

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.

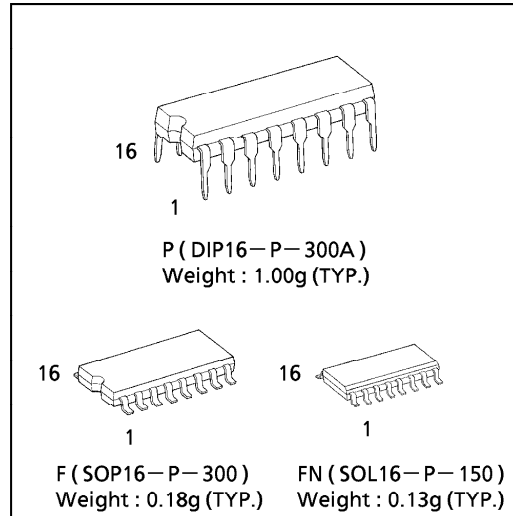
One of eight data input signals (D0 - D7) is selected by decoding of the three-bit address input (A, B, C). The selected data appears on two outputs: non-inverting (Y) and inverting (W).

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.

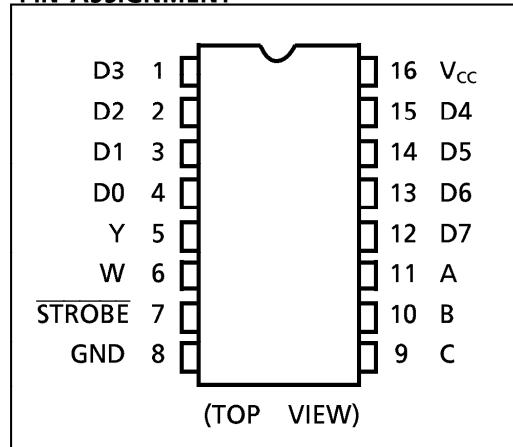
All inputs are equipped with protection circuits against static discharge or transient excess voltage.

FEATURES:

- High Speed..... $t_{pd} = 7.1\text{ns}(\text{typ.})$ at $V_{CC} = 5\text{V}$
- Low Power Dissipation..... $I_{CC} = 8\mu\text{A}(\text{Max.})$ at $T_a = 25^\circ\text{C}$
- Compatible with TTL outputs ... $V_{IL} = 0.8\text{V}(\text{Max.})$
 $V_{IH} = 2.0\text{V}(\text{Min.})$
- Symmetrical Output Impedance... $|I_{OH}| = I_{OL} = 24\text{mA}(\text{Min.})$
Capability of driving 50Ω transmission lines.
- Balanced Propagation Delays..... $t_{pLH} \approx t_{pHL}$
- Pin and Function Compatible with 74F151



PIN ASSIGNMENT

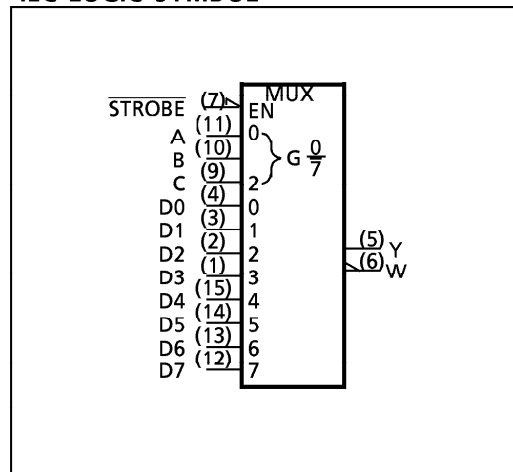


TRUTH TABLE

INPUTS				OUTPUT	
SELECT			STROBE	Y	W
C	B	A			
X	X	X	H	L	H
L	L	L	L	D0	$\overline{D0}$
L	L	H	L	D1	$\overline{D1}$
L	H	L	L	D2	$\overline{D2}$
L	H	H	L	D3	$\overline{D3}$
H	L	L	L	D4	$\overline{D4}$
H	L	H	L	D5	$\overline{D5}$
H	H	L	L	D6	$\overline{D6}$
H	H	H	L	D7	$\overline{D7}$

