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Jameco Part Number 12597FSC

CD4007C Dual Complementary Pair Plus Inverter

General Description

The CD4007C consists of three complementary pairs of N- and P-channel enhancement mode MOS transistors suitable for series/shunt applications. All inputs are protected from static discharge by diode clamps to V_{DD} and V_{SS} .

For proper operation the voltages at all pins must be constrained to be between $V_{SS} - 0.3V$ and $V_{DD} + 0.3V$ at all times.

Features

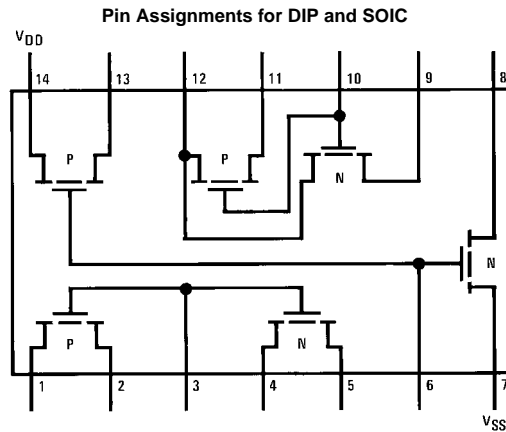
- Wide supply voltage range: 3.0V to 15V
- High noise immunity: 0.45 V_{CC} (typ.)

Ordering Code:

| Order Number | Package Number | Package Description |
|--------------|----------------|--|
| CD4007CM | M14A | 14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150" Narrow |
| CD4007CN | N14A | 14-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.

Connection Diagram



Note: All P-channel substrates are connected to V_{DD} and all N-channel substrates are connected to V_{SS} .

Top View

Absolute Maximum Ratings(Note 1)

| | | | |
|-----------------------------|------------------------------------|--------------------------|-----------------------------------|
| Voltage at Any Pin | $V_{SS} - 0.3V$ to $V_{DD} + 0.3V$ | Operating V_{DD} Range | $V_{SS} + 3.0V$ to $V_{SS} + 15V$ |
| Operating Temperature Range | $-40^{\circ}C$ to $+85^{\circ}C$ | Lead Temperature | |
| Storage Temperature Range | $-65^{\circ}C$ to $+150^{\circ}C$ | (Soldering, 10 seconds) | $260^{\circ}C$ |
| Power Dissipation (P_D) | | | |
| Dual-In-Line | 700 mW | | |
| Small Outline | 500 mW | | |

Note 1: This device should not be connected to circuits with the power on because high transient voltages may cause permanent damage.

DC Electrical Characteristics

| Symbol | Parameter | Conditions | Limits | | | | | | | | | Units |
|----------|--------------------------------------|---|----------------|-----|------|----------------|-------|------|----------------|-----|------|---------|
| | | | $-40^{\circ}C$ | | | $+25^{\circ}C$ | | | $+85^{\circ}C$ | | | |
| | | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| I_L | Quiescent Device Current | $V_{DD} = 5.0V$ | | | 0.5 | | 0.005 | 0.05 | | | 15 | μA |
| | | $V_{DD} = 10V$ | | | 1.0 | | 0.005 | 1.0 | | | 30 | μA |
| P_D | Quiescent Device Dissipation Package | $V_{DD} = 5.0V$ | | | 2.5 | | 0.025 | 2.5 | | | 75 | μW |
| | | $V_{DD} = 10V$ | | | 10 | | 0.05 | 10 | | | 300 | μW |
| V_{OL} | Output Voltage LOW Level | $V_{DD} = 5.0V$ | | | 0.05 | | 0 | 0.01 | | | 0.05 | V |
| | | $V_{DD} = 10V$ | | | 0.05 | | 0 | 0.01 | | | 0.05 | V |
| V_{OH} | Output Voltage HIGH Level | $V_{DD} = 5.0V$ | 4.95 | | | 4.95 | 5.0 | | 4.95 | | | V |
| | | $V_{DD} = 10V$ | 9.95 | | | 9.95 | 10 | | 9.95 | | | V |
| V_{NL} | Noise Immunity (All inputs) | $V_{DD} = 5.0V, V_O = 3.6V$ | | | 1.5 | | 2.25 | 1.5 | | | 1.4 | V |
| | | $V_{DD} = 10V, V_O = 7.2V$ | | | 3.0 | | 4.5 | 3.0 | | | 2.9 | V |
| V_{NH} | Noise Immunity (All Inputs) | $V_{DD} = 5.0V, V_O = 0.95V$ | 3.6 | | | 3.5 | 2.25 | | 3.5 | | | V |
| | | $V_{DD} = 10V, V_O = 2.9V$ | 7.1 | | | 7.0 | 4.5 | | 7.0 | | | V |
| I_{DN} | Output Drive Current N-Channel | $V_{DD} = 5.0V, V_O = 0.4V, V_I = V_{DD}$ | 0.35 | | | 0.3 | 1.0 | | 0.24 | | | mA |
| | | $V_{DD} = 10V, V_O = 0.5V, V_I = V_{DD}$ | 1.2 | | | 1.0 | 2.5 | | 0.8 | | | mA |
| I_{DP} | Output Drive Current P-Channel | $V_{DD} = 5.0V, V_O = 2.5V, V_I = V_{SS}$ | -1.3 | | | -1.1 | -4.0 | | -0.9 | | | mA |
| | | $V_{DD} = 10V, V_O = 9.5V, V_I = V_{SS}$ | -0.65 | | | -0.55 | -2.5 | | -0.45 | | | mA |
| I_I | Input Current | | | | | | 10 | | | | pA | |

