Fast CMOS 3.3V 8-Bit Buffer/Line Driver

Product Features

- Functionally compatible with FCT3, LVT, and 74 series 244 families of products
- Tri-State outputs
- 5V Tolerant inputs and outputs
- 2.0V-3.6V VCC supply operation
- Balanced sink and source output drives (24 mA)
- Low ground bounce outputs
- Power Down High Impedance inputs and outputs
- Supports live insertion
- ESD Protection exceeds 2000V, Human Body Model
  200V, Machine Model
- Packages available:
  – 20-pin 209-mil wide plastic SSOP (H)
  – 20-pin 173-mil wide plastic TSSOP (L)
  – 20-pin 150-mil wide plastic QSOP (Q)
  – 20-pin 300-mil wide plastic SOIC (S)

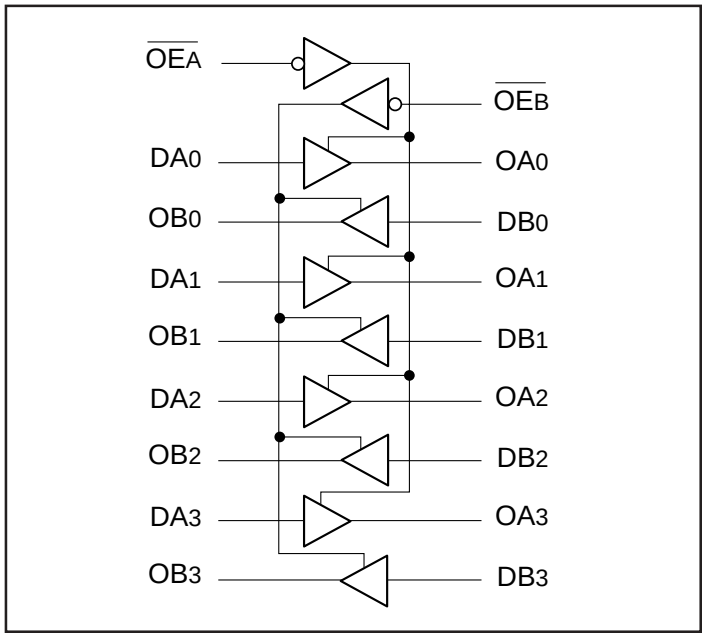
Product Description

Pericom Semiconductor's PI74LCX series of logic circuits are produced using the Company's advanced 0.6 micron CMOS technology achieving high speed while maintaining low power operation.

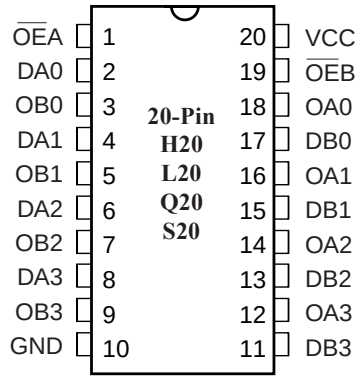
The PI74LCX244 is an 8-bit non-inverting buffer/line driver designed for driving high capacitive memory loads. With its balanced-drive characteristics, this high-speed, low power device provides lower ground bounce, transmission line matching of signals, fewer line reflections and lower EMI and RFI effects. This makes it ideal for driving on-board buses and transmission lines.

The PI74LCX244 can be driven from either 3.3V or 5.0V devices allowing this device to be used as a translator in a mixed 3.3V/5.0V system.

Logic Block Diagram



Product Pin Configuration



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

Product 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

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.

