RF Exposure Evaluation Report

Jio, Inc.

Model Name:

Jiobit

Product Description:

JioBit Smart Tag Location Tracker

FCC ID: 2AKLI-080715
IC ID: 22220-080715

Per:

CFR Part Part 1 (FCC 2.1093) and
FCC KDB 447498 D01 General RF Exposure Guidance v06

Report number: EMC_JIO_JIOBI_001_17001-FCC-SAR-EX
DATE: November 30, 2017

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1. Assessment

The following device was evaluated against the limits for general population uncontrolled exposure specified in FCC 2.1093 according to SAR evaluation exclusion requirements specified in FCC regulation as listed in KDB 447498.
This assessment deviates from 2.1093 d) 5) as a load based time averaging correction has been applied with the justification given in 4.2

The device meets the requirements for SAR exclusion as stipulated by the above given FCC rules.

Company	Description	Model #
Jio, Inc.	Jiobit Smart Tag Location Tracker	4188N8762W

Responsible for the Laboratory

Date	Section	Name	Signature
Nov 30, 2017	Compliance	Peter Nevermann (Director Radio Communications and EMC)	Peter Ne

Responsible for the Report:

Date	Section	Name	Signature
Nov 30, 2017	Compliance	Elijah Garcia (EMC Engineer)	Elijah Garcia Digitally signed by Elijah Garcia DN: cn=Elijah Garcia, o=Cetecom Inc., ou=RC&E, email=elijah.garcia@cetecom.com, c=US Date: 2017.11.30 16:43:59 -08'00'

2. Administrative Data

Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (858) 362 2400
Fax:	+1 (858) 687-4809
Lab Manager:	James Donnellan
Project Engineer:	Laith Saman

Identification of the Client

Applicant's Name:	Tom Wied
Street Address:	351 W. Hubbard St., Suite 400
City/Zip Code	Chicago, IL 60654
Country	USA

Identification of the Manufacturer

Manufacturer's Name:	Same as the Client
Manufacturers Address:	
City/Zip Code	
Country	

3. Equipment under Assessment

Model No	4188N8762W
HW Version	1.0
SW Version	2.0
FCC-ID	2AKLI-080715
IC-ID	22220-080715
HVIN	4188N8762W
PMN	Jiobit
Product Description	Jiobit Smart Tag Location Tracker
Frequency Range / number of channels	GSM: Quad band, UMTS: FDDI, FDDII, FDDV, FDDVIII
Type(s) of Modulation	Cellular (Sierra Wireless HL8548-G): (GSM: Quad band, UMTS: FDDI, FDDII, FDDV, FDDVIII)
Antenna Information as declared	max gain 0.75 dBi
Max. Output Powers	25 dBm
Power Supply/ Rated Operating Voltage Range	2.9V dc (min) / 3.8V dc (nom) / 4.35V dc (max)
Operating Temperature Range	-40ºC to 65ºC
Other Radios included in the device	Bluetooth Low Energy: GFSK 802.11b: DSSS 802.11g/n: OFDM 802.11n: MCS (20 & 40 MHz)
Sample Revision	☐Prototype Unit ☐Production Unit ■Pre-Production

4. Subject of Investigation

The objective of the evaluation done by CETECOM Inc. was to assess the applicability of SAR evaluation exclusion according to methods described in applicable standards.

The FCC Exposure Criteria

The FCC SAR test exclusions are set by FCC KDB 447498 section 4.3 (a).

According to KDB 447498, SAR evaluation can be excluded if the following equation is satisfied:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR

Where f(GHz) is the RF channel transmit frequency in GHz

SAR Exclusion Calculation Table

Band/time slots	d[mm]	f[GHz]	Max Power + tune up [mW]	Source based duty cycle. (See Notes)	Load based duty cycle based on Maximum payload. (See Notes)	Effective average max power [mW]	FCC Limit @ 5 mm [mW]	Percentage of effective average max power to FCC limit	Exclusion
GPRS850 / 1 worst case	5	0.85	1995.26	0.125	0.040	9.98	16	0.61	OK
GPRS1900 / 1 worst case	5	1.9	1000.00	0.125	0.040	5.00	11	0.46	OK
UMTS V	5	0.85	316.23	1.000	0.032	10.12	16	0.62	OK
UMTS II	5	1.9	316.23	1.000	0.032	10.12	11	0.93	Ok
WiFi 2.4 GHz	5	2.4	79.43	1.000	0.107	8.5	10	0.88	OK
BTLE	5	2.4	10.00	1.00	0.050	0.50	10	0.05	OK

Note1: According to KDB inquiry (378897) never more than 144.400 bytes are transmitted in 5 min for cellular

Note 2: According to KDB inquiry (378897) never more than 4.000.000 bytes are transmitted in 5 min for WLAN

Note 3: The above load based duty cycles were based on the below minimum data rates for WLAN and Cellular:

- *WLAN: 1Mbit/S*
- *1 TS GPRS: 9600b/s*
- *UMTS 12200 b/s*

Note 4: A conservative 5% duty cycle is used for BTLE

Maximum powers + tune up and antenna gain represent worst of case power from the unit.

Co Transmission

Co Transmission is only possible with Cellular and Bluetooth. Adding the power of both radios as a worst case is

Band/modulation/timeslots	Percentage of effective average max power to FCC limit of cellular	Percentage of effective average max power to FCC limit of BT LE	Percentage of Simultaneous transmission	SAR Exclusion
GPRS850 / 1 worst case	0.61	0.05	0.66	OK
GPRS1900 / 1 worst case	0.46	0.05	0.51	OK
UMTS V	0.62	0.05	0.67	OK
UMTS II	0.93	0.05	0.98	OK

The device meets the requirements of FCC SAR Exclusion based on the above stated operation of the device with regards to Load Based duty cycle.

5. Revision History

Date	Report Name	Changes to Report	Prepared by
Nov 30, 2017	EMC_JIO_JIOBI_001_17001-FCC-SAR-EX	Initial Release	Elijah Garcia