

SWS600L Specifications

ITEMS/UNITS	MODEL	SWS600L-3	SWS600L-5	SWS600L-12	SWS600L-15	SWS600L-24	SWS600L-36	SWS600L-48	SWS600L-60	
Input	Voltage Range (*3)	V AC85-265 or DC120-350								
	Frequency (*3)	Hz 47-63								
	Power Factor (115/230VAC) (typ) (*2)	0.98/0.95								
	Efficiency (115/230VAC) (typ) (*2)	%	70/72	75/77	79 / 82		81/84	82 / 84		
	Current (115/230VAC) (typ) (*2)	A	5.0 / 2.5		7.1 / 3.6					
	Inrush Current (typ) (*4)	20A/40A at 115VAC, 40A/40A at 230VAC, Ta=25°C (first inrush/second inrush)								
	Leakage Current (*10)	mA	Less than 0.75, 0.3 (typ) at 115VAC / 0.5 (typ) at 230VAC							
Output	Nominal Voltage	VDC	3.3	5	12	15	24	36	48	60
	Maximum Current (Peak Current) (*1)	A	120		53	43	27 (31)	18	13 (15)	10
	Maximum Power (Peak Power) (*1)	W	396	600	636	645	648 (744)	648	624 (720)	600
	Maximum Line Regulation (*5)(*6)	mV	20		48	60	96	144	192	240
	Maximum Load Regulation (*5)(*7)	mV	30		72	90	144	216	288	360
	Temperature Coefficient	Less than 0.02%/°C								
	Maximum Ripple & Noise (115/230VAC) (0<Ta<74°C) (*5)	mVp-p	120		150			200		
	Maximum Ripple & Noise (115/230VAC) (-20<Ta<0°C) (*5)	mVp-p	160		180			240		
	Hold-up Time (115/230VAC) (typ) (*2)	ms	20							
	Voltage Adjustable Range	VDC	2.64-3.96	4.0-6.0	9.6-14.4	12.0-19.5	19.2-28.8	28.8-43.2	38.4-56.0	48.0-66.0
Function	Over Current Protection (*8)	A	>126		>55.7	>45.1	>31.3	>18.9	>15.2	>10.5
	Over Voltage Protection (*9)	VDC	4.12-5.61	6.25-7.25	15.0-17.4	20.2-23.4	30.0-34.8	45.0-52.2	58.5-68.2	69.0-81.0
	Remote Sensing	Possible								
	Remote ON/OFF Control	Possible								
	Parallel Operation	Possible								
	Series Operation	Possible								
	Monitoring Signal	ALM (Open Collector Output)								
	Line DIP	Designed to meet SEMI-F47 (200VAC line only)								
Environment	Operating Temperature (*11)	°C	-20 to +74°C (-20°C to +50°C: 100%, +74°C: 50%), 100% load start up at -40°C							
	Storage Temperature	°C	-40 to +85°C							
	Operating Humidity	% RH	20 - 90 %RH (No dewdrop)							
	Storage Humidity	% RH	10 - 95%RH (No dewdrop)							
	Vibration (*12)	Designed to meet MIL-STD-810F 514.5 Category 4, 10								
	Shock (In package)	Designed to meet MIL-STD-810F 516.5 Procedure I,VI								
	Cooling	Forced air by build-in fan								
Isolation	Withstand Voltage	Input-Output : 3.0kVAC (20mA), Input-FG : 2.0kVAC (20mA), Output-FG : 500VAC (100mA), (60V model: 651VAC (130mA)), Output-CNT/ALM/AUX : 100VAC (100mA) for 1min.								
	Isolation Resistance	Input-FG, Input-Output and Output-FG: More than 50MΩ (500VDC), Output-CNT/ALM/AUX: More than 50MΩ (100VDC) at Ta=25°C and 70%RH								
Standards	Safety Standards (*13)	Approved by UL60950-1, CSA60950-1, EN60950-1, EN50178, Designed to meet DENAN, EN61010-1								
	PFHC	Designed to meet IEC61000-3-2								
	EMI	Designed to meet VCCI-B, FCC-B, EN55011/EN55022-B								
	Immunity	Designed to meet EN61000-4-2 (Level 2,3), -3 (Level 3), -4 (Level 3), -5 (Level 3,4), -6 (Level 3), -8 (Level 4), -11								
Mechanical	Weight (typ)	1.6kg								
	Size (W×H×D)	mm	120 x 61 x 190 (Refer to Outline Drawing)							

(*1) () : Peak output current is possible at 170-265VAC input range, operating period at peak output current is less than 10sec, duty less than 35%.

