

FHWS SERIES

50W WIDE INPUT RANGE



FEATURES

- 50W DIL PACKAGE
- INDUSTRY STANDARD PACKAGE
- 18-36V,36-75V, WIDE INPUT RANGE
- REGULATED OUTPUT
- INPUT UVLO & OVLO & OTP
- HIGH EFFICIENCY
- UL 94V-0 PACKAGE MATERIAL
- CUSTOM SOLUTIONS AVAILABLE
- 3 YEARS WARRANTY



OUTPUT SPECIFICATIONS		INPUT SPECIFICATIONS	
Voltage Set-point Accuracy	+/-2% max	Input Voltage Range	2:1 Input Range
Temperature Coefficient	+/-0.05%/°C	Input Filter	Pi Network
Ripple & Noise(20MHz BW) ¹	150mVp-p max	Protection	Fuse Recommended
Line Regulation ²	+/-0.5% max	OVLO(Over Voltage Lockout)	See Page 3
Load Regulation ³	+/-0.5% max	UVLO(Under Voltage Lockout)	See Page 3
Minimum Load	10% of Full Load	OVLO & UVLO Circuit Restart	Automatic
Short Circuit Protection	Continuous	OTP(Over Temperature Protection)	110°C Typ.
Short Circuit Restart	Automatic	GENERAL SPECIFICATIONS	
Over Load Protection	130%~180%	Efficiency	92% typ.
Transient Response ⁴	500uS max	Isolation Voltage ⁵	1500VDC min.
		Isolation Resistance	10 ⁹ ohms min.
		Isolation Capacitance	3000pF max.
		Switching Frequency	300 KHz typ.
		MTBF ⁶	>300,000 Hours
		Weight	43 g typ.
		Case Material	Six-Side Shielded Case
		Case Size	50.8mm*25.4mm*13.7mm
		Conducted Emissions	EN55022 Class A
		Radiated Emissions	EN55022 Class A

ALL SPECIFICATIONS TYPICAL AT NOMINAL LINE, FULL LOAD, AND 25 °C UNLESS OTHERWISE NOTED.

¹ Measured 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 10% to 100%.

⁴ 25% Step Load Change.

⁵ For 10 seconds.

⁶ MIL-HDBK-217F @25 °C, Ground Benign.

● SELECTION GUIDE

2:1 50W OUTPUT

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT ⁷		EFF (%) ⁸	CAPACITOR LOAD (Max)
				CURRENT(mA)			
				FULL LOAD	NO LOAD		
FHWS-2405	18-36	5	10000	2264	95 92	1000uF	
FHWS-2412	18-36	12	4170	2266	95 92	1000uF	
FHWS-2415	18-36	15	3333	2262	95 92	1000uF	
FHWS-4805	36-75	5	10000	1132	60 92	1000uF	
FHWS-4812	36-75	12	4170	1133	60 92	1000uF	
FHWS-4815	36-75	15	3333	1131	60 92	1000uF	

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

● PART NUMBERS STRUCTURE

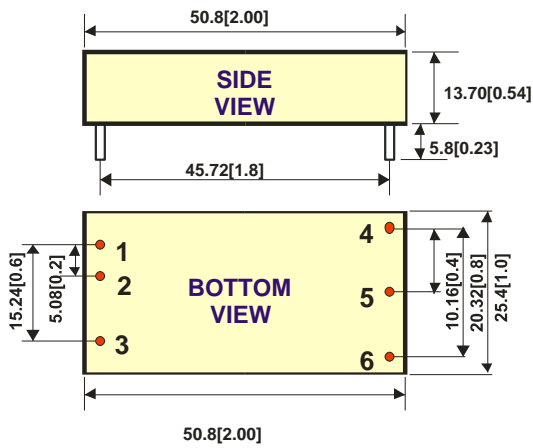
Model Name	Difference
FHWv-x1x2x3-zzz	<p>FH=Series Name W=Wide</p> <p>Input Range</p> <p>v=Type of output voltage (S=Single output ; D=Dual output) x1=24V (18~36V Input voltage) ; 48V (36~75V Input voltage)</p> <p>x2=Output voltage(5V ; 12V ; 15V)</p> <p>x3=Power zzz= 0~9 , A~Z or blank for market purpose.</p>

● MECHANICAL DIMENSIONS

PACKAGE

⁷ NOMINAL INPUT VOLTAGE.

⁸ NOMINAL INPUT VOLTAGE, FULL LOAD.



