

MODEL : TN-3000-212 OUTPUT:230V/50Hz

AC OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RATED POWER (TYP)	3000W	I/P: 12VDC Ta:25°C	<u>3000</u> W	P
2	WAVEFORM	True sine wave (THD<3%)	I/P: 13VDC O/P: FULL LOAD Ta:25°C	FULL LOAD: <u>1.5</u> %	P
3	FREQUENCY	50HZ $\pm$ 0.1HZ	I/P: 12VDC O/P: FULL LOAD Ta:25°C	FULL LOAD: <u>50</u> HZ	P
4	AC REGULATION (TYP)	$\pm$ 3%	I/P: 12VDC O/P: FULL LOAD/NO LOAD Ta:25°C	0.18 %	P
5	MAXIMUM OUTPUT POWER	(1)3450W/180sec. (2)4500w/10sec (3)SURGE POWER 6000W FOR 30CYCLE $V_{dc} \leq 13.5V$ SURGE POWER 6000W FOR 5 CYCLE FOR $V_{bat} > 13.5V_{dc}$	I/P: 12VDC O/P: TESTING LOAD Ta:25°C ※LED DISPLAY	(1) <u>3458W</u> /180 SEC (2) <u>4809W</u> /10 SEC (3) <u>5611W</u> /36 CYCLE FOR $\leq 13.5V_{dc}$ <u>5495W</u> /34 CYCLE FOR $> 14.5V_{dc}$	P
6	SAVING MODE TO NORMAL	$P_o > 7W \sim 15W$	I/P: 12VDC O/P: NO LOAD Ta:25°C ※LED DISPLAY	<u>9</u> W	P
7	NORMAL TO SAVING MODE(TYP)	$P_o \leq 5W$	I/P: 12VDC O/P: NO LOAD Ta:25°C ※LED DISPLAY	<u>5</u> W	P
8	TRANSFER TIME(TYP)	$t < 10$ mS inverter $\leftrightarrow$ by pass	I/P: 12VDC O/P: FULL LOAD Ta:25°C	INVERTER $\rightarrow$ BY PASS <u>10</u> ms BY PASS $\rightarrow$ INVERTER <u>10</u> ms	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°C	<u>283</u> A	P
2	NO LOAD DISSIPATION(TYP)	$\leq 10W$ @standby saving mode	I/P: 12VDC O/P: NO LOAD Ta:25°C	<u>10</u> W/12VDC	P
3	OFF MODE DRAW CURRENT	$\leq 1mA$	I/P: 12VDC SW OFF O/P: NO LOAD Ta:25°C	<u>0.94</u> /12VDC	P

4	VOLTAGE RANGE (TYP)	10.5±0.5VDC~15±0.5VDC	I/P: TESTING O/P:NO LOAD/FULL LOAD Ta:25°C	$\frac{10.4 \text{ VDC} \sim 14.6 \text{ VDC}}{10.6 \text{ VDC} \sim 14.6 \text{ VDC}}$ VDC/NO LOAD VDC/FULL LOAD	P
5	EFFICIENCY(TYP)	89%	I/P: 13VDC O/P: Po=2100W Ta:25°C	90.7%	P

BATTERY INPUT PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	BAT LOW ALARM (INVERTER MODE)	10.8V~11.8VDC	I/P: TESTING O/P:FULL LOAD Ta:25°C ※LED DISPLAY	11.4 V	P
2	BAT LOW SHUT DOWN	10V~11VDC	I/P: TESTING O/P: FULL LOAD Ta:25°C ※LED DISPLAY	10.8 V Shut down Recovery	P
3	BAT. RECOVERY VOLTAGE	13.7VDC~14.7VDC	I/P: TESTING O/P:FULL LOAD Ta:25°C	14.3V	P
4	TRANSFER TO AC BY PASS	10.5VDC ~11.5VDC	I/P: TESTING O/P: FULL LOAD Ta:25°C	11V	P
5	BY PASS TRANSFER TO INVERTER	13.7VDC~14.7VDC	I/P: TESTING O/P: FULL LOAD Ta:25°C	13.92V	P
6	OVER VOLTAGE	14.5V~15.5VDC	I/P: TESTING O/P:FULL LOAD Ta:25°C	15V	P

AC OUTPUT PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER TEMPERATURE	SPEC : TSW1 : 80 ± 5°C O.T.P. NO DAMAGE	I/P: 12VDC O/P: FULL LOAD SET:SAVING MODE Ta:25°C ※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°C ※LED DISPLAY	NO DAMAGE Shut down o/p voltage Re-power on to recover	P

3	OVER LOAD (INVERTER)	105%~115%LOAD 180sec 115%~150%LOAD10 Sec Shutdown Re-power ON	I/P: 12VDC O/P: TESTING Ta:25°C ※LED DISPLAY	12VDC: 113 % 180 sec 140 % 10 sec Shut down Re-power ON	P
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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°C	Fan Voltage= 12.55 V	P
2	FAN LOCK	Shut down Re-power ON	I/P: 12VDC O/P: FULL LOAD Ta:25°C ※LED DISPLAY	Shut down Re-power ON	P

AC CHARGER

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CHARGE CURRENT	25A±2A	I/P: 230VAC O/P:CV MODE=12V ACLOAD:FULL LOAD Ta:25°C	24.2A	P
2	CHARGE VOLTAGE	13.8VDC~14.8VDC	I/P: 230VAC O/P:NO LOAD ACLOAD:NO LOAD Ta:25°C	14.1V	P

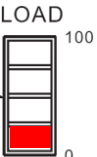
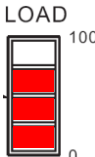
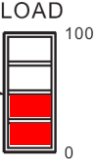
SOLAR CHARGER

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	MAX O/PEN CIRCUIT VOLTAGE	25V /30A	I/P: DC SOURCE O/P:BATTERY Ta:25°C	25 V 30 A	P
2	CHARGE VOLTAGE	13.8VDC~14.8VDC	I/P: DC SOURCE O/P:BATTERY Ta:25°C	14.12V	P

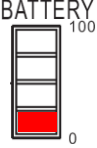
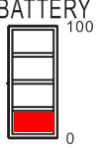
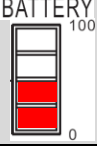
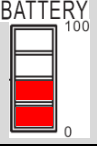
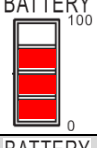
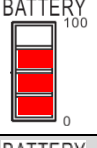
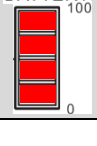
APPLICATION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INDUCTION MOTOR	1HP	I/P: BATTERYVOLTAGE O/P:1HP Ta:25°C	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-1500-48*2PIC (Pin=3000W) Ta:25°C	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~787W	P		1500W±150W ~ 2250W±150W	1550W~2300W	P
	750W±150W ~ 1500W±150W	788W~1550W~	P		2250W±150W ~ 3000W	2300W~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)	12.53V	P
	11.3V ~ 12.3V 3 LEDs→2 LEDs (11.8V)	11.54V	P		12.1V ~ 13.1V 1 LED→2 LEDs (12.6V)	12.8V	P
	11.4V ~ 12.4V 4 LEDs→3 LEDs (11.9V)	11.91V	P		12.7V ~ 13.7V 2 LEDs → 3 LED (13.2V)	13.3V	P
	> 12.7V (12.2V)	>12.1V	P		13.4V ~ 14.4V 3 LEDs → 4 LEDs (13.9V)	14V	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	11.02V	OK	P
By-pass mode & Saving mode	12.1V ~ 13.1V	 Bat Low	12.5V	OK	P

Solar charger test

Solar charger test					
STATUS	VOLTAGE RANGE	LED INDICATOR	NOTE	VOLTAGE RANGE	VERDICT
ON	12.7V ~ 13.7V		Solar charging current > 3.5A ; LED ON Solar charging current < 1A ; LED OFF	13.2V	P
OFF	13.8V ~14.8V		LED OFF	14.15V	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<P _o <15W		9W	P
Normal mode → Saving mode	P _o < 10W		6W	P

POWER ON AND MODE SETTING CODES:

1.O/Peration Mode Selection

O/PERATION MODE	LED INDICATORS	VERDICT
Energy Saving mode	RED ● YELLOW ★ GREEN ★	P
UPS mode	RED ○ YELLOW ★ GREEN ★	P

↓After pushing button 3 seconds and beeping

2.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

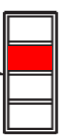
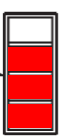
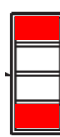
60Hz	RED ★ YELLOW ○ GREEN ○	RED ★ YELLOW ○ GREEN ●	RED ★ YELLOW ● GREEN ○	RED ★ YELLOW ● GREEN ●
VERDICT	P	P	P	P

↓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

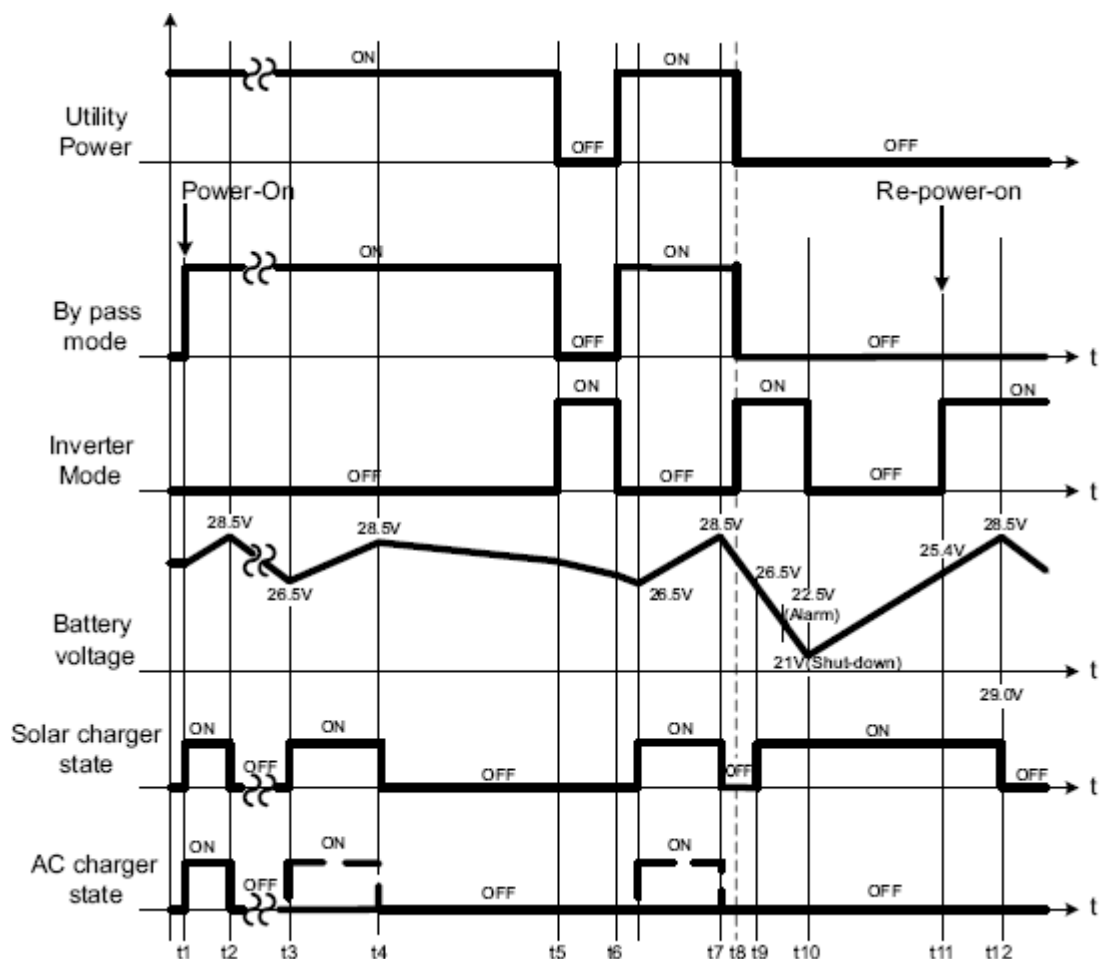
ERROR CODE LED INDICATOR

Error code								
LED INDICATOR	FAILURE MESSAGE	VERDICT	LED INDICATOR	FAILURE MESSAGE	VERDICT	LED INDICATOR	FAILURE MESSAGE	VERDICT
LOAD 	105% OLP	P	LOAD 	115% OLP	P	LOAD 	150% OLP	P
LOAD 	OTP	P	LOAD 	Inverter OVP Or Inverter UVP	P	LOAD 	AC output fail (O/P short)	P
LOAD 	Battery low shutdown	P	LOAD 	Battery bad or Battery notch	P	LOAD 	FAN -LOCK	P
LOAD 	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
230V	High limit (To INV mode)	Vac > 268±8V	271V	P
	Recovery to high (To AC mode)	Vac < 258±8V	260V	P
	Low limit (To INV mode)	Vac < 188±8V	190.2V	P
	Recovery to low (To AC mode)	Vac > 195±8V	196.8V	P

