

# 74LVT16652

## 3.3V ABT 16-Bit Transceiver/Register with TRI-STATE® Outputs

### General Description

The LVT16652 consists of sixteen bus transceiver circuits with D-type flip-flops, and control circuitry arranged for multiplexed transmission of data directly from the input bus or from the internal registers. Each byte has separate control inputs which can be shorted together for full 16-bit operation. Data on the A or B bus will be clocked into the registers as the appropriate clock pin goes to HIGH logic level. Output Enable pins (OEAB, OEBA) are provided to control the transceiver function.

The transceivers are designed for low-voltage (3.3V) V<sub>CC</sub> applications, but with the capability to provide a TTL interface to a 5V environment. The LVT16652 is fabricated with an advanced BiCMOS technology to achieve high speed operation similar to 5V ABT while maintaining a low power dissipation.

### Features

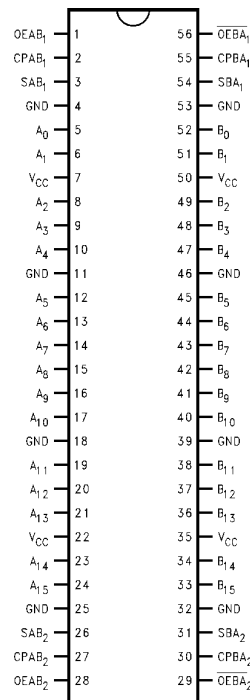
- Input and output interface capability to systems at 5V V<sub>CC</sub>
- Bus-Hold data inputs eliminate the need for external pull-up resistors to hold unused inputs
- Live insertion/extraction permitted
- Power Up/Down high impedance provides glitch-free bus loading
- Outputs source/sink -32 mA/ +64 mA
- Available in SSOP and TSSOP
- Functionally compatible with the 74 series 16652
- Latch-up performance exceeds 500 mA

### Connection Diagram

Pin Names	Description
A <sub>0</sub> -A <sub>16</sub>	Data Register A Inputs/ TRI-STATE Outputs
B <sub>0</sub> -B <sub>16</sub>	Data Register B Inputs/ TRI-STATE Outputs
CPAB <sub>n</sub> , CPBA <sub>n</sub>	Clock Pulse Inputs
SAB <sub>n</sub> , SBA <sub>n</sub>	Select Inputs
OEAB <sub>n</sub> , OEBA <sub>n</sub>	Output Enable Inputs

	SSOP EIAJ	TSSOP JEDEC
Order Number	74LVT16652MEA 74LVT16652MEAX	74LVT16652MTD 74LVT16652MTDX
NS Package Number	MS56A	MTD56

