Test Report： SLD-80-24

80W 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

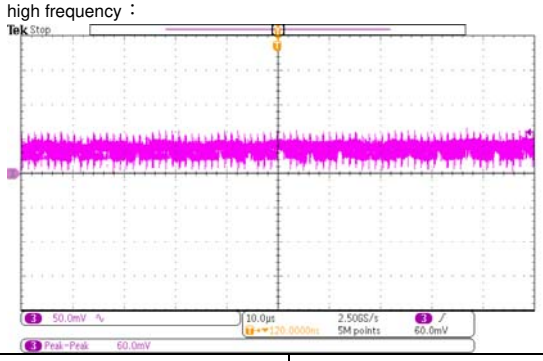
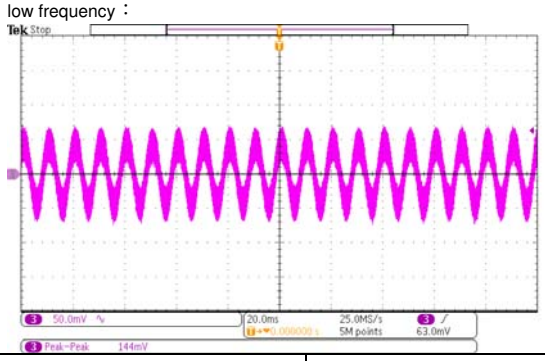
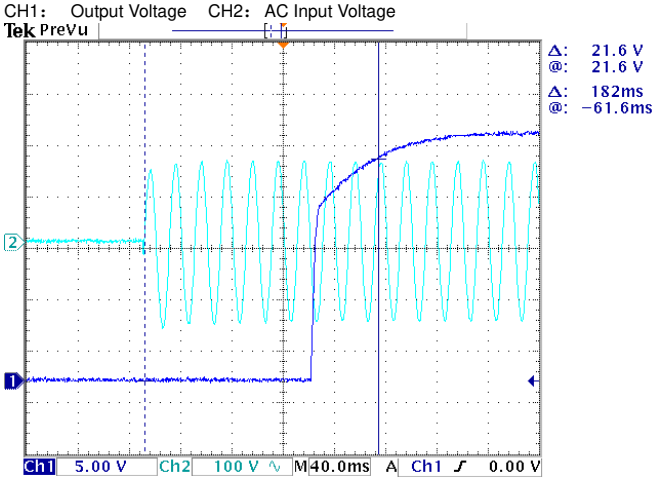
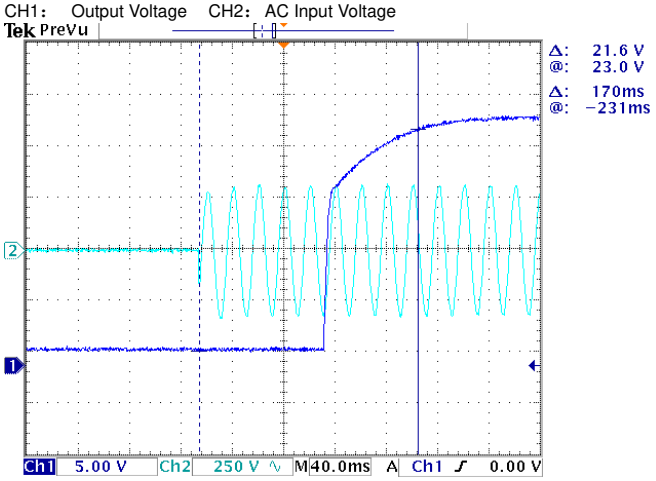
Safety Test
E.M.C. Test

