



Test Report: WDR-480-24

480W Single Output Industrial DIN RAIL Power Supply

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Protection Function Test
Control 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 : 100 mVp-p (Max)	I/P : 400VAC O/P : FULL LOAD Ta : 25°C	V1 : 32.2 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 24 V ~ 28 V	I/P : 400 VAC I/P : 230 VAC O/P : MIN LOAD Ta : 25°C	23.458 V ~ 28.722 V/ 400 VAC 23.456 V ~ 28.722 V/ 230 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : 1 %~ -1 % (Max)	I/P : 200 VAC / 550 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 0.2 %~ -0.2 %	P
4	LINE REGULATION	V1 : 0.5%~ -0.5 % (Max)	I/P : 200 VAC ~ 550 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0.01 %~ -0.01 %	P
5	LOAD REGULATION	V1 : 1 %~ -1 % (Max)	I/P : 400 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : 0.2 %~ -0.2 %	P
6	SET UP TIME	400VAC : 800 ms (Max) 230VAC : 2000 ms(Max)	I/P : 400 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	400VAC/ 510 ms 230VAC/ 976 ms	P
7	RISE TIME	400VAC : 150 ms (Max) 230VAC : 150 ms (Max)	I/P : 400 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	400VAC/ 55 ms 230VAC/ 106 ms	P
8	HOLD UP TIME	400VAC : 18 ms (TYP) 230VAC : 16 ms (TYP)	I/P : 400 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	400VAC/ 18.8 ms 230VAC/ 18 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P : 400 VAC O/P : FULL LOAD Ta : 25°C	TEST : < 5 %	P
10	DYNAMIC LOAD	V1 : 2400 mVp-p	I/P : 400 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1). 417 mVp-p (2). 608 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	180VAC~550 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C I/P : LOW-LINE-3V= 177 V HIGH-LINE+15%=550 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	167 V~550V TEST : OK	P
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P : 180 VAC ~ 550 VAC O/P : FULL~MIN LOAD Ta : 25°C	TEST : OK	P
3	EFFICIENCY	92 % (TYP)	I/P : 400 VAC O/P : FULL LOAD Ta : 25°C	92.96 %	P
4	INPUT CURRENT	400V/ 1.6 A (TYP) 230V/ 4 A (TYP)	I/P : 400 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 1.5 A/ 400 VAC I = 2.57 A/ 230 VAC	P
5	INRUSH CURRENT	400V/ 50 A (TYP) COLD START	I/P : 400 VAC O/P : FULL LOAD Ta : 25°C	I = 40 A/ 400 VAC	P
6	LEAKAGE CURRENT	< 3.5 mA / 530 VAC	I/P : 530 VAC O/P : Min LOAD Ta : 25°C	L-FG : 1.5 mA N-FG : 1.5 mA	P
7	POWER FACTOR	0.84 / 400VAC(TYP) 0.84 / 230 VAC(TYP)	I/P : 400 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.862 / 400VAC PF= 0.863 / 230 VAC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~ 130 %	I/P : 400 VAC I/P : 230 VAC O/P : TESTING Ta : 25°C	114 %/ 400 VAC 114 %/ 230 VAC Constant current limiting, unit will shut down after 3 sec. , auto-recovery after 1 minute if the fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH1 : 29~ 33 V	I/P : 400 VAC I/P : 230 VAC O/P : MIN LOAD Ta : 25°C	30.45 V/ 400 VAC 30.45 V/ 230 VAC Shut down o/p voltage, auto-recovery after 1 minute if the fault condition is removed	P
3	OVER TEMPERATURE PROTECTION	SPEC : TSW1 : 95 ± 5°C O.T.P. NO DAMAGE	I/P : 400 VAC O/P : FULL LOAD	O.T.P.Active Shut down o/p voltage , recovers automatically after temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 550 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Constant current limiting, unit will shut down after 3 sec. , auto-recovery after 1 minute if the fault condition is removed	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	DO OK RELAY CONTACT RAYINGS	60VDC/0.3A 、 30VDC/1A 、 30VAC/0.5A resistive load	I/P : 550 VAC O/P : FULL LOAD Ta : 25℃	OK	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 40 Rated : IRFB4229PbF 46A/250V	I/P : High-Line +3V = 553 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25℃	(1) 250 V (2) 250 V (3) 243 V	P
2	Diode Peak Voltage	Q100 Rated : IRFB3307 130A/75V	I/P : High-Line +3V = 553 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25℃	(1) 65.6 V (2) 66.9 V (3) 63.1 V	P
3	Input Capacitor Voltage	C 5 Rated : 390u/250V 105℃ 22*30 KMR	I/P : High-Line +3V = 553 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25℃	(1) 204 V (2) 205 V (3) 205 V	P
4	Control IC Voltage Test	U2 Rated : L6599AD 8.85V~16V	I/P : High-Line +3V = 553 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25℃	(1) 14.466 V (2) 14.278 V (3) 14.299 V	P
5	Power Transistor (D to S) or (C to E) Peak Voltage	Q901 Rated : IPW90R500C3 11A/900V	I/P : High-Line +3V = 553 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25℃	(1) 900 V (2) 900 V (3) 900 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 : 9.09 mA I/P-FG : 6.9 mA O/P-FG : 11.2 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 : 30 GΩ I/P-FG : 30 GΩ O/P-FG : 30 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	10 mΩ	P
