

Dual Bootstrapped, 12 V MOSFET Driver with Output Disable

ADP3120A

The ADP3120A is a single Phase 12 V MOSFET gate drivers optimized to drive the gates of both high-side and low-side power MOSFETs in a synchronous buck converter. The high-side and low-side driver is capable of driving a 3000 pF load with a 45 ns propagation delay and a 25 ns transition time.

With a wide operating voltage range, high or low side MOSFET gate drive voltage can be optimized for the best efficiency. Internal adaptive nonoverlap circuitry further reduces switching losses by preventing simultaneous conduction of both MOSFETs.

The floating top driver design can accommodate VBST voltages as high as 35 V, with transient voltages as high as 40 V. Both gate outputs can be driven low by applying a low logic level to the Output Disable (\overline{OD}) pin. An Undervoltage Lockout function ensures that both driver outputs are low when the supply voltage is low, and a Thermal Shutdown function provides the IC with overtemperature protection.

Features

- All-In-One Synchronous Buck Driver
 - Bootstrapped High-Side Drive
 - One PWM Signal Generates Both Drives
 - Anticross Conduction Protection Circuitry
- \overline{OD} 43 3trollTT7 1 Tf10 0 0 10 70.29 39863 th268

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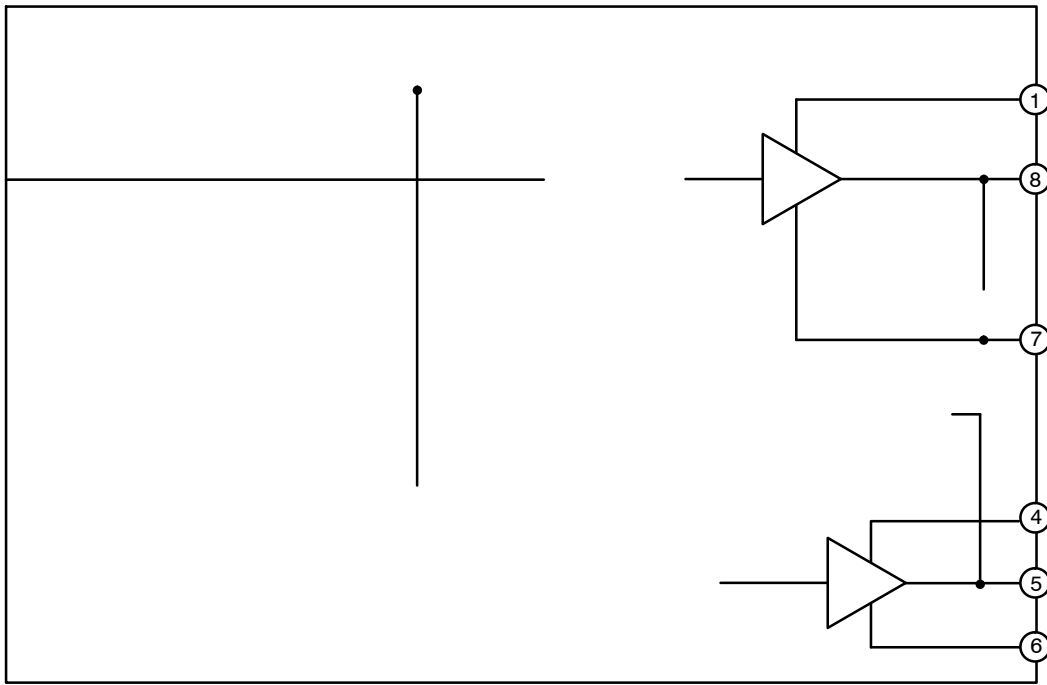


Figure 1. Block Diagram

ADP3120A

MAXIMUM RATINGS

Rating	Value	Unit
Operating Ambient Temperature, T_A	20 to 85	C
Operating Junction Temperature, T_J (Note 1)	20 to 150	C

Package Thermal Resistance: SO 8

Junction to Case, $R_{\theta JC}$

Junction to Ambient, $R_{\theta JA}$ (2 Layer Board)

Package Thermal Resistance: DFN8 (Note 2)

Junction to Case, $R_{\theta JC}$ (From die to exposed pad)

Junction to Ambient, $R_{\theta JA}$

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ELECTRICAL CHARACTERISTICS (Note 4) ($V_{CC} = 12\text{ V}$, $T_A = 20\text{ C to }+85\text{ C}$, $T_J = 0\text{ C to }+125\text{ C}$ unless otherwise noted.)

Characteristic	Symbol	Condition	Min	Typ	Max	Unit
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PWM Input

Hysteresis				400		mV
Input Current		No internal pullup or pulldown resistors	1.0		+1.0	μA

High-Side Driver

Output Resistance, Sourcing Current		BST SW = 12 V; $T_A = 20\text{ C to }85\text{ C}$ BST SW = 12 V; $T_A = 25\text{ C}$
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APPLICATIONS INFORMATION

Theory of Operation

The ADP3120A are single phase MOSFET drivers designed for driving two N-channel MOSFETs in a synchronous buck converter topology. The ADP3120A will operate from 5.0 V or 12 V, but have been optimized for high current multi-phase buck regulators that convert 12 V rail directly to the core voltage required by complex logic chips. A single PWM input signal is all that is required to properly drive the high-side and the low-side MOSFETs. Each driver is capable of driving a 3 nF load at frequencies up to 1 MHz.

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 the VT2IT035s0

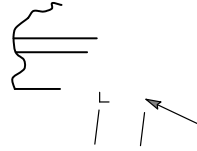
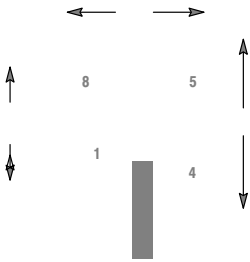
ADP3120A

DFN8 3x3, 0.5P
CASE 506BJ
ISSUE O



SOIC 8 NB
CASE 751-07
ISSUE AK

DATE 16 FEB 2011



SEATING
PLANE



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