



Test Report: XLG-320-48-ABV

312W Constant Voltage 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

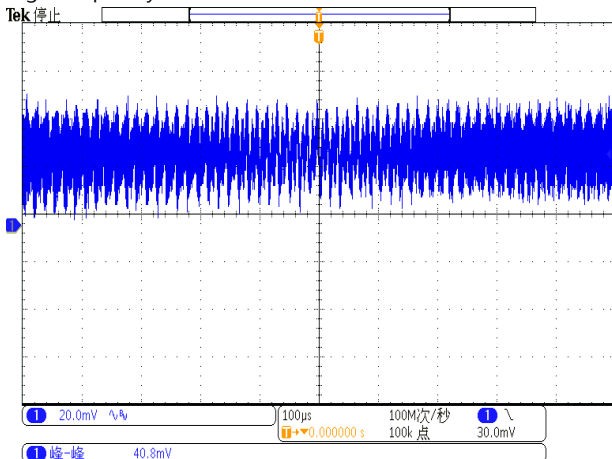
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

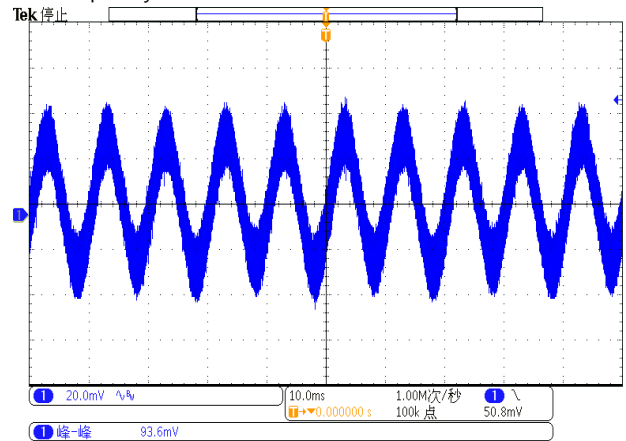
OUTPUT FUNCTION TEST

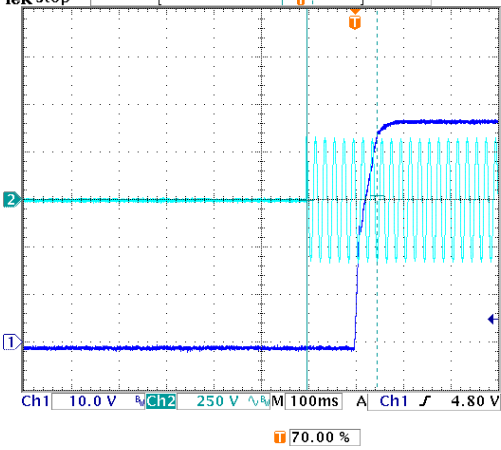
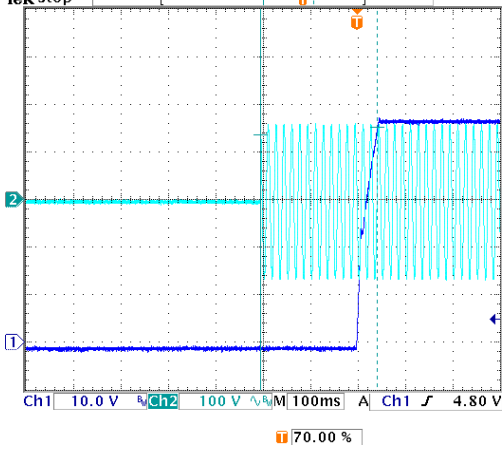
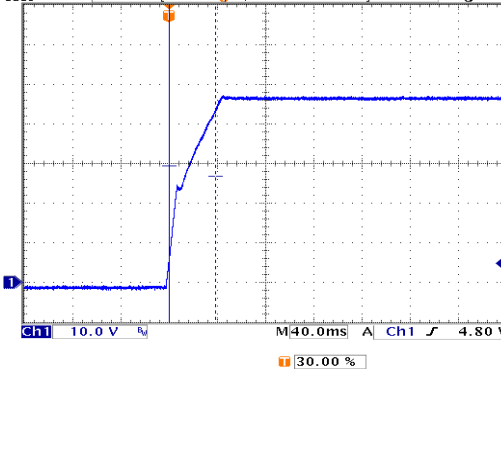
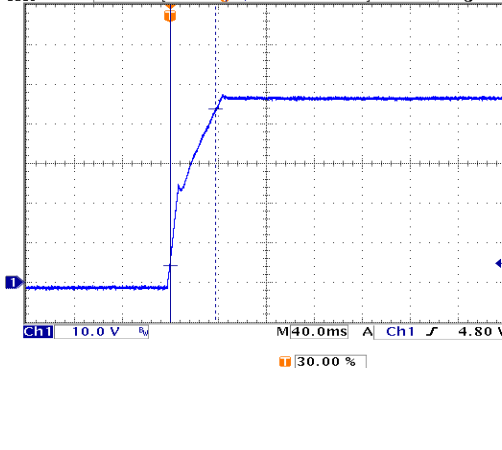
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 43.2 V~ 52.8 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	42.31V~54.10V/230VAC 43.32V~54.08V/115VAC
2	OUTPUT VOLTAGE TOLERANCE (Max)	V1: -2 % ~ 2 %	I/P:100VAC /305AC O/P:FULL/ MIN LOAD Ta:25°C	V1: -0.31%~-0.04%
3	LINE REGULATION (Max)	V1: -0.5 % ~0.5%	I/P:100VAC~305AC O/P:FULL LOAD Ta:25°C	V1: 0%~ 0%
4	LOAD REGULATION (Max)	V1: -0.5 % ~0.5%	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.1%~0.15%
5	OVER/UNDERSHOOT TEST	< +5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C CCH MODE TEST	TEST: 2.1 %
6	RIPPLE & NOISE (Max)	V1: 250 mVp-p	I/P: 230 VAC O/P:(1) FULL LOAD (2) 0%~100% LOAD Ta:25°C CCH MODE TEST	(1) 93.6mVp-p (Max) (2) 113 mVp-p(Max)

