

DC-DC Converters
EP SERIES 18~36Vdc 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-24SC28-A	18-36	24	2.1	50
EPC-24SC28-A	18-36	24	3.2	76.8
EPD-24SC28-A	18-36	24	4.2	100
EPE-24SC28-A	18-36	24	6.3	150

FEATURES

- ▶ High Power Density - Up to 61W/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(100W and 150W only)
- ▶ 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

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-24SC28-A			5.2	A	
EPC-24SC28-A			7.1	A	
EPD-24SC28-A			8.0	A	
EPE-24SC28-A			12.2	A	
Inrush Transient			1	A ² t	
Input Reflected-Ripple Current:					5Hz to 20Mhz. 12uH Source Impedance
Peak to Peak		5		mA	
Input Ripple Rejection		60		dB	@120Hz

OUTPUT SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Output Voltage Set Point ($V_{o,set}$)	23.55	24.00	24.45	V	$T_c=25^\circ\text{C}$, $V_i=28\text{V}$,
Line Regulation		0.01	0.1	%	$I_o=I_{o,max}$
Load Regulation		0.05	0.2	%	$V_i=18\text{V to }36\text{V}$
Temperature Drift		50	300	mV	$I_o=0.15\text{A to }I_{o,max}$
Total Regulation			1.5	%	$T_c=-40^\circ\text{C to }100^\circ\text{C}$
Output Ripple and Noise Voltage:					
RMS			150	mV	5Hz to 20MHz
Peak to Peak			400	mmV	
External Load Capacitance	0		3,300	uF	Electrolytic capacitor
Output Current(I_o):					
EPB-24SC28-A	0.15		2.1	A	At $I_o=I_{o,min}$, the modules may exceed output ripple specifications
EPC-24SC28-A	0.15		3.1	A	
EPD-24SC28-A	0.15		4.2	A	
EPE-24SC28-A	0.15		6.3	A	
Output Current limit:					
EPB-24SC28-A		2.4	3.0	A	$V_o=90\%$ of $V_{o,set}$
EPC-24SC28-A		3.6	4.3	A	
EPD-24SC28-A		4.8	5.8	A	
EPE-24SC28-A		7.6	8.5	A	
Output Short Circuit Current		170		$\%I_{o,max}$	$V_o=250\text{mV}$
Switching Frequency		370		kHz	
Efficiency					
EPB-24SC28-A	83	85		%	$T_c=70^\circ\text{C}$ $V_i=28\text{V}$ $I_o=I_{o,max}$
EPC-24SC28-A	85	87		%	
EPD-24SC28-A	85	87		%	
EPE-24SC28-A	83	85		%	
Dynamic Response					
Peak Deviation		3		$\%V_{o,set}$	25%-50%-75% load, 0.1A/ μs
Settling Time			300	μs	$T_c=25^\circ\text{C}$ $V_i=28\text{V}$

CONTROL SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Logic On/Off:					
Logic Low: Ion/off			1	mA	Von/off=0V
Von/off			1.2	V	Ion/off<1mA
Logic High: Ion/off			50	μA	Von/off=15V
Von/of			15	V	Ion/off=0.0 μA
Turn-On Time		8	25	ms	I_o 80% of $I_{o,max}$ V_o with = +/-% $V_{o,set}$
Output Remote Sense Range			1.2	V	
Output Voltage Trim Range	60		110	$\%V_{o,set}$	
Output Over Voltage Clamp	26.5		31.2	V	Auto recovery
Over Temperature Shutdown		105		$^\circ\text{C}$	100W,150W only;

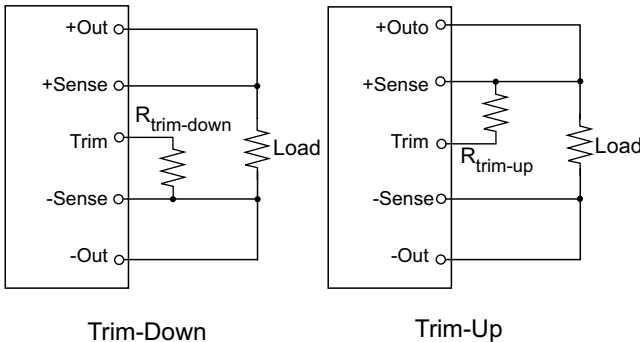
ISOLATION SPECIFICATIONS:

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



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

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

$\Delta\%$ = 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

