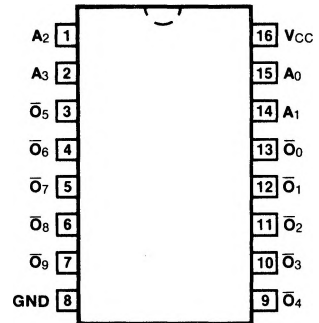


# 9302

## 1-OF-10 DECODER

(With Open-Collector Outputs)

### CONNECTION DIAGRAM PINOUT A



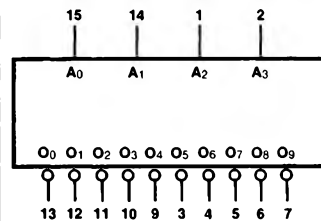
**DESCRIPTION** — The '02 is a multipurpose decoder designed to accept four inputs and provide ten mutually exclusive outputs. The open-collector outputs provide wired-OR capability which can be used for numerous summing, decoding and demultiplexing operations.

- **OUTPUTS HAVE WIRED-OR CAPABILITY**
- **PROVIDES CAPABILITY TO GENERATE AND SUM MINTERMS OF 3 OR 4 VARIABLES**
- **ACTIVE LOW OUTPUTS ARE USEFUL FOR DRIVING LOW VOLTAGE LAMPS AND RELAYS**
- **MULTIFUNCTION CAPABILITY**
- **MUTUALLY EXCLUSIVE OUTPUTS**
- **DEMULPLEXING CAPABILITY**
- **TYPICAL POWER DISSIPATION OF 145 mW**

**ORDERING CODE:** See Section 9

PKGS	PIN OUT	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
		$V_{CC} = +5.0\text{ V} \pm 5\%$ , $T_A = 0^\circ\text{C to } +70^\circ\text{C}$	$V_{CC} = +5.0\text{ V} \pm 10\%$ , $T_A = -55^\circ\text{C to } +125^\circ\text{C}$	
Plastic DIP (P)	A	9302PC		9B
Ceramic DIP (D)	A	9302DC	9302DM	6B
Flatpak (F)	A	9302FC	9302FM	4L

### LOGIC SYMBOL



$V_{CC}$  = Pin 16  
GND = Pin 8

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

PIN NAMES	DESCRIPTION	93XX (U.L.) HIGH/LOW
$A_0 - A_3$	Address Inputs	1.0/1.0
$O_0 - O_9$	Decoder Outputs (Active LOW)	OC*/10

\*OC — Open Collector

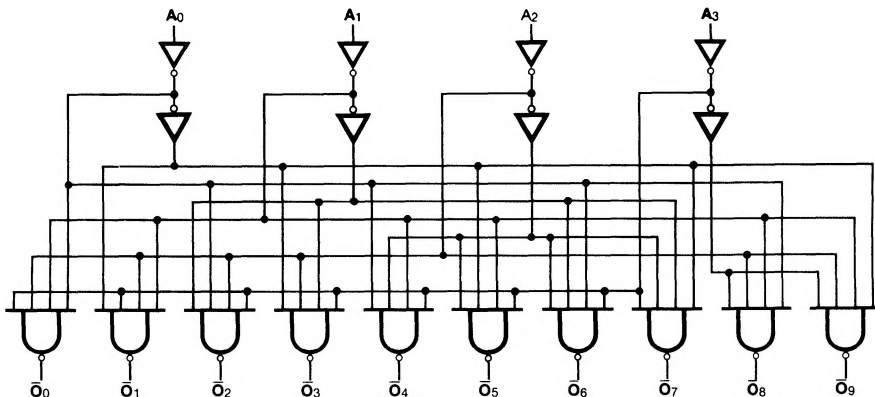
**FUNCTIONAL DESCRIPTION** — The '02 decoder accepts four active HIGH BCD inputs and provides ten mutually exclusive active LOW outputs, as shown by the logic symbol. The open-collector outputs provide easy summing of input terms. The '02 provides the capability in one package to generate and sum any or all of the minterms of three variables, or the first 10-or-16 minterms of four variables. The logic design of the '02 ensures that all outputs are HIGH when binary codes greater than nine are applied to the inputs. The most significant input ( $A_3$ ) produces a useful inhibit function when the '02 is used as a 1-of-8 decoder.

**TRUTH TABLE**

INPUTS				OUTPUTS									
$A_0$	$A_1$	$A_2$	$A_3$	$\bar{O}_0$	$\bar{O}_1$	$\bar{O}_2$	$\bar{O}_3$	$\bar{O}_4$	$\bar{O}_5$	$\bar{O}_6$	$\bar{O}_7$	$\bar{O}_8$	$\bar{O}_9$
L	L	L	L	L	H	H	H	H	H	H	H	H	H
H	L	L	L	H	L	H	H	H	H	H	H	H	H
L	H	L	L	H	H	L	H	H	H	H	H	H	H
H	H	L	L	H	H	H	L	H	H	H	H	H	H
L	L	H	L	H	H	H	H	L	H	H	H	H	H
H	L	H	L	H	H	H	H	H	L	H	H	H	H
L	H	H	L	H	H	H	H	H	H	L	H	H	H
H	H	H	L	H	H	H	H	H	H	H	L	H	H
L	L	L	H	H	H	H	H	H	H	H	H	L	H
H	L	L	H	H	H	H	H	H	H	H	H	H	L
L	H	L	H	H	H	H	H	H	H	H	H	H	H
H	H	L	H	H	H	H	H	H	H	H	H	H	H
L	L	H	H	H	H	H	H	H	H	H	H	H	H
H	L	H	H	H	H	H	H	H	H	H	H	H	H
L	H	H	H	H	H	H	H	H	H	H	H	H	H
H	H	H	H	H	H	H	H	H	H	H	H	H	H

H = HIGH Voltage Level  
L = LOW Voltage Level

**LOGIC DIAGRAM**



**DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE** (unless otherwise specified)

SYMBOL	PARAMETER	93XX		UNITS	CONDITIONS
		Min	Max		
I <sub>C</sub> EX	Output HIGH Leakage Current		250	μA	V <sub>CC</sub> = Min, V <sub>CEX</sub> = 5.5 V V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> per Truth Table
I <sub>CC</sub>	Power Supply Current		44	mA	V <sub>CC</sub> = Max

**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	93XX		UNITS	CONDITIONS
		C <sub>L</sub> = 15 pF R <sub>L</sub> = 400 Ω			
		Min	Max		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay A <sub>n</sub> to $\bar{O}_n$		35 30	ns	Figs. 3-2, 3-20