TECHNICAL SPECIFICATION

GSK600A Series

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

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OVERVIEW

The GSK600A family of open-frame chassis mount AC/DC power supplies deliver 600W of output power with a wide universal input range of 85 to 300 Vac. The series includes four models featuring a precise regulated single-output voltage selection of 5, 12, 24 or 48Vdc.

With efficiency up to 96% and extremely low no-load power consumption less than 0.5W, GSK600A 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 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

- Delivers up to 50Adc current or 600W power with system airflow
- Compact Size; U-Channel Heatsink
  - 5.00”(L) X 3.00”(W) X 1.58”(H)
  - 127.0mm(L) × 76.2mm(W) × 40.0mm(H)
- Wide input voltage range: Universal AC input up to 300Vac/47-63Hz without damage
- Active PFC (typical: 0.99 @ 115Vin, 0.96@230Vin)
- 12V fan power and 5V standby output
- High efficiency 96% typical at 50% load at high line input (95.5% for 12V)
- No-load power consumption <0.5W
- EN55032 EMI Class B with no modifications
- Wide operating temperature range -20ºC to +70°C and at -40ºC can power up (derating above 50°C)
- Convection cooled
- Full protection for Input UVP, Output OVP, OCP, SCP, OTP Cost effective, reliable design
- Meets safety standard of IEC/UL62368

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SCOPE

This document describes the specifications for the GSK600A open-frame AC/DC power supplies.

MODEL SELECTION

Description	GSK600A12	GSK600A24	GSK600A48
DC Output (Min, Nominal, Max)	11.76 / 12 / 12.24V	23.52 / 24 / 24.48V	47.04 / 48 / 48.96V
Current Range	0 - 50A	0 – 25A	0 – 12.5A
Rated Power	600W	600W	600W

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	GSK600A12	GSK600A24	GSK600A48
Input Voltage Range	90-264VDC (Safety voltage 100-240Vac)		
Frequency	47-63Hz/50/60Hz typical		
Input Current, Typical Vin=100V, Po=600W	7.5A		
Inrush Current, Typical	70A typical 230VAC cold start		
Power Factor	.95min/.98typ at nominal input and full load, Meets EN61000-3-2, Class A		
Earth Leakage Current	< 3.5mA/264VAC		
No Load Input Power	2Wtyp/3WMax, 115/264VAC unit enabled		
Efficiency, Typical	95.5%	96%	96%
Switching Frequency	65Khz		

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PROTECTION

Description	GSK600A12	GSK600A24	GSK600A48
Fusing	fuse in line		
Input Under Voltage (UVP)	Protection type: Hiccup mode at 85VAC, recovers automatically after fault condition removed		
Output Over Current (OCP)	110% - 150% rated output power Protection type: Hiccup mode, recovers automatically after fault condition removed		
Output Over Voltage (OVP)	110% load min, 150% load max Protection type: Latch mode, power cycle after fault condition removed		
Short Circuit (SCP)	Protection type: Hiccup mode, recovers automatically after fault condition removed		
Over Temperature (OTP)	Protection type: Latch mode at 59°C nominal, power cycle after fault condition removed		

DC OUTPUT SPECIFICATIONS

Description		GSK600A12	GSK600A24	GSK600A48
Rated Power		600W	600W	600W
Output Voltage[2] Main, Typical		12V±5%	24V±5%	48V±5%
Output Voltage Stdby1, Fan		11.40Vmin	12.00Vnominal	12.6Vmax
Output Voltage Stdby 2		4.74Vmin	5.00Vnominal	5.25Vmax
Output Current, Main		50A	25A	12.5A
Output Current Stdby 1, Fan		1.0A	1.0A	1.0A
Output Current Stdby 2		1.0A	1.0A	1.0A
Ripple and Noise[1]	±1% Vout Nom, ±2% Max			
Output Overshoot	±5% Vout			
Line Regulation	±0.1% max			
Load Regulation	±0.2% max			
Min Load	No requirement			
Transient Response				
Dynamic 1 (1A/us) 115/230VAC	25% to 50% to 25% load	±4%V		
Dynamic 2 (1A/S) 115/230VAC	5%-50% and 50%-100% load	±5%V		

