ZWX300

RELIABILITY DATA

信頼性データ

DWG No. A236-57-01		
APPD	CHK	DWG
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※ 試験結果は、代表データでありますが、全ての製品はほぼ同等な特性を示します。
従いまして、以下の結果は実力値とお考え願います。

Test results are typical data. Nevertheless the following results are considered to be actual capability data because all units have nearly the same characteristics.

1. MTBF計算値 CALCULATED VALUES OF MTBF

MODEL : ZWX300

(1) 算出方法 Calculating method

JEITA (RCR-9102, RCR-9102B)の部品点数法で算出されています。
それぞれの部品ごとに、部品故障率λ_Gが与えられ、各々の点数によって決定されます。
Calculated based on part count reliability projection of JEITA (RCR-9102, RCR-9102B).
Individual failure rates λ_G is given to each part and MTBF is calculated
by the count of each part.

＜算出式＞

$$MTBF = \frac{1}{\lambda_{equip}} = \frac{1}{\sum_{i=1}^{n} n_i \left(\lambda_G \pi_Q\right)_i} \times 10^6 \quad \text{時間(Hours)}$$

λequip : 全機器故障率 (故障数／10^6時間)
Total Equipment Failure Rate (Failure／10^6Hours)

λ_G : i 番目の同属部品に対する故障率 (故障数／10^6時間)
Generic Failure Rate for The ith Generic Part (Failure／10^6Hours)

Ni : i 番目の同属部品の個数
Quantity of ith Generic Part

n : 異なった同属部品のカテゴリーの数
Number of Different Generic Part Categories

π_Q : i 番目の同属部品に対する品質ファクタ (π_Q=1)
Generic Quality Factor for The ith Generic Part (π_Q=1)

(2) MTBF値 MTBF values

G_F : 地上固定 (Ground, Fixed)

RCR-9102

MTBF ≒ 143,089 時間 (hours)

RCR-9102B

MTBF ≒ 80,543 時間 (hours)

2. 部品ディレーティング COMPONENT DERATING

MODEL : ZWX300

(1) 算出方法 Calculating method

(a) 測定方法
Measuring method

・取付方法 :標準取付 Mounting method Standard mounting	・周囲温度 :50℃ Ambient temperature
・入力 :100, 200VAC Input	

・出力
Output

出力 / 負荷	V1	V2	V3-1	V3-2	V4	V5
	3.3V	5.0V	12.0V	12.0V	-12V	5.0V
1	10.0A	6.0A	4.0A	2.7A	0.2A	1.4A
2	0.0A	1.8A	3.0A	8.0A	0.2A	1.4A

それぞれの部品にとって一番厳しい負荷を使用
The severest load with each part is used.

(b) 半導体 Semiconductors

ケース温度、消費電力、熱抵抗より使用状態の接合点温度を求め
最大定格、接合点温度との比較を求めました。
Compared with maximum junction temperature and actual one which is calculated based on case temperature, power dissipation and thermal impedance.

(c) IC、抵抗、コンデンサー等 IC, Resistors, Capacitors, etc.

周囲温度、使用状態、消費電力など、個々の値は設計基準内に入っています。
Ambient temperature, operating condition, power dissipation and so on are within derating criteria.

(d) 熱抵抗算出方法 Calculating method of thermal impedance

$$\theta j-c=\frac{Tj(max)-Tc}{Pc(max)} \qquad \theta j-l=\frac{Tj(max)-Tl}{Pc(max)} \qquad \theta j-a=\frac{Tj(max)-Ta'}{Pc(max)}$$

Tc :ディレーティングの始まるケース温度 一般に25℃
Case Temperature at Start Point of Derating;25℃ in General
Tl :ディレーティングの始まるリード温度 一般に25℃
Lead Temperature at Start Point of Derating;25℃ in General
Ta' :ディレーティングの始まる周囲温度 一般に25℃
Ambient Temperature at Start Point of Derating;25℃ in General
Pc(max) :最大コレクタ(チャネル)損失
(Pch(max)) Maximum Collector (channel) Dissipation
Tj(max) :最大接合点(チャネル)温度
(Tch(max)) Maximum Junction (channel) Temperature
θj-c :接合点(チャネル)からケースまでの熱抵抗
(θch-c) Thermal Impedance between Junction (channel) and Case
θj-l :接合点(チャネル)からリードまでの熱抵抗
(θch-l) Thermal Impedance between Junction (channel) and Lead
θj-a :接合点(チャネル)から周囲までの熱抵抗
(θch-a) Thermal Impedance between Junction (channel) and Ambient

(2) 部品ディレーティング表 Component Derating List

部品番号 Location No.	Vin = 100VAC	Load = 100%	Ta = 50℃
Q1 F20W60C3 SHINDENGEN	Tch (max) = 150℃ Pch= 6.64 W Tch= T c+ ((θch-c) × Pch)= 99.5 ℃ D.F. = 66.3 %	θch-c = 0.6 ℃/W ΔTc= 45.5 ℃	Pch (max) = 75W Tc= 95.5 ℃
Q2 2SK3568 TOSHIBA	Tch (max) = 150℃ Pch = 1.95 W Tch = Tc + ((θch-c) × Pch) = 106.4 ℃ D.F. = 70.9 %	θch-c = 3.125 ℃/W ΔTc = 50.3 ℃	Pch(max) = 40W Tc = 100.3 ℃
Q3 2SK3568 TOSHIBA	Tch (max) = 150℃ Pch = 2.43 W Tch = Tc + ((θch-c) × Pch) = 104.6 ℃ D.F. = 69.7 %	θch-c = 3.125 ℃/W ΔTc = 47.0 ℃	Pch(max) = 40W Tc = 97.0 ℃
Q51 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.68 W Tch = Tc + ((θch-c) × Pch) = 81.7 ℃ D.F. = 54.5 %	θch-c = 4.17 ℃/W ΔTc = 28.9 ℃	Pch (max) = 30W Tc = 78.9 ℃
Q52 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.29 W Tch = Tc + ((θch-c) × Pch) = 78.0 ℃ D.F. = 52.0 %	θch-c = 4.17 ℃/W ΔTc = 26.8 ℃	Pch (max) = 30W Tc = 76.8 ℃
Q61 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.17 W Tch = Tc + ((θch-c) × Pch) = 109.2 ℃ D.F. = 72.8 %	θch-c = 4.17 ℃/W ΔTc = 58.5 ℃	Pch (max) = 30W Tc = 108.5 ℃
Q62 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.46 W Tch = Tc + ((θch-c) × Pch) = 112.2 ℃ D.F. = 74.8 %	θch-c = 4.17 ℃/W ΔTc = 60.3 ℃	Pch (max) = 30W Tc = 110.3 ℃
Q701 2SA1419S SANYO	Tj (max) = 150℃ Pc = 0.36 W Tj = Tc + ((θj-c) × Pc) = 115.1 ℃ D.F. = 76.7 %	θj-c = 35.7 ℃/W ΔTc = 52.2 ℃	Pc (max) = 1.5W Tc = 102.2 ℃
D1 D10XB60H SHINDENGEN	Tj (max) = 150℃ Pd = 3.97 W Tj = Tc + ((θj-c) × Pd) = 106.4 ℃ D.F. = 70.9 %	θj-c = 1.9 ℃/W ΔTc = 48.9 ℃	Tc = 98.9 ℃
D2 SF10L60U SHINDENGEN	Tj (max) = 150℃ Pd = 3.21 W Tj = Tc + ((θj-c) × Pd) = 100.7 ℃ D.F. = 67.1 %	θj-c= 2.0 ℃/W ΔTc = 44.3 ℃	Tc = 94.3 ℃
D71 YG906C2R FUJI ELECTRIC	Tj (max) = 150℃ Pd = 2.05 W Tj = Tc + ((θj-c) × Pd) = 108.2 ℃ D.F. = 72.1 %	θj-c = 2.5 ℃/W ΔTc = 53.1 ℃	Tc = 103.1 ℃
D72 YG868C15R FUJI ELECTRIC	Tj (max) = 150℃ Pd = 3.04 W Tj = Tc + ((θj-c) × Pd) = 104.5 ℃ D.F. = 69.7 %	θj-c = 1.2℃/W ΔTc = 50.8 ℃	Tc = 100.8 ℃
D901 DE5SC6M SHINDENGEN	Tj (max) = 150℃ Pd = 1.20 W Tj = Tc + ((θj-c) × Pd) = 105.5 ℃ D.F. = 70.3 %	θj-c = 12 ℃/W ΔTc = 41.1 ℃	Tc = 91.1 ℃

部品番号 Location No.	Vin = 100VAC	Load = 100%	Ta = 50℃
SR1 SF10JZ47 TOSHIBA	Tj (max) = 125℃ Pc= 1.61 W Tj = Tc + ((θj-c) × Pc) = 100.4 ℃ D.F. = 80.3 %	θj-c = 3.4℃/W ΔTc = 44.9 ℃	Tc = 94.9 ℃
A106 MIP2E2DMUL MATSUSHITA	Tch (max) = 150℃ Pch = 1.08 W Tch = Tc + ((θch-c) × Pch) = 105.9 ℃ D.F. = 70.6 %	θch-c = 10.0℃/W ΔTc = 45.1 ℃	Tc = 95.1 ℃
A801 TA58M12F TOSHIBA	Tj (max) = 150℃ Pd = 0.26 W Tj = Tc + ((θj-c) × Pd) = 98.3 ℃ D.F. = 65.5 %	θj-c= 12.5℃/W ΔTc = 45.0 ℃	Pd(max)= 1W Tc = 95.0 ℃
PC1 PS2581L1 (LED) NEC	Tj (max) = 125℃ Pd = 0.01 W Tj = Tc + ((θj-c) × Pd) = 92.3 ℃ D.F. = 73.8 %	θj-c = 150℃/W ΔTc = 40.8 ℃	Pd(max)= 150mW Tc = 90.8 ℃
PC1 PS2581L1 (TRANSISTOR) NEC	Tj (max) = 125℃ Pc = 0.01 W Tj = Tc + ((θj-c) × Pc) = 92.3 ℃ D.F. = 73.8 %	θj-c = 150℃/W ΔTc = 40.8 ℃	Pc(max)= 150mW Tc = 90.8 ℃
PC91 PS2581L1 (LED) NEC	Tj (max) = 125℃ Pd = 0.04 W Tj = Tc + ((θj-c) × Pd) = 86.6 ℃ D.F. = 69.3 %	θj-c = 150℃/W ΔTc = 30.6 ℃	Pd(max)= 150mW Tc = 80.6 ℃
PC91 PS2581L1 (TRANSISTOR) NEC	Tj (max) = 125℃ Pc = 0.04 W Tj = Tc + ((θj-c) × Pc) = 86.6 ℃ D.F. = 69.3 %	θj-c = 150℃/W ΔTc = 30.6 ℃	Pc(max)= 150mW Tc = 80.6 ℃