high frequency :



low frequency :



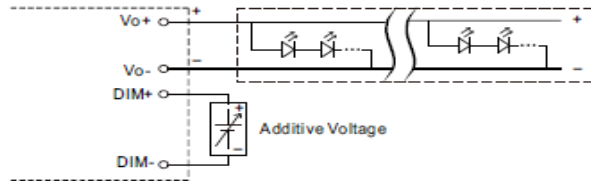
7	SET UP TIME (Max)	230VAC/ 500ms 115VAC/ 1200ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C CCH MODE TEST	230VAC/ 148ms 115 VAC/ 246 ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage CH2 : AC Input Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1 : Output Voltage CH2 : AC Input Voltage</p> 		
8	RISE TIME (Max)	230VAC/ 160ms 115VAC/ 160ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C CCH MODE TEST	230VAC/38.4ms 115 VAC/ 37.6ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1 : Output Voltage</p> 		

<p>9</p> <p>HOLD UP TIME (Typ.)</p>	<p>230VAC/ 10ms 115VAC/ 10ms</p>	<p>I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C CCH MODE TEST</p>	<p>230VAC/28.8ms 115 VAC/28.8ms</p>
<p>INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage</p>		<p>INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage</p>	
<p>10</p> <p>DYNAMIC LOAD</p>	<p>V1: 4800mVp-p</p>	<p>I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C</p>	<p>1110mVp-p 524mVp-p</p>
<p>FULL /50% LOAD 50%DUTY / 120HZ</p>		<p>FULL /50% LOAD 50%DUTY / 1KHZ</p>	

