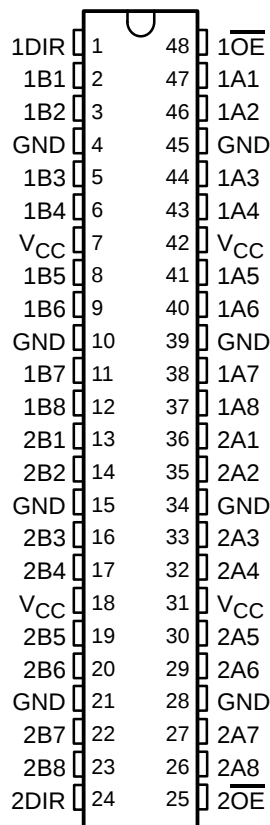


SN54ALVTH162245, SN74ALVTH162245 2.5-V/3.3-V 16-BIT BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

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- State-of-the-Art Advanced BiCMOS Technology (ABT) Widebus™ Design for 2.5-V and 3.3-V Operation and Low Static-Power Dissipation
- Support Mixed-Mode Signal Operation (5-V Input and Output Voltages With 2.3-V to 3.6-V V_{CC})
- Typical V_{OLP} (Output Ground Bounce) <0.8 V at $V_{CC} = 3.3$ V, $T_A = 25^\circ\text{C}$
- High Drive
 - A Port = $-12/12$ mA at 3.3-V V_{CC}
 - B port = $-32/64$ mA at 3.3-V V_{CC}
- I_{off} and Power-Up 3-State Support Hot Insertion
- Use Bus Hold on Data Inputs in Place of External Pullup/Pulldown Resistors to Prevent the Bus From Floating
- A-Port Outputs Have Equivalent 30- Ω Series Resistors, So No External Resistors Are Required
- Flow-Through Architecture Facilitates Printed Circuit Board Layout
- Distributed V_{CC} and GND Pins Minimize High-Speed Switching Noise
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II

SN54ALVTH162245 . . . WD PACKAGE
SN74ALVTH162245 . . . DGG, DGV, OR DL PACKAGE
(TOP VIEW)



description

The 'ALVTH162245 devices are 16-bit (dual-octal) noninverting 3-state transceivers designed for 2.5-V or 3.3-V V_{CC} operation, but with the capability to provide a TTL interface to a 5-V system environment.

These devices can be used as two 8-bit transceivers or one 16-bit transceiver. They allow data transmission from the A bus to the B bus or from the B bus to the A bus, depending on the logic level at the direction-control (DIR) input. The output-enable ($\overline{OE}$) input can be used to disable the device so that the buses are effectively isolated.

The A-port outputs, which are designed to source or sink up to 12 mA, include equivalent 30- Ω series resistors to reduce overshoot and undershoot.

These devices are fully specified for hot-insertion applications using I_{off} and power-up 3-state. The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down. The power-up 3-state circuitry places the outputs in the high-impedance state during power up and power down, which prevents driver conflict.

Active bus-hold circuitry is provided to hold unused or floating data inputs at a valid logic level. Use of pullup or pulldown resistors with the bus-hold circuitry is not recommended.



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**TEXAS
INSTRUMENTS**

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SN54ALVTH162245, SN74ALVTH162245

2.5-V/3.3-V 16-BIT BUS TRANSCEIVERS

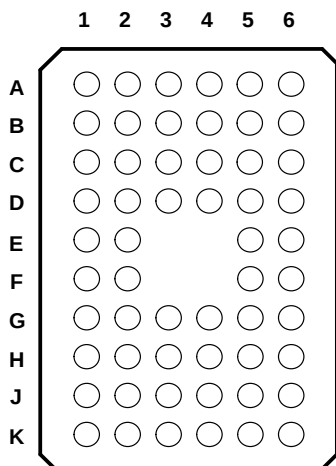
WITH 3-STATE OUTPUTS

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description (continued)

