



Test Report: XLG-20-H

21W Constant Current Mode LED Driver

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Protection Function Test
Control Function Test
Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

DESIGN VERIFY TEST

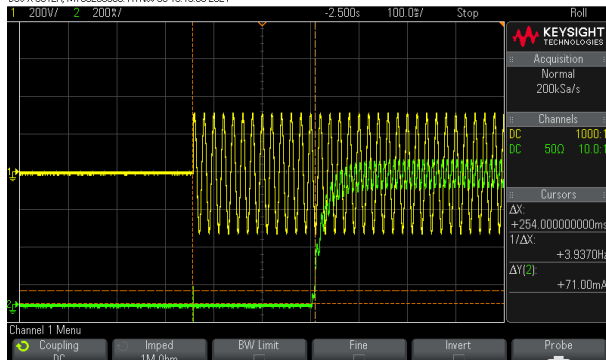
OUTPUT FUNCTION TEST

N O	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT ACCURACY	±8%	I/P: 230 VAC I/P:115VAC O/P:FULL LOAD Ta:25°C LEDH MODE TEST	-1.71%~3.42%
2	LINE REGULATION	< ±3%	I/P: 230 VAC I/P:115VAC O/P:FULL LOAD Ta:25°C LEDH MODE TEST	-1.71%
3	OPEN CIRCUIT VOLTAGE (max)	40V	I/P: 230VAC O/P:NO LOAD CP: OPEN Ta:25°C	35.62V
4	CONSTANT CURRENT OPERATION VOLTAGE	CH1: 18V~30 V	I/P: 230 VAC O/P:FULL LOAD Ta:25°C LEDH MODE TEST	16.2V~32.8V
5	CURRENT RIPPLE	< 20%	I/P: 230 VAC I/P:115VAC O/P:FULL LOAD Ta:25°C LEDH MODE TEST	< 20%
6	SET UP TIME (Max)	230VAC/500ms 115VAC/500ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C LEDH MODE TEST	230VAC/254 ms 115 VAC/250ms

INPUT=230VAC/50HZ @ FULL LOAD

CH1 : Output Voltage CH2 : AC Input Voltage

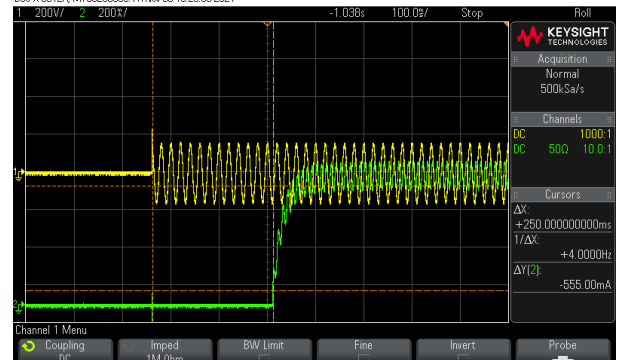
DSO-X 3012A, MY66200390 Fri Nov 05 15:15:53 2021