Recommended Operating Conditions

Symbol	Parameter		Min.	Max.	Units
V_{CC}	Supply Voltage	Operating	2.0	3.6	V
		Data Retention	1.5	3.6	
V_I	Input Voltage		0	5.5	
V_O	Output Voltage	HIGH or LOW State	0	V_{CC}	
		TRI-State	0	5.5	
I_{OH}/I_{OL}	Output Current	V_{CC} = 3.0V-3.6V	—	±24	mA
		V_{CC} = 2.7V	—	±12	
T_A	Free-Air Operating Temperature		–40	+85	°C
$\Delta t/\Delta V$	Input Edge Rate	V = 0.8V-2.0V, V_{CC} = 3.0V	0	10	ns/V

DC Electrical Characteristics (Over the Operating Range, T_A = –40°C to +85°C, V_{CC} = 2.7V to 3.6V)

Parameters	Description	Test Conditions[1]		Min.	Typ[2]	Max.	Units
V_{IH}	Input HIGH Voltage	Guaranteed Logic HIGH Level		2.0	—	—	V
V_{IL}	Input LOW Voltage	Guaranteed Logic LOW Level		—	—	0.8	
V_{OH}	Output HIGH Voltage	V_{CC} = 2.7-3.6	I_{OH} = –0.1 mA	V_{CC}-0.2	—	—	
		V_{CC} = 2.7	I_{OH} = –12 mA	2.2	—	—	
		V_{CC} = 3.0	I_{OH} = –18 mA	2.4	—	—	
			I_{OH} = –24 mA	2.2	—	—	
V_{OL}	Output LOW Voltage	V_{CC} = 2.7-3.6	I_{OL} = 0.1 mA	—	—	0.2	
		V_{CC} = 2.7	I_{OL} = 12mA	—	—	0.4	
		V_{CC} = 3.0	I_{OL} = 16 mA	—	—	0.4	
			I_{OL} = 24 mA	—	—	0.55	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = –18 mA		—	–0.7	–1.2	
I_I	Input Leakage Current	0 ≤ V_I ≤ 5.5V	Vcc = 2.7-3.6	—	—	±5	µA
I_{OZ}	Tri-State Output Leakage	0 ≤ V_O ≤ 5.5V V_I = V_{IH} or V_{IL}	V_{CC} = 2.7-3.6	—	—	±5	
I_{OFF}	Power Down Disable	V_{CC} = 0V, V_{IN} or V_{OUT} ≤ 5.5V		—	—	10	
I_{CC}	Quiescent Power Supply Current	V_{CC} = Max.	V_{IN} = GND or V_{CC}	—	0.1	10	
ΔI_{CC}	Quiescent Power Supply Current TTL Inputs HIGH	V_{CC} = Max.	V_{IN} = V_{CC} – 0.6V[3]	—	—	500	

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_{CC} = 3.3V, +25°C ambient.
3. Per TTL driven input; all other inputs at Vcc or GND.

Capacitance

Parameters	Description	Test Conditions	Typ.	Units
C_{IN}	Input Capacitance	V_{CC} = Open, V_I = 0V or V_{CC}	7	pF
C_{OUT}	Output Capacitance	V_{CC} = 3.3V, V_I = 0V or V_{CC}	8	
C_{PD}	Power Dissipation Capacitance	V_{CC} = 3.3V, V_I = 0V or V_{CC}, F = 10 MHz	25	

Switching Characteristics over Operating Range

Parameters	Description	Conditions	V_{CC} = 3.3V ± 0.3V		V_{CC} = 2.7V		Units
			Min.	Max.	Min.	Max.	
t_{PLH} t_{PHL}	Propagation Delay D_{XX} to O_{XX}	C_L = 50 pF R_L = 500Ω	1.5	6.5	1.5	7.5	ns
t_{PZH} t_{PZL}	Output Enable time		1.5	8.0	1.5	9.0	
t_{PHZ} t_{PLZ}	Output Disable Time		1.5	7.0	1.5	8.0	
$t_{SK(O)}$	Output Skew[1]		—	1.0	—	—	

