ZWX180

RELIABILITY DATA

信頼性データ

DWG No. A234-57-01		
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 : ZWX180

(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 ≒ 163,852 時間 (hours)

RCR-9102B

MTBF ≒ 89,580 時間 (hours)

2. 部品ディレーティング COMPONENT DERATING

MODEL : ZWX180

(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 3.3V	V2 5.0V	V3 12.0V	V4 -12.0V	V5 5.0V
1	6.0A	2.5A	4.1A	0.2A	1.4A
2	2.2A	5.0A	4.1A	0.2A	1.4A
3	0.9A	1.2A	6.0A	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 TK20A60T TOSHIBA	Tch (max) = 150℃ Pch= 2.48 W Tch= T c+ ((θch-c) × Pch)= 91.5 ℃ D.F. = 61.0 %	θch-c = 2.78 ℃/W ΔTc= 34.6 ℃	Pch (max) = 45W Tc= 84.6 ℃
Q2 2SK3568 TOSHIBA	Tch (max) = 150℃ Pch = 1.52 W Tch = Tc + ((θch-c) × Pch) = 87.2 ℃ D.F. = 58.1 %	θch-c = 3.125 ℃/W ΔTc = 32.4 ℃	Pch(max) = 40W Tc= 82.4 ℃
Q3 2SK3568 TOSHIBA	Tch (max) = 150℃ Pch = 1.77 W Tch = Tc + ((θch-c) × Pch) = 88.1 ℃ D.F. = 58.7 %	θch-c = 3.125 ℃/W ΔTc = 32.6 ℃	Pch(max) = 40W Tc= 82.6 ℃
Q51 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.27 W Tch = Tc + ((θch-c) × Pch) = 84.9 ℃ D.F. = 56.6 %	θch-c = 4.17 ℃/W ΔTc = 33.8 ℃	Pch (max) = 30W Tc= 83.8 ℃
Q52 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.31 W Tch = Tc + ((θch-c) × Pch) = 84.1 ℃ D.F. = 56.1 %	θch-c = 4.17 ℃/W ΔTc = 32.8 ℃	Pch (max) = 30W Tc= 82.8 ℃
Q61 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.66 W Tch = Tc + ((θch-c) × Pch) = 95.4 ℃ D.F. = 63.6 %	θch-c = 4.17 ℃/W ΔTc = 42.6 ℃	Pch (max) = 30W Tc= 92.6 ℃
Q62 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.17 W Tch = Tc + ((θch-c) × Pch) = 94.5 ℃ D.F. = 63.0 %	θch-c = 4.17 ℃/W ΔTc = 43.8 ℃	Pch (max) = 30W Tc= 93.8 ℃
Q701 2SA1419S SANYO	Tj (max) = 150℃ Pc = 0.36 W Tj = Tc + ((θj-c) × Pc) = 115.7 ℃ D.F. = 77.1 %	θj-c = 35.7 ℃/W ΔTc = 52.8 ℃	Pc (max) = 1.5W Tc= 102.8 ℃
D1 D3SB60 SHINDENGEN	Tj (max) = 150℃ Pd = 2.42 W Tj = Tc + ((θj-c) × Pd) = 94.8 ℃ D.F. = 63.2 %	θj-c = 1.9 ℃/W ΔTc = 40.2 ℃	Tc= 90.2 ℃
D2 SF5L60U SHINDENGEN	Tj (max) = 150℃ Pd = 1.80 W Tj = Tc + ((θj-c) × Pd) = 85.4 ℃ D.F. = 56.9 %	θj-c= 2.0 ℃/W ΔTc = 31.8 ℃	Tc= 81.8 ℃
D71 YG902C2R FUJI ELECTRIC	Tj (max) = 150℃ Pd = 1.43 W Tj = Tc + ((θj-c) × Pd) = 92.4 ℃ D.F. = 61.6 %	θj-c = 2.5 ℃/W ΔTc = 38.8 ℃	Tc= 88.8 ℃
D72 YG868C15R FUJI ELECTRIC	Tj (max) = 150℃ Pd = 4.10 W Tj = Tc + ((θj-c) × Pd) = 98.2 ℃ D.F. = 65.5 %	θj-c = 1.2℃/W ΔTc = 43.3 ℃	Tc= 93.3 ℃
D901 DE5SC6M SHINDENGEN	Tj (max) = 150℃ Pd = 1.20 W Tj = Tc + ((θj-c) × Pd) = 105.6 ℃ D.F. = 70.4 %	θj-c = 12 ℃/W ΔTc = 41.2 ℃	Tc= 91.2 ℃

部品番号 Location No.	Vin = 100VAC	Load = 100%	Ta = 50℃
A106 MIP2E2DMUL MATSUSHITA	Tch (max) = 150℃ Pch = 1.08 W Tch = Tc + ((θch-c) × Pch) = 109.9 ℃ D.F. = 73.3 %	θch-c = 10.0℃/W ΔTc = 49.1 ℃	Tc= 99.1 ℃
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) = 82.8 ℃ D.F. = 66.2 %	θj-c = 150℃/W ΔTc = 31.3 ℃	Pd(max)= 150mW Tc= 81.3 ℃
PC1 PS2581L1 (TRANSISTOR) NEC	Tj (max) = 125℃ Pc = 0.01 W Tj = Tc + ((θj-c) × Pc) = 82.8 ℃ D.F. = 66.2 %	θj-c = 150℃/W ΔTc = 31.3 ℃	Pc(max)= 150mW Tc= 81.3 ℃
PC91 PS2581L1 (LED) NEC	Tj (max) = 125℃ Pd = 0.04 W Tj = Tc + ((θj-c) × Pd) = 84.9 ℃ D.F. = 67.9 %	θj-c = 150℃/W ΔTc = 28.9 ℃	Pd(max)= 150mW Tc= 78.9 ℃
PC91 PS2581L1 (TRANSISTOR) NEC	Tj (max) = 125℃ Pc = 0.04 W Tj = Tc + ((θj-c) × Pc) = 84.9 ℃ D.F. = 67.9 %	θj-c = 150℃/W ΔTc = 28.9 ℃	Pc(max)= 150mW Tc= 78.9 ℃

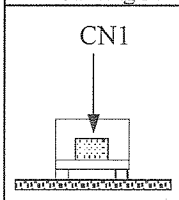
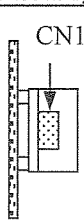
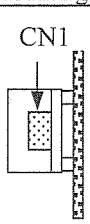
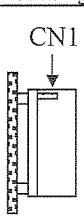
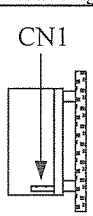
部品番号 Location No.	Vin = 200VAC	Load = 100%	Ta = 50℃
Q1 TK20A60T TOSHIBA	Tch (max) = 150℃ Pch= 2.38 W Tch= T c+ ((θch-c) × Pch)= 88.8 ℃ D.F. = 59.2 %	θch-c = 2.78 ℃/W ΔTc= 32.2 ℃	Pch (max) = 45W Tc= 82.2 ℃
Q2 2SK3568 TOSHIBA	Tch (max) = 150℃ Pch = 1.52 W Tch = Tc + ((θch-c) × Pch) = 86.3 ℃ D.F. = 57.5 %	θch-c = 3.125 ℃/W ΔTc = 31.5 ℃	Pch(max) = 40W Tc= 81.5 ℃
Q3 2SK3568 TOSHIBA	Tch (max) = 150℃ Pch = 1.77 W Tch = Tc + ((θch-c) × Pch) = 87.0 ℃ D.F. = 58.0 %	θch-c = 3.125 ℃/W ΔTc = 31.5 ℃	Pch(max) = 40W Tc= 81.5 ℃
Q51 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.27 W Tch = Tc + ((θch-c) × Pch) = 85.0 ℃ D.F. = 56.7 %	θch-c = 4.17 ℃/W ΔTc = 33.9 ℃	Pch (max) = 30W Tc= 83.9 ℃
Q52 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.31 W Tch = Tc + ((θch-c) × Pch) = 84.1 ℃ D.F. = 56.1 %	θch-c = 4.17 ℃/W ΔTc = 32.8 ℃	Pch (max) = 30W Tc= 82.8 ℃
Q61 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.66 W Tch = Tc + ((θch-c) × Pch) = 95.1 ℃ D.F. = 63.4 %	θch-c = 4.17 ℃/W ΔTc = 42.3 ℃	Pch (max) = 30W Tc= 92.3 ℃
Q62 H7N0308CF RENESAS	Tch (max) = 150℃ Pch = 0.17 W Tch = Tc + ((θch-c) × Pch) = 94.3 ℃ D.F. = 62.9 %	θch-c = 4.17 ℃/W ΔTc = 43.6 ℃	Pch (max) = 30W Tc= 93.6 ℃
Q701 2SA1419S SANYO	Tj (max) = 150℃ Pc = 0.36 W Tj = Tc + ((θj-c) × Pc) = 116.1 ℃ D.F. = 77.4 %	θj-c = 35.7 ℃/W ΔTc = 53.2 ℃	Pc (max) = 1.5W Tc= 103.2 ℃
D1 D3SB60 SHINDENGEN	Tj (max) = 150℃ Pd = 1.26 W Tj = Tc + ((θj-c) × Pd) = 74.0 ℃ D.F. = 49.3 %	θj-c = 1.9 ℃/W ΔTc = 21.6 ℃	Tc= 71.6 ℃
D2 SF5L60U SHINDENGEN	Tj (max) = 150℃ Pd = 1.56 W Tj = Tc + ((θj-c) × Pd) = 82.7 ℃ D.F. = 55.1 %	θj-c= 2.0 ℃/W ΔTc = 29.6 ℃	Tc= 79.6 ℃
D71 YG902C2R FUJI ELECTRIC	Tj (max) = 150℃ Pd = 1.43 W Tj = Tc + ((θj-c) × Pd) = 92.2 ℃ D.F. = 61.5 %	θj-c = 2.5 ℃/W ΔTc = 38.6 ℃	Tc= 88.6 ℃
D72 YG868C15R FUJI ELECTRIC	Tj (max) = 150℃ Pd = 4.10 W Tj = Tc + ((θj-c) × Pd) = 98.3 ℃ D.F. = 65.5 %	θj-c = 1.2℃/W ΔTc = 43.4 ℃	Tc= 93.4 ℃
D901 DE5SC6M SHINDENGEN	Tj (max) = 150℃ Pd = 1.20 W Tj = Tc + ((θj-c) × Pd) = 105.4 ℃ D.F. = 70.3 %	θj-c = 12 ℃/W ΔTc = 41.0 ℃	Tc= 91.0 ℃

