3000W True Sine Wave DC-AC Inverter

TS-3000 series

Features :

- True sine wave output (THD<3%)
- High surge power up to 6000W
- High efficiency up to 92%
- Power ON-OFF switch
- Standby saving mode can be selectable
- Front panel indicator for operation status
- Thermostatically controlled cooling fan
- Protections: Bat. low alarm / Bat. low shutdown / Over voltage / Over temp. / Output short / Input polarity reverse / Overload / AC circuit breaker
- Application : Home appliance, power tools, office and portable equipment, vehicle and yacht ...etc.
- Optional monitoring software and connection cable (MW order No.: DS-TN-1500)
- 3 years warranty

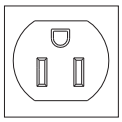
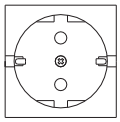
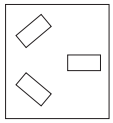
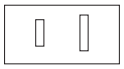
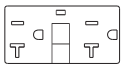
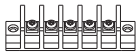
SPECIFICATION

MODEL		TS-3000-112□	TS-3000-124□	TS-3000-148□	TS-3000-212□	TS-3000-224□	TS-3000-248□
OUTPUT	RATED POWER (Typ.)	3000W					
	MAXIMUM OUTPUT POWER (Typ.)	3450W for 180 sec. / 4500W for 10 sec. / surge power 6000W for 30 cycles					
	AC VOLTAGE	Factory setting set at 110VAC			Factory setting set at 230VAC		
		100 / 110 / 115 / 120VAC selectable by setting button S.W			200 / 220 / 230 / 240VAC selectable by setting button S.W		
	FREQUENCY	60±0.1Hz 50/60Hz selectable by setting button S.W			50±0.1Hz 50/60Hz selectable by setting button S.W		
	WAVEFORM	True sine wave (THD<3%) at rated input voltage					
	AC REGULATION (Typ.)	±3%					
	SAVING MODE (Typ.)	Default disabled. Load≦5W will be changed to standby mode					
	FRONT PANEL INDICATOR	Battery voltage level, output load level, saving mode, fault and operation status					
INPUT	BAT. VOLTAGE	12V	24V	48V	12V	24V	48V
	VOLTAGE RANGE (Typ.) Note.3,6	10.5 ~ 15VDC	21 ~ 30VDC	42 ~ 60VDC	10.5 ~ 15VDC	21 ~ 30VDC	42 ~ 60VDC
	DC CURRENT (Typ.) Note.4	300A	150A	75A	300A	150A	75A
	NO LOAD DISSIPATION (Typ.)	≦10W @ standby saving mode					
	OFF MODE CURRENT DRAW (Typ.)	≦1mA					
	EFFICIENCY (Typ.) Note.1	88%	90%	91%	89%	91%	92%
	BATTERY TYPES	Open & sealed lead acid battery					
BATTERY INPUT PROTECTION	FUSE	40A*12	40A*6	20A*6	40A*12	40A*6	20A*6
	BAT. LOW ALARM Note.6	11.3V	22.5V	45V	11.3V	22.5V	45V
	BAT. LOW SHUTDOWN Note.6	10.5V	21V	42V	10.5V	21V	42V
	REVERSE POLARITY	By internal fuse open					
OUTPUT PROTECTION	OVER TEMPERATURE	90℃±5℃	85℃±5℃	85℃±5℃	80℃±5℃	75℃±5℃	75℃±5℃
		Protection type : Shut down o/p voltage, re-power on to recover					
	OUTPUT SHORT	Protection type : Shut down o/p voltage, re-power on to recover					
	OVER LOAD (Typ.)	105 ~ 115% load for 180 sec., 115% ~ 150% load for 10 sec.					
		Protection type : Shut down o/p voltage, re-power on to recover					
	CIRCUIT BREAKER	AC output receptacle:15A					
	GFCI PROCTECTION	Optional (Only type F)			None		
ENVIRONMENT	WORKING TEMP. Note.2	0 ~ +40℃ @ 100% load ; 60℃ @ 50% load					
	WORKING HUMIDITY	20% ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-30 ~ +70℃ / -22 ~ +158°F, 10 ~ 95% RH					
	VIBRATION	10 ~ 500Hz, 3G 10min./1cycle, 60min. each along X, Y, Z axes					
SAFETY & EMC	SAFETY STANDARDS	UL458 (only for Type G)		None			
	LVD	None			EN60950-1		
	WITHSTAND VOLTAGE	Bat I/P - AC O/P:3.0KVAC AC O/P - FG:1.5KVAC					
	ISOLATION RESISTANCE	Bat I/P - AC O/P, Bat I/P - FG, AC O/P - FG: 100M ohms / 500VDC / 25℃/ 70% RH					
	EMC EMISSION	Compliance to FCC class A			Compliance to EN55022 class A, 72/ 245/ CEE, 95/ 54/ CE, E-Mark		
	EMC IMMUNITY	None			Compliance to EN61000-4-2,3,4,5,6,8,11		
OTHERS	CONTROL WIRING	RJ11 -RS232 (Option)					
	DIMENSION	466.8*283.5*100mm (L*W*H)					
	PACKING	12.9Kg; 1pcs/14Kg/1.98CUFT					
NOTE	1.Efficiency is tested by 2100W, linear load at 13V, 26V, 52V input voltage. 2.Output derating capacity referenced by curve 1. 3.Output derating capacity referenced by curve 2. 4.DC current is tested by 3000W, linear load at 12V, 24V, 48V input voltage. 5.All parameters not specified above are measured at rated load, 25℃ of ambient temperature. 6.The tolerance of each voltage value by models is:112/212→±0.5V;124/224→±1V;148/248→±2V						

