

INTERFACE CIRCUITS

SERIES 75411 DUAL PERIPHERAL DRIVERS

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PERIPHERAL DRIVERS FOR HIGH-VOLTAGE, VERY HIGH-CURRENT DRIVER APPLICATIONS

performance

- 2-W Dissipation Rating
- Characterized for Use to 500 mA
- High-Voltage Outputs
- No Output Latch-Up at 55 V (After Conducting 300 mA)
- Medium-Speed Switching

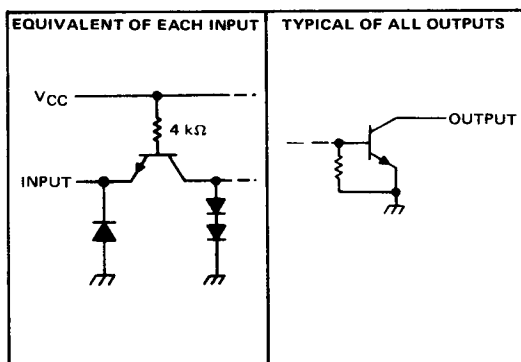
ease-of-design

- Circuit Flexibility for Varied Applications and Choice of Logic Function
- TTL or DTL Compatible Diode-Clamped Inputs
- Standard Supply Voltage

description

Series 75411 dual peripheral drivers are a family of versatile devices designed for use in systems that employ DTL or TTL logic. SN75411, SN75412, SN75413, and SN75414 provide AND, NAND, OR, and NOR drivers, respectively, (assuming positive logic) and are identical to SN75471 through SN75474 except that the package allows the output current capability to be increased to 500 mA. Diode-clamped inputs simplify circuit design. Typical applications include high-speed logic buffers, power drivers, relay drivers, lamp drivers, MOS drivers, line drivers, and memory drivers. Series 75411 drivers are characterized for operation from 0°C to 70°C.

schematics of inputs and output



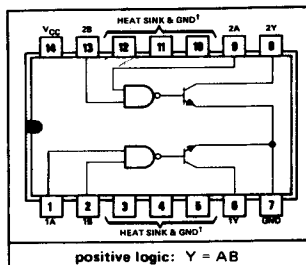
SN75411

FUNCTION TABLE
(EACH AND DRIVER)

INPUTS		OUTPUT
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

H = high-level
L = low-level

NE DUAL-IN-LINE PACKAGE (TOP VIEW)



positive logic: $Y = AB$

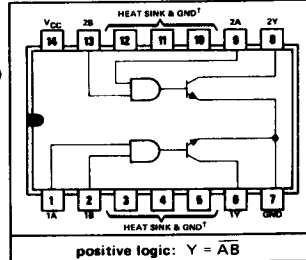
SN75412

FUNCTION TABLE
(EACH NAND DRIVER)

INPUTS		OUTPUT
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

H = high-level
L = low-level

NE DUAL-IN-LINE PACKAGE (TOP VIEW)



positive logic: $Y = \overline{AB}$

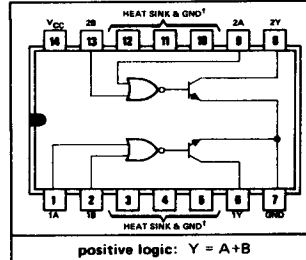
SN75413

FUNCTION TABLE
(EACH OR DRIVER)

INPUTS		OUTPUT
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	H

H = high-level
L = low-level

NE DUAL-IN-LINE PACKAGE (TOP VIEW)



positive logic: $Y = A+B$

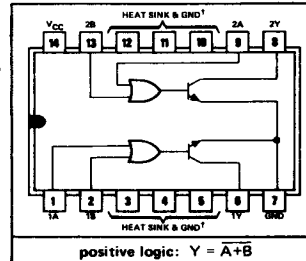
SN75414

FUNCTION TABLE
(EACH NOR DRIVER)

INPUTS		OUTPUT
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

H = high-level
L = low-level

NE DUAL-IN-LINE PACKAGE (TOP VIEW)



positive logic: $Y = \overline{A+B}$

† Heat-sink pins are internally connected to pin 7.

