P R
B X

POWERBOX Industrial Line
PME08W Series
8W 4:1 Single and Dual Output
DC/DC Converter

**Features**

- No minimum load required
- 1600VDC input to output isolation
- Standard 1.25 x 0.80 x 0.40 inch 24 pin DIP and SMD package
- UL60950-1, EN60950-1 & IEC60950-1 safety approvals
- UL62368-1, EN62368-1 & IEC62368-1 safety approvals
- Compliance to EN50155 railway standard
- Compliance to EN45545-2 fire behavior

**Input**

| | | |
|---|---|---|
| Voltage range | 24Vin (nom) | 9-36VDC |
| | 48Vin (nom) | 18-75VDC |
| | 110Vin (nom) | 43-160VDC |
| Start-up voltage | 24Vin (nom) | 9VDC max |
| | 48Vin (nom) | 18VDC max |
| | 110Vin (nom) | 43VDC max |
| Shutdown voltage | 24Vin (nom) | 8VDC typ |
| | 48Vin (nom) | 16VDC typ |
| | 110Vin (nom) | 40VDC typ |
| Start up time | Power up | 450ms max |
| | Remote ON/OFF | 5ms max |
| | Constant resistive load | |
| Input surge voltage | 24Vin(nom) | 50VDC, 100ms max |
| | 48Vin(nom) | 100VDC, 100msmax |
| | 110Vin(nom) | 170VDC, 100ms max |
| Input filter | Pi type | |
| Remote ON/OFF | Positive logic | |
| | DC-DC ON | Open or 3~12VDC |
| | DC-DC OFF | Short or 0~1.2V |
| | Input current of Ctrl pin | ±0.5mA |
| | Remote off input current | 2.5mA typ |

**Output**

| | | | |
|---|---|---|---|
| Voltage accuracy | ±1.0% | | |
| Line regulation | LL to HL at full load | | ±0.2% |
| Load regulation | DIP type: | Single | ±0.5% |
| No load to full load | | Dual | ±1.0% |
| | SMD type: | Single | ±1.0% |
| | | Dual | ±1.0% |
| Load regulation | DIP type: | Single | ±0.3% |
| 10% load to 90% load | | Dual | ±0.8% |
| | SMD type: | Single | ±0.8% |
| | | Dual | ±0.8% |
| Cross regulation | Dual | | ±5.0% |
| | Asymmetrical load 25%/100% FL | | |
| Ripple and noise | 24Vin(nom) | | 50mV p-p |
| Measured by 20MHz BW | 48Vin(nom) | | 50mV p-p |
| | 110Vin(nom) | | 75mV p-p |
| Temperature coefficient | ±0.02%/°C | | |

| | | |
|---|---|---|
| Transient response | 25% load step change | 250μs |
| Over voltage protection | Single 3.3Vout | 3.9VDC typ |
| | 5.1Vout | 6.2VDC typ |
| | 12Vout | 15VDC typ |
| | 15Vout | 18VDC typ |
| Over load protection | 150% of Iout rated; hiccup mode | |
| Short circuit protection | Continuous, automatics recovery | |

**Environmental**

| | | |
|---|---|---|
| Operating ambient temp | Standard: –40°C to +105°C (with derating)<br>M3 version: –55°C to +105°C (with derating)<br>* Converter can meet the railway T2 and TX temperature requirement.<br>T2: –40°C to +70°C as all models<br>TX: –40°C to +85°C as power derating to 55% output power. | |
| Max case temperature | 105°C | |
| Storage temperature | –55°C to +125°C | |
| Thermal impedance | Natural convection | 20°C/W |
| Thermal shock | MIL-STD-810F | |
| Shock | EN61373, MIL-STD-810F | |
| Vibration | EN61373, MIL-STD-810F | |
| Relative humidity | 5-95% RH | |

**General**

| | | |
|---|---|---|
| Isolation voltage | DIP: Input to output, 1 min | 1600VDC min |
| | Input(output) to case | 1600VDC min |
| | SMD: Input to output, 1 min | 1600VDC min |
| | Input(output) to case | 1000VDC min |
| Isolation resistance | 500VDC | 1 GΩ min |
| Isolation capacitance | max. 1500pF | |
| Switching frequency | 300KHz typ | |
| Case material | Nickel-coated copper | |
| Base material | Non-conductive black plastic | |
| Potting material | Epoxy (UL 94 V-0) | |
| Weight | 18g | |
| MTBF | MIL-HDBK-217F | 2.832 x $10^6$ hrs |

