

# MPE-350C

## 350W, High Isolation AC/DC Power Supplies



### Key Features:

- 350W Output Power
- Selectable AC Input Range
- Operating Up To 5000m Altitude
- 3,000 VAC Isolation
- Efficiency to 88.5%
- -30°C to +70°C Temp
- Meets EN 55032 A
- >300 kHour MBTF
- UL62368 Approval



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### 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   | Low Voltage (switch position 115)  | 90   |      | 132  | VAC   |
|                             |            | High Voltage (switch position 230) | 180  |      | 264  |       |
|                             | DC Input   | Switch position 230                | 240  |      | 370  | VDC   |
| Input Frequency             |            |                                    | 47   |      | 63   | Hz    |
| Input Current               |            | 115 VAC                            |      | 6.8  | 8.0  | A     |
|                             |            | 230 VAC                            |      | 3.4  | 4.0  |       |
| Inrush Current (Cold Start) |            | 115 VAC                            |      | 60   |      | A     |
|                             |            | 230 VAC                            |      | 60   |      |       |
| Leakage Current             |            | 240 VAC                            |      |      | 0.75 | mA    |

#### Output

| Parameter                   | Conditions      |   | Min.                              | Typ.  | Max. | Units    |
|-----------------------------|-----------------|---|-----------------------------------|-------|------|----------|
| Output Voltage Accuracy     | Full Load Range | 5V Output                                     |                                   | ±3    |      | %        |
|                             |                 | 12V Output                                    |                                   | ±1.5  |      |          |
|                             |                 | 15, 24, 36, 48V Outputs                       |                                   | ±1.0  |      |          |
| Line Regulation             |                 | Rated Load                                    |                                   | ±0.5  |      | %        |
| Load Regulation             | 0-100% Load     | 5V Output                                     |                                   | ±2    |      | %        |
|                             |                 | 12V Output                                    |                                   | ±1    |      |          |
|                             |                 | 15, 24, 36, 48V Outputs                       |                                   | ±0.5  |      |          |
| Ripple & Noise, See Note 1  | 20 MHz          | 5, 12, 15, 24V Outputs                        |                                   |       | 150  | mV P - P |
|                             |                 | 36, 48V Outputs                               |                                   |       | 200  |          |
| Hold-Up Time                |                 | 115 VAC                                       |                                   | 12    |      | ms       |
|                             |                 | 230 VAC                                       |                                   | 16    |      |          |
| Standby Power Consumption   |                 | 230 VAC, 25°C                                 |                                   |       | 1    | W        |
| Temperature Derating        |                 | +50°C to +70°C                                | 2                                 |       |      | %/°C     |
| Input Voltage Derating      |                 | 90 - 100 VAC                                  | 2                                 |       |      | %/VAC    |
| Temperature Coefficient     |                 |   |                                   | ±0.02 |      | %/°C     |
| Short Circuit Protection    |                 | Recovery time <8s after short circuit removed | Hiccup, Continuous, Self-Recovery |       |      |          |
| Over Current Protection     |                 |   | 110                               |       | 180  | %Io      |
| Over Temperature Protection |                 |   | Hiccup, Self-Recover              |       |      |          |

#### General

| Parameter            | Conditions      |               | Min.  | Typ. | Max. | Units |
|----------------------|-----------------|---------------|-------|------|------|-------|
| Isolation Voltage    | Input - Ground  | Leakage <3 mA | 2,000 |      |      | VAC   |
|                      | Input - Output  | Leakage <5 mA | 3,000 |      |      |       |
|                      | Output - Ground | Leakage <3 mA | 500   |      |      |       |
| Isolation Resistance |                 | See Note 6    | 100   |      |      | MΩ    |
| Switching Frequency  |                 |               |       | 65   |      | kHz   |

