
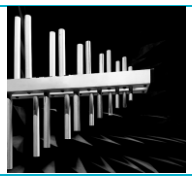
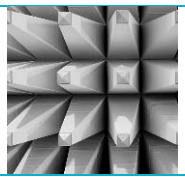

CTC advanced
member of RWTÜV group

Bundesnetzagentur

BNetzA-CAB-02/21-102

Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-0981/20-01-08 MPE (FCC_ISED)

Certification numbers and labeling requirements	
FCC ID	2AC3T-B36T40HDRA
ISED number	12323A-B36T40HDRA
HVIN (Hardware Version Identification Number)	ADC-T40-HD
PMN (Product Marketing Name)	Display
FVIN (Firmware Version Identification Number)	-/-
HMN (Host Marketing Name)	-/-

This test report is electronically signed and valid without handwritten 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]	Declared by customer	#
	conducted	EIRP			
BT LE 2450 MHz	meas. -1.6 (peak)	meas. -6.2 (peak)	-5.6	< 0 dBm (avg)	A
WLAN 2450 MHz	meas. 17.4 (peak)	meas. 14.3 (peak)	-2.3	< 18 dBm (peak)	B
ZWave / ZWave LR 902 to 928 MHz	meas. 11.3 (peak)	--	< 0	11.3 dBm (peak)	C
24 GHZ Radar	--	meas. -5.81 (peak)	--	< 0 dBm (peak)	D

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

#	Results from:		Additional information:
A	1-0981/20-01-02	CTC Advanced GmbH	Antenna gain page 21, Max conducted page 21
B	1-0981/20-01-03	CTC Advanced GmbH	Antenna gain page 22, Max conducted page 22
C	1-0981/20-01-04 1-0981/20-01-10	CTC Advanced GmbH	**ZWave:** Max field strength (page 20) 92.3 dBµV/m @3m -> -2.93 dBm EIRP **ZWave LR:** Max Conducted Output power (peak) (page 20)
D	1-0981/20-01-05	CTC Advanced GmbH	Max field strength (page 23) 89.42 dBµV/m @3m -> -5.81 dBm EIRP

Collocation overview:

Active scenario: / **Technology**	**1** (WC)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BT LE	**x**	x	x	x	x	x	x	x								
WLAN	**x**	x	x	x					x	x	x	x				
ZWave / ZWave LR	**x**	x			x	x			x	x			x	x		
RADAR	**x**		x		x		x		x		x		x		x	

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/cm²)	Averaging Time (minutes)
300 -1500	f/1500	30
1500 - 100000	1.0	30

where f = Frequency (MHz)

Prediction: worst case

	Technologies:	Zwave LR	BT LE	WLAN	RADAR	
	Frequency (MHz)	900	2450	2450	24000	
PG	Declared max power (EIRP)	11.3	0	18	0	dBm
R	Distance	20	20	20	20	cm
S	MPE limit for uncontrolled exposure	0.6	1	1	1	mW/cm²
	Calculated Power density:	0.0027	0.0002	0.0126	0.0002	mW/cm²
	Calculated percentage of Limit:	0.45%	0.02%	1.26%	0.02%	
	Collocation:					
	Scenario 1: ALL ACTVIVE BT LE + WLAN + Zwave + RADAR Calculated percentage of Limit:	1.74%				

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 LE	WLAN	ZWave LR	Radar	
	Frequency	2450	2450	900	24000	MHz
R	Distance	20	20	20	20	cm
PG	Maximum EIRP	0	18	11.3	0	dBm
PG	**Maximum EIRP**	1.0	63.1	13.5	1.0	mW
	Exclusion Limit from above:	2.71	2.71	1.37	5.00	W
	Calculated percentage of Limit:	0.04%	2.33%	0.99%	0.02%	
	Collocation:					
	Scenario 1: ALL ACTIVE BT LE + WLAN + Zwave + RADAR Calculated percentage of Limit:	3.37%				

Conclusion: RF exposure evaluation is not required.