

## DESCRIPTION

The EPM-110 is a switching device that provides control for applying power to the load, while providing overcurrent and short-circuit protection for the load wiring.

SIZE: 91 x 91 x 23 mm  
WEIGHT: 150 grams MAX

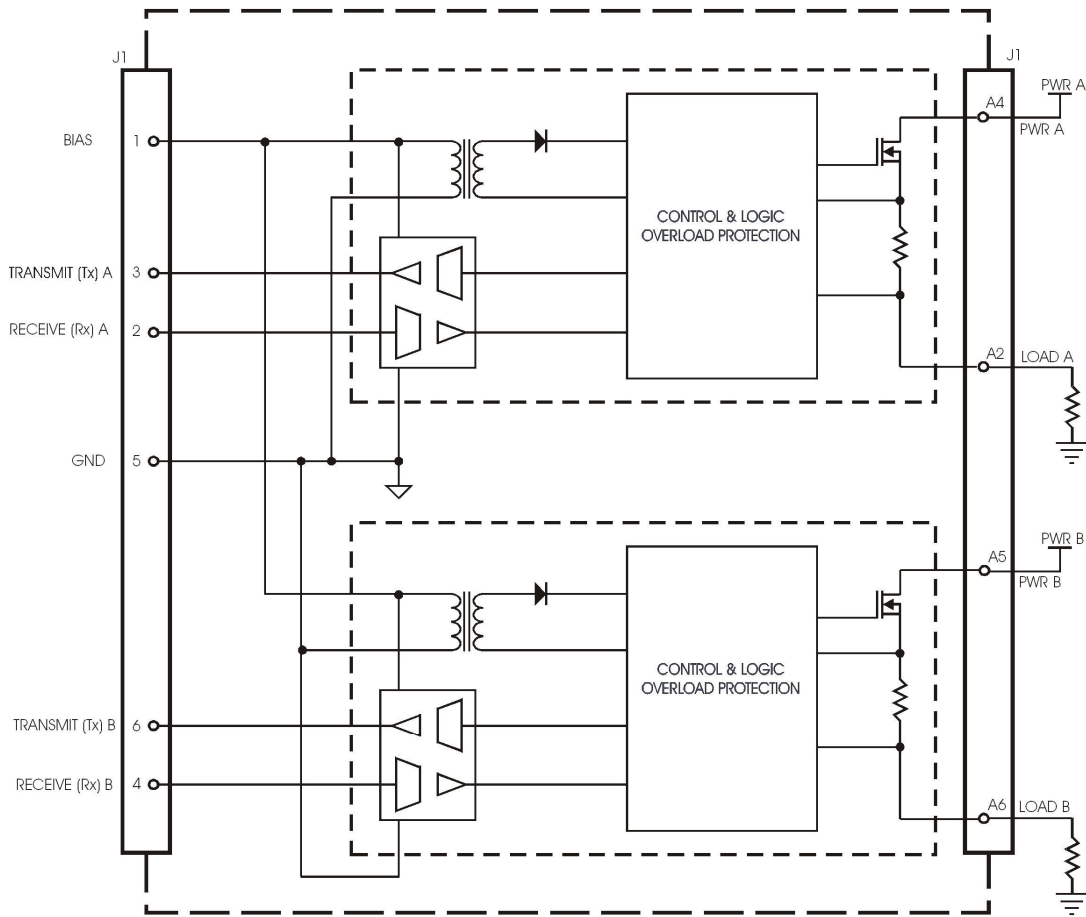
## FEATURES

- 2 channel rated at 40 Amps to 85°C
- Power up and continuous BIT
- Serial data bus interface
- Programmable ratings (25%, 50%, and 75% of the rated value) and trip parameters
- Bounce free switching
- Fast acting
- Low voltage drop and power dissipation
- Software-based design for added configuration
- High voltage isolation
- No derating for lamp, motor and inductive loads

## APPLICATION CHARACTERISTICS

- Serial control and monitoring capability
- Replaces electro-mechanical relay
- Continuous BIT
- Load status reporting
- Bounce free
- Long life, high reliability
- Trip on overloads
- Programmable ratings

