

GEN 2.4kW SERIES

RELIABILITY

DATA

DWG: IA669-79-01		
APPD	CHK	DWG
<i>hr</i> Aug 21-2008	<i>F</i> 21/08/08	<i>Asher sh</i> 21/08/08



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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: GEN8V-300A

- (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 / 10⁶ Hours)
 λ_G = Generic Failure Rate For The *i*th Generic Part (Failure / 10⁶ 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)

$$\underline{M.T.B.F. = 35,857 (HOURS)}$$

2.COMPONENTS DERATING**GEN2.4kW 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:

$$\Theta_{j-a} = \frac{T_j(\max) - T_a}{P_c(\max)} \quad \Theta_{j-c} = \frac{T_j(\max) - T_c}{P_c(\max)} \quad \Theta_{j-l} = \frac{T_j(\max) - T_l}{P_c(\max)}$$

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

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

$P_c(\max)$: Maximum Power Dissipation

$T_j(\max)$: 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

DC/DC LV

D501 STTH506DTI ST	Tjmax= 150 °C Pd = 1.12 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 3.0 °C/W ΔTc = 11.8 °C Tj = 65.2 °C	Pmax = --- W Tc = 61.8 °C D.F. = 43.4 %
D502 STTH506DTI ST	Tjmax= 150 °C Pd = 1.12 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 3.0 °C/W ΔTc = 14.2 °C Tj = 67.6 °C	Pmax = --- W Tc = 64.2 °C D.F. = 45.0 %
D503 STTH506DTI ST	Tjmax= 150 °C Pd = 1.12 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 3.0 °C/W ΔTc = 15.0 °C Tj = 68.4 °C	Pmax = --- W Tc = 65.0 °C D.F. = 45.6 %
D504 STTH506DTI ST	Tjmax= 150 °C Pd = 1.12 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 3.0 °C/W ΔTc = 25.4 °C Tj = 78.8 °C	Pmax = --- W Tc = 75.4 °C D.F. = 52.5 %
D525~D532 (8V) S60SC4M-7000 SHINDENGEN	Tjmax= 150 °C Pd = 24 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.5 °C/W ΔTc = 64.7 °C Tj = 126.7 °C	Pmax = --- W Tc = 114.7 °C D.F. = 84.5 %
D525~D532 (60V) 20DL2C41A(F) TOSHIBA	Tjmax= 150 °C Pd = 8 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.5 °C/W ΔTc = 20.0 °C Tj = 82.0 °C	Pmax = --- W Tc = 70.0 °C D.F. = 54.7 %
Q501 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 14.5 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 27.6 °C Tj = 84.0 °C	Pmax = 284.0 W Tc = 77.6 °C D.F. = 56.0 %
Q502 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 11.9 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 24.2 °C Tj = 79.4 °C	Pmax = 284.0 W Tc = 74.2 °C D.F. = 53.0 %
Q503 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 13.8 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 34.8 °C Tj = 90.9 °C	Pmax = 284.0 W Tc = 84.8 °C D.F. = 60.6 %
Q504 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 11.4 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 38.7 °C Tj = 93.7 °C	Pmax = 284.0 W Tc = 88.7 °C D.F. = 62.5 %

Vin = 170Vac

Load = 100%

Ta=50°C

DC/DC HV

D605~D620 (150V) YG911S3R FUJI	Tjmax= 150 °C Pd = 2.4 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.8 °C/W ΔTc = 34.8 °C Tj = 86.7 °C	Pmax = --- W Tc = 84.8 °C D.F. = 57.8 %
D605~D620 (600V) STTH506DTI ST	Tjmax= 150 °C Pd = 3 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.57 °C/W ΔTc = 29.7 °C Tj = 81.4 °C	Pmax = --- W Tc = 79.7 °C D.F. = 54.3 %
Q601 2SK2372-A NEC	Tjmax= 150 °C Pd = 18 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 36.2 °C Tj = 94.1 °C	Pmax = 160.0 W Tc = 86.2 °C D.F. = 62.7 %
Q602 2SK2372-A NEC	Tjmax= 150 °C Pd = 18 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 46.2 °C Tj = 104.1 °C	Pmax = 160.0 W Tc = 96.2 °C D.F. = 69.4 %
Q603 2SK2372-A NEC	Tjmax= 150 °C Pd = 18 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 39.4 °C Tj = 97.3 °C	Pmax = 160.0 W Tc = 89.4 °C D.F. = 64.9 %
Q604 2SK2372-A NEC	Tjmax= 150 °C Pd = 18 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 49.8 °C Tj = 107.7 °C	Pmax = 160.0 W Tc = 99.8 °C D.F. = 71.8 %