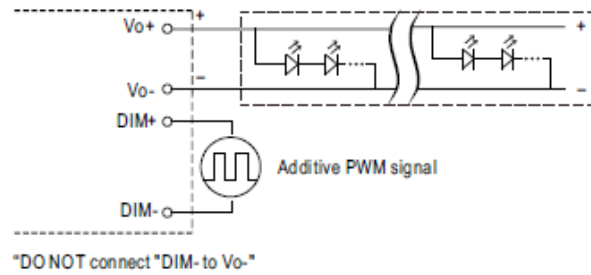
11 DIMMING OPERATION (for ABV-Type)

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

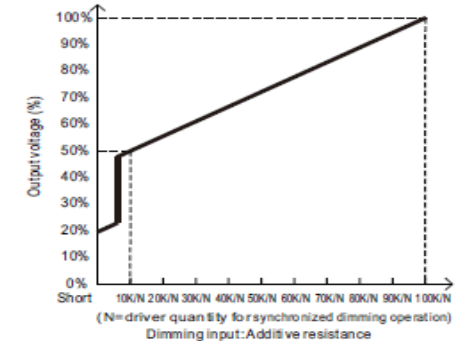
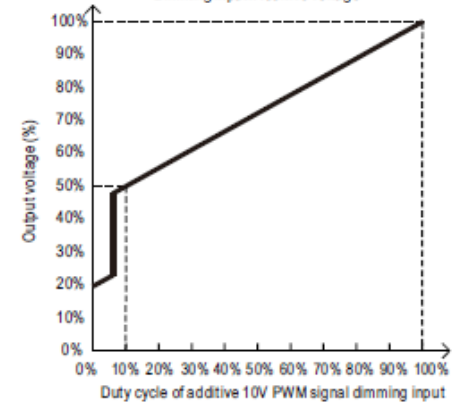
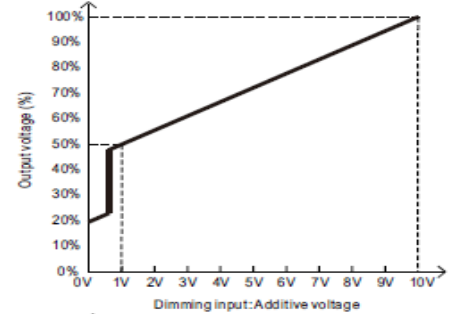
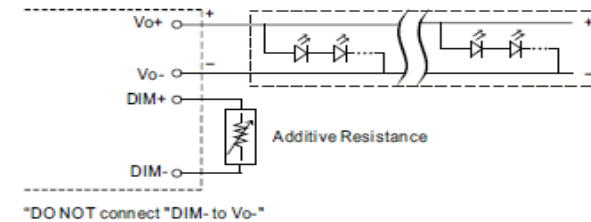
- Output constant voltage can be adjusted by applying one of the three methodologies between DIM+ and DIM-: 0 ~ 10VDC, or 10V PWM signal or resistance.
- Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.
- Dimming source current from power supply: 100µA (typ.)
- ⊙ Applying additive 0 ~ 10VDC



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



⊙ Applying additive resistance:



Note : 1. Min. dimming level is about 50% of output voltage and the output voltage is not defined when $V_{out} < 50V$
 2. The output voltage could drop down to 0V when dimming input is about 0k or 0Vdc, or 10V PWM signal with 0% duty cycle.

