NCP5338

l e a ed D e a d MOSFET

The NCP5338 integrates a MOSFET driver, high side MOSFET and low side MOSFET into a 6 mm x 6 mm 40 pin QFN package. The driver and MOSFETs have been optimized for high current DC DC buck power conversion applications. The NCP5338 integrated solution greatly reduces package parasitics and board space compared to a discrete component solution.

Features

- Optimized for High Frequency, High Conversion Ratio Operation
- Capable of Switching Frequencies Up to 1.5 MHz
- Internal Bootstrap Diode
- Zero Current Detection
- Undervoltage Lockout
- Internal Thermal Warning / Thermal Shutdown
- 40 A Continuous Output Current Capability
- These are Pb Free Devices

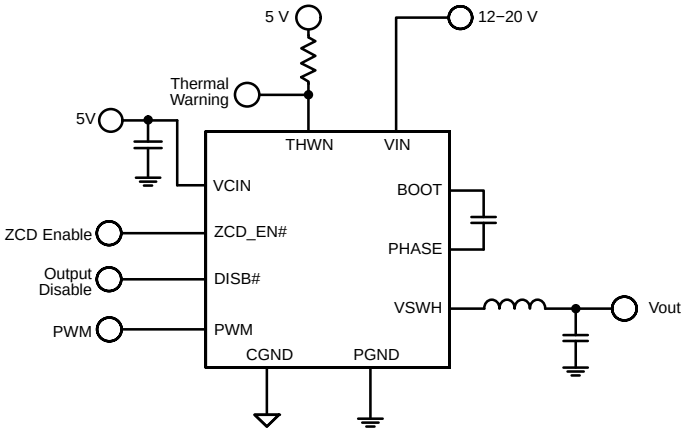

Figure 1. Application Schematic

ON Semiconductor

http://onsemi.com

MARKING DIAGRAM

QFN40
MN SUFFIX
CASE 485AZ

ORDERING INFORMATION

Device	Package	Shipping†
NCP5338MNR2G	QFN40 (Pb−Free)	2500/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

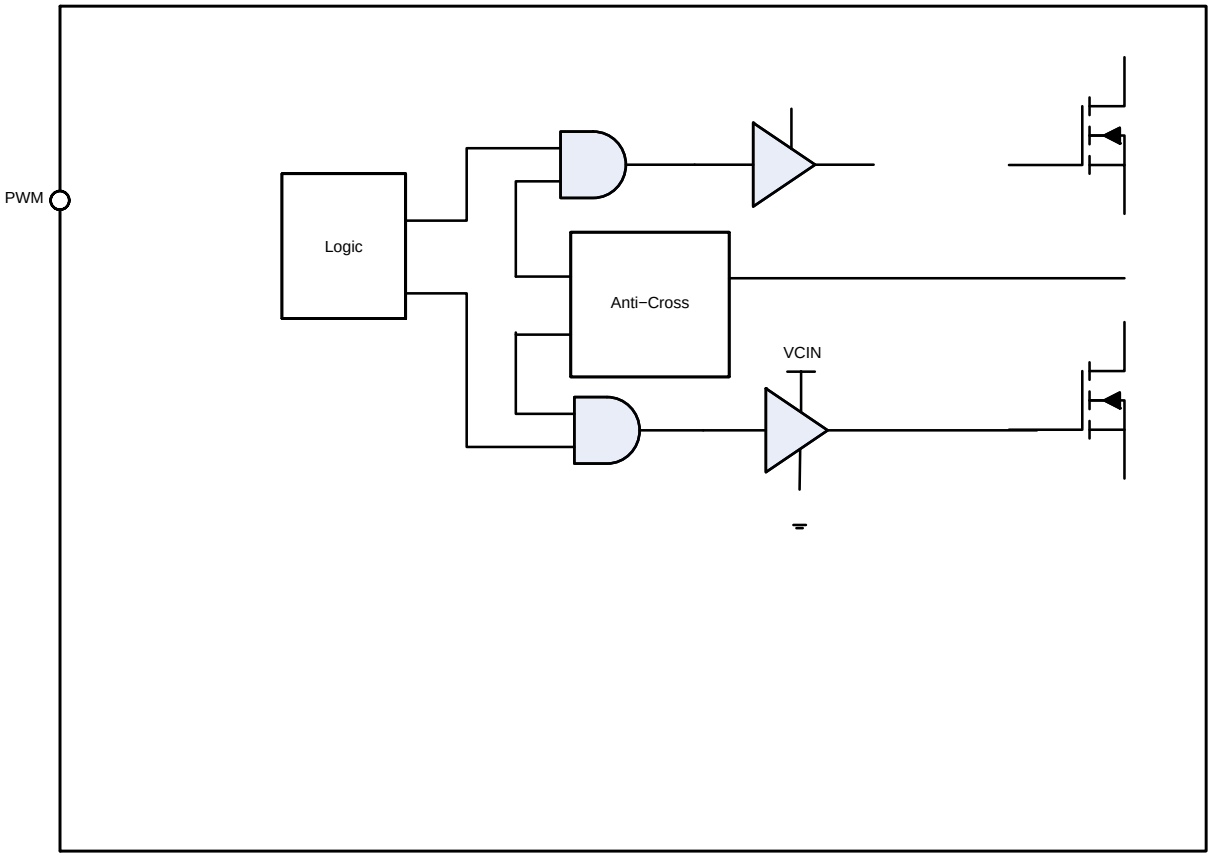
PWM
Logic
Anti−Cross
VCIN

Table 1. PIN FUNCTION DESCRIPTION

Pin No.	Pin Name	Description
1	ZCD_EN#	Enable Zero Current Detection
2	VCIN	

Table 4. THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Thermal Resistance, High−Side FET (Note 4)	$R_{\Theta JPCB}$	11.7	°C/W
Thermal Resistance, Low−Side FET (Note 4)	$R_{\Theta JPCB}$	2.8	°C/W
Operating Junction Temperature	T_J	−40 to 150	°C
Storage Temperature	T_S	−55 to 150	°C
Moisture Sensitivity Level	MSL	3	

APPLICATIONS INFORMATION

Theory of Operation

The NCP5338 is an integrated driver and MOSFET module designed for use in a synchronous buck converter topology. A single PWM input signal is all that is required to properly drive the high side and low side MOSFETs.

Low Side Driver

The low side driver is designed to drive a ground referenced low $R_{DS(on)}$ N Channel MOSFET. The voltage rail for the low side driver is internally connected to VCIN and PGND.

High Side Driver

The high side driver is designed to drive a floating low RDS(on) N channel MOSFET. The gate voltage for the high side driver is developed by a bootstrap circuit referenced to Switch Node (VSWH) pin.

The bootstrap circuit is comprised of the internal diode and an external bootstrap capacitor. When the NCP5338 is starting up, the VSWH pin is at ground, so the bootstrap capacitor will charge up to VCIN through the bootstrap diode See Figure 1. When the PWM input goes high, the high side driver will begin to turn on the high side MOSFET using the stored charge of the bootstrap capacitor.

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up, tsThe g99.7(0 1 59.754 47.7 the stored char)19.1h31ced

PACKAGE DIMENSIONS

QFN40 6x6, 0.5P
MN SUFFIX
CASE 485AZ
ISSUE O