



# Test Report: SLD-50-24

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50W Constant Voltage+ Constant Current 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

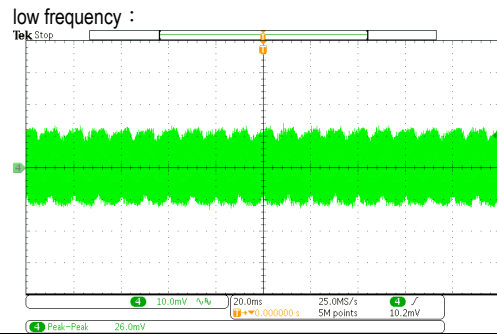
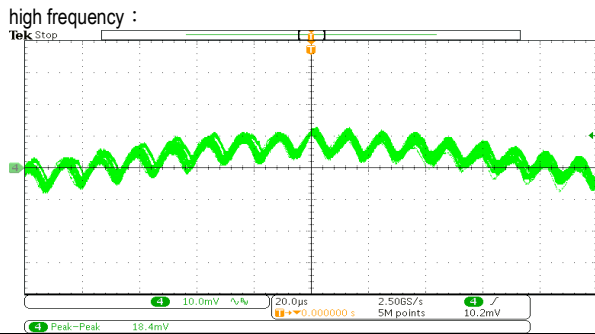
## ■ RELIABILITY TEST

Environment Test

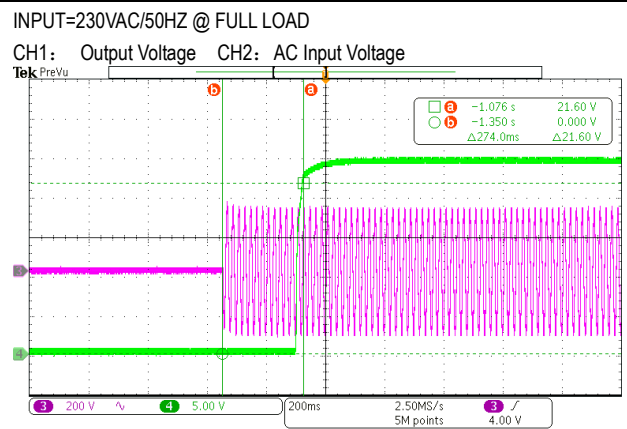
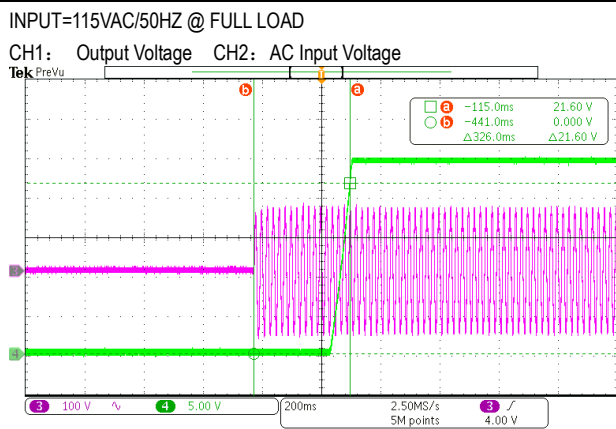
DESIGN VERIFY TEST