#### EMI Characteristics

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

#### Environmental

| Parameter                   | Conditions         | Min. | Typ. | Max. | Units |
|-----------------------------|--------------------|------|------|------|-------|
| Operating Temperature Range | Ambient            | -30  |      | +70  | °C    |
| Storage Temperature Range   |                    | -40  |      | +85  | °C    |
| Cooling                     | Forced Air Cooling |      |      |      |       |
| Operating Humidity          | Non-condensing     | 20   |      | 90   | %RH   |
| Storage Humidity            |                    | 10   |      | 95   |       |

#### Physical

|               |  |
|---------------|--|
| Case Size     | 8.46 x 4.53 x 1.18 in (See Mechanical Drawing on Page 4) |
| Case Material | Metal (AL1100, SGCC)                                     |
| Weight        | 24.69 oz (700g) (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 | See Model Selection Guide       |      |      |      |        |
| Safety Class     | Class I                         |      |      |      |        |

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Model Selection Guide

| UL | Model Number | Input              |         | Output        |                                |                  |           | Over Voltage Protection (VDC) | Output Capacitive Load (μF Max) | Efficiency (% Typ) |
|----|--------------|--------------------|---------|---------------|--------------------------------|------------------|-----------|-------------------------------|---------------------------------|--------------------|
|    |              | Current (mA) (Max) |         | Voltage (VDC) | Voltage Adjustable Range (VDC) | Current (A, Max) | Power (W) |                               |                                 |                    |
|    |              | 115 VAC            | 230 VAC |               |                                |                  |           |                               |                                 |                    |
|    | MPE-350C-05  | 8000               | 4000    | 5             | 4.5 - 5.5                      | 60               | 300       | 5.75 - 6.75                   | 10000                           | 83.5               |
| ▪  | MPE-350C-12  | 8000               | 4000    | 12            | 10.2 - 13.8                    | 29               | 348       | 13.8 - 16.2                   | 4000                            | 85                 |
|    | MPE-350C-15  | 8000               | 4000    | 15            | 13.5 - 18                      | 23.2             | 348       | 18 - 21                       | 3300                            | 86                 |
| ▪  | MPE-350C-24  | 8000               | 4000    | 24            | 21.6 - 28.8                    | 14.6             | 350.4     | 28.8 - 33.6                   | 1500                            | 87                 |
|    | MPE-350C-36  | 8000               | 4000    | 36            | 32.4 - 39.6                    | 9.7              | 349.2     | 41.4 - 46.8                   | 1500                            | 88                 |
| ▪  | MPE-350C-48  | 8000               | 4000    | 48            | 43.2 - 52.8                    | 7.3              | 350.4     | 55.2 - 62.4                   | 470                             | 88.5               |

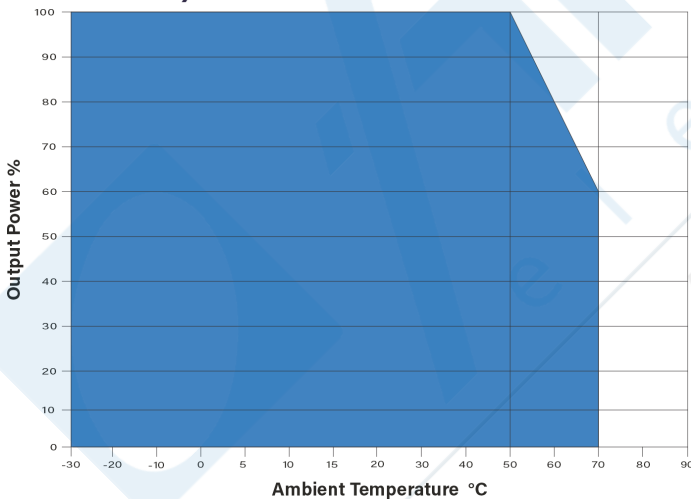
\* MPE-350C-12, -24, -48 have UL/cUL 62368-1 recognition (UL certificate). Contact factory for safety standard status of other models.

