Test Report: XLG-240-H

240W 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

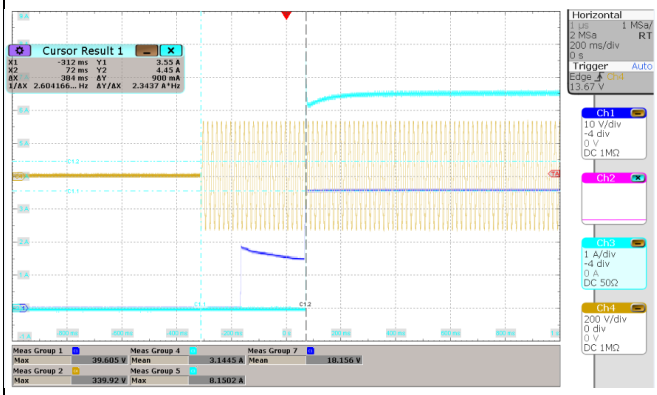
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

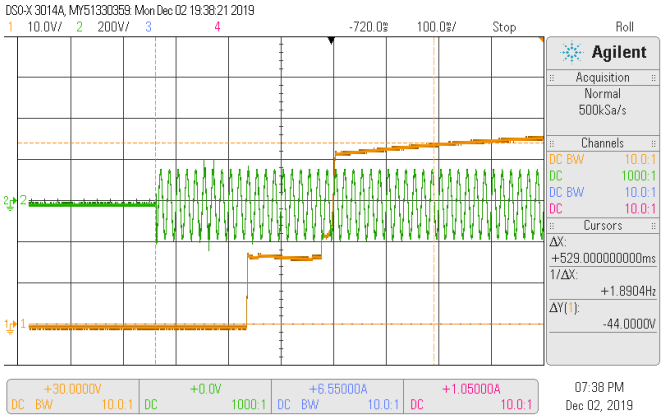
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±4%	I/P:230VAC O/P:LEDmax/ LEDmin CP: 4900mA & 6660mA Ta:25℃	CP4900mA: 4.875A/230VAC@CV MAX-1V 4.895A/230VAC@CV MIN 0.51% CP 6660mA: 6.672A/230VAC@CV MAX-1V 6.707A/230VAC@CV MIN 0.71%
2	FULL POWER CURRENT RANGE	4280~6660mA	I/P: 230VAC O/P:LEDmax CP: 4900mA & 6660mA Ta:25℃	57.33V/4280mA/230VAC 43.82V/6660mA/230VAC
3	CONSTANT POWER	O/P：239.6W	I/P：230 VAC O/P：Vo×Io	TEST：OK
4	OPEN CIRCUIT VOLTAGE (max)	60V	I/P: 230VAC O/P:NO LOAD CP: OPEN Ta:25℃	57.78V
5	CONSTANT CURRENT REGION	CP 4900mA: 27V~ 48.9V CP 6660mA: 27V~ 36V	I/P: 230VAC O/P:LEDmax CP: 4900mA & 6660mA Ta:25℃	CP 4900mA: 17.2V~ 48.9V/230VAC CP 6660mA: 16.9V~36 V/230VAC
6	CURRENT ADJ. RANGE	4900mA~6660mA	I/P: 230VAC O/P:CVmin& CVmax-1V Ta:25℃	1607mA~7620mA/230VAC@CV MAX-1V 1612mA~7626mA /230VAC@CV MIN
7	CURRENT RIPPLE	5.0% max.	I/P: 230VAC O/P:LEDmax CP: 4900mA & 6660mA Ta:25℃	CP 4900mA: 0.67% CP 6660mA: 0.94%
8	SET UP TIME	230VAC/ 500 ms (Max) 115VAC/ 1200 ms (Max)	I/P: 230VAC I/P: 115VAC O/P:LEDmax CP 4900mA Ta:25℃	230VAC/384ms 115VAC/ 529ms

INPUT=230VAC/50HZ @ LEDMAX@ CP 4900mA
CH1 : Output Voltage CH2 : AC Input Voltage



