

ZWS150BAF

RELIABILITY DATA

信頼性データ

DWG No. A250-57-01		
APPD	CHK	DWG
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※ 試験結果は、代表データであります。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 : ZWS150BAF-5

(1) 算出方法 Calculating Method

JEITA (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-9102B).
 Individual failure rates λ_G is given to each part and MTBF is calculated
 by the count of each part.

<算出式>

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

λ_{equip} : 全機器故障率 (故障数/10⁶時間)
 Total Equipment Failure Rate (Failure/10⁶Hours)

λ_G : i番目の同属部品に対する故障率 (故障数/10⁶時間)
 Generic Failure Rate for The ith Generic Part (Failure/10⁶Hours)

n_i : 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 ($\pi_Q=1$)
 Generic Quality Factor for The ith Generic Part ($\pi_Q=1$)

(2) MTBF値 MTBF Values

G_F : 地上固定 (Ground, Fixed)

RCR-9102B

MTBF ≒ 209,078 時間 (Hours)

2. 部品デイレートイング Components Derating

MODEL : ZWS150BAF-5

(1) 算出方法 Calculating Method

(a) 測定方法 Measuring method

・取付方法 Mounting method	: 標準取付 : A Standard mounting : A	・周囲温度 Ambient temperature	: 50°C
・入力電圧 Input voltage	: 100, 200VAC	・出力電圧、電流 Output voltage & current	: 5V, 30A(100%)

(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

$$\theta_{j-c} = \frac{T_j(\max) - T_c}{P_{ch}(\max)}$$

T_c : デイレートイングの始まるケース温度 一般に25°C
Case Temperature at Start Point of Derating; 25°C in General

$P_{ch}(\max)$: 最大チャネル損失
Maximum Channel Dissipation

$T_j(\max)$: 最大接合点(チャネル)温度
($T_{ch}(\max)$) Maximum Junction (channel) Temperature

θ_{j-c} : 接合点(チャネル)からケースまでの熱抵抗
(θ_{ch-c}) Thermal Impedance between Junction (channel) and Case

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

部品番号 Location No.	$V_{in} = 100VAC$	Load = 100%	$T_a = 50^{\circ}C$
Q1 IPA60R199CP INFINEON	Tch (max) = 150 °C Pch = 2.9 W Tch = Tc + ((θ_{ch-c}) × Pch) = 113.7 °C D.F. = 75.8 %	$\theta_{ch-c} = 3.7^{\circ}C/W$ $\Delta Tc = 53.0^{\circ}C$	Pch (max) = 34 W Tc = 103.0 °C
Q2 2SK3568(Q) TOSHIBA	Tch (max) = 150 °C Pch = 2.2 W Tch = Tc + ((θ_{ch-c}) × Pch) = 122.9 °C D.F. = 81.9 %	$\theta_{ch-c} = 3.125^{\circ}C/W$ $\Delta Tc = 66.0^{\circ}C$	Pch (max) = 40 W Tc = 116.0 °C
Q3 2SK3568(Q) TOSHIBA	Tch (max) = 150 °C Pch = 2.0 W Tch = Tc + ((θ_{ch-c}) × Pch) = 118.3 °C D.F. = 78.9 %	$\theta_{ch-c} = 3.125^{\circ}C/W$ $\Delta Tc = 62.0^{\circ}C$	Pch (max) = 40 W Tc = 112.0 °C
Q51 IPA057N08N3 G INFINEON	Tch (max) = 175 °C Pch = 1.6 W Tch = Tc + ((θ_{ch-c}) × Pch) = 126.1 °C D.F. = 72.1 %	$\theta_{ch-c} = 3.8^{\circ}C/W$ $\Delta Tc = 70.0^{\circ}C$	Pch (max) = 39 W Tc = 120.0 °C
Q52 IPA057N08N3 G INFINEON	Tch (max) = 175 °C Pch = 0.9 W Tch = Tc + ((θ_{ch-c}) × Pch) = 108.4 °C D.F. = 61.9 %	$\theta_{ch-c} = 3.8^{\circ}C/W$ $\Delta Tc = 55.0^{\circ}C$	Pch (max) = 39 W Tc = 105.0 °C
Q53 IPA057N08N3 G INFINEON	Tch (max) = 175 °C Pch = 0.9 W Tch = Tc + ((θ_{ch-c}) × Pch) = 110.4 °C D.F. = 63.1 %	$\theta_{ch-c} = 3.8^{\circ}C/W$ $\Delta Tc = 57.0^{\circ}C$	Pch (max) = 39 W Tc = 107.0 °C
D1 D10XB60H SHINDENGEN	Tj (max) = 150 °C Pd = 3.9 W Tj = Tc + ((θ_{j-c}) × Pd) = 107.4 °C D.F. = 71.6 %	$\theta_{j-c} = 1.9^{\circ}C/W$ $\Delta Tc = 50.0^{\circ}C$	Tc = 100.0 °C
D2 YG981S6R FUJI ELECTRIC	Tj (max) = 150 °C Pd = 1.4 W Tj = Tc + ((θ_{j-c}) × Pd) = 109.3 °C D.F. = 72.9 %	$\theta_{j-c} = 4.5^{\circ}C/W$ $\Delta Tc = 53.0^{\circ}C$	Tc = 103.0 °C
PC102 PS2861B (LED) NEC	Tj (max) = 125 °C Pd = 0.9 mW Tj = Tc + ((θ_{j-c}) × Pd) = 89.3 °C D.F. = 71.4 %	$\theta_{j-c} = 330^{\circ}C/W$ $\Delta Tc = 39.0^{\circ}C$	Tc = 89.0 °C

