



# Test Report: OWA-120E-12

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120W Single Output Moistureproof Adaptor

## ■ 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

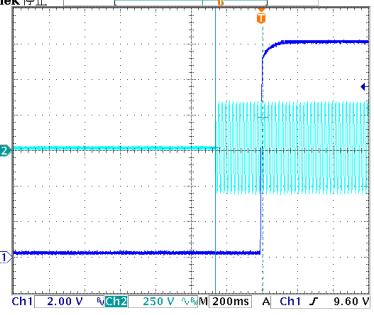
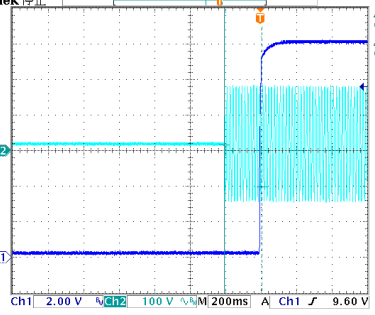
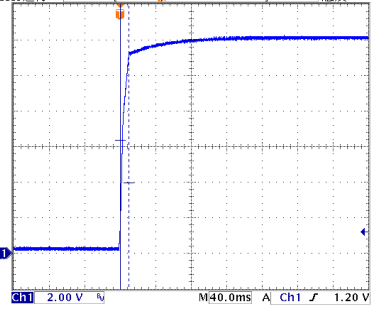
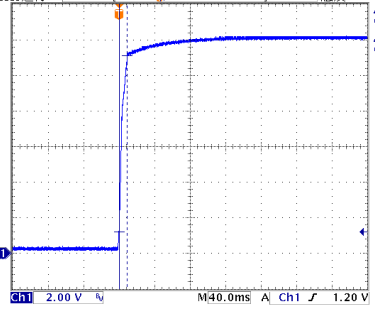
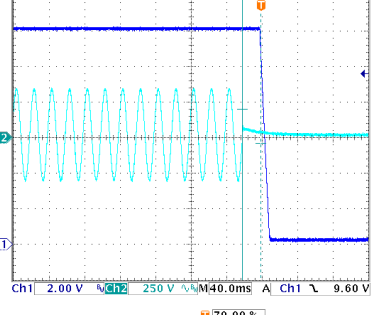
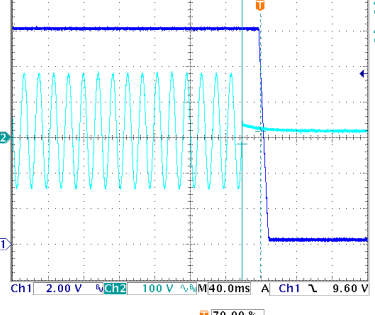
**OUTPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE TOLERANCE	-4.0%~4.0%	I/P: 90 VAC / 264 VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.83%~ 1.08 %
2	LINE REGULATION	-0.5%~0.5%	I/P: 100VAC~ 264VAC O/P: FULL LOAD Ta: 25°C	0%~0 %
3	LOAD REGULATION	-2.0 %~ 2.0%	I/P: 230VAC O/P: FULL ~NO LOAD Ta: 25°C	-0.83%~0.92%
4	DYNAMIC LOAD	1200mVp-p	I/P: 230VAC O/P : (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta: 25°C	(1) 656mVp-p (2) 496mVp-p
		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>FULL /50% LOAD 50%DUTY / 120HZ</p> </div> <div style="text-align: center;"> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p> </div> </div>		
5	OVER/UNDERSHOOT TEST	$\pm 5\%$	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5 %
6	RIPPLE & NOISE (Max)	150mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	18.2mVp-p
		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>high frequency:</p> </div> <div style="text-align: center;"> <p>low frequency:</p> </div> </div>		



