



Radio Frequency Exposure Evaluation Report

FOR
Lyft, Inc.

Marketing Name
Bike Interface Module

Model Name
BIT-01-1-9

Product Description
Location and connectivity module. LTE, NFC, GNSS and RX-only Wi-Fi to enable ride sharing capabilities and unit tracking.

FCC ID: 2ASMPBIT0119

Applied Rules and Standards:
CFR 47 Part 2.1093
FCC KDB 447498 D01 General RF Exposure Guidance v06

Test Report #: SAR_EX_LYFTH_004_19001_FCC

DATE: 8/8/2019



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IC recognized #
3462B-2

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1 Assessment

The following device was evaluated against the limits for general population uncontrolled exposure specified in CFR 47 Part 2.1093 according to SAR evaluation exclusion requirements specified in FCC regulation as listed in KDB 447498.

Responsible for Testing Laboratory:

8/8/2019	Compliance	Li, Cindy (Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

8/8/2019	Compliance	Ghanma, Issa (EMC Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3.

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2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
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Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Compliance Manager:	Li, Cindy
Responsible Project Manager:	Saman, Rami

2.2 Identification of the Client

Applicant's Name:	Lyft, Inc.
Street Address:	185 Berry St Suite 5000
City/Zip Code	San Francisco, CA 94107
Country	USA

2.3 Identification of the Manufacturer

Applicant's Name:	---Same as client-----
Street Address:	-----
City/Zip Code	-----
Country	-----

3 Equipment under Assessment

Model #:	BIT-01-1-9
Hardware Version:	1.1
Software Version:	1.1
Minimum distance of antenna or radiating parts to user	22 mm in Standalone mode 24 mm in Simultaneous transmission mode (Cellular + NFC)
Radios included in the device:	<ul style="list-style-type: none"> ❖ Cellular 4G LTE CAT-1 <ul style="list-style-type: none"> • Module name: Digi XBee Cellular LTE Cat 1 • Module number: XBC-V1-UT-101 • FCC ID: RI7LE866SV1A ❖ NFC Module: <ul style="list-style-type: none"> • 13.56 MHz Transceiver (TRF7960ARHBT) • Model number: Lyft 8DT-03-1064 ❖ WLAN(Wi-Fi): 802.11 b/g/n (Receive only) <ul style="list-style-type: none"> • Module name: Stand-alone Wi-Fi • Model number: uBlox NINA-W132 • FCC ID: XPNINAW13 ❖ GPS: <ul style="list-style-type: none"> • Module name: uBlox M8 GNSS Antenna Module • Model number: uBlox SAM-M8Q
Co-located Transmitters/ Antennas:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Exposure Category:	<input type="checkbox"/> Occupational/ Controlled <input checked="" type="checkbox"/> General Population/ Uncontrolled
Device Category:	<input type="checkbox"/> Fixed Installation <input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Mixed Mobile and Portable
Power Supply/ Rated Operating Voltage Range:	Low 30 VDC, Nominal 36 VDC, High 42 VDC
Operating Temperature Range:	Low -20° C, Nominal 25° C, High 50° C
Sample Revision:	<input type="checkbox"/> Prototype Unit; <input type="checkbox"/> Production Unit; <input checked="" type="checkbox"/> Pre-Production
EUT Dimensions [cm]:	270 x 70 x 40
Weight (grams) :	400
EUT Diameter:	<input checked="" type="checkbox"/> < 60 cm <input type="checkbox"/> Other _____

4 FCC Exemption Limits for Routine Evaluation

4.1 FCC SAR test exclusions are set by KDB 447498 D01 General RF Exposure Guidance v06

4.1.1 Section: 4.3.1. Standalone SAR test exclusion considerations

- a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$$

≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as *numeric thresholds* in step b) below

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

- b) For 100 MHz to 6 GHz and *test separation distances* > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B):³²

- 1) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)]\}$ mW, for 100 MHz to 1500 MHz
- 2) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot 10]\}$ mW, for > 1500 MHz and ≤ 6 GHz

- c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

- 1) For *test separation distances* > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f(\text{MHz}))]$
- 2) For *test separation distances* ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$

4.1.2 Section 4.3.2 Simultaneous transmission SAR test exclusion considerations

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the *reported* standalone SAR of each applicable simultaneously transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

5 SAR Exclusion Evaluation

5.1 Standalone

FCC Standalone Transmission SAR Exclusion Calculations @ 22 mm								
Radio	Frequency [GHz]	Maximum output power *1 [dBm]	Gain [dBi]	EIRP *2 [dBm]	Applying duty cycle correction factor *3 [dBm]	Corrected power [mW]	Threshold *4	1-g SAR Limit
LTE 4	1.71 – 1.755	23	3.05	26.05	17.02	50.34	2.99	≤ 3.0
LTE 13	0.779 – 0.785	26.0	- 0.21	25.79	16.97	49.76	2.00	≤ 3.0
NFC	0.01356	18.0	-	-	15.16	32.81	0.2	≤ 3.0

*1 Maximum output power from the modular grant or client declaration, whichever is the highest.

*2 Adding the Peak gain value to the Maximum power.

*3 Subtracting 10 * Log (1/ Duty Cycle %) to either EIRP or power declared by client, whichever is the highest, to establish the worst case.

For cellular radio, 12.5% duty cycle used for calculation, but client declared that in end user mode, the transmitter sends a pulse once every 5000 milliseconds. the pulse length 198.9 milliseconds to send a packet size of 450 bytes.

For NFC radio, (52%) duty cycle were measured and averaged over 6 minutes, using EMPower ETSI Burst Measurement System.

*4 Formula used for threshold calculation described in [section 4.1 a\)](#) for cellular radio, and in [section 4.1 c\) 2\)](#) for the NFC radio, of this document.

5.2 Simultaneous transmission

FCC Simultaneous Transmission SAR Exclusion Calculations @ 24 mm				
Radio	Frequency [GHz]	Corrected power [mW]	Threshold *1	1-g SAR Limit
LTE 4	1.71 – 1.755	50.34	2.74	≤ 3.0
NFC	0.01356	32.81	0.15	≤ 3.0

*1 Formula used for threshold calculation described in [section 4.1 a\)](#) for cellular radio, and in [section 4.1 c\) 2\)](#) for the NFC radio, of this document.

The worst case simultaneous transmission is LTE 4 simultaneous with NFC radio which is using 96.3% of the limit of 100%.

The sum of 1-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit.

6 Revision History

Date	Report Name	Changes to report	Report prepared by
8/8/2019	SAR_EX_LYFTH_004_19001_FCC	Initial Version	Ghanma, Issa