# Amphenol SOCAPEX

# PS SERIES
# PSD28V1CEC
## 28V SWITCH MODULE

- **Short Circuit Current Limit Adjustable**
- **Overload Breaking Current Adjustable**
- **I2C Communication**
- **Discrete Operation Option**

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### *Electrical Specifications*

**DC Input**
Input: 0 to 50 $V_{DC}$

$V_{CC}$: 3 to 5.5 $V_{DC}$

Vcc Supply Current: 25mA Typical

**Control**
• I2C Communication see
• Open drain fault discrete signal
• On/Off discrete signal

**DC Output**
• Input-to-Output impedance: Less than 2.5 mΩ @ 25 °C
• Max load capacitance per channel: 3 mF

**EMC**
Complies with MIL-STD-461F (50µH LISN): RE102, CE102, CS101[1], CE101[1], CS114[1], CS115[1], CS116[1], RS103[1]

**Output**
• Overload Breaking Current Adjustable from 2A to 30 A according to I2T curve.
• Short Circuit Current Limit Adjustable from 10 A to 125 A according to SCL curve.

Note 1: Tested with full system

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### *Environmental [1]*
Design to Meet MIL-STD-810G

**Temperature**
Operating: –55°C to +125°C at ambient
Storage: –55°C to +125°C

**Fungus**
Does not support fungus growth, in accordance with the guidelines of MIL- STD-454, Requirement 4.

**Vibration[1]**
Figure 514.6E-1. General minimum integrity exposure. (1 hour per axis.)

**Altitude**
Method 500.5, Procedure I & II
Storage/Air Transport: 40 kft
Operation/Air carriage: 70 kft

**Humidity**
Method 507.5, Up to 95% RH

**Salt Fog:**
Method 509.5

**Shock[1]**
Method 516.6
40g, 11msec saw-tooth (all directions)

Note 1: Tested with full system

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### *Reliability*
2,529,861 hours, calculated IAW MIL-HDBK-217F Notice 2 at +85°C, Ground fixed conditions.
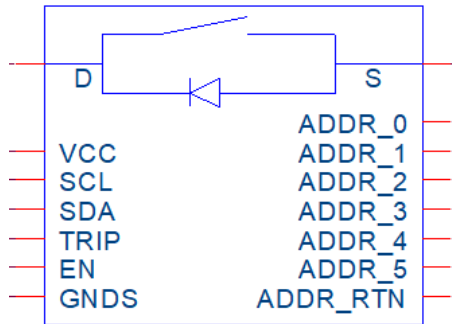
## Markets & Applications

Military, Ruggedized

Telecom, Industrial

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## Functions and Signals



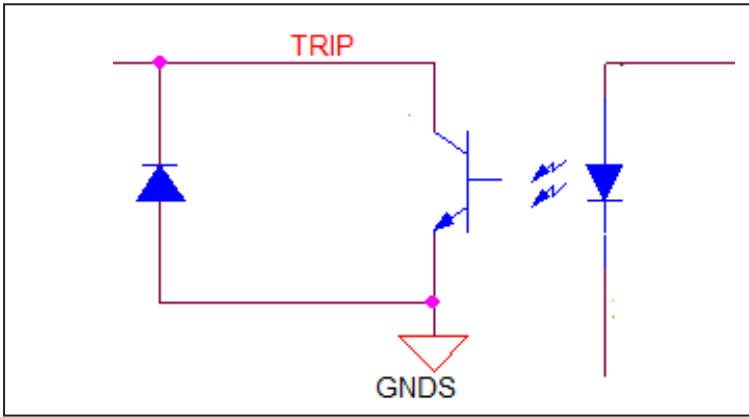| Signal Name | M9526-100 *Pinout* | Description |
|---|---|---|
| VCC | 1 | Control supply voltage with respect to GNDS. |
| SDA | 2 | I2C bus Data. |
| SCL | 3 | I2C bus Clock. |
| TRIP | 4 | Open drain fault discrete signal. See Figure 1. |
| EN | 5 | The Enable signal is used to turn the SWITCH BRICK ON and OFF. |
| ADDR_0 | 6 | Used for Slave Device Addressing . |
| ADDR_1 | 7 | Used for Slave Device Addressing . |
| ADDR_2 | 8 | Used for Slave Device Addressing. |
| ADDR_3 | 9 | Used for Slave Device Addressing. |
| ADDR_4 | 10 | Used for Slave Device Addressing . |
| ADDR_5 | 11 | Used for Slave Device Addressing. |
| ADD_RTN | 12 | Used for Slave Device Addressing. |
| GNDS | 14 | ground for I2C, TRIP, EN and VCC. |
| D | 15 | Drain for Power Path. For positive voltage switch it will be the input voltage side connection. |
| S | 16 | Source for Power Path. For positive voltage switch it will be the load side connection. |

