

Features

- Compatible with MCS-51TM Products
- 8 Kbytes of In-System Reprogrammable Downloadable Flash Memory
SPI Serial Interface for Program Downloading
Endurance: 1,000 Write/Erase Cycles
- 2 Kbytes EEPROM
Endurance: 100,000 Write/Erase Cycles
- Fully Static Operation: 0 Hz to 24 MHz
- Three-Level Program Memory Lock
- 256 x 8-Bit Internal RAM
- 32 Programmable I/O Lines
- Three 16-Bit Timer/Counters
- Nine Interrupt Sources
- Programmable UART Serial Channel
- SPI Serial Interface
- Low Power Idle and Power Down Modes
- Interrupt Recovery From Power Down
- Programmable Watchdog Timer
- Dual Data Pointer

Description

The AT89S8252 is a low-power, high-performance CMOS 8-bit microcomputer with 8 Kbytes of Downloadable Flash programmable and erasable read only memory and 2 Kbytes of EEPROM. The device is manufactured using Atmel's high density nonvolatile memory technology and is compatible with the industry standard 80C51 instruction set and pinout. The on-chip Downloadable Flash allows the program memory to be reprogrammed in-system through an SPI serial interface or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Downloadable Flash on a monolithic chip, the Atmel AT89S8252 is a powerful microcomputer which provides a highly flexible and cost effective solution to many embedded control applications.

The AT89S8252 provides the following standard features: 8 Kbytes of Downloadable Flash, 2 Kbytes extended endurance EEPROM, 256 bytes of RAM, 32 I/O lines, programmable watchdog timer, two Data Pointers, three 16-bit timer/counters, a seven-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. In addition, the AT89S8252 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power Down Mode saves the RAM contents but freezes the oscillator, disabling all other chip functions until the next interrupt or hardware reset.

The Downloadable Flash can be changed a single byte at a time and is accessible through the SPI serial interface. Holding RESET active forces the SPI bus into a slave input mode and allows the program memory to be Written-from or Read-to unless Lock Bit 3 has been activated.

8-Bit Microcontroller with 8 Kbytes Downloadable Flash

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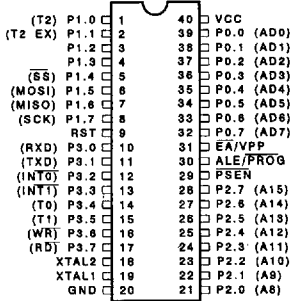
Advance Information



