FCW-E10 SERIES

10W 8:1 DC-DC Converter

FEATURES

- **DIP 2“x 1” package with standard pinout**
- **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

FCW-E10 series is a 10W DC-DC converter product with 2”x1” 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 –40ºC up to +92ºC 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

FCW	S	-	24	05	E	10	(R)
Series Name	**Output Quantity**		**Input Voltage**	**Output Voltage**	**Input Range**	**Output Power**	**Function**
	S : Single D : Dual		24 : 9~75V	03.3 : 3.3V 05 : 5V ; ±5V 09 : 9V 12 : 12V ; ±12V 15 : 15V ; ±15V 24 : 24V	E: 8:1 , 3KVdc Isolation	10 :10W	Blank : No Pin R : Remote On/Off

■ 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				
FCWS-2403.3E10(R)	24	9~75	10	503	3.3	0~3000	82	680uF
FCWS-2405E10(R)			10	484	5	0~2000	86	680uF
FCWS-2409E10(R)			10	485	9	0~1100	85	470uF
FCWS-2412E10(R)			10	478	12	0~833	87	330uF
FCWS-2415E10(R)			10	473	15	0~666	88	220uF
FCWS-2424E10(R)			10	478	24	0~417	87	100uF
FCWD-2405E10(R)	24	9~75	10	484	±5	±0~1000	86	±330uF
FCWD-2412E10(R)			10	478	±12	±0~417	87	±150uF
FCWD-2415E10(R)			10	473	±15	±0~333	88	±100uF

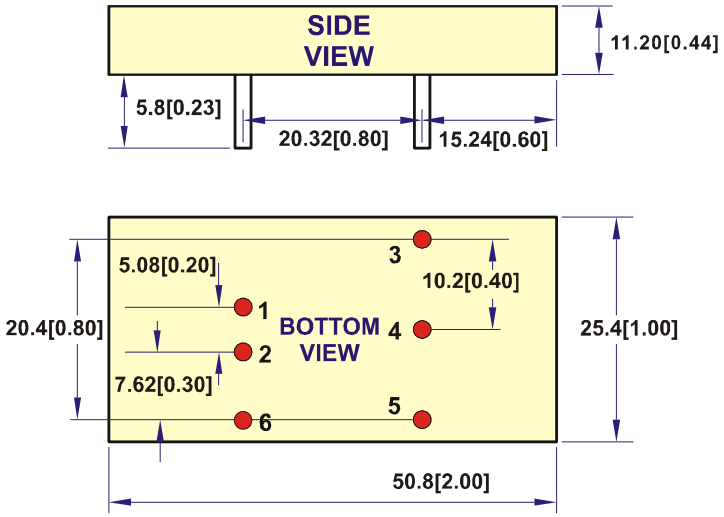
Note: Efficiency and input current are measured at nominal input voltage and full load.

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

■ SPECIFICATION

INPUT	Voltage Range	9~75V		
	Surge Voltage(100ms max.)	24Vin models : 100Vdc		
	Filter	Pi network		
	Under Voltage Lockout	Start-up voltage：8.8 Vdc		
		Shutdown voltage：8 Vdc		
	Remote Control	See page 4		
	Protection	Fuse recommended (see page 6)		
OUTPUT	Voltage Accuracy	±2% max.		
	Rated Power	10W		
	Ripple & Noise[1]	150mVp-p max.		
	Line Regulation[2]	±0.5%		
	Load Regulation[3]	±0.5%	±1% for 3.3Vdc & ±5Vdc 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~ +92°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		
	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]	>880,000Hours		
	Weight	29.0g typ.		
	Dimension(L*W*H)	50.8mm*25.4mm*11.2mm		
	Case Material	Six-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



All dimensions are in millimeters[inches]

PIN CONNECTION		
PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	NP	Common
5	-Vout	-Vout
6	NP / Remote*	

