



Medical



Industrial



LED/AV

FEATURES AND BENEFITS

Output Power of up to 250W with airflow, only derating to 180W convection cooled across entire input range

4" W x 2" L x 1.5" H Size

Universal 85-264Vac Input Range

Meets Class B Emissions levels

Greater than 10 years Electrolytic Capacitor Life

Safety: IEC/UL/EN62368-1, IEC/UL/EN60601-1, 3rd Edition + Am1

Meets Heavy Industrial/IEC60601-1-2 4th Edition EMC Requirements

Less than 100uA Leakage Current

Class I and Class II Input versions available

3 year warranty



MODEL SELECTION

Model Number	Nominal Output Voltage	Output Current (fan) ¹	Output Power (fan) ¹	Output Current (convection)	Output Power (convection)	Output Current (conduction)	Output Power (conduction)	Terminations	
								Input	Output
NGB250S12K	12V	19.1A	230W	12.1A	145W	12.1A	145W	3 pin (pin 2 removed) 0.156 Ctr Connector (Class I)	6 pin Header 0.156 Ctr Connector
NGB250S15K	15V	15.3A	230W	10.3A	155W	10.3A	155W		
NGB250S24K	24V	10.4A	250W	7.3A	175W	7.3A	175W		
NGB250S28K	28V	8.9A	250W	6.2A	175W	6.2A	175W		
NGB250S48K	48V	5.2A	250W	3.6A	175W	3.6A	175W		
NGB250S56K*	56V	4.47A	230W	3.1A	175W	3.1A	175W	3 pin (pin 2 removed) 0.156 Ctr Connector (Class II)	
NGB250S12C	12V	19.1A	230W	12.1A	145W	12.1A	145W		
NGB250S15C	15V	15.3A	230W	10.3A	155W	10.3A	155W		
NGB250S24C	24V	10.4A	250W	7.3A	175W	7.3A	175W		
NGB250S48C	48V	5.2A	250W	3.6A	175W	3.6A	175W		

* NGB250S56K is approved for IEC/UL/EN62368-1, not approved to IEC/UL/EN60601-1

INPUT

AC Input	85VAC–264VAC, single phase, 47Hz–63Hz
Input Current	2.6A max at 115VAC, 1.3A at 230VAC
Inrush Current	264VAC, cold start: will not exceed 75A peak
Input Fuses	6.3A, 250VAC fuse in both line and neutral
Leakage Current (Input to Earth)	<500uA@ 264VAC, 60 Hz input, NC
Leakage Current (Input to Output)	<100uA/500 uA @264VC, 60Hz input, NC/SFC
Efficiency	>90%, typical
No Load Input Power	<0.5W

SAFETY

UL	UL62368-1 UL60601-1, 3 rd Edition + Am1 Complies with BF rated application requirements
CSA	CAN/CSA-C22.2 No. 62368-1, 60601-1, Complies with BF rated application requirements
Demko	EN62368-1 EN60601-1, 3 rd Edition, + Am1 Complies with BF rated application requirements
CB Report	Design to meet 5000m and 50°C, 93% RH with 120h (Tropical standard) according to GB4943-1-2011, IEC62368-1, IEC60601-1, Complies with BF rated application requirements



OUTPUT

Output Power	See model list above
Ripple and Noise	1% of Vout
Load Regulation	2%.
Line Regulation	1%
Total Regulation	5%
Minimum Load	Not required
Initial Set Point Tolerance	±1 %
Output Adjustability	5%
Overshoot	<3% overshoot at turn-on, <1% overshoot at turn-off, under all conditions
Monotonic Wave form	PSU shall have monotonic wave forms on the main output at start up, shut down and fault (OVP, OCP, OTP, OPP, SCP) triggered shutdown
Transient Response	500µs response time for return to within 0.5% of final value for any 50% load step over the range of 25% to 100% of rated load, $\Delta i/\Delta t < 0.2A/\mu s$. Max. voltage deviation is +/-3.5% of final value
Capacitive Load	1000µF

Notes:

Unless otherwise noted, all parameters are specified at nominal input (115VAC/230VAC), 25°C ambient operating temperature, no load to full rated output power, and nominal output voltage.

PROTECTION

Overvoltage Protection	115% to 155% of nominal output voltage. Requires AC recycle to reset.
Short Circuit Protection	Short across the output terminals will not cause damage to the unit. Hiccup Mode
Thermal Protection	Will shutdown upon an over-temperature condition, auto-recovery.
Overload Protection	130% - 180% of rated output current value, Hiccup Mode

ISOLATION

Insulation Safety Rating	Input-Ground: 1500VAC, 1 x MOPP Input-Output: 4500VAC, 2 x MOPP Output-Ground: 1500VAC, 1 x MOPP
Electric Strength Test Voltage (HIPOT)	Input-Ground: 1500VAC Input-Output: 4500VAC Output-Ground: 1500VAC

