**Standards**

To sell a product in a market, such product typically need to carry the certification mark required in that region. These certification mark , e.g. CE & UL, are attained by adhering the standards proposed by some testing agencies e.g. UL (underwritters Laboratories), then the product needs to be tested by the agencies in able to ensure that the product does indeed adhered to the standards they proposed.

In most countries the safety and EMC compliance mark is usually combined. But for US, the safety mark is called UL and the EMC mark if FCC.

For a tpical engineer trying to comply with EMI see “EN 550022” (Meant for IT equipment). Which is also known as CISPR22. And the American counter part is FCC part 15.

The changing magnetic and electromagnetic fields in SMPs can generate electro-magnetic fields (near field) but at some distance away they become electro-magnetic waves which can propagate into the space. This propagated wave can be picked up by other devices thus generating unwated current or voltages which can cause that particular device to malfunction. Also the radiated waves can be picked up again by the conveter it self thus contributing to it own noise.

In general as frequency increases, the electro-magnetic fields gets more intense. Thus increasing the EMI. This is because as frequency increases, the smaller trace length can be more conductive or can radiate the high frequency contents/ energy in the harmonics of the SMPs.

For EMI radiated test, the frequency can start from 30MHz-1Ghz at distances of 3m (for FCC) and 10m for (CISPR). At these distances, the EM waves will be far field.

**EMC class**



