

4W DC-DC Converter P4B-Series



- Wide 4:1 input range
- -40...+85°C operation temperature range
- Isolation up to 3500 V_{DC}
- MTBF > 1.121 MHours
- Continuous short circuit protection
- Efficiency up to 84%



Model selection guide

| Typ | Input voltage range [V _{DC}] | Input current | | Output voltage [V _{DC}] | Output current [mA] | Efficiency typ. [%] | Capacitive load (*1) [μF] |
|---------------|--|---------------|----------------|-----------------------------------|---------------------|---------------------|---------------------------|
| | | No-load [mA] | Full-load [mA] | | | | |
| Single output | | | | | | | |
| P4B243R3S | 9...36 | 12 | 220 | 3.3 | 0...1200 | 75 | 1000 |
| P4B2405S | 9...36 | 15 | 210 | 5.0 | 0...800 | 79 | 680 |
| P4B247R2S | 9...36 | 18 | 210 | 7.2 | 0...555 | 79 | 220 |
| P4B2409S | 9...36 | 12 | 200 | 9.0 | 0...445 | 83 | 100 |
| P4B2412S | 9...36 | 15 | 205 | 12.0 | 0...333 | 82 | 100 |
| P4B2415S | 9...36 | 15 | 205 | 15.0 | 0...267 | 82 | 68 |
| P4B2418S | 9...36 | 15 | 205 | 18.0 | 0...223 | 82 | 47 |
| P4B2424S | 9...36 | 18 | 205 | 24.0 | 0...167 | 82 | 22 |
| P4B483R3S | 18...72 | 10 | 110 | 3.3 | 0...1200 | 76 | 1000 |
| P4B4805S | 18...72 | 8 | 105 | 5.0 | 0...800 | 79 | 680 |
| P4B487R2S | 18...72 | 10 | 100 | 7.2 | 0...555 | 82 | 220 |
| P4B4809S | 18...72 | 10 | 100 | 9.0 | 0...445 | 83 | 100 |
| P4B4812S | 18...72 | 12 | 105 | 12.0 | 0...333 | 80 | 100 |
| P4B4815S | 18...72 | 10 | 100 | 15.0 | 0...267 | 84 | 68 |
| P4B4818S | 18...72 | 10 | 100 | 18.0 | 0...223 | 84 | 47 |
| P4B4824S | 18...72 | 15 | 100 | 24.0 | 0...167 | 82 | 22 |
| Dual output | | | | | | | |
| P4B243R3D | 9...36 | 12 | 220 | ±3.3 | 0...±605 | 75 | 2 x 680 |
| P4B2405D | 9...36 | 15 | 210 | ±5.0 | 0...±400 | 79 | 2 x 330 |
| P4B247R2D | 9...36 | 18 | 210 | ±7.2 | 0...±275 | 79 | 2 x 100 |
| P4B2409D | 9...36 | 18 | 210 | ±9.0 | 0...±223 | 80 | 2 x 100 |
| P4B2412D | 9...36 | 15 | 205 | ±12.0 | 0...±167 | 82 | 2 x 47 |
| P4B2415D | 9...36 | 20 | 210 | ±15.0 | 0...±134 | 80 | 2 x 47 |
| P4B2418D | 9...36 | 25 | 210 | ±18.0 | 0...±112 | 80 | 2 x 33 |
| P4B2424D | 9...36 | 18 | 210 | ±24.0 | 0...±84 | 80 | 2 x 10 |
| P4B483R3D | 18...72 | 10 | 105 | ±3.3 | 0...±605 | 78 | 2 x 680 |
| P4B4805D | 18...72 | 15 | 105 | ±5.0 | 0...±400 | 79 | 2 x 330 |
| P4B487R2D | 18...72 | 15 | 105 | ±7.2 | 0...±275 | 79 | 2 x 100 |
| P4B4809D | 18...72 | 15 | 105 | ±9.0 | 0...±223 | 80 | 2 x 100 |
| P4B4812D | 18...72 | 12 | 100 | ±12.0 | 0...±167 | 82 | 2 x 47 |
| P4B4815D | 18...72 | 15 | 105 | ±15.0 | 0...±134 | 80 | 2 x 47 |
| P4B4818D | 18...72 | 15 | 100 | ±18.0 | 0...±112 | 81 | 2 x 33 |
| P4B4824D | 18...72 | 15 | 105 | ±24.0 | 0...±84 | 80 | 2 x 10 |

