

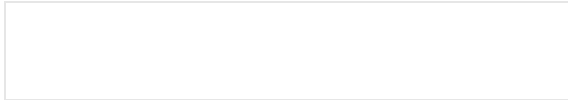
## Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-5965-23-03-05\_TR1-R01 MPE (FCC\_ISED)

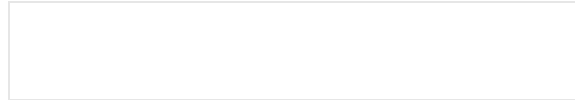
Certification numbers and labeling requirements	
FCC ID	PGP-RR30-01
ISED number	24812-RR30V01
HVIN (Hardware Version Identification Number)	11221333-2 11230003-2 11221334-2 11240769-2 11256805-2 11708433-2 11729773-2 11221321-2 11221322-2 11221309-2 11221320-2 11234882-2 11234883-2 11220108-2 11721820-2 11230002-2 11220160-2 11220109-2
PMN (Product Marketing Name)	RR30.DAJ2-11221333 RR30.DAJ2-11230003 RR30.DAJ2-11221334 RR30.DAJ2-11240769 RR30.DAJ2-11256805 RR30.DAJ2-11708433 RR30.DAJ5-11729773 RR30.DAO0-11221321 RR30.DAO0-11221322 RR30.DAJ2-11221309 RR30.DAO0-11221320 RR30.RAK0-11234882 RR30.RAQ0-11234883 RR30.DAF0-11220108 RR30.DAF0-11721820 RR30.DAF0-11230002 RR30.DAF0-11220160 RR30.DAF0-11220109
FVIN (Firmware Version Identification Number)	FW_RR30AIOF_S FW_RR30AIRF_S

	FW_RR30AIPF_S
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.

**Document authorised:**

Alexander Hnatovskiy  
Lab Manager  
Radio Labs



Eric Tuettmann  
Testing Manager  
Radio Labs

**EUT technologies:**

Technologies:	Max. power [dBm]		Antenna gain max.: [dBi]	#
	conducted	EIRP		
FMCW RADAR 122 – 123 GHz	--	meas. 18.52 (avg)	--	A

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

#	Results from:	Additional information
A	1-5965_23-03-02 1-5965_23-03-03 1-5965_23-03-07_TR1-R02 1-5965_23-03-08_TR1-R02 cetecom advanced GmbH	Measurement results page 28 Maximum taken from FCC and ISED reports for both lenses

**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 <sup>2</sup> )	Averaging Time (minutes)
1500 – 3 000 000 <sup>1)</sup>	1.0	30

where f = Frequency (MHz)

<sup>1)</sup> Extended according FCC 19-126

**Prediction: worst case**

	Technology	FMCW RADAR	
	Frequency	122500	MHz
P·G	Meas. EIRP	18.52	dBm
R	Distance	20	cm
S	MPE limit for uncontrolled exposure	1.0	mW/cm <sup>2</sup>
	<b>Calculated Power density:</b>	0.0142	mW/cm <sup>2</sup>
	<b>Calculated percentage of limit:</b>	1.42%	

**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 <sup>2</sup> )	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	$616000 / f^{1.2}$
<b>150000-300000</b>	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	<b><math>6.67 \times 10^{-5} f</math></b>	$616000 / f^{1.2}$
<b>Note:</b> f is frequency in MHz.				

**Prediction: worst case**

	Technology	FMCW RADAR	
	Frequency	122500	MHz
P·G	Meas. EIRP	18.52	dBm
R	Distance	20	cm
S	MPE limit for uncontrolled exposure	8.17	W/m <sup>2</sup>
	<b>Calculated Power density:</b>	0.142	W/m <sup>2</sup>
	<b>Calculated percentage of limit:</b>	1.73%	

**Conclusion:** RF exposure evaluation is not required.