



Radio Exposure Evaluation Report

FCC ID : UIDTG3452P2
Equipment : Wireless Voice Gateway
Brand Name : ARRIS
Model Name : TG3452
Applicant : ARRIS
3871 Lakefield Drive, #300 Suwanee, GA 30024
Manufacturer : ARRIS
3871 Lakefield Drive, #300 Suwanee, GA 30024
Standard : 47 CFR Part 2.1091

The product was received on Jan. 21, 2019, and testing was started from Feb. 02, 2019 and completed on Mar. 28, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of United States government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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Photographs of EUT V01



History of this test report

| Report No. | Version | Description | Issued Date |
|-------------|---------|-------------------------|--------------|
| FA911906-01 | 01 | Initial issue of report | May 16, 2019 |
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Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---------------|-----------------|---------------------|--------------------|--------|
| 2 | - | Exposure evaluation | PASS | - |

| |
|--|
| Declaration of Conformity: |
| The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. |
| Comments and Explanations: |
| None. |

Reviewed by: Jackson Tsai

Report Producer: Ann Hou

1 General Description

1.1 EUT General Information

| RF General Information | | | |
|------------------------|--|--|---|
| Evaluation Mode | Frequency Range (MHz) | Operating Frequency (MHz) | Modulation Type |
| 2.4GHz WLAN | 2400-2483.5 | 2412-2462 | 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) |
| 5GHz WLAN | 5150-5250 5250-5350 5470-5725 5725-5850 | 5180-5240 5260-5320 5500-5720 5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |

1.2 Testing Location

| Testing Location | | | |
|--|--------|--|----------------------|
| <input checked="" type="checkbox"/> | HWA YA | ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) | |
| | | TEL : 886-3-327-3456 | FAX : 886-3-327-0973 |
| Test site Designation No. TW1190 with FCC. | | | |
| <input type="checkbox"/> | JHUBEI | ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.) | |
| | | TEL : 886-3-656-9065 | FAX : 886-3-656-9085 |
| Test site Designation No. TW0006 with FCC. | | | |

1.3 Table for Multiple Listing

The brand/model names in the following table are all refer to the identical product.

| Brand Name | Model Name | Description |
|------------|------------|---|
| ARRIS | TG3452 | There are two enclosures for EUT. All samples are identical, only the color and enclosures are different. |

1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA911906

Below is the table for the change of the product with respect to the original one.

| Modifications | Performance Checking |
|----------------------------------|----------------------|
| U-NII-2A and U-NII-2C were added | All |

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm ²) | Averaging Time E ² , H ² or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|--|--|
| 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 |
| 300-1500 | - | - | F/300 | 6 |
| 1500-100,000 | - | - | 5 | 6 |

(B) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm ²) | Averaging Time E ² , H ² or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|--|--|
| 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 |
| 300-1500 | - | - | F/1500 | 30 |
| 1500-100,000 | - | - | 1.0 | 30 |

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 30 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

WLAN 2.4G

| Mode | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm ²) | S Limit (mW/cm ²) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;G1D | 4.00 | 24.17 | 28.17 | 0.50 | 28.67 | 0.73621 | 30 | 0.06509 | 1.00000 |
| 2.4G;D1D | 4.00 | 28.20 | 32.20 | 0.50 | 32.70 | 1.86209 | 30 | 0.16464 | 1.00000 |

WLAN 5G

| Mode | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm ²) | S Limit (mW/cm ²) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 5.2G;D1D | 4.30 | 29.02 | 33.32 | 0.50 | 33.82 | 2.40991 | 30 | 0.21308 | 1.00000 |
| 5.8G;D1D | 4.60 | 28.37 | 32.97 | 0.50 | 33.47 | 2.22331 | 30 | 0.19658 | 1.00000 |
| 5.3G;D1D | 4.22 | 23.87 | 28.09 | 0.50 | 28.59 | 0.72277 | 30 | 0.06391 | 1.00000 |
| 5.6G;D1D | 5.32 | 23.97 | 29.29 | 0.50 | 29.79 | 0.95280 | 30 | 0.08425 | 1.00000 |

Co-TX WLAN 2.4G + WLAN 5G

| Mode | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm ²) | S Limit (mW/cm ²) | Ratio (S/Limit) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|-----------------|
| 5.2G;D1D | 4.30 | 29.02 | 33.32 | 0.50 | 33.82 | 2.40991 | 30 | 0.21308 | 1.00000 | 0.21308 |
| 2.4G;D1D | 4.00 | 28.20 | 32.20 | 0.50 | 32.70 | 1.86209 | 30 | 0.16464 | 1.00000 | 0.16464 |
| | | | | | | | | | Sum Ratio | 0.37772 |
| | | | | | | | | | Ratio Limit | 1 |

—————THE END—————