FPS1000 - 48
RELIABILITY
DATA

DWG: IA599-79-01		
APPD	CHK	DWG
Doron P. Nov - 29 - 04	29.11.04	29.11.04

NEMIC-LAMBDA LTD.

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The above data is typical value. As all units have nearly the same characteristics,the data to be considered as ability value.

1. M.T.B.F

1.1 Method of calculation according to JEITA (RCR-9102)

based on part count reliability projection of MIL-HDBK-217F. Individual failure rates is given to each part and M.T.B.F is calculated by the count of each part.

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

Where:

λ_{equip} = Total Equipment Failure Rate (Failures / 10^6 Hours)
λ_G = Generic Failure Rate For The ith Generic Part (Failure / 10^6 Hours)
N_i = Quantity of ith Generic Part
n = Number of Different Generic Part Categories
π_Q = Generic Quality factor for the Generic Part (π_Q = 1)

1.2 M.T.B.F Values

GF (GROUND,FIXED)

M.T.B.F = 79395 (HOURS)

1.3 Method of calculation according to JEITA (RCR-9102)
based on part count reliability projection of MIL-HDBK-217F.
Individual failure rates is given to each part and M.T.B.F is
calculated by the count of each part.

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

Where:

λ_{equip} = Total Equipment Failure Rate (Failures / 10^6 Hours)
λ_G = Generic Failure Rate For The ith Generic Part (Failure / 10^6 Hours)
N_i = Quantity of ith Generic Part
n = Number of Different Generic Part Categories
π_Q = Generic Quality factor for the Generic Part (π_Q = 1)

1.4 M.T.B.F Values

GF (GROUND,FIXED)

M.T.B.F = 76223 (HOURS)

1.5 Method of calculation according to BELLCORE calculation method:
Limited Stress - Method I, Case 3
Individual failure rates is given to each part and M.T.B.F is calculated by the count of each part

$$\lambda = \sum_{i=1}^{n} \lambda_i \qquad MTBF = \frac{1}{\lambda}$$

where:

λ_i failure rate of I's item

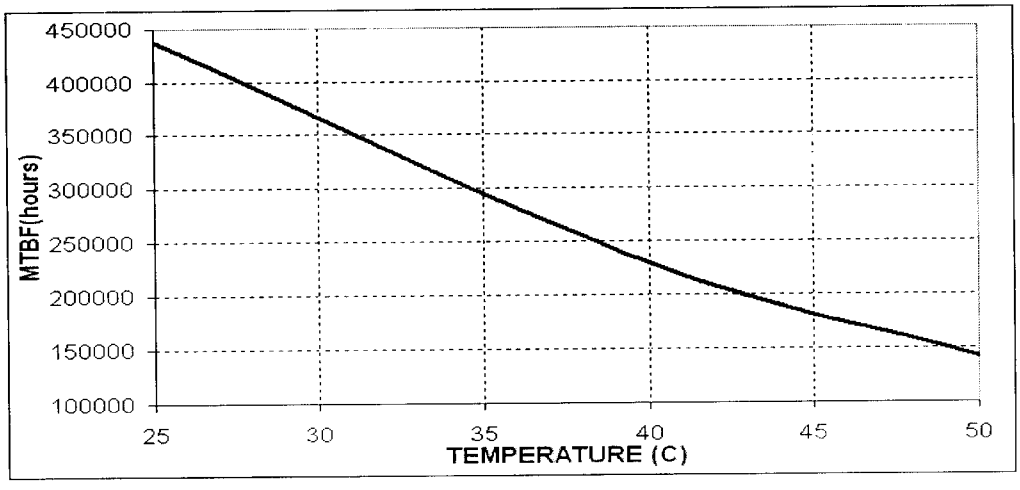
n number of item

1.6 M.T.B.F Values for 25˚C

GB (GROUND,FIXED)

M.T.B.F = 437304 (HOURS)

TEMPERATURE CURVE



1.7 Method of calculation according to BELLCORE calculation method:
Limited Stress - Method I, Case 3
Individual failure rates is given to each part and M.T.B.F is calculated by the count of each part

$$\lambda = \sum_{i=1}^{n} \lambda_i \qquad MTBF = \frac{1}{\lambda}$$

where:

