nexperia

Quarterly Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

ability labs C-Q101 Test TEST	PUMD4 Part Description Nexperia DHAM SMD package Test Conditions	Small Signal B	ipolar Transist	or				
ability labs C-Q101 Test TEST	Nexperia DHAM SMD package		ipolar Transist	or				
C-Q101 Test TEST	SMD package		ipolar Transist	or				
C-Q101 Test TEST	· · · ·							
TEST	Test Conditions		SMD package					
		Duration	# Lots	# Quantity	# Rejects			
Pre- and Post-Stress								
Electrical Test	Tamb = 25 °C	N/A	see below	all parts	see below			
	JESD22-A113	241						
BC.								
			840	61170	0			
reconditioning		5 676.65	049	01170	0			
HTDR								
Bias	reverse voltage	1000 hours	202	16160	0			
тс	JESD22-A104							
Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	1000 cycles	171	13680	0			
	JESD22-A102							
AC	Tamb = 121 °C, RH = 100 %							
Autoclave	Pressure = 205 kPa (29.7 psia)	96 hours	173	13840	0			
Temperature Reverse bias		1000 hours	1/3	13840	0			
101								
		1000 hours	107	15760	0			
Internittent Operating Life	100 C 101 10000 Cycles	TOOD HORLS	191	13/00	U			
RSH	IFSD22-4111							
		10 s	135	4050	0			
		10.3	100	1000	0			
	J-STD-002		342	3420	0			
	Bias TC Temperature Cycling AC Autoclave H3TRB High Humidity High Temperature Reverse Bias IOL Intermittent Operating Life RSH Resistance to Solder Heat SD Solderability	HarmoniaJESD22-A113 Bake Tamb = 125 °CPCSoak Tamb = 85 °C, RH = 85% PreconditioningMIL-STD-750-1 M1039 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltageHTRBMIL-STD-750-1 M1039 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltageTCJESD22-A104 -65 °C to Tjmax, not to exceed 150°CACJESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)H3TRBJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of Temperature Reverse BiasH3TRBJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of Tamb = 150 °CH3TRBJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of Tamb = 700 °C for 15000 cyclesRSHJESD22-A111 260 °C ± 5 °CSD SolderabilityJ-STD-002	HTRBJESD22-A113 Bake Tamb = 125 °C24 hours 168 hours 3 cyclesPCSoak Tamb = 85 °C, RH = 85% Soak Tamb = 85 °C, RH = 85%168 hours 3 cyclesHTRBMIL-STD-750-1 M1039 Method A High Temperature Reverse BiasMIL-STD-750-1 T j = Tjmax, Vr = 100% of max. datasheet reverse voltage1000 hoursTCJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cyclesACJESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)96 hoursH3TRBJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of Tated reverse voltage ^[1] 1000 hoursIOLMIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔT j = 1000 hours1000 hoursRSH Resistance to Solder HeatJESD22-A111 260 °C ± 5 °C10 s	Total DescriptionTotal DescriptionTotal DescriptionJESD22-A113 Bake Tamb = 125 °C24 hours 168 hoursPCSoak Tamb = 85 °C, RH = 85%168 hours 3 cyclesPreconditioningReflow soldering3 cyclesMIL-STD-750-1 M1039 Method A High Temperature ReverseMIL-STD-750-1 T j = Tjmax, Vr = 100% of max. datasheet reverse voltage1000 hoursTCJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cycles171ACJESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)96 hours173H3TRB High Humidity High Tamb = 85 °C, RH = 85%, VR = 80 % of Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of Tamb = 85 °C, RH = 85%, VR = 80 % of Tamb = 100 hours173IOL RSH Resistance to Solder HeatJESD22-A111 260 °C to 5 °C1000 hours197RSH SolderabilityJ-STD-002342	Harden in the low of the presence of the pres			

[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	Small Signal Bipolar Transistor	16160	0	0.26	3.81E+09

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