# MPE-50C

## 50W, High Isolation AC/DC Power Supplies

### Key Features:

- 50W Output Power
- 85-264 VAC Input
- 4,000 VAC Isolation
- Efficiency to 90%
- -30°C to +70°C Temp
- Meets EN 55032 B
- >300 kHour MBTF
- OVC Class III
- Reinforced Insulation
- UL62368 Approval

### Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

#### Input

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Input Voltage Range | AC Input | 85 | | 264 | VAC |
| | DC Input | 120 | | 370 | VDC |
| Input Frequency | | 47 | | 63 | Hz |
| Input Current | 115 VAC | | | 1.2 | A |
| | 230 VAC | | | 0.8 | |
| Inrush Current (Cold Start) | 115 VAC | | 30 | | A |
| | 230 VAC | | 50 | | |
| Leakage Current | 240 VAC | | | 0.75 | mA |

#### Output

| Parameter | Conditions | | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage Accuracy | Full Load | 5V Output | | ±2 | | % |
| | | Other Outputs | | ±1 | | |
| Line Regulation | Full Load | | | ±0.5 | | % |
| Load Regulation | 0-100% Load | 5V Output | | ±1 | | % |
| | | Other Outputs | | ±0.5 | | |
| Ripple & Noise (20 MHz), Note 1 | 5V Output | | | | 80 | mV P - P |
| | 12, 15V Outputs | | | | 120 | |
| | 24V Output | | | | 150 | |
| | 36, 48V Outputs | | | | 200 | |
| Hold-Up Time | 115 VAC | | 8 | | | ms |
| | 230 VAC | | 30 | | | |
| Standby Power Consumption | 230VAC | | | | 0.3 | W |
| Operating Temperature Derating | -30 to -25°C | 85 - 100VAC | 5 | | | %/°C |
| | 5V +40 to +70°C | 85 - 165VAC | 1.33 | | | |
| | 5V +50 to +70°C | 165 - 264VAC | 2 | | | |
| | Other outputs | +50 to +70°C | 2 | | | |
| Input Voltage Derating | 85 - 100VAC | | 1.33 | | | %/VAC |
| Temperature Coefficient | | | ±0.03 | | | %/°C |
| Over Load Protection | | | 120 | | 200 | %Io |
| Short Circuit Protection, Note 2 | Recovery time <5s after short circuit removed | Hiccup, Continuous, Self-Recovery | | | | |
| Switching Frequency | | | | 65 | | kHz |

#### General

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Isolation Voltage, Note 3 | Input - Ground | 2,000 | | | VAC |
| | Input - Output | 4,000 | | | |
| | Output - Ground | 1,250 | | | |
| Isolation Resistance | See Note 6 | 100 | | | MΩ |

#### EMI Characteristics

| Parameter | Standard | Criteria | Level |
|---|---|---|---|
| Radiated Emissions, See Page 3 | CISPR32/EN 55032 | | Class B |
| Conducted Emissions | CISPR32/EN 55032 | | Class B |

#### Environmental

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Operating Temperature Range | Ambient | -30 | | +70 | °C |
| Storage Temperature Range | | -40 | | +85 | °C |
| Cooling | Free Air Convection | | | | |
| Operating Humidity | Non-condensing | 20 | | 90 | %RH |
| Storage Humidity | | | | 95 | |

#### Physical

| | |
|---|---|
| Case Size | 3.90 x 3.23 x 1.18 in (See Mechanical Drawing on Page 4) |
| Case Material | Metal (AL1100, SGCC) |
| Weight | 6.35 oz (180g) (See Mechanical Drawing on Page 4) |

#### Reliability Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 0.3 | | | MHours |
| Safety Standards | UL/cUL 62368-1 Recognition (UL Certificate) | | | | |
| Safety Class | Class I | | | | |


