TEXAS INSTRUMENTS

Linear Circuits

Data Acquisition and Conversion

Data Book

Volume 2

1989

Linear Products

Linear Products Quick Reference Guide

Data Book	Contents	Document No.
• Linear Circuits Vol 1 Amplifiers, Comparators, and Special Functions	Operational Amplifiers Voltage Comparators Video Amplifiers Hall-Effect Devices Timers and Current Mirrors Magnetic-Memory Interface Frequency-to-Voltage Converters Sonar Ranging Circuits/Modules Sound Generators	SLYD003 1989
• Linear Circuits Vol 2 Data Acquisition and Conversion	A/D and D/A Converters DSP Analog Interface Analog Switches and Multiplexers Switched-Capacitor Filters	SLYD004 1989
• Linear Circuits Vol 3 Voltage Regulators and Supervisors	Supervisor Functions Series-Pass Voltage Regulators Shunt Regulators Voltage References DC-to-DC Converters PWM Controllers	SLYD005 1989
• Telecommunications Circuits	Equipment Line Interfaces Subscriber Line Interfaces Modems and Receiver/Transmitters Ringers, Detectors, Tone Encoders PCM Interface Transient Suppressors	SCTD001A 1988/89
• Optoelectronics and Image Sensors	Optocouplers CCD Image Sensors and Support Phototransistors IR-Emitting Diodes Hybrid Displays	SOYD002 1987
• Interface Circuits	High-Voltage (Display) Drivers High-Power (Peripheral/Motor) Drivers Line Drivers, Receivers, Transceivers EIA RS-232, RS-422, RS-423, RS-485 IBM 360/370, IEEE 802.3, CCITT Military Memory Interface	SLYD002 1987
• Speech System Manuals	TSP50C4X Family	SLPS025 1988

As of March 1989

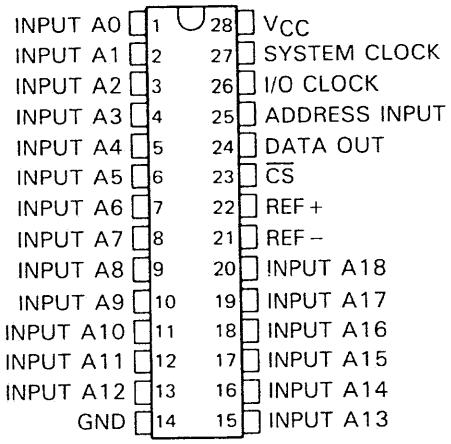
Linear Circuits Data Book
1989

Volume 2
Data Acquisition and Conversion

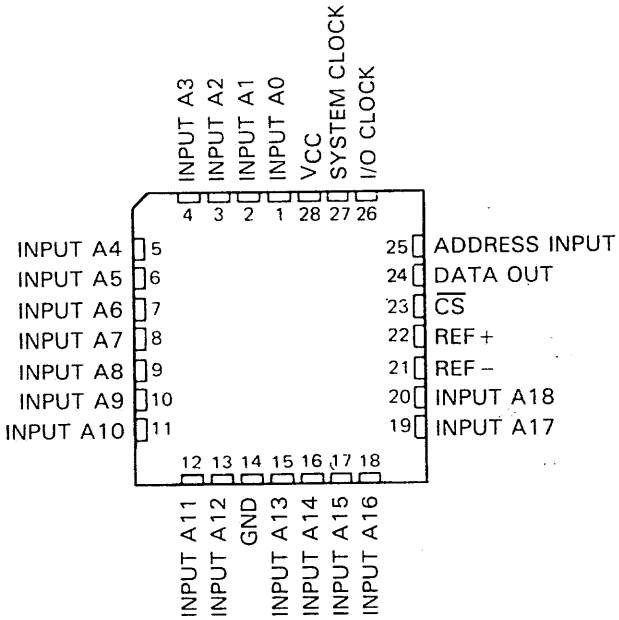
- LinCMOS™ Technology
- 8-Bit Resolution A/D Converter
- Microprocessor Peripheral or Stand-Alone Operation
- On-Chip 20-Channel Analog Multiplexer
- Built-In Self-Test Mode
- Software-Controllable Sample and Hold
- Total Unadjusted Error . . . ±0.5 LSB Max
- Timing and Control Signals Compatible with 8-Bit TLC540 and 10-Bit TLC1540 A/D Converter Families

TYPICAL PERFORMANCE	TL545	TL546
Channel Acquisition Time	1.5 μs	2.7 μs
Conversion Time	9 μs	17 μs
Sampling Rate	76 × 10^3	40 × 10^3
Power Dissipation	6 mW	6 mW

N DUAL-IN-LINE PACKAGE
(TOP VIEW)



FN CHIP CARRIER PACKAGE
(TOP VIEW)



description

The TLC545 and TLC546 are LinCMOS™ A/D peripherals built around an 8-bit switched-capacitor successive-approximation A/D converter. They are designed for serial interface to a microprocessor or peripheral via a 3-state output with up to four control inputs [including independent System Clock, I/O Clock, Chip Select ($\overline{CS}$), and Address Input]. A 4-MHz system clock for the TLC545 and a 2.1-MHz system clock for the TLC546 with a design that includes simultaneous read/write operation allowing high-speed data transfers and sample rates of up to 76,923 samples per second for the TLC545, and 40,000 samples per second for the TLC546. In addition to the high-speed converter and versatile control logic, there is an on-chip 20-channel analog multiplexer that can be used to sample any one of 19 inputs or an internal "self-test" voltage, and a sample-and-hold that can operate automatically or under microprocessor control.

