

# RF EXPOSURE EVALUATION REPORT

**Application No.:** GZCR2411001398AT  
**Applicant:** Comba Telecom Network Systems Limited  
**Address of Applicant:** Flat/Rm 10, 3/F, Bio-Informatics Ctr, 2 Science Park West Avenue, HK Science Park, Pak Shek Kok, N.T. Hong Kong  
**Manufacturer:** Comba Network Systems Company Limited  
**Address of Manufacturer:** No. 10 Shenzhou Road, Guangzhou Science City, Guangzhou 510663, Guangdong, P.R. China  
**Factory:** Comba Telecom Technology (Guangzhou) Ltd.  
**Address of Factory:** No. 6 Jinbi Road, Economics and Technology Development District, Guangzhou, Guangdong, China  
**Product Name:** Comflex NGc  
**Model No.:** MRU-7851719c-AC, MRU-7851719c-DC ♣  
 ♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.  
**Trade Mark:** Comba  
**Standard(s) :** 47 CFR Part 2.1091  
 47 CFR Part 1.1310, Part 1.1307  
**Date of Receipt:** 2024-11-25  
**Date of Evaluation:** 2025-03-21  
**Date of Issue:** 2025-03-21

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.



Jerry Chan  
Manager



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Revision Record			
Version	Report No.	Date	Remark
01	GZCR241100139803	2025-03-21	Original

Authorized for issue by:			
		Kevin Zhang	
		Kevin Zhang/Project Engineer	
		Vico Cui	
		Vico Cui/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

### ♣ Declaration of EUT Family Grouping:

**Model No.:** MRU-7851719c-AC, MRU-7851719c-DC

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on power supply module.

Therefore, only one model MRU-7851719c-AC was evaluated in this report.



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## 4 General Information

### 4.1 Details of E.U.T.

Power Supply:	AC 100-240V, 50/60Hz for MRU-7851719c-AC DC 48V for MRU-7851719c-DC	
Cable:	AC mains (4m, unshielded) for MRU-7851719c-AC	
Operating Temperature:	-20 to +55 °C	
Operating Humidity:	≤85%	
Frequency Range:	Lower 700MHz:	Uplink: 698-716MHz Downlink: 728-746MHz
	Upper 700MHz:	Uplink: 777-787MHz Downlink: 746-756MHz
	Cellular:	Uplink: 824-849MHz Downlink: 869-894MHz
	AWS-1:	Uplink: 1710-1755MHz Downlink: 2110-2155MHz
	Broadband PCS:	Uplink: 1850-1915MHz Downlink: 1930-1995MHz
Interface:	Antenna Port:	8 (NEX10-F)
	Optical Port	1 (SC-APC)
	Debug Port	1 (RJ45)
Radio System Type:	WCDMA, LTE	
Minimum Bandwidth:	5MHz	
Normal Output Power:	Uplink	19dBm (conducted)
	Downlink	10dBm/5MHz (EIRP/ERP, per antenna port)
Normal System Gain:	Uplink	65dB
	Downlink	70dB (per antenna port)
Antenna Type:	External dedicated antenna	
Antenna Gain:	9dBi declared by the manufacturer	
Cable Loss:	-9dB declared by the manufacturer	
Software Version:	MRU5667M07R00.02.05	
Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.		



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## 4.2 Evaluated Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,  
No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou,  
Guangdong, China 510663  
Tel: +86 20 82155555

## 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 <sup>2</sup> )	Averaging time (minutes)
<b>(i) Limits for Occupational/Controlled Exposure</b>				
3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
<b>(ii) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	<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/cm<sup>2</sup>)

$P$  = 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

### For downlink

1. According to the test report GZCR241100139202, the downlink tested maximum conducted power was within the tune up power range (8 to 10dBm) and the maximum tune up power was utilized as worst case for RF exposure evaluation.
2. The maximum tune up tolerance power is 10dBm= 10mW.
3. According to the declaration from the applicant, Antenna feeder system contains an antenna (gain is 9dBi) and a cable (cable loss is -9dB), so the antenna gain is equal to 0dBi.
4. Normal use condition for Distance between server antenna and body: >=20cm declared by the manufacturer, the worst case 20cm used for exposure calculation

