

Quarterly Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2023

Based on structural similarity

Supplier	User Part Number	
Nexperia B.V.	PMBD914	
Name of Laboratory	Part Description	
Assembly reliability labs	Nexperia DHAM Small Signal Bipolar Diode SMD package	
Based on AEC-Q101 Test	Test Conditions	Duration # Lots # Quantity # Rejects
TEST Pre- and Post-Stress Electrical Test	Tamb = 25 °C	N/A see below all parts see below
# E1		
PC Preconditioning	JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	24 hours 168 hours 3 cycles 1514 64430 0
# A1		
HTRB High Temperature Reverse Bias	MIL-STD-750-1 M1038 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage	1000 hours 110 4920 0
# B1		
TC Temperature Cycling	JESD22-A104 -65 °C to Tjmax, not to exceed 150°C	1000 cycles 311 14080 0
# A4		
UHAST Unbiased HAST	JESD22-A118 Tamb = 130 °C, RH = 85 %	96 hours 311 14080 0
# A3 or		
AC Autoclave	JESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)	
# A3 alt		
H3TRB High Humidity High Temperature Reverse Bias	JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1]	1000 hours 311 14080 0
# A2 alt		
IOL Intermittent Operating Life	MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C for 15000 cycles	1000 hours 312 14120 0
# A5		
RSH Resistance to Solder Heat	JESD22-A111 260 °C ± 5 °C	10 s 269 8070 0
# C8		
SD Solderability	J-STD-002	222 6660 0
# C10		

[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 #B1)

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 Diode	4920	0	0,86	1,16E+09

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