

# TECHNICAL SPECIFICATION

## **GSK048A Series**

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



## OVERVIEW

The GSK048A family of miniature open-frame chassis mount AC/DC power supplies deliver 48W 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 91% and extremely low no-load power consumption less than 0.5W typically, GSK048A 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)×0.9"(H)
  - 76.2mm(L)×50.8mm(W)×23.1mm(H)
- Wide AC input range (90-264Vac)
- High efficiency
- 48W Single DC output
- No-load power consumption 0.5W typical
- Designed to meet EN55032 EMI Class B in a system box
- Wide operating temperature range -20°C to 70°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 UL62368-1





## SCOPE

This document describes the specifications for the GSK048A open-frame AC/DC power supplies.

## MODEL SELECTION

Description	GSK048A05	GSK048A12	GSK048A24	GSK048A48
<b>DC Output</b> (50% load Min, Nominal, Max)	4.92 / 5.0 / 5.08V	11.82 / 12 / 12.18V	23.64 / 24 / 24.36V	47.28 / 48 / 48.72V
<b>Current Range</b> (Max, Conv cooling)	0-6.0A	0 – 4.0A	0 – 2A	0 – 1.0A
<b>Rated Power</b>	30W	48W	48W	48W

## 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	GSK048A05	GSK048A12	GSK048A24	GSK048A48
<b>Input Voltage Range</b> Typical	90-264Vac (Safety voltage 100-240Vac)			
<b>Frequency</b>	47-440Hz			
<b>Input Current, Max</b> Vin=100V, Po=48W	1.5A at Po 30W	1.5A	1.5A	1.5A
<b>Inrush Current, Typical</b>	50A typical 115VAC cold start			
<b>Earth Leakage Current</b>	< 0.1mA/264VAC			
<b>No Load Input Power,</b> Max, Nominal Input, Io=0	.10W	.10W	.25W	.25W
<b>Efficiency,</b> Typical at 230 VAC/50%Load	85%	90%	90%	91%
<b>Switching Frequency</b>	Variable, ~ 65Khz			





## PROTECTION

Description	GSK048A05	GSK048A12	GSK048A24	GSK048A48
<b>Fusing</b>	Fuse in line			
<b>Input Under Voltage (UVP)</b>	Triggers at <85VAC			
<b>Output Over Current (OCP)</b>	110%-150% rated output power Protection type: Hiccup mode, recovers automatically after fault condition removed			
<b>Output Over Voltage (OVP)</b>	110% load min Protection type: Latch mode, power cycle after fault condition removed and power cycle			
<b>Short Circuit (SCP)</b>	Protection type: Hiccup mode, recovers automatically after fault condition removed			
<b>Over Temperature (OTP)</b>	Protection type: Latch mode, power cycle after fault condition removed and power cycle			

## DC OUTPUT SPECIFICATIONS

Description	GSK048A05	GSK048A12	GSK048A24	GSK048A48
<b>Rated Power</b>	30W	48W	48W	48W
<b>Output Voltage, V<sub>dc</sub></b> Min/Nominal/Max	4.92/5.00/5.08	11.82/12.00/12.18	23.64/24.00/24.36	47.28/48.00/48.72
<b>Output Current, Amps</b>	0-6A	0-4A	0-2A	0-1A
<b>Ripple and Noise<sup>1</sup></b> Nominal	100mV	120mV	192mV	288mV
<b>Output Overshoot</b>	±5% V <sub>out</sub>			
<b>Voltage Tolerance<sup>2</sup></b>	±5%			
<b>Load Regulation</b>	±1%	±1%	±1%	±1%
<b>Line Regulation, Max</b>	±1%	±1%	±1%	±1%
<b>Min Load</b>	No requirement			
<b>Transient Response</b>				
<b>Dynamic 1</b> (1A/μS) 25% to 75% to 25% load	±4% V <sub>out</sub> max			
<b>Dynamic 2</b> (1A/μS) 5%-50% and 50%-100% load	±5% V <sub>out</sub> max			
<b>Recovery Time</b> Back to 1%V <sub>out</sub>	500uS			
<b>Turn On Overshoot</b>	5%V			





