Test Report: XLG-200-12

200W 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

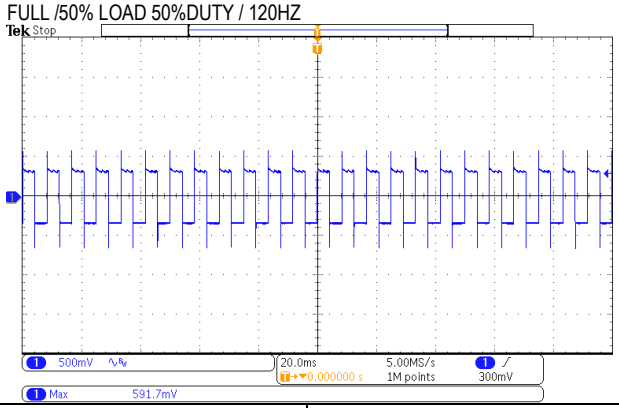
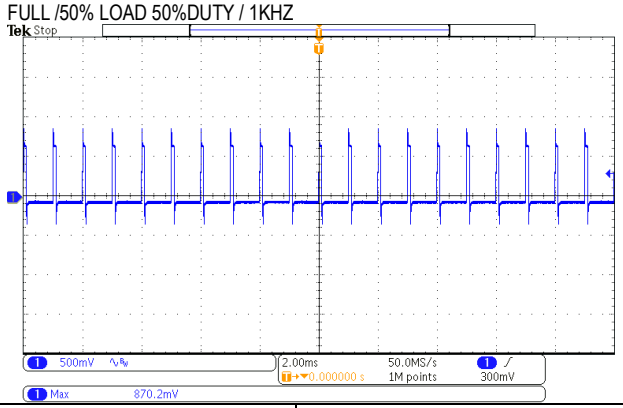
Safety Test
E.M.C. Test

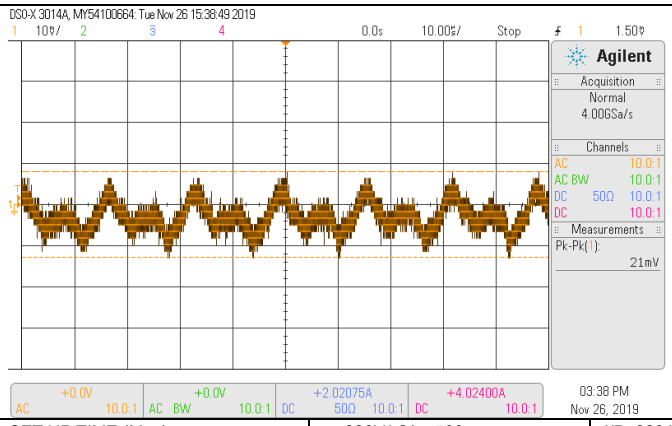
■ RELIABILITY TEST

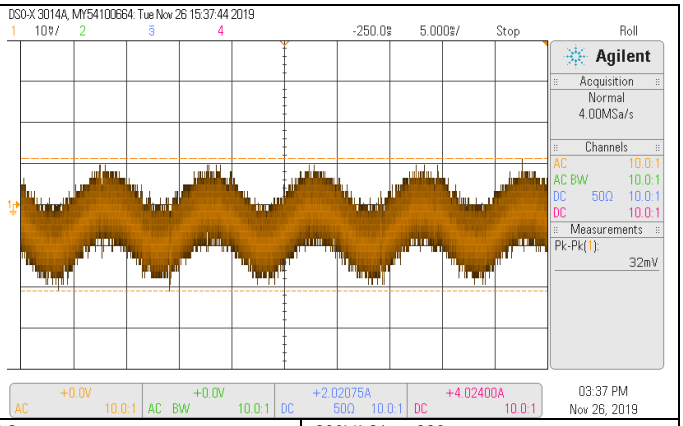
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

