MPE/SAR Exclusion Calculation EN2 PTX

1.0 Overview

The En2 PTX is a professional 'plug-on' transmitter for dynamic or phantom powered (+48V) condenser microphones equipped with a standard balanced XLR. The En2 PTX transmits in the UHF band with a maximum ERP (Effective Radiated Power) of 40mW (+16dBm). The transmitter uses a combination of the PTX metal housing and metal body of microphone as an antenna.

2.0 PTX (EUT) RF Exposure

The PTX (with attached microphone) is intended as a portable device and is normally 'hand-held' in use. A minimum distance of 12.7mm (0.5") is assumed between PTX and a person's head/body for the purpose of this calculation. A person's extremity (hand) can come into contact with the radiating element (PTX housing/microphone body).

Evaluation is given for exposure potential against the exclusion limits given in **KDB447498** section 4.3.1.

Exclusion requirements are based upon 10g SAR threshold for Extremities and 1g SAR threshold for Head/Body.

Equation of 4.3.1., part 1A transposed is:

$$\text{Exclusion Power Limit (in mW)} = [\text{Threshold} / \sqrt{(F)}\ ] * D$$

Where

Threshold = 7.5 (Extremities), or 3 (Head/Body)
F = Frequency in GHz
D = Separation distance in mm

Extremities

"When minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion". Highest permitted frequency of 698MHz gives

$$\text{Exclusion power limit} = [7.5/\sqrt{(0.698)}] * 5 = 44.89\text{mW (16.52dBm)}$$

Head/Body

Minimum separation distance is 12.7mm (0.5"). Highest permitted frequency of 698MHz gives

$$\text{Exclusion power limit} = [3/\sqrt{(0.698)}] * 12.7 = 45.60\text{mW (16.59dBm)}$$

As worst-case Average/Peak power including a 10% 'tune-up' tolerance is 44mW (16.43dBm), the EUT is excluded from RF Exposure / SAR testing requirements.