Add suffix "H" for 3.5kV isolation voltage

Note:

*1 Test by nominal input voltage and constant resistor load

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Specifications

| | |
|-----------------------------------|--|
| Input : | |
| Filter | Pi Network |
| Input reflected ripple current | 35mA _{p-p} (*2) |
| Absolute max. input voltage | |
| 24V types | -0.7...+40V _p for 100ms max. |
| 48V types | -0.7...+80V _p for 100ms max. |
| Isolation: | |
| Rated voltage input/output 3 sec. | 1500 V _{DC} , Standard 3500 V _{DC} , Suffix "H" |
| Resistance | 10 ⁹ Ω |
| Capacitance | 500 pF, typ. |
| Output: | |
| Voltage accuracy | ± 1% |
| Line voltage regulation | ± 0.5%, max. |
| Load voltage regulation | ± 0.5%, max. |
| Temperature coefficient | ± 0.02% / °C |
| Ripple and noise (at 20 MHz BW) | 60 mV _{p-p} , max. (*3) |
| Short circuit protection | Continuous |
| Short circuit restart | Automatic |
| General: | |
| Switching frequency | 266 kHz, typ. |
| Safety in accordance with | IEC60950-1:2001 |

| | |
|--------------------------------|---|
| Environmental: | |
| Operating temperatur (ambient) | -40 °C to +85 °C |
| Case temperature | 100 °C max. |
| Storage temperature | -40 °C to +125 °C |
| Derating | see diagram |
| Humidity | Up to 95%, |
| Cooling | Free-air convection |
| Physical : | |
| Dimensions | 31.75 x 20.32 x 10.16 mm |
| Weight | 17 g |
| Case material | Nickel-coated copper |
| Potting material | Epoxy (UL94V-0 rated) |
| Pin soldering temperature | 260°C for 10s distance 1.5mm from case |
| EMC in accordance with | |
| Radiated emissions | EN55022 class A |
| Conducted emissions | EN55022 class A (*4) |
| ESD | IEC61000-4-2 perf. criteria B |
| RS | IEC61000-4-3 perf. criteria A |
| EFT | IEC61000-4-4 perf. criteria B |
| CS | IEC61000-4-6 perf. criteria A |
| PFMF | IEC61000-4-8 perf. criteria A |

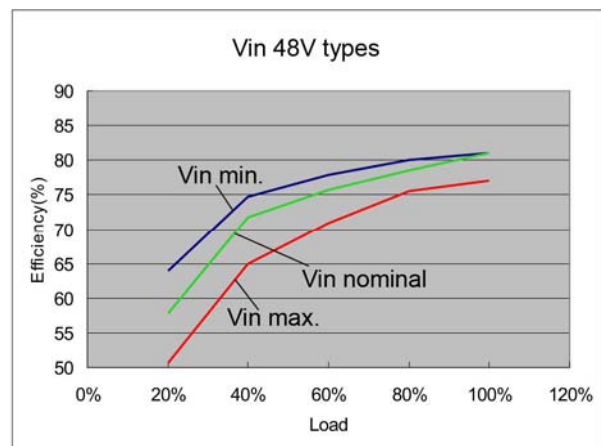
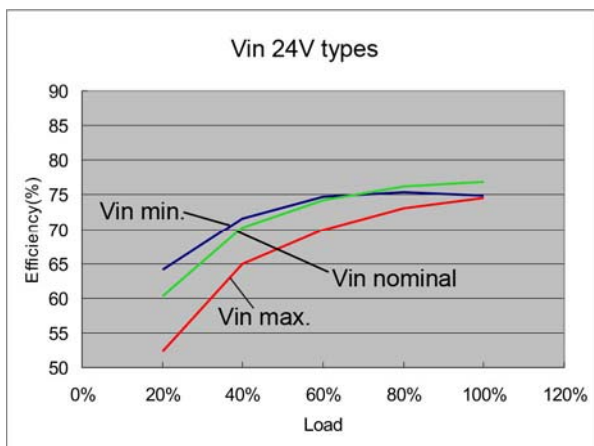
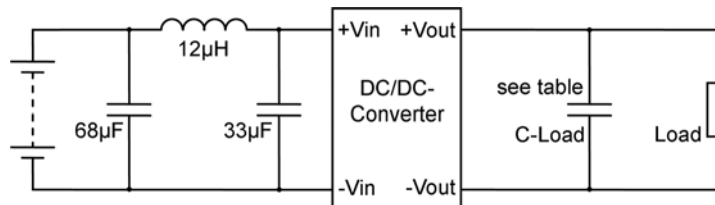
Note:

