Dual comparators BA10393 / BA10393F / BA10393N

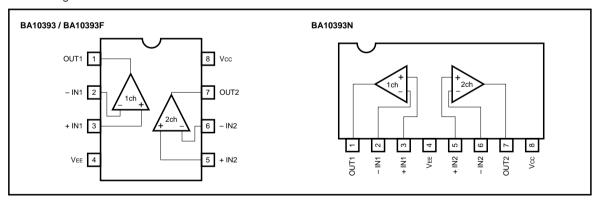
The BA10393, BA10393F, and BA10393N are dual comparators with open-collector output which allows wired OR connections.

The operating power supply voltage ranges from 2 to 36V for a single power supply and \pm 1 to \pm 18V for a dual power supply. The packages are as follows: DIP 8-pin (BA10393), SOP 8-pin (BA10393F), and SIP 8-pin (BA10393N).

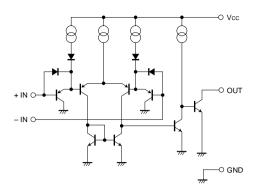
Features

- Wide operating voltage range.
 (Single power supply: 2 to 36V, dual power supply: ± 1 to ± 18V)
- 2) Low current dissipation. (0.4mA typ. at Vcc = 5V)
- Low input offset voltage. (25nA typ. at Vcc = 5V) and low input offset voltage. (typically ±1.0mV at Vcc = 5V)
- 4) Wide common-mode input voltage. (0 to Vcc 1.5V)
- 5) Open collector output.
- Compatible with 393 comparators from other manufacturers.

Block diagram



Internal circuit configuration



● Absolute maximum ratings (Ta = 25°C)

| Parameter | Symbol | | 1.1:4 | | |
|----------------------------|--------|--------------|----------------------------|---------------------|------|
| | | BA10393 | BA10393F | BA10393N | Unit |
| Power supply voltage | Vcc | 36 (± 18) | 36 (± 18) | 36 (± 18) | V |
| Power dissipation | Pd | 800* | 550* | 900* | mW |
| Differential input voltage | VID | ± Vcc | ± Vcc | ± Vcc | V |
| Common-mode input voltage | Vı | - 0.3 ~ Vcc | - 0.3 ~ Vcc | - 0.3 ~ Vcc | V |
| Operating temperature | Topr | - 40 ~ + 85 | - 40 ~ + 85 | - 40 ~ + 85 | °C |
| Storage temperature | Tstg | - 55 ~ + 125 | – 55 ~ + 125 | - 55 ~ + 125 | °C |

^{*} Refer to the Pd characteristics diagram.

●Electrical characteristics (unless otherwise noted, Ta = 25°C, Vcc = + 5V)

| Parameter | Symbol | Min. | Тур. | Max. | Unit | Conditions |
|---------------------------|--------|------|------|----------|------|---|
| Input offset voltage | Vio | _ | ± 1 | ± 5 | mV | Vo = 1.4V |
| Input offset current | lio | _ | ± 5 | ± 50 | nA | $ I_{IN}^+ - I_{IN}^- $, Vo = 1.4V |
| Input bias current | Ів | _ | 25 | 250 | nA | Vo = 1.4V |
| Common-mode input voltage | Vicм | 0 | _ | Vcc -1.5 | V | |
| Voltage gain | Av | 93 | 106 | _ | dB | R _L = 15kΩ, Vcc = 15V |
| Quiescent current | lα | _ | 0.4 | 1 | mA | R _L = ∞, on All Comparators |
| Output sink current | İsink | 6 | 16 | _ | mA | V _{IN} ⁻ = + 1V, V _{IN} ⁺ = 0V, V _O = 1.5V |
| Output saturation voltage | Vol | _ | 250 | 400 | mV | V _{IN} ⁻ = + 1V, V _{IN} + = 0V, I _{sink} = 4mA |
| Output leakage current | lleak | _ | 0.1 | _ | nA | V _{IN} ⁺ = + 1V, V _{IN} ⁻ = 0V,V _O = 5V |
| Response time | tr | _ | 1.3 | _ | μs | $R_L = 5.1 k\Omega$, $V_{RL} = 5V$ |

The values for the BA10393F are those when it is mounted on a glass epoxy PCB ($50 \text{mm} \times 50 \text{mm} \times 1.6 \text{mm}$).

Electrical characteristic curves

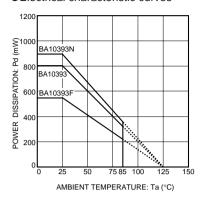


Fig. 1 Power dissipation vs. ambient temperature

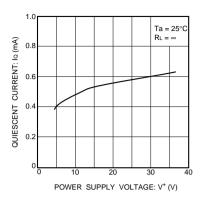


Fig. 2 Quiescent current vs. power supply voltage

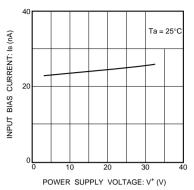


Fig. 3 Input bias current vs. power supply voltage

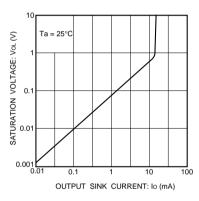


Fig. 4 Output saturation voltage vs. output current

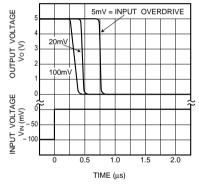


Fig. 5 Propagation characteristics (I)

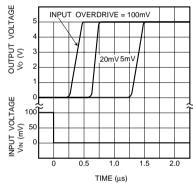


Fig. 6 Propagation characteristics (II)

Operation notes

(1) Handling unused circuits

If a circuit is not in use, we recommend connecting it as shown in Figure 7, so that its input is connected to the potential within the in-phase input voltage range (VICM) and the output is left open.

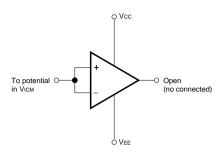
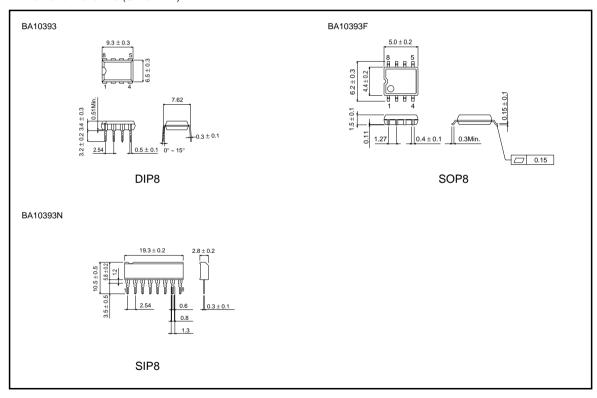


Fig. 7 Example of unused circuit connection

External dimensions (Units: mm)



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