

74F794 8-Bit Register with Readback

General Description

The 'F794 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 TRI-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

\overline{OE} is high, D_0 - D_7 are inputs to the registers configuring D as an input bus.

Features

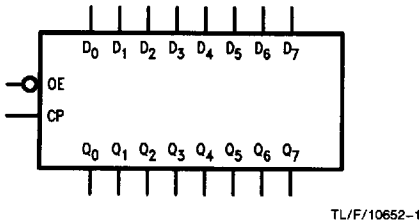
- TRI-STATE outputs on the I/O port
- D and Q output sink capability of 64 mA
- Guaranteed 4000V minimum ESD protection
- Functionally and pin equivalent to the 'LS794

Ordering Code: See Section 11

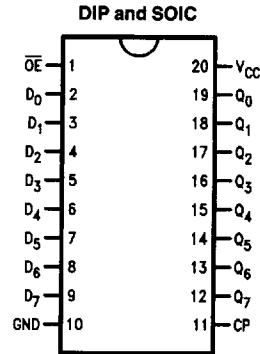
Commercial	Package Number	Package Description
74F794PC	N20A	20-Lead (0.300" Wide) Molded Dual-In-Line
74F794SC (Note 1)	M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC

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

Logic Symbol



Connection Diagram



Input Loading/Fan-Out

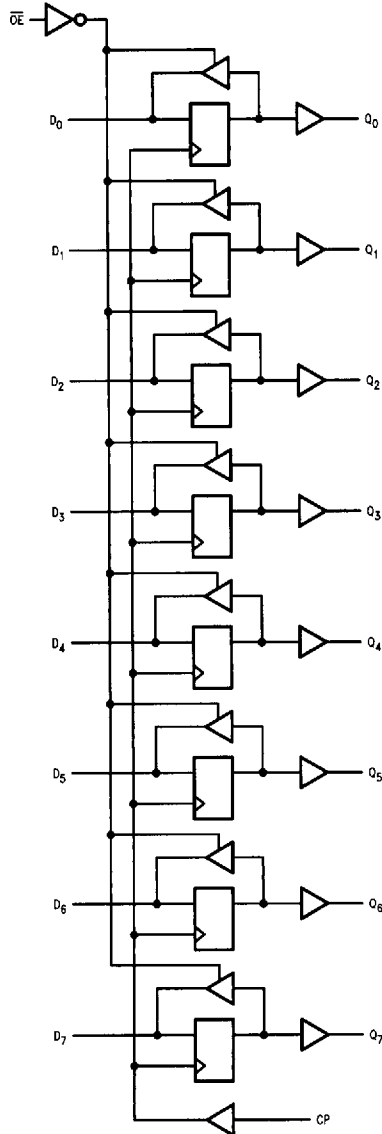
Pin Names	Description	74F High/Low	
		(U.L.)	Current
\overline{OE}	Output Enable Input	1.0/1.0	20 μ A / -0.6 mA
CP	Clock Pulse Inputs	1.0/1.0	20 μ A / -0.6 mA
D_0 - D_7	D Bus Inputs/ TRI-STATE Outputs	3.5/1.083	70 μ A / -650 μ A -15 mA/64 mA
Q_0 - Q_7	Q Bus Outputs	750/106.6	-15 mA/64 mA

Truth Table

Inputs		Outputs	
CP	\overline{OE}	Q	D
L or H or ↓	L	Q_n	Output, Q
L or H or ↓	H	Q_n	Input
↑	L	Q_n	Output, Q*
↑	H	D	Input

*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



TL/F/10652-3

Absolute Maximum Ratings (Note 1)

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 _{CC} 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

Note 1: 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 2: Either voltage limit or current limit is sufficient to protect inputs.

Voltage Applied to Output	
In HIGH State (with V _{CC} = 0V)	-0.5V to V _{CC}
Standard Output	-0.5V to +5.5V
TRI-STATE Output	

Current Applied to Output in LOW State (Max)	Twice the Rated I _{OL} (mA)
ESD Last Passing Voltage (Min)	4000V

Recommended Operating Conditions

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

DC Characteristics over Operating Temperature Range unless otherwise specified

Symbol	Parameter	74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
V _{IH}	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal
V _{IL}	Input LOW Voltage			0.8	V		Recognized as a LOW Signal
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	2.4 2.0	2.8 2.44		V	Min	I _{OH} = -3 mA I _{OH} = -15 mA
V _{OL}	Output LOW Voltage		0.45	0.55	V	Min	I _{OL} = 64 mA
I _{IH}	Input HIGH Current			5.0	μA	Max	V _{IN} = 2.7V
I _{BVI}	Input HIGH Current Breakdown Test			7.0	μA	Max	V _{IN} = 7.0V (OE, CP)
I _{BVIT}	Input HIGH Current Breakdown (I/O)			0.5	mA	Max	V _{IN} = 5.5V (D _n)
I _{CEX}	Output HIGH Leakage Current			50	μA	Max	V _{OUT} = V _{CC}
V _{ID}	Input Leakage Test	4.75			V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded
I _{OD}	Output Leakage Circuit Current			3.75	μA	0.0	V _{ID} = 150 mV All Other Pins Grounded
I _{IL}	Input LOW Current			-0.6	mA	Max	V _{IN} = 0.5V (OE, CP)

DC Characteristics over Operating Temperature Range unless other specified (Continued)

Symbol	Parameter	74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
I _{OS}	Output Short-Circuit Current	-100		-225	mA	Max	V _{OUT} = 0V
I _{IH} + I _{OZH}	Output Leakage Current			70	μA	Max	V _{OUT} = 2.7V (Dn)
I _{IL} + I _{OZL}	Output Leakage Current			-650	μA	Max	V _{OUT} = 0.5V (Dn)
V _{ID}	Input Leakage Test 74F	4.75			V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded
I _{OD}	Output Circuit Leakage Current 74F			3.75	μA	0.0	V _{IOD} = 150 mV All Other Pins Grounded
I _{ZZ}	Bus Drainage Test			100	μA	0.0	V _{OUT} = 5.25V
I _{CCH}	Power Supply Current			65	mA	Max	V _O = HIGH
I _{CCL}	Power Supply Current			80	mA	Max	V _O = LOW
I _{CCZ}	Power Supply Current			80	mA	Max	V _O = HIGH Z

AC Characteristics: See Section 2 for Waveforms and Load Configurations

Symbol	Parameter	74F			74F		Units	Fig. No.
		T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A , V _{CC} = Comm C _L = 50 pF			
		Min	Typ	Max	Min	Max		
f _{MAX}	Max. Clock Frequency	90			90		MHz	2-1
t _{PLH} t _{PHL}	Propagation Delay CP to Qn	2.5		7.0	2.5	8.0	ns	2-3
t _{PZH} t _{PZL}	Output Enable Time	2.3		8.5	2.0	9.0	ns	2-5
t _{PHZ} t _{PLZ}	Output Disable Time	1.0		7.0	1.0	8.0	ns	2-5
t _s (H) t _s (L)	Setup Time, HIGH or LOW Bus to Clock	4.0			4.0		ns	2-6
t _h (H) t _h (L)	Hold Time, HIGH or LOW Bus to Clock	1.5			1.5		ns	2-6
t _w (H)	Clock Pulse Width HIGH or LOW	5.8			5.8		ns	2-14