

SMU4 EUT RF Exposure:-

The SMU4 is intended as a mobile device. A warning statement is included in the user manual advising users to maintain a minimum distance of 20cm.

The unit contains three transmitters of which two may transmit simultaneously, one of which has prior approval as an RF module (GSM) FCC ID: QIPBGS3, for installation in mobile devices. The other transmitters are two identical short range 15.249 device transceivers operating at 915.15MHz but they do not operate simultaneously with each other.

Evaluation is therefore for exposure potential against the MPE limits given in Appendix A of OET Bulletin 65, $1\text{mW}/\text{cm}^2$ 1500-100,000MHz, or $F_{(\text{MHz})} / 1500$ (for 300-1500MHz) in mW/cm^2

Compliance requirements are based upon General population / Uncontrolled exposure.

Equation (3) of OET Bulletin 65:

$$S = \frac{P}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g. mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the centre of radiation of the antenna (appropriate units, e.g. cm)

Low power transmitter TX1 QP field strength, P = 0.189mW (-7.23dBm).
antenna gain is included in the measurement G = 1
Distance, R = 20cm (for mobile use).

$$S = 0.0000376 < 1\text{mW}/\text{cm}^2$$

Low power transmitter TX2 QP field strength, P = 0.122mW (-9.13dBm).
antenna gain is included in the measurement G = 1
Distance, R = 20cm (for mobile use).

$$S = 0.0000242 < 1\text{mW}/\text{cm}^2$$

The SMU4 EUT will be internally fitted with a pre-approved FCC GSM module FCC ID: QIPBGS3 which would therefore be co-located. Maximum powers of this module in the two useable frequency ranges are:

850MHz band: +33.45dBm (2.21309W)
1900MHz band: +30.34dBm (1.08143W)

850MHz band: S = 0.4403

MPE limit: 0.5666667 mW/cm^2

1900MHz band: S = 0.2151

MPE limit: 1 mW/cm^2

For co-location we can compare the highest powered Short range device (TX1) and one of either the 850MHz or 1900MHz GSM power densities (worst case/tightest limit is 850MHz band) to the limit and sum the percentage of limit to check 100% is not exceeded:

$$0.0000376 + 0.4403 = 0.4403376 \text{ (77.7\% limit)} < 100\%$$