When V_{CC} is between 0 and 1.2 V, the device is in the high-impedance state during power up or power down. However, to ensure the high-impedance state above 1.2 V, $\overline{OE}$ should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

SN74ALVTH162245 . . . GQL PACKAGE (TOP VIEW)



terminal assignments

	1	2	3	4	5	6
A	1DIR	NC	NC	NC	NC	$\overline{1OE}$
B	1B2	1B1	GND	GND	1A1	1A2
C	1B4	1B3	V_{CC}	V_{CC}	1A3	1A4
D	1B6	1B5	GND	GND	1A5	1A6
E	1B8	1B7			1A7	1A8
F	2B1	2B2			2A2	2A1
G	2B3	2B4	GND	GND	2A4	2A3
H	2B5	2B6	V_{CC}	V_{CC}	2A6	2A5
J	2B7	2B8	GND	GND	2A8	2A7
K	2DIR	NC	NC	NC	NC	$\overline{2OE}$

NC – No internal connection

ORDERING INFORMATION

T_A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 85°C	SSOP – DL	Tape and reel	SN74ALVTH162245LR	ALVTH162245
	TSSOP – DGG	Tape and reel	SN74ALVTH162245GR	ALVTH162245
	TVSOP – DGV	Tape and reel	SN74ALVTH162245VR	VT2245
	VFBGA – GQL	Tape and reel	SN74ALVTH162245QR	
–55°C to 125°C	CFP – WD	Tube	SNJ54ALVTH162245WD	SNJ54ALVTH162245WD

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

FUNCTION TABLE (each 8-bit section)

INPUTS		OPERATION
$\overline{OE}$	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

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[illegible]

3

SN54ALVTH162245, SN74ALVTH162245

2.5-V/3.3-V 16-BIT BUS TRANSCEIVERS

WITH 3-STATE OUTPUTS

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recommended operating conditions, $V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$ (see Note 3)

		SN54ALVTH162245			SN74ALVTH162245			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
V_{CC}	Supply voltage	2.3		2.7	2.3		2.7	V
V_{IH}	High-level input voltage	1.7			1.7			V
V_{IL}	Low-level input voltage			0.7			0.7	V
V_I	Input voltage	0	V_{CC}	5.5	0	V_{CC}	5.5	V
I_{OH}	High-level output current (A port)			–6			–8	mA
	High-level output current (B port)			–6			–8	
I_{OL}	Low-level output current (A port)			6			12	mA
	Low-level output current (B port)			6			8	
	Low-level output current; current duty cycle $\leq 50\%$; $f \geq 1\text{ kHz}$ (B port)			18			24	
$\Delta t/\Delta v$	Input transition rise or fall rate	Outputs enabled			10			ns/V
$\Delta t/\Delta V_{CC}$	Power-up ramp rate	200			200			$\mu\text{s/V}$
T_A	Operating free-air temperature	–55		125	–40		85	$^{\circ}\text{C}$

NOTE 3: All unused control inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

recommended operating conditions, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$ (see Note 3)

		SN54ALVTH162245			SN74ALVTH162245			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
V_{CC}	Supply voltage	3		3.6	3		3.6	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
V_I	Input voltage	0	V_{CC}	5.5	0	V_{CC}	5.5	V
I_{OH}	High-level output current (A port)			–8			–12	mA
	High-level output current (B port)			–24			–32	
I_{OL}	Low-level output current (A port)			8			12	mA
	Low-level output current (B port)			24			32	
	Low-level output current; current duty cycle $\leq 50\%$; $f \geq 1\text{ kHz}$ (B port)			48			64	
$\Delta t/\Delta v$	Input transition rise or fall rate	Outputs enabled			10			ns/V
$\Delta t/\Delta V_{CC}$	Power-up ramp rate	200			200			$\mu\text{s/V}$
T_A	Operating free-air temperature	–55		125	–40		85	$^{\circ}\text{C}$

