

Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-3566/21-01-04-A MPE (FCC)


Manufacturer:	hiSky SCS Ltd
Product:	Dynamic Terminal Ka 8X8 V2
Kind of test item:	Dynamic Smartellite Terminal Ka 8x8 V2

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.

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Document History:

Version	Applied Changes	Date of Release
	Initial Release	2022-10-11
-A	Corrected WLAN and BT power according module data sheet.	2023-05-15

EUT technologies:

Technologies:	Max. power		Antenna gain max.: [dBi] *	Max average EIRP Declared by customer	#
	conducted	EIRP			
Ka-Band 27.5 to 30.0 GHz	--	28.360 GHz: 48.3 dBm 29.250 GHz: 48.35 dBm 29.990 GHz: 48.2 dBm (peak values)	--	33.12 dBm (=2.05 W)	A
WLAN 2450 MHz	--	--	--	19.0 dBm (=79.4 mW)	B
BT EDR / LE	--	--	--	14.0 dBm (= 25.1 mW)	B

) * worst case of all antenna types, channels and modulations (overrated)

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

#	Results from:	Additional information
A	1-3566/21-01-02-A CTC advanced GmbH	Max PEAK-EIRP page 19 Duty Cycle correction of 3.37% (See Annex A of this document)
B	Module Datasheet: Wi-fi Module -MURE_S_A0006159321_1-2559946	

Collocation overview:

Technology	Active scenario:			
	1	2	3	4
Ka-Band	x		x	
WLAN 2450 MHz	x	x		
BT EDR/LE 2450 MHz	x			x

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

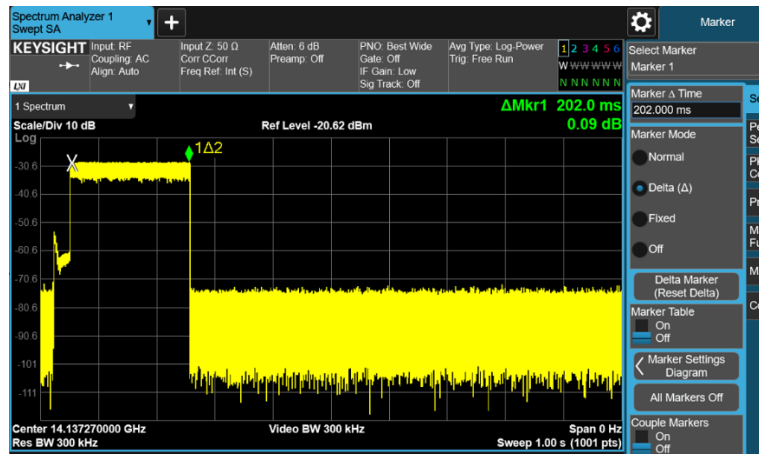
where f = Frequency (MHz)

Prediction: worst case

Technologies:		WLAN	BT EDR	Ka-Band	
	Frequency (MHz)	2450	2450	29250	
PG	Declared max power (EIRP)	19	14	33.1	dBm
R	Distance	20	20	20	cm
S	MPE limit for uncontrolled exposure	1	1	1	mW/cm ²
	Calculated Power density:	0.0158	0.0050	0.4064	mW/cm ²
	Calculated percentage of Limit:	1.58%	0.50%	40.64%	
Collocation:					
	Scenario 4: ALL ACTIVE	Calculated	42.72%		
	percentage of Limit:				

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.

Annex A: Duty cycle of the EUT (Ka-Band):

Duty Cycle 3.37%

Plot data:

Transmission Period: 6s

Pulse Duration: 202 ms

Number of pulses in 360 Seconds = 60

Total Transmission time in 360 Seconds: $60 \cdot 202\text{ms} = 12.12\text{s}$