CUS200LD

RELIABILITY DATA

信頼性データ

INDEX

※ 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、以下の結果は参考値とお考え願います。
Test results are typical data. Nevertheless the following results are considered to be reference data because all units have nearly the same characteristics.

評価負荷条件　　Load conditions

※ 入力電圧が115VAC以下の場合、下記のとおり出力ディレーティングが必要です。
Output derating is needed when input voltage is less than 115VAC.

Output voltage : 5V, 24V

Conduction cooling:

Vin	Iout:Full load	5V	24V
85VAC	80%	24.00A	5.04A
100VAC	90%	27.00A	5.67A
115 - 265VAC	100%	30.00A	6.30A

Convection cooling:

Vin	Iout:Full load	5V	24V
85VAC	80%	19.20A	4.00A
100VAC	90%	21.60A	4.50A
115 - 265VAC	100%	24.00A	5.00A

1. MTBF計算値 Calculated Values of MTBF

MODEL： CUS200LD-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＞

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

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)

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 (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-9102B

MTBF ≒ 135,710 時間 (Hours)

2. 部品ディレーティング Components Derating

MODEL：CUS200LD-5

(1) 算出方法 Calculating Method

(a) 測定方法 Measuring method

・取付方法 :標準取付 : A Mounting method Standard mounting : A	・周囲温度 :45℃(Conduction cooling) Ambient temperature 40℃(Convection cooling)
・入力電圧 :115 , 230VAC Input voltage	・出力電圧、電流 :5V, Full load Output voltage & current

(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

$$\theta j-c=\frac{Tj(max)-Tc}{Pch(max)} \qquad \theta j-l=\frac{Tj(max)-Tl}{Pch(max)}$$

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

Pj(max) :最大チャネル損失
(Pch(max)) Maximum 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

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

部品番号 Location No.	Vin = 115VAC Load = Full load Ta = 45℃ Conduction cooling		
Q101 TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 3.15 W Tch = Tc + (θch-c × Pch) = 98.8 ℃ D.F. = 65.9 %	θch-c = 0.9 ℃/W ΔTc = 51.0 ℃	Tc = 96.0 ℃
Q103A TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 1.28 W Tch = Tc + (θch-c × Pch) = 88.1 ℃ D.F. = 58.7 %	θch-c = 0.9 ℃/W ΔTc = 41.9 ℃	Tc = 86.9 ℃
Q103B TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 1.14 W Tch = Tc + (θch-c × Pch) = 85.4 ℃ D.F. = 57.0 %	θch-c = 0.9 ℃/W ΔTc = 39.4 ℃	Tc = 84.4 ℃
Q201A TPH4R008NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.58 W Tch = Tc + (θch-c × Pch) = 86.8 ℃ D.F. = 57.9 %	θch-c = 1.6 ℃/W ΔTc = 40.9 ℃	Tc = 85.9 ℃
Q201B TPH4R008NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.58 W Tch = Tc + (θch-c × Pch) = 85.3 ℃ D.F. = 56.9 %	θch-c = 1.6 ℃/W ΔTc = 39.4 ℃	Tc = 84.4 ℃
Q202 TPH2R306NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 1.05 W Tch = Tc + (θch-c × Pch) = 97.0 ℃ D.F. = 64.7 %	θch-c = 1.6 ℃/W ΔTc = 50.3 ℃	Tc = 95.3 ℃
BD1 D10XB60H-7000 SHINDENGEN	Tj (max) = 150 ℃ Pj = 1.00 W Tj = Tl + (θj-l × Pj) = 104.2 ℃ D.F. = 69.5 %	θj-l = 6 ℃/W ΔTl = 53.2 ℃	Tl = 98.2 ℃
D101 STPSC4H065B-TR STMICRO	Tj (max) = 175 ℃ Pj = 1.41 W Tj = Tc + (θj-c × Pj) = 86.2 ℃ D.F. = 49.3 %	θj-c = 2.7 ℃/W ΔTc = 37.4 ℃	Tc = 82.4 ℃
PC101 TLP385(D4GR-TL,E TOSHIBA	Tj (max) = 125 ℃ Pj = 1.6 mW Tj = Tc + (θj-c × Pj) = 80.0 ℃ D.F. = 64.0 %	θj-c = 500 ℃/W ΔTc = 34.2 ℃	Tc = 79.2 ℃

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

部品番号 Location No.	Vin = 230VAC Load = Full load Ta = 45℃ Conduction cooling		
Q101 TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 1.85 W Tch = Tc + (θch-c × Pch) = 79.8 ℃ D.F. = 53.2 %	θch-c = 0.9 ℃/W ΔTc = 33.1 ℃	Tc = 78.1 ℃
Q103A TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 1.13 W Tch = Tc + (θch-c × Pch) = 80.9 ℃ D.F. = 53.9 %	θch-c = 0.9 ℃/W ΔTc = 34.9 ℃	Tc = 79.9 ℃
Q103B TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 0.97 W Tch = Tc + (θch-c × Pch) = 79.0 ℃ D.F. = 52.6 %	θch-c = 0.9 ℃/W ΔTc = 33.1 ℃	Tc = 78.1 ℃
Q201A TPH4R008NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.58 W Tch = Tc + (θch-c × Pch) = 83.5 ℃ D.F. = 55.7 %	θch-c = 1.6 ℃/W ΔTc = 37.6 ℃	Tc = 82.6 ℃
Q201B TPH4R008NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.58 W Tch = Tc + (θch-c × Pch) = 82.1 ℃ D.F. = 54.8 %	θch-c = 1.6 ℃/W ΔTc = 36.2 ℃	Tc = 81.2 ℃
Q202 TPH2R306NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 1.05 W Tch = Tc + (θch-c × Pch) = 93.3 ℃ D.F. = 62.2 %	θch-c = 1.6 ℃/W ΔTc = 46.6 ℃	Tc = 91.6 ℃
BD1 D10XB60H-7000 SHINDENGEN	Tj (max) = 150 ℃ Pj = 0.50 W Tj = Tl + (θj-l × Pj) = 83.1 ℃ D.F. = 55.4 %	θj-l = 6 ℃/W ΔTl = 35.1 ℃	Tl = 80.1 ℃
D101 STPSC4H065B-TR STMICRO	Tj (max) = 175 ℃ Pj = 0.99 W Tj = Tc + (θj-c × Pj) = 76.5 ℃ D.F. = 43.7 %	θj-c = 2.7 ℃/W ΔTc = 28.8 ℃	Tc = 73.8 ℃
PC101 TLP385(D4GR-TL,E TOSHIBA	Tj (max) = 125 ℃ Pj = 1.6 mW Tj = Tc + (θj-c × Pj) = 76.1 ℃ D.F. = 60.9 %	θj-c = 500 ℃/W ΔTc = 30.3 ℃	Tc = 75.3 ℃

