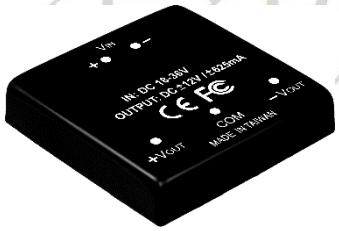
Electronic Products
Elektronisches Knowhow aus einer Hand

EP 15Watt Series - Wide Input Range

DC-DC Converter

Features

15W DIL PACKAGE
INDUSTRY STANDARD PACKAGE
9-18V,18-36V,36-72V,9-27V,18-54V, 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 3:1 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	1.5s max.
Environmental Specifications	Operating Temperature	-25°C to +71°C
	Operating Temperature Case	-25°C to +90°C
	Storage Temperature	-55°C to +125°C
	Humidity	95% max.
	Cooling	Free-Air Convection
General Specifications	Efficiency	70% 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]	>320,000 Hours
	Weight	60.0g typ.
	Case Material	Six-Side Shielded Case
	Case Size	50.8mm*50.8mm*11mm
	Potting Material	Epoxy(UL94V-0)
	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 3 seconds
[6] MIL-HDBK-217F @25 °C, Ground Benign

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Selection Guide 2:1 12W-15W Output

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT[7] CURRENT(mA) FULL LOAD	NO LOAD	EFF (%)[8]	CAPACITOR LOAD MAX.
EP9-18-3,3S3600(-3K)	9-18	3.3	3600	1320	40	75	2700uF
EP9-18-05S3000(-3K)	9-18	5	3000	1623	40	77	2700uF
EP9-18-09S1670(-3K)	9-18	9	1670	1580	30	79	2200uF
EP9-18-12D1250(-3K)	9-18	12	1250	1563	40	80	1800uF
EP9-18-15S1000(-3K)	9-18	15	1000	1545	38	81	1500uF
EP9-18-24S625(-3K)	9-18	24	625	1543	38	81	1000uF
EP9-18-05D1500(-3K)	9-18	+/-5	+/-1500	1623	40	77	+/-1200uF
EP9-18-12D625(-3K)	9-18	+/-12	+/-625	1563	40	80	+/-820uF
EP9-18-15D500(-3K)	9-18	+/-15	+/-500	1525	38	82	+/-680uF
EP9-18-24D313(-3K)	9-18	+/-24	+/-313	1510	40	83	+/-560uF
EP18-36-3,3S3600(-3K)	18-36	3.3	3600	643	20	77	2700uF
EP18-36-05S3000(-3K)	18-36	5	3000	780	20	80	2700uF
EP18-36-09S1670(-3K)	18-36	9	1670	770	20	81	2200uF
EP18-36-12S1250(-3K)	18-36	12	1250	762	18	82	1800uF
EP18-36-15S1000(-3K)	18-36	15	1000	762	18	82	1500uF
EP18-36-24S625(-3K)	18-36	24	625	781	18	80	1000uF
EP18-36-27S556(-3K)	18-36	27	556	749	21	83	820uF
EP18-36-05D1500(-3K)	18-36	+/-5	+/-1500	750	20	83	+/-1200uF
EP18-36-12D625(-3K)	18-36	+/-12	+/-625	762	18	82	+/-820uF
EP18-36-15D500(-3K)	18-36	+/-15	+/-500	753	25	83	+/-680uF
EP18-36-24D313(-3K)	18-36	+/-24	+/-313	750	35	83	+/-560uF
EP36-72-3,3S3600(-3K)	36-72	3.3	3600	321	10	77	660uF
EP36-72-05S3000(-3K)	36-72	5	3000	396	10	79	660uF
EP36-72-09S1670(-3K)	36-72	9	1670	385	10	81	470uF
EP36-72-12S1250(-3K)	36-72	12	1250	381	9	82	470uF
EP36-72-15S1000(-3K)	36-72	15	1000	381	9	82	470uF
EP36-72-24S625(-3K)	36-72	24	625	375	9	83	330uF
EP36-72-05D1500(-3K)	36-72	+/-5	+/-1500	375	10	83	+/-100uF
EP36-72-12D625(-3K)	36-72	+/-12	+/-625	381	9	82	+/-100uF
EP36-72-15D500(-3K)	36-72	+/-15	+/-500	381	17	82	+/-100uF
EP36-72-24D313(-3K)	36-72	+/-24	+/-313	375	9	83	+/-100uF

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

ORDERING INFORMATION:

FOR EXAMPLE: EP**-**-******-3K(Isolation Voltage For 3000VDC)

[7] NOMINAL INPUT VOLTAGE.
[8] NOMINAL INPUT VOLTAGE,FULL LOAD.

