Test Report: NTS-750-124

750W High Reliable True Sine Wave DC-AC Power Inverter

- DESIGN VERIFY TEST

  Output Function Test

  Input Function Test

  Protection Function Test

  Control Function Test

  APPLICATION Test

  Component Stress Test

- SAFETY & E.M.C. TEST

  Safety Test

  E.M.C. Test

- RELIABILITY TEST

  ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RATED POWER	750W	IP: 24VDC Ta:25℃	765 W
2	MAXIMUM OUTPUT POWER (TYP)	(1)862W/180sec. (2)1125w/10sec (3)SURGE POWER 1500W FOR 30CYCLE Vin (30 ± 5 CYCLE)	IP: 25VDC OP:TESTING LOAD Ta:25℃	(1) 109.68 V / 7.93 A / 180.08 Sec (2) 109.43 V / 10.28 A / 10.07 Sec (3) 107.7 V / 13.43 A/ 33 Cycle

CH3:O/P VAC CH4:O/P IAC

Fig1

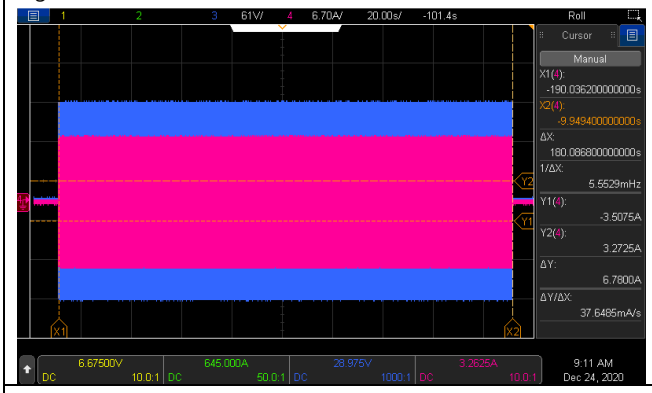


Fig2

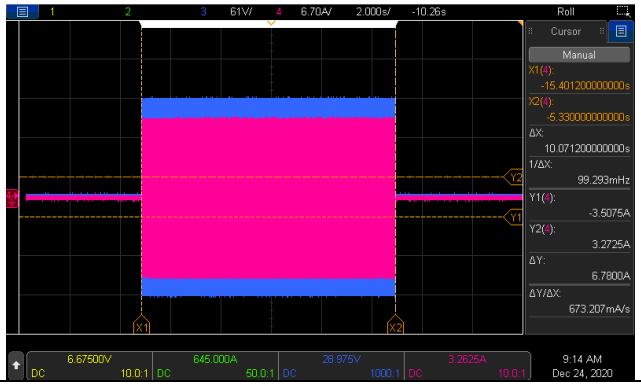
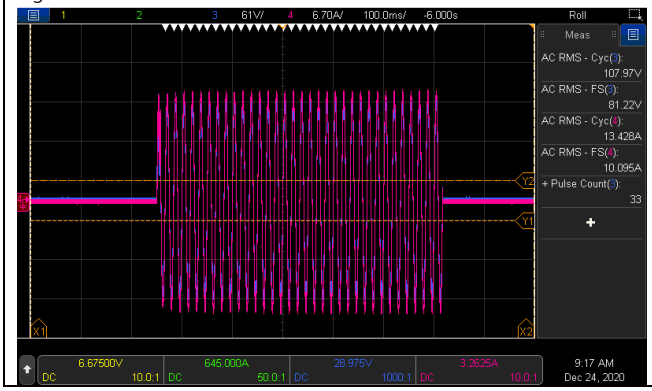


Fig3



3	AC Voltage	100 / 110 / 115 / 120Vac selectable by DIP S.W	IP: 24VDC OP: FULL LOAD Ta:25℃	DIP S.W 100VAC: 99.73 V DIP S.W 110VAC: 109.79 V DIP S.W 115VAC: 114.20 V DIP S.W 120VAC: 119.84 V
4	FREQUENCY	50/60Hz (±0.1HZ) selectable by DIP S.W	IP: 24VDC OP: FULL LOAD Ta:25℃	DIP S.W 50HZ: 50.041 HZ DIP S.W 60HZ: 59.958 HZ

