Test Report： XLG-200-12

200W 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

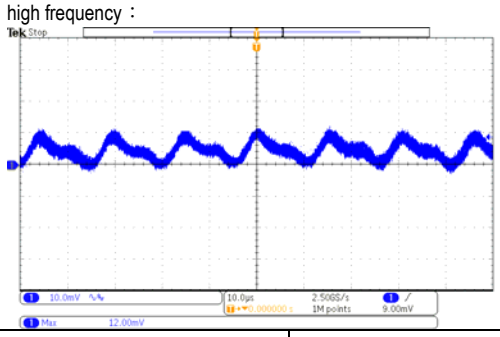
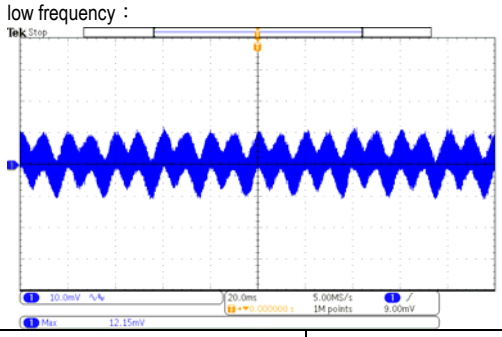
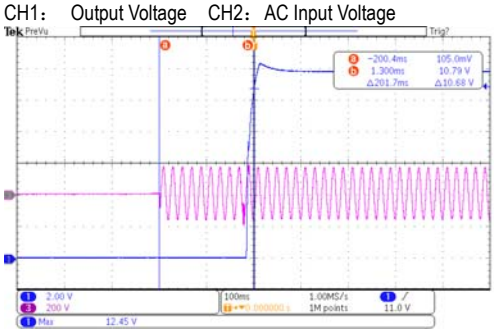
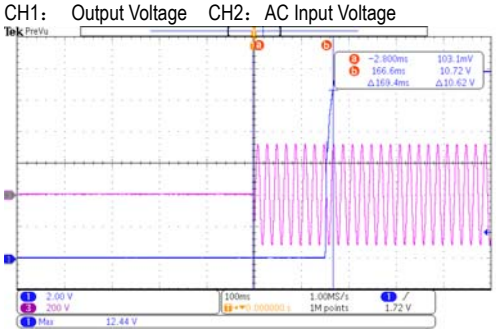
Safety Test
E.M.C. Test

■ RELIABILITY TEST

Environment Test

■ DESIGN VERIFY TEST

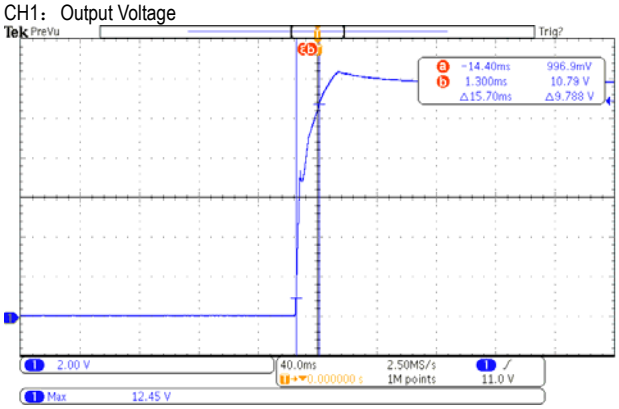
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	8.4V~12V	I/P： 230VAC O/P：LED MODE Ta：25℃	7.5V~ 12 V
2	CURRENT ADJ. RANGE	8A~16A	I/P： 230VAC O/P：SETTING Ta：25℃	6.9A~17.9A
3	VOLTAGE TOLERANCE	-3%~+3%	I/P： 90VAC / 305VAC O/P：FULL/ NO LOAD Ta：25℃	-0.83%~ 0.83%
4	LINE REGULATION	-0.5%~+0.5%	I/P： 90VAC ~ 305VAC O/P：FULL LOAD Ta：25℃	0%~0.34%
5	LOAD REGULATION	-2%~+2%	I/P： 230VAC O/P：FULL ~NO LOAD Ta：25℃	-0.75%~ 0.92%
6	OVER/UNDERSHOOT TEST	<±5 %	I/P： 230VAC O/P：FULL LOAD Ta：25℃	±3.83%
7	CONSTANT POWER	O/P： 192W	I/P：230 VAC O/P：Vo×Io	TEST：OK
8	RIPPLE & NOISE (Max)	150mVp-p	I/P： 230VAC O/P：FULL LOAD Ta：25℃	12.15mVp-p
	high frequency： 		low frequency： 	
9	SET UP TIME(Max)	115VAC/1200ms 230VAC/ 500ms	I/P： 115 VAC I/P： 230 VAC O/P：FULL LOAD Ta：25℃	115VAC/ 201.7 ms 230VAC/ 169.4 ms
	INPUT=115VAC/50HZ @ FULL LOAD CH1： Output Voltage CH2：AC Input Voltage 		INPUT=230VAC/50HZ @ FULL LOAD CH1： Output Voltage CH2：AC Input Voltage 	

