

RD74VT1G245

Bus Transceiver with 3–state Output / Dual Supply Voltage Translator

REJ03D0494–0200

Rev.2.00

Apr. 01, 2005

Description

The RD74VT1G245 has one buffer in a 6 pin package. When DIR is high, data is transferred from the A inputs to the B outputs, and when DIR is low, data is transferred from the B inputs to the A outputs. And this product has two terminals (V_{CCA} , V_{CCB}), V_{CCA} is connected with control input and A bus side V_{CCB} is connected with B bus side. V_{CCA} and V_{CCB} are isolated. The A port is designed to track V_{CCA} , which accepts voltages from 1.2V to 3.6V, and the B port is designed to track V_{CCB} , which operation at 1.2V to 3.6V. Therefore, Bidirectional board voltage conversion is possible. Low voltage and high-speed operation is suitable for the battery powered products (e.g., notebook computers), and the low power consumption extends the battery life.

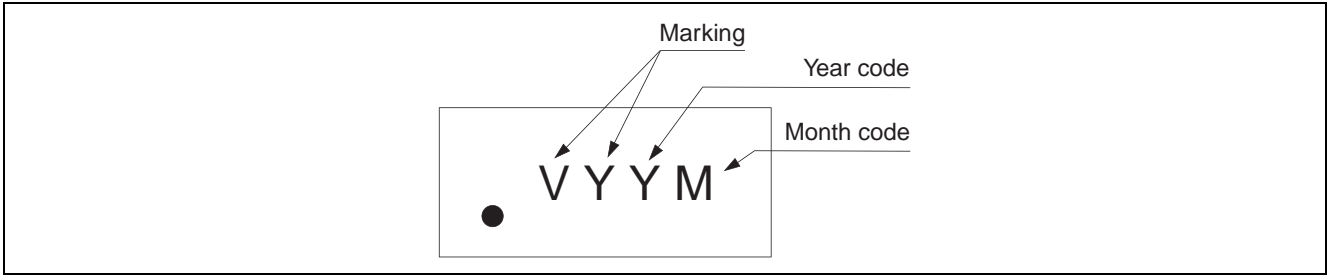
Features

- This product function as level shift transceiver that change V_{CCA} input level to V_{CCB} output level, V_{CCB} input level to V_{CCA} output level by providing different supply voltage to V_{CCA} and V_{CCB} .
- Supply voltage range: $V_{CCA} = 1.2$ to 3.6 V
 $V_{CCB} = 1.2$ to 3.6 V
- Operating temperature range: -40 to $+85^{\circ}\text{C}$
- Control input $V_{I(\max)} = 3.6$ V ($@V_{CCA} = 0$ to 3.6 V)
- A bus side input outputs $V_{I/O(\max)} = 3.6$ V ($@V_{CCA} = 0$ V or Output off state)
- B bus side input outputs $V_{I/O(\max)} = 3.6$ V ($@V_{CCB} = 0$ V or Output off state)
- High output current

A bus side: ± 2 mA ($@V_{CCA} = 1.2$ V) ± 4 mA ($@V_{CCA} = 1.5 \pm 0.1$ V) ± 6 mA ($@V_{CCA} = 1.8 \pm 0.15$ V) ± 18 mA ($@V_{CCA} = 2.5 \pm 0.2$ V) ± 24 mA ($@V_{CCA} = 3.3 \pm 0.3$ V)	B bus side: ± 2 mA ($@V_{CCB} = 1.2$ V) ± 4 mA ($@V_{CCB} = 1.5 \pm 0.1$ V) ± 6 mA ($@V_{CCB} = 1.8 \pm 0.15$ V) ± 18 mA ($@V_{CCB} = 2.5 \pm 0.2$ V) ± 24 mA ($@V_{CCB} = 3.3 \pm 0.3$ V)
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- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
RD74VT1G245CLE	WCSP–6 pin	SXBG0006KB–A (TBS–6AV)	CL	E (3,000 pcs / reel)

