



NXP non-dimmable drivers and controller for LED lighting SSL21081(A)/83(A) & SSL2109(A)

Design LED lights with best-in-class efficiency at low system cost

These compact, integrated GreenChip drivers, designed for isolated and non-isolated topologies with high output voltage, deliver excellent efficiency (up to 95%) and reduce system cost.

Key features

- ▶ Buck driver ICs
 - Integrated 300 V MOSFET (SSL21081, SSL21081A)
 - Integrated 600 V MOSFET (SSL21083, SSL21083A)
- ▶ Flyback or buck controller IC
 - Controller-only with external MOSFET (SSL2109, SSL2109A)
- ▶ Power-efficient boundary conduction mode
- ▶ Tight LED current regulation: better than 5%
- ▶ Direct PWM dimming possible
- ▶ Fast transient response via cycle-by-cycle control
- ▶ No need for binning on LED forward voltage
- ▶ Full set of internal protections
- ▶ Simple design-in
- ▶ "A" versions without short winding protection
- ▶ Support for high power factor (>0.9) and universal mains (SSL2109A)

Key benefits

- ▶ High efficiency: up to 95% measured on reference board
- ▶ Low bill of materials: only 14 components for full application
- ▶ Small PCB area: reference design measures only 18 x 22 mm
- ▶ Easy, low-cost manufacturing at high volumes
- ▶ High reliability: IC lifetime easily matches or surpasses LED lamp lifetime

Applications

- ▶ Retrofit LED lamps
- ▶ Driver modules for LED lighting

The NXP SSL21081(A)/83(A) series is a family of non-dimmable buck LED drivers with integrated power switches of 300 V SSL21081(A) or 600 V SSL21083(A). The SSL21081(A)/83(A) support applications up to 10 W. The SSL2109(A), a controller-only device used to drive an external switch, is for applications up to 25 W (external MOSFET selection enables flexibility on efficiency and system cost) and extends the SSL21081(A)/83(A) feature set with high power factor (>0.9), universal mains, and isolated topologies.

Designed for non-mains dimmable lights that use a non-isolated topology with buck conversion, these GreenChip drivers deliver best-in-class performance in terms of efficiency, line regulation, and integration. They are extremely easy to design in, and require very few additional components on the board. This makes manufacturability in high volumes easy and cost effective.



High integration leads to a small form factor. The reference board for the SSL21081, for example, implements a complete 100 V application using just 14 external components and requires a PCB that measures just 18 x 22 mm.

True current-source behavior delivers a current accuracy of better than 5%, and overall efficiency is very high. Efficiency up to 95% can be achieved with the SSL21081 reference board. A full set of protections and built-in extras increase design flexibility and reliability, and contribute to the low overall cost. There is a built-in NTC input for temperature protection, and integrated circuitry for output-short protection. Other internal protections include UnderVoltage Lock Out (UVLO), Leading-Edge Blanking (LEB), OverCurrent Protection (OVP), internal OverTemperature Protection (OTP), and brownout protection.

Support for PWM dimming means the ICs can be used in smart lighting applications that use an external control source, such as a microcontroller. The ICs are also compatible with wall switches that have a built-in indication light.

Type number	Nominal mains	Application range	MOSFET configuration	Internal MOSFET characteristics	Package
SSL21081(A)	100 - 120 V	Up to 10 W	Internal	300 V / 2 Ω	SO8
SSL21083(A)	230 V	Up to 10 W	Internal	600 V / 5 Ω	SO8
SSL2109(A)	100 - 230 V	Up to 25 W	External	n.a.	SO8