部品番号 Location No.	Vin = 200VAC	Load = 100%	Ta = 50℃
A106 MIP2E2DMUL MATSUSHITA	Tch (max) = 150℃ Pch = 1.08 W Tch = Tc + ((θch-c) × Pch) = 109.4 ℃ D.F. = 72.9 %	θch-c = 10.0℃/W ΔTc = 48.6 ℃	Tc= 98.6 ℃
A801 TA58M12F TOSHIBA	Tj (max) = 150℃ Pd = 0.26 W Tj = Tc + ((θj-c) × Pd) = 97.6 ℃ D.F. = 65.1 %	θj-c= 12.5℃/W ΔTc = 44.3 ℃	Pd(max)= 1W Tc= 94.3 ℃
PC1 PS2581L1 (LED) NEC	Tj (max) = 125℃ Pd = 0.01 W Tj = Tc + ((θj-c) × Pd) = 82.2 ℃ D.F. = 65.8 %	θj-c = 150℃/W ΔTc = 30.7 ℃	Pd(max)= 150mW Tc= 80.7 ℃
PC1 PS2581L1 (TRANSISTOR) NEC	Tj (max) = 125℃ Pc = 0.01 W Tj = Tc + ((θj-c) × Pc) = 82.2 ℃ D.F. = 65.8 %	θj-c = 150℃/W ΔTc = 30.7 ℃	Pc(max)= 150mW Tc= 80.7 ℃
PC91 PS2581L1 (LED) NEC	Tj (max) = 125℃ Pd = 0.04 W Tj = Tc + ((θj-c) × Pd) = 85.2 ℃ D.F. = 68.2 %	θj-c = 150℃/W ΔTc = 29.2 ℃	Pd(max)= 150mW Tc= 79.2 ℃
PC91 PS2581L1 (TRANSISTOR) NEC	Tj (max) = 125℃ Pc = 0.04 W Tj = Tc + ((θj-c) × Pc) = 85.2 ℃ D.F. = 68.2 %	θj-c = 150℃/W ΔTc = 29.2 ℃	Pc(max)= 150mW Tc= 79.2 ℃

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

MODEL : ZWX180

・測定条件 Measuring Conditions

		Mounting A	Mounting B	Mounting C	Mounting D	Mounting E
取付方法 Mounting Method (標準取付 : A) (Standard Mounting Method : A)						
入力電圧 Input Voltage (VAC)		100VAC				
		V1	V2	V3	V4	V5
出力電圧 Output Voltage (VDC)		3.3	5.0	12.0	-12.0	5.0
出力電流 Output Current (A)	1	6.0	2.5	4.1	0.2	1.4
	2	2.2	5.0	4.1	0.2	1.4
	3	0.9	1.2	6.0	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.

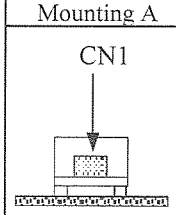
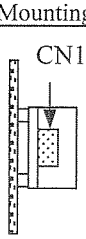
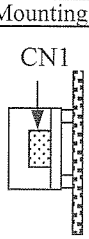
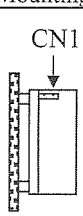
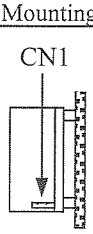
*COOLING : CONVECTION COOLING

		ΔT Temperature Rise (℃)				
出力ディレーティング Output Derating (%) Ta=50℃		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	34.6	31.5	35.4	37.4	35.3
Q2	MOS FET	32.4	30.5	33.5	35.3	35.3
Q3	MOS FET	32.6	31.5	33.2	35.9	36.4
Q51	MOS FET	33.8	31.0	22.2	26.0	30.6
Q52	MOS FET	32.8	30.2	22.1	25.3	31.1
Q61	MOS FET	42.6	34.0	30.8	33.2	39.4
Q62	MOS FET	43.8	34.6	30.0	32.8	39.5
Q701	CHIP TRANSISTOR	52.8	46.4	54.2	49.8	57.7
D1	BRIDGE DIODE	40.2	32.0	25.2	32.2	26.1
D2	F.R.D	31.8	29.1	32.0	34.1	32.7
D71	L.L.D	38.8	30.7	33.0	31.4	37.4
D72	S.B.D	43.3	33.0	35.6	33.1	40.1
D901	CHIP SBD	41.2	31.8	23.1	28.7	30.6
A102	CHIP IC	34.3	28.9	28.4	33.8	29.6
A105	CHIP IC	33.9	32.1	28.7	34.9	34.6
A106	CHIP IC	49.1	38.9	31.0	38.0	37.1
A801	CHIP IC	45.0	37.2	34.4	34.1	45.4
T1	DRIVE TRANS	25.4	25.7	23.1	31.4	31.6
T2	TRANS	36.4	32.5	32.4	36.6	38.3
T3	TRANS	28.0	23.7	18.2	22.7	21.5
T51	CURRENT TRANS	27.2	25.2	19.5	24.6	27.9
L1	BALUN	23.6	22.1	12.5	19.7	12.9
L2	BALUN	23.0	21.1	11.1	18.0	12.8
L3	CHOKE COIL	38.8	31.5	30.6	35.4	29.5
L51	CHOKE COIL	44.1	36.9	32.0	33.3	41.2
L61	CHOKE COIL	44.2	31.6	30.6	28.1	38.7
L71	MAGAMP COIL	48.1	40.3	42.4	44.7	48.2
L72	CHOKE COIL	55.5	40.2	38.6	35.8	44.6
L91	CHOKE COIL	34.9	29.9	22.1	27.2	29.5
C10	E.CAP.	26.2	21.2	20.2	23.8	22.2
C12	E.CAP.	28.4	23.9	21.9	27.2	21.1
C13	E.CAP.	26.7	24.2	20.1	25.1	24.9
C52	E.CAP.	24.6	20.8	15.6	16.3	27.3
C61	E.CAP.	27.8	20.6	20.4	17.6	30.0
C71	E.CAP.	25.5	20.5	20.7	16.9	28.8
C81	E.CAP.	36.3	28.4	25.7	24.8	36.7
C82	E.CAP.	34.4	27.2	25.1	22.9	36.6
C91	E.CAP.	28.7	23.3	16.8	21.6	23.0
C92	E.CAP.	32.0	28.7	20.2	25.9	27.9
PC1	PHOTO COUPLER	31.3	27.8	25.1	31.1	33.3
PC91	PHOTO COUPLER	28.9	27.3	19.3	26.7	27.1

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

MODEL : ZWX180

・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	V4	V5
出力電圧 Output Voltage (VDC)		3.3	5.0	12.0	-12.0	5.0
出力電流 Output Current (A)	1	6.0	2.5	4.1	0.2	1.4
	2	2.2	5.0	4.1	0.2	1.4
	3	0.9	1.2	6.0	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	32.2	34.3	35.8	39.3	35.7
Q2	MOS FET	31.5	31.4	32.9	35.9	34.7
Q3	MOS FET	31.5	32.5	33.0	36.7	36.1
Q51	MOS FET	33.9	31.3	22.1	25.7	28.7
Q52	MOS FET	32.8	30.5	22.0	24.9	29.2
Q61	MOS FET	42.3	34.6	30.3	32.8	38.3
Q62	MOS FET	43.6	35.2	29.6	32.4	38.2
Q701	CHIP TRANSISTOR	53.2	47.4	53.4	50.4	56.6
D1	BRIDGE DIODE	21.6	22.6	15.3	23.7	15.4
D2	F.R.D	29.6	30.1	31.3	34.6	32.2
D71	L.L.D	38.6	31.1	32.9	31.9	37.6
D72	S.B.D	43.4	33.4	35.5	33.7	40.2
D901	CHIP SBD	41.0	32.3	23.0	28.4	28.8
A102	CHIP IC	29.7	27.5	25.1	32.3	26.3
A105	CHIP IC	33.6	31.8	27.9	34.6	32.1
A106	CHIP IC	48.6	38.7	30.7	37.4	35.2
A801	CHIP IC	44.3	37.7	35.0	33.7	44.1
T1	DRIVE TRANS	26.2	25.7	22.6	31.5	29.5
T2	TRANS	36.3	32.6	31.8	36.6	37.2
T3	TRANS	27.5	23.6	18.0	22.4	19.8
T51	CURRENT TRANS	27.1	25.7	19.3	24.4	26.0
L1	BALUN	10.5	15.9	7.4	15.1	7.6
L2	BALUN	12.6	15.9	7.1	14.6	8.0
L3	CHOKE COIL	24.8	24.3	21.7	27.9	20.6
L51	CHOKE COIL	43.6	37.3	32.2	33.3	40.1
L61	CHOKE COIL	43.7	32.0	29.9	27.9	38.4
L71	MAGAMP COIL	48.6	40.9	42.0	45.1	47.9
L72	CHOKE COIL	56.0	40.5	39.1	36.6	44.5
L91	CHOKE COIL	34.8	30.3	21.6	26.9	28.0
C10	E.CAP.	23.5	20.2	17.9	23.1	19.5
C12	E.CAP.	21.3	21.7	17.2	24.9	17.2
C13	E.CAP.	25.7	23.4	18.6	24.7	21.5
C52	E.CAP.	24.0	21.3	15.9	16.1	26.1
C61	E.CAP.	27.6	20.6	19.9	17.4	29.8
C71	E.CAP.	25.4	20.7	20.3	17.3	28.5
C81	E.CAP.	37.0	28.8	25.9	24.5	35.4
C82	E.CAP.	34.4	27.6	25.1	22.5	35.8
C91	E.CAP.	27.7	23.8	16.8	21.2	21.4
C92	E.CAP.	31.7	29.1	19.7	25.6	26.5
PC1	PHOTO COUPLER	30.7	28.2	24.7	30.9	31.1
PC91	PHOTO COUPLER	29.2	27.4	19.2	26.5	25.1

