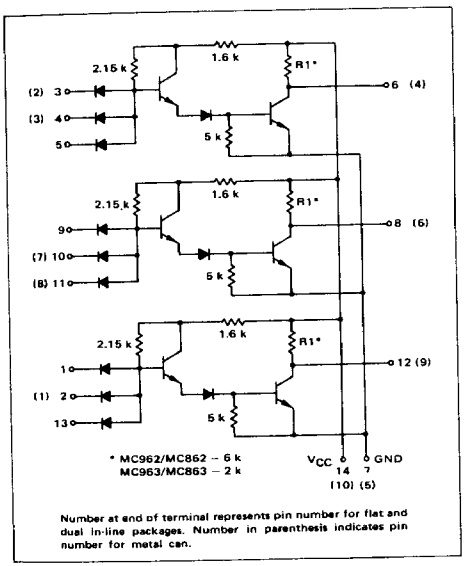
TRIPLE 3-INPUT "NAND" GATE

MC962F · MC862F, P
MC963F · MC863F, P

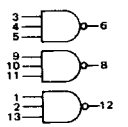
DUAL 2-INPUT "NAND" GATE PLUS INVERTER

MC962G · MC862G
MC963G · MC863G

This gate element, in the 14-pin flat and dual in-line packages, consists of three 3-input NAND gate circuits. Since the metal can (G suffix) has only 10 pins, that circuit consists of two 2-input gates and one inverter.



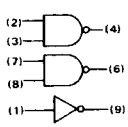
Number at end of terminal represents pin number for flat and dual in-line packages. Number in parenthesis indicates pin number for metal can.



MC962F/MC862F,P
MC963F/MC863F,P

Positive Logic: $6 = \overline{3 \cdot 4 \cdot 5}$

Negative Logic: $6 = \overline{3 + 4 + 5}$



MC962G/MC862G
MC963G/MC863G

Positive Logic: $4 = \overline{2 \cdot 3}$

Negative Logic: $4 = \overline{2 + 3}$

Input Loading Factor = 1

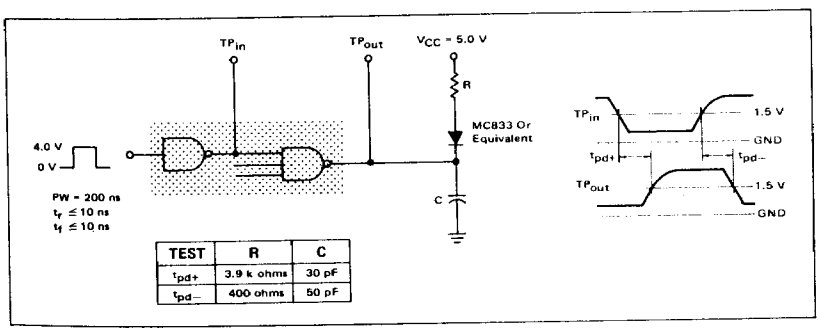
Output Loading Factor:
MC962/MC862 = 8
MC963/MC863 = 7

Total Power Dissipation:

	MC962 MC862	MC963 MC863
Inputs Low	18 mW	18 mW
Inputs High	39 mW	63 mW
50% Duty Cycle	29 mW	40 mW

Propagation Delay Time
MC962/MC862 = 30 ns typ
MC963/MC863 = 25 ns typ

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS



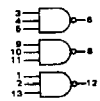
TEST	R	C
t_{pd+}	3.9 k ohms	30 pF
t_{pd-}	400 ohms	50 pF

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 flat 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												
Flat/Dual In-Line	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Metal Can	–	1	2	3	–	4	5	6	–	7	8	9	–	10



@ Test Temperature	TEST CURRENT / VOLTAGE VALUES													
	mA				Volts									
	I_{OL}		I_{OH}		V_{IL}	V_{IH}	V_F	V_R	V_{CEX}	V_{CC}	V_{CCL}	V_{CCH}	V_{max}	
	MC962	MC963	MC962	MC963										
MC962, MC963 −55°C	11.4	10.4	-0.12	-0.5	1.40	2.10	0	4.00	-	-	4.50	5.50	-	
MC962, MC963 +25°C	12.0	11.0	-0.12	-0.5	1.10	2.00	0	4.00	4.50	5.00	4.50	5.50	8.00	
MC962, MC963 +125°C	10.8	9.8	-0.12	-0.5	0.80	2.00	0	4.00	-	-	4.50	5.50	-	
	MC862	MC863	MC862	MC863										
MC862, MC863 0°C	12.0	11.0	-0.12	-0.5	1.20	2.00	0.45	4.00	-	-	5.00	5.00	-	
MC862, MC863 +25°C	12.0	11.0	-0.12	-0.5	1.10	1.90	0.45	4.00	5.00	5.00	5.00	5.00	8.00	
MC862, MC863 +75°C	11.4	10.4	-0.12	-0.5	0.95	1.80	0.50	4.00	-	-	5.00	5.00	-	

