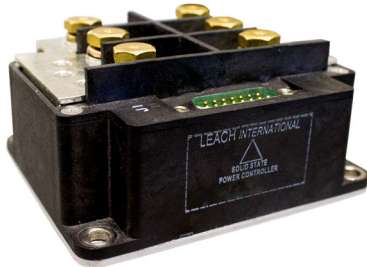


## DESCRIPTION



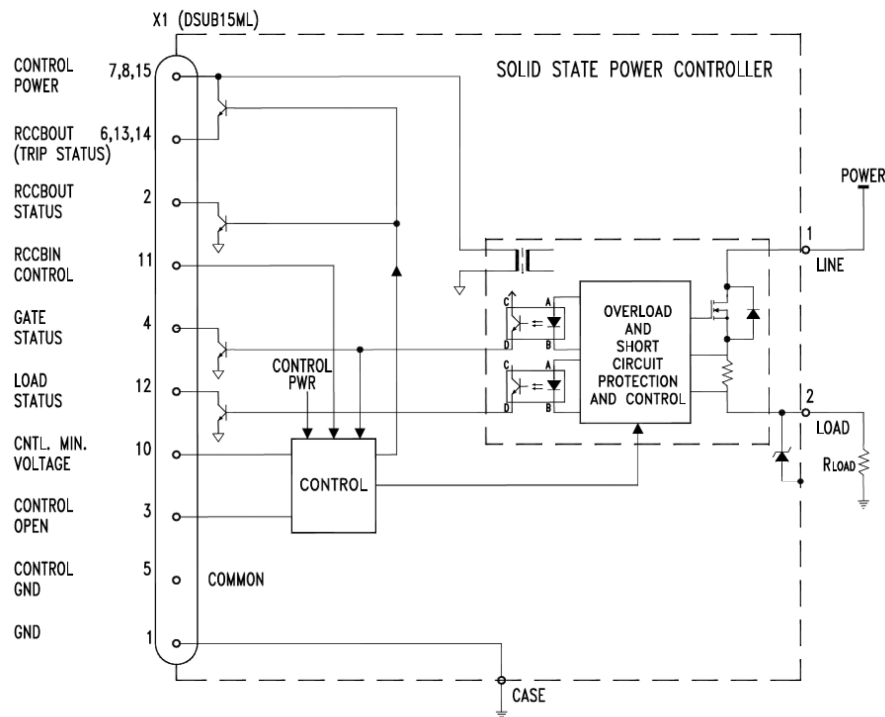
The P800 device specified herein is a solid state power controller offering combined switching, protection and status reporting features. The status signals are implemented using opto-isolators to give galvanic isolation between the controlling and power circuits. Internal power supplies are derived from a DC/DC converter fed by the CONTROL POWER input, also maintaining galvanic isolation. The protection afforded by these devices is detailed on page 8: Trip Curve. When the load current exceeds this envelope the device will trip, resulting in removing line voltage from the load. The status of the load current and output power FET Gate are reported by discrete status output lines. Timing characteristics of the device are represented on page 8 and page 5: Timing diagram.

SIZE: 80 x 96 x 45 mm  
WEIGHT: MAX 500g

## FEATURES

- Power FET output
- Low voltage drop
- Built-in overload and short circuit protection
- Trip-free characteristics
- Load status indicator
- Trip indicator
- Optically isolated (500 Vrms)
- MTBF = 62,000
- Full rated current up to 90° C
- Fast response

## BLOCK DIAGRAM



### ELECTRICAL CHARACTERISTICS

| INPUT PARAMETER                 |                   |      |      |      |       |
|---------------------------------|-------------------|------|------|------|-------|
| Parameter                       | Symbol            | Min. | Max. | Unit | Notes |
| Control Power (On)              | V <sub>IHC</sub>  | 16.0 | 33.5 | V    |       |
| Control Power (Off)             | V <sub>ILC</sub>  | 0    | 5.0  | V    |       |
| Control GND Current (On)        | I <sub>IHC</sub>  |      | 25   | mA   | 1     |
| Control Power (Trip) Current    | I <sub>TRIP</sub> |      | 11   | A    | 2     |
| Control Minimum Voltage (On)    | V <sub>IHS</sub>  | 0    | 17   | V    | 3     |
| Control Minimum Voltage (Off)   | V <sub>ILS</sub>  | 23   | 33.5 | V    | 4     |
| Control Minimum Voltage Current | I <sub>IHS</sub>  |      | 0.5  | mA   |       |
| Control Open (On)               | R <sub>IHS</sub>  | 15   |      | k Ω  |       |
| Control Open (Off)              | R <sub>IHS</sub>  |      | 5    | k Ω  |       |
| Control Open Current            | I <sub>ILS</sub>  | 0.5  |      | mA   |       |
| Control Open Blocking Voltage   | V <sub>B</sub>    | 15   |      | V    | 4     |
| RCCBIN (On)                     | R <sub>IHR</sub>  |      | 5    | k Ω  |       |
| RCCBIN (Off)                    | R <sub>ILR</sub>  | 15   |      | k Ω  |       |
| RCCBIN Current                  | I <sub>ILR</sub>  |      | 15   | mA   |       |
| RCCBIN Blocking voltage         | V <sub>BR</sub>   | 33.5 |      | V    | 4     |

