

Quarterly Reliability Monitoring Results

Quarters: Q1/2021 to Q4/2021

Based on structural similarity

bility labs C-Q101 Test TEST Pre- and Post-Stress	BC807-40L Part Description Nexperia DHAM SMD package Test Conditions	Small Signal B	ipolar Transist	or					
bility labs C-Q101 Test TEST	Nexperia DHAM SMD package		ipolar Transist	or					
C-Q101 Test TEST	SMD package		ipolar Transist	or					
C-Q101 Test TEST		Desertion							
TEST	Test Conditions	Descriptions		SMD package					
		Duration	# Lots	# Quantity	# Rejects				
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							
Preconditioning	Reflow soldering	3 cycles	849	61170	0				
5									
Blas	reverse voltage	1000 hours	202	16160	0				
тс	155022 4104								
		1000 cyclos	171	12690	0				
Temperature cycling		1000 Cycles	1/1	13080	0				
AC									
		06 hours	172	12940	0				
		90 110015	175	13640	0				
HOTOP	1FSD22-4101								
		1000 hours	173	13840	0				
		1000 110013	175	13040	0				
τοι									
		1000 hours	197	15760	0				
		1000 110015	177	13/00	U				
RSH	IFSD22-A111								
		10 s	135	4050	0				
		10.5	100	1050	0				
	1-STD-002		342	3420	0				
	Bias TC Temperature Cycling AC Autoclave H3TRB High Humidity High Temperature Reverse Bias IOL Intermittent Operating Life RSH Resistance to Solder Heat SD Solderability	PCSoak Tamb = 85 °C, RH = 85% Reflow solderingPreconditioningMIL-STD-750-1 M1039 Method A Tj = Tjmax, Vr = 100% of max. datasheet reverse voltageTCJESD22-A104 -65 °C to Tjmax, not to exceed 150°CACJESD22-A102 Tamb = 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] IOLMIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔTj = 100 °C for 15000 cyclesRSH Resistance to Solder HeatJESD22-A111 260 °C ± 5 °CSDSD	PCSoak Tamb = 85 °C, RH = 85%168 hours 3 cyclesPreconditioningReflow soldering3 cyclesHTRBMIL-STD-750-1 M1039 Method A Tie Tjmax, Vr = 100% of max. datasheet reverse voltage1000 hoursTCJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cyclesTCJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cyclesACJESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)96 hoursH3TRBJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 1000 hoursIOLMIL-STD-750 Method 1037 ton = toff, devices powered to insure ΔT = 100 °C for 15000 cycles1000 hoursRSHJESD22-A111 260 °C ± 5 °C10 sSD SolderabilityJ-STD-00210 s	PCSoak Tamb = 85 °C, RH = 85%168 hours 3 cycles849PreconditioningMIL-STD-750-1 M1039 Method A High Temperature ReverseMIL-STD-750-1 1 Jint 2 Times Treverse voltage1000 hours202TCJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cycles171ACJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cycles171ACJESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)96 hours173H3TRB High Humidity High Temperature Reverse BiasJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 1000 hours173IOLMIL-STD-750 Method 1037 ton = toff, devices powered to insure $\Delta T $ 100 °C for 15000 cycles1000 hours197RSH Resistance to Solder HeatJESD22-A111 260 °C ± 5 °C10 s135SD	PC PreconditioningSoak Tamb = 85 °C, RH = 85% Reflow soldering168 hours 3 cycles84961170HTRB High Temperature ReverseMIL-STD-750-1 M1039 Method A Tig Tjmax, NY r = 100% of max. datasheet reverse voltage1000 hours20216160TC Temperature CyclingJESD22-A104 -65 °C to Tjmax, not to exceed 150°C1000 cycles17113680AC AutoclaveJESD22-A102 Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)96 hours17313840H3TRB High Humidity High Temperature Reverse BiaJESD22-A101 Tamb = 85 °C, RH = 85%, VR = 80 % of rated reverse voltage ^[1] 1000 hours17313840IOL Intermittent Operating LifeJESD22-A111 200 °C for 15000 cycles1000 hours19715760Resistance to Solder HeatJESD22-A111 200 °C ± 5 °C100 s1354050				

[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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