5	WAVEFORM	True sine wave (THD<3%)	IP: 25VDC OP:80% LOAD(600W) (1) Vo(min) (2) Vo(nor) (3) Vo(max) Ta:25℃	(1) 1.93 % / Vo(min) /80% LOAD (2) 1.62 % / Vo(nor) /80% LOAD (3) 1.59 % / Vo(max) /80% LOAD

CH3:O/P VAC CH4:O/P IAC

Fig1

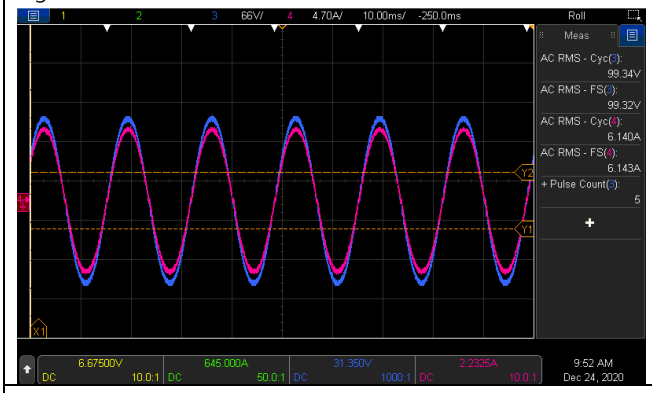


Fig2

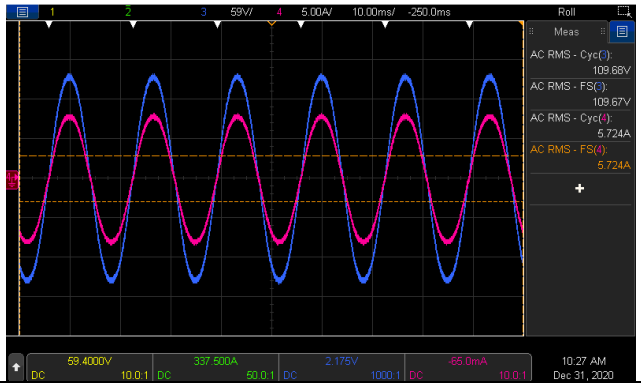
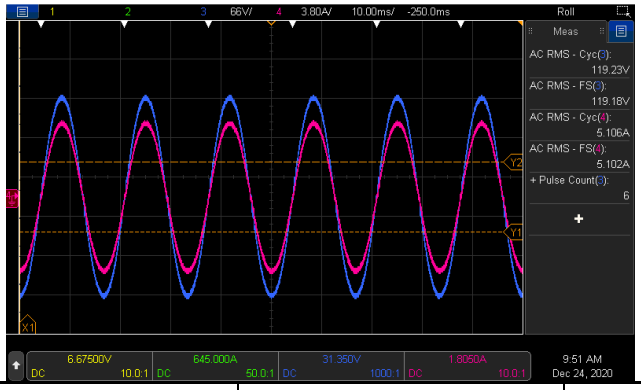


Fig3



6	AC REGULATION	±3%	IP: 25VDC OP:80% LOAD(600W) Ta:25℃	-0.155 %
7	Overshoot /Undershoot	<±10%	IP: 24VDC OP: (1) full load turn on (2) no load turn on (3) full /no load change Ta:25℃	(1) -6.91 % (2) -4.64 % (3) -6.64 %
8	O/P voltage DC offset	Vin(nor)= 24 v · Vo<200mV · no load : 85 mV / full load: 133.8 mV		

10	LED STATUS	● Statas test

LED	Statas	RESULT
Green	Inverter OK	OK
Orange	Remote off Saving mode	OK
Red	Abnormal Status (See SPEC)	OK

● Battery test

LED	Battery RANGE	RESULT
Green	25.0~31.0 Vdc±0.5v	25.126Vdc ~ 31.09Vdc
Orange	22~ 25Vdc ±0.5v	22.121Vdc ~ 24.963Vdc
Red	<22.0 Vdc ±0.5v > 31.0vdc±0.5v	< 22.072 Vdc > 31.139 Vdc

