Compliance Testing, LLC
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Test Report

Prepared for: Etherstack

Model: SFFR-6

Description: Small Form Factor Repeater

Serial Number: 17050004

FCC ID: 2ADAKSFFR6UL2

To

FCC Part 1.1310

Date of Issue: April 11, 2019

On the behalf of the applicant:	**Etherstack Inc.** **1115 Broadway** **Suite 1276** **New York, NY 10010**
Attention of:	**Doug Chapman, V.P. Business Development N.A.** **Ph: (917)661-4110** **Email: doug.chapman@etherstack.com**

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Greg Corbin

Greg Corbin
Project Test Engineer

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	October 16, 2017	Greg Corbin	Original Document
2.0	December 17, 2017	Greg Corbin	Updated model and EUT description, updated antenna gain
3.0	June 8, 2018	Greg Corbin	Updated FCC ID and revised MPE calculation with higher output power
4.0	October 15, 2018	Greg Corbin	Revised MPE calculation due to higher gain antenna provided by manufacturer
5.0	October 22, 2018	Greg Corbin	Corrected antenna gain typo on page 4, updated RF exposure calculations using the lowest frequency and highest measured output power.
6.0	April 8, 2019	Greg Corbin	Updated MPE calculations to reflect rated power including tune-up tolerances

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Non-accredited tests contained in this report:

N/A

EUT Description
Model: SFFR-6
Description: Small Form Factor Repeater
Firmware: 2.04.000
Software: N/A
Serial Number: 17060004
Additional Information:
The EUT is a UHF small form factor tactical repeater operating from 380 - 470 MHz per Table 1 below.

The EUT is AC or DC powered, with 2 battery packs for battery power.

A 7.15 dBi gain 5/8 wave collinear omnidirectional antenna was specified by the manufacturer.

Worst case RF exposure calculations were calculated using the highest gain antenna and the highest output power which is the rated output power listed on the grant plus tune-up tolerances of +/- 0.29 dB.

Table 1 Frequency Allocation

Repeater Frequency Range (380 - 470 MHz)						
Rule Part	**Frequency Range (MHz)**	**Sub-Bands (MHz)**			**Extended Frequency**	
FCC Part 90	406.1 - 470	406.1 - 420	421 - 430	450 - 470	380 - 406	430 - 450
FCC Part 22	454 - 460	454 - 455	456 - 460	N/A	N/A	N/A
FCC Part 74	450 - 456	450 - 454	455 - 456	N/A	N/A	N/A
FCC Part 80	454 - 470	454 - 455	456 - 460	462.7375 - 470	N/A	N/A
RSS 119	406.1 - 470	406.1 - 430	450 - 470	N/A	N/A	N/A

MPE Evaluation

This is a portable device used in **Uncontrolled** Exposure environment.

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)		
	0.3-1.234 MHz:	Limit [mW/cm²] = 100
	1.34-30 MHz:	Limit [mW/cm²] = (180/f²)
	30-300 MHz:	Limit [mW/cm²] = 0.2
	300-1500 MHz:	Limit [mW/cm²] = f/1500
	1500-100,000 MHz	Limit [mW/cm²] = 1.0

Test Data

Test Frequency, MHz	406.1
Power, Conducted, mW (P)	29936
Antenna Gain Isotropic	7.15 dBi
Antenna Gain Numeric (G)	5.19
Antenna Type	5/8 wave collinear omnidirectional
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$
Power Density (S) mw/cm^2
30.91 mw/cm^2

Power Density (S) = 30.91mw/cm^2
Limit =(from above table) = 0.271 mw/cm^2

The power density at 30.91 mw/cm^2 is over the 0.271 mw/cm^2 limit.

The Minimum Safe Distance was calculated on the next page.

Minimum Safe Distance Evaluation

This is a mobile device used in **Uncontrolled** Exposure environment.

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)	0.3-1.234 MHz:	Limit [mW/cm²] = 100
	1.34-30 MHz:	Limit [mW/cm²] = (180/f²)
	30-300 MHz:	Limit [mW/cm²] = 0.2
	300-1500 MHz:	Limit [mW/cm²] = f/1500
	1500-100,000 MHz	Limit [mW/cm²] = 1.0

Test Data

Test Frequency, MHz	406.1
Power, Conducted, mW (P)	29936
Antenna Gain Isotropic	7.15 dBi
Antenna Gain Numeric (G)	5.19
Antenna Type	5/8 wave collinear omnidirectional
Limit (L)	0.271 mw/cm^2

$R=\sqrt{(PG/4\pi L)}$			
Distance (R) cm	Power mW (P)	Numeric Gain (G)	Limit (L)
213.6 cm	29936	5.19	0.271 mw/cm^2

The minimum safe distance is 213.6 cm for a 7.15 dBi gain antenna.

END OF TEST REPORT