MARKING DIAGRAMS



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.

US8 **US SUFFIX CASE 493**



ПППП XX M









UDFN8, 1.45x1.0 **MU3 SUFFIX** CASE 517BZ





UDFN8, 1.95x1.0 **MU1 SUFFIX** CASE 517CA





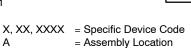
UQFN8, 1.4x1.2 **MQ2 SUFFIX** CASE 523AS





UQFN8, 1.6x1.6 **MQ1 SUFFIX** CASE 523AN





L = Lot Code Υ = Year Code W = Week Code Μ = 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.

Features

- \bullet Designed for 1.65 V to 5.5 V V_{CC} Operation
- 2.4 ns t_{PD} at $V_{CC} = 5 \text{ V (typ)}$
- 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
- -Q Suffix 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



Figure 1. Logic Symbol

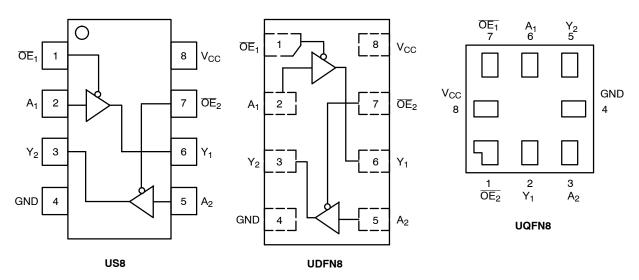


Figure 2. Pinout

PIN ASSIGNMENT (US8 / UDFN8)

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

FUNCTION TABLE

Inj	Output	
ŌĒ _n	A _n	Y _n
L	L	L
L	Н	Н
Н	X	Z

X = Don't Care n = 1, 2

MAXIMUM RATINGS

Symbol	Character	ristics	Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to +6.5	V
V _{IN}	DC Input Voltage		-0.5 to +6.5	V
V _{OUT}	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	V _{OUT} < GND	-50	mA
l _{out}	DC Output Source/Sink Current		±50	mA
I _{CC} or I _{GND}	DC Supply Current per Supply Pin or Grou	und Pin	±100	mA
T _{STG}	Storage Temperature Range		-65 to +150	°C
TL	Lead Temperature, 1 mm from Case for 10) secs	260	°C
TJ	Junction Temperature Under Bias		+150	°C
θЈА	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.
- 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	Char	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 State) Tri-State Mode (Note 1) Power-Down Mode (V _{CC} = 0 V)	0 0 0	V _{CC} 5.5 5.5	
T _A	Operating Temperature Range		-55	+125	°C
t _r , t _f	Input Rise and Fall Time	$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$ $V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$ $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$ $V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	0 0 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.

DC ELECTRICAL CHARACTERISTICS

			V _{CC}	Т	A = 25°	С	–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 x V _{CC}	_	-	0.65 x V _{CC}	-	V
	Voltage		2.3 to 5.5	$0.70 \times V_{CC}$	-	-	0.70 x V _{CC}	-	
V_{IL}	Low-Level Input		1.65 to 1.95	_	-	0.35 x V _{CC}	-	0.35 x V _{CC}	V
	Voltage		2.3 to 5.5	_	-	$0.30 \times V_{CC}$	-	$0.30 \times V_{CC}$	
Vон	High-Level Output Voltage	$\begin{split} V_{IN} &= V_{IH} \text{ or } V_{IL} \\ I_{OH} &= -100 \mu\text{A} \\ I_{OH} &= -4 \text{ mA} \\ I_{OH} &= -8 \text{ mA} \\ I_{OH} &= -12 \text{ mA} \\ I_{OH} &= -16 \text{ mA} \\ I_{OH} &= -24 \text{ mA} \\ I_{OH} &= -32 \text{ mA} \end{split}$	1.65 to 5.5 1.65 2.3 2.7 3.0 3.0 4.5	V _{CC} - 0.1 1.29 1.9 2.2 2.4 2.3 3.8	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 _{OL}	Low-Level Output Voltage	$\begin{array}{l} V_{IN} = V_{IH} \text{ or } V_{IL} \\ I_{OL} = 100 \mu\text{A} \\ I_{OL} = 4 \text{ mA} \\ I_{OL} = 8 \text{ mA} \\ I_{OL} = 12 \text{ mA} \\ I_{OL} = 16 \text{ mA} \\ I_{OL} = 24 \text{ mA} \\ I_{OL} = 32 \text{ mA} \end{array}$	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 0.42	0.1 0.24 0.3 0.4 0.4 0.55	- - - -	0.1 0.24 0.3 0.4 0.4 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
Icc	Quiescent Supply Current	$V_{IN} = V_{CC}$ or GND	5.5	-	-	1.0	-	10	μΑ
I _{OZ}	3-State Output Leakage	$V_{IN} = V_{IL}$ or V_{IH} $V_{OUT} = 0$ V to 5.5 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.

