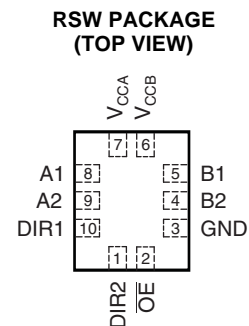


DUAL-BIT DUAL-SUPPLY BUS TRANSCEIVER WITH CONFIGURABLE VOLTAGE TRANSLATION AND 3-STATE OUTPUTS

FEATURES

- Each Channel Has Independent Direction Control
- Control Inputs V_{IH}/V_{IL} Levels Are Referenced to V_{CCA} Voltage
- Fully Configurable Dual-Rail Design Allows Each Port to Operate Over the Full 1.2-V to 3.6-V Power-Supply Range
- I/Os Are 4.6-V Tolerant
- I_{off} Supports Partial-Power-Down Mode Operation
- Typical Data Rates
 - 500 Mbps (1.8-V to 3.3-V Translation)
 - 320 Mbps (<1.8-V to 3.3-V Translation)
 - 320 Mbps (Translate to 2.5 V or 1.8 V)
 - 280 Mbps (Translate to 1.5 V)
 - 240 Mbps (Translate to 1.2 V)
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
 - 5000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1500-V Charged-Device Model (C101)



DESCRIPTION/ORDERING INFORMATION

This dual-bit noninverting bus transceiver uses two separate configurable power-supply rails. The A port is designed to track V_{CCA} . V_{CCA} accepts any supply voltage from 1.2 V to 3.6 V. The B port is designed to track V_{CCB} . V_{CCB} accepts any supply voltage from 1.2 V to 3.6 V. This allows for universal low-voltage bidirectional translation between any of the 1.2-V, 1.5-V, 1.8-V, 2.5-V, and 3.3-V voltage nodes.

ORDERING INFORMATION

T_A	PACKAGE ⁽¹⁾⁽²⁾	ORDERABLE PART NUMBER	TOP-SIDE MARKING	
–40°C to 85°C	QFN – RSW	Tape and reel	SN74AVC2T245RSWR	TLO

(1) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.

(2) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.



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.

DESCRIPTION/ORDERING INFORMATION (CONTINUED)

The SN74AVC2T245 is designed for asynchronous communication between two data buses. The logic levels of the direction-control (DIR) input and the output-enable (\overline{OE}) activate either the B-port outputs or the A-port outputs or place both output ports into the high-impedance mode. The device transmits data from the A bus to the B bus when the B-port outputs are activated and from the B bus to the A bus when the A-port outputs are activated. The input circuitry on both A and B ports always is active and must have a logic HIGH or LOW level applied to prevent excess I_{CC} and I_{CCZ} .

The SN74AVC2T245 is designed so that the control pins (DIR1, DIR2, and \overline{OE}) are supplied by V_{CCA} .

This device is fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

The V_{CC} isolation feature ensures that if either V_{CC} input is at GND, both ports are in the high-impedance state.

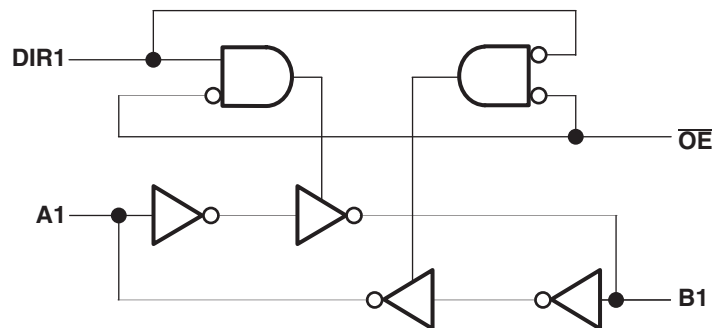
To ensure the high-impedance state during power up or power down, \overline{OE} must be connected to V_{CC} through a pull-up resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

**FUNCTION TABLE⁽¹⁾
(EACH TRANSCEIVER)**

CONTROL INPUTS		OUTPUT CIRCUITS		OPERATION
\overline{OE}	DIR1	A PORT	B PORT	
L	L	Enabled	Hi-Z	B data to A data
L	H	Hi-Z	Enabled	A data to B data
H	X	Hi-Z	Hi-Z	Isolation

(1) Input circuits of the data I/Os are always active.

