

70170AC-2-PBF

(115Vac, 47- 800Hz Input)

100W, 28V Single Output,
Airborne PFC Power Supply



Targeting Point-of-Load (POL) applications, the **70170AC-2-PBF** provides a single 28Vdc output at up to 3.6A continuous output current. It meets the most stringent airborne requirements including those for variable frequency 115Vac generator systems over the wide frequency range of 360-800Hz and RTCA/DO-160G category M emissions. Efficiency exceeds 77% at ½ to full output load helping to keep internal heat dissipation to a minimum. The **70170AC-2-PBF** is capable of providing uninterrupted ride-through at full output load during momentary input AC brown-out conditions for more than 300mSec. Standard protection features are built-in in to assure years of fault-tolerant and reliable operation in the harshest environments.

Weighing less than 36 ounces, the **70170AC-2-PBF** is housed in an aluminum enclosure with outer dimensions of 8.0" x 4.75" x 1.4". The top cover is perforated; the lower U-Chassis accepts five #4 screws to facilitate system mounting. Interconnection is accomplished using a single Samtec right angle connector.

The **70170AC-2-PBF** is a derivative of the 70170AC-1 supply; the -2 is tuned to comply with harmonic distortion requirements over the reduced output power range of 50–100W. Output power has also been limited to 100W (versus 170W for the -1 supply).



70170AC-1 SHOWN

FEATURES

	Meets both RTCA/DO-160G, section 16, notice 2 and Airbus ABD0100.1.8 issue D for power factor and input current harmonic distortion levels over the wide frequency operating range (360Hz – 800Hz)
	Efficiency: 77% minimum: ½ to full rated output load, all input (line) conditions
	Wide input range: 97Vrms – 134Vrms, 47 – 800Hz
	Complies with RTCA/DO-160G for conducted emissions, susceptibility and power input (section 16)
	Active inrush current limiting: 7Apk typical, 12Apk maximum
	Size: 8.0" x 4.75" x 1.4", weight: less than 32 ounces
	Single output: 28Vdc at up to 100W output power
	Overcurrent protection with constant current limiting
	Three layers of 28Vdc output overvoltage protection
	PFC output overvoltage protection with automatic restart (internal 360Vdc PFC output)
	Over-temperature shutdown with automatic restart (at or above 100°C)
	Under-temperature inhibit (at or below -20°C)
	AC status line (TTL)
	Output enable line (TTL)
	MTBF: 581,000 Hours, RIAC 217Plus, Aic category, 55°C case tempera-

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PERFORMANCE SUMMARY

PARAMETER	VALUE (TYPICAL)
Voltage regulation	+28Vdc +/-2%
Output current	3.6A
Minimum load	60mA
Pk-Pk Ripple + Noise (20MHz)	30mVpp
Efficiency	80%
Output ride-through / full load	330mSec
Output overcurrent threshold (1)	4.3A
Output overvoltage trip-point "soft" protection	30.4V
Output overvoltage trip-point "hard" protection	34.9V
Output overvoltage "crowbar" activation set point	38.0V
PFC output overvoltage trip-point	420V
MTBF (Aic, 55°C case)	581,000 Hours

Notes:

1. Constant current limited. Output will recover into full 3.6A load automatically when overcurrent fault condition clears.














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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 A
	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 115V - AC input, category A(WF) equipment
	RTCA/DO-160G, section 17, voltage spike, category B equipment
	RTCA/DO-160G, section 18, conducted susceptibility, category R(WF) equipment
	RTCA/DO-160G, section 19, induced signal susceptibility, category ZW equipment
	RTCA/DO-160G, section 20, conducted and radiated susceptibility, category T equipment
	RTCA/DO-160G, section 21, conducted and radiated emissions, category M equipment, with external power line EMI filter
	Operating temperature: -25°C to +70°C, forced air and/ or external heatsinking may be required
	Storage temperature: -55°C to +100°C

