

74F521 8-Bit Identity Comparator

General Description

The 74F521 is an expandable 8-bit comparator. It compares two words of up to eight bits each and provides a LOW output when the two words match bit for bit. The expansion input $\bar{I}_{A=B}$ also serves as an active LOW enable input.

Features

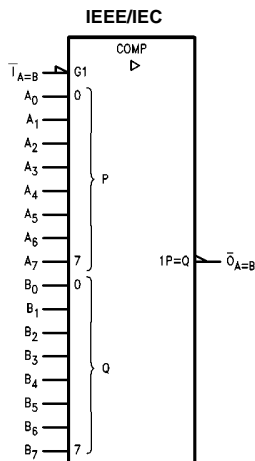
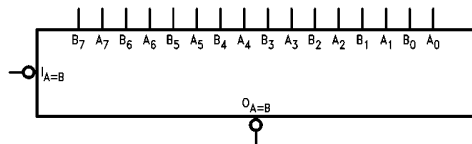
- Compares two 8-bit words in 6.5 ns typ
- Expandable to any word length
- 20-pin package

Ordering Code:

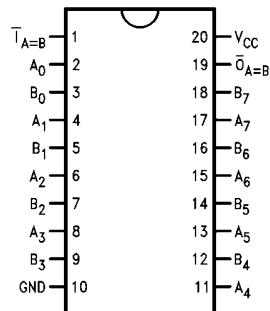
| Order Number | Package Number | Package Description |
|--------------|----------------|---|
| 74F521SC | M20B | 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide |
| 74F521SJ | M20D | 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide |
| 74F521MSA | MSA20 | 20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide |
| 74F521PC | N20A | 20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide |

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Logic Symbols



Connection Diagram



Unit Loading/Fan Out

| Pin Names | Description | U.L. | Input I_{IH}/I_{IL} |
|-----------------|--|----------|----------------------------------|
| | | HIGH/LOW | Output I_{OH}/I_{OL} |
| A_0 - A_7 | Word A Inputs | 1.0/1.0 | $20 \mu\text{A}/-0.6 \text{ mA}$ |
| B_0 - B_7 | Word B Inputs | 1.0/1.0 | $20 \mu\text{A}/-0.6 \text{ mA}$ |
| $\bar{I}_{A=B}$ | Expansion or Enable Input (Active LOW) | 1.0/1.0 | $20 \mu\text{A}/-0.6 \text{ mA}$ |
| $\bar{O}_{A=B}$ | Identity Output (Active LOW) | 50/33.3 | $-1 \text{ mA}/20 \text{ mA}$ |

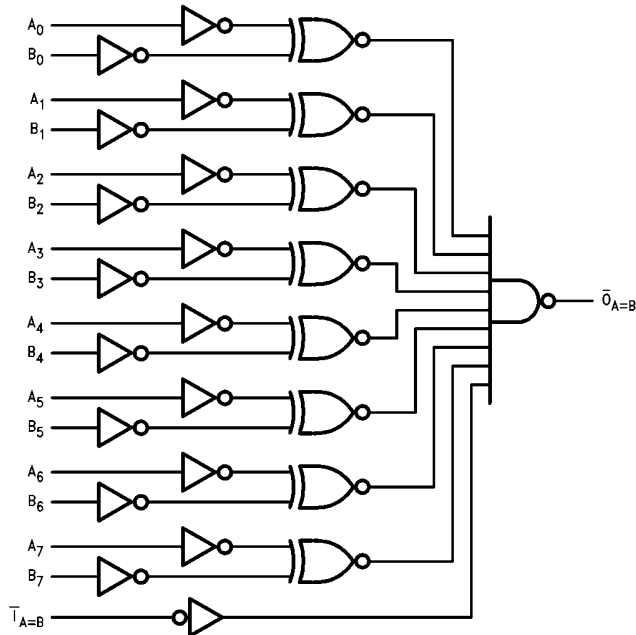
Truth Table

| Inputs | | Output |
|-----------------|----------------|-----------------|
| $\bar{I}_{A=B}$ | A, B | $\bar{O}_{A=B}$ |
| L | A = B (Note 1) | L |
| L | A \neq B | H |
| H | A = B (Note 1) | H |
| H | A \neq B | H |

H = HIGH Voltage Level
L = LOW Voltage Level

Note 1: $A_0 = B_0$, $A_1 = B_1$, $A_2 = B_2$, etc.

