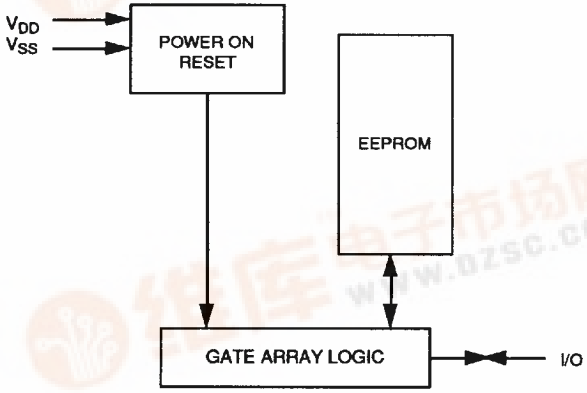
Features

- Parallel E²PROM Memory (8 bit word)
- Gate Array for Logic Design
- Up to 120 I/O
- Low Voltage Operation (2.7 to 5.5 Volts)
- Single Voltage Supply Operation
- Performs Page Write Function
- Manufactured Using Low Power CMOS Technology
- Write or Erase Time: 10 ms Maximum
- Temperature Range from -40°C to 85°C
- ESD Immunity > 4K Volts
- High Reliability and Endurance:
  - 10,000 Write/Erase Cycles
  - 10 Years Data Retention
- Ideal for Portable, Secure Applications Including PCMCIA Cards, Smart Cards, ID Tags, Keys, etc.

Block Diagram



Description

The AT88SCXXX provides 1K to 16K bits of E²PROM (Electrically Erasable and Programmable Read Only Memory) with 800 to 10K CMOS usable gates for use as personalization, security, and glue logic. The AT88SCXXX is ideal for new portable applications requiring an E²PROM with custom logic.

The outputs of the AT88SCXXX can sink and source up to 8 mA. There are up to 120 buffer sites which are configurable as inputs, outputs, bidirectional, CMOS or TTL operation. The device also provides pull-down and pull-up capability for floating signals. The AT88SCXXX is manufactured using low-power CMOS technology and features its own internal high voltage pump for single voltage supply operation. The devices are guaranteed to 10,000 erase/write cycles and 10 years data retention.

E² Logic ICs

Serial / Parallel E²PROM with Gate Array

AT88SC150
AT88SC200
AT88SC220
AT88SC250
AT88SC410
AT88SC450
AT88SC8100
AT88SC1610

Preliminary

8

Atmel or the customer can personalize the gate array as described in Figure 1. The customer's design can be accepted in one of three formats:

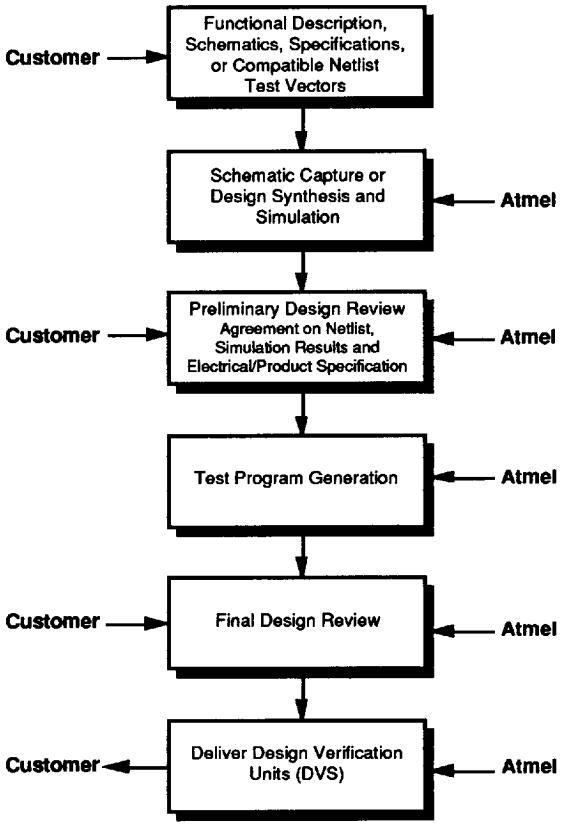
- Functional Description
- Schematic
- Compatible Netlist

Compatible netlists can be generated from Mentor™, Cadence™, Viewlogic™. The personalized devices are available in wafer, die, or standard packages.

E² Logic Family

Device Name	EEPROM Bits	Number of Usable Gates	Number of I/O	Package Type
AT88SC150	1,024	5,000	100	PQFP/TQFP/PLCC
AT88SC200	2,048	800	8	PDIP/SOIC
AT88SC220	2,048	2,000	64	PQFP/TQFP/PLCC
AT88SC250	2,048	5,000	100	PQFP/TQFP/PLCC
AT88SC410	4,096	1,000	24	PDIP/SOIC
AT88SC450	4,096	5,000	100	PQFP/TQFP/PLCC
AT88SC8100	8,192	10,000	128	PQFP/TQFP/PLCC
AT88SC1610	16,384	1,000	8	PDIP/SOIC

Figure 1. AT88SCXXX Design Flow



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Absolute Maximum Ratings*

Operating Temperature	-55°C to +125°C
Storage Temperature	-65°C to +150°C
Voltage on Any Pin with Respect to Ground	-0.6 V to V_{CC} +0.6 V
Maximum Operating Voltage	6.1 V

*NOTICE: Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

DC Characteristics

T_{AMB} = –40°C to +85°C, V_{CC} = 5 V ± 10%, V_{SS} = 0 V (unless otherwise specified)

Symbol	Characteristics	Min	Typ	Max	Unit
I_{CC}	Supply Current on V_{CC} (t_{AMB} = + 25°C) (open output buffers)		TBD		mA
I_{CCP}	Supply Current on V_{CC} during E²PROM Program (t_{AMB} = + 25°C).		TBD		mA
V_{IL}	TTL Input Low Voltage			0.8	V
V_{IL}	CMOS Input Low Voltage			0.3 x V_{DD}	V
V_{IH}	TTL Input High Voltage	2.0			V
V_{IH}	CMOS Input High Voltage	0.7 x V_{DD}			V
V_{OL}	Output Low Level (I_{OL} = 8 mA)			0.4	V
V_{OH}	Output High Level (I_{OH} = 8 mA)	0.7 x V_{DD}			V
I_L	I/O Leakage Current	-50		50	µA

Packaging

All Atmel E² logic memory ICs are available in wafer, die, or standard packaging. Back grinding is an option.

Packaging Options

Package Type	Pin Count
PQFP	44, 52, 64, 80, 100, 120, 128
TQFP	32, 44, 64, 80, 100, 120, 128
PLCC	20, 32, 44, 52, 68, 84
PDIP	8, 16, 24, 32, 40
SOIC	8, 16, 32
Tested Die	Waffle Packs
Tested Die	Wafer Form