DRL100-1

RELIABILITY DATA

INDEX

PAGE

1. Calculated Values of MTBF ····· R-1

2. Component Derating ····· R-2～4

3. Main Components Temperature Rise △T List ····· R-5～6

4. Electrolytic Capacitor Lifetime ····· R-7

5. Abnormal Test ····· R-8～11

6. Vibration Test ····· R-12

7. Shock Test ····· R-13

8. Noise Simulate Test ····· R-14

9. Thermal Shock Test ····· R-15

10. Voltage Dips, Short Interruptions Immunity Test (SEMI-F47) ····· R-16

※ 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. Calculated Values of MTBF

MODEL：DRL100-24-1

(1) Calculating Method

Calculated based on stress reliability projection of Telcordia SR-332 issue3.
Individual failure rates FR is given to each part and MTBF is calculated
by the count of each part.(Method I)

$$MTBF = \frac{1}{FR_{equip}} = \frac{1}{\sum_{i=1}^{n} n_i \left(L_G \times \pi_Q \times \pi_S \times \pi_T \times \pi_E \times \pi_{CF}\right)_i} \times 10^9 \quad \text{Hours}$$

FR_{equip} : Total Equipment Failure Rate (Failure／10^9Hours)

L_G : Mean generic (or base) failure rate.

n_i : Quantity of ith Generic Part

n : Number of Different Generic Part Categories

π_Q : Quality factor, which depends on the part's quality level.

π_S : Stress factor, which depends on the part's stress level.

π_T : Temperature factor, which depends on the part's operating temperature.

π_E : Environment factor, which depends on the circuit's operating environment.

π_{CF} : Correction Factor, which depends on the part's correction factor.

(2) MTBF Values

Condition:

G_F : Ground, Fixed — Ambient Temperature: 51℃

Model Type: Serial — UCL(upper confidence level): 90%

Io=100% load — Quality Level: II

Vin: 115Vac : MTBF ≒ 378742 (hours)

Vin: 230Vac : MTBF ≒ 437110 (hours)

2. Components Derating

MODEL：DRL100-1

(1) Calculating Method

(a) Measuring method

Mounting method : Standard mounting	Ambient temperature：51℃
Input voltage : 115, 230VAC	Output voltage & current : 100%

(b) Semiconductors

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

(c) IC, Resistors, Capacitors, etc.

