Test Report: XLG-320-H

315W 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

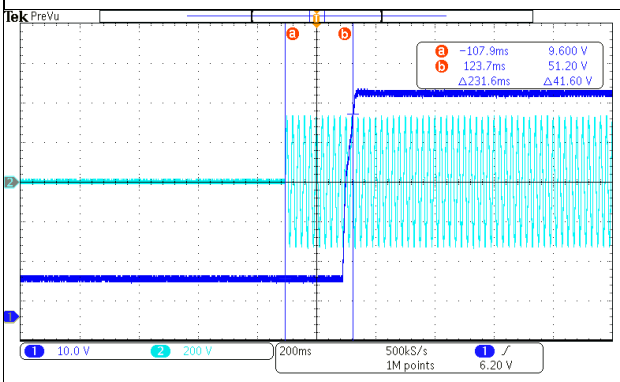
■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

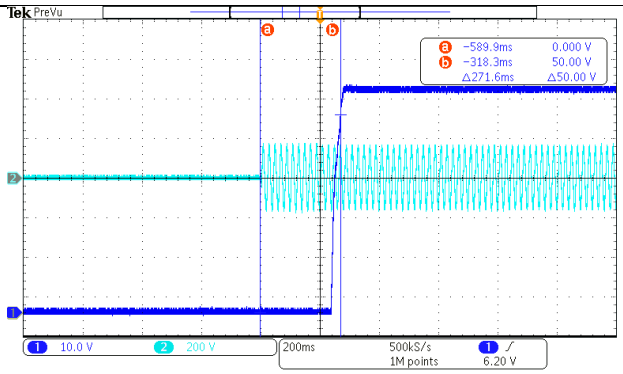
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±5%	I/P:230VAC O/P:LEDmax CP: 5.57 A & 7.42A Ta:25℃	CP:5.57 A 5.574A/230VAC@CV MAX-1V 5.415A/230VAC@CV MIN -3.01%~0.1% CP:7.42 A 7.463A/230VAC@CV MAX-1V 7.341A/230VAC@CV MIN -0.46%~0.91%
2	FULL POWER CURRENT RANGE	5570~7420 mA	I/P: 230VAC O/P:LEDmax CP: 5.57A & 7.42A Ta:25℃	56V/5.572A/230VAC 42V/7.458A/230VAC
3	OPEN CIRCUIT VOLTAGE (max)	60V	I/P: 230VAC O/P:NO LOAD CP: OPEN Ta:25℃	58.72V
4	CONSTANT CURRENT REGION	CP 5.57A: CH1: 30V~56 V CP 7.42 A: CH1: 30V~42 V	I/P: 230VAC O/P:LEDmax CP: 5.57A & 7.42A Ta:25℃	CP 5.57A: 16.2V~56.9 V/230VAC CP 7.42A: 17.9V~49.8 V/230VAC
5	CURRENT ADJ. RANGE	CH1: 2800mA~7420mA	I/P: 230VAC O/P:CVmin& CVmax-1V CP: 5.57A & 7A Ta:25℃	2582mA~5572mA/230VAC@CV MAX-1V 2511mA~7604mA/230VAC@CV MIN
6	CURRENT RIPPLE	5.0% max. @rated current	I/P: 230VAC O/P:LEDmax CP: 5.57A & 7.42A Ta:25℃	CP:5.57 A 2.87% CP:7.42A 3.57%

7	SET UP TIME	230VAC/500 ms (Max) 115VAC/ 1200ms (Max)	I/P: 230VAC I/P: 115VAC O/P:LEDmax CP 5.57A Ta:25℃	230VAC/231.6ms 115VAC/ 271.6ms

