



Test Report: XLG-240-L

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

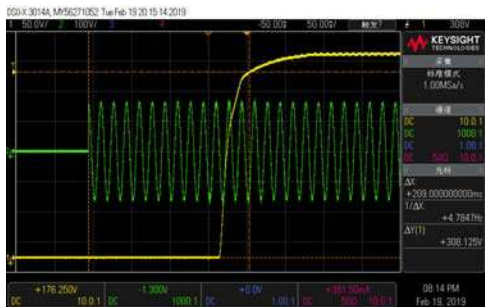
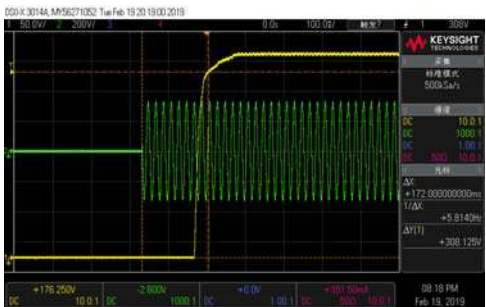
E.M.C. Test

■ RELIABILITY TEST

Environment Test

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

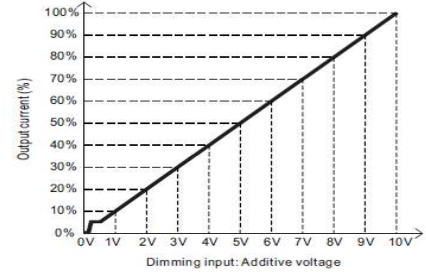
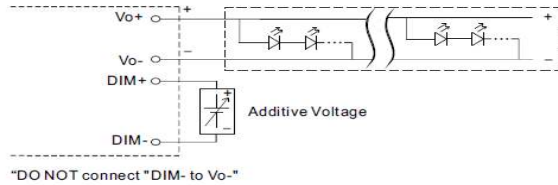
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	$\pm 4\%$	I/P: 100 VAC / 305 VAC O/P: FULL/ MIN LOAD Ta: 25°C	$< \pm 4\%$
2	CONSTANT CURRENT REGION	178V-342V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	63.9 V ~ 347.2 V
3	OPEN CIRCUIT VOLTAGE (max.)	370 V	I/P: 230 VAC O/P: NO LOAD	347.38V
4	CURRENT RIPPLE	5.0% max. @ load $\geq 50\%$ rated voltage	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	3.5%
5	CURRENT ADJ. RANGE	350 mA ~ 1050mA	I/P: 230 VAC O/P: TESTING Ta: 25°C	291mA~ 1216mA
6	CONSTANT POWER	O/P: 239.4W	I/P: 230 VAC O/P: $V_o \times I_o$	TEST: OK
7	SET UP TIME(Max)	1200ms/115VAC 500ms/230VAC	I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	209 ms /115 VAC 172 ms /230 VAC
INPUT=115VAC/50HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage  INPUT=230 VAC/50HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage 				

8 DIMMING OPERATION (for AB-Type)

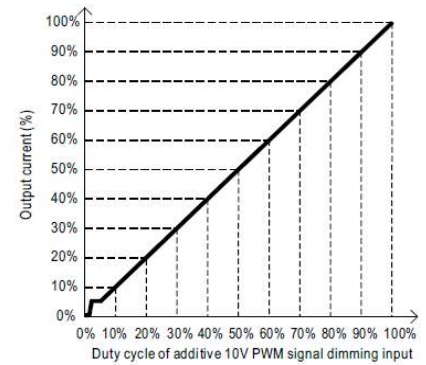
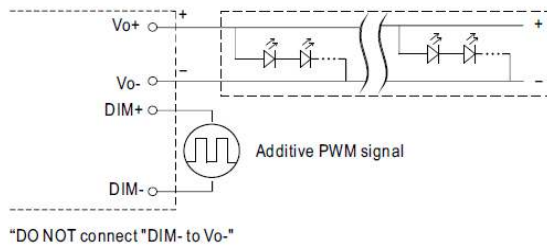
※ 3 in 1 dimming function (for AB-Type)

- 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 μ A (typ.)

