Test Report: XLG-150-M

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

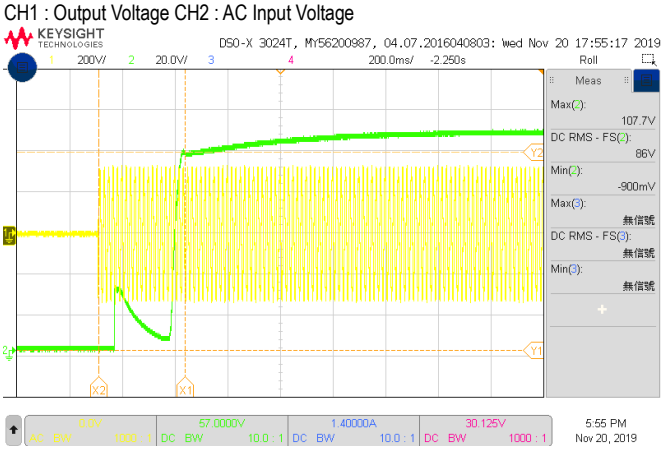
■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±5%	I/P:230VAC O/P:LEDmax/ LEDmin CP: 1400mA & 2100mA Ta:25℃	CP1400mA: 1.405A/230VAC@CV MAX-1V 1.407A/230VAC@CV MIN 0.15% CP 2100mA: 2.101A/230VAC@CV MAX-1V 2.102A/230VAC@CV MIN 0.05%
2	FULL POWER CURRENT RANGE	1400~2100mA	I/P: 230VAC O/P:LEDmax CP: 1400mA & 2100mA Ta:25℃	107V/1400mA/230VAC 71V/2100mA/230VAC
3	CONSTANT POWER	O/P：150W	I/P：230 VAC O/P：Vo×Io	TEST：OK
4	OPEN CIRCUIT VOLTAGE (max)	115V	I/P: 230VAC O/P:NO LOAD CP: OPEN Ta:25℃	110.32V
5	CONSTANT CURRENT REGION	CP 1400mA: 60V~ 107V CP 2100mA: 60V~ 71V	I/P: 230VAC O/P:LEDmax CP: 1400mA & 2100mA Ta:25℃	CP 1400mA: 60V~ 107V/230VAC CP 2100mA: 60V~ V/230VAC
6	CURRENT ADJ. RANGE	700mA~2100mA	I/P: 230VAC O/P:CVmin& CVmax-1V CP: 1400mA & 2100mA Ta:25℃	0.51A~2.463A/230VAC@CV MAX-1V 0.517mA~2.463mA /230VAC@CV MIN
7	CURRENT RIPPLE	3.0% max.	I/P: 230VAC O/P:LEDmax CP: 1400mA & 2100mA Ta:25℃	CP 1400mA: 2.21% CP 2100mA: 1.88%
8	SET UP TIME	230VAC/ 500 ms (Max) 115VAC/ 1200 ms (Max)	I/P: 230VAC I/P: 115VAC O/P:LEDmax CP 1400mA Ta:25℃	230VAC/328ms 115VAC/ 364ms

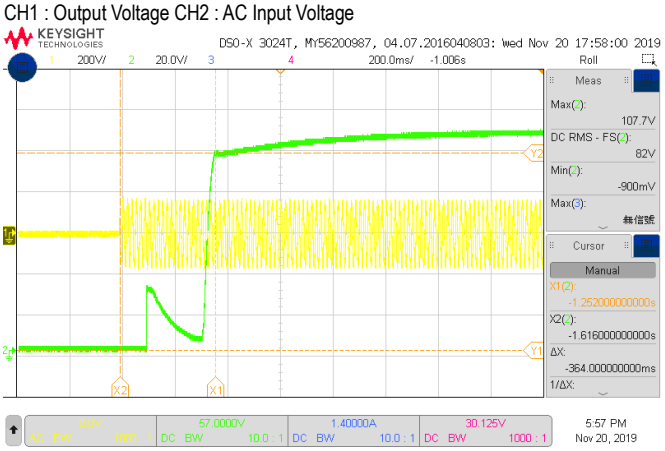
INPUT=230VAC/50HZ @ LEDMAX@ CP 1400mA

CH1 : Output Voltage CH2 : AC Input Voltage



INPUT=115VAC/60HZ @ LEDMAX@ CP 1400mA

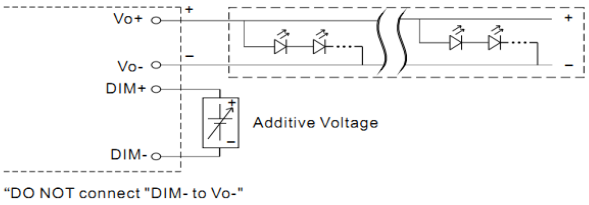
CH1 : Output Voltage CH2 : AC Input Voltage