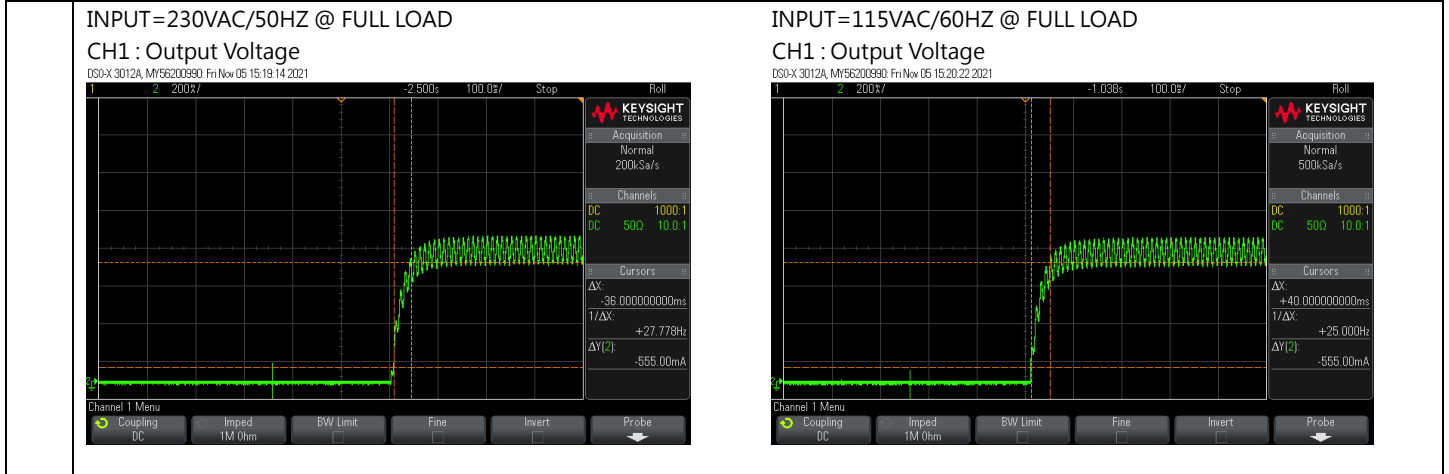
INPUT=115VAC/60HZ @ FULL LOAD

CH1 : Output Voltage CH2 : AC Input Voltage

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7	RISE TIME (Max)	230VAC/150 ms 115VAC/150ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta:25°C LEDH MODE TEST	230VAC/ 36ms 115 VAC/40ms
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DIMMING OPERATION (for B-Type)

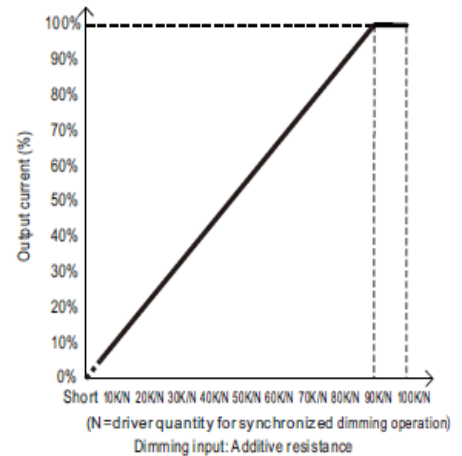
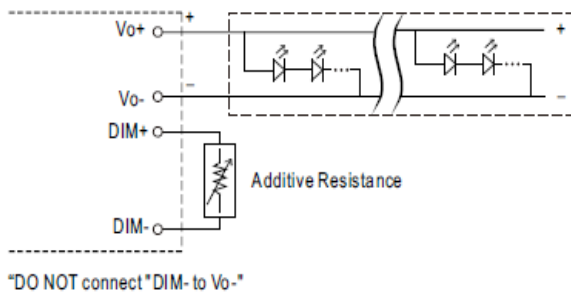
※ 3 in 1 dimming function (for B-Type)

- Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-:
 - 1 ~ 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: 103μA (typ.)

☉ Applying additive 1 ~ 10VDC

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

© Applying additive resistance:



Note : 1. Min. dimming level is about 3% and the output current is not defined when $0% < I_{out} < 3%$.

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

	V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
1	Output Current	0.099 A	0.17 5A	0.247A	0.322A	0.395A	0.468A	0.541A	0.616A	0.688A	0.693A	0.693A
	%	12.83 %	22.7 5%	32.10 %	41.77 %	51.32 %	60.78 %	70.23 %	80.00 %	89.30 %	98.97%	99.03%
2	PWM	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current (100Hz)	0.098 A	0.17 4A	0.247A	0.321A	0.395A	0.468A	0.549A	0.614A	0.686A	0.692A	0.693A
	%	12.78 %	22.6 5%	32.05 %	41.66 %	51.32 %	60.78 %	71.32 %	79.69 %	89.09 %	98.91%	98.97%
3	R	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
	Output Current	0.100 A	0.18 9A	0.250A	0.331A	0.402A	0.465A	0.556A	0.632A	0.691A	0.692A	0.697A
	%	12.94 %	24.5 5%	32.42 %	42.99 %	52.21 %	60.39 %	72.23 %	82.05 %	89.70 %	98.84%	99.60%

