AMERICAN HIGH VOLTAGE
POWER SUPPLIES FOR THE WORLD

ML Series
High Voltage Power Supply

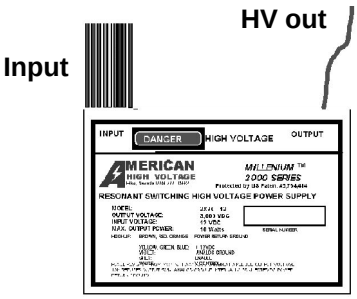
General Description

The ML Series high voltage power supplies are the newest state of the art group of switching power supplies on the market today. This series introduces a quantum leap in size reduction by utilizing a patented PWM resonant driver allowing frequencies of up to 200 kHz to be utilized. They are regulated to within 0.01% for both line and load changes and are short circuit protected with a unique "try-again" circuit. Ideal for electro-optic applications, these modules are lightweight and easy to mount. Hookup is by flying lead connection.

Features

- **Only 0.25" (6.35 mm) thick!**
- **Encapsulated - Regulated**
- **1kV to 5 kV available**
- **3, 5 and 10 Watt power**
- **Various input voltages available**

Connection Diagram



Wire connections:

Black:	DC Return
Red:	DC Return
Orange:	DC Return
Yellow:	+Vin
Green:	+Vin
Blue:	+Vin
Violet:	Analog Ground
Grey:	Enable
White:	Vcontrol
Heavy Red:	HV Output

Available Models: (other input voltages available- 5VDC, 15VDC, 24VDC, 28VDC, 48VDC):

Models History:

Name	Maximum Output Voltage	Maximum Power	1st Year
ML-2310	1,000 VDC	3 Watts	1997
ML-2320	2,000 VDC	3 Watts	2001
ML-2330	3,000 VDC	3 Watts	2002
ML-2350	5,000 VDC	3 Watts	2001
ML-2380	8,000 VDC	3 Watts	1996
ML-2510	1,000 VDC	5 Watts	1998
ML-2520	2,000 VDC	5 Watts	2007
ML-2530	3,000 VDC	5 Watts	2007
ML-2550	5,000 VDC	5 Watts	2005
ML-2X10	1,000 VDC	10 Watts	2005
ML-2X20	2,000 VDC	10 Watts	2003
ML-2X30	3,000 VDC	10 Watts	2001
ML-2X50	5,000 VDC	10 Watts	2001

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Electrical Characteristics

(at 25 degrees C unless otherwise specified)

Parameter	Conditions	Value			Units
		Min	Typical	Max	
Supply Voltage*:	(all power models)		Vnominal +/- 10%		VDC
Input Current:	No Load (3W model 12Vin):	45	55	65	mA
	No Load (5W model 12Vin):	55	65	75	mA
	No Load (10W model 12Vin):	65	75	85	mA
	Full Load (3W model 12 Vin):	330	350	375	mA
	Full Load (5W model):	500	550	650	mA
	Full Load (10W model);	1100	1150	1200	mA
Output Ripple:	No Load (all models):	0.02%	0.03%	0.05%	Vpp
	Full Load (all models):	0.1%	0.1%	0.1%	Vpp
Load Regulation:	No Load to Full Load	0.01%	0.01%	0.01%	V_{NL}/V_L
Output Linearity	No Load		1%		$\frac{\Delta V_{OUT}}{\Delta V_{OUT\ (ideal)}}$
Output Linearity	Full Load (all models):		1%		$\frac{\Delta V_{OUT}}{\Delta V_{OUT\ (Ideal)}}$
Short Circuit Current:	(I trip set at 130%)		Try again circuitry		
Power Efficiency:	Full Load	70%	80%	85%	$\frac{P_{OUT}}{P_{IN}}$
Reverse Input Polarity	Protected to 20 VDC		Input Series Diode		
Temperature Drift:	No Load			100	ppm/DegC
	Full Load			100	ppm/Deg C
Thermal Rise:	No Load (case)			15	degrees C
	Full Load (case) (10 Watt)			35	degrees C
Slew Rate (10% - 90%)	No Load			100	mS
	Full Load			120	mS
Slew Rate (90% - 10%)	No Load			200	mS
	Full Load			100	mS
Drain Out Time	No Load (5 TC)			150	mS

* Other input voltages available: 5VDC, 15VDC, 24VDC, 28VDC and 48VDC

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Physical Characteristics

(at 25 degrees C unless otherwise specified)

