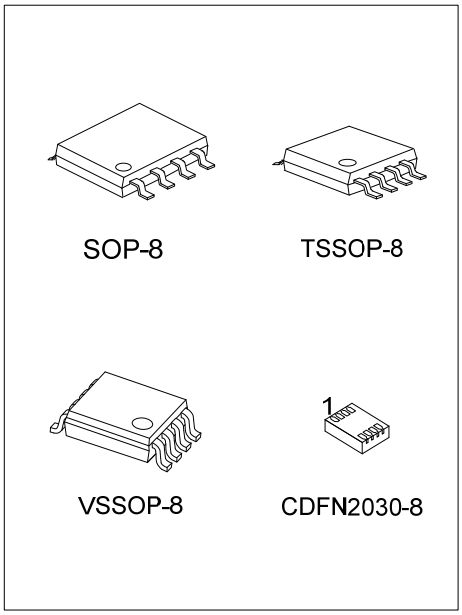
U74CBT2G125

CMOS IC

DUAL BUS SWITCH WITH LEVEL SHIFT



■ DESCRIPTION

The **U74CBT2G125** is a low on-resistance, high-speed CMOS 2-bit bus switch. This bus switch allows the connections or disconnections to be made with minimal propagation delay while maintaining Low power dissipation which is the feature of CMOS.

When output enable ($\overline{OE}$) is at low level, the switch is on; when at high level, the switch is off.

The device is enable to realize the shift of signal level from 5V to 3.3V. All inputs are equipped with protector circuits to protect the device from static discharge.

■ FEATURES

* Operating voltage: V_{CC}=4.0~5.5V
* High speed operation: t_{PD}=0.32 ns (max)
* Ultra-low on resistance: R_{ON}=5Ω (typ.)
* TTL level input (control input)
* Low Power Dissipation: I_{CC}=10μA (max.)

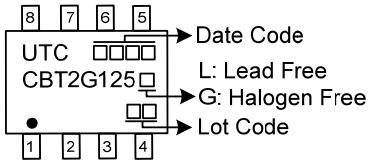
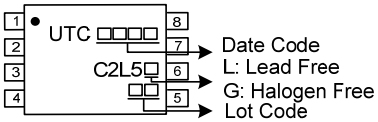
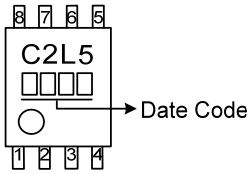
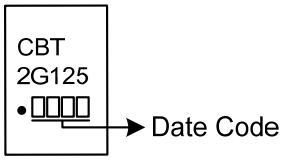
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74CBT2G125L-S08-R	U74CBT2G125G-S08-R	SOP-8	Tape Reel
U74CBT2G125L-P08-R	U74CBT2G125G-P08-R	TSSOP-8	Tape Reel
U74CBT2G125L-V08-R	U74CBT2G125G-V08-R	VSSOP-8	Tape Reel
U74CBT2G125L-CK08-2030-R	U74CBT2G125G-CK08-2030-R	CDFN2030-8	Tape Reel

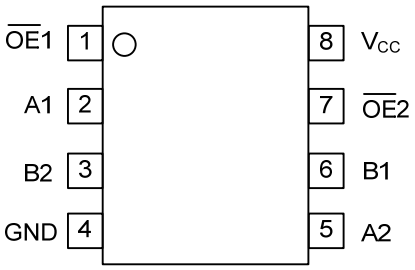
U74CBT2G125G-S08-R
(1) Packing Type
(2) Package Type
(3) Green Package

(1) R: Tape Reel
(2) S08: SOP-8, P08: TSSOP-8, V08: VSSOP-8
CK08-2030: CDFN2030-8
(3) G: Halogen Free and Lead Free, L: Lead Free

