"10A → 25A" SERIES

HIGH VOLTAGE POWER SUPPLY

- 0 to 10kV, 15kV, 20kV or 25kV output
- 4 , 15 or 30 Watts of output power
- Output current & voltage monitors
- Wide input voltage range
- Indefinite output short circuit protection
- Maximum Iout capability down to 0 Volts
- Fixed Frequency Low Stored Energy Design
- Output current & voltage monitors
- >450,000 Hr. MTBF @ 65°C
- **UL-1950, CUL-950, IEC-950 Recognized**

GENERAL INFORMATION:

The "10A → 25A" Series regulated High Voltage DC-DC converters are an extension to the "A" Series, directly addressing the needs of the miniature PCB or Chassis mount >= 10kV application. 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.

COMPATIBILITY:

The Series "10A → 25A" match the standard "A" Series for design methodology, wide input range, remote control, enable/disable, reference, shock & vibration.

HIGH VOLTAGE OUTPUT:

The "10A → 25A" Series is a non-isolated unipolar converter. Positive or negative output must be specified. Output is adjustable from 0 to 10kV, 15kV, 20kV or 25kV. As the output voltage is reduced towards 0, the maximum current capability remains unchanged.

HIGH VOLTAGE OUTPUT TERMINATION:

The "10A → 25A" Series utilizes Silicon 20kV wire on the 10A and 15A, Silicon 30kV wire on the 20A and 25A. All flying leads are 18" and can be terminated with a variety of industry standard connectors. Contact customer service for details.

OUTPUT VOLTAGE MONITOR:

The "10A → 25A" Series features a 1000:1 voltage monitor. The monitor has an output impedance calibrated for use with a 10 Megohm input impedance meter. Overall accuracy is ±2.5% with a temperature coefficient of ±200 ppm per °C.

The "10A" uses a 500 Megohm/523 k ohm divider.
The "15A" uses a 750 Megohm/806 k ohm divider.
The "20A" uses a 1 Gigohm/1.1 Meg ohm divider.
The "25A" uses a 1.25 Gigohm/1.43 Meg ohm divider.

For "10A → 25A" applications requiring a different scale factor, such as a 0 to 5Vdc ADC compatible design, a single external low voltage resistor may be added in parallel with the output voltage monitor, to rescale its output. The voltage monitor is output on pin 9 and referenced to signal ground pin 5.

OUTPUT CURRENT MONITOR:

The "10A → 25A" Series is equipped with 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 pin 5. The monitor has an output impedance of > 20 kΩ. Internal voltage dividers create a small linear offset voltage. See Application Note AP-13 for more details.

SHIELDING:

The "10A → 25A" Series models are available with optional six-sided wrap-around Mu-Metal Shielding. This shielding attenuates magnetic and electrostatic emissions, while shielding internal circuitry from outside noise, thereby reducing overall output ripple by as much as 25% to 50%.

MECHANICAL:

The "10A → 25A" Series converters are in PCB mountable plastic cases requiring footprints of only 5.5in^2 to 11.0in^2 and volumes of only 4.9in^3 to 11.6in^3. Mounting plates and brackets are available for chassis mounting. Also available is a metal RF tight PCB/chassis mount package. See Application Note 6 for Thermal considerations and mounting configurations. All models are available with optional "-M" six-sided wrap-around Mu-Metal Shielding. Despite their high efficiency, the compact PCB mounted 15 & 30 Watt units require the optional "-H" factory installed heat sink or an equivalent customer installed device in high temperature applications.

ENVIRONMENT:

The "10A → 25A" Series provides full power operation at case temperatures from -40 to +65°C. All units receive a 24-hour burn-in prior to final test. Extended temperature range is available along with other enhanced capabilities. Please contact the factory.

