi. : 23 deg.C / 45 %RH
Remarks : Other	

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Takahiro Suzuki



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]					<QP> [dBuV/m]	<QP> [dB]						
1	626.385	38.64	19.45	9.98	31.91	0.00	36.16	46.00	9.8	Hori.	162	31	LP	
2	638.287	38.98	19.25	10.03	31.92	0.00	36.34	46.00	9.6	Hori.	178	164	LP	
3	662.280	38.25	19.31	10.12	31.90	0.00	35.78	46.00	10.2	Hori.	164	187	LP	
4	667.879	37.07	19.38	10.15	31.89	0.00	34.71	46.00	11.2	Hori.	146	181	LP	
5	749.989	32.91	20.16	10.45	31.75	0.00	31.77	46.00	14.2	Hori.	100	218	LP	
6	100.005	37.82	10.19	7.29	32.13	0.06	23.23	43.50	20.2	Vert.	100	227	BC	
7	400.000	39.88	15.92	9.06	31.94	0.00	32.92	46.00	13.0	Vert.	100	193	LP	
8	450.000	40.07	16.59	9.30	31.93	0.00	34.03	46.00	11.9	Vert.	100	168	LP	
9	574.968	37.29	18.54	9.80	31.93	0.00	33.70	46.00	12.3	Vert.	100	194	LP	
10	644.190	38.65	19.19	10.05	31.92	0.00	35.97	46.00	10.0	Vert.	100	123	LP	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date :2021/10/26

Company : Panasonic Automotive Systems Co., Ltd.
 Kind of EUT : Car Navigation
 Model No. : AT2107
 Serial No. : No.1
 Remarks : Local

Mode : FM Receiving (87.5 MHz)
 Order No. : 14033198
 Power : DC 13.2 V
 Temp./Humi. : 23 deg.C / 45 %RH

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Takahiro Suzuki

<< QP DATA >>

No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]					<QP> [dBuV/m]	<QP> [dB]	<QP> [dB]					
1	87.112	23.76	7.66	7.17	32.14	0.40	6.85	40.00	33.1	Hori.	269	45	BC	
2	87.888	29.11	7.80	7.18	32.14	0.38	12.33	40.00	27.6	Hori.	205	109	BC	
3	174.224	23.25	15.77	7.83	32.07	0.01	14.79	43.50	28.7	Hori.	224	119	BC	
4	175.776	22.98	15.76	7.84	32.07	-0.01	14.50	43.50	29.0	Hori.	198	6	BC	
5	263.664	25.00	12.61	8.38	31.98	0.00	14.01	46.00	31.9	Hori.	129	220	LP	
6	351.552	27.59	15.24	8.84	31.92	0.00	19.75	46.00	26.2	Hori.	100	227	LP	
7	703.104	30.07	19.94	10.30	31.83	0.00	28.48	46.00	17.5	Hori.	138	186	LP	
8	966.768	22.07	22.20	11.17	30.46	0.00	24.98	53.90	28.9	Hori.	100	17	LP	
9	87.112	25.63	7.66	7.17	32.14	0.40	8.72	40.00	31.2	Vert.	100	223	BC	
10	87.888	28.07	7.80	7.18	32.14	0.38	11.29	40.00	28.7	Vert.	100	243	BC	
11	174.224	23.54	15.77	7.83	32.07	0.01	15.08	43.50	28.4	Vert.	100	194	BC	
12	175.776	23.75	15.76	7.84	32.07	-0.01	15.27	43.50	28.2	Vert.	100	166	BC	
13	263.664	27.28	12.61	8.38	31.98	0.00	16.29	46.00	29.7	Vert.	154	35	LP	
14	351.552	27.88	15.24	8.84	31.92	0.00	20.04	46.00	25.9	Vert.	100	166	LP	
15	703.104	29.87	19.94	10.30	31.83	0.00	28.28	46.00	17.7	Vert.	100	131	LP	
16	966.768	22.59	22.20	11.17	30.46	0.00	25.50	53.90	28.4	Vert.	100	119	LP	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date :2021/10/26

Company : Panasonic Automotive Systems Co., Ltd.
 Kind of EUT : Car Navigation
 Model No. : AT2107
 Serial No. : No.1
 Remarks : Local

Mode : FM Receiving (97.8 MHz)
 Order No. : 14033198
 Power : DC 13.2 V
 Temp./Humi. : 23 deg.C / 45 %RH

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Takahiro Suzuki

<< QP DATA >>

No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]					<QP> [dBuV/m]	<QP> [dB]	<QP> [dB]					
1	97.412	24.46	9.71	7.27	32.13	0.14	9.45	43.50	34.0	Hori.	308	273	BC	
2	98.188	24.39	9.87	7.27	32.13	0.11	9.51	43.50	33.9	Hori.	268	254	BC	
3	194.824	22.25	16.40	7.97	32.05	-0.14	14.43	43.50	29.0	Hori.	223	209	BC	
4	196.376	22.27	16.47	7.98	32.05	-0.14	14.53	43.50	28.9	Hori.	177	162	BC	
5	292.236	27.44	13.63	8.54	31.98	0.00	17.63	46.00	28.3	Hori.	129	120	LP	
6	389.648	29.38	15.56	9.00	31.94	0.00	22.00	46.00	24.0	Hori.	145	348	LP	
7	487.060	25.27	17.60	9.44	31.92	0.00	20.39	46.00	25.6	Hori.	100	38	LP	
8	779.296	34.68	20.51	10.54	31.63	0.00	34.10	46.00	11.9	Hori.	122	217	LP	
9	97.412	26.08	9.71	7.27	32.13	0.14	11.07	43.50	32.4	Vert.	100	118	BC	
10	98.188	27.05	9.87	7.27	32.13	0.11	12.17	43.50	31.3	Vert.	100	136	BC	
11	194.824	22.31	16.40	7.97	32.05	-0.14	14.49	43.50	29.0	Vert.	100	107	BC	
12	196.376	22.18	16.47	7.98	32.05	-0.14	14.44	43.50	29.0	Vert.	100	94	BC	
13	292.236	26.16	13.63	8.54	31.98	0.00	16.35	46.00	29.6	Vert.	179	180	LP	
14	389.648	24.59	15.56	9.00	31.94	0.00	17.21	46.00	28.7	Vert.	140	6	LP	
15	487.060	25.77	17.60	9.44	31.92	0.00	20.89	46.00	25.1	Vert.	100	165	LP	
16	779.296	30.83	20.51	10.54	31.63	0.00	30.25	46.00	15.7	Vert.	100	160	LP	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date :2021/10/26