λ_i failure rate of I's item

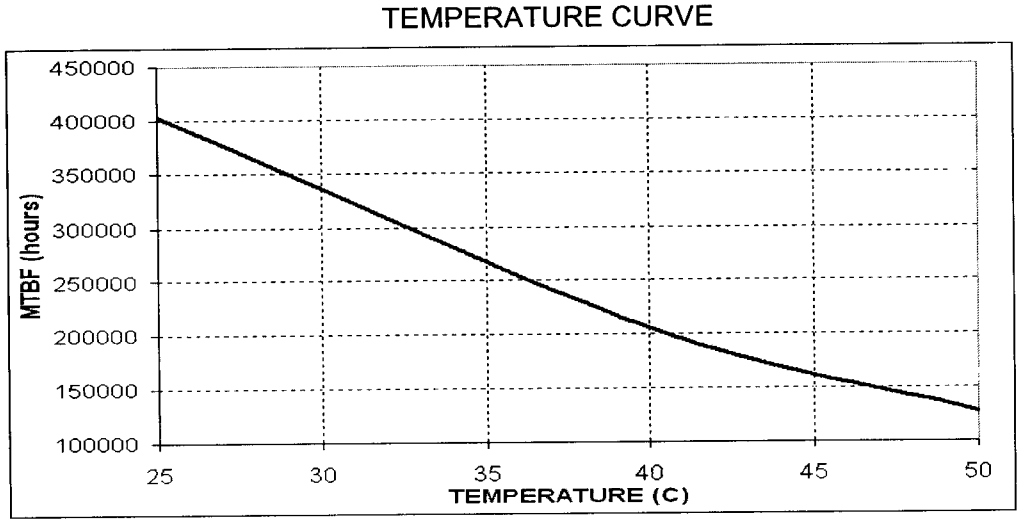
n number of item

1.8 M.T.B.F Values for 25˚C

GB (GROUND,FIXED)

M.T.B.F = 402718 (HOURS)

TEMPERATURE CURVE



2.COMPONENT DERATING

Calculation method

a) Condition

Input:	100Vac
Output:	Vout - 100%,Iout - 80,100%
Ambient temperature:	50,60°C
Mounting Method:	Standard (horizontal) mounting

b) Semiconductors

Compared with maximum junction temperature and actual one which is calculated 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) Calculation method of thermal impedance

$$\Theta_{j\text{-}c} = \frac{Tj(max)-Tc}{Pc(max)} \qquad \Theta_{j\text{-}a} = \frac{Tj(max)-Ta}{Pc(max)} \qquad \Theta_{j\text{-}l} = \frac{Tj(max)-Tl}{Pc(max)}$$

