



# Test Report: ELG-100U-24

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100W Constant Voltage+Constant Current LED Driver

## ■ 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

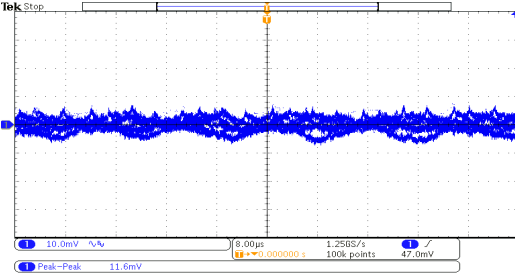
Environment Test

## DESIGN VERIFY TEST

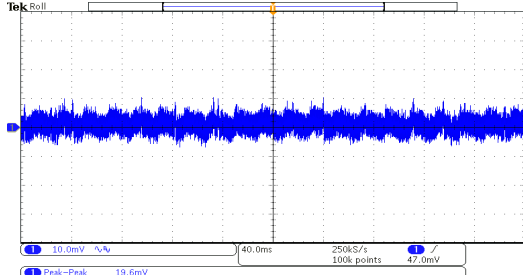
### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	12V~24V	I/P: 230VAC O/P: LED MODE Ta: 25°C	8V~ 24 V
2	OUTPUT VOLTAGE ADJUST RANGE (For A-Type only)	21.6V~26.4V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	20.69V~27.49V
3	OUTPUT CURRENT ADJUST RANGE (For A-Type only)	2A~4A (For A-Type only)	I/P: 230VAC O/P: SETTING Ta: 25°C	1.8144A~4.6544A
4	OUTPUT VOLTAGE TOLERANCE	-3%~+3%	I/P: 100VAC / 305VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.16%~1.24%
5	LINE REGULATION	-0.5%~+0.5%	I/P: 100VAC ~ 305VAC O/P: FULL LOAD Ta: 25°C	-0.16%~0.04%
6	LOAD REGULATION	-1%~+1%	I/P: 230VAC O/P: FULL ~NO LOAD Ta: 25°C	-0.16%~ 0.24%
7	OVER/UNDERSHOOT TEST	$\pm 5\%$	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	$\pm 1.667\%$
8	RIPPLE & NOISE (Max)	200mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	19.6mVp-p

high frequency :



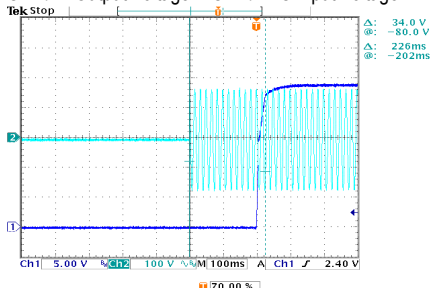
low frequency :



9	SET UP TIME(Max)	120VAC/ 1000ms 230VAC/ 500ms	I/P: 120 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	120VAC/ 226ms 230VAC/ 216 ms
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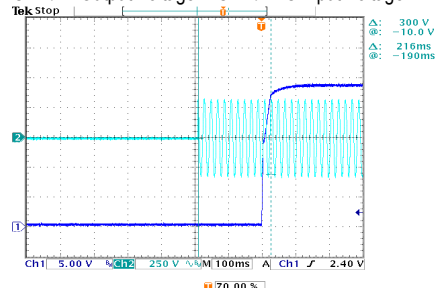
INPUT=120VAC/50HZ @ FULL LOAD