Selection Guide 3:1 15W OUTPUT

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT[9] CURRENT(mA) FULL LOAD	NO LOAD	EFF (%)[10]	CAPACITOR LOAD MAX.
EP9-27-05S3000(-3K)	9-27	5	3000	1623	40	77	2700uF
EP9-27-09S1670(-3K)	9-27	9	1670	1600	30	78	2200uF
EP9-27-12S1250(-3K)	9-27	12	1250	1562	40	80	1800uF
EP9-27-15S1000(-3K)	9-27	15	1000	1562	38	80	1500uF
EP9-27-24S625(-3K)	9-27	24	625	1562	28	80	1000uF
EP9-27-05D1500(-3K)	9-27	+/-5	+/-1500	1623	40	77	+/-1200uF
EP9-27-12D625(-3K)	9-27	+/-12	+/-625	1562	40	80	+/-820uF
EP9-27-15D500(-3K)	9-27	+/-15	+/-500	1562	38	80	+/-680uF
EP18-54-05S3000(-3K)	18-54	5	3000	791	20	79	2700uF
EP18-54-09S1670(-3K)	18-54	9	1670	782	20	80	2200uF
EP18-54-12S1250(-3K)	18-54	12	1250	771	18	81	1800uF
EP18-54-15S1000(-3K)	18-54	15	1000	762	18	82	1500uF
EP18-54-24S625(-3K)	18-54	24	625	762	15	82	1000uF
EP18-54-05D1500(-3K)	18-54	+/-5	+/-1500	791	20	79	+/-1200uF
EP18-54-12D625(-3K)	18-54	+/-12	+/-625	771	18	81	+/-820uF
EP18-54-15D500(-3K)	18-54	+/-15	+/-500	762	18	82	+/-560uF

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

ORDERING INFORMATION:

FOR EXAMPLE: EP**-**-******-3K(Isolation Voltage For 3000VDC)

[9] NOMINAL INPUT VOLTAGE.
[10] NOMINAL INPUT VOLTAGE,FULL LOAD.

Selection Guide 4:1 15W Output

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT[11] CURRENT(mA) FULL LOAD	INPUT[11] CURRENT(mA) NO LOAD	EFF (%)[12]	CAPACITOR LOAD MAX.
EP9-36-3,3S4000(-3K)	9-36	3.3	4000	1430	40	77	2700uF
EP9-36-05S3000(-3K)	9-36	5	3000	1645	40	76	2700uF
EP9-36-09S1670(-3K)	9-36	9	1670	1600	30	78	2200uF
EP9-36-12S1250(-3K)	9-36	12	1250	1562	40	80	1800uF
EP9-36-15S1000(-3K)	9-36	15	1000	1562	38	80	1500uF
EP9-36-24S625(-3K)	9-36	24	625	1562	28	80	1000uF
EP9-36-05D1500(-3K)	9-36	+/-5	+/-1500	1623	40	77	+/-1200uF
EP9-36-12D625(-3K)	9-36	+/-12	+/-625	1562	40	80	+/-820uF
EP9-36-15D500(-3K)	9-36	+/-15	+/-500	1562	38	80	+/-680uF
EP18-72-05S3000(-3K)	18-72	5	3000	791	20	79	2700uF
EP18-72-09S1670(-3K)	18-72	9	1670	782	20	80	2200uF
EP18-72-12S1250(-3K)	18-72	12	1250	771	18	81	1800uF
EP18-72-15S1000(-3K)	18-72	15	1000	762	18	82	1500uF
EP18-72-24S625(-3K)	18-72	24	625	780	18	80	1000uF
EP18-72-05D1500(-3K)	18-72	+/-5	+/-1500	791	20	79	+/-1200uF
EP18-72-12D625(-3K)	18-72	+/-12	+/-625	771	18	81	+/-820uF
EP18-72-15D500(-3K)	18-72	+/-15	+/-500	762	18	82	+/-680uF

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

ORDERING INFORMATION:

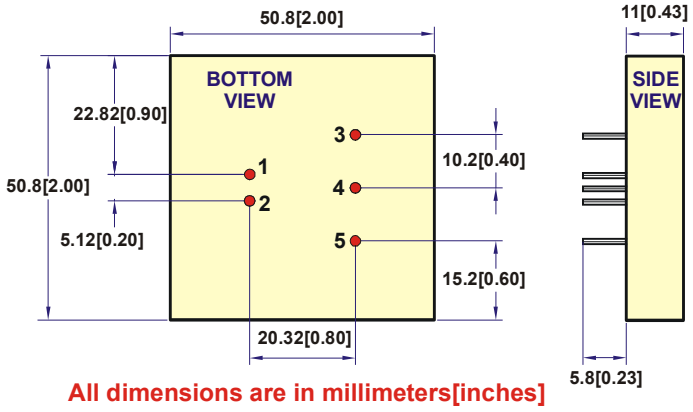
FOR EXAMPLE: EP**-**-*****-3K(Isolation Voltage For 3000VDC)

EP9-36-3,3S4000A(PACKAGE "A" For REMOTE CONTROL)

[11] NOMINAL INPUT VOLTAGE.

