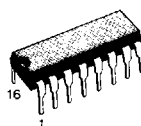
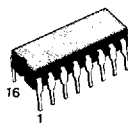


**HC257 QUAD 2-CHANNEL MULTIPLEXER (3-STATE)**  
**HC258 QUAD 2-CHANNEL MULTIPLEXER (3-STATE, INVERTING)**

S G S-THOMSON

- HIGH SPEED  
 $t_{PD} = 12 \text{ ns}$  (TYP.) at  $V_{CC} = 5V$
- LOW POWER DISSIPATION  
 $I_{CC} = 4 \mu\text{A}$  (MAX.) at  $T_A = 25^\circ\text{C}$
- HIGH NOISE IMMUNITY  
 $V_{NIH} = V_{NIL} = 28\% V_{CC}$  (MIN.)
- OUTPUT DRIVE CAPABILITY  
 15 LSTTL LOADS
- SYMMETRICAL OUTPUT IMPEDANCE  
 $|I_{OH}| = I_{OL} = 6 \text{ mA}$  (MIN.)
- BALANCED PROPAGATION DELAYS  
 $t_{PLH} = t_{PHL}$
- WIDE OPERATING VOLTAGE RANGE  
 $V_{CC}$  (OPR) = 2V to 6V
- PIN AND FUNCTION COMPATIBLE  
 WITH 54/74LS257/258


**B1N**  
 Plastic Package

**F1**  
 Ceramic Frit Seal Package

**M1**  
 Micro Package

**C1**  
 Plastic Chip Carrier

## ORDERING NUMBERS:

 M54HCXXX F1  
 M74HCXXX B1N  
 M74HCXXX F1

 M74HCXXX C1  
 M74HCXXX M1
**DESCRIPTION**

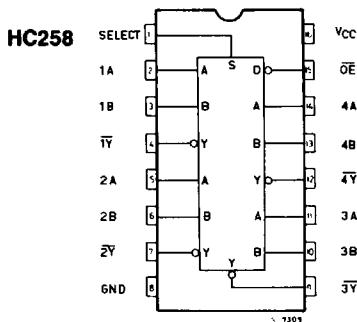
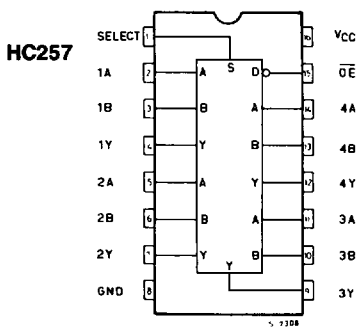
The M54/74HC257 and the M54/74HC258 are high speed CMOS MULTIPLEXERS fabricated with silicon gate C<sup>2</sup>MOS technology.

They have the same high speed performance of LSTTL combined with true CMOS low power consumption.

These IC's are composed of an independent 2-channel multiplexer with common SELECT and ENABLE INPUT.

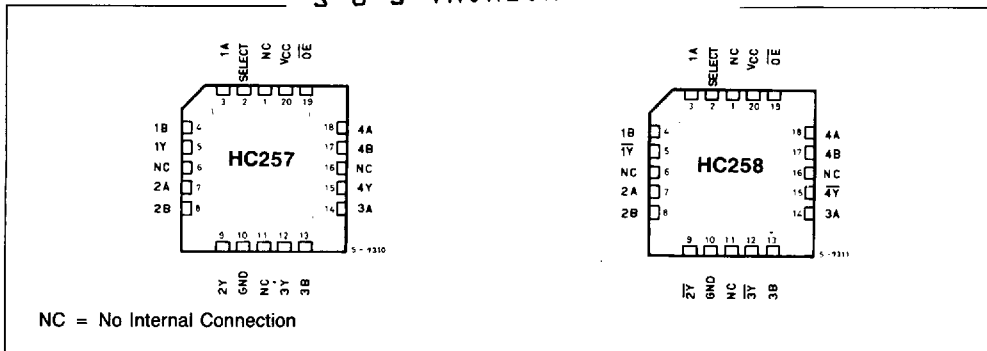
The M54/74HC258 is an inverting multiplexer while the M54/74HC257 is a non-inverting multiplexer. When the ENABLE INPUT is held "High", outputs of both IC's become high-impedance state. If SELECT INPUT is held "Low", "A" data is selected, when SELECT INPUT is high "H", "B" data is chosen.

