



P-DUKE POWER

MAD40 Multi Series

2 X 3.5 Inch AC-DC POWER SUPPLIES
Up to 40 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
Isolation
Voltage

ADJ.
Output
Voltage

Internal
EN55032
Class
Filter **B**

LOW
Cross
Reg.

LOW
Leakage
Current

LOW
Standby
Power

Operating
Altitude
5000
meter

Protection
Class I
Class II

OPP

OVP

SCP

PART NUMBER STRUCTURE

MAD	40	U						B	- xx	yy	-	
Series Name	Output Power (W)	Input Voltage (VAC)	Output Quantity	Output Voltage 1 (VDC)	Output Voltage 2 (VDC)	Output Voltage 3 polarity	Output Voltage 3 (VDC)	Protection Type	Vo2 Voltage Code	Vo3 Voltage Code		Connector Option
MAD: Open type MUD: U chassis type MED: Enclosed type MDD: Din rail type		U:Universal 85 ~ 264VAC	D: Dual T: Triple	Vo1 3: 5V 4: 7.5V 5: 9V 6: 12V 7: 15V 8: 18V 9: 24V 0: 28V	Vo2 1: 2.5V 2: 3.3V 3: 5V x: refer to Suffix xx	Vo3 (Triple only) M: Minus _: Positive	1: 2.5V 2: 3.3V 3: 5V 4: 7.5V 5: 9V 6: 12V 7: 15V 8: 18V 9: 24V y: refer to Suffix yy	B: CLASS II No: 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	Output 1			Output 2			Output 3		Max. Output Power W	Efficiency %
	Voltage VDC	Current (Normal) A	Current (MAX) A	Voltage VDC	Current (Normal) A	Current (MAX) A	Voltage VDC	Current (MAX) A		
MAD40UD32B MUD40UD32B MED40UD32B MDD40UD32B	+5	5	8	+3.3	4	6			40	89.5
MAD40UD63B MUD40UD63B MED40UD63B MDD40UD63B	+12	2.1	3.34	+5	4	6			40	89
MAD40UD62B MUD40UD62B MED40UD62B MDD40UD62B	+12	2.1	3.34	+3.3	4	6			40	90
MAD40UD73B MUD40UD73B MED40UD73B MDD40UD73B	+15	1.7	2.67	+5	4	6			40	88.5
MAD40UD93B MUD40UD93B MED40UD93B MDD40UD93B	+24	1.05	1.67	+5	4	6			40	86
MAD40UD03B MUD40UD03B MED40UD03B MDD40UD03B	+28	0.72	1.43	+5	4	6			40	85.5
MAD40UT32M3B MUD40UT32M3B MED40UT32M3B MDD40UT32M3B	+5	5	8	+3.3	4	6	-5	0.5	40	89
MAD40UT326B MUD40UT326B MED40UT326B MDD40UT326B	+5	5	8	+3.3	4	6	+12	0.5	40	89
MAD40UT32M6B MUD40UT32M6B MED40UT32M6B MDD40UT32M6B	+5	5	8	+3.3	4	6	-12	0.5	40	89
MAD40UT63M3B MUD40UT63M3B MED40UT63M3B MDD40UT63M3B	+12	2.1	3.34	+5	4	6	-5	0.5	40	88.5
MAD40UT63M6B MUD40UT63M6B MED40UT63M6B MDD40UT63M6B	+12	2.1	3.34	+5	4	6	-12	0.5	40	88
MAD40UT623B MUD40UT623B MED40UT623B MDD40UT623B	+12	2.1	3.34	+3.3	4	6	+5	0.5	40	88.5