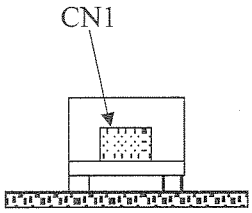
4.電解コンデンサ推定寿命計算値　Electrolytic capacitor lifetime

MODEL : ZWX180

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

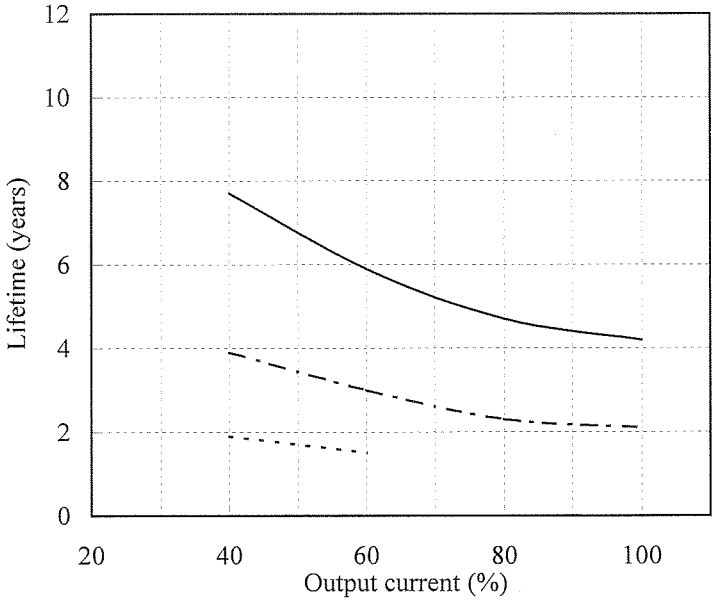
Conditions　Ta　40℃ : ——
50℃ : —·—·
60℃ : - - - -

取付方向 A
Mounting A



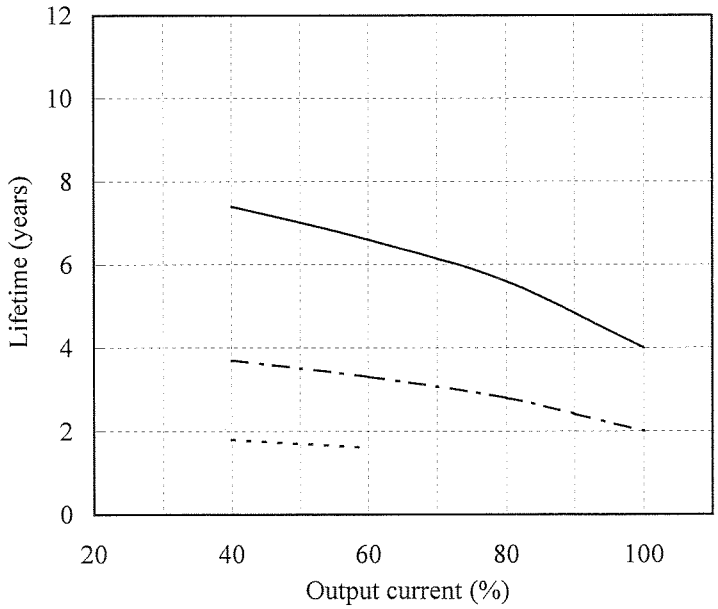
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 50℃	Ta= 60℃
40	7.7	3.9	1.9
60	5.9	3.0	1.5
80	4.7	2.3	-
100	4.2	2.1	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 50℃	Ta= 60℃
40	7.4	3.7	1.8
60	6.6	3.3	1.6
80	5.6	2.8	-
100	4.0	2.0	-

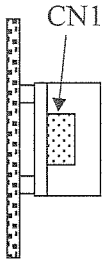


電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180

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

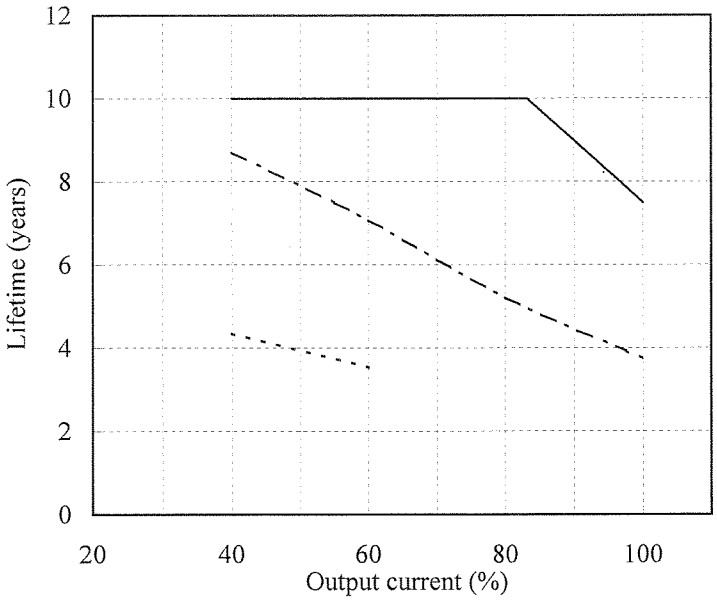
取付方向 B
Mounting B



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

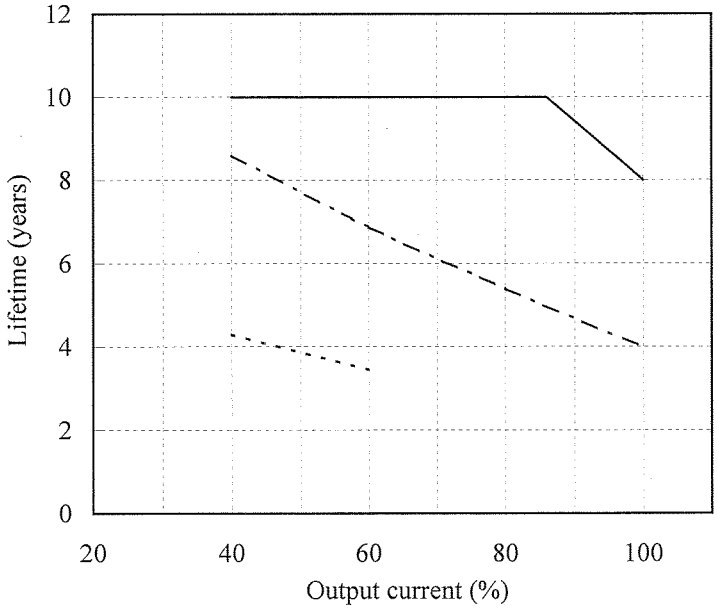
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	8.7	4.3
60	10.0	7.1	3.5
80	10.0	5.2	-
100	7.5	3.7	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	8.6	4.3
60	10.0	6.9	3.4
80	10.0	5.4	-
100	8.0	4.0	-



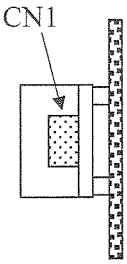
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180

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

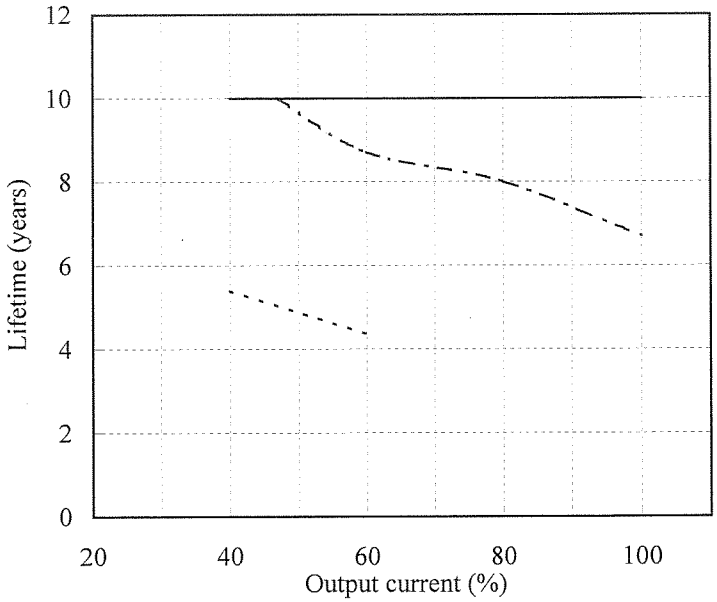
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 C
Mounting C



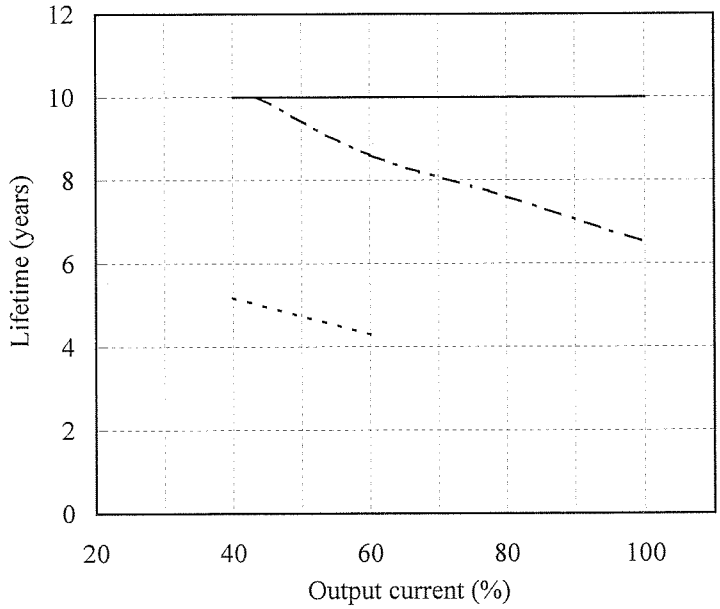
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.4
60	10.0	8.7	4.3
80	10.0	8.0	-
100	10.0	6.7	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.2
60	10.0	8.6	4.3
80	10.0	7.6	-
100	10.0	6.5	-

