Test Report: OWA-200U-20

200W Single Output Moistureproof Adaptor

■ 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

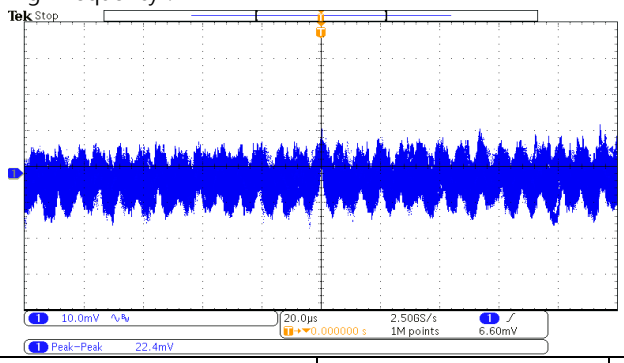
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

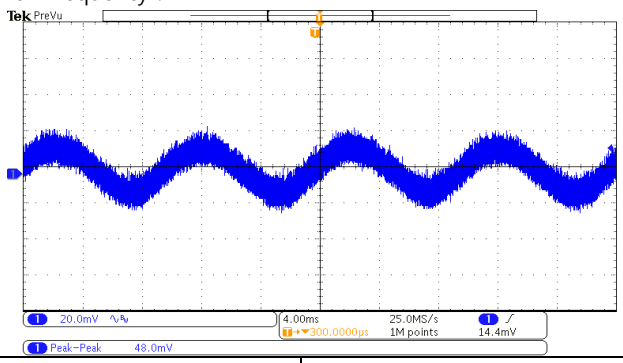
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE TOLERANCE	V1: -4% ~ 4% (Max)	I/P:110VAC /264AC O/P:FULL~MIN LOAD Ta:25℃	V1: -0.55%~1.15%
2	LINE REGULATION	V1: -0.5% ~0.5% (Max)	I/P:110VAC~264AC O/P:FULL LOAD Ta:25℃	V1: 0 %~ 0%
3	LOAD REGULATION	V1: -4% ~ 4% (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.85%~0.85%
4	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: 2.7%
5	RIPPLE & NOISE	V1: 150mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	V1: 48mVp-p / 100% load

high frequency :

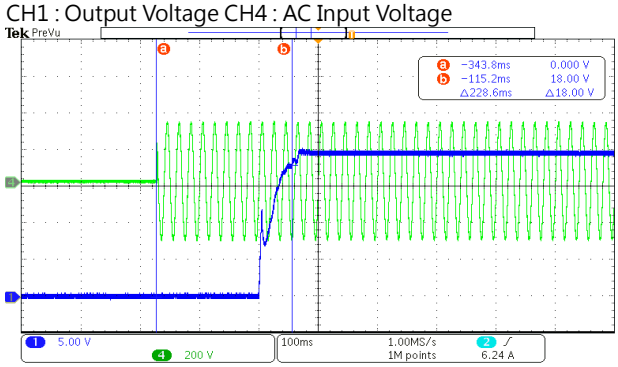


low frequency :