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

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

Pc(max): Maximum Power Dissipation

Tj(max): Maximum Junction temperature

$\Theta_{j\text{-}c}$: Thermal Impedance between Junction and Case

$\Theta_{j\text{-}a}$: Thermal Impedance between Junction and Air

$\Theta_{j\text{-}l}$: Thermal Impedance between Junction and Lead

Vin = 100Vac Load = 100% Ta=50°C

D101	Tjmax=	150	°C	θ_{j-c} =	1.0	°C/W	Pmax =	125.0	W
D25XB60H	Pd =	19	W	ΔTc =	52.2	°C	Tc =	102.2	°C
FUJI	Tj = Tc + (θ j-c x Pd) =				121.2	°C	D.F. =	80.8	%
D102	Tjmax=	150	°C	θ_{j-c} =	3.5	°C/W	Pmax =	35.7	W
YG902C3R	Pd =	3	W	ΔTc =	23.0	°C	Tc =	73.0	°C
FUJI	Tj = Tc + (θ j-c x Pd) =				83.5	°C	D.F. =	55.7	%
D104	Tjmax=	150	°C	θ_{j-c} =	3.5	°C/W	Pmax =	35.7	W
YG902C3R	Pd =	3	W	ΔTc =	33.2	°C	Tc =	83.2	°C
FUJI	Tj = Tc + (θ j-c x Pd) =				93.7	°C	D.F. =	62.5	%
D125	Tjmax=	150	°C	θ_{j-c} =	1.5	°C/W	Pmax =	83.3	W
ESAD92-02	Pd =	7	W	ΔTc =	41.4	°C	Tc =	91.4	°C
FUJI	Tj = Tc + (θ j-c x Pd) =				101.9	°C	D.F. =	67.9	%
D126	Tjmax=	150	°C	θ_{j-c} =	1.5	°C/W	Pmax =	83.3	W
ESAD92-02	Pd =	3	W	ΔTc =	39.0	°C	Tc =	89.0	°C
FUJI	Tj = Tc + (θ j-c x Pd) =				93.5	°C	D.F. =	62.3	%
D128	Tjmax=	150	°C	θ_{j-c} =	1.5	°C/W	Pmax =	83.3	W
ESAD92-02	Pd =	7	W	ΔTc =	42.6	°C	Tc =	92.6	°C
FUJI	Tj = Tc + (θ j-c x Pd) =				103.1	°C	D.F. =	68.7	%
D131	Tjmax=	150	°C	θ_{j-c} =	1.2	°C/W	Pmax =	83.3	W
ESAD85-009	Pd =	5.5	W	ΔTc =	43.7	°C	Tc =	93.7	°C
FUJI	Tj = Tc + (θ j-c x Pd) =				100.3	°C	D.F. =	66.9	%
Q101	Tjmax=	150	°C	θ_{j-c} =	0.440	°C/W	Pmax =	284.0	W
SPW32N50C3	Pd =	12	W	ΔTc =	39.9	°C	Tc =	89.9	°C
INFINEON	Tj = Tc + (θ j-c x Pd) =				95.2	°C	D.F. =	63.5	%
Q103	Tjmax=	150	°C	θ_{j-c} =	0.833	°C/W	Pmax =	150.0	W
2SK2611	Pd =	9.0	W	ΔTc =	42.9	°C	Tc =	92.9	°C
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				100.4	°C	D.F. =	66.9	%
Q105	Tjmax=	150	°C	θ_{j-c} =	0.833	°C/W	Pmax =	150.0	W
2SK2611	Pd =	9.0	W	ΔTc =	32.4	°C	Tc =	82.4	°C
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				89.9	°C	D.F. =	59.9	%

Vin = 100Vac Load = 100% Ta=50°C

Q110	Tjmax=	150	°C	θ_{j-c} =	139.0	°C/W	Pmax =	0.9	W
2SC2655	Pd =	0.24	W	ΔTc =	11.3	°C	Tc =	61.3	°C
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				94.7	°C	D.F. =	63.1	%
Q118	Tjmax=	150	°C	θ_{j-c} =	250.0	°C/W	Pmax =	0.5	W
2SB1123T	Pd =	0.046	W	ΔTc =	15.7	°C	Tc =	65.7	°C
SANYO	Tj = Tc + (θ j-c x Pd) =				77.2	°C	D.F. =	51.5	%
Q2	Tjmax=	150	°C	θ_{j-c} =	250.0	°C/W	Pmax =	0.5	W
2SB1123T	Pd =	0.1	W	ΔTc =	19.7	°C	Tc =	69.7	°C
SANYO	Tj = Tc + (θ j-c x Pd) =				94.7	°C	D.F. =	63.1	%
A102	Tjmax=	150	°C	θ_{j-c} =	3.0	°C/W	Pmax =	41.6	W
MIP0224SY	Pd =	0.7	W	ΔTc =	23.0	°C	Tc =	73.0	°C
MATSUSHITA	Tj = Tc + (θ j-c x Pd) =				75.1	°C	D.F. =	50.1	%
A104	Tjmax=	150	°C	θ_{j-c} =	27.0	°C/W	Pmax =	1	W
UCC2806DW	Pd =	0.04	W	ΔTc =	12.1	°C	Tc =	62.1	°C
TEXAS INSTR.	Tj = Tc + (θ j-c x Pd) =				63.2	°C	D.F. =	42.1	%
A105	Tjmax=	125	°C	θ_{j-a} =	180.0	°C/W	Pmax =	0.6	W
LM78L05ACM	Pd =	0.03	W	ΔTa =	26.5	°C	Ta =	76.5	°C
NEC	Tj = Ta + (θ j-a x Pd) =				81.9	°C	D.F. =	65.5	%
A106	Tjmax=	150	°C	θ_{j-c} =	7.0	°C/W	Pmax =	17.8	W
uPC7805AHF	Pd =	1.5	W	ΔTc =	30.0	°C	Tc =	80.0	°C
NEC	Tj = Tc + (θ j-c x Pd) =				90.5	°C	D.F. =	60.3	%
A109	Tjmax=	150	°C	θ_{j-c} =	7.0	°C/W	Pmax =	17.8	W
uPC78M05AHF	Pd =	1.3	W	ΔTc =	31.2	°C	Tc =	81.2	°C
NEC	Tj = Tc + (θ j-c x Pd) =				90.3	°C	D.F. =	60.2	%
A1	Tjmax=	150	°C	θ_{j-c} =	50.0	°C/W	Pmax =	0.65	W
FA5502M	Pd =	0.074	W	ΔTc =	11.1	°C	Tc =	61.1	°C
FUJI	Tj = Tc + (θ j-c x Pd) =				64.8	°C	D.F. =	43.2	%

