



Chassis 3.77"L x 2.16"W x 1.0"H



PCB 2.28"L x 1.77"W x 0.85"H

- Single / Dual / Triple Outputs
- Universal 90 to 264VAC Input
- 3.3VDC to 24VDC Outputs
- 4,000VAC Input to Output Isolation
- PCB and Chassis Mount Packages
- Full Safety Approvals



Model Number	Output Voltage	Output Amps	Output Watts	Ripple & Noise max. (Note 2)	Line/Load Reg. max. (Note 3)	Efficiency
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SINGLE OUTPUT - PCB Mount

MSMA-5000	3.3 VDC	1.25	4W	100mV pk-pk	1% / 2%	62% nom.
MSMA-5001	5 VDC	1	5W	75mV pk-pk	1% / 1%	71% nom.
MSMA-5002	12 VDC	0.42	5W	50mV pk-pk	1% / 1%	71% nom.
MSMA-5003	15 VDC	0.33	5W	50mV pk-pk	0.5% / 0.5%	71% nom.
MSMA-5005	24 VDC	0.23	5W	50mV pk-pk	0.5% / 0.5%	72% nom.

SINGLE OUTPUT - Chassis Mount

MSMC-5000	3.3 VDC	1.25	4W	100mV pk-pk	1% / 2%	62% nom.
MSMC-5001	5 VDC	1	5W	75mV pk-pk	1% / 1%	71% nom.
MSMC-5002	12 VDC	0.42	5W	50mV pk-pk	1% / 1%	71% nom.
MSMC-5003	15 VDC	0.33	5W	50mV pk-pk	0.5% / 0.5%	71% nom.
MSMC-5005	24 VDC	0.23	5W	50mV pk-pk	0.5% / 0.5%	72% nom.

SINGLE OUTPUT - DIN Rail Mount

MSMC-5000/DRL	3.3 VDC	1.25	4W	100mV pk-pk	1% / 2%	62% nom.
MSMC-5001/DRL	5 VDC	1	5W	75mV pk-pk	1% / 1%	71% nom.
MSMC-5002/DRL	12 VDC	0.42	5W	50mV pk-pk	1% / 1%	71% nom.
MSMC-5003/DRL	15 VDC	0.33	5W	50mV pk-pk	0.5% / 0.5%	71% nom.
MSMC-5005/DRL	24 VDC	0.23	5W	50mV pk-pk	0.5% / 0.5%	72% nom.

All specifications are typical at nominal input, full load, and 25DegC unless otherwise noted

* These are stress ratings. Exposure of the devices to any of these conditions may adversely affect long term reliability. Proper operation under conditions other than the standard operating conditions is neither warranted nor implied.



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Model Number	Output Voltage	Output Amps	Output Watts	Ripple & Noise max. (Note 2)	Line/Load Reg. max. (Note 3)	Efficiency
DUAL OUTPUT - PCB Mount						
MDMA-5006	±12 VDC	±0.21	5W	100mV pk-pk	0.5% / 2%	66% nom.
MDMA-5007	±15 VDC	±0.18	5W	100mV pk-pk	0.5% / 2%	67% nom.
DUAL OUTPUT - Chassis Mount						
MDMC-5006	±12 VDC	±0.21	5W	100mV pk-pk	0.5% / 2%	66% nom.
MDMC-5007	±15 VDC	±0.18	5W	100mV pk-pk	0.5% / 2%	67% nom.
DUAL OUTPUT - DIN Rail Mount						
MDMC-5006/DRL	±12 VDC	±0.21	5W	100mV pk-pk	0.5% / 2%	66% nom.
MDMC-5007/DRL	±15 VDC	±0.18	5W	100mV pk-pk	0.5% / 2%	67% nom.
TRIPLE OUTPUT - PCB Mount						
MTMA-5009	+5,±12 VDC	0.6, ±0.1	5W	50, ±75mV pk-pk	0.6%, ±0.2 / 0.5%	63% nom.
MTMA-5011	+5,±15 VDC	0.45, ±0.1	5W	50, ±75mV pk-pk	0.6%, ±0.2 / 0.5%	61% nom.
TRIPLE OUTPUT - Chassis Mount						
MTMC-5009	+5,±12 VDC	0.6, ±0.1	5W	50, ±75mV pk-pk	0.6%, ±0.2 / 0.5%	63% nom.
MTMC-5011	+5,±15 VDC	0.45, ±0.1	5W	50, ±75mV pk-pk	0.6%, ±0.2 / 0.5%	61% nom.
TRIPLE OUTPUT - DIN Rail Mount						
MTMC-5009/DRL	+5,±12 VDC	0.6, ±0.1	5W	50, ±75mV pk-pk	0.6%, ±0.2 / 0.5%	63% nom.
MTMC-5011/DRL	+5,±15 VDC	0.45, ±0.1	5W	50, ±75mV pk-pk	0.6%, ±0.2 / 0.5%	61% nom.

