



PB002700-IRR1199

Z86D99

LOW-VOLTAGE Z8 OTP MICROCONTROLLER WITH ADC

Product Block Diagram

| | | | |
|--|-----------------------------|-------------------------------------|---------------|
| 32K Bytes OTP EPROM | | | |
| 233 Bytes General-Purpose RAM | | 256 Bytes Executable RAM | |
| Z8 Core | | | |
| 8-Bit Sigma Delta ADC with External Reference | | | |
| 8-Bit C/T (T8) | 16-Bit C/T (T16) | 8-Bit GP C/T (T1) | |
| Port 2 | Port 4 | Port 5 | Port 6 |

General Description

The Z86D99 is a low-voltage general-purpose one-time programmable Z8[®] microcontroller with an integrated four-channel 8-bit sigma delta analog-to-digital converter.

The Z86D99 is designed to be used in a wide variety of embedded control applications, such as appliances, battery chargers, IR remotes, keyboards, and security systems.

Operating Characteristics

- 8-MHz operation
- 3.0 V to 5.5 V operating voltage
- Low power consumption (40 mW typical) with three standby modes:
 - Stop (2 μ A typical)
 - Halt (0.8 mA typical)
 - Low voltage standby
- Low-battery detection flag
- Low-voltage protection circuit (VBO)
- Watchdog timer and power-on reset circuits

Key Features

- 32K bytes of OTP EPROM
- 256 bytes of executable RAM
- 8-bit sigma delta A/D converter with external voltage references (not available in the 28-pin configuration)
- Two independent analog comparators
- VDD power filter (40/44-pin configuration only)
- Constant current source (100 mA)

Counter/Timer Structure

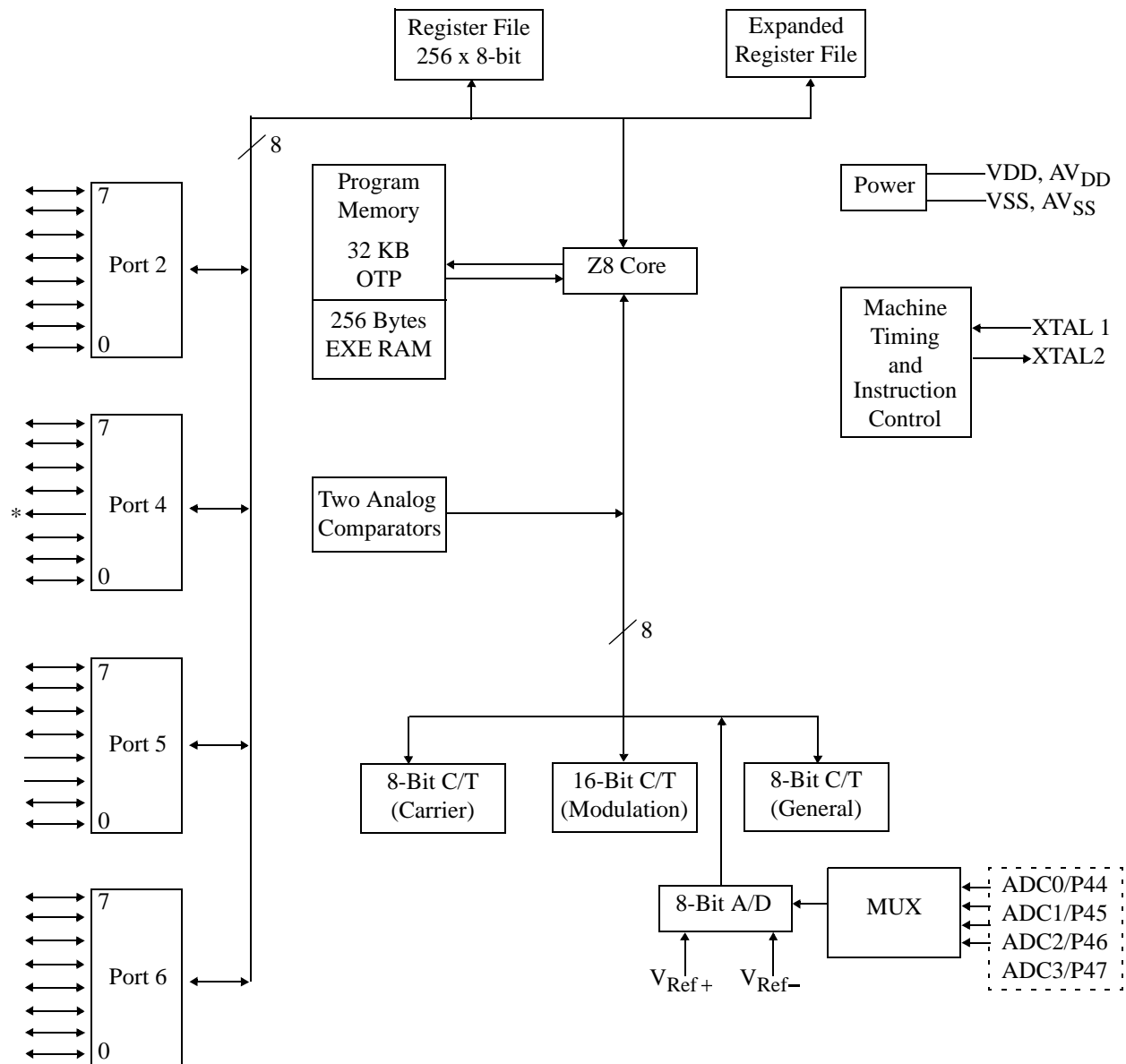
- Programmable 8-bit counter/timer (T8) with two 8-bit capture registers and two 8-bit load registers
- Programmable 16-bit counter/timer (T16) with one 16-bit capture register pair and one 16-bit load register pair
- General-purpose 8-bit counter/timer (T1) with 6-bit prescaler

