

TECHNICAL SPECIFICATION

GSK060A Series

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



OVERVIEW

The GSK060A family of miniature open-frame chassis mount AC/DC power supplies deliver 60W of output power with a ultra-wide universal input range of 90 to 264 Vac. The series includes four models featuring a precise regulated single-output voltage selection of 5, 12, 24 or 48Vdc.

With efficiency up to 90% at 230VAC and extremely low no-load power consumption less than 0.15W typically, GSK060A models meet global low power consumption and safety standards. Featuring Class II isolation design (no FG pin), 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
 - 3"(L) × 2"(W) × 1.24"(H)
 - 76.2mm(L) × 50.8mm(W) × 31.6mm(H)
- Wide AC input range (90-264Vac)
- High efficiency meets up to 90% at full load
- 60W Single DC output at 5V, 12V, 24V or 48V
- No-load power consumption 0.15W typical (5/12/24V)
- EN55022 EMI Class B with no modifications
- Wide operating temperature range -10°C to 70°C
- Wide operating temperature range (-10°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
- Meets safety standard of IEC/UL62368





SCOPE

This document describes the specifications for the GSK060A open-frame AC/DC power supplies.

MODEL SELECTION

Description	GSK060A05	GSK060A12	GSK060A24	GSK060A48
DC Output 50% load (Min, Nominal, Max)	4.90 / 5.0 / 5.10V	11.88 / 12 / 12.12V	23.76 / 24 / 24.24V	47.52 / 48 / 48.48V
Current Range (Max, Convection cooling)	0 - 7.0A	0 - 5A	0 - 2.5A	0 - 1.25A
Rated Power	60W	60W	60W	60W

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	GSK060A05	GSK060A12	GSK060A24	GSK060A48
Input Voltage Range Typical	90-264VDC (Safety voltage 100-240Vac)			
Frequency	47-63Hz			
Input Current, Max Vin=100V, Po=360W	2.0A	2.0A	2.0A	2.0A
Inrush Current, Typical	70A typical 230VAC cold start			
Power Factor, Min/Typical	95%/98%, Meets EN61000-3-2, Class A			
Earth Leakage Current	< 3.5mA/264VAC			
No Load Input Power Max, Nominal Input, Io=0	.15W	.15W	.15W	.25W
Efficiency, Typical at 230 VAC/50%Load	84%	89%	89.5%	90%
Switching Frequency	~ 65Khz			



PROTECTION

Description	GSK060A05	GSK060A12	GSK060A24	GSK060A48
Fusing	Fuse in line			
Input Under Voltage (UVP)	Triggers at <85VAC			
Output Over Current (OCP)	110%-150% rated output power Protection type: Hiccup mode, recovers automatically after fault condition removed			
Output Over Voltage (OVP)	130% Vout Max 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	GSK060A05	GSK060A12	GSK060A24	GSK060A48
Rated Power	60W	60W	60W	60W
Output Voltage¹, Vdc Min/Nominal/Max	4.90/5.00/5.10	11.88/12.00/12/12	23.76/24.00/24/24	47.52/48.00/48.48
Output Current	7.0	5.0	2.5	1.25
Output Current Peak²	10.0	8.0	4.0	2.0
Ripple and Noise³	±0.7%Vout, nominal	±1% Vout, max		
Output Overshoot	±5% Vout			
Voltage Tolerance⁴	±5%			
Load Regulation	±0.2%	±0.2%	±0.2%	±0.2%
Line Regulation, Max	±0.1%	±0.1%	±0.1%	±0.1%
Min Load	No requirement			
Transient Response				
Dynamic 1 (1A/us) 25% to 75% to 25% load	±4% max			
Dynamic 2 (1A/us) 5%-50% and 50%-100% load	±5%V			