Logic Diagram



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

Absolute Maximum Ratings (Note 2)

| | |
|--|--------------------------------------|
| Storage Temperature | -65°C to +150°C |
| Ambient Temperature under Bias | -55°C to +125°C |
| Junction Temperature under Bias | -55°C to +150°C |
| V _{CC} Pin Potential to Ground Pin | -0.5V to +7.0V |
| Input Voltage (Note 3) | -0.5V to +7.0V |
| Input Current (Note 3) | -30 mA to +5.0 mA |
| Voltage Applied to Output in HIGH State (with V _{CC} = 0V) | |
| Standard Output | -0.5V to V _{CC} |
| 3-STATE Output | -0.5V to +5.5V |
| Current Applied to Output in LOW State (Max) | twice the rated I _{OL} (mA) |

Recommended Operating Conditions

| | |
|------------------------------|----------------|
| Free Air Ambient Temperature | 0°C to +70°C |
| Supply Voltage | +4.5V to +5.5V |

Note 2: Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Note 3: Either voltage limit or current limit is sufficient to protect inputs.

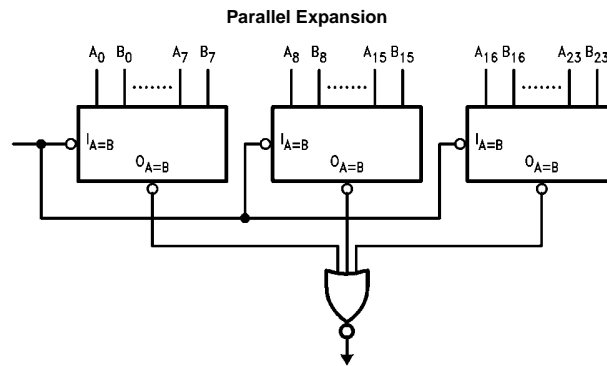
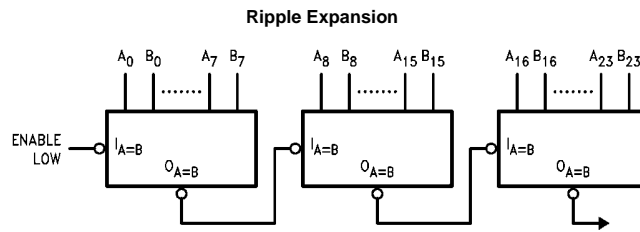
DC Electrical Characteristics

