



XR-T5683

PCM Line Interface Chip

7-75-11-17

GENERAL DESCRIPTION

The XR-T5683 is a PCM line interface chip. It consists of both transmit and receive circuitry in a DIL 18 pin package. The maximum bit rate the chip can handle is 8.448 M Bits/s and the signal level to the receiver can be attenuated by -10dB cable loss at half the bit rate. At nominal supply voltage operation the typical current consumption is 40mA.

FEATURES

Single +5.0V Supply
Receiver Input Can Be Either Balanced or Unbalanced
Up to 8.448 M Bits/s Operation in Both T_x and R_x Directions
TTL Compatible Interface

APPLICATIONS

T1, T148C, T2, 2048 & 8448 KBits/s
PCM Line Interface
CPI
DMI

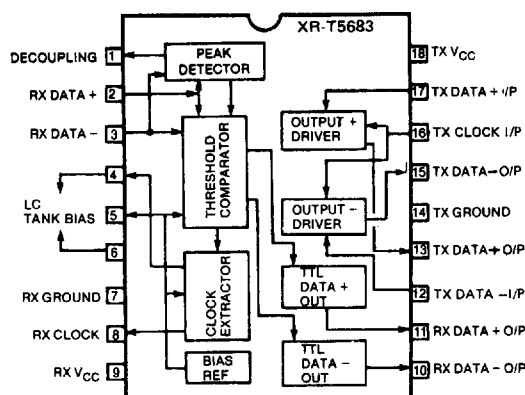
ABSOLUTE MAXIMUM RATINGS

Supply Voltage	+20V
Storage Temperature	-65°C to +150°C

ORDERING INFORMATION

Part Number	Package	Operating Temperature
XR-T5683	Ceramic	-40°C to +85°C

PIN ASSIGNMENT



SYSTEM DESCRIPTION

The incoming bipolar PCM signal which is attenuated and distorted by the cable is applied to the threshold comparator and the peak detector. The peak detector generates a DC reference for the threshold comparator for data and clock extraction. A tank circuit tuned to the appropriate frequency is added to the later operation. The clock signal, data (+) data (-) all go through a similar level shifter to be converted into TTL level to be compatible for digital processing.

In the transmit direction, the output drivers consist of two identical TTL inputs with open collector output stages. The maximum low level current these output stages can sink is 40 mA. With full width data applied to the inputs together with a synchronized clock. The output will generate a bipolar signal when driving a centre-tapped transformer. A typical circuit diagram to XR-T5683 is shown in Figure 1.

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DC ELECTRICAL CHARACTERISTICS**Test Conditions:** $V_{CC} = 5.0V \pm 5\%$, $T_A = 0^\circ - 70^\circ C$, unless otherwise specified.

PARAMETERS	MIN	TYP	MAX	UNIT	CONDITIONS
Supply Voltage	4.75	5	5.25	V	Total Current to Pin 9 & Pin 18 Transmitter Outputs Open
Supply Current		40	55	mA	
RECEIVER SECTION					
Tank Drive Current	300	500	700	μA	Measured at Pin 4, V _{CC} = 5V
Clock Output Low		0.3	0.6	V	Measured at Pin 8 I _{OL} = 1.6mA
Clock Output High	3.0	3.6		V	Measured at Pin 8
Data Output Low		0.3	0.6	V	Measured at Pin 10 & 11 I _{OL} = 1.6mA
Data Output High	3.0	3.6		V	Measured at Pin 10 & 11 I _{OH} = 400μA
TRANSMITTER SECTION					
Driver Output Low	0.6	0.8	1.0	V	Measured at Pin 13 & 15 I _{OL} = 40mA
Output Leakage Current		0	100	μA	Measured in Off State Output Pull-up to +20V
Input High Voltage	2.2			V	Measured at Pin 12, 16 & 17 I _{OL} = 40mA, V _{OL} = 1.0V
Input Low Voltage			0.8	V	Measured at Pin 12, 16 & 17
Input Low Current			-1.6	mA	Measured at Pin 12, 16 & 17 Input Low Voltage = 0.4V
Input High Current			40	μA	Measured at Pin 12, 16 & 17
Output Low Current			40	mA	Measured at Pin 13 & 15 V _{OL} = 1.0V

