

# MBC201 Series

## Open Frame Power Supplies

### Medical

The MBC201 Series of open-frame medical power supplies, with its wide universal input range 90-264 VAC, is available at 200 W of output power with forced-air cooling and a variety of single output voltages.

The MBC Series is designed and approved to the latest medical standards (EN/IEC 60601-1), providing 2 x MOPP isolation for Class I & Class II applications.

These power supplies are ideal for medical, telecom, datacom, industrial equipment and other applications.



### Key Features & Benefits

- 5 x 3 x 1.5 Inch Form Factor
- 200 W with Forced-Air Cooling
- Approved to EN/IEC 60601-1
- High Efficiency > 88%
- 12 V Fan & 5 V Standby Outputs
- Remote Sense
- IEC Protection Class Options:
  - Class I: Earthing Tab J4 (no suffix)
  - Class II: No Earthing Tab (-2 suffix)
- Medical Safety Agency Approvals
- RoHS Compliant
- CE Marked

### Applications

- Diagnostic
- Drug Pump
- Monitoring
- Dialysis
- Home Health Care
- Portable Equipment

## 1. MODEL SELECTION

| MODEL <sup>1</sup>         | CONNECTOR                 | OUTPUT VOLTAGE | MAX LOAD CONVECTION <sup>2</sup> | MAX L2AD 300 LFM <sup>2 3, 4</sup> | MINIMUM LOAD | RIPPLE & NOISE <sup>5</sup> |
|----------------------------|---------------------------|----------------|----------------------------------|------------------------------------|--------------|-----------------------------|
| MBC201-1005G               | JST                       | 5.0 VDC        | 26.0 A                           | 26.0 A                             | 0.0 A        | 1%                          |
| MBC201-1T05G               | Screw Terminal            | 5.0 VDC        | 26.0 A                           | 35.0 A                             | 0.0 A        | 1%                          |
| MBC201-1012G               | JST                       | 12 VDC         | 13.33 A                          | 16.67 A                            | 0.0 A        | 1%                          |
| MBC201-1T12G               | Screw Terminal            | 12             | 13.33 A                          | 16.67 A                            | 0.0 A        | 1%                          |
| MBC201-1015G               | JST                       | 15             | 10.66 A                          | 13.33 A                            | 0.0 A        | 1%                          |
| MBC201-1T15G               | Screw Terminal            | 15             | 10.66 A                          | 13.33 A                            | 0.0 A        | 1%                          |
| MBC201-1024G               | JST                       | 24             | 6.66 A                           | 8.33 A                             | 0.0 A        | 1%                          |
| MBC201-1T24G               | Screw Terminal            | 24             | 6.66 A                           | 8.33 A                             | 0.0 A        | 1%                          |
| MBC201-1030G               | JST                       | 30             | 5.33 A                           | 6.66 A                             | 0.0 A        | 1%                          |
| MBC201-1T30G               | Screw Terminal            | 30             | 5.33 A                           | 6.66 A                             | 0.0 A        | 1%                          |
| MBC201-1048G               | JST                       | 48             | 3.33 A                           | 4.17 A                             | 0.0 A        | 1%                          |
| MBC201-1T48G               | Screw Terminal            | 48             | 3.33 A                           | 4.17 A                             | 0.0 A        | 1%                          |
| COVER-201-XBC <sup>6</sup> | Metal cover kit accessory |                |                                  |                                    |              |                             |

## 2. INPUT SPECIFICATIONS

Specifications are for nominal input voltage, 25°C unless otherwise stated.

| PARAMETER           | DESCRIPTION / CONDITION                                   | SPECIFICATION                                                  |
|---------------------|-----------------------------------------------------------|----------------------------------------------------------------|
| Input Voltage       | Universal                                                 | 90-264 VAC / 120-390 VDC                                       |
| Input Frequency     |                                                           | 47 to 63 Hz                                                    |
| Input Current       | 120 VAC:<br>230 VAC:                                      | 2.4 A max.<br>1.2 A max.                                       |
| Inrush Current      | 120 VAC:<br>230 VAC:                                      | 35 A max.<br>65 A max.                                         |
| Leakage Current     | 120 VAC:<br>230 VAC:                                      | < 150 µA<br>< 300 µA                                           |
| Power Factor        | 120 VAC:<br>230 VAC:                                      | 0.99<br>0.95                                                   |
| Switching Frequency | PFC converter (variable)<br>Resonant converter (variable) | 35 to 250 kHz, 90 kHz typical<br>35 to 250 kHz, 90 kHz typical |

<sup>1</sup> For Class II (without input Earth pin) add suffix -2 (e.g.: MBC201-1012G-2).

