



P-DUKE POWER

MAD100 Series

2 X 3 Inch AC-DC POWER SUPPLIES
Up to 100 Watts

5

YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT



Medical



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



PV



Railway

c us

CB

CE

FC



2

x
MOPP

4000

VAC
Reinforced
Insulation

ADJ.

Output
Voltage

Internal
EN55032

Class
Filter **B**

LOW

Leakage
Current

LOW

Standby
Power

Protection
Class I

Class II

Operating
Altitude

5000
meter

OCP

OVP

SCP

PART NUMBER STRUCTURE

M	A	D	100	U	S	12	B	-	
Application	Package Code	Dimension Code	Output Power (W)	Input Voltage (VAC)	Output Quantity	Output Voltage (VDC)	Protection Type		Connector Option
Medical Application	A:Open type U:U chassis type E:Enclosed type D:Din rail type			U: Universal 85 ~ 264VAC	SSingle	12:12V 15:15V 18:18V 24:24V 28:28V 36:36V 48:48V	B:CLASS II Blank:CLASS I		Blank: JST M: Molex T: Terminal Block

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

Model Number	Input Range VAC	Output Voltage VDC	Output Current Natural convection A	Input Power No Load W	Efficiency %
MAD100US12B MUD100US12B MED100US12B MDD100US12B	85 ~ 264	12	8.34	0.3	91
MAD100US15B MUD100US15B MED100US15B MDD100US15B	85 ~ 264	15	6.67	0.3	92
MAD100US18B MUD100US18B MED100US18B MDD100US18B	85 ~ 264	18	5.56	0.3	92
MAD100US24B MUD100US24B MED100US24B MDD100US24B	85 ~ 264	24	4.17	0.3	92
MAD100US28B MUD100US28B MED100US28B MDD100US28B	85 ~ 264	28	3.58	0.3	92
MAD100US36B MUD100US36B MED100US36B MDD100US36B	85 ~ 264	36	2.78	0.3	91
MAD100US48B MUD100US48B MED100US48B MDD100US48B	85 ~ 264	48	2.09	0.3	91

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	AC input	85		264	VAC
	DC input	120		370	VDC
Input frequency	AC input	47		63	Hz
Input current	115VAC and Full Load			1.15	A
	230VAC and Full Load			0.55	
No load input power	230VAC			0.3	Watts
Leakage current	264VAC			75	μA
Power Factor		0.95			
Start up time				1000	ms
Rise time			20		ms
Hold up time	115VAC and Full Load	16			ms
Input inrush current	230VAC			60	A
Input protection	Internal fuse in line and neutral			T3.15A/250VAC	

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output power				100	Watts
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	-0.5		+0.5	%
	10% Load to 90% Load	-0.4		+0.4	%
Voltage adjustability		-10		+10	%
Minimum load			0		%
Ripple and noise	Measured by 20MHz bandwidth With a 10 μ F/25V 1206 X7R MLCC		120		mVp-p
	12Vout		150		
	15Vout		160		
	With a 1 μ F/50V 1206 X7R MLCC		160		
	24Vout		180		
	28Vout		190		
	With a 0.1 μ F/100V 1206 X7R MLCC		340		
Temperature coefficient		-0.02		+0.02	%/°C
Transient response	Load step from 50 ~ 75% change at 2.5A/ μ s			3	% Vout
	Peak deviation		500		μ s
	Recovery time				
Over voltage protection	% of Vout(nom); Latch mode	115		135	%
Over load protection	% of Iout rated; Hiccup mode	115		150	%
Short circuit protection					Continuous, automatic recovery

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute (2MOPP insulation)	4000			VAC
	Input to Output	1500			
	Input (Output) to F.G.				
Isolation resistance	500VDC	0.1			G Ω
Switching frequency			60		kHz
Safety approvals	IEC/ EN/ ANSI/AAMI ES 60601-1 IEC/ EN/ UL 60950-1				UL:E360199 CB:UL(Demko)
Weight					156g (5.50oz) 194g (6.84oz) 210g (7.41oz) 232g (8.18oz)
	MAD MUD MED MDD				
MTBF	MIL-HDBK-217F Ta=25°C, Full load				7.903 x 10 ⁵ hrs