I/P : 230 VAC O/P : DIMMING TEST

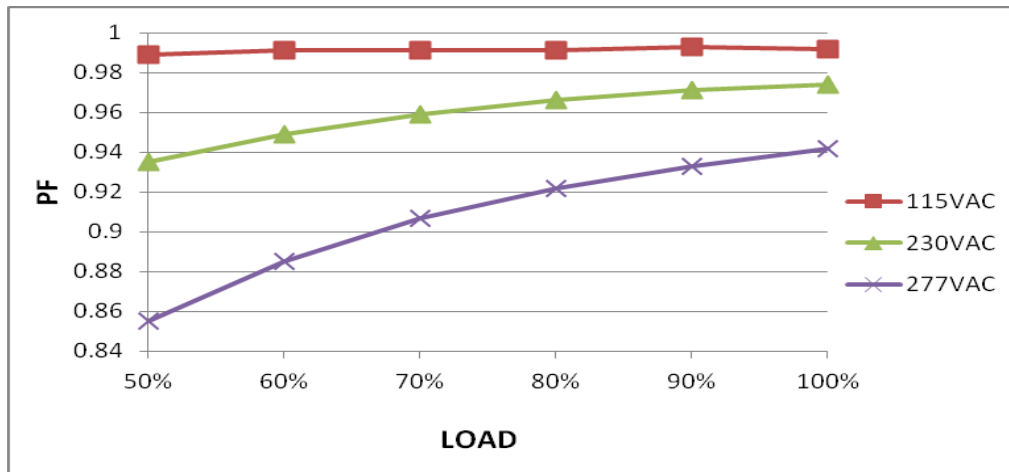
1	v	SHORT	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current	0.00	26.80	29.66	32.50	35.40	38.35	41.32	44.38	47.46	50.82	52.77	52.76
%	0.00%	50.8%	56.2%	61.6%	67.0%	72.6%	78.3%	84.1%	89.9%	96.3%	99.9%	99.9%	
2	PWM	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
	Output Current	0.00	26.76	29.23	32.57	35.47	38.29	41.38	44.32	47.62	50.78	52.75	52.76
%	0.00%	50.7%	55.36%	61.7%	67.2%	72.5%	78.4%	84.0%	90.2%	96.2%	99.9%	99.9%	
3	R	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current (100Hz)	0.00	26.74	29.15	32.57	35.46	38.27	41.37	44.35	47.65	50.75	52.75	52.76
%	0.00%	50.7%	55.2%	61.7%	67.2%	72.5%	78.4%	84.0%	90.3%	96.1%	99.9%	99.9%	

TEST RESULT : OK

INPUT FUNCTION TEST

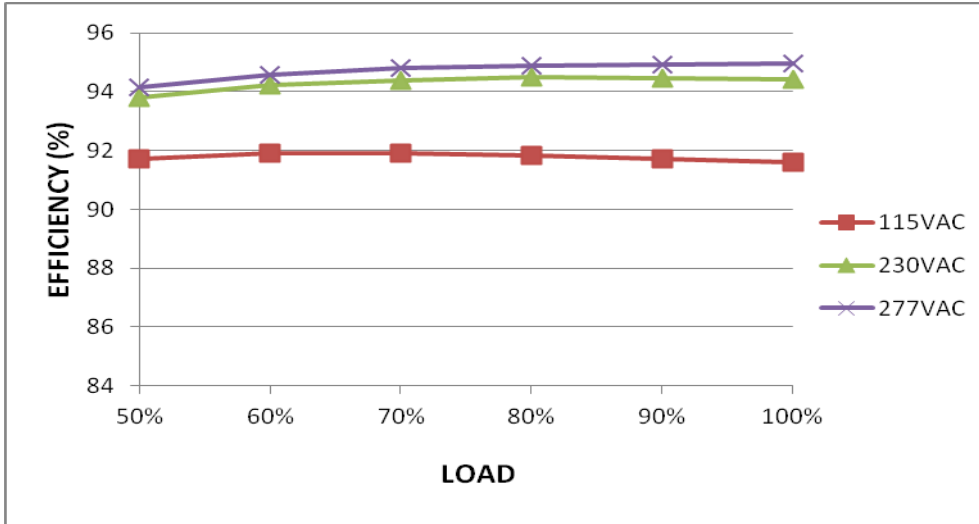
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305 VAC 142VDC~431VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL / 50% LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL / 50% LOAD (4) I/P: LOW-LINE=142VDC HIGH-LINE=431VDC O/P: Dimming on/off 【for Dimming type】 Ta:25°C	(1) 97V~308V (2) 138Vdc~434Vdc/FULL LOAD 138Vdc~434Vdc/50% LOAD (3)138 Vdc~434Vdc/FULL LOAD 138Vdc~434Vdc/50% LOAD (4) 138 Vdc~434Vdc/FULL LOAD
			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: 100 VAC ~305VAC O/P:FULL~MIN LOAD Ta:25°C	OK
3	INPUT CURRENT (TYP)	277VAC/ 1.3A 230 VAC/ 1.6 A 115 VAC/ 3 A	I/P: 277VAC/230 VAC/115 VAC O/P:FULL LOAD Ta:25°C CCH MODE TEST	I= 1.23A/277VAC I = 1.44A/ 230VAC I = 2.91A/ 115VAC
4	POWER FACTOR(TYP)	0.95/230 VAC FULL LOAD 0.98/115 VAC FULL LOAD 0.92/277 VAC FULL LOAD	I/P: 230 VAC/115VAC/277VAC O/P:FULL LOAD Ta:25°C CCH MODE TEST	PF= 0.974/230V/100%LOAD PF=0.992/115V/100%LOAD PF= 0.942/277V/100%LOAD

