

MODEL : TS-400-224

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RATED POWER (TYP)	400W	IP: 24VDC Ta:25°C	404 W	P
2	WAVEFORM	True sine wave (THD<3%)	IP: 24VDC OP: FULL LOAD/NO LOAD Ta:25°C	FULL LOAD: 1.5 % NO LOAD: 0.45 %	P
3	FREQUENCY	50/60HZ ± 0.1HZ	IP: 24VDC OP: FULL LOAD/NO LOAD Ta:25°C	FULL LOAD: 50.05 HZ NO LOAD: 49.97 HZ	P
4	AC REGULATION (TYP)	3%~3%	IP: 24VDC OP: FULL LOAD/NO LOAD Ta:25°C	1.7% ~ -1.7 %	P
7	MAXIMUM OUTPUT POWER (TYP)	460W/180sec 600w/10sec 800W / 30cycle	IP: 24VDC OP:TESTING Ta:25°C	<u>460</u> W <u>180</u> SEC <u>570</u> W <u>7</u> SEC <u>733</u> W <u>29</u> cycle Shut down o/p voltage , re-power on to recover	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	DC CURRENT (TYP)	20A	IP: 24VDC OP:FULL LOAD Ta:25°C	20.45A	P
2	NO LOAD POWER DRAW	≤0.63A	IP: 24VDC OP:NO LOAD Ta:25°C	0.53A	P
3	OFF MODE DRAW CURRENT	≤1mA	IP: SW OFF OP:NO LOAD Ta:25°C	0.63mA	P
4	VOLTAGE RANGE (TYP)	21VDC~30VDC	IP: TESTING OP:NO LOAD Ta:25°C	20.9VDC~ 29.8 VDC	P
5	EFFICIENCY (TYP)	87.5 %	IP: 24VDC OP: 300W Ta:25°C	88.8%	P

INPUT PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	BAT LOW ALARM	22.5VDC \pm 4%	IP: TESTING OP: NO LOAD Ta:25°C	22.1V	P
2	BAT LOW SHUT DOWN	21VDC \pm 4%	IP: TESTING OP: NO LOAD Ta:25°C	20.9V Shut down Recovery	P
3	BAT. RECOVERY VOLTAGE	24VDC~30VDC	IP: TESTING OP: NO LOAD Ta:25°C	25.8V	P
4	BAT POLARITY	BY INTERNAL FUSE	IP: 24VDC OP: NO LOAD Ta:25°C	OK	P

OUTPUT PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER TEMPERATURE	75°C \pm 5°C (RTH1) detect power MOSFET	IP: 24VDC OP: FULL LOAD Ta:25°C	O.T.P Active Shut down o/p voltage , re-power on to recover	P
2	OUTPUT SHORT	Shut-off :Shut down o/p voltage , re-power onto recover	IP: 24VDC OP: FULL LOAD Ta:25°C	Shut down o/p voltage , re-power on to recover	P
3	OVER LOAD (TYP)	105%~115% LOAD for 180sec 115%~150% LOAD for 10sec	IP: 24VDC OP: TESTING Ta:25°C	<u>460 W 180 SEC</u> <u>600 W 10SEC</u> Shut down o/p voltage , re-power on to recover	P

APPLICATION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INDUCTION MOTOR	0.5HP	IP: 24VDC OP:0.5HP Ta:25°C	INVERTER TURN ON/OFF :OLP protect INDUCTION MOTOR ON/OFF:OLP protect	P
2	INCANDESCENT LAMPS	400W	IP: 24VDC OP: 400W Ta:25°C	INVERTER TURN ON/OFF :OK INDUCTION MOTOR ON/OFF:OK	P

LED instruction : (★ Flash ● Light ON)

LED IS TREECOLOR LIGHT	status	RESULT
●	Inverter fail	P
★	Remote OFF	P
●	Inverter OK	P

