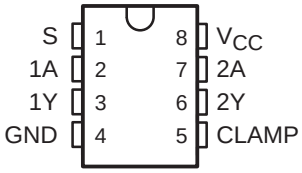
- **Very Low Power Requirements**
- **Very Low Input Current**
- **Characterized for Use to 350 mA**
- **No Output Latch-Up at 50 V (After Conducting 300 mA)**
- **High-Voltage Outputs (70 V Min)**
- **Output Clamp Diodes for Transient Suppression (350 mA, 70 V)**
- **TTL- or MOS-Compatible Diode-Clamped Inputs**
- **Standard Supply Voltage**
- **Suitable for Hammer-Driver Applications**

D OR P PACKAGE
(TOP VIEW)



description

The SN75446 and SN75447 dual peripheral drivers are designed for use in systems that require high current, high voltage, and fast switching times. The SN75446 and SN75447 provide AND and NAND drivers, respectively. These devices have diode-clamped inputs as well as high-current, high-voltage inductive-clamp diodes on the outputs.

The SN75446 and SN75447 drivers are characterized for operation from 0°C to 70°C.

Function Tables

SN75446
(each AND driver)

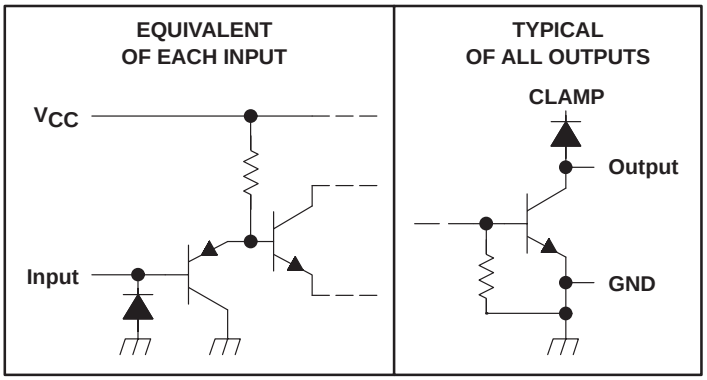
INPUTS		OUTPUT
A	S	Y
H	H	H
L	X	L
X	L	L

SN75447
(each NAND driver)

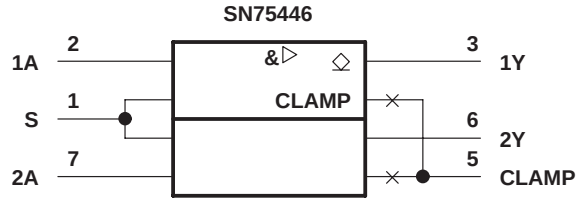
INPUTS		OUTPUT
A	S	Y
H	H	L
L	X	H
X	L	H

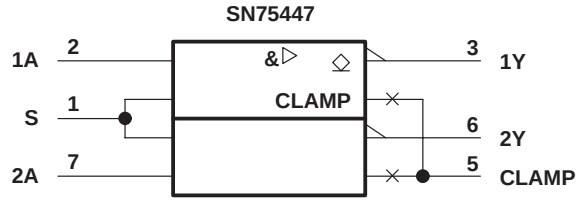
H = high level, L = low level
X = irrelevant

