



### Features

- RoHS lead free and lead-solder-exempt products are available
- High power density in an industry-standard 3" x 5" footprint
- Power Factor Correction (PFC) meets EN61000-3-2
- Main output remote sense
- Power Good signals
- CE marked to Low Voltage Directive
- Input transient & ESD compliance to EN61000-4-2/-3/-4/-5
- MTBF In excess of 1M hours based upon field data
- Optional remote on/off with 5V standby

(See page 4 for ordering information)

### Description

The MPB125 Series incorporates patented high efficiency circuitry, high power density and active Power Factor Correction (PFC) to meet the requirements of networking and data communications systems, as well as commercial and industrial configurations.

Dual output units deliver a regulated main output plus a second 12V output for fans or other system functions. Multiple output models provide tightly regulated DC power in a variety of configurations. The MPB125 is rated for convection as well as forced-air cooling. Full output power is available with as few as 5 Cubic Feet per Minute (CFM) forced-air cooling with the exception of the MPB125-2003 and -2003D which need only 10 CFM for full power. Optional remote on/off with standby power is also provided (see Options). The MPB125 product line is approved to the latest international regulatory standards, and displays the CE Mark.

### Multiple Output Model Selection

| MODEL                          | OUTPUT VOLTAGE (VOLTS) | MAXIMUM OUTPUT CURRENT (AMPS), 130 LFM | TOTAL REGULATION % | RIPPLE & NOISE <sup>1</sup> % pk-pk | REGULATION RANGE   |
|--------------------------------|------------------------|----------------------------------------|--------------------|-------------------------------------|--------------------|
| MPB125-2003 <sup>2</sup>       | +3.3V                  | 30A                                    | ±3%                | 1%                                  | 3.20V to 3.40V     |
|                                | +12V                   | 0.5A                                   | ±5%                | 1%                                  | 11.80V to 12.60V   |
| MPB125-2005 <sup>3, 4</sup>    | +5V                    | 25A                                    | ±3%                | 1%                                  | 4.85V to 5.15V     |
|                                | +12V                   | 0.5A                                   | ±5%                | 1%                                  | 10.80V to 12.60V   |
| MPB125-2012 <sup>3, 4, 5</sup> | +12V                   | 10.5A                                  | ±3%                | 1%                                  | 11.64V to 12.36V   |
|                                | 12V                    | 0.5A                                   | ±5%                | 1%                                  | 11.40V to 12.60V   |
| MPB125-2015 <sup>3, 4, 5</sup> | +15V                   | 8.3A                                   | ±3%                | 1%                                  | 14.54V to 15.45V   |
|                                | 12V                    | 0.5A                                   | ±5%                | 1%                                  | 11.40V to 12.60V   |
| MPB125-2024 <sup>3, 4, 5</sup> | +24V                   | 5.2A                                   | ±3%                | 1%                                  | 23.28V to 24.72V   |
|                                | 12V                    | 0.5A                                   | ±5%                | 1%                                  | 11.40V to 12.60V   |
| MPB125-2048 <sup>3, 4, 5</sup> | +48V                   | 2.6A                                   | ±3%                | 1%                                  | 46.56V to 49.44V   |
|                                | 12V                    | 0.5A                                   | ±5%                | 1%                                  | 11.40V to 12.60V   |
|                                | +5V                    | 16.5A                                  | ±4%                | 1% <sup>8</sup>                     | 4.85V to 5.25V     |
| MPB125-3000 <sup>6</sup>       | +12V                   | 5A/9A <sub>pk</sub>                    | ±5%                | 1%                                  | 11.40V to 12.60V   |
|                                | -12V                   | 0.5A                                   | ±5%                | 1%                                  | -11.40V to -12.60V |
|                                | +2.5V                  | 12A <sup>7</sup>                       | ±3%                | 2%                                  | 2.42V to 2.58V     |
| MPB125-4250 <sup>6</sup>       | +5V                    | 15A <sup>7</sup>                       | ±4%                | 1% <sup>8</sup>                     | 4.85V to 5.25V     |
|                                | +12V                   | 5A/9A <sub>pk</sub>                    | ±5%                | 1%                                  | 11.40V to 12.60V   |
|                                | -12V                   | 0.5A                                   | ±5%                | 1%                                  | -11.40V to -12.60V |
| MPB125-4350 <sup>6</sup>       | +3.3V                  | 10A <sup>7</sup>                       | ±3%                | 1.5%                                | 3.20V to 3.40V     |
|                                | +5V                    | 15A <sup>7</sup>                       | ±4%                | 1% <sup>8</sup>                     | 4.85V to 5.25V     |
|                                | +12V                   | 5A/9A <sub>pk</sub>                    | ±5%                | 1%                                  | 11.40V to 12.60V   |
|                                | -12V                   | 0.5A                                   | ±5%                | 1%                                  | -11.40V to -12.60V |

### NOTES:

- <sup>1</sup> Maximum peak-to-peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.
- <sup>2</sup> For MPB125-2003 and -2003D, a minimum airflow of 10 CFM is required to provide the maximum current of 30A on V1. V1 current can be as high as 25A with a minimum airflow of 5 CFM.
- <sup>3</sup> Maximum forced-air output power is 125 watts with 5 CFM airflow.
- <sup>4</sup> Maximum convection output power is 70 watts.
- <sup>5</sup> V2 is isolated from V1 and can be used as a negative or positive output.
- <sup>6</sup> 12V output's peak load maximum duration is 30 seconds. Average current must not exceed 5A.
- <sup>7</sup> Maximum power of 80 watts from V1 + V2 with 5 CFM forced-air cooling. See Application Note #M3 for details.
- <sup>8</sup> For loads less than 10 watts on V1 + V2 + V3, ripple and noise on the +5V output is Max. 2% peak-to-peak.