Vin = 100Vac Load = 80% Ta=60°C

D101	Tjmax=	150	°C	θ_{j-c} =	1.0	°C/W	Pmax =	125.0	W
D25XB60H	Pd =	15.2	W	ΔTc =	42.1	°C	Tc =	102.1	°C
FUJI	Tj = Tc + (θ_{j-c} x Pd) =				117.3	°C	D.F. =	78.2	%
D102	Tjmax=	150	°C	θ_{j-c} =	3.5	°C/W	Pmax =	35.7	W
YG902C3R	Pd =	2.4	W	ΔTc =	18.0	°C	Tc =	78.0	°C
FUJI	Tj = Tc + (θ_{j-c} x Pd) =				86.4	°C	D.F. =	57.6	%
D104	Tjmax=	150	°C	θ_{j-c} =	3.5	°C/W	Pmax =	35.7	W
YG902C3R	Pd =	2.4	W	ΔTc =	22.8	°C	Tc =	82.8	°C
FUJI	Tj = Tc + (θ_{j-c} x Pd) =				91.2	°C	D.F. =	60.8	%
D125	Tjmax=	150	°C	θ_{j-c} =	1.5	°C/W	Pmax =	83.3	W
ESAD92-02	Pd =	5.6	W	ΔTc =	32.0	°C	Tc =	92.0	°C
FUJI	Tj = Tc + (θ_{j-c} x Pd) =				100.4	°C	D.F. =	66.9	%
D126	Tjmax=	150	°C	θ_{j-c} =	1.5	°C/W	Pmax =	83.3	W
ESAD92-02	Pd =	2.4	W	ΔTc =	29.6	°C	Tc =	89.6	°C
FUJI	Tj = Tc + (θ_{j-c} x Pd) =				93.2	°C	D.F. =	62.1	%
D128	Tjmax=	150	°C	θ_{j-c} =	1.5	°C/W	Pmax =	83.3	W
ESAD92-02	Pd =	5.6	W	ΔTc =	33.8	°C	Tc =	93.8	°C
FUJI	Tj = Tc + (θ_{j-c} x Pd) =				102.2	°C	D.F. =	68.1	%
D131	Tjmax=	150	°C	θ_{j-c} =	1.2	°C/W	Pmax =	83.3	W
ESAD85-009	Pd =	4.4	W	ΔTc =	34.7	°C	Tc =	94.7	°C
FUJI	Tj = Tc + (θ_{j-c} x Pd) =				100.0	°C	D.F. =	66.7	%
Q101	Tjmax=	150	°C	θ_{j-c} =	0.440	°C/W	Pmax =	284.0	W
SPW32N50C3	Pd =	9.6	W	ΔTc =	30.8	°C	Tc =	90.8	°C
INFINEON	Tj = Tc + (θ_{j-c} x Pd) =				95.0	°C	D.F. =	63.3	%
Q103	Tjmax=	150	°C	θ_{j-c} =	0.833	°C/W	Pmax =	150.0	W
2SK2611	Pd =	7.2	W	ΔTc =	32.3	°C	Tc =	92.3	°C
TOSHIBA	Tj = Tc + (θ_{j-c} x Pd) =				98.3	°C	D.F. =	65.5	%
Q105	Tjmax=	150	°C	θ_{j-c} =	0.833	°C/W	Pmax =	150.0	W
2SK2611	Pd =	7.2	W	ΔTc =	24.6	°C	Tc =	84.6	°C
TOSHIBA	Tj = Tc + (θ_{j-c} x Pd) =				90.6	°C	D.F. =	60.4	%