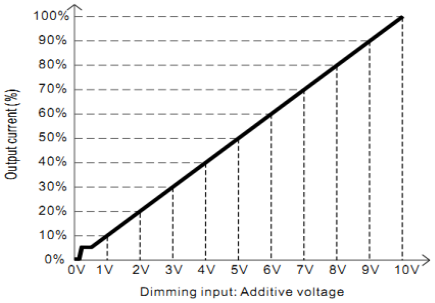
9 DIMMING OPERATION (forAB-Type)

- 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.)

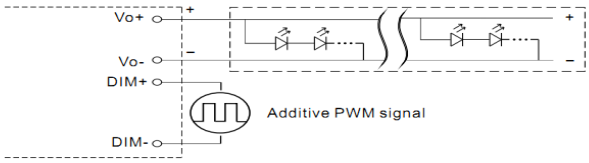
◎ Applying additive 0 ~ 10VDC



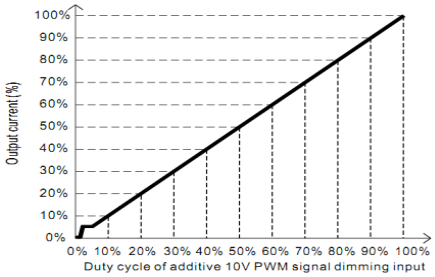
"DO NOT connect "DIM- to Vo-"



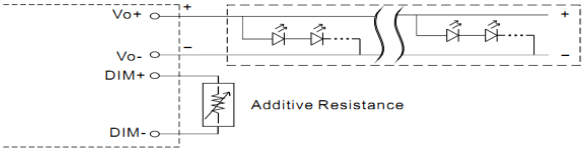
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



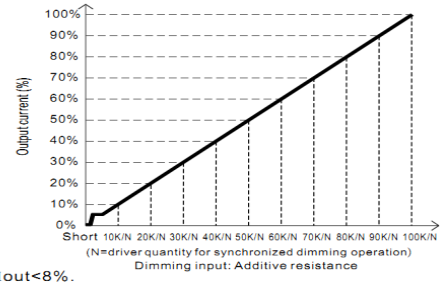
"DO NOT connect "DIM- to Vo-"



◎ Applying additive resistance:



"DO NOT connect "DIM- to Vo-"



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	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
1	Output Current	0.000 00A	0.19 0A	0.3 16A	0.444 A	0.572 A	0.680 A	0.851 A	1.006 A	1.15A	1.29A	1.41A	1.410A
	%	0.00%	13.5 7%	22. 57%	31.71 %	40.86 %	48.57 %	60.79 %	71.86 %	82.14 %	92.14 %	100.71 %	100.71 %
2	PWM	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN

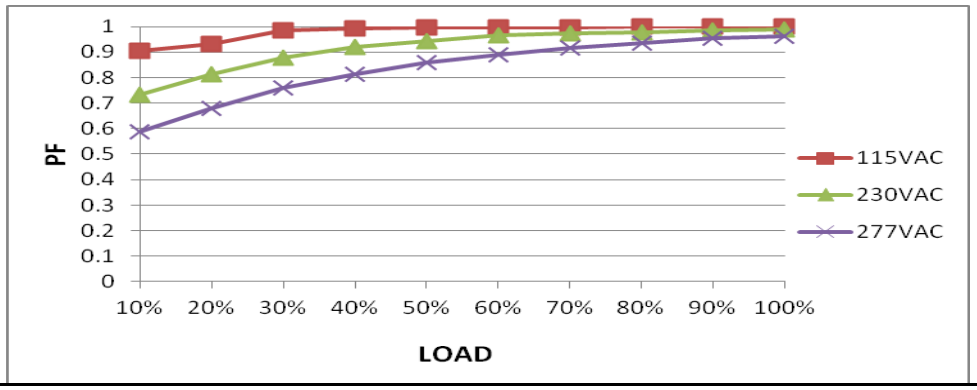
	Output Current (100Hz)	0.00000A	0.190A	0.316A	0.465A	0.594A	0.724A	0.877A	1.000A	1.154A	1.300A	1.410A	1.410A
	%	0.00%	13.57%	22.57%	33.21%	42.43%	51.71%	62.64%	71.43%	82.43%	92.86%	100.71%	100.71%
3	R	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0.00000A	0.188A	0.314A	0.441A	0.607A	0.721A	0.875A	1.007A	1.153A	1.288A	1.410A	1.410A
	%	0.00%	13.43%	22.43%	31.50%	43.36%	51.50%	62.50%	71.93%	82.36%	92.00%	100.71%	100.71%