120W Single Output Moistureproof Adaptor

OWA-120E series

7	SET UP TIME(Max)	230VAC/ 500ms 115VAC/ 500ms	I/P: 230 VAC I/P: 115 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 268ms 115VAC/ 212ms
<p>INPUT=230VAC/50HZ @ 95% LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 215 V @: 20.0 V Δ: 268ms @: -264ms</p>				<p>INPUT=115VAC/50HZ @ 95% LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 118 V @: 16.0 V Δ: 212ms @: -208ms</p>
8	RISE TIME (Max)	230VAC/ 80ms 115VAC/ 80ms	I/P: 230 VAC I/P: 115 VAC O/P: 95% LOAD Ta: 25°C	230VAC/9.6ms 115VAC/8.8ms
<p>INPUT=230VAC/50HZ @ 95% LOAD</p> <p>CH1: Output Voltage</p>  <p>Δ: 2.40 V @: 6.36 V Δ: 9.60ms @: 0.00 s</p>				<p>INPUT=115VAC/50HZ @ 95% LOAD</p> <p>CH1: Output Voltage</p>  <p>Δ: 9.92 V @: 1.20 V Δ: 8.80ms @: 0.00 s</p>
9	HOLD UP TIME(Typ)	230VAC/ 16ms 115VAC/ 16ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/20.8ms 115VAC/20.8ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 240 V @: 200 V Δ: 20.8ms @: -22.4ms</p>				<p>INPUT=115VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 36.0 V @: 18.0 V Δ: 20.8ms @: -21.6ms</p>



**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	87V~264V
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE+15%=300 V O/P: FULL/MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230VAC ON: 0.5 Sec OFF: 0.5 Sec 20MIN (3)230VAC ON: 3Sec OFF: 3Sec 12HOURS (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~NO LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	1.3A/115VAC 0.65A/230VAC	I/P: 115VAC I/P: 230VAC O/P: FULL LOAD Ta: 25°C	I=1.12A/ 115VAC I=0.57A/ 230VAC
4	LEAKAGE CURRENT	< 0.25mA / 240VAC	I/P: 240VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.003 mA N-FG: 0.003 mA
5	NO LOAD POWER CONSUMPTION	< 0.15W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.093W
6	INRUSH CURRENT(Typ)	60A/230VAC Twidth =520 us measured at 50% Ipeak COLD START	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	I=48A/ 230VAC Twidth =476us
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH2: Input current CH1: AC Input Voltage</p> <p>Ch2 Max 48.0 A</p> <p>40.40 %</p>				
7	EFFICIENCY(Typ)	87.5%/230VAC	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	87.93%
8	POWER FACTOR	0.97/ 115VAC 0.96/ 230VAC	I/P: 115VAC I/P: 230VAC O/P: FULL LOAD Ta: 25°C	PF=0.997/ 115VAC PF=0.971/ 230VAC

**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~115%	I/P: 230VAC O/P: TESTING Ta: 25°C	110.3%/230VAC Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	15V~17V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	16.03V/230VAC Shut down o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 230VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage, re-power on to recover
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup mode, recovers automatically after fault condition is removed

**COMPONENT STRESS TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated 730V/10A	I/P: High-Line +3V =267V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 693V (2) 668V (3) 685V
2	Diode Peak Voltage	Q101 Rated 75V/80A	I/P: High-Line +3V =267V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 65.8V (2) 53.6V (3) 64.5V
3	Input Capacitor Voltage	C5 Rated 100u/450V	I/P: High-Line +3V =267V O/P: (1) Full Load input on/off (2) Min load input on /Off (3) Full Load /Min load Change Ta: 25°C	(1) 445V (2) 440V (3) 446V
4	Control IC Voltage Test	U1 Rated 28V	I/P: High-Line +3V =267V O/P: (1) Full Load input on/off (2) Min load input on /Off (3) Full Load /Min load Change Ta: 25°C	(1) 17.1V (2) 17.3V (3) 17.1V
5	PFC Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 600V/15A	I/P: High-Line +3V =267V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 495V (2) 463V (3) 476V



**SAFETY TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min	I/P-O/P: 4.2KVAC/min Ta: 25°C	I/P-O/P: 1.732mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100MΩ	I/P-O/P: 500VDC Ta: 25°C	I/P-O/P: >9999MΩ

**E.M.C TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230VAC/50HZ O/P: FULL LOAD Ta:25°C	PASS
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR: 8KV Contact: 4KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
6	SURGE	EN61000-4-5 INDUSTRY L-N: 2KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare			

