P-DUKE POWER

MAD40 Multi Series

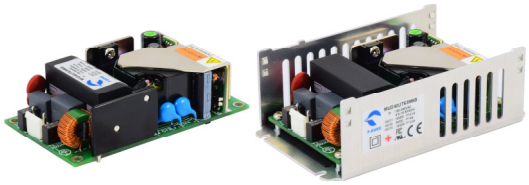
2 X 3.5 Inch AC-DC POWER SUPPLIES
Up to 40 Watts

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

cULus · CB · CE · FC

POWER SAVE

2 x MOPP · 4000 VAC Isolation Voltage · ADJ. Output Voltage · Internal EN55032 Class B Filter · 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**

				Vo1	Vo2	Vo3 (Triple only)							
MAD: Open type		**U:** Universal 85 ~ 264VAC	**D:** Dual	**3:** 5V	**1:** 2.5V	**M:** Minus	**1:** 2.5V	**B:** CLASS II					**Blank:** JST
MUD: U chassis type			**T:** Triple	**4:** 7.5V	**2:** 3.3V	**__:** Positive	**2:** 3.3V	**No:** CLASS I					**M:** Molex
MED: Enclosed type				**5:** 9V	**3:** 5V		**3:** 5V						**T:** Terminal Block
MDD: Din rail type				**6:** 12V	**x:** refer to Suffix xx		**4:** 7.5V						
				7: 15V			**5:** 9V						
				8: 18V			**6:** 12V						
				9: 24V			**7:** 15V						
				0: 28V			**8:** 18V						
							9: 24V						
							y: refer to Suffix yy						

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

Model Number	Output 1			Output 2			Output 3		Max. Output Power	Efficiency
	Voltage	Current (Normal)	Current (MAX)	Voltage	Current (Normal)	Current (MAX)	Voltage	Current (MAX)		
	VDC	A	A	VDC	A	A	VDC	A	W	%
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	Efficiency
	Voltage	Current (Normal)	Current (MAX)	Voltage	Current (Normal)	Current (MAX)	Voltage	Current (MAX)		
	VDC	A	A	VDC	A	A	VDC	A	W	%
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 DC input	85 120		264 370	VAC VDC
Input frequency	AC input	47		63	Hz
Input current	100VAC 240VAC			1.05 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 With a 10μF/25V 1206 X7R MLCC	Vout 1	5V		100		mVp-p
	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	%/℃
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, 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			GΩ
Switching frequency	230VAC	Vout 1	5V Others		70 115		kHz
		Vout 2			750		
		Vout 3			510		
Safety approvals	IEC/ EN/ ANSI/AAMI ES 60601-1					UL:E360199 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	

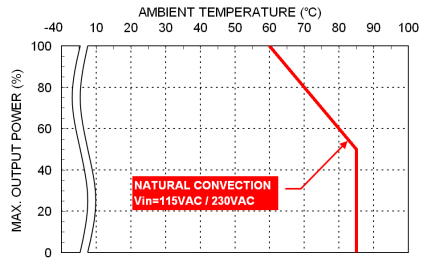
ENVIRONMENTAL SPECIFICATIONS

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

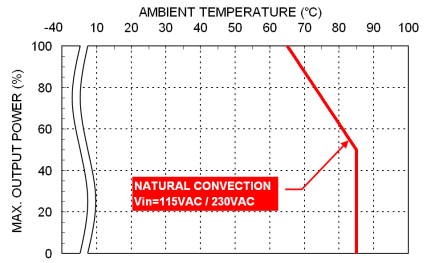
EMC SPECIFICATIONS

Parameter	Conditions		Level
EMI	EN55011, EN55032 and FCC Part 18 External components may be required for class I application.		Conducted Class B Radiated Class B
Harmonic currents	EN61000-3-2	Full Load	Class A
Voltage flicker	EN61000-3-3		
ESD	EN61000-4-2	Air ± 15kV and Contact ± 8kV	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	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		

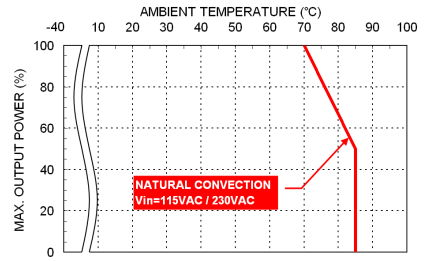
CHARACTERISTIC CURVE



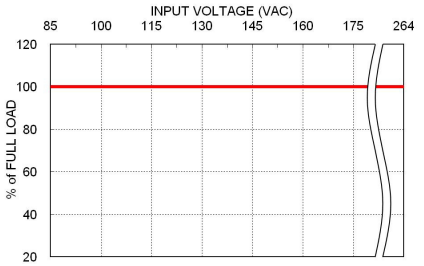
M□D40UDxxB xx=03/93
M□D40UTxxxB xxx=32M3/326/32M6/936/93M6



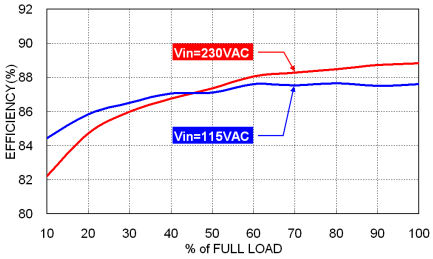
M□D40UDxxB xx=32/62
M□D40UTxxxB xxx=623/62M6



