

#### SINGLE LOW VOLTAGE C-MOS POWER AMPLIFIER

#### **■ GENERAL DESCRIPTION**

The NJU7081 is a single C-MOS Power Amplifier which is available to operate with single power supply and low voltage.

The NJU7081 realizes neary full-swing output with low voltage operation (2.4V). An output voltage is kept more than  $V_{\odot o}$ -0.3V or less than  $V_{\odot s}$ +0.3V when output current is 40mA, therefore it is suitable for an ear-set and a small size speaker driver of the battery operated audio items, especially cellular phone.

#### ■ PACKAGE OUTLINE





NJU7081M

NJU7081V





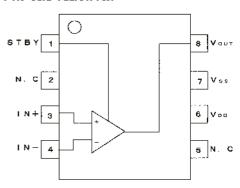
NJU7081R

NJU7081RB1

#### ■ FEATURES

- Single Power Supply
- $(V_{DD} 2.4V \sim 5.5V)$ Wide Operation Voltage Range
- Neary Full-Swing Output  $(V_{ss}+0.3V \sim V_{co}-0.3V \text{ at lout}=\pm 40\text{mA})$
- Low Distortion (0.05% at RL=38ohm, 1.0Vp-p)
- Low Operating Current  $(1.5 \text{mA} \text{ at } V_{\text{op}} = 3V)$
- Stand-by Function  $(1.0 \mu \text{A} \text{ at } V_{DD}=3V)$
- Package Outline DMP8 / SSOP8 / VSP8 / TVSP8
- C-MOS Technology

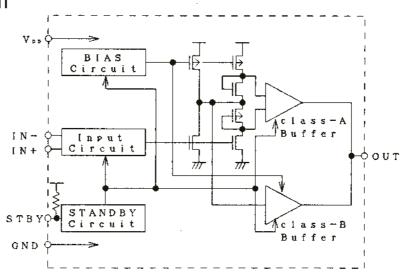
#### ■ PIN CONFIGURATION



Note1) STBY terminal

"H" or "OPEN" : Stand-by operation : Normal operation

#### EQUIVALENT CIRCUIT



## **MADE ABSOLUTE MAXIMUM RATINGS**

(Ta=25°C)

		(14-15	<del>-</del> /
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	VDD	7	٧
Input Voltage	<b>V</b> 1 D	V <sub>ss</sub> - 0.3 ~ V <sub>DD</sub> +0.3	٧
Power Dissipation	P⊳	250 (VSP8, TVSP8, SSOP8) 300 (DMP8)	mW
Operating Temperature	Tapr	− 25 <b>~</b> + 75	°C
Storage Temperature	Tate	- 40 ∼ +125	°C

## ■ ELECTRICAL CHARACTERISTICS 1

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage Range	<b>V</b> DD		2. 4		5. 5	V

## ■ ELECTRICAL CHARACTERISTICS 2 (Vop=3V)

 $(Ta=25^{\circ}C, V_{oo}=3V, V_{ss}=0V, f=1kHz)$ 

ELECTRICAL GENERALIZATION 2 (485–34)				, fb0- <b>01</b> ,	VSS-VV, I	TINITE/
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	lap	No Load Condition : Voltage Follower Vo=1.5V		1.5	2	mÅ
Standby Current	sre				1.0	μA
Standby terminal Current	PIN	V <sub>DD</sub> =3V, Vstb=0V		10		μA
Standby terminal Input Voltage	Vsгн		0.8√□□			ν
	<b>V</b> stL		1		0. 2V о о	
Input Offset Voltage	<b>V</b> 10		-10		10	Vm
Input Offset Current	10			10		рA
Input Bias Current	18			10		рĀ
Input Resistor	Rin			1011		Ω
Input Common Mode Voltage Range	VIGM		0.2~2			٧
Maximum Output	Vom	lout= 40mA	2.6	2.7		٧
Voltage Range		lout=-40mA		0.3	0.4	
Maximum Output Current	Іом	(D+N)/S<0.1% Source		30		mА
		(D+N)/S<0.1% Sink		-30		İ
Large-Signal Voltage gain	Av		55			d₿
Common Mode Rejection ration	CMRR	V <sub>10M</sub> =0. 2~2, 0V	53	·		d₿
Supply Voltage Rejection ration	PSRR	V₀₀=2. 7 <b>~</b> 3. 3V	55			dВ
Total Harmonic Distortion	(D+N)/S	V₀=1,0Vp−p 0~10dB,38Ω		0. 05		%
Equivalent Input Noise Voltage	Ent	IEC-A		3		μVrms
Signal to Noise Ratio	S/N			110		dВ
Unity Gain Bandwidth	Ft	CL=10pF, OPEN LOOP		1. 5		MHz
Slew Rate	SR	Unity Gain Turn Over, CL=32pF RL=2kΩ		1		V/µs