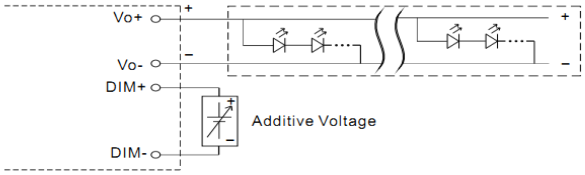
INPUT=115VAC/60HZ @ LEDMAX@ CP 4900mA
CH1 : Output Voltage CH2 : AC Input Voltage



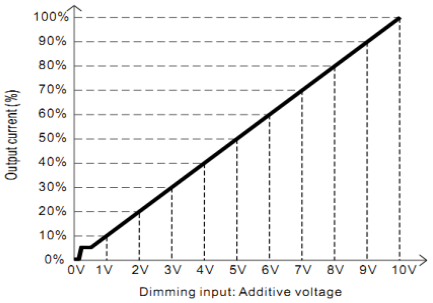
9 DIMMING OPERATION **(forAB-Type)**

- 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.)

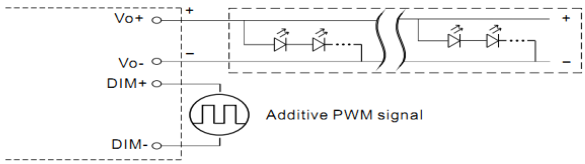
◎ Applying additive 0 ~ 10VDC



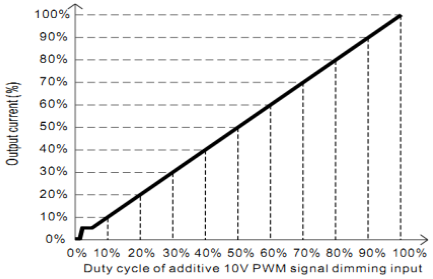
"DO NOT connect "DIM- to Vo-"



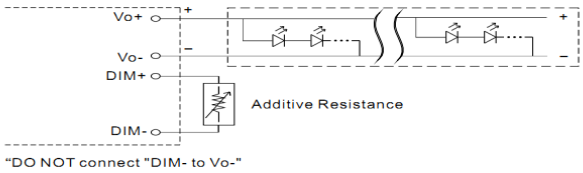
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



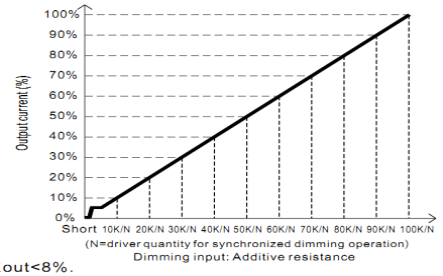
"DO NOT connect "DIM- to Vo-"



◎ 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.

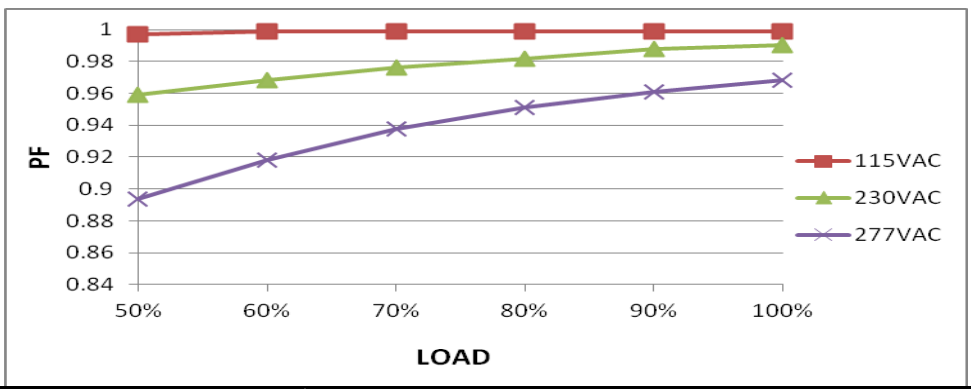
I/P： 230 VAC O/P：DIMMING TEST

1	R	SHORT	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current（100Hz）	0.00000A	0.828A	1.029	1.545	1.992	2.442	2.936	3.396	3.94	4.41	4.89	4.89
	%	0.00%	16.90%	21%	31.53%	40.65%	49.84%	59.92%	69.31%	80.41%	90%	99.8%	99.8%
2	V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN

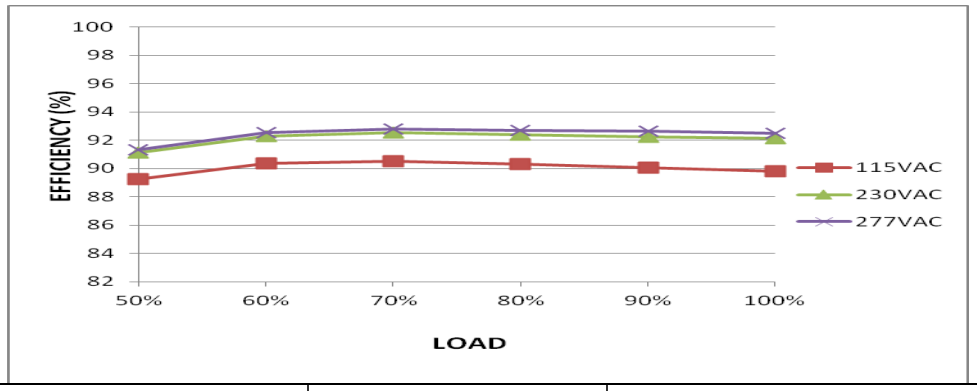
	Output Current	0.00000A	0.829A	1.147	1.59	2.038	2.566	3.022	3.558	4.007	4.492	4.885	4.89
	%	0.00%	16.92%	23.41%	32.45%	41.59%	52.37%	61.67%	72.61%	81.78%	91.67%	99.69%	99.8%
3	PWM	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0.00000A	0.825A	1.064	1.58	2.027	2.555	3.011	3.472	3.987	4.486	4.89	4.89
	%	0.00%	16.84%	21.71%	32.24%	41.37%	52.14%	61.45%	70.86%	81.37%	91.55%	99.8%	99.8%

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 4900mA Ta:25℃	86V~305 V
			I/P: LOW-LINE-3V=107V HIGH-LINE+10V=315 V O/P: LEDmax / LEDmin CP 4900mA (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 4900mA Ta:25℃	TEST:OK
3	INPUT CURRENT (TYP)	277VAC/ 1.1A 230VAC/ 1.3 A 115VAC/ 2.7A	I/P: 277VAC /230VAC/115VAC O/P:LEDmax CP 4900mA Ta:25℃	I =0.962A/ 277VAC I =1.139A/ 230VAC I =2.32A/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 4900mA Ta:25℃	PF= 0.968/277V/100%LOAD PF=0.990/230V/100%LOAD PF=0.999/115V/100%LOAD
	P.F vs LOAD 			
5	EFFICIENCY (TYP)	91%	I/P: 230VAC O/P:LEDmax CP 4900mA Ta:25℃	92.12%

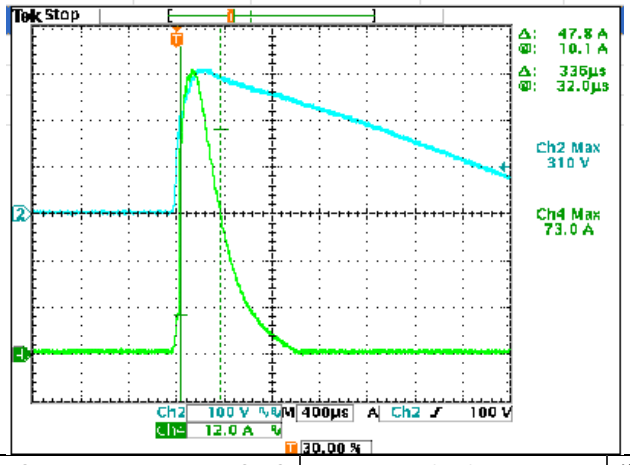
EFFICIENCY vs LOAD



6	INRUSH CURRENT (TYP)	230V/ 85A COLD START (twidth=500 usmeasured at 50% Ipeak) COLD START	I/P: 230VAC O/P:LEDmax CP 4900mA Ta:25℃	I =73A /230VAC T50= 335 μS

