

Murandi
Communications Ltd.
Innovative Radio Frequency Solutions

EUM3005 RF Exposure Calculations

As per OET Bulliten 65 – Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields – Edition 97-01, the maximum power density allowed for general population/uncontrolled exposure is $f/1500$ where f is the frequency of operation in MHz. Calculating for the lowest frequency of operation (905MHz), the maximum power density allowed is 0.603 mW/cm^2 . The power density is calculated as follows:

$$S = (P \cdot G) / (4 \cdot \pi \cdot R^2)$$

where:

S = power density in mW/cm^2

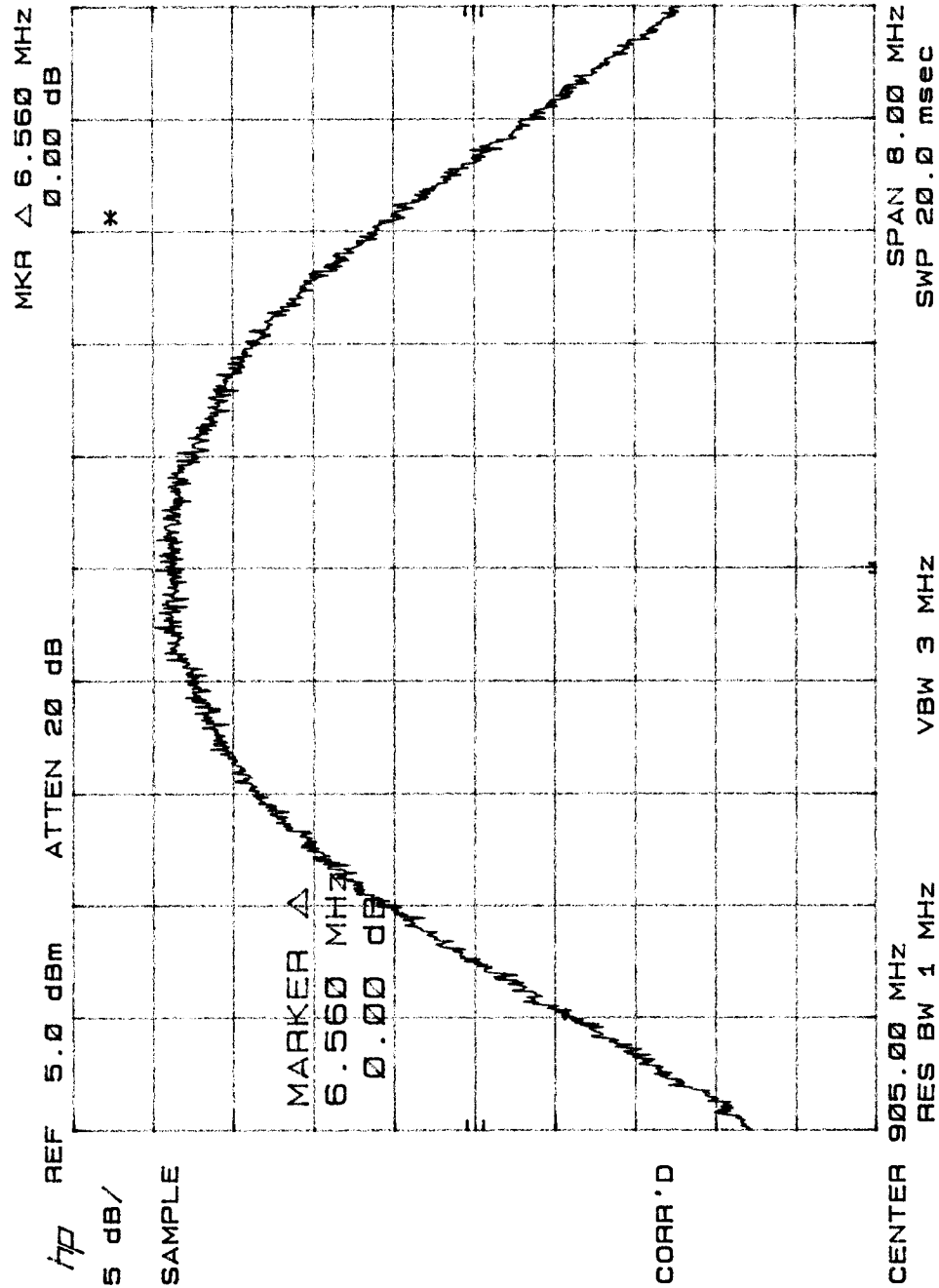
P = power at the antenna connector in mW

