TAIWAN SEMICONDUCTOR

Report Date: December 21, 2022

QUALITY & RELIABILITY ENGINEERING
FIT and MTTF Calculation Report

PN Family Series	TBS606 – TBS610
Part Description	6A, 600V - 1000V Standard Bridge Rectifier
Package Type	TBS

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 = **4.6051702** @ 90% Confidence Level

Failure Rate *(@accelerated condition)*

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

= **9967.90** **FIT**

Acceleration Factor, AF

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

= **2.604E+02**

Results:

Failure Rate *(@operating condition)*	=	(Failure Rate *@accelerated condition*) / (AF)	
	=	**38**	**FIT**
Mean Time to Failure (MTTF)	=	**26124947**	**hours**
	=	**2982**	**years**