

GEN 5kW SERIES

RELIABILITY

DATA

DWG: IA657-79-01		
APPD	CHK	DWG
<i>Ru</i> may-1-08	Ami P. 1-May-08	Dotan M. DEC-27-07



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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.

M.T.B.F.

MODEL: GEN8-600 3P400

- (1) Method of calculation according to EIAJ (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.

$$M.T.B.F. = \frac{1}{\lambda_{equip}} \times 10^6 = \frac{1}{\sum_{i=1}^n N_i (\lambda_G \pi_Q)_i} \times 10^6 (hours)$$

Where:

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

(2) M.T.B.F. Values

G_F (GROUND, FIXED)

$$\underline{M.T.B.F. = 35,465 (HOURS)}$$

2.COMPONENTS DERATING

GEN5kW SERIES

Calculation method

(1) Conditions

Input:	Nominal
Output:	Vout - 100%, Iout - 100%
Ambient temperature:	50°C
Mounting Method:	Standard Mounting

(2) Semiconductors

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

(3) IC, Resistors, Capacitors, etc.

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

(4) Calculation method of thermal impedance:

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

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

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 = 170Vac

Load = 100%

Ta=50°C

INPUT 3-PHASE 200V

A301 UPC7812AHF-AZ NEC	Tjmax= 150 °C Pd = 1.8 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 5.0 °C/W ΔTc = 43.4 °C Tj = 102.4 °C	Pmax = 15.0 W Tc = 93.4 °C D.F. = 68.3 %
D301 D25XB60-7000 SHINDENGEN	Tjmax= 150 °C Pd = 14 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.0 °C/W ΔTc = 63.4 °C Tj = 127.4 °C	Pmax = 60.0 W Tc = 113.4 °C D.F. = 84.9 %
D302 D25XB60-7000 SHINDENGEN	Tjmax= 150 °C Pd = 14 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.0 °C/W ΔTc = 58.2 °C Tj = 122.2 °C	Pmax = 60.0 W Tc = 108.2 °C D.F. = 81.5 %
D303 D25XB60-7000 SHINDENGEN	Tjmax= 150 °C Pd = 14 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.0 °C/W ΔTc = 51.6 °C Tj = 115.6 °C	Pmax = 60.0 W Tc = 101.6 °C D.F. = 77.1 %
D304 S1NB60-7101 SHINDENGEN	Tjmax= 150 °C Pd = 0.25 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 15.0 °C/W ΔTc = 17.3 °C Tj = 71.1 °C	Pmax = --- W Tc = 67.3 °C D.F. = 47.4 %

Vin = 342Vac

Load = 100%

Ta=50°C

INPUT 3-PHASE 400V

A301 UPC7812AHF-AZ NEC	Tjmax= 150 °C Pd = 15 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.5 °C/W ΔTc = 55.0 °C Tj = 112.5 °C	Pmax = --- W Tc = 105.0 °C D.F. = 75.0 %
D652 RG4C SANKEN	Tjmax= 150 °C Pd = 0.002 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 8.0 °C/W ΔTc = 19.8 °C Tj = 69.8 °C	Pmax = --- W Tc = 69.8 °C D.F. = 46.5 %
D653 S1NB60-7101 ST	Tjmax= 150 °C Pd = 0.25 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 15.0 °C/W ΔTc = 13.5 °C Tj = 67.3 °C	Pmax = --- W Tc = 63.5 °C D.F. = 44.8 %
D654 S1NB60-7101 ST	Tjmax= 150 °C Pd = 0.25 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 15.0 °C/W ΔTc = 13.5 °C Tj = 67.3 °C	Pmax = --- W Tc = 63.5 °C D.F. = 44.8 %
Q651 2SK2611(F) ST	Tjmax= 150 °C Pd = 0.825 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.833 °C/W ΔTc = 9.9 °C Tj = 60.6 °C	Pmax = 150.0 W Tc = 59.9 °C D.F. = 40.4 %
Q652 BTW69-1200 ST	Tjmax= 150 °C Pd = 0 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 9.2 °C Tj = 59.2 °C	Pmax = --- W Tc = 59.2 °C D.F. = 39.5 %
Q653 BTW69-1200 ST	Tjmax= 150 °C Pd = 11 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 42.5 °C Tj = 106.8 °C	Pmax = --- W Tc = 92.5 °C D.F. = 71.2 %