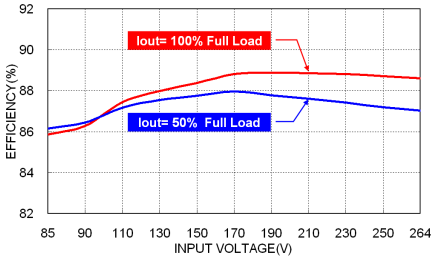
M□D40UDxxB xx=63/73
M□D40UTxxxB xxx=63M3/63M6/73M7



Derating Curve vs. Input Voltage
M□D65



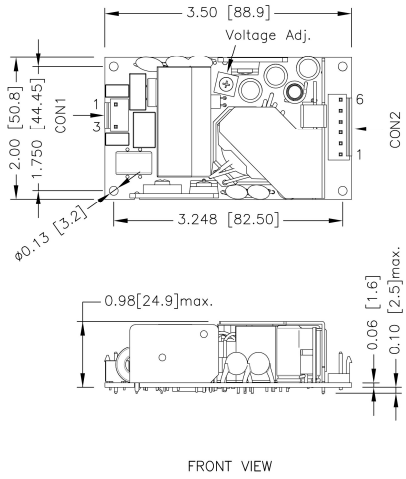
Efficiency VS Output Load
M□D40UT63M6B



Efficiency VS Input Voltage
M□D40UT63M6B

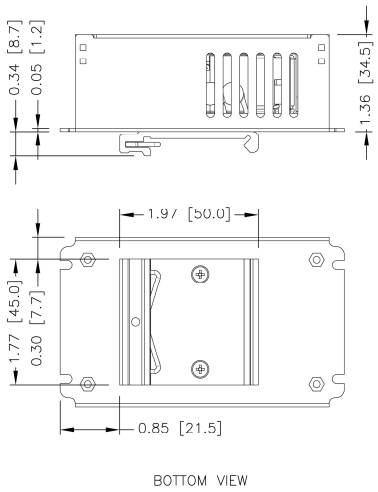
MECHANICAL DRAWING

MAD Open type



FRONT VIEW

MDD Din rail type



BOTTOM VIEW

1. All dimensions in inch [mm]
2. Tolerance : x.xx±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

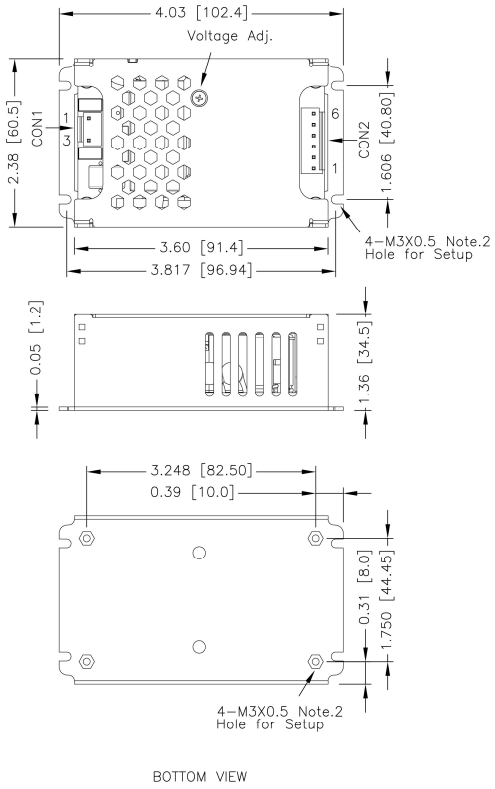
CON2 – Output Connector

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

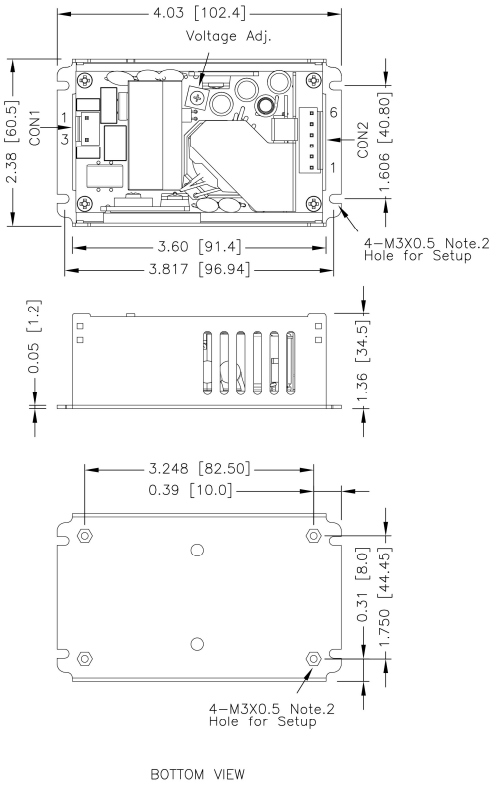
*Either one of four screws holes of Open / Chassis type can be considered as PE connection for CLASS I application.

MECHANICAL DRAWING(CONTINUED)

MED Enclosed type



MUD U chassis 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]
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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 2Kgf.cm/0.2N.m

Wire dimension range 26 ~ 16AWG

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