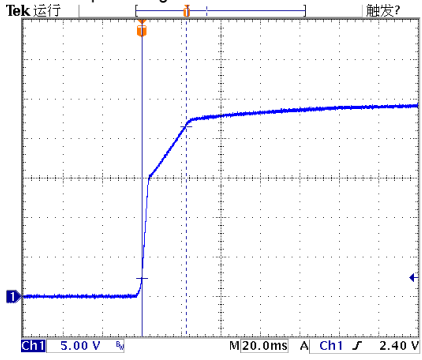
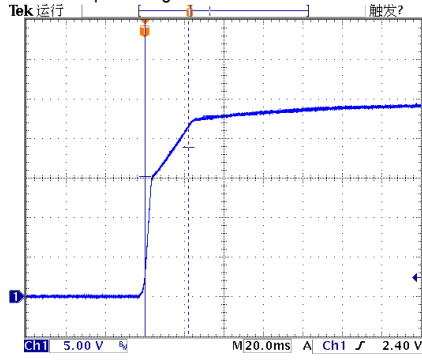
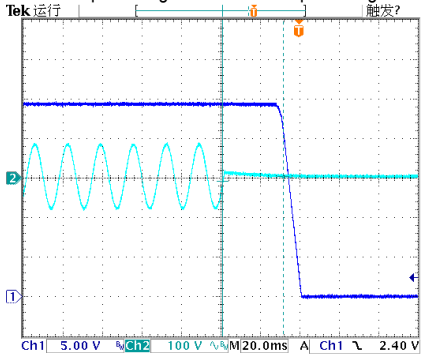
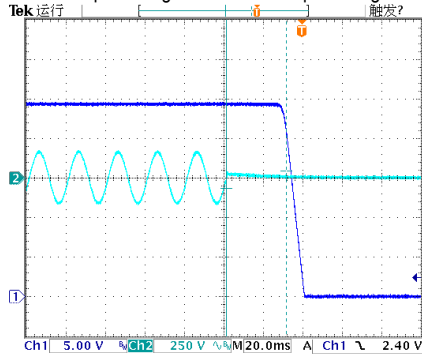
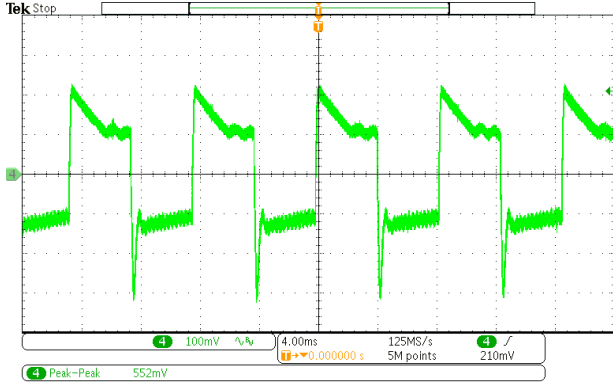
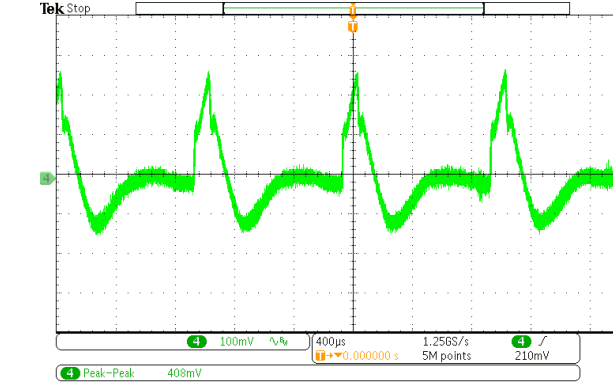
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	16.8V~24V	I/P: 230VAC O/P: LED MODE Ta: 25°C	14.3V~ 24 V
2	VOLTAGE TOLERANCE	-3%~+3%	I/P: 90VAC / 305VAC O/P: FULL/ NO LOAD Ta: 25°C	-1.16%~ 1.33%
3	LINE REGULATION	-0.5%~+0.5%	I/P: 90VAC ~ 305VAC O/P: FULL LOAD Ta: 25°C	-0.04%~0 .04%
4	LOAD REGULATION	-0.5%~+0.5%	I/P: 230VAC O/P: FULL ~NO LOAD Ta: 25°C	-0.08%~ 0.08%
5	OVER/UNDERSHOOT TEST	<±5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	±2.4%
6	RIPPLE & NOISE (Max)	240mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	26mVp-p



