Test Report: XLG-100-12

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

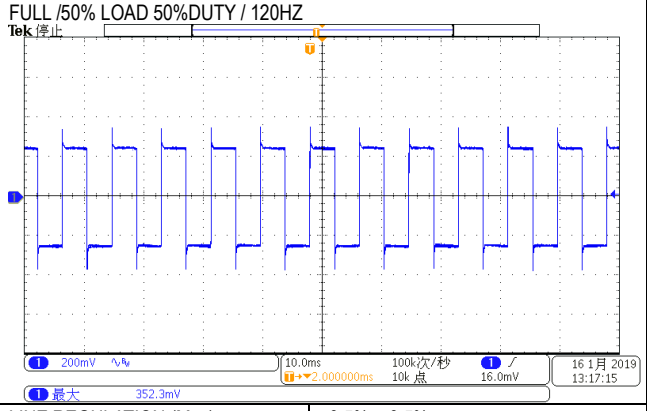
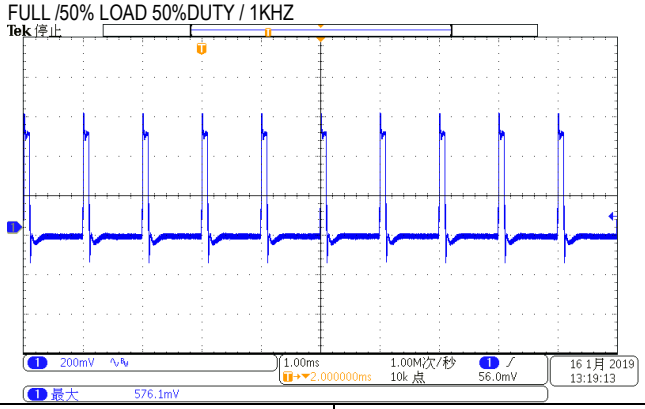
Safety Test
E.M.C. Test

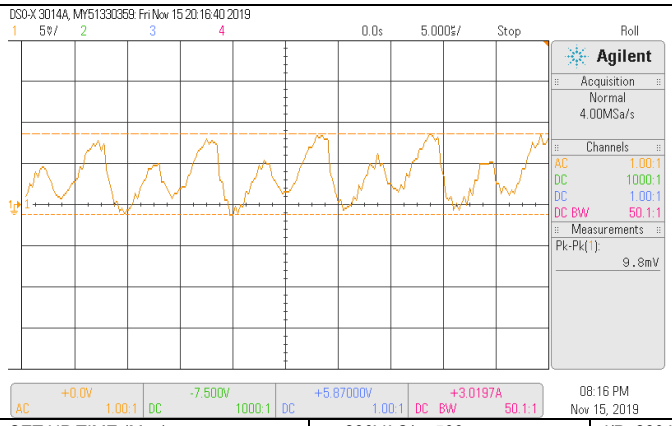
■ RELIABILITY TEST

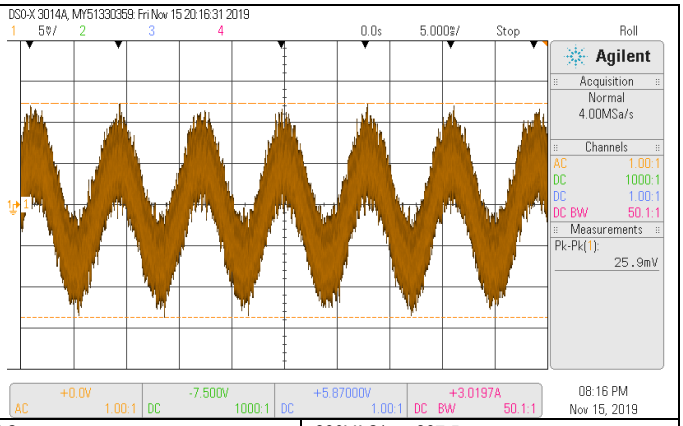
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

