

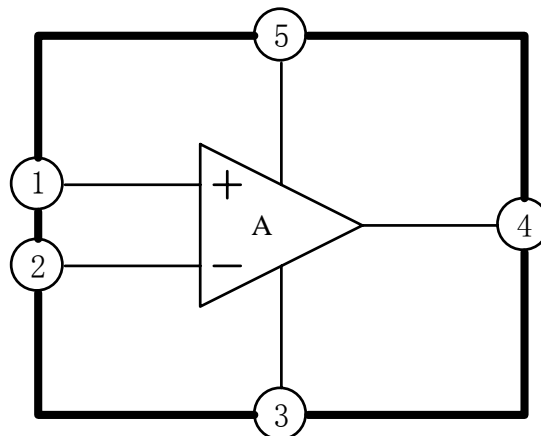
## 1. Overview

The V2030D is a monolithic IC intended for use as an audio amplifier or a driver circuit. It is particularly suited for audio amplifier without regulated supply, and also for driver circuits. With  $V_{CC} = 44V$ , using a few external components and low-cost complementary pairs, it can compose a 35W power amplifier. Its **features** are:

- High output current
- Low total harmonic distortion
- Incorporates a short circuit protection system
- Automatically limits the dissipated power so as to keep the working point of the output transistors within their safe operating area.
- Built-in thermal shut-down system
- FZIP5

## 2. Block Diagram and Pin Description

### 2.1 Block Diagram



### 2.2 Pin Description

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	IN	Signal Input	4	OUT	Output
2	NF	Negative feedback	5	$V_{CC}$	$+V_{EE}$
3	$V_{EE}/GND$	$V_{EE}/Ground$			

## 3. Electrical Characteristics

### 3.1 Absolute Maximum Ratings

Unless otherwise specified,  $T_{amb} = 25^{\circ}C$

Parameter	Symbol	Test Conditions	Value	Unit
Supply Voltage	$V_{CC}$		$\pm 22$	V
Input Voltage	$V_{in}$		$V_{CC}$	V
Differential Input Voltage	$V_{ind}$		$\pm 15$	V
Peak Output Current	$I_{OP}$		3.5	A

Power Dissipation	$P_D$	$T_C = 90^\circ\text{C}$	20	W
Operating Temperature	$T_{\text{amb}}$		-20 ~ 70	$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$		-40 ~ 150	$^\circ\text{C}$

### 3. 2 Electrical Characteristics

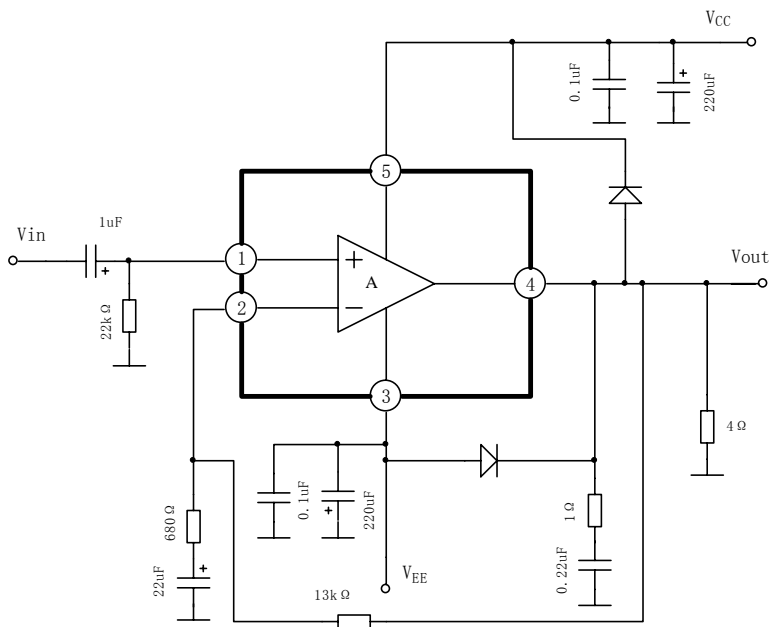
Unless otherwise specified, refer to the test circuit,  $T_{\text{amb}} = 25^\circ\text{C}$ ,  $V_{\text{CC}} = \pm 16\text{V}$

