



P-DUKE POWER

MAD150 Series

2 x 3 Inch AC-DC POWER SUPPLIES
Up to 150 Watts

5
YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT

+85°C
-40°C
AMBIENT TEMP.



Medical



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



PV



Railway



2
X
MOPP

4000
VAC
Reinforced
Insulation

ADJ.
Output
Voltage

Protection
Class
I & II

Internal
EN55032
Class
Filter **B**

LOW
Leakage
Current

LOW
Standby
Power

Operating
Altitude
5000
meter

OCP

OVP

SCP

OTP

PART NUMBER STRUCTURE

MAD150

Series Name

U

Universal
Input
(VAC)

S

Output
Quantity

12 A

Output
Voltage
(VDC)

M

Connector
Options



Package
Options

85~264

Single

12:12V
15:15V
18:18V
24:24V
28:28V
36:36V
48:48V
54:54V

M: Molex
J: JST
T: Terminal Block

☐: Open type
E1: Enclosed type
D1: Din rail type

TECHNICAL SPECIFICATION All specifications are typical at 230VAC input, full load and 25°C unless otherwise noted

Model Number	Input Range	Output Voltage	Output Current		Input Power @ No Load	Efficiency	Maximum Capacitor Load
			Natural Convection	Forced Air Cooling With 10 CFM			
	VAC	VDC	A	A	W	%	μF
MAD150US12A	85 ~ 264	12	10.84	12.5	0.2	92	8600
MAD150US15A	85 ~ 264	15	8.67	10	0.2	92	5400
MAD150US18A	85 ~ 264	18	7.23	8.34	0.2	92	4000
MAD150US24A	85 ~ 264	24	5.42	6.25	0.2	93	2200
MAD150US28A	85 ~ 264	28	4.65	5.36	0.2	93	1500
MAD150US36A	85 ~ 264	36	3.62	4.17	0.2	93	1000
MAD150US48A	85 ~ 264	48	2.71	3.13	0.2	94	560
MAD150US54A	85 ~ 264	54	2.42	2.79	0.2	94	470

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	AC input	85		264	VAC
	DC input	88		370	VDC
Input frequency	AC input	47		63	Hz
Input current	100VAC and at 150W Full Load			3	A
	240VAC and at 150W Full Load			1.5	
No load input power	230VAC		0.2		Watts
Leakage current	264VAC			100	μA
Power factor		0.95			
Start up time				1500	ms
Rise time			15		ms
Hold up time	115VAC and 130W	10			ms
Input inrush current	230VAC Cold start at 25°C		80		A
Input protection	Internal fuse			T4.0A/250VAC	

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output power	Forced air cooling with 10CFM Natural convection * Please refer to the derating curve for detailed rating. * For further information, please contact with P-DUKE.			150 130	Watts
Output peak power	Peak power Peak power time Peak power duty Average operation power (% of Full Load) * Please refer to the Definition of peak power rating. * For further information, please contact with P-DUKE.		10 20 50	200	Watts s % %
Initial set voltage accuracy	230VAC and Full Load	-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load 10% Load to 90% Load	-0.5 -0.4		+0.5 +0.4	% %
Voltage adjustability	At Full Load Condition At Peak Power Up to 200W Condition	-7 -7		+7 +2	% %
Minimum load	No minimum load required		0		%
Ripple and noise	Measured by 20MHz bandwidth With a 1 μ F/25V 1206 X7R MLCC 12Vout 15Vout 18Vout With a 1 μ F/50V 1206 X7R MLCC 24Vout 28Vout With a 0.1 μ F/100V 1206 X7R MLCC 36Vout, 48Vout, 54Vout		120 150 180 240 280 360		mVp-p mVp-p mVp-p
Temperature coefficient		-0.02		+0.02	%/°C
Transient response	Load step from 75 ~ 50% change at 2.5A/ μ s Peak deviation Recovery time		3 600		% Vout μ s
Over voltage protection	% of Vout(nom); Latch mode	110		135	%
Over load protection	% of Iout rated; Hiccup mode		160		%
Short circuit protection	Output short circuit is defined to be a short circuit load of less than 0.1 ohm	Continuous, automatics recovery			