schematics of inputs and outputs



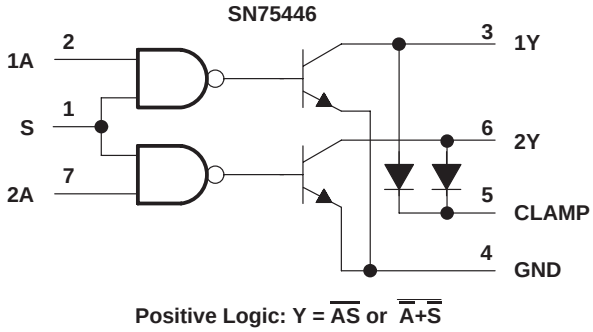
logic symbols†



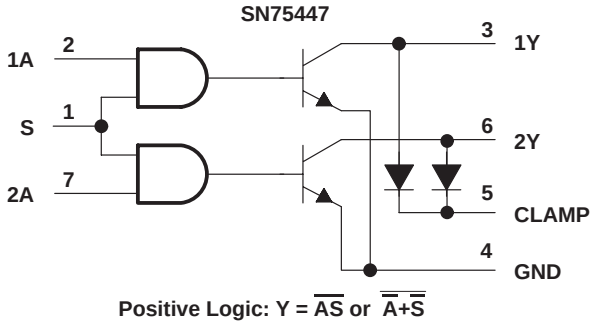


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC publication 617-12.

logic diagrams (positive logic)



Positive Logic: $Y = \overline{AS}$ or $\overline{\overline{A}+\overline{S}}$



Positive Logic: $Y = \overline{AS}$ or $\overline{\overline{A}+\overline{S}}$

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)‡

Supply voltage, V_{CC} (see Note 1) . . . . . 7 V
Input voltage, V_I . . . . . 5.5 V
Output current, I_O (see Note 2) . . . . . 400 mA
Output clamp-diode current . . . . . 400 mA
Continuous total power dissipation . . . . . See Dissipation Rating Table
Operating free-air temperature range, T_A . . . . . 0°C to 70°C
Storage temperature range, T_{stg} . . . . . –65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . . 260°C

‡ Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. Voltage values are with respect to network GND.
2. Both halves of this dual circuit may conduct rated current simultaneously; however, power dissipation averaged over a short time interval must fall within the continuous dissipation ratings.

DISSIPATION RATING TABLE

PACKAGE	$T_A \le 25°C$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25°C$	$T_A = 70°C$ POWER RATING
D	725 mW	5.8 mW/°C	464 mW
P	1000 mW	8.0 mW/°C	640 mW

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.75	5	5.25	V
High-level input voltage, V_{IH}	2			V
Low-level input voltage, V_{IL}			0.8	V
Operating free-air temperature range, T_A	0		70	°C

electrical characteristics over recommended operating free-air temperature range

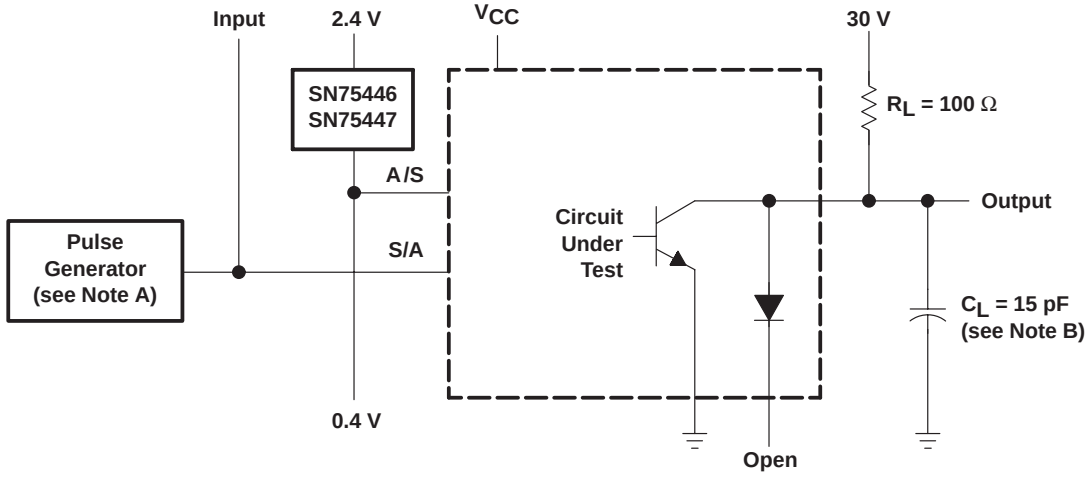
PARAMETER			TEST CONDITIONS		MIN	TYP†	MAX	UNIT
V_{IK}	Input clamp voltage		I_I = –12 mA			–0.9	–1.5	V
V_{OL}	Low-level output voltage		V_{CC} = 4.75 V, V_{IH} = 2 V, V_{IL} = 0.8 V	I_{OL} = 100 mA		0.1	0.3	V
				I_{OL} = 200 mA		0.22	0.45	
				I_{OL} = 300 mA		0.45	0.65	
				I_{OL} = 350 mA		0.55	0.75	
$V_{O(BR)}$	Output breakdown voltage		V_{CC} = 4.75 V,	I_{OH} = 100 μA	70	100		V
$V_{R(K)}$	Output clamp-diode reverse voltage		V_{CC} = 4.75 V,	I_R = 100 μA	70	100		V
$V_{F(K)}$	Output clamp-diode forward voltage		V_{CC} = 4.75 V,	I_F = 350 mA	0.6	1.2	1.6	V
I_{OH}	High-level output current		V_{CC} = 4.75 V, V_{IL} = 0.8 V,	V_{IH} = 2 V, V_{OH} = 70 V		1	100	μA
I_{IH}	High-level input current		V_{CC} = 5.25 V,	V_I = 5.25 V		0.01	10	μA
I_{IL}	Low-level input current	A input	V_{CC} = 5.25 V,	V_I = 0.8 V		–0.5	–10	μA
		S input				–1	–20	
I_{CCH}	Supply current, outputs high	SN75446	V_{CC} = 5.25 V	V_I = 5 V		11	18	mA
		SN75447		V_I = 0		11	18	
I_{CCL}	Supply current, outputs low	SN75446	V_{CC} = 5.25 V	V_I = 0		11	18	mA
		SN75447		V_I = 5 V		11	18	

