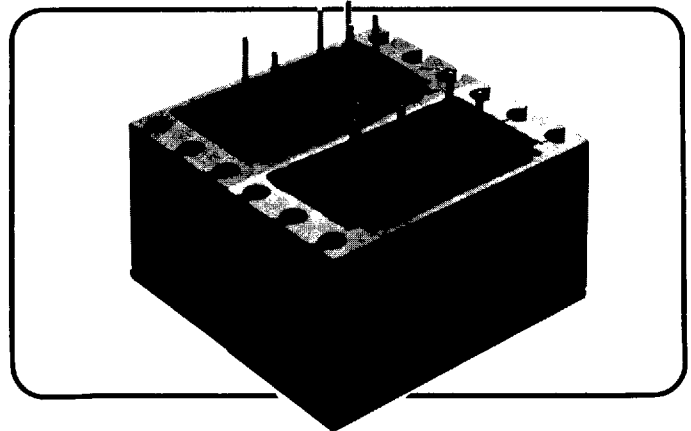


SP Switching Pre-Regulator

Features:

- "Wide" DC Input Range
- MIL-STD-704A Conditioning
- MIL-STD-461A Compatible
- High Reliability

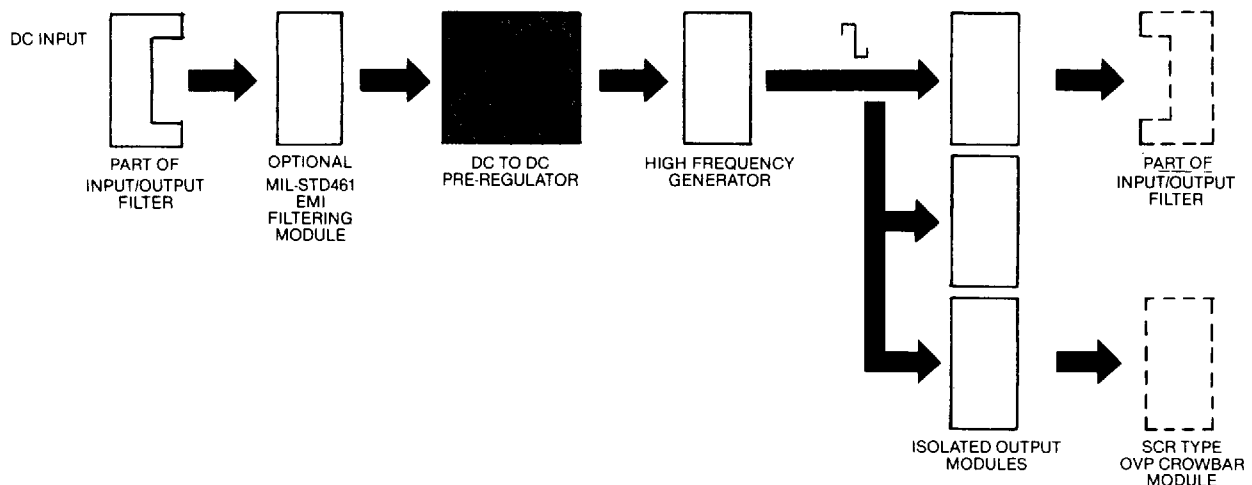


SP Switching Pre-Regulator

The SP DC input switching pre-regulator consists of two lightweight Cirkitblock® modules, each measuring 1"x2"x1" (except for the 20SP40-S1 which measures 2"x2"x1"). When interconnected, these modules accept DC inputs per MIL-STD-704A, Category B, and provide pre-regulation and filtering for the high frequency generator module.

DC-DC pre-regulation is accomplished by using a filter module (-S1) in conjunction with a DC-DC switching pre-

regulator module (-S2) which utilizes a high efficiency pulse-width modulated switching circuit, thus allowing high performance in a small package. This set of modules is especially suitable for the first stage of power conversion where a wide range of DC input voltage is required, and where the power supply must survive under the most extreme environmental conditions.



