nexperia

Quarterly Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

	User Part Number						
	PQMD10 Part Description						
boratory							
	Nexperia DHAM Small Signal Bipolar Transistor MCD package						
liability labs							
EC-Q101 Test	Test Conditions	Duration	# Lots	# Quantity	# Rejects		
TEST							
Electrical Test	Tamb = 25 °C	N/A	see below	all parts	see below		
	JESD22-A113						
PC.							
			200	16640	0		
reconditioning		5 cycles	208	10040	U		
UTDP							
Bias	reverse voltage	1000 hours	202	16160	0		
					-		
тс	JESD22-A104						
Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	1000 cycles	52	4160	0		
	JESD22-A102						
AC	Tamb = 121 °C, RH = 100 %						
Autoclave	Pressure = 205 kPa (29.7 psia)	96 hours	52	4160	0		
					-		
remperature keverse Blas		1000 hours	52	4160	0		
101							
		1000 hours	50	4160	0		
Internittent Operating Life		1000 nours	52	4160	0		
DCH	JESD22-4111						
		10 s	na	na	n.a.		
		10.5	ma.				
Solderability	J-STD-002		111	1110	0		
	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	PQMD10 boratory 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 M1039 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 % Autoclave H3TRB JESD22-A102 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 ^[11] High Humidity High Temperature Reverse Bias Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C for 15000 cycles 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 SD	PQMD10boratoryPart Description Nexperia DHAMSmall Signal Eliability labsMCD packageEC-Q101 TestTest ConditionsDurationTEST Pre- and Post-Stress Electrical TestTamb = 25 °CN/AJESD22-A113 Bake Tamb = 125 °CSoak Tamb = 85 °C, RH = 85%168 hours 168 hoursPCSoak Tamb = 85 °C, RH = 85%168 hours 168 hoursPCSoak Tamb = 750-1 MIL-STD-750-1MIL-STD-750-1 HTRBHTRBM1039 Method A reverse voltage1000 hoursTCJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cyclesACJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cyclesH3TRBJESD22-A102 ramb = 121 °C, RH = 100 % Autoclave1000 hoursH3TRBJESD22-A101 rated reverse voltage1000 hoursIOLION = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage1000 hoursIOLION = 107, devices powered to insure Δ Tj = Intermittent Operating Life100 °C for 15000 cyclesRSHJESD22-A111 260 °C to 5 °C10 s	PQMD10 boratory Part Description Nexperia DHAM Small Signal Bipolar Transist iability 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 Soak Tamb = 85 °C, RH = 85% 168 hours PC Soak Tamb = 85 °C, RH = 85% 168 hours 208 PC Soak Tamb = 125 °C 24 hours 208 HTRB MIL-STD-750-1 1000 hours 202 MIL-STD-750-1 MIL-STD-750-1 1000 hours 202 TC JESD22-A104 1000 hours 202 TC JESD22-A102 1000 hours 52 AC Tamb = 121 °C, RH = 100 % 96 hours 52 High Humidity High Tamb = 85 °C, RH = 85%, VR = 80 % of 72 72 High Humidity High Tamb = 85 °C, RH = 85%, VR = 80 % of 72 72 Itemperature Reverse Bias JESD22-A101 1000 hours 52 KSH JESD22-A101 1000 hours	PQMD10 boratory Part Description Nexperia DHAM MCD package Small Signal Bipolar Transistor Iability labs MCD package Puration # Lots # Quantity TEST Pre- and Post-Stress Tamb = 25 °C N/A see below all parts JESD22-A113 Bake Tamb = 125 °C 24 hours see below all parts PC Soak Tamb = 85 °C, RH = 85% 168 hours Jest 208 1640 HTRB MIL-STD-750-1 M1033 Method A High Temperature Reverse Tig = 100% of max. datasheet reverse voltage 1000 hours 202 16160 TC JESD22-A104 -65 °C to Tjmax, not to exceed 150°C 1000 ocycles 52 4160 Acc JESD22-A102 Tamb = 121 °C, RH = 100 % Autoclave JESD2-A102 Pressure 205 kPa (29.7 psia) 96 hours 52 4160 High Humidity High Temperature Reverse Bias JESD2-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 1000 hours 52 4160 RSH Intermittent Operating Life JESD2-A101 Tom = toff, devices powered to insure ΔTj = Intermittent Operating Life JESD2-A111 Resistance to Solder Heat JESD2-A111 Zo °C for 15000 cycles 100 hours 52 4160 RSH Resistance to Solder Heat JESD2-A1		

[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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