

SEMICONDUCTOR DEVICE AND FERROELECTRIC CAPACITOR

Abstract of the Disclosure

5 The present invention includes a semiconductor device having a layer (21, 161, 61, 81, 111, 121, 125, 133, and 137) including an elemental metal and its conductive metal oxide, wherein the layer is capable being oxidized or reduced preferentially to an adjacent region of the device. The present
10 invention also includes processes for forming the devices. Substrate regions (11), silicon-containing layers (132), dielectric layers (41, 101, 122, and 134), electrodes (135), barrier layers (141 and 144), contact and via plugs (13, 142, 34, and 132), interconnects (145), and ferroelectric capacitors may be
15 protected by and/or formed with the layer. Examples of elemental metals and their conductive metal oxides that may be used with the present invention are: ruthenium and ruthenium dioxide, rhenium and rhenium dioxide, iridium and iridium dioxide, osmium and osmium tetroxide, or the like.

(FIG. 5 accompanies this abstract)