EXAR

XR-T616

T-75-11-37

64 Kbit/s Codirectional Interface

GENERAL DESCRIPTION

The XR-T6164 is a bipolar analog IC intended for general purpose line transceiver applications. The receiver is designed for short line applications (<10dB) at bit rates up to 1.544 Mbit/s (T1). When used in conjunction with either XR-T6165 or XR-T6166 the device conforms to CCITT G.703 specification requirements for a 64Kbit/s codirectional interface. Typical current consumption is 25mA.

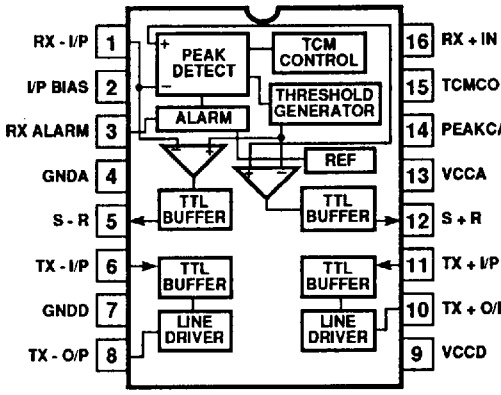
FEATURES

CCITT G.703 compatible when used with either XR-T6165 or XR-T6166
Low Power
TTL Compatible
Links Remote Equipment at Distances Up to 500M Without Equalization
Receive Input Gating Provides Ping Pong Operation Capability
Loss of Signal Alarm
Dual Matched Driver Outputs

APPLICATIONS

Data Adaption Unit (DAU).
General Purpose TTL Compatible Line Interface

PIN ASSIGNMENT



XR-T6164

ORDERING INFORMATION

Part Number	Package	Operating Temperatu
XR-T6164 CN	Ceramic DIP	0°C to 70
XR-T6164 CP	Plastic DIP	0°C to 70

ABSOLUTE MAXIMUM RATINGS

Storage Temperature	–65°C to 150
Supply Voltage	20

PIN DESCRIPTIONS

Name	I/O	Pin	Description
RX – I/P	I	1	Receiver negative bipolar Input.
I/P BIAS	I	2	Internally generated bias voltage for receive inputs.
RX ALARM	O	3	Loss of signal alarm (<–15dB) (active low).
GNDA	I	4	Analog Ground
S – R	O	5	Receive negative output data (active low).
TX – I/P	I	6	Transmit negative input signal (active high).
GNDD	I	7	Digital Ground.
TX – O/P	O	8	Transmit negative output data, open collector.
VCCD	I	9	+5V ± 5% digital supply.
TX + O/P	O	10	Transmit positive output data, open collector.
TX + I/P	I	11	Transmit positive input signal — active high.
S + R	O	12	Receive positive output data (active low).
VCCA	I	13	+5V ± 5% analog supply.
PEAK CAP	O	14	Receiver peak detector storage capacitor.
TCM CON	I	15	Time compression multiplex control pin (active low). When active disables Rx inputs and stores peak voltage.
RX + I/P	I	16	Receiver positive bipolar input.

SYSTEM DESCRIPTION

The XR-T6164 is a general purpose line interface chip. It contains both receive and transmit circuitry necessary to interface TTL signals either to or from a twisted pair cable.

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Receiver

In the receive direction XR-T6164 takes balanced bipolar input signals, having been attenuated and distorted by twisted pair cable, and outputs TTL compatible active low signals corresponding to received positive and negative input data (S+R, S–R). Received signals are fed to a peak detector and threshold generator circuit providing a slicing threshold proportional to the peak received input level. Dual stage data comparators slice the input signals at this threshold and pass signals to TTL compatible output buffers. An alarm comparator, with hysteresis to prevent output jitter, monitors input signal levels (threshold set at –15dB).

Transmitter

The XR-T6164 transmitter contains two matched open collector output drivers capable of driving line transformers directly with currents up to 40mA. The transmitter output circuits include diode clamps to ensure non-saturating operation. Transmitter inputs are TTL compatible.

XR-T6164

DC ELECTRICAL CHARACTERISTICS

Test Conditions: V_{CC} = 5V ± 5%, T_A = 25°C, unless otherwise specified.

