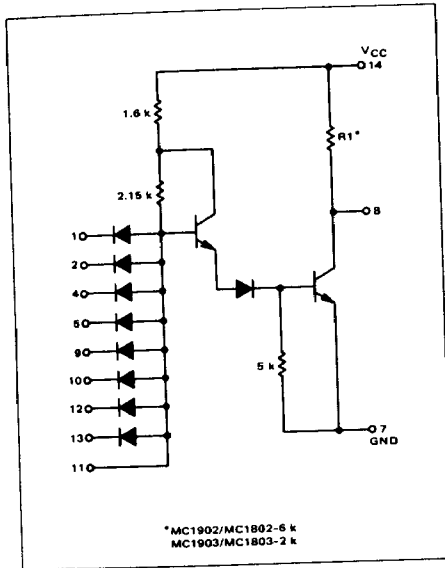


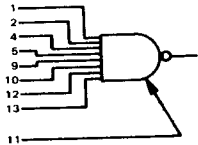
EXPANDABLE 8-INPUT
"NAND" GATE

MDTL MC930/830 series

MC1902F · MC1802F, P
MC1903F · MC1803F, P



This device is an expandable 8-input NAND gate. It is useful when processing a large number of variables, such as in encoders or decoders.



Positive Logic: $B = 1 \cdot 2 \cdot 4 \cdot 5 \cdot 9 \cdot 10 \cdot 12 \cdot 13 \cdot [11]$
Negative Logic: $B = 1+2+4+5+9+10+12+13+[11]$

Input Loading Factor = 1

Output Loading Factor:

MC1902/MC1802 = 8

MC1903/MC1803 = 7

Total Power Dissipation:

MC1902/MC1802 = 11 mW typ/pkg

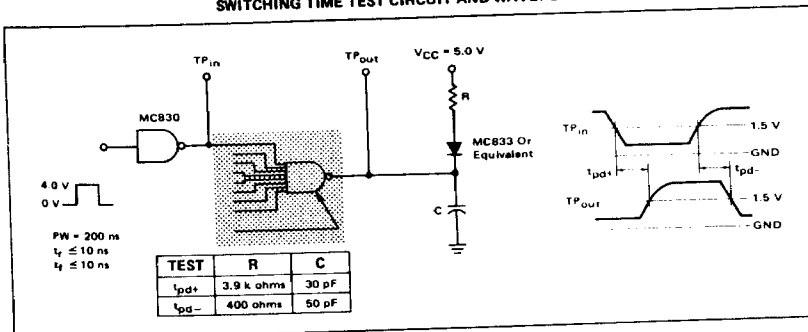
MC1903/MC1803 = 16.5 mW typ/pkg

Propagation Delay Time:

MC1902/MC1802 = 30 ns typ

MC1903/MC1803 = 25 ns typ

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS

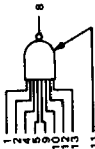


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MC1902F/MC1802F, P, MC1903F/MC1803F, P (continued)

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one input of the gate. To complete testing, sequence through remaining inputs in the same manner. (Any test necessary for the expander input is shown.)