5W Medical Grade Ultraminiature Switching Power Supplies

MMA-5 series

INPUT SPECIFICATIONS

Input Voltage	90-264VAC (100-240VAC, nom.)
Input Frequency	47-440 Hz, 50-60Hz Nom.
Input Current (LL/HL)	0.2A / 0.1A
Inrush Current (Note 1)	20A @ 100VAC, typ
	40A @ 200VAC, typ
Leakage Current	<0.3mA at 264Vin, 50Hz

OUTPUT SPECIFICATIONS

Output Voltage/Current	See Model Selection Chart
Preset Accuracy	
Single & Dual O/P:	±1% nom.
Triple O/P: (5, ±O/P)	±1%, ±5% nom.
Voltage Adjust	±6%, typ
Load/Line Regulation (Note 3)	See Model Selection Chart
Cross Regulation (Note 11)	
Dual O/P:	3% max.
Triple O/P: (5, ±O/P)	N/A, ±0.5% max.
Temperature Coefficient	±0.03%/°C
Ripple/Noise (Note 2)	See Model Selection Chart
Over Voltage Protection	Clamp*
Turn On Delay Time	<1S
Hold Up Time	
Single O/P:	30mS, typ
Multi O/P:	20mS, typ
Rise Time	<20mS
Over-Shoot/Under-Shoot	<10% nominal O/P voltage
Short Circuit Protection	Continuous, self-recovering *

GENERAL SPECIFICATIONS

On/Off Control (Note 4)	Open Collector Logic "1"/Open=ON
	Logic "0"/GND=OFF
Input-Output Isolation	4000VAC, 60S
Insulation Resistance (Note 6)	≥ 20M Ω
Operating Frequency	140 Khz, typ., fixed
Efficiency	See Model Selection Chart
Safety UL/cUL:	ANSI/AAMI ES60601-1 3rd ed.
	CSA C22.2 No. 60601-1 3rd ed.
UL-EU:	EN60601-1 3rd ed.
CB:	IEC60601-1 3rd ed.
CE:	EN60601-1-2

ENVIRONMENTAL SPECIFICATIONS

Oper. Temperature	0 to +50°C FL See Derate *
	(Free-air Convection)
Relative Humidity (Note 5)	0-95%, Non-Condensing
Storage Temperature	-25 to +71°C *
MTBF, Single/Multi O/P (Note 9)	180,000 / 110,000 Hrs
Vibration (Note 10)	2G Peak, 10-500Hz, 3 Axes
Drop Test	70 cm
EMS ESD:	EN61000-4-2, 6kV Contact, 8kV Air
RS: (Note 7)	EN61000-4-3
EFT:	EN61000-4-4, 2kV on AC Line
Surge:	EN61000-4-5, 1kV L-N
CS:	EN61000-4-6, 3V EMF
Dips: (Note 8)	EN61000-4-11
EMI	CISPR EN55011 class B

