

EP 10-15 W Serie—Wide Input Range DC-DC Converter

Features

15W DIL PACKAGE
INDUSTRY STANDARD PACKAGE
9-18V,18-36V,36-72V,9-36V,18-72V
WIDE INPUT RANGE
REGULATED OUTPUT
100% BURN IN
UL 94V-0 PACKAGE MATERIAL
CUSTOM SOLUTIONS AVAILABLE
RoHS COMPLIANT



Specification

Output Specification

Voltage Setpoint Accuracy	+/-2% max.
Temperature Coefficient	+/-0.05%/°C
Ripple & Noise(20MHz BW) ¹	100mVp-p max.
Line Regulation ²	+/-0.5% max.
Load Regulation ³	+/-0.5% max.
Minimum Load	10% of Full Load
Short Circuit Protection	Continuous
Short Circuit Restart	Automatic
Over Load Protection	180% typ.
Transient Response ⁴	200uS max.

Input Specification

Input Voltage Range	2:1 or 4:1 Input Range
Input Filter	Pi Network
Protection	Fuse Recommended
Start up time (Nominal input)	
Vin: 12V & 24V	25ms max.
Start up time (Nominal input)	
Vin: 48V	1s max.
Operating Temperature	-25°C to +71°C
Case Temperature	+90°C max.
Storage Temperature	-55°C to +125°C
Humidity	95% max.
Cooling	Free-Air Convection

Environmental Specifications

General Specifications

Efficiency		76% min.
Isolation Voltage ⁵	1500 VDC min	Standard Models
	3000 VDC min	Suffix "3K" Models
Isolation Resistance		109 ohms min.
Isolation Capacitance		550pF max.
Switching Frequency		150 KHz min.
MTBF ⁶		>700,000 Hours
Weight		31.2g typ.
Case Material		Six-Side Shielded Case
Case Size		50.8mm*25.4mm*11.2mm
Potting Material		Epoxy(UL94-V0)
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 1500VDC for 10 seconds,3000VDC for 1 seconds

⁶ MIL-HDBK-217F @25°C , Ground Benign

Selection Guide (1) 2:1 10-15W Output 1500 VDC or 3000 VDC

MODEL NUMBER	INPUT VOLTAGE E (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT ⁷		EFF (%) ⁸	CAPACITOR LOAD MAX.
				FULL LOAD	NO LOAD		
EP9-18-03,3S3000(A) (-3K)	9-18	3.3	3000	1070	35	78	2700uF
EP9-18-05S3000(A) (-3K)	9-18	5	3000	1580	30	79	2700uF
EP9-18-12S1250(A) (-3K)	9-18	12	1250	1525	30	82	1800uF
EP9-18-15S1000(A) (-3K)	9-18	15	1000	1525	30	82	1500uF
EP9-18-24S625(A) (-3K)	9-18	24	625	1560	30	80	1000uF
EP9-18-05S1500(A) (-3K)	9-18	+/-5	+/-1500	1570	30	80	+/-1200uF
EP9-18-12D625(A) (-3K)	9-18	+/-12	+/-625	1560	30	80	+/-820uF
EP9-18-15D500(A) (-3K)	9-18	+/-15	+/-500	1530	30	82	+/-680uF
EP9-18-24D313(A) (-3K)	9-18	+/-24	+/-313	1565	80	80	+/-560uF
EP18-36-03,3S3000(A) (-3K)	18-36	3.3	3000	543	20	76	2700uF
EP18-36-05S3000(A) (-3K)	18-36	5	3000	790	20	79	2700uF
EP18-36-09S1667(A) (-3K)	18-36	9	1667	780	20	80	2200uF
EP18-36-12S1250(A) (-3K)	18-36	12	1250	760	20	82	1800uF
EP18-36-15S1000(A) (-3K)	18-36	15	1000	760	20	82	1500uF
EP18-36-05D1500(A) (-3K)	18-36	+/-5	+/-1500	780	20	80	+/-1200uF
EP18-36-12D625(A) (-3K)	18-36	+/-12	+/-625	760	20	82	+/-820uF
EP18-36-15D500(A) (-3K)	18-36	+/-15	+/-500	760	20	82	+/-680uF
EP36-72-03,3S3000(A) (-3K)	36-72	3.3	3000	272	20	76	1000uF
EP36-72-05S3000(A) (-3K)	36-72	5	3000	390	20	80	1000uF
EP36-72-09S1667(A) (-3K)	36-72	9	1667	390	20	80	820uF
EP36-72-12S1250(A) (-3K)	36-72	12	1250	380	20	82	680uF
EP36-72-15S1000(A) (-3K)	36-72	15	1000	380	20	82	560uF
EP36-72-24S625(A) (-3K)	36-72	24	625	380	20	82	470uF
EP36-72-05D1500(A) (-3K)	36-72	+/-5	+/-1500	380	20	82	+/-330uF
EP36-72-12D625(A) (-3K)	36-72	+/-12	+/-625	380	20	82	+/-220uF
EP36-72-15D500(A) (-3K)	36-72	+/-15	+/-500	380	20	82	+/-100uF

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

⁷ NOMINAL INPUT VOLTAGE.