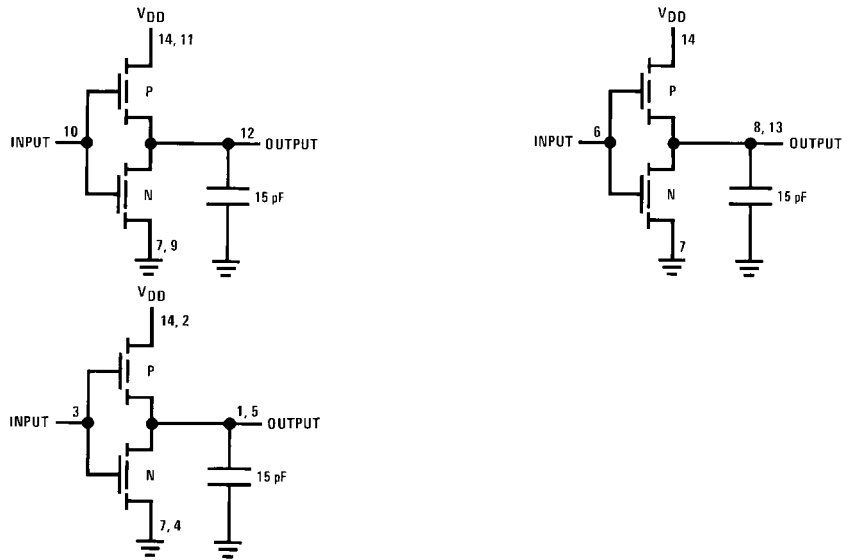
AC Electrical Characteristics (Note 2)

$T_A = 25^{\circ}C$ and $C_L = 15$ pF and rise and fall times = 20 ns. Typical temperature coefficient for all values of $V_{DD} = 0.3\%/^{\circ}C$

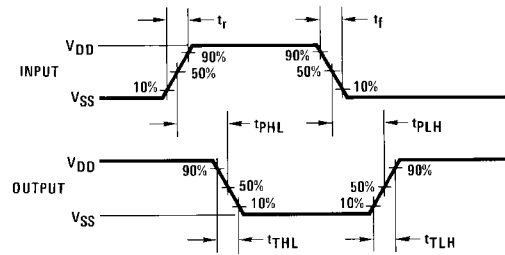
| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---------------------|------------------------|-----------------|-----|-----|-----|-------|
| $t_{PLH} = t_{PHL}$ | Propagation Delay Time | $V_{DD} = 5.0V$ | | 35 | 75 | ns |
| | | $V_{DD} = 10V$ | | 20 | 50 | ns |
| $t_{TLH} = t_{THL}$ | Transition Time | $V_{DD} = 5.0V$ | | 50 | 100 | ns |
| | | $V_{DD} = 10V$ | | 30 | 50 | ns |
| C_I | Input Capacitance | Any Input | | 5 | | pF |

Note 2: AC Parameters are guaranteed by DC correlated testing.