NOTE 3: All unused control inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

SN54ALVTH162245, SN74ALVTH162245 2.5-V/3.3-V 16-BIT BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

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electrical characteristics over recommended operating free-air temperature range,
 $V_{CC} = 2.5 \text{ V} \pm 0.2 \text{ V}$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS		SN54ALVTH162245			SN74ALVTH162245			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V _{IK}		V _{CC} = 2.3 V, I _I = −18 mA		−1.2			−1.2			V
V _{OH}	A port	V _{CC} = 2.3 V to 2.7 V, I _{OH} = −100 μA		V _{CC} −0.2			V _{CC} −0.2			V
		V _{CC} = 2.3 V	I _{OH} = −6 mA	1.7						
			I _{OH} = −8 mA				1.7			
	B port	V _{CC} = 2.3 V to 2.7 V, I _{OH} = −100 μA		V _{CC} −0.2			V _{CC} −0.2			
		V _{CC} = 2.3 V	I _{OH} = −6 mA	1.7						
			I _{OH} = −8 mA				1.7			
V _{OL}	A port	V _{CC} = 2.3 V to 2.7 V, I _{OL} = 100 μA		0.2			0.2			V
		V _{CC} = 2.3 V	I _{OL} = 6 mA	0.4						
			I _{OL} = 12 mA				0.4			
	B port	V _{CC} = 2.3 V to 2.7 V, I _{OL} = 100 μA		0.2			0.2			
		V _{CC} = 2.3 V	I _{OL} = 6 mA	0.4						
			I _{OL} = 8 mA				0.4			
			I _{OL} = 18 mA	0.5						
			I _{OL} = 24 mA				0.5			
I _I	Control inputs	V _{CC} = 2.7 V, V _I = GND		±1			±1			μA
		V _{CC} = 0 or 2.7 V, V _I = 5.5 V		10			10			
	A or B ports	V _{CC} = 2.7 V	V _I = 5.5 V	20			20			
			V _I = V _{CC}	1			1			
			V _I = 0	−5			−5			
I _{off}		V _{CC} = 0, V _I or V _O = 0 to 4.5 V					±100			μA
I _{BHL} [‡]		V _{CC} = 2.3 V, V _I = 0.7 V		115			115			μA
I _{BHH} [§]		V _{CC} = 2.3 V, V _I = 1.7 V		−10			−10			μA
I _{BHLO} [¶]		V _{CC} = 2.7 V, V _I = 0 to V _{CC}		300			300			μA
I _{BHHO} [#]		V _{CC} = 2.7 V, V _I = 0 to V _{CC}		−300			−300			μA
I _{EX}		V _{CC} = 2.3 V, V _O = 5.5 V		125			125			μA
I _{OZ(PU/PD)} [*]		V _{CC} ≤ 1.2 V, V _O = 0.5 V to V _{CC} , V _I = GND or V _{CC} , OE = don't care		±100			±100			μA
I _{CC}		V _{CC} = 2.7 V, I _O = 0, V _I = V _{CC} or GND	Outputs high	0.04	0.1	0.04		0.1	mA	
			Outputs low	2.3	4.5	2.3		4.5		
			Outputs disabled	0.04	0.1	0.04		0.1		
C _i		V _{CC} = 2.5 V, V _I = 2.5 V or 0		3.5			3.5			pF
C _{io}		V _{CC} = 2.5 V, V _O = 2.5 V or 0		8			8			pF

[†] All typical values are at $V_{CC} = 2.5 \text{ V}$, $T_A = 25^\circ\text{C}$.

[‡] The bus-hold circuit can sink at least the minimum low sustaining current at V_{IL} max. I_{BHL} should be measured after lowering V_{IN} to GND and then raising it to V_{IL} max.

[§] The bus-hold circuit can source at least the minimum high sustaining current at V_{IH} min. I_{BHH} should be measured after raising V_{IN} to V_{CC} and then lowering it to V_{IH} min.