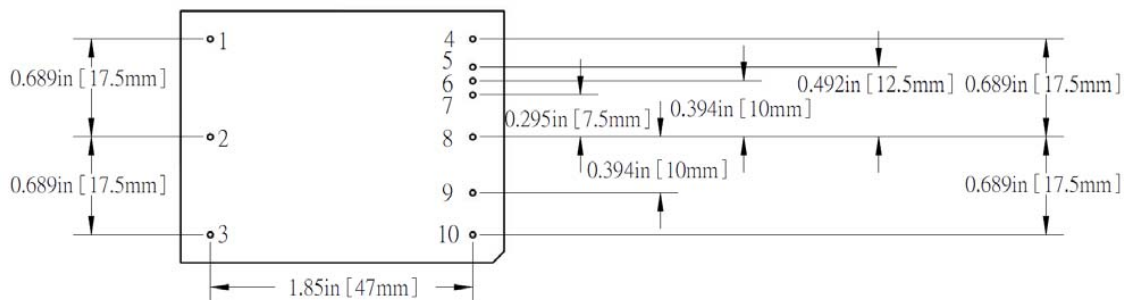
PHYSICAL SPECIFICATIONS

Case Material	Rynite, 94V-0 Rated
Construction	Encapsulated, Soft Pot
Weight PCB / CHA	4 oz (113g) / 8.5 oz (241g)

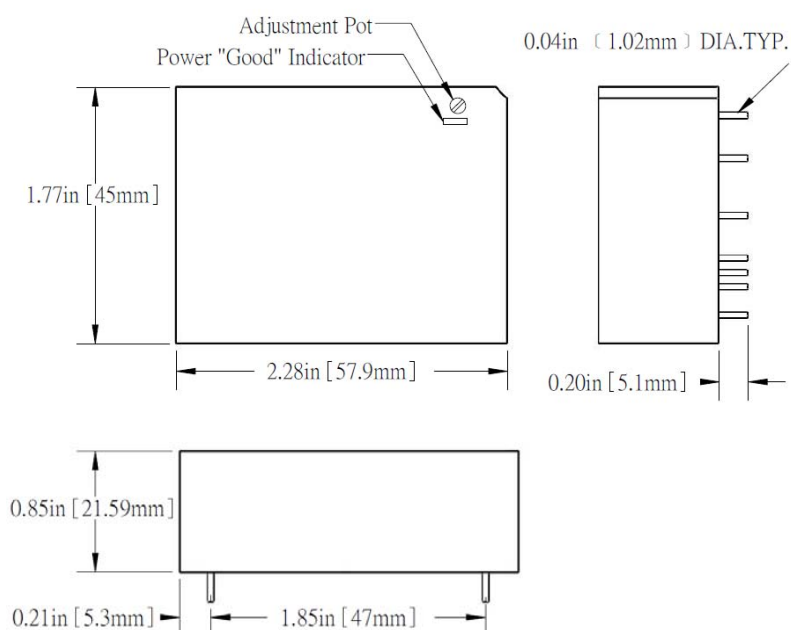
Notes:

1. Cold Start and 25°C
2. Test by dc loading side parallel with a 0.1uF ceramic capacitor and measured band-width with DC-20MHz.
3. Regulation includes line, cross temperature drift, tolerance variation
Load regulation measured from 20% to Full load. All other outputs at nominal load.
4. No termination necessary with Control pin to maintain constant "On" operation.
5. Operating or Storage
6. 500Vdc, 1 Sec between primary to secondary
7. FR: 80MHz-2.5GHz; Field Strength 3V/M
8. 95% 250Cy, 70% 25Cy, 40% 5Cy, 5% 0.5Cy
9. MIL STD 217, 25°C
10. Tested with shipping container for 30 minutes
11. Measured at nominal load with the other output(s) varied between 20% and 100% nominal load.