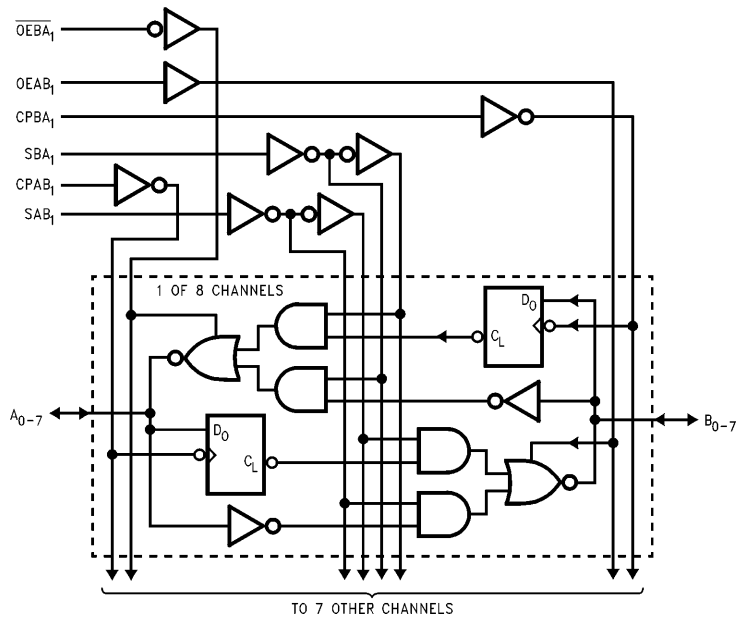
Pin Assignment for SSOP and TSSOP



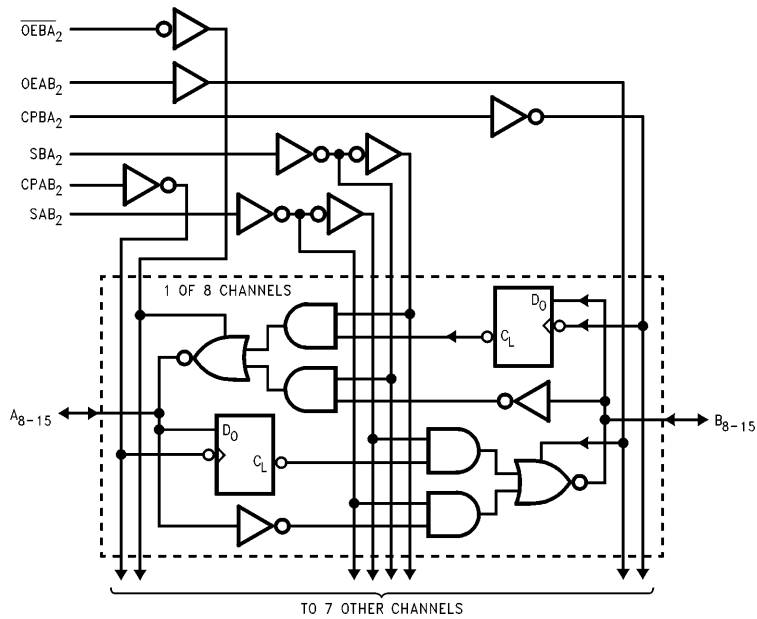
TL/F/12024-1

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## Logic Diagrams



TL/F/12024-2



TL/F/12024-3

Please note that these diagrams are provided only for the understanding of logic operations and should not be used to estimate propagation delays.

## Functional Description

In the transceiver mode, data present at the HIGH impedance port may be stored in either the A or B register or both. The select ( $SAB_n$ ,  $SBA_n$ ) controls can multiplex stored and real-time.

The examples in *Figure 1* demonstrate the four fundamental bus-management functions that can be performed with the LVT16652.

Data on the A or B data bus, or both can be stored in the internal D flip-flop by LOW to HIGH transitions at the appro-

appropriate Clock Inputs ( $CPAB_n$ ,  $CPBA_n$ ) regardless of the Select or Output Enable Inputs. When  $SAB$  and  $SBA$  are in the real time transfer mode, it is also possible to store data without using the internal D flip-flops by simultaneously enabling  $OEAB_n$  and  $OEBA_n$ . In this configuration each Output reinforces its Input. Thus when all other data sources to the two sets of bus lines are in a HIGH impedance state, each set of bus lines will remain at its last state.