Parameter	Symbol	Test Conditions	Value			Unit	
			Min	Typ	Max		
Supply Voltage	$V_{\text{CC}}$		$\pm 6$		$\pm 22$	V	
Quiescent Drain Current	$I_{\text{CCQ}}$			50	80	mA	
Input Bias Current	$I_B$	$V_{\text{CC}} = \pm 22\text{V}$		0.2	2	$\mu\text{A}$	
Input Offset Voltage	$V_{\text{OS}}$	$V_{\text{CC}} = \pm 22\text{V}$		2	20	mV	
Input Offset Current	$I_{\text{OS}}$			20	200	nA	
Output Power	$P_O$	THD = 0.5%, $A_V = 26\text{dB}$ , $f = 40\text{Hz} \sim 15\text{kHz}$					W
		$R_L = 4\ \Omega$	15	18			
		$R_L = 8\ \Omega$	10	12			
		$V_{\text{CC}} = \pm 19\text{V}$ , $R_L = 8\ \Omega$	13	16			
Bandwidth	BW	$P_O = 15\text{W}$ , $R_L = 4\ \Omega$		100		kHz	
Slew Rate	SR			8		V/ $\mu\text{S}$	
Open Loop Voltage Gain	$A_{\text{VO}}$	$f = 1\text{kHz}$		80		dB	
Closed Loop Voltage Gain	$A_V$	$f = 1\text{kHz}$	25.5	26	26.5	dB	
Total Harmonic Distortion	THD	$f = 40\text{Hz} \sim 15\text{kHz}$ $P_O = 0.1 \sim 14\text{W}$ , $R_L = 4\ \Omega$		0.08		%	
		$f = 1\text{kHz}$		0.03			
		$P_O = 0.1 \sim 9\text{W}$ , $R_L = 8\ \Omega$ $f = 40\text{Hz} \sim 15\text{kHz}$		0.5			
Second Order CCIF Intermodulation	THD <sub>2</sub>	$P_O = 4\text{W}$ , $f_2 - f_1 = 1\text{kHz}$ $R_L = 4\ \Omega$		0.03		%	
Third Order CCIF Intermodulation	THD <sub>3</sub>	$f_1 = 14\text{kHz}$ $f_2 = 15\text{kHz}$ , $2f_1 - f_2 = 13\text{kHz}$		0.08		%	
Input Noise Voltage	$V_{\text{ino}}$	B = Curve A		2		$\mu\text{V}$	
		B = 22Hz~22kHz		3	10		
Input Noise Current	$I_{\text{ino}}$	B = Curve A		50		pA	
		B = 22Hz ~ 22kHz		80	200		
Signal to Noise Ratio	S/N	$R_L = 4\ \Omega$ , B = Curve A, $R_g = 10\ \text{k}\Omega$					dB
		$P_O = 15\text{W}$		106			
		$P_O = 1\text{W}$		94			
Input Resistance	$R_I$	$f = 1\text{kHz}$	0.5	5		M $\Omega$	
Supply Voltage Rejection	R.R	$R_L = 4\ \Omega$ , $R_g = 22\ \text{k}\Omega$ $A_V = 26\text{dB}$ , $f = 100\text{Hz}$		54		dB	
Thermal Shut-down Junction Temperature	$T_j$			145		$^\circ\text{C}$	

