



SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

EMC-TRF-03 Rev 1.1

Report No.: GZCR230500052403

Page: 1 of 9

FCC ID: 2BBHB-RRH

RF EXPOSURE EVALUATION REPORT

Application No.: GZCR2305000524AT
Applicant: Flexlink Telecom Ltd
Address of Applicant: No. 12, Dinghu 3rd St., Guishan Dist., Taoyuan City 333, Taiwan
Manufacturer: Flexlink Telecom Ltd
Address of Manufacturer: No. 12, Dinghu 3rd St., Guishan Dist., Taoyuan City 333, Taiwan
Equipment Under Test (EUT):
EUT Name: Band 5 4T4R High Power Remote Radio Head
Model No.: RRH-440-05-50
Trade Mark: Parallel Wireless
Standard(s) : 47 CFR Part 2.1091
47 CFR Part 1.1310, Part 1.1307
Date of Receipt: 2023-05-20
Date of Evaluation: 2023-06-13
Date of Issue: 2023-06-13

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Ricky Liu

Ricky Liu
Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center EEC Laboratory

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Revision Record			
Version	Chapter	Date	Modifier Remark
01	GZCR230500052403	2023-06-13	Original

Authorized for issue by:			
			
		Kevin Zhang /Project Engineer	
			
		Jerry Chan /Reviewer	



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2 Evaluation Summary

Radio Spectrum Technical Requirement				
Item	Standard	Requirement	Method	Result
RF Exposure	47 CFR Part 2.1091 47 CFR Part 1.1310 47 CFR Part 1.1307	47 CFR Part 1.1310	47 CFR Part 1.1310	PASS



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4 General Information

4.1 Details of E.U.T.

Power Supply:	DC -57.6V~ -36.0V
Test Voltage:	DC -48V
Operating Temperature:	-40 to +55 °C
Operating Humidity:	≤95%
Frequency Range:	869-894MHz
Radio System Type:	Single Radio Access Technology (Single-RAT): LTE Multi-Standard Radio (MSR): GSM & LTE
Capacity: (per antenna port)	1 LTE carrier (5MHz, 10MHz, 15MHz, 20MHz) 2 LTE carriers (5MHz+5MHz, 5MHz+10MHz, 10MHz+10MHz) 1 GSM carrier+1 LTE carrier (5MHz, 10MHz) 2 GSM carriers+1 LTE carrier (5MHz, 10MHz)
Modulation Type:	GSM: GMSK, 8PSK LTE: QPSK/ 64QAM/256QAM
MIMO:	4T4R
Normal Output Power: (per antenna port)	46dBm
Interface:	TX & RX Port 4× 4.3-10-Female, ANT1~ ANT4 GPS Port 1× N-Female Power Port 1× 2-pin socket Optical Port 2× SFP+ Debug Port 1× Mini-USB
Antenna Type:	External Dedicated Antenna
Permission Antenna Gain: (declared from manufacturer)	5dBi or less



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4.2 Evaluated Location

All evaluation were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555

Fax: +86 20 82075059

4.3 Test Facility

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

● ACMA

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

● SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● FCC Recognized Accredited Test Firm(Registration No.: 486818)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

● ISED (Registration No.: 4620B, CAB identifier: CN0052)

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

● CBTL (Lab Code: TL129)

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.4 Deviation from Standards

None

4.5 Abnormalities from Standard Conditions

None



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5 Radio Spectrum Technical Requirement

5.1 RF Exposure

5.1.1 Requirement

In accordance with 47 CFR FCC Part 2.1091, this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

According to 47 CFR FCC Part 1310, the criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in Part1.1307(b).

TABLE 1 TO §1.1310(E)(1)—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) 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
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density



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5.1.2 Method

According to IEEE C95.3:2002 section 5.5.1.1, the power density S at a point on the axis at a distance d from a transmitting antenna is given by the Friis free-space transmission formula:

$$S = \frac{PG}{4\pi d^2}$$

S = power density (mW/cm²)
 P = the net power delivered to the antenna (mW)
 G = gain of the antenna in linear scale
 d = distance between observation point and center of the radiator (cm)

From the maximum EUT RF output power, as well as the gain of the used antenna, according to the RF power density limit stated in above table, the minimum distance between the antenna and human body will be calculated.

5.1.3 Conclusion

1. The maximum tune up power (46.5dBm/per port) was utilized as worst case for RF exposure evaluation. Therefore the total max conducted tune up power is 178673.44mW=52.52dBm.
2. The limit for Power Density (S)(mW/cm²) = $f/1500=0.579$ (f is the lowest operation frequency for the strictest limit, 869MHz).
3. According to the declaration from the applicant, the permitted maximum antenna gain is 5dBi and uncorrelated.
4. Refer to report GZCR230500052402 for the EUT test Max Conducted Output Power value.

Maximum Antenna Gain (Numeric)	Max. total tune up tolerance power (mW)	Limit of Power Density (S) (mW/cm ²)	Minimum Distance to human body (m)
3.162	178674	0.579	2.79

So the recommend use distance away from EUT external antenna is larger than 2.79m.



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5.2 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZCR2305000524AT.

- End of the Report -



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