Average output power and current is less than maximum output power and maximum output current.

(*2) At maximum output power, nominal input voltage, Ta=25°C.

(*3) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100-240VAC, 50/60Hz on name plate.

(*4) First/second inrush current, not applicable for the in-rush current to noise filter for less than 0.2ms.

(*5) Please refer to Fig A for measurement of line & load regulation, ripple and noise voltage.

Ripple & noise are measured at 20MHz by using a twisted pair of load wires terminated with a 0.1uF and 47uF capacitor.

(*6) 85-265VAC, constant load.

(*7) No load - full load (maximum power), constant input voltage.

(*8) Constant current limit with automatic recovery.

Avoid to operate at overload or dead short for more than 30 seconds.

(*9) OVP circuit will shutdown output, manual reset. (Remote ON/OFF control reset or re-power on).

(*10) Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.

(*11) Refer to output derating curve for details of output derating versus ambient temperature.

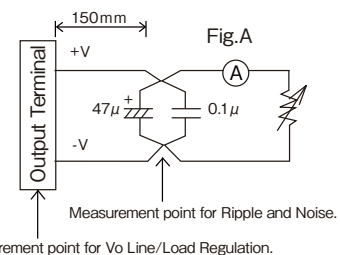
- Load (%) is percent of maximum output power and maximum output current (Item 2 and 3).

Do not exceed derating of maximum output power and maximum output current.

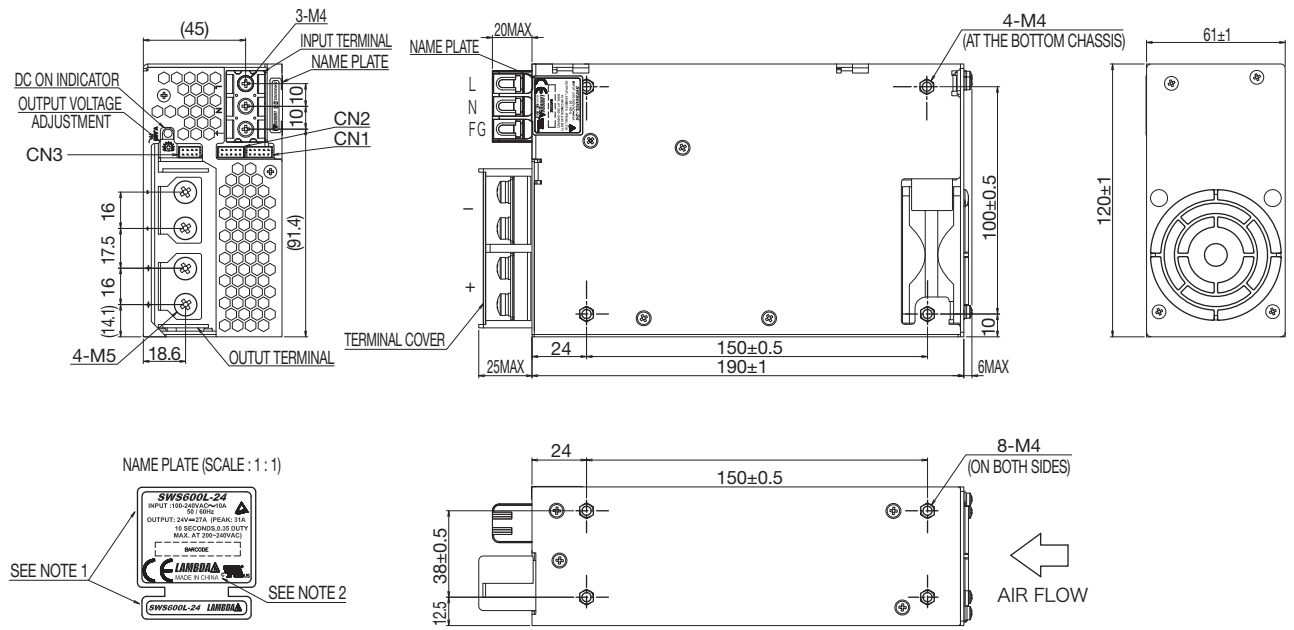
- 100% load start up at -40°C is possible. However, it may not fulfil all the specifications.