† All typical values are at V_{CC} = 5 V, T_A = 25°C.

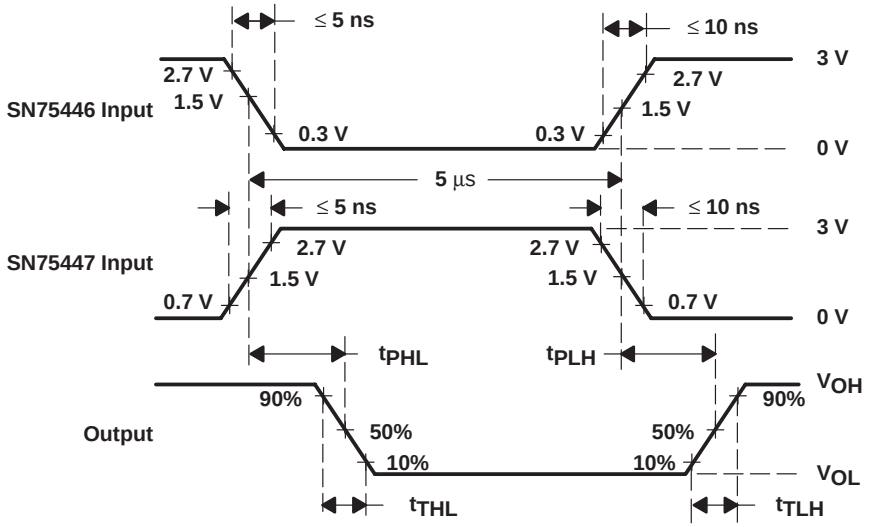
switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	C_L = 15 pF, See Figure 1	R_L = 100 Ω,		300	750	ns
t_{PHL}	Propagation delay time, high-to-low-level output				200	500	ns
t_{TLH}	Transition time, low-to-high-level output				50	100	ns
t_{THL}	Transition time, high-to-low-level output				50	100	ns
V_{OH}	High-level output voltage after switching	V_S = 55 V, See Figure 2	$I_O \approx$ 300 mA,	V_S–0.018			V

