nexperia

Quarterly Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

| | User Part Number | | | | | | |
|-----------------------------|--|---|---|--|--|--|--|
| | PESD1LVDS | | | | | | |
| boratory | Part Description | | | | | | |
| | Nexperia DHAM Protection Bipolar | | | | | | |
| liability labs | MCD package | | | | | | |
| EC-Q101 Test | Test Conditions | Duration | # Lots | # Quantity | # Rejects | | |
| TEST | | | | | | | |
| | | | | | | | |
| Electrical Test | | N/A | see below | all parts | see below | | |
| | | 24 h a | | | | | |
| PC | | | | | | | |
| | | | 142 | 11435 | 0 | | |
| | 5 | , | 172 | 11455 | 0 | | |
| HTRB | | | | | | | |
| | | | | | | | |
| Bias | reverse voltage | 1000 hours | 23 | 1840 | 0 | | |
| | | | | | | | |
| тс | JESD22-A104 | | | | | | |
| Temperature Cycling | -65 °C to Tjmax, not to exceed 150°C | 1000 cycles | 53 | 4225 | 0 | | |
| | JESD22-A102 | | | | | | |
| AC | Tamb = 121 °C, RH = 100 % | | | | | | |
| Autoclave | Pressure = 205 kPa (29.7 psia) | 96 hours | 39 | 3165 | 0 | | |
| | | | | | | | |
| | | | | | | | |
| | | 1000 | F 4 | 10.15 | • | | |
| Temperature Reverse Blas | | 1000 hours | 51 | 4045 | 0 | | |
| 101 | | | | | | | |
| | | 1000 hours | | | | | |
| Internitient Operating Life | | 1000 Hours | 11.d. | 11.d. | n.a. | | |
| RSH | 1FSD22-4111 | | | | | | |
| | | 10 s | n.a. | n a | n.a. | | |
| | | 10.0 | | | | | |
| Solderability | J-STD-002 | | 78 | 780 | 0 | | |
| | iboratory iiability labs EC-Q101 Test TEST Pre- and Post-Stress Electrical Test PC Preconditioning HTRB High Temperature Reverse Bias TC Temperature Cycling AC Autoclave H3TRB High Humidity High Temperature Reverse Bias IOL Intermittent Operating Life RSH Resistance to Solder Heat SD | PESD1LVDS bboratory Part Description Nexperia DHAM liability labs MCD package EC-Q101 Test Test Conditions TEST Pre- and Post-Stress Electrical Test Tamb = 25 °C PC Soak Tamb = 125 °C PC Soak Tamb = 85 °C, RH = 85% Preconditioning Reflow soldering HTRB M1038 Method A High Temperature Reverse Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage TC JESD22-A104 .65 °C to Tjmax, not to exceed 150°C AC Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia) H3TRB JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] High Humidity High Temperature Reverse Bias JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] Kash High Humidity High Temperature Reverse Bias JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C for 15000 cycles RSH Resistance to Solder Heat JESD22-A111 260 °C ± 5 °C | PESDILVDS biboratory Part Description Nexperia DHAM Protection Bip Itability labs MCD package Protection Bip EC-Q101 Test Test Conditions Duration TEST Pre- and Post-Stress Tamb = 25 °C N/A Electrical Test Tamb = 25 °C N/A PC Soak Tamb = 125 °C 24 hours PC Soak Tamb = 85 °C, RH = 85% 168 hours Preconditioning Reflow soldering 3 cycles MIL-STD-750-1 M1038 Method A 1000 hours HTRB M1038 Method A 1000 hours Iss JESD22-A104 1000 hours TC JESD22-A104 1000 cycles Iss JESD22-A102 1000 cycles AC Tamb = 121 °C, RH = 100 % 96 hours H3TRB JESD22-A101 1000 hours High Humidity High Tamb = 85 °C, RH = 85%, VR = 80 % of 1000 hours IOL ton = toff, devices powered to insure ΔTj = 1000 hours IOL ton = toff, devices powered to insure ΔTj = 1000 hours | PESD1LVDS Part Description Nexperia DHAM Protection Bipolar MCD package Protection Bipolar EC-Q101 Test Test Conditions Duration # Lots TEST Pre- and Post-Stress Electrical Test Tamb = 25 °C N/A see below Bake Tamb = 125 °C N/A see below JESD22-A113 Bake Tamb = 85 °C, RH = 85% 168 hours PC Soak Tamb = 85 °C, RH = 85% 168 hours 142 HTRB MIL-STD-750-1 MI038 Method A 1000 hours 23 TC JESD22-A104 reverse voltage 1000 hours 53 JESD22-A102 JESD22-A104 -65 °C to Tjmax, not to exceed 150°C 1000 cycles 53 AC Tamb = 121 °C, RH = 100 % Autoclave JESD22-A104 -65 °C to Tjmax, not to exceed 150°C 1000 cycles 53 JESD22-A102 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 1000 hours 51 High Humidity High Temperature Reverse Bias IESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 1000 hours 51 HGL Tamb = 100 °C for 15000 cycles 1000 hours 51 Intermitten | PESD1LVDS uboratory Part Description Nexperia DHAM Protection Bipolar NCD package Protection Bipolar Elec-Q101 Test Test Conditions Duration # Lots # Quantity TEST Pre- and Post-Stress Electrical Test Tamb = 25 °C N/A see below all parts Bake Tamb = 125 °C 24 hours see below all parts PC Soak Tamb = 85 °C, RH = 85% 168 hours Jack Jack Jack PC Soak Tamb = 125 °C 24 hours Jack Jack Jack PC Soak Tamb = 125 °C 24 hours Jack Jack Jack PC Soak Tamb = 85 °C, RH = 85% 168 hours Jack Jack Jack HTRB MIL-STD-750-1 MIL-STD-750-1 MIL Jack Jack Jack MID Temperature Reverse Tige Timax, Vr = 100% of max. datasheet reverse voltage Jou Jou Jou Jack Jack MIL-STD-750-1 MIL-STD-750-1 MIL-STD-750-1 Jou Jou Jack Jack Jack MID Temperature Reverse <t< td=""></t<> | | |

[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 | Protection Bipolar | 1840 | 0 | 2.31 | 4.33E+08 |

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