<sup>2</sup> Combined output power from V1, VSTBY and VFAN should not exceed the total output power rating.

<sup>3</sup> Fan output voltage tolerance is +/-20%. During V1 full load, VFAN needs min. 20 mA load to be within regulation band.

<sup>4</sup> Peak current for fan output is 1 A.

<sup>5</sup> Ripple is 2% up to 20% load and < 1% above 20% load. Ripple is peak to peak with 20 MHz bandwidth and 10 µF (Tantalum capacitor) in parallel with a 0.1 µF capacitor at rated line voltage and load ranges.

<sup>6</sup> When used in Cover Kit, de-rate output power to 70 % under all operating conditions.

### 3. OUTPUT SPECIFICATIONS

| PARAMETER                | DESCRIPTION / CONDITION                                                                       | SPECIFICATION                  |
|--------------------------|-----------------------------------------------------------------------------------------------|--------------------------------|
| Efficiency               | 120 VAC:<br>230 VAC:                                                                          | 84% typical<br>86% typical     |
| Hold Up Time             | 120 / 230 VAC                                                                                 | 10 ms                          |
| Output Power             | Derate output power linearly to 80% from 90 V to 80 VAC input.<br>Peak Power: 250 W for 0.2 s | 160 W to 200 W                 |
| Line Regulation          |                                                                                               | +/-0.5%                        |
| Load Regulation          |                                                                                               | +/-2.0%                        |
| Transient Response       | Main output 50 to 100% load change,<br>50 Hz, 50% duty cycle, 0.1A / $\mu$ s                  | < 10%,<br>recovery time < 5 ms |
| Rise Time                |                                                                                               | < 100 ms                       |
| Set Point Accuracy       |                                                                                               | $\pm$ 1%                       |
| Voltage Adjustment       | V1                                                                                            | $\pm$ 3 %                      |
| Over Voltage Protection  | V1 only                                                                                       | 110 to 150 %                   |
| Over Current Protection  |                                                                                               | 110% typical above rating      |
| Short Circuit Protection | Short term, auto recovery                                                                     |                                |

### 4. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER             | DESCRIPTION / CONDITION                                               | SPECIFICATION                                      |
|-----------------------|-----------------------------------------------------------------------|----------------------------------------------------|
| Operating Temperature | Refer to derating curve ( <i>Figure 1</i> )<br>Start-up is guaranteed | -20 to 70°C<br>-20 to 0°C                          |
| Storage Temperature   |                                                                       | -40 to 70° C                                       |
| Cooling               | 5 V model<br>Other models                                             | Convection:<br>300 LFM:<br>Convection:<br>300 LFM: |
|                       |                                                                       | 130 W<br>175 W<br>160 W<br>200 W                   |
| Humidity              | Non Condensing                                                        | 95%                                                |
| Altitude              | Operating:<br>Non-Operating:                                          | 10,000 ft.<br>40,000 ft.                           |
| Reliability           | MTBF according to Telcordia –SR332-Issue 3                            | 1.6 million hours                                  |

### 5. EMC SPECIFICATIONS

| PARAMETER                          | DESCRIPTION / CONDITION                                                        | SPECIFICATION        |
|------------------------------------|--------------------------------------------------------------------------------|----------------------|
| Conducted Emissions                | EN 55011-B, CISPR22-B, FCC PART15-B                                            | Pass                 |
| Radiated Emissions                 | EN 55011 A;<br>with external core (King core K5B RC 25x12x15-M in input cable) | Pass<br>Level B      |
| Input Current Harmonics            | EN 61000-3-2                                                                   | Class D              |
| Voltage Fluctuation and Flicker    | EN 61000-3-3                                                                   | Pass                 |
| ESD Immunity                       | EN 61000-4-2                                                                   | Level 4, Criterion A |
| Radiated Field Immunity            | EN 61000-4-3                                                                   | Level 3, Criterion A |
| Electrical Fast Transient Immunity | EN 61000-4-4                                                                   | Level 3, Criterion A |
| Surge Immunity                     | EN 61000-4-5                                                                   | Level 3, Criterion A |
| Conducted Immunity                 | EN 61000-4-6                                                                   | Level 3, Criterion A |
| Magnetic Field Immunity            | EN 61000-4-8                                                                   | Level 4, Criterion A |
| Voltage Dips, Interruptions        | EN 61000-4-11                                                                  | Criterion A & B      |