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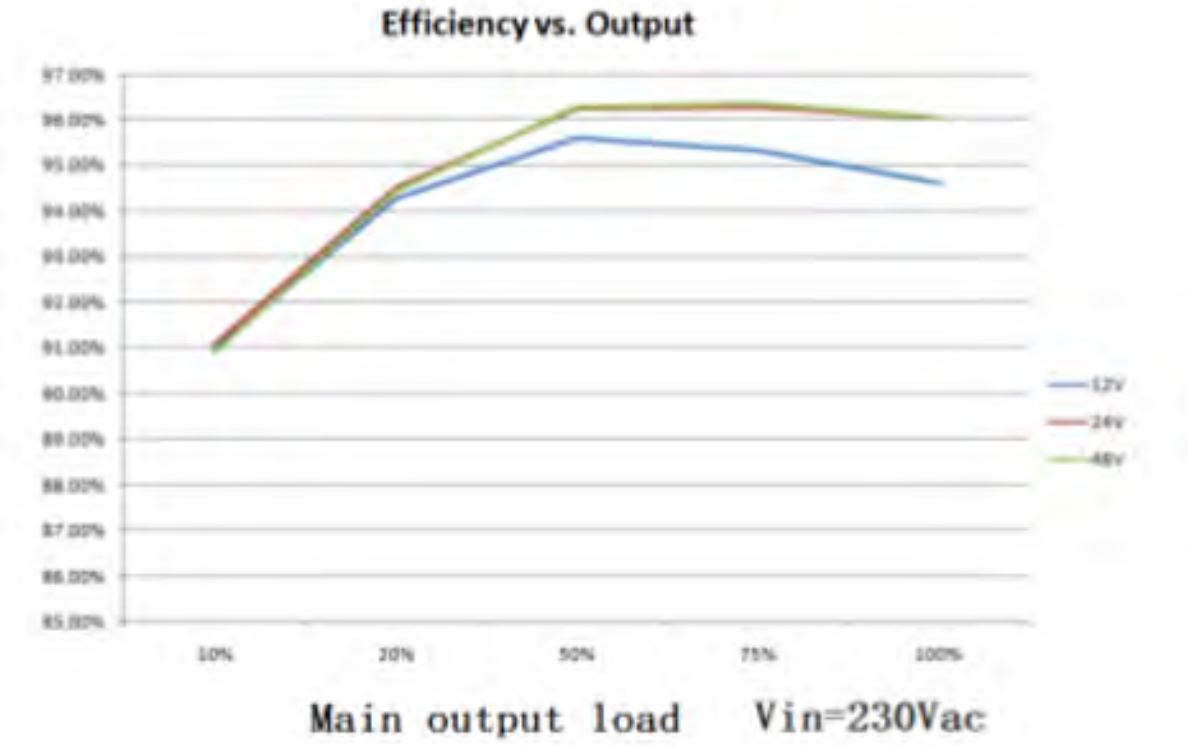
Recovery Time	Back to 1% Vout	500uS		
Turn On Overshoot	5%			
Delay Time, Nominal/Max	1/1.5 seconds max, 115/230VAC in full load			
Rise Time, 10% to 90%output	30ms nominal, 60 mS maximum 115/230VAC in full load			
Capacitive External Load		8000 µF	5000 µF	2000 µF
Hold Up Time, Min	10ms at 230VAC at full load • 10ms at 115VAC at full load			

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.



