

## PXD Series (single output) DC-DC Converters

The PXD is a DC-DC converter which provides a fully isolated and regulated output at power levels up to 20 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

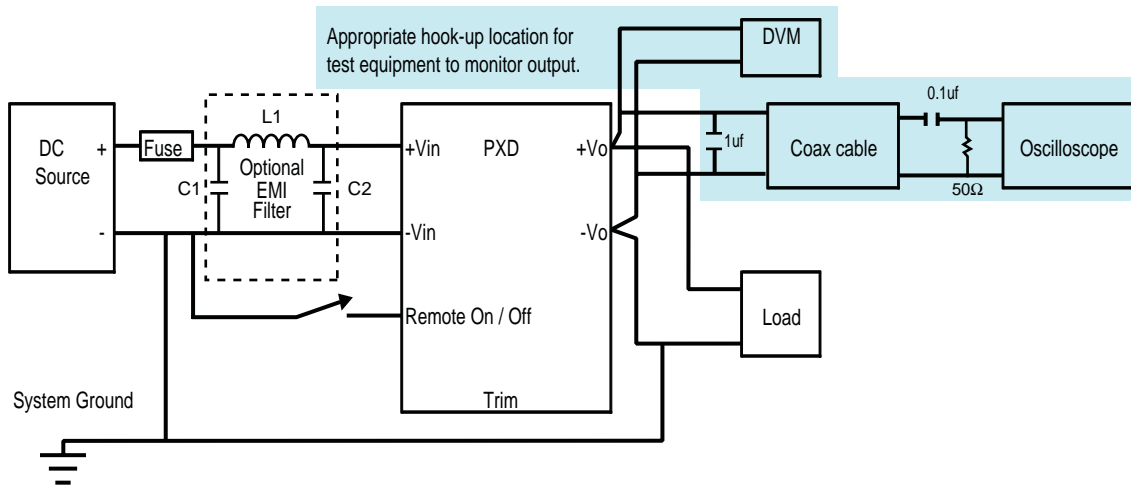
Flow soldering :  $260 \pm 10^\circ\text{C}$  less than 15 seconds  
Soldering iron :  $370 \pm 10^\circ\text{C}$  less than 5 seconds

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  $10^\circ\text{C}$  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 PXD 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
PXD10	22 $\mu$ F 100v Electrolytic	3.3 $\mu$ H	22 $\mu$ F, 100V Electrolytic
PXD15, PXD20	1 $\mu$ F, MLC	5.5 $\mu$ H	39 $\mu$ F 100V Electrolytic

## Minimum Load

The PXD20 does not require a minimum load for proper operation.

A 10% (of full load) minimum load is required on PXD10 and PXD15 models to meet the performance specifications. These models do not maintain regulation and operate properly under a no-load condition.

## Pin Assignments

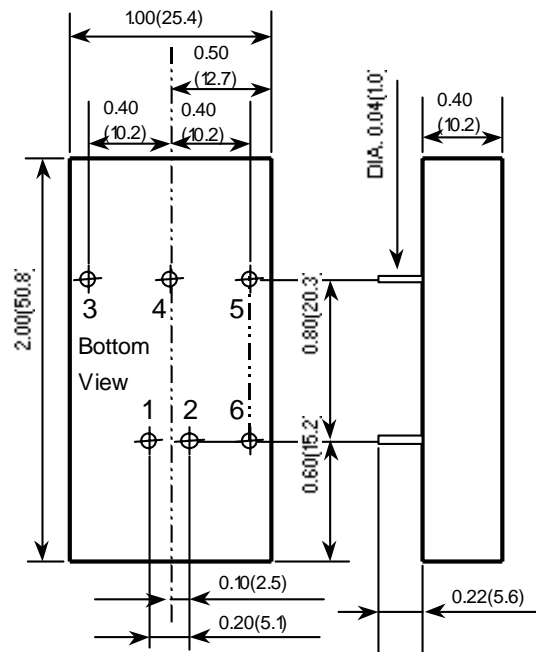
### 10 & 15 Watt

Pin	Connection
1	+ Input
2	- Input
3	+ Output
4	No Pin
5	- Output
6	Remote On / Off

### 20 Watt

Pin	Connection
1	+ Input
2	- Input
3	+ Output
4	Trim
5	- Output
6	Remote On / Off

## Outline Drawing



- All dimensions in Inches (mm)
- Pin Pitch tolerance  $\pm 0.014(0.35)$

## Remote On-Off Control

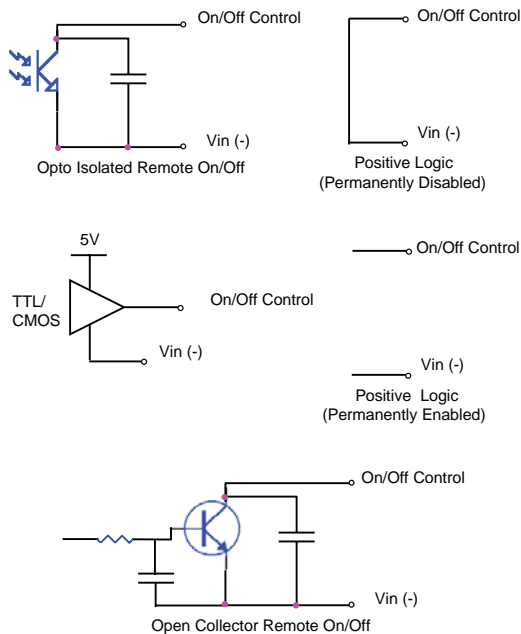
### Negative Logic

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 Von/off and the Vi(-) input terminal. With an open circuit, the module is normally off. To turn the module on, the voltage on the Von/off pin needs to be 0V-1.2V. The maximum current Ion/off should be limited to less than 200µA.

### 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 Von/off and the Vi(-) input terminal. With an open circuit the module is normally on. To turn the module off, the voltage on the Von/off pin needs to be 0V-1.2V. The maximum current Ion/off should be limited to less than 100µA.

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



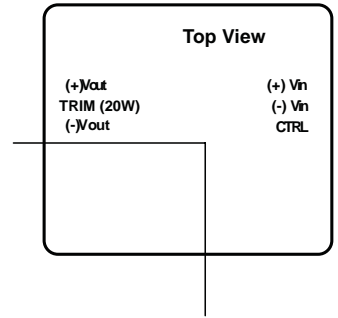
## Thermal Consideration

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

## Trim Tables

PXD20 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

cooling can be verified by measuring the case temperature. The case temperature (Tc) 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.

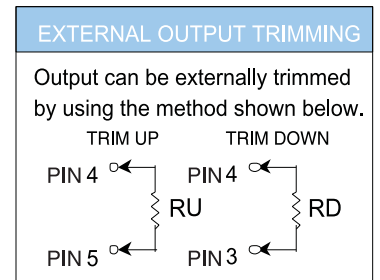
Flow Rate	Θ
Convection*	16.20°C/W
100LFM	12.98
200LFM	10.47
300LFM	8.47
400LFM	6.61
500LFM	6.12
Heatsink**	10.00

\* Mounted vertically  
\*\* Optional heatsink 7G0020A (includes adhesive pad)

## External Trim (output voltage adjustment, PXD20 - 20Watt only)

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.



## PXD20 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

## PXD20 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

## PXD20 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

## PXD20 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

## PXD20 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

## PXD20 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