

SSL Interface Controller for Analog (0-10V), PWM, and Resistor Dimming with Optocoupler Delay Elimination

1 Description

The iW350 is a PWM signal generator that works with three different types of dimming inputs, 0-10V PWM dimming, 0-10V linear dimming or simple dimming using a single resistor to ground from the DIM pin. The iW350 auto detects the dimmer type connected. A PWM dimming type is directly used, while the 0-10V linear dimming and resistor dimming signals are converted into a 0%-100% PWM duty cycle that can then be used to provide a dimming signal to a primary-side LED driver such as the iW3636, removing the need for transformers or other driver circuitry. The output of the iW350 is optimized in such a way as to remove the impact of the non-linear delay typical of optocouplers.

The iW350 offers a high level of flexibility by offering programmability for the maximum dimming voltage, minimum output duty cycle and the turn-off threshold voltage through external resistors. The output PWM frequency is also programmable from 100Hz to 5kHz through a single capacitor to ground. The input to the iW350 integrates the necessary current source to interface with both active and passive 0-10V dimmers without additional circuitry, while the output can drive an optocoupler to provide isolated dimming control from the secondary to the primary.

2 Features

- 15V to 60V operating voltage
- 3-in-1 dimmer interface
 - » 0-10V PWM dimming
 - » 0-10V linear dimming
 - » Single resistor dimming
- Dimmer type - auto detect
 - » PWM or DC input dimming signal
- 0% to 100% PWM output
 - » 1% PWM duty cycle tolerance
 - » Selectable frequency range via external capacitor
 - » Unique duty cycle drive to account for non-linear optocoupler delay
- SOIC-8 package
- External resistor configuration
 - » Programmable max dimming voltage: 8.5V, 9V, 9.5V and 10V
 - » Programmable minimum duty cycle: 1%, 3%, 5% and 10%
 - » Programmable turn-off threshold: 0.5V, 0.6V, 0.7V and 0.8V
- Programmable PWM output frequency range: 100Hz-5kHz
- Integrated current source for driving 0-10V dimmer
- Low power shutdown mode
- Integrated optocoupler driver for isolated applications

3 Applications

- 0-10V LED dimming application
- 3-in-1 LED driver interface chip (0-10V linear, 0-10V PWM and R dimming) dimming LED driver application

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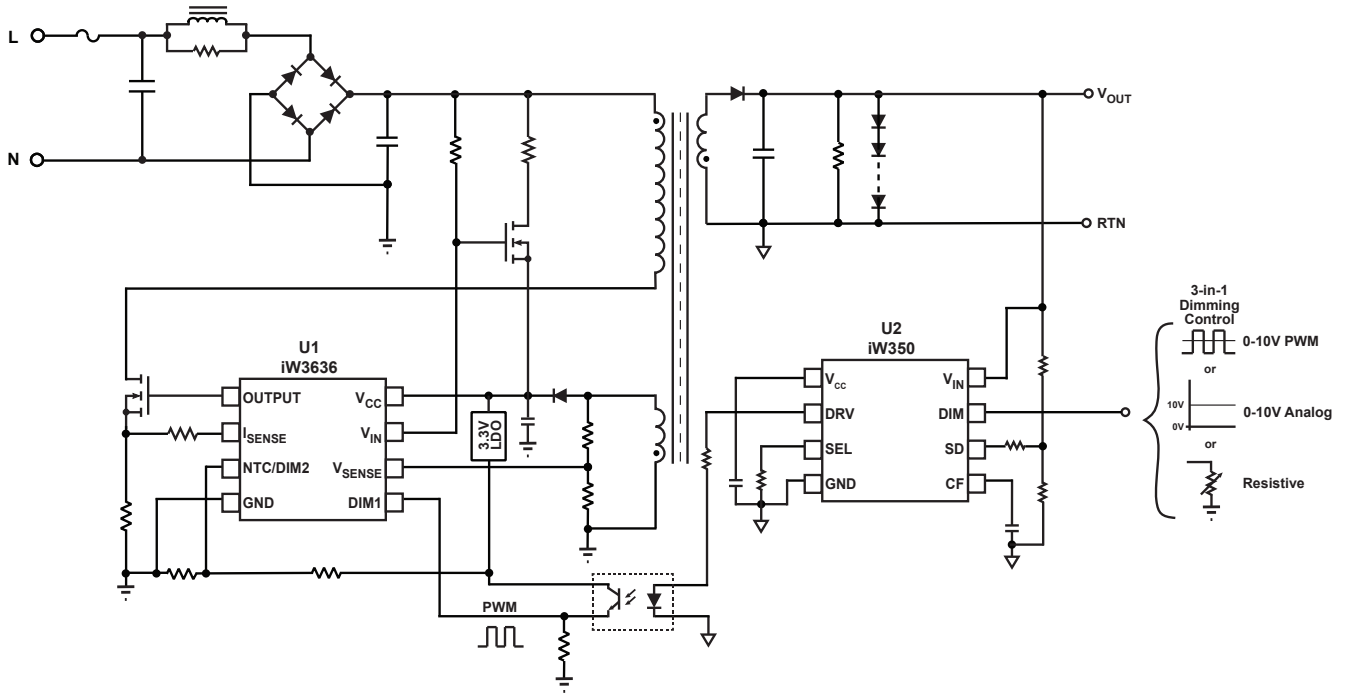