<b>Delay Time, Max</b>	2 Seconds, 115/230VACin at 90% Load			
<b>Rise Time, Typical, 10%-90%</b>	60ms			
<b>Capacitive External Load</b>	12000 $\mu$ F	10000 $\mu$ F	5000 $\mu$ F	1000 $\mu$ F
<b>Hold Up Time</b>	10mS at 115VAC / 40mS at 230VAC			
Min, Full Load				

1. Ripple & noise are measured at 20MHz of bandwidth using a 12" twisted pair-wire terminated with a 0.1  $\mu$ f & 47 $\mu$ f 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	
<b>Working Temperature</b>	-20 to +70°C
<b>Operating Humidity</b>	5%-95% RH non-condensing
<b>Storage Temperature</b>	0 - 85°C
<b>Temp. Coefficient</b>	$\pm 0.02\% \times V_{out}/^{\circ}\text{C}$ (0 - 50°C)
<b>Solder Temperature</b>	Wave soldering: 265°C, 5s (max.); Manual soldering: 390 °C, 3s (max.)
<b>Operating Altitude</b>	16,404 feet / 5000 meters

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





## EMC SPECIFICATIONS

Description			
<b>Safety Standards</b>	Designed to meet IEC62368-1		
<b>FCC CISPR Compliance</b>	FCC part 15B and EN55032 (QP/AV method)		
<b>Harmonics</b>	EN 61000-3-2, Class A		
<b>Withstand Voltage</b>	Input to Output: 4KVAC		
<b>Isolation Resistance</b>	Input to Output: 100M Ohms / 500VDC / 25°C/ 70% RH		
<b>EMC Emission</b>	<b>Parameter</b>	<b>Standard</b>	<b>Test Level/Note</b>
	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	
<b>EMC Immunity</b>	<b>Parameter</b>	<b>Standard</b>	<b>Test Level/Note</b>
	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
<b>EMC Immunity, cont.</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	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	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** Pri-Sec: 4000VAC/1mA/1min

**Leakage Current** 100nA  
 264VAC / 60Hz

**Insulation Resistance** >100Mohm, Input to output at 500 VDC.

**RoHS** Restrictions of Hazardous Substances Directive 2011/65/EU and (EU)2015/863

## ISOLATION SPECIFICATIONS

Isolation Voltage from Primary to Secondary (Main Output)	4000Vac@1Min
Isolation Voltage from Primary to Earth	1500Vac@1Min
Isolation Voltage from Main output to Earth	500Vdc@1Min

