Slimline760 Series

AC & HVDC INPUT / 48VDC INPUT
760 WATT 12V FRONT ENDS

12.68 x 2.15 x 1.57” | 322 x 54.6 x 40mm

DESCRIPTION

Unipower’s **Slimline760 Series** are new generation high density hot-swap Front-Ends for Networking and DataCom applications that utilize 12V Bus Architecture. With a power density of 17.5W/in^3 and efficiency of Up to 92%, these “GREEN” power solutions help system designers satisfy increasing demands for reduced energy consumption, smaller size and reduced costs.

Operating from either a Universal 90-264VAC/ 90-300VDC or a 36-75VDC input, these 760 Watt Power Modules feature both Analog and PMBus communications for status and control of each power module. Front panel LED indicators and an Audible alarm communicate status or fault conditions for easy identification in any environment. N+N Redundant operation is achieved with active load sharing and ORing protection circuits.

FEATURES

- Up to 92% Efficiency
- 1U High: 1.57”
- -20°C to +50°C Operation
- Universal AC or HVDC Input or 48VDC Input
- >0.95 Power Factor (minimum)
- Output Voltages: 12 VDC & 5VSB
- Power Density to 17.5W/Cu. Inch
- Hot Swappable
- Integral Active Output ORing Circuit
- Class A EMI Filter
- LED Indicators
- PMBus Serial Communications
- Variable Speed Cooling Fan
- Reverse Airflow Models

AVAILABLE MODELS

POWER [1]	12VOUT	5VOUT	INPUT [3]	MODEL [2]
760W	62.5A	2A	115/230VAC [3]	SGL3000
760W	62.5A [4]	2A	115/230VAC [3]	SGL3000-R
760W	62.5A	2A	48VDC	SGLQ3000 [5]
760W	62.5A	2A	48VDC	SGLQ3000-R [6]

Notes:
1. Total combined power output may not exceed 760 Watts.
2. -R denotes reverse airflow option (exit through front plate).
3. Input can be either AC or HVDC.
4. Reverse air @ 50C and <100V derates 6W/Vin to 90V.
5. Available Q4 2012.
6. Available Q4 2012. Derating expected to be similar to AC version.

TWO-YEAR WARRANTY

INTERNATIONAL STANDARDS

UL60950-1 2nd Ed., EN60950-1 2nd Ed.
IEC60950-1 2nd Ed., CE Mark (LVD)

SPECIFICATIONS

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

INPUT

SGL3000, SGL3000-R

Voltage Range	90-264 VAC
	90-350VDC [1]
Power Factor	>0.95
Total Harmonic Distortion, Max	5%
Frequency	47-63Hz
Inrush Current Limiting, Max	15 / 30A Peak @ 115 / 230 VAC
Input Protection	Internal Fuse, 15A

SGLQ3000, SGLQ3000-R

Voltage Range	36-75 VDC
Inrush Current Limiting, Max	50A Peak
Input Protection	Internal Fuse, 30A

INPUT EMI

Line Conducted Emissions	FCC20780 pt 15J Curve A
	EN55022 Curve A
Fast Transients Immunity	EN61000-4-4
Surges Immunity	EN61000-4-5

OUTPUT

Current & Voltage	See Model Table
Remote Sense Compensation	200mV
Output Power	760W
Ripple / Noise, max	12V = 120mV | 5V = 100mV
Line Regulation	Max ±0.5%
Load Regulation,	Max ±1%
Transient Load / Slew Rate	0.5/Aμs
Holdup Time	12msec @ Full load
Overvoltage Protection (12V Only)	14.5V Max (Latch Off)
Current Limit	>105%
Efficiency	>88%@20% Load, >92%@50% Load, >90%@Full Load

STATUS INDICATORS

IPOK (Green)	Indicates Input within operating range
DCOK (Green)	Indicates 12V DC Output within normal limits
STATUS (Yellow/Red)	Indicates various fault conditions

ALARM SIGNALS (open drain, TTL compatible)

