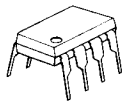
NJM2903/2403

The NJM2903/2403 consist of two independent precision voltage comparators with an offset voltage specificaiton 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)

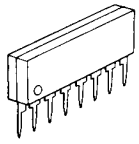
Supply Voltage	V^+	36V (or ±18V)
Differential Input Voltage	V_{ID}	36V
Input Voltage	V_{IN}	−0.3~+36V
Power Dissipation	P_D (D-Type)	500mW
	(M, E-Type)	300mW
	(L-Type)	800mW
Operating Temperature Range	T_{opr}	−40~+85°C
Storage Temperature Range	T_{stg}	−50~+125°C

■ Package Outline


NJM2903D/2403D


NJM2903M/2403M

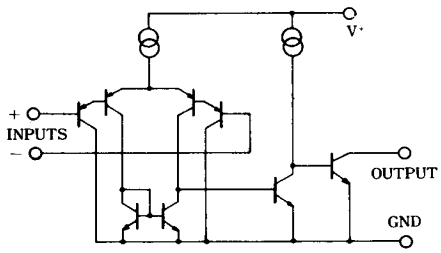

NJM2903E


NJM2903L/2403L

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

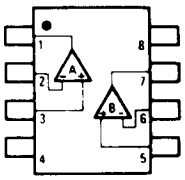
Parameter	Symbol	Test Condition	2903			2403			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Input Offset Voltage	V_{IO}	R_S=0Ω, V_o≅1.4V	—	—	±7	—	—	±10	mV
Input Offset Current	I_{IO}	$I_{IN}^+ - I_{IN}^-$	—	—	±50	—	—	±100	nA
Input Bias Current	I_B		—	—	250	—	—	500	nA
Input Common Mode Voltage Range	V_{ICM}		0~3.5	—	—	0~3.5	—	—	V
Large Signal Voltage Gain	Av	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 Leakage Current	I_{LEAK}	V_{IN-}=0V, V_{IN+}=1V, V_O=5V	—	—	1.0	—	—	1.0	μA
Supply Current	I_{CC}		—	0.4	1.0	—	0.5	1.5	mA

■ Equivalent Circuit (½ Shown)



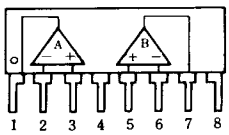
■ Connection Diagram

D,M,E-Type
(Top View)



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

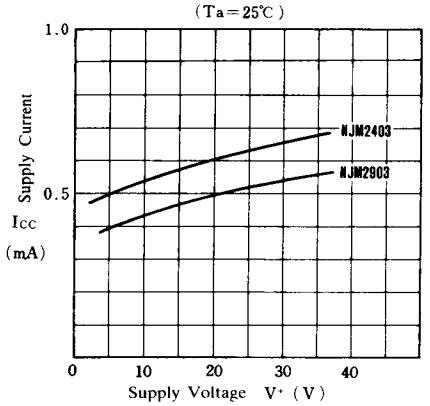
L-Type



■ **Typical Characteristics**

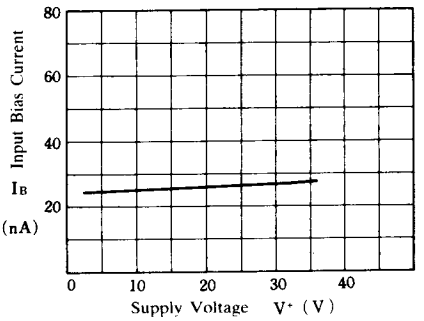
Supply Current vs. Supply Voltage

(Ta=25℃)



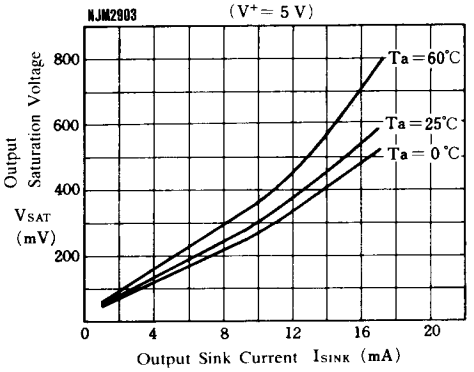
Input Bias Current vs. Supply Voltage

(Ta=25℃)



