

MOSFET DEVICE AND METHOD OF CONTROLLING DOPANT DIFFUSION
AND METAL CONTAMINATION IN THIN POLYCIDE GATE CONDUCTOR
ABSTRACT

A MOSFET device (10) is formed on a P- doped semiconductor substrate (11) with an N- well (17) formed therein, with a pair of isolation regions (14, 14') formed in the N- well (17) with a gate oxide layer (18) formed above the N- well (17). An FET device is formed with source and drain regions within the N-well (17), and a gate electrode formed above the gate oxide layer (18) aligned with the source and drain regions. The gate electrode comprises a stack of layers. A polysilicon layer (20) is formed on the gate oxide layer (18). A tungsten nitride dopant barrier layer (22) is formed upon the poly-silicon layer (20) having a thickness of from about 5 nm to about 20 nm, and a tungsten silicide layer (24) is formed upon the tungsten nitride layer (22).

Fig. 8