■ **RELIABILITY TEST**

**ENVIRONMENT TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																
1	TEMPERATURE RISE TEST	MODEL: OWA-120E-12 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 27.5°C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 42.4°C																																																																																		
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 27.5 °C</th> <th>HIGH AMBIENT Ta=42.4 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>RTH1</td><td>58.6°C</td><td>71.2°C</td></tr> <tr><td>2</td><td>RTH2</td><td>75.5°C</td><td>94.0°C</td></tr> <tr><td>3</td><td>C11</td><td>77.1°C</td><td>98.7°C</td></tr> <tr><td>4</td><td>D6</td><td>80.1°C</td><td>101.9°C</td></tr> <tr><td>5</td><td>D10</td><td>91.4°C</td><td>116.4°C</td></tr> <tr><td>6</td><td>R7</td><td>91.3°C</td><td>116.4°C</td></tr> <tr><td>7</td><td>Q1</td><td>79.5°C</td><td>102.7°C</td></tr> <tr><td>8</td><td>Q2</td><td>87.7°C</td><td>111.6°C</td></tr> <tr><td>9</td><td>C5</td><td>72.9°C</td><td>91.4°C</td></tr> <tr><td>10</td><td>C45</td><td>69.8°C</td><td>88.1°C</td></tr> <tr><td>11</td><td>U1</td><td>69.1°C</td><td>86.8°C</td></tr> <tr><td>12</td><td>T1</td><td>76.8°C</td><td>97.7°C</td></tr> <tr><td>13</td><td>Q101</td><td>68.5°C</td><td>88.1°C</td></tr> <tr><td>14</td><td>Q102</td><td>65.4°C</td><td>84.1°C</td></tr> <tr><td>15</td><td>C105</td><td>68.9°C</td><td>88.2°C</td></tr> <tr><td>16</td><td>C106</td><td>67.3°C</td><td>86.6°C</td></tr> <tr><td>17</td><td>C110</td><td>63.6°C</td><td>81.6°C</td></tr> <tr><td>18</td><td>RTH3</td><td>66.9°C</td><td>83.9°C</td></tr> <tr><td>19</td><td>TC</td><td>62.0°C</td><td>78.6°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 27.5 °C	HIGH AMBIENT Ta=42.4 °C	1	RTH1	58.6°C	71.2°C	2	RTH2	75.5°C	94.0°C	3	C11	77.1°C	98.7°C	4	D6	80.1°C	101.9°C	5	D10	91.4°C	116.4°C	6	R7	91.3°C	116.4°C	7	Q1	79.5°C	102.7°C	8	Q2	87.7°C	111.6°C	9	C5	72.9°C	91.4°C	10	C45	69.8°C	88.1°C	11	U1	69.1°C	86.8°C	12	T1	76.8°C	97.7°C	13	Q101	68.5°C	88.1°C	14	Q102	65.4°C	84.1°C	15	C105	68.9°C	88.2°C	16	C106	67.3°C	86.6°C	17	C110	63.6°C	81.6°C	18	RTH3	66.9°C	83.9°C	19	TC	62.0°C	78.6°C		
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 264VAC/100VAC O/P: FULL LOAD Ta= -45°C / -30°C	TEST: OK																																																																																
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40°C NO DAMAGE	I/P: 272VAC O/P: FULL LOAD Ta= 40°C HUMIDITY= 95% R.H	TEST: OK																																																																																
4	TEMPERATURE COEFFICIENT	±0.03%/°C (0~50°C)	I/P: 230 VAC O/P: FULL LOAD	±0.019%/°C (0~50°C)																																																																																
5	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		TEST: OK																																																																																



120W Single Output Moistureproof Adaptor

**OWA-120E series**

6	THERMAL SHOCK TEST	1. Thermal shock Temperature: -45°C~+45°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 58 sec, turn off 2 sec;	TEST: OK
7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency: 10~500Hz (3) Sweep Time: 12min/sweep cycle (4) Acceleration: 5G (5) Test Time: 72min in each axis (X.Y.Z) (6) Ta: 25°C	TEST: OK
8	CAPACITOR LIFE CYCLE	OWA-120E-12: SUPPOSE C105 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= 40 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 40 °C LIFE TIME (4) I/P: 230VAC O/P: 50% LOAD Ta= 40 °C LIFE TIME	(1) 160736 HRS (2) 41845 HRS (3) 71402 HRS (4) 165275 HRS
9	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE: 294.3K HRS	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): 50000 hours @ TC 70°C	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	CARYCHEN/ZHOUBIAO	SKY	LIUWY