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TDK·Lambda PYD20 Series

20W Single and Dual Output DC-DC converters

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



Industrial | Test | COMM | Broadcast | Railway

The 20W 2 x 1" footprint PYD series of isolated DC-DC converters operate from an ultra wide range input of 8.5 to 160Vdc (18:1) with single and dual output voltages from 5V to 48V(1). Single output models can be adjusted -20% to +15% by using the trim terminal. The PYD20 models have efficiencies of up to 90% and can operate in ambient temperature of -40 to 105°C. The input to output isolation is 3,000Vac and the units are potted to provide a high resistance to shock and vibration. The converters are certified according to the 62368-1 safety standards and with additional circuits, the PYD20 series is also tested according to the EN 50155 railroad standard for electronic equipment in railroad vehicles.

Features	Benefits
• 2" x 1" Footprint	• Industry Standard Package Size
• 8.5 - 160Vdc Wide Input Range (18:1)	• Supports the Majority of Rail DC Input Voltages
• Certified to IEC 62368-1, Tested According to EN 50155	• Easier System Compliance
• Potted Plastic Case	• High Resistance to Shock and Vibration
• 3000Vac Input to Output Isolation	• Suitable For Railway and Industrial Applications

Model Selector

Model	Input Voltage (V)	Output Voltage (V)	Maximum Current (A)	Maximum Power (W)	No Load Input Current (mA)	Efficiency (%) at 72 / 110Vdc	Maximum Load Capacitance (uF)
Single Outputs							
PYD20-72WS05	8.5 - 160	5	4	20	5	86 / 85	6800
PYD20-72WS12	8.5 - 160	12	1.67	20	8	89 / 88	3300
PYD20-72WS15	8.5 - 160	15	1.33	20	8	89 / 88	2200
Dual Outputs							
PYD20-72WD12(1)	8.5 - 160	±12	±0,833	20	8	89 / 88	820
PYD20-72WD15(1)	8.5 - 160	±15	±0,667	20	8	89 / 88	680
PYD20-72WD24(1)	8.5 - 160	±24	±0,417	20	8	90 / 89	330

Notes
(1) ±12V dual output models can provide a 24V single output by utilizing just the +Vout and -Vout pins, leaving the COM unconnected. Similarly ±15V models can be used as a 30V single output and ±24V models a single 48V output.

PYD	20	-72W	S	05	-
Series	Output Power 20W	-72W 8.5 - 160V Input Voltage	S Single Output D Dual Output	**Output Voltage** 05 = 5V 12 = 12V 15 = 15V 24 = 24V	Blank Positive Logic Remote On/Off -N Negative Logic Remote On/Off

Preferred option

Related Products

Type	Part Number	Description
DC-DC Converter	PYQ50	30-50W, Input 14-160V, quarter brick
DC-DC Converter	PYH200	200W, Input 14-160V, half brick
DC-DC Converter	CN-B	200-300W, Input 60-160V, half brick

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Specifications

Model		PYD20
Input		
Input Voltage Range	Vdc	8.5 - 160. Derate output power linearly to 70% load from 12V to 8.5 input
Input Surge Voltage	Vdc	200 (100ms maximum)
Input Shutdown Voltage	Vdc	7.5 Typ.
Start-up Time (typ)	ms	10 (15 for 5V output)
No Load Power Consumption	-	See model selector table. Typically 3mA when remote on/off is activated
Efficiency	-	See model selector table
Conducted & Radiated EMI	-	EN55032. See installation manual for external circuitry
Immunity	-	See immunity section
Safety Certification and Markings	-	IEC/UL/CSA/EN62368-1, CE Mark and UKCA Mark. Designed to meet EN45545-2

Immunity

Test	Standard	Test Level	Criteria	Notes (See installation manuals for external circuitry)
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 100uF capacitors and a 180V supressor diode (SMCJ180A)
Surge	EN61000-4-5	± 2kV	A	
Conducted Susceptibility	EN61000-4-6	10 Vrms	A	-

Specifications

Model		PYD20
Output		
Output Voltage Tolerance	%	±1
Output Voltage Adjustment	%	-20/+15 (single output models only)
Switching Frequency	kHz	180 - 220
Line Regulation	%	±0.2
Load Regulation	%	Single output: ±0.2, Dual output: ±1
Cross Regulation	%	Dual output: ±5 (Asymmetrical 25% to 100% load change)
External Load Capacitance	-	See model selector table
Ripple & Noise[2]	mVp-p	5V: 75; all other outputs: 100
Temperature Coefficient	%/°C	±0.02
Minimum Load	-	No minimum load required
Transient Loading	-	250us recovery time for a 25% load change
Overcurrent Protection (typ)	%	150 hiccup mode)
Overvoltage Protection (typ)	V	Zener clamp method. 5V: 6.2, 12V: 15, 15V: 18, 24V: 30
Overtemperature Protection	°C	110, automatic recovery when temperature falls below 92
Remote Sense	-	No remote sense
Remote On/Off	-	Positive Logic (Blank): ON: Open or 4-160V, OFF Short or 0-1.2V Negative Logic (-N): ON: Short or 0-1.2V, OFF: Open or 4-160V