Vin = 170Vac

Load = 100%

Ta=50°C

PFC200

A601 UCC2806PWTRG4 TI	Tjmax= 150 °C Pd = 0.3 W Tj = Ta + (θj-a x Pd) =>	θj-a = 120.0 °C/W ΔTa = 14.7 °C Tj = 100.7 °C	Pmax = 1.0 W Ta = 64.7 °C D.F. = 67.1 %
D601 STTH806DTI ST	Tjmax= 150 °C Pd = 12.3 W Tj = Tc + (θj-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 51.5 °C Tj = 117.5 °C	Pmax = --- W Tc = 101.5 °C D.F. = 78.3 %
D602 STTH806DTI ST	Tjmax= 150 °C Pd = 12.3 W Tj = Tc + (θj-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 40.0 °C Tj = 106.0 °C	Pmax = --- W Tc = 90.0 °C D.F. = 70.7 %
D603 STTH806DTI ST	Tjmax= 150 °C Pd = 7.8 W Tj = Tc + (θj-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 40.4 °C Tj = 100.5 °C	Pmax = --- W Tc = 90.4 °C D.F. = 67.0 %
D604 STTH806DTI ST	Tjmax= 150 °C Pd = 7.8 W Tj = Tc + (θj-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 40.5 °C Tj = 100.6 °C	Pmax = --- W Tc = 90.5 °C D.F. = 67.1 %
Q601 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 25 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 42.3 °C Tj = 103.3 °C	Pmax = 284.0 W Tc = 92.3 °C D.F. = 68.9 %
Q602 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 25 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 42.3 °C Tj = 103.3 °C	Pmax = 284.0 W Tc = 92.3 °C D.F. = 68.9 %
Q603 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 25 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 42.3 °C Tj = 103.3 °C	Pmax = 284.0 W Tc = 92.3 °C D.F. = 68.9 %
Q604 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 25 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 48.5 °C Tj = 109.5 °C	Pmax = 284.0 W Tc = 98.5 °C D.F. = 73.0 %

Vin = 342Vac

Load = 100%

Ta=50°C

PFC400

A601 E-L4981AD ST	Tjmax= 150 °C Pd = 0.23 W Tj = Ta + (θ j-a x Pd) =>	θj-a = 120.0 °C/W ΔTa = 14.4 °C Tj = 92.0 °C	Pmax = 0.6 W Ta = 64.4 °C D.F. = 61.3 %
A603 UCC2806PWTRG4 TI	Tjmax= 150 °C Pd = 0.3 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 15.0 °C/W ΔTc = 13.8 °C Tj = 68.3 °C	Pmax = 1.0 W Tc = 63.8 °C D.F. = 45.5 %
A605 E-L4981AD ST	Tjmax= 150 °C Pd = 0.23 W Tj = Ta + (θ j-a x Pd) =>	θj-a = 120.0 °C/W ΔTa = 7.3 °C Tj = 84.9 °C	Pmax = 0.6 W Ta = 57.3 °C D.F. = 56.6 %
A801 UPC24M18AHF-AZ NEC	Tjmax= 150 °C Pd = 0.6 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 7.0 °C/W ΔTc = 37.7 °C Tj = 91.9 °C	Pmax = 15.0 W Tc = 87.7 °C D.F. = 61.3 %
D802 STTH806DTI ST	Tjmax= 150 °C Pd = 10.2 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 46.9 °C Tj = 110.2 °C	Pmax = --- W Tc = 96.9 °C D.F. = 73.4 %
D805 STTH806DTI ST	Tjmax= 150 °C Pd = 10.2 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 46.9 °C Tj = 110.2 °C	Pmax = --- W Tc = 96.9 °C D.F. = 73.4 %
D806 STTH806DTI ST	Tjmax= 150 °C Pd = 10.2 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 50.7 °C Tj = 114.0 °C	Pmax = --- W Tc = 100.7 °C D.F. = 76.0 %
D807 STTH806DTI ST	Tjmax= 150 °C Pd = 10.2 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 50.7 °C Tj = 114.0 °C	Pmax = --- W Tc = 100.7 °C D.F. = 76.0 %
D810 FMG-G2CS SANKEN	Tjmax= 150 °C Pd = 9 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 4.0 °C/W ΔTc = 24.2 °C Tj = 110.2 °C	Pmax = --- W Tc = 74.2 °C D.F. = 73.5 %
D811 FMG-G2CS SANKEN	Tjmax= 150 °C Pd = 9 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 4.0 °C/W ΔTc = 19.4 °C Tj = 105.4 °C	Pmax = --- W Tc = 69.4 °C D.F. = 70.3 %