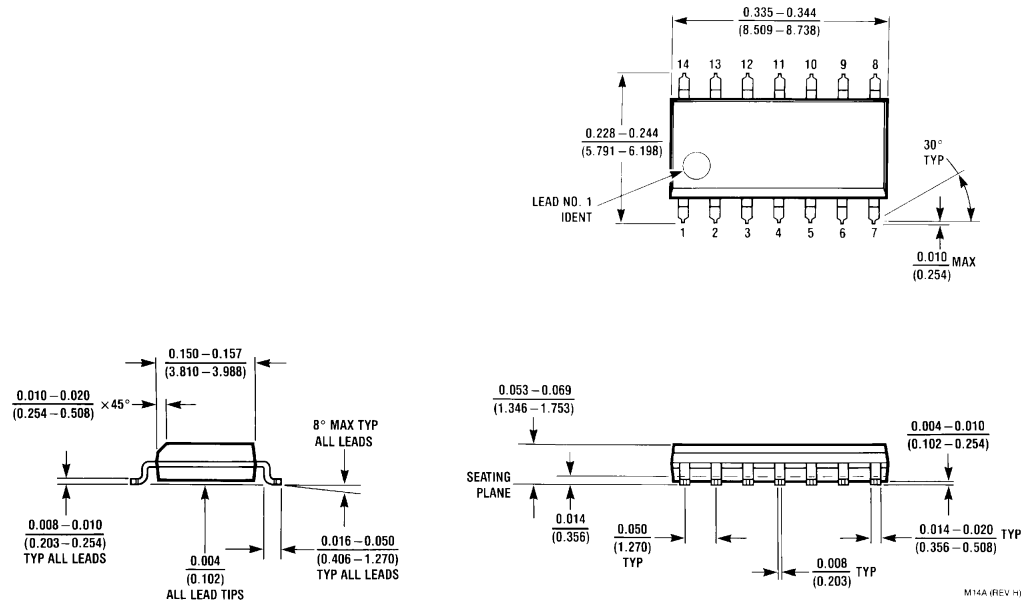
AC Test Circuits



Switching Time Waveforms

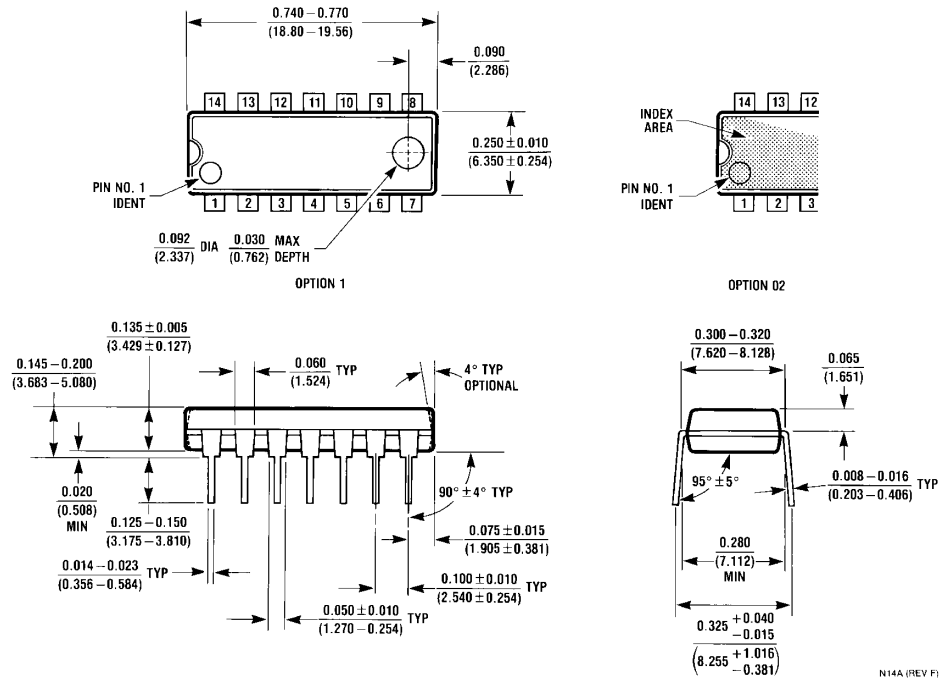


Physical Dimensions inches (millimeters) unless otherwise noted



**14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150" Narrow
Package Number M14A**

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



14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide Package Number N14A

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