10	RISE TIME (Max)	115VAC/ 100ms 230VAC/ 100ms	I/P：115 VAC I/P：230 VAC O/P：FULL LOAD Ta：25℃	115VAC/ 15.7 ms 230VAC/ 15.4 ms

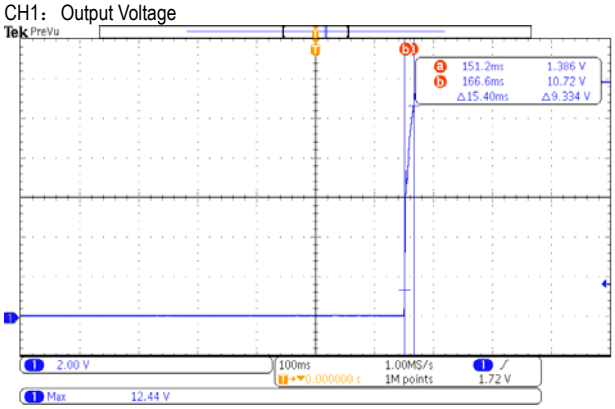
INPUT=115VAC/50HZ @ FULL LOAD

CH1：Output Voltage



INPUT=230VAC/50HZ @ FULL LOAD

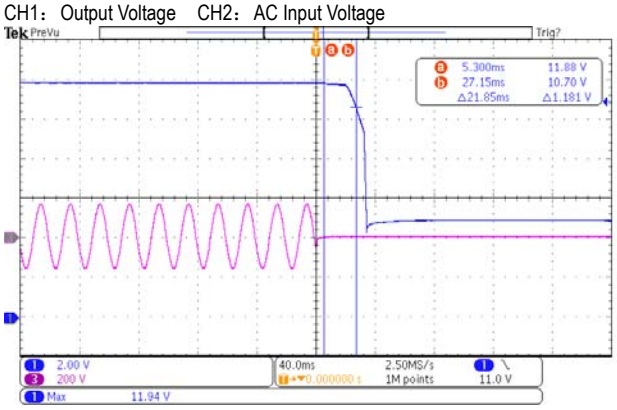
CH1：Output Voltage



11	HOLD UP TIME(Typ)	115VAC/ 10ms 230VAC/ 10ms	I/P： 115 VAC I/P： 230 VAC O/P：FULL LOAD Ta：25℃	115VAC/ 21.85 ms 230VAC/ 23.4 ms

