

PXF Series (single output) DC-DC Converters

The PXF is a DC-DC converter which provides a regulated output at power levels up to 40 watts. It accepts a wide range DC input. The converter may be operated with or without the input and output pins grounded.

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General Safety Instructions

These products are designed to be PCB mounted and for use within other equipment or enclosures. For safe installation and operation, carefully follow the instructions below:

1. Do not install, test, or operate the products near water or spill liquid on them.
2. Do not operate these products unless they are securely fastened.
3. These products must be installed in a restricted access location accessible to authorized personnel only.
4. These products must be professionally installed in accordance with the prevailing electrical wiring regulations and safety standards.
5. The output power taken from the unit must not exceed the ratings stated in the catalog datasheet.
6. Ensure adequate ventilation is provided to allow air to circulate.
7. This product has functional insulation between input and output and therefore the DC source to this product must be reinforced or double insulated to the AC input in accordance with IEC/EN 60950-1 to achieve SELV output.

Fusing

An external ceramic sand-filled fuse is needed for protection.

- 12V input ~ 250V, F8A, HBC
- 24V input ~ 250V, F5A, HBC
- 48V input ~ 250V, F5A, HBC

Installation Method

The unit can be mounted in any direction. Position single or multiple units with proper spacing to allow for adequate air ventilation. The case temperature of each unit should not exceed the temperature range as noted in the data sheet.

Avoid placing PCB traces for the DC input and DC output directly under the unit to limit the possibility of unwanted conducted noise.

Soldering and Cleaning

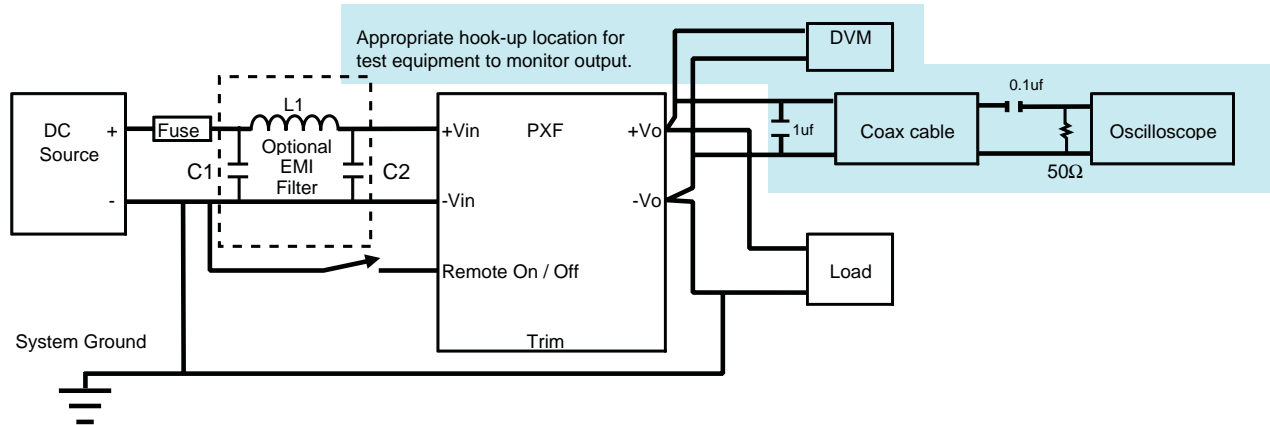
- Flow soldering : 260±10°C less than 15 seconds
- Soldering iron : 370±10°C less than 5 seconds

Note: The pins of this module are coated with Tin. To assure the solder-ability, modules should be kept in their original shipping containers to provide adequate protection. Also, the storage environment should be controlled to prevent oxidation of the pins.

Following wave solder, the converters should be given an opportunity to cool to within 10°C of the cleaning solution temperature. Cleaning while at a higher temperature may increase the risk of vacuum absorption of the solution into the converter between the pins and potting material during cooling.

It is recommended that during the wash process, the date code screening is protected to avoid erasure.

