

# NL17SG373

## Low-Power D-Type Transparent Latch with 3-State Output

The NL17SG373 MiniGate™ is an advanced high-speed CMOS D-Type Transparent Latch with 3-State Output in ultra-small footprint.

The NL17SG373 input structures provide protection when voltages up to 5.5 V are applied, regardless of the supply voltage.

This device is fully specified for partial power-down applications using I<sub>OFF</sub>. The I<sub>OFF</sub> circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

### Features

- Wide Operating V<sub>CC</sub> Range: 0.9 V to 3.6 V
- High Speed: t<sub>PD</sub> = 2.4 ns (Typ) @ V<sub>CC</sub> = 3.0 V, C<sub>L</sub> = 15 pF
- Low Power Dissipation: I<sub>CC</sub> = 0.5 μA (Max) at T<sub>A</sub> = 25°C
- 5.5 V Overvoltage Tolerant (OVT) Input Pins
- Ultra-Small Packages
- These Devices are Pb-Free and are RoHS Compliant

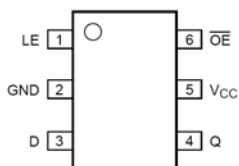


Figure 1. SC88 (Top View)

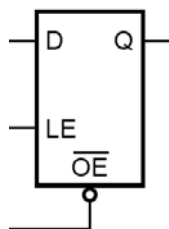


Figure 2. Logic Symbol



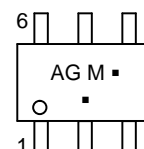
ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)

### MARKING DIAGRAMS



SC-88  
DF SUFFIX  
CASE 419B



AG = Device Code  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation and/or position may vary depending upon manufacturing location.

### PIN ASSIGNMENT

Pin	Function
1	LE
2	GND
3	D
4	Q
5	V <sub>CC</sub>
6	OE

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 9 of this data sheet.

# NL17SG373

## FUNCTION TABLE

Input			Internal Latch	Output	Operating Mode
$\overline{OE}$	LE	D		Q	
L	H	L	L	L	Enable and Read Register
L	H	H	H	H	(Transparent Mode)
L	L	X	L	L	Latch and Read Register
L	L	X	H	H	
H	X	X	X	Z	Latch Register and Disable Output

## MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CC}$	DC Supply Voltage	-0.5 to +5.5	V
$V_{IN}$	DC Input Voltage	-0.5 to +5.5	V
$V_{OUT}$	DC Output Voltage	-0.5 to $V_{CC} + 0.5$	V
$I_{IK}$	DC Input Diode Current $V_{IN} < GND$	-50	mA
$I_{OK}$	DC Output Diode Current $V_{OUT} < GND, V_{OUT} > V_{CC}$	$\pm 50$	mA
$I_O$	DC Output Source/Sink Current	$\pm 20$	mA
$I_{CC}$	DC Supply Current Per Supply Pin	$\pm 50$	mA
$I_{GND}$	DC Ground Current per Ground Pin	$\pm 50$	mA
$T_{STG}$	Storage Temperature Range	-65 to +150	$^{\circ}C$
$T_L$	Lead Temperature, 1 mm from Case for 10 Seconds	260	$^{\circ}C$
$T_J$	Junction Temperature Under Bias	150	$^{\circ}C$
MSL	Moisture Sensitivity	Level 1	
$F_R$	Flammability Rating Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	
$V_{ESD}$	ESD Withstand Voltage Human Body Mode (Note 2) Machine Model (Note 3)	> 3000 > 200	V
$I_{LATCHUP}$	Latchup Performance Above $V_{CC}$ and Below GND at 125 $^{\circ}C$ (Note 4)	$\pm 100$	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, 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.
4. Tested to EIA / JESD78.

## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
$V_{CC}$	Positive DC Supply Voltage	0.9	3.6	V
$V_{IN}$	Digital Input Voltage	0	3.6	V
$V_{OUT}$	Output Voltage Active Mode	0	$V_{CC}$	V
$T_A$	Operating Free-Air Temperature	-55	+125	$^{\circ}C$
$\Delta t / \Delta V$	Input Transition Rise or Fall Rate $V_{CC} = 3.3 V \pm 0.3 V$	0	10	nS/V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

# NL17SG373

## DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C			T <sub>A</sub> = -55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	
V <sub>IH</sub>	High-Level Input Voltage		0.9	V <sub>CC</sub>			V <sub>CC</sub>		V
			1.1 to 1.3	0.7 x V <sub>CC</sub>			0.7 x V <sub>CC</sub>		
			1.4 to 1.6	0.65 x V <sub>CC</sub>			0.65 x V <sub>CC</sub>		
			1.65 to 1.95	0.65 x V <sub>CC</sub>			0.65 x V <sub>CC</sub>		
			2.3 to 2.7	1.7			1.7		
			3.0 to 3.6	2.0			2.0		
V <sub>IL</sub>	Low-Level Input Voltage		0.9			GND		GND	V
			1.1 to 1.3			0.3 x V <sub>CC</sub>		0.3 x V <sub>CC</sub>	
			1.4 to 1.6			0.35 x V <sub>CC</sub>		0.35 x V <sub>CC</sub>	
			1.65 to 1.95			0.35 x V <sub>CC</sub>		0.35 x V <sub>CC</sub>	
			2.3 to 2.7			0.7		0.7	
			3.0 to 3.6			0.8		0.8	
V <sub>OH</sub>	High-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = -20 μA	0.9	0.75		0.75		V
			I <sub>OH</sub> = -0.3 mA	1.1 to 1.3	0.75 x V <sub>CC</sub>		0.75 x V <sub>CC</sub>		
			I <sub>OH</sub> = -1.7 mA	1.4 to 1.6	0.75 x V <sub>CC</sub>		0.75 x V <sub>CC</sub>		
			I <sub>OH</sub> = -3.0 mA	1.65 to 1.95	V <sub>CC</sub> - 0.45		V <sub>CC</sub> - 0.45		
			I <sub>OH</sub> = -4.0 mA	2.3 to 2.7	2.0		2.0		
			I <sub>OH</sub> = -8.0 mA	3.0 to 3.6	2.48		2.48		
V <sub>OL</sub>	Low-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> = 20 μA	0.9		0.1		0.1	V
			I <sub>OL</sub> = 0.3 mA	1.1 to 1.3		0.25 x V <sub>CC</sub>		0.25 x V <sub>CC</sub>	
			I <sub>OL</sub> = 1.7 mA	1.4 to 1.6		0.25 x V <sub>CC</sub>		0.25 x V <sub>CC</sub>	
			I <sub>OL</sub> = 3.0 mA	1.65 to 1.95		0.45		0.45	
			I <sub>OL</sub> = 4.0 mA	2.3 to 2.7		0.4		0.4	
			I <sub>OL</sub> = 8.0 mA	3.0 to 3.6		0.4		0.4	
I <sub>IN</sub>	Input Leakage Current	0 ≤ V <sub>IN</sub> ≤ 3.6 V	0 to 3.6			±0.1		±0.5	μA
I <sub>CC</sub>	Quiescent Supply Current	V <sub>IN</sub> = V <sub>CC</sub> or GND	3.6			0.5		10	μA
I <sub>OZ</sub>	3-State Output Leakage Current	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>OUT</sub> = 0 to 3.6 V	0.9 to 3.6			0.1		1	μA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