## Input Specifications

| PARAMETER              | CONDITIONS/DESCRIPTION                                                       | MIN | NOM | MAX      | UNITS |
|------------------------|------------------------------------------------------------------------------|-----|-----|----------|-------|
| Input Voltage- AC      | Continuous input range.                                                      | 90  |     | 264      | VAC   |
| Input Frequency        | AC Input.                                                                    | 47  |     | 63       | Hz    |
| Brownout Protection    | Lowest AC input voltage that regulation is maintained with full rated loads. | 90  |     |          | VAC   |
| Hold-up Time           | Over full AC input voltage range at full rated load.                         | 17  |     |          | ms    |
| Input Current          | 90 VAC at full rated load.                                                   |     |     | 1.8      | ARMS  |
| Input Protection       | Non-user serviceable internally located AC input line fuse, 250 VAC, 3.15A.  |     |     |          |       |
| Inrush Surge Current   | Internally limited by thermistor, one cycle, 25° C.                          |     |     | 23<br>46 | APK   |
| Power Factor Circuitry | Active PFC meets requirements of EN61000-3-2.                                |     |     |          |       |
| Operating Frequency    | Switching frequency of main transformer.                                     |     | 45  |          | kHz   |

## Output Specifications

| PARAMETER             | CONDITIONS/DESCRIPTION                                                                                                                                                           | MIN                       | NOM    | MAX | UNITS |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------|-----|-------|
| Efficiency            | Full Load, 230VAC. Varies with distribution of loads among outputs. (Minimum efficiency reflects that of MPB125-2003D and -2005D models.)                                        | 73                        | 80     | 85  | %     |
| Minimum Loads         | V1 + V2 + V3 for MPB125-4XXX and -3000.<br>V1 for MPB125-2XXX for full regulation on V2. All models operate at no load without any damage and meet all specs on V1 above 0 amps. | 5<br>5                    |        |     | Watts |
| Ripple and Noise      | Full load, 20 MHz bandwidth.                                                                                                                                                     | See Model Selection Chart |        |     |       |
| Output Power (Note 1) | At 5 CFM forced-air cooling. See Application Note #M3 for details. Convection: Consult Factory                                                                                   |                           |        | 125 | Watts |
| Overshoot /Undershoot | Output voltage overshoot/undershoot at turn-on.                                                                                                                                  |                           |        | 10  | %     |
| Regulation            | Varies by output. Total regulation includes: line changes from 85-132 VAC or 170-264 VAC, changes in load starting at 20% load and changing to 100% load.                        | See Model Selection Chart |        |     |       |
| Transient Response    | Maximum deviation due to a 25% load change with unit at 75% load. All models except MPB125-2005 and -2005D. Model MPB125-2005 and -2005D.                                        |                           | 3<br>5 |     | %     |
| Turn-on Delay         | Time required for initial output voltage stabilization.                                                                                                                          | 0.2                       |        | 1.5 | Sec   |
| Turn-on Rise Time     | Time required for output voltage to rise from 10% to 90% except for MPB125-2005 and -2005D.                                                                                      | 0.2                       |        | 20  | ms    |
|                       | MPB125-2005 and MPB125-2005D.                                                                                                                                                    | 1                         |        | 100 | ms    |

## Interface Signals and Internal Protection

| PARAMETER                                            | CONDITIONS/DESCRIPTION                                                                                                                                                                                                                                                     | MIN                                                          | NOM | MAX                                                          | UNITS |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----|--------------------------------------------------------------|-------|
| Overvoltage Protection                               | V1 of dual and triple output models; V1 & V2 outputs of 4-output models.<br>MPB125-2003 and -2003D<br>MPB125-4250 (V1)<br>MPB125-4350 (V1)<br>5V Output of MPB125-2005 and -2005D, MPB125-3000, or MPB125-4X50<br>MPB125-2012<br>MPB125-2015<br>MPB125-2024<br>MPB125-2048 | 3.67<br>3.20<br>3.76<br>5.74<br>13.5<br>17.0<br>26.9<br>57.6 |     | 4.80<br>4.00<br>4.80<br>7.00<br>16.5<br>19.0<br>31.1<br>62.4 | VDC   |
| Overload Protection                                  | Fully protected against output short circuit or overload. Automatic recovery upon removal of overload condition. MPB125-2003, -2003D -2005, and -2005D latch OFF if overload occurs on V1 which requires an AC reset.                                                      |                                                              |     |                                                              |       |
| Remote Sense (Note 2)<br>Dual Output Models          | Total (+sense and -sense) voltage compensation for cable losses on dual output models.                                                                                                                                                                                     |                                                              |     | 500                                                          | mV    |
| Remote Sense (Note 2)<br>Triple & Quad Output Models | On models MPB125-4250 and -4350 remote sense is provided on the 2.5 and 3.3V outputs, respectively. MPB125-3000 does not have positive remote sense. Total voltage compensation for cable losses on +Sense. Total voltage compensation for cable losses on -Sense.         |                                                              |     | 200<br>100                                                   | mV    |

**NOTES:** 1) For MPB125-2003, a minimum airflow of 10 CFM is required to provide the maximum current of 30A on V1. V1 current can be as high as 25A with a minimum airflow of 5 CFM.