Characteristic	Symbol	MC1902, MC1803 Test Limits										MC1902, MC1803 Test Limits										TEST CURRENT / VOLTAGE VALUES										Gnd						
		-55°C		+25°C		+125°C		0°C		+25°C		+75°C		-55°C		+25°C		+125°C		0°C		+25°C		+75°C		-55°C		+25°C		+125°C			0°C		+25°C		+75°C	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		Min	Max	Min	Max		
Output Voltage	V _{OL}	0	0.40	-	0.40	-	0.45	V _{dc}	-	0.45	-	0.50	V _{dc}	-	0.45	-	0.50	V _{dc}	-	0.45	-	0.50	V _{dc}	-	0.45	-	0.50	V _{dc}	-	0.45	-	0.50	V _{dc}	-	0.45	-	0.50	V _{dc}
	V _{OH}	0	2.50	-	2.60	-	2.50	V _{dc}	-	2.60	-	2.80	V _{dc}	-	2.60	-	2.80	V _{dc}	-	2.60	-	2.80	V _{dc}	-	2.60	-	2.80	V _{dc}	-	2.60	-	2.80	V _{dc}	-	2.60	-	2.80	V _{dc}
Short-Circuit Current	I _{SC}	0	-1.34	-	-1.36	-	-1.30	mAdc	-	-1.30	-	-1.30	mAdc	-	-1.30	-	-1.25	mAdc	-	-1.30	-	-1.30	mAdc	-	-1.30	-	-1.25	mAdc	-	-1.30	-	-1.25	mAdc	-	-1.30	-	-1.25	mAdc
	I _R	0	-4.00	-	-3.50	-	-3.00	mAdc	-	-3.00	-	-3.00	mAdc	-	-3.00	-	-3.15	mAdc	-	-3.00	-	-3.00	mAdc	-	-3.00	-	-3.15	mAdc	-	-3.00	-	-3.15	mAdc	-	-3.00	-	-3.15	mAdc
Reverse Current	I _R	1	2.0	-	2.0	-	5.0	μAdc	-	5.0	-	5.0	μAdc	-	5.0	-	10	μAdc	-	5.0	-	5.0	μAdc	-	5.0	-	10	μAdc	-	5.0	-	10	μAdc	-	5.0	-	10	μAdc
Output Leakage Current	I _{CEX}	0	-	-	50	-	-	μAdc	-	-	-	100	μAdc	-	-	-	-	μAdc	-	-	-	-	100	μAdc	-	-	-	-	-	-	-	-	-	-	-	-	-	μAdc
Forward Current	I _F	1	-1.60	-	-1.60	-	-1.50	mAdc	-	-1.40	-	-1.40	mAdc	-	-1.40	-	-1.33	mAdc	-	-1.40	-	-1.40	mAdc	-	-1.40	-	-1.33	mAdc	-	-1.40	-	-1.33	mAdc	-	-1.40	-	-1.33	mAdc
Power Drain Current (Total Device)	I _{PDR}	14	-	-	3.3	-	-	mAdc	-	-	-	4.0	mAdc	-	-	-	-	mAdc	-	-	-	-	4.0	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	-	mAdc
	I _{PDH}	14	-	-	5.4	-	-	mAdc	-	-	-	6.6	mAdc	-	-	-	-	mAdc	-	-	-	-	6.6	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	-	mAdc
	I _{max}	14	-	-	2.8	-	-	mAdc	-	-	-	4.0	mAdc	-	-	-	-	mAdc	-	-	-	-	4.0	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	-	mAdc
Switching Times	t _{pd+}	1.8	-	-	80	-	-	ns	-	-	-	25	ns	-	-	-	-	ns	-	-	-	-	25	ns	-	-	-	-	-	-	-	-	-	-	-	-	-	ns
	t _{pd-}	1.8	-	-	10	-	-	ns	-	-	-	10	ns	-	-	-	-	ns	-	-	-	-	10	ns	-	-	-	-	-	-	-	-	-	-	-	-	-	ns
	t _{pd+}	1.8	-	-	15	-	-	ns	-	-	-	15	ns	-	-	-	-	ns	-	-	-	-	15	ns	-	-	-	-	-	-	-	-	-	-	-	-	-	ns
	t _{pd-}	1.8	-	-	10	-	-	ns	-	-	-	10	ns	-	-	-	-	ns	-	-	-	-	10	ns	-	-	-	-	-	-	-	-	-	-	-	-	-	ns

Plus not listed are left open.

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PRODUCT DOCUMENTATION

The three documents listed in the following table are required for a complete description of the DSP56301 and are necessary to design properly with the part. Documentation is available from one of the following locations (see back cover for detailed information):

- A local Motorola distributor
- A Motorola semiconductor sales office
- A Motorola Literature Distribution Center
- The World Wide Web (WWW)

See the **Additional Support** section of the *DSP56300 Family Manual* for detailed information on the multiple support options available to you.

Table 1 DSP56301 Documentation

Name	Description	Order Number
DSP56300 Family Manual	Detailed description of the DSP56300 family processor core and instruction set	DSP56300FM/AD
DSP56301 User's Manual	Detailed functional description of the DSP56301 memory configuration, operation, and register programming	DSP56301UM/AD
DSP56301 Technical Data	DSP56301 features list and physical, electrical, timing, and package specifications	DSP56301/D

