

## **Reference:**

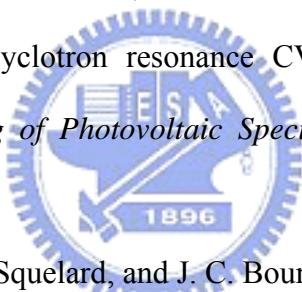
### **Chapter 1:**

- [1.1] Tatsuo Morita, “An overview of active matrix LCDs in business and technology,” in *AMLCD Tech. Dig.*, 1995, pp. 1-7.
- [1.2] Li Yulin, Yun Zhisheng, He Zhengquan, Liu Jifmg, and Zheng Genxiang,” Liquid Crystal Light Valve Color Projection System,” in *ASID Tech. Dig.*, 1997, pp. 133-135.
- [1.3] Arokia Nathan, Kapil Sakariya, Ania Kumar, peyman Servati, Karim S. Karim, Denis Striakhilev, and Anderi Sazonov,” Amorphous silicon TFT circuit integration for OLED displays on glass and plastic,” in *Proceedings of IEEE Custom Integrated Circuits Conference*, 2003, pp.215 – 222.
- [1.4] Jun Hanari, “Development of a 10.4-in. UXGA display using low-temperature poly-Si technology,” *Journal of the SID*, vol. 10, pp. 53-56, 2002.
- [1.5] Yasuhisa Oana, “Current and future technology of low-temperature poly-Si TFT-LCDs,” *Journal of the SID*, vol. 9, pp. 169-172, 2001.
- [1.6] Kiyoshi Yoneda, Hidenori Ogata, Shinji Yuda, Kohji Suzuki, Toshifumi Yamaji, Shiro Nakanishi, Tsutomu Yamada, and Yoshihiro Morimoto, “Optimization of low-temperature poly-Si TFT-LCDs and a large-scale production line for large glass substrates,” *Journal of the SID*, vol. 9, pp. 173-179, 2001.
- [1.7] J. G. Blake, J. D. III Stevens, and R. Young, “Impact of low temperature polysilicon on the AMLCD market,” *Solid State Tech.*, vol. 41, pp. 56-62, 1998.
- [1.8] Y. Aoki, T. Lizuka, S. Sagi, M. Karube, T. Tsunashima, S. Ishizawa, K. Ando, H. Sakurai, T. Ejiri, T. Nakazono, M. Kobayashi, H. Sato, N. Ibaraki, M. Sasaki, and N. Harada, “A 10.4-in. XGA low-temperature poly-Si TFT-LCD for mobile PC applications,” in *SID Tech. Dig.*, 1999, pp. 176-179.

- [1.9] H. J. Kim, D. Kim, J. H. Lee, I. G. Kim, G. S. Moon, J. H. Huh, J. W. Hwang, S. Y. Joo, K. W. Kim, and J. H. Souk, “A 7-in. full-color low-temperature poly-Si TFT-LCD,” in *SID Tech. Dig.*, 1999, pp. 184-187.
- [1.10] Y. Matsueda, T. Ozawa, M. Kimura, T. Itoh, K. Kitwada, T. Nakazawa, H. Ohsima, “A 6-bit-color VGA low-temperature poly-Si TFT-LCD with integrated digital data drivers,” in *SID Tech. Dig.*, 1998, pp. 879-882.
- [1.11] Mutsumi Kimura, Ichio Yudasaka, Sadao Kanbe, Hidekazu Kobayashi, Hiroshi Kiguchi, Shun-ichi Seki, Satoru Miyashita, Tatsuya Shimoda, Tokuro Ozawa, Kiyofumi Kitawada, Takashi Nakazawa, Wakao Miyazawa, and Hiroyuki Ohshima, “Low-temperature polysilicon thin-film transistor driving with integrated driver for high-resolution light emitting polymer display,” *IEEE Trans. Electron Devices*, vol. 46, pp. 2282-2288, 1999.
- [1.12] Mark Stewart, Robert S. Howell, Leo Pires, Miltiadis K. Hatalis, Webster Howard, and Olivier Prache, “Polysilicon VGA active matrix OLED displays – technology and performance,” in *IEDM Tech. Dig.*, 1998, pp. 871-874.
- [1.13] Mark Stewart, Robert S. Howell, Leo Pires, and Miltiadis K. Hatalis, “Polysilicon TFT technology for active matrix OLED displays,” *IEEE Trans. Electron Devices*, vol. 48, pp. 845-851, 2001.
- [1.14] Tatsuya Sasaoka, Mitsunobu Sekiya, Akira Yumoto, Jiro Yamada, Takashi Hirano, Yuichi Iwase, Takao Yamada, Tadashi Ishibashi, Takao Mori, Mitsuru Asano, Shinichiro Tamura, and Tetsuo Urabe, “A 13.0-inch AM-OLED display with top emitting structure and adaptive current mode programmed pixel circuit (TAC),” in *SID Tech. Dig.*, 2001, pp. 384-387.
- [1.15] Zhiguo Meng, Haiying Chen, Chengfeng Qiu, Hoi S. Kwok, and Man Wong, “Active-matrix organic light-emitting diode display implemented using metal-induced unilateral crystallized polycrystalline silicon thin-film transistors,” in *SID Tech. Dig.*,

2001, pp. 380-383.

- [1.16] Zhiguo Meng and Man Wong, "Active-matrix organic light-emitting diode displays realized using metal-induced unilaterally crystallized polycrystalline silicon thin-film transistors," *IEEE Trans. Electron Devices*, vol. 49, pp. 991-996, 2002.
- [1.17] G. Rajeswaran, M. Itoh, M. Boroson, S. Barry, T. K. Hatwar, K. B. Kahn, K. Yoneda, R. Yokoyama, T. Yamada, N. Komiya, H. Kanno, and H. Takahashi, "Active matrix low temperature poly-Si TFT / OLED full color displays: development status," in *SID Tech. Dig.*, 2000, pp. 974-977.
- [1.18] Kaustav Banerjee, Shukri J. Souris, Pawan Kapur, and Krishna C. Saraswat, "3-D ICs: a novel chip design for improving deep-submicrometer interconnect performance and systems-on-chip integration," *Proceedings of the IEEE*, vol. 89, pp. 602-633, 2001.
- [1.19] Atsushi Kohno, Toshiyuki Sameshima, Naoki Sano, Mitsunobu Sekiya, and Masaki Hara, "High performance poly-Si TFTs fabricated using pulsed laser annealing and remote plasma CVD with low temperature processing," *IEEE Trans. Electron Devices*, vol. 42, pp. 251- 257, 1995.
- [1.20] Zhiguo Meng; Mingxiang Wang; and Man Wong," High performance low temperature metal-induced unilaterally crystallized polycrystalline silicon thin film transistors for system-on-panel applications," *IEEE Trans. Electron Devices*, vol. 47, pp. 404-409, 2000.
- [1.21] W. G. Hawkins, "Polycrystalline-silicon device technology for large-area electronics," *IEEE Trans. Electron Devices*, vol. 33, pp. 477-481, 1986.
- [1.22] I-W. Wu, "Cell design considerations for high-aperture-ratio direct-view and projection polysilicon TFT-LCDs," in *SID Tech. Dig.*, 1995, pp. 19-22.
- [1.23] M. Takabatake, J. Ohwada, Y. A. Ono, K. Ono, A. Mimura, N. Konishi, "CMOS circuits for peripheral circuit integrated poly-Si TFT LCD fabricated at low temperature below 600 degrees C," *IEEE Trans. Electron Devices*, vol. 38, pp. 1303-1309, 1991.

- [1.24] Jin-Woo Lee; Nae-In Lee; Hoon-Ju Chung; Chul-Hi Han," Improved stability of polysilicon thin-film transistors under self-heating and high endurance EEPROM cells for systems-on-panel," in *IEDM Tech. Dig.*, 1998, pp. 265-268.
- [1.25] H. F. Matare, "Carrier transport at grain boundaries in semiconductors," *J. Appl. Phys.*, vol. 56, pp. 2605-2631, 1984.
- [1.26] S. Hirae, M. Hirose, and Y. Osaka, "Energy distribution of trapping states in polycrystalline silicon," *J. Appl. Phys.*, vol. 51, pp. 1043-1047, 1980.
- [1.27] H. Kakinuma, M. Mohri, and T. Tsuruoka, "Mechanism of low-temperature polycrystalline silicon growth from a SiF<sub>4</sub>/SiH<sub>4</sub>/H<sub>2</sub> plasma," *J. Appl. Phys.*, vol. 77, pp. 646-652, 1995.
- [1.28] P. Muller, I. Beckers, E. Conrad, L. Elstner, and W. Fuhs," Application of low-temperature electron cyclotron resonance CVD to silicon thin-film solar cell preparation," in *Proceeding of Photovoltaic Specialists Conference*, 1996, pp.673 – 676.
- 
- [1.29] K. Zellama, P. Germain, S. Squelard, and J. C. Bourgoin, "Crystallization in amorphous silicon," *J. Appl. Phys.*, vol. 50, pp. 6995-7000, 1979.
- [1.30] P. V. Kolinsky, S. M. Fluxman, R. A. King, R. M. Wood, C. S. Whitehouse, and A. J. Lowe," Laser repair of active matrix display drive circuits," *IEEE Electronics Letters* , Vol. 28, pp. 2202-2204, 1992.
- [1.31] Y. F. Tang, S. R. P. Silva, and M. J. Rose, "Super sequential lateral growth of Nd:YAG laser crystallized hydrogenated amorphous silicon," *Appl. Phys. Lett.*, vol. 78, pp. 186-188, 2001.
- [1.32] Akito Hara, Fumiyo Takeuchi, Michiko Takei, Katsuyuki Suga, Kenichi Yoshino, Mitsuru Chida, Yasuyuki Sano, and Nobuo Sasaki, "High-performance polycrystalline silicon thin film transistors on non-alkali glass produced using continuous wave laser lateral crystallization," *Jpn. J. Appl. Phys., Part 2*, vol. 41, pp. L311-L313, 2002.

- [1.33] Bohuslav Rezek, Christoph E. Nebel, and Martin Stutzmann, "Polycrystalline silicon thin films produced by interference laser crystallization of amorphous silicon," *Jpn. J. Appl. Phys., Part 2*, vol. 38, pp. L1083-L1084, 1999.
- [1.34] Y. Helen, R. Dassow, M. Nerding, K. Mourgues, F. Raoult, J.R. Kohler, T. Mohammed-Brahim, R. Rogel, O. Bonnaud, J.H. Werner, and H.P. Strunk, "High mobility thin film transistors by Nd:YVO<sub>4</sub>-laser crystallization," *Thin Solid Films*, vol. 383, pp. 143-146, 2001.
- [1.35] S. D. Brotherton, D. J. McCulloch, J. P. Gowers, J. R. Ayres, C. A. Fisher, and F. W. Rohlfing, "Excimer laser crystallization of poly-Si TFTs for AMLCDs," *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q7.1.1-Q7.1.12, 2000.
- [1.36] Miltiadis K. Hatalis and David W. Greve, "Large grain polycrystalline silicon by low-temperature annealing of low-pressure chemical vapor deposited amorphous silicon films," *J. Appl. Phys.*, vol. 63, pp. 2260-2266, 1988.
- [1.37] K. Pangal, J. C. Sturm, S. Wagner, and T. H. Buyuklimanli, "Hydrogen plasma enhanced crystallization of hydrogenated amorphous silicon films," *J. Appl. Phys.*, vol. 85, pp. 1900-1906, 1999.
- [1.38] R. B. Iverson and R. Reif, "Recrystallization of amorphized polycrystalline silicon films on SiO<sub>2</sub>: Temperature dependence of the crystallization parameters," *J. Appl. Phys.*, vol. 62, pp. 1675-1681, 1987.
- [1.39] L. Csepregi, E. F. Kennedy, and J. W. Mayer, "Substrate-orientation dependence of the epitaxial regrowth rate from Si-implanted amorphous Si," *J. Appl. Phys.*, vol. 49, pp. 3906-3911, 1978.
- [1.40] I. W. Wu, A. Chiang, M. Fuse, L. Ovecoglu, and T. Y. Huang, "Retardation of nucleation rate for grain size enhancement by deep silicon ion implantation of low-pressure chemical vapor deposited amorphous silicon films," *J. Appl. Phys.*, vol. 65, pp. 4036-4039, 1987.

