



### FEATURES

- ITE (2nd) and Medical 3rd ed. 1MOPP (primary-secondary) safety approved
- 120W compact high density
- 2" x 4" standard footprint
- High efficiency up to 91%
- Universal AC input with active PFC
- Low profile - 1U package
- Convection-cooled operation up to 75W
- RoHS compliant
- UL Class I and II approved (for IT equipment)

### DESCRIPTION

The MVAB120 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 MVAB120 Series measures only 2.0" x 4.0" x 1.35". All models offer universal AC input with active power factor correction (PFC) 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)

### ORDERING GUIDE

| Model Number  | Medical Approval <sup>1</sup> | Natural Convection Cooling | Forced Air Cooling | Main Output (V1) |
|---------------|-------------------------------|----------------------------|--------------------|------------------|
| MVAB120-12    | No                            | 75W                        | 120W @ 250LFM      | 12V              |
| MVAB120-12-01 | Yes                           |                            |                    |                  |
| MVAB120-24    | No                            |                            |                    | 24V              |
| MVAB120-24-01 | Yes                           |                            |                    |                  |
| MVAB120-28    | No                            |                            |                    | 28V              |
| MVAB120-28-01 | Yes                           |                            |                    |                  |
| MVAB120-48    | No                            |                            |                    | 48V              |
| MVAB120-48-01 | Yes                           |                            |                    |                  |

### INPUT CHARACTERISTICS

| Parameter                     | Conditions                    | Min. | Typ.    | Max. | Units |
|-------------------------------|-------------------------------|------|---------|------|-------|
| Input Voltage Operating Range | Single phase                  | 90   | 120/230 | 264  | Vac   |
|                               | DC <sup>1</sup>               | 120  |         | 300  | Vdc   |
| Input Frequency               |                               | 47   | 50/60   | 63   | Hz    |
| Turn-on Input Voltage         | Input rising at 75W           | 76   |         | 85   | Vac   |
| Turn-off Input Voltage        | Input falling at 75W          | 50   |         |      |       |
| Input Current                 | 90Vac input, full load        |      |         | 1.9  | A     |
| Inrush Current                | At 264Vac, at 25°C cold start |      |         | 75   | Apk   |

### OUTPUT CHARACTERISTICS

| Model Number  | Main Output Voltage (V1) | Load Current | Load Capacitance | Line, Load, Cross Regulation | Typical Efficiency @230Vac full load |
|---------------|--------------------------|--------------|------------------|------------------------------|--------------------------------------|
| MVAB120-12    | 12V                      | 0 to 10.0A   | 0 to 3300µF      | ± 2%                         | 88%                                  |
| MVAB120-12-01 |                          |              |                  |                              |                                      |
| MVAB120-24    | 24V                      | 0 to 5.0A    | 0 to 1000µF      | ± 2%                         | 90%                                  |
| MVAB120-24-01 |                          |              |                  |                              |                                      |
| MVAB120-28    | 28V                      | 0 to 4.29A   | 0 to 1000µF      | ± 2%                         | 90%                                  |
| MVAB120-28-01 |                          |              |                  |                              |                                      |
| MVAB120-48    | 48V                      | 0 to 2.5A    | 0 to 1000µF      | ± 2%                         | 91%                                  |
| MVAB120-48-01 |                          |              |                  |                              |                                      |

### 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      | MVAB120-12                         |      | 750   | µsec  |
|                                     | MVAB120-24, MVAB120-28, MVAB120-48 |      | 500   | µsec  |
| Turn On Delay                       | After application of input power   |      | 1     | sec   |
| Output Voltage Rise                 | Monotonic, 0 to 75W                |      | 50    | msec  |
| Setpoint Accuracy                   | 120Vac, 75W, 25°C                  |      | ± 0.5 | %     |
| Output Holdup                       | Full load                          | 14   |       | msec  |
| Temperature Coefficient             |                                    |      | 0.02  | %/°C  |
| Ripple Voltage & Noise <sup>2</sup> |                                    |      | 1     | %     |

1 Medical versions not designed for DC input voltage.

2 Ripple and noise are measured with 0.1 µF of ceramic capacitance and 47 µF of electrolytic capacitance on each of the power supply outputs. The output noise requirements apply over a 0 Hz to 20 MHz bandwidth. A short coaxial cable with 50Ω scope termination is used.

