



PW-E1 SERIES

1W 8:1 DC-DC Converter



FEATURES

- Industrial standard SIP-6 package
- 8:1 Wide input range
- High efficiency up to 80%
- No minimum load required
- No external components required internal filtering
- Overload protection & UVLO
- 1500Vdc I/O isolation
- Low cost

APPLICATIONS

- Automation equipment
- Power supplies
- Industrial PC
- Data communications
- Distributed power system

DESCRIPTION

PW-E1 series is a 1W DC-DC converter product with SIP-6 standard industrial package. It contains 8:1 extra wide input voltage range, and features high efficiency up to 80%, 1500Vdc isolation voltage between input and output, and wide working temperature range from -40°C up to $+95^{\circ}\text{C}$ with no additional heat-sink. The models meet radiated Class A of EN55032 without external components, and suit all kinds of systems like industrial control, automation field, and so on.

MODEL ENCODING

PW	S	-	24	05	E1
Series Name	Output Quantity		Input Voltage	Output Voltage	Input Range
SIP-6 SERIES	S : Single D : Dual		24 : 9~75V	05 : 5V ; $\pm 5\text{V}$ 09 : 9V 12 : 12V ; $\pm 12\text{V}$ 15 : 15V ; $\pm 15\text{V}$	E1: 8:1 Range 1Watt



■ 8:1 1W MODEL SELECTION TABLE

MODEL NUMBER	INPUT				OUTPUT		EFF. (%)	CAPACITOR LOAD (Max.)
	VOLTAGE (VDC)		CURRENT (mA)		VOLTAGE (VDC)	CURRENT (mA)		
	NOMINAL	RANGE	NO LOAD	FULL LOAD				
PWS-2403.3E1	24	9~75	3	54	3.3	0~300	77	220uF
PWS-2405E1			4	53	5	0~200	78	220uF
PWS-2409E1			5	52	9	0~111	80	47uF
PWS-2412E1			5	53	12	0~83	78	47uF
PWS-2415E1			5	52	15	0~67	80	47uF
PWS-2424E1			7	55	24	0~42	76	47uF
PWD-2405E1	24	9~75	5	53	±5	±0~100	78	±47uF
PWD-2412E1			7	55	±12	±0~42	76	±47uF
PWD-2415E1			8	54	±15	±0~33	77	±47uF

Note: Efficiency and input current are measured at nominal input voltage and full load.

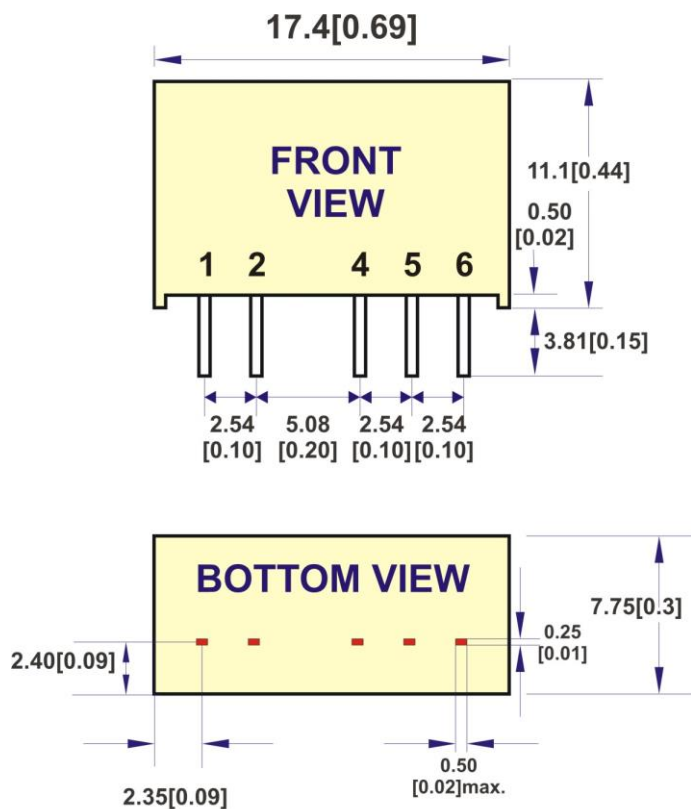
Other input to output voltages may be available. Please contact factory.



