MPE/RF EXPOSURE REPORT

FCC CFR 47 Part 1.1310

Report No.: LYFT15-U9 MPE FCC Rev A

Company: Lyft, Inc

Model Name: BIT041N

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To: FCC CFR 47 Part 1.1310

Report Serial No.: LYFT15-U9 FCC MPE Rev A

This report supersedes: NONE

Applicant: Lyft, Inc
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1. MAXIMUM PERMISSABLE EXPOSURE

Calculations for Maximum Permissible Exposure Levels
Power Density = Pd (mW/cm^2) = EIRP/(4*π*d^2)
EIRP = P * G
P = Peak output power (mW)
G = Antenna numeric gain (numeric)
d = Separation distance (cm)
Numeric Gain = 10 ^ (G (dBi)/10)

FCC CFR 47 Part 1.1310 Power Density Limits for General Population/Uncontrolled Exposure:
300-1,500 MHz; Power Density = f/1500 mW/cm^2
1,500-100,000 MHz; Power Density = 1.0 mW/cm^2

3rd party Reference reports.
The Lyft BIT041N product contains 3 pre-certified Radio modules. The following MPE assessment reports were referenced in performing this assessment of MPE Exposure

LTE Module EC21-A MINIPCIE; Tested by TA Technology (Shanghai) Co., LTD. refer to Test Reports numbers:

R1805A0226-M5V1 EC21-A FCC MPE Dated June 11, 2018
R1805A0226-R1V3 EC21-A FCC Part 22 Dated June 12, 2018
R1805A0226-R2V3 EC21-A FCC Part 24 Dated June 12, 2018
R1805A0226-R3V2 EC21-A FCC Part 27 Dated June 12, 2018

Wi-Fi Module ESP32-S2-MINI-1; Tested by TA Technology Co., Ltd Shanghai; Report number R2009A0623-M1 issued on the 29th October 2020.

The BLE Module used in this equipment was previously tested in MiCOM LABS Report # LYFT06-U5 Rev A, Date 20th April 2021.

The calculations in the table below use the highest measured conducted power values together with the antenna gain specified for the EUT.

Specification - Maximum Permissible Exposure Limits.
The Limit is defined in Table 1 of FCC §1.1310.

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm^2) @ 20cm	Power Density Limit (mW/cm^2)	Min Calculated safe distance for Limit (cm)
LTE 715	4.0	2.512	23.5	223.872	0.112	0.477	9.69
2.4 DTS	3.71	2.35	19.10	81.28	0.038	1	4.0
2.4 BLE	2.5	1.78	6.87	4.86	0.002	1	0.9

Worst Case Simultaneous Operation

These calculations represent worst case in terms of the exposure levels and assume all radio transmitters i.e. LTE Cellular, 2.4GHz Wi-Fi; BLE radios are operating simultaneously.

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance for Summation (cm)	Power Density Limit (mW/cm^2) @ 20cm Pd_{Limit}	Calculated Power Density (mW/cm^2) Pd_{Calc}	Pd_{Calc}/ Pd_{Limit}
LTE 715	4.00	2.512	23.500	223.872	20.000	0.477	0.112	0.112
2.4 DTS	3.71	2.350	19.100	81.283	20.000	1.000	0.038	0.038
2.4 BLE	2.50	1.778	6.870	4.864	20.000	1.000	0.002	0.002
Summation Pd_{Calc}/ Pd_{Limit} @ 20 cm distance:								**0.152**

Evaluation for compliance of simultaneous transmission where the power density limits are different is performed by the summation of ratios;

Calculated Power Density/Power Density Limit

$Pd_{Calc1}/Pd_{Limit1} + Pd_{Calc2}/Pd_{Limit2} + Pd_{Calc3}/Pd_{Limit3}$ + etc. < 1.

SUMMARY; Minimum safe distance to meet the RF exposure requirements = 20cm

Note: for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

Specification
Maximum Permissible Exposure Limits

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