X : Don't Care

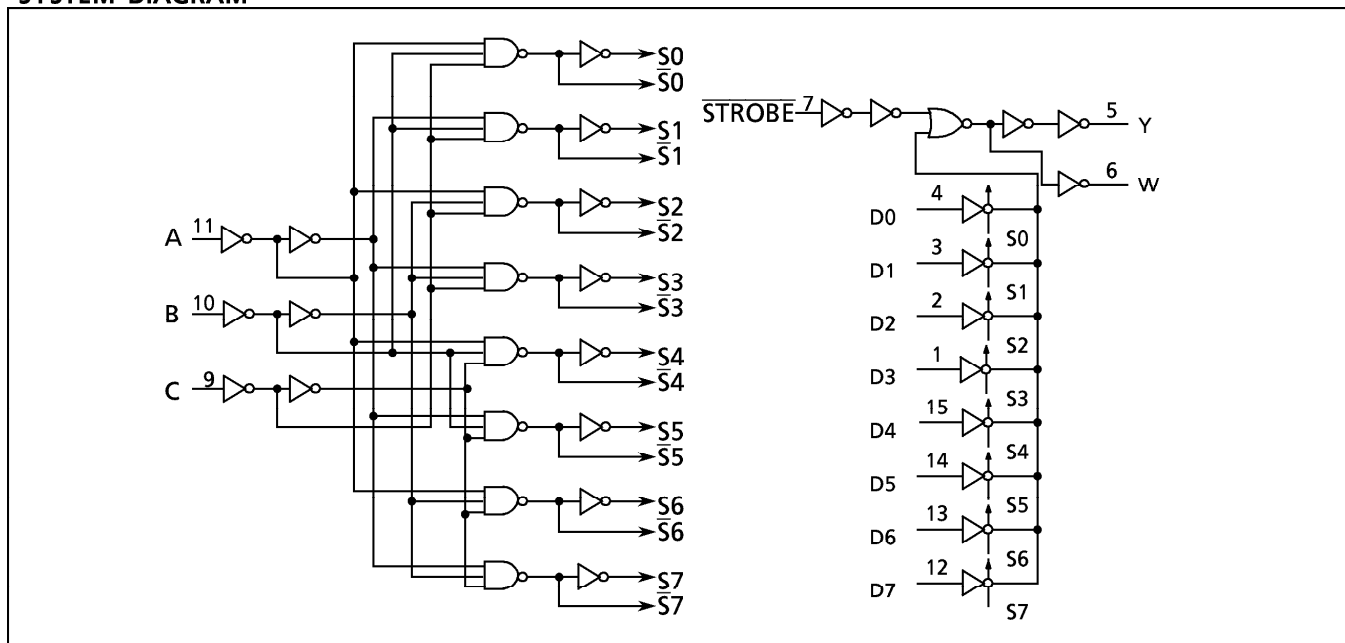
IEC LOGIC SYMBOL



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SYSTEM DIAGRAM



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage Range	V_{CC}	-0.5~7.0	V
DC Input Voltage	V_{IN}	-0.5~ $V_{CC} + 0.5$	V
DC Output Voltage	V_{OUT}	-0.5~ $V_{CC} + 0.5$	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	500 (DIP)* / 180 (SOP)	mW
Storage Temperature	T_{stg}	-65~150	$^{\circ}C$

*500mW in the range of $T_a = -40^{\circ}C \sim 65^{\circ}C$. From $T_a = 65^{\circ}C$ to $85^{\circ}C$ a derating factor of $-10mW/^{\circ}C$ should be applied up to 300mW.

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	V_{CC}	4.5~5.5	V
Input Voltage	V_{IN}	0~ V_{CC}	V
Output Voltage	V_{OUT}	0~ V_{CC}	V
Operating Temperature	T_{opr}	-40~85	$^{\circ}C$
Input Rise and Fall Time	dt/dV	0~10	ns/V

DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	V _{CC} (V)	Ta = 25°C			Ta = -40~85°C		UNIT	
				MIN.	TYP.	MAX.	MIN.	MAX.		
High - Level Input Voltage	V _{IH}		4.5 ┆ 5.5	2.0	—	—	2.0	—	V	
Low - Level Input Voltage	V _{IL}		4.5 ┆ 5.5	—	—	0.8	—	0.8	V	
High - Level Output Voltage	V _{OH}	V _{IN} = V _{IH} or V _{IL}	I _{OH} = -50μA	4.5	4.4	4.5	—	4.4	—	V
			I _{OH} = -24mA	4.5	3.94	—	—	3.80	—	
			I _{OH} = -75mA *	5.5	—	—	—	3.85	—	
Low - Level Output Voltage	V _{OL}	V _{IN} = V _{IH} or V _{IL}	I _{OL} = 50μA	4.5	—	0.0	0.1	—	0.1	V
			I _{OL} = 24mA	4.5	—	—	0.36	—	0.44	
			I _{OL} = 75mA *	5.5	—	—	—	—	1.65	
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		
		I _C	PER INPUT : V _{IN} = 3.4V OTHER INPUT : V _{CC} or GND	5.5	—	—	1.35	—	1.5	mA

* : This spec indicates the capability of driving 50Ω transmission lines.
One output should be tested at a time for a 10ms maximum duration.