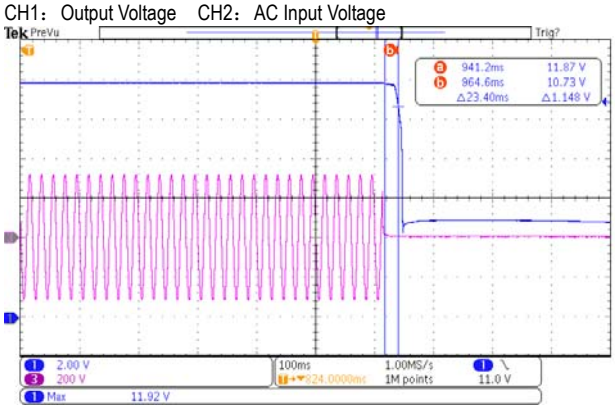
INPUT=115VAC/50HZ @ FULL LOAD

CH1：Output Voltage CH2：AC Input Voltage



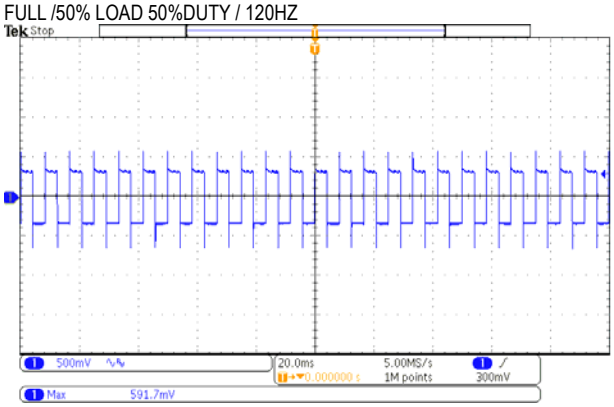
INPUT=230VAC/50HZ @ FULL LOAD

CH1：Output Voltage CH2：AC Input Voltage

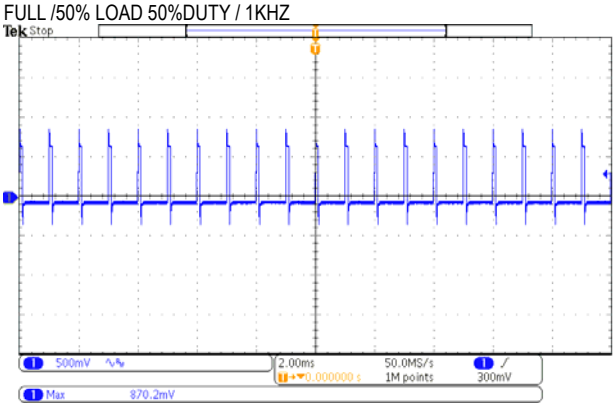


12	DYNAMIC LOAD	V1： 1200 mVp-p	I/P： 230VAC O/P： (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta：25℃	 (1) 591.7mVp-p (2) 870.2mVp-p

