

Product Brief 5038, Rev A

## COBRA Series Programmable Multi-Channel Solid State Power Controllers



The *Cobra Series* of Programmable Multi-Channel Solid State Power Controllers (SSPC) are multi-channel, microcontroller based, Solid State Power Controller boards designed for 28VDC applications. Each channel of the Cobra series is software programmable for rated current over up to 25A and can operate grouped with other channels to support large loads up to 150A of current. The Cobra is intended to be used where multiple Solid State Power Controller channels need to be co-located on the same card or in a power distribution box. These boards have integrated current sensing, temperature and voltage sensing with no derating over the full operating temperature range and communicate with the system controller over an RS-232, RS-422, and RS-485 or CAN serial bus.

### Features:

- Up to 6 channels can be grouped together
- Programmable from 1 Amp to 25 Amps
- Parallel channel capability up to 150 amps
- Trip disable and maintenance modes
- Power-up and continuous built-in test
- Non-volatile storage of parameters
- True  $I^2t$  and thermal memory protection
- Internally generated isolated supply
- High control circuit isolation
- Soft turn-on to reduce EMC issues
- Trip-free reset circuit
- Optically isolated input and outputs
- -55°C to 100°C operating temp range
- No heat sinking required

### Benefits:

Sensitron's SSPC technology and products combine functionalities of electro-mechanical breakers, solid state relays and system monitors and provide the following benefits to our customers:

- Electrical load protection and monitoring - current, voltage and temperature measurements
- Operational improvements by allowing for diagnostics, prognostics and condition-based maintenance
- Life cycle cost savings and reduced cost of ownership
- Increased radius of operation through power budgeting and load shedding
- Crew offloading and network-controlled intelligent load management

### Application Areas:

Sensitron's SSPC products are ideal for use in Power Management applications in the following markets:

- Military Ground Vehicles
- Unmanned Aerial Vehicles
- Marine Vessels
- Test & Industrial Equipment
- Communication and Command Centers
- Energy Exploration Equipment
- Off Highway and Heavy Duty Vehicles
- Medical Emergency Vehicles

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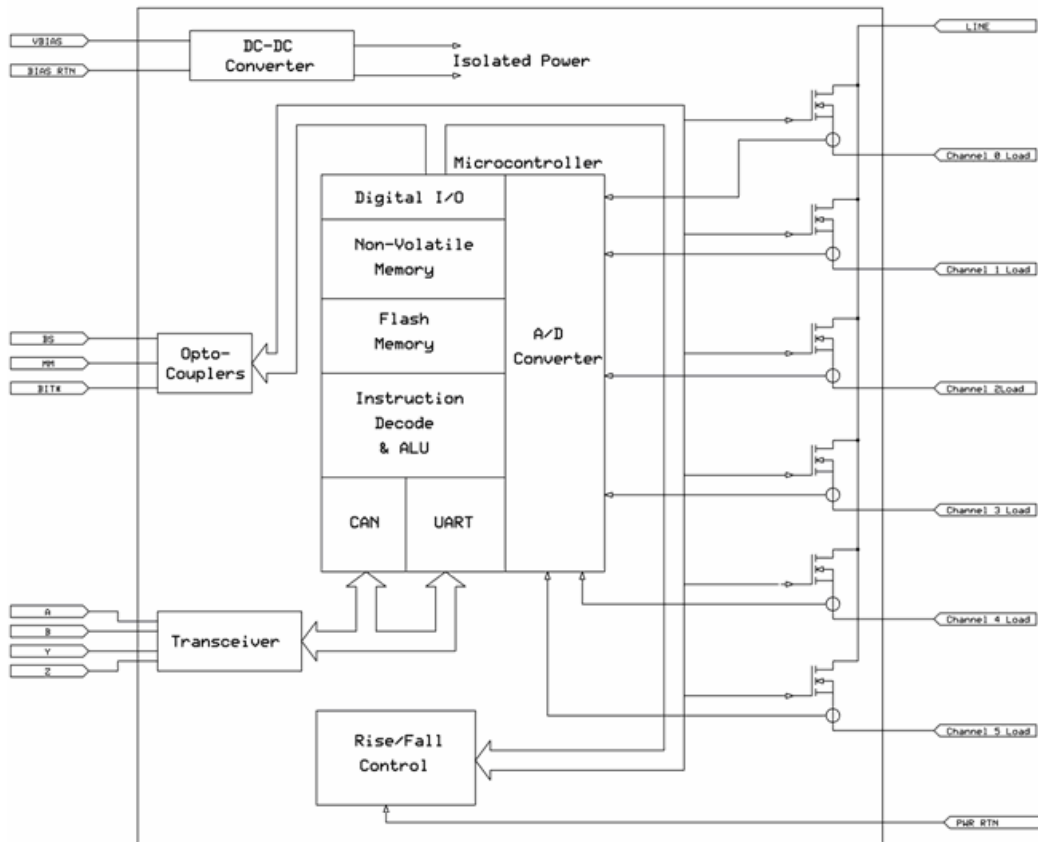