⁸ NOMINAL INPUT VOLTAGE, FULL LOAD.

Selection Guide (2) 4:1 10W-15W Output

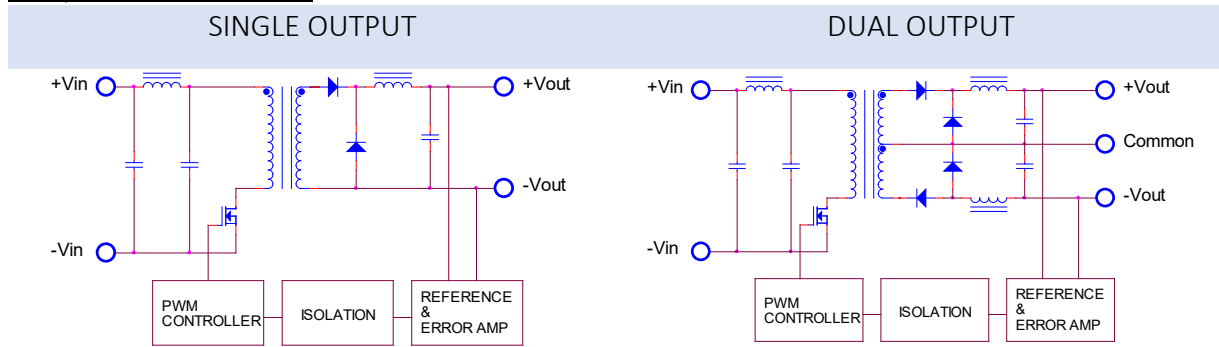
MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT ⁹		EFF (%) ¹⁰	CAPACITOR LOAD MAX.
				CURRENT(mA)			
				FULL LOAD	NO LOAD		
EP9-36-03,3S3000(A)	9-36	3.3	3000	1070	35	78	1800uF
EP9-36-05S3000(A)	9-36	5	3000	1580	30	79	1800uF
EP9-36-09S1670(A)	9-36	9	1670	1580	30	79	1500uF
EP9-36-12S1250(A)	9-36	12	1250	1525	30	82	1200uF
EP9-36-15S1000(A)	9-36	15	1000	1525	30	82	1000uF
EP9-36-05D1500(A)	9-36	+/-5	+/-1500	1570	30	80	+/-660uF
EP9-36-09D834(A)	9-36	+/-9	+/-834	1530	30	82	+/-660uF
EP9-36-12D625(A)	9-36	+/-12	+/-625	1530	30	82	+/-660uF
EP9-36-15D500(A)	9-36	+/-15	+/-500	1530	30	82	+/-660uF
EP18-72-03,3S3000(A)	18-72	3.3	3000	543	20	76	1000uF
EP18-72-05S3000(A)	18-72	5	3000	790	20	79	1000uF
EP18-72-12S1250(A)	18-72	12	1250	760	20	82	820uF
EP18-72-15D1000(A)	18-72	15	1000	760	20	82	680uF
EP18-72-05D1500(A)	18-72	+/-5	+/-1500	780	20	80	+/-470uF
EP18-72-09D834(A)	18-72	+/-9	+/-834	760	20	82	+/-470uF
EP18-72-12D625(A)	18-72	+/-12	+/-625	760	20	82	+/-470uF
EP18-72-15D500(A)	18-72	+/-15	+/-500	760	20	82	+/-470uF

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

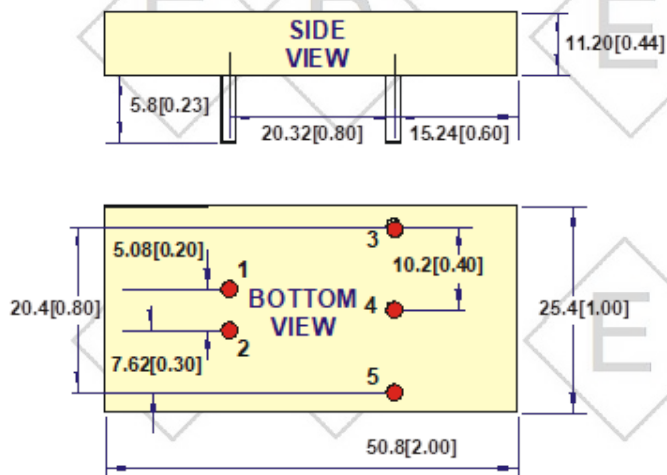
⁹ NOMINAL INPUT VOLTAGE.