#### NOTES

1. Current measured at ambient.
2. When RCCB is being driven I<sub>TRIP</sub> = 11 A max.
3. Control minimum voltage has a hysteresis of 1 V min.
4. Driver must be able to withstand this voltage.

## INPUT SIGNAL TRUTH TABLE

|    | RCCBIN Control | CONTROL POWER | CONT.MIN. VOLTAGE | CONT. OPEN | Solid State Power Controller |
|----|----------------|---------------|-------------------|------------|------------------------------|
| 1  | OPEN           | 0 V           | < 17 V            | GND        | OPEN                         |
| 2  | OPEN           | 0 V           | < 17 V            | OPEN       | OPEN                         |
| 3  | OPEN           | 0 V           | > 23 V            | GND        | OPEN                         |
| 4  | OPEN           | 0 V           | > 23 V            | OPEN       | OPEN                         |
| 5  | OPEN           | 28 V          | < 17 V            | GND        | OPEN                         |
| 6  | OPEN           | 28 V          | < 17 V            | OPEN       | OPEN                         |
| 7  | OPEN           | 28 V          | > 23 V            | GND        | OPEN                         |
| 8  | OPEN           | 28 V          | > 23 V            | OPEN       | OPEN                         |
| 9  | GND            | 0 V           | < 17 V            | GND        | OPEN                         |
| 10 | GND            | 0 V           | < 17 V            | OPEN       | OPEN                         |
| 11 | GND            | 0 V           | > 23 V            | GND        | OPEN                         |
| 12 | GND            | 0 V           | > 23 V            | OPEN       | OPEN                         |
| 13 | GND            | 28 V          | < 17 V            | GND        | OPEN                         |
| 14 | GND            | 28 V          | < 17 V            | OPEN       | CLOSED [1]                   |
| 15 | GND            | 28 V          | > 23 V            | GND        | OPEN                         |
| 16 | GND            | 28 V          | > 23 V            | OPEN       | OPEN                         |

