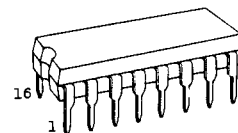


勝特力電材超市-龍山店 886-3-5773766
 勝特力電材超市-光復店 886-3-5729570
 勝特力電子(上海) 86-21-34970699
 勝特力電子(深圳) 86-755-83298787
<http://www.100y.com.tw>

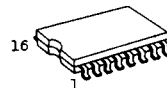
TC4063BP/TC4063BF 4-BIT MAGNITUDE COMPARATOR

TC4063BP/BF is weighted comparator which compares magnitude of 4 bits input data B₀ through B₃. When TC4063BP/BF is used, the signals of larger, smaller and equal can be obtained at three output lines by the cascade input mode of three lines of (A>B)_{IN}, (A=B)_{IN} and (A<B)_{IN}.

Cascade connection of n number of TC4063BP/BF's easily realizes magnitude comparator of 4 × n bits.



DIP 16(3D16A-P)

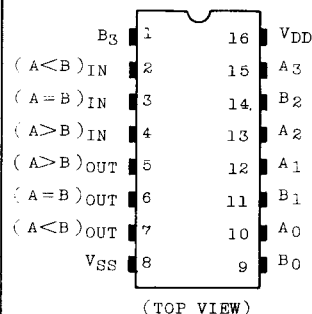


MFP 16 (F16GC-P)

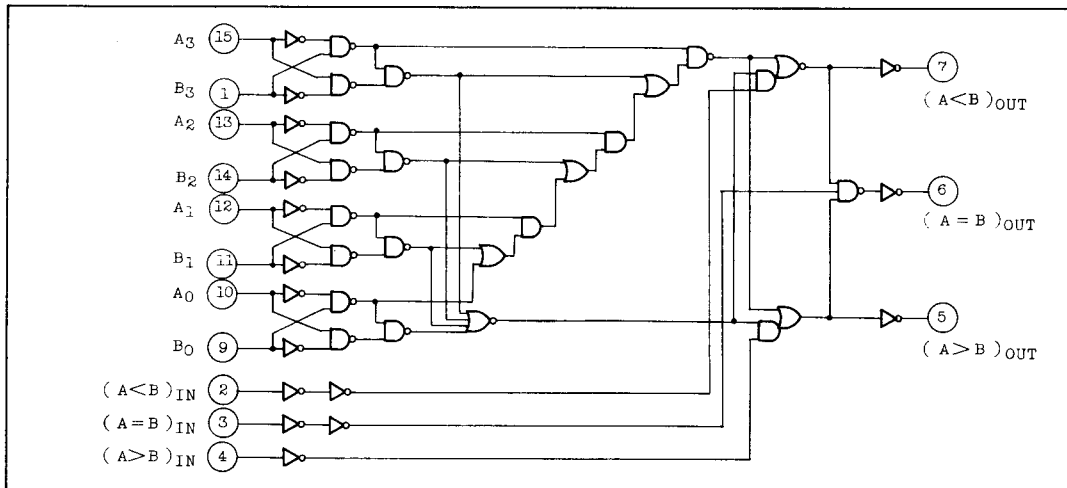
ABSOLUTE MAXIMUM RATINGS

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------------|------------------|---|------|
| DC Supply Voltage | V _{DD} | V _{SS} -0.5 ~ V _{SS} +20 | V |
| Input Voltage | V _{IN} | V _{SS} -0.5 ~ V _{DD} +0.5 | V |
| Output Voltage | V _{OUT} | V _{SS} -0.5 ~ V _{DD} +0.5 | V |
| DC Input Current | I _{IN} | ±10 | mA |
| Power Dissipation | P _D | 300(DIP)/180(MFP) | mW |
| Operating Temperature Range | T _A | -40 ~ 85 | °C |
| Storage Temperature Range | T _{stg} | -65 ~ 150 | °C |
| Lead Temp./Time | T _{sol} | 260°C · 10 sec | |

