# RF Exposure Evaluation Report

Product Name : UNIT ASSY DA

Model No. : AH2001

FCC ID : ACJ932AH2001

Applicant : Panasonic Corporation

Address : 4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-shi,
Kanagawa-ken, 224-8520, Japan

Date of Receipt : Oct. 26, 2018

Date of Declaration : Jun. 05, 2019

Report No. : 18A0361R-SAUSP03V00

Report Version : V1.0

Issued Date: Jun. 05, 2019
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|---|---|
| Product Name | UNIT ASSY DA |
| Applicant | Panasonic Corporation |
| Address | 4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken, 224-8520, Japan |
| Manufacturer | Panasonic Corporation |
| Model No. | AH2001 |
| FCC ID. | ACJ932AH2001 |
| Trade Name | Panasonic Corporation |
| Applicable Standard | FCC 47 CFR 1.1310 |
| Test Result | Complied |

Documented By : Jinn Chen

( Senior Adm. Specialist / Jinn Chen )

Tested By : wen Lee

( Senior Engineer / Wen Lee )

Approved By :

( Director / Vincent Lin )

# 1. GENERAL INFORMATION

## 1.1. EUT Description

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|---|---|
| Product Name | UNIT ASSY DA |
| Trade Name | Panasonic Corporation |
| Model No. | AH2001 |
| FCC ID. | ACJ932AH2001 |
| Frequency Range | 2412-2462MHz for 802.11b/g/n-20MHz, 2422-2452MHz for 802.11n-40MHz<br>802.11a/n-20MHz: 5500-5700MHz, 5745-5825MHz<br>802.11n-40MHz: 5510-5670MHz, 5755-5795MHz<br>802.11ac-80MHz: 5530-5610MHz, 5775MHz<br>Bluetooth: 2402 – 2480MHz |
| Channel Number | 802.11b/g/n-20MHz: 11, n-40MHz: 7<br>802.11a/n-20MHz: 16; 802.11n-40MHz: 7, 802.11ac-80MHz: 3<br>Bluetooth: 79CH |
| Type of Modulation | 802.11b:DSSS (DBPSK, DQPSK, CCK)<br>802.11a/g/n/ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>FHSS: GFSK(1Mbps) / $\pi$ /4DQPSK(2Mbps) / 8DPSK(3Mbps) |
| Antenna Type | PIFA Antenna |
| Antenna Gain | Refer to the table “Antenna List” |

**Antenna List**

| No. | Manufacturer | Part No. | Antenna Type | Peak Gain |
|---|---|---|---|---|
| 1 | Panasonic | Antenna1 | PIFA Antenna | -1.5dBi for 2.4GHz |
| | Panasonic | Antenna0 | PIFA Antenna | -1.3dBi for 2.4GHz(BT) |
| | Panasonic | Antenna0<br>Antenna1 | PIFA Antenna | -0.7dBi for 5.47~5.725GHz<br>-1.2dBi for 5.725~5.825GHz |

## 2. RF Exposure Evaluation

### 2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density ($mW/cm^2$) | Average Time (Minutes) |
|---|---|---|---|---|
| (A) Limits for Occupational/ Control Exposures | | | | |
| 300-1500 | -- | -- | F/300 | 6 |
| 1500-100,000 | -- | -- | 5 | 6 |
| (B) Limits for General Population/ Uncontrolled Exposures | | | | |
| 300-1500 | -- | -- | F/1500 | 6 |
| 1500-100,000 | -- | -- | 1 | 30 |

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where

Pd = power density in $mW/cm^2$

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0

## 2.2. Test Result of RF Exposure Evaluation

Product : UNIT ASSY DA
Test Item : RF Exposure Evaluation

**WLAN 2.4G Peak Gain: -1.5dBi; WLAN 5G Peak Gain: -0.7dBi**

| Band | Frequency | Maximum Conducted Power (dBm) | Worst Case Duty Cycle (%) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm2) | Limit (mW/cm2) | Pass/Fail |
|---|---|---|---|---|---|---|---|
| 2.4G | 2437 | 18.86 | 96.26 | 79.901 | 0.0113 | 1 | Pass |
| 5G | 5785 | 13.24 | 88.93 | 23.711 | 0.0040 | 1 | Pass |

Note: The conducted output power is refer to report No.: 18A0361R-RFUSP26V00, 18A0361R-RFUSP42V00 from the DEKRA.

**BT Peak Gain: -1.3dBi**

| Band | Frequency | Maximum Conducted Peak Power (dBm) | Output Power to Antenna (mW) | Power Density at R = 20 cm ($mW/cm^2$) | Limit ($mWc/m^2$) | Pass/Fail |
|---|---|---|---|---|---|---|
| 1Mbps | 2480 | 1.99 | 1.581 | 0.0002 | 1 | Pass |
| 3Mbps | 2480 | 1.48 | 1.406 | 0.0002 | 1 | Pass |

Note: The conducted output power is refer to report No.: 18A0361R-RFUSP01V00 from the DEKRA.

## 2.3. Calculations for Multi-Transsmitter

| Mode | Exposure Calculations | result | Limit | Pass/Fail |
|---|---|---|---|---|
| WLAN 2.4G | 0.0113 | 0.0155 | 1 | Pass |
| WLAN 5G | 0.0040 | | | |
| BT | 0.0002 | | | |