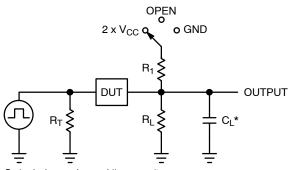
AC ELECTRICAL CHARACTERISTICS

		V _{CC}		Т	_A = 25°	С	–55°C ≤ T	A ≤ 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	4.5	-	4.8		
		3.0 to 3.6	CL = 50 pF, RL = 500 Ω	-	3.0	5.7	-	6.0	
		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,	1.65 to 1.95		-	6.5	14.0	-	15.0	ns
t _{PZL}	OE to Y	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, OE to Y	1.65 to 1.95		-	4.2	12.0	-	13.0	ns
t _{PLZ}	IPLZ OE IO Y	2.3 to 2.7		-	3.1	8.0	-	8.5	
		3.0 to 3.6		-	2.6	5.7	-	6.0	
		4.5 to 5.5		_	2.6	4.7	_	5.0	

CAPACITIVE CHARACTERISTICS

Symbol	Parameter	Condition	Typical	Units
C _{IN}	Input Capacitance	$V_{CC} = 5.5 \text{ V}, V_{IN} = 0 \text{ V or } V_{CC}$	2.5	pF
C _{OUT}	Output Capacitance	$V_{CC} = 5.5 \text{ V}, V_{IN} = 0 \text{ V or } V_{CC}$	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	R_L, Ω	R ₁ , Ω	
t _{PLH} / t _{PHL}	Open	See AC Characteristics Table			
t _{PLZ} / t _{PZL}	2 x 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

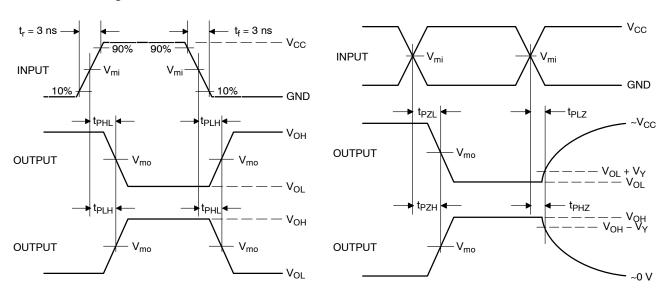


Figure 4. Switching Waveforms

		V _m		
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

DEVICE ORDERING INFORMATION

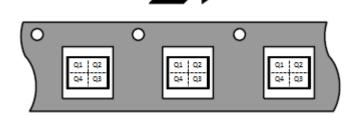
Device	Packages	Specific Device Code	Pin 1 Orientation (See below)	Shipping [†]
NL27WZ125USG	US8	MO	Q4	3000 / Tape & Reel
NL27WZ125USG-Q* (Please contact onsemi)	US8	МО	Q4	3000 / Tape & Reel
NL27WZ125MQ1TCG (Please contact onsemi)	UQFN8, 1.6 x 1.6, 0.5P	TBD	TBD	3000 / Tape & Reel
NL27WZ125MU1TCG (Please contact onsemi)	UDFN8, 1.95 x 1.0, 0.5P	TBD	TBD	3000 / Tape & Reel
NL27WZ125MU3TCG (Please contact onsemi)	UDFN8, 1.45 x 1.0, 0.35P	TBD	TBD	3000 / Tape & Reel
NL27WZ125MQ2TCG (Please contact onsemi)	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.