SP Switching Pre-Regulator

DESIGN INFORMATION

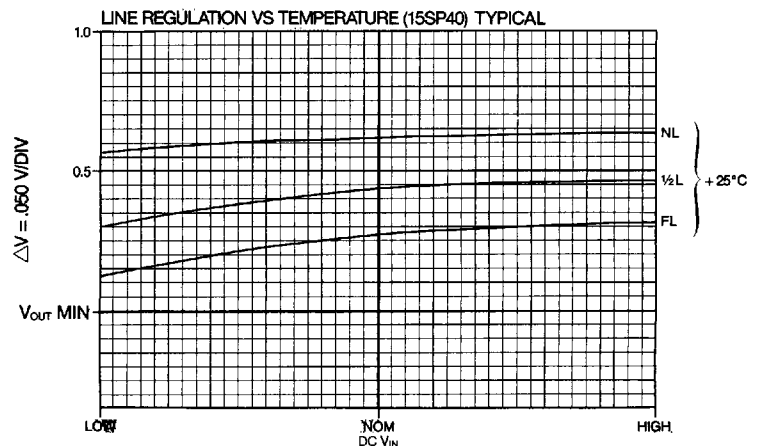
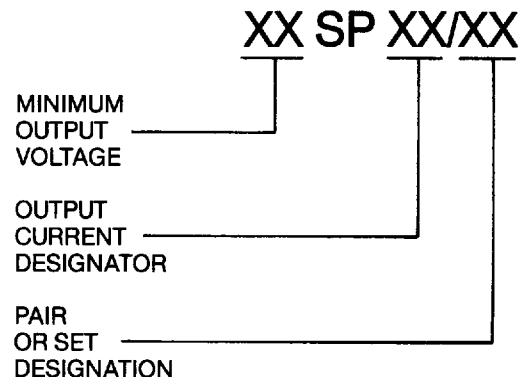
DC Input Voltage Range	Output Voltage	Total Output Power	Efficiency @ V_{in} Nom	I_{out} DC	Model Number
18-32	15.0-16.5VDC	60 watts	75%	4.0A	15SP40-S1, -S2
21-36	18.0-19.5VDC	90 watts	85%	5.0A	18SP50-S1, -S2
23-36	20.0-21.5VDC	100 watts	87%	5.0A	20SP50-S1, -S2
24-48	20.0-21.5VDC	80 watts	85%	4.0A	20SP40-S1, -S2*
32-56	24.0-25.5VDC	87 watts	85%	3.5A	24SP35-S1, -S2

* Will operate from the 36ATDC13's full unregulated DC output range. S1 dimensions, Case B.

SPECIFICATIONS

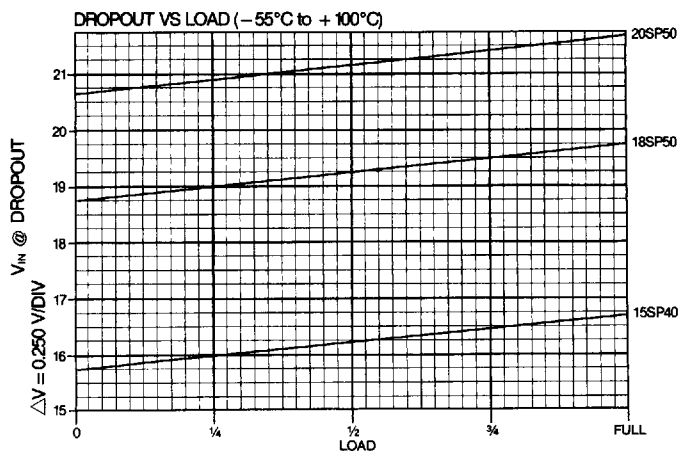
Input	See Design Information
Output:	See Design Information
Output Watts:	See Design Information
Ripple:	1.5V p-p max. as measured with a 10 MHz bandwidth isolated oscilloscope
Operating Temperature:	-55 °C to +100 °C (case temp.)
Storage Temperature:	-65 °C to +125 °C
Temperature Coefficient:	0.025%/°C max
Inrush Current:	24A (max) @ V_{in} Nom. with 1.2 Ω minimum source impedance.
Trim Control:	Output voltage can be trimmed by adding external resistance (consult factory)
Gate Control:	ON/OFF
Overcurrent Limiting:	Approximately 120% of rated output power
Isolation:	S1—all terminals to case 500VDC, 5 μ Amp leakage S2—all terminals to case 500VDC, 10 μ Amp leakage
Case finish:	Gold anodize per MIL-A-8625-II, Class 2 over aluminum
Terminals:	0.040" diameter, solderable per MIL-T-10727
Weight:	-S1: 3 oz. max. -S2: 3 oz. max. 20SP40-S1: 6 oz. max.

