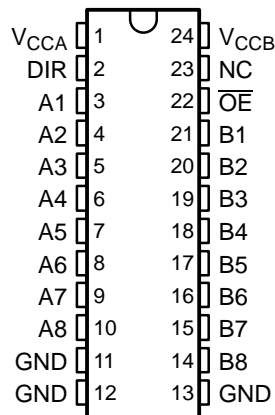


FEATURES

- Bidirectional Voltage Translator
- 2.3 V to 3.6 V on A Port and 3 V to 5.5 V on B Port
- Control Inputs V_{IH}/V_{IL} Levels Are Referenced to V_{CCA} Voltage
- Latch-Up Performance Exceeds 250 mA Per JESD 17
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

DB, DBQ, DW, NS, OR PW PACKAGE
(TOP VIEW)



NC - No internal connection

DESCRIPTION/ORDERING INFORMATION

This 8-bit (octal) noninverting bus transceiver contains two separate supply rails. The B port is designed to track V_{CCB} , which accepts voltages from 3 V to 5.5 V, and the A port is designed to track V_{CCA} , which operates at 2.3 V to 3.6 V. This allows for translation from a 3.3-V to a 5-V system environment and vice versa, from a 2.5-V to a 3.3-V system environment and vice versa.

The SN74LVCC3245A is designed for asynchronous communication between data buses. The device transmits data 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 the buses are effectively isolated. The control circuitry (DIR, \overline{OE}) is powered by V_{CCA} .

ORDERING INFORMATION

T_A	PACKAGE ⁽¹⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 85°C	SOIC – DW	Tube of 25	SN74LVCC3245ADW	LVCC3245A
		Reel of 2000	SN74LVCC3245ADWR	
	SOP – NS	Reel of 2000	SN74LVCC3245ANSR	LVCC3245A
	SSOP – DB	Reel of 2000	SN74LVCC3245ADBR	LH245A
	SSOP (QSOP) – DBQ	Reel of 2500	SN74LVCC3245ADBQR	LVCC3245A
	TSSOP – PW	Tube of 60	SN74LVCC3245APW	LH245A
		Reel of 2000	SN74LVCC3245APWR	
		Reel of 250	SN74LVCC3245APWT	

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

FUNCTION TABLE (EACH TRANSCEIVER)

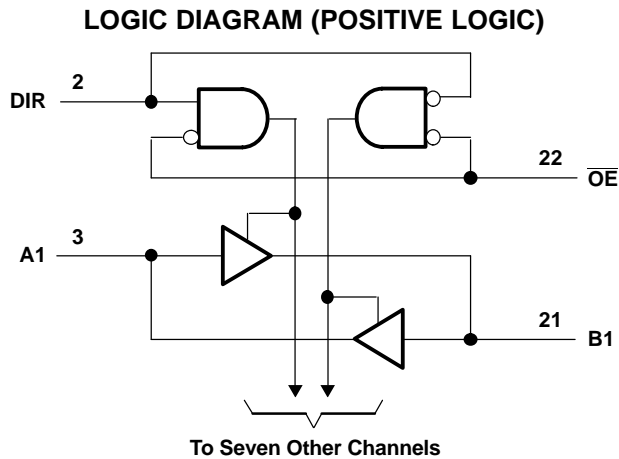
INPUTS		OPERATION
\overline{OE}	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

SN74LVCC3245A
OCTAL BUS TRANSCEIVER
WITH ADJUSTABLE OUTPUT VOLTAGE AND 3-STATE OUTPUTS

SCAS5850–NOVEMBER 1996–REVISED MARCH 2005



Absolute Maximum Ratings⁽¹⁾

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

		MIN	MAX	UNIT	
V_{CCA} V_{CCB}	Supply voltage range	-0.5	6	V	
V_I	Input voltage range	All A ports ⁽²⁾	-0.5	$V_{CCA} + 0.5$	V
		All B ports ⁽³⁾	-0.5	$V_{CCB} + 0.5$	
		Except I/O ports ⁽²⁾	-0.5	$V_{CCA} + 0.5$	
V_O	Output voltage range ⁽³⁾	All A ports	-0.5	$V_{CCA} + 0.5$	V
		All B ports	-0.5	$V_{CCB} + 0.5$	
I_{IK}	Input clamp current		$V_I < 0$	-50	mA
I_{OK}	Output clamp current		$V_O < 0$	-50	mA
I_O	Continuous output current			±50	mA
	Continuous current through V_{CCA} , V_{CCB} , or GND			±100	mA
θ_{JA}	Package thermal impedance ⁽⁴⁾	DB package		63	°C/W
		DBQ package		61	
		DW package		46	
		NS package		65	
		PW package		88	
T_{stg}	Storage temperature range	-65	150	°C	

- (1) 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.
- (2) This value is limited to 4.6 V maximum.
- (3) This value is limited to 6 V maximum.
- (4) The package thermal impedance is calculated in accordance with JESD 51-7.