MECHANICAL DIMENSIONS - PCB MOUNT



PIN-OUT VIEWED FROM BOTTOM



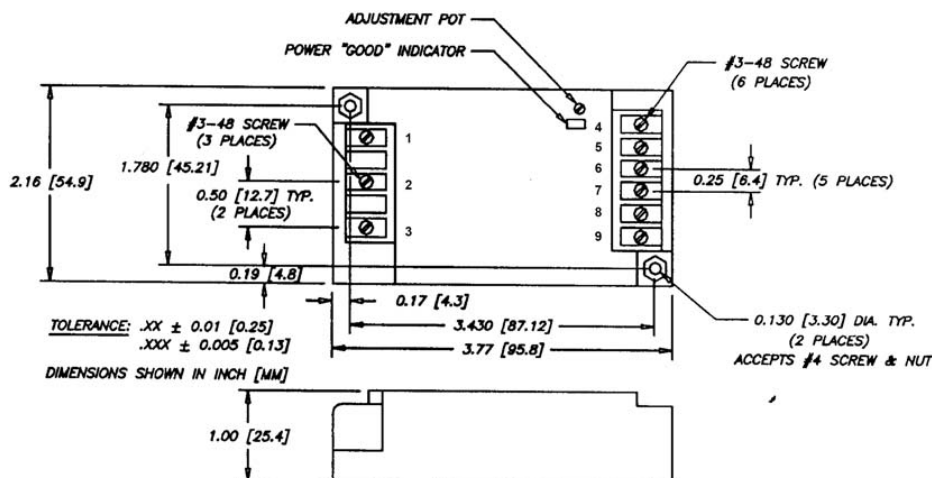
Model Type / Pin#	Single	Dual	Unmatched Dual	Triple
1	AC HI	AC HI	AC HI	AC HI
2	AC LO	AC LO	AC LO	AC LO
3	GND	GND	GND	GND
4	No Pin	No Pin	No Pin	+Vout
5	No Pin	No Pin	No Pin	Out Com
6	+Vout	+Vout	+12Vout	No Pin
7	No Pin	No Pin	No Pin	-Vout
8	No Pin	Out Com	+5Vout	+5Vout
9	-Vout	-Vout	Out Com	5V Ret
10	Ctrl	Ctrl	Ctrl	Ctrl

Tolerance : .XX $\pm$ 0.02 (0.508)

.XXX $\pm$ 0.01 (0.254)

Dimensions shown in inch (mm)

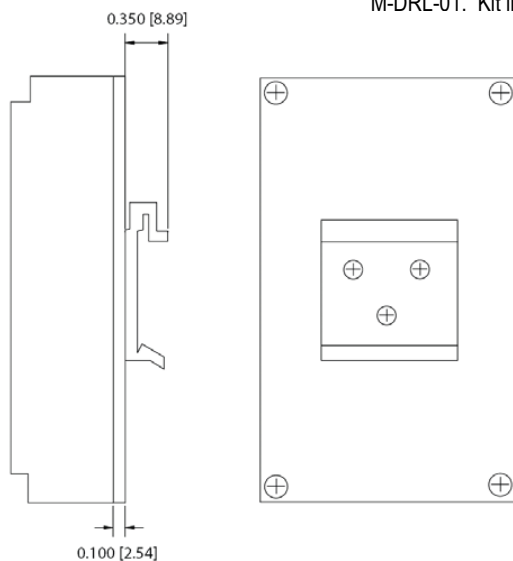
MECHANICAL DIMENSIONS - CHASSIS MOUNT



Model Type / Pin#	Single	Match Dual	Unmatch Dual	Triple
1	AC LO	AC LO	AC LO	AC LO
2	GND	GND	GND	GND
3	AC HI	AC HI	AC HI	AC HI
4	Ctrl	Ctrl	Ctrl	Ctrl
5	-Vout	-Vout	Com	+5 Ret
6	-Vout	Com	Com	+5Vout
7	+Vout	Com	+5Vout	-Vout
8	+Vout	+Vout	+12Vout	+/- Com
9	N/C	N/C	N/C	+Vout

MECHANICAL DIMENSIONS - DIN RAIL

DIN Rail mounting kit available for Chassis-mount modules, specify part # M-DRL-01. Kit includes mounting plate, DIN Rail clip and assembly hardware.



DERATE CURVE

