nexperia

Quarterly Reliability Monitoring Results

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

Pratory bility labs C-Q101 Test TEST Pre- and Post-Stress Electrical Test PC Preconditioning HTRB High Temperature Reverse	BAT760-Q Part Description Nexperia DHAM SMD package Test Conditions Tamb = 25 °C JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering MIL-STD-750-1	Schottky Duration N/A 24 hours 168 hours 3 cycles	# Lots see below	# Quantity all parts	# Rejects
bility labs -Q101 Test TEST Pre- and Post-Stress Electrical Test PC Preconditioning HTRB	Nexperia DHAM SMD package Test Conditions Tamb = 25 °C JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	Duration N/A 24 hours 168 hours			-
C-Q101 Test TEST Pre- and Post-Stress Electrical Test PC Preconditioning HTRB	SMD package Test Conditions Tamb = 25 °C JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	Duration N/A 24 hours 168 hours			-
C-Q101 Test TEST Pre- and Post-Stress Electrical Test PC Preconditioning HTRB	Test Conditions Tamb = 25 °C JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	N/A 24 hours 168 hours			-
C-Q101 Test TEST Pre- and Post-Stress Electrical Test PC Preconditioning HTRB	Test Conditions Tamb = 25 °C JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	N/A 24 hours 168 hours			
TEST Pre- and Post-Stress Electrical Test PC Preconditioning HTRB	Tamb = 25 °C JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	N/A 24 hours 168 hours			
Pre- and Post-Stress Electrical Test PC Preconditioning HTRB	JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	24 hours 168 hours	see below	all parts	see below
Electrical Test PC Preconditioning HTRB	JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	24 hours 168 hours	see below	all parts	see below
Preconditioning HTRB	JESD22-A113 Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	24 hours 168 hours			
Preconditioning HTRB	Bake Tamb = 125 °C Soak Tamb = 85 °C, RH = 85% Reflow soldering	168 hours			
Preconditioning HTRB	Soak Tamb = 85 °C, RH = 85% Reflow soldering	168 hours			
Preconditioning HTRB	Reflow soldering				
HTRB	-	JUYLIES	1514	64430	0
	M1038 Method A				
	Tj = Tjmax, Vr = 100% of max. datasheet				
Bias	reverse voltage ^[1]	1000 hours	206	9320	0
тс	JESD22-A104				
Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	1000 cvcles	311	14080	0
UHAST	JESD22-A118				
Unbiased HAST	Tamb = 130 °C, RH = 85 %	96 hours	311	14080	0
	1FSD22-A102				
AC					
Autoclave	Pressure = 205 kPa (29.7 psia)				
H3TRB	JESD22-A101				
	Tamb = 85 °C, RH = 85%, VR = 80 % of				
	rated reverse voltage ^{[1], [2]}	1000 hours	311	14080	0
	-				
IOL					
		1000 hours	312	14120	0
. 5	,				
RSH	JESD22-A111				
Resistance to Solder Heat	260 °C ± 5 °C	10 s	269	8070	0
SD					-
	1-STD-002		222	6660	0
	Temperature Cycling UHAST Unbiased HAST AC Autoclave H3TRB High Humidity High Temperature Reverse Bias IOL Intermittent Operating Life RSH Resistance to Solder Heat	Temperature Cycling-65 °C to Tjmax, not to exceed 150°CUHASTJESD22-A118Unbiased HASTTamb = 130 °C, RH = 85 %JESD22-A102ACTamb = 121 °C, RH = 100 %AutoclavePressure = 205 kPa (29.7 psia)H3TRBJESD22-A101High Humidity HighTamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^{[1], [2]} IOLMIL-STD-750 Method 1037 ton = toff, devices powered to insure Δ Tj = 100 °C for 15000 cyclesRSHJESD22-A111 260 °C ± 5 °CSD	Temperature Cycling-65 °C to Tjmax, not to exceed 150°C1000 cyclesUHASTJESD22-A11896 hoursUhastTamb = 130 °C, RH = 85 %96 hoursJESD22-A102JESD22-A10296 hoursACTamb = 121 °C, RH = 100 %96 hoursAutoclavePressure = 205 kPa (29.7 psia)1000 hoursH3TRBJESD22-A1011000 hoursHigh Humidity HighTamb = 85 °C, RH = 85%, VR = 80 % of Temperature Reverse Bias1000 hoursIOLTamb = 100 °C for 15000 cycles1000 hoursIOLton = toff, devices powered to insure ΔTj = 100 °C for 15000 cycles1000 hoursRSHJESD22-A111 260 °C ± 5 °C10 sSDSD10 s	Temperature Cycling-65 °C to Tjmax, not to exceed 150°C1000 cycles311UHASTJESD22-A118Unbiased HASTTamb = 130 °C, RH = 85 %96 hours311JESD22-A102ACTamb = 121 °C, RH = 100 %AutoclavePressure = 205 kPa (29.7 psia)H3TRBJESD22-A101H3TRBJESD22-A101High Humidity HighTamb = 85 °C, RH = 85%, VR = 80 % ofTemperature Reverse Biasrated reverse voltage ^{[1], [2]} 1000 hours311MIL-STD-750 Method 1037ton = toff, devices powered to insure ΔTj =Intermittent Operating LifeJESD22-A111RSHJESD22-A111RSHJESD22-A111RSHJESD22-A111RSHJESD22-A111RSHJESD22-A111RSHJESD22-A111RSHJESD22-A111SD	Temperature Cycling $-65 \ ^{\circ}C$ to Tjmax, not to exceed $150 \ ^{\circ}C$ $1000 \ \text{ cycles}$ 311 14080 UHASTJESD22-A11896 hours 311 14080 Unbiased HASTTamb = 130 \ ^{\circ}C, RH = 85 \ ^{\circ}AC96 hours 311 14080 ACTamb = 121 \ ^{\circ}C, RH = 100 \ ^{\circ}Autoclave96 hours 311 14080 H3TRBJESD22-A101 Tamb = 85 \ ^{\circ}C, RH = 85 \ ^{\circ}AC96 hours 311 14080 H3TRBJESD22-A101 Tamb = 85 \ ^{\circ}C, RH = 85 \ ^{\circ}AC $1000 \ hours$ 311 14080 H3TRBJESD22-A101 Tamb = 85 \ ^{\circ}C, RH = 85 \ ^{\circ}AC $1000 \ hours$ 311 14080 H3TRBJESD22-A101 Tamb = 85 \ ^{\circ}C, RH = 85 \ ^{\circ}AC $1000 \ hours$ 311 14080 RSHJESD22-A111 260 \ ^{\circ}C \pm 5 \ ^{\circ}C $10 \ ^{\circ}SD$ $10 \ ^{\circ}SD$ 8070

[1] The physical limitations of Schottky diodes have to be considered (thermal runaway). [2] 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

Nexperia DHAM Schottky 9320 0 0.46 2.19E+09	Wafer Fab	Technology	Quantity	Rejects	Failure Rate (FIT)	MTTF (hrs)
DHAM Schottky 9320 0 0.46 2.19E+09						
	DHAM	Schottky	9320	0	0,46	2,19E+09

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