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

部品番号 Location No.	Vin = 115VAC Load = Full load Ta = 40℃ Convection cooling		
Q101 TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 2.52 W Tch = Tc + (θch-c × Pch) = 111.1 ℃ D.F. = 74.0 %	θch-c = 0.9 ℃/W ΔTc = 68.8 ℃	Tc = 108.8 ℃
Q103A TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 1.02 W Tch = Tc + (θch-c × Pch) = 103.7 ℃ D.F. = 69.1 %	θch-c = 0.9 ℃/W ΔTc = 62.8 ℃	Tc = 102.8 ℃
Q103B TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 0.91 W Tch = Tc + (θch-c × Pch) = 101.1 ℃ D.F. = 67.4 %	θch-c = 0.9 ℃/W ΔTc = 60.3 ℃	Tc = 100.3 ℃
Q201A TPH4R008NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.42 W Tch = Tc + (θch-c × Pch) = 99.6 ℃ D.F. = 66.4 %	θch-c = 1.6 ℃/W ΔTc = 58.9 ℃	Tc = 98.9 ℃
Q201B TPH4R008NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.42 W Tch = Tc + (θch-c × Pch) = 97.9 ℃ D.F. = 65.2 %	θch-c = 1.6 ℃/W ΔTc = 57.2 ℃	Tc = 97.2 ℃
Q202 TPH2R306NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.74 W Tch = Tc + (θch-c × Pch) = 106.5 ℃ D.F. = 71.0 %	θch-c = 1.6 ℃/W ΔTc = 65.3 ℃	Tc = 105.3 ℃
BD1 D10XB60H-7000 SHINDENGEN	Tj (max) = 150 ℃ Pj = 0.79 W Tj = Tl + (θj-l × Pj) = 112.2 ℃ D.F. = 74.8 %	θj-l = 6 ℃/W ΔTl = 67.5 ℃	Tl = 107.5 ℃
D101 STPSC4H065B-TR STMICRO	Tj (max) = 175 ℃ Pj = 1.13 W Tj = Tc + (θj-c × Pj) = 101.3 ℃ D.F. = 57.9 %	θj-c = 2.7 ℃/W ΔTc = 58.2 ℃	Tc = 98.2 ℃
PC101 TLP385(D4GR-TL,E TOSHIBA	Tj (max) = 125 ℃ Pj = 1.6 mW Tj = Tc + (θj-c × Pj) = 93.5 ℃ D.F. = 74.8 %	θj-c = 500 ℃/W ΔTc = 52.7 ℃	Tc = 92.7 ℃

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

部品番号 Location No.	Vin = 230VAC Load = Full load Ta = 40℃ Convection cooling		
Q101 TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 1.48 W Tch = Tc + (θch-c × Pch) = 92.5 ℃ D.F. = 61.7 %	θch-c = 0.9 ℃/W ΔTc = 51.2 ℃	Tc = 91.2 ℃
Q103A TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 0.90 W Tch = Tc + (θch-c × Pch) = 94.0 ℃ D.F. = 62.7 %	θch-c = 0.9 ℃/W ΔTc = 53.2 ℃	Tc = 93.2 ℃
Q103B TK16V60W,LVQ TOSHIBA	Tch (max) = 150 ℃ Pch = 0.78 W Tch = Tc + (θch-c × Pch) = 92.3 ℃ D.F. = 61.5 %	θch-c = 0.9 ℃/W ΔTc = 51.6 ℃	Tc = 91.6 ℃
Q201A TPH4R008NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.42 W Tch = Tc + (θch-c × Pch) = 93.6 ℃ D.F. = 62.4 %	θch-c = 1.6 ℃/W ΔTc = 52.9 ℃	Tc = 92.9 ℃
Q201B TPH4R008NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.42 W Tch = Tc + (θch-c × Pch) = 92.2 ℃ D.F. = 61.4 %	θch-c = 1.6 ℃/W ΔTc = 51.5 ℃	Tc = 91.5 ℃
Q202 TPH2R306NH,L1Q TOSHIBA	Tch (max) = 150 ℃ Pch = 0.74 W Tch = Tc + (θch-c × Pch) = 100.3 ℃ D.F. = 66.9 %	θch-c = 1.6 ℃/W ΔTc = 59.1 ℃	Tc = 99.1 ℃
BD1 D10XB60H-7000 SHINDENGEN	Tj (max) = 150 ℃ Pj = 0.39 W Tj = Tl + (θj-l × Pj) = 92.0 ℃ D.F. = 61.4 %	θj-l = 6 ℃/W ΔTl = 49.7 ℃	Tl = 89.7 ℃
D101 STPSC4H065B-TR STMICRO	Tj (max) = 175 ℃ Pj = 0.79 W Tj = Tc + (θj-c × Pj) = 89.7 ℃ D.F. = 51.3 %	θj-c = 2.7 ℃/W ΔTc = 47.6 ℃	Tc = 87.6 ℃
PC101 TLP385(D4GR-TL,E TOSHIBA	Tj (max) = 125 ℃ Pj = 1.6 mW Tj = Tc + (θj-c × Pj) = 87.2 ℃ D.F. = 69.8 %	θj-c = 500 ℃/W ΔTc = 46.4 ℃	Tc = 86.4 ℃

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

MODEL : CUS200LD-5

(1) 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 : A)					
入力電圧 Vin Input Voltage	115VAC				
出力電圧 Vo Output Voltage	5VDC				
出力電流 Io Output Current	Full load				
空冷条件 Cooling Condition	伝導放熱 Conduction cooling				

(2) 測定結果 Measuring Results

出力ディレーティング Output Derating		ΔT Temperature Rise (℃)				
		Ta=45℃	Ta=45℃	Ta=45℃	Ta=35℃	Ta=35℃
部品番号	部品名	取付方向	取付方向	取付方向	取付方向	取付方向
Location No.	Part name	Mounting A	Mounting B	Mounting C	Mounting D	Mounting E
L1	BALUN	36.1	35.2	38.1	41.9	33.5
L2	BALUN	42.3	40.5	43.6	48.5	38.9
BD1	BRIDGE DIODE	53.2	57.7	53.3	57.4	53.3
C8	E.CAP.	44.7	42.2	50.2	47.3	43.4
L3	CHOKE COIL	66.1	64.5	63.5	66.4	66.0
C7	E.CAP.	33.7	32.0	39.3	35.9	33.5
T2	TRANS	68.2	67.8	66.3	67.7	70.3
A103	CHIP IC	46.7	46.4	51.0	49.4	49.4
A102	CHIP IC	47.3	47.2	50.3	49.6	48.7
A101	CHIP IC	55.8	55.4	58.7	58.1	56.0
T1	TRANS	44.4	42.9	49.4	47.2	48.4
C51A/B/C	E.CAP.	37.1	38.2	37.2	35.4	44.8
L51	CHOKE COIL	51.4	50.2	51.0	49.2	55.6
A201	CHIP IC	36.6	36.4	39.2	36.8	40.8
PC101	PHOTO COUPLER	34.2	34.2	37.6	36.2	36.9
Q201A	MOS FET	40.9	41.7	41.1	41.2	42.9
Q201B	MOS FET	39.4	40.2	39.7	39.5	41.8
Q202	MOS FET	50.3	50.4	50.6	50.4	52.2
Q101	MOS FET	51.0	51.3	52.1	52.9	51.2
Q103A	MOS FET	41.9	42.0	42.7	43.2	42.4
Q103B	MOS FET	39.4	39.8	41.2	41.2	40.4

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

MODEL : CUS200LD-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
					
入力電圧 Vin Input Voltage	230VAC				
出力電圧 Vo Output Voltage	5VDC				
出力電流 Io Output Current	Full load				
空冷条件 Cooling Condition	伝導放熱 Conduction cooling				

(2) 測定結果 Measuring Results

出力ディレーティング Output Derating		ΔT Temperature Rise (℃)				
		Ta=45℃	Ta=45℃	Ta=45℃	Ta=35℃	Ta=35℃
部品番号	部品名	取付方向	取付方向	取付方向	取付方向	取付方向
Location No.	Part name	Mounting A	Mounting B	Mounting C	Mounting D	Mounting E
L1	BALUN	22.8	22.5	24.0	28.0	21.1
L2	BALUN	27.0	26.3	28.0	32.8	24.8
BD1	BRIDGE DIODE	35.1	38.1	35.1	38.8	34.9
C8	E.CAP.	31.3	30.0	35.2	34.6	30.1
L3	CHOKE COIL	51.0	50.0	48.9	52.4	50.2
C7	E.CAP.	27.1	25.8	30.9	30.1	26.4
T2	TRANS	64.4	64.0	62.5	64.6	65.4
A103	CHIP IC	41.8	41.5	45.4	45.0	43.3
A102	CHIP IC	38.8	38.9	41.0	41.5	39.3
A101	CHIP IC	43.6	43.4	45.6	46.2	43.4
T1	TRANS	40.3	39.0	44.8	44.0	42.6
C51A/B/C	E.CAP.	35.2	35.9	35.0	33.8	41.2
L51	CHOKE COIL	48.7	47.5	48.3	47.3	51.6
A201	CHIP IC	33.9	33.6	36.2	34.6	36.9
PC101	PHOTO COUPLER	30.3	30.2	33.3	32.6	32.0
Q201A	MOS FET	37.6	38.2	37.6	38.2	38.8
Q201B	MOS FET	36.2	36.9	36.4	36.8	37.8
Q202	MOS FET	46.6	46.6	46.9	47.2	47.8
Q101	MOS FET	33.1	33.4	33.9	35.2	33.0
Q103A	MOS FET	34.9	34.9	35.4	36.4	34.8
Q103B	MOS FET	33.1	33.6	34.4	35.3	33.5

