



■ FEATURES

- Industrial standard DIP-24 package
- 8:1 Wide input range
- High efficiency up to 88%
- No minimum load required
- No external components required internal filtering
- Power saving load for high efficiency at light load
- Overload protection & UVLO
- 3000Vdc I/O isolation
- Low cost

■ APPLICATIONS

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

■ DESCRIPTION

CW-12E series is a 12W DC-DC converter product with DIP-24 standard industrial package. It contains 8:1 extra wide input voltage range, and features high efficiency up to 88%, 3000Vdc isolation voltage between input and output, and wide working temperature range from -40°C up to $+85^{\circ}\text{C}$ 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

CW	S	-	24	05	A12	E	M
Series Name	Output Quantity		Input Voltage	Output Voltage	Output Power	Input Range	Package Material
	S : Single D : Dual		24 : 9~75V	05 : 5V ; $\pm 5\text{V}$ 09 : 9V 12 : 12V ; $\pm 12\text{V}$ 15 : 15V ; $\pm 15\text{V}$	12Watt	E: 8:1 Range	M : Metal

■ 8:1 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				
CWS-2403.3A10EM			10	497	3.3	0~3000	83	1000uF
CWS-2405A12EM			10	581	5	0~2400	86	680uF
CWS-2409A12EM	24	9~75	10	588	9	0~1333	85	680uF
CWS-2412A12EM			10	575	12	0~1000	87	470uF
CWS-2415A12EM			10	575	15	0~800	87	220uF
CWD-2405A12EM			10	595	±5	±0~1200	84	±470uF
CWD-2412A12EM	24	9~75	10	568	±12	±0~500	88	±220uF
CWD-2415A12EM			10	581	±15	±0~400	86	±220uF

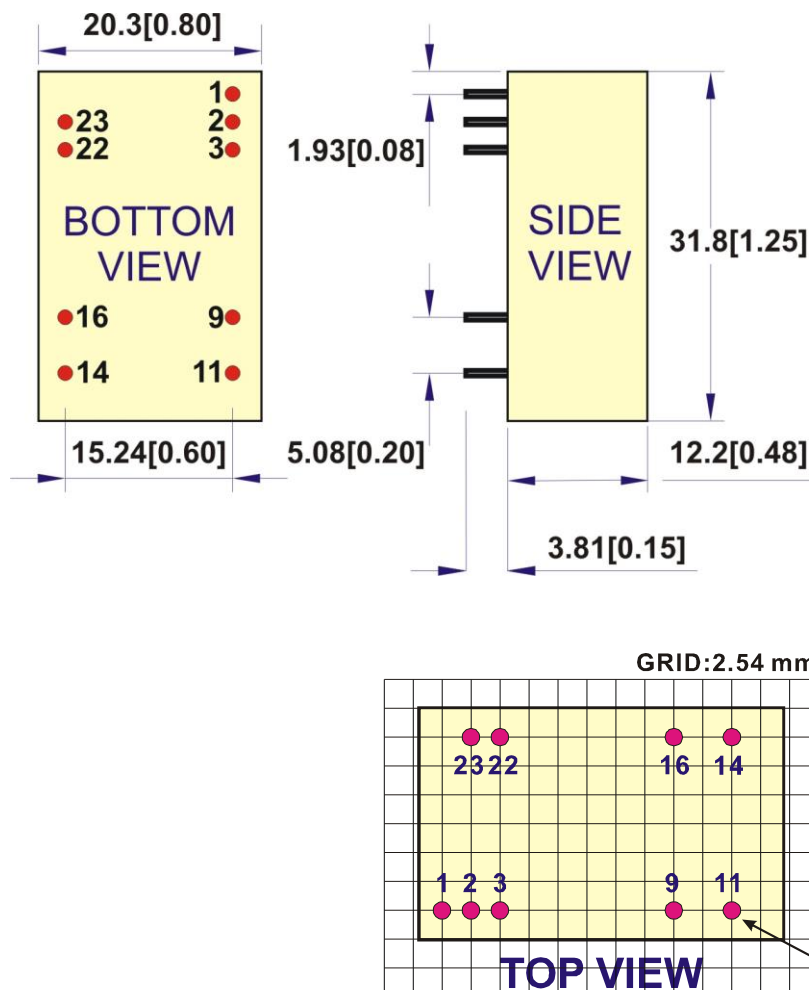
Note: Efficiency and input current are measured at nominal input voltage and full load.

