

# AN7085NS

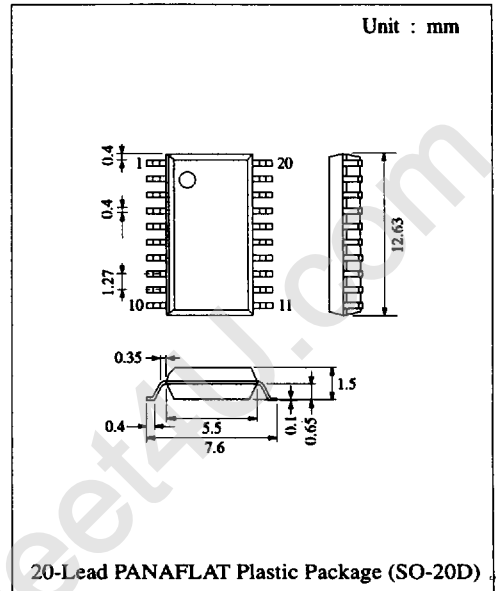
## Recording / Playback Pre- / Power Amplifier IC for 3V Microcassette

### ■ Description

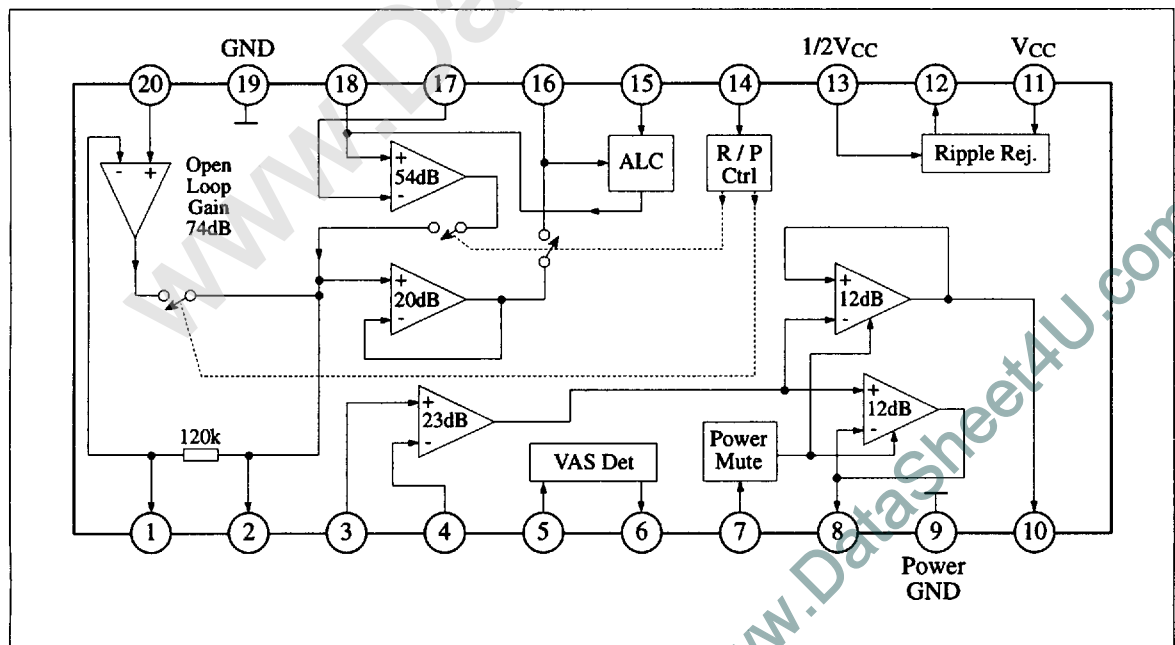
The AN7085NS is a monolithic integrated circuit designed for recording playback pre- / power amplifier, built-in VAS (Voice Activated System) function especially.