The converters incorporated in the TLC545 and TLC546 feature differential high-impedance reference inputs that facilitate ratiometric conversion, scaling, and analog circuitry isolation from logic and supply noises. A totally switched-capacitor design allows low-error (±0.5 LSB)

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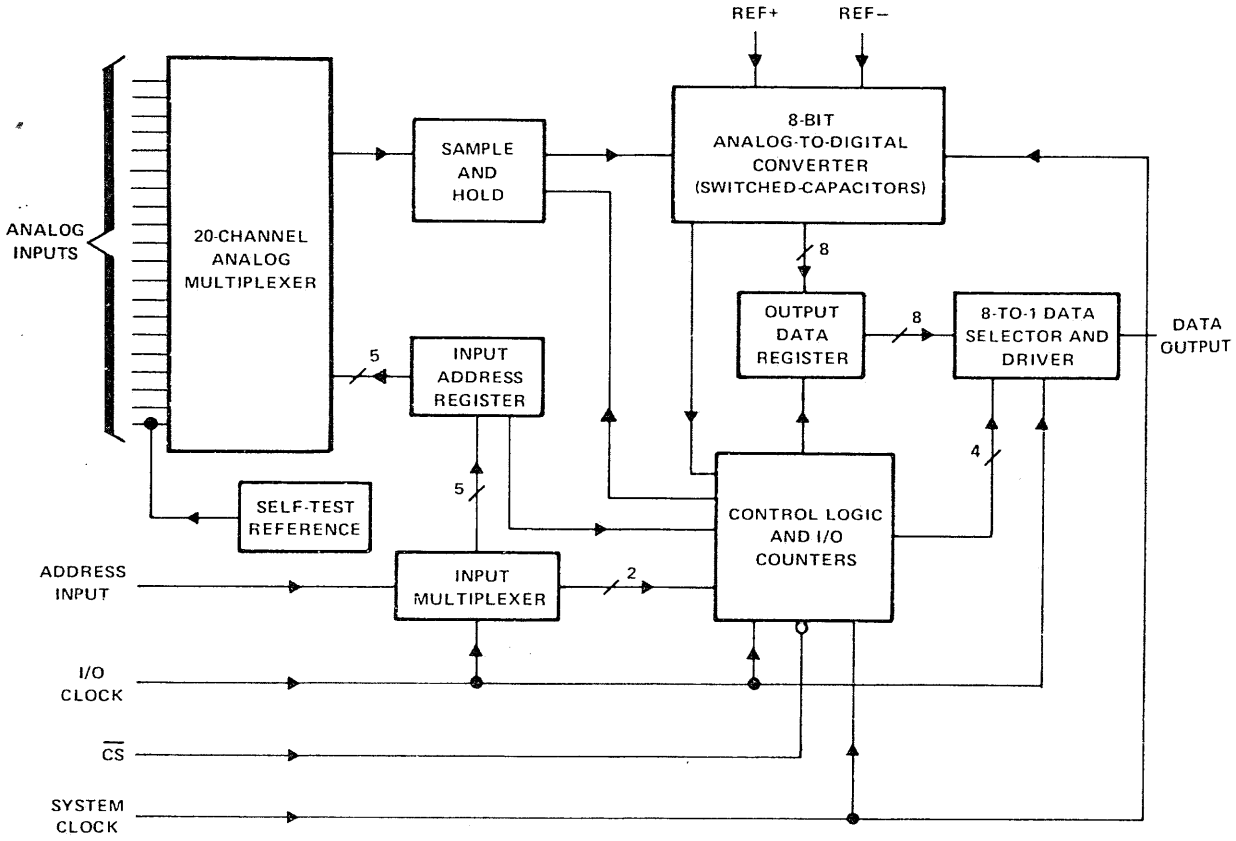
conversion in 9 μs for the TLC545, and 17 μs for the TLC546, over the full operating temperature range. Detailed information on interfacing to most popular microprocessors is readily available from the factory.

The TLC545M and the TLC546M are characterized for operation from −55°C to 125°C. The TLC545I and the TLC546I are characterized for operation from −40°C to 85°C. The TLC545C and the TLC546C are characterized for operation from 0°C to 70°C.

functional block diagram



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