

References

- Aegerter, M.A. and Mennig, M., (2004), *Sol-Gel Technologies for Glass Producers and Users*, Springer
- Aghamohammadi, M., Rödel, R., Zschieschang, U., Ocal, C., Boschker, H., Weitz, R. T., Barrera, E. and Klauk, H., (2015), "Threshold-voltage in organic transistors due to self-assembled monolayers at the dielectric: evidence for electronic coupling and dipolar effects", *ACS Applied Materials & Interfaces*, Vol. 7, p. 22775
- Ahmed, R., Sams, M., Simbrunner, C., Ullah, M., Rehman, K., Schwabegger, G., Sitter, H. and Ostermann, T., (2012), "Reproducibility and stability of C₆₀ based organic field effect transistor", *Synthetic Metals*, Vol. 161, pp. 2562-2565
- Amin, A.Y., Khassanov, A., Reuter, K., Meyer-Friedrichsen, T. and Halik, M., (2012), "Low-Voltage Organic Field Effect Transistors with a 2-Tridecyl[1]benzothieno[3,2-b][1]benzothiophene Semiconductor Layer", *Journal of the American Chemical Society*, Vol. 134, pp. 16548-16550
- Ante, F., Kälblein, D., Zaki, T., Zschieschang, U., Takimiya, K., Ikeda, M., Sekitani, T., Someya, T., Burghartz, J.N., Kern, K. and Klauk, H., (2012), "Contact Resistance and Megahertz Operation of Aggressively Scaled Organic Transistors", *Small*, Vol. 8, pp. 73-79
- Ante, F., Kälblein, D., Zschieschang, U., Canzler, T.W., Werner, A., Takimiya, K., Ikeda, M., Sekitani, T., Someya, T. and Klauk, H., (2011), "Contact Doping and Ultrathin Gate Dielectrics for Nanoscale Organic Thin-Film Transistors", *Small*, Vol. 7, pp. 1186-1191
- Bao, Z., Lovinger, A.J. and Brown, J., (1998), "New air-stable n-channel organic thin film transistors", *Journal of the American Chemical Society*, Vol. 120, pp. 207-208
- Bao, Z., Lovinger, A.J. and Dodabalapur, A., (1996), "Organic field-effect transistors with high mobility based on copper phthalocyanine", *Applied Physics Letters*, Vol. 69, pp. 3066-3068
- Baranovski, S., (2006), *Charge Transport in Disordered Solids with Applications in Electronics*, Wiley
- Bardeen, J. and Brattain, W.H., (1948), "The Transistor, A Semi-Conductor Triode", *Physical Review*, Vol. 74, pp. 230-231
- Bässler, H., (1993), "Charge Transport in Disordered Organic Photoconductors a Monte Carlo Simulation Study", *Physica Status Solidi*, Vol. 175, pp. 15-56
- Bean, L.F. and Miller, R.L., (1978), "Imaging system utilizing uncharged marking particles", *US 4124287 A Patent*
- Bisoyi, S., Zschieschang, U., Kang, M.J., Takimiya, K., Klauk, H. and Tiwari, S.P., (2014), "Bias-stress stability of low-voltage p-channel and n-channel organic thin-film transistors on flexible plastic substrates", *Organic Electronics*, Vol. 15, pp. 3173-3182
- Blanchet, G.B., Fincher, C.R., Lefenfeld, M. and Rogers, J.A., (2004), "Contact resistance in organic thin film transistors", *Applied Physics Letters*, Vol. 84, pp. 296-298
- Blythe, T. and Bloor, D., (2008), *Electrical Properties of Polymers*, Cambridge University Press
- Bobbert, P.A., Sharma, A., Mathijssen, S.G.J., Kemerink, M. and de Leeuw, D.M., (2012), "Operational Stability of Organic Field-Effect Transistors", *Advanced Materials*, Vol. 24, pp. 1146-1158
- Bradley, W.E., (1953), "The Surface-Barrier Transistor: Part I-Principles of the Surface-Barrier Transistor", *Proceedings of the IRE*, Vol. 41, pp. 1702-1706
- Chang, H.-C., Ruden, P.P., Liang, Y. and Frisbie, C.D., (2010), "Transient effects controlling the charge-carrier population of organic field effect transistor channels", *Journal of Applied Physics*, Vol. 107, p. 104502
- Chang, H.-C., Ruden, P.P., Liang, Y. and Frisbie, C.D., (2011), "Charge-carrier extraction dynamics for organic field effect transistor structures", *Applied Physics Letters*, Vol. 99, p. 073306
- Chen, H., Guo, Y., Yu, G., Zhao, Y., Zhang, J., Gao, D., Liu, H. and Liu, Y., (2012), "Highly π -extended copolymers with diketopyrrolopyrrole moieties for high-performance field-effect transistors", *Advanced materials*, Vol. 24, pp. 4618-4622
- Chiang, C.K., Fincher, C.R., Park, Y.W., Heeger, A.J., Shirakawa, H., Louis, E.J., Gau, S.C. and MacDiarmid, A.G., (1977), "Electrical Conductivity in Doped Polyacetylene", *Physical Review Letters*, Vol. 39, pp. 1098-1101
- Colleaux, F., Ball, J.M., WÖBkenberg, P.H., Hotchkiss, P.J., Marder, S.R. and Anthopoulos, T.D., (2011), "Bias-stress effects in organic field-effect transistors based on self-assembled monolayer nanodielectrics", *Physical Chemistry Chemical Physics*, Vol. 13, pp. 14387-14393
- Comber, P.G.I., Spear, W.E. and Ghaith, A., (1979), "Amorphous-silicon field-effect device and possible application", *Electronics Letters*, Vol. 15, pp. 179-181

- Cornil, J., Calbert, J.P. and Brédas, J.-L., (2001), "Electronic structure of the pentacene single crystal: Relation to transport properties", *Journal of the American Chemical Society*, Vol. 123, pp. 1250-1251
- Coropceanu, V., Sánchez-Carrera, R.S., Paramonov, P., Day, G.M. and Brédas, J.-L., (2009), "Interaction of Charge-carriers with Lattice Vibrations in Organic Molecular Semiconductors: Naphthalene as a Case Study", *The Journal of Physical Chemistry C*, Vol. 113, pp. 4679-4686
