

AC40W-12V-PBF

(115Vac, 47-800Hz INPUT)

40W/12Vdc, 5Vdc DUAL OUTPUT

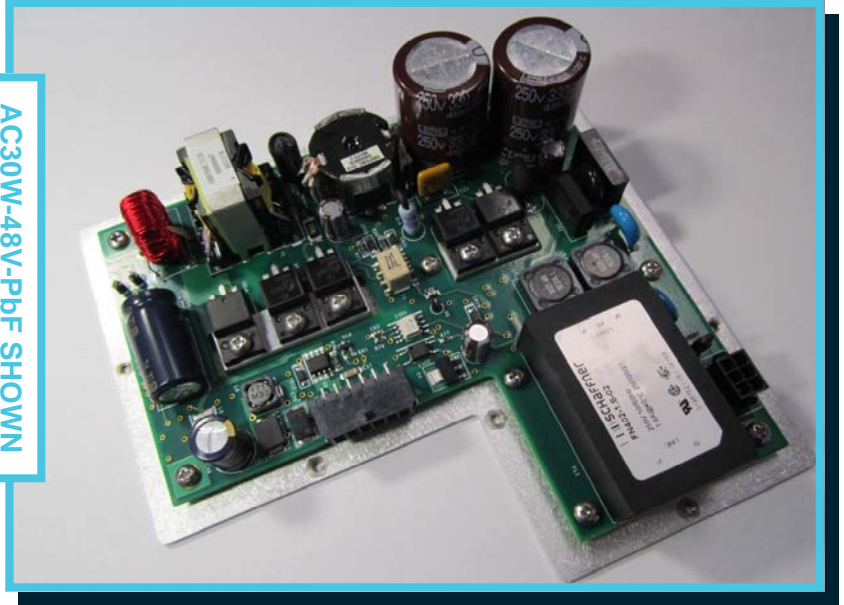
115Vac INPUT POWER SUPPLY



Providing two isolated output voltages and up to 40W continuous output power, the **AC40W-12V-PBF** is optimized for 115Vac/ 47-800Hz single phase RTCA/DO-160G airborne applications. The **AC40W-12V-PBF** is capable of providing up to 35W output during momentary input AC interrupt conditions for greater than 200mSec.

Weighing less than 10 ounces, the **AC40W-12V-PBF** is constructed on a multi-layer PWB occupying ~28in². Component height is less than 0.70" except for the area of the supply containing hold-up capacitors; in this area maximum height is less than 1.50". Interconnection is accomplished using two right angle Molex connectors. The **AC40W-12V-PBF** is designed and manufactured to stand-up to the harsh operating environments encountered in today's aircraft installations.

AC30W-48V-PbF SHOWN



FEATURES

	Efficiency: 79% typical at full rated output load
	Wide input range: 97 – 134Vac, 47-800Hz
	Inrush current limiting: < 3.7Apk
	Size: 5.5" x 5.1"; Weight: less than 10 ounces
	Two isolated DC outputs: +12V (switched), +5Vstby (unswitched)
	Independent over-current and over-voltage protection on each output
	Output DC valid status line (TTL)
	Over-temperature fault signal (TTL)
	MTBF: 472,000 Hours, RIAC 217Plus, Aic category, 50°C case temperature, 65%DC, 2190 Cycles/ year



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STANDARD OUTPUTS

PARAMETER	OUTPUT VOLTAGE	
	+12V	+5Vstby
Voltage Regulation	12V \pm 2%	5.05V \pm 3%
Output Current	3.25A	200mA
Maximum Load	39W	1W
Minimum Load	0A	0A
Pk-pk Ripple + Noise (20MHz)	< 120mVpp	< 50mVpp
Overcurrent Trip Point	3.85A (4.5A Max)	500mA (600mA Max)
Notes	1	2

Notes:

