Onsemi

MARKING DIAGRAM

Dual Inverter with Open Drain Outputs

NLV27WZ06

The NLV27WZ06 is a high performance dual inverter with open drain outputs operating from a 1.65 to 5.5 V supply.

Features

- Designed for 1.65 V to 5.5 V V_{CC} Operation
- 2.1 ns t_{PD} at $V_{CC} = 5 V (Typ)$
- Inputs/Outputs Overvoltage Tolerant up to 5.5 V
- IOFF Supports Partial Power Down Protection
- Sink 24 mA at 3.0 V
- Available in SC-88 Package
- Chip Complexity < 100 FETs
- • NLV Prefix for Automotive and Other Applications Requiring
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS



6 П XXXM = **DF SUFFIX** CASE 419B

X, XXX = Specific Device Code

= Date Code* М

SC-88

= Pb-Free Package

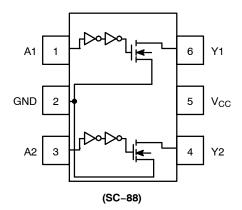
(Note: Microdot may be in either location)

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

ORDERING INFORMATION

See detailed ordering, marking and shipping information on

NLV27WZ06





PIN ASSIGNMENT

PIN ASSIGNMENT		FUNCTION TABLE
Pin	Function	A Input Y Output
1	A1	L Z S
2	GND	HLL
3	A2	EN
4	Y2	
5	V _{CC}	
6	Y1	DF cention
DEVICEP	SNOT REC	THE FOR MENDER NENDED FOR MATION ON MENDER ON TACE FOR INFORMATION ON TACE FOR INFORMATION ON TACE FOR INFORMATION

MAXIMUM RATINGS

Symbol	Characte	ristics	Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to +7.0	V
V _{IN}	DC Input Voltage		–0.5 to +7.0	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 +7.0 -0.5 to +7.0	V
Ι _{ΙΚ}	DC Input Diode Current	V _{IN} < GND	-50	mA
Ι _{ΟΚ}	DC Output Diode Current	V _{OUT} < GND	-50	mA
I _{OUT}	DC Output Source/Sink Current		±50	mA
I_{CC} or I_{GND}	DC Supply Current per Supply Pin or Gro	und Pin	±100	mA
T _{STG}	Storage Temperature Range		–65 to +150	°C
ΤL	Lead Temperature, 1 mm from Case for 1	0 secs	260	°C
TJ	Junction Temperature Under Bias		+150	∕ ∘C
θ_{JA}	Thermal Resistance (Note 2)	SC-88	377	°C/W
PD	Power Dissipation in Still Air	SC-88	332	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)		S 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.

Should not be assumed, damage may occur and reliability may be affected.
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.
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	$\begin{array}{l} V_{CC} = 1.65 \; V \; to \; 1.95 \; V \\ V_{CC} = 2.3 \; V \; to \; 2.7 \; V \\ V_{CC} = 3.0 \; V \; to \; 3.6 \; V \\ V_{CC} = 4.5 \; V \; to \; 5.5 \; V \end{array}$	0 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 ELE	CTRICAL CHARACTE	RISTICS						2	
			v _{cc}	Т,	_ = 25°C	;	–55°C ≤ T	_A ≤ 125°C	
Symbol	Parameter	Condition	(V)	Min	Тур	Max	Min	Max	Units
VIH	High-Level Input		1.65 to 1.95	0.75 V _{CC}	I		0.75 V _{CC}	-	V
	Voltage		2.3 to 5.5	0.70 V _{CC}	T		0.70 V _{CC}	-	
V_{IL}	Low-Level Input		1.65 to 1.95	-		0.25 V _{CC}	-	0.25 V _{CC}	V
	Voltage		2.3 to 5.5	-	Ý	0.30 V _{CC}	1-1	0.30 V _{CC}	
V _{OL}	Low-Level Output Voltage		1.65 to 5.5 1.65 2.3 2.7 3.0 3.0 4.5	ENPE TO	0.08 0.2 0.22 0.28 0.38 0.42	0.1 0.24 0.3 0.4 0.4 0.55 0.55		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	FU.	-	±0.1	-	±1.0	μA
I _{OZ}	3-State Output Leakage Current	V _{OUT} = 0 V to 5.5 V	1.65 to 5.5	-	1	±0.5	-	±5.0	μΑ
I _{OFF}	Power Off Leakage Current	V _{IN} = 5.5 V or V _{OUT} = 5.5 V	0	-	I	1.0	-	10	μA
I _{CC}	Quiescent Supply Current	$V_{IN} = V_{CC}$ or GND	5.5	-	-	1.0	-	10	μA
I _{CCT}	Quiescent Supply Current	V _{IN} = 3.0 V	3.6	-	I	10	-	100	μΑ

DC ELECTRICAL CHARACTERISTICS

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.