- [1.41] C. Spinella, S. Lombardo, and S. U. Campisano," Early stages of grain growth in ion-irradiated amorphous silicon," *Phys. Rev. Lett.*, Vol. 66, pp. 1102-1105, 1991.
- [1.42] H. Kumomi, T. Yonehara, and T. Noma," Manipulation of nucleation sites in solid-state Si crystallization," *Appl. Phys. Lett.*, vol. 59, pp. 3565-3567, 1991.
- [1.43] E. Scheid, B. De Maauduit, P. Taurines and D. Bielle-Daspet, "Super large grain polycrystalline silicon obtained from pyrolysis of Si<sub>2</sub>H<sub>6</sub> and annealing," *Jpn. J. Appl. Phys. Part2*, vol. 29, pp. L2105-2107, 1990.
- [1.44] K. Nakazawa, "Recrystallization of amorphous silicon films deposited by low-pressure chemical vapor deposition from Si<sub>2</sub>H<sub>6</sub> gas," *J. Appl. Phys.*, vol. 69, pp. 1703-1706, 1991.
- [1.45] C. H. Hong, C. Y. Park and H. J. Kim, "Structure and crystallization of low-pressure chemical vapor deposited silicon films using Si<sub>2</sub>H<sub>6</sub> gas," *J. Appl. Phys.*, vol. 71, pp. 5427-5432, 1992.
- [1.46] S. Hasegawa, S. Sakamoto, T. Inokuma and Y. Kurata, "Structure of recrystallized silicon films prepared from amorphous silicon deposited using disilane," *Appl. Phys. Lett.*, vol. 62, pp. 871-877, 1993.
- [1.47] Dimitrios N. Kouvatsos, Apostolos T. Voutsas, and Miltiadis K. Hatalis," High-performance thin-film transistors in large grain size polysilicon deposited by thermal decomposition of disilane," *IEEE Trans. Electron Devices*, vol. 43, pp. 1399-1406, 1996.
- [1.48] G. Radnoci, A. Robertsson, H. T. G. Hentzell, S. F. Gong, and M. A. Hasan, "Al induced crystallization of a-Si," *J. Appl. Phys.*, vol. 69, pp. 6394-6399, 1991.
- [1.49] S. W. Russell, Jian Li, and J. W. Mayer, "*In situ* observation of fractal growth during a-Si crystallization in a Cu<sub>3</sub>Si matrix," *J. Appl. Phys.*, vol. 70, pp. 5153-5155, 1991.
- [1.50] L. Hultman, A. Robertsson, H. T. G. Hentzell, I. Engström, and P. A. Psaras, "Crystallization of amorphous silicon during thin-film gold reaction," *J. Appl. Phys.*, vol.

62, pp. 3647-3655, 1987.

[1.51] Bo Bian, Jian Yie, Boquan Li, and Ziqin Wu, "Fractal formation in *a*-Si:H/Ag/*a*-Si:H films after annealing," *J. Appl. Phys.*, vol. 73, pp. 7402-7406, 1993.

[1.52] R. J. Nemanich, C. C. Tsai, M. J. Thompson, and T. W. Sigmon, "Interference enhanced Raman scattering study of the interfacial reaction of Pd on *a*-Si:H," *J. Vac. Sci. Technol.*, vol. 19, pp. 685-688, 1981.

[1.53] Yunosuke Kawazu, Hiroshi Kudo, Seinosuke Onari, and Toshihiro Arai, "Low-temperature crystallization of hydrogenated amorphous silicon induced by nickel silicide formation," *Jpn. J. Appl. Phys. Part1*, vol. 29, pp. 2698-2704, 1990.

[1.54] Soo Young Yoon, Ki Hyung, Chae Ok Kim, Jae Young Oh, and Jin Jang, "Low temperature metal induced crystallization of amorphous silicon using a Ni solution," *J. Appl. Phys.*, vol. 82, pp. 5865-5867, 1997.

[1.55] Seok-Woon Lee, Yoo-Chan Jeon, and Seung-Ki Joo, "Pd induced lateral crystallization of amorphous Si thin films," *Appl. Phys. Lett.*, vol. 66, pp.1671-1673, 1995.

[1.56] C. Hayzelden and J. L. Batstone, "Silicide formation and silicide-mediated crystallization of nickel-implanted amorphous silicon thin films," *J. Appl. Phys.*, vol. 73, pp. 8279-8289, 1993.

[1.57] Z. Jin, K. Moulding, H. S. Kwok, and M. Wang," The effects of extended heat treatment on Ni induced lateral crystallization of amorphous silicon thin film," *IEEE Trans. Electron Device*, vol. 46, pp.78-82, 1999.

[1.58] L. K. Lam, S. Chen, and D. G. Ast," Kinetics of nickel-induced lateral crystallization of amorphous silicon thin-film transistors by rapid thermal and furnace anneals," *Appl. Phys. Lett.*, vol. 74, pp.1866-1868, 1999.

[1.59] I. Kunsihima, K. Surugro, T. Aoyama, and J. Matsunga," Homogenous hetroepitaxial NiSi<sub>2</sub> formation on (100) Si," *Jpn. J. Appl. Phys.*, vol. 29, pp.2329-2332, 1990.

[1.60] G. A. Bhat, Z. Jin, H. S. Kwok, and M. Wong," Effect of longitudinal grain boundaries

on the performance of MILC-TFT's," *IEEE Electron Device Lett.*, vol.20, pp. 97-99, 1999.

[1.61] C. Hayzelden and J. L. Batstone," High resolution in situ TEM studies of silicide-mediated crystallization of amorphous silicon," *Mat. Res. Soc. Symp. Proc.*, vol. 21, 1994, pp. 579-584.

[1.62] T. Hempel and O. Schoenfeld," Needlelike crystallization of Ni doped amorphous silicon thin films," *Solid State Commun.*, vol. 85, pp. 921, 1993.

[1..63] Jin Jang, Jae Young Oh, Sung Ki Kim, Young Jin Choi, Soo Young Yoon, and Chae Ok Kim, " Electric-field-enhanced crystallization of amorphous silicon," *Nature*, vol. 395, pp. 481-483, 1998.

[1..64] Sang-Hyun Park, Peung-Ik Jun, Kyung-Sub Song, Chang-Kyung Kim, and Duck-Kyun Choi, "Field aided lateral crystallization of amorphous silicon thin film," *Jpn. J. Appl. Phys. Part2*, vol. 38, pp. L108-L109, 1999.

[1.65] Won Kyu Kwak, Bong Rae Cho, Soo Young Yoon, Seong Jin Park, and Jin Jang, "A high performance thin-film transistor using a low temperature poly-Si by silicide mediated crystallization," *IEEE Electron Device Lett.*, vol. 21, pp. 107-109, 2000.

[1.66] Soo Young Yoon, Jae Young Oh, Chae Ok Kim, and Jin Jang, "Low temperature solid phase crystallization of amorphous silicon at 380°C," *J. Appl. Phys.*, vol. 84, pp. 6463-6465, 1998.

[1.67] Seong Jin Park, Bong Rae Cho, Kyung Ho Kim, Kyu Sik Cho, Seong Yeol Yoo, Ah Young Kim, and Jin Jang, "SPC poly-Si TFT having a maximum process temperature of 380°C," in *SID Tech. Dig.*, 2001, pp. 562-565.

[1.68] J. E. Palmer, C. V. Thompson, and H. I. Smith," Grain growth and grain size distribution in thin germanium films," *J. Appl. Phys.*, vol. 62, pp. 2492-2497, 1987.

[1.69] P. M. Smith, P. G. Carey, and T. W. Sigmon, "Excimer laser crystallization and doping of silicon films on plastic substrates," *Appl. Phys. Lett.*, vol. 70, pp. 342-344, 1997.

- [1.70] S. D. Brotherton, D. J. McCulloch, J. P. Gowers, J. R. Ayres, C. A. Fisher, and F. W. Rohlfing, "Excimer laser crystallization of poly-Si TFTs for AMLCDs," *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q7.1.1-Q7.1.12, 2000.
- [1.71] S. D. Brotherton, D. J. McCulloch, and J. P. Gowers, "Excimer-laser-annealed poly-Si thin-film transistors," *IEEE Trans. Electron Device*, vol. 40, pp.407-413, 1999.
- [1.72] H. J. Kim, J. S. Im, and M. O. Thompson, in *Microcrystalline Semiconductor: Materials Science & Devices*, edited by P. M. Fauchet, C. C. Tsai, L. T. Canham, I. Shimizu, and Y. Aoyagi, MRS Symposia Proceedings No. 283, P.703, 1993.
- [1.73] D. K. Fork, G. B. Anderson, J. B. Boyce, R. I. Johnson, and P. Mei," Capillary waves in pulsed excimer laser crystallized amorphous silicon," *Appl. Phys. Lett.*, vol. 68, pp. 2138-2140, 1996.
- [1.74] J. S. Im, H. J. Kim, and Michael O. Thompson, "Phase transformation mechanisms involved on excimer laser crystallization of amorphous silicon films," *Appl. Phys. Lett.*, vol. 63, pp. 1969-1971, 1993.
- [1.75] J. S. Im and H. J. Kim, "On the super lateral growth phenomenon observed in excimer laser-induced crystallization of thin Si films," *Appl. Phys. Lett.*, vol. 64, pp. 2303-2305, 1994.
- [1.76] A. Hara, F. Takeuchi, and N. Sasaki," Selective single-crystalline growth at the pre-defined active regions of TFTs on a glass by a scanning CW laser irradiation," in *IEDM Tech. Dig.*, 2000, pp. 209-212.
- [1.77] A. Hara, Y. Mishima, T. Kakehi, and F. Takeuchi," High performance poly-Si TFTs on a glass by stable scanning CW laser lateral crystallization," in *IEDM Tech. Dig.*, 2001, pp. 747-750.
- [1.78] A. Hara, K. Yoshino, F. Takeuchi, and N. Sasaki," Selective single-crystalline-silicon growth at the pre-defined active region of a thin film transistor on glass by using continuous wave laser irradiation," *Jpn. J. Appl. Phys.*, vol. 42, pp.23-27, 2003.