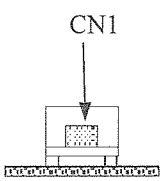
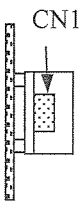
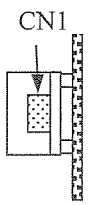
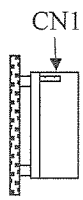
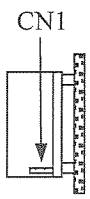
部品番号 Location No.	Vin = 200VAC　　Load = 100%　　Ta = 50℃		
Q1 F20W60C3 SHINDENGEN	Tch (max) = 150℃ Pch= 3.50 W Tch= T c+ ((θch-c) × Pch)= 83.3 ℃ D.F. = 55.5 %	θch-c = 0.6 ℃/W ΔTc= 31.2 ℃	Pch (max) = 75W Tc= 81.2 ℃
Q2 2SK3568 TOSHIBA	Tch (max) = 150℃ Pch = 1.95 W Tch = Tc + ((θch-c) × Pch) = 100.1 ℃ D.F. = 66.7 %	θch-c = 3.125 ℃/W ΔTc = 44.0 ℃	Pch(max) = 40W Tc = 94.0 ℃
Q3 2SK3568 TOSHIBA	Tch (max) = 150℃ Pch = 2.43 W Tch = Tc + ((θch-c) × Pch) = 97.5 ℃ D.F. = 65.0 %	θch-c = 3.125 ℃/W ΔTc = 39.9 ℃	Pch(max) = 40W Tc = 89.9 ℃
Q51 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.68 W Tch = Tc + ((θch-c) × Pch) = 81.1 ℃ D.F. = 54.1 %	θch-c = 4.17 ℃/W ΔTc = 28.3 ℃	Pch (max) = 30W Tc = 78.3 ℃
Q52 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.29 W Tch = Tc + ((θch-c) × Pch) = 77.6 ℃ D.F. = 51.7 %	θch-c = 4.17 ℃/W ΔTc = 26.4 ℃	Pch (max) = 30W Tc = 76.4 ℃
Q61 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.17 W Tch = Tc + ((θch-c) × Pch) = 109.0 ℃ D.F. = 72.7 %	θch-c = 4.17 ℃/W ΔTc = 58.3 ℃	Pch (max) = 30W Tc = 108.3 ℃
Q62 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.46 W Tch = Tc + ((θch-c) × Pch) = 111.9 ℃ D.F. = 74.6 %	θch-c = 4.17 ℃/W ΔTc = 60.0 ℃	Pch (max) = 30W Tc = 110.0 ℃
Q701 2SA1419S SANYO	Tj (max) = 150℃ Pc = 0.36 W Tj = Tc + ((θj-c) × Pc) = 114.6 ℃ D.F. = 76.4 %	θj-c = 35.7 ℃/W ΔTc = 51.7 ℃	Pc (max) = 1.5W Tc = 101.7 ℃
D1 D10XB60H SHINDENGEN	Tj (max) = 150℃ Pd = 2.06 W Tj = Tc + ((θj-c) × Pd) = 84.5 ℃ D.F. = 56.3 %	θj-c = 1.9 ℃/W ΔTc = 30.6 ℃	Tc = 80.6 ℃
D2 SF10L60U SHINDENGEN	Tj (max) = 150℃ Pd = 2.76 W Tj = Tc + ((θj-c) × Pd) = 90.0 ℃ D.F. = 60.0 %	θj-c= 2.0 ℃/W ΔTc = 34.5 ℃	Tc = 84.5 ℃
D71 YG906C2R FUJI ELECTRIC	Tj (max) = 150℃ Pd = 2.05 W Tj = Tc + ((θj-c) × Pd) = 105.2 ℃ D.F. = 70.1 %	θj-c = 2.5 ℃/W ΔTc = 50.1 ℃	Tc = 100.1 ℃
D72 YG868C15R FUJI ELECTRIC	Tj (max) = 150℃ Pd = 3.04 W Tj = Tc + ((θj-c) × Pd) = 101.5 ℃ D.F. = 67.7 %	θj-c = 1.2℃/W ΔTc = 47.8 ℃	Tc = 97.8 ℃
D901 DE5SC6M SHINDENGEN	Tj (max) = 150℃ Pd = 1.20 W Tj = Tc + ((θj-c) × Pd) = 105.5 ℃ D.F. = 70.3 %	θj-c = 12 ℃/W ΔTc = 41.1 ℃	Tc = 91.1 ℃

部品番号 Location No.	Vin = 200VAC	Load = 100%	Ta = 50℃
SR1 SF10JZ47 TOSHIBA	Tj (max) = 125℃ Pc= 1.38 W Tj = Tc + ((θj-c) × Pc) = 85.7 ℃ D.F. = 68.6 %	θj-c = 3.4℃/W ΔTc = 31.0 ℃	Tc = 81.0 ℃
A106 MIP2E2DMUL MATSUSHITA	Tch (max) = 150℃ Pch = 1.08 W Tch = Tc + ((θch-c) × Pch) = 101.6 ℃ D.F. = 67.7 %	θch-c = 10.0℃/W ΔTc = 40.8 ℃	Tc = 90.8 ℃
A801 TA58M12F TOSHIBA	Tj (max) = 150℃ P_D = 0.26 W Tj = Tc + ((θj-c) × Pd) = 98.2 ℃ D.F. = 65.5 %	θj-c= 12.5℃/W ΔTc = 44.9 ℃	Pd(max)= 1W Tc = 94.9 ℃
PC1 PS2581L1 (LED) NEC	Tj (max) = 125℃ Pd = 0.01 W Tj = Tc + ((θj-c) × Pd) = 91.0 ℃ D.F. = 72.8 %	θj-c = 150℃/W ΔTc = 39.5 ℃	Pd(max)= 150mW Tc = 89.5 ℃
PC1 PS2581L1 (TRANSISTOR) NEC	Tj (max) = 125℃ Pc = 0.01 W Tj = Tc + ((θj-c) × Pc) = 91.0 ℃ D.F. = 72.8 %	θj-c = 150℃/W ΔTc = 39.5 ℃	Pc(max)= 150mW Tc = 89.5 ℃
PC91 PS2581L1 (LED) NEC	Tj (max) = 125℃ P_D = 0.04 W Tj = Tc + ((θj-c) × Pd) = 85.4 ℃ D.F. = 68.3 %	θj-c = 150℃/W ΔTc = 29.4 ℃	Pd(max)= 150mW Tc = 79.4 ℃
PC91 PS2581L1 (TRANSISTOR) NEC	Tj (max) = 125℃ Pc = 0.04 W Tj = Tc + ((θj-c) × Pc) = 85.4 ℃ D.F. = 68.3 %	θj-c = 150℃/W ΔTc = 29.4 ℃	Pc(max)= 150mW Tc = 79.4 ℃

3. 主要部品温度上昇値
Main Components Temperature Rise △T List

MODEL : ZWX300

・測定条件 Measuring Conditions

取付方法 Mounting Method (標準取付：A) (Standard Mounting Method : A)		Mounting A	Mounting B	Mounting C	Mounting D	Mounting E
						
入力電圧 Input Voltage (VAC)		100VAC				
		V1	V2	V3-1	V3-2	V4	V5
出力電圧 Output Voltage (VDC)		3.3	5.0	12.0	12.0	-12.0	5.0
出力電流 Output Current (A)	1	10.0	6.0	4.0	2.7	0.2	1.4
	2	0.0	1.8	3.0	8.0	0.2	1.4

それぞれの部品にとって一番厳しい負荷を使用 The severest load with each part is used.

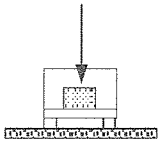
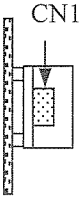
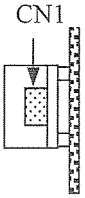
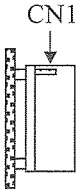
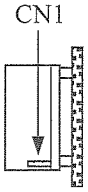
*COOLING : CONVECTION COOLING

出力ディレーティング Output Derating (%) Ta=50℃		ΔT Temperature Rise (℃) 100	60	60	60	60
部品番号 Location No.	部品名 Part name	取付方向 Mounting A	取付方向 Mounting B	取付方向 Mounting C	取付方向 Mounting D	取付方向 Mounting E
Q1	MOS FET	45.5	30.2	33.7	36.5	32.0
Q2	MOS FET	50.3	34.6	37.3	39.0	38.3
Q3	MOS FET	47.0	36.5	39.1	41.4	39.7
Q51	MOS FET	28.9	23.5	16.0	19.2	19.1
Q52	MOS FET	26.8	22.9	15.8	18.7	19.6
Q61	MOS FET	58.5	39.7	36.0	39.9	42.6
Q62	MOS FET	60.3	39.4	35.2	39.2	41.9
Q701	CHIP TRANSISTOR	52.2	41.2	44.0	40.6	50.7
D1	BRIDGE DIODE	48.9	34.8	31.5	39.9	30.8
D2	F.R.D	44.3	31.2	34.6	36.8	33.9
D71	L.L.D	53.1	35.0	36.9	36.4	40.7
D72	S.B.D	50.8	33.7	34.9	35.4	38.7
D901	CHIP SBD	41.1	32.4	22.3	30.2	26.1
SR1	THYRISTOR	44.9	30.8	28.7	36.5	28.7
A102	CHIP IC	43.8	32.6	30.3	38.3	31.7
A105	CHIP IC	44.4	35.6	32.2	40.6	36.0
A106	CHIP IC	45.1	35.0	27.4	37.4	29.3
A801	CHIP IC	45.0	33.6	30.0	30.7	39.8
T1	DRIVE TRANS	30.6	23.6	24.7	29.3	26.6
T2	TRANS	43.8	28.0	28.0	32.0	31.9
T3	TRANS	28.9	25.4	19.6	25.3	21.1
T51	CURRENT TRANS	42.6	27.7	23.1	32.0	28.0
L1	BALUN	22.6	23.1	14.8	25.0	14.2
L2	BALUN	42.5	26.7	20.7	30.5	22.7
L3	CHOKE COIL	36.9	25.9	30.1	35.6	26.1
L51	CHOKE COIL	51.3	35.9	30.7	32.2	37.2
L61	CHOKE COIL	52.0	31.9	29.7	29.9	38.1
L71	MAGAMP COIL	55.3	37.9	36.9	38.8	43.5
L72	CHOKE COIL	41.0	26.2	27.2	26.2	35.6
L73	CHOKE COIL	33.0	21.8	23.9	21.4	32.0
L74	CHOKE COIL	34.0	21.1	23.4	21.8	33.4
L91	CHOKE COIL	25.0	23.0	13.3	20.5	18.6
C10	E.CAP.	30.7	21.2	19.2	25.3	22.7
C12	E.CAP.	29.0	23.3	19.1	27.4	21.9
C13	E.CAP.	27.8	24.8	20.5	27.7	23.0
C51	E.CAP.	26.2	22.3	16.0	17.1	23.7
C61	E.CAP.	32.4	19.8	19.7	17.5	26.9
C71	E.CAP.	27.2	17.0	18.0	15.4	28.0
C81	E.CAP.	28.6	19.8	16.4	18.7	26.4
C82	E.CAP.	33.4	23.1	19.6	18.0	31.3
C91	E.CAP.	23.6	21.2	13.5	19.2	16.3
C92	E.CAP.	18.2	19.9	9.9	16.1	15.6
PC1	PHOTO COUPLER	40.8	29.1	25.0	34.1	29.6
PC91	PHOTO COUPLER	30.6	26.6	18.3	25.8	22.7

3. 主要部品温度上昇値
Main Components Temperature Rise △T List

MODEL : ZWX300

・測定条件 Measuring Conditions

取付方法 Mounting Method (標準取付 : A) (Standard Mounting Method : A)		Mounting A	Mounting B	Mounting C	Mounting D	Mounting E
						
入力電圧 Input Voltage (VAC)		200VAC				
		V1	V2	V3-1	V3-2	V4	V5
出力電圧 Output Voltage (VDC)		3.3	5.0	12.0	12.0	-12.0	5.0
出力電流 Output Current (A)	1	10.0	6.0	4.0	2.7	0.2	1.4
	2	0.0	1.8	3.0	8.0	0.2	1.4

それぞれの部品にとって一番厳しい負荷を使用 The severest load with each part is used.

