

MODEL : TN1500-212

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RATED POWER (TYP)	1500W	IP: 12VDC Ta:25°C	1437 W	P
2	WAVEFORM	True sine wave (THD<3%)	IP: 12VDC OP: FULL LOAD/NO LOAD Ta:25°C	FULL LOAD: 1.01 % NO LOAD: 0.96 %	P
3	FREQUENCY	60HZ ± 1HZ	IP: 12VDC OP: FULL LOAD/NO LOAD Ta:25°C	FULL LOAD: 60.01 HZ NO LOAD: 60.01 HZ	P
6	AC REGULATION (TYP)	3%~3%	IP: 12VDC OP: FULL LOAD/NO LOAD Ta:25°C	0.5% - -0.5 %	P
7	TRANSFER TIME (TYP)	10 ms (By pass to inverter, vice versa inverter By pass)	IP: 12VDC OP: FULL LOAD Ta:25°C	By pass to Inverter: 3 ms Inverter to By pass: 4 ms	P
8	SAVING MODE TO NORMAL	≤3S (5W~25W)	IP: 12VDC OP:NO LOAD Ta:25°C	OK	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	DC CURRENT (TYP)	150A	IP: 12VDC OP:NO LOAD Ta:25°C	136A	P
2	NO LOAD DISSIPATION	≤18W @ saving mode	IP: 12VDC OP:NO LOAD Ta:25°C	13W	P
3	OFF MODE DRAW CURRENT	<1mA	IP: SW OFF OP:NO LOAD Ta:25°C	0.15mA	P
4	VOLTAGE RANGE (TYP)	10.5VDC~15VDC	IP: TESTING OP:NO LOAD Ta:25°C	10.3 VDC~ 15.1 VDC	P
5	EFFICIENCY(TYP)	89%	IP: 13VDC OP: FULL LOAD Ta:25°C	88.7%	P

BATTERY INPUT PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	BAT LOW ALARM	10.5VDC \pm 2%	IP: TESTING OP: NO LOAD SW:ON Ta:25°C	10.65 V	P
2	BAT LOW SHUT DOWN	10VDC \pm 2%	IP: TESTING OP: NO LOAD SW:ON Ta:25°C	10.3 V Shunt down Recovery	P
3	BAT POLARITY	BY INTERNAL FUSE	IP: 12VDC OP: NO LOAD SW:ON 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: 12VDC OP: FULL LOAD SW:ON Ta:25°C	O.T.P Active Reset: re-power on	P
2	OUTPUT SHORT	Shut-off , Reset: re-power on	IP: 12VDC OP: FULL LOAD SW:ON Ta:25°C	Shut-off , Reset: re-power on	P
3	OVER LOAD (INVERTER)	100%~117% \pm 5% LOAD 180sec 117%~150% \pm 5% LOAD 10sec Shunt down Re-power ON	IP: 12VDC OP: TESTING SW:ON Ta:25°C	110 %/ 180 SEC 118 %/ 10 SEC Shunt down Re-power ON	P
4	OVER LOAD (AC LINE)	CIRCUIT BREAKER PROTECTION	IP: 220VAC OP: TESTING SW:ON Ta:25°C	CIRCUIT BREAKER PROTECTION	P

