

## SERIES UDN-5710M DUAL PERIPHERAL/POWER DRIVERS —Transient Protected Outputs

### FEATURES

- Four Logic Types
- DTL/TTL/PMOS/CMOS Compatible Inputs
- Low Input Current
- 300 mA Continuous Output Current
- Standoff Voltage of 80 V

### Description

THESE MINI-DIP dual peripheral and power drivers are bipolar monolithic integrated circuits incorporating AND, NAND, OR, or NOR logic gates, high-current switching transistors, and transient-suppression diodes 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-5700M 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, and heaters with a load current of up to 600 mA.

The integral transientsuppression diodes allow the use of these drivers with inductive loads such as relays, solenoids, or stepping motors without the need for discrete diodes. When not required for transient suppression, the diode-common bus can be used for the "lamp test" function.

### 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
Suppression Diode Off-State Voltage, $V_{OFF}$ . . . . .	80 V
Suppression Diode On-State Current, $I_{ON}$ . . . . .	600 mA
Power Dissipation at $T_A = +25^\circ\text{C}$ , $P_D$ . . . . .	1.5 W
Each Driver . . . . .	0.8 W
Derating Factor . . . . .	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				Notes	
		Temp.	$V_{CC}$	Driven Input	Other Input	Output	Min.	Typ.	Max.		Units
"1" Input Voltage	$V_{in(1)}$		MIN				2.0			V	
"0" Input Voltage	$V_{in(0)}$		MIN					0.8		V	
"0" Input Current at all Inputs except Strobe	$I_{in(0)}$		MAX	0.4 V	30 V		-50	-100		$\mu A$	2
"0" Input Current at Strobe	$I_{in(0)}$		MAX	0.4 V	30 V		-100	-200		$\mu A$	
"1" Input Current at all Inputs except Strobe	$I_{in(1)}$		MAX	30 V	0 V			10		$\mu A$	2
"1" Input Current at Strobe	$I_{in(1)}$		MAX	30 V	0 V			20		$\mu A$	
Input Clamp Voltage	$V_I$		MIN	-12 mA				-1.5		V	

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

Characteristic	Symbol	Test Conditions	Limits			Notes	
			Min.	Typ.	Max.		Units
Turn-on Delay Time	$t_{pd0}$	$V_S = 70V$ , $R_L = 465\Omega$ (10 Watts) $C_L = 15pF$		200	500	ns	3
Turn-off Delay Time	$t_{pd1}$	$V_S = 70V$ , $R_L = 465\Omega$ (10 Watts) $C_L = 15pF$		300	750	ns	3

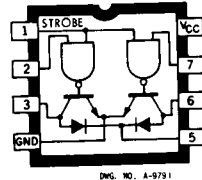
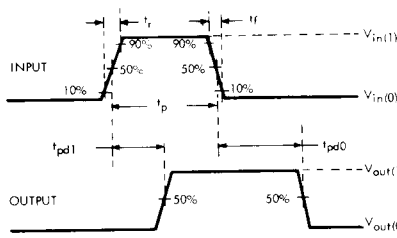
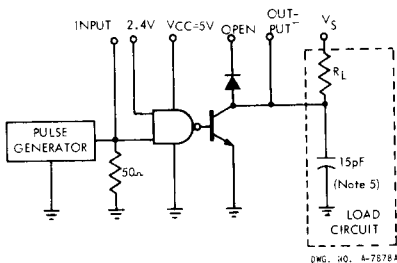
**NOTES:**

1. Typical values are at  $V_{CC} = 5.0V$ ,  $T_A = 25^\circ C$ .
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-5711M Dual AND Driver

ELECTRICAL CHARACTERISTICS over operating temperature range (unless otherwise noted)

