深圳市盛仕达电子有限公司
SHENZHEN SHENGSHIDA ELECTRONICS CO.,LTD

管道风机可靠性测试报告

客户（Customer）： SD-12

机型（Model No）： SE-A150 SE-A200 SE-A250

核准（Approved By）	审核（Checked By ）	作成（Prepared By）
肖观音	张伟	Janvy

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深圳市盛仕达电子有限公司
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管道风机可靠性测试项目

1 常温ON/OFF测试
样品数量: 5pcs
试验条件:常温25℃，湿度<75%，1.15倍额定电压通电，ON/OFF时间间隔10S
试验时间: 连续24H
试验判定: 试验后风机运转，且电参数正常。

2 运行温升试验
样品数量: 2pcs
试验条件:常温25℃，湿度<75%下通电测试（温度计探头连接线圈端）。
试验时间: 2H
试验判定: △T<70K。

3 低温试验
样品数量: 5pcs
试验条件:额定电压通电，低温温度一般为-20±2℃ （客户特殊要求除外）。
试验时间: 连续96H
试验判定: 试验后取出风机放置常温静置2H，然后通电测试风机运转，且电参数正常。

4 高温试验
样品数量: 5pcs
试验条件: 额定电压通电，高温温度一般为80±2℃ 。
试验时间: 连续96H
试验判定: 试验后取出风机放置常温静置2H，然后通电测试风机运转，且电参数正常。

5 高低温循环试验
样品数量: 5pcs
试验条件: 额定电压通电，先以高温80±2℃运行2H ,然后转为低温-20±2℃运行2H，循环进行。
试验周期:50次
试验判定: 试验后取出风机放置常温静置2H，然后通电测试风机运转，且电参数正常。

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管道风机可靠性测试项目

6 湿度试验
样品数量: 5pcs
试验条件:温度60±2℃，湿度93±3%RH。
试验时间:连续96H。
试验判定: 试验后取出风机进行耐压及电性测试。

7 振动试验
样品数量: 整箱或单体5pcs
试验条件: 频率为50/60Hz，将整箱/单体风扇固定于实验台上，分别以X、Y、Z方向进行振动测试。
试验时间:X、Y、Z方向各进行1H。
试验判定: 试验后取出风机进行通电测试，风机运转，无异音，且电参数正常。

8 盐雾试验
样品数量: 2pcs
试验条件: 盐雾试验机箱内温度调至35℃，压力桶温度调整至47℃，5%的氯化钠水溶液，连续喷雾。
试验时间:48H
试验判定: 试验后取出风机放置常温静置0.5-1H，然后用流动冷水轻轻洗涤或浸渍，以除去沉积在试样表面的盐类，用风扇吹干后检查外观是否有腐蚀生锈。

8 加速寿命试验
樣品數量: 10pcs
试验条件: 额定电压通电,以高温80±2℃持续运行。
试验周期: 直至出现第一个不良时停止。
试验判定: 通过加速因子法计算风扇寿命是否符合要求。

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SE-A150可靠性试验报告

试验项目	试验前				试验后				备注
	电流:0.30±10%A	转速:5000±10%RPM	功率:40±10%W	其它	电流:0.30±10%A	转速:5000±10%RPM	功率:40±10%W	其它	
常温ON/OFF测试	0.301	4919	40.5	OK	0.300	4921	40.3	OK	24H
	0.301	4926	40.5	OK	0.300	4928	40.3	OK	
	0.299	4978	40.6	OK	0.298	4987	40.2	OK	
	0.300	5003	40.6	OK	0.299	4998	40.2	OK	
	0.298	5012	40.4	OK	0.296	5001	40.1	OK	
运行温升试验	0.299	4998	40.2	OK	0.297	4988	40.3	OK	△T=55.7K
	0.296	5001	40.1	OK	0.298	4997	40.2	OK	△T=55.8K
低温试验	0.300	4921	40.3	OK	0.300	4921	40.3	OK	96H
	0.300	4928	40.3	OK	0.300	4928	40.3	OK	
	0.298	4987	40.2	OK	0.298	4987	40.2	OK	
	0.297	4988	40.3	OK	0.297	4988	40.3	OK	
	0.298	4997	40.2	OK	0.298	4997	40.2	OK	
高温试验	0.300	4921	40.3	OK	0.298	4938	40.2	OK	96H
	0.300	4928	40.3	OK	0.297	4923	40.2	OK	
	0.298	4987	40.2	OK	0.297	4982	40.3	OK	
	0.297	4988	40.3	OK	0.296	4984	40.2	OK	
	0.298	4997	40.2	OK	0.296	4987	40.1	OK	

