



Radio Frequency Exposure Evaluation Report

For:
Telular Corporation

Model Name:
ST100

Product Description:
Telematic gateway for communicating measurement data

FCC ID: MTFST1001
ISED: 2175D-ST1001

Per:
CFR Part1 (1.1307 &1.1310), Part 2 (2.1091),
FCC KDB 447498 D01 General RF Exposure Guidance v06
ISEDC RSS-102 Issue 6

Report number: EMC_TELUL_118_23001_FCC_ISED_RF_Exposure_Rev1

DATE: 2025-04-28



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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 6 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 #
Telular Corporation	Telematic gateway for communicating measurement data	ST100

Responsible for Testing Laboratory:

2025-04-28	Compliance	Alvin Ilarina (Senior Manager Regulatory Services)
Date	Section	Name

Responsible for the Report:

2025-04-28	Compliance	Art Thammanavarat (Senior EMC Engineer)
Date	Section	Name

The test results of this test report relate exclusively to the test item specified in Section3. CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
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Country	USA
Telephone:	+1 (408) 586 6200
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EMC Lab Manager:	Alvin Ilarina
Responsible Project Leader:	Ruby, Hall

2.2 Identification of the Client / Manufacturer

Client's Name:	Telular Corporation
Street Address:	3225 Cumberland Blvd., Suite 300
City/Zip Code	Atlanta, GA 30339
Country	USA

2.3 Identification of the Manufacturer

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

3 Equipment under Assessment

Product Description:	Telematic gateway for communicating measurement data
Marketing Name:	SkyTank
Model No:	ST100
HW Version:	X4
SW Version:	v2.60
FCC-ID:	MTFST1001
ISED:	2175D-ST1001
Radio Information as declared:	<p>Cellular</p> <ul style="list-style-type: none">Module: Telit ME910G1-W1LTE Cat-MBands: 2, 4, 12, 13, 66 <p>Bluetooth 5.1 w/ BLE (1Mbps)</p> <p>ISM900</p>
Antenna Information as declared:	<p>LTE (KAVX P822601): 698-960MHz (2.6 dBi), 1710-2200MHz (4.4 dBi), 2500-2700MHz (3.4 dBi), 2300-2400MHz (1.8 dBi), 3300-3800MHz (2.8 dBi)</p> <p>BLE: (integrated on module)</p> <p>ISM900 (WLAN) (KAVX 1001011): 868-928MHz (1.0 dBi)</p>
Power Supply/ Rated Operating Voltage Range	Four 1.5V Lithium Cells (Energizer L91) in Series -- 4V min, 6V nom, 7.2V max.
Operating Temperature Range	-30 to 60 deg C
Sample Revision	<input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production
EUT Diameter	<input checked="" type="checkbox"/> < 60 cm <input type="checkbox"/> Other _____
Note 1: The EUT specifications listed in the table above were provided by the client.	
Note 2: The radios within the EUT do not operate simultaneously.	

4 RF Exposure Limits and FCC and IC Basic Rules

4.1 Routine Environmental Evaluation Categorical Exclusion Limits according to FCC 1.1307(b)(3)(i)(B), and FCC 1.1307(b)(3)(ii)(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 P_{th} (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). P_{th} is given by:

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

Where

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

and

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

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.

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

4.2 Field reference level (FRL) exposure exemption limits according to RSS-102 Issue 6, section 6.6

Field reference level (FRL) 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 (i.e. mobile devices), except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum EIRP 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 $1.31 \times 10^{-2} f^0.6834$ 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 EIRP was derived.

5 Evaluations

5.1 Analysis of RF Exposure

FCC:

Radio	Tech-Band	Freq-Low[GHz]	Pwr[dBm]	Power[W]	Ant-G[dBi]	EIRP[W]	ERP[W]	ERP[mW]	Threshold ERP[W]	ERP < Threshold ERP[W]	FCC 2.1093(c)(1) Pth[mW] - ERP _{20cm}
Cellular	LTE 2	1.8550	22.00	0.158	4.40	0.437	0.266	266.07	0.77	Yes	3060.00
	LTE 4	1.7150	22.00	0.158	4.40	0.437	0.266	266.07	0.77	Yes	3060.00
	LTE 12	0.7040	22.00	0.158	2.60	0.288	0.176	175.79	0.36	Yes	1436.16
	LTE 13	0.7820	22.00	0.158	2.60	0.288	0.176	175.79	0.40	Yes	1595.28
	LTE 66	1.7150	22.00	0.158	4.40	0.437	0.266	266.07	0.77	Yes	3060.00
Radio	Tech-Band	Freq-Low[GHz]	Pwr[dBm]	Power[W]	Ant-G[dBi]	EIRP[W]	ERP[W]	ERP[mW]	Threshold ERP[W]	ERP < Threshold ERP[W]	FCC 2.1093(c)(1) Pth[mW] = ERP _{20cm}
BT	LE	2.4020	2.20	0.0017	1.80	0.003	0.002	1.53	0.77	Yes	3060.00
Proprietary	ISM 900	0.9020	16.00	0.0398	1.00	0.050	0.031	30.55	0.46	Yes	1840.08

Conclusion:

- The maximum RF emissions from this equipment fulfills the RF exclusion threshold limits for separation distance between the antenna and the human body greater than 20 cm. No RF Exposure evaluation is required.

IC:

Radio	Tech-Band	Freq-Low [MHz]	Pwr[dBm]	Power[W]	Ant-G [dBi]	EIRP[W]	EIRP[mW]	RF Exposure	
								RSS-102 6.6 D>20 cm (300 ≤ Freq < 6000 MHz)	
Cellular	LTE 2	1855.00	22.00	0.16	4.40	0.44	436.52	2.24	Yes
	LTE 4	1715.00	22.00	0.16	4.40	0.44	436.52	2.13	Yes
	LTE 12	704.00	22.00	0.16	2.60	0.29	288.40	1.16	Yes
	LTE 13	782.00	22.00	0.16	2.60	0.29	288.40	1.24	Yes
	LTE 66	1715.00	22.00	0.16	4.40	0.44	436.52	2.13	Yes
Radio	Tech-Band	Freq-Low [MHz]	Pwr[dBm]	Power[W]	Ant-G [dBi]	EIRP[W]	EIRP[mW]	Exemption limit for Routine Evaluation	
BT	LE	2402.00	2.20	0.00	1.80	0.00	2.51	2.68	Yes
Proprietary	ISM 900	902.00	16.00	0.04	1.00	0.05	50.12	1.37	Yes

Conclusion:

- The maximum RF emissions from this equipment fulfills the RF exclusion threshold limits for separation distance between the antenna and the human body greater than 20 cm. No RF Exposure evaluation is required.

6 Revision History

Date	Report Name	Changes to report	Prepared by
2025-02-11	EMC_TELUL_118_23001_FCC_ISED_RF_Exposure	Initial Version	Art Thammanavarat
2025-04-28	EMC_TELUL_118_23001_FCC_ISED_RF_Exposure _Rev1	Report Revised 1. Section 5.1: Updated table, Added BLE Radio. Updated FCC ID and ISED.	Art Thammanavarat

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