Figure 1 – Block Diagram

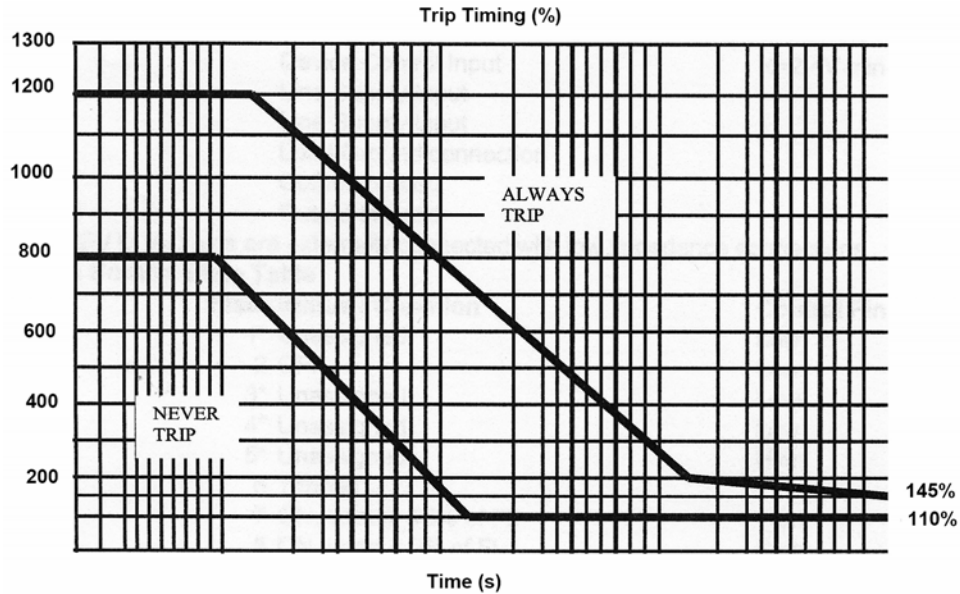
**I/O DEFINITIONS**

Control & Status (TTL/CMOS Compatible)	
BIAS (Vcc)	5.0V DC Nominal, 7.0V DC Absolute Maximum 4.5V to 5.5 VDC
BIAS (Vcc) Current	105 mA typ 150 mA, max (RS-422/RS-485 Serial I/O)
BIT* Output	$V_{oh}=3.7V$ , min, at $I_{oh}=-20mA$ $V_{ol}=0.4V$ , max, at $I_{ol}=20mA$
<b>MAINTENANCE MODE</b> and <b>BATTLESHORT</b> Inputs $V_{T+}$ (Positive-going input threshold voltage) $V_{T-}$ (Negative-going input threshold voltage) $\Delta V_T$ Hysteresis ( $V_{T+} - V_{T-}$ )	2.0V, min, 3.5V, max 1.2V, min, 2.3V, max 0.6V, min, 1.4V, max

Power	
Input Voltage – Continuous – Transient	0 to 40V DC, 50V DC Absolute Maximum +600V or –600V Spike ( $\leq 10 \mu S$ )
Power Dissipation – Single Channel <sup>1</sup>	< 0.68W typ @ 15A @ 25°C < 2.25W max @ 25A @ 25°C
Power Dissipation – Six Channels <sup>1</sup> (Each channel at indicated current)	< 4.5W typ @ 15A @ 25°C < 15.0W max @ 25A @ 25°C
Output Rise Time (turn-on)	760 $\mu$ sec typ, 500 $\mu$ sec, min.
Output Fall Time under normal turn-off	160 $\mu$ sec typ, 100 $\mu$ sec, min.
Output Fall Time under Fault	75 $\mu$ sec typ
Min Load Requirement	Nil

