## nexperia

## **Reliability Monitoring Results**

## Quarters: Q1/2021 to Q4/2021

Based on structural similarity

| Suppli  | ier                                                                  | User Part Number                                                                       |                             |           |            |              |  |  |
|---------|----------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------|-----------|------------|--------------|--|--|
| Nexperi | a B.V.                                                               | XC7SET08GV                                                                             | XC7SET08GV                  |           |            |              |  |  |
| Part D  | escription: Single 2-input A                                         | AND gate; TTL enabled                                                                  |                             |           |            |              |  |  |
| Pro     | nction Family: XC7<br>cess family: Super micron<br>kage family: TSOP |                                                                                        |                             |           |            |              |  |  |
| JESD4   | 7 Test                                                               | Test Conditions                                                                        | Duration                    | # Lots    | # Quantity | #<br>Rejects |  |  |
| # 1     | <b>TEST</b><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                         | 135       | 11128      | 0            |  |  |
| # 5a    | HTOL EFR<br>High Temperature<br>Operating Life Extrinsic             | JESD22-A108<br>Tj = 150°C<br>V <sub>CCMAX</sub> $\leq$ V $\leq$ 1.2*V <sub>CCMAX</sub> | 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>$V_{CCMAX} \le V \le 1.2*V_{CCMAX}$                       | ≥500 hours                  | 76        | 5079       | 0            |  |  |
| # 7     | TC<br>Temperature Cycling                                            | JESD22-A104<br>-65 °C to 150°C                                                         | ≥500 cycles                 | 64        | 5124       | 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                    | 75        | 6004       | 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) |
|-------------------|-------------------|----------|---------|---------------------------------|---------------------------------|------------|
| XC7               | TSOP              | 5079     | 0       | 24                              | 0.7                             | 1.57 E+09  |

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