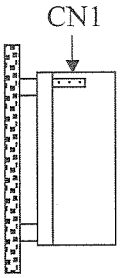


電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180

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

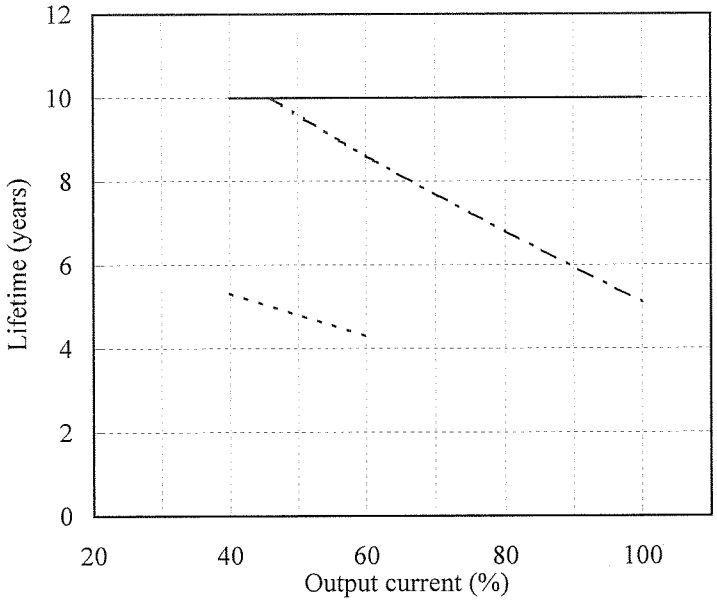
取付方向 D
Mounting D



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

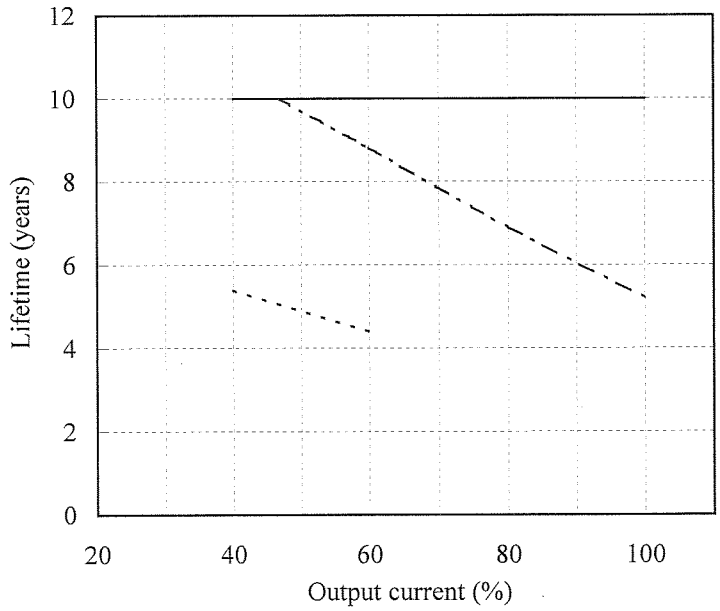
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.3
60	10.0	8.6	4.3
80	10.0	6.8	-
100	10.0	5.1	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.4
60	10.0	8.8	4.4
80	10.0	6.9	-
100	10.0	5.2	-



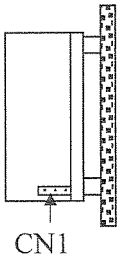
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180

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

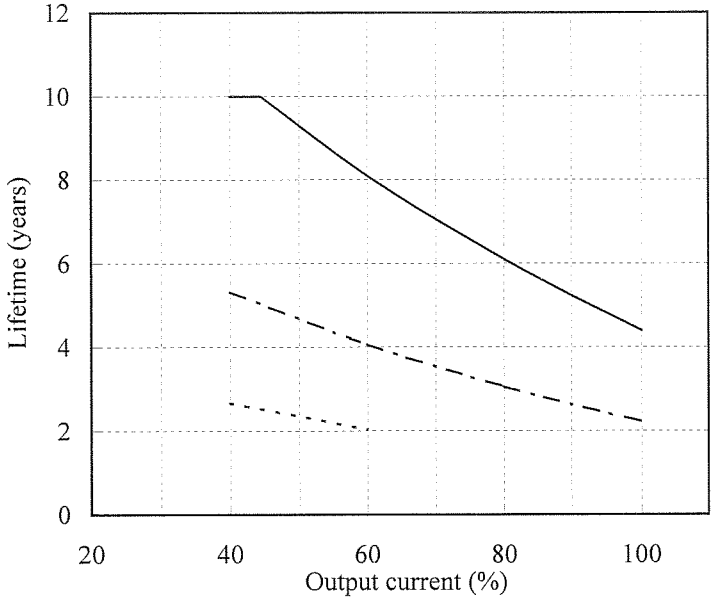
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 E
Mounting E



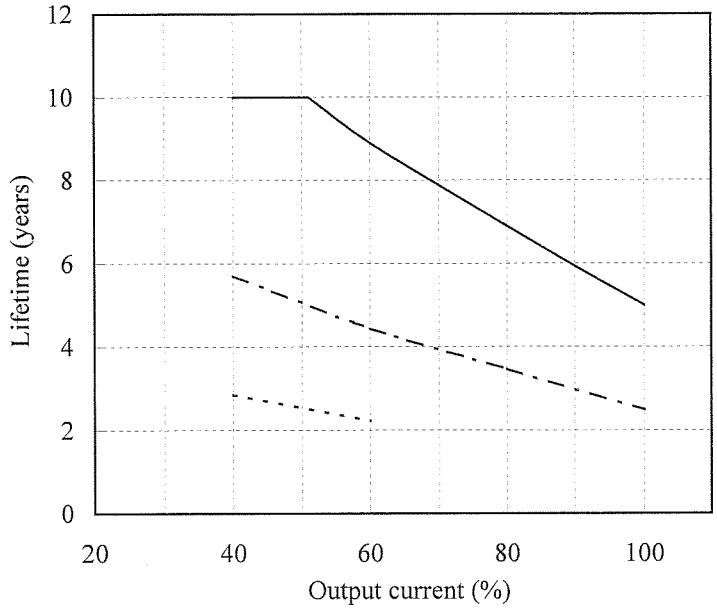
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	5.3	2.7
60	8.1	4.1	2.0
80	6.1	3.1	-
100	4.4	2.2	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	5.7	2.9
60	8.9	4.4	2.2
80	6.9	3.5	-
100	5.0	2.5	-



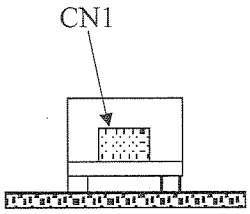
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

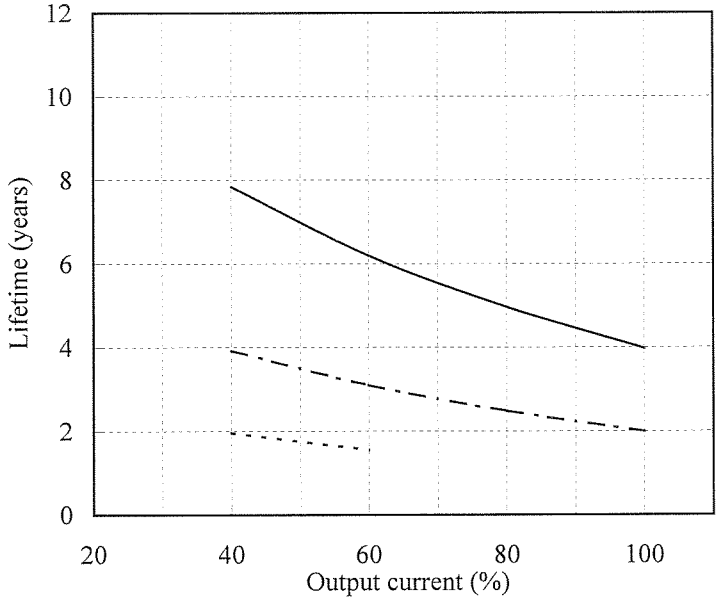
Conditions　Ta　40℃ : ——
50℃ : —·—·
60℃ : - - - -

取付方向 A
Mounting A



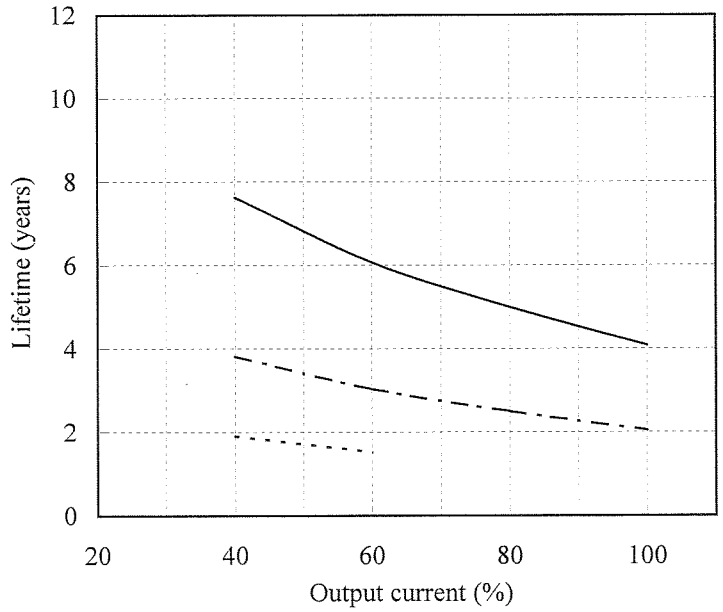
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 50℃	Ta= 60℃
40	7.8	3.9	2.0
60	6.2	3.1	1.5
80	5.0	2.5	-
100	4.0	2.0	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 50℃	Ta= 60℃
40	7.6	3.8	1.9
60	6.1	3.0	1.5
80	5.0	2.5	-
100	4.1	2.0	-



