GEN 5kW SERIES

RELIABILITY

DATA

DWG: IA657-79-01		
APPD	CHK	DWG
may-1-08	Ami P. 1-May-08	Dstan 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 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 ith Generic Part (π_Q = 1)

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

G_F (GROUND, FIXED)

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

Vin = 342Vac Load = 100% Ta=50°C INPUT 3-PHASE 400V

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

Vin = 170Vac Load = 100% Ta=50°C PFC200

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

Vin = 342Vac Load = 100% Ta=50°C PFC400

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

Vin = 342Vac Load = 100% Ta=50°C PFC400

Q801	Tjmax=	150	°C	θj-c =	0.833	°C/W	Pmax =	150.0	W
2SK2488-A	Pd =	17	W	ΔTc =	42.3	°C	Tc =	92.3	°C
NEC	Tj = Tc + (θ j-c x Pd) =>			Tj =	106.5	°C	D.F. =	71.0	%
Q802	Tjmax=	150	°C	θj-c =	0.833	°C/W	Pmax =	150.0	W
2SK2488-A	Pd =	17	W	ΔTc =	42.3	°C	Tc =	92.3	°C
NEC	Tj = Tc + (θ j-c x Pd) =>			Tj =	106.5	°C	D.F. =	71.0	%
Q803	Tjmax=	150	°C	θj-c =	0.833	°C/W	Pmax =	150.0	W
2SK2488-A	Pd =	17	W	ΔTc =	42.3	°C	Tc =	92.3	°C
NEC	Tj = Tc + (θ j-c x Pd) =>			Tj =	106.5	°C	D.F. =	71.0	%
Q804	Tjmax=	150	°C	θj-c =	0.833	°C/W	Pmax =	150.0	W
2SK2488-A	Pd =	17	W	ΔTc =	48.5	°C	Tc =	98.5	°C
NEC	Tj = Tc + (θ j-c x Pd) =>			Tj =	112.7	°C	D.F. =	75.1	%
Q805	Tjmax=	150	°C	θj-c =	0.833	°C/W	Pmax =	150.0	W
2SK2488-A	Pd =	17	W	ΔTc =	48.5	°C	Tc =	98.5	°C
NEC	Tj = Tc + (θ j-c x Pd) =>			Tj =	112.7	°C	D.F. =	75.1	%
Q806	Tjmax=	150	°C	θj-c =	0.833	°C/W	Pmax =	150.0	W
2SK2488-A	Pd =	17	W	ΔTc =	48.5	°C	Tc =	98.5	°C
NEC	Tj = Tc + (θ j-c x Pd) =>			Tj =	112.7	°C	D.F. =	75.1	%

Vin = 170Vac Load = 100% Ta=50°C DC/DC LV

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

Vin = 170Vac Load = 100% Ta=50°C DC/DC HV

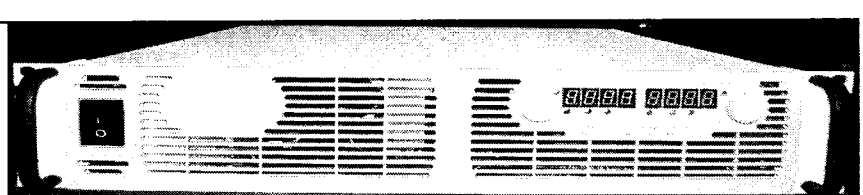
D605~D620 (150V)	Tjmax=	150	°C	θj-c =	0.80	°C/W	Pmax =	--- W
YG911S3R	Pd =	5	W	ΔTc =	61.6	°C	Tc =	111.6 °C
FUJI	Tj = Tc + (θ j-c x Pd) =>			Tj =	115.6	°C	D.F. =	77.1 %
D605~D620 (600V)	Tjmax=	150	°C	θj-c =	0.57	°C/W	Pmax =	--- W
STTH506DTI	Pd =	12.5	W	ΔTc =	41.1	°C	Tc =	91.1 °C
ST	Tj = Tc + (θ j-c x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