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Recovery Time , Back to 1%Vout	500uS
Turn On Overshoot	5%V
Delay Time , Nominal/Max	1/1.5 Seconds, 115/230VACin at 90° Load
Rise Time , Typical/Max, 10%-90%	30ms/50 mS, 115/230VACin at 90° Load
Capacitive External Load ⁵	10000 μ F 8000 μ F 4000 μ F 1600 μ F
Hold Up Time , Min, Full Load	12ms at nominal input and droop to 90%Vo

1. At 50% load
2. At >115VACin, 10 seconds max.
3. Ripple & noise are measured at 20MHz of bandwidth using a 12" twisted pair-wire terminated with a 0.1 μ f & 47 μ f parallel capacitor at 115/230VAC input at full load.
4. Tolerance: includes set up tolerance, line regulation and load regulation.
5. Unit does not support current sharing applications.
6. At full load.

ENVIRONMENTAL SPECIFICATIONS

Description	
Working Temperature	-10 to +70°C
Operating Humidity	5%-95% RH non-condensing
Storage Temperature	0 - 85°C
Temp. Coefficient	$\pm 0.02\% \times V_{out}/^{\circ}\text{C}$ (0 - 50°C)
Solder Temperature	Wave soldering: 265°C, 5s (max.); Manual soldering: 390 °C, 3s (max.)
Operating Altitude	16,404 feet / 5000 meters

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



SAFETY & EMC

Description			
Safety Standards	Designed to meet IEC62368-1		
FCC CISPR Compliance	FCC part 15B and EN55032 (QP/AV method) with system earth grounding		
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 / 25°C/ 70% RH		
EMC Emission	Parameter	Standard	Test Level/Note
	Conducted	EN55032, QP/AV method	Class B + Sys Box
	Radiated	EN55032, FCC Controlled 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	Criteria B
	Surge	EN61000-4-5, EN55024, ETSI EN300386 V.1.3.2	DM ±2KV, CM ±4KV, Criteria B
EMC Immunity, cont.	Conducted Susceptibility 150KHz-80MHz, 10V, 80%AM	EN61000-4-6, EN55024, ETSI EN300386 V.1.3.2	3V, Criteria A
	Radiated Susceptibility	EN61000-4-3, EN55024, ETSI EN 300 386 V1.3.2	80M~2GHz 10V/m, 80%AM (level3)
	Voltage Dips and interruptions	EN61000-4-11, EN55024, ETSI EN300386 V.1.3.2	Criteria B and C



Voltage Drop	Duration Time	Criteria
100%Ut	10ms/20ms	A/B
100%Ut	500ms	B
60%Ut	100ms/500ms	B
30%Ut	5000ms	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	Directive 2002/9/EU

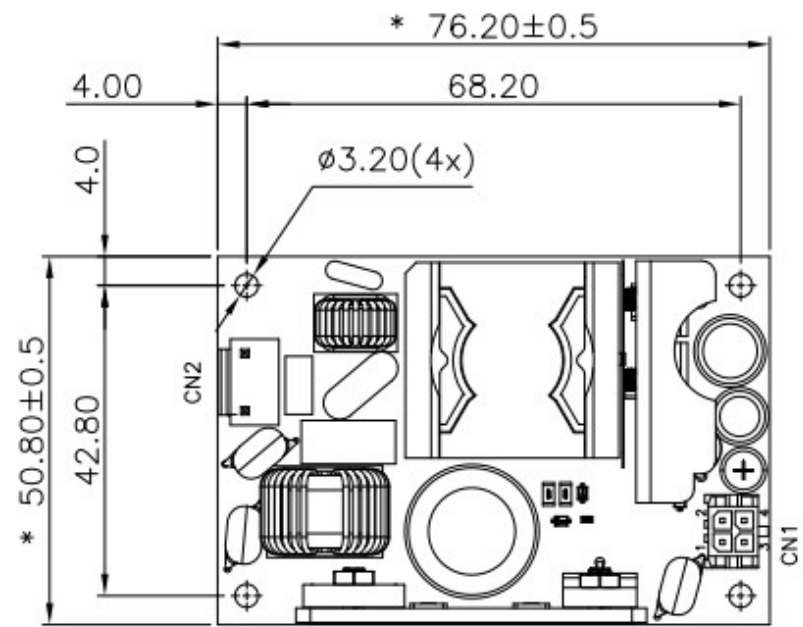
ISOLATION SPECIFICATIONS

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	3" x 2" x 1.24" / 76.2mm x 50.8mm x 31.6mm
Weight, max (oz/g)	4.4/126
Vibration	0.75 mm, 10Hz-55Hz, 20 minutes

