

OLED Driver with Output Disconnect and Automatic Burst Mode Improves Standby Mode Efficiency

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Introduction

The LT3473 is a micropower step-up DC/DC converter designed to drive self-luminous organic light-emitting diode or OLED display. The LT3473 features an integrated output disconnect switch that prevents leakage from OLED display during standby or shutdown mode by isolating the OLED display from input supply. The LT3473 also features an automatic burst mode, which allows outputs to be regulated with minimum circuit operation to maximize the light load efficiency. The small DFN package (3mm × 3mm), high level of integration and constant switching frequency yield a tiny solution size.

Some OLED applications require intermediate bias voltages for enhancing the display refreshing rate, such as in passive matrix OLED displays, the LT3473A includes two NPN transistors for generating two additional bias voltages.

OLED Bias Supply

Figure 1 shows an OLED bias supply solution ideally suited for handheld and other battery powered portable devices. Using the internal 1A switch, the circuit is capable of delivering 25V at up to 80mA from a Li-Ion cell (3~4.2V) input. An LT3473-based OLED bias supply requires only a few external components, because most functions are integrated into the part, including: the power switch, a Schottky diode, the output disconnect switch, a reference override, power good indication and optimized loop compensation. As a result, the circuit in Figure 1 only requires less than 50mm² of PC board space.

For simple dimming or contrast adjustment, the LT3473 solution has an auxiliary reference input (CTRL pin) that allows the user to override the internal 1.25V feedback reference

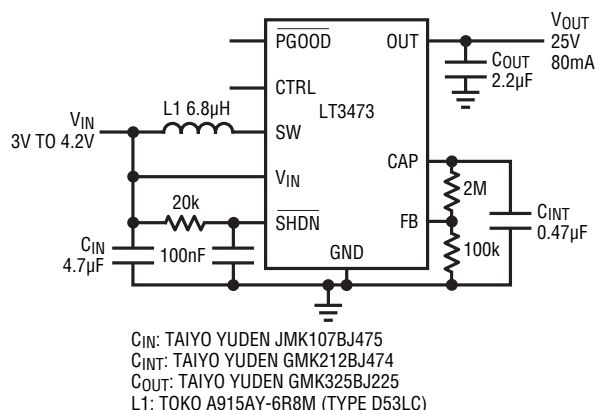


Figure 1. Space saving OLED bias supply

voltage with any lower value, allowing full control of the output voltage.

Power Good indication is also integrated in the LT3473 solution. When

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the output voltage reaches 90% of the set value, the open collector logic at power good pin starts to sink current to indicate that output voltage has reached power good stage.

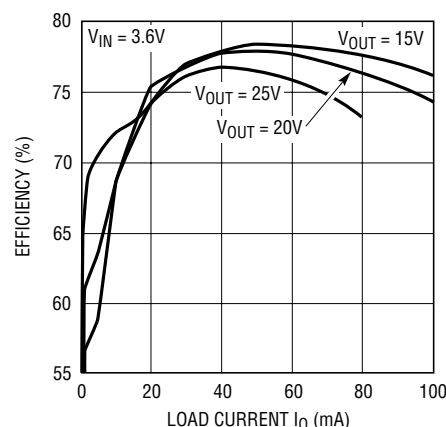


Figure 2. Efficiency of OLED bias supply

The efficiency shown in Figure 2 remains above 75% over a load current range of 20mA–70mA. Figure 2 also shows efficiency for 15V and 20V outputs. For a 15V output, the circuit is capable of generating 100mA of output current above 75% efficiency.

Conclusion

The LT3473 offers highly integrated solution for OLED bias applications. Key features include output disconnect, automatic burst mode for light load, reference override and auxiliary intermediate bias output (LT3473A) for overall efficiency and performance of OLED bias applications. The resulting small circuit size and high efficiency makes LT3473 an ideal solution for space-conscious portable device applications such as cellular phones and other handheld applications.

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