[12] NOMINAL INPUT VOLTAGE,FULL LOAD.

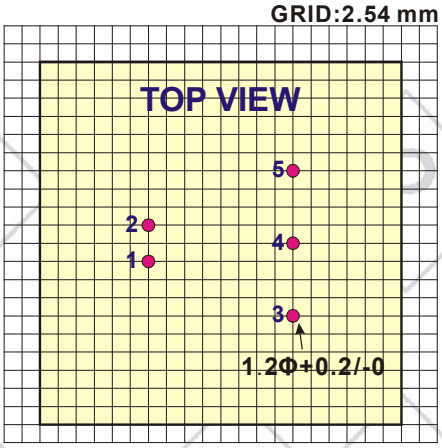
Mechanical Dimensions & Recommended Footprint Details



All dimensions are in millimeters[inches]

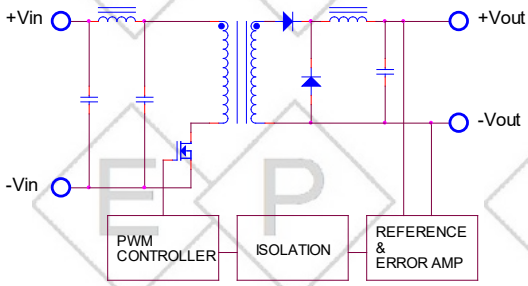
PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	NP	Common
5	-Vout	-Vout

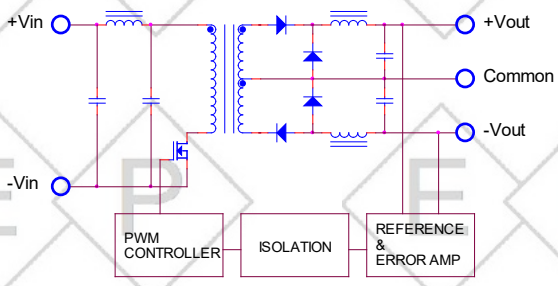
NOTE:
All dimensions are in millimeters [inches]
Pin Size is Tolerance 1.0Φ ±0.10mm
Tolerance .X or .XX= ±0.5mm



