

DRB480-xx-1

RELIABILITY DATA

I N D E X

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※Test results are example data based on a unit under our standard measurement condition.

1. Calculated Values for MTBF

MODEL : DRB480-48-1

Calculating Method

Test Specifications: Telcordia SR332 Issue 4, 2016
 Test Method: Method I (Parts Count)
 Confidence Level: 90%
 Environment: Ground, Fixed, Controlled
 Device Method: I-D
 Quality Level: II

The failure rates in Failures In Time (FITs) is given for the different sub-assemblies at a confidence level of 90% in the table below at 70°, 40°C and 25°C.

Assembly	Telcordia SR332 Issue 4								
	70°C			40°C			25°C		
	FITs (mean)	FITs (SD)	MTBF (hours)	FITs (mean)	FITs (SD)	MTBF (hours)	FITs (mean)	FITs (SD)	MTBF (hours)
DRB480-48-1	524	52	1,908,397	177	15	5,649,718	128	11	7,812,500

2. Components Derating List

MODEL: DRB480-48-1 A1-M4


Location No.	Vin = 100VAC	Load = 100%	Ta = 50°C
D11 Rectron RS1007M	Tjmax=150°C Pd=4W Tj = Tc + ((θ j-c) × Pd) =128°C D.F.=85.3%	θ j-c=1°C/W ΔTc=4°C	Tc=124°C
Q1 Toshiba TK39N60X	Tjmax=150°C Pd=10W Tj = Tc + ((θ j-c) × Pd) =92.5°C D.F.=61.7%	θ j-c=0.55°C/W ΔTc=5.5°C	Tc=87.0°C
D3 Fairchild RURP860	Tjmax=175°C Pd=1.8W Tj = Tc + ((θ j-c) × Pd) =100.4°C D.F.=54.3%	θ j-c=2°C/W ΔTc=3.6°C	Tc=91.5°C
Q5 Infineon IPW60R160C6	Tjmax=150°C Pd=2.5W Tj = Tc + ((θ j-c) × Pd) =95.1°C D.F.=61%	θ j-c=0.71°C/W ΔTc=1.8°C	Tc=89.7°C
Q3 Fairchild FDP085N10A	Tjmax=175°C Pd=4W Tj = Tc + ((θ j-c) × Pd) =111.0°C D.F.=63.4%	θ j-c=0.45°C/W ΔTc=1.8°C	Tc=109.2°C
U1 Vishay VO615A-3	Tmax = 110°C TC = 98.1°C D.F = 89.2%		
U2 Vishay VO615A-3	Tmax = 110°C TC = 95.1°C D.F = 86.5%		
L2 Custom, class F	Tmax = 125°C TC = 114.8°C D.F = 91.8%		
L1 Custom, class F	Tmax = 125°C TC = 116°C D.F = 92.8%		
TX1 Custom, class F	Tmax = 125°C TC = 119.8 °C D.F = 95.8%		

C2 Kemet PHE426MA5390JR05	Tmax = 105°C TC = 94.5°C D.F = 90.0%
C15 Jianghai ECR1ELL101MCE250611E	Tmax = 105°C TC = 73.7°C D.F = 70.2%
C21 Faratronic C42Q2684K9SC000	Tmax = 110°C TC = 92.1°C D.F = 83.7%
C5 Jianghai ECS2WZL331MT4P22555E	Tmax = 105°C TC = 76.7°C D.F = 73.0%
C26 Faratronic C42Q2684K9SC000	Tmax = 110°C TC = 97.5°C D.F = 88.63%
C9 Jianghai ECR1VHL102MMS501225E	Tmax = 105°C TC = 89.3°C D.F = 85.0%

3. Main components temperature rise ΔT list

MODEL: DRB480-48-1

Measuring conditions

<p>Mounting Method</p> <p>Standard Mounting (A) Open Frame</p>	
Input Voltage (VAC)	100
Output Voltage (VDC)	48
Output Current (A)	10

