U.S. PATENT DOCUMENTS

5,060,030 A 10/1991 Hoke
5,081,513 A 1/1992 Jackson et al.
5,108,843 A 4/1992 Ohtaka et al.
5,134,085 A 7/1992 Gilgen et al.
5,310,446 A 5/1994 Konishi et al.
5,354,695 A 10/1994 Leedy
5,371,399 A 12/1994 Burroughes et al.
5,391,510 A 2/1995 Hsu et al.
5,459,346 A 10/1995 Asakawa et al.
5,471,948 A 12/1995 Burroughes et al.
5,557,122 A 9/1996 Shrivastava et al.
5,561,302 A 10/1996 Candelaria
5,565,697 A 10/1996 Asakawa et al.
5,571,741 A 11/1996 Leedy
5,592,007 A 1/1997 Leedy
5,592,018 A 1/1997 Leedy
5,670,798 A 9/1997 Schetzina
5,679,965 A 10/1997 Schetzina
5,683,934 A 11/1997 Candelaria
5,840,593 A 11/1998 Leedy
5,861,651 A 1/1999 Brasen et al.
5,880,040 A 3/1999 Sun et al.
5,940,736 A 8/1999 Brady et al.
5,946,559 A 8/1999 Leedy
5,960,297 A 9/1999 Saki
5,989,978 A 11/1999 Peidous
6,008,126 A 12/1999 Leedy
6,025,280 A 2/2000 Brady et al.
6,046,464 A 4/2000 Schetzina
6,066,545 A 5/2000 Doshi et al.
6,090,684 A 7/2000 Ishitsuka et al.
6,107,143 A 8/2000 Park et al.
6,133,071 A 10/2000 Nagai
6,165,383 A 12/2000 Chou
6,177,722 B1 1/2001 Kovats et al.
6,221,735 B1 4/2001 Manley et al.
6,228,694 B1 5/2001 Doyle et al.
6,246,095 B1 6/2001 Brady et al.
6,255,169 B1 7/2001 Li et al.
6,261,964 B1 7/2001 Wu et al.
6,265,317 B1 7/2001 Chiu et al.
6,274,444 B1 8/2001 Wang
6,281,532 B1 8/2001 Doyle et al.
6,284,623 B1 9/2001 Zhang et al.
6,284,626 B1 9/2001 Kim
6,319,794 B1 11/2001 Akatsu et al.
6,361,885 B1 3/2002 Chou
6,362,082 B1 3/2002 Doyle et al.
6,368,931 B1 4/2002 Kuhn et al.
6,403,486 B1 6/2002 Lou
6,403,975 B1 6/2002 Brunner et al.
6,406,973 B1 6/2002 Lee
6,476,462 B2 11/2002 Shimizu et al.
6,486,513 B1 * 11/2002 Matsumoto et al. 257/347
6,493,497 B1 12/2002 Ramdani et al.
6,498,358 B1 12/2002 Lach et al.
6,501,121 B1 12/2002 Yu et al.
6,506,652 B2 1/2003 Jan et al.
6,509,618 B2 1/2003 Jan et al.
6,521,964 B1 2/2003 Jan et al.
6,531,369 B1 3/2003 Ozkan et al.
6,531,740 B2 3/2003 Bosco et al.
6,703,271 B2 * 3/2004 Yeo et al. 438/221
2001/0009784 A1 7/2001 Ma et al.
2002/0030203 A1 * 3/2002 Fitzgerald 257/194
2002/0074598 A1 6/2002 Doyle et al.
2002/0086472 A1 7/2002 Roberds et al.
2002/0086497 A1 7/2002 Kwok
2002/0090791 A1 7/2002 Doyle et al.
2003/0032261 A1 2/2003 Yeh et al.
2003/0040158 A1 2/2003 Saitoh
2003/0057184 A1 3/2003 Yu et al.
2003/0067035 A1 4/2003 Tews et al.

FOREIGN PATENT DOCUMENTS

JP 01162362 6/1989
WO WO 94/27317 5/1993
WO WO 02/45156 A2 6/2002

OTHER PUBLICATIONS

Rim, et al. "Transconductance Enhancement in Deep Submicron Strained-Si *n*-MOSFETs", International Electron Devices Meeting, 26, 8, 1, IEEE, Sep. 1998.
Rim, et al. "Characteristics and Device Design of Sub-100 nm Strained Si N- and PMOSFETs", 2002 Symposium On VLSI Technology Digest of Technical Papers, IEEE, pp. 98-99.
Scott, et al. "NMOS Drive Current Reduction Caused by Transistor Layout and Trench Isolation Induced Stress", International Electron Devices Meeting, 34.4.1, IEEE, Sep. 1999.
Effect of <100> Channel Direction for High Performance SCE Immune pMOSFET with Less Than 0.15um Gate LengthULSI Development Center, pp. 27.5.1-27.5.4, 1999 IEEE, Sayama, et al.
Ota, et al. "Novel Locally Strained Channel Technique for high Performance 55nm CMOS", International Electron Devices Meeting, 2.2.1, IEEE, Feb. 2002.
Ouyang, et al. "Two-Dimensional Bandgap Engineering in a Novel Si/SiGe pMOSFETS With Enhanced Device Performance and Scalability", Microelectronics Research Center, pp. 151-154, 2000 IEEE.
Ito, et al. "Mechanical Stress Effect of Etch-Stop Nitride and its Impact on Deep Submicron Transistor Design", International Electron Devices Meeting, 10.7.1, IEEE, Apr. 2000.
Shimizu, et al. "Local Mechanical-Stress Control (LMC): A New Technique for CMOS-Performance Enhancement", International Electron Devices Meeting, IEEE, Mar. 2001.
Jeffrey A. Davis, et al., "Interconnect Limits on Gigascale Integration (GSI) in the 21st Century", *Proceedings of the IEEE*, vol. 89, No. 3, pp. 305-324 (2001).
"Grand Challenges", *The International Technology Roadmap For Semiconductors*, pp. 9-15 (2002).

* cited by examiner