*2 Measured input reflected ripple current with a simulated source inductance of 12μH

*3 Typical value at nominal input voltage and full load

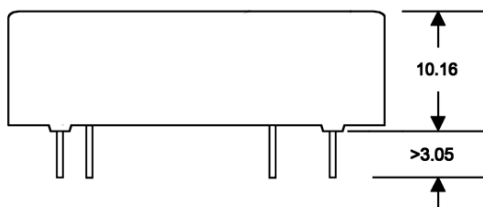
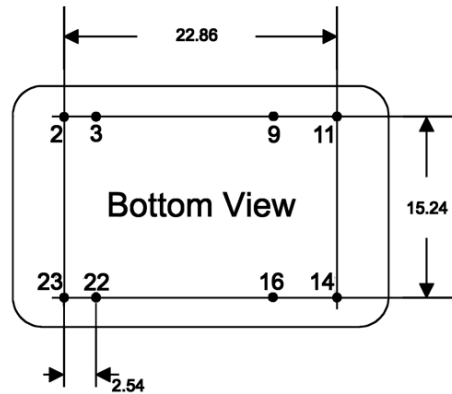
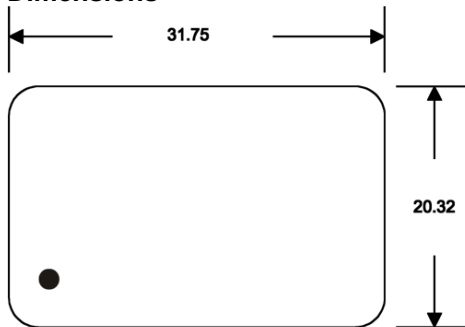
*4 It's recommended to add C: 68μF, C: 33μF and L: 12μH in input and to achieve EN55022 conducted class A

Application circuit



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Dimensions



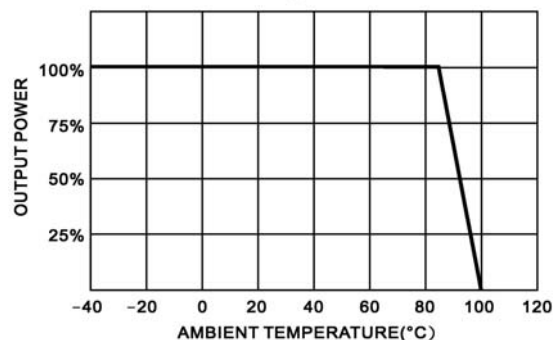
Notes: All dimensions are typical in millimeters

1. Pin diameter: 0.5 ± 0.05
2. Pin pitch tolerance: ± 0.35
3. Case Tolerance: ± 0.5

Pin connections

| Pin | 1.5 / 3.5kV _{DC} | |
|-----|---------------------------|-----------|
| | Single | Dual |
| 2 | -V Input | -V Input |
| 3 | -V Input | -V Input |
| 9 | Omitted | Common |
| 11 | N.C. | -V Output |
| 14 | +V Output | +V Output |
| 16 | -V Output | Common |
| 22 | +V Input | +V Input |
| 23 | +V Input | +V Input |

Derating Curve



Life Support Policy: HY-LINE does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user. Rev: 2.10 f