

SN54BCT2240, SN74BCT2240 OCTAL BUFFERS AND LINE DRIVERS/MOS DRIVERS WITH 3-STATE OUTPUTS

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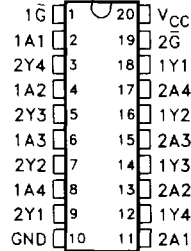
- BICMOS Design Substantially Reduces Standby Current
- Output Ports have Equivalent 33-Ω Series Resistors so No External Resistors are Required
- ESD Protection Exceeds 2000 V, MIL-STD-883C, Method 3015
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

description

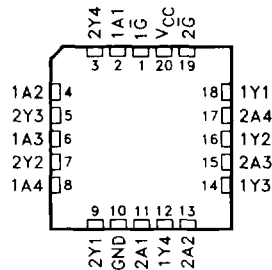
These octal buffers and line drivers are designed specifically to improve both the performance and density of three-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. Taken together with the 'BCT2241 and 'BCT2244, these devices provide the choice of selected combinations of inverting and noninverting outputs, symmetrical \bar{G} (active-low output control) inputs, and complementary G and \bar{G} inputs. These devices feature high fan-out and improved fan-in.

The SN54BCT2240 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74BCT2240 is characterized for operation from 0°C to 70°C .

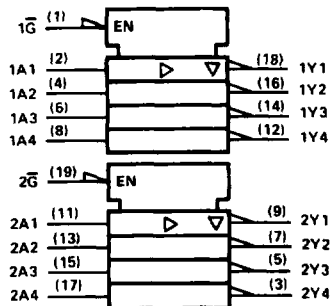
SN54BCT2240 ... J PACKAGE
SN74BCT2240 ... DW OR N PACKAGE
(TOP VIEW)



SN54BCT2240 ... FK PACKAGE
(TOP VIEW)



logic symbol†



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

PRODUCTION DATA documents contain information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

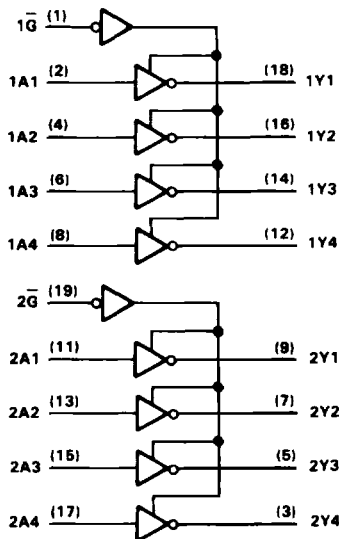


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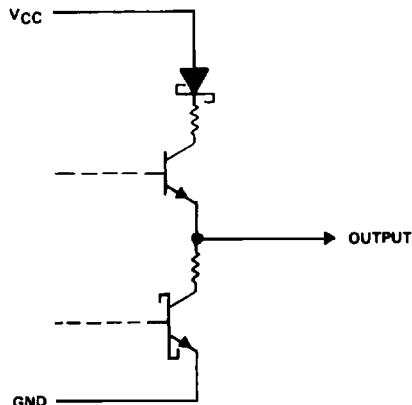
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SN54BCT2240, SN74BCT2240
OCTAL BUFFERS AND LINE DRIVERS/MOS DRIVERS
WITH 3-STATE OUTPUTS

logic diagram (positive logic)



schematic of each output



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BICMOS Circuits

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

Supply voltage, V_{CC}	-0.5 V to 7 V
Input voltage (see Note 1)	-0.5 V to 7 V
Voltage applied to any output in the disabled or power-off state	-0.5 V to 5.5 V
Voltage applied to any output in the high state	-0.5 V to V_{CC}
Input clamp current	-30 mA
Current into any output in the low state: SN54BCT2240	96 mA
SN74BCT2240	128 mA
Operating free-air temperature range: SN54BCT2240	-55°C to 125°C
SN74BCT2240	0°C to 70°C
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.