**Standards**

| | | |
|---|---|---|
| Safety standards | UL60950-1, EN60950-1, IEC60950-1, EN62368-1 | |
| Fire behavior | EN45545-2 | |

**EMC**

| | | | |
|---|---|---|---|
| EMI | EN55032, EN55011 | With external components | Class A, Class B |
| ESD | EN61000-4-2 | Air ± 8kV and Contact ± 6kV | Perf. Criteria A |
| Radiated immunity | EN61000-4-3 | 20 V/m | Perf. Criteria A |
| Fast transient | EN61000-4-4 | ± 2kV | Perf. Criteria A |
| | 24Vin<br>48Vin | With an external input filter capacitor<br>(Nippon chemi-con KY series, 220µF/100V) | |
| | 110 Vin | With an external input filter capacitor<br>(Nippon chemi-con KXJ series, 150µF/200V) | |
| Surge | EN61000-4-5 | EN55024 ±2kV and EN50155 ±2kV | Perf. Criteria A |
| | 24Vin<br>48Vin | With an external input filter capacitor<br>(Nippon chemi-con KY series, 220µF/100V) | |
| | 110 Vin | With an external input filter capacitor<br>(Nippon chemi-con KXJ series, 150µF/200V) | |
| Conducted immunity | EN61000-4-6 | 10 Vr.m.s | Perf. Criteria A |
| Power frequency magnetic field | EN61000-4-8 | 100A/m continuous; 1000A/m 1 second | Perf. Criteria A |

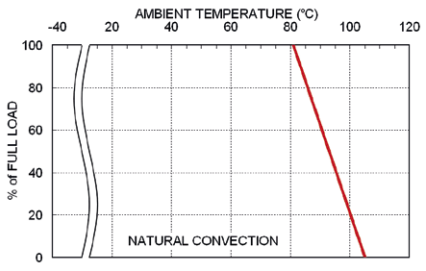
CAUTION: This power module is not internally fused. An input line fuse must always be used

| Model Number | Input Range | Output Voltage | Output Current @Full Load | Input Current @No Load | Efficiency | Max Capacitor Load |
|---|---|---|---|---|---|---|
| PME08-24S3P3W | 9 ~ 36 VDC | 3.3 VDC | 2400 mA | 40 mA | 85% | 1330 µF |
| PME08-24S05W | 9 ~ 36 VDC | 5 VDC | 1600 mA | 40 mA | 87% | 1330 µF |
| PME08-24S12W | 9 ~ 36 VDC | 12 VDC | 666 mA | 25 mA | 86% | 288 µF |
| PME08-24S15W | 9 ~ 36 VDC | 15 VDC | 533 mA | 25 mA | 86% | 200 µF |
| PME08-24D05W | 9 ~ 36 VDC | ±5 VDC | ±800 mA | 20 mA | 84% | ±900 µF |
| PME08-24D12W | 9 ~ 36 VDC | ±12 VDC | ±333 mA | 25 mA | 86% | ±133 µF |
| PME08-24D15W | 9 ~ 36 VDC | ±15 VDC | ±267 mA | 25 mA | 86% | ±90 µF |
| PME08-48S3P3W | 18 ~ 75 VDC | 3.3 VDC | 2400 mA | 20 mA | 85% | 1330 µF |
| PME08-48S05W | 18 ~ 75 VDC | 5 VDC | 1600 mA | 20 mA | 87% | 1330 µF |
| PME08-48S12W | 18 ~ 75 VDC | 12 VDC | 666 mA | 13 mA | 87% | 288 µF |
| PME08-48S15W | 18 ~ 75 VDC | 15 VDC | 533 mA | 13 mA | 88% | 200 µF |
| PME08-48D05W | 18 ~ 75 VDC | ±5 VDC | ±800 mA | 10 mA | 84% | ±900 µF |
| PME08-48D12W | 18 ~ 75 VDC | ±12 VDC | ±333 mA | 13 mA | 87% | ±133 µF |
| PME08-48D15W | 18 ~ 75 VDC | ±15 VDC | ±267 mA | 13 mA | 87% | ±90 µF |
| PME08-110S3P3W | 43 ~ 160 VDC | 3.3 VDC | 2400 mA | 8 mA | 84% | 1330 µF |
| PME08-110S05W | 43 ~ 160 VDC | 5 VDC | 1600 mA | 8 mA | 85% | 1330 µF |
| PME08-110S12W | 43 ~ 160 VDC | 12 VDC | 666 mA | 4 mA | 86% | 288 µF |
| PME08-110S15W | 43 ~ 160 VDC | 15 VDC | 533 mA | 4 mA | 86% | 200 µF |
| PME08-110D05W | 43 ~ 160 VDC | ±5 VDC | ±800 mA | 5 mA | 82% | ±900 µF |
| PME08-110D12W | 43 ~ 160 VDC | ±12 VDC | ±333 mA | 5 mA | 85% | ±133 µF |
| PME08-110D15W | 43 ~ 160 VDC | ±15 VDC | ±267 mA | 5 mA | 85% | ±90 µF |

