# RF Exposure Evaluation Declaration

| | |
|---|---|
| **FCC ID:** | 2AVK9-30178 |
| **Applicant:** | Strong Current Enterprises Limited |
| **Application Type:** | Certification |
| **Product:** | TRIFIBOOST |
| **Model No.:** | 30178 |
| **FCC Classification:** | Digital Transmission System (DTS)<br>Unlicensed National Information Infrastructure (NII) |
| **Test Procedure(s):** | KDB 447498 D01 General RF Exposure Guidance v06 |

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# Revision History

| Report No. | Version | Description | Issue Date | Note |
|---|---|---|---|---|
| 2001RSU019-U3 | Rev. 01 | Initial Report | 01-22-2020 | Valid |
| | | | | |

# 1. PRODUCT INFORMATION

## 1.1. Feature of Equipment under Test

| | |
|---|---|
| Product Name: | TRIFIBOOST |
| Model No.: | 30178, 30213 |
| Wi-Fi Specification: | 802.11a/b/g/n/ac |

Note: The different models are only for marketing different clients, others are the same.

## 1.2. Product Specification Subjective to this Report

| | |
|---|---|
| Frequency Range: | **2.4GHz**<br>802.11b/g/n-HT20: 2412 ~ 2462MHz<br>802.11n-HT40: 2422 ~ 2452MHz<br>**5GHz**<br>For 802.11a/n-HT20/ac-VHT20: 5745~5825MHz<br>For 802.11n-HT40/ac-VHT40: 5755~5795MHz<br>For 802.11ac-VHT80: 5775MHz |
| Channel Number: | **2.4GHz**<br>802.11b/g/n-HT20: 11<br>802.11n-HT40: 7<br>**5GHz**<br>For 802.11a/n-HT20/ac-VHT20: 5<br>For 802.11n-HT40/ac-VHT40: 2<br>For 802.11ac-VHT80: 1 |
| Type of Modulation: | 802.11b: DSSS<br>802.11a/g/n/ac: OFDM |
| Data Rate: | **2.4GHz**<br>802.11b: 1/2/5.5/11Mbps<br>802.11g: 6/9/12/18/24/36/48/54Mbps<br>802.11n: up to 300Mbps<br>**5GHz**<br>802.11a: 6/9/12/18/24/36/48/54Mbps<br>802.11n: up to 150Mbps<br>802.11ac: up to 433.3Mbps |

## 1.3. Working Frequencies for this report

**2.4GHz**

802.11b/g/n-HT20

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 01 | 2412 MHz | 02 | 2417 MHz | 03 | 2422 MHz |
| 04 | 2427 MHz | 05 | 2432 MHz | 06 | 2437 MHz |
| 07 | 2442 MHz | 08 | 2447 MHz | 09 | 2452 MHz |
| 10 | 2457 MHz | 11 | 2462 MHz | -- | -- |

802.11n-HT40

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 03 | 2422 MHz | 04 | 2427 MHz | 05 | 2432 MHz |
| 06 | 2437 MHz | 07 | 2442 MHz | 08 | 2447 MHz |
| 09 | 2452 MHz | -- | -- | -- | -- |

**5GHz**

802.11a/n-HT20/ac-VHT20

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 149 | 5745 MHz | 153 | 5765 MHz | 157 | 5785 MHz |
| 161 | 5805 MHz | 165 | 5825 MHz | -- | -- |

802.11n-HT40/ac-VHT40

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 151 | 5755 MHz | 159 | 5795 MHz | -- | -- |

802.11ac-VHT80

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 155 | 5775 MHz | -- | -- | -- | -- |

## 1.4. Description of Available Antennas

| Antenna Type | Frequency Band (MHz) | TX Paths | Max Antenna Gain (dBi) | | CDD Directional Gain (dBi) | |
|---|---|---|---|---|---|---|
| | | | Ant 0 | Ant 1 | For Power | For PSD |
| Dipole Antenna | 2412 ~ 2462 | 2 | 3 | 3 | 3 | 6.01 |
| | 5745 ~ 5825 | 1 | 3 | | 3 | 3 |

Note:

For 2.4GHz, the EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows, $N_{ANT}$ = 2, $N_{SS}$ = 1.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,

  Array Gain = 10 log ($N_{ANT}$/ $N_{SS}$) dB = 3.01;

- For power measurements on IEEE 802.11 devices,

  Array Gain = 0 dB for $N_{ANT} \leq 4$;

# 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 ($mW/cm^2$) | Averaging Time (Minutes) |
|---|---|---|---|---|
| (A) Limits for Occupational/ Control Exposures | | | | |
| 0.3-3.0 | 614 | 1.63 | *100 | 6 |
| 3.0-30 | 1842/f | 4.89/f | $*900/f^2$ | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1,500 | -- | -- | f/300 | 6 |
| 1,500-100,000 | -- | -- | 5 | 6 |
| (B) Limits for General Population/ Uncontrolled Exposures | | | | |
| 0.3-1.34 | 614 | 1.63 | *100 | 30 |
| 1.34-30 | 824/f | 2.19/f | $*180/f^2$ | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1,500 | -- | -- | f/1500 | 30 |
| 1,500-100,000 | -- | -- | 1.0 | 30 |

f= Frequency in MHz

* = Plane-wave equivalent power density

Calculation Formula: $P_d = (P_{out}*G)/(4*Pi*r^2)$

Where

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

$P_{out}$ = 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

$P_d$ is the limit of MPE, $1mW/cm^2$. 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 | TRIFIBOOST |
| Test Item | RF Exposure Evaluation |

Antenna Gain: Refer to Clause 1.4 of this report.

| Test Mode | Frequency Band (MHz) | Maximum Total Average Output Power (dBm) | Power Density at R = 20 cm ($mW/cm^2$) | Limit ($mW/cm^2$) | Result |
|---|---|---|---|---|---|
| 802.11b/g/n | 2412 ~ 2462 | 16.91 | 0.0195 | 1 | Pass |
| 802.11a/n/ac | 5745 ~ 5825 | 9.06 | 0.0032 | 1 | Pass |

Note: The 2.4GHz WLAN and 5GHz WLAN can't transmit simultaneously.

The End

## Appendix - EUT Photograph

Refer to “2001RSU019-UE” file.