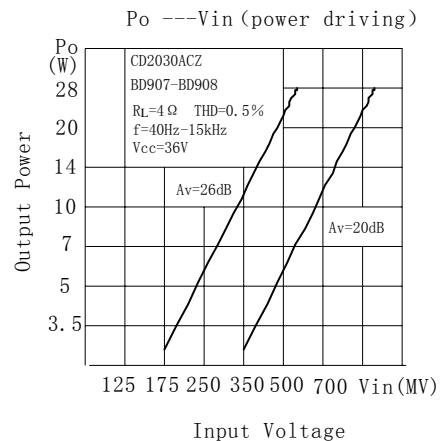
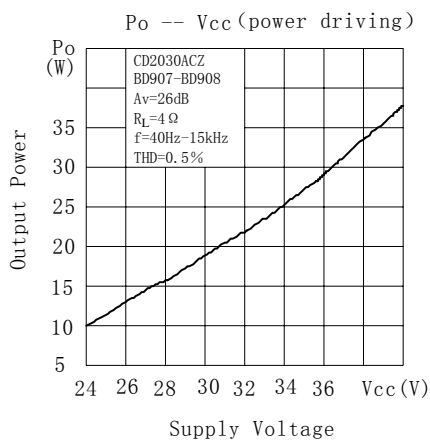
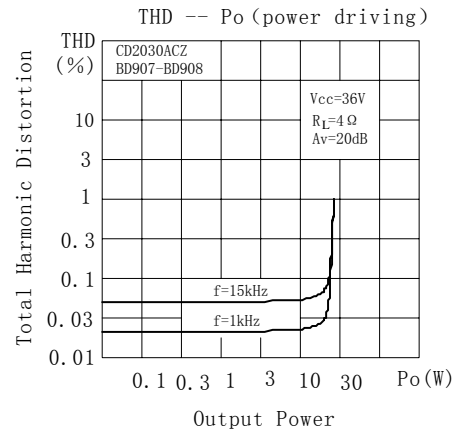
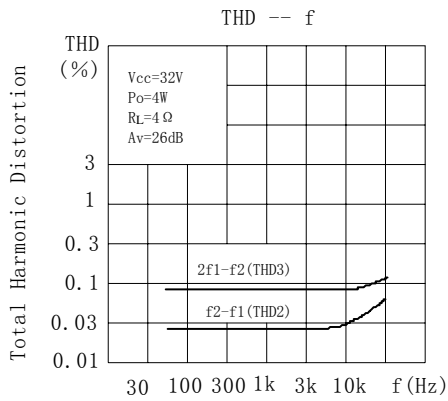
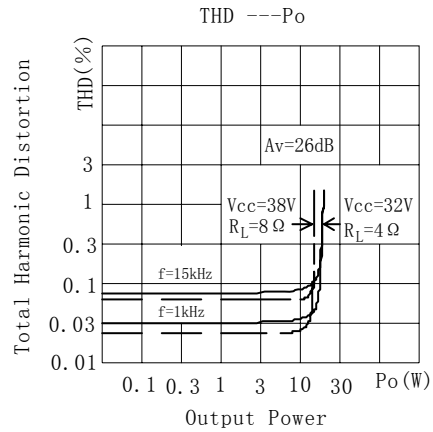
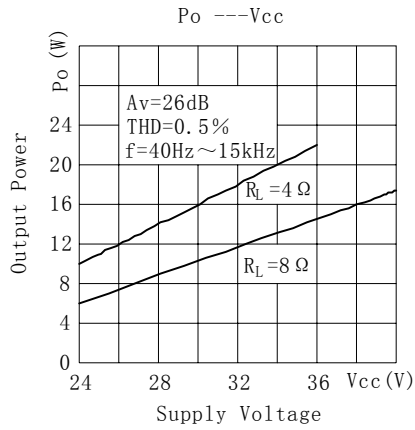
3.3 Typical Performance of the Diver Circuit