部品番号 Location No.	Vin = 200VAC Load = 100% Ta = 50°C		
Q1 IPA60R199CP INFINEON	Tch (max) = 150 °C Pch = 1.6 W Tch = Tc + ((θch-c) × Pch) = 96.9 °C D.F. = 64.6 %	θch-c = 3.7 °C/W ΔTc = 41.0 °C	Pch (max) = 34 W Tc = 91.0 °C
Q2 2SK3568(Q) TOSHIBA	Tch (max) = 150 °C Pch = 2.2 W Tch = Tc + ((θch-c) × Pch) = 119.9 °C D.F. = 79.9 %	θch-c = 3.125 °C/W ΔTc = 63.0 °C	Pch (max) = 40 W Tc = 113.0 °C
Q3 2SK3568(Q) TOSHIBA	Tch (max) = 150 °C Pch = 2.0 W Tch = Tc + ((θch-c) × Pch) = 115.3 °C D.F. = 76.9 %	θch-c = 3.125 °C/W ΔTc = 59.0 °C	Pch (max) = 40 W Tc = 109.0 °C
Q51 IPA057N08N3 G INFINEON	Tch (max) = 175 °C Pch = 1.6 W Tch = Tc + ((θch-c) × Pch) = 121.1 °C D.F. = 69.2 %	θch-c = 3.8 °C/W ΔTc = 65.0 °C	Pch (max) = 39 W Tc = 115.0 °C
Q52 IPA057N08N3 G INFINEON	Tch (max) = 175 °C Pch = 0.9 W Tch = Tc + ((θch-c) × Pch) = 103.4 °C D.F. = 59.1 %	θch-c = 3.8 °C/W ΔTc = 50.0 °C	Pch (max) = 39 W Tc = 100.0 °C
Q53 IPA057N08N3 G INFINEON	Tch (max) = 175 °C Pch = 0.9 W Tch = Tc + ((θch-c) × Pch) = 105.4 °C D.F. = 60.2 %	θch-c = 3.8 °C/W ΔTc = 52.0 °C	Pch (max) = 39 W Tc = 102.0 °C
D1 D10XB60H SHINDENGEN	Tj (max) = 150 °C Pd = 1.1 W Tj = Tc + ((θj-c) × Pd) = 90.1 °C D.F. = 60.1 %	θj-c = 1.9 °C/W ΔTc = 38.0 °C	Tc = 88.0 °C
D2 YG981S6R FUJI ELECTRIC	Tj (max) = 150 °C Pd = 1.4 W Tj = Tc + ((θj-c) × Pd) = 99.3 °C D.F. = 66.2 %	θj-c = 4.5 °C/W ΔTc = 43.0 °C	Tc = 93.0 °C
PC102 PS2861B (LED) NEC	Tj (max) = 125 °C Pd = 0.9 mW Tj = Tc + ((θj-c) × Pd) = 88.3 °C D.F. = 70.6 %	θj-c = 330 °C/W ΔTc = 38.0 °C	Tc = 88.0 °C

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

MODEL : ZWS150BAF-5

(1) 測定条件 Measuring Conditions

取付方法 Mounting Method (標準取付 : A) (Standard Mounting : A)	Mounting A	Mounting B	Mounting C	Mounting D	Mounting E	Mounting F
入力電圧 V_{in} Input Voltage	100VAC					
出力電圧 V_o Output Voltage	5VDC					
出力電流 I_o Output Current	30A(100%)					

(2) 測定結果 Measuring Results

出力デレーティング Output Derating		ΔT Temperature Rise ($^{\circ}C$)					
		$I_o=100\%$					
		$T_a=50^{\circ}C$	$T_a=50^{\circ}C$	$T_a=40^{\circ}C$	$T_a=30^{\circ}C$	$T_a=40^{\circ}C$	$T_a=30^{\circ}C$
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	取付方向 Mounting F
Q1	MOS FET	53	47	50	66	49	75
Q2	MOS FET	66	51	54	64	61	73
Q3	MOS FET	62	47	53	60	60	70
Q51	MOS FET	70	78	71	80	80	85
Q52	MOS FET	55	67	60	66	71	73
Q53	MOS FET	57	64	58	63	68	73
D1	BRIDGE DIODE	50	59	53	62	47	65
D2	DIODE	53	47	51	64	48	71
A101	CHIP IC	49	47	41	57	48	65
A102	CHIP IC	51	32	46	48	48	62
A201	CHIP IC	37	21	36	29	38	47
T1	DRIVE TRANS	48	34	49	44	54	60
T2	TRANS	68	66	71	68	77	75
L1	BALUN	43	34	37	59	36	54
L2	BALUN	45	45	44	60	39	59
L51	CHOKE COIL	55	53	58	52	68	70
C6	E.CAP.	38	27	35	43	40	46
C7	E.CAP.	42	31	33	44	38	47
C51	E.CAP.	34	26	38	35	43	42
C52	E.CAP.	33	26	39	32	42	40
PC102	PHOTO COUPLER	39	21	39	32	67	49

