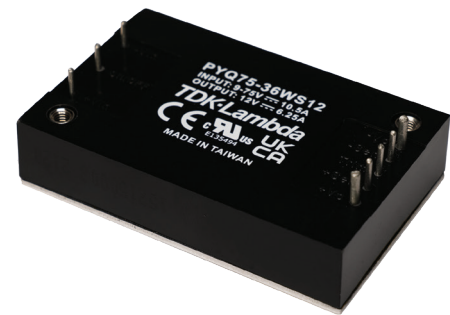


75W Single Output DC-DC converters, 1/4 Brick

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



Industrial



Test



COMM



Broadcast



Railway

The 75W Quarter-brick footprint PYQ series of isolated DC-DC converters operate from an ultra wide range input of 9 to 75Vdc (8:1) with single output voltages from 12V to 48V. The output voltage can be adjusted between -20% to +15% by using the trim terminal. Sense lines for the output voltage ensure a stable output voltage even with changing loads. The PYQ75 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 PYQ75 series is also tested according to the EN 50155 railroad standard for electronic equipment in railroad vehicles.

Features

- Quarter-Brick Footprint
- 9 - 75Vdc Wide Input Range (8:1)
- Certified to IEC 62368-1, Tested According to EN 50155
- Potted Plastic Case
- 3000Vac Input to Output Isolation

Benefits

- Industry Standard Package Size
- Supports the Majority of Railway DC Input Voltages
- Easier System Compliance
- High Resistance to Shock and Vibration
- Suitable For Railway and Industrial Applications

Model Selector

Model	Input Voltage (V)	Output Voltage (V)	Output Adjust (V)	Maximum Current (A)	Maximum Power (W)	No Load Input Current (mA)	Efficiency (%) at 36 / 48Vdc	Maximum Load Capacitance (uF)
PYQ75-36WS12	9 - 75	12	9.6 - 13.8	6.25	75	8	90 / 90	14000
PYQ75-36WS15	9 - 75	15	12 - 17.25	5	75	8	90 / 90	10000
PYQ75-36WS24	9 - 75	24	19.2 - 27.6	3.12	75	10	90 / 90	3900
PYQ75-36WS28	9 - 75	28	22.4 - 32.2	2.67	75	10	90 / 90	3200
PYQ75-36WS48	9 - 75	48	38.4 - 55.2	1.56	75	10	90 / 90	1100

PYQ	75	-36W	S	12	-
Series	75 Output Power 75W	-36W 9 - 75V Input Voltage	S Single Output	Output Voltage 12 = 12V 15 = 15V 24 = 24V 28 = 28V 48 = 48V	Blank Positive Logic Remote On/Off and M3 Thread -N Negative Logic Remote On/Off and M3 Thread -PD Positive Logic Remote On/Off and 3.2mm Hole -ND Negative Logic Remote On/Off and 3.2mm Hole

Preferred option

Related Products

Type	Series	Description
Heatsink kit (User installation)	ACC-PYQB-HC01	HC1 heatsink, thermal pad, screws and washers
Heatsink kit (User installation)	ACC-PYQB-HC05	HC5 heatsink, thermal pad, screws and washers
DC-DC Converter	PYD20	20W, Input 8.5-160V, 2" x 1"
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

Specifications

Model		PYQ75
Input		
Input Voltage Range	Vdc	9-75 Derate output power linearly from 75W to 60W between 12V and 9V input voltage
Input Surge Voltage	Vdc	100 (100ms maximum)
Input Shutdown Voltage	Vdc	8 Typ.
Start-up Time (typ)	ms	30 Typ.
No Load Power Consumption	-	See model selector table. Typically 5mA 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
Railroad Applications	-	EN 50155, EN45545-2, EN 61373, EN 50121-3-2: See application note for railroad use
Safety Certification and Markings	-	IEC/UL/CSA/EN62368-1, CE Mark and UKCA Mark