Simplified Schematic

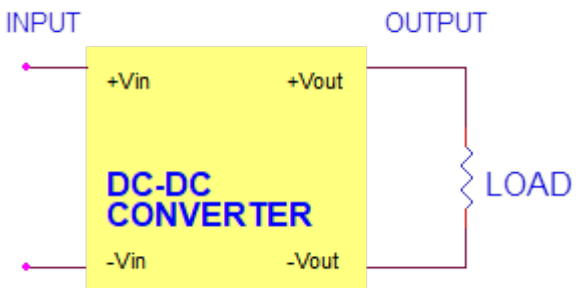
SINGLE OUTPUT	DUAL OUTPUT

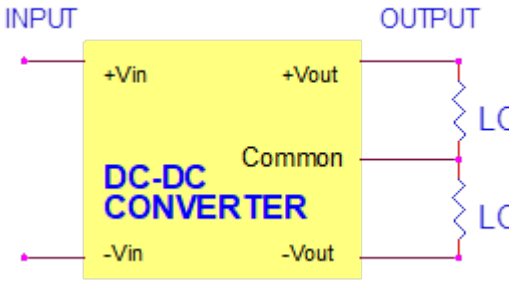




Typical Applications

SINGLE OUTPUT	DUAL OUTPUT

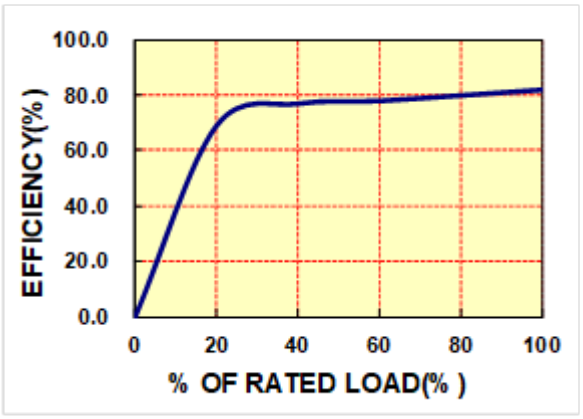




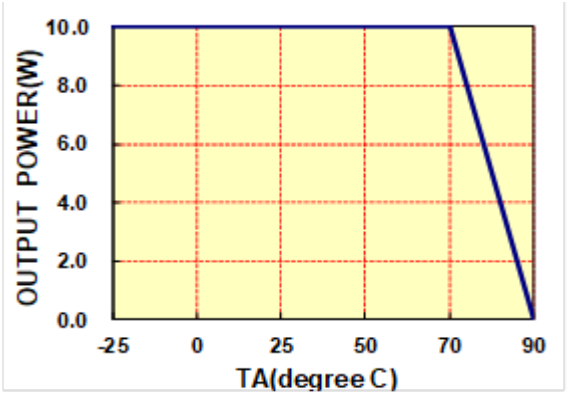
Typical Performance Curves

Specifications typical at Ta=25 ˚C ,nominal input voltage , rated output current unless otherwise specified.

OUTPUT LOAD VS EFFICIENCY



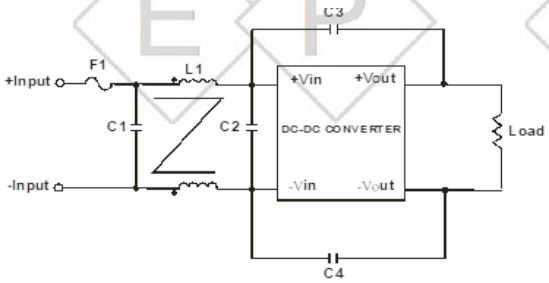
TEMPERATURE DERATING

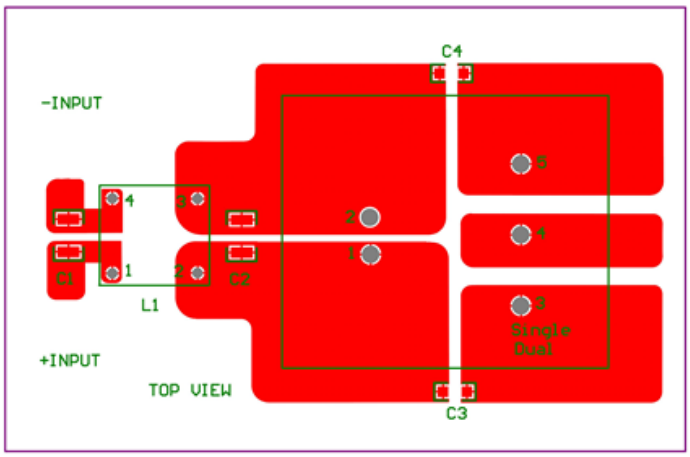


Recommended Filter for EN55022 Class B Compliance

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 1210 MLCC	N/A	1000pF/2KV or 1000pF/3KV MLCC	1000pF/2KV or 1000pF/3KV MLCC	325uH Common Choke
EP18-36-*****(A)(-3K) EP9-36-******(A)(-3K)	3.3uF/50V 1210 MLCC	N/A	1000pF/2KV or 1000pF/3KV MLCC	1000pF/2KV or 1000pF/3KV MLCC	325uH Common Choke
EP36-72-*****(A)(-3K) EP18-24-*****(A)	1.5uF/100V 1210 MLCC	1.5uF/100V 1812 MLCC	1000pF/2KV or 1000pF/3KV MLCC	1000pF/2KV or 1000pF/3KV MLCC	325uH Common Choke

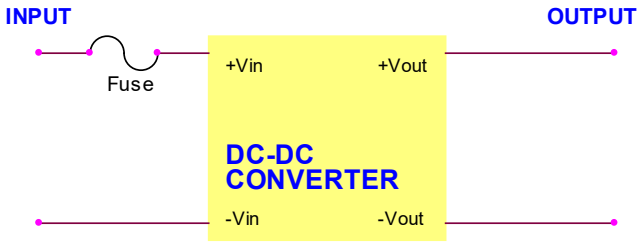




Recommended EN55022 Class B Filter Circuit Layout

Input Fuse Selection Guide

9-18V or 9-27V or 9-36V	18-36V or 18-54V or 18-72V	36-72V
INPUT VOLTAGE(VDC)	INPUT VOLTAGE(VDC)	INPUT VOLTAGE(VDC)
3000mA Slow-Blow Type	1500mA Slow-Blow Type	750mA Slow-Blow Type



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

EP 15 Watt Series Application Notes:

EXTERNAL CAPACITANCE REQUIREMENTS:
No external capacitance is required for operation of the KW 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.

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