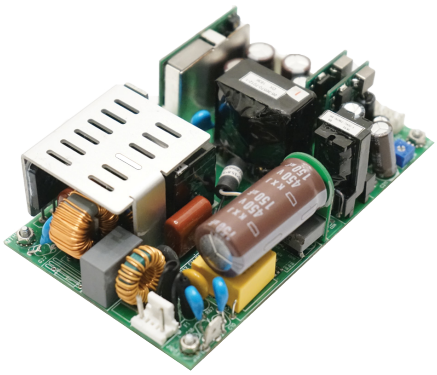
GB130Q

130W Quad Output
Medical/Test & Measurement/Industrial Grade



Medical

Test & Measurement

Industrial

FEATURES AND BENEFITS

3" x 5" x 1.5" Package	Meets Class B Radiated & Conducted EMI
130W w/air, 100W Convection Cooled	5V@1A Standby Output
Universal Input 90-264VAC	Remote Inhibit
Efficiency 87% Typical	>7 Year E-cap Life
Approved to CSA/EN/IEC/UL62368, IEC61326-1	3 Year Warranty
Approved to CSA/EN/IEC/UL60601-1, 3rd Edition	RoHS Compliant

MODEL SELECTION

Model Number[2,3]	Volts[1]		Output Current					Maximum Output Power		Ripple & Noise[2]	Total Regulation[3]	OVP Threshold
			200LFM air		Convection			200LFM air	Convection			
			Min	Max	Min	Max	Peak					
GB130QA	V1	5V	1A	16A	1A	12A	16A	130W	100W	1.0% pk-pk	±3%	7.5V max.
	V2	12V	0A	4A	0A	3A	5A			1.0% pk-pk	±3%	120%-140%
	V3	-12V	0A	1.2A	0A	1A	1.2A			1.0% pk-pk	±3%	120%-140%
	V4	12V	0A	1.2A	0A	1A	1.2A			1.0% pk-pk	±3%	120%-140%
GB130QC[4]	V1	5V	1A	16A	1A	12A	16A	130W	100W	1.0% pk-pk	±3%	7.5V max.
	V2	12V	0A	4A	0A	3A	5A			1.0% pk-pk	±3%	120%-140%
	V3	-15V	0A	1.2A	0A	1A	1.2A			1.0% pk-pk	±3%	120%-140%
	V4	15V	0A	1.2A	0A	1A	1.2A			1.0% pk-pk	±3%	120%-140%
GB130QD[4]	V1	5V	1A	16A	1A	12A	16A	130W	100W	1.0% pk-pk	±3%	7.5V max.
	V2	24V	0A	3A	0A	2A	5A			1.0% pk-pk	±3%	120%-140%
	V3	-12V	0A	1A	0A	1.2A	1.2A			1.0% pk-pk	±3%	120%-140%
	V4	12V	0A	1A	0A	1.2A	1.2A			1.0% pk-pk	±3%	120%-140%
GB130QE[4]	V1	5V	1A	16A	1A	12A	16A	130W	100W	1.0% pk-pk	±3%	7.5V max.
	V2	24V	0A	3A	0A	2A	5A			1.0% pk-pk	±3%	120%-140%
	V3	-15V	0A	1.2A	0A	1A	1.2A			1.0% pk-pk	±3%	120%-140%
	V4	15V	0A	1.2A	0A	1A	16A			1.0% pk-pk	±3%	120%-140%
GB130QP	V1	5V	1A	16A	1A	10A	16A	130W	100W	1.0% pk-pk	±3%	7.5V max.
	V2	24V	0.5A	5A	0.5A	4A	5A			1.7% pk-pk	+10%/-5%	120%-140%
	V3	-12V	0A	1.2A	0A	1A	1.2A			1.0% pk-pk	±3%	120%-140%
	V4	12V	0A	2A	0A	2A	1.2A			1.0% pk-pk	±3%	120%-140%

Notes:

1. 5V output is adjustable with +/-10% rangeOther output voltages available, consult factory.
2. Measured with noise probe directly across output terminals, and load terminated with 0.1μF ceramic and 47μF low ESR capacitors. Ripple & Noise of V2 at no load is 2% maximum. All specifications are typical at 230Vac, full load, at 25°C ambient unless noted.
3. Total Regulation is defined as the maximum deviation from the nominal voltage for all steady state conditions of initial voltage setting, input line voltage, and output load.
4. Contact factory for availability of specific models.

