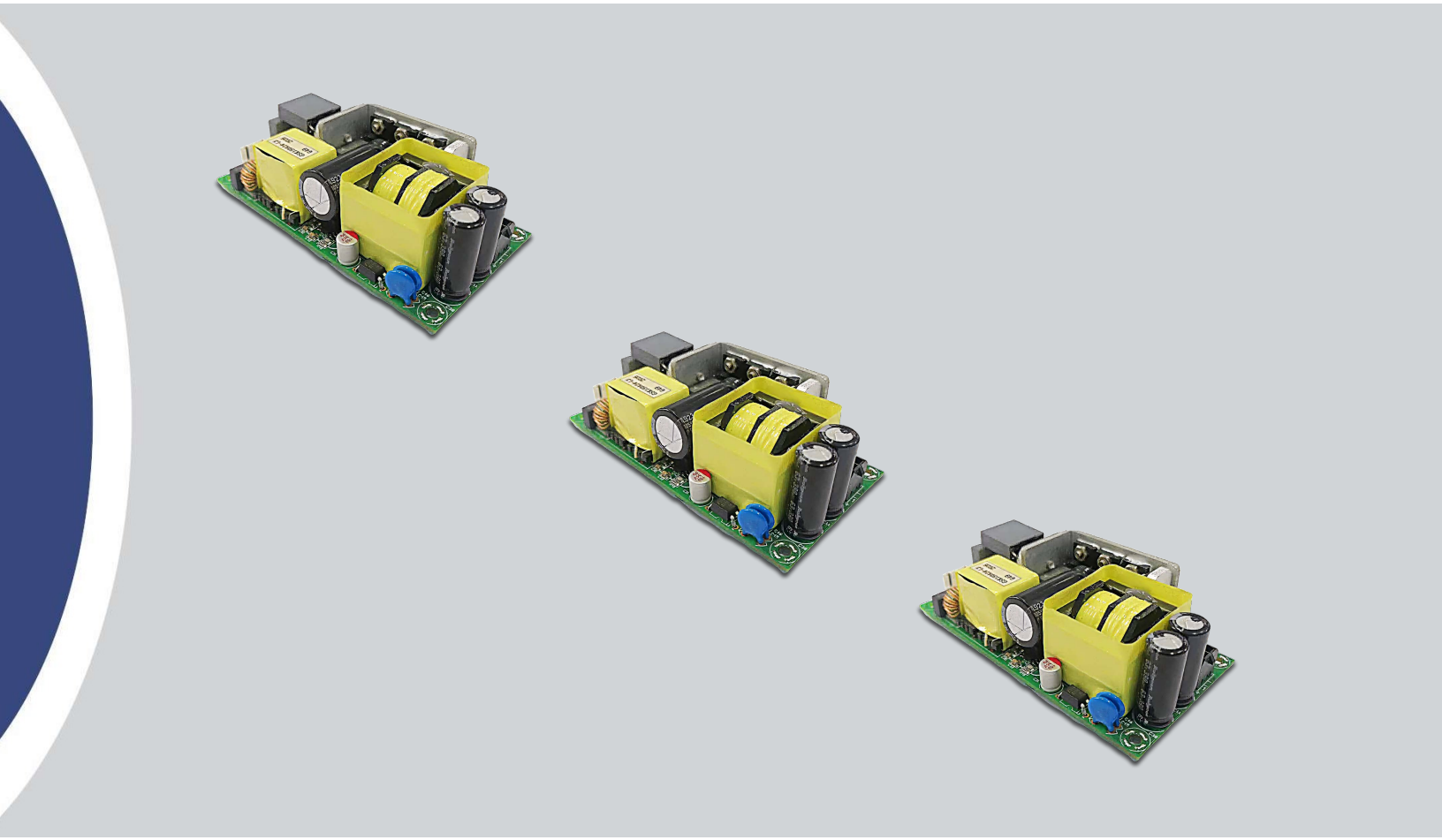
TECHNICAL SPECIFICATION

GSK150A Series

Open-Frame AC-DC Board Mount Power Supply for Consumer & Industrial Products



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OVERVIEW

The GSK150A family of miniature open-frame chassis mount AC/DC power supplies deliver 150W of output power with a ultra-wide universal input range of 90 to 300 Vac. The series includes three models featuring a precise regulated single-output voltage selection of 12, 24 or 48Vdc.

