

# 70150AC-12V-5V

(115Vac, 47- 800Hz Input)

162W, 12V / 5V Dual Output,  
Airborne PFC Power Supply



Targeting Point-of-Load (POL) applications, the **70150AC-12V-5V** provides switched outputs of 12Vdc / 11A and 5Vdc / 6A and a low current 5V standby unswitched output. 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-160E category M emissions. Efficiency is ~80% at half to full output load (162Wmin) helping to keep internal heat dissipation to a minimum. The **70150AC-12V-5V** is capable of providing uninterrupted ride-through at full output load during momentary input AC brown-out conditions for a minimum of 200mSec. 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 **70150AC-12V-5V** 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.



## FEATURES

	Meets both RTCA/DO-160G, section 16 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: 80% typical, half to full rated output load, nominal input (line) conditions
	Wide input range: 97Vrms – 134Vrms, 47 – 800Hz
	Complies with RTCA/DO-160G, category M for conducted emissions, susceptibility and power input (section 16)
	Complies with RTCA/DO-160G, category S, curve C for operational vibration (section 8)
	Complies with RTCA/DO-160G, category A1 for temperature/ altitude (section 4)
	Active inrush current limiting: 7Apk typical, 12Apk maximum
	Size: 8.0" x 4.75" x 1.4", weight: less than 32 ounces
	Dual switched outputs: 12Vdc & 5Vdc and continuous 5Vstby output at up to 162W combined output power
	Overcurrent protection on each output with foldback limiting
	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)
	AC status line (TTL)
	Output enable line (TTL)
	MTBF: 526,000 Hours, RIAC 217Plus, Aic category, 50°C case temperature, 65%DC, 2190 Cycles/ year

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## PERFORMANCE SUMMARY

PARAMETER	VALUE (TYPICAL)			
	Supply	12V Output	5V Output	5V Stby
Voltage regulation	--	+12.1V ± -2%	+5.05V ± 2%	+5.0V ± 2%
Rated output current (5)	--	11A	6A	100mA
Minimum load		0A	0A	0A
Pk-Pk Ripple + Noise (20MHz)	--	120mVpp	75mVpp	50mVpp
Module efficiency / half to full output load	80%	--	--	--
Switched	--	Yes	Yes	No
Output ride-through at full load (1)	200mSec	--	--	--
Output overcurrent threshold (2)	--	14.5A max	7.5A max	220mA
Output overvoltage set-point (3)	--	18V	5.48V	--
PFC output overvoltage set-point (3)	420V	--	--	--
Isolation Voltage (4) (Input to Output & Input to Chassis)	1500Vac	--	--	--
MTBF (Aic, 50°C case)	526,000 Hours	--	--	--

### Notes:

1. 880uF internal hold-up capacitance; ride-through based on -20% capacitor tolerance, 115Vrms nominal input, full output load
2. Foldback current limited with auto recovery into full rated output load (Von setting at 75% of Vout if using active loads)
3. Crowbar set-point; see output characteristics' table for OVP details
4. 1500Vac for 60 seconds without arc or damage; 8mArms maximum leakage current (line-to-earth capacitors installed)
5. Up to 13.5A can be drawn from the 12V output continuously if the 5V output is not loaded. Alternately, any combination of output current on the +12V and +5V main output with total output power adding up to 162W can safely be drawn from the supply

