Test Report: OWA-200U-54

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

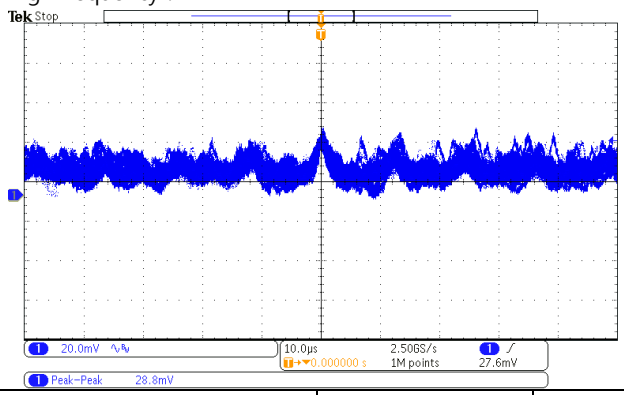
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

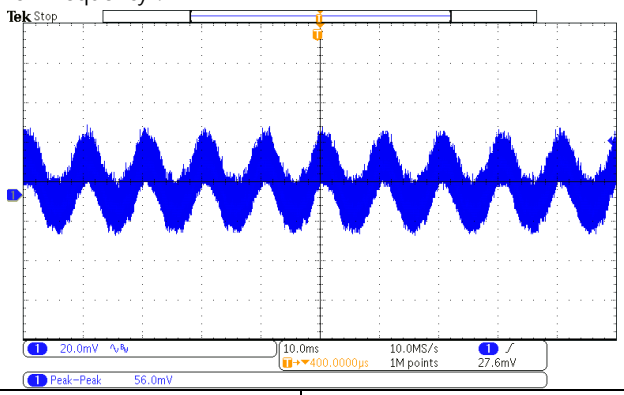
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE TOLERANCE	V1: -3% ~ 3% (Max)	I/P:110VAC /264AC O/P:FULL~MIN LOAD Ta:25℃	V1: 0.92 %~ 1.1%
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: -3% ~ 3% (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.16%~0.16 %
4	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: 3.75%
5	RIPPLE & NOISE	V1: 250mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	V1: 56mVp-p / 100% load

high frequency :

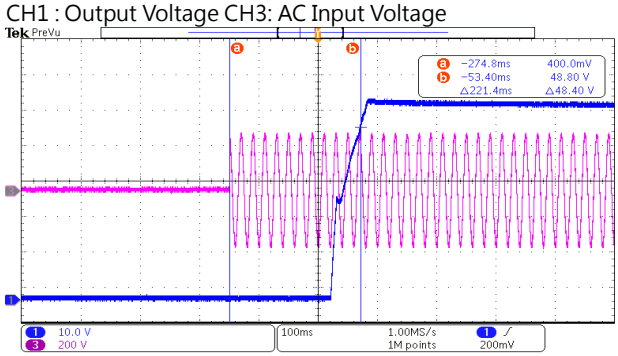


low frequency :

