



# Test Report: ELG-100-42

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100W 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

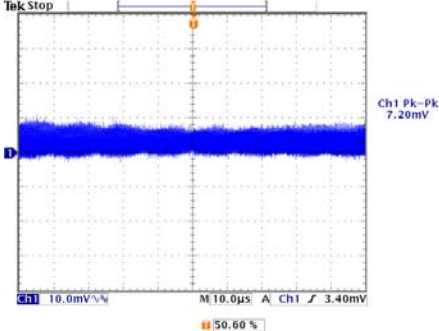
Environment Test

■ DESIGN VERIFY TEST

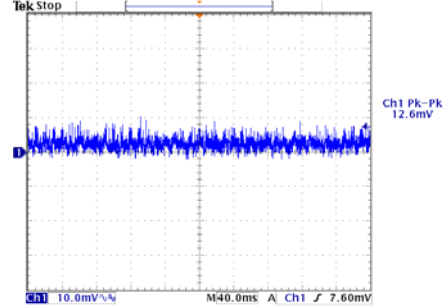
**OUTPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	21V~42V	I/P: 230VAC O/P: LED MODE Ta: 25°C	11 V~ 42 V
2	OUTPUT VOLTAGE ADJUST RANGE	37.8V~46.2V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	36.2 V~ 47.7 V
3	OUTPUT CURRENT ADJUST RANGE	1.14A~2.28A	I/P: 230VAC O/P: SETTING Ta: 25°C	0.931 A~ 2.595 A
4	OUTPUT VOLTAGE TOLERANCE	-2.5%~+2.5%	I/P: 100VAC / 305VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.18%~ 0.50%
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	-0.18%~ 0.26%
7	OVER/UNDERSHOOT TEST	<± 5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	±1.091%
8	RIPPLE & NOISE (Max)	250mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	12.6 mVp-p

high frequency :



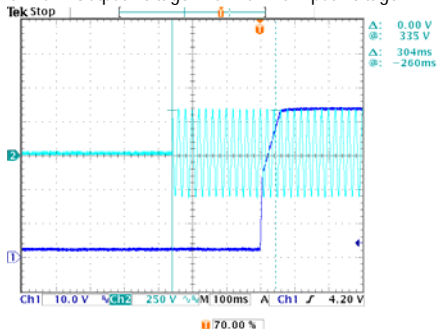
low frequency :



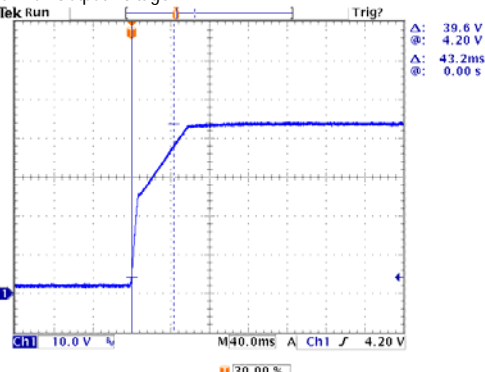
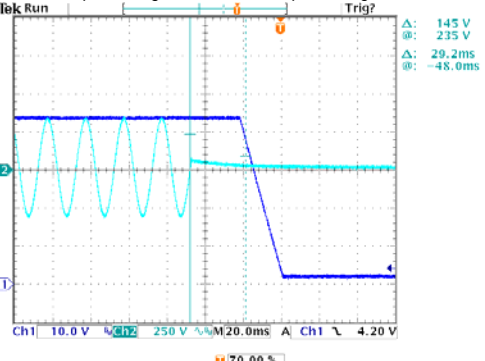
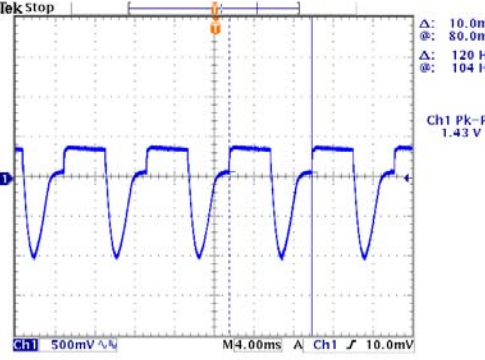
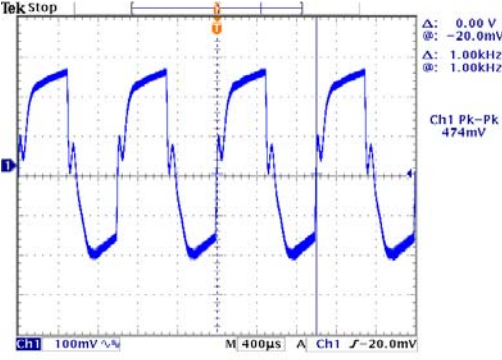
9	SET UP TIME(Max)	230VAC/ 500ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 304 ms
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INPUT=230VAC/50HZ @ 95% LOAD