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INPUT

AC Input	100-240Vac, -20, +10%, 47-63Hz, 1Ø
Input Current	115Vac: TBDA, 230Vac: TBDA
Inrush Current	264Vac, cold start: will not exceed 75A
Input Fuses	F1, F2: TBDA, 250Vac fuses provided on all models
Leakage Current Earth: Patient:	 <290µA@264Vac, 60Hz, NC <100µA@264Vac, 60Hz, NC, <500uA, SFC
Efficiency	87% typical at 230Vac

ENVIRONMENT

Vibration	Operating: 0.003g²/Hz, 1.5grms overall, 3 axes, 10 min/axis Non-Operating: 0.026g²/Hz, 5.0grms overall, 3 axes, 1 hr/axis
Dimensions	W: 4.0" x L: 6.0" x H: 1.5"
Weight	TBDg
Turn On Time	Less than 2 sec. @115Vac (inversely proportional to input voltage and thermistor temperature)
Hold-up Time	16mS typical at 110W, 120Vac input
Operating Temperature	-20°C to +70°C
Temperature Derating	Derate output power linearly above 50°C to 50% at 70°C
Storage Temperature	-40°C to +85°C
Altitude	Operating: -500 to 15,000 ft. Non-operating: -500 to 40,000 ft.
Relative Humidity	5% to 95%, non-condensing

Notes:

1. Specifications are for convection rating at factory settings at 115 Vac input, 25°C ambient unless otherwise stated.
2. For DC input an external DC safety rated fuse must be used.

AUXILIARY SIGNALS

AC Power Fail	During normal operation, stays HIGH. Signal goes LOW with at least 6mS warning before loss of DC output from AC failure.
Remote Inhibit	Via switch closure
DC OK	During normal operation, this signal is logic HIGH. Signal will go LOW for output less than 90% (typical) of nominal. Green LED will light on PCB top side during normal operation.
5V Standby Output	5V@ 1.0A output, always present when AC input is applied to the unit.

OUTPUT

Output Power	130W continuous with 200 lfm airflow, 100W convection cooled – See chart for specific voltage model ratings.
Ripple and Noise	See models chart
Output Voltage	See models chart
Voltage Adjustability	+/-10% from nominal on 5V output
Turn On Time	Less than 2 sec. @115Vac (inversely proportional to input voltage and thermistor temperature)
Hold-up Time	16mS typical at 110W, 120Vac input
Switching Frequency	PFC: 0.9 typical
Transient Response	500µS typ. for return to within 0.5% of nominal, 50% load step. Δi/Δt <0.2A/µS. Max Volt Deviation = 3%

SAFETY

Safety Standards	IEC/UL61326-1 IEC/UL/CSA62368 DEMKO EN62368

RELIABILITY

MTBF	250,000 hours, 25°C Ambient, 110Vac input
E-Cap Life	>7 Years in use condition of 40°C ambient, at 12h/day, 261 days/year. Additional information on other use profiles available on request.
Minimum Load	See models chart
Total Regulation	See models chart

PROTECTION

Parameter	Conditions/Description	Min	Nom	Max	Units
Input Fuse	TBD A/250V internal fuse in both line & neutral	Not user accessible			
Input Transient Protection	4KV(CM) and 2KV(DM) surge			4	KV (CM)
Short Circuit Protection	Provided - no damage will occur if the output is shorted.	Hiccup Mode			
Overload Protection	150%-300% above rating for V2, V3, & V4 110%-200% for V1.	Hiccup Mode			
Overvoltage Protection	Latching Type, recycle AC input to reset	See models chart for trip ranges			
Shock	Operating: Half-sine, 20gpk, 10ms, 3 axes, 6 shocks total Non-Operating: Half-sine, 40 gpk, 10 ms, 3 axes, 6 shocks total				

