

Quarterly Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2023

Based on structural similarity

| Supplier Nexperia B.V. Name of Laboratory Assembly reliability labs Based on AEC-Q101 Test | | User Part Number | | | | | | |
|--|-----------------------------------|--|-------------|-----------|------------|-----------|--|--|
| | | BZX384-C47-Q | | | | | | |
| | | Part Description | | | | | | |
| | | Nexperia DHAM | Zener | | | | | |
| | | 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 | 1514 | 64430 | 0 | | |
| | | MIL-STD-750-1 | | | | | | |
| | HTRB | M1038 Method A | | | | | | |
| | | Tj = Tjmax, VR = 80 % of rated reverse | | | | | | |
| # B1 | Bias | voltage | 1000 hours | 250 | 11400 | 0 | | |
| | | MIL-STD-750-1 | | | | | | |
| | | M1038 Method B | | | | | | |
| | SSOP | Tj = Tjmax, Iz = 100% of max. datasheet | | | | | | |
| # B1b | Steady State Operational | reverse current | 1000 hours | 44 | 1920 | 0 | | |
| | | | | | | | | |
| | тс | JESD22-A104 | | | | | | |
| # A4 | Temperature Cycling | -65 °C to Tjmax, not to exceed 150°C | 1000 cycles | 311 | 14080 | 0 | | |
| | | | | | | | | |
| # A2 | UHAST | JESD22-A118 | | | | | | |
| # A3 or | Unbiased HAST | Tamb = 130 °C, RH = 85 % | - 96 hours | 311 | 14080 | 0 | | |
| | | JESD22-A102 | | | | | | |
| | AC | Tamb = 121 °C, RH = 100 % | | | | | | |
| # A3 alt | Autoclave | Pressure = 205 kPa (29.7 psia) | | | | | | |
| | | JECD22 4101 | | | | | | |
| | H3TRB | JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of | | | | | | |
| , | High Humidity High | rated reverse voltage ^[1] | 10001 | 244 | 1 1000 | • | | |
| # A2 alt | Temperature Reverse Bias | <u> </u> | 1000 hours | 311 | 14080 | 0 | | |
| | TO: | MIL-STD-750 Method 1037 | | | | | | |
| | IOL | ton = toff, devices powered to insure $\Delta T j =$ | 1000 ! | 242 | 44400 | | | |
| # A5 | Intermittent Operating Life | 100 °C for 15000 cycles | 1000 hours | 312 | 14120 | 0 | | |
| | neu | JECD22 A111 | | | | | | |
| " CO | RSH Designation to Colder Heat | JESD22-A111 | 10 - | 260 | 0070 | 0 | | |
| # C8 | Resistance to Solder Heat | 260 °C ± 5 °C | 10 s | 269 | 8070 | 0 | | |
| # C10 | SD Coldorability | J-STD-002 | | 10 | 6660 | 0 | | |
| # C10 | Solderability | J-31D-00Z | | 19 | 6660 | 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 | Zener | 11400 | 0 | 0,37 | 2,68E+09 |

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