Recommended Operating Conditions⁽¹⁾

		V _{CCA}	V _{CCB}	MIN	NOM	MAX	UNIT
V _{CCA}	Supply voltage			2.3	3.3	3.6	V
V _{CCB}	Supply voltage			3	5	5.5	V
V _{IHA}	High-level input voltage	2.3 V	3 V	1.7			V
		2.7 V	3 V	2			
		3 V	3.6 V	2			
		3.6 V	5.5 V	2			
V _{IHB}	High-level input voltage	2.3 V	3 V	2			V
		2.7 V	3 V	2			
		3 V	3.6 V	2			
		3.6 V	5.5 V	3.85			
V _{ILA}	Low-level input voltage	2.3 V	3 V			0.7	V
		2.7 V	3 V			0.8	
		3 V	3.6 V			0.8	
		3.6 V	5.5 V			0.8	
V _{ILB}	Low-level input voltage	2.3 V	3 V			0.8	V
		2.7 V	3 V			0.8	
		3 V	3.6 V			0.8	
		3.6 V	5.5 V			1.65	
V _{IH}	High-level input voltage (control pins) (referenced to V _{CCA})	2.3 V	3 V	1.7			V
		2.7 V	3 V	2			
		3 V	3.6 V	2			
		3.6 V	5.5 V	2			
V _{IL}	Low-level input voltage (control pins) (referenced to V _{CCA})	2.3 V	3 V			0.7	V
		2.7 V	3 V			0.8	
		3 V	3.6 V			0.8	
		3.6 V	5.5 V			0.8	
V _{IA}	Input voltage			0		V _{CCA}	V
V _{IB}	Input voltage			0		V _{CCB}	V
V _{OA}	Output voltage			0		V _{CCA}	V
V _{OB}	Output voltage			0		V _{CCB}	V
I _{OHA}	High-level output current	2.3 V	3 V			–8	mA
		2.7 V	3 V			–12	
		3 V	3 V			–24	
		2.7 V	4.5 V			–24	
I _{OHB}	High-level output current	2.3 V	3 V			–12	mA
		2.7 V	3 V			–12	
		3 V	3 V			–24	
		2.7 V	4.5 V			–24	
I _{OLA}	Low-level output current	2.3 V	3 V			8	mA
		2.7 V	3 V			12	
		3 V	3 V			24	
		2.7 V	4.5 V			24	

(1) All unused inputs of the device must be held at the associated 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.

SN74LVCC3245A
OCTAL BUS TRANSCEIVER
WITH ADJUSTABLE OUTPUT VOLTAGE AND 3-STATE OUTPUTS



SCAS585O–NOVEMBER 1996–REVISED MARCH 2005

Recommended Operating Conditions (continued)

		V _{CCA}	V _{CCB}	MIN	NOM	MAX	UNIT
I _{OLB}	Low-level output current	2.3 V	3 V			12	mA
		2.7 V	3 V			12	
		3 V	3 V			24	
		2.7 V	4.5 V			24	
Δt/Δv	Input transition rise or fall rate					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 _{CCA}	V _{CCB}	MIN	TYP	MAX	UNIT
V _{OHA}		I _{OH} = -100 μA	3 V	3 V	2.9	3		V
		I _{OH} = -8 mA	2.3 V	3 V	2			
		I _{OH} = -12 mA	2.7 V	3 V	2.2	2.5		
			3 V	3 V	2.4	2.8		
		I _{OH} = -24 mA	3 V	3 V	2.2	2.6		
	2.7 V		4.5 V	2	2.3			
V _{OHB}		I _{OH} = -100 μA	3 V	3 V	2.9	3		V
		I _{OH} = -12 mA	2.3 V	3 V	2.4			
			2.7 V	3 V	2.4	2.8		
		I _{OH} = -24 mA	3 V	3 V	2.2	2.6		
	2.7 V		4.5 V	3.2	4.2			
V _{OLA}		I _{OL} = 100 μA	3 V	3 V			0.1	V
		I _{OL} = 8 mA	2.3 V	3 V			0.6	
			2.7 V	3 V		0.1	0.5	
		I _{OL} = 24 mA	3 V	3 V		0.2	0.5	
	2.7 V		4.5 V		0.2	0.5		
V _{OLB}		I _{OL} = 100 μA	3 V	3 V			0.1	V
		I _{OL} = 12 mA	2.3 V	3 V			0.4	
			3 V	3 V		0.2	0.5	
		I _{OL} = 24 mA	2.7 V	4.5 V		0.2	0.5	
I _I	Control inputs	V _I = V _{CCA} or GND	3.6 V	3.6 V		±0.1	±1	μA
				5.5 V		±0.1	±1	
I _{OZ} ⁽¹⁾	A or B ports	V _O = V _{CCA/B} or GND, V _I = V _{IL} or V _{IH}	3.6 V	3.6 V		±0.5	±5	μA
I _{CCA}	B to A	A port = V _{CCA} or GND, I _O = 0	3.6 V	Open		5	50	μA
		B port = V _{CCB} or GND, I _O = 0	3.6 V	3.6 V		5	50	
I _{CCB}	A to B	A port = V _{CCA} or GND, I _O = 0	3.6 V	3.6 V		5	50	μA
				5.5 V		8	80	
ΔI _{CCA} ⁽²⁾	A port	V _I = V _{CCA} - 0.6 V, Other inputs at V _{CCA} or GND, \overline{OE} at GND and DIR at V _{CCA}	3.6 V	3.6 V		0.35	0.5	mA
	\overline{OE}	V _I = V _{CCA} - 0.6 V, Other inputs at V _{CCA} or GND, DIR at V _{CCA}	3.6 V	3.6 V		0.35	0.5	
	DIR	V _I = V _{CCA} - 0.6 V, Other inputs at V _{CCA} or GND, \overline{OE} at GND	3.6 V	3.6 V		0.35	0.5	
ΔI _{CCB} ⁽²⁾	B port	V _I = V _{CCB} - 2.1 V, Other inputs at V _{CCB} or GND, \overline{OE} at GND and DIR at GND	3.6 V	5.5 V		1	1.5	mA
C _i	Control inputs	V _I = V _{CCA} or GND	Open	Open		4		pF
C _{io}	A or B ports	V _O = V _{CCA/B} or GND	3.3 V	5 V		18.5		pF

