

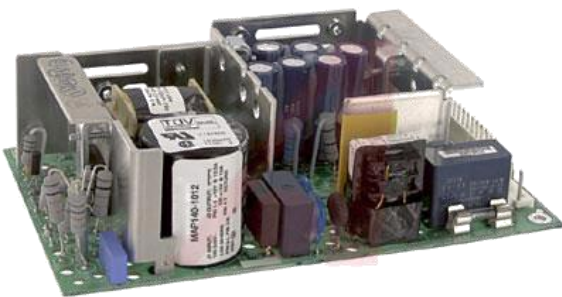
# MAP140 Series

## AC-DC Power Supplies

Bel Power Solutions MAP140 Series provides a full range of options and up to 30 watts more power than comparable products in this industry-standard footprint. With a universal input from 85 to 264 VAC and power densities up to 2.6 watts/inch<sup>3</sup>, the MAP140 meets the most rigorous requirements of commercial, industrial, and datacom systems.

Rated for use in convection and forced-air cooled (200 LFM) applications, the MAP140 delivers dependable power with a Mean Time Between Failures (MTBF) in excess of 180,000 hours.

In addition to UL, CSA, and NEMKO regulatory compliance, the MAP140 displays the CE Mark.



### Key Features & Benefits

- RoHS Lead-Solder-Exemption Compliant
- Universal Input 85-264 VAC
- Input Transient & ESD Compliance to EN61000-4-2/-3/-4
- CE marked to Low Voltage Directive
- Industry-Standard Footprint: 7.0 x 4.3 x 1.8 inch (177.8 x 109.2 x 45.7 mm)
- Remote Sense and Overvoltage Protection
- Power Fail Signal Standard on MAP140-3000P, Optional on MAP140-1012 and MAP140-1024G
- Optional Overtemperature Protection, L-bracket and Cover

## 1. SINGLE-OUTPUT MODEL SELECTION

| MODEL <sup>5</sup> | OUTPUT VOLTAGE | ADJUSTMENT RANGE | CONVECTION COOLED CURRENT | FORCED AIR CURRENT <sup>1</sup> | LINE REGULATION | LOAD REGULATION | RIPPLE & NOISE <sup>2</sup> | INITIAL SETTING ACCURACY |
|--------------------|----------------|------------------|---------------------------|---------------------------------|-----------------|-----------------|-----------------------------|--------------------------|
| MAP140-1012*       | 12V/15V        | 11.0V to 16.0V   | 9.2/7.3A <sup>3</sup>     | 12.5A/10A <sup>3</sup>          | 0.1%            | 0.5%            | 1%                          | 11.97V to 12.03V         |
| MAP140-1024G       | 24V/28V        | 22.8V to 29.2V   | 4.6/4A <sup>3</sup>       | 6.3A/5.4A <sup>3</sup>          | 0.1%            | 0.5%            | 1%                          | 23.95V to 24.05V         |
| MAP140-1048*       | 48V            | 45.6V to 54.0V   | 2.3A                      | 3.1A                            | 0.1%            | 0.5%            | 1%                          | 47.9V to 48.1V           |

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

| MODEL <sup>5</sup> | OUTPUT VOLTAGE | ADJUSTMENT RANGE | OUTPUT CURRENT <sup>4</sup> | PEAK OUTPUT CURRENT <sup>4</sup> | LINE REGULATION | LOAD REGULATION | RIPPLE & NOISE <sup>2</sup> | INITIAL SETTING ACCURACY |
|--------------------|----------------|------------------|-----------------------------|----------------------------------|-----------------|-----------------|-----------------------------|--------------------------|
| MAP140-3000P*      | +5V            | 4.75V to 5.25V   | 16A/25A <sub>PK</sub>       | 20A/25A <sub>PK</sub>            | 0.2%            | 1%              | 1%                          | 5.09V to 5.11V           |
|                    | +12V           | Fixed            | 4A/9A <sub>PK</sub>         | 4A/9A <sub>PK</sub>              | 0.1%            | 2%              | 1%                          | 11.97V to 12.03V         |
|                    | -12V           | Fixed            | 1A/1.5A <sub>PK</sub>       | 1A/1.5A <sub>PK</sub>            | 0.1%            | 2%              | 1%                          | -11.4V to -12.6V         |

<sup>1</sup> With minimum 200 LFM forced air cooling.

