



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

UL US CB CE UK CA



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 | □ | □ | □ | □ | □ | C | - xx | yy | - □ |
|------------------|------------------|-----------------------|----------------------|---|--|-------------------------|--|--|------------------|------------------|---|
| Series Name | Output Power (W) | Input Voltage (VAC) | Output Quantity | Output Voltage 1 (VDC) | Output Voltage 2 (VDC) | Output Voltage 3 (VDC) | Output Voltage 3 (VDC) | Protection Type | Vo2 Voltage Code | Vo3 Voltage Code | Connector Options |
| | | | | Vo1 | Vo2 | Vo3 (Triple only) | | | | | |
| A: Open type | | U: Universal 85 ~ 264 | D: Dual T: Triple | 3: 5V 4: 7.5V 5: 9V 6: 12V 7: 15V 8: 18V 9: 24V 0: 28V | 1: 2.5V 2: 3.3V 3: 5V x: refer to Suffix xx | 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 | C: CLASS I D: CLASS II □: CLASS I (*NRND) B: CLASS II (*NRND) | | | □: JST M: Molex T: Terminal Block |
| E: Enclosed type | | | | | | | | | | | |
| D: Din rail type | | | | | | | | | | | |
| | | | | | | | | *NRND: Not recommended for new designs | | | |



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 % | Maximum Capacitor Load µF |
|--|----------|------------------|---------------|----------|------------------|---------------|----------|---------------|------------------------|-----------------|------------------------------|
| | Voltage | Current (Normal) | Current (MAX) | Voltage | Current (Normal) | Current (MAX) | Voltage | Current (MAX) | | | |
| | VDC | A | A | VDC | A | A | VDC | A | | | |
| MAD40UD32C MUD40UD32C MED40UD32C MDD40UD32C | +5 | 5 | 8 | +3.3 | 4 | 6 | --- | --- | 40 | 89.5 | 12000 / 2000 |
| MAD40UD63C MUD40UD63C MED40UD63C MDD40UD63C | +12 | 2.1 | 3.34 | +5 | 4 | 6 | --- | --- | 40 | 89 | 1750 / 2000 |
| MAD40UD62C MUD40UD62C MED40UD62C MDD40UD62C | +12 | 2.1 | 3.34 | +3.3 | 4 | 6 | --- | --- | 40 | 90 | 1750 / 2000 |
| MAD40UD73C MUD40UD73C MED40UD73C MDD40UD73C | +15 | 1.7 | 2.67 | +5 | 4 | 6 | --- | --- | 40 | 88.5 | 1670 / 2000 |
| MAD40UD93C MUD40UD93C MED40UD93C MDD40UD93C | +24 | 1.05 | 1.67 | +5 | 4 | 6 | --- | --- | 40 | 86 | 440 / 2000 |
| MAD40UD03C MUD40UD03C MED40UD03C MDD40UD03C | +28 | 0.72 | 1.43 | +5 | 4 | 6 | --- | --- | 40 | 85.5 | 220 / 2000 |
| MAD40UT32M3C MUD40UT32M3C MED40UT32M3C MDD40UT32M3C | +5 | 5 | 8 | +3.3 | 4 | 6 | -5 | 0.5 | 40 | 89 | 10000 / 2000 / 420 |
| MAD40UT326C MUD40UT326C MED40UT326C MDD40UT326C | +5 | 5 | 8 | +3.3 | 4 | 6 | +12 | 0.5 | 40 | 89 | 10000 / 2000 / 420 |
| MAD40UT32M6C MUD40UT32M6C MED40UT32M6C MDD40UT32M6C | +5 | 5 | 8 | +3.3 | 4 | 6 | -12 | 0.5 | 40 | 89 | 10000 / 2000 / 420 |
| MAD40UT63M3C MUD40UT63M3C MED40UT63M3C MDD40UT63M3C | +12 | 2.1 | 3.34 | +5 | 4 | 6 | -5 | 0.5 | 40 | 88.5 | 1750 / 2000 / 420 |
| MAD40UT63M6C MUD40UT63M6C MED40UT63M6C MDD40UT63M6C | +12 | 2.1 | 3.34 | +5 | 4 | 6 | -12 | 0.5 | 40 | 88 | 1750 / 2000 / 420 |
| MAD40UT623C MUD40UT623C MED40UT623C MDD40UT623C | +12 | 2.1 | 3.34 | +3.3 | 4 | 6 | +5 | 0.5 | 40 | 88.5 | 1750 / 2000 / 420 |



