

Quarterly Reliability Monitoring Results

Quarters: Q3/2021 to Q4/2022

Based on structural similarity

| Supplier Nexperia B.V. Name of Laboratory Assembly reliability labs Based on AEC-Q101 Test | | User Part Number | | | | | | |
|--|--|---|-------------|-----------|------------|-----------|--|--|
| | | BCX53T | | | | | | |
| | | Part Description | | | | | | |
| | | Nexperia DHAM Small Signal Bipolar Transistor | | | | | | |
| | | SMD package | | | | | | |
| | | Test Conditions | Duration | # Lots | # Quantity | # Rejects | | |
| | TEST | | | | | | | |
| | Pre- and Post-Stress | | | | | | | |
| # E1 | Electrical Test | Tamb = 25 °C | N/A | see below | all parts | see below | | |
| | | JESD22-A113 | | | | | | |
| | | Bake Tamb = 125 °C | 24 hours | | | | | |
| | PC | Soak Tamb = 85 °C, RH = 85% | 168 hours | | | | | |
| # A1 | Preconditioning | Reflow soldering | 3 cycles | 1265 | 69890 | 0 | | |
| | | MIL-STD-750-1 | | | | | | |
| | HTRB | M1039 Method A | | | | | | |
| | . | Tj = Tjmax, Vr = 100% of max. datasheet | | | | | | |
| # B1 | Bias | reverse voltage | 1000 hours | 316 | 18920 | 0 | | |
| | | | | | | | | |
| | TC | JESD22-A104 | | | | | | |
| # A4 | Temperature Cycling | -65 °C to Tjmax, not to exceed 150°C | 1000 cycles | 260 | 15680 | 0 | | |
| | | JECD22 A110 | | | | | | |
| # A3 or | UHAST Unbiased HAST | JESD22-A118 Tamb = 130 °C, RH = 85 % | — 96 hours | 270 | 16360 | 0 | | |
| | Olibiased HAST | , , , , , , , , , , , , , , , , , , , | | | | | | |
| | •• | JESD22-A102 | | | | | | |
| | AC Autoclave | Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia) | | | | | | |
| # A3 alt | Autociave | Plessure = 203 kPa (29.7 psia) | | | | | | |
| | USTOD | JESD22-A101 | | | | | | |
| | H3TRB | Tamb = 85 °C, RH = 85%, VR = 80 % of | | | | | | |
| # A2 alt | High Humidity High Temperature Reverse Bias | rated reverse voltage ^[1] | 1000 5 | 262 | 15760 | 0 | | |
| F A2 alt | remperature Reverse Bias | | 1000 hours | 262 | 15760 | 0 | | |
| | IOL | MIL-STD-750 Method 1037 | | | | | | |
| 4 AF | Intermittent Operating Life | ton = toff, devices powered to insure $\Delta Tj = 100$ °C for 15000 cycles | 1000 have- | 262 | 15760 | 0 | | |
| ‡ A5 | Intermittent Operating Life | 100 C for 15000 cycles | 1000 hours | 262 | 15760 | 0 | | |
| | RSH | JESD22-A111 | | | | | | |
| # C8 | Resistance to Solder Heat | | 10 s | 211 | 6330 | 0 | | |
| . 00 | SD | 200 0 = 0 0 | 10.5 | 211 | 0330 | U | | |
| # C10 | Solderability | J-STD-002 | | 468 | 4680 | 0 | | |
| 4 CIU | • | | 1151/ | 400 | 4000 | U | | |

^[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 | Small Signal Bipolar | | | | |
| DHAM | Transistor | 18920 | 0 | 0,22 | 4,46E+09 |

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