

## 74F794 8-Bit Register with Readback

### General Description

The 74F794 is an 8-bit register with readback capability designed to store data as well as read the register information back onto the data bus. The I/O bus (D bus) has 3-STATE outputs. Current sinking capability is 64 mA on both the D and Q busses.

Data is loaded into the registers on the low-to-high transition of the clock (CP). The output enable ( $\overline{OE}$ ) is used to enable data on  $D_0$ - $D_7$ . When  $\overline{OE}$  is low, the output of the registers

is enabled on  $D_0$ - $D_7$ , enabling D as an output bus. When OE is high,  $D_0$ - $D_7$  are inputs to the registers configuring D as an input bus.

### Features

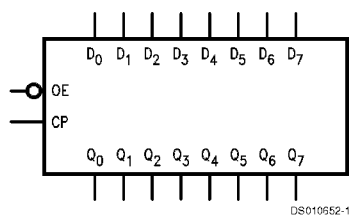
- 3-STATE outputs on the I/O port
- D and Q output sink capability of 64 mA
- Guaranteed 4000V minimum ESD protection
- Functionally and pin equivalent to the 'LS794

### Ordering Code:

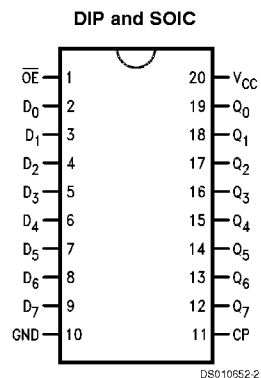
Commercial	Package Number	Package Description
74F794PC	N20A	20-Lead (0.300" Wide) Molded Dual-In-Line
74F794SC (Note 1)	M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC

Note 1: Devices also available in 13" reel. Use suffix = SCX.

### Logic Symbol



### Connection Diagram



## Input Loading/Fan-Out

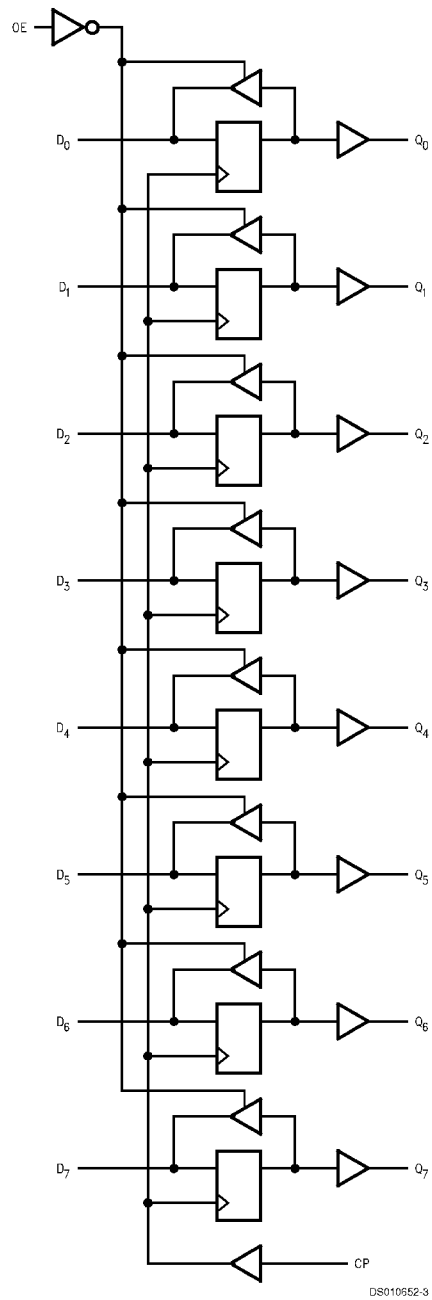
Pin Names	Description	74F High/Low	
		(U.L.)	Current
$\overline{OE}$	Output Enable Input	1.0/1.0	20 $\mu A$ /-0.6 mA
CP	Clock Pulse Inputs	1.0/1.0	20 $\mu A$ /-0.6 mA
$D_0$ - $D_7$	D Bus Inputs/ 3-STATE Outputs	3.5/1.083	70 $\mu A$ /-650 $\mu A$
$Q_0$ - $Q_7$	Q Bus Outputs	750/106.6	-15 mA/64 mA