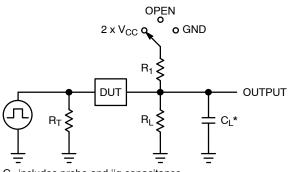
AC ELECTRICAL CHARACTERISTICS

			V _{CC}	T,	_Α = 25°	С	–55°C ≤ T	գ ≤ 125°C	
Symbol	Parameter	Condition	(V)	Min	Тур	Max	Min	Max	Units
t _{PZL}	t _{PZL} Propagation Delay, (Figures 3 and 4)		1.65 to 1.95	-	6.0	9.0	-	9.5	ns
		(Figures 3 and 4)	2.3 to 2.7	-	3.6	6.1	-	6.5	
			3.0 to 3.6	-	2.7	5.6	-	6.0	
			4.5 to 5.5	-	2.1	4.4	-	4.8	
t _{PLZ}	Propagation Delay,		1.65 to 1.95	-	4.0	9.0	-	9.5	ns
	(Figures 3 and 4)		2.3 to 2.7	-	2.8	6.1	-	6.5	
		3.0 to 3.6	-	2.5	5.6	-	6.0		
			4.5 to 5.5	-	2.2	4.4	-	4.8	

CAPACITIVE CHARACTERISTICS

CAPACIT	IVE CHARACTERISTICS		42	
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}	4.0	pF
C _{PD}	Power Dissipation Capacitance (Note 5)	10 MHz, V_{CC} = 5.5 V, V_{IN} = 0 V or V_{CC}	4.0	pF

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

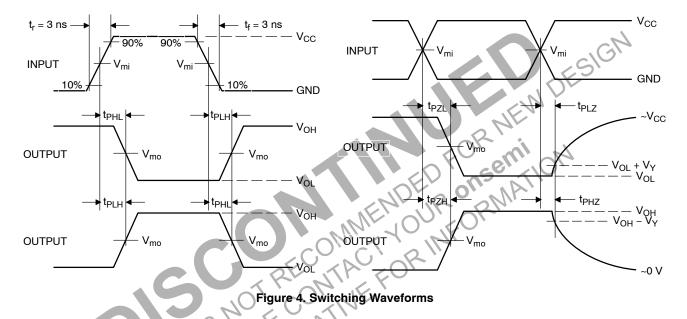


Position					
Open	See AC Characteristics Table				
$2 \times V_{CC}$	50	500	500		
GND	50	500	500		
	2 x V _{CC}	2 x V _{CC} 50	2 x V _{CC} 50 500		

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



	NCENERGE	V _m	o, V	
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

NLV27WZ06

DEVICE ORDERING INFORMATION

Device	Packages	Specific Device Code	Pin 1 Orientation (See below)	Shipping [†]
NLV27WZ06DFT2G*	SC-88	MF	Q4	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.

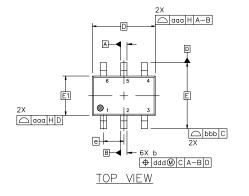
PIN 1 ORIENTATION IN TAPE AND REEL

Direction of Feed 3 THIS DEVICE PLEASE CONTACTOR INFORMATION REPRESENTATIVE FOR INFORMATION REPRESENTATIVE FOR INFORMATION

SC-88 2.00x1.25x0.90, 0.65P CASE 419B-02 **ISSUE Z**

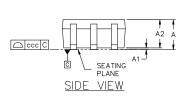
DATE 18 APR 2024

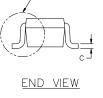
DUSEM



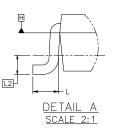
NOTES:

- DIMENSIONING AND TOLERANCING CONFORM TO ASME 1. Y14.5-2018.
- 2.
- ALL DIMENSION ARE IN MILLIMETERS. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.20 3. PER END.
- 4. DIMENSIONS D AND E1 AT THE OUTERMOST EXTREMES OF DATUMS A AND B ARE DETERMINED AT DATUM H.
- 5.
- DIMENSIONS & AND C APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.08 AND 0.15 FROM THE TIP. DIMENSION & DOES NOT INCLUDE DAMBAR PROTRUSION. 6.
- 7 ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 TOTAL IN EXCESS OF DIMENSION & AT MAXIMUM MATERIAL CONDITION. THE DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.

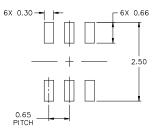




DETAIL A



	MILLIMETERS					
DIM	MIN.	NOM.	MAX.			
A			1.10			
A1	0.00		0.10			
A2	0.70	0.90	1.00			
b	0.15	0.20	0.25			
с	0.08	0.15	0.22			
D		2.00 BSC	;			
E	2.10 BSC					
E1		1.25 BSC	;			
е		0.65 BSC)			
L	0.26	0.36	0.46			
L2		0.15 BSC				
aaa	0.15					
bbb	0.30					
ccc	0.10					
ddd		0.10				



RECOMMENDED MOUNTING FOOTPRINT*

FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ONSEMI SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

XXX = Specific Device Code = Date Code* Μ

GENERIC **MARKING DIAGRAM***

XXXM-

0

6

= 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.

STYLES ON PAGE 2

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DATE 18 APR 2024

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

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