



# Test Report: OWA-200U-36

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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

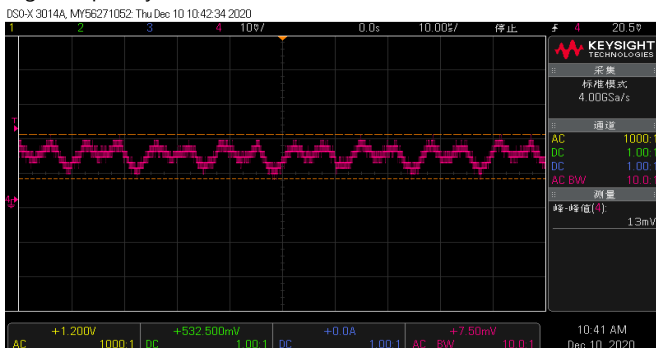
ENVIRONMENT TEST

DESIGN VERIFY TEST

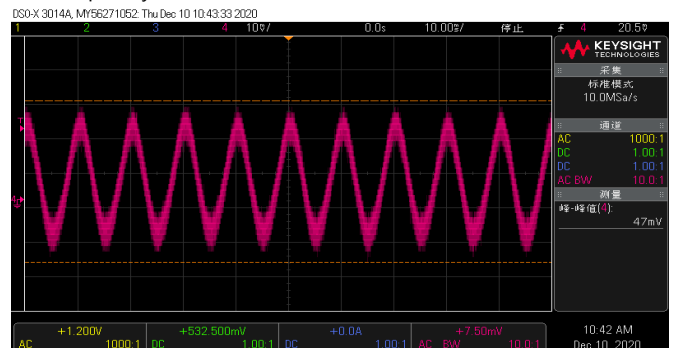
OUTPUT FUNCTION TEST

N O	TEST ITEM	SPECIFICATIO N	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE TOLERANCE	V1: -3% ~ 3% (Max)	I/P:110VAC /264AC O/P:FULL~MIN LOAD Ta:25°C	V1: 0.09%~ 0.37 %
2	LINE REGULATION	V1: -0.5% ~0.5% (Max)	I/P:110VAC~264AC O/P:FULL LOAD Ta:25°C	V1: 0.01 %~ 0.011 %
3	LOAD REGULATION	V1: -3% ~ 3% (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.22 %~ 0.23 %
4	OVER/UNDERSHOOT TEST	< +5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: 1.4 %
5	RIPPLE & NOISE	V1: 200mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 47 mVp-p / 100% load

high frequency :



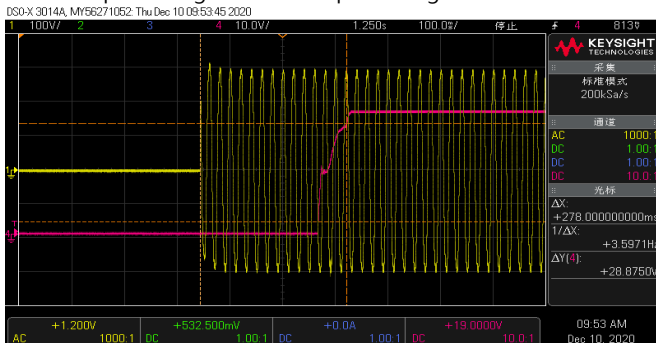
low frequency :



6	SET UP TIME (Max)	230VAC/500ms 115VAC/500ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C 使用 LEDH MODE TEST	230VAC/ 278 ms 115 VAC/ 390 ms
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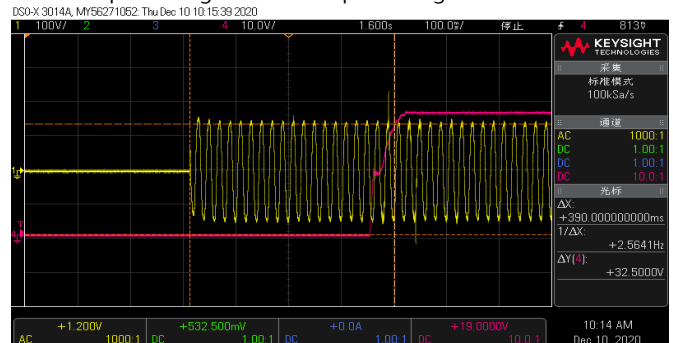
INPUT=230VAC/50HZ @ FULL LOAD

