



# Test Report: ELG-150-36

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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

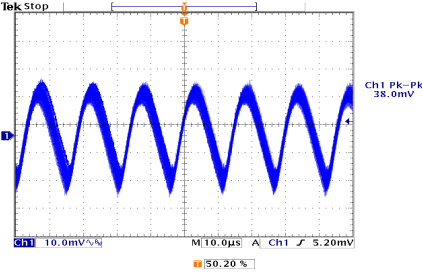
Environment Test

■ DESIGN VERIFY TEST

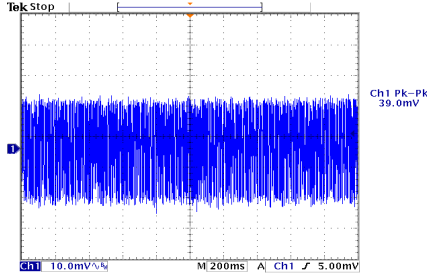
**OUTPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	18V~36V	I/P: 230VAC O/P: LED MODE Ta: 25°C	13.92 V~ 36.12 V
2	OUTPUT VOLTAGE ADJUST RANGE	32.4V~39.6V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	30.36 V~ 40.77 V
3	OUTPUT CURRENT ADJUST RANGE	2.1A~4.17A	I/P: 230VAC O/P: SETTING Ta: 25°C	1.240 A~ 4.637 A
4	OUTPUT VOLTAGE TOLERANCE	-2.5%~+2.5%	I/P: 100VAC / 305VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.11%~ 0.42%
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	-0.11%~ 0.16%
7	OVER/UNDERSHOOT TEST	<± 5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	± 1.934%
8	RIPPLE & NOISE (Max)	250mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	39.0 mVp-p

high frequency :



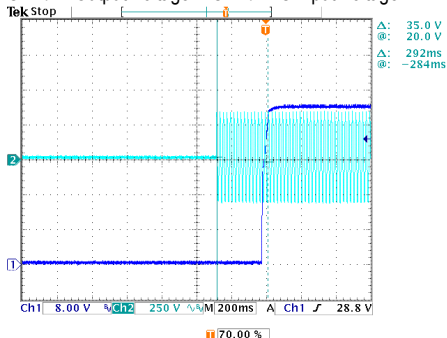
low frequency :



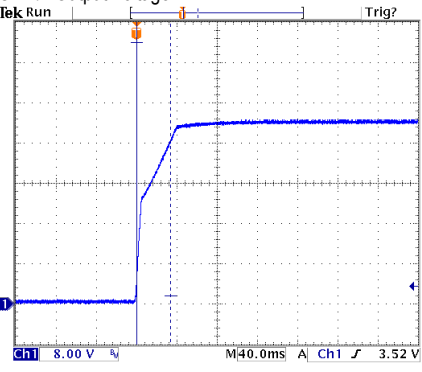
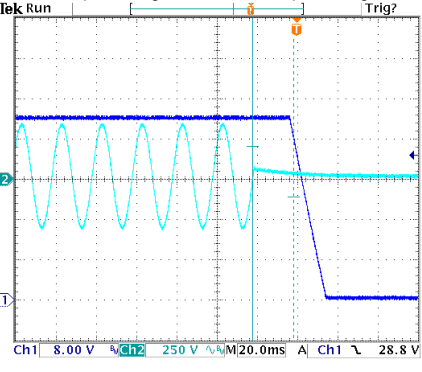
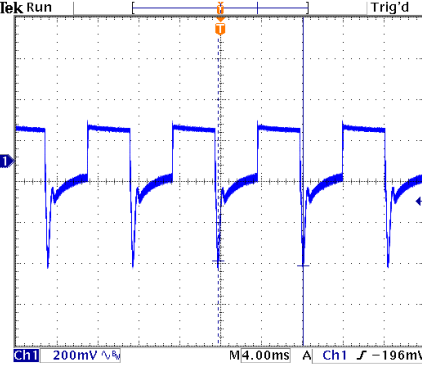
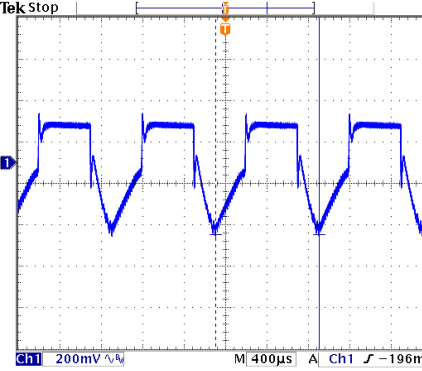
9	SET UP TIME(Max)	230VAC/ 500ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 292 ms
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INPUT=230VAC/50HZ @ 95% LOAD