Notes:

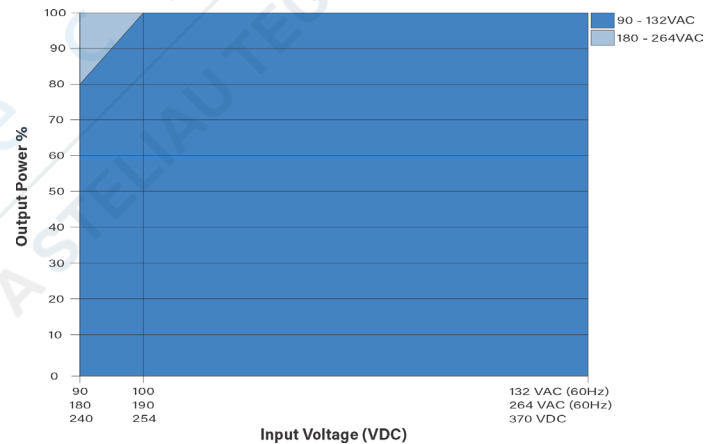
- The "tip and barrel method" is used for ripple and noise test, output parallel 47μF electrolytic capacitor and 0.1μF ceramic capacitor.
- Output short circuit protection is provided by a "hiccup mode" circuit. The unit recovers automatically when the fault condition is removed.
- Input-output isolation is tested for 60 seconds.
- A temperature derating of 5°C/1000m is required for operating altitude greater than 2000m.
- The output voltage can be adjusted by the ADJ knob. Turn clockwise to increase and counterclockwise to decrease.
- Isolation resistance is given for input - output, input - ground and output - ground. It is tested at 500VDC with an ambient temperature of 25±5°C and relative humidity <95%RH, no condensation.
- One magnetic bead should be coupled with the output load during CE/RE testing.

For conformal coating option, add the suffix "-CC" to the model number (e.g. MPE-350C-05-CC).

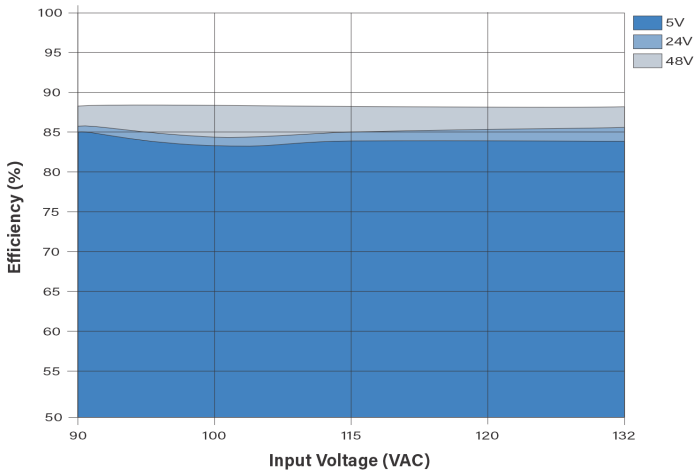
Temperature Derating (90-132VAC, 180-264VAC, 240-270VDC)



