



## PI74FCT861T/863T/864T

### Fast CMOS Bus Transceivers

#### Product Features:

- PI74FCT861/863T/864T is pin compatible with bipolar FAST™ Series at a higher speed and lower power consumption
- TTL input and output levels
- Extremely low static power
- Hysteresis on all inputs
- Industrial operating temperature range:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Packages available:
  - 24-pin 300 mil wide plastic DIP (P)
  - 24-pin 150 mil wide plastic QSOP (Q)
  - 24-pin 150 mil wide plastic TQSOP (R)
  - 24-pin 300 mil wide plastic SOIC (S)

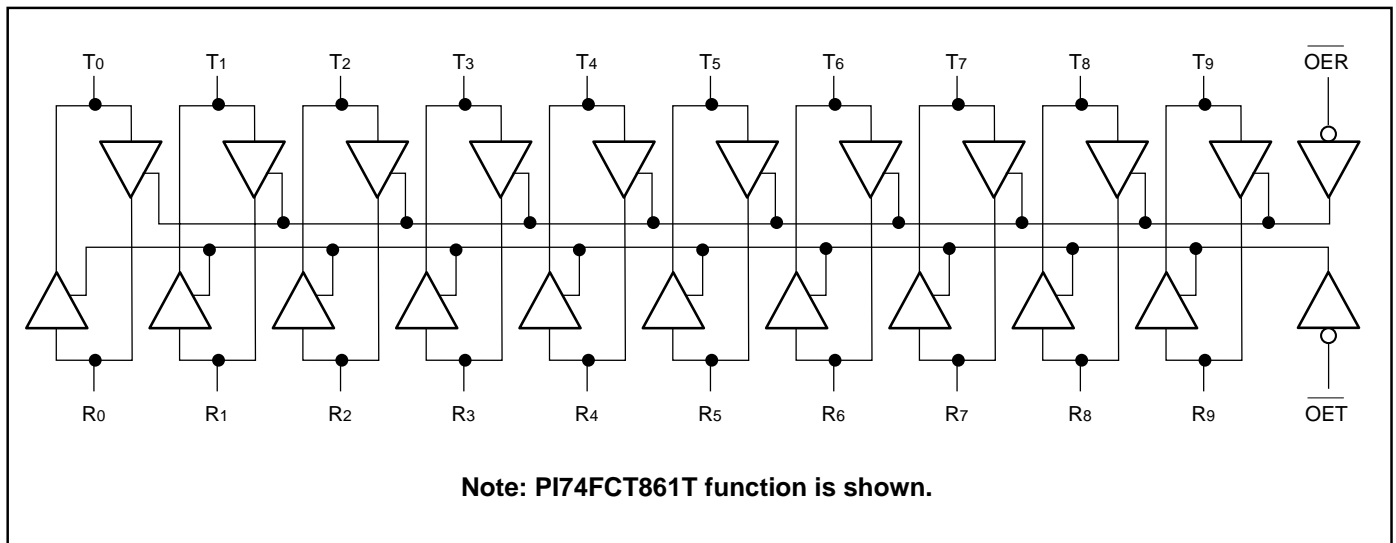
#### Product Description:

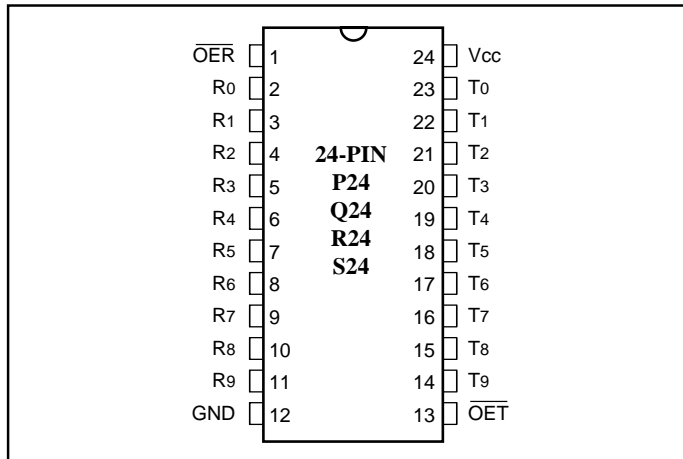
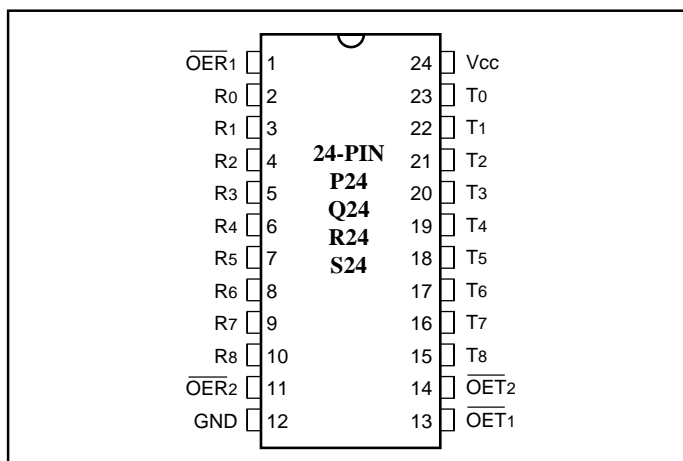
Pericom Semiconductor's PI74FCT series of logic circuits are produced in the Company's advanced 0.8 micron CMOS technology, achieving industry leading speed grades.

The PI74FCT860T series bus transceivers provide high-performance bus interface buffering for wide data/address paths carrying parity. They are designed for high-capacitance load drive capability while providing bus loading at both inputs and outputs.

The PI74FCT861T is a 10-bit non-inverting bus transceiver. The PI74FCT863T is a 9-bit non-inverting option of the PI74FCT864T 9-bit inverting bus transceiver.

#### PI74FCT861/863/864T Logic Block Diagram



**PI74FCT861T 10-Bit Product Configuration**

**PI74FCT863/864T 9-Bit Product Configuration**

**Product Pin Description**

Pin Name	Description
RN	Receive Inputs/Outputs
TN	Transmit Inputs/Outputs
$\overline{\text{OERN}}$	Output Enable Receive Mode
$\overline{\text{OETN}}$	Output Enable Transmit Mode
GND	Ground
Vcc	Power

**PI74FCT861/863T (non-inverting) Truth Table<sup>(1)</sup>**

Function	Inputs				Outputs	
	$\overline{\text{OETN}}$	$\overline{\text{OERN}}$	RN	TN	RN	TN
High-Z	H	H	X	X	Z	Z
Transmitting	L	H	L	N/A	N/A	L
Transmitting	L	H	H	N/A	N/A	H
Receiving	H	L	N/A	L	L	N/A
Receiving	H	L	N/A	H	H	N/A

- H = High Voltage Level  
L = Low Voltage Level  
X = Don't Care  
NA = Not Applicable  
Z = High Impedance

**PI74FCT864T (inverting) Truth Table<sup>(1)</sup>**

Function	Inputs				Outputs	
	$\overline{\text{OETN}}$	$\overline{\text{OERN}}$	RN	TN	RN	TN
High-Z	H	H	X	X	Z	Z
Transmitting	L	H	L	N/A	N/A	H
Transmitting	L	H	H	N/A	N/A	L
Receiving	H	L	N/A	L	H	N/A
Receiving	H	L	N/A	H	L	N/A

- H = High Voltage Level  
L = Low Voltage Level  
X = Don't Care  
NA = Not Applicable  
Z = High Impedance

### Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

Storage Temperature .....	-65°C to +150°C
Ambient Temperature with Power Applied .....	-40°C to +85°C
Supply Voltage to Ground Potential (Inputs & V <sub>CC</sub> Only) .....	-0.5V to +7.0V
Supply Voltage to Ground Potential (Outputs & D/O Only) .....	-0.5V to +7.0V
DC Input Voltage .....	-0.5V to +7.0V
DC Output Current .....	120mA
Power Dissipation .....	0.5W