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## Model Selection Guide

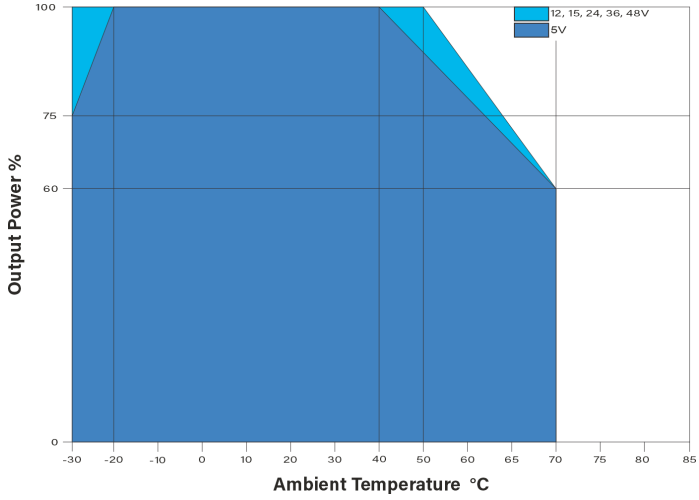
| Model Number | Input | | Output | | | | Over Voltage Protection (VDC) | Output Capacitive Load (μF Max) | Efficiency (%, Typ) |
|---|---|---|---|---|---|---|---|---|---|
| | Current (mA) | | Voltage (VDC) | Voltage Adjustable Range (VDC) | Current (A, Max) | Power (W) | | | |
| | 115 VAC | 230 VAC | | | | | | | |
| MPE-50C-05 | 1200 | 800 | 5 | 4.5 - 5.5 | 10 | 50 | 6.3 | 8500 | 86 |
| MPE-50C-12 | 1200 | 800 | 12 | 10.2 - 13.8 | 4.2 | 50.4 | 16.2 | 2000 | 87 |
| MPE-50C-15 | 1200 | 800 | 15 | 13.5 - 18 | 3.4 | 51 | 21.75 | 1500 | 88 |
| MPE-50C-24 | 1200 | 800 | 24 | 21.6 - 28.8 | 2.2 | 52.8 | 33.6 | 1000 | 89 |
| MPE-50C-36 | 1200 | 800 | 36 | 32.4 - 39.6 | 1.45 | 52.2 | 48.6 | 800 | 89 |
| MPE-50C-48 | 1200 | 800 | 48 | 43.2 - 52.8 | 1.1 | 52.8 | 60 | 680 | 90 |

**Notes:**

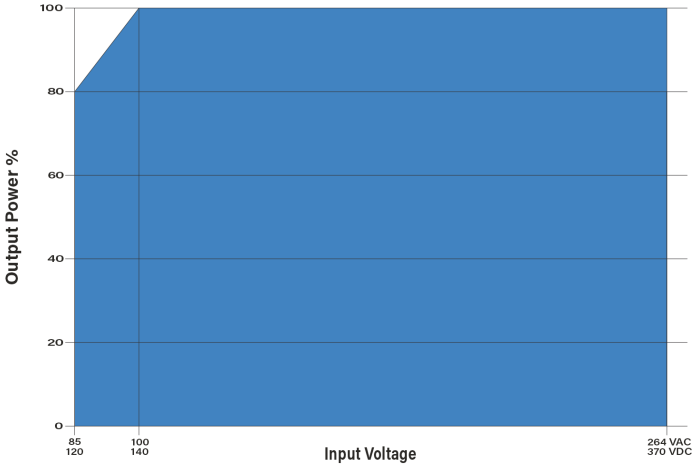
1. The "tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF ceramic capacitor.
2. Output short circuit protection is provided by a "hiccup mode" circuit. The unit recovers automatically when the fault condition is removed.
3. Input-output isolation is tested for 60 seconds with a leakage current of <10 mA.
4. A temperature derating of 5°C/1000m is required for operating altitude greater than 2000m.
5. The output voltage can be adjusted by the ADJ knob. Turn clockwise to increase and counterclockwise to decrease.
6. Isolation resistance is given for input - output, input - ground and output - ground. It is tested at 500VDC.

For conformal coating option, add the suffix "**-CC**" to the model number (e.g. **MPE-50C-05-CC**).