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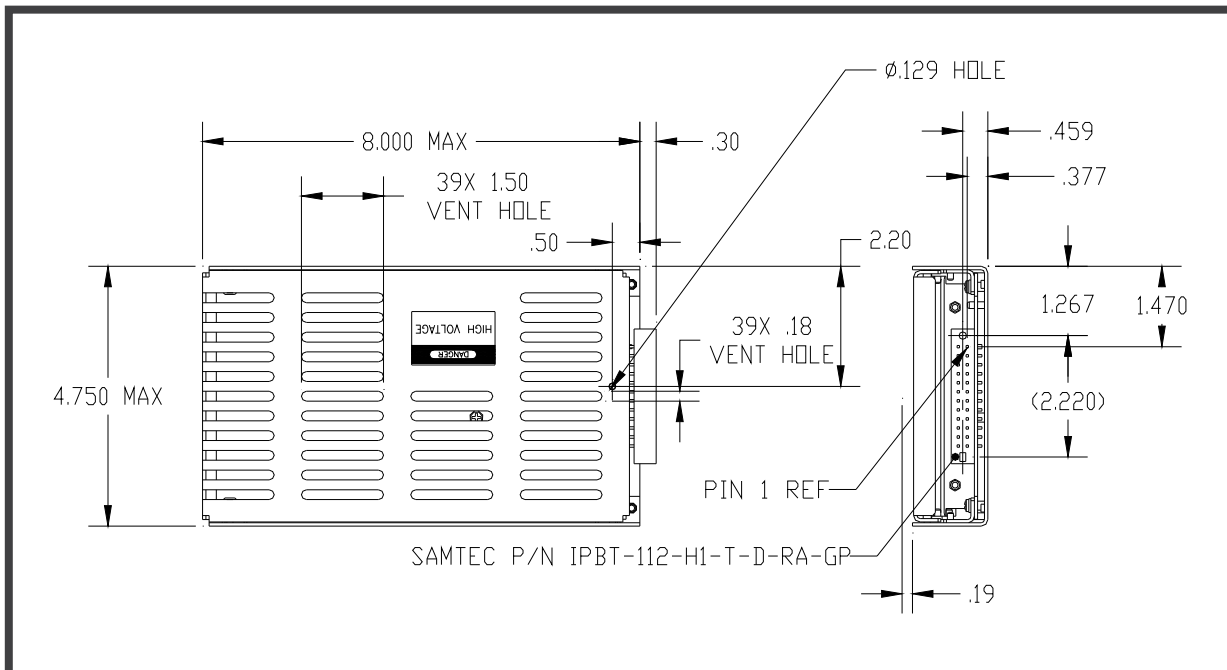


INTERCONNECTION

Interconnection is accomplished with a single Samtec IPBT-112-H1-T-D-RA-GP. Pin-outs are shown below. Use Samtec PMSD or PMSS series mating connector.

Pin	Signal	Pin	Signal	Pin	Signal
1	+28Vout	9	NC	17	28V Current Sense
2	DCRTN	10	NC	18	NC
3	DCRTN	11	Chassis	19	NC
4	ACPWRFAIL-L	12	NC	20	NC
5	NC	13	+28Vout	21	NC
6	NC	14	DCRTN	22	AC Neutral
7	NC	15	OUTPUTEN-L	23	NC
8	NC	16	DCPWRGOOD-L	24	AC Line

MECHANICAL DIAGRAM



A DETAILED OUTLINE 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 output, $V_{in} = 115\text{Vrms}$, 360Hz to 800Hz, <1.25% sinusoid.

INPUT CHARACTERISTICS

PARAMETER	70170AC-2-PBF	REMARKS	NOTES
INPUT VOLTAGE RANGE	97 – 134Vrms	Complies with normal / abnormal input voltages per DO-160G, section 16	2
INPUT UNDERVOLTAGE DISABLE	97Vrms minimum	Supply will start and remained enabled for input voltage in the range of $97\text{Vrms} < V_{in} < 134\text{Vrms}$. Supply will shutdown for sustained input undervoltages.	2
INPUT FREQUENCY RANGE	47 – 800Hz	Reduced distortion performance below 360Hz	2
EFFICIENCY	77% minimum @ 50% Load 80% minimum @ 100% Load	Full input range (97 – 134Vrms)	2
LEAKAGE CURRENT	< 5mArms	AC Line / Neutral to Chassis at 115Vrms / 400Hz	1
INRUSH CURRENT	<12.2Apk maximum	Cold or Warm Start; 7Apk typical	2
TOTAL HARMONIC DISTORTION (INPUT CURRENT)	< 3.5%	50% to 100% Output Load (50W to 100W) 360 – 800Hz	2
INDIVIDUAL HARMONICS AC CLEAN	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 $V_{thd} < 1.25\%$, $n=1$ through 99 n = order of harmonic 50% to 100% Output Load (50W to 100W)	1
INDIVIDUAL HARMONICS DISTORTED INPUT	EVEN: <1% $I_f / n + V_n$ ($n < 10$) EVEN: <0.1% $I_f + V_n$ ($n \geq 10$) ODD: <30% $I_f / n + V_n$ ODD TRIPLENS:<15% $I_f / n + V_n$	I_f = Fundamental Current $V_{thd} > 5\%$, $n=1$ through 99 V_n = corresponding voltage harmonic 50% to 100% Output Load (50W to 100W)	1
POWER FACTOR	0.98 min (0.99 typ) at 360Hz 0.90 min (0.94 typ) at 800Hz	$P_{out} > 50\text{W}$ at 360Hz $P_{out} > 50\text{W}$ at 800Hz	2
CREST FACTOR (CURRENT)	1.314 – 1.514	Ratio of Peak / RMS	1
START-UP TIME	< 1Sec	Output within regulation	2
CONDUCTED EMISSIONS	RTCA/DO-160G	Category M with external power line filter	1
STORAGE TEMPERATURE RANGE	-55°C to +100°C	Non-operational	1
OPERATING TEMPERATURE RANGE	-15°C to +70°C	Supply in inhibited at or below -20°C Auto Restart	1