Model Number	Output 1			Output 2			Output 3		Max. Output Power W	Efficiency %
	Voltage	Current (Normal)	Current (MAX)	Voltage	Current (Normal)	Current (MAX)	Voltage	Current (MAX)		
	VDC	A	A	VDC	A	A	VDC	A		
MAD40UT62M6B MUD40UT62M6B MED40UT62M6B MDD40UT62M6B	+12	2.1	3.34	+3.3	4	6	-12	0.5	40	88
MAD40UT73M7B MUD40UT73M7B MED40UT73M7B MDD40UT73M7B	+15	1.7	2.67	+5	4	6	-15	0.5	40	88
MAD40UT936B MUD40UT936B MED40UT936B MDD40UT936B	+24	1.05	1.67	+5	4	6	+12	0.5	40	86
MAD40UT93M6B MUD40UT93M6B MED40UT93M6B MDD40UT93M6B	+24	1.05	1.67	+5	4	6	-12	0.5	40	86

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	100VAC			1.05	A
	240VAC			0.55	A
No load input power	230VAC			0.15	Watts
Leakage current	264VAC			75	μA
Start up time				1000	ms
Rise time			20		ms
Hold up time	115VAC and Full Load		25		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	Pout1+Pout2+Pout3			40	Watts
Initial set voltage accuracy	230VAC and Full Load Vout 1 Vout 2、Vout 3	-1.0 -2.0		+1.0 +2.0	%
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load Vout 1 Vout 3	-0.5 -0.7		+0.5 +0.7	%
	No Load to Full Load 0.1W Load to Full Load Vout 2 Vout 2	-1.5 -0.7		+1.5 +0.7	%
Cross regulation	Asymmetrical load 25%/100% FL	-1.5		+1.5	%
Voltage adjustability	Vout 1	-10		+10	%
Minimum load	M□D40UD□□ M□D40UT□□□□; Vout 3 is full load Vout 1 + Vout 2		0 0.5		W
Ripple and noise	Measured by 20MHz bandwidth				mVp-p
	With a 10μF/25V 1206 X7R MLCC Vout 1 5V		100		
	With a 1μF/50V 1206 X7R MLCC Vout 1 12V 15V 24V 28V		120 150 240 280		
	With a 10μF/25V 1206 X7R MLCC Vout 2 All		100		
	With a 10μF/25V 1206 X7R MLCC Vout 3 5V 12V 15V		100 120 150		
Temperature coefficient		-0.02		+0.02	%/°C
Transient response	Load step from 50 ~ 75% change at 2.5A/μs Vout 1 Peak deviation Recovery time		600	3	% Vout μs
Over voltage protection	% of Vout(nom); Latch mode Vout 1	125		140	%
Over power protection	% of nominal output power; Hiccup mode Pout 1 + Pout 2		145		%
Short circuit protection		Continuous, automatic 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			GΩ
Switching frequency	230VAC Vout 1 5V Others Vout 2 Vout 3		70 115 750 510		kHz
Safety approvals	IEC/ EN/ ANSI/AAMI ES 60601-1 IEC/ EN/ UL 60950-1			UL:E360199 UL:E193009 CB:UL(Demko)	
Weight	MAD MUD MED MDD			150 (5.29oz) 198 (6.98oz) 216 (7.62oz) 238 (8.40oz)	
MTBF	MIL-HDBK-217F, Full load			1.716 x 10 ⁶ hrs	

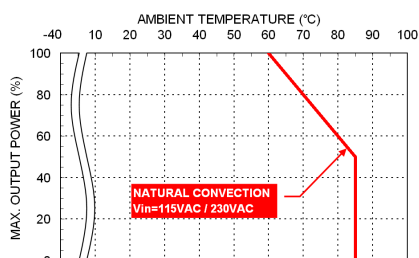
ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+85	°C
Storage temperature range		-40		+85	°C
Operating altitude				5000	m
Shock				IEC60068-2-27	
Vibration				IEC60068-2-6	
Relative humidity	Non-condensing			5% to 95% RH	