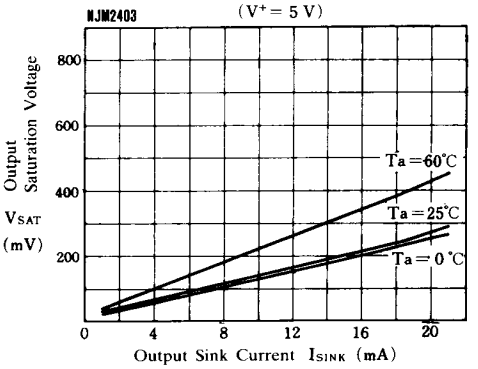
NJM2903 Output Saturation Voltage vs. Output Sink Current

(V+= 5 V)



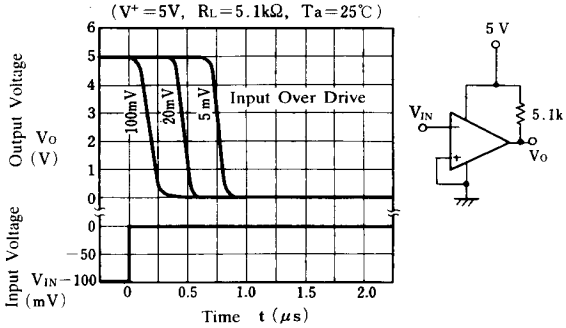
NJM2403 Output Saturation Voltage vs. Output Sink Current

(V+= 5 V)



Response Time for Various Input Overdrives

(V+=5V, RL=5.1kΩ, Ta=25℃)



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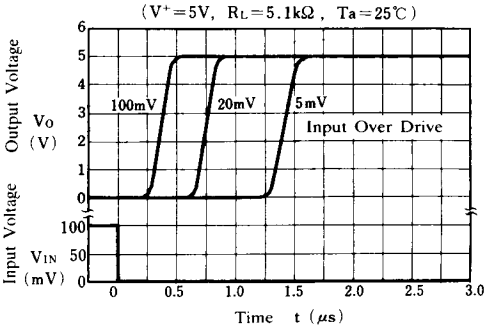
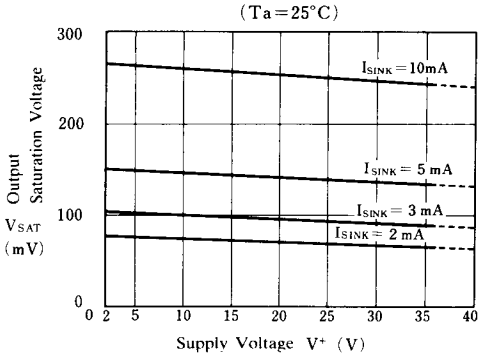
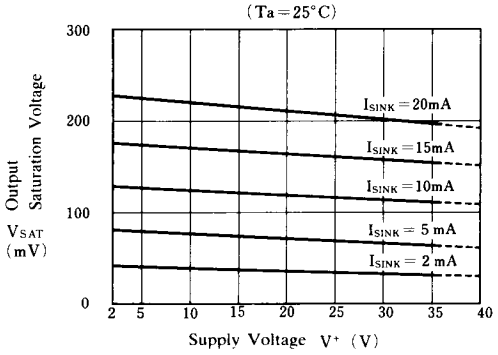


■ Typical Characteristics

NJM2903 Output Saturation Voltage vs. Supply Voltage

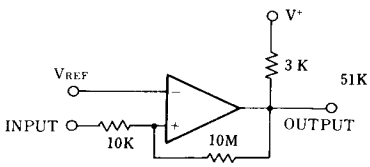


NJM2403 Output Saturation Voltage vs. Supply Voltage

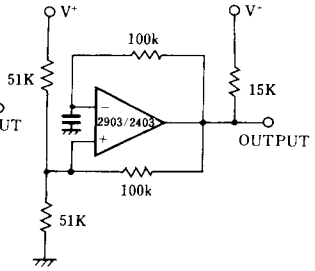


■ Typical Applications

Comparator With Hysteresis



Pulse Generator



Output Strobing Circuit