

Features

- PI74FCT244/541T and PI74FCT2244/2541T are pin compatible with bipolar Fast Series at a higher speed and lower power consumption
- 25Ω series resistor on all outputs (FCT2XXX only)
- TTL input and output levels
- Low ground bounce outputs
- Extremely low static power
- Hysteresis on all inputs
- Industrial operating temperature range: -40°C to +85°C
- Packaging (Pb-free & Green available):

PI74FCT244T

- 20-pin 173-mil wide plastic TSSOP (L)
- 20-pin 209-mil wide plastic SSOP (H)
- 20-pin 150-mil wide plastic QSOP (Q)
- 20-pin 300-mil wide plastic SOIC (S)

PI74FCT2244T

- 20-pin 173-mil wide plastic TSSOP (L)
- 20-pin 150-mil wide plastic QSOP (Q)
- 20-pin 300-mil wide plastic SOIC (S)

PI74FCT541T (Pb-free & Green)

- 20-pin 173-mil wide plastic TSSOP (L)
- 20-pin 150-mil wide plastic QSOP (Q)
- 20-pin 300-mil wide plastic SOIC (S)

PI74FCT2541T

- 20-pin 150-mil wide plastic QSOP (Q)
- 20-pin 300-mil wide plastic SOIC (S)

- Device models available upon request

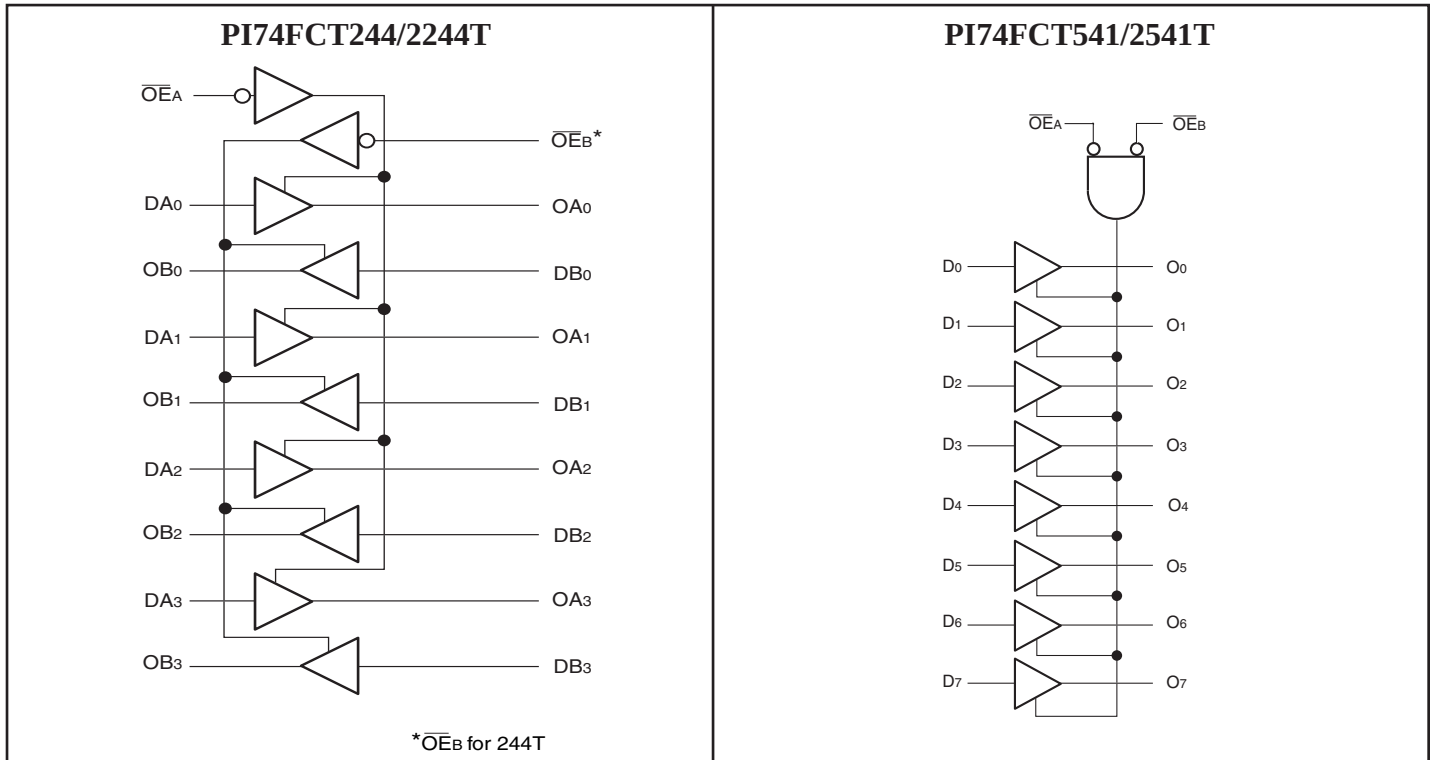
Description

Pericom Semiconductor's PI74FCT244T/541T and PI74FCT2244/2541T are 8-bit wide driver circuits, designed to be used in applications requiring high-speed and high-output drive. Ideal applications would include bus drivers, memory drivers, address drivers, and system clock drivers.