■ RELIABILITY TEST

Environment Test

■ DESIGN VERIFY TEST

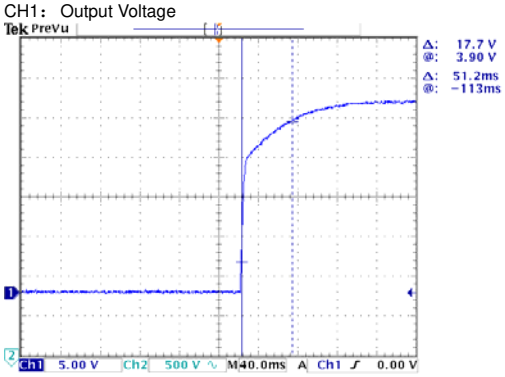
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	16.8V~24V	I/P： 230VAC O/P： LED MODE Ta： 25℃	7.5V~ 24 V
2	VOLTAGE TOLERANCE	-4%~+4%	I/P： 90VAC / 305VAC O/P： FULL/ NO LOAD Ta： 25℃	-042%~ 0.79%
3	LINE REGULATION	-0.5%~+0.5%	I/P： 90VAC ~ 305VAC O/P： FULL LOAD Ta： 25℃	0.04%~0 .08%
4	LOAD REGULATION	-0.5%~+0.5%	I/P： 230VAC O/P： FULL ~NO LOAD Ta： 25℃	-0.17%~ 0.17%
5	OVER/UNDERSHOOT TEST	<±5 %	I/P： 230VAC O/P： FULL LOAD Ta： 25℃	±2.29%
6	RIPPLE & NOISE (Max)	240mVp-p	I/P： 230VAC O/P： FULL LOAD Ta： 25℃	144mVp-p
	high frequency： 		low frequency： 	
7	SET UP TIME(Max)	115VAC/500ms 230VAC/ 500ms	I/P： 115 VAC I/P： 230 VAC O/P： FULL LOAD Ta： 25℃	115VAC/ 182 ms 230VAC/ 170 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 	

8	RISE TIME (Max)	115VAC/ 80ms 230VAC/ 80ms	I/P： 115 VAC I/P： 230 VAC O/P： FULL LOAD Ta： 25℃	115VAC/ 51.2 ms 230VAC/ 48.0 ms

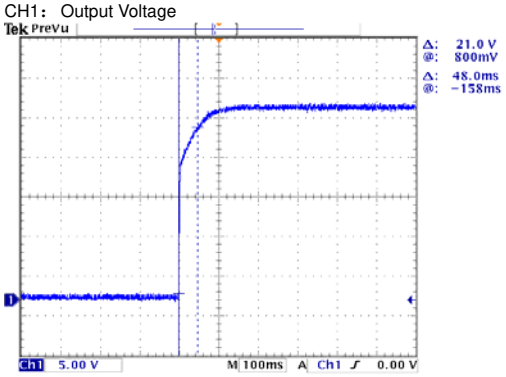
INPUT=115VAC/50HZ @ FULL LOAD

CH1： Output Voltage



INPUT=230VAC/50HZ @ FULL LOAD

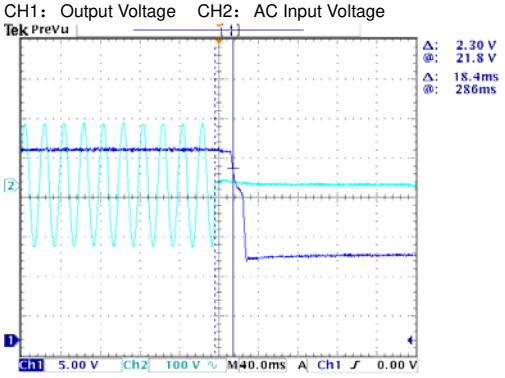
CH1： Output Voltage



9	HOLD UP TIME(Typ)	115VAC/ 10ms 230VAC/ 10ms	I/P： 115 VAC I/P： 230 VAC O/P： FULL LOAD Ta： 25℃	115VAC/ 18.4 ms 230VAC/ 16.8 ms