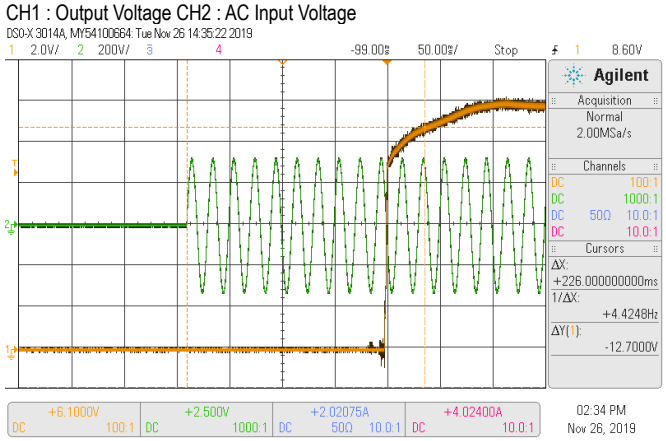
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	8.4 V~ 12V	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	1.94V~ 11.5 V /230VAC
2	CURRENT ADJ. RANGE	8A~ 16A	I/P: 230 VAC I/P:115VAC O/P:CV MIN & CV MAX-1V Ta:25℃	6.240A~16.954A /230VAC@CV MAX-1V 6.249A~ 16.956 A /230VAC@CV MIN 6.240A~ 16.953A/115VAC@CV MAX-1V 6.248A~ 16.954 A/115VAC@CV MIN
3	OUTPUT VOLTAGE TOLERANCE (Max)	-3 % ~ 3%	I/P:100VAC –305VAC O/P:MIN LOAD—FULL LOAD Ta: 25℃	-0.5%~0.5 %
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) 591.7mVp-p (2) 870.2mVp-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 %~ 0 %
6	LOAD REGULATION (Max)	-2% ~ 2%	I/P: 230 VAC O/P: MIN / HALF/ FULL LOAD Ta:25℃	0.497 %~ 0.414%
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:FULL LOAD Ta:25℃	32 mVp-p / 100% load
	high frequency：		low frequency：	



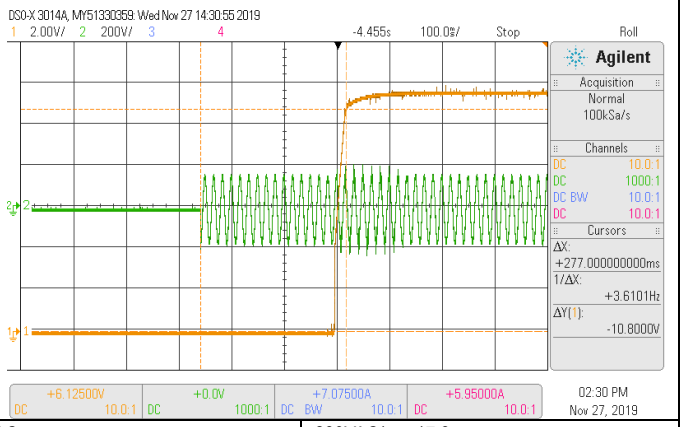


9	SET UP TIME (Max)	230VAC/ 500ms 115VAC/ 1200ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 226 ms 115 VAC/ 277 ms

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

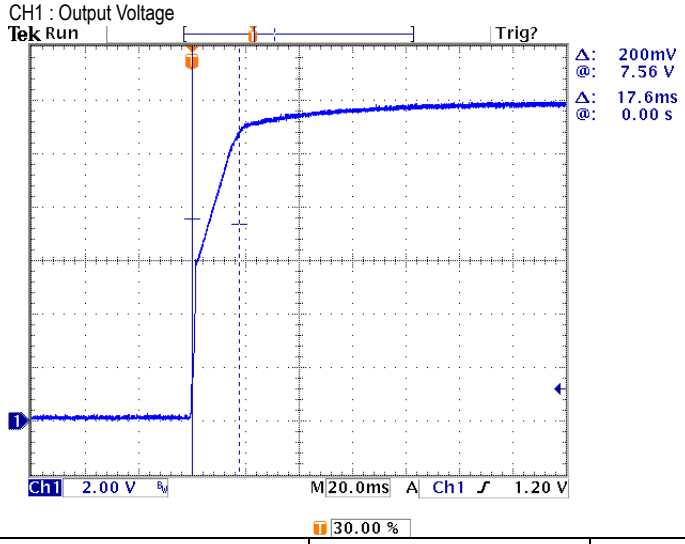


INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

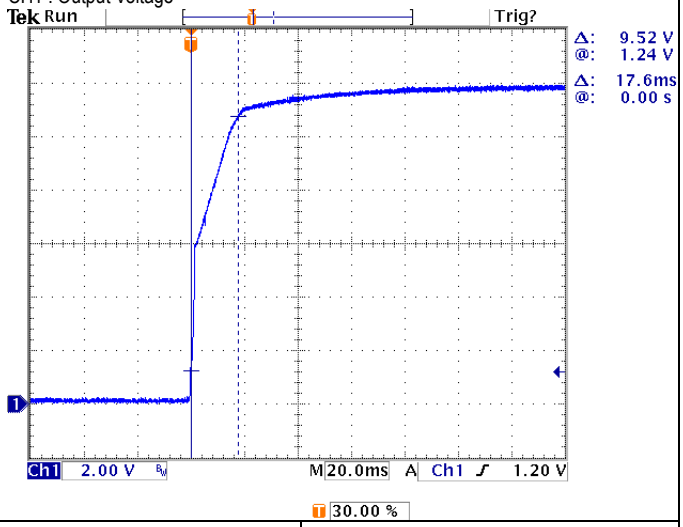


10	RISE TIME (Max)	230VAC/ 100ms 115VAC/ 100ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 17.6 ms 115 VAC/ 17.6 ms