*COOLING : CONVECTION COOLING

出力ディレーティング Output Derating (%) Ta=50℃		ΔT Temperature Rise (℃) 100	60	60	60	60
部品番号 Location No.	部品名 Part name	取付方向 Mounting A	取付方向 Mounting B	取付方向 Mounting C	取付方向 Mounting D	取付方向 Mounting E
Q1	MOS FET	31.2	27.2	29.3	32.7	28.7
Q2	MOS FET	44.0	33.2	35.3	37.3	36.4
Q3	MOS FET	39.9	34.9	36.6	39.5	37.6
Q51	MOS FET	28.3	23.1	15.5	18.5	19.1
Q52	MOS FET	26.4	22.6	15.3	18.0	19.6
Q61	MOS FET	58.3	39.5	35.3	39.2	41.8
Q62	MOS FET	60.0	39.3	34.4	38.6	41.1
Q701	CHIP TRANSISTOR	51.7	41.2	43.9	40.3	49.8
D1	BRIDGE DIODE	30.6	23.9	20.4	29.0	20.4
D2	F.R.D	34.5	29.0	31.1	33.9	31.0
D71	L.L.D	50.1	34.5	36.1	35.6	39.9
D72	S.B.D	47.8	33.2	34.0	34.5	37.9
D901	CHIP SBD	41.1	31.7	21.9	29.4	25.7
SR1	THYRISTOR	31.0	23.4	20.6	28.7	21.0
A102	CHIP IC	35.9	29.0	26.5	34.5	27.3
A105	CHIP IC	41.9	34.7	30.7	39.2	33.8
A106	CHIP IC	40.8	32.3	25.6	35.1	27.0
A801	CHIP IC	44.9	33.7	29.5	29.8	39.1
T1	DRIVE TRANS	26.2	22.2	22.5	27.7	23.6
T2	TRANS	42.8	27.8	27.3	30.9	30.7
T3	TRANS	28.2	24.5	18.8	24.8	20.5
T51	CURRENT TRANS	41.8	27.5	21.9	31.0	26.9
L1	BALUN	14.7	17.1	10.6	20.5	10.5
L2	BALUN	25.4	20.0	14.7	24.4	15.9
L3	CHOKE COIL	26.7	20.5	22.8	28.9	20.4
L51	CHOKE COIL	51.1	35.7	30.3	31.9	36.8
L61	CHOKE COIL	51.8	31.8	29.4	29.5	37.4
L71	MAGAMP COIL	54.7	37.9	36.4	38.6	42.6
L72	CHOKE COIL	40.5	26.4	26.8	26.0	34.8
L73	CHOKE COIL	32.6	21.8	23.6	21.1	31.4
L74	CHOKE COIL	33.6	21.4	23.2	21.5	32.7
L91	CHOKE COIL	25.0	22.5	12.8	19.8	18.2
C10	E.CAP.	27.1	19.8	17.5	23.6	19.5
C12	E.CAP.	25.1	21.1	17.2	25.8	18.6
C13	E.CAP.	25.6	23.4	19.0	26.6	20.6
C52	E.CAP.	26.6	22.2	15.4	16.7	23.5
C61	E.CAP.	32.4	19.9	19.2	17.3	26.5
C72	E.CAP.	26.9	17.2	19.4	15.2	27.2
C81	E.CAP.	29.7	19.7	16.1	18.5	25.8
C82	E.CAP.	32.6	23.4	18.7	17.7	30.7
C91	E.CAP.	23.6	20.7	13.0	18.5	16.1
C92	E.CAP.	20.6	19.6	9.5	15.3	15.3
PC1	PHOTO COUPLER	39.5	28.8	23.5	32.9	28.2
PC91	PHOTO COUPLER	29.4	25.8	17.2	24.9	21.4

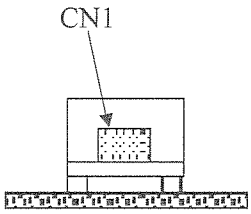
4.電解コンデンサ推定寿命計算値　Electrolytic capacitor lifetime

MODEL : ZWX300

空冷条件：自然空冷
Cooling condition : Convection cooling

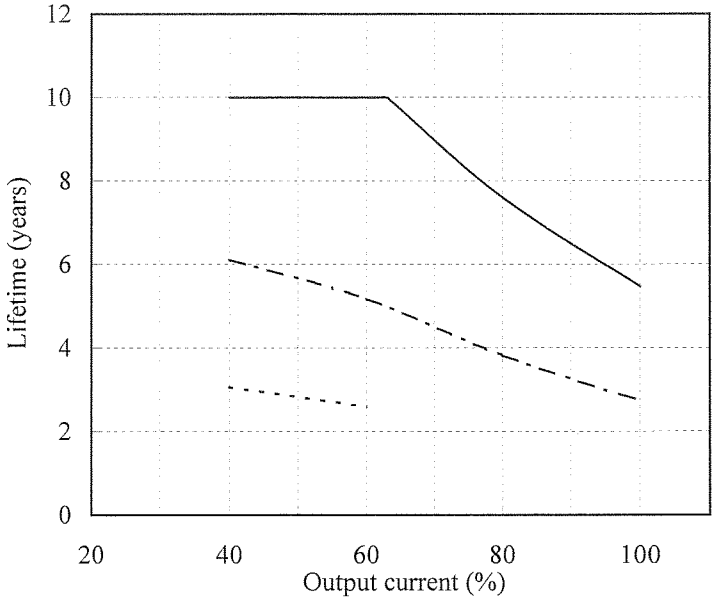
Conditions　Ta　40℃ : ——
50℃ : —·—·
60℃ : - - - -

取付方向 A
Mounting A



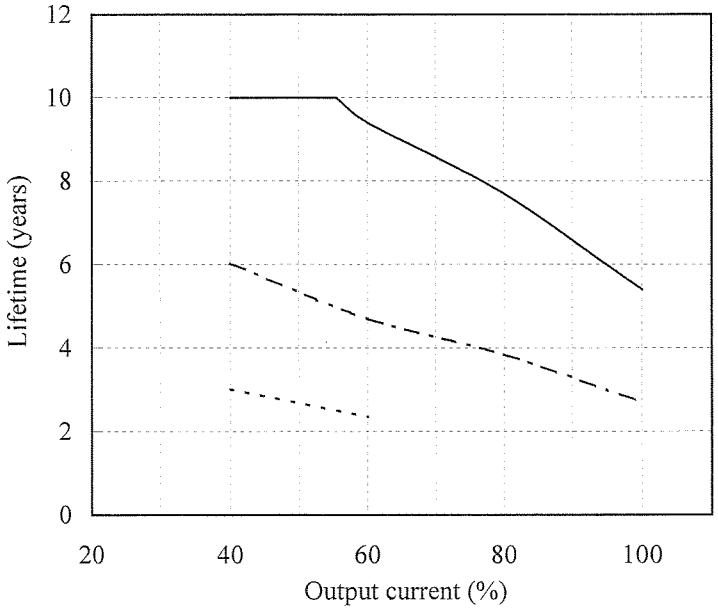
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 50℃	Ta= 60℃
40	10.0	6.1	3.1
60	10.0	5.2	2.6
80	7.6	3.8	-
100	5.5	2.7	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 50℃	Ta= 60℃
40	10.0	6.0	3.0
60	9.4	4.7	2.3
80	7.7	3.8	-
100	5.4	2.7	-



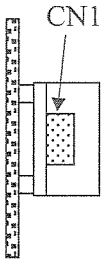
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300

空冷条件：自然空冷
Cooling condition : Convection cooling

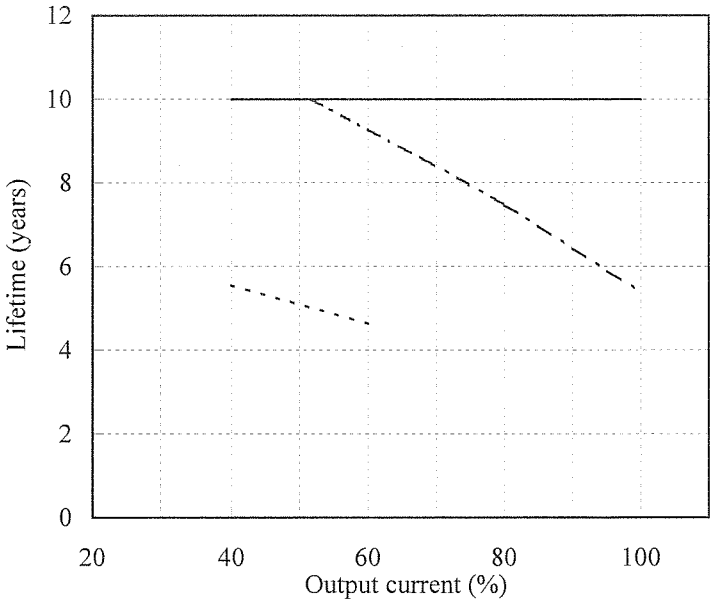
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 B
Mounting B



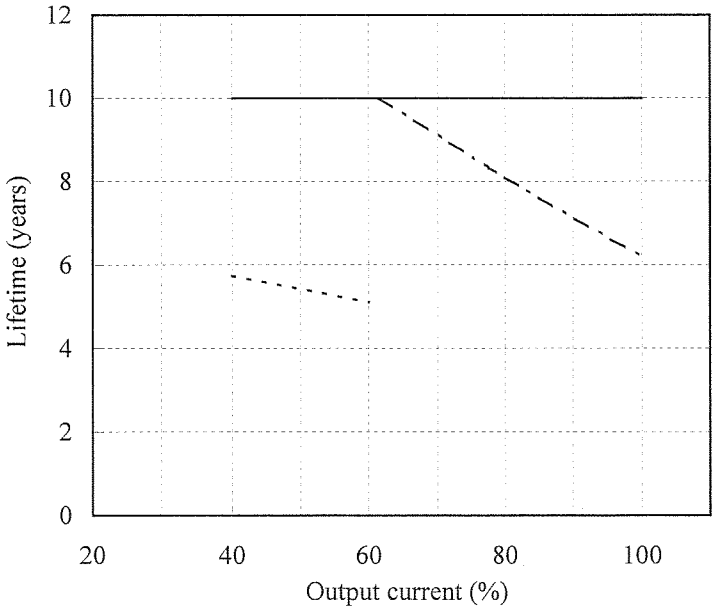
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.5
60	10.0	9.3	4.6
80	10.0	7.5	-
100	10.0	5.4	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.7
60	10.0	10.0	5.1
80	10.0	8.2	-
100	10.0	6.1	-



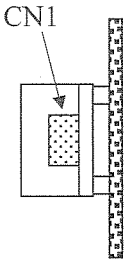
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300

空冷条件：自然空冷
Cooling condition : Convection cooling

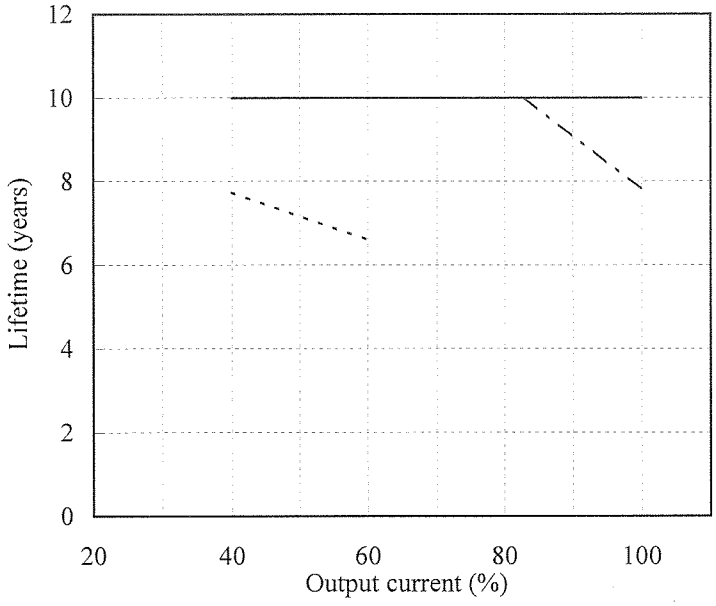
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 C
Mounting C