P.F vs LOAD



5	EFFICIENCY (TYP)	93.5 %	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C CCH MODE TEST	94.44 %
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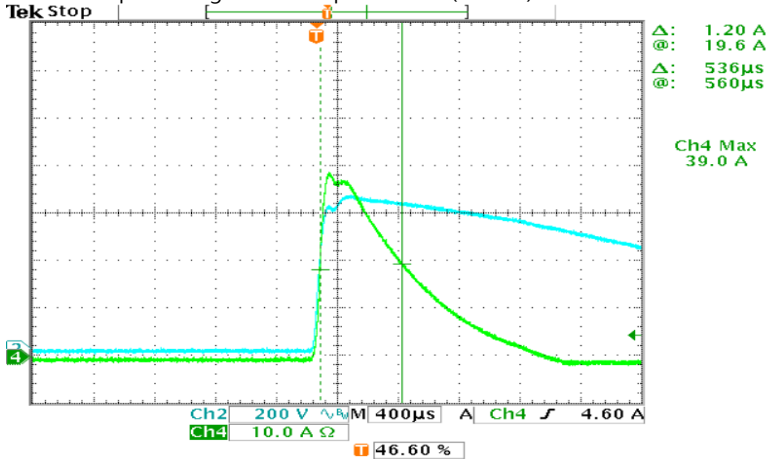
EFFICIENCY vs LOAD



6	INRUSH CURRENT (TYP)	230 V / 45 A COLD START (twidth=1200us measured at 50% Ipeak) COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C CCH MODE TEST	I = 39 A / 230VAC T50 = 536 us
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INPUT=230VAC/50HZ @ FULL LOAD

CH2 : AC Input Voltage CH4 : Input current (1V=1A)



7	TOTAL HARMONIC DISTORTION	THD < 10% @ 115/230VAC > 50% loading THD < 15% @ 227VAC > 75% loading	I/P : 230VAC/115VAC/277VAC O/P : 50% LOAD 75%LOAD Ta : 25°C CCH MODE TEST	THD : 8.93@230V /50% THD : 7.32@115V /50% THD : 10.72@277V /75%																												
<p>THD&LOAD</p> <table border="1"> <caption>THD (%) vs LOAD (%) Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>115VAC (%)</th> <th>230VAC (%)</th> <th>277VAC (%)</th> </tr> </thead> <tbody> <tr> <td>50%</td> <td>7.5</td> <td>8.5</td> <td>13.5</td> </tr> <tr> <td>60%</td> <td>7.0</td> <td>8.0</td> <td>11.5</td> </tr> <tr> <td>70%</td> <td>7.5</td> <td>7.5</td> <td>10.5</td> </tr> <tr> <td>80%</td> <td>7.5</td> <td>7.5</td> <td>10.0</td> </tr> <tr> <td>90%</td> <td>7.0</td> <td>7.0</td> <td>10.0</td> </tr> <tr> <td>100%</td> <td>7.5</td> <td>7.5</td> <td>10.0</td> </tr> </tbody> </table>					LOAD (%)	115VAC (%)	230VAC (%)	277VAC (%)	50%	7.5	8.5	13.5	60%	7.0	8.0	11.5	70%	7.5	7.5	10.5	80%	7.5	7.5	10.0	90%	7.0	7.0	10.0	100%	7.5	7.5	10.0
LOAD (%)	115VAC (%)	230VAC (%)	277VAC (%)																													
50%	7.5	8.5	13.5																													
60%	7.0	8.0	11.5																													
70%	7.5	7.5	10.5																													
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90%	7.0	7.0	10.0																													
100%	7.5	7.5	10.0																													
8	LEAKAGE CURRENT	<0.75mA / 277VAC	I/P : 277 VAC O/P : NO LOAD Ta : 25°C	L-FG: 0.461mA N-FG: 0.462mA																												
9	STANDBY POWER CONSUMPTION	Standby power consumption <0.5W for ABV/BV-Type(Dimming OFF)	I/P : 230 VAC O/P : STANDBY(ABV/BV) Ta : 25°C	0.3569W																												