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EMI/EMC COMPLIANCE

Conducted Emissions	EN55011/22 Class B, FCC Part 15, Subpart B, Class B with 6db margin
Radiated Emissions	EN55011/22 Class B; FCC Part 15, Subpart A, Class B
Common Mode Noise: High Frequency (100Khz -20 Mhz)	<50mA pk-pk, 6mA rms CM current. See Application Note.
Common Mode Noise: Low Frequency (50-120 Hz)	<50mA pk-pk, 6mA rms CM current. See Application Note.
Static Discharge Immunity	EN55024/IEC61000-4-2, Level 4, 8kV Contact Discharge, 15kV air discharge, Criteria A[1]
Radiated RF Immunity	EN55022/IEC61000-4-3, Level 3, 10V/m, Criteria A[1]
EFT/Burst Immunity	EN55024/IEC61000-4-4, Level 3, 4kV (PS Output), Criteria A; 2kV (signal outputs), Criteria B[1]
Line Surge Immunity	EN55024/IEC61000-4-5, Level 3, 1kV diff., 2kV Common-Mode, Criteria A[1] Level 4, 2kV diff., 4kV Common-mode, Criteria B[1]
Conducted RF Immunity	EN55022/IEC61000-4-6, Level 3, 10V/m, Criteria A[1]
Power Frequency Magnetic Field Immunity	EN55024/IEC61000-4-8, Level 4, 30A/m, Criteria A[1]
Voltage Dip Immunity	EN55024/IEC61000-4-11, Dips: 100%, 10ms; 30%, 500ms; 60%, 100ms; Interruptions: 100%, 5000mS; Performance Criteria A, A, B & B[1]
Line Harmonic Emissions	EN55024/IEC61000-3-2, Class A.
Flicker Test	EN55024/IEC61000-3-3

Notes:
Performance criteria are based on EN55024. According to the standards, performance criteria are defined as following:
1. Normal performance during and after the test
2. Temporary degradation, self-recoverable
3. Temporary degradation, operator intervention required to recover the operation
4. Permanent damage

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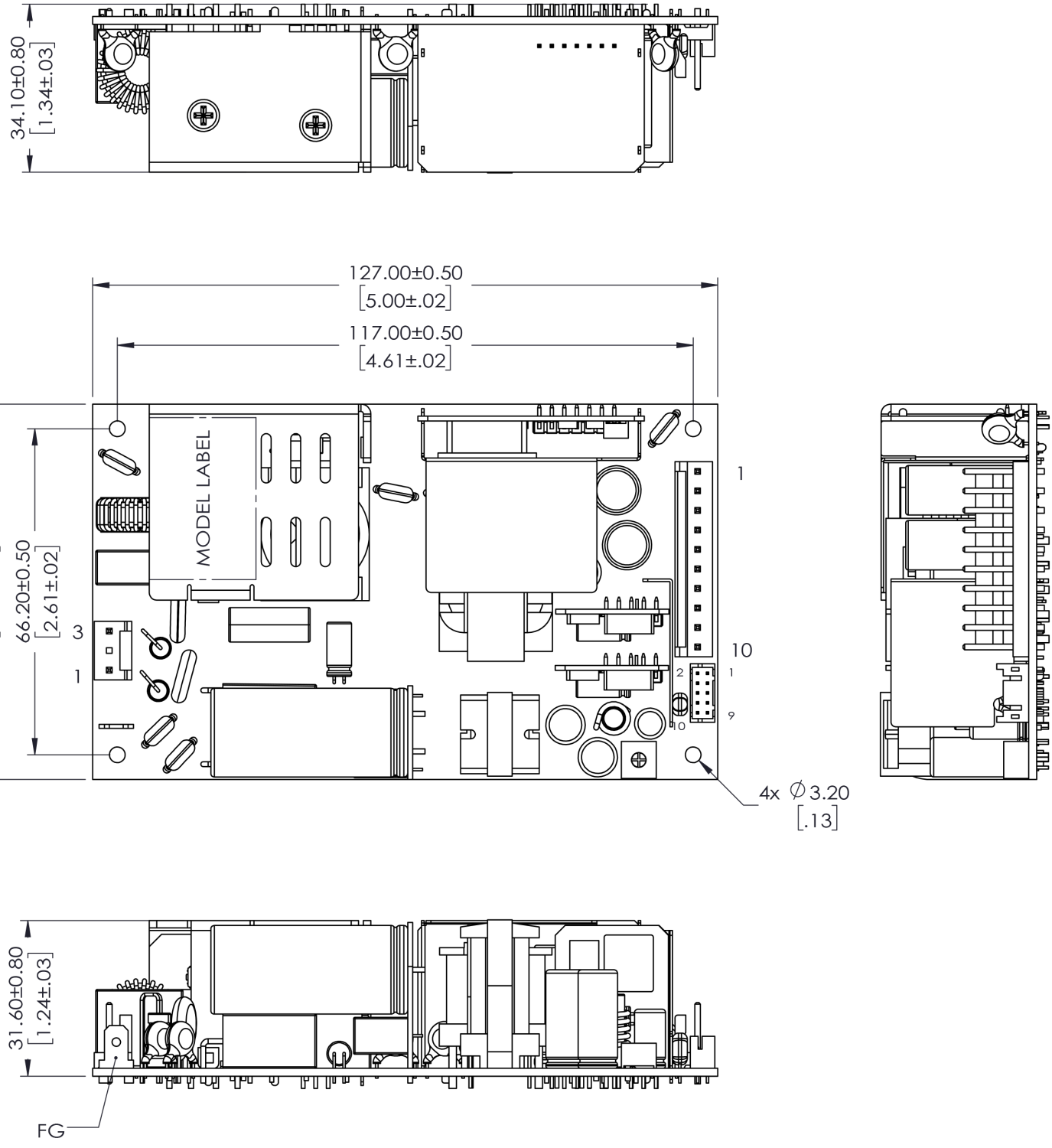
MECHANICAL DRAWING