## 6. SAFETY SPECIFICATIONS

| PARAMETER         | DESCRIPTION / CONDITION                                                                                | SPECIFICATION |
|-------------------|--------------------------------------------------------------------------------------------------------|---------------|
| Isolation Voltage | Input to Output:                                                                                       | Min. 5900 VDC |
| Safety Standards  | Approved to the latest edition of the following standards:<br>CSA/UL60601-1, EN60601-1 and IEC60601-1. |               |
| Agency Approvals  | Nemko, UL, C-UL                                                                                        |               |
| CE mark           | Complies with LVD Directive                                                                            |               |

## 7. SIGNALS

| PARAMETER         | DESCRIPTION / CONDITION                                                                    |
|-------------------|--------------------------------------------------------------------------------------------|
| Power Good Signal | TTL signal goes high after main output is in regulation band. Delay is 0.1 to 0.3 sec.     |
| Power Fail Signal | TTL signal goes low 1 ms advance before output goes out of regulation due to mains failure |
| Remote ON / OFF   | To turn-on power supply short J3 pin 4 to pin 6 (PSU is shipped in this configuration)     |
| Remote Sense      | Compensates for 200 mV cable drop                                                          |

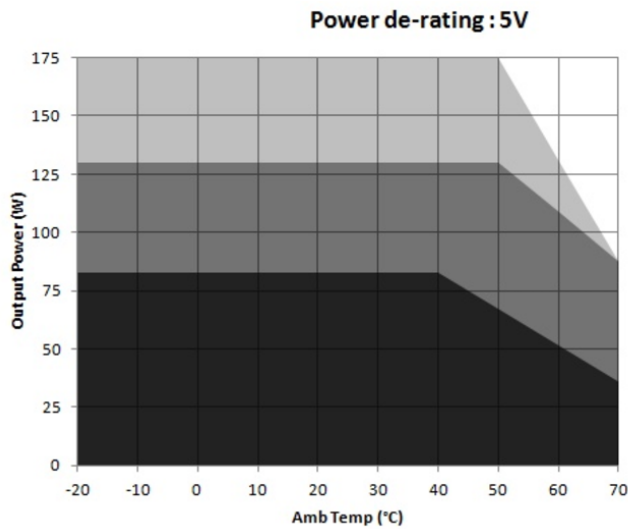
## 8. CONNECTOR & PIN DESCRIPTION

| CONNECTOR                        | PIN | DESCRIPTION / CONDITION                                                                                                                                                                            | MANUFACTURER / PN                                                                                                                                                             |
|----------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC Input Connector               | J1  | Pin 1 AC Neutral<br>Pin 2 AC Line                                                                                                                                                                  | Molex: 26-60-4030 or equivalent;<br>Mating: 09-50-3031; Pins: 08-50-0106                                                                                                      |
| DC Output Connector              | J2  | Pin 1,2,3 RTN<br>Pin 4,5,6 Vout                                                                                                                                                                    | Option 1: Tyco: 2-1776112-3 or equivalent<br>Mating: 13 AWG wire<br>Option 2: JST: B6P-VH-B (LF) (SN) or B6P-VH (LF) (SN) or equivalent<br>Mating: VHR-6M; Pins: SVH-41T-P1.1 |
| Signals & Aux Power <sup>7</sup> | J3  | Pin 1 +VE Remote Sense<br>Pin 2 VFAN (+12 V/0.5 A)<br>Pin 3 -VE Remote Sense<br>Pin 4 Remote ON/OFF<br>Pin 5 VSTBY (+5 V/1 A, +/-5%)<br>Pin 6 RTN (Signal)<br>Pin 7 Power Fail<br>Pin 8 Power Good | Molex: 22-23-2081 or equivalent<br>Mating: 22-01-2087, Pins: 08-50-0113                                                                                                       |
| Earthing Tab                     | J4  |                                                                                                                                                                                                    | Molex: 19705-4301 or equivalent<br>Mating: 190030001                                                                                                                          |

## 9. MECHANICAL SPECIFICATIONS

| PARAMETER  | DESCRIPTION / CONDITION                                                                          |
|------------|--------------------------------------------------------------------------------------------------|
| Weight     | 325 g (0.72 lbs.)                                                                                |
| Dimensions | 127.0 x 76.2 x 38.1 mm (5 x 3 x 1.5 inch)                                                        |
| Cooling    | Convection: 83 W; 300 LFM: 175 W (5 V model)<br>Convection: 160 W; 300 LFM: 200 W (other models) |

