© UNIVERSAL RESEARCH REPORTS | REFEREED | PEER REVIEWED
ISSN : 2348 - 5612 | Volume : 05 , Issue : 07 | June 2018

SIMULATION OF POWER CONSUMPTION, SCREEN RESOLUTION AND REFRESH RATE IN CASE OF OLED

[1]Swati , [2]Swati Bhasin

Research Scholar, Department of ECE, GIET, kanipla (Kurukshetra)**Chhayaswati94@gmail.com**
Assistant Professor, Department of ECE, GIET, kanipla (Kurukshetra **missbhasin@gmail.com**

Abstract: An organic light emitting diode is having many semiconducting organic layers. Those layers are located between two electrodes towards one of them existence transparent. The goal of work is to define the benefits of organic light-emitting diode upon traditional methods. The proposed work is based on dataintegration. Thatdata is related to organic light-emitting diode. Data collected is related to power consumption, refresh rate, cost, sale andallowance of organic light-emitting diode. Outputwill be withdrawn how that technology will be well than light emitting diodes and LCD. The influencing factor taken here will be Power consumption, screen resolution and refresh rate thiscommonly affect performance of display systems.

ISSN : 2348-5612 © URR
9 770234 856124

Keyword: LCD, OLED, LED, ELECTROD, SEMICONDUCTING ORGANIC LAYERS

[1] INTRODUCTION

An organic light emitting diodecontains of many semiconducting organic layers placed between two electrodes.Shortly before one of them being transparent. A simplified system structure as display in Figure 1, on the left a one-side emitting device and on the right a transparent one that emits light in both top and bottom direction. The device is fabricated by sequentially depositing organic layers on a conducting substrate followed through another conducting electrode. A general device structure comprises an indium tin oxide (ITO) coated glass substrate. It'slike transparent anode and a thin opaque metal film like a cathode. The organic stack involving the electrodes is commonly thinner as compare to 1µm. Two classes of organic materials are generallyexpends in organic light emitting devices. It involved polymeric substances and so known as small molecule materials that do not exhibit any orientating property.Therefore, form amorphous films. One interesting part of organics dependentopto-electronics is the possibility to expends simple screen printing or wet deposition method for cost-effective big area fabrication. Currently,that holds only for polymeric organics whereas for small molecules evaporating methodhave to applied.

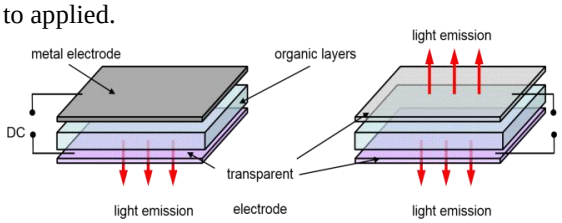

Figure 1 Simplified Structure of an organic light emitting device. On the left a one sided bottom emitting' device, on the right a transparent device is display.Thatcould be emits in both directions and appears transparent when turned off.

[2]CHALLENGES AND LIMITATIONS

In existing researches the limitation is that it is just takingorganic light emitting diode and that paper presents a new theoretical equivalent model for organic light-emitting diodes. The parameters of TEM are identified using a simple characterization procedure based on auxiliary circuits and low-cost equipment. In way to validate the proposal of tradition paper, for commercial organic light emitting diode are tested. The comparison between the theoretical and the experimental output is satisfactory.

[3] BENEFIT OF PROPOSED WORK

Proposed work allow the comparison of organic light emitting diode with light emitting diodes and LCD methods in manner to find that in which circumstances thatmethodmust be used taking factor likes as power consumption, cost factor, screen dimension.

There are many display systems that available in market as display in Fig 2. But they have been its own limitations. As we know that display systems are superior and inferior to each other on bases of refresh rate. It includes power consumption andits resolution. If we create comparison between power consumption of two system then device consuming less power will be better. If we are discuss about refresh rate then

© UNIVERSAL RESEARCH REPORTS | REFEREED | PEER REVIEWED
ISSN : 2348 - 5612 | Volume : 05 , Issue : 07 | June 2018

system within more refresh will be taken better. In concept of resolution dot per inch is take. System having higher resolution will be taken better. Cost of systemwill be considered here.

