Radio Frequency Exposure Evaluation Report

FOR:
Wire Pulse, Inc.

Model:
RSS300

Product Description:
Scout is an IoT device that creates real-time activity and location tracking of each individual asset in a company's inventory.

FCC ID: 2BBHT-RSS300

Per:
CFR Part Part1 (1.1307 &1.1310), Part 2 (2.1091),
FCC KDB 447498 D01 General RF Exposure Guidance v06
ISEDC RSS-102 Issue 5

Report number: EMC_MPCON_007_23001_FCC_ISED_RF_Exposure_Rev1

DATE: 2023-09-12

***CETECOM* Inc.**
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1 Assessment

This RF Exposure evaluation report provides evidence for compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1 (1.1307 &1.1310), Part 2 (2.1091) and IC standard RSS-102 issue 5 under worst case conditions (measured or rated RF output power, antenna gain, distance towards human body, multiple transmitter information as presented by the applicant).
In addition, maximum antenna gain or minimum distance towards the human body is calculated respectively, where relevant.

The device meets the limits as stipulated by the above given FCC and IC rule parts based on available specifications for worst case conditions at 20cm distance to the body.

Company	Description	Model
Wire Pulse, Inc.	Scout is an IoT device that creates real-time activity and location tracking of each individual asset in a company's inventory.	RSS300

Report reviewed by: TCB Evaluator

Arndt Stoecker

Digitally signed by: Arndt Stoecker
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Date: 2023.09.14 19:18:39 -07'00'

Date	Section	Name	Signature
2023-09-12	Compliance	Arndt Stoecker (Director of Regulatory Services)	

Responsible for the Report:

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Date	Section	Name	Signature
2023-09-12	Compliance	Cheng Song (EMC Engineer)	

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
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Director of Regulatory Services:	Arndt Stoecker
Responsible Project Leader:	Sangeetha Sivaraman

2.2 Identification of the Client / Manufacturer

Client's Name:	MP Consulting, LLC
Street Address:	501 West Colfax Street
City/Zip Code	Palatine, IL 60067
Country	USA

Identification of the Manufacturer

Manufacturer's Name:	A Making Company, LLC
Manufacturers Address:	100 Oakwood Road, Suite H
City/Zip Code	Lake Zurich, IL 60047
Country	USA

3 Equipment under Assessment

Product Description:	Scout is an IoT device that creates real-time activity and location tracking of each individual asset in a company's inventory.
PMN:	Scout
Model:	RSS300
HW Version :	3.0
SW Version :	3.0.0
FCC ID:	2BBHT-RSS300
Radio Information:	BLE: Nordic Semiconductors NRF52840-QIAA-R7 Cellular: Quectel BG95M1LA-64-SGNS NFC: STMicroelectronics ST25R95-VMD5T GNSS: u-blox ZOE-M8B-0
Antenna Information as declared:	BLE: Pulse Larson W3008, Gain: +1.1dBi Cellular: RFSolutions ANT-GFPCB1540-UFL, Gain: +5dBi
Power Supply/ Rated Operating Voltage Range	3.8VDC, 4900mAh/18.6Wh Lithium Polymer Battery (Rechargeable)
Operating Temperature Range	-20°C - +60°C
Sample Revision	☐Production ☒ Pre-Production
EUT Dimensions	122mm x 82.5mm x 35.7mm
Weight	288 grams
EUT Diameter	■ < 60 cm ☐ Other _____

4 RF Exposure Limits and FCC and IC Basic Rules

4.1 Routine Environmental Evaluation Categorical Exclusion Limits acc. to FCC 1.1307(b)(3)(i)(B).

Single RF sources is exempt if the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \leq 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \leq 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \leq f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \leq f \leq 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a}\frac{P_i}{P_{\text{th},i}} + \sum_{j=1}^{b}\frac{ERP_j}{ERP_{\text{th},j}} + \sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

4.2 ISED Exemption Limits for Routine Evaluation – RF Exposure Evaluation per IC RSS-102 Issue 5 section 2.5.2

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz6 and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 4.49/f0.5 W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1.31 x 10-2 f0.6834 W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

5 Evaluations

5.1 Analysis of RF Exposure

FCC:

Tech-Band	Freq-Low$_{[GHz]}$	Pwr$_{[dBm]}$	Power$_{[W]}$	Ant-G$_{[dBi]}$	Ant-G$_{[lin]}$	ERP$_{[mW]}$	FCC 2.1091(c)(1) Pth$_{[mW]}$ = ERP$_{20cm}$
LTE 4	1.7150	22.00	0.158	5.00	3.16	305.492	3060.00
LTE 13	0.7795	22.00	0.158	5.00	3.16	305.492	1590.18
Tech-Band	**Freq-Low$_{[GHz]}$**	**Pwr$_{[dBm]}$**	**Power$_{[W]}$**	**Ant-G$_{[dBi]}$**	**Ant-G$_{[lin]}$**	**ERP$_{[mW]}$**	**FCC 2.1091(c)(1) Pth$_{[mW]}$ = ERP$_{20cm}$**
BT LE	2.4020	-1.67	0.001	1.10	1.29	0.535	3060.00
NFC	0.0136	-65.00	0.000	0.00	1.00	0.000	27.66

The worst simultaneous transmissions is LTE 13 and BTLE:
TER = 0.192
RF exposure exemption applicable

IC:

Tech-Band	Freq-Low [MHZ]	$Pwr_{[dBm]}$	$Power_{[W]}$	$EIRP_{[W]}$	Exemption limit for Routine Evaluation
LTE 4	1715.0	22.00	0.158	0.501	2.13
LTE 13	779.5	22.00	0.158	0.501	1.24
Tech-Band	**Freq-Low [MHZ]**	**$Pwr_{[dBm]}$**	**$Power_{[W]}$**	**$EIRP_{[W]}$**	**Exemption limit for Routine Evaluation**
BT LE	2402.0	-1.67	0.001	0.001	2.68
NFC	13.6	-65	0.000	0.000	1.00

The worst simultaneous transmissions is LTE 13 and BTLE:
TER = 0.404
RF exposure exemption applicable

6 Revision History

Date	Report Name	Changes to report	Prepared by
2023-08-15	EMC_MPCON_007_23001_FCC_ISED_RF_Exposure	Initial Release	Cheng Song
2023-09-06	EMC_MPCON_007_23001_FCC_ISED_RF_Exposure_Rev1	Updated cellular antenna gain	Cheng Song

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