(1) 測定条件 Measuring Conditions

取付方法 Mounting Method (標準取付 : A) (Standard Mounting : A)	Mounting A	Mounting B	Mounting C	Mounting D	Mounting E	Mounting F
入力電圧 V_{in} Input Voltage	200VAC					
出力電圧 V_o Output Voltage	5VDC					
出力電流 I_o Output Current	30A(100%)					

(2) 測定結果 Measuring Results

出力デレーティング Output Derating		ΔT Temperature Rise (°C)					
		I _o =100 %					
		T _a =50°C	T _a =50°C	T _a =40°C	T _a =30°C	T _a =40°C	T _a =30°C
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	取付方向 Mounting F
Q1	MOS FET	41	35	36	52	36	58
Q2	MOS FET	63	48	49	60	55	66
Q3	MOS FET	59	44	48	56	54	63
Q51	MOS FET	65	73	65	74	73	77
Q52	MOS FET	50	62	55	61	65	66
Q53	MOS FET	52	59	53	58	62	66
D1	BRIDGE DIODE	38	43	38	48	34	49
D2	DIODE	43	38	39	52	37	57
A101	CHIP IC	43	41	35	51	40	56
A102	CHIP IC	48	31	43	45	44	57
A201	CHIP IC	36	21	35	28	36	43
T1	DRIVE TRANS	48	33	45	42	49	56
T2	TRANS	66	64	69	66	73	71
L1	BALUN	27	18	20	39	20	36
L2	BALUN	27	25	25	40	21	38
L51	CHOKE COIL	54	52	56	51	65	68
C6	E.CAP.	35	25	31	40	35	41
C7	E.CAP.	39	28	29	40	33	41
C51	E.CAP.	34	26	37	33	40	39
C52	E.CAP.	34	25	38	31	40	37
PC102	PHOTO COUPLER	38	21	38	30	36	45

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

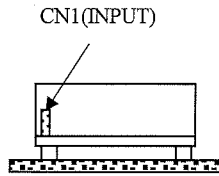
MODEL : ZWS150BAF-5

空冷条件 : 自然空冷

Cooling condition : Convection cooling

取付方向 A

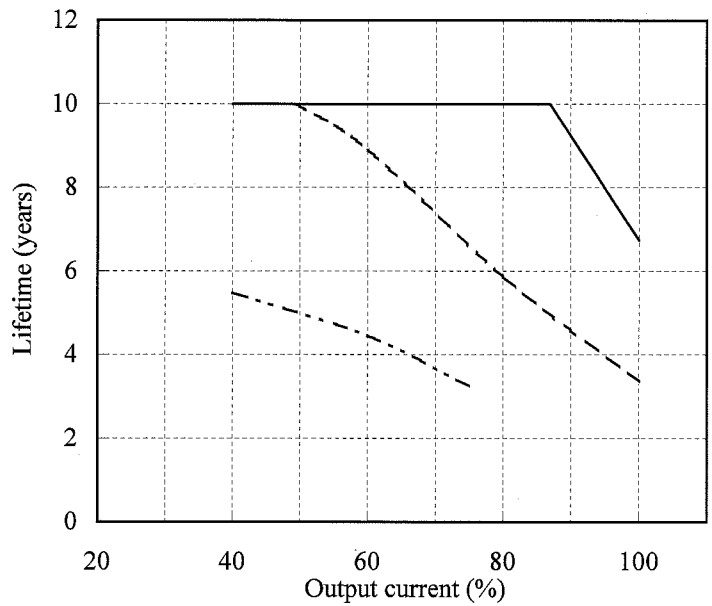
Mounting A



V_{in}=100VAC

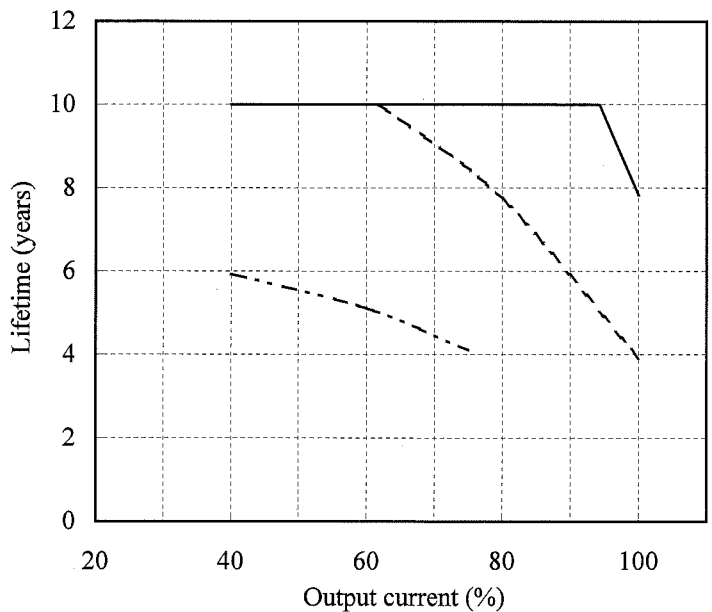
Load (%)	Lifetime (years)		
	Ta=40°C	Ta=50°C	Ta=60°C
40	10.0	10.0	5.5
60	10.0	8.9	4.5
80	10.0	5.9	-
100	6.7	3.4	-