- [1.79] M. Miyasaka, W. Itoh, H. Ohshima, and T. Shimoda," Dry thermal oxidation of polycrystalline and amorphous silicon films for application to thin film transistors," *Jpn. J. Appl. Phys.*, vol. 37, pp. 1076-1081, 1998.
- [1.80] J. Y. Lee, C. H. Han, and C. K. Kim," ECR plasma oxidation effects on performance and stability of polysilicon thin film transistors," in *IEDM Tech. Dig.*, 1994, pp. 523-526.
- [1.81] J. W. Lee, N. I. Lee, and C. H. Han," Stability of short-channel p-channel polysilicon thin-film transistors with ECR N<sub>2</sub>O-plasma gate oxide," *IEEE Electron Device Lett.*, vol. 20, pp. 12-14, 1999.
- [1.82] J. W. Lee, N. I. Lee, and C. H. Han," Characteristics of polysilicon thin-film transistor with thin-gate dielectric grown by electron cyclone resonance nitrous oxide plasma," *IEEE Electron Device Lett.*, vol. 18, pp.172-174, 1997.
- [1.83] K. Sekine, Y. Saito, M. Hirayama, and T. Ohmi," Highly reliable ultrathin silicon oxide film formation at low temperature by oxygen radical generated in high-density krypton plasma," *IEEE Trans. Electron Device*, vol. 48, pp.1550-1555, 2001.
- [1.84] F. Harris, "High temperature RTP processing on large area glass substrates for manufacturing polysilicon AMLCDs," *Intevac White Paper*, 1995.
- [1.85] Robert S. Sposili and James S. Im, "Sequential lateral solidification of thin silicon films on SiO<sub>2</sub>," *Appl. Phys. Lett.*, vol. 69, pp. 2864-2866, 1996.
- [1.86] James S. Im, Robert S. Sposili, and M. A. Crowder, "Single-crystal Si films for thin-film transistor devices," *Appl. Phys. Lett.*, vol. 70, pp. 3434-3436, 1997.
- [1.87] Paul Ch. Van der Wilt, Ryoichi Ishihara, and Jurgen Bertens, "Location-controlled large-grains in near-ablation excimer-laser crystallized silicon films," *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q7.4.1-Q7.4.6, 2000.
- [1.88] Chang-Ho Oh, Motohiro Ozawa, and Masakiyo Matsumura, "A novel phase-modulated excimer-laser crystallization method of silicon thin films," *Jpn. J. Appl. Phys. Part 2*,

vol. 37, pp. L492-L495, 1998.

- [1.89] H. J. Kim and James S. Im, "New excimer-laser-crystallization method for producing large-grained and grain boundary-location-controlled Si films for thin film transistors," *Appl. Phys. Lett.*, vol. 68, pp. 1513-1515, 1996.
- [1.90] Cheon-Hong Kim, Juhn-Suk Yoo, In-Hyuk Song and Min-Koo Han, "Excimer laser recrystallization of selectively floating a-Si active layer for large-grained poly-Si film," *Mat. Res. Soc. Symp. Proc.*, vol. 664, A6.11.1-A6.11.6 , 2001.
- [1.91] I-Wei Wu, Alan G. Lewis, Tiao-Yuan Huang, Warren B. Jackson, and Anne Chiang, "Mechanism and device-to-device variation of leakage current in polysilicon thin film transistors," in *IEDM Tech. Dig.*, 1990, pp. 867-870.
- [1.92] K. R. Olasupo, M. K. Hatalis, "Leakage current mechanism in sub-micron polysilicon thin-film transistors," *IEEE Trans. Electron Devices*, vol. 43, pp. 1218-1223, 1996.
- [1.93] M. Lack, I-W. Wu, T. J. King, A. G. Lewis, "Analysis of leakage currents in poly-silicon thin film transistors," in *IEDM Tech. Dig.*, 1993, pp. 385-388.
- [1.94] M. Hack, and A. G. Lewis, "Avalanche-induced effects in polysilicon thin-film transistors," *IEEE Electron Device Lett.*, vol. 12, pp. 203-205, 1991.
- [1.95] Anish Kumar K. P., Johnny K. O. Sin, Cuong T. Nguyen, and Ping K. Ko," Kink-free polycrystalline silicon double-gate elevated-channel thin-film transistors," *IEEE Trans. Electron Devices*, vol. 45, pp. 2514-2519, 1998.
- [1.96] S. D. Zhang, C. X. Zhu, Johnny K. O. Sin, J. N. Li, and Philip K. T. Mok," Ultra-thin elevated channel poly-Si TFT technology for fully-integrated AMLCD system on glass," *IEEE Trans. Electron Devices*, vol. 47, pp. 569-574, 2000.
- [1.97] T. J. King, K. C. Saraswat, " Polycrystalline Silicon-Germanium Thin-Film Transistors," *IEEE Trans. Electron Devices*, vol. 41, pp. 1581-1591, 1994.
- [1.98] Andrew J Tang, Julie A Tsai, and Rafael Reif, "A Novel Poly-Silicon-Capped Poly-Silicon-Germanium Thin Film Transistor", in *IEDM Tech. Dig.*, 1995, pp.

513-516.

- [1.99] Julie A. Tsai, Andrew J. Tang, Takashi Noguchi, and Rafael Reif, " Effects of Ge on Material and Electrical Properties of Polycrystalline  $\text{Si}_{1-x}\text{Ge}_x$  for Thin-Film Transistors, *J. Electrochem. Soc.*, vol. 142, pp.3220-3225, 1995.
- [1.100] F. Edelman, R. Weil, P. Werner, M. Reiche, and W. Beyer," Crystallization of amorphous hydrogenated  $\text{Si}_{1-x}\text{Ge}_x$  Films," *Phys. Stat. Sol.*, vol.140, pp. 407-425, 1995.
- [1.101] A. Rodriguez, J. Olivares, J. Sangrador, T. Rodriguez, C. Ballesteros, M. Castro, and R. M. Gwilliam," Structural improvement of SiGe films by C and F implantation and solid phase crystallization," *Thin Solid Film*, vol. 383, pp. 113-116, 2001.
- [1.102] S. Yamaguchi, N. Sugii, S. K. Park, K. Nakagawa, and M. Miyao," Solid-phase crystallization of  $\text{Si}_{1-x}\text{Ge}_x$  alloy lasers," *J. Appl. Phys.*, vol. 89, pp. 2091-2095, 2001.

## Chapter 2:



- [2.1] S. Morozumi, K. Oguchi, S. Yazama, T. Kodaira, H. Ohshima, and T. Mano, in *SID Digest*, 1983, pp.156-159.
- [2.2] A. Kohno, T. Sameshima, N. Sano, M. Sekiya, and M. Hara," High performance poly-Si TFTs fabricated using pulsed laser annealing and remote plasma CVD with low temperature processing," *IEEE Trans. Electron Devices*, vol. 42, pp. 251-257, 1995.
- [2.3] Miltiadis K. Hatalis and David W. Greve, "Large grain polycrystalline silicon by low-temperature annealing of low-pressure chemical vapor deposited amorphous silicon films," *J. Appl. Phys.*, vol. 63, pp. 2260-2266, 1988.
- [2.4] D. K. Sohn, J. N. Lee, S. W. Kang, and Byung Tae Ahn," Low-Temperature Crystallization of Amorphous Si Films by Metal Adsorption and Diffusion," *Jpn. J Appl. Phys.*, vol. 35, pp. 1005-1009, 1996.
- [2.5] B. I. Lee, K. H. Kim, W. C. Jeong, J. W. Shin, P. S. Ahn, and S. K. Joo, *Korean J. Mater.*

*Res.*, vol. 6, pp. 900, 1996.

- [2.6] T. J. King and K. C. Saraswat, "A low-temperature silicon-germanium MOS thin-film transistor technology for large-area electronics," in IEDM Tech. Dig., 1991, pp. 567-570.
- [2.7] P. M. Smith, P. G. Carey, and T. W. Sigmon, "Excimer laser crystallization and doping of silicon films on plastic substrates," *Appl. Phys. Lett.*, vol. 70, pp. 342-344, 1997.
- [2.8] S. D. Brotherton, D. J. McCulloch, J. P. Gowers, J. R. Ayres, C. A. Fisher, and F. W. Rohlfing, "Excimer laser crystallization of poly-Si TFTs for AMLCDs," *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q7.1.1-Q7.1.12, 2000.
- [2.9] James S. Im, H. J. Kim, and Michael O. Thompson, "Phase transformation mechanisms involved on excimer laser crystallization of amorphous silicon films," *Appl. Phys. Lett.*, vol. 63, pp. 1969-1971, 1993.
- [2.10] James S. Im and H. J. Kim, "On the super lateral growth phenomenon observed in excimer laser-induced crystallization of thin Si films," *Appl. Phys. Lett.*, vol. 64, pp. 2303-2305, 1994.
- [2.11] M. J. Powell, S. C. Deane, I. D. French, J. R. Hughes, W. I. Milne, *Philosophical Magazine B*, vol. 63, pp.325, 1991.
- [2.12] P. R. S. Rao, K. Remashan, K. R. Suryaprasad, K. N. Bhat and K. S. Chari, "Optimization of PECVD silicon oxynitride for silicon MIS devices with low interface state density," *Solid-State Electronics*, vol. 39, pp.1808-1810, 1996.
- [2.13] M. Ikeda, H. Nagayoshi, Y. Onozawa, T. Saitoh and K. Kamisako, "Analysis of the effect of hydrogen-radical annealing for  $\text{SiO}_2$  passivation," *Sol. Energy Mater. & Sol. Cells*, vol. 48, pp.109-115, 1997.
- [2.14] C. H. Kao, C. S. Lai, and C. L. Lee, "The TEOS oxide deposited on phosphorus in-situ/ $\text{POCl}_3$  doped polysilicon with rapid thermal annealing in  $\text{N}_2\text{O}$ ," *IEEE Trans. Electron Devices*, vol. 45, pp.1927-1933, 1998.

- [2.15] N. Bhat, A. W. Wang, and K. C. Saraswat, "Rapid thermal anneal of gate oxides for low thermal budget TFT's," *IEEE Trans. Electron Devices*, vol. 46, pp.63-69, 1999.
- [2.16] C. W. Lin, M. Z. Yang, C. C. Yeh, L. J. Cheng, T. Y. Huang, H. C. Cheng, H. C. Lin, T. S. Chao, and C. Y. Chang, "Effects of plasma treatments, substrate types, and crystallization methods on performance and reliability of low temperature polysilicon TFTs," in *IEDM Tech. Dig.*, 1999, pp. 305-308.
- [2.17] H. Kuriyama, S. Kiyama, S. Noguchi, T. Kuwahara, S. Ishida, T. Nohda, K. Sano, H. Iwata, H. Kawata, M. Osumi, S. Tsuda, S. Nakano, and Y. Kuwano," Enlargement of Poly-Si Film Grain Size by Excimer Laser Annealing and Its Application to High-Performance Poly-Si Thin Film Transistor," *Jpn. J Appl. Phys.*, vol. 30, pp. 3700-3703, 1991.
- [2.18] H. Kuriyama, S. Kiyama, S. Noguchi, T. Kuwahara, S. Ishida, T. Nohda, K. Sano, H. Iwata, S. Tsuda, and S. Nakano," High Mobility Poly-Si TFT by a New Excimer Laser Annealing Method for Large Area Electronics," in *IEDM*, 1991, pp. 563-566.
- [2.19] James S. Im, H. J. Kim, and Michael O. Thompson, "Phase transformation mechanisms involved on excimer laser crystallization of amorphous silicon films," *Appl. Phys. Lett.*, vol. 63, pp. 1969-1971, 1993.
- [2.20] James S. Im and H. J. Kim, "On the super lateral growth phenomenon observed in excimer laser-induced crystallization of thin Si films," *Appl. Phys. Lett.*, vol. 64, pp. 2303-2305, 1994.
- [2.21] D. G. Schimmel, "A comparison of chemical etches for revealing (100) silicon crystal defects," *J. Electrochem. Soc.*, vol. 123, pp. 734-741, 1976.
- [2.22] D. J. McCulloch and S. D. Brotherton, "Surface roughness effects in laser crystallized polycrystalline silicon," *Appl. Phys. Lett.*, vol. 66, pp. 2060-2062, 1995.
- [2.23] D. K. Fork, G. B. Anderson, J. B. Boyce, R. I. Johnson, and P. Mei, "Capillary waves in pulsed excimer laser crystallized amorphous silicon," *Appl. Phys. Lett.*, vol. 68, pp.

2138-2140, 1996.

