

Am25LS2521

Eight-Bit Equal-to Comparator

DISTINCTIVE CHARACTERISTICS

- 8-bit byte oriented equal comparator
- Cascadable using \bar{E}_{IN}
- High-speed, Low-Power Schottky technology
- $t_{pd} A \cdot B$ to \bar{E}_{OUT} in 9ns
- Standard 20-pin package

GENERAL DESCRIPTION

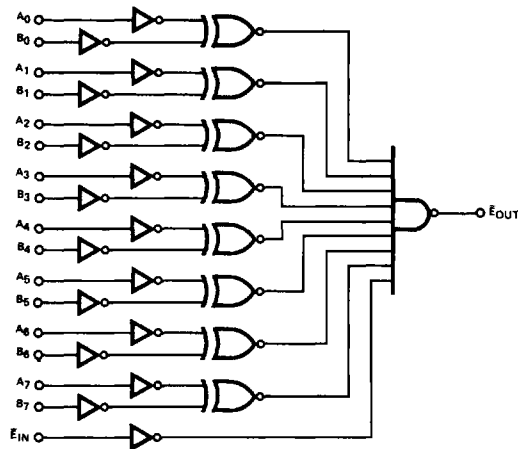
The Am25LS2521 is an 8-bit "equal to" comparator capable of comparing two 8-bit words for "equal to" with provision for expansion or external enabling. The matching of the two 8-bit inputs plus a logic LOW on the \bar{E}_{IN} produces an active LOW on the output \bar{E}_{OUT} .

The logic expression for the device can be expressed as:

$$\bar{E}_{OUT} = (\bar{A}_0 \odot \bar{B}_0) (A_1 \odot B_1) (A_2 \odot B_2) (A_3 \odot B_3) (A_4 \odot B_4)$$

$(A_5 \odot B_5) (A_6 \odot B_6) (A_7 \odot B_7) \bar{E}_{IN}$. It is obvious that the expression is valid where $A_0 - A_7$ and $B_0 - B_7$ are expressed as either assertions or negations. This is also true for pair of terms i.e. A_0 can be compared with B_0 at the same time \bar{A}_1 is compared with B_1 . It is only essential that the polarity of the paired terms be maintained.

BLOCK DIAGRAM

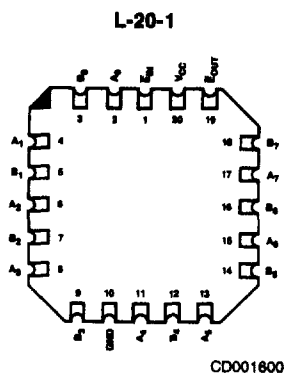
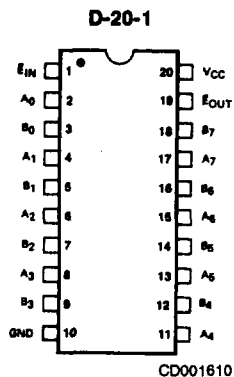


BD001390

RELATED PRODUCTS

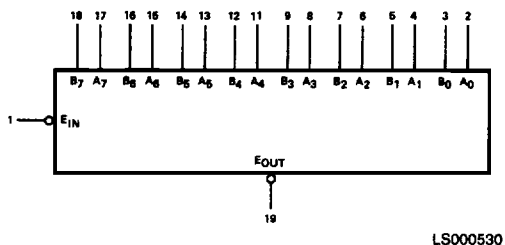
| Part No. | Description |
|----------|---------------------|
| Am29806 | Chip Select Decoder |
| Am29809 | 9-Bit Comparator |

