## nexperia

## **Reliability Monitoring Results**

## Quarters: Q1/2021 to Q4/2021

Based on structural similarity

| Suppli  | ier   | User Part Number   |                             |           |            |              |  |  |  |
|---------|---|--|-----------------------------|-----------|------------|--------------|--|--|--|
| Nexperi | ia B.V.   | 74AHCT86BQ-Q100  | 74AHCT86BQ-Q100             |           |            |              |  |  |  |
| Part D  | Description: Quad 2-input E   | XCLUSIVE-OR gate; TTL en   | abled                       |           |            |              |  |  |  |
| Pro     | nction Family: AHC(T)<br>ocess family: Super micron<br>ckage family: DHVQFN |  |                             |           |            |              |  |  |  |
| JESD4   | 7 Test  | Test Conditions  | Duration                    | # Lots    | # Quantity | #<br>Rejects |  |  |  |
| # 1     | TEST<br>Pre- and Post-Stress<br>Electrical Test                             | Tamb = 25 °C   | N/A                         | see below | all parts  | see<br>below |  |  |  |
| # 2     | <b>PC</b><br>Preconditioning  | JESD22-A113<br>MSL 1   | N/A                         | 314       | 19231      | 0            |  |  |  |
| # 5a    | HTOL EFR<br>High Temperature<br>Operating Life Extrinsic                    | JESD22-A108<br>Tj = 150°C<br>$V_{CCMAX} \le V \le 1.2*V_{CCMAX}$                       | 48 hours<br>or<br>168 hours | 128       | 38474      | 0            |  |  |  |
| # 5b    | HTOL IFR<br>High Temperature<br>Operating Life Intrinsic                    | JESD22-A108<br>Tj = 150°C<br>V <sub>CCMAX</sub> $\leq$ V $\leq$ 1.2*V <sub>CCMAX</sub> | ≥500 hours                  | 76        | 5079       | 0            |  |  |  |
| # 7     | TC<br>Temperature Cycling   | JESD22-A104<br>-65 °C to 150°C   | ≥500 cycles                 | 178       | 10253      | 0            |  |  |  |
| # 9     | uHAST / HAST<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                    | 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<br>Family | Package<br>Family | Quantity | Rejects | Extrinsic<br>Failure Rate (PPM) | Intrinsic<br>Failure Rate (FIT) | MTTF (hrs) |
|-------------------|-------------------|----------|---------|---------------------------------|---------------------------------|------------|
| AHC(T)            | DHVQFN            | 5079     | 0       | 24                              | 0.7                             | 1.57 E+09  |

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