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Specifications

Model		PYD20
Environmental		
Operating Temperature(3)	°C	-40 to +105 (see derating section and confirm case temperatures in end system)
Maximum Case Temperature	°C	105
Storage Temperature	°C	-55 to +125
Humidity (non condensing)	%RH	95 (maximum, for operation & storage)
Cooling	-	Convection or forced air
Altitude	m	5,000 (operating)
Withstand Voltage (For 1 minute)	-	Input to output 3000Vac or 4200Vdc
Isolation Capacitance	pF	20 (input to output)
Vibration (Operating)	-	MIL-STD-810F, EN61373
Thermal Shock	-	MIL-STD-810F
Other		
Weight (Typ)	g	28.5
Size (LxWxH)	mm	50.8 x 25.4 x 10.2
Size (LxWxH)	Inches	2 x 1 x 0.4
Case Material	-	Plastic
MTBF - MIL-HDBK-217F, Full Load	Hours	1,242,000 - 1,631,000 depending on model
Warranty	yrs	3

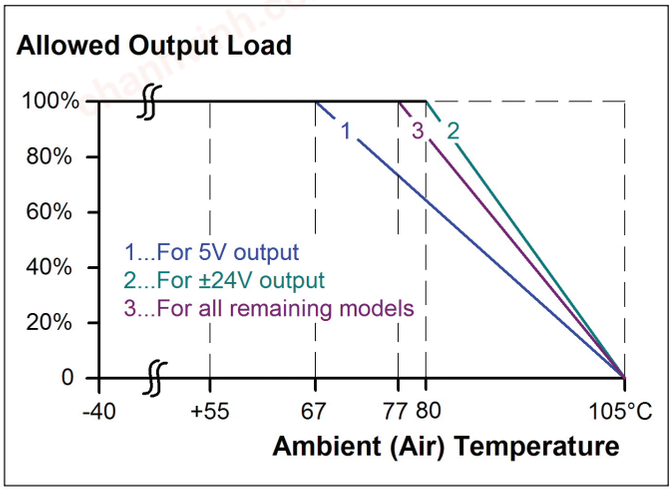
Notes

See website for detailed specifications, test methods and installation manual

(2): Measured with a 20MHz bandwidth oscilloscope across a 1uF/100V X7R MLCC

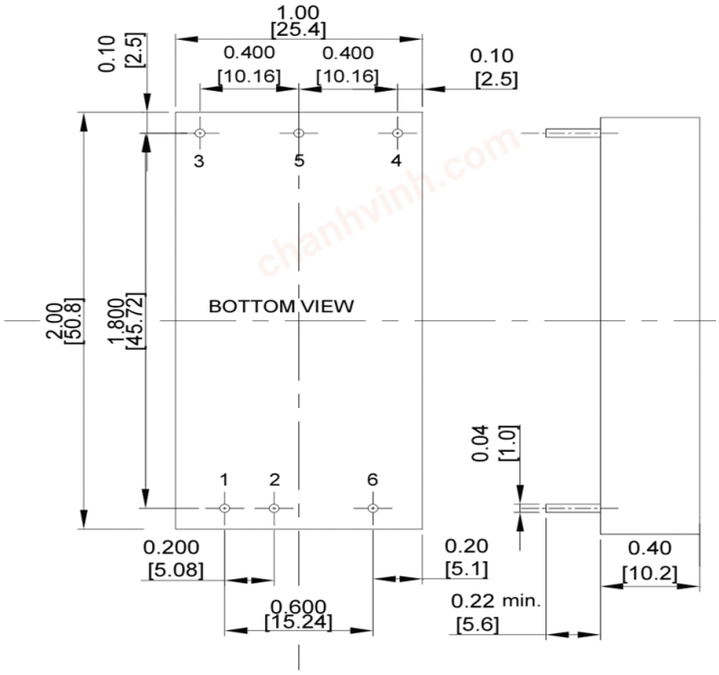
(3). The case temperature must be confirmed in the end application. The product rating may be affected by airflow direction and physical obstructions near the module.

Derating Curve - Vertical Mount, Natural Convection



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Outline Drawing and Pinout



All dimensions in inch [mm]

Inch tolerances:
x.xx±0.02, x.xxx±0.01
Pin diameter ±0.004
Millimeter tolerances:
x.x±0.5, x.xx±0.25
Pin diameter ±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]

Pin assignment

Pin	Single output	Dual outputs
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	TRIM	-V Output
5	-V Output	COM
6	R/C	R/C

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https://product.tdk.com/en/power/