Company : Panasonic Automotive Systems Co., Ltd.
 Kind of EUT : Car Navigation
 Model No. : AT2107
 Serial No. : No.1
 Remarks : Local

Mode : FM Receiving (108 MHz)
 Order No. : 14033198
 Power : DC 13.2 V
 Temp./Humi. : 23 deg.C / 45 %RH

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Takahiro Suzuki

<< QP DATA >>

No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]					<QP> [dBuV/m]	<QP> [dB]	<QP> [dB]					
1	107.612	22.64	11.51	7.35	32.12	-0.09	9.29	43.50	34.2	Hori.	209	116	BC	
2	108.388	22.68	11.63	7.35	32.12	-0.10	9.44	43.50	34.0	Hori.	221	187	BC	
3	215.224	22.37	11.20	8.10	32.03	0.00	9.64	43.50	33.8	Hori.	128	18	LP	
4	216.776	24.08	11.18	8.11	32.03	0.00	11.34	46.00	34.6	Hori.	173	104	LP	
5	322.836	28.03	14.38	8.69	31.95	0.00	19.15	46.00	26.8	Hori.	104	307	LP	
6	325.164	26.75	14.48	8.71	31.95	0.00	17.99	46.00	28.0	Hori.	100	131	LP	
7	430.448	30.08	16.20	9.21	31.93	0.00	23.56	46.00	22.4	Hori.	100	316	LP	
8	860.896	32.64	21.78	10.82	31.26	0.00	33.98	46.00	12.0	Hori.	114	235	LP	
9	107.612	23.41	11.51	7.35	32.12	-0.09	10.06	43.50	33.4	Vert.	100	285	BC	
10	108.388	23.47	11.63	7.35	32.12	-0.10	10.23	43.50	33.2	Vert.	100	119	BC	
11	215.224	22.23	11.20	8.10	32.03	0.00	9.50	43.50	34.0	Vert.	100	56	LP	
12	216.776	24.00	11.18	8.11	32.03	0.00	11.26	46.00	34.7	Vert.	100	87	LP	
13	322.836	26.18	14.38	8.69	31.95	0.00	17.30	46.00	28.7	Vert.	147	177	LP	
14	325.164	25.82	14.48	8.71	31.95	0.00	17.06	46.00	28.9	Vert.	167	171	LP	
15	430.448	28.55	16.20	9.21	31.93	0.00	22.03	46.00	23.9	Vert.	170	357	LP	
16	860.896	30.95	21.78	10.82	31.26	0.00	32.29	46.00	13.7	Vert.	100	73	LP	

DATA OF RADIATED EMISSION TEST

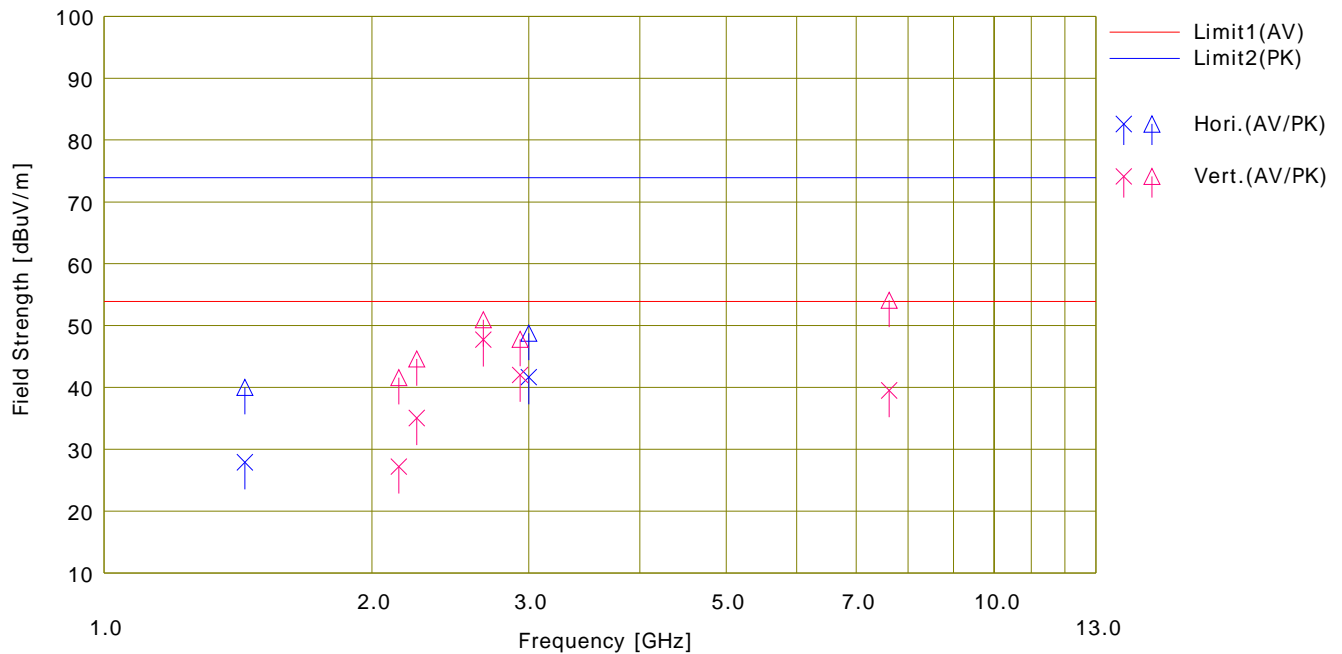
UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2021/10/27

Company : Panasonic Automotive Systems Co., Ltd.
 Kind of EUT : Car Navigation
 Model No. : AT2107
 Serial No. : No.1
 Remarks : Other, Test Distance=320 cm
 *No signal was detected above 13 GHz.

