

Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-6855-23-01-04_TR1-R01 MPE (FCC_ISED)

Certification numbers and labeling requirements	
ISED number	31624-RUIVS179
FCC ID	2BDLJ-RU-IVS179
HVIN (Hardware Version Identification Number)	RUIVS179
PMN (Product Marketing Name)	RUIVS179
FVIN (Firmware Version Identification Number)	-/-
HMN (Host Marketing Name)	-/-

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EUT technologies:

Technologies:	Max. power [dBm]		Antenna gain max.: [dBi]	#
	conducted	EIRP		
24 GHz Radar Unit	--	meas. 23.98 dBm (avg)	--	A

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

#	Results from:	Additional information
A	TR23-1-0144201T002a cetecom advanced GmbH	Measurement results page 14 119.21 dBµV/3m = 23.98 dBm

Minimum safety distance declared by manufacturer: 20cm

Prediction of MPE limit at given distance - FCC

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

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 (EIRP)

The table below is excerpted from Table 1 - Limits for Maximum Permissible Exposure (MPE) - "General Population/Uncontrolled Exposure" according 47 CFR 1.1310 (e) (1).

Frequency Range (MHz)	Power Density (mW/cm ²)	Averaging Time (minutes)
1500 – 3 000 000 ¹⁾	1.0	30

where f = Frequency (MHz)

¹⁾ Extended according FCC 19-126

Prediction: worst case

	Technology	RADAR	
	Frequency	24075	MHz
P·G	Meas. EIRP	23.98	dBm
R	Distance	20	cm
S	MPE limit for uncontrolled exposure	1.0	mW/cm ²
	Calculated Power density:	0.0498	mW/cm ²
	Calculated percentage of limit:	4.98%	

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 6, chapter 6 Reference levels for general public (uncontrolled environment):

According to: RSS 102-ISSUE 06				
Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
10-20	27.46	0.0728	2	6
20-48	$58.07 / f^{0.25}$	$0.1540 / f^{0.25}$	$8.944 / f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.3417}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000 / f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000 / f^{1.2}$
Note: f is frequency in MHz.				

Prediction: worst case

	Technology	RADAR	
	Frequency	24075	MHz
P·G	Meas. EIRP	23.98	dBm
R	Distance	20	cm
S	MPE limit for uncontrolled exposure	1.60	W/m ²
	Calculated Power density:	0.498	W/m ²
	Calculated percentage of limit:	31.11%	

Conclusion: RF exposure evaluation is not required.