

SN74ALVC16828 20-BIT BUFFER/DRIVER WITH 3-STATE OUTPUTS

SCAS273 – JANUARY 1993 – REVISED MARCH 1994

- Member of the Texas Instruments *Widebus™* Family
- *EPIC™* (Enhanced-Performance Implanted CMOS) Submicron Process
- Designed to Facilitate Incident-Wave Switching for Line Impedances of 50 Ω or Greater
- Typical V_{OLP} (Output Ground Bounce) < 0.8 V at $V_{CC} = 3.3$ V, $T_A = 25^\circ\text{C}$
- Typical V_{OHV} (Output V_{OH} Undershoot) > 2 V at $V_{CC} = 3.3$ V, $T_A = 25^\circ\text{C}$
- Bus-Hold On Data Inputs Eliminates the Need for External Pullup/Pulldown Resistors
- Package Options Include Plastic 300-mil Shrink Small-Outline (DL) and Thin Shrink Small-Outline (DGG) Packages

description

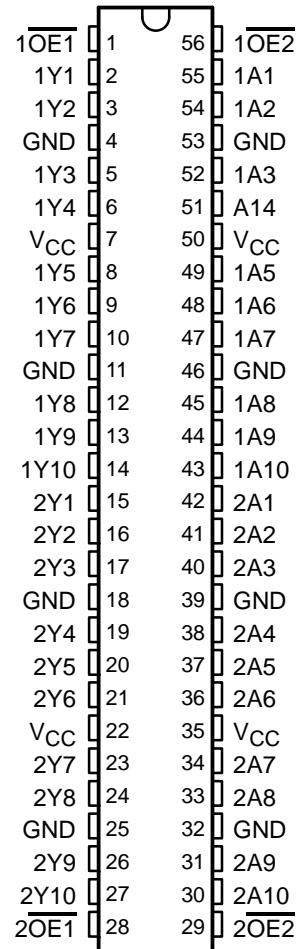
This 20-bit inverting buffer/driver is designed for 2.7-V to 3.6-V V_{CC} operation.

The SN74ALVC16828 is composed of two 10-bit sections with separate output-enable signals. For either 10-bit buffer section, the two output-enable ($\overline{1OE1}$ and $\overline{1OE2}$ or $\overline{2OE1}$ and $\overline{2OE2}$) inputs must both be low for the corresponding Y outputs to be active. If either output-enable input is high, the outputs of that 10-bit buffer section are in the high-impedance state.

The SN74ALVC16828 is available in TI's shrink small-outline (DL) and thin shrink small-outline (DGG) packages, which provide twice the I/O pin count and functionality of standard small-outline packages in the same printed-circuit-board area.

The SN74ALVC16828 is characterized for operation from -40°C to 85°C .

DGG OR DL PACKAGE
(TOP VIEW)



FUNCTION TABLE
(each 10-bit section)

INPUTS			OUTPUT Y
$\overline{OE1}$	$\overline{OE2}$	A	
L	L	L	H
L	L	H	L
H	X	X	Z
X	H	X	Z

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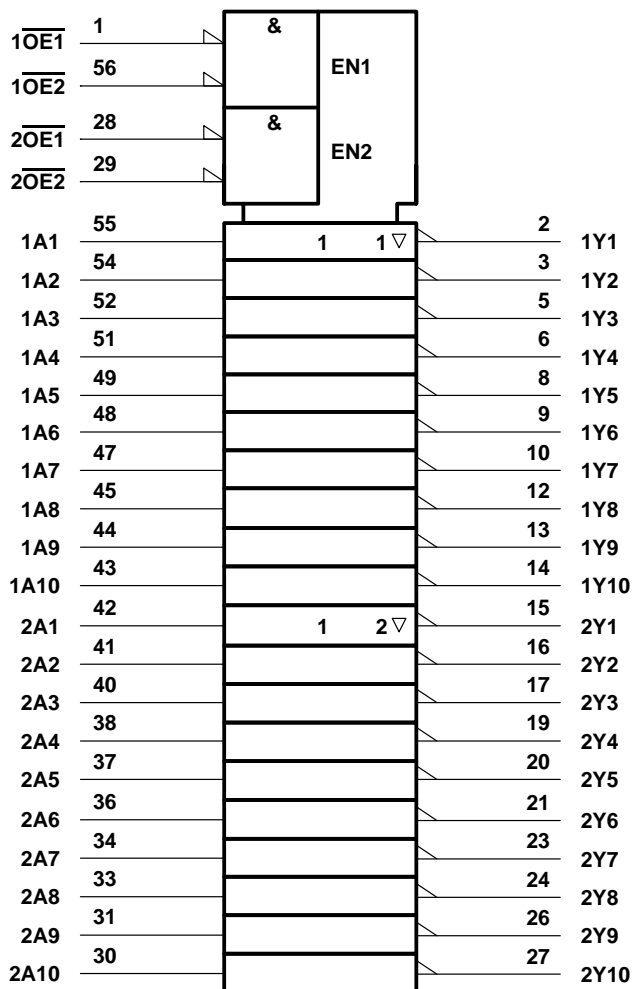
SN74ALVC16828

