nexperia

Quarterly Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on	structural	similarity
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	User Part Number						
	PTVS48VP1UTP						
boratory	Part Description						
	Nexperia DHAM						
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	Reflow soldering	3 cycles	286	21480	0		
	MIL-STD-750-1						
HTRB	M1038 Method A						
Bias	reverse voltage	1000 hours	117	9360	0		
тс	1FSD22-4104						
Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	1000 cvcles	86	6880	0		
	1ESD22-A102						
AC							
Autoclave	Pressure = 205 kPa (29.7 psia)	96 hours	86	6880	0		
H3TRB	JESD22-A101						
High Humidity High	Tamb = 85 °C, RH = 85%, VR = 80 % of						
	rated reverse voltage ^[1]	1000 hours	86	6880	0		
	MIL-STD-750 Method 1037						
IOL	ton = toff, devices powered to insure $\Delta T_j =$						
Intermittent Operating Life		1000 hours	n.a.	n.a.	n.a.		
RSH	JESD22-A111						
		10 s	28	840	0		
SD							
Solderability	J-STD-002		36	360	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	PTVS48VP1UTPboratoryPart Description Nexperia DHAMliability labsSMD packageEC-Q101 TestTest ConditionsTEST Pre- and Post-Stress Electrical TestTamb = 25 °CElectrical TestTamb = 25 °CPCSoak Tamb = 125 °CPCSoak Tamb = 85 °C, RH = 85%PreconditioningReflow solderingHTRB BiasMIL-STD-750-1 M1038 Method AHTRB BiasMIL-STD-750-1 M1038 Method ATC Temperature ReverseJESD22-A104 -65 °C to Tjmax, not to exceed 150°CAC AutoclaveTamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)H3TRB High Humidity High Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 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 ± 5 °CSDS	PTVS48VP1UTPboratoryPart Description Nexperia DHAMProtectionliability labsSMD packagePurationEC-Q101 TestTest ConditionsDurationTEST Pre- and Post-StressTamb = 25 °CN/AElectrical TestTamb = 25 °CN/APCSoak Tamb = 85 °C, RH = 85%168 hoursPreconditioningReflow soldering3 cyclesHTRB High Temperature ReverseMIL-STD-750-1 T j = Tjmax, Vr = 100% of max. datasheet reverse voltage1000 hoursTC Temperature CyclingJESD22-A104 -65 °C to Tjmax, not to exceed 150°C Tamb = 121 °C, RH = 100 % Autoclave96 hoursH3TRB High Humidity High Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[11] 1000 hoursKSH Resistance to Solder HeatJESD22-A111 260 °C ± 5 °C10 s	PTVS48VP1UTP boratory Part Description Nexperia DHAM Protection 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 286 PC Soak Tamb = 85 °C, RH = 85% 168 hours Preconditioning Reflow soldering 3 cycles 286 MIL-STD-750-1 Mi038 Method A MIL-STD-750-1 1000 hours 117 TC JESD22-A104 reverse voltage 1000 hours 117 TC JESD22-A104 reverse voltage 1000 hours 86 AC Tamb = 121 °C, RH = 100 % Autoclave Reflow soldering 86 High Humidity High Temperature Reverse Bias JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 1000 hours 86 H3TRB JESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 1000 hours 86 KSH Temperature Reverse Bias JESD22-A101 rated reverse voltage ^[1] 1000 hours 86 FRSH Resistance to Solder Heat JESD22-A111 260 °	PTVS48VP1UTPboratoryPart Description Nexperia DHAMProtectionImage: SMD packageEC-Q101 TestTest ConditionsDuration# Lots# QuantityTEST Pre- and Post-StressElectrical TestTamb = 25 °CN/Asee belowall partsJESD22-A113 Bake Tamb = 125 °C24 hours 168 hoursSoak Tamb = 85 °C, RH = 85%168 hoursPCSoak Tamb = 85 °C, RH = 85%168 hours28621480MIL-STD-750-1 MIL-STD-750-1MIL-STD-750 Timax, not to exceed 150°C1000 cyclesACTamb = 212 °C, RH = 80 % of rated reverse voltage		

[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	Protection	9360	0	0.45	2.20E+09

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