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	Pi Network		
	Remote Control	see page 4		
	Protection	Fuse recommended (see page 6)		
OUTPUT	Voltage Accuracy	±2% max.		
	Rated Power	12W		
	Ripple & Noise ¹	100mVp-p max.		
	Line Regulation ²	±0.5%		
	Load Regulation ³	±0.5% for other output	±1% for 3.3Vdc output	
	Cross Regulation	±5%	Dual : asymmetrical load 25%/100% FL	
	Switching Frequency	300Khz typ.(PWM)		
PROTECTION	Short Circuit	Protection type : continuous, recovery		
	Overload	110%~230%		
		Protection type : recovers automatically after fault condition is removed		
	Over Voltage	Clamp by TVS diode		
ENVIRONMENT	Cooling	Free-air convection		
	Working Temperature	-40~ +85°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 : 3KVdc for 60 seconds		
	Isolation Resistance	I/P-O/P : 1000M Ohms / 500VDC / 25°C / 70% RH		
	Isolation Capacitance	1000pF 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	Contact ±4KV
		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	>860,000Hours		
	Weight	17.5g typ.		
	Dimension(L*W*H)	31.8mm*20.3mm*12.2mm		
	Case Material	Five-side shielded 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	Remote	
2 & 3	-Vin	-Vin
9	NC	Common
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Common
22 & 23	+Vin	+Vin

All dimensions are in mm[Inches]

*If Remote is not selected, there is no pin on corresponding number.

