RFE1000 - 24
RELIABILITY
DATA

DWG: IA714-79-02		
APPD	CHK	DWG
Asher Sh. 25 . 11. 12	Asher Sh. 25 . 11. 12	Tzvika Solomon.

TDK-Lambda

INDEX PAGE

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.

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

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

G_F (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.

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

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

G_F (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

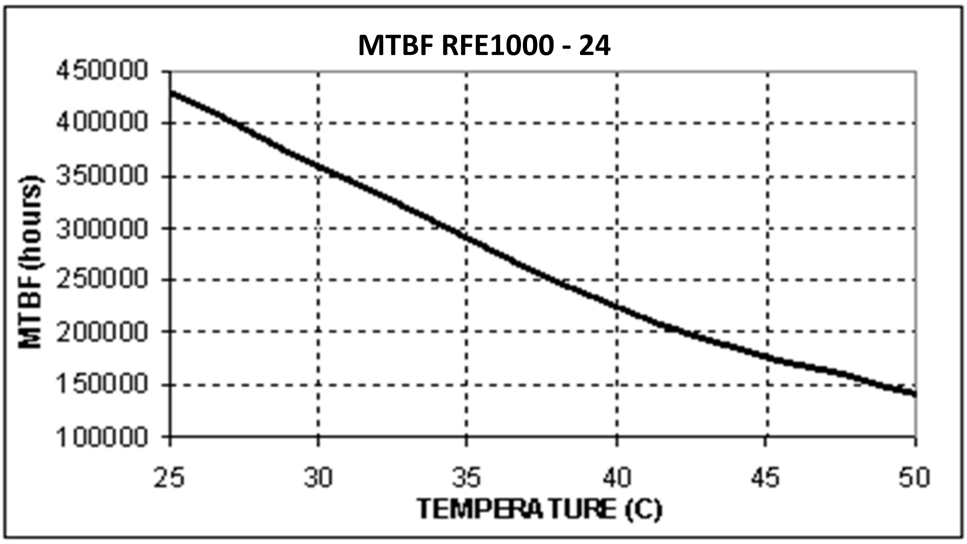
n number of item

1.6 M.T.B.F Values for 25˚C

GB (GROUND,FIXED)

<u>M.T.B.F = 430880 (HOURS)</u>

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

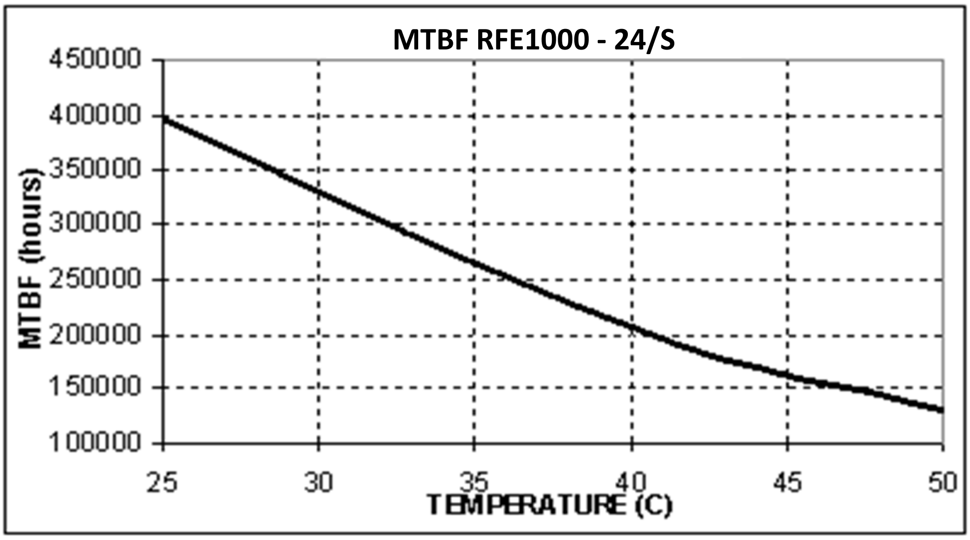
n number of item

1.8 M.T.B.F Values for 25˚C

GB (GROUND,FIXED)

M.T.B.F = 397937 (HOURS)

TEMPERATURE CURVE



2.COMPONENT DERATING

(1) Calculation method

(a) Condition

Input:	100Vac
Output:	Vout - 100%,Iout - 80,100%
Ambient temperature:	50,60℃
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℃ in General

