

PXD40 Series Instruction and Application Manual



Content:

- 1. Product Description.....2
- 2. Product Features2
- 3. Intended Use2
- 4. Installation Instructions3
- 5. Functional Description4
- 6. Functional Diagram.....5
- 7. Typical Wiring Scheme.....5
- 8. Product Nomenclature and List of Models6
- 9. Short-form Data7
- 10. Physical Dimensions and Pin Layout:.....8
- 11. Isolation and Dielectric Strength.....8
- 12. Protection Features9
- 13. Approvals and Regulatory Compliances9
- 14. Thermal Consideration and Derating10
- 15. EMC Considerations11
- 16. Remote ON/OFF Function12
- 17. Output Voltage Adjustment.....13
- 18. Accessory – Heatsink Kits14
- 19. Cleaning Process and Soldering Profile.....15

All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

1. PRODUCT DESCRIPTION

The PXD40 series are board mount 40W DC-DC converters in a rugged 2 x 1 inch housing with silicone potting. They provide a regulated and galvanically isolated output, available as either single voltage or \pm dual output voltages.

The most outstanding features of this series are the wide input voltage ranges from 9V to 36V (4:1) for the 24V and 18V to 75V (4:1) for the 48V input voltage models as well as the six-sided shielding, that makes the device immune to external EMC interference.

The wide allowed case temperature range from -40°C to $+105^{\circ}\text{C}$, the low heat generation, due to the high efficiencies up to 93% and the high shock and vibration resistance thanks to the potted design make this device suitable for nearly every situation. Additionally available fitted heat sinks simplify the design-in process in the end device.

Applications for this DC-DC converter can be found in Distributed Power Architecture (DPA), telecommunications, battery-powered devices, measurement and laboratory equipment, devices in industrial environments, and many other areas.

2. PRODUCT FEATURES

- 2 x 1 Inch (50.8 x 25.4mm) Industry Standard Footprint
- 1600Vdc Input to Output Isolation
- 9-36V or 18-75V (4:1) Wide-range Input
- Single or \pm Dual Output Voltages Available
- IEC 62368-1 (ICT) Approved
- High Shock and Vibration Resistance due to Potted Design
- Six-sided Shielding
- Efficiency up to 93% and Low No-load Power Consumption
- -40 to $+105^{\circ}\text{C}$ Operating Case Temperature Range
- Fitted or Accessory Heat Sink Options Available
- Remote ON/OFF Input, Only 3mA Current Draw in OFF-Mode

3. INTENDED USE

This device is designed and manufactured as a component part to be mounted on a pc-board and to be installed in electronic devices.

This device is intended for commercial use, such as in industrial control, process control, monitoring and measurement equipment or the like.

Do not use this device in equipment, where malfunctioning may cause severe personal injury or threaten human life without additional appropriate safety devices, that are suited for the end-application.

If this device is used in a manner outside of its specification, the protection provided by the device may be impaired.

4. INSTALLATION INSTRUCTIONS

Before operating this device, please read this manual thoroughly and retain for future reference! This device may only be installed and put into operation by qualified personnel. If damage or malfunction should occur during operation, immediately turn power off and send device to the factory for inspection. The device does not contain serviceable parts.

⚠ WARNING Risk of electrical shock, fire, personal injury or death.

Turn power off before working on the device. Protect against inadvertent re-powering.

Do not modify or repair the unit.

Do not open the unit as high voltages are present inside.

Use caution to prevent any foreign objects from entering the housing.

Do not use in locations where flammable gas or ignitable substances are present.

Do not use in wet locations or in areas where moisture or condensation can be expected.

Do not use in environment with strong electromagnetic field, corrosive gas or conductive substances or direct sunlight.

Do not touch during power-on, and immediately after power-off. Hot surfaces may cause burns.

Obey the following installation instructions:

This device may only be installed and put into operation by qualified personnel.

This device does not contain serviceable parts. Replace fuses only when explicitly permitted. If damage or malfunction should occur during installation or operation, immediately turn power off and send unit to the factory for inspection.

Install the device in an enclosure providing protection against electrical, mechanical and fire hazards.

The device is designed for pollution degree 2 areas in controlled environments. No condensation or frost is allowed.

The input can be powered from batteries or similar DC sources.

Check for correct input polarity. The device will get damaged when the voltage is reversed.

Ensure sufficient cooling to avoid overloading the device.

The device is designed for altitudes up to 5000m (16400ft).

This device is not internally fused. An external input fuse must always be used. Use an 8A fast-acting fuse for models with 24V input and a 4A slow-blow fuse for models with 48V input.

The maximum operational case temperature is +105°C (+221°F). The case temperature is defined in the middle of the top side of the cover.

The device is designed to operate in areas between 5% and 95% relative humidity.

5. FUNCTIONAL DESCRIPTION

The output is electronically protected against no-load, overload and short circuit. In case of an overload or short circuit, the device will operate intermittently (hiccup mode).

The device can supply resistive and inductive loads.

Avoid loads with large input capacitances. If the capacitive load is higher than the values specified, the device operates in an intermittent mode (hiccup mode).