The PI74FCT541 and 2541T provide similar driver capabilities, but have their pins physically grouped by function. All inputs are located on one side of the package, while outputs are on the opposite side, allowing for a much simpler and denser board layout.

All PI74FCT2XXX devices have a built-in 25Ω series resistor on all outputs to reduce noise because of reflections, thus eliminating the need for an external terminating resistor.

Block Diagrams



Product Pin Description

Pin Name	Description
$\overline{OEA}$, $\overline{OEB}$	3-State Output Enable Inputs (Active LOW)
$OEB^{(1)}$	3-State Output Enable Input (Active HIGH)
Dxx	Inputs
Oxx	Outputs
GND	Ground
VCC	Power

Notes:

1. Only offered for PI74FCT244T

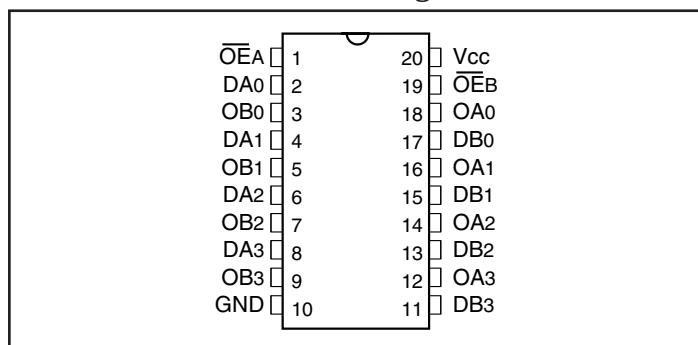
Truth Table

Inputs ⁽¹⁾				Outputs ⁽¹⁾	
$\overline{OEA}$	$\overline{OEB}$	$OEB^{(2)}$	D	244	541
L	L	H	L	L	L
L	L	H	H	H	H
H	H	L	X	Z	Z

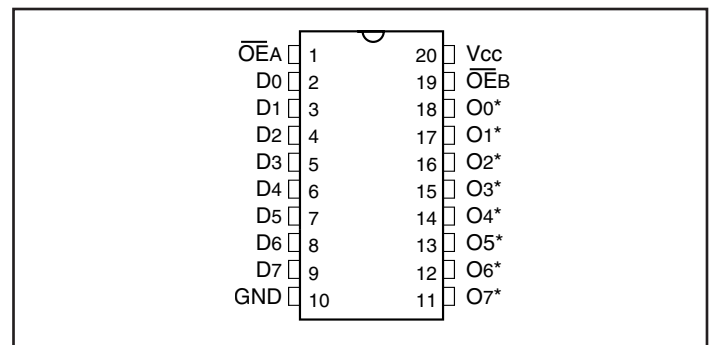
Notes:

1. H = High Voltage Level, X = Don't Care, L = Low Voltage Level, Z = High Impedance

PI74FCT244/2244T Pin Configuration



PI74FCT541/2541T Pin Configuration



Maximum Ratings

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

Storage Temperature	–65°C to +150°C	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.
Ambient Temperature with Power Applied	–40°C to +85°C	
Supply Voltage to Ground Potential (Inputs & Vcc 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	

DC Electrical Characteristics (Over the Operating Range, TA = –40°C to +85°C, VCC = 5.0V ± 5%)

Parameters	Description	Test Conditions ⁽¹⁾		Min.	Typ ⁽²⁾	Max.	Units
VOH	Output HIGH Voltage	VCC = Min., VIN = VIH or VIL	IOH = –15.0mA	2.4	3.0		V
VOL	Output LOW Current	VCC = Min., VIN = VIH or VIL	IOL = 64mA		0.3	0.55	
VOL	Output LOW Current	VCC = Min., VIN = VIH or VIL	IOL = 12mA (25ΩSeries)		0.3	0.50	
VIH	Input HIGH Voltage	Guaranteed Logic HIGH Level		2.0			
VIL	Input LOW Voltage	Guaranteed Logic LOW Level				0.8	
IIH	Input HIGH Current	VCC = Max.	VIN = VCC			1	μA
IIL	Input LOW Current	VCC = Max.	VIN = GND			–1	
IOZH	High Impedance	VCC = MAX.	VOUT = 2.7V			1	
IOZL	Output Current		VOUT = 0.5V			–1	
VIK	Clamp Diode Voltage	VCC = Min., IIN = –18mA			–0.7	–1.2	V
IOFF	Power Down Disable	VCC = GND, VOUT = 4.5V				100	μA
IOS	Short Circuit Current	VCC = Max. ⁽³⁾ , VOUT = GND		–60	–120		mA
VH	Input Hysteresis				200		

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at Vcc = 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.

