

## Reliability Monitoring Results

**Quarters:** Q1/2024 to Q4/2024

Based on structural similarity

| Supplier  |   | User Part Number   |                             |           |            |           |
|---|---|--|-----------------------------|-----------|------------|-----------|
| Nexperia B.V.   |   | 74HC191PW  |                             |           |            |           |
| <b>Part Description:</b> Presettable synchronous 4-bit binary up/down counter   |   |  |                             |           |            |           |
| Function Family: HC(T)<br>Process family: Super micron<br>Package family: TSSOP |   |  |                             |           |            |           |
| JESD47 Test   |   | Test Conditions  | Duration                    | # Lots    | # Quantity | # Rejects |
| # 1   | <b>TEST</b><br>Pre- and Post-Stress<br>Electrical Test                    | Tamb = 25 °C   | N/A                         | see below | all parts  | see below |
| # 2   | <b>PC</b><br>Preconditioning  | JESD22-A113<br>MSL 1   | N/A                         | 1177      | 93752      | 0         |
| # 5a  | <b>HTOL EFR</b><br>High Temperature<br>Operating Life Extrinsic           | JESD22-A108<br>Tj = 150°C<br>V <sub>CCMAX</sub> ≤ V ≤ 1.2*V <sub>CCMAX</sub> | 48 hours<br>or<br>168 hours | 68        | 24378      | 0         |
| # 5b  | <b>HTOL IFR</b><br>High Temperature<br>Operating Life Intrinsic           | JESD22-A108<br>Tj = 150°C<br>V <sub>CCMAX</sub> ≤ V ≤ 1.2*V <sub>CCMAX</sub> | ≥500 hours                  | 64        | 3657       | 0         |
| # 7   | <b>TC</b><br>Temperature Cycling  | JESD22-A104<br>-65 °C to 150°C   | ≥500 cycles                 | 617       | 47928      | 0         |
| # 9   | <b>uHAST / HAST</b><br>unbiased or biased High<br>Accelerated Stress Test | JESD22-A101<br>Tamb = 130 °C,<br>RH = 85%, V = V <sub>CCMAX</sub>            | 96 hours                    | 595       | 45824      | 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) |
|----------------|----------------|----------|---------|------------------------------|------------------------------|------------|
| HC(T)          | TSSOP          | 3657     | 0       | 38                           | 1.1                          | 9.93 E+08  |