PXD40-24WS3P3,	PXD40-48WS3P3:	max. 22000 μ F
PXD40-24WS05,	PXD40-48WS05:	max. 12000 μ F
PXD40-24WS12,	PXD40-48WS12:	max. 2000 μ F
PXD40-24WS15,	PXD40-48WS15:	max. 1300 μ F
PXD40-24WS24,	PXD40-48WS24:	max. 490 μ F
PXD40-24WS48,	PXD40-48WS48:	max. 120 μ F
PXD40-24WD12	PXD40-48WD12:	max. \pm 980 μ F
PXD40-24WD15	PXD40-48WD15:	max. \pm 630 μ F
PXD40-24WD24	PXD40-48WD24:	max. \pm 250 μ F

The \pm output voltage is generated by one converter. The sum of the two voltages is regulated. The power can be drawn asymmetrically but it is recommended that the less loaded output should take a minimum of 5% of the total load.

For single output voltage models, the output voltage can be adjusted with an external resistor connected between the TRIM-pin and the output voltage.

The device is equipped with an over-temperature protection. In case of a high temperature, the output shuts down and starts automatically after cooling off.

The device is equipped with under-voltage protection on the input side. If the input voltage is too low, the device does not start or switches off.

In case of an internal defect, a redundant circuit prevents the output voltage from becoming excessive or dangerous (zener diode protection).

The device is equipped with a remote ON/OFF function. Link the RC-pin and $-V_{in}$ to turn the output off (standard configuration).

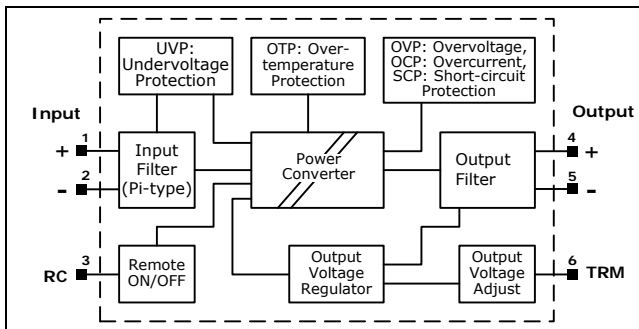
Do not apply return voltages from the load to the output terminals.

Do not connect the outputs of multiple devices in parallel for higher output currents.

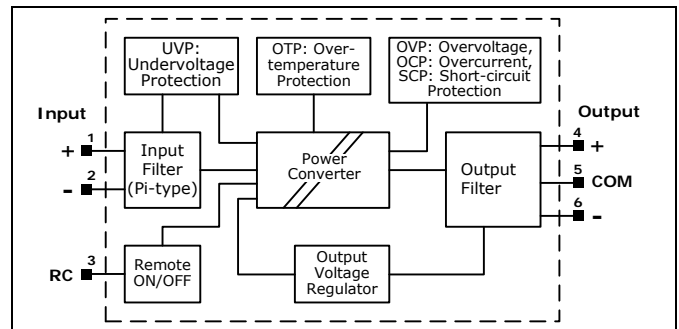
Do not connect the outputs of multiple devices in a series connection for higher output voltages.

Do not connect batteries for charging purposes to the output of the device.

6. FUNCTIONAL DIAGRAM



Functional diagram for models with a single output voltage

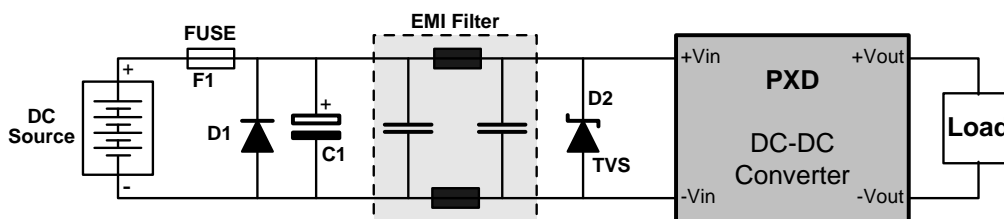


Functional diagram for models with dual output voltages

RC: Remote ON/OFF control pin

TRM: Trim pin for output voltage adjustment

7. TYPICAL WIRING SCHEME



Fuse F1: The DC-DC converter is not internally fused. An external input fuse must always be used. Use an 8A fast-acting fuse for models with 24V input and a 4A slow-blow fuse for models with 48V input.

Diode D1: The diode provides a reverse input polarity protection. In case of a reversed polarity, the fuse will open and protect the converter.

In applications where the input voltage can be reversed, it is advisable to install such a protection. Schottky diodes are most suitable for this purpose. The current should be at least 1.5 times the tripping current of the fuse. The voltage rating of the diode should be at least equal to the maximum possible input voltage.

Capacitor C1 and Diode D2: These two components provide higher transient resistance at the input. The capacitor should be 220µF and the suppressor diode should be either a 58V type (for devices with 24V input) or a 120V type (for devices with 48V input).

EMI Filter: This filter reduces the conducted emission to the input. Circuit examples for a class A or a more stringent class B filter can be found in the chapter "EMC Considerations".

All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

8. PRODUCT NOMENCLATURE AND LIST OF MODELS

Product Nomenclature:

PX	a	bb	-	ccc	d	ee	-	z
Family Name	Size	Output Power		Input Voltage	Output Type	Output Voltage		Options
PX	D = 2 x 1"	40 = 40W		24W = 9 - 36V 48W = 18 - 75V	S = Single Output D = Dual Output	3P3 = 3.3V 05 = 5V 12 = 12V or ±12V 15 = 15V or ±15V 24 = 24V or ±24V 48 = 48V		Remote ON/OFF: Blank = Pos. Logic N = Negative Logic

Model list:

