FCC RADIO EXPOSURE TEST REPORT

FCC ID	:	HED-ML60MDSB
Equipment	:	Metrolinq 60 GHz Module
Brand Name	:	IgniteNet
Model Name	:	RDO-60-FB-USBB-8
Applicant	:	Accton Technology Corporation No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.
Manufacturer	:	Accton Technology Corporation 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 Aug. 15, 2019, and testing was started from Aug. 22, 2019 and completed on Oct. 14, 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 government.

The test results in this variant 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: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FA5N2614-20	01	Initial issue of report	Oct. 29, 2019

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:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Cindy Peng

1 General Description

1.1 EUT General Information

The Channel Plan(s)			
Evaluation Mode	**Frequency Range**	**Operating Frequency (GHz)**	**Modulation Type**
60 GHz	57-71 GHz	Channel 1: 58.32 GHz Channel 1.5: 59.40 GHz Channel 2: 60.48 GHz Channel 2.5: 61.56 GHz Channel 3: 62.64 GHz Channel 3.5: 63.72 GHz Channel 4: 64.80 GHz Channel 4.5: 65.88 GHz	$\pi/2-BPSK, \pi/2-QPSK, \pi/2-16QAM$

1.2 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA5N2614-19

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

Modifications	Performance Checking
1. Adding four channels of 2.16 GHz bandwidth as below: **Channel** / **Frequency (GHz)**: 1.5 / 59.40; 2.5 / 61.56; 3.5 / 63.72; 4.5 / 65.88 2. Adding one new bandwidth “1.08GHz”, and it supports channels as below: **Channel** / **Frequency (GHz)**: 1 / 58.32; 1.5 / 59.40; 2 / 60.48; 2.5 / 61.56; 3 / 62.64; 3.5 / 63.72; 4 / 64.80; 4.5 / 65.88	Maximum Permissible Exposure.

1.3 Testing Location

Testing Location			
☐	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
☒	JHUBEI	ADD :	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
		TEL :	886-3-656-9065 FAX : 886-3-656-9085

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

15.255(g) Regardless of the power density levels permitted under this section, devices operating under the provisions of this section are subject to the radio frequency radiation exposure requirements specified in §§1.1307(b), 2.1091 and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

(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 / f)*	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/f)*	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 57 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

For 2.16 GHz bandwidth:

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)
59.40	3.089	45.35	34281.18	34284.268
61.56		45.60	36314.50	36317.591
63.72		45.52	35647.94	35651.026
65.88		40.86	12189.62	12192.705

Maximum Permissible Exposure of Fundamental Emissions									
Separation Distance (cm)			57						
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/cm²)	Limit of Power Density (S) (mW/cm²)
Channel 2.5	61.56	GHz	42	45.60	0.50	46.10	40745.54	0.998	1.00

Maximum Permissible Exposure of Fundamental Emissions + Unwanted Emissions								
Separation Distance (cm)			57					
Maximum EIPR Power of Test Frequency (GHz)			Ant. Gain (dBi)	Average EIRP Power (dBm)	Tolerance (dB)	Tune-up Average EIRP Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)
Channel 2.5	61.56	GHz	42	36317.59	0.50	40749.01	0.999	1.00

For 1.08 GHz bandwidth:

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	45.57	36057.86	36060.953
62.64		45.55	35892.19	35895.282
65.88		40.58	11428.78	11431.872

Maximum Permissible Exposure of Fundamental Emissions									
Separation Distance (cm)			57						
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/cm²)	Limit of Power Density (S) (mW/cm²)
Channel 1	58.32	GHz	42	45.57	0.50	46.07	40457.59	0.991	1.00

Maximum Permissible Exposure of Fundamental Emissions + Unwanted Emissions								
Separation Distance (cm)			57					
Maximum EIPR Power of Test Frequency (GHz)			Ant. Gain (dBi)	Average EIRP Power (dBm)	Tolerance (dB)	Tune-up Average EIRP Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)
Channel 1	58.32	GHz	42	36060.95	0.50	40461.05	0.992	1.00

———THE END———