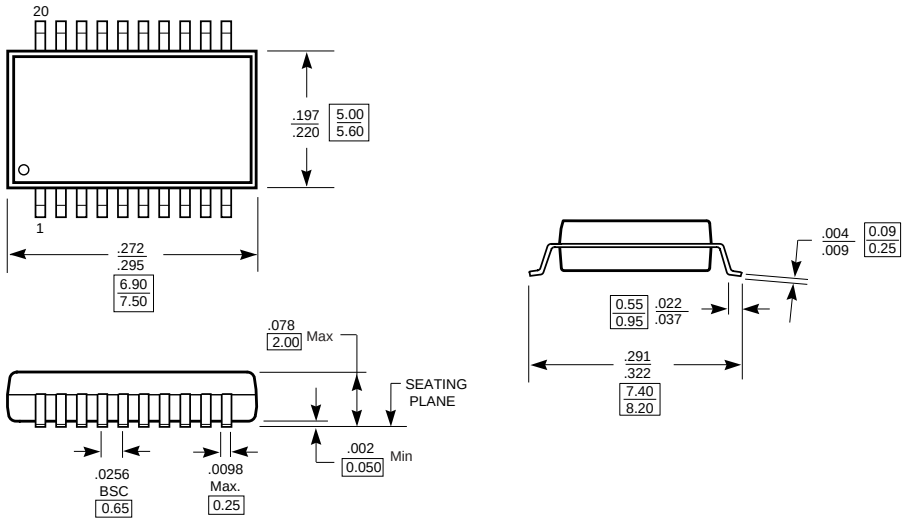
Note:
1. Skew between any two outputs, of the same package, switching in the same direction.

Dynamic Switching Characteristics (T_A = +25°C)

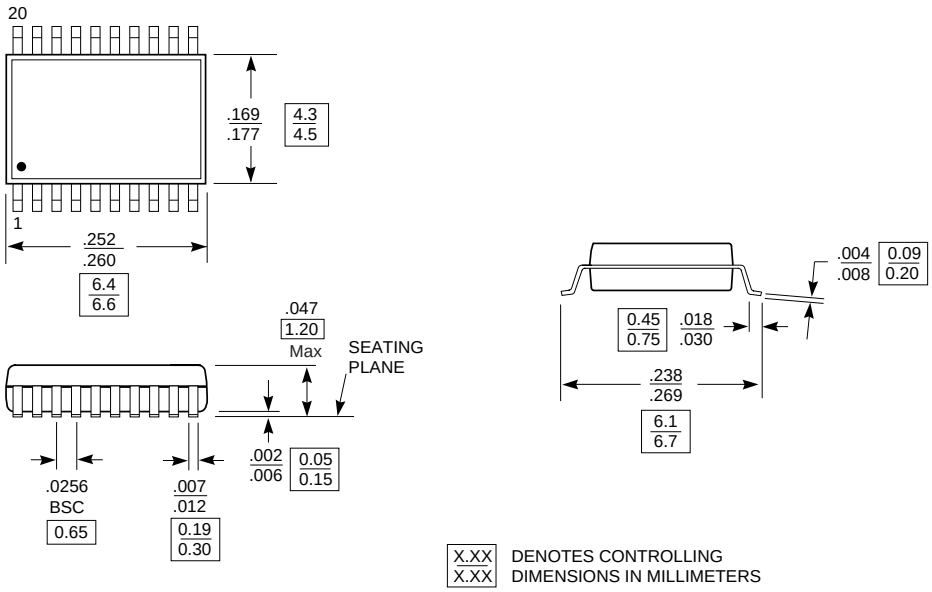
Parameters	Description	Test Conditions[1]	Typ.	Units
V_{OLP}	Dynamic LOW Peak Voltage	V_{CC} = 3.3V, C_L = 50 pF V_{IH} = 3.3V, V_{IL} = 0V	0.8	V
V_{OLV}	Dynamic LOW Valley Voltage	V_{CC} = 3.3V, C_L = 50 pF V_{IH} = 3.3V, V_{IL} = 0V		

Note:
1. Measured with n–1 outputs switching from High-to-Low or Low-to-High. The remaining output is measured in the LOW state.

