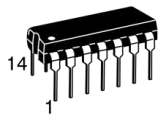
CD4007M/CD4007C Dual

Complementary Pair Plus Inverter

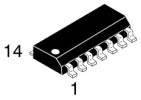
General Description

The CD4007B consists of three complementary pairs of N- and P-channel enhancement mode MOS transis- tors suitable for series/shunt applications. All inputs are pro- tected from static discharge by diode clamps to V_{DD} and VSS.

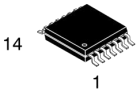
For proper operation the voltages at all pins must be con- strained to be between V_{SS} b 0.3V and V_{DD} a 0.3V at all times.



DIP14



SOP14



TSSOP14

Features

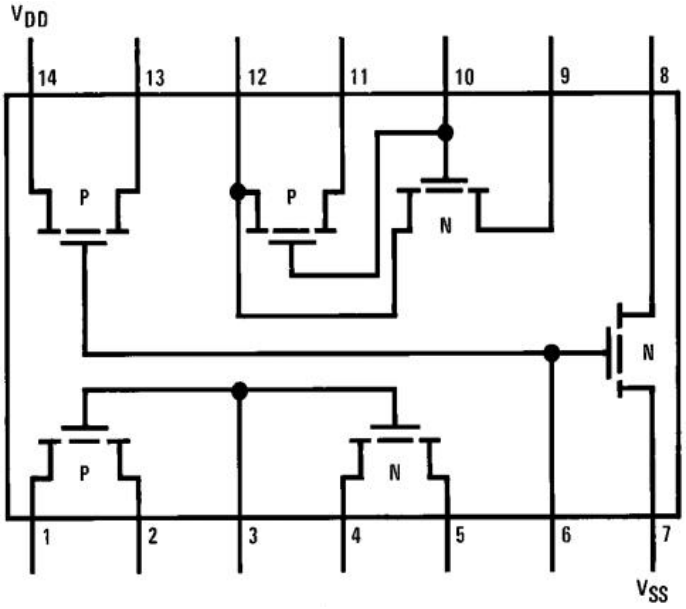
- Wide supply voltage range: 3.0V to 15V
- High noise immunity: 0.45 V_{CC} (typ.)

Ordering Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
CD4007BE	DIP14	CD4007BE	TUBE	1000pcs/Box
CD4007BM/TR	SOP14	CD4007B	REEL	2500pcs/Reel
CD4007BMT/TR	TSSOP14	CD4007B	REEL	2500pcs/Reel

Connection Diagram

Dual-In-Line Package



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

Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Parameter	Min.	Max.	Unit
Voltage at Any Pin	V_{SS} -0.3	V_{DD} -0.3	V
Operating Temperature Range	-40	+85	℃
Storage Temperature Range	-65	+150	℃
Power Dissipation (P_D)			
Dual-In-Line	700		mW
Small Outline	500		mW
Operating V_{DD} Range	V_{SS} +3.0	V_{SS} +15	V
Lead Temperature			
(Soldering, 10 seconds)	260		℃

DC Electrical Characteristics

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

Note 1:

