SWS600

RELIABILITY DATA

DWG No. CA741-57-01		
APPD	CHK	DWG
13-Oct-04	Kevin Oct,12,04'	philo 12, oct. 2004

I N D E X

※ The above data is typical value. As all units have nearly the same characteristics, the data to be considered as ability value.

1. CALCULATED VALUES OF MTBF

MODEL : SWS600-5

(1) Calculating method

Calculated based on part count reliability projection of JEITA (RCR-9102).

Individual failure rates λ_G is given to each part and MTBF is calculated by the count of each part.

<Formula> :

$$\mathrm{MTBF} = \frac{1}{\lambda_{equip}} = \frac{1}{\sum_{i=1}^{n} N_i (\lambda_G \pi_Q)_i} \times 10^6 \ (\mathrm{Hours})$$

λ_{equip} : Total Equipment Failure Rate (Failure/10^6 Hours)

λ_G : Generic Failure Rate for The ith Generic Part (Failure/10^6 Hours)

N_i : Quantity of ith Generic Part

n : Number of Different Generic Part Categories

π_Q : Generic Quality Factor for The ith Generic Part (π_Q =1)

(2) MTBF Values

G_F : (Ground , Fixed)

MTBF ≒ 231,684(Hours)

(However MTBF calculation for fan is not included.)

2. COMPONENT DERATING

MODEL : SWS600-5

(1) Calculating Method

(a) Measuring Conditions

Input	: 115/230VAC	Ambient temperature	: 50°C
Output	: 5V 100A(100%)	Mounting method	: Standard Mounting

(b) Semiconductors

Compared with maximum junction temperature and actual one which is calculated based on case temperature, power dissipation and thermal impedance.

(c) IC, Resistors, Capacitors, etc.

Ambient temperature, operating condition, power dissipation and so on are within derating criteria.

(d) Calculating Method of Thermal Impedance

$$\theta_{j-c} = \frac{T_{j(max)} - T_c}{P_{c(max)}} \qquad \theta_{j-a} = \frac{T_{j(max)} - T_a}{P_{c(max)}} \qquad \theta_{j-l} = \frac{T_{j(max)} - T_l}{P_{c(max)}}$$

