



# Test Report: XLG-320-L-DA2

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320W Constant Power Mode with DALI-2 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:230VAC O/P:LEDmax CP: 1.05A & 1.4A Ta:25°C	CP 1.05A: 1.056A/230VAC@CV MAX-1V 1.057A/230VAC@CV MIN  0.67% CP 1.4A: 1.403A/230VAC@CV MAX-1V 1.407A/230VAC@CV MIN 0.5%
2	FULL POWER CURRENT RANGE	1050~1400 mA	I/P: 230VAC O/P:LEDmax CP: 1.05A & 1.4A Ta:25°C	300V/1.05A/230VAC 223V/1.4A/230VAC
3	OPEN CIRCUIT VOLTAGE (max)	340V	I/P: 230VAC O/P:NO LOAD CP: OPEN Ta:25°C	338V
4	CONSTANT CURRENT REGION	CP 1.05A: CH1: 150V~ 300V  CP 1.4A: CH1: 150V~ 223V	I/P: 230VAC O/P:LEDmax CP: 1.05A &1.4A Ta:25°C	CP 1.05A: 116V~ 300V/230VAC  CP 1.4A: 130.8V~ 223V/230VAC
5	CURRENT ADJ. RANGE	CH1: 500mA~1400mA	I/P: 230VAC O/P:CVmin& CVmax-1V CP: 1.05A & 1.4A Ta:25°C	401mA~1120mA/230VAC@CV MAX-1V 408mA~1630mA/230VAC@CV MIN
6	CURRENT RIPPLE	5.0% max.	I/P: 230VAC O/P:LEDmax CP: 1.05A &1.4 A Ta:25°C	CP 1.05A: 3.12%  CP 1.4A: 2.57%
7	AUXILIARY DC OUTPUT	12V@250mA tolerance ± 10%, ripple 200mVp-p (only for DA2-A-type)	I/P: 230VAC O/P:LEDmax CP: 1.05A &1.4 A Ta:25°C	PASS

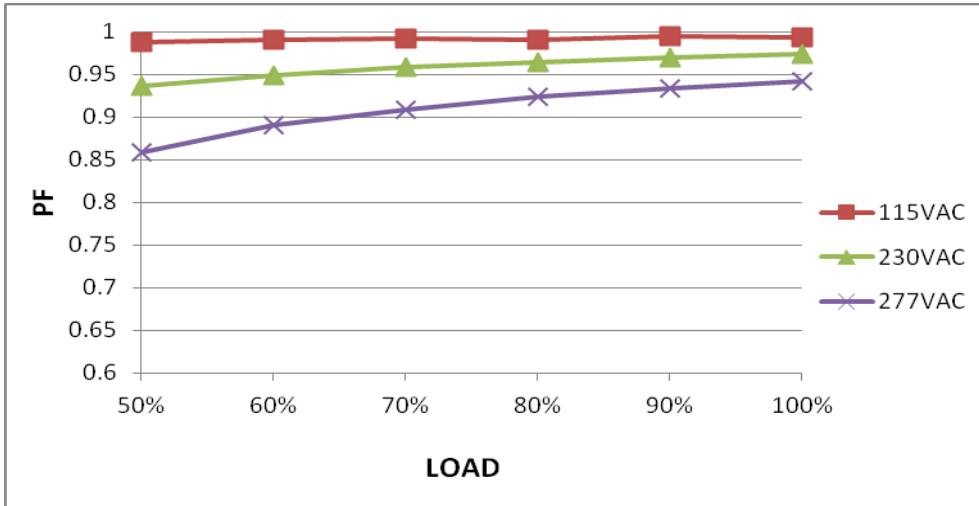
8	SET UP TIME	230VAC/ 500ms (Max) 115VAC/1200 ms (Max)	I/P: 230VAC I/P: 115VAC  O/P:LEDmax CP 1.05A Ta:25°C	230VAC/220ms 115VAC/ 328ms
INPUT=230VAC/50HZ @ LEDMAX@ CP1.05 A CH1 : Output Voltage CH2 : AC Input Voltage		INPUT=230VAC/60HZ @ LEDMAX@ CP 1.05A CH1 : Output Voltage CH2 : AC Input Voltage		

