



## **Si5SSD2-FBR-50V-2x16A Smart, Dual, 50V 2x16A Solenoid Driver, with Fixed Initial Load-Current Boost followed by a Current Reduction, and with Integrated Finned Heat Sink**

The **Si5SSD2-FBR-50V-2x16A** is a "Smart" Dual, 50V 2x16A Solenoid Driver with Fixed Load-Current Boost/Reduction and with integrated finned heat sink. **The words "Fixed Boost/Reduction" implies that after a coil is prompted, 100% PWM Load-Current is used with that coil for 100msec (Boost) and after this time, the PWM is reduced to 50% (the Time Duration and Reduction Factor is Fixed).**

The initial current boost is required to increase the pull-in force of the solenoid coil with an iron plunger, while the current reduction prevents overheating. An onboard microprocessor generates a 5kHz or 20kHz **PWM** carrier signal, controls the boost-time/reduction-factor, and monitors the control inputs (at 2kHz sampling rate). The **PWM** carrier frequency is user selectable by the jumper **CN3**, 20kHz when **CN3** is open and 5kHz when short. The high frequency PWM rate provides a smooth plunger control and insures a quiet coil environment. Two independent digital control voltages  $V_{I1,G}$  and  $V_{I2,G}$  (0 to 25V) are used that turn two coil-currents on or off. The digital control inputs are zener-diode protected and each requires only **1mA** input current (at  $V_{In,G}=5V$ ) to turn a load current fully on. Each load current is **off** (zero) when its corresponding control voltage  $V_{In,G}$  is:  $0 < V_{In,G} < 2.5V$  and the load current is fully **on** when  $2.5V < V_{In,G} < 25V$ . This board requires a single 9V to 50V DC power source (unregulated and unfiltered) at a 0A to 40A current range to operate normally with a wide range of inductive loads (coils or Solenoids). Snubbing circuits and filter capacitors are included to suppress inductive switching transients. Two onboard LEDs (red and green) are used to monitor the load-voltages. A small (2.3"x2.4"x0.95") finned integrated heat sink is included with mounting hardware (as shown on the photograph) to operate at 2x16A or 1600W power levels. Higher power-levels (50V, 2x20A or 2000W) 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: Dual Inductive-Plunger Driver, SPDT Solid State Relay, etc. This board can be configured to perform efficiently in many customized applications.



### **Specification and Application for **Si5SSD2-FBR-50V-2x16A****

- **Typical Operating Temperature at 2x16A:** 45<sup>0</sup>C with the Metal Heat-Ring Bolted to a small (2.3"x2.4"x0.95") finned Aluminum Heat-Sink, while exposed to air at 25<sup>0</sup>C (as shown on photograph).
- **Source-Voltage Requirement:**  $V_P$  (from pin +P to pin -P): 9V to 50V unregulated and unfiltered DC.
- **Load-Voltage,  $V_{L1}$  or  $V_{L2}$ :** 0V when  $0 < V_{In,G} < 2.5V$  and  $V_P$  when  $2.5V < V_{In,G} < 25V$ .
- **Load-Current,  $i_{L1}$  or  $i_{L2}$ :** 0A when  $0 < V_{In,G} < 2.5V$  and **16A max** when  $2.5V < V_{In,G} < 25V$ .
- **Load Isolation:** The Load or coil must be isolated from the source voltage ( $V_P$ ).



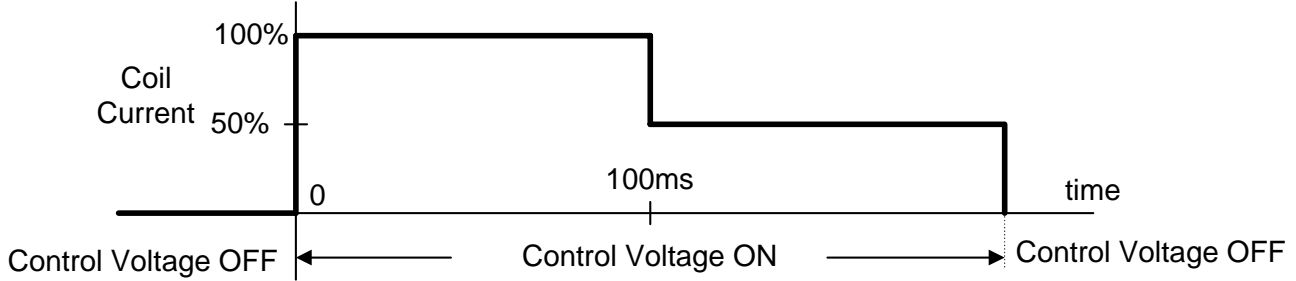
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- **Power-Conversion Efficiency:** Approximately 98.5% at full-load (50V and 16A).
- **PWM Switching Frequency:** 5kHz when CN3 short and 20kHz when CN3 open.
- **Load-Voltage Indicators and Board Protection:** Two onboard LEDs (red and green) are used to monitor the load voltages.

## Average Coil-Current Waveform as a Function of Control Signal ( $V_{I1,G}$ or $V_{I2,G}$ )



**About the Voltage Requirement:** The Si5 will work with any DC motor or load in the 9 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 **Si5SSD2-FBR-50V-2x16A**

In this dual application, two high-current (each at max of: 16A, 50V) inductive loads (coils or solenoids) are independently turned on and off by the Digital Control Voltages (**coil 1 by  $V_{I1,G}$**  and **coil 2 by  $V_{I2,G}$** ). A load current is **off** (zero) when its corresponding control voltage  $V_{In,G}$  is:  $0 < V_{In,G} < 2.5V$  and the load current is **on** when  $2.5V < V_{In,G} < 25V$ .