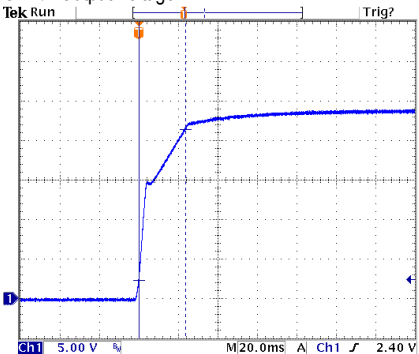
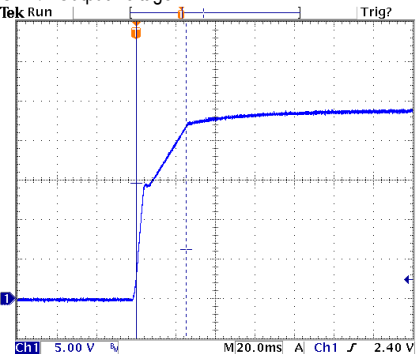
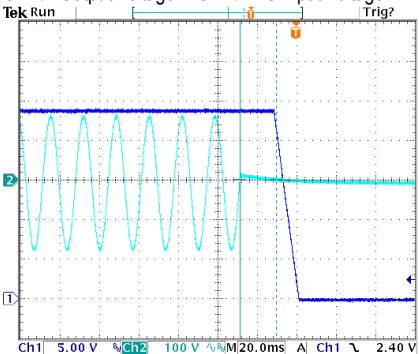
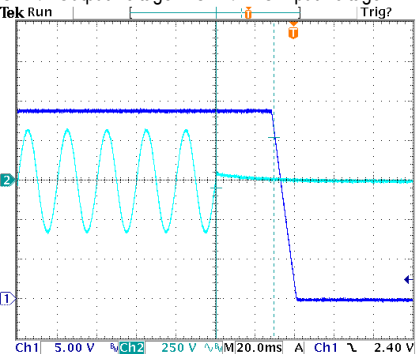
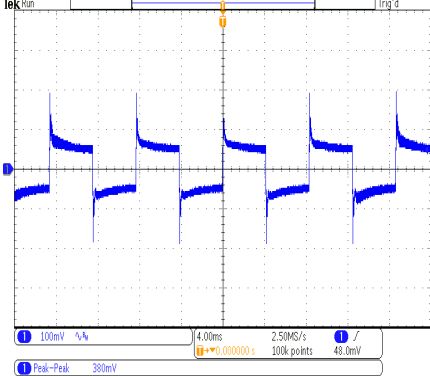
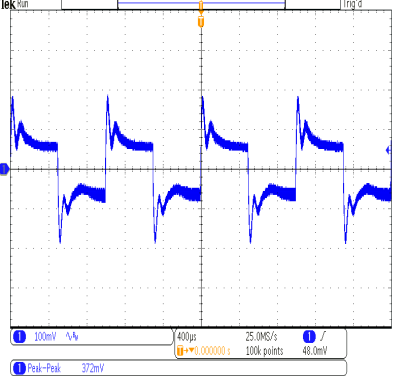
CH1: Output Voltage CH2: AC Input Voltage



INPUT=230VAC/50HZ @ FULL LOAD

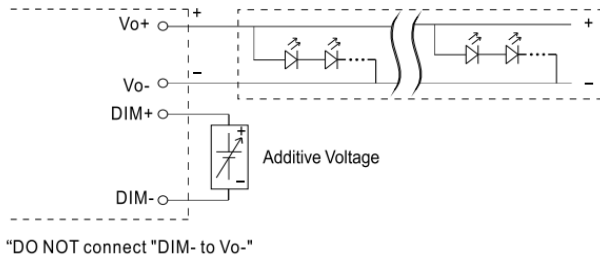
CH1: Output Voltage CH2: AC Input Voltage



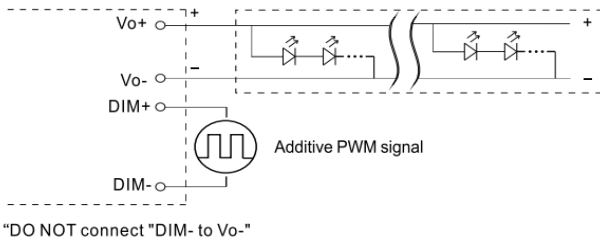
10	RISE TIME (Max)	120VAC/ 80ms 230VAC/ 100ms	I/P: 120 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	120VAC/ 23.6ms 230VAC/ 25.2ms
INPUT=120VAC/50HZ @ FULL LOAD CH1: Output Voltage 		INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage 		
11	HOLD UP TIME(Typ)	120VAC/ 15ms 230VAC/ 10ms	I/P: 120 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	120VAC/ 18.4ms 230VAC/ 29.2ms
INPUT=120VAC/50HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage 		INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage 		
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) 380mVp-p (2) 372mVp-p
FULL /50% LOAD 50%DUTY / 120HZ 		FULL /50% LOAD 50%DUTY / 1KHZ 		