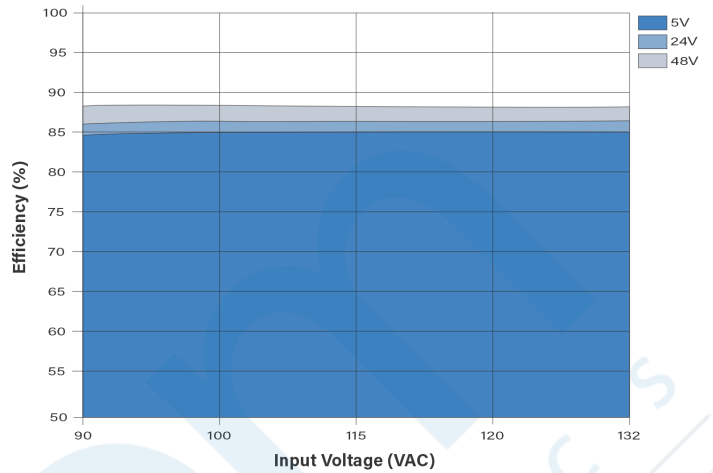
Input Voltage Derating



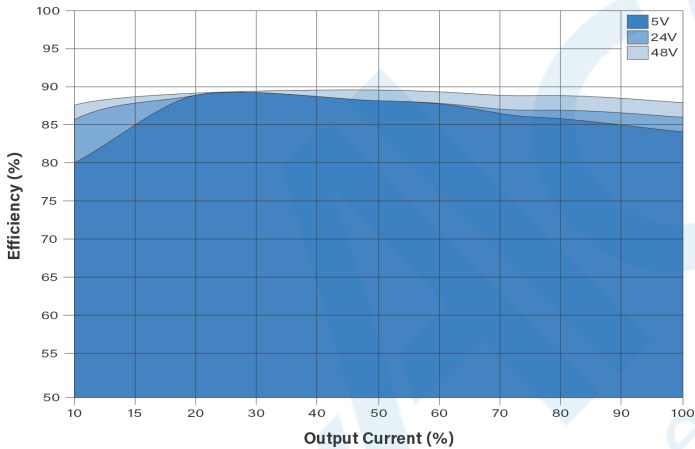
Efficiency vs Input Voltage (Full Load) (90-132VAC)



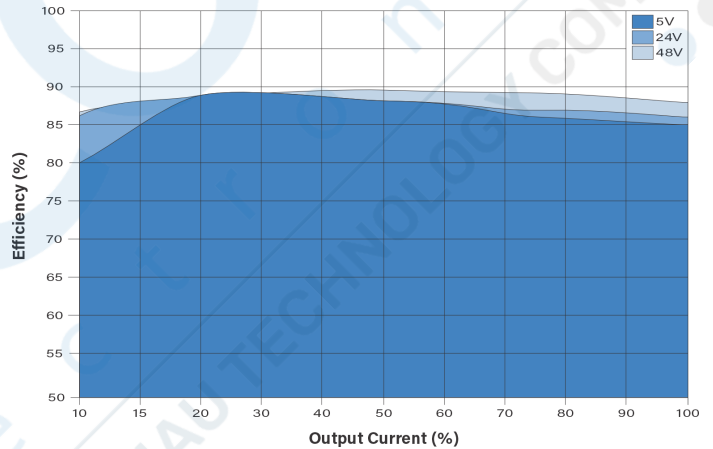
Efficiency vs Input Voltage (Full Load) (180-264VAC)



Efficiency vs Output Load (115VAC)



