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A study on the Thermally Stable Tungsten bit-line Process technology for ULSI device

나사균, 이원준*

대전산업대학교 신소재공학부 재료공학과, *현대전자주식회사

Thermally stable tungsten(W) bit-line process technology has been successfully integrated for ultra large-scale integration(ULSI) device. Major parameters of the W bit-line process flow are demonstrated to be the Ti thickness, the silicidation temperature and the dopant concentration. The minimum contact resistance($<900\Omega$) of the W bit-line into p+ active region has been obtained by the silicidation of thin Ti(7nm) at a high temperature(800°C) with the additional ion implantation of BF₂⁺ after the contact formation. The effects of the process parameters were explained in terms of the agglomeration of the Ti silicide and dopant concentration in the silicon active region.