Article Indication



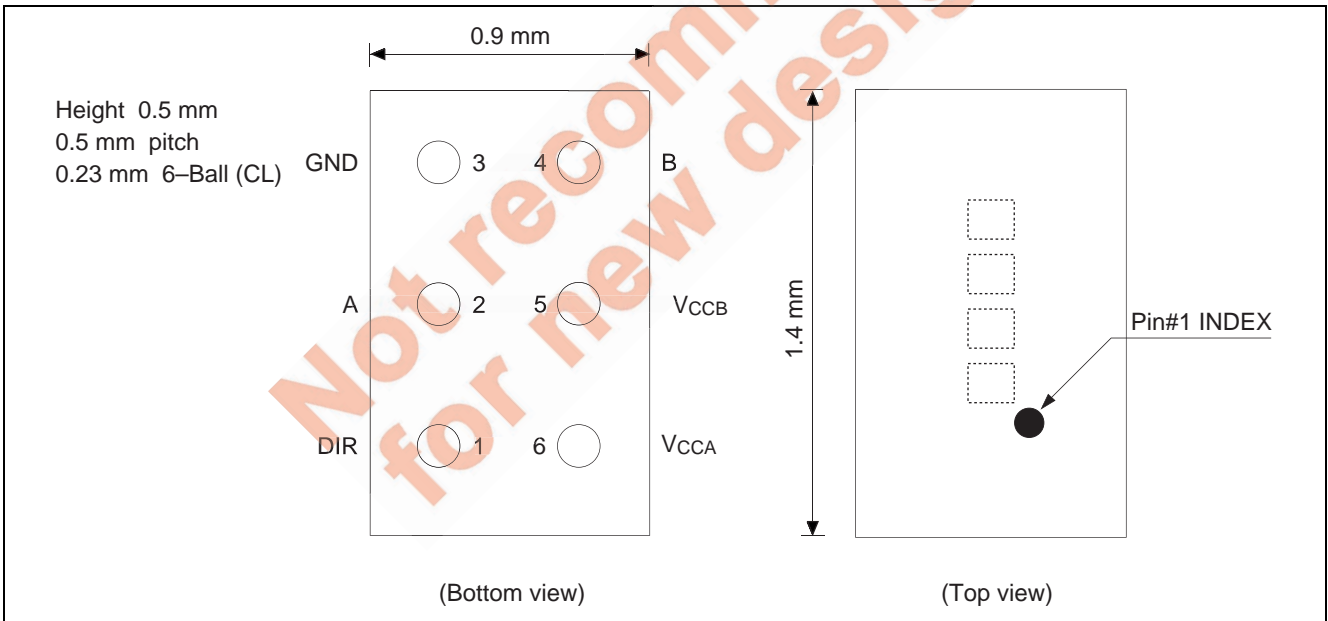
Function Table

Input	Operation
DIR	
L	B → A
H	A → B

H: High level

L: Low level

Pin Arrangement



Recommended Operating Conditions

Item	Symbol	Ratings	Unit	Conditions
Supply voltage range	V_{CCA}	1.2 to 3.6	V	
	V_{CCB}	1.2 to 3.6		
Input/Output voltage	V_I	0 to 3.6	V	DIR
	V_{IO}	0 to V_{CCA}	V	A port output: "H" or "L"
		0 to 3.6		A port output: "Z" or V_{CCA} : OFF
		0 to V_{CCB}		B port output: "H" or "L"
	0 to 3.6	B port output: "Z" or V_{CCB} : OFF		
Output current	I_{OHA}	-2	mA	$V_{CCA} = 1.2\text{ V}$
		-4		$V_{CCA} = 1.5 \pm 0.1\text{ V}$
		-6		$V_{CCA} = 1.8 \pm 0.15\text{ V}$
		-18		$V_{CCA} = 2.5 \pm 0.2\text{ V}$
		-24		$V_{CCA} = 3.3 \pm 0.3\text{ V}$
	I_{OHB}	-2	mA	$V_{CCB} = 1.2\text{ V}$
		-4		$V_{CCB} = 1.5 \pm 0.1\text{ V}$
		-6		$V_{CCB} = 1.8 \pm 0.15\text{ V}$
		-18		$V_{CCB} = 2.5 \pm 0.2\text{ V}$
		-24		$V_{CCB} = 3.3 \pm 0.3\text{ V}$
	I_{OLA}	2	mA	$V_{CCA} = 1.2\text{ V}$
		4		$V_{CCA} = 1.5 \pm 0.1\text{ V}$
		6		$V_{CCA} = 1.8 \pm 0.15\text{ V}$
		18		$V_{CCA} = 2.5 \pm 0.2\text{ V}$
		24		$V_{CCA} = 3.3 \pm 0.3\text{ V}$
	I_{OLB}	2	mA	$V_{CCB} = 1.2\text{ V}$
		4		$V_{CCB} = 1.5 \pm 0.1\text{ V}$
		6		$V_{CCB} = 1.8 \pm 0.15\text{ V}$
		18		$V_{CCB} = 2.5 \pm 0.2\text{ V}$
		24		$V_{CCB} = 3.3 \pm 0.3\text{ V}$
Input transition rise or fall time	$\Delta t / \Delta v$	10	ns / V	
Operation free-air temperature	T_a	-40 to 85	°C	

Electrical Characteristics

(Ta = -40 to 85°C)