Vin = 170Vac

Load = 100%

Ta=50°C

PFC

D604 STTH806DTI ST	Tjmax= 150 °C Pd = 10 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 34.5 °C Tj = 97.5 °C	Pmax = --- W Tc = 84.5 °C D.F. = 65.0 %
D605 STTH806DTI ST	Tjmax= 150 °C Pd = 10 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 33.0 °C Tj = 96.0 °C	Pmax = --- W Tc = 83.0 °C D.F. = 64.0 %
D606 STTH806DTI ST	Tjmax= 150 °C Pd = 10 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 41.0 °C Tj = 104.0 °C	Pmax = --- W Tc = 91.0 °C D.F. = 69.3 %
D607 STTH806DTI ST	Tjmax= 150 °C Pd = 10 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.3 °C/W ΔTc = 34.9 °C Tj = 97.9 °C	Pmax = --- W Tc = 84.9 °C D.F. = 65.3 %
D608 D25XB60-7000 SHINDENGEN	Tjmax= 150 °C Pd = 14 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.0 °C/W ΔTc = 47.9 °C Tj = 111.9 °C	Pmax = --- W Tc = 97.9 °C D.F. = 74.6 %
D609 D25XB60-7000 SHINDENGEN	Tjmax= 150 °C Pd = 14 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 1.0 °C/W ΔTc = 44.7 °C Tj = 108.7 °C	Pmax = --- W Tc = 94.7 °C D.F. = 72.5 %
Q603 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 9.3 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 32.5 °C Tj = 86.6 °C	Pmax = 284.0 W Tc = 82.5 °C D.F. = 57.7 %
Q604 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 9.3 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 31.5 °C Tj = 85.6 °C	Pmax = 284.0 W Tc = 81.5 °C D.F. = 57.1 %
Q607 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 9.3 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 38.4 °C Tj = 92.5 °C	Pmax = 284.0 W Tc = 88.4 °C D.F. = 61.7 %
Q608 SPW32N50C3 INFINEON	Tjmax= 150 °C Pd = 9.3 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.44 °C/W ΔTc = 43.2 °C Tj = 97.3 °C	Pmax = 284.0 W Tc = 93.2 °C D.F. = 64.9 %