CH1 : Output Voltage CH2 : AC Input Voltage

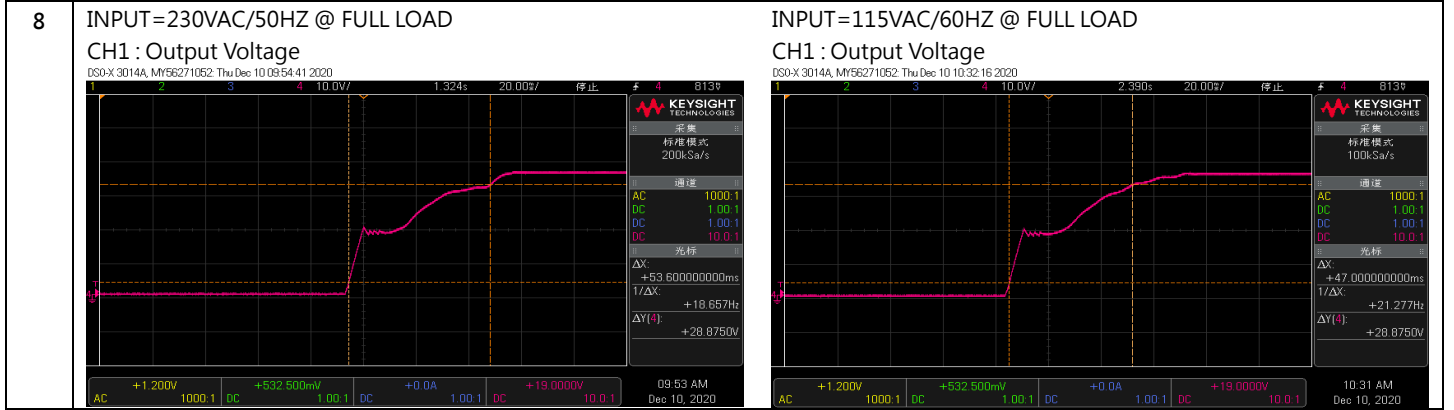


INPUT=115VAC/60HZ @ FULL LOAD

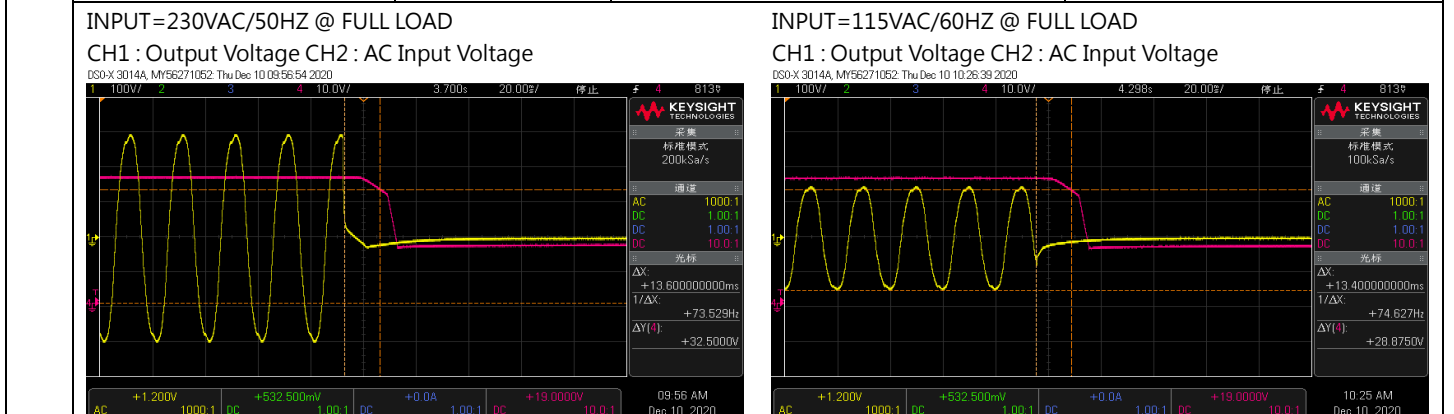
CH1 : Output Voltage CH2 : AC Input Voltage



