



# Test Report: OWA-120U-20

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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

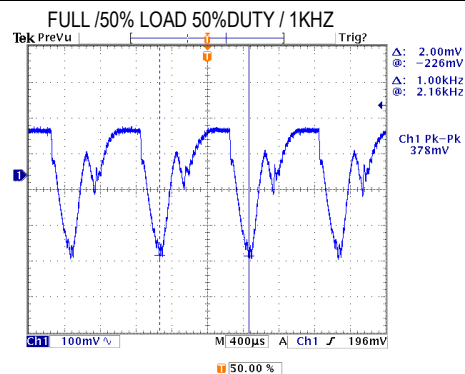
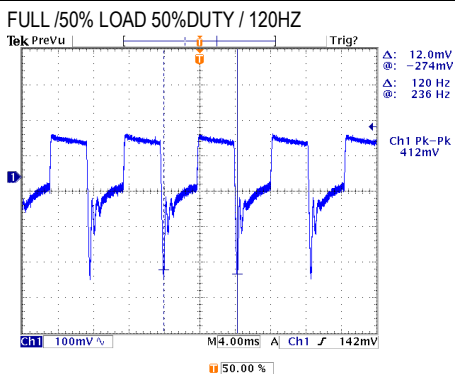
## ■ RELIABILITY TEST

Environment Test

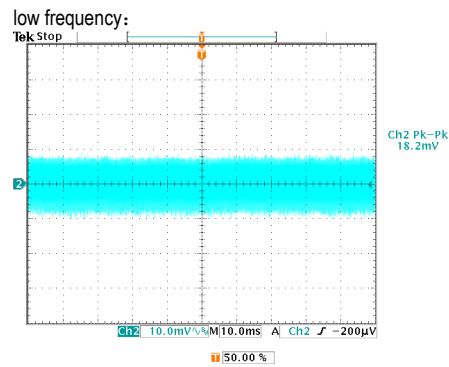
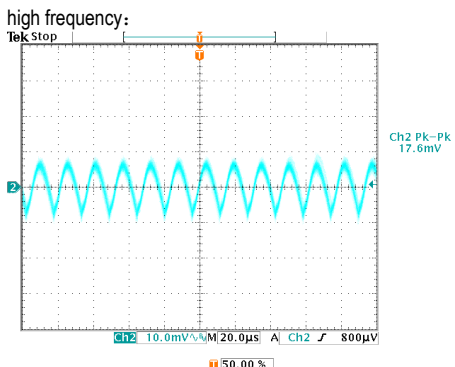
■ DESIGN VERIFY TEST

**OUTPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	12 ~20V	I/P: 230VAC O/P: LED MODE Ta: 25°C	6.2V~20V
2	OUTPUT VOLTAGE TOLERANCE	-4.0%~4.0%	I/P: 90 VAC / 264 VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.39%~ 0.39%
3	LINE REGULATION	-0.5%~0.5%	I/P: 100VAC~ 264VAC O/P: FULL LOAD Ta: 25°C	0%~0 %
4	LOAD REGULATION	-1.0%~ 1.0%	I/P: 230VAC O/P: FULL ~NO LOAD Ta: 25°C	-0.30%~0.39%
5	DYNAMIC LOAD	2000mVp-p	I/P: 230VAC O/P : (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta: 25°C	(1) 412mVp-p (2) 378mVp-p



