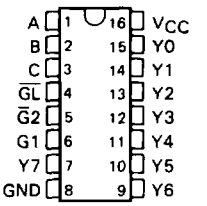
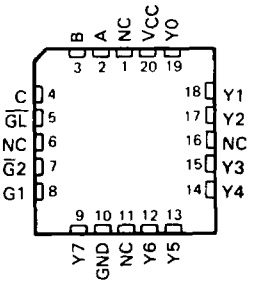
- **Inputs are TTL-Voltage Compatible**
- **Combines Decoder and 3-Bit Address Latch**
- **Incorporates 2 Output Enables to Simplify Cascading**
- **Package Options Include Ceramic Chip Carriers and Standard Plastic and Ceramic 300-mil DIPs**
- **Dependable Texas Instruments Quality and Reliability**

**SN54HCT237 . . . J PACKAGE**
**SN74HCT237 . . . N PACKAGE**
**(TOP VIEW)**




**SN54HCT237 . . . FK PACKAGE**
**(TOP VIEW)**



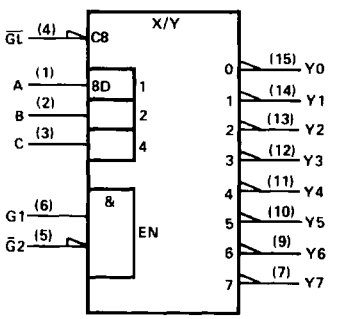

NC – No internal connection

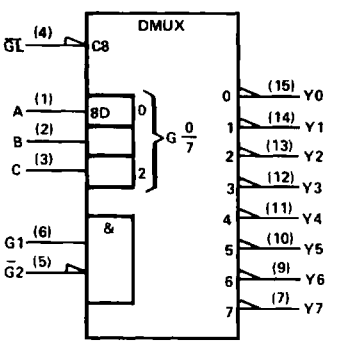
## description

The 'HCT237 is a three-line to eight-line decoder/demultiplexer with latches on the three address inputs. When the latch-enable input ($\overline{GL}$) is low, the 'HCT237 acts as a decoder/demultiplexer. When $\overline{GL}$ goes from low to high, the address present at the select inputs (A, B, and C) is stored in the latches. Further address changes are ignored as long as $\overline{GL}$ remains high. The output enable controls, G1 and $\overline{G2}$, control the outputs independently of the select or latch-enable inputs. All of the outputs are forced low if G1 is low or $\overline{G2}$ is high. The 'HCT237 is ideally suited for implementing glitch-free decoders in strobed (stored-address) applications in bus-oriented systems.

The SN54HCT237 is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74HCT237 is characterized for operation from −40°C to 85°C.