# NL17SG373

## AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3.0$ ns)

Symbol	Parameter	Test Condition	$V_{CC}$ (V)	$T_A = 25^\circ\text{C}$			$T_A = -55^\circ\text{C to } +125^\circ\text{C}$		Unit
				Min	Typ	Max	Min	Max	
$t_{PLH}$ , $t_{PHL}$	Propagation Delay, D to Q	$C_L = 10$ pF, $R_L = 1$ M $\Omega$	0.9	–	15.3	–	–	–	ns
			1.1 to 1.3	–	6.3	12.3	1.0	14.4	
			1.4 to 1.6	–	4.4	8.1	1.0	9.4	
			1.65 to 1.95	–	3.6	6.2	0.5	6.7	
			2.3 to 2.7	–	2.6	3.9	0.5	4.4	
			3.0 to 3.6	–	2.1	3.1	0.5	3.7	
		$C_L = 15$ pF, $R_L = 1$ M $\Omega$	0.9	–	17.7	–	–	–	ns
			1.1 to 1.3	–	7.1	13.6	1.0	15.6	
			1.4 to 1.6	–	5.0	9.2	1.0	10.4	
			1.65 to 1.95	–	4.1	6.9	1.0	7.1	
			2.3 to 2.7	–	2.9	4.4	0.5	5.0	
			3.0 to 3.6	–	2.4	3.4	0.5	3.9	
		$C_L = 30$ pF, $R_L = 1$ M $\Omega$	0.9	–	29	–	–	–	ns
			1.1 to 1.3	–	9.3	17.3	1.0	21.2	
			1.4 to 1.6	–	6.4	11.6	1.0	12.6	
			1.65 to 1.95	–	5.3	9.1	1.0	9.6	
			2.3 to 2.7	–	4	5.7	1.0	6.1	
			3.0 to 3.6	–	3.3	4.4	1.0	4.8	
$t_{PLH}$ , $t_{PHL}$	Propagation Delay, LE to Q	$C_L = 10$ pF, $R_L = 1$ M $\Omega$	0.9	–	15.3	–	–	–	ns
			1.1 to 1.3	–	6.3	12.3	1.0	14.4	
			1.4 to 1.6	–	4.4	8.1	1.0	9.4	
			1.65 to 1.95	–	3.6	6.2	0.5	6.7	
			2.3 to 2.7	–	2.6	3.9	0.5	4.4	
			3.0 to 3.6	–	2.1	3.1	0.5	3.7	
		$C_L = 15$ pF, $R_L = 1$ M $\Omega$	0.9	–	17.7	–	–	–	ns
			1.1 to 1.3	–	7.1	13.6	1.0	15.6	
			1.4 to 1.6	–	5.0	9.2	1.0	10.4	
			1.65 to 1.95	–	4.1	6.9	1.0	7.1	
			2.3 to 2.7	–	2.9	4.4	0.5	5.0	
			3.0 to 3.6	–	2.4	3.4	0.5	3.9	
		$C_L = 30$ pF, $R_L = 1$ M $\Omega$	0.9	–	29	–	–	–	ns
			1.1 to 1.3	–	9.3	17.3	1.0	21.2	
			1.4 to 1.6	–	6.4	11.6	1.0	12.6	
			1.65 to 1.95	–	5.3	9.1	1.0	9.6	
			2.3 to 2.7	–	4	5.7	1.0	6.1	
			3.0 to 3.6	–	3.3	4.4	1.0	4.8	

# NL17SG373

## AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3.0$ ns)

Symbol	Parameter	Test Condition	$V_{CC}$ (V)	$T_A = 25^\circ\text{C}$			$T_A = -55^\circ\text{C to } +125^\circ\text{C}$		Unit
				Min	Typ	Max	Min	Max	
$t_{pZH}$ , $t_{pZL}$	Output Enable Time, OE to Q	$C_L = 10$ pF, $R_L = 5$ k $\Omega$	0.9	-	18.9	-	-	-	ns
			1.1 to 1.3	-	6.0	10.2	1	10.6	
			1.4 to 1.6	-	4.5	6.5	1	7.0	
			1.65 to 1.95	-	3.9	5.4	1	5.8	
			2.3 to 2.7	-	2.5	3.5	1	3.8	
			3.0 to 3.6	-	2.1	2.7	1	3	
		$C_L = 15$ pF, $R_L = 5$ k $\Omega$	0.9	-	22	-	-	-	ns
			1.1 to 1.3	-	6.8	11.6	1	12.1	
			1.4 to 1.6	-	5.1	7.2	1	7.9	
			1.65 to 1.95	-	4.4	6.1	1	6.5	
			2.3 to 2.7	-	2.9	3.9	1	4.2	
			3.0 to 3.6	-	2.3	3	1	3.3	
		$C_L = 30$ pF, $R_L = 5$ k $\Omega$	0.9	-	31.8	-	-	-	ns
			1.1 to 1.3	-	9.1	15.7	1	16.2	
			1.4 to 1.6	-	6.7	9.5	1	10.5	
			1.65 to 1.95	-	5.7	7.9	1	8.6	
			2.3 to 2.7	-	3.8	5	1	5.5	
			3.0 to 3.6	-	2.9	3.8	1	4.2	
$t_{pHZ}$ , $t_{pLZ}$	Output Disable Time, OE to Q	$C_L = 10$ pF, $R_L = 5$ k $\Omega$	0.9	-	11.3	-	-	-	ns
			1.1 to 1.3	-	5.3	8.3	1	8.4	
			1.4 to 1.6	-	4.1	5.8	1	6.1	
			1.65 to 1.95	-	4.2	5.7	1	5.9	
			2.3 to 2.7	-	3.0	4	1	4.2	
			3.0 to 3.6	-	3.4	4.7	1	5	
		$C_L = 15$ pF, $R_L = 5$ k $\Omega$	0.9	-	11	-	-	-	ns
			1.1 to 1.3	-	5.8	8.2	1	11	
			1.4 to 1.6	-	3.9	5.9	1	8	
			1.65 to 1.95	-	4.5	6.6	1	7.4	
			2.3 to 2.7	-	3.2	4.3	1	5.1	
			3.0 to 3.6	-	4.8	6.2	1	6.7	
		$C_L = 30$ pF, $R_L = 5$ k $\Omega$	0.9	-	17.7	-	-	-	ns
			1.1 to 1.3	-	9.9	15.7	1	16	
			1.4 to 1.6	-	7.7	10.8	1	11.6	
			1.65 to 1.95	-	6	12.9	1	12.9	
			2.3 to 2.7	-	5	9.1	1	9.5	
			3.0 to 3.6	-	4	12.5	1	13	

