

50, 75, 100, 150, 200, 240 WATT  
DC-DC Converters,  
EP SERIES 36~75Vdc 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-24SC48-A	36-75	24	2.1	50
EPC-24SC48-A	36-75	24	3.1	75
EPD-24SC48-A	36-75	24	4.2	100
EPE-24SC48-A	36-75	24	6.3	150
EPO-24SC48-A	36-75	24	8.3	200
EPP-24SC48-A	36-75	24	10	240

**FEATURES**

- ▶ High Power Density - Up to 98W/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
- ▶ 2:1 Input Voltage Range
- ▶ Thermal Protection(except 50W and 75W)
- ▶ 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		80	Vdc	Continuous
Transient Input Voltage		100	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> )	36	48	75	V	
Maximum Input Current (I <sub>i,max</sub> ):					V <sub>i</sub> = 0Vdc to 75Vdc I <sub>o</sub> = I <sub>o,max</sub>
EPB-24SC48-A			2.1	A	
EPC-24SC48-A			2.5	A	
EPD-24SC48-A			3.5	A	
EPE-24SC48-A			4.0	A	
EPO-24SC48-A			6.5	A	
EPP-24SC48-A			8.5	A	
Inrush Transient			1.0	A <sup>2</sup> t	
Input Reflected-Ripple Current:				mAp-p	5Hz~20MHz, 12uH
Peak to Peak		5		dB	Source Impedance
Input Ripple Rejection		60			@ 120Hz

**OUTPUT SPECIFICATIONS:**

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Output Voltage Set Point ( $V_{o,set}$ )	23.55	24.00	24.45	V	$T_c=25^\circ\text{C}$ , $V_i=48\text{V}$ , $I_o=I_{o,max}$
Line Regulation		0.01	0.1	%	$V_i=36\text{V to }75\text{V}$
Load Regulation		0.05	0.2	%	$I_o=0.5\text{A to }I_{o,max}$
Temperature Drift		50	300	mV	$T_c=-40^\circ\text{C to }100^\circ\text{C}$
Total Regulation			1.5	%	
Output Ripple and Noise Voltage:					5Hz to 20MHz
RMS			150	mVrms	
Peak to Peak	0		400	mV <sub>p-p</sub>	
External Load Capacitance			3,300	uF	Electrolytic capacitor
Output Current( $I_o$ ):					
EPB-24SC48-A	0.15		2.1	A	At $I_o < I_{o,min}$ , the modules may exceed output ripple specifications
EPC-24SC48-A	0.15		3.1	A	
EPD-24SC48-A	0.15		4.2	A	
EPE-24SC48-A	0.15		6.3	A	
EPO-24SC48-A	0.15		8.4	A	
EPP-24SC48-A	0.15		10.0	A	
Output Current limit::					
EPB-24SC48-A		2.4	3.0	A	$V_o=90\%$ of $V_{o,set}$ $V_o=250\text{mV}$
EPC-24SC48-A		3.6	4.3	A	
EPD-24SC48-A		4.8	5.5	A	
EPE-24SC48-A		7.3	8.2	A	
EPO-24SC48-A		9.2	10.9	A	
EPP-24SC48-A		11.0	13.0	A	
Output Short Circuit Current			170	% $I_{o,max}$	
Switching Frequency		370		kHz	
Efficiency:					
EPB-24SC48-A	84	86		%	$T_c=70^\circ\text{C}$ $V_i=48\text{V}$ $I_o=I_{o,max}$ 25%-50%-75% load
EPC-24SC48-A	85	87		%	
EPD-24SC48-A	86	88		%	
EPE-24SC48-A	86	88		%	
EPO-24SC48-A	85	87		%	
EPP-24SC48-A1	84	86		%	
Dynamic Response:					
Peak Deviation		3		% $V_{o,set}$	0.1A/ $\mu\text{s}$
Settling Time			300	$\mu\text{s}$	$T_c=25^\circ\text{C}$ $V_i=48\text{V}$

**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		8	25	ms	$I_o=80\%$ of $I_{o,max}$ $V_o$ with +/- 1% $V_{o,set}$
Output Remote Sense Range			1.2	V	
Output Voltage Trim Range	60		110	% $V_{o,set}$	
Over Voltage Protection	26.5		31.2	V	Auto recovery
Over Temperature Protection		105		$^\circ\text{C}$	Auto recovery (except to 50W and 75W )

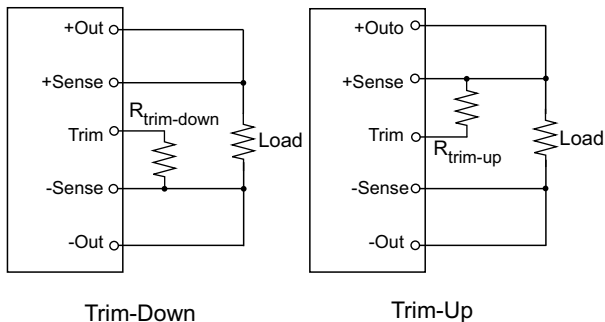
**ISOLATION SPECIFICATIONS:**

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
MTBF		1.3		Mhrs	Tc=40°C, Io =80% of Io,max
Weight		118		g	
Size		2.39x2.28x0.52		in <sup>3</sup>	

**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**

