MAP30/40/42 Series

AC-DC Open Frame Power Supplies

The Bel Power Solutions MAP30/40/42 Series of power supplies combines low cost and universal input in a board-only power solution to meet industrial requirements. MAP30/40/42 series complies with EMC product standard EN 61204-3. All RoHS compliant units bear the CE Mark.

Fixed frequency operation simplifies system level operation. The MAP30/40/42 Series is configured to the international standard 3 x 5 inch footprint. Input and output connections are made via popular single-row Molex connectors. Single output models feature wide-range output adjustability to meet a wide variety of standard and user-specific output voltage requirements.

RoHS Compliant

KEY FEATURES

- Universal Input 90 – 264 VAC
- Greater than 311,000 Hours MTBF
- Remote Sense (MAP30, MAP42)
- RoHS Compliant
- CE Marked to Low Voltage Directive
- Meets EMC standard EN 61204-3
  EN 55032
  EN 61000-3-2
  EN 61000-3-3

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1. SINGLE-OUTPUT MODEL SELECTION

MODEL [9]	OUTPUT VOLTAGE	ADJUSTMENT RANGE	MAX OUTPUT CURRENT	PEAK OUTPUT CURRENT [1]	LINE REGULATION	LOAD REGULATION	RIPPLE & NOISE [2]	INITIAL SETTING ACCURACY
MAP30-1005G	5V	4.7V to 5.8V	6A	8A [8]	0.2%	±1%	1%	4.9V to 5.1V
MAP42-1005	5V	4.7V to 5.8V	8A	11A	0.2%	±1%	1%	4.9V to 5.1V
MAP42-1012G	12V/15V	11V to 18V	3.4/2.7A [3]	4.6/3.7A [3]	0.2%	1%	1%	11.9V to 12.1V
MAP42-1024G	24V/28V	23V to 29V	1.7/1.4A [3]	2.3/1.9A [3]	0.2%	1%	1%	23.8V to 24.2V

2. MULTIPLE-OUTPUT MODEL SELECTION – 40 W CONTINUOUS OUTPUT POWER

MODEL [9]	OUTPUT VOLTAGE	ADJUSTMENT RANGE	OUTPUT CURRENT	PEAK OUTPUT CURRENT [4]	LINE REGULATION	LOAD REGULATION	RIPPLE & NOISE [2]	INITIAL SETTING ACCURACY	MAXIMUM OUTPUT POWER
MAP40-3000G	+5V	4.7V to 5.5V	3A	5A	0.2%	2%	1%	4.9V to 5.1V	40 W [7]
	+12V	Fixed	2A	3.5A	1%	3.5% [5]	1%	11.5V to 12.5V	
	-12V	Fixed	0.3A	0.5A	1%	2% [6]	1%	-11.5V to -12.5V	
MAP40-3100G	+5V	4.75V to 5.25V	3A	5A	0.2%	2%	1%	4.9V to 5.1V	40 W [7]
	+12V	Fixed	2A	3.5A	1%	3.5% [5]	1%	11.5V to 12.5V	
	-12V	Fixed	0.3A	0.5A	1%	2%	1%	-11.4V to -12.6V	
MAP40-3101G	+5V	4.75V to 5.25V	3A	5A	0.2%	2%	1%	4.9V to 5.1V	40 W [7]
	+24V	Fixed	1A	1.5A	1%	3.5% [5]	1%	23.0V to 25.0V	
	-12V	Fixed	0.3A	0.5A	1%	2%	1%	-11.5V to -12.5V	
MAP40-3105G	+5V	4.7V to 5.8V	3A	5A	0.2%	2%	1%	4.9V to 5.1V	40 W [7]
	+12V	Fixed	2A	3.5A	1%	3.5% [5]	1%	11.5V to 12.5V	
	-5V	Fixed	0.5A	1A	1%	2%	1%	-4.75V to -5.25V	
MAP40-3500G	+5V	4.7V to 5.8V	5A	6A	0.2%	2%	1%	4.9V to 5.1V	40 W [7]
	+12V	Fixed	1A	3.5A	1%	3.5% [5]	1%	11.5V to 12.5V	
	-12V	Fixed	0.3A	0.5A	1%	2%	1%	-11.4V to -12.6V	
MAP40-3003G	+5V	4.7V to 5.8V	3A	5A	0.2%	2%	1%	4.9V to 5.1V	40 W [7]
	+15V	Fixed	1.5A	3A	1%	3.5% [5]	1%	14.7V to 15.3V	
	-15V	Fixed	0.2A	0.5A	1%	2% [6]	1%	-14.3V to -15.7V	

