# mail

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#### **HIGH-POWER & LOW-VOLTAGE AUDIO POWER AMPLIFIER**

#### GENERAL DESCRIPTION

The NJM2770 is a high-power and low-voltage audio power amplifier with standby function. No external coupling capacitors required because of the differential output type. Two external resistors adjust the closed loop gain. The output power is 250mW typical at 3V-supply 80hm-load, and 400mW typical at 4.5v-supply 16ohm-load. The standby current is only 0.1µA typical.

The package of the NJM2770 is MSOP8(VSP8)\*, and the NJM2770 is suitable for PCS, codeless telephone, speaker amplifier for hands free system, and especially cellular phone because of low operating current, low standby current, and high power output.

+2-+4.5V

0.1µA typ

2.0mA typ.,at V<sup>+</sup>=3V

#### ■ FEATURS

- Operating Voltage
- Operating Current
- Low Power-Down Current
- High Power Otput 250mW typ.
  - at V<sup>+</sup>=3V,R<sub>L</sub>=8 $\Omega$ 400mW typ.
- V<sup>+</sup>=4.5V,R<sub>L</sub>=16Ω Gain Range at Voice Band Gv=0-43dB
- Load Impedance R<sub>I</sub>=4-200Ω
- Thermal Shut Down Function
- Bipolar Technology
- Package Outline

MSOP8 (VSP8)\* MSOP8 (TVSP8)\*\* \*\*MEET JEDEC MO-187-DA / THIN TYPE \*MEET JEDEC MO-187-DA

#### ■ PIN CONFIGURATION & BLOCK DIAGRAM



New Japan Radio Co.,Ltd:

#### PACKAGE OUTLINE





NJM2770R MSOP8(VSP8)

NJM2770RB1 MSOP8(TVSP8)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25				
PARAMETER	SYMBOL	RATINGS	UNIT	
Supply Voltage	V <sup>+</sup>	+5	V	
Power Dissipation	$P_D$	(MSOP8 (VSP8), MSOP8 (TVSP8)) 400	mW	
Operating Temperature Range	Topr	-40 to +85	°C	
Storage Temperature Range	Tstg	-40 to +150	O°	

#### **ELECTRICAL CHARACTERISTICS** (V<sup>+</sup>=3.0V,R<sub>L</sub>=8Ω,f=1kHz,1pin=2V,Ta=25°C,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION		TYP.	MAX.	UNIT
Operating Voltage Range	V <sup>+</sup>			-	4.5	V
Operating Current	I <sub>CC</sub>	R <sub>L</sub> =∞,no signal		2.0	4.0	mA
Power Down Current	I <sub>CCD</sub>	R <sub>L</sub> =∞ 1pin=0.8V,no signal	-	0.1	1.0	μA
Open Loop Gain	A <sub>V</sub> 1	Amp#A, f<100Hz	80	85	-	dB
Closed Loop Gain	A <sub>V</sub> 2	Amp#B	-0.35	0	+0.35	dB
Output Power	P <sub>0</sub> 1	THD=10%	110	250	-	mW
	P <sub>0</sub> 2	V <sup>+</sup> =4.5V, R <sub>L</sub> =16Ω, THD=10%	200	400	-	mW
Total Harmonic Distortion	THD1	P <sub>O</sub> =100mW, G <sub>VD</sub> =6dB	-	0.1	0.5	%
	THD2	$V^{+}$ =4.5V, R <sub>L</sub> =16 $\Omega$ , P <sub>O</sub> =150mW, G <sub>VD</sub> =6dB	-	0.1	-	%
Power Supply Rejection Ratio	SVR1	C1=∞, C2=0.01µF, DC	50	-	-	dB
(V <sup>+</sup> =3.0V-4.5V)	SVR2	C1=0.1µF, C2=0	-	35	-	dB
	SVR3	C1=1.0μF, C2=4.7μF	-	70	-	dB
Mute Attenuation	MAT	f =1kHz-20kHz, 1pin=0.8V	-	80	-	dB
Output Voltage	V <sub>0</sub> 1		0.95	1.10	1.25	V
(R <sub>f</sub> =20kΩ, DC)	V <sub>0</sub> 2	V <sup>+</sup> =4.5V, R <sub>L</sub> =16Ω	-	1.85	-	V
Output High Level	V <sub>OH</sub>	I <sub>OUT</sub> =-75mA, V <sup>+</sup> =2.0-4.5V	-	V <sup>+</sup> -1.0	-	V
Output Low Level	V <sub>OL</sub>	I <sub>OUT</sub> =75mA, V⁺=2.0-4.5V	-	0.21	-	V
Output DC Offset	$\Delta V_{O}$	R <sub>f</sub> =20kΩ, 5pin-8pin	-30	0	+30	mV
Input Bias Current	I <sub>B</sub>	4pin	-100	-	100	nA
Equivalent Resistance	R <sub>+IN</sub>	3pin	100	170	220	kΩ
	R <sub>REF</sub>	2pin	18	26	40	kΩ
CD Input Voltage H	V <sub>CDH</sub>	1pin	2.0	-	V*	V
CD Input Voltage L	V <sub>CDL</sub>	1pin	0.0	-	0.8	V
CD Input Resistance	nput Resistance $R_{CD}$ $V^+=V_{CD}=4.5V$ , 1pin		50	85	175	kΩ

#### ■ CONTROL TERMINAL EXPLANATION

CHIP DISABLE CONTROL(CD PIN)

PARAMETER	CONTROL SIGNAL	STATUS			
CD OFF	H(=V <sub>CDH</sub> )	IC is active.			
CD ON	L(=V <sub>CDL</sub> )	IC is standby. (with Mute)			

#### APPLICATION CURCUIT



- note:1.The CD terminal(1pin) should connect High level(>2.0V), when NJM2770 is active. The standby mode, when the CD terminal is Low level(<0.8V).
  - 2.To add the C1 and C2 capacitor, the power-supply-rejection-ratio will be improved. When C1 is large value, C2 will be unnecessary.
  - 3. The power-up time depend on the C1 and C2 capacitor.
  - 4. The input current of CD terminal is as shown below figure.



5.No connect oscillation-protect RC required.

To connect oscillation-protect RC, if the NJM2770 oscillate with PC board/stray capacitor/long speaker wire and others condition.

### **MEMO**

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