



# Test Report: ELG-100-54

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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

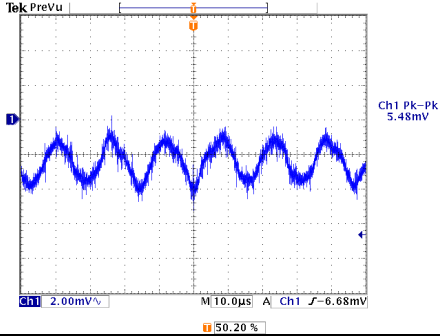
Environment Test

■ DESIGN VERIFY TEST

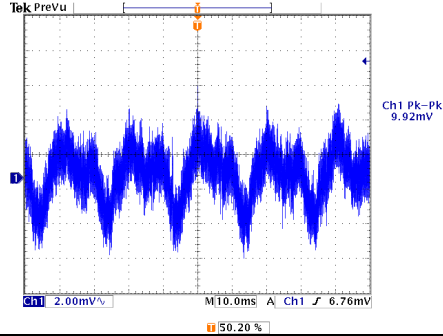
**OUTPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	27V~54V	I/P: 230VAC O/P: LED MODE Ta: 25°C	15V~ 54V
2	OUTPUT VOLTAGE ADJUST RANGE	48.6V~59.4V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	46.3V~ 61.0V
3	OUTPUT CURRENT ADJUST RANGE	0.89A~1.78A	I/P: 230VAC O/P: SETTING Ta: 25°C	0.676A~ 1.963A
4	OUTPUT VOLTAGE TOLERANCE	-2%~+2%	I/P: 180VAC / 295VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.07%~ 0.31%
5	LINE REGULATION	-0.5%~+0.5%	I/P: 190VAC ~ 295VAC 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	-0.07%~ 0.13%
7	OVER/UNDERSHOOT TEST	<± 5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	± 1.481%
8	RIPPLE & NOISE (Max)	350mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	9.92 mVp-p

high frequency :



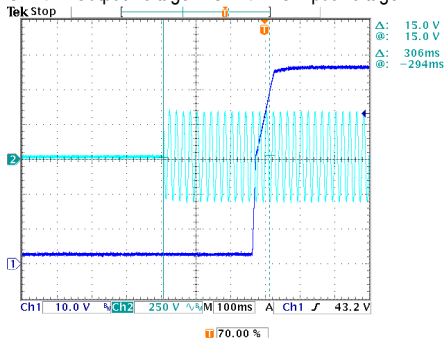
low frequency :

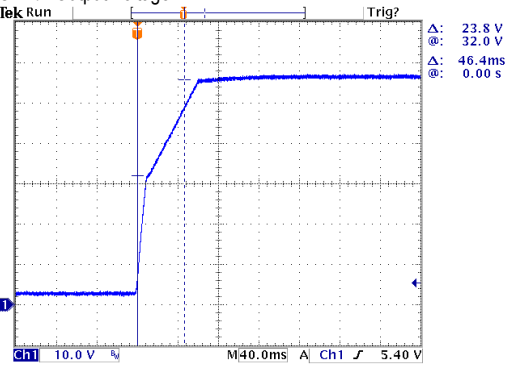
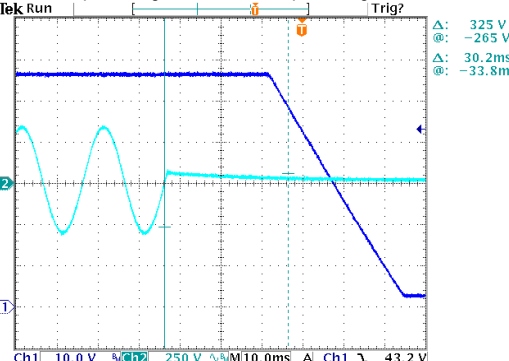
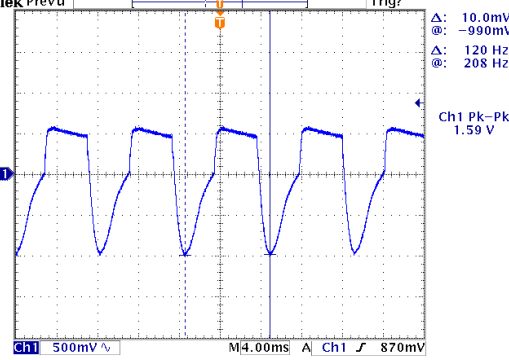
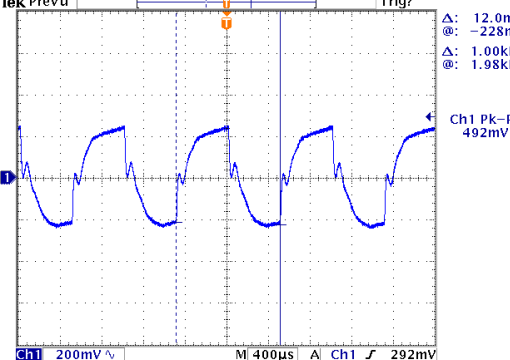


