
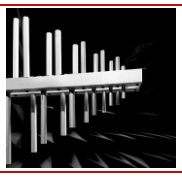
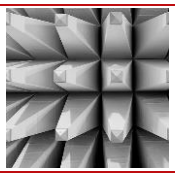

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Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-0001/15-01-26

Certification numbers and labeling requirements	
FCC ID	DWOTCWM
IC number	2099A-TCWM
HVIN (Hardware Version Identification Number)	TC-W Master
PMN (Product Marketing Name)	TC-W Master
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.

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EUT technologies:

Technologies:	Max. power: (Average conducted incl. Tune up)	Max. gain: (measured)	Min. pathloss:
DECT UPCS	20 dBm	2.5 dBi	N/A
Bluetooth Classic	5.62 dBm	0 dBi	N/A

Note 1: For DECT: full slot allocation assumed
Note 2: For Bluetooth:
Declared peak output power: 7 dBm
Tune-up tolerance: +/-2 dBm
Duty cycle correction factor for Basic rate: 3.38 dB
Max. power average conducted: 7 dBm+2 dBm – 3.38 dBm

Prediction of MPE limit at given distance - FCC

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

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

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^2)	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	DECT UPCS	Bluetooth Classic
P	Max power input to the antenna [dBm]	20 dBm	5.62 dBm
R	Distance [cm]	20 cm	20 cm
	Antenna gain [dBi]	2.5 dBi	0 dBi
G	Antenna gain factor (= 10^(antenna gain[dBi]/10))	1.78	1
S	MPE limit for uncontrolled exposure	1 mW/cm^2	1 mW/cm^2
	Calculated Power density:	**0.0358 mW/cm^2**	**0.00073 mW/cm^2**
	Percent of MPE limit	**3.58 %**	**0.073 %**
	Co-location	**0.0365 mW/cm^2**	
	Percent of MPE limit at Co-location	**3.65 %**	

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

f =2480 MHz (worst case assumed)

	Technology	DECT UPCS @ 1930 MHz	Bluetooth Classic @ 2480 MHz
P	Max power input to the antenna	20 dBm	5.62 dBm
G	Antenna gain	2.5 dBi	0 dBi
S	MPE limit for uncontrolled exposure	2.30 W	2.74 W
	Calculated output power:	**177.8 mW**	**3.65 mW**
	Percent of MPE limit	**7.71%**	**0.13%**

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