

# NL17SV32XV5T2

## Single Gate 2-Input OR Gate

The NL17SV32 is an ultra-high performance 2 input OR gate manufactured in 0.35  $\mu$  CMOS technology with excellent performance down to 0.9 volts. This device is ideal for extremely high-speed and high-drive applications. Additionally, limitations of board space are no longer a constraint. The very small SOT-553 makes this device fit most tight designs and spaces.

### Features

- Extremely High Speed:  $t_{PD} = 1.0$  ns (Typ) at  $V_{CC} = 3.3$  V
- Designed for 0.9 to 3.3 V Operation
- Overvoltage Tolerance (OVT)\* Input Pins Permit Logic Translation
- Balanced  $\pm 24$  mA Output Drive @ 3.3 Volts
- Near Zero Static Supply Current
- Ultra-Tiny SOT-553 5 Pin Package Only 1.6 x 1.6 x 0.6 mm
- All Devices in Package SOT-553 are Inherently Pb-Free\*\*

### Typical Applications

- Cellular
- Digital Camera
- PDA
- Digital Video

### Important Information

- High ESD Ratings for Handling:  
Human Body Model: 2000 V  
Machine Model: 200 V
- Latchup Max Rating: 500 mA

### Industry Standard

- Compatible with Fairchild's NC7SV32 and TI's SN74AUC1G32

**FUNCTION TABLE**

Input A	Input B	Output Y
L	L	L
L	H	H
H	L	H
H	H	H

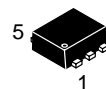
\*Overvoltage Tolerance (OVT) enables input pins to function outside (higher) of their operating voltages, with no damage to the devices or to signal integrity.

\*\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

<http://onsemi.com>



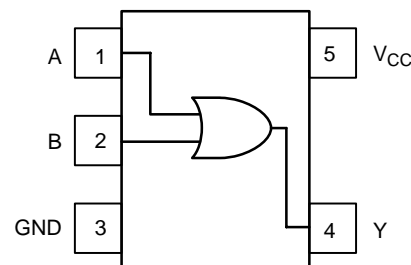
SOT-553  
CASE 463B

### MARKING DIAGRAM



UM = Specific Device Code  
D = Date Code

### PIN DIAGRAM



### PIN ASSIGNMENT

1	Input	A
2	Input	B
3	GND	-
4	Output	Y
5	$V_{CC}$	-

### ORDERING INFORMATION

Device	Package	Shipping†
NL17SV32XV5T2	SOT-553 (Pb-Free)	4000 Tape & Reel (178 mm)

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# NL17SV32XV5T2

## MAXIMUM RATINGS

Symbol	Rating	Value	Unit
V <sub>CC</sub>	DC Supply Voltage	-0.5 to + 4.6	V
V <sub>I</sub>	DC Input Voltage	-0.5 to + 4.6	V
V <sub>O</sub>	DC Output Voltage	-0.5 to V <sub>CC</sub> +0.5	V
I <sub>IK</sub>	DC Input Diode Current	V <sub>I</sub> < GND	±50
I <sub>OK</sub>	DC Output Diode Current	V <sub>O</sub> = GND V <sub>O</sub> = V <sub>CC</sub>	-50 +50
I <sub>O</sub>	DC Output Sink Current		±50
I <sub>CC</sub>	DC Supply Current per Supply Pin		±50
I <sub>GND</sub>	DC Ground Current per Ground Pin		±50
T <sub>STG</sub>	Storage Temperature Range	- 65 to +150	°C
T <sub>L</sub>	Lead Temperature, 1.0 mm from Case for 10 seconds	260	°C
T <sub>J</sub>	Junction Temperature Under Bias	+150	°C
θ <sub>JA</sub>	Thermal Resistance (Note 1)	250	°C/W
P <sub>D</sub>	Power Dissipation in Still Air at 85°C	250	mW
MSL	Moisture Sensitivity	Level 1	
F <sub>R</sub>	Flammability Rating	Oxygen index: 28 to 34	UL 94 V-0 @ 0125 in

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. Measured with minimum pad spacing on an FR4 board, using 10 mm-by-1 inch, 2 ounce copper trace no air flow.
2. Tested to EIA/JESD22-A114-A.
3. Tested to EIA/JESD22-A115-A.

## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V <sub>CC</sub>	Positive DC Supply Voltage	0.9	3.6	V
V <sub>IN</sub>	Digital Input Voltage	0	3.6	V
V <sub>out</sub>	Output Voltage	0	V <sub>CC</sub>	V
I <sub>OH</sub> /I <sub>OL</sub>	Output Current		±24 ±18 ±6 ±4 ±2 ±0.1	mA
t <sub>A</sub>	Operating Temperature Range. All Package Types	-40	+85	°C
t <sub>r</sub> , t <sub>f</sub>	Input Rise or Fall Time	0	10	nS/V

## DEVICE JUNCTION TEMPERATURE VERSUS TIME TO 0.1% BOND FAILURES

Junction Temperature °C	Time, Hours	Time, Years
80	1,032,200	117.8
90	419,300	47.9
100	178,700	20.4
110	79,600	9.4
120	37,000	4.2
130	17,800	2.0
140	8,900	1.0

# NL17SV32XV5T2

## DC CHARACTERISTICS – Digital Section (Voltages Referenced to GND)

Symbol	Parameter	Condition	V <sub>CC</sub>	T <sub>A</sub> = 25°C		T <sub>A</sub> = -40 to 85°C		Unit	
				Min	Max	Min	Max		
V <sub>IH</sub>	High Level Input Voltage		0.90	0.65 x V <sub>CC</sub>		0.65 x V <sub>CC</sub>		V	
			1.10 ≤ V <sub>CC</sub> ≤ 1.30	0.65 x V <sub>CC</sub>		0.65 x V <sub>CC</sub>			
			1.40 ≤ V <sub>CC</sub> ≤ 1.60	0.65 x V <sub>CC</sub>		0.65 x V <sub>CC</sub>			
			1.65 ≤ V <sub>CC</sub> ≤ 1.95	0.65 x V <sub>CC</sub>		0.65 x V <sub>CC</sub>			
			2.30 ≤ V <sub>CC</sub> ≤ 2.70	1.6		1.6			
2.70 ≤ V <sub>CC</sub> ≤ 3.60	2.0		2.0						
V <sub>IL</sub>	Low Level Input Voltage		0.90		0.35 x V <sub>CC</sub>		0.35 x V <sub>CC</sub>	V	
			1.10 ≤ V <sub>CC</sub> ≤ 1.30		0.35 x V <sub>CC</sub>		0.35 x V <sub>CC</sub>		
			1.40 ≤ V <sub>CC</sub> ≤ 1.60		0.35 x V <sub>CC</sub>		0.35 x V <sub>CC</sub>		
			1.65 ≤ V <sub>CC</sub> ≤ 1.95		0.35 x V <sub>CC</sub>		0.35 x V <sub>CC</sub>		
			2.30 ≤ V <sub>CC</sub> ≤ 2.70		0.7		0.7		
2.70 ≤ V <sub>CC</sub> ≤ 3.60		0.8		0.8					
V <sub>OH</sub>	High Level Output Voltage	I <sub>OH</sub> = -100 μA	0.90	V <sub>CC</sub> - 0.1		V <sub>CC</sub> - 0.1		V	
			1.10 ≤ V <sub>CC</sub> ≤ 1.30	V <sub>CC</sub> - 0.1		V <sub>CC</sub> - 0.1			
			1.40 ≤ V <sub>CC</sub> ≤ 1.60	V <sub>CC</sub> - 0.2		V <sub>CC</sub> - 0.2			
