

RF EXPOSURE EVALUATION REPORT

FCC ID : N7NEM75T
Equipment : Radio Module
Brand Name : Sierra Wireless
Model Name : EM7590
Applicant : Sierra Wireless, ULC
13811 Wireless Way, Richmond, BC V6V 3A4 Canada
Manufacturer : Sierra Wireless, ULC
13811 Wireless Way, Richmond, BC V6V 3A4 Canada
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: 3786) and the FCC designation No. TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.

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Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
FA4D1917	Rev. 01	Initial issue of report	Jan. 21, 2025

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Radio Module
Brand Name	Sierra Wireless
Model Name	EM7590
FCC ID	N7NEM75T
Wireless Technology and Frequency Range	LTE Band 106: 897.5 MHz ~ 900.5 MHz
Mode	LTE: QPSK, 16QAM, 64QAM
EUT Stage	Production Unit

Reviewed by: Jason Wang

Report Producer: Carlie Tsai

2. Maximum RF average output power among production units

Mode		Maximum Average power(dBm)
LTE	Band 106	24

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} (mW)	0.3 GHz ≤ f < 1.5 GHz:	2040 f
	1.5 GHz ≤ f ≤ 6 GHz:	3060

4. RF Exposure Evaluation

4.1. Standalone assessment

General Note:

1. P_i 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. P_{th} is mean the exemption threshold power (P_{th}) according to the § 1.1307(b)(3)(i)(B) formula for fixed, mobile, or portable RF source i .
3. The distance of 20cm is for this device.

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	P_i (dBm)	P_i (mW)	Maximum Output RF Power Limit (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) P_i/P_{th}
LTE Band 106	10.70	24.00	34.70	32.55	32.55	1798.87	3000	1830.900	0.983

4.2. Collocated assessment

General Note:

1. This MPE analysis is applicable to any collocated transmitters with transmit power for WLAN is less than or equal to 25dBm and for Bluetooth is less than or equal to 11 dBm.
2. A maximum antenna gain of 5 dBi for WLAN /BT has been assumed for all collocated antennas.
3. Either MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (*Evaluated_k* term) shall be used to determine exemption for simultaneous transmission according to Formula (C.1).
4. The sum of the ratios of the applicable terms for MPE-based and MPE shall be less than 1, to determine WWAN + WLAN + BT simultaneous transmission exposure compliance.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1 \quad (C.1)$$

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum EIRP (mW)	Maximum ERP (mW)	P_i (dBm)	P_i (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) P_i/P_{th}
LTE Band 106	9.70	24.00	33.70	31.55	2344.23	1428.89	31.55	1428.89	1830.900	0.780
WLAN2.4GHz Band	5.00	25.00	30.00	27.85	1000.00	609.54	27.85	609.54	3060.000	0.199
WLAN5GHz Band	5.00	25.00	30.00	27.85	1000.00	609.54	27.85	609.54	3060.000	0.199
WLAN6GHz Band	5.00	25.00	30.00	27.85	1000.00	609.54	27.85	609.54	3060.000	0.199
Bluetooth	5.00	11.00	16.00	13.85	39.81	24.27	13.85	24.27	3060.000	0.008

Maximum WWAN P_i/P_{th} Ratio	WLAN P_i/P_{th} Ratio	Bluetooth P_i/P_{th} Ratio	Σ (P_i/P_{th} Ratio) of WWAN + WLAN + Bluetooth
0.780	0.199	0.008	0.987

**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)
EM7590	LTE	LTE Band 106	24.00	10.70	9.70