4	APPROVAL	TUV : Certificate NO : UL : File NO : E215312			P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P : 400 /240/220VAC 50HZ O/P : 100/75/50/25%LOAD Ta : 25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P : 400 /230VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P : 400 /230VAC (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 : 400 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 INDUSTRY INPUT : 2KV	I/P : 400 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 : 400 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.	THERMO TRACER TEST (ROOM AMBIENT)	MODEL: WDR-480-24 TEST CONDITION: 100 VAC FULL LOAD ROOM AMBIENT = 25.4 °C			P																																																																																																																												
99210002.1RI (定點測溫) 111 101 90 80 70 60 49 39 29 18 8 熱顯像調整 自動加調整 高溫99.9℃ 低溫22.1℃ 座標: 185, 2 原資料溫度: 25.4℃(EO.94) 放射率: 0.94 修正後溫度: 25.4℃(EO.94) 環境溫度: 27.8℃ 最高溫(H): 99.9℃ 座標: 200,173 最低溫(L): 22.1℃ 座標: 292,236 全域放射率: 0.940 日期: 2009/ 9/21 時間: 17:24:21 <table><tr><td>p 1: 80.8℃</td><td>138x, 99y</td><td>P1</td><td>L6</td><td>80.8</td><td>PASS</td></tr><tr><td>p 2: 59.8℃</td><td>176x, 146y</td><td>P2</td><td>L8</td><td>59.8</td><td>PASS</td></tr><tr><td>p 3: 60.6℃</td><td>178x, 177y</td><td>P3</td><td>C24</td><td>60.6</td><td>PASS</td></tr><tr><td>p 4: 64.9℃</td><td>105x, 70y</td><td>P4</td><td>C902</td><td>64.9</td><td>PASS</td></tr><tr><td>p 5: 63.6℃</td><td>121x, 166y</td><td>P5</td><td>C107</td><td>63.6</td><td>PASS</td></tr><tr><td>p 6: 80.4℃</td><td>188x, 40y</td><td>P6</td><td>Q902</td><td>80.4</td><td>PASS</td></tr><tr><td>p 7: 64.5℃</td><td>113x, 45y</td><td>P7</td><td>Q40</td><td>64.5</td><td>PASS</td></tr><tr><td>p 8: 70.8℃</td><td>125x, 84y</td><td>P8</td><td>C51</td><td>70.8</td><td>PASS</td></tr><tr><td>p 9: 68.1℃</td><td>184x, 67y</td><td>P9</td><td>C6</td><td>68.1</td><td>PASS</td></tr><tr><td>p10: 73.0℃</td><td>140x, 65y</td><td>P10</td><td>T1</td><td>73.0</td><td>PASS</td></tr><tr><td>p11:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>p12:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>p13:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>p14:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>p15:</td><td></td><td></td><td></td><td></td><td></td></tr></table>				p 1: 80.8℃		138x, 99y	P1	L6	80.8	PASS	p 2: 59.8℃	176x, 146y	P2	L8	59.8	PASS	p 3: 60.6℃	178x, 177y	P3	C24	60.6	PASS	p 4: 64.9℃	105x, 70y	P4	C902	64.9	PASS	p 5: 63.6℃	121x, 166y	P5	C107	63.6	PASS	p 6: 80.4℃	188x, 40y	P6	Q902	80.4	PASS	p 7: 64.5℃	113x, 45y	P7	Q40	64.5	PASS	p 8: 70.8℃	125x, 84y	P8	C51	70.8	PASS	p 9: 68.1℃	184x, 67y	P9	C6	68.1	PASS	p10: 73.0℃	140x, 65y	P10	T1	73.0	PASS	p11:						p12:						p13:						p14:						p15:																																								
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2	TEMPERATURE RISE TEST	MODEL : WDR-480-24 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 400VAC O/P : FULL LOAD Ta= 35.1 °C 2. HIGH AMBIENT BURN-IN : 3.5 HRS I/P : 400VAC O/P : FULL LOAD Ta= 55.1 °C			P																																																																																																																												
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24	L6	TR944	90.6℃	112.1℃																																																																																																																													

3	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 400 VAC O/P : 112 % LOAD Ta : 25°C	TEST : OK	P
4	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 550VAC/100VAC O/P : 100 % LOAD Ta= -30 °C	TEST : OK	P
5	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
6	TEMPERATURE COEFFICIENT	± 0.03 %(0~50°C)	I/P : 400 VAC O/P : FULL LOAD	± 0.003 %(0~50°C)	P
7	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
8.	THERMAL SHOCK TEST	1. Thermal shock Temperature : -35°C~ +55°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 : 400VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P
9	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
10	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 400VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 400VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (3) I/P : 400VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME		(1) 207823.9 HRS (2) 35272.3 HRS (3) 76075.1 HRS	P
11	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 112.8 KHRS			P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2010/4/15	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2010/7/23	PRODUCT SAMPLE	PASS	SANFORD SU	VINCENT TSENG

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