



**THE DATASHEET OF  
MAP80-1012G**



# MAP80 Series

AC-DC Power Supplies

Bel Power Solutions MAP80 Series provides reliable, tightly regulated DC power for industrial systems which require high peak current capabilities. MAP80 series complies with EMC product standard EN 61204-3. All RoHS compliant units bear the CE Mark.

The MAP80 utilizes a variable frequency design with a thermally efficient U-channel chassis. Design innovations include metric and SAE mounting inserts on each mounting surface to provide integration flexibility. Dual-mode connectors provide traditional terminal block connections or popular single-row Molex connector mating.

Single-output models feature wide-range output adjustability to meet a wide variety of standard and user-specific output voltage requirements.



## Key Features & Benefits

- RoHS Compliant
- Wide Range Input for 110/230 VAC Applications
- CE marked to Low Voltage Directive
- TTL Compatible Power Fail Signal
- Greater than 175,000 Hours MTBF
- Metric and SAE Mounting Inserts
- Safety approved to IEC/EN 62368-1
- Meets EMC standards: EN 61204-3

EN 55032

EN 61000-3-2

EN 61000-3-3



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## 1. SINGLE-OUTPUT MODEL SELECTION

| MODEL <sup>7</sup>       | OUTPUT VOLTAGE | ADJUSTMENT RANGE | MAX OUTPUT CURRENT    | PEAK OUTPUT CURRENT <sup>1</sup> | LINE REGULATION | LOAD REGULATION | RIPPLE & NOISE <sup>2</sup> | INITIAL SETTING ACCURACY |
|--------------------------|----------------|------------------|-----------------------|----------------------------------|-----------------|-----------------|-----------------------------|--------------------------|
| MAP80-1012G <sup>6</sup> | 12V/15V        | 11.5V to 15.5V   | 7.5/6.0A <sup>3</sup> | 9.2/7.3A <sup>3</sup>            | 0.2%            | ±1%             | 1%                          | 11.76V to 12.15V         |
| MAP80-1024G <sup>6</sup> | 24V/28V        | 23.0V to 29.0V   | 3.8/3.2A <sup>3</sup> | 4.6/3.9A <sup>3</sup>            | 0.1%            | 0.5%            | 0.5%                        | 23.8V to 24.2V           |

## 2. MULTIPLE-OUTPUT MODEL SELECTION – 80 W CONTINUOUS OUTPUT POWER

| MODEL <sup>7</sup>       | OUTPUT VOLTAGE | ADJUSTMENT RANGE | OUTPUT CURRENT | PEAK OUTPUT CURRENT <sup>4</sup> | LINE REGULATION | LOAD REGULATION | RIPPLE & NOISE <sup>2</sup> | INITIAL SETTING ACCURACY |
|--------------------------|----------------|------------------|----------------|----------------------------------|-----------------|-----------------|-----------------------------|--------------------------|
| MAP80-4000G <sup>5</sup> | +5V            | 4.8V to 5.5V     | 14A            | 16A                              | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
|                          | +12V           | 11.52V to 12.48V | 4A             | 7A                               | 0.2%            | 1%              | 1%                          | 11.9V to 12.1V           |
|                          | -5V            | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | -4.8V to -5.4V           |
|                          | -12V           | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | -11.5V to -12.5V         |
| MAP80-4001G <sup>5</sup> | +5V            | 4.8V to 5.5V     | 14A            | 16A                              | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
|                          | +24V           | 23.04V to 24.96V | 2A             | 3.5A                             | 0.2%            | 1%              | 1%                          | 24.0V to 24.1V           |
|                          | -12V           | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | -11.5V to -12.5V         |
|                          | +12V           | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | 11.5V to 12.5V           |
| MAP80-4002G <sup>5</sup> | +5V            | 4.7V to 5.5V     | 14A            | 16A                              | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
|                          | +12V           | 11.52V to 12.48V | 4A             | 7A                               | 0.2%            | 1%              | 1%                          | 12.0V to 12.1V           |
|                          | -12V           | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | -11.6V to -12.4V         |
|                          | +12V           | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | 11.6V to 12.4V           |
| MAP80-4003G <sup>5</sup> | +5V            | 4.8V to 5.5V     | 14A            | 16A                              | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
|                          | +15V           | 14.4V to 15.6V   | 3.5A           | 6A                               | 0.2%            | 1%              | 1%                          | 14.6V to 15.1V           |
|                          | -5V            | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | -4.8V to -5.4V           |
|                          | -15V           | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | -14.4V to -15.5V         |
| MAP80-4004G <sup>5</sup> | +5V            | 4.8V to 5.5V     | 14A            | 16A                              | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
|                          | +24V           | 23.04V to 24.96V | 2A             | 3.5A                             | 0.2%            | 1%              | 1%                          | 24.0V to 24.1V           |
|                          | -15V           | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | -14.4V to -15.5V         |
|                          | +15V           | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | 14.4V to 15.5V           |
| MAP80-4010G <sup>5</sup> | +5V            | 4.8V to 5.5V     | 14A            | 16A                              | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
|                          | +12V           | 11.52V to 12.48V | 4A             | 7A                               | 0.2%            | 1%              | 1%                          | 12.0V to 12.1V           |
|                          | -5V            | Fixed            | 1A             | 1A                               | 0.5%            | 2%              | 1%                          | -4.8V to -5.4V           |
|                          | -12V           | Fixed            | 3A             | 3A                               | 0.5%            | 2%              | 1%                          | -11.5V to -12.5V         |