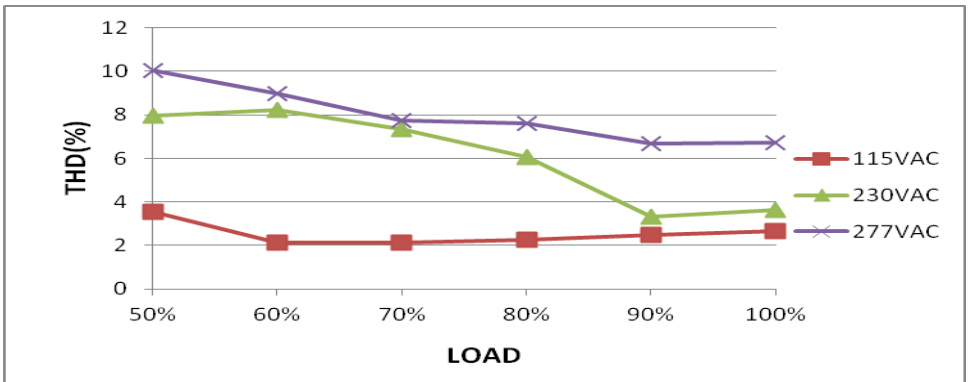
INPUT=230VAC/ 50HZ @ LEDMAX

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 4900mA Ta：25℃	THD： 7.61 %277V 75% THD： 7.95 %230V 50% THD： 3.56 %115V 50%

THD vs LOAD



8	LEAKAGE CURRENT	<0.75mA / 277VAC	I/P： 277 VAC O/P：NO LOAD Ta：25℃	L-FG：0.185 mA N-FG：0.18 mA

9	STANDBY POWER CONSUMPTION	STANDBY POWER CONSUMPTION <0.5W for AB –Type(Dimming Off)	I/P：230 VAC O/P： STANDBY(AB) Ta：25℃	0.447 W/AB

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	61V~85V	I/P: 305VAC I/P: 230VAC I/P: 100VAC CP 4900mA O/P:MIN LOAD Ta:25℃	69.23V / 305VAC 69.29V/ 230VAC 69.39V/ 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 4900mA 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: 4900mA &6660mA Ta:25℃	NO DAMAGE PROTECTION TYPE： Hiccup mode or constant current limiting, recovers automatically after fault condition is removed
4	INPUT OVER VOLTAGE (for XLG-240I 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**	Q3 Rated: 12A /600V	I/P:High-Line +3V =308V I/P:Low-Line -3V = 107V AC ON/OFF **CP: 4280mA&2100mA** VDS: O/P: (1)LEDmax (2) LEDmin(27V) (3) Output Short (4)LED min dimming on/off Ta:25℃	308V **CP: 4280mA/56V** VDS: (1) 445 V (2) 445 V (3) 485 V (4) 433 V 107V **CP: 4280mA** VDS: (1) 445V (2) 445V (3) 489V (4) 437V **CP: 6660mA/36V** VDS: (1) 445V (2) 445V (3) 485V (4) 437V **CP: 6660mA** VDS: (1) 437V (2) 449V (3) 493V (4) 437V