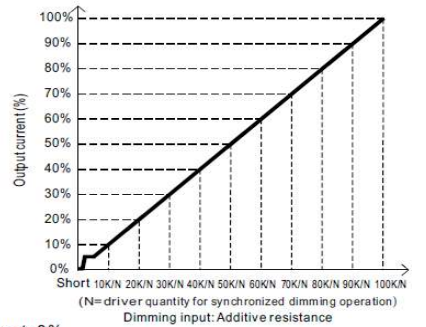
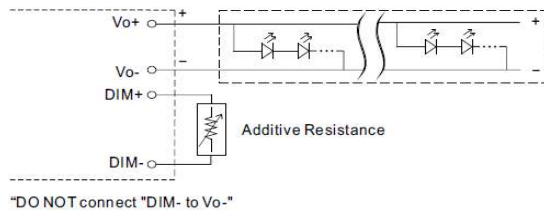
◎ Applying additive 0 ~ 10VDC



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



◎ Applying additive resistance:



- Note : 1. Min. dimming level is about 8% and the output current is not defined when $0\% < I_{out} < 8\%$.
2. The output current could drop down to 0% when dimming input is about 0k Ω or 0Vdc, or 10V PWM signal with 0% duty cycle.

I/P: 230 VAC

O/P: DIMMING TEST

Ta: 25°C

	DIMMING	Short	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
1	Output Current	0	0.068A	0.132A	0.189A	0.258A	0.333A	0.399A	0.466A	0.540A	0.615A	0.692A	0.704A
	%	0%	9.77%	18.90%	26.96%	36.80%	47.57%	56.96%	66.51%	77.07%	87.81%	98.86%	100.56%
2	PWM	0V	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0	0.071A	0.136A	0.194A	0.263A	0.333A	0.399A	0.469A	0.542A	0.615A	0.686A	0.704A
	%	0%	10.10%	19.37%	27.74%	37.59%	47.56%	56.99%	67.03%	77.44%	87.80%	98.00%	100.59%
3	R	0%	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current	0	0.070A	0.135A	0.195A	0.258A	0.333A	0.399A	0.466A	0.545A	0.619A	0.692A	0.704A
	%	0%	10.06%	19.27%	27.91%	36.84%	47.60%	57.00%	66.56%	77.91%	88.46%	98.84%	100.59%