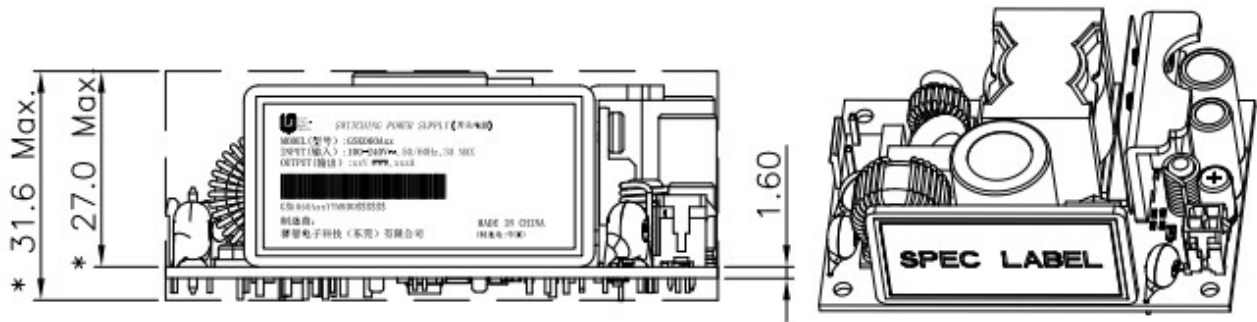


Pin assignments for CN1

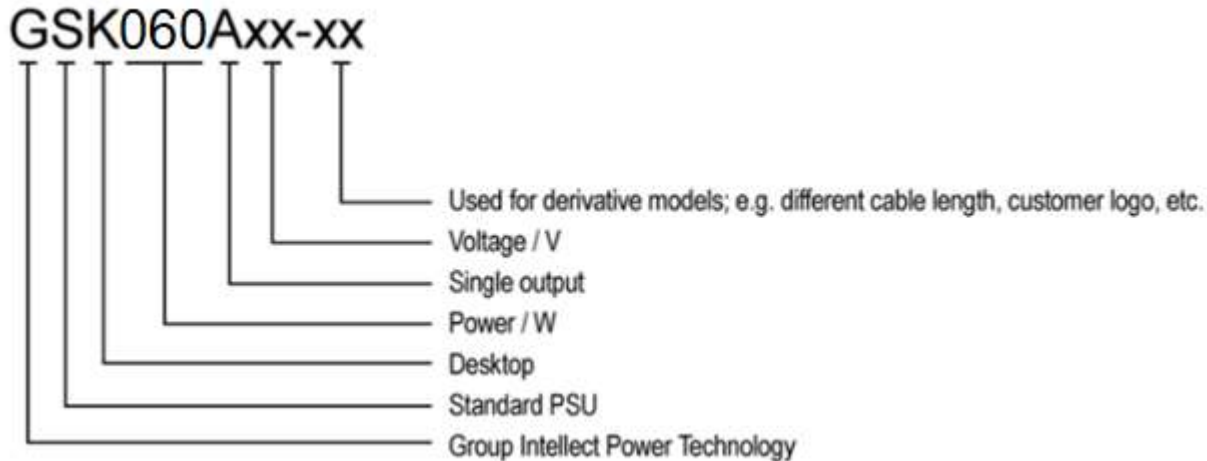
Pin No.	Function	Wafer
1	GND	MOLEX 43045-0427 or equivalent
2	V+	
3	GND	
4	V+	

Pin assignments for CN2

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



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.

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