2	P.F.C DIODE	D5 Rated: 8A/600V	I/P:High-Line +3V =308V AC ON/OFF **CP: 4280mA** VDS: O/P: (1)LEDmax (2) LEDmin (3) Output Short (4)LED min dimming on/off	(1) 445V (2) 409V (3) 425V (4)453V
3	Diode Peak **Voltage**	D100 Rated: 15A/150V	I/P:High-Line +3V =308V AC ON/OFF **CP: 4280mA** VDS: O/P: (1)LEDmax (2) Output Short (3) **burst mode** Ta:25℃	**CP: 4280mA** VDS: (1) 115.5V (2) 88.1V (3) 124.3V
4	**Control IC Voltage Test**	PWM IC U2 Rated 30V	I/P:High-Line +3V =308V AC ON/OFF **CP: 4280mA** VDS: O/P: (1)LEDmax (2) LEDmin (3) Output Short (4)NO LOAD VRmin.LOW LINE (5)OVP Ta:25℃	**U1** (1) 25.1V (2) 25.1V (3) 25.1V (4) 13V (5) 9.2V
5	PFC Transistor	Q1 Rated 26A/600 V	I/P：High-Line +3V =308V O/P: (1)Full Load (2)Output Short (3) Full Load continue	(1) 494V (2) 446V (3) 478V
6	Input Capacitor Voltage	C5 Rated： 120 μF/ 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) 440V (2) 440V (3) 446V (4) 438V

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： 2.40 KVAC/min O/P-FG：1.8 KVAC/min Ta：25℃	I/P-O/P： 2.75mA I/P-FG： 2.7mA O/P-FG： 2.2mA 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： >9999M Ω NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	11mΩ

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℃	PASS
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT：2KV	I/P： 230VAC/50HZ O/P：FULL LOAD Ta：25℃	PASS
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N ：4KV L -PE：6KV	I/P： 230VAC/50HZ O/P：FULL LOAD Ta：25℃	PASS
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-240-H-AB
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 31.4℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=52.2℃
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 31.4 ℃</th><th>HIGH AMBIENT Ta=52.2 ℃</th></tr>
<tr><td>1</td><td>BD1</td><td>68.4℃</td><td>89.3℃</td></tr>
<tr><td>2</td><td>C5</td><td>72.2℃</td><td>93.6℃</td></tr>
<tr><td>3</td><td>Q1</td><td>75.0℃</td><td>96.1℃</td></tr>
<tr><td>4</td><td>D5</td><td>75.3℃</td><td>97.0℃</td></tr>
<tr><td>5</td><td>Q2</td><td>74.7℃</td><td>99.2℃</td></tr>
<tr><td>6</td><td>Q3</td><td>74.1℃</td><td>97.9℃</td></tr>
<tr><td>7</td><td>U2</td><td>73.4℃</td><td>94.5℃</td></tr>
<tr><td>8</td><td>RTH3</td><td>75.2℃</td><td>96.8℃</td></tr>
<tr><td>9</td><td>T1</td><td>82.3℃</td><td>104.8℃</td></tr>
<tr><td>10</td><td>D100</td><td>79.7℃</td><td>103.0℃</td></tr>
<tr><td>11</td><td>D101</td><td>84.4℃</td><td>107.7℃</td></tr>
<tr><td>12</td><td>D103</td><td>85.0℃</td><td>90.8℃</td></tr>
<tr><td>13</td><td>C104</td><td>73.0℃</td><td>95.3℃</td></tr>
<tr><td>14</td><td>C105</td><td>74.1℃</td><td>96.5℃</td></tr>
<tr><td>15</td><td>J102</td><td>75.4℃</td><td>97.9℃</td></tr>
<tr><td>16</td><td>TC</td><td>66.0℃</td><td>87.4℃</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/110VAC
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 50 ℃
NO DAMAGE</td><td>I/P： 305VAC
O/P：FULL LOAD
Ta=50 ℃
HUMIDITY= 95% R.H</td><td>TEST：OK</td></tr>
<tr><td>4</td><td>TEMPERATURE
COEFFICIENT</td><td>±0.03%/℃(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~+50℃</td><td colspan="2">1. Thermal shock Temperature： -45℃~ +55℃
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
TEST：OK</td></tr>
</table>

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-240-H-AB：SUPPOSE C106 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) 57041 HRS (2) 66782 HRS (3) 78047 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 2496.2K hrs min. Telcordia SR-332 (Bellcore)； 219.8K 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