

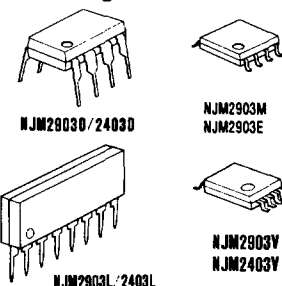
NJM2903/2403

The NJM2903/2403 consist of two independent precision voltage comparators with an offset voltage specification as low as 5.0mV max for two comparators which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. The NJM2903/2403 has a unique characteristics: the input common-mode voltage range includes ground, even though operated from a single power supply voltage. Application areas include limit comparators, simple analog-to-digital converters; pulse, square-wave and time delay generators; wide range Vco; MOS clock timers; multivibrators and high voltage digital logic gates. The NJM2903/2403 were designed to directly interface with TTL and CMOS. When operated from both plus and minus power supplies, the NJM2903/2403 will directly interface with MOS logic where their low power drain is a distinct advantage over standard comparators.

Absolute Maximum Ratings (Ta=25°C)

Supply Voltage	V ⁺	36V (or ±18V)
Differential Input Voltage	V _{ID}	36V
Input Voltage	V _{IN}	-0.3~+36V
Power Dissipation	P _D (D-Type)	500mW
	(M-Type)	300mW
	(V-type)	250mW
	(L-Type)	800mW
Operating Temperature Range	T _{opr}	-40~+85°C
Storage Temperature Range	T _{stg}	-50~+125°C

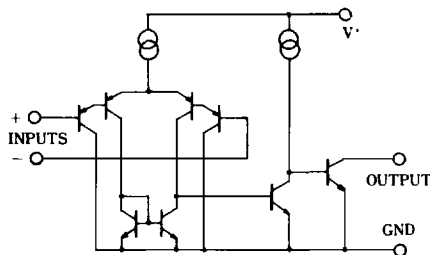
Package Outline



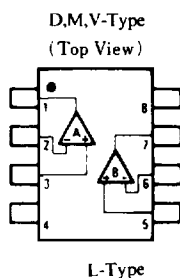
Electrical Characteristics (V⁺=5V, Ta=25°C)

Parameter	Symbol	Test Condition	2903			2403			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Input Offset Voltage	V _{IO}	R _S =0Ω, V _O ≅1.4V	—	—	7	—	—	10	mV
Input Offset Current	I _{IO}		—	—	50	—	—	100	nA
Input Bias Current	I _B		—	30	250	—	40	500	nA
Input Common Mode Voltage Range	V _{ICM}		0~3.5	—	—	0~3.5	—	—	V
Large Signal Voltage Gain	A _V	R _L =15kΩ	—	106	—	—	106	—	dB
Response Time	t _r	R _L =5.1kΩ	—	1.5	—	—	1.5	—	μs
Output Sink Current	I _{SINK}	V _{IN} ⁻ =1V, V _{IN} ⁺ =0V, V _O =1.5V	6	—	—	20	—	—	mA
Output Saturation Voltage	V _{SAT}	V _{IN} ⁻ =1V, V _{IN} ⁺ =0V, I _{SINK} =3mA	—	200	400	—	—	—	mV
Output Saturation Voltage	V _{SAT}	V _{IN} ⁻ =1V, V _{IN} ⁺ =0V, I _{SINK} =15mA	—	—	—	—	200	400	mV
Output Saturation Voltage	I _{LEAK}	V _{IN} ⁻ =0V, V _{IN} ⁺ =0V, V _O =5V	—	—	1.0	—	—	1.0	μA
Supply Current	I _{CC}		—	0.4	1.0	—	0.5	1.5	mA

Equivalent Circuit (1/2 Shown)



Connection Diagram



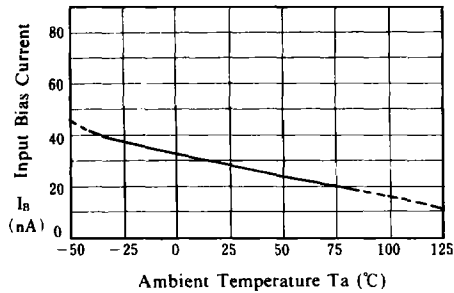
PIN FUNCTION

1. A OUTPUT
2. A-INPUT
3. A+INPUT
4. GND
5. B+INPUT
6. B-INPUT
7. B OUTPUT
8. V⁺

■ Typical Characteristics

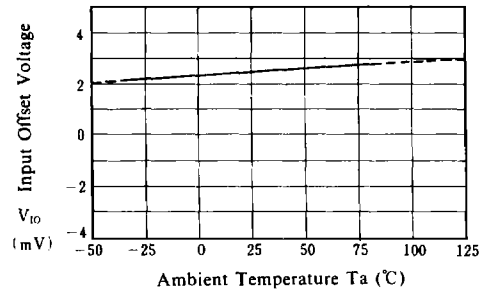
Input Bias Current vs. Temperature

($V^+ = 5\text{ V}$)



