

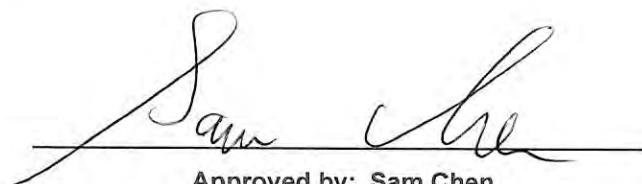


RADIO EXPOSURE TEST REPORT

FCC ID : HEDMLTG360N
Equipment : 60GHz backhaul transmitter
Brand Name : Edge-core 、 Kwikbit Networks
Model Name : MLTG-360 、 K60DNxy
(Refer to section 1.4 for detail information)
Applicant : Accton Technology Corp
No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077,
Taiwan R.O.C.
Manufacturer : Accton Technology Corp
No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077,
Taiwan R.O.C.
Standard : 47 CFR Part 2.1091

The product was received on Jun. 16, 2022, and testing was started from Jul. 02, 2022 and completed on Sep. 01, 2022. We, Sporton International Inc. Hsinchu 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 test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

Sportun International Inc. Hsinchu Laboratory
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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Photographs of EUT v02



History of this test report



Summary of Test Result

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

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sam Chen

Report Producer: Cathy Chiu



1 General Description

1.1 EUT General Information

The Channel Plan(s)		
Frequency Range (GHz)	Operating Frequency (GHz)	Modulation Type
57-71 GHz	58.32, 60.48, 62.64, 64.80 GHz	OFDM

Note: The EUT contains a certified module, and the information as below:

WIFI 2.4GHz module	
FCC	2AC7Z-ESP32WROOM32U
Brand Name	WROOM
Model No.	ESP32-WROOM-32U
Modulation Type	802.11b: DSSS 802.11g/n(HT20/HT40): OFDM
Operating Frequency Range(s)	802.11b/g/n(HT20): 2412~2462MHz 802.11n(HT40): 2422~2452MHz
Antenna	Type: External Antenna / Brand Name: Molex / Model No.: 1461530200 / Gain: 2.6dBi
Remark	The EUT only use WIFI 2.4GHz function at this time.

1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Murata	LBKA0ZZ1SV-TEMP	Array	N/A	28

Note: The above information was declared by manufacturer.

1.3 Table For Radio List

Radio 1	Radio 2	Radio 3	Radio 4
V	V	V	V

Note: According to above, Radio 2 has been evaluated to be the worst case among Radio 1~Radio 4, ths it was selected to test and record in the report as a result.



1.4 Table for Multiple Listing

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

Brand Name	Model Name	Description
Edge-core	MLTG-360	
Kwikbit Networks	K60DNxy (where "x" is [1..4] , "y" is [P R] if x = 2, otherwise y = blank, not a space)	There is nothing different for brand names and model names, just for marketing purposes only.

Note 1: From the above models, model: MLTG-360 was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

1.5 Accessories

Others
Splash-proof cover *1
Wall-mounted rack *1
Metal band*1

1.6 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2.1091
- KDB 447498 D04 Interim General RF Exposure Guidance v01

The following reference test guidance is not within the scope of accreditation of TAF.

- 47 CFR Part 1.1307
- 47 CFR Part 1.1310

1.7 Testing Location

Testing Location Information		
Test Lab. : Sporton International Inc. Hsinchu Laboratory		
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)	FAX: 886-3-656-9085
Test site Designation No. TW3787 with FCC.		
Conformity Assessment Body Identifier (CABID) TW3787 with ISED.		



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 MPE Calculation Method

2.2 MPE Calculation Method

The MPE was calculated at 46 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

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 MPE Exemption

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= P_{th}.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance R between the person and the antenna / radiating structure, where R > λ / 2 π.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R ² .
1.34-30	3,450 R ² /f ² .
30-300	3.83 R ² .
300-1,500	0.0128 R ² f.
1,500-100,000	19.2R ² .

Note: R is in meters, f is in MHz.



2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Worst-case Integrated Band Power of Unwanted Emission (30MHz ~ 40GHz)						
Start (MHz)	Stop (MHz)	Limit (dBuV/m at 3m)	Limit (mW EIRP)	RBW (MHz)	Num Intervals	Integrated Band Power (mW)
30	88	40	3.01995E-06	0.1	580	0.002
88	216	43.5	6.76083E-06	0.1	1280	0.009
216	960	46	1.20226E-05	0.1	7440	0.089
960	1000	54	7.58578E-05	0.1	400	0.030
1000	40000	54	7.58578E-05	1	39000	2.958
Total						3.089

Total Integrated Band Power of All Emission (30MHz ~ 200GHz)				
Test Frequency (GHz)	30MHz ~ 40GHz Integrated Band Power (mW)	40 ~ 200GHz EIRP (dBm)	40 ~ 200GHz EIRP (mW)	30MHz ~ 200GHz Total Integrated Band Power (mW)
58.32	3.089	35.89	3877.68	3880.773
62.64		35.66	3678.25	3681.336
64.80		29.20	831.93	835.020

Maximum Permissible Exposure of Fundamental Emissions							
Separation Distance (cm)	46						
Maximum EIPR Power of Test Frequency (GHz)	Ant. Gain (dBi)	Average EIRP Power (dBm)	Tolerance (dB)	Tune-up Average EIRP Power (dBm)	Tune-up Average EIRP Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)
58.32	28	35.89	0.50	36.39	4350.83	0.164	1.00



Maximum Permissible Exposure of Fundamental + Unwanted Emissions								
Separation Distance (cm)	46							
Maximum EIPR Power of Test Frequency (GHz)	Ant. Gain (dBi)	Average EIRP Power (dBm)	Average EIRP Power (mW)	Tolerance (dB)	Tune-up Average EIRP Power (dBm)	Tune-up Average EIRP Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)
58.32	28	35.89	3880.77	0.50	36.39	4354.30	0.164	1.00

MPE Exemption Option C							
Frequency (MHz)	$\lambda/2\pi$ (m)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	MPE Exemption
2412	0.0198	0.46	33.09	30.94	1.242	4.063	Complies
58320	0.0008		36.39	34.24	2.655	4.063	Complies

Simultaneous Transmission Analysis Mode: 60GHz + WLAN 2.4GHz

Simultaneous Transmissions Option C							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
2412	0.46	33.09	30.94	1.242	4.063	0.96	<= 1
58320		36.39	34.24	2.655	4.063		

—THE END—