1. Constant current limited
2. Foldback current limited

APPLICABLE SPECIFICATIONS

	RTCA/DO-160G, section 4, altitude/ temperature (operating) to 15,000 feet, category A1 equipment
	RTCA/DO-160G, section 6, humidity (operating) category A
	RTCA/DO-160G, section 7, shock (operating) category S, curve C
	RTCA/DO-160G, section 8, vibration (operating) category S, curve C
	RTCA/DO-160G, section 15, magnetic effect, category B
	RTCA/DO-160G, section 16, power input requirements for AC input, cat A(WF) equip, excludes harmonic distortion
	RTCA/DO-160G, section 17, voltage spike, category B equipment
	RTCA/DO-160G, section 18, conducted susceptibility, category Z equipment
	RTCA/DO-160G, section 19, induced signal susceptibility, category Z equipment
	RTCA/DO-160G, section 20, conducted and radiated susceptibility, category T equipment
	RTCA/DO-160G, section 21, conducted and radiated emissions, category M equip, within suitable metal enclosure
	Operating temperature: -25°C to +70°C, no forced air required
	Storage temperature: -55°C to +100°C



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INTERCONNECTION

SUPPLY SIDE CONNECTORS AND PIN-OUTS

Connector	J1	J2
Pin #	Molex Vertical 43045-0600	Molex Right Angle 43045-1200
1	n/c	n/c
2	Chassis Gnd	DCRTN
3	n/c	DCRTN
4	Line	DCRTN
5	n/c	+12Vout
6	Neutral	DCGOOD-L
7	--	n/c
8	--	OUTPUTEN-L
9	--	DCRTN
10	--	OVERTEMP-L
11	--	+12Vout
12	--	+5Vstby



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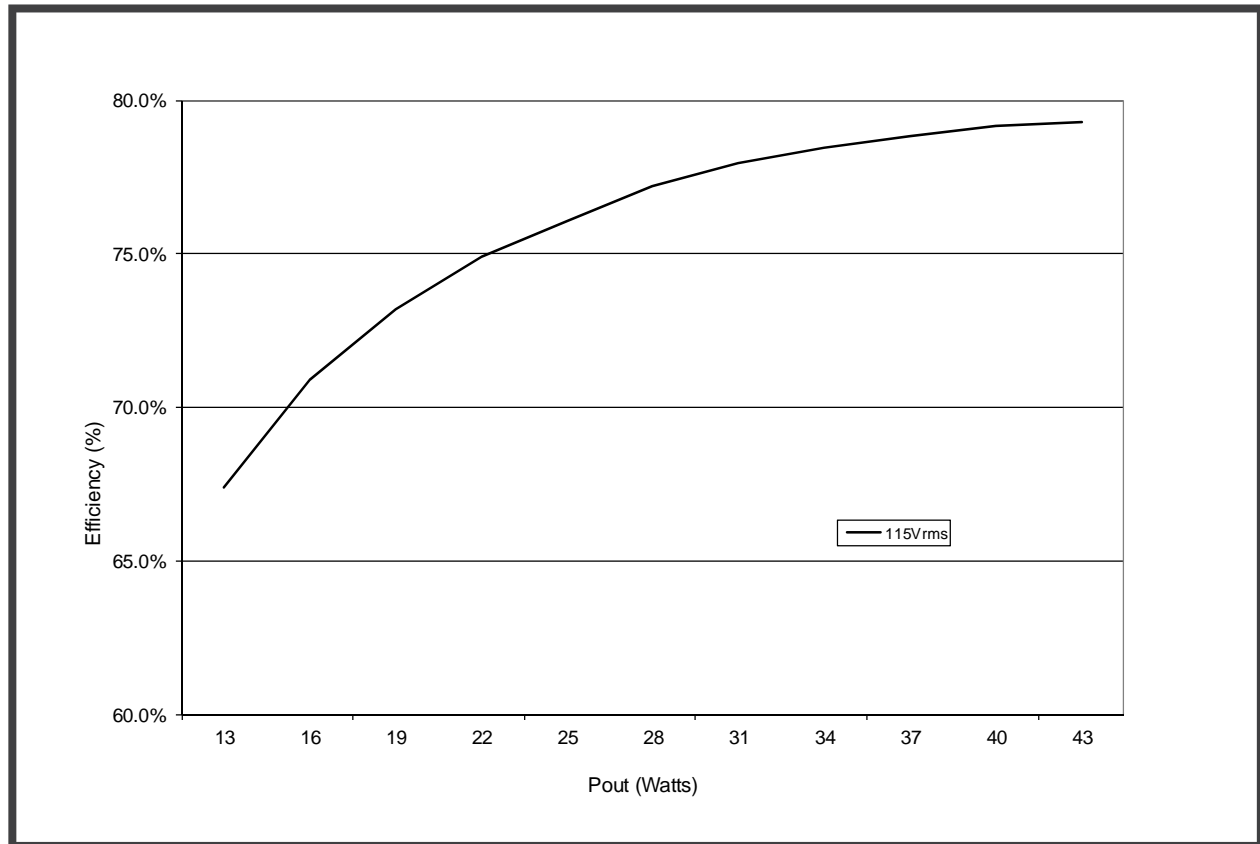
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EFFICIENCY CURVE

