

File E116994  
Project 06CA58325

January 03, 2007

REPORT  
ON  
COMPONENT - POWER SUPPLIES  
MEDICAL AND DENTAL POWER SUPPLY

SL Power Electronics Corp.  
Ventura, California

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## DESCRIPTION

## PRODUCT COVERED:

USR/CNR - Component Switching Power Supply Models GPM80A, GPM80B, GPM80C, GPM80D, GPM80E, GPM80P, GPM80-5, -12, -15, -24, -28, MSP1612, and MSP1766. Models GPM80 Series, MSP1612, and MSP1766 may be followed by suffixes: -L, -LC, -XXX and/or G. Suffix -L indicates chassis; -LC indicates chassis and cover; -XXX indicates value added configurations that have no impact on safety which may be any number from 001 thru 999; and G indicates compliance to RoHS. (RoHS compliance has not been evaluated by UL.)

## ELECTRICAL RATINGS:

Input - 100-240 V ac, 50/60 Hz, 3.2 A.

Output -

<u>Model</u>	<u>V1</u>	<u>A1</u>	<u>V2</u>	<u>A2</u>	<u>V3</u>	<u>A3</u>	<u>V4</u>	<u>A4</u>
GPM80A	+5 V dc	12 A	+12 V dc	3 A	-12 V dc	1 A	+12 V dc	1 A
GPM80B	+5 V dc	12 A	+12 V dc	3 A	-12 V dc	1 A	-5 V dc	1 A
GPM80C	+5 V dc	12 A	+12 V dc	3 A	-15 V dc	1 A	+15 V dc	1 A
GPM80D	+5 V dc	12 A	+24 V dc	2 A	-12 V dc	1 A	+12 V dc	1 A
GPM80E	+5 V dc	12 A	+24 V dc	2 A	-15 V dc	1 A	+15 V dc	1 A
GPM80P	+5 V dc	12 A	+24 V dc	3.5 A	-12 V dc	1 A	+12 V dc	2 A
GPM80-5	+5 V dc	16 A						
GPM80-12	+12 V dc	6.7 A						
GPM80-15	+15 V dc	5.3 A						
GPM80-24	+24 V dc	3.4 A						
GPM80-28	+28 V dc	2.9 A						
MSP1612,								
MSP1766	+5 V dc	12 A	+12 V dc	3 A	-12 V dc	1 A	+12 V dc	1 A

Note: See ILL. 2 for additional ratings with airflow.

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

For use in product where the acceptability of the combination is determined by Underwriters Laboratories Inc.

USR indicates that the product was evaluated to the First Edition of the Standard For Medical Electrical Equipment, Part 1: General Requirements for Safety, UL 60601-1.

CNR indicates that the product was evaluated to the Standard For Medical Electrical Equipment, Part 1: General Requirements for Safety, CSA C22.2, No. 601.1-M90.

Engineering References - Following Illustrations are provided for engineering references:

- Ill. 1 - Insulation Diagram
- Ill. 2 - Installation Instructions

Conditions of Acceptability - When installed in the end-use equipment, the following are among the considerations to be made:

1. The power supplies have been judged on the basis of the required spacings in the First Edition of the Standards for Medical Electrical Equipment, Part 1: General Requirements for Safety, UL 60601-1 and CSA C22.2 No. 601.1-M90, which covers the end use product for which the component is designed.
2. The device shall be installed in compliance with the enclosure, mounting, spacing, casualty markings, and segregation requirements of the end-use application.
3. The Temperature Test was performed at an ambient of 50°C. Consideration should be given to measuring the temperature on power electronic components and transformer windings when the power supply is installed in the end-use equipment. All transformers comply with Class 155 limits.
4. The input and output connectors are not acceptable for field connections; they are only intended for connection to mating connectors of internal wiring inside the end-use machine. The acceptability of these in the mating connectors relative to secureness, insulating materials, and temperature shall be considered.
5. The power supply should be properly bonded to ground in the end-use product.
6. The power supply has been evaluated for patient care equipment, but not patient connected.
7. The output circuits have not been evaluated for direct patient connection (Type B, BF, or CF).
8. The end use product shall ensure that the power supplies are used within their ratings with the appropriate cooling, see ILL. 4.
9. The GPM80 Series, MSP1612 and MSP1766 power supplies have been evaluated to operate in a 50 °C ambient with the following maximum output loading conditions:
  - a. 40 Watts with convection cooling, with cover and chassis.
  - b. 80 Watts with convection cooling.
  - c. 90 Watts with 26 CFM cooling, with cover and chassis.
  - d. 110 Watts with 26 CFM cooling.

