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Quarterly Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2023 Based on structural similarity

Supplier Nexperia B.V. Name of Laboratory Assembly reliability labs Based on AEC-Q101 Test		User Part Number BAT720-Q Part Description Nexperia DHAM Schottky SMD package												
								Test Conditions	# Quantity	antity # Rejects				
								TEST			Duration	# Lots		
									Pre- and Post-Stress					
								# E1	Electrical Test	Tamb = 25 °C	N/A	see below	all parts	see below
		<i>"</i> LI		JESD22-A113	,		unpurco	500 5000						
		Bake Tamb = $125 ^{\circ}\text{C}$	24 hours											
	PC	Soak Tamb = 85 °C, RH = 85%	168 hours											
# A1	Preconditioning	Reflow soldering	3 cycles	1514	64430	0								
# 41		MIL-STD-750-1	5 676.65	1317	01130	0								
	HTRB	M1038 Method A												
		Tj = Tjmax, Vr = 100% of max. datasheet												
# B1	Bias	reverse voltage ^[1]	1000 hours	206	9320	0								
# DI	Dias	Teverse voltage	1000 110015	200	9320	0								
	тс	JESD22-A104												
# A4	Temperature Cycling	-65 °C to Timax, not to exceed 150°C	1000 cycles	311	14080	0								
# A4	Temperature Cycling		1000 Cycles	511	14060	0								
	UHAST	155522 4119												
# A3 or	Unbiased HAST	JESD22-A118 Tamb = 130 °C, RH = 85 %												
# A3 01	UIDIASEU HAST		- 96 hours	311	14080	0								
		JESD22-A102												
	AC	Tamb = 121 °C, RH = 100 %												
# A3 alt	Autoclave	Pressure = 205 kPa (29.7 psia)												
	H3TRB	JESD22-A101												
	High Humidity High	Tamb = 85 °C, RH = 85%, VR = 80 % of												
# A2 alt	Temperature Reverse Bias	rated reverse voltage ^{[1], [2]}	1000 hours	311	14080	0								
		MIL-STD-750 Method 1037												
	IOL	ton = toff, devices powered to insure ΔTj =												
# A5	Intermittent Operating Life	100 °C for 15000 cycles	1000 hours	312	14120	0								
	RSH	JESD22-A111												
# C8	Resistance to Solder Heat	260 °C ± 5 °C	10 s	269	8070	0								
	SD													
# C10	Solderability	J-STD-002		222	6660	0								

The physical limitations of Schottky diodes have to be considered (thermal runaway).
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	9320	0	0.46	2 19E+09

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