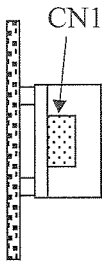
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

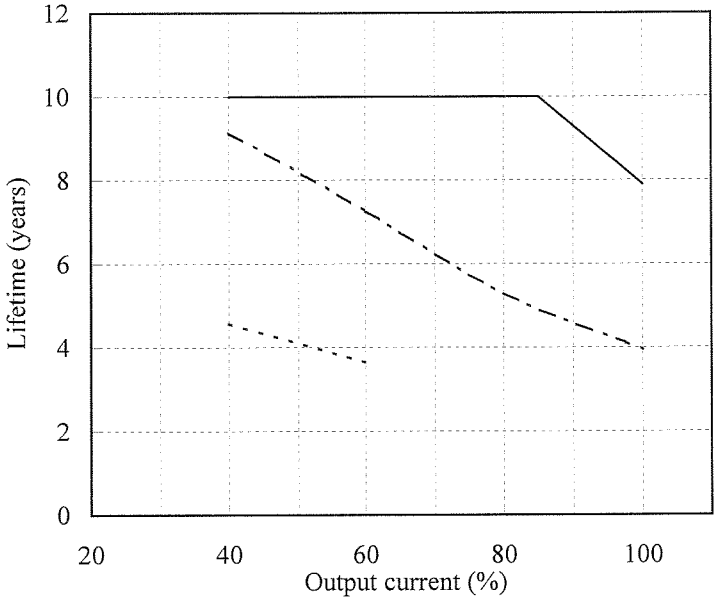
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 B
Mounting B



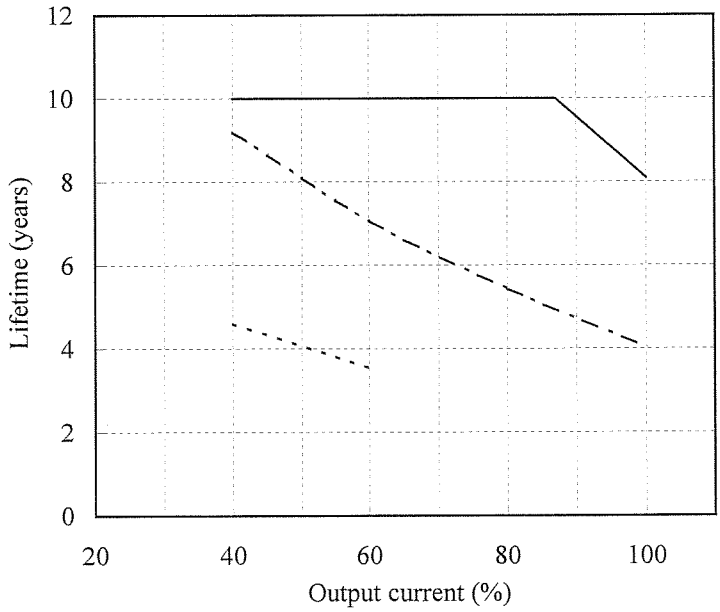
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	9.1	4.6
60	10.0	7.3	3.6
80	10.0	5.3	-
100	7.9	3.9	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	9.2	4.6
60	10.0	7.1	3.5
80	10.0	5.4	-
100	8.1	4.0	-



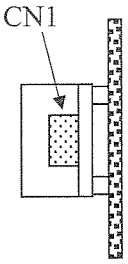
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

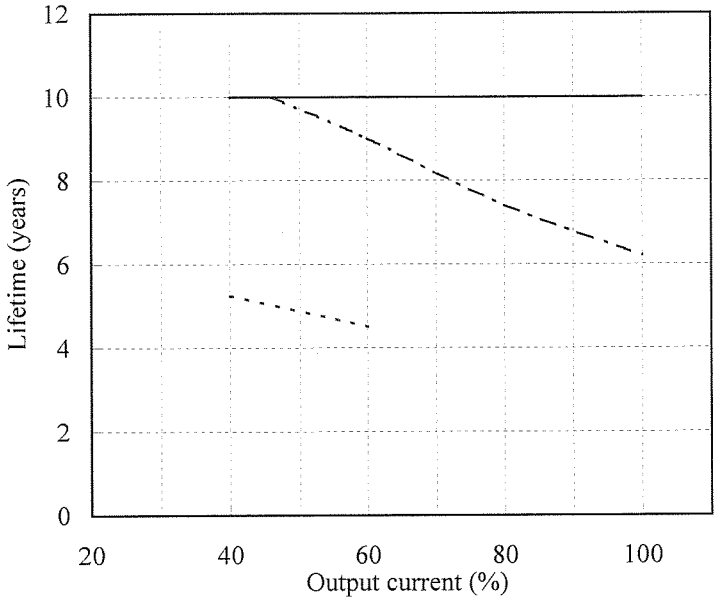
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 C
Mounting C



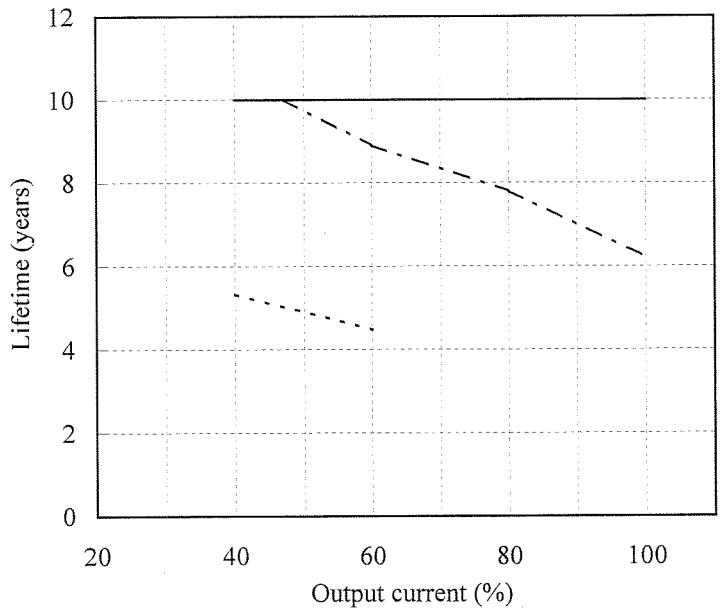
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.2
60	10.0	9.0	4.5
80	10.0	7.4	-
100	10.0	6.2	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.3
60	10.0	8.9	4.5
80	10.0	7.8	-
100	10.0	6.2	-



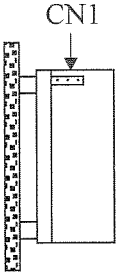
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

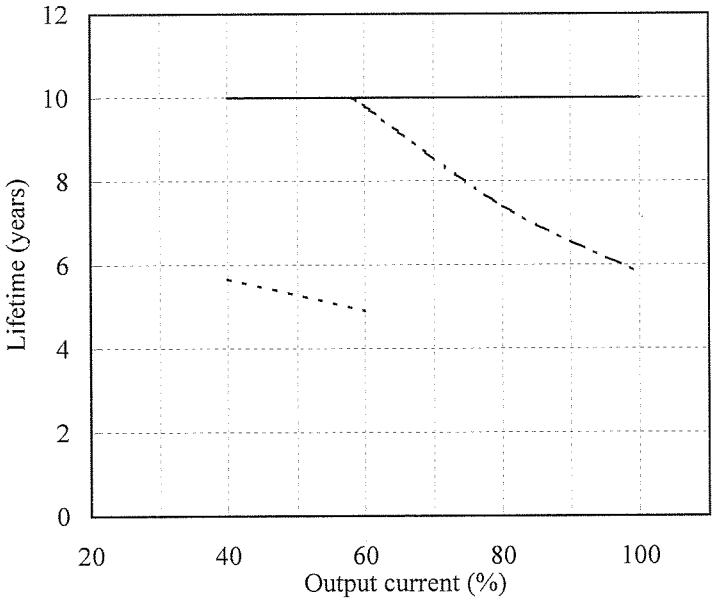
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 D
Mounting D



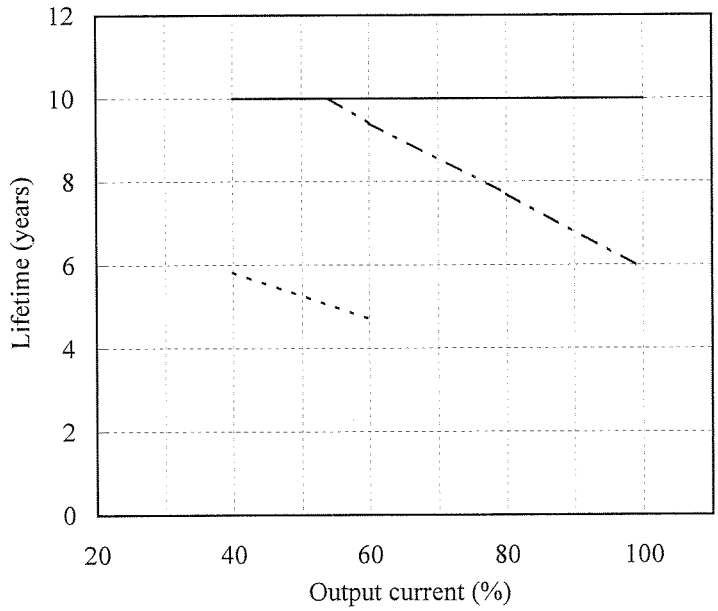
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.7
60	10.0	9.8	4.9
80	10.0	7.4	-
100	10.0	5.8	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	10.0	5.8
60	10.0	9.4	4.7
80	10.0	7.7	-
100	10.0	5.9	-



