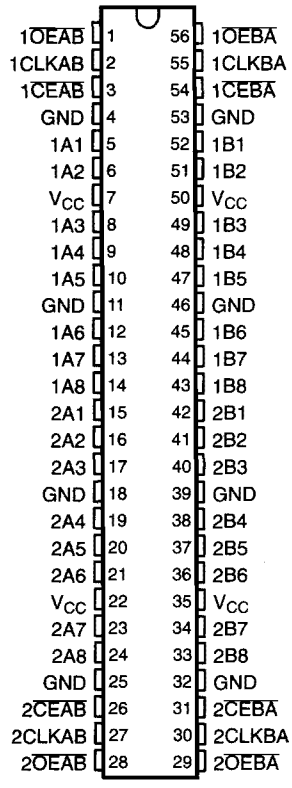
- **Member of the Texas Instruments *Widebus*™ Family**
- ***EPIC*™ (Enhanced-Performance Implanted CMOS) Submicron Process**
- **Designed to Facilitate Incident Wave Switching for Line Impedances of 50 Ω or Greater**
- **Typical V_{OLP} (Output Ground Bounce) < 0.8 V at V_{CC} = 3.3 V, T_A = 25°C**
- **Typical V_{OHV} (Output V_{OH} Undershoot) > 2 V at V_{CC} = 3.3 V, T_A = 25°C**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015; Exceeds 200 V Using Machine Model (C = 200 pF, R = 0)**
- **Latch-Up Performance Exceeds 250 mA Per JEDEC Standard JESD-17**
- **Package Options Include Plastic 300-mil Shrink Small-Outline and Thin Shrink Small-Outline Packages**

DGG OR DL PACKAGE
(TOP VIEW)



description

This 16-bit registered transceiver is designed for 2.7-V to 3.6-V V_{CC} operation.

The SN74ALVC16952 contains two sets of D-type flip-flops for temporary storage of data flowing in either direction. It can be used as two 8-bit transceivers or one 16-bit transceiver. Data on the A or B bus is stored in the registers on the low-to-high transition of the clock (CLKAB or CLKBA) input provided that the clock-enable ($\overline{CEAB}$ or $\overline{CEBA}$) input is low. Taking the output-enable ($\overline{OEAB}$ or $\overline{OEBA}$) input low accesses the data on either port.

The SN74ALVC16952 is packaged in TI's shrink small-outline package (DL), which provides twice the I/O pin count and functionality of standard small-outline packages in the same printed-circuit-board area.

The SN74ALVC16952 is characterized for operation from −40°C to 85°C.

PRODUCT PREVIEW

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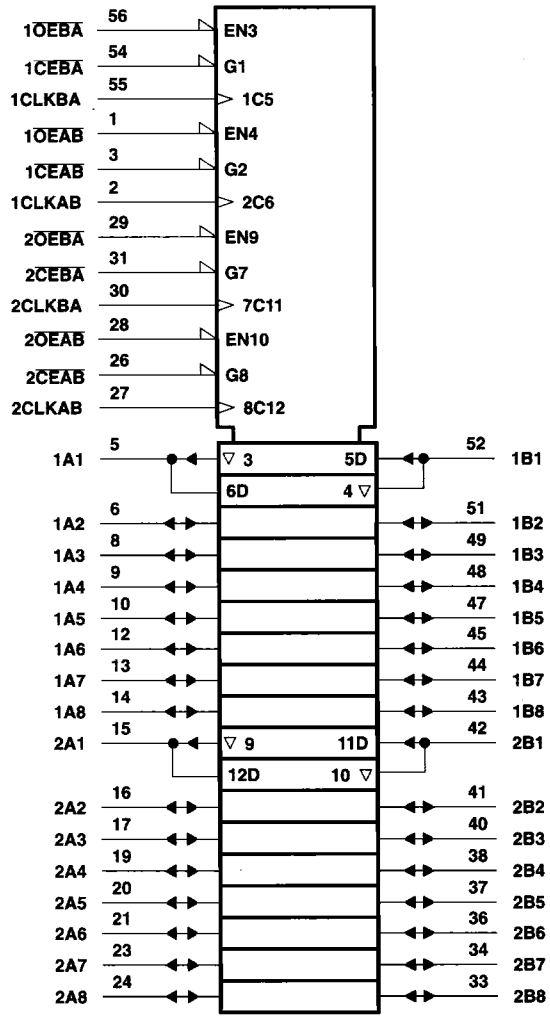
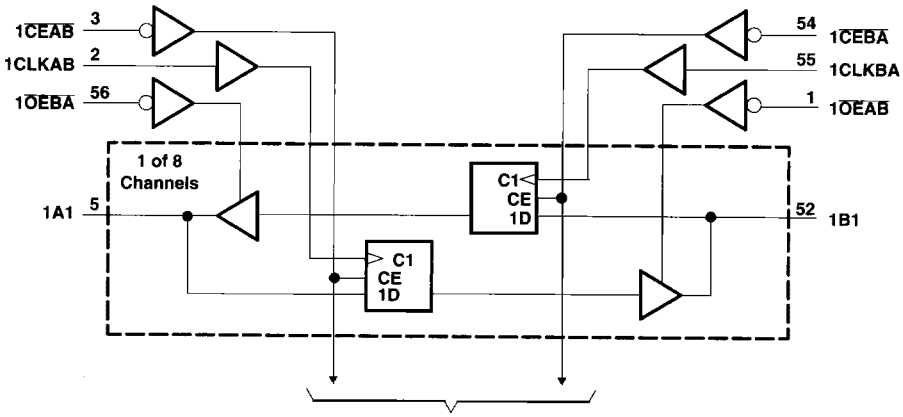
PRODUCT PREVIEW