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

Pc(max): Maximum Power Dissipation

Tj(max): Maximum Junction temperature

Θ j-c: Thermal Impedance between Junction and Case

Θ j-a: Thermal Impedance between Junction and Air

Θ j-l: Thermal Impedance between Junction and Lead

Vin = 100Vac Load = 100% Ta=50℃

D101	Tjmax=	150	℃	θj-c =	1.0	℃/W	Pmax =	125.0	W
D25XB60H	Pd =	18	W	ΔTc =	49.9	℃	Tc =	99.9	℃
SHINDENGEN	Tj = Tc + (θ j-c x Pd) =				117.9	℃	D.F. =	78.6	%
D102	Tjmax=	150	℃	θj-c =	3.5	℃/W	Pmax =	35.7	W
YG902C3R	Pd =	3	W	ΔTc =	22.2	℃	Tc =	72.2	℃
FUJI	Tj = Tc + (θ j-c x Pd) =				82.7	℃	D.F. =	55.1	%
D104	Tjmax=	150	℃	θj-c =	3.5	℃/W	Pmax =	35.7	W
YG902C3R	Pd =	3	W	ΔTc =	31.1	℃	Tc =	81.1	℃
FUJI	Tj = Tc + (θ j-c x Pd) =				91.6	℃	D.F. =	61.1	%
D125	Tjmax=	175	℃	θj-c =	0.85	℃/W	Pmax =	176.0	W
STPS40150CW	Pd =	11	W	ΔTc =	60.0	℃	Tc =	110.0	℃
ST	Tj = Tc + (θ j-c x Pd) =				119.4	℃	D.F. =	68.2	%
D126	Tjmax=	175	℃	θj-c =	0.55	℃/W	Pmax =	272.0	W
STPS40H100CW	Pd =	3	W	ΔTc =	46.8	℃	Tc =	96.8	℃
ST	Tj = Tc + (θ j-c x Pd) =				98.5	℃	D.F. =	56.3	%
D128	Tjmax=	175	℃	θj-c =	0.85	℃/W	Pmax =	176.0	W
STPS40150CW	Pd =	11	W	ΔTc =	62.0	℃	Tc =	112.0	℃
ST	Tj = Tc + (θ j-c x Pd) =				121.4	℃	D.F. =	69.3	%
D131	Tjmax=	150	℃	θj-c =	0.5	℃/W	Pmax =	250.0	W
S60SC4M	Pd =	7	W	ΔTc =	48.9	℃	Tc =	98.9	℃
SHINDEGEN	Tj = Tc + (θ j-c x Pd) =				102.4	℃	D.F. =	68.3	%
Q101	Tjmax=	150	℃	θj-c =	0.440	℃/W	Pmax =	284.0	W
SPW32N50C3	Pd =	12	W	ΔTc =	40.0	℃	Tc =	90.0	℃
INFINEON	Tj = Tc + (θ j-c x Pd) =				95.3	℃	D.F. =	63.5	%
Q103	Tjmax=	150	℃	θj-c =	0.833	℃/W	Pmax =	150.0	W
2SK2611	Pd =	9.0	W	ΔTc =	42.4	℃	Tc =	92.4	℃
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				99.9	℃	D.F. =	66.6	%
Q105	Tjmax=	150	℃	θj-c =	0.833	℃/W	Pmax =	150.0	W
2SK2611	Pd =	9.0	W	ΔTc =	30.2	℃	Tc =	80.2	℃
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				87.7	℃	D.F. =	58.5	%

