

**500 WATT SERVER POWER SUPPLY
FAULT-TOLERANT POWER SYSTEM**

13.19 x 4.17 x 1.363" | 335 x 106 x 41.5mm

DESCRIPTION

Unipower's **SGG9233-R1U** is a 500 Watt fault-tolerant power system manufactured to support high-end server and communication equipment. The power system consists of two SGG3000 Power Modules which mate into the SGGR1U Chassis / Backplane.

The SGG3000 Power Module:

- Universal AC Input with Active PFC
- 92% Efficiency (at 50% Load)
- +12V Main Output with 5VSB
- Active Current Share with OR'ng Diodes
- >100,000 Hours MTBF (MIL217F)

The SGGR1U Chassis:

- DC-DC Regulation for ATX Outputs
- Parallel Connecting the Power Modules
- ATX Output Harness (standard)

The power system provides hot-swap / redundant functionality of the AC-DC Power Supplies and Variable Speed Fans while the backplane provides parallel connection and dc-dc regulation with reliability measured in the millions of hours to support high-reliability applications.

FEATURES

- Universal AC input with Active PFC
- Efficiency >80% @ 115VAC
- Analog and Digital (PMBUS) Interface
- Front-Panel LED Indicators
- Hot-Swap AC-DC Power with Fan Modules
- High-Rel DC-DC Conversion to ATX 2.0 Outputs
- Over Current Protection
- Safety Approvals (UL, CB, TUV, CCC, BSMI)
- EMI/RFI: CE, FCC class B

TWO-YEAR WARRANTY

INTERNATIONAL STANDARDS

UL/cUL 60950-1, TUV EN 60950-1
CB IEC 60950-1, WEEE, CE Mark (LVD)



Fault-Tolerant Power System

MODEL	POWER	VOUT	IOUT
SGG9233-R1U (integrated system)	500W	3.3V	20A
		5V	20A
		12V	40A
		-12V	0.5
		5VSB	3A

Component Parts

MODEL	DESCRIPTION
SGG3000	500 Watt Hot-Swap Power Module
SGGR1U	500 Watt Chassis & Backplane

SGG3000 POWER MODULE SPECIFICATIONS

Typical at Nominal Line, Full Load and 25°C Unless Otherwise Noted.

INPUT

Voltage Range	90-264 VAC
Power Factor	>0.95
Total Harmonic Distortion, Max	5%
Frequency	47-63Hz
Inrush Current Limiting, Max	35 / 70A Peak @ 115 / 230 VAC
EMI Filter, Conducted	FCC20780 pt 15J Curve B EN55022 Curve B
Fast Transients	EN61000-4-4
Surges	EN61000-4-5
Remote Sense Compensation	>250mV
Input Protection	Internal Fuse, 10A

OUTPUT

Current & Voltage	See Table
Output Power	500W
Ripple / Noise, max	12V = 120mV 5V = 60mV
Line Regulation	Max ±1%
Load Regulation	Max ±5%
Transient Load / Slew Rate	0.5/Aµs
Holdup Time	17msec @ 70% load
Overvoltage Protection (12V Only)	14.5V Max (Latch Off)
Current Limit	>130% (Latch Off)
Efficiency (see curve)	92% (Typical)

SAFETY STANDARDS UL60950-1, CSA22.2 No. 60950-1, EN60950-1

PMBus Version Compliance 1.1

STATUS INDICATORS

Normal(AC OK)	Green
Standby (Only +5VSB output)	(AC OK) Blinking Green
Power Fail	Red
Fan Fail	Blinking Red

ALARM SIGNALS (open drain, TTL compatible)

PSON	Remote ON Off (LOW=ON)
PSKILL	Activates PSU (Short)
PDBALERT	Run Fan at Max Spdd (LOW)
PDB FAULT	System Fault Shutdown (HIGH)
PWOK	Power Good (HIGH)
PS Present	Indicates Power Module is present

