NATIONAL TECHNICAL SYSTEMS

Prediction of Maximum Permissible Exposure

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4 \Pi R^2}$$

where: S = power density
P = power input to the antenna
G = directional power gain of the antenna relative to an isotropic radiator
R = distance to the center of radiation of the antenna

*RF output power at antenna terminal(dBm):	**29.30**	
*RF output power at antenna terminal(W):	**0.851**	
Antenna gain for prediction(dBi):	**4.5**	2.35 dBd
Maximum antenna gain(numeric):	**2.8183829**	
Prediction distance(cm):	**20**	
Prediction frequency(MHz):	**849**	
Limit for uncontrolled exposure(mw/cm²):	**0.533**	
S(mw/cm²) = :	**0.477**	

*A 50% duty cycle is used for this prediction based on the allowance in the Rules for source-based time averaging of the rf exposure levels. 50% was chosen as a conservative estimate of the dwell time of a GSM mobile carrier. A GSM TDMA frame is 4.615 msec. with eight 0.577 msec. transmit bursts during the frame length. One physical channel is one out of the eight bursts. The maximum number of bursts the mobile might transmit is two (1.154 msec. in each 4.615 msec. frame), or 25% of the time. Allowing for timing tolerances and other factors it is reasonable to use a 50% duty cycle factor for the rf exposure prediction. Thus 3 dB was subtracted from the measured peak power of 32.3 dBm for the purposes of this prediction.