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*Top View:*

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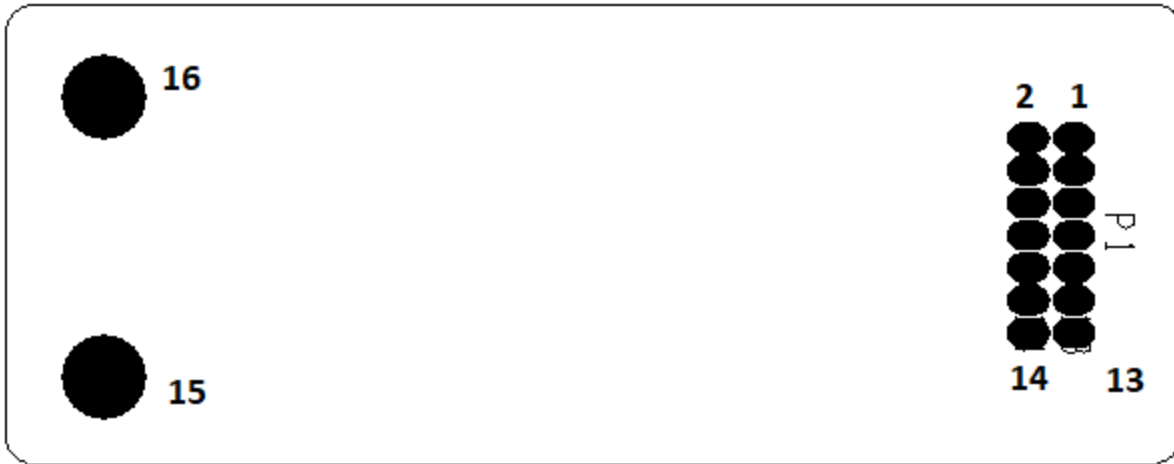
**Figure 1 – Trip stage**



