MPE/SAR exclusion/RF Exposure Evaluation

Maximum Permissible Exposure to RF (MPE) CFR 15.247 (i), CFR 1.1310 (e)

The maximum exposure level to the public from the RF power of the EUT shall not exceed a power density, **S** as per the respective limits in Table 1 below, at a distance, d, of 5 cm (Mobile condition) from the EUT.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

Therefore, for:

MPE for 902 MHz – 928 MHz:

Limit: 0.61 mW/cm^2
Peak Power (dBm) = 18.32 dBm
Peak Power (Watts) = 0.068 W
Gain of Transmit Antenna = +1.2 dB_i = 1.3 numeric

d = Distance = 20 cm = 0.2 m

$S = (PG/ 4\pi d^2)$ = EIRP/4A = 0.068(1.3)/4*π*0.2*0.2
= 0.0884/0.5030 = 0.1757 W/m^2
= (0.1757 W/m^2) (1m^2/W) (0.1 mW/cm^2)
= 0.01757 mW/cm^2

which is << less than S = 0.61 mW/cm^2

RF Exposure Evaluation – IC

According to RSS-102, Table 4

At or above 300 MHz and below 6 GHz the Power Density (W/m^2) shall be less than $0.02619 \times f^{0.6834}$ adjusted for tune up tolerance where applicable, where f= frequency in MHz.

For 902-928 MHz band: Limit = $0.02619 \times 915^{0.6834} = 2.77$ (W/m^2)

Peak Power (Watts) = 0.068 W
Gain of Transmit Antenna = 1.2 dBi = 1.3 numeric
d= Distance = 20 cm = 0.2 m

$S = (PG/4\pi d^2) = EIRP/4A = 0.068(1.3)/4*\pi*0.2*0.2$
$= 0.0884/0.5030 = 0.1757\ W/m^2$

Which is less than $S = 2.77\ (W/m^2)$

All calculations performed by:

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Signature: