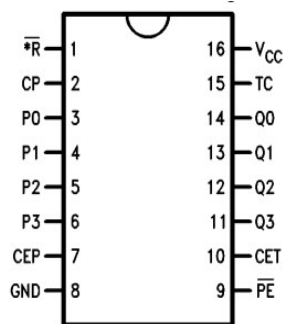


## Description

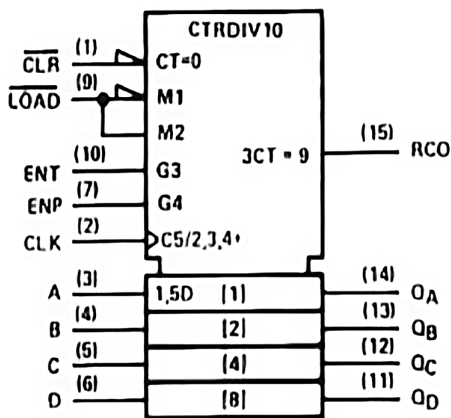
This synchronous decade counter features an internal carry look ahead for application in high-speed counting designs.

The XD74LS160 characterized for operation from 0 °c to 70 °c

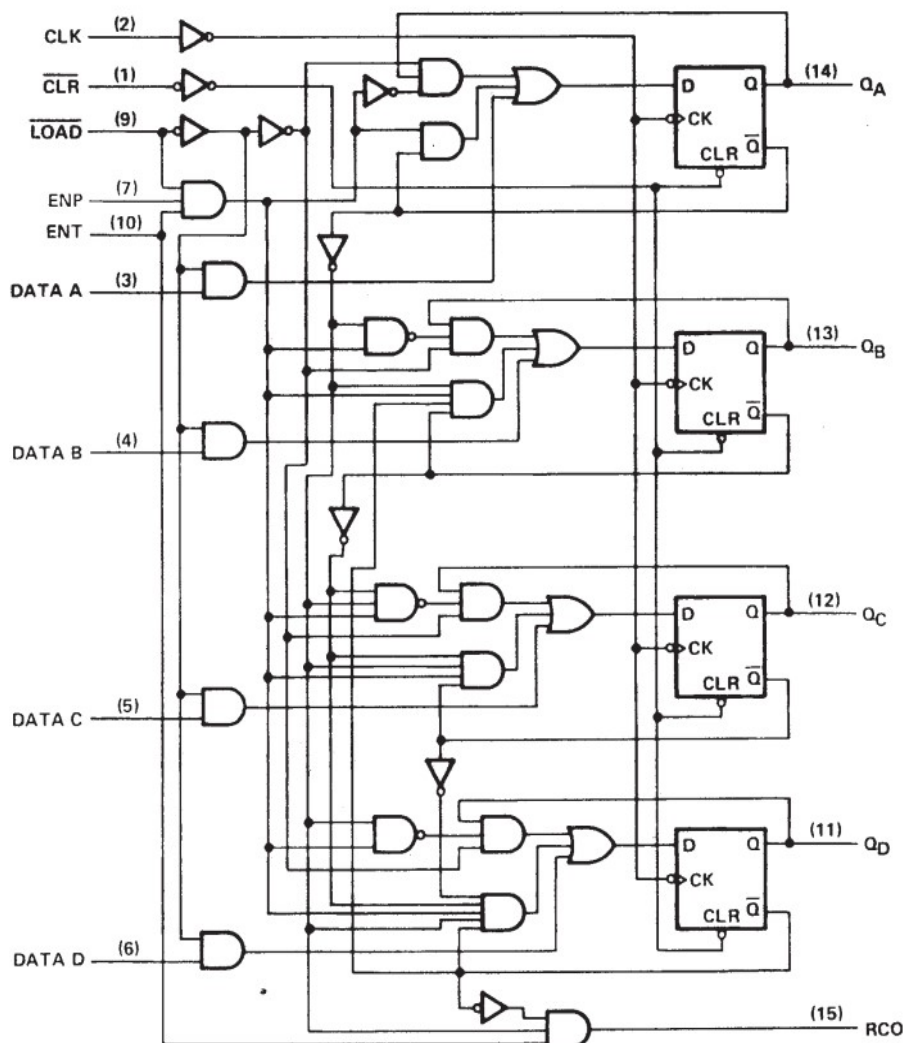
## Pin Arrangement



## Logic symbol



## Schematic



### Absolute Maximum Ratings (Note)

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

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	0°C to 70°C

Note: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will delineate the conditions for actual device operation.

