



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-00P6				
QFR0812MJ-00P0				

Representative Test P/N : QFR0812GJ-00P0

Equipment: 1.Oven: E24-F0108

◎ L_{10} Expectancy: **70,000** hours minimum @ fan rated voltage and the temperature of **40°C**

According to the equation for **Weibull distribution**,

$$MTTF \cong 1.89 \times L_{10} = 132,300 \text{ hours}$$

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,

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

where, ($B_{r,c}$) is Poisson distribution factor with the failure number of r equal to 0 and the decimal confidence level of c equal to 0.90

Stress/Elevated Temperature T_s (°C) (Actual Test Temperature)	Unstress Temperature T_u (°C)	Acceleration Factor A_F	Quantity of Test Devices n (pcs)	Poisson Distribution Factor $B_{r,c}$	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF 40 °C (hours)	Verified L_{10} 40 °C (hours)
80	40	5.06	56	2.303	10,202	14,739.0	191,138	101,131

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	☐ In process	☒ In process (exceed requested)	☐ Termination	14739.0

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_{10} 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_F	Estimated MTTF (hours)	Estimated L_{10} (hours)
25	9.30	351,144	185,790
30	7.59	286,708	151,697
40	5.06	191,138	101,131
50	3.38	127,426	67,421
55	2.76	104,043	55,049
60	2.25	84,950	44,947
70	1.50	56,634	29,965
80	1.00	37,756	19,977

Fan permission criteria for the measurement after test :

1. Speed can not drop of $\geq 15\%$ below the original measured rpm.
2. Current cannot increase $> 15\%$ of original measure current.
3. Noise cannot $> 3\text{dB}$ over the original measure noise.

Test Method according to IPC-9591.

		Test Result	☒ Accept
			☐ Reject

QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG20FNL040	6917.00	2022/11/29	Loly.Wang	Tim.Yi



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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-00P6					
				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	14739.0				
Representative Test P/N : QFR0812GJ-00P0			Current Test Status	☐ In process	☒ In process (exceed requested)	☐ Termination			
Equipment: 1.Oven: E24-F0108									
Test Data Between Initial Test and Final Test									
Sample No.	Initial Test Current Spec. (A) 1.12 Max.	Final Test Current Spec. (A) 1.12 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 7200-8800	Final Test Speed Spec. (RPM) 7200-8800	Deviation (%)	Initial Test Noise Spec. (dB A) 60.5 Max	Final Test Noise Spec. (dB A) 60.5 Max	Deviation 3 dBMax.
1	0.92	0.80	-12.6	7893	7641	-3.2	56.2	54.6	-1.6
2	0.94	0.80	-15.1	7895	7620	-3.5	56.0	54.8	-1.2
3	0.93	0.88	-5.0	7884	7803	-1.0	55.8	55.1	-0.7
4	0.90	0.91	1.4	7889	7700	-2.4	56.1	55.5	-0.6
5	0.89	0.81	-9.2	7854	7591	-3.3	55.7	54.7	-1.0
6	0.90	0.85	-6.0	7813	7573	-3.1	55.6	55.0	-0.6
7	0.89	0.82	-7.4	7866	7557	-3.9	55.6	55.7	0.1
8	0.92	0.81	-11.7	7780	7605	-2.2	56.0	55.6	-0.4
9	0.90	0.90	-0.6	8043	7698	-4.3	56.2	55.7	-0.5
10	0.93	0.85	-8.8	7907	7568	-4.3	55.5	54.8	-0.7
11	0.90	0.87	-2.9	7825	7664	-2.1	55.8	55.0	-0.8
12	0.93	0.91	-1.7	7907	7673	-3.0	55.8	54.8	-1.0
13	0.92	0.88	-5.3	7960	7696	-3.3	56.4	56.1	-0.3
14	0.90	0.91	1.3	7757	7649	-1.4	55.6	55.0	-0.6
15	0.91	0.88	-4.0	7871	7684	-2.4	55.8	55.3	-0.5
16	0.89	0.81	-9.6	7799	7557	-3.1	55.7	55.4	-0.3
17	0.85	0.79	-7.4	7472	7638	2.2	55.7	54.6	-1.1
18	0.95	0.90	-5.3	7902	7810	-1.2	55.8	55.2	-0.6
19	0.89	0.81	-9.4	7894	7594	-3.8	55.7	55.2	-0.5
20	0.90	0.88	-2.3	7886	7768	-1.5	55.2	54.6	-0.6
21	0.86	0.86	-0.2	7687	7770	1.1	56.1	55.2	-0.9
22	0.95	0.80	-15.1	7923	7636	-3.6	56.3	54.7	-1.6
23	0.88	0.80	-8.7	8136	7633	-6.2	56.0	55.5	-0.5
24	0.91	0.80	-11.5	7877	7392	-6.2	56.2	55.7	-0.5
25	0.90	0.88	-2.1	7840	7730	-1.4	55.7	54.6	-1.1
26	0.89	0.91	1.5	7758	7677	-1.0	56.0	54.7	-1.3
27	0.92	0.87	-5.9	7923	7739	-2.3	55.8	55.2	-0.6
28	0.86	0.85	-0.8	7832	7552	-3.6	55.3	55.4	0.1
29	0.91	0.75	-17.2	7925	7099	-10.4	55.5	55.2	-0.3
30	0.92	0.83	-9.7	7882	7689	-2.4	56.1	55.3	-0.8
31	0.94	0.90	-4.4	7917	7798	-1.5	56.0	55.6	-0.4
32	0.91	0.91	-0.2	7859	7701	-2.0	55.8	55.2	-0.6
QE File No.	Time-out for function test or others (hours)		Issued Date		Reported By		Approved By		
DG20FNL040	6917.00		2022/11/29		Loly.Wang		Tim.Yi		



