

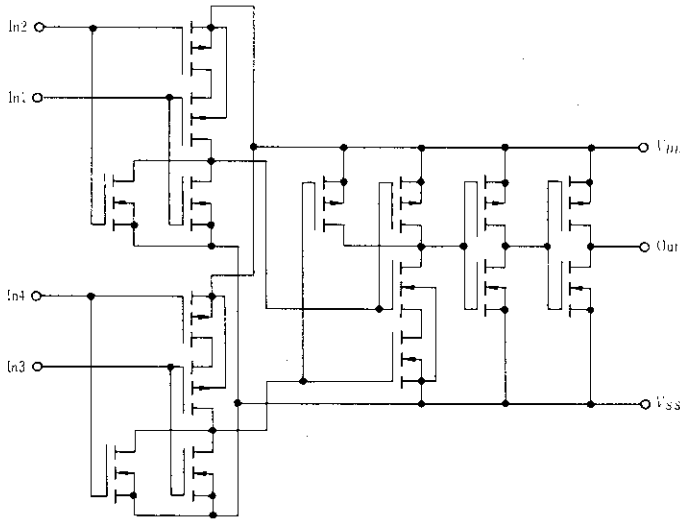
HD14072B

Dual 4-input OR Gate

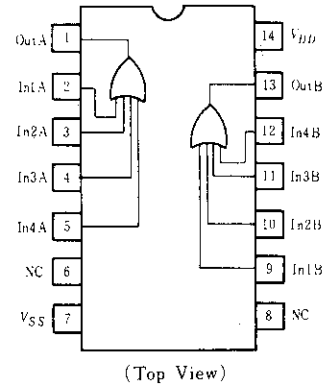
FEATURES

- Quiescent Current = 0.5nA typ/pkg @5V
- Noise Immunity = 45% of V_{DD} typ
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range
- Pin-for Pin Replacements for CD4072B and MC14072B Series

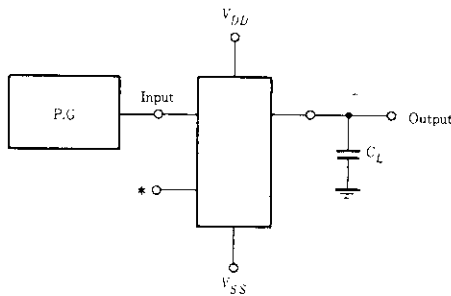
CIRCUIT SCHEMATIC (1/2)