PXD40-24WS3P3	DC-DC converter isolated, 40W, Input: 9-36V, Output: 3.3V 12.2A, 2x1 inch, pcb-mount
PXD40-24WS05	DC-DC converter isolated, 40W, Input: 9-36V, Output: 5V 8A, 2x1 inch, pcb-mount
PXD40-24WS12	DC-DC converter isolated, 40W, Input: 9-36V, Output: 12V 3.3A, 2x1 inch, pcb-mount
PXD40-24WS15	DC-DC converter isolated, 40W, Input: 9-36V, Output: 15V 2.67A, 2x1 inch, pcb-mount
PXD40-24WS24	DC-DC converter isolated, 40W, Input: 9-36V, Output: 24V 1.67A, 2x1 inch, pcb-mount
PXD40-24WS48	DC-DC converter isolated, 40W, Input: 9-36V, Output: 48V 0.83A, 2x1 inch, pcb-mount
PXD40-24WD12	DC-DC converter isolated, 40W, Input: 9-36V, Output: ±12V ±1.67A, 2x1 inch, pcb-mount
PXD40-24WD15	DC-DC converter isolated, 40W, Input: 9-36V, Output: ±15V ±1.33A, 2x1 inch, pcb-mount
PXD40-24WD24	DC-DC converter isolated, 40W, Input: 9-36V, Output: ±24V ±0.83A, 2x1 inch, pcb-mount
PXD40-48WS3P3	DC-DC converter isolated, 40W, Input: 18-75V, Output: 3.3V 12.2A, 2x1 inch, pcb-mount
PXD40-48WS05	DC-DC converter isolated, 40W, Input: 18-75V, Output: 5V 8A, 8x1 inch, pcb-mount
PXD40-48WS12	DC-DC converter isolated, 40W, Input: 18-75V, Output: 12V 3.33A, 2x1 inch, pcb-mount
PXD40-48WS15	DC-DC converter isolated, 40W, Input: 18-75V, Output: 15V 2.67A, 2x1 inch, pcb-mount
PXD40-48WS24	DC-DC converter isolated, 40W, Input: 18-75V, Output: 24V 1.67A, 2x1 inch, pcb-mount
PXD40-48WS48	DC-DC converter isolated, 40W, Input: 18-75V, Output: 48V 0.83A, 2x1 inch, pcb-mount
PXD40-48WD12	DC-DC converter isolated, 40W, Input: 18-75V, Output: ±12V ±1.67A, 2x1 inch, pcb-mount
PXD40-48WD15	DC-DC converter isolated, 40W, Input: 18-75V, Output: ±15V ±1.33A, 2x1 inch, pcb-mount
PXD40-48WD24	DC-DC converter isolated, 40W, Input: 18-75V, Output: ±24V ±0.83A, 2x1 inch, pcb-mount

All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

9. SHORT-FORM DATA

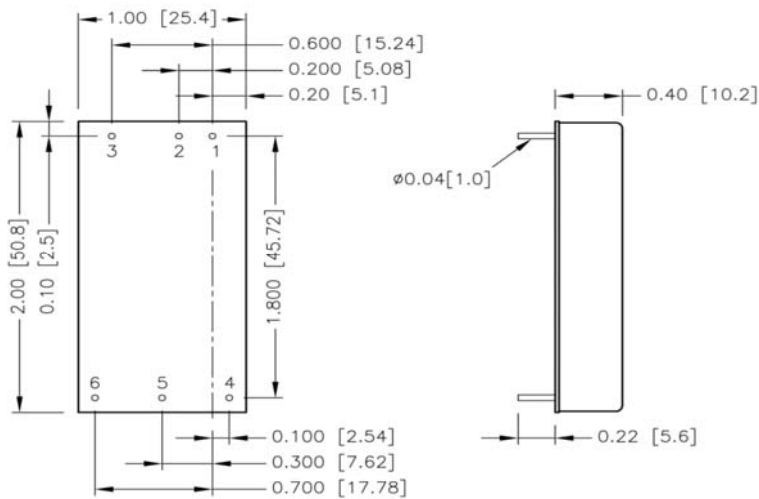
Input voltage range	Min.	9Vdc	For 24V input voltage models
	Nom.	24Vdc	
	Max.	36Vdc	
	Min.	18Vdc	For 48V input voltage models
	Nom.	48Vdc	
	Max.	75Vdc	
Input current at no load	Max.	15mA	For 24V input voltage models
	Max.	10mA	For 48V input voltage models
Input current at remote OFF	Typ.	3mA	For all models
Output power	Max.	40W	For all models
Output current	Nom.	See model list	The value is the nominal current which must not be exceeded even at lower output voltages. At higher voltages, the current is reduced according to the nominal power.
Output voltage adjustment range		Not adjustable -10%/+20% ±10%	For dual output models For 15V and 24V output models All remaining models
Output voltage accuracy		±1%	Factory setting
Line regulation		±0.2%	Between 9-36Vdc or 18-75Vdc
Load regulation		±0.3%	For single output models
		±0.5%	For dual output models
Transient response recovery time		250µs	For 25% load steps
Cross regulation (dual models)		±5%	Asymmetrical load 25%/100%
Temperature coefficient		±0.02%/°C	
Start-up time	Typ.	30ms	For resistive load, after applying an input voltage or remote ON signal
	Max.	60ms	
Ripple and noise voltage	Typ.	75mVp-p	For 3.3V and 5V outputs
	Typ.	100mVp-p	For 12V and 15V outputs
	Typ.	150mVp-p	For 24V output
	Typ.	300mVp-p	For 48V output Bandwidth 20MHz, and 1µF capacitor
Efficiency		89.5% to 93%	At full load, depending on the model
Operational temperature range		-40°C to +105°C	See chapter "Thermal Considerations" for derating requirements
Case temperature	Max.	+105°C	
Storage temperature rang		-55°C to +125°C	
Relative humidity		5% to 95%	No condensation allowed
Altitude	Max.	5000m / 16 400ft	
Atmospheric pressure		110-54kPa	
Vibration		20Hz-1kHz:0.04g ² /Hz	According to MIL-STD-810F, random vibration, units are operational
		1-2kHz: -6dB/octave 60 minutes per axis	
Shock		50 g, 11 ms	According to MIL-STD-810F, units are operational
		18 shocks (3 shocks for each ±axis)	
Size		50.8x 25.4x 10.2mm 2 x 1 x 0.4"	Length x Width x Height
Weight		34g / 0.075lb	
MTBF		1 245 000h	According to MIL HDBK 217F at full load