SERIES 75411

DUAL PERIPHERAL DRIVERS

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

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage	5.5 V
Intermitter voltage (see Note 2)	5.5 V
Off-state output voltage	70 V
Continuous output current (see Note 3)	550 mA
Peak output current ($t_w \leq 10$ ms, duty cycle $\leq 40\%$, see Note 3)	1000 mA
Continuous total power dissipation at (or below) 30°C free-air temperature (see Note 4)	2 W
Operating free-air temperature range	0°C to 70°C
Storage temperature range	-65°C to 150°C
Lead temperature $1/16$ inch from case for 10 seconds	260°C

- NOTES: 1. Voltage values are with respect to network ground terminal unless otherwise specified.
2. This is the voltage between two emitters of a multiple-emitter transistor.
3. Both halves of these dual circuits may conduct rated current simultaneously; however, power dissipation averaged over a short time interval must fall within the continuous dissipation rating.
4. For operation above 30°C free-air temperature, refer to Dissipation Derating Curves in the Thermal Information section, which starts on page 11.

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.75	5	5.25	V
Operating free-air temperature, T_A	0		70	$^\circ\text{C}$

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

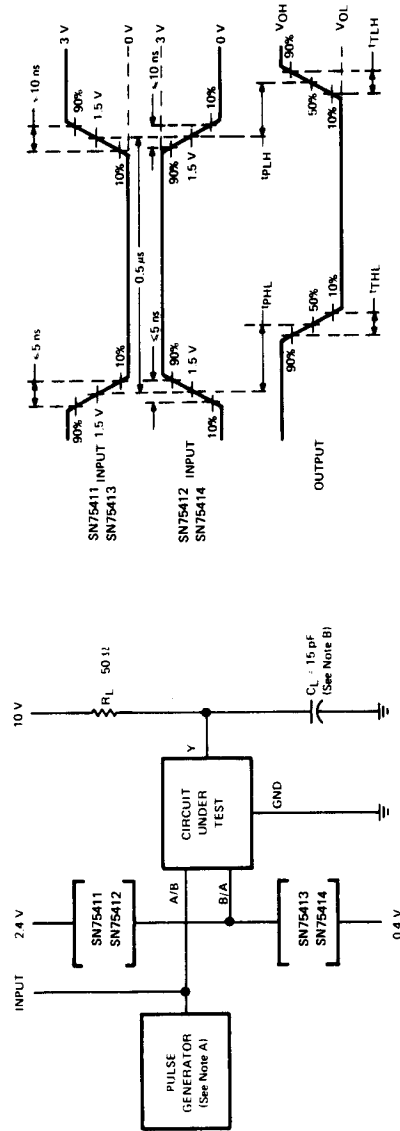
PARAMETER		TEST CONDITIONS	MIN	TYP [‡]	MAX	UNIT
V_{IH}	High level input voltage		2			V
V_{IL}	Low level input voltage				0.8	V
V_{IK}	Input clamp voltage	$V_{CC} = 4.75$ V, $I_I = -12$ mA	-1.2	-1.5		V
I_{OH}	High-level output current	$V_{CC} = 4.75$ V, $V_{IH} = 2$ V, $V_{IL} = 0.8$ V, $V_{OH} = 70$ V			100	μA
V_{OL}	Low-level output voltage	$V_{CC} = 4.75$ V, $I_{OL} = 100$ mA		0.15	0.4	V
		$V_{IH} = 2$ V, $I_{OL} = 300$ mA		0.36	0.7	
		$V_{IL} = 0.8$ V, $I_{OL} = 500$ mA		0.5	1	
I_I	Input current at maximum input voltage	$V_{CC} = 5.25$ V, $V_I = 5.5$ V			1	mA
I_{IH}	High-level input current	$V_{CC} = 5.25$ V, $V_I = 2.4$ V			40	μA
I_{IL}	Low-level input current	$V_{CC} = 5.25$ V, $V_I = 0.4$ V	-1	-1.6		mA
I_{CCH}	Supply current, outputs high	$V_{CC} = 5.25$ V	$V_I = 5$ V	8	11	mA
			$V_I = 0$	13	17	
			$V_I = 5$ V	8	11	
			$V_I = 0$	14	19	
I_{CCL}	Supply current, outputs low	$V_{CC} = 5.25$ V	$V_I = 0$	61	76	mA
			$V_I = 5$ V	65	76	
			$V_I = 0$	63	76	
			$V_I = 5$ V	72	85	