## Truth Table

Inputs		Outputs	
CP	$\overline{OE}$	Q	D
L or H or $\downarrow$	L	$Q_n$	Output, Q
L or H or $\downarrow$	H	$Q_n$	Input
$\uparrow$	L	$Q_n$	Output, Q (Note 2)
$\uparrow$	H	D	Input

**Note 2:** In this case the output of the register is clocked to the inputs and the overall Q output is unchanged at  $Q_n$ .

## Logic Diagram



## Absolute Maximum Ratings (Note 3)

Storage Temperature	-65°C to +150°C
Ambient Temperature under Bias	-55° to +125°C
Junction Temperature under Bias	-55°C to +175°C
Plastic	-55°C to +150°C
V <sub>CC</sub> Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 2)	-0.5V to +7.0V
Input Current (Note 2)	-30 mA to +5.0 mA
ESD Last Passing Voltage (Min)	4000V
Voltage Applied to Output In HIGH State (with V <sub>CC</sub> = 0V)	
Standard Output	-0.5V to V <sub>CC</sub>

3-STATE Output	-0.5V to +5.5V
Current Applied to Output in LOW State (Max)	Twice the Rated I <sub>OL</sub> (mA)
ESD Last Passing Voltage (Min)	4000V

## Recommended Operating Conditions

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

**Note 3:** 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 4:** Either voltage limit or current limit is sufficient to protect inputs.

## DC Characteristics

over Operating Temperature Range unless otherwise specified

Symbol	Parameter	74F			Units	V <sub>CC</sub>	Conditions
		Min	Typ	Max			
V <sub>IH</sub>	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal
V <sub>IL</sub>	Input LOW Voltage			0.8	V		Recognized as a LOW Signal
V <sub>CD</sub>	Input Clamp Diode Voltage			-1.2	V	Min	I <sub>IN</sub> = -18 mA
V <sub>OH</sub>	Output HIGH Voltage	2.4	2.8		V	Min	I <sub>OH</sub> = -3 mA I <sub>OH</sub> = -15 mA
V <sub>OL</sub>	Output LOW Voltage		0.45	0.55	V	Min	I <sub>OL</sub> = 64 mA
I <sub>IH</sub>	Input HIGH Current			5.0	μA	Max	V <sub>IN</sub> = 2.7V
I <sub>BVI</sub>	Input HIGH Current Breakdown Test	74F		7.0	μA	Max	V <sub>IN</sub> = 7.0V ( $\overline{OE}$ , CP)
I <sub>BVIT</sub>	Input HIGH Current Breakdown (I/O)	74F		0.5	mA	Max	V <sub>IN</sub> = 5.5V (D <sub>n</sub> )
I <sub>CEX</sub>	Output HIGH Leakage Current	74F		50	μA	Max	V <sub>OUT</sub> = V <sub>CC</sub>
V <sub>ID</sub>	Input Leakage Test	74F	4.75		V	0.0	I <sub>ID</sub> = 1.9 μA All Other Pins Grounded
I <sub>OD</sub>	Output Leakage Circuit Current	74F		3.75	μA	0.0	V <sub>ID</sub> = 150 mV All Other Pins Grounded
I <sub>IL</sub>	Input LOW Current			-0.6	mA	Max	V <sub>IN</sub> = 0.5V ( $\overline{OE}$ , CP)
I <sub>OS</sub>	Output Short-Circuit Current		-100	-225	mA	Max	V <sub>OUT</sub> = 0V
I <sub>IH</sub> + I <sub>OZH</sub>	Output Leakage Current			70	μA	Max	V <sub>OUT</sub> = 2.7V (D <sub>n</sub> )
I <sub>IL</sub> + I <sub>OZL</sub>	Output Leakage Current			-650	μA	Max	V <sub>OUT</sub> = 0.5V (D <sub>n</sub> )