# NL17SG373

## AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3.0$ ns)

Symbol	Parameter	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25 °C			T <sub>A</sub> = -55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	
C <sub>IN</sub>	Input Capacitance		0 to 3.6		1.5	-	-	-	pF
C <sub>O</sub>	Output Capacitance	V <sub>O</sub> = GND	0		3	-	-	-	pF
C <sub>PD</sub>	Power dissipation Capacitance (Note 5)	f = 10 MHz; V <sub>I</sub> = GND to V <sub>CC</sub>	0.9	-	1.6	-	-	-	pF
			1.1 to 1.3	-	1.7	-	-	-	
			1.4 to 1.6	-	1.8	-	-	-	
			1.65 to 1.95	-	1.9	-	-	-	
			2.3 to 2.7	-	2.2	-	-	-	
			3.0 to 3.6	-	2.7	-	-	-	

5. C<sub>PD</sub> is defined as the value of the internal equivalent capacitance which is calculated from the dynamic operating current consumption without load. Average operating current can be obtained by the equation  $I_{CC(OPR)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$ . C<sub>PD</sub> is used to determine the no-load dynamic power consumption:  $P_D = C_{PD} \cdot V_{CC}^2 \cdot f_{in} + I_{CC} \cdot V_{CC}$ .

## TIMING REQUIREMENTS (Input $t_r = t_f = 3.0$ ns; C<sub>L</sub> = 5 pF, 10 pF, 15 pF and 20 pF)

Symbol	Parameter	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25 °C			T <sub>A</sub> = -55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	
t <sub>w</sub>	Pulse Width, LE	High	0.9	-	4.0	-	-	-	ns
			1.1 to 1.3	-	0.7	-	2.1	-	
			1.4 to 1.6	-	0.5	-	1.3	-	
			1.65 to 1.95	-	0.4	-	1.0	-	
			2.3 to 2.7	-	0.3	-	0.8	-	
			3.0 to 3.6	-	0.2	-	0.8	-	
t <sub>SU</sub>	Set-Up Time, D to LE	High or Low	0.9	-	2.1	-	-	-	ns
			1.1 to 1.3	-	0.5	-	2.7	-	
			1.4 to 1.6	-	0.3	-	1.5	-	
			1.65 to 1.95	-	0.3	-	1.2	-	
			2.3 to 2.7	-	0.2	-	0.9	-	
			3.0 to 3.6	-	0.2	-	0.7	-	
t <sub>H</sub>	Hold Time D to LE	High or Low	0.9	-	-2.8	-	-	-	ns
			1.1 to 1.3	-	-0.7	-	-0.1	-	
			1.4 to 1.6	-	-0.4	-	-0.1	-	
			1.65 to 1.95	-	-0.4	-	0	-	
			2.3 to 2.7	-	-0.3	-	0.2	-	
			3.0 to 3.6	-	-0.4	-	0.3	-	

