



Test Report: XBG-100

100W 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



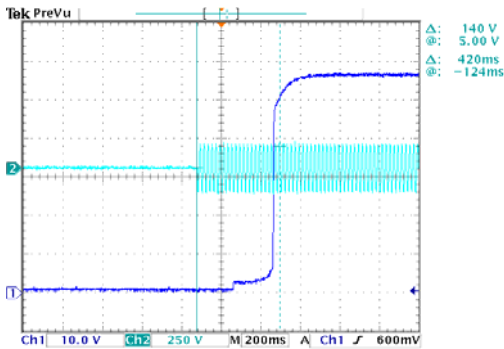
DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±5%	I/P: 230 VAC O/P: FULL/ MIN LOAD Ta: 25°C	<±5%
2	CONSTANT CURRENT REGION	27V-56V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	16.8 V~ 57.1 V
3	OPEN CIRCUIT VOLTAGE (max.)	60V	I/P: 230 VAC O/P: NO LOAD	57.9V
4	CURRENT RIPPLE	3.0% max. @ rated current	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	1.74%
5	CURRENT ADJ. RANGE	875 mA ~2780mA	I/P: 230 VAC O/P: TESTING Ta: 25°C	742 mA ~3432mA
6	CONSTANT POWER	O/P: 100W	I/P: 230 VAC O/P: Vo×Io	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	420/115 VAC 392/230 VAC

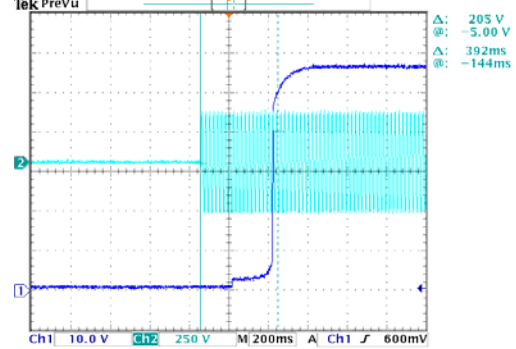
INPUT=115VAC/50HZ @ FULL LOAD

CH1: Output Voltage CH2: AC Input Voltage



INPUT=230 VAC/50HZ @ FULL LOAD

CH1: Output Voltage CH2: AC Input Voltage

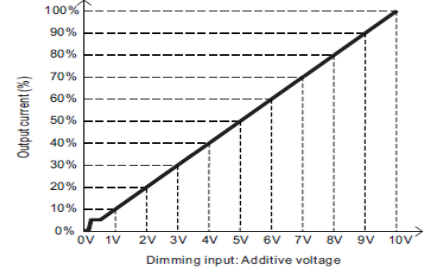
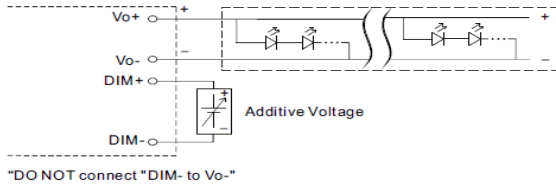


8 DIMMING OPERATION (for AB-Type)

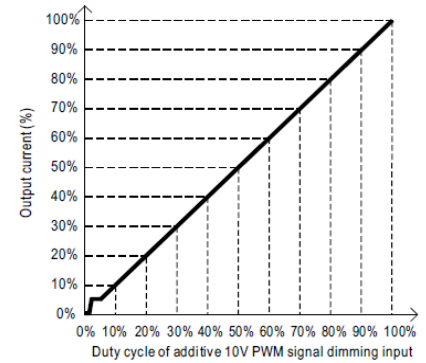
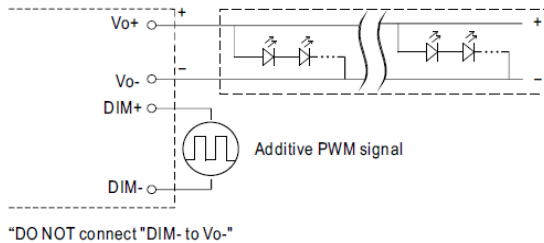
※ 3 in 1 dimming function (for AB-Type)

- 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.)