- [2.24] H. Kuriyama, T. Kuwahara, S. Ishida, T. Nohda, K. Sano, H. Iwata, S. Noguchi, S. Kiyama, S. Tsuda, S. Nakano, M. Osumi, Y. Kuwano, "Improving the uniformity of poly-Si films using a new excimer laser annealing method for giant-microelectronics," *Jpn. J Appl. Phys.*, vol. 31, pp. 4550-4554, 1992.
- [2.25] A. G. Lewis, I. W. Wu, T Y. Huang, M. Koyanagi, A. Chiang, and R. H. Bruce, "Small geometry effects in N- and P-channel polysilicon thin film transistors," in *IEDM Tech. Dig.*, 1988, pp.260-263.
- [2.26] M. Hack and A. G. Lewis, "Avalanche-induced effects in polysilicon thin-film transistors," *IEEE Electron Device Lett.*, vol. 12, pp. 203-205, 1991.
- [2.27] A. G. Lewis, T Y. Huang , I. W. Wu, ,R. H. Bruce, and A. Chiang, "Physical mechanisms for short channel effects in polysilicon thin film transistors," in *IEDM Tech. Dig.*, 1989, pp. 349-352.
- [2.28] Z. J. Ma, Z. H. Liu, J. T. Crick, H. J. Huang, Y. C. Cheng, C. Hu, and P. K. Ko, "Optimization of gate oxide N<sub>2</sub>O anneal for CMOSFET's at room and cryogenic temperatures," *IEEE Trans. Electron Devices*, vol. 41, pp.1364-1372, 1994.
- [2.29] K. Machida, N. Shimoyama, J. Takahashi, E. Arai and N. Yabumoto, *Proc. 10th Int. IEEE VLSI Multilevel Interconnection Conf.*, 1993, pp. 103-106.
- [2.30] Y. C. Chen, M. Z. Yang, I.C. Tung, M. P. Chen, M. S. Feng, H. C. Cheng, and C. Y. Chang, "Effects of O<sub>2</sub>- and N<sub>2</sub>O-plasma treatments on properties of plasma-enhanced-chemical-vapor-deposition tetraethylorthosilicate oxide," *Jpn. J. Appl. Phys.*, vol. 38, pp.4226-4232, 1999.
- [2.31] P. P. Apte, and K. C. Saraswat, "Correlation of trap generation to charge-to-breakdown (Q<sub>bd</sub>): a physical-damage model of dielectric breakdown," *IEEE Trans. Electron Devices*, vol. 41, pp.1595-1602, 1994.
- [2.32] N. Bhat, M. Cao, and K. C. Saraswat, "Bias temperature instability in hydrogenated

thin-film transistors," *IEEE Trans. Electron Devices*, vol. 44, pp.1102-1108, 1997.

## Chapter 3:

- [3.1] Jun Hanari, "Development of a 10.4-in. UXGA display using low-temperature poly-Si technology," *Journal of the SID*, vol. 10, pp. 53-56, 2002.
- [3.2] Yasuhisa Oana, "Current and future technology of low-temperature poly-Si TFT-LCDs," *Journal of the SID*, vol. 9, pp. 169-172, 2001.
- [3.3] Kiyoshi Yoneda, Hidenori Ogata, Shinji Yuda, Kohji Suzuki, Toshifumi Yamaji, Shiro Nakanishi, Tsutomu Yamada, and Yoshihiro Morimoto, "Optimization of low-temperature poly-Si TFT-LCDs and a large-scale production line for large glass substrates," *Journal of the SID*, vol. 9, pp. 173-179, 2001.
- [3.4] J. G. Blake, J. D. III Stevens, and R. Young, "Impact of low temperature polysilicon on the AMLCD market," *Solid State Tech.*, vol. 41, pp. 56-62, 1998.
- [3.5] Y. Aoki, T. Lizuka, S. Sagi, M. Karube, T. Tsunashima, S. Ishizawa, K. Ando, H. Sakurai, T. Ejiri, T. Nakazono, M. Kobayashi, H. Sato, N. Ibaraki, M. Sasaki, and N. Harada, "A 10.4-in. XGA low-temperature poly-Si TFT-LCD for mobile PC applications," in *SID Tech. Dig.*, 1999, pp. 176-179.
- [3.6] H. J. Kim, D. Kim, J. H. Lee, I. G. Kim, G. S. Moon, J. H. Huh, J. W. Hwang, S. Y. Joo, K. W. Kim, and J. H. Souk, "A 7-in. full-color low-temperature poly-Si TFT-LCD," in *SID Tech. Dig.*, 1999, pp. 184-187.
- [3.7] Y. Matsueda, T. Ozawa, M. Kimura, T. Itoh, K. Kitwada, T. Nakazawa, H. Ohsima, "A 6-bit-color VGA low-temperature poly-Si TFT-LCD with integrated digital data drivers," in *SID Tech. Dig.*, 1998, pp. 879-882.
- [3.8] Mutsumi Kimura, Ichio Yudasaka, Sadao Kanbe, Hidekazu Kobayashi, Hiroshi Kiguchi, Shun-ichi Seki, Satoru Miyashita, Tatsuya Shimoda, Tokuro Ozawa, Kiyofumi

Kitawada, Takashi Nakazawa, Wakao Miyazawa, and Hiroyuki Ohshima, “Low-temperature polysilicon thin-film transistor driving with integrated driver for high-resolution light emitting polymer display,” *IEEE Trans. Electron Devices*, vol. 46, pp. 2282-2288, 1999.

[3.9] Mark Stewart, Robert S. Howell, Leo Pires, Miltiadis K. Hatalis, Webster Howard, and Olivier Prache, “Polysilicon VGA active matrix OLED displays – technology and performance,” in *IEDM Tech. Dig.*, 1998, pp. 871-874.

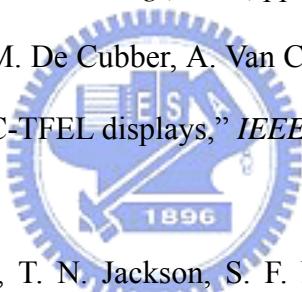
[3.10] Mark Stewart, Robert S. Howell, Leo Pires, and Miltiadis K. Hatalis, “Polysilicon TFT technology for active matrix OLED displays,” *IEEE Trans. Electron Devices*, vol. 48, pp. 845-851, 2001.

[3.11] Tatsuya Sasaoka, Mitsunobu Sekiya, Akira Yumoto, Jiro Yamada, Takashi Hirano, Yuichi Iwase, Takao Yamada, Tadashi Ishibashi, Takao Mori, Mitsuru Asano, Shinichiro Tamura, and Tetsuo Urabe, “A 13.0-inch AM-OLED display with top emitting structure and adaptive current mode programmed pixel circuit (TAC),” in *SID Tech. Dig.*, 2001, pp. 384-387.

[3.12] Zhiguo Meng, Haiying Chen, Chengfeng Qiu, Hoi S. Kwok, and Man Wong, “Active-matrix organic light-emitting diode display implemented using metal-induced unilaterial crystallized polycrystalline silicon thin-film transistors,” in *SID Tech. Dig.*, 2001, pp. 380-383.

[3.13] Zhiguo Meng and Man Wong, “Active-matrix organic light-emitting diode displays realized using metal-induced unilaterally crystallized polycrystalline silicon thin-film transistors,” *IEEE Trans. Electron Devices*, vol. 49, pp. 991-996, 2002.

[3.14] G. Rajeswaran, M. Itoh, M. Boroson, S. Barry, T. K. Hatwar, K. B. Kahn, K. Yoneda, R. Yokoyama, T. Yamada, N. Komiya, H. Kanno, and H. Takahashi, “Active matrix low temperature poly-Si TFT / OLED full color displays: development status,” in *SID Tech. Dig.*, 2000, pp. 974-977.

- [3.15] P. M. Smith, P. G. Carey, and T. W. Sigmon, “Excimer laser crystallization and doping of silicon films on plastic substrates,” *Appl. Phys. Lett.*, vol. 70, pp. 342-344, 1997.
- [3.16] S. D. Brotherton, D. J. McCulloch, J. P. Gowers, J. R. Ayres, C. A. Fisher, and F. W. Rohlfing, “Excimer laser crystallization of poly-Si TFTs for AMLCDs,” *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q7.1.1-Q7.1.12, 2000.
- [3.17] A. Hara, F. Takeuchi, and N. Sasaki, “Mobility enhancement limit of excimer-laser-crystallized polycrystalline silicon thin film transistor,” *J. Appl. Phys.*, Vol. 91, pp. 708-714, 2002.
- [3.18] T. Fujimura, A. Takami, A. Ishida, S. Kawamura, and T. Nishibe, “Reliability improvement of TFTs with thin gate insulator films by smoothing polycrystalline silicon surface roughness,” in *AMLCD Tech. Dig.*, 2001, pp. 175-178.
- [3.19] J. De Vos, H. De Smet, A. M. De Cubber, A. Van Calster, “High-voltage CdSe-Ge TFT driver circuits for passive AC-TFEL displays,” *IEEE J. Solid-State Circuits*, vol. 34 , pp. 228-232. 1999.
- 
- [3.20] D. J. Gundlach, Y. Y. Lin, T. N. Jackson, S. F. Nelson, D. G. Schlom, “Pentacene organic thin-film transistors-molecular ordering and mobility,” *IEEE Electron Device Lett.*, vol. 18, pp. 87-89, 1997.
- [3.21] I. Kymissis and A. I. Akinwande, “Organic TFT controlled organic field emitter,” in *Vacuum Microelectronics Conference Tech. Dig.*, 2003. pp. 37 – 38.
- [3.22] K. S. Choi and M. Matsumura, “Poly-Si/poly-SiC<sub>x</sub> heterojunction thin-film transistors,” *IEEE Trans. Electron Devices*, vol. 45, pp. 401-405, 1998.
- [3.23] S. M. Choe, J. A. Ahn, and O. Y. Kim, “Fabrication of laser-annealed poly-TFT by forming a Si<sub>1-x</sub>Ge<sub>x</sub> thermal barrier,” *IEEE Electron Device Lett.*, vol. 22 , pp. 121-123, 2001.
- [3.24] V. Subramanian and K. C. Saraswat, “Optimization of silicon-germanium TFT's through the control of amorphous precursor characteristics,” *IEEE Trans. Electron*

*Devices*, vol. 45, pp. 1690-1695, 1998.

- [3.25] Z. H. Jin, H. S. Kwok, and M. Wong, “High-performance polycrystalline SiGe thin-film transistors using  $\text{Al}_2\text{O}_3$  gate insulators,” *IEEE Electron Device Lett.*, vol. 19, pp. 502-504, 1998.
- [3.26] T. J. King and K. C. Saraswat, “Polycrystalline silicon-germanium thin-film transistors,” *IEEE Trans. Electron Devices*, vol. 41, pp. 1581-1591, 1994.
- [3.27] T. J. King, K. C. Saraswat, and J. R. Pfeister, “PMOS transistors in LPCVD polycrystalline silicon-germanium films,” *IEEE Electron Device Lett.*, vol. 12, pp. 584-586, 1991.
- [3.28] T. J. King and K. C. Saraswat, “low-temperature ( $<500^\circ\text{C}$ ) silicon-germanium MOS thin-film transistor technology for large-area electronics,” in *IEDM Tech. Dig.*, pp. 567-570, 1991.
- [3.29] G. Ternent, A. Asenov, L. G. Thayne, and MacIntyre, “ $\text{Si}_{1-x}\text{Ge}_x$  p-channel MOSFETs with tungsten gate,” *IEEE Electron Device Lett.*, vol. 35, pp. 430-431, 1999.
- [3.30] K. C. Liu, S. K. Ray, and S. K. Oswal, “Enhancement of drain current in vertical  $\text{Si}_{1-x}\text{Ge}_x/\text{Si}$  PMOS transistors using novel CMOS technology,” in *Device Research Conference Dig.*, 1997, pp. 128-129.
- [3.31] S. P. Voinigescu and C. A. T. Salama, “Optimized Ge channel profiles for VLSI compatible  $\text{Si}/\text{Si}_{1-x}\text{Ge}_x$  p-MOSFETs,” in *IEDM Tech. Dig.*, 1994, pp. 369-372.
- [3.32] K. Washio, E. Ohue, R. Hayami, A. Kodama, H. Shimamoto, M. Miura, K. Oda, I. Suzumura, T. Tominari, and T. Hashimoto, “High-speed scaled-down self-aligned SEG SiGe HBTs,” *IEEE Trans. Electron Devices*, vol. 50, pp. 2417-2424, 2003.
- [3.33] K. Washio, “SiGe HBT and BiCMOS technologies for optical transmission and wireless communication systems,” *IEEE Trans. Electron Devices*, vol. 50, pp. 656-668, 2003.
- [3.34] Z. Q. Ma, S. Mohammadi, P. Bhattacharya, L. P. B. Katehi, S. A. Alterovitz, and G. E.

