

MDTL MC930/830 series

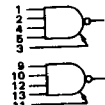
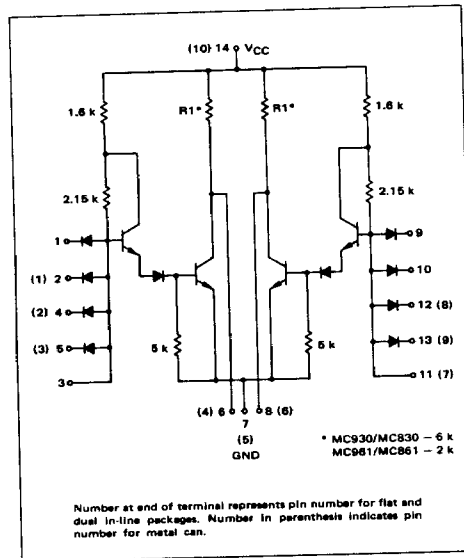
EXPANDABLE DUAL
4-INPUT "NAND" GATE

MC930F · MC830F, P
MC961F · MC861F, P

EXPANDABLE DUAL
3-2 INPUT "NAND" GATE

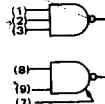
MC930G · MC830G
MC961G · MC861G

This gate element, in the 14-pin flat and dual in-line packages, consists of two expandable 4-input NAND gate circuits. Since the metal can (G suffix) has only 10 pins, that circuit consists of one 3-input and one 2-input expandable gate. The elements may be cross-coupled to form a bistable multivibrator, or the outputs may be connected in parallel to perform the logic "OR" function.



MC930F/MC830F, P
MC961F/MC861F, P

Positive Logic: $6 = 1 + 2 + 4 + 5 + 3$
Negative Logic: $6 = 1 + 2 + 4 + 6 + 3$



MC930G/MC830G
MC961G/MC861G

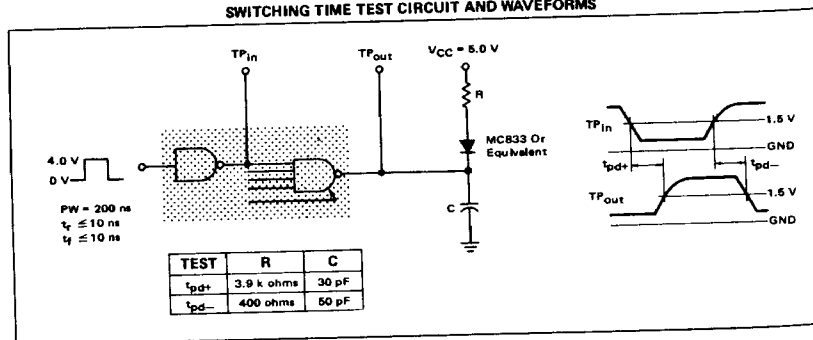
Positive Logic: $4 = 1 + 2 + 3$
Negative Logic: $4 = 1 + 2 + 3$

Total Power
Input Loading Factor = 1
Output Loading Factor:
MC930/MC830 = 8
MC961/MC861 = 7

Disipation:	MC930	MC961
MC830	MC830	MC861
Inputs Low	12 mW	12 mW
Inputs High	26 mW	42 mW
50% duty Cycle	19 mW	27 mW

Propagation Delay Time
MC930/MC830 = 30 ns typ
MC961/MC861 = 25 ns typ

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS



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MC930F/MC830F, P, MC961F/MC861F, P (continued)
 MC930G/MC830G, MC961G/MC861G (continued)

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one gate. The other gates are tested in the same manner.

NOTE: Although the test conditions and test limits are the same for devices in ALL available packages, the table shows pin connections for testing only the first and dual in-line packaged devices. To test devices in the metal can, substitute pin numbers shown in the conversion table below.