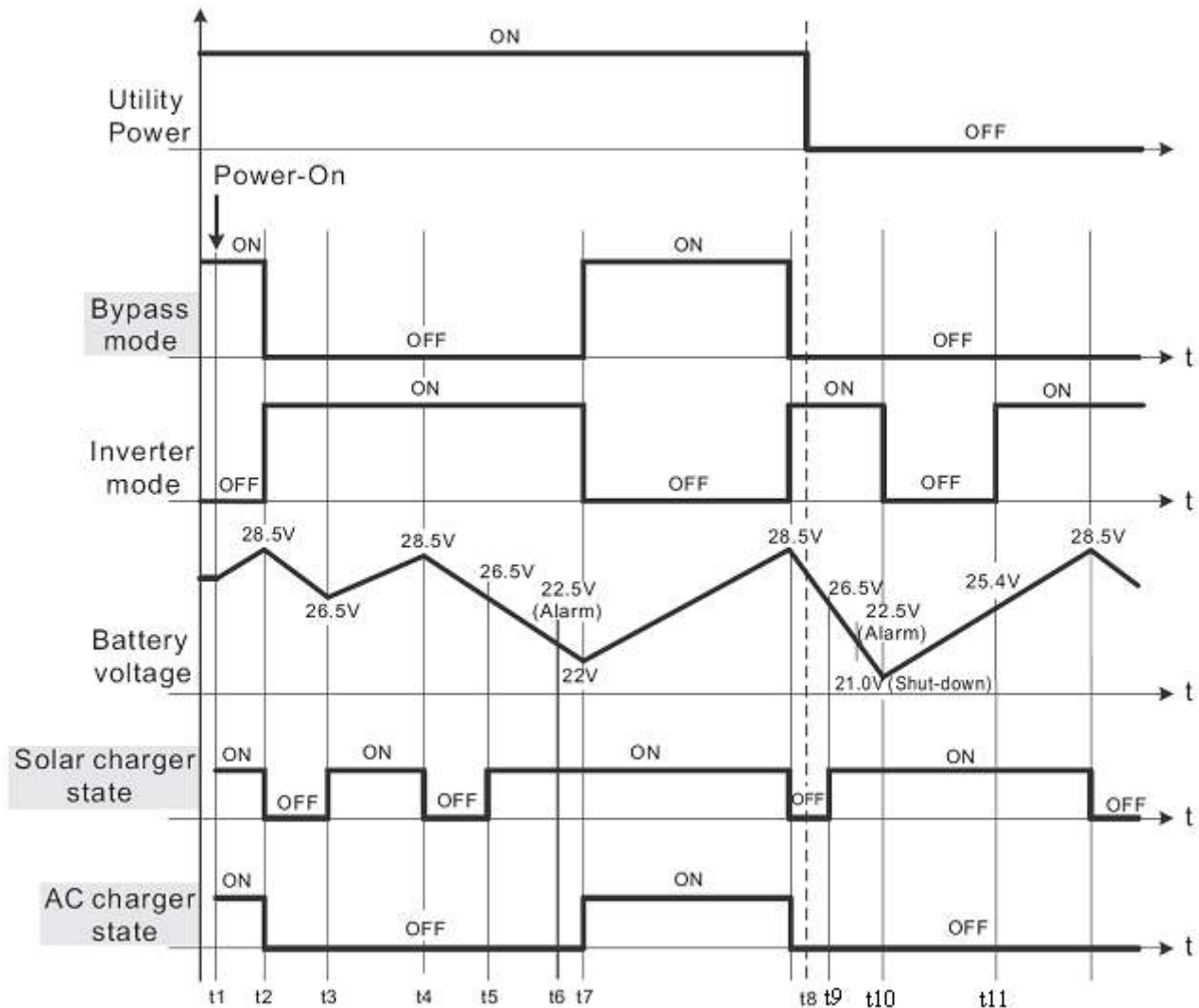
UPS MODE VERIFICATION



TIME SEQUENCE	TEST CONDITIONS	LED INDICATOR STATUS		VERDICT
t1	1、AC utility in → 110V/220V 2、Battery voltage → 12V/24V/48V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☒ 2、 ☒ 3、 ☒ 4、 ☐ 5、 ☒	P
t2	1、AC utility in → 110V/220V 2、Battery voltage → 14.5V/29V/58V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☒ 2、 ☐ 3、 ☐ 4、 ☐ 5、 ☒	P
t3	1、AC utility in → 110V/220V 2、Battery voltage →	1、AC IN 2、AC CHARGER	1、 ☒ 2、 ☐	P

	13V/26V/52V 3、Solar charging current → 3.5A	3、SOLAR CHARGER 4、INVERTER 5、BY PASS	3、 ☒ 4、 ☐ 5、 ☒	
t3'	1、AC utility in → 110V/220V 2、Battery voltage → 13V/26V/52V 3、Solar charging current → 0A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☒ 2、 ☒ 3、 ☐ 4、 ☐ 5、 ☒	P
t5	1、AC utility disconnected 2、Battery voltage → 14.5V/29V/58V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☐ 2、 ☐ 3、 ☐ 4、 ☒ 5、 ☐	P
t6	1、AC utility in → 110V/220V 2、Battery voltage → 14.5V/29V/58V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☒ 2、 ☐ 3、 ☐ 4、 ☐ 5、 ☒	P
t9	1、AC utility disconnected 2、Battery voltage → 13V/26V/52V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☐ 2、 ☐ 3、 ☒ 4、 ☒ 5、 ☐	P
t10	1、AC utility disconnected 2、Battery voltage → 10.5V/21V/42V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS ⊙Inverter shuts down	1、 ☐ 2、 ☐ 3、 ☒ 4、 ☐ 5、 ☐ error0111	P
t11	1、AC utility disconnected 2、Battery voltage → 13V/26V/52V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS ⊙Inverter resumes normal O/Peration	1、 ☐ 2、 ☐ 3、 ☒ 4、 ☒ 5、 ☐	P

ESM MODE VERIFICATION



TIME SEQUENCE	TEST CONDITIONS	LED INDICATOR STATUS		VERDICT
t1	1 、 AC utility in → 110V/220V 2 、 Battery voltage → 12V/24V/48V 3 、 Solar charging current → 3.5A	1 、 AC IN 2 、 AC CHARGER 3 、 SOLAR CHARGER 4 、 INVERTER 5 、 BY PASS	1 、 ■ 2 、 ■ 3 、 ■ 4 、 □ 5 、 ■	P
t2	1 、 AC utility in → 110V/220V 2 、 Battery voltage → 14.5V/29V/58V 3 、 Solar charging current →	1 、 AC IN 2 、 AC CHARGER 3 、 SOLAR CHARGER 4 、 INVERTER	1 、 ■ 2 、 □ 3 、 □ 4 、 ■	P