[1] Peak ratings may be used as maximum output current with 100 Linear Feet per Minute (LFM) forced air cooling.
[2] Maximum peak to peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.
[3] MAP42-1012G output currents are expressed as 12V/15V operation. MAP42-1024G output currents are expressed as 24V/28V operation.
[4] Peak loads for 30 seconds or less are acceptable, (10% duty cycle max.).
[5] Quasi regulated output. See Regulation Curves for more information.
[6] Requires a minimum load of 0.5A on V1 or 0.3A on V2.
[7] Needs 170 LFM forced air cooling for use at 50°C ambient.
[8] Needs 200 LFM forced air cooling for use at 50°C ambient.
[9] Models without suffix G are not RoHS-compliant (Leaded solder used) and are not recommended for new designs or already EOL
Models highlighted in yellow is not recommended for new designs.

3. INPUT SPECIFICATIONS

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Input Voltage - AC	Continuous input range	90		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 (115 VAC), full rated load.	15			ms
Input Current	90 VAC (40 W load).			1.2	A_{RMS}
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			38	A_{PK}
Operating Frequency	Switching frequency of power supply (fixed frequency).	23	25	30	kHz

4. OUTPUT SPECIFICATIONS

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Efficiency	Full load @120 VAC		70% typical		
Minimum Loads	MAP30-1005 / MAP42-1012 MAP42-1005 MAP42-1024 All multiple output models, see regulation graphs.	0.15 0.26 0.05 0.0			Amps
Ripple and Noise	Full load, 20 MHz bandwidth.		See Model Selection Chart.		
Output Power	Multiple output models with convection cooling.			40	Watts
Overshoot / Undershoot	Output voltage overshoot/undershoot at turn-on, V1.			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 regulation graphs.		
Transient Response	Recovery time, to within 1% of initial set point due to a 50-100% load change, 4% max. deviation. (Main output only of multiple output units).		500		µs
Turn-on Delay	Time required for initial output voltage stabilization.		1	2	Sec
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	MAP30-1005G, MAP42-1005 MAP42-1012G MAP42-1024G Main output only of multiple output units.	5.8 20.0 32.0 5.8		6.8 22.0 37.0 6.8	V
Overload Protection	Fully protected against output overload and short circuit. Automatic recovery upon removal of overload condition.		130		%
Remote Sense	Total cable drop, single output models only.			250	mV

6. SAFETY SPECIFICATIONS

PARAMETER	CONDITIONS / DESCRIPTION		MIN	NOM	MAX	UNITS
Agency Approvals	Approved to the latest edition of the following standards: UL/CSA 60950-1, IEC/EN 62368-1					
Dielectric Withstand Voltage	Input to Chassis Input to Output (tested by manufacturer only)		2121 4242			VDC
Insulation Resistance	Input to output		7			MΩ
Touch Current	EN 62368-1, 264 VAC	MAP42, MAP40-3100G/3101G/3105G/3500G			500	µA
		MAP30-1005G, MAP40-3000G, MAP40-3003G			750	

7. EMC SPECIFICATIONS

MAP30/40/42 complies with EMC product standard EN 61204-3.

Conducted emissions EN 55032 Class B (MAP30-1005G, MAP40-3000G, MAP40-3003G, MAP42-1024G meet Class A)
Radiated emissions EN 55032 Class B (MAP40-3000G, MAP40-3003G, MAP40-3500G, MAP42-1024G meet Class A.)

PHENOMENON	BASIC STANDARD	TEST ITEM	TEST SPECIFICATION	PERFORMANCE CRITERIA
Electrostatic discharge	EN 61000-4-2	Contact discharge	±4 kV	A
Radio-frequency electromagnetic field Amplitude modulated	EN 61000-4-3	Frequency Field strength AM 1 kHz	80 - 1000 MHz 10 V/m 80% 1,4 to 2 GHz 3 V/m 80% 2 to 2,7 GHz 1 V/m 80 %	A
Fast transient	EN 61000-4-4	Line to ground voltage Tr/Th Repetition freq.	±2 kV 5/50 ns 100 kHz	A
Surges	EN 61000-4-5	Tr/Th Line to ground voltage Line to line voltage	1,2/50 µs ±2 kV ±1 kV	A
Conducted disturbances induced by radio-frequency fields	EN 61000-4-6	Frequency Amplitude AM 1 kHz	0,15 to 80 MHz 10 V 80 %	A
Power frequency magnetic field	EN 61000-4-8	Frequency Field strength	50, 60 Hz 30 A/m	A
Voltage dips	EN 61000-4-11	Residual voltage	0 % during 1/2 cycle 0 % during 1 cycle 40 % during 10/12 cycles at 50/60 Hz 70 % during 25/30 cycles at 50/60 Hz 80 % during 250/300 cycles at 50/60 Hz	A
Voltage interruptions	EN 61000-4-11	Residual voltage	0 % during 250/300 cycles at 50/60 Hz	B

8. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITIONS/DESCRIPTION		MIN	NOM	MAX	UNITS
Altitude	Operating Non-operating				10k 40k	ASL Ft.
Operating Temperature	Derate linearly above 50°C by 2.5% per °C to a maximum temperature of 70°C	At 100% load: At 50% load:	0 0		50 70	°C
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, 10Hz to 2kHz, 3 axis				6	GRMS

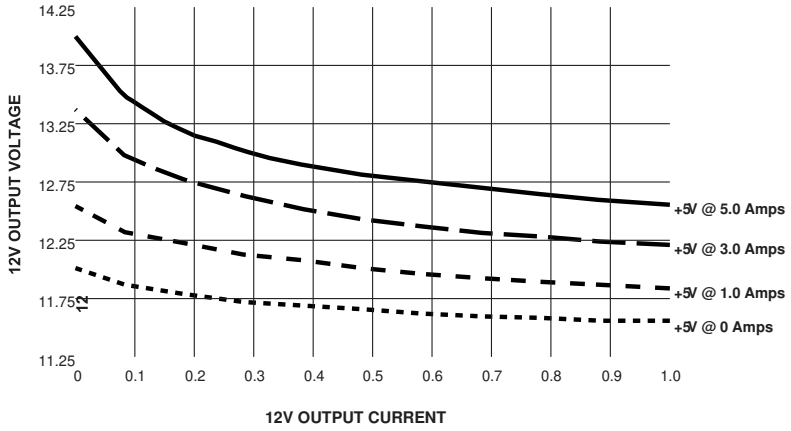


Figure1. MAP40-3500G Typical Quasi Regulation Performance For +12V Output

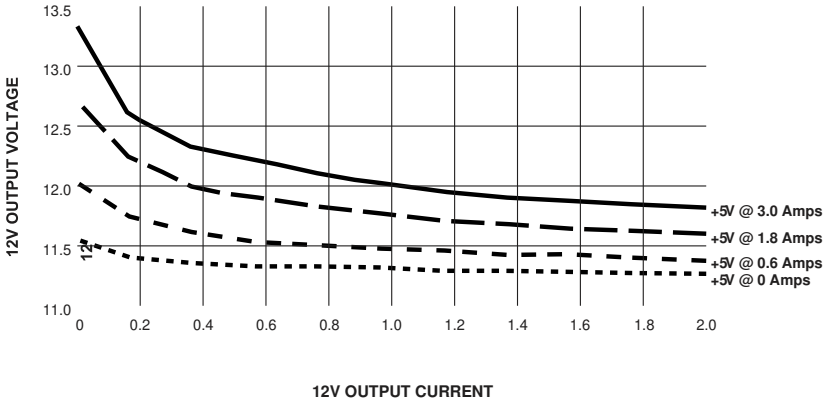


Figure 2. MAP40-3000/3100/3105G Typical Quasi Regulation Performance For +12V Output

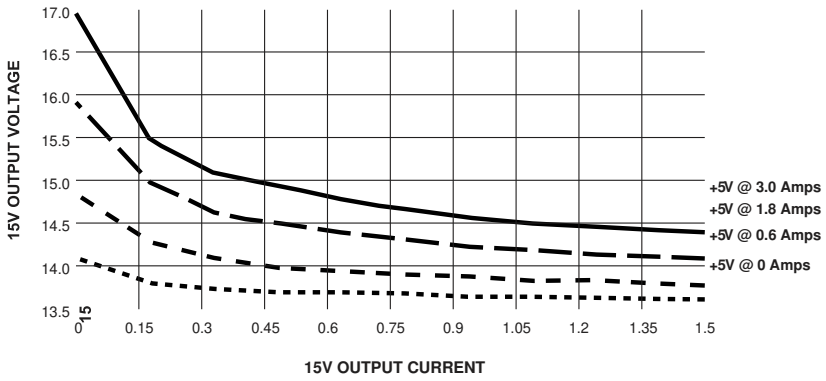
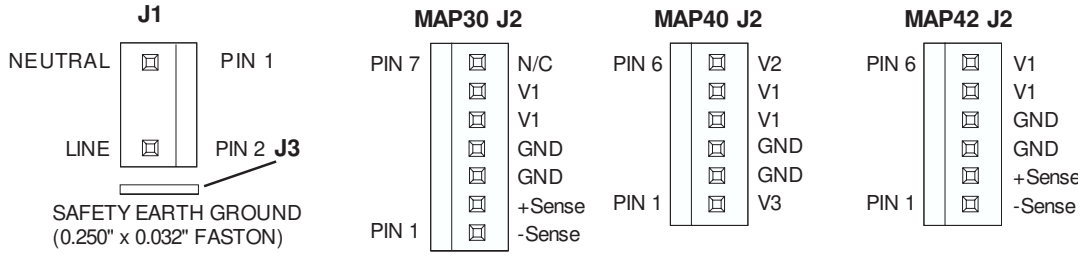