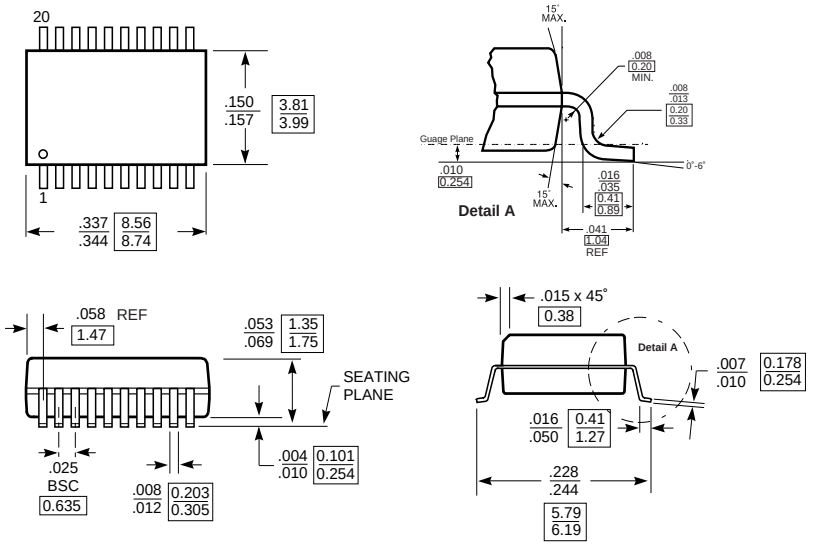
Packaging Mechanical: 20-pin SSOP (H-package)



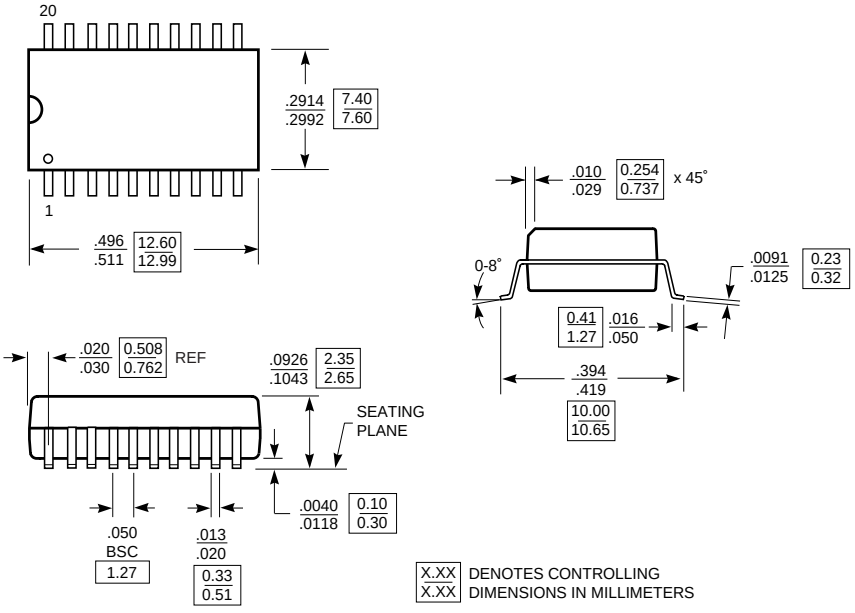
Packaging Mechanical: 20-pin TSSOP (L-package)



Packaging Mechanical: 20-pin QSOP (Q-package)



Packaging Mechanical : 20-pin SOIC (S-package)



Ordering Information

Ordering Code	Description
PI74LCX244H	20-Pin 209-mil wide Plastic SSOP (H)
PI74LCX244L	20-Pin 173-mil wide Plastic TSSOP (L)
PI74LCX244Q	20-Pin 150-mil wide Plastic QSOP(Q)
PI74LCX244S	20-Pin 300-mil wide Plastic SSOP(S)