PSON	Remote ON Off (LOW=ON)
PSKILL	Enable 12V (Short)
PWOK	Power Good (HIGH)
Present	Indicates Power Module is present
ACOK	Input OK (LOW)

PMBus

Version Compliance	1.2

ENVIRONMENTAL

Operating Temp. Range	-20°C to +50°C (Full Load)
Output Current Derating	2.5%/°C, 50°C to 70°C
Storage Temp. Range	-40°C to 85°C
Humidity	0% to 95%, Non-Condensing
ESD	Bellcore GR-1089-Core and EN61000-4-2
MTBF, 25°C (Telcordia SR-332 issue 2)	750,000 Hours
Cooling	Integral Ball Bearing Fan

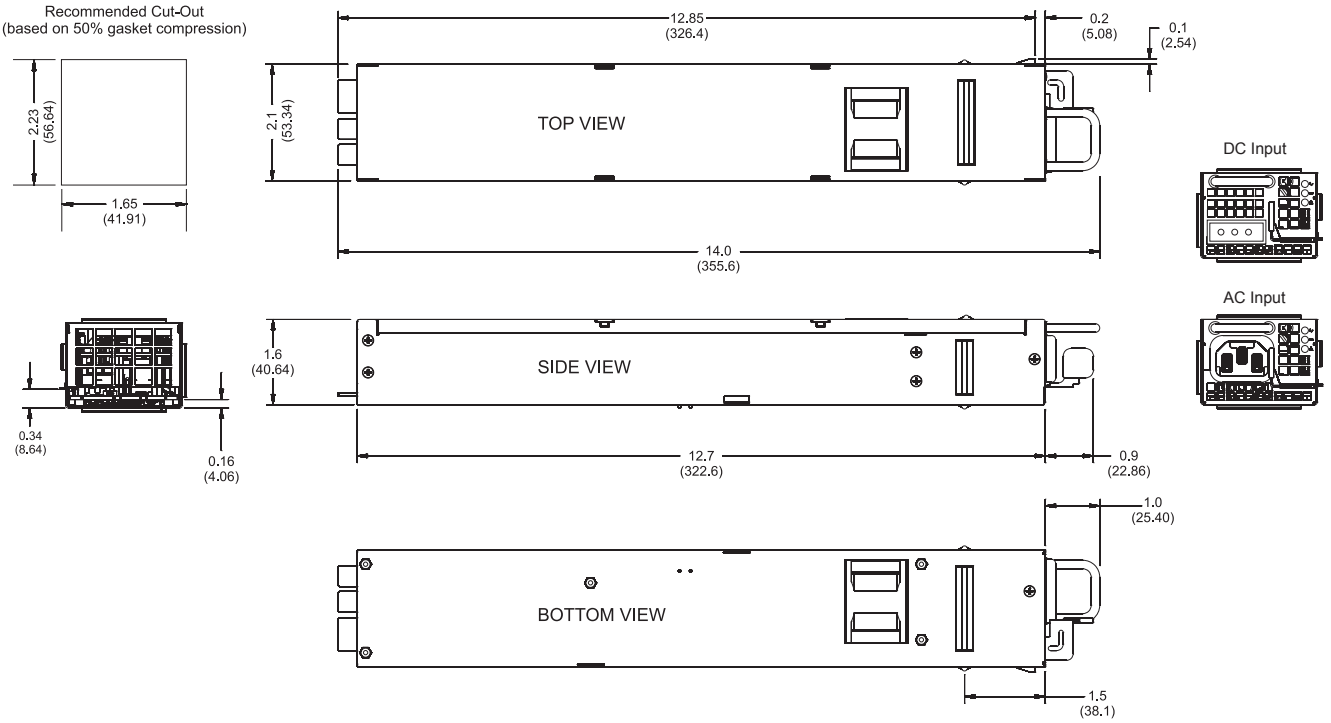
SAFETY STANDARDS ..... UL60950-1, CSA22.2 No. 60950-1, EN60950-1 2nd Edition

PHYSICAL SPECIFICATIONS

Case Material	Steel
Case Dimensions, Inches (mm)	12.68"(L) x 2.15"(W) x 1.57"(H) (322 x 54.6 x 40mm)
Weight	2.2 lbs. (1.0 kg.)

