



# Test Report: ELG-150-24

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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

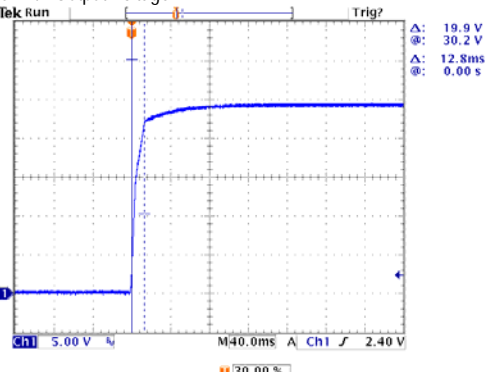
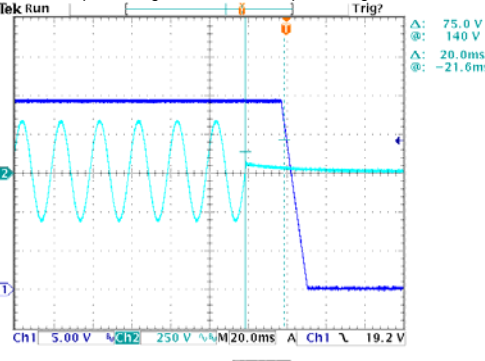
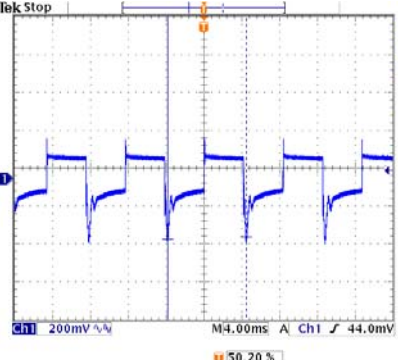
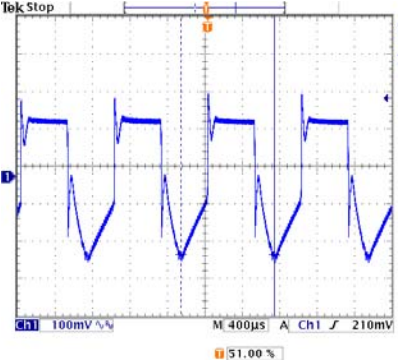
## ■ RELIABILITY TEST

Environment Test

■ DESIGN VERIFY TEST

**OUTPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	12V-24V	I/P: 230VAC O/P: LED MODE Ta: 25°C	9.67 V~ 24.02 V
2	OUTPUT VOLTAGE ADJUST RANGE	21.6V-26.4V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	19.79 V~ 27.41 V
3	OUTPUT CURRENT ADJUST RANGE	3.2A-6.25A	I/P: 230VAC O/P: SETTING Ta: 25°C	2.319 A~ 6.858 A
4	OUTPUT VOLTAGE TOLERANCE	-3%~+3%	I/P: 100VAC / 305VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.54%~ 0.87%
5	LINE REGULATION	-0.5%~+0.5%	I/P: 200VAC ~ 305VAC O/P: FULL LOAD Ta: 25°C	0%~ 0%
6	LOAD REGULATION	-1%~+1%	I/P: 230VAC O/P: FULL ~NO LOAD Ta: 25°C	-0.12%~ 0.21%
7	OVER/UNDERSHOOT TEST	<± 5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	± 1.25%
8	RIPPLE & NOISE (Max)	200mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	16.8 mVp-p
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>high frequency :</p> </div> <div style="text-align: center;"> <p>low frequency :</p> </div> </div>				
9	SET UP TIME(Max)	230VAC/ 500ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 276 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage CH2: AC Input Voltage</p>				

10	RISE TIME (Max)	230VAC/ 100ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 12.8 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage</p>  <p>Δ: 19.9 V Ⓢ: 30.2 V Δ: 12.8ms Ⓢ: 0.00 s</p> <p>Ch1 5.00 V M40.0ms A Ch1 2.40 V</p>				
11	HOLD UP TIME(Typ)	230VAC/ 10ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 20.0 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 75.0 V Ⓢ: 140 V Δ: 20.0ms Ⓢ: -21.6ms</p> <p>Ch1 5.00 V Ch2 250 V M20.0ms A Ch1 19.2 V</p>				
12	DYNAMIC LOAD	V1: 2400 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) 548mVp-p (2) 444mVp-p
<p>FULL /50% LOAD 50%DUTY / 120HZ</p>  <p>Δ: 12.0mV Ⓢ: -320mV Δ: 120 Hz Ⓢ: 255 Hz</p> <p>Ch1 Pk-Pk 548mV</p> <p>Ch1 200mV M4.00ms A Ch1 44.0mV</p> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p>  <p>Δ: 0.00 V Ⓢ: -208mV Δ: 1.00kHz Ⓢ: 1.42kHz</p> <p>Ch1 Pk-Pk 444mV</p> <p>Ch1 100mV M400µs A Ch1 210mV</p>				