Item	Symbol	V _{CCA} (V) *	V _{CCB} (V) *	Min	Typ	Max	Unit	Test conditions
Input voltage	V _{IHA}	1.2	1.2 to 3.6	V _{CCA} ×0.75	—	—	V	A port Control input
		1.5±0.1		V _{CCA} ×0.70	—	—		
		1.8±0.15		V _{CCA} ×0.65	—	—		
		2.5±0.2		1.6	—	—		
		3.3±0.3		2.0	—	—		
	V _{IHB}	1.2 to 3.6	1.2	V _{CCB} ×0.75	—	—	V	B port
			1.5±0.1	V _{CCB} ×0.70	—	—		
			1.8±0.15	V _{CCB} ×0.65	—	—		
			2.5±0.2	1.6	—	—		
			3.3±0.3	2.0	—	—		
	V _{IILA}	1.2 to 3.6	1.2	—	—	V _{CCA} ×0.25	V	A port Control input
			1.5±0.1	—	—	V _{CCA} ×0.30		
			1.8±0.15	—	—	V _{CCA} ×0.35		
			2.5±0.2	—	—	0.7		
			3.3±0.3	—	—	0.8		
	V _{ILB}	1.2 to 3.6	1.2	—	—	V _{CCB} ×0.25	V	B port
			1.5±0.1	—	—	V _{CCB} ×0.30		
			1.8±0.15	—	—	V _{CCB} ×0.35		
			2.5±0.2	—	—	0.7		
			3.3±0.3	—	—	0.8		
Output voltage	V _{OH}	1.2 to 3.6	1.2 to 3.6	V _{CC} -0.2	—	—	V	I _{OH} = -100 μA
		1.2	1.2	0.9	—	—		I _{OH} = -2 mA
		1.5±0.1	1.5±0.1	1.1	—	—		I _{OH} = -4 mA
		1.8±0.15	1.8±0.15	1.25	—	—		I _{OH} = -6 mA
		2.5±0.2	2.5±0.2	1.7	—	—		I _{OH} = -18 mA
		3.3±0.3	3.3±0.3	2.2	—	—		I _{OH} = -24 mA
	V _{OL}	1.2 to 3.6	1.2 to 3.6	—	—	0.2	V	I _{OL} = 100 μA
		1.2	1.2	—	—	0.3		I _{OL} = 2 mA
		1.5±0.1	1.5±0.1	—	—	0.3		I _{OL} = 4 mA
		1.8±0.15	1.8±0.15	—	—	0.3		I _{OL} = 6 mA
		2.5±0.2	2.5±0.2	—	—	0.6		I _{OL} = 18 mA
		3.3±0.3	3.3±0.3	—	—	0.55		I _{OL} = 24 mA
	Input current	I _{IN}	3.6	3.6	-1.5	—	1.5	μA
Off state output current	I _{OZ}	3.6	3.6	-1.5	—	1.5	μA	V _{IN} = V _{IH} or V _{IL}
Output leakage current	I _{OFF}	0	0	—	—	1.5	μA	V _{IN} , V _{OUT} = 0 to 3.6 V
Quiescent supply current	I _{CCA}	1.2 to 3.6	1.2 to 3.6	-3.0	—	3.0	μA	I _{O(A port)} = 0 V _{IN} = V _{CCB} or GND
	I _{CCB}	1.2 to 3.6	1.2 to 3.6	-3.0	—	3.0		I _{O(B port)} = 0 V _{IN} = V _{CCA} or GND
Increase in ICC per input	ΔI _{CCA}	3.6	3.6	—	—	250	μA	A port or control V _{CCA} -0.6 (1 input)
	ΔI _{CCB}	3.6	3.6	—	—	250		B port V _{CCB} -0.6 (1 input)
Input capacitance	C _{IN}	3.3	3.3	—	3.5	—	pF	V _{IN} = V _{CC} or GND
Input/output capacitance	C _{I/O}	3.3	3.3	—	6.0	—	pF	V _O = V _{CC} or GND

Note: For conditions shown as Min or Max, use the appropriate values under recommended operating conditions.

Switching Characteristics

$V_{CCA} = 3.3 \pm 0.3 \text{ V}$

Item	Symbol	From (input)	To (output)	Ta = -40 to 85°C									Unit	Test conditions	
				V _{CCB} = 1.2 V		V _{CCB} = 1.5±0.1 V		V _{CCB} = 1.8±0.15 V		V _{CCB} = 2.5±0.2 V		V _{CCB} = 3.3±0.3 V			
				Typ	Min	Max	Min	Max	Min	Max	Min	Max			Min
Propagation delay time	t _{PLH}	A	B	9.1	2.0	8.8	1.5	5.8	1.0	4.0	1.0	3.2	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{PHL}			9.1	2.0	8.8	1.5	5.8	1.0	4.0	1.0	3.2			
	t _{PLH}	B	A	4.0	1.0	4.2	1.0	3.8	1.0	3.4	1.0	3.2			
	t _{PHL}			4.0	1.0	4.2	1.0	3.8	1.0	3.4	1.0	3.2			
Output Disable time	t _{HZ}	DIR	A	4.0	1.0	4.5	1.0	4.5	1.0	4.5	1.0	4.5	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{LZ}			4.0	1.0	4.5	1.0	4.5	1.0	4.5	1.0	4.5			
	t _{HZ}	DIR	B	11.2	2.0	10.2	1.5	8.0	1.0	6.0	1.0	5.5			
	t _{LZ}			11.2	2.0	10.2	1.5	8.0	1.0	6.0	1.0	5.5			
Output Enable time	t _{ZH} ^{*1}	DIR	A	15.2	—	14.4	—	11.8	—	9.4	—	8.7	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{ZL} ^{*1}			15.2	—	14.4	—	11.8	—	9.4	—	8.7			
	t _{ZH} ^{*1}	DIR	B	13.1	—	13.3	—	10.3	—	8.5	—	7.7			
	t _{ZL} ^{*1}			13.1	—	13.3	—	10.3	—	8.5	—	7.7			

Note: 1. The enable time is a calculated value, derived using the formula shown in the section entitled enable times on page 12.