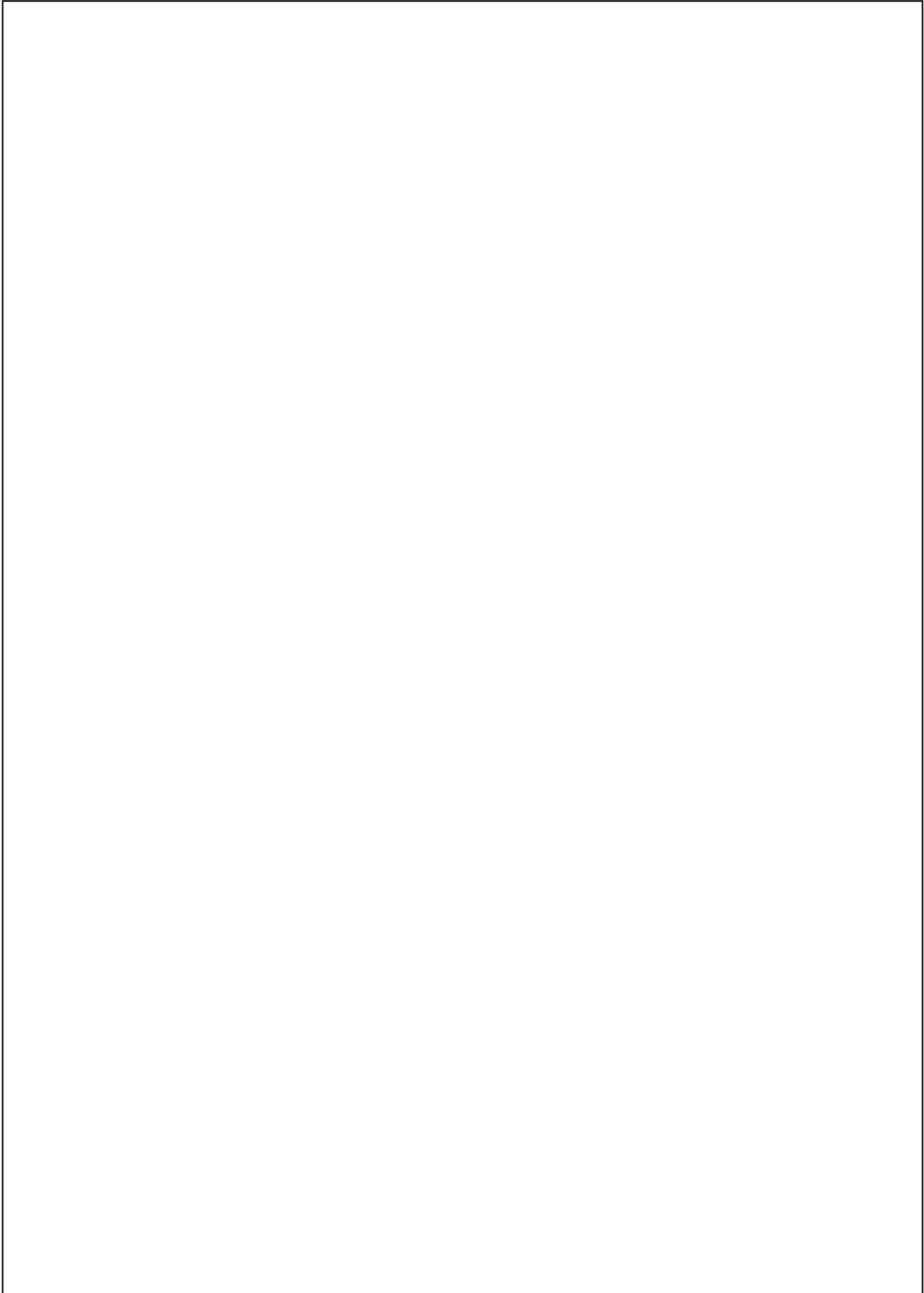
## DC Characteristics (Continued)