DATA RECORDED USING THE FOLLOWING TEST CONDITIONS: $T_a = 25^\circ\text{C}$. CONSTANT ACTIVE LOAD APPLIED TO OUTPUTS, $V_{in} = 115\text{Vrms}/400\text{Hz}$, 5Vstby loaded to 100mA.



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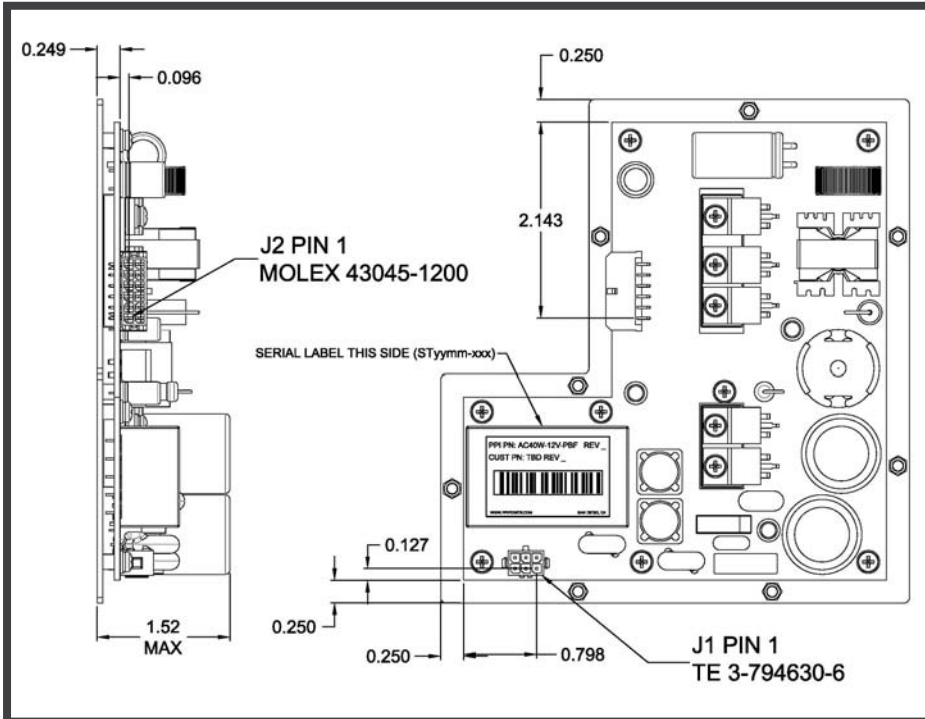
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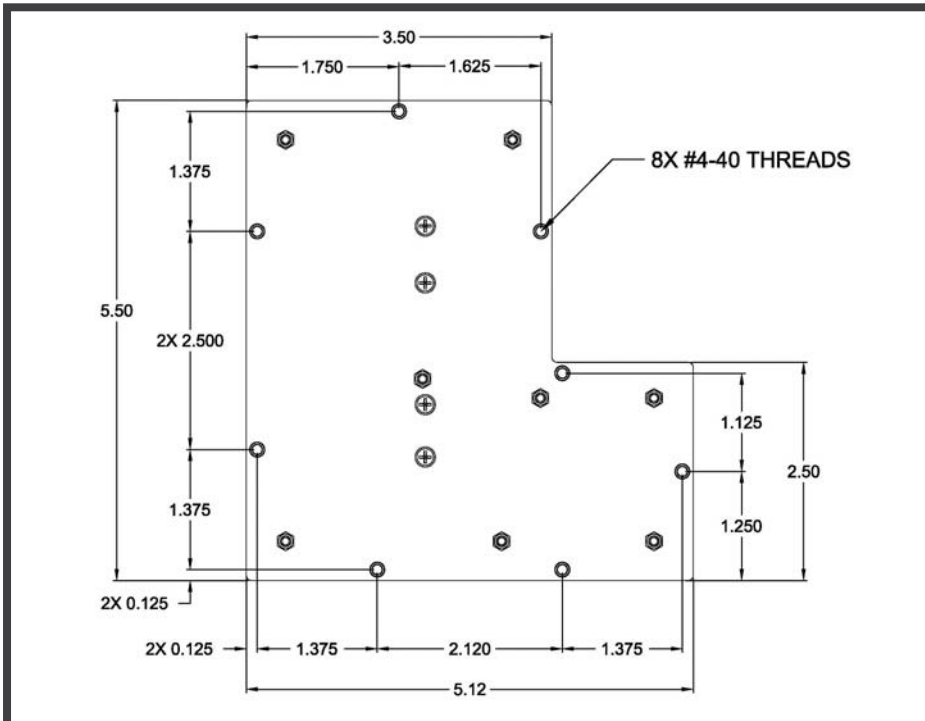
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MECHANICAL DIAGRAMS