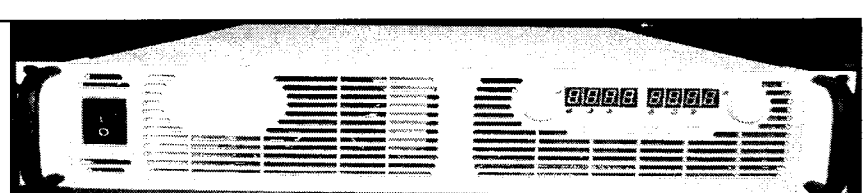
Standard Mounting	
Input Voltage	170~265V
Output Voltage	8V
Output Current	600A

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:

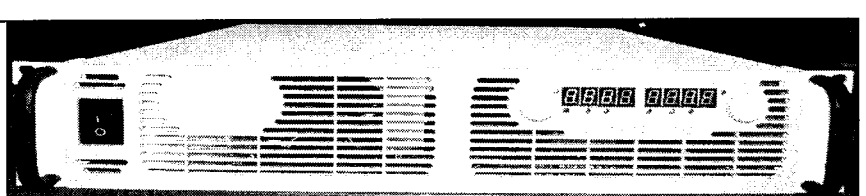
Standard Mounting	
Input Voltage	342~460V
Output Voltage	8V
Output Current	600A

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:

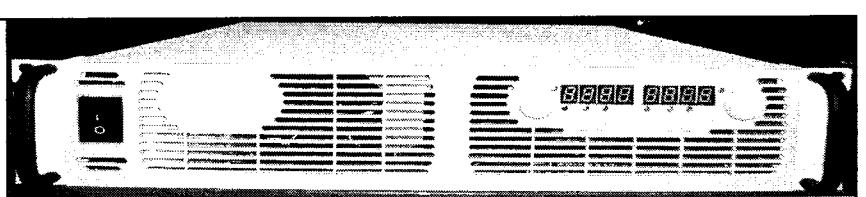
Standard Mounting	
Input Voltage	170~265V
Output Voltage	600V
Output Current	8.5A

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

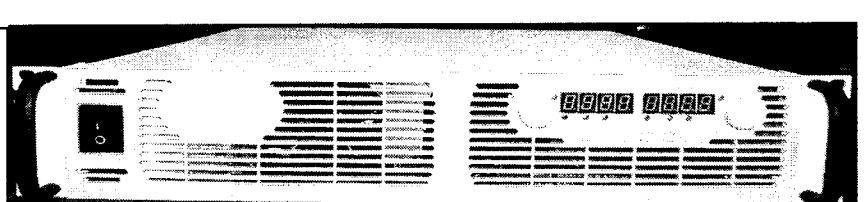
MODEL	COMPUTED LIFE (year) at Tambient		
	30°C	40°C	50°C
GEN8-600	13.73	6.86	3.43
GEN60-85 3P400 GEN150-34 3P400 GEN600-8.5 3P400	15.57	7.79	3.89

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

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

Lo: Guarantee life for Elec.capacitor

Tc: Case temperature of Elec.capacitor

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

5. ABNORMAL TEST

PFC 200

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

No.	Test Position		Test Mode		Test Result												
	Location No.	Test Point	Short	Open	1 Fire	2 Smoke	3 Burst	4 Smell	5 Red Hot	6 Damaged	7 Fuse Open	8 OVP	9 OCP	10 No Output	11 No Change	12 Others	Note
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												
	Location No.	Test Point	Short	Open	1 Fire	2 Smoke	3 Burst	4 Smell	5 Red Hot	6 Damaged	7 Fuse Open	8 OVP	9 OCP	10 No Output	11 No Change	12 Others	Note
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

