

RF EXPOSURE ANALYSIS

EQUIPMENT

Type of equipment: Data Collection Unit
 Brand name: SCA
 Type / Model: DCU / 682920
 Manufacturer: SCA Hygiene products AB By
 request of: SCA Hygiene products AB

Operating frequency: 2405 MHz; Output Power: 2 dBm.
 Contains certified Cell / PCS Module FCC ID: QIPEHS6; IC: 7830A

REQUIREMENT

CFR 47 §1.1310

CALCULATIONS

2,4 GHz radio's Highest output power to antenna is 2 dBm
 With +1.6 dBi antenna gain EIRP is 3.6 dBm or 2.3 mW

850 MHz cellular radio's highest output power to antenna is 1.119 W (with DC=50%)
 With +1 dBi antenna gain EIRP is 1.41 W
 1900 MHz cellular radio's radio's highest output power to antenna is 0.561 W (with DC=50%)
 With +2.0 dBi antenna gain EIRP is 0.886 W

A test separation distance of 20 cm is used.

A worst case Power Density is calculated according to formula:

$$S = \frac{EIRP}{4 \times \pi \times r^2}$$

Maximum power densities are at the distance of 20 cm:

$$S = 0.0023 / (4 \times \pi \times 0,2^2) = 0.0046 \text{ W/m}^2 = 0.00046 \text{ mW/cm}^2 \text{ at 2405 MHz}$$

$$S = 1.41 / (4 \times \pi \times 0,2^2) = 2.81 \text{ W/m}^2 = 0.281 \text{ mW/cm}^2 \text{ at 850 MHz}$$

$$S = 0.89 / (4 \times \pi \times 0,2^2) = 1.77 \text{ W/m}^2 = 0.177 \text{ mW/cm}^2 \text{ at 1900 MHz}$$

LIMITS & EVALUATIONS:

Standard	Limit (MPE), mW/cm ²	Power Density, S mW/cm ²	Result
CRF 47 §1.1310	1	0.0005 at 2405 MHz	PASS
CRF 47 §1.1310	850/1500 = 0.567	0.281 at 850 MHz	PASS
CRF 47 §1.1310	1	0.177 at 1900 MHz	PASS

Simultaneous transmission

KDB 447498 D01 section 7.2: Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

GSM 850 and 2.4 GHz transmitter transmitting simultaneously
 $0.281/0.567 + 0.0005/1 = 0.5$

GSM 1900 and 2.4 GHz transmitter transmitting simultaneously
 $0.177/1 + 0.0005/1 = 0.18$

Result

The EUT meets the RF Exposure requirements for distance of 20 cm.