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



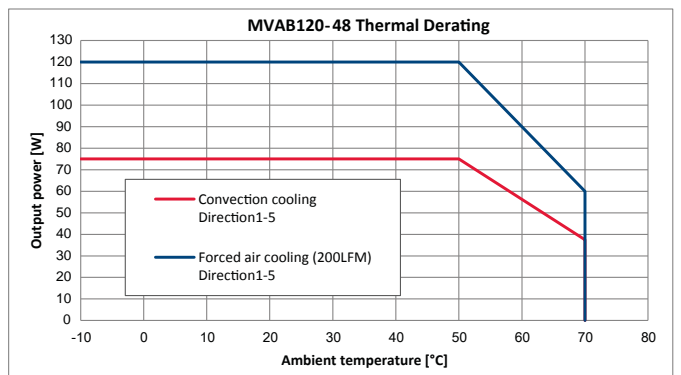
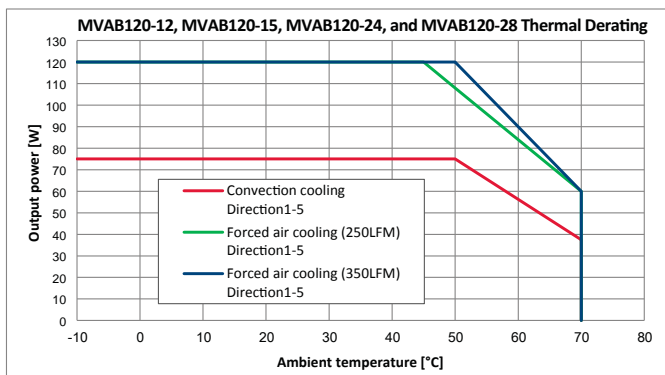
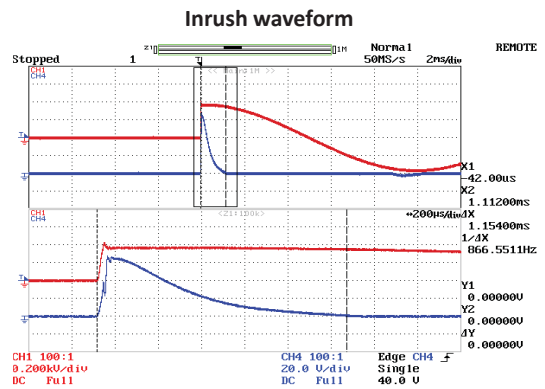
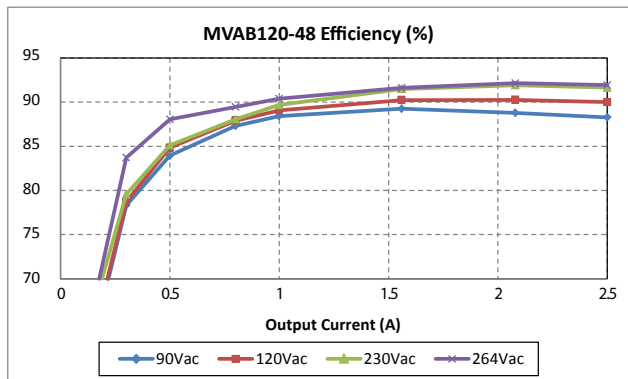
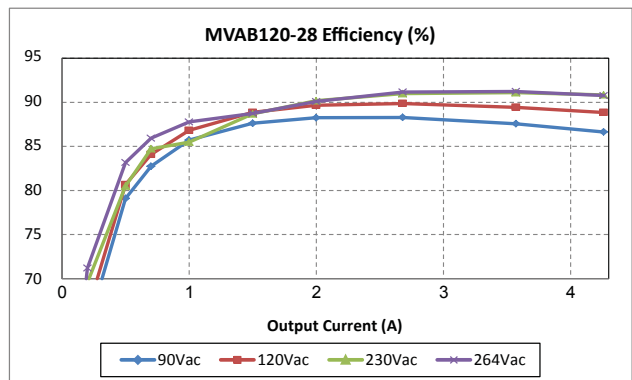
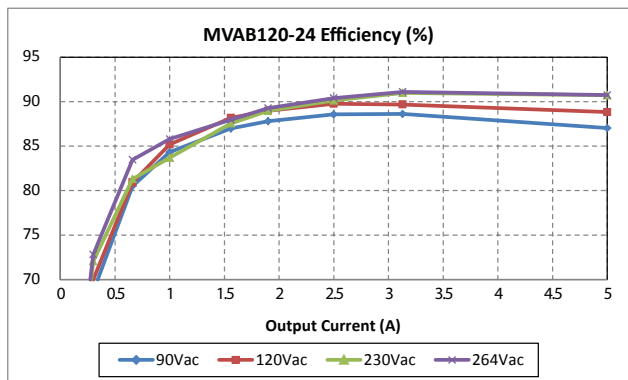
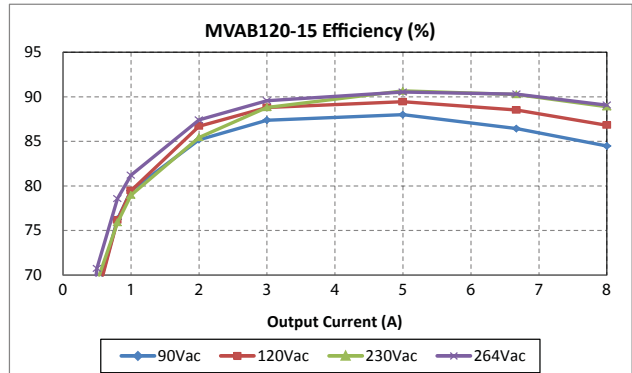
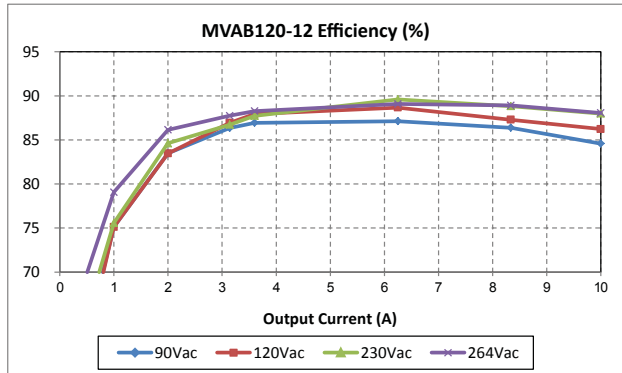
| ENVIRONMENTAL CHARACTERISTICS |  |                        |      |      |       |
|-------------------------------|--|------------------------|------|------|-------|
| Parameter                     | Conditions   | Min.                   | Typ. | Max. | Units |
| Storage Temperature Range     |  | -40                    |      | 85   | °C    |
| Operating Temperature Range   | Full load  | -10                    |      | 50   |       |
|                               | 50% load   | -10                    |      | 70   |       |
|                               | Start up   | -20                    |      |      |       |
| Operating Humidity            | Non-condensing   | 10                     |      | 95   | %     |
