PI74FCT244T/2244T
PI74FCT541T/2541T

Fast CMOS Octal Buffer/Line Drivers

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

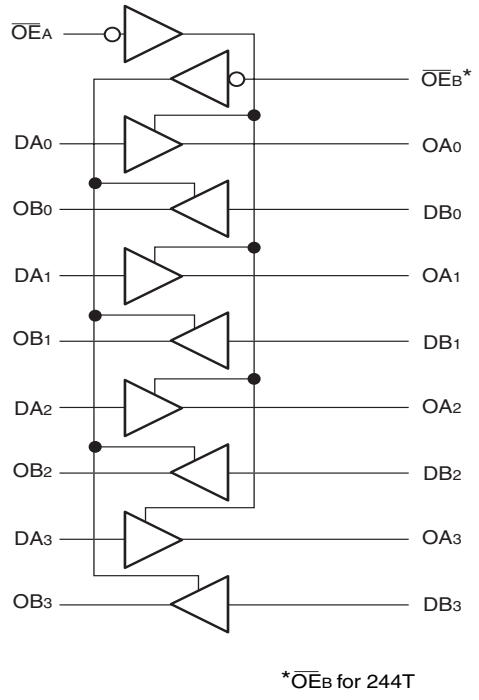
Pericom Semiconductor's PI74FCT244T/541T and P174FCT2244/2541T are 8-bit wide driver circuits, designed to be used in applications requiring high-speed and high-output drive. Ideal applications would include bus drivers, memory drivers, address drivers, and system clock drivers.

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.

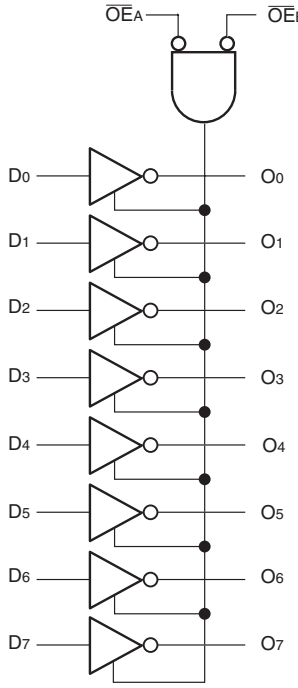
All PI74FCT2XXX devices have a built-in 25Ω series resistor on all outputs to reduce noise because of reflections, thus eliminating the need for an external terminating resistor.

Block Diagrams

PI74FCT244/2244T



PI74FCT541/2541T



Product Pin Description

Pin Name	Description
$\overline{OE}_A$, $\overline{OE}_B$	3-State Output Enable Inputs (Active LOW)
OEB[1]	3-State Output Enable Input (Active HIGH)
Dxx	Inputs
Oxx	Outputs
GND	Ground
V_{CC}	Power

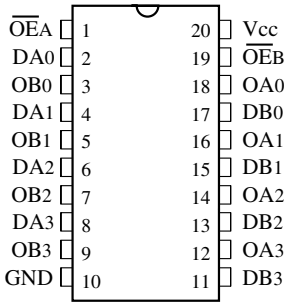
Notes:
1. Only offered for PI74FCT244T

Truth Table

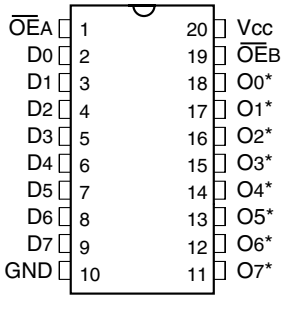
Inputs[1]				Outputs[1]	
$\overline{OE}_A$	$\overline{OE}_B$	OEB[2]	D	244	541
L	L	H	L	L	L
L	L	H	H	H	H
H	H	L	X	Z	Z

Notes:
1. H = High Voltage Level, X = Don't Care, L = Low Voltage Level, Z = High Impedance
2. OE_B for 241 only.

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
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

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, TA = –40°C to +85°C, VCC = 5.0V ± 5%)