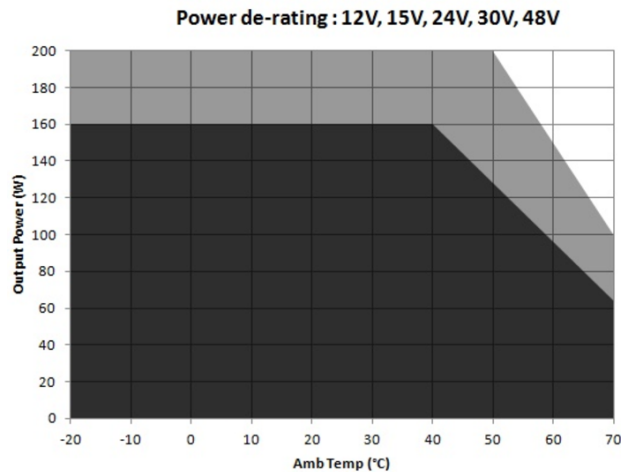
<sup>7</sup> PSU is supplied with J3 housing, pin-4 and pin-6 shorted to enable main output without remote on/off feature



Convection load: 83 W up to 40 °C  
De-rate above 40 °C @ 1.89% per °C

Forced air cooled load: 130 W up to 50°C  
(for screw terminal version)  
De-rate above 50 °C @ 1.63% per °C

Forced air cooled load: 175 W up to 50°C  
(for JST connector version)  
De-rate above 50 °C @ 2.5% per °C



Convection load: 160 W up to 40 °C  
De-rate above 40 °C @ 2% per °C

Forced air cooled load: 200 W up to 50°C  
De-rate above 50 °C @ 2.5% per °C

Figure 1. Derating Curves

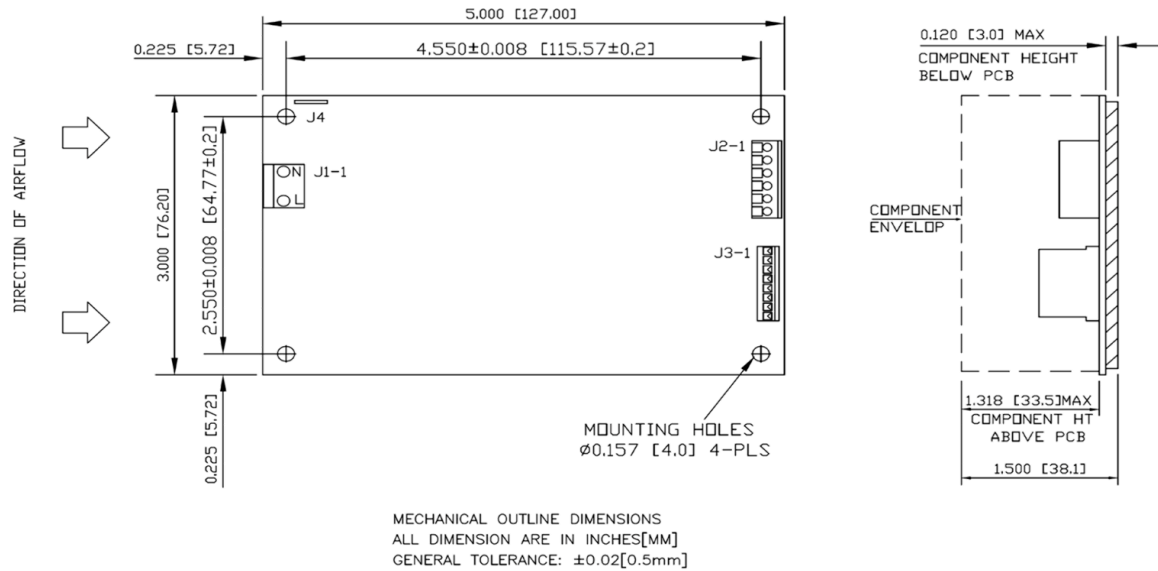


Figure 2 - Mechanical Drawing

**NOTES:** In case the PCB is mounted in a metal enclosure, using metal hardware ensure the following:

- 1 Stand off, used to mount PCB has OD of 5.4 mm max.
- 2 Screws, used to fix PCB on stand off, have head dia of 6.0 mm max.
- 3 Washer, if used, to have dia of 6.5 mm max.

**For more information on these products consult: [tech.support@psbel.com](mailto:tech.support@psbel.com)**

**NUCLEAR AND MEDICAL APPLICATIONS** - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

**TECHNICAL REVISIONS** - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9