PACKAGE	PIN NUMBER									
	1	2	3	4	5	6	7	8	9	10
Flat/Dual In-Line	1	2	3	4	5	6	7	8	9	10
Metal Can	-	1	2	3	4	5	6	-	7	8

Characteristic	Symbol	TEST LIMITS									
		-55°C		+25°C		+125°C		0°C		+75°C	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Output Voltage	V _{OL}	0.40	0.40	0.40	0.45	V _{cc}	0.45	0.45	0.50	0.50	V _{cc}
	V _{OH}	2.50	2.60	2.60	2.50	↑	2.60	2.60	2.50	↑	2.50
Short-Circuit	I _{SC}	-1.34	-1.34	-1.34	-1.30 mAdc	-1.30	-1.30	-1.30	-1.25 mAdc	-1.25	-1.25
MC930, MC830		-4.00	-4.00	-4.00	-3.90 mAdc	-3.90	-3.90	-3.90	-3.75 mAdc	-3.75	-3.75
MC961, MC861		2.0	2.0	2.0	5.0 mAdc	5.0	5.0	5.0	10 mAdc	10	10
Reverse Current	I _R	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Output Load	V _{CEX}	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Current	I _F	-1.60	-1.60	-1.60	-1.50 mAac	-1.50	-1.50	-1.40	-1.33 mAac	-1.33	-1.33
Forward Current	I _F	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑

Characteristic	Symbol	-55°C		+25°C		+125°C	
		Min	Max	Min	Max	Min	Max
Propagation Delay	t _{PHL}	6.5	6.5	ns	ns	ns	ns
MC930, MC830		10.7	10.7	ns	ns	ns	ns
MC961, MC861		5.5	5.5	ns	ns	ns	ns
All Types	t _{max}	↑	↑	↑	↑	↑	↑
Switching Times	t _{tr}	1.6	1.6	25	80	ns	ns
MC930, MC830		1.6	1.6	10	30	ns	ns
MC961, MC861		1.6	1.6	15	60	ns	ns
	t _{pd}	1.6	1.6	10	30	ns	ns

Pins not listed are left open.

Characteristic	Symbol	TEST CURRENT/VOLTAGE VALUES													
		mA		Volts											
		I _{OL}	I _{OH}	V _{OL}	V _{OH}	V _{IL}	V _{IH}	V _L	V _H	V _{OL}	V _{OH}	V _{IL}	V _{IH}	V _{OL}	V _{OH}
		MC930, MC961	MC930, MC830	MC961, MC861	MC930, MC830	MC961, MC861	MC930, MC830	MC961, MC861	MC930, MC830	MC961, MC861	MC930, MC830	MC961, MC861	MC930, MC830	MC961, MC861	MC930, MC830
Output Voltage	V _{OL}	11.4	10.4	0.12	-0.3	1.40	2.10	0	4.00	-	-	4.50	5.30	-	
	V _{OH}	12.0	11.0	-0.12	-0.5	1.02	2.00	1.80	4.00	4.50	5.00	4.50	5.00	8.00	
Short-Circuit	I _{SC}	10.8	9.8	-0.12	-0.5	0.80	2.00	0	4.00	-	-	4.50	5.50	-	
MC930, MC830		12.0	11.0	-0.12	-0.5	1.20	2.00	0	4.45	4.00	-	5.00	5.00	-	
MC961, MC861		12.0	11.0	-0.12	-0.5	1.10	1.80	0.45	4.00	5.00	5.00	5.00	5.00	8.00	
Reverse Current	I _R	11.4	10.4	-0.12	-0.5	0.98	1.80	0	5.0	4.00	-	5.00	5.00	-	
Output Load	V _{CEX}	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
Current	I _F	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
Forward Current	I _F	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
Propagation Delay	t _{PHL}	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
MC930, MC830		↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
MC961, MC861		↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
All Types	t _{max}	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
Switching Times	t _{tr}	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
MC930, MC830		↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
MC961, MC861		↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	

TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW.

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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