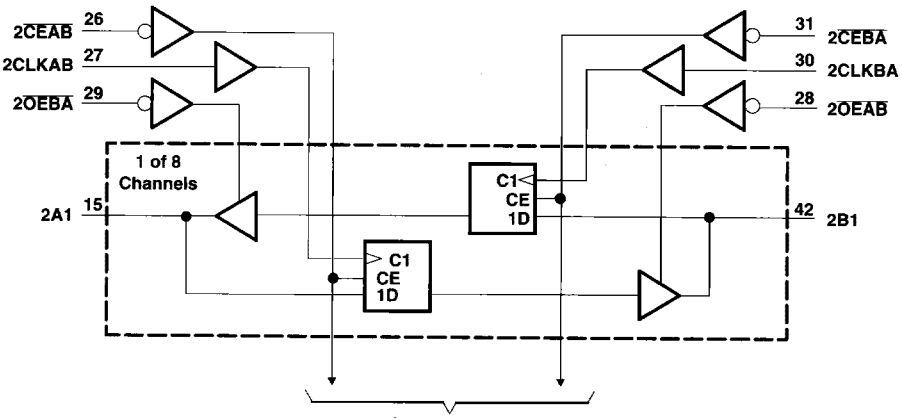
logic symbol†



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

logic diagram (positive logic)





FUNCTION TABLE†

INPUTS				OUTPUT
$\overline{CEAB}$	CLKAB	$\overline{OEAB}$	A	B
H	X	L	X	B_0‡
X	L	L	X	B_0‡
L	↑	L	L	L
L	↑	L	H	H
X	X	H	X	Z

† A-to-B data flow is shown; B-to-A data flow is similar but uses $\overline{CEBA}$, CLKBA, and $\overline{OEBA}$.
‡ Level of B before the indicated steady-state input conditions were established.

PRODUCT PREVIEW

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 (except I/O ports) (see Note 1) ..... −0.5 V to 4.6 V
Input voltage range, V_I (I/O ports) (see Notes 1 and 2) ..... −0.5 V to V_{CC} + 0.5 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 pins ..... ±100 mA
Maximum power dissipation at T_A = 55°C (in still air): DGG package ..... 0.7 W
DL package ..... 1 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.

recommended operating conditions (see Note 3)

			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

NOTE 3: Unused or floating pins (input or I/O) must be held high or low.
‡ Current duty cycle ≤ 50%, f ≥ 1 kHz

PRODUCT PREVIEW

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

PARAMETER		TEST CONDITIONS		V_{CC}†	MIN	TYP	MAX	UNIT
V_{IK}		$I_I = -18$ mA		2.7 V			−1.2	V
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_{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			20	μA
ΔI_{CC}		V_{CC} = 3 V to 3.6 V, Other inputs at V_{CC} or GND	One input at V_{CC} − 0.6 V,				500	μA
C_i	Control inputs	$V_I = V_{CC}$ or GND		3.3 V		TBD		pF
C_{io}	A or B ports	$V_O = V_{CC}$ or GND		3.3 V		TBD		pF

‡ For conditions shown as MIN or MAX, use the appropriate values under recommended operating conditions.
§ For I/O ports, the parameter I_{OZ} includes the input leakage current.

PRODUCT PREVIEW