



# 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 QFR 80x80x25.0mm series as the right table	QFR0812GJ-00G8P				
	QFR0812GJ-00P0				
	QFR0812MJ-00P0				
<b>Representative Test P/N : QFR0812GJ-00P0</b>					
<b>Equipment: 1.Oven: E24-F0108</b>					

◎ **L<sub>10</sub> Expectancy: 70,000 hours minimum @ fan rated voltage and the temperature of 40°C**  
 According to the equation for **Weibull distribution**, **MTTF ≅ 1.89×L10 = 132,300 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 T <sub>s</sub> (°C) (Actual Test Temperature)	Unstress Temperature T <sub>u</sub> (°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)
80	40	5.06	56	2.303	10,202	12,739.0	165,202	87,408

**Test Progress:**

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2020/6/9 4:00 PM	2022/2/19 2:52 PM	<input type="checkbox"/> In process	<input checked="" type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	12739.0

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	9.30	303,495	160,580
30	7.59	247,803	131,113
40	5.06	165,202	87,408
50	3.38	110,135	58,272
55	2.76	89,925	47,579
60	2.25	73,423	38,848
70	1.50	48,949	25,899
80	1.00	32,632	17,266

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 checked="" type="checkbox"/> <b>Accept</b> <input type="checkbox"/> <b>Reject</b>
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QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG20FNL040	5293.00	2022/7/1	Loly.Wang	Tim.Yi

BGN (dBA) : 16.1

Temp (°C) : 25.0



## DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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				QFR0812GJ-00P0						
				QFR0812MJ-00P0						
<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>					
10,202	2020/6/9 4:00 PM	2022/2/19 2:52 PM	56	0	<b>12739.0</b>					
Representative Test P/N : QFR0812GJ-00P0				<b>Current Test Status</b>		<input type="checkbox"/> In process		<input checked="" type="checkbox"/> In process (exceed requested)		<input type="checkbox"/> Termination
Equipment: 1.Oven: E24-F0108										
Test Data Between Initial Test and Final Test										
Sample No.	Initial Test Current Spec. (A) <b>1.12 Max.</b>	Final Test Current Spec. (A) <b>1.12 Max.</b>	Deviation (%)	Initial Test Speed Spec. (RPM) <b>7200-8800</b>	Final Test Speed Spec. (RPM) <b>7200-8800</b>	Deviation (%)	Initial Test Noise Spec. (dB A) <b>60.5 Max</b>	Final Test Noise Spec. (dB A) <b>60.5 Max</b>	Deviation <b>3 dBMax.</b>	
1	0.92	0.92	0.3	7893	7725	-2.1	56.2	54.8	-1.4	
2	0.94	0.92	-2.4	7895	7690	-2.6	56.0	55.1	-0.9	
3	0.93	0.90	-3.7	7884	7644	-3.0	55.8	55.2	-0.6	
4	0.90	0.90	0.1	7889	7702	-2.4	56.1	54.9	-1.2	
5	0.89	0.85	-5.0	7854	7566	-3.7	55.7	55.2	-0.5	
6	0.90	0.87	-2.8	7813	7660	-2.0	55.6	55.0	-0.6	
7	0.89	0.89	0.5	7866	7676	-2.4	55.6	54.9	-0.7	
8	0.92	0.89	-3.3	7780	7705	-1.0	56.0	55.0	-1.0	
9	0.90	0.91	0.2	8043	7748	-3.7	56.2	55.3	-0.9	
10	0.93	0.88	-5.3	7907	7789	-1.5	55.5	55.0	-0.5	
11	0.90	0.89	-1.3	7825	7721	-1.3	55.8	54.9	-0.9	
12	0.93	0.91	-1.5	7907	7782	-1.6	55.8	54.8	-1.0	
13	0.92	0.91	-1.5	7960	7829	-1.6	56.4	55.4	-1.0	
14	0.90	0.86	-4.7	7757	7653	-1.3	55.6	54.9	-0.7	
15	0.91	0.86	-5.6	7871	7697	-2.2	55.8	55.2	-0.6	
16	0.89	0.88	-0.7	7799	7664	-1.7	55.7	55.3	-0.4	
17	0.85	0.86	1.1	7472	7503	0.4	55.7	54.9	-0.8	
18	0.95	0.93	-2.1	7902	7745	-2.0	55.8	55.2	-0.6	
19	0.89	0.89	-0.6	7894	7653	-3.1	55.7	54.8	-0.9	
20	0.90	0.82	-9.0	7886	7635	-3.2	55.2	55.0	-0.2	
21	0.86	0.91	5.1	7687	7758	0.9	56.1	55.1	-1.0	
22	0.95	0.91	-3.4	7923	7787	-1.7	56.3	55.0	-1.3	
23	0.88	0.91	3.4	8136	7734	-4.9	56.0	55.6	-0.4	
24	0.91	0.93	2.2	7877	7794	-1.1	56.2	55.3	-0.9	
25	0.90	0.89	-0.6	7840	7677	-2.1	55.7	54.9	-0.8	
26	0.89	0.88	-1.1	7758	7727	-0.4	56.0	55.2	-0.8	
27	0.92	0.89	-2.9	7923	7750	-2.2	55.8	55.0	-0.8	
28	0.86	0.86	0.1	7832	7660	-2.2	55.3	55.6	0.3	
29	0.91	0.85	-6.3	7925	7680	-3.1	55.5	55.1	-0.4	
30	0.92	0.90	-2.0	7882	7817	-0.8	56.1	55.0	-1.1	
31	0.94	0.93	-0.9	7917	7746	-2.2	56.0	55.5	-0.5	
32	0.91	0.89	-2.0	7859	7635	-2.9	55.8	55.4	-0.4	
<b>QE File No.</b>	<b>Time-out for function test or others (hours)</b>			<b>Issued Date</b>		<b>Reported By</b>		<b>Approved By</b>		
DG20FNL040	5293.00			2022/7/1		Loly.Wang		Tim.Yi		



