nexperia

Reliability qualification information

Stress	Conditions	Duration	Quantity	Rejects
Stress				
Pre and Post stress	$T_{amb} = 25^{\circ}C$	N/A	All parts	See below
electrical test				Delow
	JESD22-A113	24 hours		
PC	Bake $T_{amb} = 125^{\circ}C$	168 hours	924	0
Preconditioning	Soak $T_{amb} = 85^{\circ}C, RH = 85\%$	3 cycles	521	Ũ
	reflow	5 67 6165		
HTRB	MIL-STD-750-1	10001	231	0
High temperature	$T_j = T_j \text{ max}, V_{DS} = 80\% \text{ of rated}$	1000 hours		
reverse bias HTGB	Voltage M1039 Method A JESD22-A108			
	$T_j = T_j \max, V_{GS} = 20V(SL), 16V$	1000 hours	231	0
High temperature gate bias	$I_j = I_j IIIax, V_{GS} = 20V(SL), 10V$ (LL)	1000 110015		
TC	JESD22-A104			
Temperature Cycling	-55°C to 150°C	500 cycles	231	0
UHAST	JESD22-A118			
Unbiased highly	$T_{amb} = 130^{\circ}C, RH = 85\%$	96 hours	231	0
accelerated stress test	Pressure = $+2.27$ atm			
HAST*	JESD22-A110			
Highly accelerated	$T_{amb} = 130^{\circ}C, RH = 85\%$	96 hours	- 231	0
stress test	$V_{DS} = 80\%$ of rated voltage			
H3TRB*	JESD22-A101		251	
Temperature Humidity	$T_{amb} = 85^{\circ}C, RH = 85\%$	1000 hours		
bias	$V_{DS} = 80\%$ of rated voltage			
IOL	MIL-STD-750 method 1037	5000	224	
Intermittent operating	ΔTj = 80°C	5000 cycles	231	0
life				
RSH	155D22 A111 (SMD)			
Resistance to solder	JESD22-A111 (SMD) 260°C ± 5°C	10s	30	0
heat	200 0 ± 5 0			
	IPC/ECA J-STD-002			
	Method A dip and look	3 sec dip	66	0
	No aging, solder $Ta = 245^{\circ}C$			
	IPC/ECA J-STD-002			
	Method B dip and look			
	No aging			
SD	Solder Ta = 245°C	8 hours		0
Solderability	>95% lead coverage required	3 sec dip	66	0
	Steam Aging: condition C			
	Steam Ta = 93° C, 8 hours			
	Solder Ta = 245°C, 3 sec dip			
	Dry Bake:			
	$Ta = 150^{\circ}C$	16 hours	66	0
	Solder Ta = 245° C	3 sec dip		
	>95% lead coverage required			

*Either HAST or HT3RB are tested for a set of devices.

Calculation of FIT and MTBF

Test considered for FIT calculation: High Temperature Reverse Bias (HTRB) and High temperature Gate Bias (HTGB). Confidence level 60%, derated to 55°C, activation energy 0.7Ev test time 168 to 1000 hours.

Technology	Quantity	Failure rate	MTBF
T6	462	2.6	3.83E+8

© 2022 Nexperia B.V.

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent – or other industrial or intellectual property rights