TDK SEMICONDUCTOR CORP.

78P2243
Triple E3/DS3/STS-1 Transceiver

Advanced Product Notice

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DESCRIPTION

The 78P2243 is a triple channel version of the 78P2241. Each of the three ports is a line interface transceiver for E3, DS3, STS-1, North America T3 and ATM applications. It includes clock recovery and transmitter pulse shaping functions for applications using 75-ohm coaxial cable at distances up to 1100 feet. These applications include DSLAMs, T3/E3 digital multiplexers, SONET Add/Drop multiplexers, PDH equipment, DS3 to Fiber optic and microwave modems and ATM WAN access for routers and switches.

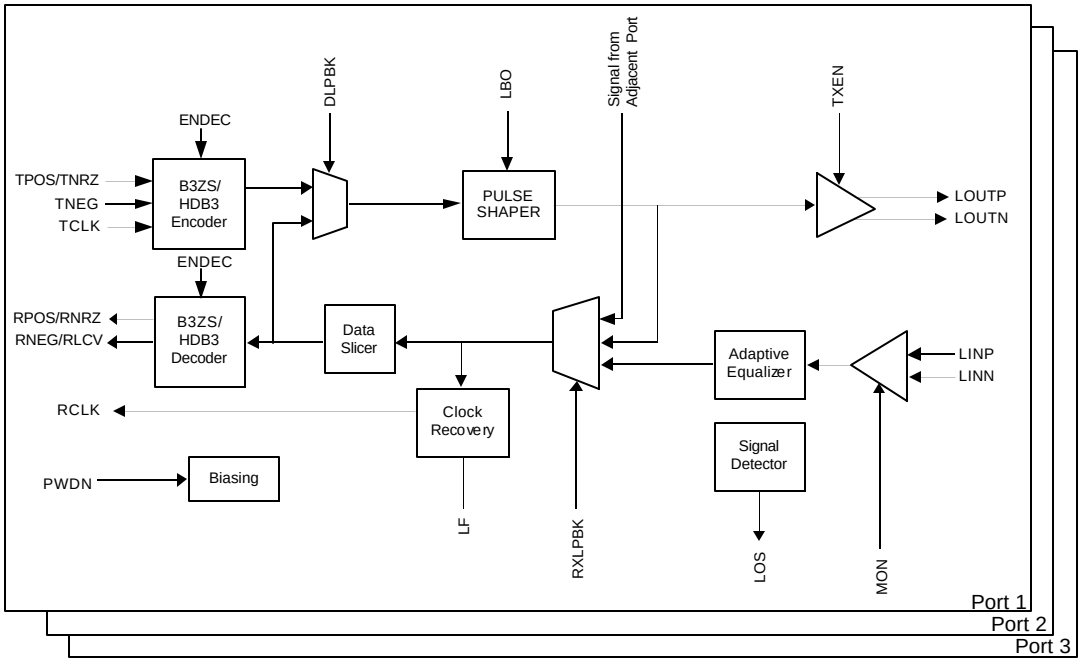
Each receiver recovers clock and data from a B3ZS or HDB3-coded AMI signal. The receiver can compensate for over 12dB of cable and 6dB of flat loss. The transmitter has a B3ZS/HDB3 ENDEC with a receive line code violation detector, a loop-back mode, a clock polarity selection mode, and the ability to receive a DSX3 monitor signal. Signals generated meet the standard pulse shape requirements.

The 78P2243 is manufactured in an advanced BiCMOS process and operates at both 3.3V and 5V power supply voltages.

FEATURES

- **Triple channel transmit and receive interface for E3, DS3 and STS-1 applications**
- **Interface to 75 ohm coaxial cable over 1100 feet at speeds up to 51.84 Mbit/s**
- **Compliant with ANSI T1.102-1993, Telcordia GR-499-CORE and GR-253-CORE, ITU-T G.703, G.823 and G.824 for jitter tolerance and G.775 for loss of signal**
- **Compliant with ATM FORUM af-phy-0034 (E3 public UNI) and af-phy-0054 (DS3 public UNI)**
- **Easily Interfaced to ATM framer ICs such as PMC-Sierra 7345 , and 7346 QJET**
- **Receive DS3-high and DSX3 monitor signals**
- **Diagnostic loop-back for AMI and digital signals**
- **Selectable B3ZS/HDB3 ENDEC**
- **Receive Line Code Violation Detector**
- **128-lead TQFP package**
- **3.3V or 5V operation**
- **Input circuit works transformer or AC coupled**

BLOCK DIAGRAM



DESCRIPTION (continued)

The 78P2243 contains all the necessary transmit and receive circuitry for connection between E3, DS3, or STS-1 signals and digital Framer/Deframer ICs.

OPERATING RATE

The DS3 and E3 pins determine which mode the chip operates in according to the table below. They control the PLL center frequency, the equalizer response, the transmitter pulse shape, and the transmitter amplitude.

Standard	DS3 PIN	E3 PIN
E3	Low	High
DS3	High	Low
STS-1	Low	Low
STS-1	High	High

B3ZS/HDB3 ENDEC with Line Code Violation Detect

The 78P2243 includes a selectable B3ZS/HDB3 Encoder/Decoder (ENDEC). When the ENDEC pin is low, the ENDEC is selected and the decoder generates a composite NRZ logic data stream following the B3ZS (for DS3/STS-1) or HDB3 (for E3) substitution codes via the RPOS/RNRZ pin as shown below.

ENDEC	RPOS/RNRZ	RNEG/RLCV
High	Positive AMI	Negative AMI
Low	NRZ data	Receive Line Code Violation Indicator

The decoder also detects Receive Line Code Violations (RLCV) and outputs a pulse via the RNEG/RLCV pin. Three different classes of line code violations are detected.

1) Too many zeros: More than two (three) consecutive zeros in B3ZS (HDB3) mode.
2) Not enough zeros between bipolar pulse (B) and bipolar violation pulse (V): (B,V) for B3ZS. (B,V) or (B,0,V) for HDB3.
3) Code violation: Even number of bipolar pulses (B) detected between bipolar violation pulses (V).

On the transmit side, when the ENDEC pin is low, NRZ input data is encoded to Positive and Negative logic data following the B3ZS (for DS3/STS-1) or HDB3 (for E3) substitution codes. The NRZ data is input to the TPOS/TNRZ pin as shown below.

ENDEC	TPOS/TNRZ	TNEG
High	Positive AMI	Negative AMI
Low	NRZ data	No Connect

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