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

MODEL : CUS200LD-5

(1) 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 : A)					
入力電圧 Vin Input Voltage	115VAC				
出力電圧 Vo Output Voltage	5VDC				
出力電流 Io Output Current	Full load				
空冷条件 Cooling Condition	自然空冷 Convection cooling				

(2) 測定結果 Measuring Results

出力ディレーティング Output Derating		ΔT Temperature Rise (℃)				
		Ta=40℃	Ta=35℃	Ta=35℃	Ta=30℃	Ta=30℃
部品番号	部品名	取付方向	取付方向	取付方向	取付方向	取付方向
Location No.	Part name	Mounting A	Mounting B	Mounting C	Mounting D	Mounting E
L1	BALUN	48.9	51.3	54.0	62.7	50.1
L2	BALUN	54.6	55.7	59.1	68.1	54.9
BD1	BRIDGE DIODE	67.5	75.7	72.1	80.1	72.8
C8	E.CAP.	59.4	58.3	66.2	67.4	60.9
L3	CHOKE COIL	77.7	77.4	77.1	82.9	81.2
C7	E.CAP.	49.4	51.1	57.9	57.7	55.0
T2	TRANS	75.2	77.4	76.0	80.2	84.7
A103	CHIP IC	64.7	67.9	73.2	74.2	75.7
A102	CHIP IC	65.9	70.1	73.7	76.5	74.9
A101	CHIP IC	72.9	76.5	80.3	83.4	79.8
T1	TRANS	58.1	59.8	66.2	66.9	70.3
C51A/B/C	E.CAP.	46.4	48.9	49.4	47.4	62.9
L51	CHOKE COIL	60.6	62.5	63.3	62.5	73.5
A201	CHIP IC	50.8	53.5	56.7	56.2	63.8
PC101	PHOTO COUPLER	52.7	56.0	59.9	61.5	63.8
Q201A	MOS FET	58.9	64.1	63.6	66.9	70.6
Q201B	MOS FET	57.2	62.3	61.9	64.7	69.3
Q202	MOS FET	65.3	69.8	70.5	73.4	76.7
Q101	MOS FET	68.8	73.1	74.6	79.6	75.8
Q103A	MOS FET	62.8	68.1	68.8	73.5	71.8
Q103B	MOS FET	60.3	65.6	67.3	71.4	69.7

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

MODEL : CUS200LD-5

(1) 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 : A)					
入力電圧 Vin Input Voltage	230VAC				
出力電圧 Vo Output Voltage	5VDC				
出力電流 Io Output Current	Full load				
空冷条件 Cooling Condition	自然空冷 Convection cooling				

(2) 測定結果 Measuring Results

出力ディレーティング Output Derating		ΔT Temperature Rise (℃)				
		Ta=40℃	Ta=35℃	Ta=35℃	Ta=30℃	Ta=30℃
部品番号	部品名	取付方向	取付方向	取付方向	取付方向	取付方向
Location No.	Part name	Mounting A	Mounting B	Mounting C	Mounting D	Mounting E
L1	BALUN	36.6	38.7	40.3	48.5	37.4
L2	BALUN	40.6	41.7	43.9	52.3	40.7
BD1	BRIDGE DIODE	49.7	55.7	53.1	60.4	53.4
C8	E.CAP.	45.5	45.0	50.3	53.4	46.0
L3	CHOKE COIL	61.9	61.6	61.3	67.1	63.7
C7	E.CAP.	41.5	42.6	47.5	48.9	44.9
T2	TRANS	69.5	70.9	69.6	73.7	76.0
A103	CHIP IC	57.7	60.0	64.4	66.0	65.3
A102	CHIP IC	55.7	59.0	61.5	64.9	61.9
A101	CHIP IC	60.0	62.7	65.3	68.9	64.6
T1	TRANS	52.4	53.4	59.0	60.3	60.6
C51A/B/C	E.CAP.	42.8	44.7	44.9	43.4	55.9
L51	CHOKE COIL	56.3	57.5	58.0	57.5	65.8
A201	CHIP IC	46.1	48.0	50.9	50.6	55.8
PC101	PHOTO COUPLER	46.4	49.0	52.3	54.1	54.5
Q201A	MOS FET	52.9	57.0	56.5	59.6	61.7
Q201B	MOS FET	51.5	55.6	55.0	57.7	60.6
Q202	MOS FET	59.1	62.5	63.0	65.8	67.4
Q101	MOS FET	51.2	54.8	55.7	60.4	56.3
Q103A	MOS FET	53.2	57.4	57.7	62.4	59.6
Q103B	MOS FET	51.6	55.7	57.0	61.0	58.2

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

MODEL : CUS200LD

Cooling condition :Conduction cooling

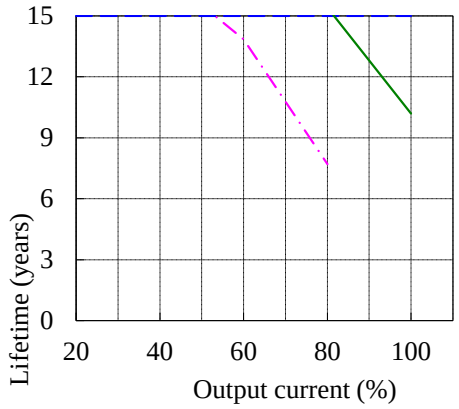
取付方向 A
Mounting A

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

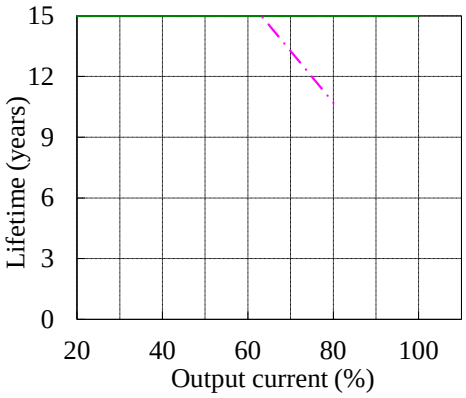
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	15.0
60%	15.0	15.0	13.9
80%	15.0	15.0	7.7
100%	15.0	10.2	-



Vin=230VAC

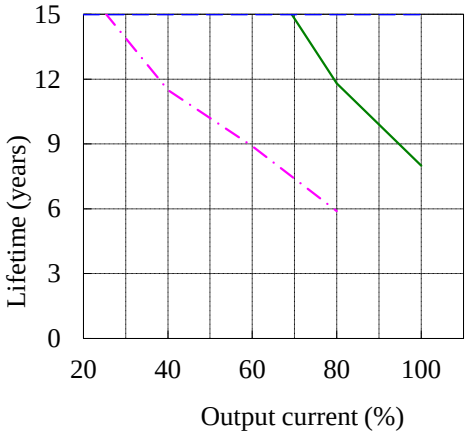
Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	15.0
60%	15.0	15.0	15.0
80%	15.0	15.0	10.7
100%	15.0	15.0	-



24V

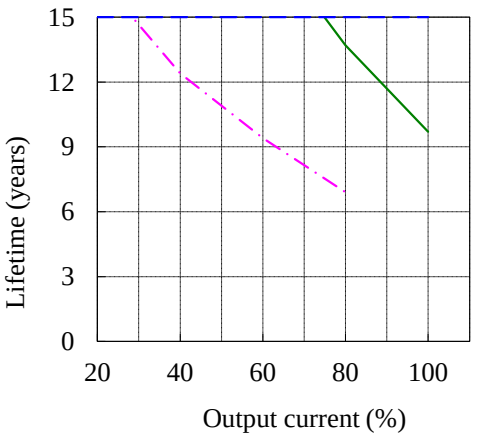
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	11.5
60%	15.0	15.0	8.9
80%	15.0	11.8	5.9
100%	15.0	8.0	-



Vin=230VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	12.4
60%	15.0	15.0	9.4
80%	15.0	13.7	6.9
100%	15.0	9.7	-



上記推定寿命は、弊社計算方法により算出した値であり、封口ｺﾞﾑの劣化等の影響を含めておりません。
The life time is calulated based on our method and doesn't include the seal rubber degradation effect etc.

