



## FEATURES

- ITE (2nd) and Medical (3rd ed. MOOP, Risk management) safety approved
- 65W compact high density
- 2" x 4" standard footprint
- High efficiency up to 90%
- Remote Sense
- Universal AC input
- Low profile - 1U package
- Convection-cooled operation up to 65W
- Complies with 5000m altitude
- RoHS compliant
- Input power < 74W
- Input power < 0.3W @ no load
- Complies with ErP/Energy Star requirement (average efficiency > 87%)

## DESCRIPTION

The MVAD065 series switching power supplies utilize advanced component and circuit technologies to deliver high efficiency. Designed for Medical, Telecom, and Industrial applications to satisfy 1U height design considerations, the MVAD065 Series measures only 2.0" x 4.0" x 1.3". All models offer universal AC input and compliance to worldwide safety and EMC standards.



Available now at  
[www.murata-ps.com/en/3d/acdc.html](http://www.murata-ps.com/en/3d/acdc.html)



For full details go to  
[www.murata-ps.com/rohs](http://www.murata-ps.com/rohs)



(pending)

(pending)

(pending)

# MVAD065 Series

**PRELIMINARY** 65W High Density AC/DC Power Supply

## ORDERING GUIDE

| Model Number | Natural Convection Cooling | Main Output (V1) |
|--------------|----------------------------|------------------|
| MVAD065-12   | 60W                        | 12V              |
| MVAD065-24   |                            | 24V              |
| MVAD065-48   | 65W                        | 48V              |

## INPUT CHARACTERISTICS

| Parameter                     | Conditions                    | Min. | Typ.    | Max. | Units |
|-------------------------------|-------------------------------|------|---------|------|-------|
| Input Voltage Operating Range | Single phase                  | 90   | 120/230 | 264  | Vac   |
|                               | DC                            | 120  |         | 300  | Vdc   |
| Input Frequency               |                               | 47   | 50/60   | 63   | Hz    |
| Turn-on Input Voltage         | Input rising at full load     | 70   |         | 85   | Vac   |
| Turn-off Input Voltage        | Input falling at full load    | 70   |         | 85   |       |
| Input Current                 | 90Vac input, full load        |      |         | 1.4  | A     |
| Inrush Current                | At 264Vac, at 25°C cold start |      | 60      |      | Apk   |

## OUTPUT CHARACTERISTICS

| Model Number | Main Output Voltage (V1) | Load Current | Load Capacitance | Line, Load, Cross Regulation | Typical Efficiency @230Vac full load |
|--------------|--------------------------|--------------|------------------|------------------------------|--------------------------------------|
| MVAD065-12   | 12V                      | 0 to 5.0A    | 0 to 1000µF      | ± 2%                         | 88%                                  |
| MVAD065-24   | 24V                      | 0 to 2.71A   | 0 to 560µF       | ± 2%                         | 89%                                  |
| MVAD065-48   | 48V                      | 0 to 1.36A   | 0 to 330µF       | ± 2%                         | 90%                                  |

## Main Output Characteristics (all models)

| Parameter                           | Conditions   | Min. | Max.  | Units |
|-------------------------------------|--|------|-------|-------|
| Transient Response                  | 50% load step, 1A/µsec slew rate   |      | ± 5   | %     |
| Settling Time to 1% of Nominal      |  |      | 200   | µsec  |
| Turn On Delay                       | After application of input power   |      | 1     | sec   |
| Output Voltage Rise                 | Monotonic, 0 to 100% load  |      | 50    | msec  |
| Setpoint Accuracy                   | 120Vac, 40W, 25°C  |      | ± 0.5 | %     |
| Output Holdup                       | 115Vac, 100% load  | 10   |       | msec  |
| Temperature Coefficient             |  |      | 0.02  | %/°C  |
| Ripple Voltage & Noise <sup>1</sup> |  |      | 1     | %     |
| Remote Sense <sup>3</sup>           | Compensates for up to 0.4V of lead drop with remote sense connected. Protected against short circuit and reverse connection. |      |       |       |

1. Ripple and noise are measured with 0.1 uF of ceramic capacitance and 47 uF of electrolytic capacitance on each of the power supply outputs. A short coaxial cable with 50ohm scope termination is used.