Band	Maximum Antenna Gain (Numeric)	Max. tune up tolerance power (mW)	Limit of Power Density ( $S_{limit}$ ) (mW/cm <sup>2</sup> )	Power Density ( $S$ ) (mW/cm <sup>2</sup> )
Lower 700MHz	1	10	0.4853	0.002
Upper 700MHz	1	10	0.4973	0.002
Cellular	1	10	0.5793	0.002
AWS-1	1	10	1	0.002
Broadband PCS	1	10	1	0.002

### Remark:

For Lower 700MHz band, the limit is  $f/1500 = 728/1500 = 0.4853$  mW/cm<sup>2</sup> for the stringent limit.

For Upper 700MHz band, the limit is  $f/1500 = 746/1500 = 0.4973$  mW/cm<sup>2</sup> for the stringent limit.

For Cellular band, the limit is  $f/1500 = 869/1500 = 0.57933$  mW/cm<sup>2</sup> for the stringent limit.

For multiple simultaneous transmission sources, the calculated Power Density should comply with:

$$(S_1/S_{limit1}) + (S_2/S_{limit2}) + (S_3/S_{limit3}) + (S_4/S_{limit4}) + (S_5/S_{limit5}) \leq 1$$

$$0.005 + 0.005 + 0.004 + 0.002 + 0.002 = 0.016 \leq 1$$

So SAR report is not required.



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## For uplink

1. According to the the test report GZCR241100139202, the uplink tested maximum conducted power was within the tune up power range (18 to 20dBm) and the maximum tune up power was utilized as worst case for RF exposure evaluation.
2. The maximum tune up tolerance power is 20dBm= 100mW.
3. According to the declaration from the applicant, Antenna feeder system contains an antenna (gain is 9dBi) and a cable (cable loss is -9dB), so the antenna gain is equal to 0dBi.
4. Normal use condition for Distance between server antenna and body:  $\geq 20\text{cm}$  declared by the manufacturer, the worst case 20cm used for exposure calculation

Band	Maximum Antenna Gain (Numeric)	Max. tune up tolerance power (mW)	Limit of Power Density ( $S_{\text{limit}}$ ) (mW/cm <sup>2</sup> )	Power Density (S) (mW/cm <sup>2</sup> )
Lower 700MHz	1	100	0.4653	0.02
Upper 700MHz	1	100	0.518	0.02
Cellular	1	100	0.5493	0.02
AWS-1	1	100	1	0.02
Broadband PCS	1	100	1	0.02

### Remark:

For Lower 700MHz band, the limit is  $f/1500 = 698/1500 = 0.4653 \text{ mW/cm}^2$  for the stringent limit.

For Upper 700MHz band, the limit is  $f/1500 = 777/1500 = 0.518 \text{ mW/cm}^2$  for the stringent limit.

For Cellular band, the limit is  $f/1500 = 824/1500 = 0.5493 \text{ mW/cm}^2$  for the stringent limit.

For multiple simultaneous transmission sources, the calculated Power Density should comply with:

$$(S_1/S_{\text{limit}1}) + (S_2/S_{\text{limit}2}) + (S_3/S_{\text{limit}3}) + (S_4/S_{\text{limit}4}) + (S_5/S_{\text{limit}5}) \leq 1$$

$$0.05 + 0.05 + 0.04 + 0.02 + 0.02 = 0.18 \leq 1$$

So SAR report is not required.

### Remark:

The donor antenna and service antenna must maintain sufficient distance to ensure isolation, otherwise the EUT will be shut down due to oscillation.

Therefore, the exposure evaluation only the uplink and downlink single transmission was concerned in this report even if the product UL and DL simultaneous emission during operation.



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### 5.2 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZCR2411001398AT.

- End of the Report -