T_c : Case Temperature at Start Point of Derating ; 25°C in General

T_a : Ambient Temperature at Start Point of Derating ; 25°C in General

T_l : Lead Temperature at Start Point of Derating ; 25°C in General

$P_{c(max)}$ ($P_{ch(max)}$) : Maximum Collector(channel) Dissipation

$T_{j(max)}$ ($T_{ch(max)}$) : Maximum Junction(channel) Temperature

θ_{j-c} (θ_{ch-c}) : Thermal Impedance between Junction(channel) and Case

θ_{j-a} : Thermal Impedance between Junction and Air

θ_{j-l} : Thermal Impedance between Junction and Lead

(2) Component Derating List

Location No.	Vin = 115VAC Load = 100% Ta = 50°C		
Q1,Q2 2SK2837 TOSHIBA	Tchmax = 150°C, Pch =13.9W, Tch = Tc + ((θ ch-c) × Pch) =92.1°C D.F. = 61.4%	θ ch-c =0.833 °C/W, Δ Tc =30.5°C,	Pch(max) =150 W, Tc =80.5 °C
Q51,Q52 2SK2611 TOSHIBA	Tchmax = 150 °C, Pch = 16.8W, Tch = Tc + ((θ ch-c) × Pch) =97.7°C D.F. = 65.1%	θ ch-c = 0.833°C/W, Δ Tc = 33.7 °C,	Pch(max) = 150W, Tc = 83.7°C
Q101 2SK2177 SHINDENGEN	Tchmax = 150 °C, Pch = 0.03 W, Tch = Tc + ((θ ch-c) × Pch) =58.6 °C D.F. = 39.1%	θ ch-c = 12.5 °C/W, Δ Tc = 8.2°C,	Pch(max) = 10W Tc=58.2 °C
Q103 2SC2873-Y-TE12L TOSHIBA	Tjmax = 150 °C, Pc = 20mW, Tj = Ta + ((θ j-a) × Pc) = 65°C D.F. = 43.3%	θ j-a = 250°C/W, Δ Ta =10 °C,	Pc(max) = 0.5W Ta =60°C
Q104 2SA1213-Y-TE12L TOSHIBA	Tjmax = 150 °C, Pc = 30m W, Tj = Ta + ((θ j-a) × Pc) =67.5°C D.F. = 45.0 %	θ j-a = 250 °C/W, Δ Ta = 10°C,	Pc(max) = 0.5W Ta=60 °C
Q204 2SA1213-Y-TE12L TOSHIBA	Tjmax = 150 °C, Pc = 25m W, Tj = Ta + ((θ j-a) × Pc) =75.4°C D.F. = 50.2%	θ j-a = 250 °C/W, Δ Ta =19.1 °C,	Pc(max) = 0.5W Ta = 69.1 °C
SR1 SM12JZ47A TOSHIBA	Tjmax = 125 °C, Pc = 3W, Tj = Tc + ((θ j-c) × Pc) =80.5°C D.F. = 64.4%	θ j-c = 3.0 °C/W, Δ Tc = 21.5 °C,	Pc(max) = 5W, Tc = 71.5 °C
D1 D15XB60 SHINDENGEN	Tjmax = 150 °C, Pd = 11W, Tj = Tc + ((θ j-c) × Pd) =106.2 °C D.F. = 70.8%	θ j-c = 1.5 °C/W, Δ Tc = 39.7°C,	Tc = 89.7 °C
D2,D3 10FL2CZ47A TOSHIBA	Tjmax = 150 °C, Pd = 3.5 W, Tj = Tc + ((θ j-c) × Pd) =88.2°C D.F. = 58.8%	θ j-c =3.6°C/W, Δ Tc = 25.6 °C,	Tc =75.6°C
D51,D52,D53 S60SC4M SINDENGEN	Tjmax = 150 °C, Pd =18.2 W, Tj = Tc + ((θ j-c) × Pd) = 111.2 °C D.F. = 74.1%	θ j-c = 0.5 °C/W, Δ Tc =52.1 °C,	Tc =102.1°C
D54,D55 5JLZ47A TOSHIBA	Tjmax = 150 °C, Pd = 0.8 W, Tj = Tc + ((θ j-c) × Pd) = 85.8°C D.F. = 57.2%	θ j-c = 4.5°C/W, Δ Tc = 32.2 °C,	Tc =82.2 °C
D105 D1FL20U-4063 SHINDENGEN	Tjmax = 150°C, Pd = 0.02W, Tj = Ta + ((θ j-a) × Pd) = 63.4°C D.F. = 42.3 %	θ j-a =157 °C/W, Δ Ta =10.3 °C,	Ta =60.3 °C
D106 D1FL20U-4063 SHINDENGEN	Tjmax = 150°C, Pd = 0.025 W, Tj = Ta + ((θ j-a) × Pd) =65.9°C D.F. = 43.9%	θ j-a =157 °C/W, Δ Ta =12 °C,	Ta = 62°C
D204 D1FL20U-4063 SHINDENGEN	Tjmax = 150 °C, Pd = 0.03W, Tj = Ta + ((θ j-a) × Pd) =88.5°C D.F. = 59%	θ j-a = 157 °C/W, Δ Ta =33.8 °C,	Ta = 83.8°C
D206,D207 D1FL20U-4063 SHINDENGEN	Tjmax = 150°C, Pd = 0.16W, Tj = Ta + ((θ j-a) × Pd) =111 °C D.F. = 74.0%	θ j-a =157 °C/W, Δ Ta =35.9°C,	Ta =85.9 °C