● Load test

LED	LOAD RANGE	RESULT
Green	Min. load ~ 40%±5% LOAD	Min. load ~42.27%
Orange	40%±5% ~ 80%±5% LOAD	42.4%~ 81.6%
Red	≧ 80%±5% LOAD	≧ 81.73%

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	VOLTAGE RANGE (TYP)	20VDC~33VDC	IP: TESTING OP:NO LOAD/FULL LOAD Ta:25℃	20.15 VDC~ 33.03 VDC/NO LOAD 20.20 VDC~ 33.046 VDC/FULL LOAD
			I/P: LOW-LINE=20.5V HIGH-LINE=32.5V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON:30Sec OFF:30Sec 10MIN (POWER ON/OFF NO DAMAGE) I/P: 24V O/P:FULL LOAD ON:30ec OFF:30ec 12Hr (POWER ON/OFF NO DAMAGE)	Test: OK

2	DC CURRENT (TYP)	38A	IP: 24VDC OP:FULL LOAD Ta:25℃	34.96 A
3	NO LOAD DISSPATION (Typ.)	NON-Saving Mode=10W	IP: 24VDC OP:NO LOAD Ta:25℃	6.72 W
		SAVING MODE (1) Po： Default disable, auto detect AC output load ≦ 10W will be changed to saving mode (2) Pi ： ≦1.4 W	IP: 24VDC OP: TESTING LOAD Ta:25℃	NORMAL TO SAVING MODE: ≦ 15.22 W
			IP: 24VDC OP: TESTING LOAD Ta:25℃	0.77 W
4	OFF MODE CURRENT DRAW (Typ.)	≦ 1mA	IP: 24VDC OP: Sw off Ta:25℃	0.76 mA
5	EFFICIENCY(TYP)	600W/90%	IP: 25VDC OP: Po=600W 230V/50HZ (factory setting) Ta:25℃	92.38%

PROTECTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	BAT LOW ALARM	22V±0.5VDC	IP: TESTING OP:FULL LOAD SW:ON Ta:25℃	22.05 V
2	BAT LOW SHUT DOWN	20V±0.5VDC	IP: TESTING OP: FULL LOAD SW:ON Ta:25℃	20.16 V
3	BAT LOW RESTART	25V±0.5VDC	IP: TESTING OP: FULL LOAD SW:ON Ta:25℃	25.09 V
4	BAT HIGH ALARM	31V±0.5VDC	IP: TESTING OP:FULL LOAD SW:ON Ta:25℃	31.11 V
5	BAT HIGH SHUT DOWN	33V±0.5VDC	IP: TESTING OP: FULL LOAD SW:ON Ta:25℃	33.04 V
6	BAT HIGH RESTART	30V±0.5VDC	IP: TESTING OP: FULL LOAD SW:ON Ta:25℃	30.13 V

7	OVER TEMPERATURE	Shut down o/p voltage: re-power on	IP: HI LINE/LOW-LINE OP: FULL LOAD SW:ON Ta:25℃	Shut down o/p voltage, re-power on to recover LED DISPLAY: OK
8	OUTPUT SHORT	Shut down o/p voltage: re-power on	IP: 24VDC O/P: FULL LOAD SW:ON Ta:25℃	Shut down o/p voltage, re-power on to recover LED DISPLAY: OK TEST: OK
9	OVER LOAD (typ.)	105%~115%LOAD 180sec 115%~150%LOAD 10 sec Shut down o/p voltage, re-power on to recover	IP: 24VDC OP: TESTING SW:ON Ta:25℃	(1). 105.87 %~ 114.67 % 180.08 sec (2). 114.8 %~ 147.73 % 10.075 sec Shut down o/p voltage, re-power on to recover

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	REMOTE CONTROL	Power ON-OFF remote control by front panel dry contact connector (by RELAY) Open : Normal work Short : Remote off	IP: 24VDC OP: FULL LOAD Ta:25℃	Open : Normal work Short : Remote off TEST: OK