10. Leakage current testing should be repeated in the end product application.
11. The power supplies were evaluated as Reinforced insulation between primary and secondary; basic insulation between primary to ground; and operational insulation only between secondary to ground.
12. The power supplies have been evaluated as Class I, continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anaesthetic mixture with air, oxygen, or nitrous oxide.
13. Fusing in the end product shall be considered since only one UL Listed fuse rated 3.5 A, 250 V, fast-blow is provided in the hot side of the input supply circuit.
14. The outputs of the power supplies do not exceed 25 V ac or 60 V dc under normal and single fault conditions.



CSA INTERNATIONAL

# Certificate of Compliance

**Certificate:** 1166448 (LR 46516C)

**Master Contract:** 150684

**Project:** 1728955

**Date Issued:** 2006/01/17

**Issued to:** **Condor D.C. Power Supplies Inc.**

2311 Statham Pky  
Oxnard, CA 93033  
USA

**Attention: Mr. Ross Sacolles**

*The products listed below are eligible to bear the CSA Mark shown*



**Issued by:** Eugen Velea, MAsc. E.Eng.

**Authorized by:** Shane Stevenson, Product  
Group Manager

## **PRODUCTS**

**CLASS 5311 20** - POWER SUPPLIES - Component Type - For Use in Medical Equipment

**CLASS 5311 07** - POWER SUPPLIES - Component Type - (CSA 60950-1-03)

CLASS 5311 07 - POWER SUPPLIES - Component Type

Component Power supplies for use in other equipment where the acceptability of the combination is to be determined by CSA International.

Model Numbers:

- Model GPC80A, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/3 A (4 A with 26 CFM airflow), -12 V/1 A (1.2 A with 26 CFM airflow), +12 V/1 A (1.2 A with 26



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CFM airflow); maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80B, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/3 A (4 A with 26 CFM airflow), -12 V/1 A (1.2 A with 26 CFM airflow), -5 V/1 A (1.2 A with 26 CFM airflow); maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80C, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/3 A (4 A with 26 CFM airflow), -15 V/1 A (1.2 A with 26 CFM airflow), +15 V/1 A (1.2 A with 26 CFM airflow); maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80D, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/3 A (4 A with 26 CFM airflow), -12 V/1 A (1.2 A with 26 CFM airflow), +24 V/2 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80E, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +15 V/1 A (1.2 A with 26 CFM airflow), -15 V/1 A (1.2 A with 26 CFM airflow), +24 V/2 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80E-107, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +15 V/1 A (1.2 A with 26 CFM airflow), -15 V/1 A (1.2 A with 26 CFM airflow), +24 V/2 A, +5 V/0.1 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80P, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/2 A, -12 V/1 A (1.2 A with 26 CFM airflow), +24 V/3.5 A (4.5 A with 26CFM airflow); maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80-5, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 5 V/20 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 68 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80-12, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 12 V/9.2 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 75 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80-15, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 15 V/7.3 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.



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- Model GPC80-24, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 24 V/4.6 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80-28, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 28 V/3.9 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPC80-48, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 48 V/2.3 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model SP1415, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/4 A, -15 V/0.5 A, -24 V/0.25 A, +24 V/2 A.

- Model SP1479, (Level 3), input rated 100-120 V, 50/60 Hz, 3.2 A; dc outputs rated +5 V/4 A, +12 V/3 A, -12 V/1 A, +12 V/1 A; maximum total output power: 80 W.

#### CLASS 5311 20 - POWER SUPPLIES - Component Type - For Use in Medical Equipment

Component power supplies for use in medical equipment where the suitability of the combination is to be determined by CSA International.

#### Model Numbers:

- Model GPM80A, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/3 A (4 A with 26 CFM airflow), -12 V/1 A (1.2 A with 26 CFM airflow), +12 V/1 A (1.2 A with 26 CFM airflow); maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPM80B, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/3 A (4 A with 26 CFM airflow), -12 V/1 A (1.2 A with 26 CFM airflow), -5 V/1 A (1.2 A with 26 CFM airflow); maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPM80C, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/3 A (4 A with 26 CFM airflow), -15 V/1 A (1.2 A with 26 CFM airflow), +15 V/1 A (1.2 A with 26 CFM airflow); maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPM80D, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/3 A (4 A with 26 CFM airflow), -12 V/1 A (1.2 A with 26 CFM airflow), +24 V/2 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.