# NL17SG373

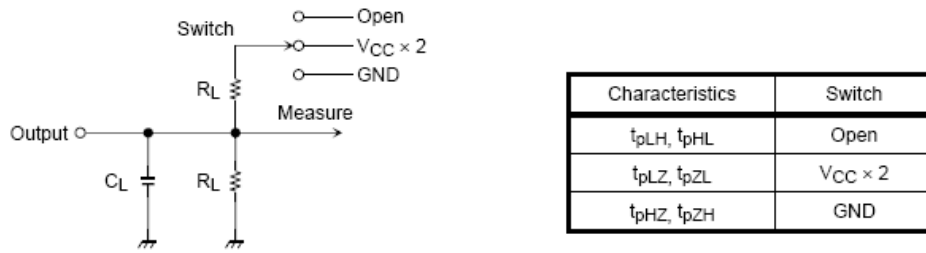
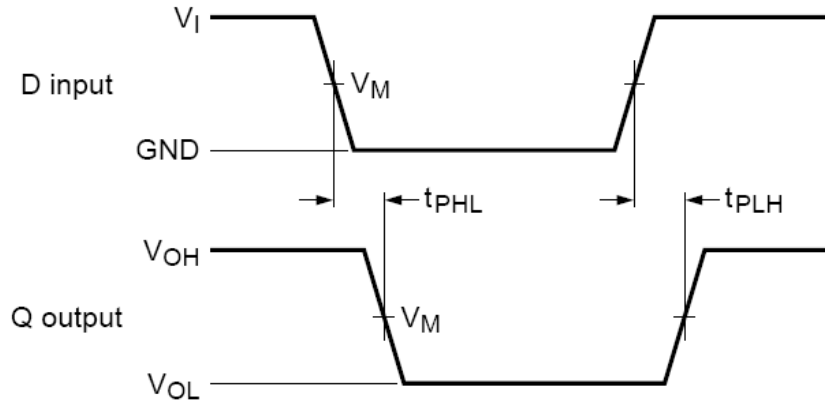
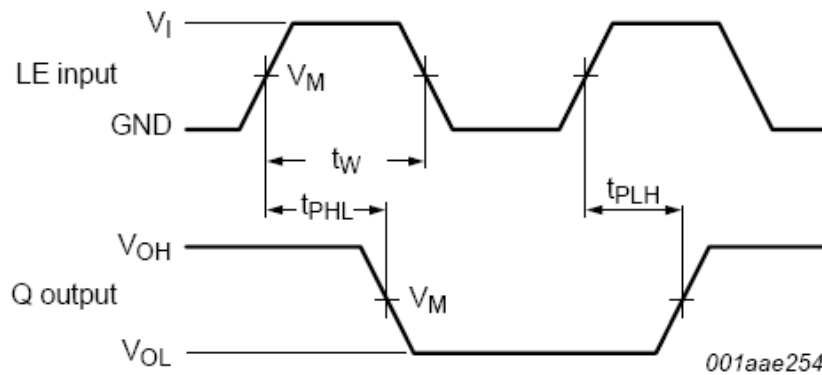


Figure 3. Test Circuit



Logic levels:  $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

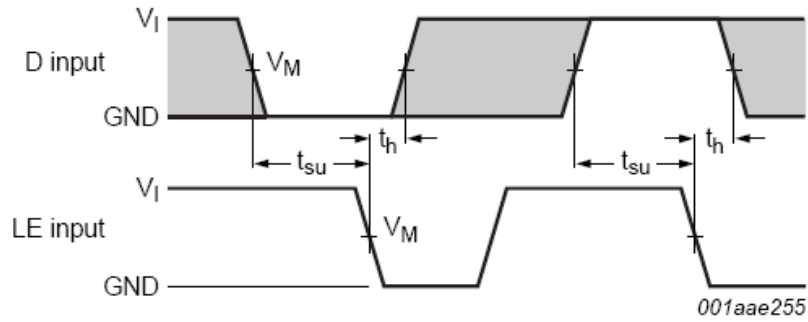
Figure 4.  $t_{pLH}$ ,  $t_{pHL}$  Waveforms (D to Q)