 (1) For I/O ports, the parameter I_{OZ} includes the input leakage current.

 (2) This is the increase in supply current for each input that is at one of the specified voltage levels, rather than 0 V or the associated V_{CC}.

SN74LVCC3245A
OCTAL BUS TRANSCEIVER
WITH ADJUSTABLE OUTPUT VOLTAGE AND 3-STATE OUTPUTS



SCAS5850–NOVEMBER 1996–REVISED MARCH 2005

Switching Characteristics

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 1 through Figure 4)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CCA} = 2.5\text{ V} \pm 0.2\text{ V}$, $V_{CCB} = 3.3\text{ V} \pm 0.3\text{ V}$		$V_{CCA} = 2.7\text{ V TO } 3.6\text{ V}$, $V_{CCB} = 5\text{ V} \pm 0.5\text{ V}$		$V_{CCA} = 2.7\text{ V TO } 3.6\text{ V}$, $V_{CCB} = 3.3\text{ V} \pm 0.3\text{ V}$		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
t_{PHL}	A	B	1	9.4	1	6	1	7.1	ns
t_{PLH}			1	9.1	1	5.3	1	7.2	
t_{PHL}	B	A	1	11.2	1	5.8	1	6.4	ns
t_{PLH}			1	9.9	1	7	1	7.6	
t_{PZL}	\overline{OE}	A	1	14.5	1	9.2	1	9.7	ns
t_{PZH}			1	12.9	1	9.5	1	9.5	
t_{PZL}	\overline{OE}	B	1	13	1	8.1	1	9.2	ns
t_{PZH}			1	12.8	1	8.4	1	9.9	
t_{PLZ}	\overline{OE}	A	1	7.1	1	7	1	6.6	ns
t_{PHZ}			1	6.9	1	7.8	1	6.9	
t_{PLZ}	\overline{OE}	B	1	8.8	1	7.3	1	7.5	ns
t_{PHZ}			1	8.9	1	7	1	7.9	

Operating Characteristics

$V_{CCA} = 3.3\text{ V}$, $V_{CCB} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER		TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance per transceiver	$C_L = 50$, $f = 10\text{ MHz}$	38	pF
			Outputs enabled	
			4.5	
			Outputs disabled	

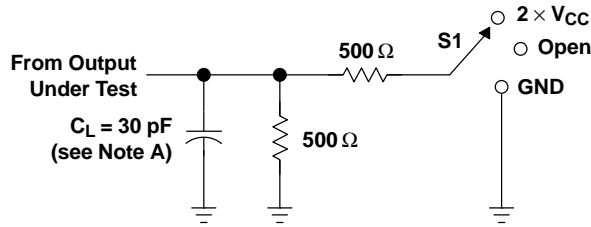
Power-Up Considerations⁽¹⁾

TI level-translation devices offer an opportunity for successful mixed-voltage signal design. A proper power-up sequence always should be followed to avoid excessive supply current, bus contention, oscillations, or other anomalies caused by improperly biased device pins. To guard against such power-up problems, take these precautions:

1. Connect ground before any supply voltage is applied.
2. Power up the control side of the device (V_{CCA} for all four of these devices).
3. Tie \overline{OE} to V_{CCA} with a pullup resistor so that it ramps with V_{CCA} .
4. Depending on the direction of the data path, DIR can be high or low. If DIR high is needed (A data to B bus), ramp it with V_{CCA} . Otherwise, keep DIR low.

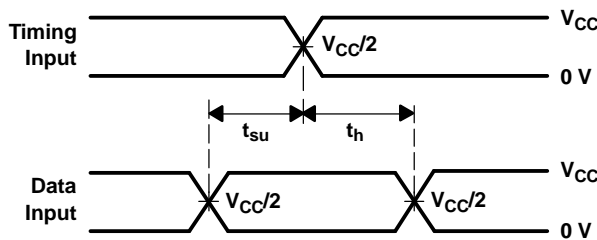
(1) Refer to the TI application report, *Texas Instruments Voltage-Level-Translation Devices*, literature number SCEA021.