INPUT=230VAC/50HZ @ LEDMAX@ CP 5.57A
CH1 : Output Voltage CH2 : AC Input Voltage

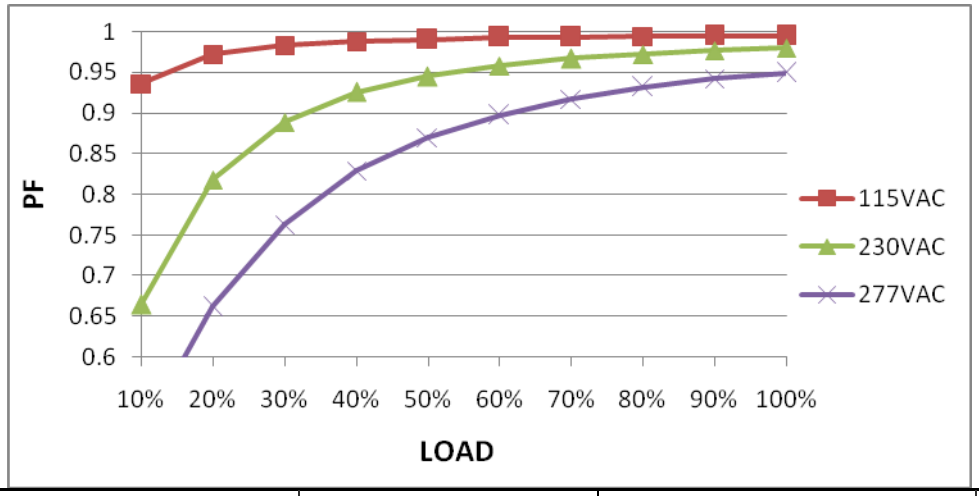
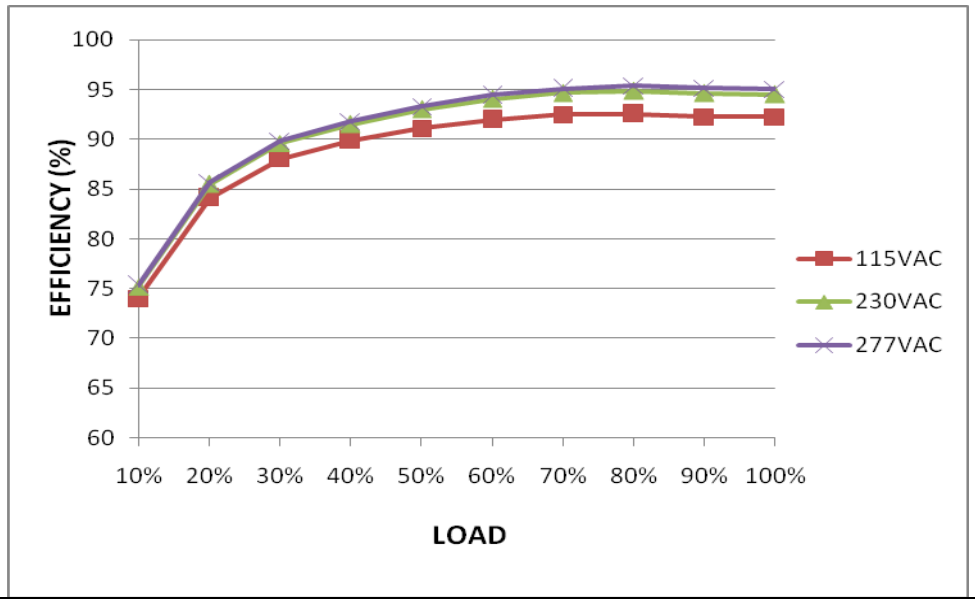