Vin = 342Vac

Load = 100%

Ta=50°C

PFC400

Q801	Tjmax= 150 °C	$\theta_{j-c} = 0.833$ °C/W	Pmax = 150.0 W
2SK2488-A	Pd = 17 W	$\Delta T_c = 42.3$ °C	Tc = 92.3 °C
NEC	Tj = Tc + ($\theta_{j-c} \times Pd$) => Tj = 106.5 °C		D.F. = 71.0 %
Q802	Tjmax= 150 °C	$\theta_{j-c} = 0.833$ °C/W	Pmax = 150.0 W
2SK2488-A	Pd = 17 W	$\Delta T_c = 42.3$ °C	Tc = 92.3 °C
NEC	Tj = Tc + ($\theta_{j-c} \times Pd$) => Tj = 106.5 °C		D.F. = 71.0 %
Q803	Tjmax= 150 °C	$\theta_{j-c} = 0.833$ °C/W	Pmax = 150.0 W
2SK2488-A	Pd = 17 W	$\Delta T_c = 42.3$ °C	Tc = 92.3 °C
NEC	Tj = Tc + ($\theta_{j-c} \times Pd$) => Tj = 106.5 °C		D.F. = 71.0 %
Q804	Tjmax= 150 °C	$\theta_{j-c} = 0.833$ °C/W	Pmax = 150.0 W
2SK2488-A	Pd = 17 W	$\Delta T_c = 48.5$ °C	Tc = 98.5 °C
NEC	Tj = Tc + ($\theta_{j-c} \times Pd$) => Tj = 112.7 °C		D.F. = 75.1 %
Q805	Tjmax= 150 °C	$\theta_{j-c} = 0.833$ °C/W	Pmax = 150.0 W
2SK2488-A	Pd = 17 W	$\Delta T_c = 48.5$ °C	Tc = 98.5 °C
NEC	Tj = Tc + ($\theta_{j-c} \times Pd$) => Tj = 112.7 °C		D.F. = 75.1 %
Q806	Tjmax= 150 °C	$\theta_{j-c} = 0.833$ °C/W	Pmax = 150.0 W
2SK2488-A	Pd = 17 W	$\Delta T_c = 48.5$ °C	Tc = 98.5 °C
NEC	Tj = Tc + ($\theta_{j-c} \times Pd$) => Tj = 112.7 °C		D.F. = 75.1 %

Vin = 170Vac

Load = 100%

Ta=50°C

DC/DC LV

D501 STTH506DTI ST	Tjmax= 150 °C Pd = 1.12 W Tj = Tc + (θj-c x Pd) =>	θj-c = 3.0 °C/W ΔTc = 22.5 °C Tj = 75.9 °C	Pmax = --- W Tc = 72.5 °C D.F. = 50.6 %
D502 STTH506DTI ST	Tjmax= 150 °C Pd = 1.12 W Tj = Tc + (θj-c x Pd) =>	θj-c = 3.0 °C/W ΔTc = 23.6 °C Tj = 77.0 °C	Pmax = --- W Tc = 73.6 °C D.F. = 51.3 %
D503 STTH506DTI ST	Tjmax= 150 °C Pd = 1.12 W Tj = Tc + (θj-c x Pd) =>	θj-c = 3.0 °C/W ΔTc = 27.9 °C Tj = 81.3 °C	Pmax = --- W Tc = 77.9 °C D.F. = 54.2 %
D504 STTH506DTI ST	Tjmax= 150 °C Pd = 1.12 W Tj = Tc + (θj-c x Pd) =>	θj-c = 3.0 °C/W ΔTc = 22.5 °C Tj = 75.9 °C	Pmax = --- W Tc = 72.5 °C D.F. = 50.6 %
D509~D514 (8V) S60SC4M-7000 ST	Tjmax= 150 °C Pd = 20 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.5 °C/W ΔTc = 61.4 °C Tj = 121.4 °C	Pmax = --- W Tc = 111.4 °C D.F. = 80.9 %
D509~D514 (60V) 20FL2C41A(F) TOSHIBA	Tjmax= 150 °C Pd = 14 W Tj = Tc + (θj-c x Pd) =>	θj-c = 1.5 °C/W ΔTc = 31.5 °C Tj = 102.5 °C	Pmax = --- W Tc = 81.5 °C D.F. = 68.3 %
D551~D554 S60SC4M-7000 ST	Tjmax= 150 °C Pd = 20 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.5 °C/W ΔTc = 62.9 °C Tj = 122.9 °C	Pmax = --- W Tc = 112.9 °C D.F. = 81.9 %
Q501 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 12 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 30.9 °C Tj = 86.2 °C	Pmax = 284.0 W Tc = 80.9 °C D.F. = 57.5 %
Q502 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 12 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 30.5 °C Tj = 85.8 °C	Pmax = 284.0 W Tc = 80.5 °C D.F. = 57.2 %
Q503 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 16 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 38.5 °C Tj = 95.5 °C	Pmax = 284.0 W Tc = 88.5 °C D.F. = 63.7 %
Q504 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 16 W Tj = Tc + (θj-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 56.6 °C Tj = 113.6 °C	Pmax = 284.0 W Tc = 106.6 °C D.F. = 75.8 %

