

SN75446, SN75447 DUAL PERIPHERAL DRIVERS

SLRS020A – DECEMBER 1978 – REVISED NOVEMBER 1995

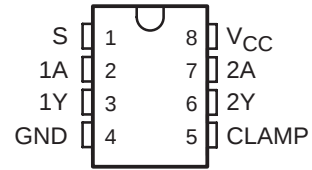
- Very Low Power Requirements
- Very Low Input Current
- Characterized for Use to 350 mA
- No Output Latch-Up at 50 V (After Conducting 300 mA)
- High-Voltage Outputs (70 V Min)
- Output Clamp Diodes for Transient Suppression (350 mA, 70 V)
- TTL- or MOS-Compatible Diode-Clamped Inputs
- Standard Supply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

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.

D OR P PACKAGE (TOP VIEW)



Function Tables

SN75446
(each AND driver)

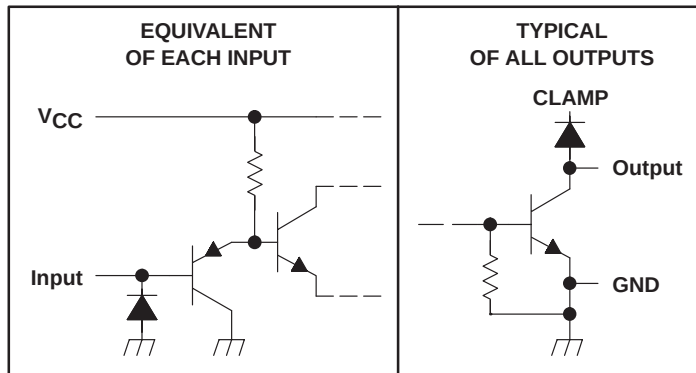
INPUTS		OUTPUT
A	S	Y
H	H	H
L	X	L
X	L	L

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



PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



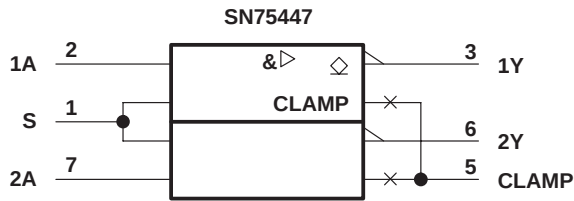
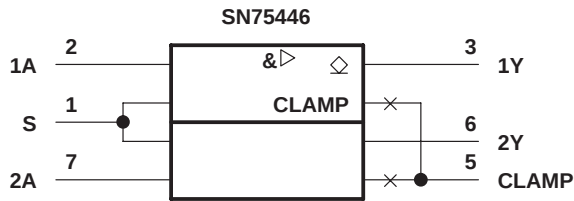
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77251-1443

Copyright © 1995, Texas Instruments Incorporated

SN75446, SN75447 DUAL PERIPHERAL DRIVERS

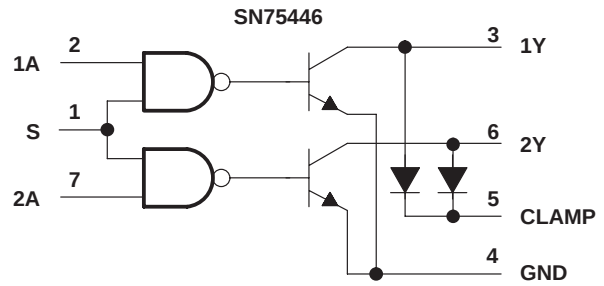
SLRS020A – DECEMBER 1978 – REVISED NOVEMBER 1995

logic symbols†

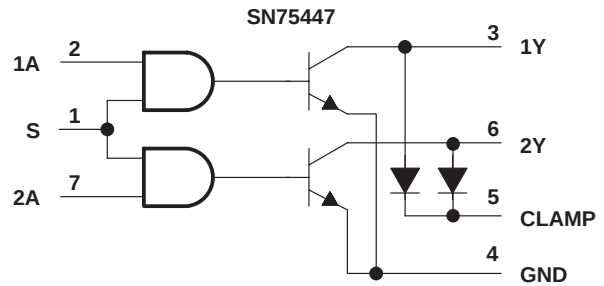


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC publication 617-12.

logic diagrams (positive logic)