*-Q Suffix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP

Pin 1 Orientation in Tape and Reel

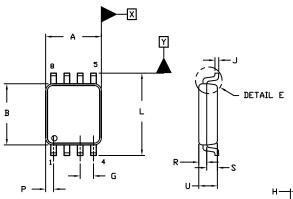
Direction of Feed

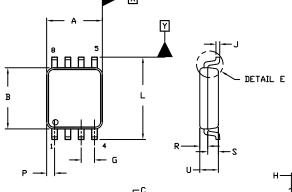


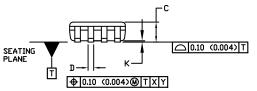
Capable.

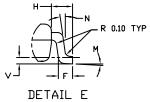
PACKAGE DIMENSIONS

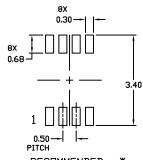
US8 **CASE 493** ISSUE F











RECOMMENDED MOUNTING FOOTPRINT

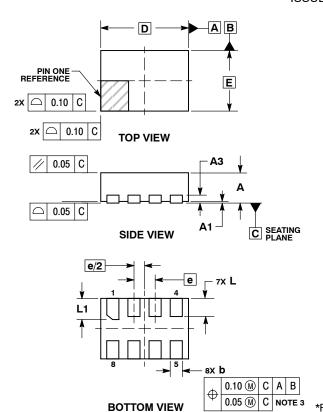
NOTES:

- 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- 2. CONTROLLING DIMENSION: MILLIMETERS
- DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSION, OR GATE BURR. MOLD FLASH, PROTRUSION, OR GATE BURR SHALL NOT EXCEED 0.14 (0.0055°) PER SIDE.
- DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH AND PROTRUSION SHALL NOT EXCEED 0.14 (0.0055") PER SIDE.
- LEAD FINISH IS SOLDER PLATING WITH THICKNESS OF 0.0076-0.0203 MM (0.003-0.008").
- ALL TOLERANCE UNLESS OTHERWISE SPECIFIED ±0.0508 MM (0.002").

	MILLIM	ETERS	INC	HES
DIM	MIN.	MAX.	MIN.	MAX.
Α	1.90	2.10	0.075	0.083
В	2.20	2.40	0.087	0.094
С	0.60	0.90	0.024	0.035
D	0.17	0.25	0.007	0.010
F	0.20	0.35	0.008	0.014
G	0.50	BSC	0.020	BSC
Н	0.40	REF	0.016 REF	
J	0.10	0.18	0.004	0.007
К	0.00	0.10	0.000	0.004
L	3.00	3.25	0.118	0.128
М	0*	6*	0*	6*
N	0*	10*	0*	10*
Р	0.23	0.34	0.010	0.013
R	0.23	0.33	0.009	0.013
S	0.37	0.47	0.015	0.019
U	0.60	0.80	0.024	0.031
	0.12	BSC	0.005	BSC

PACKAGE DIMENSIONS

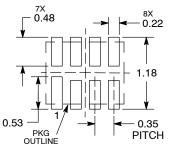
UDFN8, 1.45x1, 0.35P CASE 517BZ ISSUE O



- NOTES:
 1. DIMENSIONING AND TOLERANCING PER
- ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. DIMENSION & APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN
- 0.15 AND 0.20 MM FROM TERMINAL TIP. PACKAGE DIMENSIONS EXCLUSIVE OF BURRS AND MOLD FLASH.