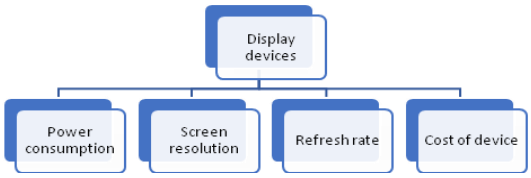

Figure 2 Criteria to compare devices

Refresh rate is how frequently TV modify image also calleda frame on screen. Within traditional televisionsthat was 60 times each secondand 60Hz.

Screen resolutionshave main ingredient like as HDTV and UHD for TV. It includes XGA and WQXGA for computer monitors. Screen resolutions havebeen a pixel say numberssuch as 1600x1200which means 1,200 vertical pixelsand 1,600 horizontal pixelsare there.

Some modern TVs can be refresh at highest rates, most generally120Hz or 120 frames per second and 240Hz as shown in Fig 3.

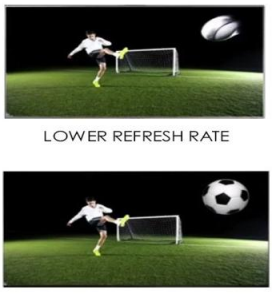

Figure 3 Comparison between lower & higher refresh rate

[4] Objective

The goal of work is to defineadvantages of organic light-emitting diode upon traditional methods. There we have worked within following goals-

1. Discovery of Quality of image as compare to light emitting diodes in concept of organic light-emitting diode.
2. Study of power consumption as compare to light emitting diodes in concept of organic light-emitting diode.
3. Analysis of acceptance rate of organic light-emitting diode in market as compare to tradition methods.
4. Discussion on efficiency of organic light-emitting diode as compare to traditional methods.

[5] PROPOSED WORK

The proposed work is depends on information collection related to organic light-emitting diode. Here information collection related to power consumption, refresh rate, cost, sale andallowance of organic light-emitting diode will be done. The conclusion will be withdrawn how thatmethodwill be better than light emitting diodes and LCD. The influencing factor taken here will be Power consumption, screen resolution and refresh rate that commonly affect performance of display system.

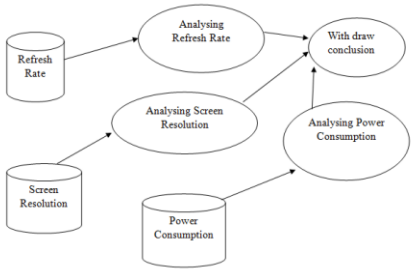

Figure 4 Proposed Models

[6] RESULT AND DISCUSSION

Power Consumption

ORGANIC LIGHT EMITTING DIODES panels are thinnerandneeds no backlight. As like, organic light emitting diode TV's tend to be lighter in weight. It is lighteras compared to LCD and LED TVs and considerably thinner. They also needs less power, producing them most efficient.

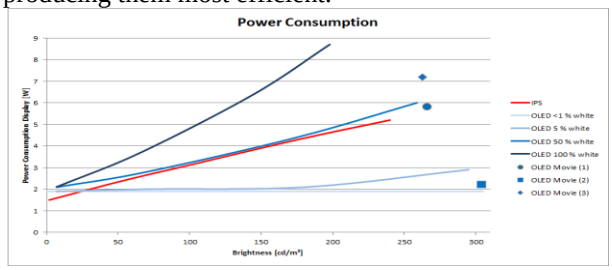

Figure 5: Comparison of power consumption

Price

Once a time, that category was handily won via LED and LCD TVs but organic light emitting diode TVs nearby snap up that category dependsupon price to performance ratio.

Thus, organic light emitting diode TVs are premium TVs, period. Commonly no budget and mid-range tier exists for OLED. Light emitting diodes TVs, thus, can be range in price from a couple hundred dollars to many thousand dollars. It making them completed more accessible as compared to OLED.

Table 1: Comparison lighting in case of light emitting diodes and OLED

© UNIVERSAL RESEARCH REPORTS | REFEREED | PEER REVIEWED
ISSN : 2348 - 5612 | Volume : 05 , Issue : 07 | June 2018

	LCD/LED	OLED
Lighting Uniformity		X
Brightness	X	
Local Dimming & Contrast		X
Burn-In	Tie	Tie
Resolution	Tie	Tie
Expanded Color Gamut		X
Viewing Angle		X
Energy Consumption		X
High Dynamic Range (HDR)	Tie	Tie
Refresh Rate / Motion Blur		X
Lifespan	X	
Price	X	

Comparative analysis between light emitting diodes and organic light emitting diode power consumption

That chart shows power consumption of light emitting diodes and organic light emitting diode in distinct in sizes.