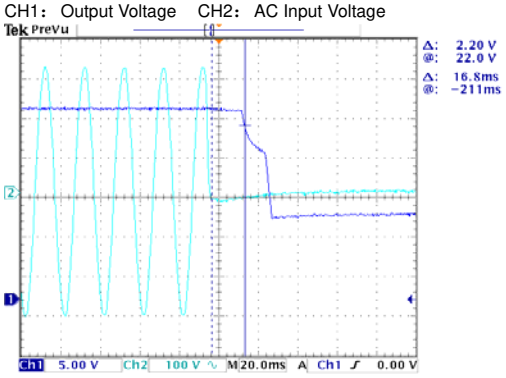
INPUT=115VAC/50HZ @ FULL LOAD

CH1： Output Voltage CH2： AC Input Voltage



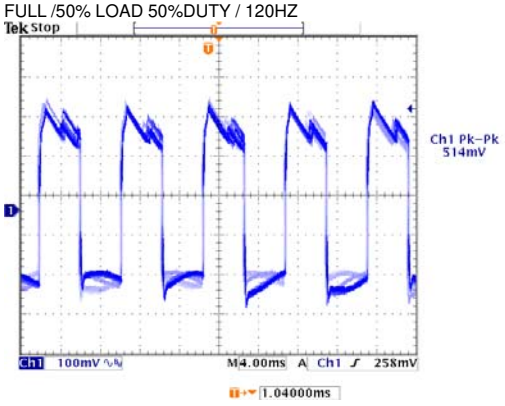
INPUT=230VAC/50HZ @ FULL LOAD

CH1： Output Voltage CH2： AC Input Voltage

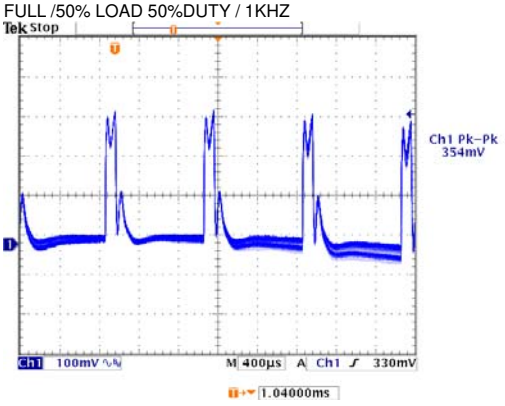


10	DYNAMIC LOAD	V1： 2400 mVp-p	I/P： 230VAC O/P： (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta： 25℃	(1) 514mVp-p (2) 354mVp-p

FULL /50% LOAD 50%DUTY / 120HZ



FULL /50% LOAD 50%DUTY / 1KHZ

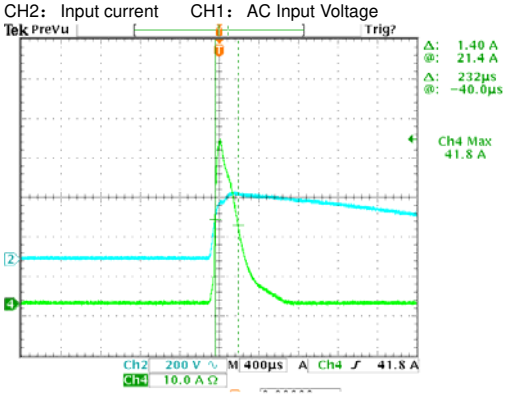


INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	100VAC~305VAC	I/P：TESTING O/P：FULL LOAD Ta：25℃	90V~ 308 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	0.38A/277VAC 0.45A/230VAC 0.9A/115VAC	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =0.31 A/ 277VAC I =0.36 A/ 230VAC I =0.72 A/ 115VAC
4	LEAKAGE CURRENT	< 0.25mA / 277VAC	I/P： 277 VAC O/P：NO LOAD Ta：25℃	L-FG： 0.028 mA N-FG： 0.028 mA
5	NO LOAD CONSUMPTION	<0.5W	I/P：230VAC O/P：NO LOAD Ta：25℃	0.36W
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℃	I = 41.8A/ 230VAC Twidth =232 us/50% Ipeak