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

(d) Calculating method of thermal impedance

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

Tc : Case Temperature at Start Point of Derating；25℃ in General

Ta : Ambient Temperature at Start Point of Derating；25℃ in General

Tl : Lead Temperature at Start Point of Derating；25℃ in General

Pd(max) : Maximum Power Dissipation

Tj(max) (Tch(max)) : Maximum Junction (channel) Temperature

θj-c (θch-c) : Thermal Impedance between Junction (channel) and Case

θj-a : Thermal Impedance between Junction and air

θj-l : Thermal Impedance between Junction and Lead

(2) Component Derating List

Model: DRL100-24-1

Location No.	Vin = 115VAC Ta = 51℃ Load = 100%(Vo: 24V, Io: 4.2A)		
A101 L6566BTR STMICRO	Tj (max) = 150 ℃ Pd = 175.4 mW Tj= Tc+ ((θj-a)× Pd) =108.9℃ D.F. = 72.63%	θj-a = 120.0 ℃/W ΔTc= 36.9℃	Pd (max) = 0.75 W Tc= 87.9 ℃
A201 TL432AIPK TI	Tj (max) = 150 ℃ Pd = 22.7 mW Tj= Tc+ ((θj-c)× Pd) =85.8℃ D.F. = 57.20%	θj-c = 9.0 ℃/W ΔTc= 34.6℃	 Tc= 85.6 ℃
Q1 STF21N65M5 STMICRO	Tch (max) = 150 ℃ Pd = 1.93 W Tch= Tc+ ((θch-c)× Pd) =127.9℃ D.F. = 85.3%	θch-c = 4.17 ℃/W ΔTc= 68.9℃	Pd (max) = 30.0 W Tc= 119.9 ℃
D1 RS405M RECTRON	Tj (max) = 150 ℃ Pd = 2.3 W Tj= Tc+ ((θj-c)× Pd) =107.0℃ D.F. = 71.33%	θj-c = 6.0 ℃/W ΔTc= 42.2℃	 Tc= 93.2 ℃
D51 STPS20170CT STMICRO	Tj (max) = 175 ℃ Pd = 3.2 W Tj= Tc+ ((θj-c)× Pd) =130.5℃ D.F. = 74.55%	θj-c = 1.3 ℃/W ΔTc= 75.3℃	 Tc= 126.3 ℃
D101 , D106 D1F60-5053 SHINDENGEN	Tj (max) = 150 ℃ Pd = 135.0 mW Tj= Tl+ ((θj-l)× Pd) =119.9℃ D.F. = 79.94%	θj-l = 23.0 ℃/W ΔTl= 65.8℃	 Tl= 116.8 ℃
D103 CRH01(TE85L,Q) TOSHIBA	Tj (max) = 150 ℃ Pd = 16.7 mW Tj= Tc+ ((θj-a)× Pd) =102.8℃ D.F. = 68.51%	θj-a = 130.0 ℃/W ΔTc= 49.6℃	 Tc= 100.6 ℃
PC101 TLP291(GR,SE (TRANSISTOR) TOSHIBA	Tj (max) = 125 ℃ Pd = 1.3 mW Tj= Tc+ ((θj-a)× Pd) =83.8℃ D.F. = 67.01%	θj-a = 666.7 ℃/W ΔTc= 31.9℃	Pd (max) = 150.0 mW Tc= 82.9 ℃
PC101 TLP291(GR,SE (LED) TOSHIBA	Tj (max) = 125 ℃ Pd = 1.1 mW Tj= Tc+ ((θj-a)× Pd) =83.3℃ D.F. = 66.61%	θj-a = 333.3 ℃/W ΔTc= 31.9℃	Pd (max) = 100.0 mW Tc= 82.9 ℃
PC102 TLP291(GR,SE (TRANSISTOR) TOSHIBA	Tj (max) = 125 ℃ Pd = 0.0 mW Tj= Tc+ ((θj-a)× Pd) =82.9℃ D.F. = 66.32%	θj-a = 666.7 ℃/W ΔTc= 31.9℃	Pd (max) = 150.0 mW Tc= 82.9 ℃
PC102 TLP291(GR,SE (LED) TOSHIBA	Tj (max) = 125 ℃ Pd = 0.0 mW Tj= Tc+ ((θj-a)× Pd) =82.9℃ D.F. = 66.32%	θj-a = 333.3 ℃/W ΔTc= 31.9℃	Pd (max) = 100.0 mW Tc= 82.9 ℃