Ponchak, “A high-power and high-gain X-band Si/SiGe/Si heterojunction bipolar transistor,” *IEEE Trans. Microwave Theory and Techniques*, vol. 50, pp. 1101-1108, 2002.

[3.35] S. P. O. Bruce, A. Rydberg, M. Kim, F. J. Beisswanger, J. F. Luy, H. Schumacher, U. Erben, M. Willander, and M. Karlsteen, “Design and realization of a millimeter-wave Si/SiGe HBT frequency multiplier,” *IEEE Trans. Microwave Theory and Techniques*, vol. 46, pp. 695-700, 1998.

[3.36] P. Abele, M. Zeuner, I. Kallfass, J. Muller, H. L. Hiwilepo, T. Hackbarth, D. Chrastina, H. von Kanel, U. Konig, and H. Schumacher, “32 GHz MMIC distributed amplifier based on n-channel SiGe MODFETs,” *Electronics Letters*, vol. 39, pp. 1448-1449, 2003.

[3.37] M. Saxarra, M. Gluck, J. N. Albers, D. Behammer, U. Langmann, and U. Konig, “Transimpedance amplifiers based on Si/SiGe MODFETs,” *Electronics Lett.*, vol. 34, pp.499-500, 1998.

[3.38] M. Arafa, K. Ismail, P. Fay, J. O. Chu, B. S. Meyerson, and I. Adesida, “High-transconductance p-type SiGe modulation-doped field-effect transistor,” *Electronics Lett.*, vol. 31, pp. 680-681, 1995.

[3.39] A. J. Joseph, J. D. Cressler, “Optimization of SiGe HBT’s for operation at high current densities,” *IEEE Trans. Electron Devices*, vol. 46, pp. 1347–1354, July 1999.

[3.40] P. E. Hellberg and S. L. Zhang, “Work function of boron-doped polycrystalline  $\text{Si}_{1-x}\text{Ge}_x$  films,” *IEEE Electron Device Lett.* , vol. 18, pp. 456 -458, 1997.

[3.41] A. Nishiyama, and K. Matsuzawa, “SiGe Source/Drain structure for the suppression of the short-channel effect of cub-0.1- $\mu\text{m}$  p-channel MOSFETs” *IEEE Trans. Electron Deices*, vol. 48, pp. 1114-1120, 2001.

[3.42] Y. C. Yeo, V. Subramanian, and C. Hu, “Nanoscale ultra-thin-body silicon-on-insulator

p-MOSFET with a SiGe/Si heterostructure channel," *IEEE Electron Device Lett.*, vol. 21, pp. 161–163, 2000.

[3.43] V. Z. Q. Li, M. R. Mirabedini, B. E. Hornung, H. H. Heinisch, M. Xu, D. Batchelor, D. M. Maher, J. J. Wortman, and R. T. Kudhn, "Structure and properties of rapid thermal chemical vapor deposited polycrystalline silicon-germanium films on  $\text{SiO}_2$  using  $\text{Si}_2\text{H}_6$ ,  $\text{GeH}_4$ , and  $\text{B}_2\text{H}_6$  gases," *J. Appl. Phys.*, vol. 83, pp. 5469-5476 , 1998.

[3.44] S. Yamaguchi, N. Sugii, S. K. Park, K. Nakagawa, and M. Miyao, "Solid-phase crystallization of  $\text{Si}_{1-x}\text{Ge}_x$  alloy layers," *J. Appl. Phys.*, vol. 89, pp. 2091-2095, 2001.

[3.45] T. J. King, J. P. McVittie, K. C. Saraswat, and J. R. Pfeister, "Electrical Properties of heavily doped polycrystalline silicon-germanium films," *IEEE Trans. Electron Devices*, vol. 41, pp.228-232, 1994.

[3.46] J. B. Rem, M. C. V. de Leuw, J. Holleman, and J. F. Verweij, "Furnace and rapid thermal crystallization of amorphous  $\text{Ge}_x\text{Si}_{1-x}$  and Si for thin film transistors," *Thin Solid Films*, vol. 296, pp. 152-156, 1997.

[3.47] C. W. Hwang, M. K. Ryu, K. B. Kim, S. C. Lee, and C. S. Kim, "Solid phase crystallization of amorphous  $\text{Si}_{1-x}\text{Ge}_x$  films deposited on  $\text{SiO}_2$  by molecular beam epitaxy," *J. Appl. Phys.*, vol. 77, pp. 3042-3047, 1995.

[3.48] J. R. Abelson, T. W. Sigmon, K. B. Kim, and K. H. Weiner, "Epitaxial  $\text{Ge}_x\text{Si}_{1-x}/\text{Si}$  (100) structures produced by pulsed laser mixing of evaporated Ge on Si (100) substrates," *Appl. Phys. Lett.*, vol. 52, pp. 230-232 , 1988.

[3.49] A. J. Yu, J. W. Mayer, D. J. Eaglesham, and J. M. Poate, "Ion beam induced epitaxy of deposited amorphous Si and Si-Ge films," *Appl. Phys. Lett.*, vol. 54, pp. 2342-2344, 1989.

[3.50] J. S. Im, H. J. Kim, and Michael O. Thompson, "Phase transformation mechanisms involved on excimer laser crystallization of amorphous silicon films," *Appl. Phys. Lett.*,

vol. 63, pp. 1969-1971, 1993.

[3.51] J. S. Im and H. J. Kim, "On the super lateral growth phenomenon observed in excimer laser-induced crystallization of thin Si films," *Appl. Phys. Lett.*, vol. 64, pp. 2303-2305, 1994.

[3.52] A. Slaoui, C. Deng, S. Talwar, J. K. Kramer, B. Prevot, and T. W. Sigmon, "Excimer laser induced crystallization of amorphous silicon-germanium films," in *Mater. Res. Soc. Symp. Proc.*, vol. 321, 1994, pp. 689-694.

[3.53] A. Slaoui, C. Deng, S. Talwar, J. K. Kramer, T. W. Sigmon, J. P. Stoquert, and B. Prevot, "Formation of poly-Si<sub>1-x</sub>Ge<sub>x</sub> using excimer-laser processing," *Appl. Surf. Sci.*, vol. 86, pp. 346-352, 1995.

[3.54] J. B. Rem, C. Salm, J. H. Klootwijk, M. H. H. Weusthof, J. Holleman, and J. F. Verweij, *Mater. Res. Soc. Symp. Proc.*, vol. 387, 1995, pp. 323.

[3.55] Y. L. Zhong, M. C. Ozturk, D. T. Grider, J. J. Wortman, and M. A. Littlejohn, "Selective low-temperature chemical vapor deposition of Si<sub>1-x</sub>Ge<sub>x</sub> alloys in a rapid thermal processor using dichlorosilane and germane," *Appl. Phys. Lett.*, vol. 57, pp. 2092-2094, 1990.

[3.56] D. T. Grider, Ph.D. thesis, North Carolina State University, 1993.

[3.57] V. Z. Q. Li, M. R. Mirabedini, R. T. Kudhn, D. Gladden, D. Batchelor, K. Christenson, J. J. Wortman, M. C. Ozturk, and D. M. Maher, *1995 MRS Fall Meeting, Polycrystalline Thin Films II-Structure, Texture, Properties, and Applications*, vol. 403, 1995, pp. 333-338..

[3.58] J. A. Tsai and R. Reif, in *Mechanisms of Thin Films Evolution*, edited by S. M. Yalisove, C. V. Thompson, and D. J. Eaglesham, vol. 317, pp. 603, 1994.

[3.59] J. A. Tsai, A. J. Tang, and R. Reif, in *Polycrystalline Thin Films- structure, Texture, Properties and Applications*, edited by M. Parker, J. Floro, K. Barmak, R. Sinclair, and D. A. Smith, vol. 343, pp. 679, 1994.

- [3.60] P. M. Garone, J. C. Sturm, and P. V. Schwatz, "Silicon vapor phase epitaxial growth catalysis by the presence of germane," *Appl. Phys. Lett.*, vol. 56, pp. 1275-1277, 1990.
- [3.61] M. Cao, T. J. King, and K. C. Saeaswat, "Determination of the densities of gap states in hydrogenated polycrystalline Si and  $\text{Si}_{0.8}\text{Ge}_{0.2}$  films," *Appl. Phys. Lett.*, vol. 61, pp. 672-674, 1992.
- [3.62] G. Y. Yang, S. H. Hur, and C. H. Han, "A physical-based analytical turn-on model of polysilicon thin-film transistors for circuit simulation," *IEEE Trans. Electron Devices*, vol. 46, pp. 165-172, 1999.
- [3.63] I. W. Wu, T. Y. Huang, W. B. Jackson, A. G. Lewis, and A. Chiang, "Passivation kinetics of two types of defects in polysilicon TFT by plasma hydrogenation," *IEEE Electron Device Lett.*, vol. 12, pp. 181-183, 1991.
- [3.64] M. Hack, and A. G. Lewis, "Avalanche-induced effects in polysilicon thin-film transistors," *IEEE Electron Device Lett.*, vol. 12, pp. 203-205, 1991.
- [3.65] M. Valdinoci, L. Colalongo, G. Baccarani, G. Fortunato, A. Pecora, and I. Policicchio, "Floating body effects in polysilicon thin-film transistors," *IEEE Trans. Electron Devices*, vol. 44, pp. 2234-2241, 1997.

## Chapter 4:

- [4.1] Jun Hanari, "Development of a 10.4-in. UXGA display using low-temperature poly-Si technology," *Journal of the SID*, vol. 10, pp. 53-56, 2002.
- [4.2] Yasuhisa Oana, "Current and future technology of low-temperature poly-Si TFT-LCDs," *Journal of the SID*, vol. 9, pp. 169-172, 2001.
- [4.3] Kiyoshi Yoneda, Hidenori Ogata, Shinji Yuda, Kohji Suzuki, Toshifumi Yamaji, Shiro Nakanishi, Tsutomu Yamada, and Yoshihiro Morimoto, "Optimization of low-temperature poly-Si TFT-LCDs and a large-scale production line for large glass

substrates," *Journal of the SID*, vol. 9, pp. 173-179, 2001.

[4.4] J. G. Blake, J. D. III Stevens, and R. Young, "Impact of low temperature polysilicon on the AMLCD market," *Solid State Tech.*, vol. 41, pp. 56-62, 1998.

[4.5] Y. Aoki, T. Lizuka, S. Sagi, M. Karube, T. Tsunashima, S. Ishizawa, K. Ando, H. Sakurai, T. Ejiri, T. Nakazono, M. Kobayashi, H. Sato, N. Ibaraki, M. Sasaki, and N. Harada, "A 10.4-in. XGA low-temperature poly-Si TFT-LCD for mobile PC applications," in *SID Tech. Dig.*, 1999, pp. 176-179.

[4.6] H. J. Kim, D. Kim, J. H. Lee, I. G. Kim, G. S. Moon, J. H. Huh, J. W. Hwang, S. Y. Joo, K. W. Kim, and J. H. Souk, "A 7-in. full-color low-temperature poly-Si TFT-LCD," in *SID Tech. Dig.*, 1999, pp. 184-187.