Mode : FM Receiving (97.8 MHz)
 Order No. : 14033198
 Power : DC 13.2 V
 Temp./Humi. : 22 deg.C / 42 %RH

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Takahiro Suzuki



No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV>	<PK>					<AV>	<PK>	<AV>	<PK>	<AV>	<PK>					
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]					
1	1439.929	39.38	51.49	25.62	3.42	41.09	0.57	27.90	40.01	53.90	73.90	26.0	33.8	Hori.	160	166	31SH3	
2	2999.759	48.83	55.93	29.03	5.03	41.79	0.57	41.67	48.77	53.90	73.90	12.2	25.1	Hori.	165	227	31SH3	
3	2145.281	36.08	50.48	27.88	4.22	41.54	0.57	27.21	41.61	53.90	73.90	26.6	32.2	Vert.	100	127	31SH3	
4	2245.985	43.32	52.87	28.43	4.31	41.57	0.57	35.06	44.61	53.90	73.90	18.8	29.2	Vert.	100	168	31SH3	
5	2666.804	55.77	58.97	28.39	4.72	41.70	0.57	47.75	50.95	53.90	73.90	6.1	22.9	Vert.	222	0	31SH3	
6	2933.193	49.36	55.11	28.91	4.96	41.77	0.57	42.03	47.78	53.90	73.90	11.8	26.1	Vert.	240	39	31SH3	
7	7620.179	37.18	51.75	37.44	7.90	43.56	0.57	39.53	54.10	53.90	73.90	14.3	19.8	Vert.	100	76	31SH3	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date :2021/10/27

Company : Panasonic Automotive Systems Co., Ltd.
 Kind of EUT : Car Navigation
 Model No. : AT2107
 Serial No. : No.1
 Remarks : Local, Test Distance=320 cm
 *No signal was detected above 13 GHz.

Mode : FM Receiving (87.5 MHz)
 Order No. : 14033198
 Power : DC 13.2 V
 Temp./Humi. : 22 deg.C / 42 %RH

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Takahiro Suzuki

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV>	<PK>					<AV>	<PK>	<AV>	<PK>	<AV>	<PK>					
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]					
1	1406.208	35.82	50.55	25.73	3.37	41.09	0.57	24.40	39.13	53.90	73.90	29.5	34.7	Hori.	114	109	31SH3	
2	1757.760	35.47	50.65	25.50	3.80	41.30	0.57	24.04	39.22	53.90	73.90	29.8	34.6	Hori.	122	154	31SH3	
3	2548.752	35.81	50.43	28.23	4.61	41.67	0.57	27.55	42.17	53.90	73.90	26.3	31.7	Hori.	127	251	31SH3	
4	3427.632	35.44	50.59	28.90	5.38	42.10	0.57	28.19	43.34	53.90	73.90	25.7	30.5	Hori.	100	34	31SH3	
5	3515.520	51.87	56.73	29.20	5.44	42.15	0.57	44.93	49.79	53.90	73.90	8.9	24.1	Hori.	100	22	31SH3	
6	7031.040	36.63	51.41	36.88	7.61	43.19	0.57	38.50	53.28	53.90	73.90	15.4	20.6	Hori.	100	56	31SH3	
7	8525.136	38.08	52.55	37.89	8.35	43.44	0.57	41.45	55.92	53.90	73.90	12.4	17.9	Hori.	100	153	31SH3	
8	1406.208	36.73	51.39	25.73	3.37	41.09	0.57	25.31	39.97	53.90	73.90	28.5	33.9	Vert.	100	39	31SH3	
9	1757.760	35.28	49.89	25.50	3.80	41.30	0.57	23.85	38.46	53.90	73.90	30.0	35.4	Vert.	118	357	31SH3	
10	2548.752	37.77	51.21	28.23	4.61	41.67	0.57	29.51	42.95	53.90	73.90	24.3	30.9	Vert.	171	23	31SH3	
11	3427.632	35.53	50.16	28.90	5.38	42.10	0.57	28.28	42.91	53.90	73.90	25.6	30.9	Vert.	100	86	31SH3	
12	3515.520	54.03	58.18	29.20	5.44	42.15	0.57	47.09	51.24	53.90	73.90	6.8	22.6	Vert.	150	316	31SH3	
13	7031.040	36.69	51.04	36.88	7.61	43.19	0.57	38.56	52.91	53.90	73.90	15.3	20.9	Vert.	100	147	31SH3	
14	8525.136	38.00	53.03	37.89	8.35	43.44	0.57	41.37	56.40	53.90	73.90	12.5	17.5	Vert.	100	17	31SH3	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date :2021/10/27

Company : Panasonic Automotive Systems Co., Ltd.
 Kind of EUT : Car Navigation
 Model No. : AT2107
 Serial No. : No.1
 Remarks : Local, Test Distance=320 cm
 *No signal was detected above 13 GHz.

Mode : FM Receiving (97.8 MHz)
 Order No. : 14033198
 Power : DC 13.2 V
 Temp./Humi. : 22 deg.C / 42 %RH

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Takahiro Suzuki

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV>	<PK>					<AV>	<PK>	<AV>	<PK>	<AV>	<PK>					
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]					
1	1071.532	38.53	52.58	24.80	2.95	41.07	0.57	25.78	39.83	53.90	73.90	28.1	34.0	Hori.	100	184	31SH3	
2	1558.592	36.27	50.66	25.31	3.57	41.14	0.57	24.58	38.97	53.90	73.90	29.3	34.9	Hori.	100	193	31SH3	
3	1948.240	37.04	50.26	26.22	4.02	41.45	0.57	26.40	39.62	53.90	73.90	27.5	34.2	Hori.	100	62	31SH3	
4	3409.420	35.83	49.88	28.86	5.35	42.08	0.57	28.53	42.58	53.90	73.90	25.3	31.3	Hori.	100	98	31SH3	
5	3506.832	51.52	56.44	29.17	5.43	42.15	0.57	44.54	49.46	53.90	73.90	9.3	24.4	Hori.	100	22	31SH3	
6	4968.012	36.09	50.81	32.16	6.47	42.89	0.57	32.40	47.12	53.90	73.90	21.5	26.7	Hori.	100	117	31SH3	
7	7013.664	36.48	51.22	36.81	7.61	43.18	0.57	38.29	53.03	53.90	73.90	15.6	20.8	Hori.	100	225	31SH3	
8	1071.532	37.93	52.19	24.80	2.95	41.07	0.57	25.18	39.44	53.90	73.90	28.7	34.4	Vert.	100	181	31SH3	
9	1558.592	35.85	50.36	25.31	3.57	41.14	0.57	24.16	38.67	53.90	73.90	29.7	35.2	Vert.	100	148	31SH3	
10	1948.240	38.18	51.15	26.22	4.02	41.45	0.57	27.54	40.51	53.90	73.90	26.3	33.3	Vert.	100	336	31SH3	
11	3409.420	35.57	50.22	28.86	5.35	42.08	0.57	28.27	42.92	53.90	73.90	25.6	30.9	Vert.	100	129	31SH3	
12	3506.832	52.48	56.91	29.17	5.43	42.15	0.57	45.50	49.93	53.90	73.90	8.4	23.9	Vert.	100	297	31SH3	
13	4968.012	36.09	50.83	32.16	6.47	42.89	0.57	32.40	47.14	53.90	73.90	21.5	26.7	Vert.	100	91	31SH3	
14	7013.664	36.53	51.05	36.81	7.61	43.18	0.57	38.34	52.86	53.90	73.90	15.5	21.0	Vert.	100	38	31SH3	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date :2021/10/27

Company : Panasonic Automotive Systems Co., Ltd.
 Kind of EUT : Car Navigation
 Model No. : AT2107
 Serial No. : No.1
 Remarks : Local, Test Distance=320 cm
 *No signal was detected above 13 GHz.