- de Oteyza, D.G., Barrena, E., Ossó, J.O., Dosch, H., Meyer, S. and Pflaum, J., (2005), "Controlled enhancement of the electron field-effect mobility of F16CuPc thin-film transistors by use of functionalized SiO₂ substrates", *Applied Physics Letters*, Vol. 87, p. 183504
- Dickey, K.C., Anthony, J.E. and Loo, Y.L., (2006), "Improving Organic Thin-Film Transistor Performance through Solvent-Vapor Annealing of Solution-Processable Triethylsilylethynyl Anthradithiophene", *Advanced Materials*, Vol. 18, pp. 1721-1726
- Dimitrakopoulos, C.D. and Malenfant, P.R.L., (2002), "Organic Thin Film Transistors for Large Area Electronics", *Advanced Materials*, Vol. 14, pp. 99-117
- Dimitrakopoulos, C.D., Purushothaman, S., Kymissis, J., Callegari, A. and Shaw, J.M., (1999), "Low-Voltage Organic Transistors on Plastic Comprising High-Dielectric Constant Gate Insulators", *Science*, Vol. 283, pp. 822-824
- Doi, I., Kang, M.J. and Takimiya, K., (2012), "High mobility organic thin-film transistors on plastic substrate", *Current Applied Physics*, Vol. 12, Supplement 1, pp. e2-e5
- Edgar, L.J., (1930), "Method and apparatus for controlling electric currents", *US1745175 A Patent*
- Fujisaki, Y., Nakajima, Y., Takei, T., Fukagawa, H., Yamamoto, T. and Fujikake, H., (2012), "Flexible Active-Matrix Organic Light-Emitting Diode Display Using Air-Stable Organic Semiconductor of Dinaphtho[2,3-b : 2', 3'-f]thieno[3, 2-b]-thiophene", *Electron Devices, IEEE Transactions on*, Vol. 59, pp. 3442-3449
- Fukuda, K., Hamamoto, T., Yokaota, T., Sekitani, T., Zschieschang, U., Klauk, H. and Someya, T., (2009) "Effects of the alkyl chain length in phosphonic acid self-assembled monolayer gate dielectrics on the performance and stability of low-voltage organic thin-film transistors", *Applied Physics Letters*, Vol. 95, p. 203301
- Głowacki, E.D., Irimia-Vladu, M., Kaltenbrunner, M., Gsiorowski, J., White, M.S., Monkowius, U., Romanazzi, G., Suranna, G.P., Mastroianni, P., Sekitani, T., Bauer, S., Someya, T., Torsi, L. and Sariciftci, N.S., (2013), "Hydrogen-Bonded Semiconducting Pigments for Air-Stable Field-Effect Transistors", *Advanced Materials*, Vol. 25, pp. 1563-1569
- Gomes, H.L., Stallinga, P., Cölle, M., de Leeuw, D.M. and Biscarini, F., (2006), "Electrical instabilities in organic semiconductors caused by trapped supercooled water", *Applied Physics Letters*, Vol. 88, p. 082101
- Gundlach, D.J., Lin, Y.Y., Jackson, T.N., Nelson, S.F. and Schlom, D.G., (1997), "Pentacene organic thin-film transistors-molecular ordering and mobility", *Electron Device Letters, IEEE*, Vol. 18, pp. 87-89
- Gundlach, D.J., Zhou, L., Nichols, J.A., Jackson, T.N., Necliudov, P.V. and Shur, M.S., (2006), "An experimental study of contact effects in organic thin film transistors", *Journal of Applied Physics*, Vol. 100, p. 024509
- Guo, D., Ikeda, S., Saiki, K., Miyazoe, H. and Terashima, K., (2006), "Effect of annealing on the mobility and morphology of thermally activated pentacene thin film transistors", *Journal of applied physics*, Vol. 99, p. 094502
- Gupta, D., Katiyar, M. and Gupta, D., (2009), "An analysis of the difference in behavior of top and bottom contact organic thin film transistors using device simulation", *Organic Electronics*, Vol. 10, pp. 775-784
- Halik, M., Klauk, H., Zschieschang, U., Schmid, G., Dehm, C., Schutz, M., Maisch, S., Effenberger, F., Brunnbauer, M. and Stellacci, F., (2004), "Low-voltage organic transistors with an amorphous molecular gate dielectric", *Nature*, Vol. 431, pp. 963-966
- Häusermann, R. and Batlogg, B., (2011), "Gate bias stress in pentacene field-effect-transistors: Charge trapping in the dielectric or semiconductor", *Applied Physics Letters*, Vol. 99, p. 083303
- Hekmatshoar, B., Cherenack, K.H., Kattamis, A.Z., Long, K., Wagner, S. and Sturm, J.C., (2008), "Highly stable amorphous-silicon thin-film transistors on clear plastic", *Applied Physics Letters*, Vol. 93, p. 032103
- Hekmatshoar, B., Wagner, S. and Sturm, J.C., (2009), "Tradeoff regimes of lifetime in amorphous silicon thin-film transistors and a universal lifetime comparison framework", *Applied Physics Letters*, Vol. 95, p. 143504
- Hirata, I., Zschieschang, U., Ante, F., Yokaota, T., Kuribara, K., Yamamoto, T., Kuwabara, H., Klauk, H., Sekitani, T. and Someya, T., (2011), "Spatial control of the threshold voltage of low-voltage organic transistors by microcontact printing of alkyl- and fluoroalkyl-phosphonic acids", *MRS Communications*, Vol. 1, p. 33

- Hofmockel, R., Zschieschang, U., Kraft, U., Rödel, R., Hansen, N.H., Stolte, M., Würthner, F., Takimiya, K., Kern, K., Pflaum, J. and Klauk, H., (2013), "High-mobility organic thin-film transistors based on a small-molecule semiconductor deposited in vacuum and by solution shearing", *Organic Electronics*, Vol. 14, pp. 3213-3221
- Horowitz, G., (1998), "Organic Field-Effect Transistors", *Advanced Materials*, Vol. 10, pp. 365-377