(*13) Category 4 exposure levels: Trunk transportation over U.S. highways, composite two-wheeled trailer.

(*14) As for DENAN, designed to meet at 100VAC.

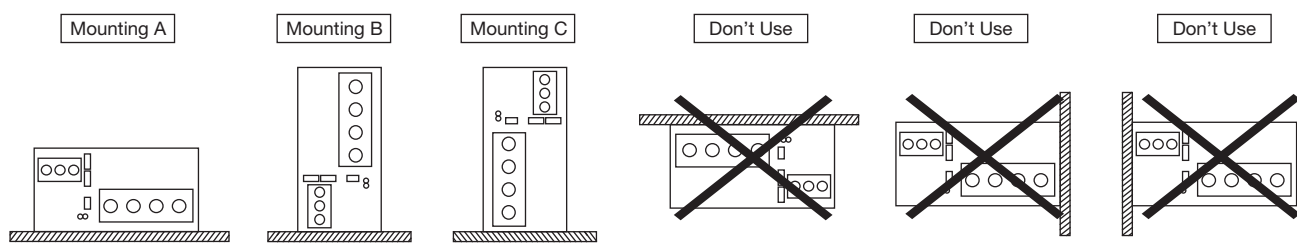
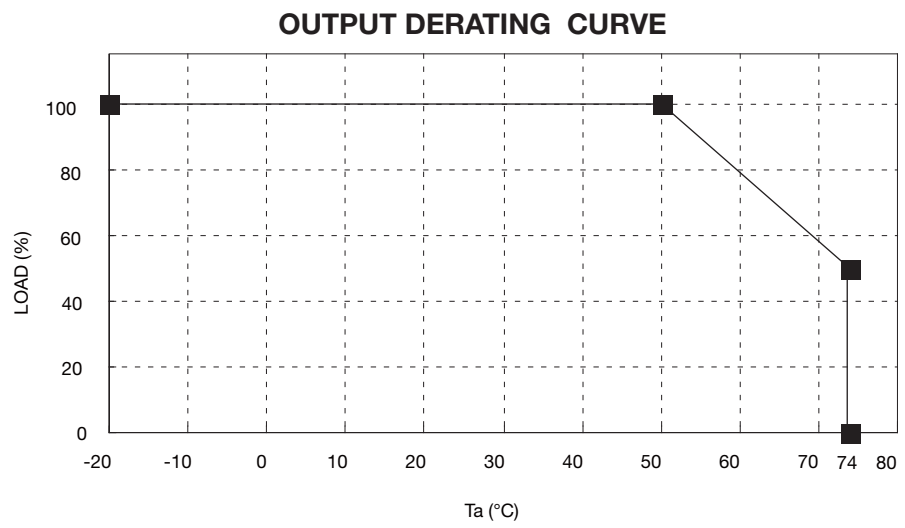


SWS600L Outline Drawing



- NOTES:
- 1: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, NOMINAL OUTPUT CURRENT AND PEAK OUTPUT CURRENT ARE SHOWN ON THE NAME PLATE IN ACCORDANCE WITH THE SPECIFICATIONS
 - 2: COUNTRY OF MANUFACTURE IS SHOWN ON THE NAME PLATE IN ACCORDANCE WITH THE SPECIFICATIONS
 - 3: M4 TAPPED HOLES (12) FOR CUSTOMER CHASSIS MOUNTING (SCREW PENETRATION DEPTH 6mm MAX.)
 - 4: RECOMMENDED SCREW TORQUE
 OUTPUT TERMINAL (M5 SCREW)=2.5N·m
 INPUT TERMINAL (M4 SCREW)=1.27N·m

SWS600L Output Derating



• All specifications are subject to change without notice.