LOGIC DIAGRAM (POSITIVE LOGIC)⁽¹⁾



(1) Shown for a single channel

TYPICAL APPLICATION

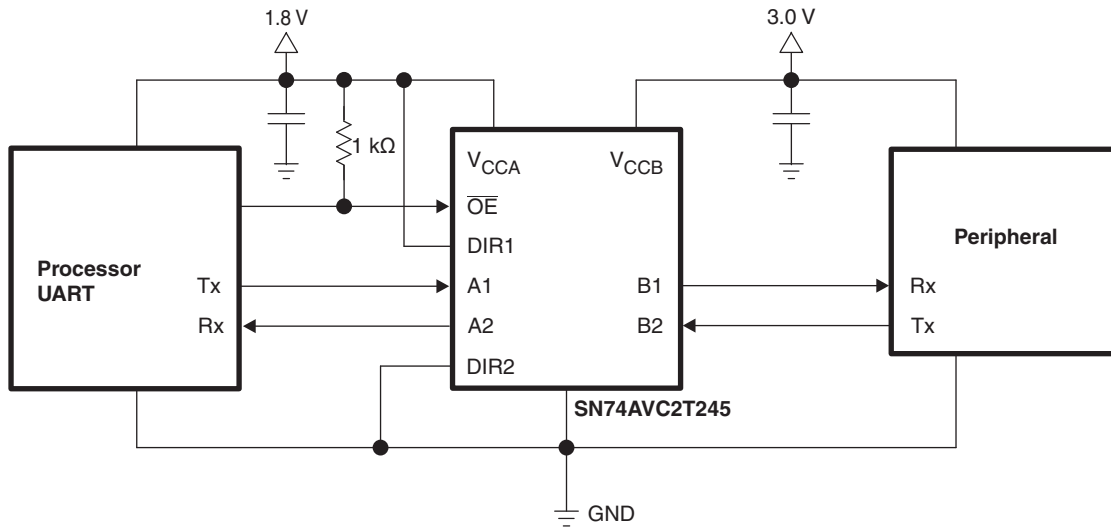


Figure 1. Typical Application of the SN74AVC2T245

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	4.6	V	
V_I	Input voltage range ⁽²⁾	I/O ports (A port)	-0.5	4.6	V
		I/O ports (B port)	-0.5	4.6	
		Control inputs	-0.5	4.6	
V_O	Voltage range applied to any output in the high-impedance or power-off state ⁽²⁾	A port	-0.5	4.6	V
		B port	-0.5	4.6	
V_O	Voltage range applied to any output in the high or low state ⁽²⁾⁽³⁾	A port	-0.5	$V_{CCA} + 0.5$	V
		B port	-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		
θ_{JA}	Package thermal impedance	D package ⁽⁴⁾	73	°C/W	
		DB package ⁽⁴⁾	82		
		DGV package ⁽⁴⁾	120		
		PW package ⁽⁴⁾	108		
		RGY package ⁽⁵⁾	39		
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) The input voltage and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The output positive-voltage rating may be exceeded up to 4.6 V maximum if the output current rating is observed.
- (4) The package thermal impedance is calculated in accordance with JESD 51-7.
- (5) The package thermal impedance is calculated in accordance with JESD 51-5.