Notes:

1. All dimensions in inches (mm), tolerance is ±.02".
2. Mounting holes should be grounded for EMI purpose
3. This power supply requires mounting on metal standoffs 0.20" (5 m) in height.

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CONNECTOR INFORMATION

Input Connector J1	DC Output Connector J2	Signal Connector J3
PIN 1) AC GROUND PIN 2) EMPTY PIN 3) AC NEUTRAL PIN 4) EMPTY PIN 5) AC LINE	PIN 1) +V1 PIN 5) RTN PIN 9) V2 PIN 13) V4 PIN 2) +V1 PIN 6) RTN PIN 10) PF PIN 3) +V1 PIN 7) RTN PIN11) V3 PIN 4) RTN PIN 8) V2 PIN12) KEY	PIN 1) DC OK PIN 2) RTN PIN 3) INHIBIT PIN 4) 5V Standby
Connector: TE/AMP P/N 640445-5 Mating Connector: TE/AMP P/N 640250-5 Pins= 770476-1	Connector: TE/AMP P/N 1-640445-3 Mating Connector: TE/AMP P/N 1-640250-3 Pins = 770476-1	Connector: TE/AMP 640456-4 Mating Connector: TE/AMP 640441-4

ISOLATION SPECIFICATIONS

Parameter	Conditions/Description	Min	Nom	Max	Units
Insulation Safety Rating	Input/Ground Input/Output Output/Ground		Basic Reinforced Operational		
Electric Strength Test Voltage	Input/Ground Input/Output Output/Ground	1800 4000 500	-	-	Vac Vac Vac

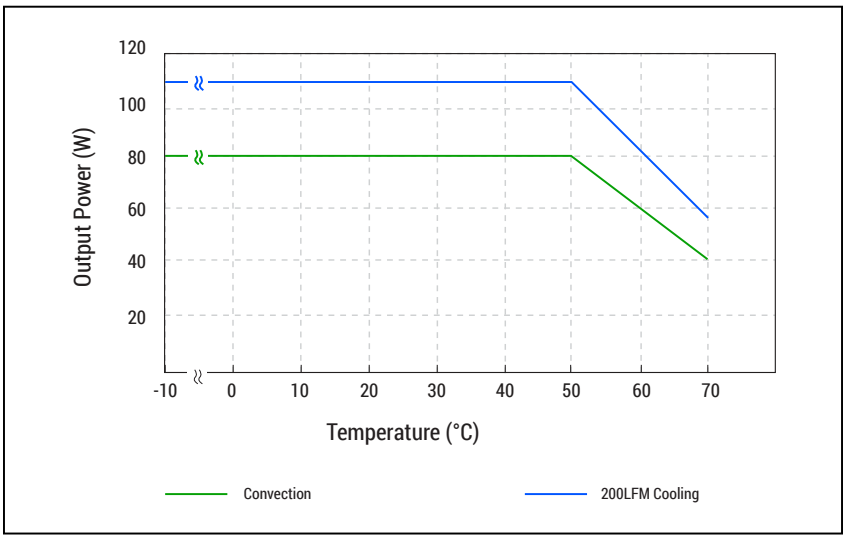
LEAKAGE CURRENT

Parameter	Conditions/Description	Max
Earth Leakage Current	Normal Condition (NC) Single Fault Condition (SFC)	290µA 420µA
Touch Current	Normal Condition (NC) Single Fault Condition (SFC)	90µA 170µA

CHARACTERISTIC CURVES

Output vs. Temperature

100W convection cooled and 130W continuous with 200 LFM airflow. Derate output power to 50% at 70C.



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