PARAMETER MEASUREMENT INFORMATION FOR A PORT
 $V_{CCA} = 2.5 \text{ V} \pm 0.2 \text{ V}$ AND $V_{CCB} = 3.3 \text{ V} \pm 0.3 \text{ V}$

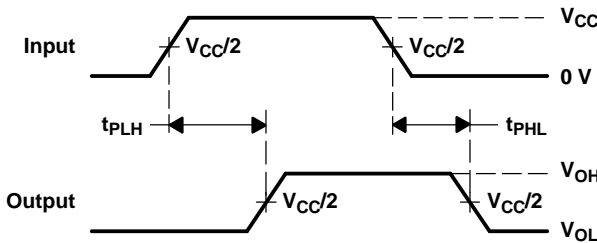


LOAD CIRCUIT

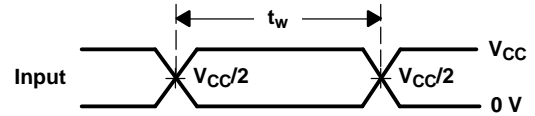
TEST	S1
t_{pd}	Open
t_{PLZ}/t_{PZL}	2 $\times V_{CC}$
t_{PHZ}/t_{PZH}	GND



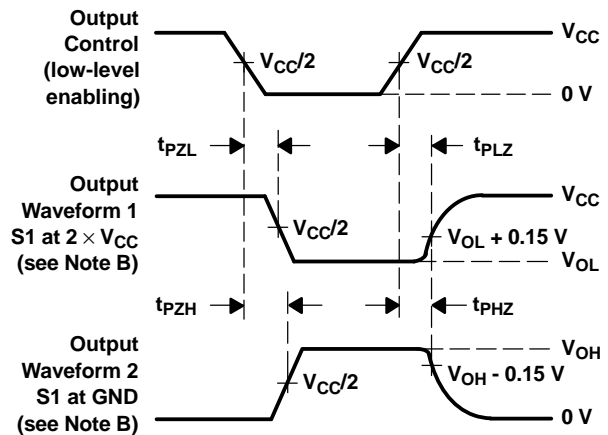
VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES



VOLTAGE WAVEFORMS
PULSE DURATION



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES

- 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. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 F. t_{PZL} and t_{PZH} are the same as t_{en} .
 G. t_{PLH} and t_{PHL} are the same as t_{pd} .
 H. All parameters and waveforms are not applicable to all devices.

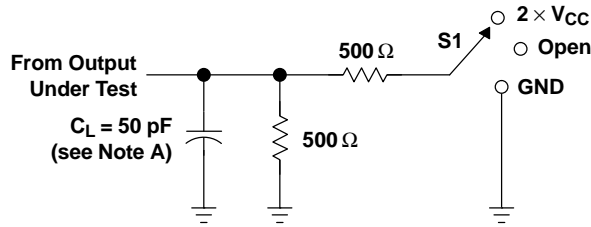
Figure 1. Load Circuit and Voltage Waveforms

SN74LVCC3245A
OCTAL BUS TRANSCEIVER
WITH ADJUSTABLE OUTPUT VOLTAGE AND 3-STATE OUTPUTS

SCAS5850—NOVEMBER 1996—REVISED MARCH 2005

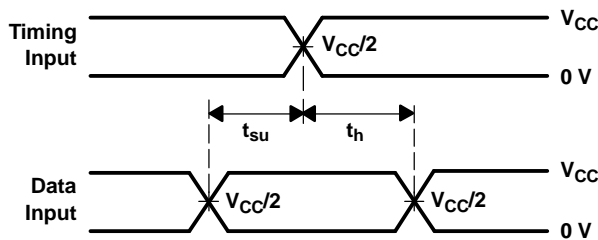
PARAMETER MEASUREMENT INFORMATION FOR B PORT

$V_{CCA} = 2.5\text{ V} \pm 0.2\text{ V}$ AND $V_{CCB} = 3.3\text{ V} \pm 0.3\text{ V}$

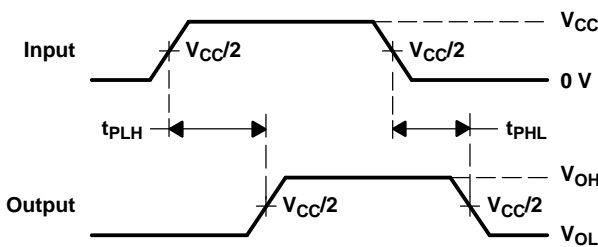


LOAD CIRCUIT

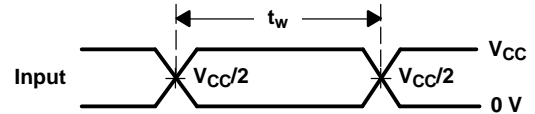
TEST	S1
t_{pd}	Open
t_{PLZ}/t_{PZL}	2 \times V_{CC}
t_{PHZ}/t_{PZH}	GND