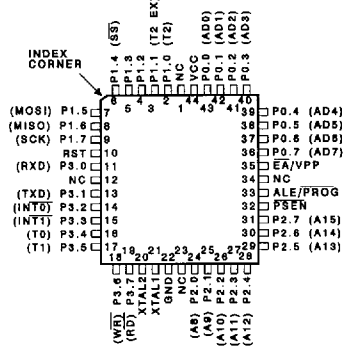


Pin Configurations

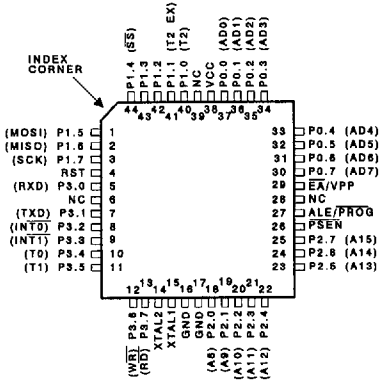
PDIP/Cerdip



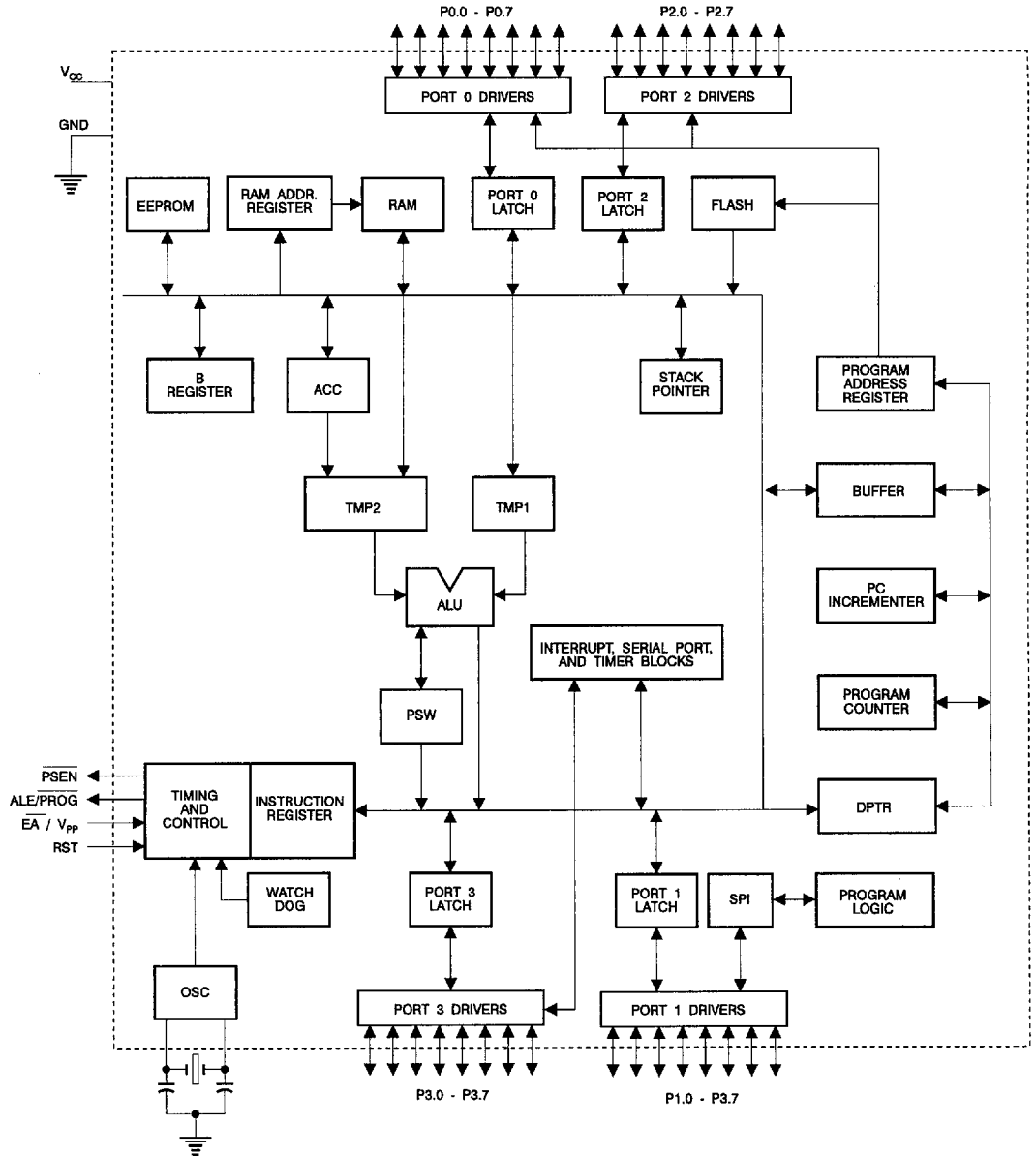
PLCC/LCC



PQFP/TQFP



Block Diagram



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Ordering Information

Speed (MHz)	Power Supply	Ordering Code	Package	Operation Range
12	2.7 V \pm 10%	AT89S8252-12AC AT89S8252-12JC AT89S8252-12PC AT89S8252-12QC	44A 44J 40P6 44Q	Commercial (0°C to 70°C)
		AT89S8252-12AI AT89S8252-12JI AT89S8252-12PI AT89S8252-12QI	44A 44J 40P6 44Q	Industrial (-40°C to 85°C)
24	5 V \pm 20%	AT89S8252-24AC AT89S8252-24JC AT89S8252-24PC AT89S8252-24QC	44A 44J 40P6 44Q	Commercial (0°C to 70°C)
		AT89S8252-24AI AT89S8252-24JI AT89S8252-24PI AT89S8252-24QI	44A 44J 40P6 44Q	Industrial (-40°C to 85°C)