1.   **Typical Tests Results**

2.   **Typical Characteristics**
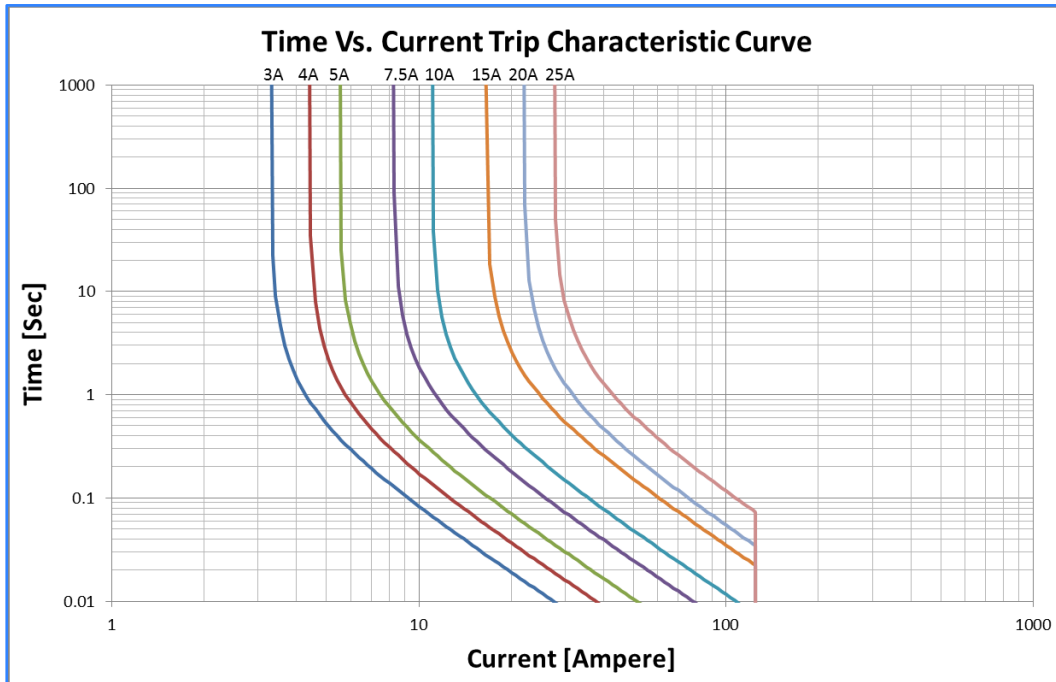


**Figure 2 - Time vs. Current Trip**

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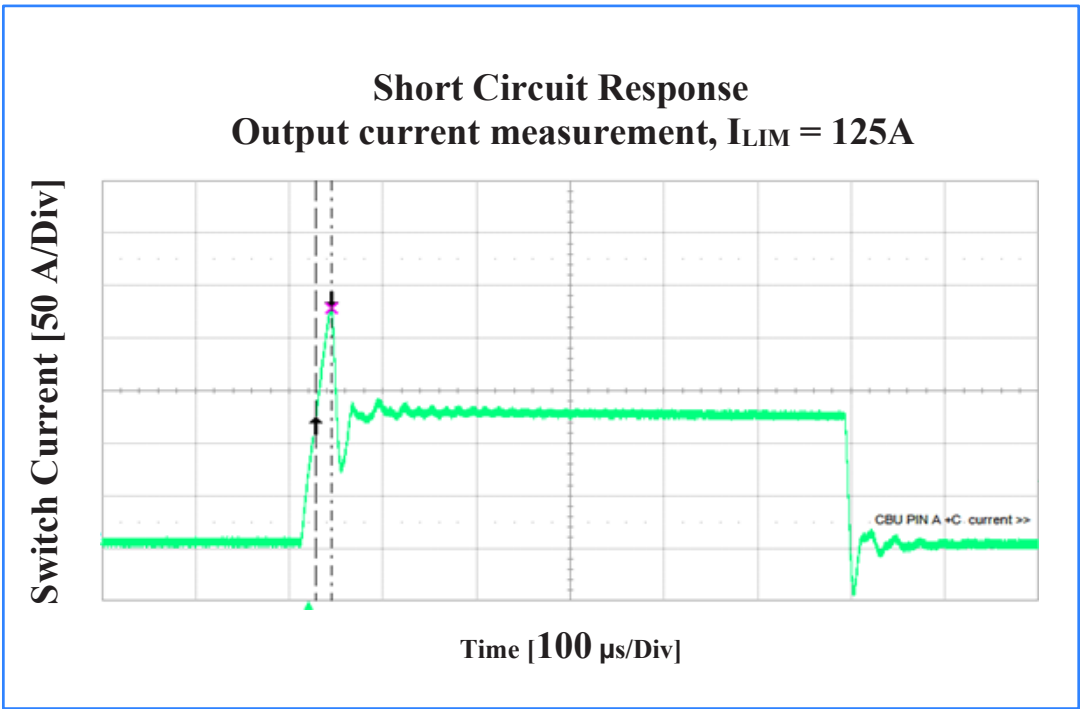**Figure 3 - Short Circuit Response**

## 1. I2C Protocol

Slave Address:

For 0 ≤ ADDR ≤ 7 -> ADDR + 0x70

For other Address = ADDR

Slave will be read as a memory device with one byte of internal address.
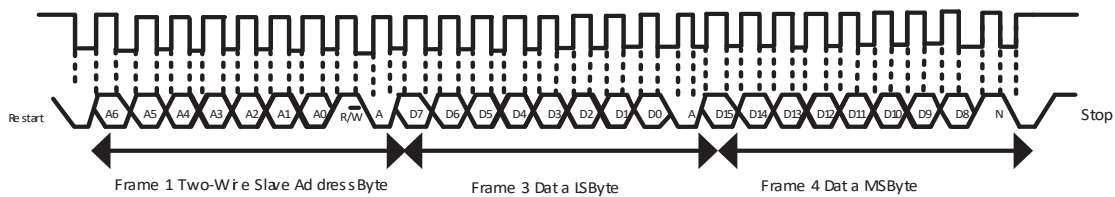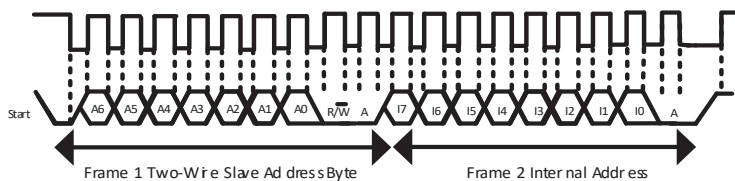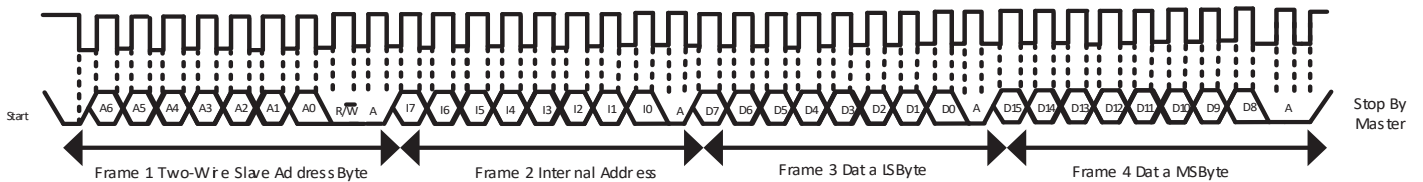
Byte order shall be little endian. For example, 01h address will be the LSB of VOUT1.

