

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		PMEG100V060ELPE-Q Part Description						
		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 ^[1]	1000 hours	206	9320	0		
	TC	JESD22-A104						
# A4	Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	1000 cycles	311	14080	0		
# 42	UHAST Unbiased HAST	JESD22-A118						
# A3 or	Undiased HAST	Tamb = 130 °C, RH = 85 %	96 hours	311	14080	0		
		JESD22-A102						
	AC	Tamb = 121 °C, RH = 100 %						
# A3 alt	Autoclave	Pressure = 205 kPa (29.7 psia)						
		JESD22-A101						
	H3TRB	Tamb = 85 °C, RH = 85%, VR = 80 % of						
# A2 - It	High Humidity High Temperature Reverse Bias	rated reverse voltage ^{[1], [2]}	1000 5	211	1.4000	0		
# A2 alt	remperature Reverse Bias		1000 hours	311	14080	0		
	701	MIL-STD-750 Method 1037						
# A5	IOL Intermittent Operating Life	ton = toff, devices powered to insure ΔTj =	1000 hours	212	14120	0		
# AD	Intermittent Operating Life	100 C for 13000 cycles	1000 hours	312	14120	0		
	RSH	JESD22-A111						
# C8	Resistance to Solder Heat	260 °C ± 5 °C	10 s	269	8070	0		
# 00	SD	200 C ± 3 C	10.5	203	0070	U		
# C10	Solderability	J-STD-002		222	6660	0		
# CIU	Joinerability	J J1D 002		LLL	0000	U		

^[1] 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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^[2] The maximum applied voltage is limited by test chamber set up and does not exceed 115V.