INPUT 200

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

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 Open	OVP	OCP	No Output	No Change	Others	Note
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												
	Location No.	Test Point	Short	Open	1 Fire	2 Smoke	3 Burst	4 Smell	5 Red Hot	6 Damaged	7 Fuse Open	8 OVP	9 OCP	10 No Output	11 No Change	12 Others	Note
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												
					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 Open	OVP	OCP	No Output	No Change	Others	Note
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												
	Location No.	Test Point	Short	Open	1 Fire	2 Smoke	3 Burst	4 Smell	5 Red Hot	6 Damaged	7 Fuse Open	8 OVP	9 OCP	10 No Output	11 No Change	12 Others	Note
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												
	Location No.	Test Point	Short	Open	1 Fire	2 Smoke	3 Burst	4 Smell	5 Red Hot	6 Damaged	7 Fuse Open	8 OVP	9 OCP	10 No Output	11 No Change	12 Others	Note
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

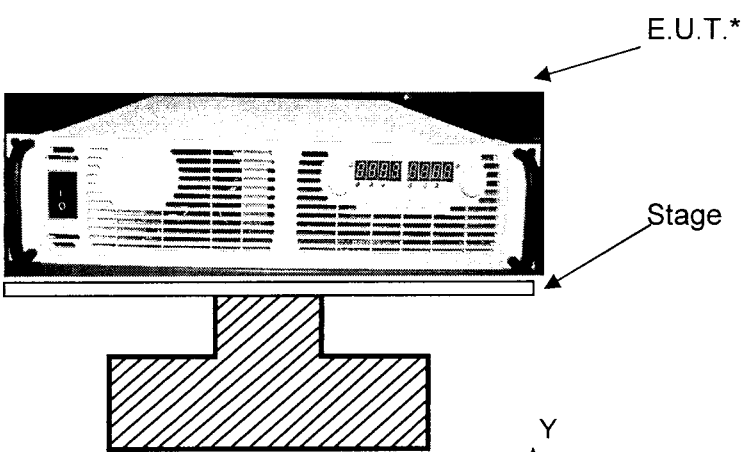
(1) Vibration test class

Frequency variable endurance test

(2) Equipment used

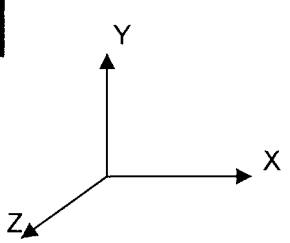
Name	Manufaturer	Model
PC computer SCENIC LI-815 P3 1000, RAM 256MB, HD 20GB	Yanir Systems	
Laser Shaker Control System	DACTRON	LASER
Accelerometer, I-TEDS, 100 mV/g	Endevco	752A12
ICP Accelerometer, 104 mV/g, 50g pk	PCB	353B34
Cable 18 GHz, 3m, SMA-SMA	Gore	NA

(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=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

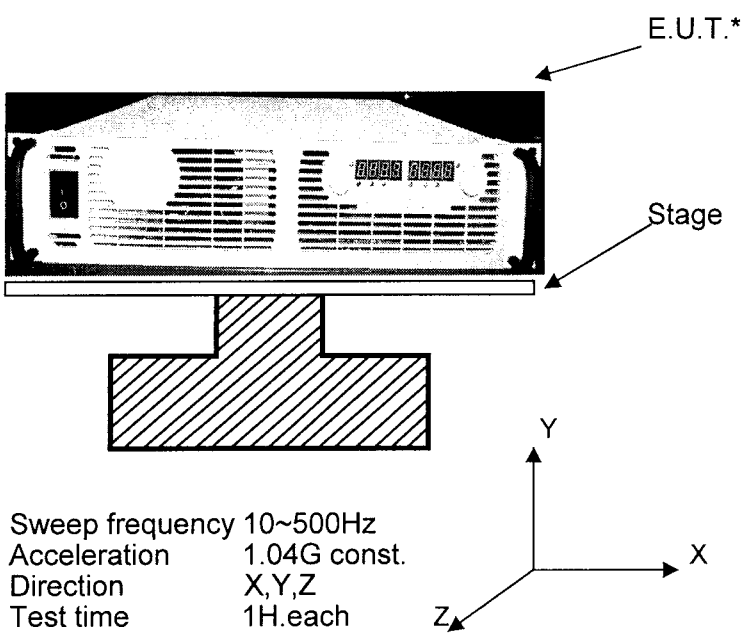
(1) Vibration test class

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.