### BLOCK DIAGRAM



### ENVIRONMENTAL DATA

| Parameter               | Symbol          | Min.             | Max. | Unit  | Notes |
|-------------------------|-----------------|------------------|------|-------|-------|
| Operational Temp. Range | T <sub>OP</sub> | -40              | +75  | °C    | 1     |
| Storage Temp. Range     | T <sub>ST</sub> | -55              | +125 | °C    | 1     |
| Vibration               |                 | 20 g, 20-2000 Hz |      |       | 2     |
| Acceleration            |                 | 500 g            |      |       | 3     |
| Shock                   |                 | 500 g, 0.5 ms    |      |       | 4     |
| MTBF                    |                 | 80,000           |      | hr/CH | 5     |

#### NOTES

1. See Thermal Derating Curve
2. MIL-STD-883, Method 2007, Test Condition A.
3. MIL-STD-883, Method 2001, Test Condition A.
4. MIL-STD-883, Method 2002, Test Condition B.
5. Per Channel

### ELECTRICAL CHARACTERISTICS

| Parameter                       | Symbol     | Conditions                                  | Limits         |      | Unit          | Notes  |
|---------------------------------|------------|---|----------------|------|---------------|--------|
|                                 |            |   | Min.           | Max  |               |        |
| <b>INPUT SPECIFICATIONS</b>     |            |   |                |      |               |        |
| BIAS ON voltage                 | $V_{ib}$   |   | 4.5            | 5.5  | V             | (1, 2) |
| BIAS ON current                 | $I_{ib}$   |   | -              | 75   | mA            | (3)    |
| RECEIVE voltage high            | $V_{ihr}$  |   | 2.4            | -    | V             |        |
| RECEIVE voltage low             | $V_{ilir}$ |   | -              | 0.8  | V             |        |
| RECEIVE current high            | $I_{ihr}$  | $V_{ihr} = 2.4\text{ V}$                    | -              | 50   | $\mu\text{A}$ |        |
| RECEIVE current low             | $I_{ilir}$ | $V_{ilir} = 0.4\text{ V}$                   | -              | -10  | $\mu\text{A}$ |        |
| Transient voltage               | $V_t$      | Pulse width = 12.5 msec<br>max. per DO-160D | -              | +50  | V             | (4)    |
| Spikes                          | $V_s$      | Pulse width = 10 msec<br>max. per DO-160D   | -600           | +600 | V             | (4)    |
| <b>OUTPUT SPECIFICATIONS</b>    |            |   |                |      |               |        |
| Load Current                    | $I_l$      |   | 0              | 100  | %rated<br>I   | (5)    |
| ON state voltage drop           | $V_{id}$   |   | -              | 200  | mV            | (6)    |
| OFF state line voltage          | $V_i$      |   | -              | 70   | V             | (7)    |
| Leakage current                 | $I_{li}$   |   | -              | 1    | mA            | (8)    |
| Maximum let through current     | $I_{tr}$   |   | 110            | 135  | %rated<br>I   |        |
| Dielectric withstanding voltage | $V_{dw}$   |   | -              | 500  | $V_{RMS}$     | (9)    |
| Insulation resistance           | $R_{ins}$  |   | 100            |      | $M_{ohm}$     | (10)   |
| TRANSMIT voltage high           | $V_{oht}$  | $I_{ot} = -4\text{ mA}$                     | $V_{ib} * 0.8$ |      | V             |        |
| TRANSMIT voltage low            | $V_{olt}$  | $I_{ot} = 4\text{ mA}$                      |                | 0.8  | V             |        |
| TRANSMIT voltage rise time      | $T_{ort}$  | CL = 15 pf                                  |                | 3    | ns            |        |
| TRANSMIT voltage fall time      | $T_{oft}$  | CL = 15 pf                                  |                | 3    | ns            |        |

#### NOTES

- BIAS voltage must be a step function.
- No reverse polarity protection.
- BIAS voltage is +5.0Vdc.
- The requirement apply only to the 28Vdc power line.
- Load current is subject to thermal derating.
- At load current  $I_l = 100\%$  rated value.
- Reverse polarity is not blocked and may damage the SSPC.
- At  $V_i = 28\text{Vdc}$ , case temperature =  $100^\circ\text{C}$ .
- 60 Hz, electrification time 10s, tested between each isolated section in turn groups (1,2 and 3), at sea level, ambient temperature, with the other two isolated sections shorted together.
- 500Vdc,  $\pm 10$ .

