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TDK·Lambda PXD60 Series

60W Single and Dual Output DC-DC converters

https://product.tdk.com/en/power/pxd
www.emea.lambda.tdk.com/pxd





The PXD60 industrial DC-DC converters feature wide 4:1 input ranges in a compact 2 x 1" (50.8 x 25mm) industry standard package. With efficiencies up to 92%, the PXD60 series typically draws a low 3mA input current when the remote on/off function is used, prolonging battery life for portable equipment. The modules have six-sided shielding to reduce radiated noise.

Features	Benefits
• Wide 4:1 Input Range	• Supports Dual 12/24V or 24/48V System Voltages
• Compact 2" x 1" Industry Package	• Less Board Area Needed
• Certified to IEC/UL/CSA/EN 62368-1	• Suitable For Industrial Applications
• Low No Load Power Consumption	• Longer Battery Life
• Six Sided Shielding	• Reduces Radiated Noise

Model Selector

Model	Input Voltage (V)	Output Voltage (V)	Maximum Current (A)	Maximum Power (W)	No Load Input Current (mA)	Efficiency (%)	Maximum Load Capacitance (uF)
Single Outputs							
PXD60-24WS3P3	9 - 36	3.3	12	39.6	10	90	32,000
PXD60-48WS3P3	18 - 75	3.3	12	39.6	10	90	32,000
PXD60-24WS05	9 - 36	5	12	60	10	92	30,000
PXD60-48WS05	18 - 75	5	12	60	10	92	30,000
PXD60-24WS12	9 - 36	12	5	60	10	92	5,850
PXD60-48WS12	18 - 75	12	5	60	10	92	5,850
PXD60-24WS15	9 - 36	15	4	60	10	92	3,900
PXD60-48WS15	18 - 75	15	4	60	10	92	3,900
PXD60-24WS24	9 - 36	24	2.5	60	10	92	2,000
PXD60-48WS24	18 - 75	24	2.5	60	10	91	2,000
Dual Outputs							
PXD60-24WD12	9 - 36	±12	±2.5	60	10	91	±3,900
PXD60-48WD12	18 - 75	±12	±2.5	60	10	91	±3,900
PXD60-24WD15	9 - 36	±15	±2	60	10	91	±2,400
PXD60-48WD15	18 - 75	±15	±2	60	10	91	±2,400
PXD60-24WD24	9 - 36	±24	±1.25	60	10	91	±1,000
PXD60-48WD24	18 - 75	±24	±1.25	60	10	91	±1,000

PXD	60	-24W	S	05	-N	-HC2

60	60W Output Power

-24W	9 - 36V input
-48W	18 - 75V input

S	Single Output
D	Dual Output

3P3	3.3V Output Voltage
05	5V Output Voltage
12	12V Output Voltage
15	15V Output Voltage
24	24V Output Voltage

Blank	Positive Logic Remote On/Off
-N	Negative Logic Remote On/Off

Blank	No heatsink fitted
-HC1	Factory installed heatsink with 7.62mm fins
-HC2	Factory installed heatsink with 12.7mm fins
-HC3	Factory installed heatsink with 20.32mm fins

Preferred model

Example: PXD60-24WS3P3-N-HC2

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Related Products

Type	Part Number	Description
Heatsink kit (User installation)	ACC-PX2X1-HC01	HC1 heatsink, thermal pad and 2 clips
Heatsink kit (User installation)	ACC-PX2X1-HC02	HC2 heatsink, thermal pad and 2 clips
Heatsink kit (User installation)	ACC-PX2x1-HC03	HC3 heatsink, thermal pad and 2 clips

