

- 8 models from 0 to 62V through 0 to 6kV
- 4, 20, or 30 watts of output power
- Maximum Iout capability down to 0 Volts
- Wide input voltage range
- Available with Ripple Stripper® Filter
- Indefinite output short-circuit protection
- Output current monitor
- Fixed-frequency, low-stored-energy design
- >430,000 hour MTBF @65°C
- UL, cUL, IEC-60950-1, and Demko Recognized



GENERAL INFORMATION:

The “A” Series of high-voltage, regulated DC-DC converters addresses the needs of the miniature-PCB-mount-regulated-high-voltage-power-supply user. Designed and built utilizing state-of-the-art power conversion topology, these units feature surface mount technology and encapsulation techniques providing high reliability and low cost.

DESIGN METHODOLOGY:

The “A” converters utilize a dual-ended forward converter topology with a nominal switch frequency of <100kHz. A precision reference is provided so the remote control can program the power supply for a specific voltage. Once input voltage stabilizes, under-voltage lockout is released. As soon as enable is raised above a TTL 1, the converter begins to switch. The soft-start circuit brings the converter to full power over a 1mS period, reducing surges on the source supply. A constant-frequency PWM regulation system controls the MOSFET push-pull power stage, which drives the high voltage transformer. The power stage is protected from output current overloads or short circuits via a secondary current limit circuit. High voltage is developed by a multistage multiplier while feedback voltage is developed and sent to the CTRL circuit to maintain regulation. Internal filters are provided to reduce input current ripple and output voltage ripple.

WIDE INPUT RANGE:

The “A” Series is designed for full power operation at up to 90% efficiency. A wide input range of +11 to +16VDC or +23 to +30VDC will maintain full power output without derating. The derated input range is +9 to +32VDC. See Application Note 16 for protection information.

WIDE OUTPUT RANGE:

The “A” Series is a non-isolated, unipolar converter. Positive or negative output must be specified. Output voltage is adjustable from 0 to 62, 125, 250, 500, 1kV, 2kV, 4kV, or 6kV. As the output voltage is reduced towards 0, the maximum current capability remains unchanged.

OUTPUT CURRENT MONITOR:

The “A” Series features an output current monitor. Current from the high-voltage multiplier can be monitored by reading the voltage appearing between Output Monitor pin 3 and Signal Ground Return pin 5. Internal voltage dividers create a small linear offset voltage. See Application Note 13.

REMOTE CONTROL:

The “A” Series is remotely programmed with 0 to +5 VDC to produce an output voltage. Input may be from a control voltage, a DAC, or from a variable or fixed resistor. On a negative output converter the programming logic of the remote adjust would be inverted, i.e.: +5 to 0VDC. Connections are on the converter for the internal reference, analog remote adjust and the signal ground. The reference is +5.0VDC, temperature compensated with a 464Ω output impedance. See Figure E & F or Application Note 1 for more information.

STANDBY MODE:

The “A” converters also have an enable function. When the enable is TTL 0 (<+0.7V Isink=1mA) the converter is in a standby mode and input current is reduced to <30 mA. All functions other than the internal reference are shut down. If the enable pin is left unconnected, TTL 1, or at greater voltages up to +32VDC the converter operates normally. The open circuit output voltage from the Enable pin is <+5VDC. In the inhibit mode, 1 mA will have to be sunk for proper shutdown.

MECHANICAL:

“A” Series converters are in PCB mountable plastic cases requiring a footprint of 5.5 in² and only 4.3 in³ of volume. Mounting plates and brackets are available for chassis mounting. This Series is also available in an RF-tight metal PCB/chassis mount package. See Application Note 6 for thermal considerations and mounting configurations. All models are available with optional, six-sided, wrap-around Mu-Metal Shielding.

ENVIRONMENTAL:

The “A” Series provides full power operation at case temperatures from -40 to +65°C. All units receive a 24-hour burn-in prior to final testing. Extended temperature range is available along with other enhanced capabilities. Please contact the factory.