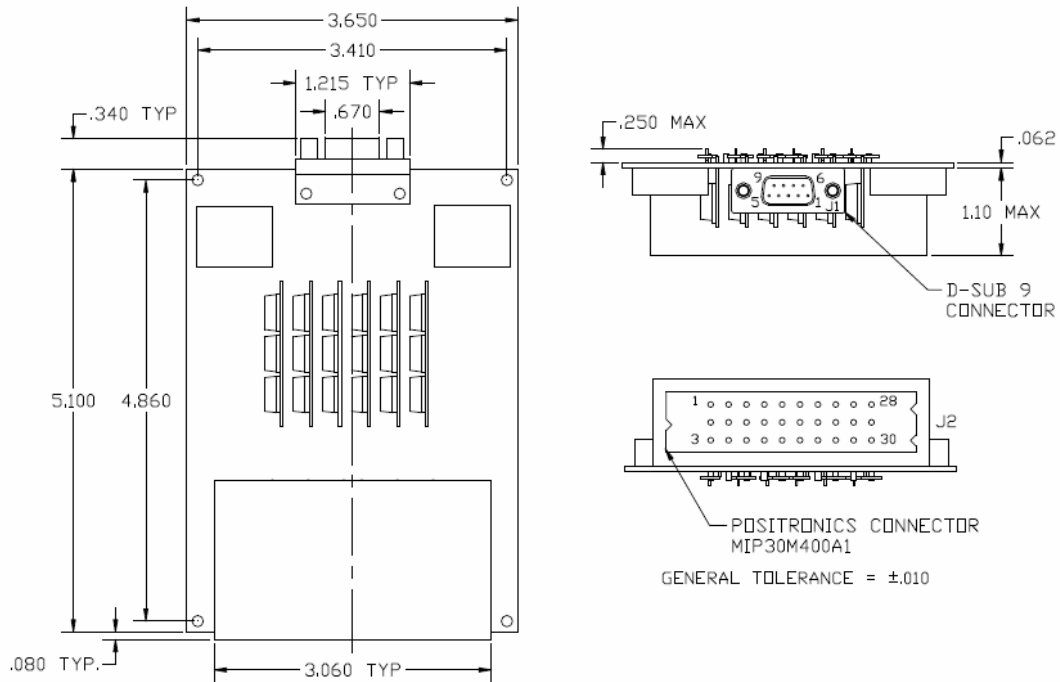
Table 1- Electrical Characteristics

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**Figure 2 – Trip Times**

The Cobra Series board measures current for each individual channel and calculates I<sup>2</sup>t and Instant Trip. If the trip condition is met, the channel turns off 28VDC rails from the load. This condition is stored on the board and can be queried by the Power Management Computer (PMC) via the communications interface.



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**SUPPORT**

Sensitron's Graphical User Interface provides a quick way to interact with the Diamondback board. This PC- based program is designed for lab use and enables the user to evaluate the board. The GUI sends the commands to the board to perform tasks such as channel turn on/off, measurement readings, channel paralleling, etc.

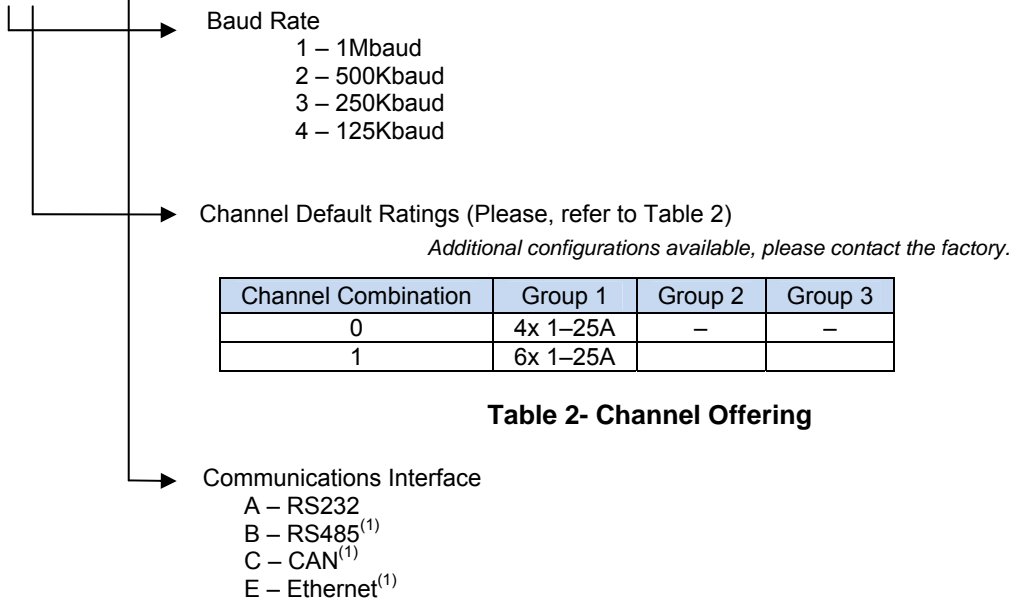
*Please contact the factory to obtain a copy of this program.*

**COMPLIANT DOCUMENTS & STANDARDS**

MIL-STD-1275D                      Characteristics of 28 Volt DC Electrical Systems in Military Vehicles  
MIL-STD-704F                      Aircraft Electrical Power Characteristics  
MIL-STD-217F, Notice 2        Reliability Prediction of Electronic Equipment

**PART NUMBERING ORDERING :**

**SPDMxxD28x**



*Note 1: Call factory for availability.*

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