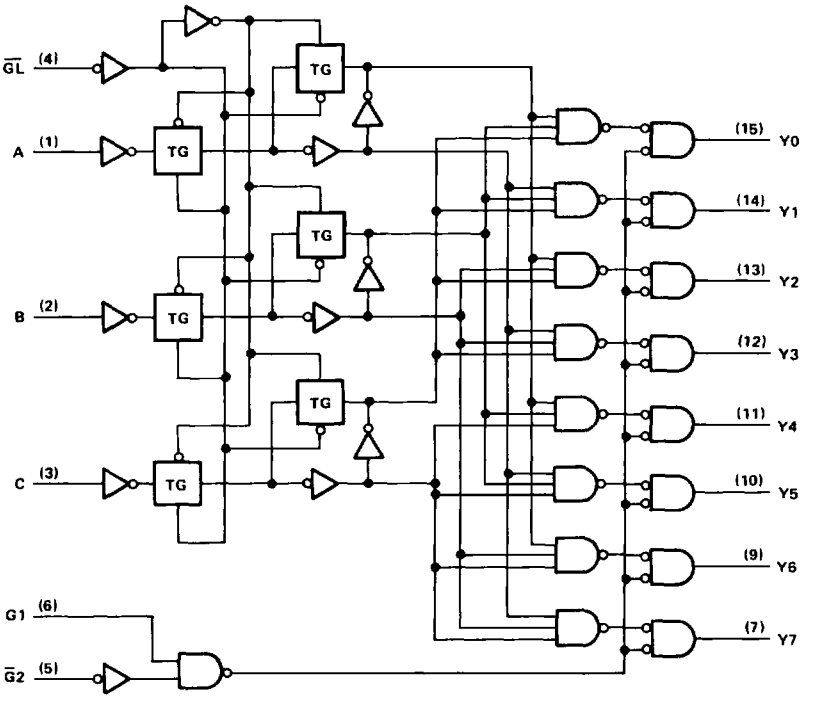
## logic symbols (alternatives)†




†These symbols are in accordance with ANS/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for J and N packages.

## logic diagram (positive logic)




Pin numbers shown are for J and N packages.

**FUNCTION TABLE**

| INPUTS | | | | | | OUTPUTS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENABLE | | | SELECT | | | | | | | | | | |
| $\overline{G1}$ | G1 | $\overline{G2}$ | C | B | A | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 |
| X | X | H | X | X | X | L | L | L | L | L | L | L | L |
| X | L | X | X | X | X | L | L | L | L | L | L | L | L |
| L | H | L | L | L | L | H | L | L | L | L | L | L | L |
| L | H | L | L | L | H | L | H | L | L | L | L | L | L |
| L | H | L | L | H | L | L | L | H | L | L | L | L | L |
| L | H | L | L | H | H | L | L | L | H | L | L | L | L |
| L | H | L | H | L | L | L | L | L | L | H | L | L | L |
| L | H | L | H | L | H | L | L | L | L | L | H | L | L |
| L | H | L | H | H | L | L | L | L | L | L | L | H | L |
| L | H | L | H | H | H | L | L | L | L | L | L | L | H |
| H | H | L | X | X | X | Output corresponding to stored address, L; all others, H | | | | | | | |



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### absolute maximum ratings over operating free-air temperature range†

Supply voltage, $V_{CC}$ . . . . . −0.5 V to 7 V
Input clamp current, $I_{IK}$ ($V_I < 0$ or $V_I > V_{CC}$) . . . . . ±20 mA
Output clamp current, $I_{OK}$ ($V_O < 0$ or $V_O > V_{CC}$) . . . . . ±20 mA
Continuous output current, $I_O$ ($V_O = 0$ to $V_{CC}$) . . . . . ±25 mA
Continuous current through $V_{CC}$ or GND pins . . . . . ±50 mA
Lead temperature 1,6 mm (1/16 in) from case for 60 s: FK or J package . . . . . 300°C
Lead temperature 1,6 mm (1/16 in) from case for 10 s: N package . . . . . 260°C
Storage temperature range . . . . . −65°C to 150°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

### recommended operating conditions

| | | | SN54HCT237 | | | SN74HCT237 | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | NOM | MAX | MIN | NOM | MAX | |
| $V_{CC}$ | Supply voltage | | 4.5 | 5 | 5.5 | 4.5 | 5 | 5.5 | V |
| $V_{IH}$ | High-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | 2 | | | 2 | | | V |
| $V_{IL}$ | Low-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | 0 | | 0.8 | 0 | | 0.8 | V |
| $V_I$ | Input voltage | | 0 | | $V_{CC}$ | 0 | | $V_{CC}$ | V |
| $V_O$ | Output voltage | | 0 | | $V_{CC}$ | 0 | | $V_{CC}$ | V |
| $t_t$ | Input transition (rise and fall) times | | 0 | | 500 | 0 | | 500 | ns |
| $T_A$ | Operating free-air temperature | | −55 | | 125 | −40 | | 85 | °C |

### electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | $V_{CC}$ | $T_A$ = 25°C | | | SN54HCT237 | | SN74HCT237 | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| $V_{OH}$ | $V_I = V_{IH}$ or $V_{IL}$, $I_{OH}$ = −20 μA | 4.5 V | 4.4 | 4.499 | | 4.4 | | 4.4 | | V |
| | $V_I = V_{IH}$ or $V_{IL}$, $I_{OH}$ = −4 mA | 4.5 V | 3.98 | 4.30 | | 3.7 | | 3.84 | | |
| $V_{OL}$ | $V_I = V_{IH}$ or $V_{IL}$, $I_{OL}$ = 20 μA | 4.5 V | | 0.001 | 0.1 | | 0.1 | | 0.1 | V |
| | $V_I = V_{IH}$ or $V_{IL}$, $I_{OL}$ = 4 mA | 4.5 V | | 0.17 | 0.26 | | 0.4 | | 0.33 | |
| $I_I$ | $V_I = V_{CC}$ or 0 | 5.5 V | | ±0.1 | ±100 | | ±1000 | | ±1000 | nA |
| $I_{CC}$ | $V_I = V_{CC}$ or 0, $I_O$ = 0 | 5.5 V | | | 8 | | 160 | | 80 | μA |
| $\Delta I_{CC}$‡ | One input at 0.5 V or 2.4 V, Other inputs at 0 V or $V_{CC}$ | 5.5 V | | 1.4 | 2.4 | | 3.0 | | 2.9 | mA |
| $C_i$ | | 4.5 to 5.5 V | | 3 | 10 | | 10 | | 10 | pF |

‡ This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather than 0 V or $V_{CC}$.

**timing requirements over recommended operating free-air temperature range (unless otherwise noted)**

| | | $V_{CC}$ | $T_A$ = 25°C | | SN54HCT237 | | SN74HCT237 | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | MAX | MIN | MAX | MIN | MAX | |
| $t_w$ | Pulse duration, $\overline{GL}$ low | 4.5 V | 26 | | 39 | | 33 | | ns |
| | | 5.5 V | 23 | | 35 | | 30 | | |
| $t_{su}$ | Setup time, A, B, and C before $\overline{GL}$↑ | 4.5 V | 15 | | 23 | | 19 | | ns |
| | | 5.5 V | 14 | | 21 | | 17 | | |
| $t_h$ | Hold time, A, B, and C after $\overline{GL}$↑ | 4.5 V | 5 | | 5 | | 5 | | ns |
| | | 5.5 V | 5 | | 5 | | 5 | | |

**switching characteristics over recommended operating free-air temperature range (unless otherwise noted), $C_L$ = 50 pF (see Note 1)**

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC}$ | $T_A$ = 25°C | | | SN54HCT237 | | SN74HCT237 | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| $t_{pd}$ | A, B, C | Any | 4.5 V | | 24 | 38 | | 57 | | 48 | ns |
| | | | 5.5 V | | 20 | 34 | | 51 | | 43 | |
| $t_{pd}$ | $\overline{G2}$ | Any | 4.5 V | | 19 | 29 | | 44 | | 36 | ns |
| | | | 5.5 V | | 16 | 26 | | 40 | | 32 | |
| $t_{pd}$ | G1 | Any | 4.5 V | | 19 | 29 | | 44 | | 36 | ns |
| | | | 5.5 V | | 16 | 26 | | 40 | | 32 | |
| $t_{pd}$ | $\overline{GL}$ | Any | 4.5 V | | 29 | 42 | | 63 | | 52 | ns |
| | | | 5.5 V | | 25 | 36 | | 57 | | 47 | |
| $t_t$ | | Any | 4.5 V | | 12 | 15 | | 22 | | 19 | ns |
| | | | 5.5 V | | 11 | 14 | | 20 | | 17 | |

| | | | |
|---|---|---|---|
| $C_{pd}$ | Power dissipation capacitance | No load, $T_A$ = 25°C | 85 pF typ |

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.