Notes:
1. Requires external DC protection.

OUTLINE DRAWING

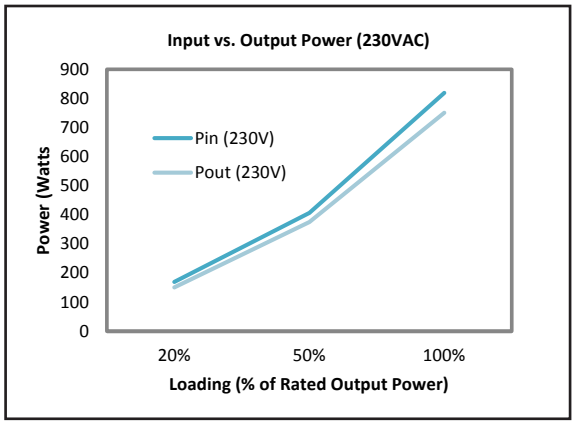


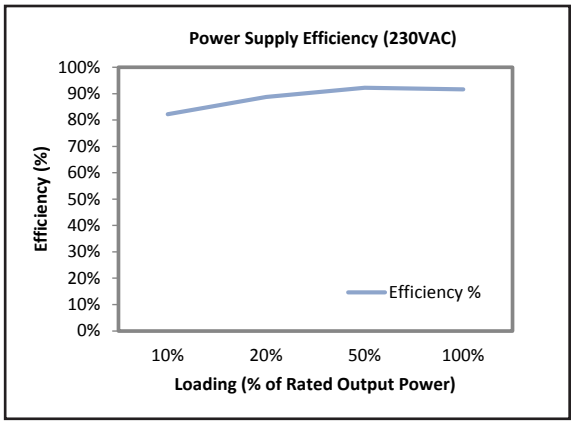
Dimension in inches (mm)

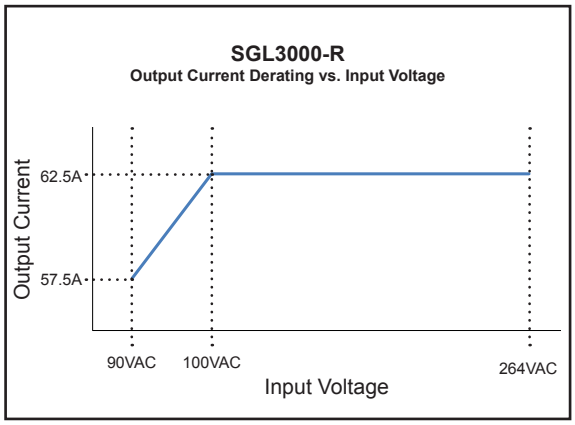
SGL3000 EFFICIENCY TEST RESULTS

		230VAC Input				115VAC Input			
Load (%)	Fraction of Load	Input Watts	Output Watts	Output Voltage	Efficiency	Input Watts	Output Watts	Output Voltage	Efficiency
10%	Low	91.3	75.0875	12.014	82.24%	91.9	75.1	12.016	81.72%
20%	Light	169.2	150.175	12.014	88.76%	171.6	150.2	12.016	87.53%
50%	Typical	406.8	375.34375	12.011	92.27%	414.1	375.46875	12.015	90.67%
100%	Full	819.5	750.9375	12.015	91.63%	839.7	750.875	12.014	89.42%

Note: Results are calculated excluding fan consumption in accordance with 80PLUS guidlines.

