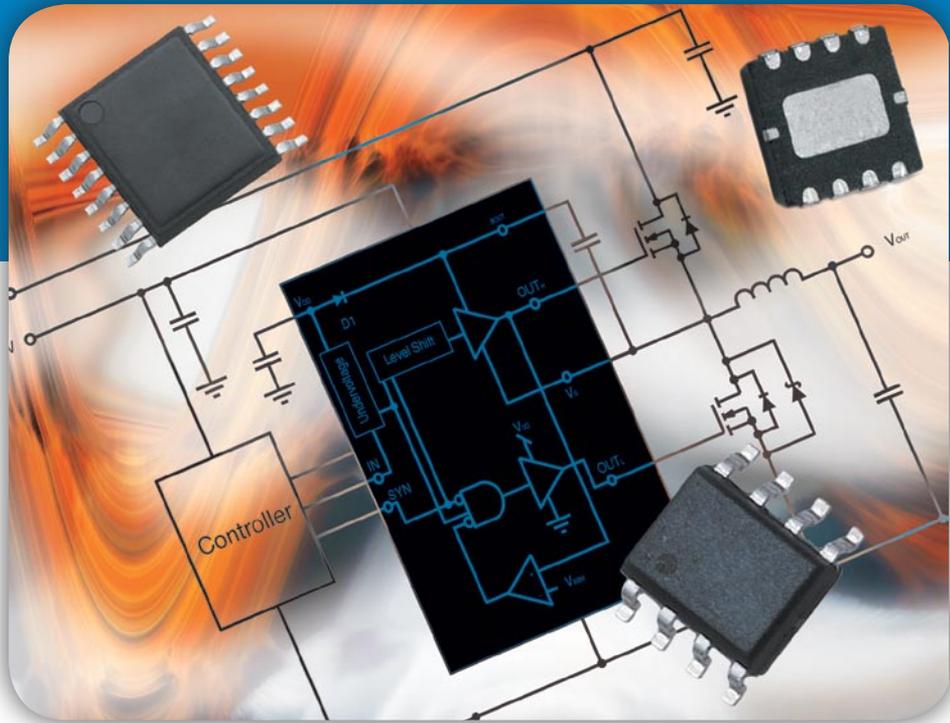




# Power ICs - Si99xx, SiP411xx



## Half-Bridge MOSFET Drivers for High-Efficiency Power Control

### FEATURES

- Drives MOSFETs in 4.5- to 50-V systems
- Up to 4-A peak drive current
- 250-kHz to 1-MHz switching frequency
- Synchronous enable/disable option
- Break-before-make circuit
- Bootstrapped high-side drive
- Under-voltage lockout

### APPLICATIONS

- High-current synchronous buck (step-down) converters
- Multi-phase dc-to-dc converters
- Asynchronous-to-synchronous adaptations
- Mobile and desktop computer dc-to-dc converters
- Motor drives

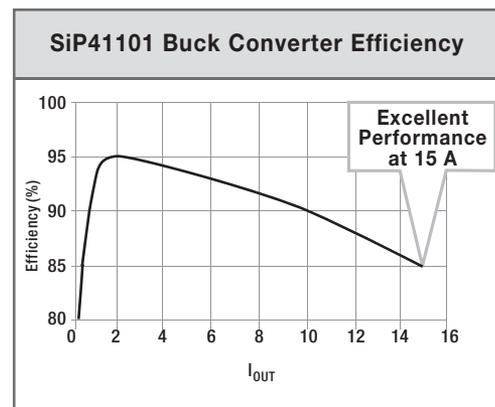
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## Half-Bridge MOSFET Drivers

FEATURE	BENEFIT
• Sub-1- $\Omega$ gate driver	• Provides up to 4 A of gate current and faster switching speed
• Internal bootstrap diode	• Reduces external component count
• Up to 1-MHz switching frequency	• Reduces capacitor and inductor size
• Synchronous MOSFET enable/disable	• Enhances efficiency at light load
• Multiple small package options	• Reduces PCB area and height

### ADDITIONAL FEATURES

- Drives MOSFETs in 4.5- to 50-V systems
- Single 5 V for IC operation
- TTL/CMOS compatible input levels
- 250-kHz to 1-MHz switching frequency
- Bootstrapped high-side drive
- Shutdown quiescent current  $<5 \mu\text{A}$
- Single PWM input generates both high-side and low-side drive
- Break-before-make circuit
- Undervoltage lockout
- Lead (Pb)-free packages



### DESCRIPTION

These high-speed, half-bridge MOSFET drivers are targeted for applications in single phase and multiphase dc-to-dc switching power supplies, and for use in the control of brushless DC motors. Drive current capabilities of these ICs range from 0.4 A peak to 4 A peak. This, combined with an operating frequency range of up to 1 MHz, allows the choice of a properly sized driver for each application's frequency of operation and size of power MOSFETs. All of these MOSFET drivers are highly integrated devices. This is reflected in the family's break-before-make logic, which prevents shoot-through currents in the external MOSFETs, as well as the bootstrap diode that is integrated into the IC. A shutdown/control pin is used to enable the drivers, and a synchronous enable pin is additionally provided on selected devices to allow disabling of the low-side or "synchronous rectifier" MOSFET, to maximize efficiency when the power supply is operating at a low output current level. These parts are available in both standard and lead (Pb)-free packages, and are rated for operation over the  $-40$  to  $+85$  °C industrial temperature range.

### HALF-BRIDGE SELECTOR TABLE

Product	Description	Frequency kHz	Current Drive (A)	Voltage (V)	Sync Enable	Package
Si9912	Half-bridge MOSFET bootstrapped driver with break-before-make	1,000	0.4	1.5 to 30		SO-8
Si9913	Half-bridge MOSFET bootstrapped driver with break-before-make	1,000	0.4	1.5 to 30	Yes	SO-8
SiP41101	Half-bridge n-channel MOSFET driver with break-before-make	1,000	4	1.5 to 30	Yes	TSSOP-16
SiP42101	Half-bridge n-channel MOSFET driver with brake for motor control	50	1	1.5 to 50		MLP33-10
SiP41103	Half-bridge n-channel MOSFET driver for dc-to-dc conversion	1,000	1	1.5 to 50	Yes	MLP33-10
SiP41104	Half-bridge n-channel MOSFET driver for dc-to-dc conversion	1,000	1	1.5 to 50		SO-8
SiP41105	Half-bridge n-channel MOSFET driver for dc-to-dc conversion	1,000	1	1.5 to 50	Yes	TSSOP-16 PowerPAK