

High-Bandwidth LVDS Support in APEX Devices

Redefining High-Speed Data Transmission Technology

LVDS Advantages

- Up to 840-Mbps/channel data-transfer rate
- Low power consumption
- High noise immunity
- Low electromagnetic interference (EMI)

LVDS Applications

- Telecom/Datacom
 - Switches
 - Hubs
 - Routers
- Computing
 - Digital copiers
 - Processor interface
 - Imaging displays
 - Audio and video digital signal processing
 - MPEG stream processing

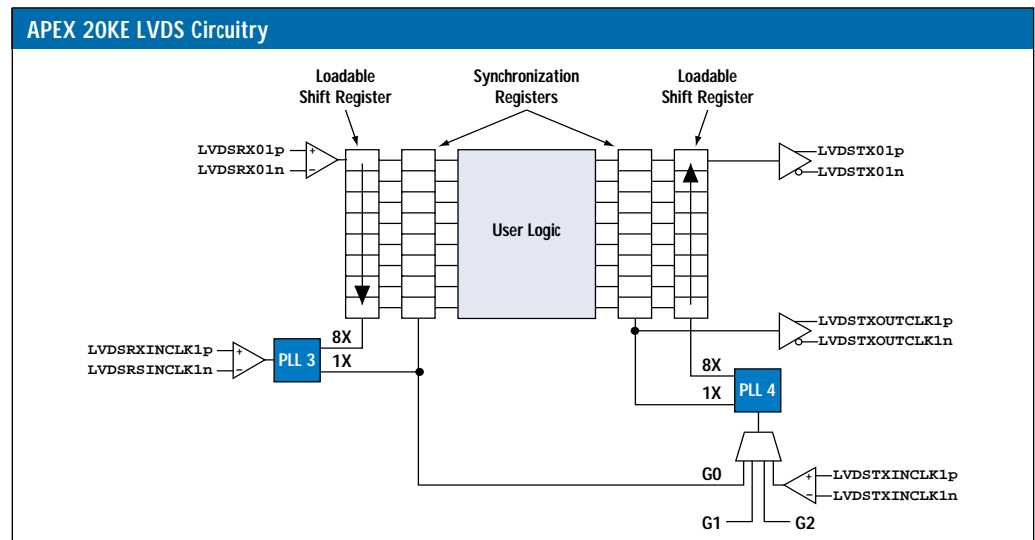
APEX: The Only Devices to Offer Up to 840-Mbps LVDS Support

Altera® APEX™ devices are the first PLDs to offer low-voltage differential signaling (LVDS) I/O interface circuitry. This interface provides data transfer rates up to 840 Mbps, with a programmable bandwidth of up to 26.8 Gbps and minimal power consumption. With LVDS, APEX devices provide significant advantages for high-performance networking, telecommunications, and other high-speed data transfer applications. APEX devices provide the highest performance, highest bandwidth system-on-a-program-

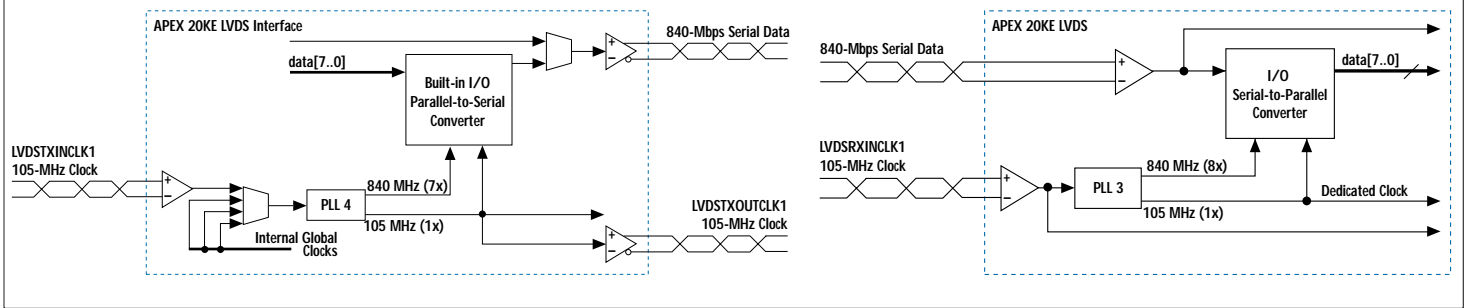
mable-chip solution for high-speed data transmission designs.

LVDS Technology

LVDS is a new data interface standard that is defined in the TIA/EIA-644 and the IEEE 1596.3 standards. LVDS can achieve signal rates faster than single-ended I/O standards. Because the receivers respond only to differential voltages, they provide immunity to noise such as common-mode signal reflections. In addition, LVDS signals emit less electromagnetic interference (EMI) than other data transmission standards.



APEX 20KE Dedicated LVDS Transmitter and Receiver Circuitry



APEX 20KE Dedicated Circuitry

The APEX 20KE LVDS block includes dedicated LVDS circuitry. This circuitry greatly facilitates LVDS implementation and ensures that complex device-level timing issues are handled with minimal design changes. It also performs the critical serial-to-parallel and parallel-to-serial conversions required to convert high-speed LVDS signals to rates that can be easily accommodated on the device. The APEX 20KE LVDS block supports data transfer rates up to 1 Gbps under laboratory conditions.

APEX 20KE LVDS Advantage

APEX 20KE devices with LVDS capability provide numerous benefits, including:

- High-frequency performance up to 840-Mbps per channel
- Total device bandwidth of over 250 Gbps (using LVDS and GTL+)
- Low power dissipation
- 16 input and output channels
- Support for 1x, 4x, 7x, or 8x serializer and deserializer
- Built-in data skew reduction circuitry
- Carefully planned on-chip LVDS pin placement
- Low ratio of chip power and ground pins to I/O pins
- Support for interfaces to multi-drop and point-to-point backplane architectures
- Support for data transfer across cables

Altera Offices

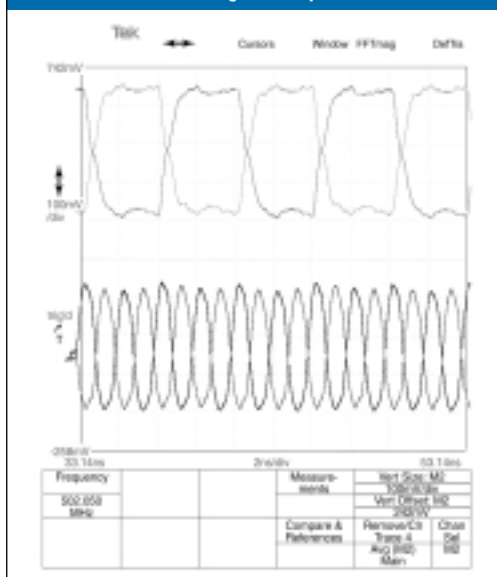
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APEX 20KE LVDS Running at 1-Gbps Data Transfer Rate*



*Data taken under laboratory conditions.

Contact Altera Today!

To determine which APEX devices work best for you, contact your local Altera Sales Representative or visit the Altera web site at <http://www.altera.com/apex>.