| Internal Address | Name | Function | R/W | Number of bytes | notes |
|---|---|---|---|---|---|
| 00h | STAT | Status Register | R | 1 | STAT[0] = Reset Flag (RST)<br>STAT[1] = Switch State ('1' = ON)<br>STAT[2] = Trip Status ( '1' = Fault)<br>STAT[3] = Short Status ('1' = Trip from short circuit)<br>STAT[4:7] = Reserved |
| 01h | OUTCURR | Load Current Measurement | R | 2 | LSB = 62.5mA |
| 03h | VOLTD | Voltage Drop Measurement | R | 2 | LSB = 62.5mV |
| 05h | TEMP | Temperature Measurement | R | 2 | LSB = 0.0625°C |
| 07h | I2TACC | $I^2$t Status | R | 3 | $I^2$t accumulator with respect to I2T_LIM |

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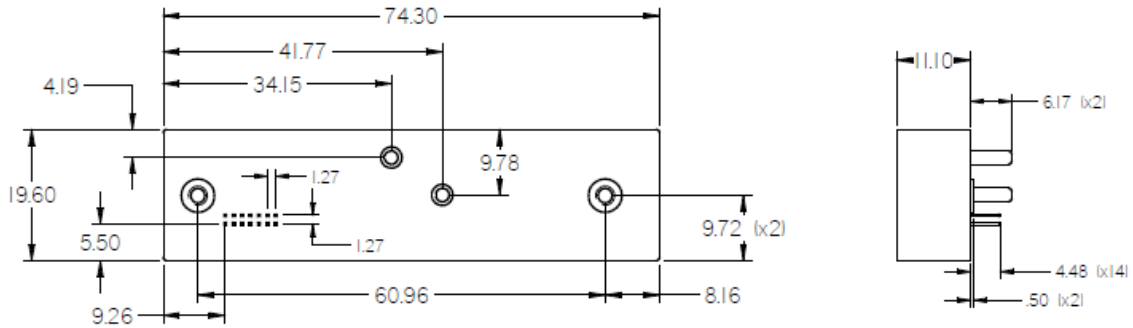| 0ah | CTRL | Control Register | RW | 1 | CTRL[0] = Switch Enable ('1' = En) <br> CTRL[1] = Trip Reset ('1' = Reset) <br> CTRL[2] = Reset Flag (RST , Reset value = '1') <br> CTRL[4:7] = Battle Mode (0xD = Battle Enable) |
|-----|------|------------------|-----|---|--------------------------------------------------|
| 0bh | OLCL | Overload Current Limit | RW | 2 | LSB = 62.5mA |
| 0dh | I2T_LIM | Maximal $I^2t$ Setting | WR | 3 | Thermal Constant(TC) is the trip time for twice of the overload current setting. <br> I2TACC can be set by following formula: <br> $I2TACC = (I_{OVERLOAD}*16)^2*TC*16$ <br> TC [s], $I_{OVERLOAD}$ [A] |
| 10h | SCCL | Short Circuit Current Limit | RW | 2 | LSB = 62.5mA |

## Timing Diagram



A[0:6] – Address
D[0:15] – Data
I[0:7] – Internal Address
A – ACK
N – NACK

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## Outline Drawing



## Notes

1. Dimensions are in mm
2. Weight: 32g
3. 3D model available

## Standard Configurations

| Part Number | Input | | Output | |
|---|---|---|---|---|
| | Input Voltage range | $V_{CC}$ | Voltage | Current |
| PSD28V1CEC | 0 to 50 $V_{DC}$ | 3 to 5.5 $V_{DC}$ | Following Input | Adjustable |

*Note: Specifications are subject to change without prior notice by the manufacturer.*

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