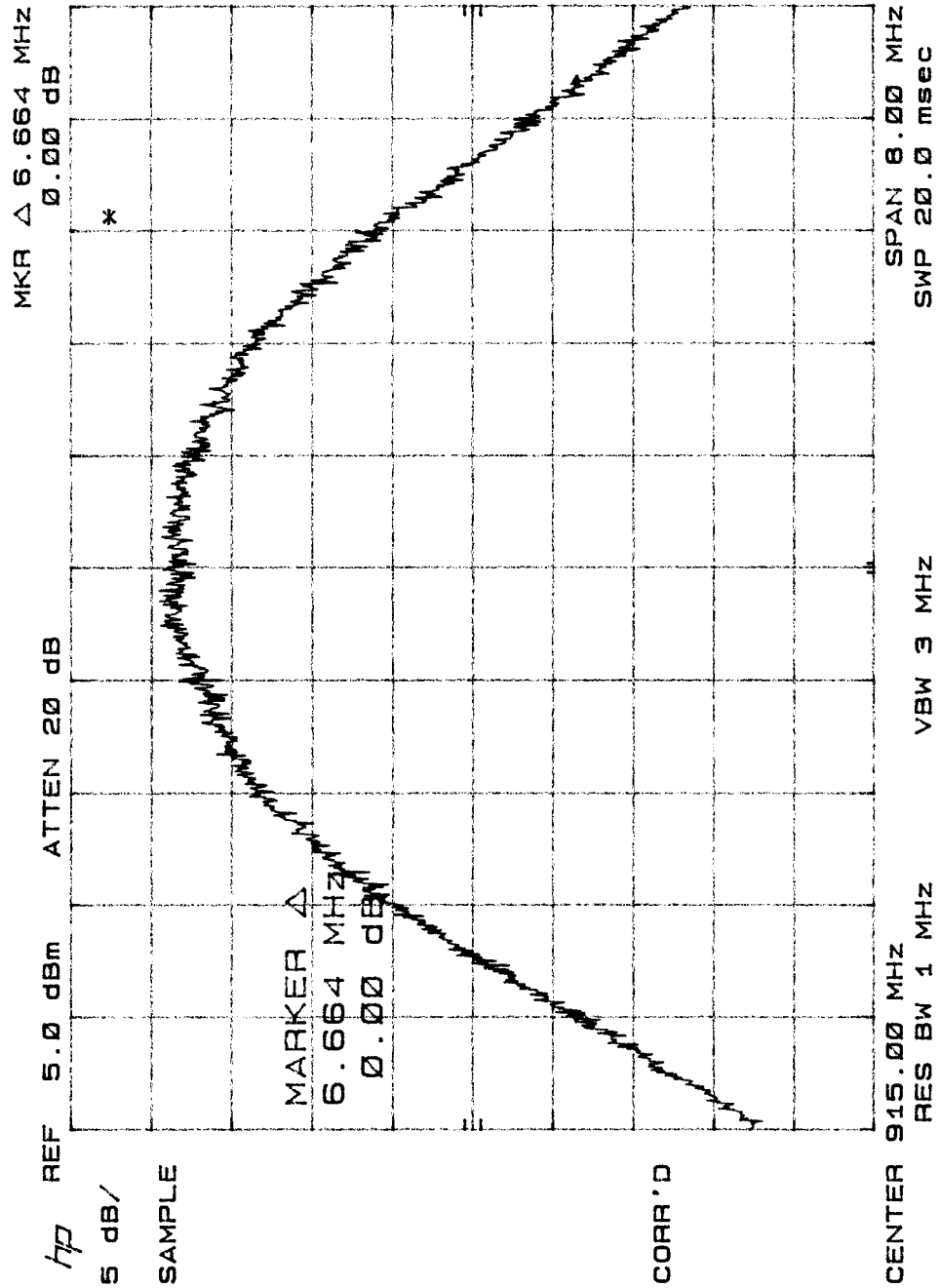
G = linear system gain of the antenna

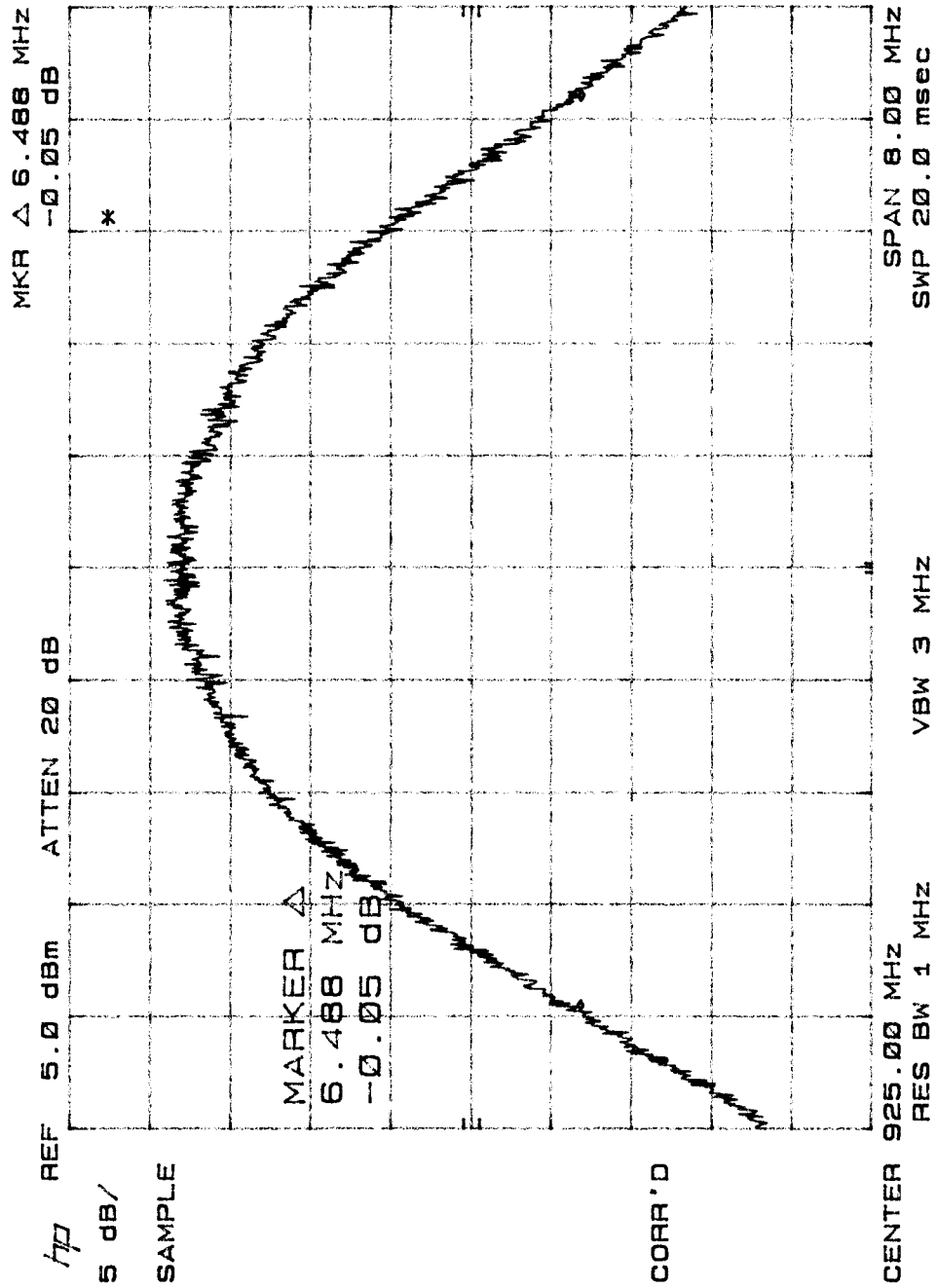
R = separation from antenna (cm)

As per the User's manual, the antenna for the EUM must be fix-mounted such that there is at least 20cm of separation between the antenna and a person. For an average output power of 25.7dBm (372mW), and a separation of 20cm, the maximum allowable antenna system gain is 9.1dBi. The WaveRider diversity antenna has a maximum gain of 6.2dBi, therefore meeting the FCC requirements for human exposure to RF radiation.

The RF exposure limit is further supported based on the following measurements:







The power under the curve was integrated in 1MHz bins and correction factors applied to account for cable loss and path loss giving the following EIRP results. Note that the power at the antenna port was calculated from the EIRP measurements assuming an antenna gain of 6.2dB.

Fundamental Frequency (MHz)	Radiated power Vertical pol. (dBm avg)	EIRP Vertical pol. (dBm avg)	Radiated power Horizontal pol. (dBm avg)	EIRP Horizontal pol. (dBm avg)
905	25.2	31.4	22.0	28.2
915	25.3	31.5	23.4	29.6
925	25.2	31.4	20.4	26.6