

QUALITY & RELIABILITY ENGINEERING

FIT and MTTF Calculation Report

PN Family Series	PUAD4B – PUAD4D
Part Description	4A, 100V - 200V Ultra Fast Surface Mount Rectifier
Package Type	Thin DPAK

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)	=	175	° C
Operating Temp (Tu)	=	50	° C
Activation Energy (Ea)	=	1.0	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)* =
$$\frac{(\text{Chi squared value})}{2 * (\text{Sample Size}) * (\text{Test Duration})}$$

= **7475.93** **FIT**

Acceleration Factor, AF =
$$e^{(Ea/k)(1/Tu - 1/Ta)}$$

= **22578.33597**

Results:

Failure Rate <i>(@operating condition)</i>	=	(Failure Rate <i>@accelerated condition</i>) / (AF)
	=	0.33 FIT
Mean Time to Failure (MTTF)	=	3.02E+09 hours
	=	344765 years