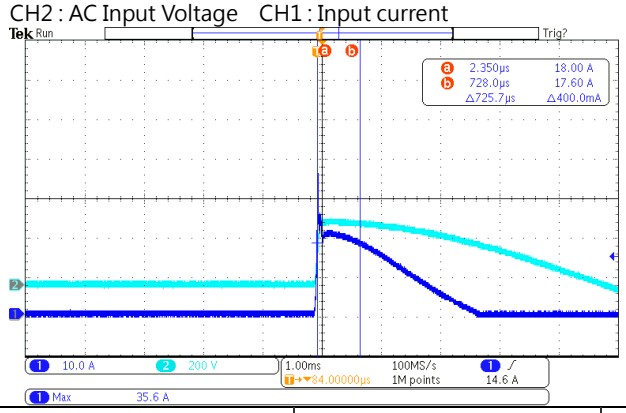
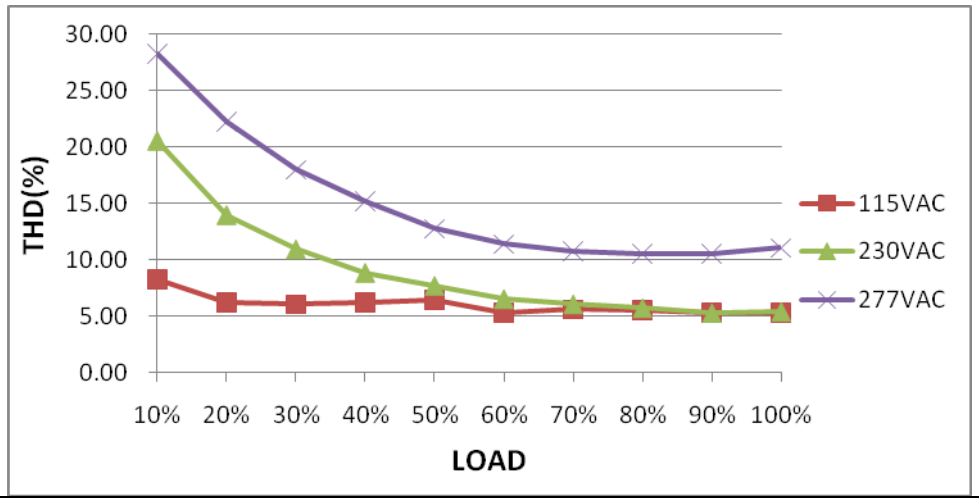
INPUT=230VAC/60HZ @ LEDMAX@ CP5.57 A
CH1 : Output Voltage CH2 : AC Input Voltage



INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305 VAC 142VDC ~ 431VDC	(1) I/P:TESTING O/P:LEDmax (2) I/P:DC TESTING(L:+ N:-) O/P:LEDmax (3) I/P:DC TESTING(L:- N:+) O/P:LEDmax Ta:25℃	(1) 97VAC~308VAC (2) 142VDC ~ 431VDC (3) 142VDC ~ 431VDC
			I/P: LOW-LINE-3V=97 V HIGH-LINE+10V=315 V O/P: LEDmax / LEDmin CP 5.57A (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: 100 VAC ~305VAC O/P: LEDmax ~ LEDmin CP :5.57A Ta:25℃	TEST:OK

3	INPUT CURRENT (TYP)	230VAC/ 1.6 A 277VAC/ 1.3 A 115VAC/3A	I/P: 230VAC/277VAC/115VAC O/P:LEDmax CP: 5.57A Ta:25℃	I =1.467A/ 230VAC I =1.25A/ 277VAC I =2.663A/ 115VAC
4	LEAKAGE CURRENT	EN61230-1 < 0.75mA / 277VAC	I/P: 277 VAC O/P:Min LOAD Ta:25℃	L-FG:0.286 mA N-FG: 0.315mA
5	POWER FACTOR(TYP)	0.95/230VAC LEDMAX 0.92/277 VAC LEDMAX 0.98/115 VAC LEDMAX	I/P: 115VAC/230VAC/277VAC O/P:LEDmax CP: 5.57A Ta:25℃	PF=0.98 /230V/100%LOAD PF=0.949/277V/100%LOAD PF=0.995/115V/100%LOAD
	P.F vs LOAD			
6	EFFICIENCY (TYP)	92.5%	I/P: 230VAC O/P:LEDmax CP: 5.57A Ta:25℃	94.49%
	EFFICIENCY vs LOAD			