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

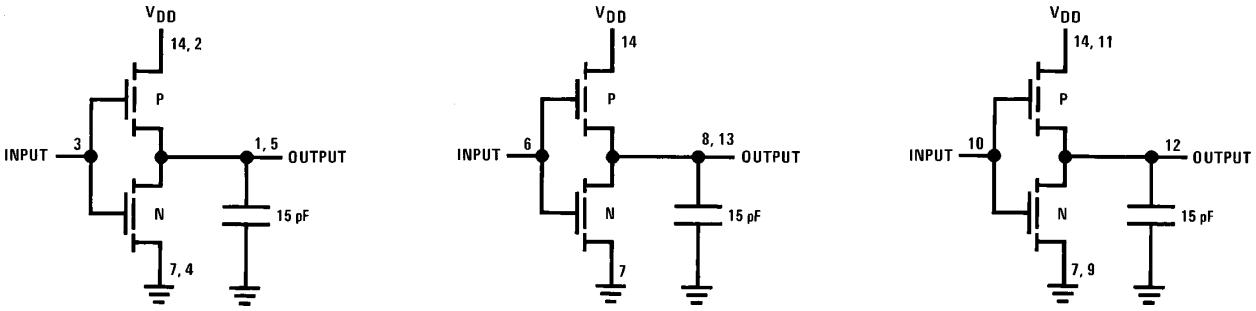
AC Electrical Characteristics*

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

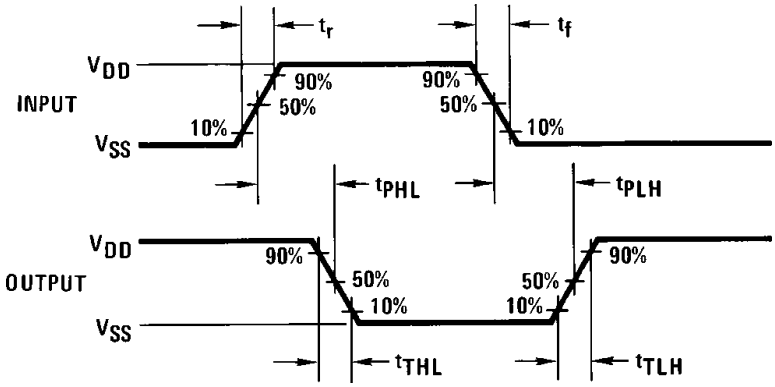
Symbol	Parameter	Conditions	Min	Typ	Max	Units
$t_{PLH} = t_{PHL}$	Propagation Delay Time	V_{DD} = 5.0V V_{DD} = 10V		35 20	75 50	ns ns
$t_{TLH} = t_{THL}$	Transition Time	V_{DD} = 5.0V V_{DD} = 10V		50 30	100 50	ns ns
C_I	Input Capacitance	Any Input		5		pF

*AC Parameters are guaranteed by DC correlated testing.

AC Test Circuits

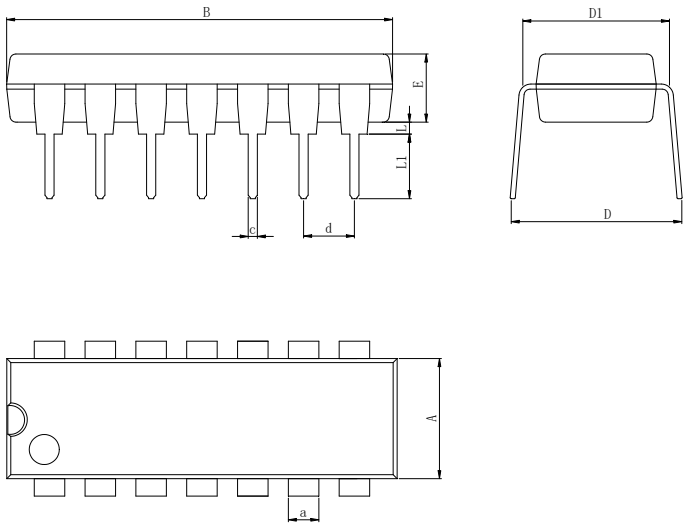


Switching Time Waveforms



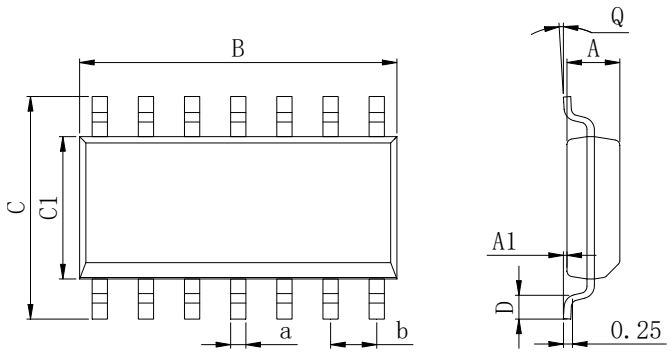
Physical Dimensions

DIP14



Dimensions In Millimeters(DIP14)										
Symbol:	A	B	D	D1	E	L	L1	a	c	d
Min:	6.10	18.94	8.40	7.42	3.10	0.50	3.00	1.50	0.40	2.54 BSC
Max:	6.68	19.56	9.00	7.82	3.55	0.70	3.60	1.55	0.50	

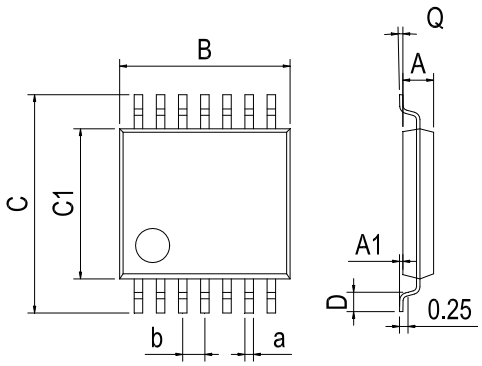
SOP14



Dimensions In Millimeters(SOP14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	8.55	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	8.75	6.20	4.00	0.80	8°	0.45	

Physical Dimensions

TSSOP14



Dimensions In Millimeters(TSSOP14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.85	0.05	4.90	6.20	4.30	0.40	0°	0.20	0.65 BSC
Max:	0.95	0.20	5.10	6.60	4.50	0.80	8°	0.25	

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