| Operating Altitude            | Without derating   | -200                   |      | 3000 | 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, 10minutes per axis, on all 3 axes   | Complies               |      |      |       |
|                               | Non-operating, IEC60068-2-6, 2.0G, 10-150Hz, 10minutes per axis, on all 3 axes   | Complies               |      |      |       |
| Safety                        | IEC60950-1:2005 (2nd Edition); Am1:2009<br>UL60950-1 2nd Edition,2011-12-19, CSA C22.2 No. 60950-1-07, 2nd Edition,2011-12<br>EN60950-1:2006 + A11:2009 + A1:2010 + A12:2011<br>IEC60601-1:2005 + CORR.1(2006) + CORR.2(2007)<br>ANSI/AAMI ES60601-1 (2005+C1:09 + A2:10), CSA-C22.2 No. 60601-1(2008), MOPP<br>CE Marking per LVD |                        |      |      |       |
| Warranty                      | 2 years  |                        |      |      |       |
| Outside Dimensions            | 2.0" x 4.0" x 1.35" (50.8mm x 101.6mm x 34.3mm); 2.0" x 4.0" x 1.41" (50.8mm x 101.6mm x 35.8mm) for medical version   |                        |      |      |       |
| Weight                        | MVAB120-12/-01   | 0.34lbs (155g) typical |      |      |       |
|                               | MVAB120-24/-01, MVAB120-28/-01, MVAB120-48/-01   | 0.36lbs (162g) typical |      |      |       |

