



PI74FCT3244

Fast CMOS 3.3V 8-Bit Buffer/Line Driver

Features

- Advanced Low Power CMOS operation
- Compatible with LVC class of products
- Compatible with industry standard octal pinouts
- Excellent output drive capability:
Balanced Drives (24mA sink and source)
- Can serve as a 5V to 3V translator
- Inputs can be driven by 3.3 V or 5V devices
- Low ground bounce outputs
- Hysteresis on all inputs
- Industrial operating temperature range:
-40°C to +85°C
- Packages available:
 - 20-pin 173 mil wide plastic TSSOP (L)
 - 20-pin 150 mil wide plastic QSOP (Q)
 - 20-pin 150 mil wide plastic TQSOP (R)
 - 20-pin 300 mil wide plastic SOIC (S)

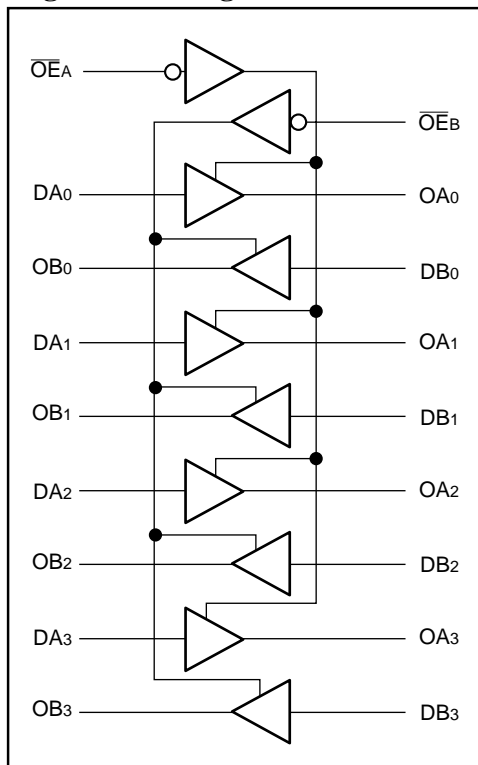
Description

Pericom Semiconductor's PI74FCT3 series of logic circuits are produced in the Company's advanced 0.6 micron CMOS technology, achieving industry leading speed grades.

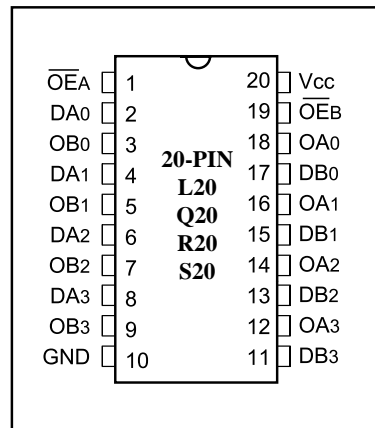
The PI74FCT3244 is an 8-bit buffer/line driver designed for driving high capacitive memory loads. With its balanced-drive characteristics, this high-speed, low power device provides lower ground bounce, transmission line matching of signals, fewer line reflections and lower EMI and RFI effects. This makes it ideal for driving on-board buses and transmission lines.

The PI74FCT3244 can be driven from either 3.3V or 5.0V devices allowing this device to be used as a translator in a mixed 3.3/5.0V system.

Logic Block Diagram



Pin Configuration



Pin Description

Pin Name	Description
$\overline{OE}_A, \overline{OE}_B$	3-State Output Enable Inputs (Active LOW)
Dxx	Inputs
Oxx	Outputs
GND	Ground
Vcc	Power

Truth Table⁽¹⁾

Inputs			Outputs
\overline{OE}_A	\overline{OE}_B	Dxx	Oxx
L	L	L	L
L	L	H	H
H	H	X	Z

Note:

1. H = High Voltage Level, X = Don't Care, L = Low Voltage Level, 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 & 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	120 mA
Power Dissipation	1.0W

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 = 2.7V to 3.6V)