Vin = 170Vac

Load = 100%

Ta=50°C

BIAS


A403 UPC24A05HF-AZ NEC	Tjmax= 150 °C Pd = 1.59 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 5.0 °C/W ΔTc = 25.5 °C Tj = 83.5 °C	Pmax = 20.0 W Tc = 75.5 °C D.F. = 55.6 %
A405 LM78L15ACM NOPB NATIONAL	Tjmax= 150 °C Pd = 0.16 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 180.0 °C/W ΔTc = 33.3 °C Tj = 112.1 °C	Pmax = 0.5 W Tc = 83.3 °C D.F. = 74.7 %
A406 MIP0225SY MATSUSHITA	Tjmax= 150 °C Pd = 4.33 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 2.0 °C/W ΔTc = 40.8 °C Tj = 99.5 °C	Pmax = --- W Tc = 90.8 °C D.F. = 66.3 %
A407 KA78R15CTU FAIRCHILD	Tjmax= 150 °C Pd = 1.6 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 4.3 °C/W ΔTc = 39.3 °C Tj = 96.2 °C	Pmax = 15.0 W Tc = 89.3 °C D.F. = 64.1 %
A413 TA58L05S(Q) TOSHIBA	Tjmax= 150 °C Pd = 3.2 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 6.25 °C/W ΔTc = 20.7 °C Tj = 90.7 °C	Pmax = 14.0 W Tc = 70.7 °C D.F. = 60.5 %
A414 TA58L15S(Q) TOSHIBA	Tjmax= 150 °C Pd = 1.6 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 6.25 °C/W ΔTc = 26.9 °C Tj = 86.9 °C	Pmax = 14.0 W Tc = 76.9 °C D.F. = 57.9 %
D407 S3L20U-5004P15 SHINDENGEN	Tjmax= 150 °C Pd = 1.6 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 6.5 °C/W ΔTc = 48.5 °C Tj = 108.9 °C	Pmax = --- W Tc = 98.5 °C D.F. = 72.6 %
D409 CUS04(TE85L,Q) TOSHIBA	Tjmax= 150 °C Pd = 0.2 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 30.0 °C/W ΔTc = 23.6 °C Tj = 79.6 °C	Pmax = --- W Tc = 73.6 °C D.F. = 53.1 %
Q408 2SK2611(F) TOSHIBA	Tjmax= 150 °C Pd = 7 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.833 °C/W ΔTc = 49.7 °C Tj = 105.5 °C	Pmax = 150.0 W Tc = 99.7 °C D.F. = 70.4 %
Q409 2SK2611(F) TOSHIBA	Tjmax= 150 °C Pd = 7 W Tj = Tc + (θ j-c x Pd) =>	θj-c = 0.833 °C/W ΔTc = 48.8 °C Tj = 104.6 °C	Pmax = 150.0 W Tc = 98.8 °C D.F. = 69.8 %

3.MAIN COMPONENTS TEMPERATURE RISE

GEN8-300 1Φ 230

Location No.	Parts Name	ΔT Temperature Rise (°C) Standard Mounting	
INPUT 1PH	C301	FILM CAPACITOR	29.5
	C302	FILM CAPACITOR	28.6
	C305	FILM CAPACITOR	28.6
	CN301	CONNECTOR	26.3
	L301	COMMON CHOKE	43.9
	L302	COMMON CHOKE	35.8
	F302	FUSE	34.8
PFC	A601	CHIP PFC IC	38.0
	C611	ELEC. CAPACITOR	16.7
	C618	FILM CAPACITOR	27.8
	C623	FILM CAPACITOR	26.3
	C625	FILM CAPACITOR	24.1
	D606	DIODE	41.0
	D608	BRIDGE	47.9
	D611	DIODE	21.8
	L603	PF CHOKE	80.0
	L605	PF CHOKE	63.7
	Q608	MOSFET	43.2
	R655	CHIP RESISTOR	23.1
BIAS	A403	5V LINEAR REGULATOR	25.7
	A405	15V LINEAR REGULATOR	33.2
	A406	TOP SWITCH	41.4
	A407	15V LINEAR REGULATOR	36.2
	A413	5V LINEAR REGULATOR	24.6
	A414	15V LINEAR REGULATOR	28.9
	C409	ELEC. CAPACITOR	25.2
	C410	ELEC. CAPACITOR	26.0
	C419	ELEC. CAPACITOR	29.7
	C426	ELEC. CAPACITOR	24.1
	C432	ELEC. CAPACITOR	25.8
	C437	ELEC. CAPACITOR	27.4
	C447	ELEC. CAPACITOR	25.9
	D407	DIODE	48.6
	D409	DIODE	32.3
	F402	FUSE	38.2
	PC406	OPTOCOUPLER	32.0
	Q408	MOSFET	33.7
	R419	CHIP RESISTOR	45.5
	T401	TRANSFORMER	46.6

Conditions:


Standard Mounting	
Input Voltage	170~265Vrms
Output Voltage	8V
Output Current	300A

