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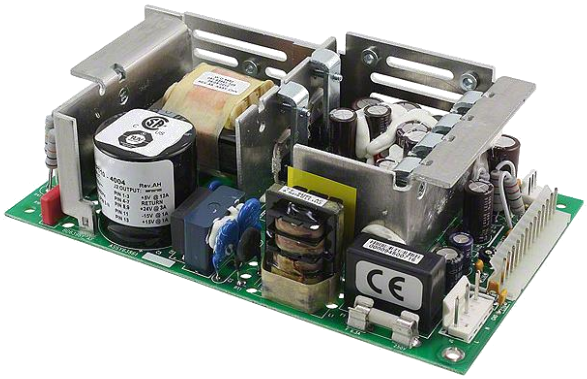
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MAP110 Series
AC-DC Power Supplies



Bel Power Solutions MAP110 Series of power supplies combines low cost and universal input in a board-only power solution to meet commercial and industrial requirements. Full international safety, EMI, and ESD compliance ensure worldwide acceptance. All units bear the CE Mark.

Wide dynamic output current and fixed-frequency operation simplifies system level operation. The MAP110 series is configured to an international standard 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.

Key Features & Benefits

- RoHS Lead-Solder-Exemption Compliant
- New 5 V Output Models
- Universal Input 85-264 VAC
- Industry-Standard Footprint:

  7.0" x 4.3" x 1.97" (177.8 x 109.2 x 50.0 mm)
- Input Transient & ESD Compliance to EN61000-4-2/-3/-4
- Remote sense and overvoltage protection on single output units and main output of multiple output units
- Options include Over temperature protection, Power Fail signal, Chassis & Cover
- Greater than 134,000 hours MTBF

1. SINGLE-OUTPUT MODEL SELECTION

MODEL [7]	OUTPUT VOLTAGE	ADJUSTMENT RANGE	CONVECTION COOLED OUTPUT CURRENT	FORCED AIR OUTPUT CURRENT [1]	LINE REGULATION	LOAD REGULATION	RIPPLE & NOISE [2]	INITIAL SETTING ACCURACY
MAP110-1005*	5V	4.95V to 5.5V	16A	22A	0.2%	1%	1%	5.09V to 5.11V
MAP110-1012G	12V	11.25V to 12.75V	7.5A	10A	0.1%	0.5%	1%	11.97V to 12.02V
MAP110-1024G	24V/28V	22.8V to 29.2V	3.8/3.2A [3]	5/4.3A [3]	0.1%	0.5%	1%	23.95V to 24.05V

