## nexperia

## **Quarterly Reliability Monitoring Results**

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

	User Part Number					
	PESD5V0X2UM Part Description					
aboratory						
	Nexperia DHAM	Protection				
liability labs	MCD package					
EC-Q101 Test	Test Conditions	Duration	# Lots	# Quantity	# Rejects	
TEST						
	T 1 25.00					
Electrical Test		N/A	see below	all parts	see below	
		24 hauna				
PC						
	Reflow soldering		142	11435	0	
5	MIL-STD-750-1			11.00	0	
HTRB						
Bias	reverse voltage	1000 hours	117	9360	0	
тс	JESD22-A104					
Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	1000 cycles	53	4225	0	
	JESD22-A102					
Autoclave	Pressure = 205 kPa (29.7 psia)	96 hours	39	3165	0	
	150000 4404					
		1000 have	<b>F1</b>	10.15	0	
Temperature Reverse bias		1000 nours	51	4045	0	
101						
		1000 hours	<b>n</b> a	<b>n</b> a	<b>n</b> a	
internition operating Life	200 C.O. 19000 Cycles	1000 1100/5	11.d.	11. <b>d</b> .	n.a.	
RSH	IFSD22-A111					
		10 s	n.a.	n.a.	n.a.	
SD						
Solderability	J-STD-002		78	780	0	
	iboratory iiability labs EC-Q101 Test TEST Pre- and Post-Stress Electrical Test PC Preconditioning HTRB High Temperature Reverse Bias TC Temperature Cycling AC Autoclave H3TRB High Humidity High Temperature Reverse Bias IOL Intermittent Operating Life RSH Resistance to Solder Heat SD	PESD5V0X2UM       bboratory     Part Description Nexperia DHAM       liability labs     MCD package       EC-Q101 Test     Test Conditions       TEST Pre- and Post-Stress Electrical Test     Tamb = 25 °C       PC     Soak Tamb = 125 °C       PC     Soak Tamb = 85 °C, RH = 85%       Preconditioning     Reflow soldering       HTRB     M1038 Method A       High Temperature Reverse     Ti = Tjmax, Vr = 100% of max. datasheet reverse voltage       TC     JESD22-A104 .65 °C to Tjmax, not to exceed 150°C       AC     Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)       H3TRB     JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage <sup>[11]</sup> High Humidity High Temperature Reverse Bias     JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage <sup>[11]</sup> Kash High Humidity High Temperature Reverse Bias     JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage <sup>[11]</sup> MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C for 15000 cycles       RSH Resistance to Solder Heat     JESD22-A111 260 °C ± 5 °C	PESD5V0X2UMIboratoryPart Description Nexperia DHAM MCD packageEC-Q101 TestTest ConditionsDurationTEST Pre- and Post-Stress Electrical TestTamb = 25 °CN/APC PC PreconditioningJESD22-A113 Bake Tamb = 125 °C24 hours 168 hours 3 cyclesPC BiasMIL-STD-750-1 M1038 Method A High Temperature Reverse BiasMIL-STD-750-1 Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage1000 hoursTC Temperature CyclingJESD22-A104 -65 °C to Tjmax, not to exceed 150°C Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)96 hoursH3TRB High Humidity High Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage1000 hoursKarse H3TRB High Humidity High Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage1000 hoursKarse HSTRB High Humidity High Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, CH = 85%, VR = 80 % of rated reverse voltage1000 hoursKSH Resistance to Solder HeatJESD22-A111 260 °C to 7 15000 cycles1000 hours	PESD5V0X2UM           Part Description Nexperia DHAM         Protection           Nexperia DHAM         Protection           Biability labs         MCD package         Duration         # Lots           EC-Q101 Test         Test Conditions         Duration         # Lots           TEST Pre- and Post-Stress Electrical Test         Tamb = 25 °C         N/A         see below           JESD22-A113 Bake Tamb = 125 °C         24 hours         168 hours           PC         Soak Tamb = 85 °C, RH = 85%         168 hours           Preconditioning         Reflow soldering         3 cycles         142           HTRB         MIL-STD-750-1         1000 hours         117           TC         JESD22-A104         1000 hours         117           TC         JESD22-A102         1000 hours         53           AC         Tamb = 121 °C, RH = 100 %         4utoclave         39           H3TRB         JESD22-A101         Tamb = 85 °C, RH = 85%, VR = 80 % of         39           H3TRB         JESD22-A101         Tamb = 85 °C, RH = 85%, VR = 80 % of         1000 hours         51           High Humidity High         Tamb = 85 °C, RH = 85%, VR = 80 % of         1000 hours         51           High Humidity High         Tamb = 85 °C, RH = 85%, V	PESD5V0X2UM         ubboratory       Part Description Nexperia DHAM       Protection         Nexperia DHAM       Protection         Itability labs       MCD package         Elec-Q101 Test       Test Conditions       Duration       # Lots       # Quantity         TEST Pre- and Post-Stress Electrical Test       Tamb = 25 °C       N/A       see below       all parts         Bake Tamb = 125 °C       24 hours       see below       all parts         PC       Soak Tamb = 85 °C, RH = 85%       168 hours       142       11435         PC       Soak Tamb = 85 °C, RH = 85%       168 hours       3 cycles       142       11435         HTRB       MIL-STD-750-1 M1038 Method A       MIL-STD-750-1 Tiomax, vr = 100% of max. datasheet Bias       1000 hours       117       9360         TC       JESD22-A104 -65 °C to Tjmax, not to exceed 150°C       1000 hours       53       4225         AC       JESD22-A102 Tamb = 121 °C, RH = 100 % Autoclave       JESD22-A102 Presure = 205 kPa (29.7 psia)       96 hours       39       3165         H3TRB High Humidity High Temperature Reverse Bias       JESD22-A101 Tamb = 85 °C, RH = 85 %, VR = 80 % of rated reverse voltage <sup>[1]</sup> 1000 hours       51       4045         KSH Resistance to Solder Heat       JESD22-A111 Z60 °C ± 5 °C       10 s </td	

[1] The maximum applied voltage is limited by test chamber set up and does not exceed 115V.

## **Calculation of FIT and MTTF**

Test considered for FIT calculation: High Temperature Reverse Bias (HTRB, Test #B1) 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 (FIT)	MTTF (hrs)
Nexperia DHAM	Protection	9360	0	0.45	2.20E+09

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