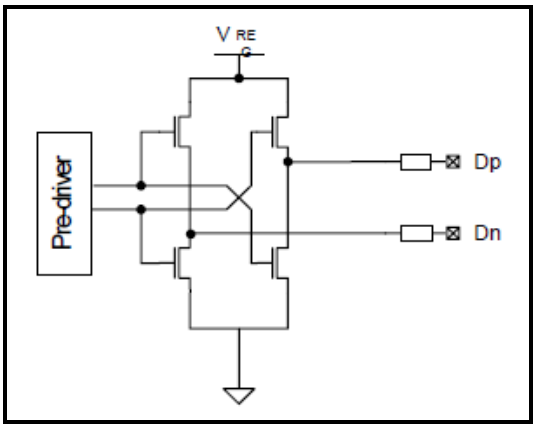
High Speed Differential Signal Transmitter IP for PHY RCTX01

Description

The RCTX01 is LVDS transmitter IP designed using 0.18um CMOS process. It can be configured and interfaced with other CMOS PHY IPs using multilevel signaling and supports data or clock signals transmission at 1Gbps (max). The LVDS Transmitter accepts CMOS input levels and translates them into low voltage 350mV differential output signals. The transmitter utilizes low-voltage differential signaling for signal transmission. The signals have a low voltage differential swing of about 200mV. LVDS differential signal is driven on the Dp and Dn pins by a differential output driver.
LVDS transmitter has following sub blocks:

1. Tristate Logic
2. Single ended to differential conversion
3. Bias generator
4. Driver stage
5. Common mode feedback circuit

Functional Diagram



Applications

- High speed transmitters
- High speed PHY
- Clock Drivers
- Camera and Display data Tx/Rx PHY

Key Features

- Low Power CMOS Design
- Power down mode
- Reconfigurable for use in various high speed PHY designs
- Supports reduced swing LVDS for low EMI

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Electrical Specification

Vcc = 1.8 V ± 10%; TA = −40°C to 125°C

DC Specifications:

Parameter	Description	Min	Nom	Max	Units
V_{CMTX}	HS transmit static common-mode voltage	150	200	250	mV
$\|\Delta V_{CMTX(1,0)}\|$	V_{CMTX} mismatch when output is Differential-1 or Differential-0			5	mV
$\|V_{OD}\|$	HS transmit differential voltage	140	200	270	mV
$\|\Delta V_{OD}\|$	V_{OD} mismatch when output is Differential-1 or Differential-0			10	mV
V_{OHHS}	HS output high voltage			360	mV
Z_{OS}	Single ended output impedance	40	50	62.5	Ω
ΔZ_{OS}	Single ended output impedance mismatch			10	%

AC Specification

Parameter	Description	Min	Nom	Max	Units
$\Delta V_{CMTX(HF)}$	Common-level variations above 450MHz			15	mV_{RMS}
$\Delta V_{CMTX(LF)}$	Common-level variation between 50-450MHz			25	mV_{PEAK}
t_R and t_F	20%-80% rise time and fall time			0.3	UI
		150			ps

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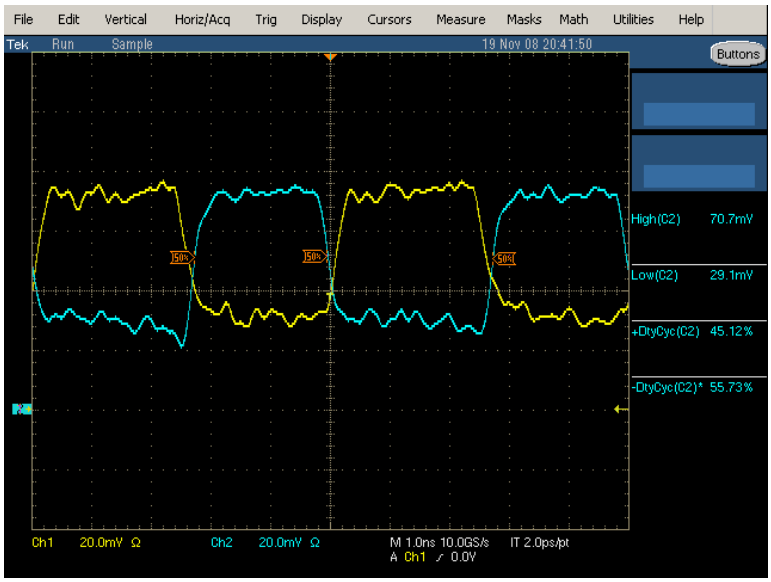
Silicon Data (@ 400Mbps):



Differential signal generated at 400Mbps