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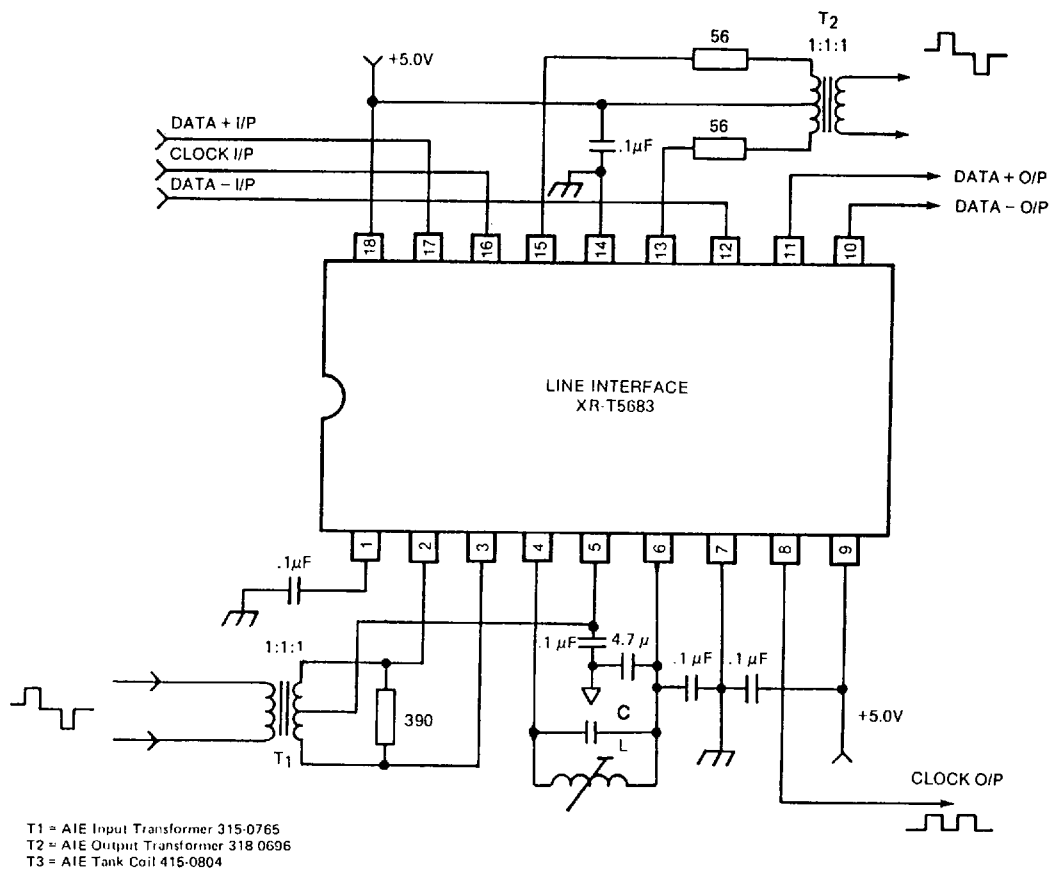
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AC ELECTRICAL CHARACTERISTICS**Test Conditions:** $V_{CC} = 5.0V$, $T_A = 25^\circ C$, unless otherwise specified.