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

MODEL : CUS200LD

Cooling condition :Conduction cooling

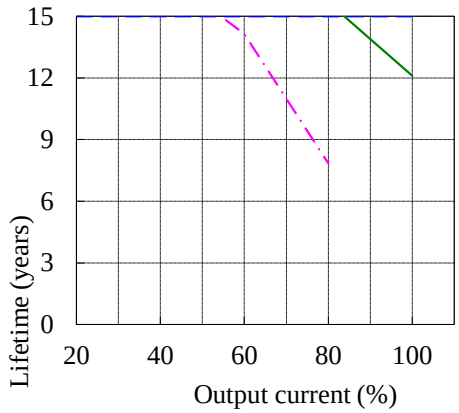
取付方向 B
Mounting B

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

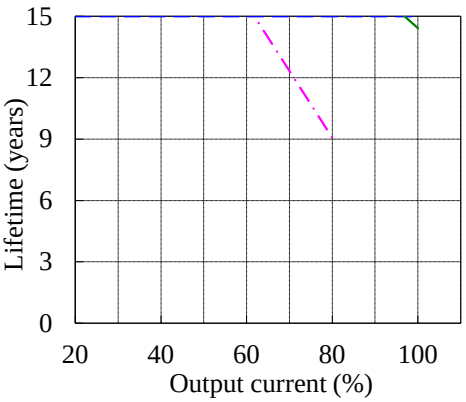
Vin=115VAC

Load \ Ta	Lifetime (years)		
	30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	15.0
60%	15.0	15.0	14.2
80%	15.0	15.0	7.8
100%	15.0	12.1	-



Vin=230VAC

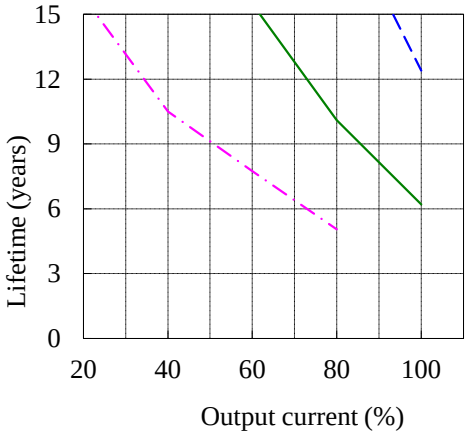
Load \ Ta	Lifetime (years)		
	30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	15.0
60%	15.0	15.0	15.0
80%	15.0	15.0	9.1
100%	15.0	14.4	-



24V

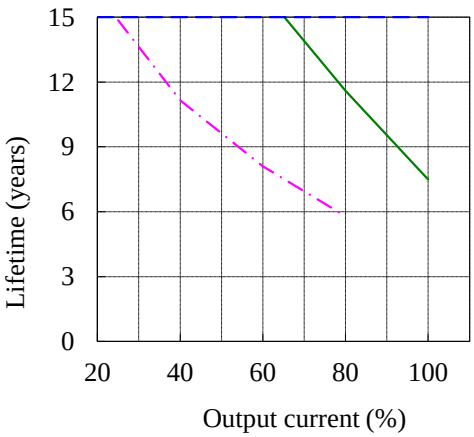
Vin=115VAC

Load \ Ta	Lifetime (years)		
	30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	10.5
60%	15.0	15.0	7.8
80%	15.0	10.1	5.1
100%	12.4	6.2	-



Vin=230VAC

Load \ Ta	Lifetime (years)		
	30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	11.2
60%	15.0	15.0	8.1
80%	15.0	11.6	5.8
100%	15.0	7.5	-



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

MODEL : CUS200LD

Cooling condition :Conduction cooling

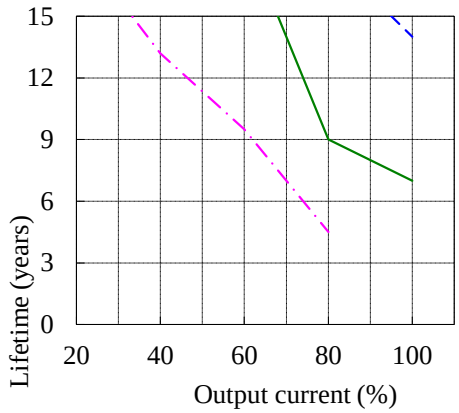
取付方向 C
Mounting C

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

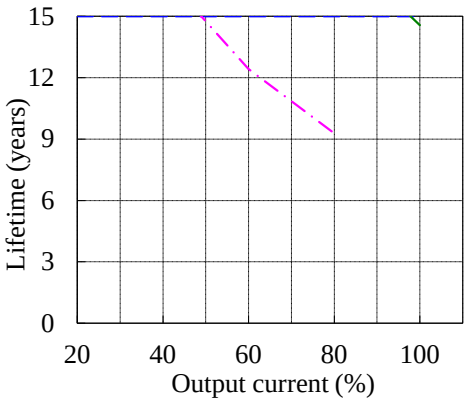
Vin=115VAC

Load \ Ta	30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	13.2
60%	15.0	15.0	9.5
80%	15.0	9.0	4.5
100%	14.0	7.0	-



Vin=230VAC

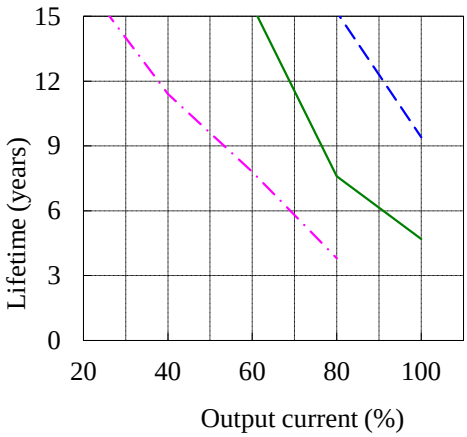
Load \ Ta	30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	15.0
60%	15.0	15.0	12.4
80%	15.0	15.0	9.3
100%	15.0	14.6	-



24V

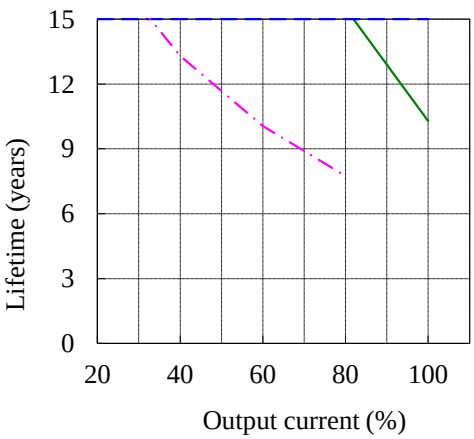
Vin=115VAC

Load \ Ta	30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	11.4
60%	15.0	15.0	7.8
80%	15.0	7.6	3.8
100%	9.4	4.7	-



Vin=230VAC

Load \ Ta	30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	13.3
60%	15.0	15.0	10.1
80%	15.0	15.0	7.8
100%	15.0	10.3	-



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The life time is calulated based on our method and doesn't include the seal rubber degradation effect etc.