2) -Sense must be connected to output common or load common for proper power supply operation.

## Interface Signals and Internal Protection (Cont.)

| PARAMETER              | CONDITIONS/DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                             | MIN | NOM | MAX      | UNITS   |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----------|---------|
| Power Good Signal      | AC/DC indicator - This signal indicates the status of the AC input or DC outputs. When there is sufficient AC voltage and the outputs are operating normally, an open collector signal is provided.                                                                                                                                                                                                                                                |     |     |          |         |
|                        | Turn-On delay time from application of AC:                                                                                                                                                                                                                                                                                                                                                                                                         | 50  |     | 500      |         |
|                        | Warning time before outputs go out of regulation:                                                                                                                                                                                                                                                                                                                                                                                                  | 5   |     |          | ms      |
|                        | Warning time before outputs deviate $\pm 10\%$ from the nominal value:                                                                                                                                                                                                                                                                                                                                                                             | 15  |     |          |         |
|                        | Sync Current<br>Pull-up Voltage                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     | 20<br>30 | mA<br>V |
| Power Supply OK Signal | Provided on dual-output models. Open collector signal intended to drive an LED. Closed collector occurs when the Power Good Signal is in its open collector state.                                                                                                                                                                                                                                                                                 |     |     |          |         |
|                        | Sync Current                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     | 20       | mA      |
|                        | Pull-up Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     | 30       | V       |
| Thermal Shutdown       | Protected against overtemperature conditions. Unit recovers when overtemperature condition is removed.                                                                                                                                                                                                                                                                                                                                             |     |     |          |         |
| Current Share          | Provided on dual-output models. Up to 4 units can be connected in parallel. There are some limits for parallel operation. See MPB125 Applications Note. N+1 redundancy is provided. V2 needs an external isolation diode for N+1 operation. An external diode is required on MPB125-2003 and MPB125-2005 models for redundancy on both V1 and V2, or when ordering, you can specify MPB125-2003D or -2005D which have an internal isolation diode. |     |     |          |         |
| Isolation Diode        | Internal isolation diode is provided on V1 for all dual-output models except the MPB125-2003 and MPB125-2005. Specify MPB125-2003D or MPB125-2005D, respectively, if an internal isolation diode is required for these models.                                                                                                                                                                                                                     |     |     |          |         |

## Safety, Regulatory, and EMI Specifications

| PARAMETER                    | CONDITIONS/DESCRIPTION                                                             | MIN  | NOM | MAX | UNITS      |
|------------------------------|------------------------------------------------------------------------------------|------|-----|-----|------------|
| Agency Approvals             | UL60950-1.<br>CSA 22.2 No. 60950-1.<br>EN60950 (TÜV).<br>IEC60950-1.               |      |     |     |            |
| Dielectric Withstand Voltage | AC to chassis.                                                                     | 1500 |     |     | VAC        |
|                              | Input to output.                                                                   | 3000 |     |     | VDC        |
| Electromagnetic Interference | EN55022 Conducted.                                                                 | B    |     |     | Class      |
| ESD Susceptibility           | Per EN61000-4-2, Level 4                                                           | 8    |     |     | kV         |
| Flicker                      | Per EN61000-3-3.                                                                   |      |     |     |            |
| Radiated Susceptibility      | Per EN61000-4-3.                                                                   |      | 3   |     | V/m        |
| EFT/Burst                    | Per EN61000-4-4.                                                                   | 1    |     |     | kV         |
| Input Transient Protection   | Per EN61000-4-5, Level 3, 2 kV (Line-to-Gnd) minimum, 1 kV (Line-to-Line) minimum. |      |     |     |            |
| RF Immunity                  | Per EN61000-4-6. 0.15 to 80 MHz (1 kHz sinewave)                                   |      | 3   |     | V/m        |
| Magnetic Fields              | Per EN61000-4-8.                                                                   |      | 1   |     | A/m        |
| Voltage Dips                 | Per EN61000-4-11.                                                                  |      |     |     |            |
| Insulation Resistance        | Input to output.                                                                   |      | 10  |     | M $\Omega$ |
| Leakage Current              | Per EN60950 (264 VAC)                                                              |      |     | 1.0 | mA         |

