
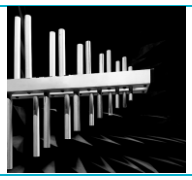
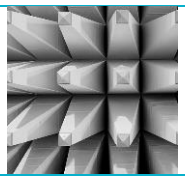

CTC advanced
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BNetzA-CAB-02/21-102

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

Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-7616/18-01-05 MPE (FCC_IC)

Certification numbers and labeling requirements	
FCC ID	2AR86GW11
IC number	24716-GW11
HVIN (Hardware Version Identification Number)	1111
PMN (Product Marketing Name)	Treon Gateway
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 EIRP: (AVG)	Max. antenna gain:
LTE 2	27.3	1.2
LTE 4	26.0	1.1
LTE 5	20.6	-5.4
WLAN 2.4 GHz	18.7	2.3
Wirepass	2.2	-1.6

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:	LTE 2	LTE 4	LTE 5	WLAN	Wirepass	
	Frequency (MHz)	1880	1710.7	836.5	2442	2480	
PG	Measured max power (EIRP)	27.3	26	20.6	18.7	2.2	dBm
R	Distance	20	20	20	20	20	cm
S	MPE limit for uncontrolled exposure	1	1	0.55767	1	1	mW/cm^2
	Calculated Power density:	0.1069	0.0792	0.0229	0.0148	0.0003	mW/cm^2
	Calculated percentage of Limit:	10.69%	7.92%	4.10%	1.48%	0.03%	
	Collocation:						
	Scenario 1: LTE 2 + WLAN + Wirepass Calculated percentage of Limit:	12.20%					
	Scenario 2: LTE 4 + WLAN + Wirepass Calculated percentage of Limit:	9.43%					
	Scenario 3: LTE 5 + WLAN + Wirepass Calculated percentage of Limit:	5.61%					

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

		LTE 2	LTE 4	LTE5	WLAN	Wirepass	
	Frequency	1880	1710.7	836.5	2442	2480	MHz
R	Distance	20	20	20	20	20	cm
PG	Maximum EIRP	27.3	26	20.6	18.7	2.2	dBm
PG	**Maximum EIRP**	537.0	398.1	114.8	74.1	1.7	mW
	Exclusion Limit from above:	2.26	2.12	1.30	2.71	2.74	W
	Calculated percentage of Limit:	23.72%	18.76%	8.82%	2.74%	0.06%	
	Collocation:						
	Scenario 1: LTE 2 + WLAN + Wirepass Calculated percentage of Limit:	26.52%					
	Scenario 2: LTE 4 + WLAN + Wirepass Calculated percentage of Limit:	21.56%					
	Scenario 3: LTE 5 + WLAN + Wirepass Calculated percentage of Limit:	11.62%					

Conclusion: RF exposure evaluation is not required.
For applications where minimum distance to radiating element is 20cm Annex C of RSS-102 should be filled out.