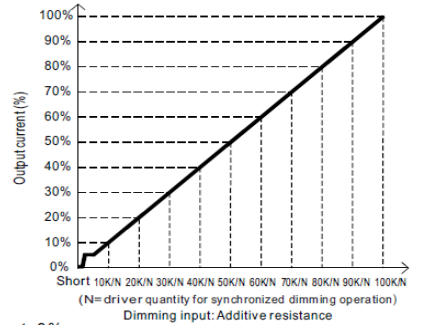
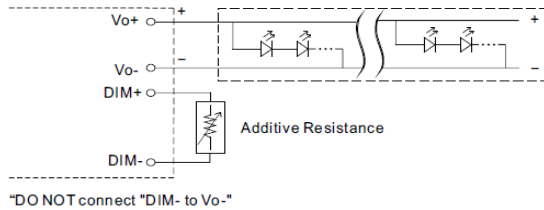
◎ Applying additive 0 ~ 10VDC



◎ 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 $0k\Omega$ 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	0.214A	0.372A	0.530A	0.680A	0.880A	1.040A	1.230A	1.380A	1.560A	1.700A	1.700A
	%	0%	12.23%	21.26%	30.29%	38.86%	50.29%	59.43%	70.29%	78.86%	89.14%	97.14%	97.14%
2	PWM	0V	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0	0.193A	0.348A	0.524A	0.690A	0.850A	1.030A	1.210A	1.380A	1.560A	1.700A	1.710A
	%	0%	11.03%	19.89%	29.94%	39.43%	48.57%	58.86%	69.14%	78.86%	89.14%	97.14%	97.71%
3	R	0%	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current	0	0.231A	0.414A	0.571A	0.700A	0.870A	1.040A	1.200A	1.400A	1.570A	1.700A	1.700A
	%	0%	13.20%	23.66%	32.63%	40.00%	49.71%	59.43%	68.57%	80.00%	89.71%	97.14%	97.14%

TEST RESULT: OK

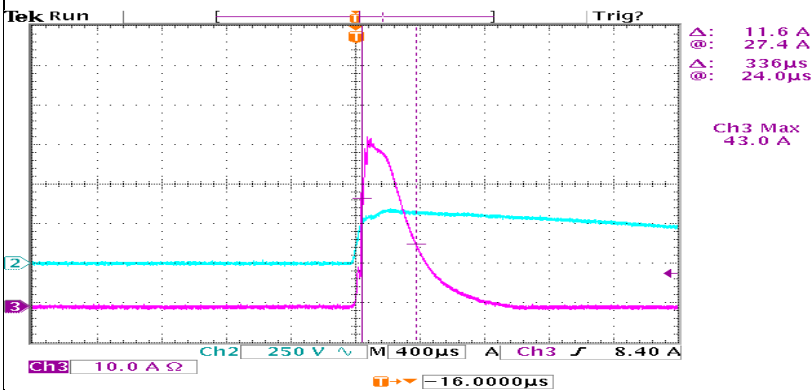


INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~305VAC	I/P: TESTING O/P: FULL LOAD (PLEASE CHECK DERATING CURVE) Ta: 25°C	87V~308V
			I/P: LOW-LINE-3V=87 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: 90 VAC ~305 VAC O/P: FULL~NO LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	1.1A/115VAC 0.5A/230VAC 0.42A/277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I = 0.953A/ 115VAC I = 0.469A/ 230VAC I = 0.398A/277VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.309mA N-FG: 0.310mA
5	STANDBY POWER CONSUMPTION	<0.5W for AB -Type	I/P: 230VAC O/P: STANDBY Ta: 25°C	0.3627W
6	INRUSH CURRENT(Typ)	230 V/ 50A COLD START (twidth=400us measured at 50% Ipeak) COLD START at 230V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I=43A/ 230VAC Twidth = 336us

INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



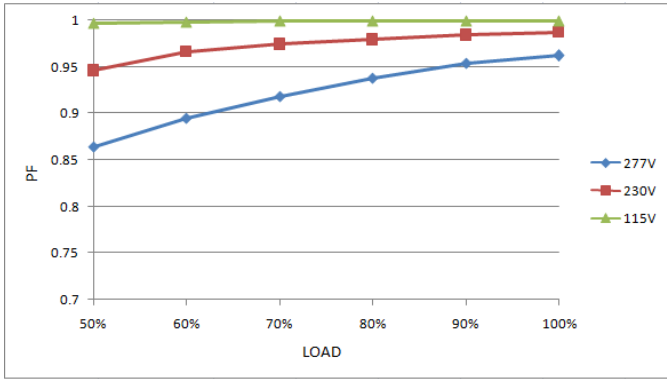


100W Constant Power Mode LED Driver

XBG-100 series

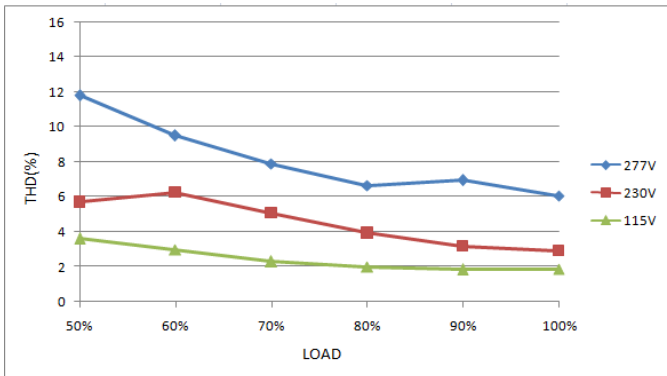
7	POWER FACTOR	0.97/ 115VAC@ FULL LOAD 0.95/ 230VAC@ FULL LOAD 0.92/ 277VAC@ FULL LOAD	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	PF=0.999 @ FULL LOAD /115VAC PF=0.987 @ FULL LOAD /230VAC PF=0.962@ FULL LOAD /277VAC
---	--------------	---	--	---

PF vs LOAD



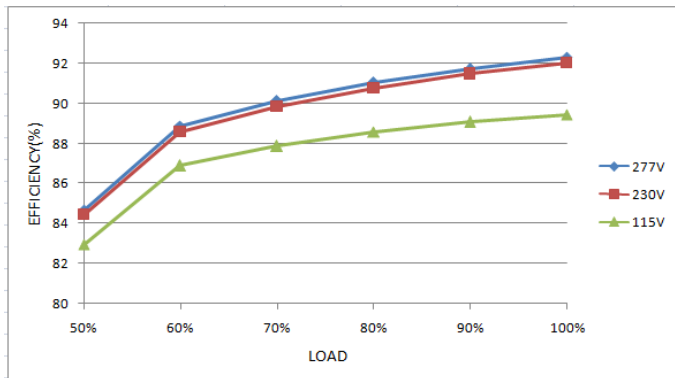
8	TOTAL HARMONIC DISTORTION	THD < 10% (@load ≥ 50%/115VAC; @load ≥ 50%/230VAC; @load ≥ 75%/277VAC)	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: 50% /75% LOAD Ta: 25°C	THD=3.61% @50% load /115VAC THD=5.7% @50% load /230VAC THD=7.42% @75% load /277VAC
---	---------------------------	---	--	--

THD vs LOAD



9	EFFICIENCY(Typ)	92%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	92.22%
---	-----------------	-----	---	--------