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/ 33.6 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage</p>  <p>Δ: 50.4 V @: 52.0 V Δ: 33.6ms @: 0.00 s</p> <p>Ch1 8.00 V 40ms M40.0ms A Ch1 3.52 V</p> <p>70.00%</p>				
11	HOLD UP TIME(Typ)	230VAC/ 10ms	I/P: 230 VAC O/P: 95% LOAD Ta: 25°C	230VAC/ 20.4 ms
<p>INPUT=230VAC/50HZ @ 95% LOAD CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Δ: 315 V @: 205 V Δ: 20.4ms @: -22.4ms</p> <p>Ch1 8.00 V 250 V 20ms M20.0ms A Ch1 28.8 V</p> <p>70.00%</p>				
12	DYNAMIC LOAD	V1: 3600 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) 716mVp-p (2) 580mVp-p
<p>FULL /50% LOAD 50%DUTY / 120HZ</p>  <p>Δ: 24.0mV @: -512mV Δ: 120 HZ @: 125 HZ</p> <p>Ch1 Pk-Pk 716mV</p> <p>Ch1 200mV 4ms M4.00ms A Ch1 -196mV</p> <p>50.20%</p> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p>  <p>Δ: 0.00 V @: -348mV Δ: 1.00kHz @: 1.12kHz</p> <p>Ch1 Pk-Pk 580mV</p> <p>Ch1 200mV 400us M400us A Ch1 -196mV</p> <p>50.20%</p>				

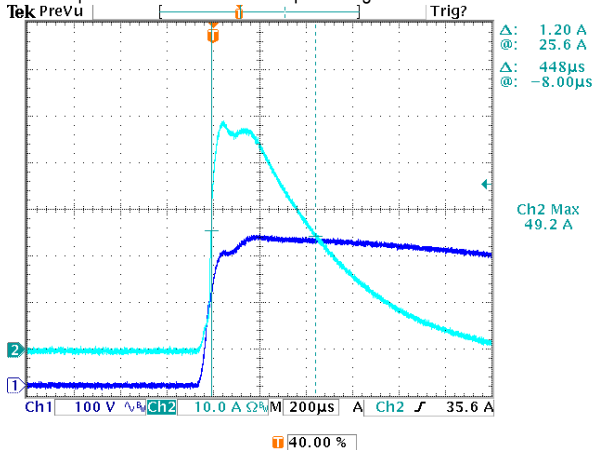
13	DIMMING TEST (For B-Type only)	SPEC:													
		※ Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-.													
		※ Please DO NOT connect "DIM-" to "-V".													
		※ 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	0.425	0.861	1.297	1.736	2.180	2.625	3.075	3.526	3.995	4.176	4.179		
	Percentage of rated current	0%	10.19%	20.65%	31.10%	41.63%	52.28%	62.95%	73.74%	84.56%	95.80%	100.14%	100.22%		
2	Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN		
	Output Current	0	0.441	0.875	1.287	1.725	2.155	2.603	3.044	3.460	3.905	4.177	4.180		
	Percentage of rated current	0%	10.58%	20.98%	30.86%	41.37%	51.68%	62.42%	73.00%	82.97%	93.65%	100.17%	100.24%		
3	Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN		
	Output Current	0	0.462	0.887	1.314	1.739	2.169	2.596	3.023	3.457	3.871	4.179	4.184		
	Percentage of rated current	0%	11.08%	21.27%	31.51%	41.70%	52.01%	62.25%	72.49%	82.90%	92.83%	100.22%	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: 0.319 mA
5	NO LOAD POWER CONSUMPTION	< 0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.168 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: 9.20 %
		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: 7.99 %
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 = 49.2 A/ 230VAC Twidth =448 us