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Typical Characteristics:

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Typical Performance Characteristics:

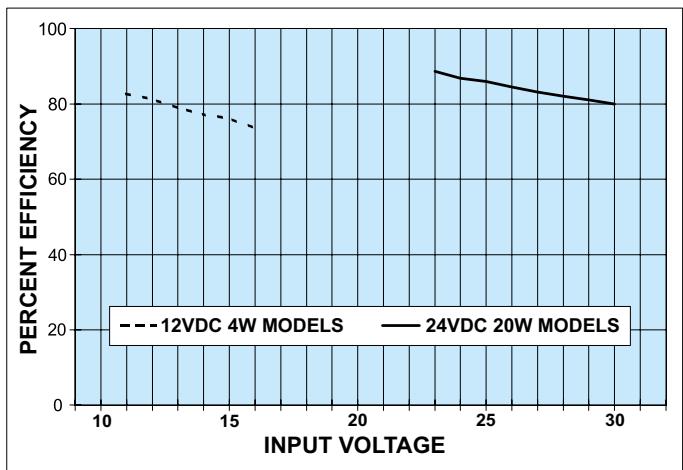


Fig. A

DC Efficiency vs. Input Voltage Range

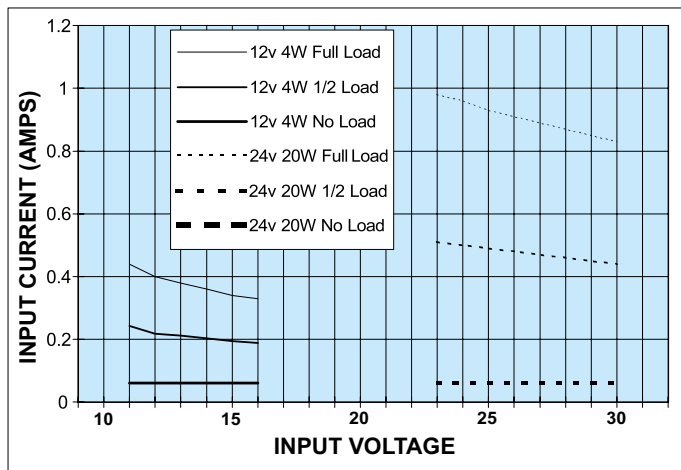


Fig. B

Input Current vs. Input Voltage Range

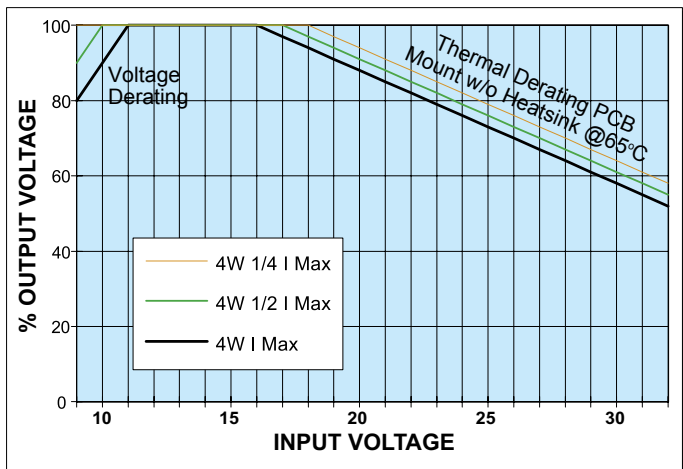


Fig. C

Output Voltage vs. 12V/4 Watt Extended Input Voltage
(Up to 65°C Chassis Mount w/o Heatsink)

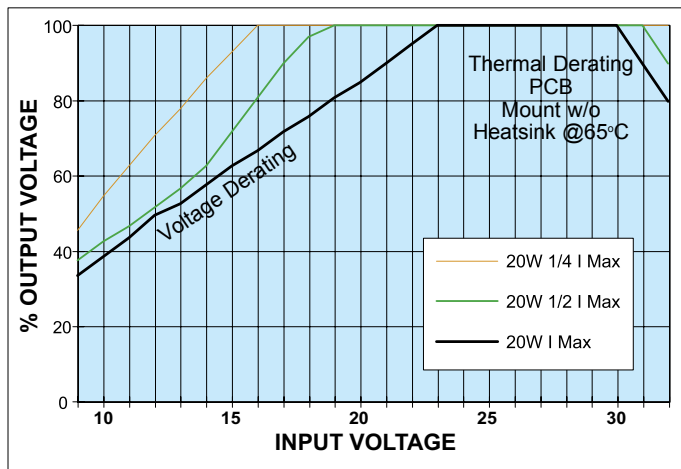


Fig. D

Output Voltage vs. 24V/20 Watt Extended Input Voltage
(Up to 65°C Chassis Mount w/o Heatsink)

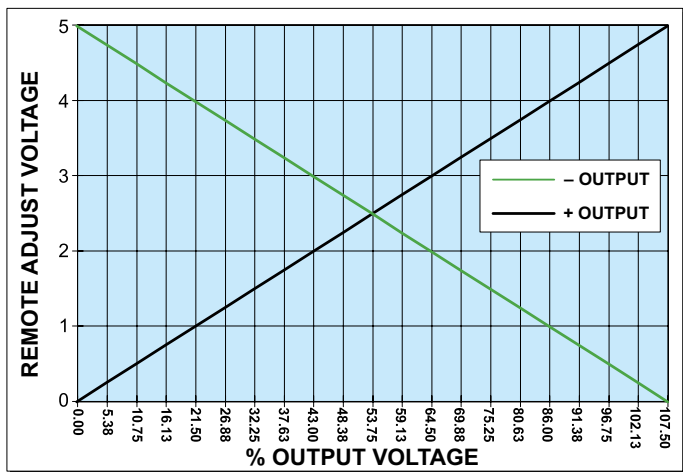


Fig. E

Remote Control Characteristics

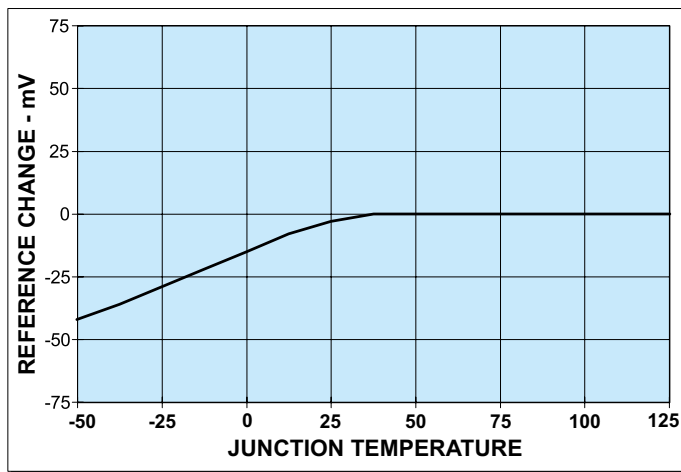


Fig. F

Reference Stability



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"A" SERIES

HIGH VOLTAGE POWER SUPPLY

PLASTIC CASE

CONSTRUCTION:

Epoxy-filled DAP box
certified to ASTM-D-5948

TOLERANCE:

Overall $\pm 0.050"$ (1.27)
Pin to Pin $\pm 0.015"$ (0.38)
Mounting hole location $\pm 0.025"$ (0.64)

MOUNTING:

#2-56 x 0.30 (7.62)
2 places threaded post
may not be flush to cover

PINS:

Gold-plated 0.025 (0.64) sq.
The center of the pins and mounting holes
is located from the center of pin 1
Pins 1 thru 7 spacing 0.200 (5.08) on
center, height from cover 0.470 (11.7) min
Pins 8, 9, and 10, 11 spacing 0.100 (2.54)
on center, height from cover 0.470 (11.7) min

NOTE:

20W and 30W versions are an
additional 0.062" (1.57) in height.
-M equipped units are an
additional 0.030" (0.76) in height.
Contact UV customer service for
drawings on models equipped with
-E or -H options.

Connections

1 - Input Power Ground Return
2 - Positive Power Input
3 - Iout Monitor
4 - Enable/Disable
5 - Signal Ground Return
6 - Remote Adjust Input
7 - +5VDC Reference Output
8 - HV Ground Return
9 - HV Ground Return or Eout Monitor (-Y5)
10 - HV Output
11 - HV Output
All grounds joined internally. Power-supply mounting points isolated from internal grounds by >100k Ω , .01uF / 50V (Max) on all models except -M, -C, and -M-E configurations which are 0 Ω .