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"10A → 25A" SERIES

HIGH VOLTAGE POWER SUPPLY

Typical Characteristics:

Parameter	Conditions	Models												Units
Input:		**12V**						**24V**						
Voltage Range	Full Power	+ 11 to 16						+ 23 to 30						VDC
Voltage Range	Derated Power Range	+ 9 to 32						+ 9 to 32						VDC
Current	Standby / Disable	< 30						< 30						mA
Current	No Load, Max Eout	10A < 0.20, 15A/20A/25A < 0.25						10A < 0.17, 15A < 0.20, 20A < 0.21, 25A < 0.25						A
Current	Max Load, Extended Input	Figures A & B						Figures A & B						Graph
AC Ripple Current	Nominal Input, Full Load	< 80						< 80						mA p-p
Output:		**10A**			**15A**			**20A**			**25A**			
Voltage Range	Nominal Input	0 to 10,000			0 to 15,000			0 to 20,000			0 to 25,000			VDC
Nominal Input Voltage / Model		12	24	24	12	24	24	12	24	24	12	24	24	VDC
Power	Nominal Input, Max Eout	4	15	30	4	15	30	4	15	30	4	15	30	Watts
Current	Iout Entire Output Voltage	0.40	1.5	3.0	0.26	1.0	2.0	0.20	0.75	1.5	0.16	0.60	1.2	mA
Ripple	Full Load, Max Eout, 300pF	0.05	0.10	0.20	0.06	0.20	0.20	0.07	0.07	0.15	0.08	0.08	0.12	%V p-p
Ripple with –F-M	Full Load, Max Eout, 300pF	0.025	0.05	0.10	0.03	0.10	0.10	0.035	0.035	0.075	0.04	0.04	0.06	%V p-p
Dynamic Load	½ to Full Load, Max Eout per	<5.0	<5.0	<5.0	<7.5	<7.5	<7.5	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	V pk
Voltage Derating	Max Iout, Extended Input	Figures C & D												Graph
Line Regulation	Nom. Input, Max Eout, Full	< 0.01 %												VDC
Static Load	No Load to Full Load, Max	<0.01%												VDC
Stability	30 Min. warmup, per 8 hr/ per	<0.01% / <0.02%												VDC
Output Voltage Monitor:		**All Types**												
Voltage	Full Eout Range, Full Iout	1.00												V per kV
Proportionality	Full Eout Range, Full Iout	±0.1%												V per kV
Remote Programming:		**All Types**												
Input Impedance	Nominal Input	+ Output Models 1.1MΩ to GND, - Output Models 1.1MΩ to +5 Vref												MΩ
Adjust Resistance	Typical Potentiometer Values	10K to 100K (Pot across Vref. & Signal GND, Wiper to Adjust)												Ω
Adjust Linearity	0% to 100%	Figure E												Graph
Adjust Voltage	Referenced to signal ground	Figure E (0 to +5 VDC)												Graph
Adjust Logic	0 to +5 for +Out, +5 to 0 for -	+4.64 VDC for +Output or +0.36 for -Output = Nominal Eout												
Reference:		**All Types**												
Output Voltage	T=+25°C, Initial Value	+ 5.00 ± 2%												VDC
Output Impedance	T=+25°C	464 ± 1%												Ω
Stability	Over Full Temperature	Figure F												Graph
Enable:		**All Types**												
Power Supply On	Floated, or voltage ≥ TTL High	+2.4 to 32												VDC
Power Supply Off	Grounded, or voltage ≤ TTL Low	0 to + 0.7 ± 0.2 (Isink 1mA minimum)												VDC
Temperature:		**All Types**												
Operating	Full Load, Max Eout, Case Temp.	-40 to +65												°C
Storage	Non-Operating, Case Temp.	-55 to +105												°C
Coefficient	Over the Specified Temperature	± 50												PPM/ °C
Thermal Shock	Mil-Std 810, Method 504, Class 2	-40 to +65												°C
Altitude:		**All Types**												
Operating	Standard Package	Sea Level through Vacuum												
Non-operating	Standard Package	Sea Level through Vacuum												
Shock & Vibration:		**Standard**						**-C Option**						
Shock	Mil-Std-810, Method 516, Proc. 4	20						40						G's
Vibration	Mil-Std-810, Method 514, Fig. 514-3	10						20						G's
Packaging:		**10A**		**15A**		**20A**		**25A**		**10A**		**15A**		**20A**	**25A**	
Material	Outer construction	Plastic (DAP) Mil-M-14F SDG-F								6063T52 Aluminum Mil-C-5541 Class 1A						
Length	Not including pins or mounting pts	3.70 ± 0.050		4.70 ± 0.050		5.70 ± 0.050		6.96 ± 0.050		4.00 ± 0.025		5.00 ± 0.025		6.00 ± 0.025	8.00 ± 0.025	In
Width	Not including pins or mounting pts	1.50 ± 0.050		1.50 ± 0.050		1.50 ± 0.050		1.60 ± 0.050		2.00 ± 0.025		2.00 ± 0.025		2.00 ± 0.025	2.00 ± 0.025	In
Height	Not including pins or mounting pts	0.90 ± 0.050		0.90 ± 0.050		1.00 ± 0.050		1.05 ± 0.050		1.10 ± 0.025		1.10 ± 0.025		1.20 ± 0.025	1.25 ± 0.025	In
Volume	Not including pins or mounting pts	4.90		6.35		8.55		11.70		8.80		11.00		14.4	20.0	In^3
Weight	Overall	6.0		8.0		11.0		15.0		11.5		14.0		19.0	22.0	Oz

