



SA306-IHZ, SA57-IHZ

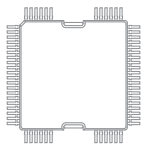


HIGH CURRENT, HIGH VOLTAGE PWM ICs FOR DRIVING MID-RANGE BRUSHLESS AND BRUSH DC MOTORS



64-PIN QFP, PACKAGE STYLE HQ
JEDEC MO-188

(actual footprint 17.45mm X 17.45mm)



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Cirrus Logic has added two new high current, high voltage pulse width modulation (PWM) ICs to its Apex Precision Power family of motor control products. The SA306-IHZ and SA57-IHZ are designed to address the lack of off-the-shelf solutions targeted at driving fractional horsepower DC motors that operate in the 9 V to 60 V supply range.

As monolithic, single package solutions, both the SA306-IHZ and the SA57-IHZ offer a very attractive option versus discrete solutions requiring up to 70% more board space. Starting with their power ratings, both ICs can provide 5 A of continuous output current and up to 17 A PEAK – an industry first for a pwm IC. An even higher 8 A of continuous output current is possible by selecting the A-Grade versions of each device – the SA306A-FHZ or the SA57A-FHZ.

Both ICs are available in a 64-pin Power Quad package (PowerQFP) with a footprint measuring less than two centimeters square. The PowerQFP provides customers with the opportunity to increase the thermal efficiency of their motor control designs. By utilizing a cutout in the printed circuit board and mounting the IC upside down, the power dissipation capabilities of the package can be increased by up to 3X versus a standard on-board mounting configuration.

This patent-pending approach developed by the Apex Precision Power product design engineers can also slim the profile of the overall board layout. With the driver placed “through” the board, the addition of a heatsink can be nearly flush mounted. The size of the heatsink is reduced as well thanks to the

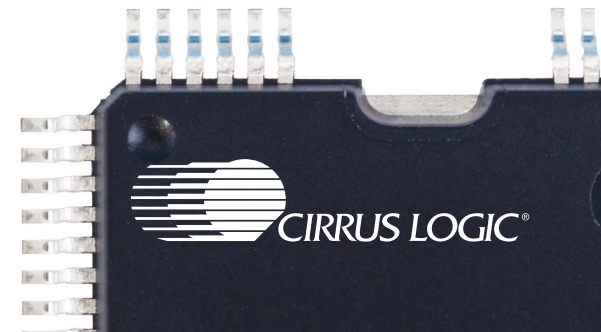
switching technology of the SA306-IHZ and SA57-IHZ. PWM operation minimizes the power dissipation issues compared with a linear amplifier, while greatly increasing thermal efficiency of the overall system. This allows the circuit to run cooler and thus increase long-term reliability. These ICs also use smaller filter components because they switch at frequencies of up to 100 kHz.

SA306-IHZ, SA57-IHZ APPLICATIONS

- Industrial Process Control
 - Motor drives in factory automation
 - Motor drives in robotics
- Office Equipment
 - Motor drives in copiers, fax machines
 - Motor drives in currency dispensers
- Military, Aerospace
 - Motor drives in positioning control
 - Motor drives in aircraft seating

SA306-IHZ, SA57-IHZ FEATURES

- Single supply voltage: 9 V to 60 V
- Output current: 5 A continuous, 17 A PEAK
- Cycle-by-cycle current limit
- Direct control of all six power devices (SA306-IHZ)
- Direct control of the dual power stages (SA57-IHZ)
- Operate with MCU or DSP control



