



# Test Report: ELG-150-42

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150W Single Output Switching Power Supply

## ■ 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

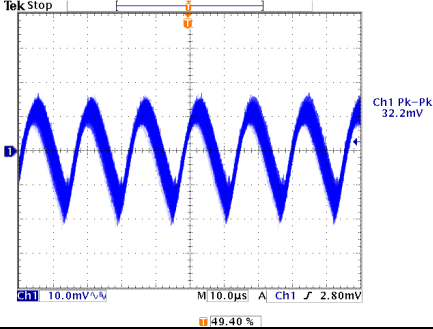
Environment Test

■ DESIGN VERIFY TEST

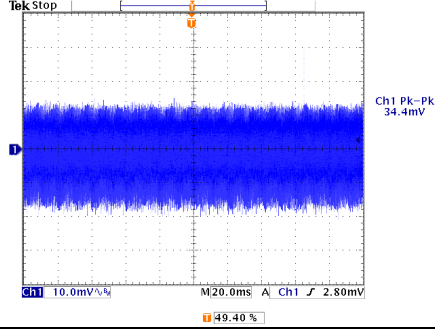
**OUTPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	21V~42V	I/P: 230VAC O/P: LED MODE Ta: 25°C	12.44 V~ 41.92 V
2	OUTPUT VOLTAGE ADJUST RANGE	37.8V~46.2V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	35.32 V~ 47.32 V
3	OUTPUT CURRENT ADJUST RANGE	1.8A~3.57A	I/P: 230VAC O/P: SETTING Ta: 25°C	1.528 A~ 3.987 A
4	OUTPUT VOLTAGE TOLERANCE	-2.5%~+2.5%	I/P: 100VAC / 305VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.05%~ 0.69%
5	LINE REGULATION	-0.5%~+0.5%	I/P: 200VAC ~ 305VAC O/P: FULL LOAD Ta: 25°C	0%~ 0%
6	LOAD REGULATION	-0.5%~+0.5%	I/P: 230VAC O/P: FULL ~NO LOAD Ta: 25°C	-0.05%~ 0.02%
7	OVER/UNDERSHOOT TEST	<± 5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	± 1.422%
8	RIPPLE & NOISE (Max)	250mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	34.4 mVp-p

high frequency :



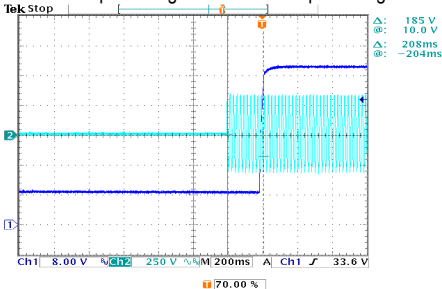
low frequency :

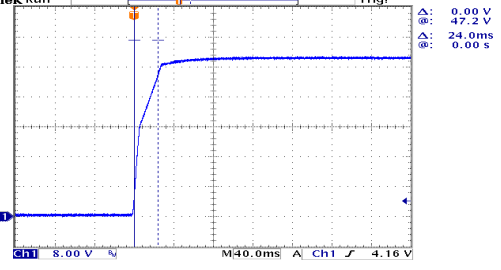
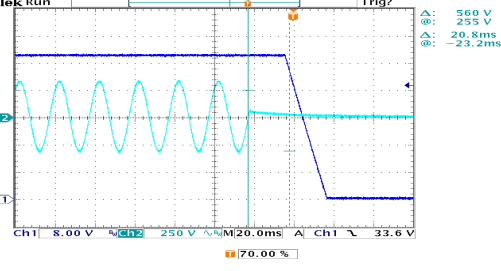
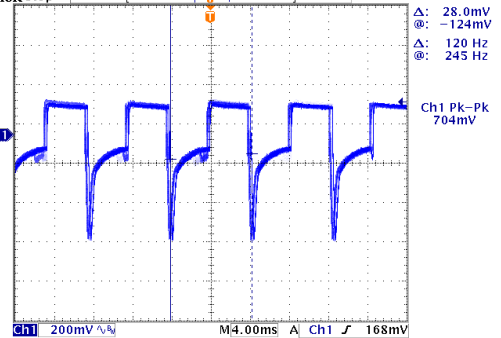
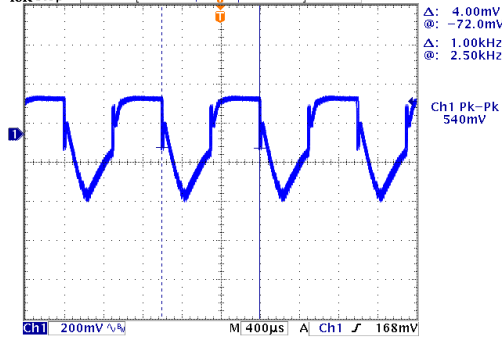