With 4-point efficiency up to 91% at 230VAC and extremely low no-load power consumption less than 0.15W typically, GSK150A models meet global low power consumption and safety standards. The devices incorporate built-in EMI filtering that ensures compliance with FCC and EN/EN55032 Class B while superior EMC characteristics protect end-use electronics from electromagnetic interference.

They are ideal for powering industrial tools, measurement instruments, industrial automation equipment, handheld household devices, gaming consoles and other portable gear.

FEATURES

- Compact Size; Low Profile
  - 4.0in(L) x 2.0in(W) x 1.19(H)
  - 101.6mm(L) x 50.8mm(W) x 30.3mm(H)
- Wide AC input range (90-300Vac)
- Active PFC (typical:0.95@115Vin, 0.92@230Vin)
- 4 point efficiency meets at 115VAC
- 150W Single DC output at 12V, 24V or 48V
- No-load power consumption <0.15W (12/24V) typical
- EN55022 EMI Class B with no modifications
- Wide operating temperature range -10ºC to70°C
- Wide operating temperature range (-20°C to 70°C) and 40°C can power up (derating above 50°C)
- Convection cooled
- Full protection for Input UVP, Output OVP, OCP, SCP, OTP
- Cost effective, reliable design
- Meets ROHS Hazardous Substances Directive 2011/65/EU and (EU)2015/863
- Designed to meet safety standard of IEC/UL62368

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SCOPE

This document describes the specifications for the GSK150A open-frame AC/DC power supplies.

MODEL SELECTION

Description	GSK150A12	GSK150A24	GSK150A48
DC Output (50% Load, Min, Nominal, Max)	11.82 / 12 / 12.18V	23.64 / 24 / 24.36V	47.28 / 48 / 48.72V
Current Range (Max, Conv/30CFM)	0 - 10A/12.5A	0-5A/6.25A	0-2.5A/3.13A
Rated Power	150W	150W	150W

ABSOLUTE MAXIMUM RATINGS

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only, functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect the device reliability.

INPUT SPECIFICATIONS

Description	GSK150A12	GSK150A24	GSK150A48
Input Voltage Range Typical	90-264VDC (Safety voltage 100-240Vac)		
Frequency	47-63Hz		
Input Current, Max Vin=100V, Po=150W	2.0A	2.0A	2.0A
Inrush Current, Typical	70A typical 230VAC cold start		
Power Factor, Min/Typical	90%/95%, Meets EN61000-3-2, Class A		
Earth Leakage Current	< 3.5mA/264VAC		
No Load Input Power, Max, Nominal Input, Io =ø	<0.15W	<0.15W	<0.25W
4-point Efficiency, Typical at 115 VAC/230VAC	90%/91%	90%/91%	90%/91%
Switching Frequency	Variable, 65Khz – 80Khz		

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PROTECTION

Description	GSK150A12	GSK150A24	GSK150A48
Fusing	Fuse in line input		
Input Under Voltage (UVP)	Triggers at <85VAC		
Output Over Current (OCP)	110%-160% rated output power Protection type: Hiccup mode, recovers automatically after fault condition removed		
Output Over Voltage (OVP)	120% load min Protection type: Latch mode, power cycle after fault condition removed and power cycle		
Short Circuit (SCP)	Protection type: Hiccup mode, recovers automatically after fault condition removed		
Over Temperature (OTP)	Protection type: Latch mode, power cycle after fault condition removed and power cycle		

DC OUTPUT SPECIFICATIONS

Description	GSK150A12	GSK150A24	GSK150A48
Rated Power	150W	150W	150W
Output Voltage, Vdc Min/Nominal/Max	11.82/12/12.18	23.64/24/24.36	48.28/48/48.72
Output Current, Convection / 30CFM	10A/12.5A	5A/6.25A	2.5A/3.13A
Ripple and Noise[1]	±0.7%Vout (nominal),	±1% Vout (max)	
Output Overshoot	±5% Vout		
Voltage Tolerance[2]	±5%		
Load Regulation	±0.2%	±0.2%	±0.2%
Line Regulation, Max	±0.1%	±0.1%	±0.1%
Min Load	No requirement		
Transient Response			
Dynamic 1 (1A/us) 25% to 75% to 25% load		±4% Vout max	
Dynamic 2 (1A/us) 5%-50% and 50%-100% load		±5% Vout max	
Recovery Time Back to 1%Vout	500uS		
Turn On Overshoot, Max	5%V		
Delay Time, Nominal/Max	2 Seconds, 115/230VACin at 90º Load		

