



Test Report: XLG-150-L

150W Constant Power Mode 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

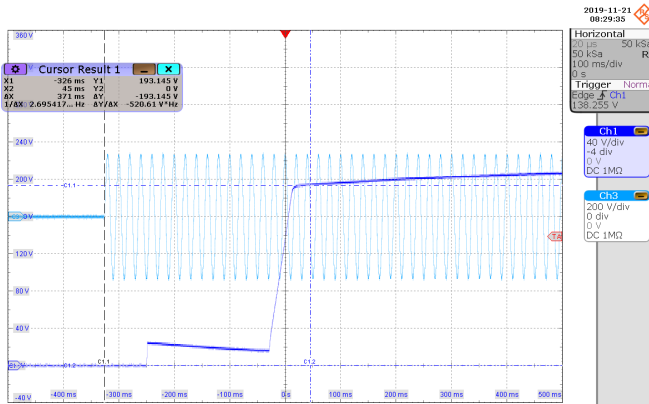
ENVIRONMENT TEST

DESIGN VERIFY TEST

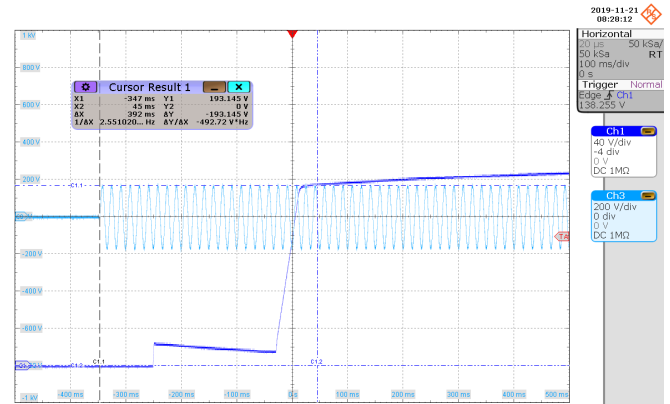
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±5%	I/P:230VAC O/P:I.LEDmax:I.LEDmin CP: 700mA & 1050mA Ta:25°C	CP700mA: 0.7013A/230VAC@CV MAX-1V 0.7028A/230VAC@CV MIN 0.4% CP 1050mA: 1.064A/230VAC@CV MAX-1V 1.065A/230VAC@CV MIN 1.4%
2	FULL POWER CURRENT RANGE	700~1050mA	I/P: 230VAC O/P:I.LEDmax CP: 700mA & 1050mA Ta:25°C	222V/700mA/230VAC 184V/1050mA/230VAC
3	CONSTANT POWER	O/P : 150W	I/P : 230 VAC O/P : Vo×Io	TEST : OK
4	OPEN CIRCUIT VOLTAGE (max)	225V	I/P: 230VAC O/P:NO LOAD CP: OPEN Ta:25°C	223.9V
5	CONSTANT CURRENT REGION	CP 700mA: 120V~ 214V CP 1050mA: 120V~ 142V	I/P: 230VAC O/P:I.LEDmax CP: 700mA & 1050mA Ta:25°C	CP 700mA: 21V~ 221.5V/230VAC CP 1050mA: 21V~ 142V/230VAC
6	CURRENT ADJ. RANGE	350mA~1050mA	I/P: 230VAC O/P:CVmin& CVmax-1V CP: 1050mA Ta:25°C	0.2423mA~1.2096mA/230VAC@CV MAX-1V 0.2428mA~1.2084mA /230VAC@CV MIN
7	CURRENT RIPPLE	3.0% max.	I/P: 230VAC O/P:I.LEDmax CP: 700mA & 1050mA Ta:25°C	CP 700mA: 1.129% CP 1050mA: 1.143%
8	SET UP TIME	230VAC/ 500 ms (Max) 115VAC/ 1200 ms (Max)	I/P: 230VAC I/P: 115VAC O/P:I.LEDmax CP 700mA Ta:25°C	230VAC/371ms 115VAC/392ms