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

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

PARAMETER	TEST CONDITIONS	SN75411		SN75412		SN75413		SN75414		UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
t_{PLH} Propagation delay time, low-to-high-level output	$I_O \approx 200\text{ mA}$, $C_L = 15\text{ pF}$,	30	55	45	65	30	55	40	65	ns
t_{PHL} Propagation delay time, high-to-low-level output	$R_L = 50\ \Omega$,	25	40	30	50	25	40	30	50	ns
t_{TTLH} Transition time, low-to-high-level output	See Figure 1	8	20	13	25	8	25	8	20	ns
t_{TTHL} Transition time, high-to-low-level output		10	20	10	20	10	25	10	20	ns
V_{OH} High-level output voltage after switching	$V_S = 55\text{ V}$, $I_O \approx 300\text{ mA}$, See Figure 2	$V_S - 18$		$V_S - 18$		$V_S - 18$		$V_S - 18$		mV

PARAMETER MEASUREMENT INFORMATION



VOLTAGE WAVEFORMS

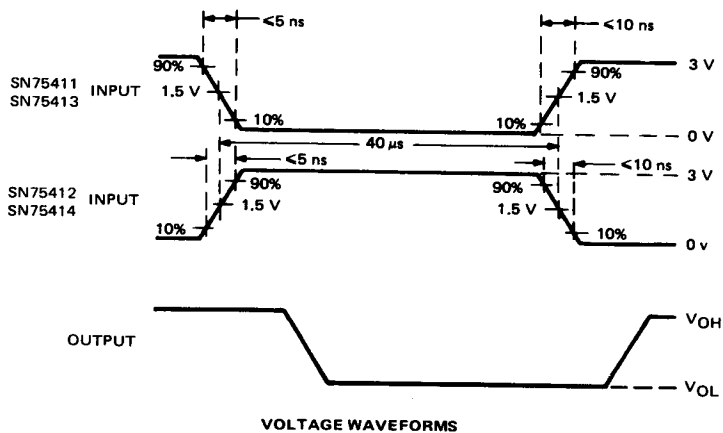
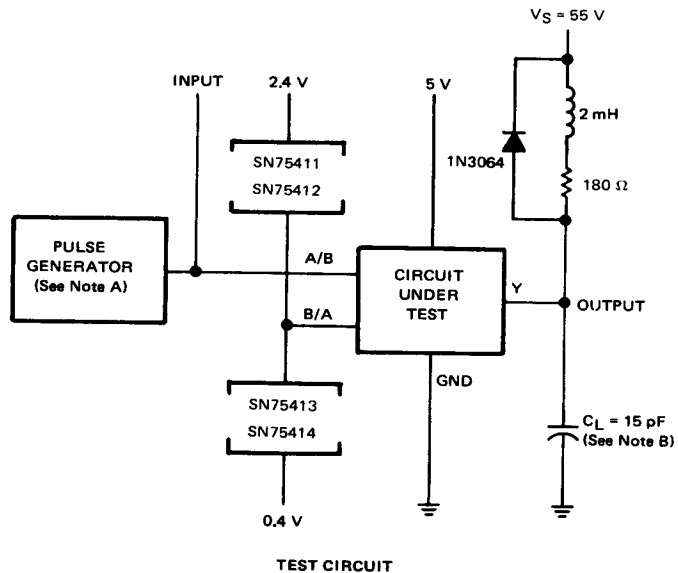
TEST CIRCUIT

NOTES: A. The pulse generator has the following characteristics: $PRR = 1\text{ MHz}$, $Z_{out} \approx 50\ \Omega$.
B. C_L includes probe and jig capacitance.

FIGURE 1—SWITCHING TIMES

SERIES 75411 DUAL PERIPHERAL DRIVERS

PARAMETER MEASUREMENT INFORMATION



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

FIGURE 2—LATCH-UP TEST