PART NUMBER DESIGNATION

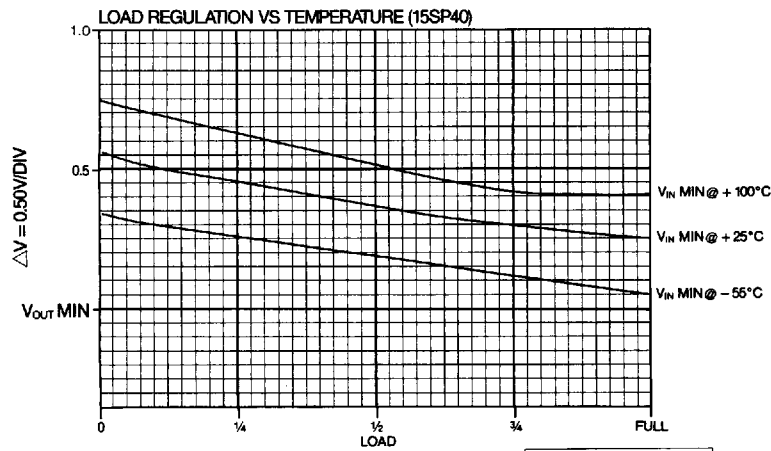


MULTIPLIERS FOR ALL SP's			
$V_{OUT MIN}$	15	18	20
$\Delta V_{OUT BY}$	1.0	1.2	1.34

TYPICAL CHARACTERISTICS

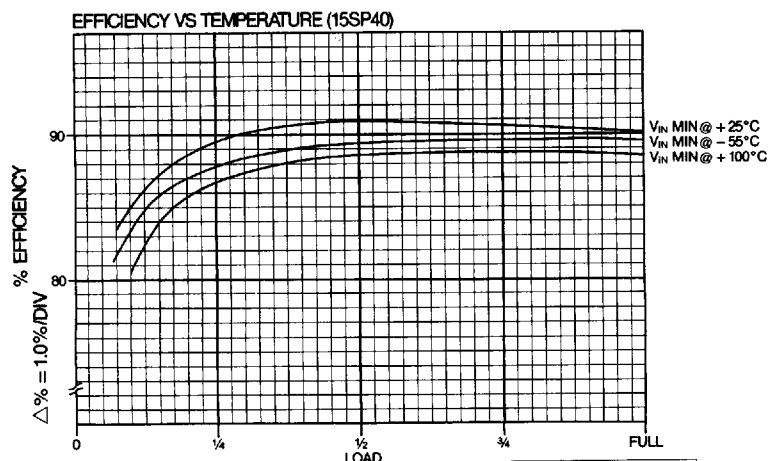


NOTE: Input dropout is that point where the output goes out of regulation when reducing the input voltage below rated V_{IN} MIN.

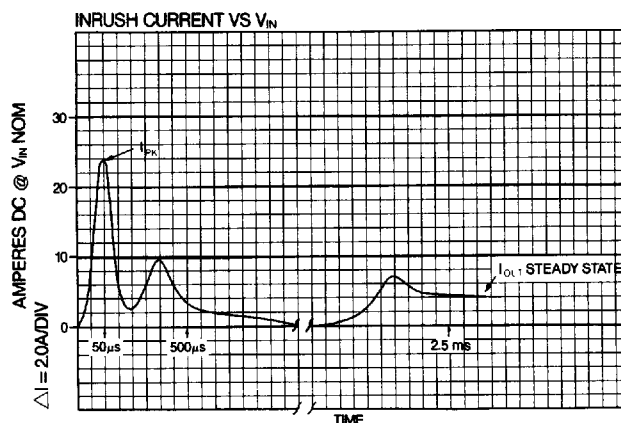


NOTE: Typical T.C. $\approx +0.2\%/^{\circ}\text{C}$

MULTIPLIERS FOR ALL SP's			
V_{OUT} MIN	15	18	20
ΔV BY	1.0	1.21	1.35



MULTIPLIERS FOR ALL SP's			
V_{OUT} MIN	15	18	20
$\Delta\%$ BY	1.0	1.01	1.02



NOTES: 1. Loading and temperature have negligible effect on I_{pk} .
2. For I_{pk} at V_{IN} MAX multiply by 1.3.
3. Transient source impedance of approximately 1.2Ω

Curve denotes characteristics for:
15 SP40 S1 & S2
18 SP50 S1 & S2
20 SP50 S1 & S2

APPLICATIONS INFORMATION

A. Select the proper high frequency generator (G-Series) to match the DC output of the DC input preregulator:

15SP40-S1,-S2	select	15G60W40
18SP50-S1,-S2	select	18G75W40
20SP50-S1,-S2	select	20G90W40
20SP40-S1,-S2	select	20G70W40
24SP35-S1,-S2	select	24G100W40

NOTE: Total output power of SP front end set may limit total output power from generator.