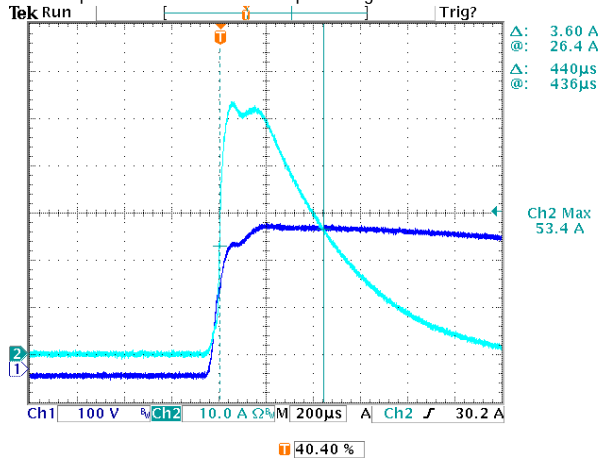
13	DIMMING TEST (For B-Type only)	SPEC:													
		※ Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 0 - 10Vdc or 10V PWM signal between DIM+ and DIM-.													
		※ Please DO NOT connect "DIM-" to "-V".													
		※ 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	0.618	1.235	1.856	2.478	3.101	3.724	4.348	4.977	5.602	6.233	6.367		
	Percentage of rated current	0%	9.89%	19.76%	29.70%	39.65%	49.62%	59.58%	69.57%	79.63%	89.63%	99.73%	101.87%		
2	Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN		
	Output Current	0	0.64	1.269	1.876	2.514	3.138	3.785	4.413	5.034	5.665	6.288	6.367		
	Percentage of rated current	0%	10.24%	20.30%	30.02%	40.22%	50.21%	60.56%	70.61%	80.54%	90.64%	100.61%	101.87%		
3	Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN		
	Output Current	0	0.631	1.247	1.872	2.493	3.121	3.743	4.367	4.997	5.618	6.191	6.367		
	Percentage of rated current	0%	10.10%	19.95%	29.95%	39.89%	49.94%	59.89%	69.87%	79.95%	89.89%	99.06%	101.87%		

**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: 0.340 mA N-FG: 0.309 mA
5	NO LOAD POWER CONSUMPTION	< 0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.116 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: 10.22 %
		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: 8.65 %
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 = 53.4 A/ 230VAC Twidth =440 us

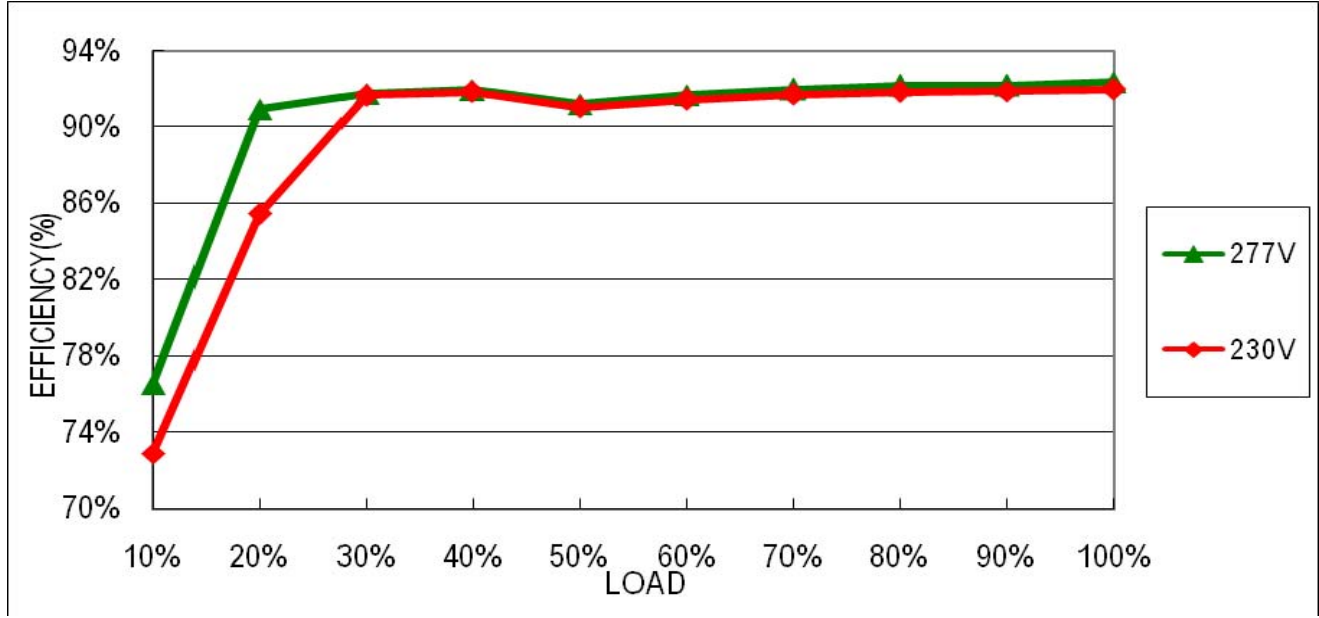
INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