### Note:

Stresses greater than those listed under **MAXIMUM RATINGS** may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

### DC Electrical Characteristics (Over the Operating Range, T<sub>A</sub> = -40°C to +85°C, V<sub>CC</sub> = 5V ± 5%)

Parameters	Description	Test Conditions <sup>(1)</sup>		Min.	Typ <sup>(2)</sup>	Max.	Units
V <sub>OH</sub>	Output HIGH Voltage	V <sub>CC</sub> = Min., V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = -15.0 mA	2.4	3.0		V
V <sub>OL</sub>	Output LOW Current	V <sub>CC</sub> = Min., V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> = 48 mA		0.3	0.50	V
V <sub>IH</sub>	Input HIGH Voltage	Guaranteed Logic HIGH Level		2.0			V
V <sub>IL</sub>	Input LOW Voltage	Guaranteed Logic LOW Level				0.8	V
I <sub>IH</sub>	Input HIGH Current	V <sub>CC</sub> = Max.	V <sub>IN</sub> = V <sub>CC</sub>			1	μA
I <sub>IL</sub>	Input LOW Current	V <sub>CC</sub> = Max.	V <sub>IN</sub> = GND			-1	μA
I <sub>OZH</sub>	High Impedance	V <sub>CC</sub> = Max.	V <sub>OUT</sub> = 2.7V			1	μA
I <sub>OZL</sub>	Output Current		V <sub>OUT</sub> = 0.5V			-1	μA
I <sub>I</sub>	Input HIGH Current	V <sub>CC</sub> = Max., V <sub>IN</sub> = V <sub>CC</sub> (Max.)				20	μA
V <sub>IK</sub>	Clamp Diode Voltage	V <sub>CC</sub> = Min., I <sub>IN</sub> = -18 mA			-0.7	-1.2	V
I <sub>OS</sub>	Short Circuit Current	V <sub>CC</sub> = Max. <sup>(3)</sup> , V <sub>OUT</sub> = GND		-60	-120		mA
I <sub>OFF</sub>	Power Down Disable	V <sub>CC</sub> = GND, V <sub>OUT</sub> = 4.5V		—	—	100	μA
V <sub>H</sub>	Input Hysteresis				200		mV

### Capacitance (T<sub>A</sub> = 25°C, f = 1 MHz)

Parameters <sup>(4)</sup>	Description	Test Conditions	Typ	Max.	Units
C <sub>IN</sub>	Input Capacitance	V <sub>IN</sub> = 0V	6	10	pF
C <sub>OUT</sub>	Output Capacitance	V <sub>OUT</sub> = 0V	8	12	pF

### Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at V<sub>CC</sub> = 5.0V, +25°C ambient and maximum loading.
3. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
4. This parameter is determined by device characterization but is not production tested.

**Power Supply Characteristics**

Parameters	Description	Test Conditions <sup>(1)</sup>		Min.	Typ <sup>(2)</sup>	Max.	Units
I <sub>CC</sub>	Quiescent Power Supply Current	V <sub>CC</sub> = Max.	V <sub>IN</sub> = GND or V <sub>CC</sub>		0.1	500	μA
ΔI <sub>CC</sub>	Supply Current per Input @ TTL HIGH	V <sub>CC</sub> = Max.	V <sub>IN</sub> = 3.4V <sup>(3)</sup>		0.5	2.0	mA
I <sub>CCD</sub>	Supply Current per Input per MHz <sup>(4)</sup>	V <sub>CC</sub> = Max., Outputs Open $\overline{OE}$ = GND; One Input Toggling 50% Duty Cycle	V <sub>IN</sub> = V <sub>CC</sub> V <sub>IN</sub> = GND		0.15	0.25	mA/ MHz
I <sub>C</sub>	Total Power Supply Current <sup>(6)</sup>	V <sub>CC</sub> = Max., Outputs Open f <sub>CP</sub> = 10 MHz 50% Duty Cycle $\overline{OE}$ = GND; f <sub>I</sub> = 5 MHz One Bit Toggling	V <sub>IN</sub> = V <sub>CC</sub> V <sub>IN</sub> = GND		1.5	3.5 <sup>(5)</sup>	mA
			V <sub>IN</sub> = 3.4V V <sub>IN</sub> = GND		1.8	4.5 <sup>(5)</sup>	
		V <sub>CC</sub> = Max., Outputs Open f <sub>CP</sub> = 10 MHz 50% Duty Cycle $\overline{OE}$ = GND; Eight Bits Toggling f <sub>I</sub> = 2.5 MHz 50% Duty Cycle	V <sub>IN</sub> = V <sub>CC</sub> V <sub>IN</sub> = GND		3.0	6.0 <sup>(5)</sup>	
			V <sub>IN</sub> = 3.4V V <sub>IN</sub> = GND		5.0	14.0 <sup>(5)</sup>	