Parameters	Description	Test Conditions ⁽¹⁾		Min.	Typ. ⁽²⁾	Max.	Units
VIH	Input HIGH Voltage (Input pins)	Guaranteed Logic HIGH Level		2.2	—	5.5	V
	Input HIGH Voltage (I/O pins)			2.0	—	5.5	V
VIL	Input LOW Voltage (Input and I/O pins)	Guaranteed Logic LOW Level		-0.5	—	0.8	V
IIH	Input HIGH Current (Input pins)	VCC = Max.	VIN = 5.5V	—	—	±1	µA
	Input HIGH Current (I/O pins)	VCC = Max.	VIN = VCC	—	—	±1	µA
IIL	Input LOW Current (Input pins)	VCC = Max.	VIN = GND	—	—	±1	µA
	Input LOW Current (I/O pins)	VCC = Max.	VIN = GND	—	—	±1	µA
IOZH	High Impedance Output Current (3-State Output pins)	VCC = Max.	VOUT = 5.5V	—	—	±1	µA
IOZL		VCC = Max.	VOUT = GND	—	—	±1	µA
VIK	Clamp Diode Voltage	VCC = Min., IIN = -18mA		—	-0.7	-1.2	V
IODH	Output HIGH Current	VCC = 3.3V, VIN = VIH or VIL, VO = 1.5V ⁽³⁾		-36	-60	-110	mA
IODL	Output LOW Current	VCC = 3.3V, VIN = VIH or VIL, VO = 1.5V ⁽³⁾		50	90	200	mA
VOH	Output HIGH Voltage	VCC = Min.	IOH = -0.1mA	Vcc-0.2	—	—	V
		VIN = VIH or VIL	IOH = -3mA	2.4	3.0	—	V
		VCC = 3.0V, VIN = VIH or VIL	IOH = -8mA IOH = -24mA	2.4 ⁽⁵⁾ 2.0	3.0	—	V
VOL	Output LOW Voltage	VCC = Min.	IOL = 0.1mA	—	—	0.2	V
		VIN = VIH or VIL	IOL = 16mA	—	0.2	0.4	V
			IOL = 24mA	—	0.3	0.5	V
IOS	Short Circuit Current ⁽⁴⁾	VCC = Max. ⁽³⁾ , VOUT = GND		-60	-85	-240	mA
IOFF	Power Down Disable	VCC = 0V, VIN or VOUT ≤ 4.5V		—	—	±100	µA
VH	Input Hysteresis			—	150	—	mV

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 = 3.3V, +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 guaranteed but not tested.
5. VOH = VCC - 0.6V at rated current.

Capacitance (TA = 25°C, f = 1 MHz)

Parameters ⁽¹⁾	Description	Test Conditions	Typ.	Max.	Units
CIN	Input Capacitance	VIN = 0V	4.5	6	pF
COUT	Output Capacitance	VOUT = 0V	5.5	8	pF

Note:

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
ICC	Quiescent Power Supply Current	VCC = Max.	VIN = GND or VCC		0.1	10	μA
ΔICC	Quiescent Power Supply Current TTL Inputs HIGH	VCC = Max.	VIN = VCC – 0.6V ⁽³⁾		2.0	30	μA
ICCD	Dynamic Power Supply ⁽⁴⁾	VCC = Max., Outputs Open OEX = GND One Bit Toggling 50% Duty Cycle	VIN = VCC VIN = GND		95	100	μA/ MHZ
IC	Total Power Supply Current ⁽⁶⁾	VCC = Max., Outputs Open fi = 10 MHZ 50% Duty Cycle OEX = GND One Bit Toggling	VIN = VCC – 0.6V VIN = GND		0.97	2.3	mA
		VCC = Max., Outputs Open fi = 2.5 MHZ 50% Duty Cycle OEX = GND 8 Bits Toggling	VIN = VCC – 0.6V VIN = GND		1.9	4.7 ⁽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 = 3.3V, +25°C ambient.
3. Per TTL driven input; 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. IC = IQUIESCENT + IINPUTS + IDYNAMIC

$$IC = ICC + \Delta ICC \cdot DHNT + ICCD (fCP/2 + fiNI)$$

ICC = Quiescent Current (ICCL, ICCH and ICCZ)

ΔICC = Power Supply Current for a TTL High Input

DH = Duty Cycle for TTL Inputs High

NT = Number of TTL Inputs at DH

ICCD = Dynamic Current Caused by an Input Transition Pair (HLH or LHL)

fCP = Clock Frequency for Register Devices (Zero for Non-Register Devices)

NCP = Number of Clock Inputs at fCP

fi = Input Frequency

NI = Number of Inputs at fi

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



Switching Characteristics over Operating Range⁽¹⁾

Parameters	Description	Conditions ⁽²⁾	FCT3244		Units
			Com.		
			Min. ⁽³⁾	Max.	
tPLH tPHL	Propagation Delay DXX to OXX	CL = 50pF RL = 500Ω	1.5	4.1	ns
tPZH tPZL	Output Enable Time OEx to Oxx		1.5	5.8	
tPHZ tPLZ	Output Disable Time ⁽⁴⁾ OEx to Oxx		1.5	5.2	
tSK(o)	Output Skew ⁽⁵⁾		0.5		

Notes:

1. Propagation Delays and Enable/Disable times are with $V_{CC} = 3.3V \pm 0.3V$, normal range.
For $V_{CC} = 2.7V$, extended range, all Propagation Delays and Enable/Disable times should be degraded by 20%.
2. See test circuit and wave forms.
3. Minimum limits are guaranteed but not tested on Propagation Delays.
4. This parameter is guaranteed but not production tested.
5. Skew between any two outputs, of the same package, switching in the same direction.
This parameter is guaranteed by design.