Block Diagram



EMI Filter (Optional)

Input filter components (C1, C2, L1) are used to help meet special conducted emissions requirements for the PXF product. These components should be mounted as close as possible to the DC-DC converter; and all leads should be minimized to decrease radiated noise.

| | C1 | L1 | C2 |
|-------|----------------|-------------|------------------------------|
| PXF40 | 1 μ F, MLC | 5.5 μ H | 39 μ F 100V Electrolytic |

Minimum Load

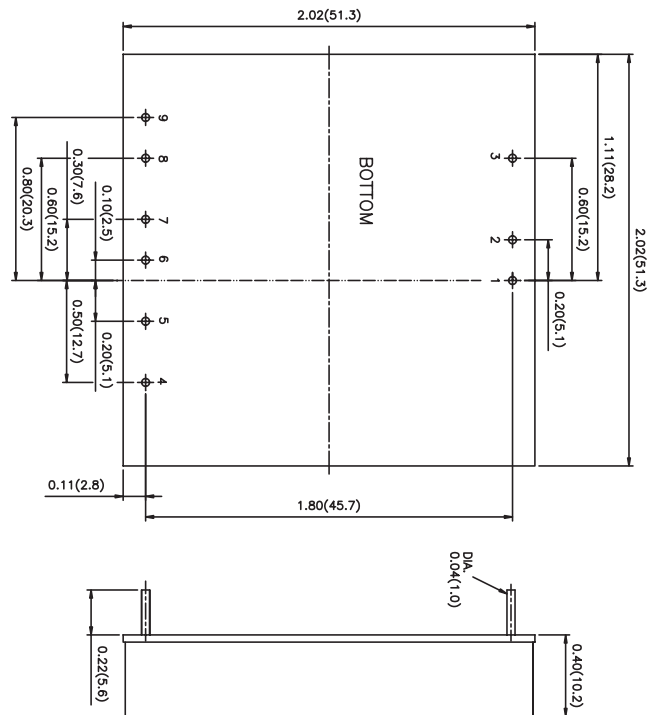
A 10% (of full load) minimum load is required to meet the performance specifications. The unit does not maintain regulation and operate properly under a no-load condition.

Pin Assignments

| Pin | Connection |
|-----|-----------------|
| 1 | + Input |
| 2 | - Input |
| 3 | Remote On / Off |
| 4 | No Pin |
| 5 | - Sense (*) |
| 6 | + Sense (*) |
| 7 | + Output |
| 8 | - Output |
| 9 | Trim |

* If remote sense is not being used, the +Sense and - Sense should be connected to their corresponding outputs; + output, -output.

Outline Drawing



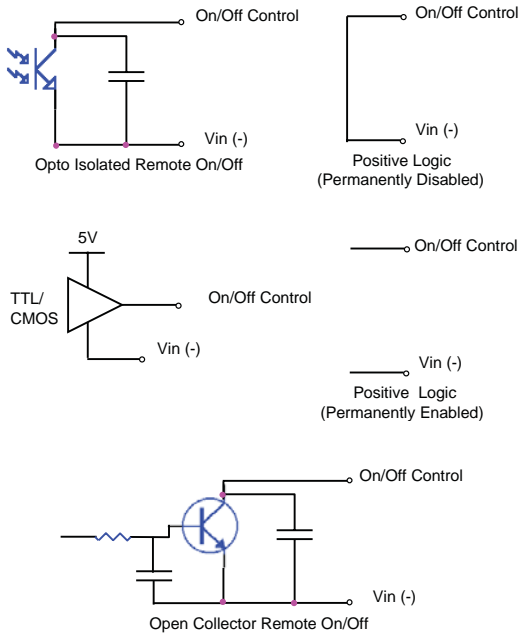
ALL DIMENSIONS IN INCHES(mm)
 PIN PITCH TOLERANCE $\pm 0.014(0.35)$
 Tolerance : x.xx $\pm 0.02(x.x \pm 0.5)$
 x.xxx $\pm 0.01(x.xx \pm 0.25)$