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute (2MOPP insulation) Input to Output Input (Output) to F.G.	4000 2500			VAC
Isolation resistance	500VDC	0.1			G Ω
Switching frequency	230VAC, Full load		100		kHz
Safety approvals(Pending)		IEC/ EN/ ANSI/AAMI ES 60601-1 IEC/ EN/ UL 62368-1			
Weight	Open type Enclosed type Din rail type			134g (4.70oz) 190g (6.70oz) 212g (7.48oz)	
MTBF	MIL-HDBK-217F Ta=25°C, Full load			7.245 x 10 ⁵	hrs

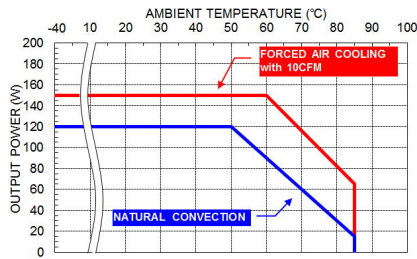
ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+85	°C
Storage temperature range		-40		+85	°C
Over temperature protection	Internal thermistor; Hiccup mode		125		°C
Operating altitude				5000	m
Thermal shock				MIL-STD-810F	
Shock				IEC60068-2-27	
Vibration				IEC60068-2-6	
Relative humidity	Non-condensing			5% to 95% RH	

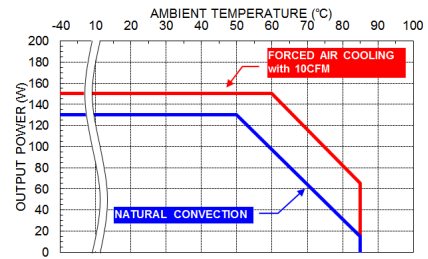
EMC SPECIFICATIONS

Parameter	Conditions	Level
EMI	EN55011, EN55032, EN60601-1-2, and FCC Part 18 / 15	Conducted Class B
		Radiated Class I Class B
		Class II* Class A
		*Unnecessary to connect with safety earth for CLASS II application.
Harmonic currents	EN61000-3-2 Full Load	Class D
Voltage flicker	EN61000-3-3	
EMS	EN55035 and EN60601-1-2	
ESD	EN61000-4-2	Perf. Criteria A
Radiated immunity	EN61000-4-3 20 V/m	Perf. Criteria A
Fast transient	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge	EN61000-4-5 DM ± 1kV and CM ± 2kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 20 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8 30 A/m	Perf. Criteria A
Dip and interruptions	EN61000-4-11	

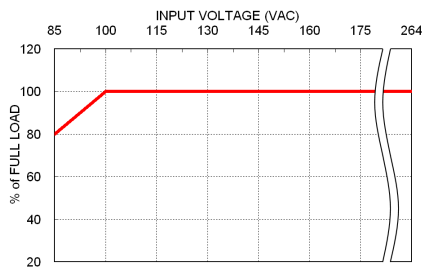
CHARACTERISTIC CURVE



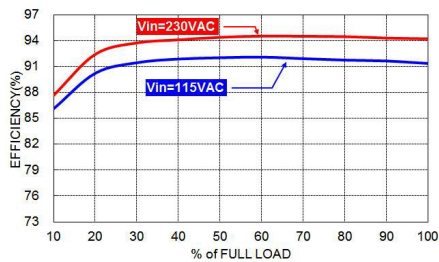
Derating Curve vs. Ambient Temperature
Vin=115VAC Open type



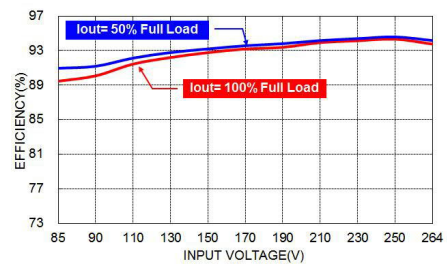
Derating Curve vs. Ambient Temperature
Vin=230VAC Open type