¹⁰ NOMINAL INPUT VOLTAGE, FULL LOAD.

Simplified Schematic



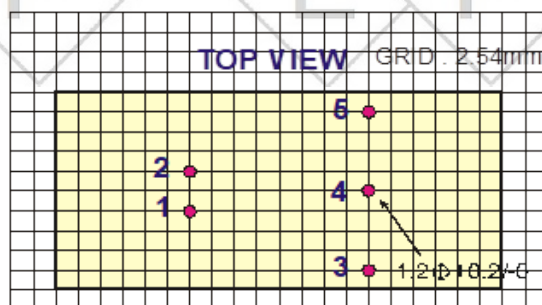
Mechanical Dimensions & Recommended Footprint Details



PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	NO PIN	Common
5	-Vout	-Vout

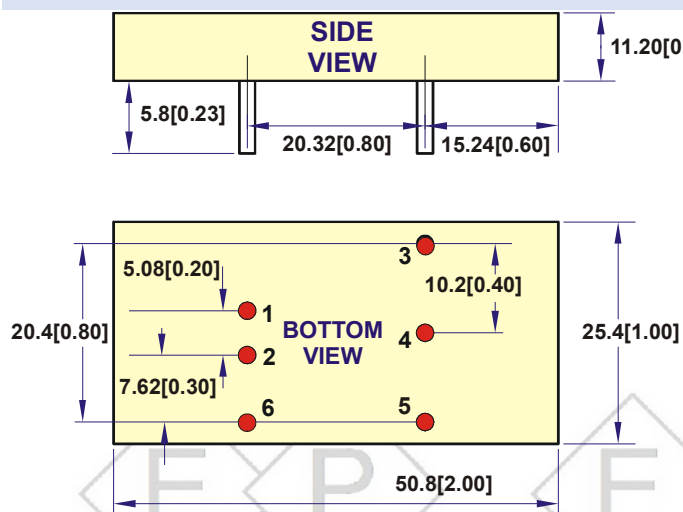
NOTE: Pin Size is Tolerance 1.0Φ ±0.10mm
 All Dimensions In mm(Inches)
 Tolerance .X or .XX= ±0.80mm

All dimensions are in millimeters[inches]



Mechanical Dimensions & Recommended Footprint Details

REMOTE CONTROL(Specially Models) Package "A"



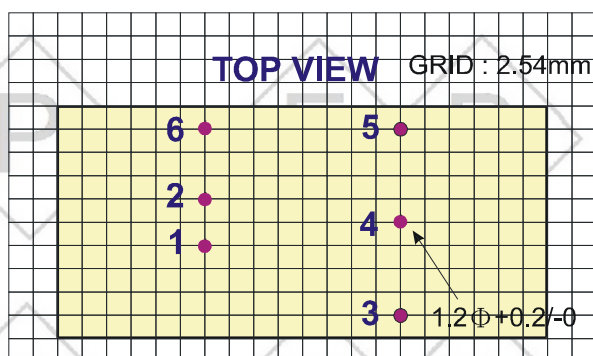
PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	NO PIN	Common
5	-Vout	-Vout
6		Remote ON/OFF

NOTE: Pin Size is Tolerance 1.0Φ ±0.10mm

All Dimensions In mm(Inches)

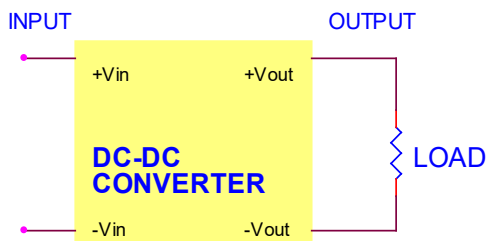
Tolerance .X or .XX= ±0.80mm

All dimensions are in millimeters[inches]