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/ 43.2 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage</p>  <p>Δ: 39.6 V Ⓢ: 4.20 V Δ: 43.2ms Ⓢ: 0.00 s</p> <p>Ch1 10.0 V M40.0ms A Ch1 4.20 V</p> <p>30.00 %</p>				
11	HOLD UP TIME(Typ)	230VAC/ 10ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 29.2 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 145 V Ⓢ: 235 V Δ: 29.2ms Ⓢ: -48.0ms</p> <p>Ch1 10.0 V Ch2 250 V M20.0ms A Ch1 4.20 V</p> <p>70.00 %</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) 1430mVp-p (2) 474mVp-p
<p>FULL /50% LOAD 50%DUTY / 120HZ</p>  <p>Δ: 10.0mV Ⓢ: 80.0mV Δ: 120 Hz Ⓢ: 104 Hz</p> <p>Ch1 Pk-Pk 1.43 V</p> <p>Ch1 500mV M4.00ms A Ch1 10.0mV</p> <p>50.60 %</p> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p>  <p>Δ: 0.00 V Ⓢ: -20.0mV Δ: 1.00kHz Ⓢ: 1.00kHz</p> <p>Ch1 Pk-Pk 474mV</p> <p>Ch1 100mV M400µs A Ch1 20.0mV</p> <p>50.00 %</p>				

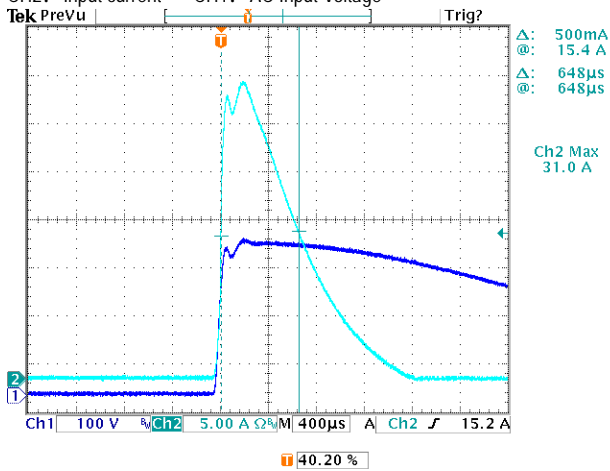
13	DIMMING TEST (For B-Type only)	SPEC:													
		※ Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 0 - 10Vdc or 10V PWM signal between DIM+ and DIM-.													
		※ Please DO NOT connect "DIM-" to "-V".													
		※ 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	0.233	0.468	0.703	0.940	1.175	1.410	1.650	1.887	2.127	2.298	2.300		
	Percentage of rated current	0%	10.22%	20.53%	30.83%	41.23%	51.54%	61.84%	72.37%	82.76%	93.29%	100.79%	100.88%		
2	Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN		
	Output Current	0	0.240	0.474	0.698	0.935	1.165	1.407	1.644	1.866	2.101	2.295	2.297		
	Percentage of rated current	0%	10.53%	20.79%	30.61%	41.01%	51.10%	61.71%	72.11%	81.84%	92.15%	100.66%	100.75%		
3	Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN		
	Output Current	0	0.232	0.465	0.701	0.934	1.170	1.403	1.637	1.872	2.105	2.293	2.296		
	Percentage of rated current	0%	10.18%	20.39%	30.75%	40.96%	51.32%	61.54%	71.80%	82.11%	92.32%	100.57%	100.70%		

