

Quarterly Reliability Monitoring Results

Quarters: Q3/2021 to Q4/2022

Based on structural similarity

| Supplier | | User Part Number | | | | |
|---------------------------|--|---|-----------------------------------|-----------|------------|-----------|
| Nexperia B.V. | | NHDTA144EU | | | | |
| 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 | 1265 | 69890 | 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 | 316 | 18920 | 0 |
| # A4 | TC Temperature Cycling | JESD22-A104 -65 °C to Tjmax, not to exceed 150°C | 1000 cycles | 260 | 15680 | 0 |
| # A3 or | UHAST Unbiased HAST | JESD22-A118 Tamb = 130 °C, RH = 85 % | 96 hours | 270 | 16360 | 0 |
| # A3 alt | AC Autoclave | JESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia) | | | | |
| # 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 | 262 | 15760 | 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 | 262 | 15760 | 0 |
| # C8 | RSH Resistance to Solder Heat | JESD22-A111 260 °C ± 5 °C | 10 s | 211 | 6330 | 0 |
| # C10 | SD 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 |

© 2023 Nexperia B.V.

All information hereunder is per Nexperia's best knowledge. This document does not provide for any representation or warranty express or implied by Nexperia. In case Nexperia has tested the product, this documentation reflects the outcome of the analysis of the actually tested parts only.

nexperia.com