| Model Number | Output 1 | | | Output 2 | | | Output 3 | | Max. Output Power | Efficiency | Maximum Capacitor Load |
|--|----------|------------------|---------------|----------|------------------|---------------|----------|---------------|-------------------|------------|------------------------|
| | Voltage | Current (Normal) | Current (MAX) | Voltage | Current (Normal) | Current (MAX) | Voltage | Current (MAX) | | | |
| | VDC | A | A | VDC | A | A | VDC | A | | | |
| MAD40UT62M6C MUD40UT62M6C MED40UT62M6C MDD40UT62M6C | +12 | 2.1 | 3.34 | +3.3 | 4 | 6 | -12 | 0.5 | 40 | 88 | 1750 / 2000 / 420 |
| MAD40UT73M7C MUD40UT73M7C MED40UT73M7C MDD40UT73M7C | +15 | 1.7 | 2.67 | +5 | 4 | 6 | -15 | 0.5 | 40 | 88 | 1670 / 2000 / 420 |
| MAD40UT936C MUD40UT936C MED40UT936C MDD40UT936C | +24 | 1.05 | 1.67 | +5 | 4 | 6 | +12 | 0.5 | 40 | 86 | 440 / 2000 / 420 |
| MAD40UT93M6C MUD40UT93M6C MED40UT93M6C MDD40UT93M6C | +24 | 1.05 | 1.67 | +5 | 4 | 6 | -12 | 0.5 | 40 | 86 | 440 / 2000 / 420 |

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 | Pout 1+Pout 2+Pout 3 | | | | 40 | Watts |
| Initial set voltage accuracy | 230VAC and Full Load | Vout 1 | -1.0 | | +1.0 | % |
| | | Vout 2 · Vout 3 | -2.0 | | +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 | -0.5 | | +0.5 | % |
| | | Vout 3 | -0.7 | | +0.7 | |
| | | Vout 2 | -1.5 | | +1.5 | |
| | 0.1W Load to Full Load | Vout 2 | -0.7 | | +0.7 | % |
| Cross regulation | Asymmetrical load 25%/100% FL | | -1.5 | | +1.5 | % |
| Voltage adjustability | | Vout 1 | -10 | | +10 | % |
| Minimum load | M□D40UD□□ | | | 0 | | W |
| | M□D40UT□□□; Vout 3 is full load | | Vout 1+Vout 2 | | 0.5 | |
| Ripple and noise | Measured by 20MHz bandwidth | | | | | mVp-p |
| | With a 10μF/25V 1206 X7R MLCC | Vout 1 | 5V | | 100 | |
| | | Vout 1 | 12V | | 120 | |
| | | | 15V | | 150 | |
| | | | 24V | | 240 | |
| | With a 10μF/25V 1206 X7R MLCC | Vout 2 | All | | 100 | |
| | | Vout 3 | 5V | | 100 | |
| | | | 12V | | 120 | |
| 15V | | | | 150 | | |
| Temperature coefficient | | | -0.02 | | +0.02 | %/°C |
| Transient response | Load step from 50 ~ 75% change at 2.5A/μs | Vout 1 | Peak deviation | | 3 | % Vout |
| | | | Recovery time | 600 | | 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 | | |