$V_{CCA} = 2.5 \pm 0.2 \text{ V}$

Item	Symbol	From (input)	To (output)	Ta = -40 to 85°C									Unit	Test conditions	
				V _{CCB} = 1.2 V		V _{CCB} = 1.5±0.1 V		V _{CCB} = 1.8±0.15 V		V _{CCB} = 2.5±0.2 V		V _{CCB} = 3.3±0.3 V			
				Typ	Min	Max	Min	Max	Min	Max	Min	Max			Min
Propagation delay time	t _{PLH}	A	B	9.5	2.0	9.2	1.5	6.0	1.0	4.2	1.0	3.4	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{PHL}			9.5	2.0	9.2	1.5	6.0	1.0	4.2	1.0	3.4			
	t _{PLH}	B	A	4.7	1.0	4.8	1.0	4.6	1.0	4.2	1.0	4.0			
	t _{PHL}			4.7	1.0	4.8	1.0	4.6	1.0	4.2	1.0	4.0			
Output Disable time	t _{HZ}	DIR	A	4.2	1.0	4.7	1.0	4.7	1.0	4.7	1.0	4.7	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{LZ}			4.2	1.0	4.7	1.0	4.7	1.0	4.7	1.0	4.7			
	t _{HZ}	DIR	B	11.2	2.0	10.6	1.5	8.4	1.0	6.0	1.0	6.0			
	t _{LZ}			11.2	2.0	10.6	1.5	8.4	1.0	6.0	1.0	6.0			
Output Enable time	t _{ZH} ^{*1}	DIR	A	15.9	—	15.4	—	13.0	—	10.2	—	10.0	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{ZL} ^{*1}			15.9	—	15.4	—	13.0	—	10.2	—	10.0			
	t _{ZH} ^{*1}	DIR	B	13.7	—	13.9	—	10.7	—	8.9	—	8.1			
	t _{ZL} ^{*1}			13.7	—	13.9	—	10.7	—	8.9	—	8.1			

Note: 1. The enable time is a calculated value, derived using the formula shown in the section entitled enable times on page 12.

Switching Characteristics (Cont.)

$V_{CCA} = 1.8 \pm 0.15 \text{ V}$

Item	Symbol	From (input)	To (output)	Ta = -40 to 85°C									Unit	Test conditions	
				V _{CCB} = 1.2 V		V _{CCB} = 1.5±0.1 V		V _{CCB} = 1.8±0.15 V		V _{CCB} = 2.5±0.2 V		V _{CCB} = 3.3±0.3 V			
				Typ	Min	Max	Min	Max	Min	Max	Min	Max			Min
Propagation delay time	t _{PLH}	A	B	9.8	2.0	9.6	1.5	6.5	1.0	4.6	1.0	3.8	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{PHL}			9.8	2.0	9.6	1.5	6.5	1.0	4.6	1.0	3.8			
	t _{PLH}	B	A	6.4	1.5	7.2	1.5	6.5	1.5	6.0	1.5	5.8			
	t _{PHL}			6.4	1.5	7.2	1.5	6.5	1.5	6.0	1.5	5.8			
Output Disable time	t _{HZ}	DIR	A	5.5	1.5	7.5	1.5	7.5	1.5	7.5	1.5	7.5	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{LZ}			5.5	1.5	7.5	1.5	7.5	1.5	7.5	1.5	7.5			
	t _{HZ}	DIR	B	12.0	2.0	11.5	1.5	9.2	1.0	7.2	1.0	7.0			
	t _{LZ}			12.0	2.0	11.5	1.5	9.2	1.0	7.2	1.0	7.0			
Output Enable time	t _{ZH} ^{*1}	DIR	A	18.4	—	18.7	—	15.7	—	13.2	—	12.8	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{ZL} ^{*1}			18.4	—	18.7	—	15.7	—	13.2	—	12.8			
	t _{ZH} ^{*1}	DIR	B	15.3	—	17.1	—	14.0	—	12.1	—	11.3			
	t _{ZL} ^{*1}			15.3	—	17.1	—	14.0	—	12.1	—	11.3			

Note: 1. The enable time is a calculated value, derived using the formula shown in the section entitled enable times on page 12.

$V_{CCA} = 1.5 \pm 0.1 \text{ V}$

Item	Symbol	From (input)	To (output)	Ta = -40 to 85°C									Unit	Test conditions	
				V _{CCB} = 1.2 V		V _{CCB} = 1.5±0.1 V		V _{CCB} = 1.8±0.15 V		V _{CCB} = 2.5±0.2 V		V _{CCB} = 3.3±0.3 V			
				Typ	Min	Max	Min	Max	Min	Max	Min	Max			Min
Propagation delay time	t _{PLH}	A	B	10.0	2.0	10.5	1.5	7.2	1.0	4.8	1.0	4.2	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{PHL}			10.0	2.0	10.5	1.5	7.2	1.0	4.8	1.0	4.2			
	t _{PLH}	B	A	8.0	2.0	10.5	2.0	9.6	2.0	9.2	2.0	8.8			
	t _{PHL}			8.0	2.0	10.5	2.0	9.6	2.0	9.2	2.0	8.8			
Output Disable time	t _{HZ}	DIR	A	6.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{LZ}			6.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0			
	t _{HZ}	DIR	B	12.5	2.0	12.7	1.5	12.0	1.0	10.7	1.0	7.5			
	t _{LZ}			12.5	2.0	12.7	1.5	12.0	1.0	10.7	1.0	7.5			
Output Enable time	t _{ZH} ^{*1}	DIR	A	20.5	—	23.2	—	21.6	—	19.9	—	16.3	ns	C _L = 15pF R _L = 2.0kΩ	
	t _{ZL} ^{*1}			20.5	—	23.2	—	21.6	—	19.9	—	16.3			
	t _{ZH} ^{*1}	DIR	B	16.0	—	20.5	—	17.2	—	14.8	—	14.2			
	t _{ZL} ^{*1}			16.0	—	20.5	—	17.2	—	14.8	—	14.2			

Note: 1. The enable time is a calculated value, derived using the formula shown in the section entitled enable times on page 12.

