National Semiconductor

ADC0851 and ADC0858 8-Bit Analog Data Acquisition and Monitoring Systems

General Description

The ADC0851 and ADC0858 are 2 and 8 input analog data acquisition systems. They can function as conventional multiple input A/D converters, automatic scanning A/D converters or programmable analog "watchdog" systems. In "watchdog" mode they monitor analog inputs and determine whether these inputs are inside or outside user programmed window limits. This monitoring process takes place independent of the host processor. When any input falls outside of its programmed window limits, an interrupt is automatically generated which flags the processor; the chip can then be interrogated as to exactly which channels crossed which limits.

The advantage of this approach is that its frees the processor from having to frequently monitor analog variables. It can consequently save having to insert many A/D subroutine calls throughout real time application code. In control systems where many variables are continually being monitored this can significantly free up the processor, especially if the variables are DC or slow varying signals.

The Auto A/D conversion feature allows the device to scan through selected input channels, performing an A/D conversion on each channel without the need to select a new channel after each conversion.

Key Specifications

- Resolution — 8 Bits
- Total error — ±½ LSB or ± 1 LSB
- Low power — 50 mW
- Conversion time — 18 μs/Channel
- Limit comparison time — 2 μs/Limit

Features

- Watchdog operation signals processor when any channel is outside user programmed window limits
- Frees microprocessor from continually monitoring analog signals and simplifies applications software
- 2 (ADC0851) or 8 (ADC0858) analog input channels
- Single ended or differential input pairs
- COM input for DC offsetting of input voltage
- 4 (ADC0851) and 16 (ADC0858), 8-bit programmable limits
- NSC MICROWIRE™ interface
- Power fail detection
- Auto A/D conversion feature
- Single 5V supply
- Window limits are user programmable via serial interface

Applications

- Instrumentation monitoring and process control
- Digitizing automotive sensor signals
- Embedded diagnostics

Simplified Block Diagram

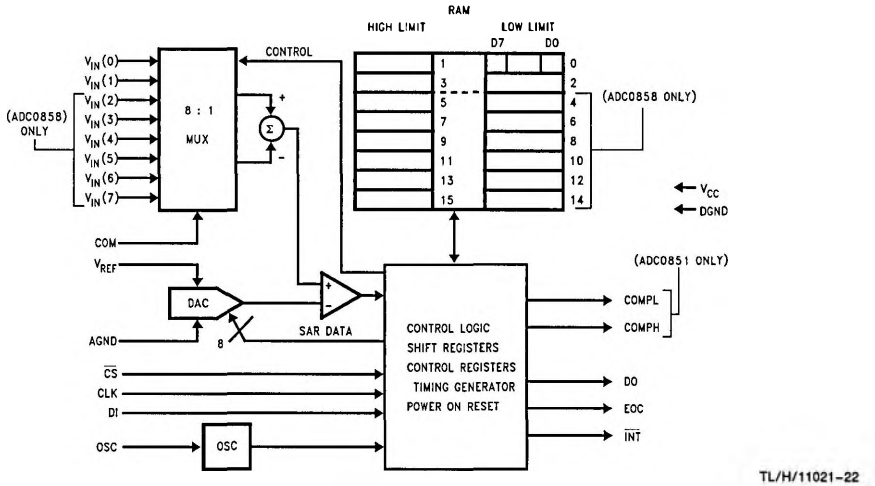
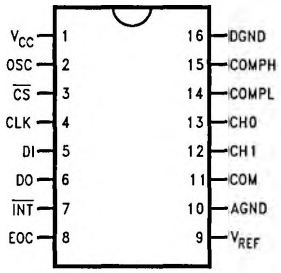


FIGURE 1

Connection Diagrams

ADC0851
2-Channel MUX
Dual-In-Line Package



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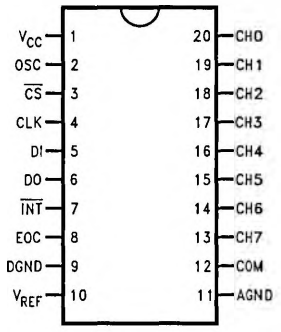
Top View

ADC0858
8-Channel MUX
Dual-In-Line Package



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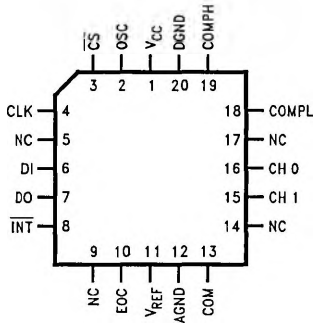
Top View

ADC0851 PLCC Package



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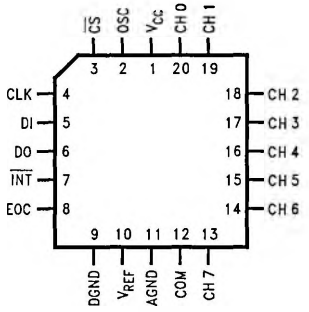
Top View

ADC0858 PLCC Package



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Top View

Ordering Information

Industrial ($-40°C \le T_A \le +85°C$)	Package
ADC0851BIN, ADC0851CIN	N16E, 16-Pin Plastic DIP
ADC0858BIN, ADC0858CIN	N20A, 20-Pin Plastic DIP
ADC0851BIV, ADC0851CIV	V20A, 20-Lead PLCC
ADC0858BIV, ADC0858CIV	V20A, 20-Lead PLCC

Military ($-55°C \le T_A \le +125°C$)	Package
ADC0851CMJ/883	J16A, 16-Pin Ceramic DIP
ADC0858CMJ/883	J20A, 20-Pin Ceramic DIP