### ■ Features

- Recording playback pre / power amplifier IC
- VAS function built-in
- Earphone monitor at recording is possible
- 200mW BTL, OCL power amplifier built-in
- Mic. amplifier built-in
- ALC function built-in
- Rec / Play switching is possible by a switch of a single circuit
- $V_{CC}$  range :  $V_{CC} = 1.8V \sim 4.5V$



### ■ Block Diagram



### ■ Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Supply Voltage	V <sub>CC</sub>	6	V
Supply Current	I <sub>CC</sub>	1000	mA
Power Dissipation	P <sub>D</sub>	460	mW
Operating Ambient Temperature	T <sub>opr</sub>	-20 ~ +75	°C
Storage Temperature	T <sub>stg</sub>	-55 ~ +125	°C

Operating Supply Voltage Range: V<sub>CC</sub> = 1.8V ~ 4.5V

### ■ Electrical Characteristics (V<sub>CC</sub>=3V, f=1kHz, Ta=25°C)

Item	Symbol	Condition	min.	typ.	max.	Unit
Quiescent Circuit Current	I <sub>CQ</sub>	At No Input / playback	10	16	35	mA

#### Pre-Amp.

Open Circuit Gain	G <sub>V(Pr)</sub>	V <sub>in</sub> = -85dBV, R <sub>g</sub> = 1kΩ	65	74		dB
Total Harmonic Distortion	THD <sub>(Pr)</sub>	V <sub>in</sub> = 3mV, R <sub>g</sub> = 1kΩ		0.1	1	%
Maximum Output Voltage	V <sub>O(Pr)</sub>	THD = 1%, R <sub>g</sub> = 1kΩ	0.4	0.6		V
Noise Voltage Referred to Input	V <sub>ni(Pr)</sub>	R <sub>g</sub> = 1kΩ, DIN/AUDIO		1	1.8	μV

#### Recording Amp.

Close Circuit Gain	G <sub>V(R)</sub>	V <sub>in</sub> = -80dBV	71	74	77	dB
Total Harmonic Distortion	THD <sub>(R)</sub>	V <sub>in</sub> = -80dBV		1.3	3	%
Maximum Output Voltage	V <sub>O(R)</sub>	THD = 5%	0.8	1.08		V
Output Noise Voltage	V <sub>no(R)</sub>	R <sub>g</sub> = 2.2kΩ, DIN/AUDIO		-46	-42	dBV

#### Power Amp.

Close Circuit Gain	G <sub>V(PO)</sub>	V <sub>in</sub> = -46dBV, R <sub>L</sub> = 8Ω	38.5	41	43.5	dB
Total Harmonic Distortion	THD <sub>(PO)</sub>	V <sub>in</sub> = -46dBV, R <sub>L</sub> = 8Ω		0.11	1	%
Maximum Output Voltage	V <sub>O(PO)</sub>	THD = 10%, R <sub>L</sub> = 8Ω	1.2	1.3		V
Output Noise Voltage	V <sub>no(PO)</sub>	R <sub>g</sub> = 0Ω, R <sub>L</sub> = 8Ω, DIN/AUDIO		-74	-65	dBV
Output Offset Voltage	V <sub>O(Offset)</sub>	R <sub>g</sub> = 0Ω, R <sub>L</sub> = 8Ω	-50	0	50	mV

#### VAS

VAS Operation Input Voltage	VAS	Mic. input level at Pin 6 voltage = 0.2V	8	14	18	μV
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#### ALC

Effective Voltage	V <sub>ALC</sub>	V <sub>in</sub> = -60dBV, R <sub>g</sub> = 1.5kΩ	-6.5	-4.5	-2.5	dBV
Effective Width	W <sub>ALC</sub>	V <sub>in</sub> = -30dBV, R <sub>g</sub> = 1.5kΩ		1.5	3	%