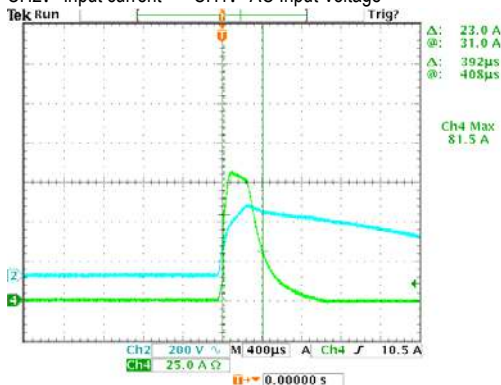
TEST RESULT: OK

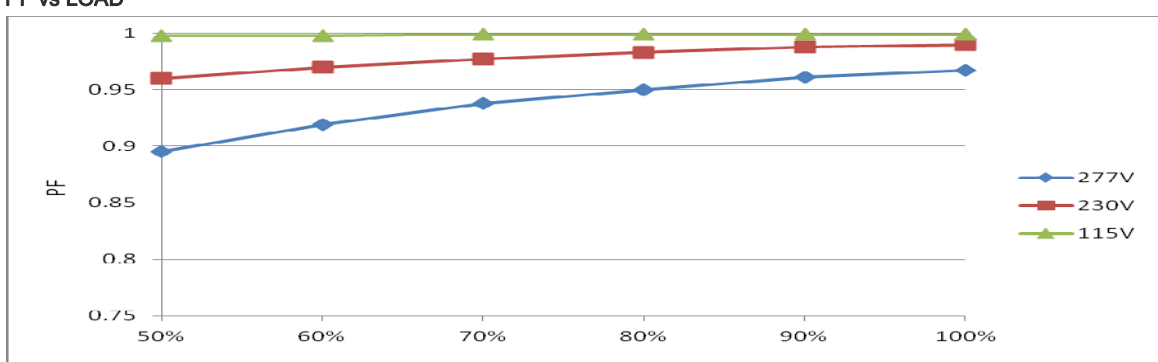
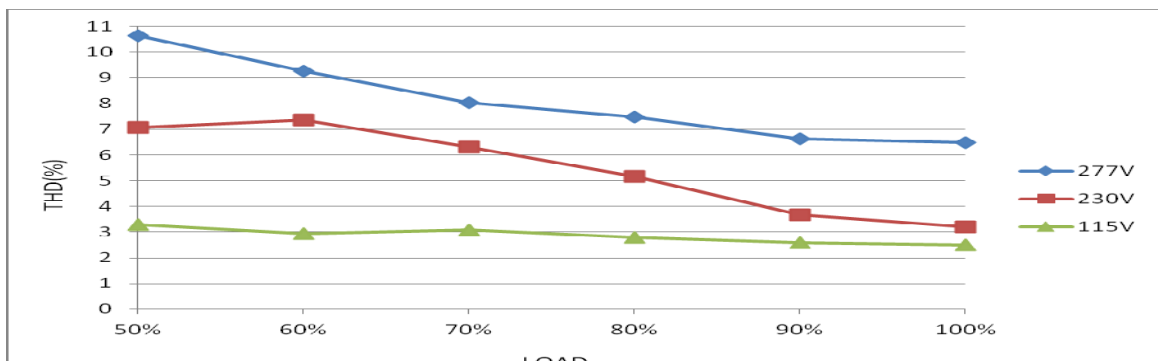
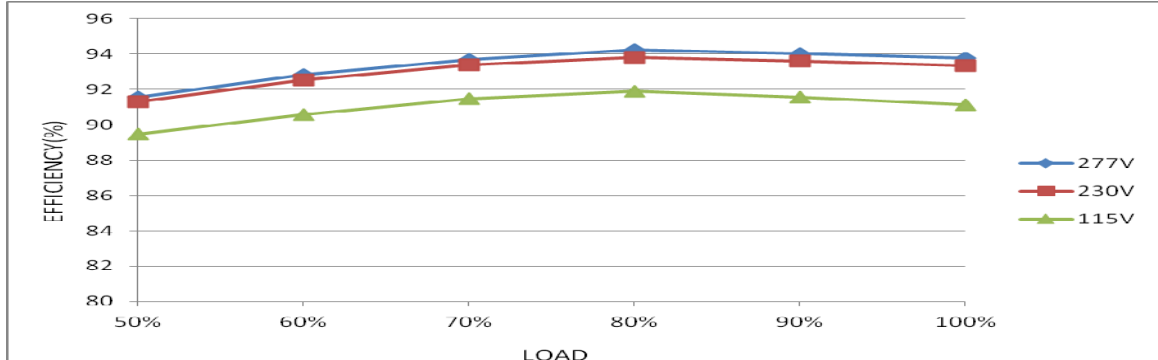
INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305VAC	I/P: TESTING O/P: FULL LOAD (PLEASE CHECK DERATING CURVE) Ta: 25°C	97V~315 V
			I/P: LOW-LINE-3V=97 V HIGH-LINE+10V=315 V 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: 100 VAC ~305 VAC O/P: FULL~NO LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	2.7A/115VAC 1.3A/230VAC 1.1A/277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I=2.29A/ 115VAC I= 1.12A/ 230VAC I= 0.95A/277VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.216mA N-FG: 0.217mA
5	STANDBY POWER CONSUMPTION	<0.5W for AB -Type	I/P: 230VAC O/P: STANDBY Ta: 25°C	0.415W
6	INRUSH CURRENT(Typ)	230 V/ 85A COLD START (twidth=500us measured at 50% Ipeak) COLD START at 230V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I=81.5A/ 230VAC Twidth = 392us

INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



7	POWER FACTOR	0.97/ 115VAC@ FULL LOAD 0.95/ 230VAC@ FULL LOAD 0.92/ 277VAC@ FULL LOAD	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	PF=0.999 @ FULL LOAD /115VAC PF=0.990 @ FULL LOAD /230VAC PF=0.967@ FULL LOAD /277VAC																												
PF vs LOAD  <table><caption>PF vs LOAD Data</caption><thead><tr><th>LOAD</th><th>115V</th><th>230V</th><th>277V</th></tr></thead><tbody><tr><td>50%</td><td>0.999</td><td>0.967</td><td>0.920</td></tr><tr><td>60%</td><td>0.999</td><td>0.970</td><td>0.925</td></tr><tr><td>70%</td><td>0.999</td><td>0.975</td><td>0.935</td></tr><tr><td>80%</td><td>0.999</td><td>0.980</td><td>0.945</td></tr><tr><td>90%</td><td>0.999</td><td>0.985</td><td>0.955</td></tr><tr><td>100%</td><td>0.999</td><td>0.988</td><td>0.965</td></tr></tbody></table>					LOAD	115V	230V	277V	50%	0.999	0.967	0.920	60%	0.999	0.970	0.925	70%	0.999	0.975	0.935	80%	0.999	0.980	0.945	90%	0.999	0.985	0.955	100%	0.999	0.988	0.965
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8	TOTAL HARMONIC DISTORTION	THD<10% (@load≥50%/115VAC; @load≥50%/230VAC; @load≥75%/277VAC)	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: 50% /75% LOAD Ta: 25°C	THD=3.29% @50% load /115VAC THD=7.07% @50% load /230VAC THD=7.65% @75% load /277VAC																												
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9	EFFICIENCY(Typ)	93%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	93.36%																												
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PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: FULL LOAD	O.T.P. Active Shut down output voltage, re-power on to recovery
2	OVER VOLTAGE PROTECTION	V1: 380V~ 450V	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P: MIN LOAD Ta: 25°C	416V/ 305VAC 416V/ 230VAC 420V/ 100VAC Shut down output voltage, re-power on to recover
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE 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°C	PASS

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated 12A/600V	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 492V (2) 548V (3) 456V
2	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) 520V (2) 460V (3) 484V
3	P.F.C DIODE	D5 Rated 600V/8A	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 447V (2) 435V (3) 443V
4	Diode Peak Voltage	D100 Rated 8A/600V	I/P: High-Line +3V =308V O/P: (1) Full Load (2) Output Short (3) Full Load continue (4) No Load Ta: 25°C	(1) 351V (2) 20.7V (3) 351V (4) 363V

5	Input Capacitor Voltage	C5 Rated: 120 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°C	(1) 446V (2) 444V (3) 448V (4) 448V
6	Control IC Voltage Test	U2 Rated 30V	I/P: High-Line +3V =308V O/P:(1)FULL LOAD (2) Output Short (3)O.V.P (4)NO LOAD VR.LOW LINE Ta: 25°C	(1) 26.4V (2) 26.4V (3) 26.4V (4) 26.3V

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°C	I/P-O/P: 2.83mA I/P-FG: 2.74mA O/P-FG: 2.31mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100M Ω I/P-FG: 500VDC>100M Ω O/P-FG: 500VDC>100M Ω	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta: 25°C	I/P-O/P: >6155M Ω I/P-FG: >6122M Ω O/P-FG: >5719M Ω NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 m Ω	40A / 2min Ta:25°C	12m Ω

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°C	PASS
2	CONDUCTION	EN55015	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	RADIATION	EN55015	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	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°C	PASS
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 2KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS



240W Constant Power Mode LED Driver

XLG-240 series

6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N : 4KV L-PE: 6KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	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

