

DC-DC Converters
EP SERIES 18~36Vdc Input
MODEL SELECTION

Model Name	Vin(Vdc)	Vout(Vdc)	Io(Amps)	Watts
EPB-3.3SC28-A	18-36	3.3	10	33
EPC-3.3SC28-A	18-36	3.3	15	49.5
EPD-3.3SC28-A	18-36	3.3	20	66
EPE-3.3SC28-A	18-36	3.3	30	99
EPO-3.3SC28-A	18-36	3.3	40	132

FEATURES

- ▶ High Power Density - Up to 54W/in³
- ▶ Constant Frequency - 370kHz
- ▶ -40 to +100°C Operation
- ▶ 105°C Over Temperature
- ▶ High Efficiency
- ▶ Low Output Noise
- ▶ Industry-Standard Pinout
- ▶ Metal Baseplate
- ▶ 2:1 Input Voltage Range
- ▶ Thermal Protection
- ▶ Over Voltage Protection
- ▶ Current Limit/Short Circuit Protection
- ▶ Adjustable Output Voltage: 60% to 110% of V_{0,set}
- ▶ 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



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

SPECIFICATION
ABSOLUTE MAXIMUM RATINGS:

Exceeding absolute maximum ratings may cause permanent damage and reduce reliability

PARAMETER	MIN	MAX	UNITS	CONDITIONS
Input Voltage		40	Vdc	Continuous
Transient Input Voltage		50	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 _i)	18	28	36	Vdc	
Maximum Input Current (I _{i,max}):					V _i = 0Vdc to 36Vdc I _o = I _{o,max}
EPB-3.3SC28-A			2.8	A	
EPC-3.3SC28-A			3.9	A	
EPD-3.3SC28-A			5.5	A	
EPE-3.3SC28-A			8.4	A	
EPO-3.3SC28-A			12.2	A	
Input Ripple Rejection		60		dB	@ 120Hz

OUTPUT SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Output Voltage Set Point ($V_{o,set}$)	3.25	3.3	3.35	V	$T_c=25^{\circ}\text{C}$, $V_i=28\text{V}$, $I_o=I_{o,max}$
Line Regulation		0.01	0.1	%	$V_i=18\text{V to }36\text{V}$
Load Regulation		0.05	0.2	%	$I_o=0.5\text{ to }I_{o,max}$
Temperature Drift		15	50	mV	$T_c=-40^{\circ}\text{C to }100^{\circ}\text{C}$
Output Ripple and Noise Voltage Peak to Peak			150	mV _{p-p}	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-3.3SC28-A	0.5		10	A	
EPC-3.3SC28-A	0.5		15	A	
EPD-3.3SC28-A	0.5		20	A	
EPE-3.3SC28-A	0.5		30	A	
EPO-3.3SC28-A	0.5		40	A	
Output Current limit:					$V_o=90\%$ of $V_{o,set}$
EPB-3.3SC28-A		7	13.2	A	
EPC-3.3SC28-A		18	20	A	
EPD-3.3SC28-A		23	26	A	
EPE-3.3SC28-A		34.5	39.5	A	
EPO-3.3SC28-A		48	52.5	A	
Output Short Circuit Current			170		$V_o=250\text{mV}$
Switching Frequency		370		kHz	
Efficiency:					$T_c=70^{\circ}\text{C}$ $V_i=28\text{V}$ $I_o=I_{o,max}$
EPB-3.3SC28-A	79	81.5		%	
EPC-3.3SC28-A	79	81.5		%	
EPD-3.3SC28-A	77	79.5		%	
EPE-3.3SC28-A	77	79		%	
EPO-3.3SC28-A	74	77		%	
Dynamic Response:		3			50% to 75% load $0.1\text{A}/\mu\text{s}$ $T_c=25^{\circ}\text{C}$ $V_i=28\text{V}$
Peak Deviation			300	% $V_{o,set}$	
Settling Time			3	μs	

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	μA	$V_{on/off}=15\text{V}$
Von/of			15	V	$I_{on/off}=0.0\ \mu\text{A}$
Turn-On Time		20	35	ms	
Output Remote Sense Range			0.5	V	
Output Voltage Trim Range	60		110	% $V_{o,set}$	
Over Voltage Protection	4.0		5.0	V	Auto recovery
Over Temperature Protection		105		$^{\circ}\text{C}$	Auto recovery

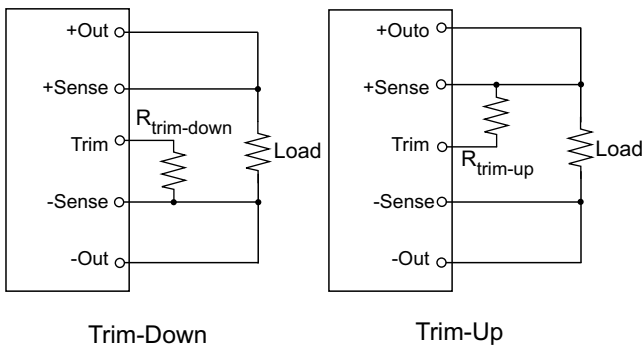
ISOLATION SPECIFICATIONS:

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 ³	

TRIM CIRCUIT



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

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

$\Delta\%$ = Desired Output Voltage Change

V_o = Output Voltage

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

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

OUTLINE DRAWING