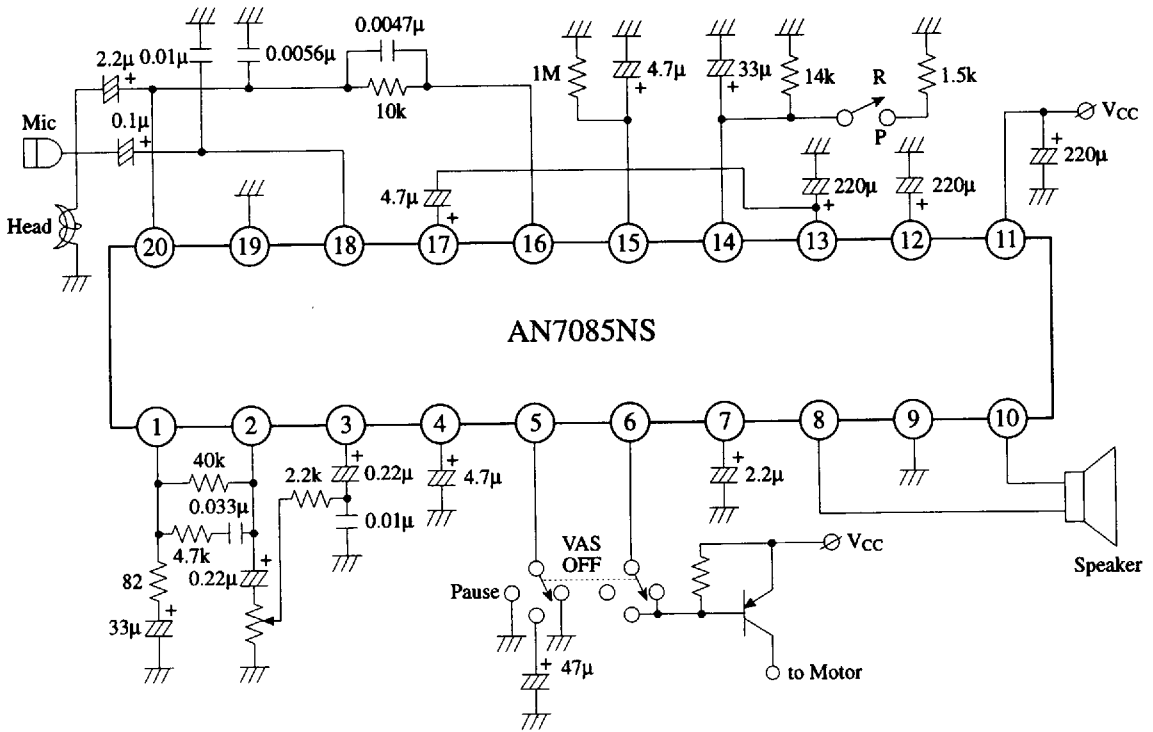
#### Ripple Rejection

Playback System Ripple Rejection	RR <sub>(PB)</sub>	f <sub>r</sub> = 270Hz, V <sub>r</sub> = 30mV, R <sub>g</sub> = 1kΩ		-70	-50	dBV
Recording System Ripple Rejection	RR <sub>(R)</sub>	f <sub>r</sub> = 270Hz, V <sub>r</sub> = 30mV, R <sub>g</sub> = 2.2kΩ		-40	-30	dBV

#### Switching Pin

Rec. / Playback Switching Pin	V <sub>PB</sub>	Playback mode	0.1		0.3	V
Rec. / Playback Switching Pin	V <sub>REC</sub>	Recording mode	1.6		2.3	V

■ Application Circuit



■ Pin Descriptions

Pin No.	Equivalent Circuit	Pin Description
20		Pre-Amp. Input Pin ● Input impedance = 120kΩ
1		Pre-Amp. NF Pin ● NF resistance = 120kΩ
2		Pre-Amp. Output Pin ● $I_{out(max)} = 300\mu A$
3		Power Amp. Input Pin ● Input impedance = 50kΩ
4		Power Amp. NF Pin ● NF resistance = 50kΩ, 3.6kΩ ● Gain = 23dB
5		<b>VAS Detection</b> ● VAS-ON: GND at 47μF ● VAS-OFF: GND ● VAS detection level change is possible at Vol.