2. Unless otherwise specified all readings are taken at 120Vac input and 25 °C ambient temperature.

3. 0.4V lead drop is compensated in remote sense.

| ENVIRONMENTAL CHARACTERISTICS |  |          |      |      |       |
|-------------------------------|--|----------|------|------|-------|
| Parameter                     | Conditions   | Min.     | Typ. | Max. | Units |
| Storage Temperature Range     |  | -40      |      | 85   | °C    |
|                               | Full load  | -10      |      | 50   |       |
|                               | 50% load   | -10      |      | 70   |       |
| Operating Temperature Range   | Start up   | -20      |      |      |       |
|                               | Operating Humidity   | 10       |      | 95   | %     |
|                               | Operating Altitude   | -200     |      | 5000 | m     |
| MTBF                          | Telcordia SR-332 M1C3 25°C   | 1M       |      |      | Hours |
| Shock                         | Operating, IEC60068-2-27, half-sine 5G, 6ms, 3 times per face, 6 faces   | Complies |      |      |       |
|                               | Non-operating, IEC60068-2-27, half-sine, 30G, 18ms, 3 times per face, 6 faces  | Complies |      |      |       |
| Vibration                     | Operating, IEC60068-2-6, 1.0G, 10-150Hz, 10 minutes per axis, on all 3 axes  | Complies |      |      |       |
|                               | Non-operating, IEC60068-2-6, 2.0G, 10-150Hz, 10 minutes per axis, on all 3 axes  | Complies |      |      |       |
| Safety (pending)              | IEC60950-1:2006/A11:2009<br>UL60950-1 2nd Ed. 2007-03-27, CSA22.2 NO.60950-1 2nd Ed. 2007.03,<br>EN60950-1:2006+A11:2009<br>IEC60601-1 Ed. 3 MOOP<br>ANSI/AAMI ES60601-1 (2005+C1:09+A2:10), CSA 22.2 No. 60601-1 (2008) 3rd Edition MOOP<br>EN60601-1:2006 3rd ed. MOOP (Evaluated)<br>CE Marking per LVD |          |      |      |       |
| Warranty                      | 2 years  |          |      |      |       |
| Outside Dimensions            | 2.0" x 4.0" x 1.3" (50.8mm x 101.6mm x 33.02mm)  |          |      |      |       |
| Weight                        | 0.27lbs (123g) typical   |          |      |      |       |

| PROTECTION CHARACTERISTICS |                     |      |      |      |       |
|----------------------------|---------------------|------|------|------|-------|
| Parameter                  | Conditions          | Min. | Typ. | Max. | Units |
| Overvoltage Protection     | Latching (60% load) | 110  |      | 160  | %V1   |
| Overcurrent Protection     | Hiccup mode         | 110  |      | 160  | %Amax |