審核: 張伟　　測試: 陈少琼　　表单编号: FM-PZ-032

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SE-A150可靠性试验报告

高低温循环试验	0.298	4938	40.2	OK	0.299	4956	40.3	OK	50次
	0.267	4923	40.2	OK	0.297	4973	40.2	OK	
	0.297	4982	40.3	OK	0.296	4968	40.2	OK	
	0.296	4984	40.2	OK	0.297	4992	40.2	OK	
	0.296	4987	40.1	OK	0.296	4996	40.3	OK	
湿度试验	0.299	4956	40.3	OK	0.298	4967	40.2	OK	试验96H后耐压1500V测试OK
	0.297	4973	40.2	OK	0.296	4978	40.3	OK	
	0.296	4968	40.2	OK	0.297	4993	40.3	OK	
	0.297	4992	40.2	OK	0.296	4996	40.1	OK	
	0.296	4996	40.3	OK	0.297	4989	40.2	OK	
振动试验	0.298	4967	40.2	OK	0.298	4947	40.3	OK	3H
	0.296	4978	40.3	OK	0.296	4983	40.2	OK	
	0.297	4993	40.3	OK	0.296	4986	40.3	OK	
	0.296	4996	40.1	OK	0.296	4997	40.1	OK	
	0.297	4989	40.2	OK	0.297	4991	40.2	OK	
盐雾试验	0.296	4997	40.1	OK	0.298	4983	40.3	OK	48H
	0.297	4991	40.2	OK	0.298	4986	40.4	OK	

審核: 張伟　　測試: 陈少琼　　表单编号: FM-PZ-032

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SE-A150可靠性试验报告

加速寿命试验（附表）

LIFE TEST & REPORT

Samples:				**Test condition:**		
Model No.: SE-A150	Sample No: SSD20170624	Quantity: 10 Pcs.		Temperature 80 ℃	Input voltage: 220 VDC	Time Tested :t (Unit:Hrs)
Voltage : 220 VAC;	Current ± 0.300 A	Speed 5,000 ± 10% rpm		Date Start: 26/Jun/17	Date Finished: 25/Sep/17	2,136 Hours
Samples From: 0						

Method:

MTTF = Mean Time To Failure of a product at a specific temperature(Ts)

* Samples powered up in chamber which is set to designated temperature, allowed to burn-in continuously.
* Daily monitoring to ensure no failure according to target plan.
* Testing stop when targe ending date is reached, no failure.

Calculate according to the equation for Weibull distribution & Analysis:

$$MTTF = \frac{t}{1.036\times(T_R \div n)^{0.9}} \times A_F$$

Where:

t: Time in hours samples tested

T_R: Confidence level(GEM 90%) = 2.3 at 0 failure

n: Samples size

A_F: Accelerate factor $=2^{(Ts-Tu)/10}$

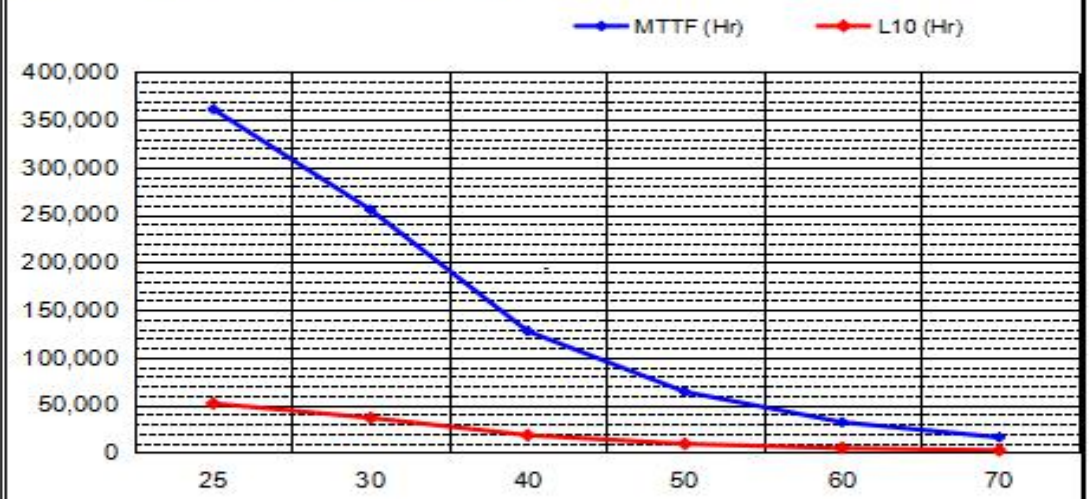
Ts: Testing temperature

Tu: Room temperature

Accelerate factor vs Room temperature

Tu(°C)	25	30	40	50	60	70	80
A_F	45.25	32	16	8	4	2	1

Fan Life expected at different temperatures



Test result:

Temperature, Ts	25	30	40	50	60	70	80
MTTF (Hr)	355,414	251,315	125,658	62,829	31,414	15,707	7,854
L10 (Hr)	50,773	35,902	17,951	8,976	4,488	2,244	1,122

Approved & Date:	Cheek by:	Prepared by:
肖观音	张伟	Janvy

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SE-A200可靠性试验报告

试验项目	试验前				试验后				备注
	电流:0.55±10%A	转速:3800±10%RPM	功率:75±10%W	其它	电流:0.55±10%A	转速:3800±10%RPM	功率:75±10%W	其它	
常温ON/OFF测试	0.560	3805	75	OK	0.543	3808	72.5	OK	24H
	0.558	3801	73.6	OK	0.548	3806	73.5	OK	
	0.556	3803	74.3	OK	0.553	3807	73.5	OK	
	0.557	3805	74.6	OK	0.553	3802	73.8	OK	
	0.558	3798	73.8	OK	0.554	3803	72.8	OK	
运行温升试验	0.553	3802	73.8	OK	0.555	3808	73.1	OK	△T=53.6K
	0.554	3803	72.8	OK	0.552	3806	72.3	OK	△T=53.4K
低温试验	0.543	3808	72.5	OK	0.545	3803	72.3	OK	96H
	0.548	3806	73.5	OK	0.546	3807	73.2	OK	
	0.553	3807	73.5	OK	0.551	3802	73.4	OK	
	0.555	3808	73.1	OK	0.552	3801	72.9	OK	
	0.552	3806	72.3	OK	0.548	3807	72.4	OK	
高温试验	0.545	3803	72.3	OK	0.543	3801	72.6	OK	96H
	0.546	3807	73.2	OK	0.545	3802	73.3	OK	
	0.551	3802	73.4	OK	0.552	3809	73.2	OK	
	0.552	3801	72.9	OK	0.547	3796	72.6	OK	
	0.548	3807	72.4	OK	0.545	3800	72.3	OK	

