

Double operational amplifier

1. Overview and characteristics

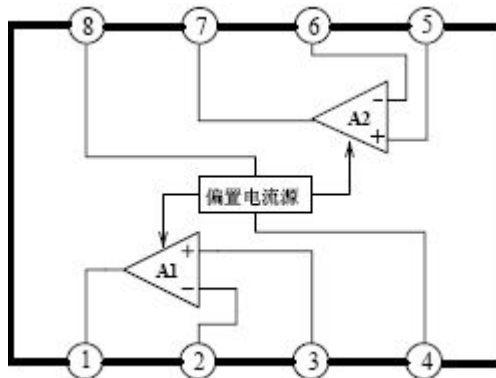
JRC4558 is a low noise dual operational amplifier circuit, which can be used as active filter, compensation amplifier, audio preamplifier, equalization amplifier and linear amplifier in electronic instruments.

Its characteristics are as follows:

- Phase compensation circuit is included;
- Low noise $V_{NI} = 2.5\mu\text{v}$;
- Speed high frequency bandwidth $BW = 3\text{MHz}$;
- Package form: DIP8 / SOP8;

2. Function block diagram and pin description

2.1 functional block diagram



2.2 pin description

Pin	Symbol	function	Pin	Symbol	function
1	OUT ₁	Output 1	5	IN ²⁺	In phase input 2
2	IN ₁₋	Invert input 1	6	IN ²⁻	Invert input 2
3	IN ₁₊	In phase input 1	7	OUT ²	Output 2
4	V _{EE}	Negative power supply	8	V _{CC}	Positive power supply

3. Electrical characteristics

3.1 limit parameters

T_{amb} = 25°C unless otherwise specified

Parameter name	Symbol	Rating	Company
supply voltage	V _{CC} /V _{EE}	± 18	V
Differential mode input voltage	V _{ID}	± 30	V
Common mode input voltage	V _{IC}	± 15	V
power waste	DIP	500	mW
	SOP	360	
Working environment temperature	T _{amb}	-20 ~ 70	°C
Storage temperature	T _{stg}	-55 ~ 125	°C

3.2 electrical characteristics

Unless otherwise specified, t_{amb} = 25 °C, V_{CC} = + 15V, V_{EE} = -15V

Parameter name	symbol	Test conditions	Canonical value			Unit	Figure number
			Min.	Typ.	Max.		
Supply current	I _{CC}			±4.0	±6.0	mA	4.5
Input offset current	I _{IO}			5	200	nA	4.2
Input bias current	I _{IB}			60	500	nA	4.2
Common-mode input voltage	V _{IC}		±12	±14		V	4.3
Maximum output voltage	V _{OM}	R _L =10KΩ	±12	±14		V	4.4
		R _L =2KΩ	±10	±13		V	4.4
Output short-circuit current	I _{OS}			40		mA	4.4
Output sink current	I _{OSink}			40		mA	4.4
Open-loop voltage gain	A _{VO}	V _O =±10V, R _L =2KΩ	86	100		dB	4.7
Common mode rejection ratio	CMRR		70	90		dB	4.3
Supply voltage rejection ratio	K _{SVR}			30	150	uV/V	4.1
Input offset voltage	V _{IO}			0.5	6	mV	4.1
Output voltage slew rate	S _R	A _V =1, R _L =2KΩ		1		V/uS	4.6
Unit incremental bandwidth	B _W	0dB		3		MHz	4.7
Equivalent input noise voltage	V _{NI}	R _S =1KΩ f=30Hz-30KHz		2.5		uV	

