RF Exposure **MPE Calculation**

KDB 447498

Prediction of MPE limit at a given distance

Equation from IEEE C95.1

$$S = \frac{EIRP}{4\pi R^2} \quad \text{re-arranged } R = \sqrt{\frac{EIRP}{S4\pi}}$$

where:

S = power density
R = distance to the centre of radiateon of the antenna
EIRP = EUT Maximum power

Note:

The EIRP was calculated as:

The maximum conducted output power adding up the maximum antenna gain.

Result

Prediction Frequency (MHz)	Maximum conducted output power (dBm)	Maximum antenna Gain (dBi)	Maximum EIRP (W)	Maximum Duty Cycle (dBi)	Minimum Distance (cm)	Power density at distance (mW/cm^2)	Power density limit (S) (mW/cm^2)
5725 - 5850	27.3	35.3	1819.7	100%	381	0.997	1

RSS-102 issue 5

Exemption Limits for Routine Evaluation

All transmitters are exempt from routine SAR and RF exposure evaluations provided that they comply with the requirements of sections RSS-GEN Issue 5 sections 2.5.1 or 2.5.2

If the EUT does not meet the appropriate exemption limit, a complete SAR or RF exposure evaluation shall be performed. However, the power exemption limits in RSS-GEN Issue 5 Table 1 can be applied to reduce the number of test configurations (e.g. testing of a tablet edge).

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 4.49/f0.5W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1.31 x 10-2 f0.6834 W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

Exemption Limits for Routine Evaluation – RF Exposure Evaluation

$$S = \frac{EIRP}{4\pi R^2} \quad \text{re-arranged } R = \sqrt{\frac{EIRP}{S4\pi}}$$

where:

S = power density
R = distance to the centre of radiation of the antenna
ERP = EUT Maximum power

RSS-102 i5		
Evaluation Frequency	5725 - 5850	MHz
Section 2.5 Exemption limits	4.85	Watts
Conducted power	27.3	dBm
Antenna Gain	35.3	dBi
R	3.87	m
MPE Level	9.67	W/m^2
Limit	9.69	W/m^2