### 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:LEDmax (2) I/P:DC TESTING(L:+ N:-) O/P:LEDmax (3) I/P:DC TESTING(L:- N:+) O/P:LEDmax (PLEASE CHECK DERATING CURVE) Ta:25°C  I/P: LOW-LINE-3V=97 V HIGH-LINE+10V=315 V O/P: LEDmax / LEDmin CP 1.05A (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN ( POWER ON/OFF NO DAMAGE )	(1) 100 VAC~308VAC (2) 142VDC ~ 431VDC (3) 142VDC ~ 431VDC          (1).TEST:ok. (2).TEST :ok
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 100 VAC ~305VAC O/P: LEDmax ~ LEDmin CP 1.4A Ta:25°C	TEST:ok
3	INPUT CURRENT (TYP)	230VAC/ 1.6A 115VAC/ 3.2A 277VAC/1.3A	I/P: 230VAC/277VAC/115VAC O/P:LEDmax CP:1.4 A Ta:25°C	I =1.495A/ 230VAC I =2.698A/115VAC I =1.267A/277VAC

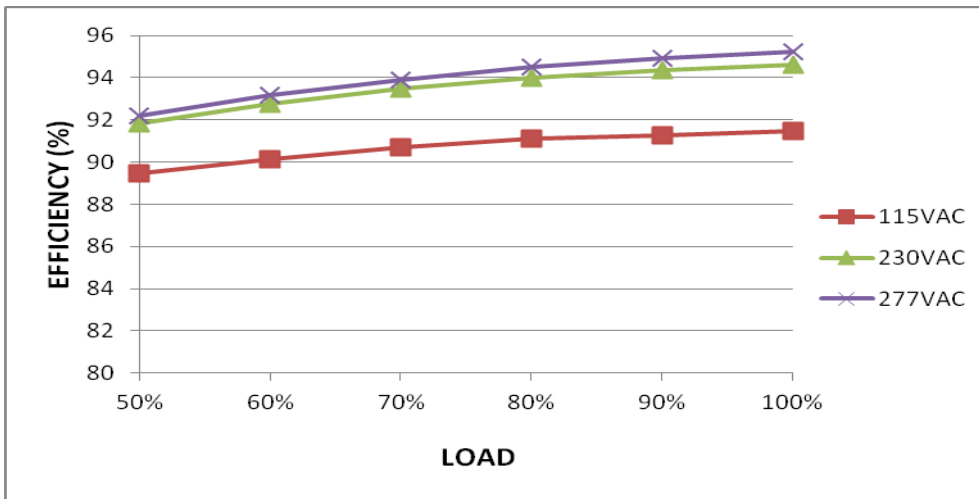
4	LEAKAGE CURRENT	EN61230-1 < 0.75mA / 277VAC	I/P: 277 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.461mA N-FG: 0.462mA
5	STANDBY POWER CONSUMPTION	Standby power consumption <0.5W (Dimming OFF, Only for standard version DA2-type)	I/P : 230VAC O/P : NO LOAD Ta : 25°C	0.4418W
6	POWER FACTOR(TYP)	0.92/277VAC LEDMAX 0.95/230VAC LEDMAX 0.97/115VAC LEDMAX	I/P: 115VAC/230VAC/277VAC O/P:LEDmax CP:1.4 A Ta:25°C	PF=0.942 /277V/100%LOAD PF=0.974/230V/100%LOAD PF=0.993/115V/100%LOAD