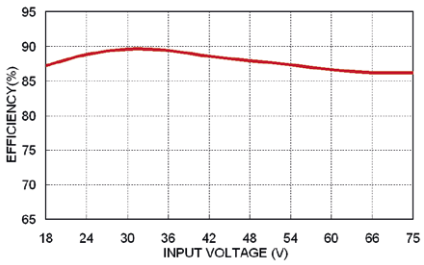
## Part Number Structure

| PME08 | - | 48 | S | 05 | W | - | SMD | M3 |
|---|---|---|---|---|---|---|---|---|
| **Series Name** | | **Input Voltage** | **Output Quantity** | **Output Voltage** | **Input Range** | | **Mounting Type Option** | **Operating Temp Option** |
| | | 24: 9-36VDC | S: Single | 3P3: 3.3VDC | 4:1 | | ☐: DIP type | ☐: Standard |
| | | 48: 18-75VDC | | 05: 5VDC | | | SMD: SMD type | -40-+105ºC |
| | | 110: 43-110VDC | | 12: 12VDC | | | | with derating |
| | | | | 15: 15VDC | | | | M3: M3 version |
| | | | | | | | | -55-+105ºC |
| | | | D: Dual | 05: ±5VDC | | | | with derating |
| | | | | 12: ±12VDC | | | | |
| | | | | 15: ±15VDC | | | | |

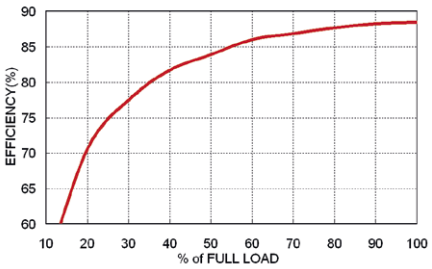
## Derating Curve




PME08-48S05W Derating Curve




PME08-48S05W Efficiency vs. Input Voltage




PME08-48S05W Efficiency vs. Output Load

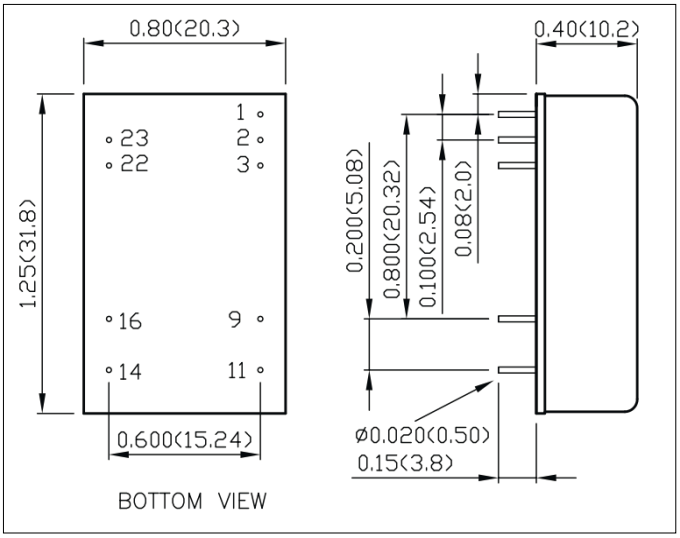
## Fuse Consideration

This power module is not internally fused. An input line fuse must always be used. This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture. To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse. The input line fuse suggest as below:

