

Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-0512/20-01-07 MPE (FCC_ISED)

Certification numbers and labeling requirements	
FCC ID	K6KSMALLSATCOM
ISED number	1275B-SMALLSATCOM
HVIN (Hardware Version Identification Number)	SMALLSATCOM
PMN (Product Marketing Name)	SMALLSATCOM
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. measured power conducted:	Max. antenna gain:	Max. measured EIRP
Satellite-Terminal* 1626.5 to 1660.5 MHz	38.8 dBm	1.37 dBi	40.6 dBm

)* for detailed test results see CTC advanced test report 1-0512/20-01-05 (page16)

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:	Satellite		
Frequency (MHz)	1626.5	1660.0	
PG Declared max power (EIRP)	40.6	40.6	dBm
R Distance	107	107	cm
S MPE limit for uncontrolled exposure	1	1	mW/cm ²
Calculated Power density:	0.0798	0.0798	mW/cm ²
Calculated percentage of Limit:	7.98%	7.98%	

This prediction demonstrates the following:

The power density levels for FCC at a distance of 107 cm are below the maximum levels allowed by regulations.

Prediction of MPE limit at given distance - ISED

RSS-102, general limitations for E- and H- Field

Reference levels for general public (uncontrolled environment) exposure to time-varying electric and magnetic fields

According to: RSS 102-ISSUE 05		
Frequency Range (MHz)	Power density (W/m ²)	Reference Period (minutes)
0.003-10	--	Instantaneous*
0.1-10	--	6**
1.1-10	--	6**
10-20	2	6
20-48	$8.944 / f^{0.5}$	6
48-300	1.291	6
300-6000	$0.02619 \times f^{0.6834}$	6
6000-15000	10	6
15000-150000	10	$616000 / f^{1.2}$
150000-300000	$6.67 \times 10^{-5} \times f$	$616000 / f^{1.2}$
<p>Note: f is frequency in MHz. * Based on nerve stimulation (NS). ** Based on specific absorption rate (SAR).</p>		

NOTE:

The resulting Limit for 1626.5MHz is 4.10W/m²

The resulting Limit for 1660.0MHz is 4.16W/m²

Prediction: worst case

		Satellite		
	Frequency	1626.5	1660.0	MHz
R	Distance	107	107	cm
PG	Maximum EIRP	40.6	40.6	dBm
PG	Maximum EIRP	11481.5	11481.5	mW
S	Power density	0.8	0.79804	W/m ²
	Exclusion Limit from above:	4.10	4.16	W/m ²
	Calculated percentage of Limit:	19.46%	19.18%	