RECOMMENDED OPERATING CONDITIONS⁽¹⁾⁽²⁾⁽³⁾

		V_{CCI}	V_{CCO}	MIN	MAX	UNIT
V_{CCA}	Supply voltage			1.2	3.6	V
V_{CCB}	Supply voltage			1.2	3.6	V
V_{IH}	High-level input voltage	Data inputs ⁽⁴⁾	1.2 V to 1.95 V	$V_{CCI} \times 0.65$		V
			1.95 V to 2.7 V	1.6		
			2.7 V to 3.6 V	2		
V_{IL}	Low-level input voltage	Data inputs ⁽⁴⁾	1.2 V to 1.95 V	$V_{CCI} \times 0.35$		V
			1.95 V to 2.7 V	0.7		
			2.7 V to 3.6 V	0.8		
V_{IH}	High-level input voltage	DIR (referenced to V_{CCA}) ⁽⁵⁾	1.2 V to 1.95 V	$V_{CCA} \times 0.65$		V
			1.95 V to 2.7 V	1.6		
			2.7 V to 3.6 V	2		
V_{IL}	Low-level input voltage	DIR (referenced to V_{CCA}) ⁽⁵⁾	1.2 V to 1.95 V	$V_{CCA} \times 0.35$		V
			1.95 V to 2.7 V	0.7		
			2.7 V to 3.6 V	0.8		
V_I	Input voltage			0	3.6	V
V_O	Output voltage	Active state		0	V_{CCO}	V
		3-state		0	3.6	
I_{OH}	High-level output current		1.1 V to 1.2 V	–3		mA
			1.4 V to 1.6 V	–6		
			1.65 V to 1.95 V	–8		
			2.3 V to 2.7 V	–9		
			3 V to 3.6 V	–12		
I_{OL}	Low-level output current		1.1 V to 1.2 V	3		mA
			1.4 V to 1.6 V	6		
			1.65 V to 1.95 V	8		
			2.3 V to 2.7 V	9		
			3 V to 3.6 V	12		
$\Delta t/\Delta v$	Input transition rise or fall rate				5	ns/V
T_A	Operating free-air temperature			–40	85	°C

(1) V_{CCI} is the V_{CC} associated with the input port.

(2) V_{CCO} is the V_{CC} associated with the output port.

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

(4) For V_{CCI} values not specified in the data sheet, V_{IH} min = $V_{CCI} \times 0.7$ V, V_{IL} max = $V_{CCI} \times 0.3$ V

(5) For V_{CCI} values not specified in the data sheet, V_{IH} min = $V_{CCA} \times 0.7$ V, V_{IL} max = $V_{CCA} \times 0.3$ V

ELECTRICAL CHARACTERISTICS⁽¹⁾⁽²⁾

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

PARAMETER	TEST CONDITIONS		V _{CCA}	V _{CCB}	T _A = 25°C			–40°C to 85°C		UNIT
					MIN	TYP	MAX	MIN	MAX	
V _{OH}		V _I = V _{IH}	1.2 V to 3.6 V	1.2 V to 3.6 V				V _{CCO} – 0.2		V
			1.2 V	1.2 V	0.95					
			1.4 V	1.4 V				1.05		
			1.65 V	1.65 V				1.2		
			2.3 V	2.3 V				1.75		
			3 V	3 V				2.3		
V _{OL}		V _I = V _{IL}	1.2 V to 3.6 V	1.2 V to 3.6 V				0.2		V
			1.2 V	1.2 V	0.25					
			1.4 V	1.4 V				0.35		
			1.65 V	1.65 V				0.45		
			2.3 V	2.3 V				0.55		
			3 V	3 V				0.7		
I _I	Control inputs	V _I = V _{CCA} or GND	1.2 V to 3.6 V	1.2 V to 3.6 V		±0.025	±0.25		±1	μA
I _{off}	A or B port	V _I or V _O = 0 to 3.6 V	0 V	0 V to 3.6 V		±0.1	±1		±5	μA
			0 V to 3.6 V	0 V		±0.1	±1		±5	
I _{OZ}	A or B port	V _O = V _{CCO} or GND, V _I = V _{CCI} or GND, \overline{OE} = V _{IH}	3.6 V	3.6 V		±0.5	±2.5		±5	μA
I _{CCA}		V _I = V _{CCI} or GND, I _O = 0	1.2 V to 3.6 V	1.2 V to 3.6 V					8	μA
			0 V	0 V to 3.6 V					–2	
			0 V to 3.6 V	0 V					8	
I _{CCB}		V _I = V _{CCI} or GND, I _O = 0	1.2 V to 3.6 V	1.2 V to 3.6 V					8	μA
			0 V	0 V to 3.6 V					8	
			0 V to 3.6 V	0 V					–2	
I _{CCA} + I _{CCB}		V _I = V _{CCI} or GND, I _O = 0	1.2 V to 3.6 V	1.2 V to 3.6 V					16	μA
C _i	Control inputs	V _I = 3.3 V or GND	3.3 V	3.3 V		3.5			4.5	pF
C _{io}	A or B port	V _O = 3.3 V or GND	3.3 V	3.3 V		6			7	pF

 (1) V_{CCO} is the V_{CC} associated with the output port.

