

**8 - CHANNEL MULTIPLEXER**

The TC74AC151 is an advanced high speed CMOS 8 - CHANNEL MULTIPLEXER fabricated with silicon gate and double - layer metal wiring C<sup>2</sup>MOS technology.

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

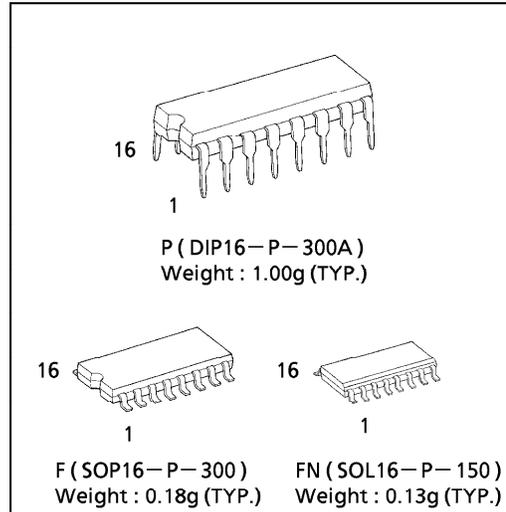
One of eight data input signals (D0 - D7) is selected by decoding of the three - bit address input (A, B, C). The selected data appears on two outputs: non - inverting (Y) and inverting (W).

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.

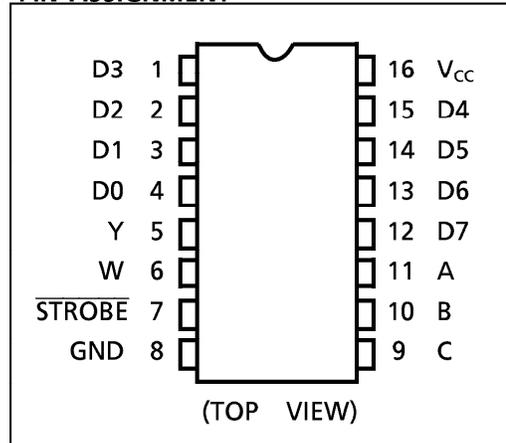
All inputs are equipped with protection circuits against static discharge or transient excess voltage.

**FEATURES:**

- High Speed.....  $t_{pd} = 5.3ns(typ.)$  at  $V_{CC} = 5V$
- Low Power Dissipation.....  $I_{CC} = 8\mu A(Max.)$  at  $T_a = 25^\circ C$
- High Noise Immunity.....  $V_{NIH} = V_{NIL} = 28\% V_{CC} (Min.)$
- Symmetrical Output Impedance...  $|I_{OH}| = I_{OL} = 24mA(Min.)$   
Capability of driving 50Ω transmission lines.
- Balanced Propagation Delays.....  $t_{pLH} \approx t_{pHL}$
- Wide Operating Voltage Range...  $V_{CC} (opr) = 2V \sim 5.5V$
- Pin and Function Compatible with 74F151



