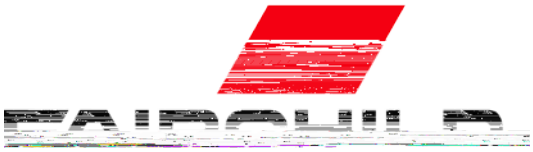

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www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

June 2015

FL663
Primary-Side-Regulation PWM Controller for LED Illumination

Fea

- Green-Mode: Linearly-Decreasing PWM Frequency with Cycle skipping.
- Fixed PWM Frequency at 50 kHz and 33 kHz with Proprietary Frequency Hopping to Solve EMI Problems
- Peak-Current-Mode Control in CV Mode
- Cycle-by-Cycle Current Limiting
- V_{DD} Over-Voltage Protection (OVP)
- V_{DD} Under-Voltage Lockout (UVLO)
- Adjustable Brownout Detector
- Gate Output Maximum Voltage Clamped at 15 V
- Thermal Shutdown (TSD) Protection
- Available in the 8-Lead SOIC Package

Applications

- LED Illumination
- Battery chargers for cellular phones, cordless phones, PDA, digital cameras, power tools

Description

This third-generation Primary-Side-Regulation (PSR) and highly integrated PWM controller provides features to enhance the performance of LED illumination.