7	SET UP TIME(Max)	115VAC/500ms 230VAC/ 500ms	I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	115VAC/ 326 ms 230VAC/ 274 ms
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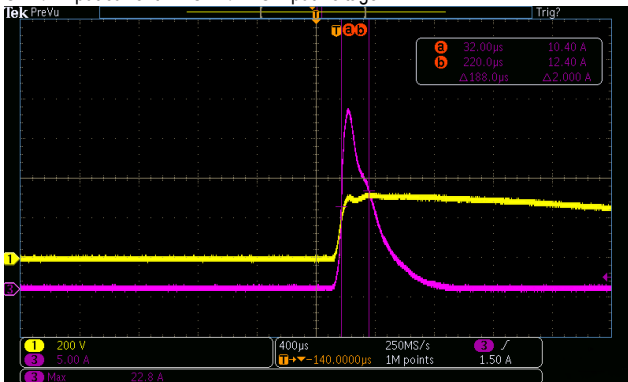
<p>8</p> <p>RISE TIME (Max)</p>	<p>115VAC/ 80ms 230VAC/ 80ms</p>	<p>I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C</p>	<p>115VAC/ 22.4 ms 230VAC/ 22.0 ms</p>
<p>INPUT=115VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage</p> 		<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage</p> 	
<p>9</p> <p>HOLD UP TIME(Typ)</p>	<p>115VAC/ 10ms 230VAC/ 10ms</p>	<p>I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C</p>	<p>115VAC/ 30.8 ms 230VAC/ 30.4 ms</p>
<p>INPUT=115VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> 		<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> 	
<p>10</p> <p>DYNAMIC LOAD</p>	<p>V1: 2400 mVp-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>(1) 552mVp-p (2) 408mVp-p</p>
<p>FULL /50% LOAD 50%DUTY / 120HZ</p> 		<p>FULL /50% LOAD 50%DUTY / 1KHZ</p> 	

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	110VAC~305VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C (PLEASE CHECK DERATING CURVE)	92V~ 310 V
			I/P: (1)LOW-LINE-3V=97 V HIGH-LINE+10V=315 V O/P: FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) 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: 110 VAC ~305 VAC O/P: FULL~NO LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	0.25A/277VAC 0.3A/230VAC 0.6A/115VAC	I/P: 277 VAC I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I=0.20 A/ 277VAC I=0.24 A/ 230VAC I=0.47 A/ 115VAC
4	LEAKAGE CURRENT	< 0.25mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.030 mA N-FG: 0.029 mA
5	NO LOAD CONSUMPTION	<0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.32W
6	INRUSH CURRENT(Typ)	230VAC/ 50A COLD START (twidth=270us measured at 50% Ipeak) COLD START at 230V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I = 22.8A/ 230VAC Twidth =188 us

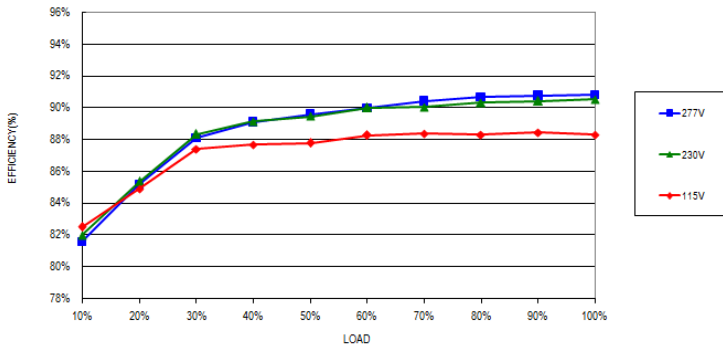
INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



