

## IP Data Sheet

# 30V 0.5A Hysteretic Buck LED Driver with High-Side and Low-Side Current Sensing

The TS\_LEDDRV\_30V0A5\_X8 is a non-synchronous hysteretic Buck LED driver. It operates with an input voltage range of 20 VDC to 30 VDC. A constant output current is set by hysteretic control using a high-side current sense resistor and a low-side drain current sensing circuit.

It supports hybrid PWM and hysteretic dimming with an approximate 1000:1 resolution and up to 500 mA LED current at 18 V LED string voltage. PWM dimming is applied for currents up to 102.5 mA. Further current increase is realized by hysteretic control.

A low-side NMOS switch with typically 400 mΩ is integrated. The circuit provides a fault detection

mechanism at the FET`s DRAIN pin that flags shorts against the rails. The operating switching frequency can range between 150 kHz and 4 MHz depending on the input voltage, buck inductance and LED current range.

The TS\_LEDDRV\_30V0A5\_X8 also supports a direct NMOS switch control mode that can be used in various applications such as switching external constant current regulators.

A low voltage power supply of 3.3 V and bandgap voltage of 1.246 V are needed for operation.

**Technology:** X-FAB XT018-0.18μm BCD-on-SOI CMOS

### OPERATING CONDITIONS

Parameters	Values
Junction Temperature	-40 °C to +150 °C
Input Voltage	20 V to 30 V
Supply Voltage	3.3 V
Bandgap Voltage	1.246 V
LED Voltage	up to 18 V
Buck Inductor	36 μH

Table 1: LED Driver Operating Conditions

### Sales & Marketing Contact



[sales\\_dst@tes-dst.com](mailto:sales_dst@tes-dst.com)

TES Electronic Solutions GmbH

[www.tes-dst.com](http://www.tes-dst.com)

**SPECIFICATION**

Parameters	Values
Maximum Average LED Current	500 mA
Minimum Average LED Current	0.513 mA
Integrated MOSFET RDS_ON	0.4 $\Omega$ to 0.8 $\Omega$
Operating Current on Supply Voltage	2 mA to 6 mA
Switching Frequency	150 kHz to 4 MHz

Table 2: LED Driver Specifications

**APPLICATION NOTES**

In order to operate the LED driver in hysteretic current control mode, a freewheeling diode with a forward voltage of approximately 0.9 V and a high-side sense resistor of 0.4  $\Omega$  ( $\pm 1\%$ ) must be connected in series between the FET's DRAIN pin and the input voltage.

**LAYOUT VIEW**

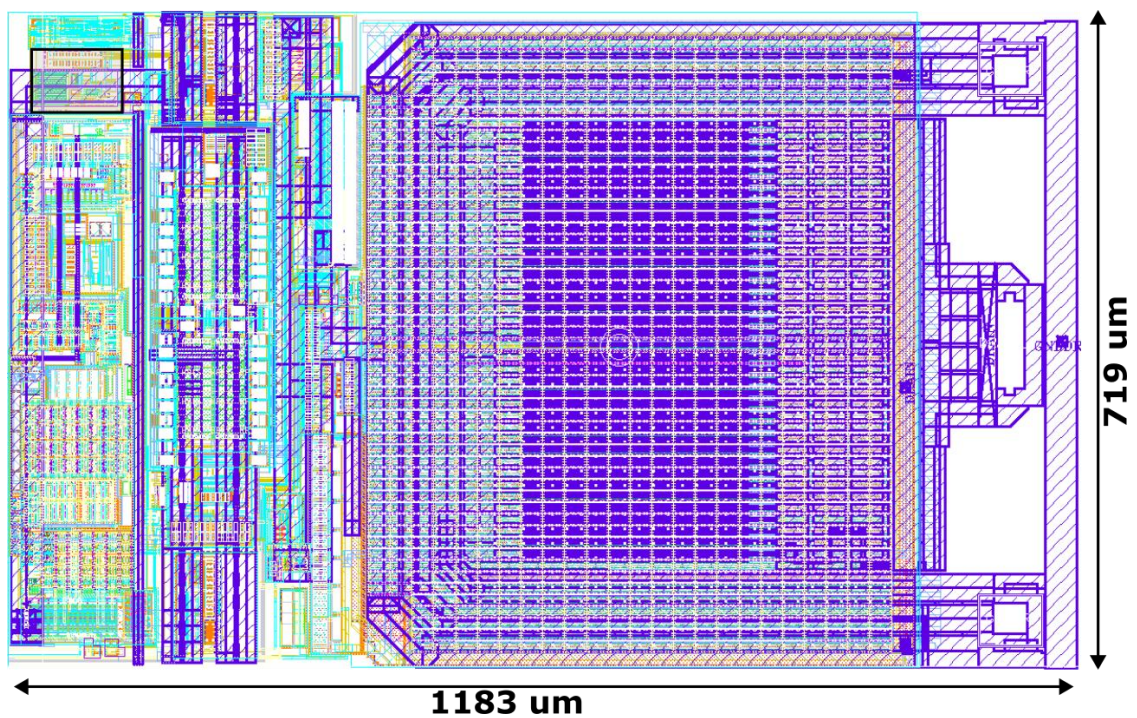


Fig. 1: LED Driver Layout View