All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

10. PHYSICAL DIMENSIONS AND PIN LAYOUT:

Length	50.8mm, 2.0"
Width	25.4mm, 1.0"
Height	10.2mm, 0.4" without heatsink 19mm, 0.75" with heatsink kit ACC-PX2X1-HC01 24.1mm, 0.95" with heatsink kit ACC-PX2X1-HC02 31.7mm, 1.25" with heatsink kit ACC-PX2X1-HC03
Weight	34g / 0.075lb (without heat sink)
Case Material	Copper (six sided)
Potting Material	Silicone



All dimensions in inch [mm]

Mechanical tolerances:

- $x.xx \pm 0.02$ [$x.x \pm 0.5$]
- $x.xxx \pm 0.010$ [$x.xx \pm 0.25$]
- Pin diameter ± 0.004 [0.10]

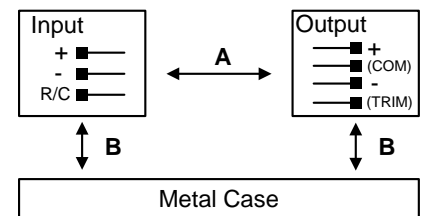
Pad size recommendations (all pads)

- Through hole: Φ 0.051 [1.30]
- Top view pad: Φ 0.064 [1.63]
- Bottom view pad: Φ 0.102 [2.60]

11. ISOLATION AND DIELECTRIC STRENGTH

The output voltage is floating and has no ohmic connection to the input or the case.

Hi-pot tests may be repeated by the customer using appropriate test equipment, which applies the voltage with a slow ramp (2s up and 2s down). Connect all input-terminals together as well as all output poles before conducting the test.



Dielectric strength	Min.	1600Vdc	Input to output (A) for 1 minute
	Min.	1600Vdc	Input or output to case (B) for 1 minute
Isolation resistance	Min.	1 GΩ	Measured at 500Vdc
Isolation capacitance	Max.	1500pF	

All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

12. PROTECTION FEATURES

Under voltage protection (UVP) Turn-On voltage	Max. 9Vdc Max. 18Vdc	For 24V input voltage models For 48V input voltage models
Under voltage protection (UVP) Shut-down voltage	Min. 7.0Vdc Typ. 8.0Vdc Max. 8.8Vdc Min. 15Vdc Typ. 16Vdc Max. 17.5Vdc	For 24V input voltage models For 48V input voltage models
Input surge voltage	Min. 50Vdc Min. 100Vdc	For 24V input voltage models, maximal 1s For 48V input voltage models, maximal 1s
Output over voltage protection (OVP)	3.9Vdc 6.2Vdc 15Vdc 20Vdc 30Vdc 60Vdc	Zener diode type For 3.3V output For 5V output For 12V output For 15V output For 24V output For 48V output
Output over-current protection (OCP)	Typ. 150% of nominal output current	Intermittent operation (hiccup mode)
Output short-circuit protection (SCP)	Included	Automatic recovery
Over temperature protection (OTP)	Typ. 115°C	Case temperature
Reverse input polarity protection	Not included	Use external protection diode if required
Degree of pollution	2	According to IEC 60664-1, not conductive

13. APPROVALS AND REGULATORY COMPLIANCES

CE	EU Declaration of Conformity includes Low-Voltage and RoHS Directive
UKCA	UK Declaration of Conformity includes Electrical Safety and RoHS Directive
EN 62368-1	Safety requirements for audio/video, information and communication technology equipment
UL 62368-1	Recognized component for audio/video, information and communication technology equipment, E-File E133400, Categories QQJQ2 and QQJQ8

All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

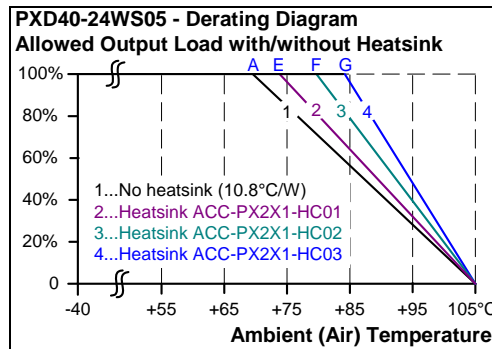
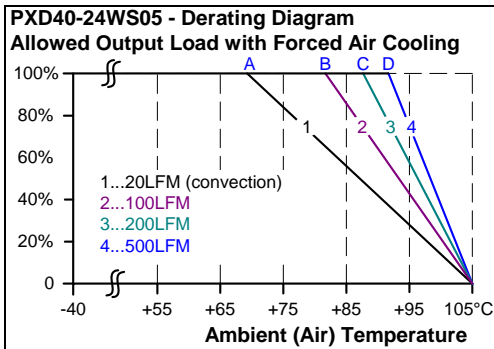
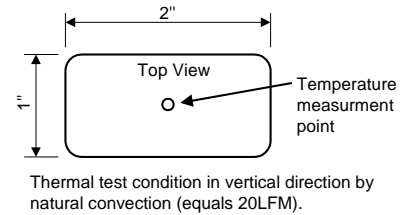
14. THERMAL CONSIDERATION AND DERATING

The DC-DC converters operate over a wide temperature range. Even if the heat generated by the DC-DC converters are very low, it must be removed. This can be done either by convection cooling, forced air cooling or the use of an additional heatsink (see chapter accessory).