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Typical Performance Curves:

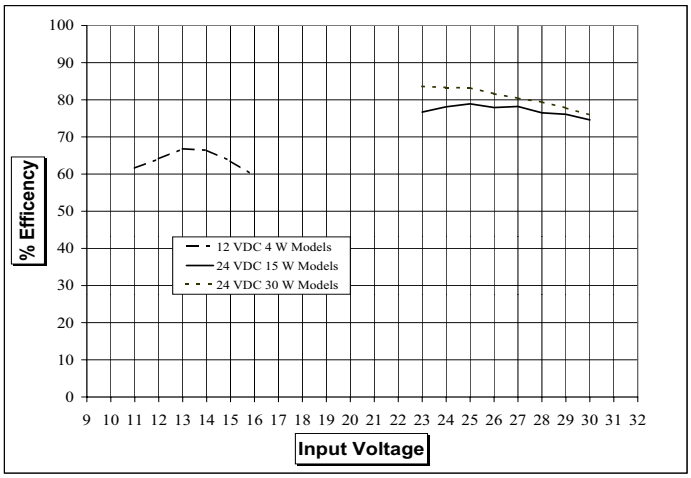


Fig. A
DC Efficency vs. Input Voltage Range

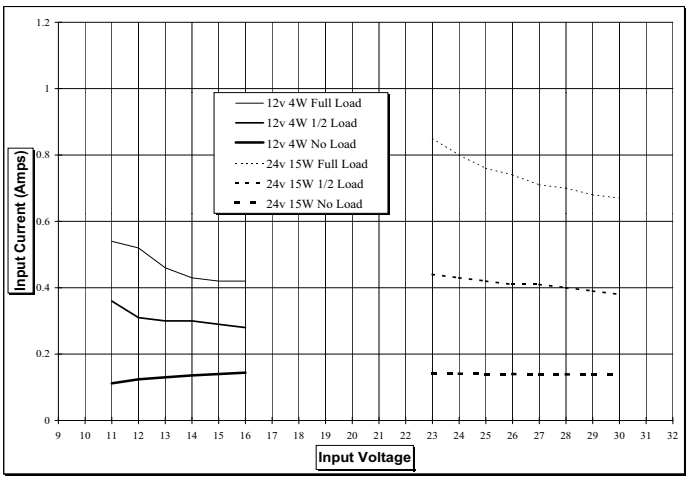


Fig. B
Input Current vs. Input Voltage Range

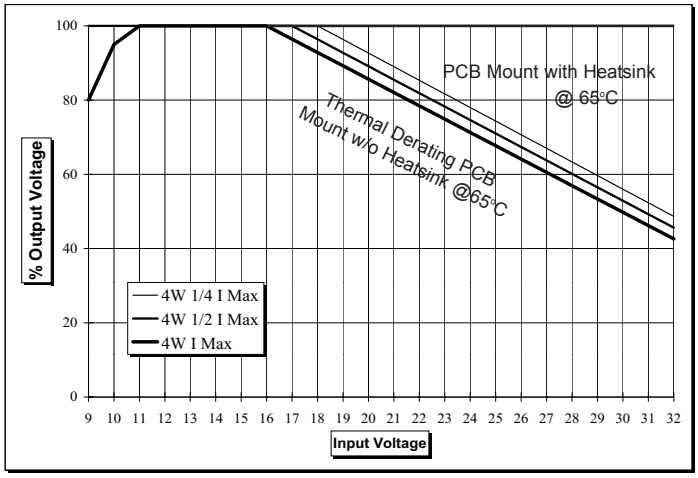


Fig. C
Output Voltage vs. 12V/4 Watt Extended Input Voltage
(Up to 65°C PCB Mount w/o Heatsink)

