

FEATURES

- Dual MOSFET drivers in single 16 pin QFN package
- Multimode operation to configure the driver as either dual or doubler/interleaved mode drivers
- Variable Gate drive from 4V to 13V to optimize system efficiency
- 5V VCC and VDRV capability for sleep states where only 5V is available
- Large drivers designed to drive 3nF in $\leq 12\text{ns}$ with any voltage from 5V to 12V (typ) supplied to the VDRV pin
 - Low side driver – 0.85Ω source/ 0.38Ω sink
 - High side driver – 1.1Ω source/ 0.60Ω sink
 - Propagation delays $\leq 20\text{ns}$
- Integrated bootstrap diode on both drivers
- Capable of high output switching frequencies from 150kHz up to greater than 1MHz
- Compatible with IR's patented Active Tri-Level (ATL) PWM for fastest response to transient overshoot as well as industry standard 3.3V and 5V Tri-State signals in most modes
- Non-overlap and under voltage protection
- Thermally enhanced 16 pin QFN package
- Lead free RoHS compliant package
- Low Quiescent power to optimize efficiency

DESCRIPTION

The IR3598 is a high-efficiency dual driver capable of switching a pair of high and low side N-channel MOSFETs in synchronous buck converters and is optimized for use with IR's Digital PWM controllers to provide a total voltage regulator solution for today's advanced computing applications. In a space saving 16-pin QFN package, the IR3598 can significantly improve density in high phase count voltage regulators saving over 50% board space versus conventional drivers.

The IR3598 can be configured as two independent drivers in DUAL mode with individual PWM signals, or as an interleaved DOUBLER driver where one PWM signal is internally split to drive the two pairs of MOSFETs 180° out of phase. The inter-leaving action is optimized internally to manage the tri-state action of multiple phases during transients, low current single phase operation, and PS2 operation (see Figs. 8 and 9.) The DOUBLER mode can double the effective maximum phase count from the controller, enabling a well-controlled, high phase count voltage regulator.

The IR3598 has a proprietary circuit which maintains the MOSFET drive strength throughout the 4.0V to 13.2V drive voltage range thus insuring fast switching even with 5V standby drive operation during system sleep modes. The integrated boot diodes reduce external component count. The IR3598 also features an adaptive non-overlap control for shoot-through protection.

The IR3598 PWM inputs are compatible with IR's fast Active Tri-Level (ATL) PWM signals as well as 3.3V and 5V Tri-State PWM signals.

APPLICATIONS

- Desktop CPU and GPU solutions
- Performance overclocking CPU and GPU VR solutions
- Optimized for Sleep state S3 systems using +5VSB

BASIC APPLICATION

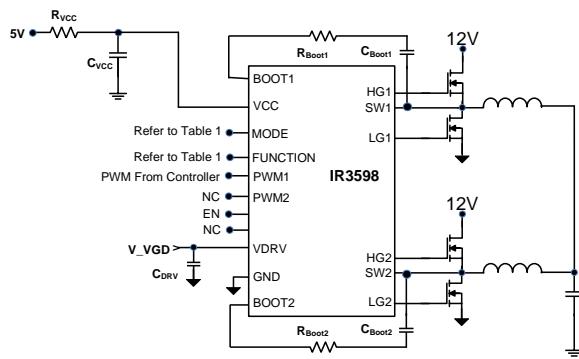


Figure 1: IR3598 Typical DOUBLER Mode Application Circuit

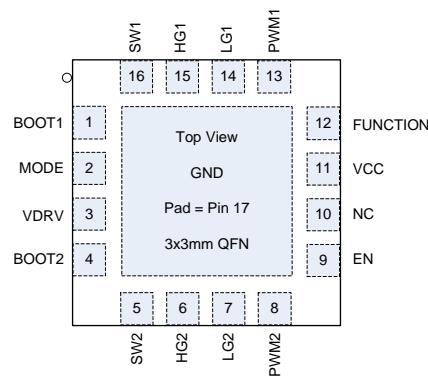
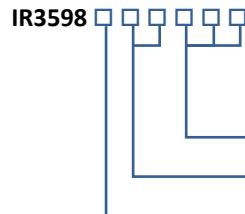


Figure 2: IR3598 Package Top View

ORDERING INFORMATION



PBF – Lead Free

TR – Tape and Reel

M – QFN Package

Package	Tape & Reel Qty	Part Number
QFN	3000	IR3598MTRPBF
QFN	100	IR3598MPBF