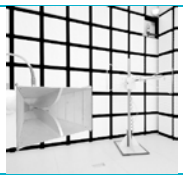
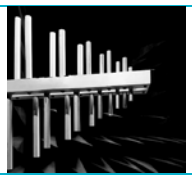
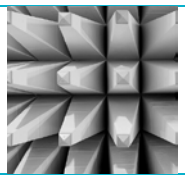

CTC advanced
member of RWTÜV group

Bundesnetzagentur

BNetzA-CAB-02/21-102

DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-03

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:

cn=Alexander Hnatovskiy, o=CTC advanced GmbH, ou=HNA-161129, email=Alexander.Hnatovskiy@ctcadvanced.com, c=DE
2021.03.16 17:19:35 +01'00'

Alexander Hnatovskiy
Lab Manager
Radio Communications & EMC

cn=Marco Scigliano, o=CTC advanced GmbH, ou=SCI-161125, email=marco.scigliano@ctcadvanced.com, c=DE
2021.03.17 09:27:44 +01'00'

Marco Scigliano
Testing Manager
Radio Communications & EMC

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^2)	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^2
	Calculated Power density:	0.0060	0.0009	0.0674	0.0177	mW/cm^2
	Calculated percentage of Limit:	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 $4.49/f^{0.5}$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

		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	**Maximum EIRP**	30.2	4.6	338.8	89.1	mW
	Exclusion Limit from above:	2.71	2.71	2.71	4.53	W
	Calculated percentage of Limit:	1.11%	0.17%	12.49%	1.97%	

Conclusion: RF exposure evaluation is not required.