



## Maximum Permissible Exposure (MPE) & Exposure evaluation

**Report identification number: 1-8617/19-01-04-B MPE (FCC\_ISED)**

Certification numbers and labeling requirements	
FCC ID	2AQ6KA1001
ISED number	24388-A111
HVIN (Hardware Version Identification Number)	A111
PMN (Product Marketing Name)	A111
FVIN (Firmware Version Identification Number)	2.0.0
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.

### Document authorised:



Alexander Hnatovskiy  
Lab Manager  
Radio Communications & EMC



Marco Scigliano  
Testing Manager  
Radio Communications & EMC

### Document History:

Version	Applied Changes	Date of Release
	Initial Release	2019-10-11
-A	<b>Editorial changes:</b> Removed collocation on page 2 and 3. Restructured EUT table on page 2. Added FVIN on page1.	2019-09-21
-B	Added tune up information, changed calculation from peak to AVG values.	2019-11-05

**EUT technologies:**

Technologies:	Max. EIRP:		Frequency range
60 GHz SRD	Declared: -2.1 dBm	Measured AVG: -4.13 dBm	57GHz to 64 GHz (RSS)
		Measured AVG: -4.10 dBm	57 GHz to 71 GHz (FCC)

NOTE: Measurements taken from CTC Advanced report 1-8617/19-01-03

**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 <sup>2</sup> )	Averaging Time (minutes)
300 -1500	f/1500	30
1500 - 100000	1.0	30

where f = Frequency (MHz)

**Prediction: worst case**

Technologies:		FCC		
	Frequency (MHz)	57000	71000	
PG	Declared max power (EIRP)	-2.1	-2.1	dBm
R	Distance	20	20	cm
S	MPE limit for uncontrolled exposure	1	1	mW/cm <sup>2</sup>
	<b>Calculated Power density:</b>	0.0001	0.0001	mW/cm <sup>2</sup>
	<b>Calculated percentage of Limit:</b>	0.01%	0.01%	

**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  $4.49/f^{0.5} \text{ W}$  (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  $1.31 \times 10^{-2} f^{0.6834} \text{ W}$  (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

		RSS		
	Frequency	57000	64000	MHz
R	Distance	20	20	cm
PG	Maximum EIRP	-2.1	-2.1	dBm
PG	Maximum EIRP	0.6	0.6	mW
	Exclusion Limit from above:	5.00	5.00	W
	Calculated percentage of Limit:	0.01%	0.01%	

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