

280 WATT

DC-DC Converters

EP SERIES 18~30Vdc Input

MODEL SELECTION

Model Name	Vin(Vdc)	Vout(Vdc)	Io(Amps)	Watts
EPF-28SC28-A	18-30	28	10	280



Size: 116.30mm x 60.45mm x 12.70mm
 (4.58in. x 2.38in. x 0.50in.)

FEATURES

- ▶ High Power Density - Up to 55W/in³
- ▶ Constant Frequency 400kHz
- ▶ High Efficiency: 89% at 560W
- ▶ Low Output Noise
- ▶ Industry-Standard Pinout
- ▶ Metal Baseplate
- ▶ Over Thermal Protection
- ▶ Over Voltage Protection
- ▶ Current Limit/Short Circuit Protection
- ▶ Adjustable Output Voltage: 75% to 103% of V_{0,set}
- ▶ Remote Sense
- ▶ Logic ON/OFF
- ▶ Safety Agency Pending

SPECIAL FEATURES

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

OPTION

- ▶ Choice Of Remote On/Off Logic Configuration
- ▶ Heat Sink Available For Extended Extended Operation

SPECIFICATION

ABSOLUTE MAXIMUM RATINGS:

Exceeding absolute maximum ratings may cause permanent damage and reduce reliability

PARAMETER	MIN	MAX	UNITS	CONDITIONS
Input Voltage (+In to -In)	-0.3	50	V	Continuous
Enable Voltage(Enable to -In)	-0.3	6.0	A	Vi=0V to 30V
Parallel Pin Voltage(Parallel Pin to - In)	-0.3	5.0	V	Io=Io,max
Storage Temperature	-55	+125	°C	
Operating Temperature	-40	+100	°C	Baseplate
Soldering Temperature: Wave Solder		260	°C	<5sec.
Hand Solder		390	°C	<7sec.

Electrical Specifications: Unless otherwise indicated specifications apply over all operating input voltage, resistive load, and temperature conditions.

INPUT SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONITIONS
Operation Input Voltage (Vi)	18	28	30	V	
Maximum Input Current (I _{i,max}):			21A	A	Vi=0V to 30V Io=Io,max
Inrush Transient			1	A ² s	
Input Ripple Rejection		60		dB	@120Hz

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● **CAUTION:** This power module is not internally fused. An input line fuse must always be used.

OUTPUT SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Output Voltage Set Point ($V_{o,set}$)	27.72	28.00	28.28	V	$T_c=25^{\circ}\text{C}$, $V_i=24\text{V}$, $I_o=I_{o,max}$
Line Regulation		0.01	0.2	%	$V_i=18\text{V to }30\text{V}$ $I_o=I_{o,min}$ to 10A
Load Regulation		0.05	0.2	%	$I_o=0.5\text{A to }10\text{A}$
Temperature Drift		50	0.015	%/ $^{\circ}\text{C}$	$T_c=-40^{\circ}\text{C to }100^{\circ}\text{C}$
Output Ripple and Noise Voltage Peak to Peak			500	mV _{p-p}	Bandwidth 5Hz to 20MHz. With 220uF/35V output capacitor.
Output Current (I_o):	0.5		10	A	At $I_o < I_{o,min}$, the modules may exceed output ripple specifications
Maximum Output Current (I_o):			11	A	For 5 minutes with $V_{in}=18\text{V to }30\text{V}$
Output Current limit:	11.5	12.5	14	A	$V_o=90\%$ of $V_{o,set}$
Output Short Circuit Current	0.15		170	% $I_{o,max}$	$V_o=250\text{mV}$
Switching Frequency		400		KHZ	
Efficiency	86	89		%	$T_c=90^{\circ}\text{C}$, $I_o=10\text{A}$
Dynamic Response Peak Deviation Settling Time		3	300	% % $V_{o,set}$ μs	25%-50%-75% load, 0.1A/s; With 220uF/35V Capacitor/35V $T_c=25^{\circ}\text{C}$, $V_i=24\text{V}$

CONTROL SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Turn-On Time		60	200	ms	$I_o=20\%$ of $I_{o,max}$ V_o with $\pm 1\% V_{o,set}$
Output Voltage Adjustment Output Voltage Trim Range	75		103	% $V_{o,set}$ V	Within 220uF/35V Capacitor
Output Over Voltage Clamp	31		39	V	
Over Temperature Shutdown	100	105	110	$^{\circ}\text{C}$	Auto recovery
Over Temperature Turn On	90	95	100	$^{\circ}\text{C}$	Auto recovery

ISOLATION SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Input to Case		1500		Vdc	
Output to Case		500		Vdc	
Input to Output Capacitance		470		pF	
Isolation Resistance	10			Mohm	

GENERAL SPECIFICATIONS:

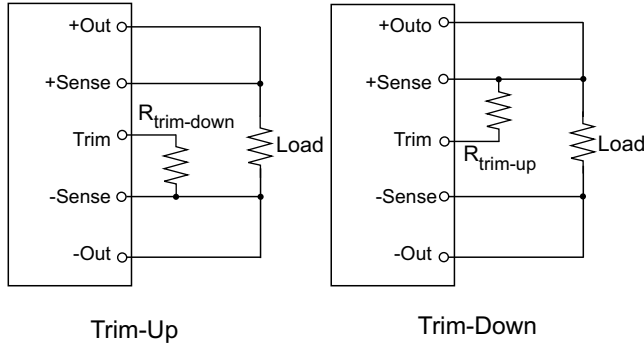
PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
MTBF		1.4		Mhrs	$T_c=40^{\circ}\text{C}$, $I_o=9\text{A}$ of $V_{in}=24\text{V}$
Weight		225		g	
Size		4.58x2.38x0.50		in ³	

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TRIM CIRCUIT



$$R_{trim-up} = \left(\frac{32.8047}{V_o - 26.031} \right) \text{ Kohms}$$

$$R_{trim-down} = \left(\frac{32.7645 - 13.1058}{V_o - 26} \right) \text{ Kohms}$$

V_o = Desired Output Voltage

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

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

OUTLINE DRAWING