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33	0.88	0.91	3.3	7736	7710	-0.3	55.3	55.4	0.1
34	0.90	0.88	-2.6	7879	7717	-2.1	55.7	54.7	-1.0
35	0.92	0.85	-7.8	7884	7564	-4.1	55.6	55.0	-0.6
36	0.82	0.88	7.5	8333	7721	-7.3	55.8	54.9	-0.9
37	0.90	0.89	-2.1	7884	7816	-0.9	55.7	55.2	-0.5
38	0.94	0.81	-14.1	7891	7640	-3.2	55.9	55.6	-0.3
39	0.92	0.90	-1.8	7701	7723	0.3	56.0	54.8	-1.2
40	0.89	0.90	1.1	7872	7787	-1.1	55.6	54.2	-1.4
41	0.85	0.90	6.0	8142	7644	-6.1	55.5	54.7	-0.8
42	0.89	0.85	-4.0	7737	7574	-2.1	55.6	55.5	-0.1
43	0.94	0.81	-13.5	7927	7594	-4.2	56.0	55.4	-0.6
44	0.87	0.90	3.3	7846	7695	-1.9	56.0	55.3	-0.7
45	0.89	0.90	1.5	8133	7805	-4.0	55.6	55.0	-0.6
46	0.86	0.91	5.3	7786	7666	-1.5	55.4	54.3	-1.1
47	0.92	0.91	-0.2	7883	7629	-3.2	56.3	55.0	-1.3
48	0.87	0.82	-6.4	7748	7597	-1.9	55.7	54.6	-1.1
49	0.90	0.75	-16.4	7747	7138	-7.9	55.6	54.6	-1.0
50	0.87	0.89	2.9	7659	7663	0.1	55.6	55.0	-0.6
51	0.93	0.91	-2.5	7835	7762	-0.9	55.5	54.2	-1.3
52	0.97	0.67	-31.0	8006	7446	-7.0	56.2	55.1	-1.1
53	0.92	0.88	-4.4	7932	7722	-2.6	56.0	55.8	-0.2
54	0.91	0.84	-8.2	7857	7638	-2.8	55.9	55.2	-0.7
55	0.84	0.91	8.2	8523	7687	-9.8	55.8	54.6	-1.2
56	0.92	0.91	-1.0	7932	7709	-2.8	56.2	56.5	0.3
X-Bar	0.90	0.86	-	7884.45	7645.57	-	55.81	55.10	-
σ	0.03	0.05	-	154.71	134.67	-	0.26	0.46	-
QE File No.	Time-out for function test or others (hrs)		Issued Date		Reported By		Approved By		
DG20FNL040	6917.00		2022/11/29		Loly.Wang		Tim.Yi		