3.MAIN COMPONENTS TEMPERATURE RISE

GEN8-300 1Φ 230

Location No.	Parts Name	ΔT Temperature Rise (°C) Standard Mounting	
DC/DC	C501	ELEC. CAPACITOR	7.2
	C524	ELEC. CAPACITOR	31.7
	C527	FILM CAPACITOR	48.1
	D529	DIODE	64.2
	L501	CHOKE	63.6
	L504	CHOKE	59.6
	PC501	OPTOCOUPLER	16.4
	Q504	MOSFET	38.7
	R520	CHIP RESISTOR	47.6
	R528	CHIP RESISTOR	14.8
	R536	CHIP RESISTOR	66.4
	T501	TRANSFORMER	67.7
	T502	TRANSFORMER	8.0
	T503	TRANSFORMER	11.6
	TS501	THERMAL GUARD	40.5
CONTROL	A101	PWM IC	35.0
	A114	CHIP OP. AMP.	26.8
	A117	RS-485 TRANSCEIVER	33.9
	A119	MICROCONTROLLER	28.5
	A124	D FLIP-FLOP	26.5
	A128	VOLT REF.	25.4
	A132	CHIP ADC	25.5
	A135	BUFFER	25.4
	PC105	OPTOCOUPLER	31.4
OUTPUT FILTER	C41	ELEC. CAPACITOR	46.8
	C44	ELEC. CAPACITOR	42.7
	C46	ELEC. CAPACITOR	44.0
	L41	CHOKE	35.4
	R41	SHUNT	67.2

Conditions:

Standard Mounting	
Input Voltage	170~265Vrms
Output Voltage	8V
Output Current	300A


3.MAIN COMPONENTS TEMPERATURE RISE

GEN 2.4kW

GEN8-300 3Φ 230

Location No.	Parts Name	ΔT Temperature Rise (°C) Standard Mounting	
INPUT 3PH	C322	FILM CAPACITOR	23.1
	C323	FILM CAPACITOR	23.9
	CN321	CONNECTOR	20.9
	L321-1	COMMON CHOKE	47.6
	L321-2	COMMON CHOKE	48.6
	L322-3	COMMON CHOKE	42.4
	F322	FUSE	39.6
PFC	A601	CHIP PFC IC	38.0
	C611	ELEC. CAPACITOR	14.7
	C618	FILM CAPACITOR	17.4
	C623	FILM CAPACITOR	23.2
	C625	FILM CAPACITOR	15.1
	D607	DIODE	31.6
	D609	BRIDGE	39.5
	D611	DIODE	18.2
	L603	PF CHOKE	79.7
	L606	PF CHOKE	33.1
	Q608	MOSFET	30.2
	R655	CHIP RESISTOR	12.1
	BIAS	A403	5V LINEAR REGULATOR
A405		15V LINEAR REGULATOR	33.2
A406		TOP SWITCH	47.5
A407		15V LINEAR REGULATOR	39.8
A413		5V LINEAR REGULATOR	28.3
A414		15V LINEAR REGULATOR	37.3
C409		ELEC. CAPACITOR	22.0
C410		ELEC. CAPACITOR	26.0
C419		ELEC. CAPACITOR	27.1
C426		ELEC. CAPACITOR	24.1
C432		ELEC. CAPACITOR	20.3
C437		ELEC. CAPACITOR	23.9
C447		ELEC. CAPACITOR	21.2
D407		DIODE	50.5
D409		DIODE	27.9
F102		FUSE	33.5
PC406		OPTOCOUPLER	28.3
Q408		MOSFET	31.4
R419		CHIP RESISTOR	62.4
T401		TRANSFORMER	61.6

Conditions:


Standard Mounting	
Input Voltage	170~265Vrms
Output Voltage	8V
Output Current	300A

