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81357-X-HPR

PFC BOOST CONVERTER MODULE (400Hz)

The **81357-X-HPR** PFC boost converter module contains all the necessary circuitry for complete power line compliance with aeronautics specification RTCA/DO-160D and Boeing's D6-36440 (rev. C). Housed in an all aluminum epoxy encapsulated enclosure, the PFC module is both compact and rugged. Providing line rectification, minimized input current harmonic distortion, active inrush current limiting and near unity power factor; this low profile (1.25") PCB mount device is ideal for avionics applications whose power demands are in the 75W - 150W range.

The module's 350Vdc standard DC output is compatible with a broad range of off-the-shelf DC/DC converter modules. Utilizing a modular approach, system power supplies are easily configured with a few individual components required. Tedious design and development cycles normally associated with custom power solutions are no longer necessary with this approach. Reliable, compliant power supplies can be configured in weeks, not months, without the need for specialized Power Supply Engineers.



FEATURES

▶	EXCEEDS BOEING SPECIFICATION D6-36440 (rev C) FOR POWER FACTOR AND INPUT CURRENT HARMONIC DISTORTION LEVELS @ 400 ± 10% Hz
▶	EFFICIENCY: 90% MINIMUM AT Pmax
▶	WIDE INPUT RANGE: 85 - 134Vrms, 47 - 685Hz
▶	350Vdc OUTPUT COMPATIBLE WITH BROAD RANGE OF <i>OFF-THE-SHELF</i> DC/DC CONVERTER MODULES
▶	COMPLIES WITH RTCA/D0-160D CONDUCTED EMISSIONS AND SUSCEPTIBILITY
▶	VL94V-0 FLAMMABILITY CLASSIFICATION
▶	RUGGEDIZED EPOXY ENCAPSULATED CONSTRUCTION WITH INTEGRAL HEATSINK PROVIDES IMMUNITY FROM HARSH ENVIRONMENTS
▶	INPUT TRANSIENT SUPPRESSION: 30J/2mSecs
▶	SIZE: (FINNED VERSION) 4.0" x 2.3" x 1.25", WEIGHT = 13oz., (FLAT TOP VERSION) 4.0" x 2.3" x 0.99", WEIGHT = 12oz.
▶	ACTIVE INRUSH CURRENT LIMITING

PARAMETER	81357-X-HPR
OUTPUT POWER RANGE (1,2)	75-150W
OUTPUT VOLTAGE	350Vdc
EFFICIENCY (3)	90%
SWITCHING FREQUENCY	100KHz
MINIMUM OUTPUT CAPACITANCE REQUIRED (4)	100uF
INPUT LINE TO NEUTRAL CAPACITANCE (5)	0.22uF
TOTAL LINE/NEUTRAL TO CHASSIS CAPACITANCE (5)	8600pF

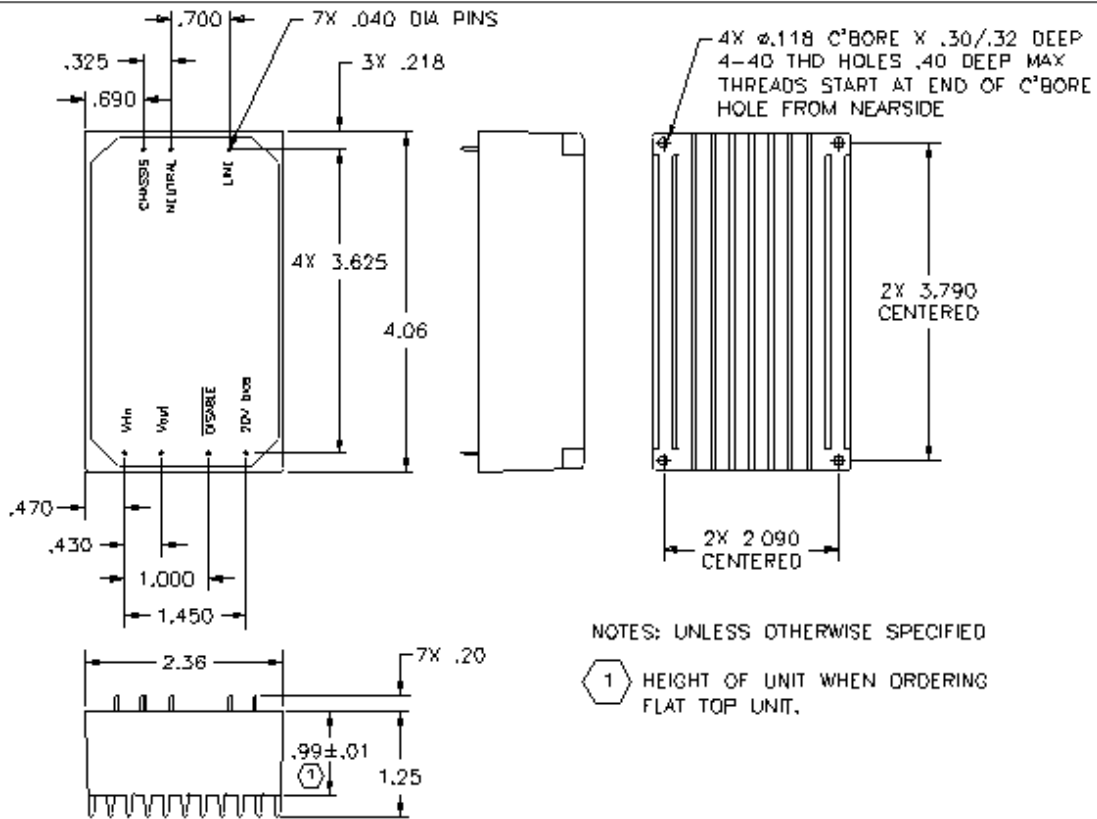
NOTES: 1. Output power range in which module complies with D6-36440 (rev C). 2. Module is power limited at upper output limit, (Pmax). 3. Minimum efficiency at Pmax. 4. Minimum output capacitance for proper boost module operation. Typical values will be larger to meet hold-up time requirements. Use polarized aluminum electrolytic type. 5. Capacitance tolerances are ± 20%.