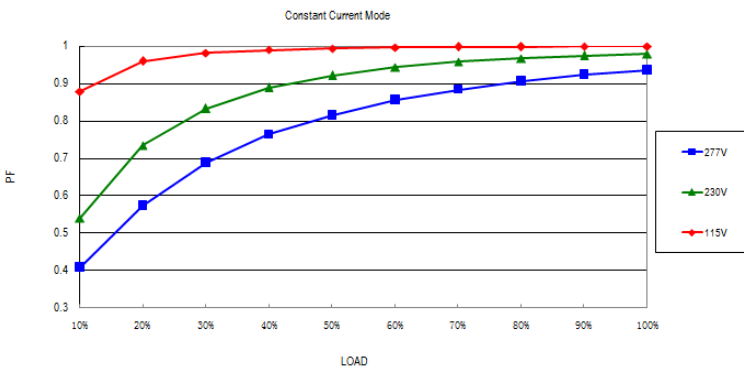
7	EFFICIENCY(Typ)	90%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	90.54%
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EFFICIENCY vs LOAD



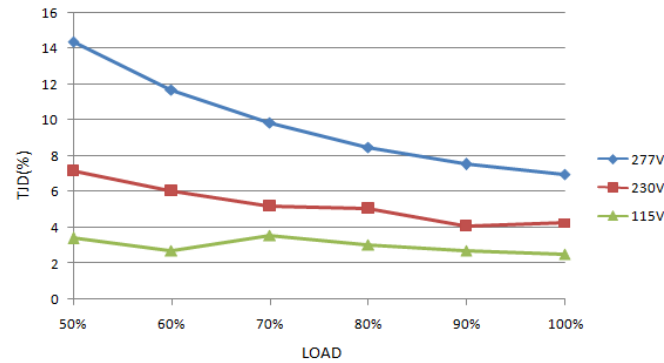
8	POWER FACTOR	0.92/ 277VAC 0.95/ 230VAC 0.97/ 115VAC	I/P: 277 VAC I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	PF= 0.936 / 277VAC PF= 0.979 / 230VAC PF= 0.999 / 115VAC
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P.F vs LOAD



9	TOTAL HARMONIC DISTORTION	THD < 10% ( @load ≥ 60%/115VAC, @load ≥ 60%/230VAC, @load ≥ 75%/277VAC )	I/P: 115 VAC/60% LOAD I/P: 230 VAC/60% LOAD I/P: 277 VAC/75% LOAD Ta: 25°C	THD=2.84% @60% load /115VAC THD=6.06% @60% load /230VAC THD=8.27% @75% load /277VAC
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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°C	102.8 %/ 100VAC 102.9 %/ 230VAC 103.2%/ 305VAC Constant Current Limiting or Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	28V~34V	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: NO LOAD Ta: 25°C	29.69V/ 100VAC 29.91V/ 230VAC 29.65V/ 305VAC Shut down and latch off o/p 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 recover
4	SHORT CIRCUIT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 100VAC I/P: 305VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup mode, recovers automatically after fault condition is removed

**COMPONENT STRESS TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Power Transistor	Q2 Rated 6A/800V	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 660 V (2) 540 V (3) 652 V
2	Diode Peak Voltage	D100 Rated 15A/150V	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 104 V (2) 124 V (3) 103 V
3	PFC Transistor	Q1 Rated 8A/600V	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 492 V (2) 496 V (3) 452 V
4	P.F.C DIODE	D5 Rated 3A/ 600V	I/P: High-Line +3V =308V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 452V (2) 456V (3) 434V
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°C	(1) 17.3 V (2) 17.3 V (3) 17.1 V (4) 17.3 V (5) 14.1 V

6	Input Capacitor Voltage	C5 Rated: 18 $\mu$ F/ 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°C	(1)446V (2)442V (3)442V (4)448V
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### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min	I/P-O/P: 4.125 KVAC/min Ta: 25°C	I/P-O/P: 1.953 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100M $\Omega$	I/P-O/P: 500 VDC Ta: 25°C	I/P-O/P: >9999 M $\Omega$