7	INRUSH CURRENT (TYP)	230V/ 45A COLD START (twidth=1200 usmeasured at 50% Ipeak) COLD START	I/P: 230VAC O/P:LEDmax CP 5.57 A Ta:25℃	I =35.6A /230VAC T50= 725.7 μ S
	INPUT=230VAC/ 60HZ @ LEDMAX CH2 : AC Input Voltage CH1 : Input current  			
8	TOTAL HARMONIC DISTORTION	THD< 10% @ 230VAC> 50% loading THD< 10% @ 115VAC> 50% loading THD< 15% @ 277VAC> 75% loading	I/P： 277/230/115VAC O/P：75%/50% LOAD CP :5.57A Ta：25℃	THD：7.71 %230V 50% THD：6.47 %115V50% THD：10.65 %277V 75%
	THD vs LOAD  			

ROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	V1: 63V~78V	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P:MIN LOAD Ta:25℃	69.9V / 305VAC 69.6V/ 230VAC 70.2V/ 100VAC PROTECTION TYPE : Shut down output voltage, re-power on to recovery

2	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 305 VAC I/P: 100 VAC O/P:LEDmax CP: 5.57A & 7.42A Ta:25℃	O.T.P. Active PROTECTION TYPE : Tcase>85 ℃ ± 5 ℃ ,derate power automatically
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 305VAC I/P: 100 VAC O/P: LEDMAX CP: 5.57A & 7.42A Ta:25℃	CP:5.57 A NO DAMAGE PROTECTION TYPE : Hiccup mode or Constant current limiting, recovers automatically after fault condition is removed CP: 7.42A NO DAMAGE PROTECTION TYPE : Hiccup mode or Constant current limiting, recovers automatically after fault condition is removed

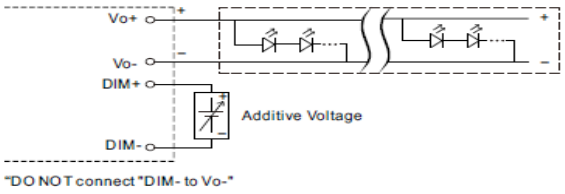
DIMMING OPERATION TEST

1 DIMMING OPERATION (forAB-Type)

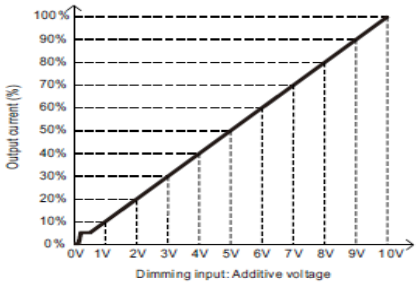
※ **3 in 1 dimming function (for AB-Type)**

- 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: 100 μA (typ.)

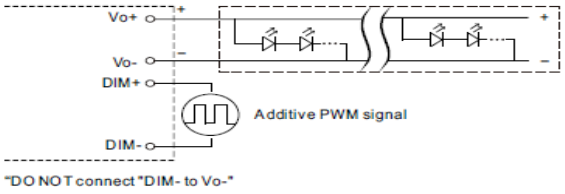
◎ Applying additive 0 ~ 10VDC



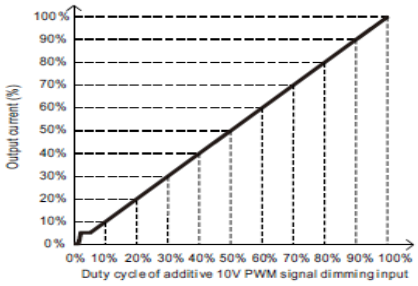
"DO NOT connect "DIM- to Vo-"



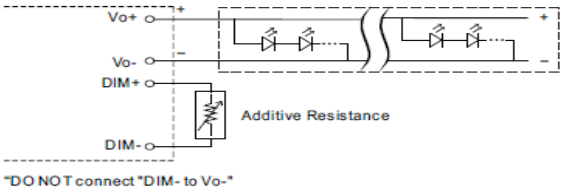
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