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- Model GPM80E, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +15 V/1 A (1.2 A with 26 CFM airflow), -15 V/1 A (1.2 A with 26 CFM airflow), +24 V/2 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPM80P, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/2 A, -12 V/1 A (1.2 A with 26 CFM airflow), +24 V/3.5 A (4.5 A with 26CFM airflow); maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPM80-5, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 5 V/20 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPM80-12, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 12 V/9.2 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPM80-15, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 15 V/7.3 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPM80-24, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 24 V/4.6 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model GPM80-28, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 28 V/3.9 A; maximum total output power: 110 W with 26 CFM airflow, 90 W with 26 CFM airflow with cover and chassis, 80 W with convection cooling, and 40 W with convection cooling with chassis and cover.

- Model MSP1343, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 2.3 A; dc outputs rated +5 V/12 A, +15 V/3 A, -15 V/1 A, -5.2 V/1 A; 80 W maximum total output.

- Model MSP1362, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated 5 V/16 A; 80 W max total output.

- Model MSP1451, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/1.2 A, +15 V/1.2 A, -15 V/0.6, +26 V/0.8 A; maximum total output power: 54 W with convection cooling.

- Model MSP1482, (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +24 V/3.5 A, -12 V/1 A, +12 V/3 A; maximum total output power: 80 W with 15 CFM airflow.

- Model MSP1612, MSP1766 (Level 3), input rated 100-240 V (continuous), 50/60 Hz, 3.2 A; dc outputs rated +5 V/12 A, +12 V/3 A (4 A with 26 CFM airflow), -12 V/1 A (1.2 A with 26 CFM airflow), +12 V/1 A (1.2 A with 26 CFM airflow); maximum total output power: 110 W with 26 CFM airflow, 80 W with convection cooling.



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#### Notes

1. The model designations (except SPXXXX and MSPXXXX) may be followed by a " PF", "L" and/or "LC" suffix to indicate the Power Fail, chassis, and/or chassis with cover options respectively.
2. Maximum ambient temperature for continuous output power listed above is 50°C.

#### **APPLICABLE REQUIREMENTS**

CAN/CSA-C22.2 No 60950-1-03 Safety of Information Technology Equipment, Part 1: General Requirements

CAN/CSA-C22.2 No. 601.1-M90 Medical Electrical Equipment, Part 1: General Requirements for Safety

CSA Standard C22.2 No 0-M1991 General Requirements - Canadian Electrical Code, Part II

0.4-M1982 Bonding and Grounding of Electrical Equipment (Protective Grounding)

234-M90 Safety of Component Power Supplies



Product Service

# CERTIFICATE

No. B 07 02 59743 028

Holder of Certificate: **SL Power Electronics, Corp.**



6050 King Drive Bldg A  
Ventura CA 93003  
USA

Production Facility(ies): 16784, 52962

Certification Mark:



Product: **Switching power supply unit  
AC/DC Switching Power Supplies**

Model(s): **MSP1612, MSP1766, GPM80X where X may be the letter A, B, C, D, E or P, and GPM80-X where X may be the number 5, 12, 15, 24, or 28. Models may be followed by -PF, -L, -LC, -FB, -TB, -XXX and/or G. Suffix -PF indicates Power Failure, -L indicates L bracket, -LC indicates L bracket and cover, -FB indicates flux band, -TB indicates terminal block, -XXX indicates value added configurations that have no impact on safety which may be any number from 001 thru 999, and/or G indicates compliance to RoHS. For further model information please see attachment.**

Parameters:

Rated Input Voltage:	100-240 Vac
Rated Frequency:	50 / 60 Hz
Rated Input Current:	3.2 A
Rated DC Outputs:	See attachment
Protection Class:	I
See attachment for Conditions of Acceptability.	

Tested according to: EN 60601-1/A13:1996

The product was tested on a voluntary basis and complies with the following essential requirements. The certification mark shown above can be affixed on the product. The certification mark must not be altered in any way. See also notes overleaf.

Test report no.: SI600002-131

Date, 2007-03-05

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