

Dual comparators

BA10393 / BA10393F / BA10393N

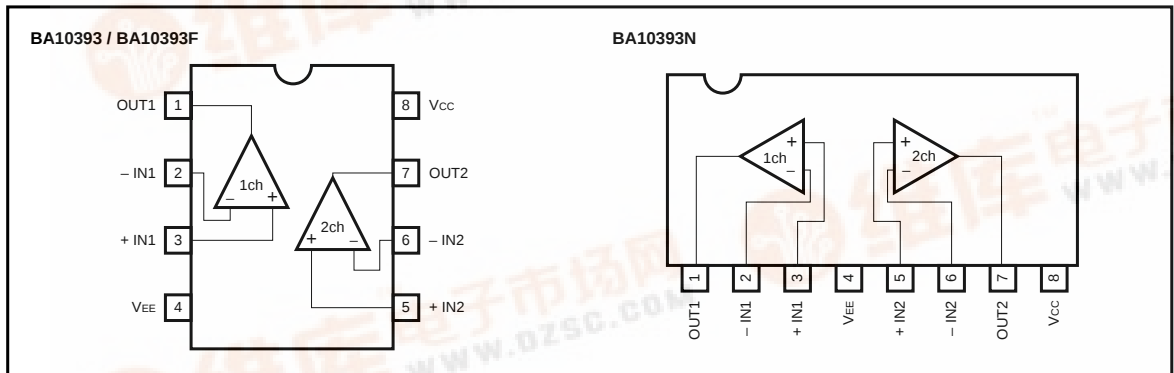
The BA10393, BA10393F, and BA10393N are dual comparators with open-collector output which allows wired OR connections.

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

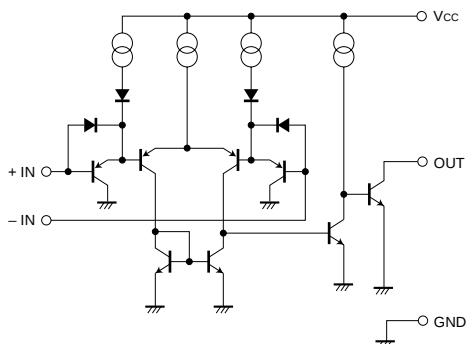
●Features

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

●Block diagram



● Internal circuit configuration



● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits			Unit
		BA10393	BA10393F	BA10393N	
Power supply voltage	V _{CC}	36 (± 18)	36 (± 18)	36 (± 18)	V
Power dissipation	P _d	800*	550*	900*	mW
Differential input voltage	V _{ID}	± V _{CC}	± V _{CC}	± V _{CC}	V
Common-mode input voltage	V _I	- 0.3 ~ V _{CC}	- 0.3 ~ V _{CC}	- 0.3 ~ V _{CC}	V
Operating temperature	T _{opr}	- 40 ~ + 85	- 40 ~ + 85	- 40 ~ + 85	°C
Storage temperature	T _{stg}	- 55 ~ + 125	- 55 ~ + 125	- 55 ~ + 125	°C

* Refer to the P_d characteristics diagram.

The values for the BA10393F are those when it is mounted on a glass epoxy PCB (50mm × 50mm × 1.6mm).

● Electrical characteristics (unless otherwise noted, Ta = 25°C, V_{CC} = + 5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input offset voltage	V _{IO}	—	± 1	± 5	mV	V _O = 1.4V
Input offset current	I _{IO}	—	± 5	± 50	nA	I _{IN} ⁺ - I _{IN} ⁻ , V _O = 1.4V
Input bias current	I _B	—	25	250	nA	V _O = 1.4V
Common-mode input voltage	V _{ICM}	0	—	V _{CC} - 1.5	V	
Voltage gain	A _v	93	106	—	dB	R _L = 15kΩ, V _{CC} = 15V
Quiescent current	I _Q	—	0.4	1	mA	R _L = ∞, on All Comparators
Output sink current	I _{sink}	6	16	—	mA	V _{IN} ⁻ = + 1V, V _{IN} ⁺ = 0V, V _O = 1.5V
Output saturation voltage	V _{OL}	—	250	400	mV	V _{IN} ⁻ = + 1V, V _{IN} ⁺ = 0V, I _{sink} = 4mA
Output leakage current	I _{leak}	—	0.1	—	nA	V _{IN} ⁺ = + 1V, V _{IN} ⁻ = 0V, V _O = 5V
Response time	t _r	—	1.3	—	μs	R _L = 5.1kΩ, V _{RL} = 5V