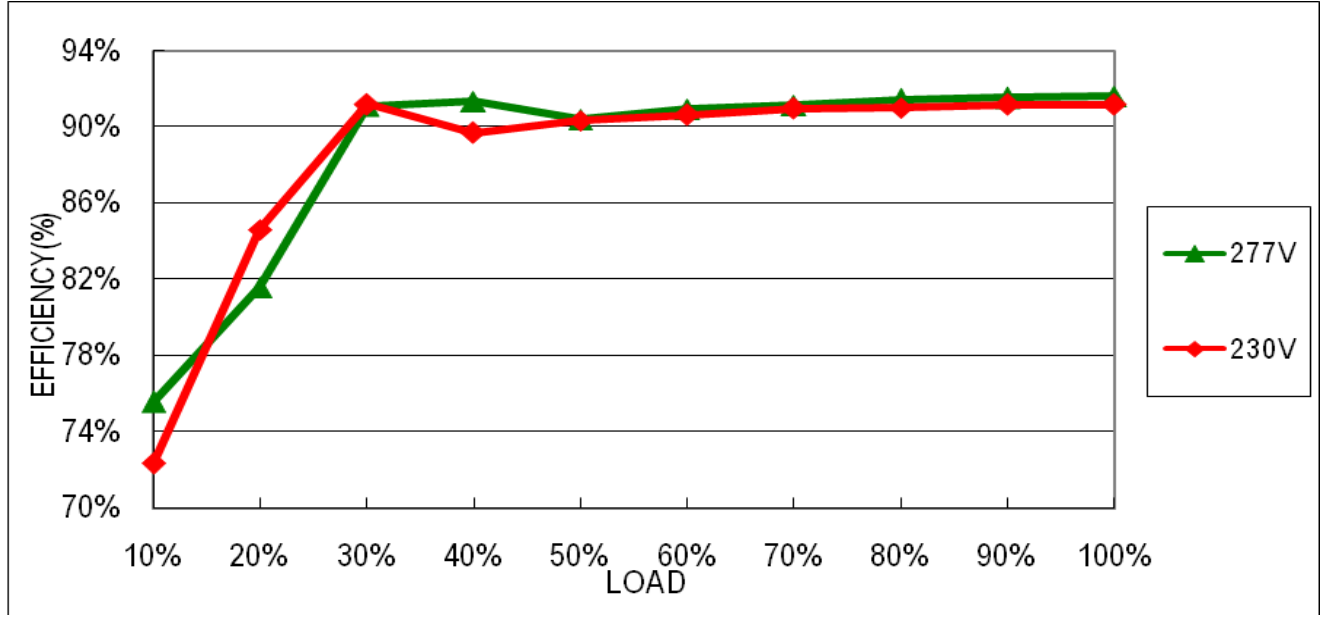
INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



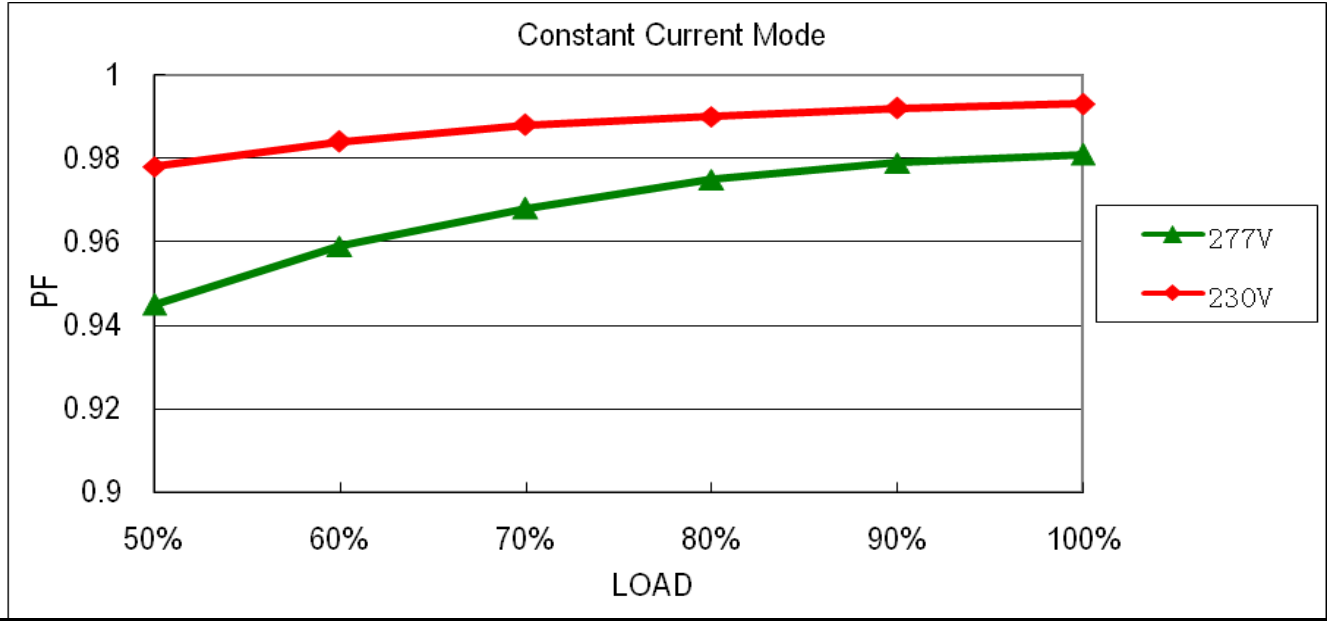
8	EFFICIENCY(Typ)	90%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	91.16%
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EFFICIENCY vs LOAD