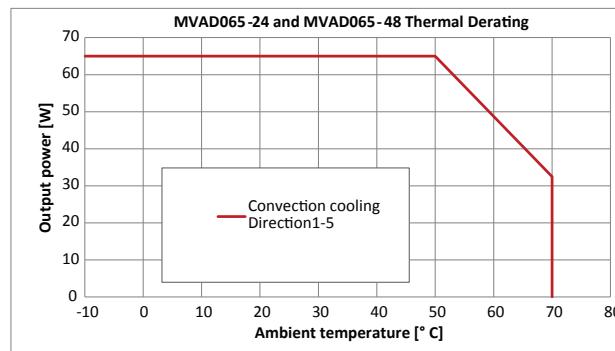
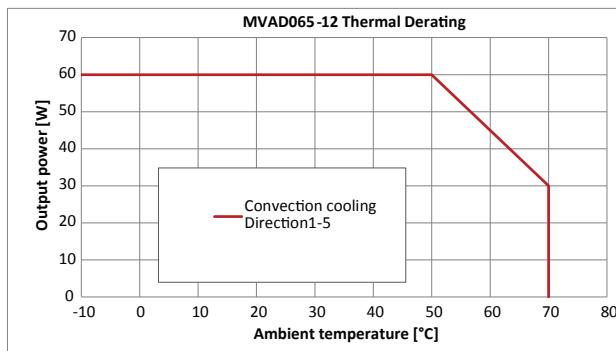
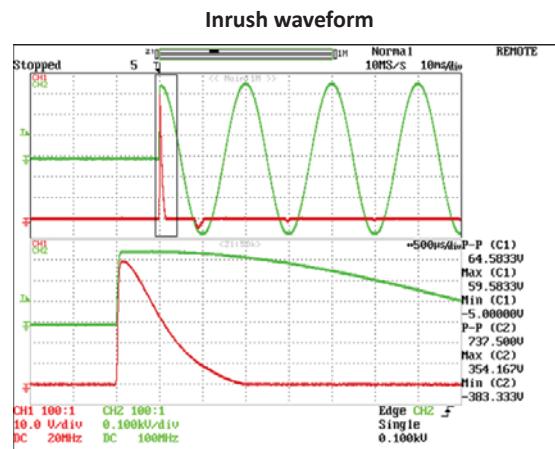
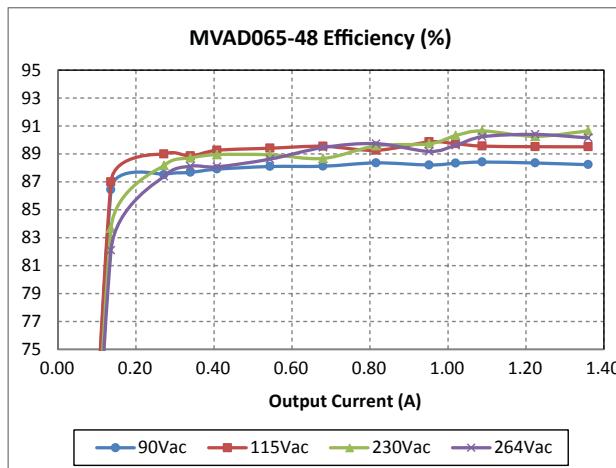
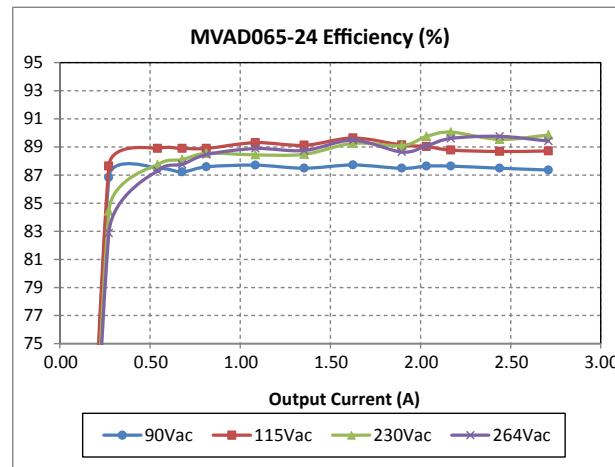
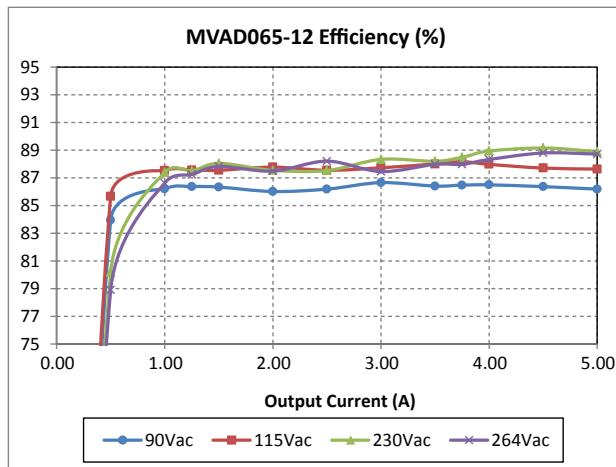
| ISOLATION CHARACTERISTICS |                      |              |      |      |       |
|---------------------------|----------------------|--------------|------|------|-------|
| Parameter                 | Conditions           | Min.         | Typ. | Max. | Units |
| Isolation                 | Primary to Chassis   | 1500 (1MOOP) |      |      | Vac   |
|                           | Primary to Secondary | 3000 (2MOOP) |      |      |       |
|                           | Secondary to Chassis | 500          |      |      | Vdc   |
| Leakage Current           | 264Vac, 60Hz, 25°C   |              |      | 250  | µA    |
| Touch Current             | 264Vac, 60Hz, 25°C   |              |      | 100  | µA    |