3.MAIN COMPONENTS TEMPERATURE RISE

GEN600-4 1Φ 230

Location No.		Parts Name	ΔT Temperature Rise (°C) Standard Mounting
INPUT 1PH	C301	FILM CAPACITOR	26.8
	C302	FILM CAPACITOR	27.4
	C305	FILM CAPACITOR	17.7
	CN301	CONNECTOR	25.6
	L301	COMMON CHOKE	41.1
	L302	COMMON CHOKE	34.6
	F302	FUSE	33.1
PFC	A601	CHIP PFC IC	35.6
	C611	ELEC. CAPACITOR	16.5
	C618	FILM CAPACITOR	29.7
	C625	FILM CAPACITOR	22.1
	D606	DIODE	40.4
	D609	BRIDGE	53.0
	L603	PF CHOKE	80.1
	L605	PF CHOKE	60.1
BIAS	Q608	MOSFET	41.7
	A403	5V LINEAR REGULATOR	25.5
	A405	15V LINEAR REGULATOR	33.3
	A406	TOP SWITCH	40.8
	A407	15V LINEAR REGULATOR	39.3
	A413	5V LINEAR REGULATOR	20.8
	A414	15V LINEAR REGULATOR	26.9
	C409	ELEC. CAPACITOR	22.0
	C410	ELEC. CAPACITOR	26.0
	C419	ELEC. CAPACITOR	31.2
	C426	ELEC. CAPACITOR	24.1
	C432	ELEC. CAPACITOR	21.0
	C437	ELEC. CAPACITOR	29.2
	C447	ELEC. CAPACITOR	21.1
	C450	ELEC. CAPACITOR	21.6
	D407	DIODE	48.5
	D409	DIODE	23.7
	F402	FUSE	40.0
	PC406	OPTOCOUPLER	37.5
	Q408	MOSFET	49.7
R419	CHIP RESISTOR	46.3	
T401	TRANSFORMER	45.1	

Conditions:


Standard Mounting	
Input Voltage	170~265Vrms
Output Voltage	600V
Output Current	4A

3.MAIN COMPONENTS TEMPERATURE RISE

GEN600-4 1Φ 230

Location No.	Parts Name	ΔT Temperature Rise (°C) Standard Mounting	
DC/DC	C601	ELEC. CAPACITOR	6.6
	C628	ELEC. CAPACITOR	10.9
	D613	DIODE	29.3
	L601	CHOKE	74.8
	Q604	MOSFET	50.9
	R624	CHIP RESISTOR	48.4
	R631	CHIP RESISTOR	28.3
	T601	TRANSFORMER	59.5
	T602	TRANSFORMER	10.1
	T603	TRANSFORMER	8.7
	TS601	THERMAL GUARD	41.3
CONTROL	A101	PWM IC	19.0
	A114	CHIP OP. AMP.	13.6
	A117	RS-485 TRANSCEIVER	19.0
	A119	MICROCONTROLLER	17.1
	A124	D FLIP-FLOP	12.2
	A128	VOLT REF.	14.0
	A132	CHIP ADC	15.3
	A135	BUFFER	13.1
	PC105	OPTOCOUPLER	21.5
OUTPUT FILTER	C83	ELEC. CAPACITOR	17.2
	CN81	CONNECTOR	17.0
	L81	CHOKE	18.4
	R85	SHUNT	19.5

Conditions:

Standard Mounting	
Input Voltage	170~265Vrms
Output Voltage	600V
Output Current	4A