^{\P} An external driver must source at least I_{BHLO} to switch this node from low to high.

^{\#} An external driver must sink at least I_{BHHO} to switch this node from high to low.

^{\parallel} Current into an output in the high state when $V_O > V_{CC}$

^{\star} High-impedance state during power up or power down

PRODUCT PREVIEW information concerns products in the formative or design phase of development. Characteristic data and other specifications are design goals. Texas Instruments reserves the right to change or discontinue these products without notice.



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SN54ALVTH162245, SN74ALVTH162245

2.5-V/3.3-V 16-BIT BUS TRANSCEIVERS

WITH 3-STATE OUTPUTS

SCES331A – APRIL 2000 – REVISED APRIL 2002

electrical characteristics over recommended operating free-air temperature range,
 $V_{CC} = 3.3 \text{ V} \pm 0.3 \text{ V}$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS		SN54ALVTH162245		SN74ALVTH162245		UNIT
				MIN	TYP†	MAX	MIN	
V _{IK}		V _{CC} = 3 V, I _I = −18 mA		−1.2		−1.2		V
V _{OH}	A port	V _{CC} = 3 V to 3.6 V, I _{OH} = −100 μA	V _{CC} −0.2		V _{CC} −0.2		V	
		V _{CC} = 3 V	I _{OH} = −8 mA	2				
			I _{OH} = −12 mA	2				
	B port	V _{CC} = 3 V to 3.6 V, I _{OH} = −100 μA	V _{CC} −0.2		V _{CC} −0.2			
		V _{CC} = 3 V	I _{OH} = −24 mA	2				
			I _{OH} = −32 mA	2				
V _{OL}	A port	V _{CC} = 3 V to 3.6 V, I _{OL} = 100 μA	0.2		0.2		V	
		V _{CC} = 3 V	I _{OL} = 8 mA	?				
			I _{OL} = 12 mA	0.8				
	B port	V _{CC} = 3 V to 3.6 V, I _{OL} = 100 μA	0.2		0.2			
		V _{CC} = 3 V	I _{OL} = 24 mA	0.5				
			I _{OL} = 32 mA	0.5				
			I _{OL} = 48 mA	0.55				
			I _{OL} = 64 mA	0.55				
I _I	Control inputs	V _{CC} = 3.6 V, V _I = V _{CC} or GND	±1		±1		μA	
		V _{CC} = 0 or 3.6 V, V _I = 5.5 V	10		10			
	A or B ports	V _{CC} = 3.6 V	V _I = 5.5 V	20		20		
			V _I = V _{CC}	1		1		
			V _I = 0	−5		−5		
I _{off}	V _{CC} = 0, V _I or V _O = 0 to 4.5 V				±100		μA	
I _{BHL} [‡]	V _{CC} = 3 V, V _I = 0.8 V		75		75		μA	
I _{BHH} [§]	V _{CC} = 3 V, V _I = 2 V		−75		−75		μA	
I _{BHLO} [¶]	V _{CC} = 3.6 V, V _I = 0 to V _{CC}		500		500		μA	
I _{BHHO} [#]	V _{CC} = 3.6 V, V _I = 0 to V _{CC}		−500		−500		μA	
I _{EX}	V _{CC} = 3 V, V _O = 5.5 V		125		125		μA	
I _{OZ(PU/PD)} [★]	V _{CC} ≤ 1.2 V, V _O = 0.5 V to V _{CC} , V _I = GND or V _{CC} , OE = don't care		±100		±100		μA	
I _{CC}	V _{CC} = 3.6 V, I _O = 0, V _I = V _{CC} or GND	Outputs high	0.07 0.1		0.07 0.1		mA	
		Outputs low	3.2 5		3.2 5			
		Outputs disabled	0.07 0.1		0.07 0.1			
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		0.2		0.2		mA	
C _i	V _{CC} = 3.3 V, V _I = 3.3 V or 0		3.5		3.5		pF	
C _{io}	V _{CC} = 3.3 V, V _O = 3.3 V or 0		8		8		pF	

[†] All typical values are at $V_{CC} = 3.3 \text{ V}$, $T_A = 25^\circ\text{C}$.

