



Test Report: OWA-200E-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

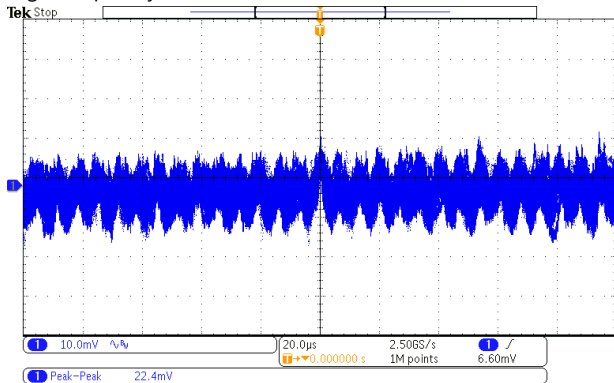
ENVIRONMENT TEST

DESIGN VERIFY TEST

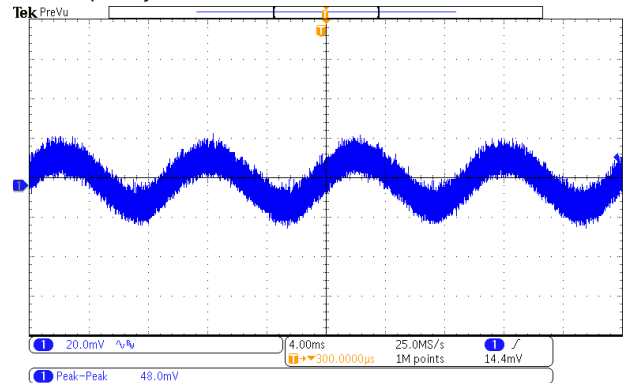
OUTPUT FUNCTION TEST

N O	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE TOLERANCE	V1: -4% ~ 4% (Max)	I/P:180VAC /264AC O/P:FULL~MIN LOAD Ta:25°C	V1: -0.55%~1.15%
2	LINE REGULATION	V1: -0.5% ~0.5% (Max)	I/P:180VAC~264AC O/P:FULL LOAD Ta:25°C	V1: 0%~ 0%
3	LOAD REGULATION	V1: -4% ~ 4% (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.85%~0.85%
4	OVER/UNDERSHOOT TEST	< +5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: 2.7%
5	RIPPLE & NOISE	V1: 150mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 48mVp-p / 100% load

high frequency :



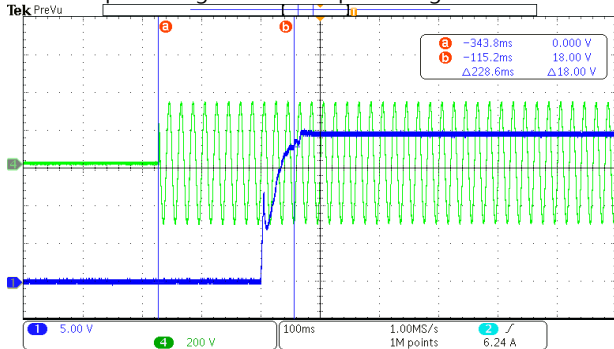
low frequency :