Vin = 100Vac Load = 80% Ta=60°C

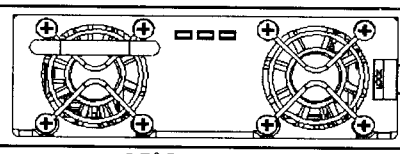
Q110	Tjmax=	150	°C	θ_{j-c} =	139.0	°C/W	Pmax =	0.9	W
2SC2655	Pd =	0.24	W	ΔTc =	10.2	°C	Tc =	70.2	°C
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				103.6	°C	D.F. =	69.0	%
Q118	Tjmax=	150	°C	θ_{j-c} =	250.0	°C/W	Pmax =	0.5	W
2SB1123T	Pd =	0.046	W	ΔTc =	13.9	°C	Tc =	73.9	°C
SANYO	Tj = Tc + (θ j-c x Pd) =				85.4	°C	D.F. =	56.9	%
Q2	Tjmax=	150	°C	θ_{j-c} =	250.0	°C/W	Pmax =	0.5	W
2SB1123T	Pd =	0.1	W	ΔTc =	18.1	°C	Tc =	78.1	°C
SANYO	Tj = Tc + (θ j-c x Pd) =				103.1	°C	D.F. =	68.7	%
A102	Tjmax=	150	°C	θ_{j-c} =	3.0	°C/W	Pmax =	41.6	W
MIP0224SY	Pd =	0.6	W	ΔTc =	20.7	°C	Tc =	80.7	°C
MATSUSHITA	Tj = Tc + (θ j-c x Pd) =				82.5	°C	D.F. =	55.0	%
A104	Tjmax=	150	°C	θ_{j-c} =	27.0	°C/W	Pmax =	1.0	W
UCC2806DW	Pd =	0.04	W	ΔTc =	10.8	°C	Tc =	70.8	°C
TEXAS INSTR.	Tj = Tc + (θ j-c x Pd) =				71.9	°C	D.F. =	47.9	%
A105	Tjmax=	125	°C	θ_{j-a} =	180.0	°C/W	Pmax =	0.6	W
LM78L05ACM	Pd =	0.03	W	ΔTa =	23.0	°C	Ta =	83.0	°C
NEC	Tj = Ta + (θ j-a x Pd) =				88.4	°C	D.F. =	70.7	%
A106	Tjmax=	150	°C	θ_{j-c} =	7.0	°C/W	Pmax =	17.8	W
uPC7805AHF	Pd =	1.2	W	ΔTc =	26.2	°C	Tc =	86.2	°C
NEC	Tj = Tc + (θ j-c x Pd) =				94.6	°C	D.F. =	63.1	%
A109	Tjmax=	150	°C	θ_{j-c} =	7.0	°C/W	Pmax =	17.8	W
uPC78M05AHF	Pd =	1.04	W	ΔTc =	27.2	°C	Tc =	87.2	°C
NEC	Tj = Tc + (θ j-c x Pd) =				94.5	°C	D.F. =	63.0	%
A1	Tjmax=	150	°C	θ_{j-c} =	50.0	°C/W	Pmax =	0.65	W
FA5502M	Pd =	0.074	W	ΔTc =	10.2	°C	Tc =	70.2	°C
FUJI	Tj = Tc + (θ j-c x Pd) =				73.9	°C	D.F. =	49.3	%

3.MAIN COMPONENTS TEMPERATURE RISE

a) Output voltage: 43V

Location No.	Parts Name	Temperature Rise (°C)
A1	IC	10.2
A102	IC	16.8
A104	IC	11.0
A106	IC	29.0
A109	IC	29.8
C101	FILM CAP	16.4
C102	FILM CAP	23.3
C110	ELEC. CAP.	8.7
C141	ELEC. CAP.	19.6
D101	BRIDGE	46.7
D126	DIODE	37.4
D128	DIODE	39.3
D131	DIODE	40.1
L101	CHOKE	31.2
L104	CHOKE	59.2
L136	CHOKE	39.4
Q101	MOSFET	34.5
Q102	MOSFET	29.1
Q103	MOSFET	40.3
Q105	MOSFET	30.6
T101	TRANSFORMER	55.0
T102	TRANSFORMER	45.7
T103	TRANSFORMER	20.4