TEST RESULT：OK

INPUT FUNCTION TEST

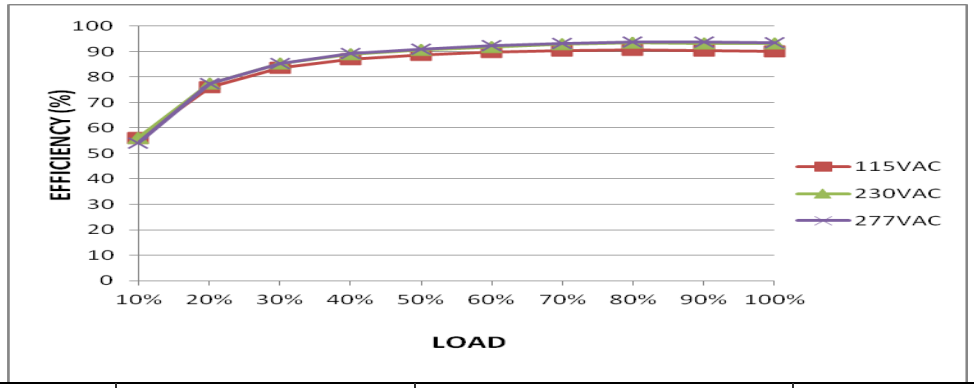
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305 VAC	I/P:TESTING O/P:LEDmax CP 1400mA Ta:25℃	81V~305 V
			I/P: LOW-LINE-3V=97V HIGH-LINE+10V=315 V O/P: LEDmax / LEDmin CP 1400mA (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	(1).TEST:OK (2).TEST :OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 100VAC ~305VAC O/P: LEDmax ~ LEDmin CP 1400mA Ta:25℃	TEST:OK
3	INPUT CURRENT (TYP)	277VAC/ 0.8A 230VAC/ 1 A 115VAC/ 1.8A	I/P: 277VAC /230VAC/115VAC O/P:LEDmax CP 1400mA Ta:25℃	I =0.61A/ 277VAC I =0.722A/ 230VAC I =1.47A/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 1400mA Ta:25℃	PF=0.961 /277V/100%LOAD PF=0.987/230V/100%LOAD PF=0.999/115V/100%LOAD

P.F vs LOAD



5	EFFICIENCY (TYP)	92.5%	I/P: 230VAC O/P:LEDmax CP 1400mA Ta:25℃	93.21%

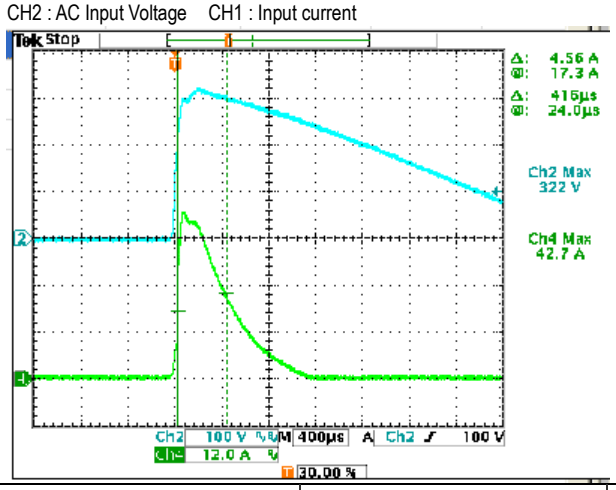
EFFICIENCY vs LOAD



6	INRUSH CURRENT (TYP)	230V/ 50A COLD START (twidth=500 usmeasured at 50% Ipeak) COLD START	I/P: 230VAC O/P:LEDmax CP 1400mA Ta:25℃	I =42.7A /230VAC T50= 415 μS

