

TC74AC257P
TC74AC258P2-CHANNEL MULTIPLEXER(3-STATE)
2-CHANNEL MULTIPLEXER(3-STATE,INVERTING)

The TC74AC257 and TC74AC258 are advanced high speed CMOS MULTIPLEXERS fabricated with silicon gate and double-layer metal wiring C²MOS technology.

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

Each is composed of four independent 2-channel multiplexers with common SELECT and OUTPUT ENABLE(OE).

The TC74AC257 is an inverting multiplexer, while the TC74AC258 is non-inverting.

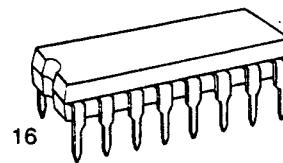
If OE is set low, the outputs are held in a high-impedance state. When SELECT is set low, "A" data inputs are enabled.

Conversely, when SELECT is high, "B" data inputs are enabled.

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

FEATURES:

- High Speed $t_{pd}=3.6ns$ (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 50 Ω 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 74F 257/258



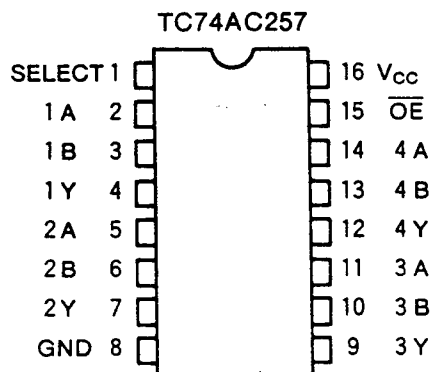
DIP16 (3D16A-P)

TRUTH TABLE

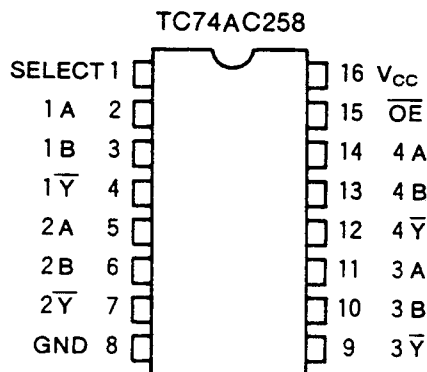
INPUTS				OUTPUTS	
$\overline{OE}$	SELECT	A	B	Y(257)	$\overline{Y}$ (258)
H	X	X	X	Z	Z
L	L	L	X	L	H
L	L	H	X	H	L
L	H	X	L	L	H
L	H	X	H	H	L

X : Don't Care
Z : High Impedance

PIN ASSIGNMENT



(TOP VIEW)



(TOP VIEW)

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1988.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage Range	V_{CC}	-0.5 ~ 6.0	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_{OLT}	± 50	mA
DC V_{CC} /Ground Current	I_{CC}	± 100	mA
Power Dissipation	P_D	500(DIP)*	mW
Storage Temperature	T_{stg}	-65 ~ 150	°C
Lead Temperature 10sec	T_L	300	°C

*500mW in the range of $T_a = -40^\circ\text{C} \sim 65^\circ\text{C}$. From $T_a = 65^\circ\text{C}$ to 85°C a derating factor of $-10\text{mW}/^\circ\text{C}$ shall be applied until 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	°C
Input Rise and Fall Time	dt/dv	0 ~ 100 ($V_{CC} = 3.3 \pm 0.3\text{V}$) 0 ~ 20 ($V_{CC} = 5 \pm 0.5\text{V}$)	ns/v

DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	V_{CC}	$T_a = 25^\circ\text{C}$			$T_a = -40 \sim 85^\circ\text{C}$		UNIT
				MIN.	TYP.	MAX.	MIN.	MAX.	
High-Level Input Voltage	V_{IH}		2.0 3.0 5.5	1.50 2.10 3.85	— — —	— — —	1.50 2.10 3.85	— — —	V
Low-Level Input Voltage	V_{IL}		2.0 3.0 5.5	— — —	— — —	0.50 0.90 1.65	— — —	0.50 0.90 1.65	V
High-Level Output Voltage	V_{OH}	$V_{IN} =$ V_{IH} or V_{IL}	$I_{OH} = -50\mu\text{A}$	2.0 3.0 4.5	1.9 2.9 4.4	2.0 3.0 4.5	— — —	1.9 2.9 4.4	V
			$I_{OH} = -4\text{mA}$ $I_{OH} = -24\text{mA}$ $I_{OH} = -75\text{mA}^*$	3.0 4.5 5.5	2.58 3.94 —	— — —	— — —	2.48 3.80 3.85	
		$V_{IN} =$ V_{IH} or V_{IL}	$I_{OL} = 50\mu\text{A}$	2.0 3.0 4.5	— — —	0.0 0.0 0.0	— — —	0.1 0.1 0.1	V
			$I_{OL} = 12\text{mA}$ $I_{OL} = 24\text{mA}$ $I_{OL} = 75\text{mA}^*$	3.0 4.5 5.5	— — —	0.36 0.36 —	— — —	0.44 0.44 1.65	
3-State Output Off-State Current	I_{OZ}	$V_{IN} = V_{IH}$ or V_{IL} $V_{OUT} = V_{CC}$ or GND	5.5	—	—	± 0.5	—	± 5.0	μA
Input Leakage Current	I_{IN}	$V_{IN} = V_{CC}$ or GND	5.5	—	—	± 0.1	—	± 1.0	
Quiescent Supply Current	I_{CC}	$V_{IN} = V_{CC}$ or GND	5.5	—	—	8.0	—	80.0	