 (2) V_{CCI} is the V_{CC} associated with the input port.

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, $V_{CCA} = 1.2\text{ V}$ (unless otherwise noted) (see [Figure 2](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CCB} = 1.2\text{ V}$	$V_{CCB} = 1.5\text{ V}$ $\pm 0.1\text{ V}$	$V_{CCB} = 1.8\text{ V}$ $\pm 0.15\text{ V}$	$V_{CCB} = 2.5\text{ V}$ $\pm 0.2\text{ V}$	$V_{CCB} = 3.3\text{ V}$ $\pm 0.3\text{ V}$	UNIT
			TYP	TYP	TYP	TYP	TYP	
t_{PLH}	A	B	2.5	2.1	1.9	1.9	1.9	ns
t_{PHL}			2.5	2.1	1.9	1.9	1.9	
t_{PLH}	B	A	2.5	2.2	2	1.8	1.7	ns
t_{PHL}			2.5	2.2	2	1.8	1.7	
t_{PZH}	\overline{OE}	A	3.8	3.1	2.7	2.6	3	ns
t_{PZL}			3.8	3.1	2.7	2.6	3	
t_{PZH}	\overline{OE}	B	3.7	3.7	3.7	3.7	3.7	ns
t_{PZL}			3.7	3.7	3.7	3.7	3.7	
t_{PHZ}	\overline{OE}	A	4.4	3.6	3.5	3.3	4.1	ns
t_{PLZ}			4.4	3.6	3.5	3.3	4.1	
t_{PHZ}	\overline{OE}	B	4.2	4.2	4.3	4.1	4.2	ns
t_{PLZ}			4.2	4.2	4.3	4.1	4.2	

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, $V_{CCA} = 1.5\text{ V} \pm 0.1\text{ V}$ (see [Figure 2](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CCB} = 1.2\text{ V}$	$V_{CCB} = 1.5\text{ V}$ $\pm 0.1\text{ V}$		$V_{CCB} = 1.8\text{ V}$ $\pm 0.15\text{ V}$		$V_{CCB} = 2.5\text{ V}$ $\pm 0.2\text{ V}$		$V_{CCB} = 3.3\text{ V}$ $\pm 0.3\text{ V}$		UNIT
			TYP	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	B	2.2	0.3	4.4	0.2	3.9	0.1	3.6	0.1	3.9	ns
t_{PHL}			2.2	0.3	4.4	0.2	3.9	0.1	3.6	0.1	3.9	
t_{PLH}	B	A	2	0.6	5.1	0.4	4.9	0.2	4.6	0.1	4.5	ns
t_{PHL}			2	0.6	5.1	0.4	4.9	0.2	4.6	0.1	4.5	
t_{PZH}	\overline{OE}	A	3.4	1.1	7.1	0.9	6.2	0.7	5.5	0.1	6.4	ns
t_{PZL}			3.4	1.1	7.1	0.9	6.2	0.7	5.5	0.1	6.4	
t_{PZH}	\overline{OE}	B	2.5	1.1	8.2	1.1	8.2	1.1	8.2	1.1	8.2	ns
t_{PZL}			2.5	1.1	8.2	1.1	8.2	1.1	8.2	1.1	8.2	
t_{PHZ}	\overline{OE}	A	4.1	1.2	7.1	0.8	6.7	0.4	5.6	1	7.4	ns
t_{PLZ}			4.1	1.2	7.1	0.8	6.7	0.4	5.6	1	7.4	
t_{PHZ}	\overline{OE}	B	3.3	0.3	7.4	0.2	5.7	0.3	5.6	0.3	5.6	ns
t_{PLZ}			3.3	0.3	7.4	0.2	5.7	0.3	5.6	0.3	5.6	