## Environmental Specifications

| PARAMETER                       | CONDITIONS/DESCRIPTION                                                                                                                                                                                                                                                                    | MIN | NOM | MAX        | UNITS           |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------------|-----------------|
| Altitude                        | Operating<br>Non-Operating                                                                                                                                                                                                                                                                |     |     | 10K<br>50K | ASL Feet        |
| Operating Temperature           | Derate linearly from 50 to 70°C to 50% power at 70°C. At 100% load: MPB125 models will operate at -20°C, but will not meet all specifications.                                                                                                                                            | 0   |     | 50         | °C              |
| Storage Temperature             |                                                                                                                                                                                                                                                                                           | -40 |     | 85         | °C              |
| Forced-Air Cooling <sup>1</sup> | Forced-air cooling of 5 CFM is required for full output power except for MPB125-2003 and -2003D. Air velocity is measured with power supply mounted on 0.375" (9.5mm) standoffs. Airflow direction is from the input section to the output section. See Application Note #M3 for details. |     |     |            |                 |
| Temperature Coefficient         | Included in total regulation of outputs.                                                                                                                                                                                                                                                  |     |     |            |                 |
| Relative Humidity               | Non-Condensing.                                                                                                                                                                                                                                                                           | 5   |     | 95         | %RH             |
| Shock                           | Operating: 11 ±3ms, 3 axes, Half Sine.<br>Non-operating: 11 ±3ms, 3 axes, Half Sine.                                                                                                                                                                                                      |     |     | 15<br>40   | G <sub>pk</sub> |
| Vibration                       | Operating: Random vibration, 5-500 Hz, 10 minutes each axis.<br>Non-Operating: Random vibration, 5-500 Hz, 10 minutes each axis.                                                                                                                                                          |     |     | 2.4<br>6.0 | GRMS<br>GRMS    |

## Options

| DESCRIPTION                                                                                                           | NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Remote On/Off Standby Output (Option R)                                                                               | Remote On/Off is a TTL-compatible signal. A logic "high" or open circuit turns the unit on. Reverse inhibit logic can be achieved by changing the position of the J6 connector. A logic "low" inhibits all outputs except the 5V standby. At remote off, the Power Good signal will warn the host equipment 2 milliseconds before the main output goes out of regulation. The rating of the standby output is +5V @ 0.2 Amps. Total regulation is ±5 %. Maximum noise and ripple is 50 mV peak-to-peak @ a 20 MHz bandwidth. |
| NOTE: The addition of Option "R" increases the supply width from 3.0 to 3.8 inches. Consult factory for availability. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

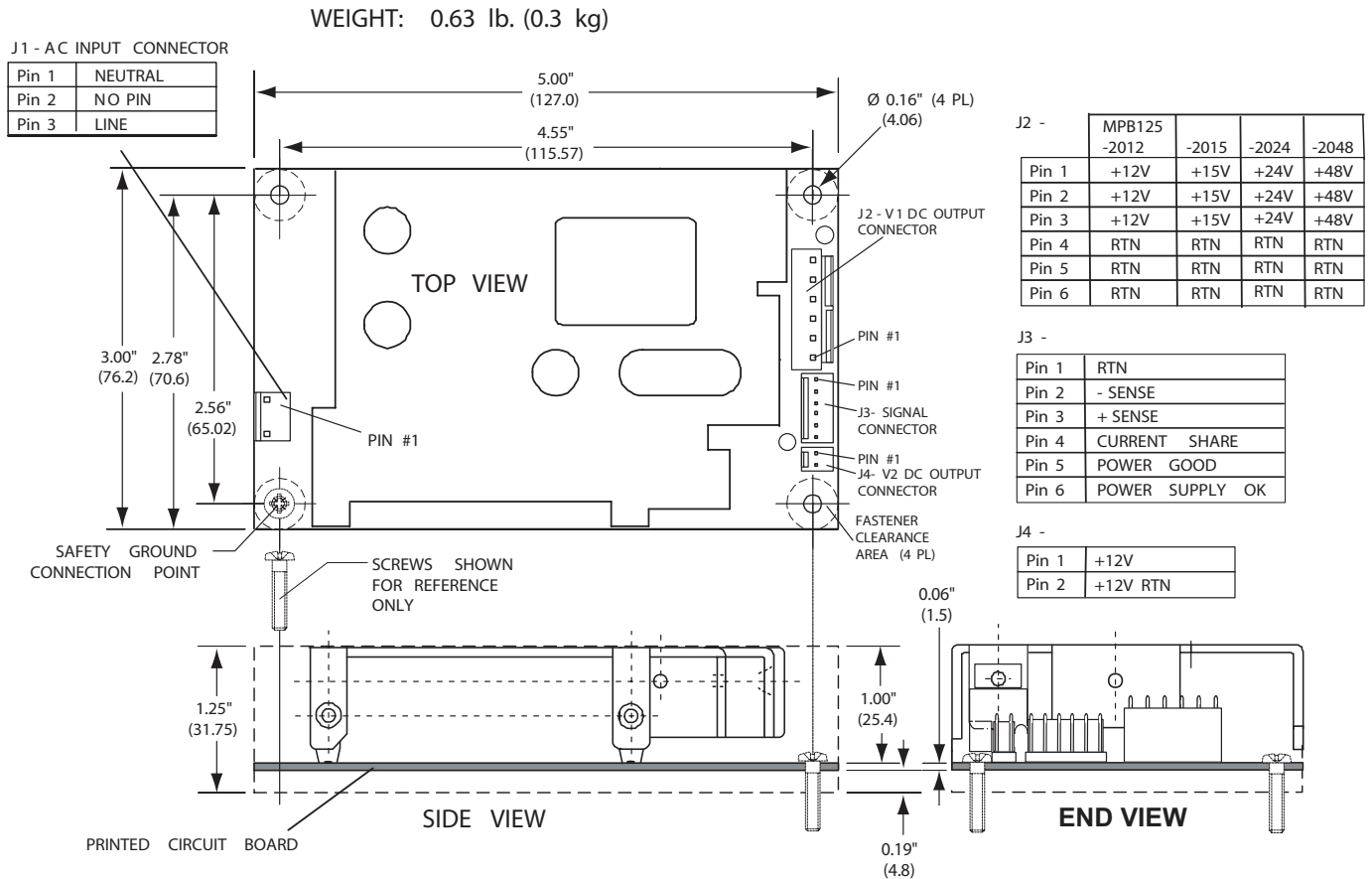
**NOTES:** <sup>1</sup> For MPB125-2003 and -2003D, a minimum airflow of 10 CFM is required to provide the maximum current of 30A on V1. V1 current can be as high as 25A with a minimum airflow of 5 CFM.