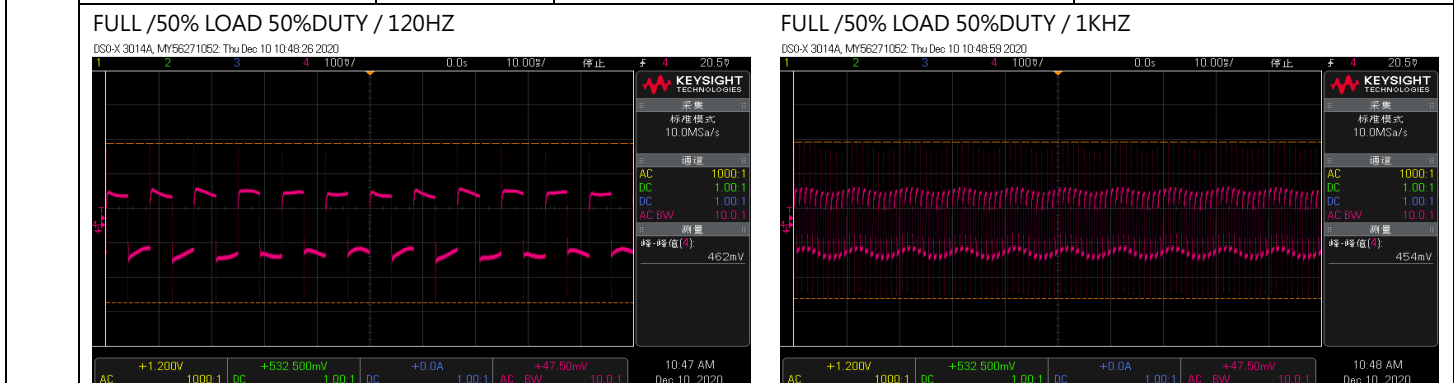
7	RISE TIME (Max)	230VAC/80ms 115VAC/80ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C 使用 LEDH MODE TEST	230VAC/ 53.6 ms 115 VAC/ 47 ms
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9	HOLD UP TIME (Typ)	230VAC/10ms 115VAC/10ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C 使用 LEDH MODE TEST	230VAC/ 13.6 ms 115 VAC/ 13.4 ms
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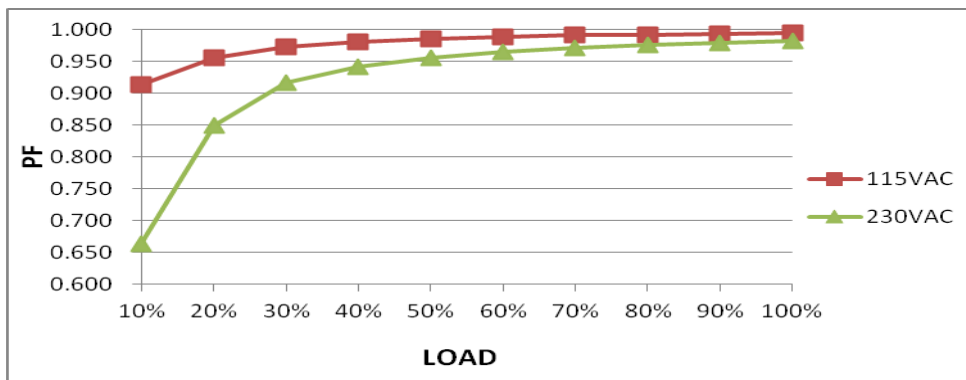
10	DYNAMIC LOAD	V1: 3600mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C	462mVp-p FULL /50% LOAD 50%DUTY / 120HZ 454mVp-p FULL /50% LOAD 50%DUTY / 1KHZ
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### INPUT FUNCTION TEST