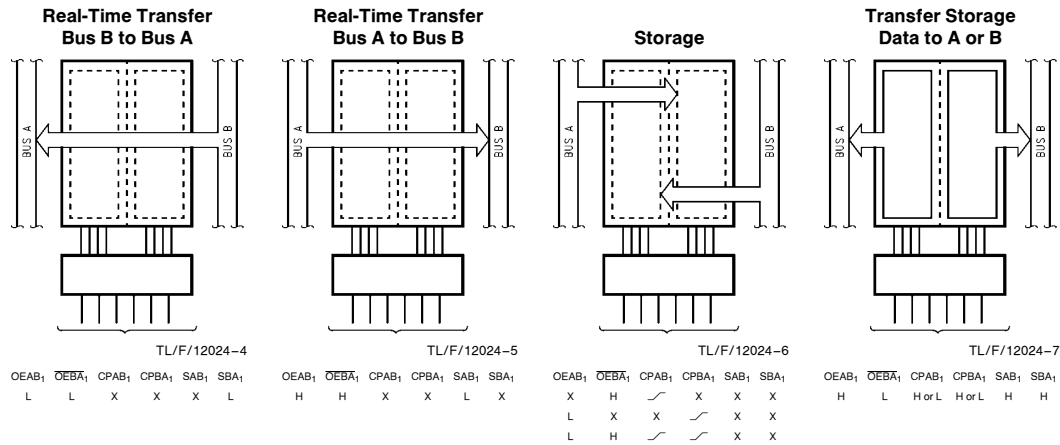


FIGURE 1

## Truth Table (Note)

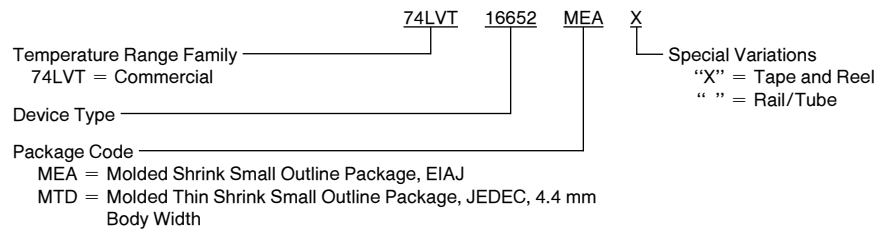
Inputs						Inputs/Outputs		Operating Mode
OEAB <sub>1</sub>	OEBA <sub>1</sub>	CPAB <sub>1</sub>	CPBA <sub>1</sub>	SAB <sub>1</sub>	SBA <sub>1</sub>	A <sub>0</sub> thru A <sub>7</sub>	B <sub>0</sub> thru B <sub>7</sub>	
L	H	H or L	H or L	X	X	Input	Input	Isolation
L	H	$\swarrow$	$\swarrow$	X	X			Store A and B Data
X	H	$\swarrow$	H or L	X	X	Input	Not Specified	Store A, Hold B
H	H	$\swarrow$	$\swarrow$	X	X	Input	Output	Store A in Both Registers
L	X	H or L	$\swarrow$	X	X	Not Specified	Input	Hold A, Store B
L	L	$\swarrow$	$\swarrow$	X	X	Output	Input	Store B in Both Registers
L	L	X	X	X	L	Output	Input	Real-Time B Data to A Bus
L	L	X	H or L	X	H			Store B Data to A Bus
H	H	X	X	L	X	Input	Output	Real-Time A Data to B Bus
H	H	H or L	X	H	X			Stored A Data to B Bus
H	L	H or L	H or L	H	H	Output	Output	Stored A Data to B Bus and Stored B Data to A Bus

H = HIGH Voltage Level L = LOW Voltage Level X = Immaterial  $\swarrow$  = LOW to HIGH Clock Transition

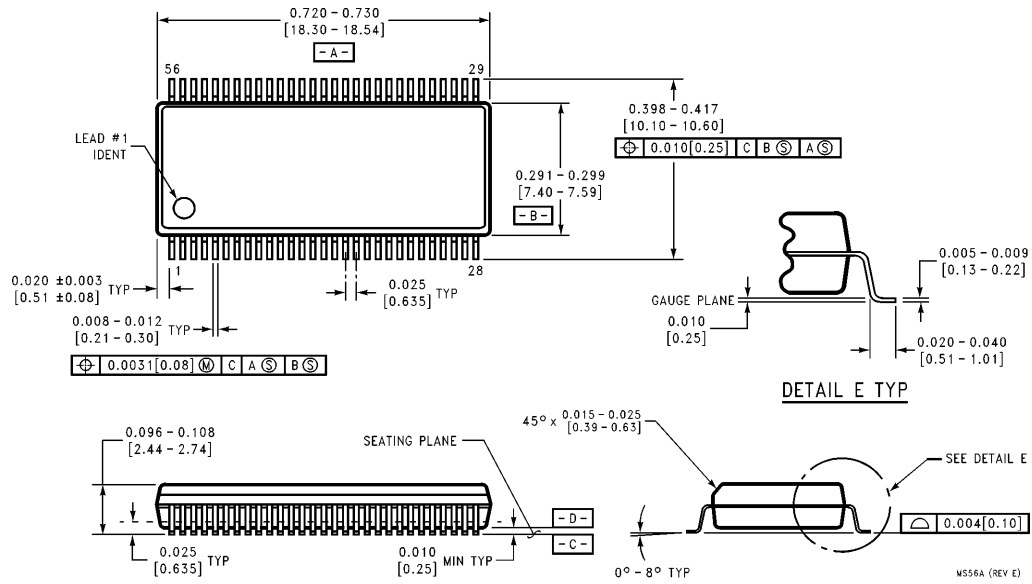
**Note:** The data output functions may be enabled or disabled by various signals at OEAB or OEBA inputs. Data input functions are always enabled, i.e., data at the bus pins will be stored on every LOW to HIGH transition on the clock inputs. This also applies to data I/O (A and B: 8-15) and #2 control pins.