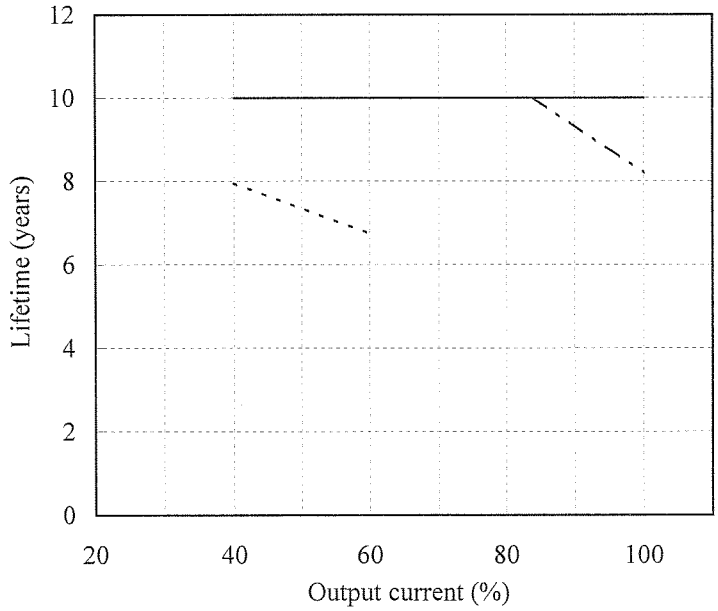
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	7.7
60	10.0	10.0	6.6
80	10.0	10.0	-
100	10.0	7.8	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	8.0
60	10.0	10.0	6.7
80	10.0	10.0	-
100	10.0	8.2	-



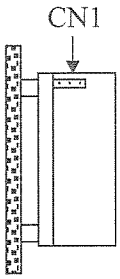
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300

空冷条件：自然空冷
Cooling condition : Convection cooling

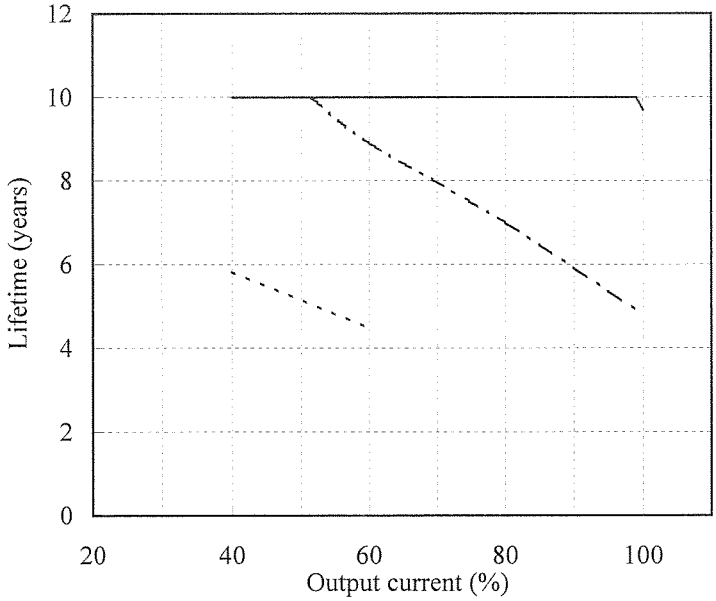
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 D
Mounting D



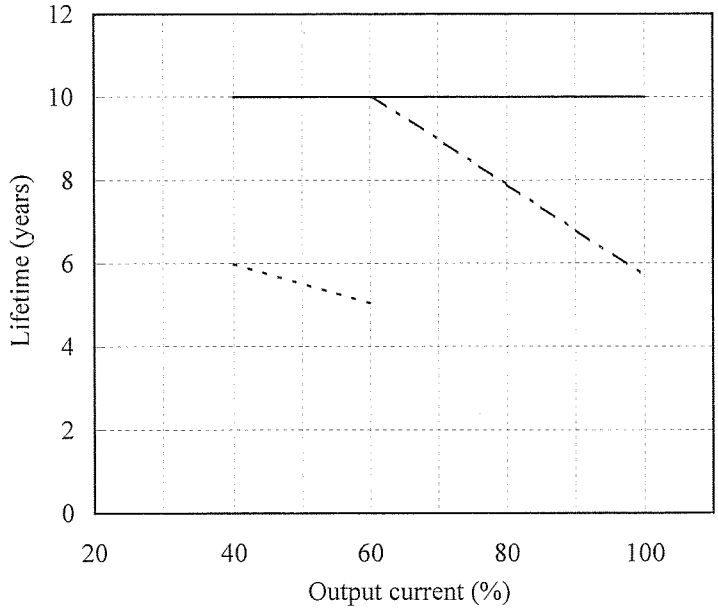
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.8
60	10.0	8.9	4.5
80	10.0	7.0	-
100	9.7	4.8	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	6.0
60	10.0	10.0	5.0
80	10.0	7.9	-
100	10.0	5.7	-



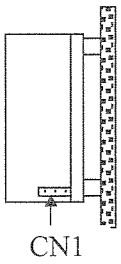
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300

空冷条件：自然空冷
Cooling condition : Convection cooling

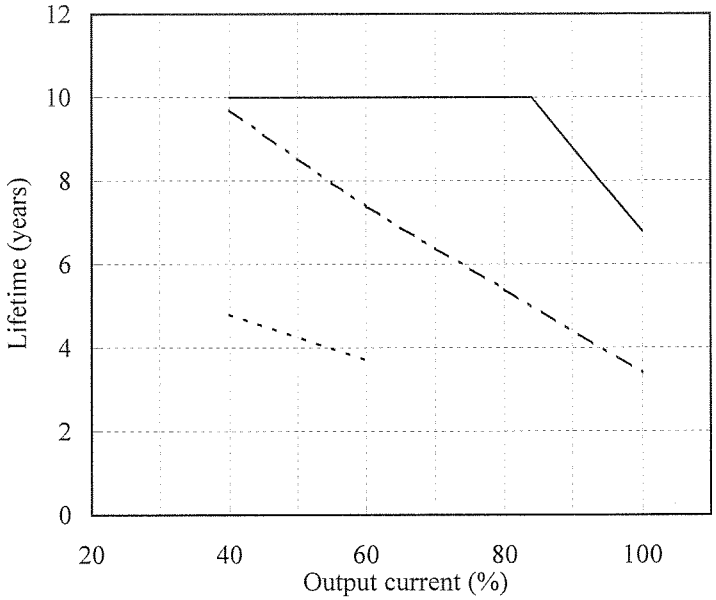
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 E
Mounting E



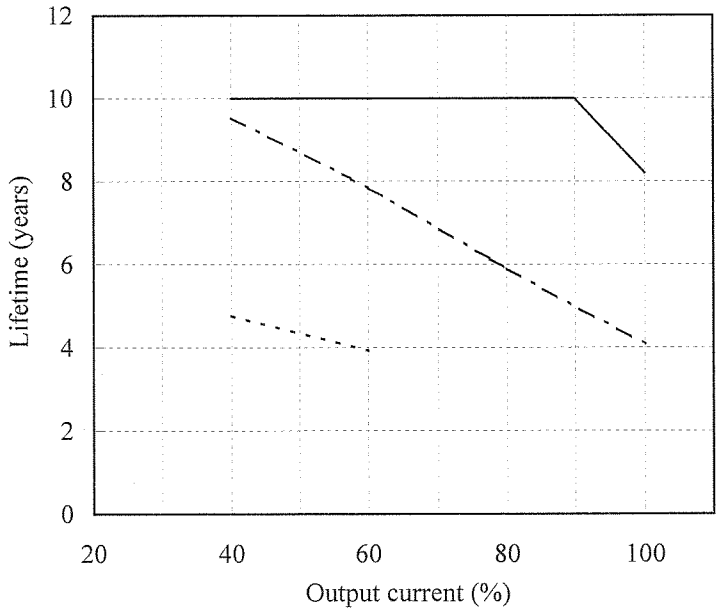
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	9.7	4.8
60	10.0	7.4	3.7
80	10.0	5.4	-
100	6.8	3.4	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	9.5	4.8
60	10.0	7.8	3.9
80	10.0	5.9	-
100	8.2	4.1	-



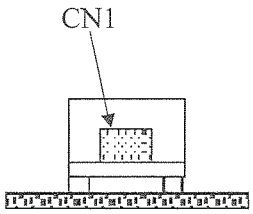
電解コンデンサ推定寿命計算値　　**Electrolytic capacitor lifetime**

MODEL : ZWX300/L
L板金付きタイプ(オプション)
With L chassis type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

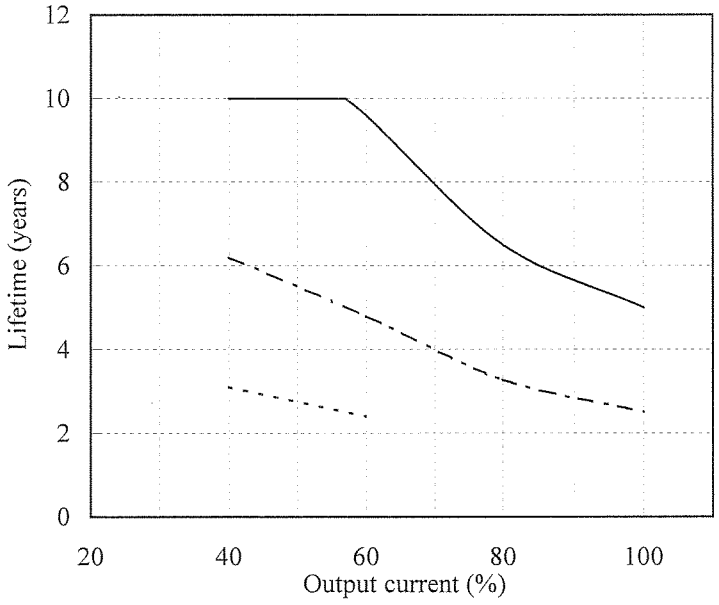
Conditions　Ta　40℃ : ——
50℃ : —·—·
60℃ : - - - -

取付方向 A
Mounting A



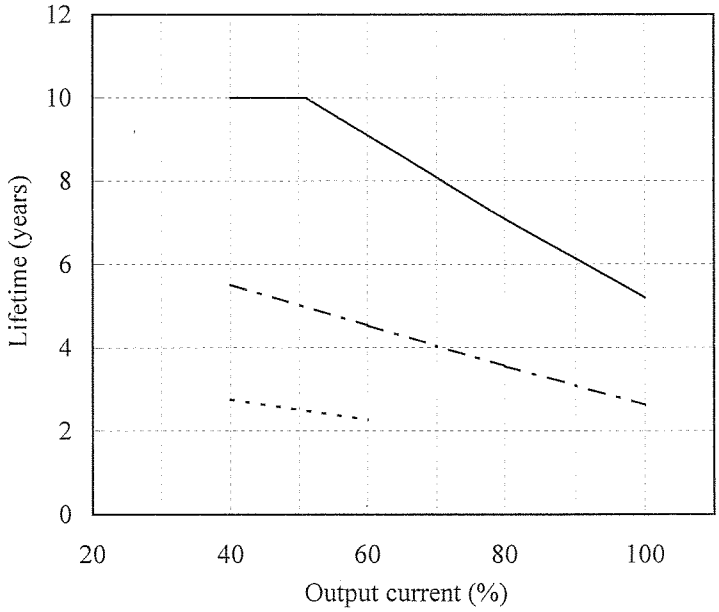
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 50℃	Ta= 60℃
40	10.0	6.2	3.1
60	9.6	4.8	2.4
80	6.5	3.3	-
100	5.0	2.5	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 50℃	Ta= 60℃
40	10.0	5.5	2.8
60	9.1	4.5	2.3
80	7.1	3.6	-
100	5.2	2.6	-