[4.7] Y. Matsueda, T. Ozawa, M. Kimura, T. Itoh, K. Kitwada, T. Nakazawa, H. Ohsima, "A 6-bit-color VGA low-temperature poly-Si TFT-LCD with integrated digital data drivers," in *SID Tech. Dig.*, 1998, pp. 879-882.

[4.8] Mutsumi Kimura, Ichio Yudasaka, Sadao Kanbe, Hidekazu Kobayashi, Hiroshi Kiguchi, Shun-ichi Seki, Satoru Miyashita, Tatsuya Shimoda, Tokuro Ozawa, Kiyofumi Kitawada, Takashi Nakazawa, Wakao Miyazawa, and Hiroyuki Ohshima, "Low-temperature polysilicon thin-film transistor driving with integrated driver for high-resolution light emitting polymer display," *IEEE Trans. Electron Devices*, vol. 46, pp. 2282-2288, 1999.

[4.9] Mark Stewart, Robert S. Howell, Leo Pires, Miltiadis K. Hatalis, Webster Howard, and Olivier Prache, "Polysilicon VGA active matrix OLED displays – technology and performance," in *IEDM Tech. Dig.*, 1998, pp. 871-874.

[4.10] Mark Stewart, Robert S. Howell, Leo Pires, and Miltiadis K. Hatalis, "Polysilicon TFT technology for active matrix OLED displays," *IEEE Trans. Electron Devices*, vol. 48, pp. 845-851, 2001.

[4.11] Tatsuya Sasaoka, Mitsunobu Sekiya, Akira Yumoto, Jiro Yamada, Takashi Hirano,

Yuichi Iwase, Takao Yamada, Tadashi Ishibashi, Takao Mori, Mitsuru Asano, Shinichiro Tamura, and Tetsuo Urabe, “A 13.0-inch AM-OLED display with top emitting structure and adaptive current mode programmed pixel circuit (TAC),” in *SID Tech. Dig.*, 2001, pp. 384-387.

[4.12] Zhiguo Meng, Haiying Chen, Chengfeng Qiu, Hoi S. Kwok, and Man Wong, “Active-matrix organic light-emitting diode display implemented using metal-induced unilaterial crystallized polycrystalline silicon thin-film transistors,” in *SID Tech. Dig.*, 2001, pp. 380-383.

[4.13] Zhiguo Meng and Man Wong, “Active-matrix organic light-emitting diode displays realized using metal-induced unilaterally crystallized polycrystalline silicon thin-film transistors,” *IEEE Trans. Electron Devices*, vol. 49, pp. 991-996, 2002.

[4.14] G. Rajeswaran, M. Itoh, M. Boroson, S. Barry, T. K. Hatwar, K. B. Kahn, K. Yoneda, R. Yokoyama, T. Yamada, N. Komiya, H. Kanno, and H. Takahashi, “Active matrix low temperature poly-Si TFT / OLED full color displays: development status,” in *SID Tech. Dig.*, 2000, pp. 974-977.

[4.15] T. Nishibe, ” Low-temperature poly-Si TFT by excimer laser annealing,” in *Proc. Mat. Res. Soc. Symp.*, vol. 685E, 2001, pp. D6.1.1-D6.1.5.

[4.16] H. Kuriyama, S. Kiyama, S. Noguchi, T. Kuwahara, S. Ishida, T. Nohda, K. Sano, H. Iwata, H. Kawata, M. Osumi, S. Tsuda, S Nakano, and Y. Kuwano,” Enlargement of poly-Si film grain size by excimer laser annealing and its application to high-performance poly-Si thin film transistor, ” *Jpn. J. Appl. Phys.* vol.30, pp. 3700-3703, 1991.

[4.17] A. Kohno, T. Sameshima, N. Sano, M. Sekiya, and M. Hara,“ High performance poly-Si TFTs fabricated using pulsed laser annealing and remote plasma CVD with low temperature processing,” *IEEE Trans. Electron Devices*, vol. 42, pp. 251-257, 1995.

[4.18] A. Hara, F. Takeuchi, and N. Sasaki, “Mobility enhancement limit of

excimer-laser-crystallized polycrystalline silicon thin film transistor," *J. Appl. Phys.*, Vol. 91, pp. 708-714, 2002.

- [4.19] T. Fujimura, A. Takami, A. Ishida, S. Kawamura, and T. Nishibe, "Reliability improvement of TFTs with thin gate insulator films by smoothing polycrystalline silicon surface roughness," in *AMLCD Tech. Dig.*, 2001, pp. 175-178.
- [4.20] T. J. King, K. C. Saraswat, and J. R. Pfeister, "PMOS transistors in LPCVD polycrystalline silicon-germanium films," *IEEE Electron Device Lett.*, vol. 12 p.p. 584-586, 1991.
- [4.21] J. B. Rem, M. C. V. de Leuw, J. Holleman, and J. F. Verweij, "Furnace and rapid thermal crystallization of amorphous  $\text{Ge}_x\text{Si}_{1-x}$  and Si for thin film transistors," *Thin Solid Films*, vol. 296, pp.152-156, 1997.
- [4.22] Andrew J Tang, Julie A Tsai, and Rafael Reif, "A novel poly-silicon-capped poly-silicon-germanium thin film transistor," in *IEDM Tech. Dig.*, 1995, pp. 513-516.
- [4.23] T. J. King, K. C. Saraswat, "Polycrystalline silicon-germanium thin-film transistors," *IEEE Trans. Electron Devices*, vol. 41, pp. 1581-1591, 1994.
- [4.24] S. Jurichich, T. J. King, K. C. Saraswat, and J. Mehlhaff, "Low thermal budget polycrystalline silicon-germanium thin-film transistors fabricated by rapid thermal annealing," *Jap. J. Appl. Phy.*, vol. 33, pp.L1139, 1994.
- [4.25] S. M. Cho, J. A. Ahn, and O. Kim, "Fabrication of laser-annealed poly-TFT by forming a  $\text{Si}_{1-x}\text{Ge}_x$  thermal barrier," *IEEE Electron Device Lett.*, vol. 22, pp. 121-123, 2001.
- [4.26] H. J. Kim and James S. Im, "Multiple pulse irradiation effects in excimer laser-induced crystallization of amorphous Si films," in *Mat. Res. Soc. Symp. Proc.*, vol. 321, 1994, pp. 665-670.
- [4.27] J. B. Rem, C. Salm, J. H. Klootwijk, M. H. H. Weusthof, J. Holleman, and J. F. Verweij, *Mater. Res. Soc. Symp. Proc.*, vol. 387, 1995, pp. 323.
- [4.28] S. R. Stiffler and M. O. Thompson, "Supercooling and nucleation of silicon after laser

melting,” *Physical Review Lett.*, vol. 60, pp. 2519 ~ 2523, 1988.

[4.29] J. S. Im, H. J. Kim, and M. O. Thompson, “Phase transformation mechanisms involved in excimer laser crystallization of amorphous silicon films,” *Appl. Phys. Lett.*, vol. 63, pp. 1970 – 1972, 1993.

[4.30] M. Cao, T. J. King, and K. C. Saeaswat, “Determination of the densities of gap states in hydrogenated polycrystalline Si and  $\text{Si}_{0.8}\text{Ge}_{0.2}$  films,” *Appl. Phys. Lett.*, vol. 61, pp. 672-674, 1992.

[4.31] A. G. Lewis, T. Y. Huang, I. W. Wu, R. H. Bruce, and A. Chiang, ”Physical mechanisms for short channel effects in polysilicon thin film transistors,” in *IEDM Tech. Dig.*, 1989, pp. 349-352.

[4.32] M. Lack, I-W. Wu, T. J. King, A. G. Lewis, “Analysis of leakage currents in poly-silicon thin film transistors,” in *IEDM Tech. Dig.*, 1993, pp. 385-388.

[4.33] K. R. Olasupo, M. K. Hatalis, “Leakage current mechanism in sub-micron polysilicon thin-film transistors,” *IEEE Trans. Electron Devices*, vol. 43, pp. 1218-1223, 1996.

[4.34] S. Seki, O. Kogure, and B. Tsujiyama, “Laser-recrystallized polycrystalline silicon thin film transistors with low leakage current and high switching ratio,” *IEEE Electron Device Lett.*, vol. 8, pp. 434-436, 1987.

[4.35] K. Tanaka, H. Arai, and S. Kohda, “Characteristics of offset-structure polycrystalline-silicon thin-film transistors,” *IEEE Electron Device Lett.*, vol. 9, pp. 23-25, 1988.

[4.36] K. Y. Choi, J. W. Lee, and M. K. Han, “Gate-overlapped lightly doped drain poly-Si thin-film transistors for large area-AMLCD,” *IEEE Trans. Electron Devices*, vol. 45, pp. 1272-1279, 1998.

[4.37] M. Hatano, H. Akimoto, and T. Sakai, “A novel self-aligned gate-overlapped LDD poly-Si TFT with high reliability and performance,” in *IEDM Tech. Dig.*, 1997, pp. 523-526.

- [4.38] K. Ohgata, Y. Mishima, and N. Sasaki, “A new dopant activation technique for poly-Si TFTs with a self-aligned gate-overlapped LDD structure,” in *IEDM Tech. Dig.*, 2000, pp. 205-208.
- [4.39] Y. Mishima and Y. Ebiko, “Improved lifetime of poly-Si TFTs with a self-aligned gate-overlapped LDD structure,” *IEEE Trans. Electron Devices*, vol. 49, pp. 981-985, 2002.
- [4.40] A. Valletta, Luigi Mariucci, Guglielmo Fortunato, S. D. Brotherton, and J. R. Ayres, “Hot carrier-induced degradation of gate overlapped lightly doped drain (GOLDD) polysilicon TFTs,” *IEEE Trans. Electron Devices*, vol. 49, pp. 636-642, 2002.
- [4.41] A. Pecora, F. Massussi, L. Mariucci, G. Fortunato, J. R. Ayres, and S. D. Brotherton, “Numerical analysis of the electrical characteristics of gate overlapped lightly doped drain polysilicon thin film transistors,” *Jpn. J. Appl. Phys.*, vol. 38, pp. 3475-3481, 1999.
- [4.42] M. Hack, and A. G. Lewis, “Avalanche-induced effects in polysilicon thin-film transistors,” *IEEE Electron Device Lett.*, vol. 12, pp. 203-205, 1991.
- [4.43] M. Valdinoci, L. Colalongo, G. Baccarani, G. Fortunato, A. Pecora, and I. Policicchio, “Floating body effects in polysilicon thin-film transistors,” *IEEE Trans. Electron Devices*, vol. 44, pp. 2234-2241, 1997.
- [4.44] I. W. Wu, T. Y. Huang, W. B. Jackson, A. G. Lewis, and A. Chiang, “Passivation kinetics of two types of defects in polysilicon TFT by plasma hydrogenation,” *IEEE Electron Device Lett.*, vol. 12, pp. 181-183, 1991.
- [4.45] C. W. Lin, Y. M. Yang, C. C. Yeh, L. J. Cheng, T. Y. Huang, H. C. Cheng, H. C. Lin, T. S. Chao, and C. Y. Chang, “Effect of plasma treatments, substrate types, and crystallization methods on performance and reliability of low temperature polysilicon TFTs,” in *IEDM Tech. Dig.*, 1999, pp. 305-308.
- [4.46] T. Poiroux, J. L. Pelloie, G. Turban, and G. Reimbold, “Plasma process-induced damage

in SOI devices," in *IEDM Tech. Dig.*, 1999, pp. 97-100.

[4.47] M. Cao, T. J. King, and K. C. Saraswat, "Determination of the densities of gap states in hydrogenated polycrystalline Si and Si<sub>0.8</sub>Ge<sub>0.2</sub> films," *Appl. Phys. Lett.*, vol. 61, pp. 10-12, 1996.

[4.48] M. Stutzmann, R. A. Street, C. C. Tsai, J. B. Boyce, and S. E. Ready, " Structural, optical, and spin properties of hydrogenated amorphous silicon-germanium alloys," *J. Appl. Phys.*, vol. 66, pp 569-592, 1989.