Table 2: Difference table of power consumption in case of light emitting diodes and OLED

SIZE (INCH)	LED (W)	OLED (W)	Difference
32	28	57	29
36	28	64	36
40	31	71	40
44	35	78	43
50	45	89	44
56	59	100	41
60	71	107	36
65	88	116	28
70	108	125	17
75	131	134	3

From below chartthat is shows to us that power consumption in concept of organic light emitting diode is well as compare to light emitting diodes. But as size maximizes power consumption of LED is maximize with more speed than OLED. Power consumption in concept of size 75 inch power consumption distinct of light emitting diodes and organic light emitting diode gets minimized. Larger TV's also follows to more heat, like any circuit would. That is not too large of a deal but that theoretically can bereasonconcept in hotter countries, if TV is not located in a temp-regulated environment.

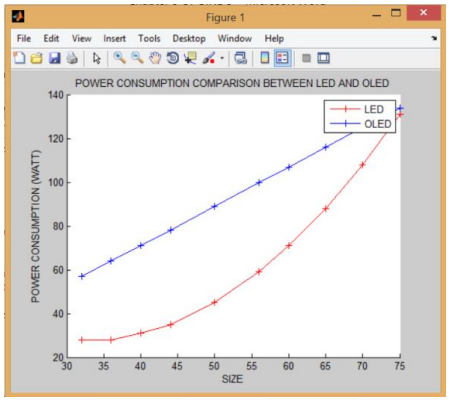

Figure 6: Comparative analysis of power consumption in case of LED and OLED

Relationship between electricity cost & size of LCD and OLED

As power consumption maximizes the cost of usage also maximize. From comparative analysis if LCD and organic light emitting diode

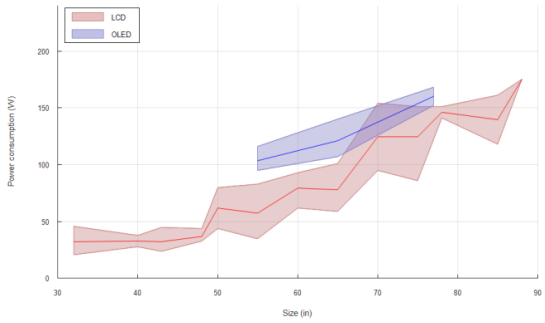

Figure 7: Power Consumption Comparison in Case Of LCD and OLED

From following chart that is clear that cost difference in concept of LCD AND organic light emitting diode is negligible in cncept of large size screen.

Brightness and Energy Consumption

In that section we would make comparison between energy consumption at distinct brightness levels. Following is reading of power consumption in term of LCD AND OLED.

Table 3: Comparative analysis of power consumption at different brightness level

BRIGHTNESS	LCD(W)	OLED(W)
50	48	52
100	50	95

150	53	110
200	75	150
250	98	175
300	100	205

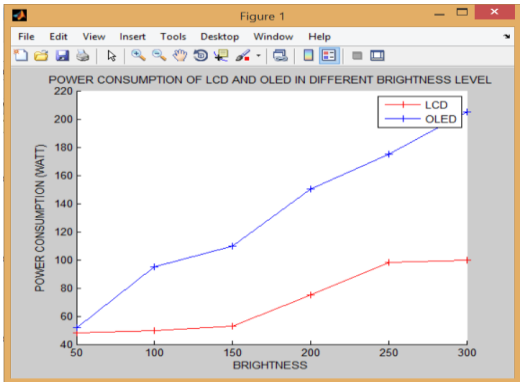

Figure 8: Comparative Analysis of Power Consumption at Different Brightness Level

From above comparison that is clear that if brightness of LCD and organic light emitting diode is maximize than power consumption also get maximized.

[7] CONCLUSION

The highest or brighter you're TV, more power it will beconsidersrunning. User can be see how much power a Television expends with power consumption calculator. Energy Consumption is a smaller factor in purchasing appliances today. TVs especially reflect that. Modern methodslike as LED and OLED have bought television power usages down a fair margin. And long gone are the days of inefficient CRTs and plasma sets whichcan be run up electricity costs via a good amount. At that time when even modern large, bright TVs don't consume that much power, easiest manner to minimize amount of energy. User's Television consumes is to go smaller, go dimmer, and turn its Television off when that is not in expend. From that research that is clear that cost difference in concept of LCD AND organic light emitting diode is negligible in concept of large size screen.From above experiments that is clear that if brightness of LCD and organic light emitting diode is maximize than power consumption also get maximized.