	3.5A	5、BY PASS	5、 ☐	
t3	1、AC utility in → 110V/220V 2、Battery voltage → 13V/26V/52V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☒ 2、 ☐ 3、 ☒ 4、 ☒ 5、 ☐	P
t4	1、AC utility in → 110V/220V 2、Battery voltage → 14.5V/29V/58V 3、Solar charging current → 0A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☒ 2、 ☐ 3、 ☐ 4、 ☒ 5、 ☐	P
t7	1、AC utility in → 110V/220V 2、Battery voltage → 11V/22V/44V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☒ 2、 ☐ 3、 ☒ 4、 ☐ 5、 ☒	P
t8	1、AC utility disconnected 2、Battery voltage → 14.5V/27V/54V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☐ 2、 ☐ 3、 ☐ 4、 ☒ 5、 ☐	P
t9	1、AC utility disconnected 2、Battery voltage → 12V/24V/48V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS	1、 ☐ 2、 ☐ 3、 ☒ 4、 ☒ 5、 ☐	P
t10	1、AC utility disconnected 2、Battery voltage → 10.5V/21V/42V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS ◎Inverter shuts down.	1、 ☐ 2、 ☐ 3、 ☒ 4、 ☐ 5、 ☐ error0111	P
t11	1、AC utility disconnected 2、Battery voltage → 13V/26V/52V 3、Solar charging current → 3.5A	1、AC IN 2、AC CHARGER 3、SOLAR CHARGER 4、INVERTER 5、BY PASS ◎Inverter re-powers on to recover	1、 ☐ 2、 ☐ 3、 ☒ 4、 ☒ 5、 ☐	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) 71 V (2) 32 V (3) 44 V	P
2	DC TO DC Diode Peak Voltage	D 400 Rated YG975C6R 20A/600V	I/P:14.5VDC O/P: (1)Full Load Turn On (2) Output Short (3)Full load continue Ta:25℃	(1) 440 V (2) 462 V (3) 436 V	P
3	DC BUS Capacitor Voltage	C403 Rated 330u/450V 105℃ 25*50 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) 430 V (2) 432 V (3) 432 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) 460 V (2) 562 V (3) 442 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) 58 V (2) 66 V (3) 52 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) 76.8 V (2) 65 V (3) 72 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) 33.8 V (2) 30.8 V (3) 33.8 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) 53.2 V (2) 42.8 V (3) 53.2 V	P
9	AC CHARGE Power Transistor (D to S) or (C to E) Peak Voltage	Q701 2SK3878:900V9A	I/P110 VAC O/P: (1)Full Load Turn On (2)Full load continue Ta:25℃	(1) 610 V (2) 600 V	P
10	AC CHARGE OUPUTDIODE Peak Voltage	D800 FMEN-230A:100V30A	I/P110 VAC O/P: (1)Full Load Turn On (2)Full load continue Ta:25℃	(1) 55 V (2) 55 V	P
11	SOLAR CHARGE Power Transistor (D to S) or (C to E) Peak Voltage	Q850 STP75NF75:75V/80A	I/P:45 VDC O/P: (1)Full Load Turn On (2)Full load continue Ta:25℃	(1) 27 V (2) 26 V	P