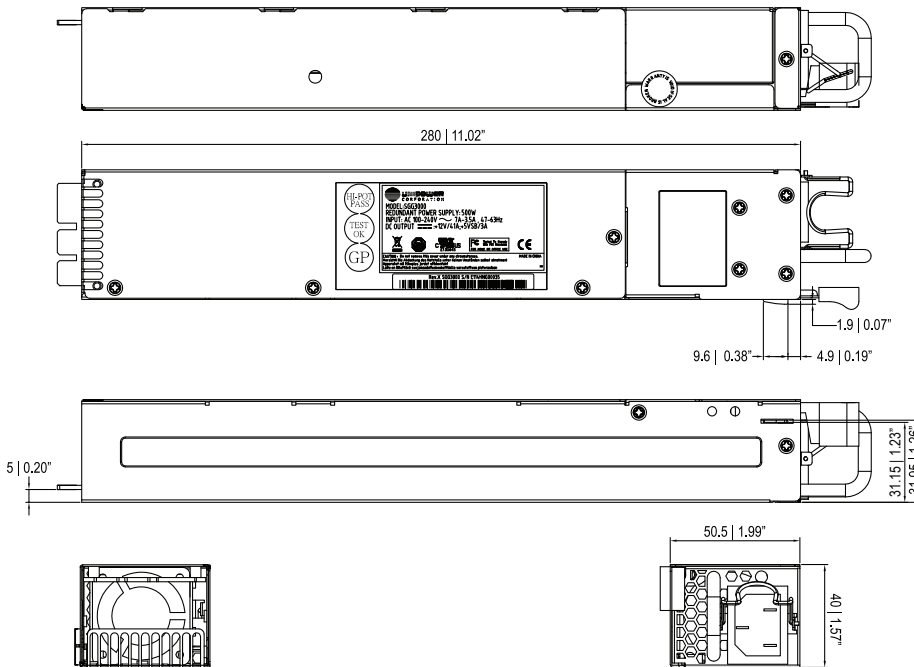
ENVIRONMENTAL

Operating Temp. Range	0°C to +45°C
Output Current Derating	2.5%/°C, 50°C to 70°C
Storage Temp. Range	-40°C to + 70°C
Humidity	0% to 95%, Non-Condensing
ESD	Bellcore GR-1089-Core and EN61000-4-2
MTBF, 25°C (MIL217F)	100,000 Hours
Cooling	Integral Ball Bearing Fans

PHYSICAL SPECIFICATIONS

Case Material	Steel
Case Dimensions, Inches (mm)	11.02"(L) x 1.99"(W) x 1.57"(H) (280 x 50.5 x 40mm)
Weight	2.4 lbs. (1.1 kg.)

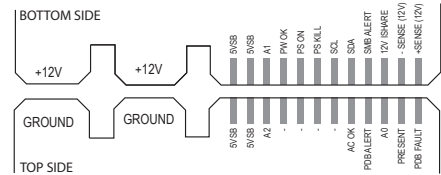
OUTLINE DRAWING



Unit: mm | inches

DC CONNECTOR DETAILS

Edge Connector mates with Molex 45984-4161



Pin Name	Function
+12V	+12V power output
GND	Grounding
5VSB	+5V standby power
A0	I2C Address
A1	I2C Address
A2	I2C Address
PW_OK	Power Good Output. Signal is pulled HIGH to indicate all outputs ok.
PSON	Module PSON. Remote control power On/Off (Pulled LOW = POWER ON)
PS_KILL	Activate PSU by hot-plug activity
SCL	I2C CLOCK
SDA	I2C DATA
PDB-ALERT	To receive ALERT signal from system or PSU backplane. If signal is pulled LOW, the power internal fan shall be forced to run at maximum speed to improve thermal performance
SMB-ALERT	If PSU FAIL, FAN FAIL, OCP occurs, signal will be pulled from High to Low. PSU normal = High (TTL LEVEL)
12LS	12V Load Share
Present	This pin is grounded with a 47R resistor. To indicate a power has been plugged in.
12VRS+	+12V Remote sense
12VRS-	+12V negative feedback
PDB-FAULT	To receive a FAULT signal. Power shall be shutdown if this pin is pulled HIGH.
AC-OK	The pin will be pulled HIGH if 5VSB is ready

SGGR1U CHASSIS SPECIFICATIONS

Typical at Full Load and 25°C Unless Otherwise Noted.

