Absolute Maximum Ratings (Notes 1 & 2)

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

Supply Voltage (V_{DD})	−0.5V to +18V
Input Voltage (V_{IN})	−0.5V to +18V
Voltage at Any Output Pin (V_{OUT})	−0.5V to V_{DD} + 0.5V
Storage Temperature Range (T_S)	−65°C to +150°C
Power Dissipation (P_D)	
Dual-In-Line	700 mW
Small Outline	500 mW
Lead Temperature (T_L)	
(Soldering, 10 seconds)	260°C

Recommended Operating Conditions (Note 2)

Supply Voltage (V_{DD})	3V to 15V
Input Voltage (V_{IN})	0V to 15V
Voltage at Any Output Pin (V_{OUT})	0 to V_{DD}
Operating Temperature Range (T_A)	
CD4049UBM, CD4050BM	−55°C to +125°C
CD4049UBC, CD4050BC	−40°C to +85°C

DC Electrical Characteristics CD4049M/CD4050BM (Note 2)

Symbol	Parameter	Conditions	−55°C		+25°C			+125°C		Units
			Min	Max	Min	Typ	Max	Min	Max	
I_{DD}	Quiescent Device Current	V_{DD} = 5V		1.0		0.01	1.0		30	μA
		V_{DD} = 10V		2.0		0.01	2.0		60	μA
		V_{DD} = 15V		4.0		0.03	4.0		120	μA
V_{OL}	Low Level Output Voltage	V_{IH} = V_{DD}, V_{IL} = 0V, $\|I_O\|$ < 1 μA								
		V_{DD} = 5V		0.05		0	0.05		0.05	V
		V_{DD} = 10V		0.05		0	0.05		0.05	V
		V_{DD} = 15V		0.05		0	0.05		0.05	V
V_{OH}	High Level Output Voltage	V_{IH} = V_{DD}, V_{IL} = 0V, $\|I_O\|$ < 1 μA								
		V_{DD} = 5V	4.95		4.95	5		4.95		V
		V_{DD} = 10V	9.95		9.95	10		9.95		V
		V_{DD} = 15V	14.95		14.95	15		14.95		V
V_{IL}	Low Level Input Voltage (CD4050BM Only)	$\|I_O\|$ < 1 μA								
		V_{DD} = 5V, V_O = 0.5V		1.5		2.25	1.5		1.5	V
		V_{DD} = 10V, V_O = 1V		3.0		4.5	3.0		3.0	V
		V_{DD} = 15V, V_O = 1.5V		4.0		6.75	4.0		4.0	V
V_{IL}	Low Level Input Voltage (CD4049UBM Only)	$\|I_O\|$ < 1 μA								
		V_{DD} = 5V, V_O = 4.5V		1.0		1.5	1.0		1.0	V
		V_{DD} = 10V, V_O = 9V		2.0		2.5	2.0		2.0	V
		V_{DD} = 15V, V_O = 13.5V		3.0		3.5	3.0		3.0	V
V_{IH}	High Level Input Voltage (CD4050BM Only)	$\|I_O\|$ < 1 μA								
		V_{DD} = 5V, V_O = 4.5V	3.5		3.5	2.75		3.5		V
		V_{DD} = 10V, V_O = 9V	7.0		7.0	5.5		7.0		V
		V_{DD} = 15V, V_O = 13.5V	11.0		11.0	8.25		11.0		V
V_{IH}	High Level Input Voltage (CD4049UBM Only)	$\|I_O\|$ < 1 μA								
		V_{DD} = 5V, V_O = 0.5V	4.0		4.0	3.5		4.0		V
		V_{DD} = 10V, V_O = 1V	8.0		8.0	7.5		8.0		V
		V_{DD} = 15V, V_O = 1.5V	12.0		12.0	11.5		12.0		V
I_{OL}	Low Level Output Current (Note 3)	V_{IH} = V_{DD}, V_{IL} = 0V								
		V_{DD} = 5V, V_O = 0.4V	5.6		4.6	5		3.2		mA
		V_{DD} = 10V, V_O = 0.5V	12		9.8	12		6.8		mA
		V_{DD} = 15V, V_O = 1.5V	35		29	40		20		mA

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed; they are not meant to imply that the devices should be operated at these limits. The table of "Recommended Operating Conditions" and "Electrical Characteristics" provides conditions for actual device operation.

Note 2: V_{SS} = 0V unless otherwise specified.

Note 3: These are *peak* output current capabilities. Continuous output current is rated at 12 mA maximum. The output current should not be allowed to exceed this value for extended periods of time. I_{OL} and I_{OH} are tested one output at a time.