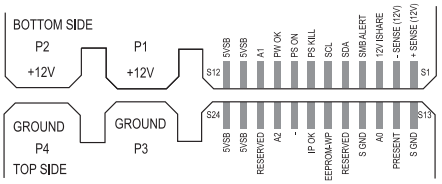






OUTPUT/SIGNAL CONNECTOR DETAILS

Edge Connector mates with Molex 45984-4161



Pin	Pin Name	Function
P1,2	+12V	+12V Power Output
P3,4	GROUND	+12v Return (Chassis GND)
S12,13,23,24	5VSB	+5V Standby Output
S15	A0	SMBus Address
S10	A1	SMBus Address
S21	A2	SMBus Address
S9	PW OK	DC Output OK (HIGH=GOOD)
S8	PS ON	Remote On/OFF Input (LOW=ON)
S7	PS KILL	Hot-Plug Enable
S6	SCL	SMBus Clock
S5	SDA	SMBus Data
S4	SMBALERT	SMBus Interrupt
S3	12V ISHARE	12V Current Share
S14	PRESENT	Indicates that unit is plugged in
S1	+SENSE(12V)	+12V Remote Sense
S2	-SENSE(12V)	+12V Remote Sense Return
S18	EEPROM-WP	Write Protect (HIGH=PROTECT)
S19	IP OK	Input Power OK (HIGH=GOOD)

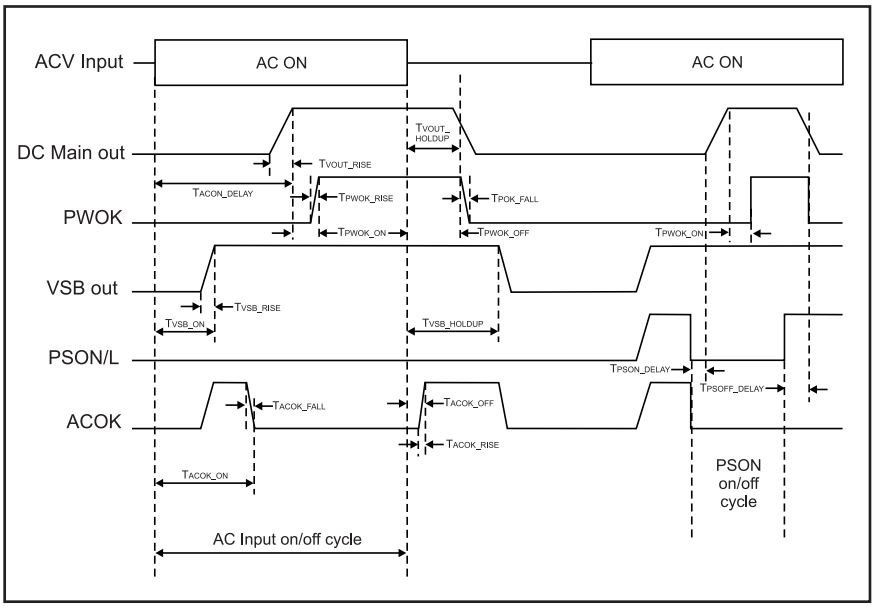
INDICATORS

LED	State	Condition
IPOK (top)	Solid GREEN	Input Voltage within operating range
	OFF	Input Voltage over or under operating range
DCOK (middle)	Solid GREEN	DC Output within normal range
	OFF	DC Output Inhibited
STATUS (bottom)	OFF	No Fault, Outputs On or Standby Mode
	Solid YELLOW	+12V in Current Limit
		Over or Under Temperature Warning
		Minor Fan Fault
		5VSB Out of Limits
		AC Input Low
	Solid RED	Over or Under Temperature Shutdown
		Overvoltage Shutdown
		Major Fan Fault
		IPOK and DCOK LEDs Both Off

