

# 54H/74H87

## 4-BIT TRUE/COMPLEMENT, ZERO/ONE ELEMENT

**DESCRIPTION** — The '87 performs four operations at its outputs, depending on the state of the Select inputs S<sub>1</sub> and S<sub>2</sub>. The outputs can be forced HIGH or LOW, or can follow the Data inputs in either the True or Complement form. The Select input coding and the output responses are shown in the Truth Table.

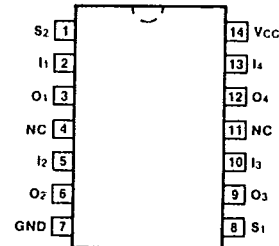
**ORDERING CODE:** See Section 9

PKGS	PIN OUT	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
		V <sub>CC</sub> = +5.0 V ±5%, T <sub>A</sub> = 0°C to +70°C	V <sub>CC</sub> = +5.0 V ±10%, T <sub>A</sub> = -55°C to +125°C	
Plastic DIP (P)	A	74H87PC		9A
Ceramic DIP (D)	A	74H87DC	54H87DM	6A
Flatpak (F)	A	74H87FC	54H87FM	3I

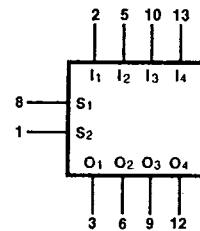
**INPUT LOADING/FAN-OUT:** See Section 3 for U.L. definitions

PIN NAMES	DESCRIPTION	54/74H (U.L.) HIGH/LOW
I <sub>1</sub> — I <sub>4</sub>	Data Inputs	1.25/1.25
S <sub>1</sub> , S <sub>2</sub>	Select Inputs	1.25/1.25
O <sub>1</sub> — O <sub>4</sub>	Outputs	25/12.5

### CONNECTION DIAGRAM PINOUT A



### LOGIC SYMBOL



V<sub>CC</sub> = Pin 14  
GND = Pin 7

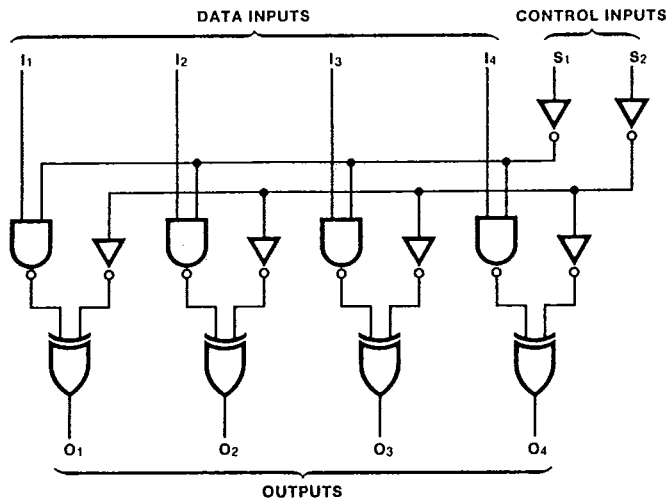
### TRUTH TABLE

SELECT INPUTS		OUTPUTS			
S <sub>1</sub>	S <sub>2</sub>	O <sub>1</sub>	O <sub>2</sub>	O <sub>3</sub>	O <sub>4</sub>
L	L	$\bar{I}_1$	$\bar{I}_2$	$\bar{I}_3$	$\bar{I}_4$
L	H	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>
H	L	H	H	H	H
H	H	L	L	L	L

H = HIGH Voltage Level  
L = LOW Voltage Level

7-43-15

LOGIC DIAGRAM



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DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER	54/74H		UNITS	CONDITIONS
		Min	Max		
V <sub>OH</sub>	Output HIGH Voltage	2.4		V	V <sub>CC</sub> = Min, I <sub>OH</sub> = -1.0 mA, V <sub>IH</sub> = 2.0 V, V <sub>IL</sub> = 0.8 V
I <sub>CC</sub>	Power Supply Current	XM	78	mA	V <sub>CC</sub> = Max
		XC	89		

AC CHARACTERISTICS: V<sub>CC</sub> = 5.0 V, T<sub>A</sub> = 25° C (See Section 3 for waveforms and load configurations)

SYMBOL	PARAMETER	54/74H		UNITS	CONDITIONS
		C <sub>L</sub> = 25 pF R <sub>L</sub> = 280 Ω			
		Min	Max		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay I <sub>n</sub> to O <sub>n</sub>	20 19		ns	Figs. 3-1, 3-20
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay S <sub>n</sub> to O <sub>n</sub>	25 25			