INPUT

Input from Power Modules+12 VDC, 5VSB

OUTPUT

Voltage	Minimum Load	Current	Load Regulation	Line Regulation	Ripple & Noise
3.3V	-	20A	±5%	±1%	60Mv
5V	-	20A	±5%	±1%	60Mv
12V	1.0A	40A	±5%	±1%	120Mv
-12V	-	0.5A	±5%	±1%	120Mv
5VSB	-	3.0A	±5%	±1%	60Mv

Output Power500W
 Holdup Time>1 AC Cycle, Full Load
 Overvoltage Protection 3.3V, 5V, 12V only (Latch Off)
 Current Limit 3.3V, 5V, 12V only (Latch Off)
 Efficiency>80% (Minimum @ 115VAC, 50% Load)

SAFETY STANDARDS UL60950-1, CSA22.2 No. 60950-1, EN60950-1

STATUS / CONTROL

Digital Communication PM Bus Rev 1.1 (see specification)
 Remote Sense 3.3V, 5V, 12V Only
 Normal High Signal (open drain, TTL compatible)
 Power Fail Low Signal (open drain, TTL compatible)
 Fan Fail Low Signal (open drain, TTL compatible)

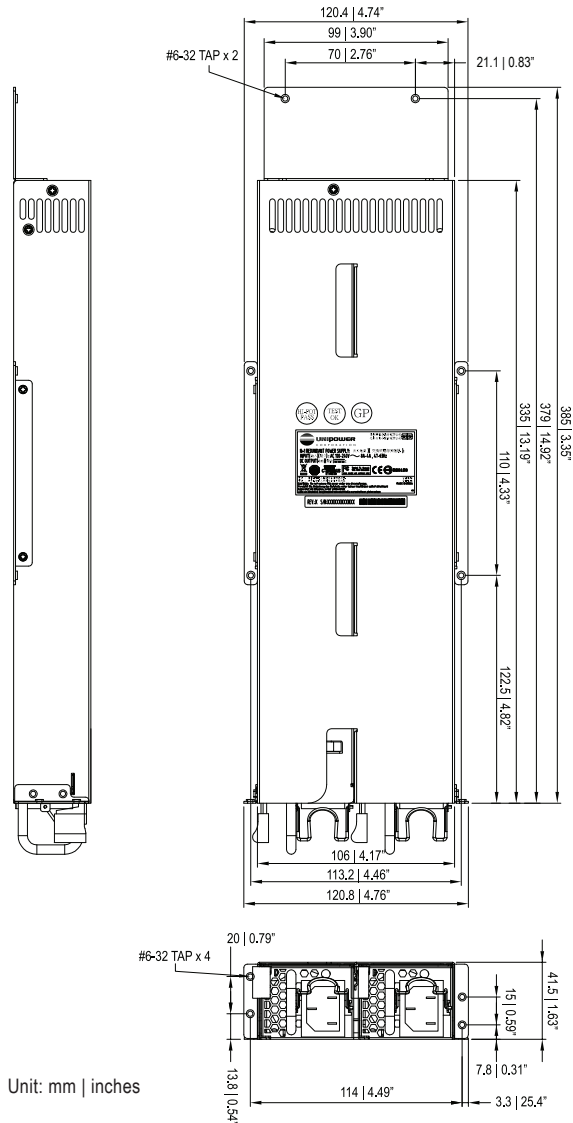
ENVIRONMENTAL

Operating Temp. Range 0°C to +50°C
 Output Current Derating 3%/°C, 50°C to 60°C
 Storage Temp. Range -40°C to +70°C
 Humidity 20% to 90%, Non-Condensing
 ESD Bellcore GR-1089-Core and EN61000-4-2
 MTBF, 25°C (MIL217F) 100,000 Hours
 Cooling Integral Ball Bearing Fans