TEMPERATURE CHARACTERISTICS

*AIRFLOW (LFM)	THERMAL IMPEDANCE (0s-a) (°C/W)	
Air velocity through cross-sectional area of fins or across flat top	INTEGRAL FINS	FLAT TOP (W/O FINS)
0 LFM	3.3	4.4
250 LFM	1.1	2.3
500 LFM	0.6	1.6
750 LFM	0.4	1.1

* Air velocity using a digital anemometer positioned within an airflow duct 1.0" X 2.3" above top of module

MECHANICAL DIAGRAM



ELECTRICAL SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE FOLLOWING TEST CONDITIONS APPLY: $T_a=T_h/s=25^{\circ}\text{C}$.. CONSTANT RESISTIVE LOAD APPLIED TO OUTPUT & 1000 μF CAPACITOR ACROSS OUTPUT, FULL OUTPUT LOAD, $V_{IN}=115V_{rms}$, 400Hz, < 1% THD SINUSOID

INPUT CHARACTERISTICS

PARAMETER	81357 SERIES	REMARKS
INPUT VOLTAGE RANGE	85 - 134Vrms	COMPLIES WITH NORMAL/ABNORMAL INPUT VOLTAGES PER RTCA/DO-160D
INPUT FREQUENCY RANGE	400Hz \pm 10%	OPERATES OVER THE RANGE OF 47 - 685Hz WITH REDUCED DISTORTION PERFORMANCE
LEAKAGE CURRENT	<3mArms	AC LINE/NEUTRAL TO CHASSIS, V_{in} @ 400Hz
INRUSH CURRENT	<5Apk	COLD START, $V_{out}=0V$
TOTAL HARMONIC DISTORTION (INPUT CURRENT)	<3.5%	SEE TABLE UNDER "SERIES OPTIONS"
INDIVIDUAL HARMONICS - AC CLEAN	EVEN: < 1% I_f / n , (n=2,4) EVEN: <0.25% I_f , (n \geq 6) ODD: < 30% I_f / n ODD TRIPLENS: < 15% I_f / n	I_f = FUNDAMENTAL CURRENT $V_{thd} \leq 1\%$ n =1 THRU 42 n = ORDER OF HARMONIC
INDIVIDUAL HARMONICS - DISTORTED INPUT	EVEN: < 1% $I_f / n + V_n$, (n=2,4) EVEN: <0.25% $I_f + V_n$, (n \geq 6) ODD: < 30% $I_f / n + V_n$ ODD TRIPLENS: < 15% $I_f / n + V_n$	I_f = FUNDAMENTAL CURRENT V_n = CORRESP. INPUT VOLTAGE HARMONIC n =1 THRU 42 n = ORDER OF HARMONIC
POWER FACTOR	0.90 min	$P_{out} > 20W$
TRANSIENT SURGE WITHSTAND	30J / 2mSec	NORMAL MODE
CREST FACTOR (CURRENT)	1.314 - 1.514	RATIO OF PEAK/RMS
BOOST INHIBIT	DISABLE PIN PULLED TO < 1V WITH RESPECT TO V_{rtn}	BOOST FUNCTION DISABLED. V_{out} WILL REMAIN AT $V_{in}SQRT2 V_{rms}$, DEPENDING ON LOADING
START-UP TIME	<500mSec	$V_{out} > 200Vdc$
CONDUCTED EMISSIONS	RTCA/DO-160D	
OPERATING TEMPERATURE RANGE	-25°C TO 100°C	BASEPLATE