It is important that the enclosure temperature at the indicated location does not exceed the maximum enclosure temperature, which is 105°C.

If no additional heatsink is fitted, the DC-DC converter can be used with the load values given in the derating diagram below. 20LFM corresponds to convection cooling in a vertical mounting position. All other curves (100-500 LFM) require forced airflow through a fan.

The derating is not hardware controlled. The user has to take this into consideration to stay below the de-rated current limits in order not to overload the unit.



The required power reduction depends on the individual device. The example shows the PXD40-24WS05. 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 heatsink ACC-PX2X1- HC01	F with heatsink ACC-PX2X1- HC02	G with heatsink ACC-PX2X1- HC03
PXD40-24WS3P3	53°C	73°C	82°C	86°C	57°C	62°C	65°C
PXD40-24WS05	69°C	83°C	88°C	92°C	74°C	81°C	84°C
PXD40-24WS12	68°C	82°C	88°C	91°C	73°C	80°C	83°C
PXD40-24WS15	71°C	84°C	90°C	93°C	76°C	83°C	87°C
PXD40-24WS24	56°C	78°C	85°C	89°C	60°C	65°C	68°C
PXD40-24WD12	63°C	79°C	86°C	89°C	67°C	74°C	77°C
PXD40-24WD15	64°C	80°C	87°C	90°C	69°C	75°C	78°C
PXD40-24WD24	63°C	79°C	87°C	90°C	67°C	74°C	77°C
PXD40-48WS3P3	55°C	74°C	82°C	87°C	59°C	64°C	67°C
PXD40-48WS05	63°C	79°C	86°C	89°C	67°C	74°C	77°C
PXD40-48WS12	68°C	82°C	88°C	91°C	73°C	80°C	83°C
PXD40-48WS15	73°C	85°C	91°C	94°C	78°C	85°C	89°C
PXD40-48WS24	66°C	81°C	87°C	90°C	71°C	77°C	81°C
PXD40-48WD12	63°C	79°C	86°C	90°C	67°C	74°C	77°C
PXD40-48WD15	63°C	80°C	86°C	90°C	67°C	74°C	77°C
PXD40-48WD24	67°C	82°C	87°C	91°C	72°C	78°C	82°C

All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

15. EMC CONSIDERATIONS

In terms of EMC, this DC-DC converter module is considered a component for installation in an end device by a device manufacturer. In order to meet all the requirements of the end device, additional components may have to be deployed and final EMC measurements must be carried out in the end application.

The following tests and measurements were performed according to EN 55032 (emission) and EN 55024 (immunity). All tests and measurements were carried out with standardized test set-ups.

EMC Immunity

Electrostatic discharge	EN 61000-4-2	Air discharge Contact discharge	±8kV ±6kV	Criterion A Criterion A
Electromagnetic RF field	EN 61000-4-3	80MHz-2.7GHz	10V/m	Criterion A
Fast transients (Burst)	EN 61000-4-4	With additional components see note 1)	±2kV	Criterion A
Surge voltage	EN 61000-4-5	With additional components see note 1)	±2kV	Criterion A
Conducted disturbance	EN 61000-4-6	0.15-80MHz	10V	Criterion A
Power frequency magnetic field	EN 61000-4-8	Continuous For 1 second	100A/m 1000A/m	Criterion A Criterion A

Performance criterion A: The device shows normal operation behavior within the defined limits.

Note 1) Burst and surge tests were performed with the following additional external components:

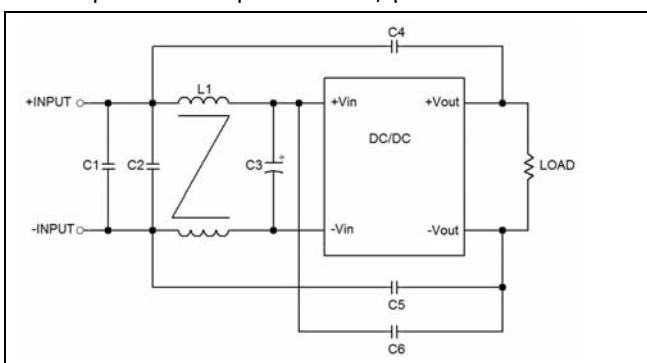
For 24V input models: 2 pcs. of electrolytic capacitor (NCC KY series, 220µF/100V) and a TVS (SMDJ58A, 58V, 3000 Watt peak pulse power) in parallel.

For 48V input models: 2 pcs. of electrolytic capacitor (NCC KY series, 220µF/100V) and a TVS (SMDJ120A, 120V, 3000 Watt peak pulse power) in parallel.