[‡] The bus-hold circuit can sink at least the minimum low sustaining current at V_{IL} max. I_{BHL} should be measured after lowering V_{IN} to GND and then raising it to V_{IL} max.

[§] The bus-hold circuit can source at least the minimum high sustaining current at V_{IH} min. I_{BHH} should be measured after raising V_{IN} to V_{CC} and then lowering it to V_{IH} min.

^{\P} An external driver must source at least I_{BHLO} to switch this node from low to high.

^{\#} An external driver must sink at least I_{BHHO} to switch this node from high to low.

^{\|} Current into an output in the high state when $V_O > V_{CC}$

^{\star} High-impedance state during power up or power down

^{\square} This is the increase in supply current for each input that is at the specified TTL voltage level rather than V_{CC} or GND.

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SN54ALVTH162245, SN74ALVTH162245 2.5-V/3.3-V 16-BIT BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

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switching characteristics over recommended operating free-air temperature range, $C_L = 30$ pF, $V_{CC} = 2.5$ V $\pm$ 0.2 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN54ALVTH162245		SN74ALVTH162245		UNIT
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	0.3	3.6	0.3	3.6	ns
t_{PHL}			0.5	3.5	0.5	3.5	
t_{PLH}	B	A	1.1	4.3	1.1	4.3	ns
t_{PHL}			1.1	3.8	1.1	3.8	
t_{PZH}	$\overline{OE}$	A	2	5.6	2	5.6	ns
t_{PZL}			1.8	4.4	1.8	4.4	
t_{PZH}	$\overline{OE}$	B	1.5	5.1	1.5	5.1	ns
t_{PZL}			1.5	4.1	1.5	4.1	
t_{PHZ}	$\overline{OE}$	A	1.9	4.9	1.9	4.9	ns
t_{PLZ}			1.5	4.3	1.5	4.3	
t_{PHZ}	$\overline{OE}$	B	1.9	4.8	1.9	4.8	ns
t_{PLZ}			1.5	4.1	1.5	4.1	

switching characteristics over recommended operating free-air temperature range, $C_L = 50$ pF, $V_{CC} = 3.3$ V $\pm$ 0.3 V (unless otherwise noted) (see Figure 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN54ALVTH162245		SN74ALVTH162245		UNIT
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	0.5	3.1	0.5	3.1	ns
t_{PHL}			0.5	3	0.5	3	
t_{PLH}	B	A	1	3.7	1	3.7	ns
t_{PHL}			1	3.4	1	3.4	
t_{PZH}	$\overline{OE}$	A	1.4	4.7	1.4	4.7	ns
t_{PZL}			1.4	3.9	1.4	3.9	
t_{PZH}	OE	B	1	3.8	1	3.8	ns
t_{PZL}			0.7	3.4	0.7	3.4	
t_{PHZ}	$\overline{OE}$	A	2.4	5	2.4	5	ns
t_{PLZ}			2.6	4.9	2.6	4.9	
t_{PHZ}	$\overline{OE}$	B	2.4	4.7	2.4	4.7	ns
t_{PLZ}			2.3	4.8	2.3	4.8	

PRODUCT PREVIEW information concerns products in the formative or design phase of development. Characteristic data and other specifications are design goals. Texas Instruments reserves the right to change or discontinue these products without notice.