Package Type	
44A	44 Lead, Thin Plastic Gull Wing Quad Flatpack (TQFP)
44J	44 Lead, Plastic J-Leaded Chip Carrier (PLCC)
40P6	40 Lead, 0.600" Wide, Plastic Dual Inline Package (PDIP)
44Q	44 Lead, Plastic Gull Wing Quad Flatpack (PQFP)

Each Atmel data sheet includes an Ordering Information Section which specifies the package types available. This section provides size specifications and outlines for all package types.⁽¹⁾

Package	Description	See Page
44A	44 Lead, Thin (1.0 mm) Plastic Gull Wing Quad Flat Package (TQFP)	7-4
40D6	40 Lead, 0.600" Wide, Non-Windowed, Ceramic Dual Inline Package (Cerdip).....	7-4
44J	44 Lead, Plastic J-Leaded Chip Carrier (PLCC)	7-4
44L	44 Pad, Non-Windowed, Ceramic Leadless Chip Carrier (LCC)	7-4
40P6	40 Lead, 0.600" Wide, Plastic Dual Inline Package (PDIP).....	7-5
20P3	20 Lead, 0.300" Wide, Plastic Dual Inline Package (PDIP).....	7-5
44Q	44 Lead, Plastic Gull Wing Quad Flat Package (PQFP)	7-5
20S	20 Lead, 0.300" Wide, Plastic Gull Wing Small Outline (SOIC).....	7-5

Package Drawings

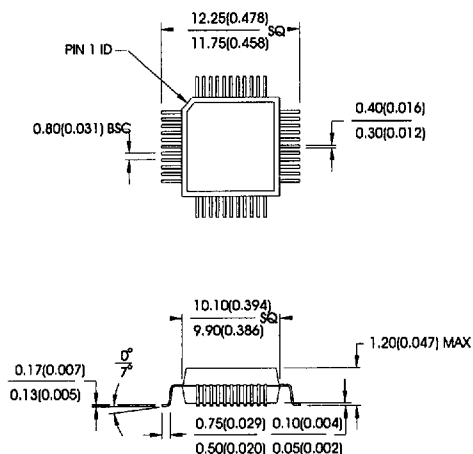
Note: 1. Dimensions shown do not include lead plating or mold flash.

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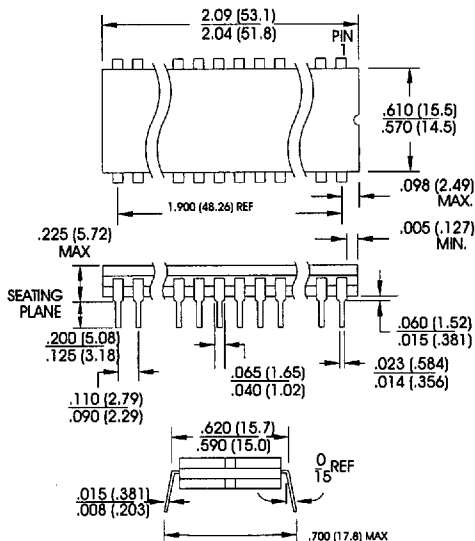


7-3

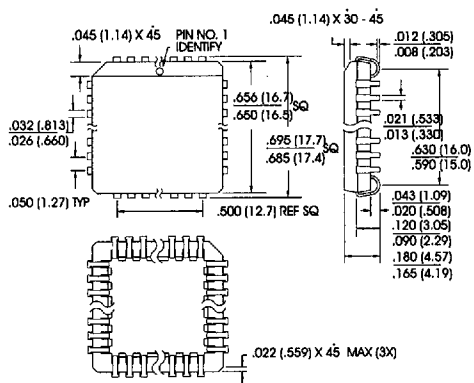
44A, 44 Lead, Thin (1.0 mm) Plastic Gull Wing Quad Flat Package (TQFP)
Dimensions in Inches and (Millimeters)