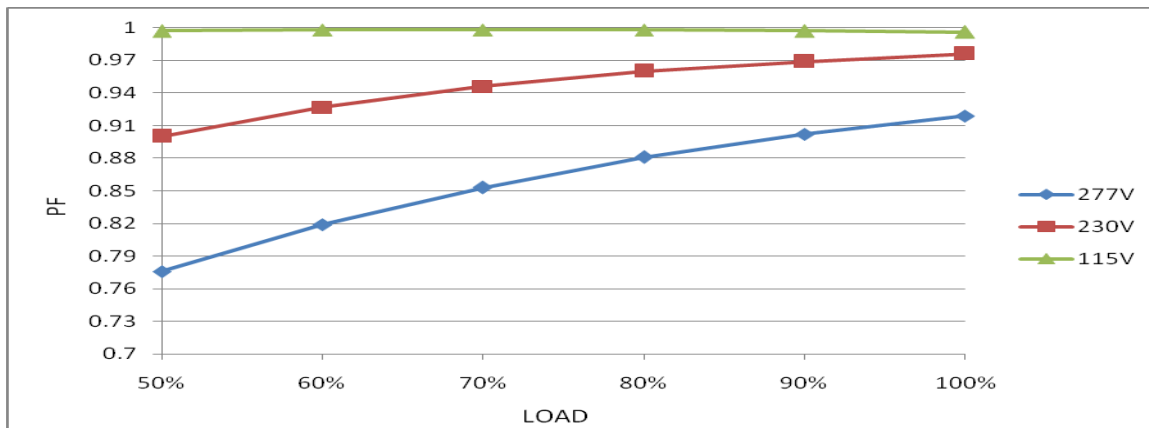
TEST RESULT : OK

INPUT FUNCTION TEST

N	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~305VAC	(1) I/P:TESTING O/P:FULL LOAD Ta:25°C	(1) 87VAC ~308VAC
			I/P: LOW-LINE-3V=87 VAC HIGH-LINE+10V=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: 90 VAC ~305VAC O/P:FULL~MIN LOAD	OK

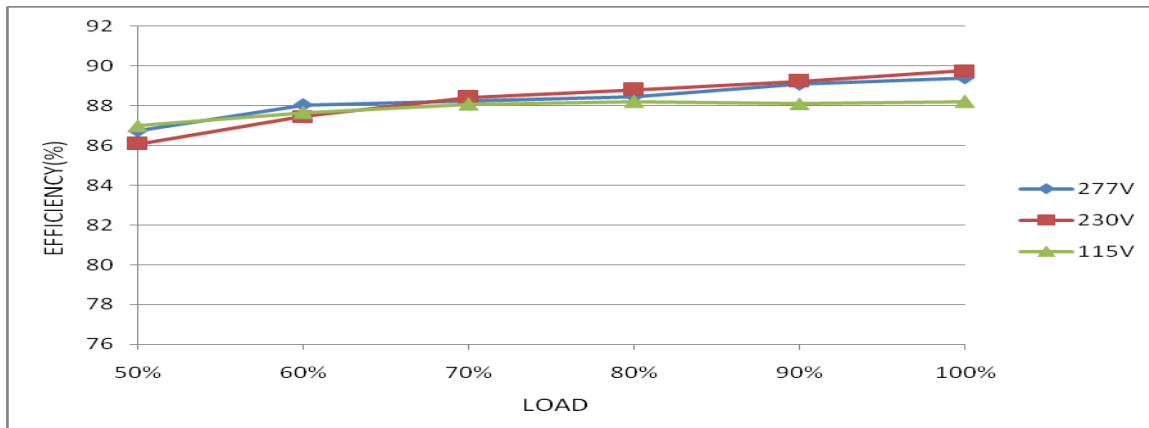
			Ta:25°C	
3	INPUT CURRENT (TYP)	277VAC/0.2A 230 VAC/0.2A 115 VAC/0.3A	I/P: 277VAC/230 VAC/115 VAC O/P:FULL LOAD Ta:25°C LEDH MODE TEST	I= 0.092A/277VAC I = 0.104A/ 230VAC I = 0.202A/ 115VAC
4	NO LOAD POWER CONSUMPTION	<0.5W	I/P: 230 VAC O/P:NO LOAD Ta:25°C	0.394W
5	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.427 mA N-FG: 0.426mA
6	POWER FACTOR(TYP)	0.95/230 VAC FULL LOAD 0.97/115 VAC FULL LOAD 0.91/277 VAC FULL LOAD	I/P: 230 VAC/115VAC/277VAC O/P:FULL LOAD Ta:25°C LEDH MODE TEST	PF= 0.976/230V/100%LOAD PF= 0.996/115V/100%LOAD PF=0.919/277V/100%LOAD