Parameter	Conditions	Value	Units
Dimensions (3,5 W)	MKS	61 W x 51 H x 6.35 T	mm
	English	2.40 W x 2 H x 0.25 T	inches
Dimensions (10 W)	MKS	78 W x 64.5 H x 6.35 T	mm
	English	3.07 W x 2.54 H x 0.25 T	inches
Volume: (3, 5 W)	MKS	19.76	cm^3
	English	1.20	$inch^3$
Volume: (10 W)	MKS	31.95	cm^3
	English	1.95	$inch^3$
Mass: (3, 5 W)	MKS	15	grams
	English	0.5	oz
Packaging:	Solid Epoxy Thermosetting		
Finish	Smooth Epoxy Case		
Terminations:	Rainbow wire input		
	HV wire flying lead output		

Environmental Characteristics

(at 25 degrees C unless otherwise specified)

Parameter	Conditions	Value	Units
Temperature Range	case temperature	-40 degrees to + 71 degrees	Celsius
	case temperature	-40 degrees to + 160 degrees	Fahrenheit
Shock:	MIL-STD-810 Method 516	40 g's	Proc IV
Altitude:	pins sealed against corona	-350 to + 16,700	meters
	pins sealed against corona	-1,000 to +55,000	feet
Vibrations:	MIL-STD-810 Method 514	20 g's	Curve E
Thermal Shock	MIL-STD-810 Method 504	-40 deg C to + 71 deg C	Class 2

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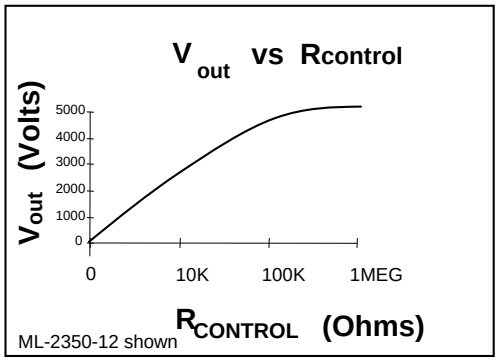
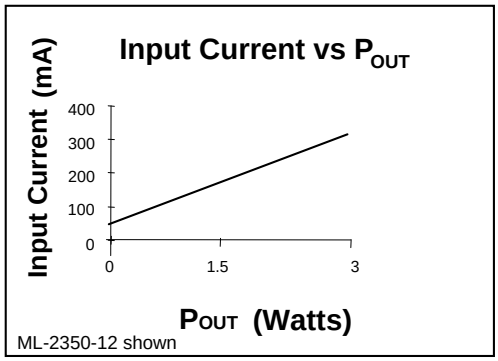
ML Series Performance Charts

