MIC2111

Single-Phase, Multi-Mode, High-Performance, Step-Down PWM Controller

PRELIMINARY

General Description

Micrel's MIC2111 is a programmable-frequency, valley-current/voltage-mode PWM controller that provides the control and protection features necessary for a high-current, step-down DC-to-DC converter. The MIC2111 is compatible with power devices and drivers which use current sensing across the inductor. MIC2111 can provide single tri-state or dual non-tri-state PWM logic signals to work with either power-stage modules or discrete driver MOSFETs. MIC2111 has precision enable and power good (PG) functions for sequencing of multiple power supply.

The MIC2111 frequency can be programmed from 200kHz to 2MHz to optimize system size and system efficiency. The device operates in power-saving mode at light loads by reducing the switching frequency. The device can be configured to operate outside audio range when the external power stage is configured for light load mode. The MIC2111 uses differential current sensing for better current-limit accuracy and also includes a dedicated differential amplifier for remote output sensing to provide a more accurate output. MIC2111 has a high-gain transconductance amplifier for loop compensation. External slope compensation can be added through a resistor to avoid sub-harmonic oscillations. The MIC2111 has programmable OCP, OVP, and thermal OTP protections as well as a dedicated FAULT pin for accurate system startup/stop in fault conditions.

The MIC2111 is available in a 20-pin 3mm × 3mm TQFN package and has a junction temperature range of –40°C to +125°C.

Datasheets and support documentation are available on Micrel's web site at: www.micrel.com.

Features

- Single 3.3V or 5V supply
- Supports load currents more than 50A
- Programmable valley-current/voltage-mode PWM architecture
- 3.3V logic PWM outputs compatible with power-stage modules and DrMOS modules
- Single tri-state PWM output
- Programmable switching frequency: 200kHz to 2MHz.
- Differential remote sensing for output voltage and inductor current
- 0.6V reference voltage with total ±1% accuracy for output
- Adjustable soft-start/soft-stop and pre-biased safe startup.
- Supports light load and outside audio modes
- Programmable slope compensation and loop compensation
- Enable input, power-good (PG) output for sequencing
- Programmable OCP, OVP, OTP, and dedicated FAULT pin for system safe startup/stop
- Internal thermal shutdown and UVLO
- –40°C to +125°C junction temperature range
- Available in 20-pin 3mm × 3mm TQFN package

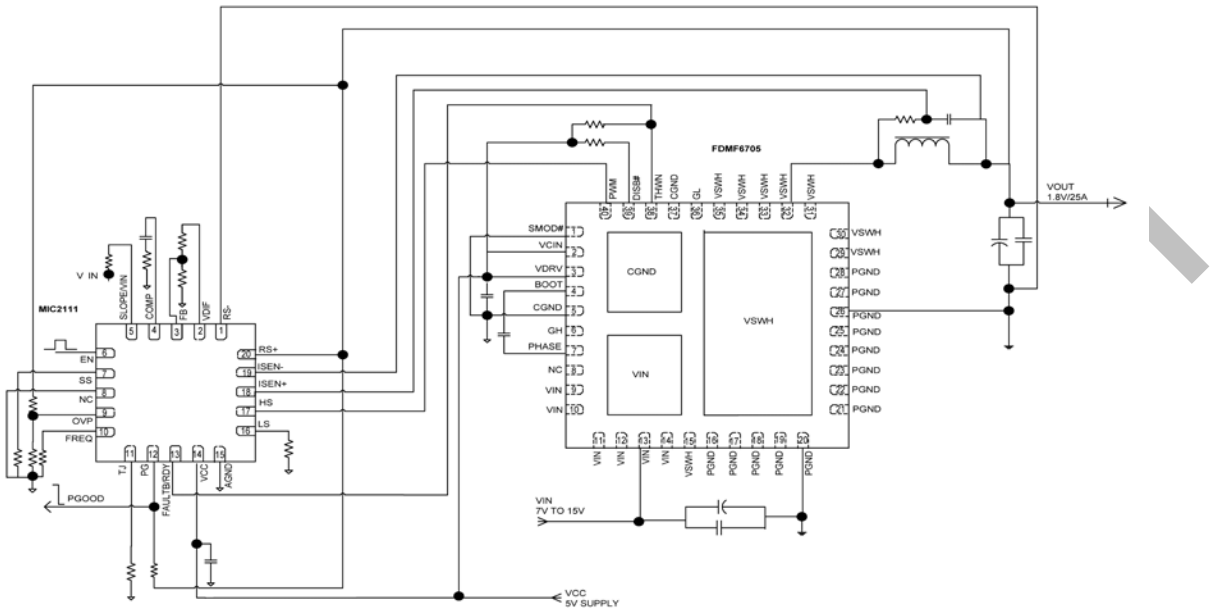
Applications

- Servers and work stations
- Routers, switches and networking/telecom infrastructure
- Printers, scanners, graphics and video cards

Ordering Information

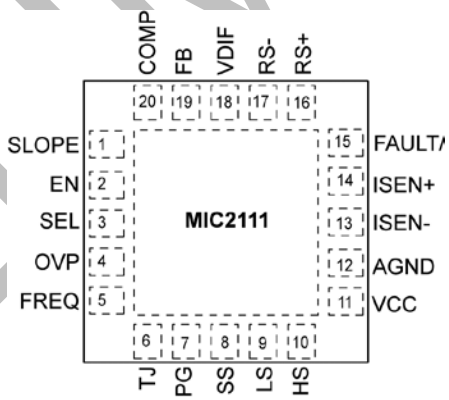
Part Number	Switching Frequency	Junction Temperature Range	Current-Sense Gain	Package	Lead Finish
MIC2111AYML	200kHz to 2MHz	–40°C to +125°C	1 V/V	20-Pin 3mm × 3mm TQFN	Pb-Free
MIC2111BYML	200kHz to 2MHz	–40°C to +125°C	30 V/V	20-Pin 3mm × 3mm TQFN	Pb-Free

Typical Application



MIC2111B and DrMOS for a 25A Synchronous Buck Converter

Pin Configuration



20-Pin 3mm × 3mm TQFN
(Top View)

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