

# 9315

## 1-OF-10 DECODER

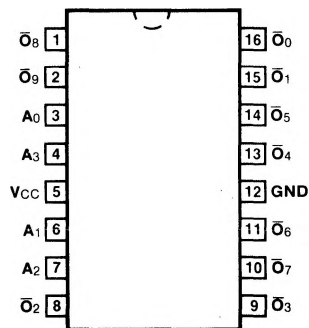
**DESCRIPTION** — The '15 accepts 1248 binary coded decimal inputs and provides ten mutually exclusive outputs to directly control the ionizing potentials of many gas filled cold cathode indicator tubes. The '15 is a pin-for-pin equivalent to the 7441 and is similar in operation to the  $C_{\mu}L9960$  but can be driven from any TTL or DTL product.

- **STABLE HIGH VOLTAGE OUTPUT CHARACTERISTICS**
- **DIRECT DISPLAY DRIVE CAPABILITY**
- **BCD ACTIVE HIGH INPUTS**
- **BLANKING TEST MODE**
- **-55°C to +125°C TEMPERATURE CAPABILITY**

**ORDERING CODE:** See Section 9

| PKGS            | PIN OUT | COMMERCIAL GRADE  | MILITARY GRADE  | PKG TYPE |
|-----------------|---------|---|---|----------|
|                 |         | $V_{CC} = +5.0\text{ V} \pm 5\%$ ,<br>$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ | $V_{CC} = +5.0\text{ V} \pm 10\%$ ,<br>$T_A = -55^{\circ}\text{C to } +125^{\circ}\text{C}$ |          |
| Plastic DIP (P) | A       | 9315PC  |   | 9B       |
| Ceramic DIP (D) | A       | 9315DC  | 9315DM  | 6B       |
| Flatpak (F)     | A       | 9315FC  | 9315FM  | 4L       |

### CONNECTION DIAGRAM PINOUT A

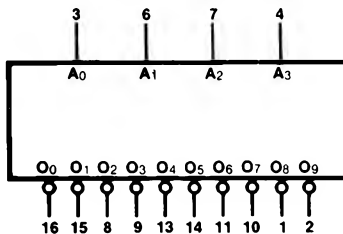


**INPUT LOADING/FAN-OUT:** See Section 3 for U.L. definitions

| PIN NAMES                              | DESCRIPTION   | 93XX (U.L.)<br>HIGH/LOW |
|--|---|-------------------------|
| $A_0 - A_3$<br>$\bar{O}_0 - \bar{O}_9$ | Address (Data) Inputs<br>Decoder Outputs (Active LOW) | 0.13/0.94<br>OC*/7.0 mA |

\*OC — Open Collector

### LOGIC SYMBOL



$V_{CC} = \text{Pin } 5$   
 $\text{GND} = \text{Pin } 12$

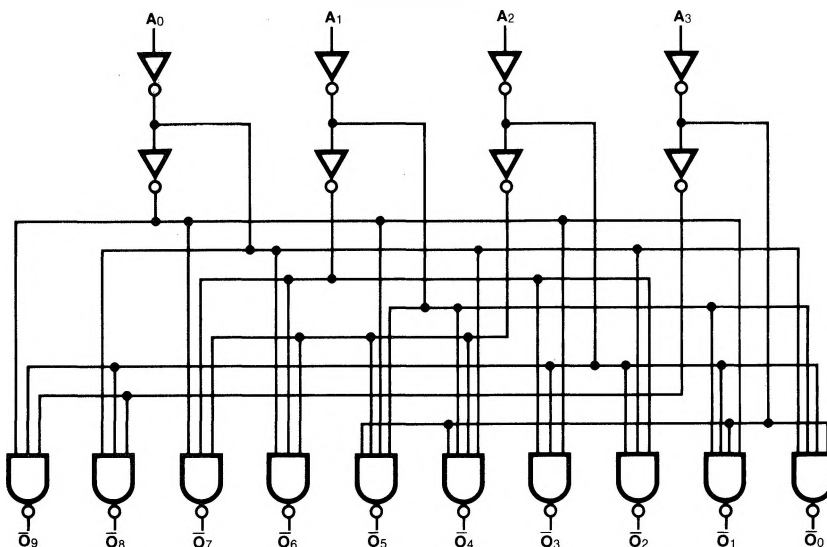
**FUNCTIONAL DESCRIPTION** — The 1-of-10 decoder/driver accepts BCD inputs from all TTL circuits and produces the correct output selection to directly drive gas filled cold cathode indicator tubes. The outputs are selected as shown in the Truth Table. It is capable of driving all known available cold cathode indicator tubes having 7.0 mA or less cathode current. Unused input codes 12 and 13 cause all the outputs to remain HIGH; no cathode will be selected. This results in the indicator tube being blanked. Using this feature for blanking may cause a slight glow to appear in the tube.