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~135%	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P: TESTING Ta: 25°C	116.2%/ 305VAC 116.6%/ 230VAC 116.9%/100VAC PROTECTION TYPE : Hiccup mode or Constant current limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	V1: 54V~60V	I/P: 308VAC I/P: 230VAC I/P: 100VAC O/P: MIN LOAD Ta: 25°C	56.32V/ 308VAC 56.30V/ 230VAC 56.36V/ 100VAC PROTECTION TYPE : Shut down output voltage, re-power on to recovery
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 305 VAC I/P: 120 VAC O/P: FULL LOAD	O.T.P Active PROTECTION TYPE : Shut down output voltage, re-power on to recovery

4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 308VAC I/P: 100 VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE PROTECTION TYPE : Hiccup mode or Constant current limiting, recovers automatically after fault condition is removed
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COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q7 Rated 15A/ 650V	AC ON/OFF I/P:High-Line +3V =308V 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)Min Load (9) No Load I/P:Low-Line -3V = 97V 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)Min Load (9) No Load Ta:25°C	VDS: (1) 494V (2) 502V (3) 510V (4) 498V (5) 510V (6) 518V (7) 494V (8) 506V (9) 506V VDS: (1) 482V (2) 510V (3) 474V (4) 482V (5) 478V (6) 486V (7) 506V (8) 430V (9) 430V

SAFETY & EMC TEST REPORT

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	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°C	I/P-O/P: 3.205mA I/P-FG: 2.157mA O/P-FG:2.342 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°C	I/P-O/P: 9999MΩ I/P-FG: 9999MΩ O/P-FG:9999M Ω NO DAMAGE
3	GROUNDING CONTINUITY	EN61230-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	12mΩ

