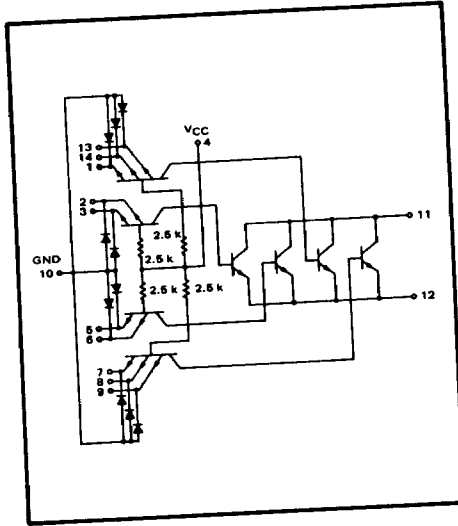


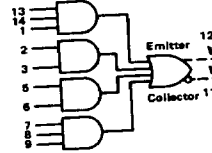
MTTL II MC2100/2000 series

4-WIDE 3-2-2-3 INPUT
EXPANDER FOR
"AND-OR-INVERT" GATES

MC2102 • MC2152
MC2002 • MC2052



This device consists of two 2-input and two 3-input AND gates ORed together with the common ORing nodes made available as the output. The basic expandable gate can be expanded up to 10 AND gates by using the MC2102 series or the MC2106 series expander package.



Total Power Dissipation = 28 mW typ/Pkg.

Propagation Delay Times:

$\Delta t_{pd} = +2.0$ ns typ

When added to the expandable AND-OR-INVERT gates.

$\Delta t_{pd}/\sigma F = +0.7$ ns/pF typ

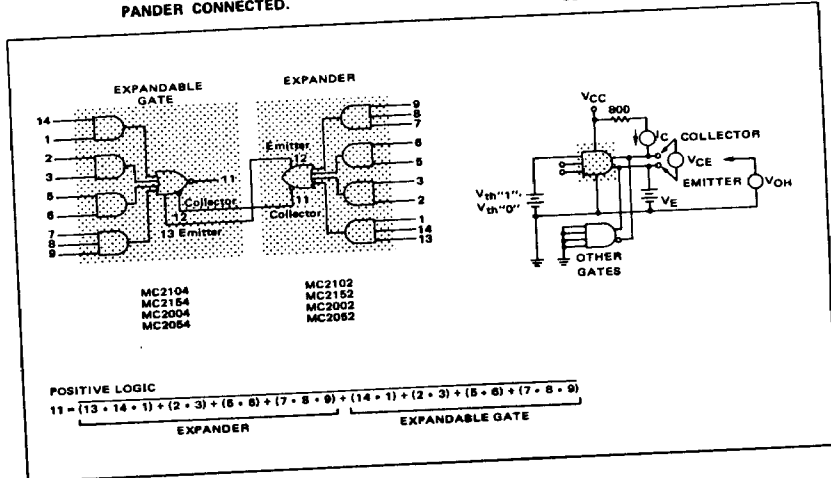
Caused by additional capacitance at expansion points.

| TYPE NO. | INPUT LOADING FACTOR | (I _F) | TEMPERATURE RANGE |
|------------------|----------------------|-------------------|-------------------|
| MC2102 MC2152 | 1 | -2.0 mA | -85°C to +128°C |
| MC2002 MC2052 | 1 | -2.5 mA | 0°C to +75°C |

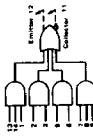
Full output loading factor of the expandable gate is maintained.

APPLICATION: EXPANDABLE 4-WIDE "AND-OR-INVERT" GATE WITH A 4-WIDE 3-2-3 INPUT EXPANDER CONNECTED.

VCE, VOH TEST CIRCUIT



ELECTRICAL CHARACTERISTICS
 Test procedures are shown for only one input of the device. To complete testing, sequence through remaining inputs in the same manner.



| Characteristic | Symbol | Pin Under Test | TEST CONDITIONS | | | | | | | | | | | | | | |
|------------------------------|---------------|----------------|-----------------|------|-------|------|--------|------|-------|------|----------------|------|------|------|-------|------|-------|
| | | | MC2102 | | | | MC2152 | | | | MC2002, MC2052 | | | | | | |
| | | | -55°C | | +25°C | | 0°C | | +25°C | | +75°C | | 0°C | | +25°C | | +75°C |
| Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | | |
| Input | | | | | | | | | | | | | | | | | |
| Forward Current | I_F | 1 | -2.0 | -2.0 | -2.0 | -2.0 | -2.5 | -2.5 | -2.5 | -2.5 | -2.5 | -2.5 | -2.5 | -2.5 | -2.5 | -2.5 | -2.5 |
| Leakage Current | I_R | 1 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Inverse Beta Current | I_L | 1 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Breakdown Voltage | $BV_{in(oh)}$ | 1 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| | $BV_{in(1)}$ | 1 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| Output | | | | | | | | | | | | | | | | | |
| Output Voltage | V_{OH} | 11 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| | $V_{CE(oh)}$ | 11 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 |
| Leakage Current | I_{OLK} | 11 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Power Requirements | | | | | | | | | | | | | | | | | |
| (Total Device) | | | | | | | | | | | | | | | | | |
| Maximum Power Supply Current | I_{max} | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Power Supply Drain | I_{PDD} | 4 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| | I_{PDL} | 4 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |

* Indicated pins tied to V_{CC} thru 800 ohms - 1.0% resistor.
 ** Indicated pins tied to V_{CEH} thru 800 ohms - 1.0% resistor.
 † V_{CE} is referenced to the emitter. Voltage (Pin 12)

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Pin-out and Package Information

Table 3-4 DSP56001A Identification by Signal Name (Continued)

| Signal Name | 132 pin "FC" PQFP or "FE" CQFP Pin No. | 88 pin "RC" PGA Pin No. | Signal Name | 132 pin "FC" PQFP or "FE" CQFP Pin No. | 88 pin "RC" PGA Pin No. |
|-------------|---|-------------------------------|-------------|---|-------------------------------|
| WT | 45 | L13 | nc | 103 | |
| X/Y | 48 | N13 | nc | 107 | |
| XTAL | 126 | A6 | nc | 110 | |
| nc | 3 | | nc | 116 | |
| nc | 4 | | nc | 117 | |
| nc | 7 | | nc | 122 | |
| nc | 17 | | nc | 125 | |
| nc | 18 | | nc | 132 | |
| nc | 21 | | | | |

Power and ground pins have special considerations for noise immunity. See the section **Design Considerations**.

Table 3-5 DSP56001A Power Supply Pins

| 132 pin "FC" PQFP or "FE" CQFP Pin No. | 88 pin "RC" PGA Pin No. | Power Supply | Circuit Supplied |
|--|-------------------------------|--------------|---------------------------|
| 63 | L8 | VCCN | Address Bus Buffers |
| 64 | | | |
| 55 | L6 | GNDN | |
| 56 | L9 | | |
| 73 | | | |
| 74 | | | |