2. MULTIPLE-OUTPUT MODEL SELECTION – 80 W CONVECTION COOLED, 110W FORCED-AIR COOLED (MINIMUM 200LFM)

MODEL [7]	OUTPUT VOLTAGE	ADJUSTMENT RANGE	CONVECTION COOLED OUTPUT CURRENT [4]	FORCED AIR OUTPUT CURRENT [4]	LINE REGULATION	LOAD REGULATION	RIPPLE & NOISE[2]	INITIAL SETTING ACCURACY
MAP110-4000G	+5V	4.75V to 5.25V	12A/20A PK	12A/20A PK	0.2%	0.5%	1%	5.09V to 5.11V
	+12V	Fixed	5A/9A PK	5A/9A PK	0.2%	1%	1%	11.97V to 12.03V
	-12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.2%	1%	1%	-11.4V to -12.6V
	-5V	Fixed	1A/1.5A PK	1A/1.5A PK	0.2%	1.5%	1%	-4.75V to -5.25V
MAP110-4001*	+5V	4.75V to 5.25V	12A/20A PK	12A/20A PK	0.2%	0.5%	1%	5.09V to 5.11V
	+24V	Fixed	3A/4.5A PK	3A/4.5A PK	0.1%	1%	1%	23.94V to 24.06V
	-12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	-11.4V to -12.6V
	+12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	11.4V to 12.6V
MAP110-4002G	+5V	4.75V to 5.25V	12A/20A PK	12A/20A PK	0.2%	0.5%	1%	5.09V to 5.11V
	+12V	Fixed	5A/9A PK	5A/9A PK	0.1%	1%	1%	11.97V to 12.03V
	-12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	-11.4V to -12.6V
	+12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	11.4V to 12.6V
MAP110-4003*	+5V	4.75V to 5.25V	12A/20A PK	12A/20A PK	0.2%	0.5%	1%	5.09V to 5.11V
	+15V	Fixed	5A/7.3A PK	5A/7.3A PK	0.1%	1%	1%	14.96V to 15.04V
	-15V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	-14.3V to -15.7V
	-5V	Fixed	1A/1.5A PK	1A/1.5A PK	0.2%	1.5%	1%	-4.75V to -5.25V
MAP110-4004G	+5V	4.75V to 5.25V	12A/20A PK	12A/20A PK	0.2%	0.5%	1%	5.09V to 5.11V
	+24V	Fixed	3A/4.5A PK	3A/4.5A PK	0.1%	1%	1%	23.94V to 24.06V
	-15V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	-14.3V to -15.7V
	+15V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	14.3V to 15.7V
MAP110-4010*	+5V	4.75V to 5.25V	12A/20A PK	12A/20A PK	0.2%	0.5%	1%	5.09V to 5.11V
	+12V	Fixed	5A/9A PK	5A/9A PK	0.1%	2%	1%	11.97V to 12.03V
	-5V	Fixed	1A/1.5A PK	1A/1.5A PK	0.2%	1.5%	1%	-4.75V to -5.25V
	-12V	Fixed	3A/4A PK	3A/4A PK	0.3%	8%	1%	-11.5V to -12.5V
MAP110-4011G	+5V	4.75V to 5.25V	12A/20A PK	12A/20A PK	0.2%	0.5%	1%	5.09V to 5.11V
	+12V	Fixed	5A/9A PK	5A/9A PK	0.1%	1%	1%	11.97V to 12.03V
	-12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	-11.4V to -12.6V
	+24V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	23.2V to 24.8V
MAP110-4015*	+5V	4.75V to 5.25V	12A/20A PK	12A/20A PK	0.2%	0.5%	1%	5.09V to 5.11V
	+12V	Fixed	5A/9A PK	5A/9A PK	0.1%	1%	1%	11.97V to 12.03V

	-15V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	-14.4V to -15.6V
	+15V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	14.4V to 15.6V
MAP110-4200G	+12V	11.55V to 12.45V	5A/9A PK	5A/9A PK	0.2%	0.5%	0.5%	11.96V to 12.03V
	+24V	Fixed	4A/4.5A PK	4A/4.5A PK	0.2%	1%	1%	23.94V to 24.06V
	-12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.2%	1%	1%	-11.4V to -12.6V
	+5V	Fixed	2A/2.5A PK	2A/2.5A PK	0.2%	1.5%	1%	4.75V to 5.25V
MAP110-4300* [5,6]	+3.3V	3.2V to 3.4V	12A/20A PK	15A/20A PK	0.3%	0.7%	1%	3.29V to 3.31V
	+5V	Fixed	5A/12A PK	8A/12A PK	0.2%	1%	1%	4.98V to 5.02V
	-12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	-11.4V to -12.6V
	+12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	11.4V to 12.6V
MAP110-4305* [5,6]	+3.3V	3.2V to 3.4V	12A/15A PK	15A/20A PK	0.3%	0.7%	1%	3.29V to 3.31V
	+5V	Fixed	5A/12A PK	8A/12A PK	0.2%	1%	1%	4.98V to 5.02V
	-5V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	-4.75V to -5.25V
	+12V	Fixed	1A/1.5A PK	1A/1.5A PK	0.1%	1%	1%	11.4V to 12.6V