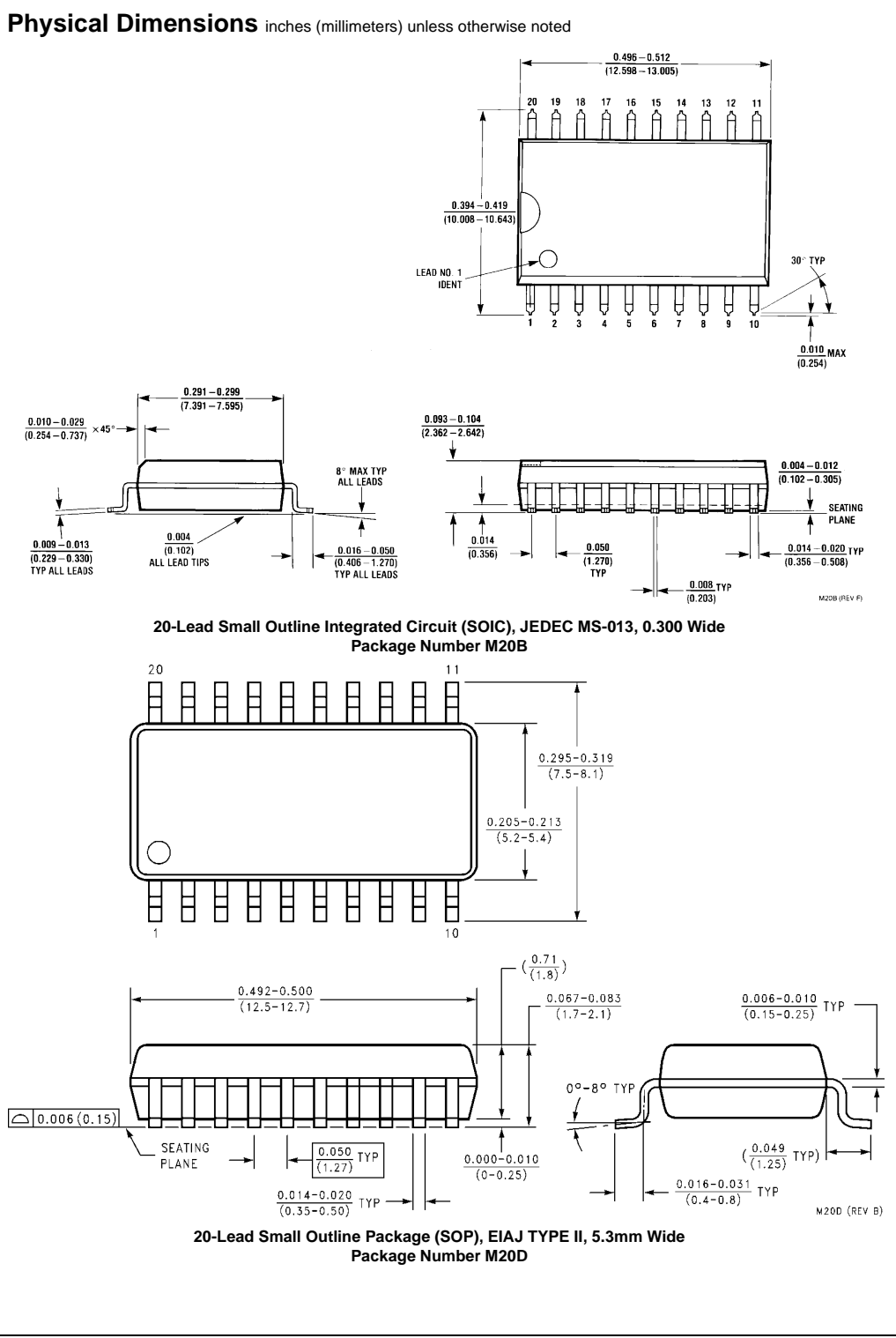
| Symbol | Parameter | Min | Typ | Max | Units | V _{CC} | Conditions |
|------------------|-----------------------------------|------|-----|------|-------|-----------------|--|
| V _{IH} | Input HIGH Voltage | 2.0 | | | V | | Recognized as a HIGH Signal |
| V _{IL} | Input LOW Voltage | | | 0.8 | V | | Recognized as a LOW Signal |
| V _{CD} | Input Clamp Diode Voltage | | | -1.2 | V | Min | I _{IN} = -18 mA |
| V _{OH} | Output HIGH | 2.5 | | | V | Min | I _{OH} = -1 mA |
| | 10% V _{CC} Voltage | 2.7 | | | | | I _{OH} = -1 mA |
| V _{OL} | Output LOW | | | 0.5 | V | Min | I _{OL} = 20 mA |
| | 10% V _{CC} Voltage | | | | | | |
| I _{IH} | Input HIGH Current | | | 5.0 | μA | Max | V _{IN} = 2.7V |
| I _{BVI} | Input HIGH Current Breakdown Test | | | 7.0 | μA | Max | V _{IN} = 7.0V |
| I _{CEX} | Output HIGH Leakage Current | | | 50 | μA | Max | V _{OUT} = V _{CC} |
| V _{ID} | Input Leakage Test | 4.75 | | | V | 0.0 | I _{ID} = 1.9 μA All Other Pins Grounded |
| I _{OD} | Output Leakage Circuit Current | | | 3.75 | μA | 0.0 | V _{IOD} = 150 mV All Other Pins Grounded |
| I _{IL} | Input LOW Current | | | -0.6 | mA | Max | V _{IN} = 0.5V |
| I _{OS} | Output Short-Circuit Current | -60 | | -150 | mA | Max | V _{OUT} = 0V |
| I _{CCH} | Power Supply Current | | 21 | 32 | mA | Max | V _O = HIGH |

