

3-10W Medical DC-DC Converters

<https://product.tdk.com/en/power/pxc-m>
www.emea.tdk-lambda.com/pxc-m



Medical



COMM

The PXC-M series of medical DC-DC converters feature a wide 4:1 input range in a compact 1.25 x 0.8" (31.8 x 20.3mm) industry standard package. With 5kV input to output isolation, 2uA touch current and a low off-load power draw, these encapsulated modules are ideal for fixed and portable applications.

Features	Benefits
• Wide 4:1 Input Range	• Supports Dual 12/24V or 24/48 System Voltages
• Compact 1.25" x 0.8" Industry Package	• Less Board Area Needed
• Certified to IEC60601-1 and ES60601-1	• Suitable For Medical Applications
• 2 x MOPP Isolation	• High Input to Output Isolation
• Low No Load Power Consumption	• Longer Battery Life

Model Selector

Model	Input Voltage (V)	Output Voltage (V)	Maximum Current (A)	Maximum Power (W)	No Load Current (mA)	Efficiency (%)	Maximum Load Capacitance (uF)
Single Outputs							
PXC-M03-24WS3P3	9 - 36	3.3	1	3.3	6	82	1050
PXC-M06-24WS3P3	9 - 36	3.3	1.8	5.9	6	83	2100
PXC-M10-24WS3P3	9 - 36	3.3	2.5	8.3	6	83	3000
PXC-M03-24WS05	9 - 36	5	0.6	3	6	84.5	750
PXC-M06-24WS05	9 - 36	5	1.2	6	6	86	1500
PXC-M10-24WS05	9 - 36	5	2	10	6	86.5	2500
PXC-M03-24WS12	9 - 36	12	0.25	3	6	87	130
PXC-M06-24WS12	9 - 36	12	0.5	6	6	89	260
PXC-M10-24WS12	9 - 36	12	0.83	10	6	89	430
PXC-M03-24WS15	9 - 36	15	0.2	3	6	87	100
PXC-M06-24WS15	9 - 36	15	0.4	6	6	89	210
PXC-M10-24WS15	9 - 36	15	0.67	10.1	6	89	350
PXC-M03-24WS24	9 - 36	24	0.125	3	6	87	39
PXC-M06-24WS24	9 - 36	24	0.25	6	6	88.5	75
PXC-M10-24WS24	9 - 36	24	0.416	10	6	89	125
PXC-M03-48WS3P3	18 - 75	3.3	1	3.3	4	81	1050
PXC-M06-48WS3P3	18 - 75	3.3	1.8	5.9	4	82.5	2100
PXC-M10-48WS3P3	18 - 75	3.3	2.5	8.3	4	82.5	3000
PXC-M03-48WS05	18 - 75	5	0.6	3	4	84	750
PXC-M06-48WS05	18 - 75	5	1.2	6	4	86.5	1500
PXC-M10-48WS05	18 - 75	5	2	10	4	86.5	2500
PXC-M03-48WS12	18 - 75	12	0.25	3	4	87	130
PXC-M06-48WS12	18 - 75	12	0.5	6	4	88	260
PXC-M10-48WS12	18 - 75	12	0.83	10	4	89	430
PXC-M03-48WS15	18 - 75	15	0.2	3	4	86.5	100
PXC-M06-48WS15	18 - 75	15	0.4	6	4	88.5	210
PXC-M10-48WS15	18 - 75	15	0.67	10.1	4	89	350
PXC-M03-48WS24	18 - 75	24	0.125	3	4	86.5	39
PXC-M06-48WS24	18 - 75	24	0.25	6	4	88	75
PXC-M10-48WS24	18 - 75	24	0.416	10	4	88.5	125