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

PARAMETER	SYMBOL	TEST CONDITION	V _{CC} (V)	Ta = 25°C			Ta = -40~85°C		UNIT
				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
				—	9.5	15.8	1.0	18.0	
Propagation Delay Time (A, B, C-Y, W)	t _{pLH} t _{pHL}		5.0 ± 0.5	—	6.3	10.1	1.0	11.5	
Propagation Delay Time (ST-Y, W)	t _{pLH} t _{pHL}		5.0 ± 0.5	—	6.3	10.1	1.0	11.5	pF
Input Capacitance	C _{IN}			—	5	10	—	10	
Power Dissipation Capacitance	C _{PD} (1)			—	66	—	—	—	

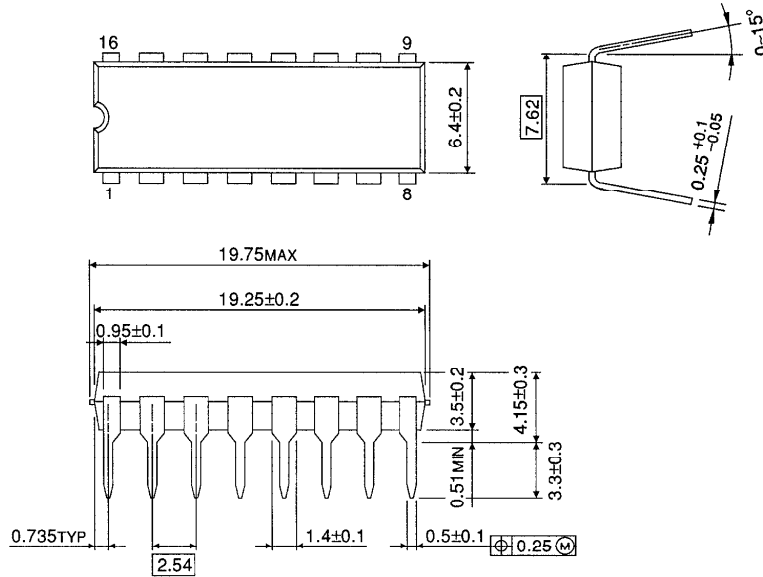
Note(1) C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation :

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

DIP 16PIN OUTLINE DRAWING (DIP16-P-300A)

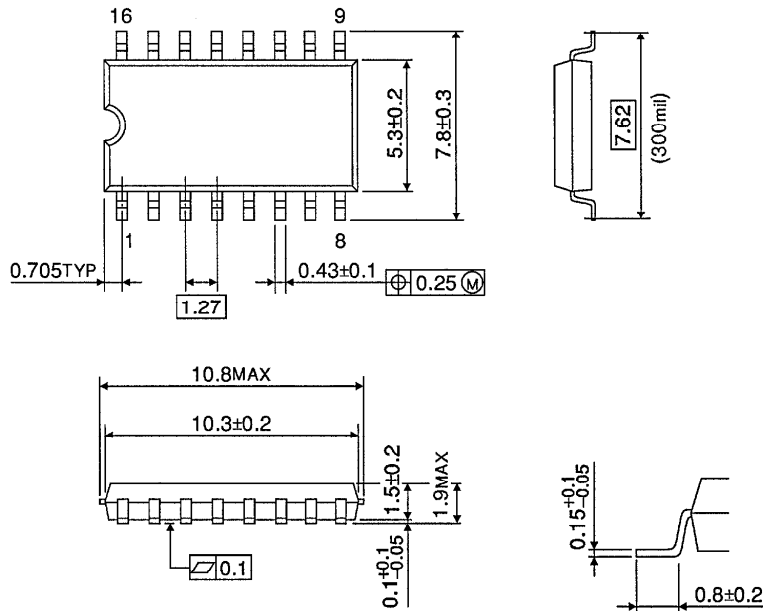
Unit in mm



Weight : 1.00g (TYP.)

SOP 16PIN (200mil BODY) OUTLINE DRAWING (SOP16-P-300)

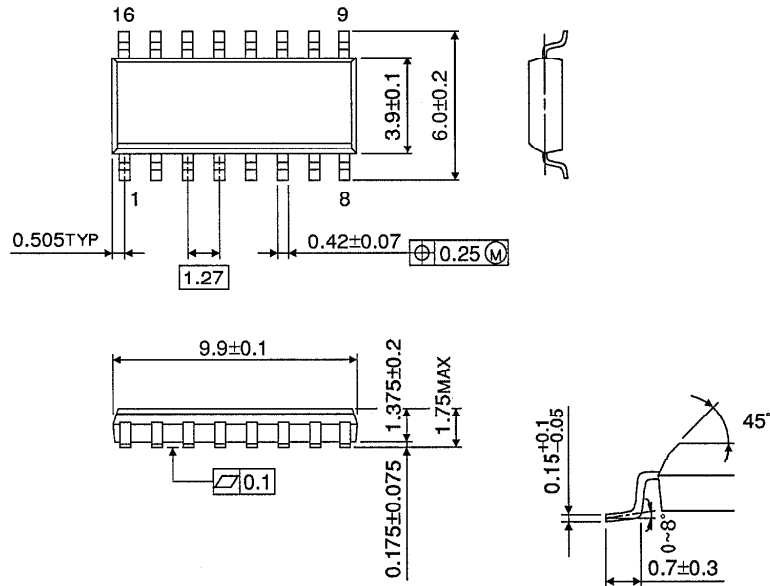
Unit in mm



Weight : 0.18g (TYP.)

SOP 16PIN (150mil BODY) OUTLINE DRAWING (SOL16-P-150)

Unit in mm



Weight : 0.13g (TYP.)