Capacitance (TA = 25°C, f = 1 MHz)

Parameters ⁽¹⁾	Description	Test Conditions	Typ.	Max.	Units
CIN	Input Capacitance	VIN = 0V	6	10	pF
COUT	Output Capacitance	VOUT = 0V	8	12	

Notes:

1. This parameter is determined by device characterization but is not production tested.

Power Supply Characteristics

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

Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
- Typical values are at V_{CC} = 5.0V, +25°C ambient.
- Per TTL driven input (V_{IN} = 3.4V); all other inputs at V_{CC} 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_{CC} 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_{CC} = Quiescent Current
 ΔI_{CC} = Power Supply Current for a TTL High Input (V_{IN} = 3.4V)
 D_H = Duty Cycle for TTL Inputs High
 N_T = Number of TTL Inputs at D_H
 I_{CCD} = Dynamic Current Caused by an Input Transition Pair (HLH or LHL)
 f_{CP} = Clock Frequency for Register Devices (Zero for Non-Register Devices)
 f_i = Input Frequency
 N_i = Number of Inputs at f_i
 All currents are in milliamps and all frequencies are in megahertz.

PI74FCT244/2244T Switching Characteristics over Operating Range

Param- eters	Description	Condi- tions ⁽¹⁾	244T/2244T		244AT/2244AT		244CT/2244CT		244DT		Units
			Com.		Com.		Com.		Com.		
			Min	Max	Min	Max	Min	Max	Min	Max	
tPLH tPHL	Propagation Delay ⁽²⁾	CL = 50pF	1.5	6.5	1.5	4.8	1.5	4.1	1.5	3.6	ns
tpZH tpZL	Output Enable Time O _{EX} to ON		1.5	8.0	1.5	6.2	1.5	5.8	1.5	4.8	ns
tPHZ tPLZ	Output Disable Time ⁽³⁾ O _{EX} to ON		1.5	7.0	1.5	5.6	1.5	5.2	1.5	4.0	ns

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Minimum limits are guaranteed but not tested on Propagation Delays.
3. This parameter is guaranteed but not production tested.

PI74FCT541/2541T Switching Characteristics over Operating Range

Parameters	Description	Conditions ⁽¹⁾	541T/2541T		541AT/ 2541AT		541CT/ 2541CT		541DT		Units
			Com.		Com.		Com.		Com.		
			Min	Max	Min	Max	Min	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation Delay ⁽²⁾ DN to ON	C _L = 50pF R _L = 500Ω	1.5	6.0	1.5	4.8	1.5	4.1	1.5	3.8	ns
t _{PZH} t _{PZL}	Output Enable Time O _{EX} to ON		1.5	9.5	1.5	6.2	1.5	5.8	1.5	5.2	ns
t _{PHZ} t _{PLZ}	Output Disable Time ⁽³⁾ O _{EX} to ON		1.5	6.5	1.5	5.6	1.5	5.2	1.5	5.2	ns

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Minimum limits are guaranteed but not tested on Propagation Delays.
3. This parameter is guaranteed but not production tested.



