

Reliability Results for Product Type PDTB114EQA

Time period: Q4/2015 to Q3/2016

Test Results

| AEC-Q101 Test | Conditions | Duration | Quantity | Rejects |
|--|---|-----------------------------------|-----------|-----------|
| TEST | | | | |
| # 1 Pre- and Post-Stress Electrical Test | $T_{amb} = 25\text{ °C}$ | N/A | all parts | see below |
| # 2 PC Preconditioning | JESD22-A113 Bake $T_{amb} = 125\text{ °C}$ Soak $T_{amb} = 85\text{ °C}$, RH = 85% Reflow soldering | 24 hours 168 hours 3 cycles | 2240 | 0 |
| # 5 HTRB High Temperature Reverse Bias | MIL-STD-750-1 M1038 Method A $T_j = T_{jmax}$, $V_r = 100\%$ of max. datasheet reverse voltage | 1000 hours | 6000 | 0 |
| # 7 TC Temperature Cycling | JESD22-A104 -55 °C to T_{jmax} , not to exceed 150 °C | 1000 cycles | 560 | 0 |
| # 8 AC Autoclave | JESD22-A102 $T_{amb} = 121\text{ °C}$, RH = 100 % Pressure = 205 kPa (29.7 psia) | 96 hours | 560 | 0 |
| # 9 H3TRB High Humidity High Temperature Reverse Bias | JESD22-A101 $T_{amb} = 85\text{ °C}$, RH = 85%, $V_R > 80\%$ of rated reverse voltage | 1000 hours | 560 | 0 |
| # 10 IOL Intermittent Operating Life | MIL-STD-750 Method 1037 $t_{on} = t_{off}$, devices powered to insure $\Delta T_j = 125\text{ °C}$ for 7500 cycles or $\Delta T_j = 100\text{ °C}$ for 15000 cycles | 1000 hours | 560 | 0 |
| # 20 RSH Resistance to Solder Heat | JESD22-A111 $260\text{ °C} \pm 5\text{ °C}$ | 10 s | 150 | 0 |
| # 21 SD Solderability | J-STD-002 Test method B and D | | 450 | 0 |

Calculation of FIT and MTBF

Test considered for FIT calculation: High Temperature Reverse Bias (HTRB, AEC-Q101 Test # 5)

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 | MTBF |
|---------------|----------------------|----------|---------|--------------|--------------|
| Nexperia DHAM | Small Signal Bipolar | 6000 | 0 | 0.71 FIT | 161178 years |