VOLTAGE AND FREQUENCY SETTING CODES

Vout	100V	110V	115V	240V
LED	●	★	●	★
RESULT	P	P	P	P

Frequency	LED	RESULT
50HZ	●	P
60HZ	★	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																																				
1	TEMPERATURE RISE TEST	MODEL : TS-400-224 1. ROOM AMBIENT BURN-IN : 1 HRS I/P: 24 VDC O/P: FULL LOAD Ta= 31.7 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P: 24 VDC O/P: FULL LOAD Ta=38.2 °C			P																																																																																																				
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>P/N</th> <th>ROOM AMBIENT Ta= 31.7 °C</th> <th>HIGH AMBIENT Ta=38.2 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>C300</td><td>2200u/35V 105°C 16*31.5</td><td>35.6°C</td><td>42.4°C</td></tr> <tr><td>2</td><td>C302</td><td>565/250V 5% P=27.5 MPE</td><td>39.0°C</td><td>45.8°C</td></tr> <tr><td>3</td><td>T310</td><td>TF1855 ETD-39</td><td>77.1°C</td><td>88.4°C</td></tr> <tr><td>4</td><td>Q311</td><td>STP80NF12 80A/120V TO220</td><td>43.7°C</td><td>50.5°C</td></tr> <tr><td>5</td><td>LF500</td><td>LF102-R1 ET-24V 3.8A 1.3mH B</td><td>41.9°C</td><td>49.0°C</td></tr> <tr><td>6</td><td>D400</td><td>YG975C6R 20A/600V TO220F</td><td>63.2°C</td><td>70.4°C</td></tr> <tr><td>7</td><td>L500</td><td>TR833 T131-52 8m</td><td>73.1°C</td><td>80.1°C</td></tr> <tr><td>8</td><td>Q540</td><td>STP21NM60N 17A/600V TO220</td><td>52.8°C</td><td>62.4°C</td></tr> <tr><td>9</td><td>L300</td><td>TF1849 ETD-24</td><td>48.2°C</td><td>55.3°C</td></tr> <tr><td>10</td><td>T600</td><td>TF1858 EEL-19</td><td>44.7°C</td><td>51.3°C</td></tr> <tr><td>11</td><td>Q600</td><td>IRF3710 57A/100V TO220</td><td>39.2°C</td><td>46.3°C</td></tr> <tr><td>12</td><td>RG630</td><td>RG LM317T 1.5A TO220</td><td>37.7°C</td><td>44.0°C</td></tr> <tr><td>13</td><td>D600</td><td>HER104 1A/300V T-52mm</td><td>36.6°C</td><td>43.6°C</td></tr> <tr><td>14</td><td>U100</td><td>PIC18F65J10-I/PT</td><td>39.9°C</td><td>46.2°C</td></tr> <tr><td>15</td><td>U600</td><td>PWM TL3845D-8 TI SO-8</td><td>38.6°C</td><td>45.7°C</td></tr> <tr><td>16</td><td>C733</td><td>47u/35V L6Kh 5*11 ZLH</td><td>39.6°C</td><td>45.7°C</td></tr> <tr><td>17</td><td>RTH1</td><td>NTC 10KΩ 4Φ TTC3A103F34D1EY 1%</td><td>44.5°C</td><td>49.9°C</td></tr> <tr><td>18</td><td>C400</td><td>150u/450V 105°C 22*35 HU5</td><td>43.6°C</td><td>49.2°C</td></tr> <tr><td>19</td><td>C500</td><td>105/275VAC 10% P=22 KNB1560</td><td>44.3°C</td><td>51.1°C</td></tr> </tbody> </table>	NO	Position		P/N	ROOM AMBIENT Ta= 31.7 °C	HIGH AMBIENT Ta=38.2 °C	1	C300	2200u/35V 105°C 16*31.5	35.6°C	42.4°C	2	C302	565/250V 5% P=27.5 MPE	39.0°C	45.8°C	3	T310	TF1855 ETD-39	77.1°C	88.4°C	4	Q311	STP80NF12 80A/120V TO220	43.7°C	50.5°C	5	LF500	LF102-R1 ET-24V 3.8A 1.3mH B	41.9°C	49.0°C	6	D400	YG975C6R 20A/600V TO220F	63.2°C	70.4°C	7	L500	TR833 T131-52 8m	73.1°C	80.1°C	8	Q540	STP21NM60N 17A/600V TO220	52.8°C	62.4°C	9	L300	TF1849 ETD-24	48.2°C	55.3°C	10	T600	TF1858 EEL-19	44.7°C	51.3°C	11	Q600	IRF3710 57A/100V TO220	39.2°C	46.3°C	12	RG630	RG LM317T 1.5A TO220	37.7°C	44.0°C	13	D600	HER104 1A/300V T-52mm	36.6°C	43.6°C	14	U100	PIC18F65J10-I/PT	39.9°C	46.2°C	15	U600	PWM TL3845D-8 TI SO-8	38.6°C	45.7°C	16	C733	47u/35V L6Kh 5*11 ZLH	39.6°C	45.7°C	17	RTH1	NTC 10KΩ 4Φ TTC3A103F34D1EY 1%	44.5°C	49.9°C	18	C400	150u/450V 105°C 22*35 HU5	43.6°C	49.2°C	19	C500	105/275VAC 10% P=22 KNB1560	44.3°C	51.1°C		
NO	Position	P/N	ROOM AMBIENT Ta= 31.7 °C	HIGH AMBIENT Ta=38.2 °C																																																																																																					
1	C300	2200u/35V 105°C 16*31.5	35.6°C	42.4°C																																																																																																					
2	C302	565/250V 5% P=27.5 MPE	39.0°C	45.8°C																																																																																																					
3	T310	TF1855 ETD-39	77.1°C	88.4°C																																																																																																					
4	Q311	STP80NF12 80A/120V TO220	43.7°C	50.5°C																																																																																																					
5	LF500	LF102-R1 ET-24V 3.8A 1.3mH B	41.9°C	49.0°C																																																																																																					
6	D400	YG975C6R 20A/600V TO220F	63.2°C	70.4°C																																																																																																					
7	L500	TR833 T131-52 8m	73.1°C	80.1°C																																																																																																					
8	Q540	STP21NM60N 17A/600V TO220	52.8°C	62.4°C																																																																																																					
9	L300	TF1849 ETD-24	48.2°C	55.3°C																																																																																																					
10	T600	TF1858 EEL-19	44.7°C	51.3°C																																																																																																					
11	Q600	IRF3710 57A/100V TO220	39.2°C	46.3°C																																																																																																					
12	RG630	RG LM317T 1.5A TO220	37.7°C	44.0°C																																																																																																					
13	D600	HER104 1A/300V T-52mm	36.6°C	43.6°C																																																																																																					
14	U100	PIC18F65J10-I/PT	39.9°C	46.2°C																																																																																																					
15	U600	PWM TL3845D-8 TI SO-8	38.6°C	45.7°C																																																																																																					
16	C733	47u/35V L6Kh 5*11 ZLH	39.6°C	45.7°C																																																																																																					
17	RTH1	NTC 10KΩ 4Φ TTC3A103F34D1EY 1%	44.5°C	49.9°C																																																																																																					
18	C400	150u/450V 105°C 22*35 HU5	43.6°C	49.2°C																																																																																																					
19	C500	105/275VAC 10% P=22 KNB1560	44.3°C	51.1°C																																																																																																					
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	IP: 24VDC OP: FULL LOAD Ta= -10°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	IP: 29VDC OP: FULL LOAD Ta:= 40°C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																																				
4	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°C	TEST : OK	P																																																																																																				