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°C	PASS
2	CONDUCTION	EN 55015	I/P:230VAC (50HZ) O/P: LEDmax Ta:25°C	PASS Test by certified Lab
3	RADIATION	EN 55015	I/P: 230VAC (50HZ) O/P:LEDmax Ta:25°C	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°C	CRITERIA A
5	E.F.T	EN61000-4-4 INPUT: 2KV	I/P: 230VAC (50HZ) O/P:LEDmax Ta:25°C	CRITERIA A
6	SURGE	IEC61000-4-5 L-N :4KV L,N-PE:6KV	I/P: 230VAC (50HZ) O/P:LEDmax 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 : XLG-320-48-ABV 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=25.6 °C 2. HIGH AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta=46.2 °C																																																																										
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=25.6°C</th> <th>HIGH AMBIENT Ta=46.2 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>72.4°C</td><td>82.8°C</td></tr> <tr><td>2</td><td>C5</td><td>68.8°C</td><td>78.7°C</td></tr> <tr><td>3</td><td>Q2</td><td>73.9°C</td><td>84.4°C</td></tr> <tr><td>4</td><td>L2</td><td>76.6°C</td><td>86.9°C</td></tr> <tr><td>5</td><td>U2</td><td>68.4°C</td><td>79.3°C</td></tr> <tr><td>6</td><td>Q7</td><td>78.7°C</td><td>89.8°C</td></tr> <tr><td>7</td><td>T1</td><td>78.5°C</td><td>89.6°C</td></tr> <tr><td>8</td><td>Q100</td><td>68.7°C</td><td>79.9°C</td></tr> <tr><td>9</td><td>Q101</td><td>68.0°C</td><td>79.3°C</td></tr> <tr><td>10</td><td>C104</td><td>69.1°C</td><td>79.9°C</td></tr> <tr><td>11</td><td>U101</td><td>68.8°C</td><td>80.2°C</td></tr> <tr><td>12</td><td>U104</td><td>73.7°C</td><td>85.0°C</td></tr> <tr><td>13</td><td>U300</td><td>73.9°C</td><td>85.2°C</td></tr> <tr><td>14</td><td>C308</td><td>72.2°C</td><td>82.8°C</td></tr> <tr><td>15</td><td>RTH2</td><td>66.7°C</td><td>77.3°C</td></tr> <tr><td>16</td><td>RTH7</td><td>68.4°C</td><td>79.6°C</td></tr> <tr><td>17</td><td>TC</td><td>61.4°C</td><td>73.6°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=25.6°C	HIGH AMBIENT Ta=46.2 °C	1	BD1	72.4°C	82.8°C	2	C5	68.8°C	78.7°C	3	Q2	73.9°C	84.4°C	4	L2	76.6°C	86.9°C	5	U2	68.4°C	79.3°C	6	Q7	78.7°C	89.8°C	7	T1	78.5°C	89.6°C	8	Q100	68.7°C	79.9°C	9	Q101	68.0°C	79.3°C	10	C104	69.1°C	79.9°C	11	U101	68.8°C	80.2°C	12	U104	73.7°C	85.0°C	13	U300	73.9°C	85.2°C	14	C308	72.2°C	82.8°C	15	RTH2	66.7°C	77.3°C	16	RTH7	68.4°C	79.6°C	17	TC	61.4°C	73.6°C
NO	Position	ROOM AMBIENT Ta=25.6°C	HIGH AMBIENT Ta=46.2 °C																																																																									
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10	C104	69.1°C	79.9°C																																																																									
11	U101	68.8°C	80.2°C																																																																									
12	U104	73.7°C	85.0°C																																																																									
13	U300	73.9°C	85.2°C																																																																									
14	C308	72.2°C	82.8°C																																																																									
15	RTH2	66.7°C	77.3°C																																																																									
16	RTH7	68.4°C	79.6°C																																																																									
17	TC	61.4°C	73.6°C																																																																									
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 116 * LOAD Ta : 25°C	TEST : OK																																																																								
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/120VAC O/P : 100 * LOAD Ta=-25 °C	TEST : OK																																																																								
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 45°C NO DAMAGE	I/P : 315 VAC O/P : FULL LOAD Ta= 45 °C HUMIDITY= 95 %R.H	TEST : OK																																																																								
5	TEMPERATURE COEFFICIENT	+ 0.03 % (0°C~60°C)	I/P : 230 VAC O/P : FULL LOAD	+ 0.0211 % (0~50°C)																																																																								

6	STORAGE TEMPERATURE TEST	-20~85°C	<ol style="list-style-type: none"> 1. Thermal shock Temperature : -25°C~ +85°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
7	THERMAL SHOCK TEST	-20~45°C	<ol style="list-style-type: none"> 1. Thermal shock Temperature : -25°C~ +50°C 2. Temperature change rate : 25°C / 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
8	VIBRATION TEST	10 ~ 500Hz, 5G 12min./1cycle, 72min. each along X, Y, Z axes	<ol style="list-style-type: none"> 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°C
9	CAPACITOR LIFE CYCLE	SUPPOSE C104 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	<ol style="list-style-type: none"> (1) 73664HRS (2) 83250HRS (3) 99601HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 1476.4K hrs min. Telcordia SR-332 (Bellcore) ; 168.1K hrs min. MIL-HDBK-217F (25°C)	
11	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/HUANGMK	WENF	LINKX

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