Vin = 170Vac

Load = 100%

Ta=50°C

DC/DC HV

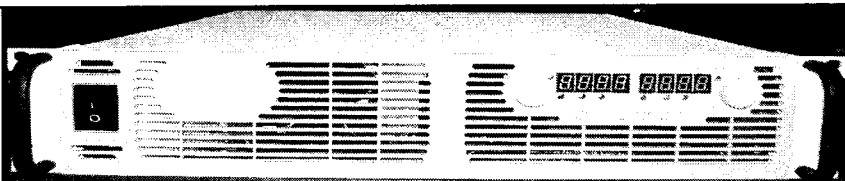
D605~D620 (150V) YG911S3R FUJI	Tjmax= 150 °C Pd = 5 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.80 °C/W ΔTc = 61.6 °C Tj = 115.6 °C	Pmax = --- W Tc = 111.6 °C D.F. = 77.1 %
D605~D620 (600V) STTH506DTI ST	Tjmax= 150 °C Pd = 12.5 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.57 °C/W ΔTc = 41.1 °C Tj = 98.2 °C	Pmax = --- W Tc = 91.1 °C D.F. = 65.5 %
Q501 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 24.5 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 64.4 °C Tj = 125.2 °C	Pmax = 284.0 W Tc = 114.4 °C D.F. = 83.5 %
Q502 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 24.5 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 60.2 °C Tj = 121.0 °C	Pmax = 284.0 W Tc = 110.2 °C D.F. = 80.7 %
Q503 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 24.5 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 47.6 °C Tj = 108.4 °C	Pmax = 284.0 W Tc = 97.6 °C D.F. = 72.3 %
Q504 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 24.5 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 59.1 °C Tj = 119.9 °C	Pmax = 284.0 W Tc = 109.1 °C D.F. = 79.9 %

3.MAIN COMPONENTS TEMPERATURE RISE

GEN8-600 3Φ 200

Location No.		Parts Name	ΔT Temperature Rise (°C)
			Standard Mounting
DC-DC	C501	ELEC. CAPACITOR	2.4
	C502	ELEC. CAPACITOR	2.7
	C504	ELEC. CAPACITOR	29.1
	D551	DIODE	71.2
	L501	CHOKE	67.7
	Q504	MOSFET	52.5
	T501	TRANSFORMER	58.8
	T502	TRANSFORMER	5.5
	T503	TRANSFORMER	5.5
PFC200	A601	IC	14.7
	C601	FILM CAPACITOR	24.0
	C605	FILM CAPACITOR	23.7
	C610	ELEC. CAPACITOR	4.9
	D604	DIODE	40.5
	D607	DIODE	52.2
	L601	CHOKE	51.9
	L603	CHOKE	45.0
	Q602	MOSFET	39.3
	R615	RESISTOR	68.6
	T601	TRANSFORMER	20.0
CONTROL	A101	IC	31.3
	A102	IC	35.8
	A138	IC	31.7
	PC106	OPTOCOUPLER	28.3
OUTPUT FILTER	C44	ELEC. CAPACITOR	36.0
	C47	ELEC. CAPACITOR	33.0
	L41	CHOKE	39.1
	R41	SHUNT	67.7
	R42	SHUNT	67.0
BIAS	A406	IC	38.0
	A407	IC	47.2
	D403	DIODE	39.8
	D405	DIODE	37.4
	D407	DIODE	52.5
	PC407	OPTOCOUPLER	19.4
	Q401	PNP TRANSISTOR	23.5
	Q408	MOSFET	38.7
	Q409	MOSFET	35.9
T401	TRANSFORMER	33.0	
INPUT	A301	IC	43.4
	C303	FILM CAPACITOR	25.1
	C311	ELEC. CAPACITOR	12.8
	C312	CER. CAPACITOR	15.7
	D301	BRIDGE	64.4
	D304	BRIDGE	17.3
	D307	DIODE	18.5
	L301	CHOKE	51.4
	RL301	RELAY	16.1
	T301	TRANSFORMER	19.8

Conditions:

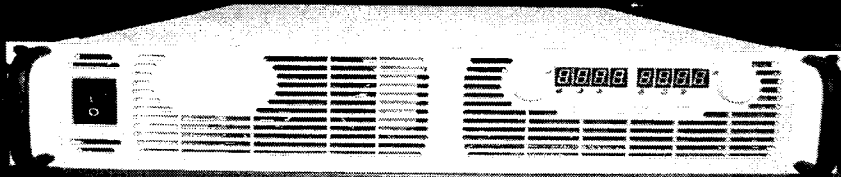
Standard Mounting	
Input Voltage	170~265V
Output Voltage	8V
Output Current	600A

3.MAIN COMPONENTS TEMPERATURE RISE

GEN8-600 3Φ 400

Location No.		Parts Name	ΔT Temperature Rise (°C)
			Standard Mounting
DC-DC	C501	ELEC. CAPACITOR	2.5
	C502	ELEC. CAPACITOR	2.7
	C504	ELEC. CAPACITOR	26.9
	Q504	MOSFET	56.6
	T501	TRANSFORMER	57.3
	T502	TRANSFORMER	5.5
	T503	TRANSFORMER	5.7
PFC400	A601	IC	14.4
	A603	IC	13.8
	A605	IC	7.3
	A801	IC	37.7
	C806	FILM CAPACITOR	18.7
	C807	ELEC. CAPACITOR	7.7
	C811	ELEC. CAPACITOR	27.5
	C814	ELEC. CAPACITOR	29.7
	D805	DIODE	46.9
	D806	DIODE	50.7
	D810	DIODE	24.2
	D811	DIODE	19.4
	L801	CHOKE	50.8
	L802	CHOKE	49.7
	PC801	OPTOCOUPLER	23.1
	Q801	MOSFET	42.3
	Q804	MOSFET	48.5
	R660	RESISTOR	35.9
	R826	RESISTOR	54.2
	R840	RESISTOR	27.0
T801	TRANSFORMER	28.0	
OUTPUT FILTER	C44	ELEC. CAPACITOR	34.0
	C47	ELEC. CAPACITOR	34.7
BIAS	C442	ELEC. CAPACITOR	37.5
	PC401	OPTOCOUPLER	18.3
	T401	TRANSFORMER	26.5
INPUT	C653	FILM CAPACITOR	20.0
	C660	FILM CAPACITOR	25.2
	C668	FILM CAPACITOR	14.7
	C670	ELEC. CAPACITOR	16.1
	D651	BRIDGE	55.0
	D652	DIODE	19.8
	D654	BRIDGE	13.5
	L652	CHOKE	26.2
	L653	CHOKE	41.7
	Q653	SCR	42.5
	T651	TRANSFORMER	21.2
T652	TRANSFORMER	20.4	