**PIN ASSIGNMENT**

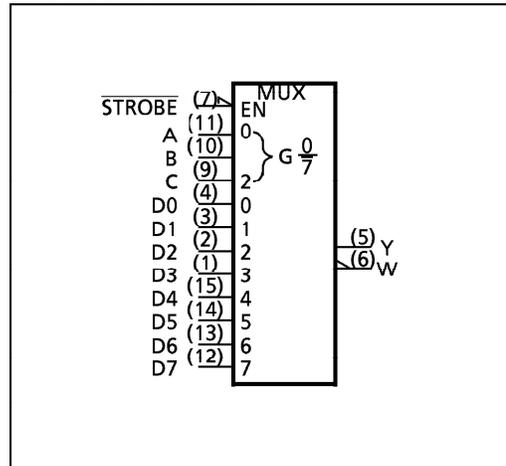


**TRUTH TABLE**

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

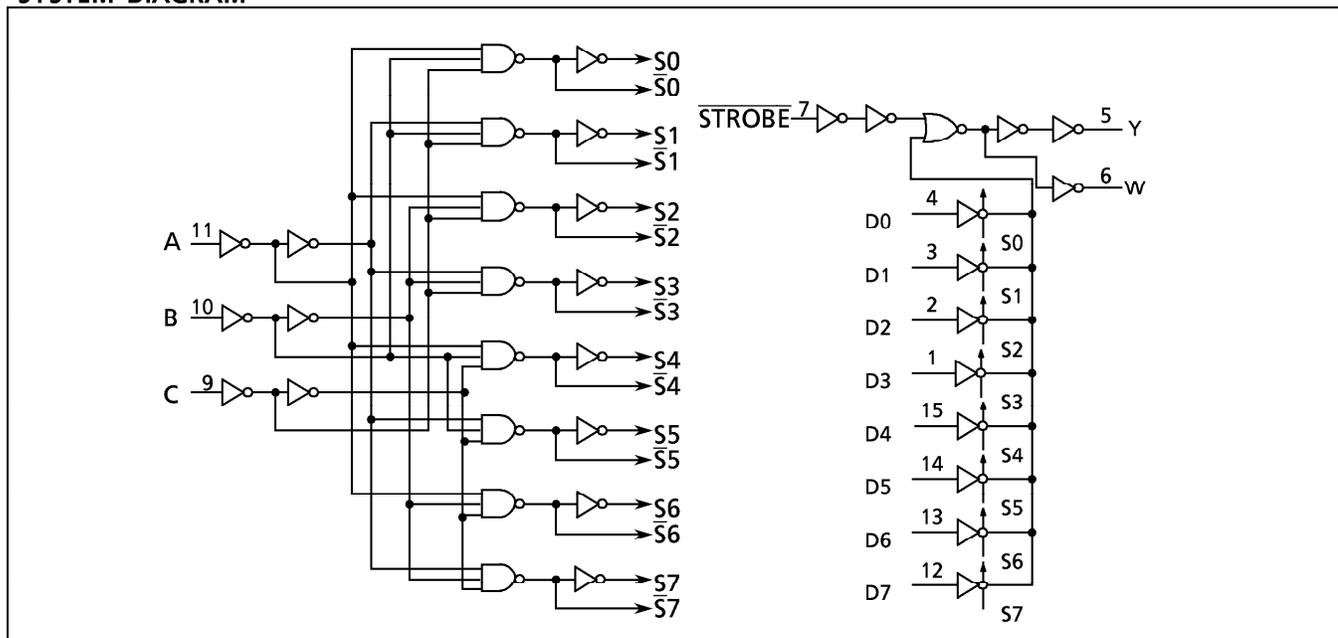
**IEC LOGIC SYMBOL**



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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	$I_{IK}$	$\pm 20$	mA
Output Diode Current	$I_{OK}$	$\pm 50$	mA
DC Output Current	$I_{OUT}$	$\pm 50$	mA
DC $V_{CC}$ /Ground Current	$I_{CC}$	$\pm 100$	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	$V_{CC}$	2.0~5.5	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	0~100 ( $V_{CC} = 3.3 \pm 0.3V$ ) 0~20 ( $V_{CC} = 5 \pm 0.5V$ )	ns/V

**DC ELECTRICAL CHARACTERISTICS**

PARAMETER	SYMBOL	TEST CONDITION	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40~85°C		UNIT				
				MIN.	TYP.	MAX.	MIN.	MAX.					
High - Level Input Voltage	V <sub>IH</sub>		2.0 3.0 5.5	1.50 2.10 3.85	— — —	— — —	1.50 2.10 3.85	— — —	V				
Low - Level Input Voltage	V <sub>IL</sub>		2.0 3.0 5.5	— — —	— — —	0.50 0.90 1.65	— — —	0.50 0.90 1.65	V				
High - Level Output Voltage	V <sub>OH</sub>	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = -50μA	2.0	1.9	2.0	—	1.9	—	V			
				3.0	2.9	3.0	—	2.9	—				
				4.5	4.4	4.5	—	4.4	—				
Low - Level Output Voltage	V <sub>OL</sub>	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> = 50μA	2.0	—	0.0	0.1	—	0.1	V			
				3.0	—	0.0	0.1	—	0.1				
				4.5	—	0.0	0.1	—	0.1				
Input Leakage Current	I <sub>IN</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND	5.5	—	—	±0.1	—	±1.0	μA				
				Quiescent Supply Current	I <sub>CC</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND	5.5	—		—	8.0	—	80.0

\* : 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<sub>L</sub> = 50pF, R<sub>L</sub> = 500Ω, Input t<sub>r</sub> = t<sub>f</sub> = 3ns)**

PARAMETER	SYMBOL	TEST CONDITION	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40~85°C		UNIT
				MIN.	TYP.	MAX.	MIN.	MAX.	
Propagation Delay Time (D-Y, W)	t <sub>pLH</sub> t <sub>pHL</sub>		3.3 ± 0.3	—	10.7	19.3	1.0	22.0	ns
			5.0 ± 0.5	—	6.6	10.5	1.0	12.0	
Propagation Delay Time (A, B, C-Y, W)	t <sub>pLH</sub> t <sub>pHL</sub>		3.3 ± 0.3	—	13.3	23.7	1.0	27.0	
			5.0 ± 0.5	—	8.2	13.0	1.0	14.8	
Propagation Delay Time (ST-Y, W)	t <sub>pLH</sub> t <sub>pHL</sub>		3.3 ± 0.3	—	8.6	15.3	1.0	18.0	
			5.0 ± 0.5	—	5.6	9.6	1.0	11.0	
Input Capacitance	C <sub>IN</sub>		—	5	10	—	10	pF	
Power Dissipation Capacitance	C <sub>PD</sub> (1)		—	68	—	—	—		