### NOTES

1. SSPC will be closed if not tripped.

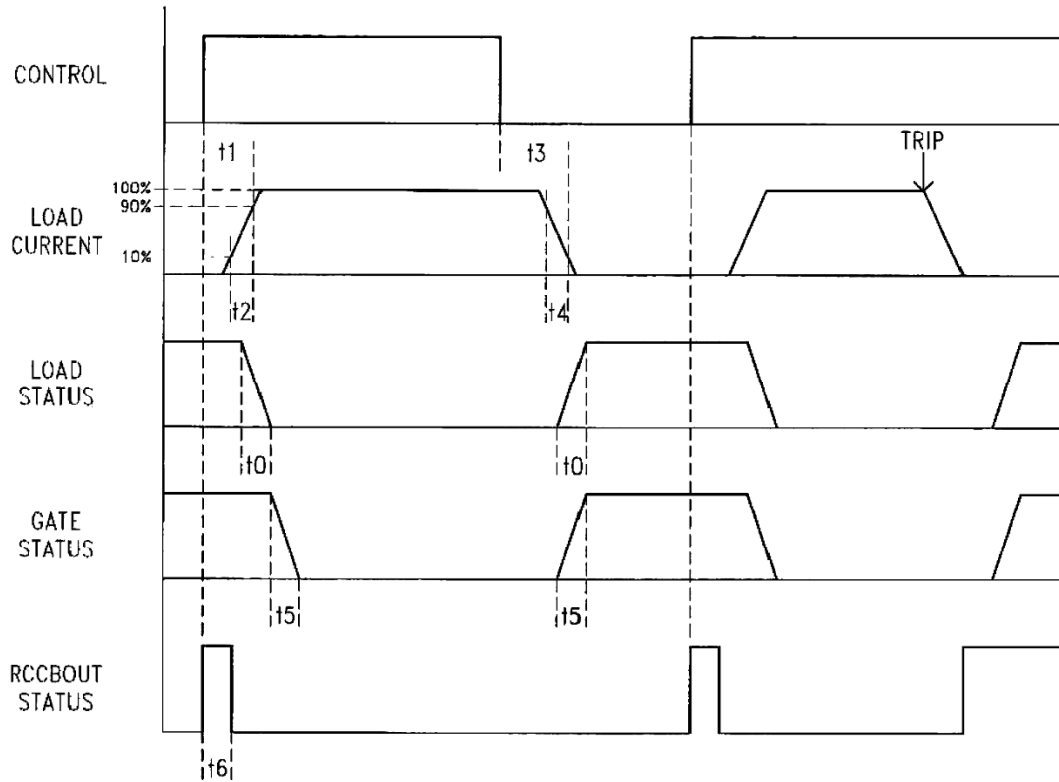
## ELECTRICAL CHARACTERISTICS

| OUTPUT PARAMETERS             |            |      |      |               |       |
|-------------------------------|------------|------|------|---------------|-------|
| Parameter                     | Symbol     | Min. | Max. | Unit          | Notes |
| Load current                  | $I_L$      | 0    | 150  | A             | 1, 8  |
| On State Voltage Drop         | $V_{LD}$   |      | 300  | mV            | 2     |
| Off State Line Voltage        | $V_L$      |      | 33.5 | V             | 3     |
| Leakage Current               | $I_{LL}$   |      | 20   | mA            | 4     |
| Trip Current                  | $I_T$      | 104  | 120  | %             | 5     |
| Gate Status High Impedance    | $R_{OHS}$  | 1    |      | M $\Omega$    | 7     |
| Gate Status Low Impedance     | $R_{OLS}$  |      | 1.5  | k $\Omega$    | 7     |
| Load Status High Impedance    | $R_{OHS}$  | 1    |      | M $\Omega$    | 7     |
| Load Status Low Impedance     | $R_{OLL}$  |      | 1.5  | k $\Omega$    |       |
| Load Status Pickup            |            |      | 15   | % $I_{rated}$ |       |
| Load Status Dropout           |            | 5    |      | % $I_{rated}$ |       |
| RCCBOUT Voltage High          |            | 33.5 | V    |               |       |
| RCCBOUT Impedance             |            | 2    | 4    | $\Omega$      | 6     |
| RCCBOUT Status Low Impedance  | $R_{OSLS}$ |      | 1.5  | k $\Omega$    | 7     |
| RCCBOUT Status High Impedance | $R_{OSHS}$ | 1    |      | M $\Omega$    | 7     |

### NOTES

1. Load current is subject to thermal derating.
2. Load current is 100% rated current.
3. Reverse polarity is not blocked and may damage the SSPC.
4. At  $V_L = 28^\circ\text{C}$ , case temperature =  $70^\circ\text{C}$ .
5. Refer to trip characteristics.
6. RCCBOUT current sourced on device trip, compatible with 0,5 Amp circuit breaker type MS 22073.
7. Open collector type output. Maximum blocking voltage is 75V.
8. 150 A is 100% rated load, for the existing device. Variants 75 amps and 220 amps are also available.

### TIMING DIAGRAM



### STATUS CONDITIONS

| State | Control [1] | Gate-Status | Load-Status | RCCBOUT | RCCBOUT-Status | Condition  |
|-------|-------------|-------------|-------------|---------|----------------|------------|
| 1     | Off         | Low         | Low         | Low     | High           | Error      |
| 2     | Off         | Low         | High        | Low     | High           | Error      |
| 3     | Off         | High        | Low         | Low     | High           | Error      |
| 4     | Off         | High        | High        | Low     | High           | Normal Off |
| 5     | On          | Low         | Low         | Low     | High           | Normal On  |
| 6     | On          | Low         | High        | Low     | High           | No load    |
| 7     | On          | High        | Low         | Low     | High           | Error      |
| 8     | On          | High        | High        | High    | Low            | Tripped    |

#### NOTES

1. The column "CONTROL" in the above table represents the combined effect on the device of the three controlling signals RCCBIN, CONTROL, CONTROL OPEN and CONTROL MINIMUM VOLTAGE. All three signals must be in the ON condition to turn the device ON. Any one signal in the OFF condition will turn the device OFF.

