nexperia

Quarterly Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

	User Part Number					
	PMEG045V150EPD Part Description					
boratory						
	Nexperia DHAM	Schottky				
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					
Preconditioning		3 cycles	810	58300	0	
5 1						
Bias	reverse voltage ¹³	1000 hours	116	9280	0	
тс	1FSD22-&104					
Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	1000 cycles	170	13600	0	
	1FSD22-A102					
AC						
Autoclave	Pressure = 205 kPa (29.7 psia)	96 hours	170	13600	0	
H3TRB	JESD22-A101					
	Tamb = 85 °C, RH = 85%, VR = 80 % of					
	rated reverse voltage ^{[1], [2]}	1000 hours	170	13600	0	
	MIL-STD-750 Method 1037					
IOL						
Intermittent Operating Life		1000 hours	170	13600	0	
			-		-	
RSH	JESD22-A111					
Resistance to Solder Heat		10 s	130	3900	0	
SD						
Solderability	J-STD-002		363	3630	0	
	Iability 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	PMEG045V150EPD boratory Part Description Nexperia DHAM iiability 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 M1038 Method A TC JESD22-A104 Temperature Cycling -65 °C to Tjmax, not to exceed 150°C JESD22-A102 AC Autoclave Pressure = 205 kPa (29.7 psia) H3TRB JESD22-A101 High Humidity High Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^{[11], [2]} MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C for 15000 cycles RSH JESD22-A111 Resistance to Solder Heat JESD22-A111 260 °C ± 5 °C SD	PMEG045V150EPD boratory Part Description Nexperia DHAM Schottky iiability labs SMD package Duration EC-Q101 Test Test Conditions Duration TEST Pre- and Post-Stress Tamb = 25 °C N/A Electrical Test Tamb = 25 °C N/A PC Soak Tamb = 125 °C 24 hours PC Soak Tamb = 85 °C, RH = 85% 168 hours Preconditioning Reflow soldering 3 cycles HTRB M1038 Method A 1000 hours High Temperature Reverse Bias Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage ^[1] 1000 hours TC JESD22-A104 -65 °C to Tjmax, not to exceed 150 °C 1000 cycles AC JESD22-A102 -Tamb = 121 °C, RH = 100 % Autoclave JESD22-A102 -Tamb = 121 °C, RH = 80 % of rated reverse voltage ^{[1], [2]} 1000 hours H3TRB JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^{[1], [2]} 1000 hours IOL ton = toff, devices powered to insure ΔTj = Intermittent Operating Life 100 °C for 15000 cycles 1000 hours RSH JESD22-A111 260 °C to 5 °C 10 s	PMEG045V150EPD boratory Part Description Nexperia DHAM Schottky iability labs SMD 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 68 hours PC Soak Tamb = 85 °C, RH = 85% 168 hours Pre-conditioning MIL-STD-750-1 1000 hours 116 TC JESD22-A104 reverse voltage ^[11] 1000 hours 116 TC JESD22-A104 reverse voltage ^[11] 1000 hours 170 AC Tamb = 121 °C, RH = 100 % Autoclave Pressure = 205 kPa (29.7 psia) 96 hours 170 H3TRB JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^{[11], [21]} 1000 hours 170 H3TRB JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^{[11], [21]} 1000 hours 170 KSH Resistance to Solder Heat JESD22-A111 260 °C ± 5 °C 10 s 130	PMEG045V150EPDboratoryPart Description Nexperia DHAM SebutiveSchuttkyItability labsSMD packageElect-Q101 TestTest ConditionsDuration# Lots# QuantityTEST Pre- and Post-StressTamb = 25 °CN/Asee belowall partsJESD22-A113 Bake Tamb = 125 °C24 hours 168 hoursS800S800PCSoak Tamb = 85 °C, RH = 85% Mile Shours168 hours 3 cyclesS810PreconditioningMIL-STD-750-1 M1038 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltage ^[1] 1000 hours1169280TC Temperature ReverseJESD22-A104 -65 °C to Tjmax, not to exceed 150°C Tamb = 121 °C, RH = 100 % AutoclaveJESD22-A102 Tamb = 121 °C, RH = 100 % Autoclave17013600H3TRB High Humidity High Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^{[1], [2]} Tom = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^{[1], [2]} Tom = 55 °C, RH = 85%, VR = 80 % of rated reverse voltage ^{[1], [2]} Tom = 100 °C for 15000 cycles17013600MIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = Intermittent Operating Life 100 °C for 15000 cycles100 s To s To s Tom s<	

[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

Wafer Fab	Technology	Quantity	Rejects	Failure Rate (FIT)	MTTF (hrs)
Nexperia DHAM	Schottky	9280	0	0.46	2.19E+09
	Beneticity	200	5		21152.05

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