SPECIFICATION

INPUT	Voltage Range	9~75V		
	Surge Voltage(100ms max.)	9-75 Vin models : 100 Vdc		
	Under Voltage Lockout	Start-up voltage : 8.8 Vdc		
		Shutdown voltage : 8 Vdc		
	Filter	Capacitor Network		
	Protection	Fuse recommended (see page 6)		
OUTPUT	Voltage Accuracy	±2% max.		
	Rated Power	1W		
	Ripple & Noise ¹	3.3~9V : 100mV Vp-p max.	12~24V : 1% Output Vp-p max.	
	Line Regulation ²	±0.5%		
	Load Regulation ³	±1% for 3.3Vdc output	±0.5% for others output	
	Cross Regulation	±5% Dual : asymmetrical load 25%/100% FL		
	Switching Frequency	330Khz typ.		
PROTECTION	Short Circuit	Protection type : continuous, recovery		
	Overload	110%~350% Protection type : recovers automatically after fault condition is removed		
ENVIRONMENT	Cooling	Free-air convection		
	Working Temperature	-40~ +95°C (refer to “Derating Curve”)		
	Case Temperature	+110 °C max.		
	Working Humidity	5% ~ 95% RH non-condensing		
	Storage Temp., Humidity	-55 ~ +125°C, 10 ~ 95% RH non-condensing		
	Temperature Coefficient	±0.05% / °C		
	Soldering Temperature	1.5mm from case of 3~5 sec./265°C(max.)		
	Vibration	10~500Hz, 2G 10min./1cycle, period for 60 min. each along X, Y, Z axes		
SAFETY & EMC	Isolation Voltage	I/P-O/P : 1500Vdc for 3 seconds		
	Isolation Resistance	I/P-O/P : 1000M Ohms / 500VDC / 25°C / 70% RH		
	Isolation Capacitance	60pF typ.		
	EMC Emission	Parameter	Standard	Test Level / Note
		Conducted	EN55032(CISPR32)	N/A
		Radiated	EN55032(CISPR32)	Class A
	EMC Immunity	Parameter	Standard	Test Level / Note
		ESD	BS IEC 61000-4-2	Air ±8KV
		Radiated Susceptibility	BS IEC 61000-4-3	3V/m
		EFT/Burst	BS IEC 61000-4-4	±0.5KV
		Surge	BS IEC 61000-4-5	Line-Line ±0.5KV
		Conducted	BS IEC 61000-4-6	3Vrms
		Magnetic field immunity	BS IEC 61000-4-8	1A/m
OTHERS		MTBF ⁴	>1,200,000Hours	
	Weight	3.0g typ.		
	Dimension(L*W*H)	17.4mm*7.75mm*11.1mm		
	Case Material	Plastic case		
	NOTE	¹ Ripple & noise are measured at 20MHz BW with 1uF ceramic capacitor connect to the output pins. ² High line to low line. ³ Load regulation is for output load current change from 0% to 100%. ⁴ MIL-HDBK-217F @25 °C, Ground Benign. *All specifications are measured at Ta=25°C, humidity < 75%, nominal input voltage, and rated output load unless otherwise specified.		

MECHANICAL SPECIFICATION



PIN CONNECTION		
PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
4	+Vout	+Vout
5	NP	Common
6	-Vout	-Vout

NOTE :

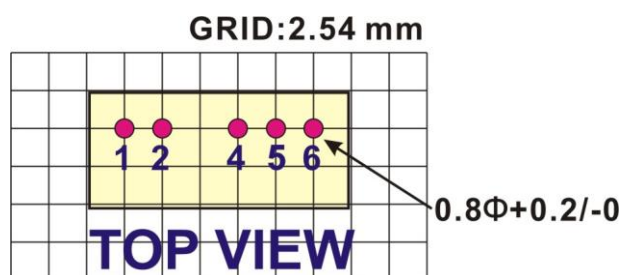
All dimensions are in mm [inches]