Measuring Results

Output Derating		ΔT Temperature Rise ($^{\circ}\text{C}$)	
		$I_o = 100\%$ $T_a = 50^{\circ}\text{C}$	$I_o = 62.5\%$ $T_a = 70^{\circ}\text{C}$
Location No.	Parts Name	Mounting(A)	Mounting (A)
D11	Bridge Diode	74.0	44.4
Q1	Boost FET	37.0	24.0
D3	Boost Diode	41.5	26.7
Q5	Primary FET	39.7	25.0
Q3	Secondary FET	59.1	35.9
U1	Optocoupler	48.1	31.2
U2	Optocoupler	45.1	30.0
L2	Common Mode Choke	64.8	34.7
L1	Boost Choke	66.0	40.0
TX1	Transformer Winding	69.8	44.3
C2	Resonant Cap	44.5	29.7
C15	Auxilliary Cap	23.7	16.4
C21	X Cap	42.1	25.4
C5	Boost Cap	26.7	17.5
C26	X Cap	47.5	27.6
C9	Output Cap	39.3	26.7

4. Electrolytic capacitor lifetime

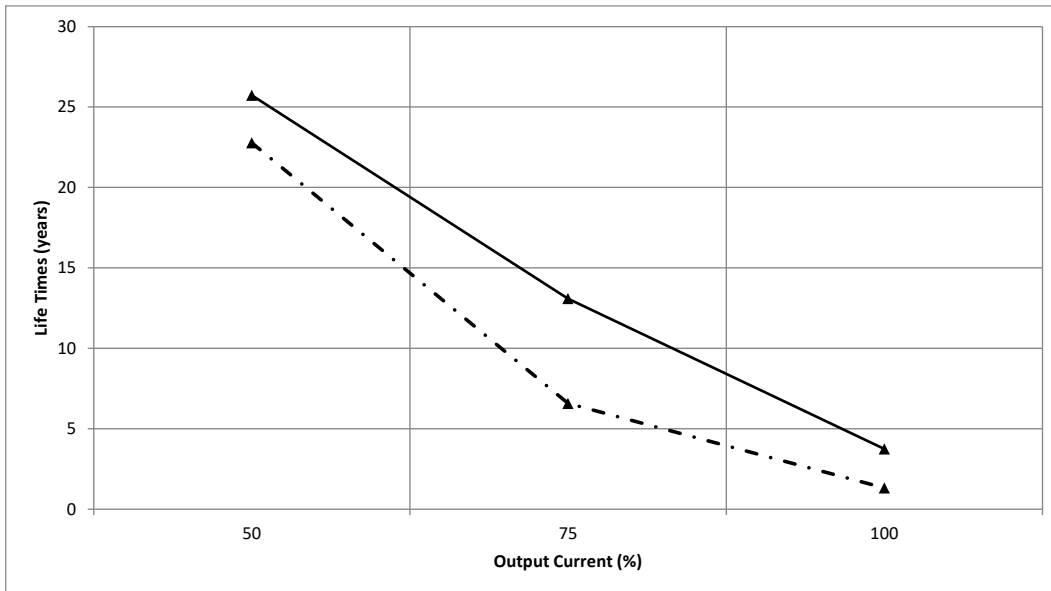
MODEL: DRB480-48-1

Standard Mounting

Conditions Ta 230Vac ———
120Vac - - - - -

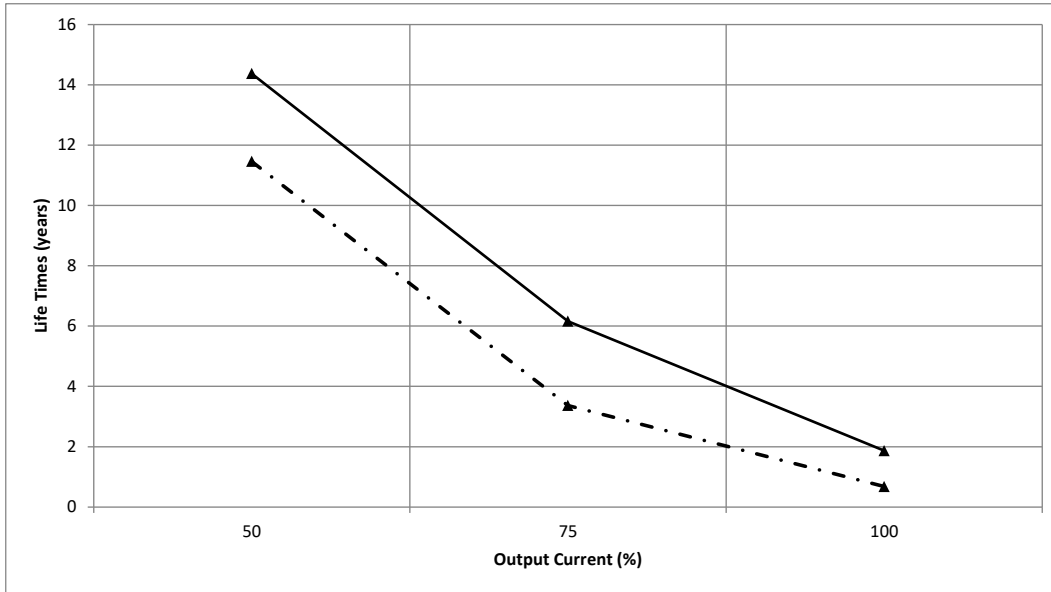
Ambient = 40°C

Load (%)	Lifetime (years)	
	230Vac	120Vac
50	25.73	22.77
75	13.08	6.57
100	3.74	1.32



Ambient = 50°C

Load (%)	Lifetime (years)	
	230Vac	120Vac
50	14.37	11.46
75	6.16	3.37
100	1.87	0.68



Note : E-cap life calculation is based on 24hrs/day operation.
e.g. For 12Hrs/day operation life numbers will double

5. Vibration Test

MODEL: DRB480-48-1

(1) Vibration Test Class