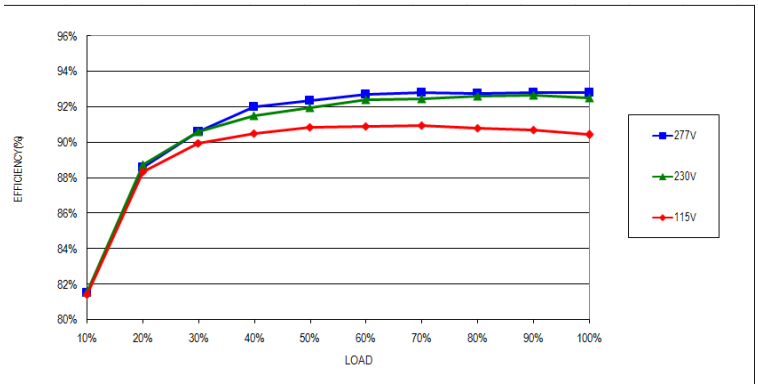
INPUT=230VAC/50HZ @ FULL LOAD

CH2： Input current CH1： AC Input Voltage



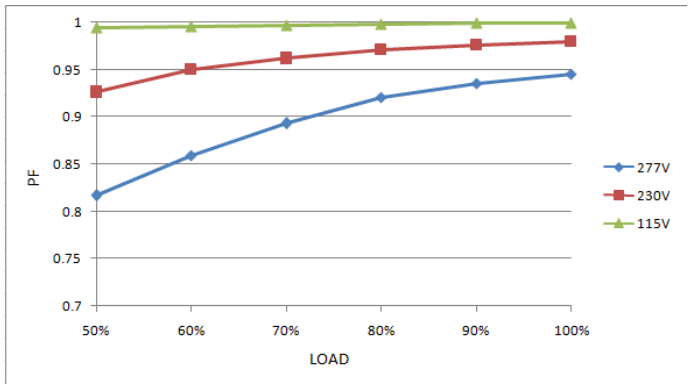
7	EFFICIENCY(Typ)	91.5%	I/P： 230VAC O/P： FULL LOAD Ta： 25℃	92.51%

EFFICIENCY vs LOAD



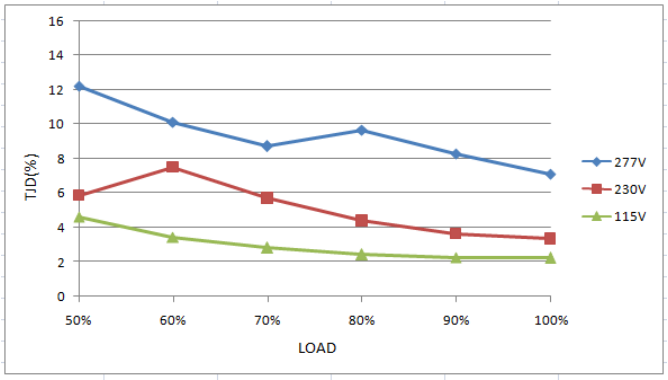
8	POWER FACTOR	0.92/ 277VAC 0.95/ 230VAC 0.97/ 115VAC	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P： FULL LOAD Ta： 25℃	PF= 0.94 / 277VAC PF= 0.97 / 230VAC PF= 0.99 / 115VAC

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=4.26% @50% load /115VAC THD=5.82% @50% load /230VAC THD=8.92% @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℃	102 %/ 100VAC 102 %/ 230VAC 102 %/ 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℃	31.7V/ 100VAC 31.9V/ 230VAC 31.9V/ 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 Hiccup mode，recovers automatically after fault condition is removed
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

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Power Transistor	Q 2 Rated 6A/600V	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	 (1) 456 V (2) 472 V (3) 440 V
2	Diode Peak Voltage	D100 Rated 20A/100V	I/P：High-Line +3V =308V O/P： (1) Full Load Turn on (2) Output Short (3) Full load continue Ta：25℃	 (1) 57.6 V (2) 10.4 V (3) 57.2 V
3	PFC Transistor	Q1 Rated 11A/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) 482 V
4	P.F.C DIODE	D5 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)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℃	 (1) 12.2 V (2) 12.1 V (3) 12.2 V (4) 12.2 V (5) 12.2 V

6	Input Capacitor Voltage	C5 Rated: 18 μF/ 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)454V (2)446V (3)454V (4)446V