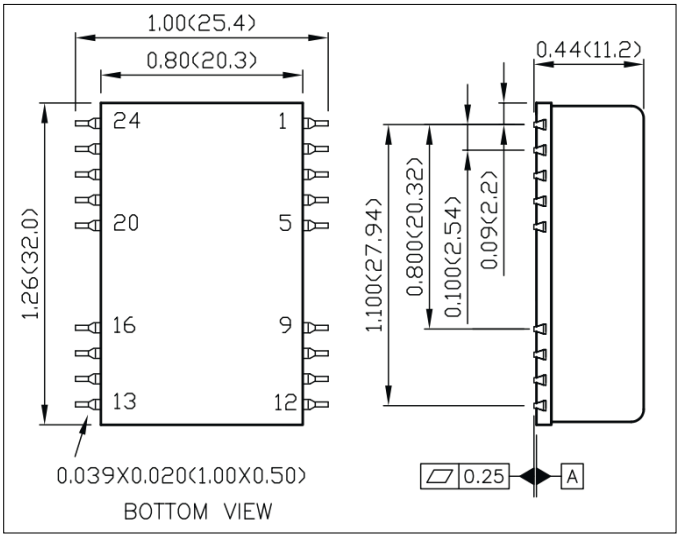
| Model | Fuse Rating | Fuse Type |
|---|---|---|
| PME08-24S□□W, PME08-24D□□W | 2 | Slow-Blow |
| PME08-48S□□W, PME08-48D□□W | 1 | Slow-Blow |
| PME08-110S□□W, PME08-110D□□W | 0.5 | Slow-Blow |

The table based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

## Mechanical DIP type




## Mechanical SMD type




### Pin Connection

| Pin | Single | Dual | Pin | Single | Dual |
|---|---|---|---|---|---|
| 1 | Ctrl | Ctrl | | | |
| 2 | -Vin | -Vin | 23 | +Vin | +Vin |
| 3 | -Vin | -Vin | 22 | +Vin | +Vin |
| | | | | | |
| 9 | NC | Common | 16 | -Vout | Common |
| 11 | NC | -Vout | 14 | +Vout | +Vout |

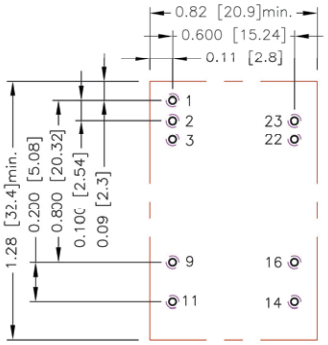
1. . All dimensions in inch (mm)
2. Tolerance: x.xx±0.02 (x.x±0.5)
   x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1

### Pin Connection

| Pin | Single | Dual | Pin | Single | Dual |
|---|---|---|---|---|---|
| 1 | Ctrl | Ctrl | | | |
| 2 | -Vin | -Vin | 23 | +Vin | +Vin |
| 3 | -Vin | -Vin | 22 | +Vin | +Vin |
| | | | | | |
| 9 | NC | Common | 16 | -Vout | Common |
| 11 | NC | -Vout | 14 | +Vout | +Vout |
| Others | NC | NC | | | |

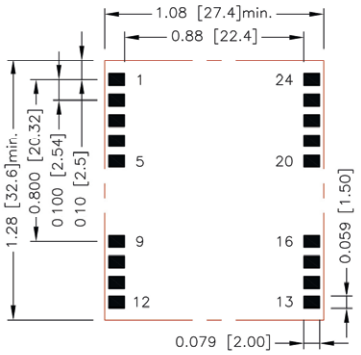
## Recommended Pad Layout

**DIP type**




All dimensions in inch[mm]
Pad size(lead free recommended)
Through hole 1.2.3.9.11.14.16.22.23:Φ 0.031[0.80]
Top view pad 1.2.3.9.11.14.16.22.23: Φ 0.039[1.00]
Bottom view pad 1.2.3.9.11.14.16.22.23: Φ 0.063[1.60]

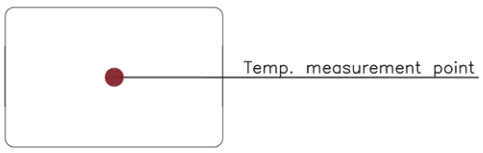
**SMD type**




All dimensions in inch[mm]
Pad size(lead free recommended)
Top view pad:0.079x0.059[2.00x1.50]

## Thermal Considerations

The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point as the figure below. The temperature at this location should not exceed 105°C. When Operating, adequate cooling must be provided to maintain the test point temperature at or below 105°C. Although the maximum point Temperature of the power modules is 105°C, you can limit this Temperature to a lower value for extremely high reliability.
Thermal test condition with vertical direction by natural convection (20LFM).




TOP VIEW

Specifications are subject to change without notice.