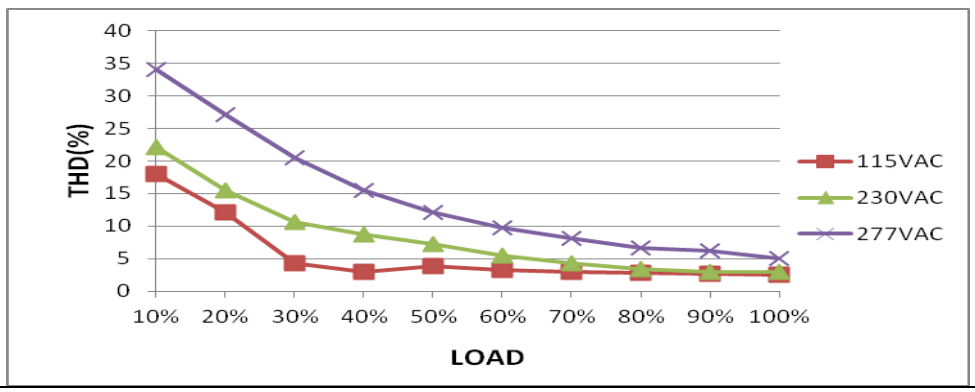
INPUT=230VAC/ 50HZ @ LEDMAX

CH2 : AC Input Voltage CH1 : Input current



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 1400mA Ta：25℃	THD： 7.52 %277V 75% THD： 7.25 %230V 50% THD： 3.92 %115V 50%

THD vs LOAD



8	LEAKAGE CURRENT	<0.75mA / 277VAC	I/P： 277 VAC O/P：NO LOAD Ta：25℃	L-FG: 0.22mA N-FG: 0.22mA L,N –V(+):0.08mA L,N-V(-):0.08mA
9	STANDBY POWER CONSUMPTION	STANDBY POWER CONSUMPTION <0.5W for AB –Type(Dimming Off)	I/P：230 VAC O/P：NO LOAD Ta：25℃	0.4W/ AB

ROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	128V~150V	I/P: 305VAC I/P: 230VAC I/P: 100VAC CP 1400mA O/P:MIN LOAD Ta:25℃	135.26V / 305VAC 135.1V/ 230VAC 135.6V/ 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 1400mA Ta:25℃	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: 1400mA &2100mA Ta:25℃	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℃	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: 11A/650V	I/P:High-Line +3V =308V I/P:Low-Line -3V = 97V AC ON/OFF **CP: 1400mA&2100mA** VDS: O/P: (1)LEDmax (2) LEDmin (3) Output Short (4)LED min dimming on/off	308V **CP: 1400mA** VDS: (1) 435V (2) 448V (3) 469V (4) 448V **CP: 2100mA** VDS: (1) 435V (2) 452V (3) 469V (4) 443V

			Ta:25℃	97V **CP: 1400mA** VDS: (1) 448V (2) 456V (3) 485V (4) 456V **CP: 2100mA** VDS: (1) 443V (2) 452V (3) 485V (4) 460V
2	P.F.C DIODE	D1 Rated: 600V/9A	I/P:High-Line +3V =308V AC ON/OFF **CP: 1400mA** O/P: (1)LEDmax (2) LEDmin (3) Output Short (4)LED min dimming on/off	(1) 456V (2) 456V (3) 469V (4)456V
3	Diode Peak **Voltage**	Q100 Rated: 10A/400V	I/P:High-Line +3V =308V AC ON/OFF **CP: 1400mA&2100mA** O/P: (1)LEDmax (2) Output Short (3) **burst mode**	**CP: 1400mA** (1) 231V (2) 26V (3) 219V
4	**Control IC Voltage Test**	PWM IC U2 Rated 30V	I/P:High-Line +3V =308V AC ON/OFF **CP: 1400mA** O/P: (1)LEDmax (2) LEDmin (3) Output Short (4)NO LOAD VRmin.LOW LINE (5)OVP Ta:25℃	**U1** (1) 13.3V (2) 13.9V (3) 14.5V (4) 13.3V (5) 13.9V
5	PFC Transistor	Q1 Rated 10.6A/650V	I/P：High-Line +3V =308V O/P: (1)Full Load (2)Output Short (3) Full Load continue Ta：25℃	(1) 466V (2) 462V (3) 462V
6	**Input Capacitor Voltage**	C5 Rated： 82 μ F/ 450V	I/P：High-Line +3V =308 V O/P: (1)Full Load input on/off (2) Min load input on /Off (3)Full Load /Min load Change (4)Full load continue Ta：25℃	(1) 448V (2) 449V (3) 445V (4) 447V