The proprietary topology, TRUECURRENT®, enables

Application Diagram

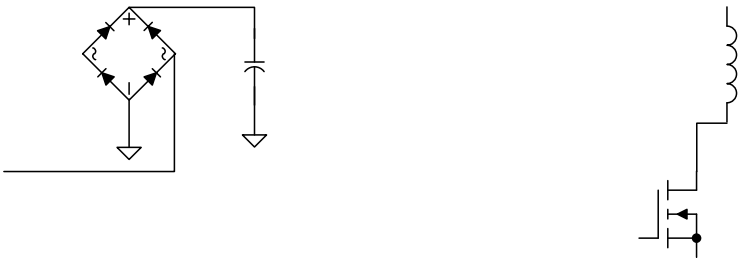

Figure 2. Typical Application

Block Diagram

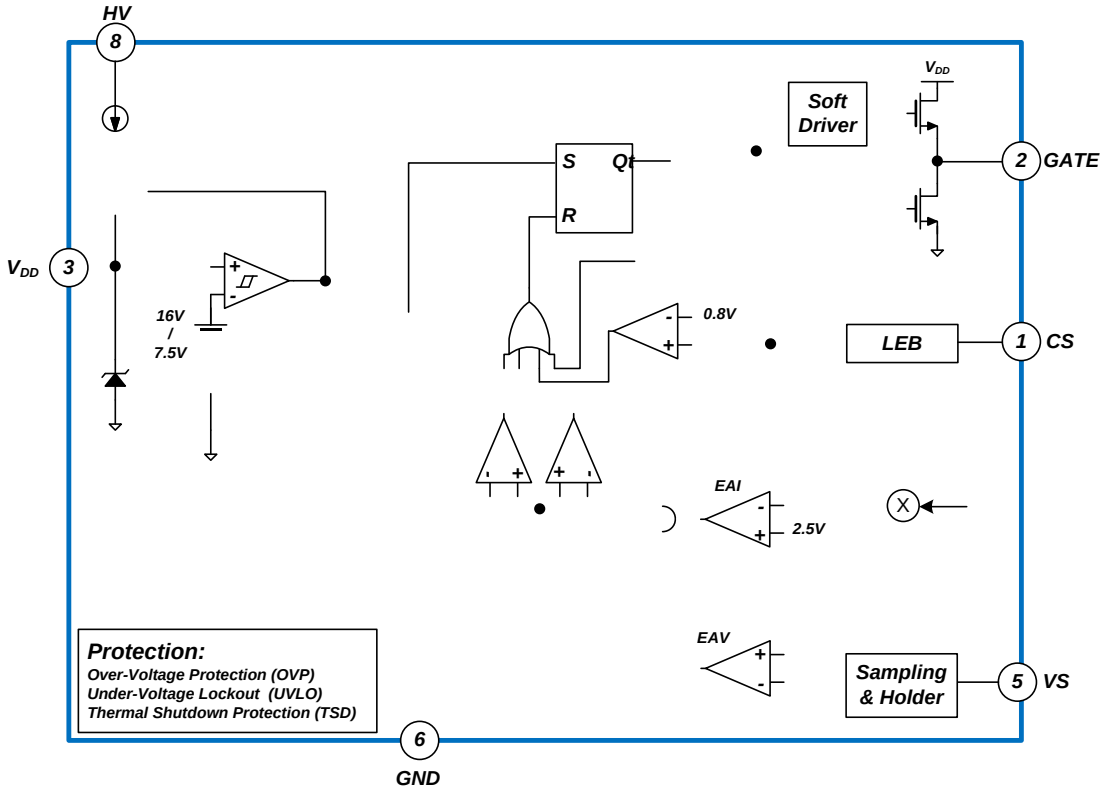

Figure 3. Internal Block Diagram

Marking Information

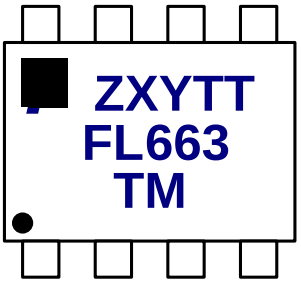

Figure 4. Top Mark

Pin Configuration

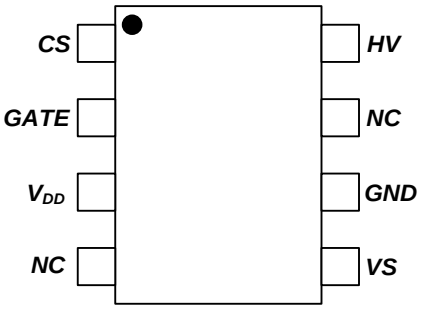

Figure 5. Pin Configuration

Pin Definitions

Pin #	Name	Description
1	CS	**Current Sense**. This pin connects a current-sense resistor to detect the MOSFET current for peak-current-mode control in CV Mode and provides the output-current regulation in CC Mode.
2	GATE	**PWM Signal Output**. This pin uses the internal totem-pole output driver to drive the power MOSFET. It is internally clamped below 15 V.
3	V_{DD}	**Power Supply**. IC operating current and MOSFET driving current are supplied using this pin. This pin is connected to an external V_{DD} capacitor of typically 10 µF. The threshold voltages for startup and turn-off are 16 V and 7.5 V, respectively. The operating current is lower than 5 mA.
4	NC	**No Connect**. This pin is connected to GND or no connection. Does not connect any voltage source.
5	VS	**Voltage Sense**. This pin detects the output voltage information and discharge time based on voltage of auxiliary winding.
6	GND	**Ground**
7	NC	**No Connect**
8		

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Min.	Max.	Unit
V_{HV}				

Electrical Characteristics

V_{DD}=15

Ty( )]TJETQ0.0000001 -1 1 0.0000000014 Tm[(7)]TJETBT1 0 0 1 3070t7

Typical Performance Characteristics (Continued)

Typical Performance Characteristics (Continued)

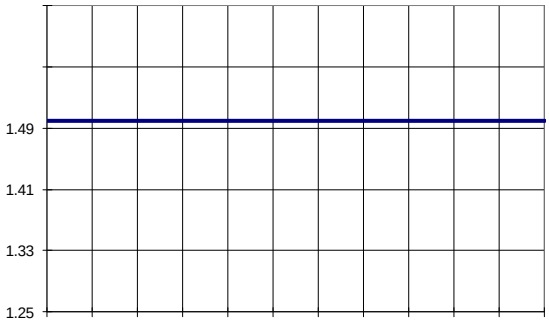

Figure 18. $V_{F\text{-}JUM\text{-}35}$ vs. Temperature

Functional Description

Figure 19. Basic Circuit of a PSR Flyback

Constant Voltage Regulation

During the inductor current discharge time (t_{DIS}), the sum of output voltage (V_O) and diode forward-voltage drop (V_F) is reflected to the auxiliary winding side as (V_O+V_F) N_A/N_S. Since the diode forward-voltage drop (V_F) decreases as current decreases, the auxiliary winding voltage (V_A) reflects the output voltage (V_O) at the end of diode conduction time (

V_{DD} Under