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



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

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	$T_A \leq 25^\circ\text{C}$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25^\circ\text{C}$	$T_A = 70^\circ\text{C}$ 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	$I_I = -12\text{ mA}$			-0.9	-1.5	V
V_{OL}	Low-level output voltage	$V_{CC} = 4.75\text{ V},$ $V_{IH} = 2\text{ V},$ $V_{IL} = 0.8\text{ V}$	$I_{OL} = 100\text{ mA}$		0.1	0.3	V
			$I_{OL} = 200\text{ mA}$		0.22	0.45	
			$I_{OL} = 300\text{ mA}$		0.45	0.65	
			$I_{OL} = 350\text{ mA}$		0.55	0.75	
$V_{O(BR)}$	Output breakdown voltage	$V_{CC} = 4.75\text{ V},$	$I_{OH} = 100\text{ }\mu\text{A}$	70	100		V
$V_{R(K)}$	Output clamp-diode reverse voltage	$V_{CC} = 4.75\text{ V},$	$I_R = 100\text{ }\mu\text{A}$	70	100		V
$V_{F(K)}$	Output clamp-diode forward voltage	$V_{CC} = 4.75\text{ V},$	$I_F = 350\text{ mA}$	0.6	1.2	1.6	V
I_{OH}	High-level output current	$V_{CC} = 4.75\text{ V},$ $V_{IL} = 0.8\text{ V},$	$V_{IH} = 2\text{ V},$ $V_{OH} = 70\text{ V}$		1	100	μA
I_{IH}	High-level input current	$V_{CC} = 5.25\text{ V},$	$V_I = 5.25\text{ V}$		0.01	10	μA
I_{IL}	Low-level input current	A input	$V_{CC} = 5.25\text{ V},$ $V_I = 0.8\text{ V}$		-0.5	-10	μA
		S input			-1	-20	
I_{CCH}	Supply current, outputs high	SN75446	$V_{CC} = 5.25\text{ V}$	$V_I = 5\text{ V}$	11	18	mA
		SN75447		$V_I = 0$	11	18	
I_{CCL}	Supply current, outputs low	SN75446	$V_{CC} = 5.25\text{ V}$	$V_I = 0$	11	18	mA
		SN75447		$V_I = 5\text{ V}$	11	18	

[†] All typical values are at $V_{CC} = 5\text{ V}, T_A = 25^\circ\text{C}$.

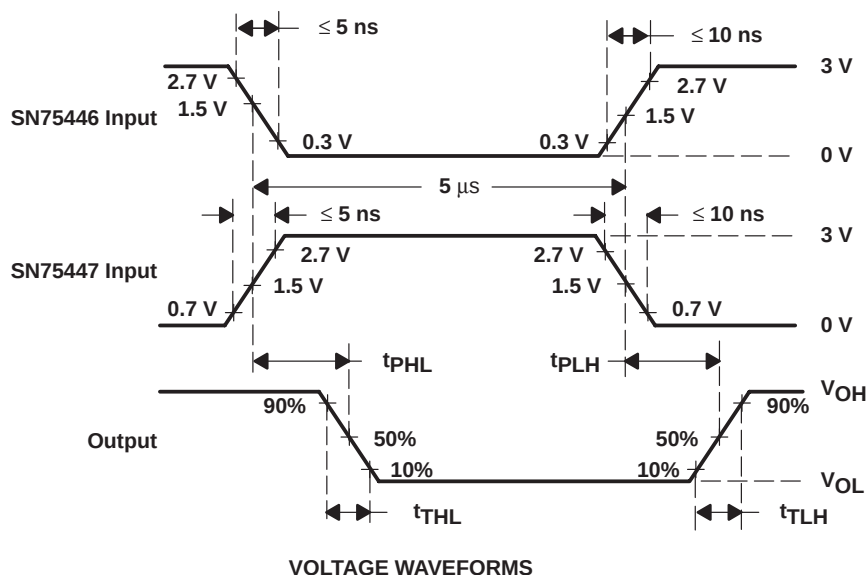
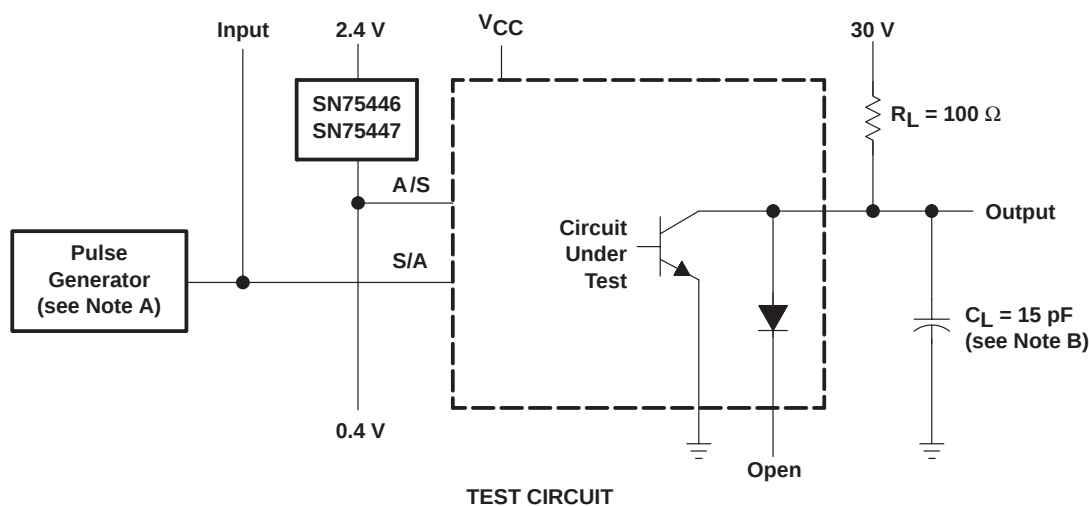
switching characteristics, $V_{CC} = 5\text{ V}, T_A = 25^\circ\text{C}$