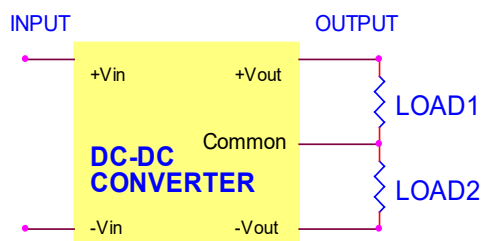


Typical Applications

SINGLE OUTPUT



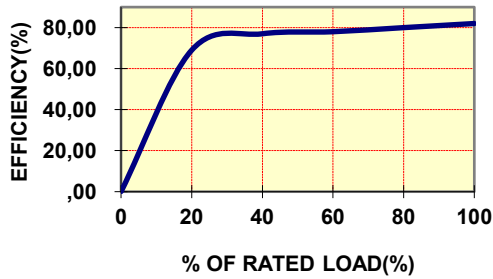
DUAL OUTPUT



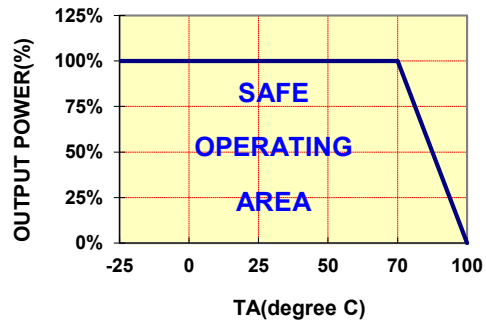
Typical Performance Curves

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

OUTPUT LOAD VS EFFICIENCY



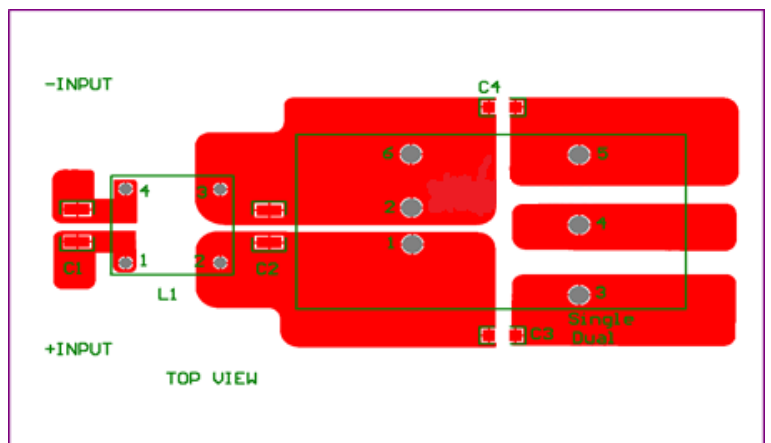
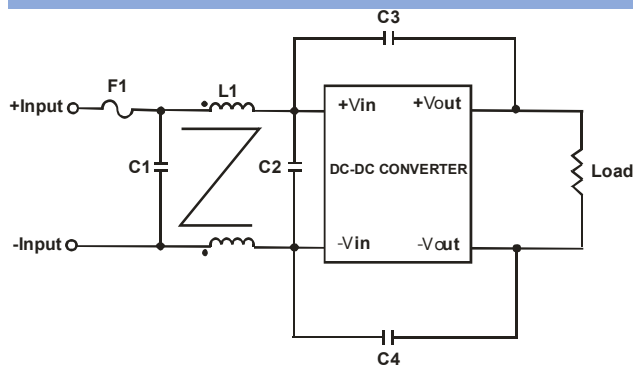
TEMPERATURE DERATING



Recommended Filter for EN55022 Class B Compliance

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

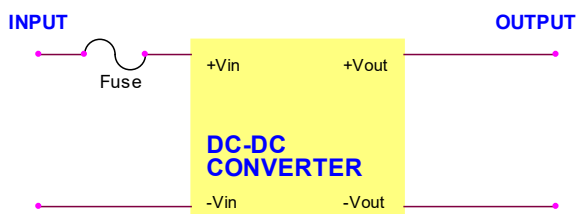
	C1	C2	C3	C4	L1
EP9-18-***** (A)(-3K)	3.3uF/50V 1812 MLCC	N/A	1000pF/2KV or 1000pF/3KV MLCC	1000pF/2KV or 1000pF/3KV MLCC	325uH Common Choke
EP18-36***** (A)(-3K)	3.3uF/50V 1812 MLCC	N/A	1000pF/2KV or 1000pF/3KV MLCC	1000pF/2KV or 1000pF/3KV MLCC	325uH Common Choke
EP9-36-***** (A)			1000pF/3KV MLCC	1000pF/3KV MLCC	
EP36-72-***** (A)(-3K)	1.5uF/100V 1812 MLCC	1.5uF/100V 1812 MLCC	1000pF/2KV or 1000pF/3KV MLCC	1000pF/2KV or 1000pF/3KV MLCC	325uH Common Choke
EP18-72-***** (A)					



Recommended EN55022 Class B Filter Circuit Layout

Input Fuse Selection Guide

9-18V & 9-36V	18-36V & 18-72V	36-72V
INPUT VOLTAGE(VDC)	INPUT VOLTAGE(VDC)	INPUT VOLTAGE(VDC)
3000mA Slow-Blow Type	1400mA Slow-Blow Type	700mA Slow-Blow Type



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

EP 10-15W Series Application Notes:

EXTERNAL CAPACITANCE REQUIREMENTS:

No external capacitance is required for operation of the EP10-15 W series.

To meet the reflected ripple requirements of the converter, an input impedance of less than 0.5 ohm from DC to 220KHz is required.

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.

Additional output capacitance may be added for increased filtering, but should not exceed 1000uF.

We Can Offer 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.

Spezifikationen können sich ohne Vorankündigung ändern.

Für etwaige fehlerhafte Angaben oder unvollständige Bezeichnungen kann keine Haftung übernommen werden.