

## **Efficient GaN-Powered LED Drivers Target Smart-Lighting Designs**

[Power Integrations](#) LYT6078C is a new member of the LYTSwitch-6 family of safety-isolated LED drivers for smart lighting applications (Fig. 1). The LYTSwitch-6 IC uses the company's PowiGaN GaN technology to deliver efficiency and performance benefits, which are demonstrated in the recently announced design example report (DER-920).

The LYT6078C IC incorporates a 750-V power switch and delivers flicker-free output up to 90 W. By using a 750-V GaN power switch, the LYT6078C increases the power output capability of the LYTSwitch-6 LED driver over that which the original members of the family could deliver using a silicon MOSFET.

However, the LYT6078C is not the first member of the LYTSwitch-6 family to offer a GaN power switch. In September of last year, the company introduced the LYT6079C and LYT6070C, which use the PowiGaN technology to deliver up to 100 W and 110 W, respectively. The difference between these three parts is simply the size of the GaN power switch die, with the higher power versions using larger die. (The GaN die in the LYT6078C is classified as a size 8, while the LYT6079C contains a size 9 die and the LYT6070C, a size 10 die.)

Naturally, this difference is also reflected in the cost of the device. By offering these three different models, the company gives designers options for selecting a part that minimizes cost for the required power output, while also providing other tradeoffs as Doug Bailey, VP of marketing at Power Integrations, explained.

"We released the beefier GaN parts (LYT6079C and LYT6070C) a while ago. However, customers really want to have the efficiency and higher breakdown voltage at lower power levels and the biggest silicon transistor we can fit into the package is only 650 V in the size 8 range. We added the size 8 GaN as a way to help those customers use commercial 277 Vac or withstand India mains power problems," said Bailey.

The table below shows how LYT6078C performance compares with the other members of the LYTSwitch-6 family including the original devices with the silicon MOSFETs.

Including both the PFC stage and the LYTSwitch-6 LED driver, system efficiency exceeds 90%. Housed in the miniature InSOP-24 surface-mount package, LYTSwitch-6 ICs are protected by an advanced thermal foldback system, which reduces output power to limit device temperature during abnormal conditions, while still providing light output.

The LYTSwitch-6 ICs also incorporate Power Integrations' FluxLink communication technology, which allows secondary-side control without the need for an optocoupler, and provides better than  $\pm 3\%$  CV and CC regulation across line, load, temperature, and manufacturing. All LYTSwitch-6 ICs exhibit fast transient response and easily support PWM dimming.

The performance benefits of the LYT6078C are evident in the DER-920 design report, which details a two-stage PFC boost plus isolated flyback on a dimmable LED ballast. It employs the LYTSwitch-6 LYT6078C IC and the company's HiperPFS-4 PFS7624C PFC controller and provides peak efficiency of greater than 91% when driving a 48-V LED string at 1350 mA from a 90-Vac to 277-Vac input. In standby mode, system power consumption is less than 80 mW, which provides engineers with substantial flexibility when designing lighting controls and particularly dim-to-off circuits.

Hubie Notohamiprodjo, director of product marketing for LED lighting said, "Power Integrations' new PowiGaN-based LYTSwitch-6 ICs save lighting manufacturers space and system costs for smart lighting power supplies. The company's key design goals for our latest design report were high power factor, low harmonic content, high efficiency, and 3-in-1 dimming with zero-to-100% output current. The new LYT6078C driver IC combined with our HiperPFS-4 PFC controller easily met these challenges."

PowiGaN-based LYTSwitch-6 LED-driver ICs are available now, priced at \$2.52 in 10,000 quantities. Technical support and the [DER-920](#) design report are available from the company [website](#).

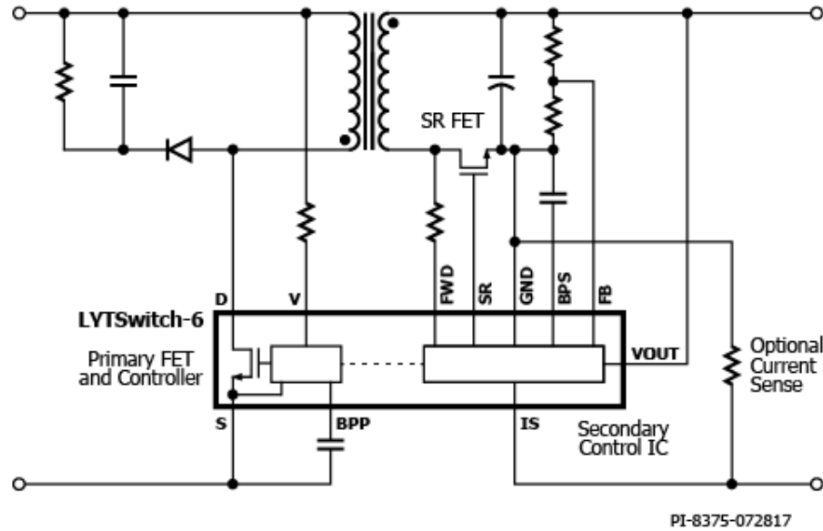


Fig. 1. The LYT6078C is a flyback CV/CC LED driver IC with integrated high-voltage switch and FluxLink feedback. By using a 750-V GaN power switch, the LYT6078C increases the power output capability of the LYTSwitch-6 LED driver over that which the original members of the family could deliver using a silicon MOSFET, while also offering a higher breakdown voltage for those looking to operate from a commercial 277-Vac source or poorly regulated power grids (see the table).

Table. The LYT6078C is one of three members of the LYTSwitch-6 family of safety-isolated LED drivers that employ a 750-V GaN power switch to boost output power levels.

Output Power Table			
Product <sup>2,3</sup>	277 VAC ± 15%	85-305 VAC	380 VDC / 450 VDC <sup>2</sup>
	Open Frame <sup>1</sup>	Open Frame <sup>1</sup>	Open Frame <sup>1</sup>
<b>LYT6063C/6073C</b>	15 W	12 W	25 W
<b>LYT6065C/6075C</b>	30 W	25 W	40 W
<b>LYT6067C/6077C</b>	50 W	45 W	60 W
<b>LYT6068C</b>	65 W	55 W	
Product <sup>2</sup>	750 V PowiGaN Switch		
<b>LYT6078C</b>	75 W	65 W	90 W
<b>LYT6079C</b>	85 W	75 W	100 W
<b>LYT6070C</b>	95 W	85 W	110 W

Table 1. Output Power Table.

Notes:

1. Minimum continuous power in a typical non-ventilated and PCB size measured at 40 °C ambient. Max output power is dependent on the design. With condition that package temperature must be < 125 °C.
2. Package: InSOP-24D.
3. LYT606x – 650 V MOSFET, LYT607x – 725 V MOSFET.