PARAMETER	MIN	TYP	MAX	UNIT	CONDITIONS
Supply Voltage	4.75		5.25	V	
Analog Supply Current	4		6.5	mA	
Digital Supply	13		20	mA	
RECEIVER					
Peak Input Signal		2	2.2	Vp	Pins 1, 16 with respect to pin 2 (See Note 1)
Dynamic Range			10	dB	Without Equalization
Input Impedance		20		kΩ	Pins 1, 16
Input Slicing Threshold		50		%	
Input Bias Voltage		1.45		V	Pin 2
Loss of Signal Alarm		–15		dB	
Alarm Level Hysteresis		1.5		dB	
Peak Detector Leakage		–80		µA	Pin 14; V_{IN} = 1V
Data Output Low			0.4	V	Pins 5, 12; I_{OUT} = –1.6mA
Data Output High	3.6			V	Pins 5, 12; I_{OUT} = +40µA
Alarm Output Low			0.4	V	Pin 3; I_{OUT} = –1.6mA
Alarm Output High	4.9			V	Pin 3; I_{OUT} = +40µA
TCM Input Low Voltage			0.8	V	Pin 15; I_{IN} min = –500µA Pin 15; I_{IN} max = +5µA
TRANSMITTER					
Input Low Voltage			0.8	V	Pins 6, 11; I_{IN} = –700µA
Input High Voltage	2.2			V	Pins 6, 11; I_{IN} = +5µA
Output Low Voltage		1		V	Pins 8, 10; I_{OUT} = –40mA
Output Low Current	–40		–40	mA	Pins 8, 10; V_{OUT} = 1V
Output Leakage	–100			µA	Pins 8, 10; V_{OUT} = 10V Outputs in off state.

AC ELECTRICAL CHARACTERISTICS

Test Conditions: V_{CC} =5V ± 5%, T_A = 25°C, unless otherwise specified.

PARAMETER	MIN	TYP	MAX	UNIT	CONDITIONS
RECEIVER					
Input Level	1		2.2	Vp	Pin 1, 16 with Respect to Pin 2 (See Note 1)
Output Rise Time			50	ns	Pins 5, 12; C_L = 15pF 10% to 90%
Output Fall Time			50	ns	Pins 5, 12; C_L = 15pF
TRANSMITTER					
Output Rise Time			50	ns	Pins 8, 10; R_L = 130, C_L = 15pF 10% to 90%
Output Fall Time			50	ns	Pins 8, 10; R_L = 130, C_L = 15pF 90% to 10%
Rising Edge Delay			60	ns	Pins 8, 10; R_L = 130, C_L = 15pF 50% to 50% (i/p to o/p)
Falling Edge Delay			60	ns	Pins 8, 10; R_L = 130, C_L = 15pF 50% to 50% (i/p to o/p)

Note 1. Higher input voltages are possible if a resistive input attenuator is used.

