



Test Report: NDR-75-48

75W Single Output Industrial DIN RAIL

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function 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	VERDICT
1	RIPPLE & NOISE	V1 : 150 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 38.8 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 48 V ~ 55 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	46.92 V ~ 57.80 V / 230 VAC 46.92 V ~ 57.80 V / 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : -1%~ 1 % (Max)	I/P : 100VAC / 264 VAC O/P : FULL / MIN LOAD Ta : 25°C	V1 : -0.012 %~ 0.025 %	P
4	LINE REGULATION	V1 : -0.5%~ 0.5 % (Max)	I/P : 100VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : -0.012 %~ 0.012 %	P
5	LOAD REGULATION	V1 : -1%~ 1 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : -0.012 %~ 0.025 %	P
6	SET UP TIME	230VAC : 1200 ms (Max) 115VAC : 2000 ms(Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 734.245 ms 115VAC/ 1555.515 ms	P
7	RISE TIME	230VAC : 60 ms (Max) 115VAC : 60 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 21.413 ms 115VAC/ 22.362 ms	P
8	HOLD UP TIME	230VAC : 60 ms (TYP) 115VAC : 12 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 87.814 ms 115VAC/ 19.507 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	< 5%	P
10	DYNAMIC LOAD	V1 : 4800 mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 90%DUTY/ 3KHZ (3).O/P : FULL /Min LOAD 90%DUTY/ 5KHZ (4).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1)201 mVp-p (2)150 mVp-p (3)128 mVp-p (4)412 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
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1	INPUT VOLTAGE RANGE	90VAC~264 VAC 127VDC ~ 370VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL / 50% LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL / 50% LOAD Ta : 25°C	(1) 57.737V~264V (2) 115.9Vdc~370Vdc/FULL LOAD 115.8Vdc~370Vdc/50% LOAD (3) 115.9Vdc~370Vdc/FULL LOAD 115.8Vdc~370Vdc/50% LOAD	P
			I/P : LOW-LINE-3V= 87 V (PLEASE CHECK DERATING CURVE) HIGH-LINE+15%=300 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST : OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P : 90 VAC ~ 264 VAC O/P : FULL~MIN LOAD Ta : 25°C	TEST : OK	P
4	EFFICIENCY	89 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	90.0 %	P
5	INPUT CURRENT	230V/ 0.9 A (TYP) 115V/ 1.45 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.68 A/ 230 VAC I = 1.30 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 35 A (TYP) 115V/ 20 A(TYP) COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 33.671 A/ 230 VAC I = 17.625 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.527 mA N-FG : 0.519 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~ 130 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	122.8%/ 230 VAC 122.7%/ 115 VAC Protection type : Constant current limiting, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH1 : 56 V ~ 65V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	63.2V/ 230 VAC 63.0V/ 115 VAC Protection type : Shut down o/p voltage, re-power on to recover	P
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Protection type : Shut down o/p voltage, re-power on to recover	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Constant Current Limiting, recovers automatically after fault condition is removed	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q 1 Rated : 600V / 10A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 492 V (2) 392 V (3) 494 V	P
2	Diode Peak Voltage	D 100 Rated : 300V / 20 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 237 V (2) 187 V (3) 237 V	P
3	Clamp Diode Peak Voltage	D 5 Rated : 600 V / 3 A	I/P : High-Line +3V = 267 V O/P : (1) Dynamic Load 90%Duty/1KHz (2)Full load continue Ta : 25°C	(1) 446 V (2) 448 V	P
4	Input Capacitor Voltage	C5 Rated : 150u /400 V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 368 V (2) 366 V (3) 368 V	P
5	Control IC Voltage Test	U 1 Rated : 28 V ~ 9V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 17.9 V (2) 22.0 V (3) 18.0 V	P

