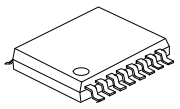
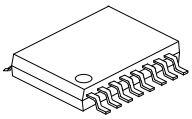
U74CBT3251

CMOS IC

1-OF-8 FET MULTIPLEXER/ DEMULTIPLEXER



SSOP-16(150mil)



TSSOP-16

■ DESCRIPTION

The **U74CBT3251** is a 1-OF-8 high-speed TTL-compatible FET multiplexer / demultiplexer. The low on-state resistance of the switch allows connections to be made with minimal propagation delay.

When output enable (OE) is low, the **U74CBT3251** is enabled. S0, S1, and S2 select one of the B outputs for the A-input data.

■ FEATURES

* V_{CC} Operating Range From 4V to 5.5V
* Bidirectional Data Flow, With minimal Propagation Delay
* Low ON-State Resistance (R_{ON}) Characteristics (R_{ON} =5Ω Typ.)
* Low Power Consumption I_{CC}=3μA (Max)

■ ORDERING INFORMATION

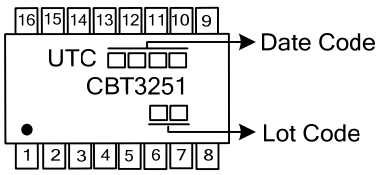
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74CBT3251L-R16-R	U74CBT3251G-R16-R	SSOP-16	Tape Reel
U74CBT3251L-P16-R	U74CBT3251G-P16-R	TSSOP-16	Tape Reel

U74CBT3251G-R16-T

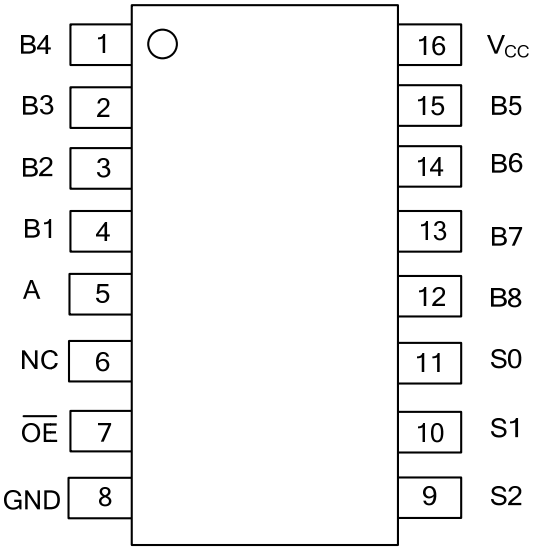
(1) Packing Type
(2) Package Type
(3) Green Package

(1) R: Tape Reel
(2) R16: SSOP-16, P16: TSSOP-16
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