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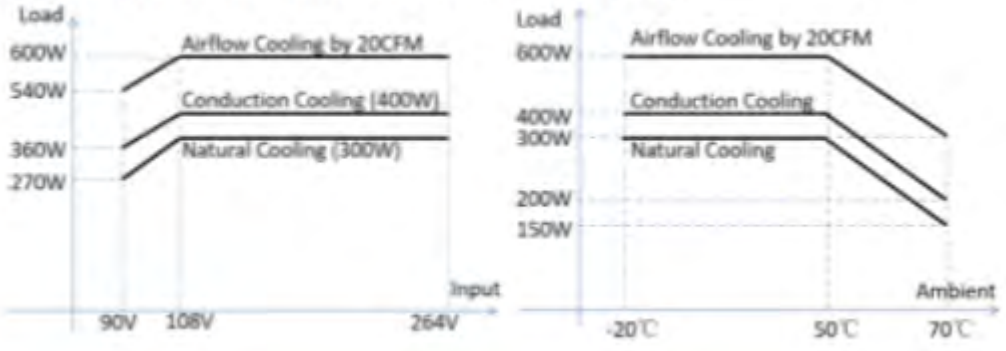
ENVIRONMENTAL SPECIFICATIONS

Description	
Working Temperature[1]	-20 to +50ºC
Operating Humidity	0-90% RH non-condensing
Storage Temperature	-40 ºC to 85ºC
Temp. Coefficient	±0.03% x Vout/ ºC (0 - 50ºC)
Airflow	System Airflow. See derating curve for natural cooling condition.
Vibration	10 - 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes
Solder Temperature	Wave soldering: 265ºC, 5s (max.); Manual soldering: 390 ºC, 3s (max.)
Operating Altitude	16,404 feet / 5000 meters

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

Derating Curve

(Note: Conduction Cooling is tested on 228.6x381.0x2.5mm base plate)



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SAFETY & EMC

Description			
Safety Standards	IEC62368-1 cULus		
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		
Lightning AC power fault	GR-1089 Issue 4		
EMC Emission	**Parameter**	**Standard**	**Test Level/Note**
	Conducted	EN55032(CISPR32), QP/AV method	Class B + Sys Box
	Radiated	EN55032(CISPR32), FCC Controlled System	Class B + Sys Box
	Harmonic Current (Note 5)	EN61000-3-2, EN55024, ETSI EN300386 V.1.3.2	NC, Class A
	Voltage Flicker	EN61000-3-3, EN55024, ETSI EN300386 V.1.3.2	NC
EMC Immunity	**EN55035, EN61000-6-2**		
	Parameter	**Standard**	**Test Level/Note**
	ESD	EN61000-4-2, EN55024, ETSI EN300386 V.1.3.2	±8KV air; ±6KV touch, Criteria B
	EFT/Burst	EN61000-4-4, EN55024, ETSI EN300386 V.1.3.2,	±2KV (Level 2)
EMC Immunity, cont.	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 80M~2GHz 10V/m, 80%AM (level3)	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	See table below

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Voltage Drop	Duration Time	Criteria
0%Ut	12ms	B
70%Ut	500ms	C
40%Ut	200ms	C
0%Ut	5000ms	C

