

## SERIES UDN-3610M DUAL 2-INPUT PERIPHERAL/POWER DRIVERS

### FEATURES

- Four Logic Types
- DTL/TTL/PMOS/CMOS Compatible Inputs
- Low Input Current
- 300 mA Continuous Output Current
- Standoff Voltage of 80 V
- Pin-for-Pin Replacement for Series LM3600N
- Pin-for-Pin Replacement for SN75451BP through SN75454BP and 75461 through 75464

### Description

THESE MINI-DIP dual 2-input peripheral power drivers are bipolar monolithic integrated circuits with AND, NAND, OR, or NOR logic gates and high-current switching transistors on the same chip. The two output transistors are capable of simultaneously sinking 300 mA continuously at ambient temperatures of up to +70°C. In the OFF state, these drivers will withstand at least 80 V.

### Applications

Series UDN-3600M dual drivers are ideally suited for interface between low-level or high-level logic and high-current/high-voltage loads. Typical applications include driving peripheral loads such as incandescent lamps, light-emitting diodes, memories, heaters, and other non-inductive loads of up to 600 mA (both drivers in parallel).

With appropriate external-diode transient-suppression, Series UDN-3600M drivers can also be used with inductive loads such as relays, solenoids, and stepping motors.

### ABSOLUTE MAXIMUM RATINGS

Supply Voltage, $V_{CC}$ .....	7.0 V
Input Voltage, $V_{IN}$ .....	30 V
Output Off-State Voltage, $V_{OFF}$ .....	80 V
Output On-State Sink Current, $I_{ON}$ .....	600 mA
Power Dissipation, $P_D$ .....	1.5 W
Each Driver .....	0.8 W
Derating Factor Above $T_A = 25^\circ\text{C}$ .....	12.5 mW/°C or 80°C/W
Operating Free-Air Temperature Range, $T_A$ .....	-20°C to +85°C
Storage Temperature Range, $T_S$ .....	-55°C to +150°C

**RECOMMENDED OPERATING CONDITIONS**

	Min.	Nom.	Max.	Units
Supply Voltage ( $V_{CC}$ )	4.75	5.0	5.25	V
Operating Temperature Range	0	+25	+85	°C
Current into any output (ON state)			300	mA

**INPUT PULSE CHARACTERISTICS**

$V_{in(0)}$ = 0V	$t_f$ = 7ns	$t_p$ = 1 $\mu$ s
$V_{in(1)}$ = 3.5V	$t_r$ = 14ns	PRR = 500kHz

**ELECTRICAL CHARACTERISTICS over operating temperature range (unless otherwise noted)**

Characteristic	Symbol	Test Conditions					Limits			Units	Notes
		Temp.	$V_{CC}$	Driven Input	Other Input	Output	Min.	Typ.	Max.		
"1" Input Voltage	$V_{in(1)}$		MIN				2.0			V	
"0" Input Voltage	$V_{in(0)}$		MIN						0.8	V	
"0" Input Current	$I_{in(0)}$		MAX	0.4 V	30 V			-50	-100	$\mu$ A	2
"1" Input Current	$I_{in(1)}$		MAX	30 V	0 V				10	$\mu$ A	2
Input Clamp Voltage	$V_i$		MIN	-12 mA					-1.5	V	

**SWITCHING CHARACTERISTICS at  $V_{CC} = 5.0$  V,  $T_A = 25^\circ$  C**

Characteristic	Symbol	Test Conditions	Limits			Units	Notes
			Min.	Typ.	Max.		
Turn-on Delay Time	$t_{pdo}$	$V_S = 70$ V, $R_L = 465 \Omega$ (10 Watts) $C_L = 15$ pF		200	500	ns	3
Turn-off Delay Time	$t_{pdl}$	$V_S = 70$ V, $R_L = 465 \Omega$ (10 Watts) $C_L = 15$ pF		300	750	ns	3