| PROTECTION CHARACTERISTICS |               |      |          |      |       |
|----------------------------|---------------|------|----------|------|-------|
| Parameter                  | Conditions    | Min. | Typ.     | Max. | Units |
| Overvoltage Protection     | Latching      | 110  |          | 160  | %V1   |
| Overcurrent Protection     | Hiccup mode   | 105  |          | 150  | %Amax |
| Overtemperature Protection | Auto recovery |      | Complies |      |       |

| ISOLATION CHARACTERISTICS                 |  |      |      |      |       |
|---|--|------|------|------|-------|
| Parameter                                 | Conditions                             | Min. | Typ. | Max. | Units |
| Isolation                                 | Primary to Earth Ground (1MOOP)        | 1500 |      |      | Vac   |
|   | Primary to Secondary (2MOOP or 1 MOPP) | 3000 |      |      |       |
|   | Secondary to Earth Ground              | 500  |      |      | Vdc   |
| Leakage Current (under normal conditions) | 264Vac, 60Hz, 25°C                     |      | 500  |      | 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, Class A (at class II equipment) |
|                                    | FCC Part 15       | Class B, Class A (at class II equipment) |
| 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 3, Criterion A                     |
| RF Conducted Immunity              | IEC/EN 61000-4-6  | Level 2, Criterion A                     |
| Magnetic Field Immunity            | IEC/EN 61000-4-8  | Level 1, Criterion A                     |
| Voltage dips,interruptions         | IEC/EN 61000-4-11 | Level 3, Criterion B                     |

**PERFORMANCE DATA**



**EMI CONSIDERATIONS**

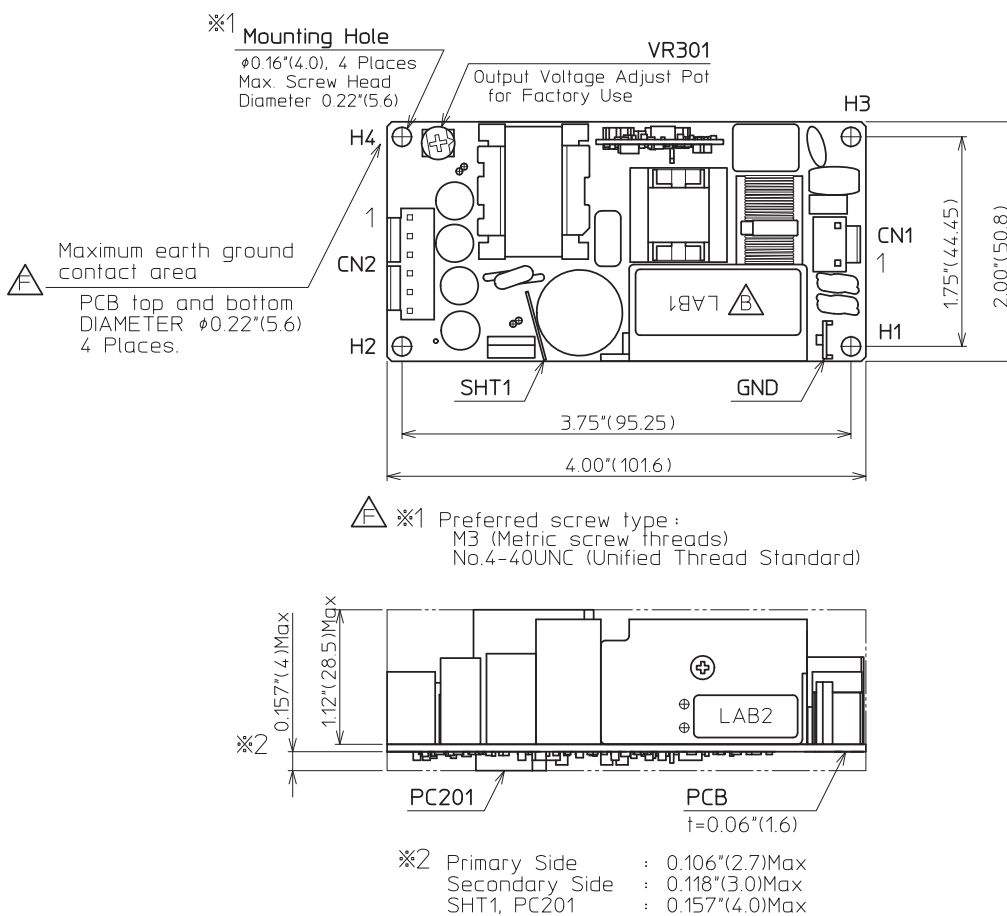
For optimum EMI performance, the power supply should be mounted to a metal plate grounded to all 4 mounting holes of the power supply. To comply with safety standards, this plate must be properly grounded to protective earth (see mechanical dimension notes). Pre-compliance testing has shown the stand-alone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