EFFICIENCY vs LOAD



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 after fault condition is removed to recover
2	OVER VOLTAGE PROTECTION	V1: 61V~ 78V	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P: MIN LOAD Ta: 25°C	65.81V/ 305VAC 64.41V/ 230VAC 66.07V/ 100VAC Shut down output voltage, re-power on after fault condition is removed 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	Over Power Protection	105%-150%	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P: Testing Ta: 25°C	123%/ 305VAC 131%/ 230VAC 132%/ 100VAC Hiccup mode, recovers automatically after fault condition is removed

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated 7.5A/600V	I/P: High-Line +3V =308V O/P: (1) Full Load (2) Output Short (3) Full load continue Ta: 25°C	(1) 514V (2) 510V (3) 474V
2	PFC Transistor	Q1 Rated 11A/650V	I/P: High-Line +3V =308V O/P: (1) Full Load (2) Output Short (3) Full Load continue Ta: 25°C	(1) 568V (2) 459V (3) 560V
3	P.F.C DIODE	D5 Rated 600V/5A	I/P: High-Line +3V =308V O/P: (1) Full Load (2) Output Short (3) Full load continue Ta: 25°C	(1) 474V (2) 434V (3) 466V
4	Diode Peak Voltage	D100 Rated 15A/150V	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) 117V (2) 7V (3) 115V (4) 119V



100W Constant Power Mode LED Driver

XBG-100 series

5	Input Capacitor Voltage	C5 Rated: 47 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) 448V (2) 449V (3) 445V (4) 445V
6	Control IC Voltage Test	U1 Rated 27 V	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) 13.3V (2) 13.6V (3) 13.1V (4) 13.1V

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: 2.4 KVAC/min O/P-FG: 1.8 KVAC/min Ta: 25°C	I/P-O/P: 2.536mA I/P-FG: 2.511mA O/P-FG: 2.775mA 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: >9999G Ω I/P-FG: >9999 G Ω O/P-FG: >9999 G Ω NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 m Ω	40A / 2min Ta:25°C	20m 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	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A



100W Constant Power Mode LED Driver

XBG-100 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	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