Frequency Variable Endurance Test

(2) Equipment Used

Controller: LDS Dactron Comet
Vibrator: V830-335 T M8 R-CE
Accelerometer: DeltaTron 4533-B

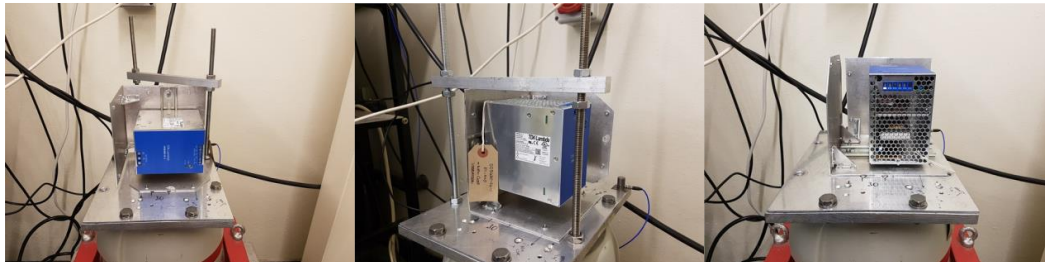
(3) The Number of D.U.T. (Device Under Test)

TRG3580005

(4) Test Conditions

Sweep Frequency:	10 - 500Hz	Direction:	X, Y, Z
Sweep Time:	1 minute	Test Time:	1 hour each axis
Acceleration:	2.2G	Non-operation	
Mounting:	Standard Mounting		

(5) Test Method



(6) Acceptable Conditions

1. Not to be broken.
2. No abnormal output after test.

(7) Test Results

Visually OK and functions after test.

6. Thermal shock test

MODEL : DRB480-48-1

(1) Equipment used

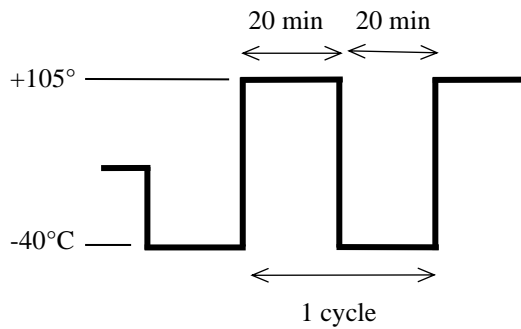
Thermal shock chamber Thermotron

(2) The number of PSUT. (Power Supply Under Test)

1 unit

(3) Test Conditions

Ambient Temperature:	-40°C ↔ 85°C
Test Time:	15 min ~ 15 min
Test Cycle:	500 cycles
Not Operating	



(4) Test Method

Before the test, check if there is no abnormal output and put the PSUT in the testing chamber. Then test it in above cycles. After the test is completed, leave it for 1 hour at the room temperature and check to make sure that there is no abnormal output.

(5) Test Results

Visually and electrically OK.