9	SET UP TIME(Max)	230VAC/ 500ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 306 ms
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INPUT=230VAC/50HZ @ 95% LOAD

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/ 46.4 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage</p>  <p>Δ: 23.8 V @: 32.0 V Δ: 46.4ms @: 0.00 s</p> <p>Ch1 10.0 V M40.0ms A Ch1 5.40 V</p>				
11	HOLD UP TIME(Typ)	230VAC/ 10ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 30.2 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 325 V @: -265 V Δ: 30.2ms @: -33.8ms</p> <p>Ch1 10.0 V Ch2 250 V M10.0ms A Ch1 43.2 V</p>				
12	DYNAMIC LOAD	V1: 5400 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) 1590mVp-p (2) 492mVp-p
<p>FULL /50% LOAD 50%DUTY / 120HZ</p>  <p>Δ: 10.0mV @: -990mV Δ: 120 Hz @: 208 Hz</p> <p>Ch1 Pk-Pk 1.59 V</p> <p>Ch1 500mV M4.00ms A Ch1 870mV</p> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p>  <p>Δ: 12.0mV @: -228mV Δ: 1.00kHz @: 1.98kHz</p> <p>Ch1 Pk-Pk 492mV</p> <p>Ch1 200mV M400µs A Ch1 292mV</p>				

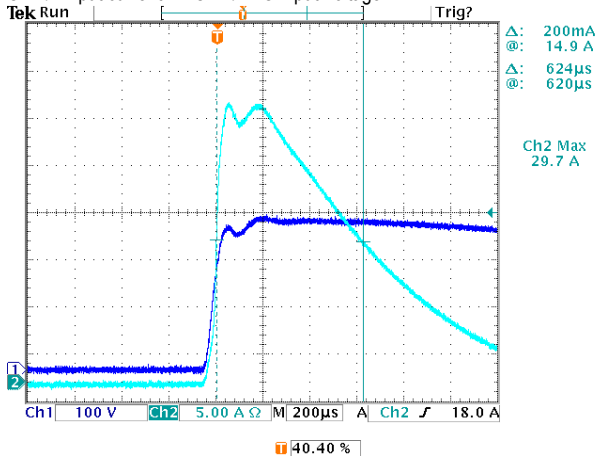
13	DIMMING TEST (For B-Type only)	SPEC:													
		※ Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-.													
		※ Please DO NOT connect "DIM-" to "-V".													
		※ 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	0.148	0.331	0.512	0.694	0.875	1.055	1.235	1.418	1.601	1.780	1.794		
	Percentage of rated current	0%	8.31%	18.60%	28.76%	38.99%	49.16%	59.27%	69.38%	79.66%	89.94%	100.00%	100.79%		
2	Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN		
	Output Current	0	0.158	0.345	0.523	0.713	0.897	1.090	1.277	1.456	1.645	1.793	1.794		
	Percentage of rated current	0%	8.88%	19.38%	29.38%	40.06%	50.39%	61.24%	71.74%	81.80%	92.42%	100.73%	100.79%		
3	Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN		
	Output Current	0	0.166	0.347	0.531	0.713	0.897	1.079	1.259	1.442	1.625	1.785	1.791		
	Percentage of rated current	0%	9.33%	19.49%	29.83%	40.06%	50.39%	60.62%	70.73%	81.01%	91.29%	100.28%	100.62%		

**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~295VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	177 V~ 295 V
			I/P: LOW-LINE-3V=177 V HIGH-LINE+10V=305 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: 180 VAC ~295 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: 0.424 mA N-FG: 0.408 mA
5	NO LOAD POWER CONSUMPTION	< 0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.222 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: 13.25 %
		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: 12.04 %
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 = 29.7 A/ 230VAC Twidth =624 us