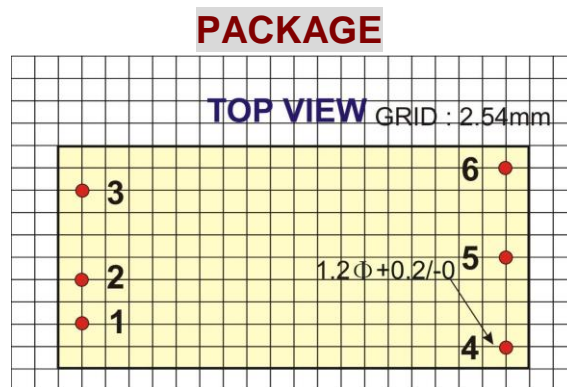
All dimensions are in millimeters [inches]

PIN	SINGLE
1	+Vin
2	-Vin
3	Remote On/Off
4	+Vout
5	-Vout
6	Trim

NOTE: Pin Size is Tolerance 1.0Φ ±0.10mm
All Dimensions In mm(Inches)

Tolerance .X or .XX= ±0.80mm

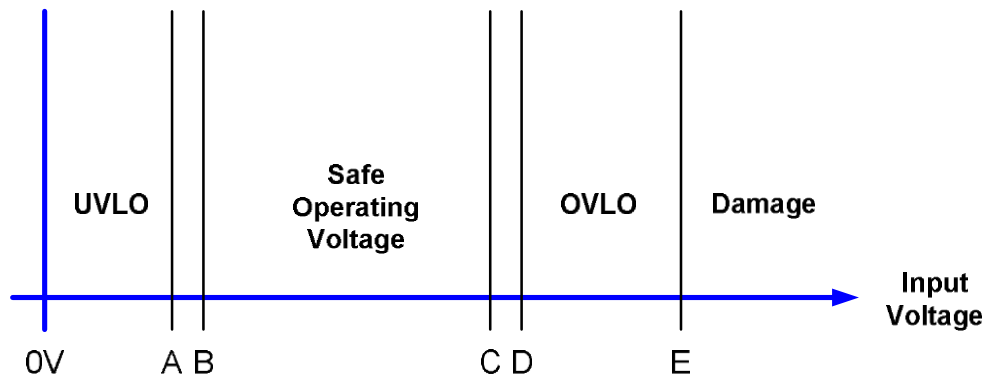
● RECOMMENDED FOOTPRINT DETAILS



● Table1 (Remote On/Off Control)

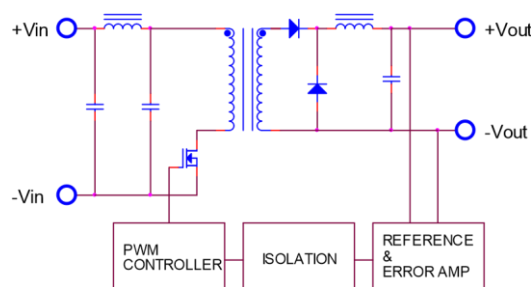
Remote On/Off Control			
Control Input	PIN3	Control Common	PIN2
Control Voltage		Converter Shutdown Idle Current	10mA
ON	>+2.5VDC or Open Circuit		CMOS or Open
OFF	<+0.8VDC or Jumper to PIN2	Logic Compatibility	Collector TTL

● INPUT OPERATING VOLTAGE



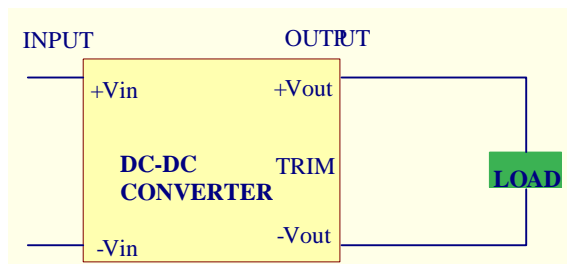
	A	B	C	D	E
FEWS-24****	16V typ.	18V	36V	40V typ.	50V
FEWS-48****	32V typ.	36V	75V	80V typ.	100V