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

<sup>3</sup> MAP140-1012 output currents are expressed as 12V/15V operation. MAP140-1024G output currents are expressed as 24V/28V operation.

<sup>4</sup> Peak loads up to 140 Watts for 60 seconds or less are acceptable, (10% duty cycle max.). Peak power must not exceed 140 watts.

<sup>5</sup> Non-G models use lead solder exemption and are not recommended for new designs.

Model numbers highlighted in yellow are not recommended for new designs.

\* Obsolete

## 3. INPUT SPECIFICATIONS

| PARAMETER            | CONDITIONS / DESCRIPTION                                                     | MIN | NOM | MAX        | UNITS            |
|----------------------|------------------------------------------------------------------------------|-----|-----|------------|------------------|
| Input Voltage - AC   | Continuous input range                                                       | 85  |     | 264        | VAC              |
| Input Frequency      | AC input                                                                     | 47  |     | 63         | Hz               |
| Brown Out Protection | Lowest AC input voltage that regulation is maintained with full rated loads. | 85  |     |            | VAC              |
| Hold-up Time         | Nominal AC input voltage (110VAC), full rated load.                          |     |     |            | ms               |
|                      | 110 watt load:                                                               | 20  |     |            |                  |
|                      | 140 watt load:                                                               | 16  |     |            |                  |
| Input Current        | 85 VAC (140 W load)<br>110 VAC (140 W load)                                  |     |     | 2.5<br>2.0 | 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           |     |     | 41         | A <sub>PK</sub>  |
| Operating Frequency  | Switching frequency of main transformer                                      |     | 22  |            | kHz              |

## 4. OUTPUT SPECIFICATIONS

| PARAMETER              | CONDITIONS / DESCRIPTION                                                                                                                        | MIN                  | NOM                       | MAX | UNITS |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------------|-----|-------|
| Efficiency             | Full load @110 VAC. Varies with distribution of loads among outputs                                                                             |                      | 70% typical               |     |       |
| Minimum Loads          | Single output models<br>MAP140-3000P, total output current of V1 + V2 <sup>6</sup>                                                              | 0<br>2               |                           |     | Amps  |
| Ripple and Noise       | Full load, 20 MHz bandwidth.                                                                                                                    |                      | See Model Selection Chart |     |       |
| Output Power           | Single output models                                                                                                                            |                      | See Model Selection Chart |     |       |
|                        | MAP140-3000P with convection cooling                                                                                                            |                      |                           | 80  | Watts |
|                        | MAP140-3000P with 200 LFM forced air cooling                                                                                                    |                      |                           | 140 | Watts |
| Overshoot / Undershoot | Output voltage overshoot/undershoot at turn-on / turn-off.                                                                                      |                      |                           | 1   | %     |
| Regulation             | Varies by output, 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 only on multiple output units).  |                      | 500                       |     | μs    |
| Turn-on Delay          | Time required for initial output voltage stabilization.                                                                                         | MAP140-3000P         |                           | 1   | Sec   |
|                        |                                                                                                                                                 | Single output models |                           | 2   |       |
| Turn-on Rise Time      | Time required for output voltage to rise from 10% to 90%.                                                                                       |                      |                           | 20  | ms    |

<sup>6</sup> Minimum load is required only to meet the regulation limits of V3.