SWS1000L Specifications

ITEMS/UNITS	MODEL	SWS1000L-3	SWS1000L-5	SWS1000L-12	SWS1000L-15	SWS1000L-24	SWS1000L-36	SWS1000L-48	SWS1000L-60	
Input	Voltage Range (*3)	V AC85-265 or DC120-350								
	Frequency (*3)	Hz 47-63								
	Power Factor (115/230VAC) (typ) (*2)	0.98 / 0.95								
	Efficiency (115/230VAC) (typ) (*2)	×	75 / 77	79 / 81	82 / 84		84 / 86			
	Current (115/230VAC) (typ) (*2)	A	8 / 4		12 / 6					
	Inrush Current (typ) (*4)	A	20A/40A at 115VAC, 40A/40A at 230VAC, Ta=25°C (first inrush/second inrush)							
	Leakage Current (typ) (*11)	mA	0.1mA at 115VAC, 60Hz / 0.2mA at 230VAC, 60Hz							
Output	Nominal Voltage	VDC	3.3	5	12	15	24	36	48	60
	Maximum Current (Peak Current) (*1)	A	200		88	70	44 (51)	29	22 (25)	17
	Maximum Power (Peak Power) (*1)	W	660	1000	1056	1050	1056 (1224)	1044	1056 (1200)	1020
	Maximum Line Regulation (*6)(*7)	mV	20		48	60	96	144	192	240
	Maximum Load Regulation (*6)(*8)	mV	30		72	90	144	216	288	360
	Temperature Coefficient		Less than 0.02%/°C							
	Maximum Ripple & Noise (115/230VAC) (0s<Ta<74°C) (*5)	mVp-p	120		150			200		
	Maximum Ripple & Noise (115/230VAC) (-20<Ta<0°C) (*5)	mVp-p	160		180			240		
	Hold-up Time (115/230VAC) (typ) (*2)	ms	20							
	Voltage Adjustable Range	VDC	2.64-3.96	4.0-6.0	9.6-14.4	12.0-19.5	19.2-28.8	28.8-43.2	38.4-56.0	48.0-66.0
Function	Over Current Protection (*9)	A	>210		>92.4	>73.5	>51.6	>30.5	>25.3	>17.9
	Over Voltage Protection (*10)	VDC	4.12-5.61	6.25-7.25	15.0-17.4	20.2-23.4	30.0-34.8	45.0-52.2	58.5-68.2	69.0-81.0
	Remote Sensing		Possible							
	Remote ON/OFF Control		Possible							
	Parallel Operation		Possible							
	Series Operation		Possible							
	Monitoring Signal		ALM (Open Collector Output)							
	Line DIP		Designed to meet SEMI-F47 (200VAC line only)							
Environment	Operating Temperature (*12)	×	-20 to +74 °C (-20°C to +50°C: 100%, +74°C: 50%), 100% load start up at -40°C							
	Storage Temperature	×	-40 to +85°C							
	Operating Humidity	×RH	20-90 (No dewdrop)							
	Storage Humidity	×RH	10-95 (No dewdrop)							
	Vibration (*13)		Designed to meet MIL-STD-810F 514.5 Category 4, 10							
	Shock (In package)		Designed to meet MIL-STD-810F 516.5 Procedure I,VI							
	Cooling		Forced air by build-in fan							
Isolation	Withstand Voltage		Input - Output : 4.0kVAC (20mA), Input - FG : 2.0kVAC (20mA) Output - FG : 500VAC (100mA) (60V model: 651VAC(130mA)), Output - CNT/ALM/AUX : 100VAC (100mA) for 1min.							
	Isolation Resistance		Input - FG, Input - Output and Output - FG: More than 50MΩ (500VDC), Output - CNT/ALM/AUX: More than 50MΩ (100VDC) at Ta=25°C and 70%RH							
Standards	Safety Standards (*14)		Approved by UL60950-1, CSA60950-1, EN60950-1, EN50178, UL60601-1, EN60601-1, CSA-C22.2 No.601.1-M90 Designed to meet DENAN, EN61010-1.							
	PFHC		Designed to meet IEC61000-3-2							
	EMI		Designed to meet VCCI-B, FCC-B, EN55011/EN55022-B							
	Immunity		Designed to meet EN61000-4-2 (Level 2,3), -3 (Level 3), -4 (Level 3), -5 (Level 3,4), -6 (Level 3), -8 (Level 4), -11							
Mechanical	Weight (typ)	g	2.3kg							
	Size (W×H×D)	mm	150 x 61 x 240 (Refer to Outline Drawing)							

