

EXPANDABLE DUAL 4-INPUT
POWER GATE

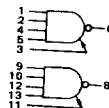
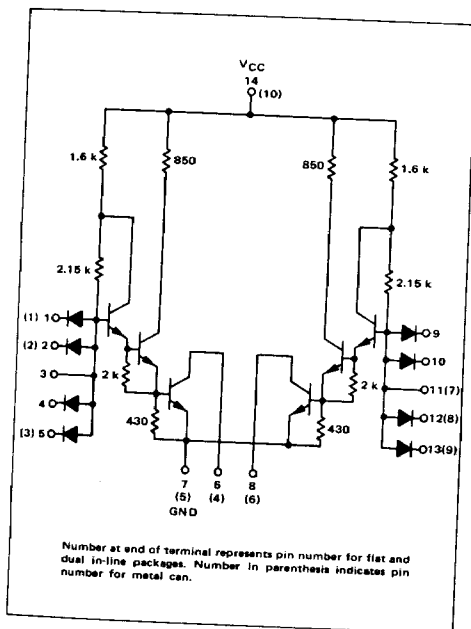
MC944F • MC844F, P

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:

$$6 = 1 \cdot 2 \cdot 4 \cdot 5 \cdot 3$$

Negative Logic:

$$6 = 1 \cdot 2 \cdot 4 \cdot 5 \cdot 3$$



MC944G/MC844G

Positive Logic: $4 = 1 \cdot 2 \cdot 3$

Negative Logic: $4 = 1 \cdot 2 \cdot 3$

Input Loading Factor = 1
Output Loading Factor = 27

Total Power
Dissipation:

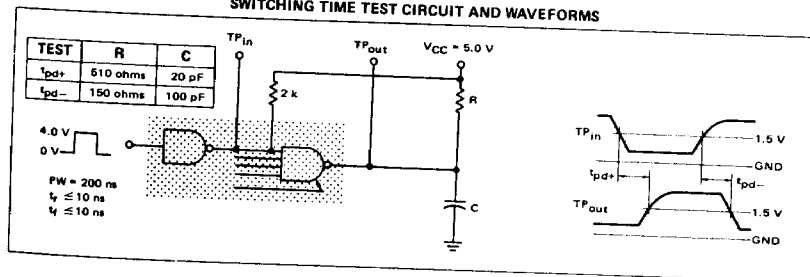
	MC944	MC844
Inputs Low	12 mW	
Inputs High	64 mW	
50% Duty Cycle	38 mW	

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 Ω - 2 loads
1 k Ω - 4 loads
510 Ω - 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

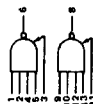


MC944F/MC844F, P (continued)
MC944G/MC844G (continued)

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 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													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
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	11	12	13	14

Characteristic	Symbol	Pin Under Test	MC944 Test Limits										MC844 Test Limits										Gnd									
			-55°C					+25°C					0°C					+75°C														
			Test	Min	Max	Min	Max	Test	Min	Max	Min	Max	Test	Min	Max	Min	Max	Test	Min	Max	Min	Max										
Output Voltage	V _{OL}	6	-	0.40	-	0.40	-	0.45	-	0.45	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	7	
Output Breakdown Voltage	V _{CE}	6	-	-	-	6.0	-	-	-	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	V _{dc}	-	1.7	
Reverse Current	I _R	1	-	2.0	-	2.0	-	5.0	-	5.0	μA _{dc}	-	10	-	10	μA _{dc}	-	10	-	10	μA _{dc}	-	10	-	10	μA _{dc}	-	10	-	10	-	2.4, 5.7
		2	-	-	-	-	-	-	-	-	μA _{dc}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4, 5.7	
		4	-	-	-	-	-	-	-	-	μA _{dc}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4, 5.7	
		5	-	-	-	-	-	-	-	-	μA _{dc}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4, 5.7	
Output Leakage Current	I _{CEX}	6	-	-	-	50	-	-	-	-	μA _{dc}	-	100	-	100	μA _{dc}	-	100	-	100	μA _{dc}	-	100	-	100	μA _{dc}	-	100	-	100	-	7
		↑	-	-	-	-	-	-	-	-	μA _{dc}	-	↑	-	↑	μA _{dc}	-	↑	-	↑	μA _{dc}	-	↑	-	↑	μA _{dc}	-	↑	-	↑	-	↑
Forward Current	I _F	1	-	-1.90	-	-1.90	-	-1.50	-	-1.40	mA _{dc}	-	-1.40	-	-1.33	mA _{dc}	-	-1.33	-	-1.33	mA _{dc}	-	-1.33	-	-1.33	mA _{dc}	-	-1.33	-	-1.33	-	↑
		2	-	-	-	-	-	-	-	-	mA _{dc}	-	-	-	-	mA _{dc}	-	-	-	-	mA _{dc}	-	-	-	-	mA _{dc}	-	-	-	-	↑	
		4	-	-	-	-	-	-	-	-	mA _{dc}	-	-	-	-	mA _{dc}	-	-	-	-	mA _{dc}	-	-	-	-	mA _{dc}	-	-	-	-	↑	
		5	-	-	-	-	-	-	-	-	mA _{dc}	-	-	-	-	mA _{dc}	-	-	-	-	mA _{dc}	-	-	-	-	mA _{dc}	-	-	-	-	↑	
Power Drain Current (Total Device)	I _{PDH} I _{max}	14	-	-	-	20	-	-	-	-	mA _{dc}	-	22.5	-	22.5	mA _{dc}	-	22.5	-	22.5	mA _{dc}	-	22.5	-	22.5	mA _{dc}	-	22.5	-	22.5	-	7
		14	-	-	-	6.0	-	-	-	-	mA _{dc}	-	6.0	-	6.0	mA _{dc}	-	6.0	-	6.0	mA _{dc}	-	6.0	-	6.0	mA _{dc}	-	6.0	-	6.0	-	7
Switching Times	t _{pd} t _{pd}	1, 6	-	15	-	50	-	-	-	-	ns	-	15	-	50	ns	-	15	-	50	ns	-	15	-	50	ns	-	15	-	50	-	7
		1, 6	-	10	-	35	-	-	-	-	ns	-	10	-	35	ns	-	10	-	35	ns	-	10	-	35	ns	-	10	-	35	-	7

Pin 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