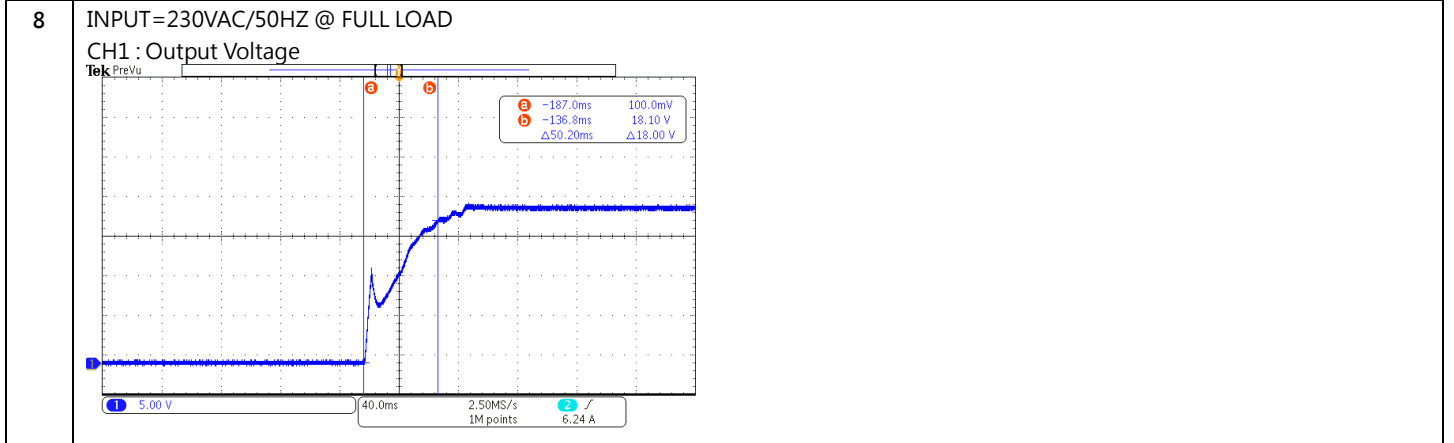
6	SET UP TIME (Max)	230VAC/500ms	I/P: 230 VAC O/P:FULL LOAD Ta:25°C 使用 LEDH MODE TEST	230VAC/228.6 ms
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INPUT=230VAC/50HZ @ FULL LOAD

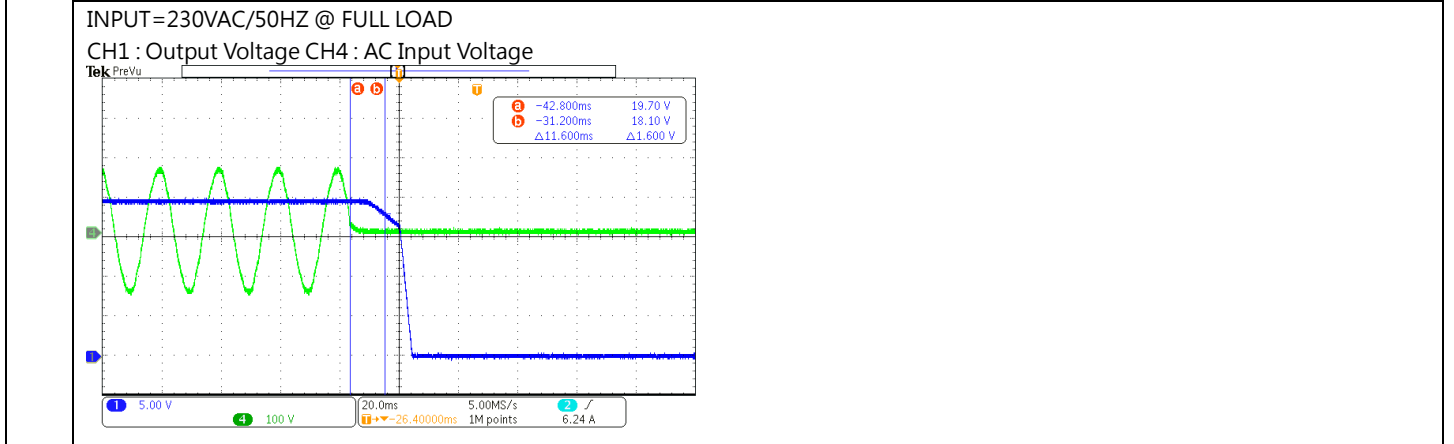
CH1 : Output Voltage CH4 : AC Input Voltage