<sup>1</sup> Peak load for 60 seconds or less are acceptable, 10% duty cycle, maximum.

<sup>2</sup> Maximum peak to peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.

<sup>3</sup> MAP80-1012 output currents are expressed as 12V/15V operation. MAP80-1024 output currents are expressed as 24V/28V operation.

<sup>4</sup> Peak loads up to 90 Watts for 60 seconds or less are acceptable, (10% duty cycle max.). Peak power must not exceed 90 Watts.

<sup>5</sup> Output rated 65 W max for 50°C ambient, convection cooled.

<sup>6</sup> Output rated 75 W max for 50°C ambient, convection cooled.

<sup>7</sup> Models without suffix G are not RoHS-compliant (Leaded solder used) and are not recommended for new designs or already EOL.



### 3. INPUT SPECIFICATIONS

| PARAMETER            | CONDITIONS / DESCRIPTION   | MIN       | NOM | MAX        | UNITS            |
|----------------------|--|-----------|-----|------------|------------------|
| Input Voltage - AC   | Continuous input range   | 90<br>175 |     | 135<br>264 | VAC              |
| Input Frequency      | AC input   | 47        |     | 63         | Hz               |
| Brown Out Protection | Lowest AC input voltage that regulation is maintained with full rated loads. | 90        |     |            | VAC              |
| Hold-up Time         | Nominal AC input voltage (115VAC), full rated load.                          | 20        |     |            | ms               |
| Input Current        | 90 VAC (80 W load)<br>110VAC (80W load)                                      |           |     | 2.5<br>1.8 | A <sub>RMS</sub> |
| Input Protection     | Non-user serviceable internally located AC input line fuse.                  |           |     |            |                  |
| Inrush Surge Current | Internally limited by thermistor, Vin = 264 VAC (one cycle), 25° C           |           |     | 45         | APK              |
| Operating Frequency  | Switching frequency of power supply (varies with load)                       | 22        |     | 120        | kHz              |

### 4. OUTPUT SPECIFICATIONS

| PARAMETER              | CONDITIONS / DESCRIPTION  | MIN                  | NOM                       | MAX      | UNITS |
|------------------------|---|----------------------|---------------------------|----------|-------|
| Efficiency             | Full load @ 115 VAC.<br>Varies with distribution of loads among outputs.  |                      | 73% typical               |          |       |
| Minimum Loads          | MAP80-1012<br>MAP80-1024<br>All multiple output models, main channel only   | 0.42<br>0.21<br>1.50 |                           |          | A     |
| Ripple and Noise       | Full load, 20 MHz bandwidth.  |                      | See Model Selection Chart |          |       |
| Output Power           | Continuous output power, all multiple output models.<br>Peak output power (60 s maximum, 10% duty cycle), all multiple output models.                 |                      |                           | 80<br>90 | W     |
| Overshoot / Undershoot | Output voltage overshoot/undershoot at turn-on, V1, V2.   |                      |                           | 1        | %     |
| Regulation             | Varies by output. Total regulation includes: line changes from 90-132 VAC or 175-264, changes in load starting at 20% load and changing to 100% load. |                      | See Model Selection Chart |          |       |
| Transient Response     | Recovery time, to within 1% of initial set point due to a 50-100% load change, 4% max. deviation. (Main output of multiple output units).             |                      |                           | 500      | μs    |
| Turn-on Delay          | Time required for initial output voltage stabilization.   | 1                    |                           | 5        | s     |
| Turn-on Rise Time      | Time required for output voltage to rise from 10% to 90%.   |                      |                           | 20       | ms    |