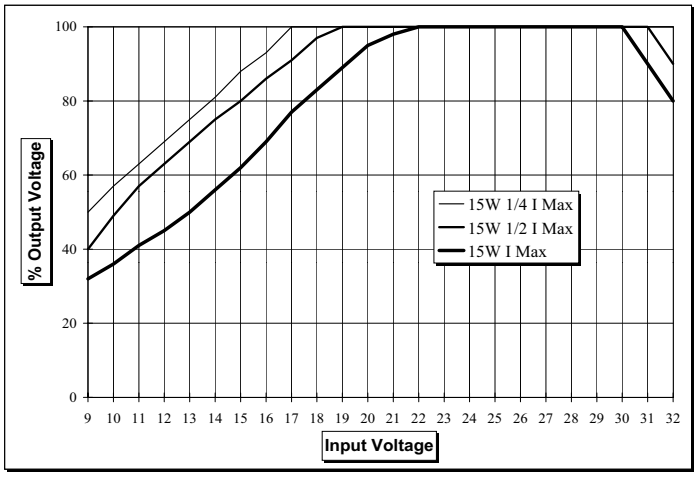


Fig. D
Output Voltage vs. 24V/15 Watt Extended Input Voltage
(Up to 65°C PCB Mount w/o Heatsink)

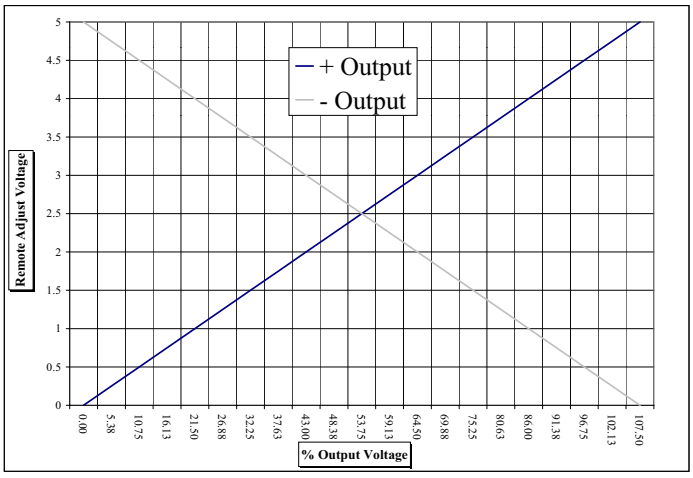


Fig. E
Remote Control Characteristics

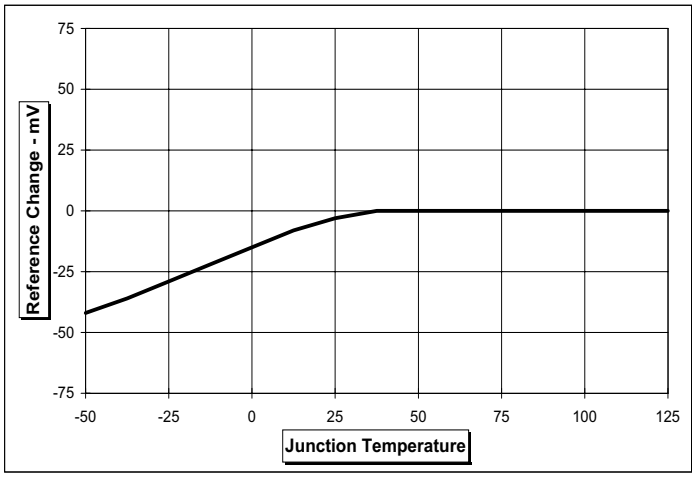


Fig. F
Reference Stability mV vs. °C

"10A → 25A" SERIES

HIGH VOLTAGE POWER SUPPLY

PLASTIC CASE

CONSTRUCTION:

Epoxy Filled DAP Box
Chem Film per MIL-M-14F
SDG-F

TOLERANCE:

Overall ±0.050"
Pin to Pin ±0.015"