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

MODEL : CUS200LD

Cooling condition :Conduction cooling

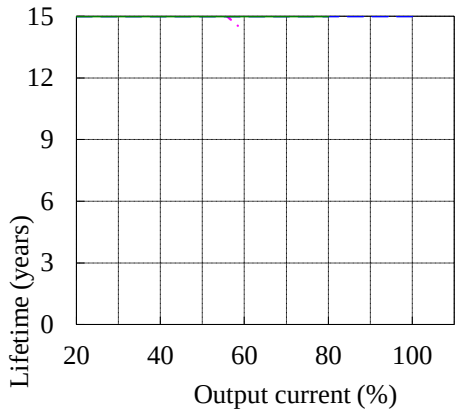
取付方向 D
Mounting D

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

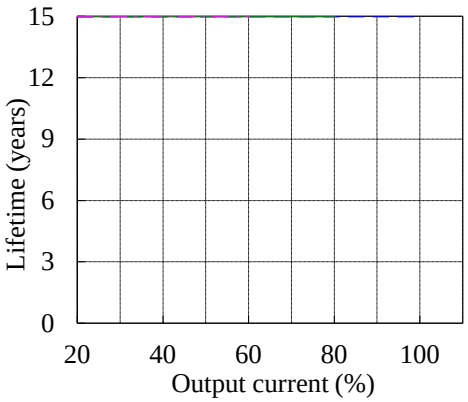
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	15.0
60%	15.0	15.0	14.3
80%	15.0	15.0	-
100%	15.0	-	-



Vin=230VAC

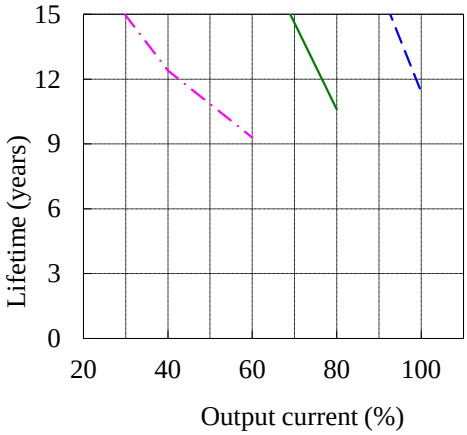
Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	15.0
60%	15.0	15.0	15.0
80%	15.0	15.0	-
100%	15.0	-	-



24V

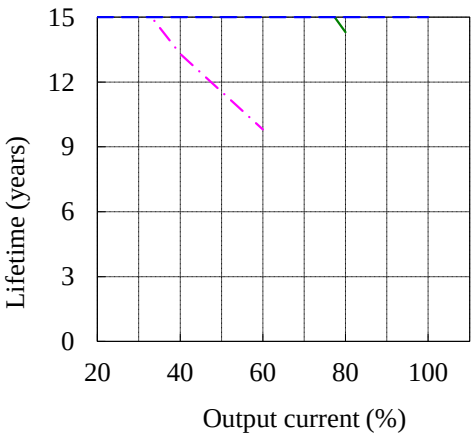
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	12.4
60%	15.0	15.0	9.3
80%	15.0	10.6	-
100%	11.4	-	-



Vin=230VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	13.3
60%	15.0	15.0	9.8
80%	15.0	14.3	-
100%	15.0	-	-



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The life time is calulated based on our method and doesn't include the seal rubber degradation effect etc.

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

MODEL : CUS200LD

Cooling condition :Conduction cooling

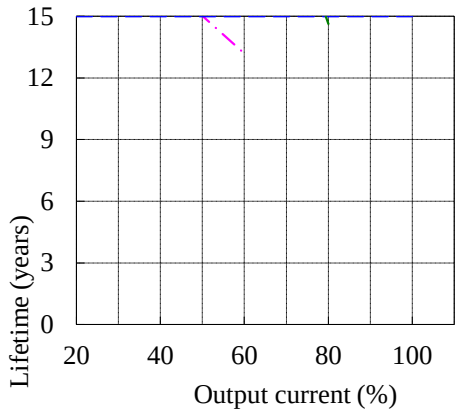
取付方向 E
Mounting E

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

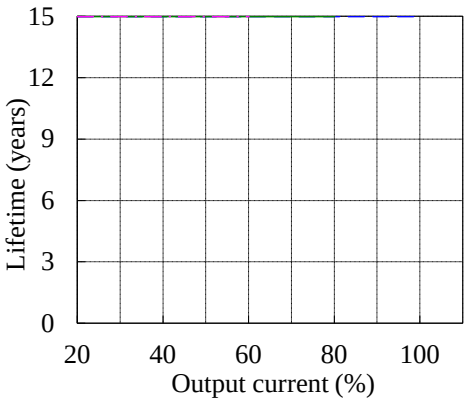
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	15.0
60%	15.0	15.0	13.2
80%	15.0	14.6	-
100%	15.0	-	-



Vin=230VAC

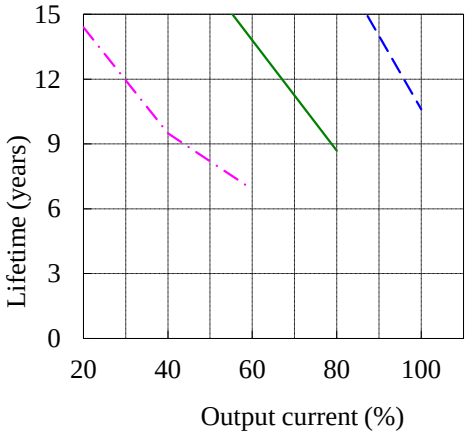
Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	15.0
40%	15.0	15.0	15.0
60%	15.0	15.0	15.0
80%	15.0	15.0	-
100%	15.0	-	-



24V

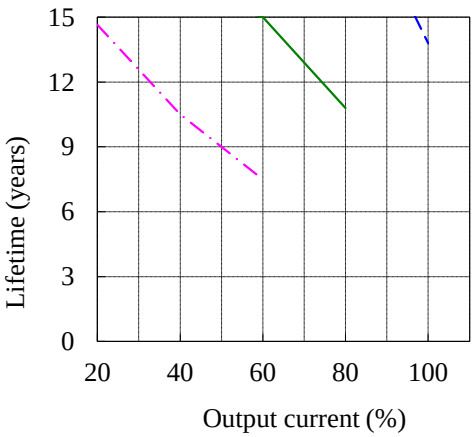
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	14.4
40%	15.0	15.0	9.5
60%	15.0	13.8	6.9
80%	15.0	8.7	-
100%	10.6	-	-



Vin=230VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	14.7
40%	15.0	15.0	10.5
60%	15.0	15.0	7.5
80%	15.0	10.8	-
100%	13.8	-	-



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The life time is calulated based on our method and doesn't include the seal rubber degradation effect etc.

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

MODEL : CUS200LD

Cooling condition :Convection cooling

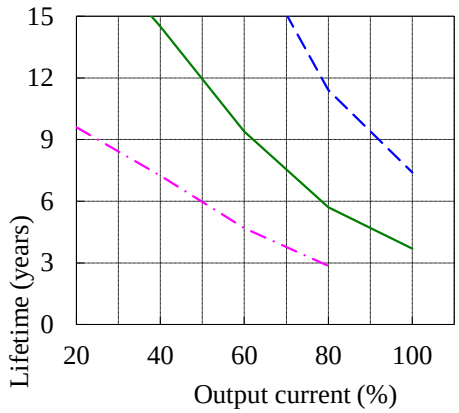
取付方向 A
Mounting A

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

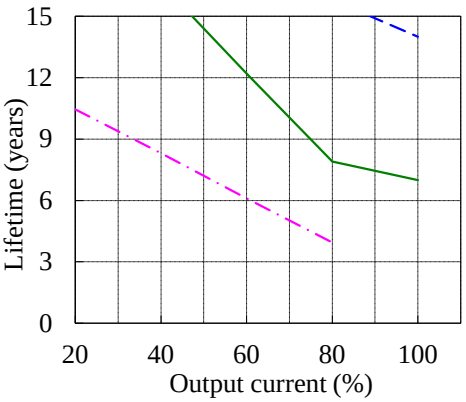
Vin=115VAC

Load \ Ta	Lifetime (years)		
	30℃	40℃	50℃
20%	15.0	15.0	9.6
40%	15.0	14.5	7.3
60%	15.0	9.4	4.7
80%	11.4	5.7	2.9
100%	7.4	3.7	-