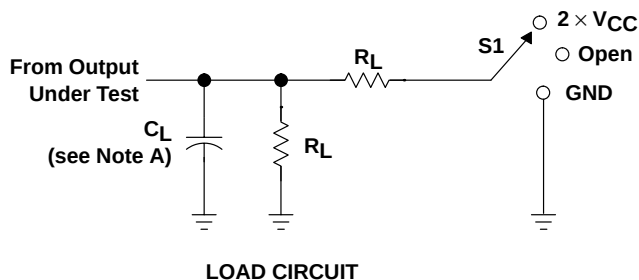


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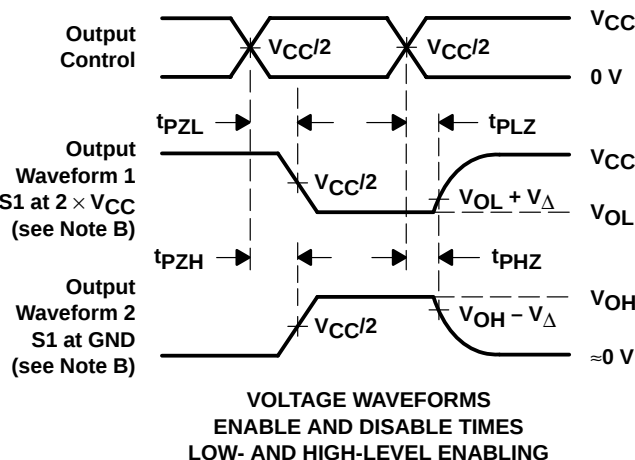
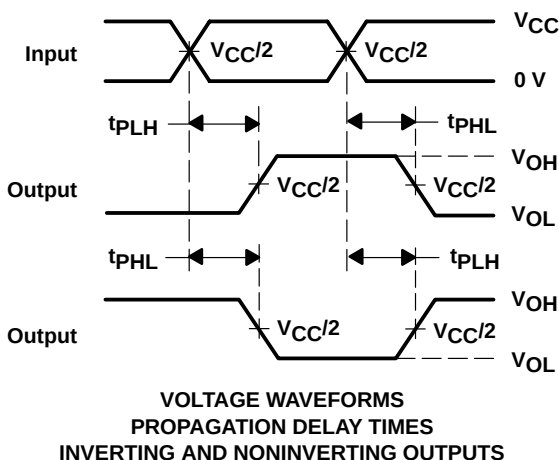
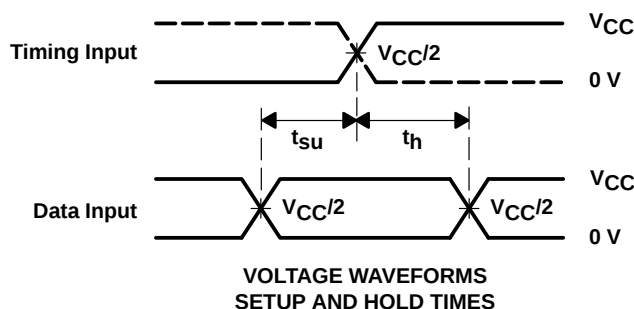
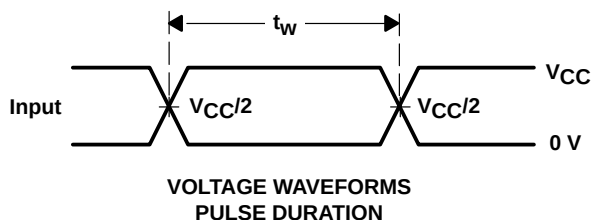
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PARAMETER MEASUREMENT INFORMATION



TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	$2 \times V_{CC}$
t_{PHZ}/t_{PZH}	GND

V_{CC}	C_L	R_L	V_{Δ}
$2.5 \text{ V} \pm 0.2 \text{ V}$	30 pF	500 Ω	0.15 V
$3.3 \text{ V} \pm 0.3 \text{ V}$	50 pF	500 Ω	0.3 V