Location No.	Vin = 115VAC Load = 100% Ta = 50°C		
A51 uPC78M12AHF NEC	Tjmax =150 °C, Pd = 1.8W, Tj = Tc + ((θ j-c) × Pd) = 94.1°C D.F. = 62.7%	θ j-c =7 °C/W, Δ Tc =31.5°C,	Pd(max) =15W Tc=81.5°C
A101 FA5502M-TE1 FUJI-ELEC.	Tjmax = 150 °C, Pd = 0.24W, Tj = Tc + ((θ j-c) × Pd) = 76.1°C D.F. = 50.7%	θ j-c =50 °C/W, Δ Tc =14.1°C,	Tc=64.1 °C
A201 M51995AFP-600C MITSUBISHI	Tjmax = 150 °C, Pd= 0.36 W, Tj = Tc + ((θ j-c) × Pd) = 84.7 °C D.F. = 56.5 %	θ j-c = 40 °C/W, Δ Tc = 20.3 °C,	Tc = 70.3°C
A202 UPC1093T-E1 NEC	Tjmax = 150 °C, Pd = 0.01W, Tj = Ta + ((θ j-a) × Pd) = 58.7 °C D.F. = 39.1 %	θ j-a = 315 °C/W, Δ Ta = 5.5 °C,	Ta = 55.5 °C
PC51 TLP721F(D4-GR,M) (LED) TOSHIBA	Tjmax = 125 °C, I_f = 0 mA, Allowable I_f(max) = 47.6mA (at Ta = 56.7°C) D.F. = 0%	ΔI_f/°C = -0.7mA/°C , Δ Ta = 6.7 °C,	I_f(max) = 60mA, Ta = 56.7 °C
PC51 TLP721F(D4-GR,M) (TRANSISTOR) TOSHIBA	Tjmax = 125 °C, Pc =0 W, Tj = Tc + ((θ j-a) × Pc) =56.7°C D.F. =45.4%	θ j-a = 667°C/W, Δ Ta =6.7 °C,	Pc(max) = 0.15W, Ta=56.7 °C
PC52 TLP721F(D4-GR,M) (LED) TOSHIBA	Tjmax = 125 °C, I_f = 1.2 mA, Allowable I_f(max) = 47.8mA (at Ta = 56.4°C) D.F. = 2.5%	ΔI_f/°C = -0.7mA/°C , Δ Ta = 6.4°C,	I_f(max) = 60mA, Ta = 56.4°C
PC52 TLP721F(D4-GR,M) (TRANSISTOR) TOSHIBA	Tjmax = 125 °C, Pc = 10mW, Tj = Ta + ((θ j-a) × Pc) =63.07 °C D.F. = 50.5%	θ j-a = 667°C/W, Δ Ta = 6.4°C,	Pc(max) = 0.15W, Ta = 56.4°C
PC53 TLP721F(D4-GR,M) (LED) TOSHIBA	Tjmax = 125 °C, I_f = 3 mA, Allowable I_f(max) = 46.3mA (at Ta = 58.6°C) D.F. = 6.5%	ΔI_f/°C = -0.7mA/°C , Δ Ta = 8.6°C,	I_f(max) = 60mA, Ta = 58.6°C
PC53 TLP721F(D4-GR,M) (TRANSISTOR) TOSHIBA	Tjmax = 125 °C, Pc = 2.4mW, Tj = Ta + ((θ j-a) × Pc) = 60.2°C D.F. = 48.2%	θ j-a = 667°C/W, Δ Ta = 8.6 °C,	Pc(max) = 0.15W, Ta = 58.6°C
PC54 TLP721F(D4-GR,M) (LED) TOSHIBA	Tjmax = 125 °C, I_f = 0 mA, Allowable I_f(max) = 47.1mA (at Ta = 57.4°C) D.F. = 0%	ΔI_f/°C = -0.7mA/°C , Δ Ta = 7.4°C,	I_f(max) = 60mA, Ta = 57.4°C
PC54 TLP721F(D4-GR,M) (TRANSISTOR) TOSHIBA	Tjmax = 125 °C, Pc = 0m W, Tj = Ta + ((θ j-a) × Pc) =57.4°C D.F. = 45.9%	θ j-a = 667°C/W, Δ Ta = 7.4 °C,	Pc(max) = 0.15W, Ta = 57.4°C