## EMIC CHARACTERISTICS

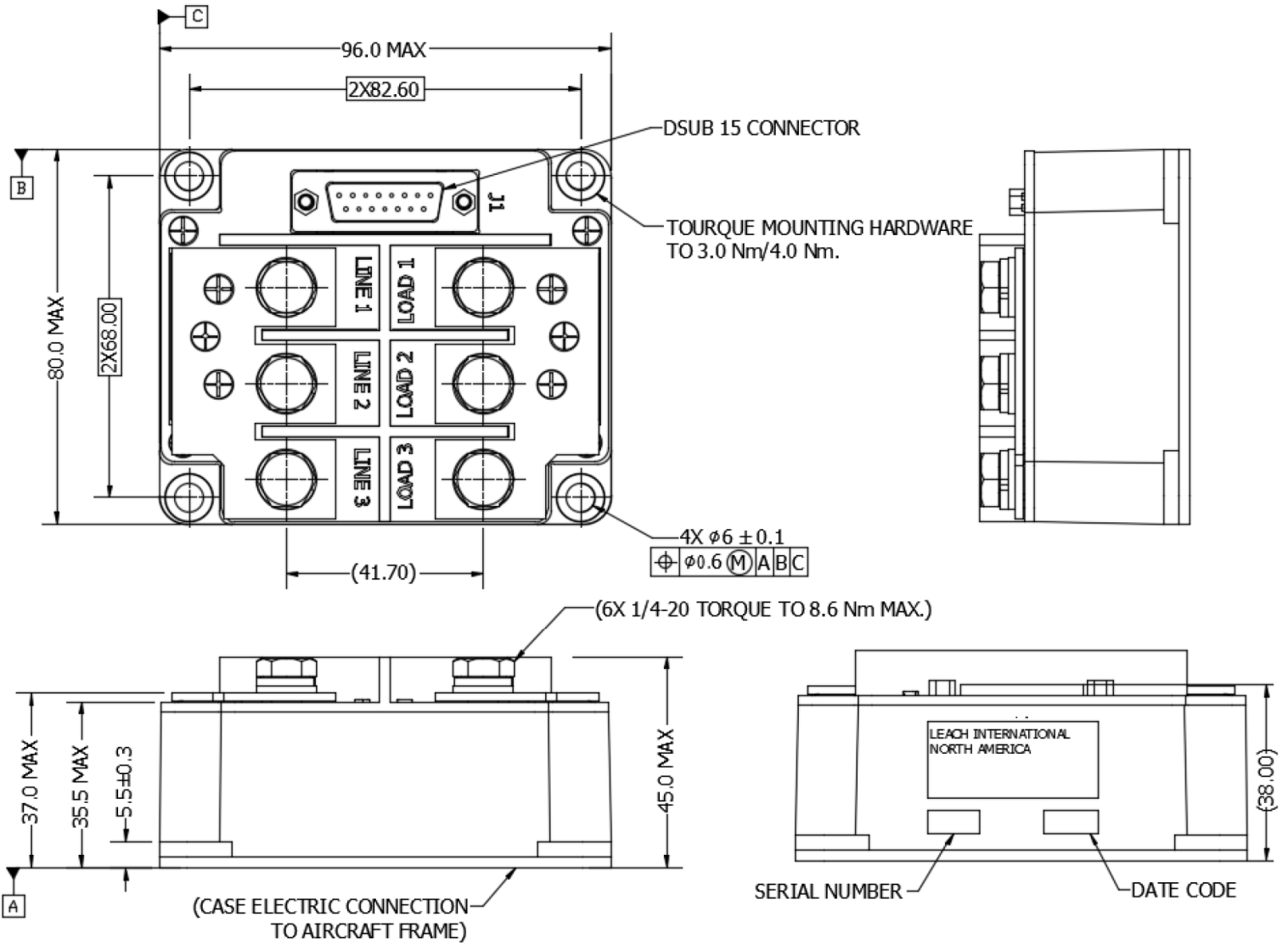
The device will meet the following EMIC-requirements

|  |  |
|--|--|
| - Magnetic effect                          | per RTCA/DO-160C, section 15, category A |
| - Power inputs                             | per RTCA/DO-160C, section 16, category A |
| - Voltage spike                            | per RTCA/DO-160C, section 17, category A |
| - Audio Frequency Conducted Susceptibility | per RTCA/DO-160C, section 18, category Z |
| - Induced signal Susceptibility            | per RTCA/DO-160C, section 19, category A |
| - Radio Frequency Susceptibility,          | per RTCA/DO-160C, section 20, category W |
|  | HIRF: 10 KHz - 400 MHz: 100 V/m          |
|  | 400 MHz - 18 GHz: 150 V/m                |
| - Emission of Radio Frequency Energy       | per RTCA/DO-160C, section 21, category Z |
| - Lightning, PIN injection                 | per RTCA/DO-160D, section 22,            |
|  | Waveform 2                    300V/60A   |
|  | Waveform 3 (1MHz)        600V/24A        |
|  | Waveform 4                    300V/60A   |
|  | Waveform 5A                 300V/60A     |