[1] With minimum 200LFM forced-air cooling.
[2] Maximum peak to peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.
[3] MAP110-1024 output currents are expressed as 24V/28V operation.
[4] Peak loads up to 110 watts for 60 seconds or less are acceptable, (10% duty cycle max.). Peak power must not exceed 110 watts.
[5] Sum of the output currents of V1 + V2 may not exceed 15 A continuous, 22 A peak.
[6] Maximum operating ambient temperature of 40°C
[7] Non-G models use lead solder exemption and are not recommended for new designs.
* Obsolete

3. MAXIMUM OUTPUT RATING

MODEL/OUTPUT OPTION	MULTIPLE OUTPUT BOARD ONLY	SINGLE OUTPUT BOARD ONLY	MULTIPLE OUTPUT 'C'-COVER	SINGLE OUTPUT C'-COVER
Convection Continuous / Peak	80W/110W	90W/120W	60W/110W	65W/120W
Forced Air 200 LMF	110W	120W	110W	120W

4. 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 when regulation is maintained with full rated loads.	85			VAC
Hold-up Time	Nominal AC input voltage (110 VAC) 50% load: Full rated load:	40 20			mS
Input Current	85 VAC (110W load) 110VAC (110W load)			3.5 2.8	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.			41	A_{PK}
Operating Frequency	Switching frequency of main transformer, (fixed frequency).	20		25	kHz

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5. OUTPUT SPECIFICATIONS

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Efficiency	Full load @ 230 VAC (Varies with distribution of loads among outputs.)		70% typical		
Minimum Loads	Single output models Multiple output models, V1 + V2[8]	0 1			Amps
Ripple and Noise	Full Load, 20 MHz Bandwidth.		See Model Selection Chart		
Output Power	Multiple output units with convection cooling. Multiple output units with 200 LFM forced air cooling.	5 5		80 110	Watts
Overshoot / Undershoot	Output voltage overshoot/undershoot at turn-on.			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.			1	Sec
Turn-on Rise Time	Time required for output voltage to rise from 10% to 90%.			20	mS

[8] Minimum load is required only to meet the regulation limits of V3 and V4. If V3 and V4 are unused, no minimum load is necessary.

6. INTERFACE SIGNALS & INTERNAL PROTECTION

PARAMETER	CONDITIONS / DESCRIPTION		MIN	NOM	MAX	UNITS
Overvoltage Protection	Provided on single output models and the main output of multiple output models.	MAP110-1005G MAP110-1012G MAP110-1024G MAP110-4200G MAP110-4300G All other models	6.10 17.3 32.2 13.8 3.7 5.75		7.20 20.2 37.8 16.2 4.35 6.75	V
Overload Protection	Fully protected against output overload and short circuit. Automatic recovery upon removal of overload condition.			150	200	%
Remote Sense	Voltage drop compensated for at the load.				250	mV
Input Power Fail Warning	Option, TTL compatible logic signal. Time before regulation dropout due to loss of input power at 110 VAC. Active low.		3	5		mS
Over temperature Protection	Option, system shutdown due to excessive internal temperature.					

7. 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 Input to Output (tested by manufacturer only)	2121 4242			VDC
Electromagnetic Interference, Conducted	FCC CFR title 47 Part 15 Sub-Part B - conducted & radiated EN55022 / CISPR 22 conducted EN55022 / CISPR 22 radiated[9]		B B A		Class
Input Transient Protection	EN61000-4-5 Level 3	2			kV
Insulation Resistance	Input to output	10			MΩ
Leakage Current	Per EN60950, 264 VAC			750	µA

[9] The following units meet Class B: MAP110-1005, MAP110-4000/4011/4015/4200/4300.

8. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Altitude	Operating Non-operating			10k 50k	ASL Ft.
Operating Temperature	Derate linearly above 50°C by 2.5% per °C to a max. temp. of 70°C At 100% load: At 50% load:	 0 0		 50 70	°C
Storage Temperature		-55		85	°C
Temperature Coefficient	0°C to 70°C (after 15 minute warm-up)		±0.03	±0.05	%/°C
Relative Humidity	Non-condensing			95	%RH

9. 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	Add 'C' suffix to model number (Please check with Factory for availability)
Power Fail Signal	Add 'P' suffix to model number. Provides >5 mS typical warning time before main output drops 5%. Warning time increases at reduced load levels.
Thermal Shutdown	Add 'T' suffix to model number. Initiates shut-down in the event of an over temperature condition. Automatic recovery.