1. Pin Size is 0.50 x 0.30mm[0.02x0.01"]

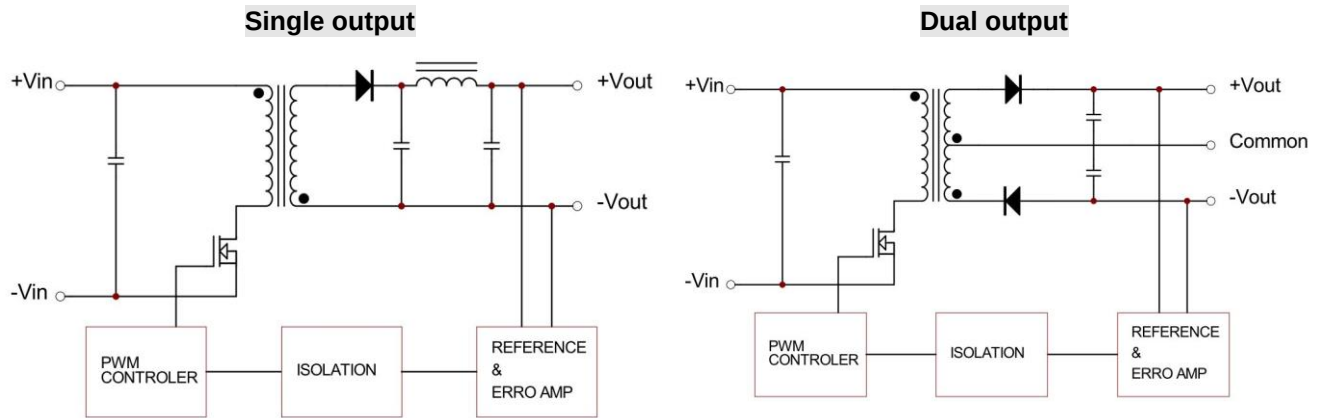
2. Pin is Tolerance .XX= ±0.05mm

3. Tolerance .X or .XX= ±0.5mm

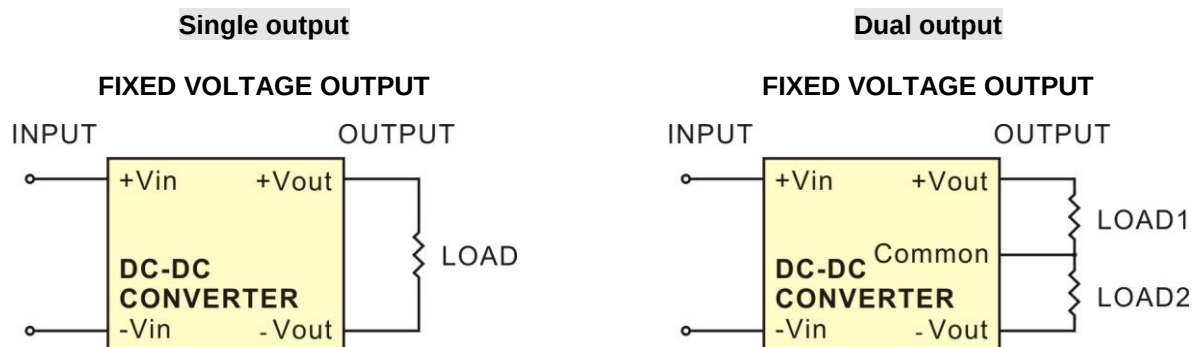
All dimensions are in mm[inches]