Vin=230VAC

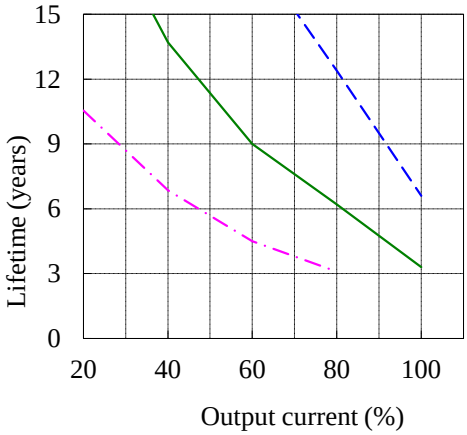
Load \ Ta	Lifetime (years)		
	30℃	40℃	50℃
20%	15.0	15.0	10.5
40%	15.0	15.0	8.3
60%	15.0	12.2	6.1
80%	15.0	7.9	4.0
100%	14.0	7.0	-



24V

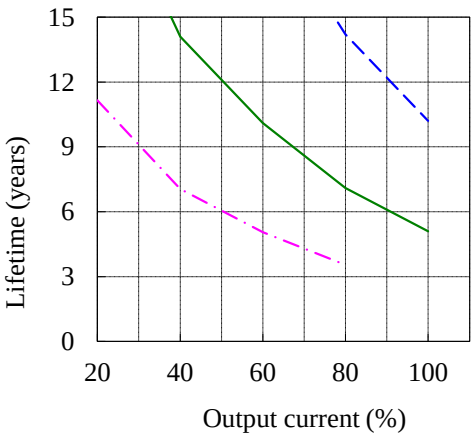
Vin=115VAC

Load \ Ta	Lifetime (years)		
	30℃	40℃	50℃
20%	15.0	15.0	10.6
40%	15.0	13.7	6.9
60%	15.0	9.0	4.5
80%	12.4	6.2	3.1
100%	6.6	3.3	-



Vin=230VAC

Load \ Ta	Lifetime (years)		
	30℃	40℃	50℃
20%	15.0	15.0	11.2
40%	15.0	14.1	7.1
60%	15.0	10.1	5.1
80%	14.2	7.1	3.6
100%	10.2	5.1	-



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The life time is calulated based on our method and doesn't include the seal rubber degradation effect etc.

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

MODEL : CUS200LD

Cooling condition :Convection cooling

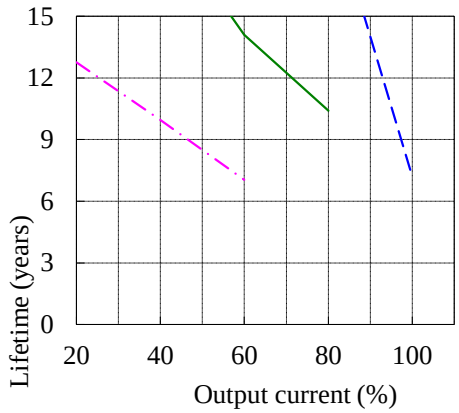
取付方向 B
Mounting B

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

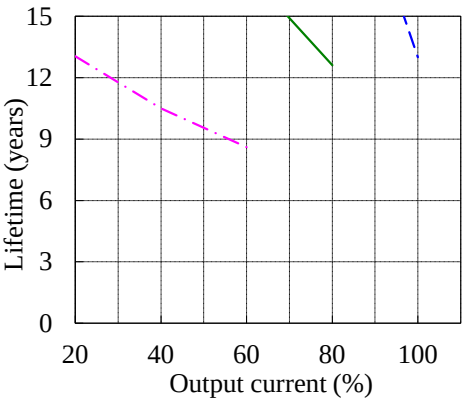
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	12.8
40%	15.0	15.0	10.0
60%	15.0	14.1	7.1
80%	15.0	10.4	-
100%	7.2	-	-



Vin=230VAC

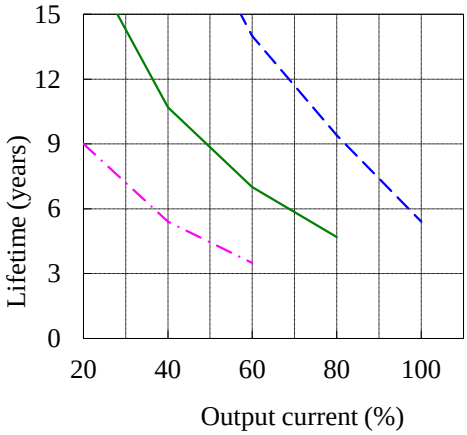
Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	13.1
40%	15.0	15.0	10.5
60%	15.0	15.0	8.6
80%	15.0	12.6	-
100%	13.0	-	-



24V

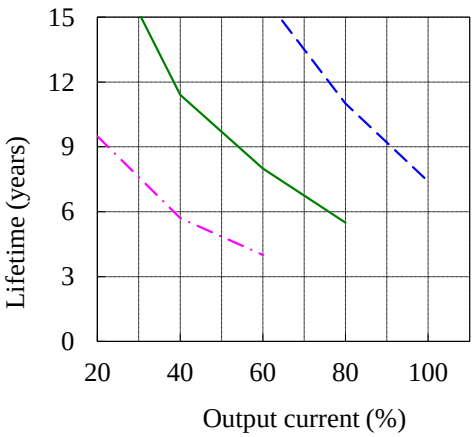
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	9.0
40%	15.0	10.7	5.4
60%	14.0	7.0	3.5
80%	9.4	4.7	-
100%	5.4	-	-



Vin=230VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	9.5
40%	15.0	11.4	5.7
60%	15.0	8.0	4.0
80%	11.0	5.5	-
100%	7.4	-	-



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The life time is calulated based on our method and doesn't include the seal rubber degradation effect etc.

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

MODEL : CUS200LD

Cooling condition :Convection cooling

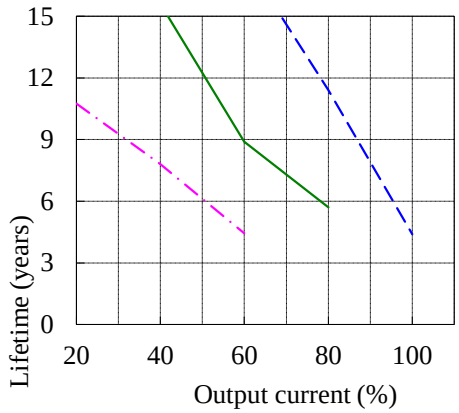
取付方向 C
Mounting C

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

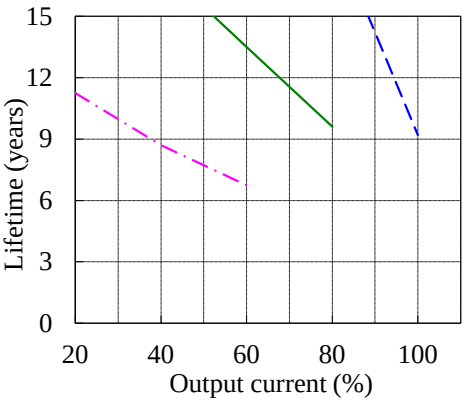
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	10.8
40%	15.0	15.0	7.8
60%	15.0	8.9	4.5
80%	11.4	5.7	-
100%	4.4	-	-



Vin=230VAC

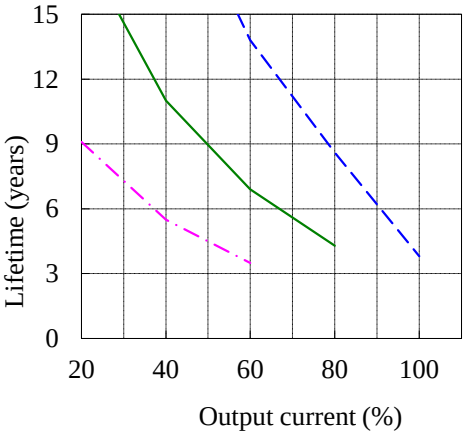
Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	11.3
40%	15.0	15.0	8.7
60%	15.0	13.5	6.8
80%	15.0	9.6	-
100%	9.2	-	-