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min I/P-FG : 2 KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 3.6 KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 3.59 mA I/P-FG : 3.40 mA O/P-FG : 2.93 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ I/P-FG : 500VDC>100MΩ O/P-FG : 500VDC>100MΩ	I/P-O/P : 500 VDC I/P-FG : 500 VDC O/P-FG : 500 VDC Ta : 25°C/70% RH	I/P-O/P : 3433 MΩ I/P-FG : 2057 MΩ O/P-FG : 4179 MΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C /70% RH	28 mΩ	P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	BS EN/EN61000-3-2 CLASS A	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS	P
2	CONDUCTION	BS EN/EN55032 (CISPR32) CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	BS EN/EN55032 (CISPR32) CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab	P
4	E.S.D	BS EN/EN61000-4-2 INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	BS EN/EN61000-4-4 INDUSTRY INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	BS EN/EN61000-4-5 INDUSTRY L-N : 2KV L,N-PE : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																												
1	TEMPERATURE RISE TEST	MODEL : NDR-75-24 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta=31°C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta=46.5°C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=31.0°C</th> <th>HIGH AMBIENT Ta=46.5°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF2</td><td>51.6°C</td><td>66.2°C</td></tr> <tr><td>2</td><td>C200</td><td>53.9°C</td><td>69.0°C</td></tr> <tr><td>3</td><td>BD1</td><td>59.3°C</td><td>73.4°C</td></tr> <tr><td>4</td><td>C5</td><td>54.3°C</td><td>68.9°C</td></tr> <tr><td>5</td><td>Q1</td><td>60.9°C</td><td>76.1°C</td></tr> <tr><td>6</td><td>U1</td><td>55.2°C</td><td>71.3°C</td></tr> <tr><td>7</td><td>D100</td><td>63.5°C</td><td>78.0°C</td></tr> <tr><td>8</td><td>T1</td><td>77.0°C</td><td>90.7°C</td></tr> <tr><td>9</td><td>C36</td><td>71.0°C</td><td>85.1°C</td></tr> <tr><td>10</td><td>D5</td><td>73.6°C</td><td>88.1°C</td></tr> <tr><td>11</td><td>U107</td><td>55.5°C</td><td>70.0°C</td></tr> <tr><td>12</td><td>C106</td><td>57.8°C</td><td>72.2°C</td></tr> <tr><td>13</td><td>RTH2</td><td>68.8°C</td><td>82.6°C</td></tr> <tr><td>14</td><td>ZNR1</td><td>48.8°C</td><td>63.8°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=31.0°C	HIGH AMBIENT Ta=46.5°C	1	LF2	51.6°C	66.2°C	2	C200	53.9°C	69.0°C	3	BD1	59.3°C	73.4°C	4	C5	54.3°C	68.9°C	5	Q1	60.9°C	76.1°C	6	U1	55.2°C	71.3°C	7	D100	63.5°C	78.0°C	8	T1	77.0°C	90.7°C	9	C36	71.0°C	85.1°C	10	D5	73.6°C	88.1°C	11	U107	55.5°C	70.0°C	12	C106	57.8°C	72.2°C	13	RTH2	68.8°C	82.6°C	14	ZNR1	48.8°C	63.8°C		P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 113% LOAD Ta : 25°C	TEST : OK	P																																																												
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -20°C	TEST : OK	P																																																												
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50°C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50°C HUMIDITY= 95 %R.H	TEST : OK	P																																																												
5	TEMPERATURE COEFFICIENT	±0.03%/°C (0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0%/°C (0~50°C)	P																																																												
6	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		OK	P																																																												
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -20°C~ +70°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 : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P																																																												

8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK	P
9	CAPACITOR LIFE CYCLE	SUPPOSE C106 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25°C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=50°C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=50°C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=50°C LIFE TIME	(1) 327994 HRS (2) 62141 HRS (3) 64750 HRS (4) 106015 HRS	P
10	MTBF	2757.3K hrs min. Telcordia SR-332 (Bellcore) ; 486.2K hrs min. MIL-HDBK-217F (25°C)		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C		P

SAMPLE	TESTER	APPROVAL
PRODUCT SAMPLE	FRANK	WangDZ

2007/3/20 A50-S014