TOP AND SIDE VIEWS



BOTTOM VIEW (PLATE)

OUTLINE OR DETAILED SOLIDWORKS
DRAWING FURNISHED UPON
REQUEST



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ELECTRICAL SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE FOLLOWING TEST CONDITIONS APPLY: $T_a = 25^{\circ}\text{C}$. CONSTANT ACTIVE LOAD APPLIED TO OUTPUTS, $V_{in} = 115\text{Vrms} / 400\text{Hz}$.

INPUT CHARACTERISTICS

PARAMETER	AC40W-12V-PBF	REMARKS	NOTES
INPUT VOLTAGE RANGE	97 – 134Vrms	Complies with normal/ abnormal input voltages for AC operation per RTCA/DO-160G, Section 16, Category A	2
MUST START VOLTAGE	97Vrms minimum	Supply will start and remained enabled for input voltage in the range of $97\text{Vrms} < V_{in} < 134\text{Vrms}$.	2
INPUT FREQUENCY RANGE	47 – 800Hz	Reduced distortion performance below 360Hz.	2
EFFICIENCY (FULL LOAD)	79% typical	Full rated output load (40W)	2
EFFICIENCY (50% LOAD)	73% typical	Half rated output load (20W)	2
INPUT CURRENT	445mA _{rms} at 115Vrms	Full rated output load (40W)	1
INRUSH CURRENT	<3.7A _{pk}	Cold Start	2
CREST FACTOR (CURRENT)	1.314 – 1.514	Ratio of peak / RMS.	1
POWER FACTOR	0.98 min 0.98 min	$P_{out} > 23\text{W}$ at 400Hz $P_{out} > 40\text{W}$ at 800Hz	2
START-UP TIME	<1000mSec	Outputs within regulation	2
CONDUCTED EMISSIONS	RTCA/DO-160G, Section 21	Category M equipment	1
QUIESCENT POWER	2W typical	$P_{out} = 0\text{W}$	2
TOTAL HARMONIC DISTORTION (INPUT CURRENT)	< 5.0%	25W-40W output load	2
INDIVIDUAL HARMONICS AC CLEAN INPUT	EVEN: <1% I_f / n ($n < 10$) EVEN: <0.1% I_f ($n \geq 10$) ODD: <30% I_f / n ODD TRIPLENS:<15% I_f / n	I_f = Fundamental current $V_{thd} < 1.25\%$, n = order of harmonic (1 - 40) 25W-40W output load Harmonics < 10mA disregarded	1



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INPUT CHARACTERISTICS—CONTINUED

