

Module Level failure Rate Calculation is calculated from the following equation

Based on Mil-HDBK-217F

$$\lambda_m = \lambda_1 + \lambda_2 + \lambda_3 + \dots \quad (\lambda_m : \text{Failure Rate of Module})$$

for NAND & Controller component's failure rate has following relationship.

λ_{nand} (Failure Rate of NAND Component)

λ_{ctrl} (Failure Rate of Controller Component)

And KLM8G1GETF-B041 is composed of 1 NAND Chip and 1 Controller Chip.

$$\text{So, } \lambda_c = \lambda_{\text{nand}} + \lambda_{\text{ctrl}}$$

From internal qualification results for components is as follows ;

$\lambda_{\text{nand}} = 4.31$ Fits (for KLM8G1GETF-B041 NAND Chip)

$$, 60\% \text{ CL FIT} = \chi^2 (2n+2, 60\%) / \{2 \times \text{Sample Size} \times \text{Test Time} \times \text{AF}\} \times 10^9$$

$\lambda_{\text{ctrl}} = 15.5$ Fits (for KLM8G1GETF-B041 Controller Chip)

$$, 60\% \text{ CL FIT} = \chi^2 (2n+2, 60\%) / \{2 \times \text{Sample Size} \times \text{Test Time} \times \text{AF}\} \times 10^9$$

$$\lambda_c = \lambda_{\text{nand}} (1\text{chip}) + \lambda_{\text{ctrl}} (1\text{chip})$$

$$= 4.31 \text{ Fits} + 15.5 \text{ Fits}$$

$$= 19.81 \text{ Fits}$$

The MTBF of component for KLM8G1GETF-B041 are defined as

$$\text{MTBF} = 1 / \lambda_c = 1 / 19.81 \text{ FIT} = 1 / (32.74 \times 1.0\text{E-}9) = 5.048\text{E}7 \text{ hrs}$$