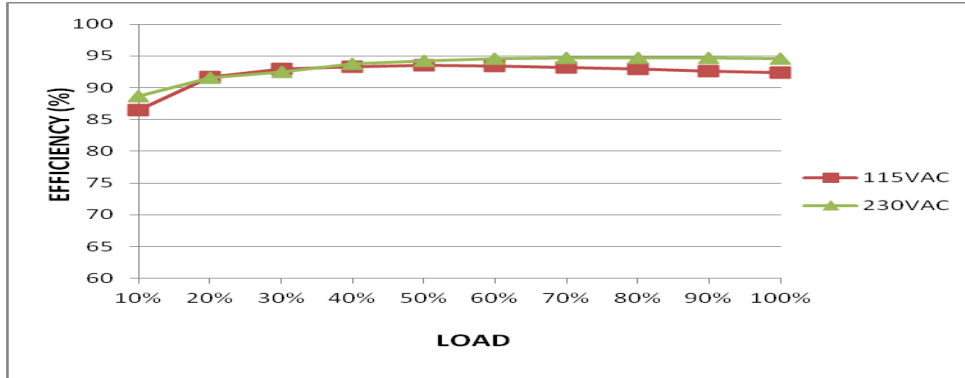
N O	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~264VAC 142VDC~ 370VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL / 50% LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL / 50% LOAD (PLEASE CHECK DERATING CURVE) Ta:25°C	(1)100 V~264VAC  (2)242Vdc~370Vdc/FULL 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°C	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°C	I = 0.9301A/ 230VAC I = 1.88 A/ 115VAC
	NO LOAD POWER CONSUMPTION	<0.15W	I/P: 230 VAC/115 VAC O/P:NO LOAD Ta:25°C	0.124W/ 230VAC
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°C	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°C	92.33%/115VAC 94.61%/230VAC
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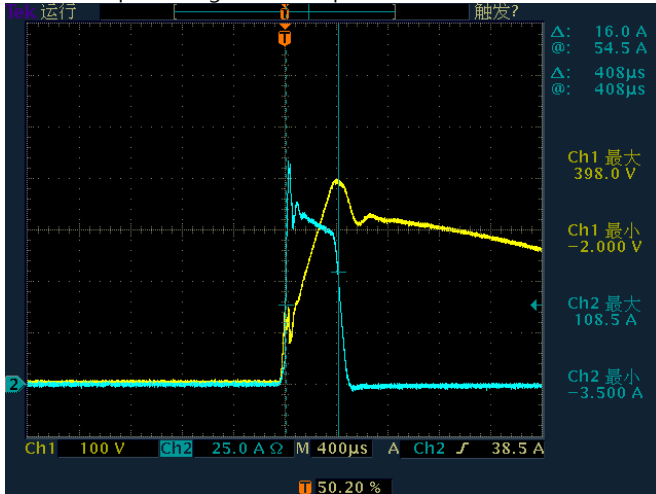
EFFICIENCY vs LOAD



6	INRUSH CURRENT (TYP)	230 V/ 180A 115VV/ 90A (twidh=450us measured at 50% Ipeak) COLD START at 230VAC (twidh=300 us measured at 50% Ipeak) COLD START at 115VAC	I/P: 230 VAC 115VAC O/P:FULL LOAD Ta:25°C	I =108.5A/ 230VAC T50=408us I = 71.5A/ 115VAC T50=232us
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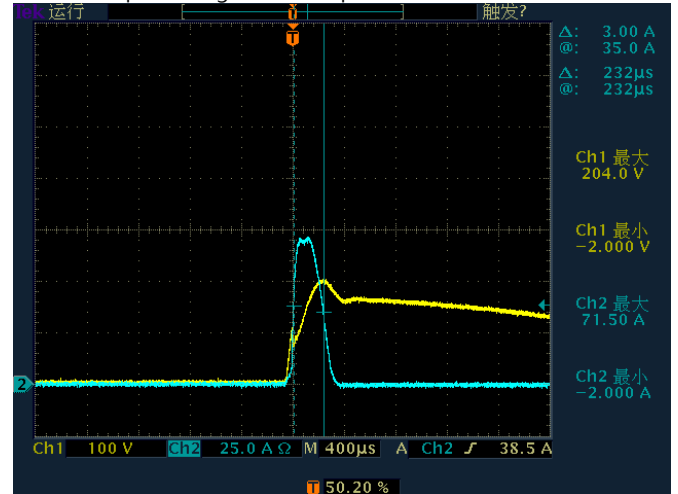
INPUT=230VAC/50HZ @ FULL LOAD