(2) Component Derating List

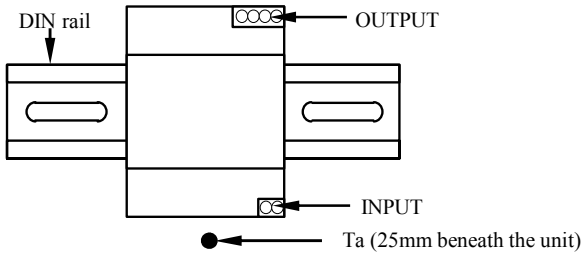
Model: DRL100-24-1

Location No.	Vin = 230VAC Ta = 51℃ Load = 100%(Vo: 24V, Io: 4.2A)		
A101 L6566BTR STMICRO	Tj (max) = 150 ℃ Pd = 189.0 mW Tj= Tc+ ((θj-a)× Pd) =107.2℃ D.F. = 71.45%	θj-a = 120.0 ℃/W ΔTc= 33.5℃	Pd (max) = 0.75 W Tc= 84.5 ℃
A201 TL432AIPK TI	Tj (max) = 150 ℃ Pd = 22.4 mW Tj= Tc+ ((θj-c)× Pd) =83.3℃ D.F. = 55.53%	θj-c = 9.0 ℃/W ΔTc= 32.1℃	Tc= 83.1 ℃
Q1 STF21N65M5 STMICRO	Tch (max) = 150 ℃ Pd = 1.61 W Tch= Tc+ ((θch-c)× Pd) =123.7℃ D.F. = 82.48%	θch-c = 4.17 ℃/W ΔTc= 66.0℃	Pd (max) = 30.0 W Tc= 117.0 ℃
D1 RS405M RECTRON	Tj (max) = 150 ℃ Pd = 1.1 W Tj= Tc+ ((θj-c)× Pd) =81.9℃ D.F. = 54.6%	θj-c = 6.0 ℃/W ΔTc= 24.3℃	Tc= 75.3 ℃
D51 STPS20170CT STMICRO	Tj (max) = 175 ℃ Pd = 3.2 W Tj= Tc+ ((θj-c)× Pd) =126.3℃ D.F. = 72.15%	θj-c = 1.3 ℃/W ΔTc= 71.1℃	Tc= 122.1 ℃
D101 , D106 D1F60-5053 SHINDENGEN	Tj (max) = 150 ℃ Pd = 198.0 mW Tj= Tl+ ((θj-l)× Pd) =114.4℃ D.F. = 76.24%	θj-l = 23.0 ℃/W ΔTl= 58.8℃	Tl= 109.8 ℃
D103 CRH01(TE85L,Q) TOSHIBA	Tj (max) = 150 ℃ Pd = 17.6 mW Tj= Tc+ ((θj-a)× Pd) =97.1℃ D.F. = 64.73%	θj-a = 130.0 ℃/W ΔTc= 43.8℃	Tc= 94.8 ℃
PC101 TLP291(GR,SE (TRANSISTOR) TOSHIBA	Tj (max) = 125 ℃ Pd = 1.3 mW Tj= Tc+ ((θj-a)× Pd) =80.9℃ D.F. = 64.69%	θj-a = 666.7 ℃/W ΔTc= 29.0℃	Pd (max) = 150.0 mW Tc= 80.0 ℃
PC101 TLP291(GR,SE (LED) TOSHIBA	Tj (max) = 125 ℃ Pd = 1.0 mW Tj= Tc+ ((θj-a)× Pd) =80.3℃ D.F. = 64.27%	θj-a = 333.3 ℃/W ΔTc= 29.0℃	Pd (max) = 100.0 mW Tc= 80.0 ℃
PC102 TLP291(GR,SE (TRANSISTOR) TOSHIBA	Tj (max) = 125 ℃ Pd = 0.0 mW Tj= Tc+ ((θj-a)× Pd) =80.0℃ D.F. = 64.%	θj-a = 666.7 ℃/W ΔTc= 29.0℃	Pd (max) = 150.0 mW Tc= 80.0 ℃
PC102 TLP291(GR,SE (LED) TOSHIBA	Tj (max) = 125 ℃ Pd = 0.0 mW Tj= Tc+ ((θj-a)× Pd) =80.0℃ D.F. = 64.%	θj-a = 333.3 ℃/W ΔTc= 29.0℃	Pd (max) = 100.0 mW Tc= 80.0 ℃

3. Main Components Temperature Rise △T List

MODEL : DRL100-1

(1) Measuring Conditions

Mounting Method (Standard Mounting)	Standard Mounting 
Input voltage (Vin)	115VAC
Output voltage (Vo)	24VDC
Output current (Io)	4.2A(100%)

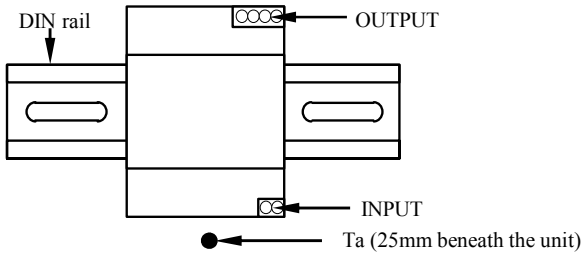
(2) Measuring Results

		ΔT Temperature Rise (℃)
Output Derating		Io=100 %
		Ta=51℃
Location No.	Part name	Standard Mounting
		24VDC
A101	IC	36.9
A201	IC	34.6
C2	E.CAP.	36.8
C3	E.CAP.	39.1
C5	E.CAP.	37.9
C51	E.CAP.	48.7
C52	E.CAP.	46.4
C54	E.CAP.	38.8
D1	BRIDGE DIODE	42.2
D51	S.B.D	75.3
L1	BALUN COIL	42.6
L2	BALUN COIL	33.4
L51	CHOKE COIL	57.1
L52	CHOKE COIL	49.4
PC101	PHOTO COUPLER	31.9
PC102	PHOTO COUPLER	31.9
Q1	MOSFET	68.9
T1	TRANSFORMER	66.2

3. Main Components Temperature Rise △T List

MODEL : DRL100-1

(1) Measuring Conditions

Mounting Method (Standard Mounting)	Standard Mounting 
Input voltage (Vin)	230VAC
Output voltage (Vo)	24VDC
Output current (Io)	4.2A(100%)