Conditions Ta 40°C : ———
50°C : - - - -
60°C : ·····

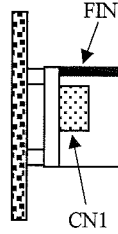


V_{in}=200VAC

Load (%)	Lifetime (years)		
	Ta=40°C	Ta=50°C	Ta=60°C
40	10.0	10.0	5.9
60	10.0	10.0	5.1
80	10.0	7.7	-
100	7.8	3.9	-



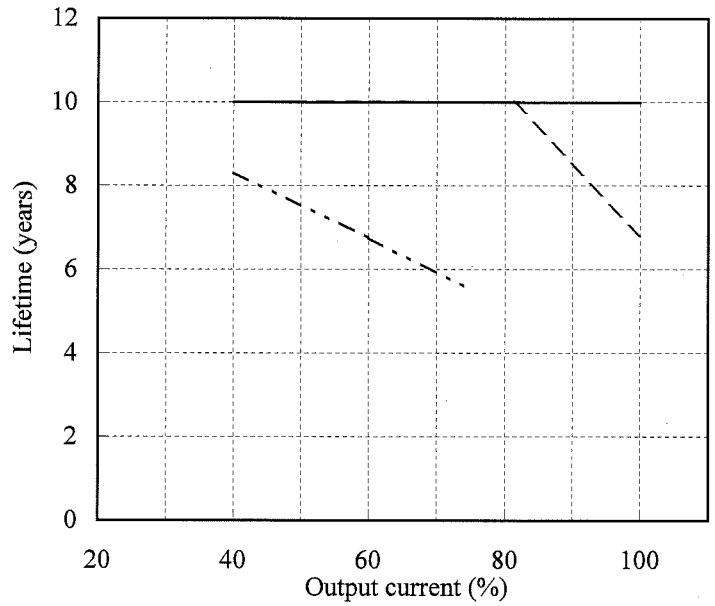
取付方向 B
Mounting B



$V_{in}=100VAC$

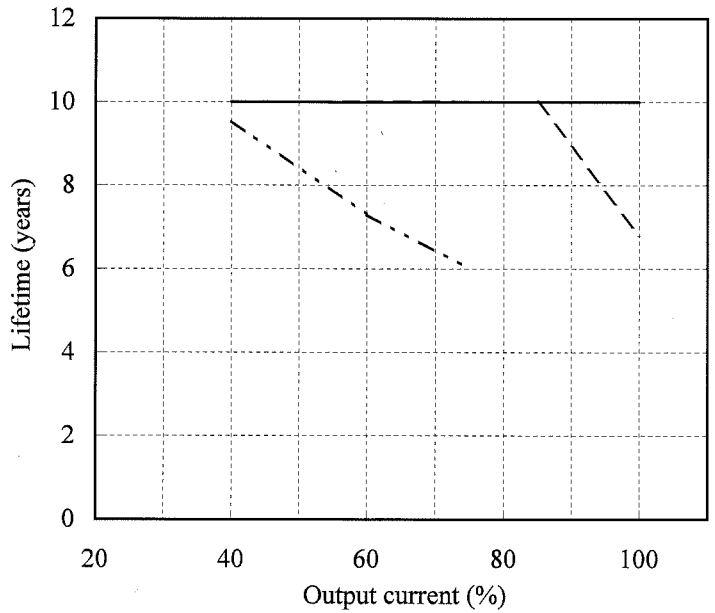
Load (%)	Lifetime (years)		
	Ta=40°C	Ta=50°C	Ta=60°C
40	10.0	10.0	8.3
60	10.0	10.0	6.7
80	10.0	10.0	-
100	10.0	6.8	-

Conditions Ta 40°C : ———
50°C : - - - -
60°C : ·····

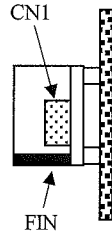


$V_{in}=200VAC$

Load (%)	Lifetime (years)		
	Ta=40°C	Ta=50°C	Ta=60°C
40	10.0	10.0	9.5
60	10.0	10.0	7.3
80	10.0	10.0	-
100	10.0	6.8	-



