

RF Exposure Report (FCC)

Report No.: WIR130984_130989-FCC-CalAmp-RF Exposure

Test Model: LMU4350LB/ LMU4351LB

Received Date: March 01, 2024

Test Date: March 02, 2024– April 30, 2024

Issued Date: May 01, 2024

Applicant: CalAmp Wireless Networks, Inc

Address: 2200 Faraday Ave, #200, Carlsbad, CA 92008

Issued By: Eurofins Electrical and Electronic Testing NA, Inc.

Lab Address: 3162 Belick St. Santa Clara CA, 95054



1. Certificate of Conformity

Product: LTE CAT1 Telematics Gateway
Brand: CalAmp
Test Model: LMU4350LB/ LMU4351LB
FCC ID: APV-4350LB
Series Model: N/A
Sample Status: Product Sample
Applicant: CalAmp Wireless Networks, Inc
Test Date: March 02, 2024– April 30, 2024

Standard: FCC Part 2 (Section 2.1091)
 KDB 447498 D01 General RF Exposure Guidance v06
 IEEE C95.1-1992

Richard Dollente
 Richard Dollente
 Test Engineer, Wireless Laboratory

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made.

Gary Chou
 Gary Chou
 Wireless Engineering Manager, Wireless Laboratory

Revision	Report Date	Reason for Revision
Ø	March 29, 2024	Initial Issue.
1.0	MAY 01, 2024	Update Bluetooth Power Level

2. RF Exposure

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	f/1500	30
1500-100,000	1.0	30

f = Frequency in MHz; *Plane-wave equivalent power density

2.1 MPE Calculation Formula

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

Where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.2 Antenna Gain

Cellular External:

Antenna Manufacturer/ Model:

CIROCOMM TECHNOLOGY / Optimus MA220

Antenna Type: Combination Antenna

Antenna Gain:

617 MHz- 960 MHz : 1.4 dBi

1427 MHz- 1518 MHz : -4.5 dBi

1710 MHz- 2200 MHz : 2.0 dBi

2490 MHz- 2690 MHz : -3 dBi

3300 MHz- 5000 MHz : 1.3 dBi

Internal External:

Antenna Manufacturer/ Model:

KYOCERA A/VX/ 1004795

Antenna Type: Universal Broadband FR4 Embedded Antenna

Antenna Gain:

698 MHz- 960 MHz : 1.6 dBi

1710 MHz- 2400 MHz : 3.1 dBi

2500 MHz- 2700 MHz : 1.7 dBi

Bluetooth:

Antenna Manufacturer/ Model:

CIROCOMM TECHNOLOGY / DCAK0012

Antenna Type: Chip Antenna

Antenna Gain: 2.00 dBi

2.3 Calculation Result worst case of Maximum Conducted Power

Type/ Band	Frequency Band (MHz)	Max Power (tune up) (dBm)	Max Power (tune up) (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
LTE	B2/4/5/7/12/13/14/25/26	25	316.2278	3.1	20	0.128514	0.467
GSM	850/ 1900	28.5	707.9458	1.6	20	0.203681	0.5495
WCDMA	B2/B4/B5	25.5	354.8134	3.1	20	0.144195	0.5509
Bluetooth LE	2402	5.28	3.3729	2.0	20	0.001064	1

The maximum calculations of above situations are less than the limit.
The SAR evaluation is not required.

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

3. This device contains

TYPE	Model No.	FCC ID	Note
-	-	-	-

4. Conclusion

Conclusion:

The formula of calculated the MPE is:

$$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Worse case

Total MPE Percentage for

$$\text{LTE+Bluetooth LE} = 0.276254578 < 1$$

$$\text{WCDMA+Bluetooth LE} = 0.262808418 < 1$$

Therefore, the maximum calculations of above situations are less than the “1” limit.
The SAR evaluation is not required.