SWITCHING CHARACTERISTICS

 over recommended operating free-air temperature range, $V_{CCA} = 1.8 \text{ V} \pm 0.15 \text{ V}$ (see [Figure 2](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CCB} = 1.2 \text{ V}$		$V_{CCB} = 1.5 \text{ V} \pm 0.1 \text{ V}$		$V_{CCB} = 1.8 \text{ V} \pm 0.15 \text{ V}$		$V_{CCB} = 2.5 \text{ V} \pm 0.2 \text{ V}$		$V_{CCB} = 3.3 \text{ V} \pm 0.3 \text{ V}$		UNIT
			TYP		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	B	2		0.1	4.1	0.1	3.6	0.1	3.1	0.1	3.3	ns
t_{PHL}			2		0.1	4.1	0.1	3.6	0.1	3.1	0.1	3.3	
t_{PLH}	B	A	1.9		0.4	4.3	0.1	4.1	0.1	3.8	0.1	3.7	ns
t_{PHL}			1.9		0.4	4.3	0.1	4.1	0.1	3.8	0.1	3.7	
t_{PZH}	\overline{OE}	A	3.2		0.8	6.7	0.4	5.8	0.4	4.8	0.3	4.6	ns
t_{PZL}			3.2		0.8	6.7	0.4	5.8	0.4	4.8	0.3	4.6	
t_{PZH}	\overline{OE}	B	1.9		0.2	6.7	0.2	6.6	0.2	6.7	0.2	6.7	ns
t_{PZL}			1.9		0.2	6.7	0.2	6.6	0.2	6.7	0.2	6.7	
t_{PHZ}	\overline{OE}	A	3.8		0.7	6.2	0.3	6.5	0.1	5.2	0.8	6.5	ns
t_{PLZ}			3.8		0.7	6.2	0.3	6.5	0.1	5.2	0.8	6.5	
t_{PHZ}	\overline{OE}	B	3.4		0.1	6.8	0.1	6.8	0.1	6.7	0.1	6.7	ns
t_{PLZ}			3.4		0.1	6.8	0.1	6.8	0.1	6.7	0.1	6.7	

SWITCHING CHARACTERISTICS

 over recommended operating free-air temperature range, $V_{CCA} = 2.5 \text{ V} \pm 0.2 \text{ V}$ (see [Figure 2](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CCB} = 1.2 \text{ V}$		$V_{CCB} = 1.5 \text{ V} \pm 0.1 \text{ V}$		$V_{CCB} = 1.8 \text{ V} \pm 0.15 \text{ V}$		$V_{CCB} = 2.5 \text{ V} \pm 0.2 \text{ V}$		$V_{CCB} = 3.3 \text{ V} \pm 0.3 \text{ V}$		UNIT
			TYP		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	B	1.9		0.1	3.8	0.1	3.2	0.1	2.7	0.1	2.6	ns
t_{PHL}			1.9		0.1	3.8	0.1	3.2	0.1	2.7	0.1	2.6	
t_{PLH}	B	A	1.8		0.5	3.4	0.2	3.1	0.1	2.8	0.1	2.6	ns
t_{PHL}			1.8		0.5	3.4	0.2	3.1	0.1	2.8	0.1	2.6	
t_{PZH}	\overline{OE}	A	3.1		0.7	6.2	0.5	5.2	0.3	4.1	0.3	3.6	ns
t_{PZL}			3.1		0.7	6.2	0.5	5.2	0.3	4.1	0.3	3.6	
t_{PZH}	\overline{OE}	B	1.4		0.4	4.5	0.4	4.5	0.4	4.5	0.4	4.5	ns
t_{PZL}			1.4		0.4	4.5	0.4	4.5	0.4	4.5	0.4	4.5	
t_{PHZ}	\overline{OE}	A	3.6		0.2	5.2	0.1	5.4	0.1	4.5	0.7	6	ns
t_{PLZ}			3.6		0.2	5.2	0.1	5.4	0.1	4.5	0.7	6	
t_{PHZ}	\overline{OE}	B	2.1		0.1	4.7	0.1	4.6	0.1	4.7	0.1	4.7	ns
t_{PLZ}			2.1		0.1	4.7	0.1	4.6	0.1	4.7	0.1	4.7	