● SIMPLIFIED SCHEMATIC

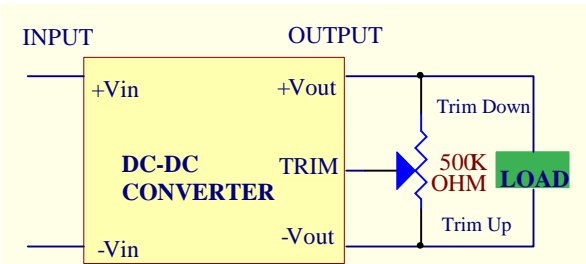


● TYPICAL APPLICATIONS

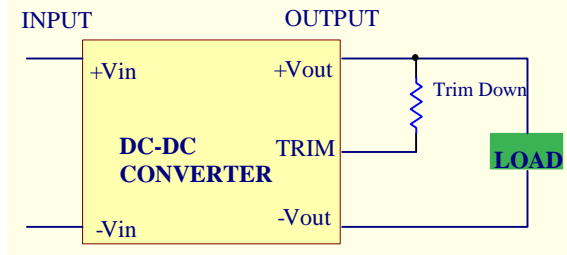
FIXED VOLTAGE OUTPUT



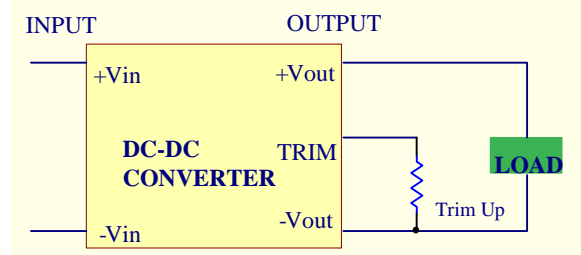
TRIM CONNECTIONS USING A TRIMPOT



FIXED-VALUE TRIM DOWN RESISTOR



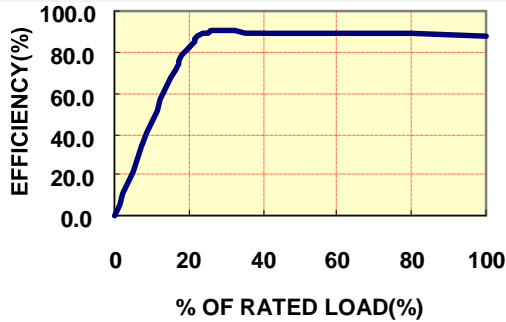
FIXED-VALUE TRIM UP RESISTOR



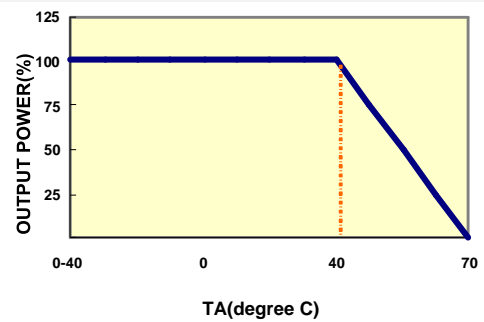
● TYPICAL PERFORMANCE CURVES

Specifications typical at $T_a=25^\circ\text{C}$, nominal input voltage, rated output current unless otherwise specified.

OUTPUT LOAD VS EFFICIENCY



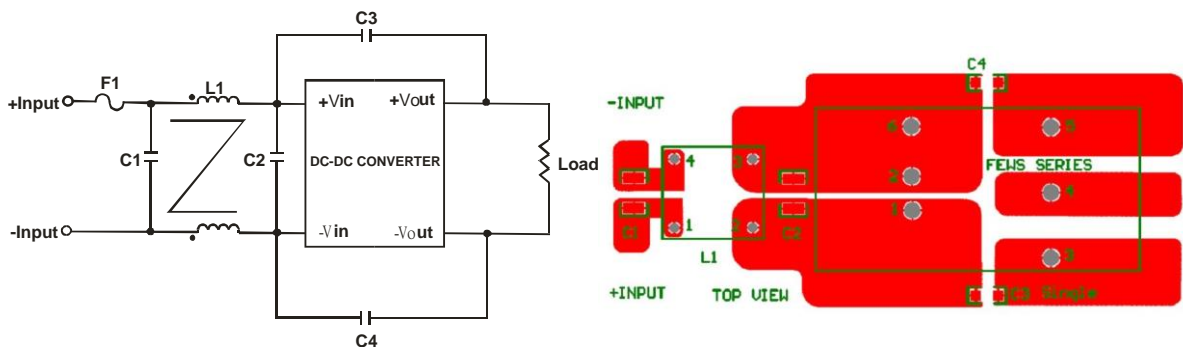
TEMPERATURE DERATING



● RECOMMENDED FILTER FOR EN55022 CLASS B

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

	C1	C2	C3	C4	L1
FEWS-24*****	3.3uF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke
FEWS-48*****	1.5uF/100V 1812 MLCC	1.5uF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke



RECOMMENDED EN55022 CLASS B FILTER CIRCUIT LAYOUT

● INPUT FUSE SELECTION GUIDE

18-36V INPUT VOLTAGE(VDC)	36-75V INPUT VOLTAGE(VDC)
5000mA Slow-Blow Type	2500mA Slow-Blow Type

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

FHWS SERIES APPLICATION NOTES: EXTERNAL CAPACITANCE REQUIREMENTS:

No external capacitance is required for operation of the FHWS series.

External output capacitance is not required for operation; however it is recommended that 10uF tantalum and 0.1uF ceramic capacitance be selected for reduced system noise.

We Can OfFhr EMC-Filter According To EN55011/22 Class B.

Negative Outputs:

A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting – OUT as the negative output.

Remote ON/OFF:

The remote ON/OFF pin may be left floating if this function is not use. It is recommended to drive this pin with an open collector arrangement or a relay contact. When the ON/OFF pin is pulled low with respect to the –VIN, the converter is placed in a low power drain state.

Output TRIM:

The TRIM pin may be used to adjust the output +10% ~ -20% from the nominal setting .this function allows adjustment for voltage drops in the system wiring. If the TRIM function is not required the pin may be left floating.