nexperia

Quarterly Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

	User Part Number						
	BCW32 Part Description						
boratory							
	Nexperia DHAM Small Signal Bipolar Transistor						
liability labs	SMD package						
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	241					
PC							
			840	61170	0		
		5 676165	049	01170	0		
HTPR							
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	173	13840	0		
101							
		1000 hours	107	15760	0		
Internitient Operating Life		1000 Hours	191	12/00	U		
RSH	IESD22-4111						
		10 s	135	4050	0		
		10.3	133	1000	0		
Solderability	J-STD-002		342	3420	0		
	boratory liability 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	BCW32 boratory 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 M1L-STD-750-1 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 ^[1] High Humidity High Temperature Reverse Bias 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 Imate Toff devices powered to insure ΔTj = 100 °C for 15000 cycles RSH Resistance to Solder Heat JESD22-A111 260 °C ± 5 °C	BCW32boratoryPart Description Nexperia DHAMSmall Signal Eliability labsSMD packageEC-Q101 TestTest ConditionsDurationTEST Pre- and Post-Stress Electrical TestTamb = 25 °CN/AJESD22-A113 Bake Tamb = 125 °CSoak Tamb = 85 °C, RH = 85%168 hoursPC PCSoak Tamb = 85 °C, RH = 85%168 hoursPreconditioningReflow soldering3 cyclesHTRB High Temperature Reverse BiasMIL-STD-750-1 HTRB1000 hoursTC Temperature CyclingJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cyclesAC AutoclaveJESD22-A104 -65 °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 voltage ^[11] 1000 hoursIOL ton = toff, devices powered to insure Δ Tj = Intermittent Operating LifeJESD22-A111 260 °C to 7 15000 cycles1000 hoursRSH Resistance to Solder HeatJESD22-A111 260 °C to 5 °C 10 o s10 s	BCW32 boratory Part Description Nexperia DHAM Small Signal Bipolar Transist ilability labs SMD package 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 68 hours PC Soak Tamb = 85 °C, RH = 85% 168 hours Preconditioning Reflow soldering 3 cycles 849 HTRB MIL-STD-750-1 1000 hours 202 TC JESD22-A104 1000 hours 202 TC JESD22-A102 1000 hours 171 JESD22-A102 Tamb = 121 °C, RH = 100 % 1000 hours 173 AC Tamb = 121 °C, RH = 100 % 1000 hours 173 H3TRB JESD22-A101 1000 hours 173 High Humidity High Temperature Reverse Bias Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] 1000 hours 173 H3TRB JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] 1000 hours 173	boratory Part Description Nexperia DHAM Small Signal Bipolar Transistor Small Signal Bipolar Signal Bipolar Signal Bipolar S		

[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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