Switching Characteristics (Cont.)

$V_{CCA} = 1.2 \text{ V}$

Item	Symbol	From (input)	To (output)	Ta = -40 to 85°C					Unit	Test conditions
				V _{CCB} = 1.2 V	V _{CCB} = 1.5±0.1 V	V _{CCB} = 1.8±0.15 V	V _{CCB} = 2.5±0.2 V	V _{CCB} = 3.3±0.3 V		
				Typ	Typ	Typ	Typ	Typ		
Propagation delay time	t _{PLH}	A	B	10.5	8.0	6.4	4.7	4.0	ns	C _L = 15pF R _L = 2.0kΩ
	t _{PHL}			10.5	8.0	6.4	4.7	4.0		
	t _{PLH}	B	A	10.5	10.0	9.8	9.5	9.1		
	t _{PHL}			10.5	10.0	9.8	9.5	9.1		
Output Disable time	t _{HZ}	DIR	A	8.0	8.0	8.0	8.0	8.0	ns	C _L = 15pF R _L = 2.0kΩ
	t _{LZ}			8.0	8.0	8.0	8.0	8.0		
	t _{HZ}	DIR	B	13.5	10.5	9.5	7.5	7.5		
	t _{LZ}			13.5	10.5	9.5	7.5	7.5		
Output Enable time	t _{ZH} ^{*1}	DIR	A	24.0	20.5	19.3	17.0	16.6	ns	C _L = 15pF R _L = 2.0kΩ
	t _{ZL} ^{*1}			24.0	20.5	19.3	17.0	16.6		
	t _{ZH} ^{*1}	DIR	B	18.5	16.0	14.4	12.7	12.0		
	t _{ZL} ^{*1}			18.5	16.0	14.4	12.7	12.0		

Note: 1. The enable time is a calculated value, derived using the formula shown in the section entitled enable times on page 12.

Operating Characteristics

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

Item	Symbol	V _{CCA} (V)	V _{CCB} (V)	Min	Typ	Max	Unit	Test conditions
Power dissipation capacitance	C _{PD}	3.3	3.3	—	12	—	pF	f = 10 MHz C _L = 0

Power-up considerations

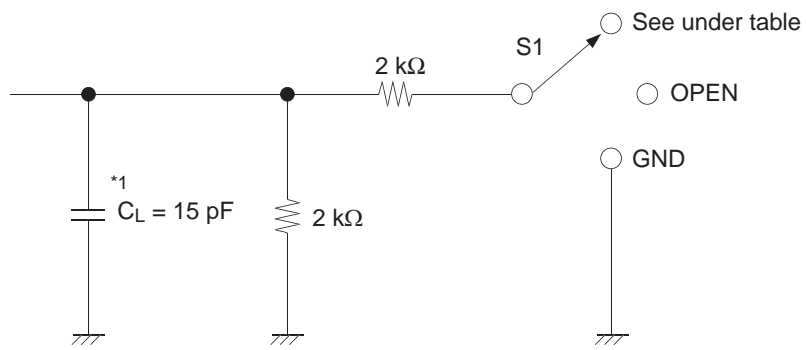
Level-translation devices offer an opportunity for successful mixed-voltage signal design.

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.

Take these precautions to guard against such power-up problems.

1. Connect ground before any supply voltage is applied.
2. Next, power up the control side of the device. (Power up of V_{CCA} is first. Next power up is V_{CCB})
3. 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, DIR low is needed (B data to A bus), ramp it with GND.

Test Circuit



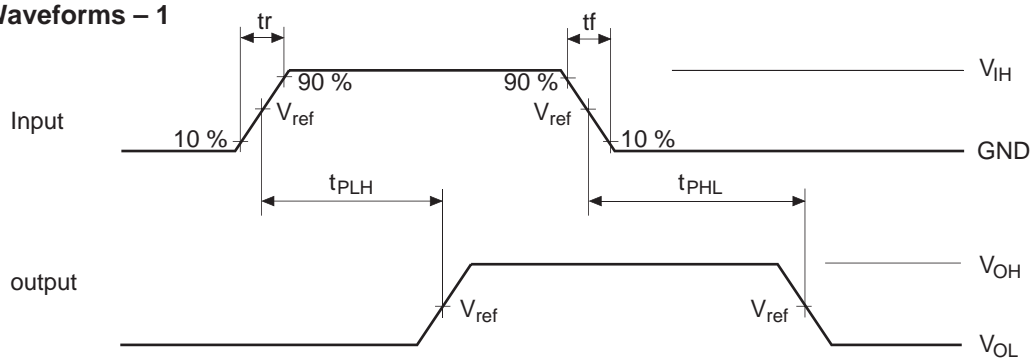
Load circuit for outputs

Symbol	S1
t_{PLH} / t_{PHL}	OPEN
t_{ZH} / t_{HZ}	GND
t_{ZL} / t_{LZ}	$2 \times V_{CC}$