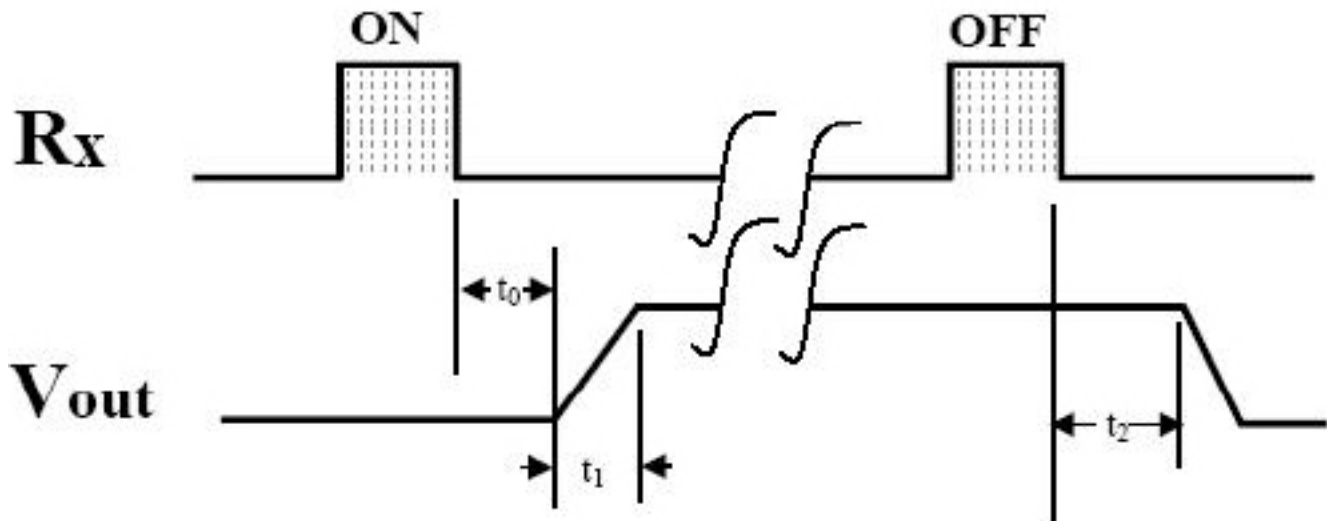
## ELECTRICAL CHARACTERISTICS

| TIMING                   |        |     |      |                 |       |
|--------------------------|--------|-----|------|-----------------|-------|
| Parameter                | Symbol | TYP | Max. | Units           | Notes |
| RECEIVE to ON delay      | $t_0$  | 500 | 2000 | $\mu\text{sec}$ |       |
| Output voltage rise time | $t_1$  | 50  | 500  | $\mu\text{sec}$ | 1     |
| RECEIVE to OFF delay     | $t_2$  | 500 | 2000 | $\mu\text{sec}$ | 2     |

