Radio Exposure Evaluation Report

FCC ID	:	**UIDTG6442**
Equipment	:	**Telephone Gateway**
Brand Name	:	**ARRIS**
Model Name	:	**TG6442; TG6441**
Applicant	:	**ARRIS** **3871 Lakefield Drive, Suite 300, Suwanee, GA 30024**
Manufacturer	:	**ARRIS** **3871 Lakefield Drive, Suite 300, Suwanee, GA 30024**
Standard	:	**47 CFR FCC Part 2 Subpart J, section 2.1091**

The product was received on Nov. 02, 2020, and testing was started from Dec. 03, 2020 and completed on Jun. 18, 2021. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR FCC Part 2 Subpart J, section 2.1091 and shown compliance with the applicable technical standards.

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

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. Hsinhua Laboratory
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Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FA0O1610-01	01	Initial issue of report	Nov. 22, 2021

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: Sam Tsai

Report Producer: Amber Chiu

1 General Description

1.1 Information

1.1.1 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) 802.11VHT/ax: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5700 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11 VHT/ax: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector
1	1	Galtronics	02036140-07247B1	PIFA	Murata
2	2	Galtronics	02036140-07247C2	PIFA	Murata
3	3	Galtronics	02036140-07247E1	PIFA	Murata
4	4	Galtronics	02036140-07247C1	PIFA	Murata

Frequency (MHz)	BW (MHz)	2.4G Directional Gain (dBi)	
		1TX 1Stream / 4TX 1Stream (Correlated)	4TX 4Streams (Uncorrelated)
2412	20	6.42	0.4
2417	20	6.42	0.4
2437	20	6.42	0.4
2457	20	6.42	0.4
2462	20	6.42	0.4
2422	40	6.42	0.4
2427	40	6.42	0.4
2437	40	6.42	0.4
2447	40	6.42	0.4
2452	40	6.42	0.4

Ant.	Port	Brand	Model Name	Antenna Type	Connector
1	4	Galtronics	02036140-07247C1	PIFA	Murata
2	3	Galtronics	02036140-07247E1	PIFA	Murata
3	2	Galtronics	02036140-07247C2	PIFA	Murata
4	1	Galtronics	02036140-07247B1	PIFA	Murata

Frequency (MHz)	BW (MHz)	5G Directional Gain (dBi)	
		4TX 1Stream (Correlated)	4TX 4Streams (Uncorrelated)
5180	20	6.52	0.5
5200	20	6.52	0.5
5240	20	6.52	0.5
5260	20	6.52	0.5
5300	20	6.52	0.5
5320	20	6.52	0.5
5500	20	6.32	0.3
5580	20	6.32	0.3
5700	20	6.32	0.3
5720	20	6.32	0.3
5745	20	6.42	0.4
5785	20	6.42	0.4
5825	20	6.42	0.4
5190	40	6.52	0.5
5230	40	6.52	0.5
5270	40	6.52	0.5
5310	40	6.52	0.5
5510	40	6.32	0.3
5550	40	6.32	0.3
5670	40	6.32	0.3
5710	40	6.32	0.3
5755	40	6.42	0.4
5795	40	6.42	0.4
5210	80	6.52	0.5
5290	80	6.52	0.5
5530	80	6.32	0.3
5610	80	6.32	0.3
5690	80	6.32	0.3
5775	80	6.42	0.4

Frequency (MHz)	BW (MHz)	5G Directional Gain (dBi)	
		4TX 1Stream (Correlated)	4TX 4Streams (Uncorrelated)
5250	160	6.52	0.5
5570	160	6.42	0.4

For 2.4GHz function:

For IEEE 802.11 b mode (1TX/1RX)

Support diversity function and pre-tested on each single chain, the worst case was Ant. 4(port 4) and it was recorded in this test report.

For IEEE 802.11 g/n/ac/ax mode (4TX/4RX)

Ant. 1 (port 1), Ant. 2 (port 2), Ant. 3 (port 3) and Ant. 4 (port 4) could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax mode (4TX/4RX)

Ant. 1 (port 4), Ant. 2 (port 3), Ant. 3 (port 2) and Ant. 4 (port 1) could transmit/receive simultaneously.

1.1.3 Table for Multiple Listing

Sample	Model	Phone Jack
1	TG6442	2
2	TG6441	1

Note: Sample 1 configuration was measured during the test.

1.1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA0O1610AN

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 was added	MPE was evaluated.

1.1.5 Accessories

Accessories				
AC Adapter	Brand Name	NetBit	Model Name	NBS42D120350VU
	Power Rating	I/P: 100 - 240Vac, 1 A,O/P: 12Vdc, 3.5 A		
	Power Cord	1.8 meter, non-shielded cable, w/o ferrite core		

Reminder: Regarding to more detail and other information, please refer to user manual.

1.2 Testing Location

Test Lab.：Sporton International Inc. Hsinhua Laboratory		
☒ Hsinhua **(TAF:** 3785**)**	**ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)	
	TEL: 886-3-327-3456	**FAX:** 886-3-327-0973
Test site Designation No. TW3785 with FCC.		

☐	Wen 33rd.St.	**ADD:** No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)	
	(TAF: 3785**)**	**TEL:** 886-3-318-0787	**FAX:** 886-3-318-0287
		Test site Designation No. TW0008 with FCC.	

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/ cm²)	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 / f²)*	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/ cm²)	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/f²)*	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

Multiple Transmitters Condition
Co-location as simultaneously transmitting (co-transmitting) and the evaluation shall be consider that simultaneous transmissions from co-located devices the individual transmitters are evaluated separately. After sum of the individual value (basic restriction / reference level) are measured/calculated also have to under basic restriction / reference level.
Co-transmitting mode: 2.4GHz WLAN+5GHz WLAN Mode

2.2 MPE Calculation Method

The MPE was calculated at 24 cm to show compliance with the power density limit.
The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

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 2.4GHz +WLAN 5GHz

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)
2.4G;D1D	6.42	29.06	35.48	0.00	35.48	3.53183	24	0.48794	1.00000	0.48794
5.8G;D1D	6.42	29.03	35.45	0.00	35.45	3.50752	24	0.48458	1.00000	0.48458
									Sum Ratio	0.97252
									Ratio Limit	1

———THE END———