



## Maximum Permissible Exposure (MPE) & Exposure evaluation

**Report identification number: 1-1204/16-01-15**

Certification numbers and labeling requirements	
FCC ID	ZKSQC250B included WLAN module: ZKSRS9110N1122
IC number	9849A-QC250B Included WLAN Module: 9849A-RS9110N1122
HVIN (Hardware Version Identification Number)	QC250 Rev. B
PMN (Product Marketing Name)	QC250
FVIN (Firmware Version Identification Number)	-/-
HMN (Host Marketing Name)	-/-

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

**Document authorized:**

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**EUT technologies:**

Technologies:	Max. conducted power:	Max. EIRP:	Min. pathloss:
ISM 902-928 MHz (Proprietary FHSS)	18 dBm	20 dBm	-- (if applicable)
WLAN 2.4 GHz	15 dBm	20 dBm	-- (if applicable)

**Prediction of MPE limit at given distance - FCC**

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

where: S = Power density  
 P = Power input to the antenna  
 G = Antenna gain  
 R = Distance to the center of radiation of the antenna

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled "Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure"

Frequency Range (MHz)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
300 -1500	f/1500	30
1500 - 100000	1.0	30

where f = Frequency (MHz)

**Prediction: worst case**

		< 1500 MHz	> 1500 MHz
	Technology	915 MHz ISM	2450 MHz WLAN
PG	Max EIRP	20 dBm	20 dBm
R	Distance	20 cm	20 cm
S	MPE limit for uncontrolled exposure	0.62 mW/cm <sup>2</sup>	1 mW/cm <sup>2</sup>
	<b>Calculated Power density:</b>	0.0198 mW/cm <sup>2</sup>	0.0198 mW/cm <sup>2</sup>
	<b>Percentage of limit:</b>	3.2%	3.2%
	<b>Percentage of limit: (Collocation)</b>	<b>6.4%</b>	

**This prediction demonstrates the following:**

The power density levels for FCC at a distance of 20 cm are below the maximum levels allowed by regulations.

**Prediction of MPE limit at given distance - IC**

RSS-102, Issue 5, 2.5.2

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $4.49/f^{0.5}W$  (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834} W$  (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

Prediction: worst case

	Technology	915 MHz ISM application	2450 MHz WLAN
P	Max power input to the antenna	18 dBm	15 dBm
PG	Maximum EIRP	20 dBm	20 dBm
PG	Maximum EIRP	100 mW	100 mW
	Exclusion limit from above	1.383 W	2710 W
	Percentage of limit:	7.2%	3.7%
	Percentage of limit: (Collocation)	<b>10.9%</b>	

**Conclusion:** RF exposure evaluation is not required.

For applications where minimum distance to radiating element is 20cm Annex C of RSS-102 should be filled out.