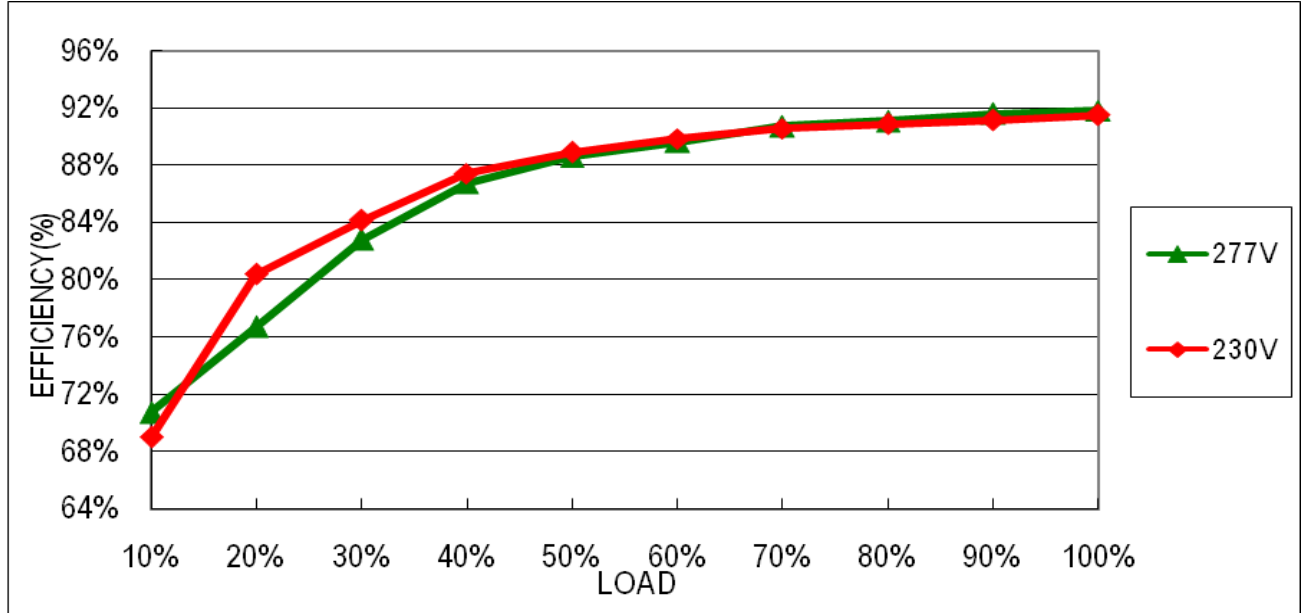
INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



8	EFFICIENCY(Typ)	91%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	91.50 %
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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= 0.952 / 277VAC PF= 0.981 / 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: 190VAC I/P: 230VAC I/P: 295VAC O/P: TESTING Ta: 25°C	101.53 %/ 190VAC 101.54 %/ 230VAC 101.59 %/ 295VAC Constant Current Limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	62V~72V	I/P: 180VAC I/P: 230VAC I/P: 295VAC O/P: NO LOAD Ta: 25°C	65.49 V/ 180VAC 65.44 V/ 230VAC 65.43 V/ 295VAC Shut down o/p voltage, re-power on to recovery
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 190VAC I/P: 230VAC I/P: 295VAC 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: 190VAC I/P: 295VAC 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 =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 672 V (2) 488 V (3) 660 V
2	O/P Diode (MOSFET)	Q101 Rated 300V/20A	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 195 V (2) 132 V (3) 191 V
3	Input Capacitor	C5 Rated 100u/ 450V	I/P: High-Line +3V =298 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) 446 V (2) 448 V (3) 442 V
4	Control IC	U1 Rated 28V (MAX.)	I/P: High-Line +3V =298 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) 17.2 V (2) 14.8 V (3) 10.8 V (4) 14.9 V (5) 17.1 V
5	PFC Power Transistor	Q 1 Rated 600V/10A	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 474 V (2) 428 V (3) 474 V
6	Clamp Diode	D10 Rated 800V/2A	I/P: High-Line +3V = 298V O/P: (1) Full Load input on/off (2) Output Short Ta: 25°C	(1) 636 V (2) 512 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: 2.588 mA I/P-FG: 2.512 mA O/P-FG: 1.977 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: 3KV 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			

