© INTERNATIONAL JOURNAL FOR RESEARCH PUBLICATION & SEMINAR
ISSN: 2278-6848 | Volume: 08 Issue: 05 | April - June 2017
Paper is available at www.jrps.in | Email : info@jrps.in

A REVIEW ON POLYTRONICS FOR LESS POWER CONSUMPTION

Tanshu[1], Research Scholar, Department Electronics & Communication,
Sant Kabir Institute of Technology & Management, Tanshudelhi@gmail.com
Sumit Dalal[2], Department Electronics & Communication, Sant Kabir Institute of Technology & Management, Sumit828dalal@yahoo.co.in

ISSN : 2278-6848 03
9 772278 684800
© International Journal for Research Publication and Seminar

Abstract: For many years plastics were well known merely as insulators & were used predominantly for shielding copper wires. Now emerging new technology Polytronics, changes our viewpoint in visualizing conducting polymers as a material of microelectronics. Polytronics devices provide several benefits such as Easy Manufacturability (mass production) & low cost. They could be recycled & reused or decreases environmental stress. They Consumes less power are mobile, small, & light in weight. They are used to make display devices that have extraordinary picture quality. In this research we have to study scope of polychromic devices & investigate their benefits & limitations as compare to traditional technology.

Keywords: microelectronic, transistors, semiconductor, polytronics, materials.

[1] INTRODUCTIN

Microelectronics is a subfield of electronics. As name suggests, microelectronics relates to study & manufacture of very small electronic designs & components. Usually, but not always, this means micrometre-scale or smaller. These devices are typically made from semiconductor materials. Many components of normal electronic design are available in a microelectronic equivalent. These include transistors, capacitors, inductors, resistors, diodes & insulators & conductors could all be found in microelectronic devices. Unique wiring techniques such as wire bonding are also often used in microelectronics because of unusually small size of components, leads & pads. This technique requires specialized equipment & is expensive. Digital integrated circuits consist mostly of transistors. Analog circuits commonly contain resistors & capacitors as well. Inductors are used in some high frequency analog circuits, but tend to occupy large chip area if used at low frequencies; gyrators could replace them in many applications. As techniques improve, scale of microelectronic components continues to decrease. At smaller scales, relative impact of intrinsic circuit properties such as interconnections may become more significant. These are called parasitic effects, & goal of microelectronics design engineer is to find ways to compensate for or to minimize these effects, while always delivering smaller, faster, & cheaper devices. Microelectronics technology in conjunction with silicon is flexible enough to easy rolling up of circuits that consume less power & above all they could be manufactured at a fraction of cost involved in making semiconductor chips. This technology has number of upcoming areas of interest where lot of research is going on to manufacture microelectronic components on plastic substrates which would allow manufacturing of gadgets through just printing process.

© INTERNATIONAL JOURNAL FOR RESEARCH PUBLICATION & SEMINAR
ISSN: 2278-6848 | Volume: 08 Issue: 05 | April - June 2017
Paper is available at www.jrps.in | Email : info@jrps.in

Nanoelectronics

Nanoelectronics meant for use of nanotechnology in electronic components. The term covers a diverse set of devices & materials, with common characteristic that they are so small that inter-atomic interactions & quantum mechanical properties need to be studied extensively. Silicon has largely influenced Electronics industry & would continue to do so over a period of time. However, technologists are now looking at other alternatives, mainly "plastic circuits", to meet our future needs.

Polytronics

Silicon has largely influenced Electronics industry & would continue to do so over a period of time. However, technologists are now looking at other alternatives, mainly "PLASTIC CIRCUITS", to meet our future needs. The feasibility of developing entire electronic components on basis of polymers is met by "INKJET PRINTING TECHNOLOGY" & is illustrated by several applications such as electronic paper, plastic batteries, etc

[2] LITERATURE REVIEW

Here we have discussed existing researches related to polytronics. We have discussed research topic with author including summary of those researches.

Polymer electronics - fancy or the future of electronics by Karlheinz Bock, Rolf Aschenbrenner

At present, electronic world is very much dominated by inorganic materials, in particular silicon. Organic materials in electronic devices were mostly used as insulators, so far. The history of polymer electronics started 25 years ago – firstly conductors, than semiconductors, transistors & fully functional polymer ICs. But mobility of charge carriers in polymers is limited & incomparable to silicon. Nevertheless, polymer electronics plays more & more important role nowadays, especially in flexible electronic.

Chip technologies for Entertainment Robots - present & future by T. Makimoto

The historical background, current status & future prospect of Entertainment Robots would be reviewed, & critical roles played by chip technologies - including processor performance, sensing capability & actuator elements - discussed. Entertainment Robots were developed & introduced to market in late 1990s. Sony's AIBO, a dog-like Entertainment Robot, was first of this kind & was sold through Internet channels beginning in 1999. Biped humanoid robots have also been developed & would be introduced to market in not too distant future.

Polytronics by S Nagraj stated that for many years plastics were well known merely as insulators & were used predominantly for shielding copper wires. Now emerging new technology Polytronics, changes our viewpoint in visualizing conducting polymers as a material of microelectronics. Microelectronics technology in conjunction with silicon is flexible enough to easy rolling up of circuits that consume less power & above all they could be manufactured at a fraction of cost involved in making semiconductor chips.

