

**Manufacturer:** Satel OY, MERINIITYNKATU 17, SALO, FI-24101  
**Model / HVIN:** SATEL-TR489  
**FCC ID:** MRBSATEL-TA43  
**ISED ID:** 2422A-SATELTA43

**Test Laboratory:** SGS Fimko Oy  
**Address:** Karakaarenkuja 4, FI-02610 Espoo, FINLAND  
**Accreditation Body:** FINAS  
**CAB Identifier:** T004  
**ISED Company Number:** 8708A

## REFERENCE DOCUMENTS

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KDB447498 D01 General RF Exposure Guidance v06, 23 October 2015  
FCC CFR 47 §1.1310, Radio frequency exposure limits  
FCC CFR 47 §2.1091, Radio frequency exposure evaluation: mobile devices  
RSS-102 Issue 5, 2015

## EUT SPECIFICATION

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RF module, 902.0 – 928.0 MHz, 1W  
Using the maximum power (including tune-up tolerances), the power density was calculated. Maximum antenna gain was assumed (6 dBi).

## RF EXPOSURE RESULT

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### FCC

Test Description	Standard	Compliance distance
RF Exposure (General Public)	FCC CFR 47 §1.1310	=> 0.23 m when 6 dBi antenna used

### ISED

Test Description	Standard	Compliance distance
RF Exposure (General Public)	RSS-102	=> 0.34m when 6 dBi antenna used

## RF EXPOSURE ASSESSMENT

### FCC: Exposure Limits for Uncontrolled / Controlled Environment

Frequency Range /MHz	RF power density, occupational/controlled [mW/cm <sup>2</sup> ]	RF power density, general population/uncontrolled [mW/cm <sup>2</sup> ]
300 – 1500 MHz	f/300	f/1500

f = frequency in MHz

### ISED: Exposure Limits for Uncontrolled Environment

**Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)**

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m <sup>2</sup> )	Reference Period (minutes)
0.003-10 <sup>21</sup>	83	90	-	Instantaneous*
0.1-10	-	0.73/ f	-	6**
1.1-10	87/ f <sup>0.5</sup>	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ f <sup>0.25</sup>	0.1540/ f <sup>0.25</sup>	8.944/ f <sup>0.5</sup>	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 f <sup>0.3417</sup>	0.008335 f <sup>0.3417</sup>	0.02619 f <sup>0.6834</sup>	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ f <sup>1.2</sup>
150000-300000	0.158 f <sup>0.5</sup>	4.21 x 10 <sup>-4</sup> f <sup>0.5</sup>	6.67 x 10 <sup>-5</sup> f	616000/f <sup>1.2</sup>

Note: f is frequency in MHz.

\* Based on nerve stimulation (NS).

\*\* Based on specific absorption rate (SAR).

### ISED: Exposure Limits for Controlled Environment

**Table 6: RF Field Strength Limits for Controlled Use Devices (Controlled Environment)**

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m <sup>2</sup> )	Reference Period (minutes)
0.003-10 <sup>22</sup>	170	180	-	Instantaneous*
0.1-10	-	1.6/ f	-	6**
1.29-10	193/ f <sup>0.5</sup>	-	-	6**
10-20	61.4	0.163	10	6
20-48	129.8/ f <sup>0.25</sup>	0.3444/ f <sup>0.25</sup>	44.72/ f <sup>0.5</sup>	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 f <sup>0.25</sup>	0.04138 f <sup>0.25</sup>	0.6455f <sup>0.5</sup>	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/f <sup>1.2</sup>
150000-300000	0.354 f <sup>0.5</sup>	9.40 x 10 <sup>-4</sup> f <sup>0.5</sup>	3.33 x 10 <sup>-4</sup> f	616000/f <sup>1.2</sup>

Note: f is frequency in MHz.

\* Based on nerve stimulation (NS).

\*\* Based on specific absorption rate (SAR).

**Single transmission RF Exposure Levels (mW/cm<sup>2</sup>)**

FCC

Lowest frequency (902 MHz)

EUT		Antenna		General Public		Controlled Environment	
Freq.	Power	Gain	G	Level	Safe D	Level	Safe D
MHz	W	dBi	G	mW/cm <sup>2</sup>	cm	mW/cm <sup>2</sup>	cm
902	1.0	0	1.0	0.60	11.519	3.0	5.152
		4	2.5		18.214		8.145
		6	4.0		23.039		10.303

Highest frequency (928 MHz)

EUT		Antenna		General Public		Controlled Environment	
Freq.	Power	Gain	G	Level	Safe D	Level	Safe D
MHz	W	dBi	G	mW/cm <sup>2</sup>	cm	mW/cm <sup>2</sup>	cm
928	1.0	0	1.0	0.62	11.332	3.1	5.068
		4	2.5		17.918		8.013
		6	4.0		22.664		10.136

**Single transmission RF Exposure Levels (W/m<sup>2</sup>)**

ISED

Lowest frequency (902 MHz)

EUT		Antenna		General Public		Controlled Environment	
Freq.	Power	Gain		Level	Safe D	Level	Safe D
MHz	W	dBi	G	W/m <sup>2</sup>	m	W/m <sup>2</sup>	m
902	1.0	0	1.0	2.74	0.170	19.39	0.064
		4	2.5		0.270		0.101
		6	4.0		0.341		0.128

Highest frequency (928 MHz)

EUT		Antenna		General Public		Controlled Environment	
Freq.	Power	Gain		Level	Safe D	Level	Safe D
MHz	W	dBi	G	W/m <sup>2</sup>	m	W/m <sup>2</sup>	m
928	1.0	0	1.0	2.79	0.169	19.66	0.064
		4	2.5		0.267		0.101
		6	4.0		0.338		0.127

Report Issue Date: March 4, 2022



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