APPLICATION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	LAMP	LAMP: 459 W · turn on OK LAMP: 756 W · turn on OK LAMP: 832 W · turn on OK	1. Vin=HIGH LINE 2. O/P=110V/60Hz TEST: OK	
2	INDUCTION MOTOR	0.35 HP	1. Vin=HIGH LINE 2. O/P=110V/60Hz TEST: OK	
3	SWITCHING POWER SUPPLY	WITH PFC: RSP-1600-48 · O/P= 761 W	1. Vin=HIGH LINE 2. O/P=110V/60Hz TEST: OK	
		NO PFC: SE-1000-48 · O/P= 350 W	1. Vin=HIGH LINE 2. O/P=110V/60Hz TEST: OK	

COMPONENT WEAFORM TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	DC TO DC Power Transistor (D to S) or (C to E) Peak Voltage	Q102 Rated : 120V /100 A	I/P: high line O/P:V(max)/Freq 60HZ VDS: O/P: (1)Full Load Turn On (2) Output Short (3)O.L.P(200%) Turn On (4) NO LOAD Turn On (5) Saving mode Ta:25℃	(1) 76.4V (2) 74.0V (3) 78.0V (4) 72.4V (5) 74.8V

2	DC TO DC Diode Peak Voltage	D 105 Rated : 600V/ 20A	I/P: high line O/P:V(max) /Freq 60HZ O/P: (1)Full Load Turn On (2) Output Short (5)O.L.P(200%) Turn On (4) NO LOAD Turn On (5) Saving mode Ta:25℃	(1) 294V (2) 310V (3) 294V (4) 298V (5) 298V
3	DC BUS Capacitor Voltage	C118 Rated : 390 u/ 315 V	I/P: high line O/P:V(max) /Freq 60HZ O/P: (1)Full Load Turn On (2) Output Short (3)O.L.P(200%) Turn On (4) NO LOAD Turn On (5) Saving mode Ta:25℃	C118 (1) 293V (2) 293V (3) 293V (4) 293V (5) 293V
4	DC TO AC Power Transistor (D to S) or (C to E) Peak Voltage	Q 200 Rated : 40A / 600 V	I/P: high line O/P:V(min)/Freq 50HZ VDS: O/P: (1)Full Load Turn On (2) Output Short (3)O.L.P(200%) Turn On (4) NO LOAD Turn On (5) Saving mode Ta:25℃	(1) 294V (2)398V (3) 322V (4) 306V (5) 306V
5	AUX PWM MOS	Q504 Rated : 40 A/ 200 V Q105 Rated : 40 A/ 200 V	I/P: high line O/P:V(max) /Freq 60HZ O/P: (1)Full Load Turn On (2) Output Short (5)O.L.P(200%) Turn On (4) NO LOAD Turn On (5) Saving mode Ta:25℃	Q504 (1) 82.8V (2) 82.8V (3) 82.8V (4) 82.8V (5) 82.8V Q105 (1) 65.5V (2) 65.5V (3) 65.1V (4) 65.5V (5) 65.5V
6	Control IC Voltage Test	MCU IC U303 Rated 2.4 V~ 3.6 V AUX IC U501 Rated 8.2V~30V CHARGE IC U101 Rated -0.3V~20V	I/P: high line O/P:V(max) /Freq 60HZ O/P: (1)Full Load Turn On (2) Output Short (3)O.L.P(200%) Turn On (4) NO LOAD Turn On (5) Saving mode Ta:25℃	U303 (1) 3.34V (2) 3.38V (3) 3.34V (4) 3.34V (5) 3.34V U501 (1) 13.67V (2) 13.67V (3) 13.67V

		Gate Driver IC U200 Rated -0.3V~20V		(4) 13.67V (5) 13.67V U101 (1) 12.38V (2) 12.38V (3) 12.38V (4) 12.38V (5) 12.38V U200 (1) 5.06V (2) 5.02V (3) 5.06V (4) 5.06V (5) 5.06V