13 DIMMING TEST  
(For B-Type only)

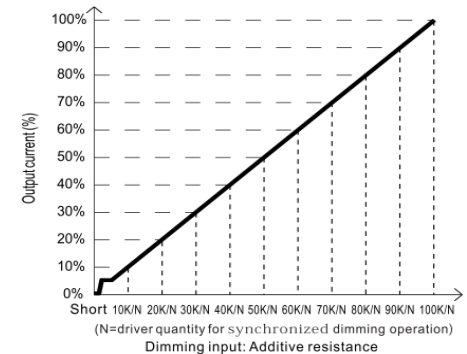
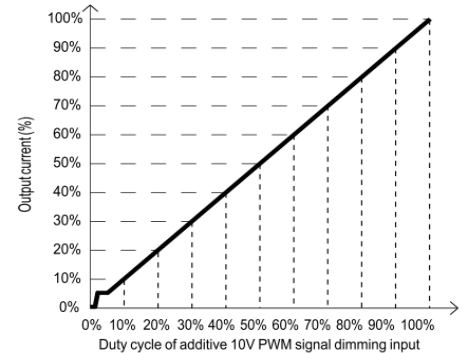
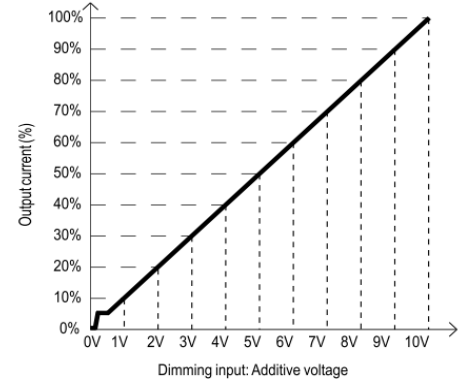
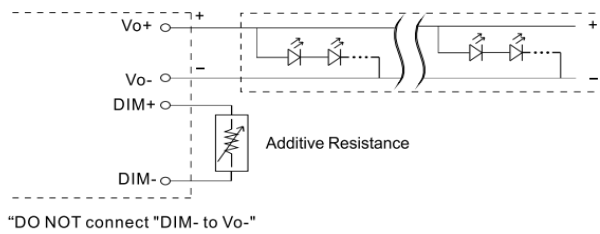
- Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-:
  - 0 ~ 10Vdc, or 10V PWM signal or resistance.
- Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.
- Dimming source current from power supply: 100uA (typ.)
- Applying additive 0 ~ 10VDC



- Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



- Applying additive resistance:



Note : 1. Min. dimming level is about 8% and the output current is not defined when 0% < Iout < 8%.  
 2. The output current could drop down to 0% when dimming input is about 0k  $\Omega$  or 0Vdc, or 10V PWM signal with 0% duty cycle.

I/P: 230 VAC  
 O/P: DIMMING TEST  
 Ta: 25°C

1	R	0K	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current	0	0.4060	0.8180	1.2320	1.6500	2.0724	2.4992	2.9300	3.3600	3.7880	4.0708	4.0732
%	0%	10.15%	20.45%	30.80%	41.25%	51.81%	62.48%	73.25%	84.00%	94.70%	101.77%	101.83%	
2	V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
	Output Current	0	0.4048	0.8108	1.1900	1.6000	2.0000	2.4100	2.8100	3.2048	3.6000	3.9932	4.0748
	%	0%	10.12%	20.27%	29.75%	40.00%	50.00%	60.25%	70.25%	80.12%	90.00%	99.83%	101.87%
3	PWM(100Hz)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0	0.4016	0.8036	1.2044	1.6060	2.0064	2.4096	2.8000	3.2000	3.6072	4.0000	4.0560
	%	0%	10.04%	20.09%	30.11%	40.15%	50.16%	60.24%	70.00%	80.00%	90.18%	100.00%	101.40%