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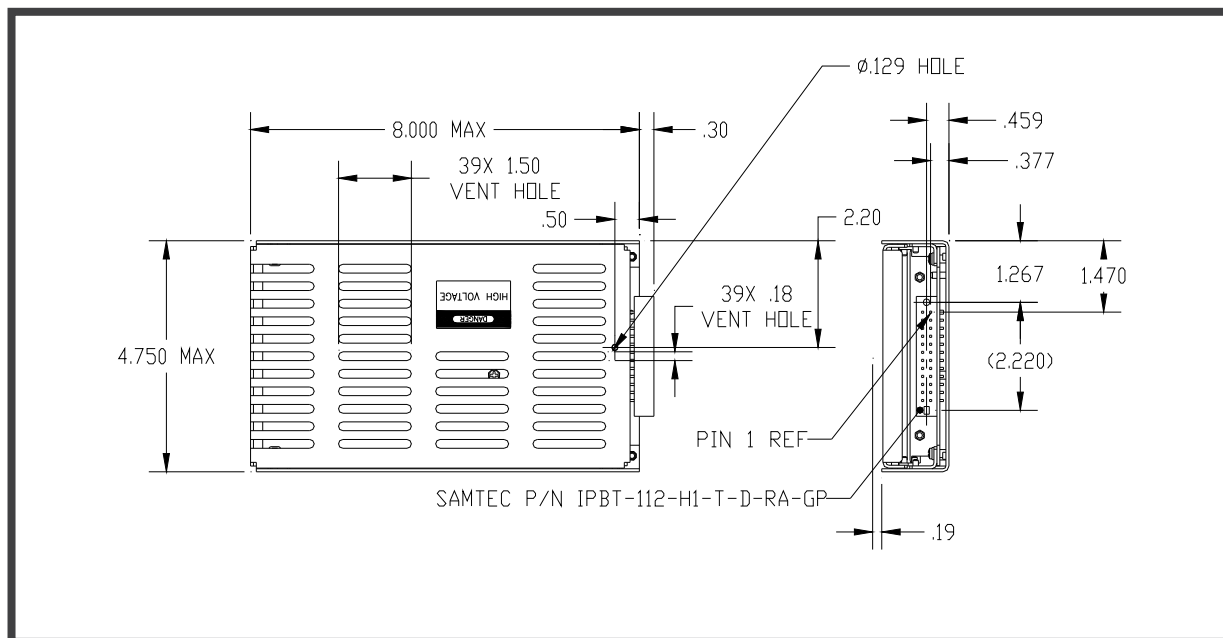


## INTERCONNECTION

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	+12Vout	9	NC	17	5VStby
2	DCRTN	10	NC	18	+5Vout
3	DCRTN	11	Chassis	19	NC
4	ACPWRFAIL-L	12	NC	20	NC
5	+5Vsns	13	+12Vout	21	NC
6	+5Vout	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: Ta = 25°C, constant active load applied to output, Vin = 115Vrms, 360Hz to 800Hz, <1.25% sinusoid.

## INPUT CHARACTERISTICS

PARAMETER	70150AC-12V-5V	REMARKS	NOTES
INPUT VOLTAGE RANGE	97 – 134Vrms	Complies with normal / abnormal input voltages per DO-160G, sect 16, cat A. Output power maximum is 150W combined at 97Vrms – 104Vrms input	2
MUST START VOLTAGE	97Vrms minimum	Supply will start and remained enabled for input voltage in the range of 97Vrms < Vin < 134Vrms. Supply will shutdown for sustained input undervoltages. Output power maximum is 150W combined at 97Vrms – 104Vrms input	2
INPUT FREQUENCY RANGE	47 – 800Hz	Reduced distortion performance below 360Hz	2
EFFICIENCY	80% typical 78% minimum	50% to 100% output load (81W to 162W)	2
LEAKAGE CURRENT	< 5mArms	AC Line / Neutral to Chassis at 115Vrms / 400Hz	1
INRUSH CURRENT	<22.7Apk for first 3mSec, <10.1Apk up to 500mSec, <5.04 Apk up to 2Secs	Per RTCA/DO-160G, Section 16, Category A. Cold or warm start. 7Apk typical for <500mSec	2
TOTAL HARMONIC DISTORTION (Input Current)	< 3.5% max at 360Hz & 400Hz < 5.0% max at 800Hz	50% to 100% output load (81W to 162W)	2
INDIVIDUAL HARMONICS AC CLEAN	EVEN: <1% If / n (n < 10) EVEN: <0.1%If (n ≥ 10) ODD: <30% If / n ODD TRIPLENS:<15% If /n	If = Fundamental current Vthd < 1.25%, n = 1 through 99 n = order of harmonic 50% - 100% output load (81W to 162W) harmonic currents < 10mA disregarded	1
INDIVIDUAL HARMONICS DISTORTED INPUT	EVEN: <1% If / n + Vn (n < 10) EVEN: <0.1%If + Vn (n ≥ 10) ODD: <30% If / n + Vn ODD TRIPLENS:<15% If /n+Vn	If = Fundamental current Vthd > 10%, n = 1 through 99 Vn = corr input voltage harmonic 50% - 100% output load (81W to 162W) harmonic currents < 10mA disregarded	1
POWER FACTOR	0.98 min	360-800Hz, Pout > 85W	2
CREST FACTOR (Current)	1.314 – 1.514	Ratio of peak / RMS	1