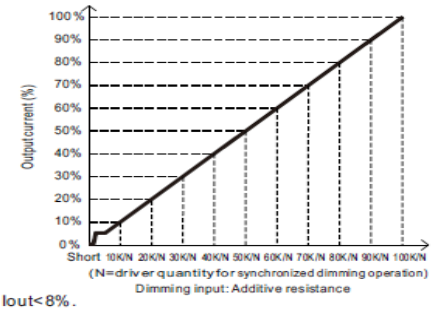
"DO NOT connect "DIM- to Vo-"



◎ 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 0Ωor 0Vdc, or 10V PWM signal with 0% duty cycle.
3. When PWM frequency >2K HZ ,the lighting will be triggered at 10~15% PWM duty .

I/P： 230 VAC O/P：DIMMING TEST

	V	Short	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
1	Output Current	0.00000A	0.786A	1.265A	1.762A	2.266A	2.783A	3.312A	3.852A	4.403A	4.972A	5.563A	5.563A
	%	0.00%	14.10%	22.71%	31.64%	40.69%	49.97%	59.46%	69.15%	79.05%	89.26%	99.87%	99.87%
2	PWM	0V	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current（100Hz）	0.00000A	0.866A	1.353A	1.860A	2.379A	2.909A	3.455A	4.006A	4.572A	5.195A	5.563A	5.564A
	%	0.00%	15.55%	24.29%	33.40%	42.71%	52.23%	62.03%	71.93%	82.08%	93.27%	99.87%	99.90%
	Output Current（3KHz）	0.00000A	0.782A	1.271A	1.777A	2.293A	2.819A	3.360A	3.911A	4.472A	5.062A	5.565A	5.563A
	%	0.00%	14.04%	22.82%	31.91%	41.17%	50.61%	60.33%	70.22%	80.29%	90.89%	99.91%	99.88%
3	R	0%	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current	0.00000A	0.861A	1.348A	1.863A	2.387A	2.921A	3.465A	4.018A	4.585A	5.209A	5.566A	5.562A
	%	0.00%	15.46%	24.20%	33.44%	42.86%	52.44%	62.21%	72.13%	82.32%	93.52%	99.92%	99.86%

TEST RESULT：OK

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) **Peak Voltage**	Q8 Rated 13 A/ 600V	I/P:High-Line +3V =308v AC ON/OFF **CP:** 5.57A & 7.42A VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short I/P:Low-Line -3V = 97V VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short Ta:25℃	308V **CP: 5.57A** Q8 VDS: (1) 476V (2) 448V (3) 464V (4) 436V (5) 480V **CP: 7.42A** **VDS:** (1) 496V (2) 452V (3) 504V (4) 456V (5) 496V 97V **CP:5.57 A** Q8 VDS: (1) 452V (2) 448V (3) 440V (4) 431V (5) 440V **CP: 7.42A** VDS: (1) 464V (2) 456V (3) 472V (4) 456V (5) 504V
2	P.F.C Transistor (D to S) or (C to E) **Peak Voltage**	Q1 Rated 20 A/ 600V	I/P:High-Line +3V =308v AC ON/OFF **CP:** 5.57A VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short	 **CP: 5.57A** Q1 VDS: (1) 484V (2) 464V (3) 460V (4) 448V (5) 476V

