



PRELIMINARY

54ABT/74ABT16794C 18-Bit Register with Readback

General Description

The ABT16794C is an 18-bit register with readback capability designed to store data as well as read the register information back onto the data bus. Each 9-bit byte, D_0 – D_8 , or D_9 – D_{17} , functions identically but independent of each other. The I/O bus (D bus) has TRI-STATE® outputs. Current sinking capability is 64 mA on both the D and Q busses.

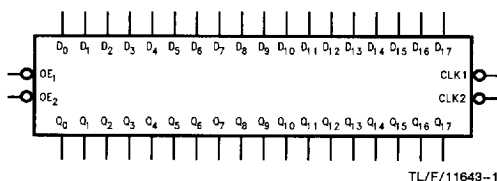
Data is loaded into the registers on the low-to-high transition of the clock (CP). The output enable ($\overline{OE}$) is used to enable data on D_0 – D_7 . When $\overline{OE}$ is low, the output of the registers is enabled on D_0 – D_7 , enabling D as an output bus. When $\overline{OE}$ is high, D_0 – D_7 are inputs to the registers configuring D as an input bus.

Features

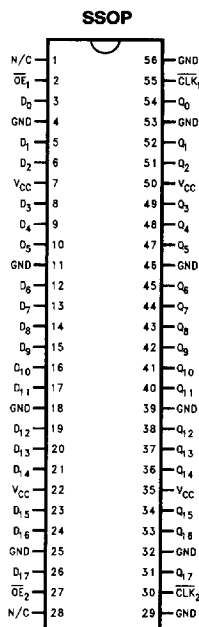
- Outputs sink capability of 64 mA, source capability of 32 mA
- Guaranteed latchup protection
- High impedance glitch free bus loading during entire power up and power down cycle
- Non-destructive hot insertion capability

Ordering Code: See Section 10

Logic Symbol



Connection Diagram



Pin Description

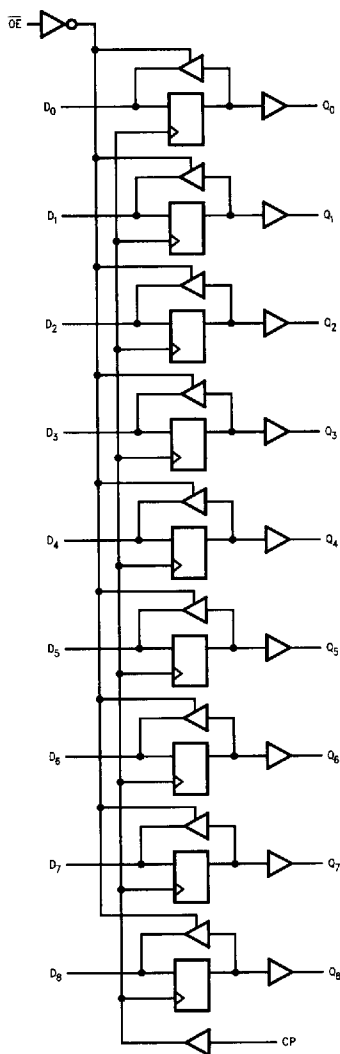
Pin Names	Description
$\overline{OE}$	Output Enable Inputs
CLK	Clock Pulse Inputs
D_0 – D_{17}	D Bus Inputs/ TRI-STATE Outputs
Q_0 – Q_{17}	Q Bus Outputs

Truth Tables

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



Similar for D9-D17 and Q9-Q17.

TL/F/11643-5

Absolute Maximum Ratings (Note 1)

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

Storage Temperature	-65°C to +150°C
Ambient Temperature under Bias	-55°C to +125°C
Junction Temperature under Bias	
Ceramic	-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
Voltage Applied to Any Output in the Disabled or Power-off State	-0.5V to 5.5V
in the HIGH State	-0.5V to V _{CC}
Current Applied to Output in LOW State (Max)	twice the rated I _{OL} (mA)

DC Latchup Source Current -500 mA

Over Voltage Latchup (I/O) 10V

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.