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°C	131.1%/ 267VAC 130.6%/ 230VAC 130.0%/110VAC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	V1: 41 V~ 49V	I/P: 267VAC I/P: 230VAC I/P: 110VAC O/P:TESTING Ta:25°C	46.9V/ 267VAC 46.7V/ 230VAC 46.7V/ 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°C	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	Q73 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) 437V (2) 461V (3) 437V (4) 437V (5) 432V (6) 428V (7) 445V

			<p>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°C</p>	<p>VDS:  (1) 436V  (2) 457V  (3) 432V  (4) 432V  (5) 432V  (6) 428V  (7) 440V</p>
2	P.F.C Transistor ( D to S) or (C to E) Peak Voltage	Q1 Rated 26A/ 600 V	<p>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.</p> <p>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°C</p>	<p>VDS:  (1) 501V  (2) 445V  (3) 501V  (4) 501V  (5) 501V  (6) 485V  (7) 485V</p> <p>VDS:  (1) 485V  (2) 461V  (3) 485V  (4) 485V  (5) 485V  (6) 485V  (7) 485V</p>
3	P.F.C DIODE	D 5 Rated 9A/ 600V	<p>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</p>	<p>(1) 485V  (2) 445V  (3) 485V  (4) 485V</p>

			<p>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°C</p>	<p>(1) 424V  (2) 412V  (3) 424V  (4) 424V</p>
4	Diode Peak Voltage	<p>Q101 Rated  46A/ 100V    Q100 Rated  46A/ 100V</p>	<p>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°C</p>	<p>Q101:  VDS:  (1) 84.7V  (2) 11.7V  (3) 84.7V  (4) 84.7V  (5) 84.7V  (6) 85.5V  (7) 82.3V  (8) 81.5 V    Q100:  VDS:  (1) 82.3V  (2) 11.5V  (3) 82.3V  (4) 82.3V  (5) 82.3V  (6) 82.3V  (7) 83.1V  (8) 83.1 V</p>
5	Input Capacitor Voltage	C5 Rated: 100μ / 450V	<p>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°C</p>	<p>(1) 422V  (2) 422V  (3) 422V  (4) 422V</p>
6	Control IC Voltage Test	<p>U2 Rated  -0.3V~20V    U1 Rated  -0.3V~35V</p>	<p>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°C</p>	<p>U2                      U1  (1) 16.36V            (1) 16.8V  (2) 17.0V            (2) 16.8V  (3) 17.0V            (3) 17.0V  (4) 16.8V            (4) 16.8V  (5) 16.6V            (5) 16.8V</p>



## 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: 4.5KVAC/min Ta:25°C	I/P-O/P: 1.397 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25°C	I/P-O/P: 9999 MΩ NO DAMAGE
3	LEAKAGE CURRENT	<0.25mA / 240VAC <0.125mA /120VAC	I/P: 120/240 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.062mA N-FG:0.057 mA

### 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 Any contradictions of the test results, please refer to the latest EMC test report			