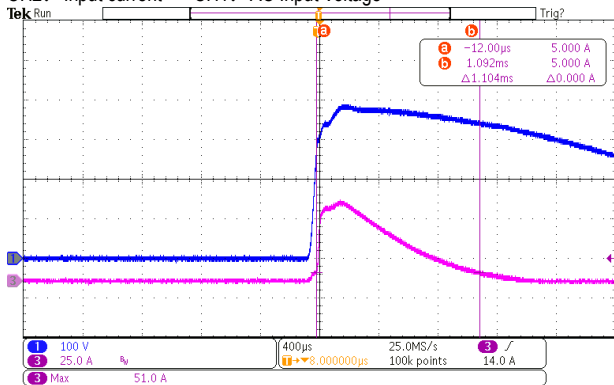
TEST RESULT: OK

## 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: (1)LOW-LINE-3V=97 V HIGH-LINE+10V=315 V O/P: FULL/MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230VAC ON: 0.5 Sec OFF: 0.5 Sec 20MIN ( 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 1.1A/120VAC	I/P: 277 VAC I/P: 230 VAC I/P: 120 VAC O/P: FULL LOAD Ta: 25°C	I = 0.38 A/ 277VAC I = 0.45 A/ 230VAC I = 0.86 A/ 120VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.325 mA N-FG: 0.336 mA
5	NO LOAD/STANDBY POWER CONSUMPTION	< 0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.176 W/ 230VAC
6	INRUSH CURRENT(Typ)	277VAC/ 60A Twidth =1.4ms measured at 10% Ipeak, Twidth =620us measured at 50% Ipeak,  COLD START	I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I = 51 A/ 277VAC Twidth =1092 us/10% Ipeak Twidth =532 us/50% Ipeak

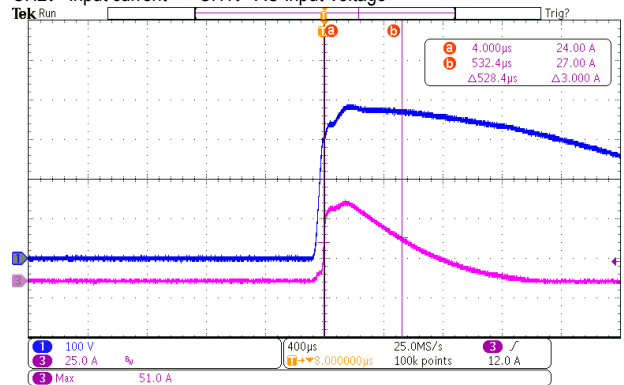
INPUT=277VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