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Rise Time[4], Typical/Max, 10%-90%	30mS/50 mS, 115/230VACin at 90º Load		
Capacitive External Load	5000 µF	3000 µF	1000 µF
Hold Up Time, Min, Full Load	16mS at nominal input and droop to 90% Vo		

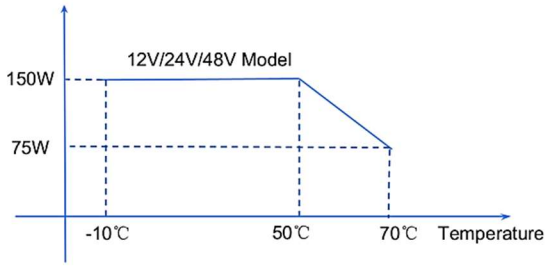
1. Ripple & noise are measured at 20MHz of bandwidth using a 12" twisted pair-wire terminated with a 0. 1µf & 47µf parallel capacitor at 115/230VAC input at full load.
2. Tolerance: includes set up tolerance, line regulation and load regulation.
3. Unit does not support current sharing applications.
4. Monotonic, no external capacitor.

ENVIRONMENTAL SPECIFICATIONS

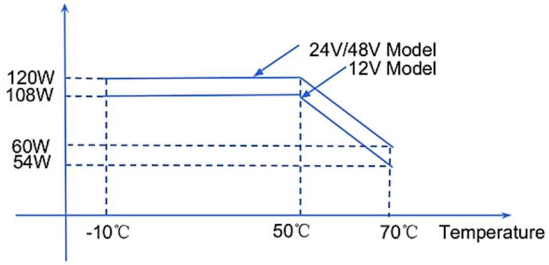
Description	
Working Temperature	-10 to +70ºC
Operating Humidity	5%-95% RH non-condensing
Storage Temperature	0 - 85ºC
Temp. Coefficient	±0.02% x Vout/ºC (0 - 50ºC)
Solder Temperature	NC
Operating Altitude	10,000 feet / 3048 meters

