

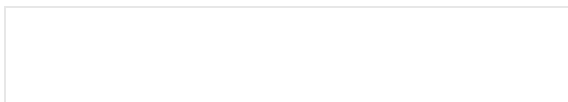
## Maximum Permissible Exposure (MPE) & Exposure evaluation

**Report identification number: 1-0397/20-02-17 MPE (FCC\_ISED)**

Certification numbers and labeling requirements	
FCC ID	MCQ-CCIMX8MN
ISED number	1846A-CCIMX8MN
HVIN (Hardware Version Identification Number)	CC8MN
PMN (Product Marketing Name)	ConnectCore 8M Nano
FVIN (Firmware Version Identification Number)	-/-
HMN (Host Marketing Name)	-/-

This 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 authorised:



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**EUT technologies:**

Technologies:	Max. measured power [dBm]		Antenna gain max.: [dBi] **	#
	conducted	EIRP		
BT 2450 MHz	10.2	14.8	4.6	1
BT LE 2450 MHz	2.0	6.6	4.6	2
WLAN 2450 MHz	20.7	25.3	4.6	3
WLAN 5 GHz	14.0	19.5	5.5	4

) \* worst case of all antenna types, channels and modulations (overrated)

Details and origins of the measurements shown in the table above:

#	Results from:		Additional information
1	1-0397/20-02-12	CTC advanced GmbH report	Antenna gain page 7, Max conducted page 26
2	1-0397/20-02-13	CTC advanced GmbH report	Antenna gain page 7, Max conducted page 27
3	1-0397/20-02-11	CTC advanced GmbH report	Antenna gain page 7, Max conducted page 24
4	1-0397/20-02-14	CTC advanced GmbH report	Antenna gain page 7, Max conducted page 26

### **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  
 PG = Output Power including antenna gain

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

Technologies:		BT	BT LE	WLAN	WLAN	
	Frequency (MHz)	2450	2450	2450	5180	
PG	max power (EIRP)	14.8	6.6	25.3	19.5	dBm
R	Distance	20	20	20	20	cm
S	MPE limit for uncontrolled exposure	1	1	1	1	mW/cm <sup>2</sup>
	<b>Calculated Power density:</b>	0.0060	0.0009	0.0674	0.0177	mW/cm <sup>2</sup>
	<b>Calculated percentage of Limit:</b>	0.60%	0.09%	6.74%	1.77%	

**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 - ISED

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  $4.49/f^{0.5} \text{ W}$  (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  $1.31 \times 10^{-2} f^{0.6834} \text{ W}$  (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

		BT	BT LE	WLAN	WLAN	
	Frequency	2450	2450	2450	5180	MHz
R	Distance	20	20	20	20	cm
PG	Maximum EIRP	14.8	6.6	25.3	19.5	dBm
PG	<b>Maximum EIRP</b>	30.2	4.6	338.8	89.1	mW
	<b>Exclusion Limit from above:</b>	2.71	2.71	2.71	4.53	W
	<b>Calculated percentage of Limit:</b>	1.11%	0.17%	12.49%	1.97%	

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