TAIWAN SEMICONDUCTOR

# QUALITY & RELIABILITY ENGINEERING

## FIT and MTTF Calculation Report

**May 21, 2025**

| **PN Family Series** | **TSM60NE110CIT** |
|---|---|
| **Part Description** | 600V N-Channel Power MOSFET |
| **Package Type** | ITO-220TL |

## Test Variables:

Stress Test = **HTRB**
No. of failures = 0 **units**
Sample Size = 308 **units**
Test Duration = 1000 **hours**
Total device hours = 308000 **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 *(@accelerated condition)*

$$= \frac{\text{(Chi squared value)}}{\text{2*(Sample Size)*(Test Duration)}}$$

= **7475.93** **FIT**

Acceleration Factor, AF

$$= e^{(Ea/k)(1/Tu - 1/Ta)}$$

= **260.4108858**

## Results:

**Failure Rate** *(@operating condition)* = (Failure Rate *@accelerated condition*) / (AF)
= **29** **FIT**

**Mean Time to Failure (MTTF)** = **34833263.3** **hours**
= **3976** **years**