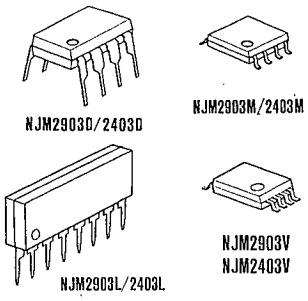
SINGLE-SUPPLY DUAL COMPARATOR

■ GENERAL DESCRIPTION

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.

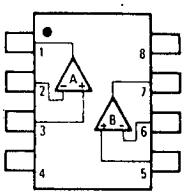
■ PACKAGE OUTLINE



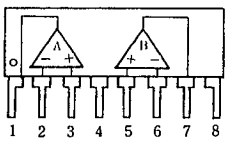
■ FEATURES

- Operating Voltage (+2V～+36V)
- Single Supply Operation
- Open Collector Output
- High Output Sink Current (15mA @2403)
- Package Outline DIP8, DMP8, SIP8, (SSOP8)
- Bipolar Technology

■ PIN CONFIGURATION



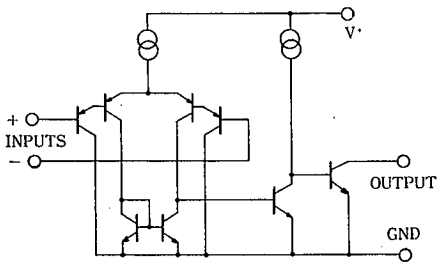
NJM2903D/2403D
NJM2903M/2403M
NJM2903V/2403V



NJM2903L/2403L

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

■ EQUIVALENT CIRCUIT (1/2 Shown)



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	36(or ±18)	V
Differential Input Voltage	V_{ID}	36	V
Input Voltage	V_{IN}	−0.3～+36	V
Power Dissipation	P_D	(DIP8) 500	mW
		(DMP8) 300	mW
		(SSOP8) 250	mW
		(SIP8) 800	mW
Operating Temperature Range	T_{opr}	−40～+85	℃
Storage Temperature Range	T_{stg}	−50～+125	℃

■ ELECTRICAL CHARACTERISTICS

(V^+=5V, Ta=25℃)

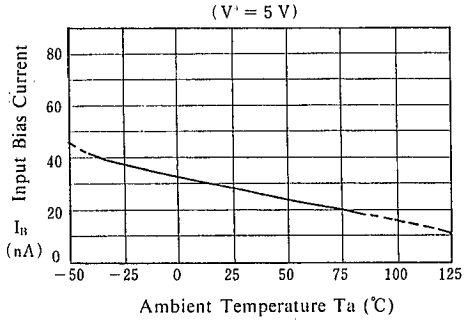
PARAMETER	SYMBOL	TEST CONDITION	2903			2403			UNIT
			MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
Input Offset Voltage	V_{IO}	R_S =0Ω, V_O≅1.4V	—	—	7	—	—	10	mV
Input Offset Current	I_{IO}		—	—	50	—	—	100	nA
Input Bias Current	I_B		—	30	250	—	40	500	nA
Input Common Mode Voltage Range	V_{ICM}		0～3.5	—	—	0～3.5	—	—	V
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}^+=0Vm 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}^+=0V, V_O=5V	—	—	1.0	—	—	1.0	μA
Operating Current	I_{CC}		—	0.4	1.0	—	0.5	1.5	mA

5

■ TYPICAL CHARACTERISTICS

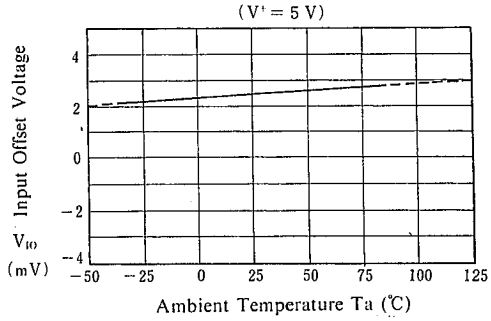
Input Bias Current vs. Temperature

(V⁺ = 5 V)



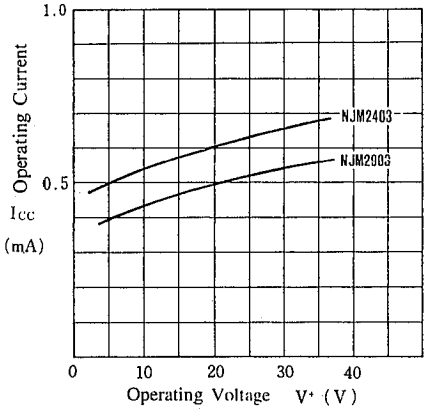
Input Offset Voltage vs. Temperature

(V⁺ = 5 V)



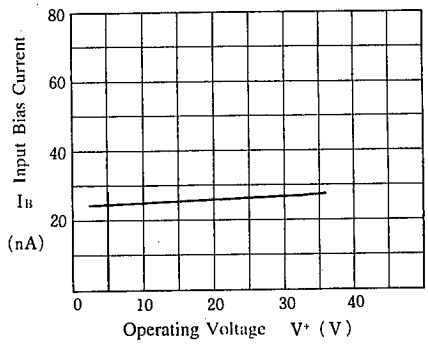
Operating Current vs. Operating Voltage

(Ta=25℃)