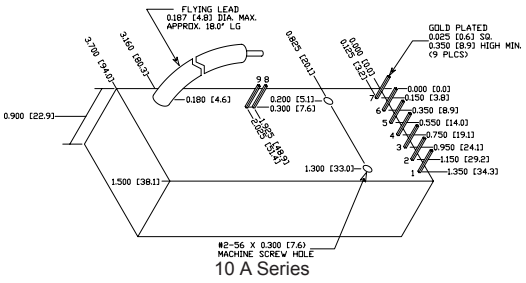
#2-56 Standoffs may not be flush to cover

NOTE:

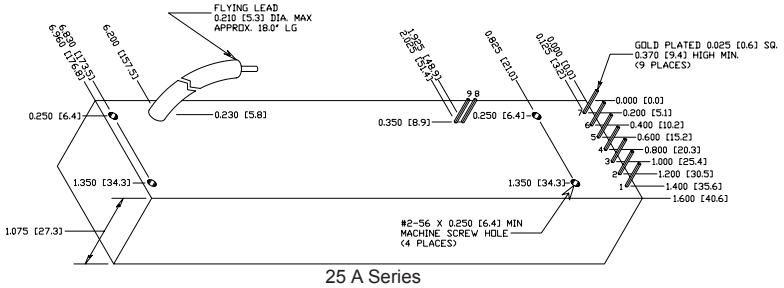
15 & 30 Watt versions are an additional 0.070" in Height.

-M equipped units are an additional 0.030" in Height.

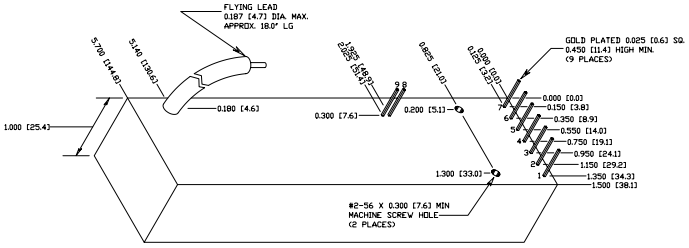
Contact UV Customer Service for Drawings on models eqquipped with -E , -C, or -H options.



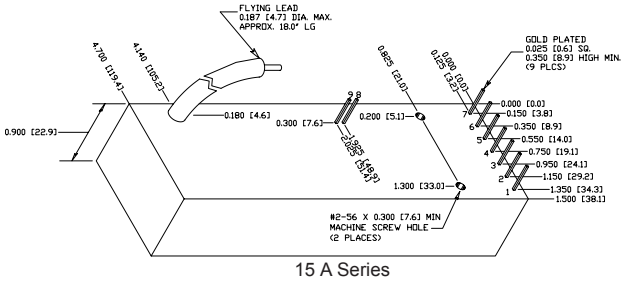
10 A Series



25 A Series



20 A Series



15 A Series

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 - +5V Reference Output
8 - HV Ground Return
9 - Eout Monitor
All grounds joined internally. Power supply mounting points isolated from internal grounds by >100kΩ, .01uF / 50V (Max) on all models except -M, -M-C and -M-E configurations which are 0Ω.

Ordering Information

Type:	0 to 10,000 VDC Output	**10A**
	0 to 15,000 VDC Output	**15A**
	0 to 20,000 VDC Output	**20A**
	0 to 25,000 VDC Output	**25A**
Input:	12VDC nominal (4W only)	**12**
	24VDC nominal (15W & 30W only)	**24**
Polarity:	Positive Output	**-P**
	Negative Output	**-N**
Power:	Watts Output (12V Only)	**4**
	Watts Output (24V Only)	**15**
	Watts Output (24V Only)	**30**
Case:	Plastic Case - Diallyl Phthalate	**STD**
	"Eared" Heatsink Plate (Plastic Case)	**-E**
	RF Tight Aluminum Enclosure	**-C**
Heatsink:	.400" high (sized to fit case)	**-H**
Shield:	Six-Sided Mu-Metal Shield	**-M**
Ripple Stripper®:	Integral Output Filter (See "-F" Data Sheet) and Mu-Metal	**-F-M**
Lead Options:	Shielded Flying Lead	**-AS**
	Protected Flying Lead	**-AP**
	Terminated Flying Lead (Contact Customer Service)	**-ATxx**

Example: 10A12-P4-C

Type
- Voltage: 10A
- Model: 12
- Input: P
- Option (Case): C
- Power: 4
- Polarity: -

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