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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		PTVS30VS1UTR-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					
	PC	Bake Tamb = 125 °C	24 hours				
# A1	Preconditioning	Soak Tamb = 85 °C, RH = 85% Reflow soldering	168 hours 3 cycles	524	22940	0	
# A1	1 conditioning	-	5 Cycles	524	22940	U	
	HTRB	MIL-STD-750-1 M1038 Method A					
		Tj = Tjmax, Vr = 100% of max. datasheet					
# B1	Bias	reverse voltage	1000 hours	205	9400	0	
# DI		5	1000 110010	200	5100		
	тс	JESD22-A104					
# A4	Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	1000 cycles	156	7080	0	
	UHAST	JESD22-A118					
# A3 or	Unbiased HAST	Tamb = 130 °C, RH = 85 %	— 96 hours	156	7080	0	
		JESD22-A102	- 90 Hours	150	7080	0	
	AC	Tamb = 121 °C, RH = 100 %					
# A3 alt	Autoclave	Pressure = 205 kPa (29.7 psia)					
		150500 4404					
	H3TRB	JESD22-A101					
	High Humidity High	Tamb = 85 °C, RH = 85%, VR = 80 % of					
# A2 alt	Temperature Reverse Bias		1000 hours	156	7080	0	
	101	MIL-STD-750 Method 1037					
# AF	IOL Intermittent Operating Life	ton = toff, devices powered to insure ΔT_j =	1000 have				
# A5	Internittent Operating Life		1000 hours	n.a.	n.a.	n.a.	
	RSH	JESD22-A111					
# C8	Resistance to Solder Heat	$260 \text{ °C} \pm 5 \text{ °C}$	10 s	56	1700	0	
	SD		10.5	50	1700	<u> </u>	
# C10	Solderability	J-STD-002		56	1700	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 #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	Protection	9400	0	0,45	2,21E+09

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