	MILLIMETERS	
DIM	MIN	MAX
Α	0.45	0.55
A1	0.00	0.05
А3	0.13 REF	
b	0.15	0.25
D	1.45 BSC	
Е	1.00 BSC	
е	0.35 BSC	
L	0.25	0.35
L1	0.30	0.40
	A A1 A3 b D E	DIM MIN A 0.45 A1 0.00 A3 0.13 b 0.15 D 1.45 E 1.00 e 0.35 L 0.25

RECOMMENDED **SOLDERING FOOTPRINT***

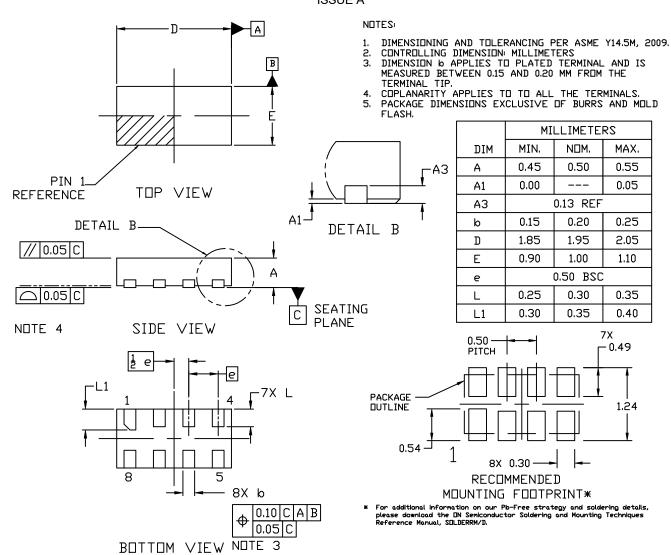


DIMENSIONS: MILLIMETERS *For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting

Techniques Reference Manual, SOLDERRM/D.

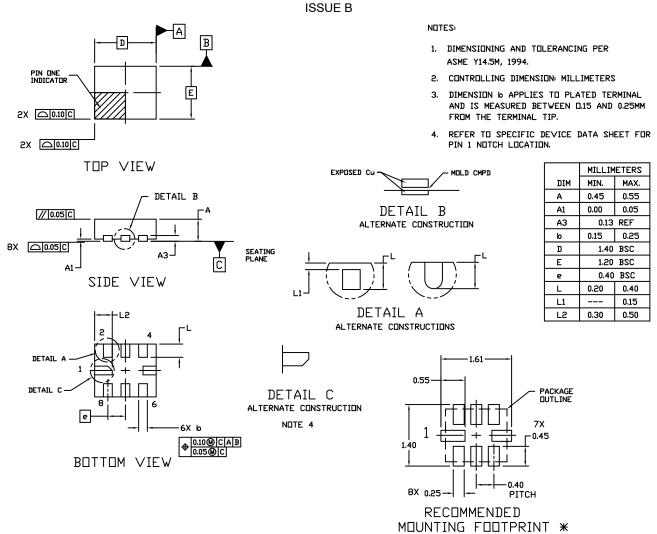
PACKAGE DIMENSIONS

UDFN8, 1.95x1.0, 0.5PCASE 517CA ISSUE A



PACKAGE DIMENSIONS

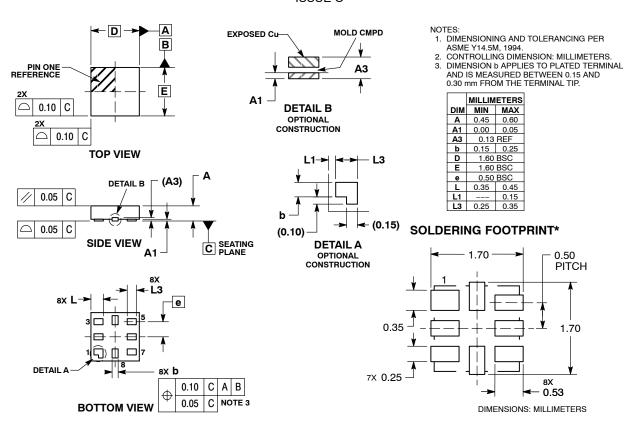
UQFN8, 1.40x1.20, 0.40P CASE 523AS



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

PACKAGE DIMENSIONS

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



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