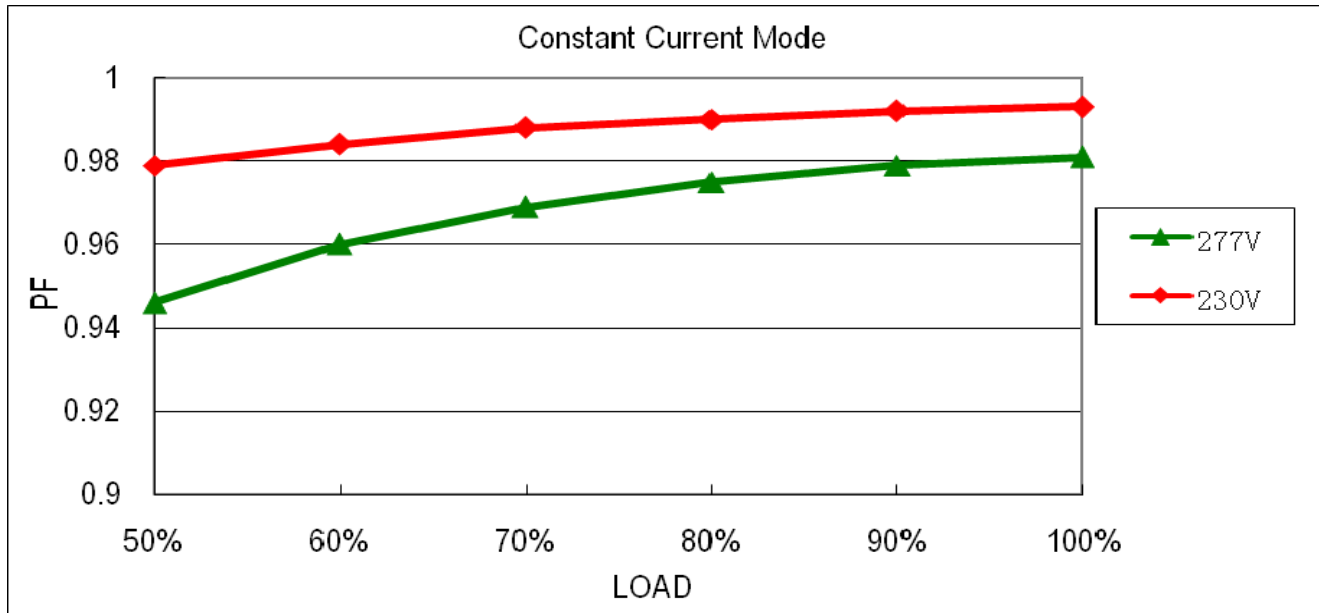
8	EFFICIENCY(Typ)	89%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	91.99%
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EFFICIENCY vs LOAD



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= 0.981 / 277VAC PF= 0.993 / 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	100.48 %/ 200VAC 100.43 %/ 230VAC 100.35 %/ 305VAC Constant Current Limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	28V-34V	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: NO LOAD Ta: 25°C	31.43 V/ 100VAC 31.44 V/ 230VAC 31.44 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) 690 V (2) 560 V (3) 666 V
2	O/P Diode (MOSFET)	Q101 Rated 120V/56A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 105 V (2) 78.8 V (3) 103 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) 444 V (2) 448 V (3) 448 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) 15.0 V (3) 12.1 V (4) 15.0 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) 516 V (2) 517 V (3) 482 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) 584 V (2) 484 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: 2.387 mA I/P-FG: 2.068 mA O/P-FG: 1.389 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			