SGL3000 & SGL3000-R Timings

Value	Min.	Typ.	Max.	Description
TACON_DELAY	1000ms	1800ms	2000ms	Delay from AC input voltage applied to output in regulation.
TVOUT_HOLDUP	12ms	15ms		Time from loss of AC input to DC output voltage falling to 90% of original value. Timing given is for full load.
TVSB_HOLDUP	20ms	80ms		Time from loss of AC input to VSB going out of regulation. Typical timing given is for full load on all outputs.
TVSB_ON	100ms	1000ms	1500ms	Delay from AC input voltage applied to VSB in regulation.
TACOK_ON	1000ms	1700ms	2000ms	Time from AC input voltage applied to ACOK output being low (good).
TACOK_OFF	10ms	12.5ms		Time from loss of AC input to ACOK output being high. Timing given is for full load.
TVOUT_RISE	5ms	10ms	15ms	Time for DC output to rise to final regulated voltage.
TVSB_RISE	5ms	12ms	15ms	Time for VSB to rise to final regulated voltage.
TPSON_DELAY		50ms		Time from PSON going low to main output coming on (default, this is reprogrammable via PMBus)
TPSOFF_DELAY		50ms		Time from PSON going high to main output going off (default, this is reprogrammable via PMBus)
TPWOK_ON	99ms	100ms	1000ms	Time from main output being in regulation to PWOK going high.
TPWOK_FALL	50ns	100ns	1000ns	Time for PWOK signal to transition from high to low*
TPWOK_RISE	1µs	2µs	10µs	Time for PWOK signal to transition from low to high*
TACOK_FALL	50ns	100ns	1000ns	Time for ACOK signal to transition from high to low*
TACOK_RISE	1µs	2µs	10µs	Time for ACOK signal to transition from low to high*

*PWOK and ACOK signals pulled up to 5V with 10kOhm resistor.



PMBus SPECIFICATIONS

PHYSICAL ADDRESSING

The module responds to a single PMBus address. Multiple units can be used together on a single bus by configuring each module with a different physical address. Three of the address bits are brought out on the module connector and these may be either tied high (to 5VSB) or low (to GROUND) to configure the address. The remaining bits are internally set. The table below summarizes the addressing capability.

0/0/0	0/0/1	0/1/0	0/1/1	1/0/0	1/0/1	1/1/0	1/1/1
30h	32h	34h	36h	38h	3Ah	3Ch	3Eh

DC SPECIFICATIONS

Vil, SMBus signal input low ..... 0.8V max.
Vih, SMBus signal input high..... 2.1V min. / 5.0V max.
Vol, SMBus signal output low (@pullup) ..... 0.4V min.
Ipullup Current sinking, Vol=0.4V ..... 4mA min.
Ci, capacitance of SCL or SDA pin ..... 25pF max.

BUS SPEED

Minimum 10kHz
Maximum.....100kHz

FAULT REPORTING

faults are reported using the SMBALERT signal. This allows the bus master to determine if a fault has occurred so that it can quickly determine which module has a fault.

Packet Error Checking (PEC)

The SlimLine760 PMBus implementation supports packet error checking. The user may configure messages with an additional CRC check byte at the end. Any errors will cause an alert enabling the master to resend the message. Messages received from the module also have a PEC byte appended to the end. This byte may be read if required or only the message bytes may be read.

PMBus Command Summary (see software manual for full details)