TS – 3000 – 112 A

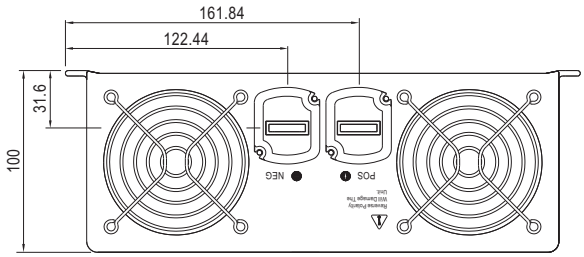
- TS: True sine wave inverter
- O/P Wattage: 3000W
- Bat. Voltage: 12:12VDC, 24:24VDC, 48:48VDC
- Output: 1:110VAC, 2:230VAC
- A: TYPE A OUTLET
- B: TYPE B OUTLET
- C: TYPE C OUTLET
- D: TYPE D OUTLET
- E: TYPE E OUTLET
- F: TYPE F OUTLET
- G: TYPE G TERMINAL

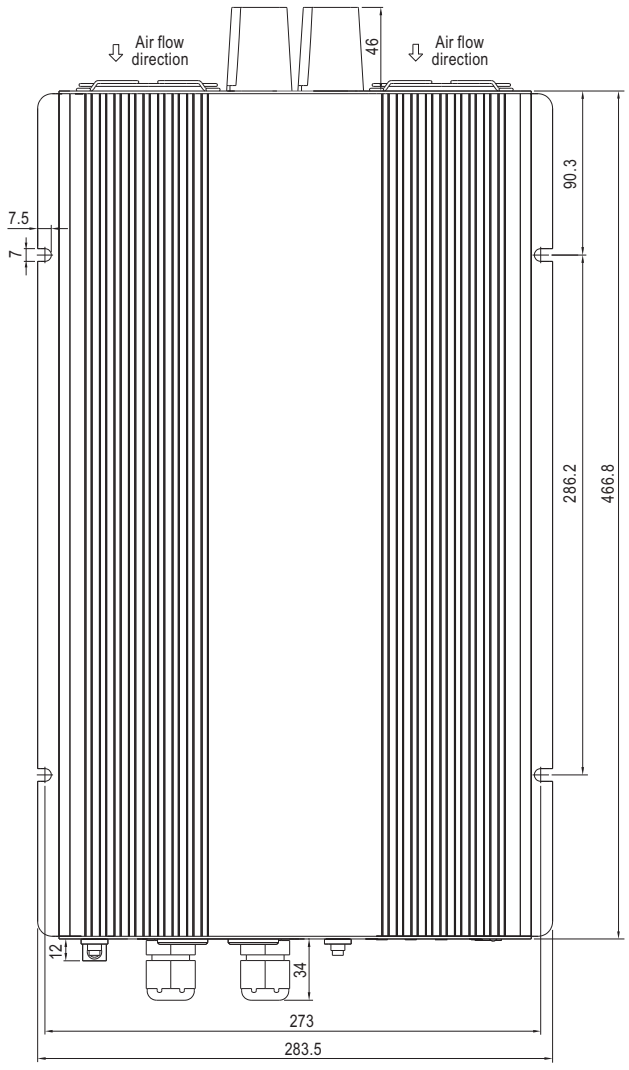
■ AC Output Receptacle (optional)

