

# 33, 49.5, 66, 99 WATT DC-DC Converters EP SERIES 20~70Vdc Input



Size: 60.70mm x 57.91mm x 13.30mm  
(2.39in. x 2.28in. x 0.52in.)

## MODEL SELECTION

Model Name	Vin(Vdc)	Vout(Vdc)	Io(Amps)	Watts
EPB-3.3SC36-A	20-60	3.3	10	33
EPC-3.3SC36-A	20-60	3.3	15	49.5
EPD-3.3SC36-A	20-60	3.3	20	66
EPE-3.3SC36-A	20-60	3.3	30	99

## FEATURES

- ▶ High Power Density - Up to 40W/in<sup>3</sup>
- ▶ Constant Frequency - 370kHz
- ▶ -40 to +100°C Operation
- ▶ 105°C Over Temperature
- ▶ High Efficiency
- ▶ Low Output Noise
- ▶ Industry-Standard Pinout
- ▶ Metal Baseplate
- ▶ 3:1 Input Voltage Range
- ▶ Thermal Protection
- ▶ Over Voltage Protection
- ▶ Current Limit/Short Circuit Protection
- ▶ Adjustable Output Voltage: 60% to 110% of V<sub>0,set</sub>
- ▶ Remote Sense
- ▶ Logic ON/OFF
- ▶ Safety Agency Approval

## SPECIAL FEATURES

- ▶ Long Lead(0.23in)-LL
- ▶ Negative Logic Control-Neg.  
(Remote Control For C-T)
- ▶ Threaded hole standoff-Td

## SPECIFICATION

### ABSOLUTE MAXIMUM RATINGS:

Exceeding absolute maximum ratings may cause permanent damage and reduce reliability

PARAMETER	MIN	MAX	UNITS	CONDITIONS
Input Voltage		62	Vdc	Continuous
Transient Input Voltage		80	Vdc	100 msec max.
Input/Output Isolation		1500	Vdc	
Operating Case Temperature	-40	100	°C	
Storage Temperature	-40	110	°C	

### INPUT SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Operation Input Voltage (V <sub>i</sub> )	20	36	60	Vdc	
Maximum Input Current (I <sub>i,max</sub> ):					V <sub>i</sub> = 0Vdc to 60Vdc I <sub>o</sub> = I <sub>o,max</sub>
EPB-3.3SC36-A			2.5	A	
EPC-3.3SC36-A			3.7	A	
EPD-3.3SC36-A			4.8	A	
EPE-3.3SC36-A			7.5	A	
Input Ripple Rejection		60		dB	@ 120Hz

#### OUTPUT SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Output Voltage Set Point ( $V_{o,set}$ )	3.20	3.30	3.40	V	$T_c=25^\circ\text{C}$ , $V_i=36\text{V}$ ,
Line Regulation		0.01	0.1	%	$I_o=I_{o,max}$
Load Regulation		0.05	0.2	%	$V_i=20\text{V to }60\text{V}$
Temperature Drift		15	50	mV	$I_o=0.5$ to $I_{o,max}$
Output Ripple and Noise Voltage Peak to Peak			150	mV <sub>p-p</sub>	$T_c=-40^\circ\text{C to }100^\circ\text{C}$ 5Hz to 20MHz
External Load Capacitance	0		10,000	uF	Electrolytic capacitor
Output Current( $I_o$ ):					At $I_o < 0.5\text{A}$ , the modules may exceed output ripple specifications
EPB-3.3SC36-A	0.5		10	A	
EPC-3.3SC36-A	0.5		15	A	
EPD-3.3SC36-A	0.5		20	A	
EPE-3.3SC36-A	0.5		30	A	
Output Current limit:		115	130	% $I_{o,max}$	$V_o=90\%$ of $V_{o,set}$
Output Short Circuit Current		170		% $I_{o,max}$	$V_o=250\text{mV}$
Efficiency:					
EPB-3.3SC36-A	77	79		%	$T_c=70^\circ\text{C}$ $V_i=36\text{V}$
EPC-3.3SC36-A	78	80		%	$I_o=I_{o,max}$
EPD-3.3SC36-A	78	80		%	
EPE-3.3SC36-A	77	79		%	
Dynamic Response:					25%-50%-75% load
Peak Deviation		3		% $V_{o,set}$	0.1A/ $\mu\text{s}$
Settling Time		300		$\mu\text{s}$	$T_c=25^\circ\text{C}$ $V_i=36\text{V}$

#### CONTROL SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Logic On/Off:					
Logic Low: Ion/off			1	mA	$V_{on/off}=0\text{V}$
Von/off			1.2	V	$I_{on/off}<1\text{mA}$
Logic High: Ion/off			50	$\mu\text{A}$	$V_{on/off}=15\text{V}$
Von/of			15	V	$I_{on/off}=0.0 \mu\text{A}$
Turn-On Time		20	35	ms	$I_o=80\%$ of $I_{o,max}$ $V_o$ with +/- 1% $V_{o,set}$
Output Remote Sense Range			0.5	V	
Output Voltage Trim Range	60		110	% $V_{o,set}$	
Over Voltage Protection	3.0		4.0	V	Auto recovery
Over Temperature Protection		105		$^\circ\text{C}$	Auto recovery

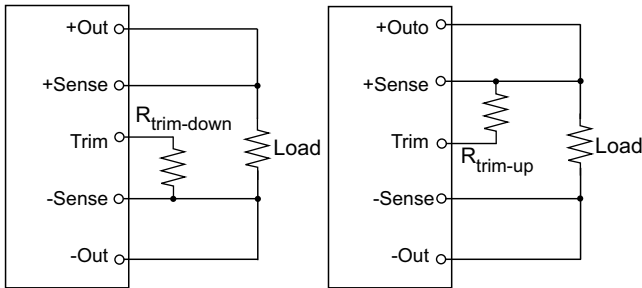
#### ISOLATION SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Input to Output		1500		Vdc	
Input to Case		1500		Vdc	
Output to Case		500		Vdc	
Input to Output Capacity		2000		pF	
Isolation Resistance	10			Mohm	

#### GENERAL SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Weight		118		g	
Size		2.39x2.28x0.52		in <sup>3</sup>	

#### TRIM CIRCUIT



Trim-Down

Trim-Up

$$R_{\text{trim-down}} = ((100/\Delta\%) - 2) \text{ Kohms}$$

$$R_{\text{trim-up}} = \left( \frac{V_o(100 + \Delta\%)}{1.225\Delta\%} - \frac{100 + 2\Delta\%}{\Delta\%} \right) \text{ Kohms}$$

$\Delta\%$  = Desired Output Voltage Change

$V_o$  = Output Voltage

$R_{\text{trim-up}}$  = External Resistor Value to Increase  $V_o$

$R_{\text{trim-down}}$  = External Resistor Value to Decrease  $V_o$

#### OUTLINE DRAWING