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高低温循环试验	0.543	3801	72.6	OK	0.542	3803	72.4	OK	50次
	0.545	3802	73.3	OK	0.546	3806	73.5	OK	
	0.552	3809	73.2	OK	0.550	3802	73.4	OK	
	0.547	3796	72.6	OK	0.545	3804	72.3	OK	
	0.545	3800	72.3	OK	0.543	3803	72.7	OK	
湿度试验	0.542	3803	72.4	OK	0.543	3812	72.6	OK	试验96H后耐压1500V测试OK
	0.546	3806	73.5	OK	0.547	3807	73.8	OK	
	0.550	3802	73.4	OK	0.548	3805	73.7	OK	
	0.545	3804	72.3	OK	0.546	3816	73.4	OK	
	0.543	3803	72.7	OK	0.547	3808	73.3	OK	
振动试验	0.543	3812	72.6	OK	0.543	3808	72.6	OK	3H
	0.547	3807	73.8	OK	0.548	3801	73.2	OK	
	0.548	3805	73.7	OK	0.551	3807	73.7	OK	
	0.546	3816	73.4	OK	0.548	3801	72.9	OK	
	0.547	3808	73.3	OK	0.545	3807	73.1	OK	
盐雾试验	0.548	3801	72.9	OK	0.546	3803	72.6	OK	48H
	0.545	3807	73.1	OK	0.543	3802	73.2	OK	

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SE-A200可靠性试验报告

加速寿命试验（附表）

LIFE TEST & REPORT

Samples:			**Test condition:**		
Model No.: SE-A200	Sample No: SSD20170529	Quantity: 10 Pcs.	Temperature 80 ℃	Input voltage: 220 VDC	Time Tested :t (Unit:Hrs)
Voltage : 220 VAC;	Current ± 0.550 A	Speed 3,800 ± 10% rpm	Date Start: 5/Jun/17	Date Finished: 5/Sep/17	2,160 Hours
Samples From: 0					

Method:

MTTF = Mean Time To Failure of a product at a specific temperature(Ts)

* Samples powered up in chamber which is set to designated temperature, allowed to burn-in continuously.
* Daily monitoring to ensure no failure according to target plan.
* Testing stop when targe ending date is reached, no failure.

Calculate according to the equation for Weibull distribution & Analysis:

$$MTTF = \frac{t}{1.036\times(T_R \div n)^{0.9}} \times A_F$$

Where:

t: Time in hours samples tested

T_R: Confidence level(GEM 90%) = 2.3 at 0 failure

n: Samples size

A_F: Accelerate factor $=2^{(Ts-Tu)/10}$

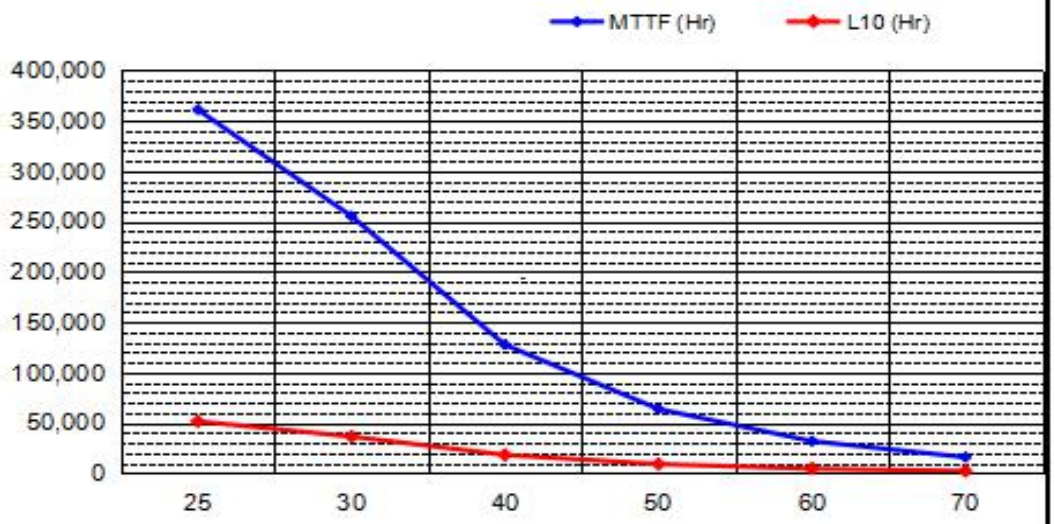
Ts: Testing temperature

Tu: Room temperature

Accelerate factor vs Room temperature

Tu(°C)	25	30	40	50	60	70	80
A_F	45.25	32	16	8	4	2	1

Fan Life expected at different temperatures



Test result:

Temperature, Ts	25	30	40	50	60	70	80
MTTF (Hr)	359,407	254,139	127,070	63,535	31,767	15,884	7,942
L10 (Hr)	51,344	36,306	18,153	9,076	4,538	2,269	1,135

Approved & Date:	Cheek by:	Prepared by:
肖观音	张伟	Janvy

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SE-A250可靠性试验报告

试验项目	试验前				试验后				备注
	电流:1.0±10%A	转速:3200±10%RPM	功率:140±10%W	其它	电流:1.0±10%A	转速:3200±10%RPM	功率:≤140±10%W	其它	
常温ON/OFF测试	1.043	3202	141.8	OK	0.996	3202	136.1	OK	24H
	1.041	3208	141.3	OK	0.998	3211	136.8	OK	
	1.038	3206	141.6	OK	0.997	3205	136.3	OK	
	1.036	3207	141.4	OK	0.998	3203	136.5	OK	
	1.042	3204	141.2	OK	0.996	3213	136.2	OK	
运行温升试验	0.998	3203	136.5	OK	0.996	3205	136.7	OK	△T=51.7K
	0.996	3213	136.2	OK	0.997	3209	136.4	OK	△T=51.9K
低温试验	0.996	3202	136.1	OK	0.998	3206	136.3	OK	96H
	0.998	3211	136.8	OK	0.995	3201	136.5	OK	
	0.997	3205	136.3	OK	1.002	3208	136.6	OK	
	0.996	3205	136.7	OK	0.999	3203	136.1	OK	
	0.997	3209	136.4	OK	0.998	3204	136.7	OK	
高温试验	0.998	3206	136.3	OK	0.998	3202	136.4	OK	96H
	0.995	3201	136.5	OK	0.996	3205	136.7	OK	
	1.002	3208	136.6	OK	0.998	3202	136.2	OK	
	0.999	3203	136.1	OK	0.997	3208	136.3	OK	
	0.998	3204	136.7	OK	0.998	3212	136.3	OK	

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SE-A250可靠性试验报告

高低温循环试验	0.998	3202	136.4	OK	0.996	3221	136.8	OK	50次
	0.996	3205	136.7	OK	0.997	3198	136.2	OK	
	0.998	3202	136.2	OK	0.998	3201	136.5	OK	
	0.997	3208	136.3	OK	0.999	3205	136.6	OK	
	0.998	3212	136.3	OK	0.997	3214	136.0	OK	
湿度试验	0.998	3202	136.4	OK	0.997	3216	137.2	OK	试验96H后耐压1500V测试OK
	0.996	3205	136.7	OK	0.999	3203	138.1	OK	
	0.998	3202	136.2	OK	0.997	3211	137.3	OK	
	0.997	3208	136.3	OK	0.998	3213	136.9	OK	
	0.998	3212	136.3	OK	0.996	3206	136.4	OK	
振动试验	0.997	3216	137.2	OK	0.998	3221	136.8	OK	3H
	0.999	3203	138.1	OK	0.997	3203	135.9	OK	
	0.997	3211	137.3	OK	0.999	3206	137.3	OK	
	0.998	3213	136.9	OK	0.997	3208	137.2	OK	
	0.996	3206	136.4	OK	0.996	3204	137.6	OK	
盐雾试验	0.997	3208	137.2	OK	1.006	3193	138.4	OK	48H
	0.996	3204	137.6	OK	1.013	3191	138.3	OK	

