

In the frequency range 40 GHz to 231 GHz, spurious frequencies are measured as power densities. For further remarks see section 1.). The RBW and VBW are set to such a value that spurious power levels are clearly readable above the fundamental noise level of spectrum analyzer.

4. Measurements of maximum safe level for radiated power density

According to FCC § 1.1307, 1.1310, 2.1091, and 2.1093 and also according to ETSI/EN 301 091 measurements are carried out in order to evaluate the impact of human exposure to RF radiation. For this test the EUT is in normal operation mode.

The measurements are applicable only for far field conditions. The near field area extends to a distance of R (meters) and can be calculated from the following equation:

$$R < 2 * L^2 / \lambda$$

with R = distance in meters, L = largest dimension of either receiving or transmitting horn antenna (L = 0.02 m), and λ = wavelength in meters. In case of 76 GHz (λ = 0.0039 m), the far field starts at R > 0.205 m.

The peak power density is measured in 3 m distance as 0.992 $\mu\text{W}/\text{cm}^2$.

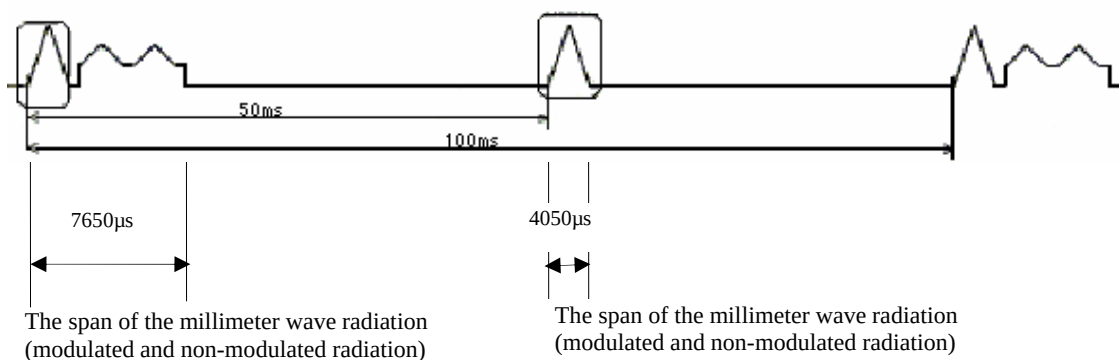
Peak Power (EIRP)

$$\begin{aligned} \text{EIRP} &= \text{PD} * 4\pi * R^2 \\ \text{EIRP} &= 1.12 \text{ W (30.5 dBm)} \end{aligned}$$

As the sample works with switched CWFM-modulation there is a difference between peak and average value of the output power.

DENSO

The Duty Cycle



Millimeter Radar Sensor (DNMWR003)

As the output is switched on/off with 11.7 % duty cycle, we have a correction factor of -9.3 dB.

So the average result is 21.2 dBm = 0.132 Watt

Limit of maximum ERP for frequencies above 1.5 GHz is 3 W. See FCC § 2.1091 (EIRP = 4.91 Watt)

RF Exposure for mobile conditions at **R = 20 cm** distance from EUT

$$\begin{aligned} PD &= EIRP / (4\pi * R^2) \\ PD &= 0.026 \text{ mW/cm}^2 \end{aligned}$$

Limit of maximum permissible exposure (MPE) for uncontrolled environment: 1.0 mW/cm². See FCC § 1.1310.