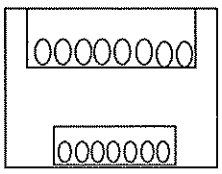
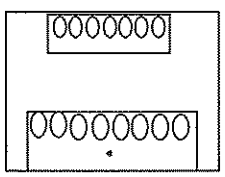
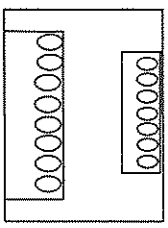
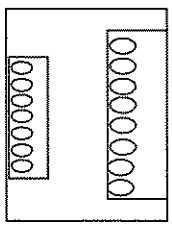
Location No.	Vin = 230VAC Load = 100% Ta = 50°C		
Q1,Q2 2SK2837 TOSHIBA	Tchmax = 150°C, Pch =7.2 W, Tch = Tc + ((θ ch-c) × Pch) =71 °C D.F. =47.3%	θ ch-c =0.833 °C/W, Δ Tc =15°C,	Pch(max) =150 W, Tc =65°C
Q51,Q52 2SK2611 TOSHIBA	Tchmax = 150 °C, Pch = 16.5 W, Tch = Tc + ((θ ch-c) × Pch) =98.5°C D.F. =65.7%	θ ch-c = 0.833°C/W, Δ Tc = 34.8 °C,	Pch(max) = 150W, Tc = 84.8°C
Q101 2SK2177 SHINDENGEN	Tchmax = 150 °C, Pch = 0.03 W, Tch= Tc + ((θ ch-c) × Pch) =58.0°C D.F. = 38.7%	θ ch-c = 12.5 °C/W, Δ Tc =7.6 °C,	Pch(max) = 10W Tc= 57.6 °C
Q103 2SC2873-Y-TE12L TOSHIBA	Tjmax = 150 °C, Pc= 0.02W, Tj= Ta + ((θ j-a) × Pc) =65 °C D.F. =43.3%	θ j-a = 250°C/W, Δ Ta =10 °C,	Pc(max) = 0.5W Ta =60 °C
Q104 2SA1213-Y-TE12L TOSHIBA	Tjmax = 150 °C, Pc = 0.03W, Tj= Ta + ((θ j-a) × Pc) =67.5 °C D.F. =45 %	θ j-a = 250 °C/W, Δ Ta = 10°C,	Pc(max) = 0.5W Ta=60°C
Q204 2SA1213-Y-TE12L TOSHIBA	Tjmax = 150 °C, Pc = 0.025 W, Tj= Ta + ((θ j-a) × Pc) =77.0°C D.F. =51.3 %	θ j-a = 250 °C/W, Δ Ta =20.7 °C,	Pc(max) = 0.5W Ta=70.7 °C
SR1 SM12JZ47A TOSHIBA	Tjmax = 125 °C, Pc = 2.9W, Tj = Tc + ((θ j-c) × Pc) =75.3°C D.F. =60.2%	θ j-c = 3.0 °C/W, Δ Tc = 16.6°C,	Pc(max) = 5W, Tc = 66.6C
D1 D15XB60 SHINDENGEN	Tjmax = 150 °C, Pd= 5.1W, Tj= Tc + ((θ j-c) × Pd) =77.0 °C D.F. =51.3%	θ j-c =1.5 °C/W, Δ Tc = 19.3°C,	Tc = 69.3 °C
D2,D3 10FL2CZ47A TOSHIBA	Tjmax = 150 °C, Pd=3.2 W, Tj= Tc + ((θ j-c) × Pd) =81.2 °C D.F. =54.2%	θ j-c =3.6°C/W, Δ Tc =19.7 °C,	Tc =69.7 °C
D51,D52,D53 S60SC4M SINDENGEN	Tjmax = 150 °C, Pd=18.2W, Tj= Tc + ((θ j-c) × Pd) = 111.4°C D.F. = 74.3%	θ j-c = 0.5 °C/W, Δ Tc =52.3 °C,	Tc =102.3°C
D54,D55 5JLZ47A TOSHIBA	Tjmax = 150 °C, Pd=0.8 W, Tj= Tc + ((θ j-c) × Pd) =85.5°C D.F. =57%	θ j-c =4.5°C/W, Δ Tc =31.9 °C,	Tc =81.9 °C
D105 D1FL20U-4063 SHINDENGEN	Tjmax = 150°C, Pd = 0.03W, Tj = Ta + ((θ j-a) × Pd) =65.9 °C D.F. =43.9 %	θ j-a =157 °C/W, Δ Ta =11.2 °C,	Ta =61.2 °C
D106 D1FL20U-4063 SHINDENGEN	Tjmax = 150°C, Pd=0.02 W, Tj= Ta + ((θ j-a) × Pd) =62.6 °C D.F. =41.8%	θ j-a =157 °C/W, Δ Ta =9.5°C,	Ta = 59.5°C
D204 D1FL20U-4063 SHINDENGEN	Tjmax = 150 °C, Pd = 0.03W, Tj= Ta + ((θ j-a) × Pd) =89.7°C D.F. =59.8%	θ j-a = 157 °C/W, Δ Ta =35 °C,	Ta = 85°C
D206,D207 D1FL20U-4063 SHINDENGEN	Tjmax = 150°C, Pd = 0.16W, Tj = Ta + ((θ j-a) × Pd) =113.3 °C D.F. =75.5 %	θ j-a =157 °C/W, Δ Ta =38.2°C,	Ta =88.2 °C

Location No.	Vin = 230VAC Load = 100% Ta = 50°C		
A51 uPC78M12AHF NEC	Tjmax =150 °C, Pd = 2W, Tj = Tc + ((θ j-c) × Pd) =95°C D.F. =63.3%	θ j-c =7 °C/W, Δ Tc =31°C,	Pd(max) =15W Tc=81°C
A101 FA5502M-TE1 FUJI-ELEC.	Tjmax =150 °C, Pd = 0.24W, Tj = Tc + ((θ j-c) × Pd) =72.8°C D.F. =48.5%	θ j-c =50 °C/W, Δ Tc =10.8°C,	Tc=60.8°C
A201 M51995AFP-600C MITSUBISHI	Tjmax = 150 °C, Pd= 0.36 W, Tj= Tc + ((θ j-c) × Pd) =85.4 °C D.F. =56.9 %	θ j-c = 40 °C/W, Δ Tc = 21 °C,	Tc = 71°C
PC51 TLP721F(D4-GR,M) (LED) TOSHIBA	Tjmax = 125 °C, I_f = 0 mA, Allowable I_f (max) = 46.6mA (at Ta = 58.1°C) D.F. = 0%	ΔI_f/°C = -0.7mA/°C , Δ Ta = 8.1 °C,	I_f(max) = 60mA, Ta = 58.1 °C
PC51 TLP721F(D4-GR,M) (TRANSISTOR) TOSHIBA	Tjmax = 125 °C, Pc = 0 W, Tj = Ta + ((θ j-a) × Pc) =58.1 °C D.F. =46.5%	θ j-a = 667°C/W, Δ Ta =8.1 °C,	Pc(max) = 0.15W, Ta=58.1 °C
PC52 TLP721F(D4-GR,M) (LED) TOSHIBA	Tjmax = 125 °C, I_f = 1.2 mA, Allowable I_f (max) = 46.7mA (at Ta = 57.9°C) D.F. = 2.6%	ΔI_f/°C = -0.7mA/°C , Δ Ta = 7.9°C,	I_f(max) = 60mA, Ta = 57.9°C
PC52 TLP721F(D4-GR,M) (TRANSISTOR) TOSHIBA	Tjmax = 125 °C, Pc = 10m W, Tj = Ta + ((θ j-a) × Pc) =64.6 °C D.F. = 51.7%	θ j-a = 667°C/W, Δ Ta =7.9 °C,	Pc(max) = 0.15W, Ta = 57.9 °C
PC53 TLP721F(D4-GR,M) (LED) TOSHIBA	Tjmax = 125 °C, I_f = 3 mA, Allowable I_f (max) = 45.2mA (at Ta = 60.2°C) D.F. = 6.6%	ΔI_f/°C = -0.7mA/°C , Δ Ta = 10.2°C,	I_f(max) = 60mA, Ta = 60.2°C
PC53 TLP721F(D4-GR,M) (TRANSISTOR) TOSHIBA	Tjmax = 125 °C, Pc = 2.4m W, Tj = Ta + ((θ j-a) × Pc) = 61.8°C D.F. = 49.4%	θ j-a = 667°C/W, Δ Ta =10.2 °C,	Pc(max) = 0.15W, Ta=60.2°C
PC54 TLP721F(D4-GR,M) (LED) TOSHIBA	Tjmax = 125 °C, I_f = 0 mA, Allowable I_f (max) = 46.3mA (at Ta = 58.6°C) D.F. = 0%	ΔI_f/°C = -0.7mA/°C , Δ Ta = 8.6°C,	I_f(max) = 60mA, Ta = 58.6°C
PC54 TLP721F(D4-GR,M) (TRANSISTOR) TOSHIBA	Tjmax = 125 °C, Pc = 0m W, Tj = Ta + ((θ j-a) × Pc) = 58.6°C D.F. =46.9 %	θ j-a = 667°C/W, Δ Ta =8.6 °C,	Pc(max) = 0.15W, Ta= 58.6°C