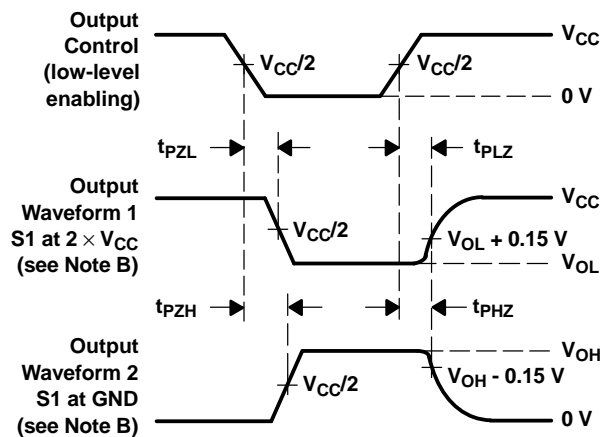
**VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES**



**VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES**



**VOLTAGE WAVEFORMS
PULSE DURATION**



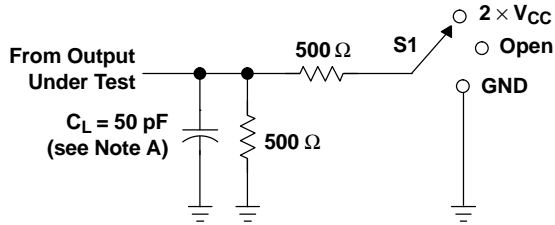
**VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES**

- 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 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. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
F. t_{PZL} and t_{PZH} are the same as t_{en} .
G. t_{PLH} and t_{PHL} are the same as t_{pd} .
H. All parameters and waveforms are not applicable to all devices.

Figure 2. Load Circuit and Voltage Waveforms

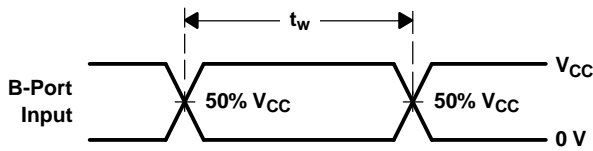
PARAMETER MEASUREMENT INFORMATION FOR B PORT

$V_{CCA} = 3.6\text{ V}$ and $v_{CCB} = 5.5\text{ V}$

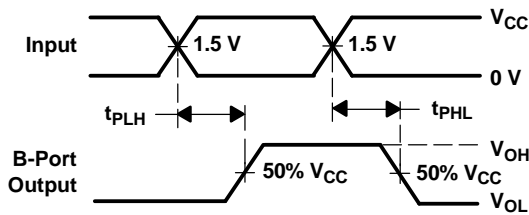


LOAD CIRCUIT

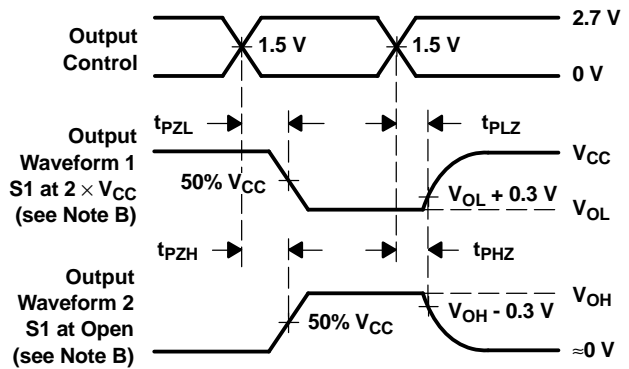
TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	$2 \times V_{CC}$
t_{PHZ}/t_{PZH}	Open



VOLTAGE WAVEFORMS
PULSE DURATION



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
NONINVERTING OUTPUTS

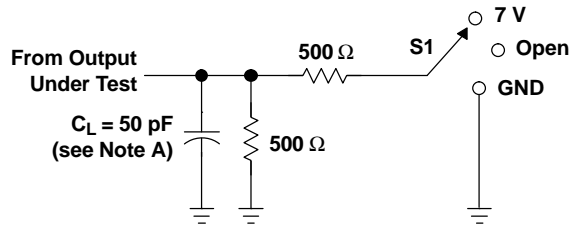


VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES
LOW- AND HIGH-LEVEL ENABLING

- 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: $PRR \leq 10\text{ MHz}$, $Z_O = 50\ \Omega$, $t_r \leq 2.5\text{ ns}$, $t_f \leq 2.5\text{ ns}$.
 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.

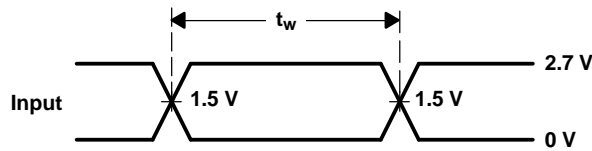
Figure 3. Load Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION FOR A AND B PORT
 V_{CCA} AND $V_{CCB} = 3.6\text{ V}$