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P：3.75KVAC/min I/P-FG： 2KVAC/min O/P-FG：1.5KVAC/min	I/P-O/P：4.125KVAC/min I/P-FG： 2.4 KVAC/min O/P-FG：1.8 KVAC/min Ta：25℃	I/P-O/P： 3.079mA I/P-FG： 2.585mA O/P-FG： 3.89mA 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： >9999MΩ I/P-FG： >9999MΩ O/P-FG： >9999MΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	15mΩ

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：2KV	I/P： 230VAC/50HZ O/P：FULL LOAD Ta：25℃	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℃	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

<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： XLG-150-L
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 25.0℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=55.0℃
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 25.0 ℃</th><th>HIGH AMBIENT Ta=55.0 ℃</th></tr>
<tr><td>1</td><td>BD1</td><td>63.5℃</td><td>86.2℃</td></tr>
<tr><td>2</td><td>ZNR1/2</td><td>56.1℃</td><td>79.4℃</td></tr>
<tr><td>3</td><td>Q1</td><td>63.5℃</td><td>86.3℃</td></tr>
<tr><td>4</td><td>LF1</td><td>61.3℃</td><td>83.6℃</td></tr>
<tr><td>5</td><td>L1</td><td>63.3℃</td><td>85.4℃</td></tr>
<tr><td>6</td><td>LF2</td><td>62.5℃</td><td>84.7℃</td></tr>
<tr><td>7</td><td>L2</td><td>64.8℃</td><td>87.0℃</td></tr>
<tr><td>8</td><td>RTH1</td><td>65.6℃</td><td>86.1℃</td></tr>
<tr><td>9</td><td>C5</td><td>64.8℃</td><td>86.9℃</td></tr>
<tr><td>10</td><td>C13</td><td>63.8℃</td><td>81.6℃</td></tr>
<tr><td>11</td><td>T1(core)</td><td>67.8℃</td><td>89.2℃</td></tr>
<tr><td>12</td><td>T1(wire)</td><td>67.1℃</td><td>88.8℃</td></tr>
<tr><td>13</td><td>C106</td><td>62.9℃</td><td>85.5℃</td></tr>
<tr><td>14</td><td>C108</td><td>62.1℃</td><td>84.8℃</td></tr>
<tr><td>15</td><td>D1</td><td>64.7℃</td><td>88.7℃</td></tr>
<tr><td>16</td><td>Q5</td><td>67.5℃</td><td>92.3℃</td></tr>
<tr><td>17</td><td>D101/Q101</td><td>62.8℃</td><td>85.9℃</td></tr>
<tr><td>18</td><td>U2</td><td>68.1℃</td><td>90.6℃</td></tr>
<tr><td>19</td><td>RTH3</td><td>61.2℃</td><td>84.1℃</td></tr>
<tr><td>20</td><td>R7</td><td>62.5℃</td><td>85.5℃</td></tr>
<tr><td>21</td><td>TC</td><td>53.5℃</td><td>76.6℃</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/100VAC
O/P：FULL LOAD
Ta= -45℃/-35℃</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 55 ℃
NO DAMAGE</td><td>I/P： 305VAC
O/P：FULL LOAD
Ta=55 ℃
HUMIDITY= 95% R.H</td><td>TEST：OK</td></tr>
<tr><td>4</td><td>TEMPERATURE
COEFFICIENT</td><td>±0.06%/℃(0~60℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>±0.003%/℃(0~60℃)</td></tr>
<tr><td>5</td><td>STORAGE TEMPERATURE TEST</td><td>-40~+80℃</td><td colspan="2">1. Thermal shock Temperature： -50℃~ +125℃
2. Temperature change rate ：25℃ / MIN
3. Dwell time low and high temperature ： 30 MIN/EACH
4. Total test cycle：200CYCLE
5. Input/Output condition： STATIC
TEST：OK</td></tr>
<tr><td>6</td><td>THERMAL SHOCK TEST</td><td>-40~+55℃</td><td colspan="2">1. Thermal shock Temperature： -45℃~ +60℃
2. Temperature change rate ：25℃ / 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</td></tr>
</table>

			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℃ 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 ℃ LIFE TIME (2) I/P： 230VAC O/P：75% LOAD Tc= 75 ℃ LIFE TIME (3) I/P： 230VAC O/P：50% LOAD Tc= 75 ℃ 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℃)		
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	WUWQ/ZHOUB	WENF	LIUWY