- Horowitz, G., Hajlaoui, R., Bourguiga, R. and Hajlaoui, M., (1999), "Theory of the organic field-effect transistor", *Synthetic Metals*, Vol. 101, pp. 401-404
- Horowitz, G., Peng, X.-Z., Fichou, D. and Garnier, F., (1992), "Role of the semiconductor/insulator interface in the characteristics of π -conjugated-oligomer-based thin-film transistors", *Synthetic Metals*, Vol. 51, pp. 419-424
- Hsiao-Wen, Z. and Shin-Chin, K., (2008), "The Effects of Drain-Bias on the Threshold Voltage Instability in Organic TFTs", *Electron Device Letters, IEEE*, Vol. 29, pp. 155-157
- Hwang, D., Lee, K., Kim, J.H., Im, S., Kim, C.S., Baik, H.K., Park, J.H. and Kim, E., (2006), "Low-voltage high-mobility pentacene thin-film transistors with polymer/high-k oxide double gate dielectrics", *Applied physics letters*, Vol. 88, p. 243513
- Hwang, D.K., Fuentes-Hernandez, C., Kim, J.B., Potscavage Jr, W.J. and Kippelen, B., (2011), "Flexible and stable solution-processed organic field-effect transistors", *Organic Electronics*, Vol. 12, pp. 1108-1113
- Ishida, K., Masunaga, N., Takahashi, R., Sekitani, T., Shino, S., Zschieschang, U., Klauk, H., Takamiya, M., Someya, T. and Sakurai, T., (2011), "User Customizable Logic Paper (UCLP) With Sea-Of-Transmission-Gates (SOTG) of 2-V Organic CMOS and Ink-Jet Printed Interconnects", *Solid-State Circuits, IEEE Journal of*, Vol. 46, pp. 285-292
- Jafarabadiashtiani, S., Chaji, G., Sambandan, S., Striakhilev, D., Nathan, A. and Servati, P., (2005), "P-25: A New Driving Method for a-Si AMOLED Displays Based on Voltage Feedback", *SID Symposium Digest of Technical Papers*, Vol. 36, pp. 316-319
- K. Suemori, M. Taniguchi and T. Kamata, (2009), "Effect of silicon dioxide surface on bias stress effect for organic field-effect transistors", *Japanese Journal of Applied Physics*, Vol. 48, p. 04C170
- Kagan, C.R., Afzali, A. and Graham, T.O., (2005), "Operational and environmental stability of pentacene thin-film transistors", *Applied Physics Letters*, Vol. 86, p. 193505
- Kalb, W.L., Mathis, T., Haas, S., Stassen, A.F. and Batlogg, B., (2007), "Organic small molecule field-effect transistors with Cytotop™ gate dielectric: Eliminating gate bias stress effects", *Applied Physics Letters*, Vol. 90, p. 092104
- Kalb, W.L., Meier, F., Mattenberger, K. and Batlogg, B., (2007), "Defect healing at room temperature in pentacene thin films and improved transistor performance", *Physical Review B*, Vol. 76, p. 184112
- Kang, M.J., Doi, I., Mori, H., Miyazaki, E., Takimiya, K., Ikeda, M. and Kuwabara, H., (2011), "Alkylated Dinaphtho[2,3-b:2',3'-f]Thieno[3,2-b]Thiophenes (Cn-DNTTs): Organic Semiconductors for High-Performance Thin-Film Transistors", *Advanced Materials*, Vol. 23, pp. 1222-1225
- Kang, M.J., Miyazaki, E., Osaka, I., Takimiya, K. and Nakao, A., (2013), "Diphenyl derivatives of dinaphtho [2, 3-B: 2', 3'-F] thieno [3, 2-B] thiophene: Organic semiconductors for thermally stable thin-film transistors", *ACS applied materials & interfaces*, Vol. 5, pp. 2331-2336
- Karim, K., Nathan, A., Hack, M. and Milne, W., (2004), "Drain-bias dependence of threshold voltage stability of amorphous silicon TFTs", *IEEE Electron Device Letters*, Vol. 25, pp. 188-190
- Katz, H.E., Johnson, J., Lovinger, A.J. and Li, W., (2000), "Naphthalenetetracarboxylic Diimide-Based n-Channel Transistor Semiconductors: Structural Variation and Thiol-Enhanced Gold Contacts", *Journal of the American Chemical Society*, Vol. 122, pp. 7787-7792
- Kilby, J.S., (1964), "Miniaturized electronic circuits", *US3138743Patent*
- Kim, W.J., Koo, W.H., Jo, S.J., Kim, C.S., Baik, H.K., Hwang, D.K., Lee, K., Kim, J.H. and Im, S., (2006), "Ultraviolet-enduring performance of flexible pentacene TFTs with SnO₂ encapsulation films", Vol. 9, pp. G251-G253
- Klauk, H., (2010), "Organic thin-film transistors", *Chemical Society Reviews*, Vol. 39, p. 2463
- Klauk, H., Gundlach, D.J. and Jackson, T.N., (1999), "Fast organic thin-film transistor circuits", *Electron Device Letters, IEEE*, Vol. 20, pp. 289-291
- Klauk, H., Halik, M., Zschieschang, U., Eder, F., Schmid, G. and Dehm, C., (2003), "Pentacene organic transistors and ring oscillators on glass and on flexible polymeric substrates", *Applied Physics Letters*, Vol. 82, pp. 4175-4177
- Klauk, H., Halik, M., Zschieschang, U., Schmid, G., Radlik, W. and Weber, W., (2002), "High-mobility polymer gate dielectric pentacene thin film transistors", *Journal of Applied Physics*, Vol. 92, pp. 5259-5263
- Klauk, H., Zschieschang, U., Pflaum, J. and Halik, M., (2007), "Ultralow-power organic complementary circuits", *Nature*, Vol. 445, pp. 745-748

- Klauk, H., Zschieschang, U., Weitz, R.T., Meng, H., Sun, F., Nunes, G., Keys, D.E., Fincher, C.R. and Xiang, Z., (2007), "Organic Transistors Based on Di(phenylvinyl)anthracene: Performance and Stability", *Advanced Materials*, Vol. 19, pp. 3882-3887
- Knipp, D., Street, R. and Völkel, A., (2003), "Morphology and electronic transport of polycrystalline pentacene thin-film transistors", *Applied physics letters*, Vol. 82, pp. 3907-3909