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, $V_{CCA} = 3.3 \text{ V} \pm 0.3 \text{ V}$ (see [Figure 2](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CCB} = 1.2 \text{ V}$	$V_{CCB} = 1.5 \text{ V} \pm 0.1 \text{ V}$		$V_{CCB} = 1.8 \text{ V} \pm 0.15 \text{ V}$		$V_{CCB} = 2.5 \text{ V} \pm 0.2 \text{ V}$		$V_{CCB} = 3.3 \text{ V} \pm 0.3 \text{ V}$		UNIT
			TYP	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	B	1.8	0.1	3.6	0.1	3	0.1	2.6	0.1	2.4	ns
t_{PHL}			1.8	0.1	3.6	0.1	3	0.1	2.6	0.1	2.4	
t_{PLH}	B	A	1.9	0.5	3.4	0.2	2.9	0.1	2.5	0.1	2.3	ns
t_{PHL}			1.9	0.5	3.4	0.2	2.9	0.1	2.5	0.1	2.3	
t_{PZH}	\overline{OE}	A	3.1	0.9	5.9	0.5	5	0.3	3.8	0.3	3.3	ns
t_{PZL}			3.1	0.9	5.9	0.5	5	0.3	3.8	0.3	3.3	
t_{PZH}	\overline{OE}	B	1.2	0.4	3.6	0.4	3.6	0.4	3.6	0.4	3.6	ns
t_{PZL}			1.2	0.4	3.6	0.4	3.6	0.4	3.6	0.4	3.6	
t_{PHZ}	\overline{OE}	A	3.4	0.1	4.6	0.1	4.7	0.3	4.8	0.7	4.5	ns
t_{PLZ}			3.4	0.1	4.6	0.1	4.7	0.3	4.8	0.7	4.5	
t_{PHZ}	\overline{OE}	B	2.9	0.1	5.4	0.1	5.3	0.1	5.3	0.1	5.3	ns
t_{PLZ}			2.9	0.1	5.4	0.1	5.3	0.1	5.3	0.1	5.3	

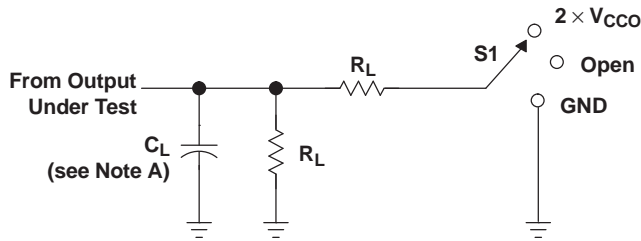
OPERATING CHARACTERISTICS

$T_A = 25^\circ\text{C}$

PARAMETER			TEST CONDITIONS	$V_{CCA} = V_{CCB} = 1.2 \text{ V}$	$V_{CCA} = V_{CCB} = 1.5 \text{ V}$	$V_{CCA} = V_{CCB} = 1.8 \text{ V}$	$V_{CCA} = V_{CCB} = 2.5 \text{ V}$	$V_{CCA} = V_{CCB} = 3.3 \text{ V}$	UNIT
				TYP	TYP	TYP	TYP	TYP	
$C_{pdA}^{(1)}$	A to B	Outputs enabled	$C_L = 0,$ $f = 10 \text{ MHz},$ $t_r = t_f = 1 \text{ ns}$	3	3	3	3	4	pF
		Outputs disabled		1	1	1	2	2	
	B to A	Outputs enabled		12	13	13	15	15	
		Outputs disabled		1	2	2	2	2	
$C_{pdB}^{(1)}$	A to B	Outputs enabled	$C_L = 0,$ $f = 10 \text{ MHz},$ $t_r = t_f = 1 \text{ ns}$	12	13	13	14	16	pF
		Outputs disabled		1	2	2	2	2	
	B to A	Outputs enabled		3	3	3	4	4	
		Outputs disabled		1	1	1	2	2	