| EMISSIONS AND IMMUNITY             |                   |                      |  |  |  |
|------------------------------------|-------------------|----------------------|--|--|--|
| Characteristic                     | Standard          | Compliance           |  |  |  |
| Input Current Harmonics            | IEC/EN 61000-3-2  | Class A              |  |  |  |
| Voltage Fluctuation and Flicker    | IEC/EN 61000-3-3  | Complies             |  |  |  |
| Conducted Emissions                | EN 55022          | Class B              |  |  |  |
| FCC Part 15                        |                   | Class B              |  |  |  |
| ESD Immunity                       | IEC/EN 61000-4-2  | Level 4, Criterion A |  |  |  |
| Radiated Field Immunity            | IEC/EN 61000-4-3  | Level 2, Criterion A |  |  |  |
| Electrical Fast Transient Immunity | IEC/EN 61000-4-4  | Level 3, Criterion A |  |  |  |
| Surge Immunity                     | IEC/EN 61000-4-5  | Level 4, Criterion A |  |  |  |
| RF Conducted Immunity              | IEC/EN 61000-4-6  | Level 2, Criterion A |  |  |  |
| Magnetic Field Immunity            | IEC/EN 61000-4-8  | Level 2, Criterion A |  |  |  |
| Voltage dips, interruptions        | IEC/EN 61000-4-11 | Level 3, Criterion B |  |  |  |

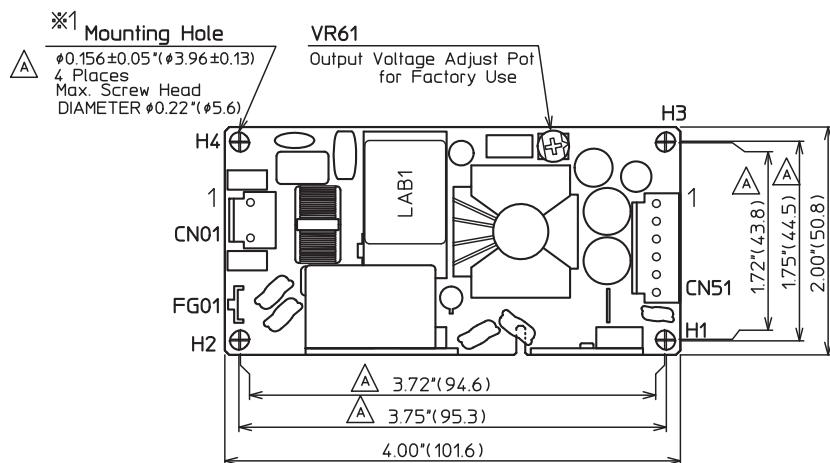
## EMI CONSIDERATIONS

For optimum EMI performance, the power supply should be mounted to a metal plate grounded to all 4 mounting holes of the power supply. To comply with safety standards, this plate must be properly grounded to protective earth (see mechanical dimension notes). Pre-compliance testing has shown the stand-alone power supply to comply with EN55022 class A radiated emissions. Radiated emission results vary with system enclosure and cable routing paths.