- Knipp, D., Street, R.A., Völkel, A. and Ho, J., (2003), "Pentacene thin film transistors on inorganic dielectrics: Morphology, structural properties, and electronic transport", *Journal of Applied Physics*, Vol. 93, pp. 347-355
- Kozuka, H., Tsumura, A. and Ando, T., (1987), "Field-effect transistor with polythiophene thin film", *Synthetic Metals*, Vol. 18, pp. 699-704
- Kraft, U., Zschieschang, U., Ante, F., Kälblein, D., Kamella, C., Amsharov, K., Jansen, M., Kern, K., Weber, E. and Klauk, H., (2010), "Fluoroalkylphosphonic acid self-assembled monolayer gate dielectrics for threshold voltage control in low-voltage organic thin-film transistors", *Journal of Materials Chemistry*, Vol. 20, p. 6416
- Kraft, U., Sejfić, M., Kang, M. J., Takimiya, K., Zaki, T., Letzkus, F., Burghartz, J. N., Weber, E. and Klauk, H., (2014), "Flexible low-voltage organic complementary circuits: finding the optimum combination of semiconductors and monolayer gate dielectrics", *Advanced Materials*, Vol. 27, p. 207
- Kuo, Y., (2013), "Thin Film Transistor Technology--Past Present and Future. ", *Electrochemical Society Interface*, pp. 55-61
- Le Comber, P.G. and Spear, W.E., (1970), "Electronic Transport in Amorphous Silicon Films", *Physical Review Letters*, Vol. 25, pp. 509-511
- Levy, D.H., Freeman, D., Nelson, S.F., Cowdery-Corvan, P.J. and Irving, L.M., (2008), "Stable ZnO thin film transistors by fast open air atomic layer deposition", *Applied Physics Letters*, Vol. 92, p. 192101
- Li, C., Duan, L., Li, H. and Qiu, Y., (2014), "Universal Trap Effect in Carrier Transport of Disordered Organic Semiconductors: Transition from Shallow Trapping to Deep Trapping", *The Journal of Physical Chemistry C*, Vol. 118, pp. 10651-10660
- Li, F., Nathan, A., Wu, Y. and Ong, B.S., (2011), *Organic Thin Film Transistor Integration: A Hybrid Approach*, Wiley-VCH
- Liang, Y., Chang, H.-C., Ruden, P.P. and Frisbie, C.D., (2011), "Examination of Au, Cu, and Al contacts in organic field-effect transistors via displacement current measurements", *Journal of Applied Physics*, Vol. 110, p. 064514
- Liang, Y., Frisbie, C.D., Chang, H.-C. and Ruden, P.P., (2009), "Conducting channel formation and annihilation in organic field-effect structures", *Journal of Applied Physics*, Vol. 105, p. 024514
- Libsch, F.R. and Kanicki, J., (1993), "Bias-stress-induced stretched-exponential time dependence of charge injection and trapping in amorphous thin-film transistors", *Applied Physics Letters*, Vol. 62, pp. 1286-1288
- Lin, Y.Y., Gundlach, D.J., Nelson, S.F. and Jackson, T.N., (1997), "Stacked pentacene layer organic thin-film transistors with improved characteristics", *Electron Device Letters, IEEE*, Vol. 18, pp. 606-608
- Ling, M.-M. and Bao, Z., (2006), "Copper hexafluorophthalocyanine field-effect transistors with enhanced mobility by soft contact lamination", *Organic Electronics*, Vol. 7, pp. 568-575
- Ling, M.M., Erk, P., Gomez, M., Koenemann, M., Locklin, J. and Bao, Z., (2007), "Air-Stable n-Channel Organic Semiconductors Based on Perylene Diimide Derivatives without Strong Electron Withdrawing Groups", *Advanced Materials*, Vol. 19, pp. 1123-1127
- Liu, T., (2013), "Thesis Titled: Stability of amorphous silicon thin film transistors and circuits ", Princeton University
- Liu, T., Wagner, S. and Sturm, J.C., (2012), "Two-stage model for lifetime prediction of highly stable amorphous-silicon thin-film transistors under low-gate field", *70th Annual Device Research Conference*
- Lu, X., Minari, T., Kumatani, A., Liu, C. and Tsukagoshi, K., (2011), "Effect of air exposure on metal/organic interface in organic field-effect transistors", *Applied Physics Letters*, Vol. 98, p. 243301
- Madan, A. and Shaw, M.P., (1988), *The Physics and applications of amorphous semiconductors*, Elsevier
- Madou, M. J., (2011), *Fundamentals of Microfabrication and Nanotechnology*, CRC Press Taylor & Francis Group
- Majima, Y., Kawakami, D., Suzuki, S. and Yasutake, Y., (2007), "Simultaneous measurements of drain-to-source current and carrier injection properties of top-contact pentacene thin-film transistors", *Japanese journal of applied physics*, Vol. 46, p. 390
- Marinov, O., Deen, M.J., Zschieschang, U. and Klauk, H., (2009), "Organic Thin-Film Transistors: Part I- Compact DC Modeling", *IEEE Transactions on Electron Devices*, Vol. 56, pp. 2952-2961
- Mathijssen, S.G.J., Cölle, M., Gomes, H., Smits, E.C.P., de Boer, B., McCulloch, I., Bobbert, P.A. and de Leeuw, D.M., (2007), "Dynamics of Threshold Voltage Shifts in Organic and Amorphous Silicon Field-Effect Transistors", *Advanced Materials*, Vol. 19, pp. 2785-2789

- Mathijssen, S.G.J., Spijkman, M.-J., Andringa, A.-M., van Hal, P.A., McCulloch, I., Kemerink, M., Janssen, R.A.J. and de Leeuw, D.M., (2010), "Revealing Buried Interfaces to Understand the Origins of Threshold Voltage Shifts in Organic Field-Effect Transistors", *Advanced Materials*, Vol. 22, pp. 5105-5109
