

## SINGLE-SUPPLY QUAD COMPARATOR

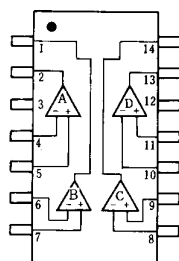
### ■ GENERAL DESCRIPTION

These devices offer higher frequency operation and faster switching than can be had from internally compensated quad op amps. Indeed for single-supply applications, the Darlington PNP input stage allows them to compare voltages that include ground. The two-stage common-emitter output circuit provides gain and output sink capacity of 6mA at an output level of 400mV. The output collector is left open, permitting the designer to drive devices in the range of 2V to 36V.

### ■ FEATURES

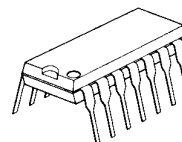
- Operating Voltage ( +2V~+36V )
- Single Supply Operation
- Open Collector Output
- Package Outline DIP14,DMP14,SSOP14
- Bipolar Technology

### ■ PIN CONFIGURATION

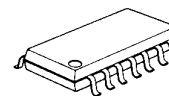


NJM2901N  
NJM2901M  
NJM2901V

### ■ PACKAGE OUTLINE



NJM2901N



NJM2901M

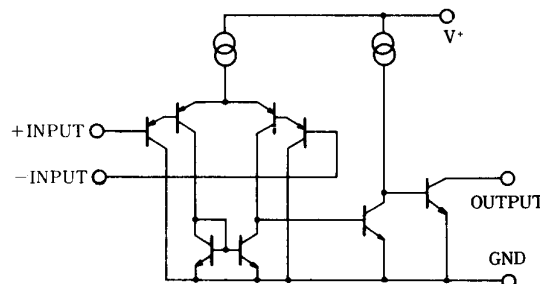


NJM2901V

### PIN FUNCTION

1. B OUTPUT
2. A OUTPUT
3. V<sup>+</sup>
4. A -INPUT
5. A +INPUT
6. B -INPUT
7. B +INPUT
8. C -INPUT
9. C +INPUT
10. D -INPUT
11. D +INPUT
12. GND
13. D OUTPUT
14. C OUTPUT

### ■ EQUIVALENT CIRCUIT ( 1/4 Shown )



# NJM2901

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+$	36 ( $\pm 18$ )	V
Differential Input Voltage	$V_{ID}$	36	V
Input Voltage	$V_{IN}$	-0.3~+36	V
Power Dissipation	$P_D$	(DIP14) 570 (DMP14) 300 (SSOP14) 300	mW
Operating Temperature Range	$T_{opr}$	-40~+85	°C
Storage Temperature Range	$T_{stg}$	-50~+125	°C

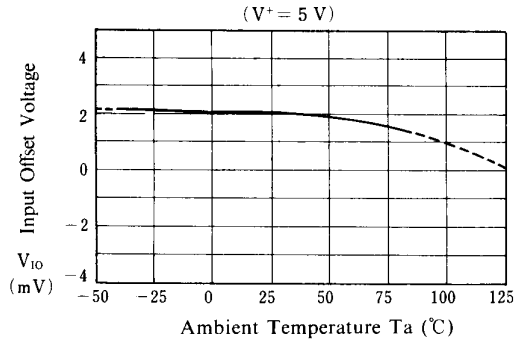
## ■ ELECTRICAL CHARACTERISTICS

(Ta=25°C,  $V^+=5V$ )

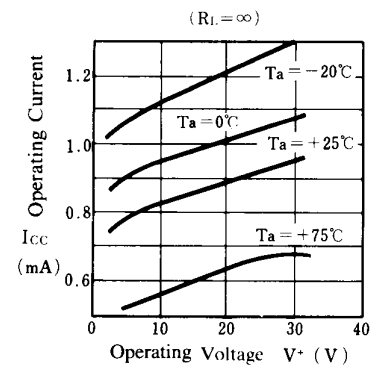
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	$V_{IO}$	$R_S=0\Omega, V_O=1.4V$	-	2	7	mV
Input Offset Current	$I_{IO}$	$I_{IN}=I_{IN^+}-I_{IN^-}$	-	5	50	nA
Input Bias Current	$I_B$		-	25	250	nA
Input Common Mode Voltage Range	$V_{ICM}$		0~3.5	-	-	V
Large Signal Voltage Gain	$A_V$	$R_L=15k\Omega$	-	106	-	dB
Response Time	$t_R$	$R_L=5.1k\Omega$	-	1.3	-	$\mu s$
Output Sink Current	$I_{SINK}$	$V_{IN^-}=1V, V_{IN^+}=0V, V_O=1.5V$	6	16	-	mA
Output Saturation Voltage	$V_{SAT}$	$V_{IN^-}=1V, V_{IN^+}=0V, I_{SINK}=3mA$	-	200	400	mV
Output Leakage Current	$I_{LEAK}$	$V_{IN^-}=0V, V_{IN^+}=1V, V_O=5V$	-	0.1	1.0	$\mu A$
Operating Current	$I_{CC}$	$R_L=\infty$	-	0.8	2	mA