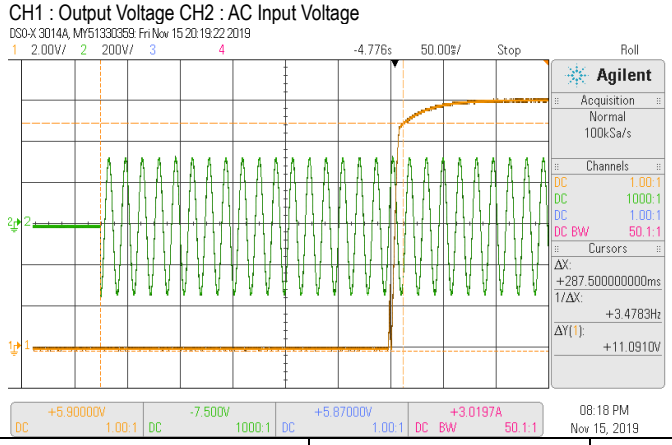
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	8.4 V~ 12V	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	0.9V~ 12V /230VAC
2	CURRENT ADJ. RANGE	4A~ 8A	I/P: 230 VAC I/P:115VAC O/P:CV MIN & CV MAX-1V Ta:25℃	2.976A~9.269A /230VAC@CV MAX-1V 2.978A~9.27 A /230VAC@CV MIN 2.976A~9.268A /115VAC@CV MAX-1V 2.979A~ 9.272A/115VAC@CV MIN
3	OUTPUT VOLTAGE TOLERANCE (Max)	-3 % ~ 3%	I/P:100VAC –305VAC O/P:MIN LOAD—FULL LOAD Ta: 25℃	-0.458 %~ 0.458 %
4	DYNAMIC LOAD	V1：1200 mVp-p	I/P： 230VAC O/P： (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta：25℃	 (1) 352mVp-p (2) 576mVp-p
	FULL /50% LOAD 50%DUTY / 120HZ 		FULL /50% LOAD 50%DUTY / 1KHZ 	
5	LINE REGULATION (Max)	-0.5% ~ 0.5%	I/P:110VAC~305AC O/P:FULL LOAD Ta:25℃	-0.082%~ 0 %
6	LOAD REGULATION (Max)	-2% ~ 2%	I/P: 230 VAC O/P: MIN / HALF/ FULL LOAD Ta:25℃	-0.33 %~ 0.33 %
7	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P: FULL LOAD/Min LOAD Ta:25℃	< 5 %
8	RIPPLE & NOISE (Max)	150mVp-p	I/P: 230 VAC O/P: MIN LOAD—FULL LOAD Ta:25℃	25.9mVp-p / 100% load
	high frequency：		low frequency：	



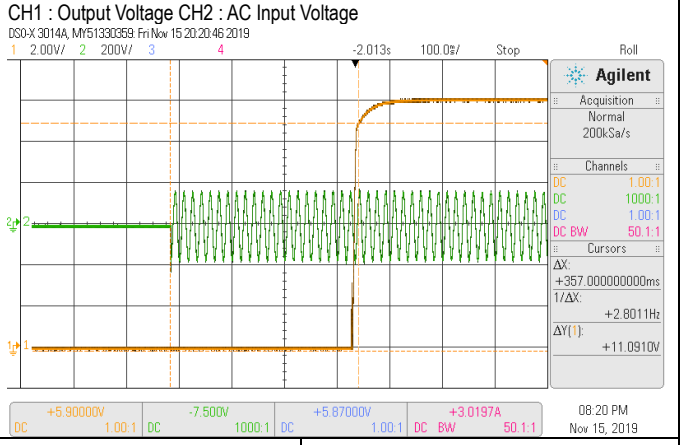


9	SET UP TIME (Max)	230VAC/ 500ms 115VAC/ 1200ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 287.5 ms 115 VAC/ 357 ms

INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

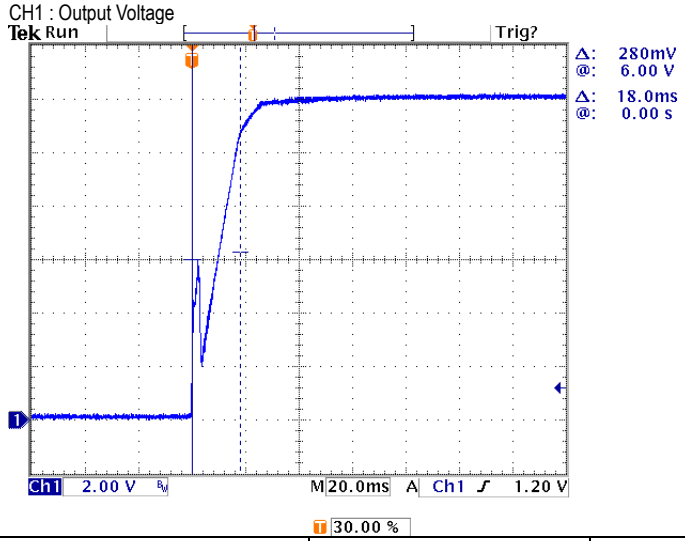


INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

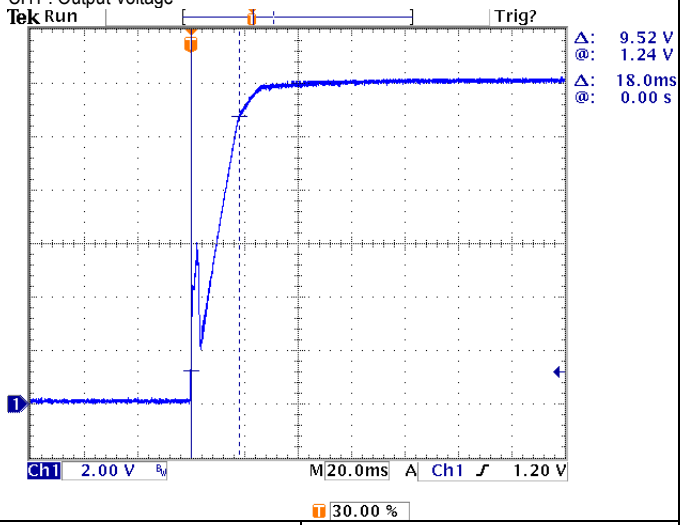


10	RISE TIME (Max)	230VAC/ 100ms 115VAC/ 100ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 18 ms 115 VAC/ 18 ms

INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage

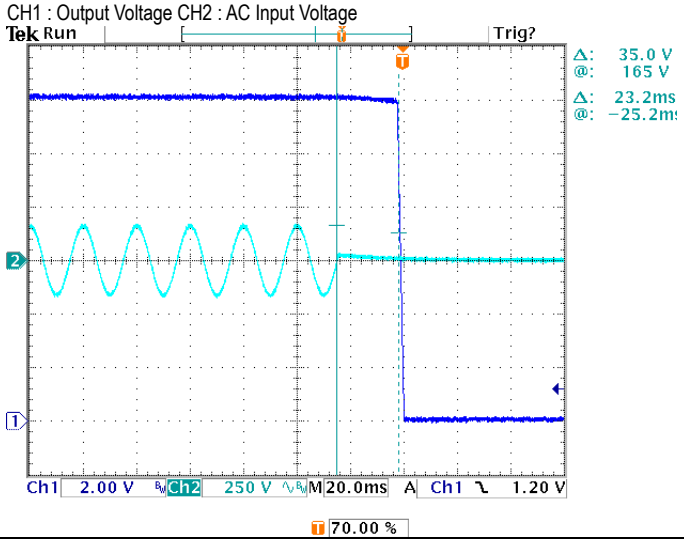


INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage

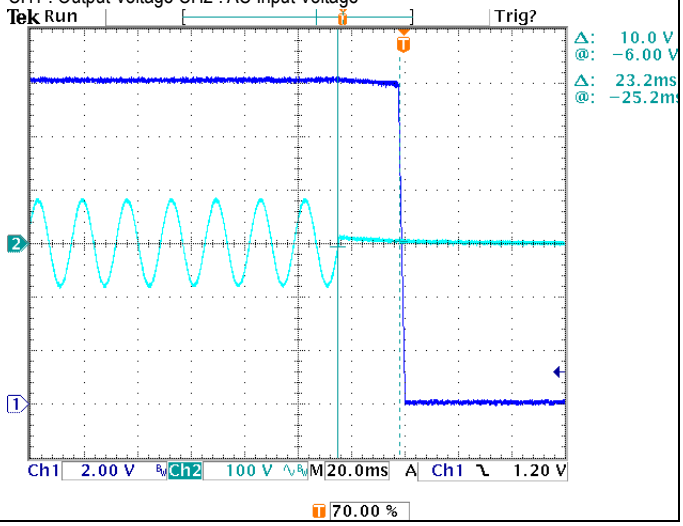


11	HOLD UP TIME (Typ.)	230VAC/12ms 115VAC/12ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃ 使用 **CCH MODE TEST**	230VAC/23.2 ms 115 VAC/23.2 ms

INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

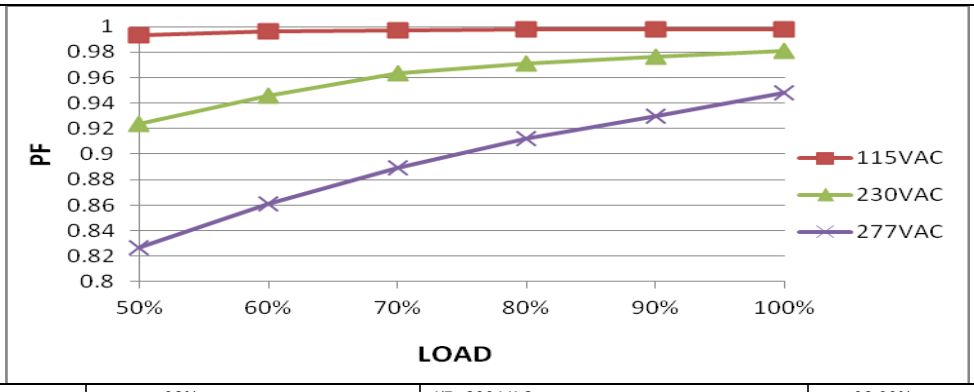


INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage



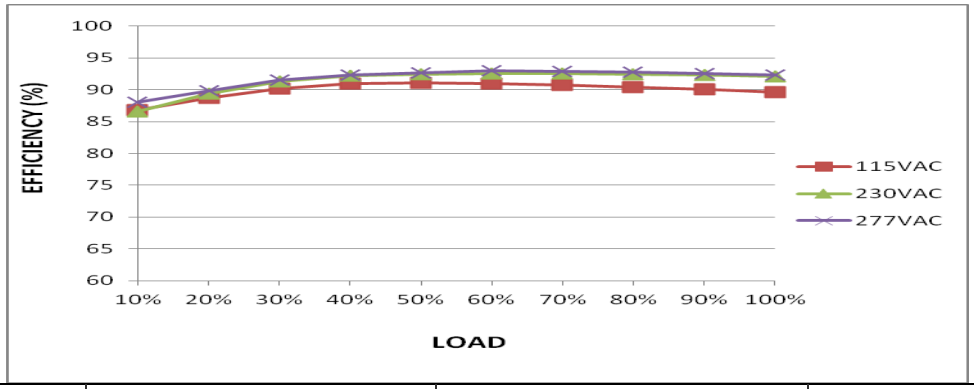
INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	71V~308 V
			I/P: LOW-LINE-3VAC=97 VAC HIGH-LINE+10VAC=315 VAC O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST:OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 100VAC~305VAC O/P:FULL~MIN LOAD Ta:25℃	OK
3	INPUT CURRENT (TYP)	277VAC/ 0.42 A 230 VAC/ 0.5 A 115 VAC/ 1.1 A	I/P: 277VAC/230 VAC/115 VAC O/P:FULL LOAD Ta:25℃	I= 0.37A/277VAC I =0.44A/ 230VAC I =0.89A/ 115VAC
4	LEAKAGE CURRENT	<0.75mA/277AC	I/P ： 277 VAC O/P ：MIN LOAD Ta ：25℃	L-FG: 0.17mA N-FG: 0.17mA
5	NO LOAD CONSUMPTION	<0.5W	I/P ：115VAC I/P ：230VAC O/P ：NO LOAD Ta ：25℃	< 0.277W < 0.325W
6	POWER FACTOR(TYP)	0.92/277 VAC FULL LOAD 0.95/230 VAC FULL LOAD 0.97/115 VAC FULL LOAD	I/P: 230 VAC/115VAC/277VAC O/P:FULL LOAD Ta:25℃	PF=0.948 /277V/100%LOAD PF= 0.981/230V/100%LOAD PF= 0.998/115V/100%LOAD
	P.F vs LOAD			



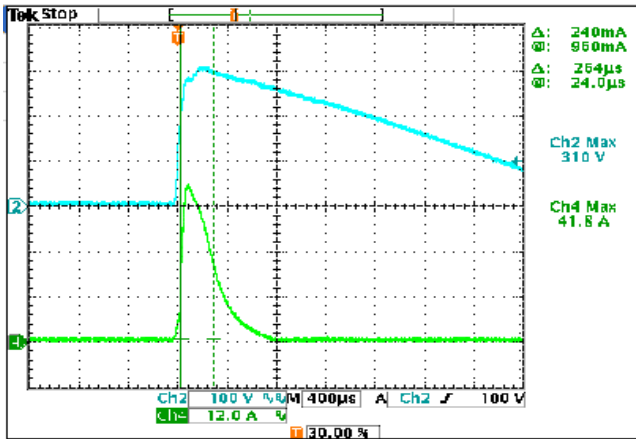
7	EFFICIENCY (TYP)	92%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	92.09%

