TEST REPORT

Applicant:	MonoLets, Inc.
Address:	701 W Evelyn Ave, Suite B, Mountain View CA 94041 USA
Equipment Type:	Cellular Tracker
Model Name:	Cellular Tracker v7.0
Brand Name:	MonoLets Cellular Tracker
FCC ID:	2BLATMLCELTRK072409
Test Standard:	47 CFR Part 2.1091 KDB 447498 D04 v01
Test Date:	Sep. 22, 2024 - Oct. 11, 2024
Date of Issue:	Dec. 31, 2024

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Xiong Lining **Checked by:** Xu Rui **Approved by:** Tolan Tu (Testing Director)

Revision History

Version	Issue Date	Revisions Content
Rev. 01	Dec. 31, 2024	Initial Issue

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☐ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☑ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	MonoLets, Inc.
Address	701 W Evelyn Ave, Suite B, Mountain View CA 94041 USA

2.2 Manufacturer Information

Manufacturer	MonoLets, Inc.
Address	701 W Evelyn Ave, Suite B, Mountain View CA 94041 USA

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	Cellular Tracker
Model Name Under Test	Cellular Tracker v7.0
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	7.0
Software Version	Test software
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

Network and Wireless connectivity	4G Network LTE Cat-M1 FDD Band 2/4/5/12/13/25/26/66 Bluetooth (BR+EDR+BLE), GPS

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	LTE Cat-M1, Bluetooth		
Frequency Range	Bluetooth	2400 ~ 2483.5 MHz	
	LTE-M1 Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE-M1 Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE-M1 Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE-M1 Band 12	TX: 699 ~ 716 MHz	RX: 729 ~ 746 MHz
	LTE-M1 Band 13	TX: 777 ~ 787 MHz	RX: 746 ~ 756 MHz
	LTE-M1 Band 25	TX: 1850 ~ 1915 MHz	RX: 1930 ~ 1995 MHz
	LTE-M1 Band 26	TX: 814 ~ 849 MHz	RX: 859 ~ 894 MHz
	LTE-M1 Band 66	TX: 1710 ~ 1780 MHz	RX: 2110 ~ 2180 MHz
Antenna Type	Bluetooth	PIFA Antenna	
	WWAN	PIFA Antenna	
Exposure Category	General Population/Uncontrolled Exposure		
Product Type	Mobile Device		

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices
2	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

4 DEVICE CATEGORY AND LEVELS LIMITS

Mobile Devices:

CFR Title 47 §2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

FCC KDB 447498 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP20cm in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{\text{th}}\ (\text{mW}) = ERP_{20\,\text{cm}}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases} \qquad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold Pth (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by Formula (B.2).

$$P_{\text{th}}\,(\text{mW}) = \begin{cases} ERP_{20\,\text{cm}}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\,\text{cm}} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases} \qquad \text{(B.2)}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,\text{cm}}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1).
The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

According with FCC KDB 447498 D04, Appendix A, Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.

This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

When maximum available power each individual transmitting antenna within the same time averaging period is ≤ 1 mW, and the nearest parts of the antenna structures of the simultaneously operating transmitters are separated by at least 2 cm.

When the aggregate maximum available power of all transmitting antennas is ≤ 1 mW in the same time-averaging period.

5 ASSESSMENT RESULT

5.1 Output Power

Bluetooth	
Mode	BLE
Conducted Power (dBm)	-1.46
Antenna Gain (dBi)	-2.00
EIRP (dBm)	-3.46
Note: This report listed the worst case conducted power value, please refer to RF test report No. BL-SH2490649-601 for more details.	

LTE-M1								
Mode	Band 2	Band 4	Band 5	Band 12	Band 13	Band 25	Band 26	Band 66
Conducted Power (dBm)	23.93	23.99	23.94	23.28	23.78	23.95	23.84	23.86
Antenna Gain (dBi)	1.59	2.00	2.53	3.95	4.45	1.59	3.19	2.00
ERP/EIRP (dBm)	25.52	25.99	24.32	25.08	26.08	25.54	24.88	25.86
Note: This report listed the worst case conducted power value, please refer to RF test report No. BL-SH2490649-501 for more details.								

5.2 Tune-up power

Mode		Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
LTE-M1	Band 2	[23.00,25.00]	[24.59,26.59]	[22.44,24.44]
	Band 4	[23.00,25.00]	[25.00,27.00]	[22.85,24.85]
	Band 5	[23.00,25.00]	/	[23.38,25.38]
	Band 12	[22.50,24.50]	/	[24.30,26.30]
	Band 13	[23.00,25.00]	/	[25.30,27.30]
	Band 25	[23.00,25.00]	[24.59,26.59]	[22.44,24.44]
	Band 26	[23.00,25.00]	/	[23.38,25.38]
	Band 66	[23.00,25.00]	[25.00,27.00]	[22.85,24.85]
Bluetooth	Bluetooth	[-2.50, -0.50]	[-4.50, -2.50]	[-6.65, -4.65]
Note1: ERP= EIRP -2.15dB. Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.				

5.3 RF Exposure Evaluation Result

Evolution mode	Frequency (MHz)	Distance (cm)	Maximum Tune up(dBm)	Maximum power (mw)	Threshold Power (mW)	Power/ Limit	Verdict
LTE-M1 Band 2	1850	20	25.00	316.23	3060.00	0.1033	Pass
LTE-M1 Band 4	1710	20	25.00	316.23	3060.00	0.1033	Pass
LTE-M1 Band 5	824	20	25.38	345.14	1680.96	0.2053	Pass
LTE-M1 Band 12	699	20	26.30	426.58	1425.96	0.2992	Pass
LTE-M1 Band 13	777	20	27.30	537.03	1585.08	0.3388	Pass
LTE-M1 Band 25	1850	20	25.00	316.23	3060.00	0.1033	Pass
LTE-M1 Band 26	814	20	25.38	345.14	1660.56	0.2078	Pass
LTE-M1 Band 66	1710	20	25.00	316.23	3060.00	0.1033	Pass
Bluetooth	2400	20	-0.50	0.89	3060.00	0.0003	Pass

5.4 Collocated Power Calculation

Evolution mode	Frequency (MHz)	Power /Limit	Σ(Power / Limit) of LTE-M1 Band 13 + Bluetooth	Verdict
LTE-M1 Band 13	777MHz ~ 787MHz	0.3388	0.3391	Pass
Bluetooth	2400MMHz ~ 2483.5MHz	0.0003		

Note:

1. Σ(Power / Limit): This is a summation of [(power for each transmitter/ antenna included in the simultaneous transmission)/ (corresponding Power limit)], for Bluetooth+ WWAN.
2. Both of the 777MHz/2.4GHz can transmit simultaneously, the formula of calculated the Power is
   CP1 / LP1 + CP2 / LP2 + ……etc. < 1
   CP = Calculation power
   LP = Limit of power
3. The worst-case situation is 0.3391, which is less than “1”. This confirmed that the device comply with FCC KDB 447498 D04 Power limit.
4. The DUT work frequency range used is 1850 MHz ~ 1915 MHz, 1710 MHz ~ 1780 MHz, 814 ~849 MHz, 699 MHz ~ 716 MHz, 777 MHz ~ 787 MHz, 2400MHz ~ 2483.5 MHz, the result close to the limit by the above formula, so we select worst case power to calculate the exclusion power threshold.
5. More power list please refer to test report No. BL-SH2490649-601/501.

5.5 Conclusion

This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

Statement

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--END OF REPORT--