Model Selector							
Model	Input Voltage (V)	Output Voltage (V)	Maximum Current (A)	Maximum Power (W)	No Load Current (mA)	Efficiency (%)	Maximum Load Capacitance (uF)
Dual Outputs							
PXC-M03-24WD05	9 - 36	±5	±0.3	3	6	83	±430
PXC-M06-24WD05	9 - 36	±5	±0.6	6	6	85	±860
PXC-M10-24WD05	9 - 36	±5	±1	10	6	85	±1440
PXC-M03-24WD12	9 - 36	±12	±0.125	3	6	87	±75
PXC-M06-24WD12	9 - 36	±12	±0.25	6	6	88.5	±150
PXC-M10-24WD12	9 - 36	±12	±0.416	10	6	89	±250
PXC-M03-24WD15	9 - 36	±15	±0.1	3	6	86	±56
PXC-M06-24WD15	9 - 36	±15	±0.2	6	6	88.5	±110
PXC-M10-24WD15	9 - 36	±15	±0.333	10	6	88	±180
PXC-M03-48WD05	18 - 75	±5	±0.3	3	4	83	±430
PXC-M06-48WD05	18 - 75	±5	±0.6	6	4	85	±860
PXC-M10-48WD05	18 - 75	±5	±1	10	4	85	±1440
PXC-M03-48WD12	18 - 75	±12	±0.125	3	4	86	±75
PXC-M06-48WD12	18 - 75	±12	±0.25	6	4	88	±150
PXC-M10-48WD12	18 - 75	±12	±0.416	10	4	88	±250
PXC-M03-48WD15	18 - 75	±15	±0.1	3	4	86	±56
PXC-M06-48WD15	18 - 75	±15	±0.2	6	4	87	±110
PXC-M10-48WD15	18 - 75	±15	±0.333	10	4	88	±180

PXC-M-	10	-24W	S	05	-A
	03 3W Output Power 06 6W Output Power 10 10W 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 Pinout style B (No remote on/off & no trim pin) -A Pinout style A -P Pinout style B (Positive remote on/off & no trim pin) -T Pinout style B (Trim pin & no remote on/off) -PT Pinout style B (Positive remote on/off & trim pin)

Preferred model

Blank Primarily stocked in EMEA
-A Primarily stocked by North American distributors

Specifications			
Model	PXC-M03	PXC-M06	PXC-M10
Input			
Input Voltage Range	Vdc	See model selector table	
Input Surge Voltage	Vdc	-24W models: 50, -48W models: 100. (100ms maximum)	
Input Shutdown Voltage	Vdc	-24W models: 7 - 8.8, -48W models: 15 - 17.5	
Start-up Time	ms	30 maximum	
Touch Current	uA	2 maximum	
No Load Power Consumption	W	See model selector table	
Efficiency	-	See model selector table	
Conducted & Radiated EMI	-	EN55011, EN55032, Class A and FCC part 18 without external components. Class B with external components	
Immunity	-	See immunity section	
Safety Agency Certifications	-	IEC/EN60601-1, ES60601-1, CE Mark (LVD and RoHS)	

Immunity				
Test	Standard	Test Level	Criteria	Notes
ESD	EN61000-4-2	Air ± 15kV and Contact ± 8kV	A	-
Radiated Susceptibility	EN61000-4-3	10V/m	A	-
Electrical Fast Transient Burst	EN61000-4-4	± 2kV	A	5V outputs: With an input filter of one 1000µF capacitor and a reverse diode (Vishay V10P45) in parallel.
Surge	EN61000-4-5	± 2kV	A	12/24V outputs: With an input filter of one 470µF capacitor. 48V outputs: With an input filter of one 330µF capacitor.
Conducted Susceptibility	EN61000-4-6	10 Vrms	A	-
Magnetic Fields	EN61000-4-8	100A/m continuous; 1000A/m 1s	A	-

