

## Quarterly Reliability Monitoring Results

Quarters: Q3/2021 to Q4/2022

Based on structural similarity

Supplier	User Part Number	
Nexperia B.V.	BSR33-Q	
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	<b>TEST</b> Pre- and Post-Stress Electrical Test Tamb = 25 °C	N/A see below all parts see below
# A1	<b>PC</b> Preconditioning JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	24 hours 168 hours 3 cycles 1265 69890 0
# B1	<b>HTRB</b> High Temperature Reverse Bias MIL-STD-750-1 M1039 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage	1000 hours 316 18920 0
# A4	<b>TC</b> Temperature Cycling JESD22-A104 -65 °C to Tjmax, not to exceed 150°C	1000 cycles 260 15680 0
# A3 or	<b>UHAST</b> Unbiased HAST JESD22-A118 Tamb = 130 °C, RH = 85 %	96 hours 270 16360 0
# A3 alt	<b>AC</b> Autoclave JESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)	
# A2 alt	<b>H3TRB</b> High Humidity High Temperature Reverse Bias JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage <sup>[1]</sup>	1000 hours 262 15760 0
# A5	<b>IOL</b> Intermittent Operating Life MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C for 15000 cycles	1000 hours 262 15760 0
# C8	<b>RSH</b> Resistance to Solder Heat JESD22-A111 260 °C ± 5 °C	10 s 211 6330 0
# C10	<b>SD</b> Solderability J-STD-002	468 4680 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	Small Signal Bipolar Transistor	18920	0	0,22	4,46E+09

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