3. MAIN COMPONENTS TEMPERATURE RISE ΔT LIST

MODEL : SWS600-5

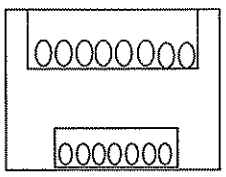
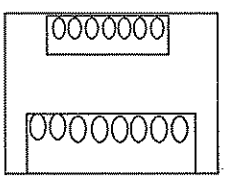
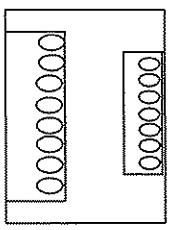
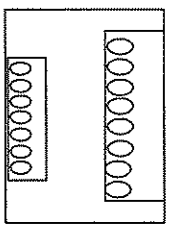
Measuring Conditions

	(A)	(B)	(C)	(D)
Mounting Method (Standard Mounting Method:(A))				
Input Voltage (VAC)	115			
Output Voltage (VDC)	5			
Output Current (A)	100			

		ΔT Temperature rise (°C)			
Output Derating (%)		100 (Ta =50°C)	100 (Ta =50°C)	100 (Ta =50°C)	100 (Ta =40°C)
Location No.	Parts Name	Mounting A	Mounting B	Mounting C	Mounting D
A101	CHIP IC	14.1	15.2	13.6	16.2
A201	CHIP IC	20.3	20.0	19.3	34.3
C66	E. CAP.	16.0	16.1	16.0	17.0
C12	E. CAP.	4.9	5.1	5.3	8.3
C58	E. CAP.	20.0	19.4	20.6	17.7
C62	E. CAP.	3.5	3.1	4.2	3.5
C64	E. CAP.	8.3	8.7	8.2	11.0
C65	E. CAP.	18.6	19.3	20.6	24.6
C69	E. CAP.	3.7	3.5	4.5	6.5
D1	BRIDGE DIODE	39.7	40.4	39.8	43.3
D2	LLD	25.6	27.7	26.3	26.2
D51	SBD	52.1	53.3	54.2	62.5
D54	LLD	32.2	34.6	31.9	35.5
L2	BALUN COIL	32.1	34.0	33.1	41.6
L58	CHOKE COIL	54.9	55.2	54.9	54.3
Q1	MOS FET	30.5	31.5	30.7	32.8
Q52	MOS FET	33.7	34.0	33.5	57.7
SR1	TRIAC	21.5	23.6	22.0	24.2
T52	TRANSE PULSE	43.5	48.8	42.8	50.7

MODEL : SWS600-5

Measuring Conditions

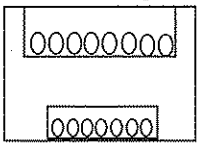
Mounting Method (Standard Mounting Method:(A))	(A) 	(B) 	(C) 	(D) 
Input Voltage (VAC)	230			
Output Voltage (VDC)	5			
Output Current (A)	100			