(*1) (): Peak output current is possible at 170-265VAC input range, operating period at peak output current is less than 10sec, duty less than 35%. Average output power and current is less than maximum output power and maximum output current.

(*2) At maximum output power, nominal input voltage, Ta=25°C.

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(*4) First/second inrush current, not applicable for the in-rush current to noise filter for less than 0.2ms.

(*5) Ripple & noise are measured at 20MHz by using a 150mm twisted pair of load wires terminated with a 0.1uF film capacitor and a 47uF electrolytic capacitor.

(*6) Measure line & load regulation at output terminal M4 tapped point.

(*7) 85-265VAC, constant load.

(*8) No load - full load (maximum power), constant input voltage.

(*9) Constant current limit with automatic recovery.

Avoid to operate at overload or dead short for more than 30 seconds.

(*10) OVP circuit will shutdown output, manual reset (remote ON/OFF control reset or re-power on).

(*11) Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.

Worst case: <0.3mA at 264VAC, 63Hz (normal condition); <0.5mA (single fault condition)

(*12) Refer to output derating curve for details of output derating versus ambient temperature.

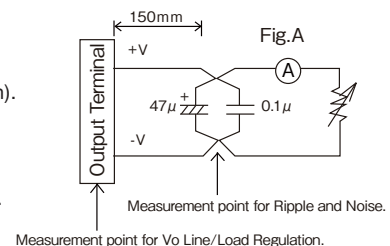
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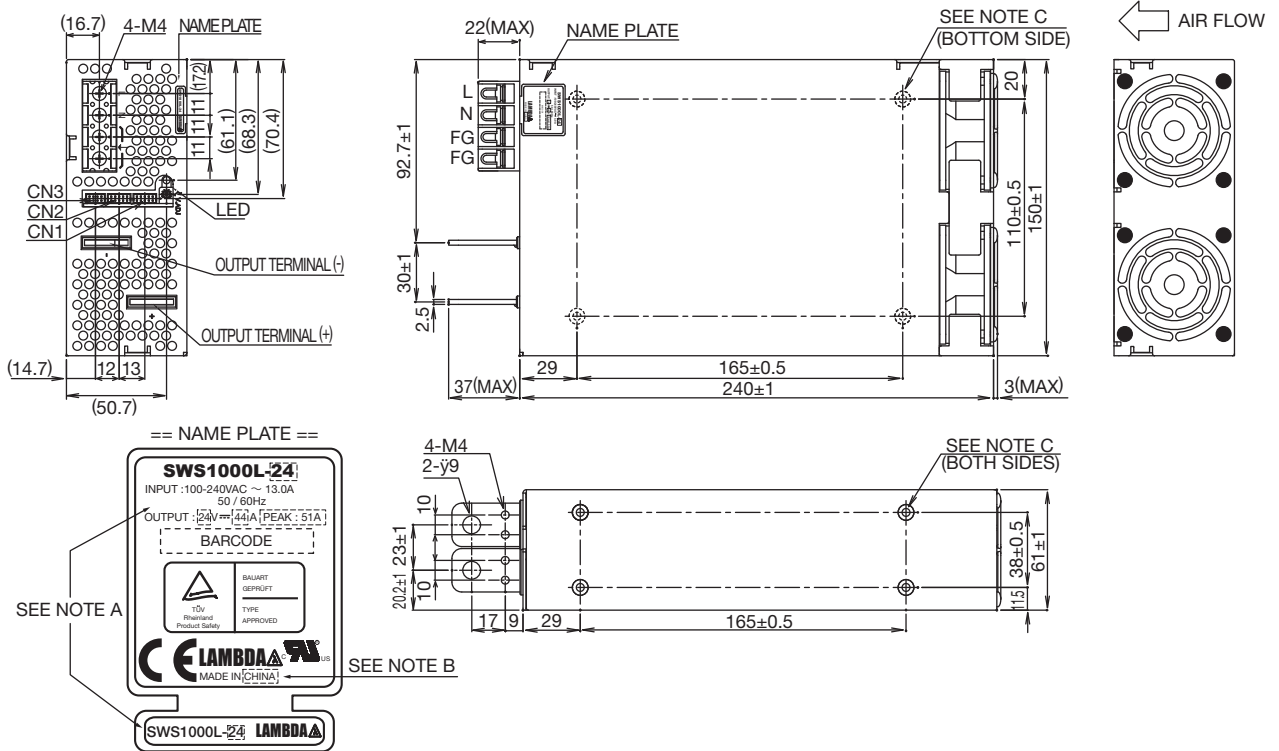
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SWS1000L Outline Drawing