## ■ RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																												
1	TEMPERATURE RISE TEST	MODEL : OWA-200U-36 1. ROOM AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta=23.5 °C 2. HIGH AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta=48.3 °C																																																																														
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=23.5 °C</th> <th>HIGH AMBIENT Ta=48.3°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>U3</td><td>55.1°C</td><td>76.0°C</td></tr> <tr><td>2</td><td>BD1</td><td>60.3°C</td><td>82.0°C</td></tr> <tr><td>3</td><td>C1</td><td>58.7°C</td><td>77.6°C</td></tr> <tr><td>4</td><td>Q1</td><td>60.4°C</td><td>82.6°C</td></tr> <tr><td>5</td><td>U1</td><td>59.2°C</td><td>81.1°C</td></tr> <tr><td>6</td><td>U2</td><td>62.0°C</td><td>84.2°C</td></tr> <tr><td>7</td><td>C35</td><td>57.8°C</td><td>80.1°C</td></tr> <tr><td>8</td><td>Q50</td><td>60.5°C</td><td>82.7°C</td></tr> <tr><td>9</td><td>T1</td><td>69.4°C</td><td>92.4°C</td></tr> <tr><td>10</td><td>C5</td><td>58.3°C</td><td>80.3°C</td></tr> <tr><td>11</td><td>U101</td><td>60.5°C</td><td>83.6°C</td></tr> <tr><td>12</td><td>Q100</td><td>52.7°C</td><td>77.0°C</td></tr> <tr><td>13</td><td>Q101</td><td>57.2°C</td><td>81.5°C</td></tr> <tr><td>14</td><td>C115</td><td>49.4°C</td><td>72.3°C</td></tr> <tr><td>15</td><td>C105</td><td>48.8°C</td><td>72.8°C</td></tr> <tr><td>16</td><td>C106</td><td>50.0°C</td><td>73.7°C</td></tr> <tr><td>17</td><td>RTH5</td><td>59.3°C</td><td>81.4°C</td></tr> <tr><td>18</td><td>TC</td><td>52.3°C</td><td>74.9°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=23.5 °C	HIGH AMBIENT Ta=48.3°C	1	U3	55.1°C	76.0°C	2	BD1	60.3°C	82.0°C	3	C1	58.7°C	77.6°C	4	Q1	60.4°C	82.6°C	5	U1	59.2°C	81.1°C	6	U2	62.0°C	84.2°C	7	C35	57.8°C	80.1°C	8	Q50	60.5°C	82.7°C	9	T1	69.4°C	92.4°C	10	C5	58.3°C	80.3°C	11	U101	60.5°C	83.6°C	12	Q100	52.7°C	77.0°C	13	Q101	57.2°C	81.5°C	14	C115	49.4°C	72.3°C	15	C105	48.8°C	72.8°C	16	C106	50.0°C	73.7°C	17	RTH5	59.3°C	81.4°C	18	TC	52.3°C	74.9°C
NO	Position	ROOM AMBIENT Ta=23.5 °C	HIGH AMBIENT Ta=48.3°C																																																																													
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14	C115	49.4°C	72.3°C																																																																													
15	C105	48.8°C	72.8°C																																																																													
16	C106	50.0°C	73.7°C																																																																													
17	RTH5	59.3°C	81.4°C																																																																													
18	TC	52.3°C	74.9°C																																																																													
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 127 * LOAD Ta : 25°C	TEST : OK																																																																												
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230VAC/110VAC O/P : 100 * LOAD Ta=-45 °C	TEST : OK																																																																												
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 45 °C NO DAMAGE	I/P : 264VAC O/P : FULL LOAD Ta= 45 °C HUMIDITY= 95 %R.H	TEST : OK																																																																												
5	TEMPERATURE COEFFICIENT	± 0.03 %/(0°C~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.012 %/°C(0~50°C)																																																																												

6	STORAGE TEMPERATURE TEST	-40~85°C	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 : 10CYCLE 5. Input/Output condition : STATIC
7	THERMAL SHOCK TEST	-40~45°C	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 : 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°C
9	CAPACITOR LIFE CYCLE	SUPPOSE C106 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) 581123HRS (2) 157085HRS (3) 276430HRS (4) 374468 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°C)	
11	Ongoing Reliability Test	I/P : 230VAC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 50,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/HUANGMK	WENF	LINKX

2018.4.30

GP-A50-F010