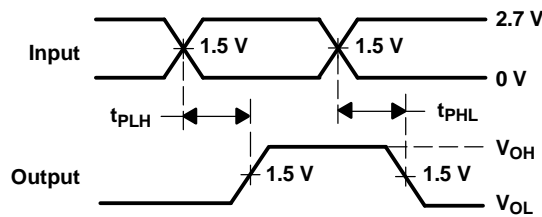


TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	7 V
t_{PHZ}/t_{PZH}	Open

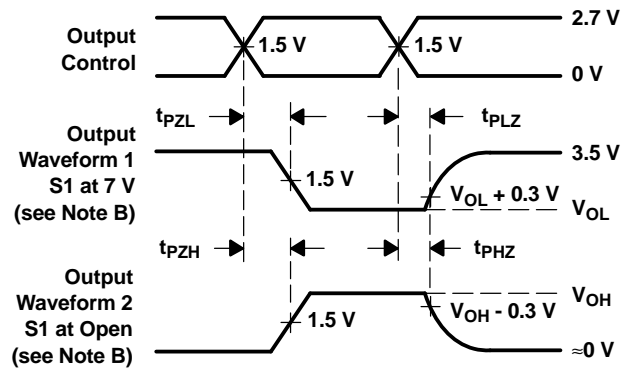
LOAD CIRCUIT



VOLTAGE WAVEFORMS
 PULSE DURATION



VOLTAGE WAVEFORMS
 PROPAGATION DELAY TIMES
 NONINVERTING OUTPUTS



VOLTAGE WAVEFORMS
 ENABLE AND DISABLE TIMES
 LOW- AND HIGH-LEVEL ENABLING

- 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: $PRR \leq 10\text{ MHz}$, $Z_O = 50\ \Omega$, $t_r \leq 2.5\text{ ns}$, $t_f \leq 2.5\text{ ns}$.
 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 4. Load Circuit and Voltage Waveforms

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
74LVCC3245ADBQRE4	ACTIVE	SSOP/QSOP	DBQ	24	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
74LVCC3245ADBQRG4	ACTIVE	SSOP/QSOP	DBQ	24	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
SN74LVCC3245ADBLE	OBSOLETE	SSOP	DB	24		TBD	Call TI	Call TI
SN74LVCC3245ADBQR	ACTIVE	SSOP/QSOP	DBQ	24	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
SN74LVCC3245ADBR	ACTIVE	SSOP	DB	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ADBRE4	ACTIVE	SSOP	DB	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ADBRG4	ACTIVE	SSOP	DB	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ADW	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ADWE4	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ADWG4	ACTIVE	SOIC	DW	24	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ADWR	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ADWRE4	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ADWRG4	ACTIVE	SOIC	DW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ANSR	ACTIVE	SO	NS	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ANSRE4	ACTIVE	SO	NS	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245ANSRG4	ACTIVE	SO	NS	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245APW	ACTIVE	TSSOP	PW	24	60	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245APWE4	ACTIVE	TSSOP	PW	24	60	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245APWG4	ACTIVE	TSSOP	PW	24	60	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245APWLE	OBSOLETE	TSSOP	PW	24		TBD	Call TI	Call TI
SN74LVCC3245APWR	ACTIVE	TSSOP	PW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245APWRE4	ACTIVE	TSSOP	PW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245APWRG4	ACTIVE	TSSOP	PW	24	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245APWT	ACTIVE	TSSOP	PW	24	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245APWTE4	ACTIVE	TSSOP	PW	24	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LVCC3245APWTG4	ACTIVE	TSSOP	PW	24	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
no Sb/Br)								

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

Important Information and Disclaimer:The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

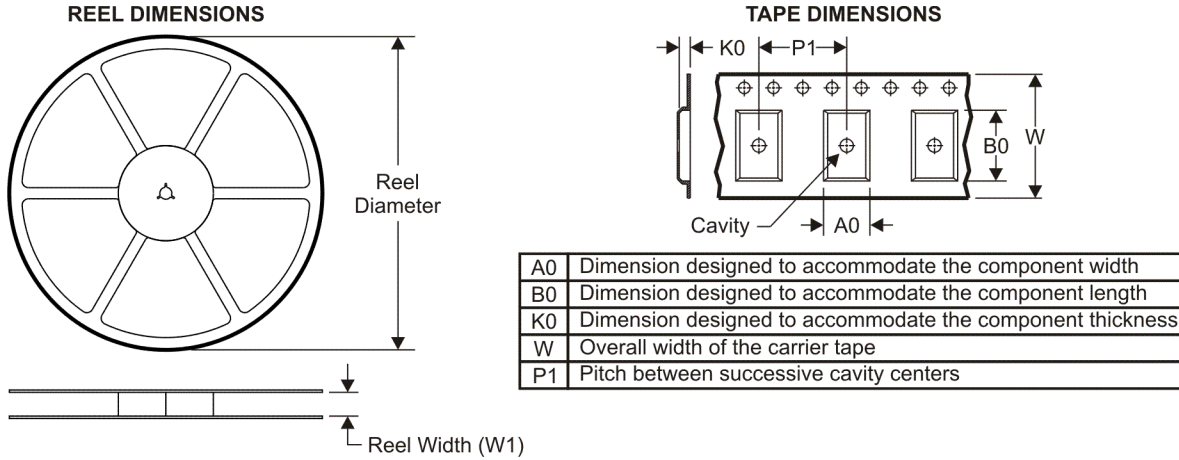
OTHER QUALIFIED VERSIONS OF SN74LVCC3245A :