- McDowell, M., Hill, I.G., McDermott, J.E., Bernasek, S.L. and Schwartz, J., (2006), "Improved organic thin-film transistor performance using novel self-assembled monolayers", *Applied Physics Letters*, Vol. 88, p. 073505
- McNeill, R., Siudak, R., Wardlaw, J. and Weiss, D., (1963), "Electronic Conduction in Polymers. I. The Chemical Structure of Polypyrrole", *Australian Journal of Chemistry*, Vol. 16, pp. 1056-1075
- Meerheim, R., Olthof, S., Hermenau, M., Scholz, S., Petrich, A., Tessler, N., Solomeshch, O., Lüssem, B., Riede, M. and Leo, K., (2011), "Investigation of C60F36 as low-volatility p-dopant in organic optoelectronic devices", *Journal of Applied Physics*, Vol. 109, p. 103102
- Meyerhofer, D., (1978), "Characteristics of resist films produced by spinning", *Journal of Applied Physics*, Vol. 49, pp. 3993-3997
- Moore, A.R., (1977), "Electron and hole drift mobility in amorphous silicon", *Applied Physics Letters*, Vol. 31, pp. 762-764
- Moore, G.E., (1998), "Cramming More Components Onto Integrated Circuits", *Proceedings of the IEEE*, Vol. 86, pp. 82-85
- Morigaki, K., (1993), *Physics of Amorphous Semiconductors*, Imperial College Press
- Myny, K., Beenhakkers, M.J., van Aerle, N.A., Gelinck, G.H., Genoe, J., Dehaene, W. and Heremans, P., (2011), "Unipolar organic transistor circuits made robust by dual-gate technology", *Solid-State Circuits, IEEE Journal of*, Vol. 46, pp. 1223-1230
- Nakajima, Y., Takei, T., Tsuzuki, T., Suzuki, M., Fukagawa, H., Yamamoto, T. and Tokito, S., (2009), "Fabrication of 5.8-in. OTFT-driven flexible color AMOLED display using dual protection scheme for organic semiconductor patterning", *Journal of the Society for Information Display*, Vol. 17, pp. 629-634
- Necliudov, P.V., Shur, M.S., Gundlach, D.J. and Jackson, T.N., (2003), "Contact resistance extraction in pentacene thin film transistors", *Solid-State Electronics*, Vol. 47, pp. 259-262
- Niimi, K., Kang, M.J., Miyazaki, E., Osaka, I. and Takimiya, K., (2011), "General Synthesis of Dinaphtho[2,3-b:2',3'-f]thieno[3,2-b]thiophene (DNNT) Derivatives", *Organic Letters*, Vol. 13, pp. 3430-3433
- Noda, M., Kobayashi, N., Katsuhara, M., Yumoto, A., Ushikura, S., Yasuda, R., Hirai, N., Yukawa, G., Yagi, I., Nomoto, K. and Urabe, T., (2011), "An OTFT-driven rollable OLED display", *Journal of the Society for Information Display*, Vol. 19, pp. 316-322
- Ogawa, S., (2005), "Displacement Current Measurement as a Tool to Characterize Organic Field Effect Transistors", *Synthetic Metals*, Vol. 153, pp. 253-256
- Ogawa, S., Kimura, Y., Ishii, H. and Niwano, M., (2003), "Carrier Injection Characteristics in Organic Field Effect Transistors Studied by Displacement Current Measurement*", *Japanese journal of applied physics*, Vol. 42, p. L1275
- Ogawa, S., Kimura, Y., Niwano, M. and Ishii, H., (2007), "Trap elimination and injection switching at organic field effect transistor by inserting an alkane (C₄₄H₉₀) layer", *Applied physics letters*, Vol. 90, p. 033504
- Ogawa, S., Naijo, T., Kimura, Y., Ishii, H. and Niwano, M., (2005), "Photoinduced doping effect of pentacene field effect transistor in oxygen atmosphere studied by displacement current measurement", *Applied Physics Letters*, Vol. 86, p. 252104
- Ogawa, S., Naijo, T., Kimura, Y., Ishii, H. and Niwano, M., (2006), "Photoinduced doping of organic field effect transistors studied by displacement current measurement and infrared absorption spectroscopy in multiple internal reflection geometry", *Japanese journal of applied physics*, Vol. 45, p. 530
- Oh, J.H., Suraru, S.L., Lee, W.-Y., Könnemann, M., Höffken, H.W., Röger, C., Schmidt, R., Chung, Y., Chen, W.-C., Würthner, F. and Bao, Z., (2010), "High-Performance Air-Stable n-Type Organic Transistors Based on Core-Chlorinated Naphthalene Tetracarboxylic Diimides", *Advanced Functional Materials*, Vol. 20, pp. 2148-2156
- OLED, (2014), "LG's 55'' OLED TVs", www.oled-info.com/oled-tv; 15 December 2014
- Ou-Yang, W., Uemura, T., Miyake, K., Onish, S., Kato, T., Katayama, M., Kang, M., Takimiya, K., Ikeda, M., Kuwabara, H., Hamada, M. and Takeya, J., (2012), "High-performance organic transistors with high-k dielectrics: A comparative study on solution-processed single crystals and vacuum-deposited polycrystalline films of 2,9-didodecyl-dinaphtho[2,3-b:2',3'-f]thieno[3,2-b]thiophene", *Applied Physics Letters*, Vol. 101, p. 223304
- Park, S.K., Jackson, T.N., Anthony, J.E. and Mourey, D.A., (2007), "High mobility solution processed 6,13-bis(triisopropyl-silylethynyl) pentacene organic thin film transistors", *Applied Physics Letters*, Vol. 91, p. 063514

- Peng, B. and Chan, P.K., (2014), "Flexible organic transistors on standard printing paper and memory properties induced by floated gate electrode", *Organic Electronics*, Vol. 15, pp. 203-210
- Plummer, J.D., Deal, M.D. and Griffin, P.B., (2000), *Silicon VLSI technology- Fundamentals, Practice and Modeling*, Prentice Hall
- PolyIC, (2014), "*PolyID*", www.polyic.com/poly-id; 15 December 2014