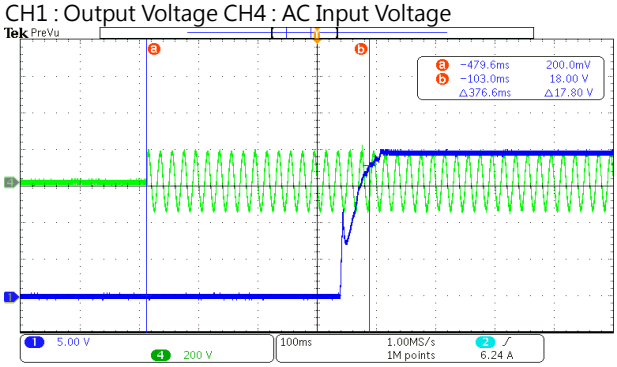


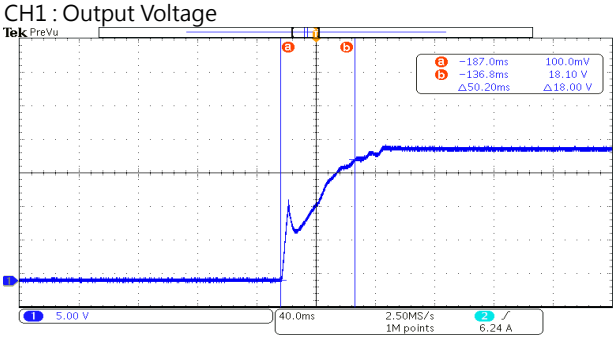
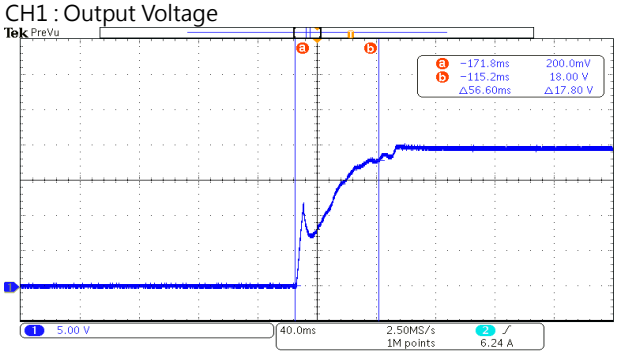
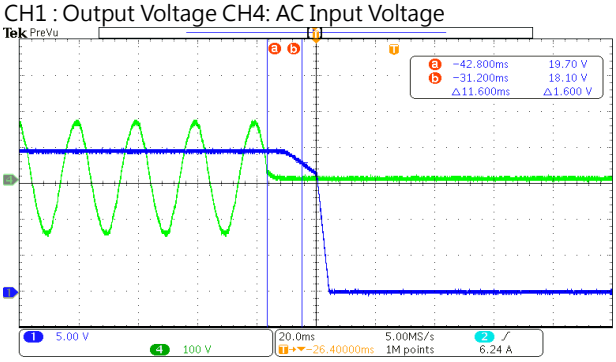
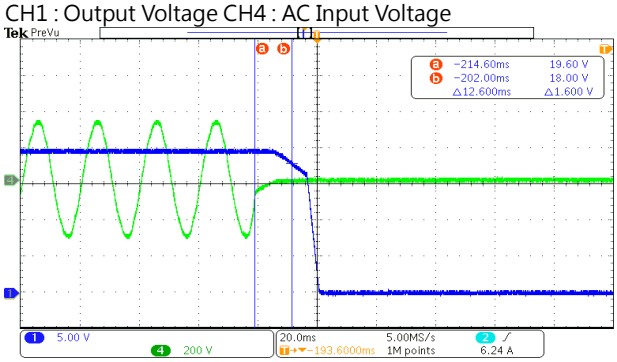
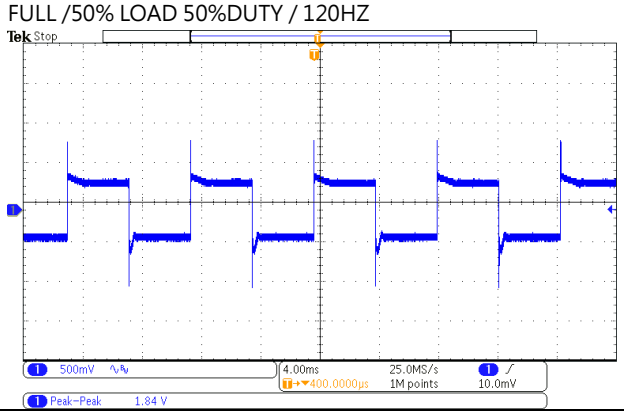
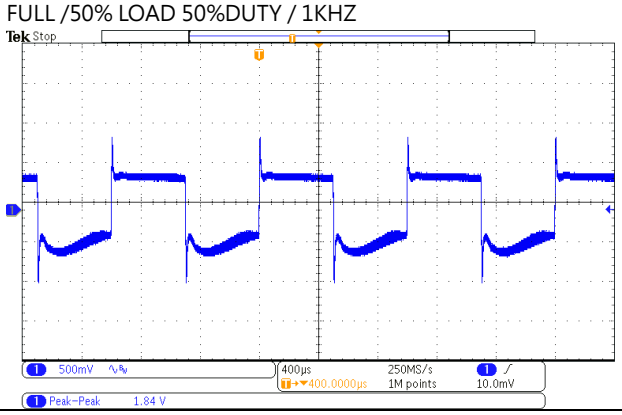
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
6	SET UP TIME (Max)	230VAC/500ms 115VAC/500ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃ 使用 **LEDH MODE TEST**	230VAC/228.6 ms 115 VAC/ 376.6ms

INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage CH4 : AC Input Voltage

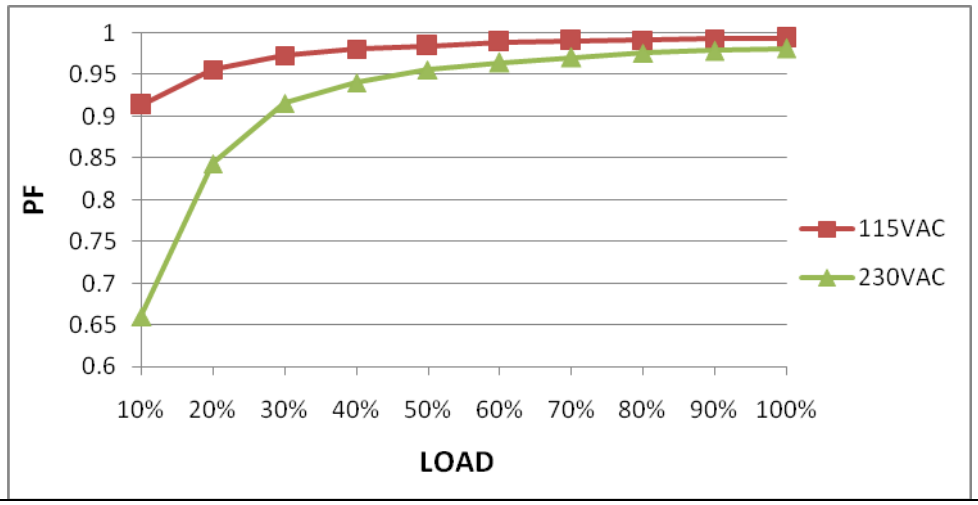


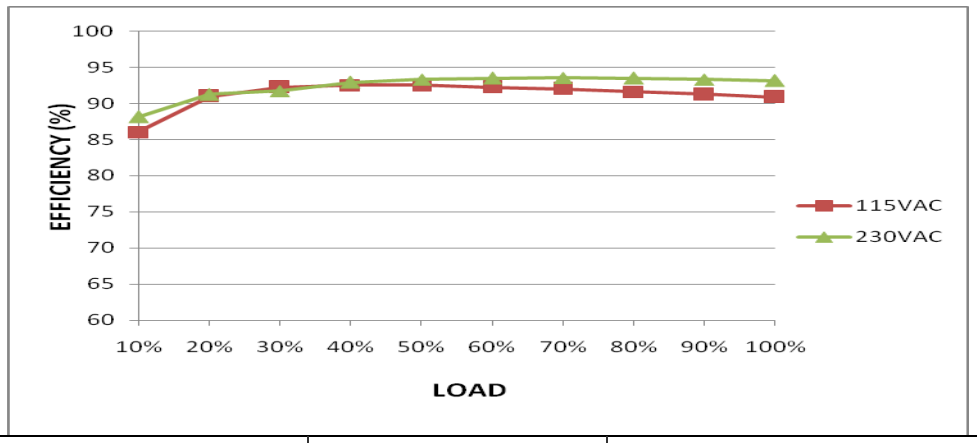
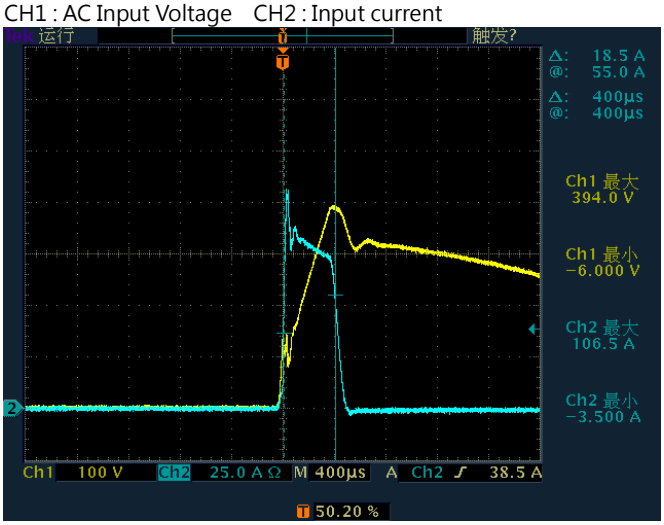
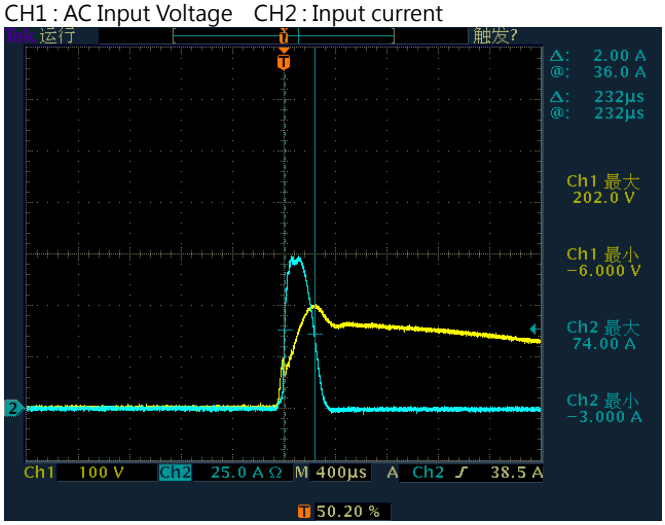
INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH4 : AC Input Voltage