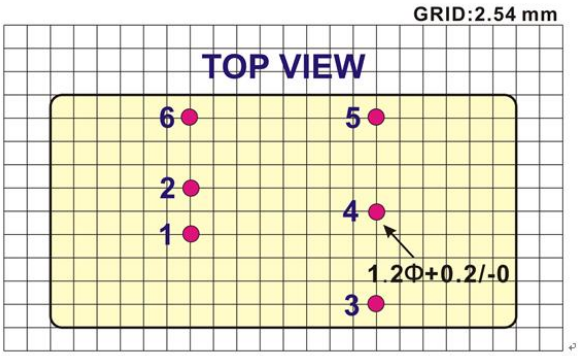
All dimensions are in mm[Inches]

NP：No pin

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

Pin size is 1.0Φ ±0.10mm

Tolerance .X or .XX= ±0.5mm

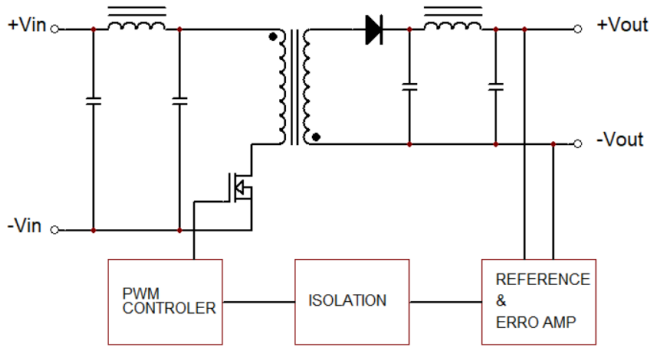


REMOTE ON/OFF CONTROL

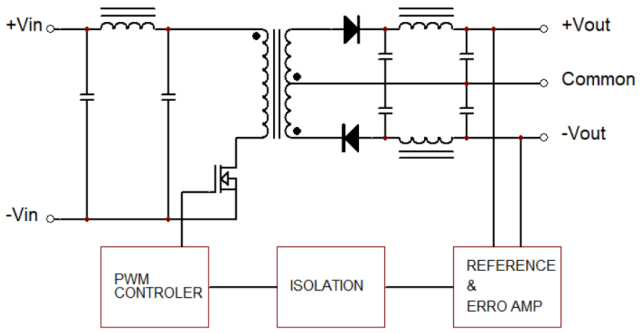
Remote On/Off Control			
Control Input	PIN6	Control Common	PIN2
Control Voltage		Converter Shutdown Idle Current	10mA
ON	> 4 ~ 30VDC or Open Circuit	Logic Compatibility	CMOS or Open Collector TTL
OFF	< 1.0VDC or Jumper to PIN2		