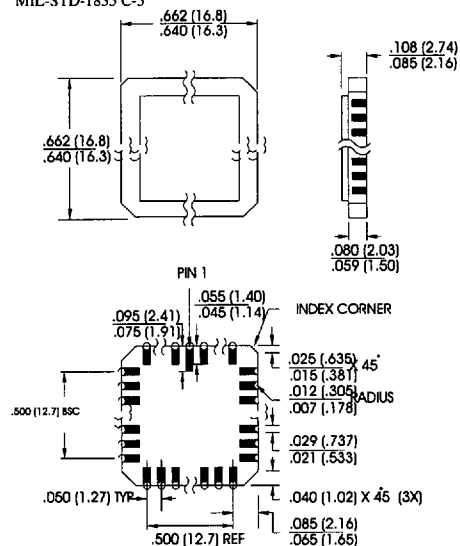
40D6, 40 Lead, 0.600" Wide, Non-Windowed, Ceramic Dual Inline Package (Cerdip)
Dimensions in Inches and (Millimeters)
MIL-STD-1835 D-5 CONFIG A



44J, 44 Lead, Plastic J-Leaded Chip Carrier (PLCC)
Dimensions in Inches and (Millimeters)
JEDEC OUTLINE MO-047 AC

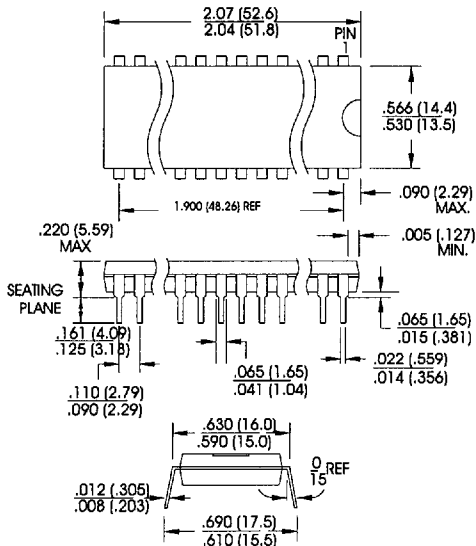


44L, 44 Pad, Non-Windowed, Ceramic Leadless Chip Carrier (LCC)
Dimensions in Inches and (Millimeters)*
MIL-STD-1835 C-5

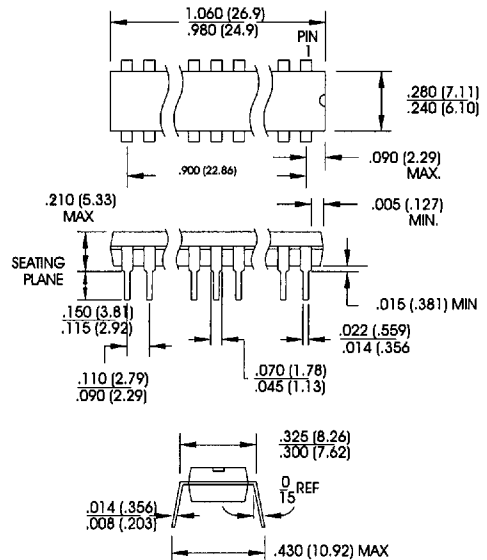


*Ceramic lid standard unless specified.

40P6, 40 Lead, 0.600" Wide,
Plastic Dual Inline Package (PDIP)
Dimensions in Inches and (Millimeters)

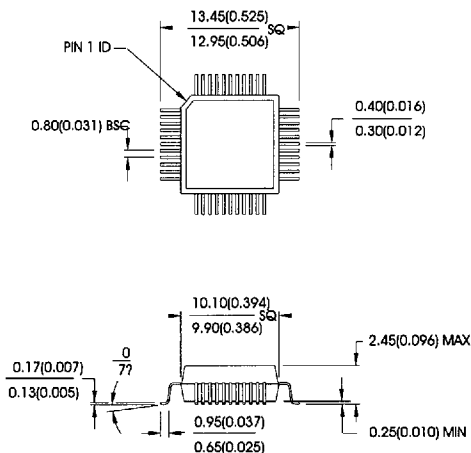


20P3, 20 Lead, 0.300" Wide,
Plastic Dual Inline Package (PDIP)
Dimensions in Inches and (Millimeters)



*Controlling dimension: millimeters

44Q, 44 Lead, Plastic Gull Wing Quad Flat
Package (PQFP)
Dimensions in Inches and (Millimeters)



20S, 20 Lead, 0.300" Wide,
Plastic Gull Wing Small Outline (SOIC)
Dimensions in Inches and (Millimeters)

