Data Sheet

ADATE324

1.6 GHz Quad Integrated DCL with VHH Drive Capability, Level Setting DACs, and On-Chip Calibration Registers

FEATURES

- 2 selectable data rates up to 1.6 GHz or 3.2 Gbps maximum toggle rate
- DCL disable mode (low leakage typically <10 nA)
- Power and speed programmable (driver and comparators active)
  - 1.025 W power dissipation per channel low speed (Case A)
  - 1.125 W power dissipation per channel high speed (Case B)
- Voltage driver
  - 3-level driver with high-Z and reflection clamps
  - Voltage range: –1.5 V to +4.5 V (+5 V extended range)
  - Precision trimmed output resistance
  - Functional amplitude (VIH – VIL): 0.05 V minimum to 6.0 V maximum
  - 312.5 ps minimum pulse width (1.0 V programmed swing)
  - 26 ps deterministic jitter and 1.4 ps random jitter
- Comparator
  - Differential and single-ended window modes
  - Input voltage range: –1.5 V to +4.5 V (+5 V extended range)
  - 130 ps ERT/EFT normal window comparator 1.0 V, terminated
- Active load: ±12 mA current range
- VHH drive
  - Dedicated VHH output pin
  - Voltage range: 0.0 V to 13.5 V
- DC levels
  - Fully integrated and dedicated 16-bit DACs
  - On-chip gain and offset calibration registers with automatic add and multiply functions
- Package: 9 mm × 9 mm, 121-ball chip scale package ball grid array [CSP_BGA]

APPLICATIONS

- ATE
- Semiconductor and board test systems
- Instrumentation and characterization equipment

GENERAL DESCRIPTION

The ADATE324 is a complete, single-chip, quad-channel automatic test equipment (ATE) solution that performs the pin electronics (PE) functions of a driver, a comparator, and an active load (DCL). The device also features a high voltage (VHH) drive capability per chip to support flash memory testing applications. Dedicated 16-bit digital-to-analog converters (DACs) with on-chip calibration registers provide all the necessary dc levels for operation of the device.

The voltage driver features three active states: high, low, and terminate mode, as well as a high impedance inhibit state. The inhibit state, in conjunction with the integrated dynamic clamps, facilitates significant attenuation of transmission line reflections when the driver is not actively terminating the line. The open circuit drive capability is −1.5 V to +4.5 V to accommodate the standard range of ATE and instrumentation applications.

The ADATE324 can be used as a quad, single-ended, pin electronics channel or as a dual differential channel. In additional to per channel, high speed window comparators, the ADATE324 provides two programmable threshold differential comparators for differential ATE applications.

All dc levels for DCL functions are generated by dedicated on-chip 16-bit DACs. To facilitate accurate programming levels, the ADATE324 also includes an integrated calibration function to correct for gain and offset errors of each functional block. Correction coefficients can be stored on chip, and any values written to the DACs are automatically adjusted using the appropriate correction factors.

The ADATE324 uses a serial programmable interface (SPI) bus to program all functional blocks, DACs, and on-chip calibration constants. The device also has an on-chip temperature sensor, and overvoltage and undervoltage fault clamps, for monitoring and reporting the device temperature, and any output pin voltage faults that may occur during operation.

For more information on the ADATE324, contact ADATE324@analog.com.

Rev. SpA

NOTES

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