■ SIMPLIFIED SCHEMATIC

Single output



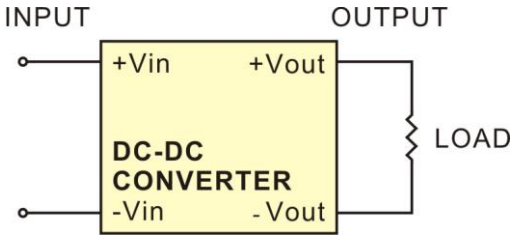
Dual output



■ TYPICAL APPLICATIONS

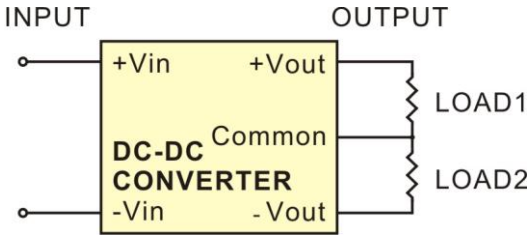
Single output

FIXED VOLTAGE OUTPUT

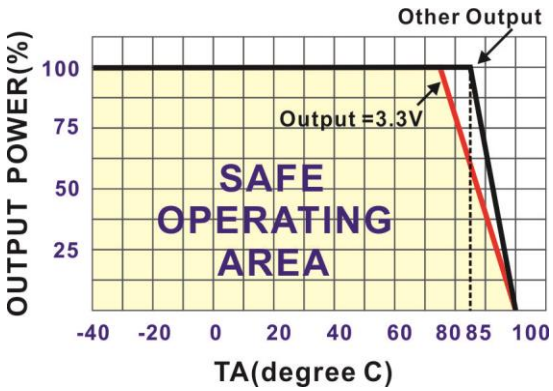


Dual output

FIXED VOLTAGE OUTPUT

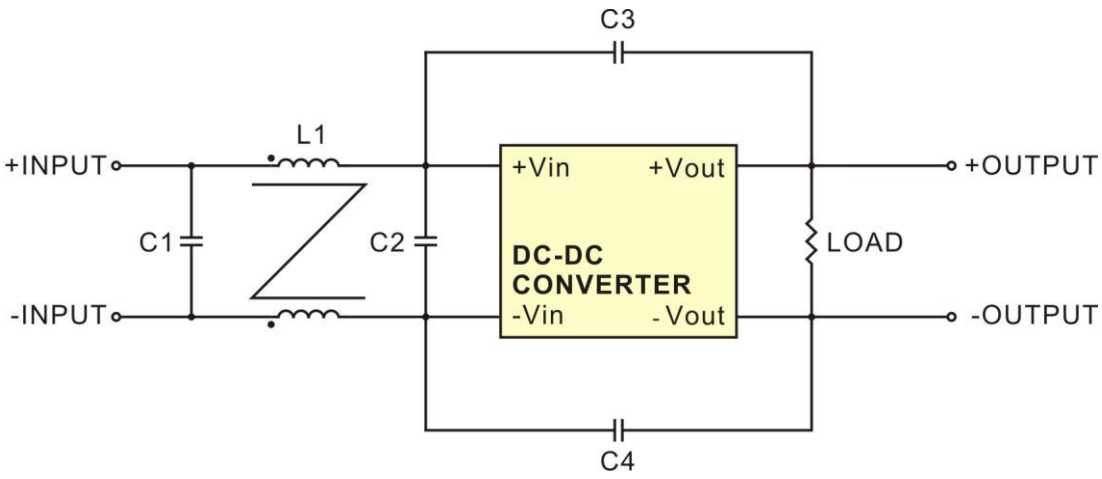


■ DERATING CURVE



■ 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:



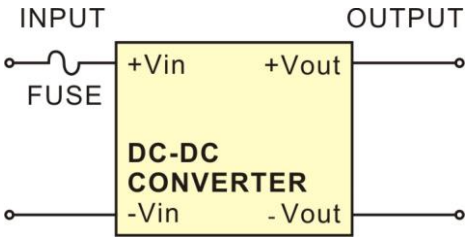
MODEL NUMBER	C1	C2	C3	C4	L1
FCWX-24XXE10(R)	2.2uF/100V MLCC	X	X	X	500uH Common Choke

Note: All of capacitors are ceramic capacitors.

■ INPUT FUSE SELECTION GUIDE

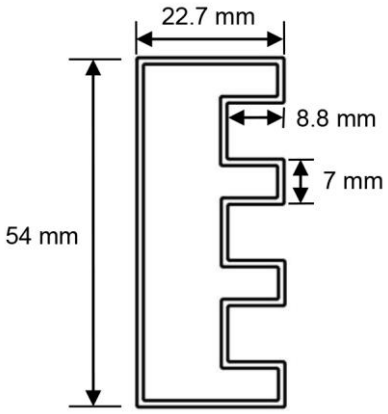
9-75V Input Voltage (Vdc)

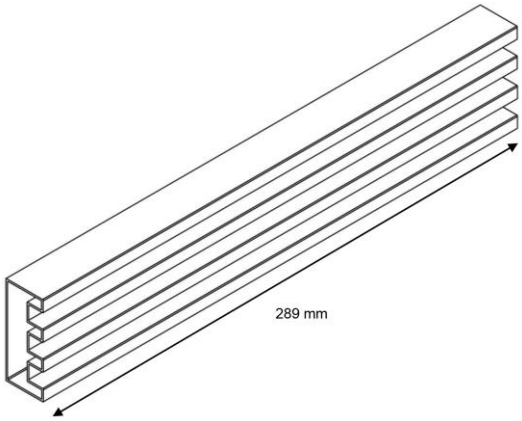
3000mA Slow-Blow Type



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

■ PACKAGING INFORMATION





Packaging Quantity: 10 pcs converter per tube

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