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℃	I/P-O/P: 1.765 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100MΩ	I/P-O/P: 500 VDC Ta: 25℃	I/P-O/P: >9999 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: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25℃	CRITERIA A
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N: 1KV	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

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： SLD-80-24
1. ROOM AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=27.0℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta=51.1℃
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=27.0 ℃</th><th>HIGH AMBIENT Ta=51.1 ℃</th></tr>
<tr><td>1</td><td>BD1</td><td>56.0℃</td><td>77.7℃</td></tr>
<tr><td>2</td><td>C8</td><td>51.9℃</td><td>73.8℃</td></tr>
<tr><td>3</td><td>L2</td><td>52.7℃</td><td>74.5℃</td></tr>
<tr><td>4</td><td>Q1</td><td>60.6℃</td><td>82.3℃</td></tr>
<tr><td>5</td><td>R7</td><td>59.1℃</td><td>81.2℃</td></tr>
<tr><td>6</td><td>C6</td><td>56.5℃</td><td>78.5℃</td></tr>
<tr><td>7</td><td>Q2</td><td>63.1℃</td><td>85.8℃</td></tr>
<tr><td>8</td><td>U2</td><td>71.6℃</td><td>94.3℃</td></tr>
<tr><td>9</td><td>L3</td><td>65.2℃</td><td>87.6℃</td></tr>
<tr><td>10</td><td>C51</td><td>60.1℃</td><td>82.7℃</td></tr>
<tr><td>11</td><td>C15</td><td>69.1℃</td><td>91.5℃</td></tr>
<tr><td>12</td><td>T1core</td><td>81.6℃</td><td>105.4℃</td></tr>
<tr><td>13</td><td>D100</td><td>98.2℃</td><td>122.3℃</td></tr>
<tr><td>14</td><td>C105</td><td>68.8℃</td><td>92.6℃</td></tr>
<tr><td>15</td><td>J100</td><td>69.1℃</td><td>91.2℃</td></tr>
<tr><td>16</td><td>RTH2</td><td>75.2℃</td><td>99.0℃</td></tr>
<tr><td>17</td><td>TC</td><td>61.2℃</td><td>83.9℃</td></tr>
</table></td></tr>
<tr><td>2</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P： 305VAC/110VAC
O/P：100% LOAD
Ta= -25℃</td><td>TEST：OK</td></tr>
<tr><td>3</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 50℃
NO DAMAGE</td><td>I/P： 305VAC
O/P：FULL LOAD
Ta=50℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td></tr>
<tr><td>4</td><td>TEMPERATURE
COEFFICIENT</td><td>±0.03 %/℃(0~60℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>±0.0224 %/℃(0~60℃)</td></tr>
<tr><td>5</td><td>STORAGE TEMPERATURE TEST</td><td>-40℃~ +80℃</td><td colspan="2">1. Thermal shock Temperature： -45℃~ +90℃
2. Temperature change rate ： 25℃ / MIN
3. Dwell time low and high temperature ： 30 MIN/EACH
4. Total test cycle：10CYCLE
5. Input/Output condition： STATIC
TEST：OK</td></tr>
<tr><td>6</td><td>THERMAL SHOCK TEST</td><td>-20~+50℃</td><td colspan="2">1. Thermal shock Temperature： -25℃~ +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</td></tr>
</table>

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℃ TEST： OK
8	CAPACITOR LIFE CYCLE	SLD-80-24： SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P： FULL LOAD Tc= 75 ℃ LIFE TIME (2) I/P： 230VAC O/P： 75% LOAD Tc= 75 ℃ LIFE TIME (3) I/P： 230VAC O/P： 50% LOAD Tc= 75 ℃ LIFE TIME	(1) 37081 HRS (2) 47965 HRS (3) 68039 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 867.33K hrs min. Telcordia SR-332 (Bellcore) 260.96K hrs min. MIL-HDBK-217F (25℃)	
10	Ongoing Reliability Test	I/P： 230VAC O/P： FULL LOAD TA=50℃ Demonstration Mean Time Between Failure : 30,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/ZHOUB	WENF	LIUWY