Test Report： ELG-150-48

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

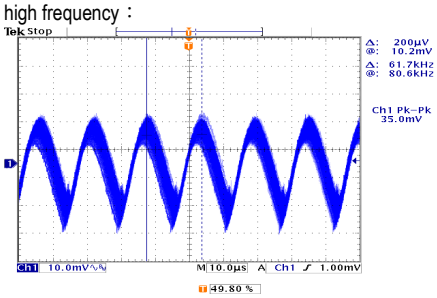
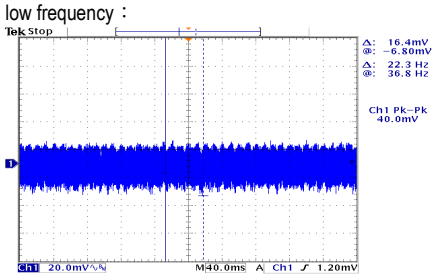
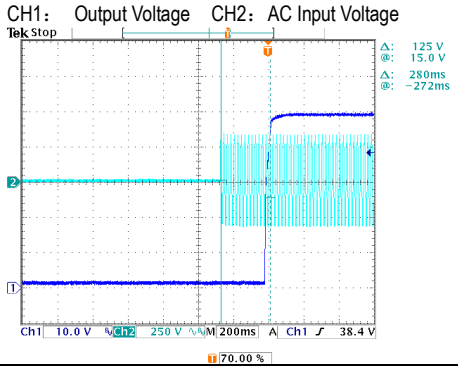
Safety Test
E.M.C. Test

■ RELIABILITY TEST

Environment Test

■ DESIGN VERIFY TEST

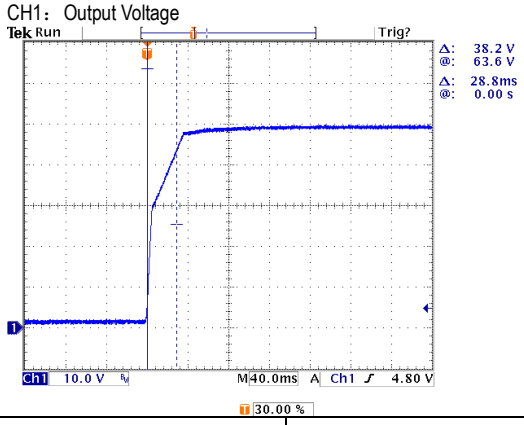
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	24V~48V	I/P： 230VAC O/P：LED MODE Ta：25℃	9.01 V~ 48.03 V
2	OUTPUT VOLTAGE ADJUST RANGE	43.2V~52.8V	I/P： 230VAC O/P：NO LOAD Ta：25℃	40.14 V~ 54.56 V
3	OUTPUT CURRENT ADJUST RANGE	1.56A~3.13A	I/P： 230VAC O/P：SETTING Ta：25℃	1.229 A~ 3.535 A
4	OUTPUT VOLTAGE TOLERANCE	-2%~+2%	I/P： 100VAC / 305VAC O/P：FULL/ NO LOAD Ta：25℃	-0.21%~ 0.35%
5	LINE REGULATION	-0.5%~+0.5%	I/P： 200VAC ~ 305VAC O/P：FULL LOAD Ta：25℃	-0.02%~ 0.02%
6	LOAD REGULATION	-0.5%~+0.5%	I/P： 230VAC O/P：FULL ~NO LOAD Ta：25℃	-0.04%~ 0.02%
7	OVER/UNDERSHOOT TEST	<±5 %	I/P： 230VAC O/P：FULL LOAD Ta：25℃	±2.092%
8	RIPPLE & NOISE (Max)	250mVp-p	I/P： 230VAC O/P：FULL LOAD Ta：25℃	40.0 mVp-p
	high frequency：  low frequency： 			
9	SET UP TIME(Max)	230VAC/ 500ms	I/P： 230 VAC O/P：95% LOAD Ta：25℃	230VAC/ 280 ms
	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℃	230VAC/ 28.8 ms

