

EEE4086F

RF and Microwave systems

Safety Standards and Health Effects



Health effects

- Our understanding of biological effects of exposure to RF radiations is still evolving and more so for cellular mobile phones and wireless communication systems.
- RF induced heating can cause blindness, sterility, or cancers.
- Body tissues that are subjected to very high levels of RF energy (several kW) may suffer serious heat damage. These effects depend upon the frequency of the energy, the power density of the RF field and some other factors such as the polarization of the wave.
- It is still difficult to conclude on the effect of low energy electromagnetic radiations (athermal effects) on the body.



Radiation level standards

- It is important to define a safe radiation level standard, so that users of wireless equipment are not exposed to harmful power levels.
- US safety standard for human exposure to electromagnetism is ANSI/IEEE Standard C 95.1-1999
- Another organization making recommendations is the National Council on Radiation Protection and measurements (NCRP)
- The International Radiation Protection Association's (IRPA) International Commission on Non-Ionizing Radiation Protection (ICNIRP) also publishes guidelines for exposure to RF/microwaves.



Recommended power density limits

- Recommendations of frequency-dependent and time-dependent maximum permissible exposure levels for human exposure to RF and microwave electromagnetic field