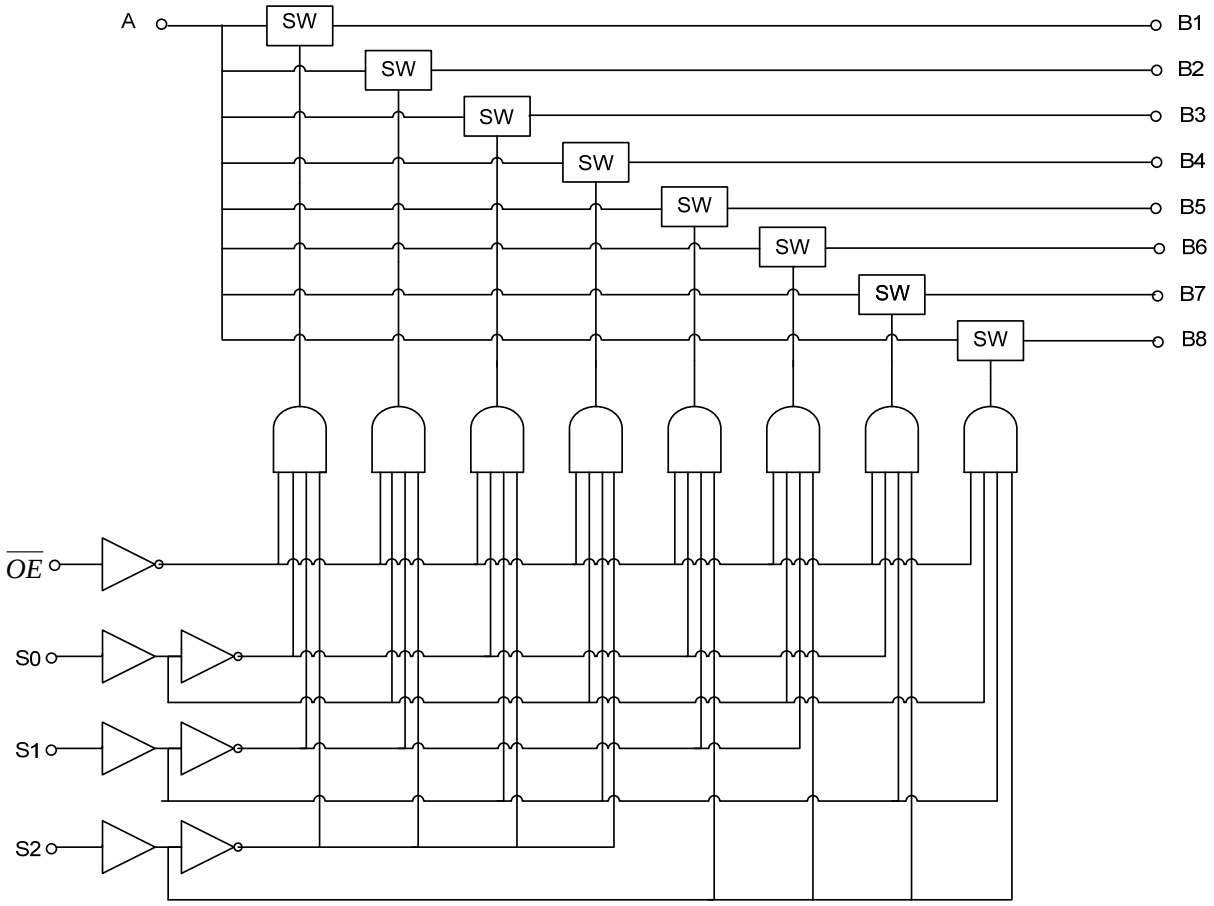
■ PIN CONFIGURATION



■ FUNCTION TABLE

INPUT				FUNCTION
$\overline{OE}$	S2	S1	S0	
L	L	L	L	A port=B1 port
L	L	L	H	A port=B2 port
L	L	H	L	A port=B3 port
L	L	H	H	A port=B4 port
L	H	L	L	A port=B5 port
L	H	L	H	A port=B6 port
L	H	H	L	A port=B7 port
L	H	H	H	A port=B8 port
H	X	X	X	Disconnect

■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 7	V
DC Input Voltage(see Note 2,3)	V_{IN}	-0.5 ~ 7	V
Control Input Clamp Current	I_{IK}	-50	mA
ON-State Switch Current	$I_{IN(SW)}$ $I_{OUT(SW)}$	±128	mA
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. All voltages are with respect to ground.
3. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SSOP-16	θ_{JA}	90	°C/W
	TSSOP-16		110	

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	4		5.5	V
High-Level Control Input Voltage	V_{IH}	2		5.5	V
Low-Level Control Input Voltage	V_{IL}	0		0.8	V
Data Input Voltage	V_{IN}	0		5.5	V
Data Output Voltage	V_{OUT}	0		5.5	V

■ ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

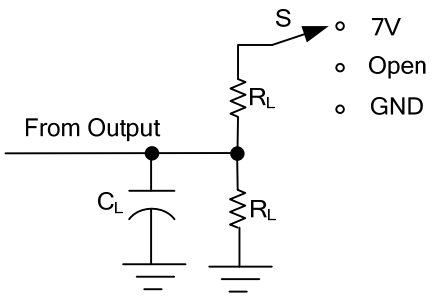
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Control Input Clamp Voltage	V_{IK}	V_{CC} =4.5V, I_{IN} = -18mA				-1.2	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC} =5.5V, V_{IN} =V_{CC} or GND				±1	μA
Quiescent Supply Current	I_{CC}	V_{CC}=5.5 V, I_{IN} /I_{OUT} =0 V_{IN}=V_{CC} or GND, Switch ON or OFF				3	μA
Additional Quiescent Supply Current	ΔI_{CC}	V_{CC}=5.5V, One input at 3.4V, Other inputs at V_{CC} or GND				2.5	mA
Control Input Capacitance	C_{IN}	V_{IN}=3V or 0			3.5		pF
A Port Input Capacitance	$C_{IO(OFF)}$	V_{CC}=5V, V_{IN}/V_{OUT}=3V or 0			17.5		pF
B Port Input Capacitance		V_{IN}=V_{CC} or GND, Switch OFF			4		pF
ON-Resistance	R_{ON}	V_{CC}=4V, V_{IN}=2.4V, I_{OUT} =-15mA			14	20	Ω
		V_{CC} =4.5V, V_{IN} =0	I_{OUT} =64mA		5	7	Ω
			I_{OUT} =30mA		5	7	Ω
		V_{CC} =4.5V, V_{IN} =2.4V	I_{OUT} =-15mA		10	15	Ω