Conditions:

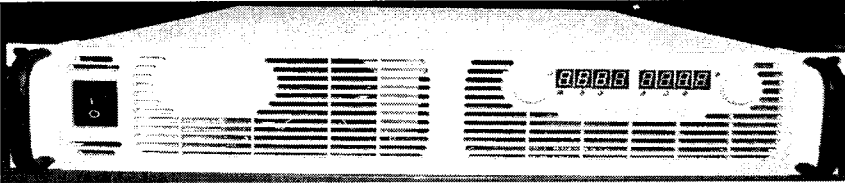
Standard Mounting	
Input Voltage	342~460V
Output Voltage	8V
Output Current	600A

3.MAIN COMPONENTS TEMPERATURE RISE

GEN600-8.5 3Φ 200

Location No.	Parts Name	ΔT Temperature Rise (°C)	
		Standard Mounting	
DC-DC	C602	ELEC. CAPACITOR	3.5
	C603	ELEC. CAPACITOR	16.3
	C629	ELEC. CAPACITOR	14.8
	D607	DIODE	50.5
	L601	CHOKE	44.7
	Q604	MOSFET	57.9
	T601	TRANSFORMER	85.0
	T602	TRANSFORMER	19.2
	T603	TRANSFORMER	15.1
PFC200	A601	IC	15.0
	C601	FILM CAPACITOR	26.9
	C605	FILM CAPACITOR	30.9
	C610	ELEC. CAPACITOR	5.6
	D601	DIODE	47.5
	D608	DIODE	40.9
	L602	CHOKE	48.9
	L603	CHOKE	48.8
	Q602	MOSFET	36.1
	R615	RESISTOR	53.3
	T601	TRANSFORMER	21.8
CONTROL	A101	IC	20.5
	A102	IC	21.4
	A138	IC	19.7
	PC108	OPTOCOUPLER	19.9
OUTPUT FILTER	C84	ELEC. CAPACITOR	14.1
	D81	DIODE	13.9
	L81	CHOKE	13.8
	R85	SHUNT	17.4
BIAS	A406	IC	43.6
	A407	IC	50.3
	D403	DIODE	36.3
	D405	DIODE	34.5
	D407	DIODE	56.9
	PC407	OPTOCOUPLER	27.6
	Q401	PNP TRANSISTOR	25.9
	Q408	MOSFET	62.9
	Q409	MOSFET	60.3
T401	TRANSFORMER	31.3	
INPUT	A301	IC	40.6
	C303	FILM CAPACITOR	25.4
	C311	ELEC. CAPACITOR	13.3
	C312	CER. CAPACITOR	12.9
	D301	BRIDGE	40.2
	D304	BRIDGE	17.7
	D307	DIODE	21.3
	L301	CHOKE	53.2
	RL301	RELAY	19.3
	T301	TRANSFORMER	19.2

Conditions:

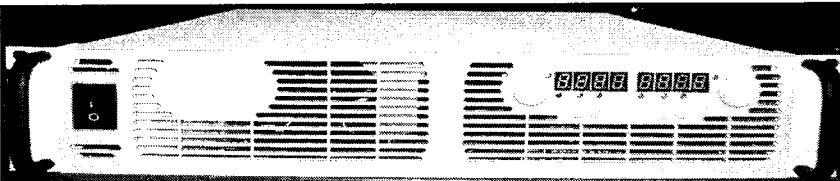
Standard Mounting	
Input Voltage	170~265V
Output Voltage	600V
Output Current	8.5A

