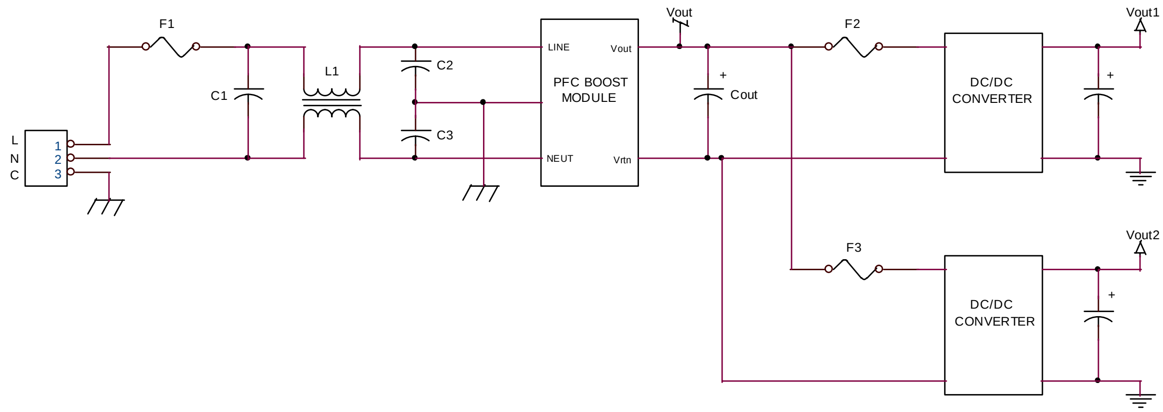

Designator	P/N or Description
F1	3A, 125Vac, Fast-Blow
F2, F3	2.5A, 450V, PC-Tron
L1	JW Miller #7109 or #7116
C1	0.033uF, 275Vac, “X2”
C2, C3	3300pF, 250Vac, “Y1/Y2”

1) EXTERNAL COMPONENT SELECTION:

A) FUSES

F1 = 3A, 125Vac, FAST BLOW, AXIAL
F2 = F3 = BUSS, PC-TRON, DC FUSE, PCB SERIES, 450V/2.5A

B) COMMON MODE CHOKE (L1)

Used for suppression of conducted emissions as a result of PCB trace lengths from input power connector to boost module input. F1 and L1 should be placed as close as possible to AC entry point within assembly (i.e., @ power connector). The addition of L1 will have no impact on harmonic distortion performance of boost module.

Typical L1 values are 1 - 8 mH @ 1 - 2 Arms

Suggested manufacturers:

JW Miller
(310) 515-1720
P/N's 7108, 7114, 7116

Coilcraft
(312) 639-2361
P/N F5593A

C) OUTPUT CAPACITOR(S) (Cout)

The 81006 series boost module requires a minimum output capacitance of 100uF for proper operation. Typical values will be larger due to hold-up time requirements of particular application. For large values of external output capacitance (e.g., 1500uF), special provisions should be taken to limit inrush current. The 81006 module does not contain internal inrush current limiting.

Recommended capacitor type and placement:

250V, Aluminum Electrolytic, Snap-mount, 105°C
United Chemi-Con, KMH series
Cornell Dubilier, 381LX series

Placement:

Output capacitor(s) should be placed within several inches of the boost module output prior to the DC/DC converter input fuses F2 and F3.

Output Capacitor Ripple Requirements:

Observe capacitor ripple current requirements at 800Hz and 100kHz. Normal (full load) 800Hz ripple current can be calculated by:

I (800) = P in / V in (rms)

100kHz ripple current content is generated as a function of the boost module's normal operation. The maximum 100kHz ripple current for the 81006 series is 500mApk-pk and occurs at the internal switching frequency of the converter.

Hold-up Time Calculations:

Output capacitance (Cout) vs. hold-up time (t) can be calculated by the following formula:

$E = Pt = 1/2Cout(Vi^2 - Vf^2)$

where:
P = Power delivered to DC/DC converters
Vi = Normal operating DC output voltage of boost converter (200Vdc)
Vf = Minimum operating voltage of DC/DC converter

2) EMI CONSIDERATIONS

Although the 81006 series boost module complies with RTCA/DO-160C EMI requirements as a stand-alone unit, often times circuit implementation (i.e., component placement, DC/DC converter selection, PCB layout and grounding, supply enclosure, power trace/wire lengths) enter into the spectrum. Certain precautions should be taken to assure successful EMI compliance. Among these are:

- Use of solid chassis ground plane on power supply PCB
- Solid mechanical interconnection from chassis ground to module frame (#4 hardware, 4 places)
- Incorporation of suggested common mode choke (L1) and optional bypass capacitors (C1, C2 & C3)
- Observance of EMI guidelines for specific DC/DC converters chosen
- Avoid routing traces directly under module

Should the configured modular power supply fail preliminary conducted emissions scans, most likely the emissions are coupling around the boost module input filter. Try inserting 50 - 100uH (1.5Apk) toroidal inductors at the nearest AC power point of entry in both line and neutral leads. This technique usually provides an additional 20dB attenuation of input current in the frequency range of interest (150kHz - 5MHz). Implementation input toroidal inductors will have no impact on harmonic distortion or power factor performance of configured power supply. Several manufacturers (Pulse Engineering, TMC Magnetics and Coilcraft) offer "off-the-shelf" toroidal inductors for AC power line filter applications.

3) PRECAUTIONS

PPI Boost module (81006 series) is a non-isolated device. The output is a 200Vdc differential potential but not with respect to chassis ground. The 200V return line (Vrtn) is not at chassis potential. Isolation (primary to secondary) is accomplished within the DC/DC converters. Special care must be exercised when monitoring the module's DC output on an oscilloscope. Either the oscilloscope must be floated from chassis ground or the input neutral line disconnected from chassis ground. Typical aircraft application is to tie neutral and chassis ground together. Failure to isolate neutral from the module's return line can permanently damage the boost module device. Proper input fusing of the AC high line should protect the boost module in the event the neutral is inadvertently tied to the module's return line (i.e., during testing).