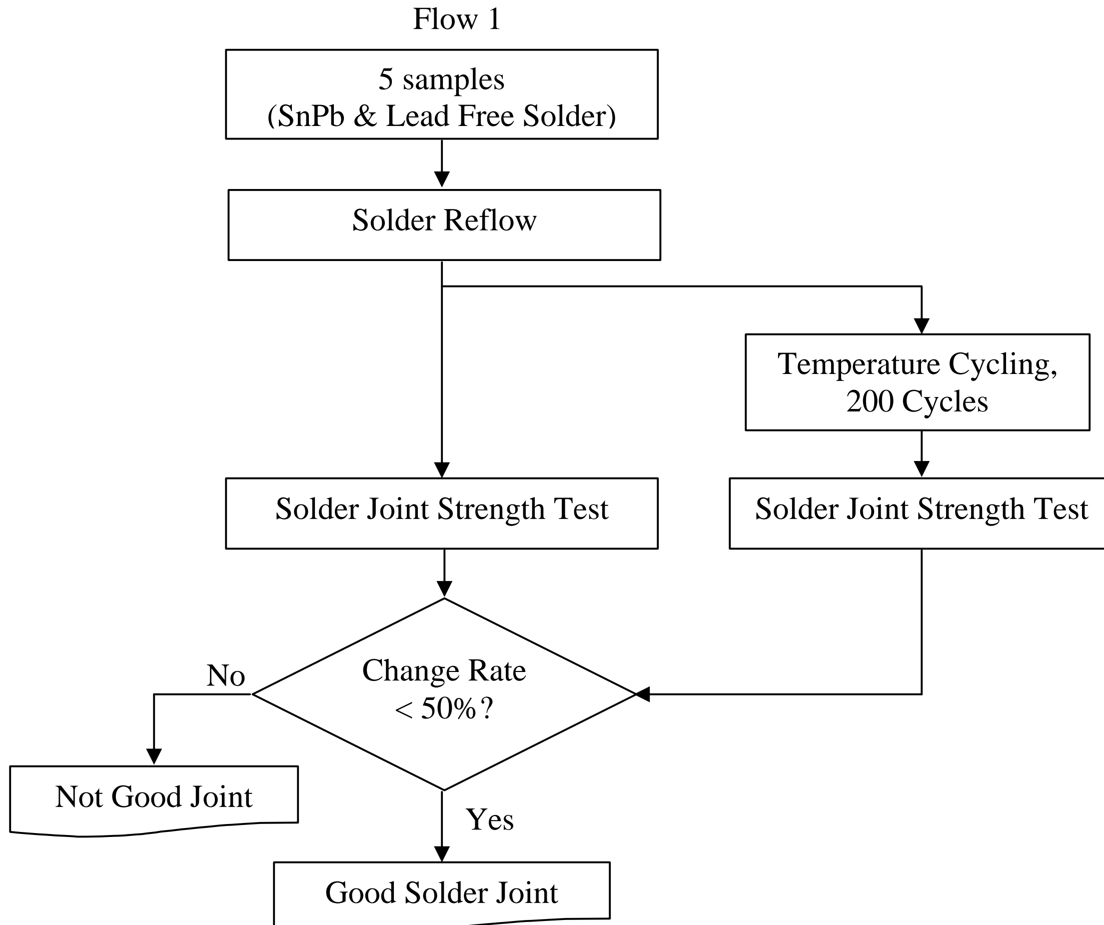
LEAD FREE SOLDER JOINT RELIABILITY

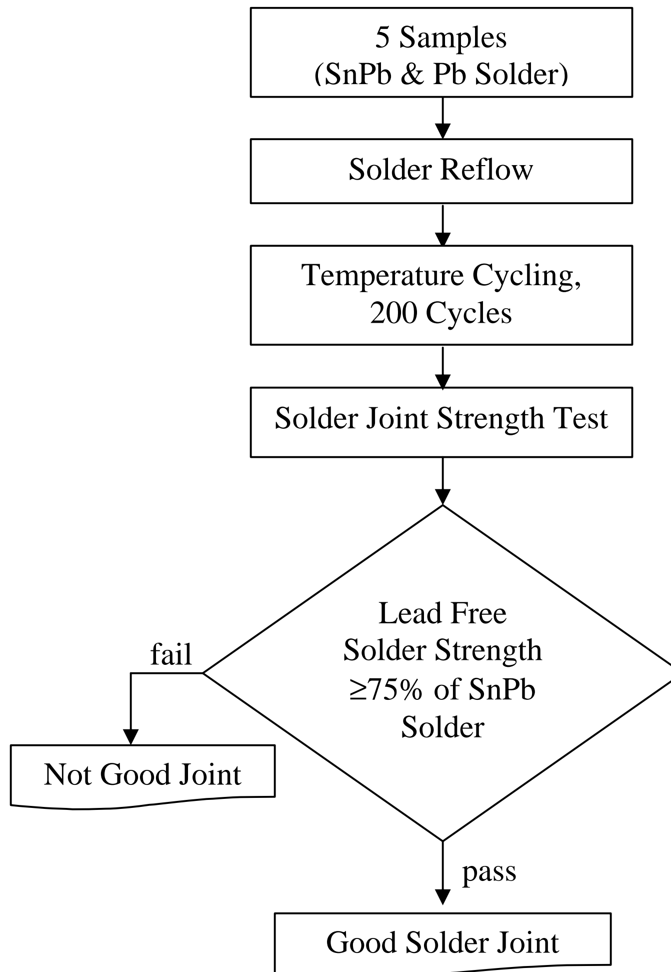
QUALITY ENG :	REPORT DATE:
Herb Grimm	3/4/2004

PACKAGE TYPE:	TEST DESCRIPTION:	SOLDER PASTE	SAMPLE SIZE:	RESULT:	INSPECTION METHOD:
20L TSSOP Lead -Free	Temperature Cycle Ta=-65°C/+150°C	Sn,Ag.Cu	5 samples board mounted using +260C peak reflow	PASS	Measure solder joint shear strength before and after temperature cycle stress.
20L TSSOP Std. SnPb	Temperature Cycle Ta=-65°C/+150°C	SnPb	5 units board mounted using +240C peak reflow	CONTROL	Measure solder joint shear strength before and after temperature cycle stress.

Solder Joint Strength Evaluation of matte tin plated package vs. Pb plated package.



Lead	Shearing Force, N			
	Before TMCL		After TMCL	
	SnPb	Pb Free	SnPb	Pb-free
1	69.7	64.6	60.5	53.4
2	73.6	75.4	56.1	53.4
3	65.6	71.2	62.9	54.7
4	68.5	69.8	62.3	62.4
5	69.6	69.1	59.7	54.2
Average	**69.4**	**70.02**	**60.3**	**55.62**
Max	**73.6**	**75.4**	**62.9**	**62.4**
Min	**65.6**	**64.6**	**56.1**	**53.4**
Std Dev, s	**2.87**	**3.89**	**2.68**	**3.83**



Summary & Discussion:

1) Solder joint strength pre and post 200 cycles of Temperature Cycling Test.

Solder Type	Average Solder Joint Strength (N)		% of Change	Judgment
	Before TMCL	After TMCL		
SnPb	69.4	60.3	13.11	Pass
Pb Free	70.0	55.62	20.54	Pass

2) Solder joint strength comparison between SnPb and Lead Free solder after 200 cycles of Temperature Cycling Test.

Solder Type	Solder Joint Strength (N) After 200 Cycles of TMCL	% of Difference	Judgment
SnPb	60.30	7.76	Pass
Pb Free	55.62		

Conclusion:

i) The change of solder joint strength on both test legs is less than 30% after 200 cycles of Temperature Cycling Test.

ii) The lead-free solder joint strength is less than 10% of SnPb solder joint strength after 200 cycles of Temperature Cycling Test.