Receptacle type							 (Terminal only)
	TYPE-A	TYPE-B	TYPE-C	TYPE-D	TYPE-E	TYPE-F	TYPE-G
Country	USA	EUROPE	AUSTRALIA	U.K	JAPAN	GFCI	-----
Certificate	FC	E13 CE	E13 CE	E13 CE	FC	FC	c UL us (Expect for 48V input) FC

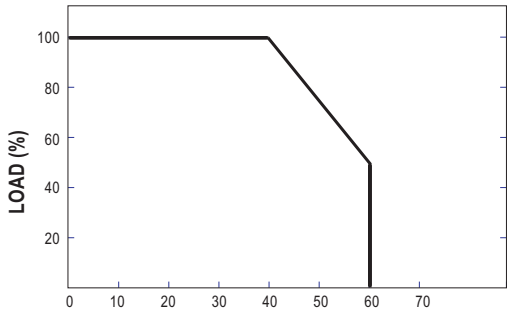
■ Mechanical Specification

Unit:mm

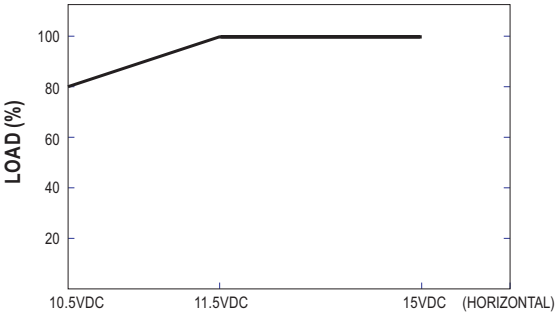




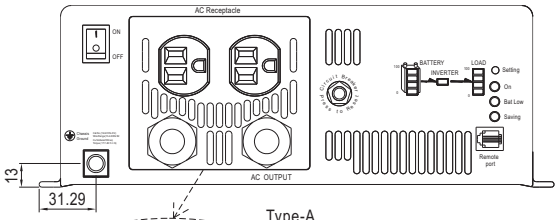
■ Derating Curve



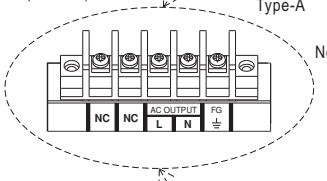
CURVE 1



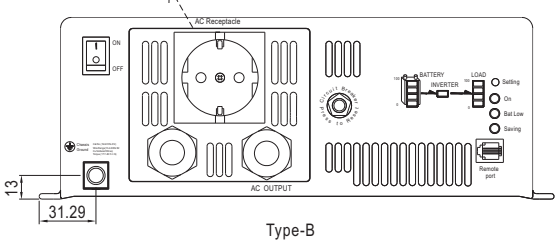
CURVE 2



Type-A



Note: When the load current is >15A, must use output terminal connection which can be found inside the AC output panel of the inverter.