CONNECTION DIAGRAM Top View

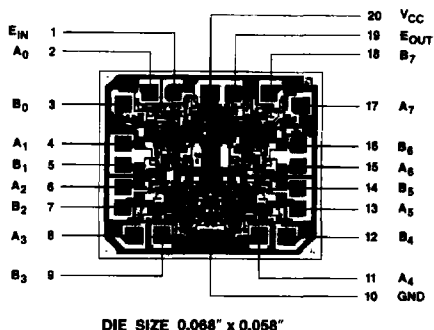


Note: Pin 1 is marked for orientation

LOGIC SYMBOL

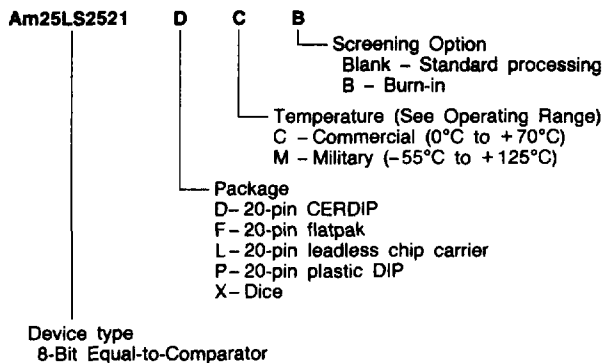


METALLIZATION AND PAD LAYOUT



ORDERING INFORMATION

AMD products are available in several packages and operating ranges. The order number is formed by a combination of the following: Device number, speed option (if applicable), package type, operating range and screening option (if desired).



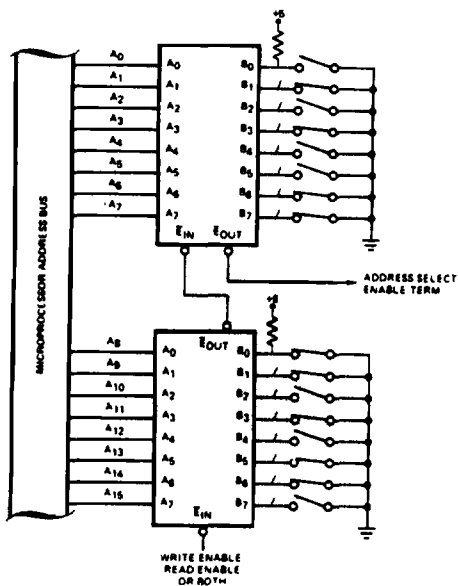
| Valid Combinations | |
|--------------------|--|
| Am25LS2521 | PC DC, DM FM LC, LM XC, XM |

Valid Combinations
Consult the AMD sales office in your area to determine if a device is currently available in the combination you wish.

PIN DESCRIPTION

| Pin No. | Name | I/O | Description |
|---------|--------------------------------|-----|--------------------------|
| | A ₀ -A ₇ | I | A input to comparator. |
| | B ₀ -B ₇ | I | B input to comparator. |
| 1 | E _{IN} | I | Enable active LOW. |
| 19 | E _{OUT} | O | EQUAL output active LOW. |

APPLICATION



AF000651

Note: This part does not have internal pull up resistors. In this application external pull ups should be added to the 16 ports.

**MICROPROCESSOR ENABLE CONTROLLED,
SELECTABLE, ADDRESS DECODER**

**MAX, ENABLE (HIGH-to-LOW) DELAY
OVER 16-BITS
(Commercial Range)**

| | | |
|------------------|---|--------|
| t _{PHL} | A ₁ or B ₁ to E _{OUT} | 19ns |
| t _{PHL} | E _{IN} to E _{OUT} | 12.5ns |
| Total | | 31.5ns |

ABSOLUTE MAXIMUM RATINGS

Storage Temperature -65°C to +150°C
 (Ambient) Temperature Under Bias -55°C to +125°C
 Supply Voltage to Ground Potential
 Continuous -0.5V to +7.0V
 DC Voltage Applied to Outputs For
 High Output State -0.5V to +V_{CC} max
 DC Input Voltage -0.5V to +7.0V
 DC Output Current, Into Outputs 30mA
 DC Input Current -30mA to +5.0mA

Stresses above those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability.

OPERATING RANGES

Commercial (C) Devices
 Temperature 0°C to +70°C
 Supply Voltage +4.75V to +5.25V
 Military (M) Devices
 Temperature -55°C to +125°C
 Supply Voltage +4.5V to +5.5V
Operating ranges define those limits over which the functionality of the device is guaranteed.