			I/P:Low-Line -3V = 97V VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short Ta:25℃	Q1 VDS: (1) 468V (2) 468V (3) 468V (4) 464V (5) 472V
3	P.F.C DIODE	D5 Rated 9 A/ 600 V	I/P:High-Line +3V =308v AC ON/OFF **CP: 5.57A** VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short I/P:Low-Line -3V = 97V O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short Ta:25℃	 (1) 491V (2) 443V (3) 475V (4)455V (5)467V (1)463 V (2) 459V (3) 463V (4)443V (5)463V
4	Diode Peak **Voltage**	Q100 Rated: 80A/150V	I/P:High-Line +3V =308v AC ON/OFF **CP:** 5.57A & 7.42A VDS: O/P: (1)LEDmax (2) LEDmax continue (3) Output Short Ta:25℃	 **CP: 5.57A** Q100 VDS: (1) 117.1V (2) 114.7V (3) 15.5V **CP: 7.42A** Q100 VDS: (1) 99.1V (2) 93.4V (3) 17.1V
5	**Input Capacitor Voltage**	C5 Rated: 180:μ /450 V	I/P:High-Line +3V =308v AC ON/OFF **CP: 5.57A** VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue Ta:25℃	 (1) 451V (2)435 V (3) 447V (4) 431V

6	**Control IC Voltage Test**	PWM IC U2 Rated 8.9 V~ 15.5V PFC IC U1 Rated 11.85V~ 20V O/P IC U101 Rated 8V~ 24V	I/P:High-Line +3V =308v AC ON/OFF **CP:** 5.57A VDS: O/P: (1)LEDmax (2) LEDmin (3) Output Short (4) NO LOAD VRmin.LOW LINE Ta:25℃	**U1&U2** (1) 14.1V14 (2) 13.84V15 (3) 13.68V16 (4) 14.16V U101 (1) 10.8V (2) 10.7V (3) 10.7V (4) 10.8V
7	VCC Diode Peak Voltage	D304 Rated 400 V2 A D401 Rated 400 V2 A	AC ON/OFF I/P：High-Line +3V = 308 V O/P：(1) Full load (2) Full load continue Ta：25℃	D304 D401 (1) 143V (1) 127V (2) 139V (2) 123V
8	TOP SWITCHING STAND BY POWER	U300 Rated 1.5A/ 700V	AC ON/OFF **CP: 5.57A** I/P:High-Line +3V =308 V O/P: (1)LEDmax (2) LEDmin I/P:Low-Line -3V =97 V O/P: (1)LEDmax (2) LEDmin Ta:25℃	**CP: 5.57A** (1) 528V (2) 520V (1) 512V (2) 516V

■ 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 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℃	I/P-O/P:2.969 mA I/P-FG:2.588 mA O/P-FG: 2.082mA 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:9999 M Ω O/P-FG: 9999M Ω NO DAMAGE