**SAFETY CONSIDERATIONS**



1. This power supply is a component level power supply intended for use in class I or class II applications. Secondary ground traces need to be suitably isolated from primary ground traces when used in class II applications.
2. When the power supply is used in class II equipment, all ground traces and components connected to the primary side are considered primary for spacing and insulation considerations.
3. Double pole/neutral fusing (-01 medical versions only).

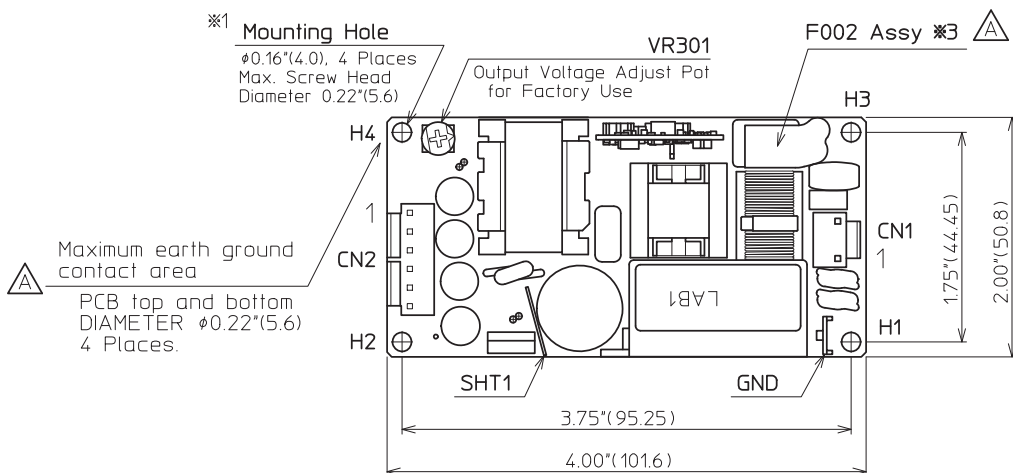
**MECHANICAL DIMENSIONS – MVAB120-12**



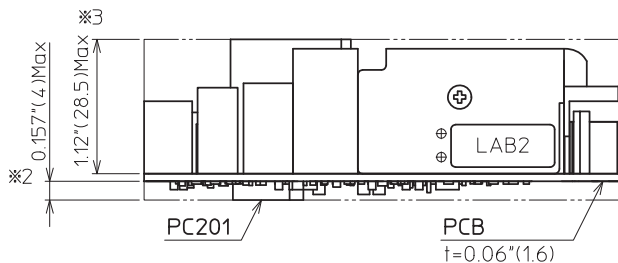
- All dimensions in inches (mm), tolerance is +/-0.02" (0.5mm)
- Mounting holes H1 and H4 should be grounded for EMI purpose
- Mounting hole H1 is safely ground connection
- This power supply requires mounting on standoffs minimum 0.20"(5.0mm) in height