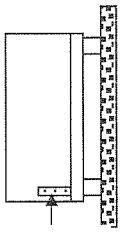
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

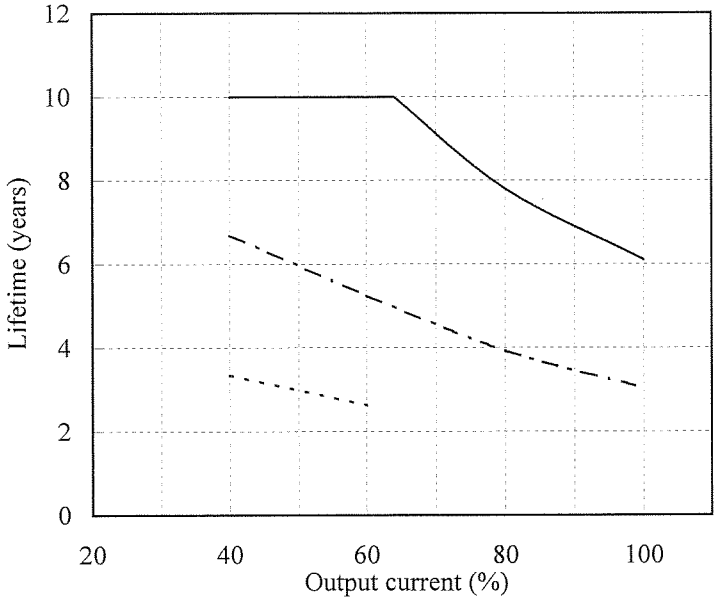
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 E
Mounting E



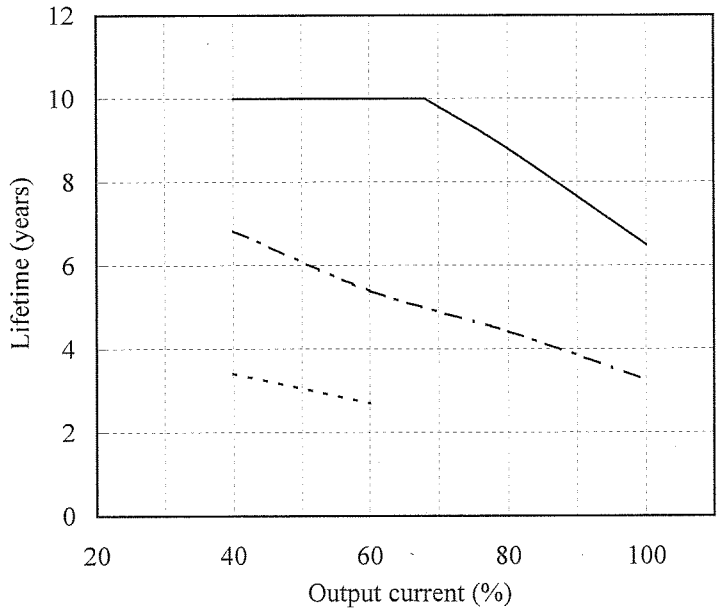
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	6.7	3.3
60	10.0	5.2	2.6
80	7.8	3.9	-
100	6.1	3.0	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	6.8	3.4
60	10.0	5.4	2.7
80	8.8	4.4	-
100	6.5	3.3	-



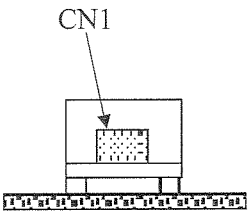
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

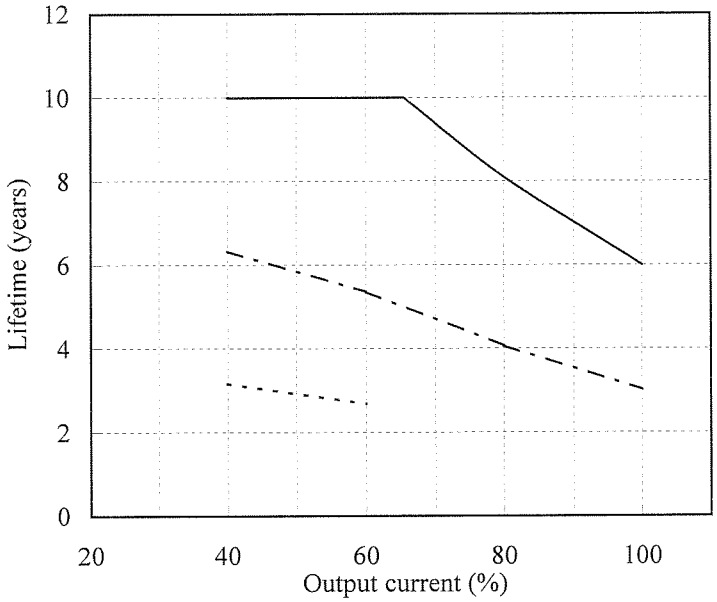
Conditions　Ta　30℃ : ——
40℃ : —·—·
50℃ : - - - -

取付方向 A
Mounting A



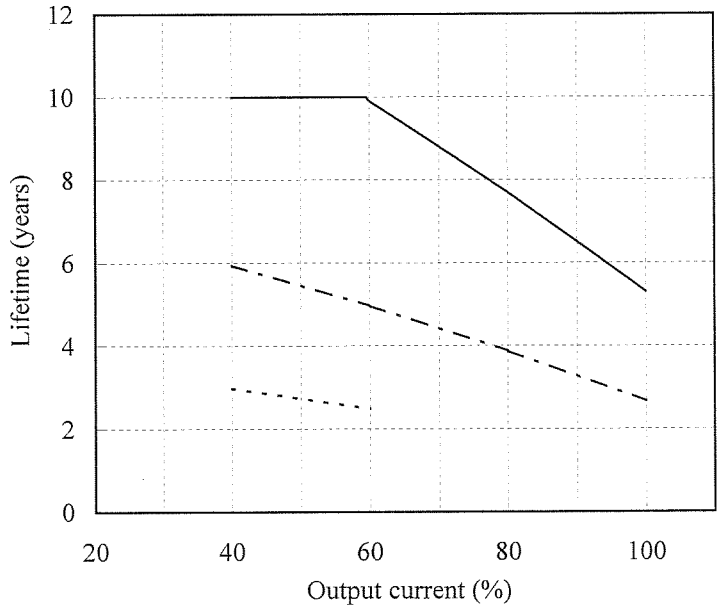
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	6.3	3.2
60	10.0	5.4	2.7
80	8.1	4.1	-
100	6.0	3.0	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	5.9	3.0
60	9.9	5.0	2.5
80	7.7	3.9	-
100	5.3	2.7	-



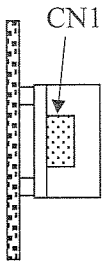
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

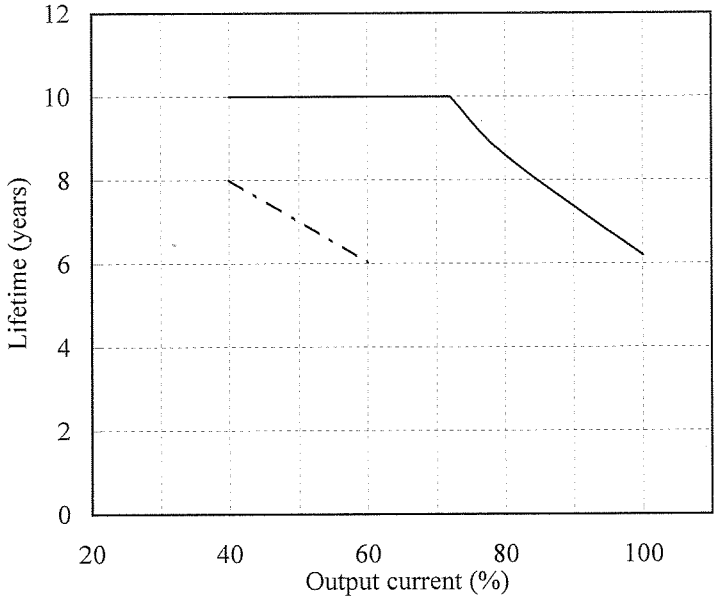
Conditions　Ta　30℃：——
40℃：—·—·

取付方向 B
Mounting B



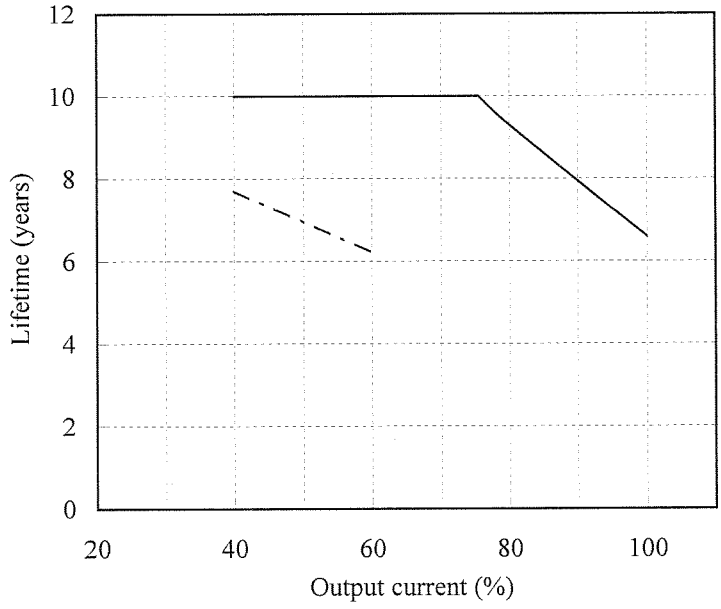
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	8.0	-
60	10.0	6.0	-
80	8.6	-	-
100	6.2	-	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	7.7	-
60	10.0	6.2	-
80	9.3	-	-
100	6.6	-	-