7	RISE TIME (Max)	230VAC/80ms 115VAC/80ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃ 使用 **LEDH MODE TEST**	230VAC/50.2 ms 115 VAC/ 56.6 ms
8	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage  		INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage  	
9	HOLD UP TIME (Typ)	230VAC/10ms 115VAC/10ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃ 使用 **LEDH MODE TEST**	230VAC/ 11.6 ms 115 VAC/ 12.6 ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH4: AC Input Voltage  		INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH4 : AC Input Voltage  	
10	DYNAMIC LOAD	V1: 2000mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25℃	1840mVp-p FULL /50% LOAD 50%DUTY / 120HZ 1840mVp-p FULL /50% LOAD 50%DUTY / 1KHZ
	FULL /50% LOAD 50%DUTY / 120HZ  		FULL /50% LOAD 50%DUTY / 1KHZ  	

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~264VAC 142VDC~ 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 (PLEASE CHECK DERATING CURVE) Ta:25℃	(1) 100V~267VAC (2) 242Vdc~370Vdc/FULL LOAD 142Vdc~370Vdc/50% LOAD (3) 242Vdc~370Vdc/FULL LOAD 142Vdc~370Vdc/50% LOAD
			I/P: LOW-LINE-3V=97 VAC HIGH-LINE+15%=300 VAC O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) 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: 110 VAC ~264VAC O/P:FULL~MIN LOAD Ta:25℃	OK
3	INPUT CURRENT (TYP)	230 VAC/1.1A 115 VAC/2.2A	I/P: 230 VAC/115 VAC O/P:FULL LOAD Ta:25℃	I = 0.94A/ 230VAC I = 1.9A/ 115VAC
	NO LOAD POWER CONSUMPTION	<0.15W	I/P: 230 VAC O/P:NO LOAD Ta:25℃	0.1253W
4	POWER FACTOR(TYP)	0.96/230 VAC FULL LOAD 0.97/115 VAC FULL LOAD	I/P: 230 VAC/115VAC O/P:FULL LOAD Ta:25℃	PF= 0.982/230V/100%LOAD PF= 0.994/115V/100%LOAD
	P.F vs LOAD 			