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

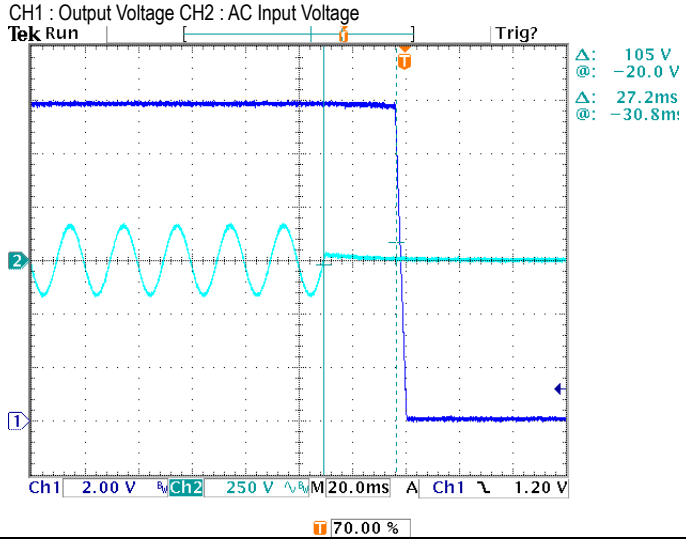


INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage

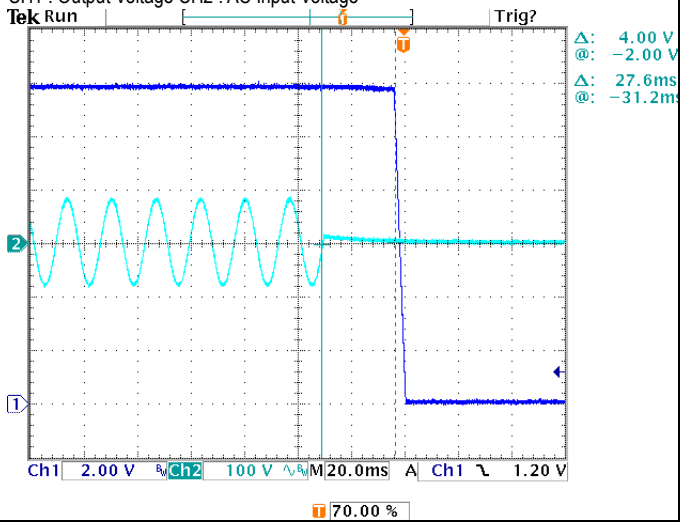


11	HOLD UP TIME (Typ.)	230VAC/ 10ms 115VAC/ 10ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 27.2 ms 115 VAC/ 27.6 ms