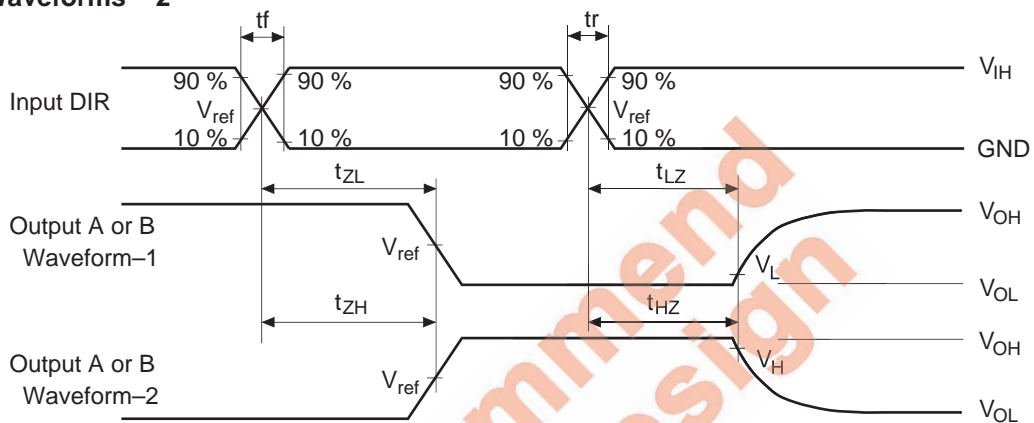
Note: 1. C_L includes probe and jig capacitance.

Not recommend
for new design

• Waveforms – 1



• Waveforms – 2



Symbol	$V_{CC} = 1.2 \text{ V},$ $1.5 \pm 0.1 \text{ V}$	$V_{CC} = 1.8 \pm 0.15 \text{ V}$	$V_{CC} = 2.5 \pm 0.2 \text{ V}$	$V_{CC} = 3.3 \pm 0.3 \text{ V}$
t_r / t_f	2.0 ns	2.0 ns	2.0 ns	2.0 ns
V_{IH}	V_{CC}	V_{CC}	V_{CC}	V_{CC}
V_{ref}	$1/2 V_{CC}$	$1/2 V_{CC}$	$1/2 V_{CC}$	$1/2 V_{CC}$
V_H / V_L	$V_H = V_{OH} - 0.1 \text{ V}$ $V_L = V_{OL} + 0.1 \text{ V}$	$V_H = V_{OH} - 0.15 \text{ V}$ $V_L = V_{OL} + 0.15 \text{ V}$	$V_H = V_{OH} - 0.15 \text{ V}$ $V_L = V_{OL} + 0.15 \text{ V}$	$V_H = V_{OH} - 0.3 \text{ V}$ $V_L = V_{OL} + 0.3 \text{ V}$

- Notes:
1. Input waveform : PRR $\leq 10 \text{ MHz}$, $Z_o = 50 \Omega$, duty cycle 50%.
 2. Waveform – 1 is for an output with internal conditions such that the output is low except when disabled by the output control.
 3. Waveform – 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
 4. The output are measured one at a time with one transition per measurement.

Application Information

Figure 1 is an example circuit of the RD74VT1G245 being used in a bidirectional logic level–shifting application.