**TRUTH TABLE**

|    | INPUTS         |                |                |                | OUTPUTS     |             |             |             |             |             |             |             |             |             |
|----|----------------|----------------|----------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|    | A <sub>0</sub> | A <sub>1</sub> | A <sub>2</sub> | A <sub>3</sub> | $\bar{O}_0$ | $\bar{O}_1$ | $\bar{O}_2$ | $\bar{O}_3$ | $\bar{O}_4$ | $\bar{O}_5$ | $\bar{O}_6$ | $\bar{O}_7$ | $\bar{O}_8$ | $\bar{O}_9$ |
| 0  | L              | L              | L              | L              | L           | H           | H           | H           | H           | H           | H           | H           | H           | H           |
| 1  | H              | L              | L              | L              | H           | L           | H           | H           | H           | H           | H           | H           | H           | H           |
| 2  | L              | H              | L              | L              | H           | H           | L           | H           | H           | H           | H           | H           | H           | H           |
| 3  | H              | H              | L              | L              | H           | H           | H           | L           | H           | H           | H           | H           | H           | H           |
| 4  | L              | L              | H              | L              | H           | H           | H           | H           | L           | H           | H           | H           | H           | H           |
| 5  | H              | L              | H              | L              | H           | H           | H           | H           | H           | L           | H           | H           | H           | H           |
| 6  | L              | H              | H              | L              | H           | H           | H           | H           | H           | H           | L           | H           | H           | H           |
| 7  | H              | H              | H              | L              | H           | H           | H           | H           | H           | H           | H           | L           | H           | H           |
| 8  | L              | L              | L              | H              | H           | H           | H           | H           | H           | H           | H           | H           | L           | H           |
| 9  | H              | L              | L              | H              | H           | H           | H           | H           | H           | H           | H           | H           | H           | L           |
| 10 | L              | H              | L              | H              | H           | H           | L           | H           | H           | H           | H           | H           | L           | H           |
| 11 | H              | H              | L              | H              | H           | H           | H           | L           | H           | H           | H           | H           | H           | L           |
| 12 | L              | L              | H              | H              | H           | H           | H           | H           | H           | H           | H           | H           | H           | H           |
| 13 | H              | L              | H              | H              | H           | H           | H           | H           | H           | H           | H           | H           | H           | H           |
| 14 | L              | H              | H              | H              | H           | H           | H           | H           | H           | H           | L           | H           | H           | H           |
| 15 | H              | H              | H              | H              | H           | H           | H           | H           | H           | H           | H           | L           | H           | H           |

H = HIGH Voltage Level  
L = LOW Voltage Level  
X = Immaterial

**LOGIC DIAGRAM**



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

| SYMBOL          | PARAMETER            |    | 93XX |      | UNITS | CONDITIONS   |
|-----------------|----------------------|----|------|------|-------|--|
|                 |                      |    | Min  | Max  |       |  |
| V <sub>OH</sub> | Output HIGH Voltage  |    | 70   |      | V     | V <sub>CC</sub> = Max, Force 2.0 mA into HIGH Output   |
| V <sub>OL</sub> | Output LOW Voltage   | XM | 2.5  |      | V     | V <sub>CC</sub> = Min, I <sub>OL</sub> = 7.0 mA<br>Inputs at Threshold Voltages, (V <sub>IL</sub> or V <sub>IH</sub> ) as per Truth Table            |
|                 |                      | XC | 3.0  |      |       |  |
| V <sub>IH</sub> | Input HIGH Voltage   | XM | 1.9  |      | V     | Guaranteed Input HIGH Threshold Voltage  |
|                 |                      | XC | 2.0  |      |       |  |
| V <sub>IL</sub> | Input LOW Voltage    | XM | 1.1  |      | V     | Guaranteed Input LOW Threshold Voltage   |
|                 |                      | XC | 0.85 |      |       |  |
| I <sub>OH</sub> | Output HIGH Current  | XM | 20   |      | μA    | V <sub>CC</sub> = Max, V <sub>OUT</sub> = 55 V<br>Inputs at Threshold Voltages, (V <sub>IL</sub> = Gnd, V <sub>IH</sub> = 4.5 V), as per Truth Table |
|                 |                      | XC | 40   |      |       |  |
| I <sub>IH</sub> | Input HIGH Current   | XM | 2.0  |      | μA    | V <sub>CC</sub> = Max, V <sub>IN</sub> = 4.5 V<br>Other Inputs Open  |
|                 |                      | XC | 5.0  |      |       |  |
| I <sub>IL</sub> | Input LOW Current    |    |      | -1.5 | mA    | V <sub>CC</sub> = Max, V <sub>IN</sub> = 0.4 V<br>Other Inputs Open  |
| I <sub>CC</sub> | Power Supply Current | XM | 29   |      | mA    | V <sub>CC</sub> = 5.0 V, No Connection to Input or Output Pins   |
|                 |                      | XC | 31   |      |       |  |