- 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 generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r \leq 2 \text{ ns}$, $t_f \leq 2 \text{ ns}$.
D. The outputs are measured one at a time with one transition per measurement.
E. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
SN74ALVTH162245DL	Obsolete	Production	SSOP (DL) 48	-	-	Call TI	Call TI	-40 to 85	ALVTH162245
SN74ALVTH162245GR	Obsolete	Production	TSSOP (DGG) 48	-	-	Call TI	Call TI	-40 to 85	ALVTH162245
SN74ALVTH162245LR	Obsolete	Production	SSOP (DL) 48	-	-	Call TI	Call TI	-40 to 85	ALVTH162245
SN74ALVTH162245VR	Obsolete	Production	TVSOP (DGV) 48	-	-	Call TI	Call TI	-40 to 85	VT2245

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

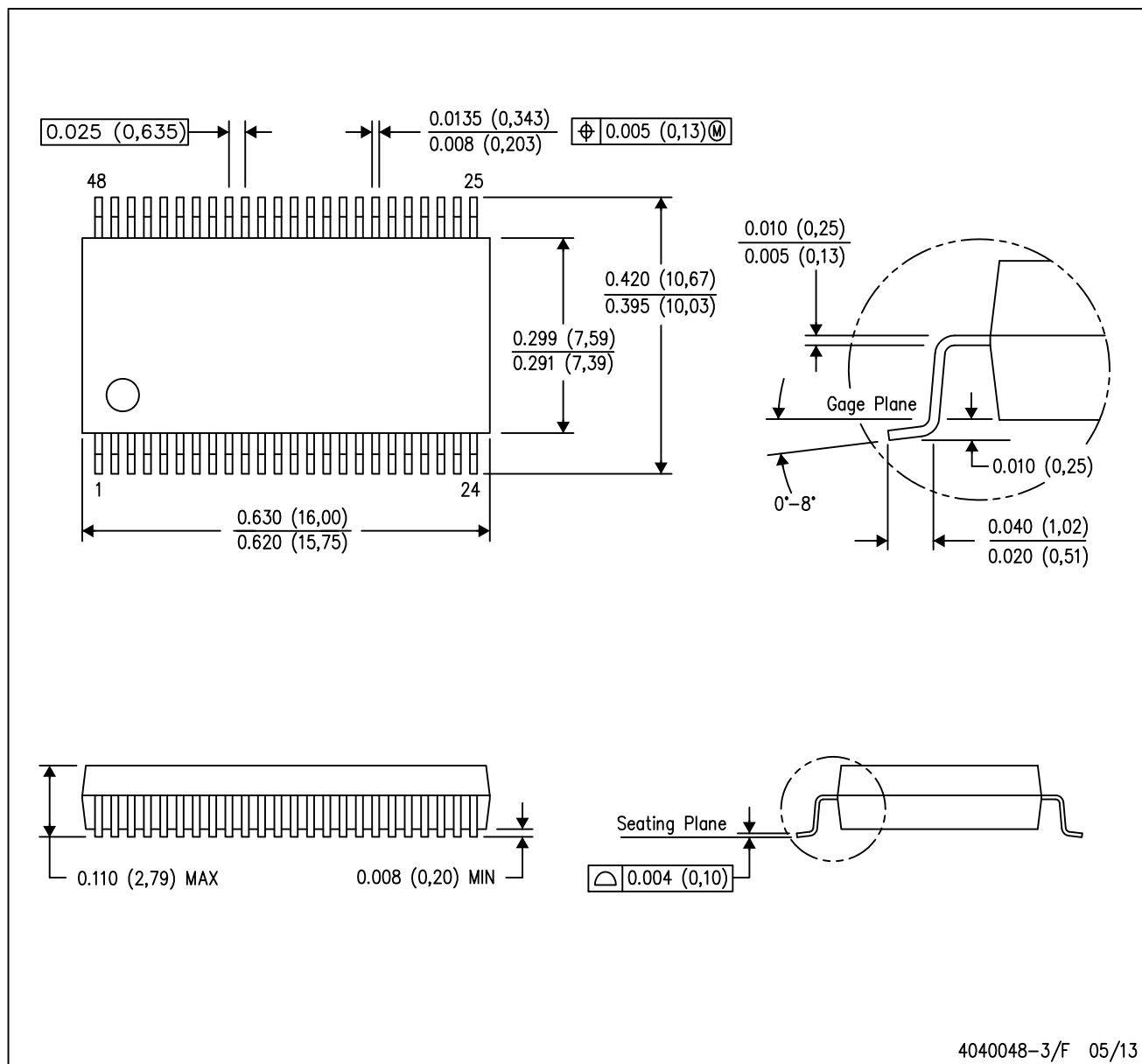
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "-" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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DL (R-PDSO-G48)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
 - D. Falls within JEDEC MO-118