Mode : FM Receiving (108 MHz)
 Order No. : 14033198
 Power : DC 13.2 V
 Temp./Humi. : 22 deg.C / 42 %RH

Limit : FCC_Part 15 Subpart B(15.109)_Class B

Engineer : Takahiro Suzuki

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV>	<PK>					<AV>	<PK>	<AV>	<PK>	<AV>	<PK>					
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]					
1	1291.344	35.79	50.23	25.64	3.23	41.08	0.57	24.15	38.59	53.90	73.90	29.7	35.3	Hori.	135	156	31SH3	
2	1721.792	35.42	49.97	25.41	3.76	41.27	0.57	23.89	38.44	53.90	73.90	30.0	35.4	Hori.	183	42	31SH3	
3	1937.016	34.85	49.63	26.16	4.01	41.44	0.57	24.15	38.93	53.90	73.90	29.7	34.9	Hori.	100	214	31SH3	
4	3013.136	35.19	50.06	29.06	5.04	41.80	0.57	28.06	42.93	53.90	73.90	25.8	30.9	Hori.	100	155	31SH3	
5	3443.584	53.92	58.31	28.94	5.39	42.11	0.57	46.71	51.10	53.90	73.90	7.1	22.8	Hori.	183	50	31SH3	
6	5057.764	39.44	52.95	32.36	6.52	42.95	0.57	35.94	49.45	53.90	73.90	17.9	24.4	Hori.	173	267	31SH3	
7	6887.168	36.73	51.50	36.07	7.55	43.27	0.57	37.65	52.42	53.90	73.90	16.2	21.4	Hori.	100	34	31SH3	
8	1291.344	36.72	50.57	25.64	3.23	41.08	0.57	25.08	38.93	53.90	73.90	28.8	34.9	Vert.	100	32	31SH3	
9	1721.792	35.00	49.57	25.41	3.76	41.27	0.57	23.47	38.04	53.90	73.90	30.4	35.8	Vert.	100	354	31SH3	
10	1937.016	34.96	50.04	26.16	4.01	41.44	0.57	24.26	39.34	53.90	73.90	29.6	34.5	Vert.	100	127	31SH3	
11	3013.136	35.28	49.44	29.06	5.04	41.80	0.57	28.15	42.31	53.90	73.90	25.7	31.5	Vert.	100	45	31SH3	
12	3443.584	55.88	59.63	28.94	5.39	42.11	0.57	48.67	52.42	53.90	73.90	5.2	21.4	Vert.	100	201	31SH3	
13	5057.764	41.57	53.54	32.36	6.52	42.95	0.57	38.07	50.04	53.90	73.90	15.8	23.8	Vert.	131	205	31SH3	
14	6887.168	36.69	50.87	36.07	7.55	43.27	0.57	37.61	51.79	53.90	73.90	16.2	22.1	Vert.	100	19	31SH3	

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

DATA OF ANTENNA TERMINAL TEST

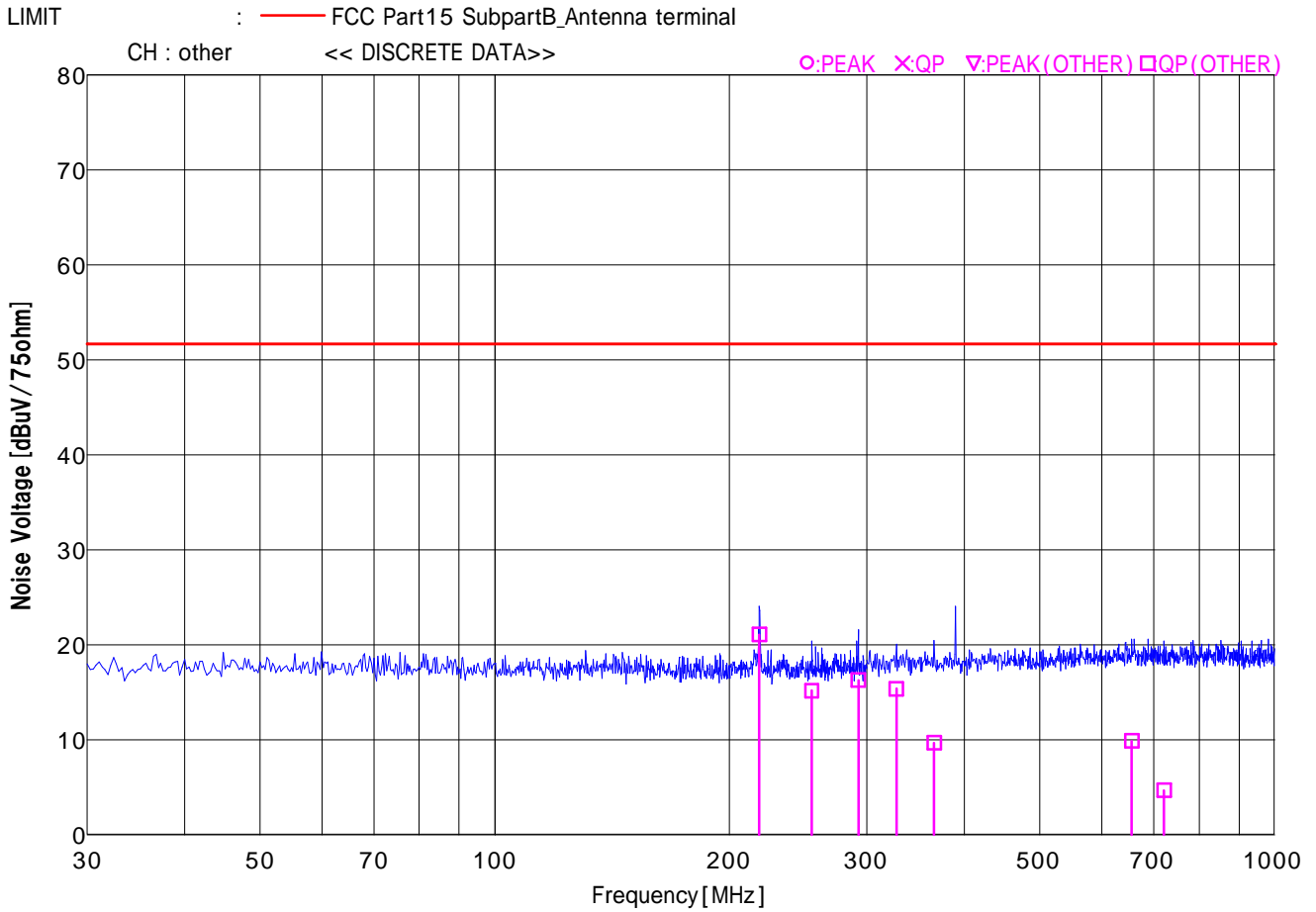
UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 26 / Oct / 2021