Logic levels:  $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

Figure 5.  $t_{pLH}$ ,  $t_{pHL}$ ,  $t_W$  Waveforms (LE to Q)

# NL17SG373

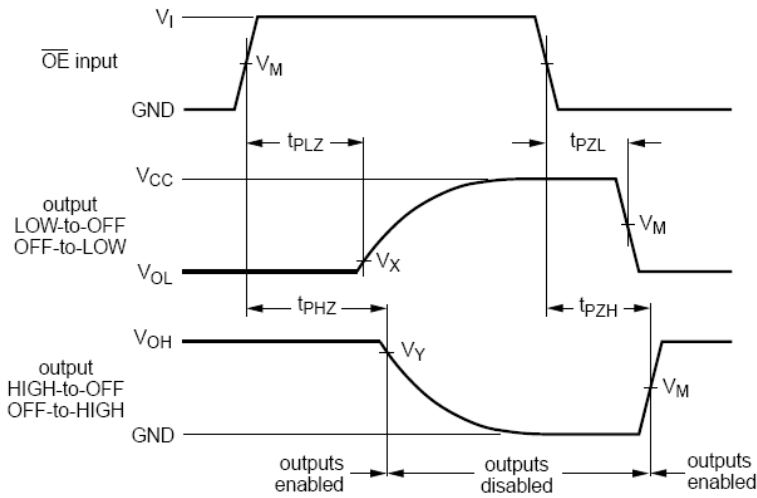


Logic levels:  $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

**Figure 6.  $t_{SU}$ ,  $t_H$  Waveforms (D to LE)**

## MEASUREMENT POINTS FOR FIGURES 4, 5 AND 6

Supply Voltage	Input			Output
$V_{CC}$	$V_M$	$V_I$	$t_r = t_f$	$V_M$
0.9 V to 3.6 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$



Logic levels:  $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.

**Figure 7.  $t_{PLZ}$ ,  $t_{PHZ}$ ,  $t_{PZH}$ ,  $t_{PZL}$  Waveforms ( $\overline{OE}$  to Q)**

## MEASUREMENT POINTS FOR FIGURE 7

Supply Voltage	Input			Output		
$V_{CC}$	$V_M$	$V_I$	$t_r = t_f$	$V_M$	$V_X$	$V_Y$
0.9 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$	$V_{OL} + 0.1$ V	$V_{OH} - 0.1$ V
1.1 V to 1.3 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$	$V_{OL} + 0.1$ V	$V_{OH} - 0.1$ V
1.4 V to 1.6 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$	$V_{OL} + 0.1$ V	$V_{OH} - 0.1$ V
1.65 V to 1.95 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$	$V_{OL} + 0.15$ V	$V_{OH} - 0.15$ V
2.3 V to 2.7 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$	$V_{OL} + 0.15$ V	$V_{OH} - 0.15$ V
3.0 V to 3.6 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$	$V_{OL} + 0.3$ V	$V_{OH} - 0.3$ V



# NL17SG373

## ORDERING INFORMATION

Device	Package	Shipping†
NL17SG373DFT2G	SC-88 / SOT-363 / SC-70-6 (Pb-Free)	3000 / Tape & Reel

†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.

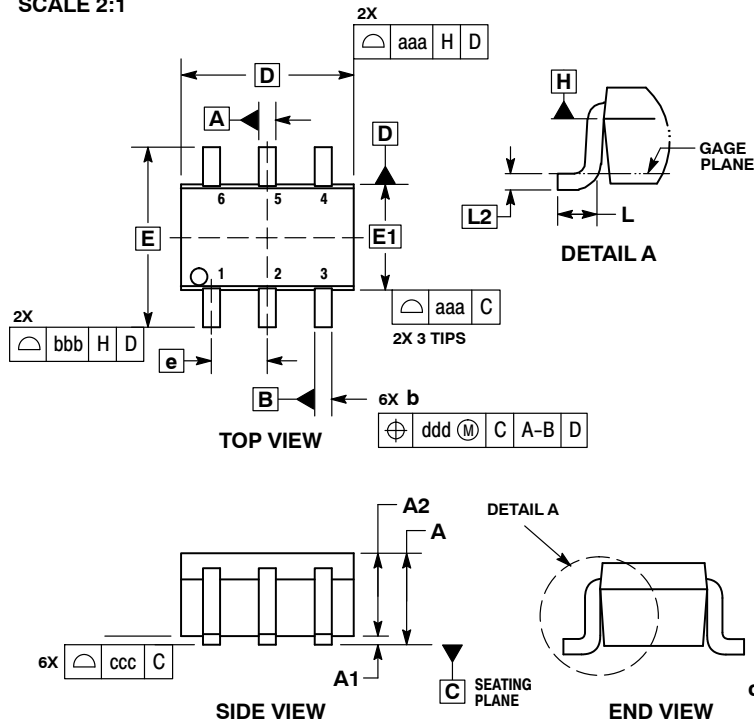
# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