## Chapter 5:

[5.1] H. Kuriyama, S. Kiyama, S. Noguchi, T. Kuwahara, S. Ishida, T. Nohda, K. Sano, H. Iwata, S. Tsuda, and S. Nakano, "High mobility poly-Si TFT by a new excimer laser annealing method for large area electronics," in *IEDM Tech. Dig.*, 1991, pp. 563-566.

[5.2] J. R. Ayres, "Low temperature poly-Si active matrix LCDs," *IEE Colloquium on Novel Display Technologies*, 1995, pp. 3/1.

[5.3] A. Kohno, T. Sameshima, N. Sano, M. Sekiya, and M. Hara, "High performance poly-Si TFTs fabricated using pulsed laser annealing and remote plasma CVD with low temperature processing," *IEEE Trans. Electron Devices*, vol. 42, pp. 251-257, 1995.

[5.4] W. G. Hawkins, "Polycrystalline-silicon device technology for large-area electronics," *IEEE Trans. Electron Devices*, vol. 33, pp. 477-481, 1986.

[5.5] A. Yin and S. J. Fonash, "High-performance p-channel poly-Si TFT's using electron cyclotron resonance hydrogen plasma passivation," *IEEE Electron Device Lett.*, vol. 15, pp. 502-503, 1994.

[5.6] I. W. Wu, "Cell design considerations for high-aperture-ratio direct-view and projection polysilicon TFT-LCDs," in *SID Tech. Dig.*, 1995, pp. 19-22.

[5.7] M. Takabatake, J. Ohwada, Y. A. Ono, K. Ono, A. Mimura, N. Konishi, "CMOS circuits

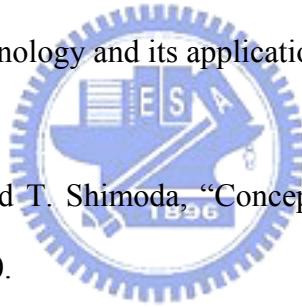
for peripheral circuit integrated poly-Si TFT LCD fabricated at low temperature below 600 degrees C,” *IEEE Trans. Electron Devices*, vol. 38, pp. 1303-1309, 1991.

[5.8] K. Yuda, K. Sera, F. Uesugi, I. Nishiyama, and F. Okumura, “Reliability improvement in low-temperature processed poly-Si TFTs for AMLCDs,” in *IEDM Tech. Dig.*, 1994, pp. 519-522.

[5.9] J. H. Oh, H. J. Chung, N. I. Lee, and C. H. Han, “A high-endurance low-temperature polysilicon thin-film transistor EEPROM cell,” *IEEE Electron Device Lett.*, vol. 21, pp. 304-306, 2000.

[5.10] C. L. Yiu and P. K. T. Mok, “Design of polysilicon TFT operational amplifier for analog TFT AMLCD driver,” in *IEEE Electronic, Circuits and Systems Tech. Dig.*, vol. 1, pp. 317-320, 2001.

[5.11] A. Imaya, “CG Silicon technology and its application,” in *AMLCD Tech. Dig.*, 2003, pp. 1-4.



[5.12] Y. Matsueda, S. Inoue, and T. Shimoda, “Concept of system on panel,” in *AMLCD Tech. Dig.*, 2001, pp. 77-80.

[5.13] K. Sera, F. Okumura, H. Uchida, S. Itoh, S. Kaneko, and K. Hotta, “High-performance TFTs fabricated by XeCl excimer laser annealing of hydrogenated amorphous-silicon film,” *IEEE Trans. Electron Devices*, vol. 36, pp. 2868-2872, 1989.

[5.14] K. Shimizu, O. Sugiura, and M. Matsumura, “High-mobility poly-Si TFT’s fabricated by a novel excimer laser crystallization method,” *IEEE Trans. Electron Devices*, vol. 39, pp. 2664-2665, 1992.

[5.15] N. Kubo, N. Kusumoto, T. Inushima, and S. Yamazaki, “Characteristics of polycrystalline-Si thin film transistors fabricated by excimer laser annealing method,” *IEEE Trans. Electron Devices*, vol. 41, pp. 1876-1879, 1994.

[5.16] H. Kuriyama, “Excimer laser crystallization of silicon films for AMLCDs,” in *AMLCD Tech. Dig.*, 1995, pp. 87-92.

- [5.17] James S. Im and H. J. Kim, "On the super lateral growth phenomenon observed in excimer laser-induced crystallization of thin Si films," *Appl. Phys. Lett.*, vol. 64, pp. 2303-2305, 1994.
- [5.18] K. Yamaguchi, "Modeling and characterization of polycrystalline-silicon thin film transistors with a channel-length comparable to a grain size," *J. Appl. Phys.*, vol. 89, pp. 590-595, 2001.
- [5.19] M. Kimira, S. Inoue, T. Shimoda, and T. Eguchi, "Dependence of polycrystalline silicon thin-film transistor characteristics on the grain-boundary location," *J. Appl. Phys.*, vol. 89, pp. 596-600, 2001.
- [5.20] M. A. Crowder, A. T. Voutsas, S. R. Droes, M. Moriguchi, and Y. Mitani, "Sequential lateral solidification processing for polycrystalline Si TFTs," *IEEE Trans. Electron Devices*, vol. 51, pp. 560-568, 2004.
- [5.21] R. S. Sposili and J. S. Im, "Sequential lateral solidification of thin silicon films on  $\text{SiO}_2$ ," *Appl. Phys. Lett.*, vol. 69, pp. 2864-2866, 1996.
- [5.22] J. S. Im, R. S. Sposili, and M. A. Crowder, "Single-crystal Si films for thin-film transistor devices," *Appl. Phys. Lett.*, vol. 70, pp. 3434-3436, 1997.
- [5.23] M. A. Crowder, P. G. Carey, P. M. Smith, Robert S. Sposili, Hans S. Cho, and James S. Im, "Low-temperature single-crystal Si TFT's fabricated on Si films processed via sequential lateral solidification," *IEEE Electron Device Lett.*, vol. 19, pp. 306-308, 1998.
- [5.24] H. S. Cho, D. B. Kim, A. B. Limanov, M. A. Crowder, and J. S. Im, "Sequential lateral solidification of ultra-thin a-Si films," *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q9.9.1-Q9.9.6, 2000.
- [5.25] Y. H. Jung, J. M. Yoon, M. S. Yang, W. K. Park, H. S. Soh, H. S. Cho, A. B. Limanov, and J. S. Im, "The dependence of poly-Si TFT characteristics on the relative misorientation between grain boundaries and the active channel," *Mat. Res. Soc. Symp.*

*Proc.*, vol. 621, Q9.14.1-Q9.14.6, 2000.

- [5.26] Y. H. Jung, J. M. Yoon, M. S. Yang, W. K. Park, H. S. Soh, H. S. Cho, A. B. Limanov, and J. S. Im, “Low temperature polycrystalline Si TFTs fabricated with directionally crystallized Si film,” *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q8.3.1-Q8.3.6, 2000.
- [5.27] M. A. Crowder, Robert S. Sposili, A. B. Limanov, and James. S. Im, “Sequential lateral solidification of PECVD and sputter deposited a-Si films,” *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q9.7.1-Q9.7.6, 2000.
- [5.28] M. A. Crowder, A. B. Limanov, and James. S. Im, “Sub-grain boundary spacing in directionally crystallized Si films obtained via sequential lateral solidification,” *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q9.6.1-Q9.6.6, 2000.
- [5.29] Paul Ch. Van der Wilt, R. Ishihara, and J. Bertens, “Location-controlled large-grains in near-ablation excimer-laser crystallized silicon films,” *Mat. Res. Soc. Symp. Proc.*, vol. 621, Q7.4.1-Q7.4.6, 2000.
- [5.30] B. D. van Dijk, Paul Ch. Van der Wilt, G. J. Bertens, Lis.K. Nanver, and R. Ishihara, “Single-crystal thin film transistor by grain-filter location-controlled excimer-laser crystallization,” *Mat. Res. Soc. Symp. Proc.*, vol. 685E, D12.3.1-D12.3.6, 2001.
- [5.31] Paul Ch. van der Wilt, B. D. van Dijk, G. J. Bertens, R. Ishihara, and C. I. M. Beenakker, “Formation of location-controlled crystalline islands using substrate-embedded seeds in excimer-laser crystallization of silicon films,” *Appl. Phys. Lett.*, vol. 79, pp. 1819-1821, 2001.
- [5.32] C. H. Oh, M. Ozawa, and M. Matsumura, “A novel phase-modulated excimer-laser crystallization method of silicon thin films,” *Jpn. J. Appl. Phys. Part 2*, vol. 37, pp. L492-L495, 1998.
- [5.33] C. H. Oh and M. Matsumura, “Preparation of position-controlled crystal- silicon island arrays by means of excimer-laser annealing,” *Jpn. J. Appl. Phys. Part 1*, vol. 37, pp. 5474-5479, 1998.

- [5.34] M. Ozawa, C. H. Oh, and M. Matsumura, “Two-dimensionally position-controlled excimer-laser-crystallization of silicon thin films on glassy substrate,” *Jpn. J. Appl. Phys. Part 1*, vol. 38, pp. 5700-5705, 1999.
- [5.35] M. Matsumura and C. H. Oh, “Advanced excimer-laser annealing process for quasi single-crystal silicon thin-film devices,” *Thin Solid Films*, vol. 337, pp. 123-128, 1999.
- [5.36] C. H. Oh and M. Matsumura, “A proposed single grain-boundary thin-film transistor,” *IEEE Electron Device Lett.*, vol. 22, pp. 20-22, 2001.
- [5.37] H. J. Kim and James S. Im, “New excimer-laser-crystallization method for producing large-grained and grain boundary-location-controlled Si films for thin film transistors,” *Appl. Phys. Lett.*, vol. 68, pp. 1513-1515, 1996.
- [5.38] H. J. Kim and James S. Im, “Optimization and transformation analysis of grain-boundary-location-controlled Si films,” *Mat. Res. Soc. Symp. Proc.*, vol. 397, pp. 401-406, 1996.
- [5.39] L. Mariucci, R. Carluccio, A. Pecora, V. Foglietti, G. Fortunato, P. Legagneux, D. Pribat, D. Della Sala, and J. Stoemenos, “Lateral growth control in excimer laser crystallized polysilicon,” *Thin Solid Films*, vol. 337, pp. 137-142, 1999.
- [5.40] J. H. Jeon, M. C. Lee, S. H. Jung, and M. K. Han, “Excimer laser recrystallization of a-Si employing aluminum masking window,” *Mat. Res. Soc. Symp. Proc.*, vol. 609, A25.3.1-A25.3.5 , 2000.
- [5.41] J. H. Jeon, M. C. Lee, K. C. Park, and M. K. Han, “A new polycrystalline silicon TFT with a single grain boundary in the channel,” *IEEE Electron Device Lett.*, vol. 22, pp. 429-431, 2001.
- [5.42] J. H. Jeon, M. C. Lee, K. C. park, and M. K. Han, “New excimer laser recrystallization of poly-Si for effective grain growth and grain boundary arrangement,” *Jpn. J. Appl. Phys. Part 1*, vol. 39, pp. 2012-2014, 2000.
- [5.43] C. H. Kim, J. S. Yoo, I. H. Song and M. K. Han, “Excimer laser recrystallization of

selectively floating a-Si active layer for large-grained poly-Si film," *Mat. Res. Soc. Symp. Proc.*, vol. 664, A6.11.1-A6.11.6 , 2001.

[5.44] C. H. Kim, I. H. Song, W. J. Nam, and M. K. Han, "Excimer laser recrystallization of selectively floating a-Si thin film," *J. Non-Cryst. Solids*, vol. 299-302, pp. 721-725, 2002.