Vin = 100Vac   Load = 100%   Ta=50℃

Q110	Tjmax=	150	℃	θj-c =	139.0	℃/W	Pmax =	0.9	W
2SC2655	Pd =	0.24	W	ΔTc =	20.3	℃	Tc =	70.3	℃
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				103.7	℃	D.F. =	69.1	%
Q118	Tjmax=	150	℃	θj-c =	250.0	℃/W	Pmax =	0.5	W
2SB1123T	Pd =	0.046	W	ΔTc =	18.6	℃	Tc =	68.6	℃
SANYO	Tj = Tc + (θ j-c x Pd) =				80.1	℃	D.F. =	53.4	%
Q2	Tjmax=	150	℃	θj-c =	250.0	℃/W	Pmax =	0.5	W
2SB1123T	Pd =	0.1	W	ΔTc =	10.5	℃	Tc =	60.5	℃
SANYO	Tj = Tc + (θ j-c x Pd) =				85.5	℃	D.F. =	57.0	%
A102	Tjmax=	150	℃	θj-c =	3.0	℃/W	Pmax =	41.6	W
MIP0224SY	Pd =	0.7	W	ΔTc =	22.3	℃	Tc =	72.3	℃
MATSUSHITA	Tj = Tc + (θ j-c x Pd) =				74.4	℃	D.F. =	49.6	%
A104	Tjmax=	150	℃	θj-c =	27.0	℃/W	Pmax =	1	W
UCC2806DW	Pd =	0.04	W	ΔTc =	13.7	℃	Tc =	63.7	℃
TEXAS INSTR.	Tj = Tc + (θ j-c x Pd) =				64.8	℃	D.F. =	43.2	%
A105	Tjmax=	125	℃	θj-a =	180.0	℃/W	Pmax =	0.6	W
LM78L05ACM	Pd =	0.03	W	ΔTa =	33.9	℃	Ta =	83.9	℃
NEC	Tj = Ta + (θ j-a x Pd) =				89.3	℃	D.F. =	71.4	%
A106	Tjmax=	150	℃	θj-c =	7.0	℃/W	Pmax =	17.8	W
uPC7805AHF	Pd =	1.5	W	ΔTc =	33.5	℃	Tc =	83.5	℃
NEC	Tj = Tc + (θ j-c x Pd) =				94.0	℃	D.F. =	62.7	%
A109	Tjmax=	150	℃	θj-c =	7.0	℃/W	Pmax =	17.8	W
uPC78M05AHF	Pd =	1.3	W	ΔTc =	36.3	℃	Tc =	86.3	℃
NEC	Tj = Tc + (θ j-c x Pd) =				95.4	℃	D.F. =	63.6	%
A1	Tjmax=	150	℃	θj-c =	50.0	℃/W	Pmax =	0.65	W
FA5502M	Pd =	0.074	W	ΔTc =	17.2	℃	Tc =	67.2	℃
FUJI	Tj = Tc + (θ j-c x Pd) =				70.9	℃	D.F. =	47.3	%

Vin = 100Vac Load = 80% Ta=60ºC

D101	Tjmax=	150	℃	θj-c =	1.0	℃/W	Pmax =	125.0	W
D25XB60H	Pd =	15.2	W	ΔTc =	34.2	℃	Tc =	94.2	℃
SHINDENGEN	Tj = Tc + (θ j-c x Pd) =				109.4	℃	D.F. =	72.9	%
D102	Tjmax=	150	℃	θj-c =	3.5	℃/W	Pmax =	35.7	W
YG902C3R	Pd =	2.4	W	ΔTc =	17.7	℃	Tc =	77.7	℃
FUJI	Tj = Tc + (θ j-c x Pd) =				86.1	℃	D.F. =	57.4	%
D104	Tjmax=	150	℃	θj-c =	3.5	℃/W	Pmax =	35.7	W
YG902C3R	Pd =	2.4	W	ΔTc =	24.4	℃	Tc =	84.4	℃
FUJI	Tj = Tc + (θ j-c x Pd) =				92.8	℃	D.F. =	61.9	%
D125	Tjmax=	175	℃	θj-c =	0.85	℃/W	Pmax =	176.0	W
STPS40150CW	Pd =	8.8	W	ΔTc =	45.1	℃	Tc =	105.1	℃
ST	Tj = Tc + (θ j-c x Pd) =				112.6	℃	D.F. =	64.3	%
D126	Tjmax=	175	℃	θj-c =	0.55	℃/W	Pmax =	272.0	W
STPS40H100CW	Pd =	2.4	W	ΔTc =	34.7	℃	Tc =	94.7	℃
ST	Tj = Tc + (θ j-c x Pd) =				96.0	℃	D.F. =	54.9	%
D128	Tjmax=	175	℃	θj-c =	0.85	℃/W	Pmax =	176.0	W
STPS40150CW	Pd =	8.8	W	ΔTc =	48.9	℃	Tc =	108.9	℃
ST	Tj = Tc + (θ j-c x Pd) =				116.4	℃	D.F. =	66.5	%
D131	Tjmax=	150	℃	θj-c =	0.5	℃/W	Pmax =	250.0	W
S60SC4M	Pd =	5.6	W	ΔTc =	38.6	℃	Tc =	98.6	℃
SHINDENGEN	Tj = Tc + (θ j-c x Pd) =				101.4	℃	D.F. =	67.6	%
Q101	Tjmax=	150	℃	θj-c =	0.440	℃/W	Pmax =	284.0	W
SPW32N50C3	Pd =	9.6	W	ΔTc =	30.2	℃	Tc =	90.2	℃
INFINEON	Tj = Tc + (θ j-c x Pd) =				94.4	℃	D.F. =	62.9	%
Q103	Tjmax=	150	℃	θj-c =	0.833	℃/W	Pmax =	150.0	W
2SK2611	Pd =	7.2	W	ΔTc =	32.6	℃	Tc =	92.6	℃
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				98.6	℃	D.F. =	65.7	%
Q105	Tjmax=	150	℃	θj-c =	0.833	℃/W	Pmax =	150.0	W
2SK2611	Pd =	7.2	W	ΔTc =	23.1	℃	Tc =	83.1	℃
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				89.1	℃	D.F. =	59.4	%