DIGITAL INTERFACE

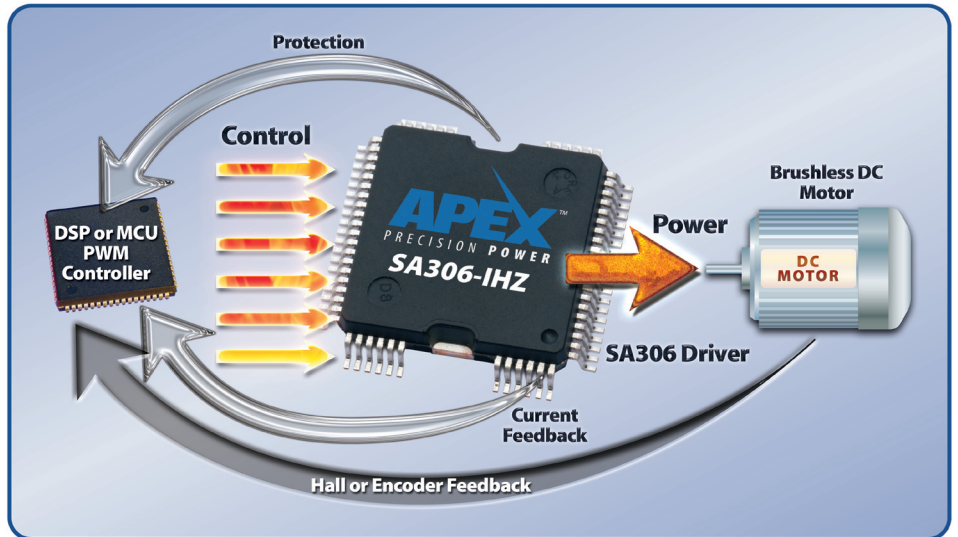
The SA306-IHZ and the SA57-IHZ are both designed to provide a seamless interface to either a digital microcontroller (MCU) or DSP. The top side and bottom side output FETs on these PWM drivers can be individually controlled via direct signals from the processor. Communication between the driver and the processor includes current sensing for each phase and is supplied as individual inputs to the processor. Short circuit protection and high temperature sensing is handled as digital feedback signals. Communication with the motor is the responsibility of the processor. In the case of a brushless motor, the processor changes the PWM signals to the top transistors, as well as the ON-OFF signals to the bottom transistors. This is based on the three hall-effect feedback signals in the case of the brushless motor which indicates position of the rotor. For a brush motor, the PWM signals work between the SA57-IHZ's dual power stages and the motor.

CYCLE-BY-CYCLE CURRENT LIMIT

In typical motor control applications, the task of controlling current is handled directly by the processor or DSP. By using the SA306-IHZ or SA57-IHZ as the system driver, current can be controlled on a cycle-by-cycle basis in real time for each motor phase. This unique functionality represents next generation performance compared with existing control methodologies.

An extended benefit of cycle-by-cycle current limit is the ability to soft start the motor by allowing the SA306-IHZ or SA57-IHZ to handle the inrush of start-up current. For both of these ICs, this ability negates the necessity to de-rate their current rating even at 5 A continuous or greater.

TYPICAL APPLICATION

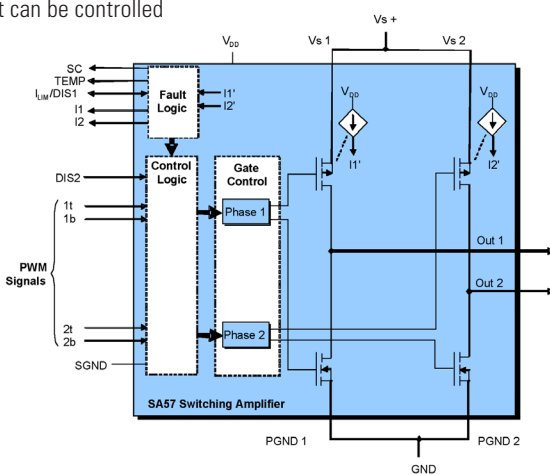


DEMONSTRATION BOARDS AVAILABLE

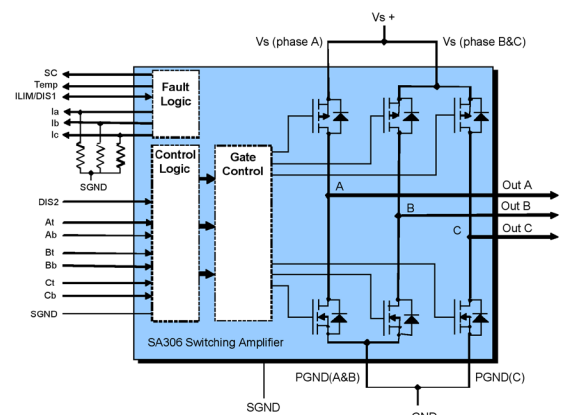
Fully assembled demonstration boards are available now for both the SA306-IHZ and the SA57-IHZ to help with rapid prototyping. The DB63 is the demo board for the SA57-IHZ, and the DB64 is set up for the SA306-IHZ. Each board comes fully assembled, including an evaluation unit of either the SA57-IHZ or the SA306-IHZ.

A GRADES AVAILABLE

- SA306-FHZ
 - Specific performance enhancements
 - 8 A continuous output current
 - Case temp range -40°C up to +125°C
- SA57-FHZ
 - Specific performance enhancements
 - 8 A continuous output current
 - Case temp range -40°C up to +125°C



SA57-IHZ Block Diagram: 2-phase driver (Out 1 and 2)



SA306-IHZ Block Diagram: 3-phase driver (Out A, B and C)