

RF Exposure Report

Report No.: SA171005C05

FCC ID: REP-8020-1

Test Model: HotPort 8020

Received Date: Oct. 05, 2017

Test Date: Oct. 23 ~ Dec. 26, 2017

Issued Date: Dec. 26, 2017

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:



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specifically mentioned, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 RF Exposure	5
2.1 Limits for Maximum Permissible Exposure (MPE).....	5
2.2 MPE Calculation Formula	5
2.3 Classification	5
3 Calculation Result of Maximum Conducted Power	6

Release Control Record

Issue No.	Description	Date Issued
SA171005C05	Original release.	Dec. 26, 2017

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. 26, 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 EMC characteristics under the conditions specified in this report.

Prepared by : Suntee Liu , **Date:** Dec. 26, 2017
Suntee Liu / Specialist

Approved by : Ken Liu , **Date:** Dec. 26, 2017
Ken Liu / Senior Manager

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
	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
	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
	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	
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

---END---