Vin = 100Vac Load = 80% Ta=60ºC

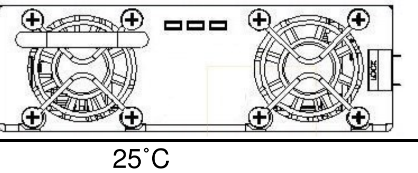
Q110	Tjmax=	150	℃	θj-c =	139.0	℃/W	Pmax =	0.9	W
2SC2655	Pd =	0.24	W	ΔTc =	17.2	℃	Tc =	77.2	℃
TOSHIBA	Tj = Tc + (θ j-c x Pd) =				110.6	℃	D.F. =	73.7	%
Q118	Tjmax=	150	℃	θj-c =	250.0	℃/W	Pmax =	0.5	W
2SB1123T	Pd =	0.046	W	ΔTc =	14.6	℃	Tc =	74.6	℃
SANYO	Tj = Tc + (θ j-c x Pd) =				86.1	℃	D.F. =	57.4	%
Q2	Tjmax=	150	℃	θj-c =	250.0	℃/W	Pmax =	0.5	W
2SB1123T	Pd =	0.1	W	ΔTc =	9.2	℃	Tc =	69.2	℃
SANYO	Tj = Tc + (θ j-c x Pd) =				94.2	℃	D.F. =	62.8	%
A102	Tjmax=	150	℃	θj-c =	3.0	℃/W	Pmax =	41.6	W
MIP0224SY	Pd =	0.7	W	ΔTc =	19.8	℃	Tc =	79.8	℃
MATSUSHITA	Tj = Tc + (θ j-c x Pd) =				81.9	℃	D.F. =	54.6	%
A104	Tjmax=	150	℃	θj-c =	27.0	℃/W	Pmax =	1.0	W
UCC2806DW	Pd =	0.04	W	ΔTc =	10.8	℃	Tc =	70.8	℃
TEXAS INSTR.	Tj = Tc + (θ j-c x Pd) =				71.9	℃	D.F. =	47.9	%
A105	Tjmax=	125	℃	θj-a =	180.0	℃/W	Pmax =	0.6	W
LM78L05ACM	Pd =	0.03	W	ΔTa =	28.7	℃	Ta =	88.7	℃
NEC	Tj = Ta + (θ j-a x Pd) =				94.1	℃	D.F. =	75.3	%
A106	Tjmax=	150	℃	θj-c =	7.0	℃/W	Pmax =	17.8	W
uPC7805AHF	Pd =	1.5	W	ΔTc =	33.5	℃	Tc =	93.5	℃
NEC	Tj = Tc + (θ j-c x Pd) =				104.0	℃	D.F. =	69.3	%
A109	Tjmax=	150	℃	θj-c =	7.0	℃/W	Pmax =	17.8	W
uPC78M05AHF	Pd =	1.04	W	ΔTc =	32.8	℃	Tc =	92.8	℃
NEC	Tj = Tc + (θ j-c x Pd) =				100.1	℃	D.F. =	66.7	%
A1	Tjmax=	150	℃	θj-c =	50.0	℃/W	Pmax =	0.65	W
FA5502M	Pd =	0.074	W	ΔTc =	16.6	℃	Tc =	76.6	℃
FUJI	Tj = Tc + (θ j-c x Pd) =				80.3	℃	D.F. =	53.5	%