## 5. INTERFACE SIGNALS & INTERNAL PROTECTION

| PARAMETER                  | CONDITIONS/DESCRIPTION                                                                                                                                              |                  | MIN  | NOM | MAX  | UNITS |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------|-----|------|-------|
| Overvoltage Protection     |                                                                                                                                                                     | MAP140-3000P, V1 | 6.1  |     | 7.2  | V     |
|                            | Provided on single output models and V1 of MAP140-3000P.                                                                                                            | MAP140-1012      | 17.3 |     | 20.2 |       |
|                            |                                                                                                                                                                     | MAP140-1024G     | 32.2 |     | 37.8 |       |
|                            |                                                                                                                                                                     | MAP140-1048      | 55.2 |     | 64.8 |       |
| Overload Protection        | Fully protected against output overload and short circuit. Automatic recovery upon removal of overload condition.                                                   |                  |      |     |      |       |
| Remote Sense               | Voltage drop compensated for at the load.                                                                                                                           |                  |      |     | 250  | mV    |
| Power Fail Warning         | TTL compatible logic signal. Time before regulation dropout due to loss of input power at 140 watts, 110 VAC. Standard on MAP140-3000P and optional on MAP140-1012. |                  | 2.3  |     |      | ms    |
| Overtemperature Protection | Optional signal provides system shutdown due to excessive internal temperature. See options.                                                                        |                  |      |     |      |       |

## 6. SAFETY, REGULATORY AND EMI SPECIFICATIONS

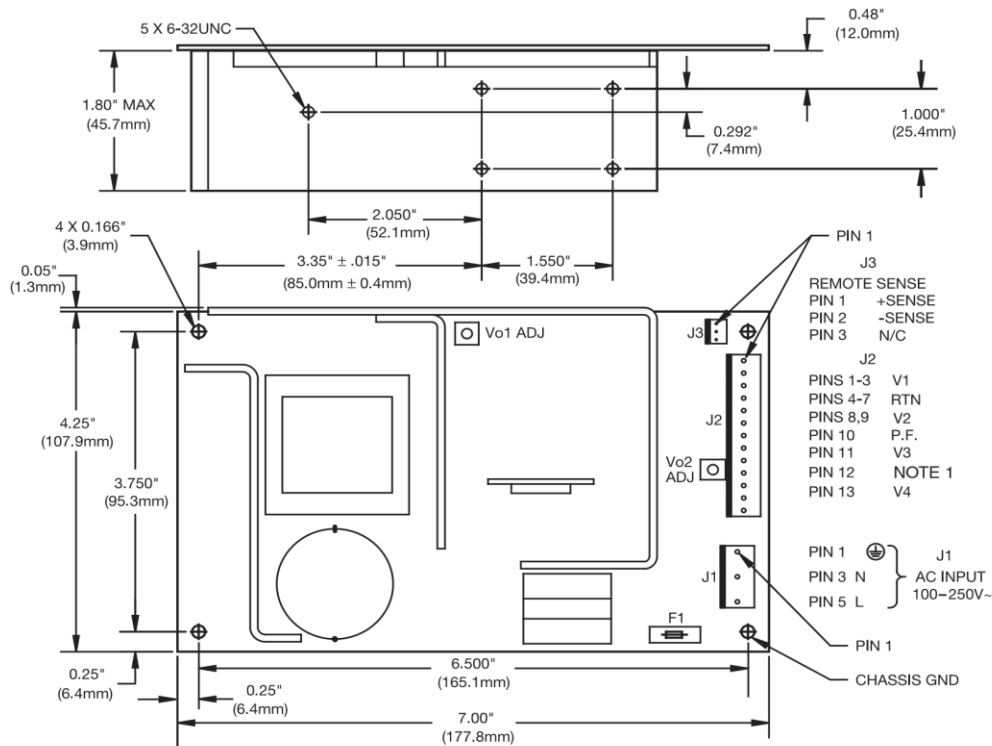
| PARAMETER                    | CONDITIONS / DESCRIPTION                                                                                        | MIN                            | NOM    | MAX        | UNITS |
|------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------|--------|------------|-------|
| Agency Approvals             | Approved to the latest edition of the following standards; UL/CSA60950-1 2nd, IEC60950-1 2nd and EN60950-1 2nd. |                                |        |            |       |
| Dielectric Withstand Voltage | Input to Chassis<br>Input to Output (tested by manufacturer only)                                               | 2121<br>4242                   |        |            | VDC   |
| Electromagnetic Interference | FCC CFR title 47 Part 15 Sub-Part B - conducted & radiated                                                      |                                | B      |            | Class |
| Conducted                    | EN55022 / CISPR 22 conducted                                                                                    |                                | B      |            | Class |
| ESD Susceptibility           | Per EN61000-4-2, level 4                                                                                        | 8                              |        |            | kV    |
| Radiated Susceptibility      | Per EN61000-4-3, level 3                                                                                        | 10                             |        |            | V/M   |
| EFT/Burst                    | Per EN61000-4-4, level 3                                                                                        | ±2                             |        |            | kV    |
| Input Transient Protection   | EN61000-4-5 Class 3                                                                                             | Line to Line<br>Line to Ground | 1<br>2 |            | kV    |
| Insulation Resistance        | Input to output                                                                                                 | 10                             |        |            | MΩ    |
| Leakage Current              | Per EN60950, 264 VAC                                                                                            | 110 VAC<br>264 VAC             |        | 0.5<br>1.5 | mA    |