Immunity

Test	Standard	Test Level	Criteria	Notes (See installation manuals for external circuitry)
ESD	EN61000-4-2	Air $\pm$ 8kV and Contact $\pm$ 6kV	A	-
Radiated Susceptibility	EN61000-4-3	20V/m	A	-
Electrical Fast Transient Burst	EN61000-4-4	$\pm$ 2kV	A	With an input filter of two 220uF capacitors and a 78V suppressor diode (SMDJ78A)
Surge	EN61000-4-5	$\pm$ 2kV	A	
Conducted Susceptibility	EN61000-4-6	10Vrms	A	-

Specifications

Model		PYQ75
Output		
Output Voltage Tolerance	%	$\pm$ 1
Output Voltage Adjustment	%	-20/+15
Switching Frequency	kHz	180-220
Line Regulation	%	$\pm$ 0.2
Load Regulation	%	$\pm$ 0.2
External Load Capacitance	-	See model selector table
Ripple & Noise(1)	mVp-p	150 (12V, 15V models), 240 (24V, 28V models), 480 (48V model)
Temperature Coefficient	%/°C	$\pm$ 0.02
Minimum Load	-	No minimum load required
Transient Loading	-	250us recovery time for a 25% load change
Overcurrent Protection (typ)	%	110-210 (hiccup mode)
Overvoltage Protection (typ)	%	117-140
Overtemperature Protection	°C	110, automatic recovery when temperature falls below 100
Remote Sense	%	+15
Remote On/Off	-	Positive Logic (Blank): ON: Open or 4-75V, OFF Short or 0-1V Negative Logic (-N): ON: Short or 0-1V, OFF: Open or 4-75V

Specifications

Model

PYQ75

Environmental

Operating Temperature ⁽²⁾	°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, conduction or forced air
Altitude	m	5,000 (operating)
Withstand Voltage (For 1 minute)	Vac	Input to output 3000Vac, input to case 2100Vac, output to case 1500Vac
Isolation Capacitance	pF	1000 (input to output)
Shock and Vibration (Operating)	-	MIL-STD-810F, EN61373
Thermal Shock	-	MIL-STD-810F

Other

Weight (Typ)	g	66
Size (LxWxH)	mm	57.9 x 36.8 x 12.7
Size (LxWxH)	Inches	2.28 x 1.45 x 0.5
Case Material	-	Plastic
Base Plate Material	-	Aluminium
MTBF - MIL-HDBK-217F, Full Load, GB25	Hours	663,000 - 780,000 depending on model
Warranty	yrs	3

Notes

See website for detailed specifications, test methods and installation manual

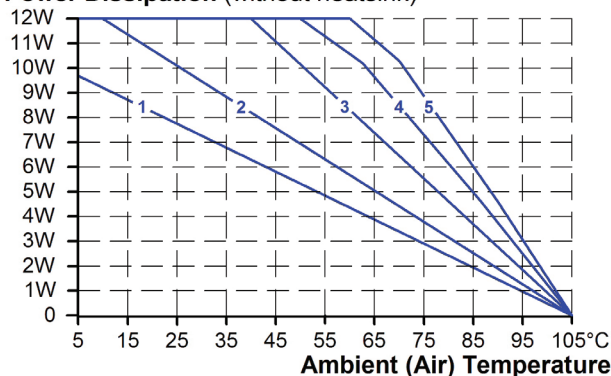
(1): Measured with a 22 μ F electrolytic/tantalum capacitor and a 1 μ F ceramic multi-layer capacitor parallel in measurement path.

(2): 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

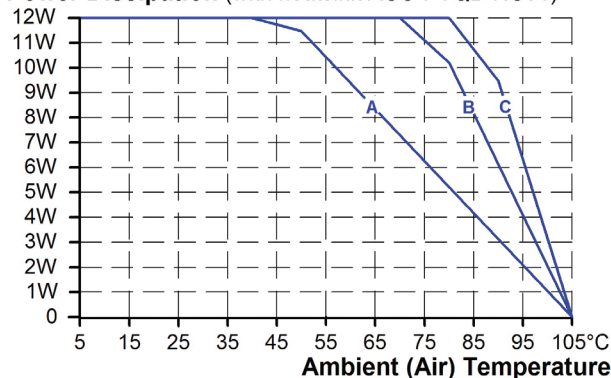
The possible temperature range depends on the power dissipation at the operating point of the DC-DC converter and the cooling method used. See installation manual for details.