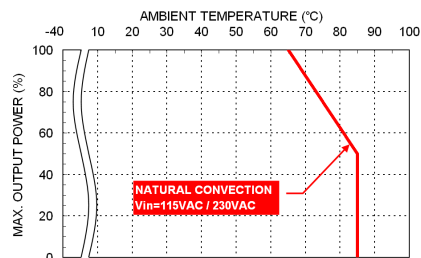
EMC SPECIFICATIONS

Parameter	Conditions		Level	
EMI	EN55011, EN55032 and FCC Part 18		Conducted	Class B
			Radiated	Class B
	External components may be required for class I application.			
Harmonic currents	EN61000-3-2	Full Load	Class A	
Voltage flicker	EN61000-3-3			
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 $\pm 1\text{kV}$	Perf. Criteria A	
Conducted immunity	EN61000-4-6	20 V/r.m.s	Perf. Criteria A	
Power frequency magnetic field	EN61000-4-8	30 A/m	Perf. Criteria A	
Dip and interruptions	EN61000-4-11			

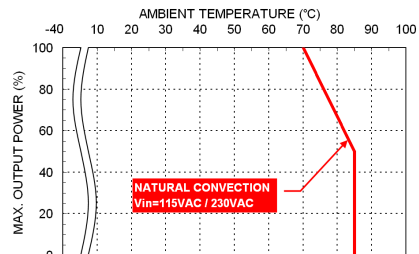
CHARACTERISTIC CURVE



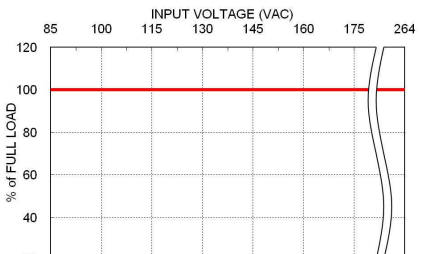
M□D40UDxxB xx=03/93
M□D40UTxxxB xxx=32M3/326/32M6/936/93M6



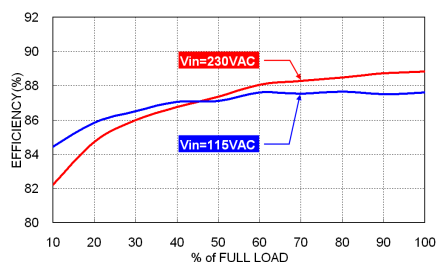
M□D40UDxxB xx=32/62
M□D40UTxxxB xxx=623/62M6



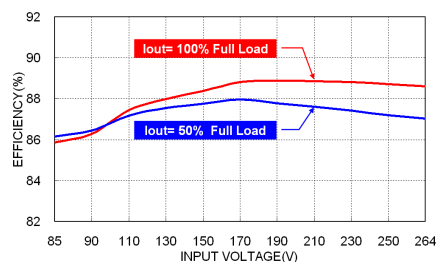
M□D40UDxxB xx=63/73
M□D40UTxxxB xxx=63M3/63M6/73M7



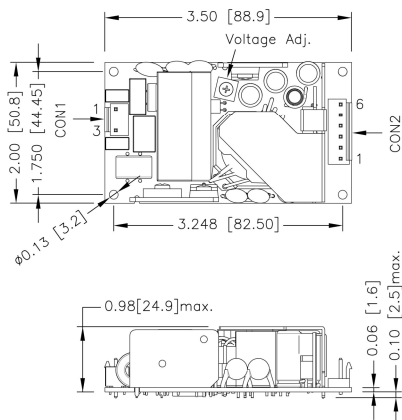
Derating Curve vs. Input Voltage
M□D65



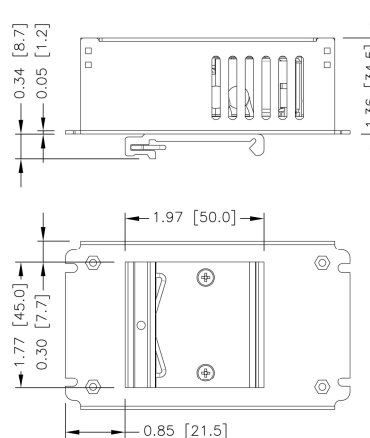
Efficiency VS Output Load
M□D40UT63M6B



Efficiency VS Input Voltage
M□D40UT63M6B

MECHANICAL DRAWING
MAD Open type


FRONT VIEW

MDD Din rail type


BOTTOM VIEW

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. M3×0.5 screw locked torque MAX 5Kgf.cm/0.49N.m