(2) Measuring Results

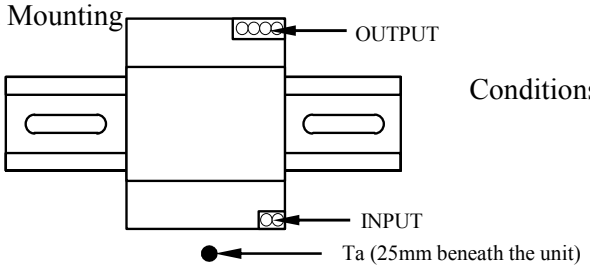
		ΔT Temperature Rise (℃)
Output Derating		Io=100 %
		Ta=51℃
Location No.	Part name	Standard Mounting
		24VDC
A101	IC	33.5
A201	IC	32.1
C2	E.CAP.	30.5
C3	E.CAP.	32.5
C5	E.CAP.	33.9
C51	E.CAP.	46.3
C52	E.CAP.	43.8
C54	E.CAP.	36.1
D1	BRIDGE DIODE	24.3
D51	S.B.D	71.1
L1	BALUN COIL	23.7
L2	BALUN COIL	21.1
L51	CHOKE COIL	55.1
L52	CHOKE COIL	46.9
PC101	PHOTO COUPLER	29.0
PC102	PHOTO COUPLER	29.0
Q1	MOSFET	66.0
T1	TRANSFORMER	63.5

4. Electrolytic Capacitor Lifetime

MODEL : DRL100-24-1

Cooling condition : Convection cooling

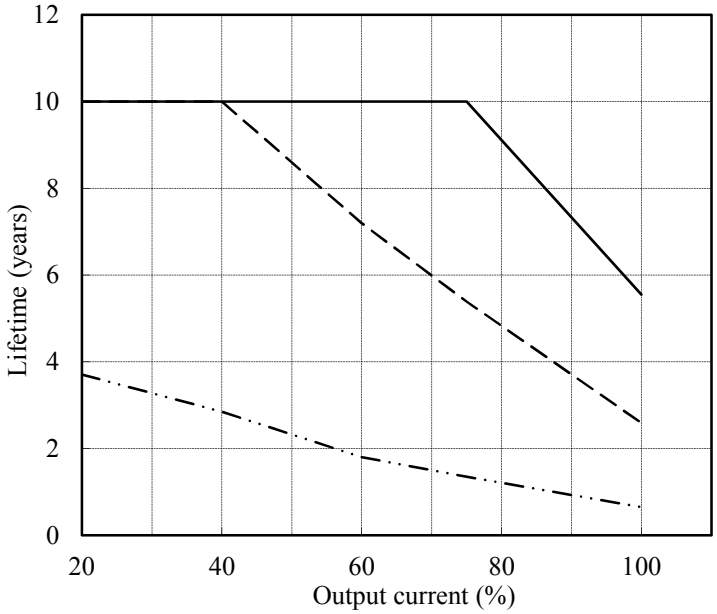
Standard Mounting



Conditions Ta 40℃ : ——
51℃ : – – –
71℃ : —·—

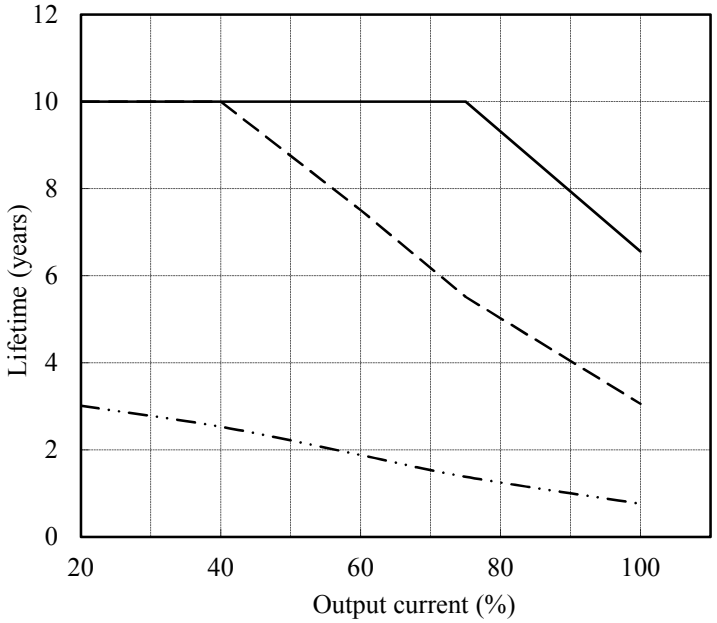
Vin=115VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 51℃	Ta= 71℃
20	10.0	10.0	3.7
40	10.0	10.0	2.9
60	10.0	7.2	1.8
75	10.0	5.4	1.4
100	5.6	2.6	0.7



Vin=230VAC

Load (%)	Lifetime (years)		
	Ta= 40℃	Ta= 51℃	Ta= 71℃
20	10.0	10.0	3.0
40	10.0	10.0	2.5
60	10.0	7.5	1.9
75	10.0	5.5	1.4
100	6.6	3.1	0.8