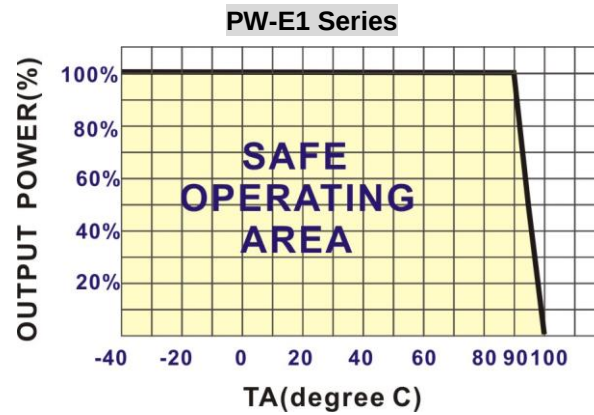
■ SIMPLIFIED SCHEMATIC



■ TYPICAL APPLICATIONS

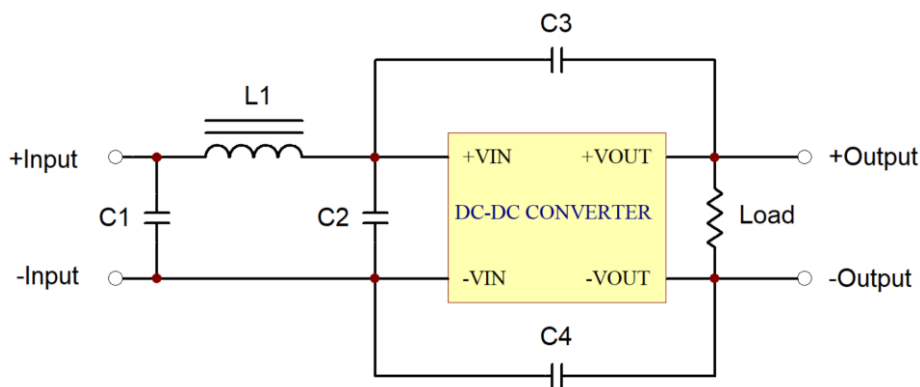


DERATING CURVE



RECOMMENDED FILTER FOR EN55032 CLASS B

The components used in the under figure, together with the manufacturer's part numbers for these components, are as follows:



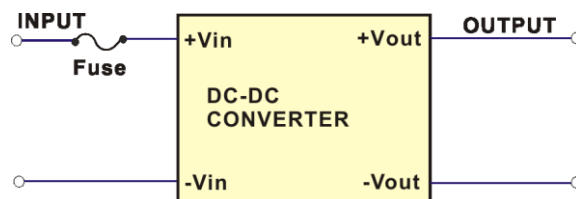
No	CLASS B
C1	2.2uF/100V
C2	2.2uF/100V
C3	152/5KV
C4	152/5KV
L1	10uH

Note: All of capacitors are ceramic capacitors.

INPUT FUSE SELECTION GUIDE

9-75V Input Voltage (Vdc)

400mA Slow-Blow Type(PW-E1)



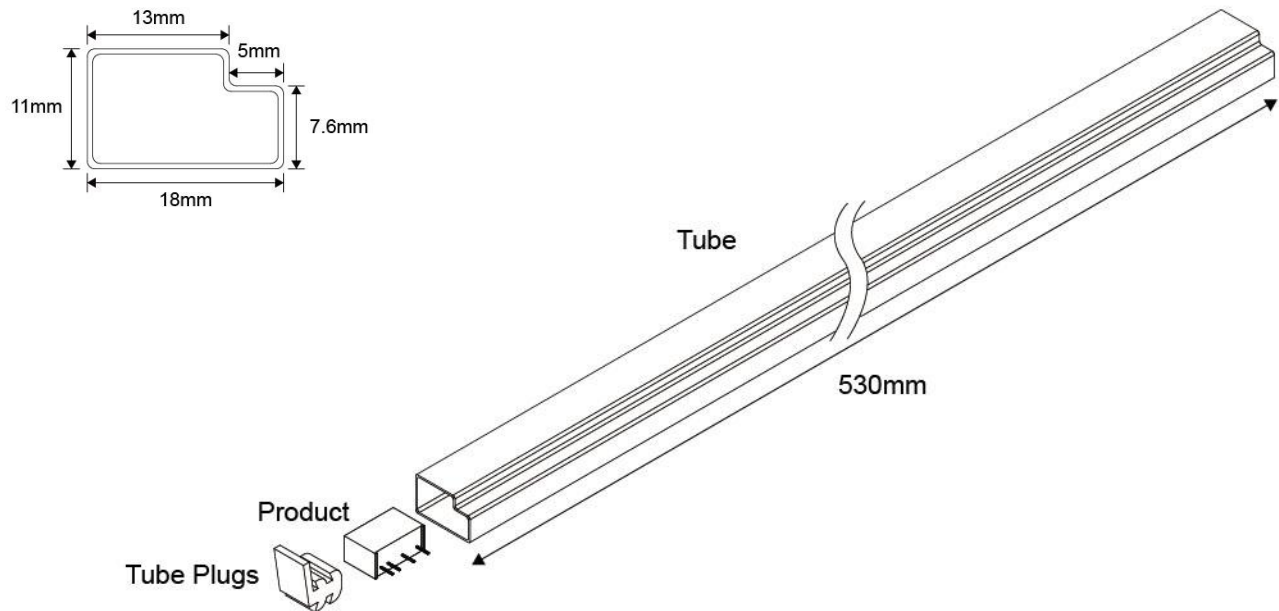
Note: Certain applications may require the installation of external fuse in front of the input.



PW-E1 SERIES

1W 8:1 DC-DC Converter

■ PACKAGING INFORMATION



Packaging Quantity: 28 pcs converter per tube



DANUBE ENTERPRISE CO., LTD.

Tel: 886-7-3755165 Fax: 886-7-3755330

E-mail: danube@ms10.hinet.net