## ■ TYPICAL CHARACTERISTICS

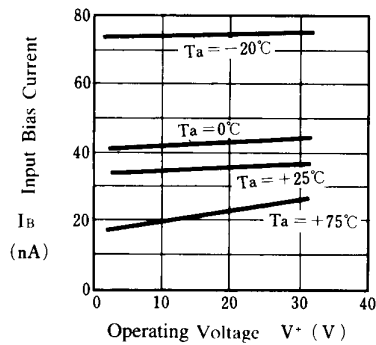
**Input Offset Voltage vs. Temperature**



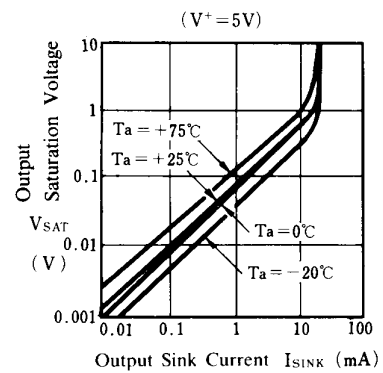
**Operating Current**



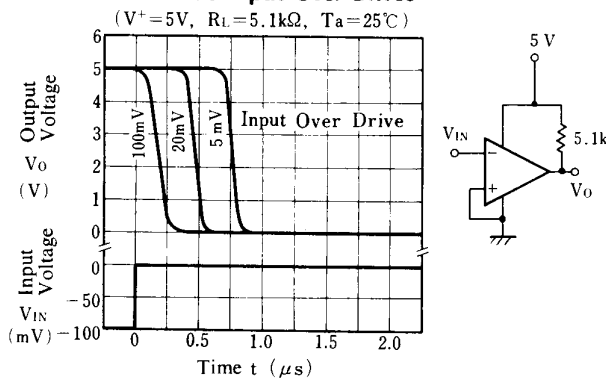
**Input Bias Current**



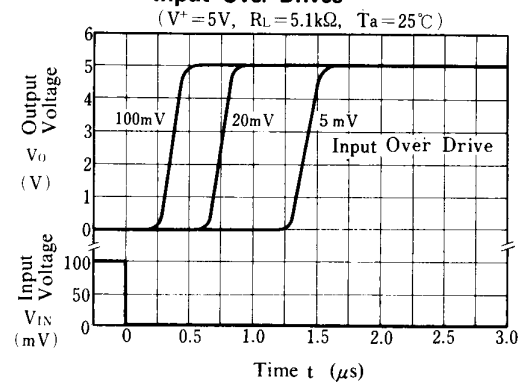
**Output Saturation Voltage**



**Response Time for Various Input Over Drives**

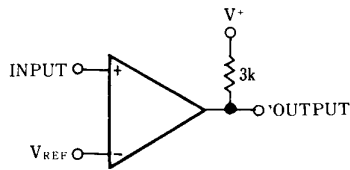


**Response Time for Various Input Over Drives**

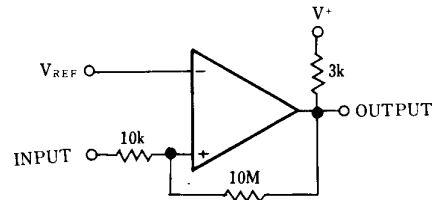


## ■ TYPICAL APPLICATIONS

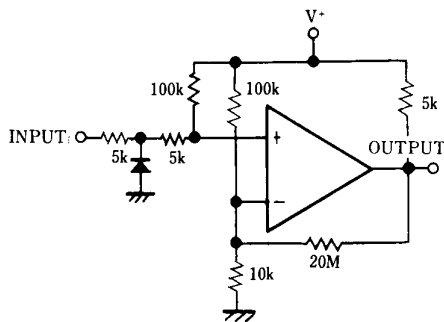
Basic Comparator



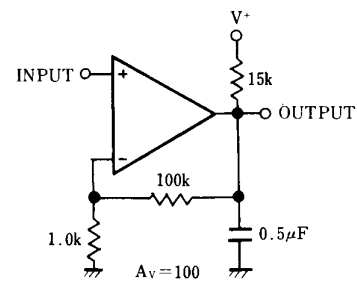
Comparator With Hysteresis



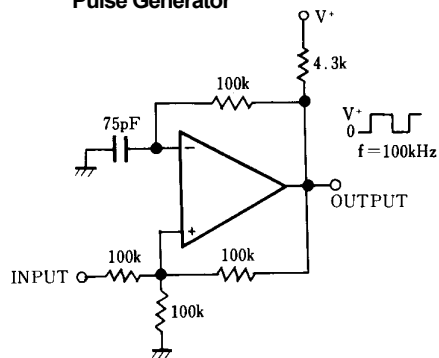
Zero Crossing Detector



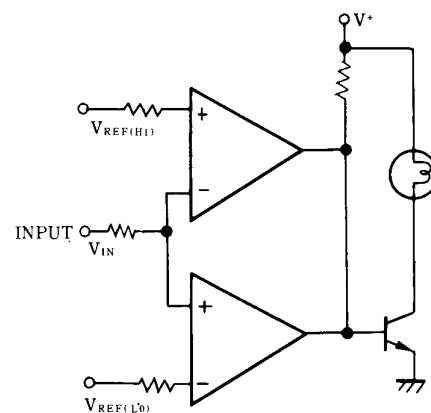
Low Frequency Op Amp.



Pulse Generator



Limit Comparator



[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.