Figure 3. MAP40-3003G Typical Quasi Regulation Performance For +15V Output



J1/J2 MATES WITH MOLEX (SERIES 2139 or SERIES 41695) .156" (4mm) CENTER CRIMP TERMINAL HOUSING OR EQUIVALENT

Figure 4. Electrical Connectors

9. MECHANICAL SPECIFICATIONS / OPTIONS

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Dimensions			127.0 x 76.2 x see table below 5.0 x 3.0 x see table below		mm in
Weight			0.26 0.6		kg lb

SINGLE OUTPUT MODELS	
Model	*Height*
MAP30-1005G	1.16" (29.5)
MAP42-1005	1.25" (31.8)
MAP42-1012G	1.25" (31.8)
MAP42-1024G	1.25" (31.8)

MULTIPLE OUTPUT MODELS	
Model	*Height*
MAP40-3000G	1.16" (29.5)
MAP40-3003G	1.16" (29.5)
MAP40-3100G	1.25" (31.8)
MAP40-3101G	1.25" (31.8)
MAP40-3105G	1.25" (31.8)
MAP40-3500G	1.60" (40.6)

Table 1. MAP30/40/42 Series Height

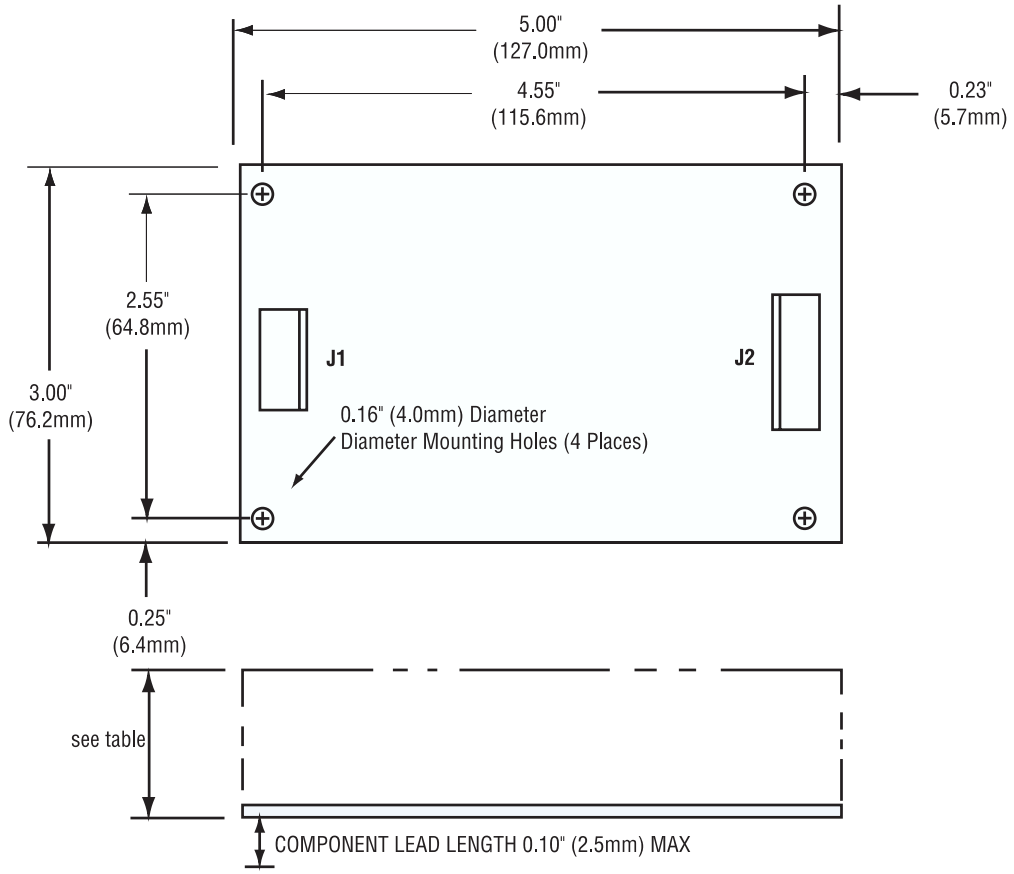


Figure 5. Mechanical Drawing

For more information on these products consult: 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.

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