## Ordering Information:

| OPTIONS                              | SUFFIXES TO ADD TO PART NUMBER                    |
|--------------------------------------|---------------------------------------------------|
| RoHS lead solder exempt <sup>1</sup> | No RoHS suffix character required.                |
| RoHS compliant for all 6 substances  | Add "G" as the last character of the part number. |

<sup>1</sup> The solder exemption refers to all the restricted materials except lead in solder.

**Mechanical Drawing (-2012, -2015, -2024, & -2048 Models)**

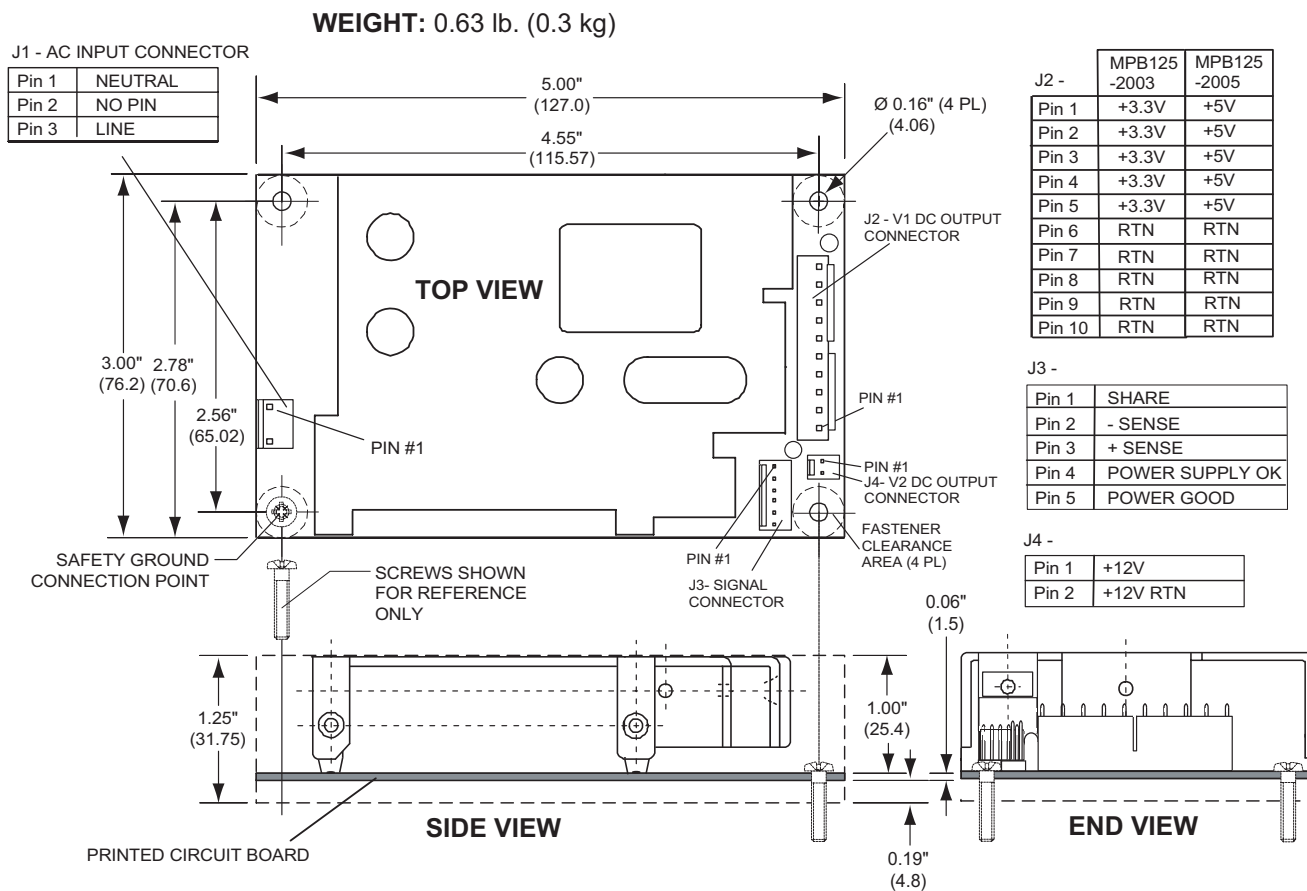


**Mating Connectors**

NOTE: Part numbers are MOLEX; equivalents are acceptable.