P.F vs LOAD

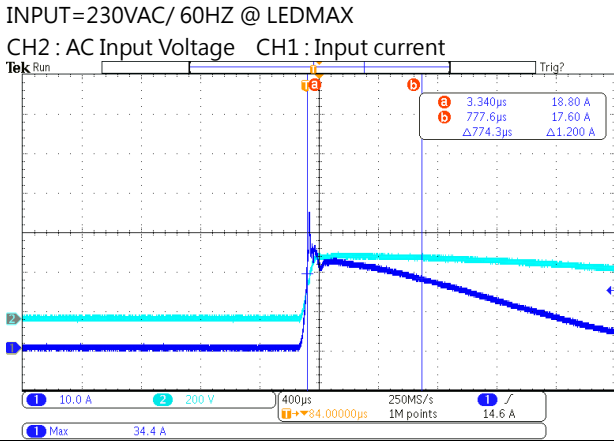


7	EFFICIENCY (TYP)	94.5 %	I/P: 230VAC O/P:LEDmax CP: 1.4 A Ta:25°C	94.63%
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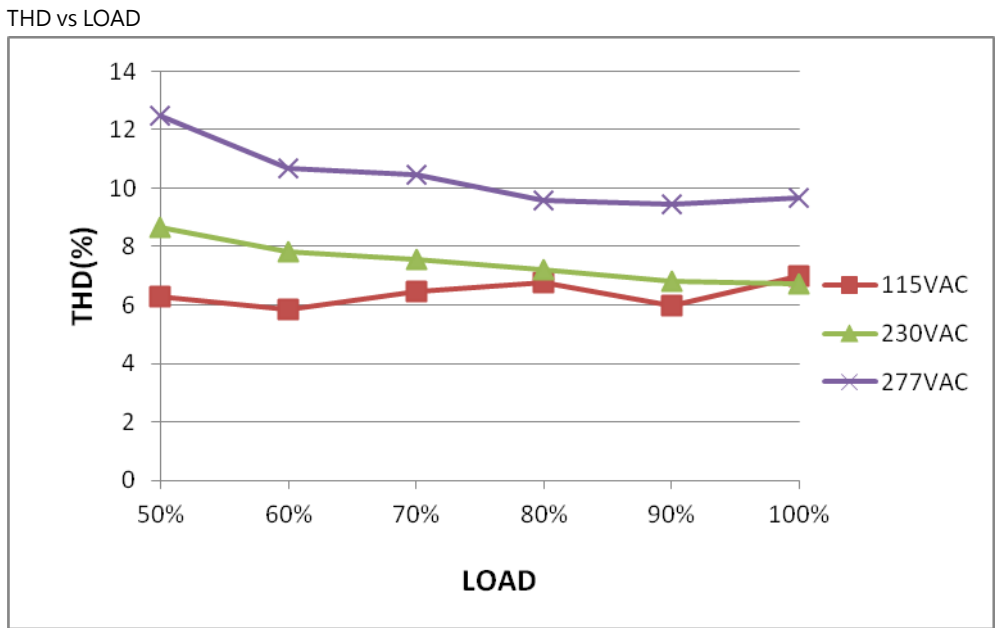
EFFICIENCY vs LOAD



8	INRUSH CURRENT (TYP)	230V/ 45A COLD START  (twidh=1200 usmeasured at 50% Ipeak) COLD START	I/P: 230VAC O/P:LEDmax CP:1.4 A Ta:25°C	I =34.4A /230VAC  T50= 773.3 μ S
	INPUT=230VAC/ 60HZ @ LEDMAX CH2 : AC Input Voltage CH1 : Input current			



9	TOTAL HARMONIC DISTORTION	THD < 10% @ 230VAC > 50% loading THD < 10% @ 115VAC > 50% loading THD < 15% @ 277VAC > 75% loading	I/P : 277/230/115VAC O/P : 75%/50% LOAD CP :1.4A Ta : 25°C	THD : 8.67%230V 50% THD : 6.3%115V50% THD : 10.10%277V 75%
	THD vs LOAD			



## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 305 VAC I/P: 100 VAC O/P: LEDmax CP: 1.4A Ta: 25°C	O.T.P. Active PROTECTION TYPE : OK Stage 1: Derating to 75% loading; stage 2: Derating to 50% loading, recovers automatically after fault condition is removed
2	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 305VAC I/P: 100 VAC O/P: LEDMAX CP: 1.05 A & 1.4A Ta: 25°C	CP: 1.05A NO DAMAGE PROTECTION TYPE : Hiccup mode or Constant current limiting, recovers automatically after fault condition is removed CP: 1.4A NO DAMAGE PROTECTION TYPE : Hiccup mode or Constant current limiting, recovers automatically after fault condition is removed
3	INPUT OVER VOLTAGE (for XLG-320I only)	320 ~ 390VAC (Shut down output voltage when the input voltage exceeds protection voltage, recovers automatically after fault condition is removed)  Can survive input voltage stress of 440Vac for 48 hours	I/P: TESTING O/P: LEDMAX	pass

### COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor ( D to S) or (C to E) <b>Peak Voltage</b>	Q8 Rated 13 A/ 600V	I/P:High-Line +3V =308v AC ON/OFF <b>CP: 1.05A&amp;1.4A</b> VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short I/P:Low-Line -3V = 97V VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short  Ta:25°C	308V <b>CP: 1.05A</b> Q8 VDS: (1) 489V (2) 457V (3) 485V (4) 453V (5) 529V <b>CP: 1.4A</b> <b>VDS:</b> (1) 481V (2) 453V (3) 481V (4) 469V (5) 525V  97V <b>CP:1.05 A</b> Q8 VDS: (1) 491V (2) 472V (3) 482V (4) 449V (5) 489V <b>CP: 1.4A</b> VDS: (1) 491V (2) 462V (3) 484V (4) 462V (5) 499V
2	P.F.C Transistor ( D to S) or (C to E) <b>Peak Voltage</b>	Q1 Rated 20 A/ 600V	I/P:High-Line +3V =308v AC ON/OFF <b>CP: 1.05A</b> VDS: O/P: (1)LEDmax (2) LEDmax continue (3) LEDmin (4) LEDmin continue (5) Output Short	<b>CP: 1.05</b> Q1 VDS: (1) 488V (2) 480V (3) 477V (4) 472V (5) 497V

			<p>I/P:Low-Line -3V = 97V  VDS:  O/P: (1)LEDmax  (2) LEDmax continue  (3) LEDmin  (4) LEDmin continue  (5) Output Short</p> <p>Ta:25°C</p>	<p>Q1  VDS:  (1) 492V  (2) 484V  (3) 492V  (4) 484V  (5) 473V</p>
3	P.F.C DIODE	D5 Rated 9 A/ 600 V	<p>I/P:High-Line +3V =308v  AC ON/OFF  <b>CP:1.05 A</b>  VDS:  O/P: (1)LEDmax  (2) LEDmax continue  (3) LEDmin  (4) LEDmin continue  (5) Output Short</p> <p>I/P:Low-Line -3V = 97V  O/P: (1)LEDmax  (2) LEDmax continue  (3) LEDmin  (4) LEDmin continue  (5) Output Short</p> <p>Ta:25°C</p>	<p>(1) 501V  (2) 452V  (3) 493V  (4)486V  (5)449V</p> <p>(1) 472V  (2) 465V  (3) 478V  (4)452V  (5)465V</p>
4	Diode Peak Voltage	D100 Rated: 9A/600V	<p>I/P:High-Line +3V =308v  AC ON/OFF  <b>CP: 1.05A&amp;1.4A</b>  VDS:  O/P: (1)LEDmax  (2) LEDmax continue  (3) Output Short</p> <p>Ta:25°C</p>	<p><b>CP: 1.05A</b>  Q100  VDS:  (1) 307V  (2) 307V  (3) 309V  <b>CP: 1.4A</b>  Q100  VDS:  (1) 242V  (2) 238V  (3) 22V</p>
5	Input Capacitor Voltage	C5 Rated: 180;μ /450 V Surge voltage: 500 V	<p>I/P:High-Line +3V =308v  AC ON/OFF  <b>CP: 1.05A</b>  VDS:  O/P: (1)LEDmax  (2) LEDmax continue  (3) LEDmin  (4) LEDmin continue</p> <p>Ta:25°C</p>	<p>(1) 452V  (2) 445V  (3) 461V  (4) 435V</p>