## 7. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER                          | CONDITIONS / DESCRIPTION                  | MIN                           | NOM    | MAX        | UNITS    |
|------------------------------------|-------------------------------------------|-------------------------------|--------|------------|----------|
| Altitude                           | Operating<br>Non-operating                |                               |        | 10k<br>40k | ASL Feet |
| Operating Temperature <sup>9</sup> | Derate linearly above 50°C by 2.5% per °C | At 100% load:<br>At 50% load: | 0<br>0 | 50<br>70   | °C       |
| Storage Temperature                |                                           | -40                           |        | 85         | °C       |
| Temperature Coefficient            | 0°C to 70°C (after 15 minute warm-up)     |                               | ±0.02  | ±0.05      | %/°C     |
| Relative Humidity                  | Non-condensing                            |                               |        | 95         | %RH      |
| Shock                              | Operating, peak acceleration              |                               |        | 20         | G        |
| Vibration                          | Random vibration, 10Hz to 2kHz, 3 axis    |                               |        | 6          | GRMS     |

## 8. MECHANICAL SPECIFICATIONS / OPTIONS

| PARAMETER         | CONDITIONS / DESCRIPTION                                                                                                                                                                                                                     |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions        | 177.8 x 109.2 x 50.0 mm (7.00 x 4.30 x 1.97 inch)                                                                                                                                                                                            |
| Weight            | 0.59 kg (1.3 lbs)                                                                                                                                                                                                                            |
| Cover (Option)    | Add 'C' suffix to model number (Please check with factory for availability).<br>For convection cooled applications, derate output power to 75 watts, maximum.<br>Dimensions: 182.9 x 106.7 x 50.0 mm (7.20 x 4.20 x 1.97 inch)               |
| Power Fail Signal | Add 'P' suffix to model number. Provides 2.3mS warning time before main output drops 5%.<br>Warning time increases at reduced load levels. Option available only on MAP140-1012 and MAP140-1024G.<br>Power fail is standard on MAP140-3000P. |
| Thermal Shutdown  | Add 'T' suffix to model number. Initiates shut-down in the event of an overtemperature condition.<br>Automatic recovery. Where available, Power Fail signal is initiated prior to shutdown.                                                  |



| MOLEX PCB PIN CONNECTOR INFORMATION |          |             |              |              |
|-------------------------------------|----------|-------------|--------------|--------------|
| REF DESIG                           | SERIES   | MOLEX P/N   | SPACING      | PINS, SQUARE |
| J1                                  | 41671 or | 26-48-1055* | 0.156 (3.96) | 0.045 (1.14) |
|                                     | 41791    | 26-60-4050* | 0.156 (3.96) | 0.045 (1.14) |
| J2                                  | 41671 or | 26-48-1135  | 0.156 (3.96) | 0.045 (1.14) |
|                                     | 41791    | 26-60-4130  | 0.156 (3.96) | 0.045 (1.14) |
| J3                                  | 6373     | 22-23-2031  | 0.100 (2.54) | 0.025 (0.64) |

\*With pins 2 & 4 removed for double spacing.

Figure 1. Mechanical Drawing

### NOTES:

- 1.) When the V4 output is a positive (+) output, pin 12 on J2 is connected to RTN.  
When the V4 output is a negative (-) output, pin 12 on J2 is connected to V4.

**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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Asia-Pacific  
+86 755 298 85888

Europe, Middle East  
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### 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

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