Company : Panasonic Automotive Systems Co., Ltd.
Kind of EUT : Car Navigation
Model No. : AT2107
Serial No. : No.1

Mode : FM Receiving (97.8 MHz)
Order No. : 14033198
Power : DC 13.2 V
Temp./Humi. : 24 deg.C / 43 %RH

Remarks : Main port, Other

Engineer : Shuma Terasawa



Calculation:Result [dBuV]=Reading [dBuV]+Fac (Cable+Matching Pad - Amp) [dB]+1.76 (50 ohm to 75 ohm) [dB]

DATA OF ANTENNA TERMINAL TEST

UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 26 / Oct / 2021

Company : **Panasonic Automotive Systems Co., Ltd.** Mode : **FM Receiving (97.8 MHz)**
 Kind of EUT : **Car Navigation** Order No. : **14033198**
 Model No. : **AT2107** Power : **DC 13.2 V**
 Serial No. : **No.1** Temp./Humi. : **24 deg.C / 43 %RH**

Remarks : **Main port, Other**

Engineer : **Shuma Terasawa**

LIMIT : FCC Part15 SubpartB_Antenna terminal

CH	Freq	Reading		Factor	Result		Limit	Margin
		PEAK	QP		PEAK	QP		
	[MHz]	[dBuV]		[dB]	[dBuV/75]		[dBuV/75]	[dB]
other	218.461	----	33.8	-12.7	----	21.1	51.7	30.6
	254.911	----	27.8	-12.6	----	15.2	51.7	36.5
	292.440	----	28.9	-12.6	----	16.3	51.7	35.4
	327.301	----	28.0	-12.6	----	15.4	51.7	36.3
	365.801	----	22.2	-12.5	----	9.7	51.7	42.0
	655.606	----	21.7	-11.8	----	9.9	51.7	41.8
	721.407	----	16.5	-11.8	----	4.7	51.7	47.0

Calculation: Result [dBuV] = Reading [dBuV] + Fac (Cable + Matching Pad - Amp) [dB] + 1.76 (50 ohm to 75 ohm) [dB]

DATA OF ANTENNA TERMINAL TEST

UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 26 / Oct / 2021

Company : Panasonic Automotive Systems Co., Ltd. Mode : FM Receiving (87.5 MHz)
 Kind of EUT : Car Navigation Order No. : 14033198
 Model No. : AT2107 Power : DC 13.2 V
 Serial No. : No.1 Temp./Humi. : 24 deg.C / 43 %RH

Remarks : Main port, Local

Engineer : Shuma Terasawa

LIMIT (Fundamental) : FCC Part15 SubpartB_Antenna terminal
 LIMIT (Harmonics) : FCC Part15 SubpartB_Antenna terminal

CH	Freq [MHz]	Reading		Factor [dB]	Result		Limit [dBuV/75]	Margin [dB]
		PEAK	QP		PEAK	QP		
		[dBuV]			[dBuV/75]			
87.5 MHz	87.888	----	18.7	-13.0	----	5.7	51.7	46.0
	175.776	----	18.7	-12.8	----	5.9	51.7	45.8
	263.664	----	27.6	-12.6	----	15.0	51.7	36.7
	351.552	----	36.1	-12.5	----	23.6	51.7	28.1
	439.440	----	17.0	-12.3	----	4.7	51.7	47.0
	527.328	----	16.6	-12.1	----	4.5	51.7	47.2
	615.216	----	17.5	-11.9	----	5.6	51.7	46.1
	703.104	----	20.5	-11.8	----	8.7	51.7	43.0
	790.992	----	16.4	-11.7	----	4.7	51.7	47.0
	878.880	----	17.4	-11.8	----	5.6	51.7	46.1
	966.768	----	16.4	-11.9	----	4.5	51.7	47.2
	87.112	----	16.7	-13.0	----	3.7	51.7	48.0
	174.224	----	16.7	-12.8	----	3.9	51.7	47.8
	261.336	----	16.7	-12.6	----	4.1	51.7	47.6
	348.448	----	16.4	-12.5	----	3.9	51.7	47.8
	435.560	----	16.4	-12.3	----	4.1	51.7	47.6
	522.672	----	16.2	-12.1	----	4.1	51.7	47.6
	609.784	----	16.8	-11.9	----	4.9	51.7	46.8
	696.896	----	16.9	-11.8	----	5.1	51.7	46.6
	784.008	----	16.3	-11.7	----	4.6	51.7	47.1
871.120	----	16.8	-11.8	----	5.0	51.7	46.7	
958.232	----	17.6	-11.9	----	5.7	51.7	46.0	

Calculation: Result [dBuV] = Reading [dBuV] + Fac (Cable + Matching Pad - Amp) [dB] + 1.76 (50 ohm to 75 ohm) [dB]

DATA OF ANTENNA TERMINAL TEST

UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 26/Oct/2021

Company	: Panasonic Automotive Systems Co., Ltd.	Mode	: FM Receiving (97.8 MHz)
Kind of EUT	: Car Navigation	Order No.	: 14033198
Model No.	: AT2107	Power	: DC 13.2 V
Serial No.	: No.1	Temp./Humi.	: 24 deg.C / 43 %RH