[3] AREA OF APPLICATION

The huge cost of manufacturing Silicon microchip is due to large complex processes involved. Photolithographic techniques are used to pattern wafers with microcircuit, which is grown in powerful vacuum, while wafers are baked at temperatures of several hundred centigrade' The objective of research is to make study of polytronic technology, here we would have to

1. Study scope of polytronic technology.

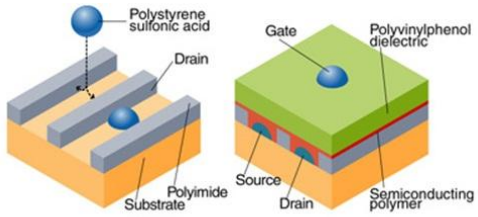
© INTERNATIONAL JOURNAL FOR RESEARCH PUBLICATION & SEMINAR
ISSN: 2278-6848 | Volume: 08 Issue: 05 | April - June 2017
Paper is available at www.jrps.in | Email : info@jrps.in

2. Study of application areas where polytronic technology is use Investigate architecture of polytronic based technology.

4. Comparative study of performance of polytronic devices with traditional using simulator such as Matlab.

[4] TOOLS & TECHNOLOGY

A piezoelectric material expands when a voltage is passed across it, pressing on a reservoir fluid & sending droplets flying out on to substrates. Here, construction of "TOPGATE TRANSISTOR" is explained below.



Construction of topgate transistor

The water based droplets contain organic conductor droplets dry they become a conducting layer & form source & drain of a transistor. They are then coated with a layer of semi conducting followed by a dielectric layer of polyvinyl phenol. Finally gate is printed, creating a so called top gate transistor. How semiconductor polymer dries is very crucial. The molecular chains must line up in a way that makes it easy for an electron to hop from one chain to another, but polymers tend to form into disordered microstructure that reduces electron charge.

[5] PROPOSED WORK

Microelectronics technology at combination within silicon is plastic to simple rolling up of circuits that needs less power & they could be manufactured at a fraction of cost involved at making semiconductor chips. This technology has number of upcoming areas of interest where lot of research is going on to manufacture microelectronic components on plastic substrates which would allow manufacturing of gadgets through just printing process.

The widespread use of silicon electronic goods large number of disadvantages some are,

Production of silicon embedded circuits involves a huge investment.

1. These circuits needs more power.
2. Silicon chips are not flexible, products.
3. They are not easily portable.
4. We need polytronics to overcome these limitations.
5. Polytronics devices are manufactured at low cost as compared to conventional chips.

Polytronics seems to be best answer for electronic wastes.

[6] Conclusion

Plastic batteries are new type of low power batteries that do not require a case & are thin enough to be printed on a paper. They are of low cost & could be mass produced as battery material is roughly 0.5 millimeters thick. Polytronics could be used for incorporating power source in integrated circuits. Polymer battery system could be used to power space satellites, giving them uninterrupted power supply by harnessing solar energy.

References

1. PC-6: Manual for Poly-com "6" Transceiver for 6 meters. Compliments of Larry Saletzki, WA9VRH.
2. T.Makimoto & T.T.Doi, "Polytronics – Present & future," in Tech.Dig.Electronics Technologies Meeting,IEDM'02,2002,pp.9-16

3. Veendrick, H.J.M. (2011). Bits on Chips. p. 253. ISBN 978-1-61627-947-9
4. Melosh, N.; Boukai, Abram; Diana, Frederic; Gerardot, Brian; Badolato, Antonio; Petroff, Pierre; Heath, James R. (2003). "Ultrahigh density nanowire lattices & circuits". Science. 300 (5616): 112–5. Bibcode:2003Sci...300..112M. doi:10.1126/science.1081940. PMID 12637672.
5. Das, S.; Gates, A.J.; Abdu, H.A.; Rose, G.S.; Picconatto, C.A.; Ellenbogen, J.C. (2007). "Designs for Ultra-Tiny, Special-Purpose Nanoelectronic Circuits". IEEE Trans. on Circuits & Systems I. 54 (11): 11. doi:10.1109/TCSI.2007.907864.
6. Goicoechea, J.; Zamarreñoa, C.R.; Matiasa, I.R.; Arregui, F.J. (2007). "Minimizing photobleaching of self-assembled multilayers for sensor applications". Sensors & Actuators B: Chemical. 126 (1): 41–47. doi:10.1016/j.snb.2006.10.037.
7. Petty, M.C.; Bryce, M.R.; Bloor, D. (1995). An Introduction to Molecular Electronics. London: Edward Arnold. ISBN 0-19-521156-1.
8. Aviram, A.; Ratner, M. A. (1974). "Molecular Rectifier". Chemical Physics Letters. 29 (2): 277–283. Bibcode:1974CPL....29..277A. doi:10.1016/0009-2614(74)85031-1.
9. Aviram, A. (1988). "Molecules for memory, logic, & amplification". Journal of American Chemical Society. 110 (17): 5687–5692. doi:10.1021/ja00225a017.
10. Postma, Henk W. Ch.; Teepen, Tijs; Yao, Zhen; Grifoni, Milena; Dekker, Cees (2001). "Carbon annotate single-electron transistors at room temperature". Science. 293 (5527): 76–79. Bibcode:2001Sci...293...76P. doi:10.1126/science.1061797. PMID 11441175.
11. Xiang, Jie; Lu, Wei; Hu, Yongjie; Wu, Yue; Yan Hao; Lieber, Charles M. (2006). "Ge/Si nanowire heterostructures as high-performance field-effect transistors". Nature. 441 (7092): 489–493. Bibcode:2006Natur.441..489X. doi:10.1038/nature04796. PMID 16724062.
12. Waldner, Jean-Baptiste (2007). Nanocomputers & Swarm Intelligence. London: ISTE. p. 26. ISBN 1-84704-002-0.
13. Jensen, K.; Weldon, J.; Garcia, H.; Zettl A. (2007). "Nanotube Radio". Nano Lett. 7 (11): 3508–3511. Bibcode:2007NanoL...7.3508J. doi:10.1021/nl0721113. PMID 17973438.