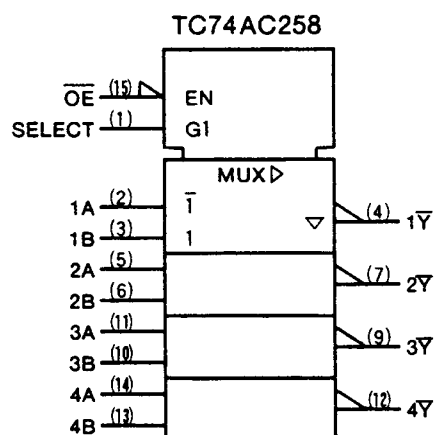
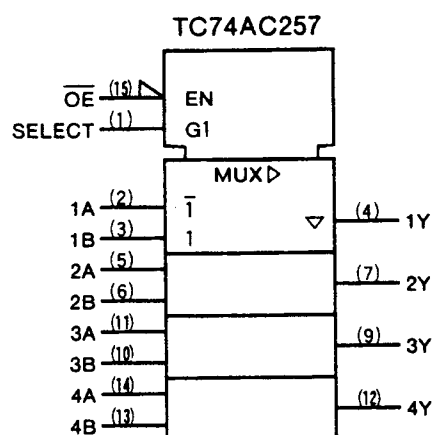
* : This spec is indicated the capability of driving 50Ω transmission lines.

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

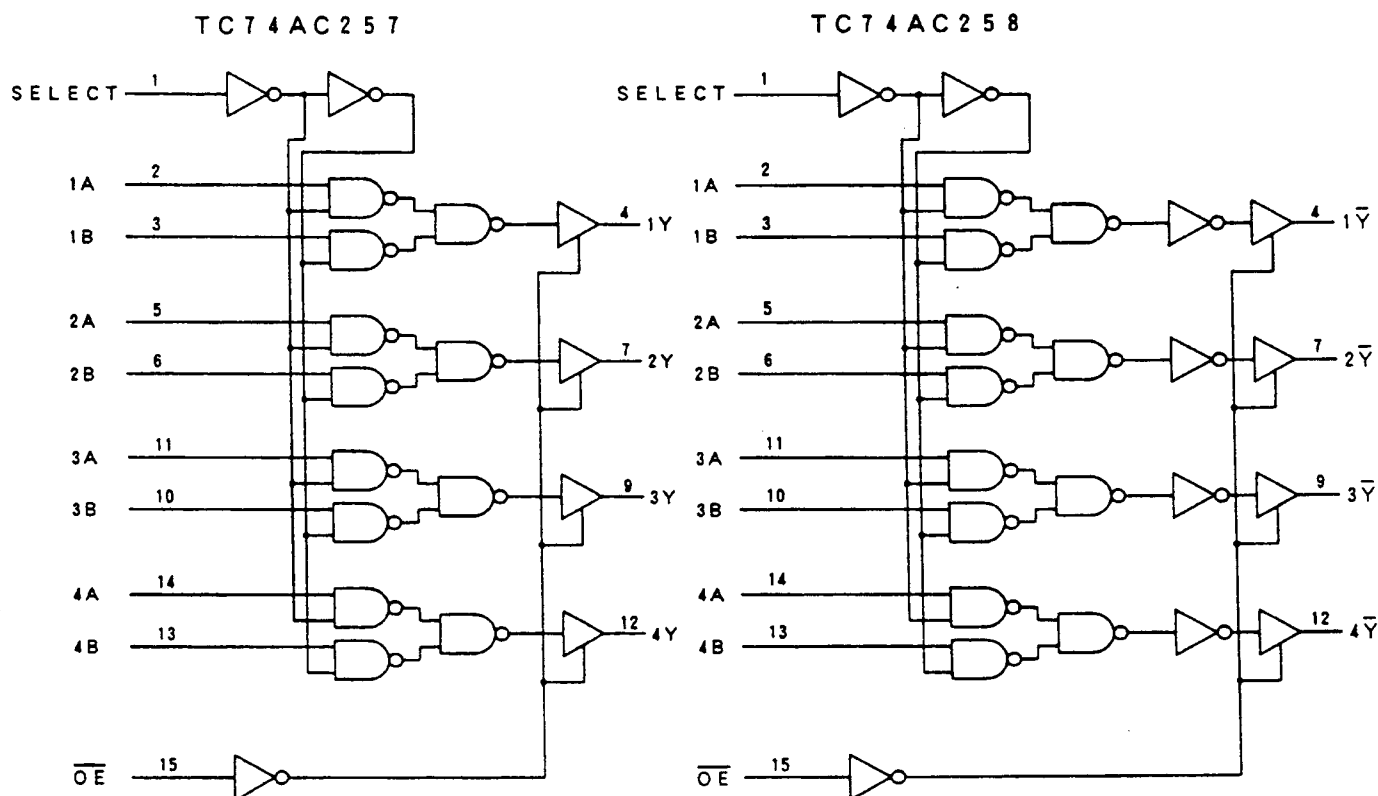
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IEC LOGIC SYMBOL