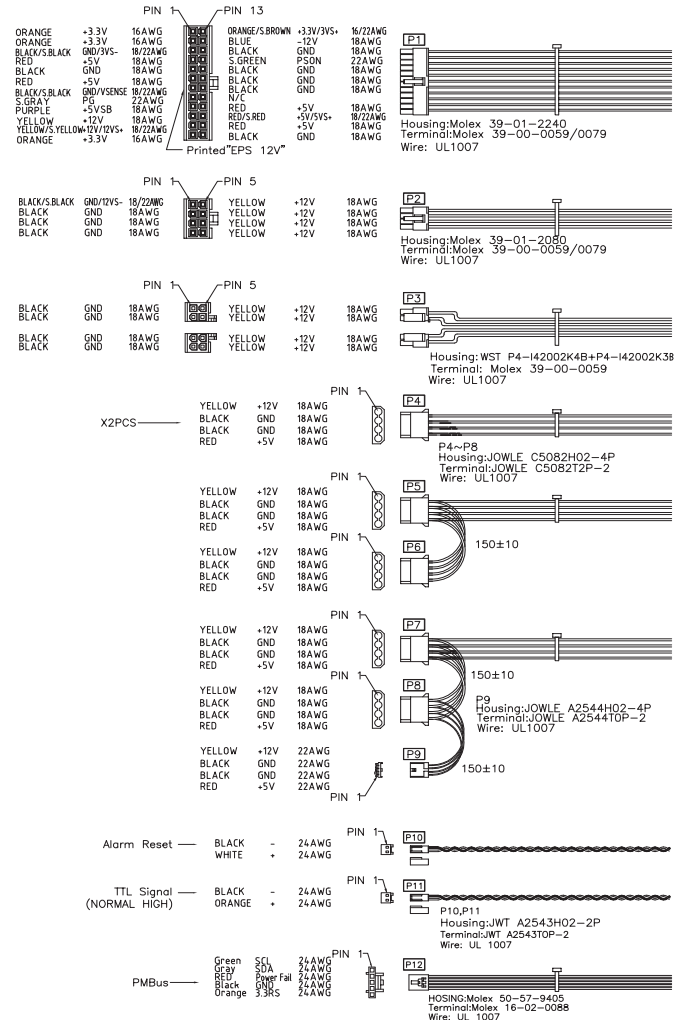
PHYSICAL SPECIFICATIONS

Case Material Steel
 Dimensions 13.19 x 4.17 x 1.363" | 335 x 106 x 41.5mm
 Weight (populated chassis) 9.92 lbs. (4.5 kg.)

OUTLINE DRAWING



Standard Cable Assemblies are 500mm ±20mm. Customer specified cable assemblies available upon request and will be designated by customer specific suffix in the final part number.



PMBus SPECIFICATIONS

Command Code	Command Name	SMBus Transaction Type	Number of Data Bytes
19h	CAPABILITY	Read Byte	1
1Ah	QUERY	Read Byte	1
88h	READ_VIN(Note1)	READ WORD	2
89h	READ_IIN	READ WORD	2
8Bh	READ_VOUT	READ WORD	2
8Ch	READ_IOUT	READ WORD	2
8Dh	READ_TEMPERATURE_1	READ WORD	2
90h	READ_FAN_SPEED_1	READ WORD	2
91h	READ_FAN_SPEED_2	READ WORD	2
96h	READ_POUT	READ WORD	2
97h	READ_PIN	READ WORD	2
98h	PMBUS_REVISION	READ BYTE	1
99h	MFR_ID	R/W Block	Variable
9Ah	MFR_MODEL	R/W Block	Variable
9Bh	MFR_REVISION	R/W Block	Variable
9Eh	MFR_SERIAL	R/W Block	Variable
A0h	MFR_VIN_MIN	READ WORD	2
A1h	MFR_VIN_MAX	READ WORD	2
A7h	MFR_POUT_MAX	READ WORD	2
B0h	USER_DATA_00	READ BYTE	1