DC Electrical Characteristics CD4049M/CD4050BM (Note 2) (Continued)

Symbol	Parameter	Conditions	−55°C		+25°C			+125°C		Units
			Min	Max	Min	Typ	Max	Min	Max	
I_{OH}	High Level Output Current (Note 3)	$V_{IH} = V_{DD}$, $V_{IL} = 0V$								
		$V_{DD} = 5V$, $V_O = 4.6V$	−1.3		−1.1	−1.6		−0.72		mA
		$V_{DD} = 10V$, $V_O = 9.5V$	−2.6		−2.2	−3.6		−1.5		mA
		$V_{DD} = 15V$, $V_O = 13.5V$	−8.0		−7.2	−12		−5.0		mA
I_{IN}	Input Current	$V_{DD} = 15V$, $V_{IN} = 0V$		−0.1		-10^{-5}	−0.1		−1.0	μA
		$V_{DD} = 15V$, $V_{IN} = 15V$		0.1		10^{-5}	0.1		1.0	μA

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed; they are not meant to imply that the devices should be operated at these limits. The table of "Recommended Operating Conditions" and "Electrical Characteristics" provides conditions for actual device operation.

Note 2: $V_{SS} = 0V$ unless otherwise specified.

Note 3: These are *peak* output current capabilities. Continuous output current is rated at 12 mA maximum. The output current should not be allowed to exceed this value for extended periods of time. I_{OL} and I_{OH} are tested one output at a time.

DC Electrical Characteristics CD4049UBC/CD4050BC (Note 2)

Symbol	Parameter	Conditions	−40°C		+25°C			+85°C		Units
			Min	Max	Min	Typ	Max	Min	Max	
I_{DD}	Quiescent Device Current	$V_{DD} = 5V$		4		0.03	4.0		30	μA
		$V_{DD} = 10V$		8		0.05	8.0		60	μA
		$V_{DD} = 15V$		16		0.07	16.0		120	μA
V_{OL}	Low Level Output Voltage	$V_{IH} = V_{DD}$, $V_{IL} = 0V$, $\|I_O\| < 1\ \mu A$								
		$V_{DD} = 5V$		0.05		0	0.05		0.05	V
		$V_{DD} = 10V$		0.05		0	0.05		0.05	V
		$V_{DD} = 15V$		0.05		0	0.05		0.05	V
V_{OH}	High Level Output Voltage	$V_{IH} = V_{DD}$, $V_{IL} = 0V$, $\|I_O\| < 1\ \mu A$								
		$V_{DD} = 5V$	4.95		4.95	5		4.95		V
		$V_{DD} = 10V$	9.95		9.95	10		9.95		V
		$V_{DD} = 15V$	14.95		14.95	15		14.95		V
V_{IL}	Low Level Input Voltage (CD4050BC Only)	$\|I_O\| < 1\ \mu A$								
		$V_{DD} = 5V$, $V_O = 0.5V$		1.5		2.25	1.5		1.5	V
		$V_{DD} = 10V$, $V_O = 1V$		3.0		4.5	3.0		3.0	V
		$V_{DD} = 15V$, $V_O = 1.5V$		4.0		6.75	4.0		4.0	V
V_{IL}	Low Level Input Voltage (CD4049UBC Only)	$\|I_O\| < 1\ \mu A$								
		$V_{DD} = 5V$, $V_O = 4.5V$		1.0		1.5	1.0		1.0	V
		$V_{DD} = 10V$, $V_O = 9V$		2.0		2.5	2.0		2.0	V
		$V_{DD} = 15V$, $V_O = 13.5V$		3.0		3.5	3.0		3.0	V
V_{IH}	High Level Input Voltage (CD4050BC Only)	$\|I_O\| < 1\ \mu A$								
		$V_{DD} = 5V$, $V_O = 4.5V$	3.5		3.5	2.75		3.5		V
		$V_{DD} = 10V$, $V_O = 9V$	7.0		7.0	5.5		7.0		V
		$V_{DD} = 15V$, $V_O = 13.5V$	11.0		11.0	8.25		11.0		V
V_{IH}	High Level Input Voltage (CD4049UBC Only)	$\|I_O\| < 1\ \mu A$								
		$V_{DD} = 5V$, $V_O = 0.5V$	4.0		4.0	3.5		4.0		V
		$V_{DD} = 10V$, $V_O = 1V$	8.0		8.0	7.5		8.0		V
		$V_{DD} = 15V$, $V_O = 1.5V$	12.0		12.0	11.5		12.0		V

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed; they are not meant to imply that the devices should be operated at these limits. The table of "Recommended Operating Conditions" and "Electrical Characteristics" provides conditions for actual device operation.

Note 2: $V_{SS} = 0V$ unless otherwise specified.

Note 3: These are *peak* output current capabilities. Continuous output current is rated at 12 mA maximum. The output current should not be allowed to exceed this value for extended periods of time. I_{OL} and I_{OH} are tested one output at a time.