nexperia

Quarterly Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2023 Based on structural similarity

	User Part Number				
	HPZR-C47-Q				
aboratory	Part Description				
	Nexperia DHAM	Zener			
liability labs	SMD package				
EC-Q101 Test	Test Conditions	Duration	# Lots	# Quantity	# Rejects
TEST					
Pre- and Post-Stress					
Electrical Test	Tamb = 25 °C	N/A	see below	all parts	see below
	JESD22-A113				
	Bake Tamb = 125 °C	24 hours			
PC		168 hours			
Preconditioning	Reflow soldering	3 cycles	1514	64430	0
	MIL-STD-750-1				
HTRB					
Bias	voltage	1000 hours	250	11400	0
	MIL-STD-750-1				
	5 5 7				
Steady State Operational	reverse current	1000 hours	44	1920	0
70					
		1000 evelop	211	14000	0
Temperature Cycling		1000 cycles	511	14080	0
IIHAST	1ESD22-4119				
		96 hours	311	14080	0
AC					
H3TRB	JESD22-A101				
		1000 hours	311	14080	0
IOL					
		1000 hours	312	14120	0
	· · ·				
RSH	JESD22-A111				
Resistance to Solder Heat	260 °C ± 5 °C	10 s	269	8070	0
SD					
Solderability	J-STD-002		19	6660	0
	aboratory iliability labs FEC-Q101 Test TEST Pre- and Post-Stress Electrical Test PC Preconditioning HTRB High Temperature Reverse Bias SSOP Steady State Operational TC Temperature Cycling UHAST Unbiased HAST AC Autoclave H3TRB High Humidity High Temperature Reverse Bias IOL Intermittent Operating Life RSH Resistance to Solder Heat SD	aboratoryPart Description Nexperia DHAM SMD packageHiability labsSMD packageKEC-Q101 TestTest ConditionsTEST Pre- and Post-Stress Electrical TestTamb = 25 °CJESD22-A113 Bake Tamb = 125 °CPCSoak Tamb = 85 °C, RH = 85% PreconditioningPFCSoak Tamb = 85 °C, RH = 85% PreconditioningHTRB High Temperature Reverse BiasMIL-STD-750-1 M1038 Method A Tj = Tjmax, VR = 80 % of rated reverse voltageSSOP Steady State OperationalMIL-STD-750-1 M1038 Method B Tj = Tjmax, Iz = 100% of max. datasheet reverse currentTC Temperature CyclingJESD22-A104 -65 °C to Tjmax, not to exceed 150°CUHAST JUbiased HASTJESD22-A104 Tamb = 130 °C, RH = 85 % JESD22-A102AC AutoclaveJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse laisH3TRB High Humidity High Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] MIL-STD-750 Method 1037 ton = toff, devices powered to insure Δ Tj = 100 °C for 15000 cyclesRSH Resistance to Solder HeatJESD22-A111 260 °C \pm 5 °CSD	aboratoryPart Description Nexperia DHAM SMD packageZenerBilability labsSMD packageVEC-Q101 TestTest ConditionsDurationTEST Pre- and Post-Stress Electrical TestTamb = 25 °CN/AJESD22-A113 Bake Tamb = 125 °C24 hoursBake Tamb = 125 °C24 hoursPCSoak Tamb = 85 °C, RH = 85% M1038 Method A168 hours 3 cyclesHTRB High Temperature Reverse BiasMIL-STD-750-1 M1038 Method A1000 hoursTCJESD22-A104 Temperature Cycling1000 hoursTCJESD22-A104 Temperature Cycling1002-A118 Tamb = 130 °C, RH = 85 % JESD22-A10496 hoursAC AutoclaveJESD22-A101 Tamb = 130 °C, RH = 85 % JESD22-A101 Tamb = 205 kPa (29.7 psia)96 hoursMIL-STD-750 Method 1037 IoL Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] 1000 hoursMIL-STD-750 Method 1037 ToOL Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] 1000 hoursMIL-STD-750 Method 1037 ToOL Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] 1000 hoursMIL-STD-750 Method 1037 ToOL Intermittent Operating LifeJESD22-A111 260 °C ± 5 °C1000 hoursRSH RSH SDJESD22-A111 260 °C ± 5 °C10 s1000 hours	Part Description Nexperia DHAM SMD packageZenerSMD packageSMD packageElectO11 TestTest ConditionsDuration# LotsTEST Pre- and Post-Stress Electrical TestTamb = 25 °CN/Asee belowJESD22-A113 Bake Tamb = 125 °C24 hours24 hoursPCSoak Tamb = 85 °C, RH = 85%168 hoursPreconditioningReflow soldering3 cycles1514HTRB High Temperature Reverse BiasMIL-STD-750-1 MIL038 Method A1000 hours250SSOPTj = Tjmax, VR = 80 % of rated reverse bias1000 hours250Steady State Operationalreverse current1000 hours44TC Temperature CyclingJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cycles311UHAST Unbiased HASTJESD22-A102 Tamb = 130 °C, RH = 85 % JESD22-A10296 hours311Ac AutoclaveJESD22-A102 Pressure = 205 kPa (29.7 psia)96 hours311H3TRB High Humidity High Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of Temperature Reverse Bias311ML-STD-750 Method 1037 ton = toff, devices powered to insure $\Delta T_j =$ Intermittent Operating LifeJESD22-A111 100 °C for 15000 cycles1000 hours312RSH Resistance to Solder HeatJESD22-A111 200 °C ± 5 °C10 s269269	Part Description Nexperia DHAMZenerHigh EmperatorSMD packageVEC-Q101 TestTest ConditionsDuration# Lots# QuantityTEST Pre- and Post-Stress Electrical TestTamb = 25 °CN/Asee belowall partsJESD22-A113 Bake Tamb = 125 °CN/Asee belowall partsPCSoak Tamb = 85 °C, RH = 85%168 hours151464430PreconditioningReflow soldering3 cycles151464430HTRB High Temperature Reverse BiasMIL-STD-750-1 M1038 Method AMIL-STD-750-1 M1038 Method A1000 hours25011400SSOPTj = Tjmax, VR = 80 % of rated reverse voltage1000 hours441920TC Temperature Reverse Unbased HASTJESD22-A104 Tamb = 121 °C, RH = 85 % Tamb = 310 °C, RH = 85 % Tamb = 310 °C, RH = 85 %, VR = 80 % of Tamb = 310 °C, RH = 85 %, VR = 80 % of Tamb = 310 °C, RH = 85 %, VR = 80 % of Tamb = 31114080MLSTD High Humidity High Temperature Reverse BiaJESD22-A101 Tamb = 85 °C, RH = 85 %, VR = 80 % of Tamb = 35 °C, RH = 85 %, VR = 80 % of Tamb = 312 °C, RH = 85 %, VR = 80 % of Tamb = 312 °C, RH = 85 %, VR = 80 % of Tamb = 312 °C, RH = 85 %, VR = 80 % of Tamb = 121 °C, RH = 100 % Autoclave31114080ML-STD-750 Method 1037 Tom = 10ff, devices powered to insure ΔT] = Intermittent Operating LifeJESD22-A111 Tamb = 35 °C, RH = 85 °C, R

[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

2,68E+09
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