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT

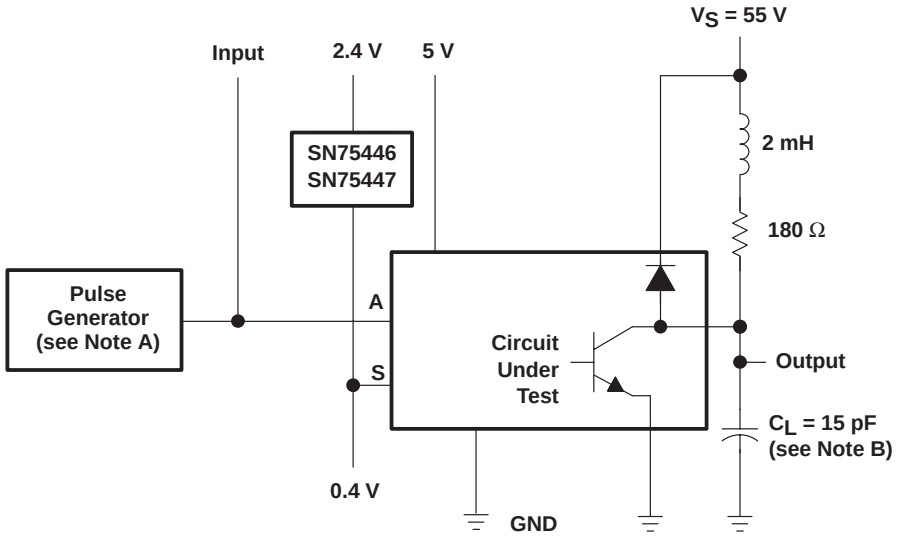


VOLTAGE WAVEFORMS

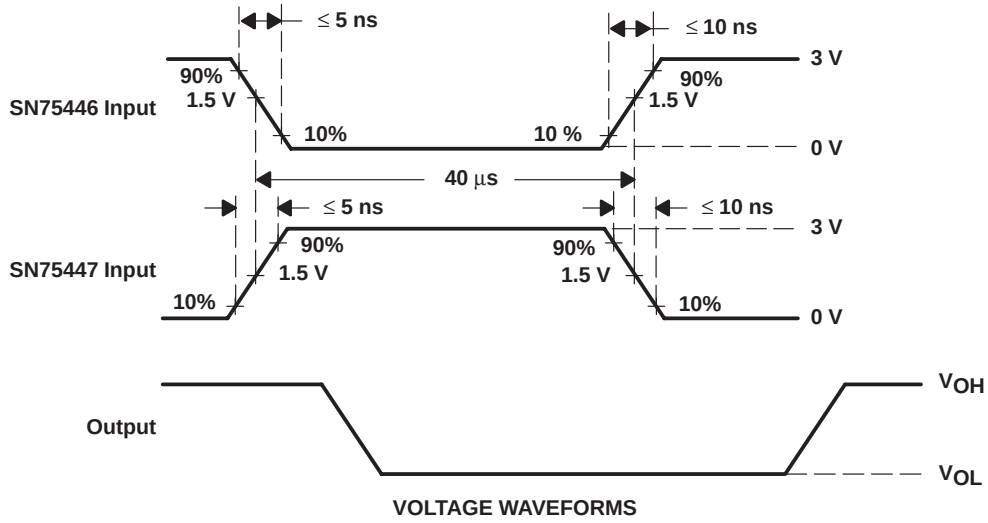
NOTES: A. The pulse generator has the following characteristics: PRR = 100 kHz, Z_O = 50 Ω.
B. C_L includes probe and jig capacitance.

Figure 1. Test Circuit and Voltage Waveforms, Switching Characteristics

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. The pulse generator has the following characteristics: PRR = 12.5 kHz, Z_O = 50 Ω.
B. C_L includes probe and jig capacitance.

Figure 2. Latch-Up Test Circuit and Voltage Waveforms

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
SN75446D	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI
SN75446DR	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI
SN75446P	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI
SN75447D	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI
SN75447P	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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