ABSTRACT

CYLINDRICAL SEMICONDUCTOR CAPACITOR AND MANUFACTURING METHOD THEREFOR

A cylindrical semiconductor capacitor and manufacturing method is provided which starts by taking an oxide layer which is formed over a semiconductor substrate and simultaneously removing a cylindrical volume and a toroidal volume around the cylindrical volume. The removed cylindrical and toroidal volumes are filled with a copper/tantalum nitride conductor to form a metal cylinder and ring. An oxide ring between the conductive cylinder and ring is removed. A high dielectric constant material is formed to replace the oxide ring between the metal cylinder and ring to form a cylindrical capacitor. Additional oxide material is deposited, patterned, and filled with copper/tantalum nitride conductor a to make a first connection to the metal ring, and a further dielectric is deposited, patterned, and filled with additional copper/tantalum nitride conductor to form a second connection to the metal cylinder.

(FIGURE 1 IS SUGGESTED FOR PUBLICATION)