Input/Output and Interrupts

- Twenty-nine bidirectional I/Os with programmable resistive pull-up transistors (Twenty-one I/Os are available in the 28-pin configuration.)
- Sixteen I/Os are selectable as stop-mode recovery sources.
- Six interrupt vectors with nine interrupt sources
 - Three external sources
 - Two comparator interrupts
 - Three timer interrupts
 - One low-voltage detector

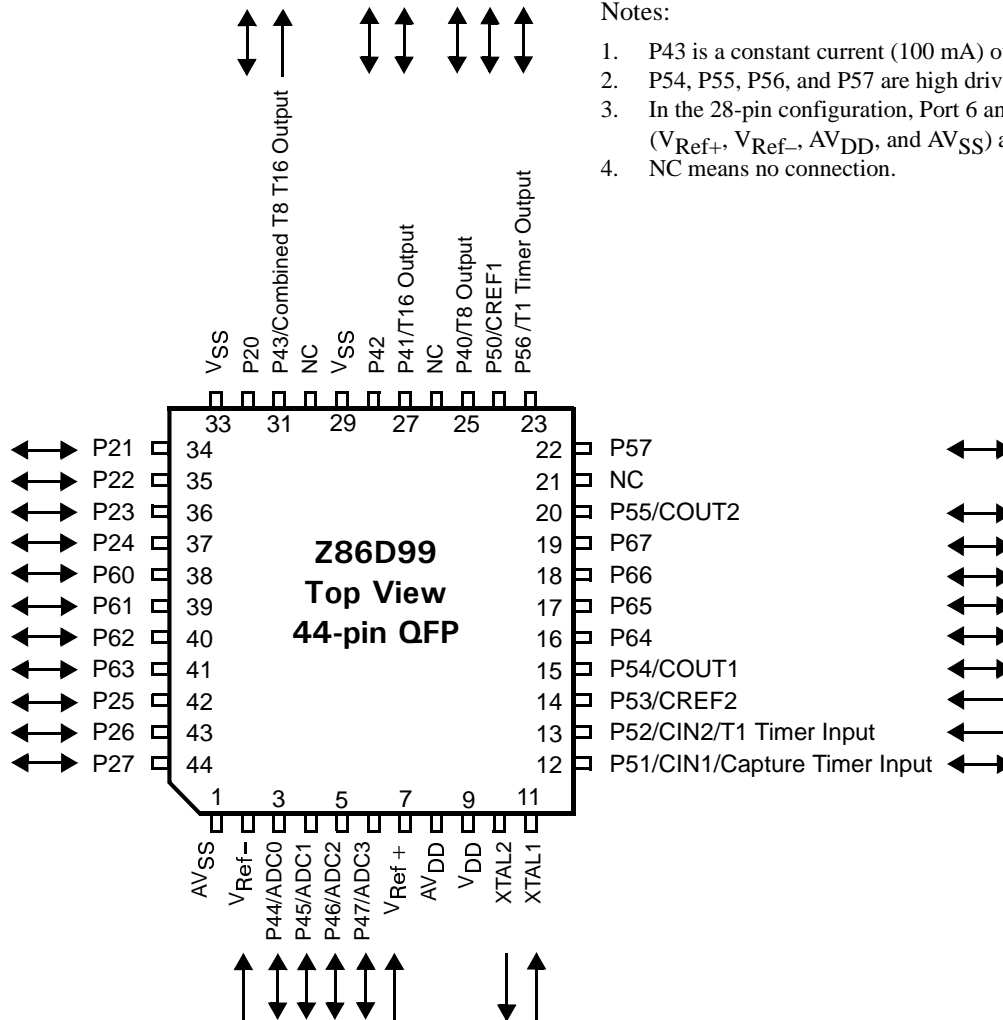


Block Diagram of Z86D99



*Constant Current Source (100 mA)

Pin-Outs and Pin Direction



Notes:

1. P43 is a constant current (100 mA) output source.
2. P54, P55, P56, and P57 are high drive outputs.
3. In the 28-pin configuration, Port 6 and the ADC (V_{Ref+} , V_{Ref-} , AV_{DD} , and AV_{SS}) are not available.
4. NC means no connection.

User Selectable Option Bits

- RC/other (LC, resonator, or crystal)
- Watchdog timer default state
- 32-kHz crystal
- Port 6 enable
- Ports 20-27 pull-up transistor
- Ports 40-42 pull-up transistor
- Ports 44-47 pull-up transistor
- Ports 50-51 pull-up transistor
- Ports 54-57 pull-up transistor
- Ports 60-63 pull-up transistor
- Ports 64-67 pull-up transistor



Development Suite

The following development tools are available for the programming and debugging of this device:

- Z86L9900ZEM Emulator/Programmer
- ZiLOG Developer Studio (ZDS)
- ZiLOG C-Compiler

Related Products

Z8 microcontrollers of interest are as follows:

| | |
|--------|--|
| Z86L99 | ROM equivalent of Z86D99 (16K ROM, 2 V to 3.6 V operation) |
| Z86L88 | Low-voltage IR Controller (16K ROM, 28 pin) |
| Z86L87 | Low-voltage IR Keyboard Controller (16K ROM, 40 pin) |

Electrical Features Summary

- 50 μ A Maximum Supply Current
- 3.0 V to 5.5 V Operating Range

Ordering Information

| Part | PSI | Description |
|----------|--------------|---------------------------------|
| Z86D990 | Z86D99008PSC | 40-pin PDIP |
| Z86D990 | Z86D99008FSC | 44-pin QFP |
| Z86D991 | Z86D99108SSC | 28-pin SOIC (ADC not available) |
| Emulator | Z86L9900ZEM | Emulator/Programmer |

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