- Pope, M., Kallmann, H.P. and Magnante, P., (1963), "Electroluminescence in Organic Crystals", *The Journal of Chemical Physics*, Vol. 38, pp. 2042-2043
- Powell, M., van Berkel, C., Franklin, A., Deane, S. and Milne, W., (1992), "Defect pool in amorphous-silicon thin-film transistors", *Physical review. B, Condensed matter*, Vol. 45, pp. 4160-4170
- Powell, M.J., (1989), "The physics of amorphous-silicon thin-film transistors", *Electron Devices, IEEE Transactions on*, Vol. 36, pp. 2753-2763
- Powell, M.J., van Berkel, C. and Hughes, J.R., (1989), "Time and temperature dependence of instability mechanisms in amorphous silicon thin-film transistors", *Applied Physics Letters*, Vol. 54, pp. 1323-1325
- Ren, X. and Chan, P.K., (2014), "23 bits optical sensor based on nonvolatile organic memory transistor", *Applied Physics Letters*, Vol. 104, p. 113302
- RFID, (2014), "*Polymer Flexible RFID tag from POLYIC*", www.rfidconsultants.com/rfid.htm; 15 December 2014
- Richards, T. and Sirringhaus, H., (2008), "Bias-stress induced contact and channel degradation in staggered and coplanar organic field-effect transistors", *Applied Physics Letters*, Vol. 92, p. 023512
- Riedl, T., Görrn, P., Hölzer, P. and Kowalsky, W., (2007), "Ultra-high long-term stability of oxide-TFTs under current stress", *physica status solidi*, Vol. 1, pp. 175-177
- Rödel, R., Letzkus, F., Zaki, T., Burghartz, J.N., Kraft, U., Zschieschang, U., Kern, K. and Klauk, H., (2013), "Contact properties of high-mobility, air-stable, low-voltage organic n-channel thin-film transistors based on a naphthalene tetracarboxylic diimide", *Applied Physics Letters*, Vol. 102, p. 233303
- Salleo, A. and Street, R.A., (2003), "Light-induced bias stress reversal in polyfluorene thin-film transistors", *Journal of Applied Physics*, Vol. 94, pp. 471-479
- Sánchez-Carrera, R.S., Atahan, S., Schrier, J. and Aspuru-Guzik, A., (2010), "Theoretical characterization of the air-stable, high-mobility dinaphtho [2, 3-b: 2' 3'-f] thieno [3, 2-b]-thiophene organic semiconductor", *The Journal of Physical Chemistry C*, Vol. 114, pp. 2334-2340
- Sekitani, T., Iba, S., Kato, Y., Noguchi, Y., Someya, T. and Sakurai, T., (2005), "Suppression of DC bias stress-induced degradation of organic field-effect transistors using postannealing effects", *Applied Physics Letters*, Vol. 87, p. 073505
- Sekitani, T., Zschieschang, U., Klauk, H. and Someya, T., (2010), "Flexible organic transistors and circuits with extreme bending stability", *Nature materials*, Vol. 9, pp. 1015-1022
- Servati, P., Nathan, A. and Amaratunga, G.A.J., (2006), "Generalized transport-band field-effect mobility in disordered organic and inorganic semiconductors", *Physical Review B*, Vol. 74, p. 245210
- Shaw, J.M. and Seidler, P.F., (2001), "Organic electronics: Introduction", *IBM Journal of Research and Development*, Vol. 45, pp. 3-9
- Shinhyuk, Y., Jun Yong, B., Sung-Min, Y., Min Ki, R., Himchan, O., Chi-Sun, H., Gi Heon, K., Sang-Hee Ko, P. and Jin, J., (2011), "Low-Temperature Processed Flexible In-Ga-Zn-O Thin-Film Transistors Exhibiting High Electrical Performance", *Electron Device Letters*, Vol. 32, pp. 1692-1694
- Shockley, W., (1949), "The Theory of p-n Junctions in Semiconductors and p-n Junction Transistors", *Bell System Technical Journal*, Vol. 28, pp. 435-489
- Simeone, D., Cipolloni, S., Mariucci, L., Rapisarda, M., Minotti, A., Pecora, A., Cuscunà, M., Maiolo, L. and Fortunato, G., (2009), "Pentacene TFTs with parylene passivation layer", *Thin Solid Films*, Vol. 517, pp. 6283-6286
- Singh, J. and Shimakawa, K., (2003), *Advances in Amorphous Semiconductors*, CRC Press
- Sirringhaus, H., (2009), "Reliability of Organic Field-Effect Transistors", *Advanced Materials*, Vol. 21, pp. 3859-3873
- Sirringhaus, H., (2014), "25th Anniversary Article: Organic Field-Effect Transistors: The Path Beyond Amorphous Silicon", *Advanced Materials*, Vol. 26, pp. 1319-1335
- Sirringhaus, H., Kawase, T., Friend, R.H., Shimoda, T., Inbasekaran, M., Wu, W. and Woo, E.P., (2000), "High-Resolution Inkjet Printing of All-Polymer Transistor Circuits", *Science*, Vol. 290, pp. 2123-2126
- Sony, (2010), "*Technology and Research*", www.sony.net/SonyInfo/News/Press/201012/10-161E/; 15 December 2014
- Studel, S., Myny, K., Schols, S., Vicca, P., Smout, S., Tripathi, A., van der Putten, B., van der Steen, J.-L., van Neer, M., Schütze, F., Hild, O.R., van Veenendaal, E., van Lieshout, P., van Mil, M., Genoe, J., Gelinck, G. and Heremans, P., (2012), "Design and realization of a flexible QQVGA AMOLED display with organic TFTs", *Organic Electronics*, Vol. 13, pp. 1729-1735

- Stolte, M., Suraru, S.L., Würthner, F., Oh, J.H., Bao, Z., Brill, J., Könnemann, M., Qu, J., Zschieschang, U. and Klauk, H., (2010), "Organic n-channel thin film transistors based on dichlorinated naphthalene diimides", *Proceedings of SPIE*, Vol. 7778, p. 777804