3.MAIN COMPONENTS TEMPERATURE RISE

a) Output voltage: 21.5V

Location No.	Parts Name	Temperature Rise (℃)
A1	IC	17.6
A102	IC	22.0
A104	IC	14.0
A106	IC	33.4
A109	IC	36.5
C101	FILM CAP	18.3
C102	FILM CAP	22.9
C110	ELEC. CAP.	7.0
C141	ELEC. CAP.	21.8
D101	BRIDGE	48.3
D126	DIODE	43.8
D128	DIODE	59.3
D131	DIODE	48.5
L101	CHOKE	33.5
L104	CHOKE	52.2
L136	CHOKE	45.2
Q101	MOSFET	39.3
Q102	MOSFET	34.6
Q103	MOSFET	39.6
Q105	MOSFET	27.4
T101	TRANSFORMER	56.5
T102	TRANSFORMER	47.3
T103	TRANSFORMER	21.5

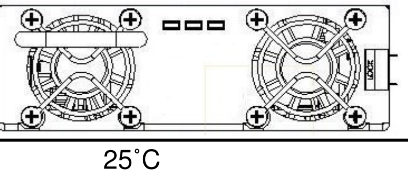
Conditions:

Standard Mounting	
Ta	25˚C
Input Voltage	100VAC
Output Voltage	21.5V
Output Current	40A

b) Output voltage: 24V

Location No.	Parts Name	Temperature Rise (℃)
A1	IC	17.2
A102	IC	22.3
A104	IC	13.7
A106	IC	33.5
A109	IC	36.3
C101	FILM CAP	20.1
C102	FILM CAP	25.7
C110	ELEC. CAP.	7.0
C141	ELEC. CAP.	22.3
D101	BRIDGE	49.9
D126	DIODE	46.8
D128	DIODE	62.0
D131	DIODE	48.9
L101	CHOKE	39.1
L104	CHOKE	59.0
L136	CHOKE	45.0
Q101	MOSFET	40.0
Q102	MOSFET	36.5
Q103	MOSFET	42.4
Q105	MOSFET	30.2
T101	TRANSFORMER	59.7
T102	TRANSFORMER	50.6
T103	TRANSFORMER	24.1

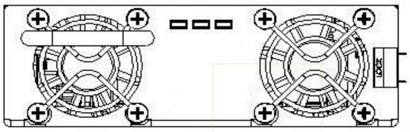
Conditions:

Standard Mounting	
Ta	25˚C
Input Voltage	100VAC
Output Voltage	24V
Output Current	40A

c) Output voltage: 29V

Location No.	Parts Name	DT Temperature Rise (℃)
A1	IC	17.9
A102	IC	23.1
A104	IC	13.8
A106	IC	35.2
A109	IC	37.3
C101	FILM CAP	20.2
C102	FILM CAP	25.9
C110	ELEC. CAP.	7.0
C141	ELEC. CAP.	21.0
D101	BRIDGE	51.1
D126	DIODE	35.8
D128	DIODE	56.9
D131	DIODE	42.3
L101	CHOKE	39.5
L104	CHOKE	61.4
L136	CHOKE	35.3
Q101	MOSFET	37.3
Q102	MOSFET	38.5
Q103	MOSFET	37.2
Q105	MOSFET	26.1
T101	TRANSFORMER	52.0
T102	TRANSFORMER	42.5
T103	TRANSFORMER	23.0

Conditions:

Standard Mounting	
Ta	25˚C
Input Voltage	100VAC
Output Voltage	29V
Output Current	34A

4.ELECTROLYTIC CAPACITORS LIFE TIME ESTIMATION

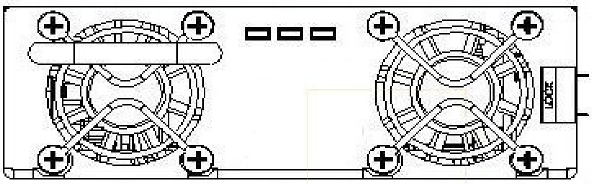
MODEL	COMPUTED LIFE (years) AT Ta			
	30℃	40℃	50℃	60˚C
RFE1000 - 24	29.94	14.97	7.49	4.3
Load(%)	100	100	100	80

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	24V

5. ABNORMAL TEST

RFE1000 - 24

Model:24V Vout=24V

Input:230VAC Ta:25℃ Iout=40A

No	Test Position: Location No.	Test Position: Test Point	Test Mode: Short	Test Mode: Open	1 Fire	2 Smoke	3 Burst	4 Smell	5 Red Hot	6 Damaged	7 Fuse opened	8 OVP	9 OCP	10 No Output	11 No Change	12 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 26V, see note 1
10	D119		●											●			
				●											●		
11	D121		●											●			Hicc-up
				●											●		
12	D125		●								●			●			F102
				●												●	Vo=15.5V
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=15.5V
		5		●												●	Vo=15V, see note 2
15	T103	1-3	●											●			
		5-6	●											●		●	see note 3
		A-B	●											●		●	
		5-D	●											●		●	see note 4

NOTE 1: Pin increase by ~90W
NOTE 2: Pin reduced by ~410W
NOTE 3: Pin increase by ~5W. Output shutdown after ~1min
NOTE 4: Pin increase ~8W. Output shutdown after ~1 min.