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## INPUT CHARACTERISTICS—CONTINUED

PARAMETER	70150AC-12V-5V	REMARKS	NOTES
START-UP TIME	< 750mSec	Outputs within regulation	2
CONDUCTED EMISSIONS	RTCA/DO-160G	Category M	1, 3
STORAGE TEMP RANGE	-55°C to +100°C	Non-operational	1
OPERATING TEMP RANGE	-25°C to +70°C	Supply can safely operate down to -55°C; start-up time will increase several seconds at low temperature	1
OUTPUT ENABLE SIGNAL (OUTPUTEN-L)	TTL active low signal; internally pulled high to 5Vstby. Pull OUTPUTEN-L signal to output return (DCRTN) to enable switched outputs	Secondary referenced; switched outputs will disable within 1 second of asserting high level logic state (or floating OUTPUTEN-L signal)	2
OVERTEMPERATURE SHUTDOWN	100°C +/- 4°C	Supply is inhibited at or above 100°C, auto restart at ~ 80°C case temp	1

## OUTPUT CHARACTERISTICS

PARAMETER	70150AC-12V-5V	REMARKS	NOTES
RATED OUTPUT POWER	162W	Continuous	2
OUTPUT VOLTAGES	12.1Vdc +/- 2%, 5.05Vdc +/- 2%, 5Vstby is 5.0V +/- 2%		2
OUTPUT OVERCURRENT THRESHOLD	12V output: 14.5A maximum, 5V output: 7.5A maximum, 5V Stby output: 220mA typical	Output voltage will foldback and recover automatically into full rated load if threshold is exceeded	2
TEMPERATURE STABILITY COEFFICIENT	0.01% / °C	Output voltage variation with change in temperature	1
OUTPUT RIPPLE + NOISE	12V output: 120mVpp max, 5V output: 75mVpp max, 5V stby output: 50mVpp max	20MHz bandwidth	2
LINE REGULATION	<0.5%	Output deviation for +/- 20% step change in input voltage	1
LOAD REGULATION	Outputs remain in regulation	50% step change in output load	1

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## OUTPUT CHARACTERISTICS—CONTINUED

PARAMETER	70150AC-12V-5V	REMARKS	NOTES
MINIMUM LOAD	0A	No minimum load required for proper output regulation	2
HOLD-UP TIME	200mSec minimum	At full rated 162W load (combined)	2
ISOLATION VOLTAGE INPUT TO CHASSIS	1500Vac, 60Hz	No arcing or damage for 60-second test duration (8mArms max leakage)	1
ISOLATION VOLTAGE INPUT TO OUTPUT	1500Vac, 60Hz	No arcing or damage for 60-second test duration (8mArms max leakage)	1
ISOLATION VOLTAGE OUTPUT TO CHASSIS	250Vdc	No arcing or damage for 60-second test duration (100Mohm min)	1
DCPWRGOOD-L	0.5V maximum when outputs are within proper regulation	Secondary referenced, TTL Level, 16mA max sink current	2
ACPWRFAIL-L	Transitions to 0.5V max upon loss of input AC within 10mSec	Secondary referenced, TTL Level, 16mA max sink current	2
OUTPUT OVERVOLTAGE PROTECTION (SOFT)	12V output: 13.5V set-point 5V output: n/a	Pulse by pulse protection (inner loop), auto-restart	1
OUTPUT OVERVOLTAGE PROTECTION (HARD )	12V output: 14.7V set-point 5V output: n/a	Supply enters low duty cycle operation as long as fault condition persists, auto-restart	1
OUTPUT OVERVOLTAGE PROTECTION (CROWBAR)	12V output: 18V set-point 5V output: 5.48V set-point	Output is clamped to this level if soft and hard OVP circuits fail to limit output voltage; individual outputs may not recover if overvoltage fault persists	1
OUTPUT VOLTAGE ADJUSTMENT	None		

### Notes:

1. Ensured by design, not 100% tested in production.
2. 100% tested for specification compliance in production.
3. May require small external inductor, common-mode inductor or X capacitor installed on power lines for full compliance when installed in upper level assembly, please contact PPI engineering for details.