Ordering Information: PI74FCT244T

Ordering Code	Package Code	Speed Grade	Package Description
PI74FCT244TH	H	Blank	20-pin 209-mil wide plastic SSOP
PI74FCT244THE	H	Blank	Pb-free & Green, 20-pin 209-mil wide plastic SSOP
PI74FCT244TL	L	Blank	20-pin 173-mil wide plastic TSSOP
PI74FCT244TLE	L	Blank	Pb-free & Green, 20-pin 173-mil wide plastic TSSOP
PI74FCT244ATQE	Q	A	Pb-free & Green, 20-pin 150-mil wide plastic QSOP
PI74FCT244ATSE	S	A	Pb-free & Green, 20-pin 300-mil wide plastic SOIC
PI74FCT244CTH	H	C	20-pin 209-mil wide plastic SSOP
PI74FCT244CTHE	H	C	Pb-free & Green, 20-pin 209-mil wide plastic SSOP
PI74FCT244DTQ	Q	D	20-pin 150-mil wide plastic QSOP
PI74FCT244DTSE	S	D	Pb-free & Green, 20-pin 300-mil wide plastic SOIC
PI74FCT244TQE	Q	Blank	Pb-free & Green, 20-pin 150-mil wide plastic QSOP
PI74FCT244CTQE	Q	C	Pb-free & Green, 20-pin 150-mil wide plastic QSOP
PI74FCT244DTQE	Q	C	Pb-free & Green, 20-pin 150-mil wide plastic QSOP
PI74FCT244CTSE	S	C	Pb-free & Green, 20-pin 300-mil wide plastic SOIC
PI74FCT244TQE	Q		Pb-free & Green, 20-pin 150-mil wide plastic QSOP
PI74FCT244TQSE	Q		Pb-free & Green, 20-pin, Tape/Reel, 150-mil wide plastic QSOP

Notes:

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free and Green
- Adding an X suffix = Tape/Reel

Ordering Information: PI74FCT2244T

Ordering Code	Package Code	Speed Grade	Package Description
PI74FCT2244TQE	Q	Blank	Pb-free & Green, 20-pin 150 mil wide plastic QSOP
PI74FCT2244TSE	S	Blank	Pb-free & Green, 20-pin 300 mil wide plastic SOIC
PI74FCT2244ATLE	L	A	Pb-free & Green, 20-pin 173 mil wide plastic TSSOP
PI74FCT2244ATQE	Q	A	Pb-free & Green, 20-pin 150 mil wide plastic QSOP
PI74FCT2244ATSE	S	A	Pb-free & Green, 20-pin 300 mil wide plastic SOIC
PI74FCT2244CTQE	Q	C	Pb-free & Green, 20-pin 150 mil wide plastic QSOP

Ordering Information: PI74FCT541T

Ordering Code	Package Code	Speed Grade	Package Description
PI74FCT541ATQE	Q	A	Pb-free & Green, 20-pin 150-mil wide plastic QSOP
PI74FCT541CTLE	L	C	Pb-free & Green, 20-pin 173-mil wide plastic TSSOP
PI74FCT541TQE	Q	Blank	Pb-free & Green, 20-pin 150-mil wide plastic QSOP
PI74FCT541TS	S	Blank	20-pin 300-mil wide plastic SOIC
PI74FCT541ATQ	Q	A	20-pin 150-mil wide plastic QSOP
PI74FCT541ATS	S	A	20-pin 300-mil wide plastic SOIC
PI74FCT541ATSE	S	A	Pb-free & Green, 20-pin 300-mil wide plastic SOIC
PI74FCT541TSE	T	Blank	Pb-free & Green, 20-pin 300-mil wide plastic SOIC

Ordering Information: PI74FCT2541T

Ordering Code	Package Code	Speed Grade	Package Description
PI74FCT2541TQ	Q	Blank	20-pin 150 mil wide plastic QSOP
PI74FCT2541TSE	S	Blank	Pb-free & Green, 20-pin 300 mil wide plastic SOIC
PI74FCT2541ATQ	Q	A	20-pin 150 mil wide plastic QSOP
PI74FCT2541ATS	S	A	20-pin 300 mil wide plastic SOIC
PI74FCT2541ATSE	S	A	Pb-free & Green, 20-pin 300 mil wide plastic SOIC
PI74FCT2541ATQE	Q	A	Pb-free & Green, 20-pin 150 mil wide plastic QSOP

Notes:

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free and Green
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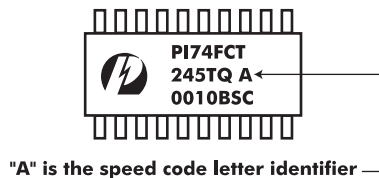
Part Marking Information

Pericom's standard product mark follows our standard part number ordering information, except for those products with a speed letter code. For marking purposes, the speed letter code mark is placed after the package code letter, rather than after the device number as it is ordered.

Although all products are marked immediately after assembly to assure material traceability, Pericom does not usually mark the speed code at that time. After electrical test screening and speed binning have been completed, we then perform an "add mark" operation which places the speed code letter at the end of the complete part number.

Please refer to the example shown below:

- Part Number as ordered: PI74FCT245ATQ
- Example of Part Number as marked:

**Notes:**

- 1) 8-pin DIP, 8-pin SOIC, 8-pin TSSOP, 14-pin SOIC, 16-pin QSOP, SC70, MSOP, and SOT23 packages are not marked with the Pericom logo due to space limitations on the package.