DC CHARACTERISTICS over operating range unless otherwise specified

| Parameters | Description | Test Conditions (Note 2) | Min | Typ (Note 1) | Max | Units |
|-----------------|---------------------------------------|---|---------------------------------|--------------|-------|-------|
| V _{OH} | Output HIGH Voltage | V _{CC} = MIN V _{IN} = V _{IH} or V _{IL} I _{OH} = -440μA | MIL | 2.5 | | Volts |
| | | | COM'L | 2.7 | | |
| V _{OL} | Output LOW Voltage | V _{CC} = MIN V _{IN} = V _{IH} or V _{IL} | I _{OL} = 4.0 mA | | 0.4 | Volts |
| | | | I _{OL} = 8.0mA | | 0.45 | |
| | | | I _{OL} = 12mA | | 0.5 | |
| V _{IH} | Input HIGH Level | Guaranteed input logical HIGH voltage for all inputs | 2.0 | | | Volts |
| V _{IL} | Input LOW Level | Guaranteed input logical LOW voltage for all inputs. | MIL | | 0.7 | Volts |
| | | | COM'L | | 0.8 | |
| V _I | Input Clamp Voltage | V _{CC} = MIN, I _{IN} = -18mA | | | -1.5 | Volts |
| I _{IL} | Input LOW Current | V _{CC} = MAX, V _{IN} = 0.4V | A _i , B _i | | -0.36 | mA |
| | | | E | | -0.72 | |
| I _{IH} | Input HIGH Current | V _{CC} = MAX, V _{IN} = 2.7V | A _i , B _i | | 20 | μA |
| | | | E | | 40 | |
| I _I | Input HIGH Current | V _{CC} = MAX, V _{IN} = 7.0V | A _i , B _i | | 0.1 | mA |
| | | | E | | 0.2 | |
| I _{SC} | Output Short Circuit Current (Note 3) | V _{CC} = MAX | -15 | | -85 | mA |
| I _{CC} | Power Supply Current (Note 4) | V _{CC} = MAX | | 27 | 40 | mA |

- Notes: 1. Typical limits are at V_{CC} = 5.0V, 25°C ambient and maximum loading.
 2. For conditions shown as MIN or MAX, use the appropriate value specified under Operating Ranges for the applicable device type.
 3. Not more than one output should be shorted at a time. Duration of the short circuit test should not exceed one second.
 4. E = GND, all other inputs and outputs open.

SWITCHING CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{CC} = 5.0\text{V}$)

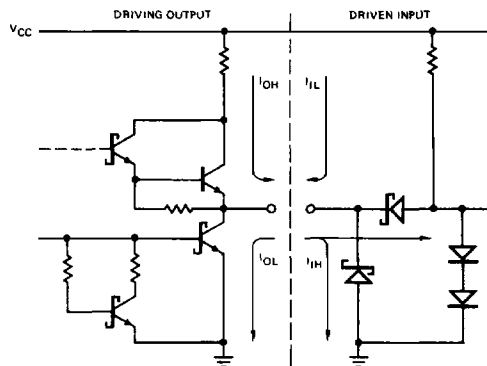
| Parameters | Description | Test Conditions | Min | Typ | Max | Units |
|------------|---|--|-----|-----|-----|-------|
| t_{PLH} | A _i or B _i to $\overline{\text{Equal}}$ | $C_L = 15\text{pF}$ $R_L = 2.0\text{k}\Omega$ | | 9 | 15 | ns |
| t_{PHL} | | | | 9 | 15 | |
| t_{PLH} | E to $\overline{\text{Equal}}$ | | | 5 | 7 | ns |
| t_{PHL} | | | | 6 | 8 | |

SWITCHING CHARACTERISTICS over operating range unless otherwise specified*

| Parameters | Description | Test Conditions | COMMERCIAL | | MILITARY | | Units |
|------------|---------------------------------------|--|------------|------|------------|-----|-------|
| | | | Am25LS2521 | | Am25LS2521 | | |
| | | | Min | Max | Min | Max | |
| t_{PLH} | A _i or B _i to | $C_L = 50\text{pF}$ $R_L = 2.0\text{k}\Omega$ | | 20 | | 22 | ns |
| t_{PHL} | Equal Output | | | 19 | | 21 | |
| t_{PLH} | E to $\overline{\text{Equal}}$ Output | | | 10.5 | | 12 | ns |
| t_{PHL} | | | | 12.5 | | 15 | |

*AC performance over the operating temperature range is guaranteed by testing defined in Group A, Subgroup 9.

Am25LS2521 LOW-POWER SCHOTTKY INPUT/OUTPUT CURRENT INTERFACE CONDITIONS



IC000180

Note: Actual current flow direction shown.