(1) Power dissipation capacitance per transceiver

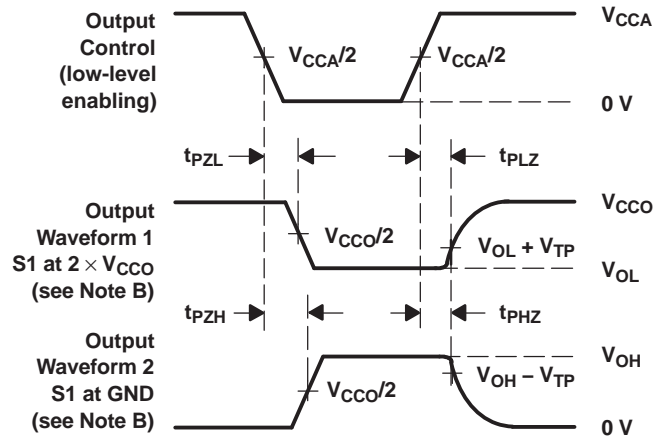
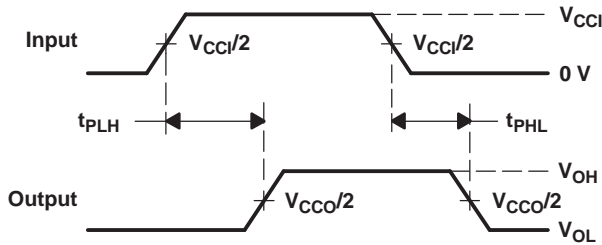
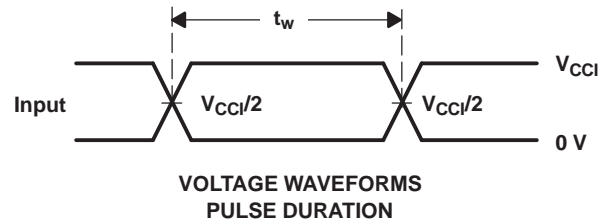
PARAMETER MEASUREMENT INFORMATION



LOAD CIRCUIT

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

V_{CCO}	C_L	R_L	V_{TP}
1.2 V	15 pF	2 k Ω	0.1 V
1.5 V \pm 0.1 V	15 pF	2 k Ω	0.1 V
1.8 V \pm 0.15 V	15 pF	2 k Ω	0.15 V
2.5 V \pm 0.2 V	15 pF	2 k Ω	0.15 V
3.3 V \pm 0.3 V	15 pF	2 k 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 MHz, $Z_O = 50 \Omega$, $dv/dt \geq 1$ V/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. V_{CCi} is the V_{CC} associated with the input port.
 - I. V_{CCo} is the V_{CC} associated with the output port.

Figure 2. Load and 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⁾
SN74AVC2T245RSWR	ACTIVE	QFN	RSW	10	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

⁽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.

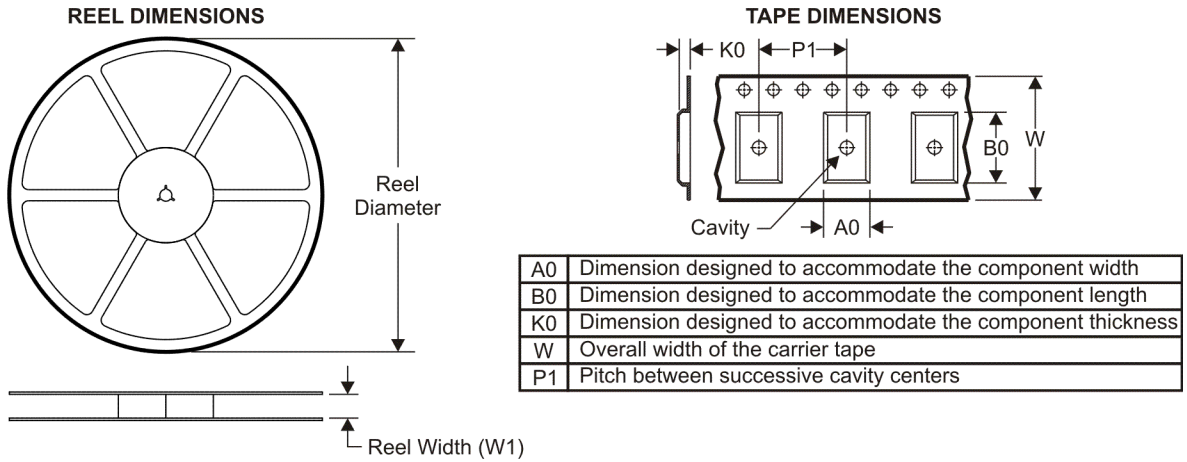
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