3.MAIN COMPONENTS TEMPERATURE RISE

GEN600-8.5 3Φ 400

Location No.	Parts Name	ΔT Temperature Rise (°C)	
		Standard Mounting	
DC-DC	C602	ELEC. CAPACITOR	4.2
	C603	ELEC. CAPACITOR	14.3
	C629	ELEC. CAPACITOR	11.4
	D613	DIODE	48.9
	L601	CHOKE	65.9
	Q601	MOSFET	66.0
	T601	TRANSFORMER	80.5
	T602	TRANSFORMER	10.7
	T603	TRANSFORMER	7.0
PFC400	A801	IC	34.9
	C806	FILM CAPACITOR	21.1
	C807	ELEC. CAPACITOR	8.1
	C811	ELEC. CAPACITOR	24.8
	C814	ELEC. CAPACITOR	29.0
	D805	DIODE	57.9
	D806	DIODE	45.5
	D810	DIODE	26.8
	D811	DIODE	16.1
	L801	CHOKE	51.8
	L802	CHOKE	45.7
	Q801	MOSFET	54.8
	Q804	MOSFET	46.2
	R826	RESISTOR	50.5
	R840	RESISTOR	24.4
	T801	TRANSFORMER	30.7
OUTPUT FILTER	C84	ELEC. CAPACITOR	14.4
	L81	CHOKE	16.5
INPUT	C653	FILM CAPACITOR	19.4
	C660	FILM CAPACITOR	20.5
	C668	FILM CAPACITOR	15.6
	C670	ELEC. CAPACITOR	18.0
	D651	BRIDGE	50.5
	D652	DIODE	24.3
	D654	BRIDGE	11.3
	L652	CHOKE	26.5
	L653	CHOKE	42.1
	Q653	SCR	31.0
T652	TRANSFORMER	15.7	

Conditions:

Standard Mounting	
Input Voltage	342~460V
Output Voltage	600V
Output Current	8.5A

4.ELECTROLYTIC CAPACITORS LIFE TIME ESTIMATION

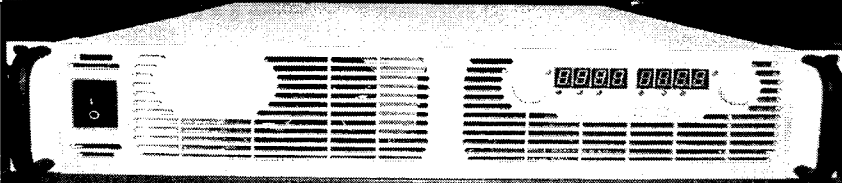
MODEL	COMPUTED LIFE (year) at Tambient		
	30°C	40°C	50°C
GEN8-600	13.73	6.86	3.43
GEN60-85 3P400 GEN150-34 3P400 GEN600-8.5 3P400	15.57	7.79	3.89

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

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

L_o: Guarantee life for Elec.capacitor

T_c: Case temperature of Elec.capacitor

Standard Mounting	
Input Voltage	Nom.
Output Voltage	100%
Output Current	100%

5. ABNORMAL TEST

Condition: Ta:25°C Input:240VAC Vout:100% Iout:100%

No.	Test Position		Test Mode		Test Result												Note
	Location No.	Test Point	Short	Open	1	2	3	4	5	6	7	8	9	10	11	12	
					Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse Open	P < O	P O O	No Output	No Change	Others	
1	Q603	D-S	•								•						F301
2		G-S	•													•	P input rise to 50W
3		D-G	•							•	•			•			F302;303;Q601;603;605;607;ZD601;R605;609
4		D		•												•	
5		S		•												•	
6		G		•						•	•			•			F302;303;Q601
7	D603	A-K	•							•	•			•			F301;Q603;ZD601;R609
8		A		•												•	P input rise to 80W
9	D605	A-K	•							•	•			•			F301;R613
10		A		•												•	
11	D609	A-K	•											•			
12		A		•												•	
13	D610	A-K	•													•	V out;I out -unstable
14		A		•						•	•			•			F302;303;Q603;607R609
15	L601		•							•	•			•			F302;303;Q601;603;605;607;R605
16				•												•	V out;I out -unstable
17	L603		•													•	
18				•												•	
19	Q610	C-E	•													•	
20		C-B	•													•	
21		B		•						•	•			•			After 15 min.Blow:F302;Q601;603;609;D601;D607;ZD601;R609;605;613;615;645;652
22	R622			•													V out;I out -unstable

5. ABNORMAL TEST

Condition: Ta:25°C Input:415VAC Vout:100% Iout:100%

No.	Test Position		Test Mode		Test Result												Note
	Location No.	Test Point	Short	Open	1	2	3	4	5	6	7	8	9	10	11	12	
					Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse Open	P < O	P C O	No Output	No Change	Others	
1	A801	1-2	•											•			
2		1-3	•												•		
3		2-3	•											•			
4		1		•										•			
5		2		•										•			
6		3		•										•			
7	D801	A-K	•						•								D808
8		A		•											•		
9	D805	A-K	•						•	•				•			D802;F651;Q802
10		A		•											•		
11	D810	A-K	•						•								R846;847
12		A		•											•		
13	Q801	D-S	•						•	•				•			F651;652
14		G-S	•												•		
15		D-G	•						•	•				•			F651;652;Q653;801;802;803;807;808;ZD802;R813
16		D		•												•	P input rise to 10W
17		S		•					•							•	P input rise to 10W;Q801-Blow
18		G		•					•	•				•			F651;652;Q801
19	L801	13-14	•									•		•			
20		14		•												•	V out;I out -unstable
21		2-3	•													•	P input rise to 50W
22		3		•											•		
23	PC801	1-2	•											•		•	AC Fail
24		3-4	•													•	
25		1		•										•			
26		3		•										•		•	AC Fail
27	PC603	3-4	•									•		•			

