nexperia

Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2022

Based on structural similarity

Suppli	ier	User Part Number						
Nexper	ia B.V.	74HCT164BQ-Q100	4HCT164BQ-Q100					
Part D	Description: 8-bit serial-in/p	arallel-out shift register; ∏	L enabled					
Pro	nction Family: HC(T) ocess family: Super micron ckage family: DHVQFN							
JESD4	17 Test	Test Conditions	Duration	# Lots	# Quantity	# Rejects		
# 1	TEST Pre- and Post-Stress	Tamb = 25 °C	N/A	see below	all parts	see below		
	Electrical Test					below		
# 2	PC Preconditioning	JESD22-A113 MSL 1	N/A	386	23019	0		
# 5a	HTOL EFR High Temperature Operating Life Extrinsic	JESD22-A108 Tj = 150°C $V_{CCMAX} \le V \le 1.2*V_{CCMAX}$	48 hours or 168 hours	136	39090	0		
# 5b	HTOL IFR High Temperature Operating Life Intrinsic	JESD22-A108 Tj = 150°C $V_{CCMAX} \le V \le 1.2*V_{CCMAX}$	≥500 hours	84	5695	0		
# 7	TC Temperature Cycling	JESD22-A104 -65 °C to 150°C	≥500 cycles	208	12655	0		
# 9	uHAST / HAST unbiased or biased High Accelerated Stress Test	JESD22-A101 Tamb = 130 °C, RH = 85%, V = V _{CCMAX}	96 hours	178	10364	0		

Calculation of PPM, FIT and MTTF

Test considered for PPM calculation: High Temperature Operating LifeTest Extrinsic (HTOL EFR, Test # 5a above) Test considered for FIT and MTTF calculations: High Temperature Operating LifeTest Intrinsic(HTOL IFR, Test # 5b above)

Confidence level 60%, derated to 55 °C, activation energy 0.7 eV, test time 168 to 1000 hours

Product Family	Package Family	Quantity	Rejects	Extrinsic Failure Rate (PPM)	Intrinsic Failure Rate (FIT)	MTTF (hrs)
HC(T)	DHVQFN	5695	0	24	0.6	1.74 E+09

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