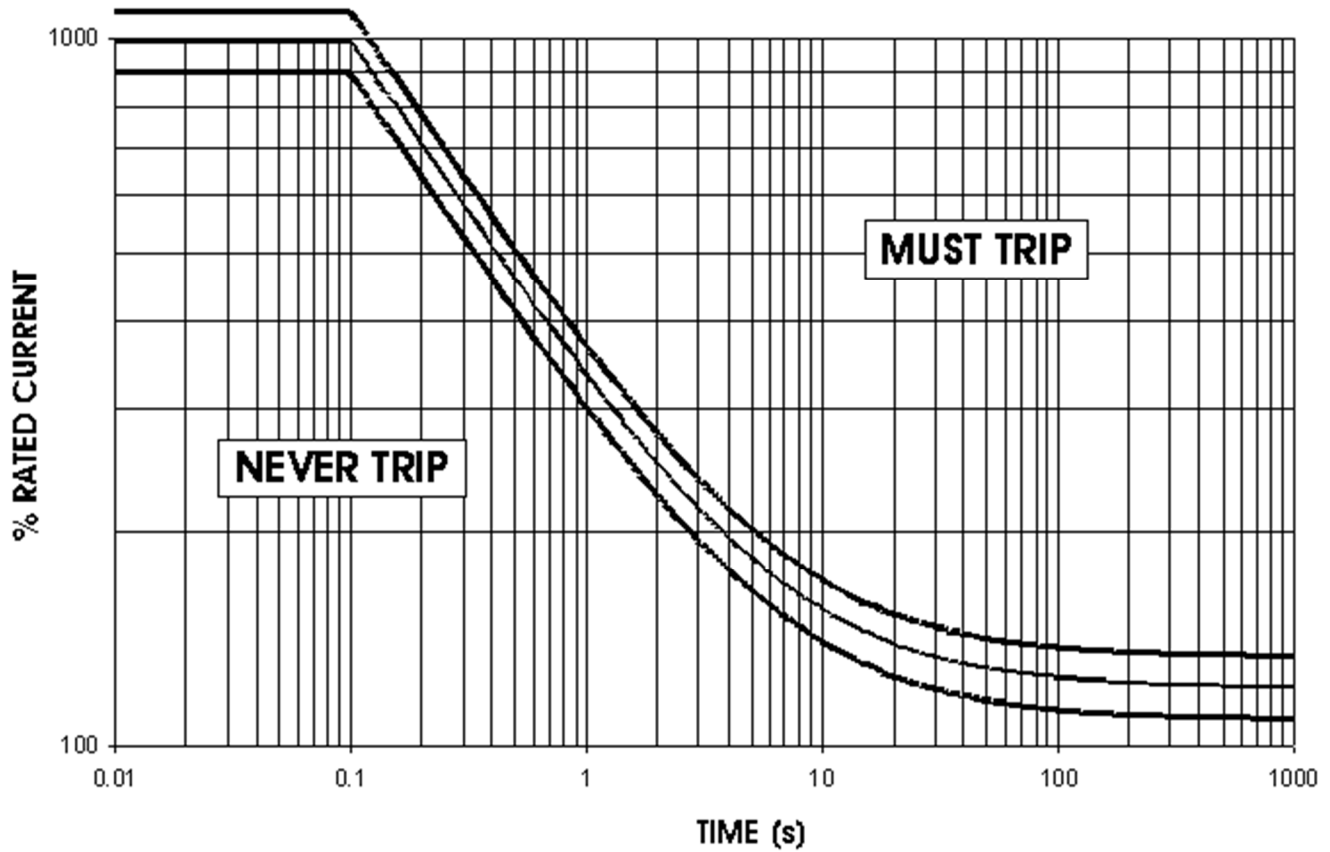
### NOTES

1. Timing measurements taken at 10% and 90% points into resistive rated load
2. Delay time from trip dependant on overload condition.

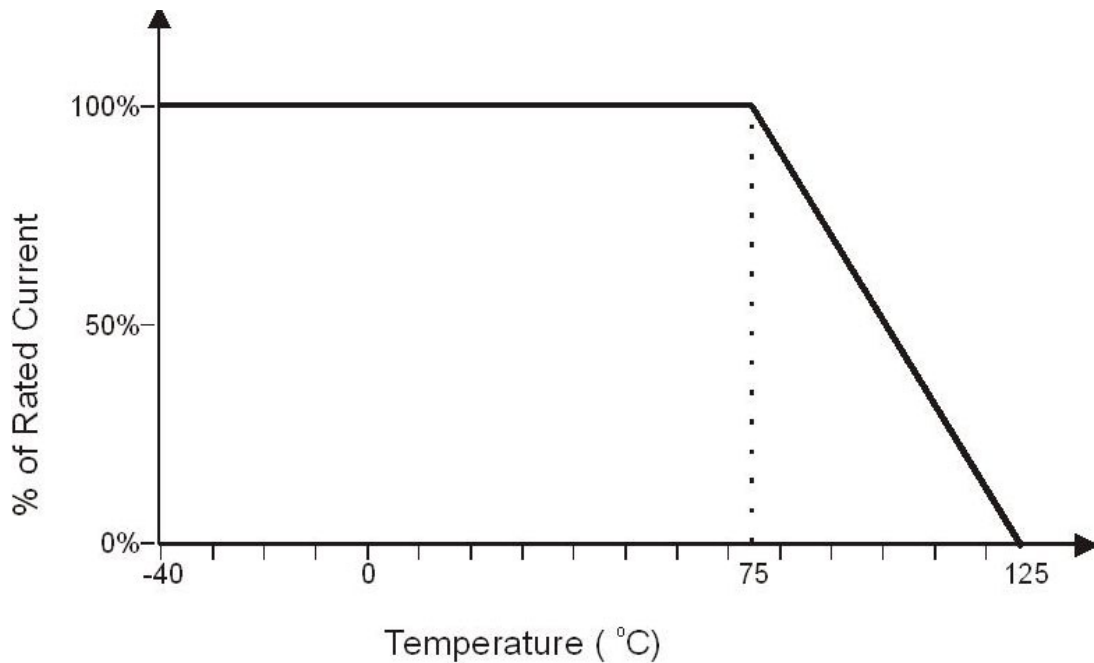
## TIMING DIAGRAM



### TRIP CHARACTERISTIC



### THERMAL DERATING



## PHYSICAL DATA (in mm)