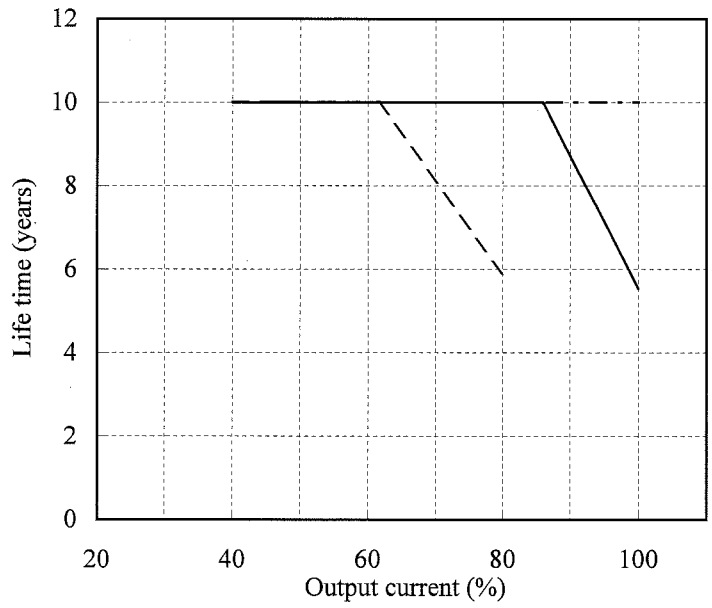
取付方向 C
Mounting C



V_{in}=100VAC

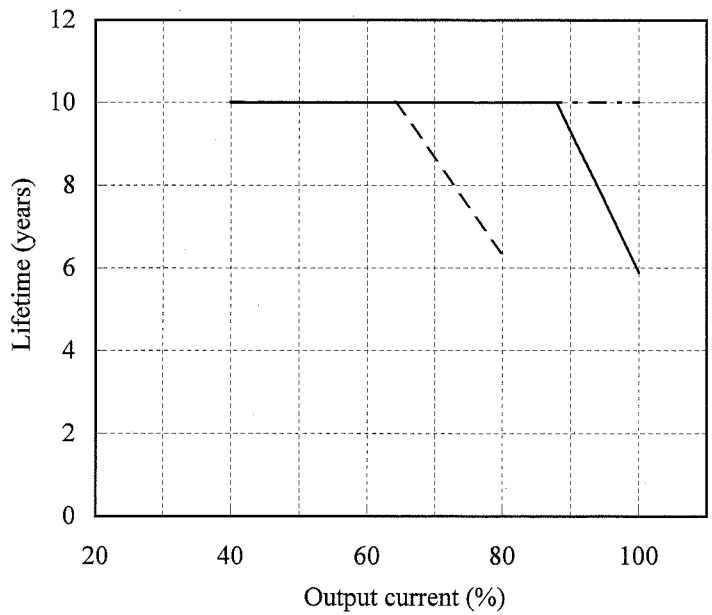
Load (%)	Lifetime (years)		
	Ta=30°C	Ta=40°C	Ta=50°C
40	10.0	10.0	10.0
60	10.0	10.0	10.0
80	10.0	10.0	5.9
100	10.0	5.5	-

Conditions Ta 30°C : - · - · -
40°C : ———
50°C : - - - -

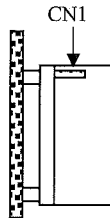


V_{in}=200VAC

Load (%)	Lifetime (years)		
	Ta=30°C	Ta=40°C	Ta=50°C
40	10.0	10.0	10.0
60	10.0	10.0	10.0
80	10.0	10.0	6.4
100	10.0	5.9	-



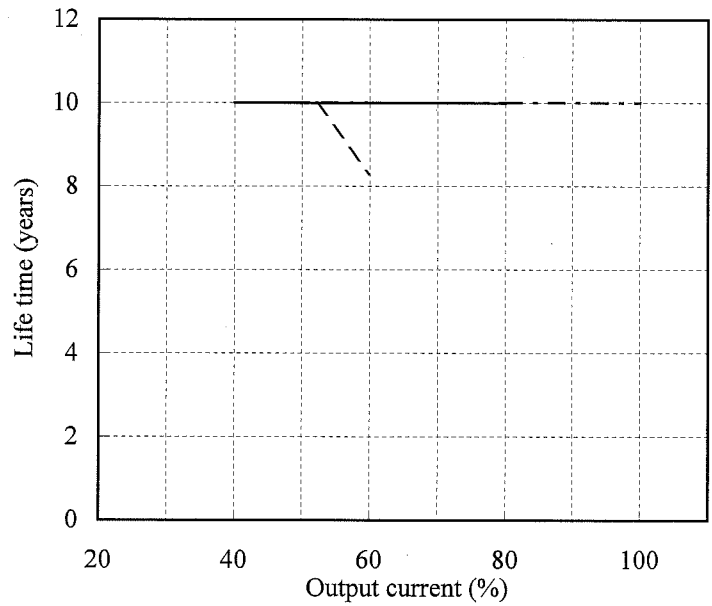
取付方向 D
Mounting D



Vin=100VAC

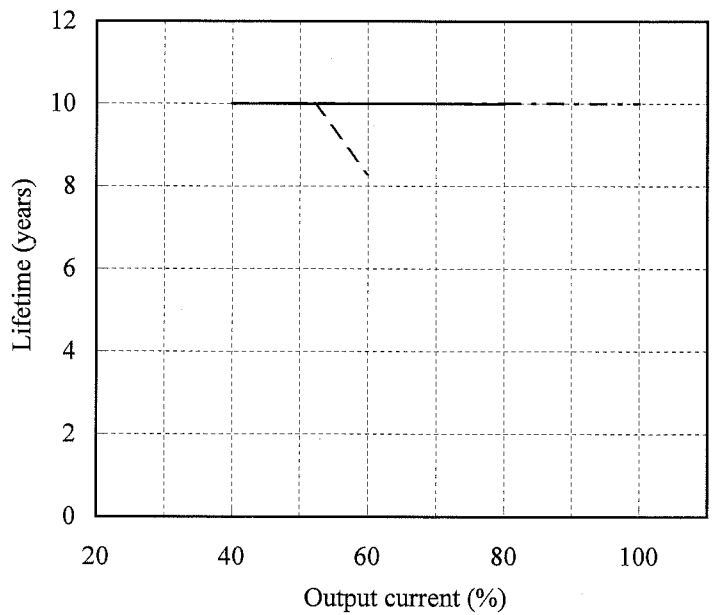
Load (%)	Lifetime (years)		
	Ta= 30°C	Ta= 40°C	Ta= 50°C
40	10.0	10.0	10.0
60	10.0	10.0	8.3
80	10.0	10.0	-
100	10.0	-	-