Remarks : Main port, Local

Engineer : Shuma Terasawa

LIMIT (Fundamental) : FCC Part15 SubpartB_Antenna terminal
LIMIT (Harmonics) : FCC Part15 SubpartB_Antenna terminal

CH	Freq [MHz]	Reading		Factor [dB]	Result		Limit [dBuV/75]	Margin [dB]
		PEAK	QP		PEAK	QP		
		[dBuV]			[dBuV/75]			
97.8 MHz	98.188	----	16.7	-13.0	----	3.7	51.7	48.0
	196.376	----	16.9	-12.8	----	4.1	51.7	47.6
	294.564	----	16.7	-12.6	----	4.1	51.7	47.6
	392.752	----	16.2	-12.4	----	3.8	51.7	47.9
	490.940	----	16.3	-12.2	----	4.1	51.7	47.6
	589.128	----	16.6	-11.9	----	4.7	51.7	47.0
	687.316	----	16.2	-11.8	----	4.4	51.7	47.3
	785.504	----	16.4	-11.7	----	4.7	51.7	47.0
	883.692	----	17.4	-11.8	----	5.6	51.7	46.1
	981.880	----	16.3	-11.8	----	4.5	51.7	47.2
	97.412	----	17.1	-13.0	----	4.1	51.7	47.6
	194.824	----	17.7	-12.8	----	4.9	51.7	46.8
	292.236	----	28.9	-12.6	----	16.3	51.7	35.4
	389.648	----	33.1	-12.4	----	20.7	51.7	31.0
	487.060	----	17.6	-12.2	----	5.4	51.7	46.3
	584.472	----	17.2	-11.9	----	5.3	51.7	46.4
	681.884	----	17.2	-11.8	----	5.4	51.7	46.3
	779.296	----	22.7	-11.7	----	11.0	51.7	40.7
876.708	----	16.8	-11.8	----	5.0	51.7	46.7	
974.120	----	16.3	-11.9	----	4.4	51.7	47.3	

Calculation: Result [dBuV] = Reading [dBuV] + Fac (Cable + Matching Pad - Amp) [dB] + 1.76 (50 ohm to 75 ohm) [dB]

DATA OF ANTENNA TERMINAL TEST

UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 26/Oct/2021

Company : **Panasonic Automotive Systems Co., Ltd.** Mode : **FM Receiving (108 MHz)**
 Kind of EUT : **Car Navigation** Order No. : **14033198**
 Model No. : **AT2107** Power : **DC 13.2 V**
 Serial No. : **No.1** Temp./Humi. : **24 deg.C / 43 %RH**

Remarks : **Main port, Local**

Engineer : **Shuma Terasawa**

LIMIT (Fundamental) : FCC Part15 SubpartB_Antenna terminal
 LIMIT (Harmonics) : FCC Part15 SubpartB_Antenna terminal

CH	Freq [MHz]	Reading		Factor [dB]	Result		Limit [dBuV/75]	Margin [dB]
		PEAK	QP		PEAK	QP		
		[dBuV]			[dBuV/75]			
108 MHz	108388	----	16.7	-13.0	----	3.7	51.7	48.0
	216776	----	18.2	-12.7	----	5.5	51.7	46.2
	325164	----	16.5	-12.6	----	3.9	51.7	47.8
	433552	----	16.4	-12.3	----	4.1	51.7	47.6
	541940	----	16.7	-12.1	----	4.6	51.7	47.1
	650328	----	19.7	-11.8	----	7.9	51.7	43.8
	758716	----	16.1	-11.7	----	4.4	51.7	47.3
	867104	----	16.8	-11.8	----	5.0	51.7	46.7
	975492	----	16.3	-11.8	----	4.5	51.7	47.2
	107612	----	17.5	-13.0	----	4.5	51.7	47.2
	215224	----	24.7	-12.8	----	11.9	51.7	39.8
	322836	----	27.9	-12.6	----	15.3	51.7	36.4
	430448	----	30.7	-12.3	----	18.4	51.7	33.3
	538060	----	17.1	-12.1	----	5.0	51.7	46.7
	645672	----	20.1	-11.8	----	8.3	51.7	43.4
	753284	----	16.4	-11.7	----	4.7	51.7	47.0
	860896	----	19.6	-11.8	----	7.8	51.7	43.9
968508	----	16.3	-11.9	----	4.4	51.7	47.3	

Calculation: Result [dBuV] = Reading [dBuV] + Fac (Cable + Matching Pad - Amp) [dB] + 1.76 (50 ohm to 75 ohm) [dB]

