

## **Quarterly Reliability Monitoring Results**

## Quarters: Q1/2022 to Q4/2023

Based on structural similarity

Supplier		User Part Number						
Nexperia B.V.  Name of Laboratory  Assembly reliability labs  Based on AEC-Q101 Test		PMEG40T20ER-Q						
		Part Description						
		Nexperia DHAM	Schottky					
		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 = 100% of max. datasheet						
# B1	Bias	reverse voltage <sup>[1]</sup>	1000 hours	206	9320	0		
		JECD22 A104						
# 44	TC Temperature Cycling	JESD22-A104 -65 °C to Timax, not to exceed 150°C	1000	211	1.4000	0		
# A4	remperature Cycling	-65 °C to Tjillax, flot to exceed 150°C	1000 cycles	311	14080	0		
	UHAST	JESD22-A118						
# A3 <b>or</b>	Unbiased HAST	Tamb = 130 °C, RH = 85 %	96 hours	311	14080	0		
# A3 01	onbiased 17751	IESD22-A102						
	AC	Tamb = 121 °C, RH = 100 %						
# A3 alt	Autoclave	Pressure = 205 kPa (29.7 psia)						
" AS aic								
	H3TRB	JESD22-A101						
	High Humidity High	Tamb = 85 °C, RH = 85%, VR = 80 % of						
# A2 alt	Temperature Reverse Bias	rated reverse voltage <sup>[1], [2]</sup>	1000 hours	311	14080	0		
	-	MIL-STD-750 Method 1037						
	IOL	ton = toff, devices powered to insure $\Delta T_j$ =						
# A5	Intermittent Operating Life		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		

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

## **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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<sup>[2]</sup> The maximum applied voltage is limited by test chamber set up and does not exceed 115V.