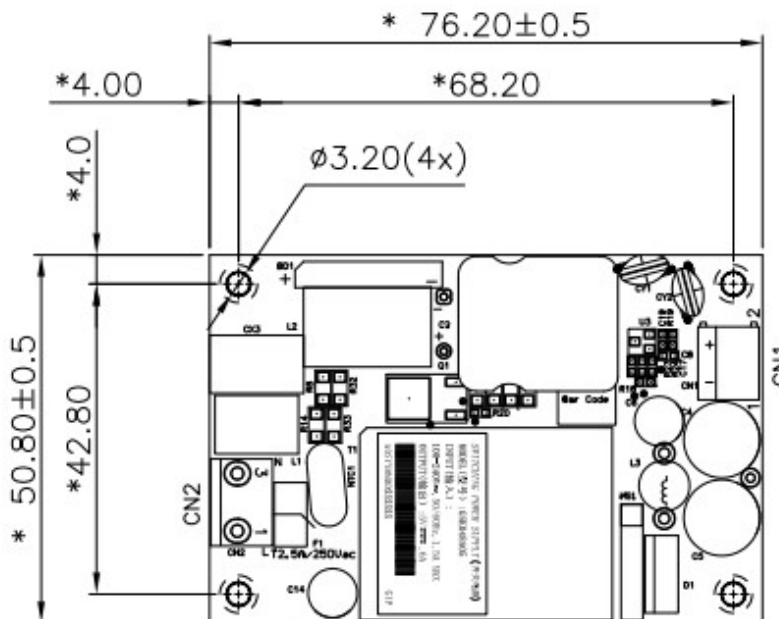




## MECHANICAL PACKAGE

Description	
<b>Dimensions</b>	3" x 2" x 0.9" / 76.2mm x 50.8mm x 23.1mm
L x W x H (in / mm)	
<b>Weight max (oz / g)</b>	3.1 / 88
<b>Vibration</b>	0.75 mm, 10Hz-55Hz, 20 minutes

### Open Frame

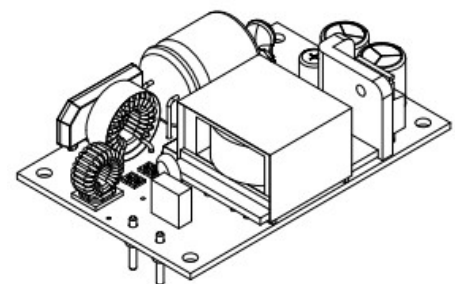
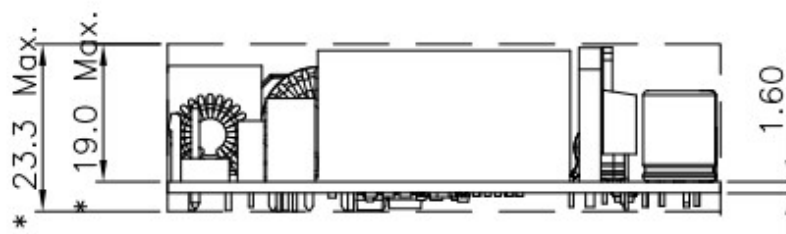