PARAMETERS	MIN	TYP	MAX	UNIT	CONDITIONS
RECEIVER SECTION					
Input Level		6	6.6	Vpp	Measured Between Pin 2 & 3
Loss Input Signal Alarm Level		0.8		Vpp	Measured Between Pin 2 & 3
Input Impedance at 2048KHz		2.5		k Ω	Measured Between Pin 2 & 3
Clock Duty Cycle	35	50	65	%	Measured at Pin 8 at 2.0V
Clock Rise & Fall Time		20		ns	Measured at Pin 8, $C_L = 15pF$
Data Pulse Width	35	50	75	% of clock period	Measured at Pin 10 & 11 At 1V DC Level, Cable Loss = 0
TRANSMITTER SECTION					
Pulse Width at 8448KHz	53		65	ns	Measured at Pin 13 & 15 See Test Circuit 1
Output Rise Time		12	25	ns	See Test Circuit 1
Output Fall Time		12	25	ns	See Test Circuit 1
Output Pulse Imbalance		2.5		ns	At 50% Output Level

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T1 = AIE Input Transformer 315-0765
T2 = AIE Output Transformer 318-0696
L = AIE Tank Coil 415-0804 (1.5 & 2MBPS)
AIE Tank Coil 15-0111 (8MBPS)

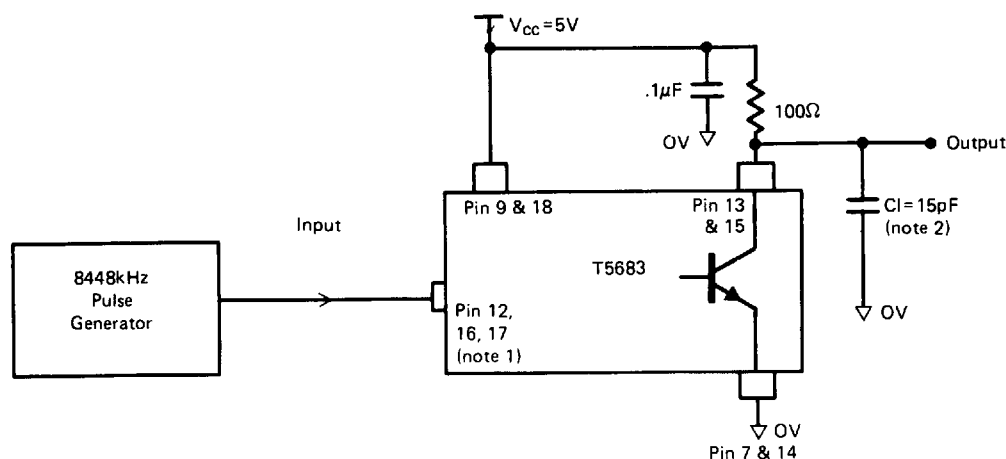
Device	1.544 MBPS	2.048 MBPS	8.048MBPS
L	~60μH	~60μH	~5μH
C	175pF	100pF	70pF

Figure 1. Application Circuit for XRT5683

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Note 1. Inputs that are not connected to pulse generator will be tied to $+V_{CC}$ via 1K resistor.

Note 2. C_L includes probe and jig capacitance.

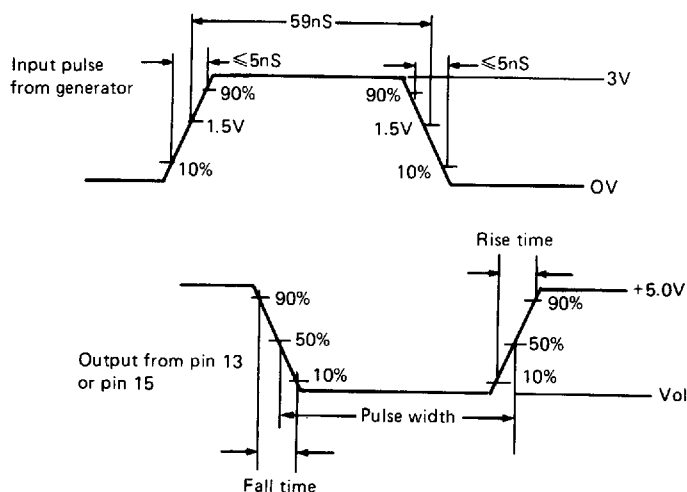


Figure 2. T5683 Transmitter test circuit and switching waveforms (measured @ 8.448 MBPS).