SGS-THOMSON MICROELECTRONICS

QUALIFICATION REPORT

M28F101
1 Megabit CMOS/T5 FLASH MEMORY in TSOP32

INTRODUCTION

The M28F101 is a 1 Megabit FLASH MEMORY organised as 128K x 8 bits. It is manufactured in the SGS-THOMSON Advanced CMOS 0.8 micron T5 process which has been especially developed for flash memory products. The memory features a fast 100ns access time, very low standby power consumption of 100µA at 5V, an endurance of 10,000 Erase/Program cycles and an integrated Erase/Program Stop timer.

SGS-THOMSON 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,

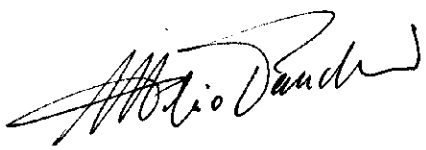
- adequate and realistic product specifications have been developed;
- design and layout rules, as documented in the Design Rules Manual, have been respected;
- critical performance parameters and process variables have been identified;
- previously untested design techniques or manufacturing processes 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 to the combinations of new die or new package to be evaluated.

The tests have been performed on the M28F101 FLASH MEMORY product in TSOP32 8 x 20mm package.

The results are on the attached pages of this qualification report.

Director of
Memory Products Group
Quality Control & Reliability



Attilio PANCHIERI

Table 1. Product Qualification, Plastic Package Related Tests M28F101, TSOP32, CMOS/T5

Subgroup	Test Procedure	MIL-STD-883 Procedure	Test Conditions	Result		Note
				Samp.	Fail	
1	Physical Dimensions	2016	Published Data	5	0	
2	Solderability Package	CECC 90,000	215°C, 3 sec, Precondition Dry Air, 150°C, 16 hrs	15	0	
3	Resistance to Solvents	2015	4 Solvent Solutions	20	0	
4	Package External Visual Inspection	2009		5	0	

Table 2. Product Qualification, Plastic Packages - Die Related Tests M28F101, TSOP32, CMOS/T5

Subgroup	Test Procedure	MIL-STD-883 Procedure	Test Conditions	Results		Note
				Samp.	Fail	
1	Operating Life Test	1005	140°C, V_{CC} = 6V, – 168 hrs – 500 hrs – 1000 hrs	 228 228 228	 0 0 0	1, 2
2	Retention Bake	1008	150°C, – 168 hrs – 500 hrs – 1000 hrs	258 258 258	0 0 0	1
3	Temperature, Humidity, Bias	CECC 90,000	85°C, RH = 85%, V_{CC} = 5V, – 168 hrs – 500 hrs – 1000 hrs	 179 179 179	 0 0 0	1, 2
4	Temperature Cycling	1010	–65 to 150°C, – 500 cycles – 1000 cycles	 176 176	 0 0	1, 2
5	Thermal Shock	1011	–55 to 125°C, – 100 cycles – 500 cycles	 75 75	 0 0	1, 2
6	Pressure Pot		121°C, 2 Atm, – 96 hrs – 168 hrs – 240 hrs	 179 179 179	 0 0 0	1, 2
7	HAST	CECC 90,000	130°C, RH = 85%, 5,5V – 48 hrs – 96 hrs – 168 hrs – 240 hrs	 75 75 75 75	 0 0 0 0	
8	Pressure Pot		121°C, 2 Atm, – 96 hrs – 168 hrs – 240 hrs	 97 97 97	 0 0 0	

Notes: 1. Sample is coming from 3 different lots minimum.
2. Surface mounting preconditioned sample, according to SGS-THOMSON specification.