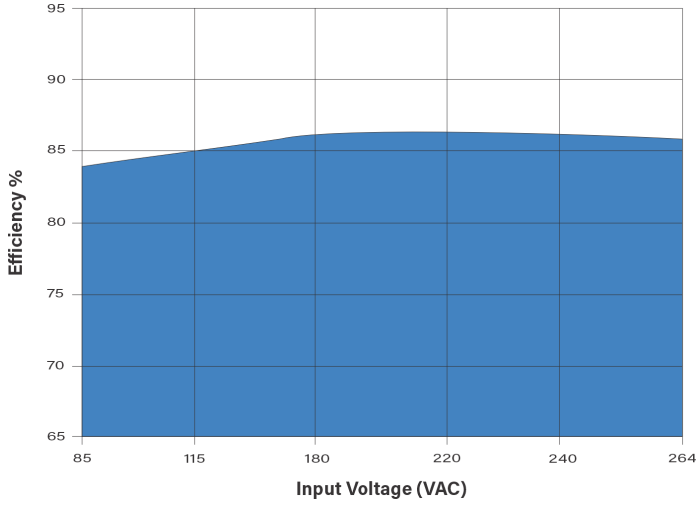
### Temperature Derating



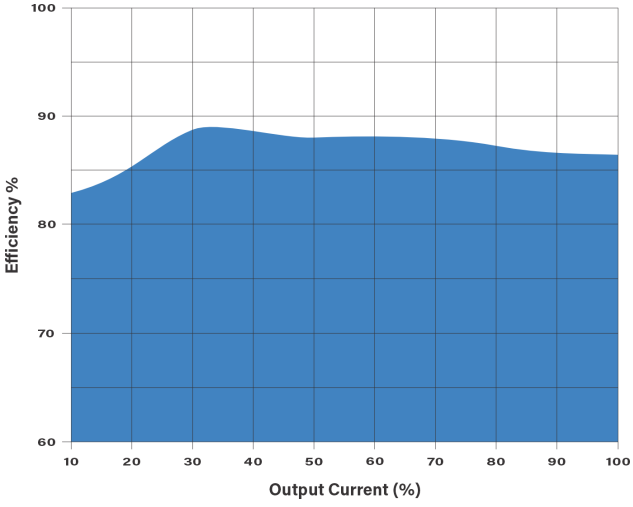

### Input Voltage Derating



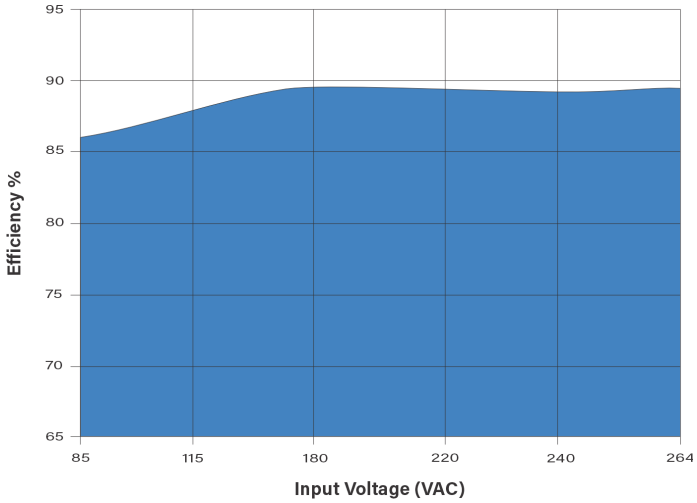

### Efficiency vs Input Voltage: 5V



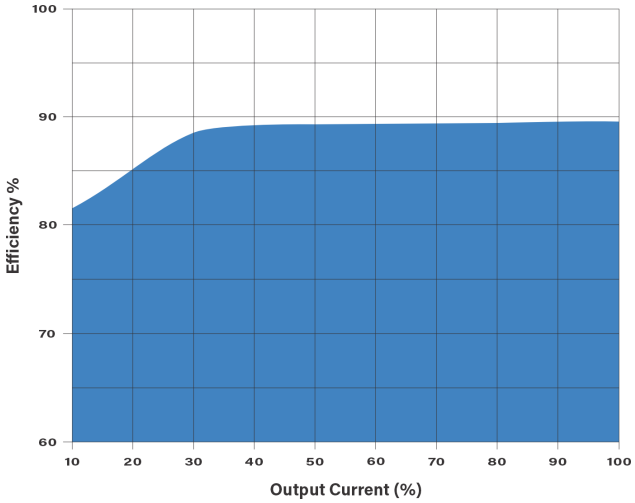

### Efficiency vs Output Load: 5V (230VAC)



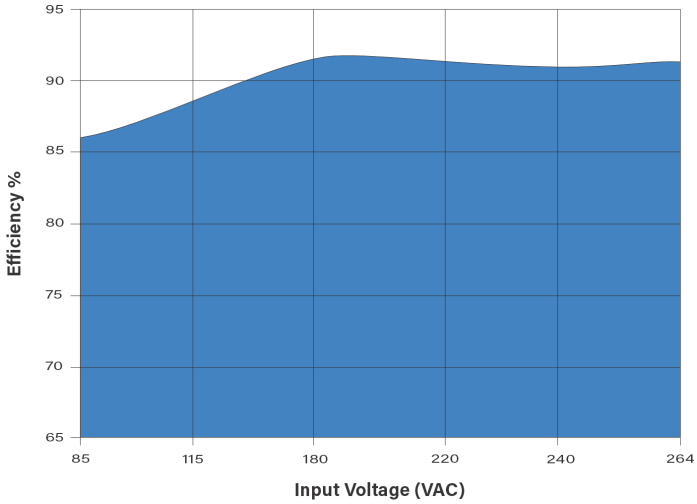
### Efficiency vs Input Voltage: 24V



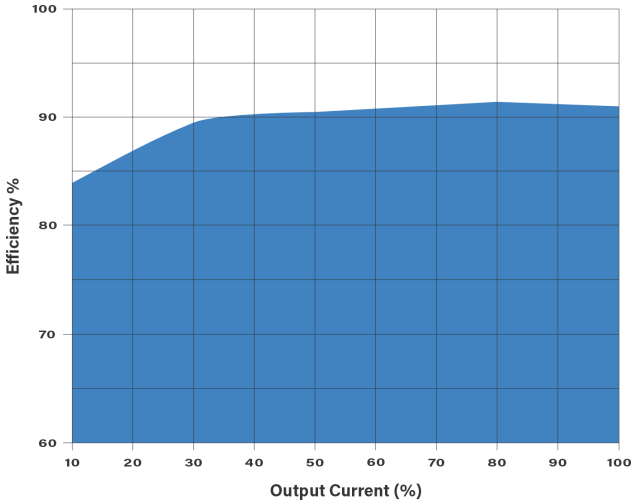

### Efficiency vs Output Load: 24V (230VAC)




### Efficiency vs Input Voltage: 48V



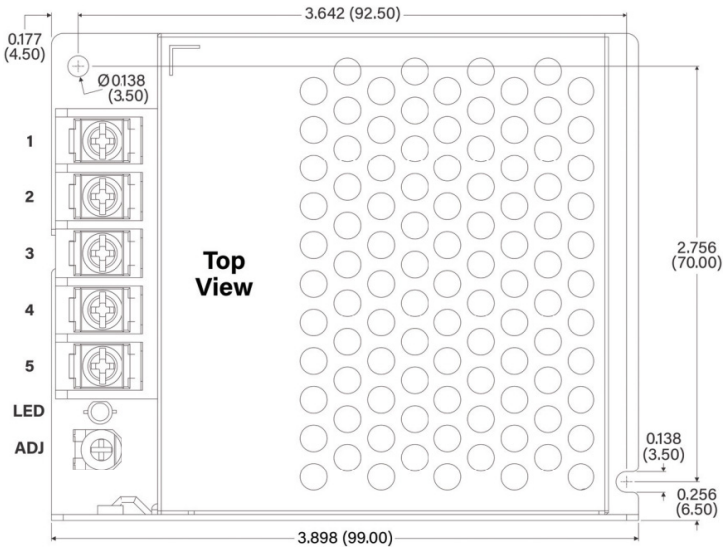

### Efficiency vs Output Load: 48V (230VAC)

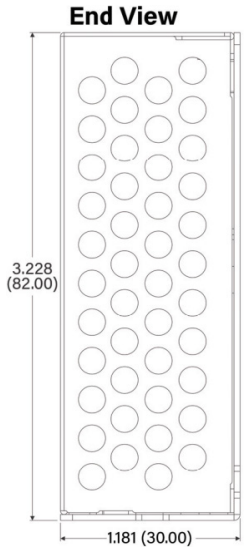