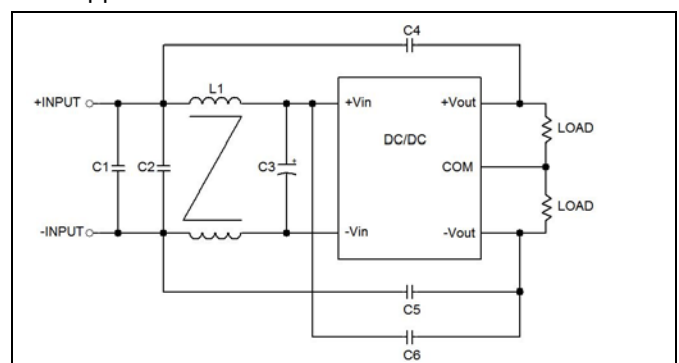
EMC Emission

Recommended external EMI filter for EN 55032 Class A

The placement of components and the routing of traces on the pc-board must be carried out according to EMC aspects. If help is needed, please contact our technical support team.



EN 55032 Class A filter for models with a single output voltage



EN 55032 Class A filter for models with a dual output voltages

BOM	C1	C2	C3	C4	C5	C6	L1
24V-Input models	-	10µF/50V 1210 MLCC	-	1000pF / Y1 TDK CD series	-	-	398µH, PMT-177
48V-Input models	2.2µF/100V 1210 MLCC	2.2µF/100V 1210 MLCC	100µF/100V Rubycon ZLH	330pF / Y1 TDK CD series	680pF / Y1 TDK CD series	330pF / Y1 TDK CD series	398µH, PMT-177

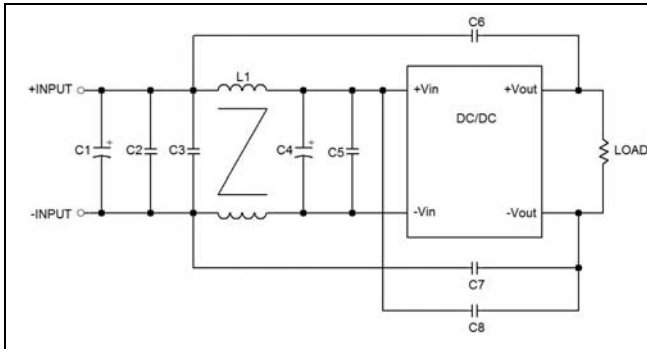
All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

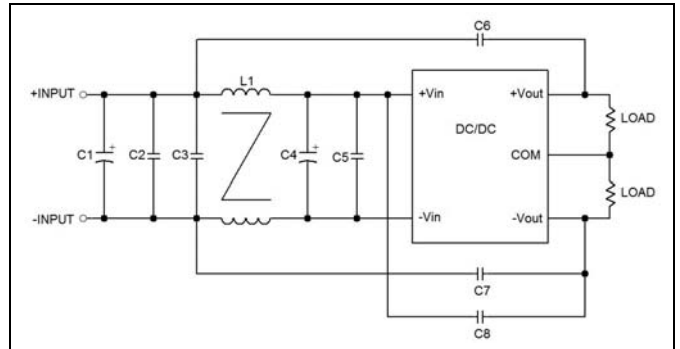
DC-DC Converter Isolated, 40W, 2x1", PCB Mount

Recommended external EMI filter for EN 55032 Class B

The placement of components and the routing of traces on the pc-board must be carried out according to EMC aspects. If help is needed, please contact our technical support team.



EN 55032 Class B filter for models with a single output voltage



EN 55032 Class B filter for models with a dual output voltages

BOM	C1	C2	C3	C4	C5	C6	C7	C8	L1
24V-Input models	-	-	10µF/50V 1210 MLCC	270µF/50V Rubycon ZLH	-	1000pF/ Y1 TDK CD series	470pF/ Y1 TDK CD series	680pF/ Y1 TDK CD series	398µH, PMT-177
48V-Input models	220µF/100V NCC KY	2.2µF/100V 1210 MLCC	2.2µF/100V 1210 MLCC	100µF/100V Rubycon ZLH	2.2µF/100V 1210 MLCC	1000pF/ Y1 TDK CD series	1000pF/ Y1 TDK CD series	680pF/ Y1 TDK CD series	398µH, PMT-177

Switching Frequency

Main converter	Min.	225kHz	Fixed frequency
	Typ.	250kHz	
	Max.	275kHz	

16. REMOTE ON/OFF FUNCTION

The device is equipped with a remote ON/OFF function to turn the output ON or OFF.

Two logics are possible. With the positive logic (standard version), the output switches OFF as soon as pin 2 (-Vin) and pin 3 (RC) are linked or a voltage of less than 1.2V is present.

The optionally available negative logic (option -N) is exactly the vice versa. Here the output switches ON as soon as pin 2 (-Vin) and pin 3 (RC) are linked or a voltage of less than 1.2V is present.

The RC-input is a sink input, which requires a minimal current of 0.5mA to be activated. The maximal allowed voltage (open circuit voltage) for this pin is 12Vdc.

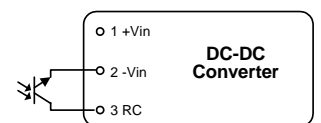
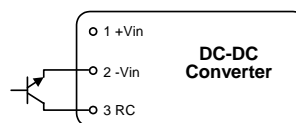
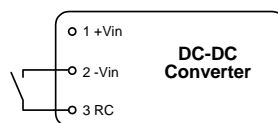
The input current in remote OFF mode is 3mA.