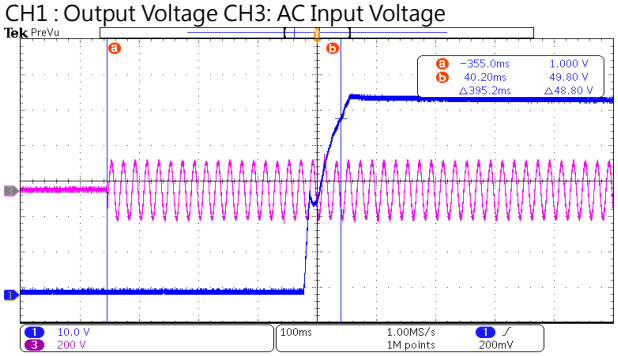


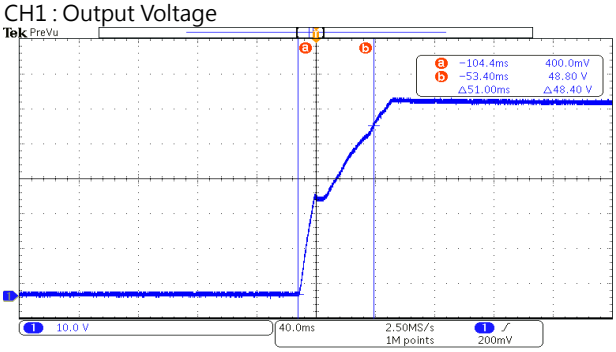
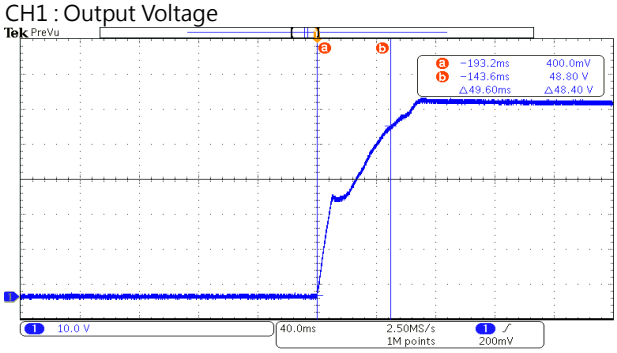
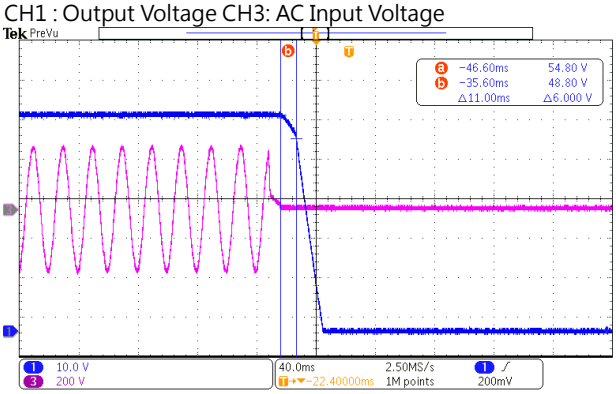
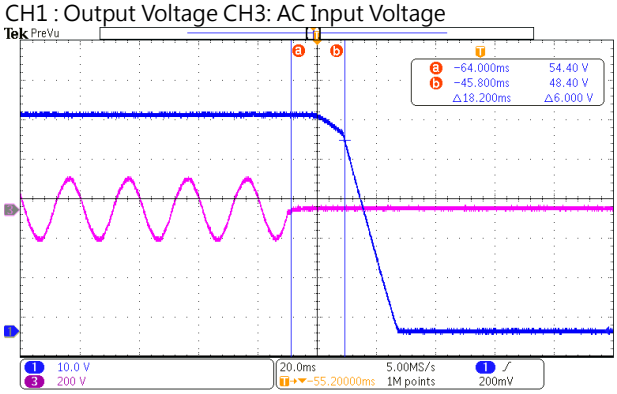
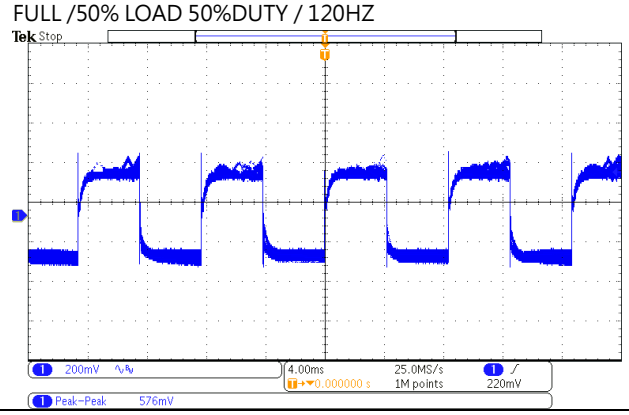
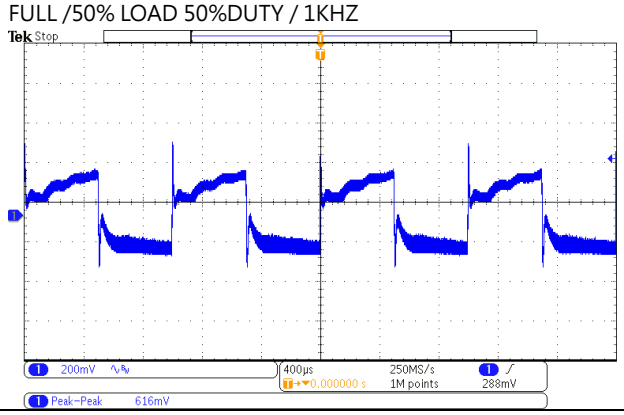
6	SET UP TIME (Max)	230VAC/500ms 115VAC/500ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃ 使用 **LEDH MODE TEST**	230VAC/ 221.4 ms 115 VAC/ 395.2ms

INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage CH3: AC Input Voltage



INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH3: AC Input Voltage

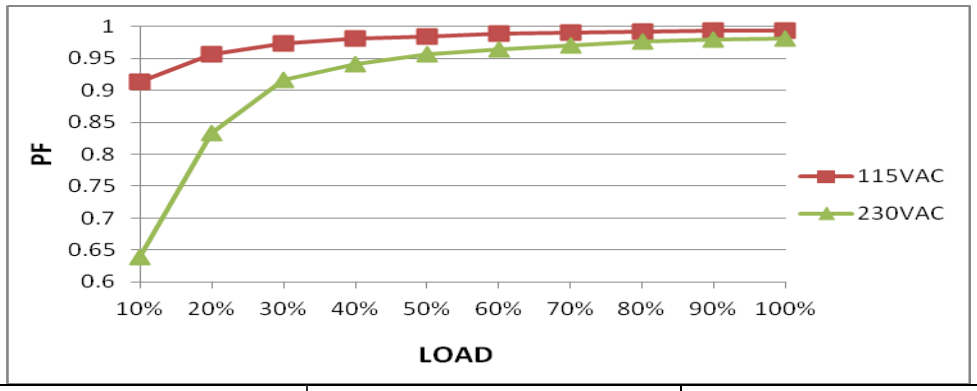


7	RISE TIME (Max)	230VAC/80ms 115VAC/80ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃ 使用 **LEDH MODE TEST**	230VAC/ 51 ms 115 VAC/ 49.6 ms
8	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage  		INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage  	
9	HOLD UP TIME (Typ)	230VAC/10ms 115VAC/10ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃ 使用 **LEDH MODE TEST**	230VAC/11 ms 115 VAC/ 18.2ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH3: AC Input Voltage  		INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH3: AC Input Voltage  	
10	DYNAMIC LOAD	V1: 5400mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25℃	576mVp-p FULL /50% LOAD 50%DUTY / 120HZ 616mVp-p FULL /50% LOAD 50%DUTY / 1KHZ
	FULL /50% LOAD 50%DUTY / 120HZ  		FULL /50% LOAD 50%DUTY / 1KHZ  	

INPUT FUNCTION TEST

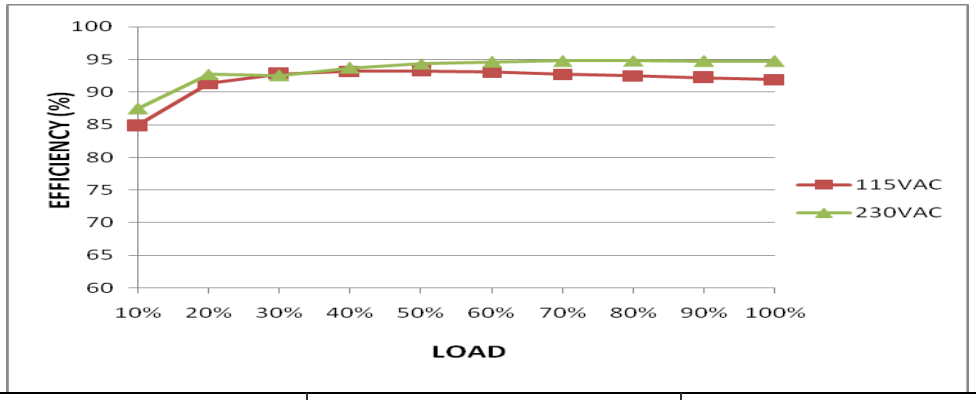
NO	TEST ITEM	SPECI FICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~264VAC 142VDC~ 370VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL / 50% LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL / 50% LOAD (PLEASE CHECK DERATING CURVE) Ta:25℃	(1) 107V~264VAC (2) 242Vdc~370Vdc/FULL 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 =0.93 A/ 230VAC I =1.9A/ 115VAC
	NO LOAD POWER CONSUMPTION	<0.15W	I/P: 230 VAC O/P:NO LOAD Ta:25℃	0.1318W/230V
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