## EMI Characteristics

| Parameter | Standard | Criteria | Level |
|---|---|---|---|
| Radiated Emissions (RE) | CISPR32/EN55032 | | B |
| Conducted Emissions (CE) | CISPR32/EN55032 | | B |
| Harmonic Current | IEC/EN61000-3-2 | | A |
| ESD | IEC/EN61000-4-2 | A | Contact ±6kV/Air ±8KV |
| RS | IEC/EN61000-4-3 | A | 10V/m |
| EFT | IEC/EN61000-4-4 | A | ±2KV |
| Surge | IEC/EN61000-4-5 | A | line to line ±2KV/line to ground ±4KV |
| CS | IEC/EN61000-4-6 | A | 10 Vr.m.s |
| MS | IEC/EN61000-4-8 | A | 30A/m |
| Voltage Dips, Short, Interruption | IEC/EN61000-4-11 | B | 0%, 70% |

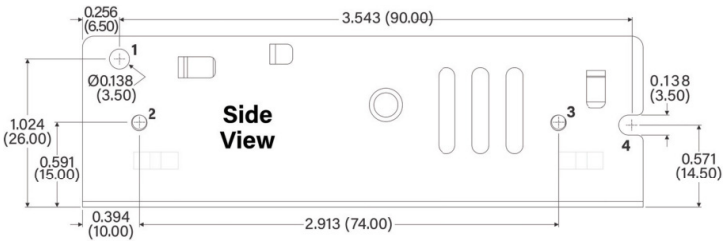