1. Derated from 50 ºC to 70 ºC by 2.5% / ºC. See derating curve for natural cooling conditions.

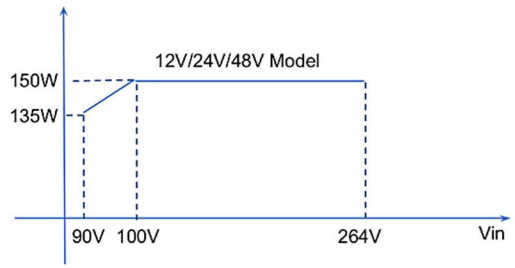
Derating Curves



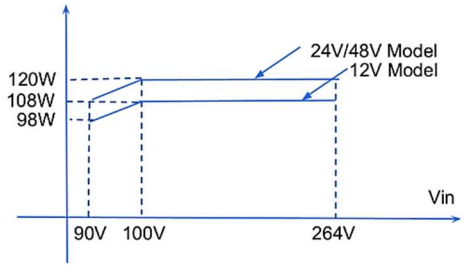
Derating on ambient with 1m/S airflow



Derating on ambient with natrual cooling



Derating on input voltage with 1m/S airflow



Derating on input voltage with natrual cooling

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SAFETY & EMC

Description			
Safety Standards	Designed to meet IEC62368-1		
FCC CISPR Compliance	FCC part 15B and EN55032 (QP/AV method)		
Harmonics	EN 61000-3-2 / ETSI EN 300386 V1.3.2, Class A		
Withstand Voltage	Input to Output: 3KVAC		
Isolation Resistance	Input to Output: 100M Ohms / 500VDC / 25ºC/ 70% RH		
EMC Emission	**Parameter**	**Standard**	**Test Level/Note**
	Conducted	EN55032,QP/AV method	Class B + Sys Box
	Radiated	EN55032, FCC Controlled by System	Class B + Sys Box
	Harmonic Current (Note 5)	EN61000-3-2	Class A
	Voltage Flicker	EN61000-3-3	
EMC Immunity			
	Parameter	**Standard**	**Test Level/Note**
	ESD	EN61000-4-2	±8KV air; ±4KV contact, Criteria B
	Radiated Susceptibility	EN61000-4-3	3 V/m, Criteria A
	EFT/Burst	EN61000-4-4	±2KV (Level 2) Criteria B
	Surge	EN61000-4-5, EN55024, ETSI EN300386 V.1.3.2	DM ±2KV, CM ±4KV, Criteria B
	Conducted Susceptibility 150KHz-80MHz, 10V, 80%AM	EN61000-4-6, EN55024, ETSI EN300386 V.1.3.2	Criteria A
	Radiated Susceptibility	EN61000-4-3, EN55024, ETSI EN 300 386 V1.3.2	Criteria A
	Voltage Dips and interruptions	EN61000-4-11, EN55024, ETSI EN300386 V.1.3.2	Criteria B and C

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Voltage Drop	Duration Time	Criteria
100%Ut	15ms/29mS	A/B
100%Ut	500ms	B
60%Ut	100ms/500ms	B
30%Ut	500ms	A

Notes: EMC 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

SAFETY & RELIABILITY

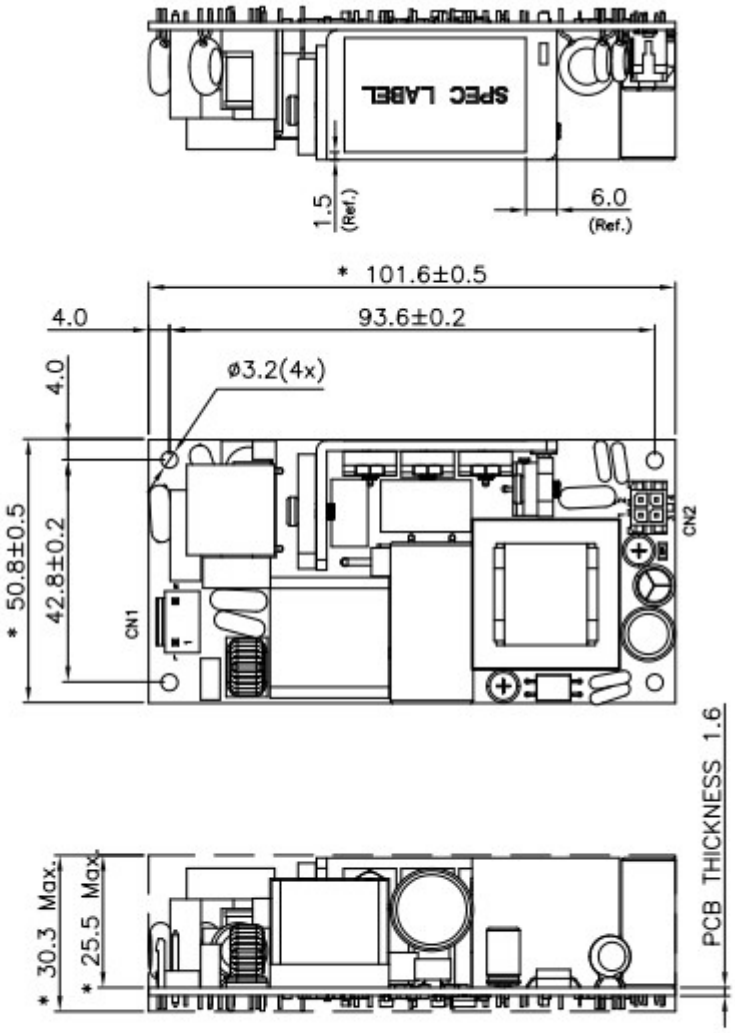
Description	
Hi-pot	<10 mA, Pri-Sec: 3000Vrms, 10 mA 1 min
Leakage Current	<3.5mA, 264VAC / 60Hz
Insulation Resistance	>100Mohm, Input to output at 500 VDC.
RoHS	Meets ROHS Hazardous Substances Directive 2011/65/EU and (EU)2015/863