INPUT=230VAC/50HZ @ LEDMAX@ CP 700mA
CH1 : Output Voltage CH2 : AC Input Voltage



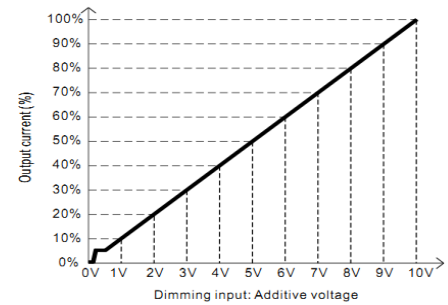
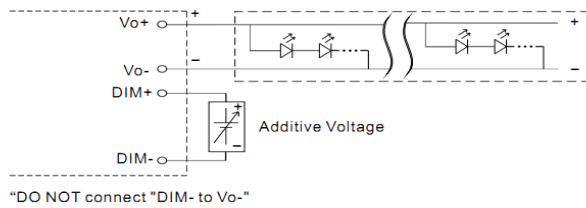
INPUT=115VAC/60HZ @ LEDMAX@ CP 700mA
CH1 : Output Voltage CH2 : AC Input Voltage



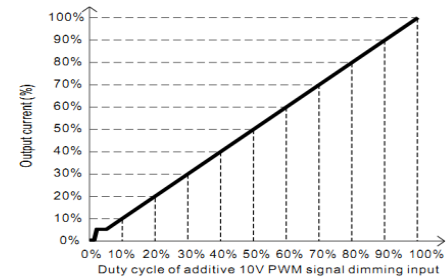
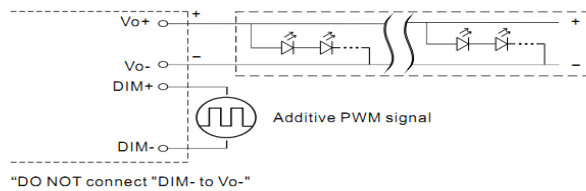
9 DIMMING OPERATION (forAB-Type)

- 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.)

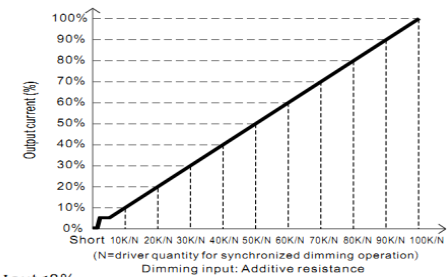
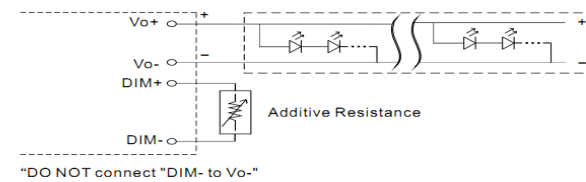
⊙ Applying additive 0 ~ 10VDC



⊙ 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 0kΩ or 0Vdc, or 10V PWM signal with 0% duty cycle.

I/P : 230 VAC O/P : DIMMING TEST

	V	Short	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
1	Output Current	0A	0.080A	0.148A	0.222A	0.286A	0.351A	0.427A	0.494A	0.566A	0.634A	0.699A	0.699A
	%	0%	11.38%	21.10%	31.70%	40.86%	50.14%	61.04%	70.50%	80.86%	90.53%	99.89%	99.89%
2	PWM	0V	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0A	0.084A	0.147A	0.220A	0.285A	0.361A	0.426A	0.503A	0.570A	0.644A	0.699A	0.699A

3	(100Hz)													
	%	0%	11.96 %	20.94 %	31.43 %	40.71 %	51.53 %	60.89 %	71.91 %	81.47 %	91.97 %	99.79 %	99.79 %	
	R	0%	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN	
	Output Current	0A	0.079A	0.153A	0.216A	0.286A	0.362A	0.427A	0.493A	0.571A	0.645A	0.699A	0.699A	
	%	0%	11.31 %	21.80 %	30.89 %	40.80 %	51.66 %	61.03 %	70.49 %	81.63 %	92.11 %	99.89 %	99.90 %	
TEST RESULT : OK														

