
**M28F512 512K (64K x 8)
CMOS T5-U20 FLASH MEMORY in PLCC32**

INTRODUCTION

The M28F512 is a 512K FLASH Memory organised as 64K x 8 bits. It is manufactured in the SGS-THOMSON Advanced CMOS 0.8 micron T5-U20 (-20% upgrade) 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 results of the tests for the M28F512 FLASH Memory are on the attached pages of this qualification report.

Director of
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**Table 1. Product Qualification, Plastic Packages - Die Related Tests ⁽¹⁾
M28F512, PLCC32, CMOS T5-U20**

Sub-group	Test Procedure	MIL-STD-883 Procedure	Test Conditions	Results			Note
				Lots	Samp.	Fail	
1	Operating Life Test	1005	140°C, V _{CC} = 7V, – 168 hrs – 500 hrs – 1000 hrs		320 115 115	0 0 0	4
2	Retention Bake	1008	150°C, – 168 hrs – 500 hrs – 1000 hrs – 2000 hrs		50 50 50 50	0 0 0 0	
3	Retention Bake (after 10k cycles)	1008	150°C, – 168 hrs		50	0	
4	Write/Erase Cycling		10,000 cycles 20,000 cycles		50 50	0 0	2
5	Temperature, Humidity, Bias	CECC 90,000	85°C, RH = 85%, V _{CC} = 5.5V, – 168 hrs – 500 hrs – 1000 hrs – 2000 hrs		61 61 61 61	0 0 0 0	4
6	Temperature Cycling	1010	–65 to 150°C, – 500 cycles – 1000 cycles		64 64	0 0	4
7	Thermal Shock	1011	–55 to 125°C, – 100 cycles – 500 cycles		34 34	0 0	4
8	Pressure Pot		121°C, 2 Atm, – 96 hrs – 168 hrs – 240 hrs		68 68 68	0 0 0	4
9	Pressure Pot		121°C, 2 Atm, – 96 hrs – 168 hrs – 240 hrs		68 68 68	0 0 0	
10	Electrostatic Discharge	3015	1500Ω, 100pF, 1750V		36	0	
11	Electrostatic Discharge	EIAJ IC-121	0Ω, 200pF, 200V (min)				3
12	Latch-up	JEDEC STD-17	Current Injection 200mA (min), Overvoltage 14V/500mA (min)		45	0	

- Notes:**
1. Package qualified with another die version. Refer to the internal report: TR08-1992.
 2. More information is available from the characterization of the test vehicle for this T5-U20 technology, the M28F101, refer to the latest Quality and Reliability Report (QRR).
 3. Test not performed.
 4. Samples previously submitted to preconditioning flow for Surface Mounting devices according to SGS-THOMSON specification.
 5. Sample size decreased for capacity reasons.

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