INPUT=230VAC/50HZ @ 95% LOAD

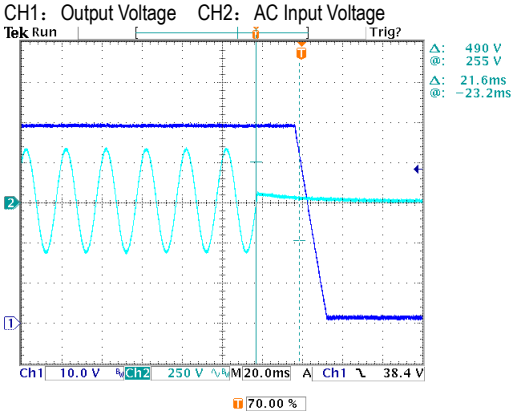
CH1： Output Voltage



11	HOLD UP TIME(Typ)	230VAC/ 10ms	I/P： 230 VAC O/P：95% LOAD Ta：25℃	230VAC/ 21.6 ms

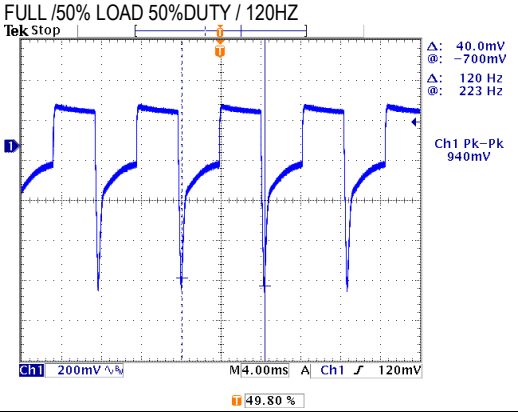
INPUT=230VAC/50HZ @ 95% LOAD

CH1： Output Voltage CH2： AC Input Voltage

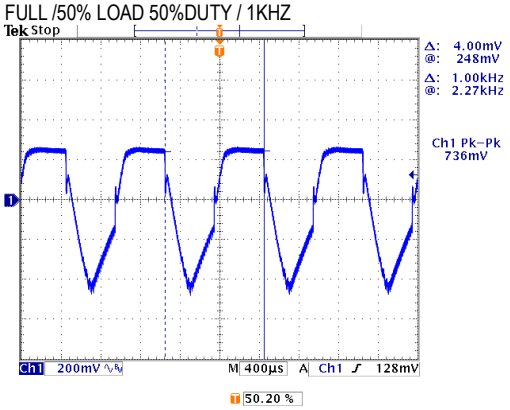


12	DYNAMIC LOAD	V1： 4800 mVp-p	I/P： 230VAC O/P： (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta：25℃	 (1) 940mVp-p (2) 736mVp-p

FULL /50% LOAD 50%DUTY / 120HZ



FULL /50% LOAD 50%DUTY / 1KHZ



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℃

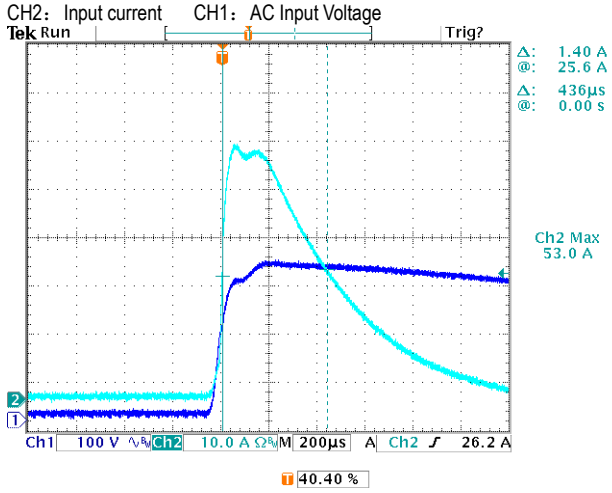
1	Resistance value	Short	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current	0	0.289	0.601	0.910	1.220	1.530	1.837	2.145	2.457	2.763	3.073	3.137
	Percentage of rated current	0%	9.23%	19.20%	29.07%	38.98%	48.88%	58.69%	68.53%	78.50%	88.27%	98.18%	100.22%
2	Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
	Output Current	0	0.306	0.624	0.927	1.249	1.563	1.891	2.212	2.518	2.836	3.134	3.140
	Percentage of rated current	0%	9.78%	19.94%	29.62%	39.90%	49.94%	60.42%	70.67%	80.45%	90.61%	100.13%	100.32%
3	Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0	0.320	0.631	0.944	1.254	1.569	1.880	2.191	2.508	2.817	3.099	3.135
	Percentage of rated current	0%	10.22%	20.16%	30.16%	40.06%	50.13%	60.06%	70.00%	80.13%	90.00%	99.01%	100.16%