3	GROUNDING CONTINUITY	EN61230-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	13mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P: 230VAC/50HZ O/P: LEDmax Ta:25℃	PASS
2	CONDUCTION	EN 55015	I/P:230VAC (50HZ) O/P: LEDmax Ta:25℃	PASS Test by certified Lab
3	RADIATION	EN 55015	I/P: 230VAC (50HZ) O/P:LEDmax Ta:25℃	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 AIR：8KV / Contact：4KV	I/P: 230VAC (50HZ) O/P:LEDmax Ta:25℃	CRITERIA A
5	E.F.T	EN61000-4-4 INPUT: 2KV	I/P: 230VAC (50HZ) O/P:LEDmax Ta:25℃	CRITERIA A
6	SURGE	IEC61000-4-5 L-N :4KV L,N-PE:6KV	I/P: 230VAC (50HZ) O/P:LEDmax Ta:25℃	CRITERIA B
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-320-H-AB
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=30.3 ℃
2. HIGH AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=47.3 ℃</td></tr>
<tr><td colspan="5">
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=30.3℃</th><th>HIGH AMBIENT Ta=47.3℃</th></tr>
<tr><td>1</td><td>LF1</td><td>63.2℃</td><td>76.3℃</td></tr>
<tr><td>2</td><td>BD1</td><td>71.8℃</td><td>83.9℃</td></tr>
<tr><td>3</td><td>Q1</td><td>69.6℃</td><td>81.6℃</td></tr>
<tr><td>4</td><td>L2</td><td>73.1℃</td><td>84.7℃</td></tr>
<tr><td>5</td><td>Q2</td><td>70.4℃</td><td>81.9℃</td></tr>
<tr><td>6</td><td>D5</td><td>72.5℃</td><td>84.7℃</td></tr>
<tr><td>7</td><td>C5</td><td>65.0℃</td><td>77.2℃</td></tr>
<tr><td>8</td><td>R15</td><td>67.3℃</td><td>79.7℃</td></tr>
<tr><td>9</td><td>RY1</td><td>69.5℃</td><td>81.5℃</td></tr>
<tr><td>10</td><td>RTH1</td><td>70.8℃</td><td>82.6℃</td></tr>
<tr><td>11</td><td>C16</td><td>72.4℃</td><td>84.1℃</td></tr>
<tr><td>12</td><td>U1</td><td>63.4℃</td><td>76.1℃</td></tr>
<tr><td>13</td><td>U2</td><td>65.3℃</td><td>78.1℃</td></tr>
<tr><td>14</td><td>Q7</td><td>75.6℃</td><td>86.7℃</td></tr>
<tr><td>15</td><td>Q8</td><td>75.3℃</td><td>86.4℃</td></tr>
<tr><td>16</td><td>C88</td><td>70.1℃</td><td>81.6℃</td></tr>
<tr><td>17</td><td>T1</td><td>79.4℃</td><td>90.6℃</td></tr>
<tr><td>18</td><td>C142</td><td>64.3℃</td><td>76.5℃</td></tr>
<tr><td>19</td><td>Q100</td><td>64.6℃</td><td>78.3℃</td></tr>
<tr><td>20</td><td>Q101</td><td>63.9℃</td><td>77.6℃</td></tr>
<tr><td>21</td><td>C104</td><td>65.4℃</td><td>77.6℃</td></tr>
<tr><td>22</td><td>C105</td><td>62.3℃</td><td>75.6℃</td></tr>
<tr><td>23</td><td>U101</td><td>65.4℃</td><td>78.8℃</td></tr>
<tr><td>24</td><td>J101</td><td>63.2℃</td><td>78.1℃</td></tr>
<tr><td>25</td><td>OTP1</td><td>63.2℃</td><td>76.1℃</td></tr>
<tr><td>26</td><td>RTH2</td><td>63.1℃</td><td>75.9℃</td></tr>
<tr><td>27</td><td>TC</td><td>59.8℃</td><td>73.4℃</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/100VAC
O/P： 100%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 45 ℃
NO DAMAGE</td><td>I/P： 315 VAC
O/P：FULL LOAD
Ta=45 ℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td></tr>
</table>

4	TEMPERATURE COEFFICIENT	± 0.03 %/(0℃~60℃)	I/P： 230 VAC O/P：FULL LOAD	± 0.0087 %/℃(0~60℃)
5	STORAGE TEMPERATURE TEST	-40~85℃	1. Thermal shock Temperature： -45℃~ +90℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：10CYCLE 5. Input/Output condition： STATIC TEST：OK	
6	THERMAL SHOCK TEST	-40~45℃	1. Thermal shock Temperature： -45℃~ +50℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：16 CYCLE 5. Input/Output condition： 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test TEST：OK	
7	VIBRATION TEST	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform： Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：12min/sweep cycle (4) Acceleration：6G (5) Test Time：180min in each axis (X.Y.Z) (6) Ta：25℃	
8	CAPACITOR LIFE CYCLE	SUPPOSE C104 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Tc=70 ℃ LIFE TIME (2) I/P： 230VAC O/P：75% LOAD Tc=70 ℃ LIFE TIME (3) I/P： 230VAC O/P：50% LOAD Tc= 70 ℃ LIFE TIME		(1) 60311HRS (2) 58855HRS (3) 65054HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 1476.4K hrs min. Telcordia SR-332 (Bellcore)； 168.1K 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/HUANGMK	WENF	LINKX