3.MAIN COMPONENTS TEMPERATURE RISE

GEN 2.4kW

GEN600-4 3Φ 230

Location No.	Parts Name	ΔT Temperature Rise (°C) Standard Mounting	
INPUT 3PH	C322	FILM CAPACITOR	29.3
	C323	FILM CAPACITOR	28.4
	CN321	CONNECTOR	20.8
	L321-1	COMMON CHOKE	48.9
	L321-2	COMMON CHOKE	44.5
	L322-3	COMMON CHOKE	42.3
	F322	FUSE	40.1
PFC	A601	CHIP PFC IC	35.6
	C611	ELEC. CAPACITOR	13.1
	C618	FILM CAPACITOR	24.2
	C625	FILM CAPACITOR	13.1
	D606	DIODE	37.2
	D609	BRIDGE	49.3
	L603	PF CHOKE	60.9
	L605	PF CHOKE	43.1
	Q608	MOSFET	49.9
BIAS	A403	5V LINEAR REGULATOR	26.2
	A405	15V LINEAR REGULATOR	32.9
	A406	TOP SWITCH	48.6
	A407	15V LINEAR REGULATOR	37.5
	A413	5V LINEAR REGULATOR	26.9
	A414	15V LINEAR REGULATOR	35.5
	C409	ELEC. CAPACITOR	21.7
	C426	ELEC. CAPACITOR	26.0
	C432	ELEC. CAPACITOR	20.0
	C437	ELEC. CAPACITOR	27.2
	D407	DIODE	54.8
	D409	DIODE	20.0
	F102	FUSE	35.2
	PC406	OPTOCOUPLER	33.2
	Q408	MOSFET	51.4
	R419	CHIP RESISTOR	49.2
	T401	TRANSFORMER	42.4

Conditions:

Standard Mounting	
Input Voltage	170~265Vrms
Output Voltage	600V
Output Current	4A

4.ELECTROLYTIC CAPACITORS LIFE TIME ESTIMATION


MODEL	COMPUTED LIFE (year) at T(ambient)		
	30°C	40°C	50°C
GEN8-300	10.19	5.09	2.55
GEN60-40	17.04	7.78	3.89
GEN150-16	15.55	7.78	3.89
GEN600-4	15.55	7.78	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

MODEL: GEN2.4kW

Condition: Ta: 25°C
 Vin: 230 VAC
 Vout: 100%
 Iout: 100%

GEN 2.4kW

BOARD: PFC

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	OVP	OTP	No Output	No Change	Others		
1	Q604	D-S	•											•			F322;323	
2		G-S	•												•			
3		D-G	•								•	•						F321;322;Q604;606;ZD601;R651-654
4		D		•												•		
5		S		•												•		
6		G		•											•			F322;323;Q604
7	D604	A-K	•							•	•			•			F322;323;Q604	
8		A		•											•			
9	D605	A-K	•							•	•			•			F322;323;Q603	
10		A		•											•			
11	D601	A-K	•												•			
12		A		•											•			
13	L601		•												•			
14				•											•			
15	L605		•							•	•			•			F321-;323;Q603;604	
16				•											•			
17	R626			•												•	VCF-300V;V out reduced by 10%	
18	C619		•											•			F322;323	
19				•											•			
20	D608	1-2	•								•			•		•	F321;AC fall	
21		2-4		•										•			F321;323	
22	D609	1-2	•								•			•		•	F322;AC fall	
23		2-4		•										•			F322;323	
24	D603	A-K	•								•			•			R613-616	
25	D610	A-K	•								•	•		•			F321;322;R613-616;Q603;604;607;608	
26		A		•											•			
27	D613	A-K	•												•			
28		A		•											•			

5. ABNORMAL TEST

MODEL: GEN2.4kW

Condition: Ta: 25°C
 Vin: 230 VAC
 Vout: 100%
 Iout: 100%

GEN 2.4kW

BOARD: DCDC 8V

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 > O	No Output	No Change	Others	
29	Q504	D-S	•							•	•			•			F321;322;Q502;503;513;R513;518
30		G-S	•							•				•		•	Q503;504;R513;514;518;519;528; Vout;lout not stable (3.8~4.4V.216~226A)
31		G-D	•							•	•			•			F322;323;Q502-504;511;512
32		D		•						•	•			•			F321-323;Q501-504;R522;523;508
33		S		•						•	•			•			F321-323;Q503;504;508;516;R522-524;518;531
34		G		•						•	•			•			F322;323;Q501-504;R508;509;513;518;523
35	Q507	C-E	•						•	•			•				F321;322Q501;504;R528
36				•						•	•			•			F321;R613-616;Q501;504;509;510;515;516; R508;523
37	D505	A-K	•						•	•			•				F322;R613-616;Q501-504;R507;508;513;523
38					•					•	•			•			
39	D532	A-K	•						•								D532
40					•										•		
41	D528	A-K	•						•								D528
42					•										•		
43	C521	+/-	•													•	V out -0.2V;Pin-0.7kW
44					•											•	
45	L501		•							•			•				Noise acoustic; Pin above 100W
46	T501		•													•	V out drop to 4.2V
47	T503	A		•					•	•			•				F321;R613-616;Q501;502;504;509;511; R508;513;523
48	C501	+/-	•							•			•				F322;323
49					•										•		