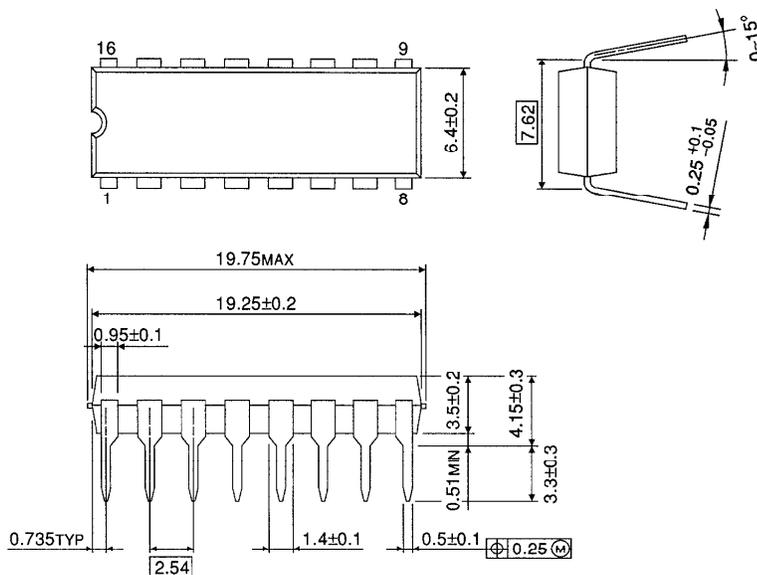
Note(1) C<sub>PD</sub> is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

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)**

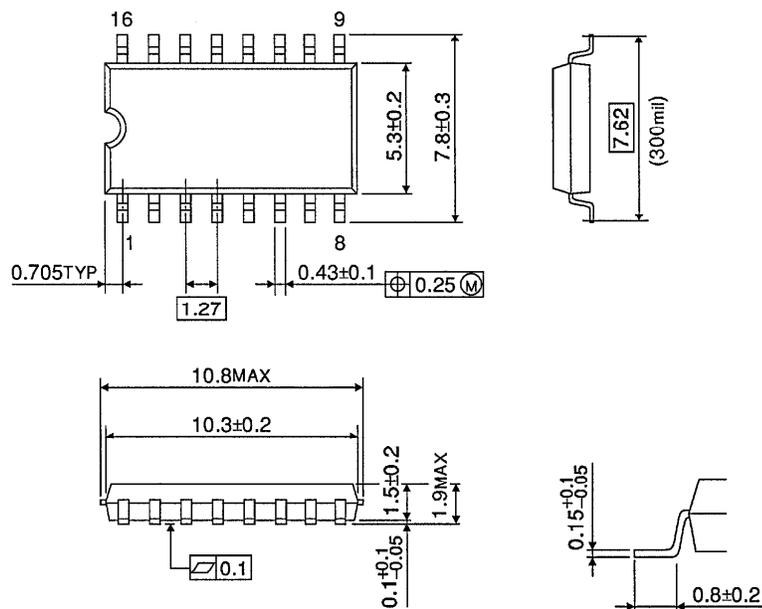
Unit in mm



Weight : 1.00g (TYP.)

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

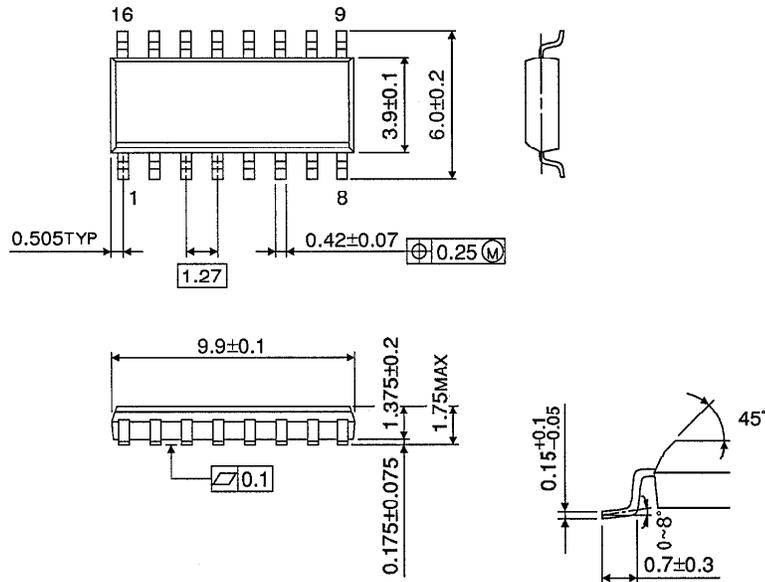
Unit in mm



Weight : 0.18g (TYP.)

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

Unit in mm



Weight : 0.13g (TYP.)