[8] FUTURE SCOPE

Research and enhancement in the field of organic light emitting diode s is proceeding immediately.Thatconcentrates to future applications in the heads up display, automotive dash boards, billboard type displays. Due to organic light emitting diode s refresh faster as compared to LCDs, a system with organic light emitting diode display. It could modifydata in real time. Video images can be much more realistic and constantly updated. Organic light emitting diodes have beenbig fields of displaylike they createits own light. Organic light emitting diodes have been wide seeing angle as compared to LCDs and couldreplace LCDs in future. It is a key methods in the enhancement of flexible displays.

REFERENCES

[1] W. Hu, K. Manabe, T. Furukawa, M. Matsumura, ―Lowering of operational voltage of organic electroluminescent devices by coating indium-tin-oxide electrodes with a thin CuOx layer‖, in Applied Physics Letters 80 (2002) 2640-2643

[2] Hamilton M. C., Martin S., Kanicki J. *IEEE Trans. Electron Devices*, 51 (2004) 877.

[3] Chieh-Wei Chen, Yin-Jui Lu and Chung-ChihWua (2005) "Effective connecting architecture for tandem organic light-emitting devices", digital object identifier 11.1108/TED.2005.2963699

[4] Bernard Geffroy,Philippe le Roy and Christophe Prat (2006) "Organic light-emitting diode (OLED) technology: materials, devices and display technologies".

[5] Ashtiani, Shahin J.; Reza Chaji, G.; Nathan, Arokia. "AMOLED Pixel Circuit With Electronic Compensation of Luminance Degradation". Journal of Display Technology 38: 36. DOI:10.1109/JDT.2006.890711

[6] E. Menard, M. A. Meitl, Y. Sun et al., "Micro- and nanopatterning techniques for organic electronic and optoelectronic systems," Chemical Reviews, vol. 107, no. 4, pp. 1117–1160, 2007.

[7] W.X. Li, J. Hagen, R. Jones, J. Heikenfeld (2007) "Colortunable organic light emitting diodes using Eu complex doping",

[8] J. GODLEWSKI and M. OBAROWSKA (2007) "Organic light emitting diodes", International Journal of Knowledge Engineering, 15/4 (2007) 179-183.

[9] W. A. MacDonald, M. K. Looney, D. Mackerron et al., "Latest advances in substrates for flexible electronics," Journal of the Society for Information Display, vol. 15, no. 12, pp. 1075–1083, 2007

[10] W. A. MacDonald, M. K. Looney, D. Mackerron et al., "Latest advances in substrates for flexible electronics," Journal of the Society for Information Display, vol. 15, no. 12, pp. 1075–1083, 2007

[11] D.-H. Lee, J. Choi, H. Chae, C.-H. Chung, and S. M. Cho, (2008) "Single-layer organic-light-emitting devices fabricated by screen printing method," Korean Journal of Chemical Engineering, vol. 25, no. 1, pp. 176–180, 2008.

[12] Mao-Kuo Wei, Chii-Wann Lin, Chih-Chung Yang (2010) "Emission Characteristics of Organic Light-Emitting Diodes and Organic Thin-Films with Planar and Corrugated Structures", Int. J. Mol. Sci. 2010,

[13] Vanessa Wood and Vladimir Bulovic´ *(2010) "Colloidal quantum dot light-emitting devices",

[14] ShahulHameed, P. Predeep (2010) "Polymer Light Emitting Diodes - A Review on Materials and Techniques",

[15] Kihyon Hong and Jong-Lam Lee (2011) "Review Paper: Recent Developments in Light Extraction Technologies of Organic Light Emitting Diodes", Electronic Materials Letters, Vol. 7, No. 2 (2011), pp. 77-91

[16] MohamadSalehAlSalhi, JavedAlam (2011) "Recent Advances in Conjugated Polymers for Light Emitting Devices", Int. J. Mol. Sci. 2011

[17] Khaty N.T., Muley A.A., Ugemuge N.S. (2012) "A Review -The Development In Organic Light Emitting Diodes The Future Of Displays", International Journal of Knowledge Engineering, Volume 3, Issue 1, 2012, pp.-89-90.

[18] Dalip Singh Mehta, and KanchanSaxena (2012) "Light out-coupling strategies in organic light emitting devices", Proc. of ASID'06, 8-12 Oct, New Delhi .

