Designated client product

This product will be discontinued its production in the near term.
And it is provided for customers currently in use only, with a time limit.
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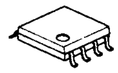
VOLTAGE DETECTOR

■ GENERAL DESCRIPTION

NJM2405 is a dual comparator, including the high precision reference voltage circuit. Both channels have hystersis pins, so it could provide the hysteretic 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

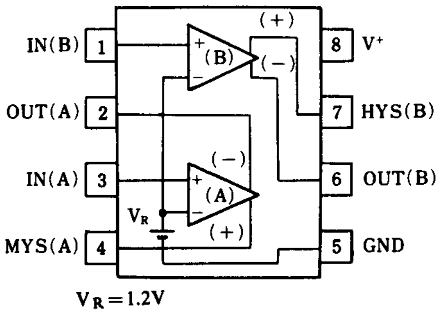


NJM2405M

■ FEATURES

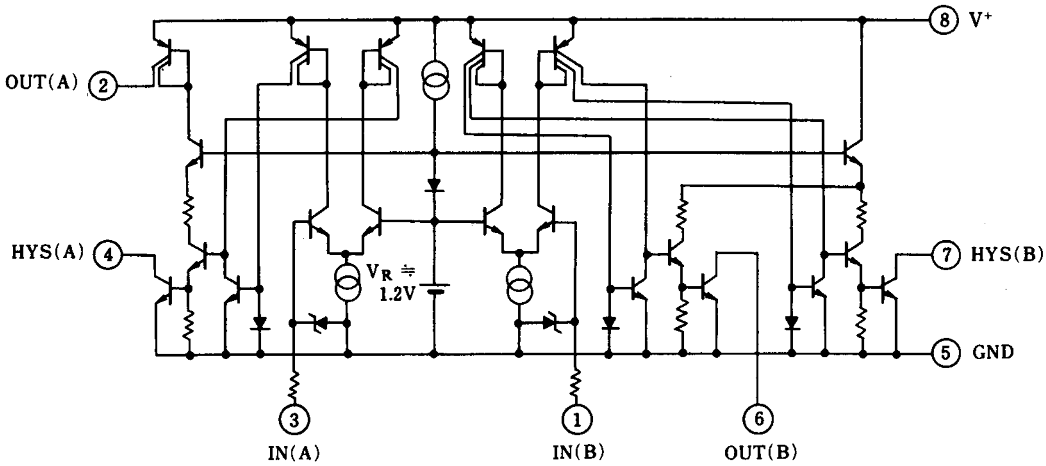
- Operating Voltage (2.5V to 20V)
- Low Operating Current
- Internal Low Reference Voltage
- Adjustable Hystersis Voltage
- Package Outline DMP8
- Bipolar Technology

■ PIN CONFIGURATION



NJM2405M

■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

(T_a = 25°C)

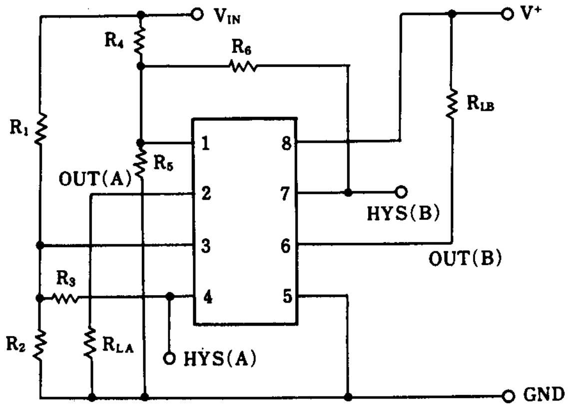
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	21	V
Output Voltage	V_O	21	V
Output Current	I_O	50	mA
Input Voltage	V_{IN}	-0.3 to +6.5	Vdc
Power Dissipation	P_D	300	mW
Operating Temperature Range	T_{opr}	-20 to + 75	ºC
Storage Temperature Range	T_{stg}	-40 to +125	ºC