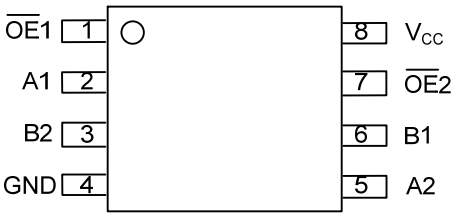
■ MARKING

SOP-8	TSSOP-8
	
VSSOP-8	**CDFN2030-8**
	

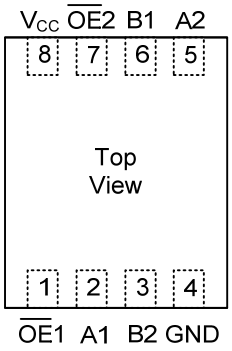
■ PIN CONFIGURATION



SOP-8/TSSOP-8



VSSOP-8

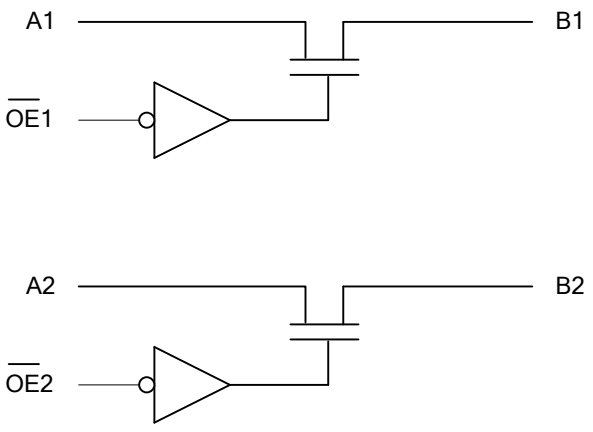


CDFN2030-8

■ FUNCTION TABLE (each gate)

INPUT $\overline{OE}$	OUTPUT
L	A port = B port
H	Disconnect

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)(Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 7.0	V
Input Voltage	V_{IN}	-0.5 ~ 7.0	V
Switch terminal I/O voltage	V_S	-0.5 ~ 7.0	V
Switch I/O current	I_S	128	mA
Input Clamp Current (V_I < 0)	I_{IK}	-50	mA
DC V_{CC}/GND current	I_{CC} / I_{GND}	±100	mA
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. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
3. The package thermal impedance is calculated in accordance with JESD 51.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-8	θ_{JA}	97	°C/W
	TSSOP-8		149	°C/W
	VSSOP-8		160	°C/W
	CDFN2030-8		230	°C/W

■ RECOMMENDED OPERATING COMDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	4		5.5	V
Control Pin Input Voltage	V_{IN}	0		5.5	V
Switch I/O Voltage	V_S	0		5.5	V
High-Control Input Voltage	V_{IH}	2			V
Low-Control Input Voltage	V_{IL}			0.8	V
Control Pin Input Rise/Fall Time	dt/dv	0		10	ns/V
Operating Temperature	T_A	-40		+85	°C

■ STATIC CHARACTERISTICS

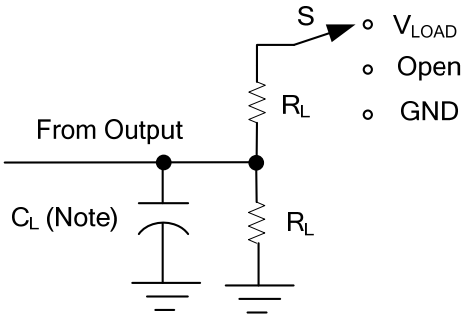
PARAMETER	SYMBOL	TEST CONDITIONS			MIN	TYP	MAX	UNIT
Digital Input Diode Voltage	V_{IK}	V_{CC}=4,Ii=-18mA					-1.2	V
Input Leakage Current	I_{IN}	V_{CC}=4.5~5.5V, V_{IN}=0~5.5V					±1.0	μA
Quiescent Supply Current	I_{CC}	V_{CC}=5.5V, V_I=5.5V or GND, I_O=0					10	μA
Additional Quiescent Supply Current	ΔI_{CC}	V_{CC}=5.5V , V_{IN}=3.4 V (one input)					2.5	mA
Power off Leakage Current	I_{OFF}	V_{CC}=0, A=B= $\overline{OE}$ =0~5.5V					±1.0	μA
Off-STATE Leakage Current (Switch Off)	I_{SZ}	V_{CC}=4.5~5.5V, A,B=0~5.5V, $\overline{OE}$ = V_{CC}					±1.0	μA
Control Input Capacitance	C_{IN}	V_{CC}=5V				4.5		pF
Switch Terminal Capacitance	$C_{I/O}$	V_{CC}=5V, $\overline{OE}$ = V_{CC}				6.5		pF
ON-Resistance	R_{ON}	V_{CC}=4.5V	V_I=0V	I_I=64mA		5	9	Ω
				I_I=30mA		5	9	Ω
			V_I=2.3V, I_I=-15mA			35	65	Ω

