

MODEL : TN1500-248

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RATED POWER (TYP)	1500W	IP: 48VDC Ta:25°C	1436 W	P
2	WAVEFORM	True sine wave (THD<3%)	IP: 48VDC OP: FULL LOAD/NO LOAD Ta:25°C	FULL LOAD: 1.03 % NO LOAD: 0.76 %	P
3	FREQUENCY	60HZ $\pm$ 1HZ	IP: 48VDC OP: FULL LOAD/NO LOAD Ta:25°C	FULL LOAD: 60.01HZ NO LOAD: 59.95 HZ	P
6	AC REGULATION (TYP)	3%~3%	IP: 48VDC OP: FULL LOAD/NO LOAD Ta:25°C	0.3% ~ -0.3%	P
7	TRANSFER TIME (TYP)	10 ms (By pass to inverter, vice versa inverter By pass)	IP: 48VDC OP: FULL LOAD Ta:25°C	By pass to Inverter: 2 ms Inverter to By pass: 4 ms	P
8	SAVING MODE TO NORMAL	$\leq$ 3S (5W~25W)	IP: 48VDC OP:NO LOAD Ta:25°C	OK	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	DC CURRENT (TYP)	40A	IP: 48VDC OP:NO LOAD Ta:25°C	33.5A	P
2	NO LOAD DISSIPATION	$\leq$ 18W @ saving mode	IP: 48VDC OP:NO LOAD Ta:25°C	9W	P
3	OFF MODE DRAW CURRENT	<1mA	IP: SW OFF OP:NO LOAD Ta:25°C	0.15mA	P
4	VOLTAGE RANGE (TYP)	42VDC~60VDC	IP: TESTING OP:NO LOAD Ta:25°C	40.7 VDC~ 59.6 VDC	P
5	EFFICIENCY(TYP)	91%	IP: 48VDC OP: 1000W Ta:25°C	91.2%	P

BATTERY INPUT PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	BAT LOW ALARM	45VDC $\pm$ 4%	IP: TESTING OP: NO LOAD Ta:25°C	44.3 V	P
2	BAT LOW SHUT DOWN	42VDC $\pm$ 4%	IP: TESTING OP: NO LOAD Ta:25°C	41.7 V Shut down Recovery	P
3	BAT POLARITY	BY INTERNAL FUSE	IP: 48VDC OP: NO LOAD Ta:25°C	OK	P

OUTPUT PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER TEMPERATURE	40°C~45°C at full load , Reset: re-power on	IP: 48VDC OP: FULL LOAD Ta:25°C	O.T.P Active Reset: re-power on	P
2	OUTPUT SHORT	Shut-off , Reset: re-power on	IP: 48VDC OP: FULL LOAD Ta:25°C	Shut-off , Reset: re-power on	P
3	OVER LOAD (INVERTER)	100%~115% $\pm$ 5% LOAD 180sec 115%~150% $\pm$ 5% LOAD 10sec Shunt down Re-power ON	IP: 48VDC OP: TESTING Ta:25°C	103 %/ 180 SEC 115 %/ 10 SEC Shut down Re-power ON	P
4	OVER LOAD (AC LINE)	CIRCUIT BREAKER PROTECTION	IP: 220VAC OP: TESTING Ta:25°C	CIRCUIT BREAKER PROTECTION	P

AC CHARGER FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CHARGE CURRENT	1.35A $\pm$ 0.2A	IP: 220VAC OP: BAT LOAD Ta:25°C	1.48 A	P
2	BOOST CHARGE VOLTAGE	58VDC $\pm$ 4%	IP: 220VAC OP: BAT LOAD Ta:25°C	57.3 VDC	P
3	SHORT CIRCUIT PROTECTION	Constant current limiting	IP: 220VAC OP: BAT LOAD Ta:25°C	NO DAMAGE Constant current limiting	P



