QRMS9901
QUALIFICATION REPORT

M36W108A T6X-U35:
8 Mbit (x8) Flash Memory and 1 Mbit (x8) SRAM Multiple Memory

INTRODUCTION

The M36W108A is a Multiple Memory device contains an 8 Mbit (3V) Flash memory and a 1 Mbit SRAM, both organized by 8 bits. The two components are distinguishable by use of the three chip enable lines, one for the Flash and two for SRAM.

The Flash memory component is similar to the M29W008A device. It is manufactured with the STMicroelectronics advanced CMOS 0.35 micron T6X-U35 process, especially developed for Flash memory products. The memory features a fast access time, low power consumption in all operations (Standby, Read, Erase and Program) and an endurance of 100,000 Program/Erase cycles per block.

The SRAM component is a low power product that features fully static operation and requires a single 3V supply. It is manufactured by Samsung Electronics with a 0.3 micron technology.

Qualification Report History

– August 1999: Agrate R1 and Catania M5 Diffusion Lines, Asat Assembly Line

ST recognises that the quality of a product must be built-in during the design, material procurement, manufacturing and testing. Also that the reliability must be demonstrated before the product is released to full mass production. The qualification of new products and the certification of new processes is a rigorous task undertaken by Quality and Reliability professionals, to ensure stable products and processes capable of fully meeting customer requirements.

A key step of this activity is the Design Review where we assure that,

– adequate and realistic product specifications have been developed;
– design and layout rules, as documented in the Design Rules Manual, have been respected;
– critical performance parameters and process variables have been identified;
– previously untested design techniques or manufacturing processes are recognised;
– manufacturability concerns are identified;
– comprehensive and efficient qualification programs are defined.

Product Qualification is made on all new products and on new packages. Qualification is also remade on existing products when there are major changes to the design or manufacturing. The tests performed are tailored to the parameters affected by the major change or the combinations of new die or new package to be evaluated.

The results of the tests for this Multiple Memory Product are on the attached pages of this qualification report.

Director of
Memory Products Group
Quality Control & Reliability

Attilio PANCHIERI

Table 1. BGA48 and LGA48 (10 x 12mm) Package Related Tests, Asat Assembly Line

Sub-group	Test Procedure	MIL-STD-883 Procedure	Test Conditions	Result			Note
				Lots	Samp.	Fail	
1	Phisical Dimensions Coplanarity BGA48 and LGA48 Packages	2016	Published Data Published Data	5 5	25 25	0 0	
2	Bond Strenght	2011		2	4	0	
3	Die Attach Strength	2019 or 2027		2	20	0	
4	Radiography	2012		5	225	0	
5	Internal Visual and Mechanical	2014		5	25	0	
6	Solderability Package	2003					1
7	Resistance to Solvents	2015					2
8	Solder Coating Thickness and Compositions						3
9	Resistance to Surface Mounting BGA48 and LGA48 Packages: 1. Drying 2. Temperature, Humidity Exposure 3. 3 IR Cycles Exposure 4. Visual Inspection 5. Delamination Inspection by Acustic Microscopy (SAM) 6. Electrical Test		 125°C, 24 hrs 30°C, RH = 60%, 192 hrs T_{PEAK} = 235°C ± 5°C 40 x	5	75	0	

Note: 1. Not applicable as lead frame do not exist.
2. Not applicable because of laser marking.
3. Not applicable on BGA as ball composition is: Sn/Pb/Ag 62/36/2, and LGA as balls do not exist.

Table 2. BGA48 and LGA48 (10 x 12mm) Package - Die Related Tests

Sub-group	Test Procedure	MIL-STD-883 Procedure	Test Conditions	Results			Note
				Lots	Samp.	Fail	
1	Operating Life Test on Frash	1005	140°C, V_{CC} = 4.7V, – 168 hrs – 500 hrs – 1000 hrs	6	 397 397 397	 0 0 0	1, 2
2	Low Temperature Operating Life Test on Frash	1005	–40°C, V_{CC} = 4.7V, – 168 hrs – 500 hrs – 1000 hrs	4	 184 184 184	 0 0 0	2
3	Operating Life Test on SRAM	1005	125°C, V_{CC} =7V, – 168 hrs – 500 hrs – 1000 hrs		 387 387 387	 0 0 0	3
4	Low Temperature Operating Life Test on SRAM	1005	–10°C, V_{CC} =7V, – 168 hrs – 500 hrs – 1000 hrs		 76 76 76	 0 0 0	3
5	Retention Bake	1008	150°C – 168 hrs – 500 hrs – 1000 hrs	1	 60 60 60	 0 0 0	
6	Retention Bake on Frash	1008	250°C – 168 hrs – 500 hrs – 1000 hrs	6	 334 334 334	 0 0 0	2
7	Write/Erase Cycling on Frash		10,000 cycles 20,000 cycles 100,000 cycles	7	445 445 445	0 0 0	2
8	Retention Bake (after 100k cycles) on Frash		250°C – 168 hrs – 500 hrs – 1000 hrs	4	 167 167 167	 0 0 0	2
9	Temperature, Humidity, Bias	CECC 90,000	85°C, RH = 85%, V_{CC} = 3.6V, – 168 hrs – 500 hrs	1	 60 60	 0 0	1
10	Temperature Cycling	1010C	–40 to 125°C, – 500 cycles – 1000 cycles	3	 196 196	 0 0	1
11	Temperature Cycling with devices on board		–25 to 125°C, – 500 cycles – 1000 cycles	1	 60 60	 0 0	
12	Pressure Pot		121°C, 2 Atm, RH = 100%, – 96 hrs – 168 hrs – 240 hrs	3	 180 180 180	 0 0 0	1
13	HAST	CECC 90,000	130°C, RH = 85%, V_{CC} = 3.6V, – 96 hrs – 168 hrs	1	 15 15	 0 0	1

Note: 1. Samples previously submitted to preconditioning flow for Surface Mounting devices according to ST specification.
2. Data applies by similarity from the M29W800A. Results come from the relevant Qualification Report.
3. Data applies by similarity from the 5V device. Test performed by Samsung Electronics.

If you have any questions or suggestion concerning the matters raised in this document please send them to the following electronic mail address:

ask.memory@st.com (for general enquiries)

Please remember to include your name, company, location, telephone number and fax number.