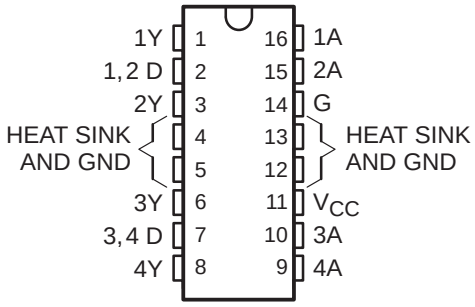
SLRS019B – DECEMBER 1986 – REVISED SEPTEMBER 2000

- **Saturating Outputs With Low On-State Resistance**
- **High-Impedance Inputs Compatible With CMOS and TTL Levels**
- **Very Low Standby Power . . . 21 mW Max**
- **High-Voltage Outputs . . . 70 V Min**
- **No Power-Up or Power-Down Output Glitch**
- **No Latch-Up Within Recommended Operating Conditions**
- **Output-Clamp Diodes for Transient Suppression**
- **Packaged in 2-W Power, Thermally Enhanced Plastic DIP**

NE PACKAGE
(TOP VIEW)



description

The SN75437A quadruple peripheral driver is designed for use in systems requiring high current, high voltage, and high load power. This device features four inverting open-collector outputs with a common-enable (G) input that, when taken low, disables all four outputs. The envelope of 1-V characteristics exceeds the specifications sufficiently to avoid high-current latch-up. Applications include driving relays, lamps, solenoids, motors, LEDs, transmission lines, hammers, and other high-power-demand devices.

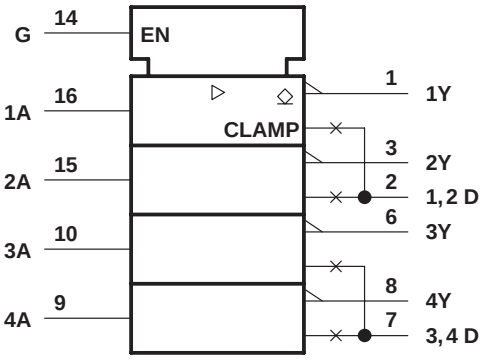
The SN75437A is characterized for operation over the free-air temperature range of 0°C to 70°C.

FUNCTION TABLE
(each NAND driver)

INPUTS		OUTPUT
A	G	Y
H	H	L
L	X	H
X	L	H

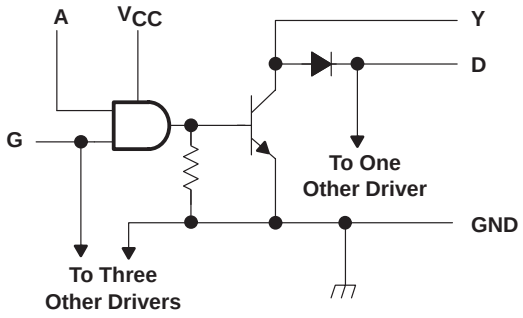
H = high level, L = low level,
X = irrelevant

logic diagram (positive logic)†

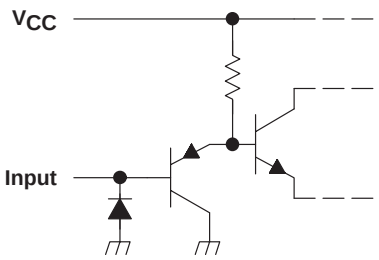


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC publication 617-12.

logic diagram (positive logic, each driver)



equivalent schematic of each input



absolute maximum ratings over operating temperature range (unless otherwise noted)

Supply voltage, V_{CC} . . . . . 7 V
Input voltage, V_I . . . . . 30 V
Output current (see Note 1) . . . . . 0.75 A
Output clamp-diode current, I_{OK} . . . . . 1.25 A
Output voltage, V_O (off state) . . . . . 70 V
Continuous total power dissipation at (or below) 25°C free-air temperature (see Note 2) . . . . . 2075 mW
Lead temperature 1,6 mm (1/16-inch) from case for 10 seconds . . . . . 260°C
Storage temperature range, T_{stg} . . . . . –65°C to 150°C

NOTES: 1. All four sections of these circuits may conduct rated current simultaneously; however, power dissipation averaged over a short time interval must fall within the continuous dissipation ratings.
2. For operation above 25°C free-air temperature, derate linearly to 1328 mW at 70°C at the rate of 16.6 mW/°C.

recommended operating conditions

PARAMETER	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
Output supply voltage in inductive switching circuit (see Figure 2), V_S			35	V
Output current, I_O			0.5	A
Operating free-air temperature, T_A	0		70	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