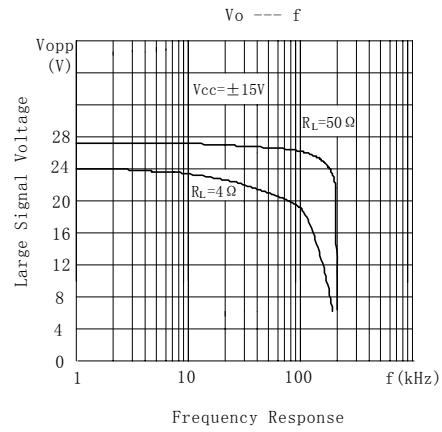
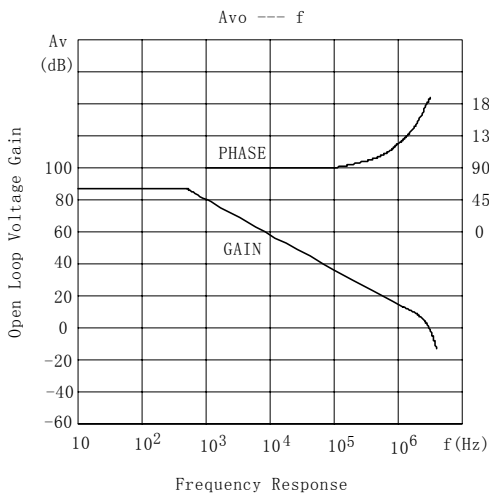
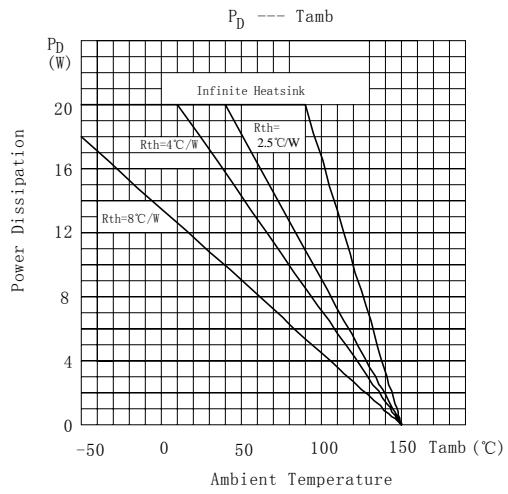
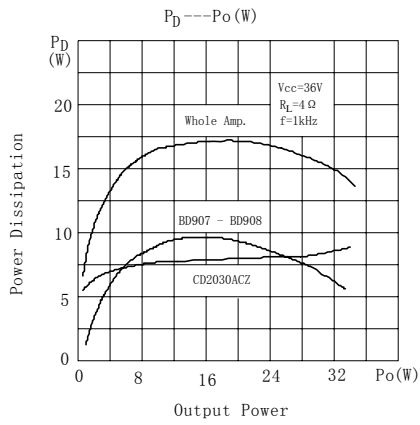
Parameter	Symbol	Test Conditions	Value			Unit
			Min	Typ	Max	
Supply Voltage	$V_{CC}$			36	44	V
Quiescent Current	$I_{CCQ}$	$V_{CC} = 36V$		50		mA
Output Power	$P_O$	THD = 0.5%, $R_L = 4 \Omega$ , $f = 40Hz \sim 15kHz$				W
		$V_{CC} = 39V$		35		
		$V_{CC} = 36V$		28		
		THD = 10%, $R_L = 4 \Omega$ , $f = 1kHz$				
		$V_{CC} = 39V$		44		
		$V_{CC} = 36V$		35		
Closed Loop Voltage Gain	$A_V$	$f = 1kHz$	19.5	20	20.5	dB
Slew Rate	SR			8		V/uS
Total Harmonic Distortion	THD	$f = 1kHz, P_O = 20W$		0.02		%
		$f = 40Hz \sim 15kHz, P_O = 20W$		0.05		
Input Sensitivity	$V_i$	$A_V = 20dB, f = 1kHz, P_O = 20W, R_L = 4 \Omega$		890		mV
Signal to Noise Ratio	S/N	$R_L = 4 \Omega, R_g = 10k \Omega, B = \text{Curve A}$				dB
		$P_O = 25W$		108		
		$P_O = 4W$		100		