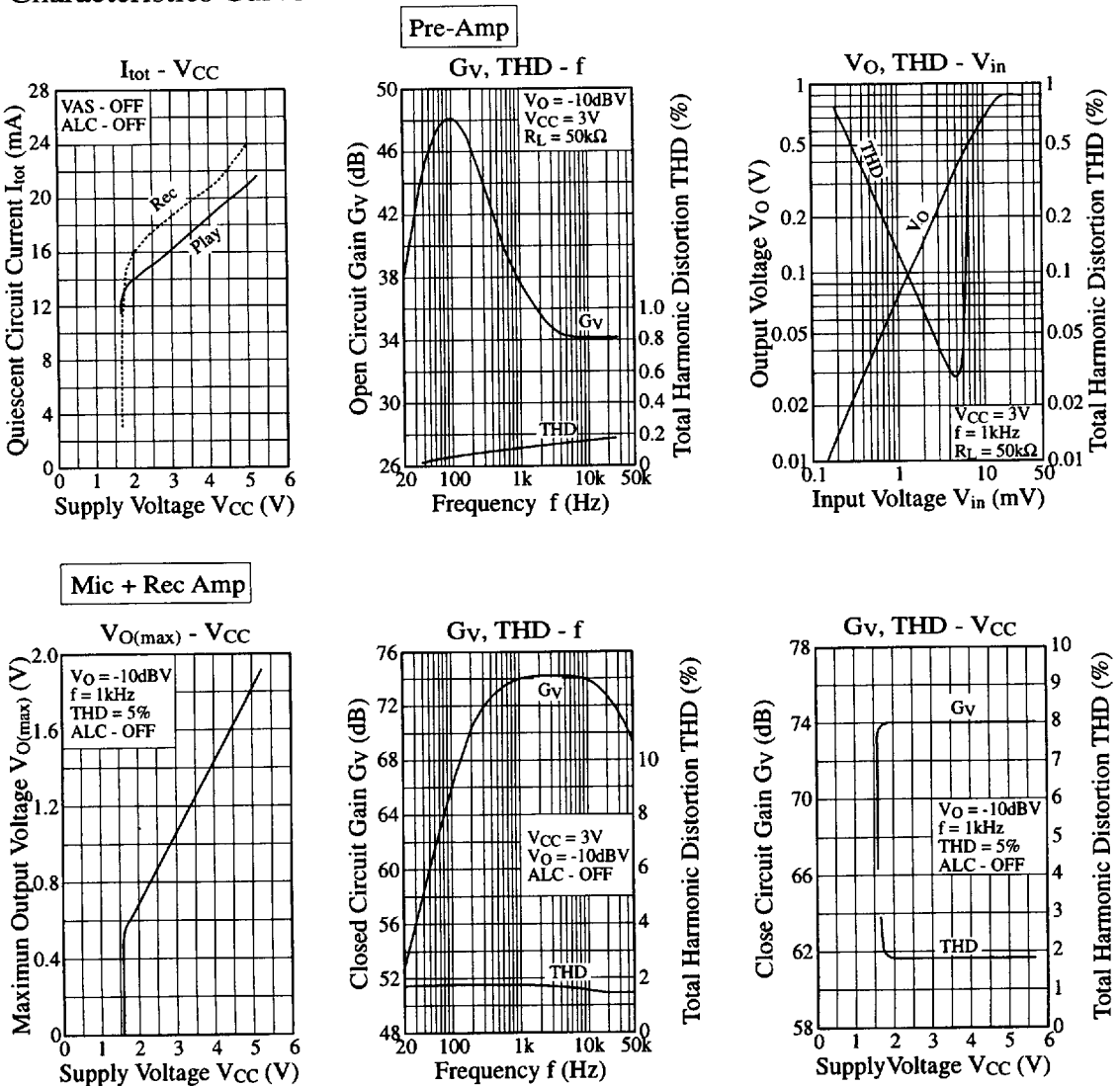
■ Pin Descriptions (Continue)