4. Test line

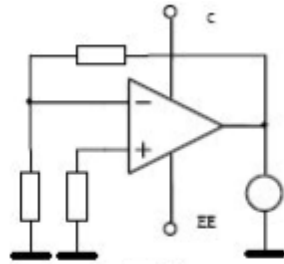


figure 4. 1

$$V_{10} = V_o / 100 \quad (V)$$

$$K_{SVR} = (V_{101} - V_{102}) / 5 \quad (\mu V/V)$$

$$V_{101}: V_{CC} = +17.5V, V_{EE} = -17.5V$$

$$V_{102}: V_{CC} = +12.5V, V_{EE} = -12.5V$$

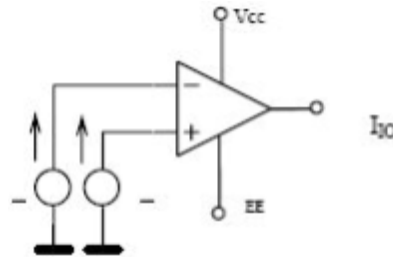


figure 4. 2

$$I_{10} = | I_1(+)-I_1(-) |$$

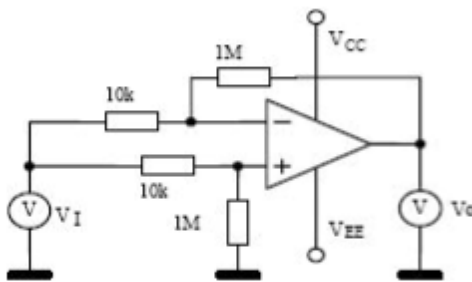


figure 4. 3

V_{1C} : V Positive and negative DC adjustable voltage The DC input voltage when it makes the output voltage 1V

CMRR The ratio of differential-mode voltage gain to common-mode

The switch positions in the left figure are as follows

V_{OM} :

S1=output voltage when S3 is disconnected when BS2 is disconnected

S1=output voltage when S3 is disconnected

S1=output voltage when S3 is disconnected when BS2 is disconnected

S1=output voltage when S3 is disconnected when BS2 is disconnected:

I_{OS}, i_{osink} :

S1=input current when S3 is switched on when BS2 is disconnected,

S1=output current when S3 is switched on when BS2 is disconnected

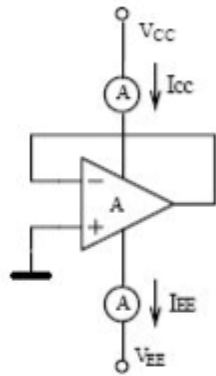


figure 4. 5

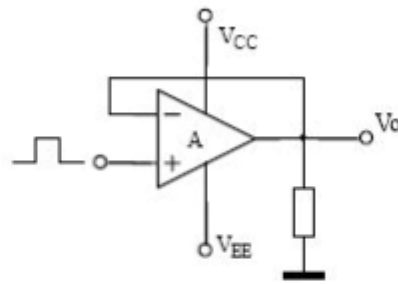


figure 4. 6

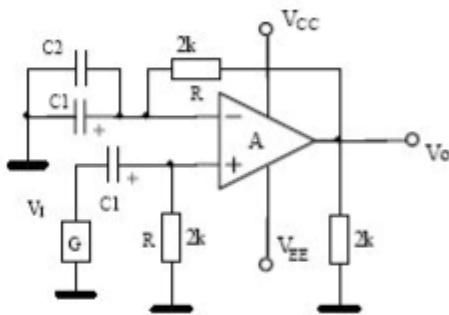
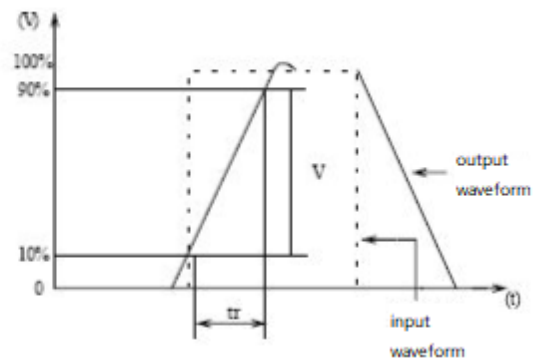


figure 4.7



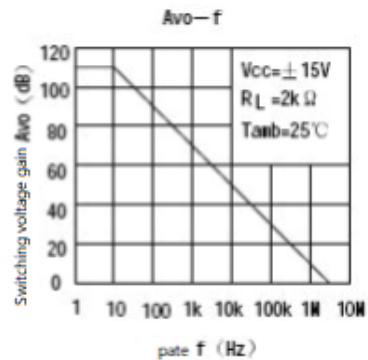
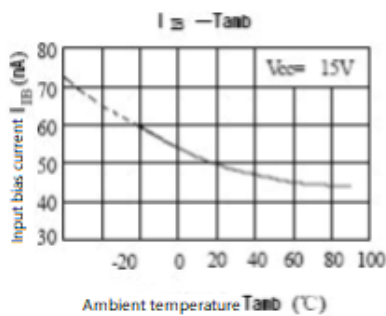
$$A_{VD} = 20 \log(V_o/V_i)$$

