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Quarterly Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2023

Based on structural similarity

Supplier		User Part Number						
Nexperia B.V.		PBSS5350T						
Name of Laboratory Assembly reliability labs Test		Part Description						
		Nexperia DHAM Small Signal Bipolar Transistor						
		SMD package						
		Test Conditions	Duration	# Lots	# Quantity	# Rejects		
	TEST							
	Pre- and Post-Stress							
# 1	Electrical Test	Tamb = 25 °C	N/A	see below	all parts	see below		
		JESD22-A113						
		Bake Tamb = 125 °C	24 hours					
# 2	PC Preconditioning	Soak Tamb = 85 °C, RH = 85% Reflow soldering	168 hours 3 cycles	1674	70.400	0		
# 2	Freconditioning	-	J CYCIES	1674	70490	0		
	HTRB	MIL-STD-750-1 M1039 Method A						
		$T_j = T_j max$, $Vr = 100\%$ of max. datasheet						
# 5	Bias	reverse voltage	1000 hours	415	18680	0		
	тс	JESD22-A104						
# 7	Temperature Cycling	-65 °C to Tjmax, not to exceed 150°C	500 cycles	343	15360	0		
	UHAST	JESD22-A118						
# 8 or	Unbiased HAST	Tamb = 130 °C, RH = 85 %	96 hours	362	15920	0		
		JESD22-A102						
# 8a	AC Autoclave	Tamb = 121 °C, RH = 100 % Pressure = 205 kPa (29.7 psia)						
# 0d	Autoclave							
	H3TRB	JESD22-A101						
	High Humidity High	Tamb = 85 °C, RH = 85%, VR = 80 % of						
# 9	Temperature Reverse Bias	rated reverse voltage ^[1]	1000 hours	343	15360	0		
		MIL-STD-750 Method 1037						
	IOL	ton = toff, devices powered to insure ΔTj =						
# 10	Intermittent Operating Life	100 °C	333 hours	343	15360	0		
	RSH	JESD22-A111						
# 20	Resistance to Solder Heat	260 °C ± 5 °C	10 s	283	8490	0		
# 21	SD Solderability	J-STD-002		214	6420	0		
# 21	,	J-SID-002		214	6420	0		

[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 # 5) 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	18680	0	0,23	4,40E+09

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