|    |         | MPB125<br>-2012<br>-2015<br>-2024<br>-2048 |
|----|---------|--------------------------------------------|
| J1 | Housing | 09-50-8031                                 |
|    | Pins    | 08-52-0113                                 |
| J2 | Housing | 09-50-8061                                 |
|    | Pins    | 08-52-0113                                 |
| J3 | Housing | 22-01-3067                                 |
|    | Pins    | 08-50-0114                                 |
| J4 | Housing | 22-01-3027                                 |
|    | Pins    | 08-50-0114                                 |

**Mechanical Drawing (-2003, -2003D, -2005, and -2005D Models)**

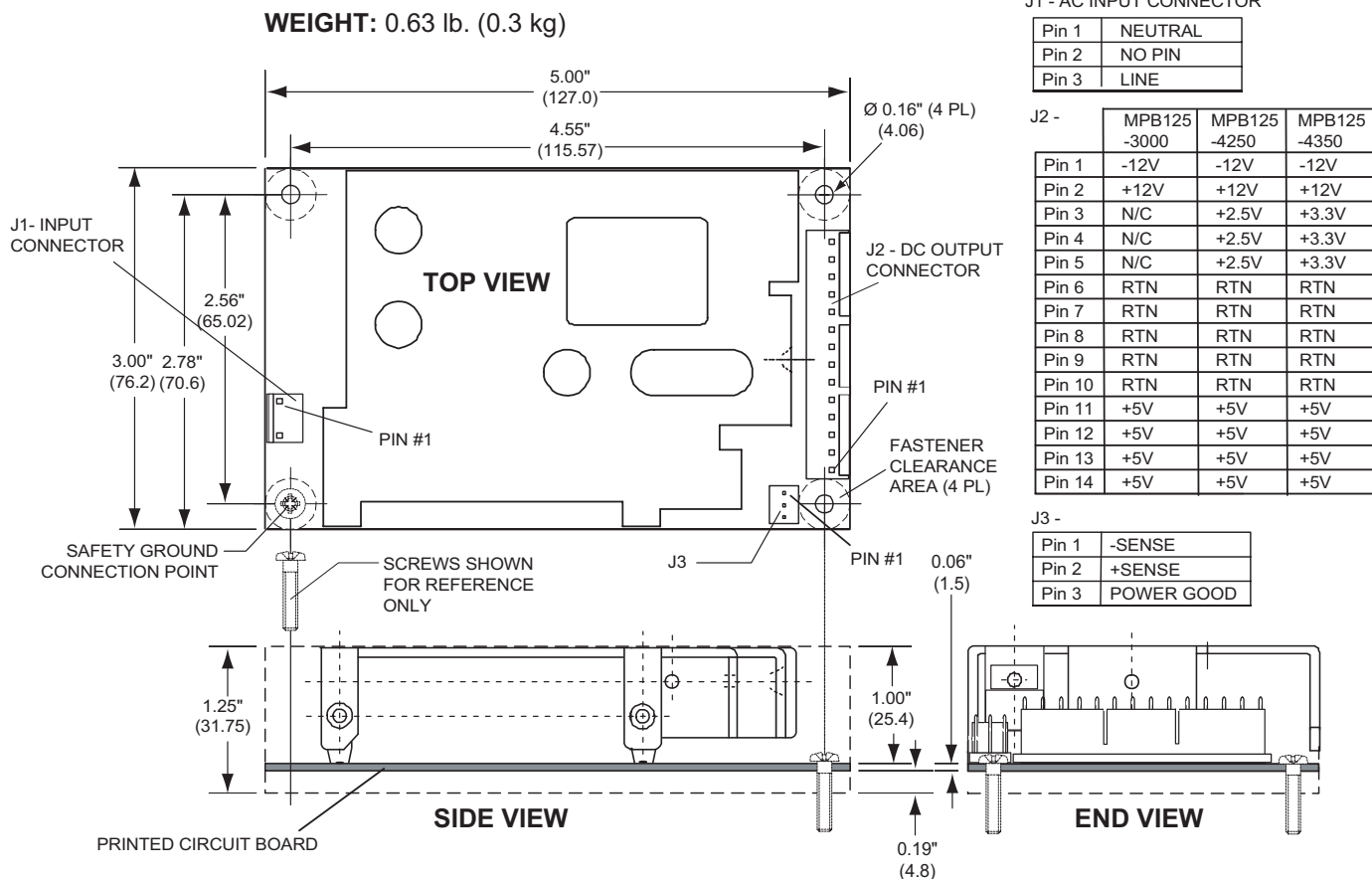


**Mating Connectors**

NOTE: Part numbers are MOLEX; equivalents are acceptable.