			1.65 ≤ V <sub>CC</sub> ≤ 1.95	V <sub>CC</sub> - 0.2		V <sub>CC</sub> - 0.2			
			2.30 ≤ V <sub>CC</sub> ≤ 2.70	V <sub>CC</sub> - 0.2		V <sub>CC</sub> - 0.2			
			2.70 ≤ V <sub>CC</sub> ≤ 3.60	V <sub>CC</sub> - 0.2		V <sub>CC</sub> - 0.2			
			I <sub>OH</sub> = -2.0 mA	1.10 ≤ V <sub>CC</sub> ≤ 1.30	0.75 x V <sub>CC</sub>		0.75 x V <sub>CC</sub>		
I <sub>OH</sub> = -4.0 mA	1.40 ≤ V <sub>CC</sub> ≤ 1.60	0.75 x V <sub>CC</sub>		0.75 x V <sub>CC</sub>					
I <sub>OH</sub> = -6.0 mA	1.65 ≤ V <sub>CC</sub> ≤ 1.95	2.30 ≤ V <sub>CC</sub> ≤ 2.70	1.25		1.25				
			2.0		2.0				
I <sub>OH</sub> = -12 mA	2.30 ≤ V <sub>CC</sub> ≤ 2.70	2.70 ≤ V <sub>CC</sub> ≤ 3.60	1.8		1.8				
			2.2		2.2				
I <sub>OH</sub> = -18 mA	2.30 ≤ V <sub>CC</sub> ≤ 2.70	2.70 ≤ V <sub>CC</sub> ≤ 3.60	1.7		1.7				
			2.4		2.4				
I <sub>OH</sub> = -24 mA	2.70 ≤ V <sub>CC</sub> ≤ 3.60		2.2		2.2				
V <sub>OL</sub>	Low Level Output Voltage	I <sub>OL</sub> = 100 μA	0.90		0.1		0.1	V	
			1.10 ≤ V <sub>CC</sub> ≤ 1.30		0.1		0.1		
			1.40 ≤ V <sub>CC</sub> ≤ 1.60		0.2		0.2		
			1.65 ≤ V <sub>CC</sub> ≤ 1.95		0.2		0.2		
			2.30 ≤ V <sub>CC</sub> ≤ 2.70		0.2		0.2		
			2.70 ≤ V <sub>CC</sub> ≤ 3.60		0.2		0.2		
			I <sub>OL</sub> = 2.0 mA	1.10 ≤ V <sub>CC</sub> ≤ 1.30		0.25 x V <sub>CC</sub>			0.25 x V <sub>CC</sub>
			I <sub>OL</sub> = 4.0 mA	1.40 ≤ V <sub>CC</sub> ≤ 1.60		0.25 x V <sub>CC</sub>			0.25 x V <sub>CC</sub>
I <sub>OL</sub> = 6.0 mA	1.65 ≤ V <sub>CC</sub> ≤ 1.95			0.3		0.3			
I <sub>OL</sub> = 12 mA	2.30 ≤ V <sub>CC</sub> ≤ 2.70	2.70 ≤ V <sub>CC</sub> ≤ 3.60		0.4		0.4			
				0.4		0.4			
I <sub>OL</sub> = 18 mA	2.30 ≤ V <sub>CC</sub> ≤ 2.70	2.70 ≤ V <sub>CC</sub> ≤ 3.60		0.6		0.6			
				0.4		0.4			
I <sub>OL</sub> = 24 mA	2.70 ≤ V <sub>CC</sub> ≤ 3.60			0.55		0.55			
I <sub>IN</sub>	Input Leakage Current	0 = V <sub>I</sub> = 3.6 V	0.90 to 3.60		±0.1		±0.9	μA	
I <sub>OFF</sub>	Power Off Leakage Current		0		1		5	μA	
I <sub>CC</sub>	Quiescent Supply Current	V <sub>I</sub> = V <sub>CC</sub> or GND	0.90 to 3.60		0.9		5	μA	

