

Quarterly Reliability Monitoring Results

Quarters: Q1/2023 to Q4/2024

Based on structural similarity

Supplier		User Part Number				
Nexperia B.V.		BAT54GW				
Name of Laboratory		Part Description				
Assembly reliability labs		Nexperia DHAM Schottky 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	1602	61540	0
# A1						
HTRB High Temperature Reverse Bias		MIL-STD-750-1 M1038 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage ^[1]	1000 hours	231	9240	0
# B1						
TC Temperature Cycling		JESD22-A104 -65 °C to Tjmax, not to exceed 150°C	1000 cycles	337	13480	0
# A4						
UHAST Unbiased HAST		JESD22-A118 Tamb = 130 °C, RH = 85 %	96 hours	337	13480	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], [2]}	1000 hours	337	13480	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	337	13480	0
# A5						
RSH Resistance to Solder Heat		JESD22-A111 260 °C ± 5 °C	10 s	254	7620	0
# C8						
SD Solderability		J-STD-002		210	6300	0
# C10						

[1] The physical limitations of Schottky diodes have to be considered (thermal runaway).

[2] 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	Schottky	9240	0	0,46	2,18E+09

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