■ DYNAMIC CHARACTERISTICS (Input: t_R, t_F≤2.5ns; P_{RR} ≤ 10MHz; C_L=50pF)

See Fig. 1 and Fig. 2 for test circuit and waveforms.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
From Input (A or B) to Output (B or A)	t_{pd}	V_{CC}=4.5V			0.32	ns
From Input $\overline{OE}$ to Output (A or B)	t_{en}	V_{CC}=4.5V			13	ns
From Input $\overline{OE}$ to Output (A or B)	t_{dis}	V_{CC}=4.5V			5.0	ns

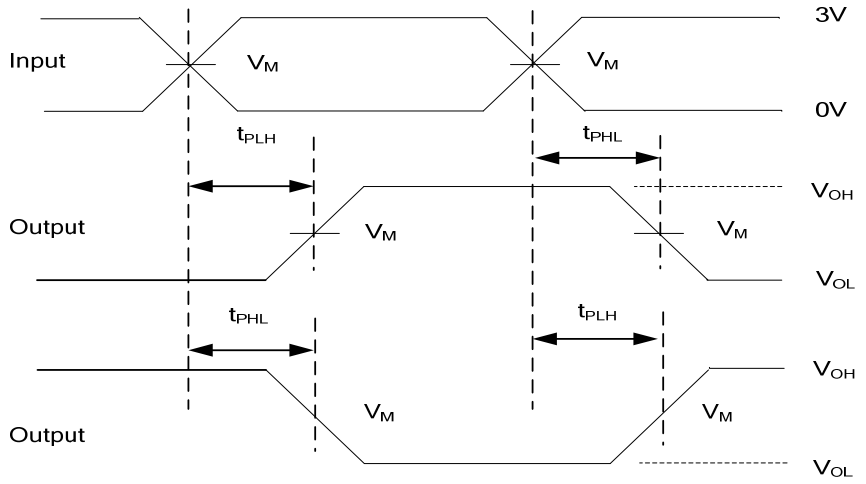
■ TEST CIRCUIT AND WAVEFORMS (C_L=50pF, R_L=500Ω, V_{LOAD}=7V, V_M=1.5V)



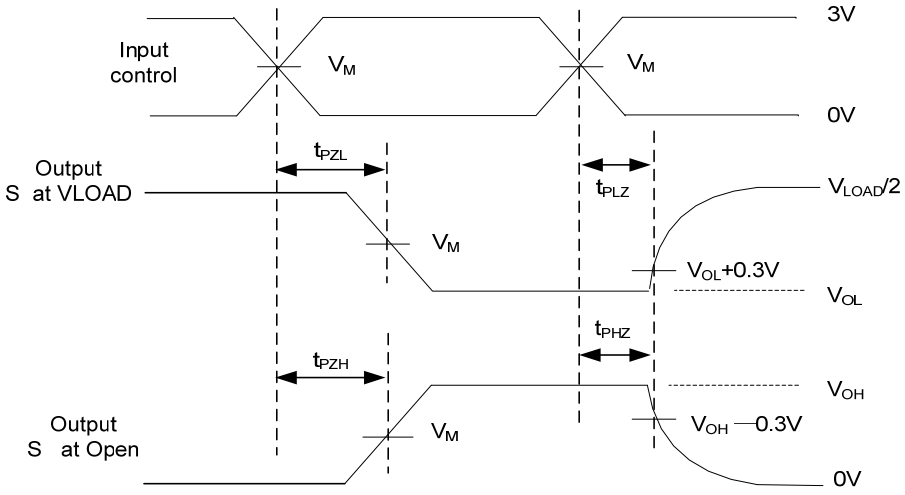
TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}

Note: C_L includes probe and jig capacitance.

Fig. 1 Load circuitry for switching times



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Fig. 2 Propagation delay from input(A) to output(B) and Output transition time