ISOLATION SPECIFICATIONS

Isolation Voltage from Primary to Secondary (Main Output)	3000Vac@1Min
Isolation Voltage from Primary to Earth	1500Vac@1Min
Isolation Voltage from Main output to Earth	500Vdc@1Min

MECHANICAL PACKAGE

Description	
Dimensions - L x W x H (in / mm)	4" x 2" x 1.19" / 101.6mm x 50.8mm x 30.3mm
Weight max (oz / g)	5.64 / 160

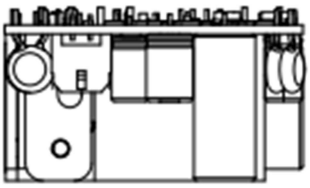


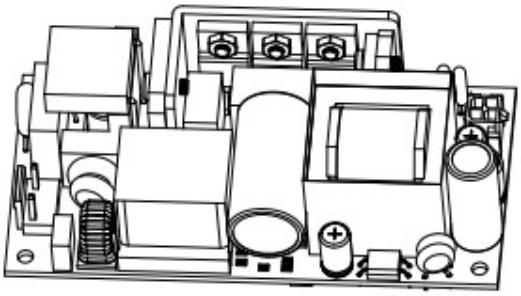
Pin assignments for CN1

Pin No.	Function	Connection P/N
1	L	JWT A3963WV2-3P-D or equivalent
2		
3	N	

Pin assignments for CN2

Pin No.	Function	Connection P/N
1	V+	MOLEX 43045-0427 or equivalent
2	GND	
3	V+	
4	GND	





NOTES
1. THE DIMENSIONS MARKED BY "*" ARE SIGNIFICANT DIMENSIONS AND MUST TO BE CONTROLED.

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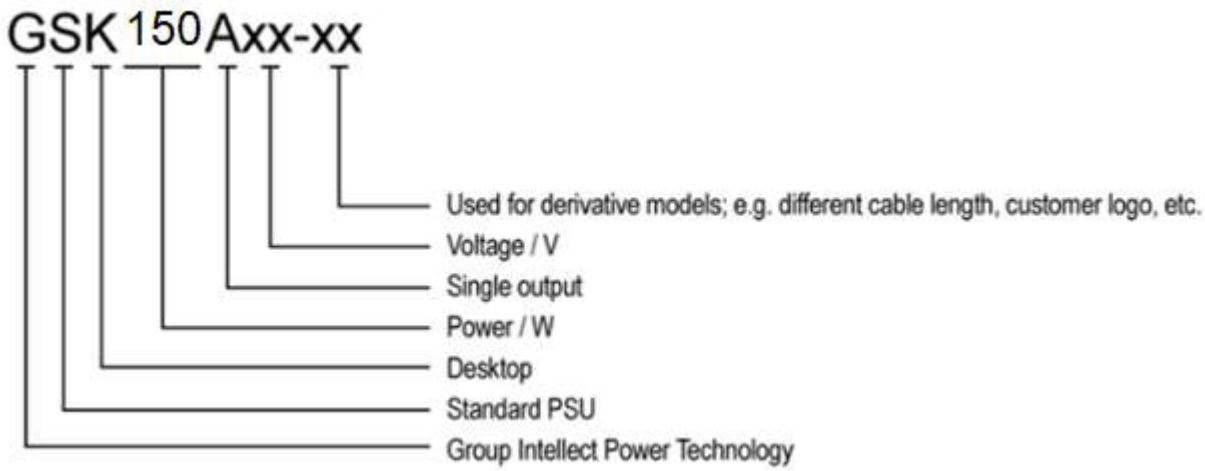
PART NUMBERING



NOTES

1. PSU should have adequate airflow to avoid triggering OTP
2. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.
3. Ripple & noise are measured at 20MHz of bandwidth using a 12" twisted pair-wire terminated with a 0. 1μf & 47μf parallel capacitor.
4. The power supply is considered as an independent unit, but the final equipment still needs to re-confirm that the whole system complies with the EMC directives and safety regulations.

All specifications are typical at nominal input, full load, at 25°C ambient unless otherwise noted. Specifications are subject to change without notice. Please consult our Applications Engineering office at 858-275-6423 for additional technical data and support or email us at info@brightworks-usa.com.