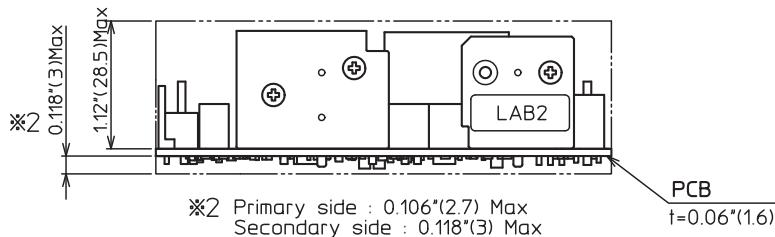
## PERFORMANCE DATA



## MECHANICAL DIMENSIONS – MVAD065-12 ONLY



※1 Preferred screw type:  
M3 (Metric screw threads)  
No.4-40UNC (Unified Thread Standard)



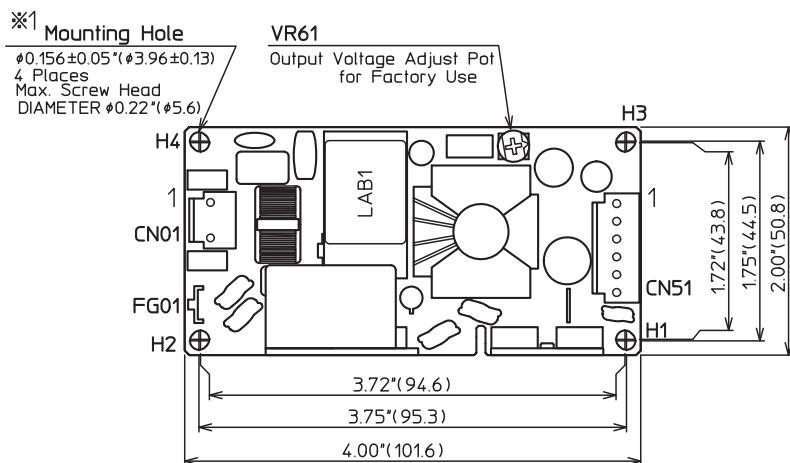
- All dimensions in inches (mm), tolerance is +/-0.02" (0.5mm)
- Mounting holes H1 and H4 should be grounded for EMI purpose
- Mounting hole H1 is safely ground connection
- This power supply requires mounting on standoffs minimum 0.20" (5.0mm) in height

Dimensions: 2.0" x 4.0" x 1.3" (50.8mm x 101.6mm x 33.02mm)

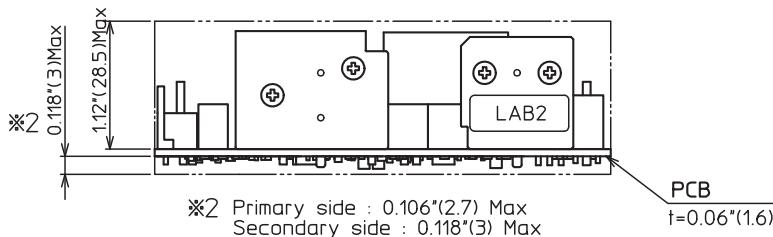
## INPUT/OUTPUT CONNECTOR AND SIGNAL SPECIFICATION AND MATING CONNECTORS

| PIN                                     | Description        | Mating Housing                     | Crimp terminal/pins |
|---|--------------------|------------------------------------|---------------------|
| Input Connector CN1 : Molex 26-62-4030  |                    |                                    |                     |
| 1                                       | AC Line (V-)       | Molex 09-50-8031 with locking ramp | Molex 6838 Series   |
| 3                                       | AC Neutral (V+)    |                                    |                     |
| Spade Connector: #250                   |                    |                                    |                     |
| GND                                     | Earth Ground       |                                    |                     |
| Output Connector CN2 : Molex 26-60-4060 |                    |                                    |                     |
| 1, 2                                    | V1                 |                                    |                     |
| 3, 4                                    | DC Return          | Molex 09-50-8061 with locking ramp | Molex 6838 Series   |
| 5                                       | -Remote Sense (NC) |                                    |                     |
| 6                                       | +Remote Sense      |                                    |                     |

## MECHANICAL DIMENSIONS – MVAD065-xx 24V and 48V MODELS



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M3 (Metric screw threads)  
No.4-40UNC (Unified Thread Standard)



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| 5                                       | -Remote Sense (NC) |                                    |                     |
| 6                                       | +Remote Sense      |                                    |                     |

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