Model:24V Vout=24V

Input:230VAC Ta:25℃ Iout=40A

No	Test Position: Location No.	Test Position: Test Point	Test Mode: Short	Test Mode: Open	1 Fire	2 Smoke	3 Burst	4 Smell	5 Red Hot	6 Damaged	7 Fuse opened	8 OVP	9 OCP	10 No Output	11 No Change	12 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 26V,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=15V, 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 ~10W
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
				●											●		

Model:24V Vout=24V

Input:230VAC Ta:25℃ Iout=40A

No	Test Position: Location No.	Test Position: Test Point	Test Mode: Short	Test Mode: Open	1 Fire	2 Smoke	3 Burst	4 Smell	5 Red Hot	6 Damaged	7 Fuse opened	8 OVP	9 OCP	10 No Output	11 No Change	12 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	●							●				●			R151, ZD106, A102
		D		●										●			
		G		●										●			
		S		●										●			

Model:24V Vout=24V

Input:100VAC Ta:25℃ Iout=40A

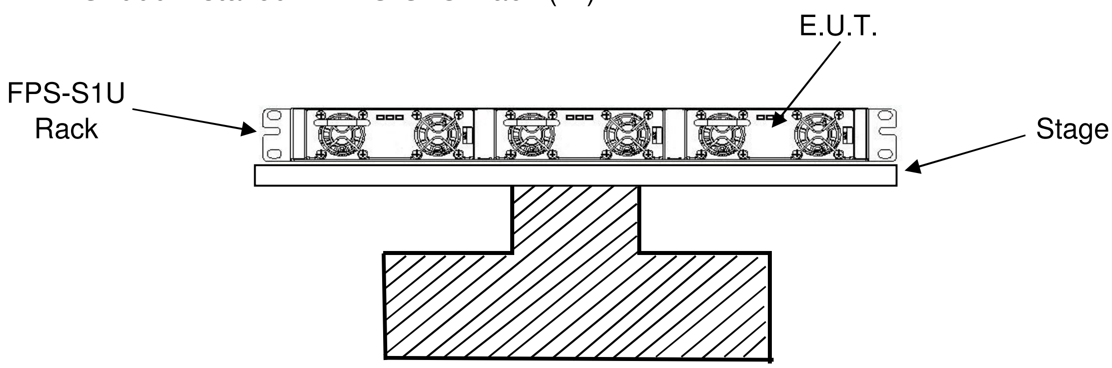
No	Test Position: Location No.	Test Point	Test Mode: Short	Test Mode: Open	1 Fire	2 Smoke	3 Burst	4 Smell	5 Red Hot	6 Damaged	7 Fuse opened	8 OVP	9 OCP	10 No Output	11 No Change	12 Others	Note
1	D106		●							●							R112, R113
				●											●		
2	D118			●												●	Vout: 26V, Pin increased by ~90W
			●											●			Hicc-up
3	L104		●							●	●			●			Q101, Q102, A1, ZD101, F101
				●										●			
4	L105		●												●		
				●						●				●			Q101, Q102, A1, ZD101, R103
5	L106		●													●	Pin increased by ~20W
				●						●				●			R103, A1, Q101, Q102, ZD101
6	C108		●							●				●			R103
				●											●		
7	C110		●							●				●			R103
				●											●		
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 increase 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.FPS1000 VIBRATION TEST (*1):

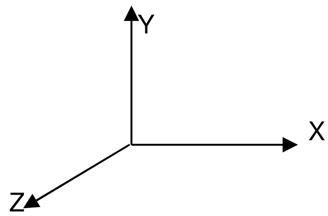
1) Vibration test class
Frequency variable endurance test
2) Equipment used
Controller: GENRAD-2503
Vibrator: ULHOLTZ-DICKIE TA1000

3) Testing method
FPS1000 installed in FPS-S1U Rack (*1)



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

Pass

Note:

*1. RFE1000 ASSEMBLY IS SAME AS FPS1000 EXCEPT FOR INPUT/OUTPUT CONNECTOR'S.
ALL MOUNTING HOLES ARE LOCATED AT THE SAME PLACE.