5	EFFICIENCY (TYP)	90%/115VAC 92.5%/230VAC	I/P: 115/ 230VAC O/P: 100%Load Ta:25℃	93.18%/230VAC 90.9%/115VAC
	EFFICIENCY vs LOAD 			
6	INRUSH CURRENT (TYP)	230 V/ 180A 115VV/ 90A (twidth=450us measured at 50% Ipeak) COLD START at 230VAC (twidth=300 us measured at 50% Ipeak) COLD START at 115VAC	I/P: 230 VAC 115VAC O/P:FULL LOAD Ta:25℃	I = 106.5A/ 230VAC T50=400us I =74A/ 115VAC T50=232us
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : AC Input Voltage CH2 : Input current 		INPUT=115VAC/ 60HZ @ FULL LOAD CH1 : AC Input Voltage CH2 : Input current 	

ROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER CURRENT PROTECTION	105 %~150%	I/P: 267VAC I/P: 230VAC I/P: 110VAC O/P:TESTING Ta:25℃	129.6%/ 267VAC 129.4%/ 230VAC 129.5%/110VAC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	V1: 22V~ 27 V	I/P: 267VAC I/P: 230VAC I/P: 110VAC O/P:TESTING Ta:25℃	25.9V/ 267VAC 25.7V/ 230VAC 25.9V/ 110VAC PROTECTION TYPE : Shut down o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 267 VAC I/P: 110 VAC O/P:FULL LOAD	O.T.P. Active PROTECTION TYPE : Shut down o/p voltage, re-power on to recover
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 267VAC I/P: 110 VAC O/P: FULL LOAD Ta:25℃	NO DAMAGE PROTECTION TYPE : 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	Q 73 Rated 11A/600V	AC ON/OFF I/P:High-Line +3V =267V VDS: O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load.	 VDS: (1) 458V (2) 470V (3) 458V (4) 450V (5) 450V (6) 458V (7) 462V

			I/P:Low-Line -3V = 97V O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25℃	VDS: (1) 462V (2) 470V (3) 462V (4) 454V (5) 458V (6) 466V (7) 474V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q 1 Rated 26A/600V	I/P:High-Line +3V =267 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. I/P:Low-Line -3V =97V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25℃	VDS: (1) 503V (2) 501V (3) 508V (4) 503V (5) 504V (6) 501V (7) 504V VDS: (1) 496V (2) 444V (3) 496V (4) 492V (5) 500V (6) 500V (7) 440V
3	P.F.C DIODE	D5 Rated 9 A/ 600V	I/P:High-Line +3V =267 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz	(1) 484V (2) 460V (3) 474V (4) 468V

			I/P:Low-Line -3V = 97V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz Ta:25℃	 (1) 432V (2) 426V (3) 430V (4) 438V
4	Diode Peak Voltage	Q101 Rated 140 A/60V Q100 Rated 140A/ 60V	AC ON/OFF I/P:High-Line +3V =267 V O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. (8).NO LOAD Ta:25℃	Q101: VDS: (1) 47.8V (2) 13.6V (3) 47.4V (4) 47.4V (5) 47.4V (6) 47.8V (7) 7.8V (8) 46.6V Q100: VDS: (1) 49V (2) 11V (3) 49.4V (4) 49V (5) 48.6V (6) 49V (7) 10.6V (8) 45.8V
5	Input Capacitor Voltage	C5 Rated: 100μ / 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 (4)Full load continue Ta:25℃	 (1) 430V (2) 421V (3) 430V (4) 423V

6	Control IC Voltage Test	U2 Rated -0.3V~20V U1 Rated 0.3V~ 35V	AC ON/OFF I/P:High-Line +3V =267 V O/P(1)FULL LOAD (2) Output Short (3)O.L.P (4)O.V.P. (5)NO LOAD VRmin(LOW LINE) Ta:25℃	 U2: (1) 16.8 V (2) 16.7V (3) 17.3V (4) 15.7V (5) 15.8V U1: (1) 16.7 V (2) 16.6V (3) 16.7V (4) 16.8V (5) 16.7V

■ SAFETY & EMC TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 4.2KVAC/min	I/P-O/P: 4.5 KVAC/min Ta:25℃	I/P-O/P: 1.351mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25℃	I/P-O/P: 9999MΩ NO DAMAGE
3	LEAKAGE CURRENT	<0.25mA / 240VAC <0.125mA /120VAC	I/P: 120/240 VAC O/P:Min LOAD Ta:25℃	L-FG: 0.061 mA N-FG: 0.054mA

