## Quarterly Reliability Monitoring Results

### Quarters: Q1/2022 to Q4/2023

Based on structural similarity

| **Supplier**<br>Nexperia B.V. | | **User Part Number**<br>BCW72 | | | | |
|---|---|---|---|---|---|---|
| **Name of Laboratory**<br>Assembly reliability labs | | **Part Description**<br>Nexperia DHAM<br>SMD package | Small Signal Bipolar Transistor | | | |
| **Based on AEC-Q101 Test** | | **Test Conditions** | **Duration** | **# Lots** | **# Quantity** | **# Rejects** |
| # E1 | **TEST**<br>Pre- and Post-Stress Electrical Test | Tamb = 25 °C | N/A | see below | all parts | see below |
| # A1 | **PC**<br>Preconditioning | JESD22-A113<br>Bake Tamb = 125 °C<br>Soak Tamb = 85 °C, RH = 85%<br>Reflow soldering | 24 hours<br>168 hours<br>3 cycles | 1674 | 70490 | 0 |
| # B1 | **HTRB**<br>High Temperature Reverse Bias | MIL-STD-750-1<br>M1039 Method A<br>Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage | 1000 hours | 415 | 18680 | 0 |
| # A4 | **TC**<br>Temperature Cycling | JESD22-A104<br>-65 °C to Tjmax, not to exceed 150°C | 1000 cycles | 343 | 15360 | 0 |
| # A3 **or** | **UHAST**<br>Unbiased HAST | JESD22-A118<br>Tamb = 130 °C, RH = 85 % | 96 hours | 362 | 15920 | 0 |
| # A3 alt | **AC**<br>Autoclave | JESD22-A102<br>Tamb = 121 °C, RH = 100 %<br>Pressure = 205 kPa (29.7 psia) | | | | |
| # A2 alt | **H3TRB**<br>High Humidity High Temperature Reverse Bias | JESD22-A101<br>Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage[1] | 1000 hours | 343 | 15360 | 0 |
| # A5 | **IOL**<br>Intermittent Operating Life | MIL-STD-750 Method 1037<br>ton = toff, devices powered to insure ΔTj = 100 °C for 15000 cycles | 1000 hours | 343 | 15360 | 0 |
| # C8 | **RSH**<br>Resistance to Solder Heat | JESD22-A111<br>260 °C ± 5 °C | 10 s | 283 | 8490 | 0 |
| # C10 | **SD**<br>Solderability | J-STD-002 | | 214 | 6420 | 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 | 18680 | 0 | 0,23 | 4,40E+09 |

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