Type-B

MODEL：TS-3000-112 OUTPUT:110V/60Hz

AC OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RATED POWER (TYP)	3000W	I/P: 12VDC Ta:25℃	3000 W	P
2	WAVEFORM	True sine wave (THD<3%)	I/P: 12VDC O/P: FULL LOAD Ta:25℃	FULL LOAD: 1.77 %	P
3	FREQUENCY	60HZ ± 0.1HZ	I/P: 12VDC O/P: FULL LOAD Ta:25℃	FULL LOAD: 59.98 HZ	P
4	AC REGULATION (TYP)	±3%	I/P: 12VDC O/P: FULL LOAD/NO LOAD Ta:25℃	1.2%	P
5	MAXIMUM OUTPUT POWER	(1)3450W/180sec. (2)4500w/10sec (3)SURGE POWER 6000W FOR 30CYCLE Vdc≦13.5V SURGE POWER 6000W FOR 5 CYCLE FOR Vbat>13.5Vdc	I/P: 12VDC O/P:TESTING LOAD Ta:25℃ ※LED DISPLAY	(1) 3439W /180 SEC (2) 4427W /10 SEC (3) 5497W / 41 CYCLE FOR ≦13.5VDC 5529.6W /40 CYCLE FOR >14.5VDC	P
6	SAVING MODE TO NORMAL	Po>7W~15W	I/P: 12VDC O/P:NO LOAD Ta:25℃ ※LED DISPLAY	10 W	P
7	NORMAL TO SAVING MODE(TYP)	Po≦5W	I/P: 12VDC O/P:NO LOAD Ta:25℃ ※LED DISPLAY	4 W	P

DC INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	DC CURRENT (TYP)	300A	I/P: 12VDC O/P:FULL LOAD Ta:25℃	296 A	P
2	NO LOAD DISSI/PATION(TYP)	≦ 10W @standby saving mode	I/P: 12VDC O/P:NO LOAD Ta:25℃	10 W/12VDC	P
3	OFF MODE DRAW CURRENT	≦1mA	I/P: 12VDC SW OFF O/P:NO LOAD Ta:25℃	0.966mA /12VDC	P
4	VOLTAGE RANGE (TYP)	10.5±0.5VDC~15±0.5VDC	I/P: TESTING O/P:NO LOAD/FULL LOAD Ta:25℃	10.5 VDC~ 14.7 VDC/NO LOAD 10.8 VDC~ 14.7 VDC/FULL LOAD	P
5	EFFICIENCY(TYP)	88%	I/P: 13VDC O/P: Po=2100W Ta:25℃	88.13%	P

BATTERY INPUT PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	BAT LOW ALARM	10.8V~11.8VDC	I/P: TESTING O/P:FULL LOAD Ta:25℃ ※LED DISPLAY	11.6 V	P
2	BAT LOW SHUT DOWN	10V~11VDC	I/P: TESTING O/P: FULL LOAD Ta:25℃ ※LED DISPLAY	10.9 V Shut down Recovery	P
3	BAT. RECOVERY VOLTAGE	13.7VDC~14.7VDC	I/P: TESTING O/P:FULL LOAD Ta:25℃	14.3 V	P
4	OVER VOLTAGE	14.5V~15.5VDC	I/P: TESTING O/P:FULL LOAD Ta:25℃	14.7V	P

AC OUTPUT PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER TEMPERATURE	SPEC： TSW1： 90±5℃ O.T.P. NO DAMAGE	I/P: 12VDC O/P: FULL LOAD SET:SAVING MODE Ta:25℃ ※LED DISPLAY	O.T.P. Active Shut down o/p voltage Re-power on to recover	P
2	SHORT PROTECTION	SHORT EVERY OUTPUT NO DAMAGE	I/P:14.6VDC O/P: FULL LOAD TEST: 3 TIMES Ta:25℃ ※LED DISPLAY	NO DAMAGE Shut down o/p voltage Re-power on to recover	P
3	OVER LOAD	105%~115%LOAD 180sec 115%~150%LOAD10 Sec Shutdown Re-power ON	I/P: 12VDC O/P: TESTING Ta:25℃ ※LED DISPLAY	12VDC: 110 % 180 sec 140 % 10 sec Shut down Re-power ON	P