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℃	PASS Test by certified Lab
2	RADIATION	FCC Part15 CLASS B	I/P：230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	PASS Test by certified Lab
3	Test by certified Lab & Test Report Prepare Any contradictions of the test results, please refer to the latest EMC test report			

■ RELIABILITY TEST

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： OWA-200U-24
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=23.5 ℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=48.3 ℃
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=23.5℃</th><th>HIGH AMBIENT Ta=48.3℃</th></tr>
<tr><td>1</td><td>U3</td><td>55.7℃</td><td>76.4℃</td></tr>
<tr><td>2</td><td>BD1</td><td>59.9℃</td><td>81.5℃</td></tr>
<tr><td>3</td><td>C1</td><td>56.4℃</td><td>75.3℃</td></tr>
<tr><td>4</td><td>Q1</td><td>60.4℃</td><td>82.4℃</td></tr>
<tr><td>5</td><td>U1</td><td>58.9℃</td><td>80.7℃</td></tr>
<tr><td>6</td><td>U2</td><td>62.7℃</td><td>84.6℃</td></tr>
<tr><td>7</td><td>C35</td><td>59.3℃</td><td>81.5℃</td></tr>
<tr><td>8</td><td>Q50</td><td>61.9℃</td><td>84.0℃</td></tr>
<tr><td>9</td><td>T1</td><td>72.0℃</td><td>95.1℃</td></tr>
<tr><td>10</td><td>C5</td><td>58.4℃</td><td>80.3℃</td></tr>
<tr><td>11</td><td>U101</td><td>64.7℃</td><td>88.1℃</td></tr>
<tr><td>12</td><td>Q100</td><td>57.6℃</td><td>81.4℃</td></tr>
<tr><td>13</td><td>Q101</td><td>62.6℃</td><td>86.5℃</td></tr>
<tr><td>14</td><td>C115</td><td>53.2℃</td><td>76.2℃</td></tr>
<tr><td>15</td><td>C105</td><td>52.0℃</td><td>75.3℃</td></tr>
<tr><td>16</td><td>C106</td><td>53.8℃</td><td>77.2℃</td></tr>
<tr><td>17</td><td>RTH5</td><td>60.8℃</td><td>82.9℃</td></tr>
<tr><td>18</td><td>TC</td><td>54.9℃</td><td>75.9℃</td></tr>
</table></td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P： 230 VAC
O/P：123 % LOAD
Ta：25℃</td><td>TEST：OK</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P： 264VAC/110VAC
O/P： 100 % LOAD
Ta= -45 ℃</td><td>TEST：OK</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 45 ℃
NO DAMAGE</td><td>I/P： 264VAC
O/P：FULL LOAD
Ta= 45 ℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.03 %/(0℃~50℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>± 0.001 %/℃(0~50℃)</td></tr>
</table>

6	STORAGE TEMPERATURE TEST	-40~85℃	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：10CYCLE 5. Input/Output condition： STATIC
7	THERMAL SHOCK TEST	-40~50℃	1. Thermal shock Temperature： -45℃~ +55℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：16 CYCLE 5. Input/Output condition： 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test
8	VIBRATION TEST	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform： Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：12min/sweep cycle (4) Acceleration：6G (5) Test Time：180min in each axis (X.Y.Z) (6) Ta：25℃
9	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Ta=25 ℃ LIFE TIME (2) I/P： 230VAC O/P：FULL LOAD Ta=45 ℃ LIFE TIME (3) I/P： 230VAC O/P：75% LOAD Ta=45 ℃ LIFE TIME (4) I/P： 230VAC O/P：50% LOAD Ta=45 ℃ LIFE TIME	(1) 406639HRS (2) 112019HRS (3) 219086HRS (4) 341519 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 2680.8K hrs min. Telcordia SR-332 (Bellcore)； 268.5K hrs min. MIL-HDBK-217F (25℃)	
11	Ongoing Reliability Test	I/P：230VAC O/P：FULL LOAD TA=50℃ Demonstration Mean Time Between Failure：50,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/HUANGMK	WENF	LINKX

2018.4.30

GP-A50-F010