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

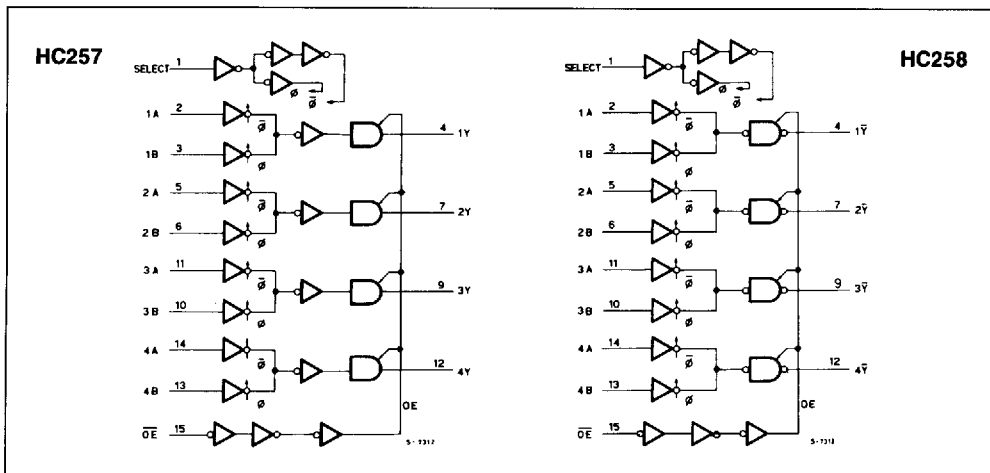
**PIN CONNECTIONS (top view)**

CHIP CARRIER

S G S-THOMSON



LOGIC DIAGRAM



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

ABSOLUTE MAXIMUM RATINGS S G S-THOMSON

Symbol	Parameter	Value	Unit
$V_{CC}$	Supply Voltage	-0.5 to 7	V
$V_I$	DC Input Voltage	-0.5 to $V_{CC}+0.5$	V
$V_O$	DC Output Voltage	-0.5 to $V_{CC}+0.5$	V
$I_{IK}$	DC Input Diode Current	$\pm 20$	mA
$I_{OK}$	DC Output Diode Current	$\pm 20$	mA
$I_O$	DC Output Source Sink Current Per Output Pin	$\pm 35$	mA
$I_{CC}$ or $I_{GND}$	DC $V_{CC}$ or Ground Current	$\pm 70$	mA
$P_D$	Power Dissipation	500 (*)	mW
$T_{stg}$	Storage Temperature	-65 to 150	$^{\circ}C$

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.

(\*) 500 mW:  $\approx 65^{\circ}C$  derate to 300 mW by 10 mW/ $^{\circ}C$ :  $65^{\circ}C$  to  $85^{\circ}C$ .

## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
$V_{CC}$	Supply Voltage	2 to 6	V
$V_I$	Input Voltage	0 to $V_{CC}$	V
$V_O$	Output Voltage	0 to $V_{CC}$	V
$T_A$	Operating Temperature	74HC Series 54HC Series	$^{\circ}C$
		-40 to 85 -55 to 125	
$t_r, t_f$	Input Rise and Fall Time	$V_{CC} \begin{cases} 2 \text{ V} & 0 \text{ to } 1000 \\ 4.5 \text{ V} & 0 \text{ to } 500 \\ 6 \text{ V} & 0 \text{ to } 400 \end{cases}$	ns