EFFICIENCY vs LOAD



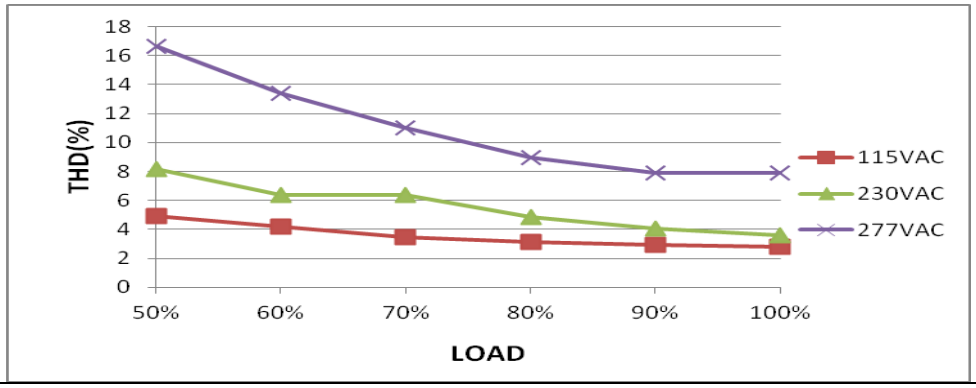
8	INRUSH CURRENT (TYP)	230 V/ 50A COLD START (twidth=300us measured at 50% Ipeak) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	I =41.8A/ 230VAC T50=264us

INPUT=230VAC/50HZ @ FULL LOAD
CH2 : AC Input Voltage CH4 : Input current (1V=1A)



9	TOTAL HARMONIC DISTORTION	THD<10%(@load≧50% /115VC,230VAC; @load≧75% /277VAC)	I/P： 115VAC I/P： 230VAC O/P：50% LOAD Ta：25℃	THD:4.94% THD: 8.17%
			I/P： 277VAC O/P：75% LOAD Ta：25℃	THD: 9.43%

THD&LOAD



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER CURRENT PROTECTION	95%~ 108%	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P:TESTING Ta:25℃	100.11%/ 305VAC 100.11%/ 230VAC 100.21%/100VAC PROTECTION TYPE： Hiccup mode or Constant current limiting,recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	13.5V~ 18V	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P:MIN LOAD Ta:25℃	14.37V/ 305VAC 14.42V/ 230VAC 14.46V/ 100VAC PROTECTION TYPE： Shut down output voltage, re-power on to recover
3	OVERTEMPERATURE PROTECTION	NO DAMAGE	I/P: 305 VAC I/P: 110 VAC O/P:FULL LOAD	O.T.P Active PROTECTION TYPE： Shut down output voltage, re-power on to recover
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE PROTECTION TYPE：	I/P: 305VAC I/P: 100 VAC O/P: FULL LOAD Ta:25℃	NO DAMAGE PROTECTION TYPE： Hiccup mode or Constant current limiting,recovers automatically after fault condition is removed
5	INPUT OVER VOLTAGE (for XLG-100I 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 7.5A /600V	AC ON/OFF I/P:High-Line +3V =308V I/P:Low-Line -3V = 97V	Q3 308VAC 97VAC (1)445V (1)449V (2)449V (2)457V

			VDS: O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. (8)No load (9)LED MODE max (10)LED MODE min Ta:25℃	(3)449V (3)441 V (4)445V (4) 445V (5)449V (5) 445V (6)449V (6) 441V (7)453V (7) 453V (8)473V (8)429 V (9)429V (9) 437V (10)433V (10)433 V
2	PFC DIODE	D5 Rated: 9A/600V	I/P:High-Line +3V =308 V O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz Ta:25℃	D5 308VAC VDS/ID (1)436V (2)436V (3) 448V (4) 444V
3	Diode Peak Voltage	Q100 Rated : 70A/40V	AC ON/OFF I/P:High-Line +3V =308 V O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (5).NO LOAD Ta:25℃	Q100: VDS: (1) 23.9V (2)10.7 V (3)28.2 V (4) 28.2V (5)26.3V (6) 26.7V
4	Control IC Voltage Test	PWM IC U2 Rated 30V	I/P:High-Line +3VAC=308V AC ON/OFF O/P: (1)Full Load Input On/Off (2) Output Short (3)O.L.P (4)O.V.P. (5) Low Line No Load Vo(min) (6) CV MAX =11V (7) CV MIN =8.4V Ta:25℃	U1 (1) 25.5V (2) 25.5V (3) 25.5V (4) 25.5V (5) 16.9V (6) 25.5V (7) 25.5V
5	PFC Transistor	Q1 Rated 700V/12.5A	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	 (1) 475 V (2) 470 V (3) 474 V
6	Input Capacitor Voltage	C5 Rated： 47 μf 450 V	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)446V (2)439V (3)445V (4)439V