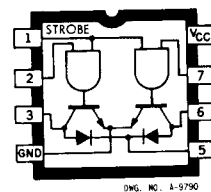
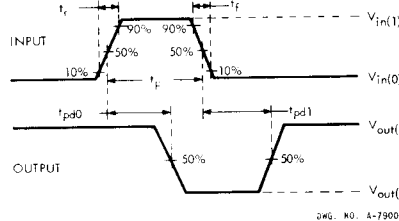
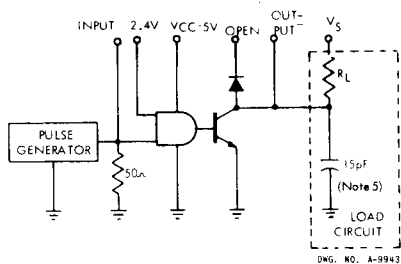
Characteristic	Symbol	Test Conditions				Limits				Notes	
		Temp.	V <sub>CC</sub>	Driven Input	Other Input	Output	Min.	Typ.	Max.		Units
"1" Output Reverse Current	I <sub>off</sub>		MIN	2.0 V	2.0 V	80 V			100	μA	
			OPEN	2.0 V	2.0 V	80 V			100	μA	
"0" Output Voltage	V <sub>on</sub>		MIN	0.8 V	V <sub>CC</sub>	150 mA	0.35	0.5	V		
			MIN	0.8 V	V <sub>CC</sub>	300 mA	0.5	0.7	V		
Diode Leakage Current	I <sub>LK</sub>	NOM	NOM	0 V	0 V	OPEN			200	μA	3
Diode Forward Voltage Drop	V <sub>D</sub>	NOM	NOM	V <sub>CC</sub>	V <sub>CC</sub>		1.5	1.75	V		4
"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-5712M 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	150 mA	0.35	0.5	V		
			MIN	2.0 V	2.0 V	300 mA	0.5	0.7	V		
Diode Leakage Current	I <sub>LK</sub>	NOM	NOM	V <sub>CC</sub>	V <sub>CC</sub>	OPEN			200	μA	3
Diode Forward Voltage Drop	V <sub>D</sub>	NOM	NOM	0 V	0 V		1.5	1.75	V		4
"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	53	mA		1, 2



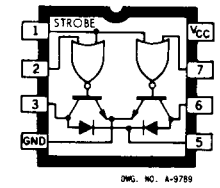
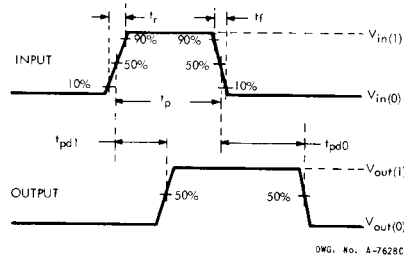
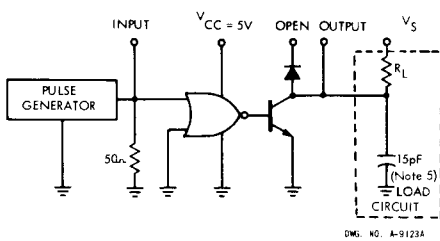
NOTES:

1. Typical values are at V<sub>CC</sub> = 5.0 V, T<sub>A</sub> = 25°C.
2. Per package.
3. Diode leakage current measured at V<sub>R</sub> = V<sub>off(min)</sub>.
4. Diode forward voltage drop measured at I<sub>F</sub> = 300 mA.
5. Capacitance values specified include probe and test fixture capacitance.

## Type UDN-5713M 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	150 mA	0.35		0.5	V	
			MIN	0.8 V	0.8 V	300 mA		0.5	0.7	V	
Diode Leakage Current	I <sub>LK</sub>	NOM	NOM	0 V	0 V	OPEN			200	μA	3
Diode Forward Voltage Drop	V <sub>D</sub>	NOM	NOM	V <sub>CC</sub>	V <sub>CC</sub>		1.5		1.75	V	4
"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

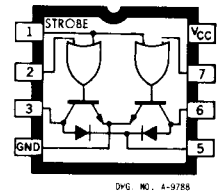
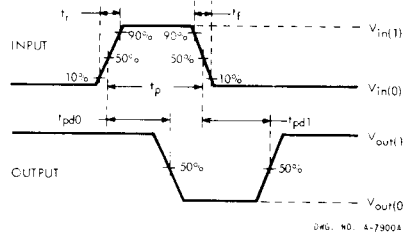
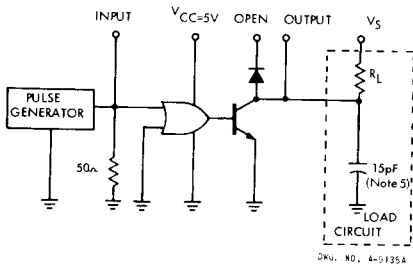


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## Type UDN-5714M Dual NOR Driver

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	150 mA	0.35		0.5	V	
			MIN	2.0 V	0 V	300 mA		0.5	0.7	V	
Diode Leakage Current	I <sub>LK</sub>	NOM	NOM	V <sub>CC</sub>	V <sub>CC</sub>	OPEN			200	μA	3
Diode Forward Voltage Drop	V <sub>D</sub>	NOM	NOM	0 V	0 V		1.5		1.75	V	4
"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> = 5.0V, T<sub>A</sub> = 25°C.
2. Per package.
3. Diode leakage current measured at V<sub>A</sub> = V<sub>off(min)</sub>.
4. Diode forward voltage drop measured at I<sub>F</sub> = 300 mA.
5. Capacitance values specified include probe and test fixture capacitance.