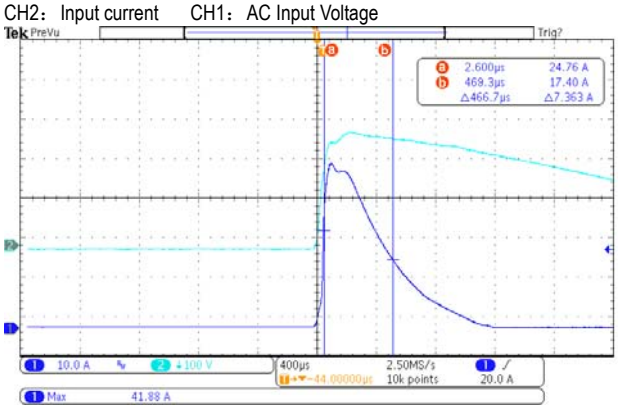
FULL /50% LOAD 50%DUTY / 120HZ



FULL /50% LOAD 50%DUTY / 1KHZ

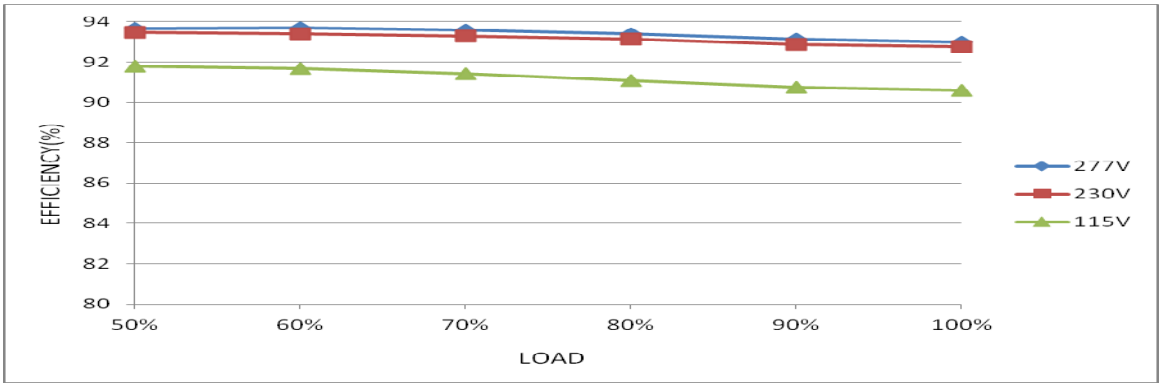


INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305VAC	I/P：TESTING O/P：FULL LOAD Ta：25℃	90V~ 315 V
			I/P： (1)LOW-LINE-3V=97 V HIGH-LINE+10V=315 V O/P：FULL/MIN LOAD ON：30 Sec OFF：30 Sec 10MIN (2)230VAC ON：0.5 Sec OFF：0.5 Sec 20MIN (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℃	TEST： OK
3	AC CURRENT	0.9A/277VAC 1.1A/230VAC 2.2A/115VAC	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =0.72 A/ 277VAC I =0.85 A/ 230VAC I =1.72 A/ 115VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P： 277 VAC O/P：NO LOAD Ta：25℃	L-FG： 0.296 mA N-FG： 0.296 mA
5	NO LOAD CONSUMPTION	<0.5W	I/P：230VAC O/P：NO LOAD Ta：25℃	0.3814W
6	INRUSH CURRENT(Typ)	230VAC/ 65A COLD START (twidth=550us measured at 50% Ipeak) COLD START at 230V	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	I = 41.88A/ 277VAC Twidth =466.7 us/50% Ipeak
	INPUT=230VAC/50HZ @ FULL LOAD CH2：Input current CH1：AC Input Voltage 			

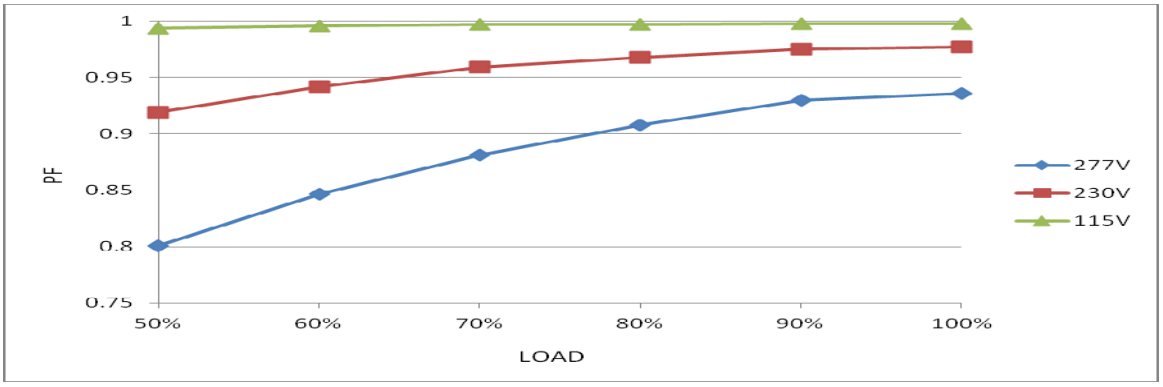
7	EFFICIENCY(Typ)	92%	I/P： 230VAC O/P：FULL LOAD Ta：25℃	92.76%

EFFICIENCY vs LOAD



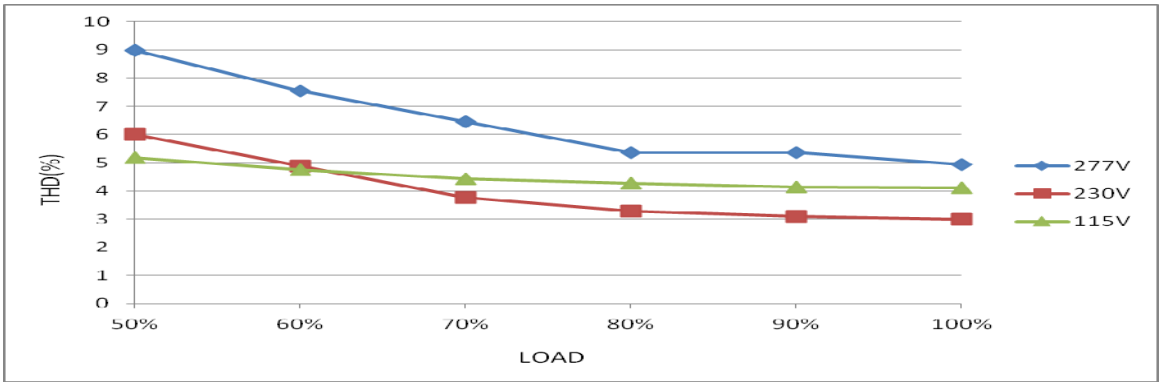
8	POWER FACTOR	0.92/ 277VAC 0.95/ 230VAC 0.97/ 115VAC	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	PF= 0.936 / 277VAC PF= 0.977 / 230VAC PF= 0.998 / 115VAC

P.F vs LOAD



9	TOTAL HARMONIC DISTORTION	THD＜10% （@load≥50%/115VAC， @load≥50%/230VAC， @load≥75%/277VAC）	I/P：115 VAC/50% LOAD I/P：230 VAC/50% LOAD I/P：277 VAC/75% LOAD Ta：25℃	THD=5.17% @50% load /115VAC THD=6.01% @50% load /230VAC THD=5.84% @75% load /277VAC