DGV (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

24 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
 D. Falls within JEDEC: 24/48 Pins – MO-153
 14/16/20/56 Pins – MO-194



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NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. Reference JEDEC registration MO-153.

EXAMPLE BOARD LAYOUT

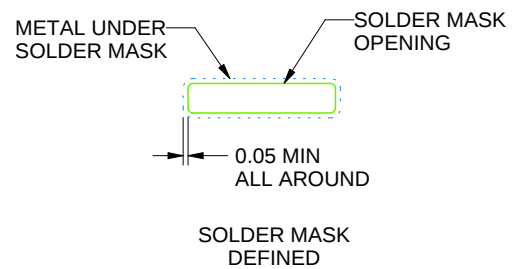
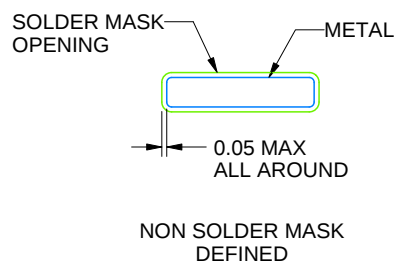
DGG0048A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
SCALE:6X



SOLDER MASK DETAILS

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NOTES: (continued)

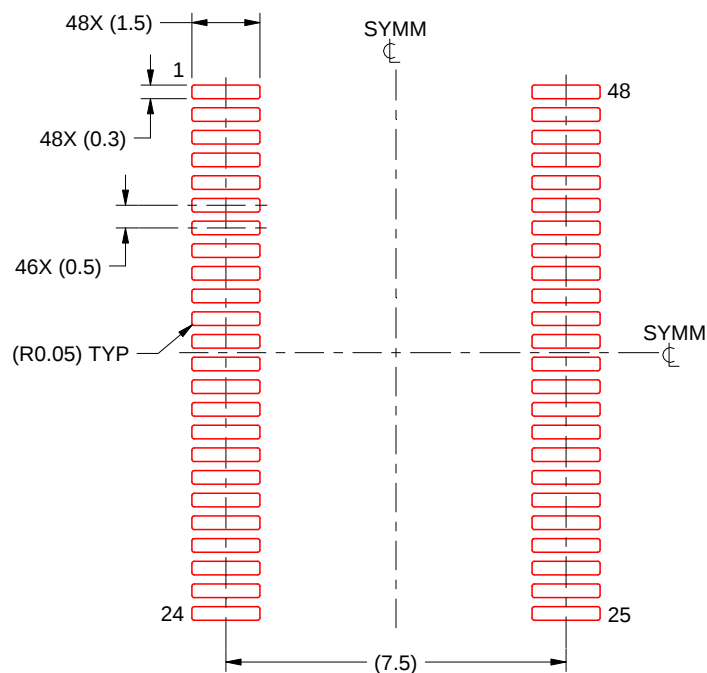
5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DGG0048A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:6X

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NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

DGG (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

48 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold protrusion not to exceed 0,15.
 D. Falls within JEDEC MO-153

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