Parameters	Description	Test Conditions[1]		Min.	Typ[2]	Max.	Units
V_{OH}	Output HIGH Voltage	V_{CC} = Min., V_{IN} = V_{IH} or V_{IL}	I_{OH} = –15.0mA	2.4	3.0		V
V_{OL}	Output LOW Current	V_{CC} = Min., V_{IN} = V_{IH} or V_{IL}	I_{OL} = 64mA		0.3	0.55	
V_{OL}	Output LOW Current	V_{CC} = Min., V_{IN} = V_{IH} or V_{IL}	I_{OL} = 12mA (25ΩSeries)		0.3	0.50	
V_{IH}	Input HIGH Voltage	Guaranteed Logic HIGH Level		2.0			
V_{IL}	Input LOW Voltage	Guaranteed Logic LOW Level				0.8	
I_{IH}	Input HIGH Current	V_{CC} = Max.	V_{IN} = V_{CC}			1	µA
I_{IL}	Input LOW Current	V_{CC} = Max.	V_{IN} = GND			–1	
I_{OZH}	High Impedance	V_{CC} = Max.	V_{OUT} = 2.7V			1	
I_{OZL}	Output Current		V_{OUT} = 0.5V			–1	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = –18mA			–0.7	–1.2	V
I_{OFF}	Power Down Disable	V_{CC} = GND, V_{OUT} = 4.5V				100	µA
I_{OS}	Short Circuit Current	V_{CC} = Max.[3], V_{OUT} = GND		–60	–120		mA
V_H	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
C_{IN}	Input Capacitance	V_{IN} = 0V	6	10	pF
C_{OUT}	Output Capacitance	V_{OUT} = 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 $\overline{OE}_A$ = $\overline{OE}_B$ = GND or $\overline{OE}_A$ = 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 $\overline{OE}_A$ = $\overline{OE}_B$ = GND or $\overline{OE}_A$ = 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 $\overline{OE}_A$ = $\overline{OE}_B$ = GND or $\overline{OE}_A$ = 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:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
2. Typical values are at Vcc = 5.0V, +25°C ambient.
3. Per TTL driven input (V_{IN} = 3.4V); all other inputs at Vcc or GND.
4. This parameter is not directly testable, but is derived for use in Total Power Supply Calculations.
5. Values for these conditions are examples of the Icc formula. These limits are guaranteed but not tested.
6. $I_C = I_{QUIESCENT} + I_{INPUTS} + I_{DYNAMIC}$
   $I_C = I_{CC} + \Delta I_{CC} D_H N_T + I_{CCD} (f_{CP}/2 + f_i N_i)$
   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

Parameters	Description	Conditions[1]	244T/2244T		244AT/2244AT		244CT/2244CT		244DT		Units
			Com.		Com.		Com.		Com.		
			Min	Max	Min	Max	Min	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay[2]	C_L = 50pF	1.5	6.5	1.5	4.8	1.5	4.1	1.5	3.6	ns
t_{PZH} t_{PZL}	Output Enable Time $\overline{OE}_X$ to O_N		1.5	8.0	1.5	6.2	1.5	5.8	1.5	4.8	ns
t_{PHZ} t_{PLZ}	Output Disable Time[3] $\overline{OE}_X$ to O_N		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] D_N to O_N	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 $\overline{OE}_X$ to O_N		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] $\overline{OE}_X$ to O_N		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
PI74FCT244TQ	Q	Blank	20-pin 150-mil wide plastic QSOP
PI74FCT244TS	S	Blank	20-pin 300-mil wide plastic SOIC
PI74FCT244ATL	L	A	20-pin 173-mil wide plastic TSSOP
PI74FCT244ATQ	Q	A	20-pin 150-mil wide plastic QSOP
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
PI74FCT244CTL	L	C	20-pin 173-mil wide plastic TSSOP
PI74FCT244CTQ	Q	C	20-pin 150-mil wide plastic QSOP
PI74FCT244CTS	S	C	20-pin 300-mil wide plastic SOIC
PI74FCT244DTQ	Q	D	20-pin 150-mil wide plastic QSOP
PI74FCT244DTS	S	D	20-pin 300-mil wide plastic SOIC
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
PI74FCT244ATS	S	A	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

Ordering Information: PI74FCT2244T

Ordering Code	Package Code	Speed Grade	Package Description
PI74FCT2244TQ	Q	Blank	20-pin 150 mil wide plastic QSOP
PI74FCT2244TQE	Q	Blank	Pb-free & Green, 20-pin 150 mil wide plastic QSOP
PI74FCT2244TS	S	Blank	20-pin 300 mil wide plastic SOIC
PI74FCT2244TSE	S	Blank	Pb-free & Green, 20-pin 300 mil wide plastic SOIC
PI74FCT2244ATL	L	A	20-pin 173 mil wide plastic TSSOP
PI74FCT2244ATLE	L	A	Pb-free & Green, 20-pin 173 mil wide plastic TSSOP
PI74FCT2244ATQ	Q	A	20-pin 150 mil wide plastic QSOP
PI74FCT2244ATQE	Q	A	Pb-free & Green, 20-pin 150 mil wide plastic QSOP
PI74FCT2244ATS	S	A	20-pin 300 mil wide plastic SOIC
PI74FCT2244ATSE	S	A	Pb-free & Green, 20-pin 300 mil wide plastic SOIC
PI74FCT2244CTQ	Q	C	20-pin 150 mil wide plastic QSOP
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
PI74FCT541TQ	Q	Blank	20-pin 150-mil wide plastic QSOP
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
PI74FCT541CTL	L	C	20-pin 173-mil wide plastic TSSOP
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
PI74FCT2541TS	S	Blank	20-pin 300 mil wide plastic SOIC
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:

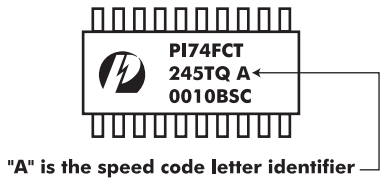
- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free and Green
- Adding an X suffix = Tape/Reel

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.