

## **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 HPZR-C42-Q Part Description										
								Nexperia DHAM Zener				
								SMD package				
		Test Conditions	Duration	# Lots	# Quantity	# Rejects						
			TEST									
			Pre- and Post-Stress									
# E1	Electrical Test	Tamb = 25 °C	N/A	see below	all parts	see below						
		JESD22-A113										
		Bake Tamb = 125 °C	24 hours									
	PC	Soak Tamb = 85 °C, RH = 85%	168 hours									
# A1	Preconditioning	Reflow soldering	3 cycles	1514	64430	0						
		MIL-STD-750-1										
	HTRB	M1038 Method A										
		Tj = Tjmax, VR = 80 % of rated reverse										
# B1	Bias	voltage	1000 hours	250	11400	0						
		MIL-STD-750-1										
		M1038 Method B										
	SSOP	Tj = Tjmax, Iz = 100% of max. datasheet				_						
# B1b	Steady State Operational	reverse current	1000 hours	44	1920	0						
	TC	JESD22-A104				_						
# A4	Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	1000 cycles	311	14080	0						
	HUACT	JECD22 A110										
# A3 <b>or</b>	UHAST Unbiased HAST	JESD22-A118 Tamb = 130 °C, RH = 85 %										
# A3 UI	Olibiased FIAST	· · · · · · · · · · · · · · · · · · ·	- 96 hours	311	14080	0						
	40	JESD22-A102										
# AO -II	<b>AC</b> Autoclave	Tamb = 121 °C, RH = 100 %										
# A3 alt	Autociave	Pressure = 205 kPa (29.7 psia)										
	H3TRB	JESD22-A101										
	High Humidity High	Tamb = 85 °C, RH = 85%, VR = 80 % of										
# A2 alt		rated reverse voltage <sup>[1]</sup>	1000 have	311	14000	0						
r AZ dil	remperature neverse bias		1000 hours	211	14080	U						
	IOL	MIL-STD-750 Method 1037										
# A5	Intermittent Operating Life	ton = toff, devices powered to insure $\Delta T_j = 100  \text{g}$ for 15000 cycles	1000 hours	312	14120	0						
r AD	Intermittent Operating Life	100 C for 13000 Cycles	1000 Hours	212	14120	U						
	RSH	JESD22-A111										
# C8	Resistance to Solder Heat	260 °C ± 5 °C	10 s	269	8070	0						
r C0	SD	200 0 = 3 0	10.5	203	0070	U						
# C10	Solderability	J-STD-002		19	6660	0						
+ CIU	Solderability		4451/	19	UDDU	U						

<sup>[1]</sup> 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	Zener	11400	0	0,37	2,68E+09

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