

TC74ACT151FN

8-Channel Multiplexer

The TC74ACT151 is an advanced high speed CMOS 8-CHANNEL MULTIPLEXER fabricated with silicon gate and double-layer metal wiring C²MOS technology.

It achieves the high speed operation similar to equivalent Bipolar Schottky TTL while maintaining the CMOS low power dissipation.

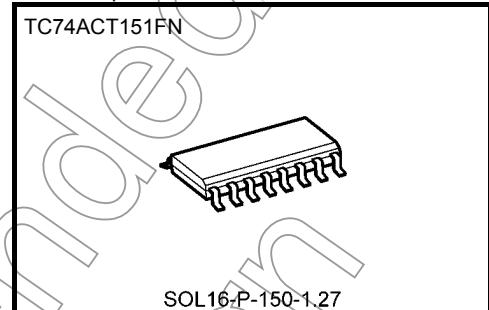
This device may be used as a level converter for interfacing TTL or NMOS to High Speed CMOS. The inputs are compatible with TTL, NMOS and CMOS output voltage levels.

One of eight date input signals (D0-D7) is selected by decoding of the three-bit address input (A, B, C). The selected data appears on two outputs: non-inverting (Y) and inverting (W).

The STROBE input provides two output conditions: a low level on the STROBE input transfers the selected data to the outputs. A high level on the STROBE input sets the Y output low and the W output high without regard to the data or select input conditions.

All inputs are equipped with protection circuits against static discharge or transient excess voltage.

Note: xxxFN (JEDEC SOP) is not available in Japan.

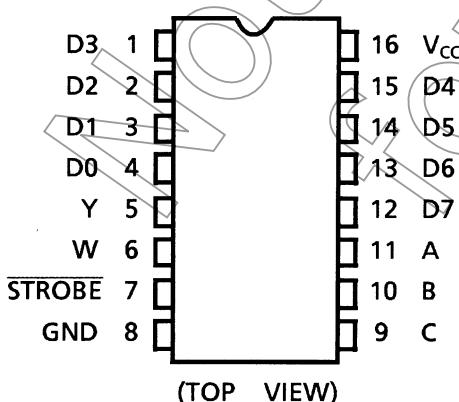


Weight
SOL16-P-150-1.27: 0.13 g (typ.)

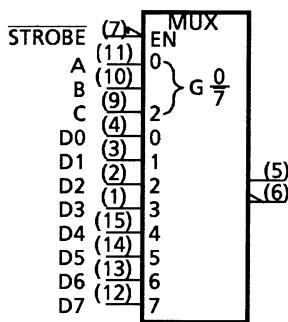
Features

- High speed: $t_{pd} = 7.1$ ns (typ.) at $V_{CC} = 5$ V
- Low power dissipation: $I_{CC} = 8$ μ A (max) at $T_a = 25^\circ$ C
- Compatible with TTL outputs: $V_{IL} = 0.8$ V (max)
 $V_{IH} = 2.0$ V (min)
- Symmetrical output impedance: $|I_{O(H)} - I_{O(L)}| = 24$ mA (min)
Capability of driving 50 Ω transmission lines.
- Balanced propagation delays: $t_{pLH} \approx t_{pHL}$
- Pin and function compatible with 74F151

