

QUALITY & RELIABILITY ENGINEERING

FIT and MTTF Calculation Report

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|-------------------------|--|
| PN Family Series | TSM60NE084PW, TSM60NE069PW & TSM60NE048PW |
| Part Description | 600V N-Channel Power MOSFET |
| Package Type | TO-247 |

Test Variables:

| | | | |
|-------------------------|---|-------------|----------------|
| Stress Test | = | HTRB | |
| No. of failures | = | 0 | units |
| Sample Size | = | 231 | units |
| Test Duration | = | 1000 | hours |
| Total device hours | = | 231000 | hours |
| Accelerated Temp (Ta) | = | 150 | ° C |
| Operating Temp (Tu) | = | 55 | ° C |
| Activation Energy (Ea) | = | 0.7 | eV |
| Confidence Level | = | 90 | % |
| Boltzman's Constant (k) | = | 8.617E-05 | eV / °K |

Calculations:

| | | | |
|--|---|--|------------------------|
| Chi squared value | = | 4.60517019 | @ 90% Confidence Level |
| Failure Rate (<i>@accelerated condition</i>) | = | $\frac{(\text{Chi squared value})}{2 * (\text{Sample Size}) * (\text{Test Duration})}$ | |
| | = | 9967.90 | FIT |
| Acceleration Factor, AF | = | $e^{(Ea/k)(1/Tu - 1/Ta)}$ | |
| | = | 260.4108858 | |

Results:

| | | | |
|---|---|--|--------------|
| Failure Rate (<i>@operating condition</i>) | = | (Failure Rate <i>@accelerated condition</i>) / (AF) | |
| | = | 38 | FIT |
| Mean Time to Failure (MTTF) | = | 26124947.5 | hours |
| | = | 2982 | years |