**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	0.5A/277VAC 0.6A/230VAC	I/P: 277 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I = 0.37 A/ 277VAC I = 0.44 A/ 230VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.373 mA N-FG: 0.362 mA
5	NO LOAD POWER CONSUMPTION	< 0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.273 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: 13.57 %
		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: 12.51 %
7	INRUSH CURRENT(Typ)	230V/ 60A Twidth =850us measured at 50% Ipeak COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I = 31.0 A/ 230VAC Twidth =648 us

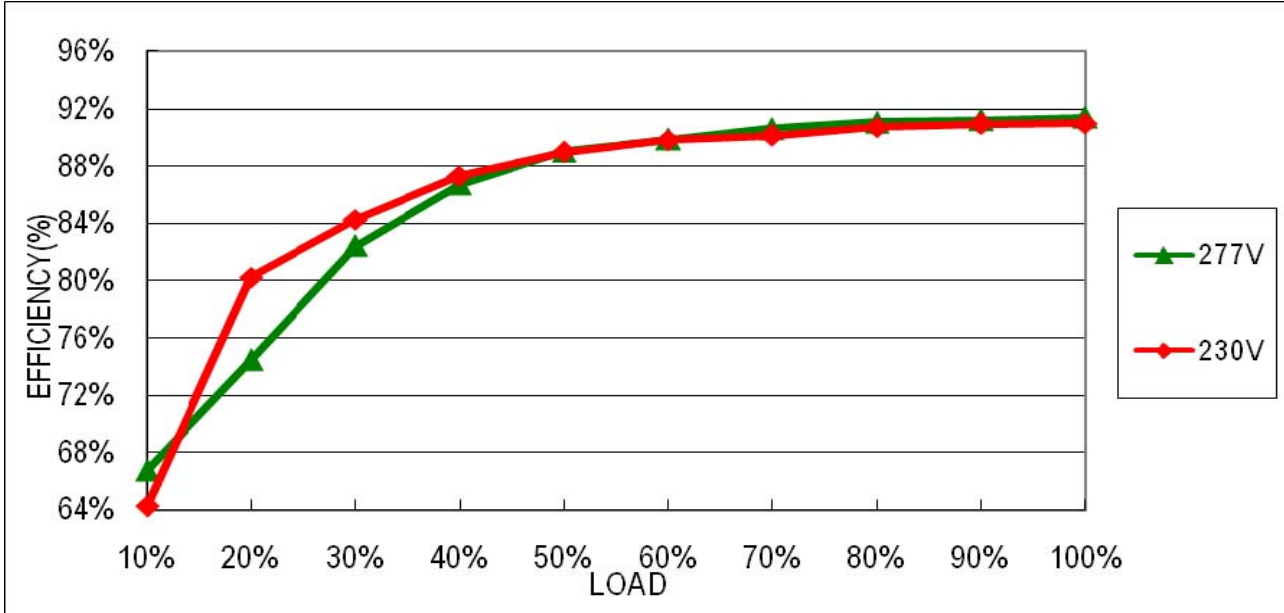
INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