[5.45] C. H. Kim, I. H. Song, W. J. Nam, and M. K. Han, "A poly-Si TFT fabricated by excimer laser recrystallization on floating active structure," *IEEE Electron Device Lett.*, vol. 23, pp. 325-327, 2002.

[5.46] D. H. Choi, K. Shimizu, O. Sugiura, and M. Matsumura, "Drastic enlargement of grain size of excimer-laser-crystallized polysilicon films," *Jpn. J. Appl. Phys. Part 1*, vol. 31, pp. 4545-4549, 1992.

[5.47] D. H. Choi, E. Sadayuki, O. Sugiura, and M. Matsumura, "Lateral growth of poly-Si film by excimer laser and its thin film transistor application," *Jpn. J. Appl. Phys. Part 1*, vol. 33, pp. 70-74, 1994.

[5.48] M. Cao, S. Talwar, K. Josef Kramer, T. W. Sigmon, and K. C. Saraswat, "A high-performance polysilicon thin-film transistor using XeCl excimer laser crystallization of pre-patterned amorphous Si films," *IEEE Trans. Electron Devices*, vol. 43, pp. 561-567, 1996.

[5.49] G. K. Giust and T. W. Sigmon, "Comparison of excimer laser recrystallized prepatterned and unpatterned silicon films on SiO<sub>2</sub>," *J. Appl. Phys.*, vol. 81, pp. 1204-1211, 1997.

[5.50] G. K. Giust and T. W. Sigmon, "Performance improvement obtained for thin-film transistors fabricated in prepatterned laser-recrystallized polysilicon," *IEEE Electron Device Lett.*, vol. 18, pp. 296-298, 1997.

[5.51] A. Hara and N. Sasaki, "Use of necked-down areas to control nucleation site and direction of solidification of polycrystalline silicon using excimer laser crystallization,"

*J. Appl. Phys.*, vol. 88, pp. 3349-3353, 2000.

- [5.52] R. Ishihara, A. Burtsev, and P. F. A. Alkemade, “Location-control of large Si grains by dual-beam excimer-laser and thick oxide portion,” *Jpn. J. Appl. Phys. Part 1*, vol. 39, pp. 3873-3878, 2000.
- [5.53] J. H. Jeon, M. C. Lee, K. C. Park, and M. K. Han, “A new polycrystalline silicon TFT with a single grain boundary in the channel”, *IEEE Electron Device Lett.*, vol. 22, pp.429-431, 2001
- [5.54] I. H. Song, S. H. Kang, W. J. Nam, and M. K. Han, “A High-Performance Multichannel Dual-Gate Poly-SiTFT Fabricated by Excimer Laser Irradiation on a Floating a-Si Thin Film”, *IEEE Electron Device Lett.*, vol. 24, pp.580-582, 2001
- [5.55] M .H .Lee, S. J. Moon, M. Hatano, K. Suzuki, and C. P. Grigoropoulos, “Relationship between fluence gradient and lateral grain growth in spatially controlled excimer laser crystallization of amorphous silicon films,” *J. Appl. Phys.*, vol. 88, pp. 4994-4999, 2000.
- [5.56] J. S. Im, and H. J. Kim, “On the super lateral growth phenomenon observed in excimer laser-induced crystallization of thin Si films,” *Appl. Phys. Lett.*, vol. 64, pp. 2303-2305, 1994.
- [5.57] M. Koyanagi, T. Shimatani, M. Tsuno, T. Matsumoto, N. Kato, and S. Yamada, “Evaluation of self-heating effect in poly-Si TFT using quasi three-dimension temperature analysis,” in *IEDM Tech. Dig.*, 1993, pp. 97-100.
- [5.58] T. Shimatani, T. Matsumoto, T. Hashimoto, N. Kato, S. Yamada and M. Koyanagi, “Device simulation with quasi three-dimension temperature analysis for short-channel poly-Si thin film transistors,” *Jpn. J. Appl. Phys., Part 1*, vol. 33, pp. 619-622, 1994.

## Publication Lists

### A. International Letter:

- [1] **Ting-Kuo Chang**, Fu-Tsun Chu, Chin-Wei Lin, Chang-Ho Tseng, and Hunag-Chung Cheng, “A novel germanium doping method for fabrication of high-performance p-channel poly-Si<sub>1-x</sub>Ge<sub>x</sub> TFT by excimer laser crystallization”, *IEEE Electron Device Lett.*, vol. 24, pp. 233-235, 2003.
- [2] **Ting-Kuo Chang**, Ching-Wei Lin, Chun-Chien Tsai, Jian-Hao Lu, Bo-Ting Chen and Huang-Chung Cheng, “High-performance poly-Si thin film transistors crystallized by excimer laser irradiation with a-Si spacer structure,” to appear in *IEEE/ECS Electrochemical and solid-state Lett.*
- [3] Bo-Ting Chen, Chang-Ho Tseng, Huang-Chung Cheng, Chi-Wei Chao, **Ting-Kuo Chang**, Jian-Hao Lu, and Albert Chin, “Symmetric gate-overlapped LDD poly-Si TFTs with selective and isotropic deposited Ni sub-gate,” *IEEE/ECS Electrochemical and Solid-State Lett.*, vol. 7, pp. G37-G39, 2004.
- [4] Ching-Wei Lin, Chang-Ho Tseng, **Ting-Kuo Chang**, Chiung-Wei Lin, Wen-Tung Wang, and Huang-Chung Cheng, “A novel laser-processed self-aligned gate-overlapped LDD poly-Si TFT,” *IEEE Electron Device Lett.*, vol. 23, pp. 133-135, 2002.
- [5] Huang-Chung Cheng, Ching-Wei Lin, Li-Jing Cheng, Chang-Ho Tseng, **Ting-Kuo Chang**, Yuan-Ching Peng, and Wen-Tung Wang, “Fabrication of low-temperature poly-Si thin film transistors with self-aligned graded lightly doped drain structure,” *IEEE/ECS Electrochemical and Solid-State Lett.*, vol. 5, pp. G1-G3, 2002.
- [6] Chang-Ho Tseng, **Ting-Kuo Chang**, Fang-Tsun Chu, Jia-Min Shieh, Bau-Tong Dai,

Huang-Chung Cheng, and Albert Chin, "Investigation of inductively coupled plasma gate oxide on low temperature polycrystalline-silicon thin film transistors", *IEEE Electron Device Letter*, vol. 23, pp. 333-335, 2002.

- [7] Chang-Ho Tseng, Chin-Wei Lin, Ting-Kuo Chang, Huang-Chung Cheng, and Albert Chin, "Effects of excimer laser dopant activation on the low temperature polysilicon thin-film transistors with lightly doped drains," *IEEE/ECS Electrochemical and solid-state Lett.* vol. 4, pp. G94–G97, 2001.

## B. International Journal:

- [1] Ting-Kuo Chang, Ching-Wei Lin, Yuan-Hsun Chang, Chang-Ho Tseng, Fang-Tsun Chu, Li-Jen Chou, and Hunag-Chung Cheng "Thickness dependence of microstructure of laterally crystallized poly-Si thin film and electrical characteristics of low-temperature poly-Si TFTs," *J. Electrochem. Soc.* vol. 150, pp. G494-497, 2003.
- [2] Ching-Wei Lin, Chang-Ho Tseng, Ting-Kuo Chang, Yuan-Hsun Chang, Fang-Tsun Chu, Chiung-Wei Lin, Wen-Tung Wang, and Huang-Chung Cheng, "An investigation of bias temperature instability in hydrogenated low-temperature polycrystalline silicon thin film transistors," *Jpn. J. Appl. Phys., Part 1*, vol. 41, 2002.
- [3] Chang-Ho Tseng, Ching-Wei Lin, Teh-Hung Teng, Ting-Kuo Chang, Huang-Chung Cheng, and A. Chin, "Study on dopant activation of phosphorous implanted polycrystalline silicon thin films by KrF excimer laser annealing", *Solid-State Electronics*, vol. 46, pp. 1085-1090, 2002.
- [4] Ten-Hung.Teng, Chun-Yao.Huang, Ting-Kuo Chang, Chin-Wei Lin, Lin-Ji.Cheng, Yi-Lung.Lu, Hunag-Chung.Cheng, "Degradation of passivated and non-passivated N-channel low-temperature polycrystalline silicon TFTs prepared by excimer laser

processing," *Solid State Electronics*, vol. 46, pp. 1079-1083, 2002.

### C. International and Local Conferences:

- [1] Ting-Kuo Chang, Ching-Wei Lin, Chang-Ho Tseng, Huang-Chung Cheng, Yuan-Ching Peng, and Wen-Tung Wang," Characteristics of large-area plasma enhanced chemical vapor deposited TEOS oxide with various short-time Plasma treatments", in *Mat. Res. Soc. Symp. Proc.*, vol. 685E, D5.3.1-D5.3.6, 2001.
- [2] Ting-Kuo Chang, Bo-Ting Chen, Jian-Hao Lu, Fu-Tsun Chu, and Huang-Chung Cheng, "Excimer laser crystallization of a-Si<sub>1-x</sub>Ge<sub>x</sub> thin films and its applications to the low-temperature poly-Si<sub>1-x</sub>Ge<sub>x</sub> TFTs," in *Asia Society for Information Display Proc.*, p. 36-139, 2003.
- [3] Ting-Kuo Chang, Jian-Hao Lu, Ching-Wei Lin, Chun-Chien Tsai, Bo-Ting Chen and Huang-Chung Cheng, "A novel periodic lateral grain growth method and its applications on high-performance poly-Si thin film transistors," to appear in *AMLCD Tech. Dig.*, 2004.
- [4] Huang-Chung Cheng, Ting-Kuo Chang, Chun-Chien Tsai, Jian-Hao Lu, and Bo-Ting Chen, "Fabrication of high-performance poly-Si thin film transistors by excimer laser irradiation with a-Si spacer structure," in *Taiwan Display Conference Proc.*, pp. 134-138, 2004.
- [5] Teh-Hung Teng, Chun-Yao Huang, Ching-Wei Lin, Ting-Kuo Chang, Cheng-Jer Yang, Huang-Chung Cheng," Effect of Temperature and Illumination on The Instability of a-Si:H TFTS Under AC Gate Bias Stress", *Material Research Society (MRS) 2001 spring meeting*, San Francisco, USA.2001.
- [6] Chang-Ho Tseng, Ting-Kuo Chang, Huang-Chung Cheng, A. Chin," Dopant Activation of Phosphorus Implanted Poly-Silicon Film Capped With Silicon Oxide Film by KrF Excimer Laser Annealing", *2000 International Electron Devices and*

*Material Symposia (2000 IEDMS)*, pp. 304-307.

- [7] Chun-Yao.Huang, Ting-Kuo Chang, Chin-Wei Lin, Li-Jing Cheng, Yin-Lung Lu, and Huang-Chung Cheng, “Degradation of passivated and non-passivated n-channel low-temperature polycrystalline silicon TFTs prepared by excimer laser processing,” *2000 International Electron Devices and Material Symposia (2000 IEDMS)*, pp. 257-260.
- [8] Li-Jing. Cheng, Yin-Lung. Lu, Chin-Wei Lin, Ting-Kuo Chang, and Huang-Chung Cheng, “Novel device structure for low temperature polysilicon TFT with controlled grain growth in channel region,” *Photonics Taiwan, 2000, Proceeding of SPIE*, vol. 4079-06.
- [9] Ten-Hung.Teng, Chun-Yao.Huang, Ting-Kuo Chang, Chin-Wei Lin, Lin-Ji.Cheng, Yi-Lung.Lu, Hunag-Chung.Cheng, ” Degradation of Passivated and Non-Passivated N-Channel Low-Temperature Polycrystalline Silicon TFTs Prepared by Excimer Laser Processing”, *2000 International Electron Devices and Material Symposia (2000 IEDMS)*.