Pin assignments for CN1

Pin No.	Function	Vendor PN
1	V-	KAFA127-5.08-02P-14 or equivalent
2	V+	

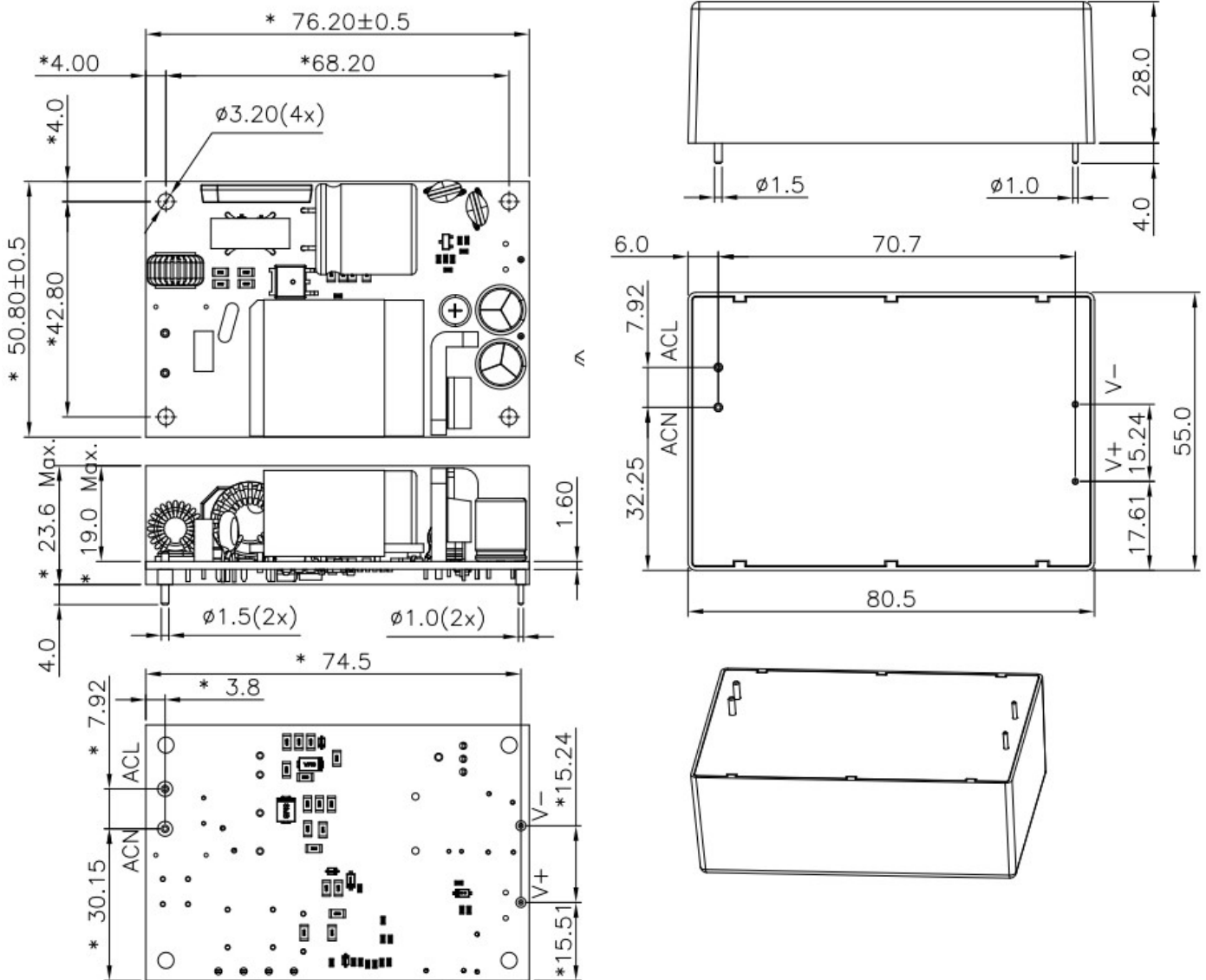
Pin assignments for CN2

Pin No.	Function	Vendor PN
1	ACL	JWT A3963WV2-3P-D or equivalent
2		
3	ACN	





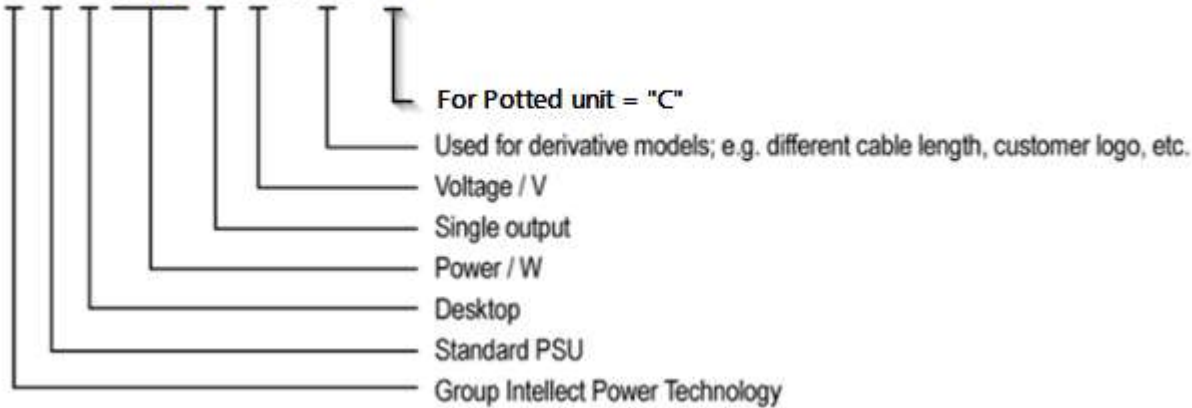
**Potted Unit**





## PART NUMBERING

GSK048 Axx-xx -x



## 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](mailto:info@brightworks-usa.com).**

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