Positive logic (standard)

Converter ON: open or 3-12V
Converter FF: closed or 0-1.2V

Negative logic (option -N)

Converter ON: closed or 0-1.2V
Converter FF: open or 3-12V



All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

17. OUTPUT VOLTAGE ADJUSTMENT

For models with only one output, the output voltage can be adjusted in the range of $\pm 10\%$ (3.3V, 5V, 12V and 48V) or $-10\%/+20\%$ (15V and 24V).

To increase the output voltage, connect an external resistor between the TRIM-Pin and the negative output voltage (-Vout) and to decrease the voltage, connect the resistor between the TRIM-Pin and the positive output voltage (+Vout).

Choose a resistor with at least 1/8W of rated power.



Resistor values for adjusting the 3.3V output model (adjustment range $\pm 10\%$):

Output (V)	2.97	3.036	3.102	3.168	3.234	3.3V	3.366	3.432	3.498	3.564	3.630
R-up (Ω)	-	-	-	-	-	-	21758	8966	4325	1927	462
R-down (Ω)	715	2639	5841	12227	31256	-	-	-	-	-	-

Resistor values for adjusting the 5V output model (adjustment range $\pm 10\%$):

Output (V)	4.5	4.6	4.7	4.8	4.9	5V	5.1	5.2	5.3	5.4	5.5
R-up (Ω)	-	-	-	-	-	-	16244	6483	3198	1550	559
R-down (Ω)	656	1903	3984	8162	20817	-	-	-	-	-	-

Resistor values for adjusting the 12V output model (adjustment range $\pm 10\%$):

Output (V)	10.8	11.04	11.28	11.52	11.76	12V	12.24	12.48	12.72	12.96	13.2
R-up (Ω)	-	-	-	-	-	-	172175	66591	32068	14929	4685
R-down (Ω)	5157	17639	38371	79573	201116	-	-	-	-	-	-

Resistor values for adjusting the 15V output model (adjustment range $-10\%/+20\%$):

Output (V)	13.5	13.8	14.1	14.4	14.7	15V	15.6	16.2	16.8	17.4	18
R-up (Ω)	-	-	-	-	-	-	89445	34820	16568	7434	1951
R-down (Ω)	3916	11826	25055	51685	132978	-	-	-	-	-	-

Resistor values for adjusting the 24V output model (adjustment range $-10\%/+20\%$):

Output (V)	21.6	22.08	22.56	23.04	23.52	24V	24.96	25.92	26.88	27.84	28.8
R-up (Ω)	-	-	-	-	-	-	216605	83329	38099	15330	1619
R-down (Ω)	6454	26282	59383	125790	326672	-	-	-	-	-	-

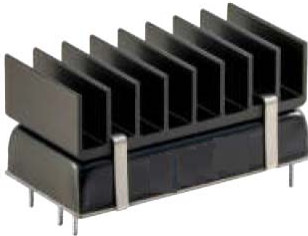
Resistor values for adjusting the 48V output model (adjustment range $\pm 10\%$):

Output (V)	43.2	44.16	45.12	46.08	47.04	48V	48.96	49.92	50.88	51.84	52.80
R-up (Ω)	-	-	-	-	-	-	226403	86042	40910	18642	5376
R-down (Ω)	5798	21811	48413	101292	257390	-	-	-	-	-	-

All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

18. ACCESSORY – HEATSINK KITS

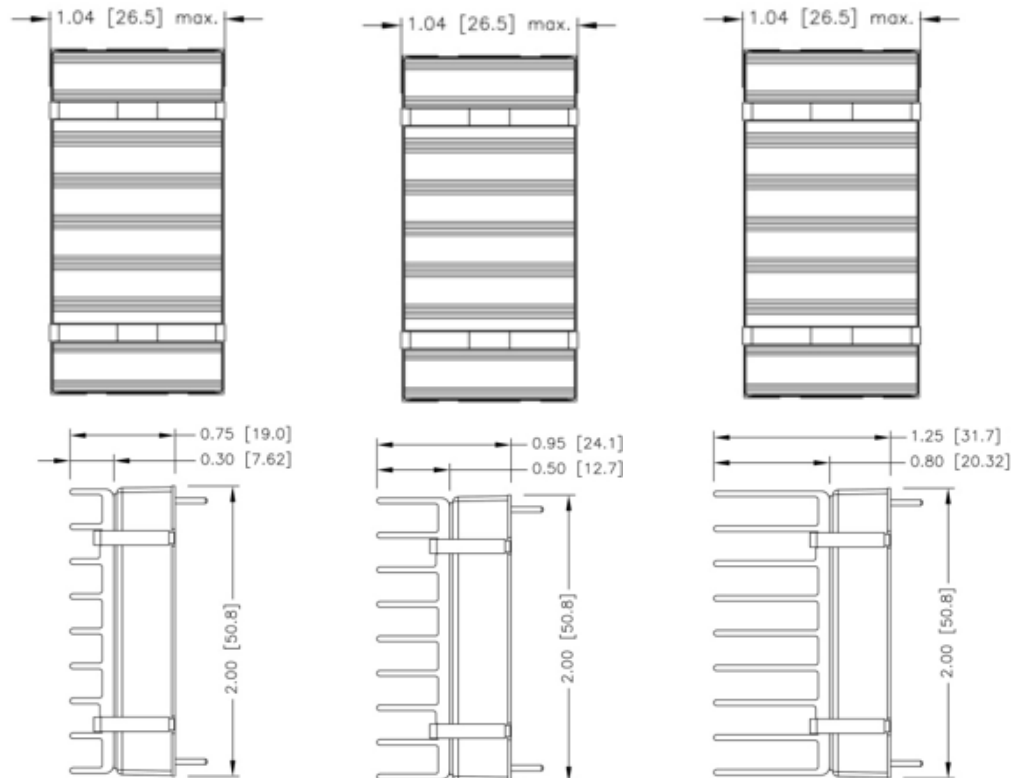


Heatsink kits can be ordered separately and mounted on the converter by means of 2 clips. The heatsink must be installed before the converter is mounted on the pc-board.