9	SET UP TIME(Max)	230VAC/ 500ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 208 ms
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INPUT=230VAC/50HZ @ 95% LOAD

CH1: Output Voltage CH2: AC Input Voltage



10	RISE TIME (Max)	230VAC/ 100ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 24.0 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage</p>  <p>Measurement: <math>\Delta</math>: 0.00 V, @: 47.2 V, <math>\Delta</math>: 24.0ms, @: 0.00 s</p>				
11	HOLD UP TIME(Typ)	230VAC/ 10ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 20.8 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Measurement: <math>\Delta</math>: 560 V, @: 255 V, <math>\Delta</math>: 20.8ms, @: -23.2ms</p>				
12	DYNAMIC LOAD	V1: 4200 mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta: 25°C	(1) 704mVp-p (2) 540mVp-p
<p>FULL /50% LOAD 50%DUTY / 120HZ</p>  <p>Measurement: <math>\Delta</math>: 28.0mV, @: -124mV, <math>\Delta</math>: 120 Hz, @: 245 Hz</p> <p>Ch1 Pk-Pk 704mV</p> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p>  <p>Measurement: <math>\Delta</math>: 4.00mV, @: -72.0mV, <math>\Delta</math>: 1.00kHz, @: 2.50kHz</p> <p>Ch1 Pk-Pk 540mV</p>				

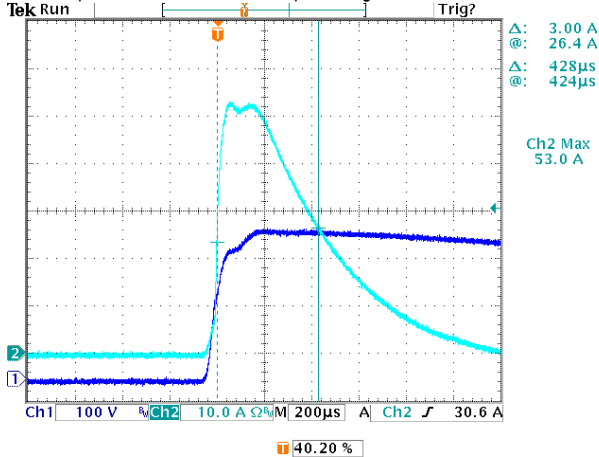
13	DIMMING TEST (For B-Type only)	SPEC:													
		※ Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-.													
		※ Please DO NOT connect "DIM-" to "-V".													
		※ Reference resistance value for output current adjustment (Typical)													
		Resistance value	Single driver	Short	10K Ω	20K Ω	30K Ω	40K Ω	50K Ω	60K Ω	70K Ω	80K Ω	90K Ω	100K Ω	OPEN
			Multiple drivers (N=driver quantity for synchronized dimming operation)	Short	10K Ω/N	20K Ω/N	30K Ω/N	40K Ω/N	50K Ω/N	60K Ω/N	70K Ω/N	80K Ω/N	90K Ω/N	100K Ω/N	.....
		Percentage of rated current		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%
		※ 0 ~ 10V dimming function for output current adjustment (Typical)													
		Dimming value		0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
		Percentage of rated current		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%
		※ 10V PWM signal for output current adjustment (Typical): Frequency range: 100Hz~3KHz													
		Duty value		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
		Percentage of rated current		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%
TEST RESULT:															
I/P: 230 VAC; Ta: 25°C															
1	Resistance value	Short	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN		
	Output Current	0	0.291	0.662	1.035	1.412	1.794	2.179	2.569	2.962	3.364	3.580	3.582		
	Percentage of rated current	0%	8.15%	18.54%	28.99%	39.55%	50.25%	61.04%	71.96%	82.97%	94.23%	100.28%	100.34%		
2	Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN		
	Output Current	0	0.306	0.674	1.024	1.397	1.762	2.142	2.516	2.867	3.241	3.578	3.582		
	Percentage of rated current	0%	8.57%	18.88%	28.68%	39.13%	49.36%	60.00%	70.48%	80.31%	90.78%	100.22%	100.34%		
3	Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN		
	Output Current	0	0.325	0.685	1.048	1.409	1.774	2.136	2.498	2.866	3.227	3.554	3.582		
	Percentage of rated current	0%	9.10%	19.19%	29.36%	39.47%	49.69%	59.83%	69.97%	80.28%	90.39%	99.55%	100.34%		