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

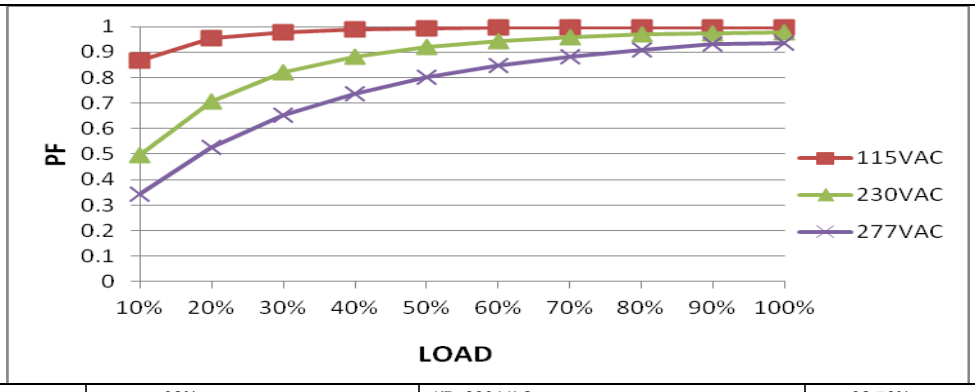


INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage



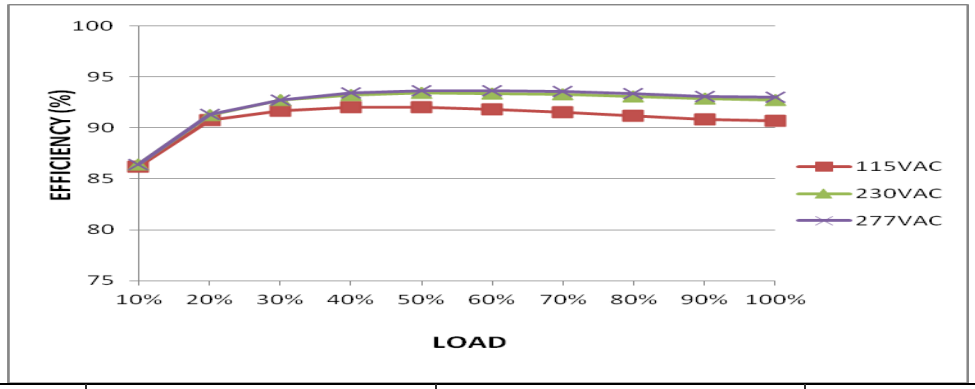
INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	70V~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/ 0.9 A 230 VAC/ 1.1 A 115 VAC/ 2.2 A	I/P: 277VAC/230 VAC/115 VAC O/P:FULL LOAD Ta:25℃ CCH MODE TEST	I=0.75 A/277VAC I =0.87 A/ 230VAC I =1.75 A/ 115VAC
4	LEAKAGE CURRENT	<0.75mA/277AC	I/P ： 277 VAC O/P ：MIN LOAD Ta ：25℃	L-FG: 0.22 mA N-FG: 0.22mA
5	NO LOAD CONSUMPTION	<0.5W	I/P ：115VAC I/P ：230VAC O/P ：NO LOAD Ta ：25℃	0.4142 W/115VAC 0.4734 W/230VAC
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℃ CCH MODE TEST	PF= 0.936 /277V/100%LOAD PF= 0.977 /230V/100%LOAD PF= 0.998 /115V/100%LOAD
	P.F vs LOAD			



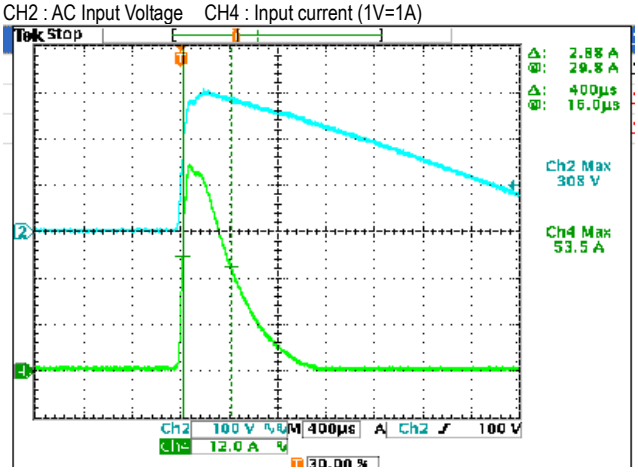
7	EFFICIENCY (TYP)	92%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	92.76%

EFFICIENCY vs LOAD



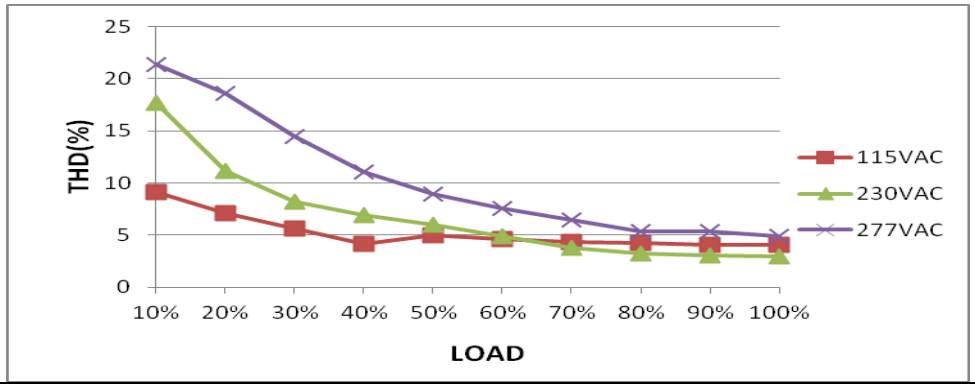
8	INRUSH CURRENT (TYP)	230 V/ 65A COLD START (twidth=550us measured at 50% Ipeak) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	I = 53.5 A/ 230VAC T50= 400 us