●Electrical characteristic curves

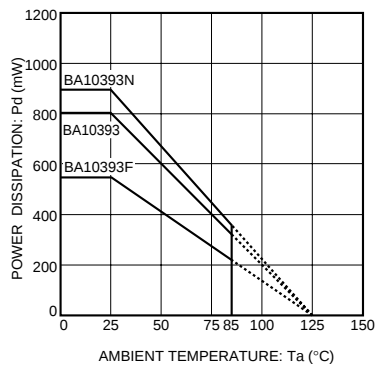


Fig. 1 Power dissipation vs. ambient temperature

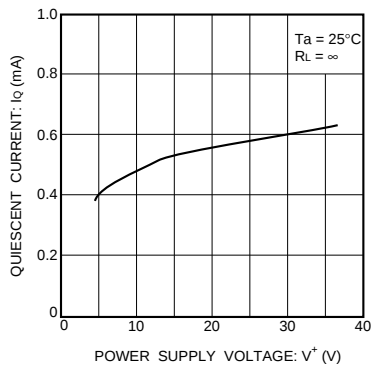


Fig. 2 Quiescent current vs. power supply voltage

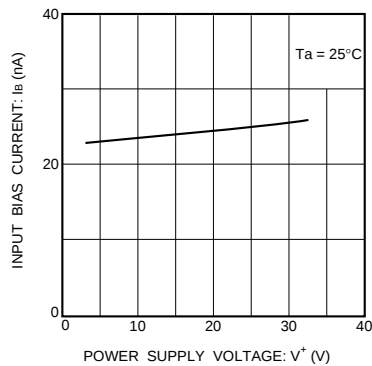


Fig. 3 Input bias current vs. power supply voltage

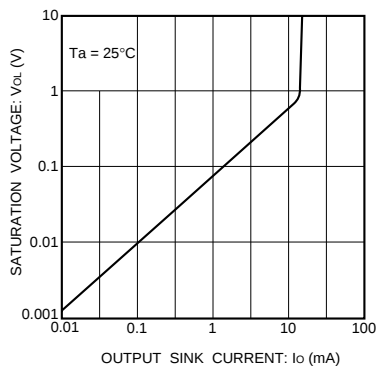


Fig. 4 Output saturation voltage vs. output current

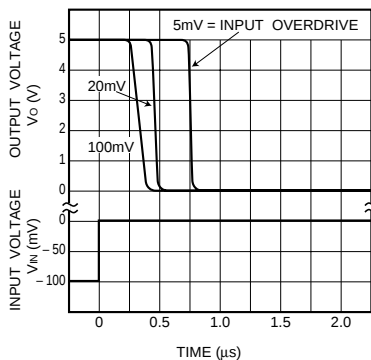


Fig. 5 Propagation characteristics (I)

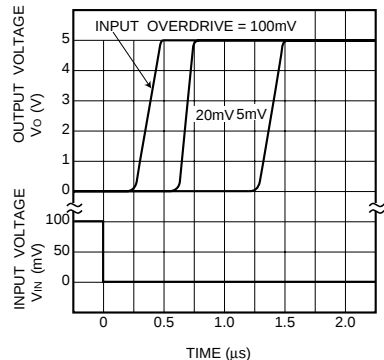


Fig. 6 Propagation characteristics (II)

●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 (V_{ICM}) and the output is left open.

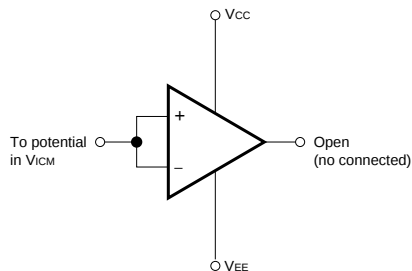
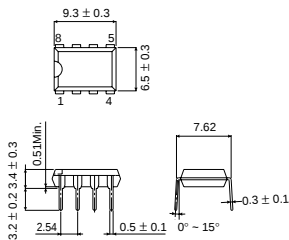


Fig. 7 Example of unused circuit connection

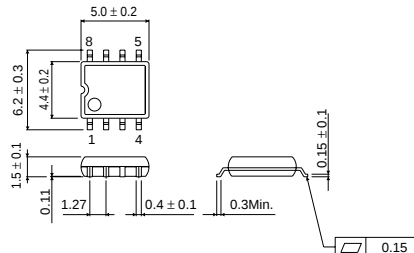
●External dimensions (Units: mm)

BA10393



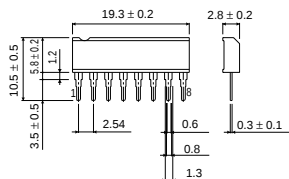
DIP8

BA10393F



SOP8

BA10393N



SIP8