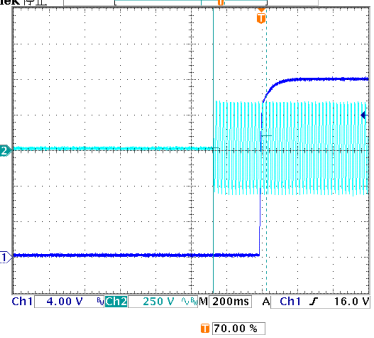
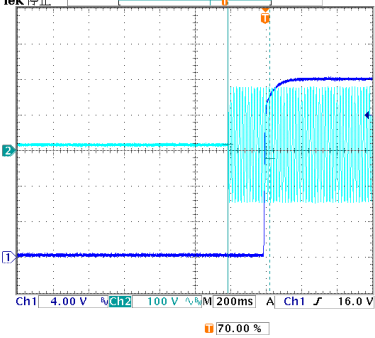
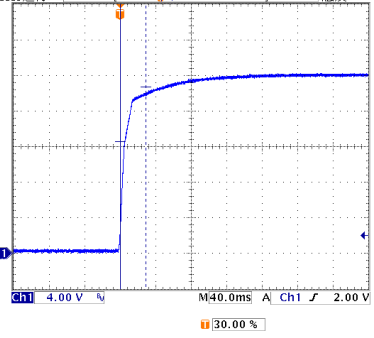
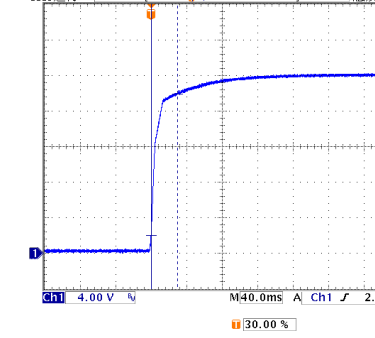
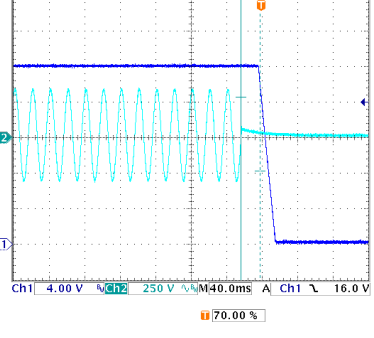
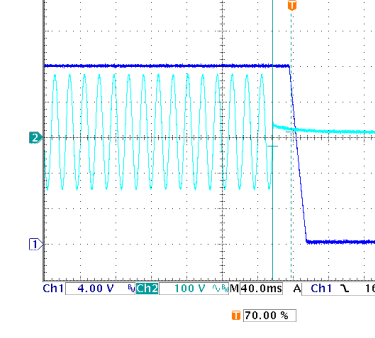
6	OVER/UNDERSHOOT TEST	$\pm 5\%$	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5 %
7	RIPPLE & NOISE (Max)	150mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	18.2mVp-p





120W Single Output Moistureproof Adaptor

OWA-120U series

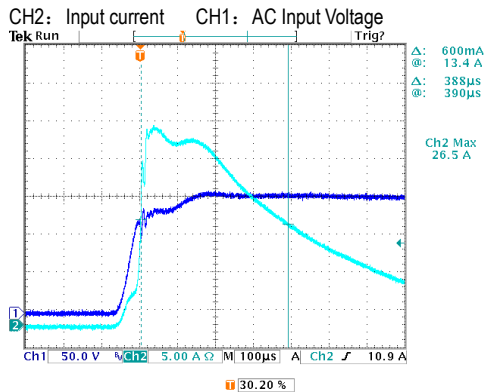
8	SET UP TIME(Max)	230VAC/ 500ms 115VAC/ 500ms	I/P: 230 VAC I/P: 115 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 300ms 115VAC/ 236ms
<p>INPUT=230VAC/50HZ @ 95% LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 85.0 V Ⓢ: 20.0 V Δ: 300ms Ⓢ: -276ms</p> <p>CH1 4.00 V CH2 250 V M 200ms A Ch1 16.0 V</p> <p>70.00 %</p>		<p>INPUT=115VAC/50HZ @ 95% LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 40.0 V Ⓢ: 18.0 V Δ: 236ms Ⓢ: -216ms</p> <p>CH1 4.00 V CH2 100 V M 200ms A Ch1 16.0 V</p> <p>70.00 %</p>		
9	RISE TIME (Max)	230VAC/ 80ms 115VAC/ 80ms	I/P: 230 VAC I/P: 115 VAC O/P: 95% LOAD Ta: 25°C	230VAC/28.8ms 115VAC/29.6ms
<p>INPUT=230VAC/50HZ @ 95% LOAD</p> <p>CH1: Output Voltage</p>  <p>Δ: 6.16 V Ⓢ: 12.6 V Δ: 28.8ms Ⓢ: 0.00 s</p> <p>CH1 4.00 V M 40.0ms A Ch1 2.00 V</p> <p>30.00 %</p>		<p>INPUT=115VAC/50HZ @ 95% LOAD</p> <p>CH1: Output Voltage</p>  <p>Δ: 15.9 V Ⓢ: 2.00 V Δ: 29.6ms Ⓢ: 0.00 s</p> <p>CH1 4.00 V M 40.0ms A Ch1 2.00 V</p> <p>30.00 %</p>		
10	HOLD UP TIME(Typ)	230VAC/ 16ms 115VAC/ 16ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/21.6ms 115VAC/20.8ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 520 V Ⓢ: 285 V Δ: 21.6ms Ⓢ: -24.0ms</p> <p>CH1 4.00 V CH2 250 V M 40.0ms A Ch1 16.0 V</p> <p>70.00 %</p>		<p>INPUT=115VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 40.0 V Ⓢ: -24.0 V Δ: 20.8ms Ⓢ: -23.2ms</p> <p>CH1 4.00 V CH2 100 V M 40.0ms A Ch1 16.0 V</p> <p>70.00 %</p>		



