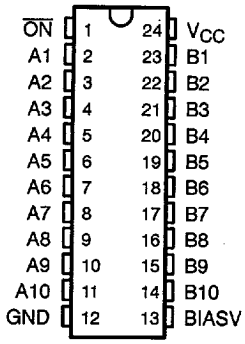
- 5-Ω Switch Connection Between Two Ports
- Near-Zero Propagation Delay
- TTL-Compatible Input and Output Levels
- Outputs Are Precharged by Bias Voltage to Minimize Signal Distortion During Live Insertion
- Package Options Include Plastic Small-Outline (DW) and Thin Shrink Small-Outline (PW) Packages

DW OR PW PACKAGE
(TOP VIEW)



description

The SN74CBT6800 provides ten bits of high-speed TTL-compatible bus switches. The low on-state resistance of the switch allows bidirectional connections to be made while adding near-zero propagation delay. The device also precharges the B port to a user-selectable bias voltage (BIASV) to minimize live-insertion noise.

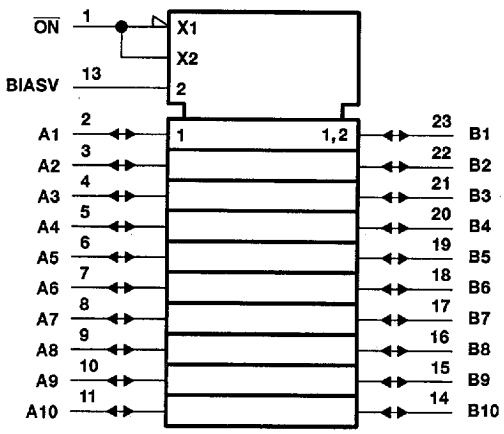
The SN74CBT6800 is organized as one 10-bit switch bank with a single enable ($\overline{ON}$) input. When $\overline{ON}$ is low, the switch is on and port A is connected to port B. When $\overline{ON}$ is high, the switch between port A and port B is open and the B port is precharged to the BIASV voltage through the equivalent of a 10-kΩ resistor.

The SN74CBT6800 is characterized for operation from −40°C to 85°C.

FUNCTION TABLE

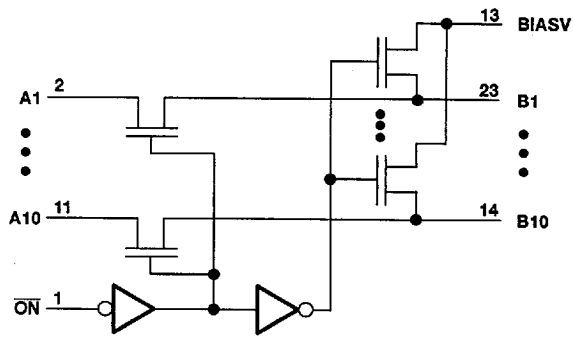
$\overline{ON}$	B1–B10	FUNCTION
L	A1–A10	Connect
H	BIASV	Precharge

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram



PRODUCT PREVIEW

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V_{CC} ..... −0.5 V to 7 V
Bias voltage range, BIASV ..... −0.5 V to 6 V
Input voltage range, V_I (see Note 1) ..... −0.5 V to V_{CC} + 0.5 V
Current into any pin, I_O ..... 128 mA
Input clamp current, I_{IK} ($V_I < 0$) ..... −50 mA
Maximum power dissipation at T_A = 55°C (in still air) (see Note 2): DW package ..... 1.7 W
PW package ..... 0.7 W
Storage temperature range ..... −65°C to 150°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
2. The maximum package power dissipation is calculated using a junction temperature of 150°C and a board trace length of 750 mils. For more information, refer to the *Package Thermal Considerations* application note.

recommended operating conditions

		MIN	MAX	UNIT
V_{CC}	Supply voltage	4.5	5.5	V
BIASV	Supply voltage	0	V_{CC}	V
V_{IH}	High-level input voltage	2		V
V_{IL}	Low-level input voltage		0.8	V
T_A	Operating free-air temperature	−40	85	°C

PRODUCT PREVIEW

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS			MIN	TYP‡	MAX	UNIT
V_{IK}		V_{CC} = 4.5 V,	I_I = −18 mA				−1.2	V
I_I		V_{CC} = 0,	V_I = 5.5 V				10	µA
		V_{CC} = 5.5 V,	V_I = 5.5 V or GND				±1	
I_O		V_{CC} = 4.5 V,	BIASV = 2.4 V,	V_O = 0	0.25			mA
I_{OS}		V_{CC} = 4.5 V,	$V_{I(A)}$ = 0,	$V_{I(B)}$ = 4.5 V	100			mA
I_{CC}		V_{CC} = 5.5 V,	I_O = 0,	V_I = V_{CC} or GND			1	mA
ΔI_{CC}§		V_{CC} = 3.6 V,	One input at 2.7 V,	Other inputs at V_{CC} or GND			0.2	mA
C_i	Control pins	V_I = 3 V or 0				4		pF
$C_{o(ON)}$		V_O = 3 V or 0,	Switch on			8		pF
$C_{o(OFF)}$		V_O = 3 V or 0,	Switch off			6		pF
r_{on}¶		V_{CC} = 4.5 V	V_I = 0,	I_I = 64 mA			6	Ω
			V_I = 2.4 V,	I_I = 15 mA			12	
I_O		V_{CC} = 4.5 V,	BIASV = 2.4 V,	V_O = 0	0.25			mA

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ This is the increase in supply current for each input that is at the specified TTL voltage level rather than V_{CC} or GND.
¶ Measured by the voltage drop between the A and B pins at the indicated current through the switch. On-state resistance (r_{on}) is determined by the lower of the voltages of the two (A or B) pins.

switching characteristics over recommended operating free-air temperature range, C_L = 50 pF (unless otherwise noted) (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = −40°C to 85°C		T_A = 0°C to 70°C		UNIT
			MIN	MAX	MIN	MAX	
t_{PLH}†	A or B	B or A				0.25	ns
t_{PHL}†						0.25	
t_{PZH}‡	$\overline{ON}$	A or B			1.5	7.5	ns
t_{PZL}§					1.5	7.5	
t_{PHZ}‡	$\overline{ON}$	A or B			1.5	6.5	ns
t_{PLZ}§					1.5	6.5	

† This parameter is characterized but not tested. This propagation delay is due to the RC time constant of the on-state resistance of the switch and the load capacitance.
‡ BIASV = GND
§ BIASV = 3 V
NOTE 3: Load circuit and voltage waveforms are shown in Section 1.

PRODUCT PREVIEW