| MPB125<br>-2005 |         |            |
|-----------------|---------|------------|
| J1              | Housing | 09-50-8031 |
|                 | Pins    | 08-52-0113 |
| J2              | Housing | 09-50-8103 |
|                 | Pins    | 08-52-0113 |
| J3              | Housing | 22-01-3057 |
|                 | Pins    | 08-50-0114 |
| J4              | Housing | 22-01-3027 |
|                 | Pins    | 08-50-0114 |

**Mechanical Drawing (-3000, -4250, & -4350 Models)**



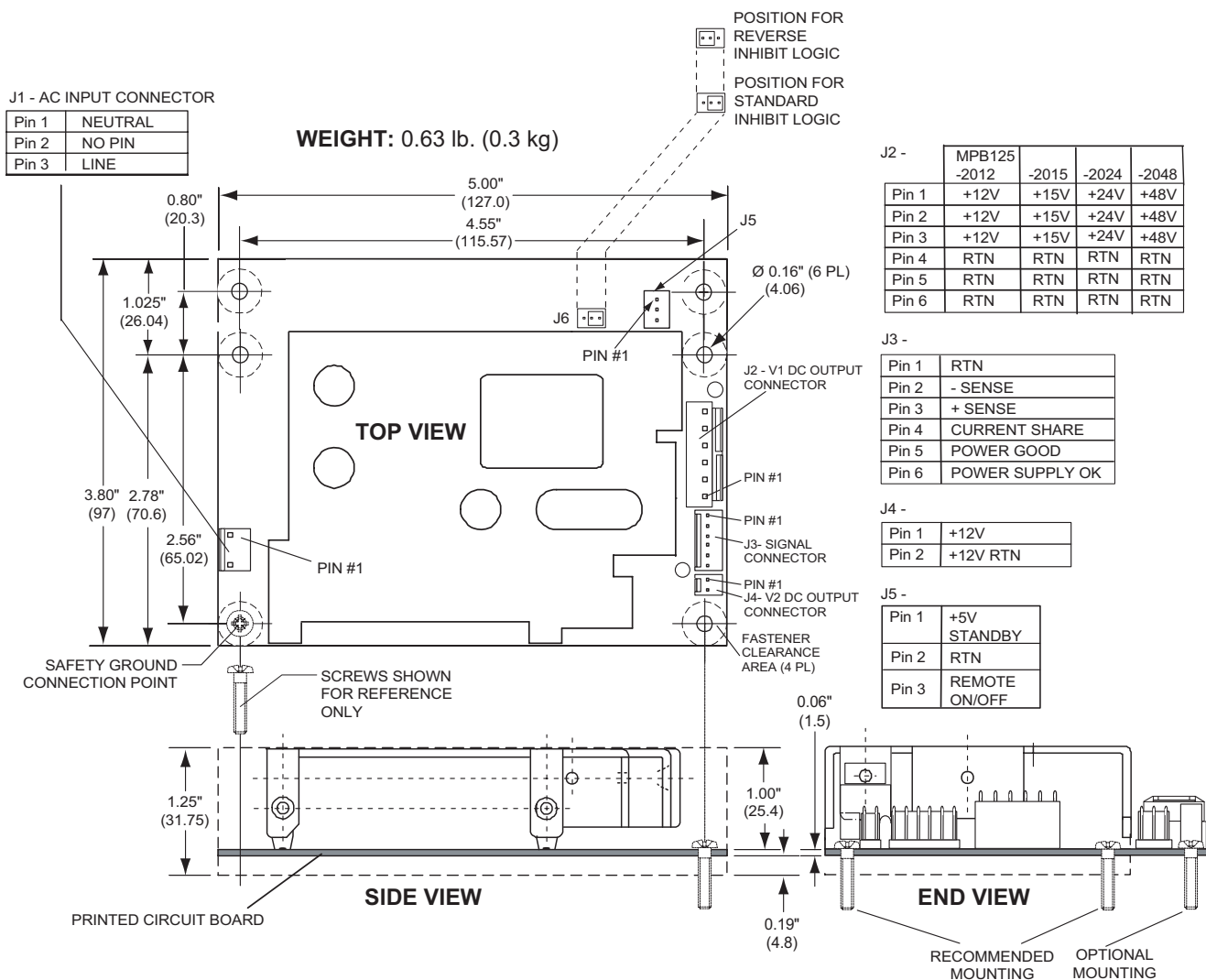
**Mating Connectors**

**NOTE:** Part numbers are MOLEX; equivalents are acceptable.

| MPB125<br>-3000<br>-4250<br>-4350 |         |            |
|-----------------------------------|---------|------------|
| J1                                | Housing | 09-50-8033 |
|                                   | Pins    | 08-52-0113 |
| J2                                | Housing | 09-50-8143 |
|                                   | Pins    | 08-52-0113 |
| J3                                | Housing | 22-01-3037 |
|                                   | Pins    | 08-50-0114 |