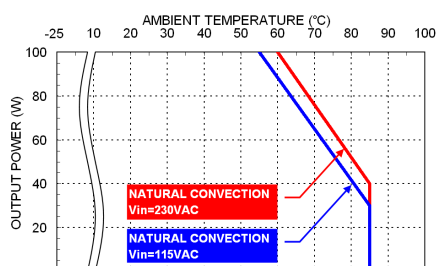
ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating case temperature	Natural convection	-25		+85	°C
Storage temperature range		-40		+85	°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

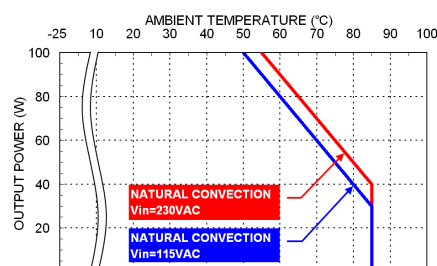
EMC SPECIFICATIONS

Parameter	Conditions	Level
EMI	EN55011, EN55032, EN60601-1-2 and FCC Part 18 / 15 External components may be required for class I application.	Conducted ClassB Radiated ClassA
Harmonic currents	EN61000-3-2 Full Load	Class A and D
Voltage flicker	EN61000-3-3	
EMS	EN55024 and EN60601-1-2	
ESD	EN61000-4-2 Air $\pm 15\text{kV}$ and Contact $\pm 8\text{kV}$	Perf. Criteria A
Radiated immunity	EN61000-4-3 20 V/m	Perf. Criteria A
Fast transient	EN61000-4-4 $\pm 2\text{kV}$	Perf. Criteria A
Surge	EN61000-4-5 DM $\pm 1\text{kV}$ and CM $\pm 2\text{kV}$	Perf. Criteria A
Conducted immunity	EN61000-4-6 20 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8 10 A/m	Perf. Criteria A
Dip and interruptions	EN61000-4-11	

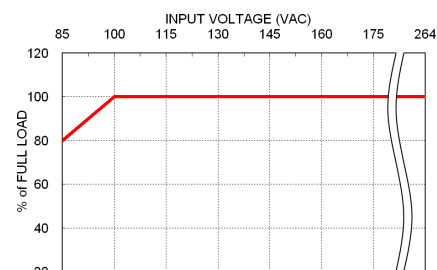
CHARACTERISTIC CURVE



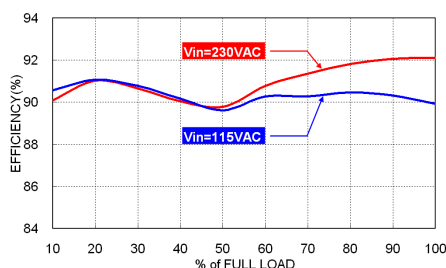
Derating Curve vs. Ambient Temperature
MED100 & MDD100



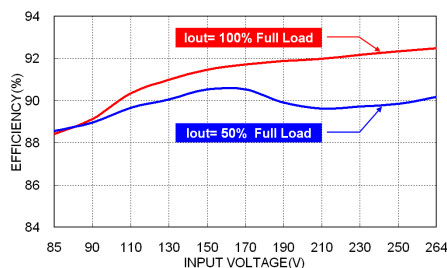
Derating Curve vs. Ambient Temperature
MAD100 & MUD100



