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Reliability qualification information

Stress	Conditions	Duration	Quantity	Rejects
Stress				
Pre and Post stress	$T_{amb} = 25^{\circ}C$	N/A	All parts	See
electrical test				below
	JESD22-A113	24 hours		
PC	Bake T _{amb} = 125°C	24 hours	602	0
Preconditioning	Soak T _{amb} = 85°C, RH = 85%	168 hours	693	0
5	reflow	3 cycles		
HTRB	MIL-STD-750-1			
High temperature	$T_j = T_j \max$, $V_{DS} = 80\%$ of rated	1000 hours	231	0
reverse bias	Voltage M1039 Method A			
HTGB	JESD22-A108			
High temperature gate	$T_j = T_j \max_{i} V_{GS} = 20V(SL)_{i}, 16V$	1000 hours	231	0
bias	(LL)			
TC	JESD22-A104		221	0
Temperature Cycling	-55°C to 150°C	500 cycles	231	0
UHAST	JESD22-A118			
Unbiased highly	$T_{amb} = 130$ °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		0
stress test	$V_{DS} = 80\%$ of rated voltage			
H3TRB*	JESD22-A101		231	
Temperature Humidity	$T_{amb} = 85^{\circ}C, RH = 85\%$	1000 hours		
bias	$V_{DS} = 80\%$ of rated voltage			
IOL	MIL CTD 750 method 1027			
Intermittent operating	MIL-STD-750 method 1037	5000 cycles	231	0
life	$\Delta T j = 80^{\circ}C$	-		
RSH				
Resistance to solder	JESD22-A111 (SMD)	10s	30	0
heat	260°C ± 5°C	105	30	0
lieat				
			66	0
	IPC/ECA J-STD-002	2 aaa d!=		
	Method A dip and look	3 sec dip	66	0
	No aging, solder Ta = 245°C			
	IPC/ECA J-STD-002			
	Method B dip and look			
	No aging			
SD	Solder Ta = 245°C	8 hours		
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		
	Solder Ta = $245^{\circ}C$	3 sec dip	66	0
	>95% lead coverage required			
*Fither HAST or HT3RB are tes		1		

*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
T12	462	2.6	3.83E+8

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