MTBF

Report of Apacer products, Flash Card & USB SSD Series

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Apacer
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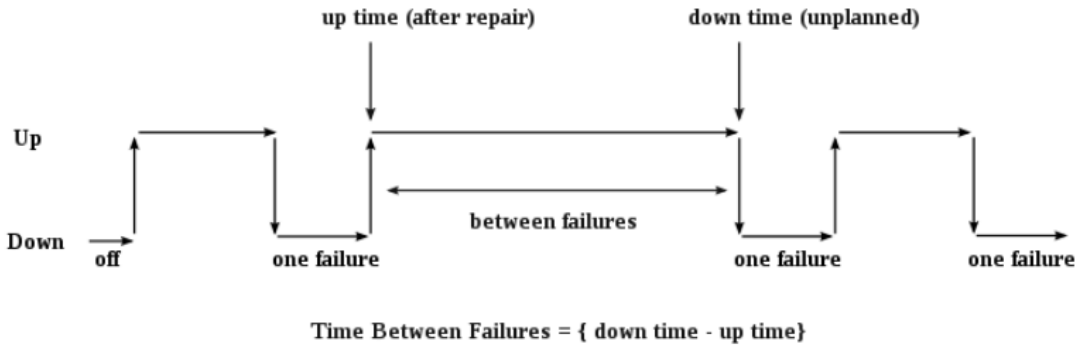
MTBF

Overview

MTBF, stands for mean time between failures, is the average time between failures of hardware modules. It is the average time a manufacturer estimates before a failure occurs in a hardware module.



*This figure depicts the background of MTBF calculation and is granted by its author to anyone using this work for any purpose. For further detail, refer to http://en.wikipedia.org/wiki/File:Time_between_failures.svg

In above figure, downtime is the momentary period it went down uptime. The difference of downtime subtracts by uptime is the amount of time between the two events, which is the time between failures.

MTBF plays an important role in the development of products. Engineers of reliability and design engineers often utilize reliability applications to figure out a product's MTBF according to various methods/standards and to put efforts on the yield rate in the production.

MTBF Prediction

Apacer's MTBF prediction adopts and complies with Bellcore analysis method 1. Assuming device failure rate can be generated by the sum of failure rates in each component, then, a steady state failure rate can be expressed as below equation.

$$\lambda_{ss} = \pi_E \sum_{i=1}^{m} (Ni\lambda_{SSi})$$

m: number of component types
λ_{SS}: device failure rate at steady state
Ni: quantity of i type component
λ_{SSi}: failure rate for i type component at steady state
π_E: device environment factor

PROCEDURE OF MTBF CALCULATION

1. Collect characteristic information of the product.
2. Prepare bill of material (BOM) and component specifications.
3. Analyze BOM and produce component parameters.
4. Determine calculation equation for every component.
5. Calculate failure rates of each component.
6. Generate product failure rate and MTBF.

CALCULATED MTBF (HOURS) BY PRODUCTS

No.	Project	MTBF(hr)
1	*CFIII*	$\geqq 1.93 \times 10^6$
2	*ATA CF*	$\geqq 2.02 \times 10^6$
3	*UDMII*	$\geqq 2.50 \times 10^6$
4	*Industrial SD*	$\geqq 1.77 \times 10^6$
5	*UDM2 Plus (-M)*	$\geqq 3.29 \times 10^6$
6	*CFast (-M)*	$\geqq 1.84 \times 10^6$
7	*UDM3*	$\geqq 3.05 \times 10^6$
8	*Industrial CF5*	$\geqq 1.64 \times 10^6$
9	*SD (-M)*	$\geqq 1.77 \times 10^6$
10	*mPDM (-M)*	$\geqq 2.17 \times 10^6$
11	*AH321 (-M)*	$\geqq 3.59 \times 10^6$
12	*AH322 (-M)*	$\geqq 3.59 \times 10^6$
13	*EH353 (-M)*	$\geqq 5.82 \times 10^6$
14	*UDM 3.0 1U (-M)*	$\geqq 3.86 \times 10^6$
15	*Industrial CF6*	$\geqq 1.17 \times 10^6$

CALCULATED MTBF (HOURS) BY PRODUCTS

No.	Project	MTBF(hr)
16	*CompactFlash6*	$\geqq 1.18 \times 10^6$
17	*UDM2A(-M)*	$\geqq 4.39 \times 10^6$
18	*mSD R1-M,R1-M,R1-SL*	$\geqq 2.35 \times 10^6$
19	*SD R1,R1-M,R1-SL*	$\geqq 2.29 \times 10^7$
20	*SM220-CFast*	$\geqq 1.80 \times 10^6$
21	*SS220-CFast*	$\geqq 1.82 \times 10^6$

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