- Enhanced Product: [SN74LVCC3245A-EP](#)

NOTE: Qualified Version Definitions:

- Enhanced Product - Supports Defense, Aerospace and Medical Applications

TAPE AND REEL INFORMATION



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LVCC3245ADBQR	SSOP/QSOP	DBQ	24	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LVCC3245ADB	SSOP	DB	24	2000	330.0	16.4	8.2	8.8	2.5	12.0	16.0	Q1
SN74LVCC3245ADWR	SOIC	DW	24	2000	330.0	24.4	10.75	15.7	2.7	12.0	24.0	Q1
SN74LVCC3245ANSR	SO	NS	24	2000	330.0	24.4	8.2	15.4	2.5	12.0	24.0	Q1
SN74LVCC3245APWR	TSSOP	PW	24	2000	330.0	16.4	6.95	8.3	1.6	8.0	16.0	Q1

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVCC3245ADBQR	SSOP/QSOP	DBQ	24	2500	346.0	346.0	33.0
SN74LVCC3245ADBR	SSOP	DB	24	2000	346.0	346.0	33.0
SN74LVCC3245ADWR	SOIC	DW	24	2000	346.0	346.0	41.0
SN74LVCC3245ANSR	SO	NS	24	2000	346.0	346.0	41.0
SN74LVCC3245APWR	TSSOP	PW	24	2000	346.0	346.0	33.0

DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



4040065 /E 12/01

- 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.
 D. Falls within JEDEC MO-150

MECHANICAL DATA

NS (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14-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.

PW (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN

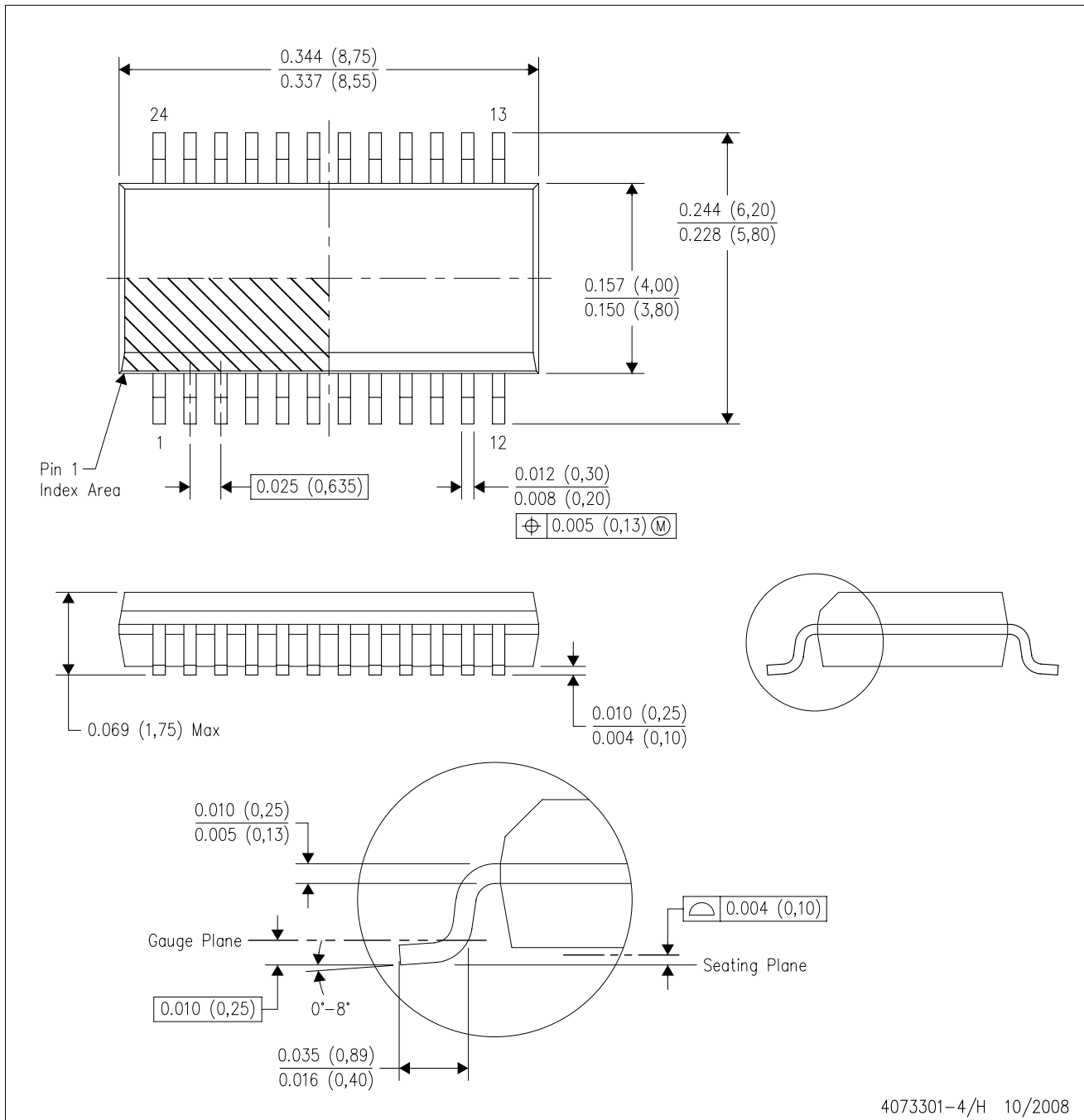


4040064/F 01/97

- 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.
 D. Falls within JEDEC MO-153

