

Quarterly Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

Supplier	User Part Number					
Nexperia B.V.	PBL54004Y					
Name of Laboratory	Part Description					
Assembly reliability labs	Nexperia DHAM Small Signal Bipolar Transistor SMD package					
Based on AEC-Q101 Test	Test Conditions	Duration	# Lots	# Quantity	# Rejects	
# E1	TEST Pre- and Post-Stress Electrical Test Tamb = 25 °C	N/A	see below	all parts	see below	
# A1	PC Preconditioning JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	24 hours 168 hours 3 cycles	849	61170	0	
# B1	HTRB High Temperature Reverse Bias MIL-STD-750-1 M1039 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage	1000 hours	202	16160	0	
# A4	TC Temperature Cycling JESD22-A104 -65 °C to Tjmax, not to exceed 150°C	1000 cycles	171	13680	0	
# A3 alt	AC Autoclave JESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)	96 hours	173	13840	0	
# A2 alt	H3TRB High Humidity High Temperature Reverse Bias JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1]	1000 hours	173	13840	0	
# A5	IOL Intermittent Operating Life MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C for 15000 cycles	1000 hours	197	15760	0	
# C8	RSH Resistance to Solder Heat JESD22-A111 260 °C ± 5 °C	10 s	135	4050	0	
# C10	SD Solderability J-STD-002		342	3420	0	

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

Calculation of FIT and MTF

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	Small Signal Bipolar Transistor	16160	0	0.26	3.81E+09

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