EMI/EMC COMPLIANCE

Conducted Emissions	EN55011/15/32: Class B, CISPR11/15/32: Class B, FCC Part 15.107, Class B, Measured at 10%, 50%, and 100% load steps; 6db margin typ, at 120VAC and 230VAC
Radiated Emissions	EN55011/15/32: Class B, CISPR11/15/32: Class B, FCC Part 15.107, Class B, Measured at 10%, 50%, and 100% load steps; 3db margin typ, at 120VAC and 230VAC
Harmonic Current Emissions	EN61000-3-2, Class A at 230VAC, 100% load
Voltage Fluctuations & Flicker	IEC61000-3-3
Electro Static Discharge Immunity	EN55024/IEC61000-4-2, Level 4: ±8kV contact, ±15kV air, Criteria A IEC60601-1-2, 4 th Edition, Table 4
Radiated RF EM Fields Susceptibility	EN55022/EN61000-4-3, 10V/m, 80MHz-2.7GHz, 80% AM at 1kHz IEC60601-1-2, 4 th Edition, Table 4
Electrical Fast Transients / Bursts	EN55024/IEC61000-4-4, Level 4, ±4kV, 100Khz rep rate, 40A, Criteria A IEC60601-1-2, 4 th Edition, Table 5
Surges Line to Line (DM) and Line to Ground (CM)	EN55024/IEC61000-4-5, Level 4, ±2kV DM, ±4kV CM, Criteria A Surpasses IEC60601-1-2, 4 th Edition requirements
Conducted Disturbances induced by RF Fields	EN55022/IEC61000-4-6, 3V/m – Level 4, 0.15 to 80MHz; and 12V/m) in ISM and amateur radio bands between 0.15MHz and 80MHz, 80% AM at 1KHz IEC60601-1-2, 4 th Edition, Table 5
Rated Power Frequency Magnetic Fields Test	EN55024/IEC1000-4-8, Level 4: 30A/m, 50Hz / 60Hz IEC60601-1-2, 4 th Edition, Table 4
Voltage Dips	EN55024/IEC/EN61000-4-11: --100% dip for 10 mS, at 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°: --100% dip for 20mS, 0°, Criteria B (Criteria A at 160W output) --100% dip for 5000mS (250/300 cycles), Criteria B -- 60% dip for 100mS, Criteria B -- 30% dip for 500mS, Criteria A IEC60601-1-2, 4 th Edition, Table 5
Common Mode Noise: High Freq. (100KHz-20MHz)	20mA pk-pk

Notes:

Performance criteria are based on EN55024. According to the standards, performance criteria are defined as following:

- A – Normal performance during and after the test
- B – Temporary degradation, self-recoverable
- C – Temporary degradation, operator intervention required to recover the operation
- D – Permanent damage



ENVIRONMENT

Operating Temperature Range	-20°C to +80°C
Power Derating over temperature	Derate output power linearly above 50°C to 40% Load at 80°C
Relative Humidity	5% to 95%, non-condensing
Altitude	Operating: -500 m to 5,000m Non-operating: -500 m to 12,192 meters
Storage Temperature	-40°C to +85°C
Vibration	<p>Random Vibration: Operating: 0.003g/Hz, 1.5 grams overall, 3 axes, 10 min/axis, 5Hz-500Hz.</p> <p>Non-Oper.: random waveform, 3 minutes/axis, 3 axes and Sine waveform, Vib. frequency/acceleration: 10H z-500Hz/1g, sweep rate of 1 octave/minutes, Vibration time of 10 sweeps/axes, 3 axes</p> <p>Transportation Vibration: Random vibration per MIL-STD-810E, Method 514.4, Cat. 1, Figure 514.4-1, 1 hr in each of three axes</p>
Shock (IEC 60068-2-27)	<p>Operating: Half-sine, 20gpk, 10mS, 3 axes, 6 shocks total.</p> <p>Non-Operating: Half-sine waveform, impact acceleration of 50G, Pulse duration of 6mS, Number of shocks: 3 for each of the three axis</p>
Cooling	Airflow: >=300LFM Convection
Audible Noise	<20 dbA

RELIABILITY

MTBF	>500K hours
Warranty	3 Years
E-Cap and other parts Lifetime	All specified E-Caps shall exceed 10 year life based on operation at 25°C ambient temperature, 365 days/year, 24 hrs/day.
ROHS	Product is ROHS compliant
REACH	Product is REACH compliant

UNIT PACKAGING

Inserted Instructions	Instruction Sheet to be provided with all units packaged in individual unit box if used
Individual Unit Packing	Units can be packed in egg crate type cartons for production quantities. Individual product shipments should include an individual unit box
Master Carton Shipping Box	40 units per master carton. Unit packaged into carton must be protected such that it will sustain 1.4m drop test onto hard surface. Only anti-static packing material may be used inside the box. Exterior box sealing tape shall be anti-static type.
Individual Carton Packing Box (when used)	Individual carton must be labeled with ROHS sticker and individual label showing unit serial number, bar code, manufacturing date, bar code, and Manufacturing part number, bar code, country of origin.

DERATING SPECIFICATIONS

Ambient Temperature	12V Model			15V Model			24V, 48V & 56 Models		
	100-265Vac	90Vac	80Vac	100-265Vac	90Vac	80Vac	100-265Vac	90Vac	80Vac
50°C-Convection	145W	135W	120W	155W	145W	125W	175W	165W	145W
50°C-w/Airflow	230W	220W	200W	230W	220W	200W	250W	250W	250W
60°C-Convection	116W	108W	96W	124W	116W	100W	140W	132W	116W
60°C-w/Airflow	184W	176W	160W	184W	176W	160W	200W	200W	200W
70°C-Convection	87W	81W	72W	93W	87W	75W	105W	99W	87W
70°C-w/Airflow	138W	132W	120W	138W	132W	120W	150W	150W	150W
80°C-Convection	58W	54W	48W	62W	58W	50W	70W	66W	58W
80°C-w/Airflow	92W	88W	80W	92W	88W	80W	100W	100W	100W



MECHANICAL SPECIFICATIONS

Dimensions	W: 2.13" x L: 4.06" x H: 1.5"
Input Connector	TE# 640445-3 (middle pin removed)
Output Connector	TE# 640445-6
Unit Weight	290g

OUTLINE DRAWING