20-BIT BUFFER/DRIVER

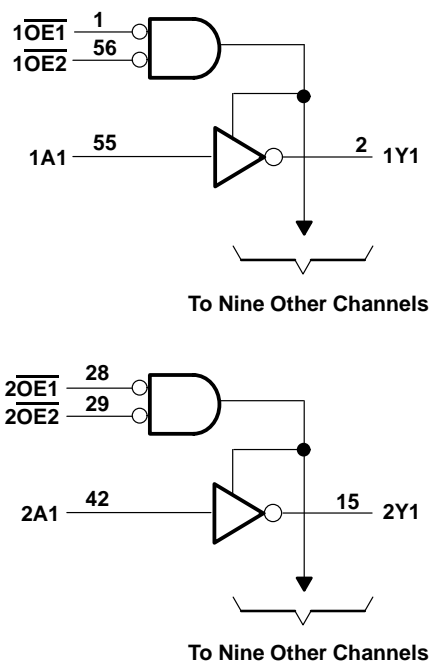
WITH 3-STATE OUTPUTS

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logic symbol†



logic diagram (positive logic)



PRODUCT PREVIEW

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

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

Supply voltage range, V_{CC}	–0.5 V to 4.6 V
Input voltage range, V_I (see Note 1)	–0.5 V to 4.6 V
Output voltage range, V_O (see Notes 1 and 2)	–0.5 V to $V_{CC} + 0.5$ V
Input clamp current, I_{IK} ($V_I < 0$)	–50 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$)	±50 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	±50 mA
Continuous current through V_{CC} or GND	±100 mA
Maximum power dissipation at $T_A = 55^\circ\text{C}$ (in still air) (see Note 3): DGG package	1 W
DL package	1.4 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 voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
2. This value is limited to 4.6 V maximum.
3. 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		2.7	3.6	V
V_{IH}	High-level input voltage	$V_{CC} = 2.7$ V to 3.6 V	2		V
V_{IL}	Low-level input voltage	$V_{CC} = 2.7$ V to 3.6 V		0.8	V
V_I	Input voltage		0	V_{CC}	V
V_O	Output voltage		0	V_{CC}	V
I_{OH}	High-level output current	$V_{CC} = 2.7$ V		–12	mA
		$V_{CC} = 3$ V		–24	
I_{OL}	Low-level output current	$V_{CC} = 2.7$ V		12	mA
		$V_{CC} = 3$ V		24	
$\Delta t/\Delta v$	Input transition rise or fall rate		0	10	ns/V
T_A	Operating free-air temperature		–40	85	°C

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

PARAMETER	TEST CONDITIONS	V _{CC} [†]	MIN	MAX	UNIT
V _{OH}	I _{OH} = −100 μA	MIN to MAX	V _{CC} −0.2		V
	I _{OH} = −12 mA	2.7 V	2.2		
		3 V	2.4		
	I _{OH} = −24 mA	3 V	2		
V _{OL}	I _{OL} = 100 μA	MIN to MAX	0.2		V
	I _{OL} = 12 mA	2.7 V	0.4		
	I _{OL} = 24 mA	3 V	0.55		
I _I	V _I = V _{CC} or GND	3.6 V	±5		μA
I _I (hold)	V _I = 0.8 V	3 V	75		μA
	V _I = 2 V		−75		
I _{OZ}	V _O = V _{CC} or GND	3.6 V	±10		μA
I _{CC}	V _I = V _{CC} or GND, I _O = 0	3.6 V	40		μA
ΔI _{CC}	V _{CC} = 3 V to 3.6 V, One input at V _{CC} − 0.6 V, Other inputs at V _{CC} or GND		750		μA
C _i	V _I = V _{CC} or GND	3.3 V			pF
C _O	V _O = V _{CC} or GND	3.3 V			pF

[†] For conditions shown as MIN or MAX, use the appropriate values under recommended operating conditions.

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