Analog Products Fact Sheet

MC33395

Three-Phase Bridge Gate Driver IC

Power Actuation

H-Bridge Motor Drivers

ARCHIVE INFORMATION

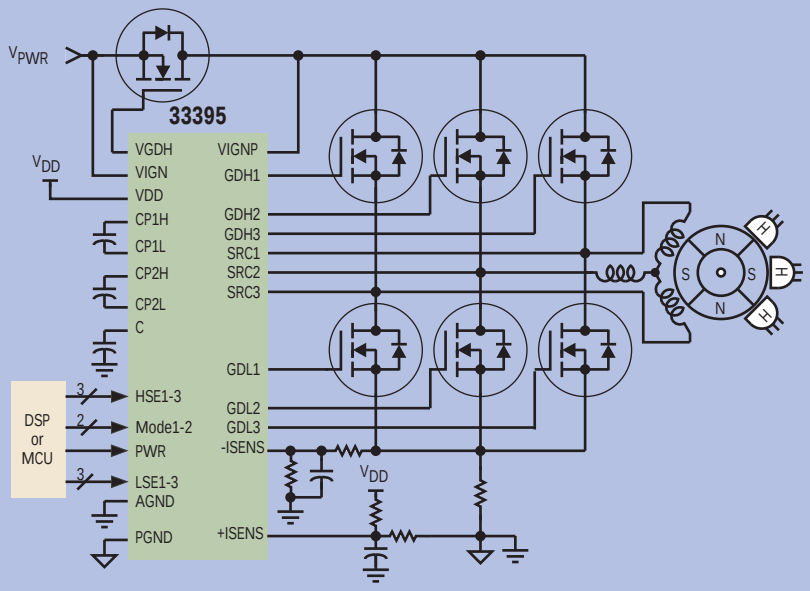
DESCRIPTION

The 33395 simplifies the design of high-power BLDC motor control design by combining the gate drive, charge pump, current sense, and protection circuitry necessary to drive a three-phase bridge configuration of six N-channel power MOSFETs. Mode logic is incorporated to route a pulse width modulation (PWM) signal to either the low-side MOSFETs or high-side MOSFETs of the bridge, or to provide complementary PWM outputs to both the low- and high-sides of the bridge.

Detection and drive circuitry are also incorporated to control a reverse battery protection high-side MOSFET switch. PWM frequencies up to 28 kHz are possible. Built-in protection circuitry prevents damage to the MOSFET bridge as well as the drive IC and includes overvoltage shutdown, overtemperature shutdown, overcurrent shutdown, and undervoltage shutdown.

The device is parametrically specified over an ambient temperature range of -40°C ≤ T_A ≤ 125°C and 5.5 V ≤ V_{IGN} ≤ 24 V supply.

33395 SIMPLIFIED APPLICATION DIAGRAM



ARCHIVE INFORMATION

APPLICATIONS

- Automotive Systems
- Marine Electromechanical Systems
- Aircraft Electromechanical Systems
- Industrial Automation and Robotics
- 3-Phase DC-AC Power Inverters and UPS Systems
- DC-Powered Refrigeration Compressors

PERFORMANCE	TYPICAL VALUES
Outputs	6
Gate Drive Current	1.0 A peak
Operating Voltage	5.5 – 18 V
Switching Time	1.0 µs
ESD	± 2000 V
Operating Temperature	-40°C ≤ T_A ≤ 125°C
Junction Operating Temp	-40°C ≤ T_J ≤ 150°C

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FEATURES

- Drives six N-channel low $R_{DS(ON)}$ power MOSFETs
- Built-in charge pump circuitry
- Built-in current sense comparator and output drive current limiting
- Built-in PWM mode control logic
- Built-in circuit protection
- Designed for fractional to integral HP BLDC motors
- 32-terminal SOIC wide body surface mount package
- 33395 incorporates a <5.0 µs shoot-through suppression timer
- 33395T incorporates a <1.0 µs shoot-through suppression timer
- Pb-free packaging designated by suffix code EW
- Additional devices available for comparison in Analog Product Selector Guide, SG1002 and Automotive Product Selector Guide, SG187

QUESTIONS

- Are you designing a brushless DC-motor controller?
- Do you need to interface a DSP or microcontroller to a power FET three-phase bridge?
- Would a gate-driver IC with built-in system protection features benefit your design?
- Does your circuit need to withstand long time-constant voltage transients?
- Is proven IC robustness important to your product?

PROTECTION	DETECT	LIMITING	SHUT DOWN	AUTO RETRY
Overvoltage	●		●	●
Undervoltage	●		●	●
Overcurrent	●	●		
Overtemperature	●		●	●
Reverse Battery	●		●	

CUSTOMER BENEFITS

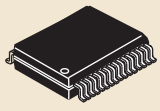
- Integrated drive and protection solution for 3-phase power MOSFET bridges
- Inputs compatible with 5.0 V CMOS logic
- Provides interface from microcontroller or DSP to a 3-phase MOSFET bridge
- Two input control bits provide four possible PWM output drive modes
- Works with low-cost N-channel MOSFETs
- Low-system cost with minimal component count
- High-reliability circuitry

ORDERING INFORMATION

Device	Temperature Range (T_A)	Package
MC33395DWB/R2	-40°C to 125°C	32 SOICW
MC33395EW/R2		32 SOICW (Pb-Free)
MCZ33395EW/R2		
MC33395TDWB/R2		32 SOICW
MC33395TEW/R2		32 SOICW (Pb-Free)

Data Sheet Order Number MC33395

Contact Sales for Evaluation Kit Availability



32 SOICW
0.65 mm Pitch
11.0 mm x 7.5 mm Body

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MC33395FS
Rev. 3.0

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