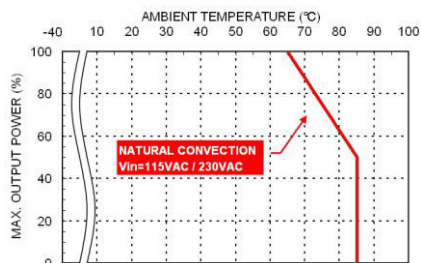
| GENERAL SPECIFICATIONS | | | | | | |
|------------------------|--|------------------------|--------|------|------|--|
| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
| Isolation voltage | 1 minute (2MOPP insulation) | Input to Output | 4000 | | | VAC |
| | | Input (Output) to F.G. | 2500 | | | |
| Isolation resistance | 500VDC | | 0.1 | | | GΩ |
| Switching frequency | 230VAC | Vout 1 | 5V | 70 | | kHz |
| | | Vout 2 | Others | 115 | | |
| | | | Vout 3 | | 750 | |
| | | | | 510 | | |
| Safety approvals | IEC/ EN/ ANSI/AAMI ES 60601-1 IEC/ EN/ UL 62368-1 | | | | | UL:E360199 UL:E193009 CB:UL(Demko) |
| Weight | | MAD | | | | 150 (5.29oz) |
| | | MUD | | | | 198 (6.98oz) |
| | | MED | | | | 216 (7.62oz) |
| | | MDD | | | | 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 |

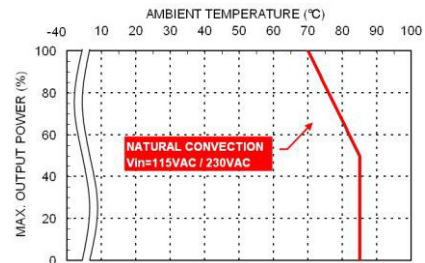
EMC SPECIFICATIONS

| Parameter | Conditions | Level |
|--------------------------------|--|---------------------------------------|
| EMI | EN55011, EN55032, EN60601-1-2 and FCC Part 18 / 15 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 | |
| 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 $\pm 2kV$ | Perf. Criteria A |
| Surge | EN61000-4-5 DM $\pm 1kV$ and CM $\pm 2kV$ | 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 | |

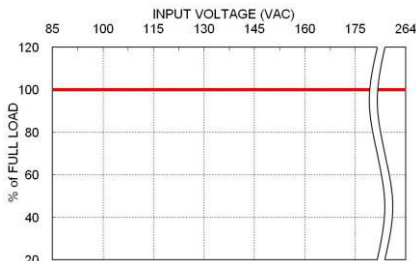
CHARACTERISTIC CURVE



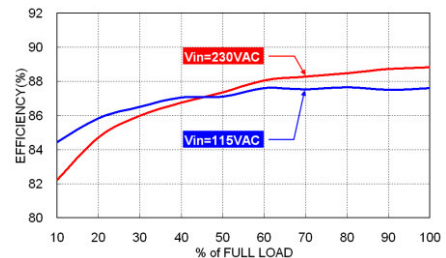
Derating Curve vs. Ambient Temperature
M□D40UD



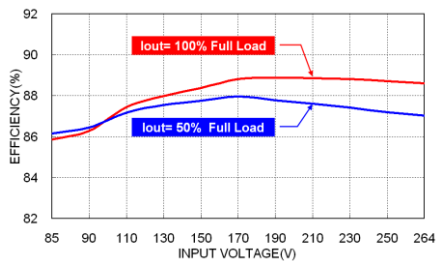
Derating Curve vs. Ambient Temperature
M□D40UT