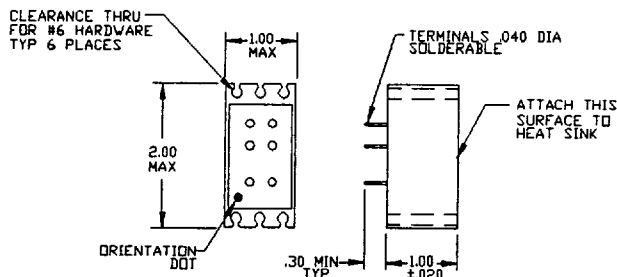
B. Caution: Do not ground either output terminal

C. These modules are intended to be used as a set (S1 and S2). All testing at the factory is done with S1 and S2 interconnected. The set is not a matched pair. Any SP-S1 will function with any SP-S2 of the same base number.

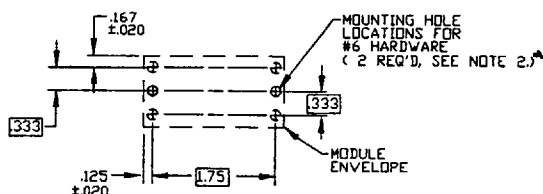
D. Please refer to Section 7 of the catalog for detailed applications information on current limiting, external trim, on/off control, and other topics.

SP Switching Pre-Regulator

CASE A DIMENSIONAL DRAWINGS



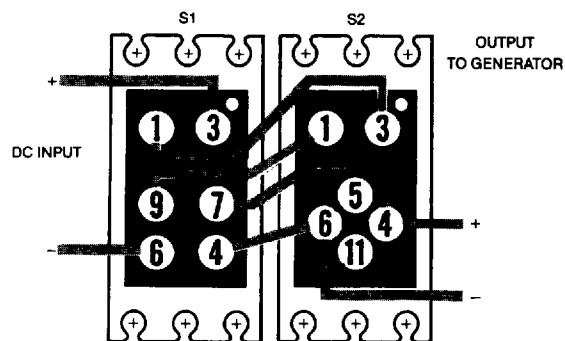
MOUNTING DIMENSIONS



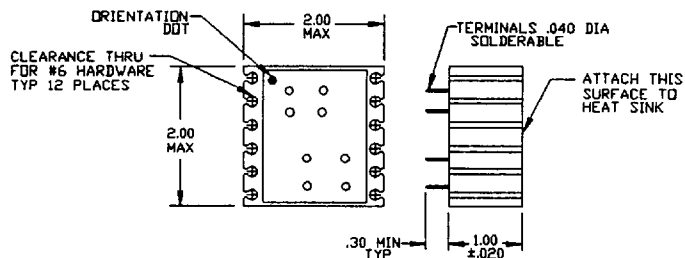
NOTES:

1. ALL DIMENSIONS IN INCHES.
2. A TOTAL OF 2 MOUNTING SCREWS ARE RECOMMENDED, 1 ON EACH SIDE OF THE MODULE. POWERCUBE SUGGESTS THAT THE "CENTER" LOCATIONS (SHOWN AS SOLID CIRCLES) BE USED.

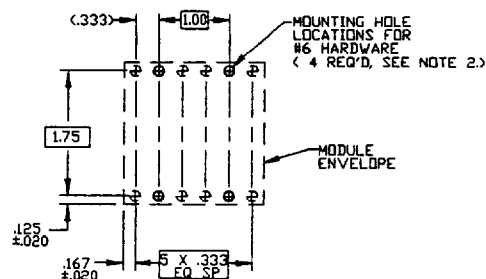
FUNCTIONAL DRAWING



CASE B DIMENSIONAL DRAWING (20SP40-S1 ONLY)



MOUNTING DIMENSIONS



NOTES:

1. ALL DIMENSIONS IN INCHES.
2. A TOTAL OF 4 MOUNTING SCREWS ARE RECOMMENDED, 2 ON EACH SIDE OF THE MODULE. POWERCUBE SUGGESTS THAT THE 2 SPACED AT 1.00 INCH (SHOWN AS SOLID CIRCLES) BE USED.

ELECTRICAL SCHEMATIC