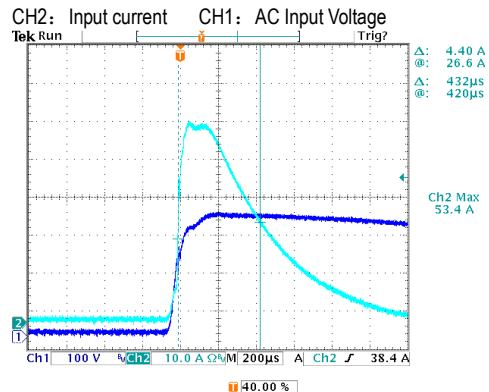
**INPUT FUNCTION TEST**

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=0.58A/ 230VAC
4	LEAKAGE CURRENT	< 0.125mA / 120VAC < 0.25mA / 240VAC	I/P: 120VAC I/P: 240VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.001 mA/120VAC N-FG: 0.001 mA/120VAC L-FG: 0.003 mA/240VAC N-FG: 0.003 mA/240VAC
5	NO LOAD POWER CONSUMPTION	< 0.15W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.116W
6	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 60% or higher at 115V/230VAC	I/P: 115VAC I/P: 230VAC O/P: 60% LOAD	THD: 6.29%/115VAC THD: 14.28%/230VAC
7	INRUSH CURRENT(Typ)	30A/115VAC 60A/230VAC Twidth =520 us measured at 50% Ipeak COLD START	I/P: 115VAC I/P: 230VAC O/P: FULL LOAD Ta: 25°C	I=26.5A/ 115VAC Twidth =388us I=53.4A/ 230VAC Twidth =432us

