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VOLTAGE DETECTOR

■ GENERAL DESCRIPTION

NJM2405 is a dual comparator, including the high precision reference voltage circuit. Both channels have hysteresis pins, so it could provide the hysteresis function for systems.

It has the wide range of operating voltage and works with less current consumption, so that it is suitable for detecting abnormal conditions, to change over to back up memories when the voltage drops off in operation.

■ PACKAGE OUTLINE

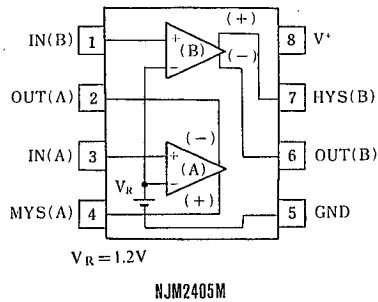


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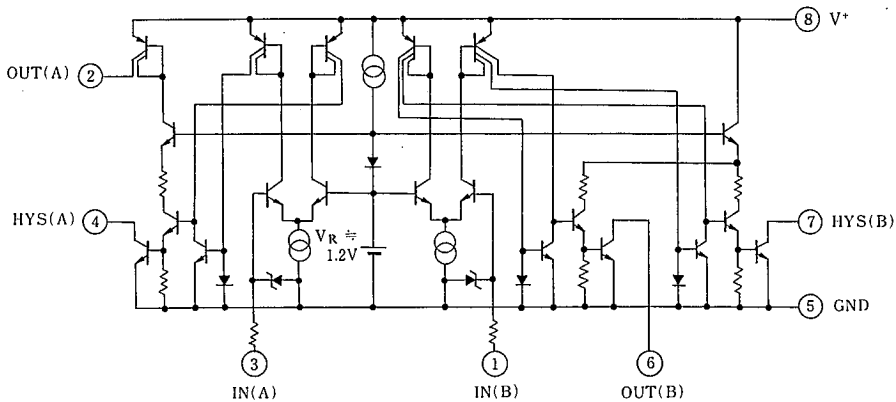
■ FEATURES

- Operating Voltage (2.5V~20V)
- Low Operating Current
- Internal Low Reference Voltage
- Adjustable Hysteresis Voltage
- Package Outline DMP8
- Bipolar Technology

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



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■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

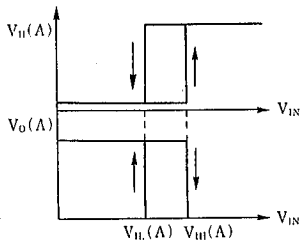
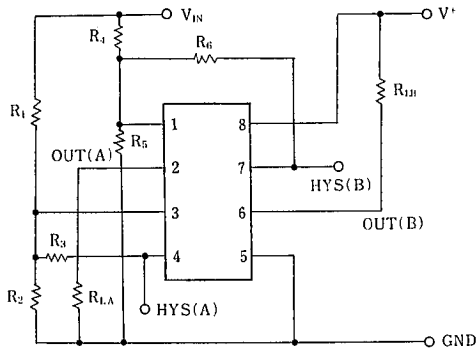
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V+	21	V
Output Voltage	Vo	21	V
Output Current	Io	50	mA
Input Voltage	VIN	-0.3~+6.5	Vdc
Power Dissipation	Pd	300	mW
Operating Temperature Range	Topr	-20~+75	°C
Storage Temperature Range	Tsig	-40~+125	°C

■ ELECTRICAL CHARACTERISTICS

(V+=5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	ICCH	V+ =20V, VIH=1.5V	—	250	400	μA
	ICCL	V+ =20V, VIL=1.0V	—	400	60	μA
Threshold Voltage	VTH	Io=2mA, Vo=1V	1.1	1.20	1.25	V
Threshold Voltage Deviation vs Supply Voltage	ΔVTH1	2.5V ≤ V+ ≤ 5.5V	—	3	12	mV
	ΔVTH2	4.5V ≤ V+ ≤ 40V	—	10	40	mV
Offset Voltage between Normal Output and Hysteresis Output		Io(A)=20μA, Vo(A)=3V	—	2.0	—	mV
		Ih(A)=4.5mA, Vh(A)=2V	—	—	—	—
Threshold Voltage Temperature Coefficient		Io(B)=3mA, Vo(B)=2V	—	2.0	—	mV
		Ih(B)=3mA, Vh(B)=2V	—	—	—	—
Threshold Voltage Difference Between Channels		-20°C ≤ Ta ≤ 70°C	—	±0.05	—	mV/°C
Threshold Voltage Difference Between Channels			10	—	10	mV
Input Current	IIL	IIL=1.0V	—	5	—	nA
	IHH	VIH=1.5V	—	100	500	nA
Output Leak Current	IOH(A)	V+=20V, Vo(A)=0V, VIH=1.5V	—	—	0.1	μA
	IOH(B)	Vo(B)=20V, VIL=1.0V	—	—	1	μA
Hysteresis Output leak Current	IHH(A)	VIH(A)=20V, VIH=1.5V	—	—	1	μA
	IHH(B)	VH(B)=20V, VIH=1.5V	—	—	1	μA
Output Source Current	IOL(A)	Vo(A)=0V, VIL=1.0V	40	80	—	μA
Output Sink Current	IOL(B)	Vo(B)=1.0V, VIH=1.5V	4	10	—	mA
Hysteresis Current	IHL(A)	VIH(A)=1.0V, VIL=1.0V	6	12	—	mA
	IHL(B)	VH(B)=1.0V, VIL=1.0V	4	10	—	mA
Output Saturation Voltage	VOL(A)	Io(A)=20μA, VIL=1.0V	—	50	200	mV
	VOL(B)	Io(B)=3.0mA, VIH=1.5V	—	120	400	mV
Hysteresis Output Saturation Voltage	VHL(A)	Ih(A)=4.5mA, VIL=1.0V	—	120	400	mV
	VHL(B)	Ih(B)=3.0mA, VIL=1.0V	—	120	400	mV
Delay Time	tPHL	RL=5kΩ	—	2	—	μs
	tPLH	RL=5kΩ	—	3	—	μs

■ GENERAL OPERATING INFORMATION (Operation Principle)



Relational Function (Attention)

$$V_{TH}(A) = \left(1 + \frac{R_1}{R_2 \parallel R_3}\right) V_R$$

$$V_{TL}(A) = \left(1 + \frac{R_1}{R_2}\right) V_R$$

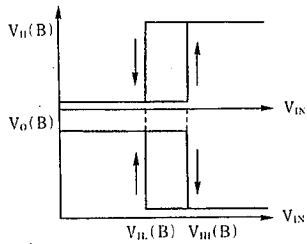
$$V_{TH}(B) = \left(1 + \frac{R_4}{R_5 \parallel R_6}\right) V_R$$

$$V_{TL}(B) = \left(1 + \frac{R_4}{R_5}\right) V_R$$

(note) $V_R \doteq V_{TH} (\approx 1.20V)$

$$R_2 \parallel R_3 = \frac{R_2 R_3}{R_2 + R_3}$$

$$R_5 \parallel R_6 = \frac{R_5 R_6}{R_5 + R_6}$$



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MEMO

[CAUTION]

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