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SE-A250可靠性试验报告

加速寿命试验（附表）

LIFE TEST & REPORT

Samples:			**Test condition:**		
Model No.: SE-A250	Sample No: SSD20170505	Quantity: 10 Pcs.	Temperature 80 ℃	Input voltage: 220 VDC	Time Tested :t (Unit:Hrs)
Voltage : 220 VAC;	Current ±1.000 A	Speed 3,200 ± 10% rpm	Date Start: 8/May/17	Date Finished: 7/Aug/17	2,136 Hours
Samples From: 0					

Method:

MTTF = Mean Time To Failure of a product at a specific temperature(Ts)

* Samples powered up in chamber which is set to designated temperature, allowed to burn-in continuously.
* Daily monitoring to ensure no failure according to target plan.
* Testing stop when targe ending date is reached, no failure.

Calculate according to the equation for Weibull distribution & Analysis:

$$MTTF = \frac{t}{1.036\times(T_R \div n)^{0.9}} \times A_F$$

Where:

t: Time in hours samples tested

T_R: Confidence level(GEM 90%) = 2.3 at 0 failure

n: Samples size

A_F: Accelerate factor $= 2^{(Ts-Tu)/10}$

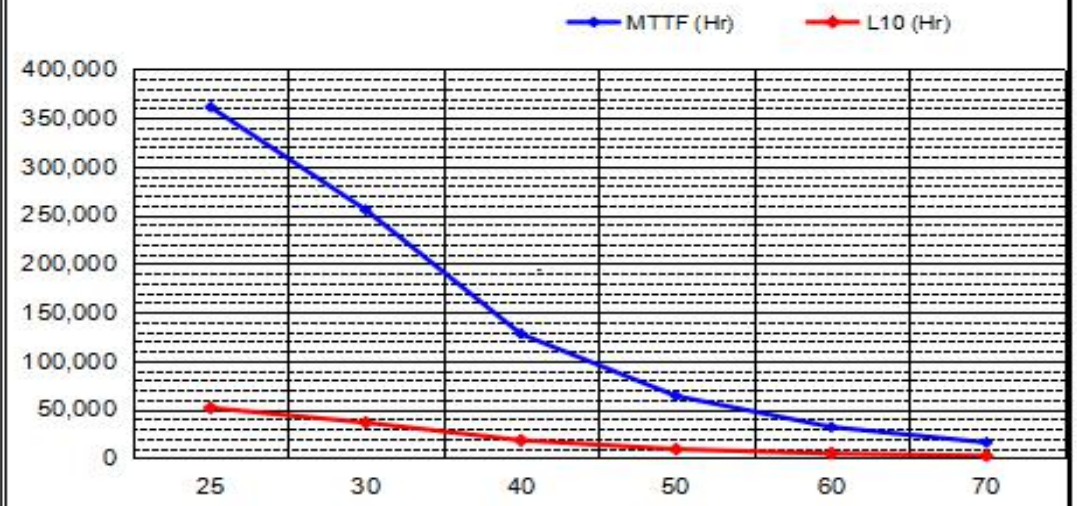
Ts: Testing temperature

Tu: Room temperature

Accelerate factor vs Room temperature

Tu(°C)	25	30	40	50	60	70	80
A_F	45.25	32	16	8	4	2	1

Fan Life expected at different temperatures



Test result:

Temperature, Ts	25	30	40	50	60	70	80
MTTF (Hr)	355,414	251,315	125,658	62,829	31,414	15,707	7,854
L10 (Hr)	50,773	35,902	17,951	8,976	4,488	2,244	1,122

Approved & Date:	Cheek by:	Prepared by:
肖观音	张伟	Janvy