

## Quarterly Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2023

Based on structural similarity

| Supplier                  | User Part Number  |  |
|---------------------------|---|--|
| Nexperia B.V.             | PMBT4403-Q  |  |
| Name of Laboratory        | Part Description  |  |
| Assembly reliability labs | Nexperia DHAM Small Signal Bipolar Transistor<br>SMD package  |  |
| Based on AEC-Q101 Test    | Test Conditions   | Duration # Lots # Quantity # Rejects           |
| # E1                      | <b>TEST</b><br>Pre- and Post-Stress<br>Electrical Test<br>Tamb = 25 °C  | N/A see below all parts see below              |
| # A1                      | <b>PC</b><br>Preconditioning<br>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                      | <b>HTRB</b><br>High Temperature Reverse<br>Bias<br>MIL-STD-750-1<br>M1039 Method A<br>Tj = Tjmax, Vr = 100% of max. datasheet<br>reverse voltage              | 1000 hours 415 18680 0                         |
| # A4                      | <b>TC</b><br>Temperature Cycling<br>JESD22-A104<br>-65 °C to Tjmax, not to exceed 150°C   | 1000 cycles 343 15360 0                        |
| # A3 or                   | <b>UHAST</b><br>Unbiased HAST<br>JESD22-A118<br>Tamb = 130 °C, RH = 85 %  | 96 hours 362 15920 0                           |
| # A3 alt                  | <b>AC</b><br>Autoclave<br>JESD22-A102<br>Tamb = 121 °C, RH = 100 %<br>Pressure = 205 kPa (29.7 psia)  |  |
| # A2 alt                  | <b>H3TRB</b><br>High Humidity High<br>Temperature Reverse Bias<br>JESD22-A101<br>Tamb = 85 °C, RH = 85%, VR = 80 % of<br>rated reverse voltage <sup>[1]</sup> | 1000 hours 343 15360 0                         |
| # A5                      | <b>IOL</b><br>Intermittent Operating Life<br>MIL-STD-750 Method 1037<br>ton = toff, devices powered to insure ΔTj =<br>100 °C for 15000 cycles                | 1000 hours 343 15360 0                         |
| # C8                      | <b>RSH</b><br>Resistance to Solder Heat<br>JESD22-A111<br>260 °C ± 5 °C   | 10 s 283 8490 0                                |
| # C10                     | <b>SD</b><br>Solderability<br>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<br>DHAM | Small Signal Bipolar<br>Transistor | 18680    | 0       | 0,23               | 4,40E+09   |

© 2024 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.