## 74LVT16652 Ordering Information

The device number is used to form part of a simplified purchasing code where the package type and temperature range are defined as follows:



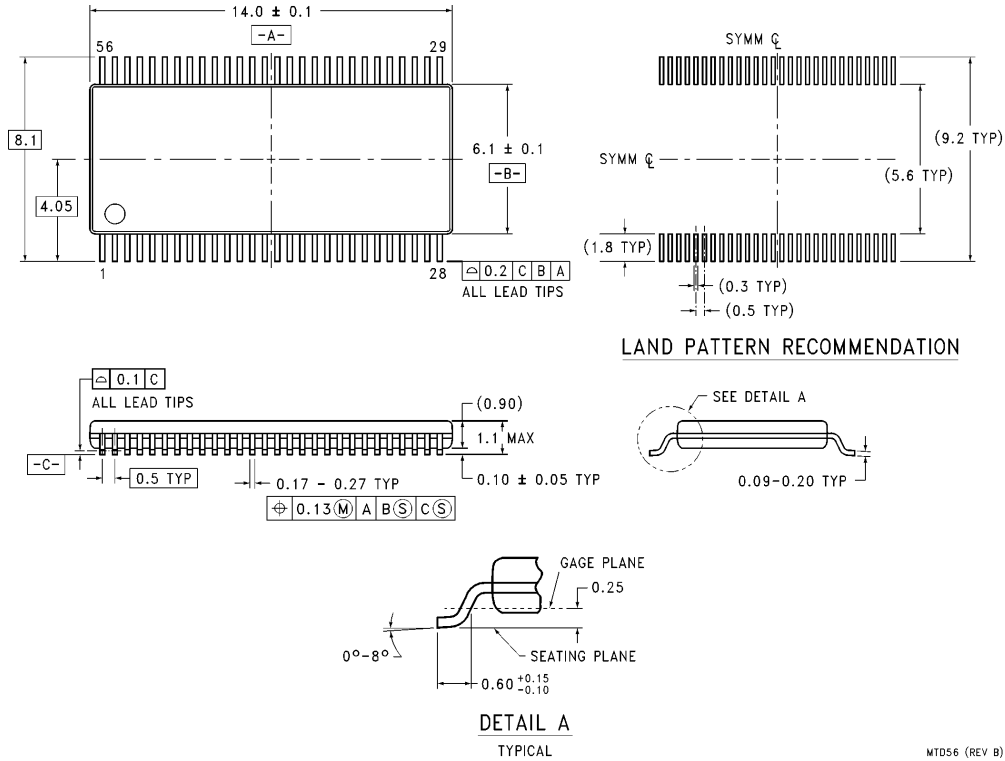
**Physical Dimensions** inches (millimeters) unless otherwise noted



**56-Lead Molded Shrink Small Outline Package, EIAJ**  
**Order Number 74LVT16652MEA or 74LVT16652MEAX**  
**NS Package Number MS56A**

MS56A (REV E)

**Physical Dimensions** millimeters (Continued)




**56-Lead Molded Thin Shrink Small Outline Package, JEDEC, 6.1 mm Body Width**  
**Order Number 74LVT16652MTD or 74LVT16652MTDX**  
**NS Package Number MTD56**

MTD56 (REV B)

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