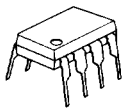
PRECISION VOLTAGE COMPARATOR

■ GENERAL DESCRIPTION

The NJM311 is a valtage comparator that has low input currents. It is also designed to operate covering a wider range of supply voltages from Standard ±15V op amp supplies down to the single 5V supply used for IC logic. Its output is compatible with RTL, DTL and TTL as well as MOS circuits. Further more, it can drive lamps or relays, switching voltages up to 40V at currents as high as 50mA. Offset balancing is provided, and the outputs can be OR wired.

■ PACKAGE OUTLINE



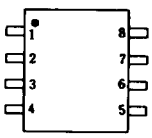
NJM311D

NJM311M

■ FEATURES

- Operating Voltage (+5V~+36V)
- Single Supply Operation
- Single Circuit
- With V_{IO} Trim Terminal
- Response Time (200ns typ.)
- Package Outline DIP8, DMP8
- Bipolar Technology

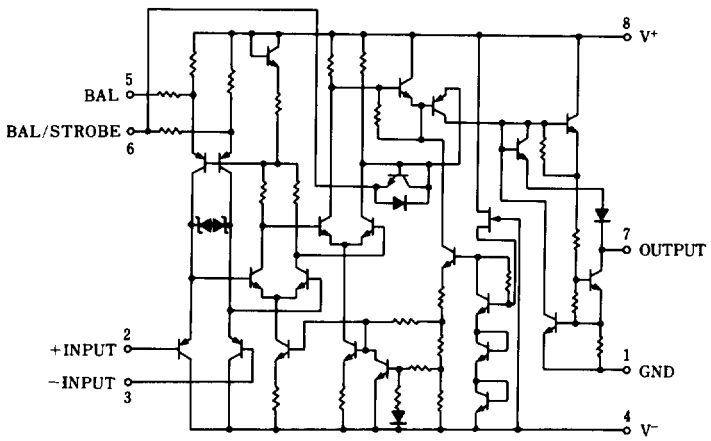
■ PIN CONFIGURATION



NJM311D
NJM311M

PIN FUNCTION
1. GND
2. +INPUT
3. −INPUT
4. V⁻
5. BAL
6. BAL/STROBE
7. OUTPUT
8. V⁺

■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	36(±18)	V
Output to Negative Supply Voltage	V_{7-4}	40	V
Ground to Negative Supply Voltage	V_{1-4}	30	V
Differential Input Voltage	V_{ID}	±30	V
Input Voltage	V_{IN}	±15 (note 1)	V
Power Dissipation	P_D	(DIP8) 500	mW
		(DMP8) 300	mW
Operating Temperature Range	T_{opr}	−20～+75	℃
Storage Temperature Range	T_{stg}	−40～+125	℃

(note) For supply voltage less than ±15V, the absolute input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS

(V^+/V^-=±15V, Ta=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	$R_S \leqq 50k\Omega$	—	2.0	7.5	mV
Input Offset Current	I_{IO}		—	6.0	50	nA
Input Bias Current	I_B		—	100	250	nA
Voltage Gain	A_V		—	106	—	dB
Response Time	t_R		—	200	—	ns
Saturation Voltage	V_{SAT}	$V_{IN} \leqq -10mV$, I_O=50mA	—	0.75	1.5	V
Strobe ON Current	I_{STR}		—	3.0	—	mA
Output Leakage Current	I_{LEAK}	$V_{IN} \geqq 10mV$, V_O=35V	—	0.2	50	nA
Input Common Mode Voltage Range	V_{ICM}		—	±14	—	V
Positive Quiescent Current	I^+		—	5.1	7.5	mA
Negative Quiescent Current	I^-		—	4.1	5.0	mA

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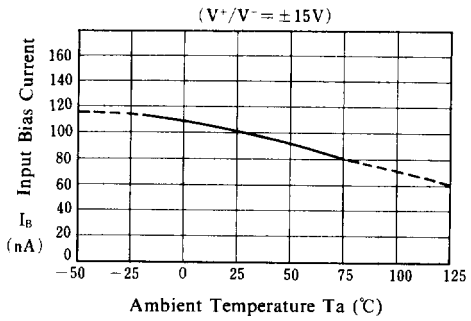
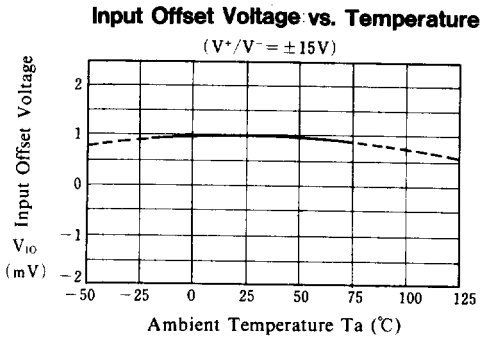
■ TYPICAL CHARACTERISTICS

