1.1. S34ML-1 Product 48 nm

SLC NAND

48 nm SLC NAND was introduced in July 2012 and utilize tunnel Oxide, Polysilicon floating gate and interconnections are three metal layers with contact plugs and barrier metals. The 1st Metal layer for 48 nm SLC NAND is using Tungsten.

Data Summary and Failure Rate Estimation using Exponential Model HTOL Stress Temperature - 125°C

Failure Mechanisms	Read Point / Test Result		Modeling Parameters @ 55°C					Average Failure Rate	
	Early Life (hrs)	Inherent Life (hrs)	Ea eV	TAF	VAF	OAF	MTTF (yrs)	Early Life (PPM)	Inherent Life (FITS)
	96	1000							
Sample Size	500	150							
125C, Zero fails, Process ave. Ea	0	0	0.7	74	1	74	8317	0	14

Data Retention Bake - 150°C

Reliability Stress	Sample Size	Reject	PPM	FITS
500	77	0	0	2
1000	693	0	0	

Endurance - 90°C

Reliability Stress	Sample Size	Reject	PPM	FITS
10000	60	0	0	2
100000(Decade)	64	0	0	

1.2. S34ML-1 Product Families

41 nm SLC NAND

41 nm SLC NAND were introduced in Jun 2012 and utilize tunnel Oxide, Polysilicon floating gate and interconnections are three metal layers with contact plugs and barrier metals. The 1st Metal layer for 41 nm SLC NAND is using Copper.

Data Summary and Failure Rate Estimation using Exponential Model HTOL Stress Temperature - 125°C

Failure Mechanisms	Read Point / Test Result		Modeling Parameters @ 55°C					Average Failure Rate	
	Early Life (hrs)	Inherent Life (hrs)	Ea eV	TAF	VAF	OAF	MTTF (yrs)	Early Life (PPM)	Inherent Life (FITS)
	96	1000							
Sample Size	500	150							
125C, Zero fails, Process ave. Ea	0	0	0.7	74	1	74	9259	0	12

Data Retention Bake - 150°C

Reliability Stress	Sample Size	Reject	PPM	FITS
500	77	0	0	1
1000	692	0	0	
2000	77	0	0	

Endurance - 90°C

Reliability Stress	Sample Size	Reject	PPM	FITS
10000	60	0	0	2
100000(Decade)	64	0	0	

1.3. S34ML-2 Product

Families 32 nm SLC

NAND

32 nm SLC NAND were introduced in October 2012 and utilize tunnel Oxide, Polysilicon floating gate and interconnections are three metal layers with contact plugs and barrier metals. The 1st Metal layer for 32 nm SLC NAND is using Copper

Data Summary and Failure Rate Estimation using Exponential Model HTOL Stress Temperature - 125°C

Failure Mechanisms	Read Point / Test Result		Modeling Parameters @ 55°C					Average Failure Rate	
	Early Life (hrs)	Inherent Life (hrs)	Ea eV	TAF	VAF	OAF	MTTF (yrs)	Early Life (PPM)	Inherent Life (FITS)
	96	1000							
Sample Size	500	240							
125C, Zero fails, Process ave. Ea	0	0	0.7	74	1	74	12198	0	9

Data Retention Bake - 150°C

Reliability Stress	Sample Size	Reject	PPM	FITS
500	77	0	0	<1
1000	923	0	0	

Endurance - 90°C

Reliability Stress	Sample Size	Reject	PPM	FITS
10000	60	0	0	2
100000(Decade)	64	0	0	

2. Data Summaries by Package Family

2.1. BGA (Ball Grid Array)

Reliability Stress		Sample Size	Reject	Failure Rate PPM
HAST	96hrs	1821	0	0
	264hrs	3236	0	0
HIGH TEMP STORAGE	1000hrs	5493	0	0
TEMP CYCLE	500cycle	3714	0	0
	1000cycle	4008	0	0
UNBIASED HAST TEST	96hrs	4889	0	0
	264hrs	585	0	0

2.2. TSOP (Thin Small Outline Package)

Reliability Stress		Sample Size	Reject	Failure Rate PPM
HAST	96hrs	3221	0	0
	264hrs	100	0	0
HIGH TEMP STORAGE	1000hrs	5095	0	0
PRESSURE COOKER TEST	96hrs	150	0	0
	168hrs	2141	0	0
TEMP CYCLE	500cycle	5030	0	0
	1000cycle	107	0	0
UNBIASED HAST TEST	96hrs	1831	0	0

SkyHigh Memory