SOLAR CHARGER FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	MAX OPEN CIRCUIT VOLTAGE	75V	IP: TESTING OP: BAT LOAD Ta:25℃	75V	P
2	CHARGE CURRENT (MAX)	30A	IP: OPEN CIRCUIT VOLTAGE 75V OP: BAT LOAD Ta:25℃	30A	P
3	V max CHARGE VOLTAGE	58VDC $\pm$ 4%	IP: OPEN CIRCUIT VOLTAGE 75V OP: BAT LOAD Ta:25℃	57.3VDC	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																																												
1	TEMPERATURE RISE TEST	MODEL : TN-1500-212 1. ROOM AMBIENT BURN-IN : 2HRS I/P: 12 VDC O/P: FULL LOAD Ta= 27.5 °C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P: 12 VDC O/P: FULL LOAD Ta= 41.6 °C <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 27.5°C</th><th>HIGH AMBIENT Ta= 41.6°C</th></tr><tr><td>1</td><td>C301</td><td>54.2°C</td><td>66.6°C</td></tr><tr><td>2</td><td>C311</td><td>60.0°C</td><td>73.8°C</td></tr><tr><td>3</td><td>PCB</td><td>85.5°C</td><td>103.7°C</td></tr><tr><td>4</td><td>L301</td><td>92.8°C</td><td>108.4°C</td></tr><tr><td>5</td><td>D413</td><td>54.5°C</td><td>65.5°C</td></tr><tr><td>6</td><td>T302</td><td>78.4°C</td><td>90.9°C</td></tr><tr><td>7</td><td>C416</td><td>50.2°C</td><td>61.8°C</td></tr><tr><td>8</td><td>L13</td><td>74.1°C</td><td>85.9°C</td></tr><tr><td>9</td><td>C7</td><td>32.7°C</td><td>44.3°C</td></tr><tr><td>10</td><td>L1</td><td>40.7°C</td><td>55.7°C</td></tr><tr><td>11</td><td>CT1</td><td>28.1°C</td><td>41.7°C</td></tr><tr><td>12</td><td>Q328</td><td>61.3°C</td><td>73.7°C</td></tr><tr><td>13</td><td>RTH3</td><td>59.2°C</td><td>71.5°C</td></tr><tr><td>14</td><td>Q11</td><td>56.3°C</td><td>67.4°C</td></tr><tr><td>15</td><td>U301</td><td>45.6°C</td><td>55.5°C</td></tr><tr><td>16</td><td>Q602</td><td>39.6°C</td><td>49.6°C</td></tr><tr><td>17</td><td>D601</td><td>42.3°C</td><td>52.0°C</td></tr><tr><td>18</td><td>RG602</td><td>37.1°C</td><td>46.1°C</td></tr><tr><td>19</td><td>RG601</td><td>42.0°C</td><td>51.6°C</td></tr><tr><td>20</td><td>U509</td><td>31.0°C</td><td>38.6°C</td></tr><tr><td>21</td><td>Q702</td><td>32.9°C</td><td>44.8°C</td></tr><tr><td>22</td><td>D806</td><td>34.8°C</td><td>47.1°C</td></tr><tr><td>23</td><td>T701</td><td>33.8°C</td><td>46.6°C</td></tr><tr><td>24</td><td>Q802</td><td>36.4°C</td><td>49.5°C</td></tr><tr><td>25</td><td>C811</td><td>32.7°C</td><td>45.9°C</td></tr><tr><td>26</td><td>內環溫</td><td>43.9°C</td><td>53.8°C</td></tr></table>			NO	Position	ROOM AMBIENT Ta= 27.5°C	HIGH AMBIENT Ta= 41.6°C	1	C301	54.2°C	66.6°C	2	C311	60.0°C	73.8°C	3	PCB	85.5°C	103.7°C	4	L301	92.8°C	108.4°C	5	D413	54.5°C	65.5°C	6	T302	78.4°C	90.9°C	7	C416	50.2°C	61.8°C	8	L13	74.1°C	85.9°C	9	C7	32.7°C	44.3°C	10	L1	40.7°C	55.7°C	11	CT1	28.1°C	41.7°C	12	Q328	61.3°C	73.7°C	13	RTH3	59.2°C	71.5°C	14	Q11	56.3°C	67.4°C	15	U301	45.6°C	55.5°C	16	Q602	39.6°C	49.6°C	17	D601	42.3°C	52.0°C	18	RG602	37.1°C	46.1°C	19	RG601	42.0°C	51.6°C	20	U509	31.0°C	38.6°C	21	Q702	32.9°C	44.8°C	22	D806	34.8°C	47.1°C	23	T701	33.8°C	46.6°C	24	Q802	36.4°C	49.5°C	25	C811	32.7°C	45.9°C	26	內環溫	43.9°C	53.8°C	P
NO	Position	ROOM AMBIENT Ta= 27.5°C	HIGH AMBIENT Ta= 41.6°C																																																																																																														
1	C301	54.2°C	66.6°C																																																																																																														
2	C311	60.0°C	73.8°C																																																																																																														
3	PCB	85.5°C	103.7°C																																																																																																														
4	L301	92.8°C	108.4°C																																																																																																														
5	D413	54.5°C	65.5°C																																																																																																														
6	T302	78.4°C	90.9°C																																																																																																														
7	C416	50.2°C	61.8°C																																																																																																														
8	L13	74.1°C	85.9°C																																																																																																														
9	C7	32.7°C	44.3°C																																																																																																														
10	L1	40.7°C	55.7°C																																																																																																														
11	CT1	28.1°C	41.7°C																																																																																																														
12	Q328	61.3°C	73.7°C																																																																																																														
13	RTH3	59.2°C	71.5°C																																																																																																														
14	Q11	56.3°C	67.4°C																																																																																																														
15	U301	45.6°C	55.5°C																																																																																																														
16	Q602	39.6°C	49.6°C																																																																																																														
17	D601	42.3°C	52.0°C																																																																																																														
18	RG602	37.1°C	46.1°C																																																																																																														
19	RG601	42.0°C	51.6°C																																																																																																														
20	U509	31.0°C	38.6°C																																																																																																														
21	Q702	32.9°C	44.8°C																																																																																																														
22	D806	34.8°C	47.1°C																																																																																																														
23	T701	33.8°C	46.6°C																																																																																																														
24	Q802	36.4°C	49.5°C																																																																																																														
25	C811	32.7°C	45.9°C																																																																																																														
26	內環溫	43.9°C	53.8°C																																																																																																														
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	IP: 12VDC OP:FULL LOAD Ta= -10°C	TEST : OK	P																																																																																																												
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40°C NO DAMAGE	IP: 13.6VDC OP:FULL LOAD Ta:= 40°C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																																												
5	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave																																																																																																															