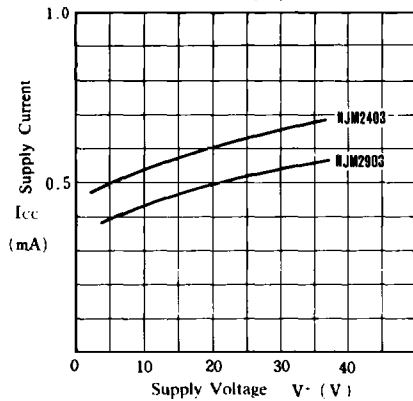
Input Offset Voltage vs. Temperature

($V^+ = 5\text{ V}$)



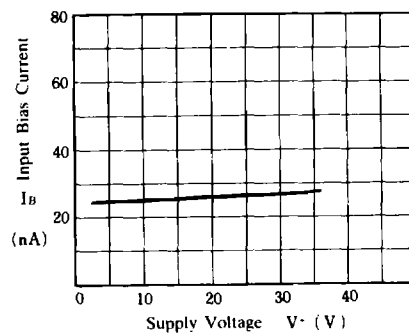
Supply Current vs. Supply Voltage

($T_a = 25^\circ\text{C}$)



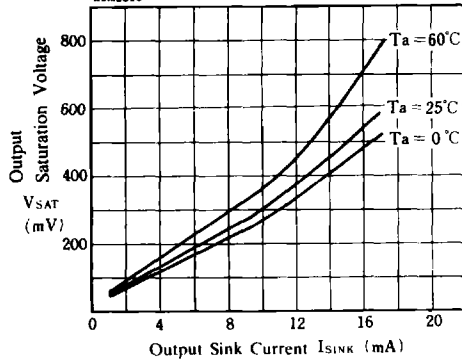
Input Bias Current vs. Supply Voltage

($T_a = 25^\circ\text{C}$)



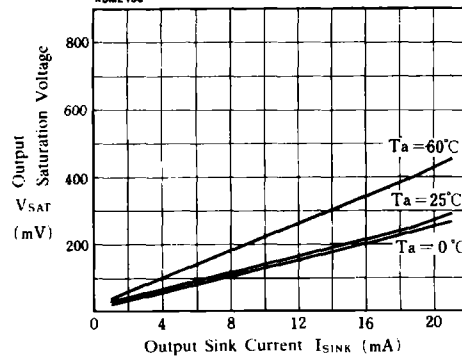
NJM2903 Output Saturation Voltage vs. Output Sink Current

($V^+ = 5\text{ V}$)

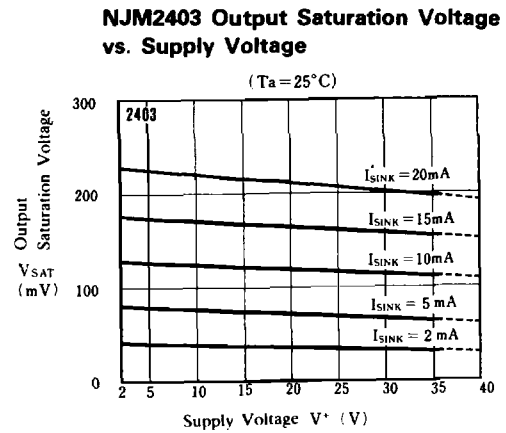
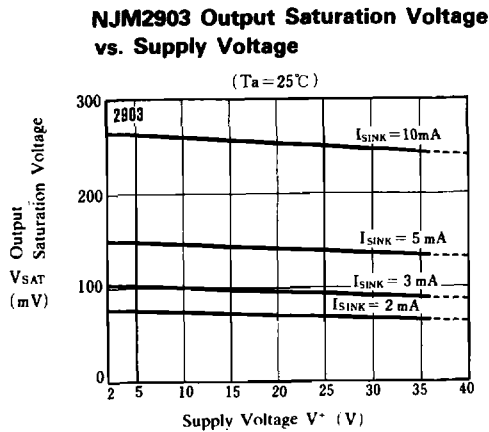
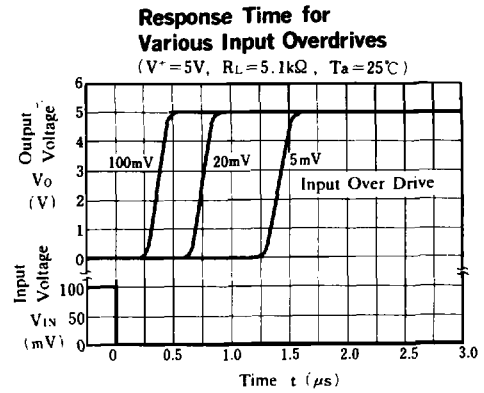
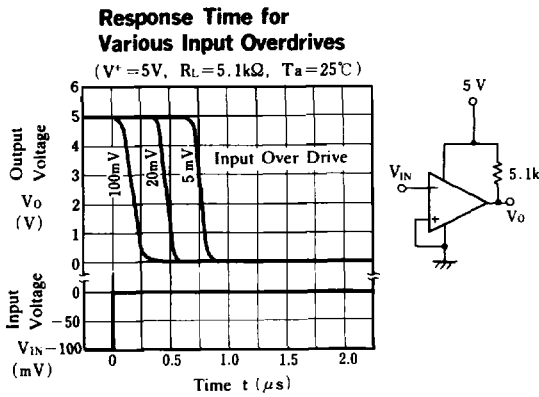


NJM2403 Output Saturation Voltage vs. Output Sink Current

($V^+ = 5\text{ V}$)



■ Typical Characteristics



■ Typical Applications