THD vs LOAD



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER CURRENT PROTECTION	95%~108%	I/P： 100VAC I/P： 230VAC I/P： 305VAC O/P：TESTING Ta：25℃	100.8 %/ 100VAC 100.4 %/ 230VAC 100.6 %/ 305VAC Hiccup mode or Constant Current Limiting，recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	13.5V~18V	I/P： 100VAC I/P： 230VAC I/P： 305VAC O/P：NO LOAD Ta：25℃	17.07V/ 100VAC 16.98V/ 230VAC 17.03V/ 305VAC Shut down output voltage， re-power on to recovery
3	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
4	SHORT CIRCUIT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P： 100VAC I/P： 305VAC O/P：FULL LOAD Ta：25℃	NO DAMAGE Hiccup mode，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 Power Transistor	Q 2 Rated 9A/600V	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	 (1) 452 V (2) 512 V (3) 456 V
2	Diode Peak Voltage	Q100 Rated 100A/40V	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	 (1) 23.3 V (2) 1.0 V (3) 23.4 V
3	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
4	P.F.C DIODE	D1 Rated 9A/ 600V	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	 (1)484V (2)472V (3)464V

5	Control IC	U1 Rated 27V (MAX.)	I/P：High-Line +3V =308 V O/P：((1) FULL LOAD (2) Output Short (3) O.L.P (4) O.V.P (5) Low Line No Load Vo(min) Ta：25℃	 (1) 11.9 V (2) 11.9 V (3) 11.9 V (4) 11.9 V (5) 11.9 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 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：4.125KVAC/min I/P-FG： 2.4 KVAC/min O/P-FG：1.8 KVAC/min Ta：25℃	I/P-O/P：2.666 mA I/P-FG： 2.649 mA O/P-FG：2.435 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：>9999 MΩ I/P-FG： >9999 MΩ O/P-FG：>9999 MΩ
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	15 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

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL： XLG-200-12A 1. ROOM AMBIENT BURN-IN：2 HRS I/P： 230VAC O/P： FULL LOAD Ta=28.4℃ 2. HIGH AMBIENT BURN-IN： 2 HRS I/P： 230VAC O/P： FULL LOAD Ta=53.0℃		

NO	Position	ROOM AMBIENT Ta=28.4 ℃	HIGH AMBIENT Ta=53.0 ℃
1	ZNR3	67.6℃	87.5℃
2	ZNR2	55.9℃	79.9℃
3	ZNR3	57.9℃	82.8℃
4	LF2	57.8℃	82.6℃
5	C9	59.0℃	83.7℃
6	BD1	60.8℃	85.3℃
7	L2	59.4℃	84.7℃
8	Q1	58.8℃	83.5℃
9	D1	60.9℃	86.8℃
10	C5	57.4℃	82.2℃
11	C51	61.1℃	86.8℃
12	C15	60.5℃	86.2℃
13	C10	58.7℃	83.7℃
14	D15	60.5℃	86.2℃
15	R7	59.6℃	84.8℃
16	Q2	62.6℃	87.7℃
17	Q3	62.1℃	87.0℃
18	U1	57.7℃	82.3℃
19	U2	61.4℃	87.3℃
20	T1	67.0℃	94.4℃
21	U101	63.9℃	90.6℃
22	Q100	65.6℃	92.2℃
23	Q101	66.5℃	93.3℃
24	C106	64.6℃	91.5℃
25	C107	63.8℃	90.8℃
26	C109	61.1℃	87.3℃
27	RTH3	58.7℃	83.8℃
28	TC	55.3℃	80.1℃

2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 305VAC/110VAC O/P：100% 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
4	TEMPERATURE COEFFICIENT	±0.03 %/℃(0~60℃)	I/P： 230 VAC O/P：FULL LOAD	±0.014 %/℃(0~60℃)
5	STORAGE TEMPERATURE TEST	-40℃~ +90℃	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	
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= 70 ℃ LIFE TIME (2) I/P： 230VAC O/P：75% LOAD Tc= 70 ℃ LIFE TIME (3) I/P： 230VAC O/P：50% LOAD Tc= 70 ℃ LIFE TIME		(1) 33088 HRS (2) 66904 HRS (3) 108133 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 749.06K hrs min. Telcordia SR-332 (Bellcore) 200.67K 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