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																
1	TEMPERATURE RISE TEST	MODEL: XBG-100-AB 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 28.7°C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=62.7°C																																																																																																		
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 28.7 °C</th> <th>HIGH AMBIENT Ta=62.7 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>56.0°C</td><td>86.1°C</td></tr> <tr><td>2</td><td>ZNR2</td><td>56.7°C</td><td>86.6°C</td></tr> <tr><td>3</td><td>C5</td><td>59.2°C</td><td>88.7°C</td></tr> <tr><td>4</td><td>Q1</td><td>61.3°C</td><td>91.8°C</td></tr> <tr><td>5</td><td>C51</td><td>63.9°C</td><td>94.8°C</td></tr> <tr><td>6</td><td>C13</td><td>60.8°C</td><td>91.8°C</td></tr> <tr><td>7</td><td>U1</td><td>58.3°C</td><td>88.4°C</td></tr> <tr><td>8</td><td>U2</td><td>57.6°C</td><td>89.1°C</td></tr> <tr><td>9</td><td>D5</td><td>62.8°C</td><td>94.8°C</td></tr> <tr><td>10</td><td>Q2</td><td>58.4°C</td><td>90.5°C</td></tr> <tr><td>11</td><td>Q3</td><td>61.6°C</td><td>94.0°C</td></tr> <tr><td>12</td><td>R7</td><td>58.0°C</td><td>88.4°C</td></tr> <tr><td>13</td><td>T1</td><td>69.6°C</td><td>101.1°C</td></tr> <tr><td>14</td><td>D100</td><td>73.4°C</td><td>105.1°C</td></tr> <tr><td>15</td><td>D101</td><td>73.8°C</td><td>105.7°C</td></tr> <tr><td>16</td><td>C200</td><td>61.3°C</td><td>92.4°C</td></tr> <tr><td>17</td><td>C105</td><td>56.7°C</td><td>87.5°C</td></tr> <tr><td>18</td><td>C106</td><td>61.2°C</td><td>91.3°C</td></tr> <tr><td>19</td><td>LF100</td><td>52.4°C</td><td>83.4°C</td></tr> <tr><td>20</td><td>U100</td><td>58.5°C</td><td>89.6°C</td></tr> <tr><td>21</td><td>J100</td><td>57.5°C</td><td>88.4°C</td></tr> <tr><td>22</td><td>RTH3</td><td>56.8°C</td><td>87.8°C</td></tr> <tr><td>23</td><td>TC</td><td>49.8°C</td><td>80.1°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 28.7 °C	HIGH AMBIENT Ta=62.7 °C	1	BD1	56.0°C	86.1°C	2	ZNR2	56.7°C	86.6°C	3	C5	59.2°C	88.7°C	4	Q1	61.3°C	91.8°C	5	C51	63.9°C	94.8°C	6	C13	60.8°C	91.8°C	7	U1	58.3°C	88.4°C	8	U2	57.6°C	89.1°C	9	D5	62.8°C	94.8°C	10	Q2	58.4°C	90.5°C	11	Q3	61.6°C	94.0°C	12	R7	58.0°C	88.4°C	13	T1	69.6°C	101.1°C	14	D100	73.4°C	105.1°C	15	D101	73.8°C	105.7°C	16	C200	61.3°C	92.4°C	17	C105	56.7°C	87.5°C	18	C106	61.2°C	91.3°C	19	LF100	52.4°C	83.4°C	20	U100	58.5°C	89.6°C	21	J100	57.5°C	88.4°C	22	RTH3	56.8°C	87.8°C	23	TC	49.8°C	80.1°C
NO	Position	ROOM AMBIENT Ta= 28.7 °C	HIGH AMBIENT Ta=62.7 °C																																																																																																	
1	BD1	56.0°C	86.1°C																																																																																																	
2	ZNR2	56.7°C	86.6°C																																																																																																	
3	C5	59.2°C	88.7°C																																																																																																	
4	Q1	61.3°C	91.8°C																																																																																																	
5	C51	63.9°C	94.8°C																																																																																																	
6	C13	60.8°C	91.8°C																																																																																																	
7	U1	58.3°C	88.4°C																																																																																																	
8	U2	57.6°C	89.1°C																																																																																																	
9	D5	62.8°C	94.8°C																																																																																																	
10	Q2	58.4°C	90.5°C																																																																																																	
11	Q3	61.6°C	94.0°C																																																																																																	
12	R7	58.0°C	88.4°C																																																																																																	
13	T1	69.6°C	101.1°C																																																																																																	
14	D100	73.4°C	105.1°C																																																																																																	
15	D101	73.8°C	105.7°C																																																																																																	
16	C200	61.3°C	92.4°C																																																																																																	
17	C105	56.7°C	87.5°C																																																																																																	
18	C106	61.2°C	91.3°C																																																																																																	
19	LF100	52.4°C	83.4°C																																																																																																	
20	U100	58.5°C	89.6°C																																																																																																	
21	J100	57.5°C	88.4°C																																																																																																	
22	RTH3	56.8°C	87.8°C																																																																																																	
23	TC	49.8°C	80.1°C																																																																																																	
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOURS	I/P: 305VAC/110VAC O/P: FULL LOAD Ta= -45°C/-35°C	TEST: OK																																																																																																
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60 °C NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=60 °C HUMIDITY= 95% R.H	TEST: OK																																																																																																
4	TEMPERATURE COEFFICIENT	±0.03%/°C (0~60°C)	I/P: 230 VAC O/P: FULL LOAD	±0.001%/°C (0~60°C)																																																																																																



100W Constant Power Mode LED Driver

XBG-100 series

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~+60°C	1. Thermal shock Temperature: -45°C~ +65°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	XBG-100-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) 52177 HRS (2) 67424 HRS (3) 72819 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 727.29 K hrs min. Telcordia SR-332 (Bellcore) 188.8K 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/ZHOUBIAO	WENF	LIUWY