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℃	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℃	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℃	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℃	L-FG： 0.339 mA N-FG： 0.307 mA
5	NO LOAD POWER CONSUMPTION	< 0.5W	I/P：230VAC O/P：NO LOAD Ta：25℃	0.338 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： 12.28 %
		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： 9.82 %
7	INRUSH CURRENT(Typ)	230V/ 65A Twidth =550us measured at 50% Ipeak COLD START	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	I = 53.0 A/ 230VAC Twidth =436 us

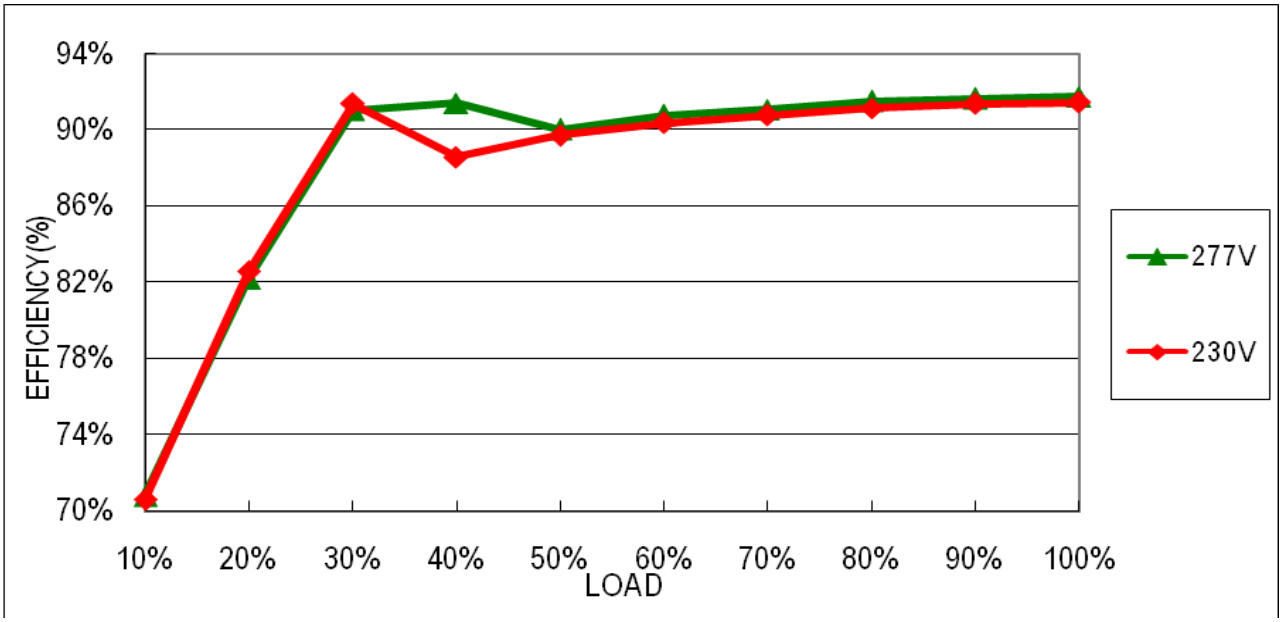
INPUT=230VAC/50HZ @ FULL LOAD

CH2：Input current CH1：AC Input Voltage



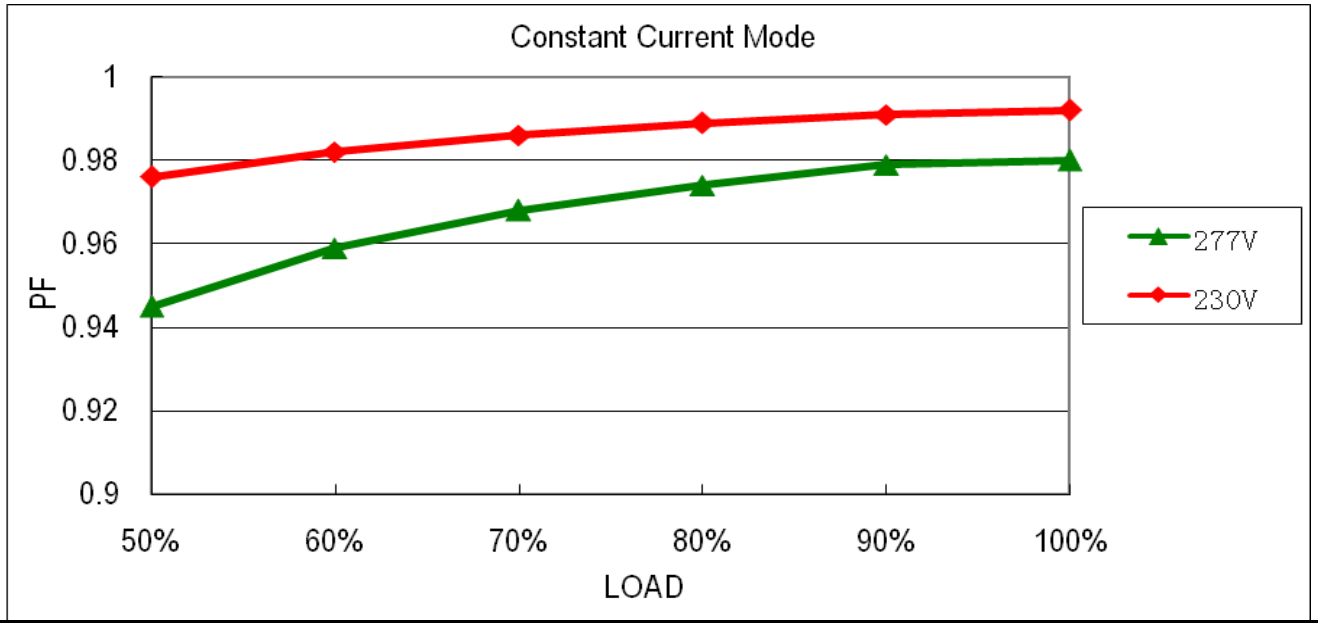
8	EFFICIENCY(Typ)	90%	I/P： 230VAC O/P：FULL LOAD Ta：25℃	91.43 %

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℃	PF= 0.980 / 277VAC PF= 0.992 / 230VAC

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℃	101.56 %/ 200VAC 101.68 %/ 230VAC 101.68 %/ 305VAC Constant Current Limiting，recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	54V~62V	I/P： 100VAC I/P： 230VAC I/P： 305VAC O/P：NO LOAD Ta：25℃	57.32 V/ 100VAC 57.29 V/ 230VAC 57.30 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℃	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℃	 (1) 670 V (2) 544 V (3) 666 V
2	O/P Diode (MOSFET)	Q101 Rated 300V/20A	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	 (1) 204 V (2) 154 V (3) 204 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℃	 (1) 448 V (2) 442 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℃	 (1) 17.7 V (2) 15.0 V (3) 11.0 V (4) 14.9 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℃	 (1) 528 V (2) 492 V (3) 490 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℃	(1) 652 V (2) 480 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℃	I/P-O/P：1.415 mA I/P-FG： 2.070 mA O/P-FG：1.403 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℃	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℃	PASS
2	CONDUCTION	EN55015	I/P：230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	PASS Test by certified Lab
3	RADIATION	EN55015	I/P：230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	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℃	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT：1KV	I/P： 230VAC/50HZ O/P：FULL LOAD Ta：25℃	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℃	CRITERIA A
7	Test by certified Lab ＆ Test Report Prepare			