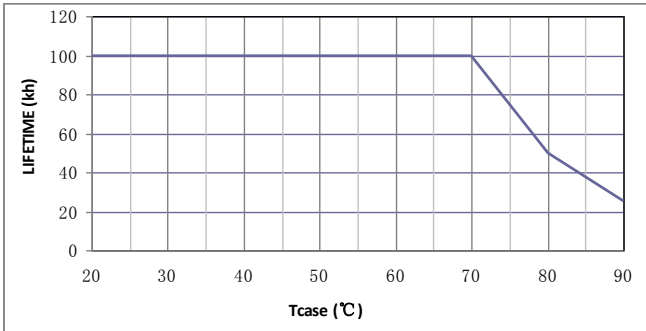


■ **RELIABILITY TEST**

**ENVIRONMENT TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																
1	TEMPERATURE RISE TEST	MODEL: ELG-100-54 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=39.7 °C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=60.7 °C																																																																																		
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=39.7 °C</th> <th>HIGH AMBIENT Ta=60.7 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF2</td><td>63.2°C</td><td>82.2°C</td></tr> <tr><td>2</td><td>C11</td><td>65.9°C</td><td>84.7°C</td></tr> <tr><td>3</td><td>L2</td><td>64.7°C</td><td>83.5°C</td></tr> <tr><td>4</td><td>L1</td><td>64.9°C</td><td>83.4°C</td></tr> <tr><td>5</td><td>Q1</td><td>66.7°C</td><td>85.9°C</td></tr> <tr><td>6</td><td>Q2</td><td>69.0°C</td><td>88.3°C</td></tr> <tr><td>7</td><td>D6</td><td>67.3°C</td><td>86.2°C</td></tr> <tr><td>8</td><td>D10</td><td>73.1°C</td><td>92.4°C</td></tr> <tr><td>9</td><td>R7</td><td>71.2°C</td><td>90.6°C</td></tr> <tr><td>10</td><td>C5</td><td>64.9°C</td><td>83.8°C</td></tr> <tr><td>11</td><td>C45</td><td>65.3°C</td><td>84.5°C</td></tr> <tr><td>12</td><td>U1</td><td>64.8°C</td><td>83.6°C</td></tr> <tr><td>13</td><td>T1</td><td>70.0°C</td><td>90.1°C</td></tr> <tr><td>14</td><td>Q101</td><td>67.0°C</td><td>85.9°C</td></tr> <tr><td>15</td><td>C105</td><td>65.7°C</td><td>84.7°C</td></tr> <tr><td>16</td><td>C106</td><td>63.5°C</td><td>82.4°C</td></tr> <tr><td>17</td><td>C108</td><td>62.3°C</td><td>81.3°C</td></tr> <tr><td>18</td><td>RTH2</td><td>64.4°C</td><td>83.3°C</td></tr> <tr><td>19</td><td>TC</td><td>58.7°C</td><td>78.1°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=39.7 °C	HIGH AMBIENT Ta=60.7 °C	1	LF2	63.2°C	82.2°C	2	C11	65.9°C	84.7°C	3	L2	64.7°C	83.5°C	4	L1	64.9°C	83.4°C	5	Q1	66.7°C	85.9°C	6	Q2	69.0°C	88.3°C	7	D6	67.3°C	86.2°C	8	D10	73.1°C	92.4°C	9	R7	71.2°C	90.6°C	10	C5	64.9°C	83.8°C	11	C45	65.3°C	84.5°C	12	U1	64.8°C	83.6°C	13	T1	70.0°C	90.1°C	14	Q101	67.0°C	85.9°C	15	C105	65.7°C	84.7°C	16	C106	63.5°C	82.4°C	17	C108	62.3°C	81.3°C	18	RTH2	64.4°C	83.3°C	19	TC	58.7°C	78.1°C
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9	R7	71.2°C	90.6°C																																																																																	
10	C5	64.9°C	83.8°C																																																																																	
11	C45	65.3°C	84.5°C																																																																																	
12	U1	64.8°C	83.6°C																																																																																	
13	T1	70.0°C	90.1°C																																																																																	
14	Q101	67.0°C	85.9°C																																																																																	
15	C105	65.7°C	84.7°C																																																																																	
16	C106	63.5°C	82.4°C																																																																																	
17	C108	62.3°C	81.3°C																																																																																	
18	RTH2	64.4°C	83.3°C																																																																																	
19	TC	58.7°C	78.1°C																																																																																	
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 295VAC/190VAC 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	±0.015 %/°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-100-54: 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) 488504 HRS (2) 49963 HRS (3) 58991 HRS (4) 92547 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