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																								
1	TEMPERATURE RISE TEST	MODEL: XLG-240I-L-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=55.8℃ <table><thead><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 31.4 ℃</th><th>HIGH AMBIENT Ta=55.8 ℃</th></tr></thead><tbody><tr><td>1</td><td>BD1</td><td>74.8℃</td><td>97.4℃</td></tr><tr><td>2</td><td>C5</td><td>73.3℃</td><td>96.2℃</td></tr><tr><td>3</td><td>Q1</td><td>76.8℃</td><td>100.1℃</td></tr><tr><td>4</td><td>D5</td><td>77.8℃</td><td>101.5℃</td></tr><tr><td>5</td><td>Q2</td><td>76.8℃</td><td>99.4℃</td></tr><tr><td>6</td><td>Q3</td><td>78.4℃</td><td>101.4℃</td></tr><tr><td>7</td><td>U2</td><td>71.6℃</td><td>94.3℃</td></tr><tr><td>8</td><td>RTH3</td><td>70.9℃</td><td>94.3℃</td></tr><tr><td>9</td><td>T1</td><td>81.3℃</td><td>105.6℃</td></tr><tr><td>10</td><td>D100</td><td>79.3℃</td><td>102.3℃</td></tr><tr><td>11</td><td>D101</td><td>80.9℃</td><td>104.0℃</td></tr><tr><td>12</td><td>D102</td><td>80.3℃</td><td>103.3℃</td></tr><tr><td>13</td><td>D103</td><td>82.9℃</td><td>106.0℃</td></tr><tr><td>14</td><td>C104</td><td>69.4℃</td><td>92.8℃</td></tr><tr><td>15</td><td>C105</td><td>70.9℃</td><td>94.2℃</td></tr><tr><td>16</td><td>J102</td><td>71.7℃</td><td>95.1℃</td></tr><tr><td>17</td><td>TC</td><td>65.9℃</td><td>89.0℃</td></tr></tbody></table>			NO	Position	ROOM AMBIENT Ta= 31.4 ℃	HIGH AMBIENT Ta=55.8 ℃	1	BD1	74.8℃	97.4℃	2	C5	73.3℃	96.2℃	3	Q1	76.8℃	100.1℃	4	D5	77.8℃	101.5℃	5	Q2	76.8℃	99.4℃	6	Q3	78.4℃	101.4℃	7	U2	71.6℃	94.3℃	8	RTH3	70.9℃	94.3℃	9	T1	81.3℃	105.6℃	10	D100	79.3℃	102.3℃	11	D101	80.9℃	104.0℃	12	D102	80.3℃	103.3℃	13	D103	82.9℃	106.0℃	14	C104	69.4℃	92.8℃	15	C105	70.9℃	94.2℃	16	J102	71.7℃	95.1℃	17	TC	65.9℃	89.0℃
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7	U2	71.6℃	94.3℃																																																																									
8	RTH3	70.9℃	94.3℃																																																																									
9	T1	81.3℃	105.6℃																																																																									
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16	J102	71.7℃	95.1℃																																																																									
17	TC	65.9℃	89.0℃																																																																									
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 305VAC/110VAC O/P: FULL LOAD Ta= -45℃/-35℃	TEST: OK																																																																								
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 ℃ NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=50 ℃ HUMIDITY= 95% R.H	TEST: OK																																																																								



240W Constant Power Mode LED Driver

XLG-240 series

4	TEMPERATURE COEFFICIENT	$\pm 0.03\%/^{\circ}\text{C}$ (0~60°C)	I/P: 230 VAC O/P: FULL LOAD	$\pm 0.01\%/^{\circ}\text{C}$ (0~60°C)
5	STORAGE TEMPERATURE TEST	-40~+80°C	1. Thermal shock Temperature: -50°C ~ +125°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle: 200CYCLE 5. Input/Output condition: STATIC TEST: OK	
6	THERMAL SHOCK TEST	-40~+50°C	1. Thermal shock Temperature: -45°C ~ +55°C 2. Temperature change rate : 25°C / 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: 10min/sweep cycle (4) Acceleration: 6G (5) Test Time: 180min in each axis (X.Y.Z) (6) Ta: 25°C TEST: OK	
8	CAPACITOR LIFE CYCLE	XLG-240I-L-AB: SUPPOSE C106 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P: FULL LOAD Tc= 75 °C LIFE TIME (2) I/P: 230VAC O/P: 75% LOAD Tc= 75 °C LIFE TIME (3) I/P: 230VAC O/P: 50% LOAD Tc= 75 °C LIFE TIME		(1) 77729 HRS (2) 86839 HRS (3) 78801 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 830.77 K hrs min. Telcordia SR-332 (Bellcore) 219.75K hrs min. MIL-HDBK-217F (25°C)		
10	Ongoing Reliability Test	I/P: 230VAC O/P: FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 50,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/ZHOUB	WENF	LIUWY