■ SWITCHING CHARACTERISTICS (C_L=50pF, R_L=500Ω；see TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
From input (A or B) to output (B or A) (Note)	t_{pd}	V_{CC}=4V			0.35	ns
		V_{CC}= 5V±0.5V			0.25	ns
From input S to output A	$t_{pd(s)}$	V_{CC}=4V			6.0	ns
		V_{CC}= 5V±0.5V		2	5.5	ns
From input S to output B	t_{en}	V_{CC}=4V			6.4	ns
		V_{CC}= 5V±0.5V		1.5	5.6	ns
From input $\overline{OE}$ to output (A or B)		V_{CC}=4V			6.4	ns
		V_{CC}= 5V±0.5V		1.6	5.8	ns
From input S to output B	t_{dis}	V_{CC}=4V			6.8	ns
		V_{CC}= 5V±0.5V		1.9	6.4	ns
From input $\overline{OE}$ to output (A or B)		V_{CC}=4V			6.0	ns
		V_{CC}= 5V±0.5V		2.3	6.2	ns

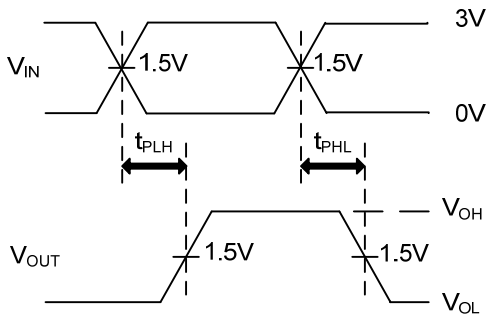
Note: The propagation delay is the calculated RC time constant of the typical ON-state resistance of the switch and the specified load capacitance, when driven by an ideal voltage source (zero output impedance).

■ TEST CIRCUIT AND WAVEFORMS

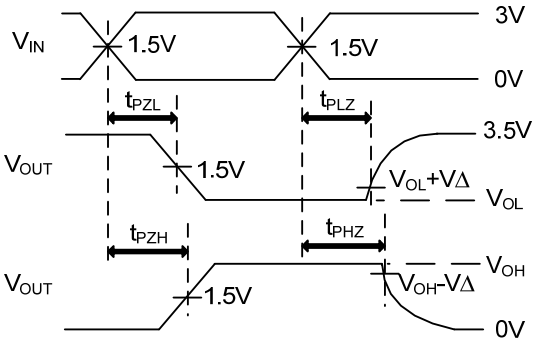


TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	Open
t_{PLZ}/t_{PZL}	7V

TEST	V_{CC}	V_I	t_R / t_F	VΔ	S	C_L	R_L
t_{PLH}/t_{PHL}	4V	V_{CC} or GND	≤2.5ns		Open	50pF	500Ω
	5V±0.5V	V_{CC} or GND	≤2.5ns		Open	50pF	500Ω
t_{PLZ}/t_{PZL}	4V	GND	≤2.5ns	0.3V	7V	50pF	500Ω
	5V±0.5V	GND	≤2.5ns	0.3V	7V	50pF	500Ω
t_{PHZ}/t_{PZH}	4V	V_{CC}	≤2.5ns	0.3V	Open	50pF	500Ω
	5V±0.5V	V_{CC}	≤2.5ns	0.3V	Open	50pF	500Ω



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Notes: 1. C_L includes probe and jig capacitance.
2. All input pulses are supplied by generators having the following characteristics: PRR≤10MHz, Z_O=50Ω, tr≤2.5ns, tf≤2.5 ns.
3. The outputs are measured one at a time with one transition per measurement.
4. t_{PLZ} and t_{PHZ} are the same as tdis.
5. t_{PZL} and t_{PZH} are the same as ten.
6. t_{PLH} and t_{PHL} are the same as tpd(s).
7. All parameters and waveforms are not applicable to all devices.