

QUALITY & RELIABILITY ENGINEERING FIT and MTTF Calculation Report

PN Family Series	RTBS40M
Part Description	4A, 1000V Fast Recovery 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 (<i>@accelerated condition</i>)	=	$\frac{(\text{Chi squared value})}{2 * (\text{Sample Size}) * (\text{Test Duration})}$	
	=	9967.90	FIT
Acceleration Factor, AF	=	$e^{(Ea/k)(1/Tu - 1/Ta)}$	
	=	2.604E+02	

Results:

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