Specifications				
Model		PXC-M03	PXC-M06	PXC-M10
Output				
Output Voltage Tolerance	%	±1		
Output Voltage Adjustment	-	±10% (-10% +20% on 15V & 24V single output models)		
Switching Frequency	kHz	150 (±15)	250 (±25)	300 (±30)
Line Regulation	%	Single output: ±0.2. Dual output: +/-0.5		
Load Regulation	%	Single output: ±0.2. Dual output: +/-1		
Cross Regulation	%	Dual output: ±5 (Asymmetrical 25% to 100% load change)		
External Load Capacitance	uF	See model selector table		
Ripple & Noise (1)	mV	3.3/5V outputs: 30, 12/15V outputs: 40, 24V outputs: 50		
Temperature Coefficient	%/°C	±0.02		
Minimum Load	-	No minimum load required		
Transient Loading	-	250us recovery time for a 25% load change		
Overcurrent Protection	-	Hiccup mode. 150%		
Overvoltage Protection	V	Zener clamp method. Single Output: 3.3V: 3.7-5V, 5V: 5.6-7V, 12V: 13.5-16V, 15V: 18.3-22V, 24V: 29.1-34.5V Dual Output: 5V: 5.6-7V, 12V: 13.5-18.2V, 15V: 17-22V"		
Remote Sense	-	No remote sense		
Remote On/Off	-	Only for B-type Pin connection option (-P or -PT) Positive Logic: ON: Open or 0-1.2V, OFF 2.2-12V		
Parallel Operation	-	Not possible		
Series Operation	-	Possible		
Environmental				
Operating Temperature (2)	°C	-40 to +105°C Derating required above 94°C Derating required above 88°C Derating required above 77°C		
Maximum Case Temperature	°C	105. Measured centrally on the upper case (module top view)		
Thermal Impedance	°C/W	18		
Storage Temperature	°C	-55 to +125		
Humidity (non condensing)	%RH	5 - 95 (Operating & Storage)		
Cooling	-	Convection		
Altitude	m	5,000 (operating)		
Withstand Voltage (For 1 minute)	Vac	Input to output 5,000 (2xMOPPs)		
Isolation Capacitance	pF	17		
Vibration (Operating)	-	MIL-STD-810F		
Thermal Shock	-	MIL-STD-810F		
Other				
Weight (Typ)	g	14		
Size (LxWxH)	mm	31.8 x 20.3 x 10.2		
Size (LxWxH)	Inches	1.25 x 0.8 x 0.4		
Case Material	-	Non-conductive black plastic. (Silicone (UL94 V-0) potting)		
MTBF - MIL-HDBK-217F, Full Load	Hours	6,444,000	4,718,000	3,849,000
Warranty	yrs	5		