Power Dissipation (without heatsink)



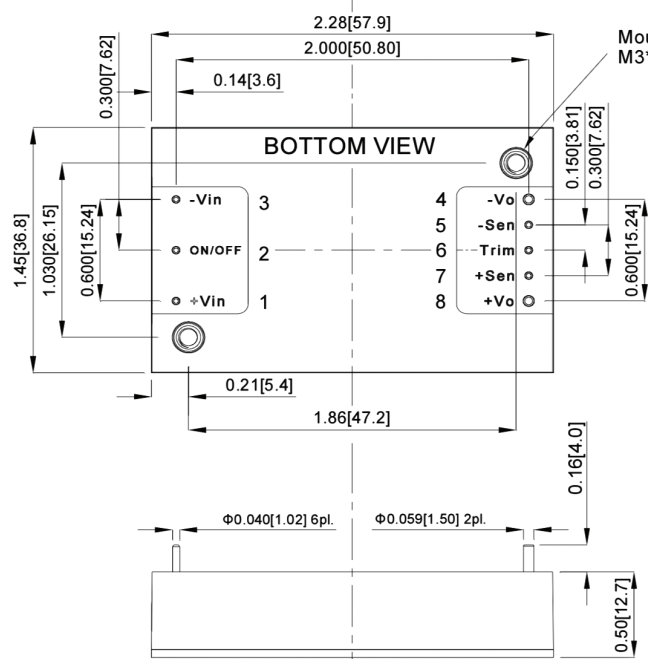
1. Natural convection 20LFM (0.1m/s, RTH 10.1°C/W)
2. Forced air 100LFM (0.5m/s, RTH 8.0°C/W)
3. Forced air 200LFM (1.0m/s, RTH 5.4°C/W)
4. Forced air 300LFM (1.5m/s, RTH 4.4°C/W)
5. Forced air 400LFM (2.0m/s, RTH 3.4°C/W)

Power Dissipation (with heatsink ACC-PYQB-HC01)



- A. Natural convection 20LFM (0.1m/s, RTH 4.78°C/W)
- B. Forced air 100LFM (0.5m/s, RTH 2.44°C/W)
- C. Forced air 400LFM (2.0m/s, RTH 1.58°C/W)

Outline Drawing and Pinout



Pin Assignment:

Pin	Function
1	+V Input
2	R/C
3	-V Input
4	-V Output
5	- Sense
6	Trim
7	+ Sense
8	+V Output

All dimensions in inch [mm]

Inch Tolerances: x.xx±0.02, x.xxx±0.01

Millimetre Tolerances: x.x±0.5, x.xx±0.25

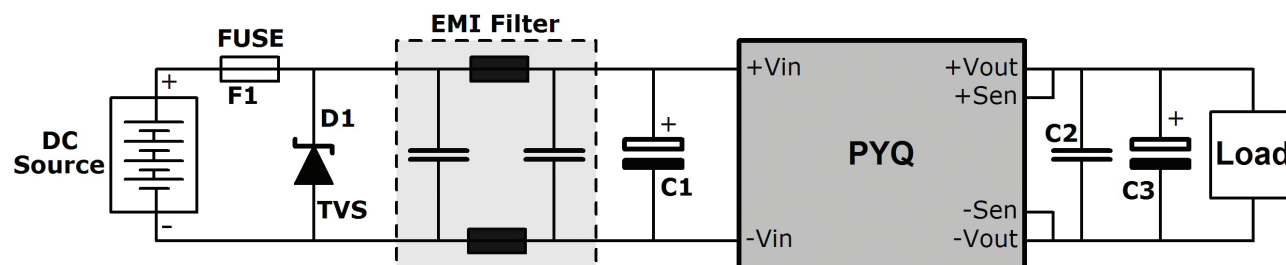
Recommendations for Pad Design:

Pin 4, 8: 1.8mm plated, through hole 3.3mm pad size

Pin 1, 2, 3, 5, 6, 7: 1.3mm plated, through hole 2.5mm pad size

Converter Screws: 3.5mm through hole

Recommended Wiring Scheme



Fuse F1: The DC-DC converter is not internally fused. An external input fuse must always be used. Use a 12A slow-blow fuse.