		ΔT Temperature rise (°C)			
Output Derating (%)		100 (Ta =50°C)	100 (Ta =50°C)	100 (Ta =50°C)	100 (Ta =40°C)
Location No.	Parts Name	Mounting A	Mounting B	Mounting C	Mounting D
A101	CHIP IC	10.8	11.3	10.9	12.2
A201	CHIP IC	21.0	20.4	20.3	35.2
C66	E. CAP.	16.5	15.9	16.7	17.6
C12	E. CAP.	4.7	4.3	4.8	6.8
C58	E. CAP.	19.9	18.8	19.7	16.3
C62	E. CAP.	3.6	2.1	3.7	3.9
C64	E. CAP.	7.9	8.2	7.6	10.6
C65	E. CAP.	21.3	19.9	21.5	26.5
C69	E. CAP.	4.2	3.8	4.7	6.7
D1	BRIDGE DIODE	19.3	19.9	19.4	21.0
D2	LLD	19.7	20.8	19.9	20.1
D51	SBD	52.3	52.7	53.5	62.4
D54	LLD	31.9	33.3	31.2	35.6
L2	BALUN COIL	8.6	8.7	8.7	11.2
L58	CHOKE COIL	55.6	54.4	56.0	55.6
Q1	MOS FET	15.0	15.3	14.7	16.1
Q52	MOS FET	34.8	33.8	34.4	58.6
SR1	TRIAC	16.6	17.6	16.7	16.2
T52	TRANSE PULSE	43.5	48.0	41.5	50.6

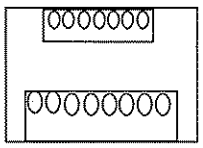
4. ELECTROLYTIC CAPACITOR LIFETIME

MODEL: SWS600-5

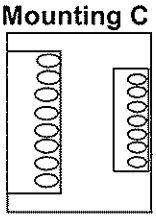
Mounting A



Mounting B



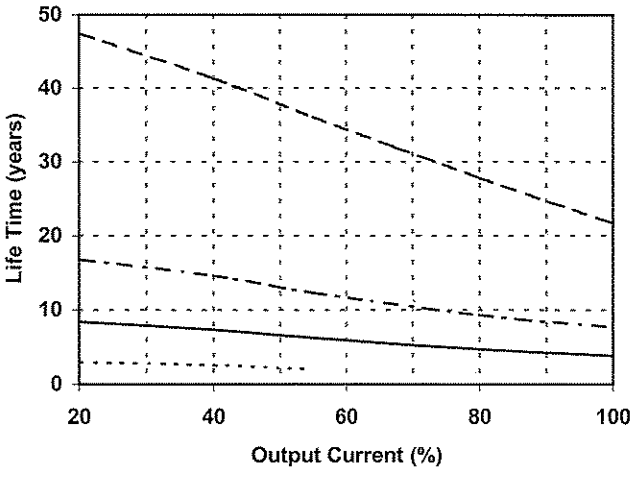
Mounting C



Ta = 25°C ------
Ta = 40°C -·-·-·-
Ta = 50°C ——————
Ta = 65°C --------

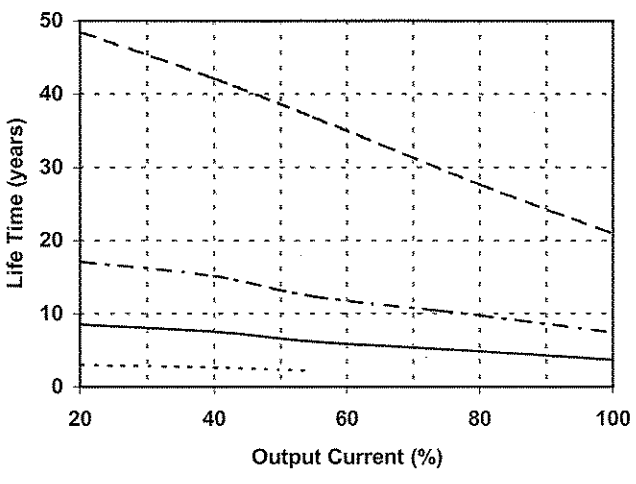
Vin = 115VAC

Load (%)	Life Time (years)			
	Ta = 25°C	Ta = 40°C	Ta = 50°C	Ta = 65°C
20	47.5	16.8	8.4	3.0
40	41.3	14.6	7.3	2.6
55	36.1	12.3	6.2	2.0
80	27.8	9.3	4.7	—
100	21.7	7.7	3.8	—



Vin = 230VAC

Load (%)	Life Time (years)			
	Ta = 25°C	Ta = 40°C	Ta = 50°C	Ta = 65°C
20	48.5	17.1	8.6	3.0
40	42.1	15.1	7.6	2.7
55	36.8	12.4	6.2	2.2
80	27.6	9.8	4.9	—
100	21.0	7.4	3.7	—



Formula:

1. For 105°C Elect. capacitor

$L = Lo * 2^{(105-\Delta T-Ta)/10} / (8 * 365)$ (years)

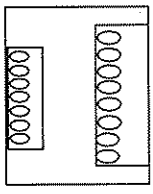
2. For 85°C Elect. capacitor

$L = Lo * 2^{(85-\Delta T-Ta)/10} / (8 * 365)$ (years)

Where:
- L —— Elec. Capacitor computed life (8 hours per day , 365 days operation)
- Lo —— Guarantee life for Elec. capacitor
- Ta —— Ambient temperature
- ΔT —— Temperature rise of Elec. capacitor

MODEL: **SWS600-5**

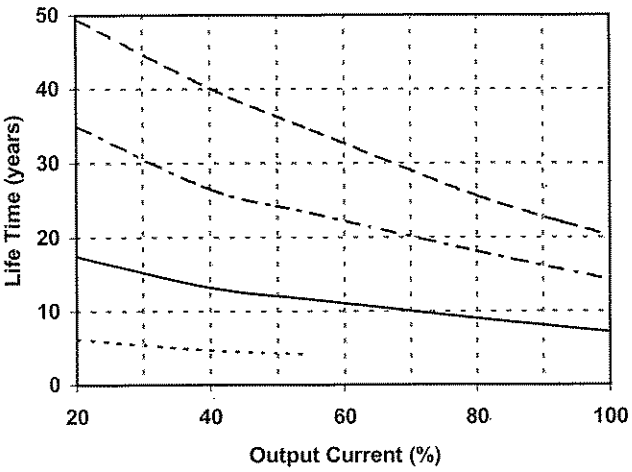
Mounting D



Ta = 25°C
Ta = 30°C
Ta = 40°C
Ta = 55°C

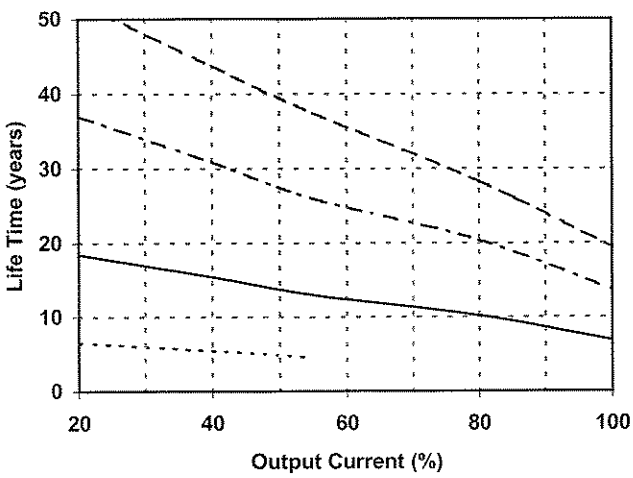
Vin = 115VAC

Load (%)	Life Time (years)			
	Ta = 25°C	Ta = 30°C	Ta = 40°C	Ta = 55°C
20	49.5	35.0	17.5	6.2
40	40.1	26.5	13.3	4.7
55	34.5	23.2	11.6	4.1
80	25.6	18.1	9.1	—
100	20.2	14.3	7.2	—



Vin = 230VAC

Load (%)	Life Time (years)			
	Ta = 25°C	Ta = 30°C	Ta = 40°C	Ta = 55°C
20	52.3	37.0	18.5	6.5
40	43.7	30.9	15.4	5.5
55	37.4	26.0	13.0	4.6
80	28.3	20.4	10.2	—
100	19.4	13.7	6.9	—



Formula:

1. For 105°C Elect. capacitor

$L = Lo * 2^{(105-\Delta T-Ta)/10} / (8 * 365)$ (years)

2. For 85°C Elect. capacitor

$L = Lo * 2^{(85-\Delta T-Ta)/10} / (8 * 365)$ (years)

Where:

L —— Elec. Capacitor computed life (8 hours per day , 365 days operation)
Lo —— Guarantee life for Elec. capacitor
Ta —— Ambient temperature
ΔT —— Temperature rise of Elec. capacitor

5. VIBRATION TEST

MODEL : SWS600-24

(1) Vibration Test Class

Frequency Variable Endurance Test

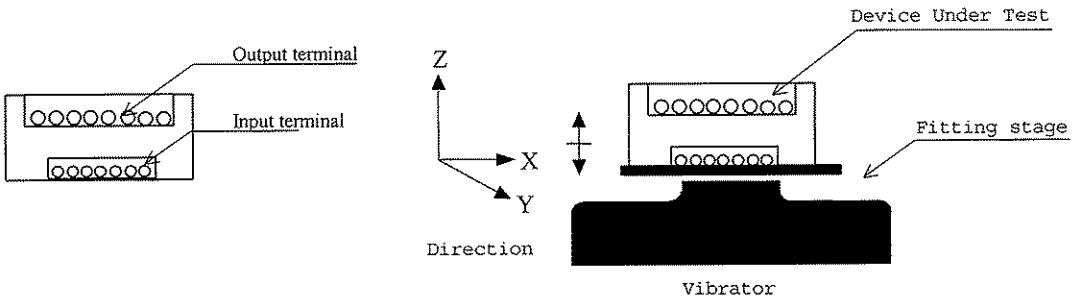
(2) Equipment Used

- Controller : DP550 (DP CORP. USA)
- Vibrator : V870 (LDS CORP. UK)

