

Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

| Supplier | | User Part Number | | | | |
|---|--|-----------------------------|-----------|------------|-----------|--|
| Nexperia B.V. | | 74AHC594BQ | | | | |
| Part Description: 8-bit serial-in/parallel-out shift register with output storage register | | | | | | |
| Function Family: AHC(T) Process family: Super micron Package family: DHVQFN | | | | | | |
| JESD47 Test | Test Conditions | Duration | # Lots | # Quantity | # Rejects | |
| # 1 TEST Pre- and Post-Stress Electrical Test | Tamb = 25 °C | N/A | see below | all parts | see below | |
| # 2 PC Preconditioning | JESD22-A113 MSL 1 | N/A | 314 | 19231 | 0 | |
| # 5a HTOL EFR High Temperature Operating Life Extrinsic | JESD22-A108 Tj = 150°C V _{CCMAX} ≤ V ≤ 1.2*V _{CCMAX} | 48 hours or 168 hours | 128 | 38474 | 0 | |
| # 5b HTOL IFR High Temperature Operating Life Intrinsic | JESD22-A108 Tj = 150°C V _{CCMAX} ≤ V ≤ 1.2*V _{CCMAX} | ≥500 hours | 76 | 5079 | 0 | |
| # 7 TC Temperature Cycling | JESD22-A104 -65 °C to 150°C | ≥500 cycles | 178 | 10253 | 0 | |
| # 9 uHAST / HAST unbiased or biased High Accelerated Stress Test | JESD22-A101 Tamb = 130 °C, RH = 85%, V = V _{CCMAX} | 96 hours | 156 | 8978 | 0 | |

Calculation of PPM, FIT and MTTF

Test considered for PPM calculation: High Temperature Operating LifeTest Extrinsic (HTOL EFR, Test # 5a above)

Test considered for FIT and MTTF calculations: High Temperature Operating LifeTest Intrinsic (HTOL IFR, Test # 5b above)

Confidence level 60%, derated to 55 °C, activation energy 0.7 eV, test time 168 to 1000 hours

| Product Family | Package Family | Quantity | Rejects | Extrinsic Failure Rate (PPM) | Intrinsic Failure Rate (FIT) | MTTF (hrs) |
|----------------|----------------|----------|---------|------------------------------|------------------------------|------------|
| AHC(T) | DHVQFN | 5079 | 0 | 24 | 0.7 | 1.57 E+09 |