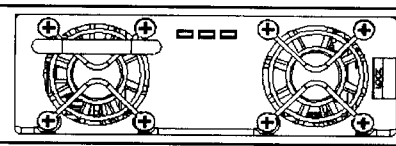
Conditions:

Standard Mounting	
Ta	25°C
Input Voltage	100VAC
Output Voltage	43V
Output Current	21A

b) Output voltage: 48V

Location No.	Parts Name	Temperature Rise (°C)
A1	IC	11.1
A102	IC	18.1
A104	IC	12.1
A106	IC	30.0
A109	IC	31.2
C101	FILM CAP	18.5
C102	FILM CAP	26.7
C110	ELEC. CAP.	8.8
C141	ELEC. CAP.	20.8
D101	BRIDGE	52.2
D126	DIODE	39.0
D128	DIODE	42.6
D131	DIODE	43.7
L101	CHOKE	36.9
L104	CHOKE	62.9
L136	CHOKE	40.0
Q101	MOSFET	39.9
Q102	MOSFET	33.7
Q103	MOSFET	42.9
Q105	MOSFET	32.4
T101	TRANSFORMER	57.9
T102	TRANSFORMER	48.0
T103	TRANSFORMER	22.4

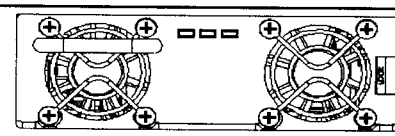
Conditions:

Standard Mounting	
Ta	25˚C
Input Voltage	100VAC
Output Voltage	48V
Output Current	21A

c) Output voltage: 58V

Location No.	Parts Name	DT Temperature Rise (°C)
A1	IC	10.7
A102	IC	17.3
A104	IC	11.5
A106	IC	30.3
A109	IC	31.5
C101	FILM CAP	17.8
C102	FILM CAP	25.4
C110	ELEC. CAP.	8.8
C141	ELEC. CAP.	21.0
D101	BRIDGE	49.6
D126	DIODE	35.0
D128	DIODE	41.5
D131	DIODE	39.0
L101	CHOKE	34.5
L104	CHOKE	60.4
L136	CHOKE	32.4
Q101	MOSFET	37.4
Q102	MOSFET	31.6
Q103	MOSFET	50.4
Q105	MOSFET	39.0
T101	TRANSFORMER	56.4
T102	TRANSFORMER	44.2
T103	TRANSFORMER	21.9

Conditions:

Standard Mounting	
Ta	25˚C
Input Voltage	100VAC
Output Voltage	58V
Output Current	17.25A

4.ELECTROLYTIC CAPACITORS LIFE TIME ESTIMATION

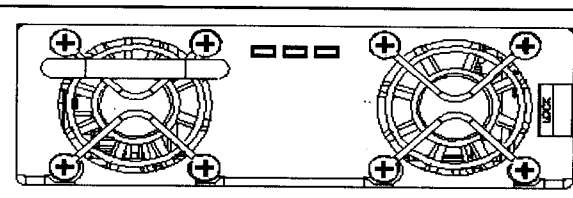
MODEL	COMPUTED LIFE (years) AT Ta			
	30°C	40°C	50°C	60°C
FPS1000 - 48	24.44	12.22	6.11	4.17
Load(%)	100	100	100	80

FORMULA: $L = L_0 \times 2^{\frac{105 - T_C}{10}}$ (years)

L: Elec.capacitor computed life (24 hours per day,365 days operation)