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$C_L = 15\text{ pF},$ $R_L = 100\text{ }\Omega,$ See Figure 1			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	$V_S = 55\text{ V},$ See Figure 2	$I_O \approx 300\text{ mA},$	$V_S - 0.018$			V

SN75446, SN75447 DUAL PERIPHERAL DRIVERS

SLRS020A – DECEMBER 1978 – REVISED NOVEMBER 1995

PARAMETER MEASUREMENT INFORMATION

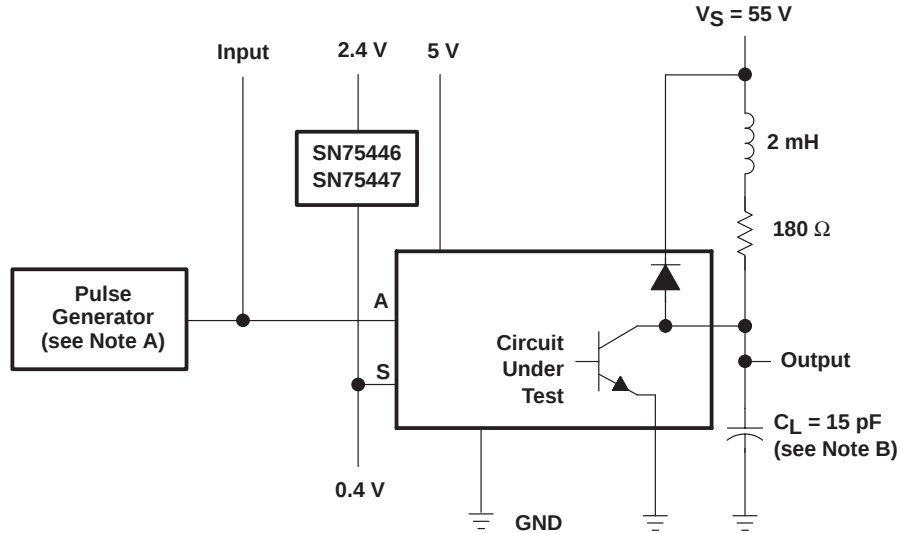


- NOTES: A. The pulse generator has the following characteristics: PRR = 100 kHz, $Z_O = 50 \Omega$.
B. C_L includes probe and jig capacitance.

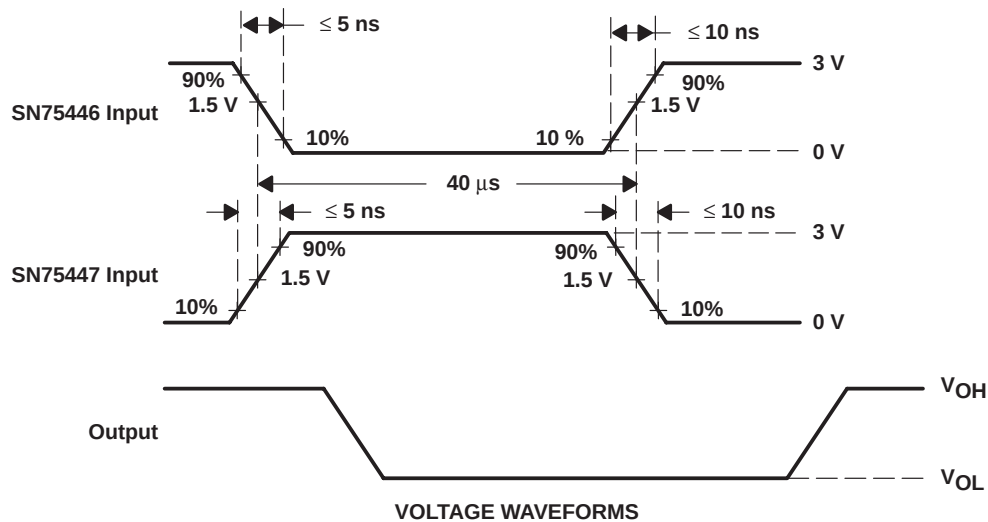
Figure 1. Test Circuit and Voltage Waveforms, Switching Characteristics



PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

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

Figure 2. Latch-Up Test Circuit and Voltage Waveforms

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Audio	www.ti.com/audio
Automotive	www.ti.com/automotive
Broadband	www.ti.com/broadband
Digital Control	www.ti.com/digitalcontrol
Medical	www.ti.com/medical
Military	www.ti.com/military
Optical Networking	www.ti.com/opticalnetwork
Security	www.ti.com/security
Telephony	www.ti.com/telephony
Video & Imaging	www.ti.com/video
Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2008, Texas Instruments Incorporated