Storage Temperature Range -65°C to +150°C

### Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit	
Supply voltage	V <sub>CC</sub>	4.75	5.00	5.25	V	
Output current	I <sub>OH</sub>	—	—	-400	μA	
	I <sub>OL</sub>	—	—	8	mA	
Operating temperature	T <sub>opr</sub>	-20	25	75	°C	
Clock frequency	f <sub>clock</sub>	0	—	25	MHz	
Clock pulse width	t <sub>w (clock)</sub>	25	—	—	ns	
Clear pulse width	t <sub>w (clear)</sub>	20	—	—	ns	
Setup time	A, B, C, D	t <sub>su</sub>	20	—	—	ns
	Enable P, T		20	—	—	ns
	Load		20	—	—	ns
Hold time	t <sub>h</sub>	3	—	—	ns	

### Electrical Characteristics over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = -18 mA			-1.5	V
V <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OH</sub> = Max, V <sub>IL</sub> = Max	XD74	2.7		V
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max, V <sub>IH</sub> = Min	XD74		0.5	V
		I <sub>OL</sub> = 4 mA, V <sub>CC</sub> = Min	XD74		0.4	

Note 1: All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.

### Electrical Characteristics

over recommended operating free air temperature range (unless otherwise noted) (Continued)

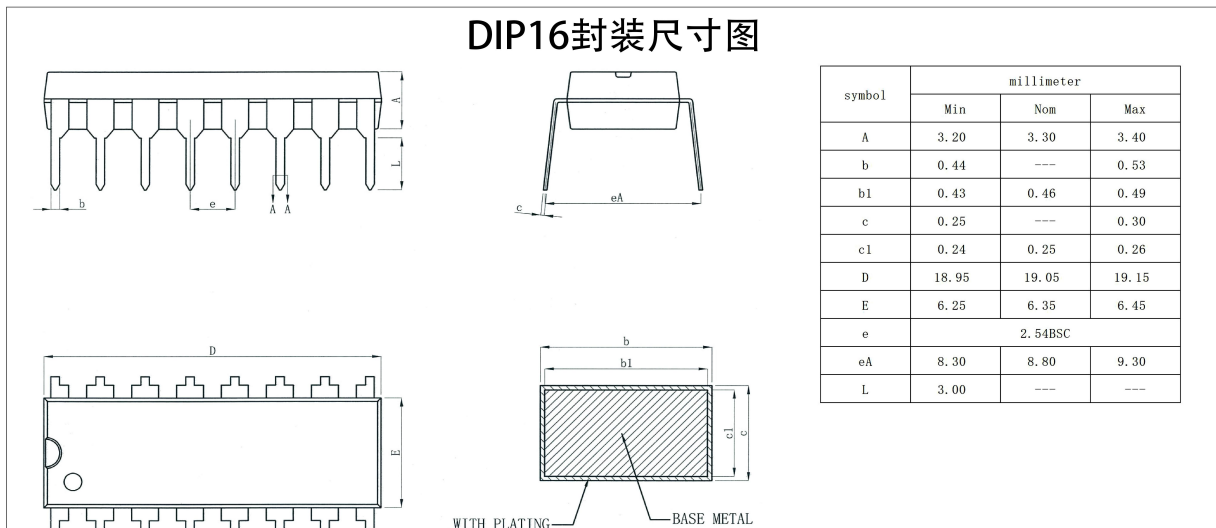
Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 7V			0.1	mA
		Other PE, CET Inputs			0.2	
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.7V			20	μA
		Other PE, CET Inputs			40	
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V Inputs	XD74		-1.6	mA
		PE, CET Inputs			-0.8	
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 2)	XD74	-20	-100	mA
I <sub>CCH</sub>	Supply Current with Outputs HIGH	V <sub>CC</sub> = Max, PE = GND CP = , Other Inputs = 4.5V			31	mA
I <sub>CCL</sub>	Supply Current with Outputs LOW	V <sub>CC</sub> = Max, V <sub>IN</sub> = GND CP =			31	mA

### Switching Characteristics V<sub>CC</sub> = +5.0V, T<sub>A</sub> = +25°C

Symbol	Parameter	R <sub>L</sub> = 2 kΩ C <sub>L</sub> = 15 pF		Units
		Min	Max	
f <sub>max</sub>	Maximum Clock Frequency	25		MHz
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay CP to TC		25 21	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay CP to Q <sub>n</sub>		24 27	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay CET to TC		14 23	ns
t <sub>PHL</sub>	Propagation Delay MR to Q <sub>n</sub> ('160)		28	ns

### Ordering information

PN:	Package
XD74LS160	DIP16 1,000Pcs/Tube



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