Specifications

Model		PXD60
Input		
Input Voltage Range	-	See model selector table
Input Surge Voltage	Vdc	-24W models: 50, -48W models: 100. (1s maximum)
Input Shutdown Voltage	Vdc	-24W models: 7 - 8.8, -48W models: 15 - 17.5
Start-up Time	ms	60 typical
No Load Current Consumption	-	See model selector table. Typically 3mA if remote on/off is activated
Efficiency	-	See model selector table
Conducted & Radiated EMI	-	EN55032. See instruction manual on website for external circuitry
Immunity	-	See immunity section
Safety Certifications and Markings	-	IEC/UL/CSA/EN62368-1, CE Mark and UKCA Mark

Immunity

Test	Standard	Test Level	Criteria	Notes
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	A	-
Radiated Susceptibility	EN61000-4-3	20V/m	A	-
Electrical Fast Transient Burst	EN61000-4-4	± 2kV	A	With an input filter of two 220uF capacitors and a TVS (SMDJ58A for PXD60-24W or SMDJ120A for PXD60-48W)
Surge	EN61000-4-5	± 2kV	A	
Conducted Susceptibility	EN61000-4-6	10 Vrms	A	-
Magnetic Fields	EN61000-4-8	100A/m continuous; 1000A/m 1s	A	-

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Specifications

Model		PXD60
Output		
Output Voltage Tolerance	%	±1
Output Voltage Adjustment	%	Single output only. 3.3V-12V, 48V: ±10, 15V-24V: -10/+20, No adjustment on dual output models.
Switching Frequency	kHz	225 - 275
Line Regulation	%	±0.2
Load Regulation	%	Single output: ±0.5 Dual output: ±1
Cross Regulation	%	Dual output: ±5 (Asymmetrical 25% to 100% load change)
External Load Capacitance	-	See model selector table
Ripple & Noise (1)	mVp-p	Single output: 3.3-5V outputs: <100, 12-15V outputs: <150, 24V outputs: <200
Temperature Coefficient	%/°C	±0.02
Minimum Load	-	No minimum load required
Transient Loading	-	250us recovery time for a 25% load change
Overcurrent Protection	%	150, hiccup mode
Overvoltage Protection	V	Zener clamp method. 3.3 V: 3.9, 5V: 6.2, 12V: 15, 15V: 20, 24V: 30 (typical)
Overtemperature Protection	°C	Shutdown, typically 115
Remote Sense		No remote sense
Remote On/Off	-	Positive Logic (Blank): ON: Open or 3-12V, OFF Short or 0-1.2V Negative Logic (-N suffix): ON: Short or 0-1.2V, OFF: Open or 3-12V
Environmental		
Operating Temperature (2)	°C	-40 to +105 - see derating section and instruction manual on website (Confirm case temperatures in end system)
Maximum Case Temperature	°C	105 (Overtemperature Protection 115)
Thermal Impedance	°C/W	No heatsink: 10.8, -HC1: 8.3, -HC2: 7.0, -HC3: 5.7
Storage Temperature	°C	-55 to +125
Humidity (non condensing)	%RH	5 - 95 (Operating & Storage)
Cooling	-	Convection or forced air
Altitude	m	5,000 (operating)
Withstand Voltage (For 1 minute)	Vdc	Input to output to case 1,600
Isolation Capacitance	pF	<2200
Vibration (Operating)	-	MIL-STD-810F
Thermal Shock	-	MIL-STD-810F
Other		
Weight (Typ)	g	33 (no heatsink fitted)
Size (LxWxH)	mm	50.8 x 25.4 x 10.2 (no heatsink fitted)
Size (LxWxH)	Inches	2 x 1 x 0.4 (no heatsink fitted)
Case Material	-	Copper
MTBF - MIL-HDBK-217F, Full Load	Hours	858,200
Warranty	Years	3