Lo: Guaranteed life for Elec.capacitor

Tc: Case temperature of Elec.capacitor

Standard Mounting	
Input Voltage	100VAC
Output Voltage	48V

5. ABNORMAL TEST

FPS1000 - 48

Model:48V — Vout=48V

Input:230VAC — Ta:25°C — Iout=21A

No	Test Position		Test Mode		Test Result												
					1	2	3	4	5	6	7	8	9	10	11	12	
	Location No.	Test Point	Short	Open	Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse opened	OVP	OCP	No Output	No Change	Others	Note
1	D101	AC-DC	•								•			•			F101
		AC-AC	•								•			•			F101
		AC		•										•			
		DC		•										•			
2	D102		•							•	•			•			F101, Q101, Q102, D103, ZD101, A1
				•											•		
3	D104		•							•	•			•			F101, Q101, Q102, D103, ZD101, A1
				•											•		
4	D106		•							•							R112, R113-opened
				•											•		
5	D108		•							•	•			•			F102
				•											•		
6	D114		•							•				•			A102, ZD106,R151-opened
				•											•		
7	D115		•											•			
				•											•		
8	D117		•											•			Hicc-up
				•										•			
9	D118		•											•			Hicc-up
				•												•	Vo up to 52V, see note 1
10	D119		•											•			
				•											•		
11	D121		•											•			Hicc-up
				•											•		
12	D125		•								•			•			F102
				•												•	Vo=31V
13	D126		•								•			•			F102
				•											•		
14	T101	1-3	•							•	•			•			F102, Q103, Q104, D138, D139
		5-9	•							•	•			•			F102, Q103, Q104, D138, D139
		A-B	•							•	•			•			F102, Q103, Q104, D138, D139
		1		•											•		
		A		•												•	Vo=31V
		5		•												•	Vo=30V, see note 2
15	T103	1-3	•											•			
		5-6	•											•		•	see note 3
		A-B	•											•		•	
		5-D	•											•		•	see note 4

NOTE 1: Pin increase by ~92W

NOTE 2: Pin reduced to ~725W

NOTE 3: Pin increase by ~5W. Output shutdown after ~1min

NOTE 4: Pin increase ~8W. Output shutdown after ~1 min.

Model:48V
Input:230VAC

Ta:25°C

Vout=48V
Iout=21A

No	Test Position		Test Mode		Test Result												
					1	2	3	4	5	6	7	8	9	10	11	12	
	Location No.	Test Point	Short	Open	Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse opened	OVP	OCP	No Output	No Change	Others	Note
15	T103	5-C	•											•		•	after 1 minute - no output
		7-8	•											•		•	after 1 minute - no output
		C		•								•		•		•	
		1		•										•			
		6		•										•			
		D		•												•	Vo increase to 52V,Pin increase by ~90W
		A		•										•			
16	Q101	G-S	•							•						•	R21-open, Pin increase by ~7W
		D-S	•							•				•			F101
		D-G	•							•				•			F101
		S		•												•	Pin increase by~10W
		G		•						•				•			Q101, Q102, ZD101, R110, R111, R103
		D		•												•	Pin increase by ~7W
17	Q103	D-S	•							•				•			F102, D138, D139, Q115, Q118
		G-S	•							•						•	Pin ~400W, Vo=30V, R177-open
		G-D	•							•				•			F102, D138, D139
		D		•						•				•			F102, D138, D139, ZD102, A104, Q115, Q118, R119 and R176-opened,
		S		•						•				•			Q103, ZD102, A104, F102 R115, R116 and R119-opened
		G		•						•				•			F102, D138, D139, ZD102, A104, Q115, Q118, R119 and R176-opened
18	L104		•							•	•			•			Q101, Q102, A1, ZD101, F101
				•										•			
19	L105		•												•		
				•												•	Pin Increase by ~8W
20	L106		•												•		
				•												•	Pin increase by ~35W
21	L136		•								•			•			F102
				•										•			Pin increase by ~80W
22	C113		•							•	•			•			F102, D138, D139, Q115, Q118
				•											•		
23	C118		•											•			
				•											•		
24	C119		•											•			
				•											•		
25	C120		•											•			Hicc-up
				•											•		
26	C121		•											•			Hicc-up
				•											•		

FPS1000 - 48

Model:48V
Input:230VAC

Ta:25°C

Vout=48V
Iout=21A

No	Test Position		Test Mode		Test Result												
					1	2	3	4	5	6	7	8	9	10	11	12	
	Location No.	Test Point	Short	Open	Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse opened	OVP	OCP	No Output	No Change	Others	Note
27	C122		●											●			Hicc-up
				●											●		
28	C123		●							●							R265-open
				●											●		
29	C124		●											●			Hicc-up
				●											●		
30	C125		●											●			Hicc-up
				●											●		
31	C126		●											●			Hicc-up
				●											●		
32	C127		●													●	+12V AUX - 4.5V
				●											●		
33	C138		●							●							R184-open
				●											●		
34	C139		●							●							R185-open
				●											●		
35	C141		●								●			●			F102
				●											●		
36	C148		●										●	●			
				●											●		
37	C186		●											●			Pin increase by ~6W
				●											●		
38	A102	G-S	●											●			
		D-S	●							●				●			R151-open
		D-G	●							●				●			ZD106, A102, R151-open
		D		●										●			
		G		●										●			
		S		●										●			