- Street, R.A., Chabinyk, M.L., Endicott, F. and Ong, B., (2006), "Extended time bias stress effects in polymer transistors", *Journal of Applied Physics*, Vol. 100, p. 114518
- Streetman, B.G. and Banerjee, S., (2005), *Solid State Electronic Devices*, Prentice-Hall
- Suzuki, S., Yasutake, Y. and Majima, Y., (2008), "Frequency dependences of displacement current and channel current in pentacene thin-film transistors", *Japanese Journal of Applied Physics*, Vol. 47, p. 3167
- Sze, S.M. and Ng, K.K., (1969), *Physics of Semiconductor Devices*, Wiley Interscience
- Tang, C.W., (1986), "Two-layer organic photovoltaic cell", *Applied Physics Letters*, Vol. 48, pp. 183-185
- Tang, C.W. and VanSlyke, S.A., (1987), "Organic electroluminescent diodes", *Applied Physics Letters*, Vol. 51, pp. 913-915
- Teichler, A., Perelaer, J. and Schubert, U.S., (2013), "Inkjet printing of organic electronics - comparison of deposition techniques and state-of-the-art developments", *Journal of Materials Chemistry C*, Vol. 1, pp. 1910-1925
- Teijin DuPont., (2014), "PEN film", www.teijindupontfilms.jp/english/product/pen_teo.html; 15 December 2014
- Tiwari, S.P., Kim, J., Knauer, K.A., Hwang, D.K., Polander, L.E., Barlow, S., Marder, S.R. and Kippelen, B., (2012), "Complementary-like inverters based on an ambipolar solution-processed molecular bis(naphthalene diimide)-dithienopyrrole derivative", *Organic Electronics*, Vol. 13, pp. 1166-1170
- Tiwari, S.P., Zhang, X.-H., Potscavage, W.J. and Kippelen, B., (2009), "Low-voltage solution-processed n-channel organic field-effect transistors with high-k HfO₂ gate dielectrics grown by atomic layer deposition", *Applied Physics Letters*, Vol. 95, p. 223303
- Tiwari, S.P., Zhang, X.-H., Potscavage, W.J. and Kippelen, B., (2009), "Study of electrical performance and stability of solution-processed n-channel organic field-effect transistors", *Journal of Applied Physics*, Vol. 106, p. 054504
- Torsi, L., Dodabalapur, A., Sabbatini, L. and Zamboni, P.G., (2000), "Multi-parameter gas sensors based on organic thin-film-transistors", *Sensors and Actuators B: Chemical*, Vol. 67, pp. 312-316
- Troisi, A. and Orlandi, G., (2005), "Band structure of the four pentacene polymorphs and effect on the hole mobility at low temperature", *The Journal of Physical Chemistry B*, Vol. 109, pp. 1849-1856
- U. Kraft, U. Zschieschang, K. Takimiya, E. Weber and Klauk, H., (2014), "Time-Dependent Improvement in Contact Resistance and Dynamic Performance of Low-Voltage Organic p-Channel TFTs based on Air-Stable DNTT Derivatives", *56th Electronic Materials Conference*, Santa Barbara
- Vissenberg, M.C.J.M. and Matters, M., (1998), "Theory of the field-effect mobility in amorphous organic transistors", *Physical Review B*, Vol. 57, pp. 12964-12967
- Wang, S.D., Minari, T., Miyadera, T., Aoyagi, Y. and Tsukagoshi, K., (2008), "Bias stress instability in pentacene thin film transistors: Contact resistance change and channel threshold voltage shift", *Applied Physics Letters*, Vol. 92, p. 063305
- Wang, S.D., Minari, T., Miyadera, T., Tsukagoshi, K. and Aoyagi, Y., (2007), "Contact-metal dependent current injection in pentacene thin-film transistors", *Applied Physics Letters*, Vol. 91, p. 203508
- Wei, C.-Y., Shu-Hao, K., Yu-Ming, H., Wen-Chieh, H., Adriyanto, F. and Yeong-Her, W., (2011), "High-Mobility Pentacene-Based Thin-Film Transistors With a Solution-Processed Barium Titanate Insulator", *Electron Device Letters, IEEE*, Vol. 32, pp. 90-92
- Wikipedia, (2014), "Transistor Count", www.en.wikipedia.org/wiki/Transistor_count; 15 December 2014
- Wikipedia, (2014), "Lee de Forest", www.en.wikipedia.org/wiki/Lee_de_Forest; 16 December 2014
- Wikipedia, (2014), "Integrated Circuit", www.en.wikipedia.org/wiki/Integrated_circuit; 15 December 2014
- Winler, M. and Houk, K. N., (2007), "Nitrogen-rich oligoacenes: candidates for n-channel organic semiconductors", *Journal of the American Chemical Society*, Vol. 129, pp. 1805
- Woo Jin, K.I.M., Chang Su, K.I.M., Sung Jin, J.O., Sung Won, L.E.E., Se Jong, L.E.E. and Hong Koo, B., (2007), "Observation of the hysteresis behavior of pentacene thin-film transistors in I-V and C-V measurements", *Electrochemical and solid-state letters*, Vol. 10, pp. H1-H4
- Xia, Y., Kalihari, V., Frisbie, C.D., Oh, N.K. and Rogers, J.A., (2007), "Tetracene air-gap single-crystal field-effect transistors", *Applied physics letters*, Vol. 90, p. 162106
- Yagi, I., Hirai, N., Miyamoto, Y., Noda, M., Imaoka, A., Yoneya, N., Nomoto, K., Kasahara, J., Yumoto, A. and Urabe, T., (2008), "A flexible full-color AMOLED display driven by OTFTs", *Journal of the Society for Information Display*, Vol. 16, pp. 15-20
- Yamamoto, T. and Takimiya, K., (2007), "Facile Synthesis of Highly π -Extended Heteroarenes, Dinaphtho[2,3-b:2',3'-f]chalcogenopheno[3,2-b]chalcogenophenes, and Their Application to Field-Effect Transistors", *Journal of the American Chemical Society*, Vol. 129, pp. 2224-2225

- Yan, Y., She, X.J., Zhu, H. and Wang, S.D., (2011), "Origin of bias stress induced instability of contact resistance in organic thin film transistors", *Organic Electronics*, Vol. 12, pp. 823-826