Diode D1: Transient voltage suppressor diode (TVS) SMDJ78A.

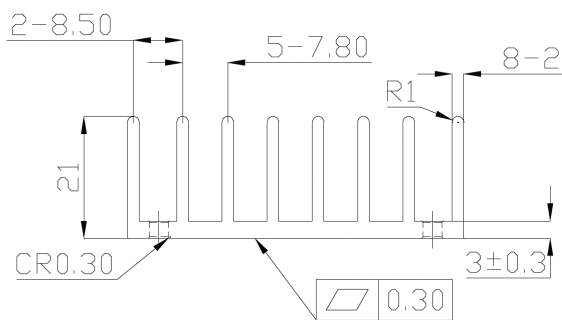
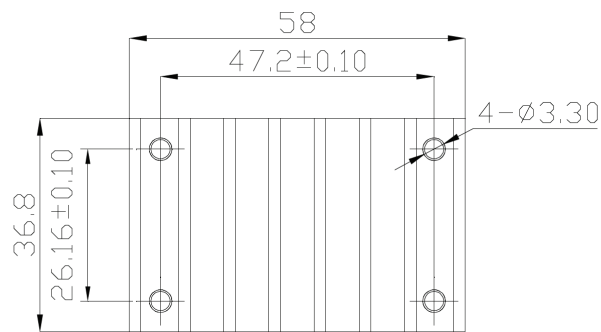
Capacitor C1: 220uF aluminium capacitor.

Capacitor C2: 1uF multi layer ceramic capacitor.

Capacitor C3: 22uF aluminium or tantalum capacitor.

EMI Filter: This filter reduces the conducted emission to the input. See installation manual for details.

Heatsinks



ACC-PYQB-HC01

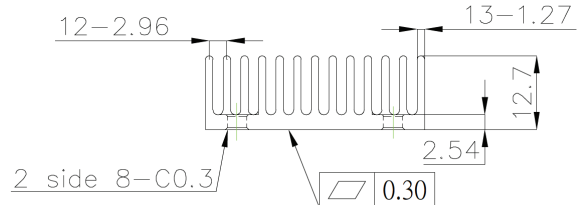
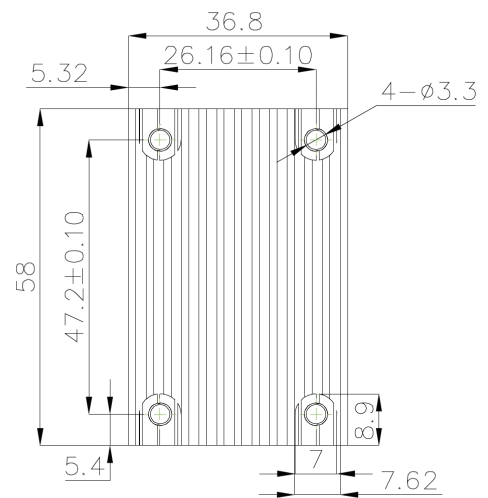
Transverse

Fin Style

Size (L x W x H)

Thermal Impedance

58 x 36.8 x 21mm
4.78°C/W nat. convection
2.44°C/W with 100LFM
2.06°C/W with 200LFM
1.76°C/W with 300LFM
1.58°C/W with 400LFM



ACC-PYQB-HC05

Longitudinal

36.8 x 58 x 12.7mm
5.61°C/W nat. convection
4.01°C/W with 100LFM
3.39°C/W with 200LFM
2.86°C/W with 300LFM
2.49°C/W with 400LFM