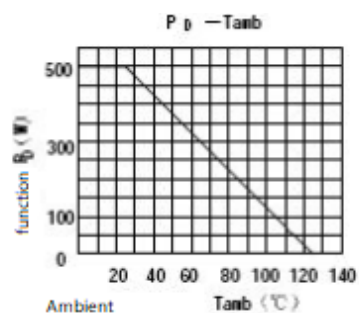
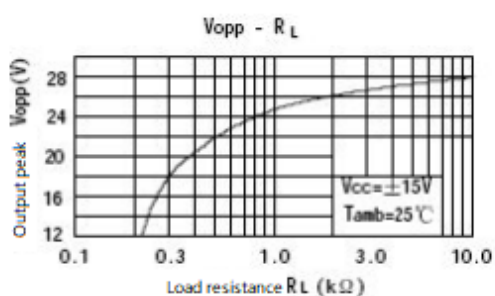
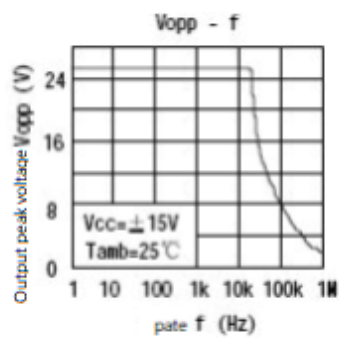
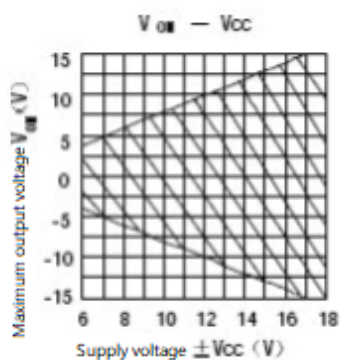
BW is the V_{II} frequency at $V_O = V$ (MHz)

C1: DC isolation capacitor

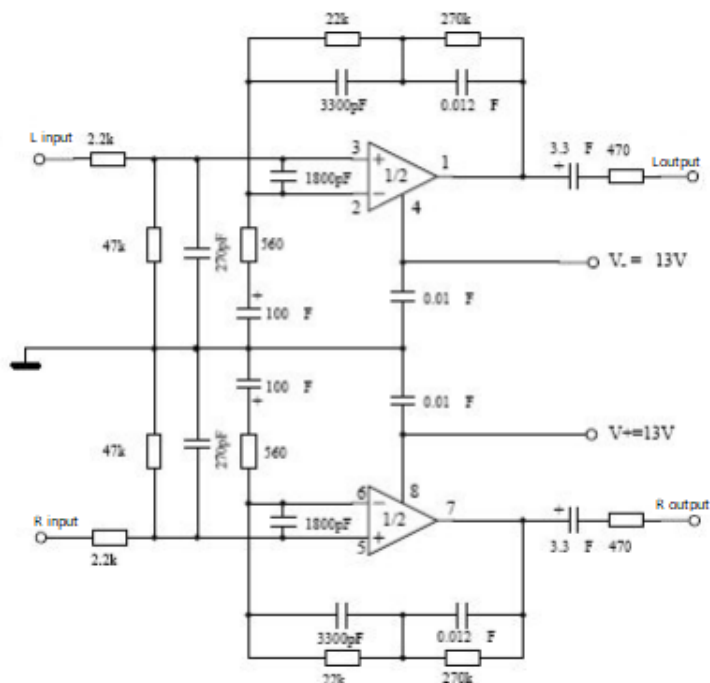
C2: high frequency capacitor of mica foil

5. Characteristic curve



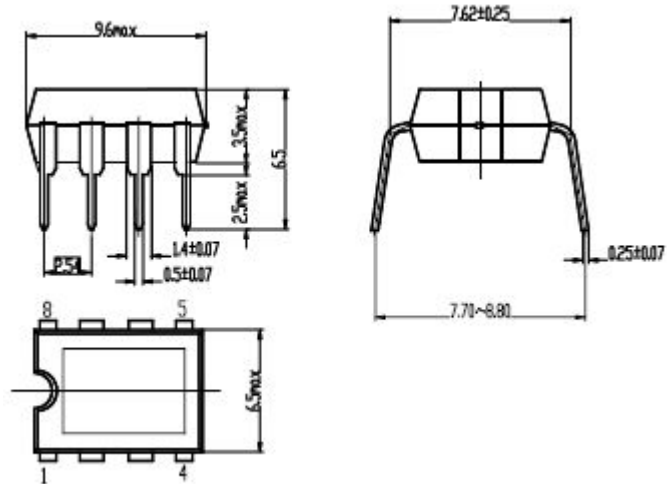


6. Application line



7. Dimensions

7.1 DIP8 package



7.2 SOP8 package