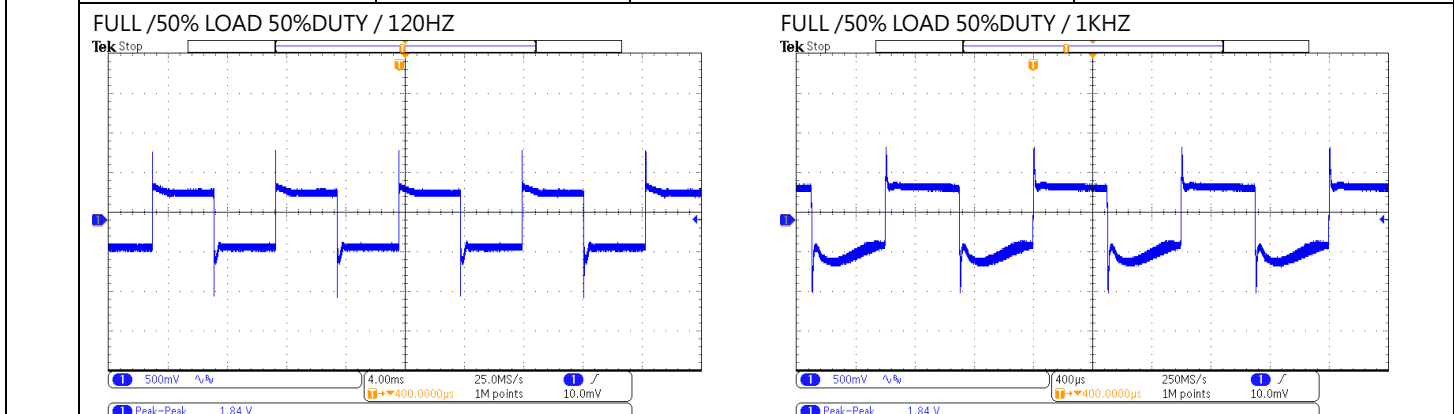
7	RISE TIME (Max)	230VAC/80ms	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C 使用 LEDH MODE TEST	230VAC/50.2 ms
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9	HOLD UP TIME (Typ)	230VAC/10ms	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C 使用 LEDH MODE TEST	230VAC/ 11.6 ms
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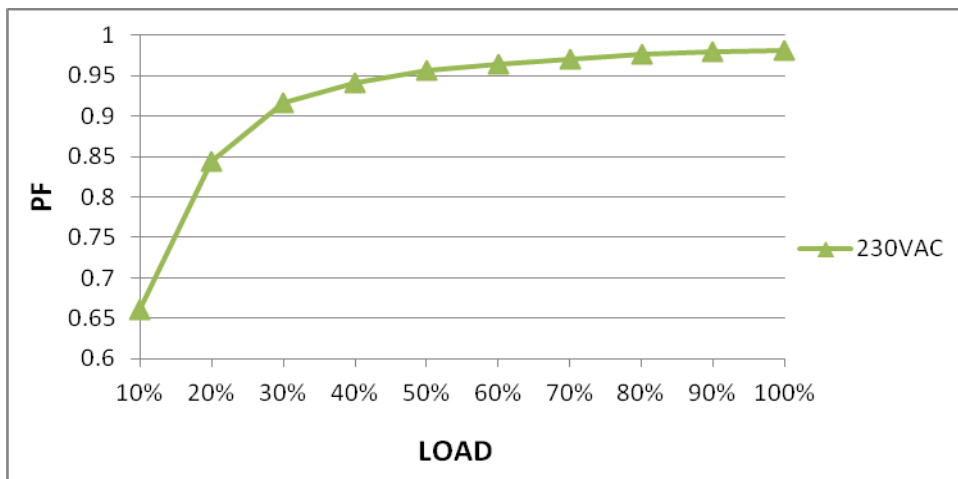
10	DYNAMIC LOAD	V1: 2000mVp-p	I/P: 230VAC O/P: (1) FULL /50% LOAD 50%DUTY / 120HZ (2) FULL /50% LOAD 50%DUTY / 1KHZ Ta: 25°C	1840mVp-p FULL /50% LOAD 50%DUTY / 120HZ 1840mVp-p FULL /50% LOAD 50%DUTY / 1KHZ
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INPUT FUNCTION TEST