Reliability Test report

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																																																																																																																																			
1	TEMPERATURE RISE TEST	MODEL : TN-3000-212 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 12VDC O/P : FULL LOAD Ta= 32.9 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 12VDC O/P : FULL LOAD Ta= 35.5 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 32.9°C</th><th>HIGH AMBIENT Ta= 35.5 °C</th></tr><tr><td>6</td><td>C333</td><td>2200u/16V L10Kh 105°C YXG</td><td>65.8°C</td><td>71.3°C</td></tr><tr><td>7</td><td>L330</td><td>TF1966-R1</td><td>75.4°C</td><td>84.7°C</td></tr><tr><td>8</td><td>C337</td><td>755/250V 5% P=32.5 MPE</td><td>71.8°C</td><td>76.8°C</td></tr><tr><td>9</td><td>T330 COIL</td><td>TF2007-R2</td><td>91.0°C</td><td>97.9°C</td></tr><tr><td>10</td><td>T330 CORE</td><td>TF2007-R2</td><td>77.3°C</td><td>84.2°C</td></tr><tr><td>11</td><td>Q337</td><td>FET IXT160N075T 160A/75V TO220</td><td>98.9°C</td><td>107.4°C</td></tr><tr><td>12</td><td>Q333</td><td>FET IXT160N075T 160A/75V TO220</td><td>83.8°C</td><td>92.4°C</td></tr><tr><td>13</td><td>Q350</td><td>FET IXT160N075T 160A/75V TO220</td><td>75.7°C</td><td>84.1°C</td></tr><tr><td>14</td><td>D330</td><td>HER203 2A/200V</td><td>90.3°C</td><td>98.6°C</td></tr><tr><td>15</td><td>D405</td><td>SF20LC30 20A/300V</td><td>90.6°C</td><td>97.8°C</td></tr><tr><td>16</td><td>D409</td><td>SF20LC30 20A/300V</td><td>93.0°C</td><td>100.4°C</td></tr><tr><td>17</td><td>C403</td><td>680u/250V 105°C 25*50 MXR</td><td>73.8°C</td><td>80.8°C</td></tr><tr><td>18</td><td>L13</td><td>TR-COIL</td><td>104.4°C</td><td>111.4°C</td></tr><tr><td>19</td><td>L1</td><td>TR-COIL</td><td>79.9°C</td><td>86.8°C</td></tr><tr><td>20</td><td>C7</td><td>C/MPE 156/250V 10,-5% P=41.5 MEK</td><td>76.9°C</td><td>83.3°C</td></tr><tr><td>21</td><td>Q70</td><td>IGBT IRGP50B60PD1pbF 50A/600V TO247</td><td>81.2°C</td><td>88.3°C</td></tr><tr><td>22</td><td>Q71</td><td>IGBT IRGP50B60PD1pbF 50A/600V TO247</td><td>83.4°C</td><td>90.8°C</td></tr><tr><td>23</td><td>RTH2</td><td>10KΩ 1% NA1033F12D5</td><td>73.6°C</td><td>80.5°C</td></tr><tr><td>24</td><td>C320</td><td>10u/50V UL10Kh 5*11 YXM</td><td>82.7°C</td><td>89.5°C</td></tr><tr><td>25</td><td>U310</td><td>DRIVER IC MCP1403-E/SN(Tap.)