Pin No.	Pin Name	Equivalent Circuit	Description
7	Power Mute		Power Amp. NF becomes low and output pin does High by setting Pin 7 voltage High (0.7V). Mute power amp. by this.
8	Power Output 1		Output impedance at Rec = High impedance
9	Power GND		No contact with Sub
10	Power Output 2		Inverting output. Earphone monitor at Rec. is possible.
6	Motor Drive		$I_{out (typ.)} = 57mA (V_{CC} = 3V)$ $I_{out (min.)} = 14mA (V_{CC} = 1.8V)$ $I_{out}$ current control by using $R_1$ and $R_2$
11	Vcc		Charge Up Circuit { $1/2 V_{CC}$ R / P CTL Pre NF Power NF Muting Circuit      Power Mute
12	Filter		$V_{12} = V_{CC} \times 0.93$ $1/2 V_{CC} > 0.7V \sim V_{12} ON$ $V_{12} < 2/3$ , within $V_{CC}$ ALC OFF
13	1/2 Vcc		
14	Rec. / Play Switching		Playback mode at less than 0.7V. Rec. mode at more than 1.4V. Total circuit Mute mode at less than 0.7V / more than 1.4V. $I_{out} = 150\mu A$ (enable to use DC bias for head).
15	ALC Detection		Detect Rec. Amp. output level and generate voltage at Pin 15. Change input impedance of Mic input pin by the voltage and apply ALC.
16	Rec. Amp. Output		Gain = 20dB

■ Pin Descriptions (Continue)

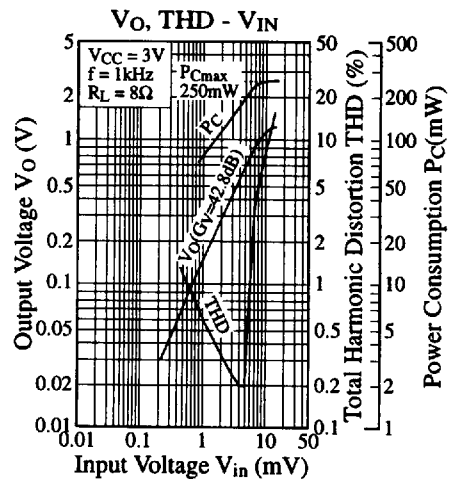
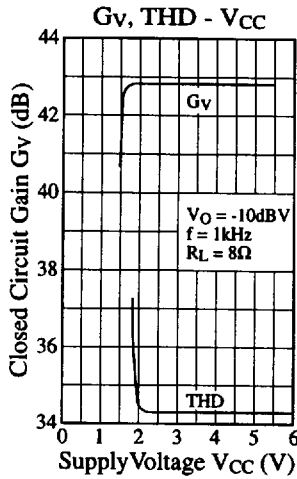
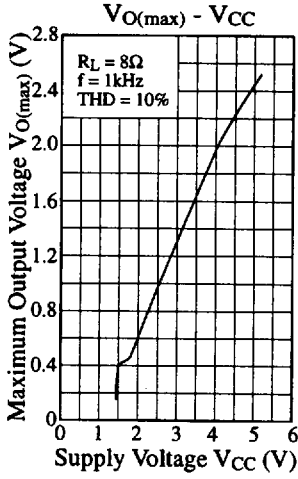
Pin No.	Pin Name	Equivalent Circuit	Description
17	Mic. Amp. NF		It is desirable to put capacitance between $1/2 V_{CC}$ and this pin to prevent shock sound.
18	Mic. Amp. Input		Input impedance = $3.5k\Omega$ . ALC level change by input resistance ( $R_g = 1.5k\Omega$ ) is possible.
19	GND		Pre., Rec., Mic. Amp. GND and Sub GND

■ Characteristics Curve



■ Characteristics Curve (Continue)

Pwr.-Amp.



ALC

