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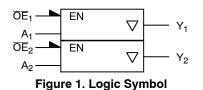
Dual Buffer with 3-State Outputs

NL27WZ125

The NL27WZ125 is a high performance dual noninverting buffer operating from a 1.65 V to 5.5 V supply.

Features

- Designed for 1.65 V to 5.5 V V_{CC} Operation
- 2.4 ns t_{PD} at $V_{CC} = 5 V (typ)$
- Inputs/Outputs Overvoltage Tolerant up to 5.5 V
- IOFF Supports Partial Power Down Protection
- Source/Sink 24 mA at 3.0 V
- Available in US8, UDFN8 and UQFN8 Packages
- Chip Complexity < 100 FETs
- NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant





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US8

US SUFFIX

CASE 493

MARKING DIAGRAMS







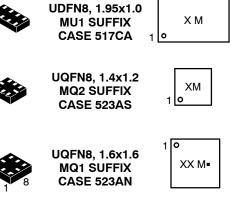




UDFN8, 1.45x1.0 MU3 SUFFIX CASE 517BZ



1

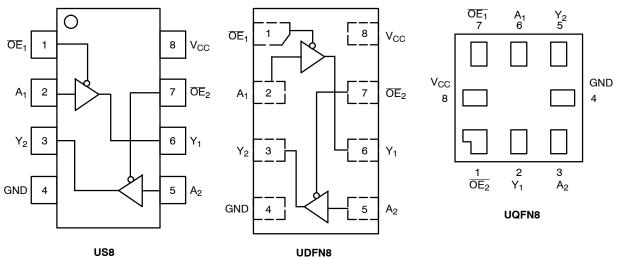


X, XX, XXXX	= Specific Device Code
А	= Assembly Location
L	= Lot Code
Y	= Year Code
W	= Week Code
М	= Date Code
•	= Pb-Free Package

ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 7 of this data sheet.

NL27WZ125



UDFN8

Figure 2. Pinout

PIN ASSIGNMENT (US8 / UDFN8)

Pin	Function
1	\overline{OE}_1
2	A ₁
3	Y ₂
4	GND
5	A ₂
6	Y ₁
7	OE ₂
8	V _{CC}

PIN ASSIGNMENT (UQFN8)

	-
Pin	Function
1	OE ₂
2	Y ₁
3	A ₂
4	GND
5	Y ₂
6	A ₁
7	OE ₁
8	V _{CC}

FUNCTION TABLE

Inj	Output	
0E _n	A _n	Y _n
L	L	L
L	Н	Н
Н	Х	Z

X = Don't Care

n = 1, 2

MAXIMUM RATINGS

Symbol	Characteris	stics	Value	Unit
V_{CC}	DC Supply Voltage	NLV	−0.5 to +7.0 −0.5 to +6.5	V
V _{IN}	DC Input Voltage	NLV	−0.5 to +7.0 −0.5 to +6.5	V
V _{OUT}	DC Output Voltage (NLV)	Active-Mode (High or Low State) Tri-State Mode (Note 1) Power-Down Mode (V _{CC} = 0 V)	-0.5 to V _{CC} + 0.5 -0.5 to +7.0 -0.5 to +7.0	V
	DC Output Voltage Active-Mode (High or Low State) Tri-State Mode (Note 1) Power-Down Mode (V _{CC} = 0 V)		-0.5 to V _{CC} + 0.5 -0.5 to +6.5 -0.5 to +6.5	V
I _{IK}	DC Input Diode Current	V _{IN} < GND	-50	mA
I _{OK}	DC Output Diode Current	-50	mA	
I _{OUT}	DC Output Source/Sink Current	±50	mA	
I_{CC} or I_{GND}	DC Supply Current per Supply Pin or Ground Pin		±100	mA
T _{STG}	Storage Temperature Range		-65 to +150	°C
ΤL	Lead Temperature, 1 mm from Case for 10	secs	260	°C
ТJ	Junction Temperature Under Bias		+150	°C
θ_{JA}	Thermal Resistance (Note 2)	US8 UQFN8 UDFN8	250 210 231	°C/W
P _D	Power Dissipation in Still Air	US8 UQFN8 UDFN8	500 595 541	mW
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 (Note 3)	Human Body Model Charged Device Model	2000 1000	V
I _{Latchup}	Latchup Performance (Note 4)		±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. Applicable to devices with outputs that may be tri-stated.