N O	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~264VAC 254VDC~ 370VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL LOAD Ta:25°C	(1) 180V~267VAC (2) 242Vdc~370Vdc/FULL LOAD (3) 242Vdc~370Vdc/FULL LOAD
			I/P: LOW-LINE-3V=177VAC 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: 180 VAC ~264VAC O/P:FULL~MIN LOAD Ta:25°C	OK
3	INPUT CURRENT (TYP)	230 VAC/1.1A	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 0.94A/ 230VAC
	NO LOAD POWER CONSUMPTION	<0.15W	I/P: 230 VAC O/P:NO LOAD Ta:25°C	0.1253W
4	POWER FACTOR(TYP)	0.96/230 VAC FULL LOAD	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	PF= 0.982/230V/100%LOAD

P.F vs LOAD



5	EFFICIENCY (TYP)	92.5%	I/P: 230VAC O/P: 100%Load Ta:25°C	93.18%																						
<p>EFFICIENCY vs LOAD</p> <table border="1"> <caption>Efficiency vs Load Data (Approximate)</caption> <thead> <tr> <th>LOAD (%)</th> <th>EFFICIENCY (%)</th> </tr> </thead> <tbody> <tr><td>10%</td><td>88</td></tr> <tr><td>20%</td><td>91</td></tr> <tr><td>30%</td><td>91.5</td></tr> <tr><td>40%</td><td>92</td></tr> <tr><td>50%</td><td>92.5</td></tr> <tr><td>60%</td><td>92.8</td></tr> <tr><td>70%</td><td>93</td></tr> <tr><td>80%</td><td>93</td></tr> <tr><td>90%</td><td>93</td></tr> <tr><td>100%</td><td>93.18</td></tr> </tbody> </table>					LOAD (%)	EFFICIENCY (%)	10%	88	20%	91	30%	91.5	40%	92	50%	92.5	60%	92.8	70%	93	80%	93	90%	93	100%	93.18
LOAD (%)	EFFICIENCY (%)																									
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100%	93.18																									
6	INRUSH CURRENT (TYP)	230 V/ 65A (twidh=550us measured at 50% Ipeak) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 51.6A/ 230VAC T50=440us																						
<p>INPUT=230VAC/50HZ @ FULL LOAD CH2 : AC Input Voltage CH4 : Input current (1V=1A)</p> <p>Ch3 Max 51.6 A</p> <p>Ch2 100 V 50ms M 400µs A Ch3 20.0 A</p> <p>Ch3 10.0 A Ω</p> <p>50.20 %</p>																										

ROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER CURRENT PROTECTION	105 %~150%	I/P: 267VAC I/P: 230VAC I/P: 180VAC O/P:TESTING Ta:25°C	129.6%/ 267VAC 129.4%/ 230VAC 129.5%/180VAC 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: 180VAC O/P:TESTING Ta:25°C	25.9V/ 267VAC 25.7V/ 230VAC 25.9V/ 180VAC PROTECTION TYPE : Shut down o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 267 VAC I/P: 180 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: 180 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	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. I/P:Low-Line -3V = 177V 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	VDS: (1) 458V (2) 470V (3) 458V (4) 450V (5) 450V (6) 458V (7) 462V 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	<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 =177V 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>Ta:25°C</p>	<p>VDS: (1) 503V (2) 501V (3) 508V (4) 503V (5) 504V (6) 501V (7) 504V</p> <p>VDS: (1) 496V (2) 444V (3) 496V (4) 492V (5) 500V (6) 500V (7) 440V</p>
3	P.F.C DIODE	D5 Rated 9 A/ 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>I/P:Low-Line -3V = 177V 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>Ta:25°C</p>	<p>(1) 484V (2) 460V (3) 474V (4) 468V</p> <p>(1) 432V (2) 426V (3) 430V (4) 438V</p>
4	Diode Peak Voltage	Q101 Rated 140 A/60V Q100 Rated	<p>AC ON/OFF I/P:High-Line +3V =267 V O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/</p>	<p>Q101: VDS: (1) 47.8V (2) 13.6V (3) 47.4V</p>