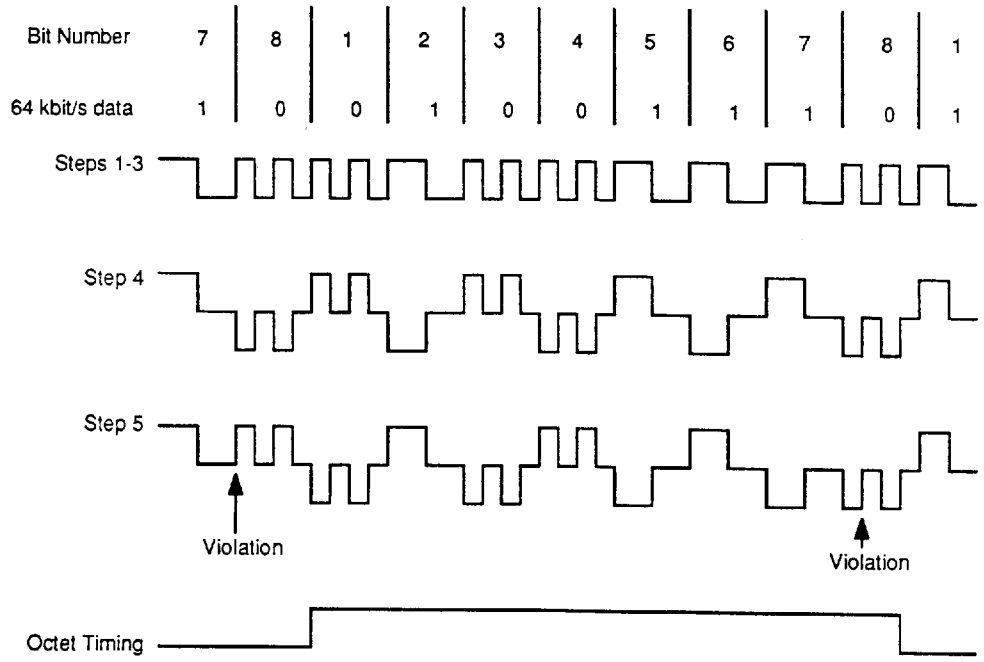

Figure 1. Transmitter Code Conversion for 64 Kbit/s Bipolar Line Signal

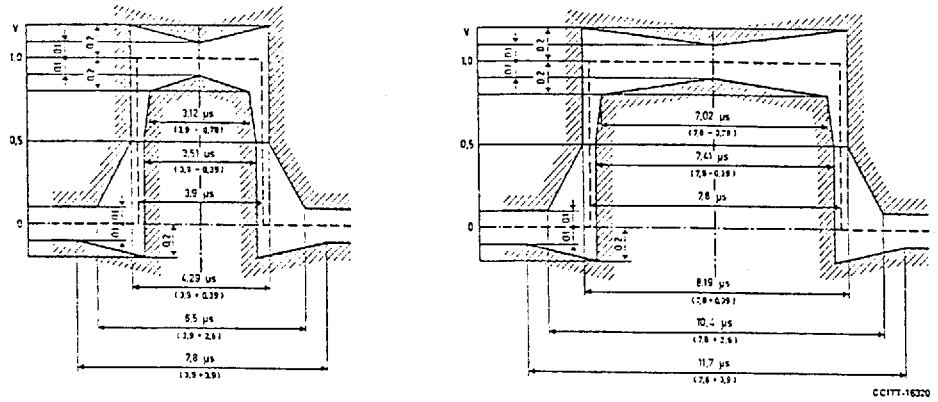

Figure 2. Pulse Masks of the 64 Kbit/s Codirectional Interface

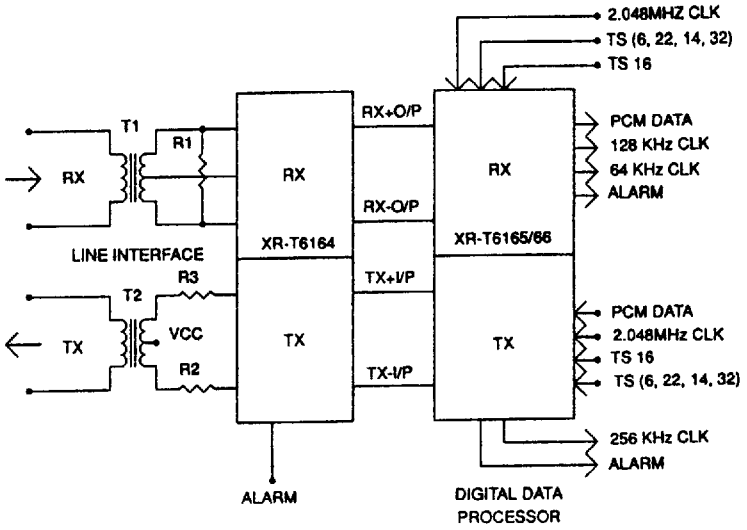