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	BAT I/P-AC I/P: 3 KVAC/min BAT I/P-AC O/P: 3 KVAC/min AC I/P-FG: 1.5 KVAC/min	BAT I/P-AC I/P: 3.3 KVAC/min BAT I/P-AC O/P: 3.3 KVAC/min AC I/P-FG: 1.8 KVAC/min Ta:25℃	BAT I/P-AC I/P: 9.55 mA BAT I/P-AC O/P: 9.55 mA AC I/P-FG: 9.22 mA NO DAMAGE	P
2	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25℃	21 mΩ	P
3	APPROVAL	TUV: Certificate NO : UL: File NO :			N/A

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25℃	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV L,N-PE:2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA B	P
7	Test by certified Lab & Test Report Prepare				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	TN-1500-112 : SUPPOSE C812 IS THE MOST CRITICAL COMPONENT I/P: 12VDC O/P:FULL LOAD Ta= 25℃ LIFE TIME= 420711 HRS I/P: 12VDC O/P:FULL LOAD Ta= 40℃ LIFE TIME= 136874 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 8.5KHRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	DC TO DC Power Transistor (D to S) or (C to E) Peak Voltage	Q324 Rated STP40N20 : 200V 40A	I/P:51 VDC O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 221 V (2) 161 V (3) 157 V	P
2	DCTO DC Diode Peak Voltage	D414 Rated HFA16TA60C : 8A 600V	I/P:51VDC O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 392 V (2) 392 V (3) 392 V	P
3	Input Capacitor Voltage	C417 Rated : 220u / 450V/ 105℃	I/P:51VDC O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change (4)Burn in 1hour Ta:25℃	(1) 360 V (2) 370 V (3) 360 V	P
4	INVERTER Power Transistor (D to S) or (C to E) Peak Voltage	Q12 Rated HGTG12N60A4D : 12A/ 600V	I/P:51VDC O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 502 V (2) 466 V (3) 498 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2006/4/18	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2006/9/25	PRODUCT SAMPLE W0605A45	PASS	VINCENT TSENG	MAX LIN
2007/5/15	PRODUCT SAMPLE W0703A19	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023