

RF EXPOSURE EVALUATION REPORT

FCC ID : GKRRXLG1
Equipment : 5G LGA Module
Brand Name : Compal
Model Name : RXL-G1
Applicant : Compal Electronics, Inc.
No.581 & 581-1, Ruiguang Rd., Neihu District, Taipei, (114) Taiwan
Manufacturer : Compal Electronics, Inc.
No.581 & 581-1, Ruiguang Rd., Neihu District, Taipei, (114) Taiwan
Standard : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part2.1091 and it complies with applicable limit.

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.

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History of this test report

Report No.	Version	Description	Issued Date
FA2D2711-02	Rev. 01	Initial issue of report	Jun. 20, 2023



1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	5G LGA Module
Brand Name	Compal
Model Name	RXL-G1
FCC ID	GKRRXLG1
Wireless Technology and Frequency Range	5G NR n48 : 3550 MHz ~ 3700 MHz
Mode	5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM
HW Version	DVT-2
EUT Stage	Production Unit

Reviewed by: Jason Wang

Report Producer: Carlie Tsai

2. Maximum RF average output power among production units

Mode		Maximum Conducted power(dBm)
5G NR	n48	24.00

3. Determination of exemption

Per 1.1307(b)(3), (i) For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

- (A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);
- (B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

$$P_{th} \text{ (mW)} = ERP_{20cm} (d / 20)^x \text{ for distance } d \leq 20cm$$

$$P_{th} \text{ (mW)} = ERP_{20cm} \text{ for distance } 20cm < d \leq 40cm$$

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

$ERP_{20cm} \text{ (mW)}$	$0.3 \text{ GHz} \leq f < 1.5 \text{ GHz}:$	2040 f
	$1.5 \text{ GHz} \leq f \leq 6 \text{ GHz}:$	3060

- (C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP 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 (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2.$
1.34-30	$3,450 R^2/f^2.$
30-300	$3.83 R^2.$
300-1,500	$0.0128 R^2f.$
1,500-100,000	$19.2R^2.$



4. RF Exposure Evaluation

4.1. Standalone assessment

General Note:

- 1. Pi is mean the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm
- 2. Pth is mean the exemption threshold power (Pth) according to the § 1.1307(b)(3)(i)(B) formula for fixed, mobile, or portable RF source i.
- 3. In this report was used Part1.1307(b)(3)(i)(B) perform RF Exposure evaluation
- 4. The distance of 20cm is for this device

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum EIRP (mW)	Maximum ERP (mW)	Pi (dBm)	Pi (mW)	Maximum Output RF Power Limit (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) Pi/Pth
5G NR n48	-1.00	24.00	23.0	20.85	199.53	121.62	24.00	251.19	200	3060.000	0.082

4.2. Sim-Tx analysis

General Note:

- 1. This MPE analysis is applicable to any collocated transmitters with transmit power for WLAN is less than or equal to 26dBm and for Bluetooth is less than or equal to 15dBm.
- 2. A maximum antenna gain of 5 dBi for WLAN/BT has been assumed for all collocated antennas.

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum EIRP (mW)	Maximum ERP (mW)	Pi (dBm)	Pi (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) Pi/Pth
5G NR n48	-1.00	24.00	23.0	20.85	199.53	121.62	24.00	251.19	3060.000	0.082
WLAN2.4GHz Band	5.00	26.00	31.0	28.85	1258.93	767.36	28.85	767.36	3060.000	0.251
WLAN5GHz Band	5.00	26.00	31.0	28.85	1258.93	767.36	28.85	767.36	3060.000	0.251
Bluetooth	5.00	15.00	20.0	17.85	100.00	60.95	17.85	60.95	3060.000	0.020

WWAN P/Pth Ratio	WLAN P/Pth Ratio	Bluetooth P/Pth Ratio	Σ (P/Pth Ratio) of WWAN + WLAN + Bluetooth
0.082	0.251	0.020	0.353

Note:

- 1. According part1.1307b, the P/Pth Ratio is using for Sim-Tx analysis, above table was showing WWAN transmitting with WLAN and Bluetooth and the summation ratio is smaller than 1.

Conclusion:

Based on FCC 47 CFR §1.1307, the analysis concludes that this product when transmitting in standalone within a host device, is compliant with the FCC RF exposure requirements in mobile exposure condition, provided the conducted power and antenna gain do not exceed the limits for each given frequency band per wireless technology as follow table:

Device	Technology	Band	Maximum Conducted Power (dBm)	Standalone Allow Antenna Gain (dBi)	Collocated Allow Antenna Gain (dBi)
RXL-G1	5G NR	n48	24.00	-1.00	-1.00