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305 VAC	I/P:TESTING O/P:LEDmax CP 700mA Ta:25°C	79V~305 V
			I/P: LOW-LINE-3V=97V HIGH-LINE+10V=315 V O/P: LEDmax / LEDmin CP 700mA (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	(1).TEST : OK (2).TEST : OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 100VAC ~305VAC O/P: LEDmax ~ LEDmin CP 700mA Ta:25°C	TEST : OK
3	INPUT CURRENT (TYP)	277VAC/ 0.8A 230VAC/ 1 A 115VAC/ 1.8A	I/P: 277VAC /230VAC/115VAC O/P:LEDmax CP 700mA Ta:25°C	I =0.602A/ 277VAC I =0.711A/ 230VAC I =1.452A/115VAC
4	POWER FACTOR(TYP)	0.92/277 VAC LEDMAX 0.95/230 VAC LEDMAX 0.97/115 VAC LEDMAX	I/P: 277VAC/230VAC/115VAC O/P:LEDmax CP 700mA Ta:25°C	PF=0.959/277V/100%LOAD PF=0.986/230V/100%LOAD PF=0.999/115V/100%LOAD
	P.F vs LOAD			



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5	EFFICIENCY (TYP)	93%	I/P: 230VAC O/P: LEDmax CP 700mA Ta: 25°C	93.65%
	<p>EFFICIENCY vs LOAD</p>			
6	INRUSH CURRENT (TYP)	230V/ 50A COLD START (twidth=500 us measured at 50% Ipeak) COLD START	I/P: 230VAC O/P: LEDmax CP 700mA Ta: 25°C	I = 42.7A / 230VAC T50 = 415 μS
	<p>INPUT=230VAC/ 50HZ @ LEDMAX CH2 : AC Input Voltage CH1 : Input current</p>			
7	TOTAL HARMONIC DISTORTION	THD < 10% @ load, ≥ 50% at 230VAC/115VAC, load, ≥ 75% at 277VAC	I/P : 277VAC I/P : 230VAC I/P : 115VAC O/P : 50%/75% LOAD CP 700mA Ta : 25°C	THD : 7.58 %277V 75% THD : 7.75 %230V 50% THD : 3.34 %115V 50%

THD vs LOAD																																															
<table border="1"> <caption>THD vs LOAD Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>115VAC THD (%)</th> <th>230VAC THD (%)</th> <th>277VAC THD (%)</th> </tr> </thead> <tbody> <tr><td>10%</td><td>15</td><td>24</td><td>35</td></tr> <tr><td>20%</td><td>12</td><td>16</td><td>28</td></tr> <tr><td>30%</td><td>8</td><td>12</td><td>22</td></tr> <tr><td>40%</td><td>6</td><td>10</td><td>18</td></tr> <tr><td>50%</td><td>5</td><td>8</td><td>15</td></tr> <tr><td>60%</td><td>4</td><td>6</td><td>12</td></tr> <tr><td>70%</td><td>4</td><td>5</td><td>10</td></tr> <tr><td>80%</td><td>4</td><td>4</td><td>8</td></tr> <tr><td>90%</td><td>4</td><td>4</td><td>7</td></tr> <tr><td>100%</td><td>4</td><td>4</td><td>6</td></tr> </tbody> </table>				LOAD (%)	115VAC THD (%)	230VAC THD (%)	277VAC THD (%)	10%	15	24	35	20%	12	16	28	30%	8	12	22	40%	6	10	18	50%	5	8	15	60%	4	6	12	70%	4	5	10	80%	4	4	8	90%	4	4	7	100%	4	4	6
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8	STANDBY POWER CONSUMPTION	STANDBY POWER CONSUMPTION <0.5W for AB-Type(Dimming Off)	I/P : 230 VAC O/P : STANDBY(AB) Ta : 25°C	0.3937W/AB																																											
9	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P : 277 VAC O/P : NO LOAD Ta : 25°C	L-FG : 0.291mA N-FG : 0.290mA																																											

ROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	230V~265V	I/P: 305VAC I/P: 230VAC I/P: 100VAC CP 700mA O/P: MIN LOAD Ta:25°C	249.8V / 305VAC 249.67V / 230VAC 249.23V / 100VAC PROTECTION TYPE : Shut down output voltage, re-power on to recovery
2	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 305VAC I/P: 100VAC O/P: LEDmax CP 700mA Ta:25°C	O.T.P. Active PROTECTION TYPE : Shut down output voltage, re-power on to recovery
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 305VAC I/P: 100VAC O/P: LEDMAX CP: 700mA & 1050mA Ta:25°C	NO DAMAGE PROTECTION TYPE : Hiccup mode or Constant current limiting, recovers automatically after fault condition is removed CP:
4	INPUT OVER VOLTAGE (for XLG-150I only)	320 ~ 390VAC (Shut down output voltage when the input voltage exceeds protection voltage Can survive input voltage stress of 440Vac for 48 hours	I/P : TESTING O/P: FULL LOAD Ta:25°C	PASS

