

## Reliability Monitoring Results

Quarters: Q1/2022 to Q4/2022

Based on structural similarity

Supplier		User Part Number				
Nexperia B.V.		NCA9539PW-Q100				
<b>Part Description:</b> Low-voltage 16-Bit I <sup>2</sup> C and SMBus low-power I/O expander with interrupt output. reset pin and configuration registers  Function Family: NCA Process family: BCD180 Package family: TSSOP						
JESD47 Test	Test Conditions	Duration	# Lots	# Quantity	# Rejects	
# 1	<b>TEST</b> Pre- and Post-Stress Electrical Test	Tamb = 25 °C	N/A	see below	all parts	see below
# 2	<b>PC</b> Preconditioning	JESD22-A113 MSL 1	N/A	1070	83683	0
# 5a	<b>HTOL EFR</b> High Temperature Operating Life Extrinsic	JESD22-A108 Tj = 150°C V <sub>CCMAX</sub> ≤ V ≤ 1.2*V <sub>CCMAX</sub>	48 hours or 168 hours	10	2939	0
# 5b	<b>HTOL IFR</b> High Temperature Operating Life Intrinsic	JESD22-A108 Tj = 150°C V <sub>CCMAX</sub> ≤ V ≤ 1.2*V <sub>CCMAX</sub>	≥500 hours	7	539	0
# 7	<b>TC</b> Temperature Cycling	JESD22-A104 -65 °C to 150°C	≥500 cycles	549	43127	0
# 9	<b>uHAST / HAST</b> unbiased or biased High Accelerated Stress Test	JESD22-A101 Tamb = 130 °C, RH = 85%, V = V <sub>CCMAX</sub>	96 hours	521	40556	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)
NCA	TSSOP	539	0	312	5.8	1.74 E+08