DBQ (R-PDSO-G24)

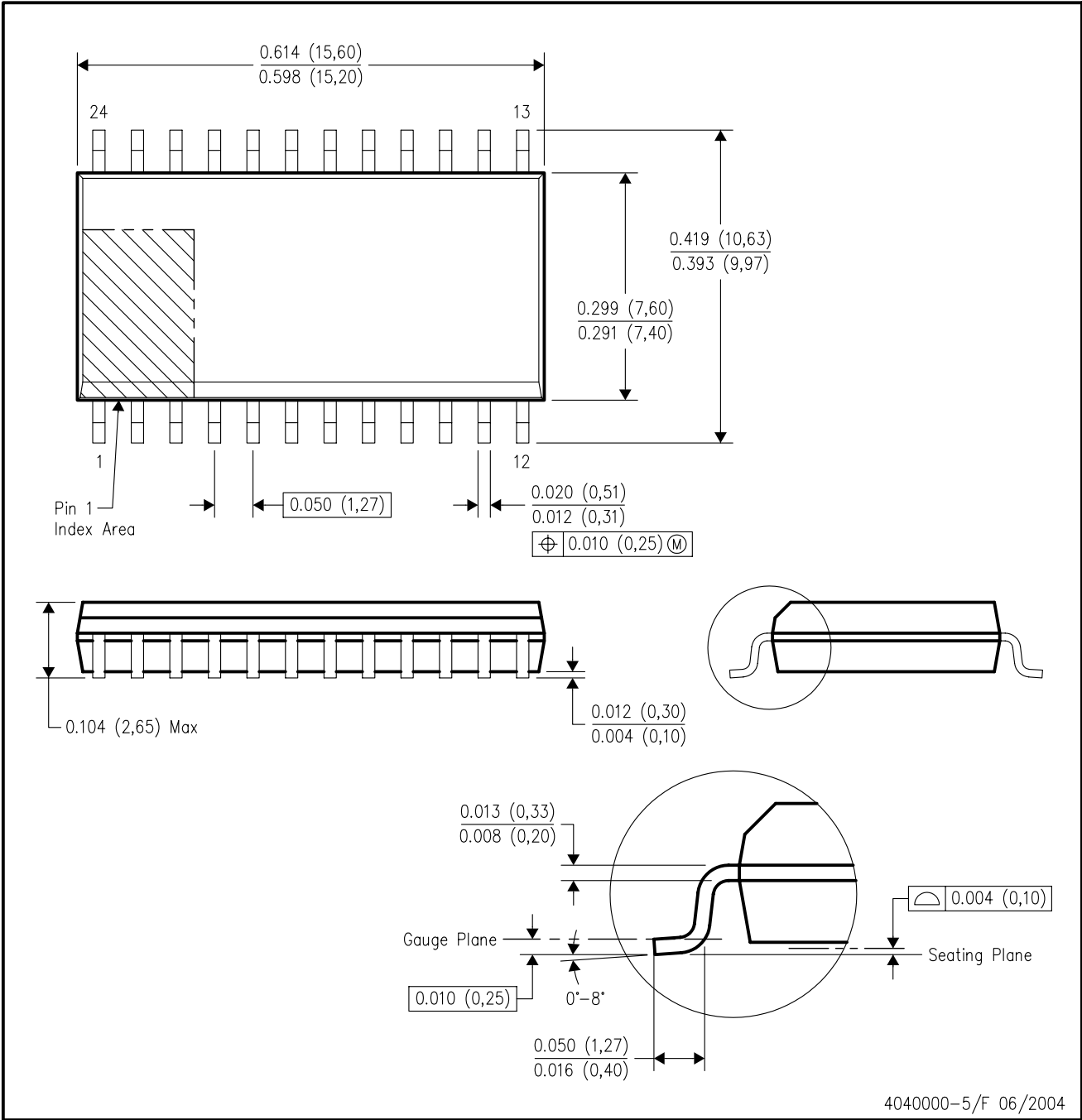
PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15) per side.
 - Falls within JEDEC MO-137 variation AE.

DW (R-PDSO-G24)

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 MS-013 variation AD.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Audio	www.ti.com/audio
Automotive	www.ti.com/automotive
Broadband	www.ti.com/broadband
Digital Control	www.ti.com/digitalcontrol
Medical	www.ti.com/medical
Military	www.ti.com/military
Optical Networking	www.ti.com/opticalnetwork
Security	www.ti.com/security
Telephony	www.ti.com/telephony
Video & Imaging	www.ti.com/video
Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2008, Texas Instruments Incorporated