Derating Curve vs. Input Voltage
MAD150



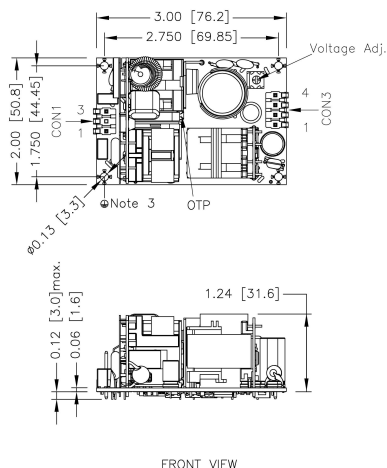
Efficiency vs. Output Load
MAD150US24 with Forced air cooling



Efficiency vs. Input Voltage
MAD150US24 with Forced air cooling

MECHANICAL DRAWING

Open type



CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 3	Line
Pin 1	Neutral

Mates with
Molex housing : **09-93-0300**
Molex crimp terminals : **2478**

CON3 – Output Connector

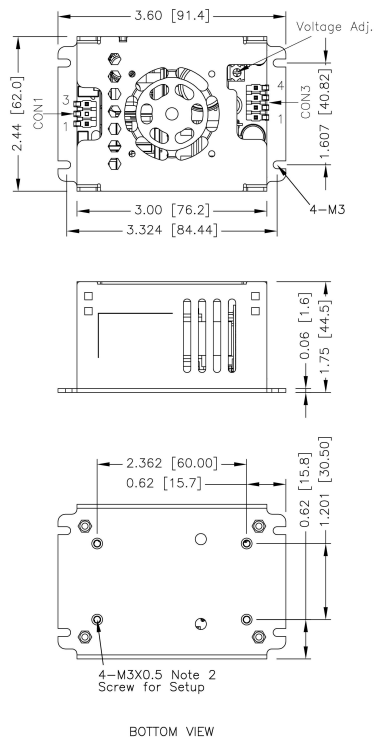
Pin 1,2	+Vout
Pin 3,4	-Vout

Mates with
Molex housing : **09-93-0400**
Molex crimp terminals : **2478**

- All dimensions in inch [mm]
Tolerance : x.xx±0.02 [x.x±0.5]
x.xxx±0.010 [x.xx±0.25]
- The screw locked torque: MAX 3.4kgf-cm/0.33N-m
- The screws holes can be considered as PE connection for CLASS I application.
- Unnecessary to connect with safety earth for CLASS II application.

MECHANICAL DRAWING(CONTINUED)

Enclosed type



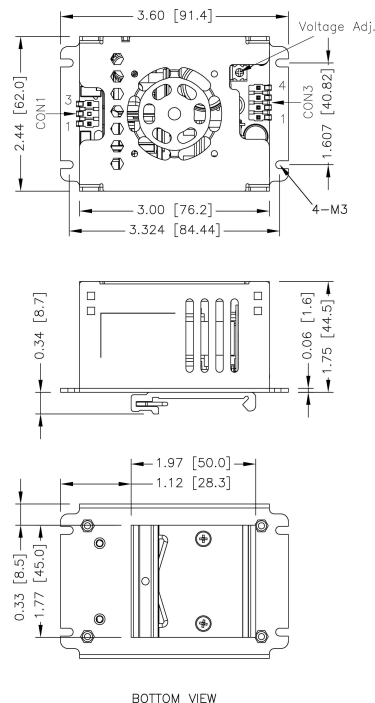
- All dimensions in inch [mm]
Tolerance : x.xx±0.02 [x.x±0.5]
x.xxx±0.010 [x.xx±0.25]
- The screw locked torque: MAX 4.2Kg·cm/0.41N·m

CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 3	Line
Pin 1	Neutral

Din rail type



- All dimensions in inch [mm]
Tolerance : x.xx±0.02 [x.x±0.5]
x.xxx±0.010[x.xx±0.25]

CON3 – Output Connector

Pin 1,2	+Vout
Pin 3,4	-Vout

CONNECTOR OPTIONS

- J

JST Type

Mates with housing
CON1: VHR-3N
CON2: VHR-4N



Crimp terminals
CON1: SVH-21T-P1.1
CON2: SVH-21T-P1.1

- M

Molex Type

Mates with housing
CON1: 09-93-0300
CON2: 09-93-0400



Crimp terminals
CON1: 2478
CON2: 2478

- T

Terminal Block



Screw locked torque
MAX 2Kg·cm/0.2N·m

Wire dimension range
26 ~ 16AWG