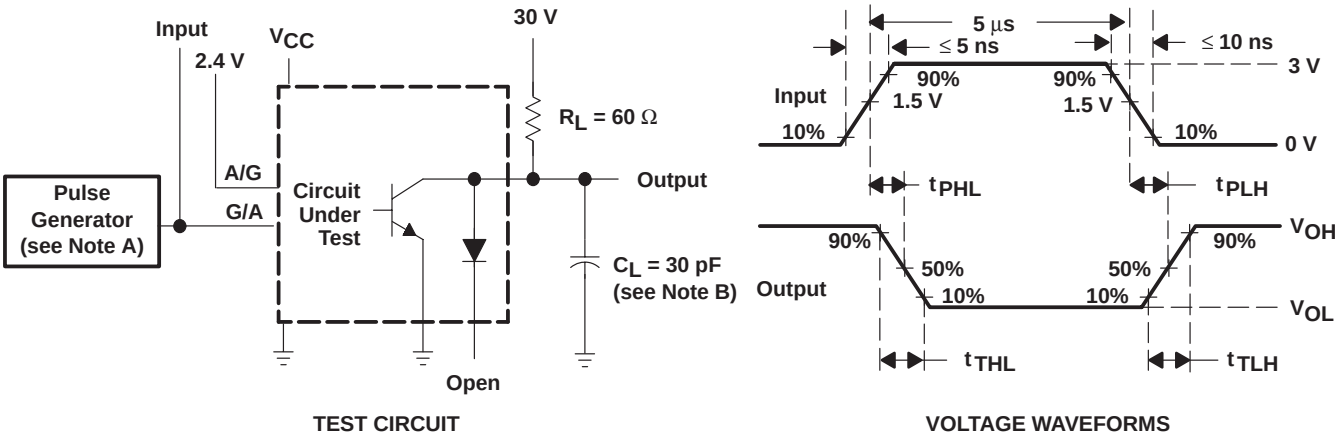
PARAMETER		TEST CONDITIONS		MIN	TYP†	MAX	UNIT
V_{IK}	Input clamp voltage	V_{CC} = 4.75 V,	I_I = –12 mA		–0.9	–1.5	V
V_{OL}	Low-level output voltage	V_{CC} = 4.75 V, V_{IH} = 2 V	I_{OL} = 250 mA		0.14	0.25	V
			I_{OL} = 500 mA		0.28	0.5	
$V_{R(K)}$	Output clamp-diode reverse voltage	V_{CC} = 4.75 V,	I_R = 100 μA	70	100		V
$V_{F(K)}$	Output clamp-diode forward voltage	I_F = 500 mA			1	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		0.1	10	μA
I_{IL}	Low-level input current	V_{CC} = 5.25 V,	V_I = 0.8 V		–0.25	–10	μA
I_{CCH}	Supply current, outputs high	V_{CC} = 5.25 V,	V_I = 0		1	4	mA
I_{CCL}	Supply current, outputs low	V_{CC} = 5.25 V,	V_I = 5 V		45	65	mA

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

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

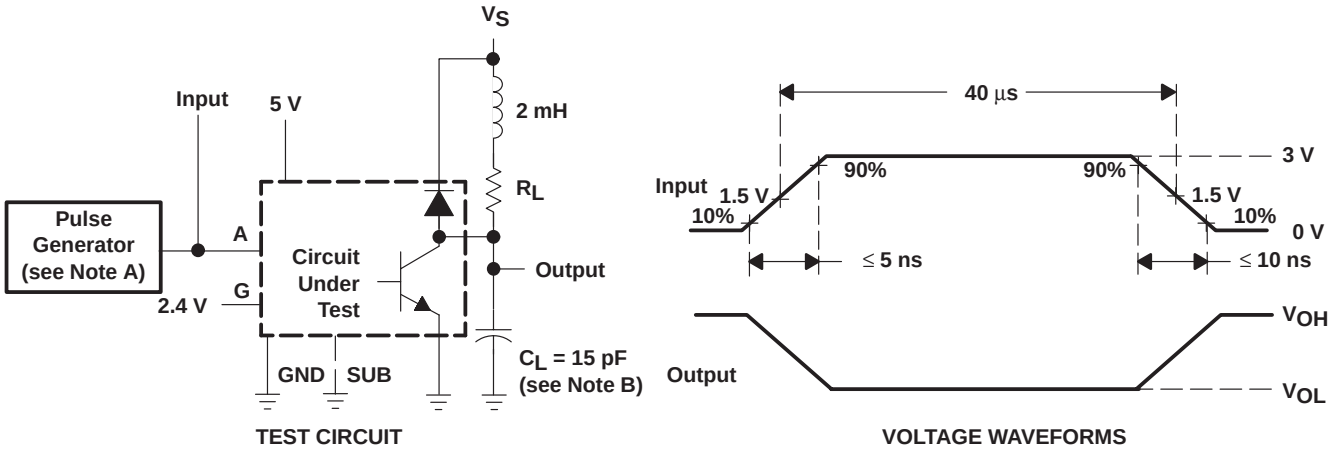
PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	C_L = 30 pF, See Figure 1	R_L = 60 Ω,		1950	5000	ns
t_{PHL}	Propagation delay time, high-to-low-level output				150	500	ns
t_{TLH}	Transition time, low-to-high-level output				40		ns
t_{THL}	Transition time, high-to-low-level output				36		ns
V_{OH}	High-level output voltage after switching	V_S = 35 V, R_L = 70 Ω,	I_O ≈ 500 mA, See Figure 2	V_S–10			mV

PARAMETER MEASUREMENT INFORMATION



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



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)
SN75437ANE	ACTIVE	PDIP	NE	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN75437ANEE4	ACTIVE	PDIP	NE	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type

(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.