5. Abnormal Test

MODEL :DRL100-24-1

(1) Test Conditions

Input : 230VAC Output : 24V, 4.2A Ta : 25℃

(2) Test Results

(Da : Damaged)

No.	Test position		Test mode		Test result												Note
	Location No.	Test point	Short	Open	a Fire	b Smoke	c Burst	d Smell	e Red hot	f Damaged	g Fuse blown	h O.V.P	i O.C.P	j No output	k No change	l Others	
1	D1	AC-AC	O							O	O			O			Da:F1
2		DC-DC	O							O	O			O			Da:F1
3		AC-DC+	O							O	O			O			Da:F1
4		AC-DC-	O							O	O			O			Da:F1
5		AC		O										O			
6		DC		O										O			
7	Q1	D-S	O							O	O			O			Da: F1,Z105
8		D-G	O							O	O			O			Da: F1,Z101
9		G-S	O											O			
10		D		O										O			
11		S		O										O			
12		G		O						O	O			O			Da: F1,Q1,Z105
13	D51	A-K	O													O	Output hiccup
14		A(Pin1)		O												O	Pin increase 0.35W
15		A(Pin3)		O												O	Pin increase 0.35W
16		K		O						O	O			O			Da: F1,Q1,Z105
17	Q101	B-C	O												O		
18		C-E	O												O		
19		E-B	O													O	Output hiccup
20		B		O												O	Output hiccup
21		C		O												O	Output hiccup
22		E		O												O	Output hiccup
23	D101	A-K	O													O	Output hiccup
24		A,K		O											O		
25	D102	A-K	O												O		
26		A,K		O											O		
27	D103	A-K	O											O			
28		A,K		O												O	Output hiccup
29	D104	A-K	O												O		
30		A,K		O											O		
31	D106	A-K	O													O	Output hiccup
32		A,K		O											O		
33	D107	A-K	O												O		
34		A,K		O											O		

(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	
35	D201	A-K	O												O		
36		A,K		O											O		
37	D202	A-K	O												O		
38		A,K		O											O		
39	Z101	A-K	O											O			
40		A,K		O											O		
41	Z103	A-K	O											O			
42		A,K		O											O		
43	Z104	A-K	O												O		OVP malfunction
44		A,K		O											O		
45	Z105	A-K	O													O	Screaming noise ,Pin increase 6W
46		A,K		O											O		
47	Z106	A-K	O											O			
48		A,K		O											O		
49	Z202	A-K	O									O		O			Triger OVP
50		A,K		O											O		OVP malfunction
51	Z203	A-K	O									O		O			Triger OVP
52		A,K		O											O		OVP malfunction
53	T1	1-2	O													O	Output hiccup
54		4-6	O											O			
55		9-11	O													O	Output hiccup
56		1,2		O												O	Output hiccup
57		4,6		O										O			
58		11		O						O	O			O			Da: F1,Q1,Z105
59	L51	1-2	O												O		
60		1,2		O											O		
61	L52	1-2	O												O		
62		1,2		O										O			
63	L1	1-2	O												O		
64		1,2		O										O			
65	L2	1-2	O											O			Da:F1
66		3-4	O											O			Da:F1
67		1-4	O												O		
68		2-3	O												O		
69		1,2,3,4		O										O			
70	PC101	1-2	O										O			O	Output hiccup
71		3-4	O											O		O	Output hiccup
72		1,2		O									O			O	Output hiccup
73		3,4		O									O			O	Output hiccup

(Da : Damaged)

