



FEATURES

- DIP 2"x 1" package with standard pinout
- 8:1 Wide input range
- High efficiency up to 86%
- 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

APPLICATIONS

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

DESCRIPTION

FCW-E series is a 15W DC-DC converter products with 2"x1" standard industrial package. It features wide 8:1 input voltage range, high efficiency up to 86%, 3000Vdc isolation, continuous mode short circuit, and various protections such as overload, input under voltage, The models meet radiated Class A of EN55032 without external components, and suits for all kinds of systems like industrial control, automation field, and so on.

MODEL ENCODING

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

■ 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-2403.3E(R)	24	9~75	10	679	3.3	0~4000	81	680uF
FCWS-2405E(R)			10	744	5	0~3000	84	680uF
FCWS-2409E(R)			10	727	9	0~1666	86	470uF
FCWS-2412E(R)			15	727	12	0~1250	86	330uF
FCWS-2415E(R)			15	727	15	0~1000	86	220uF
FCWS-2424E(R)			15	727	24	0~625	86	100uF
FCWD-2405E(R)	24	9~75	10	744	±5	±0~1500	84	±330uF
FCWD-2412E(R)			15	727	±12	±0~625	86	±150uF
FCWD-2415E(R)			15	727	±15	±0~500	86	±100uF

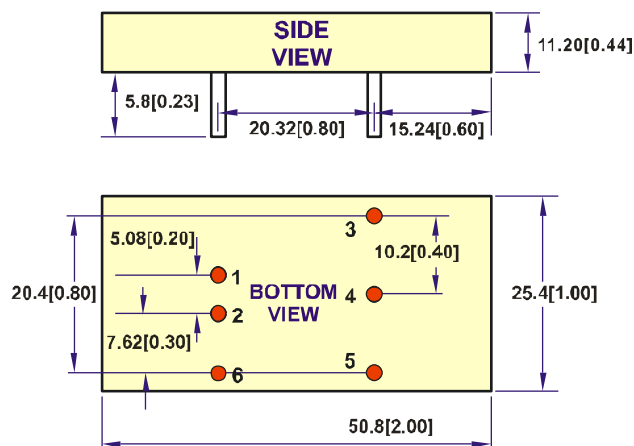
Note: Efficiency and input current are measured at nominal input voltage and full load.

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

SPECIFICATION

INPUT	Voltage Range	9~75V		
	Surge Voltage(100ms max.)	9-75 Vin models : 100Vdc		
	Filter	Pi network		
	Protection	Fuse recommended (see page 6)		
	Under Voltage Lockout	Start-up voltage : 8.8 Vdc Shutdown voltage : 8 Vdc		
	Remote Control	(see page 4)		
	OUTPUT	Voltage Accuracy	±2% max.	
Rated Power		15W		
Ripple & Noise ¹		150mVp-p max.		
Line Regulation ²		±0.5%		
Load Regulation		±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 diodes		
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 ³	>860,000Hours		
	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 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

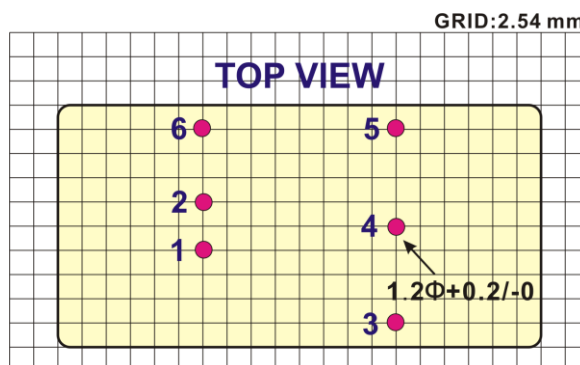


PIN CONNECTION		
PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	NP	Common
5	-Vout	-Vout
6	NP / Remote On/Off	

All dimensions are in mm [Inches]

Pin size is 1.0Φ ±0.10mm

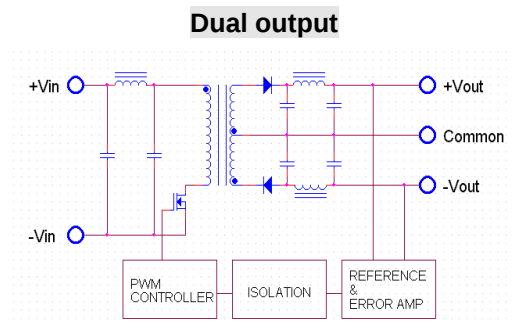
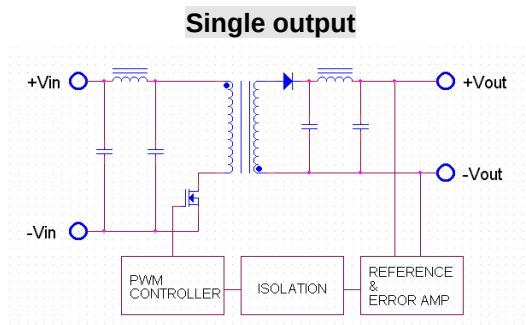
Tolerance .X or .XX = ±0.5mm