### 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/60% 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
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N: 1KV	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: SLD-50-24 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=25.9°C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=50.7°C																																																																																		
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=25.9 °C</th> <th>HIGH AMBIENT Ta=50.7 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>51.4°C</td><td>73.4°C</td></tr> <tr><td>2</td><td>C7</td><td>48.3°C</td><td>70.5°C</td></tr> <tr><td>3</td><td>Q1</td><td>60.7°C</td><td>81.2°C</td></tr> <tr><td>4</td><td>R5</td><td>62.3°C</td><td>83.2°C</td></tr> <tr><td>5</td><td>C5</td><td>59.8°C</td><td>80.1°C</td></tr> <tr><td>6</td><td>C15</td><td>68.5°C</td><td>89.3°C</td></tr> <tr><td>7</td><td>Q2</td><td>89.4°C</td><td>109.8°C</td></tr> <tr><td>8</td><td>R60</td><td>78.2°C</td><td>99.1°C</td></tr> <tr><td>9</td><td>T1</td><td>79.4°C</td><td>100.3°C</td></tr> <tr><td>10</td><td>T1core</td><td>77.9°C</td><td>98.0°C</td></tr> <tr><td>11</td><td>D7</td><td>89.4°C</td><td>110.3°C</td></tr> <tr><td>12</td><td>U2</td><td>73.7°C</td><td>94.5°C</td></tr> <tr><td>13</td><td>D100</td><td>88.1°C</td><td>110.3°C</td></tr> <tr><td>14</td><td>C105</td><td>64.0°C</td><td>85.9°C</td></tr> <tr><td>15</td><td>C106</td><td>59.4°C</td><td>81.6°C</td></tr> <tr><td>16</td><td>J100</td><td>64.1°C</td><td>86.8°C</td></tr> <tr><td>17</td><td>LF100</td><td>52.4°C</td><td>75.2°C</td></tr> <tr><td>18</td><td>RTH2</td><td>71.6°C</td><td>92.6°C</td></tr> <tr><td>19</td><td>TC</td><td>58.6°C</td><td>79.5°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=25.9 °C	HIGH AMBIENT Ta=50.7 °C	1	BD1	51.4°C	73.4°C	2	C7	48.3°C	70.5°C	3	Q1	60.7°C	81.2°C	4	R5	62.3°C	83.2°C	5	C5	59.8°C	80.1°C	6	C15	68.5°C	89.3°C	7	Q2	89.4°C	109.8°C	8	R60	78.2°C	99.1°C	9	T1	79.4°C	100.3°C	10	T1core	77.9°C	98.0°C	11	D7	89.4°C	110.3°C	12	U2	73.7°C	94.5°C	13	D100	88.1°C	110.3°C	14	C105	64.0°C	85.9°C	15	C106	59.4°C	81.6°C	16	J100	64.1°C	86.8°C	17	LF100	52.4°C	75.2°C	18	RTH2	71.6°C	92.6°C	19	TC	58.6°C	79.5°C
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 305VAC/110VAC O/P: 100% LOAD Ta= -25°C	TEST: OK																																																																																
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50°C NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=50°C HUMIDITY= 95 %R.H	TEST: OK																																																																																
4	TEMPERATURE COEFFICIENT	±0.03 %/°C (0~50°C)	I/P: 230 VAC O/P: FULL LOAD	±0.002 %/°C (0~50°C)																																																																																
5	STORAGE TEMPERATURE TEST	-40°C~ +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	-20~+50°C	1. Thermal shock Temperature: -25°C~ +55°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, 2G 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: 3G (5) Test Time: 72min in each axis (X.Y.Z) (6) Ta: 25°C TEST: OK
8	CAPACITOR LIFE CYCLE	SLD-50-24: SUPPOSE C105 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) 58855 HRS (2) 66120 HRS (3) 77498 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 4150.1K hrs min. Telcordia SR-332 (Bellcore) ; 362.8K 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 : 30,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/ZHOUBIAO	WENF	LIUWY