

Qualification and Reliability Report

 Part Number: EUKB10-54.000M

 Report #: 071023-01

Qualification Tests				
Test	Method/Condition	Test	Pass	Fail
Fine Leak	MIL-STD-883, Method 1014, Condition A	105	105	0
Gross Leak	MIL-STD-883, Method 1014, Condition C	105	105	0
ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM: 1,500V	3	3	0
Flammability	UL94-V0	10	10	0
Lead Integrity	MIL-STD-883, Method 2004	10	10	0
Mechanical Dimensions	Per Datasheet	50	50	0
Mechanical Shock	MIL-STD-202, Method 213, Condition C	105	105	0
MSL	JESD-22, Method A113, MSL = 1, 260°C	10	10	0
Resistance to Soldering Heat	MIL-STD-202, Method 210	50	50	0
Resistance to Solvents	MIL-STD-202, Method 215	10	10	0
Solderability	MIL-STD-883, Method 2003	50	50	0
Temperature Cycle	MIL-STD-883, Method 1010	105	105	0
Vibration	MIL-STD-883, Method 2007, Condition A	105	105	0

Reliability Tests				
Test	Method/Condition	Test	Pass	Fail
Vibration	MIL-STD-883, Method 2007, 20 G's	8,215	8,215	0
Mechanical Shock	MIL-STD-883, Method 2002, 1,500G's, 0.5msec, ½ sine	8,215	8,215	0
Temperature Cycle	MIL-STD-883, Method 1010, -55°C to +125°C, 10 cycles	8,215	8,215	0
Aging	Biased, Temperature = 85°C, Duration = 720 hours	8,215	8,215	0

Reliability Data		
Characteristic	Constant	Value
Number of Units	<i>N</i>	8,215
Hours Tested	<i>t</i>	720
Activation Voltage	<i>Ea</i>	0.4eV
Boltzman's Constant	<i>k</i>	8.62 x 10 ⁻⁵
Aging Temperature	<i>T1</i>	85°C
Ambient Temperature	<i>T2</i>	25°C
Confidence Level	$\chi^2_{(CL, 2 \text{ dof})}$	90%

Reliability Calculations	
Parameter	Value
Failures in Time (<i>FIT</i>)	29 Units / 1 x 10 ⁹ Hours
Mean Time To Failure (<i>MTTF</i>)	34,925,000 Hours / Failure

$$FIT = \frac{(\chi^2 / 2) \cdot 1,000,000,000}{\sum \left[f_i \cdot t_i \cdot e^{\frac{Ea}{k} \left(\frac{1}{T1+273} - \frac{1}{T2+273} \right)} \right] + \left[N \cdot t \cdot e^{\frac{Ea}{k} \left(\frac{1}{T1+273} - \frac{1}{T2+273} \right)} \right]}$$

$$MTTF = 1,000,000,000 / FIT$$