1  
SCALE 2:1

SC-88/SC70-6/SOT-363  
CASE 419B-02  
ISSUE Y

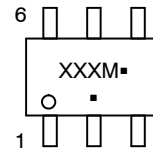
DATE 11 DEC 2012



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
  2. CONTROLLING DIMENSION: MILLIMETERS.
  3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.20 PER END.
  4. DIMENSIONS D AND E1 AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AND DATUM H.
  5. DATUMS A AND B ARE DETERMINED AT DATUM H.
  6. DIMENSIONS b AND c APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.08 AND 0.15 FROM THE TIP.
  7. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 TOTAL IN EXCESS OF DIMENSION b AT MAXIMUM MATERIAL CONDITION. THE DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	0.043
A1	0.00	---	0.10	0.000	---	0.004
A2	0.70	0.90	1.00	0.027	0.035	0.039
b	0.15	0.20	0.25	0.006	0.008	0.010
C	0.08	0.15	0.22	0.003	0.006	0.009
D	1.80	2.00	2.20	0.070	0.078	0.086
E	2.00	2.10	2.20	0.078	0.082	0.086
E1	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.26	0.36	0.46	0.010	0.014	0.018
L2	0.15 BSC			0.006 BSC		
aaa	0.15			0.006		
bbb	0.30			0.012		
ccc	0.10			0.004		
ddd	0.10			0.004		

### GENERIC MARKING DIAGRAM\*



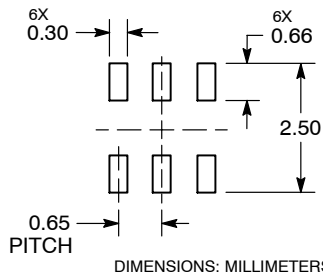
- XXX = Specific Device Code
- M = Date Code\*
- = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation and/or position may vary depending upon manufacturing location.

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

### RECOMMENDED 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.

### STYLES ON PAGE 2

DOCUMENT NUMBER:	98ASB42985B	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	SC-88/SC70-6/SOT-363	PAGE 1 OF 2

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi 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. onsemi does not convey any license under its patent rights nor the rights of others.