### 5. INTERFACE SIGNALS & INTERNAL PROTECTION

| PARAMETER                       | CONDITIONS/DESCRIPTION  | MIN               | NOM | MAX             | UNITS |
|---------------------------------|---|-------------------|-----|-----------------|-------|
| Overvoltage Protection          | Provided on the main output of multiple output units.<br>MAP80-1012<br>MAP80-1024                                 | 5.5<br>17.5<br>32 |     | 6.8<br>23<br>37 | V     |
| Overload Protection             | Fully protected against output overload and short circuit. Automatic recovery upon removal of overload condition. |                   |     |                 |       |
| Power Fail Warning <sup>8</sup> | Logic LO (denotes power fail detected).   |                   |     | 0.7             | V     |
|                                 | Logic HI with internal pull-up to output.   |                   | 5.1 |                 | kΩ    |
|                                 | Power Fail trip point, maximum load, decreasing line.   | 86                |     | 94              | VAC   |
|                                 | Time before regulation dropout, at full load, due to loss of input power.   | 4                 |     |                 | ms    |

<sup>8</sup> Power Fail Warning is not available for MAP80-1024. The MAP80-1012 is an open collector output, capable of sinking 35 mA, maximum



## 6. SAFETY SPECIFICATIONS

| PARAMETER                    | CONDITIONS / DESCRIPTION   | MIN  | NOM | MAX | UNITS |
|------------------------------|--|------|-----|-----|-------|
| Agency Approvals             | Approved to the latest edition of the following standards:<br>UL/CSA 60950-1 2nd, IEC 62368-1 and EN 62368-1 |      |     |     |       |
| Dielectric Withstand Voltage | Input to Chassis   | 2121 |     |     | VDC   |
|                              | Input to Output (tested by manufacturer only)  | 4242 |     |     |       |
| Insulation Resistance        | Input to output  | 7    |     |     | MΩ    |
| Touch Current                | EN 62368-1, 264 VAC  |      |     | 800 | μA    |

## 7. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER                          | CONDITIONS / DESCRIPTION  | MIN           | NOM   | MAX   | UNITS            |
|------------------------------------|---|---------------|-------|-------|------------------|
| Altitude                           | Operating   |               |       | 10k   | ASL Feet         |
|                                    | Non-operating   |               |       | 40k   |                  |
| Operating Temperature <sup>9</sup> | Derate linearly above 50°C by 2.5% per °C<br>to a maximum temperature of 70°C | At 100% load: | 0     | 50    | °C               |
|                                    |   | At 50% load:  | 0     | 70    |                  |
| Storage Temperature                |   | -40           |       | 85    | °C               |
| Temperature Coefficient            | 0°C to 70°C (after 15-minute warm-up)   |               | ±0.02 | ±0.03 | %/°C             |
| Relative Humidity                  | Non-condensing  | 5             |       | 95    | %RH              |
| Shock                              | Operating, peak acceleration  |               |       | 20    | G                |
| Vibration                          | Random vibration, 10 Hz to 2 kHz, 3 axis                                      |               |       | 6     | G <sub>RMS</sub> |

<sup>9</sup> The use of an external cooling fan (100LFM (linear feet per minute), minimum) shall be determined at end use if the 25°C ambient is exceeded.

## 8. EMC SPECIFICATIONS

**MAP80 complies with EMC product standard EN 61204-3.**

Conducted emissions EN 55032 Class B.  
Radiated emissions EN 55032 Class B.