Model:48V　　Vout=48V

Input:100VAC　　Ta:25°C　　Iout=21A

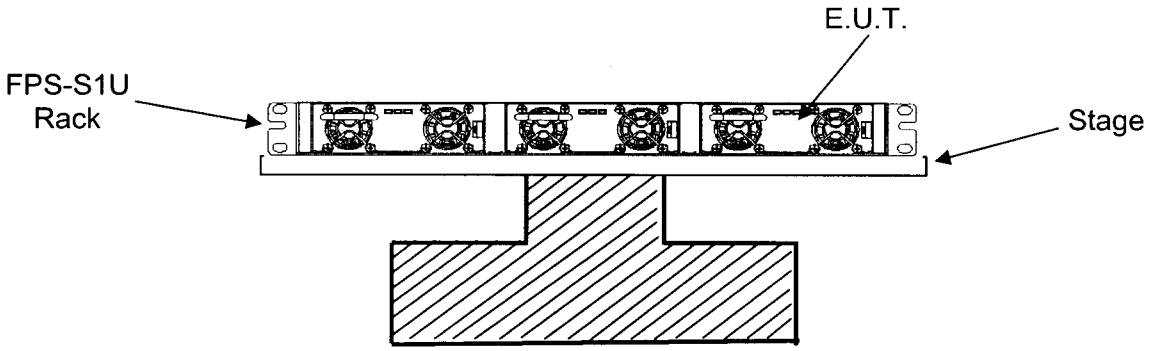
No	Test Position		Test Mode		Test Result												
					1	2	3	4	5	6	7	8	9	10	11	12	
	Location No.	Test Point	Short	Open	Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse opened	OVP	OCP	No Output	No Change	Others	Note
1	D106		•							•							R112, R113
				•											•		
2	D118			•												•	Vout: 52V, Pin increased by ~90W
			•											•			Hicc-up
3	L104		•							•	•			•			Q101, Q102, A1, ZD101, F101
				•										•			
4	L105		•												•		
				•						•				•			Q101, Q102, A1, ZD101, R103-open
5	L106		•													•	Pin increased by ~20W
				•						•				•			R103, A1, Q101, Q102, ZD101
6	C108		•							•				•			R103-open
				•											•		
7	C110		•							•				•			R103-open
				•											•		
8	Q101	G-S	•							•	•			•			Pin increase by ~70W, see note 5
		D-S	•							•	•			•			F101, ZD101, R109, R110, R111, Q101, Q102, Q1, Q2, R103
		D-G	•							•				•			ZD101, R109, R110, R111, Q101, Q102, R103
		D		•						•				•			Pin increased by ~70W, see note 5
		S		•						•				•			Q101, Q102, ZD101, R103
		G		•						•				•			Pin increase by ~70W, see note 5

NOTE 5: Q101, Q102, ZD101, R103 damaged after ~1min.

6.VIBRATION TEST

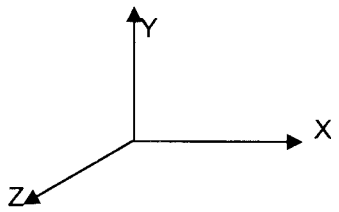
1) Vibration test class
   Frequency variable endurance test
2) Equipment used
   Controller: GENRAD-2503
   Vibrator: ULHOLTZ-DICKIE TA1000

3) Testing method
   FPS1000 installed in FPS-S1U Rack



Test condition:

A) Vibration Test with Frequency Sweep



Sinusoidal Vibration in Freq.: 5 - 500 Hz
Test level: 1.5G
Test time: 1 oct/min, 20 sweeps Per axis
Test performed in Axes x-y-z

B) Mech. Shock

Test level: half sine, 30G 11ms
3 mech.shocks in all of the 3 axes at each direction.

(4)Test Result
Vin=100Vac;
Iout=63A;

Check item	Vout		Ripple(mV_{p-p})		E.U.T.state
	CH1	CH2	CH1	CH2	
Initial / Directions	48.084	11.837	90	100	
X	48.081	11.839	100	110	
Y	48.072	11.822	100	110	
Z	48.071	11.822	100	105	