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	BAT I/P-AC O/P: 3 KVAC/min AC O/P-FG: 1.5 KVAC/min	BAT I/P-AC O/P: 3.6 KVAC/min AC O/P-FG: 1.8 KVAC/min Ta:25°C	BAT I/P-AC O/P: 4.25 mA AC O/P-FG: 5.44 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	BAT I/P-AC O/P:500VDC>100MΩ BAT I/P-FG: 500VDC>100MΩ	BAT I/P-AC O/P: 500 VDC BAT I/P-FG: 500 VDC Ta:25°C	BAT I/P-AC O/P: 22.5 GΩ BAT I/P-FG: 18.6 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C	11 mΩ	P
4	APPROVAL	TUV: Certificate NO : UL: File NO :			N/A

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RADIATION	EN 55022 CLASS A	I/P:24 VDC O/P: :FULL/50% LOAD Ta:25°C	PASS	P
2	E.S.D	EN 61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 24VDC O/P:100 %LOAD Ta:25°C	CRITERIA A	P
3	E.F.T	EN 61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 24VDC O/P: 100 %LOAD Ta:25°C	CRITERIA A	P
4	SURGE	EN 61000-4-5 LIGHT INDUSTRY L-N :1KV L,N-PE:1KV	I/P: 24 VDC O/P: 100 %LOAD Ta:25°C	CRITERIA A	P
5	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	TS-400-224: SUPPOSE C300 IS THE MOST CRITICAL COMPONENT	I/P: 24VDC O/P:FULL LOAD Ta= 25°C LIFE TIME=2363856 HRS I/P: 24VDC O/P:FULL LOAD Ta= 40°C LIFE TIME=818565 HRS		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	Q 310 Rated STP80NF12 80A/120V	I/P:29.5 VDC O/P: (1)Full Load Turn On (2) Output Short Ta:25°C	(1) 103 V (2) 103 V	P
2	DCTO DC Diode Peak Voltage	D 400 Rated YG975C6R 20A/600V	I/P:29.5 VC O/P: (1)Full Load Turn On (2) Output Short Ta:25°C	(1) 480 V (2) 508 V	P
3	DC BUS Capacitor Voltage	C400 Rated 150U/450V 105°C 22*30 HU5	I/P:29.5VDC O/P: (1)Full Load Turn On /Off (2) Min load Turn On /Off Ta:25°C	(1) 430 V (2) 430 V	P
4	DC TO AC Power Transistor (D to S) or (C to E) Peak Voltage	Q 520 Rated STP21NM60N 17A/600V	I/P:29.5 VDC O/P: (1)Full Load Turn On (2) Output Short Ta:25°C	(1) 536 V (2) 558 V	P
5	DC TO FAN Power Transistor (D to S) or (C to E) Peak Voltage	Q600 Rated IRF3710 57A/100V	I/P:29.5VDC O/P: (1)Full Load Turn On (2) Output Short Ta:25°C	(1) 97 V (2) 97 V	P
6	DCTO FAN Diode Peak Voltage	D 700 Rated HER203 2A/200V	I/P:29.5 VDC O/P: (1)Full Load Turn On (2) Output Short Ta:25°C	(1) 61 V (2) 56 V	P
7	DC TO CPU Power Transistor (D to S) or (C to E) Peak Voltage	D710 Rated HER203 2A/200V	I/P:29.5 VDC O/P: (1)Full Load Turn On (2) Output Short Ta:25°C	(1) 91 V (2) 98 V	P
8	FAN TO CPU Diode Peak Voltage	D 730 Rated MBR2400 1A/200V	I/P:29.5 VDC O/P: (1)Full Load Turn On (2) Output Short Ta:25°C	(1) 129 V (2) 120 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/4/15	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/6/3	PRODUCT SAMPLE W0904E57	PASS	SANFORD SU	VINCENT TSENG

2003/24/24 A50-F023