

EXCESS 3-TO-DECIMAL DECODER

S5443 N7443

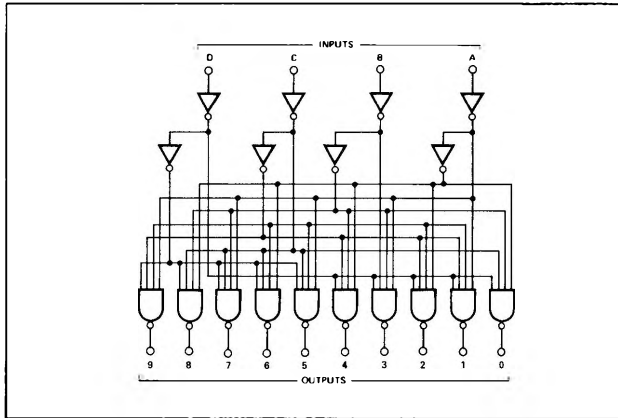
S5443-B,F,W • N7443-B

DIGITAL 54/74 TTL SERIES

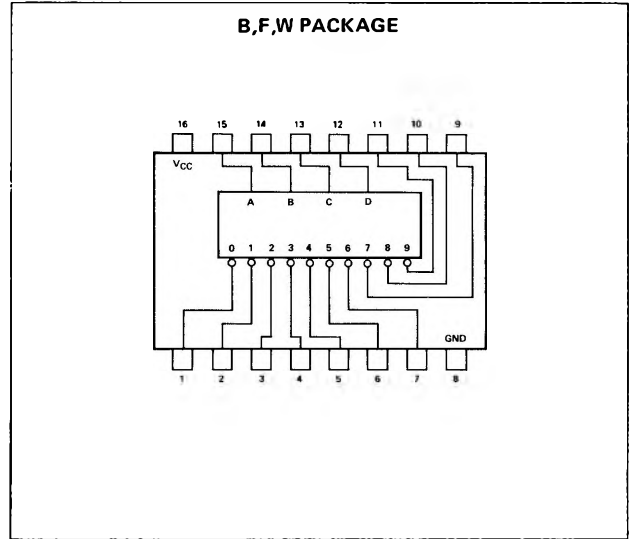
DESCRIPTION

The 54/7443 Excess 3 Code to Decimal Decoder is a TTL MSI array utilized in decoding and logic conversion application. The 54/7443 decodes excess 3 code numbers to one of ten outputs.

LOGIC DIAGRAM



PIN CONFIGURATIONS



TRUTH TABLE

| S5443/N7443 EXCESS INPUT | | | | ALL TYPES DECIMAL OUTPUT | | | | | | | | | |
|--------------------------------|---|---|---|--------------------------------|---|---|---|---|---|---|---|---|---|
| D | C | B | A | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

RECOMMENDED OPERATING CONDITIONS

| | MIN | NOM | MAX | UNIT |
|--|------|-----|------|------|
| Supply Voltage V_{CC} : S5443 Circuits | 4.5 | 5 | 5.5 | V |
| N7443 Circuits | 4.75 | 5 | 5.25 | V |
| Normalized Fan-Out from each Output, N | | | 10 | |

SIGNETICS DIGITAL 54/74 TTL SERIES - S5443 • N7443

ELECTRICAL CHARACTERISTICS (over recommended operating free-air temperature range unless otherwise noted)

| PARAMETER | | TEST CONDITIONS* | MIN | TYP** | MAX | UNIT |
|--------------|--|---|------------|----------|------------|----------|
| $V_{in(1)}$ | Input voltage required to ensure logical 1 at any input terminal | $V_{CC} = \text{MIN}$ | 2 | | | V |
| $V_{in(0)}$ | Input voltage required to ensure logical 0 at any input terminal | $V_{CC} = \text{MIN}$ | | | 0.8 | V |
| $V_{out(1)}$ | Logical 1 output voltage | $V_{CC} = \text{MIN}, V_{in(1)} = 2V, V_{in(0)} = 0.8V, I_{load} = -400\mu A$ | 2.4 | | | V |
| $V_{out(0)}$ | Logical 0 output voltage | $V_{CC} = \text{MIN}, V_{in(1)} = 2V, V_{in(0)} = 0.8V, I_{sink} = 16mA$ | | | 0.4 | V |
| $I_{in(1)}$ | Logical 1 level input current (each input) | $V_{CC} = \text{MAX}, V_{in} = 2.4V$ | | | 40 | μA |
| $I_{in(0)}$ | Logical 0 level input current (each input) | $V_{CC} = \text{MAX}, V_{in} = 5.5V$ | | | 1 | mA |
| $I_{in(0)}$ | Logical 0 level input current (each input) | $V_{CC} = \text{MAX}, V_{in} = 0.4V$ | | | -1.6 | mA |
| I_{OS} | Short-circuit output current† | $V_{CC} = \text{MAX},$ S5443 N7443 | -20 -18 | | -55 -55 | mA mA |
| I_{CC} | Supply current | $V_{CC} = \text{MAX},$ S5443 N7443 | | 28 28 | 41 56 | mA mA |

SWITCHING CHARACTERISTICS, $V_{CC} = 5V, T_A = 25^\circ C, N = 10$

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------|--|-------------------------------|-----|-----|-----|------|
| t_{pd0} | Propagation delay time to logical 0 level through two logic levels | $C_L = 15pF, R_L = 400\Omega$ | 10 | 22 | 30 | ns |
| t_{pd0} | Propagation delay time to logical 0 level through three logic levels | $C_L = 15pF, R_L = 400\Omega$ | | 23 | 35 | ns |
| t_{pd1} | Propagation delay time to logical 1 level through two logic levels | $C_L = 15pF, R_L = 400\Omega$ | 10 | 17 | 25 | ns |
| t_{pd1} | Propagation delay time to logical 1 level through three logic levels | $C_L = 15pF, R_L = 400\Omega$ | | 26 | 35 | ns |

* For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions of the applicable device type.

** All typical values are at $V_{CC} = 5V, T_A = 25^\circ C$.

† Not more than one output should be shorted at a time.