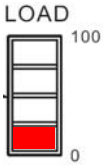
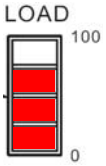
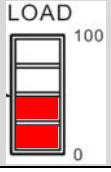
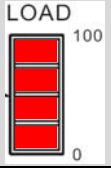
FAN CONTROL FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	FAN SPEED CONTROL	----------	I/P: 12VDC O/P: FULL LOAD Ta:25℃	Fan Voltage= 12.45V	P
2	FAN LOCK	Shut down Re-power ON	I/P: 12VDC O/P: FULL LOAD Ta:25℃ ※LED DISPLAY	Shut down Re-power ON	P

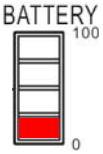
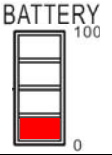
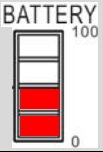
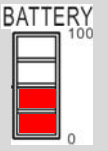
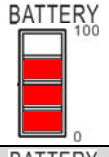
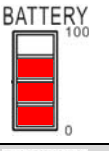
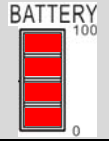
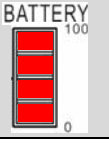
APPLICATION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INDUCTION MOTOR	1HP	I/P: BATTERYVOLTAGE O/P:1HP Ta:25℃	INVERTER TURN ON/OFF :OK INDUCTION MOTOR ON/OFF:OK	P
2	SWITCHING POWER SUPPLY	RSP-1500-48*2PIC(Pin=3000W)	I/P:BATTERYVOLTAGE(190H52) O/P: RSP-3000*1PIC Ta:25℃	INVERTER TURN ON/OFF :OK INDUCTION MOTOR ON/OFF:OK	P

Load indicator test

Load indicator test							
LED INDICATOR	LOAD RANGE	RESULT	VERDICT	LED INDICATOR	LOAD RANGE	RESULT	VERDICT
	0W ~ 750W±150W	0W~ 775W	P		1500W±150W ~ 2250W±150W	1517W~ 2272W	P
	750W±150W ~ 1500W±150W	775W~ 1517W	P		2250W±150W ~ 3000W	2272W~ 3000W	P

Battery capacity indicator test

Battery capacity indicator test							
Inverter mode				By-pass mode			
LED INDICATOR	VOLTAGE RANGE	RESULT	VERDICT	LED INDICATOR	VOLTAGE RANGE	RESULT	VERDICT
	10.7V ~ 11.7V 2 LEDs➔1 LED (11.2V)	11.3V	P		<12V (12.5V)	12.5V	P
	11.3V ~ 12.3V 3 LEDs➔2 LEDs (11.8V)	11.81V	P		12.1V ~ 13.1V 1 LED➔2 LEDs (12.6V)	12.8V	P
	11.4V ~12.4V 4 LEDs➔3 LEDs (11.9V)	11.88V	P		12.7V ~13.7V 2 LEDs ➔3 LED (13.2V)	13.38V	P
	> 12.7V (12.2V)	12.13V	P		13.4V ~14.4V 3 LEDs ➔4 LEDs (13.9V)	14.1V	P

Battery low alarm test

Battery low alarm test					
O/PERATING MODE	VOLTAGE RANGE	LED INDICATOR	VOLTAGE RANGE	LED	VERDICT
Inverter mode	10.8V ~ 11.8V	Bat Low Buzzer sounds	11.24V	OK	P
By-pass mode & Saving mode	12.1V ~13.1V	Bat Low	12.56V	OK	P

Saving mode test

NOTE：Both of load & battery indictors should be off under saving mode				
Saving mode test				
O/PERATING MODE	POWER LEVEL FOR TRANSITION	LED INDICATOR	P o	VERDICT
Saving mode ➔ Normal mode	7W<Po<15W	Saving	10W	P
Normal mode ➔ Saving mode	Po < 10W	Saving	8W	P

POWER ON AND MODE SETTING CODES:

1.Voltage And Frequency Mode Selection

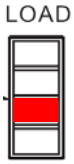
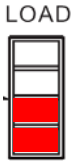
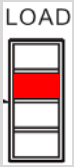
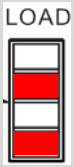
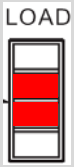
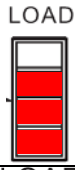
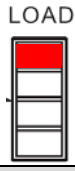
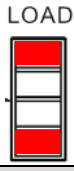
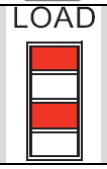
	100V (200V)	110V (220V)	115V (230V)	120V (240V)
50Hz	RED ● YELLOW ○ GREEN ○	RED ● YELLOW ○ GREEN ●	RED ● YELLOW ● GREEN ○	RED ● YELLOW ● GREEN ●
VERDICT	P	P	P	P
60Hz	RED ★ YELLOW ○ GREEN ○	RED ★ YELLOW ○ GREEN ●	RED ★ YELLOW ● GREEN ○	RED ★ YELLOW ● GREEN ●
VERDICT	P	P	P	P

↓After pushing button 3 seconds and beeping

3.Saving Mode Selection

Saving mode	LED INDICATOR	VERDICT
ENABLED	RED ★ YELLOW ★ GREEN ●	P
DISABLED	RED ★ YELLOW ★ GREEN ○	P

ERROR CODE LED INDICATOR

Error code								
LED INDICATOR	FAILURE MESSAGE	VERDICT	LED INDICATOR	FAILURE MESSAGE	VERDICT	LED INDICATOR	FAILURE MESSAGE	VERDICT
	105% OLP	P		115%OLP	P		150%OLP	P
	OTP	P		Inverter OVP Or Inverter UVP	P		AC output fail (O/P short)	P
	Battery low shutdown	P		Battery bad or Battery notch	P		FAN -LOCK	P
	Remote-off	P						

VOLTAGE RANGE OF AC UTILITY FOR O/PERATION MODE TRANSITION：

AC input high / low line limit				
AC MAINS	VOLTAGE LIMIT	VOLTAGE RANGE	RESULT	VERDICT
110V	**High limit (To INV mode)**	**Vac > 127±4V**	**130**	**P**
	Recovery to high (To AC mode)	**Vac < 124±4V**	**123.6**	**P**
	Low limit (To INV mode)	**Vac < 90±4V**	**92.5**	**P**
	Recovery to low (To AC mode)	**Vac > 94±4V**	**94.1**	**P**

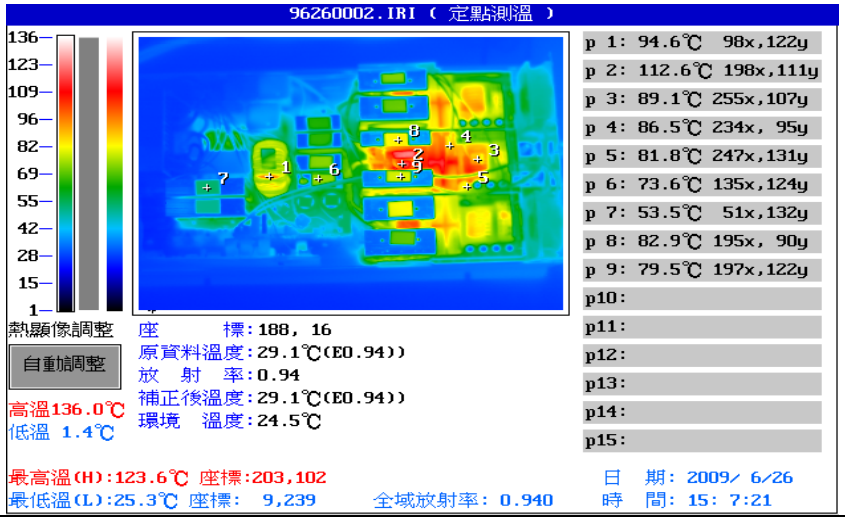
COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	DC TO DC Power Transistor (D to S) or (C to E) **Peak Voltage**	Q 310 Rated IXT160N075T 160A/75V	I/P:14.5VDC O/P: (1)Full Load Turn On (2) Output Short (3)Full load continue Ta:25℃	(1) 51.4 V (2) 47.4 V (3) 46 V	P
2	DC TO DC Diode Peak **Voltage**	D 400 Rated SF20LC30:300 V20 A	I/P:14.5VDC O/P: (1)Full Load Turn On (2) Output Short (3)Full load continue Ta:25℃	(1) 267 V (2) 262 V (3) 245 V	P
3	**DC BUS Capacitor Voltage**	C403 Rated 680u/250V/105℃ MXG	I/P:14.5VDC O/P: (1)Full Load Turn SW On /Off (2) Min load Turn SW On /Off (3)Full Load /Min load Change Ta:25℃	(1) 250 V (2) 250 V (3) 250 V	P

