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Characteristics of nanostructure silicon photodiode using laser assisted etching

Abstract

We prepared nanostructures silicon photodiode (nPSi) by using laser assisted etching at fixed current density (30 mA/cm2) with different etching wavelengths of laser diode (532, 650 and 810 nm), a (metal/nanostructure silicon/metal) photodiode has been fabricated from rapid thermal oxidation (RTO) and rapid thermal annealing (RTA) processes to improve the characterizations of PSi photodiode, A responsivity of (3A/w) was measured at (450 nm) with low value of dark current (1.33 μA/cm2) and higher value of photo current (610 μA/cm2) at 5 volt reverse bias. The results show that the wavelength IR (810 nm) give us the best photodiode and electrical characteristics.