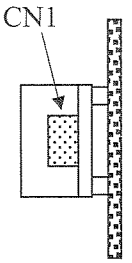
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

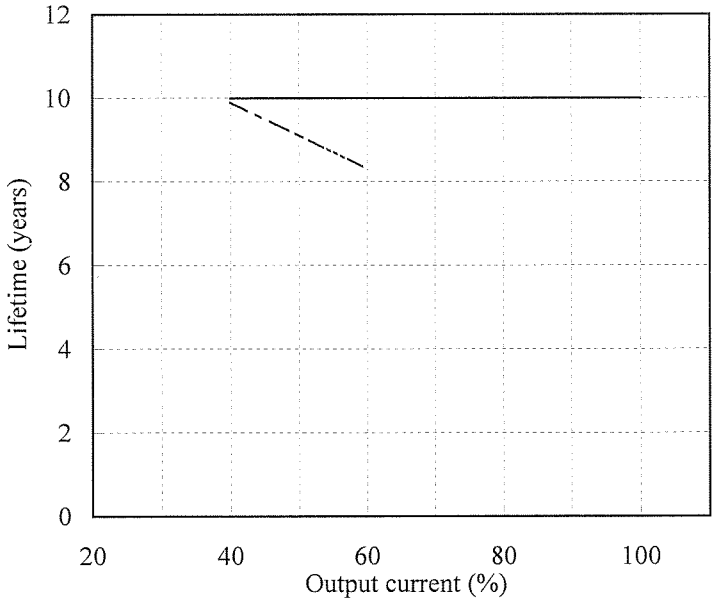
Conditions　Ta　30℃ : ——
40℃ : —·—·

取付方向 C
Mounting C



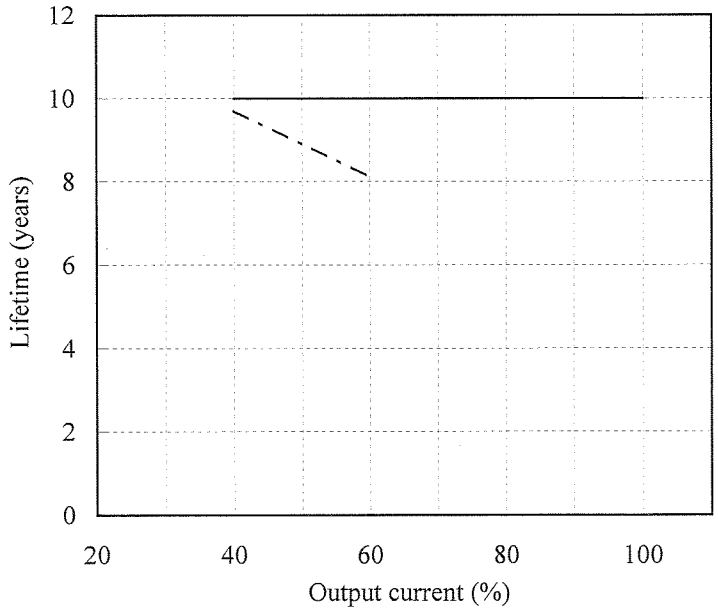
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	9.9	-
60	10.0	8.3	-
80	10.0	-	-
100	10.0	-	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	9.7	-
60	10.0	8.1	-
80	10.0	-	-
100	10.0	-	-



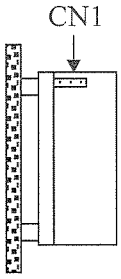
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

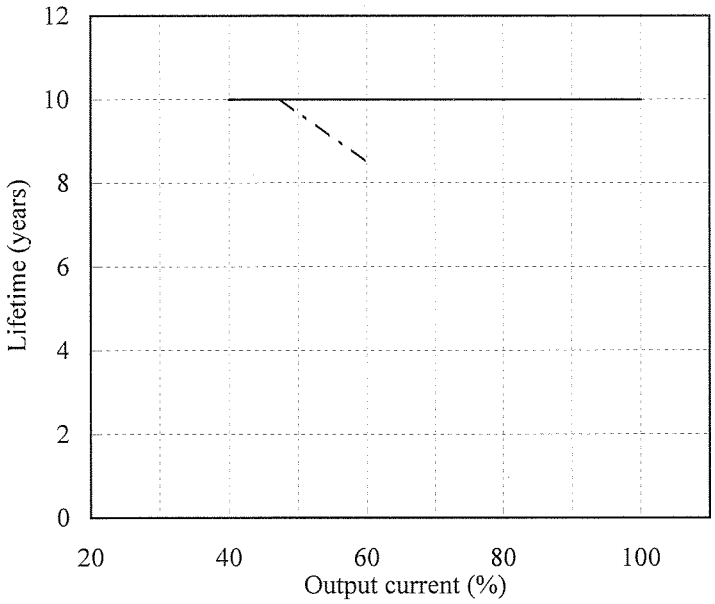
Conditions　Ta　30℃：——
40℃：—·—·

取付方向 D
Mounting D



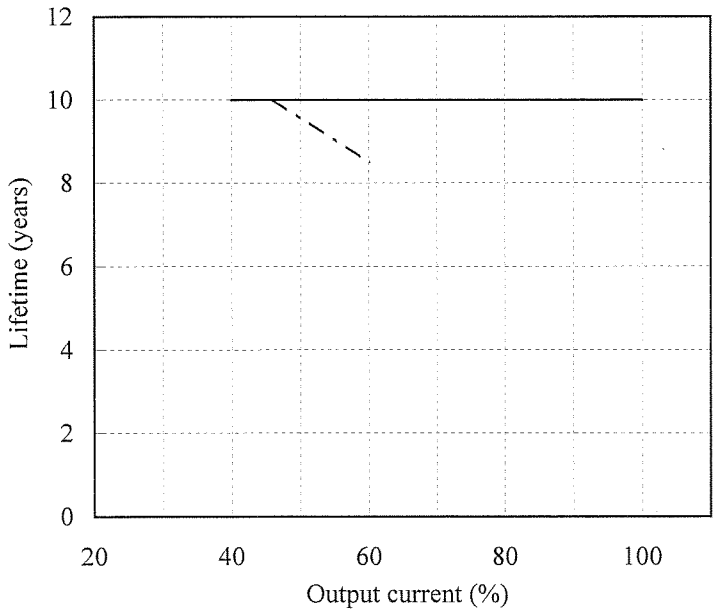
Vin=100VAC

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



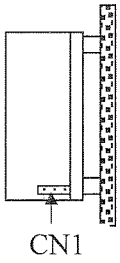
電解コンデンサ推定寿命計算値　**Electrolytic capacitor lifetime**

MODEL : ZWX180/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

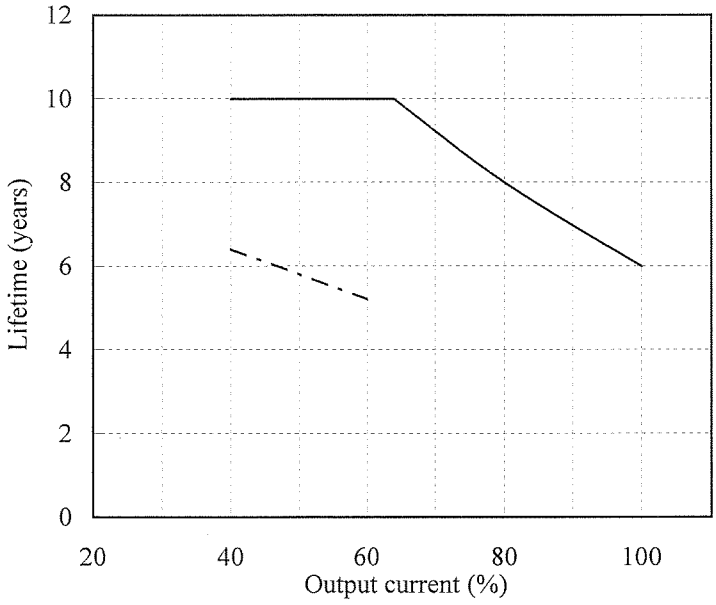
Conditions　Ta　30℃ : ——
40℃ : —·—·

取付方向 E
Mounting E



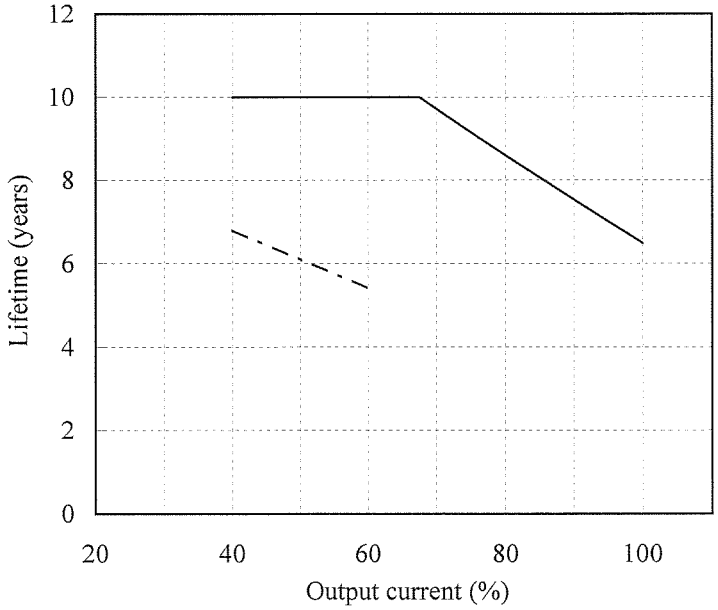
Vin=100VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	6.4	-
60	10.0	5.2	-
80	8.0	-	-
100	6.0	-	-