Notes

See website for detailed specifications, test methods and installation manual

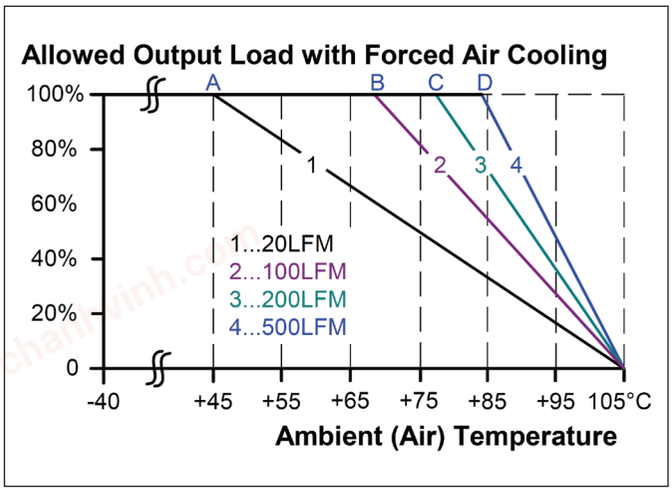
(1) Measured with a 20MHz bandwidth oscilloscope across an X7R multi-layer ceramic capacitor. 10uF/25V for 3.3 to 15V outputs, 4.7uF/50V for 24V output models

(2) The case temperature must be confirmed in end application. The product rating may be affected by airflow direction and physical obstructions near the module.

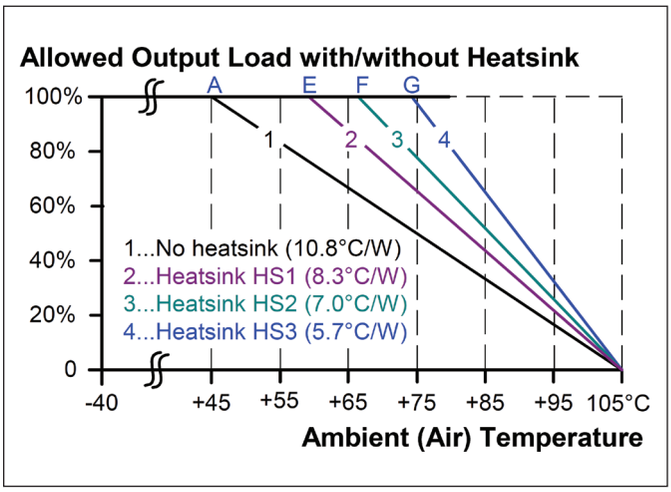
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Derating Section

PXD60-48WS12 - Derating Diagram



PXD60-48WS12 - Derating Diagram

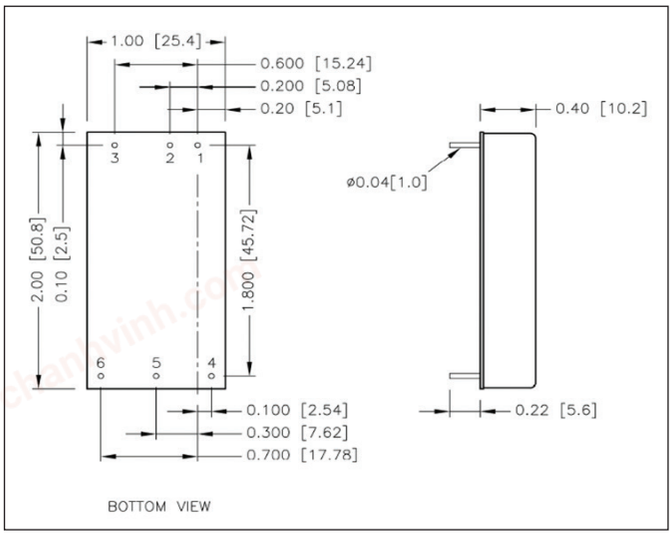


The required power reduction depends on the individual device. The example shows the PXD60-48WS12. The points A to G describe the temperatures at which the power reduction starts. For other models, these points can be taken from the table.