6	Control IC Voltage Test	<p>PWM IC U2 Rated 8.9 V~ 15.5V</p> <p>PFC IC U1 Rated 10.5V~ 20V</p> <p>O/P IC U107 Rated 8V~ 24V</p>	<p>I/P:High-Line +3V =308v AC ON/OFF <b>CP: 1.05A</b> VDS: O/P: (1)LEDmax (2) LEDmin (3) Output Short (4) NO LOAD VRmin.LOW LINE Ta:25°C</p>	<p><b>U1/U2:</b> (1) 14.3V (2) 14.5V (3) 14.1V (4) 14.1V</p> <p><b>U107</b> (1) 11.3V (2) 11.1V (3) 10.9V (4) 10.5V</p>
7	VCC Diode Peak Voltage	<p>D304 Rated 400 V2 A</p> <p>D401 Rated 400 V 2A</p>	<p>AC ON/OFF I/P : High-Line +3V = 308 V O/P : (1) Full load (2) Full load continue  Ta : 25°C</p>	<p>D304 (1) 159V (2) 147V</p> <p>D401 (1) 138V (2) 129V</p>
8	TOP SWITCHING STAND BY POWER	<p>U300 Rated 1.5A/ 750V</p>	<p>AC ON/OFF <b>CP: 1.05A</b> I/P:High-Line +3V =308 V O/P: (1)LEDmax (2) LEDmin I/P:Low-Line -3V =97 V O/P: (1)LEDmax (2) LEDmin  Ta:25°C</p>	<p><b>CP:1.05 A</b> (1) 581V (2) 562V  (1) 568 V (2) 554V</p>