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	102.36 %/ 200VAC 102.45 %/ 230VAC 102.37 %/ 305VAC Constant Current Limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	41V~48V	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: NO LOAD Ta: 25°C	43.97 V/ 100VAC 43.97 V/ 230VAC 43.97 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) 672 V (2) 552 V (3) 670 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) 158 V (2) 118 V (3) 155 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) 440 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) 17.2 V (2) 15.0 V (3) 11.1 V (4) 15.0 V (5) 17.0 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) 514 V (3) 492 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) 648 V (2) 488 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: 1.525 mA I/P-FG: 2.244 mA O/P-FG: 1.561 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-150-36 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=26.2 °C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=63.0 °C																																																																																																														
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=26.2 °C</th> <th>HIGH AMBIENT Ta=63.0 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>L3</td><td>65.5°C</td><td>93.2°C</td></tr> <tr><td>2</td><td>ZNR2</td><td>66.6°C</td><td>93.5°C</td></tr> <tr><td>3</td><td>C10</td><td>67.0°C</td><td>92.8°C</td></tr> <tr><td>4</td><td>C11</td><td>67.3°C</td><td>94.5°C</td></tr> <tr><td>5</td><td>BD1</td><td>69.1°C</td><td>92.5°C</td></tr> <tr><td>6</td><td>Q1</td><td>72.7°C</td><td>93.8°C</td></tr> <tr><td>7</td><td>Q2</td><td>77.3°C</td><td>94.2°C</td></tr> <tr><td>8</td><td>D6</td><td>73.4°C</td><td>94.5°C</td></tr> <tr><td>9</td><td>D10</td><td>79.4°C</td><td>96.9°C</td></tr> <tr><td>10</td><td>RTH1</td><td>75.2°C</td><td>94.8°C</td></tr> <tr><td>11</td><td>U1</td><td>65.0°C</td><td>90.6°C</td></tr> <tr><td>12</td><td>R7</td><td>79.1°C</td><td>95.5°C</td></tr> <tr><td>13</td><td>D5</td><td>62.3°C</td><td>89.8°C</td></tr> <tr><td>14</td><td>U100</td><td>58.8°C</td><td>87.4°C</td></tr> <tr><td>15</td><td>C5</td><td>68.6°C</td><td>96.4°C</td></tr> <tr><td>16</td><td>T1</td><td>75.5°C</td><td>98.2°C</td></tr> <tr><td>17</td><td>C45</td><td>67.6°C</td><td>95.1°C</td></tr> <tr><td>18</td><td>Q101</td><td>68.2°C</td><td>90.5°C</td></tr> <tr><td>19</td><td>Q102</td><td>69.6°C</td><td>91.9°C</td></tr> <tr><td>20</td><td>C205</td><td>65.3°C</td><td>93.4°C</td></tr> <tr><td>21</td><td>C105</td><td>57.0°C</td><td>86.8°C</td></tr> <tr><td>22</td><td>C106</td><td>65.0°C</td><td>90.6°C</td></tr> <tr><td>23</td><td>C108</td><td>61.9°C</td><td>89.8°C</td></tr> <tr><td>24</td><td>LF100</td><td>55.3°C</td><td>85.9°C</td></tr> <tr><td>25</td><td>RTH2</td><td>65.4°C</td><td>93.7°C</td></tr> <tr><td>26</td><td>TC</td><td>58.3°C</td><td>86.5°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=26.2 °C	HIGH AMBIENT Ta=63.0 °C	1	L3	65.5°C	93.2°C	2	ZNR2	66.6°C	93.5°C	3	C10	67.0°C	92.8°C	4	C11	67.3°C	94.5°C	5	BD1	69.1°C	92.5°C	6	Q1	72.7°C	93.8°C	7	Q2	77.3°C	94.2°C	8	D6	73.4°C	94.5°C	9	D10	79.4°C	96.9°C	10	RTH1	75.2°C	94.8°C	11	U1	65.0°C	90.6°C	12	R7	79.1°C	95.5°C	13	D5	62.3°C	89.8°C	14	U100	58.8°C	87.4°C	15	C5	68.6°C	96.4°C	16	T1	75.5°C	98.2°C	17	C45	67.6°C	95.1°C	18	Q101	68.2°C	90.5°C	19	Q102	69.6°C	91.9°C	20	C205	65.3°C	93.4°C	21	C105	57.0°C	86.8°C	22	C106	65.0°C	90.6°C	23	C108	61.9°C	89.8°C	24	LF100	55.3°C	85.9°C	25	RTH2	65.4°C	93.7°C	26	TC	58.3°C	86.5°C
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25	RTH2	65.4°C	93.7°C																																																																																																													
26	TC	58.3°C	86.5°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-150-24: SUPPOSE C110 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) 45500 HRS (2) 54802 HRS (3) 61424 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