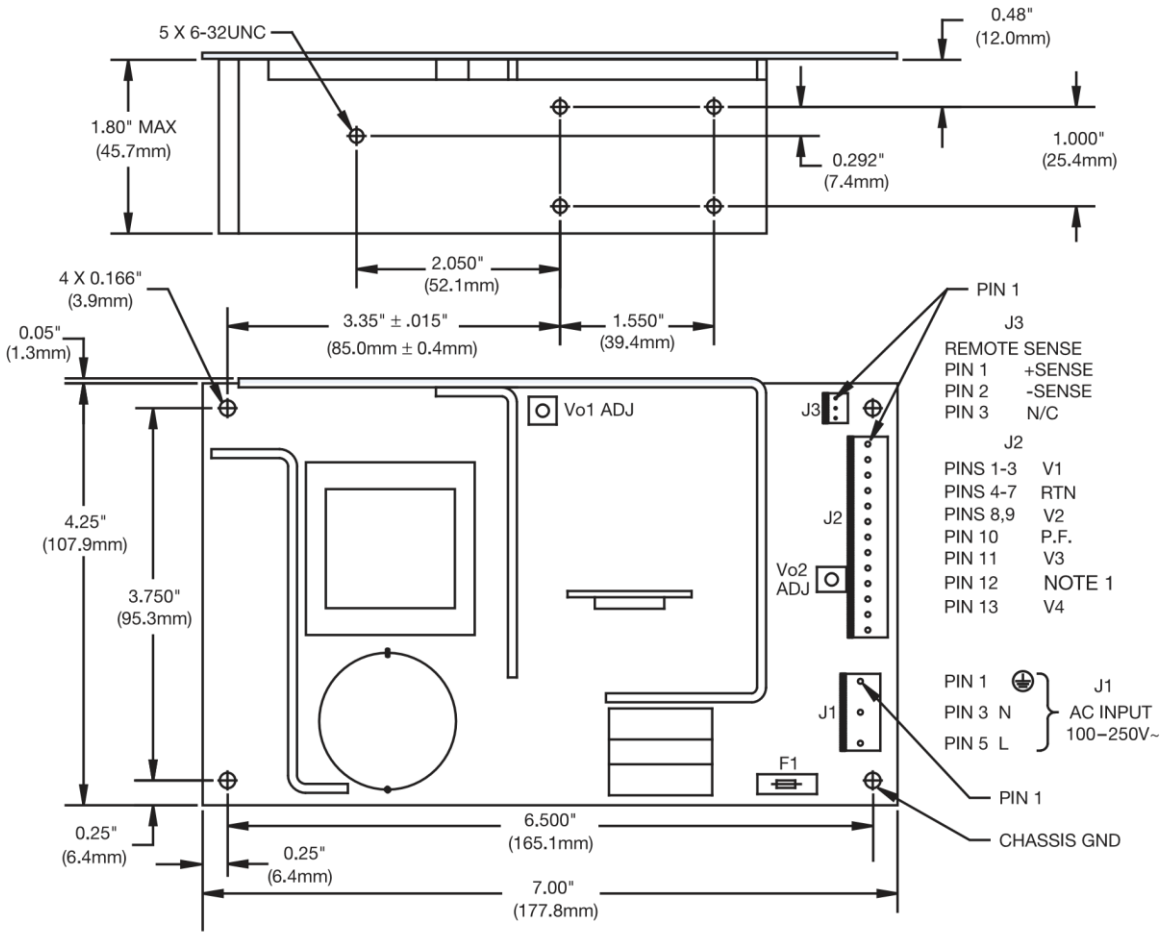
Please consult factory regarding availability of a specific version.

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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.

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.

Figure 1. 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.

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