INPUT=115VAC/50HZ @ FULL LOAD



INPUT=230VAC/50HZ @ FULL LOAD



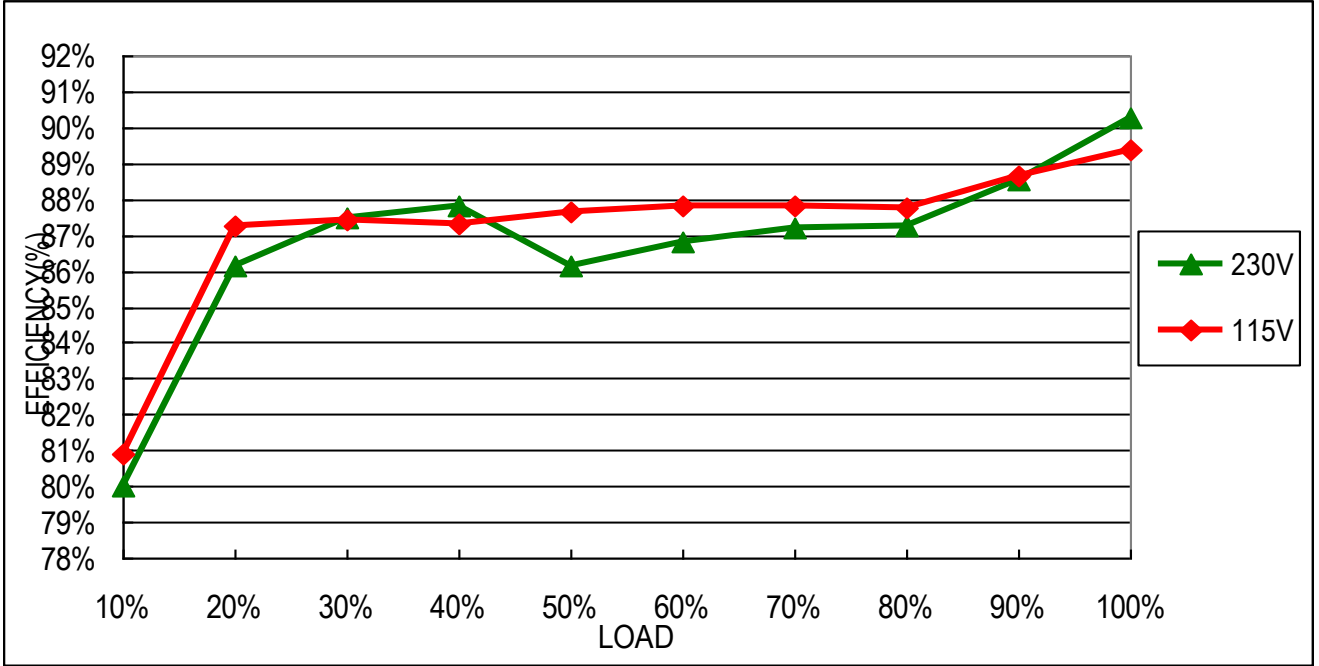


120W Single Output Moistureproof Adaptor

OWA-120U series

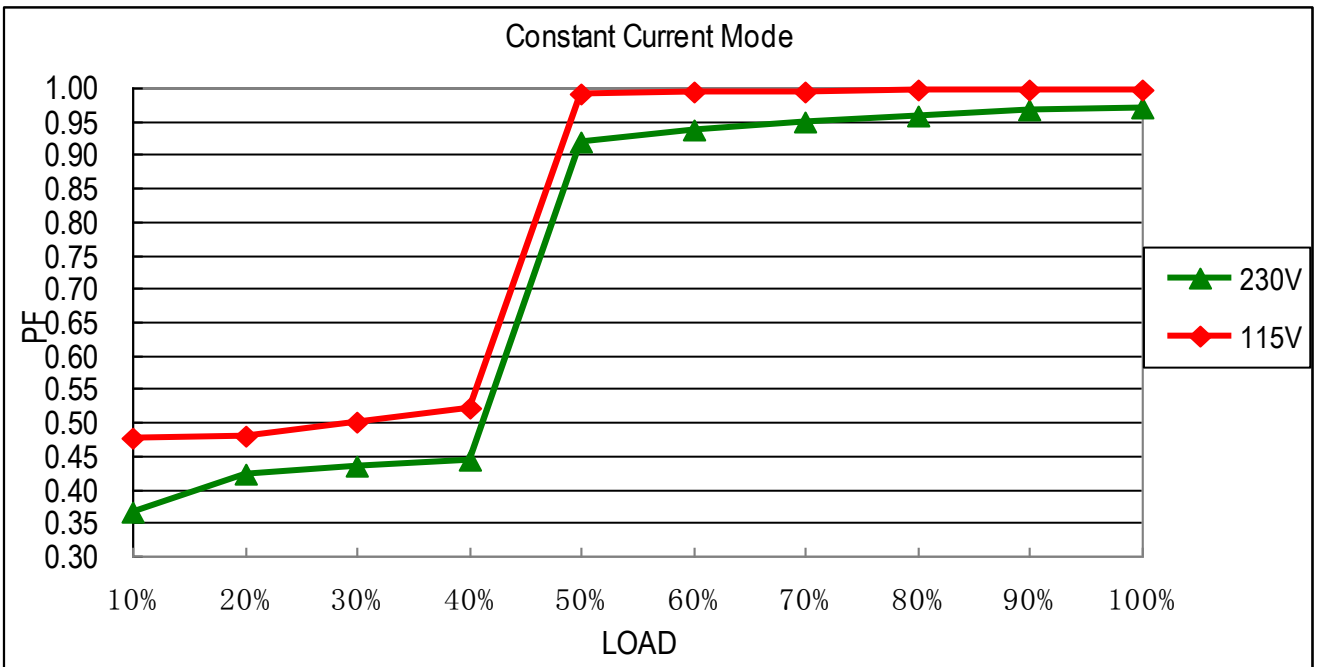
8	EFFICIENCY(Typ)	89%/115VAC	I/P: 115VAC	89.39%/115VAC
		90%/230VAC	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	90.29%/230VAC