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q6 Rated: 650V/11A	I/P:High-Line +3V =308V I/P:Low-Line -3V = 97V AC ON/OFF CP: 700mA&1050mA VDS: O/P: (1)LEDmax (2) LEDmin (3) Output Short (4)LED min dimming on/off Ta:25°C	308V CP: 700mA VDS: (1) 444V (2) 452V (3) 464V (4) 452V 97V CP: 700mA VDS: (1) 448V (2) 452V (3) 464V (4) 452V CP: 1050mA VDS: (1) 448V (2) 452V (3) 476V (4) 452V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated: 650V/10.6A	I/P:High-Line +3V =308V I/P:Low-Line -3V = 97V AC ON/OFF CP: 700mA VDS: O/P: (1)LEDmax (2) LEDmin (3) Output Short (4)LED min dimming on/off Ta:25°C	308V CP: 700mA VDS: (1) 528V (2) 532V (3) 516V (4) 532V 97V CP: 700mA VDS: (1) 528V (2) 528V (3) 476V (4) 528V
3	P.F.C DIODE	D1 Rated: 9A/600V	I/P:High-Line +3V =308V AC ON/OFF CP: 700mA VDS: O/P: (1)LEDmax (2) LEDmin (3) Output Short (4)LED min dimming on/off	(1) 468V (2) 484V (3) 464V (4)484V
4	Diode Peak Voltage	Q100 Rated: 10A/600V	I/P:High-Line +3V =308V AC ON/OFF CP: 700mA&1050mA VDS: O/P: (1)LEDmax (2) Output Short (3) burst mode Ta:25°C	CP: 700mA VDS: (1) 444V (2) 27.2V (3) 524V

5	Input Capacitor Voltage	C5 Rated: :82 μ /450 V	I/P:High-Line +3V =308V AC ON/OFF CP: 700mA VDS: O/P: (1)LEDmax (2) LEDmin Ta:25°C	(1) 448V (2) 449V
6	Control IC Voltage Test	PWM IC U2 Rated 30V	I/P:High-Line +3V =308V AC ON/OFF CP: 700mA VDS: O/P: (1)LEDmax (2) LEDmin (3) Output Short (4)NO LOAD VRmin.LOW LINE (5)OVP Ta:25°C	U1 (1) 25.6V (2) 25.6V (3) 25.6V (4) 18.6V (5) 25.8V

SAFETY & EMC TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	EN61230-1 I/P-O/P: 3.75KVAC/min I/P-FG: 2 KVAC/min<4.5mA O/P-FG:1.5KVAC/min	I/P-O/P: 4.125 KVAC/min I/P-FG: 2.4KVAC/min O/P-FG: 1.8 KVAC/min Ta:25°C	I/P-O/P: 3.47mA I/P-FG: 2.8mA O/P-FG: 6.71mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100M Ω I/P-FG: 500VDC>100M Ω O/P-FG:500VDC>100M Ω	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: 30G Ω I/P-FG: 30G Ω O/P-FG: 29.2G Ω NO DAMAGE
3	GROUNDING CONTINUITY	EN61230-1 FG(PE) TO CHASSIS OR TRACE < 100 m Ω	40A / 2min Ta:25°C	37m Ω

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



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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 : 2KV	I/P : 230VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N : 4KV L-PE : 6KV	I/P : 230VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare. Any contradictions of the test results please refer to the latest EMC test report.			