SAFETY &EMC TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	BAT I/P-ACO/P: 3 KVAC/min AC O/P-FG: 1.5 KVAC/min	BATI/P-ACO/P 3.6 KVAC/min AC O/P-FG:1.8 KVAC/min Ta:25℃	BAT I/P-ACO/P: 2.418 mA AC O/P-FG: 6.38 mA NO DAMAGE
2	GROUNDING CONTINUITY	IEC62368 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25℃	3mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RADIATION	▓ FCC(expect for Type-UN) CLASS A	I/P:24 VDC O/P: :FULL/50% LOAD Ta:25℃	
2	E.S.D	EN61000-4-2 AIR：8KV / Contact：4KV	I/P: 12VDC O/P:FULL LOAD Ta:25℃	■ CRITERIA A □ CRITERIA B
3	Test by certified Lab & Test Report Prepare Any contradictions of the test results, please refer to the latest EMC test report			

Reliability Test

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL：NTS-750-124 1. ROOM AMBIENT BURN-IN：2 HRS I/P： 12.5VDC O/P： FULL LOAD Ta= 26.5 ℃ 2. HIGH AMBIENT BURN-IN： 2 HRS I/P： 12.5VDC O/P： FULL LOAD Ta= 44.5 ℃		
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 25VDC O/P： 100%LOAD Ta= -25 ℃	TEST：OK

NO	Position	ROOM AMBIENT Ta=26.5 ℃	HIGH AMBIENT Ta= 44.5 ℃
1	Q102	37.8℃	56.5℃
2	C101	38.4℃	55.6℃
3	Q103	40.6℃	59.6℃
4	C146	44.2℃	60.3℃
5	T101	50.8℃	65.2℃
6	RT300	40.7℃	59.1℃
7	U501	45.5℃	59.7℃
8	U303	41.5℃	58.2℃
9	L100	54.0℃	68.9℃
10	C112	50.7℃	66.1℃
11	D107	64.3℃	81.6℃
12	D105	62.5℃	79.7℃
13	U101	33.4℃	50.5℃
14	Q200	74.3℃	90.7℃
15	Q202	74.5℃	90.4℃
16	TSW1	43.3℃	60.4℃
17	C119	43.7℃	57.8℃
18	C118	40.1℃	54.9℃
19	ZR200	31.9℃	51℃
20	C219	28.9℃	47.7℃
21	L201	38.3℃	55.3℃
22	L200	41.1℃	57.1℃
23	C115	31.3℃	49℃
24	T501	33.6℃	51.3℃
25	T100	31.8℃	49.4℃
26	Q504	40.0℃	57℃
27	Q501	45.3℃	60.3℃
28	R149	33.3℃	50.1℃
29	U500	38.5℃	56.1℃
30	U200	41.2℃	58.5℃
31	U100	40.2℃	57.7℃

3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 ℃ NO DAMAGE	I/P：32.5VDC O/P：FULL LOAD Ta= 40 ℃ HUMIDITY= 95 %R.H	TEST：OK
4	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
5	THERMAL SHOCK TEST	1. Thermal shock Temperature： -25℃~ +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： 25VDC/Full Load		TEST：OK
6	VIBRATION TEST	1 Carton & 1 Set (1) Waveform： Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：10min/sweep cycle (4) Acceleration：4G (5) Test Time：60min in each axis (X.Y.Z) (6) Ta：25℃		TEST：OK
7	CAPACITOR LIFE CYCLE	SUPPOSE C146 IS THE MOST CRITICAL COMPONENT (1) I/P： 12.5VDC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME (2) I/P： 12.5VDC O/P：FULL LOAD Ta= 40 ℃ LIFE TIME		(1) 1096452.8HRS (2) 438189.1HRS
8	MTBF	Conducted by Parts Stress Analysis Prediction 715.7K hrs min. Telcordia SR-332 (Bellcore) ; 78.0K hrs min. MIL-HDBK-217F (25℃)		
9	Ongoing Reliability Test	I/P：25VDC O/P：80% LOAD TA=50℃ Demonstration Mean Time Between Failure : 30,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIUTT		WANGDZ

2018.4.30 GP-A50-F010