24V

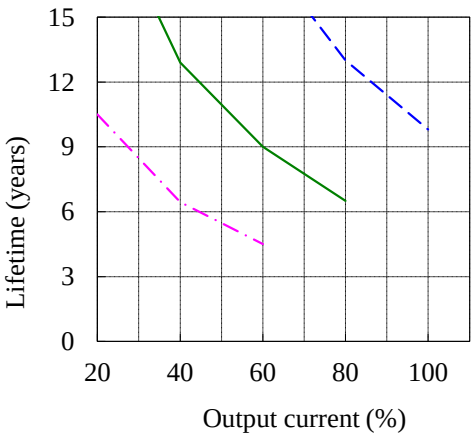
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	9.1
40%	15.0	11.0	5.5
60%	13.8	6.9	3.5
80%	8.6	4.3	-
100%	3.8	-	-



Vin=230VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	10.5
40%	15.0	12.9	6.5
60%	15.0	9.0	4.5
80%	13.0	6.5	-
100%	9.8	-	-



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The life time is calulated based on our method and doesn't include the seal rubber degradation effect etc.

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

MODEL : CUS200LD

Cooling condition :Convection cooling

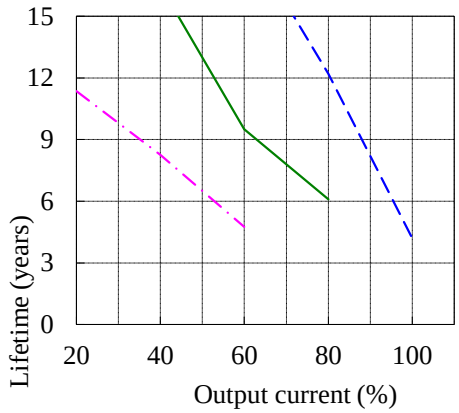
取付方向 D
Mounting D

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

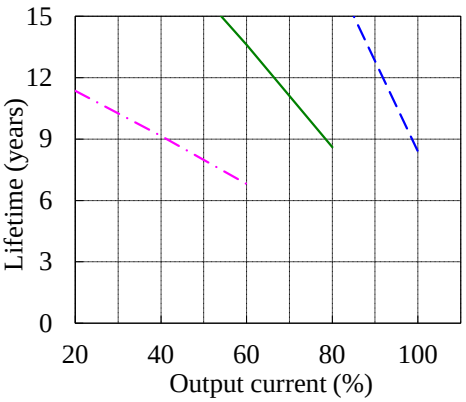
Vin=115VAC

Load \ Ta	30℃	40℃	50℃
20%	15.0	15.0	11.4
40%	15.0	15.0	8.3
60%	15.0	9.5	4.8
80%	12.2	6.1	-
100%	4.2	-	-



Vin=230VAC

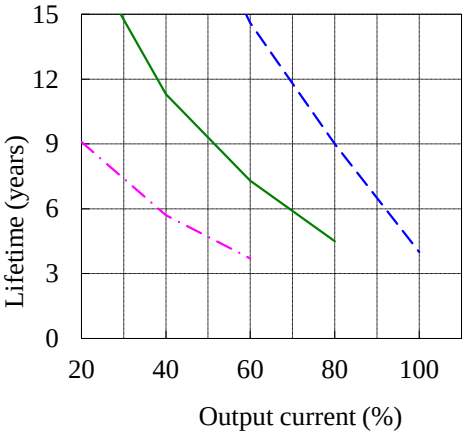
Load \ Ta	30℃	40℃	50℃
20%	15.0	15.0	11.4
40%	15.0	15.0	9.2
60%	15.0	13.6	6.8
80%	15.0	8.6	-
100%	8.4	-	-



24V

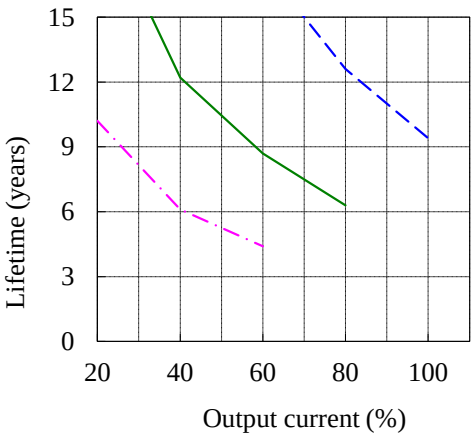
Vin=115VAC

Load \ Ta	30℃	40℃	50℃
20%	15.0	15.0	9.1
40%	15.0	11.3	5.7
60%	14.6	7.3	3.7
80%	9.0	4.5	-
100%	4.0	-	-



Vin=230VAC

Load \ Ta	30℃	40℃	50℃
20%	15.0	15.0	10.2
40%	15.0	12.2	6.1
60%	15.0	8.7	4.4
80%	12.6	6.3	-
100%	9.4	-	-



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The life time is calulated based on our method and doesn't include the seal rubber degradation effect etc.

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

MODEL : CUS200LD

Cooling condition :Convection cooling

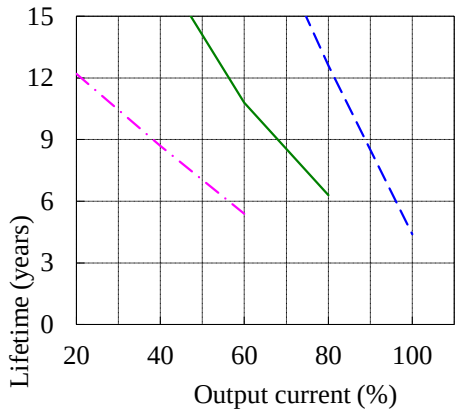
取付方向 E
Mounting E

Conditions　Ta　30℃ :
40℃ :
50℃ :

5V

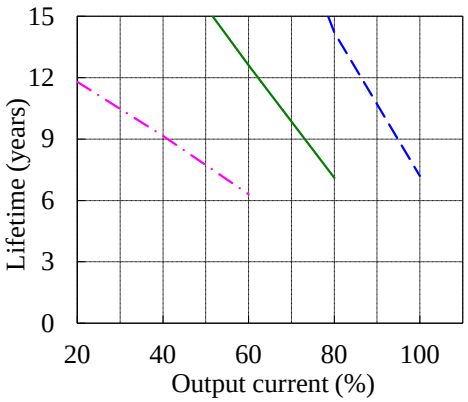
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	12.2
40%	15.0	15.0	8.7
60%	15.0	10.8	5.4
80%	12.6	6.3	-
100%	4.4	-	-



Vin=230VAC

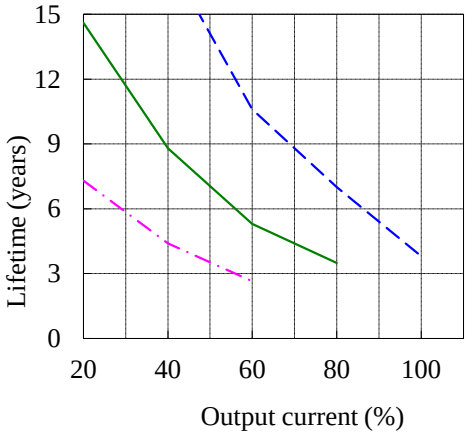
Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	11.8
40%	15.0	15.0	9.2
60%	15.0	12.6	6.3
80%	14.2	7.1	-
100%	7.2	-	-



24V

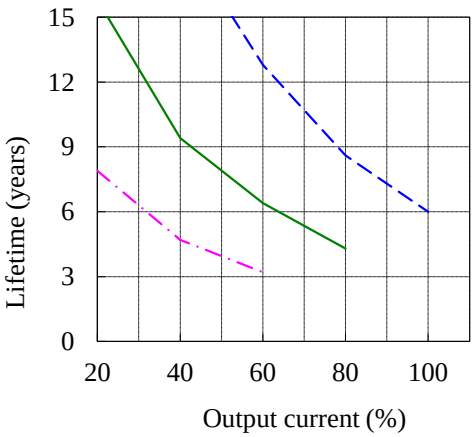
Vin=115VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	14.6	7.3
40%	15.0	8.8	4.4
60%	10.6	5.3	2.7
80%	7.0	3.5	-
100%	3.8	-	-