Recommended Operating Conditions

Free Air Ambient Temperature	
Military	-55°C to +125°C
Commercial	-40°C to +85°C
Supply Voltage	
Military	+4.5V to +5.5V
Commercial	+4.5V to +5.5V
Minimum Input Edge Rate	(ΔV/Δt)
Data Input	50 mV/ns
Enable Input	20 mV/ns

DC Electrical Characteristics

Symbol	Parameter	ABT16794C			Units	V _{CC}	Conditions
		Min	Typ	Max			
V _{IH}	Input HIGH Voltage	2.0			V		Recognized HIGH Signal
V _{IL}	Input LOW Voltage			0.8	V		Recognized LOW Signal
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	54ABT/74ABT	2.5		V	Min	I _{OH} = -3 mA
		54ABT	2.0		V	Min	I _{OH} = -24 mA
		74ABT	2.0		V	Min	I _{OH} = -32 mA
V _{OL}	Output LOW Voltage	54ABT		0.55	V	Min	I _{OL} = 48 mA
		74ABT		0.55	V	Min	I _{OL} = 64 mA
I _{IH}	Input HIGH Current			5	μA	Max	V _{IN} = 2.7V (Note 1) V _{IN} = V _{CC}
I _{BVI}	Input HIGH Current Breakdown Test			7	μA	Max	V _{IN} = 7.0V
I _{IL}	Input LOW Current			-5	μA	Max	V _{IN} = 0.5V (Note 1) V _{IN} = 0.0V
V _{ID}	Input Leakage Test	4.75			V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded
I _{OZH}	Output Leakage Current			50	μA	0 - 5.5V	V _{OUT} = 2.7V; $\overline{OE}_n$ = 2.0V
I _{OZL}	Output Leakage Current			-50	μA	0 - 5.5V	V _{OUT} = 0.5V; $\overline{OE}_n$ = 2.0V
I _{OS}	Output Short-Circuit Current	-100		-275	mA	Max	V _{OUT} = 0.0V
I _{CEX}	Output High Leakage Current			50	μA	Max	V _{OUT} = V _{CC}
I _{ZZ}	Bus Drainage Test			100	μA	0.0	V _{OUT} = 5.5V All Other Pins GND
I _{CCH}	Power Supply Current			100	μA	Max	All Outputs HIGH
I _{CCL}	Power Supply Current			60	mA	Max	All Outputs LOW
I _{CCZ}	Power Supply Current			100	μA	Max	$\overline{OE}_n$ = V _{CC} All Others at V _{CC} or GND
I _{CCT}	Additional I _{CC} /Input	Outputs Enabled Outputs TRI-STATE Outputs TRI-STATE	2.5		mA	Max	V _I = V _{CC} - 2.1V
			2.5		mA		Enable Input V _I = V _{CC} - 2.1V
			50		μA		Data Input V _I = V _{CC} - 2.1V All Others at V _{CC} or GND
I _{CCD}	Dynamic I _{CC} (Note 1)	No Load		0.1	mA/MHz	Max	Outputs Open, $\overline{OE}_n$ = GND One Bit Toggling, 50% Duty Cycle

Note 1: Guaranteed but not tested.

AC Electrical Characteristics: See Section 2 for Waveforms

Symbol	Parameter	74ABT			54ABT		74ABT		Units	Fig. No.
		T _A = +25°C V _{CC} = +5V C _L = 50 pF			T _A = -55°C to +125°C V _{CC} = 4.5V-5.5V C _L = 50 pF		T _A = -40°C to +85°C V _{CC} = 4.5V-5.5V C _L = 50 pF			
		Min	Typ	Max	Min	Max	Min	Max		
t _{PLH}	Propagation	1.0		3.9			1.0	3.9	ns	2-3, 5
t _{PHL}	Delay Data to Outputs	1.0		3.9			1.0	3.9		2-3, 5
t _{PZH}	Output Enable	1.5		6.3			1.5	6.3	ns	2-4
t _{PZL}	Time	1.5		6.3			1.5	6.3		
t _{PHZ}	Output Disable	1.0		6.7			1.0	6.7	ns	2-4
t _{PLZ}	Time	1.0		6.7			1.0	6.7		

Capacitance

Symbol	Parameter	Typ	Units	Conditions T _A = 25°C
C _{IN}	Input Capacitance	5.0	pF	V _{CC} = 5.0V
C _{OUT} (Note 1)	Output Capacitance	9.0	pF	V _{CC} = 5.0V

Note 1: C_{OUT} is measured at frequency f = 1 MHz; per MIL STD-883B, Method 3012.