AC CHARGER FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CHARGE CURRENT	5.5A \pm 0.5A	IP: 220VAC OP: BAT LOAD SW:ON Ta:25°C	5.81 A	P
2	CHARGE VOLTAGE	14.5VDC \pm 4%	IP: 220VAC OP: BAT LOAD SW:ON Ta:25°C	14.5 VDC	P
3	SHORT CIRCUIT PROTECTION	Constant current limiting	IP: 220VAC OP: BAT LOAD SW:ON 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	25V	IP: TESTING OP: BAT LOAD SW:ON Ta:25°C	25V	P
2	CHARGE CURRENT (MAX)	30A	IP: OPEN CIRCUIT VOLTAGE 25V OP: BAT LOAD SW:ON Ta:25°C	30A	P
3	V max CHARGE VOLTAGE	14.5VDC \pm 4%	IP: OPEN CIRCUIT VOLTAGE 25V OP: BAT LOAD SW:ON Ta:25°C	14.5 VDC	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: 95% LOAD Ta= 27.55 ℃ 2. HIGH AMBIENT BURN-IN : 1 HRS I/P: 12 VDC O/P: 95% LOAD Ta= 41.6 ℃				P		
					ROOM AMBIENT Ta= 27.5℃		HIGH AMBIENT Ta= 41.6℃	
		1	C301	2200U/16Y 105℃ KY	118.8℃		128.6℃	
		2	C311	565/100V TAI YANG	71.8℃		81.3℃	
		3	PCB	BAT+/BAT-之間	77.5℃		86.2℃	
		4	L301	TF-1407	60.3℃		69.1℃	
		5	D413	HFA16TA60C 8A/600V	63.3℃		71.9℃	
		6	T302	TF-1374	82.3℃		91.6℃	
		7	C416	22U/450V 105℃ HU	60.2℃		69.5℃	
		8	L13	TR-640	64.7℃		75.2℃	
		9	C7	7U/250V	41.5℃		49.5℃	
		10	L1	TR-645	41.7℃		50.2℃	
		11	CT1	TF-1386	42.8℃		53.2℃	
		12	Q328	IRF1405Z 75A/55V	34.4℃		44.8℃	
		13	RTH3	NTC 10K 5%	85.5℃		96.0℃	
		14	Q11	HGTG12N60A4D 12A/600V	88.7℃		98.4℃	
		15	U301	UC3846	81.0℃		92.2℃	
		16	Q602	CEP50N06 50A/60V	77.8℃		88.4℃	
		17	D601	HER302 3A/100V	84.0℃		94.8℃	
		18	RG602	LC7805CV 1A/5V	74.2℃		85.5℃	
		19	RG601	LC7812CV 1A/12V	56.8℃		65.8℃	
		20	U509	PIC18F6520	83.2℃		94.8℃	
		21	Q702	K2651-01MR 6A/900V	54.9℃		64.1℃	
		22	D806	SB1040FCT 10A/40V	52.0℃		61.3℃	
		23	T701	TF-1473	54.0℃		63.9℃	
		24	Q802	IRF1010E 84A/60V	45.4℃		54.5℃	
25	C811	1000U/25V 105℃ KY	48.0℃	57.3℃				
26	內環溫	T302-D411 間	49.2℃	59.9℃				
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	IP: 12VDC OP: FULL LOAD Ta= -10℃	TEST : OK	P			
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40℃ NO DAMAGE	IP: 13.6VDC OP: FULL LOAD Ta= 40℃ HUMIDITY= 95 %R.H	TEST : OK	P			
5	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (3) Sweep Time: 10min/sweep cycle (5) Test Time: 1 hour in each axis (X.Y.Z)	(2) Frequency: 10-500Hz (4) Acceleration: 3G (6) Ta: 25℃	TEST : OK	P			

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°C	BAT I/P-AC I/P: 8.79 mA BAT I/P-AC O/P: 8.79 mA AC I/P-FG: 8.77 mA NO DAMAGE	P
2	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C	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°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25°C	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°C	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°C	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°C	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°C LIFE TIME= 420711 HRS I/P: 12VDC O/P:FULL LOAD Ta= 40°C 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 IRF1405Z : 55V 75A	I/P:14 VDC O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 57.8 V (2) 49.8 V (3) 47 V	P
2	DCTO DC Diode Peak Voltage	D414 Rated HFA16TA60C : 8A 600V	I/P:14VDC O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 414 V (2) 372 V (3) 416 V	P
3	Input Capacitor Voltage	C417 Rated : 220u / 450V/ 105°C	I/P:14VDC 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°C	(1) 336 V (2) 382 V (3) 336 V	P
4	INVERTER Power Transistor (D to S) or (C to E) Peak Voltage	Q12 Rated HGTG12N60A4D : 12A/ 600V	I/P:14VDC O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 536 V (2) 466 V (3) 542 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