 Applicable to devices with outputs that hidy be in-stated.
 Measured with minimum pad spacing on an FR4 board, using 10mm-by-1inch, 2 ounce copper trace no air flow per JESD51-7.
 HBM tested to ANSI/ESDA/JEDEC JS-001-2017. CDM tested to EIA/JESD22-C101-F. JEDEC recommends that ESD qualification to EIA/JESD22–A115–A (Machine Model) be discontinued per JEDEC/JEP172A. 4. Tested to EIA/JESD78 Class II.

RECOMMENDED OPERATING CONDITIONS

Symbol	Characteristics	Min	Max	Unit
V _{CC}	Positive DC Supply Voltage	1.65	5.5	V
V _{IN}	DC Input Voltage	0	5.5	V
V _{OUT}	DC Output Voltage Active-Mode (High or Low Tri-State Mode (Power-Down Mode (V _{CC}	Note 1) 0	V _{CC} 5.5 5.5	
T _A	Operating Temperature Range		+125	°C
t _r , t _f	Input Rise and Fall Time $V_{CC} = 1.65 \text{ V to}$ $V_{CC} = 2.3 \text{ V t}$ $V_{CC} = 3.0 \text{ V t}$ $V_{CC} = 4.5 \text{ V t}$	o 2.7 V 0 o 3.6 V 0	20 20 10 5	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.

			Vcc	T,	₄ = 25°(C	–55°C ≤ T	A ≤ 125°C	
Symbol	Parameter	Condition	(V)	Min	Тур	Max	Min	Max	Units
V _{IH}	High-Level Input		1.65 to 1.95	0.65 V _{CC}	-	_	0.65 V _{CC}	_	V
	Voltage		2.3 to 5.5	0.70 V _{CC}	-	-	0.70 V _{CC}	-	
VIL	Low-Level Input		1.65 to 1.95	-	-	$0.35 V_{CC}$	-	$0.35 V_{CC}$	V
	Voltage		2.3 to 5.5	-	-	0.30 V _{CC}	-	0.30 V _{CC}	
V _{OH}	High-Level Output Voltage	$ \begin{array}{l} V_{IN} = V_{IH} \text{ or } V_{IL} \\ I_{OH} = -100 \ \mu A \\ I_{OH} = -4 \ m A \\ I_{OH} = -8 \ m A \\ I_{OH} = -12 \ m A \\ I_{OH} = -16 \ m A \\ I_{OH} = -24 \ m A \\ I_{OH} = -32 \ m A \end{array} $	1.65 to 5.5 1.65 2.3 2.7 3.0 3.0 4.5	$\begin{array}{c} V_{CC} = 0.1 \\ 1.29 \\ 1.9 \\ 2.2 \\ 2.4 \\ 2.3 \\ 3.8 \end{array}$	V _{CC} 1.4 2.1 2.4 2.7 2.5 4.0		V _{CC} - 0.1 1.29 1.9 2.2 2.4 2.3 3.8		V
V _{OL}	Low-Level Output Voltage		1.65 to 5.5 1.65 2.3 2.7 3.0 3.0 4.5	- - - - -	- 0.08 0.2 0.22 0.28 0.38 0.38	0.1 0.24 0.3 0.4 0.4 0.55 0.55	- - - - -	0.1 0.24 0.3 0.4 0.4 0.55 0.55	V
I _{IN}	Input Leakage Current	V _{IN} = 5.5 V or GND	1.65 to 5.5	-	-	±0.1	-	±1.0	μΑ
I _{OFF}	Power Off Leakage Current	V _{IN} = 5.5 V or V _{OUT} = 5.5 V	0	-	-	1.0	-	10	μΑ
I _{CC}	Quiescent Supply Current	$V_{IN} = V_{CC}$ or GND	5.5	-	-	1.0	-	10	μΑ
I _{OZ}	3-State Output Leakage	$V_{IN} = V_{IL} \text{ or } V_{IH}$ $V_{OUT} = 0 \text{ V to } 5.5 \text{ V}$	1.65 to 5.5	-	-	±0.5	-	±5	μΑ

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.

