

RF Exposure Report

Report No.: SA171005C05A

FCC ID: REP-8020-1

Test Model: HotPort 8020

Received Date: Oct. 05, 2017

Test Date: Oct. 23 ~ Dec. 22, 2017

Issued Date: Jan. 03, 2018

Applicant: Firetide Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

FCC Registration / 788550 / TW0003

Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
SA171005C05A	Original release.	Jan. 03, 2018

1 Certificate of Conformity

Product: Firetide Wireless Mesh Node

Brand: Firetide

Test Model: HotPort 8020

Sample Status: Engineering sample

Applicant: Firetide Inc.

Test Date: Oct. 23 ~ Dec. 22, 2017

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by :



Date:

Jan. 03, 2018

Suntee Liu / Specialist

Approved by :



Date:

Jan. 03, 2018

Bruce Chen / Project Engineer

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

2.2 MPE Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 51cm away from the body of the user. So, this device is classified as Mobile Device.

3 Calculation Result of Maximum Conducted Power

Function	Frequency Band (MHz)	Mode	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN 5GHz	Radio 1, Antenna 1						
	5180~5240	CDD	10.92	13.02	51	0.008	1
		Beamforming	4.90	13.02	51	0.002	1
	5260~5320	CDD	19.56	13.02	51	0.055	1
		Beamforming	13.54	13.02	51	0.014	1
	5500~5720	CDD	21.36	13.02	51	0.084	1
		Beamforming	15.34	13.02	51	0.021	1
	5745~5825	CDD	25.98	13.02	51	0.243	1
		Beamforming	19.96	13.02	51	0.061	1
	Radio 1, Antenna 2						
	5180~5240	CDD	13.95	23.27	51	0.161	1
		Beamforming	7.93	23.27	51	0.040	1
	5260~5320	CDD	8.39	23.27	51	0.045	1
		Beamforming	2.36	23.27	51	0.011	1
	5500~5720	CDD	8.43	23.27	51	0.045	1
		Beamforming	2.41	23.27	51	0.011	1
	5745~5825	CDD	14.32	23.27	51	0.176	1
		Beamforming	8.16	23.27	51	0.043	1
	Radio 2, Antenna 1						
	5180~5240	CDD	10.94	13.02	51	0.008	1
		Beamforming	4.72	13.02	51	0.002	1
	5260~5320	CDD	19.29	13.02	51	0.052	1
		Beamforming	13.27	13.02	51	0.013	1
	5500~5720	CDD	21.36	13.02	51	0.084	1
		Beamforming	15.34	13.02	51	0.021	1
	5745~5825	CDD	26.05	13.02	51	0.247	1
		Beamforming	20.03	13.02	51	0.062	1
	Radio 2, Antenna 2						
	5180~5240	CDD	13.78	23.27	51	0.155	1
		Beamforming	7.76	23.27	51	0.039	1
	5260~5320	CDD	8.35	23.27	51	0.044	1
		Beamforming	2.33	23.27	51	0.011	1
	5500~5720	CDD	8.40	23.27	51	0.045	1
		Beamforming	2.38	23.27	51	0.011	1
	5745~5825	CDD	14.27	23.27	51	0.174	1
		Beamforming	8.25	23.27	51	0.043	1
WLAN 4.9GHz	Radio 1, Antenna 1						
	4942.5~4987.5	-	17.62	12.52	51	0.032	1
	Radio 1, Antenna 2						
	4942.5~4987.5	-	17.62	22.27	51	0.298	1
	Radio 2, Antenna 1						
	4942.5~4987.5	-	19.15	12.52	51	0.045	1
	Radio 2, Antenna 2						
	4942.5~4987.5	-	19.15	22.27	51	0.424	1

Note:

5GHz:

Antenna 1 max. directional gain = 7dBi + 10log(4) = 13.02dBi

Antenna 2 max. directional gain = 18.5dBi + 10log(3) = 23.27dBi

4.9GHz:

Antenna 1 max. directional gain = 6.5dBi + 10log(4) = 12.52dBi

Antenna 2 max. directional gain = 17.5dBi + 10log(3) = 22.27dBi

Frequency Band	Max Power (dBm)		Total Power (dBm)	Power Limit (dBm)
	Radio 1	Radio 2		
WLAN 5GHz	25.98	26.05	29.03	30
WLAN 4.9GHz	17.62	19.15	21.46	27

Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

Max.: Radio 1, Antenna 1, 5GHz + Radio 2, Antenna 1, 5GHz = 0.243 + 0.247 = 0.490 < 1
 Max.: Radio 1, Antenna 2, 5GHz + Radio 2, Antenna 2, 5GHz = 0.176 + 0.174 = 0.350 < 1
 Max.: Radio 1, Antenna 1, 4.9GHz + Radio 2, Antenna 1, 4.9GHz = 0.032 + 0.045 = 0.077 < 1
 Max.: Radio 1, Antenna 2, 4.9GHz + Radio 2, Antenna 2, 4.9GHz = 0.298 + 0.424 = 0.722 < 1
 Max.: Radio 1, Antenna 1, 5GHz + Radio 2, Antenna 1, 4.9GHz = 0.243 + 0.045 = 0.288 < 1
 Max.: Radio 1, Antenna 2, 5GHz + Radio 2, Antenna 2, 4.9GHz = 0.176 + 0.424 = 0.600 < 1
 Max.: Radio 1, Antenna 1, 4.9GHz + Radio 2, Antenna 1, 5GHz = 0.032 + 0.247 = 0.279 < 1
 Max.: Radio 1, Antenna 2, 4.9GHz + Radio 2, Antenna 2, 5GHz = 0.298 + 0.174 = 0.472 < 1

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