Characteristic	Symbol	Pin Under Test	MC962, MC963 TEST LIMITS −55°C Min	−55°C Max	+25°C Min	+25°C Max	+125°C Min	+125°C Max	Unit	MC862, MC863 TEST LIMITS 0°C Min	0°C Max	+25°C Min	+25°C Max	+75°C Min	+75°C Max	Unit	TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW: I_{OL}	I_{OH}	V_{IL}	V_{IH}	V_F	V_R	V_{CEX}	V_{CC}	V_{CCL}	V_{CCH}	V_{max}	Gnd
Output Voltage	V_{OL}	6	-	0.40	-	0.40	-	0.45	Vdc	-	0.45	-	0.45	-	0.50	Vdc	6	-	-	3,4,5	-	-	-	-	14	-	-	7
	V_{OH}	6	2.50	-	2.60	-	2.50	-		2.60	-	2.60	-	2.50	-		-	6	3	-	-	-	-	-	-	-	-	
																	-		4	-	-	-	-	-	-	-	-	
																	-		5	-	-	-	-	-	-	-	-	
Short-Circuit Current MC962, MC862	I_{SC}	6	-	-1.34	-	-1.34	-	-1.30	mAdc	-	-1.30	-	-1.30	-	-1.25	mAdc	-	-	-	-	-	-	-	-	-	14	-	3,6,7
MC963, MC863		6	-	-4.00	-	-4.00	-	-3.90	mAdc	-	-3.90	-	-3.90	-	-3.75	mAdc	-	-	-	-	-	-	-	-	-	14	-	3,6,7
Reverse Current	I_R	3	-	2.0	-	2.0	-	5.0	μAdc	-	5.0	-	5.0	-	10	μAdc	-	-	-	-	-	3	-	-	-	14	-	4,5,7
		4	-		-		-			-		-		-			-	-	-	-	-	4	-	-	-		-	3,5,7
		5	-		-		-			-		-		-			-	-	-	-	-	5	-	-	-		-	3,4,7
Output Leakage Current	I_{CEX}	6	-	-	-	50	-	-	μAdc	-	-	-	100	-	-	μAdc	-	-	-	-	-	-	6,14	-	-	-	-	3,7
Forward Current	I_F	3	-	-1.60	-	-1.60	-	-1.50	mAdc	-	-1.40	-	-1.40	-	-1.33	mAdc	-	-	-	-	3	4,5	-	-	-	14	-	7
		4	-		-		-			-		-		-			-	-	-	-	4	3,5	-	-	-		-	
		5	-		-		-			-		-		-			-	-	-	-	5	3,4	-	-	-		-	
Power Drain Current (Total Device) MC962/MC862	I_{PDH}	14	-	-	-	9.75	-	-	mAdc	-	-	-	12	-	-	mAdc	-	-	-	-	-	-	-	14	-	-	-	7
MC963/MC863	I_{PDH}	14	-	-	-	16	-	-		-	-	-	19.6	-	-		-	-	-	-	-	-	-	14	-	-	-	7
All Types	I_{max}	14	-	-	-	8.25	-	-		-	-	-	12	-	-		-	-	-	-	-	-	-	-	-	-	14	3,7,9,13
Switching Times																	Pulse In	Pulse Out										
MC962, MC862	t_{pd-}	3,6	-	-	25	80	-	-	ns	-	-	25	80	-	-	ns	3	6	-	-	-	-	-	14	-	-	-	7
	t_{pd-}	3,6	-	-	10	30	-	-		-	-	10	30	-	-				-	-	-	-	-		-	-	-	
MC963, MC863	t_{pd-}	3,6	-	-	15	60	-	-		-	-	15	60	-	-				-	-	-	-	-		-	-	-	
	t_{pd-}	3,6	-	-	10	30	-	-		-	-	10	30	-	-				-	-	-	-	-		-	-	-	

Pins not listed are left open.

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