PIN ASSIGNMENT



LOGIC DIAGRAM



TRUTH TABLE

| INPUTS | | | | | | | OUTPUTS | | | * Don't care |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|-----------|-------|-------|---------|-------|-------|--------------|
| COMPARING | | | | CASCADING | | | | | | |
| A ₃ , B ₃ | A ₂ , B ₂ | A ₁ , B ₁ | A ₀ , B ₀ | A < B | A = B | A > B | A < B | A = B | A > B | |
| A ₃ > B ₃ | * | * | * | * | * | * | L | L | H | |
| A ₃ = B ₃ | A ₂ > B ₂ | * | * | * | * | * | L | L | H | |
| A ₃ = B ₃ | A ₂ = B ₂ | A ₁ > B ₁ | * | * | * | * | L | L | H | |
| A ₃ = B ₃ | A ₂ = B ₂ | A ₁ = B ₁ | A ₀ > B ₀ | * | * | * | L | L | H | |
| A ₃ = B ₃ | A ₂ = B ₂ | A ₁ = B ₁ | A ₀ = B ₀ | L | L | H | L | L | H | |
| A ₃ = B ₃ | A ₂ = B ₂ | A ₁ = B ₁ | A ₀ = B ₀ | L | H | L | L | H | L | |
| A ₃ = B ₃ | A ₂ = B ₂ | A ₁ = B ₁ | A ₀ = B ₀ | H | L | L | H | L | L | |
| A ₃ = B ₃ | A ₂ = B ₂ | A ₁ = B ₁ | A ₀ < B ₀ | * | * | * | H | L | L | |
| A ₃ = B ₃ | A ₂ < B ₂ | * | * | * | * | * | H | L | L | |
| A ₃ < B ₃ | * | * | * | * | * | * | H | L | L | |

RECOMMENDED OPERATING CONDITIONS (V_{SS}=0V)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-------------------|-----------------|------|------|-----------------|------|
| DC Supply Voltage | V _{DD} | 3 | - | 18 | V |
| Input Voltage | V _{IN} | 0 | - | V _{DD} | V |

STATIC ELECTRICAL CHARACTERISTICS (V_{SS}=0V)

| CHARACTERISTIC | SYM-BOL | TEST CONDITION | V _{DD} (V) | -40°C | | 25°C | | | 85°C | | UNIT |
|---------------------------|-----------------|---|------------------------|-------|------|-------|-------|------|-------|------|------|
| | | | | MIN. | MAX. | MIN. | TYP. | MAX. | MIN. | MAX. | |
| High-Level Output Voltage | V _{OH} | I _{OUT} < 1μA V _{IN} =V _{SS} , V _{DD} | 5 | 4.95 | - | 4.95 | 5.00 | - | 4.95 | - | V |
| | | | 10 | 9.95 | - | 9.95 | 10.00 | - | 9.95 | - | |
| | | | 15 | 14.95 | - | 14.95 | 15.00 | - | 14.95 | - | |
| Low-Level Output Voltage | V _{OL} | I _{OUT} < 1μA V _{IN} =V _{SS} , V _{DD} | 5 | - | 0.05 | - | 0.00 | 0.05 | - | 0.05 | V |
| | | | 10 | - | 0.05 | - | 0.00 | 0.05 | - | 0.05 | |
| | | | 15 | - | 0.05 | - | 0.00 | 0.05 | - | 0.05 | |
| Output High Current | I _{OH} | V _{OH} =4.6V V _{OH} =2.5V V _{OH} =9.5V V _{OH} =13.5V V _{IN} =V _{SS} , V _{DD} | 5 | -0.61 | - | -0.51 | -1.0 | - | -0.42 | - | mA |
| | | | 5 | -2.5 | - | -2.1 | -4.0 | - | -1.7 | - | |
| | | | 10 | -1.5 | - | -1.3 | -2.2 | - | -1.1 | - | |
| | | | 15 | -4.0 | - | -3.4 | -9.0 | - | -2.8 | - | |
| | | | | | | | | | | | |

STATIC ELECTRICAL CHARACTERISTICS (V_{SS}=0V)