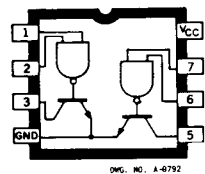
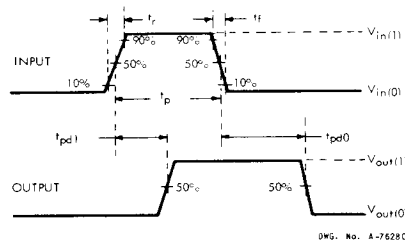
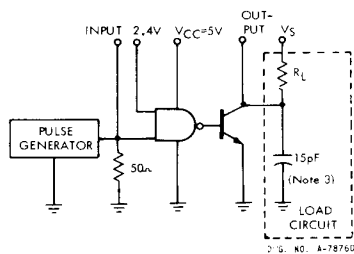
**NOTES:**

1. Typical values are at  $V_{CC} = 5.0$  V,  $T_A = 25^\circ$  C.
2. Each input tested separately.
3. Voltage values shown in the test circuit waveforms are with respect to network ground terminal.
4. Capacitance values specified include probe and test fixture capacitance.

## Type UDN-3611M Dual AND Driver

**ELECTRICAL CHARACTERISTICS over operating temperature range (unless otherwise noted)**

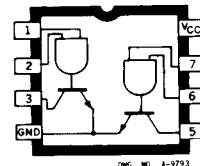
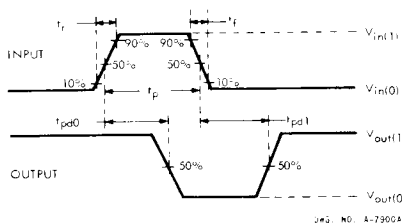
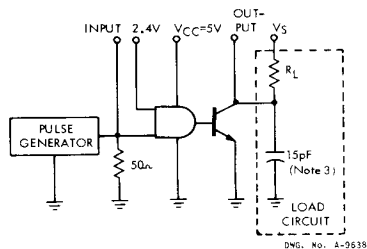
Characteristic	Symbol	Test Conditions				Limits				Notes	
		Temp.	V <sub>CC</sub>	Driven Input	Other Input	Output	Min.	Typ.	Max.		Units
"1" Output Reverse Current	I <sub>off</sub>		MIN	2.0 V	2.0 V	80 V			100	μA	
			OPEN	2.0 V	2.0 V	80 V			100	μA	
"0" Output Voltage	V <sub>on</sub>		MIN	0.8 V	V <sub>CC</sub>	100 mA		0.25	0.4	V	
			MIN	0.8 V	V <sub>CC</sub>	300 mA		0.5	0.7	V	
"1" Level Supply Current	I <sub>CC(1)</sub>	NOM	MAX	5.0 V	5.0 V			8.0	12	mA	1, 2
"0" Level Supply Current	I <sub>CC(0)</sub>	NOM	MAX	0 V	0 V			35	49	mA	1, 2



## Type UDN-3612M Dual NAND Driver

**ELECTRICAL CHARACTERISTICS over operating temperature range (unless otherwise noted)**

Characteristic	Symbol	Test Conditions				Limits				Notes	
		Temp.	V <sub>CC</sub>	Driven Input	Other Input	Output	Min.	Typ.	Max.		Units
"1" Output Reverse Current	I <sub>off</sub>		MIN	0.8 V	V <sub>CC</sub>	80 V			100	μA	
			OPEN	0.8 V	V <sub>CC</sub>	80 V			100	μA	
"0" Output Voltage	V <sub>on</sub>		MIN	2.0 V	2.0 V	100 mA		0.25	0.4	V	
			MIN	2.0 V	2.0 V	300 mA		0.5	0.7	V	
"1" Level Supply Current	I <sub>CC(1)</sub>	NOM	MAX	0 V	0 V			12	14	mA	1, 2
"0" Level Supply Current	I <sub>CC(0)</sub>	NOM	MAX	5.0 V	5.0 V			40	53	mA	1, 2