No.	Test position		Test mode		Test result												Note
	Location No.	Test point	Short	Open	a Fire	b Smoke	c Burst	d Smell	e Red hot	f Damaged	g Fuse blown	h O.V.P	i O.C.P	j No output	k No change	l Others	
74	PC102	1-2	O												O		OVP malfunction
75		3-4	O											O			
76		1,2		O											O		OVP malfunction
77		3,4		O											O		OVP malfunction
78	A101	1-2	O												O		
79		2-3	O												O		
80		3-4	O											O			
81		4-5	O							O	O			O			Da: F1,Q1,Z105
82		5-6	O							O	O			O			Da: F1,Q1,Z105
83		6-7	O							O	O			O		O	Da: F1,Q1,Z105
84		7-8	O							O	O			O			Da: F1,Q1,Z105
85		9-10	O													O	Output hiccup
86		10-11	O											O			
87		11-12	O												O		
88		12-13	O													O	Pin increase 9W
89		13-14	O													O	Vout=19.05V,Pin=89W
90		14-15	O												O		
91		15-16	O												O		
92		1		O											O		Start up malfunctin
93		2		O											O		
94		3		O										O			
95		4		O						O	O			O			Da: F1,Q1,Z105
96		5		O										O			
97		6		O											O		
98		7		O												O	Output hiccup
99		8		O											O		OVP malfunction
100		9		O												O	Output hiccup
101		10		O											O		
102		11		O											O		
103		12		O											O		
104		13		O										O			
105		14		O											O		
106		15		O												O	Output hiccup
107		16		O										O			
108	A201	1-2	O													O	Output hiccup
109		2-3	O													O	Output hiccup
110		1		O												O	Output hiccup
111		2		O												O	Output hiccup
112		3		O												O	Output hiccup
113	C1	-	O							O	O			O			Da:F1
114		-		O											O		

(Da : Damaged)

No.	Test position		Test mode		Test result												Note
	Location No.	Test point	Short	Open	a Fire	b Smoke	c Burst	d Smell	e Red hot	f Damaged	g Fuse blown	h O.V.P	i O.C.P	j No output	k No change	l Others	
115	C2	-	O							O	O			O			Da:F1
116		-		O											O		
117	C3	-	O							O	O			O			Da:F1
118		-		O											O		
119	C5	-	O											O			
120		-		O											O		
121	C51	-	O											O		O	Output hiccup
122		-		O											O		
123	C52	-	O											O		O	Output hiccup
124		-		O											O		
125	C54	-	O											O		O	Output hiccup
126		-		O											O		
127	C101	-	O													O	Output hiccup
128		-		O											O	O	Pin increase 0.2W
129	C201	-	O													O	Pin increase 0.3W
130		-		O											O		
131	C202	-	O													O	Pin increase 1.3W
132		-		O											O		
133	C203	-	O													O	Output hiccup
134		-		O											O		
135	C204	-	O											O		O	Output hiccup
136		-		O											O		
137	C205	-	O											O		O	Output hiccup
138		-		O											O		
139	C117	-	O												O		
140		-		O											O		
141	C102	-	O											O			
142		-		O											O		
143	C111	-	O											O			
144		-		O											O		
145	C103	-	O												O		OVP malfunction
146		-		O											O		
147	C109	-	O												O		
148		-		O											O		
149	C112	-	O											O			
150		-		O											O		
151	R51	-	O												O		
152		-		O											O		
153	R108	-	O													O	Screaming noise ,Pin increase 6W
154		-		O												O	Output hiccup

6. Vibration Test

MODEL：DRL100-24-1

(1) Vibration Test Class

Frequency variable endurance test

(2) Equipment Used

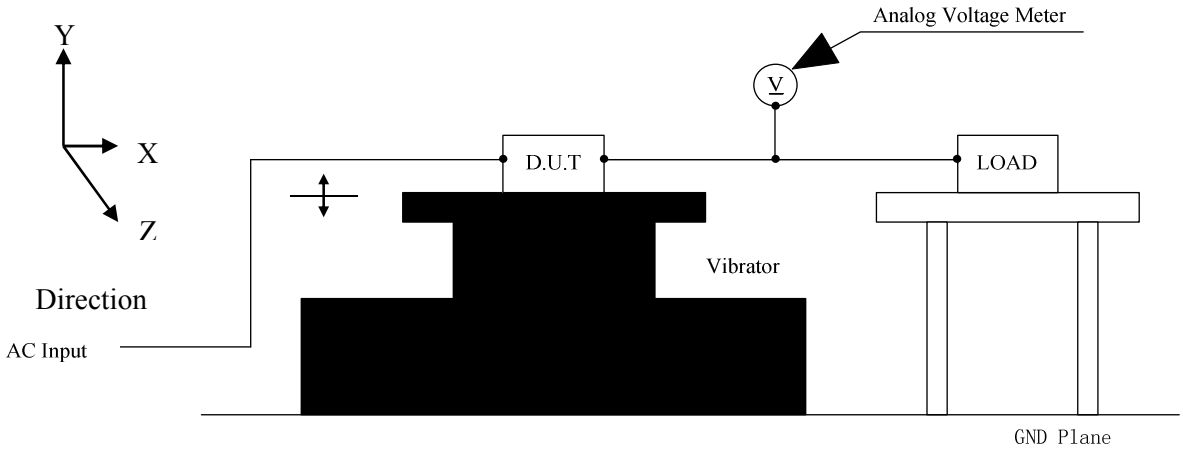
Controller	: ES-30-370 Suzhou Dongling	Vibrator	: ES-30-370 Suzhou Dongling

(3) Test Conditions

D.U.T is fixed on the DIN rail(TS-35) during the vibration test.

