



# EMI TEST REPORT

## Test Report No. 14206673H-A

<b>Customer</b>	<b>Panasonic Corporation of North America</b>
<b>Description of EUT</b>	<b>Cooling Box</b>
<b>Model Number of EUT</b>	<b>AE-V06GXR</b>
<b>FCC ID</b>	<b>ACJAE-V06GXR</b>
<b>Test Regulation</b>	<b>FCC Part 15 Subpart B: 2021 Class A</b>
<b>Test Result</b>	<b>Complied (Refer to SECTION 3)</b>
<b>Issue Date</b>	<b>March 9, 2022</b>
<b>Remarks</b>	-

**Representative Test Engineer**

Hiroyuki Furutaka  
Engineer

**Approved By**

Takumi Shimada  
Engineer



CERTIFICATE 5107.02

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

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

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- The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan, Inc. has been accredited.
- The information provided from the customer for this report is identified in SECTION 1.

## **REVISION HISTORY**

**Original Test Report No.: 14206673H-A**

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14206673H-A	March 9, 2022	-

## Reference: Abbreviations (Including words undescribed in this report)

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

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## **SECTION 1: Customer information**

Company Name	Panasonic Corporation of North America *1)
Address	Two Riverfront Plaza, 9th Floor, Newark, NJ 07102-5490, U.S.A.
Telephone Number	+1-201-348-7760
Contact Person	Ben Botros

\*1) Remarks:

Panasonic Corporation is on behalf of the applicant: Panasonic Corporation of North America (Company incorporated abroad).

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	Cooling Box
Model Number	AE-V06GXR
Serial Number	Refer to SECTION 4.2
Condition	Production model
Modification	No Modification by the test lab
Receipt Date	February 17, 2022
Test Date	March 8, 2022

### **2.2 Product Description**

#### **General Specification**

Rating	None (supplied by NFC)
Clock frequency (ies) in the system	16 MHz

#### **Radio Specification**

Equipment Type	Passive Tag
Frequency of Operation	13.56 MHz
Type of Modulation	ASK

EUT has following 2-types:

<b>Model No.</b>	<b>Difference from the base model</b>
Type-S : AE-V06GXR (EUT)	- (Original)
Type-L : AE-V12UXR	size and weight

## SECTION 3: Test specification, procedures & results

### 3.1 Test Specification

Test Specification	FCC Part 15 Subpart B FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021
Title	FCC 47CFR Part15 Radio Frequency Device Subpart B Unintentional Radiators

### 3.2 Procedures and results

#### [Part 15 Class A Digital Device]

Item	Test Procedure	Limits	Deviation	Worst margin	Result	Remarks
Conducted emission	<b>FCC:</b> ANSI C63.4: 2014 + C63.4a: 2017 7. AC power - line conducted emission measurements	Class A	N/A	N/A	N/A	*1)
Radiated emission	<b>FCC:</b> ANSI C63.4: 2014 + C63.4a: 2017 8. Radiated emission measurements	Class A	N/A	7.3 dB 393.245 MHz, Horizontal, QP	Complied a)	*2)
* Note: UL Japan, Inc.'s EMI Work Procedure: Work Instructions-ULID-003591.						
*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.						
*2) Measurements were limited up to 1GHz since the highest frequency of internal source of the EUT is less than 108 MHz.						
a) Refer to APPENDIX 1 (data of Radiated Emission)						
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 Addition to standard

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

### 3.4 Uncertainty

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

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

#### Radiated emission

Measurement distance	Frequency range		Uncertainty (+/-)
3 m	30 MHz to 200 MHz	Horizontal	4.8 dB
		Vertical	5.0 dB
	200 MHz to 1000 MHz	Horizontal	5.1 dB
		Vertical	6.2 dB
10 m	30 MHz to 200 MHz	Horizontal	4.8 dB
		Vertical	4.8 dB
	200 MHz to 1000 MHz	Horizontal	5.0 dB
		Vertical	5.0 dB

### 3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

\*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919

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

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

Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-
Large Chamber	16.9 x 22.1 x 10.17	16.9 x 22.1	-	10 m
Small Chamber	5.3 x 6.69 x 3.59	5.3 x 6.69	-	-