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																								
1	TEMPERATURE RISE TEST	MODEL : XLG-150-L 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 25.0°C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=55.0°C																																																																																										
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 25.0 °C</th> <th>HIGH AMBIENT Ta=55.0 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>63.5°C</td><td>86.2°C</td></tr> <tr><td>2</td><td>ZNR1/2</td><td>56.1°C</td><td>79.4°C</td></tr> <tr><td>3</td><td>Q1</td><td>63.5°C</td><td>86.3°C</td></tr> <tr><td>4</td><td>LF1</td><td>61.3°C</td><td>83.6°C</td></tr> <tr><td>5</td><td>L1</td><td>63.3°C</td><td>85.4°C</td></tr> <tr><td>6</td><td>LF2</td><td>62.5°C</td><td>84.7°C</td></tr> <tr><td>7</td><td>L2</td><td>64.8°C</td><td>87.0°C</td></tr> <tr><td>8</td><td>RTH1</td><td>65.6°C</td><td>86.1°C</td></tr> <tr><td>9</td><td>C5</td><td>64.8°C</td><td>86.9°C</td></tr> <tr><td>10</td><td>C13</td><td>63.8°C</td><td>81.6°C</td></tr> <tr><td>11</td><td>T1(core)</td><td>67.8°C</td><td>89.2°C</td></tr> <tr><td>12</td><td>T1(wire)</td><td>67.1°C</td><td>88.8°C</td></tr> <tr><td>13</td><td>C106</td><td>62.9°C</td><td>85.5°C</td></tr> <tr><td>14</td><td>C108</td><td>62.1°C</td><td>84.8°C</td></tr> <tr><td>15</td><td>D1</td><td>64.7°C</td><td>88.7°C</td></tr> <tr><td>16</td><td>Q5</td><td>67.5°C</td><td>92.3°C</td></tr> <tr><td>17</td><td>D101/Q101</td><td>62.8°C</td><td>85.9°C</td></tr> <tr><td>18</td><td>U2</td><td>68.1°C</td><td>90.6°C</td></tr> <tr><td>19</td><td>RTH3</td><td>61.2°C</td><td>84.1°C</td></tr> <tr><td>20</td><td>R7</td><td>62.5°C</td><td>85.5°C</td></tr> <tr><td>21</td><td>TC</td><td>53.5°C</td><td>76.6°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 25.0 °C	HIGH AMBIENT Ta=55.0 °C	1	BD1	63.5°C	86.2°C	2	ZNR1/2	56.1°C	79.4°C	3	Q1	63.5°C	86.3°C	4	LF1	61.3°C	83.6°C	5	L1	63.3°C	85.4°C	6	LF2	62.5°C	84.7°C	7	L2	64.8°C	87.0°C	8	RTH1	65.6°C	86.1°C	9	C5	64.8°C	86.9°C	10	C13	63.8°C	81.6°C	11	T1(core)	67.8°C	89.2°C	12	T1(wire)	67.1°C	88.8°C	13	C106	62.9°C	85.5°C	14	C108	62.1°C	84.8°C	15	D1	64.7°C	88.7°C	16	Q5	67.5°C	92.3°C	17	D101/Q101	62.8°C	85.9°C	18	U2	68.1°C	90.6°C	19	RTH3	61.2°C	84.1°C	20	R7	62.5°C	85.5°C	21	TC	53.5°C	76.6°C
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19	RTH3	61.2°C	84.1°C																																																																																									
20	R7	62.5°C	85.5°C																																																																																									
21	TC	53.5°C	76.6°C																																																																																									
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/100VAC O/P : FULL LOAD Ta= -45°C/-35°C	TEST : OK																																																																																								



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3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 55 °C NO DAMAGE	I/P : 305VAC O/P : FULL LOAD Ta=55 °C HUMIDITY= 95% R.H	TEST : OK
4	TEMPERATURE COEFFICIENT	±0.06%/°C (0~60°C)	I/P : 230 VAC O/P : FULL LOAD	±0.00139%/°C (0~60°C)
5	STORAGE TEMPERATURE TEST	-40~+80°C	1. Thermal shock Temperature : -50°C~ +125°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 200CYCLE 5. Input/Output condition : STATIC TEST : OK	
6	THERMAL SHOCK TEST	-40~+55°C	1. Thermal shock Temperature : -45°C~ +60°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 16CYCLE 5. Input/Output condition : 15cycle:230VAC/ FULL LOAD AC on 3 sec/AC off 1 sec TEST 1cycle:230VAC/ FULL LOAD Burn In Test TEST : OK	
7	VIBRATION TEST	10~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 6G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C TEST : OK	
8	CAPACITOR LIFE CYCLE	XLG-150-L : 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) 60534 HRS (2) 57143 HRS (3) 63665 HRS	
9	MTBF	Conducted by Parts Stress Analysis Prediction 2269.5K hrs min. Telcordia SR-332 (Bellcore); 213.3K 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