

## 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.

**Address:** Firetide Inc. A Division of UNICOM GLOBAL 2105, South Bascom Avenue, Suite 220, Campbell, California, United States, 950008

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

**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 :**                     *Suntee Liu*                     , **Date:**                     Jan. 03, 2018                      
Suntee Liu / Specialist

**Approved by :**                     *Bruce Chen*                     , **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 <sup>2</sup> )	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/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
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	<b>0.243</b>	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	<b>0.176</b>	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	<b>0.247</b>	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	<b>0.174</b>	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	<b>0.032</b>	1
	Radio 1, Antenna 2						
	4942.5~4987.5	-	17.62	22.27	51	<b>0.298</b>	1
	Radio 2, Antenna 1						
	4942.5~4987.5	-	19.15	12.52	51	<b>0.045</b>	1
Radio 2, Antenna 2							
4942.5~4987.5	-	19.15	22.27	51	<b>0.424</b>	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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