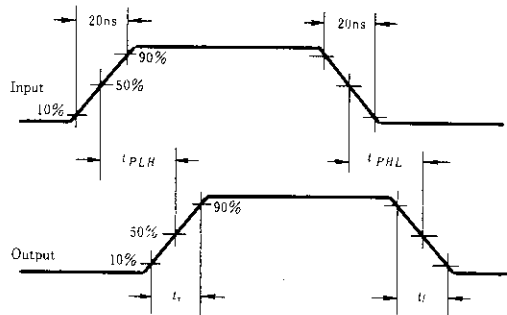
PIN ARRANGEMENT



SWITCHING TIME TEST CIRCUIT



* All Unused inputs of OR, NOR gates must be connected to V_{SS}



■ ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | Test Conditions | -40°C | | 25°C | | | 85°C | | Unit | |
|-----------------------|-----------------|--|-------|-------|------|---------|--------|------|-------|------|----|
| | | | min | max | min | typ | max | min | max | | |
| Output Voltage | V _{OL} | V _{in} = 0 | 5.0 | — | 0.05 | — | 0 | 0.05 | — | 0.05 | V |
| | | | 10 | — | 0.05 | — | 0 | 0.05 | — | 0.05 | |
| | | | 15 | — | 0.05 | — | 0 | 0.05 | — | 0.05 | |
| | V _{OH} | V _{in} = V _{DD} | 5.0 | 4.95 | — | 4.95 | 5.0 | — | 4.95 | — | V |
| | | | 10 | 9.95 | — | 9.95 | 10 | — | 9.95 | — | |
| | | | 15 | 14.95 | — | 14.95 | 15 | — | 14.95 | — | |
| Input Voltage | V _{IL} | V _{out} = 0.5V | 5.0 | — | 1.5 | — | 2.25 | 1.5 | — | 1.5 | V |
| | | | 10 | — | 3.0 | — | 4.50 | 3.0 | — | 3.0 | |
| | | | 15 | — | 4.0 | — | 6.75 | 4.0 | — | 4.0 | |
| | V _{IH} | V _{out} = 4.5V | 5.0 | 3.5 | — | 3.5 | 2.75 | — | 3.5 | — | V |
| | | | 10 | 7.0 | — | 7.0 | 5.50 | — | 7.0 | — | |
| | | | 15 | 11.0 | — | 11.0 | 8.25 | — | 11.0 | — | |
| Output Drive Current | I _{OH} | V _{OH} = 2.5V | 5.0 | -2.5 | — | -2.1 | -4.2 | — | -1.7 | — | mA |
| | | | 5.0 | -0.52 | — | -0.44 | -0.88 | — | -0.36 | — | |
| | | | 10 | -1.3 | — | -1.1 | -2.25 | — | -0.9 | — | |
| | | | 15 | -3.6 | — | -3.0 | -8.8 | — | -2.4 | — | |
| | I _{OL} | V _{OL} = 0.4V | 5.0 | 0.52 | — | 0.44 | 0.88 | — | 0.36 | — | mA |
| | | | 10 | 1.3 | — | 1.1 | 2.25 | — | 0.9 | — | |
| 15 | | | 3.6 | — | 3.0 | 8.8 | — | 2.4 | — | | |
| Input Current | I _{in} | 15 | — | ±0.3 | — | ±0.0001 | ±0.3 | — | ±1.0 | μA | |
| Input Capacitance | C _{in} | — | — | — | — | 5.0 | 7.5 | — | — | pF | |
| Quiescent Current | I _{DD} | Zero Signal, per Package | 5.0 | — | 1.0 | — | 0.0005 | 1.0 | — | 7.5 | μA |
| | | | 10 | — | 2.0 | — | 0.0010 | 2.0 | — | 15.0 | |
| | | | 15 | — | 4.0 | — | 0.0015 | 4.0 | — | 30.0 | |
| Total Supply Current* | I _T | Dynamic +I _{DD} , C _L = 50pF per Gate, f = 1kHz | 5.0 | — | — | — | 0.3 | — | — | — | μA |
| | | | 10 | — | — | — | 0.6 | — | — | — | |
| | | | 15 | — | — | — | 0.9 | — | — | — | |

* To calculate total supply current at frequency other than 1kHz.
 @ V_{DD} = 5.0V I_T = (0.3μA/kHz) / f + I_{DD}/2 @ V_{DD} = 10V I_T = 10.6μA/kHz / f + I_{DD}/2 @ V_{DD} = 15V I_T = (0.9μA/kHz) / f + I_{DD}/2

■ SWITCHING CHARACTERISTICS (C_L = 50pF, T_a = 25°C)

| Characteristic | Symbol | V _{DD} (V) | min | typ | max | Unit |
|------------------------|------------------|---------------------|-----|-----|-----|------|
| Output Rise Time | t _r | 5.0 | — | 100 | 200 | ns |
| | | 10 | — | 50 | 100 | |
| | | 15 | — | 40 | 80 | |
| Output Fall Time | t _f | 5.0 | — | 100 | 200 | ns |
| | | 10 | — | 50 | 100 | |
| | | 15 | — | 40 | 80 | |
| Propagation Delay Time | t _{PLH} | 5.0 | — | 160 | 320 | ns |
| | | 10 | — | 65 | 130 | |
| | | 15 | — | 50 | 100 | |
| | t _{PHL} | 5.0 | — | 160 | 320 | ns |
| | | 10 | — | 65 | 130 | |
| | | 15 | — | 50 | 100 | |



| | |
|--------------------------|----------|
| Hitachi Code | DP-14 |
| JEDEC | Conforms |
| EIAJ | Conforms |
| Weight (reference value) | 0.97 g |