

# MSKSEMI

SEMICONDUCTOR



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Product data sheet

## GENERAL DESCRIPTION

JRC4558 是一款双路低功耗的差分式运算放大器，可以单电源或双电源供电。具有较高的开环增益、内部补偿、高共模范围和良好的温度稳定性，以及具有输出短路保护的特点。广泛应用于音频放大电路和传统的运算放大电路中。

## FEATURES

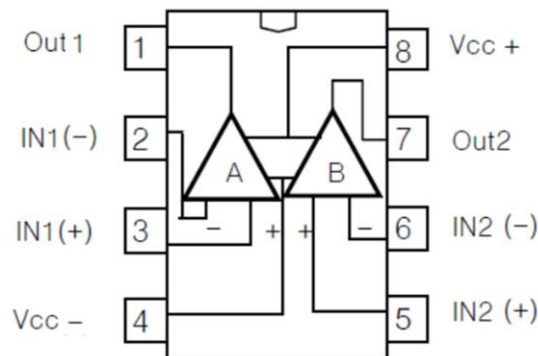
- 内部频率补偿
- 短路保护
- 低功耗：典型值 500uA @  $V_{CC}=5V$
- 封装形式：DIP8、SOP8
- 单电源电压范围：3V~30V
- 双电源电压范围：±15V
- 单位增益带宽：可达 1.2MHZ

## APPLICATION

- 传感器信号放大器
- 直流增益
- 音频放大器
- 其它应用领域

## PIN CONFIGURATION

DIP8/SOP8 管脚序号	管脚定义	功能说明
1	OUT1	第 1 路输出
2	IN1-	第 1 路反相输入
3	IN1+	第 1 路正相输入
4	VCC-	电源负
5	IN2+	第 2 路正相输入
6	IN2-	第 2 路反相输入
7	OUT2	第 2 路输出
8	VCC+	电源正



## 极限参数

项目	符号	极限值 <sup>(1)</sup>	单位
单电源供电电压	VCC	36	V
双电源供电电压	V <sub>S(VCC+, VCC-)</sub>	±18	V
差分输入电压 <sup>(2)</sup>	V <sub>IDR</sub>	±15	V
共模输入电压	V <sub>ICR</sub>	-0.3~36V	V
输出短路时间	t <sub>sc</sub>	连续	
耗散功率	P <sub>D</sub>	400	mW
工作温度	T <sub>A</sub>	0~70	°C
储存温度	T <sub>S</sub>	-65~150	°C
焊接温度	T <sub>W</sub>	260, 10s	°C

注：（1）极限值是指无论在任何条件下都不能超过的极限值。如果达到此极限值，将有可能造成产品劣化等物理性损伤；同时在接近极限参数下，不能保证芯片可以正常工作。

（2）输入端IN+相对于IN-之间的电压差。

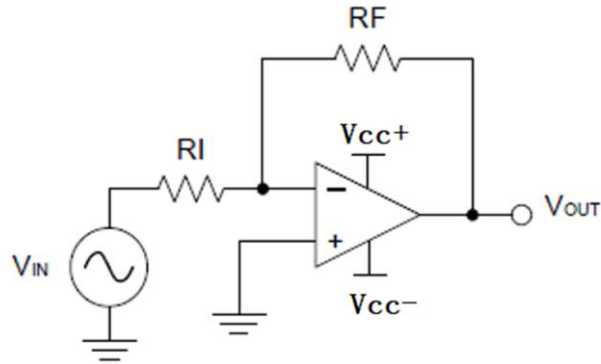
## 直流电学特性

(T<sub>A</sub>=25°C, VCC+ = +5V, VCC+ - =GND 除非特别指定)