SYSTEM DIAGRAM



AC ELECTRICAL CHARACTERISTICS ($C_L=50\text{pF}$, $R_L=500\Omega$, Input $t_r=t_f=3\text{ns}$)

PARAMETER	SYMBOL	TEST CONDITION	V_{CC}	$T_a=25^\circ\text{C}$			$T_a=-40 \sim 85^\circ\text{C}$		UNIT
				MIN.	TYP.	MAX.	MIN.	MAX.	
Propagation Delay Time (A, B-Y, $\bar{Y}$)	t_{pLH}		3.3 ± 0.3	—	7.0	14.3	1.0	16.3	ns
	t_{pHL}		5.0 ± 0.5	—	4.7	7.5	1.0	8.5	
Propagation Delay Time (SELECT-Y, $\bar{Y}$)	t_{pLH}		3.3 ± 0.3	—	8.6	17.2	1.0	19.6	
	t_{pHL}		5.0 ± 0.5	—	5.5	9.1	1.0	10.4	
Output Enable Time	t_{pZL}		3.3 ± 0.3	—	7.3	14.0	1.0	16.0	
	t_{pZH}		5.0 ± 0.5	—	5.0	7.9	1.0	9.0	
Output Disable Time	t_{pLZ}		3.3 ± 0.3	—	5.6	9.6	1.0	11.0	pF
	t_{pHZ}		5.0 ± 0.5	—	5.1	7.9	1.0	9.0	
Input Capacitance	C_{IN}			—	5	10	—	10	
Output Capacitance	C_{OUT}			—	10	—	—	—	
Power Dissipation Capacitance	$C_{PD(1)}$			—	28	—	—	—	

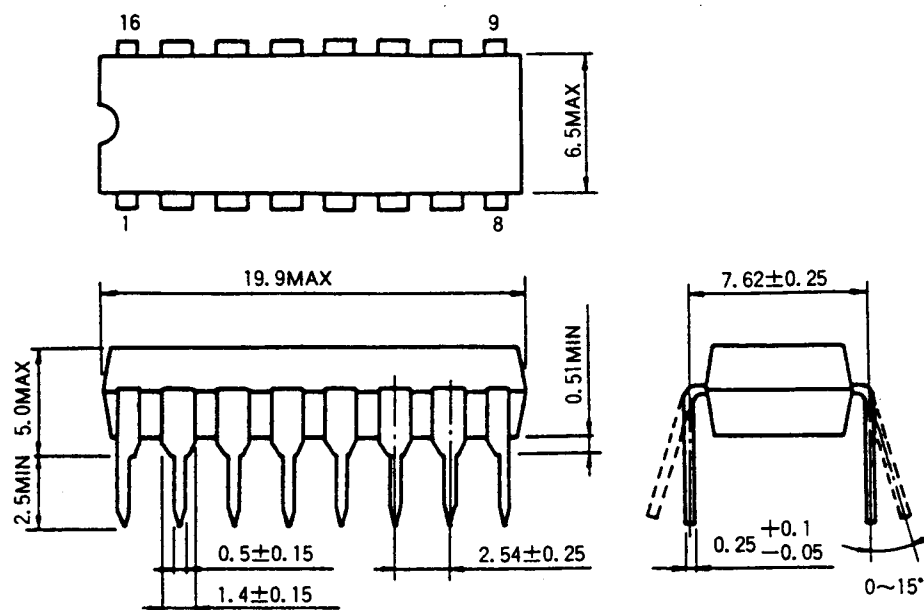
Note (1) C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation:

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

DIP 16 PIN OUTLINE DRAWING (3D16A-P)

Unit in mm



Note) Lead pitch is 2.54 and tolerance is ± 0.25 against theoretical center of each lead that is obtained on the basis of No. 1 and No. 16 leads.

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