Conditions Ta 30°C : - · - · -
40°C : ———
50°C : - - -

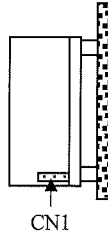


Vin=200VAC

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



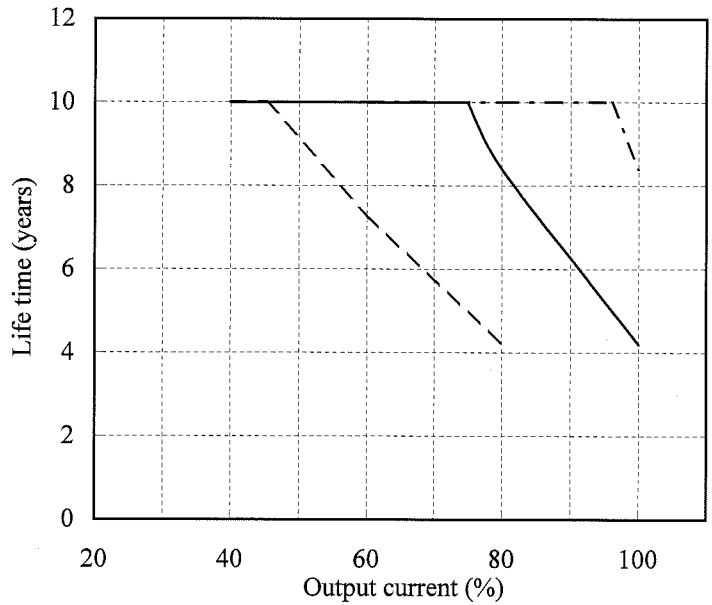
取付方向 E
Mounting E



V_{in}=100VAC

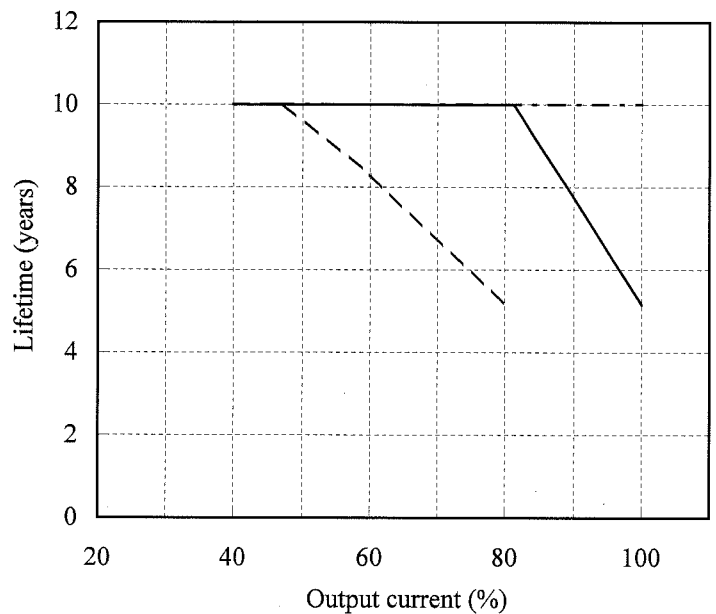
Load (%)	Lifetime (years)		
	T _a = 30°C	T _a = 40°C	T _a = 50°C
40	10.0	10.0	10.0
60	10.0	10.0	7.3
80	10.0	8.4	4.2
100	8.4	4.2	-

Conditions Ta 30°C : - · - · -
40°C : ———
50°C : - - - -

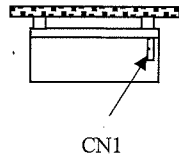


V_{in}=200VAC

Load (%)	Lifetime (years)		
	T _a = 30°C	T _a = 40°C	T _a = 50°C
40	10.0	10.0	10.0
60	10.0	10.0	8.3
80	10.0	10.0	5.2
100	10.0	5.2	-