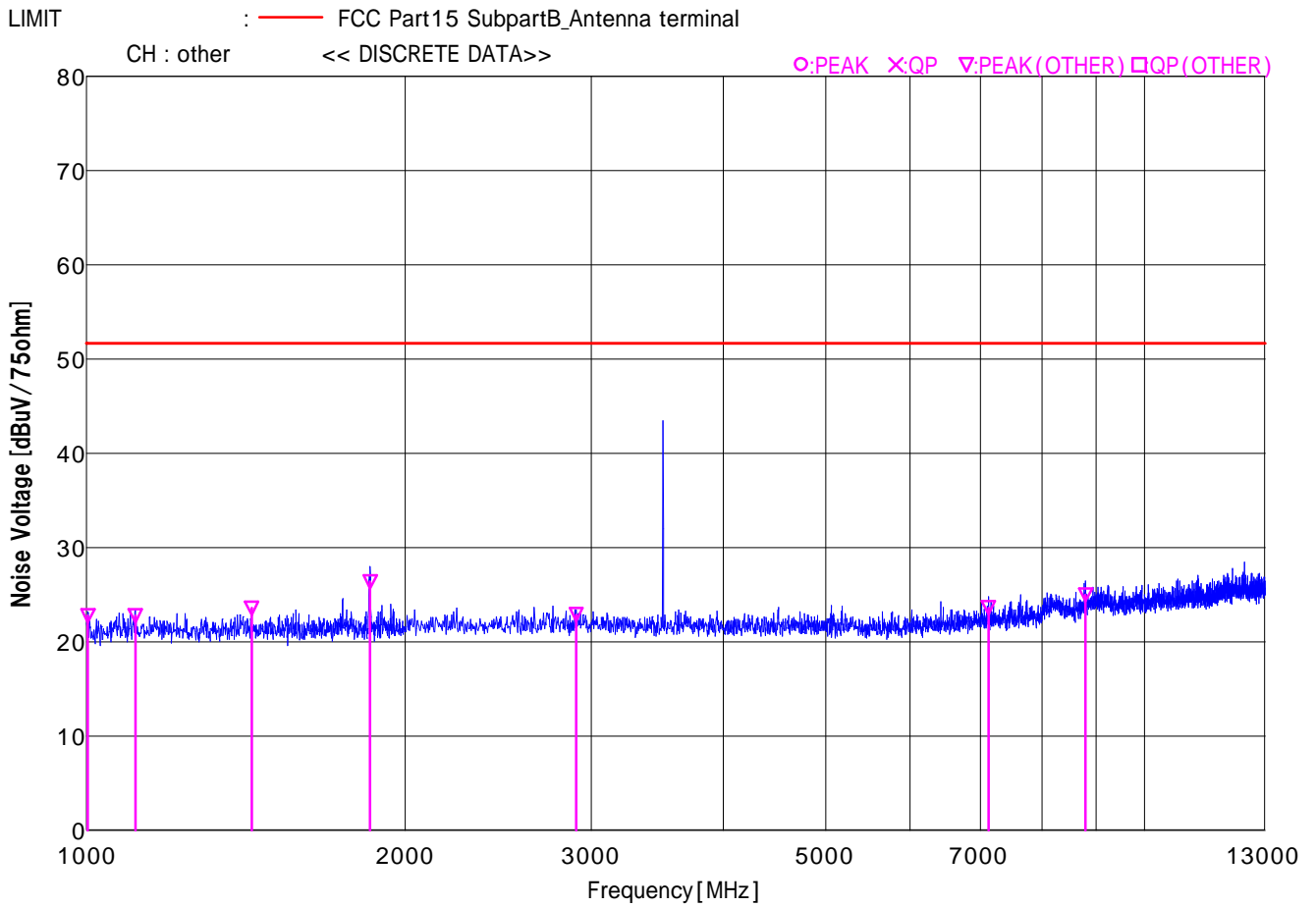
DATA OF ANTENNA TERMINAL TEST

UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 27/Oct/2021

Company	: Panasonic Automotive Systems Co., Ltd.	Mode	: FM Receiving (97.8 MHz)
Kind of EUT	: Car Navigation	Order No.	: 14033198
Model No.	: AT2107	Power	: DC 13.2 V
Serial No.	: No.1	Temp./Humi.	: 25 deg.C / 38 %RH

Remarks : Main port, Other
*No signal was detected above 13 GHz.

Engineer : Kouki Yamada



Calculation:Result [dBuV]=Reading [dBuV]+Fac (Cable+ATT - Amp) [dB]+1.76 (50 ohm to 75 ohm) [dB]

DATA OF ANTENNA TERMINAL TEST

UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 27 / Oct / 2021

Company : **Panasonic Automotive Systems Co., Ltd.** Mode : **FM Receiving (97.8 MHz)**
 Kind of EUT : **Car Navigation** Order No. : **14033198**
 Model No. : **AT2107** Power : **DC 13.2 V**
 Serial No. : **No.1** Temp./Humi. : **25 deg.C / 38 %RH**

Remarks : **Main port, Other**
 *No signal was detected above 13 GHz.

Engineer : **Kouki Yamada**

LIMIT : FCC Part15 SubpartB_Antenna terminal

CH	Freq	Reading		Factor	Result		Limit	Margin
		PEAK	QP		PEAK	QP		
	[MHz]	[dBuV]		[dB]	[dBuV/75]		[dBuV/75]	[dB]
other	1003.000	48.0	----	-25.2	22.8	----	51.7	28.9
	1112.000	47.6	----	-24.8	22.8	----	51.7	28.9
	1432.000	47.6	----	-24.0	23.6	----	51.7	28.1
	1854.000	49.7	----	-23.3	26.4	----	51.7	25.3
	2903.000	45.8	----	-22.9	22.9	----	51.7	28.8
	7121.000	45.0	----	-21.4	23.6	----	51.7	28.1
	8798.000	46.1	----	-21.1	25.0	----	51.7	26.7

Calculation: Result [dBuV] = Reading [dBuV] + Fac (Cable+ATT - Amp) [dB] + 1.76 (50 ohm to 75 ohm) [dB]

DATA OF ANTENNA TERMINAL TEST

UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 27 / Oct / 2021

Company : **Panasonic Automotive Systems Co., Ltd.** Mode : **FM Receiving (87.5 MHz)**
 Kind of EUT : **Car Navigation** Order No. : **14033198**
 Model No. : **AT2107** Power : **DC 13.2 V**
 Serial No. : **No.1** Temp./Humi. : **25 deg.C / 38 %RH**

Remarks : **Main port, Local**
 *No signal was detected above 13 GHz.

Engineer : **Kouki Yamada**

LIMIT (Fundamental) : FCC Part15 SubpartB_Antenna terminal
 LIMIT (Harmonics) : FCC Part15 SubpartB_Antenna terminal

CH	Freq [MHz]	Reading		Factor [dB]	Result		Limit [dBuV/75]	Margin [dB]
		PEAK	QP		PEAK	QP		
		[dBuV]			[dBuV/75]			
87.5 MHz	1406208	46.9	----	-24.0	22.9	----	51.7	28.8
	1757760	46.5	----	-23.4	23.1	----	51.7	28.6
	2548752	46.1	----	-22.9	23.2	----	51.7	28.5
	3427632	45.8	----	-22.5	23.3	----	51.7	28.4
	3515520	65.9	----	-22.4	43.5	----	51.7	8.2
	7031040	45.7	----	-21.4	24.3	----	51.7	27.4
	8525136	45.9	----	-21.0	24.9	----	51.7	26.8

Calculation: Result [dBuV] = Reading [dBuV] + Fac (Cable+ATT - Amp) [dB] + 1.76 (50 ohm to 75 ohm) [dB]

DATA OF ANTENNA TERMINAL TEST

UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 27 / Oct / 2021

Company : **Panasonic Automotive Systems Co., Ltd.** Mode : **FM Receiving (97.8 MHz)**
 Kind of EUT : **Car Navigation** Order No. : **14033198**
 Model No. : **AT2107** Power : **DC 13.2 V**
 Serial No. : **No.1** Temp./Humi. : **25 deg.C / 38 %RH**

Remarks : **Main port, Local**
 *No signal was detected above 13 GHz.