Dimensions: 2.0" x 4.0" x 1.35" (50.8mm x 101.6mm x 34.3mm)

**MECHANICAL DIMENSIONS – MVAB120-12-01 (MEDICAL VERSION)**



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



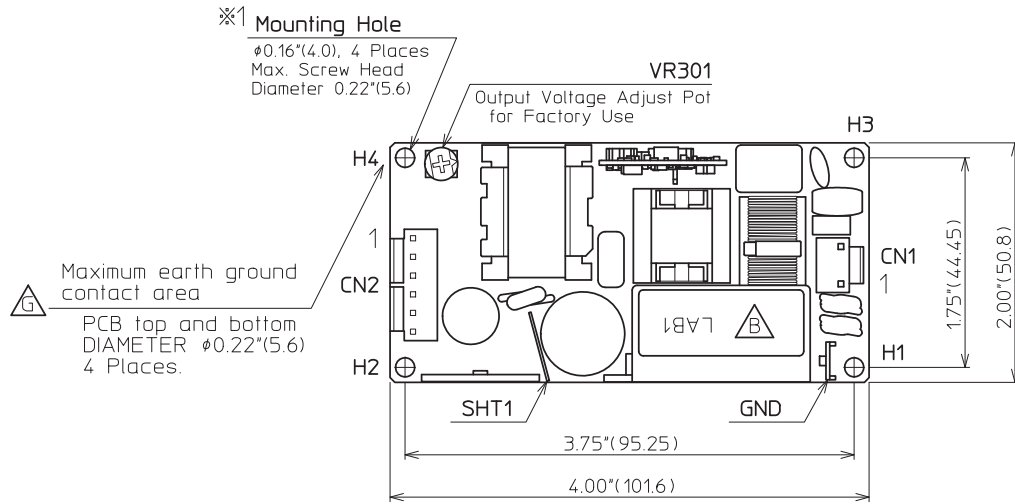
※2 Primary Side : 0.106"(2.7)Max  
Secondary Side : 0.118"(3.0)Max  
SHT1, PC201 : 0.157"(4.0)Max

⚠ ※3 F002 Assy : 1.18"(30.0)Max

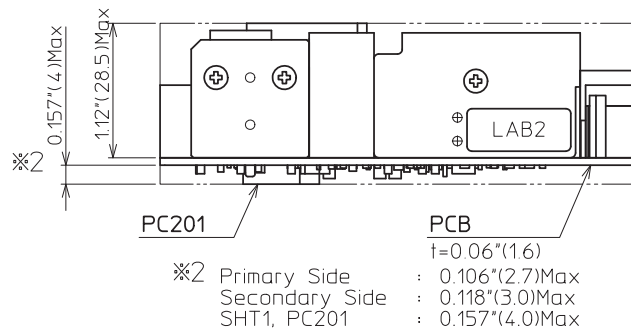
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Dimensions: 2.0" x 4.0" x 1.41" (50.8mm x 101.6mm x 35.8mm)