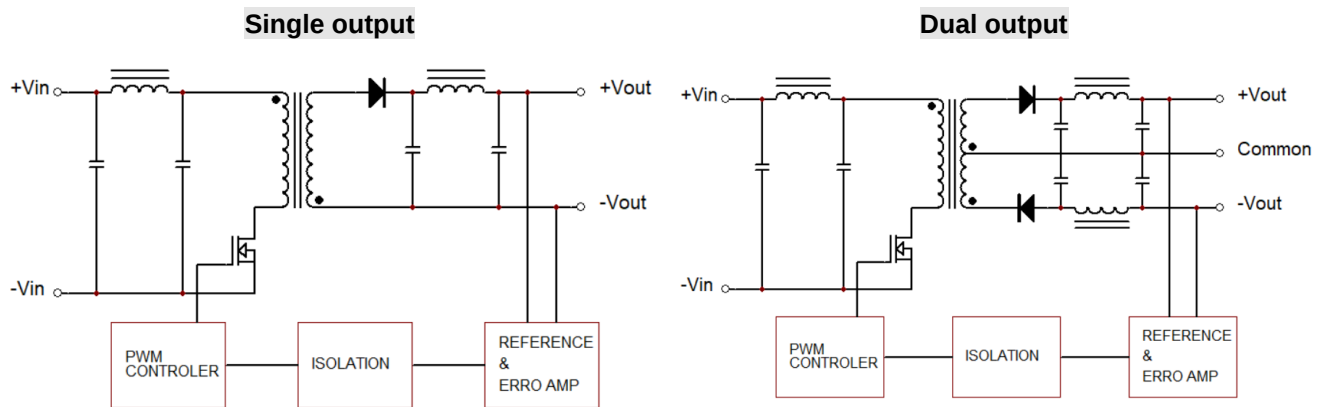
Pin size is 0.6Φ ±0.10mm

Tolerance .X or .XX= ±0.5mm

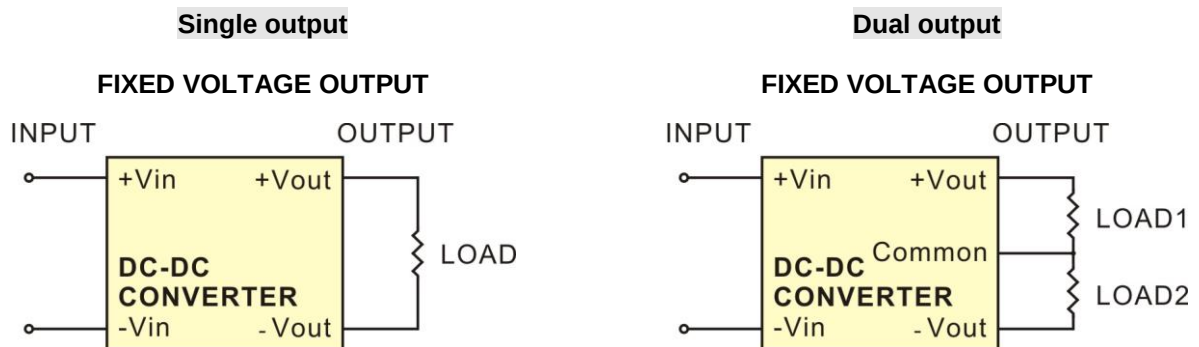
REMOTE ON/OFF CONTROL

Remote On/Off Control			
Control Input		PIN1	Control Common
Control Voltage		PIN2	
ON		10mA	
> 2.5 ~ 30VDC or Open Circuit		CMOS or Open	
OFF		Collector TTL	
< 1.0VDC or Jumper to PIN2		Logic Compatibility	

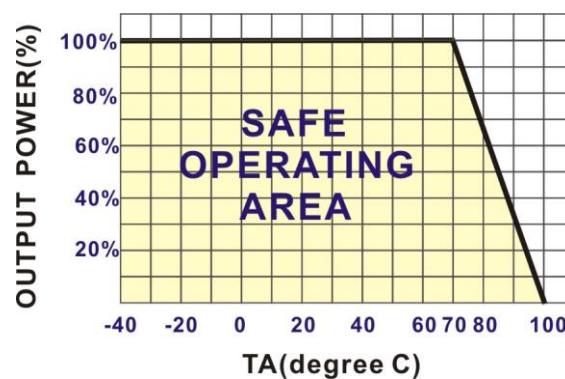
■ SIMPLIFIED SCHEMATIC



■ TYPICAL APPLICATIONS

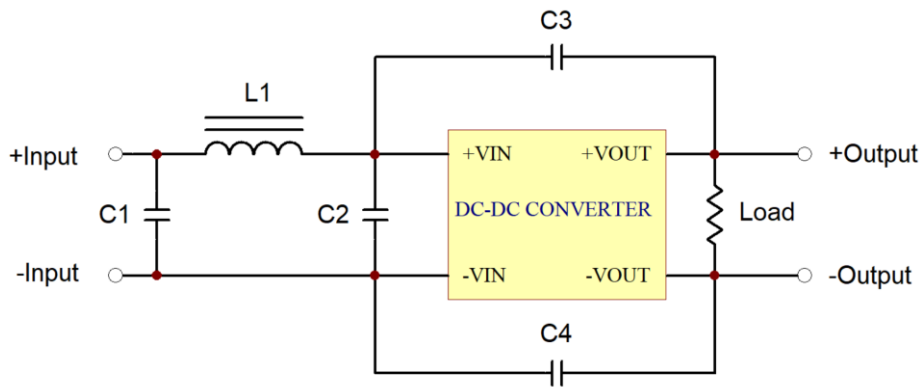


■ DERATING CURVE



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:



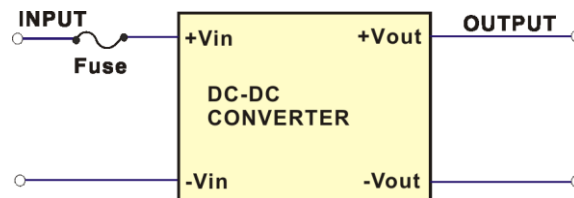
No	CLASS B
C1	2.2uF/100V
C2	2.2uF/100V
C3	152/5KV
C4	152/5KV
L1	10uH

Note: All of capacitors are ceramic capacitors.