**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	97 V~ 305 V
			I/P: LOW-LINE-3V=97 V HIGH-LINE+10V=315 V O/P: FULL/NO LOAD 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: 100 VAC ~305 VAC O/P: FULL~NO LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	0.7A/277VAC 0.9A/230VAC	I/P: 277 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I = 0.57 A/ 277VAC I = 0.68 A/ 230VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.344 mA N-FG: 0.336 mA
5	NO LOAD POWER CONSUMPTION	< 0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.149 W/ 230VAC
6	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 50% or higher at 230VAC	I/P: 230VAC O/P: 50% LOAD	THD: 9.75 %
		Total harmonic distortion will be lower than 20% when output loading is 75% or higher at 277VAC	I/P: 277VAC O/P: 75% LOAD	THD: 8.27 %
7	INRUSH CURRENT(Typ)	230V/ 65A Twidth =550us measured at 50% Ipeak COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I = 53.0 A/ 230VAC Twidth =428 us

INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



8	EFFICIENCY(Typ)	90%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	91.95%																																	
<p>EFFICIENCY vs LOAD</p> <table border="1"> <caption>Efficiency vs Load Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>277V Efficiency (%)</th> <th>230V Efficiency (%)</th> </tr> </thead> <tbody> <tr><td>10%</td><td>74%</td><td>72%</td></tr> <tr><td>20%</td><td>83%</td><td>85%</td></tr> <tr><td>30%</td><td>91%</td><td>91%</td></tr> <tr><td>40%</td><td>92%</td><td>90%</td></tr> <tr><td>50%</td><td>91%</td><td>91%</td></tr> <tr><td>60%</td><td>92%</td><td>91%</td></tr> <tr><td>70%</td><td>92%</td><td>92%</td></tr> <tr><td>80%</td><td>92%</td><td>92%</td></tr> <tr><td>90%</td><td>92%</td><td>92%</td></tr> <tr><td>100%</td><td>92%</td><td>92%</td></tr> </tbody> </table>					LOAD (%)	277V Efficiency (%)	230V Efficiency (%)	10%	74%	72%	20%	83%	85%	30%	91%	91%	40%	92%	90%	50%	91%	91%	60%	92%	91%	70%	92%	92%	80%	92%	92%	90%	92%	92%	100%	92%	92%
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9	POWER FACTOR	0.92/ 277VAC 0.95/ 230VAC	I/P: 277 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	PF= 0.981 / 277VAC PF= 0.992 / 230VAC																																	
<p>P.F vs LOAD</p> <p>Constant Current Mode</p> <table border="1"> <caption>P.F vs Load Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>277V PF</th> <th>230V PF</th> </tr> </thead> <tbody> <tr><td>50%</td><td>0.945</td><td>0.978</td></tr> <tr><td>60%</td><td>0.958</td><td>0.982</td></tr> <tr><td>70%</td><td>0.968</td><td>0.986</td></tr> <tr><td>80%</td><td>0.975</td><td>0.988</td></tr> <tr><td>90%</td><td>0.978</td><td>0.991</td></tr> <tr><td>100%</td><td>0.980</td><td>0.992</td></tr> </tbody> </table>					LOAD (%)	277V PF	230V PF	50%	0.945	0.978	60%	0.958	0.982	70%	0.968	0.986	80%	0.975	0.988	90%	0.978	0.991	100%	0.980	0.992												
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**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	95%~108%	I/P: 200VAC I/P: 230VAC I/P: 305VAC O/P: TESTING Ta: 25°C	101.97 %/ 200VAC 101.96 %/ 230VAC 101.95 %/ 305VAC Constant Current Limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	47V~54V	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: NO LOAD Ta: 25°C	49.75 V/ 100VAC 49.75 V/ 230VAC 49.75 V/ 305VAC Shut down o/p voltage, re-power on to recovery
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 200VAC I/P: 230VAC I/P: 305VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage, re-power on to recovery
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 200VAC I/P: 305VAC 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 Power Transistor	Q 2 Rated 730V/10A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 670 V (2) 544 V (3) 654 V
2	O/P Diode (MOSFET)	Q101 Rated 200V/20A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 188 V (2) 137 V (3) 182 V
3	Input Capacitor	C5 Rated 100u/ 450V	I/P: High-Line +3V =308 V O/P: (1) Full Load input on/off (2) NO LOAD input on /Off (3) Full Load /NO LOAD Change Ta: 25°C	(1) 442 V (2) 444 V (3) 446 V
4	Control IC	U1 Rated 28V (MAX.)	I/P: High-Line +3V =308 V O/P: ((1) FULL LOAD (2) Output Short (3) O.L.P (4) O.V.P (5) Low Line No Load Vo(min) Ta: 25°C	(1) 17.5 V (2) 15.3 V (3) 11.1 V (4) 15.2 V (5) 17.2 V
5	PFC Power Transistor	Q 1 Rated 600V/10A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 530 V (2) 508 V (3) 488 V