4	DC TO AC Power Transistor (D to S) or (C to E) **Peak Voltage**	Q 51 Rated IRGP50B60PD1pbF 50A/600V	I/P:14.5VDC O/P: (1)Full Load Turn On (2) Output Short (3)Full load continue Ta:25℃	(1) 396 V (2) 492 V (3) 314 V	P
5	DC TO FAN Power Transistor (D to S) or (C to E) **Peak Voltage**	Q 100 Rated STP75NF75 80A/75V	I/P:14.5VDC O/P: (1)Full Load Turn On (2) Output Short (3)Full load continue Ta:25℃	(1) 54.4 V (2) 53 V (3) 48 V	P
6	DCTO FAN Diode Peak **Voltage**	D 200 Rated MBR20H100CT 20A/100V	I/P:14.5VDC O/P: (1)Full Load Turn On (2) Output Short (3)Full load continue Ta:25℃	(1) 80 V (2) 91 V (3) 77.6 V	P
7	FAN TO CPU Power Transistor (D to S) or (C to E) **Peak Voltage**	Q601 Rated STP75NF75 80A/75V	I/P:14.5VDC O/P: (1)Full Load Turn On (2) Output Short (3)Full load continue Ta:25℃	(1) 41.2 V (2) 50 V (3) 37 V	P
8	FAN TO CPU Diode Peak **Voltage**	D 630 Rated 21DQ10 2A/100V	*I/P:14.5VDC* *O/P: (1)Full Load Turn On* (2) Output Short (3)Full load continue *Ta:25 ℃*	*(1)* 58.6 *V* (2) 10 V (3) 55 V	*P*

Reliability Test report

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1.	THERMO TRACER TEST (**ROOM AMBIENT)**	MODEL:TN-3000-112 TEST CONDITION:12VDC FULL LOAD TA=23.8℃			P
2	TEMPERATURE RISE TEST	MODEL： TN-3000-112 1. ROOM AMBIENT BURN-IN：1 HRS I/P： 12VDC O/P： FULL LOAD Ta= 28.8 ℃ 2. HIGH AMBIENT BURN-IN： 2 HRS I/P： 12VDC O/P： FULL LOAD Ta= 41.4 ℃			P