Pin Assignment



IEC Logic Symbol

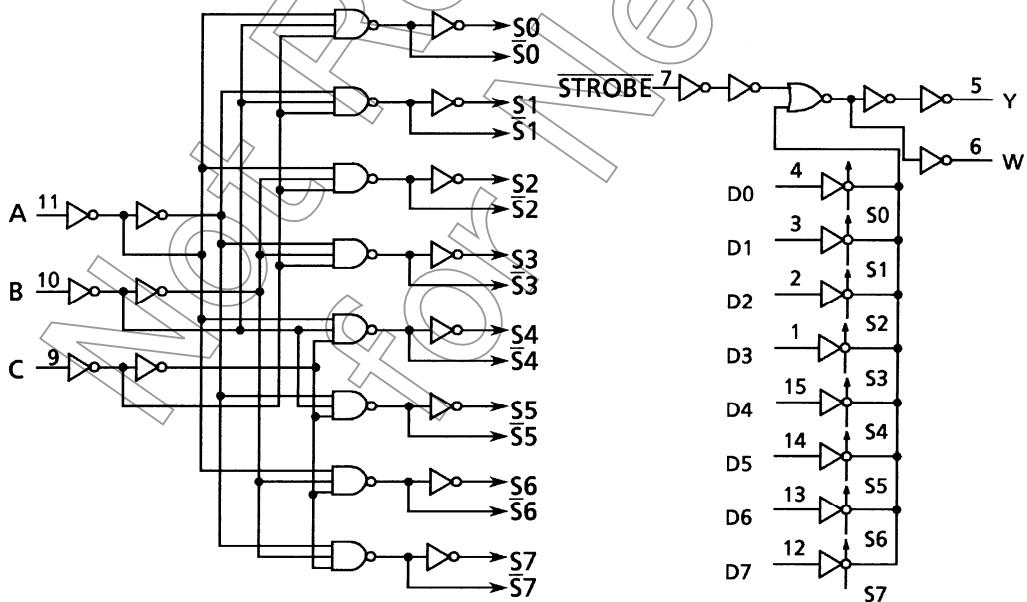


Truth Table

Inputs			Outputs		
Select			$\overline{\text{STROBE}}$	Y	W
C	B	A			
X	X	X	H	L	H
L	L	L	L	D0	$\bar{D}0$
L	L	H	L	D1	$\bar{D}1$
L	H	L	L	D2	$\bar{D}2$
L	H	H	L	D3	$\bar{D}3$
H	L	L	L	D4	$\bar{D}4$
H	L	H	L	D5	$\bar{D}5$
H	H	L	L	D6	$\bar{D}6$
H	H	H	L	D7	$\bar{D}7$

X: Don't care

System Diagram



Absolute Maximum Ratings (Note 1)

Characteristics	Symbol	Rating	Unit
Supply voltage range	V_{CC}	-0.5 to 7.0	V
DC input voltage	V_{IN}	-0.5 to $V_{CC} + 0.5$	V
DC output voltage	V_{OUT}	-0.5 to $V_{CC} + 0.5$	V
Input diode current	I_{IK}	± 20	mA
Output diode current	I_{OK}	± 50	mA
DC output current	I_{OUT}	± 50	mA
DC V_{CC} /ground current	I_{CC}	± 100	mA
Power dissipation	P_D	180	mW
Storage temperature	T_{STG}	-65 to 150	°C

Note 1: Exceeding any of the absolute maximum ratings, even briefly, lead to deterioration in IC performance or even destruction.

Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Operating Ranges (Note)

Characteristics	Symbol	Rating	Unit
Supply voltage	V_{CC}	4.5 to 5.5	V
Input voltage	V_{IN}	0 to V_{CC}	V
Output voltage	V_{OUT}	0 to V_{CC}	V
Operating temperature	T_{OPR}	-40 to 85	°C
Input rise and fall time	dt/dV	0 to 10	ns/V

Note: The operating ranges must be maintained to ensure the normal operation of the device.
Unused inputs must be tied to either V_{CC} or GND.

Electrical Characteristics

DC Characteristics

Characteristics	Symbol	Test Condition			Ta = 25°C			Ta = -40 to 85°C		Unit
				V _{CC} (V)	Min	Typ.	Max	Min	Max	
High-level input voltage	V _{IH}	—		4.5 to 5.5	2.0	—	—	2.0	—	V
Low-level input voltage	V _{IL}	—		4.5 to 5.5	—	—	0.8	—	0.8	V
High-level output voltage	V _{OH}	V _{IN} = V _{IH} or V _{IL}	I _{OH} = -50 µA I _{OH} = -24 mA I _{OH} = -75 mA (Note)	4.5 4.5 5.5	4.4 3.94 —	4.5 — —	—	4.4 3.80 3.85	—	V
Low-level output voltage	V _{OL}	V _{IN} = V _{IH} or V _{IL}	I _{OL} = 50 µA I _{OL} = 24 mA I _{OL} = 75 mA (Note)	4.5 4.5 5.5	— — —	0.0 — —	0.1 0.36 —	— 0.44 1.65	0.1 0.44 1.65	V
Input leakage current	I _{IN}	V _{IN} = V _{CC} or GND		5.5	—	—	±0.1	—	±1.0	µA
Quiescent supply current	I _{CC}	V _{IN} = V _{CC} or GND		5.5	—	—	8.0	—	80.0	µA
	I _C	Per input: V _{IN} = 3.4 V Other input: V _{CC} or GND		5.5	—	—	1.35	—	1.5	mA

Note: This spec indicates the capability of driving 50 Ω transmission lines.