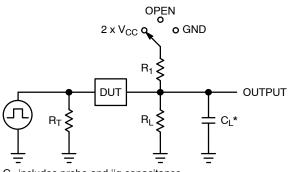
AC ELECTRICAL CHARACTERISTICS

		V _{cc}		T _A = 25°C		С	–55°C ≤ T	A ≤ 125°C	125°C
Symbol	Parameter	(V)	Condition	Min	Тур	Max	Min	Max	Units
t _{PLH,}	Propagation Delay,	1.65 to 1.95		-	6.0	12.0	-	13.0	ns
t _{PHL}	A to Y	2.3 to 2.7	R1 = Open	-	3.5	7.5	-	8.0	
		3.0 to 3.6		-	2.6	5.2	-	5.5	
		4.5 to 5.5		-	2.0	5.7	-	6.0	
		3.0 to 3.6	$CL = 50 \text{ pF}, \text{ RL} = 500 \Omega$	-	3.0	4.5	-	4.8	
		4.5 to 5.5	R1 = Open	-	2.4	5.0	-	5.3	
t _{OSLH,}	Output to Output Skew	3.0 to 3.6	RL = 500 Ω, CL = 50 pF	-	0.08	1.0	-	1.0	ns
toshl		4.5 to 5.5		-	0.05	0.8	-	0.8	
t _{PZH,}	Output Enable Time, OE to Y	1.65 to 1.95		-	6.5	14.0	-	15.0	ns
t _{PZL}		2.3 to 2.7		-	3.7	8.5	-	9.0	
		3.0 to 3.6		-	2.8	6.2	-	6.5	
		4.5 to 5.5		-	2.1	5.5	-	5.8	
t _{PHZ,}	Output Enable Time,	1.65 to 1.95		-	4.2	12.0	-	13.0	ns
t _{PLZ}		2.3 to 2.7		-	3.1	8.0	-	8.5	1
		3.0 to 3.6		-	2.6	5.7	-	6.0	1
		4.5 to 5.5		-	2.6	4.7	-	5.0	

CAPACITIVE CHARACTERISTICS

Symbol	Parameter	Condition	Typical	Units
C _{IN}	Input Capacitance	V_{CC} = 5.5 V, V_{IN} = 0 V or V_{CC}	2.5	pF
C _{OUT}	Output Capacitance	V_{CC} = 5.5 V, V_{IN} = 0 V or V_{CC}	2.5	pF
C _{PD}	Power Dissipation Capacitance (Note 5)	10 MHz, V_{CC} = 3.3 V, V_{IN} = 0 V or V_{CC} 10 MHz, V_{CC} = 5.5 V, V_{IN} = 0 V or V_{CC}	9 11	pF

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

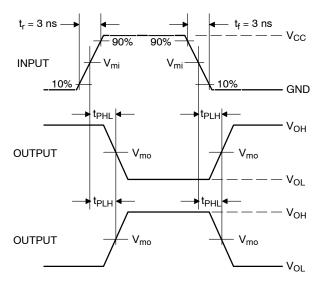


Test	Switch Position	C _L , pF	F R _L , Ω		R _L , Ω Ι	
t _{PLH} / t _{PHL}	Open	See AC Characteristics Table				
t _{PLZ} / t _{PZL}	$2 \times V_{CC}$	50	500	500		
t _{PHZ} / t _{PZH}	GND	50	500	500		

X = Don't Care

 C_L includes probe and jig capacitance R_T is Z_{OUT} of pulse generator (typically 50 $\Omega)$ f = 1 MHz

Figure 3. Test Circuit



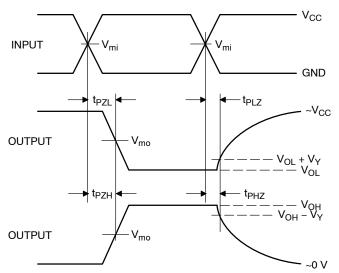


Figure 4. Switching Waveforms

		Vm		
V _{CC} , V	V _{mi} , V	t _{PLH} , t _{PHL}	t _{PZL} , t _{PLZ} , t _{PZH} , t _{PHZ}	V _Y , V
1.65 to 1.95	V _{CC} /2	V _{CC} /2	V _{CC} /2	0.15
2.3 to 2.7	V _{CC} /2	V _{CC} /2	V _{CC} /2	0.15
3.0 to 3.6	V _{CC} /2	V _{CC} /2	V _{CC} /2	0.3
4.5 to 5.5	V _{CC} /2	V _{CC} /2	V _{CC} /2	0.3