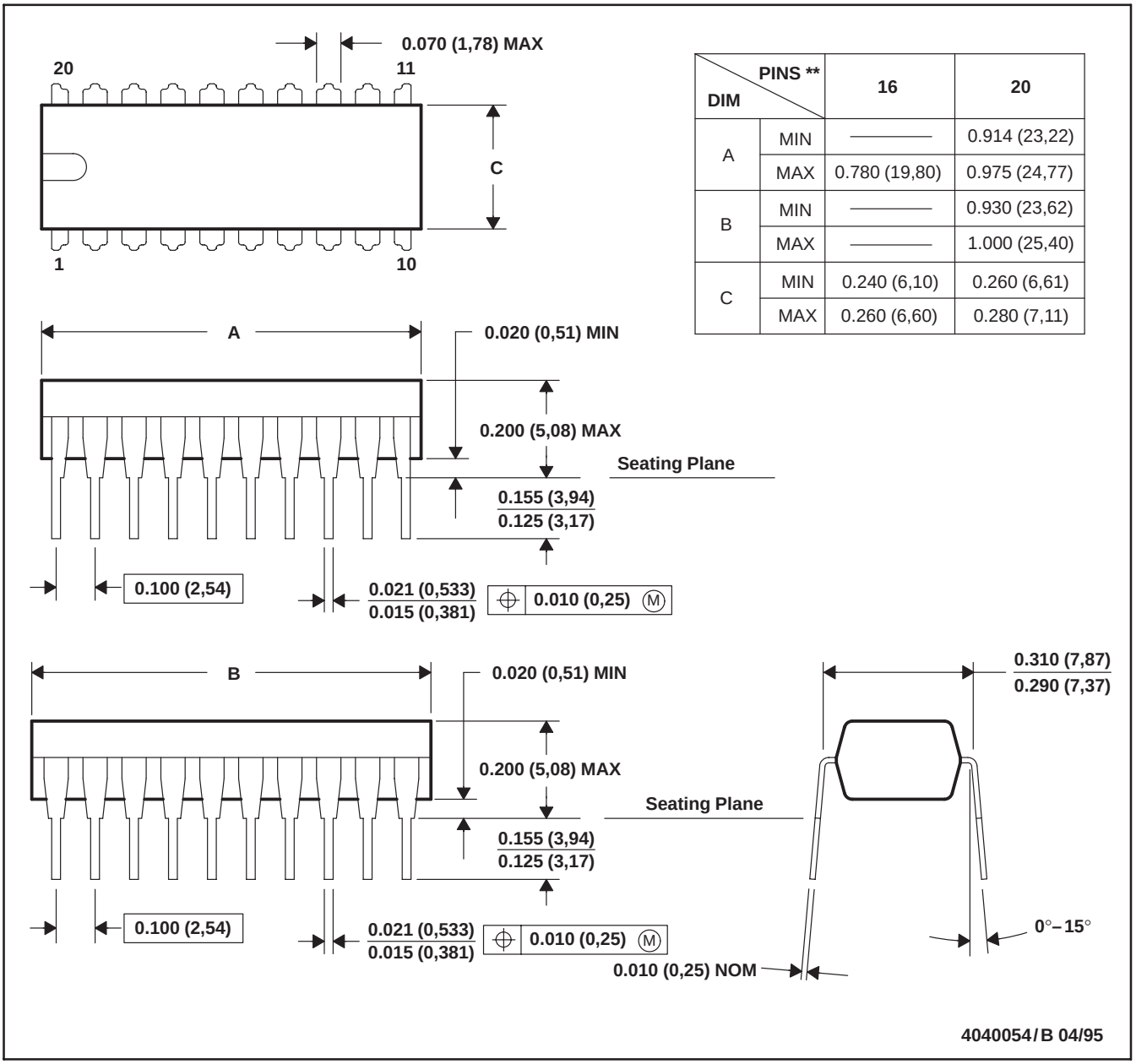
(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been 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.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
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.

MPDI003 – OCTOBER 1994

NE (R-PDIP-T)** **PLASTIC DUAL-IN-LINE PACKAGE**

20 PIN SHOWN



DIM \ PINS **		16	20
A	MIN	———	0.914 (23,22)
	MAX	0.780 (19,80)	0.975 (24,77)
B	MIN	———	0.930 (23,62)
	MAX	———	1.000 (25,40)
C	MIN	0.240 (6,10)	0.260 (6,61)
	MAX	0.260 (6,60)	0.280 (7,11)

NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Falls within JEDEC MS-001 (16 pin only)

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