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

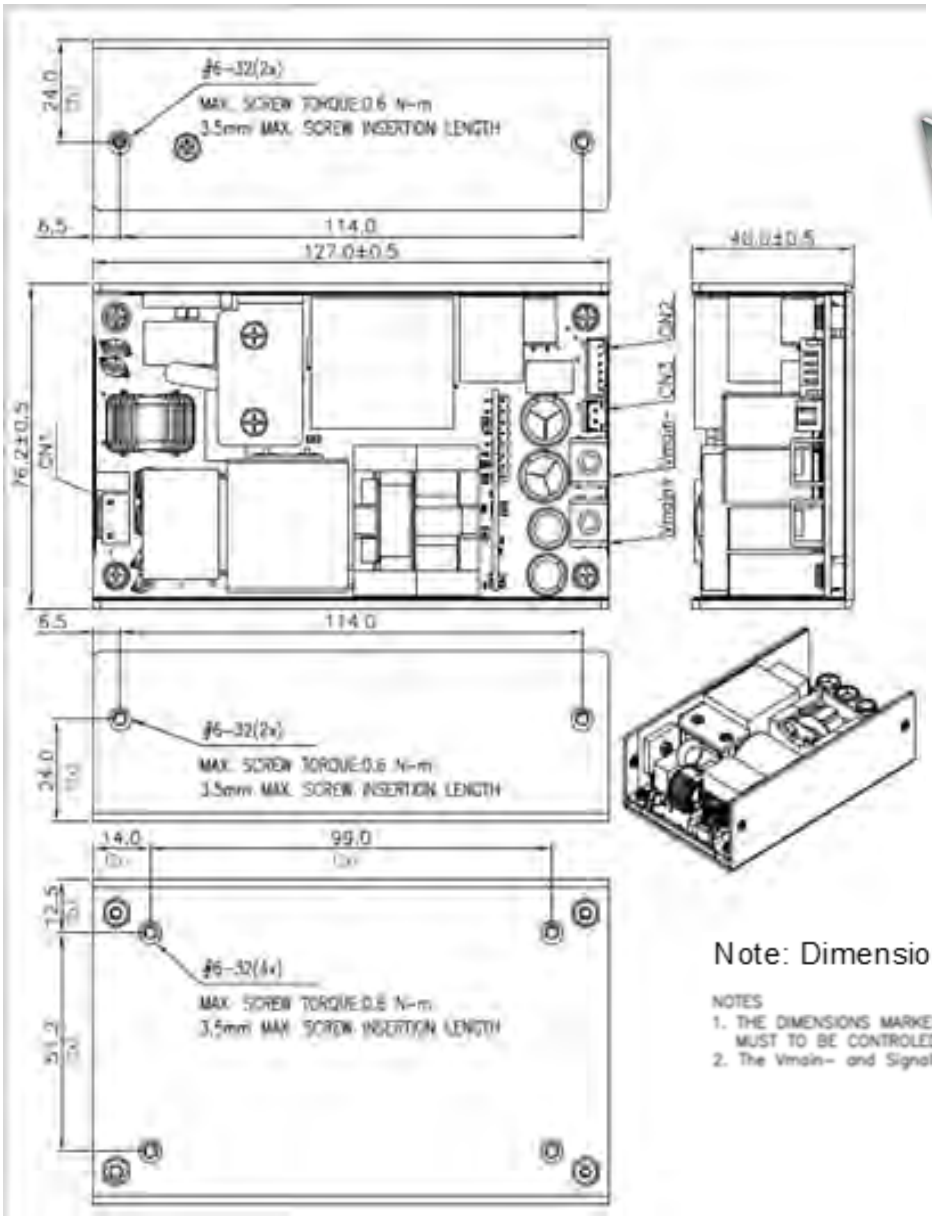
Description	
Hi-pot	<10 mA, Pri-Sec: 3000Vrms, 10 mA 1 min
Hot Spot Temperature	118°C nominal
Leakage Current	<3.5mA, 264VAC / 60Hz
Insulation Resistance	>100Mohm, Input to output at 500 VDC.
RoHS	Directive 2002/95/EU

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	5” x 3” x 1.58” / 127mm x 76.2mm x 40mm
Weight oz / g	21.86 / 620 typical



Note: Dimensions are shown in mm

NOTES
1. THE DIMENSIONS MARKED BY "*" ARE SIGNIFICANT DIMENSIONS AND MUST TO BE CONTROLED.
2. The Vmain- and Signal RTN are connected together in power supply.

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CONNECTOR INFORMATION

Detail Mechanical Drawing and Pin Part Number

	Power Supply Side		System Side (Suggested)	
	P/N	Vendor	P/N	Vendor
Input Connector	A3963WV2-3P	JWT	A3963H02-3P	JWT
Main Output Connector	PCB-7(M4)	Kangyang	Screw M4*0.7	NC
Standby Output 1	A2501WV2-2P	JWT	A2501H02-2P	JWT
Standby Output 2	A2001WV2-6P	JWT	A2001H02-6P	JWT

Connectors Information

	Connector type	Mating Connector type
CN1	JWT A3963WV2-3P,P2 empty or equivalent	JWT A3961H02-3P or equivalent
CN2	JWT A2001WV2-6P or equivalent	JWT A2001H02-6P or equivalent
CN3	JWT A2501WV2-2P or equivalent	JWT A2501H02-2P or equivalent
Vmain+	M4 Brass terminal	
Vmain-	M4 Brass terminal	

Pin assignments for CN1

P1	P2	P3
N	NC	L

Pin assignments for CN2

P1	P2	P3	P4	P5	P6
Vstd_2+	Signal RTN	Sense+	Sense-	ON/OFF	Power good

Pin assignments for CN3

P1	P2
Vstd_1+	Vstd_1-

Pin assignments for Vmain+/Vmain-

Vmain+	Vmain-
Vout+	Vout-

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PIN DESCRIPTIONS

CN1 connector

CN1/P1(N)

It is input pin for Neutral.