Test Spec	: IEC60068-2-6	D.U.T condition	: Operating
Sweep frequency	: 10～500Hz(sine wave)	Direction	: X, Y, Z
Sweep time	: 10.0min per cycle	Sweep count	: 1 hour each
Acceleration	: Constant 19.6m/s^2 (2G)		

(4) Test Method



(5) Judging Conditions

1. Output voltage not to exceed ±5% of initial value during test.
2. Not broken during test, sold pads no change by visual check after test.
3. Characteristic to be within regulation specification after the test.

(6) Test Results

OK

7. Shock Test

MODEL：DRL100-24-1

(1) Shock Test Class

Refer to IEC 60068-2-27, Half sine wave

(2) Equipment Used

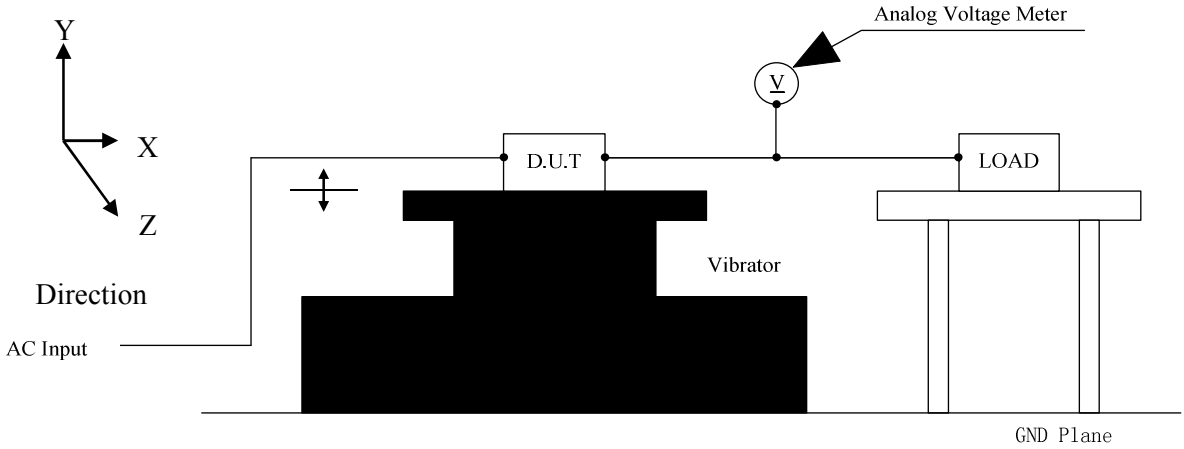
Controller	: ES-30-370 Suzhou Dongling	Vibrator	: ES-30-370 Suzhou Dongling

(3) Test Conditions

D.U.T is fixed on the DIN rail(TS-35) during the shock test.

Test Spec	: IEC60068-2-27	D.U.T condition	: Operating
Waveform	: Half sine wave	Direction	: X, Y, Z
Duration time	: 22ms	Shock times	: 3 shocks each
Acceleration	: Constant 39.2m/s^2 (4G)		

(4) Test Method



(5) Judging Conditions

1. Output voltage not to exceed ±5% of initial value during test.
2. Not broken during test, sold pads no change by visual check after test.
3. Characteristic to be within regulation specification after the test.

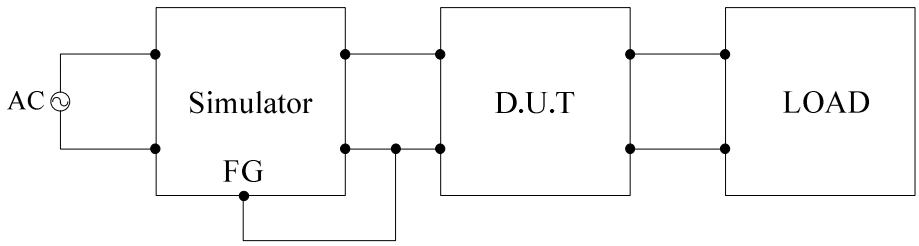
(6) Test Results

OK

8. Noise Simulate Test

MODEL：DRL100-24-1

(1) Test Circuit and Equipment



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

(2) Test Conditions

Input voltage	: 115, 230VAC	Noise level	: 0～2kV
Output Voltage	: Rated	Phase	: 0～360 deg
Output current	: 0, 100%	Polarity	: ＋,－
Ambient temperature	: 25℃	Mode	: Normal
Pulse width	: 50～1000ns	Trigger select	: Line