## 9. MECHANICAL SPECIFICATIONS / OPTIONS

| PARAMETER      | CONDITIONS / DESCRIPTION   |
|----------------|--|
| Dimensions     | 182.9 x 106.7 x 45.7 mm (7.2 x 4.2 x 1.8 in)   |
| Weight         | 0.82 kg (1.8 lb)   |
| Tolerances     | .XX = ± 0.03 in (± 0.76 mm); .XXX = ± 0.010 in (± 0.25 mm)   |
| Cover (Option) | Add 'C' suffix to model number or order part number 412-59585-G separately.<br>For convection cooled applications, derate output power to 65 watts on all multiple output models and MAP80-1005.<br>Derate MAP80-1012 and MAP80-1024 to 75 watts.<br>Dimensions: 182.9 x 106.7 x 52.0 mm (7.20 x 4.20 x 2.05 in) |



10. CONNECTIONS

| CONNECTOR                 | CONDITIONS / DESCRIPTION  |
|---------------------------|---|
| Input & Output Connectors | 6-32 screw wire clamps on 0.312" (7.9 mm) centers, 0.045" (1.1 mm) square pins on 0.156" (3.9 mm) centers, mates with Molex series 2139, 6442, or 41695 |
| Power Fail Connections    | J1: 0.035" (0.9 mm) square pins on 0.100" (2.5 mm) centers, mates with Molex series 2695/6471   |
| Chassis                   | 0.090" (2.3 mm) aluminum alloy, with clear finish   |

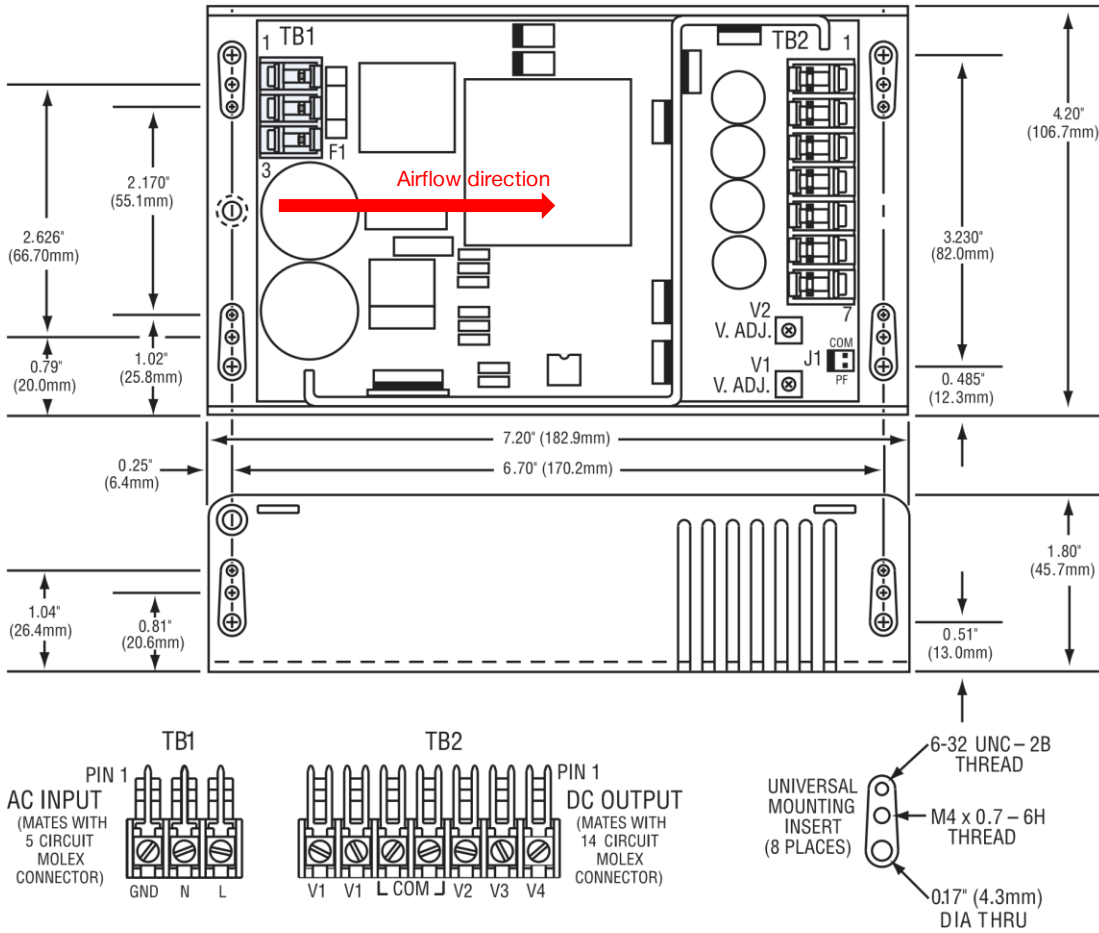


Figure 1. Mechanical Drawing

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.

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