■ RELIABILITY TEST

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： ELG-150-48
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=32.8 ℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=62.2 ℃</td></tr>
<tr><td colspan="5">
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=32.8 ℃</th><th>HIGH AMBIENT Ta=62.2 ℃</th></tr>
<tr><td>1</td><td>LF2</td><td>65.6℃</td><td>91.1℃</td></tr>
<tr><td>2</td><td>L1</td><td>69.1℃</td><td>94.1℃</td></tr>
<tr><td>3</td><td>L3</td><td>68.2℃</td><td>93.2℃</td></tr>
<tr><td>4</td><td>ZNR2</td><td>68.9℃</td><td>93.8℃</td></tr>
<tr><td>5</td><td>C11</td><td>70.8℃</td><td>96.2℃</td></tr>
<tr><td>6</td><td>Q1</td><td>73.6℃</td><td>99.7℃</td></tr>
<tr><td>7</td><td>Q2</td><td>76.5℃</td><td>103.3℃</td></tr>
<tr><td>8</td><td>D6</td><td>75.5℃</td><td>102.0℃</td></tr>
<tr><td>9</td><td>D10</td><td>80.4℃</td><td>108.5℃</td></tr>
<tr><td>10</td><td>U1</td><td>66.7℃</td><td>93.1℃</td></tr>
<tr><td>11</td><td>R7</td><td>79.2℃</td><td>106.4℃</td></tr>
<tr><td>12</td><td>U100</td><td>70.7℃</td><td>96.5℃</td></tr>
<tr><td>13</td><td>C5</td><td>76.4℃</td><td>103.8℃</td></tr>
<tr><td>14</td><td>T1</td><td>69.1℃</td><td>95.7℃</td></tr>
<tr><td>15</td><td>C45</td><td>60.9℃</td><td>87.4℃</td></tr>
<tr><td>16</td><td>Q101</td><td>71.5℃</td><td>97.5℃</td></tr>
<tr><td>17</td><td>Q102</td><td>71.9℃</td><td>98.1℃</td></tr>
<tr><td>18</td><td>Q105</td><td>60.9℃</td><td>87.7℃</td></tr>
<tr><td>19</td><td>C205</td><td>68.0℃</td><td>94.2℃</td></tr>
<tr><td>20</td><td>C105</td><td>61.4℃</td><td>87.6℃</td></tr>
<tr><td>21</td><td>C106</td><td>66.7℃</td><td>93.0℃</td></tr>
<tr><td>22</td><td>C108</td><td>63.6℃</td><td>89.5℃</td></tr>
<tr><td>23</td><td>RTH2</td><td>66.7℃</td><td>92.9℃</td></tr>
<tr><td>24</td><td>U500</td><td>57.7℃</td><td>84.3℃</td></tr>
<tr><td>25</td><td>TC</td><td>59.3℃</td><td>86.7℃</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P： 305VAC/200VAC
O/P：FULL LOAD
Ta= -45℃</td><td>TEST：OK</td></tr>
<tr><td>3</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 60℃
NO DAMAGE</td><td>I/P： 305VAC
O/P：FULL LOAD
Ta=60℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td></tr>
<tr><td>4</td><td>TEMPERATURE
COEFFICIENT</td><td>±0.03 %/℃(0~50℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>±0.009 %/℃(0~50℃)</td></tr>
<tr><td>5</td><td>STORAGE TEMPERATURE TEST</td><td colspan="2">1. Thermal shock Temperature： -45℃~ +90℃
2. Temperature change rate ： 25℃ / MIN
3. Dwell time low and high temperature ： 30 MIN/EACH
4. Total test cycle：5 CYCLE
5. Input/Output condition： STATIC</td><td>TEST：OK</td></tr>
</table>

6	THERMAL SHOCK TEST	1. Thermal shock Temperature： -45℃~ +65℃ 2. Temperature change rate ： 25℃ / 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℃	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 ℃ LIFE TIME (2) I/P： 230VAC O/P：75% LOAD Tc= 80 ℃ LIFE TIME (3) I/P： 230VAC O/P：50% LOAD Tc= 80 ℃ 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℃)	
10	Ongoing Reliability Test	I/P：230VAC O/P：FULL LOAD TA=50℃ Demonstration Mean Time Between Failure : 50,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	ZHANGZJ/ZHUOKB	SKY	LIUWY