CODE	NAME	SHORT DESCRIPTION	CODE	NAME	SHORT DESCRIPTION
01h	OPERATION	Used for on/off and margining	80h	STATUS_MISC	Reads the misc. status register
02h	ON_OFF_CONFIG	Used to configure the function of OPERATION	81h	STATUS_FANS_1_2	Reads the FAN status register
03h	CLEAR_FAULTS	Clears status bytes and SMBALERT signal	88h	READ_VIN	Reads the VIN voltage value
12h	RESTORE_DEFAULT_ALL	Restores all user parameters from default store	89h	READ_IIN	Reads the IIN current value
15h	STORE_USER_ALL	Stores all user parameters in the user store	8Ah	READ_VCAP	Reads the VCAP voltage value
16h	RESTORE_USER_ALL	Restores all user parameters from user store	8Bh	READ_VOUT	Reads the output voltage value
20h	VOUT_MODE	Reads the data format for VOUT related commands	8Ch	READ_IOUT	Reads the output current value
21h	VOUT_COMMAND	Sets the output voltage	8Dh	READ_TEMPERATURE_1	Reads the internal temperature value
22h	VOUT_TRIM	Trims the output voltage	8Eh	READ_TEMPERATURE_2	Reads the internal temperature value
24h	VOUT_MAX	Sets the voltage above which an alert will be issued	90h	READ_FAN_SPEED_1	Reads the speed of fan 1
25h	VOUT_MARGIN_HIGH	Sets the output voltage when high margin is set	98h	PMBUS_REVISION	Reads the revision of the PMBus implementation
26h	VOUT_MARGIN_LOW	Sets the output voltage when low margin is set	99h	MFR_ID	Reads the manufacturer ID
27h	VOUT_TRANSITION_RATE	Sets the rate of change of output voltage	9Ah	MFR_MODEL	Reads the power supply model number
42h	VOUT_OV_WARN_LIMIT	Sets the output over voltage warning limit	9Bh	MFR_REVISION	Reads the power supply hardware revision
43h	VOUT_UV_WARN_LIMIT	Sets the output under voltage warning limit	9Ch	MFR_LOCATION	Reads the power supply manufacturer location
44h	VOUT_UV_FAULT_LIMIT	Sets the output under voltage fault limit	9Dh	MFR_DATE	Reads the power supply manufacture date
45h	VOUT_UV_FAULT_RESPONSE	Sets the output under voltage fault response	9Eh	MFR_SERIAL	Reads the power supply serial number
46h	IOUT_OC_FAULT_LIMIT	Sets the output over current fault limit	D0h	OVP_SETTING	Sets the OVP voltage level
47h	IOUT_OC_FAULT_RESPONSE	Sets the output over current fault response	D1h	READ_ISHARE	Reads the ISHARE current level
4Ah	IOUT_OC_WARN_LIMIT	Sets the output over current warning limit	D2h	READ_VSB	Reads the standby voltage
4Fh	OT_FAULT_LIMIT	Sets the over temperature fault limit	D3h	MINIMUM_FAN_SPEED	Sets the minimum fan speed
50h	OT_FAULT_RESPONSE	Sets the over temperature fault response	D4h	MISC_CONFIG	Enables front panel buttons, signal polarity
51h	OT_WARN_LIMIT	Sets the over temperature warning limit	D5h	SOFTWARE_REVISION	Reads the software revision
52h	UT_WARN_LIMIT	Sets the under temperature warning limit	D6h	MODEL	Reads the basic hardware model (12,24,48)
53h	UT_FAULT_LIMIT	Sets the under temperature fault limit	D7h	PART_NUMBER	Reads the module part number (001-xxxx-xxxx)
54h	UT_FAULT_RESPONSE	Sets the under temperature fault response	D6h	MODEL	Reads the basic hardware model (12,24,48)
5Eh	POWER_GOOD_ON	Sets the output power good turn on voltage level	D7h	PART_NUMBER	Reads the module part number (001-xxxx-xxxx)
5Fh	POWER_GOOD_OFF	Sets the output power good turn off voltage level	A0h	MFR_VIN_MIN	Returns the minimum input voltage rating
60h	TON_DELAY	Sets the time before the output voltage comes up	A1h	MFR_VIN_MAX	Returns the maximum input voltage rating
64h	TOFF_DELAY	Sets the delay time before the output goes off	A2h	MFR_IN_MAX	Returns the maximum input current rating
78h	STATUS_BYTE	Reads the status byte	A3h	MFR_PIN_MAX	Returns the maximum input power rating
79h	STATUS_WORD	Reads the status word	A4h	MFR_VOUT_MIN	Returns the minimum output voltage rating
7Ah	STATUS_VOUT	Reads the VOUT status register	A5h	MFR_VOUT_MAX	Returns the maximum output voltage rating
7Bh	STATUS_IOUT	Reads the IOUT status register	A6h	MFR_IOUT_MAX	Returns the maximum output current rating
7Ch	STATUS_INPUT	Reads the INPUT status register	A7h	MFR_POUT_MAX	Returns the maximum output power rating
7Dh	STATUS_TEMPERATURE	Reads the TEMPERATURE status register	A8h	MFR_TAMBIENT_MAX	Returns the maximum ambient temperature rating
7Eh	STATUS_CML	Reads the CML status register	A9h	MFR_TAMBIENT_MIN	Returns the minimum ambient temperature rating