AC Electrical Characteristics

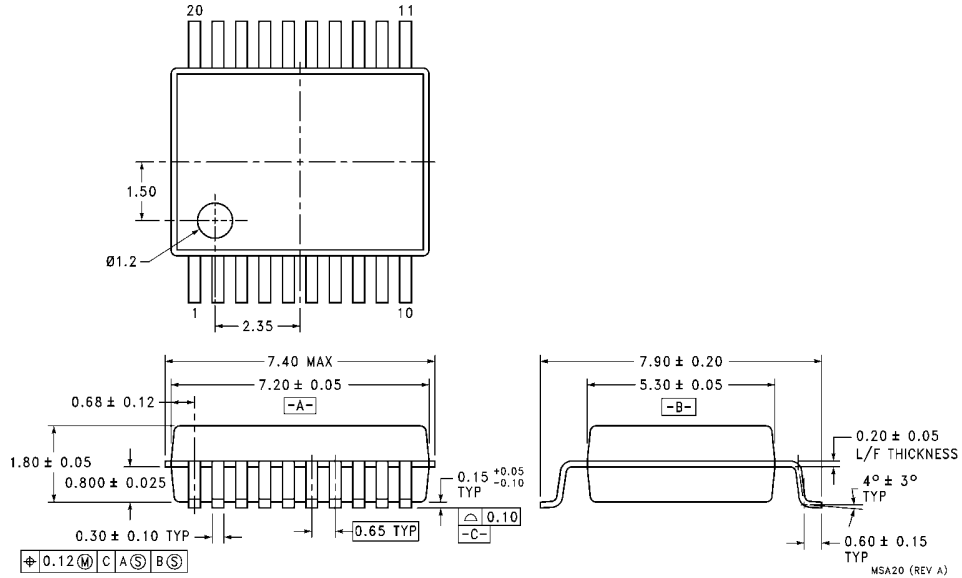
| Symbol | Parameter | $T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$ | | | $T_A = -55^\circ\text{C to } +125^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$ | | $T_A = 0^\circ\text{C to } +70^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$ | | Units |
|-----------|--|--|-----|------|---|------|--|------|-------|
| | | Min | Typ | Max | Min | Max | Min | Max | |
| t_{PLH} | Propagation Delay | 3.0 | 7.0 | 10.0 | 3.0 | 14.0 | 3.0 | 11.0 | ns |
| t_{PHL} | A_n or B_n to $\overline{O}_{A=B}$ | 4.5 | 7.0 | 10.0 | 4.0 | 15.0 | 4.0 | 11.0 | |
| t_{PLH} | Propagation Delay | 3.0 | 5.0 | 6.5 | 3.0 | 8.5 | 3.0 | 7.5 | ns |
| t_{PHL} | $\overline{I}_{A=B}$ to $\overline{O}_{A=B}$ | 3.5 | 6.5 | 9.0 | 3.5 | 13.5 | 3.5 | 10.0 | |

Applications





Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



**20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide
Package Number MSA20**

MSA20 (REV A)

