NJM311

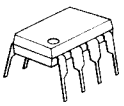
The NJM311 is a voltage comparator that has low input currents. It is also designed to operate covering a wider range of supply voltages: from standard ±15V op amp supplies down to the single 5V supply used for IC logic. Its output is compatible with RTL, DTL and TTL as well as MOS circuits. Further 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.

■ Absolute Maximum Ratings (Ta=25°C)

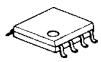
Supply Voltage	V^+/V^-	36V (±18V)
Ooutput to Negative Supply Voltage	V_{7-4}	40V
Ground to Negative Supply Voltage	V_{1-4}	30V
Differential Input Voltage	V_{ID}	±30V
Input Voltage	V_{IN}	±15V (note 1)
Power Dissipation	P_D (D-Type)	500mW
	(M-Type)	300mW
Operating Temperature Range	T_{opr}	−20~+75°C
Storage Temperature Range	T_{stg}	−40~+125°C

(note 1) For supply voltage less than ±15V, the absolute input voltage is equall to the supply voltage.

■ Package Outline



NJM311D

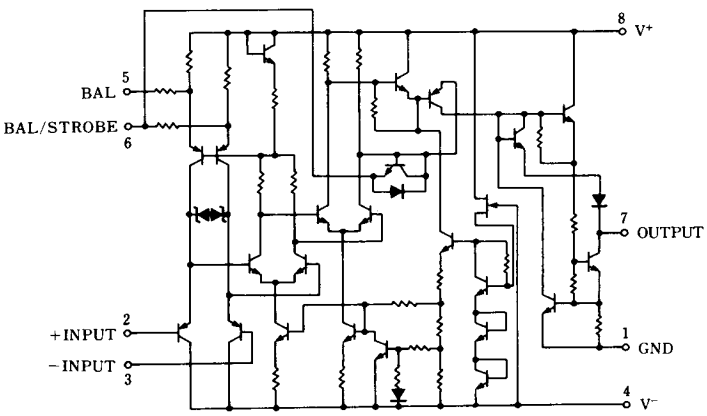


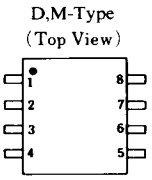
NJM311M

■ Electrical Characteristics (V^+/V^-=±15V, Ta=25°C)

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	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

■ Equivalent Circuit

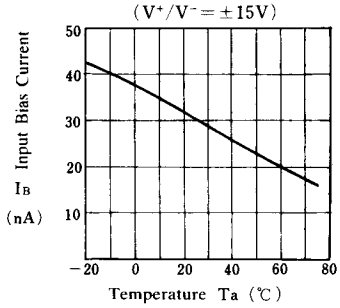




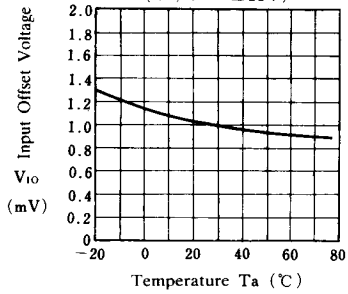
PIN FUNCTION
1. GND
2. +INPUT
3. −INPUT
4. V⁻
5. BAL
6. BAL/STROBE
7. OUTPUT
8. V⁺

■ **Typical Characteristics**

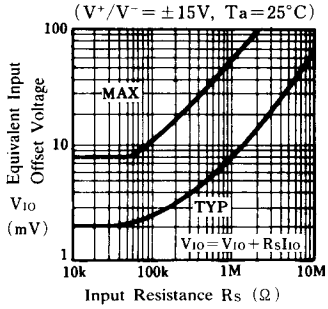
Input Bias Current vs. Temperature



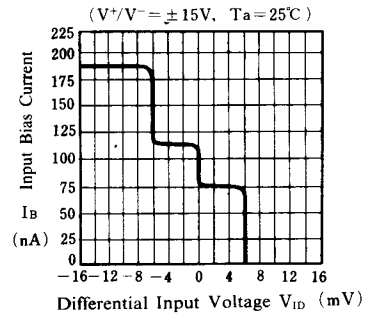
Input Offset Voltage vs. Temperature



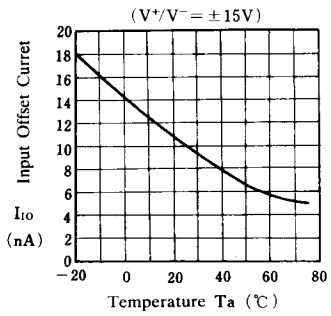
Offset Voltage vs. Input Resistance



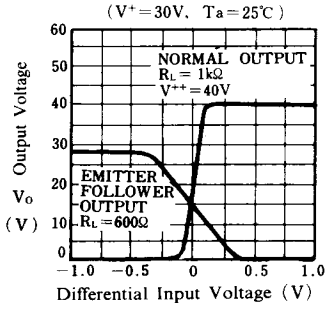
Input Bias Current vs. Differential Input Voltage