Pin Diameter: 1mm (0.04")

Positive Logic

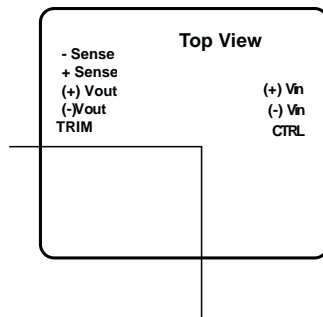
To turn the module on and off, the user must supply a switch (or equivalent circuit below) to control the voltage between the on/off terminal $V_{on/off}$ and the $V_{i(-)}$ input terminal. With an open circuit the module is normally on. To turn the module off the voltage on the $V_{on/off}$ pin needs to be 0V-1.2V. The maximum current $I_{on/off}$ should be limited to less than 100 μ A

Below are five possible circuits for driving the ON/OFF Pin:



Thermal Consideration

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 case temperature. The case temperature (T_c) should be



measured at the position indicated in figure to the right.

When operating the module, adequate cooling must be provided to maintain the case temperature at or below 100°C. Maintaining a lower temperature will yield higher reliability of the device. Optimum cooling is obtained with forced convection.

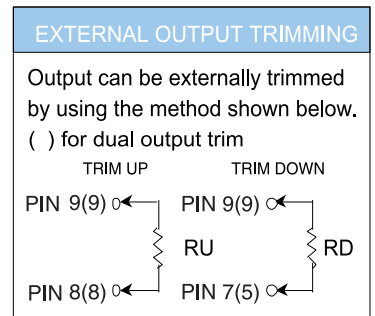
| Flow Rate | Θ |
|-------------|----------------|
| Convection* | 9.2°C/W |
| 100LFM | - |
| 200LFM | 6.5 |
| 300LFM | 5.3 |
| 400LFM | 4.0 |
| 500LFM | 3.5 |
| Heatsink** | 8.5 Convection |
| | 2.8 500LFM |

* Mounted vertically
** Optional heatsink 7G0026A (includes adhesive pad)

External Trim (output voltage adjustment)

Output voltage set point adjustment allows the user to increase or decrease the output voltage set point of a module. This is accomplished by connecting an external resistor between the TRIM pin and either the (+)Vout or (-)Vout pins. With an external resistor between the TRIM and (+)Vout pin, the output voltage set point decreases. With an external resistor between the TRIM and (-)Vout pin, the output voltage set point increases.

See the following pages for values.



Trim Tables

| PXF40 1.5V | | | | | | | | | | | |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 1.485 | 1.470 | 1.455 | 1.440 | 1.425 | 1.410 | 1.395 | 1.380 | 1.365 | 1.350 | Volts |
| RD= | 5.704 | 2.571 | 1.527 | 1.005 | 0.692 | 0.483 | 0.334 | 0.222 | 0.135 | 0.065 | KOhms |
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 1.515 | 1.530 | 1.545 | 1.560 | 1.575 | 1.590 | 1.605 | 1.620 | 1.635 | 1.650 | Volts |
| RU= | 4.578 | 2.065 | 1.227 | 0.808 | 0.557 | 0.389 | 0.270 | 0.180 | 0.110 | 0.054 | KOhms |

PXF40 1.8V

| | | | | | | | | | | | |
|-----------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 1.782 | 1.764 | 1.746 | 1.728 | 1.710 | 1.692 | 1.674 | 1.656 | 1.638 | 1.620 | Volts |
| RD= | 14.660 | 6.570 | 3.874 | 2.525 | 1.716 | 1.177 | 0.792 | 0.503 | 0.278 | 0.098 | KOhms |
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 1.818 | 1.836 | 1.854 | 1.872 | 1.890 | 1.908 | 1.926 | 1.944 | 1.962 | 1.980 | Volts |
| RU= | 11.639 | 5.205 | 3.060 | 1.988 | 1.344 | 0.915 | 0.609 | 0.379 | 0.200 | 0.057 | KOhms |