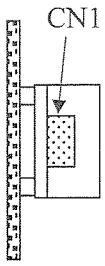
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300/L
L板金付きタイプ(オプション)
With L chassis type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

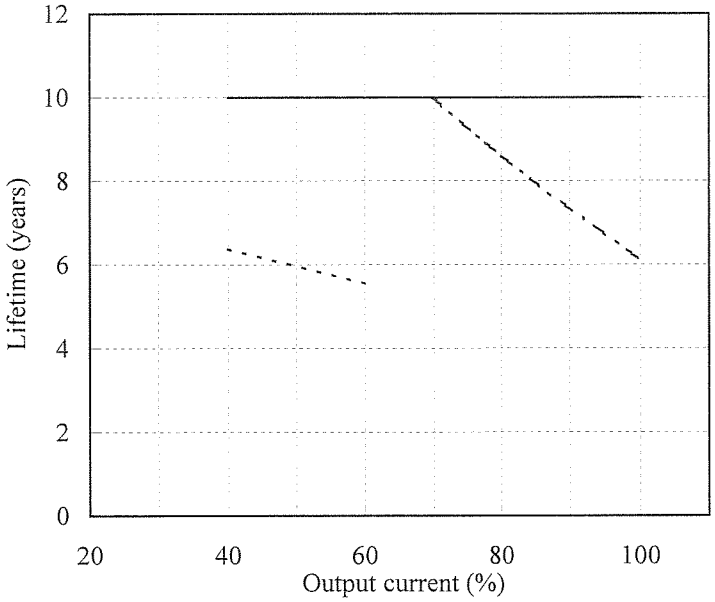
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 B
Mounting B



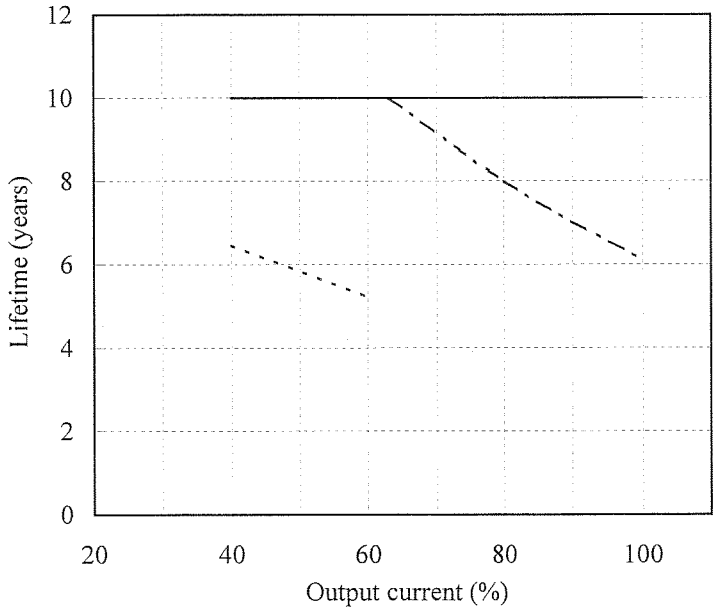
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	6.4
60	10.0	10.0	5.5
80	10.0	8.6	-
100	10.0	6.1	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	6.5
60	10.0	10.0	5.2
80	10.0	8.0	-
100	10.0	6.1	-



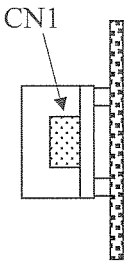
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300/L
L板金付きタイプ(オプション)
With L chassis type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

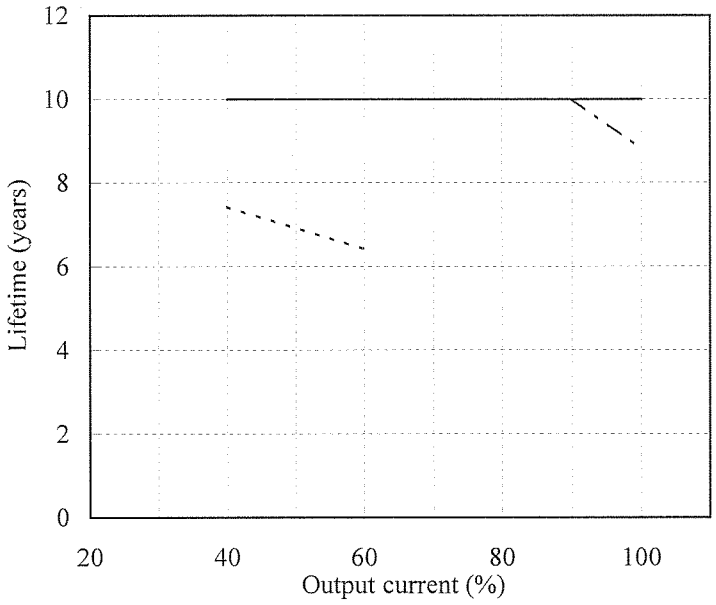
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 C
Mounting C



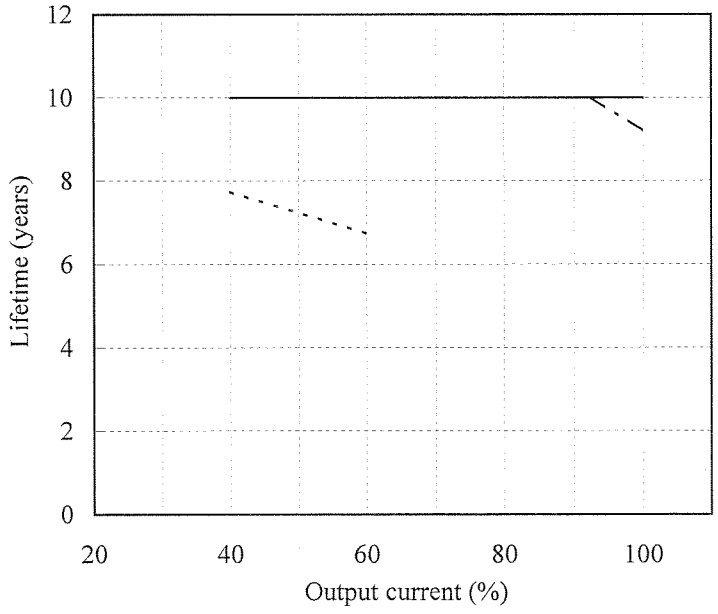
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	7.4
60	10.0	10.0	6.4
80	10.0	10.0	-
100	10.0	8.8	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	7.7
60	10.0	10.0	6.7
80	10.0	10.0	-
100	10.0	9.2	-



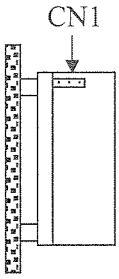
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300/L
L板金付きタイプ(オプション)
With L chassis type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

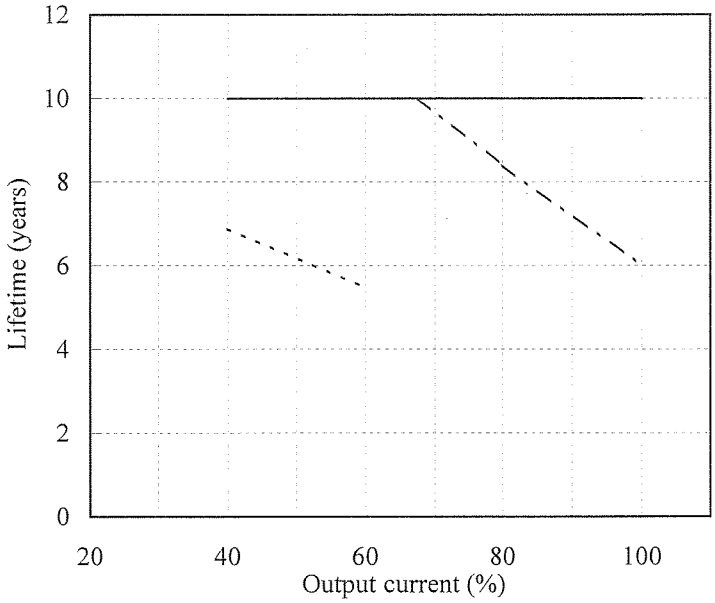
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 D
Mounting D



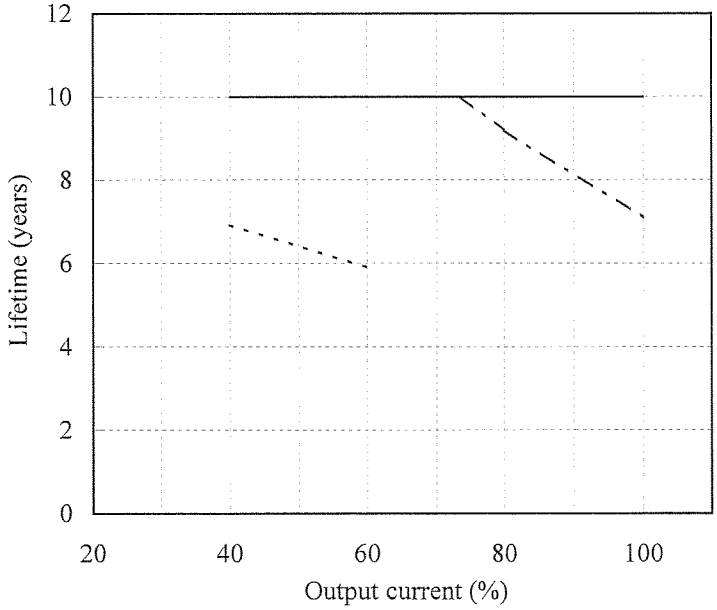
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	6.9
60	10.0	10.0	5.5
80	10.0	8.4	-
100	10.0	6.0	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	6.9
60	10.0	10.0	5.9
80	10.0	9.2	-
100	10.0	7.1	-



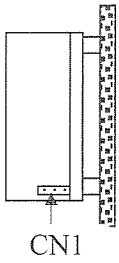
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300/L
L板金付きタイプ(オプション)
With L chassis type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

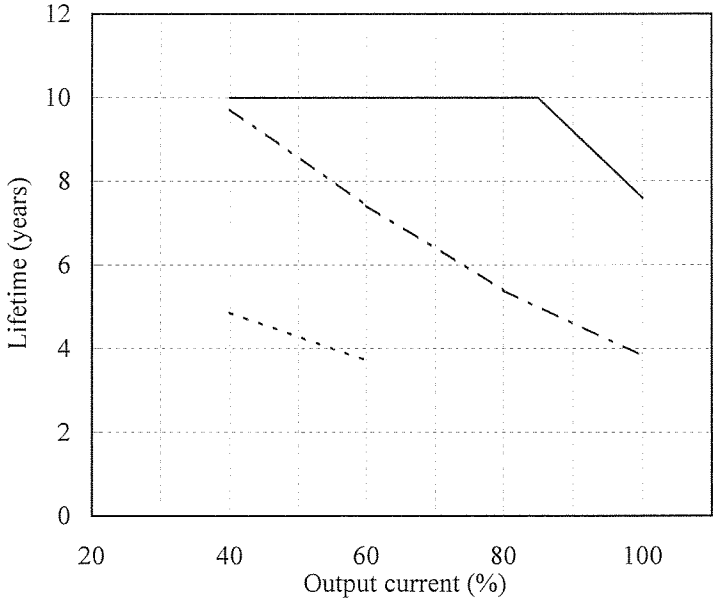
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 E
Mounting E