PARAMETER	AC40W-12V-PBF	REMARKS	NOTES
INDIVIDUAL HARMONICS DISTORTED INPUT	EVEN: $<1\% I_f / n + 1.25V_n$ ($n < 10$) EVEN: $<0.1\% I_f + 1.25V_n$ ($n \geq 10$) ODD: $<30\% I_f / n + 1.25V_n$ ODD TRIPLENS: $<15\% I_f / n + 1.25V_n$	I_f = Fundamental current $V_{thd} > 10\%$ (clipped method) n = order of harmonic (1 - 40) V_n = corr input voltage harmonic 25W-40W output load Harmonics $< 10mA$ disregarded	1
STORAGE TEMPERATURE RANGE	-55°C TO +100°C	Non operational	1
OPERATING TEMPERATURE RANGE	-25°C TO +70°C	No external airflow required	1
OUTPUTEN-L	Pull to $<2V_{dc}$ with respect to DCRTN in order to enable the +12V output	Internally pulled high to $5V_{stby}$ through 5.1k pull-up resistor. Pull to $<2V_{dc}$ with respect to DCRTN in order to enable +12V output. $5V_{stby}$ output is unaffected by this signal	1

OUTPUT CHARACTERISTICS

PARAMETER	AC40W-12V-PBF	REMARKS	NOTES
RATED OUTPUT POWER	40W	Continuous	2
OUTPUT VOLTAGE TOLERANCE	+12V \pm 2% +5.05V \pm 3%	See "STANDARD OUTPUTS" table	2
TEMPERATURE STABILITY COEFFICIENT	0.01% / °C	Maximum output voltage drift with temperature	1
OUTPUT RIPPLE + NOISE (pk-pk)	$<120mV_{pp}$: +12V output $<50mV_{pp}$: +5Vstby output	20MHz Bandwidth	2
MINIMUM OUTPUT LOAD	0A	No minimum load is required for proper output regulation.	2
LINE REGULATION	$<0.5\%$	Individual output deviation for $\pm 20\%$ step change in input voltage	1
LOAD REGULATION (TRANSIENT LOAD RECOVERY)	Outputs remain within regulation limits	50% to 100% step change in individual output load currents	1
HOLD-UP TIME	200mSec min @ $P_{out} = 35W$	Uninterrupted ride through for momentary power interrupt	2



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OUTPUT CHARACTERISTICS—CONTINUED

PARAMETER	AC40W-12V-PBF	REMARKS	NOTES
ISOLATION VOLTAGE INPUT TO OUTPUT	1500Vac	No arcing or damage for 60 second test duration	1
ISOLATION VOLTAGE INPUT TO CHASSIS	1500Vac	No arcing or damage for 60 second test duration	2
DC OUTPUT STATUS "DCGOOD-L"	Transitions to TTL high (4V min) upon detection of +12V output 6% below nominal set point	Secondary side referenced (w/ respect to DCRTN), 10mSec delay time, TTL level, 1mA max source current; 16mA max sink current	2
OUTPUT OVERVOLTAGE PROTECTION (non-latching)	+12V output is limited to 110% of nominal set point	Pulse-by-pulse protection, 4mSec fault to activation delay, auto-restart	1
OUTPUT OVERVOLTAGE PROTECTION (latching)	+12V set point = 14.5V +5Vstby set point = 6.2V	Supply will shutdown and remain disabled until input AC power is recycled if OVP set points are detected internally	1
OVERTEMP-L STATUS SIGNAL	Transitions to 0.5V max level upon detecting an internal operating temperature of +100°C +/- 7°C	Supply provides status signal OVERTEMP-L that asserts low when supply PWB temperature is sensed at 100°C, with ~2°C hysteresis. OVERTEMP-L signal is secondary side referenced w/ respect to DCRTN), capable of sinking 16mA	1
PFC 200Vdc OUTPUT	200Vdc ± 3%	5W ≤ Pout < 40W.	2,3

Notes:

1. Ensured by design, not 100% tested in production.
2. 100% tested for specification compliance in production.
3. 200Vdc PFC output voltage tolerance is +/-5% for Pout < 5W.