		140A/ 60V	<p>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</p> <p>Ta:25°C</p>	<p>(4) 47.4V (5) 47.4V (6) 47.8V (7) 7.8V (8) 46.6V</p> <p>Q100: VDS: (1) 49V (2) 11V (3) 49.4V (4) 49V (5) 48.6V (6) 49V (7) 10.6V (8) 45.8V</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</p> <p>Ta:25°C</p>	<p>(1) 430V (2) 421V (3) 430V (4) 423V</p>
6	Control IC Voltage Test	U2 Rated -0.3V~20V U1 Rated 0.3V~ 35V	<p>AC ON/OFF</p> <p>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: (1) 16.8 V (2) 16.7V (3) 17.3V (4) 15.7V (5) 15.8V</p> <p>U1: (1) 16.7 V (2) 16.6V (3) 16.7V (4) 16.8V (6) 16.7V</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: 4.5 KVAC/min Ta:25°C	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°C	I/P-O/P: 9999MΩ NO DAMAGE
3	LEAKAGE CURRENT	0.25mA / 240VAC	I/P: 240 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.061 mA N-FG: 0.054mA

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P: 230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
2	CONDUCTION	EN55032 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab
3	RADIATION	EN55032 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	IEC61000-4-5 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 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-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=23.5 °C 2. HIGH AMBIENT BURN-IN : 2 HRS 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>55.7°C</td><td>76.4°C</td></tr> <tr><td>2</td><td>BD1</td><td>59.9°C</td><td>81.5°C</td></tr> <tr><td>3</td><td>C1</td><td>56.4°C</td><td>75.3°C</td></tr> <tr><td>4</td><td>Q1</td><td>60.4°C</td><td>82.4°C</td></tr> <tr><td>5</td><td>U1</td><td>58.9°C</td><td>80.7°C</td></tr> <tr><td>6</td><td>U2</td><td>62.7°C</td><td>84.6°C</td></tr> <tr><td>7</td><td>C35</td><td>59.3°C</td><td>81.5°C</td></tr> <tr><td>8</td><td>Q50</td><td>61.9°C</td><td>84.0°C</td></tr> <tr><td>9</td><td>T1</td><td>72.0°C</td><td>95.1°C</td></tr> <tr><td>10</td><td>C5</td><td>58.4°C</td><td>80.3°C</td></tr> <tr><td>11</td><td>U101</td><td>64.7°C</td><td>88.1°C</td></tr> <tr><td>12</td><td>Q100</td><td>57.6°C</td><td>81.4°C</td></tr> <tr><td>13</td><td>Q101</td><td>62.6°C</td><td>86.5°C</td></tr> <tr><td>14</td><td>C115</td><td>53.2°C</td><td>76.2°C</td></tr> <tr><td>15</td><td>C105</td><td>52.0°C</td><td>75.3°C</td></tr> <tr><td>16</td><td>C106</td><td>53.8°C</td><td>77.2°C</td></tr> <tr><td>17</td><td>RTH5</td><td>60.8°C</td><td>82.9°C</td></tr> <tr><td>18</td><td>TC</td><td>54.9°C</td><td>75.9°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=23.5°C	HIGH AMBIENT Ta=48.3°C	1	U3	55.7°C	76.4°C	2	BD1	59.9°C	81.5°C	3	C1	56.4°C	75.3°C	4	Q1	60.4°C	82.4°C	5	U1	58.9°C	80.7°C	6	U2	62.7°C	84.6°C	7	C35	59.3°C	81.5°C	8	Q50	61.9°C	84.0°C	9	T1	72.0°C	95.1°C	10	C5	58.4°C	80.3°C	11	U101	64.7°C	88.1°C	12	Q100	57.6°C	81.4°C	13	Q101	62.6°C	86.5°C	14	C115	53.2°C	76.2°C	15	C105	52.0°C	75.3°C	16	C106	53.8°C	77.2°C	17	RTH5	60.8°C	82.9°C	18	TC	54.9°C	75.9°C
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18	TC	54.9°C	75.9°C																																																																													
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 123 * LOAD Ta : 25°C	TEST : OK																																																																												
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/180VAC 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	± 0.001 %/°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	-40~50°C	1. Thermal shock Temperature : -45°C~ +55°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 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) 406639HRS (2) 112019HRS (3) 219086HRS (4) 341519 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 2677.8K hrs min. Telcordia SR-332 (Bellcore); 267.6K 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