



Test Report: SLD-50-12

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

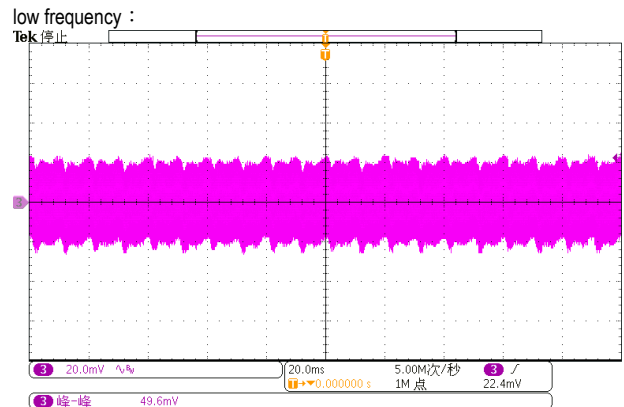
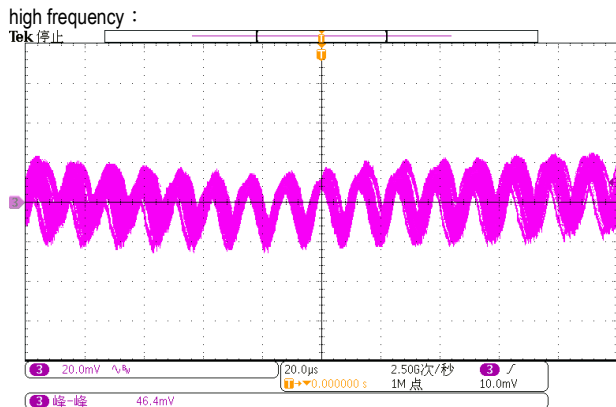
■ RELIABILITY TEST

Environment Test

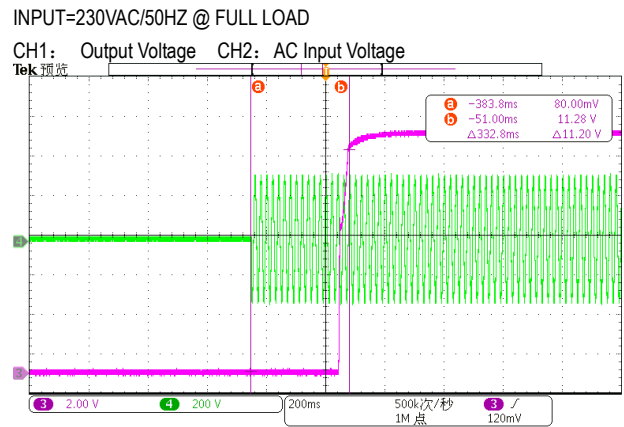
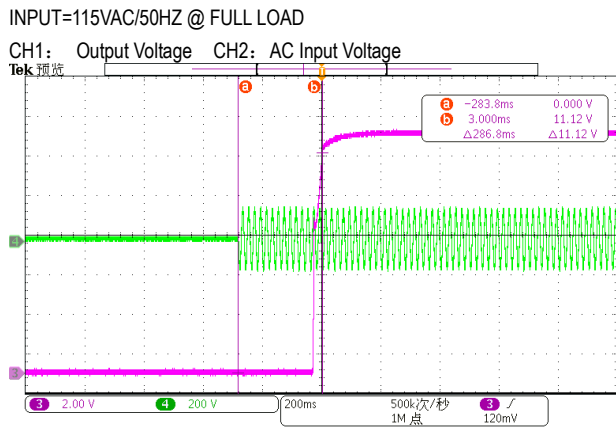
DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	8.4V~12V	I/P: 230VAC O/P: LED MODE Ta: 25°C	6.8V~ 12 V
2	VOLTAGE TOLERANCE	-4%~+4%	I/P: 90VAC / 305VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.5%~ 1.33%
3	LINE REGULATION	-0.5%~+0.5%	I/P: 90VAC ~ 305VAC O/P: FULL LOAD Ta: 25°C	0%~0 %
4	LOAD REGULATION	-1.5%~+1.5%	I/P: 230VAC O/P: FULL ~NO LOAD Ta: 25°C	-0.41%~ 0.41%
5	OVER/UNDERSHOOT TEST	<±5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	±3.75%
6	RIPPLE & NOISE (Max)	150mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	49.6mVp-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/ 286.6 ms 230VAC/ 332.8 ms
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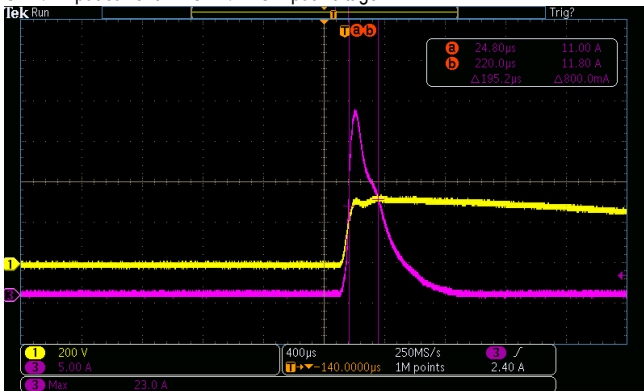
<p>8</p> <p>RISE TIME (Max)</p>	<p>115VAC/ 80ms 230VAC/ 80ms</p>	<p>I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C</p>	<p>115VAC/ 28.6 ms 230VAC/ 29.6 ms</p>
<p>INPUT=115VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage</p>		<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage</p>	
<p>9</p> <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/ 29.84 ms 230VAC/ 28.64 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: 1200 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) 364mVp-p (2) 360mVp-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)	91V~ 308 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=0.2 A/ 277VAC I=0.24 A/ 230VAC I=0.48 A/ 115VAC
4	LEAKAGE CURRENT	< 0.25mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.032 mA N-FG: 0.032 mA
5	NO LOAD CONSUMPTION	<0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.41W
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 = 23A/ 230VAC Twidth =195 us