P.F vs LOAD



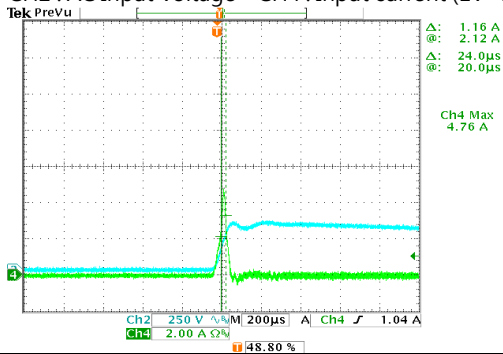
7	EFFICIENCY (TYP)	88 %	I/P: 230 VAC O/P:FULL LOAD Ta:25°C LEDH MODE TEST	89.76%
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EFFICIENCY vs LOAD



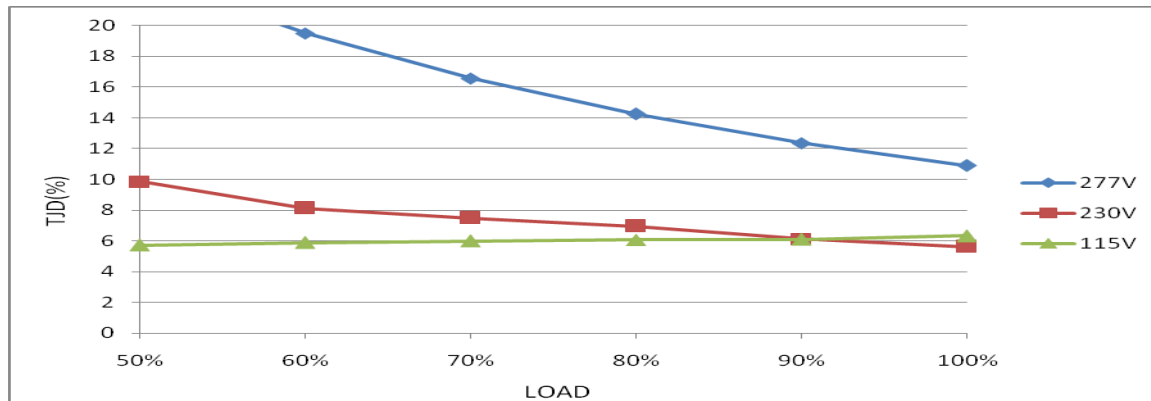
8	INRUSH CURRENT (TYP)	230 V/ 5A COLD START (twitdh=350us measured at 50% Ipeak) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25°C LEDH MODE TEST	I = 4.76A/ 230VAC T50= 24 us
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INPUT=230VAC/50HZ @ FULL LOAD
CH2 : AC Input Voltage CH4 : Input current (1V=1A)



9	TOTAL HARMONIC DISTORTION	THD<20%@load _≥ 50% at 230VAC/115VAC, load _≥ 75% at 277VAC	I/P : 277VAC /230VAC/115VAC O/P : 75%LOAD 50% LOAD Ta : 25°C	THD : 5.72% 115VAC 50% THD : 12.38% 230VAC 50% THD : 15.34% 277VAC 75%
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THD vs LOAD



ROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 305VAC I/P: 90 VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE PROTECTION TYPE : 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	Q1 Rated 6 A/ 800 V	AC ON/OFF I/P:High-Line +3V =308v VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short I/P:Low-Line -3V = 87V VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short	308V VDS: (1) 618V (2) 618V (3) 561V (4) 537V (5) 465V	87V VDS: (1) 293V (2) 289V (3) 257V (4) 245V (5) 150V
2	Diode Peak Voltage	D100 Rated 3 A/ 600 V	AC ON/OFF I/P:High-Line +3V =308 V Q101 : VDS: O/P: (1)LEDmax (2) LEDmax continue (3) Output Short Ta:25°C	(1) 140V (2) 138V (3) 110V	
3	Control IC Voltage Test	PWM IC U1 Rated -0.3V~30V	AC ON/OFF I/P:High-Line +3V =308 V O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) NO LOAD Ta:25°C	U1 (1) 19V (2) 13.8V (3) 17.8V (4) 13.8V (5) 17.8V	
4	Clamp Diode Peak Voltage	D11 Rated : 400V /2A D10 Rated : 1000V /1A	AC ON/OFF I/P : High-Line +3V = 308 V O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) NO LOAD Ta : 25°C	D11 (1)184V (2)183V (3)162V (4)158V (5)183V	D10 (1)563V (2)529V (3)529V (4)505V (5)585V