NOTE2) The NJU7081 should be operated gaining of triple or more for stable operation.
NOTE3) When the NJU7081 using no-current-load and low gain application (voltage follower, etc.), oscillation will be worst. In this case, the stray capacitance of the output terminal should be less than 100pF.

#### ■ ELECTRICAL CHARACTERISTICS 3 (VDD=5V)

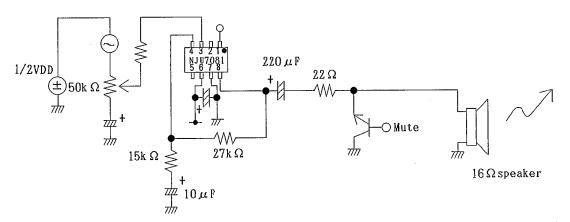
 $(Ta=25^{\circ}C, V_{DD}=5V, V_{SS}=0V, f=1kHz)$ 

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I <sub>DD</sub>	No Load Condition : Voltage Follower Vo=2.5V		3	4	mA
Standby Current	IstB	•			1	μΑ
Standby terminal Current	  PIN	V <sub>DD</sub> =3V, Vstb=0V		30		μΑ
Standby terminal	Vsін		0. 8V <sub>DD</sub>			٧
Input Voltage	VsiL				0. 2V <sub>DD</sub>	V
Input Offset Voltage	Via		-10		10	mV
Input Offset Current	110			10		рA
Input Bias Current	lıв			10		рA
Input Resistor	Rin			10 <sup>11</sup>		Ω
Input Common Mode Voltage Range	V <sub>I см</sub>		0.4~4			V
Maximum Output Voltage Range	V <sub>ом</sub>	lout= 40mA	4. 6	4. 7		٧
voitage kange		lout=-40mA		0. 3	0.4	
Maximum Output Current	Гом	(D+N)/S<0.1% Source		30		mA
		(D+N)/S<0.1% Sink		-30		
Large-Signal Voltage gain	Av		55			dB
Common Mode Rejection ration	CMRR	V <sub>1 CM</sub> =0. 4~4. 0V	53			ďΒ
Supply Voltage Rejection ration	PSRR	V <sub>DD</sub> =4. 5~5. 5V	55			dB
Total Harmonic Distortion	(D+N)/S	V <sub>o</sub> =1. 0Vp−p 0~10dB, 38 Ω		0. 05		%
Equivalent Input Noise Voltage	Ent	IEC-A		3		μVrms
Signal to Noise Ratio	S/N			110		dB
Unity Gain Bandwidth	Ft	CL=10pF, OPEN LOOP	1	1. 5		MHz
Slew Rate	SR	Unity Gain Turn Over,CL=32pF RL=2kΩ		1		V/μs

NOTE4) The NJU7081 should be operated gaining of triple or more for stable operation.

NOTE5) When the NJU7081 using no-current-load and low gain application (voltage follower, etc.), oscillation will be worst. In this case, the stray capacitance of the output terminal should be less than 100pF.

# **APPLICATION CIRCUIT**



# **NJU7081**

# **MEMO**

[CAUTION]
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