项目	符号	测试条件	最小值	典型值	最大值	单位	
输入失调电压	V <sub>IO</sub>	VCC+=5V to 30V, V <sub>IC</sub> =V <sub>ICR</sub> (min), V <sub>O</sub> =1.4V	-	5	-	mV	
输入失调电流	I <sub>IO</sub>	V <sub>O</sub> = 1.4 V	-	10	50	nA	
偏置电流	I <sub>BIAS</sub>	V <sub>O</sub> = 1.4 V	-	50	250	nA	
共模输入电压	V <sub>ICR</sub>	VCC+ =5V to 30V	VCC-	-	VCC+ -1.5V	V	
开环电压增益	A <sub>OL</sub>	VCC+ =15V, V <sub>O</sub> =1V to 11V, R <sub>L</sub> ≥2kΩ		100	-	V/mV	
共模抑制比	CMRR	VCC+ =5V to MAX, V <sub>IC</sub> =V <sub>ICR</sub> (min)	-	80	-	dB	
单位增益带宽	GBWP		-	1.2	-	MHZ	
电源电压抑制比 P <sub>SSR</sub>	ΔV <sub>VDD</sub> /ΔV <sub>IO</sub>	VCC+ =5V to MAX, f=20kHz	-	90	-	dB	
串扰衰减抑制比 CS	V <sub>O1</sub> /V <sub>O2</sub>	f=1kHz to 20kHz	-	120	-	dB	
输出高电平电压	V <sub>OH</sub>	VCC+ =15V, V <sub>ID</sub> =1V	I <sub>out</sub> =-50uA	-	13.6	-	V
			I <sub>out</sub> =-1mA	-	13.5	-	V
			I <sub>out</sub> =-5mA	-	13.4	-	V
		VCC+ =28V	RL=2k		26	-	V
输出低电平电压	V <sub>OL</sub>	VCC+ =15V, V <sub>ID</sub> =-1V	I <sub>out</sub> =50uA	-	0.1	-	V
			I <sub>out</sub> =1mA	-	0.7	-	V
			I <sub>out</sub> =5mA	-	1.0	-	V
		VCC+ =28V	RL=2k		0.85	-	V
电源工作电流	I <sub>CC</sub>	VCC+ =5V, V <sub>O</sub> =1/2VCC+ , No load	-	0.5	-	mA	
		VCC+ =30, V <sub>O</sub> =1/2VCC+ , No load	-	0.8	-	mA	
单电源工作电压	VCC+	VCC- =0V (GND)	3	-	30	V	
双电源工作电压	V <sub>S</sub>	VCC+ , VCC-	-15	-	+15	V	

## 典型应用

### 1、线路图



### 2、设计要求

必须选择大于输入电压范围和输出范围的电源电压。

例如，将信号源  $V_{IN}$  从  $\pm 0.5\text{ V}$  放大到  $\pm 1.8\text{ V}$ 。将电源设置为  $\pm 5\text{ V}$  足以适应此应用要求。

### 3、设计过程

根据公式(1)计算放大倍数(增益)  $A_V$

$$A_V = -V_O/V_{IN} \quad \text{-----(1)}$$

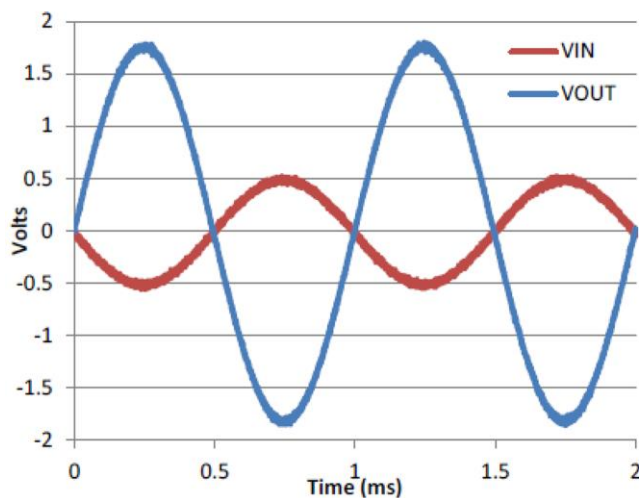
$$A_V = -V_O/V_{IN} = -1.8/0.5 = -3.6$$

一旦确定了所需的增益  $A_V$ ，就要为  $R_I$  或  $R_F$  电阻选择一个值。根据运放的电特性及功耗的需要，可选择  $1\text{ k}\Omega$  -  $100\text{ k}\Omega$  范围内的值。本例将选择  $R_I = 10\text{ k}\Omega$ ，则  $R_F = 36\text{ k}\Omega$ 。这由方程式 2 确定。