Engineer : **Kouki Yamada**

LIMIT (Fundamental) : FCC Part15 SubpartB_Antenna terminal
 LIMIT (Harmonics) : FCC Part15 SubpartB_Antenna terminal

CH	Freq	Reading		Factor	Result		Limit	Margin
		PEAK	QP		PEAK	QP		
	[MHz]	[dBuV]		[dB]	[dBuV / 75]		[dBuV / 75]	[dB]
97.8 MHz	1071.532	49.4	----	-25.1	24.3	----	51.7	27.4
	1558.592	46.5	----	-23.8	22.7	----	51.7	29.1
	1948.240	46.3	----	-23.3	23.0	----	51.7	28.7
	3409.420	45.9	----	-22.5	23.4	----	51.7	28.3
	3506.832	66.0	----	-22.4	43.6	----	51.7	8.1
	4968.012	45.2	----	-21.7	23.5	----	51.7	28.2
	7013.664	46.6	----	-21.4	25.2	----	51.7	26.5

Calculation: Result [dBuV] = Reading [dBuV] + Fac (Cable+ATT - Amp) [dB] + 1.76 (50 ohm to 75 ohm) [dB]

DATA OF ANTENNA TERMINAL TEST

UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date : 27 / Oct / 2021

Company : **Panasonic Automotive Systems Co., Ltd.** Mode : **FM Receiving (108 MHz)**
 Kind of EUT : **Car Navigation** Order No. : **14033198**
 Model No. : **AT2107** Power : **DC 13.2 V**
 Serial No. : **No.1** Temp./Humi. : **25 deg.C / 38 %RH**

Remarks : **Main port, Local**
 *No signal was detected above 13 GHz.

Engineer : **Kouki Yamada**

LIMIT (Fundamental) : FCC Part15 SubpartB_Antenna terminal
 LIMIT (Harmonics) : FCC Part15 SubpartB_Antenna terminal

CH	Freq	Reading		Factor	Result		Limit	Margin
		PEAK	QP		PEAK	QP		
	[MHz]	[dBuV]		[dB]	[dBuV / 75]		[dBuV / 75]	[dB]
108 MHz	1291.344	45.4	----	-24.4	21.0	----	51.7	30.7
	1721.792	45.2	----	-23.5	21.7	----	51.7	30.0
	1937.016	44.9	----	-23.3	21.6	----	51.7	30.1
	3013.136	44.0	----	-22.9	21.1	----	51.7	30.6
	3443.584	68.0	----	-22.5	45.5	----	51.7	6.2
	5057.764	43.3	----	-21.6	21.7	----	51.7	30.0
	6887.168	46.2	----	-21.3	24.9	----	51.7	26.8

Calculation: Result [dBuV] = Reading [dBuV] + Fac (Cable+ATT - Amp) [dB] + 1.76 (50 ohm to 75 ohm) [dB]

APPENDIX 2

Test Instruments

EMI test equipment

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Interval (Month)
AT	COTS-SEMI-2	144866	EMI Software for AV Equipment	TSJ (Techno Science Japan)	TEPTO-DV(AT,TV)	2	-	-
AT	KAF-02	144878	Pre Amplifier	Hewlett Packard	8449B	3008A01268	2021/04/09	12
AT	KMP-08	146512	Matching Pad	TAMAGAWA	ZT-130	1209458	2021/06/08	12
AT	SAF-07	145006	Pre Amplifier	TSJ (Techno Science Japan)	MLA-8k03-D01-35	81212	2021/06/08	12
AT	SAT10-05	145136	Attenuator	Keysight Technologies Inc	8493C-010	74864	2021/10/07	12
AT	SCC-AT1/AT2/KM P-09	180424	Coaxial cable, Matching pad	TAMAGAWA	5D2W/ZT-130	-/1454514E	2021/06/08	12
AT	SCC-G65	196942	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803416/2	2022/03/01	12
AT	SCC-G66	196947	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803478/2	2022/03/02	12
AT	SOS-05	146293	Humidity Indicator	A&D Company	AD-5681	4062518	2021/08/02	12
AT	SOS-24	191841	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/10/14	12
AT	STR-01	145790	Test Receiver	Rohde & Schwarz	ESU40	100093	2021/04/27	12
AT	STR-02	145791	Test Receiver	Rohde & Schwarz	ESCI	100575	2021/06/02	12
AT,RE	KMP-09	146513	Matching Pad	TAMAGAWA	ZT-130	1454514E	2021/06/08	12
AT,RE	STR-08	150463	Test Receiver	Rohde & Schwarz	ESW44	101581	2022/03/02	12
RE	COTS-SEMI-5	170932	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(RE,CE,ME,PE)	-	-	-
RE	KJM-02	146432	Measure	TAJIMA	GL19-55	-	-	-
RE	SAEC-03(NSA)	145565	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	2022/04/15	12
RE	SAEC-03(SVSWR)	145566	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	2021/05/21	12
RE	SAF-03	145126	Pre Amplifier	SONOMA	310N	290213	2022/02/24	12
RE	SAF-06	145005	Pre Amplifier	Toyo Corporation	TPA0118-36	1440491	2022/02/04	12
RE	SAF-08	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2022/03/03	12
RE	SAT6-13	167094	Attenuator	JFW	50HF-006N	-	2022/02/21	12
RE	SBA-03	145023	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	BBA9106	91032666	2021/05/15	12
RE	SCC-C1/C2/C3/C4/C5/C10/SRSE-03	145171	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	2021/04/12	12
RE	SCC-G40	166491	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	1612S005	2022/01/06	12
RE	SCC-G42	151618	Coaxial Cable	Junkosha	J12J103275-00	FEB-28-17-017	2022/03/03	12
RE	SCC-G43	156380	Coaxial Cable	Huber+Suhner	SUCOFLEX_104_E	SN MY 13406/4E	2021/05/17	12
RE	SCC-G57	179540	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	802815/2	2021/05/18	12
RE	SCC-G58	183047	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	800287/4A	2021/05/17	12

EMI test equipment

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Interval (Month)
RE	SHA-03	145501	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	9120D-739	2022/03/16	12
RE	SHA-04	145512	Horn Antenna	ETS-Lindgren	3160-09	00094868	2021/06/14	12
RE	SHA-10	194685	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA 9120 C	711	2022/03/16	12
RE	SLA-07	145529	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	196	2021/05/15	12
RE	SOS-23	191840	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/08/02	12
RE	SSG-12	146257	Signal Generator	Rohde & Schwarz	SMBV100A	262152	2021/09/13	12
RE	STS-03	146210	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997823	2021/09/14	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,

AT: Antenna terminal disturbance voltage