NL27WZ125

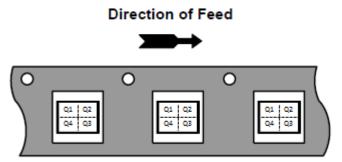
DEVICE ORDERING INFORMATION

Device	Packages	Specific Device Code	Pin 1 Orientation (See below)	Shipping [†]
NL27WZ125USG	US8	МО	Q4	3000 / Tape & Reel
NLV27WZ125USG*	US8	МО	Q4	3000 / Tape & Reel
NL27WZ125MQ1TCG (In Development)	UQFN8, 1.6 x 1.6, 0.5P	TBD	TBD	3000 / Tape & Reel
NL27WZ125MU1TCG (In Development)	UDFN8, 1.95 x 1.0, 0.5P	TBD	TBD	3000 / Tape & Reel
NL27WZ125MU3TCG (In Development)	UDFN8, 1.45 x 1.0, 0.35P	TBD	TBD	3000 / Tape & Reel
NL27WZ125MQ2TCG (In Development)	UQFN8, 1.4 x 1.2, 0.4P	TBD	TBD	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.

*NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC–Q100 Qualified and PPAP Capable.

Pin 1 Orientation in Tape and Reel



NL27WZ125

PACKAGE DIMENSIONS

SHALL NOT E3XCEED 0.140 (0.0055") PER

INCHES

MIN MAX

0.024 0.035

0.007 0.010

0.008 0.014 0.020 BSC

0.016 REF

0.004 0.007

0.024 0.031

0.005 BSC

0.083

0.094

0.004

0.126

6

10 °

0.013

0.013

0.019

0.075

0.087

0.000

0.118

0

0.010

0.009

0.015

THICKNESS OF 0.0076-0.0203 MM.

SPECIFIED ±0.0508 (0.0002 "). MILLIMETERS

MIN MAX

0.50 BSC 0.40 REF

2.10

2.40 0.90

0.25

0.35

0.18

0.10

3.20

6

10

0.34

0.33

0.47

0.80

1.90

2.20

0.60

0.17

0.20

0.10

0.00

3.00

0

5 '

0.23

0.23

0.37

0.60

0.12 BSC

DIM

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в

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D

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Ν

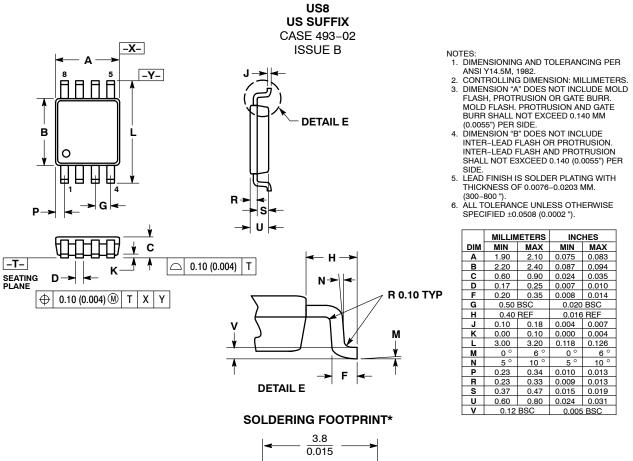
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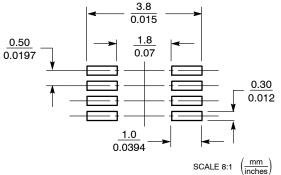
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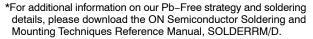
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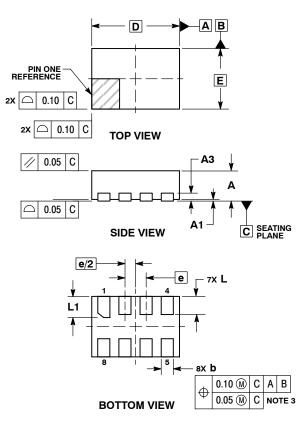
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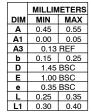


UDFN8, 1.45x1, 0.35P CASE 517BZ ISSUE O

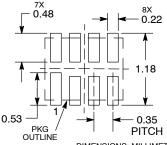


NOTES: 1. DIMENSIONING AND TOLERANCING PER Simerosioning and Doleranding FER ASME V14.5M, 1994.
 CONTROLLING DIMENSION: MILLIMETERS.
 DIMENSION & APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN

- 0.15 AND 0.20 MM FROM TERMINAL TIP. PACKAGE DIMENSIONS EXCLUSIVE OF 4 BURRS AND MOLD FLASH.