SAFETY & EMC TEST

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: 3.642mA I/P-FG: 3.428mA O/P-FG: 3.025mA
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: 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°C	9mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P: 230VAC/50Hz O/P:50%/FULL LOAD Ta:25°C	PASS
2	CONDUCTION	EN55015	I/P: 230 VAC (50HZ) O/P:FULL/50% 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 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 INDUSTRY INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA B
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-20-H-B 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=32.3 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=61.1 °C																																																														
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=32.3°C</th> <th>HIGH AMBIENT Ta=61.1°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>D5</td><td>47.3°C</td><td>76.6°C</td></tr> <tr><td>2</td><td>BD1</td><td>48.7°C</td><td>77.9°C</td></tr> <tr><td>3</td><td>C13</td><td>50.5°C</td><td>79.8°C</td></tr> <tr><td>4</td><td>U1</td><td>49.9°C</td><td>79.3°C</td></tr> <tr><td>5</td><td>Q1</td><td>52.6°C</td><td>82.4°C</td></tr> <tr><td>6</td><td>D10</td><td>52.0°C</td><td>81.5°C</td></tr> <tr><td>7</td><td>Q10</td><td>58.6°C</td><td>87.8°C</td></tr> <tr><td>8</td><td>T1 初</td><td>52.6°C</td><td>81.9°C</td></tr> <tr><td>9</td><td>C101</td><td>48.1°C</td><td>77.3°C</td></tr> <tr><td>10</td><td>C102</td><td>50.1°C</td><td>79.4°C</td></tr> <tr><td>11</td><td>D100</td><td>60.4°C</td><td>89.9°C</td></tr> <tr><td>12</td><td>D600</td><td>54.2°C</td><td>83.0°C</td></tr> <tr><td>13</td><td>U600</td><td>49.6°C</td><td>78.9°C</td></tr> <tr><td>14</td><td>TC</td><td>45.3°C</td><td>74.0°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=32.3°C	HIGH AMBIENT Ta=61.1°C	1	D5	47.3°C	76.6°C	2	BD1	48.7°C	77.9°C	3	C13	50.5°C	79.8°C	4	U1	49.9°C	79.3°C	5	Q1	52.6°C	82.4°C	6	D10	52.0°C	81.5°C	7	Q10	58.6°C	87.8°C	8	T1 初	52.6°C	81.9°C	9	C101	48.1°C	77.3°C	10	C102	50.1°C	79.4°C	11	D100	60.4°C	89.9°C	12	D600	54.2°C	83.0°C	13	U600	49.6°C	78.9°C	14	TC	45.3°C	74.0°C
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230VAC/100VAC O/P : 100%LOAD Ta= -45/-30 °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 : 315 VAC O/P : FULL LOAD Ta=60 °C HUMIDITY= 95 %R.H	TEST : OK																																																												
4	TEMPERATURE COEFFICIENT	$\pm 0.03 \%$ /(0°C~50°C)	I/P : 230 VAC O/P : FULL LOAD	$\pm 0.001 \%$ /°C(0~50°C)																																																												
5	STORAGE TEMPERATURE TEST	-40~80°C	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10CYCLE 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 : 16 CYCLE 5. Input/Output condition : 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test TEST : OK
7	VIBRATION TEST	10 ~ 500Hz, 5G 10min./1cycle, 60min. 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 : 180min in each axis (X.Y.Z) (6) Ta : 25°C
8	CAPACITOR LIFE CYCLE	SUPPOSE C102 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Tc=80 °C LIFE TIME (2) I/P : 230VAC O/P : 75% LOAD Tc=80 °C LIFE TIME (3) I/P : 230VAC O/P : 50% LOAD Tc= 80 °C LIFE TIME	(1) 57274HRS (2) 59350HRS (3) 61059HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 5721.2K hrs min. Telcordia SR-332 (Bellcore); 747.1K 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	LINKX