NOTE 1: The input negative-voltage rating may be exceeded if the input clamp current rating is observed.

recommended operating conditions

	SN54BCT2240			SN74BCT2240			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC} Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH} High-level input voltage	2			2			V
V_{IL} Low-level input voltage			0.8			0.8	V
I_{IK} Input clamp current			-18			-18	mA
I_{OH} High-level output current			12			-12	mA
I_{OL} Low-level output current			12			12	mA
T_A Operating free-air temperature	-55	125		0	70		°C

SN54BCT2240, SN74BCT2240
OCTAL BUFFERS AND LINE DRIVERS/MOS DRIVERS
WITH 3-STATE OUTPUTS

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

PARAMETER	TEST CONDITIONS		SN54BCT2240			SN74BCT2240			UNIT
			MIN	TYP†	MAX	MIN	TYP†	MAX	
V _{IK}	V _{CC} = 4.5 V,	I _{OH} = -18 mA			-1.2			-1.2	V
V _{OH}	V _{CC} = 4.5 V	I _{OH} = -1 mA	2.4	3.3		2.4	3.3		V
		I _{OH} = -12 mA	2	3.2		2	3.2		
V _{OL}	V _{CC} = 4.5 V	I _{OL} = 1 mA		0.15	0.5		0.15	0.5	V
		I _{OL} = 12 mA		0.35	0.8		0.35	0.8	
I _I	V _{CC} = 5.5 V,	V _I = 5.5 V			0.1			0.1	mA
I _{IH}	V _{CC} = 5.5 V,	V _I = 2.7 V			20			20	μA
I _{IL}	V _{CC} = 5.5 V,	V _I = 0.5 V			-1			-1	mA
I _{OZH}	V _{CC} = 5.5 V,	V _O = 2.7 V			50			50	μA
I _{OZL}	V _{CC} = 5.5 V,	V _O = 0.5 V			-50			-50	μA
I _{OS} ‡	V _{CC} = 5.5 V,	V _O = 0	-100		-225	-100		-225	mA
I _{CCH}	V _{CC} = 5.5 V,	Outputs open		19	32		19	32	mA
I _{CCL}			46	76		46	76		
I _{CCZ}			6	8		6	8		

† All typical values are at V_{CC} = 5 V, T_A = 25°C.

‡ Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

switching characteristics (see Figure 1)

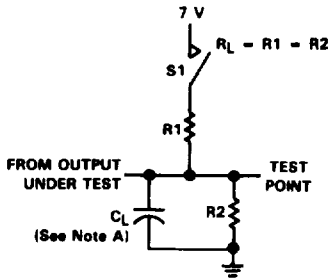
PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = 25°C			V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = MIN to MAX				UNIT
			74BCT2240			SN54BCT2240		SN74BCT2240		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A	Y	0.5	3.4	4.8	0.5	6.3	0.5	5.7	ns
t _{PHL}			0.5	2.8	4	0.5	4.6	0.5	4.4	
t _{PZH}	\bar{G}	Y	2.6	6.2	8.2	2.6	10.1	2.6	9.3	ns
t _{PZL}			4.3	8.8	10.9	4.3	12.9	4.3	12.4	
t _{PHZ}	\bar{G}	Y	2	5.3	7.1	2	9.2	2	8.7	ns
t _{PLZ}			2.2	6.7	8.5	2.2	12.2	2.2	10.6	

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BiCMOS Circuits

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WITH 3-STATE OUTPUTS

PARAMETER MEASUREMENT INFORMATION

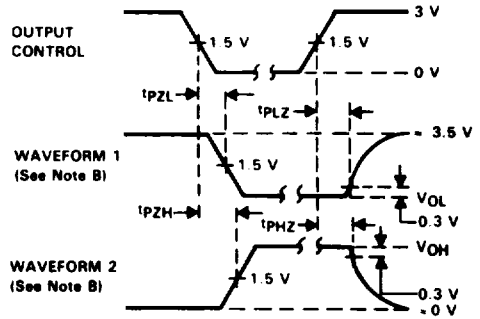
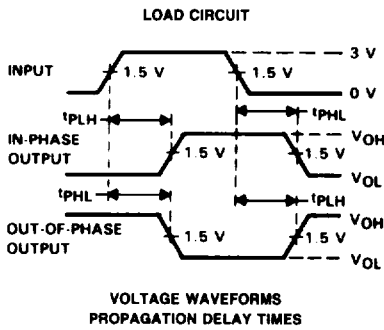


SWITCH POSITION TABLE

TEST	S1
t_{PLH}	Open
t_{PHL}	Open
t_{PZH}	Open
t_{PZL}	Closed
t_{PHZ}	Open
t_{PLZ}	Closed

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BICMOS Circuits



NOTES: A. C_L includes probe and jig capacitance.

B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.

Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.

C. All input pulses are supplied by the generators having the following characteristics: PRR \leq 10 MHz, $Z_O = 50 \Omega$, $t_r \leq 2.5$ ns, $t_f \leq 2.5$ ns.

D. The outputs are measured one at a time with one transition per measurement.

FIGURE 1. SWITCHING CHARACTERISTICS