## DC SPECIFICATIONS

Symbol	Parameter	$V_{CC}$	Test Condition	$T_A = 25^{\circ}C$			$-40 \text{ to } 85^{\circ}C$		$-55 \text{ to } 125^{\circ}C$		Unit	
				54HC and 74HC			74HC		54HC			
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.		
$V_{IH}$	High Level Input Voltage	2.0 4.5 6.0		1.5 3.15 4.2	— — —	— — —	1.5 3.15 4.2	— — —	1.5 3.15 4.2	— — —	V	
$V_{IL}$	Low Level Input Voltage	2.0 4.5 6.0		— — —	— — —	0.5 1.35 1.8	— — —	0.5 1.35 1.8	— — —	0.5 1.35 1.8	V	
$V_{OH}$	High Level Output Voltage	2.0 4.5 6.0	$V_I$	$I_O$ -20 $\mu A$	1.9	2.0	—	1.9	—	1.9	—	V
			$V_{IH}$ or $V_{IL}$		4.4 5.9	4.5 6.0	— —	4.4 5.9	— —	4.4 5.9	— —	
		4.5 6.0	$V_{IL}$	-4.0 mA	4.18	4.31	—	4.13	—	4.10	—	
				-5.2 mA	5.68	5.8	—	5.63	—	5.60	—	

## DC SPECIFICATIONS (Continued)

S G S-THOMSON

Symbol	Parameter	V <sub>CC</sub>	Test Condition	T <sub>A</sub> = 25°C 54HC and 74HC			- 40 to 85°C 74HC		- 55 to 125°C 54HC		Unit								
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.									
V <sub>OL</sub>	Low Level Output Voltage	2.0	V <sub>IH</sub> or V <sub>IL</sub>	20 μA	—	0.0	0.1	—	0.1	—	0.1	V							
		4.5			—	0.0	0.1	—	0.1	—	0.1								
		6.0			—	0.0	0.1	—	0.1	—	0.1								
I <sub>I</sub>	Input Leakage Current	6.0	V <sub>I</sub> = V <sub>CC</sub> or GND	—	—	±0.1	—	±1.0	—	±1.0	μA								
		4.5										4.0 mA	—	0.17	0.26	—	0.33	—	0.40
		6.0											5.2 mA	—	0.18	0.26	—	0.33	—
I <sub>OZ</sub>	3-State Output Off-State Current	6.0	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> V <sub>O</sub> = V <sub>CC</sub> or GND	—	—	±0.5	—	±5	—	±10	μA								
I <sub>CC</sub>	Quiescent Supply Current	6.0	V <sub>I</sub> = V <sub>CC</sub> or GND	—	—	4	—	40	—	80	μA								

AC ELECTRICAL CHARACTERISTICS (C<sub>L</sub> = 50pF, Input t<sub>r</sub> = t<sub>f</sub> = 6ns)

Symbol	Parameter	V <sub>CC</sub>	Test Condition	T <sub>A</sub> = 25°C 54HC and 74HC			- 40 to 85°C 74HC		- 55 to 125°C 54HC		Unit
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
t <sub>TLH</sub> t <sub>THL</sub>	Output Transition Time	2.0 4.5 6.0		— — —	23 7 6	60 12 10	— — —	75 15 13	— — —	90 18 15	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay Time HC257 A, B - Y	2.0 4.5 6.0		— — —	50 15 13	100 20 17	— — —	125 25 21	— — —	150 30 26	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay Time HC257 (SELECT - Y)	2.0 4.5 6.0		— — —	80 22 19	160 32 17	— — —	200 40 34	— — —	240 48 41	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay Time HC258 (A, B - Y)	2.0 4.5 6.0		— — —	50 15 13	100 20 27	— — —	125 25 21	— — —	150 30 26	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay Time HC258 SELECT - $\bar{Y}$	2.0 4.5 6.0		— — —	80 22 19	160 32 27	— — —	200 40 34	— — —	240 48 41	ns
t <sub>PZL</sub> t <sub>PZH</sub>	Output Enable Time	2.0 4.5 6.0	R <sub>L</sub> = 1kΩ	— — —	60 15 13	110 22 19	— — —	140 28 24	— — —	165 33 28	ns