5. ABNORMAL TEST

MODEL: GEN2.4kW

Condition: Ta: 25°C
 Vin: 230 VAC
 Vout: 100%
 Iout: 100%

GEN 2.4kW

BOARD: DCDC 600V

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	V O	P O	No Output	No Change	Others	
50	Q603	D-S	•							•	•			•		F322;323;Q601;602;604;609;611;R605;620	
51		G-S	•													F322;323;Q601;602;604;609-611;R605;620;610;612	
52		G-D	•							•	•			•		F322;323;Q601-604;609-611;R615;612	
53		D		•						•	•			•		F322;323;Q601;603;604;R615;620	
54		S		•						•	•			•		F322;323;Q601-604;R615	
55		G		•						•	•			•		F322;323;Q601-604;609;611;R605;620;610	
56		D611	A-K	•												•	
57	A			•												• V out=374V;Iout=4A	
58	D601	A-K	•						•	•			•			F322;(R613-616 PFC);Q601-604;609-612; R605;610;615;620	
59				•					•	•			•			F322;323;Q601-604;609-612;R605;610;615;620	
60	Q605	K-E	•										•				
61	D617	A-K	•												•		
62		A		•											•		
63	C627	+/-	•									•		•			
64				•											•		
65	L601		•						•	•			•			F322-323;Q601-603;D605;607;614;616;R605;615	
66				•					•	•			•			F322;323;(Q601-604;R605;620 SLAVE)	
67	T603	14		•					•	•			•			F321;(R613-616 PFC);Q601;603;604;609;611;612; R605;616;615;620;D624	
68	T601	8-10		•					•	•			•			F322;323;(Q601-604;R605;620 SLAVE)	
69	C601	+/-	•							•			•			F322;323	
70				•											•		

6.VIBRATION TEST

MODEL: GEN8-300

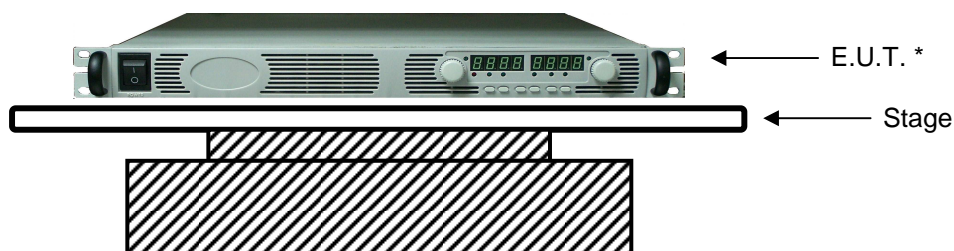
(1) Vibration test class

Frequency variable endurance test

(2) Equipment used

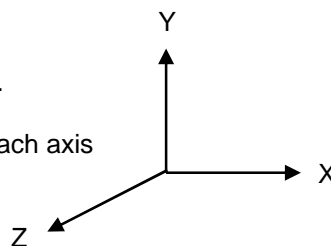
Name	Manufacturer	Model
PC Computer SCENIC LI-815 P3 1000, RAM 256MB, HD 20GB	Yanir Systems	
Laser Shaker Control System	DACTRON	LASER
Accelerometer, I-TEDS, 100 mV/g	Endevco	752A12
Cable 18 GHz, 3m, SMA-SMA	Gore	NA

(3) Testing method



Test condition:

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



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

(4) Test Result

OK NG

Check item	Output Voltage	Ripple (mVp-p)	E.U.T. state
Before test	7.9961	30	O.K.
Direction			
X	7.9958	32	O.K.
Y	7.9962	30	O.K.
Z	7.9965	30	O.K.