**MECHANICAL DIMENSIONS – MVAB120-24, MVAB120-28, and MVAB120-48**



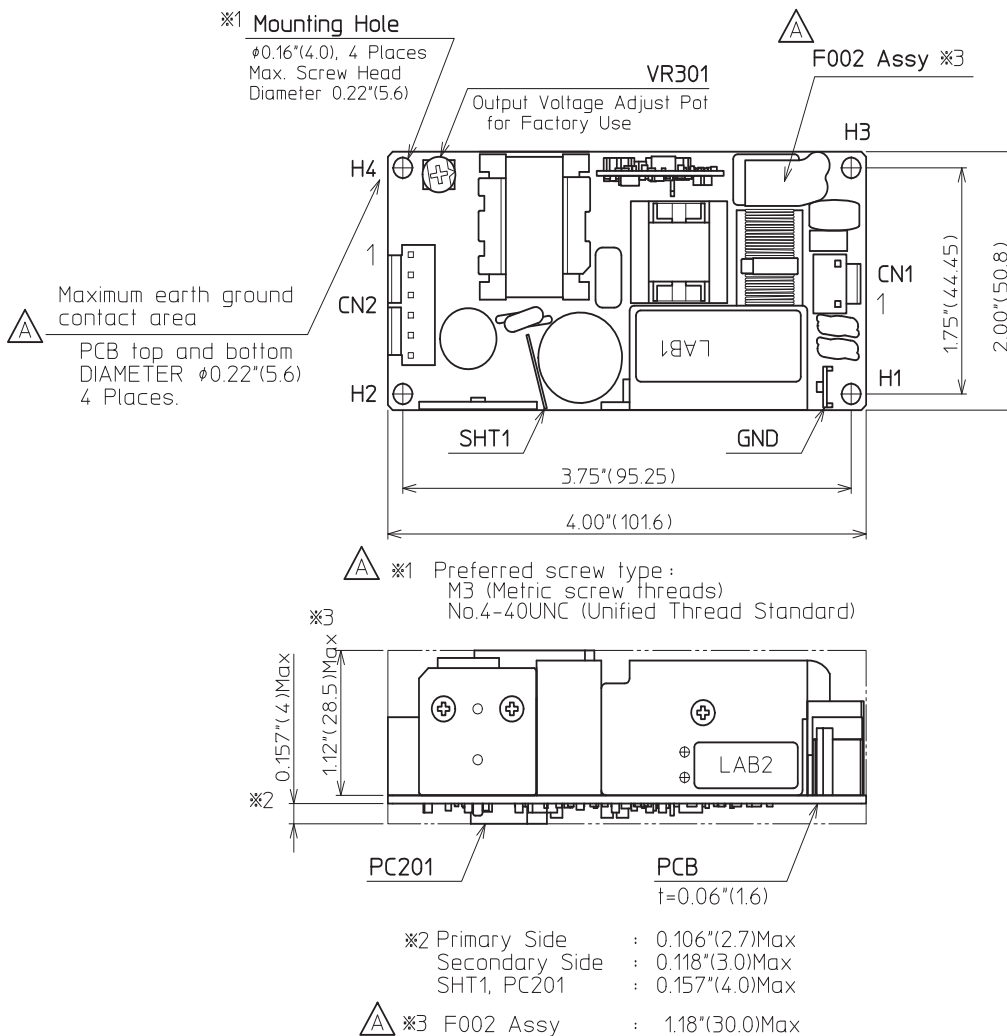
※1 Preferred screw type:  
 M3 (Metric screw threads)  
 No.4-40UNC (Unified Thread Standard)



- All dimensions in inches (mm), tolerance is  $\pm 0.02''$  (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  $0.20''(5.0\text{mm})$  in height

Dimensions: 2.0" x 4.0" x 1.35" (50.8mm x 101.6mm x 34.3mm)

**MECHANICAL DIMENSIONS – MVAB120-24-01, MVAB120-28-01, and MVAB120-48-01 (MEDICAL VERSION)**



-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 safety ground connection  
 -This power supply requires mounting on standoffs minimum 0.20"(5.0mm) in height

Dimensions: 2.0" x 4.0" x 1.41" (50.8mm x 101.6mm x 35.8mm)

**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 Neutral   | Molex 09-50-8031 with locking ramp | Molex 6838 Series   |
| 3                                       | AC Line      |                                    |                     |
| Spade Connector: #250                   |              |                                    |                     |
| GND                                     | Earth Ground |                                    |                     |
| Output Connector CN2 : Molex 26-60-4060 |              |                                    |                     |
| 1, 2, 3                                 | DC Return    | Molex 09-50-8061 with locking ramp | Molex 6838 Series   |
| 4, 5, 6                                 | V1           |                                    |                     |

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 ISO 9001 and 14001 REGISTERED



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