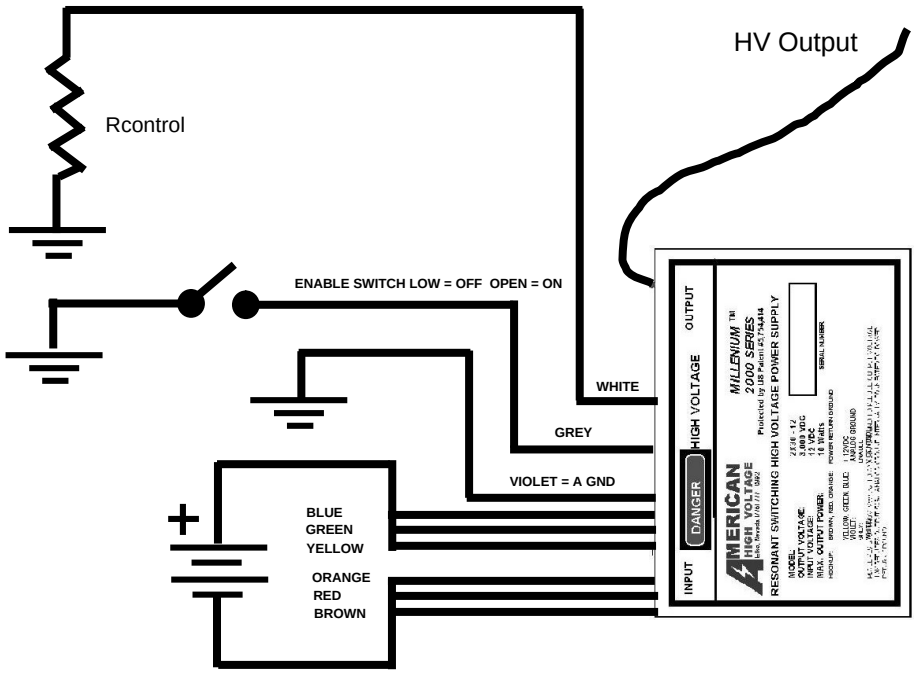


ML-2350-12 shown



ML-2350-12 shown

ML Series Hookup Diagram



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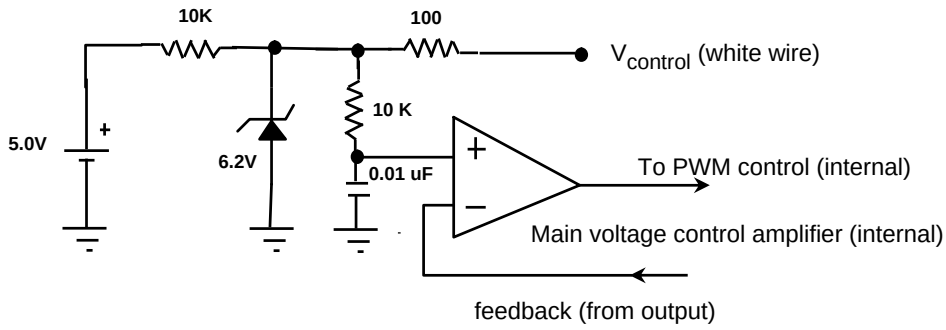
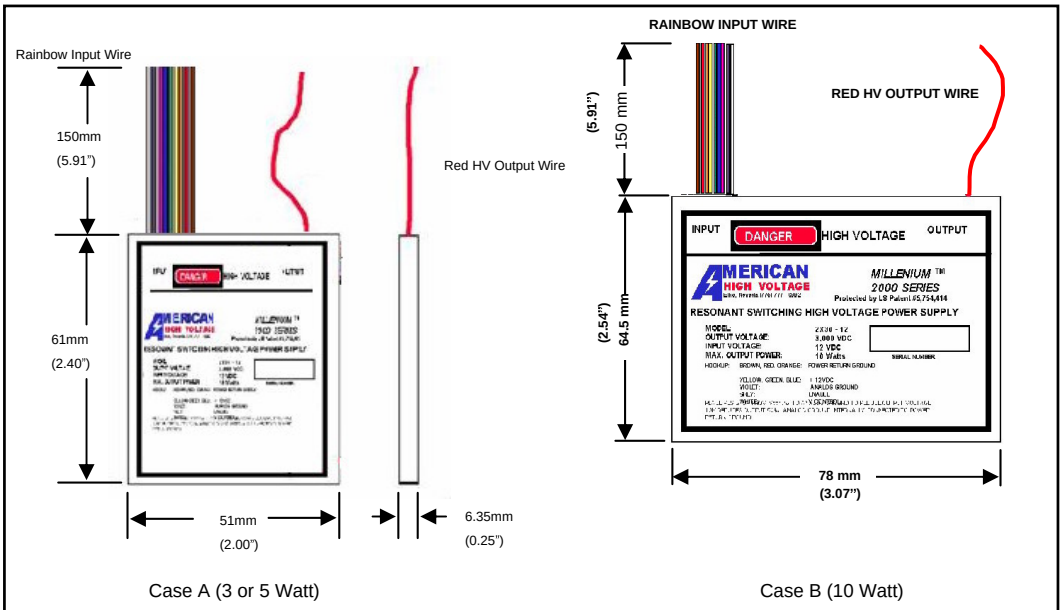
Equivalent ML Circuit Model



Outline Drawing: (millimeters(INCHES))



Case A (3 or 5 Watt)

Case B (10 Watt)

Ordering Information:

ML – 2AB-C

A: Wattage 3 = 3Watt, 5 = 5 Watt, X = 10 Watt
B: Output Voltage: 10 = 1kV, 20 = 2kV, 30 = 3kV etc.
C = Input Voltage: 5 = 5VDC, 12 = 12VDC, etc.

Example:

ML – 2X30-12: Maximum output = 3,000 V 10 Watts 12 VDC input
ML – 2350-5: Maximum output = 5,000 V 3Watts 5VDC input