

RF Exposure Evaluation Declaration

FCC ID: HD5-HONST60Q

APPLICANT: Honeywell International Inc
Honeywell Safety and Productivity Solutions

Application Type: Class II Permissive Change

Product: Wi-Fi module

Model No.: HON-ST60Q

Brand Name: Honeywell

FCC Rule Part(s): FCC Part 2 (Section 2.1091)
KDB 447498 D01 General RF Exposure Guidance v06
IEEE C95.1-1992

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The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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Revision History

| Report No. | Version | Description | Issue Date | Note |
|---------------|---------|----------------|------------|-------|
| 1905RSU028-U8 | Rev. 01 | Initial Report | 08-12-2019 | Valid |
| | | | | |

1. PRODUCT INFORMATION

1.1. Equipment Description

| | |
|------------------------------|--|
| Product Name | Wi-Fi module |
| Model No. | HON-ST60Q |
| Brand Name | Honeywell |
| Wi-Fi Specification | 802.11a/b/g/n/ac |
| Antenna Type: | Dipole Antenna |
| Antenna Gain: | 2.44dBi for 2.4GHz and 5GHz |
| Frequency Range | <p><u>2.4GHz:</u> For 802.11b/g/n-HT20: 2412 ~ 2462 MHz For 802.11n-HT40: 2422 ~ 2452 MHz</p> <p><u>5GHz:</u> For 802.11a/n-HT20/ac-VHT20: 5180~5320MHz, 5500~5720MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz</p> |
| Type of Modulation | 802.11b: DSSS 802.11g/a/n/ac: OFDM |
| Maximum Average Output Power | <p><u>For 2.4GHz Band:</u> 802.11b: 13.88dBm 802.11g: 13.75dBm 802.11n-HT20: 13.90dBm 802.11n-HT40: 13.78dBm</p> <p><u>For 5GHz Band:</u> 802.11a: 15.82dBm 802.11n-HT20: 15.92dBm 802.11n-HT40: 14.14dBm 802.11ac-VHT20: 16.16dBm 802.11ac-VHT40: 14.33dBm 802.11ac-VHT80: 10.04dBm</p> |

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

Calculation Formula: $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

Pd = power density in mW/cm²

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

Pd is the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Result of RF Exposure Evaluation

| | |
|-----------|------------------------|
| Product | Wi-Fi module |
| Test Item | RF Exposure Evaluation |

| Test Mode | Frequency Band (MHz) | Maximum Average Output Power (dBm) | E.I.R.P (dBm) | Power Density at R = 20 cm (mW/cm ²) | Limit (mW/cm ²) |
|--|----------------------|------------------------------------|---------------|--|-----------------------------|
| 802.11b/g/n | 2412 ~ 2462 | 13.90 | 16.34 | 0.0086 | 1 |
| 802.11a/n/ac | 5180 ~ 5825 | 16.16 | 18.60 | 0.0144 | 1 |
| Host Information (Product name: Printer, M/N: PX940) | | | | | |
| Bluetooth-LE | 2402 ~ 2480 | 0.69 | 1.99 | 0.0003 | 1 |

CONCLUSION:

Both of the WLAN 2.4GHz or WLAN 5GHz Band and BLE can transmit simultaneously.

The Max Power Density at R (20 cm) = $0.0144\text{mW/cm}^2 + 0.0003\text{mW/cm}^2 = 0.0147\text{mW/cm}^2 < 1\text{mW/cm}^2$.

So the EUT complies with the requirement.

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