5. ABNORMAL TEST

Condition: Ta:25°C Input:240VAC Vout:100% Iout:100%

No.	Test Position		Test Mode		Test Result												Note
	Location No.	Test Point	Short	Open	1	2	3	4	5	6	7	8	9	10	11	12	
					Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse Open	P < O	P C O	No Output	No Change	Others	
1	D301	1-2	●							●				●			F301
2		2-4	●							●				●			F301
3	D302	1-2	●							●				●			F302
4		2-4	●							●				●			F302
5	D303	1-2	●							●				●			F303
6		2-4	●							●				●			F303
7	D304	1-2	●						●					●			R307;RL301-Not work
8	D305	A-K	●											●			RL301-Not work
9	D308	A-K	●						●					●			R308;309;310

5. ABNORMAL TEST

INPUT 400

Condition: Ta:25°C Input:415VAC Vout:100% Iout:100%

No.	Test Position		Test Mode		Test Result												Note
	Location No.	Test Point	Short	Open	1	2	3	4	5	6	7	8	9	10	11	12	
					Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse Open	P < O	P O O	No Output	No Change	Others	
1	D651	1-4	●							●				●			F651
2		4-5	●							●				●			F651;652;653
3	Q652	1-2	●							●				●			F652;653
4	Q653	1-2	●												●		
5	D653	1-2	●												●		
6		2-4	●												●		

5. ABNORMAL TEST

DC-DC 8V

Condition: Ta:25°C Input:415VAC Vout:100% Iout:100%

No.	Test Position		Test Mode		Test Result												Note
	Location No.	Test Point	Short	Open	1	2	3	4	5	6	7	8	9	10	11	12	
					Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse Open	P < O	P O	No Output	No Change	Others	
1	Q501	D-S	●							●			●			F651,652	
2		G-S	●						●	●			●			F651,652;Q503;504	
3		G-D	●							●			●			F651,652	
4	Q507	C-E	●							●			●			F651,652	
5	D505	A-K	●							●			●			F652	
6	D509	A-K	●							●			●			F652	
7	D514	A-K	●							●			●			F652	
8	C503	+/-	●									●	●				
9	L501		●							●			●			F651;652	
10	T601		●												●	V out drop to 2V	
11	T603	3-4							●						●	After 1hour work P in=1.13kW;V out=0.8V;I out=540A R528-open	
12		A-B													●	After 1hour work P in=1.13kW;V out=0.8V;I out=540A	
13		A							●				●			Q502;503;803;D802;805;R846;847;675;676;677;680	

5. ABNORMAL TEST

DC-DC 600V

Condition: Ta:25°C Input:415VAC Vout:100% Iout:100%

No.	Test Position		Test Mode		Test Result												Note
	Location No.	Test Point	Short	Open	1	2	3	4	5	6	7	8	9	10	11	12	
					Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse Open	P	V	O	P	C	
1	Q601	D-S	●							●	●			●			F651;652;Q602;R620
2		G-S	●													●	Pin +65W
3		G-D	●							●	●			●			F651;Q602;R610;609Q610
4	D605	A-K	●							●	●		●	●			D606;Q603;F652
5	D601	A-K	●										●	●			
6	Q605	K-E	●											●			
7	D617	A-K	●									●		●			
8	C620	+/-	●							●				●			C621

Condition: Ta:25°C Input:240VAC Vout:100% Iout:100%

No.	Test Position		Test Mode		Test Result												Note
	Location No.	Test Point	Short	Open	1	2	3	4	5	6	7	8	9	10	11	12	
					Fire	Smoke	Burst	Smell	Red Hot	Damaged	Fuse Open	P	V	O	P	C	
1	L601		●							●	●			●			F301;302;303;Q601;602;603;D607;616;605;614;R617;R609;626;(BUST-D601-604;Q603)
2				●						●	●			●			F301;302;(SLAVE-Q602;603;R626;617)(BUST-D601-604)
3	T603	3-4	●							●	●			●			F301-303;(SLAVE-Q602-604;R626;617;659;(BUST-D601-604;Q601;R605)
4		9-10	●							●	●			●			F301;302;Q603;602;R626;617;(BUST-D601-604)
5		10		●						●	●			●			F301;302;Q602;604;R617;659;(BUST-D601-604;Q602;R606)
6	T601	8-10	●							●	●			●			F301-303;Q603;604;R626;659;(BUST-D601-604;Q602;R606)