### 3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

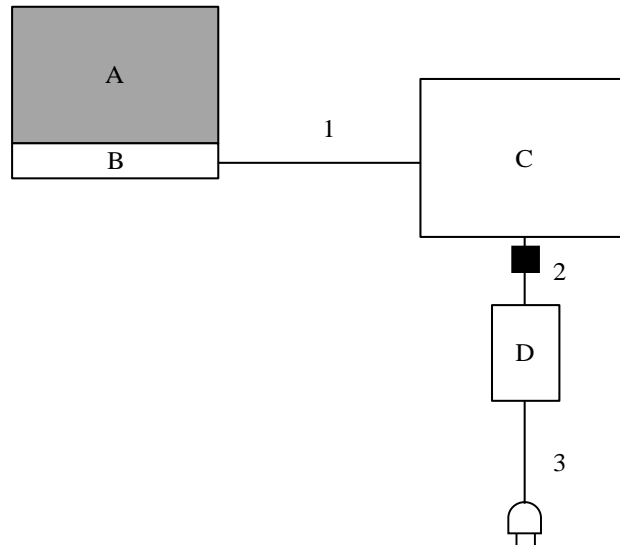
## SECTION 4: Operation of EUT during testing

### 4.1 Operating Mode(s)

Mode	Remarks
1. RFID Communication mode	-

Software(s)	VIXELL Performance Inspection Ver. 1.06E
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### 4.2 Configuration and peripherals



AC 120 V / 60 Hz

■ : Standard Ferrite Core

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

#### Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Cooling box	AE-V06GXR	21061011381900	Panasonic Corporation	EUT
B	RFID Read and Writer	AMI2450X/08C/ U-PAP	7E5310003	Art Finex Co.,Ltd	-
C	Laptop PC	X1 Carbon	R9-OH8TU 15/9	LENOVO	-
D	AC Adapter	ADLX45NCC2A	SA10E75794	LENOVO	-

#### List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Cable	1.8	Shielded	Shielded	-
2	DC Cable	1.6	Unshielded	Unshielded	-
3	AC Cable	0.9	Unshielded	Unshielded	-



## SECTION 5: Radiated Emission

### 5.1 Operating environment

Test place : No.1 semi anechoic chamber  
Temperature : See data  
Humidity : See data

### 5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The EUT was set on the edge of the tabletop.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Photographs of the set up are shown in Appendix 3.

### 5.3 Test conditions

Frequency range : 30 MHz - 200 MHz (Biconical antenna) / 200 MHz - 1000 MHz (Logperiodic antenna)  
Test distance : 10 m  
EUT position : Table top  
EUT operation mode : See Clause 4.1

### 5.4 Test procedure

The height of the measuring antenna 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 with the Test Receiver.

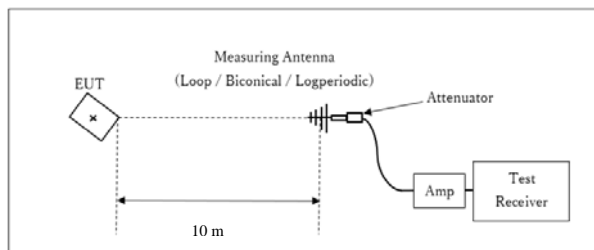
The radiated emission measurements were made with the following detector function of the Test Receiver.

For above 1 GHz, 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.

Frequency	Below 1 GHz
Instrument used	Test Receiver
IF Bandwidth	QP: BW 120 kHz

Figure 1: Test Setup

Below 1 GHz



Test Distance: 10 m

The test was made on EUT at the normal use position.

## 5.5 Test result

Summary of the test results: Pass

The limit is rounded down to one decimal place.