One output should be tested at a time for a 10 ms maximum duration.

AC Characteristics (C_L = 50 pF, R_L = 500 Ω, Input: t_r = t_f = 3 ns)

Characteristics	Symbol	Test Condition			Ta = 25°C			Ta = -40 to 85°C		Unit
				V _{CC} (V)	Min	Typ.	Max	Min	Max	
Propagation delay time (D-Y, W)	t _{PLH} t _{PHL}	—		5.0 ± 0.5	—	7.5	11.8	1.0	13.5	ns
Propagation delay time (A, B, C-Y, W)	t _{PLH} t _{PHL}	—		5.0 ± 0.5	—	9.5	15.8	1.0	18.0	ns
Propagation delay time (S̄T-Y, W)	t _{PLH} t _{PHL}	—		5.0 ± 0.5	—	6.3	10.1	1.0	11.5	ns
Input capacitance	C _{IN}	—			—	5	10	—	10	pF
Power dissipation capacitance	C _{PD} (Note)	—			—	66	—	—	—	pF

Note: C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

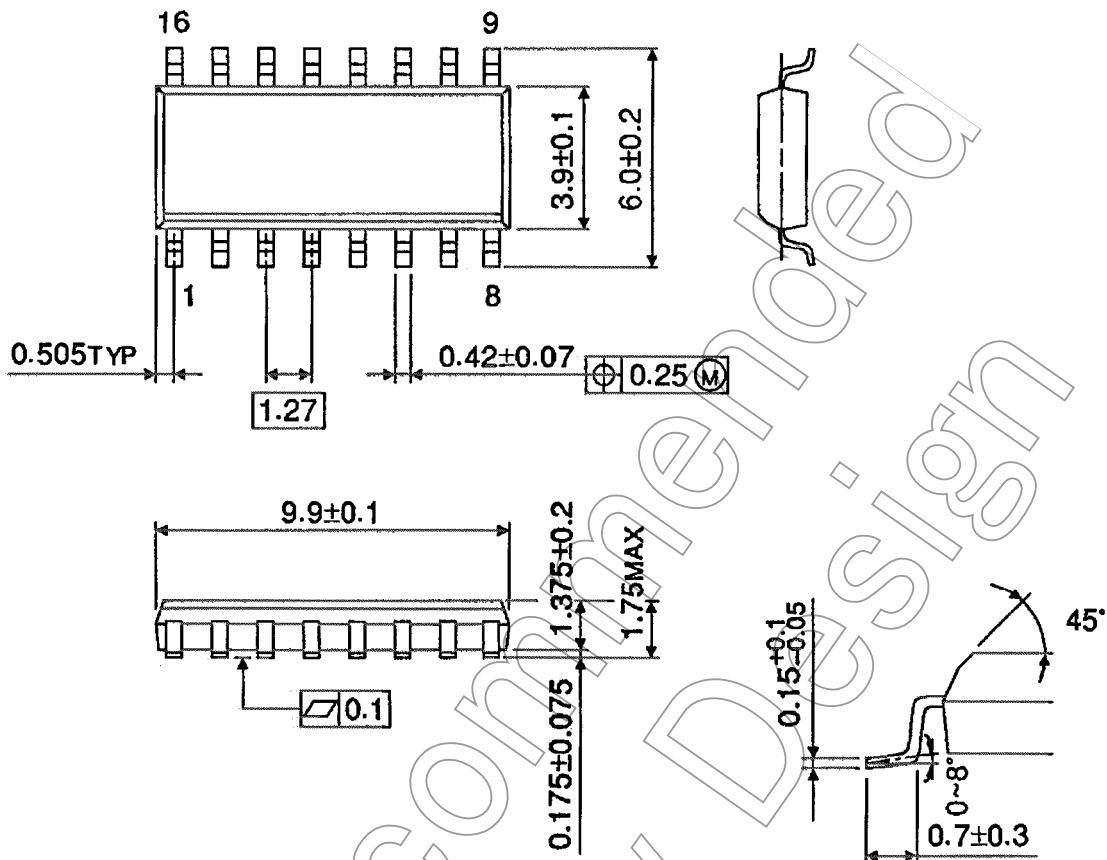
Average operating current can be obtained by the equation:

$$I_{CC} (\text{opr}) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$$

Package Dimensions (Note)

SOL16-P-150-1.27

Unit : mm



Note: This package is not available in Japan.

Weight: 0.13 g (typ.)

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