CN1/P2(NC)

No connection for this pin due to safety clearance.

CN1/P3(L)

It is input pin for Line.

CN2 connector

CN2/P1(Vstd_2+)

It is standby output for 5V. The current for this standby power is 1A. Pls contact with sales for other voltage.

Note: When Vstd_2+ is OCP or SCP, main output and Vstd_1 are still on.

CN2/P2(Signal RTN)

It is signal return for standby output for 5V and signal control. Inside of power supply, the signal return is connected with Vout- of main power.

CN2/P3(Sense+)

It is voltage drop compensation for Vout+. The biggest voltage compensation is 0.25V. Pls note the highest power limit is 600W. Pls leave the pin open if do not use it.

CN2/P4(Sense-)

It is voltage drop compensation for Vout-. The biggest voltage compensation is 0.25V. Pls note the highest power limit is 600W. Pls leave the pin open if do not use it.

CN2/P5(On/off)

The pin is used to turn on or off main output. When the pin is logic high (>3V) or floating, main output can be turned on. When the pin is logic low (<0.8V), main output can be turned off.

Note: Standby power 1 and Standby power 2 are always on when input is in defined range.

CN2/P6(power good)

The pin is to indicate power status. It is OC output. When main output is normal, the pin is low (<0.8V), otherwise, it is OC output. The maximum voltage is 16V by proper pull up resistor.

CN3 connector

CN3/P1(Vstd_1+)

The pin is output+ of standby output 1. It is +12V with reference to CN3/P2. The current for this power 1A.

CN3/P2(Vstd_1-)

The pin is output- of standby output 1. It is -12V with reference to CN3/P1. The current for this power 1A.

It is suggested that Vstd_1 is used for fan power. It also can be used for others.

Note1: When Vstd_1+ is OCP or SCP or other protection, main output and Vstd_1 are off.

Note2: Inside of power supply, the signal return and Vout- and Vstd_1- are connected together.

Vmain+/Vmain-

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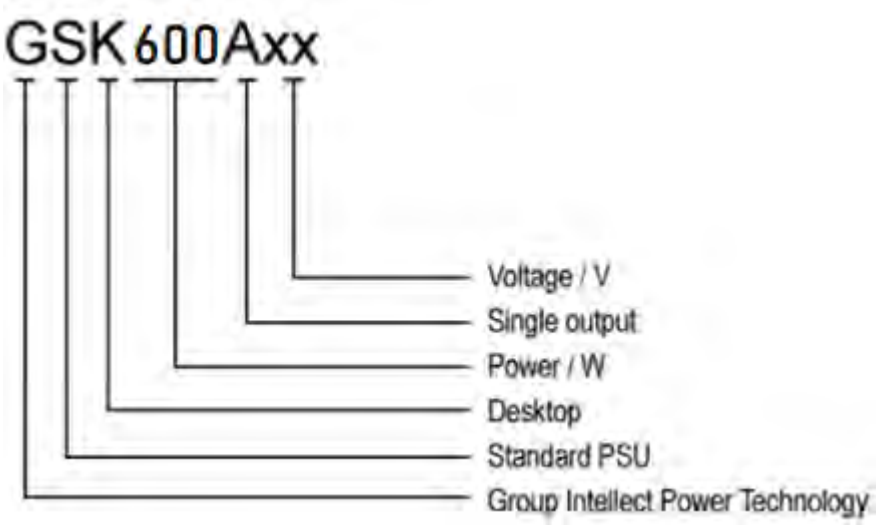
PART NUMBERING



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.