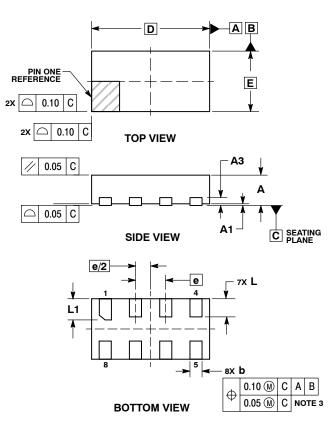


RECOMMENDED SOLDERING FOOTPRINT*



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

UDFN8, 1.95x1, 0.5P CASE 517CA ISSUE O

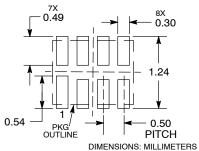


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- NOTES:
 DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
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 DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.20 MM FROM TERMINAL TIP.
 PACKAGE DIMENSIONS EXCLUSIVE OF BUIDES AND MOL D ELASH ASH.

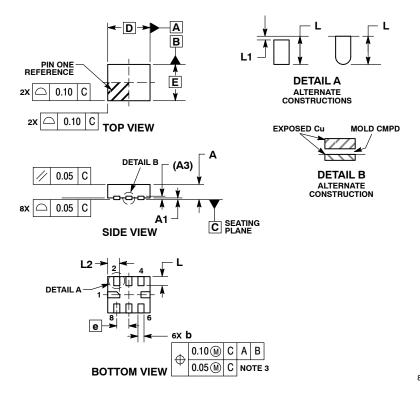
BURRS AND MOLD FL					
	MILLIMETERS				
IM	MIN	MAX			
Α	0.45	0.55			
\1	0.00	0.05			
\3	0.13 REF				
b	0.15	0.25			
D	1.95 BSC				
Е	1.00 BSC				
е	0.50 BSC				
L	0.25	0.35			
.1	0.30	0.40			
	IM A A A A A A A A A A A A A A A A A A A	MILLIN IM MIN A 0.45 MI 0.00 A3 0.13 b 0.15 D 1.95 E 1.00 e 0.500 L 0.25	MILLIMETERS MIN MAX A 0.45 0.55 A 0.00 0.05 J 0.013 REF b 0.15 0.25 D 1.95 BSC E 1.00 BSC e 0.50 BSC L 0.25 0.35		

RECOMMENDED **SOLDERING FOOTPRINT***

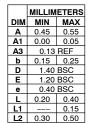


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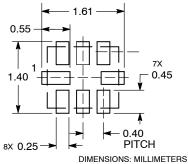
UQFN8, 1.4x1.2, 0.4P CASE 523AS **ISSUE A**



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 CONTROLLING DIMENSION: MILLIMETERS.
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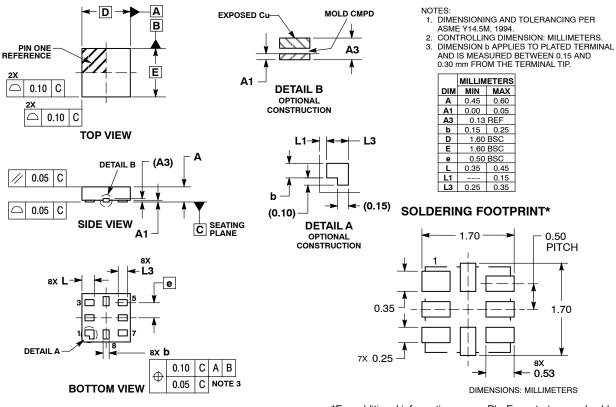


SOLDERING FOOTPRINT*



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UQFN8, 1.6x1.6, 0.5P CASE 523AN ISSUE O



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