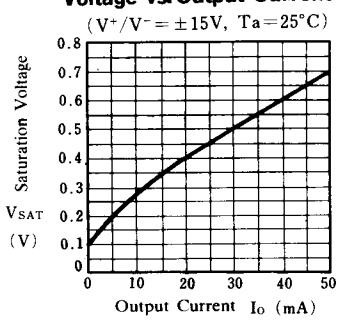
Input Offset Current vs. Temperature



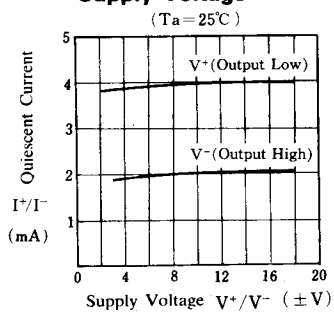
Output Voltage vs. Differential Input Voltage



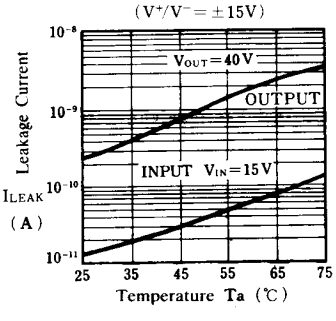
Saturation Voltage vs. Output Current



Quiescent Current vs. Supply Voltage



Leakage Current vs. Temperature



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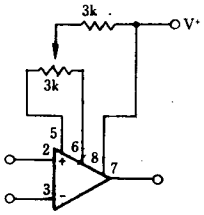
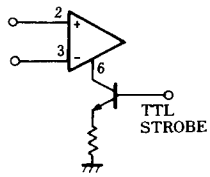
■ **Typical Applications**

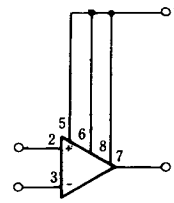
Offset Null Circuit



Strobing

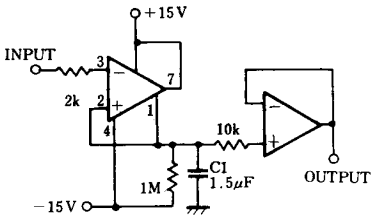


Increasing Input Stage Current



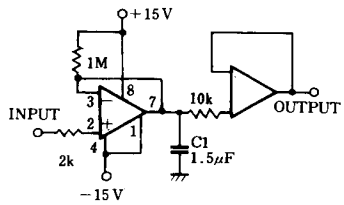
Increases typical common mode slew from 7.0V/μs to 18V/μs

Positive Peak Detector



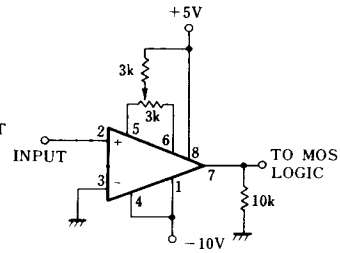
*Solid tantalum

Negative Peak Detector

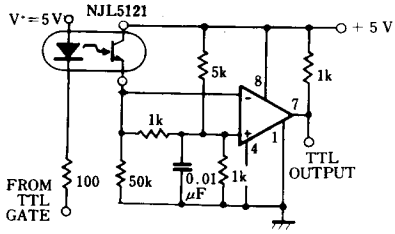


*Solid tantalum

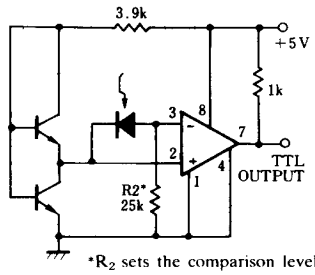
Zero Crossing Detector driving MOS Logic



Digital Transmission Isolator

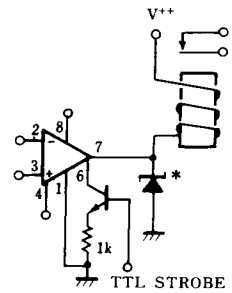


Precision Photodiode Comparator



*R_2 sets the comparison level.

Relay Driver with Strobe



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