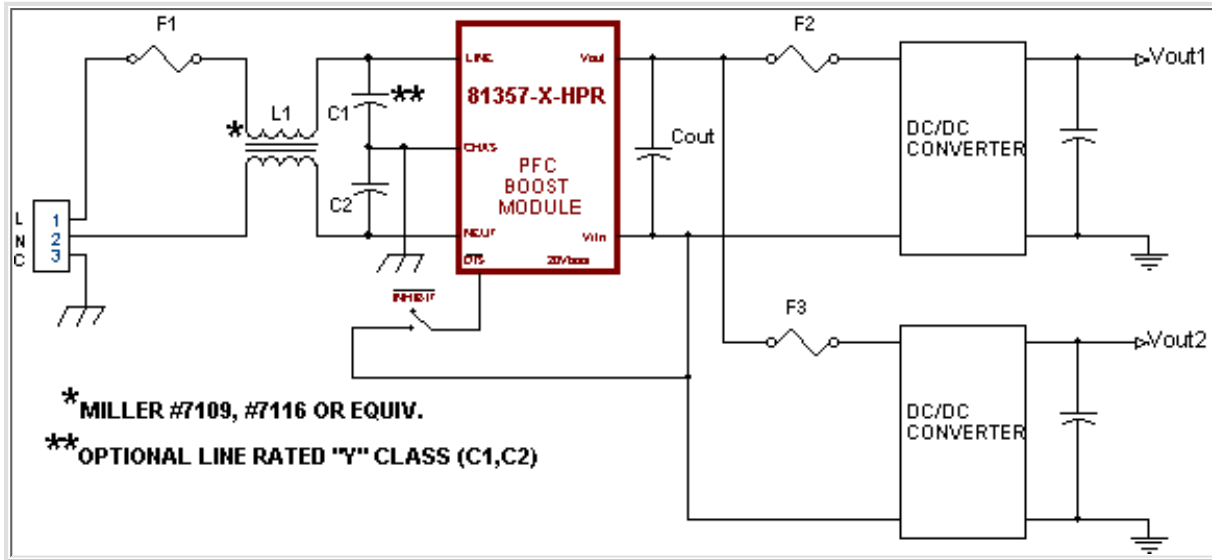
OUTPUT CHARACTERISTICS

PARAMETER	81357 SERIES	REMARKS
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RATED OUTPUT VOLTAGE	350Vdc ± 3%	
MINIMUM OUTPUT CURRENT	0A_{dc}	
MAXIMUM BASEPLATE TEMPERATURE	100°C	
TEMPERATURE STABILITY COEF.	0.03% / °C	OUTPUT VOLTAGE
OUTPUT RIPPLE + NOISE (pk - pk)	<0.5%	20MHz BANDWIDTH, C_{out} = 220uF
LINE REGULATION	< 1%	OUTPUT DEVIATION FOR ± 20%, STEP CHANGE IN LINE VOLTAGE
HOLD-UP TIME	0mSec	REQUIRES EXTERNAL HOLD-UP CAPACITOR
MINIMUM OUTPUT CAPACITANCE	100uF	OBSERVE RIPPLE CURRENT REQUIREMENTS @ 800Hz & 100kHz FOR EXTERNAL OUTPUT CAPACITORS
INPUT TO OUTPUT ISOLATION VOLTAGE	NONE	
INPUT/OUTPUT TO CHASSIS ISOLATION VOLTAGE	1500V_{rms}, 60Hz	60 SECONDS WITHOUT DAMAGE OR ARCING
SHORT-CIRCUIT PROTECTION	NONE	FUSE INPUT WITH 3AMP FAST BLOW FUSE
OUTPUT VOLTAGE ADJUSTMENT	NONE	
20V_{bias} OUTPUT	12mA SOURCE CURRENT	REFERENCED TO V_{rtn}, MAXIMUM SOURCE CURRENT IS 5mA DURING MODULE START-UP AND 12mA AFTER MODULE START-UP. OUTPUT VOLTAGE MAY DROP BELOW 16.6V WHEN BOOST MODULE IS DISABLED OR LIGHTLY LOADED ON THE OUTPUT. 20V_{bias} OUTPUT IS INTERNALLY OVER-CURRENT PROTECTED.

TYPICAL APPLICATION

To obtain additional information click on schematic



ORDERING INFORMATION



INSERT FOR FIN CONFIG.:	"H"	"F"
	INTEGRAL FIN	FLAT TOP

rev 9/25/03

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