



Product brief

XDPL8221

Infineon's solution for advanced, smart and connected LED driver

The XDPL8221 is a digital, highly-integrated, future-proof LED driver IC which combines a quasi-resonant (QR) PFC with a QR flyback controller with the primary-side regulation. A serial communication interface supports direct communication with external microcontroller. This device targets advanced LED drivers in smart lighting and other IoT applications such as drivers for light emitting diode (LED) luminaires. The multi-control feature of constant voltage, constant current and limited power enables highly versatile LED driver.

Key advantages of designing with the XDPL8221 LED driver IC

Outstanding performance enabling more efficient designs and end-product differentiation

The device has a power factor > 0.9 , THD $< 15\%$, and output power down to 30% of its nominal load. Output voltage varies by a factor of 3 (e.g. 18 V – 54 V). The dim-to-off feature with low standby power < 100 mW reduces the non-active power consumption of the device.

Reduced BoM for minimized system cost and increased flexibility

Primary-side regulation, digital control loop, and other versatile built-in functions reduce the number of external components and the need for additional devices. The topology allows small caps for bus and output voltage.

High reliability for a long driver lifetime

Comprehensive and configurable protections increase product quality and features. Digital algorithms optimize tolerances and prevent stress for the whole driver.

Built-in functions reducing time-to-market and efforts for value products

Digital parameter configuration allows real-time design changes with a few mouse-clicks. The UART interface and the command set enable designers to control the function of the XDPL8221 or retrieve status information and real-time measurement values.

Supply chain efficiency optimizing stock keeping and ensuring high customization

The XDPL8221 enables customizable LED driver designs and simplifies the generation and maintenance of multiple board variants without increasing the number of stock keeping units.

Key features

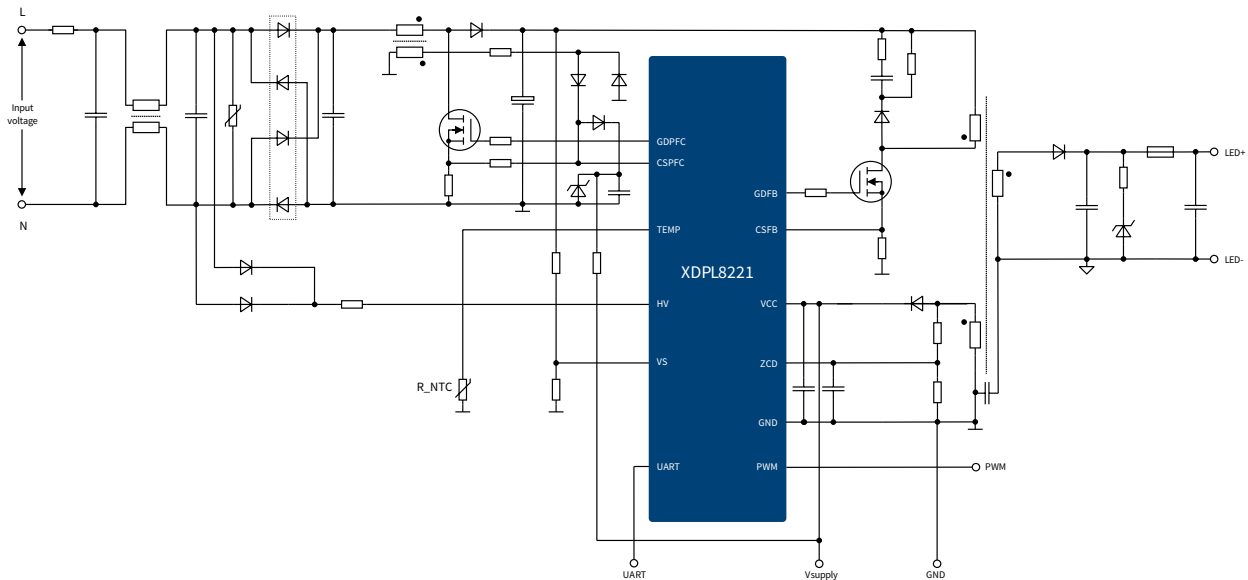
- > Universal AC input load range (~ 100 – 277 V_{AC}) or DC input load range (~ 127 – 430 V_{DC})
- > Three operation modes: quasi-resonant (QRM), discontinuous conduction (DCM), and active burst (ABM)
- > Digital control for automatic selection of the optimal operation mode depending on the design requirements
- > Monitoring and protection of all relevant error conditions for safe operation:
 - Under-voltage
 - Over-voltage
 - Open load
 - Output shorted
- > UART interface and command set
- > Available in DSO-16 package
- > Reference board efficiency $> 90\%$



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Typical application schematic



Design support for lighting applications using Infineon's XDPL8221 digital platform ICs

Infineon's XDPL8221 reference designs demonstrate the performance of the XDPL8221 in a typical application. Thanks to the XDPL8221 digital platform, their parameters can be easily configured to meet any application requirement.

The .dp Vision parameter tool can be used together with the .dp Interface Gen2 to connect to customer-specific designs based on the XDPL8221. This setup ensures faster prototyping as the tools allow fine-tuning and interactive changing of parameters as well as the development of multiple parameter sets.

Product portfolio

Type	Description	Ordering code
XDPL8221	Digital dual stage multi-mode flyback controller for CC, CV, LP with 1 percent dimming	SP001398160
REF-XDPL8221-U50W	50 W reference board with CDM10V isolated 0 V – 10 V dimming interface	SP001630060
REF-XDPL8221-U100W	100 W reference board with CDM10V isolated 0 V – 10 V dimming interface	SP001630066

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XDPL8221 100 W reference design



XDPL8221 50 W reference design



Additional information

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