Derating Curve vs. Input Voltage
MD100



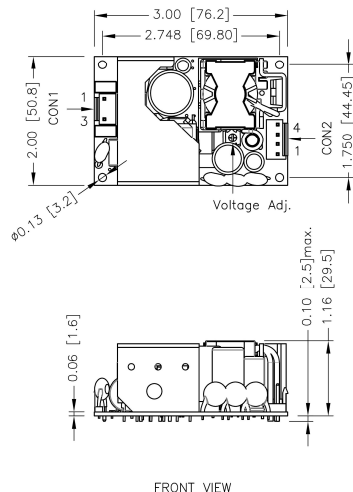
Efficiency vs. Output Load
MD100US24B



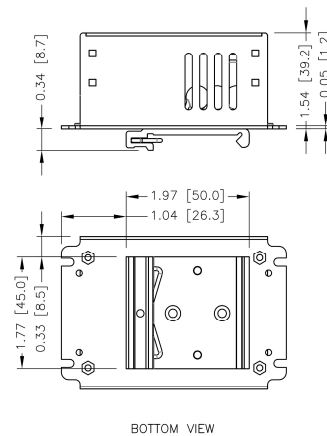
Efficiency vs. Input Voltage
MD100US24B

MECHANICAL DRAWING

MAD Open type



MDD Din rail type



1. All dimensions in inch [mm]
2. Tolerance : x.xx±0.02 [x.x±0.5] x.xxx±0.01 [x.xx±0.25]
3. M3×0.5 screw locked torque MAX 5Kgf.cm/0.49N.m

CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

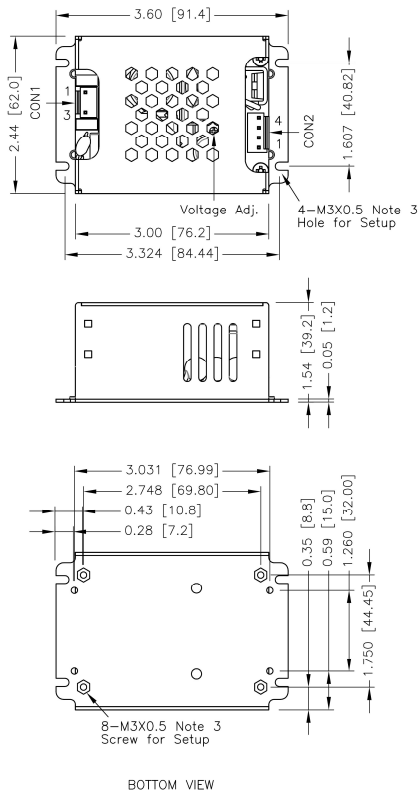
CON2 – Output Connector

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

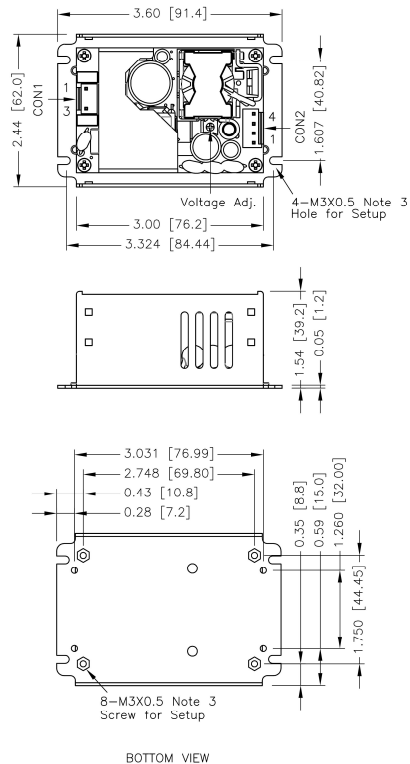
*Either one of four screws holes of Open / Chassis type can be considered as PE connection for CLASS I application.

MECHANICAL DRAWING(CONTINUED)

MED Open type



MUD Din rail type



1. All dimensions in inch [mm]
2. Tolerance : $x.xx \pm 0.02$ [$x.x \pm 0.5$] $x.xxx \pm 0.01$ [$x.xx \pm 0.25$]
3. M3x0.5 screw locked torque MAX 5Kgf.cm/0.49N.m

CONNECTORS CONNECTIONS

CON1 – Input Connector	
Pin 1	Line
Pin 3	Neutral

CON2 – Output Connector	
Pin 1,2	-Vout
Pin 3,4	+Vout

*Either one of four screws holes of Open / Chassis type can be considered as PE connection for CLASS I application.

CONNECTOR OPTIONS

Blank:	JST Type	-M	Molex Type	-T	Terminal Block
	Mates with housing CON1: VHR-3N CON2: VHR-4N		Mates with housing CON1: 09-50-8031 CON2: 09-50-8041		Screw locked torque MAX 2Kgf.cm/0.2N.m
	Crimp terminals CON1: SVH-21T-P1.1 CON2: SVH-21T-P1.1		Crimp terminals CON1: SD-2478 CON2: SD-2478		Wire dimension range 26 ~ 16AWG