4. Test Circuit



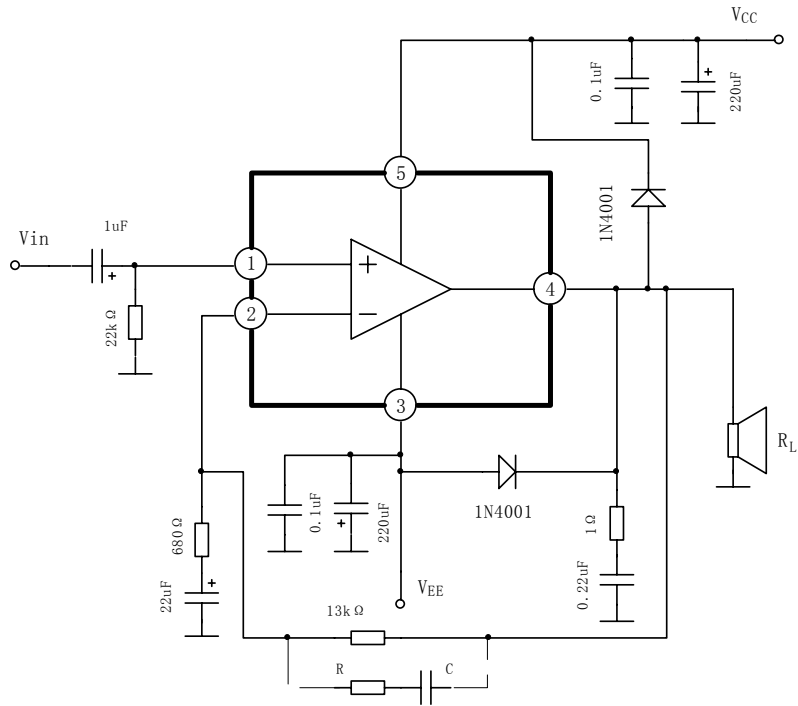
## 5.Characteristics Curve



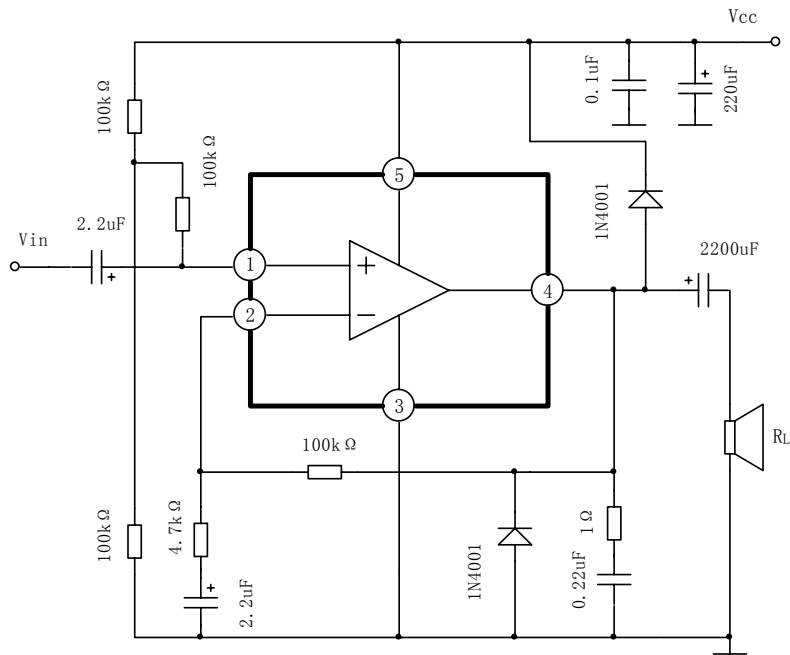


6. Application Circuit

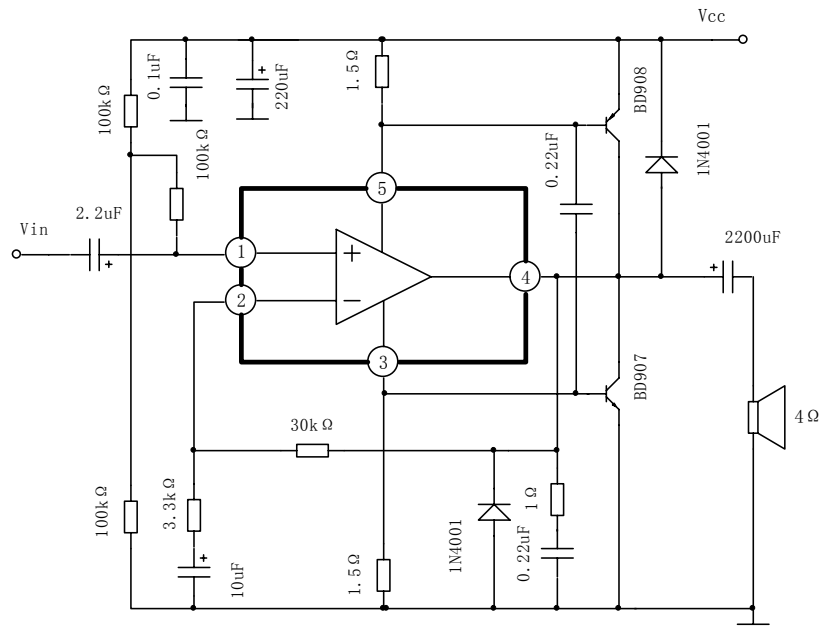
6.1 Typical Application Circuit