**MPB125 Series "R" Option**

**Mechanical Drawing (-2012R, -2015R, -2024R, & -2048R Models)**



**Mating Connectors**

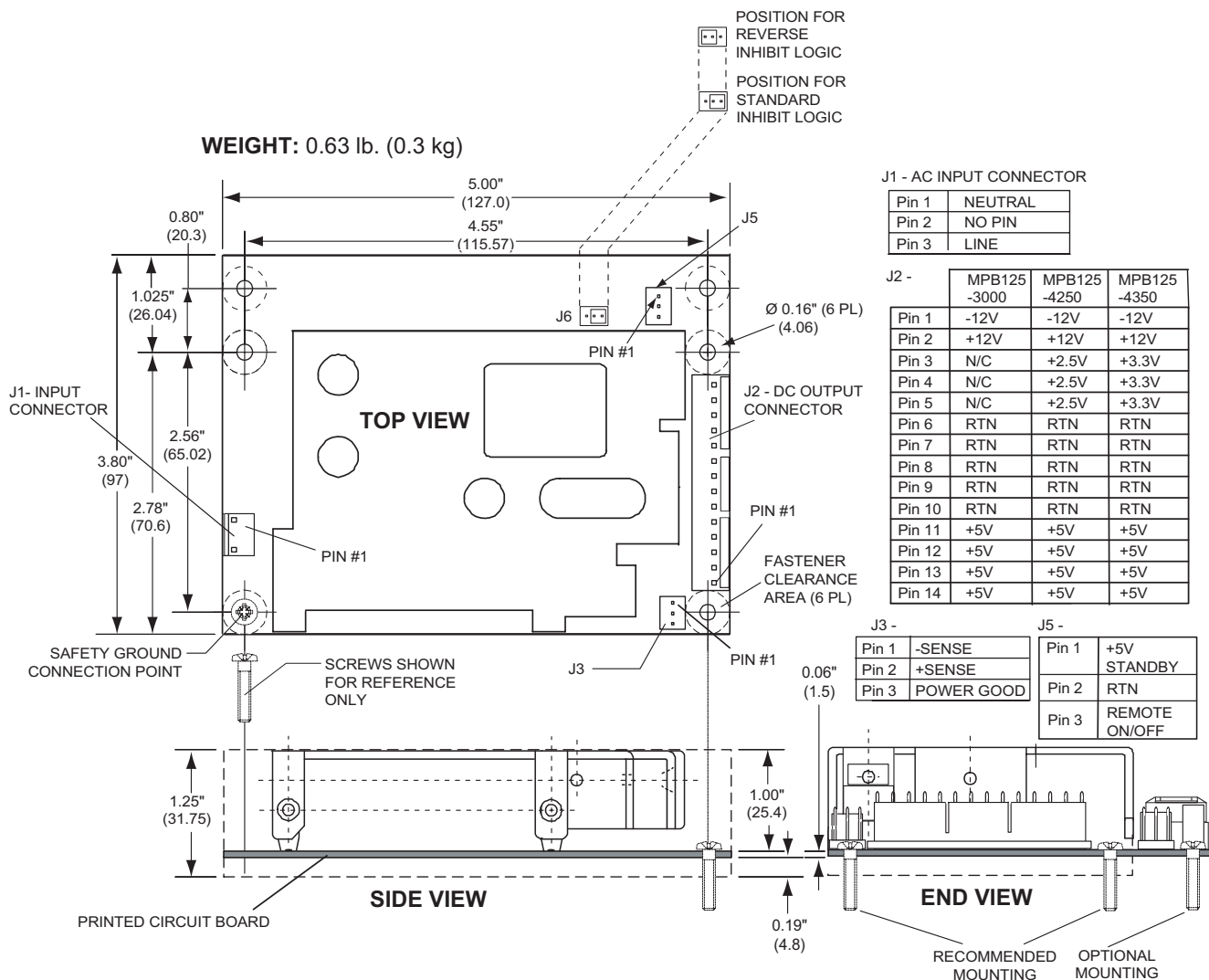
**NOTE:** Part numbers are MOLEX; equivalents are acceptable.

|    |         | MPB125<br>-2012<br>-2015<br>-2024<br>-2048 |
|----|---------|--------------------------------------------|
| J1 | Housing | 09-50-8033                                 |
|    | Pins    | 08-52-0113                                 |
| J2 | Housing | 09-50-8063                                 |
|    | Pins    | 08-52-0113                                 |
| J3 | Housing | 22-01-3067                                 |
|    | Pins    | 08-50-0114                                 |
| J4 | Housing | 22-01-3027                                 |
|    | Pins    | 08-50-0114                                 |
| J5 | Housing | 22-01-3037                                 |
|    | Pins    | 08-50-0114                                 |



**MPB125 Series "R" Option**

**Mechanical Drawing (-3000R, -4250R, & -4350R Models)**



**Mating Connectors**

NOTE: Part numbers are MOLEX; equivalents are acceptable.

| MPB125<br>-3000R<br>-4250R<br>-4350R |         |            |
|--------------------------------------|---------|------------|
| J1                                   | Housing | 09-50-8033 |
|                                      | Pins    | 08-52-0113 |
| J2                                   | Housing | 09-50-8143 |
|                                      | Pins    | 08-52-0113 |
| J3                                   | Housing | 22-01-3037 |
|                                      | Pins    | 08-50-0114 |
| J5                                   | Housing | 22-01-3037 |
|                                      | Pins    | 08-50-0114 |

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