Derating Starting Point	A 20LFM (convection)	B 100LFM	C 200LFM	D 500LFM	E with HC1	F with HC2	G with HC3
PXD60-24WS3P3	61°C	77°C	85°C	89°C	71°C	77°C	82°C
PXD60-24WS05	50°C	70°C	80°C	85°C	62°C	69°C	76°C
PXD60-24WS12	43°C	67°C	77°C	82°C	58°C	65°C	72°C
PXD60-24WS15	51°C	72°C	80°C	85°C	64°C	70°C	77°C
PXD60-24WS24	51°C	72°C	80°C	85°C	64°C	70°C	77°C
PXD60-24WD12	39°C	65°C	75°C	81°C	55°C	62°C	70°C
PXD60-24WD15	50°C	71°C	80°C	84°C	62°C	69°C	76°C
PXD60-24WD24	48°C	70°C	78°C	84°C	61°C	68°C	75°C
PXD60-48WS3P3	61°C	77°C	85°C	89°C	71°C	77°C	82°C
PXD60-48WS05	50°C	70°C	80°C	85°C	62°C	69°C	76°C
PXD60-48WS12	45°C	68°C	77°C	84°C	59°C	66°C	73°C
PXD60-48WS15	44°C	67°C	77°C	82°C	58°C	65°C	73°C
PXD60-48WS24	45°C	68°C	78°C	83°C	59°C	66°C	73°C
PXD60-48WD12	39°C	65°C	75°C	81°C	55°C	62°C	70°C
PXD60-48WD15	45°C	68°C	78°C	83°C	58°C	66°C	73°C
PXD60-48WD24	48°C	70°C	79°C	84°C	61°C	68°C	75°C

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Outline Drawing



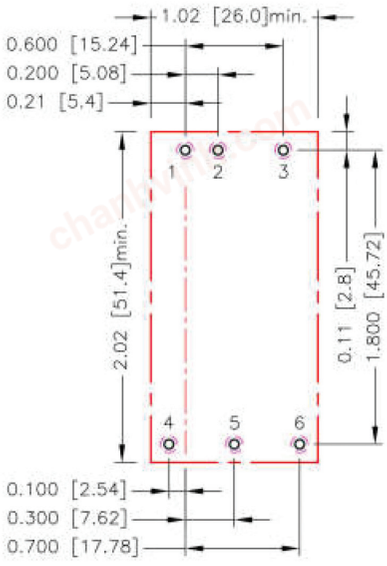
Pinout

PIN	Function	
	Single	Dual
1	+Vin	
2	-Vin	
3	Ctrl	
4	+Vout	
5	-Vout	Com
6	Trim	-Vout

1. All dimensions in inch (mm)
   Tolerance: x.xx±0.02 [x.x ± 0.5]
   x.xx±0.02 [x.x ± 0.25]
2. Pin dimension tolerance ±0.004 [0.10]