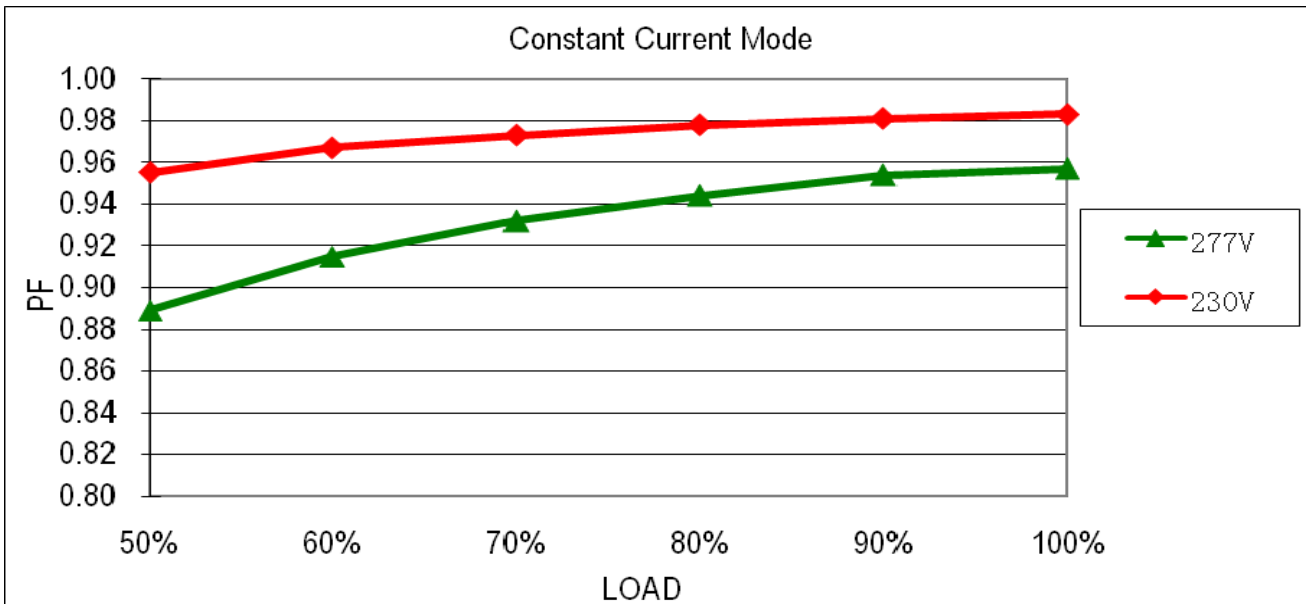
8	EFFICIENCY(Typ)	90%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	91.04 %
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EFFICIENCY vs LOAD



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= 0.957 / 277VAC PF= 0.983 / 230VAC
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P.F vs LOAD



**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	100.76 %/ 200VAC 100.71 %/ 230VAC 100.74 %/ 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	49.34 V/ 100VAC 49.41 V/ 230VAC 49.45 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 800V/5.7A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 678 V (2) 478 V (3) 672 V
2	O/P Diode (MOSFET)	Q101 Rated 170V/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) 143 V (2) 92.7 V (3) 138 V
3	Input Capacitor	C5 Rated 100u/ 450V	I/P: High-Line +3V =308V O/P: (1) Full Load input on/off (2) NO LOAD input on /Off (3) Full Load /NO LOAD Change Ta: 25°C	(1) 440 V (2) 448 V (3) 446 V
4	Control IC	U1 Rated 28V (MAX.)	I/P: High-Line +3V =308V 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) 17.4 V (2) 15.2 V (3) 11.7 V (4) 15.2 V (5) 17.4 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) 470 V (2) 432 V (3) 472 V
6	Clamp Diode	D10 Rated 800V/2A	I/P: High-Line +3V = 308V O/P: (1) Full Load input on/off (2) Output Short Ta: 25°C	(1) 680 V (2) 460 V

**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: 2.630 mA I/P-FG: 2.169 mA O/P-FG: 1.622 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 Ta: 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare			