Note1: If AC Input= 90V ~ 180V PMBus sent the value of 115V
If AC Input= 181V ~ 264V PMBus sent the value of 230V

Bit Number	Status Bit Name	Meaning
7	Reserved	Default=0
6	Reserved	Default=0
5	Reserved	Default=0
4	Reserved	Default=0
3	Reserved	Default=0
2	Module Status	Inserted=0, Not inserted=1
1	PS_ON Status	PS_OFF=0, PS_ON=1
0	AC Status	AC_OK=0, AC Fail=1

PDB address A0/A1	0/0	0/1	1/0	1/1
PSU PMBUS Device	B0h	B2h	B4h	B6h

INDICATORS (on each module)

Power Supply Status	Color
Normal(AC OK)	Green
Standby (AC OK)	Blinking Green
Power Fail	Red
Fan Fail	Blinking Red

CAPACITIVE LOADING

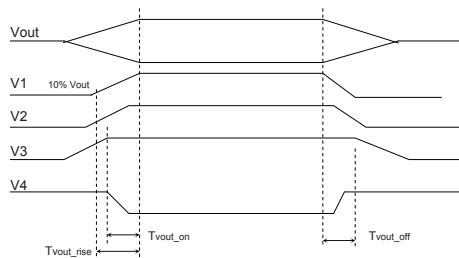
Output	MIN	MAX	Units
+3.3V	10	12,000	uF
+5V	10	12,000	uF
+12V	10	11,000	uF
-12V	1	350	uF
+5VSB	1	350	uF

TRANSIENT LOAD RESPONSE

Output	ΔStep Load Size	Load Slew Rate	Capacitive Load
+5V	50% of Max. Load	0.5 A/uS	1000 uF
+3.3V	50% of Max. Load	0.5 A/uS	1000 uF
+12V	50% of Max. Load	0.5 A/uS	2200 uF
+5VSB	50% of Max. Load	0.5 A/uS	1 uF

OUTPUT VOLTAGE TIMING

Item	Description	MIN	MAX	Units
Tvout_rise	Output voltage rise time from each main output	1	20	mS
	Output voltage rise time for the 5Vsb out put	1	25	mS
Tvout_on	All main output must be within regulation of each other within this time.		50	mS
Tvout_off	All main output must leave regulation within this time		400	mS



TURN ON / OFF TIMING

Item	Description	MIN	MAX	Units
Tsb_on-delay	Delay from AC being applied to +5VSB being within regulation.		1500	mS
Tac_on-delay	Delay from AC being applied to all output voltages being within regulation.		2500	mS
Tvout_holdup	Time all output voltage stay within regulation after loss of AC tested at 60% of maximum load.	17		mS
Tpwok_holdup	Delay from loss of AC deassertion of PWOK tested at 60% of maximum load.	16		mS
Tpson_on_delay	Delay from PS_ON# active to output voltage within regulation limits.	5	400	mS
Tpson_pwok	Delay from PS_ON# deactive to PWOK being deasserted.		50	mS
Tpwok_on	Delay from output voltage within regulation limits to PWOK asserted at turn on.	100	500	mS
Tpwok_off	Delay from PWOK deasserted to output voltages (+5V, +3.3V, +12V, -12V) dropping out of regulation limits. Tested at 60% of maximum load.	1		mS
Tpwok_low	Duration of PWOK being in the deasserted state during an off/on cycle using AC or the PS_ON# signal.	100		mS
Tsb_vout	Delay from +5VSB being in regulation to O/Ps being in regulation at AC turn on.	50	1000	mS

