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Abstract of the Invention.

Salicide (self-aligned silicide) structures are formed using a process that does not form oxide spacer structures alongside polysilicon gate electrodes and wiring lines. A shaped polysilicon electrode is formed having protrusions extending beyond the sidewalls of the electrode. LDD source/drain regions are formed by ion implantation using only the polysilicon gate electrode as a mask, thereby forming LDD source drain/regions without using spacer oxide regions. Physical vapor deposition is used to deposit a metal layer having discontinuities at or adjacent the protrusions. A first rapid thermal anneal is performed to cause the metal to form a metal silicide over the polysilicon electrode. Unreacted metal is etched and then a second rapid thermal anneal is performed to convert the metal silicide to its lowest resistivity phase. Gate electrodes and wiring lines having this structure generally are formed having lower stress in the silicide layers, producing salicide structures having lower resistance than gate electrodes and wiring lines formed using conventional salicide techniques.

Fig. 15