QUALITY & RELIABILITY ENGINEERING
FIT and MTTF Calculation Report

November 6, 2023

PN Family Series	TQL821CSV50
Part Description	200mA, Low-IQ 30µA Low-Dropout Liner Regulator with Enabl
Package Type	SOP-8 EP

Test Variables:

Stress Test	=	**HTOL**	
No. of failures	=	0	**units**
Sample Size	=	80	**units**
Test Duration	=	1000	**hours**
Total device hours	=	80000	**hours**
Accelerated Temp (Ta)	=	125	**° 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 = **4.60517** @ 90% Confidence Level

Failure Rate *(@accelerated condition)* $= \dfrac{\text{(Chi squared value)}}{2*\text{(Sample Size)}*\text{(Test Duration)}}$

= **28782.31** FIT

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

= **77.94097874**

Results:

Failure Rate *(@operating condition)*	= (Failure Rate *@accelerated condition*) / (AF)	
	= **369**	**FIT**
Mean Time to Failure (MTTF)	= **2707947**	**hours**
	= **309**	**years**