**Notes:**

- For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device.
- Typical values are at V<sub>CC</sub> = 5. V, +25°C ambient.
- Per TTL driven input (V<sub>IN</sub> = 3.4V); all other inputs at V<sub>CC</sub> or GND.
- This parameter is not directly testable, but is derived for use in Total Power Supply Calculations.
- Values for these conditions are examples of the I<sub>CC</sub> formula. These limits are guaranteed but not tested.

$$I_C = I_{\text{QUIESCENT}} + I_{\text{INPUTS}} + I_{\text{DYNAMIC}}$$

$$I_C = I_{CC} + \Delta I_{CC} D_H N_T + I_{CCD} (f_{CP}/2 + f_I N_I)$$

I<sub>CC</sub> = Quiescent Current

ΔI<sub>CC</sub> = Power Supply Current for a TTL High Input (V<sub>IN</sub> = 3.4V)

D<sub>H</sub> = Duty Cycle for TTL Inputs High

N<sub>T</sub> = Number of TTL Inputs at D<sub>H</sub>

I<sub>CCD</sub> = Dynamic Current Caused by an Input Transition Pair (HLH or LHL)

f<sub>CP</sub> = Clock Frequency for Register Devices (Zero for Non-Register Devices)

f<sub>I</sub> = Input Frequency

N<sub>I</sub> = Number of Inputs at f<sub>I</sub>

All currents are in milliamps and all frequencies are in megahertz.

**PI74FCT861T (non-inverting) Switching Characteristics over Operating Range**

Parameters	Description	Conditions <sup>(1)</sup>	861AT		861BT		861CT		Unit
			Com.		Com.		Com.		
			Min	Max	Min	Max	Min	Max	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay R <sub>N</sub> to T <sub>N</sub> or T <sub>N</sub> to R <sub>N</sub>	C <sub>L</sub> = 50 pF R <sub>L</sub> = 500Ω	1.5	8.0	1.5	6.0	1.5	5.5	ns
		C <sub>L</sub> = 300 pF <sup>(3)</sup> R <sub>L</sub> = 500Ω	1.5	15.0	1.5	13.0	1.5	11.5	ns
t <sub>PZH</sub> t <sub>PZL</sub>	Output Enable Time $\overline{\text{OET}}$ to T <sub>N</sub> or $\overline{\text{OER}}$ to R <sub>N</sub>	C <sub>L</sub> = 50 pF R <sub>L</sub> = 500Ω	1.5	12.0	1.5	8.0	1.5	6.8	ns
		C <sub>L</sub> = 300 pF <sup>(3)</sup> R <sub>L</sub> = 500Ω	1.5	20.0	1.5	15.0	1.5	13.0	ns
t <sub>PHZ</sub> t <sub>PLZ</sub>	Output Disable Time <sup>(3)</sup> $\overline{\text{OET}}$ to T <sub>N</sub> or $\overline{\text{OER}}$ to R <sub>N</sub>	C <sub>L</sub> = 50 pF R <sub>L</sub> = 500Ω	1.5	9.0	1.5	6.0	1.5	5.0	ns
		C <sub>L</sub> = 5 pF <sup>(3)</sup> R <sub>L</sub> = 500Ω	1.5	10.0	1.5	7.0	1.5	6.0	ns