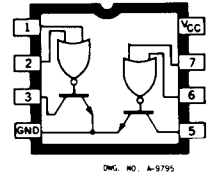
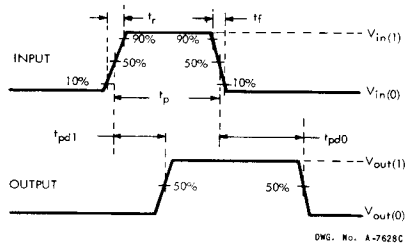
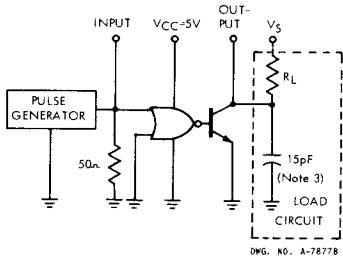
**NOTES:**

1. Typical values are at V<sub>CC</sub> = 5.0 V, T<sub>A</sub> = 25°C.
2. Per package.
3. Capacitance values specified include probe and test fixture capacitance.

## Type UDN-3613M Dual OR Driver

**ELECTRICAL CHARACTERISTICS over operating temperature range (unless otherwise noted)**

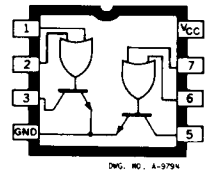
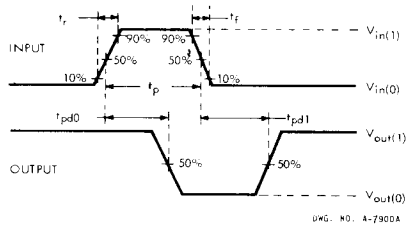
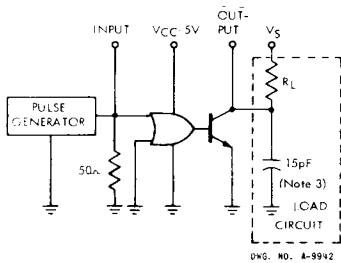
Characteristic	Symbol	Test Conditions				Limits				Notes	
		Temp.	V <sub>CC</sub>	Driven Input	Other Input	Output	Min.	Typ.	Max.		Units
"1" Output Reverse Current	I <sub>off</sub>		MIN	2.0 V	0 V	80 V			100	μA	
			OPEN	2.0 V	0 V	80 V			100	μA	
"0" Output Voltage	V <sub>on</sub>		MIN	0.8 V	0.8 V	100 mA	0.25	0.4		V	
			MIN	0.8 V	0.8 V	300 mA	0.5	0.7		V	
"1" Level Supply Current	I <sub>CC(1)</sub>	NOM	MAX	5.0 V	5.0 V		8.0	13		mA	1, 2
"0" Level Supply Current	I <sub>CC(0)</sub>	NOM	MAX	0 V	0 V		36	50		mA	1, 2



## Type UDN-3614M Dual NOR Driver

**ELECTRICAL CHARACTERISTICS over operating temperature range (unless otherwise noted)**

Characteristic	Symbol	Test Conditions				Limits				Notes	
		Temp.	V <sub>CC</sub>	Driven Input	Other Input	Output	Min.	Typ.	Max.		Units
"1" Output Reverse Current	I <sub>off</sub>		MIN	0.8 V	0.8 V	80 V			100	μA	
			OPEN	0.8 V	0.8 V	80 V			100	μA	
"0" Output Voltage	V <sub>on</sub>		MIN	2.0 V	0 V	100 mA	0.25	0.4		V	
			MIN	2.0 V	0 V	300 mA	0.5	0.7		V	
"1" Level Supply Current	I <sub>CC(1)</sub>	NOM	MAX	0 V	0 V		12	15		mA	1, 2
"0" Level Supply Current	I <sub>CC(0)</sub>	NOM	MAX	5.0 V	5.0 V		40	50		mA	1, 2



**NOTES:**

1. Typical values are at V<sub>CC</sub> = 5.0 V, T<sub>A</sub> = 25°C.
2. Per package.
3. Capacitance values specified include probe and test fixture capacitance.

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