Vin=230VAC

Load \ Ta	Lifetime (years) 30℃	40℃	50℃
20%	15.0	15.0	7.9
40%	15.0	9.4	4.7
60%	12.8	6.4	3.2
80%	8.6	4.3	-
100%	6.0	-	-



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5. アブノーマル試験 Abnormal Test

MODEL : CUS200LD-5

(1) 試験条件 Test Conditions

Input : 265VAC Output : 5V, 30A Ta : 25℃

(2) 試験結果 Test Results

(Da : Damaged)

No.	Test position		Test mode		Test result												記事 Note
					a	b	c	d	e	f	g	h	I	j	k	l	
	部品No. Location No.	試験端子 Test point	ショート Short	オープン Open	発火 Fire	発煙 Smoke	破裂 Burst	異臭 Smell	赤熱 Red hot	破損 Damaged	ヒューズ断 Fuse blown	OVP	OCP	出力断 No output	変化なし No change	その他 Others	
1	Q101	D-S	○							○	○			○			Da:F1
2		D-G	○							○	○			○			Da:F1,A101,Q101,R106, R105,C116,C104
3		G-S	○													○	Power factor low
4		D		○										○			
5		S		○										○			
6		G		○						○	○			○			Da:F1,A101,Q101,Z105
7	Q103A	D-S	○											○			
8		D-G	○											○			
9		G-S	○											○			
10		D		○										○			
11		S		○										○			
12		G		○										○			
13	Q103B	D-S	○											○			
14		D-G	○											○			
15		G-S	○											○			
16		D		○										○			
17		S		○										○			
18		G		○										○			
19	Q201A/B	D-S	○											○		○	Power supply hiccup
20		D-G	○											○			
21		G-S	○													○	Input power increase
22		D		○											○		
23		S		○											○		
24		G		○												○	Input power increase
25	Q202	D-S	○											○		○	Power supply hiccup
26		D-G	○							○				○			DA:Q202
27		G-S	○													○	Input power increase
28		D		○										○			
29		S		○										○			
30		G		○										○			

(Da : Damaged)

No.	Test position		Test mode		Test result												
					a	b	c	d	e	f	g	h	I	j	k	l	
No.	部品No. Location No.	試験端子 Test point	ショート Short	オープン Open	発火 Fire	発煙 Smoke	破裂 Burst	異臭 Smell	赤熱 Red hot	破損 Damaged	ヒューズ断 Fuse blown	OVP	OCP	出力断 No output	変化なし No change	その他 Others	記事 Note
31	D101		○							○	○			○			Da:F1,Q101,R105,A101,R106,Z105
32				○						○	○			○			Da:F1,Q101,R105,A101,R106,Z105
33	C7		○							○	○			○			Da:F1
34				○						○	○			○			Da:F1,Q101,R105,A101,R106,Q105,C112
35	C51A/B/C		○											○			
36				○											○		
37	BD1	AC-AC	○							○	○			○			Da:F1
38		DC+-DC-	○							○	○			○			Da:F1
39		AC-DC+	○							○	○			○			Da:F1
40		AC-DC-	○							○	○			○			Da:F1
41		AC		○										○			
42		DC+		○										○			
43		DC-		○										○			
44	T2	1-2	○											○			
45		5-6	○											○			
46		7,8-9,10	○											○			
47		11-12	○											○			
48		1		○										○			
49		5		○										○			
50		7,8		○										○			
51		11		○												○	Input power increase
52	L51		○											○			
53				○										○			

6. 振動試験 Vibration Test

MODEL： CUS200LD-5

(1) 振動試験種類 Vibration Test Class

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

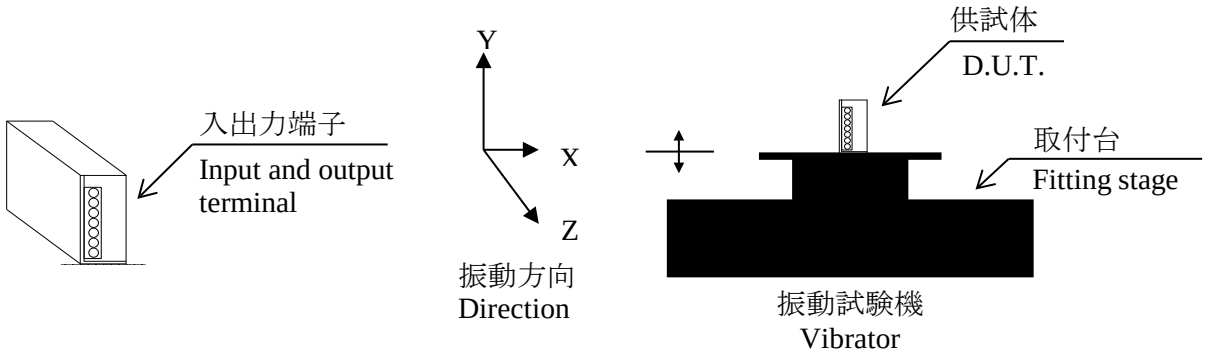
(2) 使用振動試験装置 Equipment Used

Unholtz Dickie Corp. SAI30-R16C

(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. 試験後の出力に異常がない事
   No abnormal output after test.

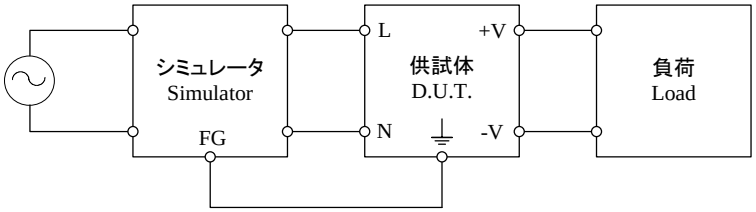
(6) 試験結果 Test Results

合格 OK

7. ノイズシミュレート試験 Noise Simulate Test

MODEL： CUS200LD-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	: 115, 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	: Full Load	・極性 Polarity	: ＋,－
・周囲温度 Ambient temperature	: 25℃	・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. 試験中、5%を超える出力電圧の変動のない事
   The regulation of output voltage must not exceed 5% of initial value during test.
2. 試験後の出力電圧は初期値から変動していない事
   The output voltage must be within the regulation of specification after the test.
3. 発煙・発火のない事
   Smoke and fire are not allowed.

(4) 試験結果 Test Results

合格 OK

8. 熱衝撃試験 Thermal Shock Test

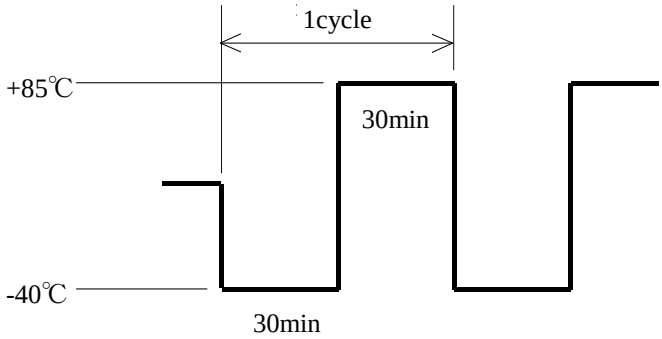
MODEL： CUS200LD-5

(1) 使用計測器 Equipment Used

TSA-72ES-A : ESPEC

(2) 試験条件 Test Conditions

・電源周囲温度 : -40℃ ⇔ 85℃
Ambient Temperature
・試験時間 : 図参照
Test Time Refer to Dwg.
・試験サイクル : 200 サイクル
Test Cycle 200 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。200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. 200 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

試験後の出力に異常がない事
No abnormal output after test.

(5) 試験結果 Test Results

合格 OK