Figure 3.1 : iW350 Typical Application Circuit

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4 Pinout Description

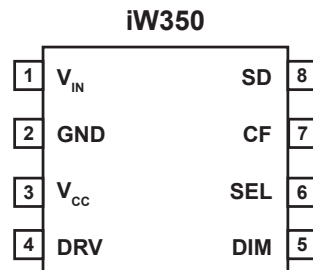


Figure 4.1 : 8-Lead SOIC Package

Pin Number	Pin Name	Type	Pin Description
1	V _{IN}	Power	Power supply up to 60V.
2	GND	Ground	Ground.
3	V _{CC}	Power	5V power supply for internal circuit, connect a 4.7uF capacitor to GND.
4	DRV	Digital Output	PWM driver.
5	DIM	Analog Input/Output	Dimming interface connection.
6	SEL	Analog Input/Output	Connect an external resistor to set max dimming voltage and turn-off threshold voltage.
7	CF	Analog Input/Output	Sets the PWM output frequency: 100Hz to 5kHz.
8	SD	Analog Input/Output	Shuts down the IC if voltage is over 0.5V, and programs the minimum duty cycle with a resistor to ground.

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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
V_{IN} to GND	V_{IN}	-0.3 to 65	V
V_{CC} to GND (IC internal power supply)	V_{CC}	-0.3 to 6.5	V
DIM to GND	V_{DIM}	-0.3 to 65	V
CF, SD and SEL to GND		-0.3 to 6.5	V
DRV to GND	V_{DRV}	-0.3 to 6.5	V
Operating temperature	T_J	85	°C
Storage temperature range	T_{STRG}	150	°C
ESD rating (HBM)		±2000	V