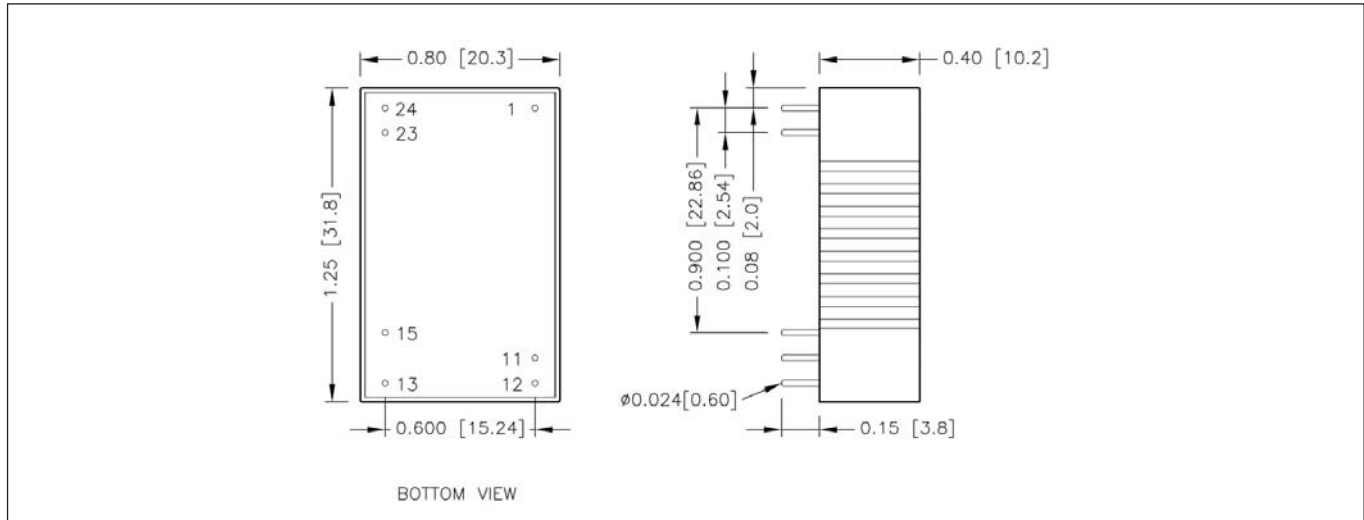
Notes

See website for detailed specifications, test methods and installation manual

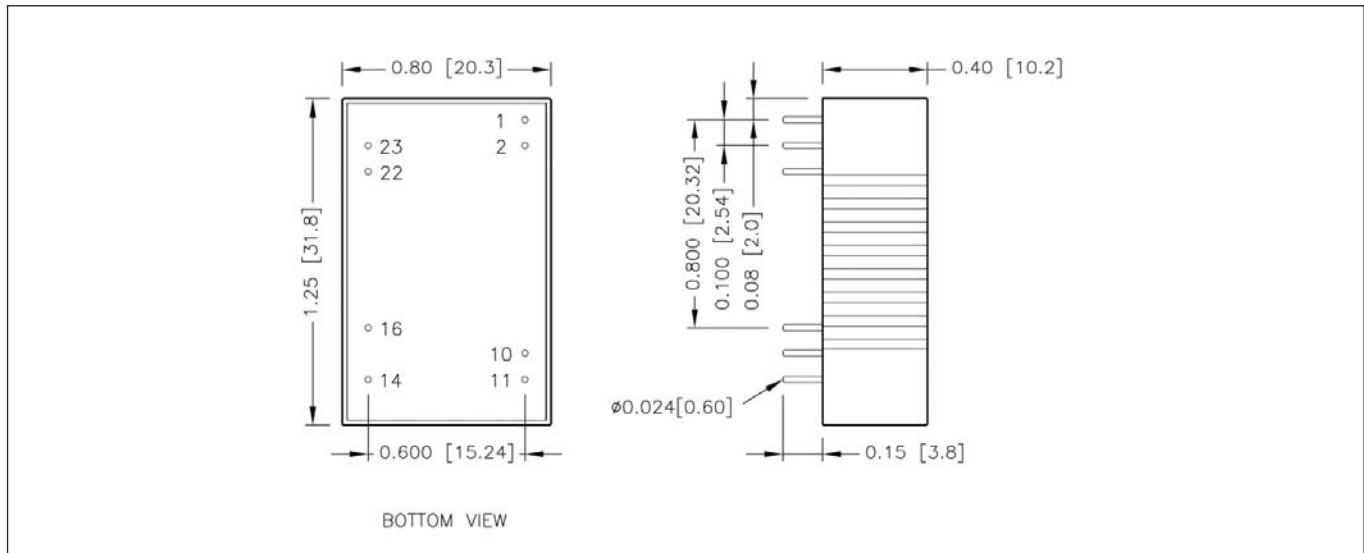
(1): Measured with a 20MHz bandwidth oscilloscope across a 10uF 25V X7R MLCC (4.7uF 50V for 24V models)

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

Outline Drawing, Pinout Style A



Outline Drawing, Pinout Style B



Pinout (Style A)			
PIN	Function		Dual
	Single		
1		+Vin	
11	No pin		Com
12	-Vout		No pin
13	+Vout		-Vout
15	No pin		+Vout
23		-Vin	
24		-Vin	

Pinout (Style B)			
PIN	Function		Dual
	Single		
1		Ctrl (Option) / No pin*	
2		-Vin	
10		Trim (Option) / No pin*	
11	No pin / NC**		-Vout
14		+Vout	
16	-Vout		Com
22		+Vin	
23		+Vin	

* If no Ctrl or Trim option, there is no pin on the corresponding pin number.

** No pin for Trim option (-T and -PT) and NC for models without Trim option

1. All dimensions in inch (mm)

2. Tolerance: X.XX±0.02 (X.X±0.5)

X.XXX±0.01 (X.XX±0.25)

3. Pin dimension tolerance ±0.004(0.10)



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