INPUT FUSE SELECTION GUIDE

9-75V Input Voltage (Vdc)

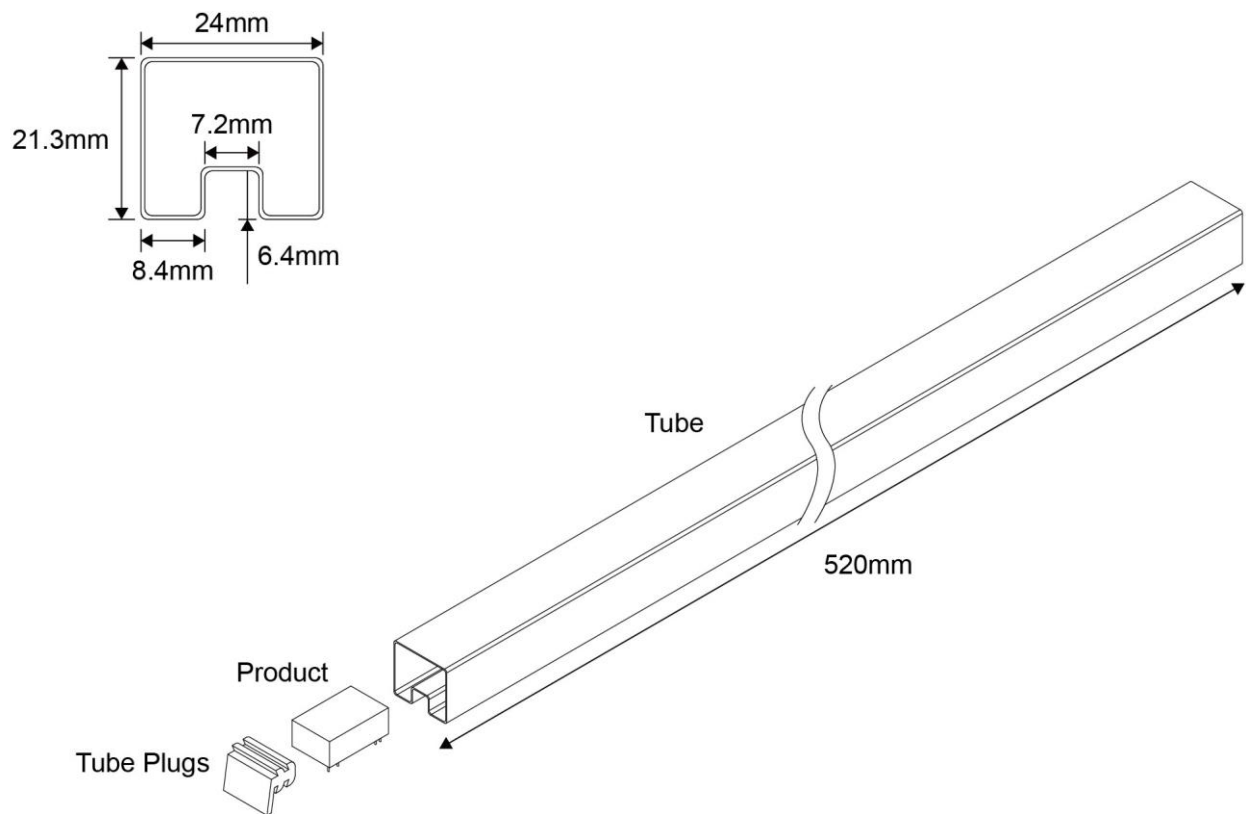
4000mA Slow-Blow Type



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



■ PACKAGING INFORMATION



Packaging Quantity: 15 pcs converter per tube



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