nexperia

Quarterly Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

	User Part Number						
	PTVS3V3P1UP Part Description						
boratory							
	Nexperia DHAM	Protection					
liability labs	SMD package						
EC-Q101 Test	Test Conditions	Duration	# Lots	# Quantity	# Rejects		
TEST							
	T 1 05 00						
Electrical Test		N/A	see below	all parts	see below		
		24 hauna					
PC							
			286	21480	0		
	5	,	200	21100	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	86	6880	0		
	JESD22-A102						
	Tamb = 121 °C, RH = 100 %						
Autoclave	Pressure = 205 kPa (29.7 psia)	96 hours	86	6880	0		
		10001	0.0	6000	•		
Temperature Reverse Blas		1000 hours	86	6880	0		
101							
		1000 hours	n 3	n a	n		
internition operating Life		1000 1100/5	11.d.	11. d .	n.a.		
RSH	IFSD22-A111						
		10 s	28	840	0		
SD			_0		-		
Solderability	J-STD-002		36	360	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	PTVS3V3P1UP bboratory Part Description Nexperia DHAM liability labs SMD 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 .55 °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 ^[1] High Humidity High Temperature Reverse Bias JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] Kesh High Humidity High Temperature Reverse Bias JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 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	PTVS3V3P1UP Iboratory Part Description Nexperia DHAM Protection Nexperia DHAM Protection Bibility labs SMD package Duration TEST Pre- and Post-Stress Electrical Test Tamb = 25 °C N/A JESD22-A113 Bake Tamb = 125 °C Q4 hours PC Soak Tamb = 85 °C, RH = 85% 168 hours Preconditioning Reflow soldering 3 cycles MIL-STD-750-1 M1038 Method A 1000 hours TC JESD22-A104 -65 °C to Tjmax, not to exceed 150°C 1000 cycles TC JESD22-A102 -7amb = 121 °C, RH = 100 % Autoclave Pressure = 205 kPa (29.7 psia) 96 hours H3TRB JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] 1000 hours IOL MIL-STD-750 Method 1037 to n = toff, devices powered to insure ΔTj = Intermittent Operating Life III-STD-750 Method 1037 to n = toff, devices powered to insure ΔTj = 1000 hours RSH Resistance to Solder Heat JESD22-A111 260 °C 5 °C 10 s	PTVS3V3P1UP Mboratory Part Description Nexperia DHAM Protection Nexperia DHAM Protection #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 568 hours 286 PC Soak Tamb = 85 °C, RH = 85% 168 hours 286 PC Soak Tamb = 85 °C, RH = 85% 168 hours 286 Preconditioning Reflow soldering 3 cycles 286 MIL-STD-750-1 Mi1038 Method A MIL-STD-750-1 1000 hours 117 TC JESD22-A104 1000 hours 117 TC JESD22-A102 1000 cycles 86 AC Tamb = 121 °C, RH = 100 % 86 86 H3TRB JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of 86 High Humidity High Tamb = 85 °C, RH = 85%, VR = 80 % of 1000 hours 86 H3TRB JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of 1000 hours	Image: PrvS3V3P1UP PrvS3V3P1UP Nexperia DHAM Protection Nexperia DHAM Protection Itability labs SMD 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 zes zes zes PC Soak Tamb = 85 °C, RH = 85% 168 hours zes zes zes MIL-STD-750-1 HTRB MIL-STD-750-1 M1038 Method A MIL-STD-750-1 max, vr = 100% of max. datasheet reverse voltage 1000 hours 117 9360 TC JESD22-A104 -65 °C to Tjmax, not to exceed 150°C 1000 cycles 86 6880 MIL-STD-750 relectrical Tamb = 121 °C, RH = 100 % Autoclave JESD2-A102 -65 °C to Tjmax, not to exceed 150°C 1000 hours 86 6880 High Humidity High Temperature Reverse Bias JESD2-A101 Tamb = 212 °C, RH = 80 % of rated reverse voltage ^[11] 1000 hours 86 6880 High Humidity High Temperature Reverse Bias JESD2-A101 Tam = 100 °C		

[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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