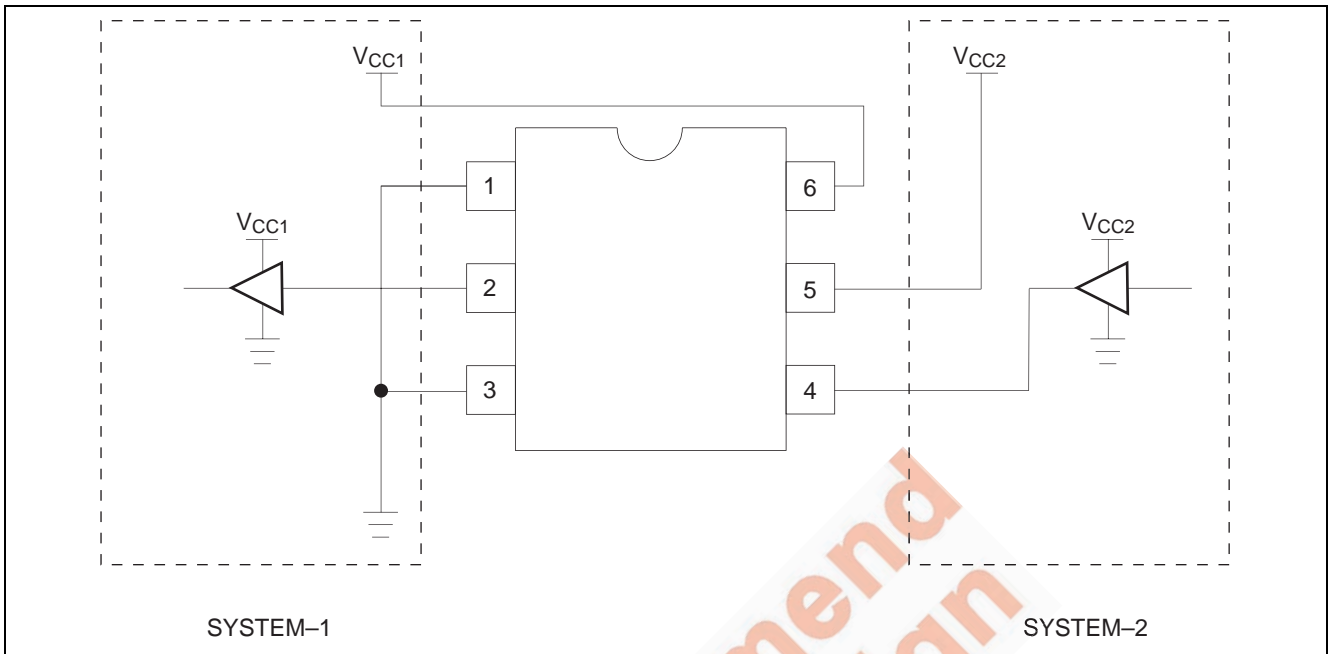


Figure 1. Bidirectional Logic Level–Shifting Application

Pin Description

PIN	NAME	FUNCTION	DESCRIPTION
1	DIR	DIR	The GND (low–level) determines B–port to A–port direction
2	A	OUT	Output level depends on V_{CC1} voltage
3	GND	GND	Device GND
4	B	IN	Input threshold value depends on V_{CC2} voltage
5	V_{CCB}	V_{CC2}	SYSTEM–2 supply voltage (1.2V to 3.6V)
6	V_{CCA}	V_{CC1}	SYSTEM–1 supply voltage (1.2V to 3.6V)

Application Information (Cont.)

Figure 2 shows the RD74VT1G245 used in a bidirectional logic level-shifting application. Since the RD74VT1G245 does not have an output enable (OE) pin, the system designer should take precautions to avoid bus contention between SYSTEM-1 and SYSTEM-2 when changing directions.

