

# SUPER LOW OPERATING CURRENT AND LOW OFFSET VOLTAGE TINY SINGLE C-MOS OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJU7006 is a super low operating current and low offset voltage tiny single C-MOS operational amplifier.

The input offset voltage is lower than 2mV ( max ) and the input bias current is as low as less than 1pA ( typ ),consequently the very small signal around the ground level can be amplified.

The operating current is 3μA ( typ ),and the output stage permits output signals to swing between both of the supply rails.

Furthermore, the NJU7006 is packaged with very small SOT-23-5,therefore it can be especially applied to battery operated portable items.

■ PACKAGE OUTLINE

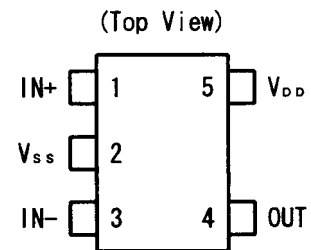


NJU7006F

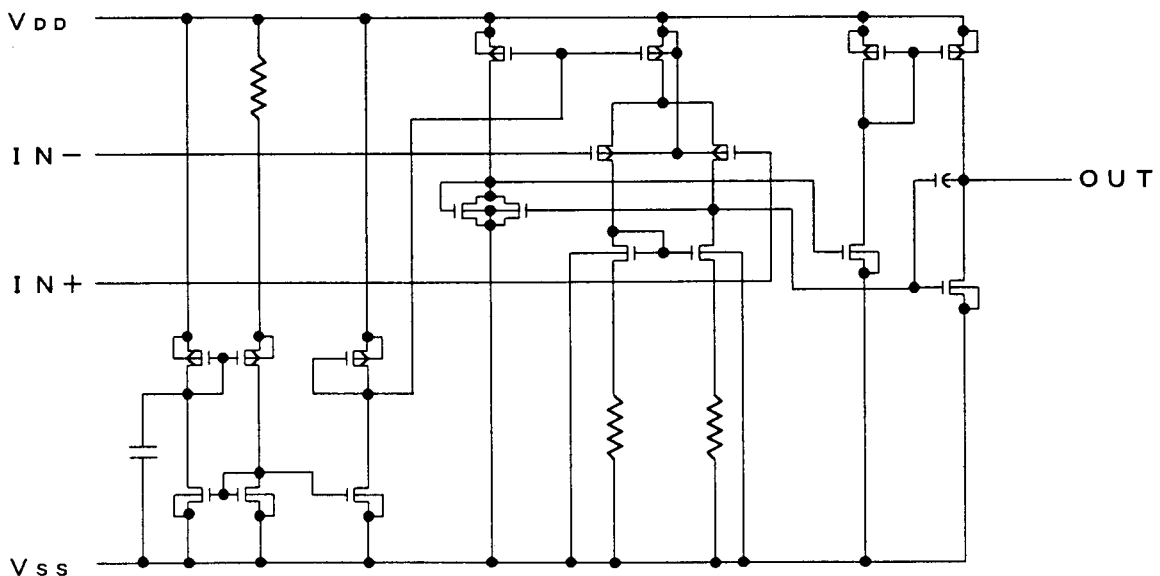
■ FEATURES

- Super Low Operating Current (  $I_{DD}=3.0\mu A$  typ. )
- Single Power Supply (  $V_{DD}=1.8\sim 3.6V$  )
- Low Offset Voltage (  $V_{IO}=2mV$  max.@ 3.0V )
- Wide Output Swing Range (  $V_{OM}=2.9V$  min.@ 3.0V )
- Low Bias Current (  $I_B=1pA$  typ. )
- Compensation Capacitor Incorporated
- Package Outline SOT-23-5
- C-MOS Technology

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



# NJU7006

## ■ ABSOLUTE MAXIMUM RATINGS

( Ta=25°C )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>IN</sub>	7	V
Differential Input Voltage	V <sub>ID</sub>	± 7 ( note1 )	V
Common Mode Input Voltage	V <sub>IC</sub>	-0.3~7	V
Power Dissipation	P <sub>D</sub>	200	mW
Operating Temperature Range	T <sub>opr</sub>	-40~+85	°C
Storage Temperature Range	T <sub>stg</sub>	-55~+125	°C

( note1 ) If the supply voltage ( V<sub>DD</sub> ) is less than 7V, the input voltage must not over the V<sub>DD</sub> level though 7V is limit specified.

( note2 ) Decoupling capacitor should be connected between V<sub>DD</sub> and V<sub>SS</sub> for the stable operation.

## ■ ELECTRICAL CHARACTERISTICS

( Ta=25°C, V<sub>DD</sub>=3.0V, R<sub>L</sub>=∞ )

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V <sub>IO</sub>	V <sub>IN</sub> =1/2V <sub>DD</sub>	-	-	2	mV
Input Offset Current	I <sub>IO</sub>		-	1	-	pA
Input Bias Current	I <sub>IB</sub>		-	1	-	pA
Input Impedance	R <sub>IN</sub>		-	1	-	TΩ
Large Signal Voltage Gain	A <sub>VD</sub>		60	70	-	dB
Input Common Mode Voltage Range	V <sub>ICM</sub>		0~2.5	-	-	V
Maximum Output Swing Voltage	V <sub>OM1</sub>	R <sub>L</sub> =10MΩ	V <sub>DD</sub> -0.1	-	-	V
	V <sub>OM2</sub>	R <sub>L</sub> =10MΩ	-	-	V <sub>SS</sub> +0.1	V
Common Mode Rejection Ratio	CMR	V <sub>IN</sub> =1/2V <sub>DD</sub>	55	65	-	dB
Supply Voltage Rejection Ratio	SVR	V <sub>DD</sub> =3.0~3.6V	60	70	-	dB
Operating Current	I <sub>DD</sub>		-	3.0	4.5	μA
Slew Rate	SR	C <sub>L</sub> =10pF	0.02	0.04	-	V/μs
Unity Gain Bandwidth	F <sub>t</sub>	A <sub>v</sub> =40dB, C <sub>L</sub> =10pF	-	95	-	kHz

( note3 ) The source current is less than 0.29μA ( at V<sub>OM</sub>/R<sub>L</sub>=2.9V/10MΩ ).

( note4 ) The load capacitance ( C<sub>L</sub> ) is less than 200pF.

**[CAUTION]**

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