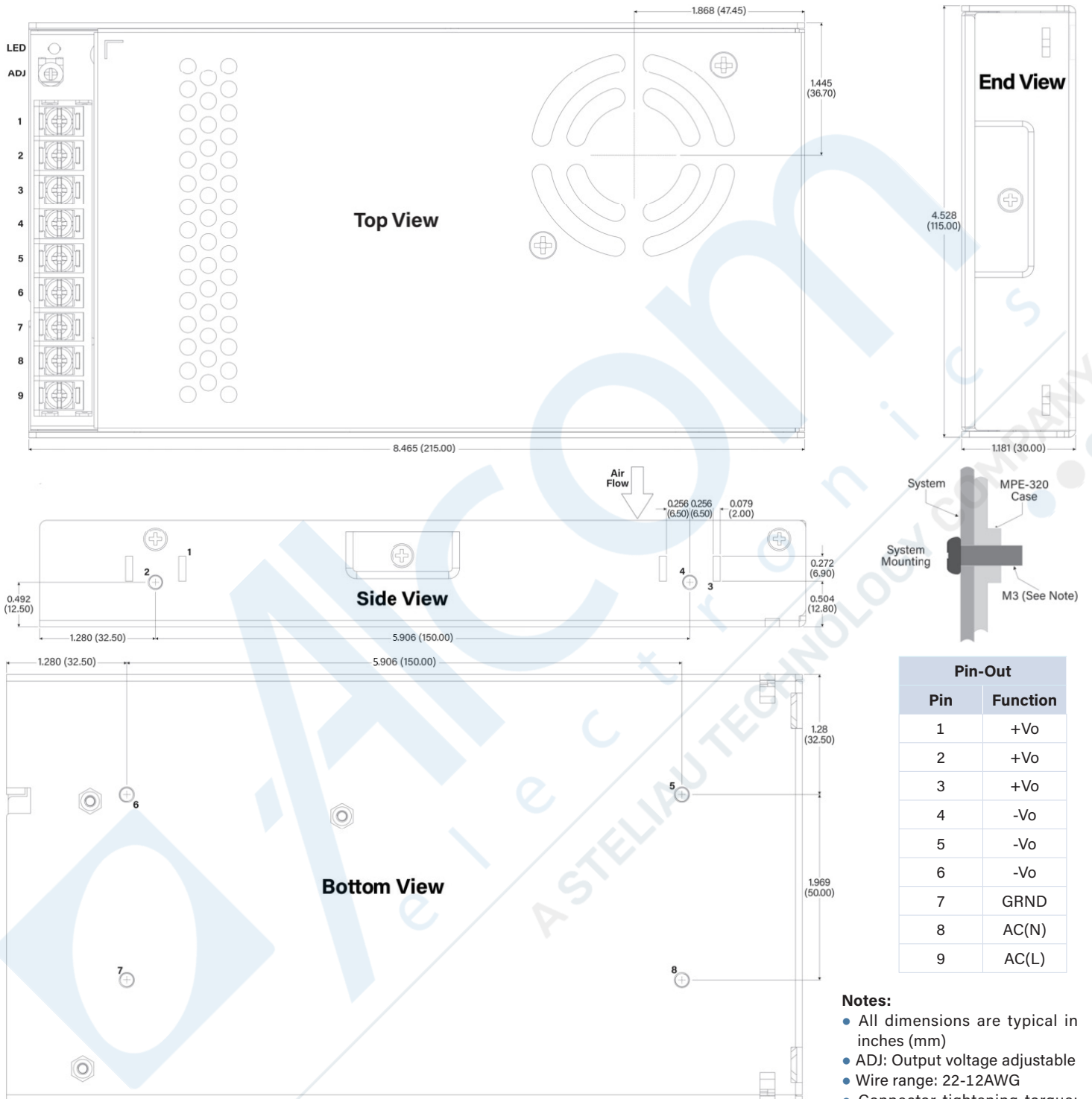
Efficiency vs Output Load (230VAC)



## EMI Characteristics

| Parameter                         | Standard         | Criteria | Level                                 |
|-----------------------------------|------------------|----------|---------------------------------------|
| Radiated Emissions (RE)           | CISPR32/EN55032  |          | A                                     |
| Conducted Emissions (CE)          | CISPR32/EN55032  |          | 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                             |
| Voltage Dips, Short, Interruption | IEC/EN61000-4-11 | B        | 0%, 70%                               |

Mechanical Diagrams



| Pin-Out |          |
|---------|----------|
| Pin     | Function |
| 1       | +Vo      |
| 2       | +Vo      |
| 3       | +Vo      |
| 4       | -Vo      |
| 5       | -Vo      |
| 6       | -Vo      |
| 7       | GRND     |
| 8       | AC(N)    |
| 9       | AC(L)    |

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 Max
- General tolerances: ±0.039 (±1.00)
- 1 - 8 any position must be connected to PE

Weight:

- 24.69 oz (700g)

| Switch | AC Input      | DC Input      |
|--------|---------------|---------------|
|        | 90 - 132 VAC  | -             |
|        | 180 - 264 VAC | 240 - 370 VDC |

| Position | Screw | Length L (max) | Torque (max) |
|----------|-------|----------------|--------------|
| 1 - 4    | M4    | 5mm            | 0.9N · m     |
| 5 - 8    | M4    | 3mm            | 0.9N · m     |