Vin=200VAC

Load (%)	Lifetime (years)		
	Ta= 30℃	Ta= 40℃	Ta= 50℃
40	10.0	6.8	-
60	10.0	5.4	-
80	8.6	-	-
100	6.5	-	-



5.Abnormal test

MODEL : ZWX180

(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 Da:D105,D106,R1
2		D-G	○							○	○			○			Fuse blown:F1 Da:Q1,D105,D106,R1
3		G-S	○													○	Power Factor low
4		D		○												○	Power Factor low
5		S		○												○	Power Factor low
6		G		○						○	○			○			Fuse blown:F1 Da:Q1,D105,D106,R1
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												
					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
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,D105,D106,R1
48		A-K		○						○	○			○			Fuse blown:F1 Da:Q1,D105,D106,R1
49	D71	A-K	○											○			No output V1,V3
50		A-K		○										○			No output V1,V3
51	D72	A-K	○											○			No output except V5
52		A-K		○												○	Input power increase
53	C10	-	○							○	○			○			Fuse blown:F1 Da:Q1,D105,D106,R1
54		-		○											○		

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	
55	T1	1-2	○											○		○	No output except V5 The output voltage of V5 changes from 0V to 5V
56		6-7	○											○		○	No output except V5 The output voltage of V5 changes from 0V to 5V
57		1		○										○			No output except V5
58		2		○										○			No output except V5
59		6		○										○			No output except V5
60		7		○										○			No output except V5
61	T2	3-4	○											○			No output except V5
62		7-8	○											○			No output except V5
63		8-9	○												○		
64		9-10	○											○			No output except V5
65		10-11	○											○			No output except V5
66		11-12	○											○			No output except V5
67		3	○											○			No output except V5
68		7		○										○			No output V1,V3
69		9		○										○			No output V1
70		10		○										○			No output V1,V2,V4
71	T3	1-2	○											○			No output all CH
72		2-3	○							○	○			○			Fuse blown:F2,F101 Da:A101,A102,A106, D105,D106,R180
73		3-4	○											○			No output all CH
74		5-6	○											○			No output all CH
75		1		○										○			No output all CH
76		3		○										○			No output all CH
77		5		○										○			No output all CH
78	T51	1-2	○												○		
79		3-4	○												○		
80		1		○										○			No output V1
81		2		○										○			No output V1
82		3		○											○		
83		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
84	L1	1		○										○			No output all CH
85		2		○										○			No output all CH
86		3		○										○			No output all CH
87		4		○										○			No output all CH
88	L2	1		○										○			No output all CH
89		2		○										○			No output all CH
90		3		○										○			No output all CH
91		4		○										○			No output all CH
92	L3	3,4-9,10	○							○	○			○			Fuse blown:F1 Da:Q1,D105,D106,R1
93		3,4		○										○			No output all CH
94	L51	1,2-3	○											○			No output except V5
95		4,5-6	○											○			No output except V5
96		4,5		○										○			No output V2,V4
97		6		○										○			No output V4
98	L61	1,2,3-4,5,6	○											○			No output except V5
99		4,5,6		○										○			No output V1
100	L71	2-4	○											○			No output except V5
101		4		○										○			No output V1,V3
102	L72	2,3-7,8	○											○			No output except V5
103		2,3		○										○			No output V1,V3
104	L91	-	○												○		
105		-		○										○			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
106	Q101	D-S	○											○		○
107		D-G	○											○		○
108		G-S	○											○		
109		D		○										○		
110		S		○										○		
111		G		○										○		
112	Q102	C-E	○											○		
113		B-E	○													○
114		B-C	○											○		
115		C		○												○
116		E		○										○		
117		B		○										○		
118	Q107	C-E	○											○		
119		B-E	○												○	
120		B-C	○											○		
121		C		○											○	
122		E		○						○	○			○		
123		B		○						○	○			○		
124	Q501	D-S	○													○
125		D-G	○											○		
126		G-S	○							○						○
127		D		○												○
128		S		○												○
129		G		○												○

No.	Note
106	No output except V5 The output voltage of V5 changes from 0 to 5V
107	No output except V5 The output voltage of V5 changes from 0 to 5V
108	No output except V5
109	No output except V5
110	No output except V5
111	No output except V5
112	No output except V5
113	Input power increase
114	No output except V5
115	Input power increase
116	No output except V5
117	No output except V5
118	No output except V5
119	
120	No output except V5
121	
122	Fuse blown:F1 Da:Q1,D105,D106,R1
123	Fuse blown:F1 Da:Q1,D105,D106,R1
124	Input power increase
125	No output except V5
126	Input power increase Da:Q501
127	Input power increase The output voltage of V2 and V4 decreases
128	Input power increase The output voltage of V2 and V4 decreases
129	Input power increase The output voltage of V2 and V4 decreases

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
130	A106	D-S	○							○	○			○			Fuse blown:F2 Da:F101
131		D-CON	○							○	○			○			Fuse blown:F2 Da:F101,A106,A107, PC91,Q111,Q112
132		CON-S	○							○	○			○			Fuse blown:F101 Da:A106
133		D		○										○			No output all CH
134		S		○										○			No output all CH
135		CON		○										○			No output all CH
136	A801	I-GND	○											○			No output except V5
137		O-GND	○						○				○	○			No output V4
138		I-O	○													○	The output voltage of V4 rises
139		I		○										○			No output V4
140		O		○										○			No output V4
141		GND		○										○			No output V4
142	D109	A-K	○								○			○			Fuse blown:F2
143		A-K		○											○		
144	D110	A-K	○											○			No output except V5
145		A-K		○											○		
146	D801	A-K	○											○			No output except V5
147		A-K		○										○			No output V4
148	D901	A-K	○											○			No output all CH
149		A-K		○										○			No output all CH

6. 振動試験 VIBRATION TEST

MODEL : ZWX180

(1) 振動試験種類 Vibration test class

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

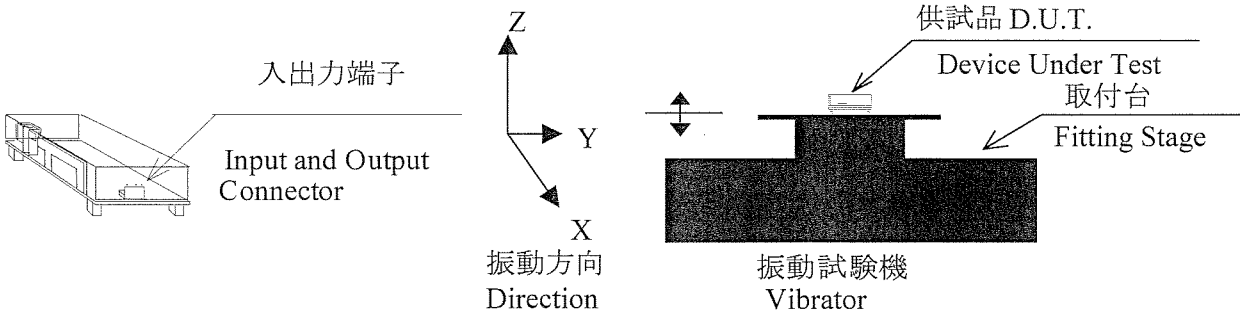
(2) 使用振動試験装置 Equipment used

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

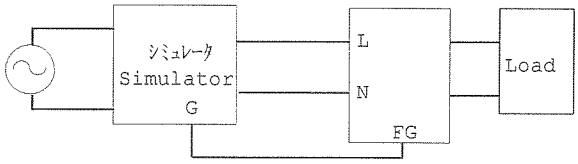
合格 OK

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	V4	V5	V1	V2	V3	V4	V5	
試験前 Before Test	-	3.33	4.97	12.00	-12.00	4.98	22.4	40.2	23.8	17.0	28.8	-
試験後 After Test	X	3.33	4.97	12.00	-12.00	4.98	20.0	36.0	23.8	16.0	30.0	異常なし OK
	Y	3.33	4.97	12.00	-12.00	4.98	20.0	36.0	23.8	16.0	30.0	異常なし OK
	Z	3.33	4.97	12.00	-12.00	4.98	20.0	36.0	23.8	16.0	30.0	異常なし OK

7. ノイズシミュレート試験 NOISE SIMULATE TEST

MODEL : ZWX180

(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

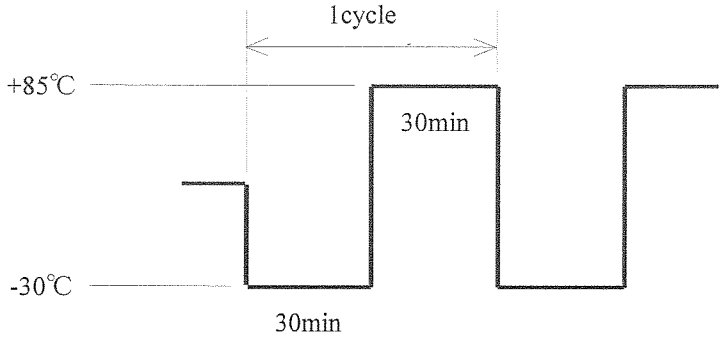
MODEL : ZWX180

(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		V4		V5	
		From	To	From	To	From	To	From	To	From	To
リップル電圧 Ripple voltage	mVp-p	24.0	30.0	31.0	35.0	33.0	36.0	17.0	20.0	44.0	46.0
スパイクノイズ Spike noise	mVp-p	55.0	60.0	78.0	80.0	66.0	76.0	32.0	30.0	91.0	98.0
出力電圧	V	3.31	3.31	4.89	4.89	11.85	11.85	-12.10	-12.10	4.98	4.98
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	-	異常なし OK