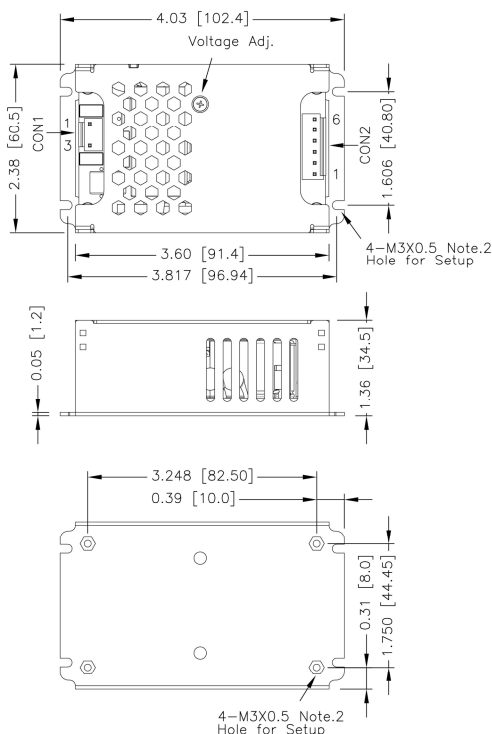
CONNECTORS CONNECTIONS
CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

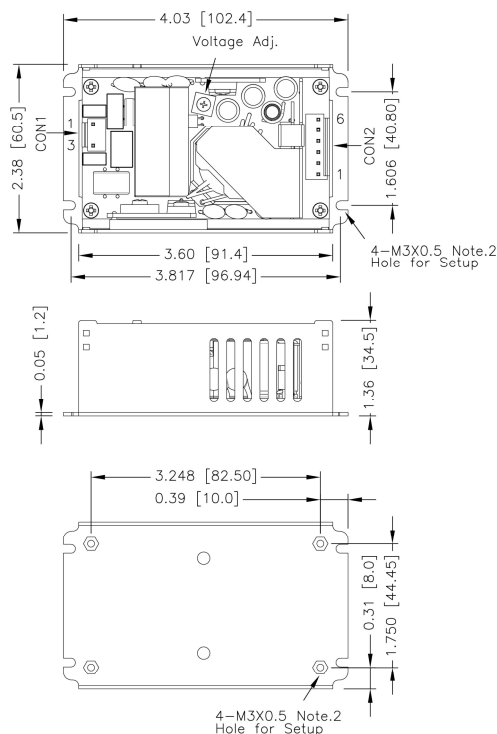
CON2 – Output Connector

Pin 1	Vout3
Pin 2,3	Com
Pin 4,5	Vout2
Pin 6	Vout1

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

MECHANICAL DRAWING(CONTINUED)
MED Enclosed type


BOTTOM VIEW

MUD U chassis type


BOTTOM VIEW

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 5Kg.cm/0.49N.m

CONNECTORS CONNECTIONS
CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

CON2 – Output Connector

Pin 1	Vout3
Pin 2,3	Com
Pin 4,5	Vout2
Pin 6	Vout1

*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

Mates with housing

CON1: VHR-3N
CON2: VHR-6N

Crimp terminals

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

-M

Molex Type

Mates with housing

CON1: 09-50-8031
CON2: 09-50-8061

Crimp terminals

CON1: SD-2478
CON2: SD-2478

-T

Terminal Block

**Screw locked torque
MAX 2Kg.cm/0.2N.m**
**Wire dimension range
26 ~ 16AWG**