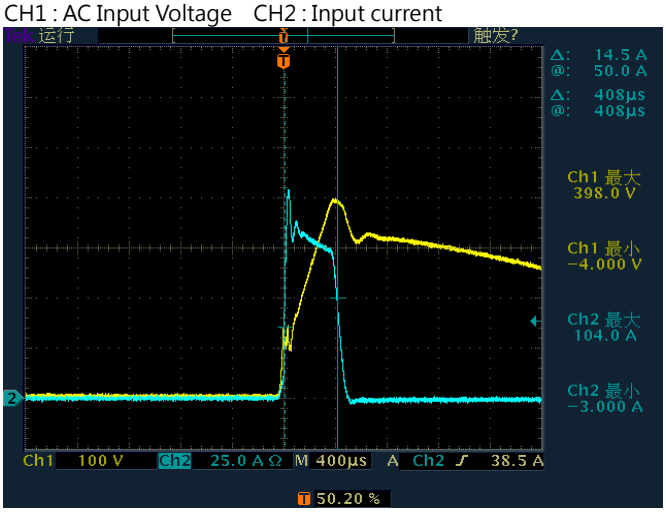
5	EFFICIENCY (TYP)	91.5%/115VAC 94%/230VAC	I/P: 115/ 230VAC O/P: 100%Load Ta:25℃	94.71%/230VAC 91.91%/115VAC

EFFICIENCY vs LOAD

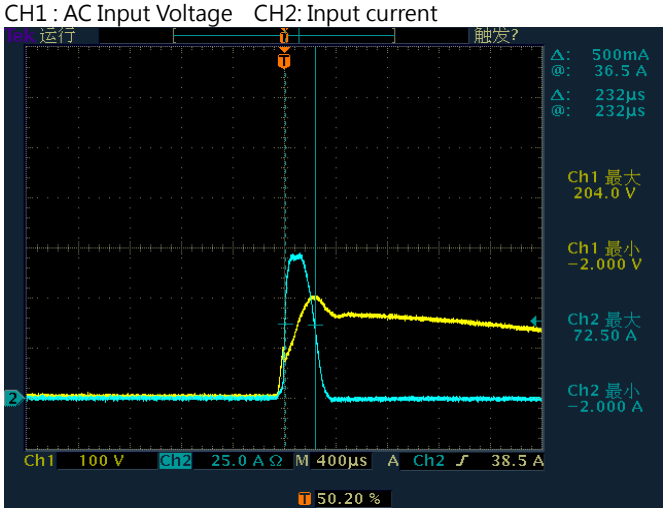


6	INRUSH CURRENT (TYP)	230 V/ 180A 115VV/ 90A (twidth=450us measured at 50% Ipeak) COLD START at 230VAC (twidth=300 us measured at 50% Ipeak) COLD START at 115VAC	I/P: 230 VAC 115VAC O/P:FULL LOAD Ta:25℃	`I = 104 A/ 230VAC T50=408us I = 72.5A/ 115VAC T50=232us

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℃	127.2%/ 267VAC 126.6%/ 230VAC 126.8%/110VAC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	V1:59 V~ 70 V	I/P: 267VAC I/P: 230VAC I/P: 110VAC O/P:TESTING Ta:25℃	63.8V/230VAC 64.4V/180VAC 64.2V/267VAC 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 : 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) 466V (2) 478V (3) 470V (4) 466V (5) 466V (6) 470V (7) 486V

			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) 470V (2) 482V (3) 470V (4) 466V (5) 470V (6) 470V (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) 501V (2) 456V (3) 499V (4) 503V (5) 508V (6) 503V (7) 462V VDS: (1) 501V (2) 446V (3) 503V (4) 499V (5) 503V (6) 491V (7) 468V
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) 491V (2) 455V (3) 438V (4) 436V

			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) 431V (2) 428V (3) 431V (4) 427V
4	Diode Peak Voltage	Q101 Rated 33 A/ 150V Q100 Rated 33A/ 150V	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) 126V (2) 14V (3) 126V (4) 125V (5) 125V (6) 125V (7) 12.4V (8) 123V Q100: VDS: (1) 122V (2) 12.4V (3) 124V (4) 123V (5) 124V (6) 122V (7) 14.8V (8) 124V
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) 435V (2) 416V (3) 431V (4) 421V
6	Control IC Voltage Test	U2 Rated -0.3V~20V U1 Rated -0.3V ~ 35 V	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℃	 U1: (1) 16.7 (2) 16.7 (3) 17.1 (4) 15.9 (5) 16.7 (6)

