

SZCCS-TRF-01 Rev. A/0 Aug01,2022

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RF EXPOSURE EVALUATION REPORT

Application No.:	FYCR2307000082AT
Applicant:	Radio Flyer Inc.
Address of Applicant:	6515 West grand Ave, Chicago, USA IL 60707
Manufacturer:	Radio Flyer Inc.
Address of Manufacturer:	6515 West grand Ave, Chicago, USA IL 60707
Factory:	Wuxi Leader Micro Electronics Co.,Ltd
Address of Factory:	5th Floor,Building 23,Science And Education Software Pack,Binhu District,Wuxi Jiangsu,P.R.China
Equipment Under Test (EU	Т):
EUT Name:	Display
Model No.:	LD920RF
Trade Mark:	FLYER
FCC ID:	2AMIG-80022
Standard(s) :	FCC Rules 47 CFR §2.1093 KDB 447498 D04 interim General RF Exposure Guidance v01
Date of Receipt:	2023-07-28
Date of Test:	2023-08-11 to 2023-08-22
Date of Issue:	2023-08-24
Test Result:	Pass*
* In the configuration tested	the ELIT complied with the standards apositied above

* In the configuration tested, the EUT complied with the standards specified above.

WinkeyWang

Winkey Wang EMC Technical Manager



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Revision Record								
Version Chapter Date Modifier Remark								
01		2023-08-24		Original				

Authorized for issue by:		
	Gree Zhan	
	Tree Zhan/Project Engineer	
	WinkeyWarg	
	Winkey Wang/Reviewer	



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2 General Information

2.1 General Description of E.U.T.

	Portable device
Product Type:	Mobile device
	Fixed device

2.2 Details of E.U.T.

Power supply:	Input 48Vdc, USB Output 5Vdc, 1.5A
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0 LE
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PCB Antenna
Antenna Gain:	3.0dBi

2.3 Separation Distance

Minimum test separation distance: 5mm

Remark: This minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.



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2.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc. Shenzhen branch. Fuyong lab. Xinlong TechnoPark,Fengtang Road, Fuyong Subdistrict, Bao'an, Shenzhen, China Tel: +86 755 8866 3988 Fax: +86 755 2671 0594 No tests were sub-contracted.

2.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 6606.01)

Compliance Certification Services (Kunshan) Inc. Shenzhen branch is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6606.01.

• FCC – Designation Number: CN1322

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized as an accredited testing laboratory.

Designation Number: CN1322. Test Firm Registration Number: 718073

• Innovation, Science and Economic Development Canada

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0129.

IC#: 28189.

2.6 Deviation from Standards

None

2.7 Abnormalities from Standard Conditions

None



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3 FCC Radiofrequency radiation exposure limits

Test exemptions apply for devices used in general population/uncontrolled exposure environments, according to the SAR-based, or MPE-based exemption thresholds.

3.1 Blanket 1 mW Blanket Exemption

The 1 mW Blanket Exemption of §1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

The 1-mW blanket exemption applies at separation distances less than 0.5 cm, including where there is no separation. This exemption shall not be used in conjunction with other exemption criteria other than those for multiple RF sources in paragraph §1.1307(b)(3)(ii)(A).

The 1-mW exemption is independent of service type and covers the full range of 100 kHz to 100 GHz, but it shall not be used in conjunction with other exemption criteria or in devices with higher-power transmitters operating in the same time-averaging period. Exposure from such higher-power transmitters would invalidate the underlying assumption that exposure from the lower-power transmitter is the only contributor to SAR in the relevant volume of tissue.

3.2 MPE-based Exemption

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of 1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

RF Source Frequency			Minim	Threshold ERP				
<i>f</i> ∟ MHz	Hz f _H MHz		λ _L / 2π	λ_ / 2π		W		
0.3	_	1.34	159 m	_	35.6 m	1,920 R ²		
1.34	-	30	35.6 m	_	1.6 m	3,450 R²/f ²		
30	-	300	1.6 m	_	159 mm	3.83 R ²		
300	-	1,500	159 mm	_	31.8 mm	0.0128 R ² f		
1,500	_	100,000	31.8 mm	_	0.5 mm	19.2R ²		
Subscripts L and H are low and high; λ is wavelength.								
From §1.1307(From §1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.							

Table B.1—Thresholds For Single RF Sources Subject to Routine Enviro	onmental Evaluation

The table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least $\lambda/2\pi$. The thresholds are based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator.



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For mobile devices that are not exempt per Table B.1 [Table 1 of \$1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in \$1.1310 is necessary if the ERP of the device is greater than *ERP*_{20cm} in Formula (B.1) [repeated from \$2.1091(c)(1); also in \$1.1307(b)(1)(i)(B)].

$$P_{\rm th} (\rm mW) = ERP_{20 \rm \ cm} (\rm mW) = \begin{cases} 2040f & 0.3 \rm \ GHz \le f < 1.5 \rm \ GHz \\ 3060 & 1.5 \rm \ GHz \le f \le 6 \rm \ GHz \end{cases}$$
(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 $\lambda/4$ 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.

Limit calculation							
Frequency range Frequency (MHz) $R(\lambda/2\pi)(m)$ Threshold ERP(W)							
300~1500MHz	915	0.0522	0.032				
1500~100000MHz	2480	0.0193	0.007				

3.3 SAR-based Exemption

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of $\lambda/4$.

As for devices with antennas of length greater than $\lambda/4$ where the gain is not well defined, but always less than that of a half-wave dipole (length $\lambda/2$), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

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 P_{th} (mW).



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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). P_{th} is given by Formula (B.2).

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

where

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

and *f* is in GHz, d is the separation distance (cm), and *ERP*_{20cm} is per Formula (B.1).



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Example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)										
Frequency					Distan	ce(mm)				
(MHz)	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

Limit calculation								
Frequency range(GHz)	Frequency(GHz)	Х	Distance(cm)	Pth (mW)				
0.3~1.5	0.915	1.474	0.5	8.133				
1.5~6	2.48	1.905	0.5	2.717				



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4 Measurement and Calculation

4.1 Maximum transmit power

The Power Data is based on the RF Test Report FYCR230700008201.

Test Mode	Test Channel		Conducted Peak Output Power [mW]	EIRP [dBm]	EIRP (mW)
BLE	2480MHz	1.99	1.58	4.99	3.16

Note: The best case gain of the antenna is 3.0dBi.

4.2 **RF Exposure Calculation**

The Max EIRP is 3.16mW. The best case gain of the antenna is 3.0dBi.

Remark: we used the maximum power between the conducted power and ERP/EIRP to perform RF exposure exemption evaluation.

	Evaluation method	Exempt Limit(mW)	Verdict
	Blanket 1 mW Blanket Exemption	1mW	N/A
	MPE-based Exemption(ERP)	7mW(ERP)	N/A
\boxtimes	SAR-based Exemption(<i>P</i> th)	6.79mW*	Yes

Remark: "*", the exempt limit is an assessment based on the condition that the portable device is close to the human limbs.

So, the device is to qualify for SAR test exemption, the exemption report is in lieu of the SAR report.

--End of the Report--



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