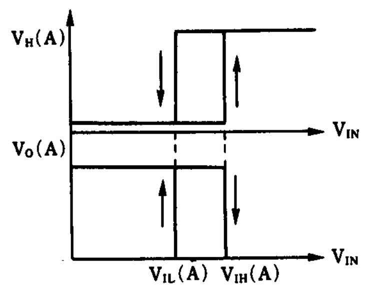
■ ELECTRICAL CHARACTERISTICS

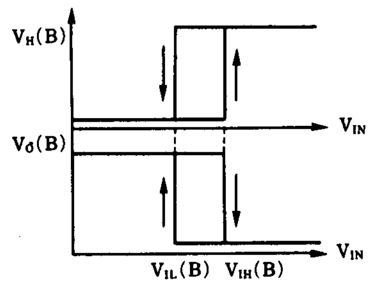
(V^+ = 5V, T_a = 25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CCH}	V^+ = 20V, V_{IH} = 1.5V	-	250	400	µA
	I_{CCL}	V^+ = 20V, V_{IL} = 1.0V	-	400	600	µA
Threshold Voltage	V_{TH}	I_O = 2mA, V_O = 1V	1.15	1.20	1.25	V
Threshold Voltage Deviation vs Supply Voltage	ΔV_{TH1}	2.5V≦ V^+ ≦5.5V	-	3	12	mV
	ΔV_{TH2}	4.5V≦ V^+ ≦40V	-	10	40	mV
Offset Voltage between Normal Output and Hysteresis Output		I_O(A) = 20µA, V_O(A) = 3V, I_H(A) = 4.5mA, V_H(A) = 2V	-	2.0	-	mV
		I_O(B) = 3mA, V_O(B) = 2V, I_H(B) = 3mA, V_H(B) = 2V	-	2.0	-	mV
Threshold Voltage Temperature coefficient		-20ºC ≦ Ta ≦ 70ºC	-	±0.05	-	mV/ºC
Threshold Voltage Difference Between Channels			-10	-	10	mV
Input Current	I_{IL}	I_{IL} = 1.0V	-	5	-	nA
	I_{IH}	V_{IH} = 1.5V	-	100	500	nA
Output Leak Current	I_{OH}(A)	V^+ = 20V, V_O(A) = 0V, V_{IH} = 1.5V	-	-	0.1	µA
	I_{OH}(B)	V_O(B) = 20V, V_{IL} = 1.0V	-	-	1	µA
Hysteresis Output leak Current	I_{HH}(A)	V_H(A) = 20V, V_{IH} = 1.5V	-	-	1	µA
	I_{HH}(B)	V_H(B) = 20V, V_{IH} = 1.5V	-	-	1	µA
Output Source Current	I_{OL}(A)	V_O(A) = 0V, V_{IL} = 1.0V	40	80	-	µA
Output Sink Current	I_{OL}(B)	V_O(B) = 1.0V, V_{IH} = 1.5V	4	10	-	mA
Hysteresis Current	I_{HL}(A)	V_H(A) = 1.0V, V_{IL} = 1.0V	6	12	-	mA
	I_{HL}(B)	V_H(B) = 1.0V, V_{IL} = 1.0V	4	10	-	mA
Output Saturation Voltage	V_{OL}(A)	I_O(A) = 20µA, V_{IL} = 1.0V	-	50	200	mV
	V_{OL}(B)	I_O(B) = 3.0mA, V_{IH} = 1.5V	-	120	400	mV
Hysteresis Output Saturation Voltage	V_{HL}(A)	I_H(A) = 4.5mA, V_{IL} = 1.0V	-	120	400	mV
	V_{HL}(B)	I_H(B) = 3.0mA, V_{IL} = 1.0V	-	120	400	mV
Delay Time	t_{PHL}	RL = 5kΩ	-	2	-	µs
	t_{PLH}	RL = 5kΩ	-	3	-	µs

■ GENERAL OPERATING INFORMATION (Operation Principle)







Relational Function (Attention)

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

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

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

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

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

$$R_2//R_3 = \frac{R_2R_3}{R_2+R_3}$$

$$R_5//R_6 = \frac{R_5R_6}{R_5+R_6}$$