INPUT=277VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



7	EFFICIENCY(Typ)	88%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	90.18%																												
<p><b>EFFICIENCY vs LOAD</b></p> <table border="1"> <caption>Efficiency vs Load Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>277V (%)</th> <th>230V (%)</th> <th>120V (%)</th> </tr> </thead> <tbody> <tr><td>50%</td><td>90.0</td><td>89.5</td><td>88.5</td></tr> <tr><td>60%</td><td>90.5</td><td>89.8</td><td>88.5</td></tr> <tr><td>70%</td><td>91.0</td><td>90.0</td><td>88.5</td></tr> <tr><td>80%</td><td>91.0</td><td>90.0</td><td>88.5</td></tr> <tr><td>90%</td><td>91.0</td><td>90.0</td><td>88.0</td></tr> <tr><td>100%</td><td>91.0</td><td>90.5</td><td>87.8</td></tr> </tbody> </table>					LOAD (%)	277V (%)	230V (%)	120V (%)	50%	90.0	89.5	88.5	60%	90.5	89.8	88.5	70%	91.0	90.0	88.5	80%	91.0	90.0	88.5	90%	91.0	90.0	88.0	100%	91.0	90.5	87.8
LOAD (%)	277V (%)	230V (%)	120V (%)																													
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8	POWER FACTOR	0.92/ 277VAC 0.95/ 230VAC 0.97/ 120VAC	I/P: 277 VAC I/P: 230 VAC I/P: 120 VAC O/P: FULL LOAD Ta: 25°C	PF= 0.941 / 277VAC PF= 0.976 / 230VAC PF= 0.995 / 120VAC																												
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9	TOTAL HARMONIC DISTORTION	THD < 20% ( @load ≥ 50%/120VAC, @load ≥ 60%/230VAC, @load ≥ 75%/277VAC )	I/P: 120 VAC/50% LOAD I/P: 230 VAC/60% LOAD I/P: 277 VAC/75% LOAD Ta: 25°C	THD=7.44% @50% load /120VAC THD=14.94% @60% load /230VAC THD=17.75% @75% load /277VAC																												
<p><b>THD vs LOAD</b></p> <table border="1"> <caption>THD vs Load Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>277V (%)</th> <th>230V (%)</th> <th>120V (%)</th> </tr> </thead> <tbody> <tr><td>50%</td><td>24.0</td><td>17.5</td><td>7.5</td></tr> <tr><td>60%</td><td>21.0</td><td>15.0</td><td>6.5</td></tr> <tr><td>70%</td><td>18.5</td><td>13.5</td><td>6.0</td></tr> <tr><td>80%</td><td>16.5</td><td>12.0</td><td>5.8</td></tr> <tr><td>90%</td><td>15.0</td><td>10.5</td><td>5.8</td></tr> <tr><td>100%</td><td>14.0</td><td>9.5</td><td>5.8</td></tr> </tbody> </table>					LOAD (%)	277V (%)	230V (%)	120V (%)	50%	24.0	17.5	7.5	60%	21.0	15.0	6.5	70%	18.5	13.5	6.0	80%	16.5	12.0	5.8	90%	15.0	10.5	5.8	100%	14.0	9.5	5.8
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**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER CURRENT PROTECTION	95%~108%	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: TESTING Ta: 25°C	100.25%/ 100VAC 100.25%/ 230VAC 100.25 %/ 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	30.00 V/ 100VAC 30.01 V/ 230VAC 30.00 V/ 305VAC Shut down output voltage, re-power on to recovery
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: FULL LOAD	O.T.P. Active Shut down output voltage with auto-recovery or re-power on to recover
4	SHORT CIRCUIT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 100VAC 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) 654 V (2) 500 V (3) 652 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) 86.8 V (2) 62 V (3) 84.8 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) 442 V (3) 449 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) 17.7 V (2) 15.1 V (3) 15.1 V (4) 15.1 V (5) 16.3 V

5	PFC Power Transistor	Q 1 Rated 600V/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) 464 V (2) 442 V (3) 462 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: 4.125 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG: 1.8 KVAC/min Ta: 25°C	I/P-O/P: 2.666 mA I/P-FG: 2.986 mA O/P-FG: 3.086 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
3	GROUNDING CONTINUITY	IEC60950-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	16mΩ

## E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONDUCTION	FCC PART 15 CLASS B	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
2	RADIATION	FCC PART 15 CLASS B	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR: 8KV Contact: 4KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
4	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
5	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N: 1KV L,N-PE: 2KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
6	Test by certified Lab & Test Report Prepare			



## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																				
1	TEMPERATURE RISE TEST	MODEL: ELG-100U-24 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=27.8℃ 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=59.4℃																																																																																																						
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 305VAC/120VAC/100VAC O/P: FULL LOAD/70% LOAD Ta= -45℃ / -30℃	TEST: OK																																																																																																				
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 55℃ NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=55℃ HUMIDITY= 95 %R.H	TEST: OK																																																																																																				
4	TEMPERATURE COEFFICIENT	±0.03 %/℃ (0~60℃)	I/P: 230 VAC O/P: FULL LOAD	±0.004 %/℃ (0~60℃)																																																																																																				
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature: -45℃~ +85℃ 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		TEST: OK																																																																																																				



6	THERMAL SHOCK TEST	1. Thermal shock Temperature: Tcase=-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: 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-100U-24: SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P: FULL LOAD Tc= 75 °C LIFE TIME (2) I/P: 230VAC O/P: 75% LOAD Tc= 75 °C LIFE TIME (3) I/P: 230VAC O/P: 50% LOAD Tc= 75 °C LIFE TIME	(1) 68508 HRS (2) 88437 HRS (3) 86961 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 2877.8K hrs min. Telcordia SR-332 (Bellcore) ; 287.5K 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	WUWQ/ZHOUB	WENF	LIUWY