SPECTRAL RESPONSE OF Si PHOTODIODE

from Melles Griot Catalog

Planck's Constant. Therefore, expressing the responsivity in amps/watt (as opposed to amps/photon) gives this parameter an inherent wavelength dependency:

$$\mathscr{R} = \frac{q\eta\lambda}{hc} \quad [A/W]$$

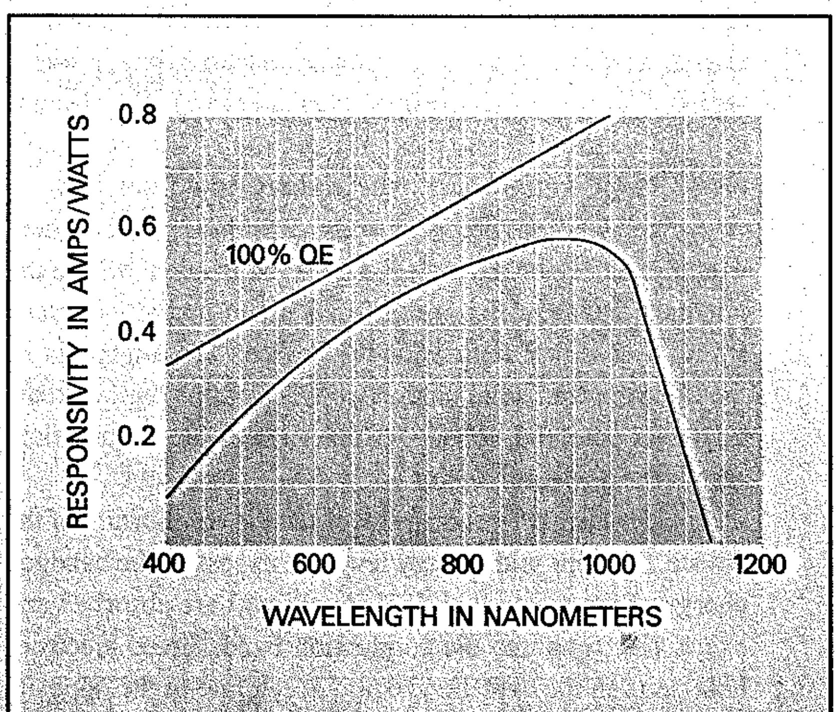
i.e. $$\mathscr{R} = \frac{\eta\lambda}{1.24 \times 10^{-6}} \text{ amps/watt}$$

where, c is the speed of light

q is the charge of an electron

λ is the wavelength in meters of the photons being detected.

Responsivity has an additional wavelength dependence arising from the variation of quantum efficiency with wavelength. At wavelengths where silicon does not absorb strongly, photons may penetrate deeper into the device (or pass through it) leading to minority carrier generation too remote from the junction to be detected, i.e. lower quantum efficiency. The typical shape of the silicon photodiode responsivity spectral curve is determined by the



TYPICAL RESPONSIVITY of a Melles Griot silicon photodiode.