Power Supplies and Drivers for OLEDs

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InnoSys makes tiny to not-so tiny (i.e., high power) supplies and drivers.

InnoSys offers a complete customized power supply design and associated manufacturing services.

InnoSys can provide power supplies and drivers ranging from simple, low cost to advanced smart and intelligent power supplies/drivers.

InnoSys is knowledgeable and experienced with LED and OLED device physics and related matters.
* A minority women owned small business headquartered in Salt Lake City, UT.
* Full capability to design, implement, produce, manufacture and test electronics from DC to over 100 GHz.
* Has the necessary test and measurement equipment and facilities
* Provides power solutions including general lighting power supply and control/monitor solutions.
In-house microelectronics, micro-electromechanical system (MEMS), nanotechnology fabrication capability including class 100 and class 1000 clean rooms

Complete in-house machining, assembly and packaging manufacturing capability.

Complete 3-dimensional computer aided design (CAD) and circuit and device simulation and modeling capability.

Complete testing, DC, high frequency, and optical characterization, EMI/EMC pre-cert testing, etc.

Comprehensive characterization (optical microscopes, scanning electron microscopes, etc.) and testing equipment (dc, high frequency, high voltage, high temperature, and optical), inspection and quality control.
Most power supplies/drivers/ballasts have many things in common: Need to have high PF; low EMI; low THD; low noise; UL or CE mark; numerous protections (i.e., typically surge, OVP, OCP, OTP) for the power supply itself, the load; and living creatures that may come in contact with the power supply; fit in the space allowed, be efficient (or highly efficient), possibly manually or remotely dim (no flicker) or have set intensity levels and ideally cost nothing or next to nothing.
COST

X
Although it may appear that LED power supplies are suitable for driving OLEDs this is not always the case.

OLEDs have their own set (or subset) of considerations when it comes to being driven and controlled. Fundamental differences.

Interconnectivity and drive voltages and currents

OLED wall plug efficiency and lifetime and other considerations

Form factor is one of the considerations.

Protection is another.

Failure mode and mitigation is yet another.

Dimming (digital vs. analog, PWM flavors, etc.).
Trying to fit a square bulb into a round hole
Solution: How many engineers does it take to change a light bulb?
OLEDs (area light sources) are different from LEDs (point light sources) in that the respective form factors present different challenges and opportunities that can be exploited.
Need to exploit the advantages of OLEDs

* Should OLED power supplies and drivers be Triac/phase cut dimmer compatible?
* Should there be a separate power supply for each OLED panel?
* Should OLEDs be stacked in parallel or in series or a combination of these or...
* What types of analog and digital interfaces should a typical OLED power supply offer (0-10V, DALI, DMX, other serial, other wired and wireless...)?
* Fluorescent lighting typically merely requires ‘boxy’ power supplies (electronic ballasts).
* LEDs power supplies and drivers are all over the map being as simple as a diode bridge, resistor and capacitor (some of which are optional) to power supplies delivering 100s (or more) watts of output power.
* Power supplies for OLEDs can range from being a follower to a trend setter/maker.
Need to face the fact that OLEDs are going to cost more than LEDs for at least the next few years.

Yes, one could use a cheap power supply with each OLED panel and try to create the equivalent of an A-lamp bulb (maybe different form factor or shape) – however is this really where OLEDs are going to shine?

Will the proverbial low cost LED replacement A-lamp end up being an OLED (possibly curved to form fit an incandescent lamp)? Possibly but probably not.
What’s wrong with this picture?

Conventional A-lamp

In many ways, the same applies to power supplies and drivers for OLEDs.

OLED A-Lamp
Do we just need to look at it from a different perspective/viewpoint/angle? (answer: yes and no)
Wireless or wired control and monitoring
* Added Operational Energy Savings as well as customer satisfaction and ROI, etc.
* Tracking of energy demand and associated costs.
* Being able to make the OLEDs more interactive.
* Provides some additional levels of security.
* Color changing, mood modifying...
* Neat, fun things and such...
* Enabling opportunities...
* Special effects and other personalized features...
Is OLED general lighting going to grab market share or will OLEDs be the new EL?

Examples of Colors from Two Interconnected OLEDs Powered by an InnoSys Smart/Intelligent Power Supply/Driver with Wireless Control

We think OLEDs have a bright future and want to be part of the food/supply chain helping OLED grab and gain both market share and market acceptance in general lighting.
Examples of InnoSys Power Supplies for OLEDs

1. A universal (80 to 305 VAC and up to 500 V DC) isolated power supply for a ~6 W (6.3 V, 1 amp) OLED panel.
2. A universal (80 to 305 VAC and up to 500 V DC) non-isolated power supply for a ~6 W (6.3 V, 1 amp) OLED panel.
3. A 10 to 60 V AC and up to 85 VDC input power supply for a ~6 W (6.3 V, 1 amp) OLED panel.
4. A 6 W to 150 W single to multiple OLED power supply with wireless control and monitoring.
5. A ~ 6W desk lamp that uses a single 6.3 V 960 mA OLED panel that is locally and remotely dimmable.
Some of the Experimental Measured Data Obtained in Phase I

85+% efficiency, high power factor and low THD for universal isolated power supply.

88+% efficiency, high power factor and low THD for universal non-isolated power supply.

92+% efficiency, high power factor and THD for 10 to 50 V AC and 12 to 80 V DC input power supply (Note: can increase the range of this power supply).

All of the above can be wirelessly interfaced, controlled and monitored using, for example, smart phones (i.e., Iphones, Androids), tablets (i.e., Ipad, Ipod touch, droid, etc.), laptops, desktops and other such digital assistants and also other dimming including 0-10 Volt dimming and powerline (PLC) dimming/control. The universal drivers can also support Triac and other forward/reverse phase cut dimming.
We are and are looking to:

- Collaborate and interact with architects and lighting designers as well as OLED manufacturers and luminaire manufacturers.
- Provide ultra-efficient design and product solutions for solid state lighting including and especially OLEDs.
- Provide solutions to challenging lighting problems and situations in terms of power supplies, drivers, control and monitor electronics.
- Help to develop, foster and be a part of complete supply chains for OLED-based lighting and luminaires.
- Provide value-added, cost-efficient and cost-effective lighting and related applications including and especially for OLED lighting.
- Provide innovative solutions.
- Provide enabling solutions.
Examples of InnoSys’ Smart/Intelligent Power Supplies/Drivers Wirelessly Controlling Color OLED Panels
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