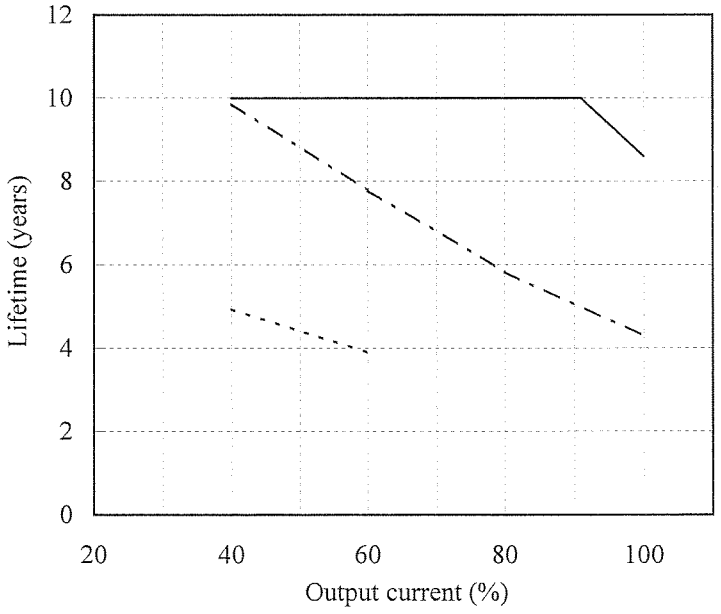
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	9.7	4.9
60	10.0	7.4	3.7
80	10.0	5.4	-
100	7.6	3.8	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	9.9	4.9
60	10.0	7.8	3.9
80	10.0	5.8	-
100	8.6	4.3	-



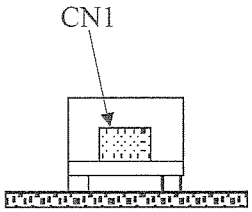
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300/A
カバー付きタイプ（オプション）
With cover type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

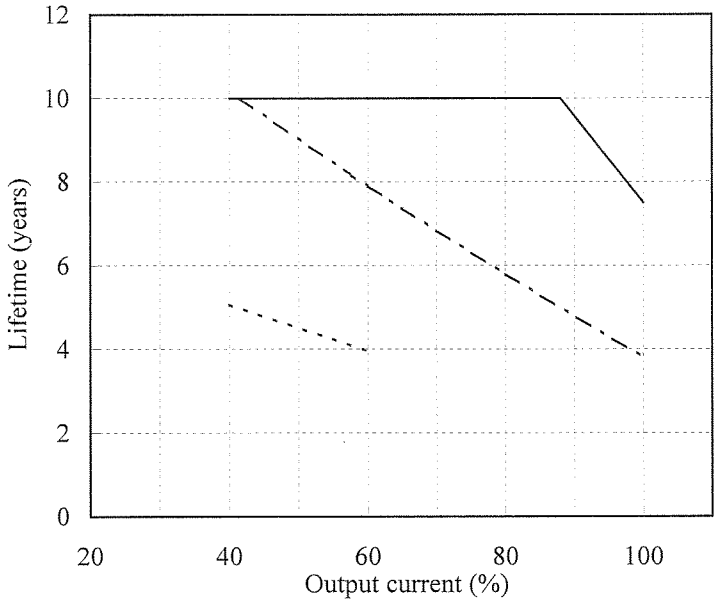
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 A
Mounting A



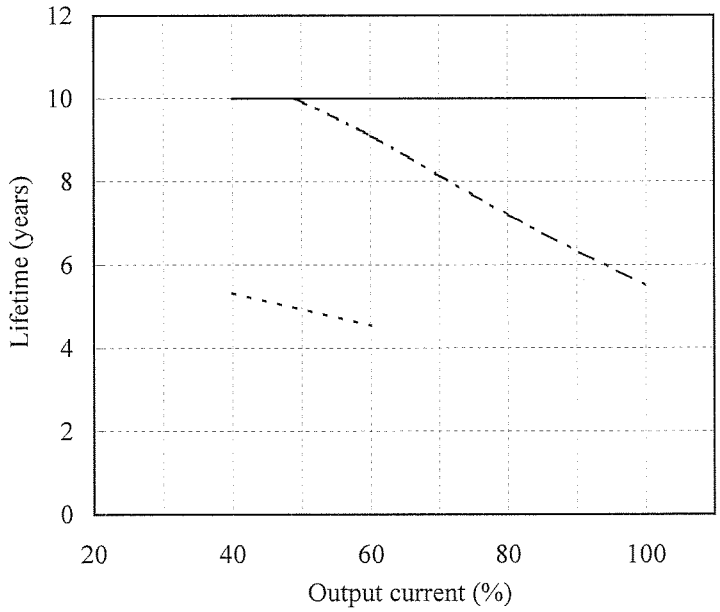
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.1
60	10.0	7.9	3.9
80	10.0	5.8	-
100	7.5	3.8	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.3
60	10.0	9.1	4.5
80	10.0	7.2	-
100	10.0	5.5	-



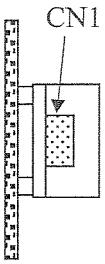
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300/A
カバー付きタイプ（オプション）
With cover type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

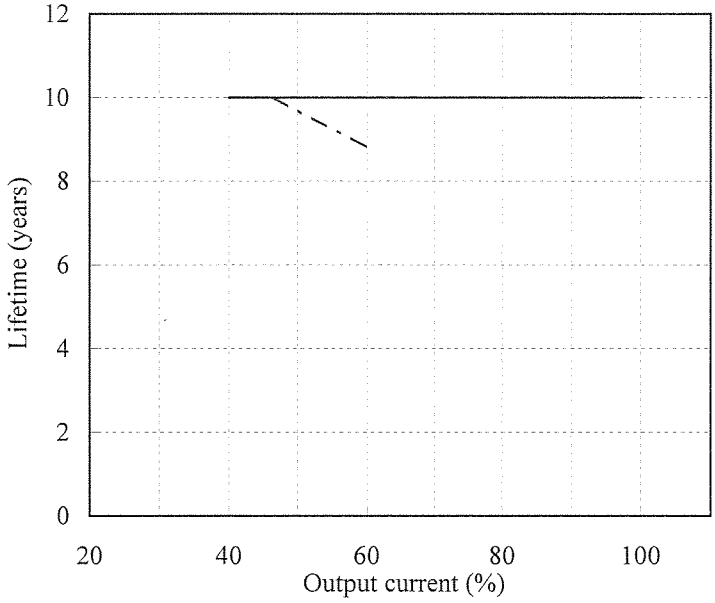
Conditions　Ta　30℃：——
40℃：—·—·

取付方向 B
Mounting B



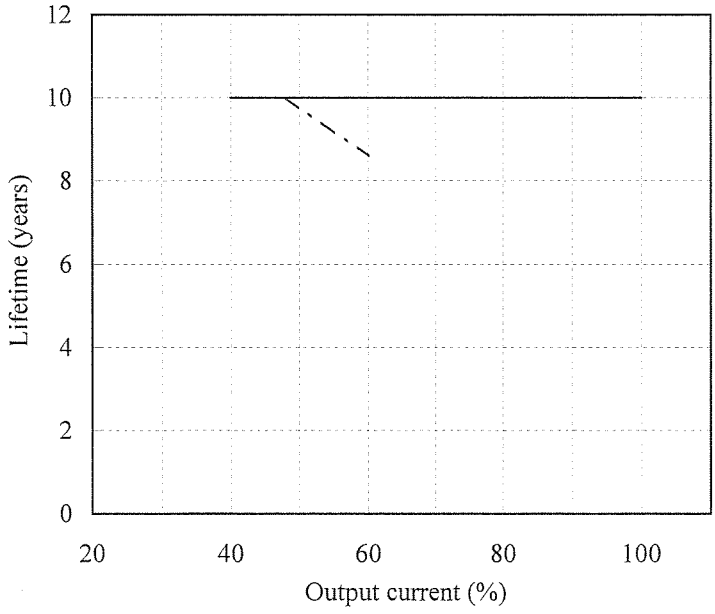
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	-
60	10.0	8.8	-
80	10.0	-	-
100	10.0	-	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	-
60	10.0	8.6	-
80	10.0	-	-
100	10.0	-	-



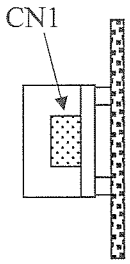
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300/A
カバー付きタイプ（オプション）
With cover type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

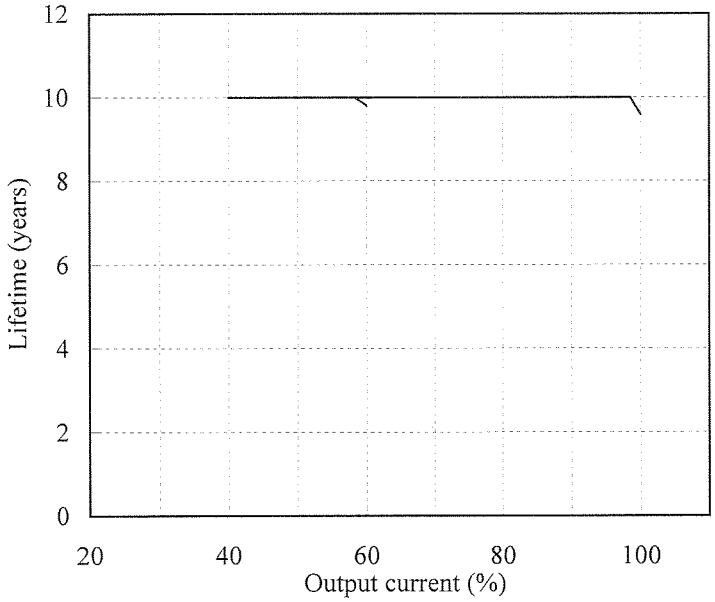
Conditions　Ta　30℃ : ——
40℃ : —·—·

取付方向 C
Mounting C



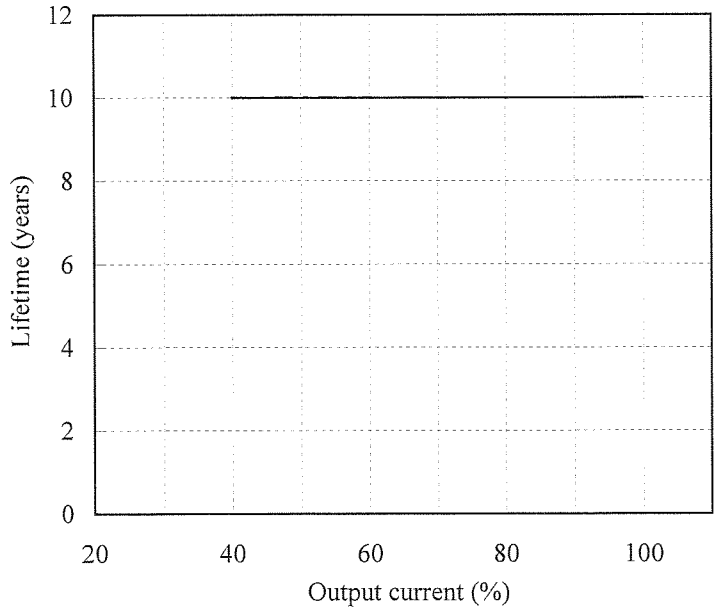
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	-
60	10.0	9.8	-
80	10.0	-	-
100	9.6	-	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	-
60	10.0	10.0	-
80	10.0	-	-
100	10.0	-	-