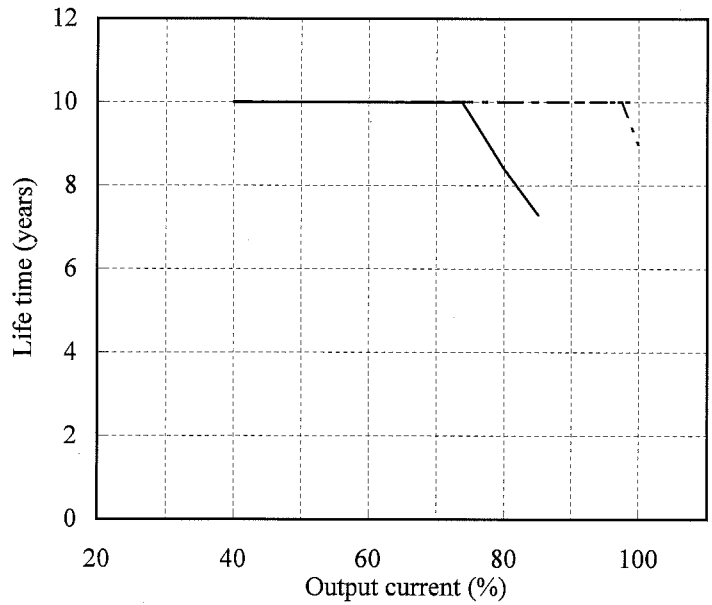
取付方向 F
Mounting F



Conditions Ta 20°C : - - - - -
30°C : - · - · -
40°C : ———

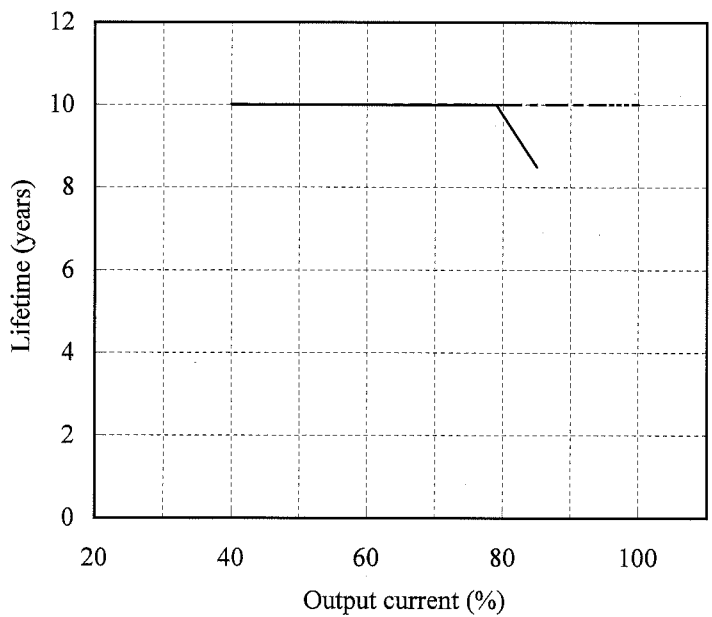
V_{in}=100VAC

Load (%)	Lifetime (years)		
	Ta=20°C	Ta=30°C	Ta=40°C
40	10.0	10.0	10.0
60	10.0	10.0	10.0
80	10.0	10.0	8.4
100	10.0	9.0	-



V_{in}=200VAC

Load (%)	Lifetime (years)		
	Ta=20°C	Ta=30°C	Ta=40°C
40	10.0	10.0	10.0
60	10.0	10.0	10.0
80	10.0	10.0	9.6
100	10.0	10.0	-



5. アブノーマル試験 Abnormal Test

MODEL : ZWS150BAF-5

(1) 試験条件 Test Conditions

Input : 230VAC Output : 5V, 30A Ta : 25°C

(2) 試験結果 Test Results

(Da : Damaged)

No.	Test position		Test mode		Test result											記事 Note		
	部品No. Location No.	試験端子 Test point	ショート Short	オープン Open	a 発火 Fire	b 発煙 Smoke	c 破裂 Burst	d 異臭 Smell	e 赤熱 Red hot	f 破損 Damaged	g ヒューズ断 Fuse blown	h OVP	I OCP	j 出力断 No output	k 変化なし No change		l その他 Others	
1	Q1	D-S	○							○	○			○			Da : D101,R104,R105	
2		D-G	○							○	○			○			Da : Q1, D102, A101	
3		G-S	○														○	Power Factor Low
4		D		○													○	Power Factor Low
5		S		○													○	Power Factor Low
6		G		○							○				○			Da : Q1, D101
7	Q2	D-S	○											○				
8		D-G	○											○				
9		G-S	○											○				
10		D		○										○				
11		S		○										○				
12		G		○										○				
13	Q3	D-S	○											○				
14		D-G	○											○				
15		G-S	○											○				
16		D		○										○				
17		S		○										○				
18		G		○										○				
19	Q51	D-S	○											○				
20		D-G	○											○				
21		G-S	○													○	Input Power Increase	
22		D		○										○				
23		S		○										○				
24		G		○												○	Input Power Increase	
25	Q52	D-S	○											○				
26		D-G	○											○				
27		G-S	○													○	Input Power Increase	
28		D		○												○	Input Power Increase	
29		S		○												○	Input Power Increase	
30		G		○												○	Input Power Increase	

(Da : Damaged)

No.	Test position		Test mode		Test result											記事 Note		
	部品No.	試験端子	ショート	オープン	a	b	c	d	e	f	g	h	I	j	k		l	
					発火	発煙	破裂	異臭	赤熱	破損	ヒューズ断	OVP	OCP	出力断	変化なし		その他	
Location No.	Test point	Short	Open	Fire	Smoke	Burst	Smell	Red hot	Damaged	Fuse blown			No output	No change	Others			
31	C6		○							○	○			○			Da : D1,D101,R104,R105	
32				○											○			
33	C51		○										○	○				
34				○													○	Output Ripple Increase
35	D1	AC-AC	○								○			○				
36		DC-DC	○							○	○			○			Da : D1	
37		AC-DC	○								○			○				
38		AC		○										○				
39		DC		○										○				
40	D2	A-K	○							○	○			○			Da : Q1,D101	
41		A		○						○	○			○			Da : Q1	
42	D109	A-K	○										○	○				
43		A		○												○	Input Power Increase	
44	D111	A-K	○										○	○				
45		A		○												○	Input Power Increase	
46	T1	1-2	○											○				
47		6-7	○											○				
48		1		○										○				
49		6		○										○				
50	T2	1-2	○											○				
51		7-8	○											○				
52		10-11	○										○	○				
53		1		○										○				
54		4		○										○				
55		7		○													○	Input Power Increase
56		9		○											○			

