



Test Report: NDR-75-24

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 : 120 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 18.2 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 24 V ~ 28 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	23.34 V ~ 28.77 V / 230 VAC 23.34 V ~ 28.77 V / 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : -1% ~ 1% (Max)	I/P : 100 VAC / 264 VAC O/P : FULL / MIN LOAD Ta : 25°C	V1 : -0.07% ~ 0.05%	P
4	LINE REGULATION	V1 : -0.5% ~ 0.5% (Max)	I/P : 100VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : -0.025% ~ 0.025%	P
5	LOAD REGULATION	V1 : -1% ~ 1% (Max)	I/P : 230 VAC O/P : FULL ~ MIN LOAD Ta : 25°C	V1 : -0.07% ~ 0.05%	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/ 738.628 ms 115VAC/ 1633.666 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/ 25.518 ms 115VAC/ 30.675 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/ 85.301 ms 115VAC/ 18.777 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	< 5%	P
10	DYNAMIC LOAD	V1 : 2400 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) 147 mVp-p (2) 158 mVp-p (3) 153 mVp-p (4) 218 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	57.718V~264V	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	88 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	89.0 %	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 = 1.36 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 = 34.421 A/ 230 VAC I = 18.359 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.509 mA N-FG : 0.601 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	113%/ 230 VAC 113%/ 115 VAC Constant Current Limiting,recovers automatically after fault condition removed	P
2	OVER VOLTAGE PROTECTION	CH1 : 29 V ~ 33 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	32.4 V/ 230 VAC 32.2V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Shut down Re-power ON	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Shut down Re-power ON Constant Current Limiting,recovers automatically after fault condition 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) 496 V (2) 392 V (3) 492 V	P
2	Diode Peak Voltage	D 100 Rated : 150V /10 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) 125 V (2) 101 V (3) 124 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) 444 V (2) 444 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) 366 V (2) 364 V (3) 364 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) 17.8 V (2) 20.0 V (3) 17.9 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 : 3.41 mA I/P-FG : 3.30 mA O/P-FG : 2.90 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 : 3823 MΩ I/P-FG : 2165 MΩ O/P-FG : 4418 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	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 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 INDUSTRY INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 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℃ 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta=46.5℃ <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=31.0℃</th><th>HIGH AMBIENT Ta=46.5℃</th></tr><tr><td>1</td><td>LF2</td><td>51.6℃</td><td>66.2℃</td></tr><tr><td>2</td><td>C200</td><td>53.9℃</td><td>69.0℃</td></tr><tr><td>3</td><td>BD1</td><td>59.3℃</td><td>73.4℃</td></tr><tr><td>4</td><td>C5</td><td>54.3℃</td><td>68.9℃</td></tr><tr><td>5</td><td>Q1</td><td>60.9℃</td><td>76.1℃</td></tr><tr><td>6</td><td>U1</td><td>55.2℃</td><td>71.3℃</td></tr><tr><td>7</td><td>D100</td><td>63.5℃</td><td>78.0℃</td></tr><tr><td>8</td><td>T1</td><td>77.0℃</td><td>90.7℃</td></tr><tr><td>9</td><td>C36</td><td>71.0℃</td><td>85.1℃</td></tr><tr><td>10</td><td>D5</td><td>73.6℃</td><td>88.1℃</td></tr><tr><td>11</td><td>U107</td><td>55.5℃</td><td>70.0℃</td></tr><tr><td>12</td><td>C106</td><td>57.8℃</td><td>72.2℃</td></tr><tr><td>13</td><td>RTH2</td><td>68.8℃</td><td>82.6℃</td></tr><tr><td>14</td><td>ZNR1</td><td>48.8℃</td><td>63.8℃</td></tr></table>			NO	Position	ROOM AMBIENT Ta=31.0℃	HIGH AMBIENT Ta=46.5℃	1	LF2	51.6℃	66.2℃	2	C200	53.9℃	69.0℃	3	BD1	59.3℃	73.4℃	4	C5	54.3℃	68.9℃	5	Q1	60.9℃	76.1℃	6	U1	55.2℃	71.3℃	7	D100	63.5℃	78.0℃	8	T1	77.0℃	90.7℃	9	C36	71.0℃	85.1℃	10	D5	73.6℃	88.1℃	11	U107	55.5℃	70.0℃	12	C106	57.8℃	72.2℃	13	RTH2	68.8℃	82.6℃	14	ZNR1	48.8℃	63.8℃		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℃	TEST : OK	P																																																													
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -20℃	TEST : OK	P																																																													
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50℃ NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																													
5	TEMPERATURE COEFFICIENT	±0.03%/℃ (0~50℃)	I/P : 230 VAC O/P : FULL LOAD	± 0%/℃ (0~50℃)	P																																																													
6	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		OK	P																																																													
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -20℃~ +70℃ 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 : 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	MIL-HDBK-217F TOTAL FAILURE RATE : 486.2 KHRS		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

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