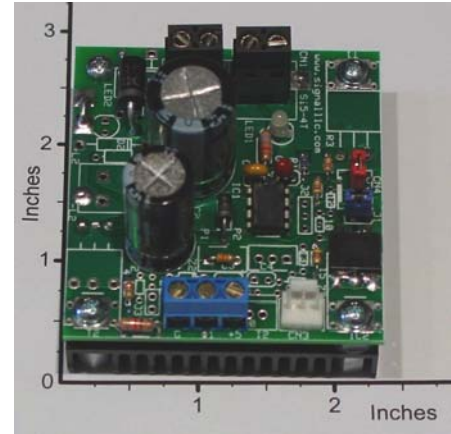


## **Si5HyUdMCDF1-50V-20A, Single, 50V 20A, Proportional Closed-Loop, Hybrid, Unidirectional Motor Controller with Integrated Heat Sink, Digital Feedback Port and with 5kHz or 20kHz PWM, T-Chip**

The **Si5HyUdMCDF1-50V-20A** is a 50V 20A, microprocessor based, Single, Closed-Loop, Hybrid, Unidirectional, Motor-Controller with an integrated heat sink and with a Digital Feedback port. This board uses pulse-width modulation (**PWM**) to efficiently control the speed of a brush type DC motor (or load current) in open or closed loop control mode in the 0 to 1000W power range, and in 8.3W steps. The desired control mode is selected by a jumper (**J1M**). An open-circuit (no jumper) selects the open-loop mode, while short-circuit (jumper installed) selects the closed-loop mode. The desired motor speed (or load current) is set by a (0 to 5V) range external analog voltage (applied to **I1** input pin on port **CN5**). The [Si18V1RPM-Sens](#) optical interrupter (connected to port **CN3**) along with [Si18V1RPM-Wheel](#) optical wheel (mounted on the motor shaft) provides proportional feedback, keeping the motor-shaft rotating at a constant speed. The speed-range is adjustable with an onboard 25-turn trim pot in the 50 to 3000 rpm range. This board requires a single 9V to 50V DC power source (unregulated and unfiltered) at a 0A to 20A current range to operate normally. An onboard microprocessor generates a 5kHz or 20kHz **PWM** carrier signal, controls the load-power (or motor speed) and monitors the sensor inputs. The **PWM** carrier frequency is user selectable by the jumper **CN4**, 20kHz when **CN4** is open and 5kHz when short. The high frequency PWM rate provides a smooth motor-speed control, and insures a quiet motor environment. As the name hybrid (**Hy**) implies, the required motor speed (or PWM pulse-duration) is derived from a variable analog-voltage ( $V_{I1,G}$ ), while the other control-signals are digital. This analog (**I1**) input is zener-diode protected. 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 1000W power levels. Higher power-levels (50V, 30A or 1500W) 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: DC Motor-Speed Controller, Light-Dimmer with variable delay, Power Amplifier, SPST Solid State Relay, etc.



### **Specification and Application for Si5HyUdMCDF1-50V-20A**

- **Typical Operating Temperature at 20A:** 45°C with the Metal Heat-Ring Bolted to a small (2.3"x2.4"x0.45") finned Aluminum Heat-Sink, while exposed to air at 25°C (as shown on photograph).
- **Source-Voltage Requirement ( $V_p$ , from pin +P to pin -P):** Any DC voltage from 9V to 50V, unregulated DC.
- **Average Load-Voltage:** Linearly variable from 0 to  $V_p$  in 0.833% steps, using  $V_{I1,G}$  as control input.
- **Max. Continuous Average Load-Current:** 20A at 100% duty-cycle, with heat-sink (as shown).
- **Max. Load-Current for 5sec:** 40A at 100% duty-cycle, with heat-sink (as shown).
- **Load Isolation:** The Load or Motor must be isolated from the source voltage ( $V_p$ ).
- **Power-Conversion Efficiency:** Approximately 97.5% at full-load (50V and 20A).
- **PWM Switching Frequency:** 5kHz when **CN4** short and 20kHz when **CN4** open.

