Diode-Based Devices and Methods for Making the Same

ABSTRACT OF THE DISCLOSURE

In accordance with an embodiment, a diode comprises a substrate, a dielectric material including an opening that exposes a portion of the substrate, the opening having an aspect ratio of at least 1, a bottom diode material including a lower region disposed at least partly in the opening and an upper region extending above the opening, the bottom diode material comprising a semiconductor material that is lattice mismatched to the substrate, a top diode material proximate the upper region of the bottom diode material, and an active diode region between the top and bottom diode materials, the active diode region including a surface extending away from the top surface of the substrate.

Figure 3