[19] Bower C. A., Menard E., Bonafede S., Hamer J. W., Cok R. S., IEEE Transactions on Components packaging and manufacturing Technology, 1 (2013) 1916

[20] M. Aleksandrova, G. Kolev, I. Cholakova, G. Dobrikov, and G. Bodurov, "Photolithography versus lift off process for patterning of sputtered indium tin oxide for flexible displays," International Journal of Thin Films Science and Technology, vol. 2, no. 2, pp. 67–75, 2013.

[21] Yibin Jiang a, JiarongLianc, Shuming Chen (2013) "Fabrication of colortunable organic light-emitting diodes by an alignment free mask patterning method".

[22] Hakim Choukri, Alexis Fischer, Sébastien Forget (2013) "White Organic Light-Emitting Diodes with fine chromaticity tuning via ultrathin layer position shifting".

[23] Mr. Bhrijesh N. Patel, Mr. Mrugesh M. Prajapati (2014) "OLED: A Modern Display Technology", International Journal of Scientific and Research Publications, Volume 4, Issue 6, June 2014

[24] Junichi Tanaka, Mitsuru Morimoto, Takashi Kawai, FujioKajikawa (2014) "Development and Mass-Production of OLED Lighting Panels with High Luminance, Long Lifetime and High Efficiency", Mitsubishi Heavy Industries Technical Review Vol. 51 No. 3

[25] Askari Mohammad Bagher (2014) "OLED display technology", American Journal of Optics and Photonics 2014

[26] Y. Karzazi (2014) "Organic Light Emitting Diodes: Devices and applications", J. Mater. Environ. Sci. Laboratory of Applied chemistry CNRST-URAC-18, Faculty of Sciences ISSN, B.P. 4808, 60 046 5 (1) (2014).

[27] Hyun-Su Choi, Hye-Kyung Kwon, Keun-Soo Kim, Joon-Sik Park And CHoel-Hee Moon IEEE TRANSACTION Packaging And Manufacturing Technology, Vol 4, No 7 , July 2014

[28] Atul Shire, Prof. UmeshJawarkar, AkshayArbat (2015) "A Review Paper on: Organic Light Emitting Diode over Conventional Led", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 5, Issue 1, January 2015.

[29] Malte C. Gathera,and Sebastian Reinekeb (2015) "Recent advances in light out coupling from white organic light-emitting diodes", Journal of Photonics for Energy Vol. 5, 2015

[30] G. M. Farinola and R. Ragni (2015) "Organic emitters for solid state lighting", Journal of Solid State Lighting (2015)

[31] Yi-Jun Wang , Jian-Gang Lu and Han-Ping D. Shieh , Fellow IEEE " Efficiency Enhancement of Organic Light Emitting

Diodes on Flexible Substrate with Patterned Inverted Conical Structure DOI.10.1109.JPHOT/2015.2509862,IEEE

[32] Tao Wang, Yiwei Zhang, Yu Yan (2016) "Polymer Light Emitting Diodes Powered via Paper-mounted Electronics", Journal of Display Technology, 12

[33] Geeta Dhyani1, Nivedita Bisht2 (2016) "A review paper on: study of organic light emitting diode", International Research Journal of Engineering and Technology, Volume: 03 Issue: 06 | June-2016

[34] SzuhengHo, Shuyi Liu, Ying Chen (2016) "Review of recent progress in multilayer solution-processed organic light-emitting diodes", Journal of Photonics for Energy Vol. 5, 2016

[35] FaziaBatool (2016) "A Review Paper on: Organic Light-Emitting Diode (OLED) Technology and Applications", International Journal of Advanced Research in Computer and Communication Engineering, Vol. 5, Issue 11, November 2016

[36] MariyaAleksandrova (2016) "Specifics and Challenges to Flexible Organic Light-Emitting Devices", Advances in Materials Science and Engineering Volume 2016.

[37] DaeWhan Kim, Byeng Dong Youn and Dongil Kwon(2016) are with the school of Mechincal and Aerospace Engineering , Seoul National university " Bivariate model for organic light emitting diode '' Digital Object Identifier 10.1109/TED.2016.2624853

[38] Ms. DikshaAshokrao Mule (2017) "Organic Light Emitting Diode Technology: Review", Special Issue of International Journal of Electronics, Communication & Soft Computing Science and Engineering.