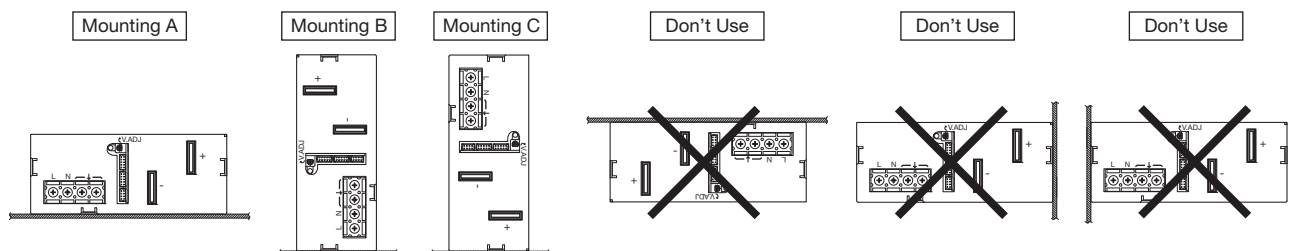
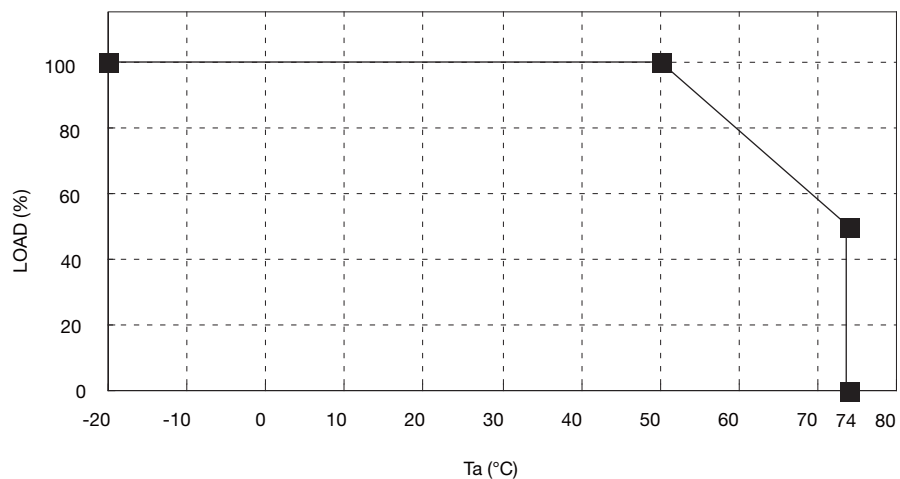


NOTES:

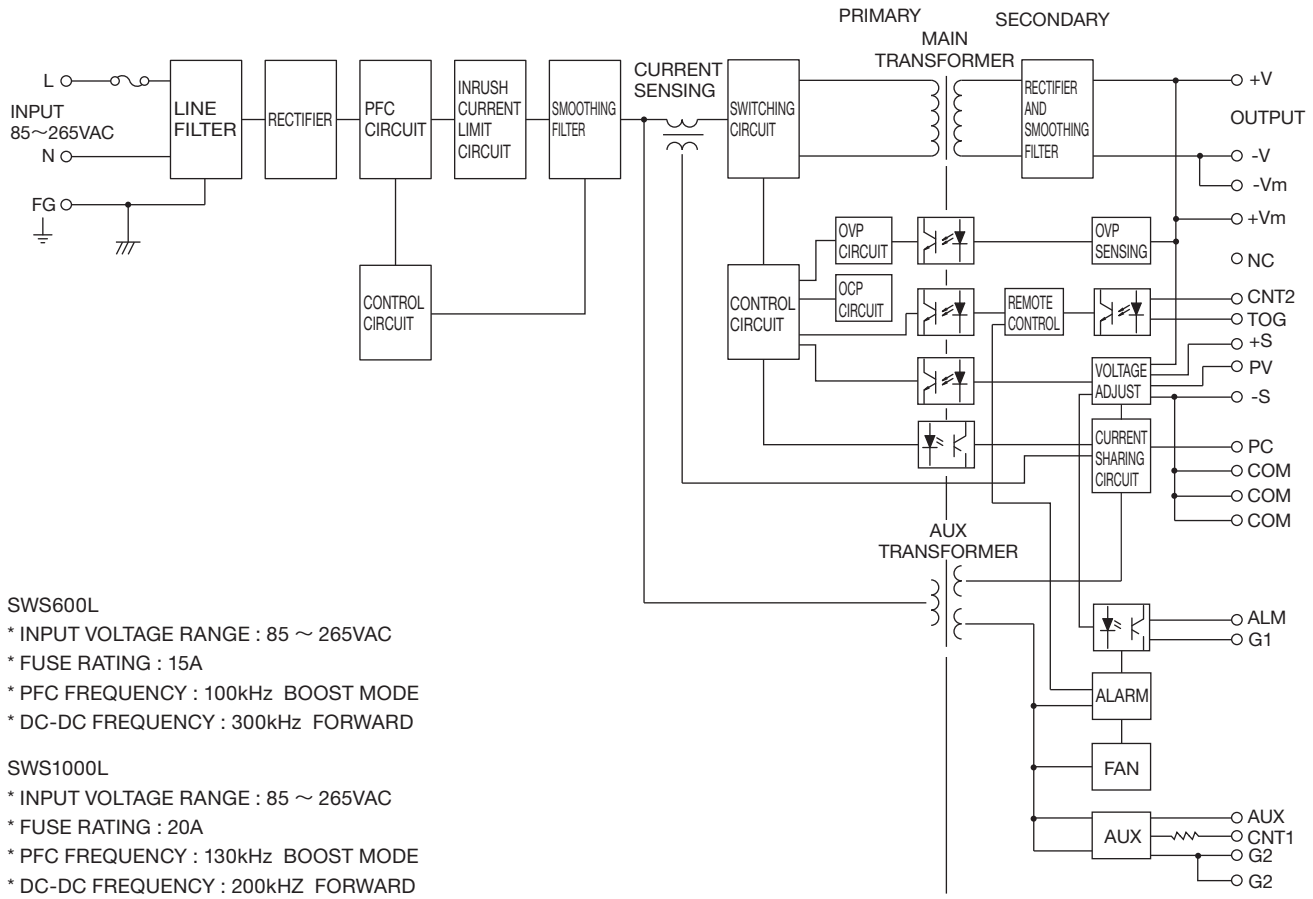
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- 2:COUNTRY OF MANUFACTURE IS SHOWN HERE.
- 3:M4 TAPPED HOLES (12) FOR CUSTOMER CHASSIS MOUNTING. (SCREW PENETRATION DEPTH 6m/m MAX.)

SWS1000L Output Derating

OUTPUT DERATING CURVE



Block Diagram



SWS600L
 * INPUT VOLTAGE RANGE : 85 ~ 265VAC
 * FUSE RATING : 15A
 * PFC FREQUENCY : 100kHz BOOST MODE
 * DC-DC FREQUENCY : 300kHz FORWARD

SWS1000L
 * INPUT VOLTAGE RANGE : 85 ~ 265VAC
 * FUSE RATING : 20A
 * PFC FREQUENCY : 130kHz BOOST MODE
 * DC-DC FREQUENCY : 200kHz FORWARD

Sequence Time Chart