NO	Position	P/N	ROOM AMBIENT Ta= 28.8 ℃	HIGH AMBIENT Ta= 41.4 ℃
1	C333	2200u/16V L10Kh 12.5*25 YXG	44.5℃	54.5℃
2	L330	TF1966	61.4℃	72.0℃
3	C337	C/MPP 755/250V 5% P=32.5 MPE	46.5℃	56.3℃
4	T330 COIL	TF-2001	61.0℃	71.6℃
5	T330 CORE	TF-2001	67.8℃	78.0℃
6	Q337	FET IXTP160N075T 160A/75V TO220	68.0℃	80.1℃
7	Q350	FET IXT160N075T 160A/75V TO220	61.9℃	72.7℃
8	D330	HER305 3A/400V	61.8℃	72.9℃
9	D350	HER305 3A/400V	67.7℃	78.6℃
10	D409	SF20LC30 20A/300V	71.6℃	82.3℃
11	C403	680u/250V 105℃ 25*50 MXR	64.9℃	75.8℃
12	L13	TR906	81.6℃	92.6℃
13	L1	TR908	84.1℃	96.2℃
14	C7	C/MPP 306/250V 5% P=45 BX+CP	62.4℃	73.2℃
15	U4	CURRENT ACS756ECA-100-PFF CA	47.9℃	58.5℃
16	Q70	IGBT IRGP50B60PD1pbF 50A/600V	81.5℃	93.1℃
17	Q71	IGBT IRGP50B60PD1pbF 50A/600V	82.3℃	93.5℃
18	RTH2	10KΩ 1% NA1033F12D5	74.3℃	84.8℃
19	C320	33u/50V UL10Kh 6.3*11 YXM	51.1℃	63.3℃
20	U310	DRIVER IC MCP1403-E/SN(Tap.) 8-SOIC	61.8℃	74.4℃
21	T100 COIL	TF1969	56.3℃	68.2℃
22	Q200	STD17NF03L-1 17A/30V Ipak	50.4℃	62.3℃
23	U100	PWM TL3845P	60.6℃	72.1℃
24	Q100	STP75NF75 80A/75V	61.6℃	74.0℃
25	D200	MBR20H100CT 20A/100V	52.9℃	64.3℃
26	U703	PHOTO KPC6N137	42.1℃	54.6℃
27	RG701	LM317T 1.5A	59.0℃	71.1℃
28	Q601	STP75NF75 80A/75V	43.2℃	55.9℃
29	RG602	RG L7805CV 1.0A/5V TO220	39.3℃	51.6℃
30	T601 COIL	TF2167	46.3℃	58.5℃
31	BD700	30A/800V US30KB80R	31.2℃	41.3℃
32	Q700	2SK4108 20A/500V	33.6℃	43.7℃
33	Q701	FET 2SK3878 9A/900V TO3P	34.5℃	45.0℃
34	D800	FMEN-230A 30A/100V	33.8℃	43.4℃
35	T700	TF883-R5	33.0℃	42.6℃
36	Q850	STP75NF75 80A/75V	31.2℃	44.4℃

3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 12VDC O/P： 100 % LOAD Ta= 0 ℃	TEST：OK	P

4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 ℃ NO DAMAGE	I/P：14.5VDC O/P：FULL LOAD Ta= 40 ℃ HUMIDITY= 95 %R.H	TEST：OK	P
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature： -45℃~ +90℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：5 CYCLE 5. Input/Output condition： STATIC		TEST：OK	P
6	THERMAL SHOCK TEST	1. Thermal shock Temperature： -5℃~ +45℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：10 CYCLE 5. Input/Output condition： 12VDC/Full Load		TEST：OK	P
7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform： Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：10min/sweep cycle (4) Acceleration：3G (5) Test Time：60min in each axis (X.Y.Z) (6) Ta：25℃		TEST：OK	P
8	CAPACITOR LIFE CYCLE	SUPPOSE C 333 IS THE MOST CRITICAL COMPONENT (1) I/P： 12VDC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME (2) I/P： 12VDC O/P：FULL LOAD Ta= 40 ℃ LIFE TIME		(1) 517337.4 HRS (2) 219000 HRS	P

SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	BAT I/P-AC I/P: 3 KVAC/min BAT I/P-ACO/P: 3 KVAC/min AC O/P-FG: 1.5 KVAC/min	BAT I/P-ACI/P: 3.6 KVAC/min BATI/P-ACO/P 3.6 KVAC/min AC O/P-FG:1.8 KVAC/min Ta:25℃	BAT I/P-ACI/P: 9.31mA BAT I/P-ACO/P: 9.31mA AC O/P-FG: 5.67 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	BAT I/P-AC I/P:500VDC>100MΩ BATI/P- AC O/P:500VDC>100MΩ AC O/P-FG:500VDC>100MΩ	BAT I/P-AC I/P: 500 VDC BATI/P-ACO/P: 500 VDC AC O/P-FG: 500 VDC Ta:25℃	BAT I/P-AC I/P: 10GΩ BAT I/P-AC O/P: 10GΩ AC O/P-FG: 8.4GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	EN 60950 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25℃	11mΩ	P
4	APPROVAL	TUV： Certificate NO ： UL： File NO ：			N/A

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CONDUCTION	FCC CLASS A	I/P: 12 VDC O/P:FULL/50% LOAD Ta:25℃	CRITERIA A	P
2	RADIATION	FCC CLASS A	I/P:12 VDC O/P: :FULL/50% LOAD Ta:25℃	CRITERIA A	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2010/4/2	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2010/8/4	PRODUCT SAMPLE	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023