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

Date: March 8, 2022

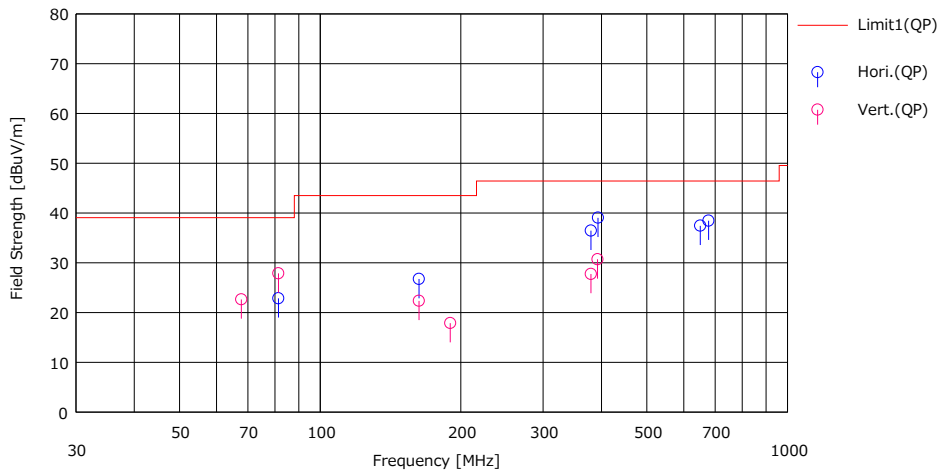
Test engineer: Hiroyuki Furutaka

**APPENDIX 1: Test data**

**Radiated Emission**

Test place                    Ise EMC Lab.  
Semi Anechoic Chamber    No.1  
Date                            March 8, 2022  
Temperature / Humidity    21 deg. C / 32 % RH  
Engineer                      Hiroyuki Furutaka  
Mode                            Mode 1

Limit : FCC\_Part 15 Subpart B(15.109)\_Class A



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				<(QP)> [dBuV/m]	<(QP)> [dB]	<(QP)> [dB]					
1	81.361	46.70	7.07	8.14	39.05	22.86	39.08	16.2	Hori.	400	358	BA	
2	162.720	41.30	15.45	9.13	39.13	26.75	43.52	16.7	Hori.	400	357	BA	
3	379.678	48.60	15.56	11.01	38.72	36.45	46.44	9.9	Hori.	200	350	LA20	
4	393.245	50.50	16.14	11.11	38.69	39.06	46.44	7.3	Hori.	196	178	LA20	
5	650.891	43.70	19.38	12.79	38.42	37.45	46.44	8.9	Hori.	149	213	LA20	
6	677.996	44.20	19.74	12.95	38.42	38.47	46.44	7.9	Hori.	120	178	LA20	
7	678.03	47.20	6.55	7.93	39.03	22.65	39.08	16.4	Vert.	100	21	BA	
8	81.363	51.70	7.07	8.14	39.05	27.86	39.08	11.2	Vert.	100	11	BA	
9	162.727	36.90	15.45	9.13	39.13	22.35	43.52	21.1	Vert.	100	358	BA	
10	189.843	31.20	16.40	9.41	39.12	17.89	43.52	25.6	Vert.	100	238	BA	
11	379.692	39.90	15.56	11.01	38.72	27.75	46.44	18.6	Vert.	100	291	LA20	
12	392.248	42.20	16.09	11.10	38.69	30.70	46.44	15.7	Vert.	281	290	LA20	

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(CABLE + ATT) - GAIN(AMP)

Except for the above table: adequate margin data below the limits.

## **APPENDIX 2: Test instruments**

### **Test equipment**

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MAEC-01	141998	AC1_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	06/08/2020	24
RE	MOS-27	141566	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	A08Q26	01/10/2022	12
RE	MMM-03	141530	Digital Tester	Fluke Corporation	FLUKE 26-3	78030621	08/10/2021	12
RE	MJM-25	142226	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	KBA-05	141198	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103+BBA9106	2513	04/10/2021	12
RE	MLA-20	141264	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	189	04/10/2021	12
RE	MAT-08	141213	Attenuator(6dB)	Weinschel Corp	2	BK7971	11/09/2021	12
RE	MCC-02	141350	Coaxial Cable	Suhner/storm/Agilent/TSJ	-	-	06/02/2021	12
RE	MPA-19	141585	Pre Amplifier	MITEQ	MLA-10K01-B01-35	1237616	02/28/2022	12
RE	MTR-09	141950	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	-	-

\*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**