## ENVIRONMENTAL CHARACTERISTICS

| Parameter               | Symbol   | Min.   | Max.    | Unit | Notes |
|-------------------------|--|--------|---------|------|-------|
| Operational temp. range | Case   | -40    | +90     | °C   |       |
| Storage temp. range     |  | -55    | +85     | °C   |       |
| Altitude                |  | -1,300 | +51,000 | ft   |       |
| Vibration               | per RTCA/DO-160C, Section 8, Category D          |        |         |      |       |
| Acceleration            | per MIL-STD-810, Method 513.4, Category Aircraft |        |         |      |       |
| Shock                   | per RTCA/DO-160C, Section 7, Category B          |        |         |      |       |
| Humidity                | per DO-160C, Section 6, Category B               |        |         |      |       |

## PHYSICAL DATA (in mm)



Housing Finish: Plastic  
 Base: Aluminum  
 Finish: Flat Black  
 Mass: 500 grams max

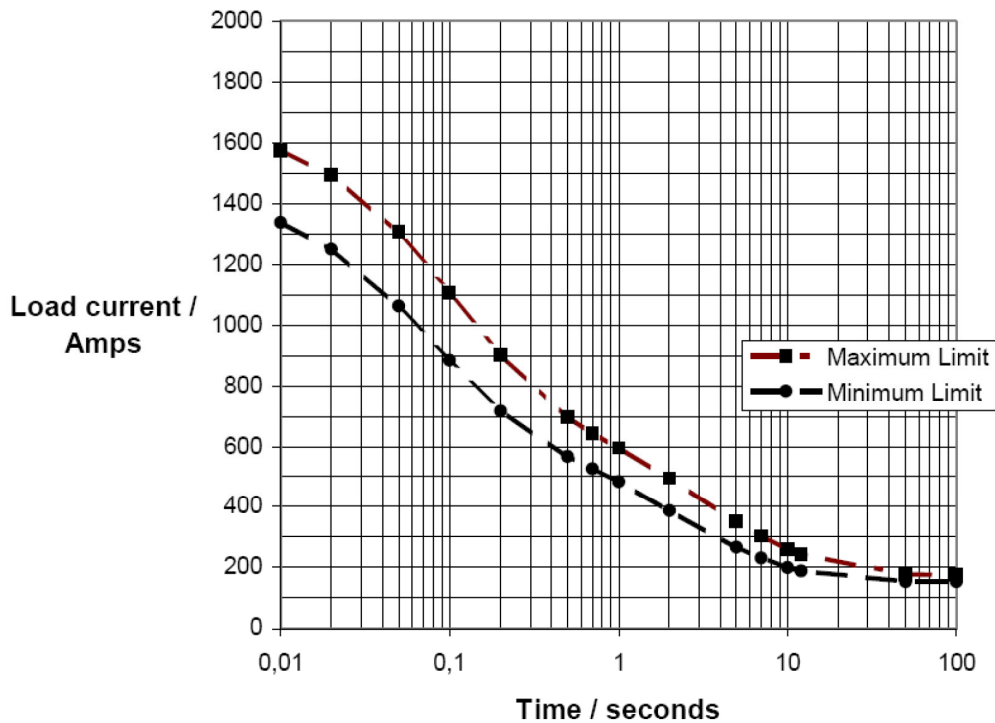
## TIMING

| Parameter                   | Symbol | Max. | Unit          | Notes |
|-----------------------------|--------|------|---------------|-------|
| STATUS Rise and Fall Time   | $t_0$  | 20   | $\mu\text{s}$ | 1     |
| Turn-on                     | $t_1$  | 5000 | $\mu\text{s}$ | 1     |
| Load Current Rise Time      | $t_2$  | 1000 | $\mu\text{s}$ | 1     |
| Turn off                    | $t_3$  | 5000 | $\mu\text{s}$ | 1     |
| Load Current Fall Time      | $t_4$  | 1000 | $\mu\text{s}$ | 1, 2  |
| BIT/TRIP Rise and Fall Time | $t_5$  | 20   | $\mu\text{s}$ | 1     |
| RCCBOUT Status              | $t_6$  | 600  | $\mu\text{s}$ | 1     |

## NOTES

1. All timing measurements taken at 10% and 90% points with a resistive rated load.
2. Load current fall time from trip event is dependant on overload condition.

## TRIP CHARACTERISTICS





### TRIP CHARACTERISTICS

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