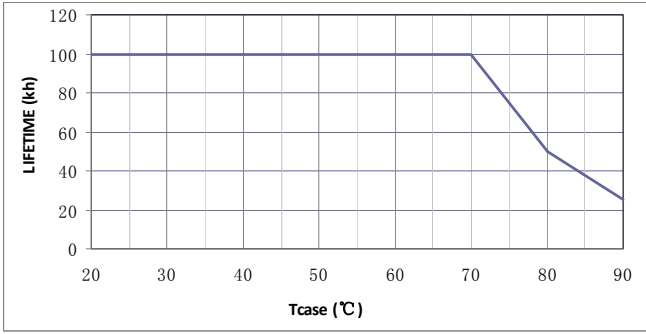


■ **RELIABILITY TEST**

**ENVIRONMENT TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																				
1	TEMPERATURE RISE TEST	MODEL: ELG-100-48 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=31.1 °C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=61.6 °C																																																																																																						
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=31.1 °C</th> <th>HIGH AMBIENT Ta=61.6 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>ZNR1</td><td>54.4°C</td><td>79.8°C</td></tr> <tr><td>2</td><td>LF2</td><td>55.9°C</td><td>82.1°C</td></tr> <tr><td>3</td><td>C10</td><td>57.1°C</td><td>83.7°C</td></tr> <tr><td>4</td><td>C11</td><td>57.4°C</td><td>84.1°C</td></tr> <tr><td>5</td><td>L2</td><td>57.8°C</td><td>83.9°C</td></tr> <tr><td>6</td><td>L1</td><td>35.6°C</td><td>82.7°C</td></tr> <tr><td>7</td><td>Q1</td><td>58.0°C</td><td>84.7°C</td></tr> <tr><td>8</td><td>Q2</td><td>59.6°C</td><td>86.3°C</td></tr> <tr><td>9</td><td>D6</td><td>58.8°C</td><td>85.5°C</td></tr> <tr><td>10</td><td>D10</td><td>63.1°C</td><td>90.6°C</td></tr> <tr><td>11</td><td>C5</td><td>56.2°C</td><td>82.3°C</td></tr> <tr><td>12</td><td>C45</td><td>58.0°C</td><td>83.9°C</td></tr> <tr><td>13</td><td>U1</td><td>57.6°C</td><td>84.3°C</td></tr> <tr><td>14</td><td>T1</td><td>62.8°C</td><td>88.7°C</td></tr> <tr><td>15</td><td>Q101</td><td>58.8°C</td><td>85.3°C</td></tr> <tr><td>16</td><td>Q105</td><td>53.6°C</td><td>80.3°C</td></tr> <tr><td>17</td><td>C205</td><td>57.7°C</td><td>83.9°C</td></tr> <tr><td>18</td><td>C105</td><td>58.1°C</td><td>84.4°C</td></tr> <tr><td>19</td><td>C106</td><td>55.8°C</td><td>82.3°C</td></tr> <tr><td>20</td><td>C108</td><td>55.3°C</td><td>81.8°C</td></tr> <tr><td>21</td><td>LF100</td><td>52.7°C</td><td>79.7°C</td></tr> <tr><td>22</td><td>RTH2</td><td>55.5°C</td><td>81.6°C</td></tr> <tr><td>23</td><td>U100</td><td>52.9°C</td><td>79.7°C</td></tr> <tr><td>24</td><td>TC</td><td>51.2°C</td><td>77.5°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=31.1 °C	HIGH AMBIENT Ta=61.6 °C	1	ZNR1	54.4°C	79.8°C	2	LF2	55.9°C	82.1°C	3	C10	57.1°C	83.7°C	4	C11	57.4°C	84.1°C	5	L2	57.8°C	83.9°C	6	L1	35.6°C	82.7°C	7	Q1	58.0°C	84.7°C	8	Q2	59.6°C	86.3°C	9	D6	58.8°C	85.5°C	10	D10	63.1°C	90.6°C	11	C5	56.2°C	82.3°C	12	C45	58.0°C	83.9°C	13	U1	57.6°C	84.3°C	14	T1	62.8°C	88.7°C	15	Q101	58.8°C	85.3°C	16	Q105	53.6°C	80.3°C	17	C205	57.7°C	83.9°C	18	C105	58.1°C	84.4°C	19	C106	55.8°C	82.3°C	20	C108	55.3°C	81.8°C	21	LF100	52.7°C	79.7°C	22	RTH2	55.5°C	81.6°C	23	U100	52.9°C	79.7°C	24	TC	51.2°C	77.5°C
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24	TC	51.2°C	77.5°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	±0.002 %/°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-100-48: SUPPOSE C108 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= 60 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 60 °C LIFE TIME (4) I/P: 230VAC O/P: 50% LOAD Ta= 60 °C LIFE TIME	(1) 453181 HRS (2) 52859 HRS (3) 60597 HRS (4) 79217 HRS
9	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE: 282.9K HRS	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50000 hours @ Tc 80°C 	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	ZHANGZJ/ZHUOKB	SKY	LIUWY