- Yang, Y.S., Yasuda, T., Kakizoe, H., Mieno, H., Kino, H., Tateyama, Y. and Adachi, C., (2013), "High performance organic field-effect transistors based on single-crystal microribbons and microsheets of solution-processed dithieno[3,2-b:2'-b']thiophene derivatives", *Chemical Communications*, Vol. 49, pp. 6483-6485
- Yang, J., Yim, S. and Jones, T. S., (2015), "Molecular-orientation-induced rapid roughening and morphology transition in organic semiconductor thin-film growth", *Scientific Reports*, Vol. 5, p. 9441
- Ye, R., Baba, M., Suzuki, K. and Mori, K., (2009), "Improved performance of fluorinated copper phthalocyanine thin film transistors using an organic pn junction: Effect of copper phthalocyanine film thickness", *Thin Solid Films*, Vol. 517, pp. 3001-3004
- Yen-Yi, L., Gundlach, D.L., Nelson, S.F. and Jackson, T.N., (1997), "Pentacene-based organic thin-film transistors", *Electron Devices, IEEE Transactions on*, Vol. 44, pp. 1325-1331
- Yokota, T., Kuribara, K., Tokuhara, T., Zschieschang, U., Klauk, H., Takimiya, K., Sadamitsu, Y., Hamada, M., Sekitani, T. and Someya, T., (2013), "Flexible Low-Voltage Organic Transistors with High Thermal Stability at 250 °C", *Advanced Materials*, Vol. 25, pp. 3639-3644
- Yokota, T., Sekitani, T., Kato, Y., Kuribara, K., Zschieschang, U., Klauk, H., Yamamoto, T., Takimiya, K., Kuwabara, H. and Ikeda, M., (2011), "Low-voltage organic transistor with subfemtoliter inkjet source-drain contacts", *MRS Communications*, Vol. 1, pp. 3-6
- Zaki, T., Rodel, R., Letzkus, F., Richter, H., Zschieschang, U., Klauk, H. and Burghartz, J.N., (2013), "S-parameter characterization of submicrometer low-voltage organic thin-film transistors", *Electron Device Letters, IEEE*, Vol. 34, pp. 520-522
- Zaki, T., Scheinert, S., Horselmann, I., Rodel, R., Letzkus, F., Richter, H., Zschieschang, U., Klauk, H. and Burghartz, J.N., (2014), "Accurate Capacitance Modeling and Characterization of Organic Thin-Film Transistors", *Electron Devices, IEEE Transactions on*, Vol. 61, pp. 98-104
- Zhang, X.-H., Domercq, B., Wang, X., Yoo, S., Kondo, T., Wang, Z.L. and Kippelen, B., (2007), "High-performance pentacene field-effect transistors using Al₂O₃ gate dielectrics prepared by atomic layer deposition (ALD)", *Organic Electronics*, Vol. 8, pp. 718-726
- Zhang, X.-H., Tiwari, S.P. and Kippelen, B., (2009), "Pentacene organic field-effect transistors with polymeric dielectric interfaces: Performance and stability", *Organic Electronics*, Vol. 10, pp. 1133-1140
- Zhou, J., Hao, Y., Yu, X., Zhou, N. and Lin, H., (2013), "High-performance and operationally stable organic thin-film transistors using bi-buffer layers with low-cost electrodes", *Journal of Physics D: Applied Physics*, Vol. 46, p. 385104
- Zhou, L., Wanga, A., Wu, S.-C., Sun, J., Park, S. and Jackson, T.N., (2006), "All-organic active matrix flexible display", *Applied Physics Letters*, Vol. 88, p. 083502
- Zschieschang, U., Ante, F., Kälblein, D., Yamamoto, T., Takimiya, K., Kuwabara, H., Ikeda, M., Sekitani, T., Someya, T., Nimoth, J.B. and Klauk, H., (2011), "Dinaphtho[2,3-b:2',3'-f]thieno[3,2-b]thiophene (DNIT) thin-film transistors with improved performance and stability", *Organic Electronics*, Vol. 12, pp. 1370-1375
- Zschieschang, U., Ante, F., Schlörholz, M., Schmidt, M., Kern, K. and Klauk, H., (2010), "Mixed Self-Assembled Monolayer Gate Dielectrics for Continuous Threshold Voltage Control in Organic Transistors and Circuits", *Advanced Materials*, Vol. 22, pp. 4489-4493
- Zschieschang, U., Ante, F., Yamamoto, T., Takimiya, K., Kuwabara, H., Ikeda, M., Sekitani, T., Someya, T., Kern, K. and Klauk, H., (2010), "Flexible Low-Voltage Organic Transistors and Circuits Based on a High-Mobility Organic Semiconductor with Good Air Stability", *Advanced Materials*, Vol. 22, pp. 982-985
- Zschieschang, U., Hofmockel, R., Rödel, R., Kraft, U., Kang, M.J., Takimiya, K., Zaki, T., Letzkus, F., Butschke, J., Richter, H., Burghartz, J.N. and Klauk, H., (2013), "Megahertz operation of flexible low-voltage organic thin-film transistors", *Organic Electronics*, Vol. 14, pp. 1516-1520
- Zschieschang, U., Kang, M.J., Takimiya, K., Sekitani, T., Someya, T., Canzler, T.W., Werner, A., Blochwitz-Nimoth, J. and Klauk, H., (2012), "Flexible low-voltage organic thin-film transistors and circuits based on C10-DNIT", *Journal of Materials Chemistry*, Vol. 22, pp. 4273-4277
- Zschieschang, U., Weitz, R.T., Kern, K. and Klauk, H., (2009), "Bias stress effect in low-voltage organic thin-film transistors", *Applied Physics A*, Vol. 95, pp. 139-145
- Zschieschang, U., Ante, F., Schlörholz, M., Kern, K. and Klauk, H., (2009), "Deterministic and continuous control of the threshold voltage and noise margin of organic thin-film transistors and organic complementary circuits using mixed phosphonic acid self-assembled monolayer gate dielectrics", *Presented at Device Research Conference*, p. 181