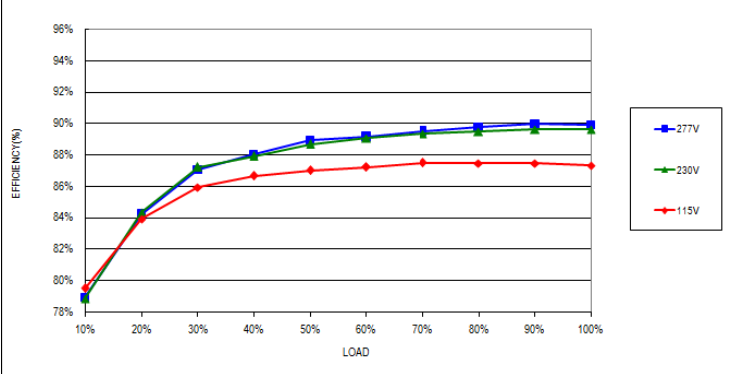
INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



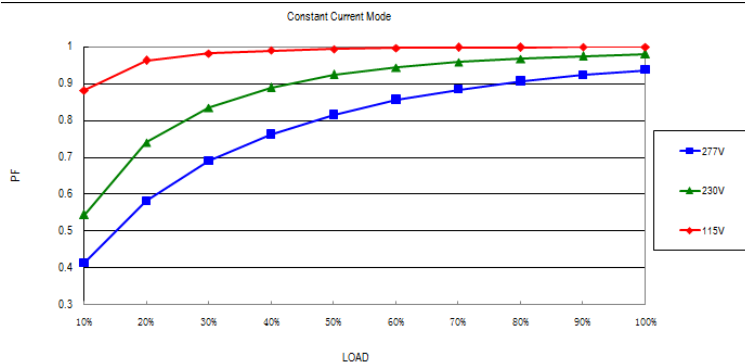
7	EFFICIENCY(Typ)	88%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	89.62%
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EFFICIENCY vs LOAD



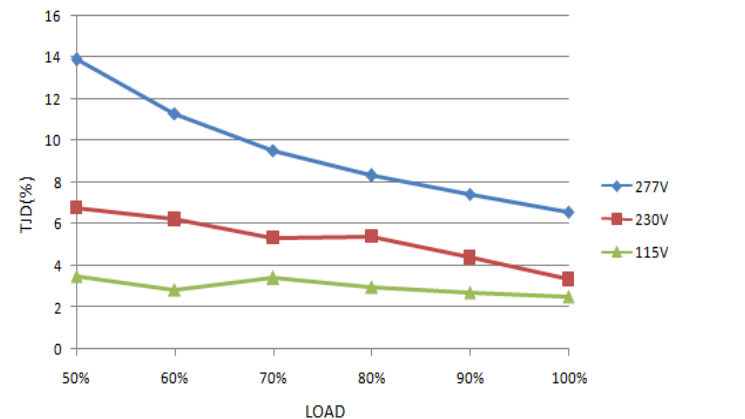
8	POWER FACTOR	0.92/ 277VAC 0.95/ 230VAC 0.97/ 115VAC	I/P: 277 VAC I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	PF= 0.937 / 277VAC PF= 0.981 / 230VAC PF= 0.999 / 115VAC
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P.F vs LOAD



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=2.85% @60% load /115VAC THD=6.24% @60% load /230VAC THD=8.43% @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	102.3 %/ 100VAC 103 %/ 230VAC 102.8 %/ 305VAC Constant Current Limiting or Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	14V~17V	I/P: 100VAC I/P: 230VAC I/P: 305VAC O/P: NO LOAD Ta: 25°C	15.951V/ 100VAC 15.964V/ 230VAC 15.931V/ 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 (2) Output Short (3) Full load continue Ta: 25°C	(1) 672 V (2) 510 V (3) 642 V
2	Diode Peak Voltage	Q100 Rated 46A/100V	I/P: High-Line +3V =308V O/P: (1) Full Load (2) Output Short (3) Full load continue Ta: 25°C	(1) 58.4 V (2) 50.4 V (3) 56.8 V
3	PFC Transistor	Q1 Rated 8A/600V	I/P: High-Line +3V =308V O/P: (1) Full Load (2) Output Short (3) Full load continue Ta: 25°C	(1) 446 V (2) 442 V (3) 442 V
4	P.F.C DIODE	D5 Rated 3A/ 600V	I/P: High-Line +3V =308V O/P: (1) Full Load (2) Output Short (3) Full load continue Ta: 25°C	(1)422V (2)425V (3)426V
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) 17.8 V (2) 18.2 V (3) 18.2 V (4) 17.4 V (5) 13.2 V

