Quarterly Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2023

Based on structural similarity

Supplier		**User Part Number**				
Nexperia B.V.		PEMB11				
Name of Laboratory		**Part Description**				
		Nexperia DHAM	Small Signal Bipolar Transistor			
Assembly reliability labs		SMD package				
Test		**Test Conditions**	**Duration**	**# Lots**	**# Quantity**	**# Rejects**
# 1	**TEST** Pre- and Post-Stress Electrical Test	Tamb = 25 °C	N/A	see below	all parts	see below
# 2	**PC** Preconditioning	JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	24 hours 168 hours 3 cycles	1674	70490	0
# 5	**HTRB** High Temperature Reverse Bias	MIL-STD-750-1 M1039 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage	1000 hours	415	18680	0
# 7	**TC** Temperature Cycling	JESD22-A104 -65 °C to Tjmax, not to exceed 150°C	500 cycles	343	15360	0
# 8 **or**	**UHAST** Unbiased HAST	JESD22-A118 Tamb = 130 °C, RH = 85 %	96 hours	362	15920	0
# 8a	**AC** Autoclave	JESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)				
# 9	**H3TRB** High Humidity High Temperature Reverse Bias	JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage[1]	1000 hours	343	15360	0
# 10	**IOL** Intermittent Operating Life	MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C	333 hours	343	15360	0
# 20	**RSH** Resistance to Solder Heat	JESD22-A111 260 °C ± 5 °C	10 s	283	8490	0
# 21	**SD** Solderability	J-STD-002		214	6420	0

[1]The maximum applied voltage is limited by test chamber set up and does not exceed 115V.

Calculation of FIT and MTTF

Test considered for FIT calculation: High Temperature Reverse Bias (HTRB, Test # 5)
Confidence level 60%, derated to 55 °C, activation energy 0.7 eV, test time 168 to 1000 hours

Wafer Fab	**Technology**	**Quantity**	**Rejects**	**Failure Rate (FIT)**	**MTTF (hrs)**
Nexperia DHAM	Small Signal Bipolar Transistor	18680	0	0,23	4,40E+09

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