

RF Exposure Calculation

Applicant: FALCOM GmbH

FCC ID: QIXPHD1000

The internal / external antennas used for this mobile transmitter must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

A safety statement concerning minimum separation distances from enclosure of the **PHD1000** will be integrated in the user's manual to provide end-users with transmitter operating conditions for satisfying RF exposure compliance.

The appropriate Max conducted power can be drawn from the test report no. G0M20506-9586-P-2224.

For transmitter operating in the 824-849 MHz range, paragraph 1.1310 Table 1 limits maximum permissible exposure (MPE) to 0.549 mW/cm² for uncontrolled environments and 2.75 mW/cm² for controlled environments.

For transmitter operating in the 1850-1910 MHz range, paragraph 1.1310 Table 1 limits maximum permissible exposure (MPE) to 1 mW/cm² for uncontrolled environments and 5 mW/cm² for controlled environments.

The far field on-axis power flux density (W/m²) is calculated using the following formula:

S = Power density (mW/cm²)

ERP = effective radiated power (mW)

EIRP = isotropically radiated power (mW)

r = Distance in cm

$$S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2} = \frac{1.64 ERP}{4\pi R^2} = \frac{0.41 ERP}{\pi R^2}$$

Calculations

name			nature value	log value	
max conducted power			1472,31 mW	31,68 dBm	
max Antenna gain dBi			2,00	3,00 dBi	
max Antenna gain dBd			1,22	0,85 dBd	
calculated radiated power		EIRP	2937,65 mW	34,68 dBm	
		ERP	1791,25 mW	32,53 dBm	
radiated (EIRP) and conducted outputs to the threshold values, using source-based time-averaged power					
frequency 824 MHz					
dwell time			12 ms		
Time of occupancy/puls-train time			100 ms		
duty cycle factor	10log(dwell time/100 ms)		12,00%	-9,21 dB	
max source-based time-averaged power					
source-based time-averaged power conducted			176,68 mW	22,47 dB	
calculated source-based time-averaged power EIRP		EIRP	352,52 mW	25,47 dB	
measured source-based time-averaged power EIRP		EIRP	mW	dB	
$S = \frac{PG}{4\pi R^2}$		r in cm	20	2,5	1,5
	calculated	S in mW/cm ²	0,070	2,45	13,40
	Limit general population	in mW/cm ²	0,549	for f = 824 MHz	
	Limit occupational population	in mW/cm ²	2,75		

ETS

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name			nature value	log value	
max conducted power			770,90 mW	28,87 dBm	
max Antenna gain dBi			2,00	3,00 dBi	
max Antenna gain dBd			1,22	0,85 dBd	
calculated radiated power		EIRP	1538,15 mW	31,87 dBm	
		ERP	937,90 mW	29,72 dBm	
radiated (EIRP) and conducted outputs to the threshold values, using source-based time-averaged power					
frequency 1850 MHz					
dwell time			12 ms		
Time of occupancy/puls-train time			100 ms		
duty cycle facto	10log(dwell time/100 ms)		12,00%	-9,21 dB	
max source-based time-averaged power					
source-based time-averaged power conducted			92,51 mW	19,66 dB	
calculated source-based time-averaged power EIRP		EIRP	184,58 mW	22,66 dB	
measured source-based time-averaged power EIRP		EIRP	mW	dB	
$S = \frac{PG}{4\pi R^2}$		r in cm	20	2,5	1,5
	calculated	S in mW/cm²	0,037	2,50	0,037
	Limit general population	in mW/cm²	1,000		
	Limit occupational population	in mW/cm²	5,00	for f = 1850 MHz	