**SC-88/SC70-6/SOT-363**  
**CASE 419B-02**  
**ISSUE Y**

DATE 11 DEC 2012

<b>STYLE 1:</b> PIN 1. EMITTER 2 2. BASE 2 3. COLLECTOR 1 4. EMITTER 1 5. BASE 1 6. COLLECTOR 2	<b>STYLE 2:</b> CANCELLED	<b>STYLE 3:</b> CANCELLED	<b>STYLE 4:</b> PIN 1. CATHODE 2. CATHODE 3. COLLECTOR 4. EMITTER 5. BASE 6. ANODE	<b>STYLE 5:</b> PIN 1. ANODE 2. ANODE 3. COLLECTOR 4. EMITTER 5. BASE 6. CATHODE	<b>STYLE 6:</b> PIN 1. ANODE 2 2. N/C 3. CATHODE 1 4. ANODE 1 5. N/C 6. CATHODE 2
<b>STYLE 7:</b> PIN 1. SOURCE 2 2. DRAIN 2 3. GATE 1 4. SOURCE 1 5. DRAIN 1 6. GATE 2	<b>STYLE 8:</b> CANCELLED	<b>STYLE 9:</b> PIN 1. EMITTER 2 2. EMITTER 1 3. COLLECTOR 1 4. BASE 1 5. BASE 2 6. COLLECTOR 2	<b>STYLE 10:</b> PIN 1. SOURCE 2 2. SOURCE 1 3. GATE 1 4. DRAIN 1 5. DRAIN 2 6. GATE 2	<b>STYLE 11:</b> PIN 1. CATHODE 2 2. CATHODE 2 3. ANODE 1 4. CATHODE 1 5. CATHODE 1 6. ANODE 2	<b>STYLE 12:</b> PIN 1. ANODE 2 2. ANODE 2 3. CATHODE 1 4. ANODE 1 5. ANODE 1 6. CATHODE 2
<b>STYLE 13:</b> PIN 1. ANODE 2. N/C 3. COLLECTOR 4. EMITTER 5. BASE 6. CATHODE	<b>STYLE 14:</b> PIN 1. VREF 2. GND 3. GND 4. IOUT 5. VEN 6. VCC	<b>STYLE 15:</b> PIN 1. ANODE 1 2. ANODE 2 3. ANODE 3 4. CATHODE 3 5. CATHODE 2 6. CATHODE 1	<b>STYLE 16:</b> PIN 1. BASE 1 2. EMITTER 2 3. COLLECTOR 2 4. BASE 2 5. EMITTER 1 6. COLLECTOR 1	<b>STYLE 17:</b> PIN 1. BASE 1 2. EMITTER 1 3. COLLECTOR 2 4. BASE 2 5. EMITTER 2 6. COLLECTOR 1	<b>STYLE 18:</b> PIN 1. VIN1 2. VCC 3. VOUT2 4. VIN2 5. GND 6. VOUT1
<b>STYLE 19:</b> PIN 1. IOUT 2. GND 3. GND 4. V CC 5. V EN 6. V REF	<b>STYLE 20:</b> PIN 1. COLLECTOR 2. COLLECTOR 3. BASE 4. EMITTER 5. COLLECTOR 6. COLLECTOR	<b>STYLE 21:</b> PIN 1. ANODE 1 2. N/C 3. ANODE 2 4. CATHODE 2 5. N/C 6. CATHODE 1	<b>STYLE 22:</b> PIN 1. D1 (i) 2. GND 3. D2 (i) 4. D2 (c) 5. VBUS 6. D1 (c)	<b>STYLE 23:</b> PIN 1. Vn 2. CH1 3. Vp 4. N/C 5. CH2 6. N/C	<b>STYLE 24:</b> PIN 1. CATHODE 2. ANODE 3. CATHODE 4. CATHODE 5. CATHODE 6. CATHODE
<b>STYLE 25:</b> PIN 1. BASE 1 2. CATHODE 3. COLLECTOR 2 4. BASE 2 5. EMITTER 6. COLLECTOR 1	<b>STYLE 26:</b> PIN 1. SOURCE 1 2. GATE 1 3. DRAIN 2 4. SOURCE 2 5. GATE 2 6. DRAIN 1	<b>STYLE 27:</b> PIN 1. BASE 2 2. BASE 1 3. COLLECTOR 1 4. EMITTER 1 5. EMITTER 2 6. COLLECTOR 2	<b>STYLE 28:</b> PIN 1. DRAIN 2. DRAIN 3. GATE 4. SOURCE 5. DRAIN 6. DRAIN	<b>STYLE 29:</b> PIN 1. ANODE 2. ANODE 3. COLLECTOR 4. EMITTER 5. BASE/ANODE 6. CATHODE	<b>STYLE 30:</b> PIN 1. SOURCE 1 2. DRAIN 2 3. DRAIN 2 4. SOURCE 2 5. GATE 1 6. DRAIN 1

Note: Please refer to datasheet for style callout. If style type is not called out in the datasheet refer to the device datasheet pinout or pin assignment.

<b>DOCUMENT NUMBER:</b>	<b>98ASB42985B</b>	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
<b>DESCRIPTION:</b>	<b>SC-88/SC70-6/SOT-363</b>	<b>PAGE 2 OF 2</b>

**onsemi** and **ONSEMI** are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** 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. **onsemi** does not convey any license under its patent rights nor the rights of others.

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** 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. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** 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. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** 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 **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

---

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at [www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)