6	Clamp Diode	D 10 Rated 800V/2A	I/P: High-Line +3V = 308V O/P: (1) Full Load input on/off (2) Output Short Ta: 25°C	(1) 612 V (2) 468 V
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### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min I/P-FG: 2.0KVAC/min O/P-FG: 1.5KVAC/min	I/P-O/P: 4.2KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG: 1.8 KVAC/min Ta: 25°C	I/P-O/P: 1.345 mA I/P-FG: 2.048 mA O/P-FG: 1.367 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG: 500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta: 25°C	I/P-O/P: >9999 MΩ I/P-FG: >9999 MΩ O/P-FG: >9999 MΩ

### 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/50% LOAD Ta: 25°C	PASS
2	CONDUCTION	EN55015	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	RADIATION	EN55015	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: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
6	SURGE	EN61000-4-5 INDUSTRY L-N: 4KV L,N-PE: 6KV	I/P: 230VAC/50HZ O/P: FULL LOAD L-N: 4KV L,N-PE: 6KV Ta: 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare			



■ **RELIABILITY TEST**

**ENVIRONMENT TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																								
1	TEMPERATURE RISE TEST	MODEL: ELG-150-48 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=32.8 °C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=62.2 °C																																																																																																										
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NO	Position	ROOM AMBIENT Ta=32.8 °C	HIGH AMBIENT Ta=62.2 °C																																																																																																									
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6	Q1	73.6°C	99.7°C																																																																																																									
7	Q2	76.5°C	103.3°C																																																																																																									
8	D6	75.5°C	102.0°C																																																																																																									
9	D10	80.4°C	108.5°C																																																																																																									
10	U1	66.7°C	93.1°C																																																																																																									
11	R7	79.2°C	106.4°C																																																																																																									
12	U100	70.7°C	96.5°C																																																																																																									
13	C5	76.4°C	103.8°C																																																																																																									
14	T1	69.1°C	95.7°C																																																																																																									
15	C45	60.9°C	87.4°C																																																																																																									
16	Q101	71.5°C	97.5°C																																																																																																									
17	Q102	71.9°C	98.1°C																																																																																																									
18	Q105	60.9°C	87.7°C																																																																																																									
19	C205	68.0°C	94.2°C																																																																																																									
20	C105	61.4°C	87.6°C																																																																																																									
21	C106	66.7°C	93.0°C																																																																																																									
22	C108	63.6°C	89.5°C																																																																																																									
23	RTH2	66.7°C	92.9°C																																																																																																									
24	U500	57.7°C	84.3°C																																																																																																									
25	TC	59.3°C	86.7°C																																																																																																									
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 305VAC/200VAC O/P: FULL LOAD Ta= -45°C	TEST: OK																																																																																																								
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60°C NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=60°C HUMIDITY= 95 %R.H	TEST: OK																																																																																																								
4	TEMPERATURE COEFFICIENT	±0.03 %/°C (0~50°C)	I/P: 230 VAC O/P: FULL LOAD	±0.009 %/°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~+65°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 AC on 3 sec/AC off 1 sec TEST	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	ELG-150-48: SUPPOSE C108 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P: FULL LOAD Tc= 80 °C LIFE TIME (2) I/P: 230VAC O/P: 75% LOAD Tc= 80 °C LIFE TIME (3) I/P: 230VAC O/P: 50% LOAD Tc= 80 °C LIFE TIME	(1) 40709 HRS (2) 43123 HRS (3) 51570 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 2661.6K hrs min. Telcordia SR-332 (Bellcore); 313.7K hrs min. MIL-HDBK-217F (25°C)	
10	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	ZHANGZJ/ZHUOKB	SKY	LIUWY