

CROSS POINT DRAM CELL AND PROCESS

Abstract of the Disclosure

A DRAM cross point memory cell (1800) forms the pass transistor vertically in an upstanding portion (502) of semiconductor material or pillar electrically isolated from other cells by a trench isolation material (602). A chamber (1002) extends down into the upstanding portion (502). Dopant from bit line (704) diffuses into the top parts (1804) of the side walls (1004) to form one of the source/drain electrodes. Part of a word line (1102) extends down into the chamber to form the transistor gate. The gate dielectric is a layer (1010) of SiO₂. The other source/drain electrode (1808) is formed of dopant from the storage node material 1502 that diffuses into the bottom wall 1006 of the chamber. The channel region is formed of the side walls (1004) adjacent the gate.

Figure 18