6.VIBRATION TEST

MODEL: GEN600-8.5-3P200

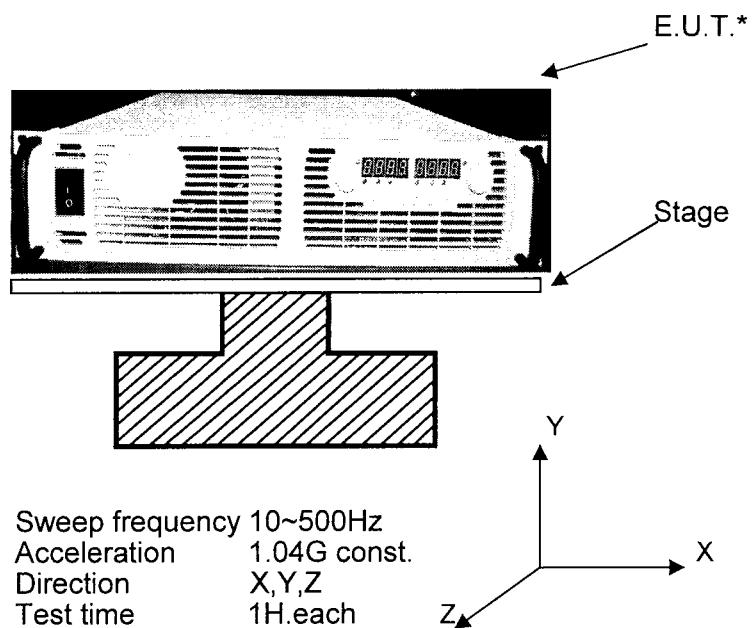
(1) Vibration test class

Frequency variable endurance test

(2) Equipment used

Name	Manufacturer	Model
PC computer SCENIC LI-815 P3 1000, RAM 256MB, HD 20GB	Yanir Systems	
Laser Shaker Control System	DACTRON	LASER
Accelerometer, I-TEDS, 100 mV/g	Endevco	752A12
ICP Accelerometer, 104 mV/g, 50g pk	PCB	353B34
Cable 18 GHz, 3m, SMA-SMA	Gore	NA

(3) Testing method



Test condition:

Sweep frequency 10~500Hz
 Acceleration 1.04G const.
 Direction X,Y,Z
 Test time 1H.each

*E.U.T. is fixed to vibrator surface by mounting straps

(4)Test Result

OK NG

Vin=200Vac;Iout=8.5A

Check item	Vout	Ripple(mVp-p)	E.U.T.state
Directions \Initial	600	170	O.K.
X	600	170	O.K.
Y	600	170	O.K.
Z	600	170	O.K.

6.VIBRATION TEST

MODEL: GEN8-600-3P400

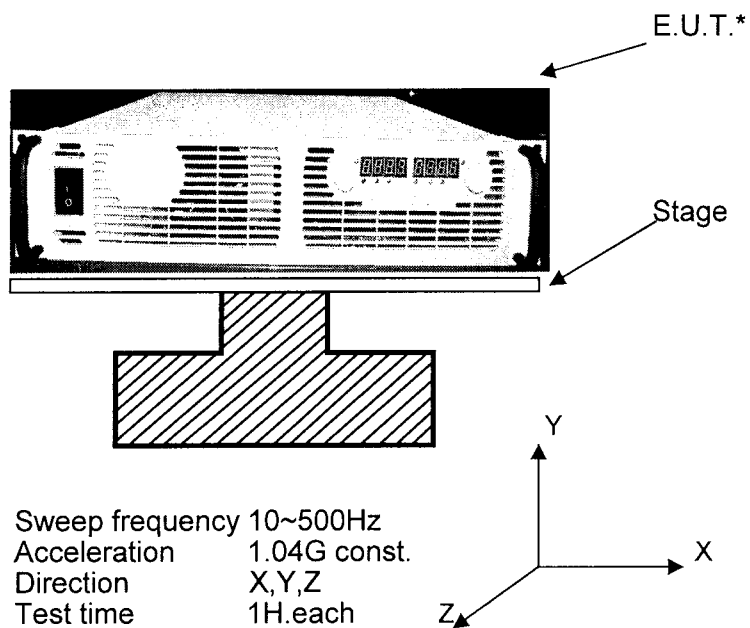
(1) Vibration test class

Frequency variable endurance test

(2) Equipment used

Name	Manufaturer	Model
PC computer SCENIC LI-815 P3 1000, RAM 256MB, HD 20GB	Yanir Systems	
Laser Shaker Control System	DACTRON	LASER
Accelerometer, I-TEDS, 100 mV/g	Endevco	752A12
ICP Accelerometer, 104 mV/g, 50g pk	PCB	353B34
Cable 18 GHz, 3m, SMA-SMA	Gore	NA

(3) Testing method



Test condition:

Sweep frequency 10~500Hz
 Acceleration 1.04G const.
 Direction X,Y,Z
 Test time 1H.each

*E.U.T. is fixed to vibrator surface by mounting straps

(4)Test Result

OK NG

Vin=400Vac,Iout=600A

Check item	Vout	Ripple(mVp-p)	E.U.T.state
Directions \Initial	7.996	50	O.K.
X	7.996	50	O.K.
Y	7.996	50	O.K.
Z	7.996	50	O.K.