(3) Judging Conditions

1. Output voltage not to exceed ±5% of initial value during test.
2. Not broken during test.

(4) Test Results

OK

9. Thermal Shock Test

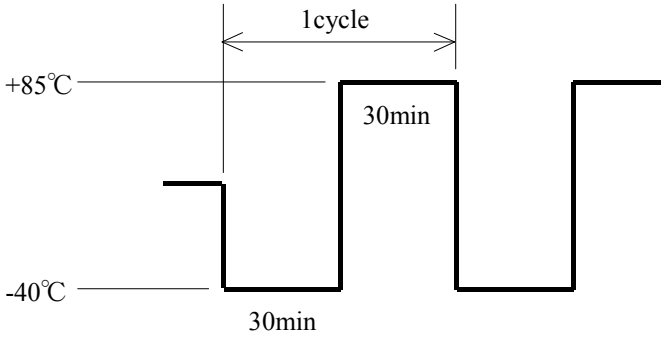
MODEL : DRL100-24-1

(1) Equipment Used

TSA-101S-W : ESPEC

(2) Test Conditions

Ambient Temperature : -40℃ ⇔ 85℃
Test Time : Refer to Dwg.
Test Cycle : 100 Cycles
Not Operating



(3) Test Method

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) Judging Conditions

1. Not to be broken
2. Characteristic to be within regulation specification after the test.

(5) Test Results

OK

10. Voltage Dips, Short Interruptions Immunity Test (SEMI-F47)

MODEL : DRL100-24-1

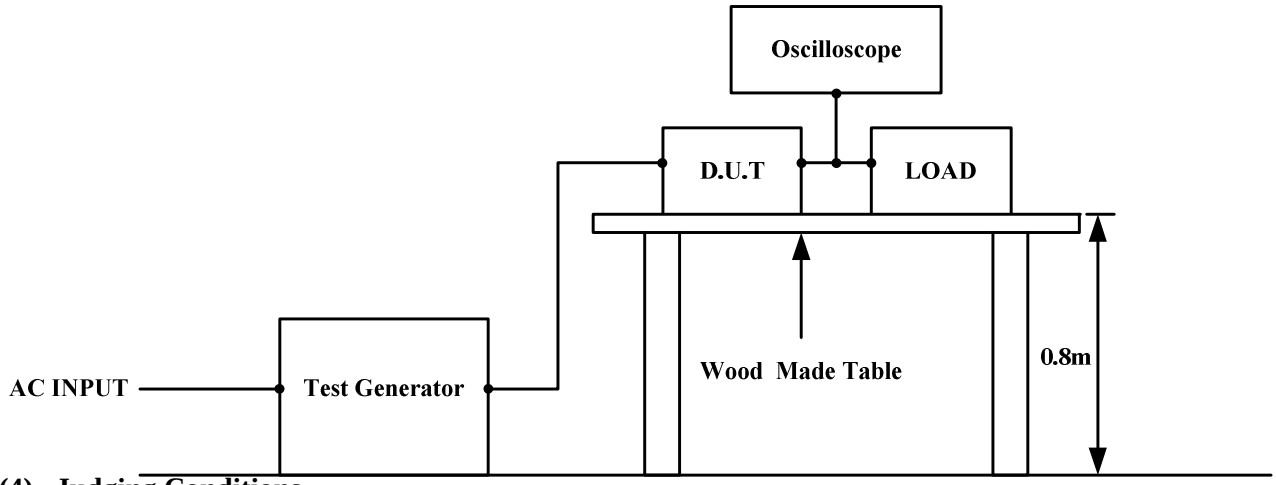
(1) Equipment Used

Test Generator :PCR2000L（KIKUSUI）

(2) Test Conditions

Input Voltage	: 200VAC	Output Voltage	: Rated
Output Current	: 100%	Ambient Temperature	: 25℃
Number of Tests	: 3 times	Test interval	: More than 10 seconds

(3) Test Method and Device Test Point



(4) Judging Conditions

1. Output voltage to be within output voltage regulation specification after the test.
2. Smoke and fire do not occur.

(5) Test Result

Test Level	Dip rate	Continue Time	DRL100-24-1
50%	50%	50~200ms	PASS
70%	30%	200~500ms	PASS
80%	20%	500~1000ms	PASS
50%	50%	1000ms	PASS