$$A_V = -R_F/R_I \quad \text{-----(2)}$$

$$R_F = -A_V * R_I = 3.6 * 10 = 36\text{ k}\Omega$$

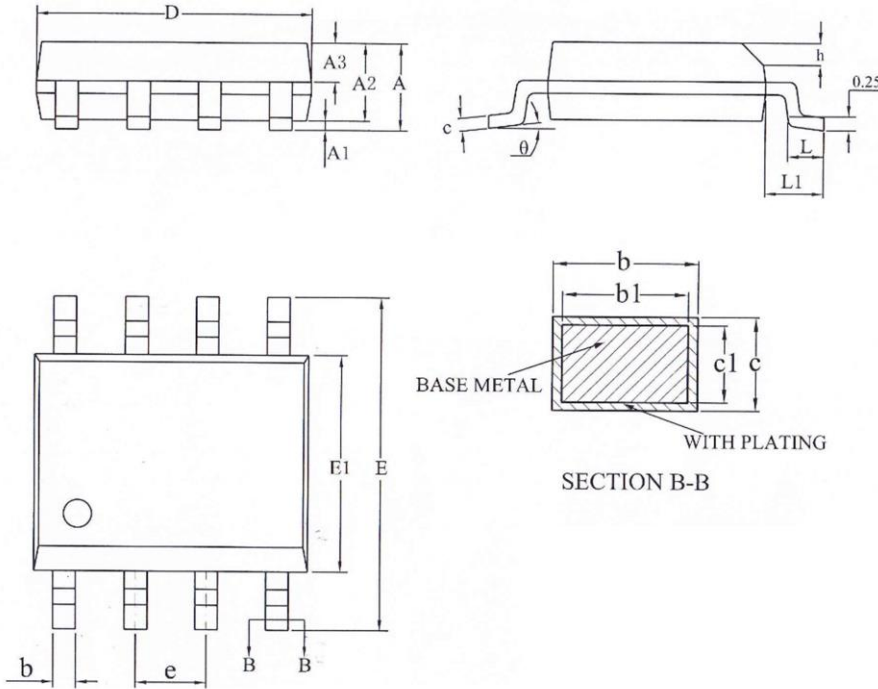
### 4、应用曲线图



反相放大器的输入电压 VS 输出电压

**PACKAGE MECHANICAL DATA**

**SOP8**

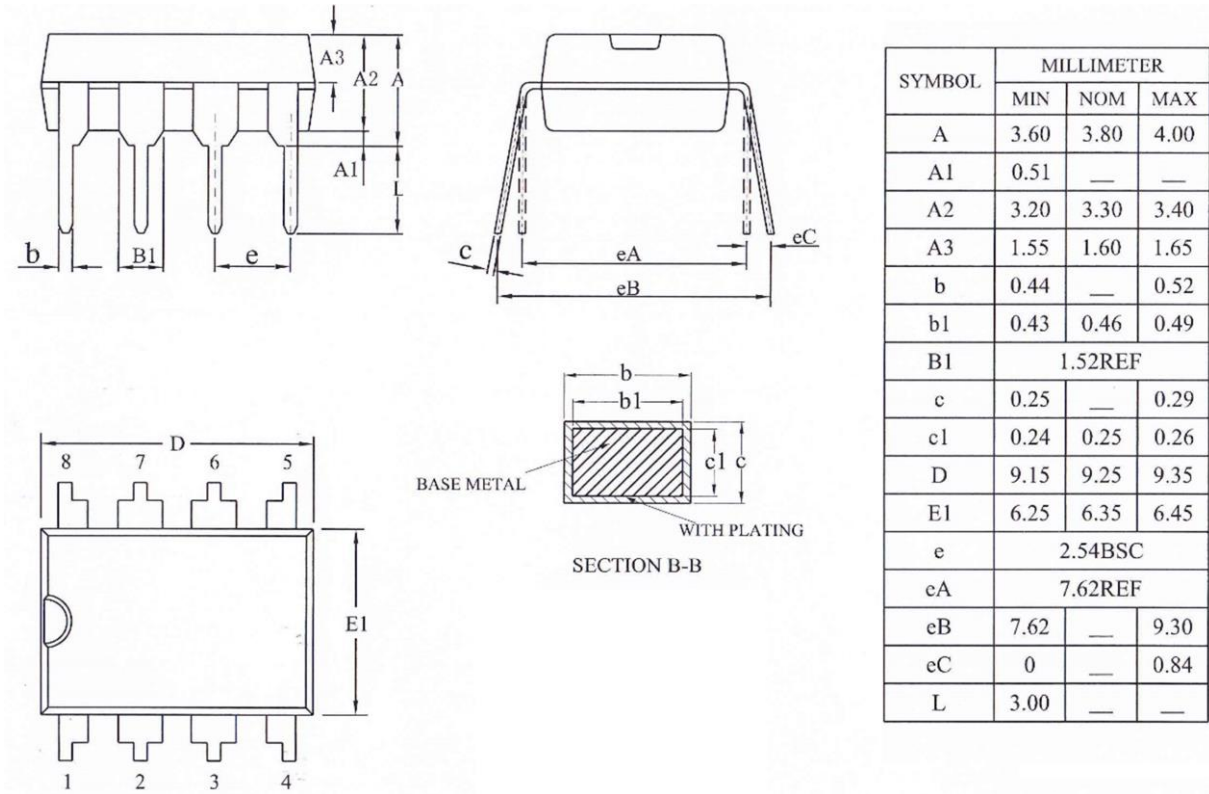


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.75
A1	0.10	—	0.225
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.39	—	0.47
b1	0.38	0.41	0.44
c	0.20	—	0.24
c1	0.19	0.20	0.21
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27BSC		
h	0.25	—	0.50
L	0.50	—	0.80
L1	1.05REF		
θ	0	—	8°

**REEL SPECIFICATION**

P/N	PKG	QTY
JRC4558	SOP-8	2500

**PACKAGE MECHANICAL DATA**



**REEL SPECIFICATION**

P/N	PKG	QTY
JRC4558	DIP-8	50

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