Derating Curve vs. Input Voltage
M□D40



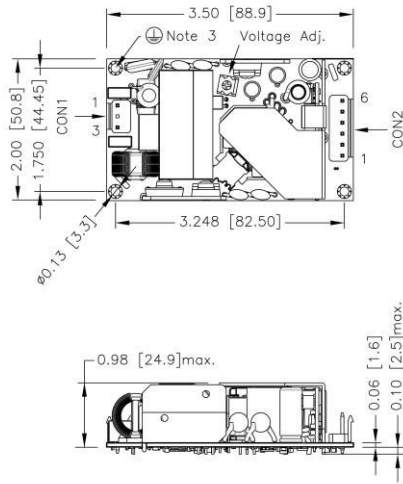
Efficiency vs. Output Load
M□D40UT63M6B



Efficiency vs. Input Voltage
M□D40UT63M6B

MECHANICAL DRAWING

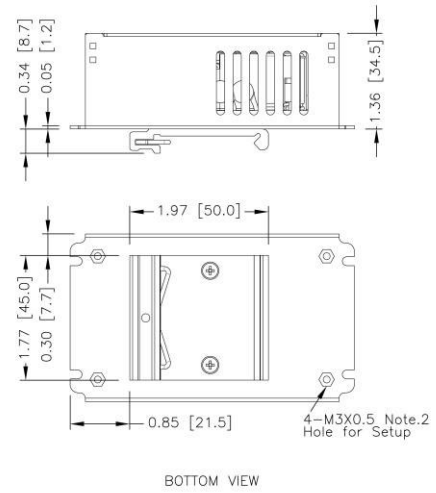
MAD Open type



FRONT VIEW

- 1.All dimensions in inch[mm]
Tolerance: $x.xx \pm 0.02 [x.x \pm 0.5]$ $x.xxx \pm 0.010 [x.xx \pm 0.25]$
- 2.The screw locked torque: MAX 5.0kgf-cm/0.49N-m
- 3.The screws holes can be considered as PE connection for CLASS I application.

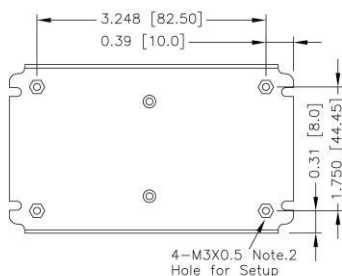
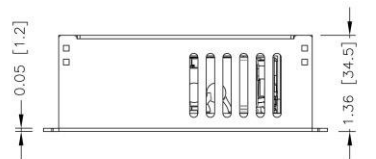
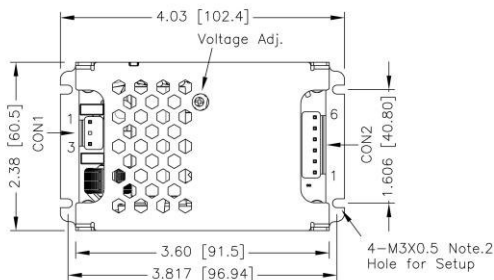
MDD Din rail type



BOTTOM VIEW

- 1.All dimensions in inch[mm]
Tolerance: $x.xx \pm 0.02 [x.x \pm 0.5]$ $x.xxx \pm 0.010 [x.xx \pm 0.25]$
- 2.The screw locked torque: MAX 5.0kgf-cm/0.49N-m

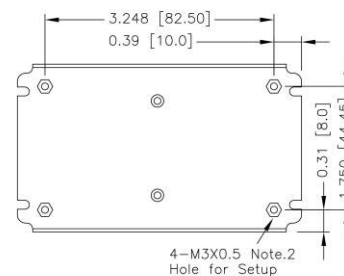
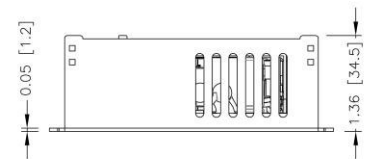
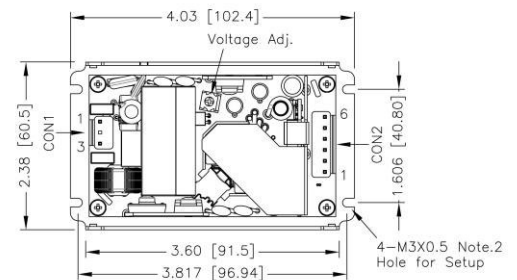
MED Enclosed type



BOTTOM VIEW

- 1.All dimensions in inch[mm]
Tolerance: $x.xx \pm 0.02 [x.x \pm 0.5]$ $x.xxx \pm 0.010 [x.xx \pm 0.25]$
- 2.The screw locked torque: MAX 5.0kgf-cm/0.49N-m

MUD U chassis type



BOTTOM VIEW

- 1.All dimensions in inch[mm]
Tolerance: $x.xx \pm 0.02 [x.x \pm 0.5]$ $x.xxx \pm 0.010 [x.xx \pm 0.25]$
- 2.The screw locked torque: MAX 5.0kgf-cm/0.49N-m

CONNECTOR CONNECTIONS

CON1 – Input Connector

| Pin Number | AC Input | DC Input |
|------------|----------|--|
| | | M□D40UDXXC · M□D40UDXXD M□D40UTXXC · M□D40UTXXD |
| Pin 1 | Line | DC+ |
| Pin 3 | Neutral | DC- |

CON2 – Output Connector

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

*Either one of four screws holes of 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**