Figure 3. Digital Data Processor Application

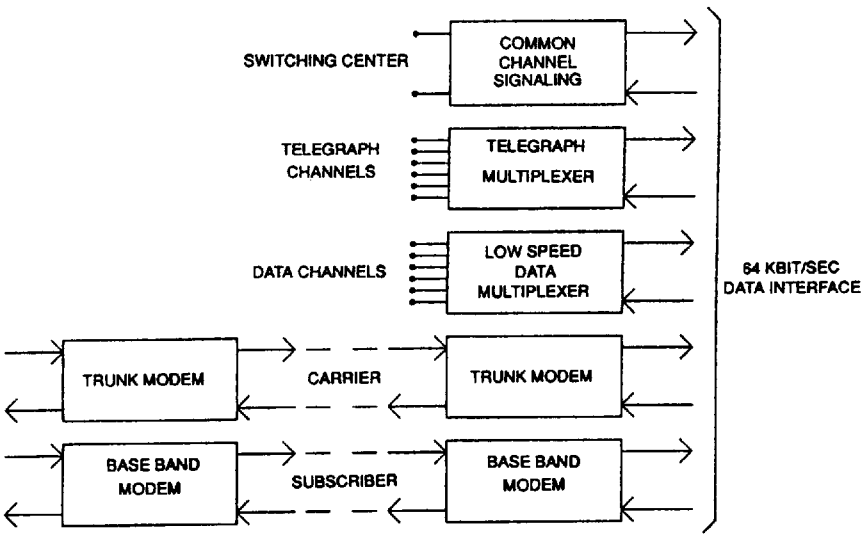

Figure 4. Typical 64 kbit/s Data Interface

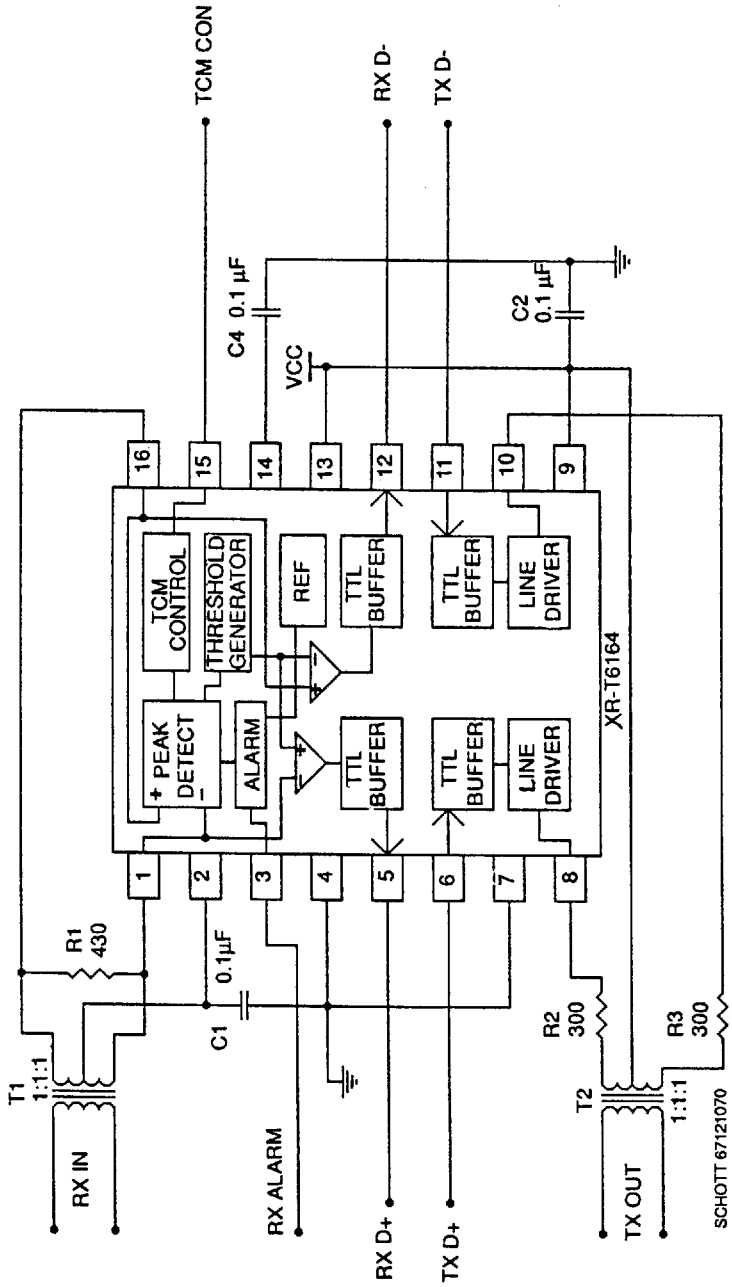

Figure 5. Typical Applications Schematic For XR-T6164