(3) Test Conditions

- Sweep frequency 10 ~ 55Hz
- Sweep time 1.0 min.
- Acceleration Constant 23.52m/s^2 (2G)
- Direction X, Y, Z.
- Test time 1 hour each

(4) Test Method



(5) Test Results

O K

Vin : 230VAC

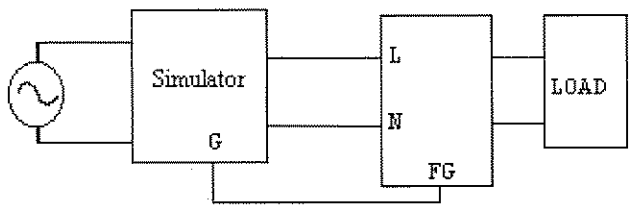
Iout : 100%

Check item		Output Voltage (V)	Ripple Voltage (mVp-p)	D.U.T.State
Before Test		24.001	70	———
After Test	X	24.003	75	O.K.
	Y	24.003	78	O.K.
	Z	24.004	80	O.K.

6. NOISE SIMULATE TEST

MODEL : SWS600 - 24

(1) Test Circuit And Equipment



Simulator : INS-400L Noise Laboratory Co.,LTD

(2) Test Conditions

• Input Voltage	:	115, 230VAC	• Noise Level	:	0V~2.4kV
• Output Voltage	:	Rated	• Phase Shift	:	0° ~ 360°
• Output Current	:	0%, 100%	• Polarity	:	+ , −
• Ambient Temperature	:	25°C	• Mode	:	Normal
• Pulse Width	:	50ns ~ 1000ns	• Trigger Select	:	Common Line

(3) Acceptable Conditions

1. Not to be broken.
2. Not to be shut down output.
3. No other out of orders.

(4) Test Result

O K

7. FAN LIFE EXPECTANCY

MODEL: SWS600

(1) PART NAME

9A0812G4D011(SANYO DENKI)

(2) LIFE EXPECTANCY

The data shows fan life expectancy for fan only by manufacture (90% survival rate).
Fig1 shows measuring point of fan exhaust temperature.

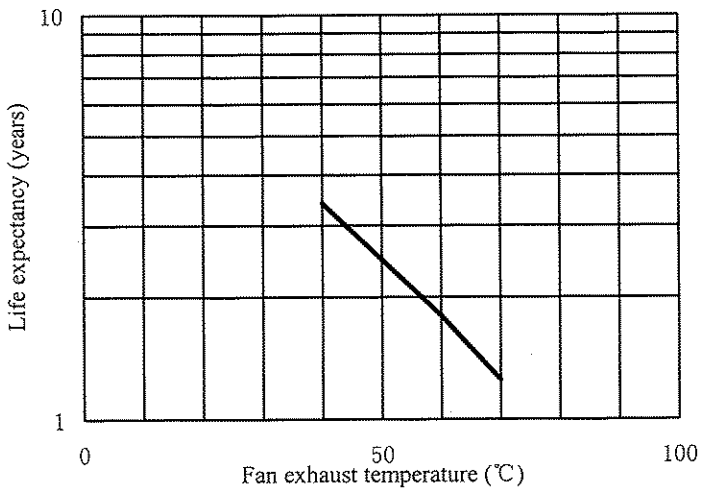
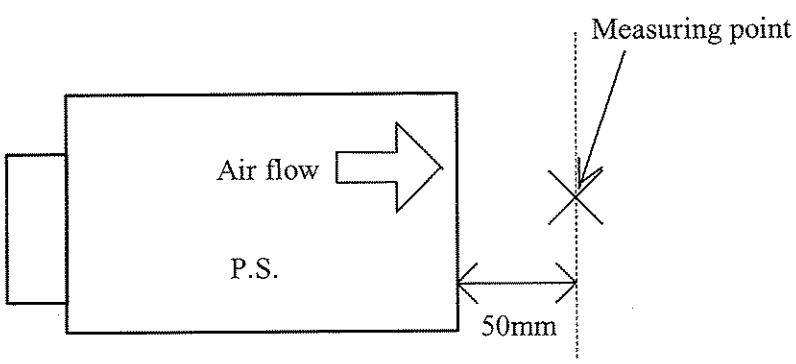


fig1. Measuring point of fan exhaust temperature.



1year = 365 day x 24 hours/day = 8760 hours