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QFR0812GJ-00P0				
QFR0812MJ-00P0				

Required Test Time (hrs)	Date for Test Beginning	Date for Test Termination	Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)
10,202	2020/6/9 4:00 PM	2022/2/19 2:52 PM	56	0	<b>12739.0</b>
Representative Test P/N : QFR0812GJ-00P0			<b>Current Test Status</b> <input type="checkbox"/> In process <input checked="" type="checkbox"/> In process (exceed requested) <input type="checkbox"/> Termination		

Equipment: 1.Oven: E24-F0108

### Test Data Between Initial Test and Final Test

Sample No.	Initial Test Current Spec. (A) <b>1.12 Max.</b>	Final Test Current Spec. (A) <b>1.12 Max.</b>	Deviation (%)	Initial Test Speed Spec. (RPM) <b>7200-8800</b>	Final Test Speed Spec. (RPM) <b>7200-8800</b>	Deviation (%)	Initial Test Noise Spec. (dB A) <b>60.5 Max</b>	Final Test Noise Spec. (dB A) <b>60.5 Max</b>	Deviation <b>3 dBMax.</b>
33	0.88	0.89	1.5	7736	7728	-0.1	55.3	54.9	-0.4
34	0.90	0.88	-1.8	7879	7743	-1.7	55.7	54.9	-0.8
35	0.92	0.88	-4.1	7884	7648	-3.0	55.6	55.0	-0.6
36	0.82	0.90	10.2	8333	7737	-7.2	55.8	54.9	-0.9
37	0.90	0.90	-0.1	7884	7666	-2.8	55.7	55.1	-0.6
38	0.94	0.89	-4.7	7891	7798	-1.2	55.9	55.2	-0.7
39	0.92	0.89	-3.5	7701	7802	1.3	56.0	55.1	-0.9
40	0.89	0.91	2.4	7872	7668	-2.6	55.6	54.5	-1.1
41	0.85	0.87	2.1	8142	7624	-6.4	55.5	55.2	-0.3
42	0.89	0.88	-0.2	7737	7643	-1.2	55.6	54.9	-0.7
43	0.94	0.90	-4.3	7927	7735	-2.4	56.0	55.0	-1.0
44	0.87	0.89	2.0	7846	7679	-2.1	56.0	54.9	-1.1
45	0.89	0.90	1.9	8133	7717	-5.1	55.6	55.1	-0.5
46	0.86	0.87	0.9	7786	7651	-1.7	55.4	54.8	-0.6
47	0.92	0.88	-3.8	7883	7674	-2.7	56.3	55.1	-1.2
48	0.87	0.91	4.0	7748	7696	-0.7	55.7	54.7	-1.0
49	0.90	0.86	-4.4	7747	7663	-1.1	55.6	55.8	0.2
50	0.87	0.89	2.9	7659	7715	0.7	55.6	55.3	-0.3
51	0.93	0.93	-0.3	7835	7760	-1.0	55.5	55.7	0.2
52	0.97	0.84	-14.1	8006	7562	-5.5	56.2	55.1	-1.1
53	0.92	0.88	-3.9	7932	7660	-3.4	56.0	55.4	-0.6
54	0.91	0.96	5.4	7857	7862	0.1	55.9	55.3	-0.6
55	0.84	0.92	9.7	8523	7792	-8.6	55.8	55.1	-0.7
56	0.92	0.90	-2.3	7932	7751	-2.3	56.2	55.7	-0.5
X-Bar	0.90	0.89	-	7884.45	7705.82	-	55.81	55.11	-
$\sigma$	0.03	0.03	-	154.71	69.24	-	0.26	0.26	-

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