## SAFETY & EMC TEST

### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	EN61230-1 I/P-O/P: 3.75KVAC/min I/P-FG: 2 KVAC/min O/P-FG:1.8KVAC/min	I/P-O/P: 4.125 KVAC/min I/P-FG: 2.4KVAC/min O/P-FG: 2.16 KVAC/min Ta:25°C	I/P-O/P: 2.584mA I/P-FG: 2.455mA O/P-FG: 2.235mA 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: 9999M Ω 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 ■ LIGHT INDUSTRY AIR : 8KV / Contact : 4KV	I/P: 230VAC (50HZ) O/P:LEDmax Ta:25°C	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 2KV	I/P: 230VAC (50HZ) O/P:LEDmax Ta:25°C	CRITERIA A
6	SURGE	IEC61000-4-5 light industry L-N :4KV L,N-PE:6KV	I/P: 230VAC (50HZ) O/P:LEDmax 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-320-L-DA2-A 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=27.8 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=48.4 °C																																																																																																																		
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=27.8°C</th> <th>HIGH AMBIENT Ta=48.4°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>RTH1</td><td>64.3°C</td><td>84.0°C</td></tr> <tr><td>2</td><td>BD1</td><td>65.1°C</td><td>84.0°C</td></tr> <tr><td>3</td><td>C5</td><td>61.1°C</td><td>80.1°C</td></tr> <tr><td>4</td><td>L2</td><td>64.3°C</td><td>84.0°C</td></tr> <tr><td>5</td><td>U2</td><td>61.2°C</td><td>80.7°C</td></tr> <tr><td>6</td><td>Q1</td><td>64.1°C</td><td>83.3°C</td></tr> <tr><td>7</td><td>Q2</td><td>64.7°C</td><td>84.0°C</td></tr> <tr><td>8</td><td>C16</td><td>66.8°C</td><td>86.7°C</td></tr> <tr><td>9</td><td>Q7</td><td>68.0°C</td><td>88.4°C</td></tr> <tr><td>10</td><td>D6</td><td>70.4°C</td><td>90.5°C</td></tr> <tr><td>11</td><td>U1</td><td>60.4°C</td><td>79.1°C</td></tr> <tr><td>12</td><td>C88</td><td>65.8°C</td><td>85.2°C</td></tr> <tr><td>13</td><td>T1</td><td>70.8°C</td><td>90.6°C</td></tr> <tr><td>14</td><td>T1core</td><td>66.1°C</td><td>85.9°C</td></tr> <tr><td>15</td><td>D100</td><td>65.1°C</td><td>85.0°C</td></tr> <tr><td>16</td><td>D102</td><td>63.1°C</td><td>83.8°C</td></tr> <tr><td>17</td><td>C104</td><td>62.4°C</td><td>82.4°C</td></tr> <tr><td>18</td><td>C106</td><td>61.5°C</td><td>81.3°C</td></tr> <tr><td>19</td><td>U300</td><td>71.2°C</td><td>91.6°C</td></tr> <tr><td>20</td><td>T2</td><td>70.5°C</td><td>90.3°C</td></tr> <tr><td>21</td><td>C312</td><td>66.3°C</td><td>85.7°C</td></tr> <tr><td>22</td><td>C480</td><td>61.7°C</td><td>80.9°C</td></tr> <tr><td>23</td><td>U430</td><td>56.7°C</td><td>75.5°C</td></tr> <tr><td>24</td><td>U431</td><td>58.2°C</td><td>77.2°C</td></tr> <tr><td>25</td><td>RG47</td><td>63.9°C</td><td>83.2°C</td></tr> <tr><td>26</td><td>RT22</td><td>63.0°C</td><td>82.3°C</td></tr> <tr><td>27</td><td>TC</td><td>57.3°C</td><td>76.0°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=27.8°C	HIGH AMBIENT Ta=48.4°C	1	RTH1	64.3°C	84.0°C	2	BD1	65.1°C	84.0°C	3	C5	61.1°C	80.1°C	4	L2	64.3°C	84.0°C	5	U2	61.2°C	80.7°C	6	Q1	64.1°C	83.3°C	7	Q2	64.7°C	84.0°C	8	C16	66.8°C	86.7°C	9	Q7	68.0°C	88.4°C	10	D6	70.4°C	90.5°C	11	U1	60.4°C	79.1°C	12	C88	65.8°C	85.2°C	13	T1	70.8°C	90.6°C	14	T1core	66.1°C	85.9°C	15	D100	65.1°C	85.0°C	16	D102	63.1°C	83.8°C	17	C104	62.4°C	82.4°C	18	C106	61.5°C	81.3°C	19	U300	71.2°C	91.6°C	20	T2	70.5°C	90.3°C	21	C312	66.3°C	85.7°C	22	C480	61.7°C	80.9°C	23	U430	56.7°C	75.5°C	24	U431	58.2°C	77.2°C	25	RG47	63.9°C	83.2°C	26	RT22	63.0°C	82.3°C	27	TC	57.3°C	76.0°C
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16	D102	63.1°C	83.8°C																																																																																																																	
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18	C106	61.5°C	81.3°C																																																																																																																	
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/120VAC O/P : 100%LOAD Ta= -45/-35 °C	TEST : OK																																																																																																																
3	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																																																																																																																

4	TEMPERATURE COEFFICIENT	$\pm 0.06$ %/(0°C~60°C)	I/P : 230 VAC O/P : FULL LOAD	$\pm 0.001$ %/°C(0~60°C)
5	STORAGE TEMPERATURE TEST	-40~80°C	1. Thermal shock Temperature : -45°C~ +85°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 : AC OFF STATIC TEST : OK	
6	THERMAL SHOCK TEST	-40~45°C	1. Thermal shock Temperature : -45°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 TEST : OK	
7	VIBRATION TEST	10 ~ 500Hz, 5G 12min./1cycle, 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 : 180min in each axis (X.Y.Z) (6) Ta : 25°C	
8	CAPACITOR LIFE CYCLE	SUPPOSE C104 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Tc=70 °C LIFE TIME (2) I/P : 230VAC O/P : 75% LOAD Tc=70 °C LIFE TIME (3) I/P : 230VAC O/P : 50% LOAD Tc= 70 °C LIFE TIME		(1) 70570HRS (2) 71048HRS (3) 72782HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 1397.7K hrs min. Telcordia SR-332 (Bellcore); 145.1K 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/HUANGMK	WENF	LINKX