over Operating Temperature Range unless otherwise specified

Symbol	Parameter	74F			Units	V <sub>CC</sub>	Conditions
		Min	Typ	Max			
V <sub>ID</sub>	Input Leakage Test	74F	4.75		V	0.0	I <sub>ID</sub> = 1.9 μA All Other Pins Grounded
I <sub>OD</sub>	Output Circuit Leakage Current	74F		3.75	μA	0.0	V <sub>I<sub>OD</sub></sub> = 150 mV All Other Pins Grounded
I <sub>ZZ</sub>	Bus Drainage Test			100	μA	0.0	V <sub>OUT</sub> = 5.25V
I <sub>CCH</sub>	Power Supply Current			65	mA	Max	V <sub>O</sub> = HIGH
I <sub>CCL</sub>	Power Supply Current			80	mA	Max	V <sub>O</sub> = LOW
I <sub>CCZ</sub>	Power Supply Current			80	mA	Max	V <sub>O</sub> = HIGH Z

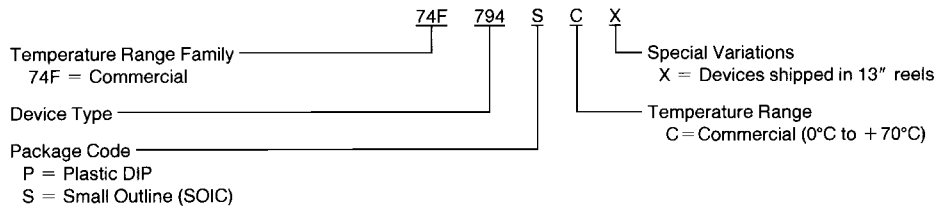
## AC Characteristics

Symbol	Parameter	74F			74F		Units
		T <sub>A</sub> = +25°C V <sub>CC</sub> = +5.0V C <sub>L</sub> = 50 pF			T <sub>A</sub> , V <sub>CC</sub> = Comm C <sub>L</sub> = 50 pF		
		Min	Typ	Max	Min	Max	
f <sub>MAX</sub>	Max. Clock Frequency	90			90		MHz
t <sub>PLH</sub>	Propagation Delay	2.5		7.0	2.5	8.0	ns
t <sub>PHL</sub>	CP to Qn	2.5		8.0	2.5	9.0	ns
t <sub>PZH</sub>	Output Enable Time	2.3		8.5	2.0	9.0	ns
t <sub>PZL</sub>		2.0		10.0	2.0	10.5	ns
t <sub>PHZ</sub>	Output Disable Time	1.0		7.0	1.0	8.0	ns
t <sub>PLZ</sub>		1.0		7.0	1.0	8.0	ns
t <sub>s</sub> (H)	Setup Time, HIGH or LOW	4.0			4.0		ns
t <sub>s</sub> (L)	Bus to Clock	4.0			4.0		ns
t <sub>h</sub> (H)	Hold Time, HIGH or LOW	1.5			1.5		ns
t <sub>h</sub> (L)	Bus to Clock	1.5			1.5		ns
t <sub>w</sub> (H)	Clock Pulse Width	5.8			5.8		ns
	HIGH or LOW	5.8			5.8		ns