SAFETY & EMC TEST REPORT

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	IEC60950-1 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: 4.2 KVAC/min I/P-FG: 2.4KVAC/min O/P-FG: 1.8 KVAC/min Ta:25℃	I/P-O/P: 3.87 mA I/P-FG: 3.28mA O/P-FG:3.34 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℃	I/P-O/P: 30 GΩ I/P-FG: 30 GΩ O/P-FG: 30 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	IEC60950-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	27 mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P：230 VAC/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,N-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-100-12A
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=60.0℃
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=25.0 ℃</th><th>HIGH AMBIENT Ta=60.0 ℃</th></tr>
<tr><td>1</td><td>BD1</td><td>56.8℃</td><td>85.6℃</td></tr>
<tr><td>2</td><td>ZNR4</td><td>56.1℃</td><td>84.5℃</td></tr>
<tr><td>3</td><td>ZNR1</td><td>52.1℃</td><td>80.8℃</td></tr>
<tr><td>4</td><td>D1</td><td>51.5℃</td><td>80.1℃</td></tr>
<tr><td>5</td><td>LF2</td><td>55.6℃</td><td>83.8℃</td></tr>
<tr><td>6</td><td>Q1</td><td>60.2℃</td><td>89.4℃</td></tr>
<tr><td>7</td><td>C5</td><td>60.0℃</td><td>88.5℃</td></tr>
<tr><td>8</td><td>T1(core)</td><td>89.4℃</td><td>120.4℃</td></tr>
<tr><td>9</td><td>T1(wire)</td><td>71.9℃</td><td>101.2℃</td></tr>
<tr><td>10</td><td>L2</td><td>61.1℃</td><td>90.9℃</td></tr>
<tr><td>11</td><td>C13</td><td>61.7℃</td><td>90.6℃</td></tr>
<tr><td>12</td><td>C105</td><td>62.9℃</td><td>92.7℃</td></tr>
<tr><td>13</td><td>C106</td><td>60.6℃</td><td>90.4℃</td></tr>
<tr><td>14</td><td>Q101</td><td>67.0℃</td><td>97.2℃</td></tr>
<tr><td>15</td><td>LF100</td><td>59.0℃</td><td>89.1℃</td></tr>
<tr><td>16</td><td>Q3</td><td>65.2℃</td><td>95.1℃</td></tr>
<tr><td>17</td><td>D5</td><td>57.0℃</td><td>87.0℃</td></tr>
<tr><td>18</td><td>Q2</td><td>58.2℃</td><td>89.3℃</td></tr>
<tr><td>19</td><td>J101</td><td>60.7℃</td><td>92.3℃</td></tr>
<tr><td>20</td><td>RTH3</td><td>55.8℃</td><td>84.9℃</td></tr>
<tr><td>21</td><td>TC</td><td>52.9℃</td><td>82.8℃</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 60℃
NO DAMAGE</td><td>I/P： 305VAC
O/P：FULL LOAD
Ta=60℃
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>±0.013 %/℃(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>
</table>

6	THERMAL SHOCK TEST	-40~+60℃	1. Thermal shock Temperature： -45℃~ +65℃ 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
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：12min/sweep cycle (4) Acceleration：6G (5) Test Time：72min in each axis (X.Y.Z) (6) Ta：25℃ TEST：OK
8	CAPACITOR LIFE CYCLE	XLG-100-12：SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Tc= 80 ℃ LIFE TIME (2) I/P： 230VAC O/P：75% LOAD Tc= 80 ℃ LIFE TIME (3) I/P： 230VAC O/P：50% LOAD Tc= 80 ℃ LIFE TIME	(1) 113771 HRS (2) 149979 HRS (3) 209426 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 2782.6K hrs min. Telcordia SR-332 (Bellcore)； 276.4K 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