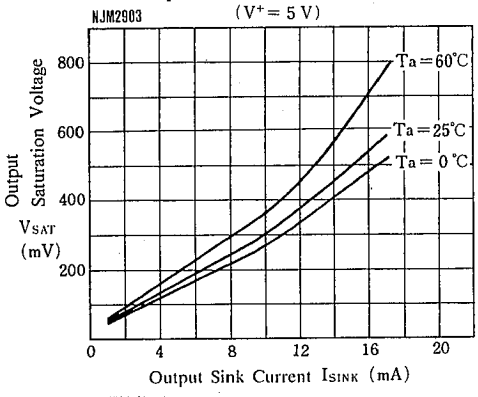
Input Bias Current vs. Operating Voltage

(Ta=25℃)



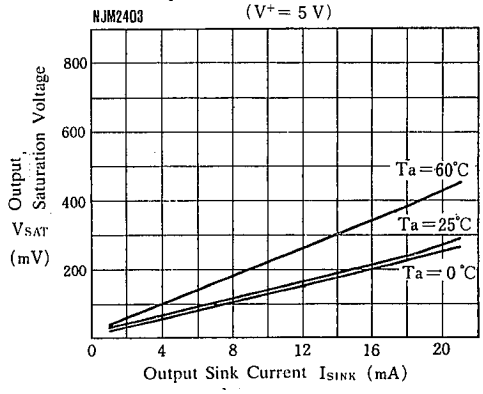
NJM2903 Output Saturation Voltage vs. Output Sink Current

NJM2903 (V⁺= 5 V)



NJM2403 Output Saturation Voltage vs. Output Sink Current

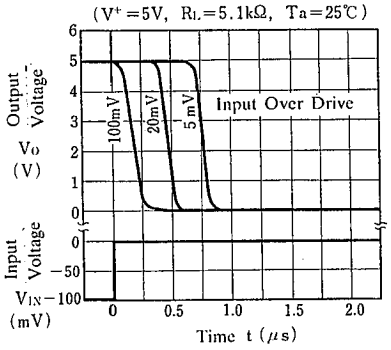
NJM2403 (V⁺= 5 V)

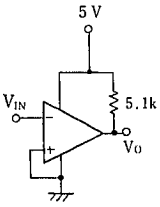


■ TYPICAL CHARACTERISTICS

Response Time for Various Input Overdrives

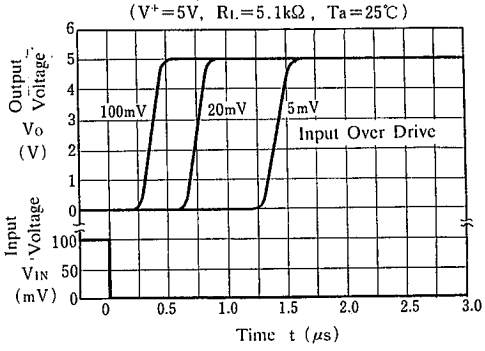
(V^+=5V, R_L=5.1kΩ, Ta=25℃)





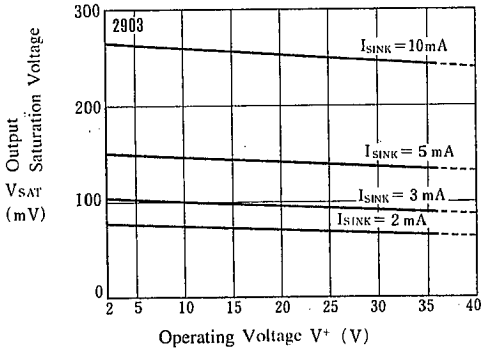
Response Time for Various Input Overdrives

(V^+=5V, R_L=5.1kΩ, Ta=25℃)



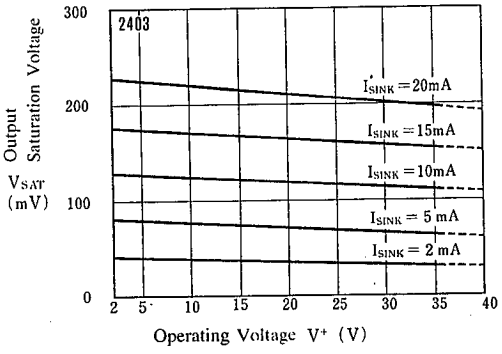
NJM2903 Output Saturation Voltage vs. Operating Voltage

(Ta=25℃)



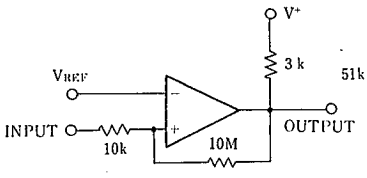
NJM2403 Output Saturation Voltage vs. Operating Voltage

(Ta=25°C)

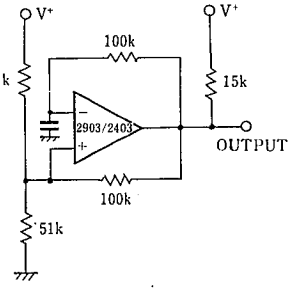


■ TYPICAL APPLICATIONS

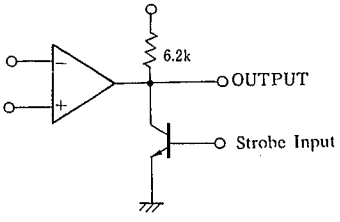
Comparator With Hysteresis



Pulse Generator



Output Strobing Circuit



MEMO

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