6	Input Capacitor Voltage	C5 Rated: 18 μ 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)448V (2)442V (3)446V (4)442V
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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: 2.039 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100M Ω	I/P-O/P: 500 VDC Ta: 25°C	I/P-O/P: >9999 M Ω

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-50-12 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=23.2°C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=51.3°C																																																																																																														
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=23.2 °C</th> <th>HIGH AMBIENT Ta=51.3 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>RTH1</td><td>50.4°C</td><td>68.6°C</td></tr> <tr><td>2</td><td>ZNR1</td><td>38.6°C</td><td>61.6°C</td></tr> <tr><td>3</td><td>BD1</td><td>51.9°C</td><td>76.3°C</td></tr> <tr><td>4</td><td>C7</td><td>48.5°C</td><td>73.2°C</td></tr> <tr><td>5</td><td>L1</td><td>50.4°C</td><td>75.1°C</td></tr> <tr><td>6</td><td>L2</td><td>54.8°C</td><td>79.0°C</td></tr> <tr><td>7</td><td>Q1</td><td>62.8°C</td><td>86.4°C</td></tr> <tr><td>8</td><td>R5</td><td>64.2°C</td><td>88.1°C</td></tr> <tr><td>9</td><td>C5</td><td>64.4°C</td><td>88.1°C</td></tr> <tr><td>10</td><td>Q2</td><td>89.2°C</td><td>112.4°C</td></tr> <tr><td>11</td><td>R60</td><td>80.9°C</td><td>105.4°C</td></tr> <tr><td>12</td><td>T1</td><td>83.2°C</td><td>108.0°C</td></tr> <tr><td>13</td><td>T1core</td><td>76.8°C</td><td>101.8°C</td></tr> <tr><td>14</td><td>U1</td><td>52.2°C</td><td>76.8°C</td></tr> <tr><td>15</td><td>D5</td><td>68.6°C</td><td>93.8°C</td></tr> <tr><td>16</td><td>D7</td><td>88.2°C</td><td>113.1°C</td></tr> <tr><td>17</td><td>Q4</td><td>72.9°C</td><td>97.6°C</td></tr> <tr><td>18</td><td>U2</td><td>73.1°C</td><td>98.4°C</td></tr> <tr><td>19</td><td>Q100</td><td>81.1°C</td><td>106.3°C</td></tr> <tr><td>20</td><td>U101</td><td>73.1°C</td><td>97.8°C</td></tr> <tr><td>21</td><td>C105</td><td>68.0°C</td><td>93.4°C</td></tr> <tr><td>22</td><td>C106</td><td>62.0°C</td><td>87.7°C</td></tr> <tr><td>23</td><td>J100</td><td>67.7°C</td><td>93.8°C</td></tr> <tr><td>24</td><td>LF100</td><td>52.2°C</td><td>78.4°C</td></tr> <tr><td>25</td><td>RTH2</td><td>70.2°C</td><td>95.0°C</td></tr> <tr><td>26</td><td>TC</td><td>63.3°C</td><td>89.0°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=23.2 °C	HIGH AMBIENT Ta=51.3 °C	1	RTH1	50.4°C	68.6°C	2	ZNR1	38.6°C	61.6°C	3	BD1	51.9°C	76.3°C	4	C7	48.5°C	73.2°C	5	L1	50.4°C	75.1°C	6	L2	54.8°C	79.0°C	7	Q1	62.8°C	86.4°C	8	R5	64.2°C	88.1°C	9	C5	64.4°C	88.1°C	10	Q2	89.2°C	112.4°C	11	R60	80.9°C	105.4°C	12	T1	83.2°C	108.0°C	13	T1core	76.8°C	101.8°C	14	U1	52.2°C	76.8°C	15	D5	68.6°C	93.8°C	16	D7	88.2°C	113.1°C	17	Q4	72.9°C	97.6°C	18	U2	73.1°C	98.4°C	19	Q100	81.1°C	106.3°C	20	U101	73.1°C	97.8°C	21	C105	68.0°C	93.4°C	22	C106	62.0°C	87.7°C	23	J100	67.7°C	93.8°C	24	LF100	52.2°C	78.4°C	25	RTH2	70.2°C	95.0°C	26	TC	63.3°C	89.0°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	±0.0118 %/°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-50-12: 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) 61548 HRS (2) 80266 HRS (3) 88297 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