## nexperia

## **Quarterly Reliability Monitoring Results**

Quarters: Q1/2022 to Q4/2023

Based on structural similarity

Supplier		User Part Number						
Nexperia B.V.		PIMN32						
Name of Laboratory Assembly reliability labs Test		Part Description						
		Nexperia DHAM Small Signal Bipolar Transistor						
		SMD package						
		Test Conditions	Duration	# Lots	# Quantity	# Rejects		
	TEST							
	Pre- and Post-Stress							
# 1	Electrical Test	Tamb = 25 °C	N/A	see below	all parts	see below		
		JESD22-A113 Bake Tamb = 125 °C	24 hours					
	PC	Soak Tamb = $85 ^{\circ}$ C, RH = $85\%$	168 hours					
# 2	Preconditioning	Reflow soldering	3 cycles	1674	70490	0		
		MIL-STD-750-1						
	HTRB	M1039 Method A						
		Tj = Tjmax, Vr = 100% of max. datasheet						
# 5	Bias	reverse voltage	1000 hours	415	18680	0		
	тс							
# 7	Temperature Cycling	JESD22-A104 -65 °C to Timax, not to exceed 150°C	500 cycles	343	15360	0		
# /	remperature eyemig		JUU Cycles	242	15500	0		
	UHAST	JESD22-A118						
# 8 <b>or</b>	Unbiased HAST	Tamb = 130 °C, RH = 85 %		362	15920	0		
		JESD22-A102	— 96 hours					
	AC	Tamb = 121 °C, RH = 100 %						
# 8a	Autoclave	Pressure = 205 kPa (29.7 psia)						
		JESD22-A101						
	<b>H3TRB</b> High Humidity High	Tamb = $85 ^{\circ}$ C, RH = $85\%$ , VR = $80\%$ of						
# 9	Temperature Reverse Bias		1000 hours	343	15360	0		
# 9		MIL-STD-750 Method 1037	1000 110013	545	15500	0		
	IOL	ton = toff, devices powered to insure $\Delta T_j$ =						
# 10	Intermittent Operating Life	100 °C	333 hours	343	15360	0		
	RSH	JESD22-A111						
# 20	Resistance to Solder Heat	260 °C ± 5 °C	10 s	283	8490	0		
" 01	<b>SD</b> Solderability	J-STD-002		24.4	6 4 3 9	0		
# 21	,	J-SID-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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