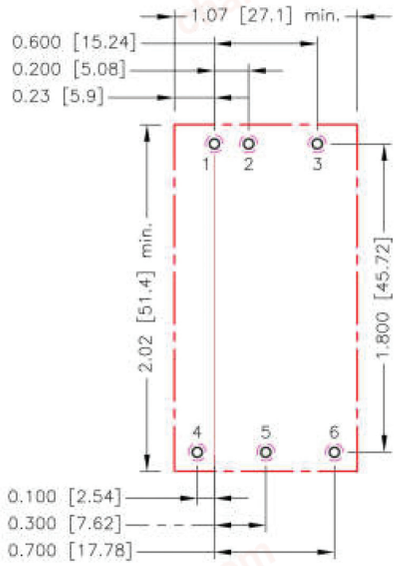
Recommended PCB Layout

Standard



Recommended PCB Layout

-HC1、-HC2、-HC3

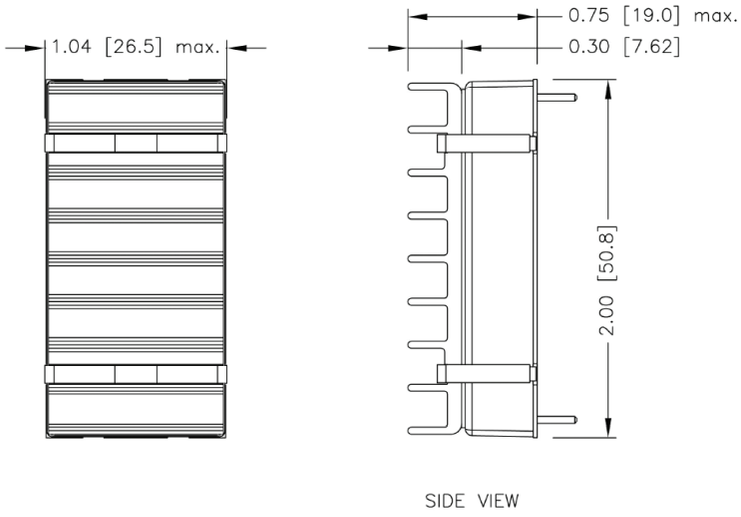


All dimensions in inch[mm]
Pad size(lead free recommended)
Through hole 1.2.3.4.5.6: Φ0.051[1.30]
Top view pad 1.2.3.4.5.6: Φ0.064[1.63]
Bottom view pad 1.2.3.4.5.6: Φ0.102[2.60]

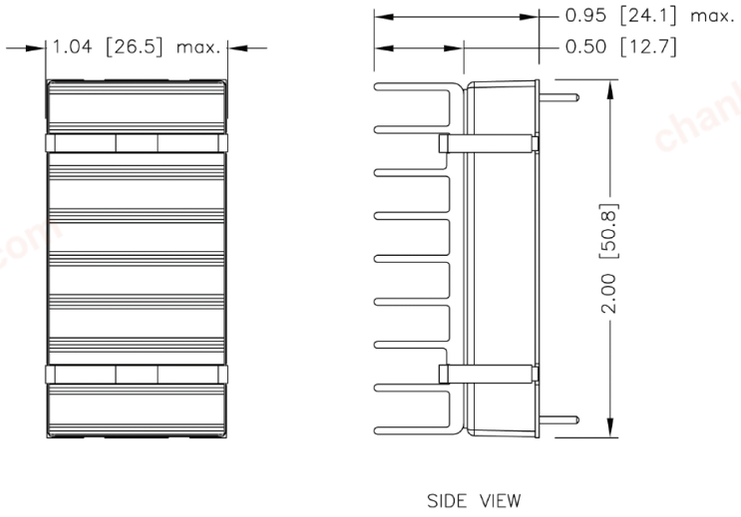
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Heat-Sink Type Options

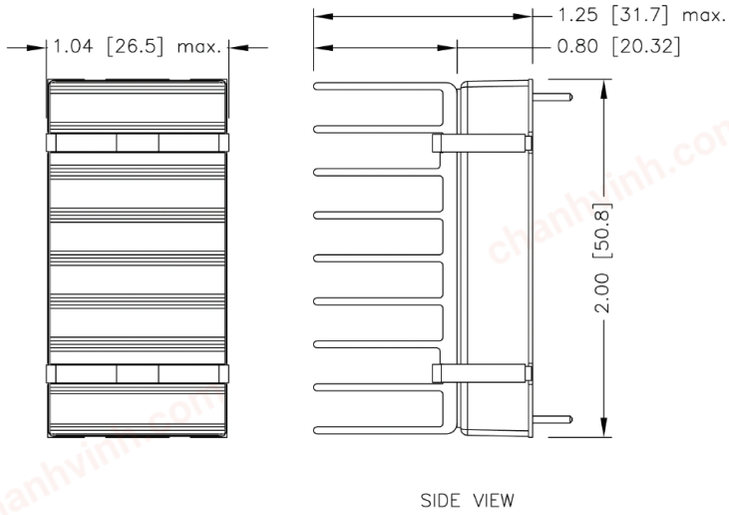
HC1



HC2



HC3



1. All dimensions in inch [mm]
2. Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.010 [x.xx±0.25]

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