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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
SN74AVC2T245RSWR	QFN	RSW	10	3000	179.0	8.4	1.7	2.1	0.7	4.0	8.0	Q1

TAPE AND REEL BOX DIMENSIONS

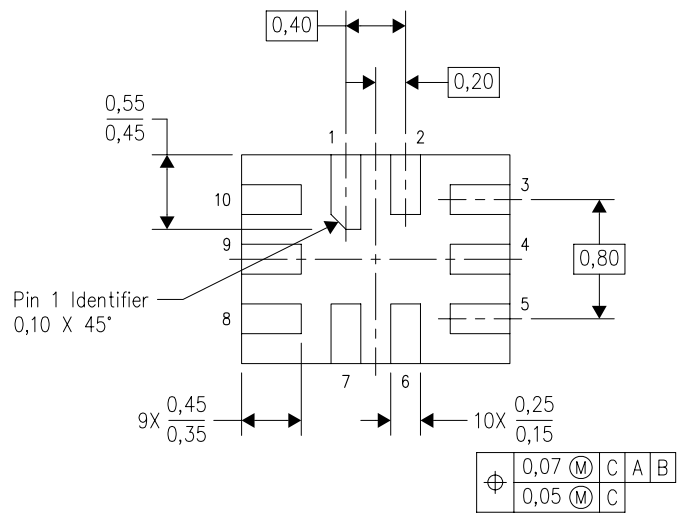
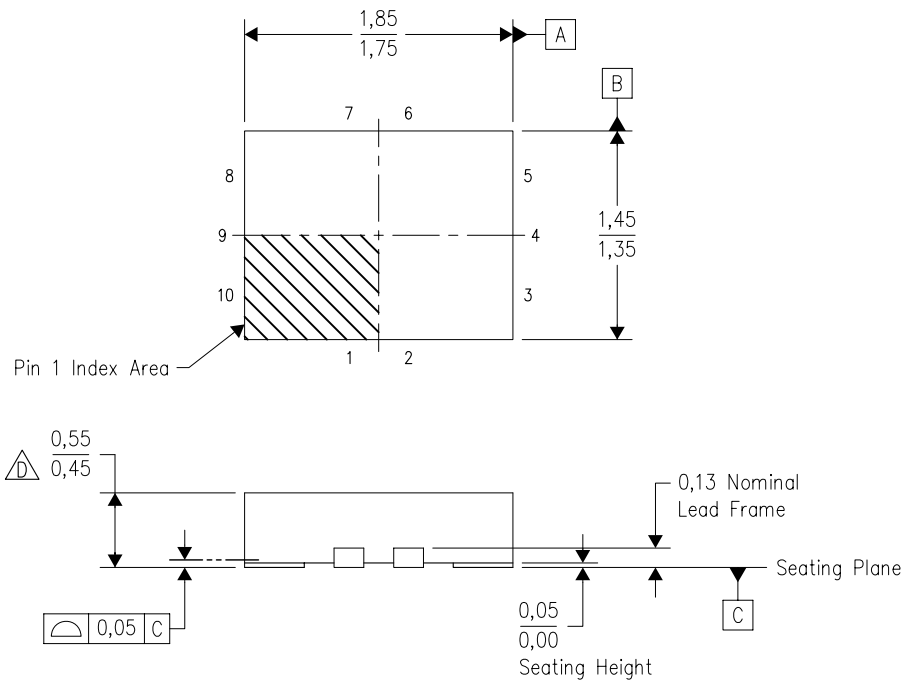


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AVC2T245RSWR	QFN	RSW	10	3000	220.0	205.0	50.0


RSW (R-PUQFN-N10)

PLASTIC QUAD FLATPACK NO-LEAD



Bottom View

4208097/C 07/2008

- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. QFN (Quad Flatpack No-lead) package configuration.
-  This package complies to JEDEC MO-288 variation UDEE, except minimum package height.

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