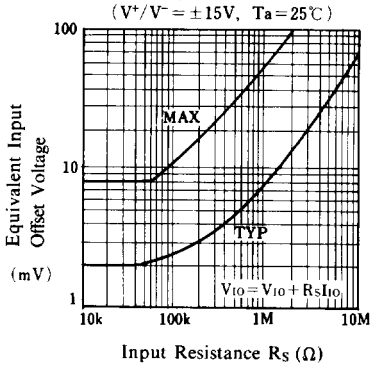
Input Bias Current vs. Temperature



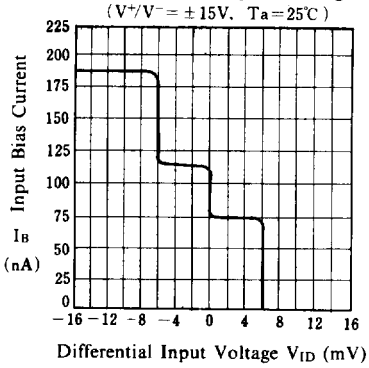
Input Offset Voltage vs. Temperature



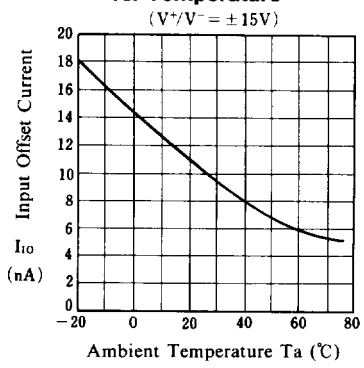
Offset Voltage vs. Input Resistance



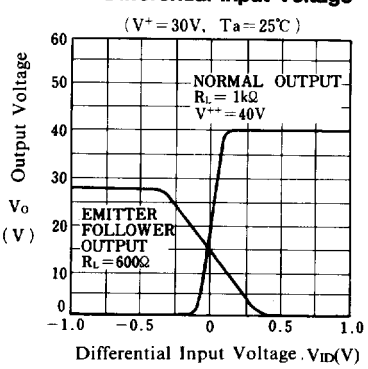
Input Bias Current vs. Differential Input Voltage



Input Offset Current vs. Temperature

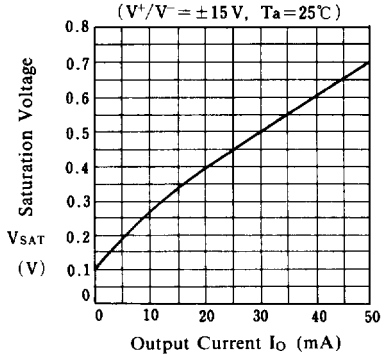


Output Voltage vs. Differential Input Voltage

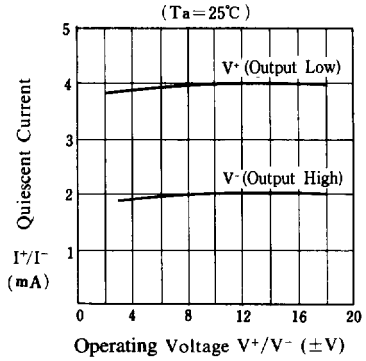


■ TYPICAL CHARACTERISTICS

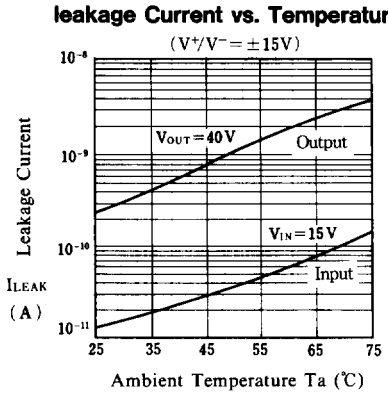
Saturation Voltage vs. Output Current



Quiescent Current vs. Operating Voltage



leakage Current vs. Temperature



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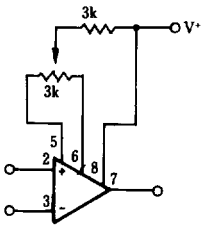
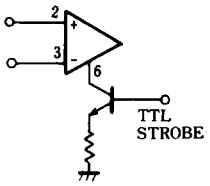
■ TYPICAL APPLICATIONS

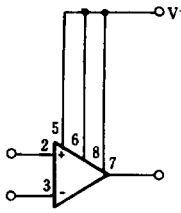
Offset Null Circuit



Strobing

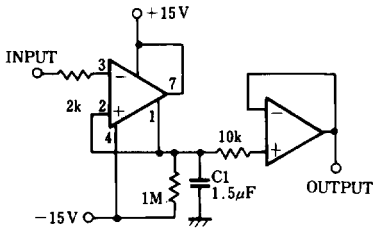


Increasing Input Stage Current



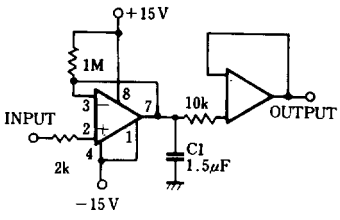
Increases typical common mode slew from 7.0V/μs to 18V/μs

Positive Peak Detector



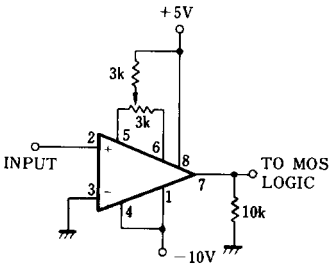
*Solid tantalum

Negative Peak Detector

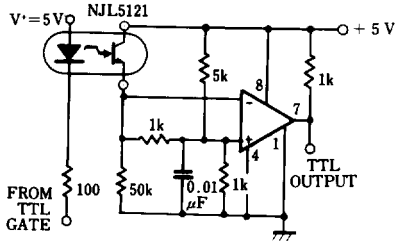


*Solid tantalum

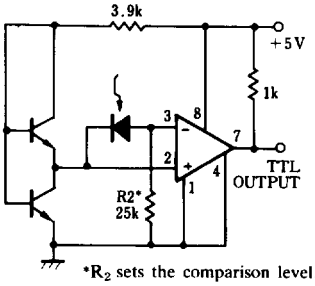
Zero Crossing Detector driving MOS Logic



Digital Transmission Isolator

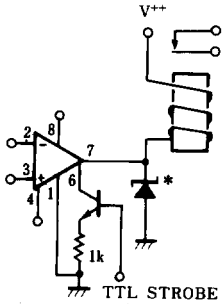


Precision Photodiode Comparator



*R_2 sets the comparison level.

Relay Driver with Strobe



*Absorbs inductive kickback of relay and protects IC from severe voltage.