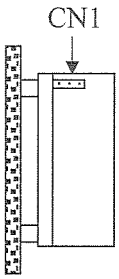
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300/A
カバー付きタイプ（オプション）
With cover type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

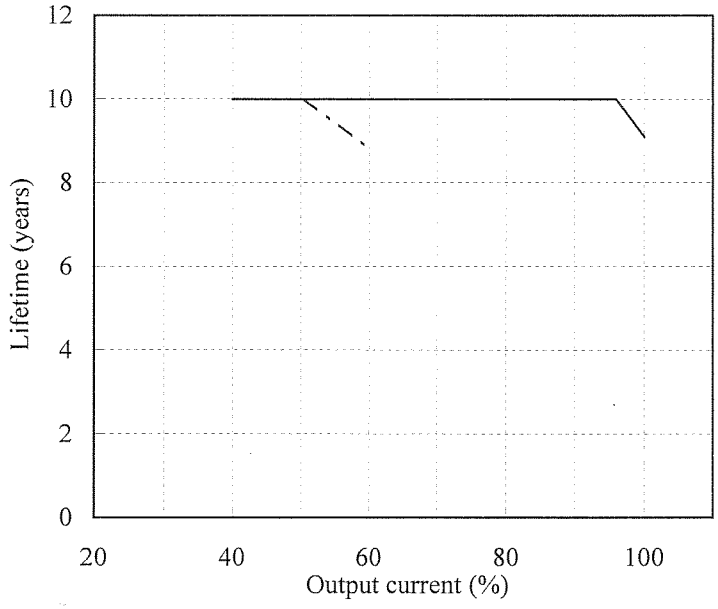
Conditions　Ta　30℃：——
40℃：—·—·

取付方向 D
Mounting D



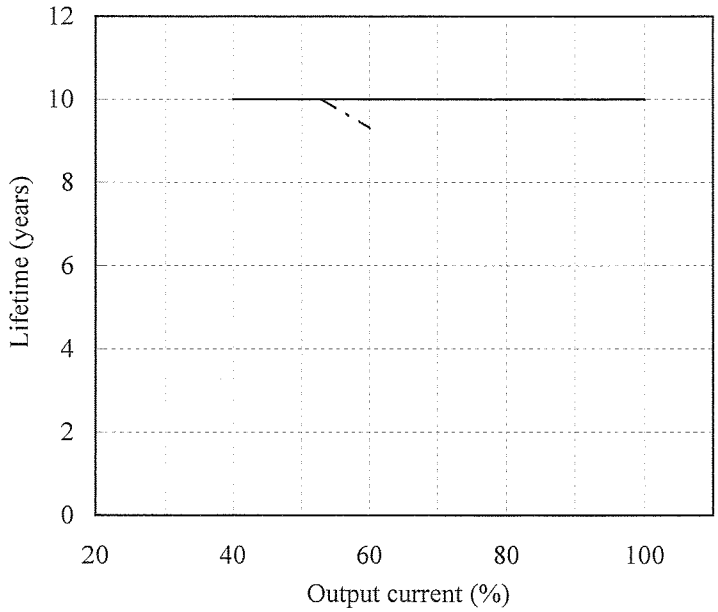
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	-
60	10.0	8.8	-
80	10.0	-	-
100	9.1	-	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	-
60	10.0	9.3	-
80	10.0	-	-
100	10.0	-	-



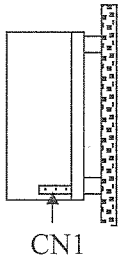
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX300/A
カバー付きタイプ（オプション）
With cover type (Option model)

空冷条件：自然空冷
Cooling condition : Convection cooling

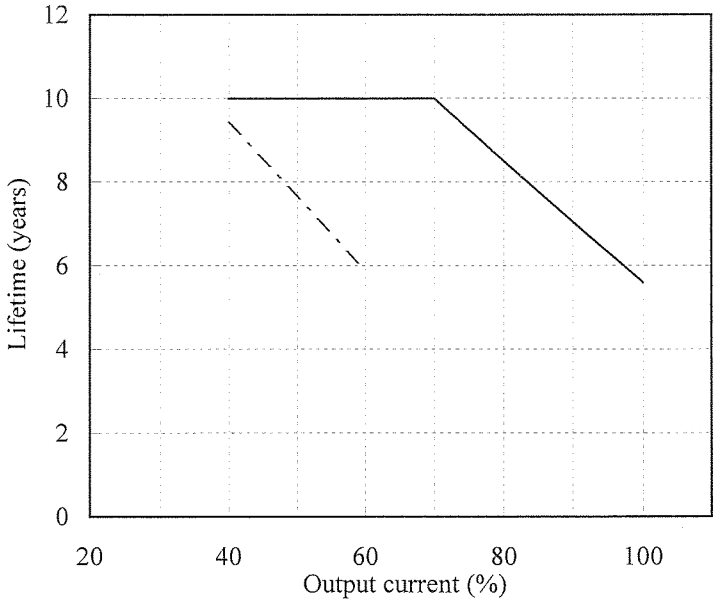
Conditions　Ta　30℃：——
40℃：—·—·

取付方向 E
Mounting E



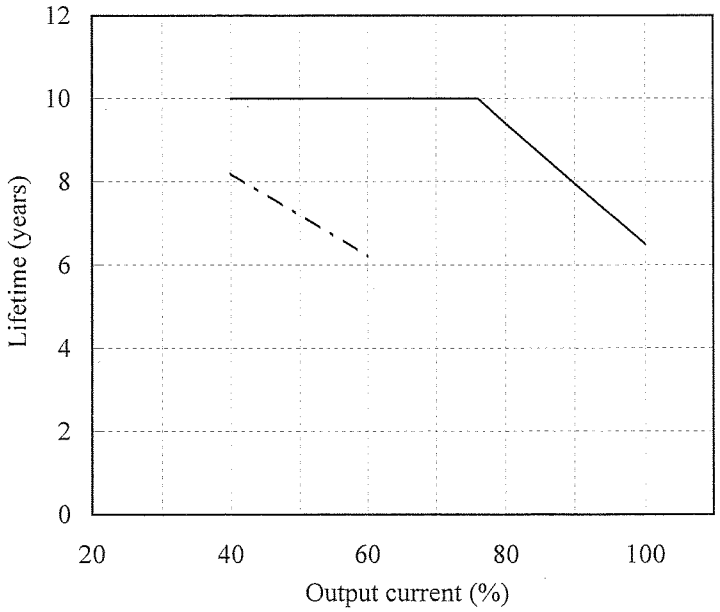
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	9.4	-
60	10.0	5.9	-
80	8.5	-	-
100	5.6	-	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	8.2	-
60	10.0	6.2	-
80	9.4	-	-
100	6.5	-	-



5.Abnormal test

MODEL : ZWX300

(1) Conditions

Input : 200VAC Output : Rating Ta : R.T

(2) Test result

(Da : Damaged)

No.	Test position		Test mode		Test result												Note
					a	b	c	d	e	f	g	h	I	j	k	l	
	Location No.	Test point	Short	Open	Fire	Smoke	Burst	Smell	Red hot	Damaged	Fuse blown	O.V.P.	O.C.P.	No output	No change	Others	
1	Q1	D-S	○								○			○			Fuse blown:F1
2		D-G	○							○	○			○			Fuse blown:F1 Da:Q1
3		G-S	○											○			No output except V5
4		D		○										○			No output except V5
5		S		○										○			No output except V5
6		G		○						○	○			○			Fuse blown:F1 Da:Q1
7	Q2	D-S	○											○			No output except V5
8		D-G	○											○			No output except V5
9		G-S	○											○			No output except V5
10		D		○										○			No output except V5
11		S		○										○			No output except V5
12		G		○										○			No output except V5
13	Q3	D-S	○											○			No output except V5
14		D-G	○											○			No output except V5
15		G-S	○											○			No output except V5
16		D		○										○			No output except V5
17		S		○										○			No output except V5
18		G		○										○			No output except V5
19	Q51	D-S	○											○			No output except V5
20		D-G	○											○			No output except V5
21		G-S	○													○	Input power increase
22		D		○										○			No output V1,V2,V4
23		S		○										○			No output V1,V2,V4
24		G		○										○			No output except V5
25	Q52	D-S	○											○			No output except V5
26		D-G	○											○			No output except V5
27		G-S	○							○						○	Input power increase Da:Q501,R507,R508
28		D		○												○	Input power increase
29		S		○												○	Input power increase
30		G		○												○	Input power increase

No.	Test position		Test mode		Test result												Note
					a	b	c	d	e	f	g	h	I	j	k	l	
	Location No.	Test point	Short	Open	Fire	Smoke	Burst	Smell	Red hot	Damaged	Fuse blown	O.V.P.	O.C.P.	No output	No change	Others	
31	Q61	D-S	○													○	The outputs other than V5,V1 decrease
32		D-G	○											○			No output except V5
33		G-S	○							○				○			No output V1 Da:Q610,Q611,R619,R620
34		D		○										○			No output V2
35		S		○										○			No output V2
36		G		○										○			No output V2
37	Q62	D-S	○											○			No output except V5
38		D-G	○											○			No output V1
39		G-S	○											○			No output V1
40		D		○												○	Input power increase The outputs of V1 decrease
41		S		○												○	Input power increase The outputs of V1 decrease
42		G		○										○			No output except V5
43	D1	AC-AC	○								○			○			Fuse blown:F1
44		DC-DC	○								○			○			Fuse blown:F1
45		AC-"+"	○								○			○			Fuse blown:F1
46		AC-"-"	○								○			○			Fuse blown:F1
47	D2	A-K	○							○	○			○			Fuse blown:F1 Da:Q1
48		A-K		○						○	○			○			Fuse blown:F1 Da:Q1
49	D71	A-K	○											○			No output V1,V3-1,V3-2
50		A-K		○										○			No output V1,V3-1,V3-2
51	D72	A-K	○											○			No output except V5
52		A-K		○												○	Input power increase
53	D73	A-K	○											○			No output except V5
54		A-K		○												○	Input power increase
55	C10	-	○							○					○		Da:TFR1
56		-		○											○		
57	SR1	A-K	○												○		
58		K-G	○							○	○			○			Fuse blown:F1 Da:Q1,D2,TFR1
59		G-A	○												○		
60		A		○						○	○			○			Fuse blown:F1 Da:Q1,D2,TFR1
61		K		○						○	○			○			Fuse blown:F1 Da:Q1,D2,TFR1
62		G		○						○	○			○			Fuse blown:F1 Da:Q1,D2,TFR1

No.	Test position		Test mode		Test result												
					a	b	c	d	e	f	g	h	I	j	k	l	
	Location No.	Test point	Short	Open	Fire	Smoke	Burst	Smell	Red hot	Damaged	Fuse blown	O.V.P.	O.C.P.	No output	No change	Others	Note
63	T1	1-2	○											○		○	No output except V5 The output voltage of V5 changes from 0V to 5V
64		6-7	○											○		○	No output except V5 The output voltage of V5 changes from 0V to 5V
65		1		○										○			No output except V5
66		2		○										○			No output except V5
67		6		○										○			No output except V5
68		7		○										○			No output except V5
69	T2	6-7	○											○			No output except V5
70		7-8	○											○			No output except V5
71		9-10	○											○			No output except V5
72		10-11	○												○		
73		11-12	○											○			No output except V5
74		12-13	○											○			No output except V5
75		14-15	○											○			No output except V5
76		6		○										○			No output except V5
77		9		○										○			No output V1,V3-1,V3-2
78		11		○										○			No output V1
79		13,14		○										○			No output V1,V2,V4
80	T3	1-2	○											○			No output all CH
81		2-3	○							○	○			○			Fuse blown:F2,F101 Da:A101,A102, A106,R180
82		3-4	○											○			No output all CH
83		5-6	○											○			No output all CH
84		1		○										○			No output all CH
85		3		○										○			No output all CH
86		5		○										○			No output all CH
87	T51	1-2	○												○		
88		3-4	○												○		
89		1		○										○			No output V1
90		2		○										○			No output V1
91		3		○											○		
92		4		○											○		