</td><td>93.9°C</td><td>100.8°C</td></tr><tr><td>26</td><td>T100 COIL</td><td>TF1969-R4</td><td>73.6°C</td><td>80.2°C</td></tr><tr><td>27</td><td>Q200</td><td>STD17NF03L-1 17A/30V</td><td>67.0°C</td><td>74.0°C</td></tr><tr><td>28</td><td>D110</td><td>2A/200V FR203</td><td>61.6°C</td><td>67.7°C</td></tr><tr><td>29</td><td>U100</td><td>PWM TL3845P</td><td>75.7°C</td><td>83.9°C</td></tr><tr><td>30</td><td>Q100</td><td>STP75NF75 80A/75V</td><td>77.3°C</td><td>84.7°C</td></tr><tr><td>31</td><td>D125</td><td>HER203 2A/200V</td><td>71.2°C</td><td>78.4°C</td></tr><tr><td>32</td><td>D200</td><td>MBR20H100CT 20A/100V</td><td>71.2°C</td><td>78.2°C</td></tr><tr><td>33</td><td>Q601</td><td>STP75NF75 80A/75V</td><td>53.1°C</td><td>59.9°C</td></tr><tr><td>34</td><td>RG602</td><td>PS7805F-TB3T 1.0A/5V</td><td>54.0°C</td><td>60.8°C</td></tr><tr><td>35</td><td>RG601</td><td>LM317T-DG 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CORE	TF2007-R2	77.3°C	84.2°C	11	Q337	FET IXT160N075T 160A/75V TO220	98.9°C	107.4°C	12	Q333	FET IXT160N075T 160A/75V TO220	83.8°C	92.4°C	13	Q350	FET IXT160N075T 160A/75V TO220	75.7°C	84.1°C	14	D330	HER203 2A/200V	90.3°C	98.6°C	15	D405	SF20LC30 20A/300V	90.6°C	97.8°C	16	D409	SF20LC30 20A/300V	93.0°C	100.4°C	17	C403	680u/250V 105°C 25*50 MXR	73.8°C	80.8°C	18	L13	TR-COIL	104.4°C	111.4°C	19	L1	TR-COIL	79.9°C	86.8°C	20	C7	C/MPE 156/250V 10,-5% P=41.5 MEK	76.9°C	83.3°C	21	Q70	IGBT IRGP50B60PD1pbF 50A/600V TO247	81.2°C	88.3°C	22	Q71	IGBT IRGP50B60PD1pbF 50A/600V TO247	83.4°C	90.8°C	23	RTH2	10KΩ 1% NA1033F12D5	73.6°C	80.5°C	24	C320	10u/50V UL10Kh 5*11 YXM	82.7°C	89.5°C	25	U310	DRIVER IC MCP1403-E/SN(Tap.)	93.9°C	100.8°C	26	T100 COIL	TF1969-R4	73.6°C	80.2°C	27	Q200	STD17NF03L-1 17A/30V	67.0°C	74.0°C	28	D110	2A/200V FR203	61.6°C	67.7°C	29	U100	PWM TL3845P	75.7°C	83.9°C	30	Q100	STP75NF75 80A/75V	77.3°C	84.7°C	31	D125	HER203 2A/200V	71.2°C	78.4°C	32	D200	MBR20H100CT 20A/100V	71.2°C	78.2°C	33	Q601	STP75NF75 80A/75V	53.1°C	59.9°C	34	RG602	PS7805F-TB3T 1.0A/5V	54.0°C	60.8°C	35	RG601	LM317T-DG 1.5A	53.4°C	59.9°C	36	T603 COIL	TF2169-R1	57.5°C	64.8°C	37	U601	PWM TL3845D-8	63.9°C	71.3°C	38	D601	SFRD US1D 1A/200V	55.7°C	63.0°C	39	ZD600	ZD 0.5W 20V 5% MMSZ5250B	57.7°C	65.1°C	40	U700	PWM ML4800CP	40.3°C	46.2°C	41	Q700	FET IRFP460A 20A/500V	39.3°C	44.4°C	42	Q701	FET 2SK3878 9A/900V	39.7°C	44.9°C	43	Q850	STP75NF75 80A/75V	32.9°C	39.0°C	P
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 12VDC O/P : 100 % LOAD Ta= 0 °C	TEST : OK	P																																																																																																																																																																																																			