| CHARACTERISTIC | SYM-BOL | TEST CONDITION | V _{DD} (V) | -40°C | | 25°C | | | 85°C | | UNIT | |
|--------------------------|------------------|---|----------------------|-------|------|------|-------|-------------------|------|------|------|----|
| | | | | MIN. | MAX. | MIN. | TYP. | MAX. | MIN. | MAX. | | |
| Output Low Current | I _O L | V _{OL} =0.4V | 5 | 0.61 | - | 0.51 | 1.5 | - | 0.42 | - | mA | |
| | | V _{OL} =0.5V | 10 | 1.5 | - | 1.3 | 3.8 | - | 1.1 | - | | |
| | | V _{OL} =1.5V | 15 | 4.0 | - | 3.4 | 15.0 | - | 2.8 | - | | |
| | | V _{IN} =V _{SS} , V _{DD} | | | | | | | | | | |
| Input High Voltage | V _I H | V _{OUT} =0.5V, 4.5V | 5 | 3.5 | - | 3.5 | 2.75 | - | 3.5 | - | V | |
| | | V _{OUT} =1.0V, 9.0V | 10 | 7.0 | - | 7.0 | 5.5 | - | 7.0 | - | | |
| | | V _{OUT} =1.5V, 13.5V | 15 | 11.0 | - | 11.0 | 8.25 | - | 11.0 | - | | |
| | | I _{OUT} < 1μA | | | | | | | | | | |
| Input Low Voltage | V _I L | V _{OUT} =0.5V, 4.5V | 5 | - | 1.5 | - | 2.25 | 1.5 | - | 1.5 | V | |
| | | V _{OUT} =1.0V, 9.0V | 10 | - | 3.0 | - | 4.5 | 3.0 | - | 3.0 | | |
| | | V _{OUT} =1.5V, 13.5V | 15 | - | 4.0 | - | 6.75 | 4.0 | - | 4.0 | | |
| | | I _{OUT} < 1μA | | | | | | | | | | |
| Input Current | "H" Level | I _I H | V _I H=18V | 18 | - | 0.1 | - | 10 ⁻⁵ | 0.1 | - | 1.0 | μA |
| | "L" Level | I _I L | V _I L=0V | 18 | - | -0.1 | - | -10 ⁻⁵ | -0.1 | - | -1.0 | |
| Quiescent Device Current | I _{DD} | V _{IN} =V _{SS} , V _{DD} * | 5 | - | 5 | - | 0.005 | 5 | - | 150 | μA | |
| | | | 10 | - | 10 | - | 0.010 | 10 | - | 300 | | |
| | | | 15 | - | 20 | - | 0.015 | 20 | - | 600 | | |

* All valid input combinations.

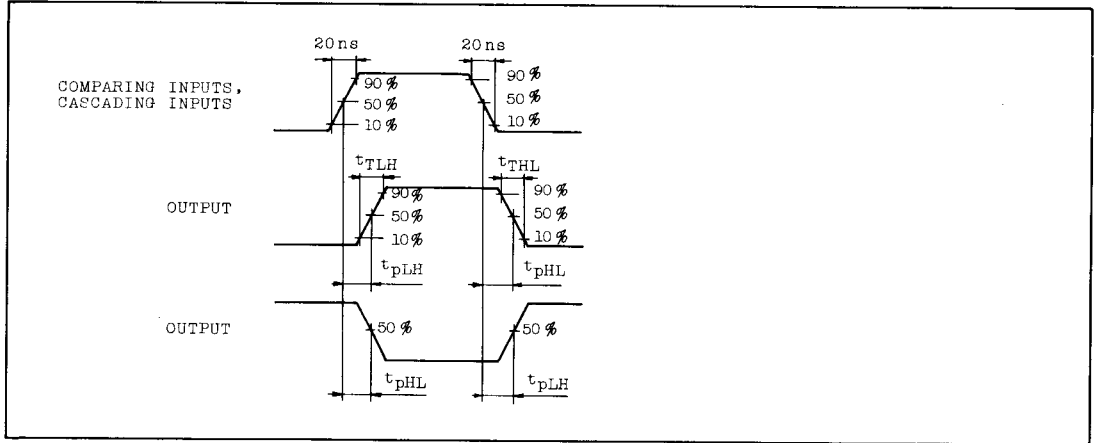
DYNAMIC ELECTRICAL CHARACTERISTICS (T_a=25°C, V_{SS}=0V, C_L=50pF)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | V _{DD} (V) | MIN. | TYP. | MAX. | UNIT |
|---|--------------------------------------|----------------|---------------------|------|------|------|------|
| | | | | | | | |
| Output Transition Time (Low to High) | t _{TLH} | | 5 | - | 80 | 200 | ns |
| | | | 10 | - | 50 | 100 | |
| | | | 15 | - | 40 | 80 | |
| Output Transition Time (High to Low) | t _{THL} | | 5 | - | 80 | 200 | ns |
| | | | 10 | - | 50 | 100 | |
| | | | 15 | - | 40 | 80 | |
| Propagation Delay Time (COMPARING INPUTS - OUTPUTS) | t _{pLH} t _{pHL} | | 5 | - | 340 | 1250 | ns |
| | | | 10 | - | 140 | 500 | |
| | | | 15 | - | 100 | 350 | |

DYNAMIC ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, $V_{SS}=0\text{V}$, $C_L=50\text{pF}$)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | V_{DD} (V) | MIN. | TYP. | MAX. | UNIT |
|---|------------------------|----------------|--------------|------|------|------|------|
| | | | | | | | |
| Propagation Delay Time (CASCADING INPUTS - OUTPUTS) | t_{pLH} t_{pHL} | | 5 | - | 280 | 1000 | ns |
| | | | 10 | - | 110 | 400 | |
| | | | 15 | - | 90 | 280 | |
| Input Capacitance | C_{IN} | | | - | 5 | 7.5 | pF |

WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS



APPLICATION CIRCUIT