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： 230VAC I/P： 115VAC O/P：50% LOAD Ta：25℃	THD: 6.01% %230V 50% THD:5.03 % %115V 50%
			I/P： 277VAC O/P：75% LOAD Ta：25℃	THD: 5.86% %277V 75%

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: 110VAC O/P:TESTING Ta:25℃	100.6%/ 305VAC 100.6%/ 230VAC 100.6%/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℃	16V/ 305VAC 16V/ 230VAC 16V/ 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 o/p voltage, re-power on to recover
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	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-200I 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: 650V/11A	AC ON/OFF I/P:High-Line +3V =308V I/P:Low-Line -3V = 107V VDS: O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/	Q3 308VAC 107VAC (1) 432V (1)468V (2) 464V (2)488V (3) 432V (3)460 V (4) 432V (4) 460V (5) 432V (5) 460V (6) 432V (6) 452V (7) 484V (7) 476V

			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℃	(8) 432V (8) 428V (9) 432V (9) 452V (10) 432V (10) 452V
2	PFC OUTPUT DIODE PEAK VOLTAGE TEST	D1 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℃	D1 308VAC (1)448V (2)464V (3)448V (4)452V
3	Diode Peak Voltage	Q100 Rated : 100A/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 (6) burst mode Ta:25℃	Q100: (1)27.2V (2)4.36V (3)26.8V (4)26.6V (5)25.2V (6)25.4V
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 (7) CV MIN Ta:25℃	U2 (1) 25.8V (2) 25.7V (3) 25.7V (4) 25.9V (5) 16.3V (6) 25.7V (7) 25.7V
5	PFC Transistor	Q1 Rated 20A/600V	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	(1) 472 V (2) 480 V (3) 476 V
6	Input Capacitor Voltage	C5 Rated： 100 μ/ 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)441V (2)441V (3)454V (4)436V

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: 2.93 mA I/P-FG: 2.52 mA O/P-FG: 3.05mA 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℃	18mΩ

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-200-12A
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=50.0℃
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=25.0 ℃</th><th>HIGH AMBIENT Ta=50.0 ℃</th></tr>
<tr><td>1</td><td>BD1</td><td>56.7℃</td><td>81.8℃</td></tr>
<tr><td>2</td><td>ZNR1</td><td>53.8℃</td><td>78.2℃</td></tr>
<tr><td>3</td><td>LF2</td><td>56.0℃</td><td>81.1℃</td></tr>
<tr><td>4</td><td>Q1</td><td>57.5℃</td><td>83.0℃</td></tr>
<tr><td>5</td><td>C5</td><td>56.4℃</td><td>82.2℃</td></tr>
<tr><td>6</td><td>T1(core)</td><td>65.5℃</td><td>93.4℃</td></tr>
<tr><td>7</td><td>T1(wire)</td><td>70.5℃</td><td>99.2℃</td></tr>
<tr><td>8</td><td>L2</td><td>59.3℃</td><td>85.3℃</td></tr>
<tr><td>9</td><td>C13</td><td>59.8℃</td><td>86.2℃</td></tr>
<tr><td>10</td><td>C105</td><td>62.7℃</td><td>90.3℃</td></tr>
<tr><td>11</td><td>C10</td><td>57.5℃</td><td>83.1℃</td></tr>
<tr><td>12</td><td>Q100</td><td>65.6℃</td><td>91.9℃</td></tr>
<tr><td>13</td><td>U2</td><td>58.6℃</td><td>85.2℃</td></tr>
<tr><td>14</td><td>R7</td><td>60.0℃</td><td>87.8℃</td></tr>
<tr><td>15</td><td>Q3</td><td>62.4℃</td><td>89.8℃</td></tr>
<tr><td>16</td><td>D1</td><td>58.2℃</td><td>84.3℃</td></tr>
<tr><td>17</td><td>Q2</td><td>59.6℃</td><td>86.4℃</td></tr>
<tr><td>18</td><td>J102</td><td>67.8℃</td><td>96.1℃</td></tr>
<tr><td>19</td><td>RTH3</td><td>57.9℃</td><td>83.8℃</td></tr>
<tr><td>20</td><td>TC</td><td>53.1℃</td><td>79.0℃</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：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 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>±0.014 %/℃(0~60℃)</td></tr>
<tr><td>5</td><td>STORAGE TEMPERATURE TEST</td><td>-40℃~ +90℃</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~+50℃	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
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-200-12：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) 24063 HRS (2) 47321 HRS (3) 75968 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 2300.1K hrs min. Telcordia SR-332 (Bellcore)； 200.7K 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