75 Word Abstract

ELFIN (ELevated Field INsulator) and SEP (S/D Elevated by Poly-Si Plugging) Process for Ultra-Thin SOI MOSFETs with High Performance and High Reliability

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ELFIN (ELevated Field INsulator) process for device isolation and SEP (S/D Elevated by Poly-Si Plugging) process for elevated S/D structure is developed for ultra-thin SOI MOSFETs with SOI film less than 20 nm. With ELFIN, reverse narrow channel effect of NMOSFET is improved by about 50 %, gate leakage current decreased by about 30 %, and hot-carrier immunity increased by about 20 %. With SEP, thick S/D region is obtained even with 20 nm SOI film so that S/D resistance is deceased to a third with excellent uniformity.