## Mechanical Diagrams



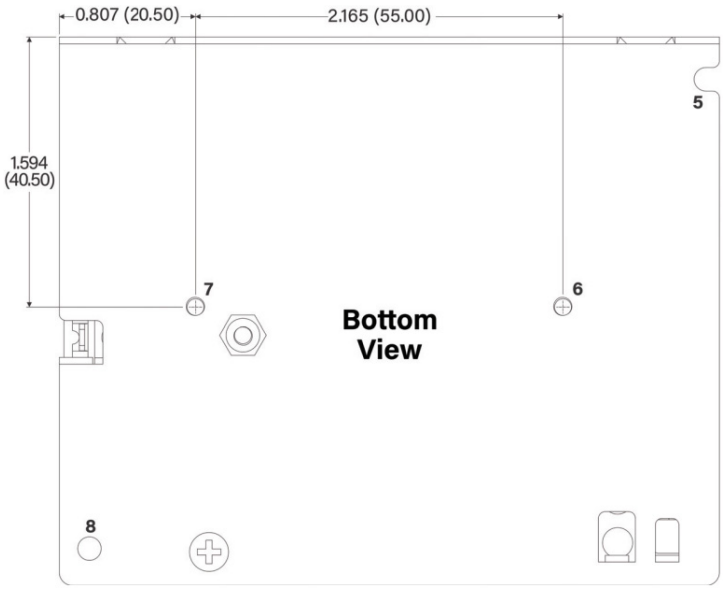

THIRD ANGLE PROJECTION

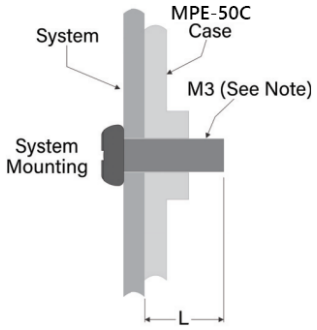
| Pin-Out | |
|---|---|
| **Pin** | **Function** |
| 1 | AC(L) |
| 2 | AC(N) |
| 3 | GRND |
| 4 | -Vo |
| 5 | +Vo |




| Position | Screw Spec | Length of Locking Screw L (max) | Torque (max) |
|---|---|---|---|
| 2 - 3 | M3 | 5mm | 0.4N · m |
| 6 - 7 | M3 | 3mm | 0.4N · m |

1 - 8 any position must be connected to PE




**Notes:**
- All dimensions are typical in inches (mm)
- ADJ: Output voltage adjustable
- Wire range: 22-12AWG
- Connector tightening torque: M3.5, Max 0.8N · m
- General tolerances: ±0.039 (±1.00)

**Weight:**
- 6.35 oz (180g)