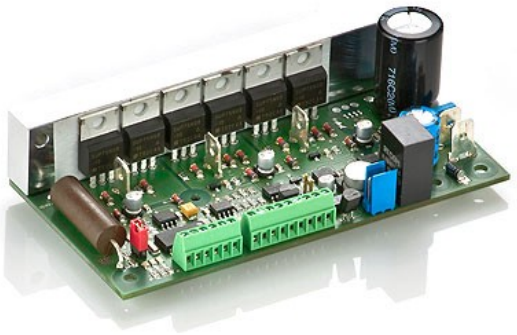
ECHall48V20A
High-Performance Sinusoidal Drive for Brushless DC (EC) Motors with Hall Sensor Feedback



- Rotor position detection via Hall sensor feedback
- Sinusoidal motor current
- Compact dimensions: 108 mm × 55 mm × 20 mm
- Supply voltage: 20 VDC to 50 VDC, alternatively 18 VDC to 34 VDC
- Continuous current per phase: 20 A
- Maximum peak current: 50 A
- Suitable for brushless three-phase motors in delta or star (wye) configuration
- Analog speed reference input: 0–10 V or external potentiometer
- Direction input
- Enable input
- Adjustable phase advance
- Speed output signal: 3 pulses per revolution

ECHall48V20A is a three-phase motor driver for brushless DC motors (EC motors).

Rotor position is determined by evaluating the Hall sensor signals, and the corresponding phase signals for the power driver are generated accordingly.

The phase signals are generated in such a way that a sinusoidal current flows through the motor, ensuring smooth operation and low torque ripple.

The control electronics and power driver are integrated on a single 108 × 55 mm printed circuit board.

The compact heat sink flange allows the unit to be easily mounted to virtually any chassis while providing excellent thermal coupling. This enables efficient dissipation of power losses.

Alternatively, the ECHall48V20A can be fitted with a commercially available heat sink.

The power driver is based on discrete power MOSFET technology.

Thanks to the low RDS(on) of the power MOSFETs, efficiency ranges from 85% to 97%, depending on the motor type and supply voltage. The power stage operates at a switching frequency of 16.4 kHz.

The maximum continuous current is 20 A, while the maximum peak current is 50 A per motor phase for short periods. This allows reliable startup of very low-resistance EC motors, even under load.

The supply voltage range is 20 VDC to 50 VDC, or alternatively 18 VDC to 34 VDC.

Motor speed can be adjusted either via an analog control voltage of 0 to 10 V or by means of an externally connected potentiometer.

Various control inputs, including direction, enable, and phase-advance control, provide extensive configuration options.

In addition, a speed output signal with 3 pulses per revolution is available, along with a monitor output for detecting incorrect rotation direction.

ECHall48V20A – Technical Specifications

Operating Modes:	Sensorless commutation, Mains operationHall sensor commutation
Supply Voltage (single supply voltage):	230 VAC, 50 Hz, Single-phase20-48 VDC alternative 18-34 VDC
Maximum Continuous Current (Current Limited):	20 A
Maximum Power:	480 W
Power Stage Switching Frequency:	16,4 kHz
Control Inputs: • Speed reference (0–10 V or external potentiometer) • Direction (CW/CCW) • Enable • Phase advance	 Analog input, 0 to 10 V, or adjustment via an external potentiometer; dedicated potentiometer connections provided. High (5 V) = clockwise Low (GND) or open = counterclockwise High (5 V) = enabled Low (GND) or open = disabled Adjustable from 0° to 58° via analog voltage: 0 V or open = 0° 5 V = 58° (5-bit A/D resolution)
Outputs: • Speed Signal (FG): • Reverse Rotation Detection (REV):	 3 pulses per revolution, 5 V Push-pull output, Â±1 mA (max.), 5 V
Connections: • Supply Voltage and Motor Connection: • Inputs / Outputs: • Potentiometer Connection: • Hall Sensor Connections:	 6.3 mm blade terminals 9-pin screw terminal, 2.54 mm pitch 3-pin HE-14 connector 6-pin screw terminal, 2.54 mm pitch
Dimensions with heat sink flange: Optional: Dimensions with heat sink:	108 x 55 x 25 mm 108 x 77 x 33 mm
Operating Temperature Range:	0 ... +50 °C
Storage Temperature Range:	-40 ... +85 °C