

MTBF Test Report- Simulation

Product Name

Test Condition

Room Temperature: 25 +/- 3 degree C
 Relative Humidity: Uncontrolled room ambinet
 Line Voltage: 120VAC +/- 5%

System Configuration

Test Criteria

At least 25 units
 Each unit is tested for at least 600 power-on-hours
 At least 20,000 power-on-hours

Total Power-on-hour $T = \frac{\text{#####}}{\text{hours}}$
Number of Service Call $k = \frac{0}{\text{}}$
Confidence Level $1-a = \frac{50\%}{\text{}}$

$$L_{\alpha, (2k+2)} = \frac{2T}{\chi^2_{\alpha} (2k+2)}$$

	0	1	2	3	4	5	6	7
0.02	7.4594	11.2395	14.5566	17.6511	20.6079	23.4687	26.2578	28.9905
0.05	5.9915	9.4877	12.5916	15.5073	18.3070	21.0261	23.6848	26.2962
0.10	4.6052	7.7794	10.6446	13.3616	15.9872	18.5493	21.0641	23.5418
0.20	3.2189	5.9886	8.5581	11.0301	13.4420	15.8120	18.1508	20.4651
0.30	2.4079	4.8784	7.2311	9.5245	11.7807	14.0111	16.2221	18.4179
0.40	1.8326	4.0446	6.2108	8.3505	10.4732	12.5838	14.6853	16.7795
0.50	1.3863	3.3567	5.3481	7.3441	9.3418	11.3403	13.3393	15.3385

The Lower confidence limit of MTBF at 90% confidence level $L = 1E+05 \text{ hours}$

Temperature Acceleration

Test Temperature $T_{test} = \frac{40 \text{ deg.C}}{\text{}}$
Field Temperature $T_{field} = \frac{35 \text{ deg.C}}{\text{}}$

$$A = \frac{R_{test}}{R_{field}} = \frac{e^{-\Delta H / K \cdot T_{test}^*}}{e^{-\Delta H / K \cdot T_{field}^*}} = e^{\frac{\Delta H}{K} \left(\frac{1}{T_{test}^*} - \frac{1}{T_{field}^*} \right)} = e^{\frac{1.0}{8.623 \times 10^{-5}} \left(\frac{1}{T_{test} + 273} - \frac{1}{T_{field} + 273} \right)}$$

Accelerate Factor $A = 1.825$
Accelerated MTBF $200,081 \text{ hours}$