PXF40 2.5V

| | | | | | | | | | | | |
|-----------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 2.475 | 2.450 | 2.425 | 2.400 | 2.375 | 2.350 | 2.325 | 2.300 | 2.275 | 2.250 | Volts |
| RD= | 49.641 | 22.481 | 13.428 | 8.902 | 6.186 | 4.375 | 3.082 | 2.112 | 1.358 | 0.754 | KOhms |
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 2.525 | 2.550 | 2.575 | 2.600 | 2.625 | 2.650 | 2.675 | 2.700 | 2.725 | 2.750 | Volts |
| RU= | 37.076 | 16.675 | 9.874 | 6.474 | 4.434 | 3.074 | 2.102 | 1.374 | 0.807 | 0.354 | KOhms |

PXF40 3.3V

| | | | | | | | | | | | |
|-----------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 3.267 | 3.234 | 3.201 | 3.168 | 3.135 | 3.102 | 3.069 | 3.036 | 3.003 | 2.97 | Volts |
| RD= | 69.470 | 31.235 | 18.490 | 12.117 | 8.294 | 5.745 | 3.924 | 2.559 | 1.497 | 0.647 | KOhms |
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 3.333 | 3.366 | 3.399 | 3.432 | 3.465 | 3.498 | 3.531 | 3.564 | 3.597 | 3.630 | Volts |
| RU= | 57.930 | 26.165 | 15.577 | 10.283 | 7.106 | 4.988 | 3.476 | 2.341 | 1.459 | 0.753 | KOhms |

PXF40 5V

| | | | | | | | | | | | |
|-----------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 4.950 | 4.900 | 4.850 | 4.800 | 4.750 | 4.700 | 4.650 | 4.600 | 4.550 | 4.500 | Volts |
| RD= | 45.533 | 20.612 | 12.306 | 8.152 | 5.660 | 3.999 | 2.812 | 1.922 | 1.230 | 0.676 | KOhms |
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 5.050 | 5.100 | 5.150 | 5.200 | 5.250 | 5.300 | 5.350 | 5.400 | 5.450 | 5.500 | Volts |
| RU= | 36.570 | 16.580 | 9.917 | 6.585 | 4.586 | 3.253 | 2.302 | 1.588 | 1.032 | 0.588 | KOhms |

PXF40 12V

| | | | | | | | | | | | |
|-----------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|-------|
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 11.880 | 11.760 | 11.640 | 11.520 | 11.400 | 11.280 | 11.160 | 11.040 | 10.920 | 10.800 | Volts |
| RD= | 460.992 | 207.946 | 123.597 | 81.423 | 56.118 | 39.249 | 27.199 | 18.162 | 11.132 | 5.509 | KOhms |
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 12.120 | 12.240 | 12.360 | 12.480 | 12.600 | 12.720 | 12.840 | 12.960 | 13.080 | 13.200 | Volts |
| RU= | 367.908 | 165.954 | 98.636 | 64.977 | 44.782 | 31.318 | 21.701 | 14.488 | 8.879 | 4.391 | KOhms |

PXF40 15V

| | | | | | | | | | | | |
|-----------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|-------|
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 14.850 | 14.700 | 14.550 | 14.400 | 14.250 | 14.100 | 13.950 | 13.800 | 13.650 | 13.500 | Volts |
| RD= | 499.816 | 223.408 | 131.272 | 85.204 | 57.563 | 39.136 | 25.974 | 16.102 | 8.424 | 2.282 | KOhms |
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | % |
| Vout= | 15.150 | 15.300 | 15.450 | 15.600 | 15.750 | 15.900 | 16.050 | 16.200 | 16.350 | 16.500 | Volts |
| RU= | 404.184 | 180.592 | 106.061 | 68.796 | 46.437 | 31.531 | 20.883 | 12.898 | 6.687 | 1.718 | KOhms |