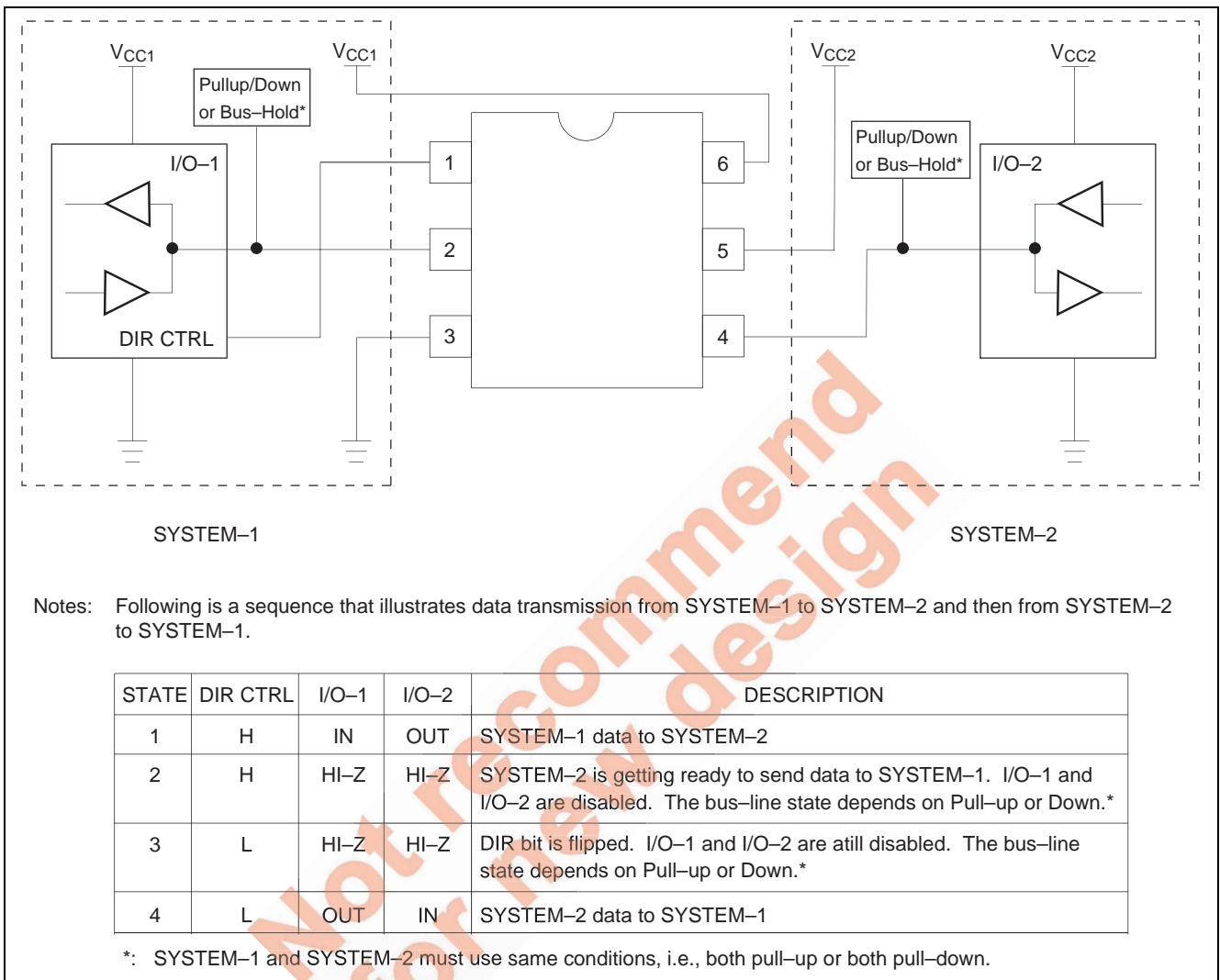


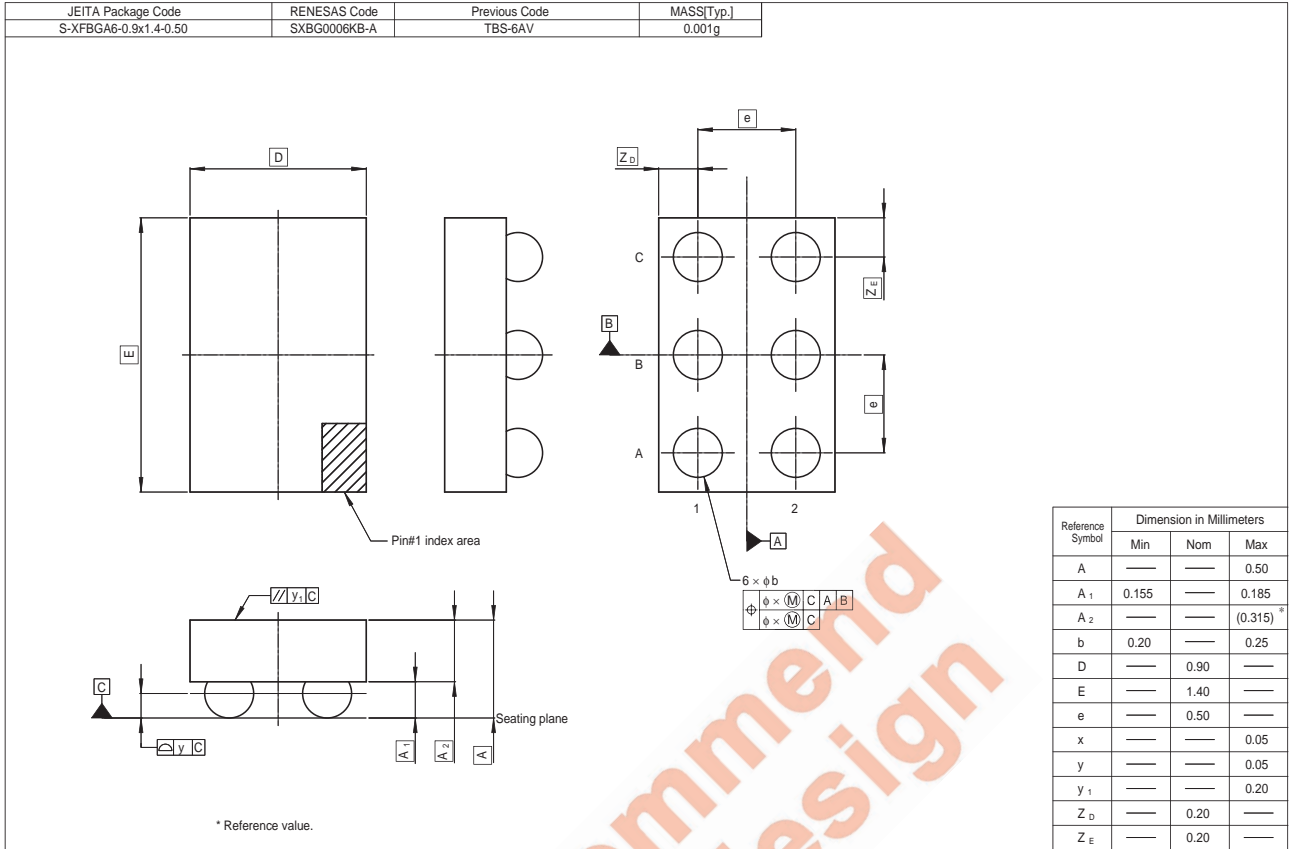
Figure 2. Bidirectional Logic Level-Shifting Application

Calculate the enable times for the RD74VT1G245 using the following formulas:

- $t_{ZH}(\text{DIR to A}) = t_{LZ}(\text{DIR to B}) + t_{PLH}(\text{B to A})$
- $t_{ZL}(\text{DIR to A}) = t_{HZ}(\text{DIR to B}) + t_{PHL}(\text{B to A})$
- $t_{ZH}(\text{DIR to B}) = t_{LZ}(\text{DIR to A}) + t_{PLH}(\text{A to B})$
- $t_{ZL}(\text{DIR to B}) = t_{HZ}(\text{DIR to A}) + t_{PHL}(\text{A to B})$

In a bidirectional application, these enable times provide the maximum delay from the time the DIR bit is switched until an output is expected. For example, if the RD74VT1G245 initially is transmitting from A to B, then the DIR bit is switched, the B port of the device must be disabled before presenting it with an input. After the B port has been disabled, an input signal applied to it appears on the corresponding A port after the specified propagation delay.

Package Dimensions



Not recommended for new design

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