				U2: (1) 16.5V (2) 16.5V (3) 16.6V (4) 16.7V (7) 15.6V

■ 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: 1.864mA 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: 0.037mA N-FG:0.042mA

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-54
1. ROOM AMBIENT BURN-IN : 2 HRS
I/P : 230VAC O/P : FULL LOAD Ta=27 ℃
2. HIGH AMBIENT BURN-IN : 2 HRS
I/P : 230VAC O/P : FULL LOAD Ta=49 ℃</td></tr>
<tr><td colspan="5">
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=27 ℃</th><th>HIGH AMBIENT Ta=49 ℃</th></tr>
<tr><td>1</td><td>RT1</td><td>73.0℃</td><td>89.2℃</td></tr>
<tr><td>2</td><td>ZNR1</td><td>53.9℃</td><td>74.9℃</td></tr>
<tr><td>3</td><td>U3</td><td>56.2℃</td><td>77.8℃</td></tr>
<tr><td>4</td><td>C1</td><td>59.4℃</td><td>79.4℃</td></tr>
<tr><td>5</td><td>LF2</td><td>59.8℃</td><td>82.3℃</td></tr>
<tr><td>6</td><td>C6</td><td>59.1℃</td><td>81.8℃</td></tr>
<tr><td>7</td><td>R18</td><td>59.7℃</td><td>82.6℃</td></tr>
<tr><td>8</td><td>BD1</td><td>61.2℃</td><td>83.7℃</td></tr>
<tr><td>9</td><td>L2</td><td>58.3℃</td><td>81.3℃</td></tr>
<tr><td>10</td><td>L2core</td><td>58.7℃</td><td>81.7℃</td></tr>
<tr><td>11</td><td>Q1</td><td>59.9℃</td><td>82.7℃</td></tr>
<tr><td>12</td><td>D5</td><td>65.4℃</td><td>88.1℃</td></tr>
<tr><td>13</td><td>U1</td><td>58.4℃</td><td>81.0℃</td></tr>
<tr><td>14</td><td>U2</td><td>60.7℃</td><td>84.1℃</td></tr>
<tr><td>15</td><td>Q71</td><td>60.4℃</td><td>83.8℃</td></tr>
<tr><td>16</td><td>Q72</td><td>60.8℃</td><td>84.5℃</td></tr>
<tr><td>17</td><td>C35</td><td>56.4℃</td><td>80.2℃</td></tr>
<tr><td>18</td><td>T1</td><td>66.1℃</td><td>90.9℃</td></tr>
<tr><td>19</td><td>C5</td><td>58.0℃</td><td>81.2℃</td></tr>
<tr><td>20</td><td>U101</td><td>60.0℃</td><td>84.3℃</td></tr>
<tr><td>21</td><td>Q100</td><td>51.1℃</td><td>75.8℃</td></tr>
<tr><td>22</td><td>Q101</td><td>50.7℃</td><td>75.1℃</td></tr>
<tr><td>23</td><td>C115</td><td>47.3℃</td><td>71.5℃</td></tr>
<tr><td>24</td><td>C105</td><td>46.4℃</td><td>70.8℃</td></tr>
<tr><td>25</td><td>C106</td><td>46.6℃</td><td>71.2℃</td></tr>
<tr><td>26</td><td>C107</td><td>42.6℃</td><td>66.6℃</td></tr>
<tr><td>27</td><td>RTH5</td><td>58.1℃</td><td>81.6℃</td></tr>
<tr><td>28</td><td>LF100</td><td>39.4℃</td><td>63.2℃</td></tr>
<tr><td>29</td><td>TC</td><td>53.3℃</td><td>74.8℃</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 : 126 % 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 : 230VAC/110VAC
O/P : 100 % LOAD
Ta=-45 ℃</td><td>TEST : OK</td></tr>
</table>

4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 45 ℃ NO DAMAGE	I/P： 264VAC O/P：FULL LOAD Ta= 45 ℃ HUMIDITY= 95 %R.H	TEST：OK
5	TEMPERATURE COEFFICIENT	± 0.03 %/(0℃~50℃)	I/P： 230 VAC O/P：FULL LOAD	± 0.001 %/℃(0~50℃)
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	-40~45℃	1. Thermal shock Temperature： -45℃~ +50℃ 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) 240361HRS (2) 203524HRS (3) 310483HRS (4) 402278 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