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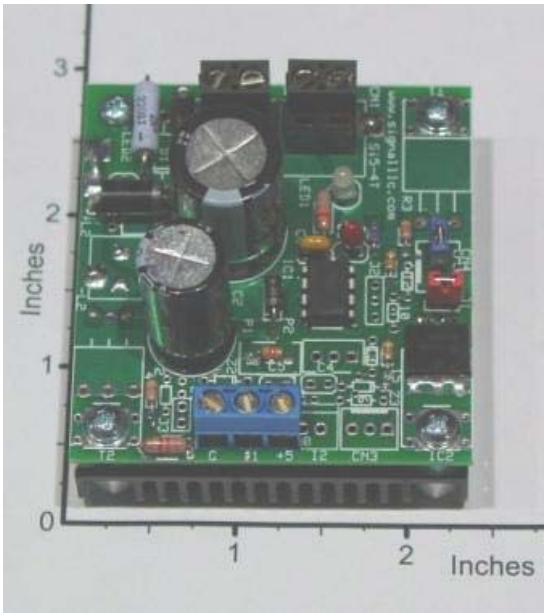
Si5SDOI1-50V-20A, Single, 50V 20A Solenoid Driver with Optically Isolated Control Input and with Integrated Heat Sink



The **Si5SDOI1-50V-20A** is a Single, 50V 20A Solenoid Driver with an integrated heat sink that uses an optically isolated digital control voltage $\mathbf{V_{I1,G}}$ (0 to 15V) to turn a load-current on or off. This board requires a single 6V to 50V DC power source (unregulated and unfiltered) at a 0A to 20A current range to operate normally with a wide range of inductive loads (coils or Solenoids). The digital control input is zener-diode protected and optically isolated from the power source $\mathbf{V_p}$ (with a breakdown voltage of 1000V); this input requires only **2mA** current at ($\mathbf{V_{In,G}=5V}$) to fully turn on the load current. This current is **off** (zero) when 0< $\mathbf{V_{I1,G}}$<2.5V and the load current is fully **on** (max.) when 2.5V< $\mathbf{V_{I1,G}}$<15V. Snubbing circuits and filter capacitors are included to suppress inductive switching transients. An onboard LED (red) is used to monitor the load-voltage. A small (2.3"x2.4"x0.45") finned integrated heat sink is included with mounting hardware (as shown on the photograph) to operate at 20A or 600W power levels. Higher power-levels (30V, 30A or 900W) can be achieved with more efficient heat-sinks. Please click on this link and read the **Board Mounting Instructions and Heat Sink Selection Guide**. Typical applications are: Inductive-Plunger Driver, SPST Solid State Relay, etc. This board can be configured to perform efficiently in many customized applications.

Specification and Application for Si5SDOI1-50V-20A

- **Typical Operating Temperature at 20A:** 45^{0}C with the Metal Heat-Ring Bolted to Bolted to a small (2.3"x2.4"x0.45") finned Aluminum Heat-Sink, while it is exposed to air at 25^{0}C (as shown on photograph).
- **Control- Input I1:** This digital control input is optically isolated from the power source $\mathbf{V_P}$ (Isolation Breakdown Voltage of 1000V). In addition, the control input (**I1**) is zener-diode protected and requires only **2mA** input current at $\mathbf{V_{I1,G}=5V}$ to turn the load-current fully on. This load-current is **off** (zero) when 0< $\mathbf{V_{I1,G}}$<2.5V and the load current is **on** (max.) when 2.5V< $\mathbf{V_{I1,G}}$<15V.
- **Source-Voltage Requirement: $\mathbf{V_P}$ (from pin +P to pin -P):** 6V to 50V unregulated DC.
- **Load-Voltage, $\mathbf{v_{L1}(t)}$:** 0V when 0< $\mathbf{V_{I1,G}}$<2.5V and $\mathbf{V_p}$ when 2.5V< $\mathbf{V_{I1,G}}$<15V.
- **Max. Continuous Average Load-Current:** 20A with the heat-sink (as shown).
- **Max. Load-Current for 5sec:** 60A at 100% duty-cycle, with heat-sink (as shown).
- **Load Isolation:** The Load or coil must be isolated from the source voltage ($\mathbf{V_P}$).

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- **Power-Conversion Efficiency:** Approximately 98.5% at full-load (50V and 20A).
- **Switching Frequency:** 0 to 2kHz (or min. switching period is 500 μSec).
- **Load-Voltage Indicator and Board Protection:** An onboard LED (red) is used to monitor the load voltage.

- **About the Voltage Requirement:** The Si4 will work with any DC motor or load in the 6 V to 50 V voltage range. In addition, the power filters are included on this board, consequently, only unfiltered (full-wave rectified) DC input power is required in most applications.

A Typical Application of the Si5SDOI1-50V-20A

In this application, a high-current (20A at 50V) inductive load (coil or solenoid) is turned on and off by the optically isolated Digital Control Voltage $\mathbf{V_{I1,G}}$. The load current is **off** (zero) when 0< $\mathbf{V_{I1,G}}$<2.5V and the load current is **on** (max.) when 2.5V< $\mathbf{V_{I1,G}}$<15V.