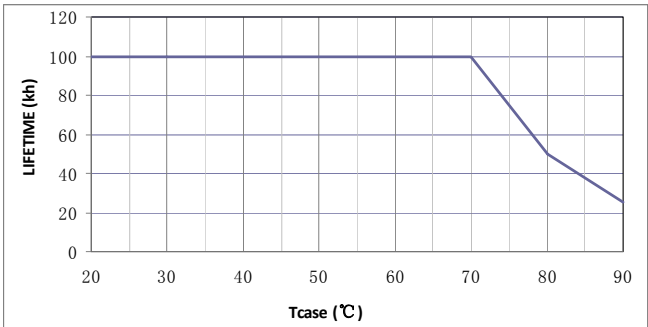


■ **RELIABILITY TEST**

**ENVIRONMENT TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																								
1	TEMPERATURE RISE TEST	MODEL: ELG-150-24 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=34.7 °C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=60.8 °C																																																																																										
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=34.7 °C</th> <th>HIGH AMBIENT Ta=60.8 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>L3</td><td>67.7°C</td><td>93.5°C</td></tr> <tr><td>2</td><td>C11</td><td>69.1°C</td><td>94.8°C</td></tr> <tr><td>3</td><td>Q1</td><td>71.6°C</td><td>97.4°C</td></tr> <tr><td>4</td><td>Q2</td><td>77.0°C</td><td>102.6°C</td></tr> <tr><td>5</td><td>D6</td><td>73.1°C</td><td>99.6°C</td></tr> <tr><td>6</td><td>D10</td><td>80.6°C</td><td>108.1°C</td></tr> <tr><td>7</td><td>U1</td><td>66.2°C</td><td>93.0°C</td></tr> <tr><td>8</td><td>R7</td><td>83.4°C</td><td>110.2°C</td></tr> <tr><td>9</td><td>C5</td><td>71.5°C</td><td>97.5°C</td></tr> <tr><td>10</td><td>T1</td><td>75.1°C</td><td>102.8°C</td></tr> <tr><td>11</td><td>C45</td><td>67.0°C</td><td>93.5°C</td></tr> <tr><td>12</td><td>C12</td><td>70.6°C</td><td>97.2°C</td></tr> <tr><td>13</td><td>U101</td><td>67.4°C</td><td>96.5°C</td></tr> <tr><td>14</td><td>Q101</td><td>68.0°C</td><td>95.5°C</td></tr> <tr><td>15</td><td>Q102</td><td>68.1°C</td><td>95.6°C</td></tr> <tr><td>16</td><td>C201</td><td>65.8°C</td><td>93.0°C</td></tr> <tr><td>17</td><td>C105</td><td>62.1°C</td><td>88.5°C</td></tr> <tr><td>18</td><td>C106</td><td>65.9°C</td><td>93.0°C</td></tr> <tr><td>19</td><td>C110</td><td>61.6°C</td><td>88.2°C</td></tr> <tr><td>20</td><td>RTH2</td><td>66.8°C</td><td>92.9°C</td></tr> <tr><td>21</td><td>TC</td><td>60.7°C</td><td>85.6°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=34.7 °C	HIGH AMBIENT Ta=60.8 °C	1	L3	67.7°C	93.5°C	2	C11	69.1°C	94.8°C	3	Q1	71.6°C	97.4°C	4	Q2	77.0°C	102.6°C	5	D6	73.1°C	99.6°C	6	D10	80.6°C	108.1°C	7	U1	66.2°C	93.0°C	8	R7	83.4°C	110.2°C	9	C5	71.5°C	97.5°C	10	T1	75.1°C	102.8°C	11	C45	67.0°C	93.5°C	12	C12	70.6°C	97.2°C	13	U101	67.4°C	96.5°C	14	Q101	68.0°C	95.5°C	15	Q102	68.1°C	95.6°C	16	C201	65.8°C	93.0°C	17	C105	62.1°C	88.5°C	18	C106	65.9°C	93.0°C	19	C110	61.6°C	88.2°C	20	RTH2	66.8°C	92.9°C	21	TC	60.7°C	85.6°C
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21	TC	60.7°C	85.6°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	±0.003 %/°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-150-24: 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= 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) 416693 HRS (2) 35608 HRS (3) 60627 HRS (4) 80290 HRS
9	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE: 313.66K 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