No.	Test position		Test mode		Test result												
					a	b	c	d	e	f	g	h	I	j	k	l	
	Location No.	Test point	Short	Open	Fire	Smoke	Burst	Smell	Red hot	Damaged	Fuse blown	O.V.P.	O.C.P.	No output	No change	Others	Note
93	L1	1		○										○			No output all CH
94		2		○										○			No output all CH
95		3		○										○			No output all CH
96		4		○										○			No output all CH
97	L2	1		○										○			No output all CH
98		2		○										○			No output all CH
99		3		○										○			No output all CH
100		4		○										○			No output all CH
101	L3	5,6-4	○							○	○			○			Fuse blown:F1 Da:Q1
102		1,2-3	○							○	○			○			Fuse blown:F1 Da:Q1
103		3-4	○												○		
104		4		○						○	○			○			Fuse blown:F1 Da:Q1,D2,TFR1
105	L51	1,2-3	○											○			No output except V5
106		4,5-6	○											○			No output except V5
107		4,5		○										○			No output V2,V4
108		6		○										○			No output V4
109	L61	2,3,4-7,8,9	○											○			No output except V5
110		7,8,9		○										○			No output V1
111	L71	1,2-3,4	○											○			No output except V5
112		4		○										○			No output V1,V3-1,V3-2
113	L72	3,4-9,10	○											○			No output except V5
114		3,4		○										○			No output V1,V3-1,V3-2
115	L73	-	○											○			No output except V5
116		-		○										○			No output V3-1
117	L74	-	○											○			No output except V5
118		-		○										○			No output V3-2
119	L91	-	○												○		
120		-		○										○			No output all CH

No.	Test position		Test mode		Test result												
					a	b	c	d	e	f	g	h	I	j	k	l	
	Location No.	Test point	Short	Open	Fire	Smoke	Burst	Smell	Red hot	Damaged	Fuse blown	O.V.P.	O.C.P.	No output	No change	Others	Note
121	Q101	D-S	○											○		○	No output except V5 The output voltage of V5 changes from 0 to 5V
122		D-G	○											○		○	No output except V5 The output voltage of V5 changes from 0 to 5V
123		G-S	○											○			No output except V5
124		D		○										○			No output except V5
125		S		○										○			No output except V5
126		G		○										○			No output except V5
127	Q102	C-E	○											○			No output except V5
128		B-E	○													○	Input power increase
129		B-C	○											○			No output except V5
130		C		○												○	Input power increase
131		E		○										○			No output except V5
132		B		○										○			No output except V5
133	Q107	C-E	○											○			No output except V5
134		B-E	○												○		
135		B-C	○											○			No output except V5
136		C		○											○		
137		E		○						○	○			○			Fuse blown:F1 Da:Q1
138		B		○						○	○			○			Fuse blown:F1 Da:Q1
139	Q501	D-S	○													○	Input power increase
140		D-G	○											○			No output except V5
141		G-S	○							○						○	Input power increase Da:Q501
142		D		○												○	Input power increase The output voltage of V2 and V4 decreases
143		S		○												○	Input power increase The output voltage of V2 and V4 decreases
144		G		○												○	Input power increase The output voltage of V2 and V4 decreases

No.	Test position		Test mode		Test result												Note
					a	b	c	d	e	f	g	h	I	j	k	l	
	Location No.	Test point	Short	Open	Fire	Smoke	Burst	Smell	Red hot	Damaged	Fuse blown	O.V.P.	O.C.P.	No output	No change	Others	
145	A106	D-S	○							○	○			○			Fuse blown:F2 Da:F101
146		D-CON	○							○	○			○			Fuse blown:F2 Da:F101,A106,A107, PC91,Q111,Q112
147		CON-S	○							○	○			○			Fuse blown:F101 Da:A106
148		D		○										○			No output all CH
149		S		○										○			No output all CH
150		CON		○										○			No output all CH
151	A801	I-GND	○											○			No output except V5
152		O-GND	○						○				○	○			No output V4
153		I-O	○													○	The output voltage of V4 rises
154		I		○										○			No output V4
155		O		○										○			No output V4
156		GND		○										○			No output V4
157	D109	A-K	○								○			○			Fuse blown:F2
158		A-K		○											○		
159	D110	A-K	○											○			No output except V5
160		A-K		○											○		
161	D801	A-K	○											○			No output except V5
162		A-K		○										○			No output V4
163	D901	A-K	○											○			No output all CH
164		A-K		○										○			No output all CH

6. 振動試験 VIBRATION TEST

MODEL : ZWX300

(1) 振動試験種類 Vibration test class

掃引振動数耐久試験 Frequency variable endurance test

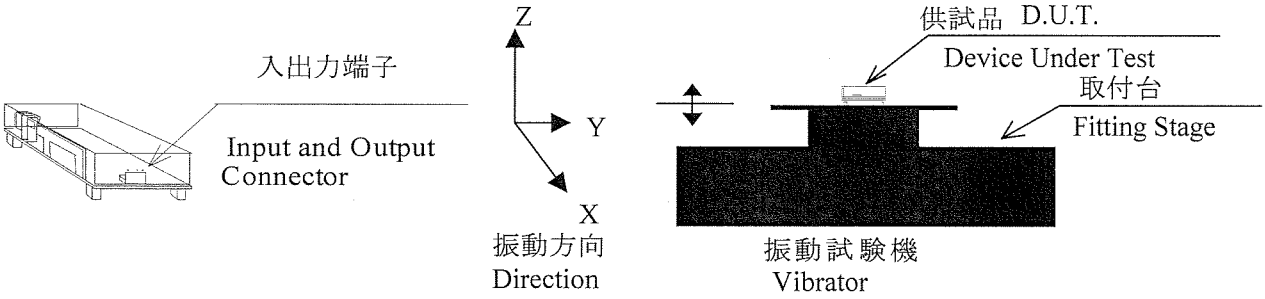
(2) 使用振動試験装置 Equipment used

EMIC (株) 製 EMIC CORP	・制御部 Controller	:F-400-BM-E47	・加振部 Vibrator	:905-FN

(3) 試験条件 Test Conditions

・周波数範囲 Sweep frequency	10～55Hz	・振動方向 Direction	X, Y, Z
・掃引時間 Sweep time	1.0min	・試験時間 Sweep count	各方向共 1時間 1 hour each
・加速度 Acceleration	Constant 19.6m/s^2 (2G)		

(4) 試験方法 Test method



(5) 試験結果 Test Results

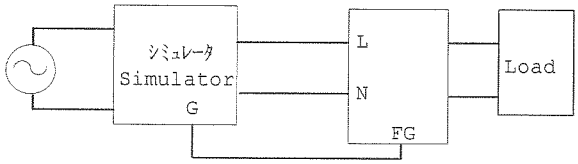
合格 OK

測定確認項目 Check Item		出力電圧 (V) Output Voltage						リップル電圧 (mVp-p) Ripple Voltage						機構・実装状態 D.U.T. State
		V1	V2	V3-1	V3-2	V4	V5	V1	V2	V3-1	V3-2	V4	V5	
試験前 Before Test	-	3.34	4.96	11.97	11.96	-12.00	4.95	50.0	32.0	16.0	16.0	22.0	36.0	-
試験後 After Test	X	3.34	4.96	11.97	11.96	-12.00	4.95	56.0	46.0	10.0	10.0	20.0	30.0	異常なし OK
	Y	3.34	4.96	11.97	11.96	-12.00	4.95	56.0	46.0	10.0	10.0	20.0	30.0	異常なし OK
	Z	3.34	4.96	11.97	11.96	-12.00	4.95	56.0	46.0	10.0	10.0	20.0	30.0	異常なし OK

7. ノイズシミュレート試験 NOISE SIMULATE TEST

MODEL : ZWX300

(1) 試験回路及び測定器 Test circuit and equipment



シミュレーター :INS-4320(A) (ノイズ研究所)
Simulator :INS-4320(A) (Noise Laboratory Co.,LTD)

(2) 試験条件 Test Conditions

・入力電圧 Input voltage	: 100, 230VAC	・ノイズ電圧 Noise level	: 0V～2kV
・出力電圧 Output Voltage	: 定格 Rated	・位相 Phase	: 0°～360°
・出力電流 Output current	: 0%, 100%	・極性 Polarity	: ＋,－
・周囲温度 Ambient temperature	: 25℃	・印加モード Mode	: Normal Common
・パルス幅 Pulse width	: 50ns～1000ns	・トリガ選択 Trigger select	: Line

(3) 判定条件 Acceptable conditions

1.破壊しない事	Not to be broken
2.出力がダウンしない事	Not to be shut down output
3.その他異常のない事	No other out of orders

(4) 試験結果 Test Results

合格 **OK**

8. 熱衝撃試験 THERMAL SHOCK TEST

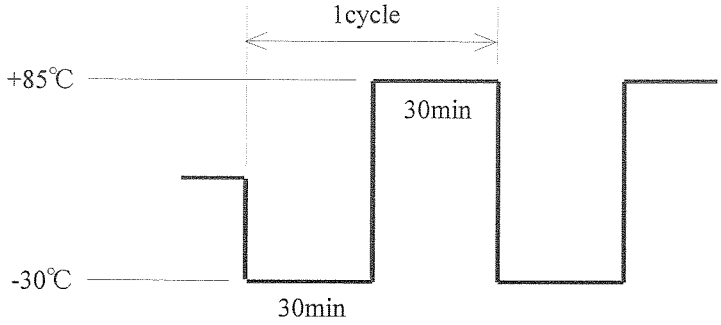
MODEL : ZWX300

(1) 使用計測器 Equipment Used

TSA-70H-W : ESPEC

(2) 試験条件 Test Conditions

・電源周囲温度 Ambient Temperature : -30℃ ⇔ 85℃
・試験時間 Test Time : 図参照 Refer to Dwg.
・試験サイクル Test Cycle : 100 サイクル 100 Cycles
・非動作 Not Operating



(3) 試験方法 Test Method

初期測定の後、供試品を試験槽に入れ、上記サイクルで試験を行う。100サイクル後に、供試品を常温常湿下に1時間放置し、出力に異常がない事を確認する。

Before testing, check if there is no abnormal output, then put the D.U.T. in testing chamber, and test it according to the above cycle. 100 cycles later, leave it for 1 hour at the room temperature , then check if there is no abnormal output.

(4) 試験結果 Test Results

合格 **OK**

入力電圧 Vin:100VAC 出力電流 Io:100%		V1		V2		V3-1		V3-2	
		From	To	From	To	From	To	From	To
リップル電圧 Ripple voltage	mVp-p	30.0	40.0	22.0	30.0	10.0	10.0	10.0	10.0
スパイクノイズ Spike noise	mVp-p	72.0	70.0	38.0	50.0	20.0	28.0	20.0	28.0
出力電圧	V	3.34	3.34	4.96	4.96	11.97	11.97	11.96	11.96
半田状態 Solder condition		-	異常なし OK	-	異常なし OK	-	異常なし OK	-	異常なし OK

入力電圧 Vin:100VAC 出力電流 Io:100%		V4		V5	
		From	To	From	To
リップル電圧 Ripple voltage	mVp-p	10.0	20.0	34.0	30.0
スパイクノイズ Spike noise	mVp-p	30.0	38.0	58.0	60.0
出力電圧	V	-12.00	-12.00	4.95	4.95
半田状態 Solder condition		-	異常なし OK	-	異常なし OK