## NL17SV32XV5T2

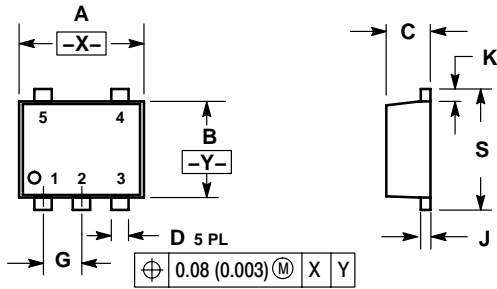
### AC CHARACTERISTICS (Input $t_r = t_f = 3.0$ nS)

Symbol	Parameter	-40°C		25°C			85°C		Unit
		Condition	V <sub>CC</sub>	Min	Typ	Max	Min	Max	
T <sub>PHL</sub> , T <sub>PLH</sub>	Propagation Delay	C <sub>L</sub> = 15 pF, R <sub>L</sub> = 1.0 MΩ	0.90		13				nS
		C <sub>L</sub> = 15 pF, R <sub>L</sub> = 2.0 kΩ	1.10 ≤ V <sub>CC</sub> ≤ 1.30	3.0	6.0	15.8	1.0	18.6	nS
			1.40 ≤ V <sub>CC</sub> ≤ 1.60	1.0	3.2	8.7	1.0	9.7	
C <sub>L</sub> = 30 pF, R <sub>L</sub> = 500 kΩ	1.65 ≤ V <sub>CC</sub> ≤ 1.95	1.0	2.0	6.0	1.0	6.8	nS		
		2.30 ≤ V <sub>CC</sub> ≤ 2.70	0.8	1.2	4.1	0.7		4.7	
		2.70 ≤ V <sub>CC</sub> ≤ 3.60	0.7	1.0	3.3	0.6		4.0	
C <sub>IN</sub>	Input Capacitance		0		2.0				pF
C <sub>OUT</sub>	Output Capacitance		0		4.5				pF
C <sub>PD</sub>	Power Dissipation Capacitance	V <sub>I</sub> = 0 V or V <sub>CC</sub> F = 10 MHz	0.90 to 3.60		20				pF

# NL17SV32XV5T2

## PACKAGE DIMENSIONS

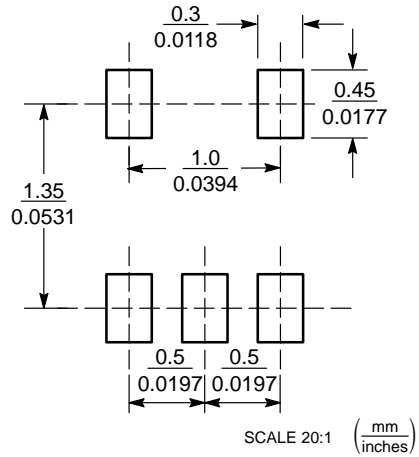
**SOT-553**  
**5-LEAD PACKAGE**  
**CASE 463B-01**  
**ISSUE A**




- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETERS
  3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.50	1.70	0.059	0.067
B	1.10	1.30	0.043	0.051
C	0.50	0.60	0.020	0.024
D	0.17	0.27	0.007	0.011
G	0.50 BSC		0.020 BSC	
J	0.08	0.18	0.003	0.007
K	0.10	0.30	0.004	0.012
S	1.50	1.70	0.059	0.067

### SOLDERING FOOTPRINT\*



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**ON Semiconductor** and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
P.O. Box 61312, Phoenix, Arizona 85082-1312 USA  
**Phone:** 480-829-7710 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 480-829-7709 or 800-344-3867 Toll Free USA/Canada  
**Email:** orderlit@onsemi.com

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada

**Japan:** ON Semiconductor, Japan Customer Focus Center  
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051  
**Phone:** 81-3-5773-3850

**ON Semiconductor Website:** <http://onsemi.com>

**Order Literature:** <http://www.onsemi.com/litorder>

For additional information, please contact your  
local Sales Representative.