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6 Physical Dimensions

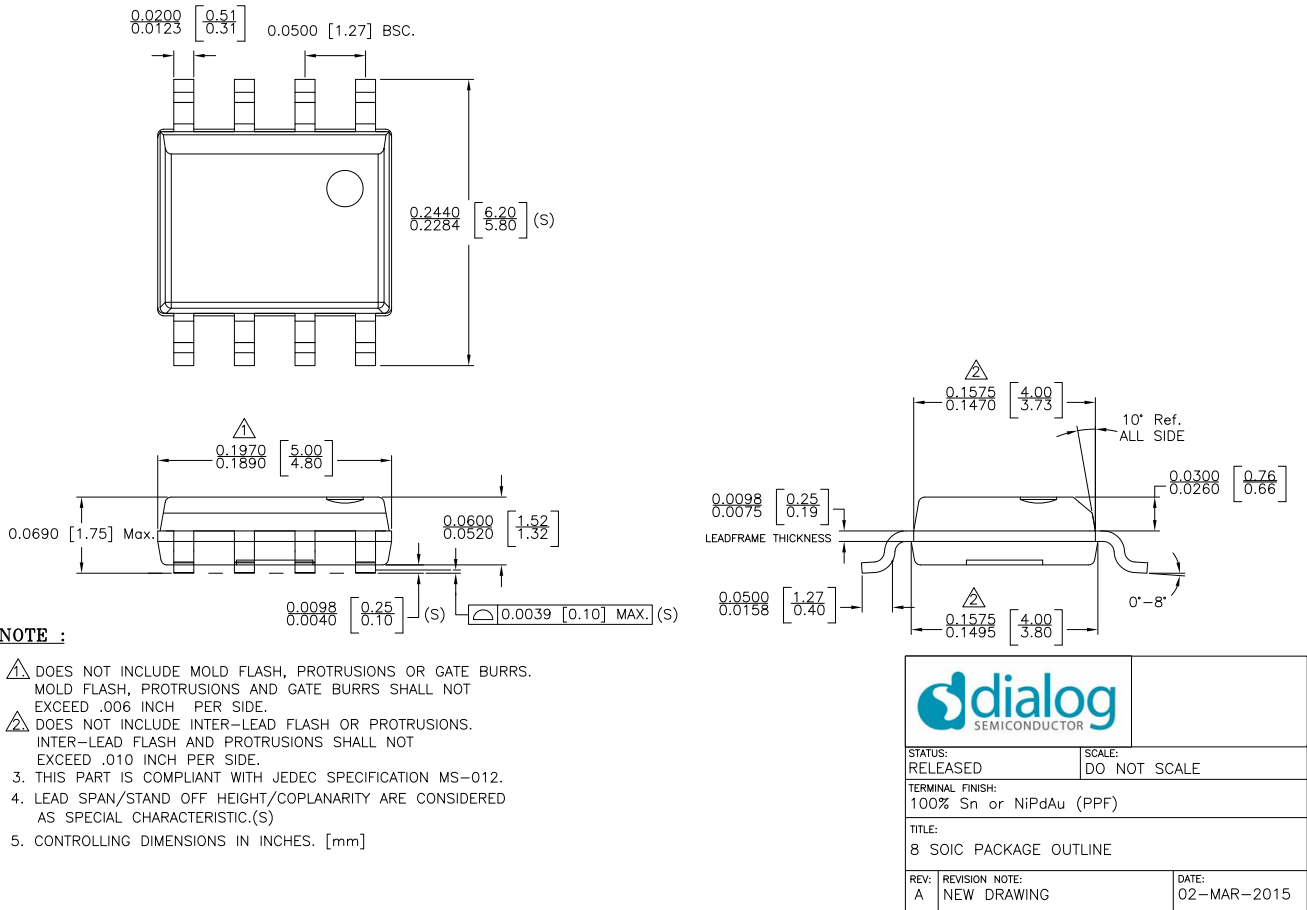


Figure 6.1 : Physical Dimensions of 8-Pin SOIC Package

7 Ordering Information

Part Number	Options	Package	Description
iW350-00	Standard PWM Output; Dimming Curve Figure 9.1; Turn-off Function Disabled	SOIC-8	Tape & Reel ¹
iW350-02	Standard PWM Output; Dimming Curve Figure 9.2; Turn-off Function Disabled	SOIC-8	Tape & Reel ¹
iW350-30	Standard PWM Output; Dimming Curve Figure 9.3; Turn-off Function Enabled	SOIC-8	Tape & Reel ¹
iW350-32	Standard PWM Output; Dimming Curve Figure 9.4; Turn-off Function Enabled	SOIC-8	Tape & Reel ¹

Note 1. Tape and reel packing quantity is 2,500/reel. Minimum packing quantity is 2,500.

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