

EXPANDABLE DUAL 4-INPUT  
POWER GATE

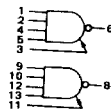
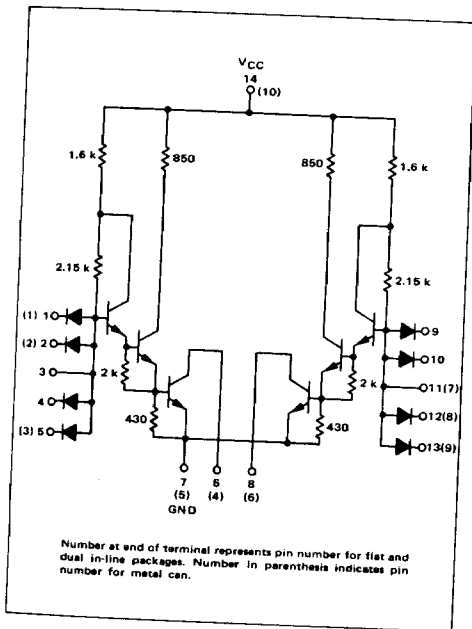
MC944F • MC844F, P

EXPANDABLE DUAL 3-2 INPUT  
POWER GATE

MC944G • MC844G

MDTL MC930/830 series

The MC944/MC844 is a dual NAND power gate with an output transistor capable of sinking more current than standard gate elements. It is useful as a high fan-out gate (with an external pull-up resistor), and as a line, relay, or lamp driver. Each output of the MC944/MC844 is capable of sinking up to 100 mA individually (90 mA if both outputs are conducting simultaneously) provided that temperature extremes are limited to 0°C to +100°C for MC944, and +15°C to +55°C for MC844. The typical breakdown voltage of the output transistor is greater than 12 V.



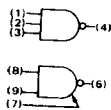
MC944F/MC844F, P

Positive Logic:

$$6 = \overline{1 \cdot 2 \cdot 4 \cdot 5} \cdot [3]$$

Negative Logic:

$$6 = \overline{1 \cdot 2 \cdot 4 + 6} \cdot [3]$$



MC944G/MC844G

Positive Logic:  $4 = \overline{1 \cdot 2 \cdot 3}$

Negative Logic:  $4 = \overline{1 \cdot 2 + 3}$

Input Loading Factor = 1  
Output Loading Factor = 27

Total Power

Dissipation:

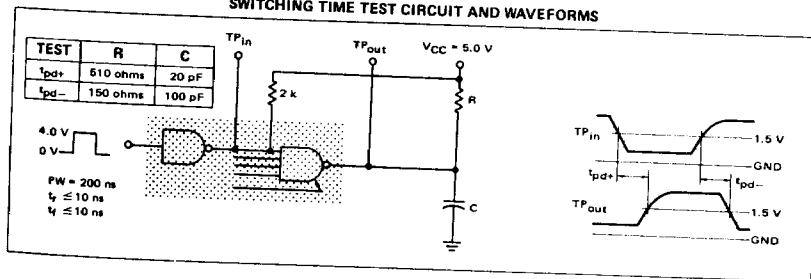
	MC944
	MC844
Inputs Low	12 mW
Inputs High	64 mW
50% Duty Cycle	38 mW

Propagation Delay Time = 30 ns typ

OPERATING RULES

- The outputs of the Dual Power Gate may be tied together to perform the wired-collector OR function.
- An external load resistor should be utilized with the Dual Power Gate. At  $V_{CC} = 5.0 \pm 0.5$  V, subtract the following output loads:  
R  
2 k $\Omega$  - 2 loads  
1 k $\Omega$  - 4 loads  
510  $\Omega$  - 8 loads
- For increased current capability, the inputs and outputs of  $\frac{1}{2}$ MC944 and  $\frac{1}{2}$ MC932 can be paralleled (up to and including 4 common outputs). The combined output will equal 100 loads while each combined input will equal 4 loads.

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS



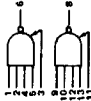
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MC944F/MC844F, P (continued)  
MC944G/MC844G (continued)

**ELECTRICAL CHARACTERISTICS**

Test procedures are shown for only one gate.  
The other gates is 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													
	-55°C		+25°C		+125°C		0°C		+75°C					
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	-	-



Characteristic	Symbol	Pin Under Test	MC944 Test Limits												MC844 Test Limits												TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW:										
			-55°C		+25°C		+125°C		0°C		+75°C		-55°C		+25°C		+125°C		0°C		+75°C		I <sub>CC</sub>		V <sub>IN</sub>		V <sub>OUT</sub>										
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	I <sub>CC</sub>	V <sub>IN</sub>	V <sub>X</sub>	V <sub>Y</sub>	V <sub>Z</sub>	V <sub>CC1</sub>	V <sub>CC2</sub>	V <sub>CO1</sub>	V <sub>CO2</sub>						
			Unit		Unit		Unit		Unit		Unit		Unit		Unit		Unit		Unit		Unit		Unit		mA		Volts		Volts								
			MC944 Test Limits												MC844 Test Limits												TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW:										
Output Voltage	V <sub>OL</sub>	6	-	0.40	-	0.40	-	0.45	-	0.45	-	0.45	-	0.50	Vdc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	
Output Breakdown Voltage	V <sub>BCE</sub>	6	-	-	-	-	-	-	-	-	-	-	-	-	Vdc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	
Reverse Current	I <sub>R</sub>	1	2	2.0	-	2.0	-	5.0	µAde	-	5.0	-	5.0	-	10	µAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	
On/Off Leakage Current	I <sub>CEX</sub>	6	-	-	-	-	-	-	-	-	-	-	-	-	100	µAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	
Forward Current	I <sub>F</sub>	1	2	-1.80	-	-1.80	-	-1.40	-	-1.40	-	-1.40	-	-1.35	mAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	
Power Dissipation Current (Total Device)	I <sub>PDH max</sub>	14	-	-	-	20	-	-	-	-	-	-	-	22.5	mAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	
Switching Times	t <sub>pd</sub> -	1,6	-	-	-	15	50	-	-	-	-	-	-	ns	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	
	t <sub>pd</sub> -	1,6	-	-	-	10	35	-	-	-	-	-	-	ns	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	
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Pins 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