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INPUT CHARACTERISTICS—CONTINUED

PARAMETER	70170AC-1	REMARKS	NOTES
OUTPUT ENABLE SIGNAL - L	TTL active LOW signal; requires a TTL HIGH (> 5mA drive current) to disable supply	Secondary referenced; supply will disable within 1 second of asserting high level logic state	1
OVERTEMPERATURE SHUTDOWN	100°C +/- 4°C	Supply is inhibited at or above 100°C Auto Restart at ~ 80°C case temp	1

Notes:

1. Ensured by design, not 100% tested in production.
2. 100% tested for specification compliance in production.

OUTPUT CHARACTERISTICS

PARAMETER	70170AC-2-PBF	REMARKS	NOTES
RATED OUTPUT POWER	100W	Continuous	2
OUTPUT VOLTAGE	28Vdc +/- 2% typical, 28Vdc +/-5% maximum		2
OUTPUT OVERCURRENT THRESHOLD	4.0A typical, 4.3A maximum	Constant current limited, Output voltage will foldback with auto-recovery into full output load	2
TEMPERATURE STABILITY COEFFICIENT	0.01% / °C	Output voltage variation with temperature	1
OUTPUT RIPPLE + NOISE	150mVpp	150mVpp maximum; 30mVpp typical. 20MHz bandwidth	2
LINE REGULATION	<0.5%	28V output deviation for +/- 20% step change in input voltage	1
LOAD REGULATION	Output Remains in Regulation	50% step change in output load	1
MINIMUM LOAD	60mA	60mA minimum for proper output regulation. Can safely unload the output – supply may not regulate within -5% limit when output is unloaded at high line	2
HOLD-UP TIME	300mSec minimum	330mSec typical into full 100W load	2
ISOLATION VOLTAGE INPUT TO CHASSIS	1500Vac, 60Hz	No arcing or damage for 60-second test duration (8mAmrs max leakage)	1
ISOLATION VOLTAGE INPUT TO OUTPUT	1500Vac, 60Hz	No arcing or damage for 60-second test duration (8mAmrs max leakage)	1
ISOLATION VOLTAGE OUTPUT TO CHASSIS	50Vdc	No arcing or damage for 60-second test duration (100Mohm min)	1

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OUTPUT CHARACTERISTICS—CONTINUED

PARAMETER	70170AC-2-PBF	REMARKS	NOTES
DCPWRGOOD-L	0.5V maximum when output is within proper regulation	TTL Level, 16mA max sink current	2
ACPWRFAIL-L	Transitions to 0.5V max within 10mSec upon loss of input AC	Secondary referenced, TTL Level, 16mA max sink current	2
28V CURRENT SENSE	500mV +/-10% per Amp	Valid for all lout > 0.5A	1
OUTPUT OVERVOLTAGE PROTECTION (SOFT)	30.4V set-point	Pulse by pulse protection (inner loop), auto-restart	1
OUTPUT OVERVOLTAGE PROTECTION (HARD)	34.9V set-point	Supply enters low duty cycle operation as long as fault condition persists, auto-restart	1
OUTPUT OVERVOLTAGE PROTECTION (CROWBAR)	38.0V set-point	Output is clamped to this level if soft and hard OVP circuits fail to limit output voltage.	1
OUTPUT VOLTAGE ADJUSTMENT	None		

Notes:

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2. 100% tested for specification compliance in production.

To inquire about price, delivery and supply options information please contact PPI sales department.