EFFICIENCY vs LOAD



9	POWER FACTOR	0.97/ 115VAC	I/P: 115VAC	PF=0.997/ 115VAC
		0.96/ 230VAC	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	PF=0.971/ 230VAC

P.F vs LOAD



**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	95 %~ 108 %	I/P: 230VAC O/P: TESTING Ta: 25°C	101.16%/ 230VAC Constant current limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	23V~27V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	24.66V/ 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) <b>Peak Voltage</b>	Q 2 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) 655V (2) 602V (3) 650V
2	<b>Diode Peak Voltage</b>	Q101 Rated 120V/56A	I/P: High-Line +3V =267V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 106V (2) 89.2V (3) 103V
3	<b>Input Capacitor Voltage</b>	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) 448V (2) 443V (3) 446V
4	<b>Control IC Voltage Test</b>	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) 17.1V (3) 17.2V
5	PFC Transistor ( D to S) or (C to E) <b>Peak Voltage</b>	Q 1 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) 508V (2) 483V (3) 495V



## 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: 1.721mA 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	CONDUCTION	FCC Part15 CLASS B	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
2	RADIATION	FCC Part15 CLASS B	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	Test by certified Lab & Test Report Prepare			

## ■ RELIABILITY TEST

## ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																
1	TEMPERATURE RISE TEST	MODEL: OWA-120U-24 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 33.1°C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 52.2°C																																																		
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 33.1 °C</th> <th>HIGH AMBIENT Ta=52.2 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>C5</td><td>76.7°C</td><td>98.5°C</td></tr> <tr><td>2</td><td>C105</td><td>71.9°C</td><td>94.0°C</td></tr> <tr><td>3</td><td>T1</td><td>77.2°C</td><td>99.8°C</td></tr> <tr><td>4</td><td>Q2</td><td>85.1°C</td><td>108.1°C</td></tr> <tr><td>5</td><td>Q101</td><td>72.8°C</td><td>95.5°C</td></tr> <tr><td>6</td><td>D10</td><td>89.5°C</td><td>113.4°C</td></tr> <tr><td>7</td><td>C45</td><td>72.0°C</td><td>93.9°C</td></tr> <tr><td>8</td><td>C41</td><td>72.4°C</td><td>93.9°C</td></tr> <tr><td>9</td><td>C11</td><td>77.2°C</td><td>98.9°C</td></tr> <tr><td>10</td><td>RTH3</td><td>73.4°C</td><td>94.7°C</td></tr> <tr><td>11</td><td>TC</td><td>69.0°C</td><td>89.5°C</td></tr> </tbody> </table>			NO	Position	ROOM AMBIENT Ta= 33.1 °C	HIGH AMBIENT Ta=52.2 °C	1	C5	76.7°C	98.5°C	2	C105	71.9°C	94.0°C	3	T1	77.2°C	99.8°C	4	Q2	85.1°C	108.1°C	5	Q101	72.8°C	95.5°C	6	D10	89.5°C	113.4°C	7	C45	72.0°C	93.9°C	8	C41	72.4°C	93.9°C	9	C11	77.2°C	98.9°C	10	RTH3	73.4°C	94.7°C	11	TC	69.0°C	89.5°C
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5	Q101	72.8°C	95.5°C																																																	
6	D10	89.5°C	113.4°C																																																	
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9	C11	77.2°C	98.9°C																																																	
10	RTH3	73.4°C	94.7°C																																																	
11	TC	69.0°C	89.5°C																																																	
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																																																



120W Single Output Moistureproof Adaptor

**OWA-120U series**

3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 45°C NO DAMAGE	I/P: 272VAC O/P: FULL LOAD Ta=45°C HUMIDITY= 95% R.H	TEST: OK
4	TEMPERATURE COEFFICIENT	±0.03%/°C (0~50°C)	I/P: 230 VAC O/P: FULL LOAD	±0.007%/°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
6	THERMAL SHOCK TEST	1. Thermal shock Temperature: -45°C~ +50°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-120U-24: 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= 45 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 45 °C LIFE TIME (4) I/P: 230VAC O/P: 50% LOAD Ta= 45 °C LIFE TIME		(1) 208506 HRS (2) 30334 HRS (3) 67383 HRS (4) 131890 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	ZHANGZJ/ZHUOKB	SKY	LIUWY