The DC-DC converters can also be purchased with pre-mounted heatsinks. For this purpose, please add the suffix -HC1, -HC2 or -HC3 to the end of the part number of the DC-DC converter.

The heatsink kit includes the heatsink, two clips and a thermal pad which is already pasted on the bottom of the heatsink.

	-HC1	-HC2	-HC3
Order number	ACC-PX2X1-HC01	ACC-PX2X1-HC02	ACC-PX2X1-HC03
Size (L x W x H)	50.8 x 26.5 x 7.62mm 2.0 x 1.04 x 0.3"	50.8 x 26.5 x 12.7mm 2.0 x 1.04 x 0.5"	50.8 x 26.5 x 20.32mm 2.0 x 1.04 x 0.8"
Material	Aluminium	Aluminium	Aluminium
Weight			
Thermal impedance with DC-DC converter	9.3°C/W	7.7°C/W	6.2°C/W



All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.

19. CLEANING PROCESS AND SOLDERING PROFILE

Cleaning Agents

Cleaning Method	Classification	Cleaning Agents
Ultrasonic wave	Water type	Deionized water (DI)
	Solvent type	Isopropyl Alcohol (IPA)

Cleaning process

PWB cooling prior to cleaning

Power modules and their associated application PWB assemblies should not be wash-cleaned after soldering until the power modules have had an opportunity to cool to within the cleaning solution temperature. This will prevent vacuum absorption of the cleaning liquid into the module between the pins and the potting during cooling.

*Note: In general, the liquid temperature shall be less than 60°C

Cleaning process

In aqueous cleaning, it is preferred to have an in-line cleaner system consisting of several cleaning stages (prewash, wash, rinse, final rinse, and drying). Deionized water is recommended for aqueous cleaning; the minimum resistivity level is 1MΩ-cm. Tap-water quality varies per region in terms of hardness, chloride, and solid contents; therefore, the use of tap water is not recommended for aqueous cleaning.

The total time of ultrasonic wave shall be less than 3 minutes.

Drying

After cleaning, dry converters enough to assure that the moisture and other potential foreign contaminants are driven out.

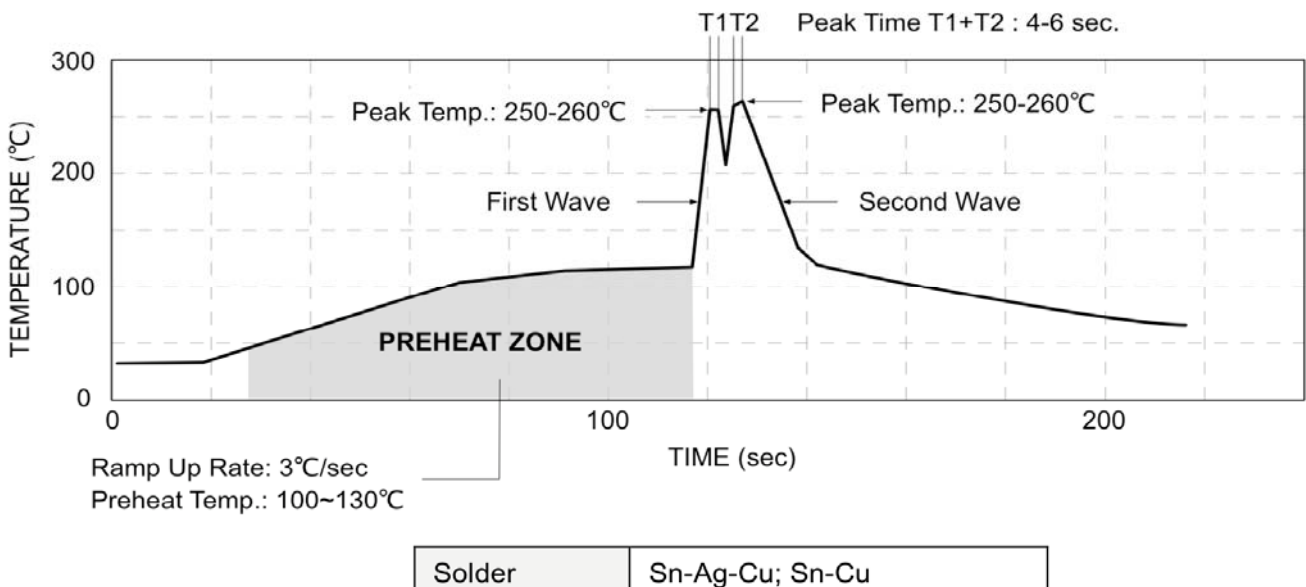
Recommended baking conditions:

- When no aluminium electrolytic capacitors applied in products: 100°C for 45 minutes.
- When aluminium electrolytic capacitors applied in products: 80°C for 2 hours.

Product Post-wash external appearance

The marking or date-code may fade or disappear after cleaning but performance will not change.

Lead free wave soldering profile



All parameters are typical values specified at nominal input voltage, nominal output load, 25°C ambient and after a 5 minutes run-in time unless otherwise noted. The information presented in this document is believed to be accurate and reliable and may change without notice.

For additional information, please visit <https://product.tdk.com/en/power/pxd>.