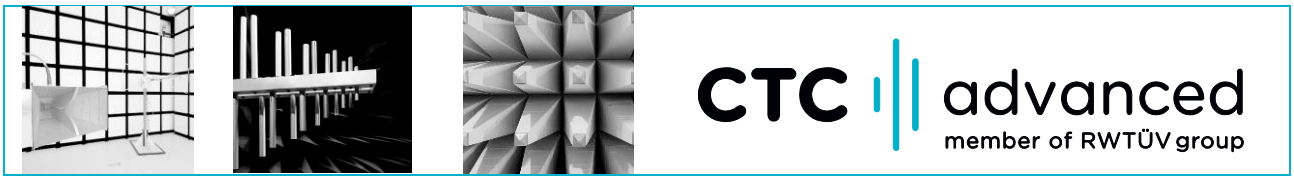

Bundesnetzagentur

BNetzA-CAB-02/21-102

Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-0437/20-01-08-A MPE (FCC_ISED)

Certification numbers and labeling requirements	
FCC ID	2AYYK-2640M2
ISED number	26994-2640M2
HVIN (Hardware Version Identification Number)	KE2640MODA2
PMN (Product Marketing Name)	IO-Link Wireless Master Module
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.

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EUT technologies:

Technologies:	Max. power [dBm]		Antenna gain max.: [dBi] *	#
	conducted	EIRP		
DTS 2450 MHz	decl.10.0 meas. 8.6	decl. 14.9 meas. 13.5	4.9	A

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

#	Results from:	Additional information
A	1-0437/20-01-04 CTC Advanced GmbH	Antenna gain page 19, Max conducted page 26

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

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

	Technology	DTS	
	Frequency	2450	MHz
P	Declared max power input to the antenna	10	dBm
R	Distance	20	cm
G	Antenna gain	4.9	dBi
S	MPE limit for uncontrolled exposure	1.0000	mW/cm^2
	Calculated Power density:	0.0062	mW/cm^2
	Calculated percentage of limit:	0.62%	

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

		DTS	
	Frequency	2450	MHz
R	Distance	20	cm
P	Max power input to the antenna	10	dBm
G	Antenna gain	4.9	dBi
PG	Maximum EIRP	14.9	dBm
PG	**Maximum EIRP**	30.9	mW
	Exclusion Limit from above:	2.71	W
	Calculated percentage of Limit:	1.14%	

Conclusion: RF exposure evaluation is not required.