**PI74FCT863T (non-inverting) Switching Characteristics over Operating Range**

Parameters	Description	Conditions <sup>(1)</sup>	863AT		863BT		863CT		Unit
			Com.		Com.		Com.		
			Min	Max	Min	Max	Min	Max	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay R <sub>N</sub> to T <sub>N</sub> or T <sub>N</sub> to R <sub>N</sub>	C <sub>L</sub> = 50 pF R <sub>L</sub> = 500Ω	1.5	8.0	1.5	6.0	1.5	5.5	ns
		C <sub>L</sub> = 300 pF <sup>(3)</sup> R <sub>L</sub> = 500Ω	1.5	15.0	1.5	13.0	1.5	11.5	ns
t <sub>PZH</sub> t <sub>PZL</sub>	Output Enable Time $\overline{\text{OET}}$ to T <sub>N</sub> or $\overline{\text{OER}}$ to R <sub>N</sub>	C <sub>L</sub> = 50 pF R <sub>L</sub> = 500Ω	1.5	12.0	1.5	8.0	1.5	6.8	ns
		C <sub>L</sub> = 300 pF <sup>(3)</sup> R <sub>L</sub> = 500Ω	1.5	20.0	1.5	15.0	1.5	13.0	ns
t <sub>PHZ</sub> t <sub>PLZ</sub>	Output Disable Time <sup>(3)</sup> $\overline{\text{OET}}$ to T <sub>N</sub> or $\overline{\text{OER}}$ to R <sub>N</sub>	C <sub>L</sub> = 50 pF R <sub>L</sub> = 500Ω	1.5	9.0	1.5	6.0	1.5	5.0	ns
		C <sub>L</sub> = 5 pF <sup>(3)</sup> R <sub>L</sub> = 500Ω	1.5	10.0	1.5	7.0	1.5	6.0	ns

**Notes:**

1. See test circuit and wave forms.
2. Minimum limits are guaranteed but not tested on Propagation Delays.
3. This parameter is guaranteed but not production tested.

**PI74FCT864T (inverting) Switching Characteristics over Operating Range**

Parameters	Description	Conditions <sup>(1)</sup>	864AT		864BT		864CT		Unit
			Com.		Com.		Com.		
			Min	Max	Min	Max	Min	Max	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay R <sub>N</sub> to T <sub>N</sub> or T <sub>N</sub> to R <sub>N</sub>	C <sub>L</sub> = 50 pF R <sub>L</sub> = 500Ω	1.5	8.0	1.5	6.0	1.5	5.5	ns
		C <sub>L</sub> = 300 pF <sup>(3)</sup> R <sub>L</sub> = 500Ω	1.5	15.0	1.5	13.0	1.5	11.5	ns
t <sub>PZH</sub> t <sub>PZL</sub>	Output Enable Time O <sub>ET</sub> to T <sub>N</sub> or O <sub>ER</sub> to R <sub>N</sub>	C <sub>L</sub> = 50 pF R <sub>L</sub> = 500Ω	1.5	12.0	1.5	8.0	1.5	6.8	ns
		C <sub>L</sub> = 300 pF <sup>(3)</sup> R <sub>L</sub> = 500Ω	1.5	20.0	1.5	15.0	1.5	13.0	ns
t <sub>PHZ</sub> t <sub>PLZ</sub>	Output Disable Time <sup>(3)</sup> O <sub>ET</sub> to T <sub>N</sub> or O <sub>ER</sub> to R <sub>N</sub>	C <sub>L</sub> = 50 pF R <sub>L</sub> = 500Ω	1.5	9.0	1.5	6.0	1.5	5.0	ns
		C <sub>L</sub> = 5 pF <sup>(3)</sup> R <sub>L</sub> = 500Ω	1.5	10.0	1.5	7.0	1.5	6.0	ns

**Notes:**

1. See test circuit and wave forms.
2. Minimum limits are guaranteed but not tested on Propagation Delays.
3. This parameter is guaranteed but not production tested.