

PCM AMI Line Receiver and Clock Recovery Circuit

GENERAL DESCRIPTION

The XR-T5640 is a monolithic bipolar IC designed for T1 type line receiver application operating at 1.544 M bit/s. It provides all the active circuitry required to perform automatic line build out (ALBO), threshold detection, binary NRZ data and clock recovery.

A clock recovery using crystal filter circuit version of the XR-T5640 is also available as XR-T5740.

FEATURES

- On Chip NRZ Data and Clock Recovery
- Less than 10 ns Sampling Pulse Over the Operating Range
- Triple Matched ALBO Ports
- Single 5.1 Power Supply

APPLICATIONS

- T1 PCM Line Receiver
- T1C PCM Line Receiver (requires external gain)
- General Purpose Bipolar Line Receiver

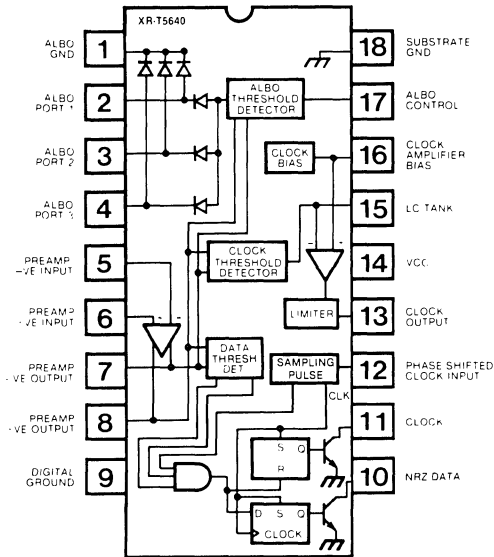
ABSOLUTE MAXIMUM RATINGS

Storage Temperature	-65°C to +150°C
Operating Temperature	-40°C to +85°C
Supply Voltage	-0.5 to +10V
Supply Voltage Surge (10 ms)	+25V
Input Voltage (except Pins 2,3,4,17)	-0.5 to 7V
Input Voltage (Pins 2,3,4,17)	-0.5 to +0.5V
Data Output Voltage (Pins 10,11)	20V
Voltage Surge (Pins 5,6,10,11) (10 msec only)	50V

ORDERING INFORMATION

Part Number	Package	Operating Temperature
XR-T5640	Ceramic	-40°C to 85°C

FUNCTIONAL BLOCK DIAGRAM



SYSTEM DESCRIPTION

The XR-T5640 is designed as a receiver for interfacing T1 PCM carrier lines on plastic or pulp insulated cables. It can also be used as a general purpose alternate mark inversion (AMI) receiver.

The XR-T5640 is a modified version of XR-T5620 PCM repeater IC. It contains all the active circuitry needed to build a T1 line receiver for interfacing up to 6300 ft. The preamplifier, the clock amplifier, threshold detectors, ALBO port, data latches and output drivers are similar to the ones on XR-T5620. Clock extraction is done by means of an L-C tank circuit.

Bipolar +1 and -1 pulses are combined within the IC to form a binary non-return to zero PCM signal at Pin 10. A synchronous clock signal is made available at Pin 11. Both outputs have open collector transistors.

XR-T5640

ELECTRICAL CHARACTERISTICS

Test Conditions: $T_A = 25^\circ\text{C}$, $V_{CC} = 5.1\text{V} \pm 5\%$

PARAMETERS	MIN	TYP	MAX	UNIT	CONDITIONS
Supply Current		22	30	mA	ALBO Off $V_{\text{pull-up}} = 15\text{V}$ At Unity DC Gain $R_S = 8.2\text{k}\Omega$
Clock & Data Output Leakage Current		0	100	μA	
Amplifier Pin Voltages	2.4	2.9	3.4	V	
Amplifier Output Voltage Swing	2.2			V	
Amplifier Output Offset Voltage	-50	0	50	mV	
Amplifier Input Bias Current			5	μA	
ALBO on Current	3			mA	
Drive Current		1		mA	
AC CHARACTERISTICS					
Pre-Amplifier					Open Loop
AC Gain at 1 MHz	20	50		dB	
Input Impedance			200	$\text{k}\Omega$	
Output Impedance				Ω	Open Loop
Clock Amplifier					
AC Gain	10	32		dB	
-3 dB Bandwidth				MHz	
Delay		10		ns	
Output Impedance			200	Ω	
ALBO					
Off Impedance	20			$\text{k}\Omega$	
On Impedance			25	Ω	
CLOCK DATA OUTPUT BUFFERS					$R_L = 130\Omega$, $V_{\text{pull-up}} = 5.1\text{V} \pm 5\%$
Rise Time		30		ns	
Fall Time		30		ns	
Output Pulse Width		244		ns	
Sample Pulse Width		10		ns	
V_{OL}		0.7		V	
I_L sink		35		mA	
THRESHOLDS					
ALBO	1.4	1.5	1.6	V	At $V_O = V_{ALBO}$ Threshold
Clock Drive Current Peak		1.0		mA	
Clock Thresholds					
% of ALBO	63		75	%	
Data Threshold					
% of ALBO	40	46	52	%	