3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 °C NO DAMAGE	I/P : 14.5VDC O/P : FULL LOAD Ta= 40 °C HUMIDITY= 95 %R.H	TEST : OK	P
4	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C ~ +90°C 2. Temperature change rate : 25°C / 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
5	THERMAL SHOCK TEST	1. Thermal shock Temperature : -5°C ~ +45°C 2. Temperature change rate : 25°C / 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
6	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°C		TEST : OK	P
7	CAPACITOR LIFE CYCLE	TN-3000-212 : SUPPOSE C 333 IS THE MOST CRITICAL COMPONENT (1) I/P : 12VDC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 12VDC O/P : FULL LOAD Ta= 40 °C LIFE TIME	(1) 247044 HRS (2) 71460 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-AC I/P: 3.6 KVAC/min BAT I/P-ACO/P: 3.6 KVAC/min AC O/P-FG: 1.8 KVAC/min Ta:25°C	BAT I/P-AC I/P: 9.18mA BAT I/P-ACO/P: 9.18mA AC O/P-FG: 5.63mA NO DAMAGE	P
2	ISOLATION RESISTANCE	BAT I/P-AC I/P: 500VDC > 100MΩ BAT I/P-AC O/P: 500VDC > 100MΩ AC O/P-FG: 500VDC > 100MΩ	BAT I/P-AC I/P: 500 VDC BAT I/P-ACO/P: 500 VDC AC O/P-FG: 500 VDC Ta:25°C	BAT I/P-AC I/P: 3.4GΩ BAT I/P-AC O/P: 3.4GΩ AC O/P-FG: 1.5GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	EN 60950 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C	11mΩ	P

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CONDUCTION	EN55022 CLASS A	I/P: 24 VDC O/P: FULL/50% LOAD Ta:25°C	CRITERIA A	P
2	RADIATION	EN55022 CLASS A	I/P: 24 VDC O/P: : FULL/50% LOAD Ta:25°C	CRITERIA A	P
3	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 24VDC O/P: FULL LOAD Ta:25°C	CRITERIA A	P
4	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 24 VDC O/P: FULL LOAD Ta:25°C	CRITERIA A	P
5	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV L,N-PE:2KV	I/P: 24 VDC O/P: FULL LOAD Ta:25°C	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