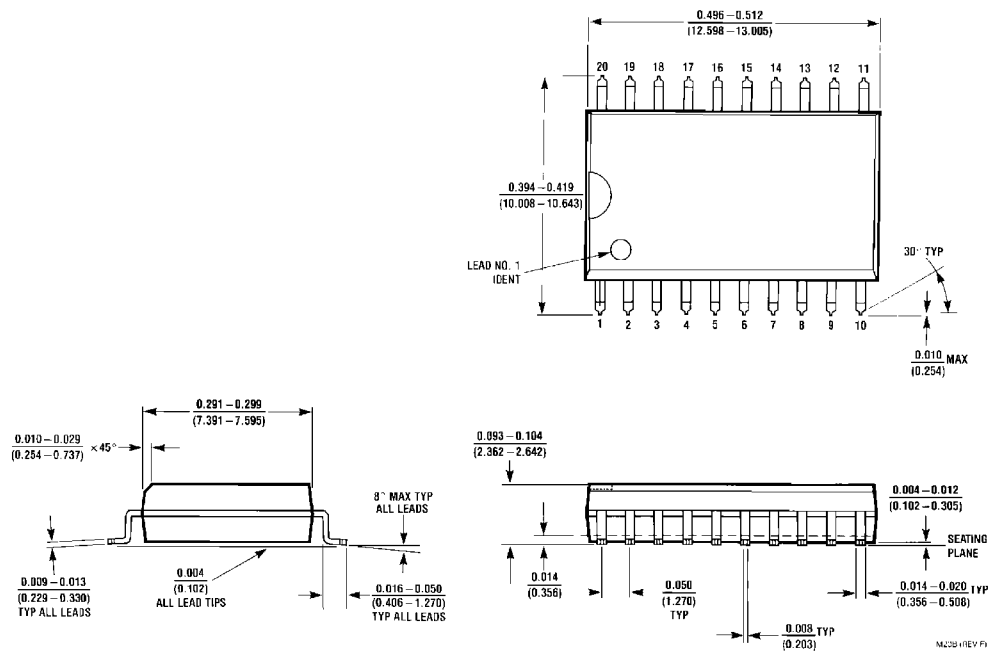
## Ordering Informaton

The device number is used to form part of a simplified purchasing code where a package type and temperature range are defined as follow:



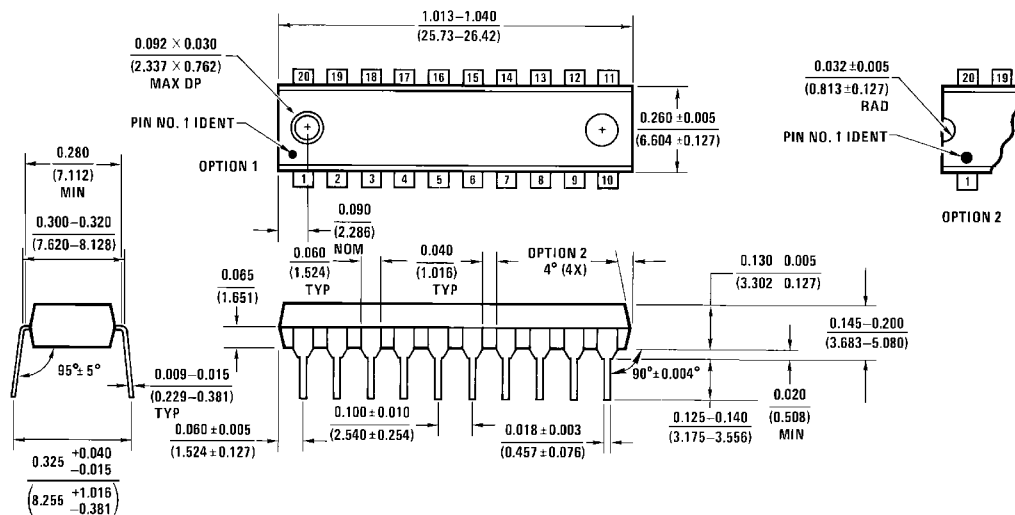
DS010652-5

## Physical Dimensions inches (millimeters) unless otherwise noted



**20-Lead (0.300" Wide) Molded Small Outline Package, JEDEC (S)  
 Package Number M20B**

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



**20-Lead (0.300" Wide) Molded Dual-In-Line Package (P)  
Package Number N20A**

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