



# DC FAN CUSTOMIZED LIFE EXPERIMENT REPORT

Available for these models with lower speed and same physical structure. All model may be followed by Rxx or Fxx series suffixes. This test report applies to TAA 40x40x20.0mm series as the right table	TAA0412CD-CD01	TAA0412CD-AM2D	THA0412CD-AE26	
	THA0412AD	TAA0412CD-AF83	THA0412AD-DA40	
	THA0412AD-SP09	TAA0412CD-BD1A	TAA0412ADAJ7	
	TAA0412CDA01	THA0405AD-BF1B	TAA0412CD-CM17	

<b>Representative Test P/N : TAA0412CD-9K35</b>	
<b>Equipment: 1.Oven: E24-F0059</b>	<b>On/Off Cycles: Every 500 hours</b>

☉ **L<sub>10</sub> Expectancy:** **90,000** hours minimum @ fan rated voltage and the temperature of 40°C  
 According to the equation for **Weibull distribution**, **MTTF ≐ 1.89×L10 = 170,100 hours**

And we rely on a zero failure Weibull test strategy and accelerated testing technique, to determine the total test time (t) for verifying the above life estimation by the equations,

$$t = 1.119 \times \text{MTTF} \times [(B_{r;c}) \div n]^{0.33} \div A_F, \text{ and } A_F = 1.5^{(T_s - T_u)/10}$$

where, (B<sub>r;c</sub>) is Poisson distribution factor with the failure number of r equal to 0 and the decimal confidence level of c equal to 0.90(90%).

Stress/Elevated Temperature Ts (°C) (Actual Test Temperature)	Unstress Temperature Tu (°C)	Acceleration Factor A <sub>F</sub>	Quantity of Test Devices n (pcs)	Poisson Distribution Factor B <sub>r;c</sub>	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF 40 °C (hours)	Verified L <sub>10</sub> 40 °C (hours)
<b>70</b>	<b>40</b>	<b>3.38</b>	<b>55</b>	<b>2.303</b>	<b>19,792</b>	<b>34,478.0</b>	<b>296,311</b>	<b>156,779</b>

**Test Progress:**

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2010/6/11 4:00 PM	2014/6/15 2:52 AM	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination	<b>34478.0</b>

Herewith, we could assume as right on the basis of above test result. Besides, if the actual test time exceed the required, it comes out that those fans' L<sub>10</sub> expectancy and MTTF are greater than the warrant. ( **MTTF** : means Mean Time To Failures, it should be used in a non-repairable system setting. Now we show the MTTF in our life report, that's because we will not repair the failed fans during life experiment. **MTBF**: means Mean Time Between failures, it should be used in a repairable system setting. )

Temperature for MTTF Estimation (°C)	Acceleration Factor A <sub>F</sub>	Estimated MTTF (hours)	Estimated L <sub>10</sub> (hours)
25	6.20	544,359	288,021
30	5.06	444,467	235,168
40	3.38	296,311	156,779
50	2.25	197,541	104,519
60	1.50	131,694	69,679
70	1.00	87,796	46,453

Fan permission criteria for the measurement after test :

1. Speed can not drop of ≥ 15% below the original measured rpm.
2. Current cannot increase > 15% of original measure current.
3. Noise cannot >3dB over the original measure noise.

Test Method according to IPC-9591.

<b>Test Result</b>	<input type="checkbox"/> <b>Accept</b>
	<input type="checkbox"/> <b>Reject</b>

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG10FNL074	15354.50	2016/5/12	Loly.Wang	Tim.Yi

BGN (dBA) : 16.0

Temp (°C) : 23.8



## DC FAN FUNCTION TEST RECORD FOR CUSTOMIZED LIFE EXPERIMENT

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THA0412AD-SP09	TAA0412CD-BD1A	TAA0412ADAJ7
TAA0412CDA01	THA0405AD-BF1B	TAA0412CD-CM17

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
19,675	2010/6/11 4:00 PM	2014/6/15 2:52 AM	55	0	34478.0

Representative Test P/N : TAA0412CD-9K35	<b>Current Test Status</b>	<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination

Equipment: 1.Oven: E24-F0059      On/Off Cycles: Every 500 hours

### Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. ( mA ) <b>520 Max.</b>	Final Test Current Spec. ( mA ) <b>520 Max.</b>	Deviation (%)	Initial Test Speed Spec. ( RPM ) <b>14040-17160</b>	Final Test Speed Spec. ( RPM ) <b>14040-17160</b>	Deviation (%)	Initial Test Noise Spec. ( dB A ) <b>56.0 Max</b>	Final Test Noise Check. ( dB A ) <b>56.0 Max</b>	Deviation <b>3 dBMax.</b>
1	457	443	-3.1	16103	16016	-0.5	51.7	50.3	-1.4
2	456	438	-3.9	15432	16013	3.8	51.9	51.6	-0.3
3	476	448	-5.9	14894	15982	7.3	51.4	51.9	0.5
4	458	434	-5.2	15123	16024	6.0	51.6	51.7	0.1
5	478	448	-6.3	14797	15895	7.4	51.8	50.4	-1.4
6	466	455	-2.4	15240	15838	3.9	51.8	54.3	2.5
7	456	453	-0.7	15320	15794	3.1	51.5	52.4	0.9
8	466	428	-8.2	15416	15904	3.2	51.6	52.2	0.6
9	454	450	-0.9	15531	16280	4.8	51.5	51.7	0.2
10	469	430	-8.3	15149	15837	4.5	51.7	51.9	0.2
11	448	445	-0.7	15643	15970	2.1	51.6	51.0	-0.6
12	461	435	-5.6	15205	16073	5.7	51.6	51.4	-0.2
13	452	438	-3.1	15155	16066	6.0	51.8	52.0	0.2
14	460	442	-3.9	15443	15970	3.4	51.7	51.3	-0.4
15	465	436	-6.2	15111	16047	6.2	51.6	51.9	0.3
16	462	420	-9.1	15137	16051	6.0	51.4	51.3	-0.1
17	454	442	-2.6	15398	15853	3.0	51.7	52.7	1.0
18	470	436	-7.2	15102	15883	5.2	51.5	50.7	-0.8
19	475	457	-3.8	15090	15915	5.5	51.8	54.0	2.2
20	462	436	-5.6	15529	15858	2.1	51.7	54.0	2.3
21	462	444	-3.9	15132	16281	7.6	51.9	52.1	0.2
22	480	442	-7.9	14645	16218	10.7	51.4	51.3	-0.1
23	489	439	-10.2	14728	16169	9.8	51.7	50.2	-1.5
24	460	433	-5.9	15373	15986	4.0	51.4	53.0	1.6
25	471	444	-5.7	15043	15723	4.5	51.8	51.4	-0.4
26	462	443	-4.1	15419	15748	2.1	51.5	51.5	0.0
27	477	447	-6.3	14968	16122	7.7	51.7	53.5	1.8
28	447	439	-1.8	15334	15836	3.3	51.8	51.9	0.1
29	466	424	-9.0	15244	16074	5.4	52.4	51.0	-1.4
30	466	435	-6.7	15160	15910	4.9	52.6	51.2	-1.4
31	462	432	-6.5	15658	15958	1.9	52.1	51.4	-0.7
32	477	438	-8.2	15313	15969	4.3	51.6	51.3	-0.3

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG10FNL074	15354.50	2016/5/12	NaNa.Wang	Tim.Yi



## DC FAN FUNCTION TEST RECORD FOR CUSTOMIZED LIFE EXPERIMENT

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<b>Required Test Time (hrs)</b>	<b>Date for Test Beginning</b>	<b>Date for Test Termination</b>	<b>Sample Size (pcs):</b>	<b>Failure (pcs):</b>	<b>Current Total Test Time (hrs)</b>					
19,675	2010/6/11 4:00 PM	2014/6/15 2:52 AM	55	0	<b>34478.0</b>					
Representative Test P/N : TAA0412CD-9K35				<b>Current Test Status</b>		<input type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input checked="" type="checkbox"/> Termination		
Equipment: 1.Oven: E24-F0059						On/Off Cycles: Every 500 hours				
<b>Test Data Between Initial Test and Final Test</b>										
Sample No.	Initial Test Current Spec. (mA) <b>520 Max.</b>	Final Test Current Spec. (mA) <b>520 Max.</b>	Deviation (%)	Initial Test Speed Spec. (RPM) <b>14040-17160</b>	Final Test Speed Spec. (RPM) <b>14040-17160</b>	Deviation (%)	Initial Test Noise Spec. (dB A) <b>56.0 Max</b>	Final Test Noise Check. (dB A) <b>56.0 Max</b>	Deviation <b>3 dBMax.</b>	
33	454	422	-7.0	15213	16090	5.8	51.9	51.1	-0.8	
34	463	445	-3.9	15239	15881	4.2	51.5	50.6	-0.9	
35	451	434	-3.8	15627	15915	1.8	52.1	52.2	0.1	
36	459	441	-3.9	15268	16008	4.8	52.3	50.9	-1.4	
37	495	441	-10.9	14361	16058	11.8	51.5	51.9	0.4	
38	483	439	-9.1	14572	15869	8.9	52.3	50.7	-1.6	
39	456	445	-2.4	15274	15926	4.3	51.8	51.3	-0.5	
40	461	447	-3.0	15454	15907	2.9	51.7	51.2	-0.5	
41	462	442	-4.3	15283	16043	5.0	52.3	51.0	-1.3	
42	459	439	-4.4	15236	15939	4.6	52.5	52.0	-0.5	
43	482	434	-10.0	15057	16015	6.4	51.4	51.6	0.2	
44	472	451	-4.4	15448	16097	4.2	51.7	51.4	-0.3	
45	450	436	-3.1	15591	16111	3.3	52.3	51.9	-0.4	
46	457	447	-2.2	15519	16033	3.3	51.9	52.4	0.5	
47	457	442	-3.3	15193	16122	6.1	52.5	55.0	2.5	
48	474	424	-10.5	14426	16166	12.1	52.4	51.0	-1.4	
49	480	419	-12.7	14624	16240	11.1	51.8	51.3	-0.5	
50	470	444	-5.5	15229	16131	5.9	51.6	51.8	0.2	
51	466	439	-5.8	15161	16061	5.9	52.1	51.0	-1.1	
52	474	435	-8.2	15385	15892	3.3	52.4	50.4	-2.0	
53	461	442	-4.1	15327	15031	-1.9	52.2	51.9	-0.3	
54	453	445	-1.8	15508	15900	2.5	51.9	52.0	0.1	
55	475	442	-6.9	14978	15900	6.2	52.0	50.4	-1.6	
X-Bar	465.055	439.436	-	15214.691	15974.509	-	51.835	51.700	-	
$\sigma$	10.591	8.228	-	319.080	181.372	-	0.330	1.002	-	
<b>QE File No.</b>	<b>Time-out for function test or others (hrs)</b>			<b>Issued Date</b>		<b>Reported By</b>		<b>Approved By</b>		
<b>DG10FNL074</b>	<b>15354.50</b>			<b>2016/5/12</b>		<b>NaNa.Wang</b>		<b>Tim.Yi</b>		