6. 振動試験 Vibration Test

MODEL : ZWS150BAF-5

(1) 振動試験種類 Vibration Test Class

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

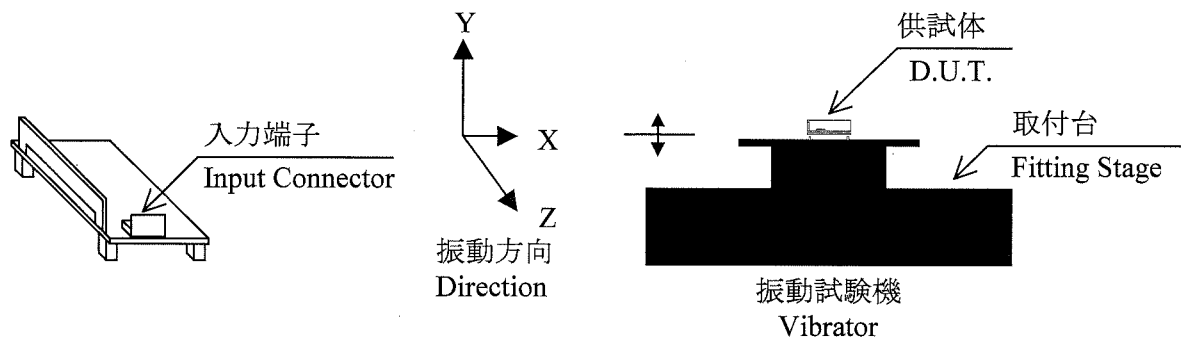
(2) 使用振動試験装置 Equipment Used

EMIC (株) 製 EMIC CORP	・制御部 Controller	: F-400-BM-E47	・加振部 Vibrator	: 905-FN
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(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	: 1.0分間 1.0min	・試験時間 Sweep count	: 各方向共 1時間 1 hour each
・加速度 Acceleration	: 一定 19.6m/s ² (2G) Constant		

(4) 試験方法 Test Method



(5) 判定条件 Acceptable Conditions

1. 破壊しない事
Not to be broken
2. 試験後の特性は初期値から変動していない事
Characteristic to be within regulation specification after the test.

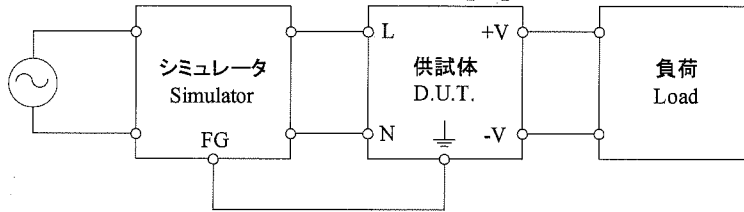
(6) 試験結果 Test Results

合格 OK

7. ノイズシミュレート試験 Noise Simulate Test

MODEL : ZWS150BAF-5

(1) 試験回路及び測定器 Test Circuit and Equipment



シミュレータ : INS-4320(A) (ノイズ研究所)
 Simulator : (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	: 0~2kV
・出力電圧 Output Voltage	: 定格 Rated	・位相 Phase	: 0~360 deg
・出力電流 Output current	: 0, 100%	・極性 Polarity	: +, -
・周囲温度 Ambient temperature	: 25°C	・印加モード Mode	: コモン、ノーマル Common, Normal
・パルス幅 Pulse width	: 50~1000ns	・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

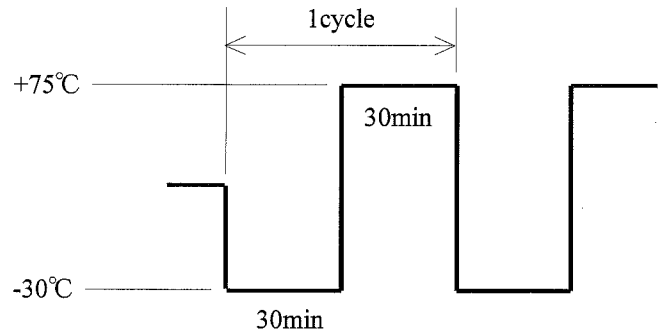
MODEL : ZWS150BAF-5

(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 : -30°C ⇔ 75°C +75°C
Ambient Temperature
- ・試験時間 : 図参照
Test Time Refer to Dwg.
- ・試験サイクル : 100 サイクル
Test Cycle 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) 判定条件 Acceptable Conditions

1. 破壊しない事
Not to be broken
2. 試験後の特性は初期値から変動していない事
Characteristic to be within regulation specification after the test.

(5) 試験結果 Test Results

合格 OK