

Quarterly Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2023

Based on structural similarity

Supplier		User Part Number				
Nexperia B.V.		BC53-16PAS				
Name of Laboratory		Part Description				
Assembly reliability labs		Nexperia DHAM MCD package Small Signal Bipolar Transistor				
Test	Test Conditions	Duration	# Lots	# Quantity	# Rejects	
# 1	TEST Pre- and Post-Stress Electrical Test Tamb = 25 °C	N/A	see below	all parts	see below	
# 2	PC Preconditioning JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	24 hours 168 hours 3 cycles	464	20960	0	
# 5	HTRB High Temperature Reverse Bias MIL-STD-750-1 M1039 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage	1000 hours	415	18680	0	
# 7	TC Temperature Cycling JESD22-A104 -65 °C to Tjmax, not to exceed 150°C	500 cycles	116	5240	0	
# 8 or	UHAST Unbiased HAST JESD22-A118 Tamb = 130 °C, RH = 85 %	96 hours	116	5240	0	
# 8a	AC Autoclave JESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)					
# 9	H3TRB High Humidity High Temperature Reverse Bias JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1]	1000 hours	116	5240	0	
# 10	IOL Intermittent Operating Life MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C	333 hours	116	5240	0	
# 20	RSH Resistance to Solder Heat JESD22-A111 260 °C ± 5 °C	10 s	n.a.	n.a.	n.a.	
# 21	SD Solderability J-STD-002		86	2580	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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