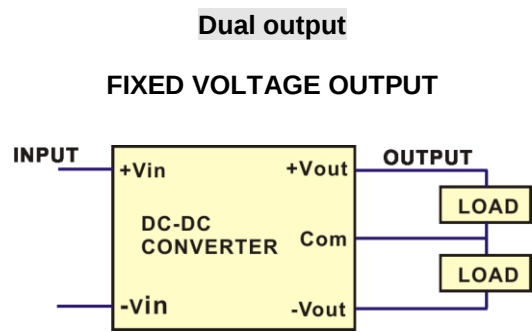
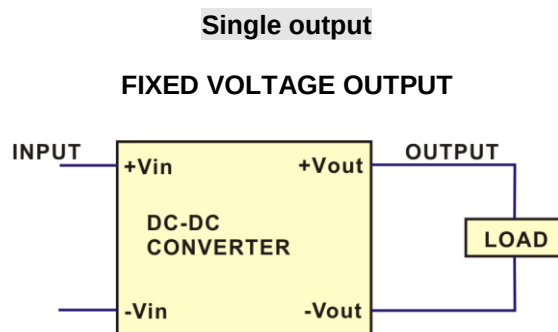
REMOTE ON/OFF CONTROL

Remote On/Off Control			
Control Input		PIN6	Control Common
Control Voltage			PIN2
ON		> 2.5 ~ 30VDC or Open Circuit	Converter Shutdown Idle Current
OFF		< 1.0VDC or Jumper to PIN2	10mA
		Logic Compatibility	CMOS or Open Collector TTL

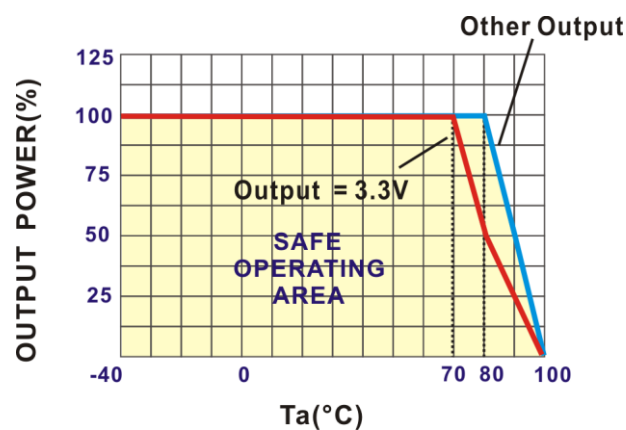
SIMPLIFIED SCHEMATIC



TYPICAL APPLICATIONS



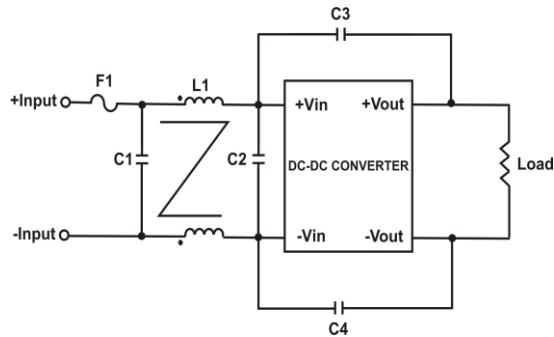
DERATING CURVE



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:

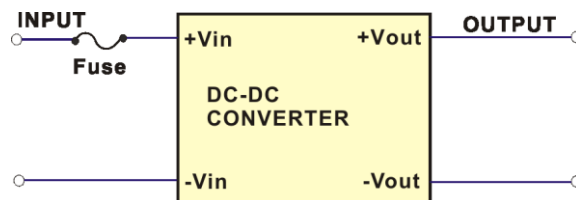
	C1	C2	C3	C4	L1
FCW*-24****	47 μ F/100V	2.2uF/100V 1210 MLCC	1000pF/5KV MLCC	1000pF/5KV MLCC	325uH Common Choke



INPUT FUSE SELECTION GUIDE

9-75V Input Voltage (Vdc)

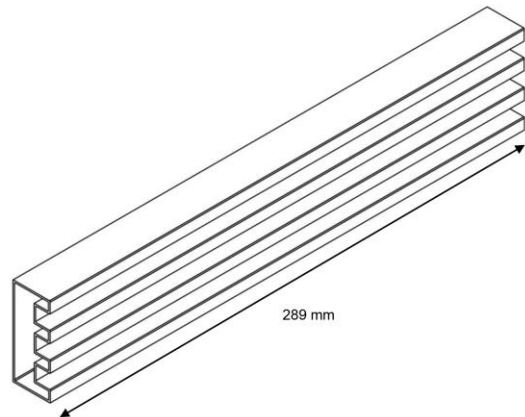
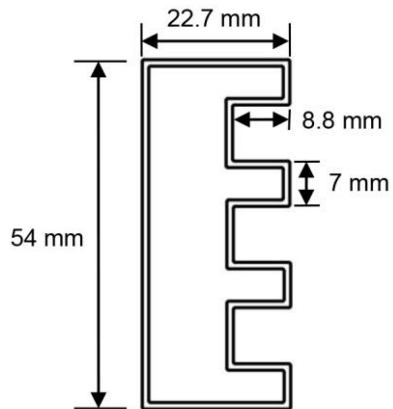
5000mA Slow-Blow Type



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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