
**M28F201: 2 Megabit (256K x 8)
CMOS T6 FLASH MEMORY in PLCC32**

INTRODUCTION

The M28F201 is a 2 Megabit FLASH Memory organised as 256K x 8 bits. It is manufactured in the SGS-THOMSON Advanced CMOS 0.6 micron T6 process which has been especially developed for flash memory products. The memory features a fast 90ns 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. It is offered in PLCC32 and TSOP32 packages.

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 M28F201 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
M28F201, PLCC32, CMOS T6**

Subgroup	Test Procedure	MIL-STD-883 Procedure	Test Conditions	Results			Note
				Lots	Samp.	Fail	
1	Operating Life Test	1005	140°C, V _{CC} = 6V, - 168 hrs - 500 hrs - 1000 hrs		153 153 153	0 0 0	1
2	Retention Bake	1008	250°C, - 168 hrs - 500 hrs		186 186	0 0	2, 4
3	Retention Bake	1008	150°C, - 168 hrs - 500 hrs - 1000 hrs		64 64 64	0 0 0	
4	Retention Bake (after 10k cycles)	1008	250°C, - 168 hrs		226	0	4
5	Write/Erase Cycling		10,000 cycles 20,000 cycles		226 226	0 0	1, 3, 4
6	Temperature, Humidity, Bias	CECC 90,000	85°C, RH = 85%, V _{CC} = 5V, - 168 hrs - 500 hrs - 1000 hrs		60 60 60	0 0 0	1
7	Temperature Cycling	1010	-65 to 150°C, - 500 cycles - 1000 cycles		60 60	0 0	1
8	Thermal Shock	1011	-55 to 125°C, - 100 cycles - 500 cycles		25 25	0 0	1
9	Pressure Pot		121°C, 2 Atm, - 96 hrs - 168 hrs		197 197	0 0	1, 4
10	Pressure Pot		121°C, 2 Atm, - 96 hrs - 168 hrs		224 224	0 0	4
11	HAST	CECC 90,000	130°C, RH = 85%, V _{CC} = 5.5V, - 48 hrs - 96 hrs - 168 hrs		25 25 25	0 0 0	1

Notes: 1. Samples previously submitted to preconditioning flow for Surface Mounting devices according to SGS-THOMSON specification.
 2. Test performed on FDIP32W package.
 3. Data collection in progress.
 4. Samples is coming from 3 different lots minimum.

**Table 2. Product Qualification, Plastic Package Related Tests
M28F201, PLCC32, CMOS T6**

Subgroup	Test Procedure	MIL-STD-883 Procedure	Test Conditions	Result			Note
				Lots	Samp.	Fail	
1	Physical Dimensions	2016	Published Data				1
	Coplanarity PLCC32 Package		Published Data				1
2	Bond Strength	2011					1
3	Die Attach Strength	2019 or 2027					1
4	Radiography	2012		1	45	0	
5	Internal Visual and Mechanical	2014		1	5	0	
6	Solderability PLCC32 Package	2003	215°C, 3 sec, Precondition, 8 hrs, Steam aging		1185	0	1
7	Resistance to Solvents	2015	4 Solvent Solutions		732	0	1
8	Solder Coating Thickness and Compositions	(Note 2)	5µm min Sn/Pb 85/15				1
9	Resistance to Surface Mounting PLCC32 Package: 1. Drying 2. Temperature, Humidity Exposure 3. 3 IR Cycles Exposure 4. Visual Inspection 5. Delamination Inspection by Acoustic Microscopy (SAM) 6. Electrical Test	(Note 2)	125°C, 24 hrs 30°C, RH = 60%, 192 hrs T _{PEAK} = 235°C ± 5°C 40 x	1	15	0	

Notes: 1. Results for similarity, from standard production monitor.
 2. According to SGS-THOMSON specification.

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