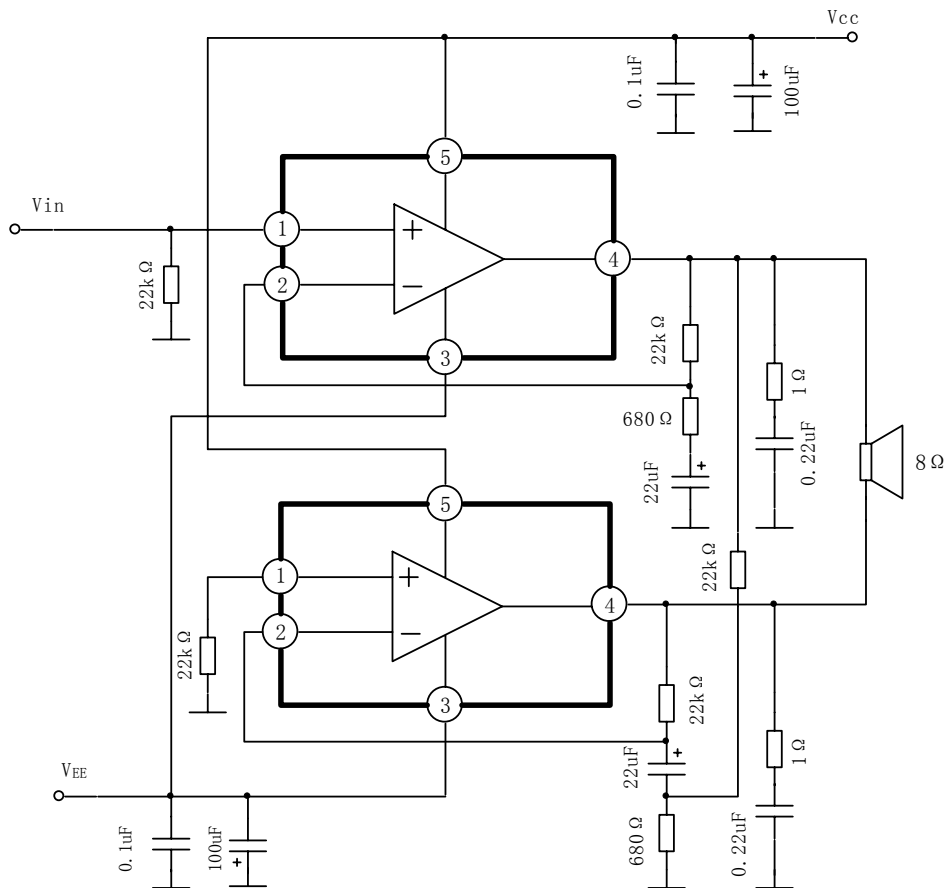
6.2 Single Supply Application Circuit



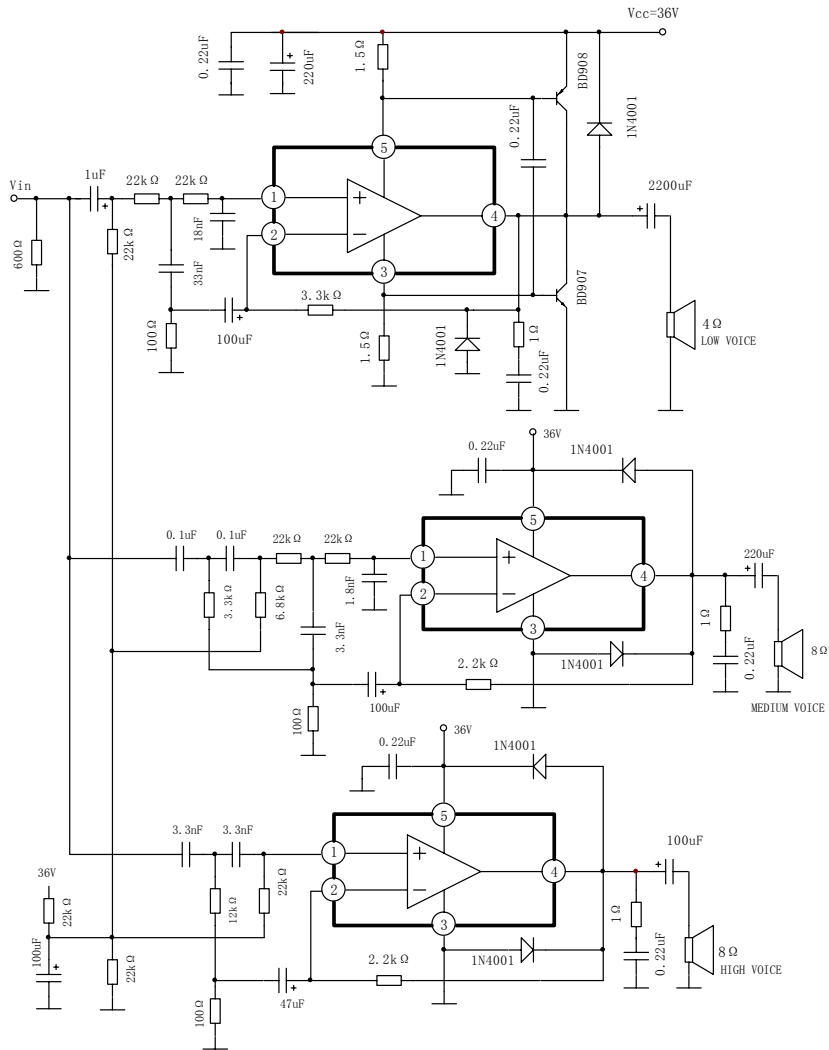
6.3 Power Driver Application Circuit



6.4 Bridge Amplifier with Split Power Supply ( $V_{CC} = +16V$ ,  $V_{EE} = -16V$ ,  $P_O > 34W$ )



## 6.5 3×60W Active Loudspeaker System



### 6.6 Note

- (1) The recommended supply voltage should not be higher than 44V.
- (2) Please refer to the power dissipation curve when making heat sink.

## 7.Package Dimensions

