

Single-Stage SSL LED Driver for Dimmable Retrofit Lamps up to 25W

1 Description

The iW3659 is a highly integrated, high-performance off-line power supply controller for phase-cut dimmable LED luminaires. It uses patented **PrimAccurate™** primary-side sensing technology to regulate output current accurately without the need for a feedback circuit. The iW3659 operates at boundary conduction mode to achieve high efficiency and low EMI.

With advanced dimming control technology, the iW3659 can operate with most wall dimmers including leading-edge dimmers (R-type or R-L type) and trailing-edge dimmers (R-C type). The iW3659 operates in buck-boost mode to regulate current to the output LEDs.

With Dialog's proprietary V_{CC} regulation circuit, the iW3659's V_{CC} level is well maintained regardless of the LED voltage and dimmer phase angle, which eliminates the possibility of low end flickering.

2 Features

- Isolated/non-isolated off-line 120V_{AC}/230V_{AC} LED driver
- Wide line frequency range (45Hz – 66Hz)
- Excellent dimmer compatibility
 - Leading-edge dimmer
 - Trailing-edge dimmer
- Low BOM cost
- Single-winding inductor
- Start-up without the need for a dedicated high voltage startup circuit
- Closed-loop constant current regulation
- Built-in LED current derating at high temperature
- Built-in over-temperature shut-down
- LED open and short protection
- Fast start-up (< 0.5s without dimmer)
- Resonant control to achieve high efficiency (typical > 85%)
- Supports Buck-Boost topology

3 Applications

- Dimmable LED retrofit lamps up to 25W
 - A-style, BR, GU, PAR, All-Glass, and downlight lamps

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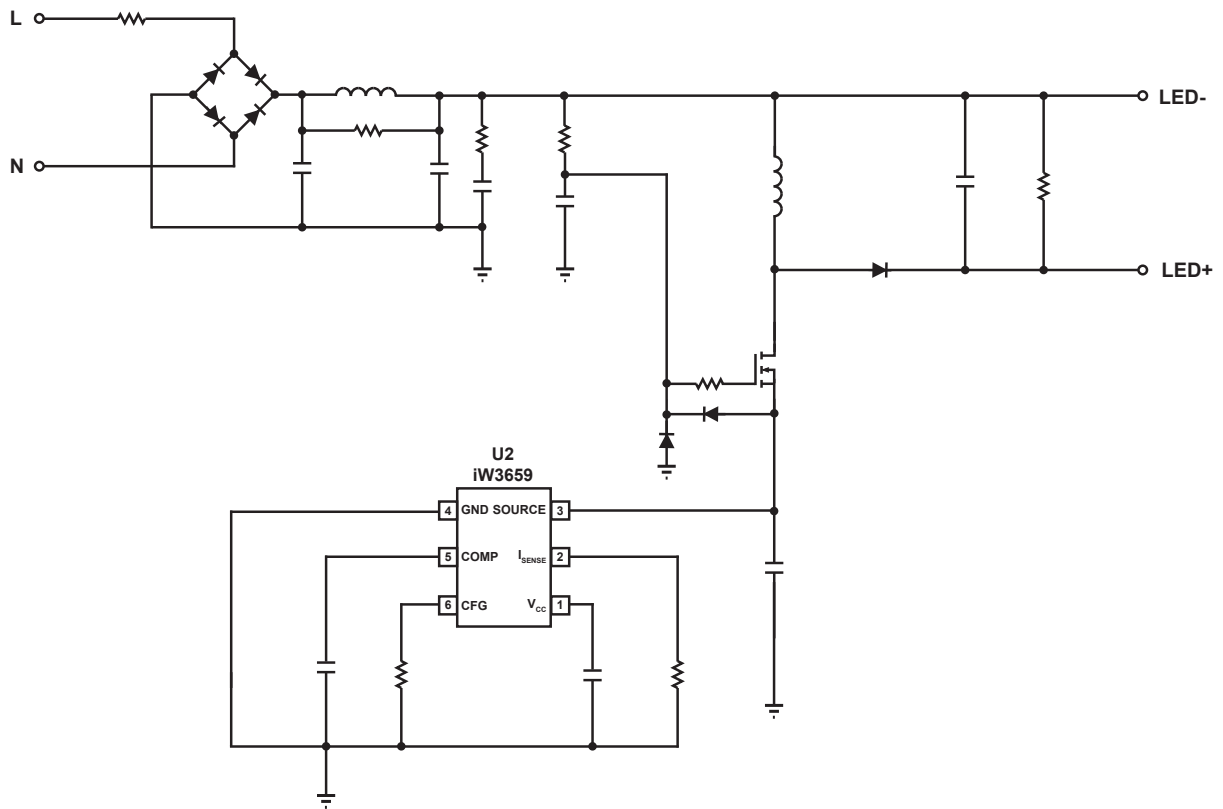


Figure 3.1 : iW3659 Typical Application Circuit

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4 Pinout Description

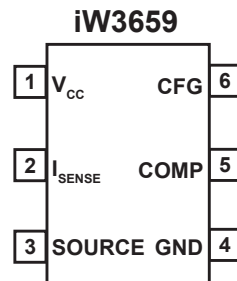


Figure 4.1 : 6-Lead SOT-23 Package

Pin Number	Pin Name	Type	Pin Description
1	V _{CC}	Power Input	Power supply to control logic and MOSFET drive
2	I _{SENSE}	Analog	Current sense
3	SOURCE	Power Input	Connect to high voltage MOSFET source
4	GND	Ground	Ground reference
5	COMP	Analog	Constant current regulation loop compensation
6	CFG	Analog	OVP level configuration

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5 Absolute Maximum Ratings

Absolute maximum ratings are the parameter values or ranges which can cause permanent damage if exceeded.

Parameter	Symbol	Value	Units
DC supply voltage range (pin 1)	V_{CC}	-0.3 to 6.0	V
COMP (pin 5)		-0.3 to 6.0	V
SOURCE (pin 3)		35	V
I_{SENSE} (pin 2)		-0.3 to 6.0	V
CFG (pin 6)		-0.3 to 6.0	V
Maximum junction temperature	T_{JMAX}	150	°C
Operating junction temperature	T_{JOPT}	-40 to 150	°C
Storage temperature	T_{STG}	-65 to 150	°C
Thermal resistance junction-to-ambient	θ_{JA}	238	°C/W
ESD rating per JEDEC JESD22-A114		±2000	V
Latch-up test per JESD78D		±100	mA

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