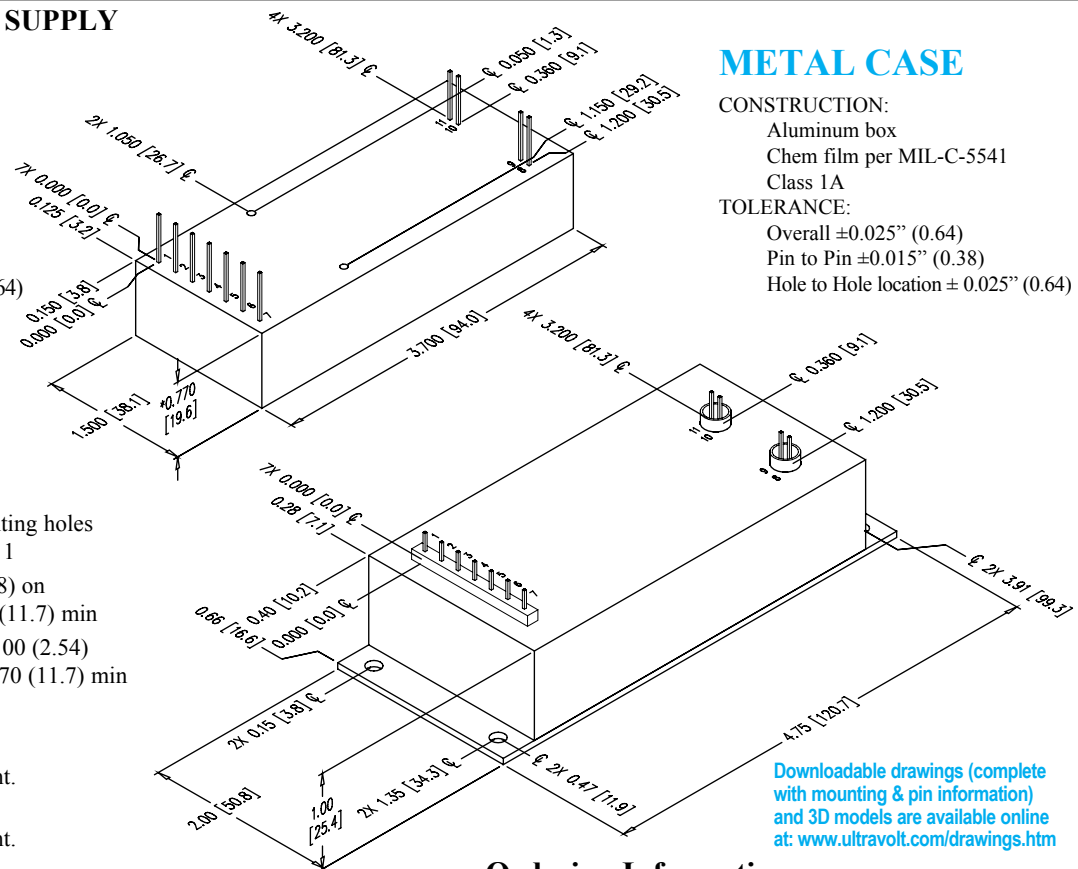
METAL CASE

CONSTRUCTION:

Aluminum box
Chem film per MIL-C-5541
Class 1A

TOLERANCE:

Overall $\pm 0.025"$ (0.64)
Pin to Pin $\pm 0.015"$ (0.38)
Hole to Hole location $\pm 0.025"$ (0.64)



Ordering Information

Type:	0 to 62 VDC Output	1/16A
	0 to 125 VDC Output	1/8A
	0 to 250 VDC Output	1/4A
	0 to 500 VDC Output	1/2A
	0 to 1,000 VDC Output	1A
	0 to 2,000 VDC Output	2A
	0 to 4,000 VDC Output	4A
	0 to 6,000 VDC Output	6A
Input:	12VDC Nominal	12
	24VDC Nominal	24
Polarity:	Positive Output	-P
	Negative Output	-N
Power:	Watts Output (12V only)	4
	Watts Output (24V only)	20
	Watts Output (24V only)	30
Case:	Plastic Case - Diallyl Phthalate	STD
	'Eared' Chassis Mounting Plate	-E
	RF-Tight Aluminum Case	-C
Heat Sink:	.400" High (sized to fit case)	-H
Shield:	Six-Sided Mu-Metal Shield	-M
Ripple Stripper®:	Integral Output Filter (see "F" Series DS)	-F
Voltage Monitor:	Optional Eout Monitor	-Y5
Iout Monitor Boost:	Boosted Iout Monitor Signal Level	-Y10
Temp Coefficient:	25PPM Temperature Coefficient	-25PPM

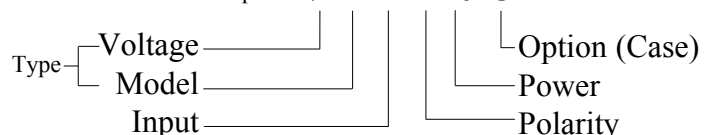


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Rev. V 3/08

Example: 1/2A24-P20-C



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