

HA1124A 伴音中放、鉴频及音频前置放大电路

日立公司

性能说明:

本电路内部包括多级伴音限幅中放、鉴频、电子音量衰减以及能直接驱动NPN 功放晶体管或高跨导电子管的音频放大电路。相互代换的电路较多。

极限值 ($T_A = 25^\circ\text{C}$)

参 数 名 称	符 号	极 限 值	单 位
输入电压	V_I	± 3	V
电源电流	I_{CC}	50	mA
功耗	P_D	350	mW
工作环境温度	T_A	-20~85	$^\circ\text{C}$
贮存温度	T_{stg}	-55~125	$^\circ\text{C}$

电特性 ($T_A = 25^\circ\text{C}$)

参 数 名 称	符 号	测 试 条 件	最 小	典 型	最 大	单 位
电源稳定电压	V_5	$V_{CC} = 30V, R_5 = 600\Omega$	10.3	11.2	12.2	V
电源输入电流	I_5	$V_5 = 9V$	10	16	20	mA
1 端电压	V_1			2		V
7 端电压	V_7			6.1		V
9 端电压	V_9			3.7		V
12端电压	V_{12}		4	5.1	5.8	V
限幅输入电压	V_I	$f_0 = 4.5\text{MHz}, \Delta f = 25\text{kHz}, f_M = 400\text{Hz}$		200	400	μV
音频检波输出	V_0	$V_I = 100\text{mV}, f = 4.5\text{MHz}$	0.5	0.75		V_{rms}
最大音量衰减	A_{11}	6端开路	60	80		dB
音频电压增益	G_V	$V_I = 0.1V, f = 400\text{Hz}$	17.5	20		dB
最大输出电压	V_{OMAX}	THD=5%, $f = 400\text{Hz}$	2	2.5		V

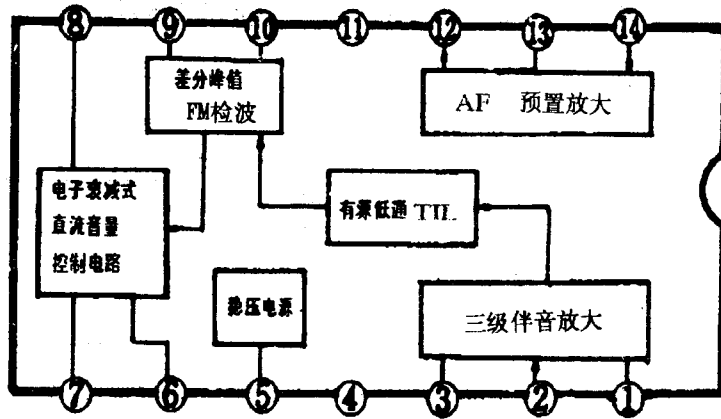
引出端说明 (14-DIP 见封装图B33)

代号	引出端说明与符号	代号	引出端说明与符号	代号	引出端说明与符号
1	6.5MHz伴音中频输入	2	6.5MHz伴音中频输入	3	地
4	地	5	电源	6	音量调节
7	去加重电路	8	缓冲放大输出	9	鉴频器调谐回路
10	鉴频器调谐回路	11	空	12	音频放大输出
13	负反馈	14	音频放大输入		

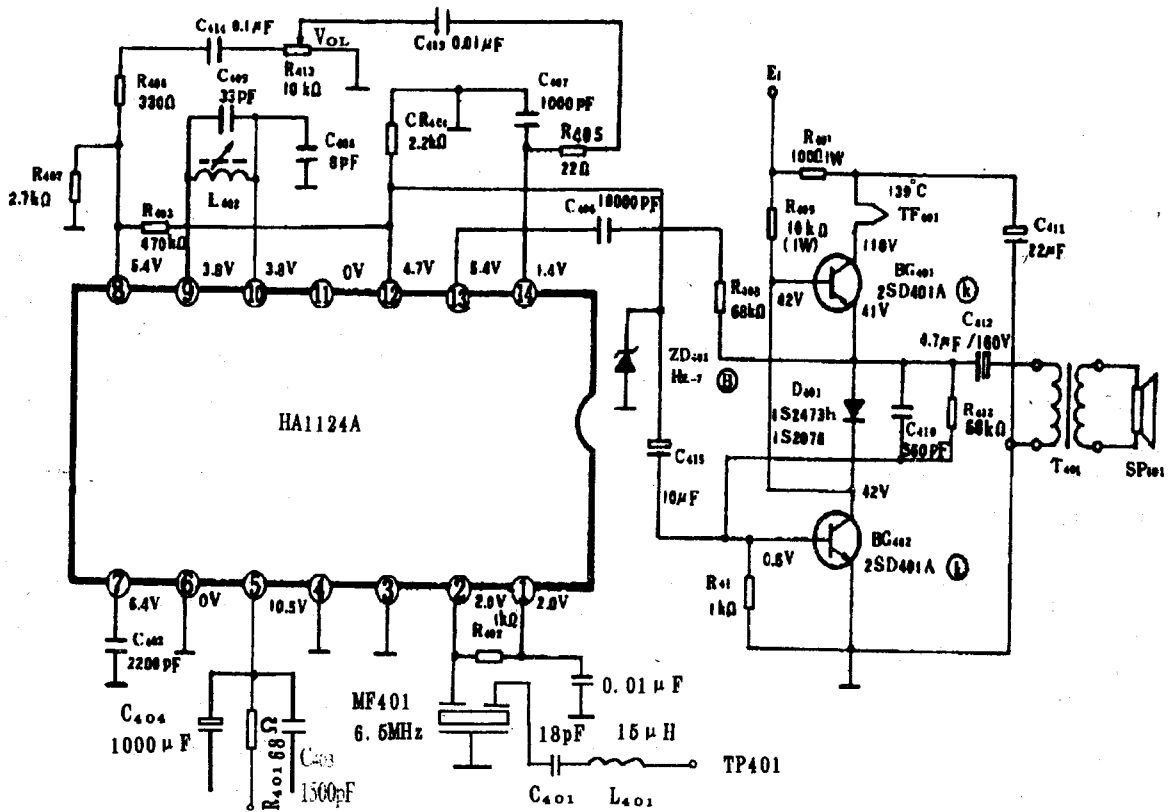
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功能框图



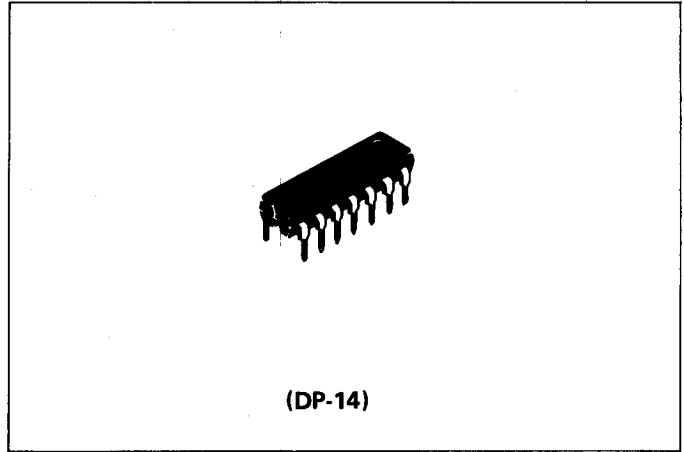
应用图例



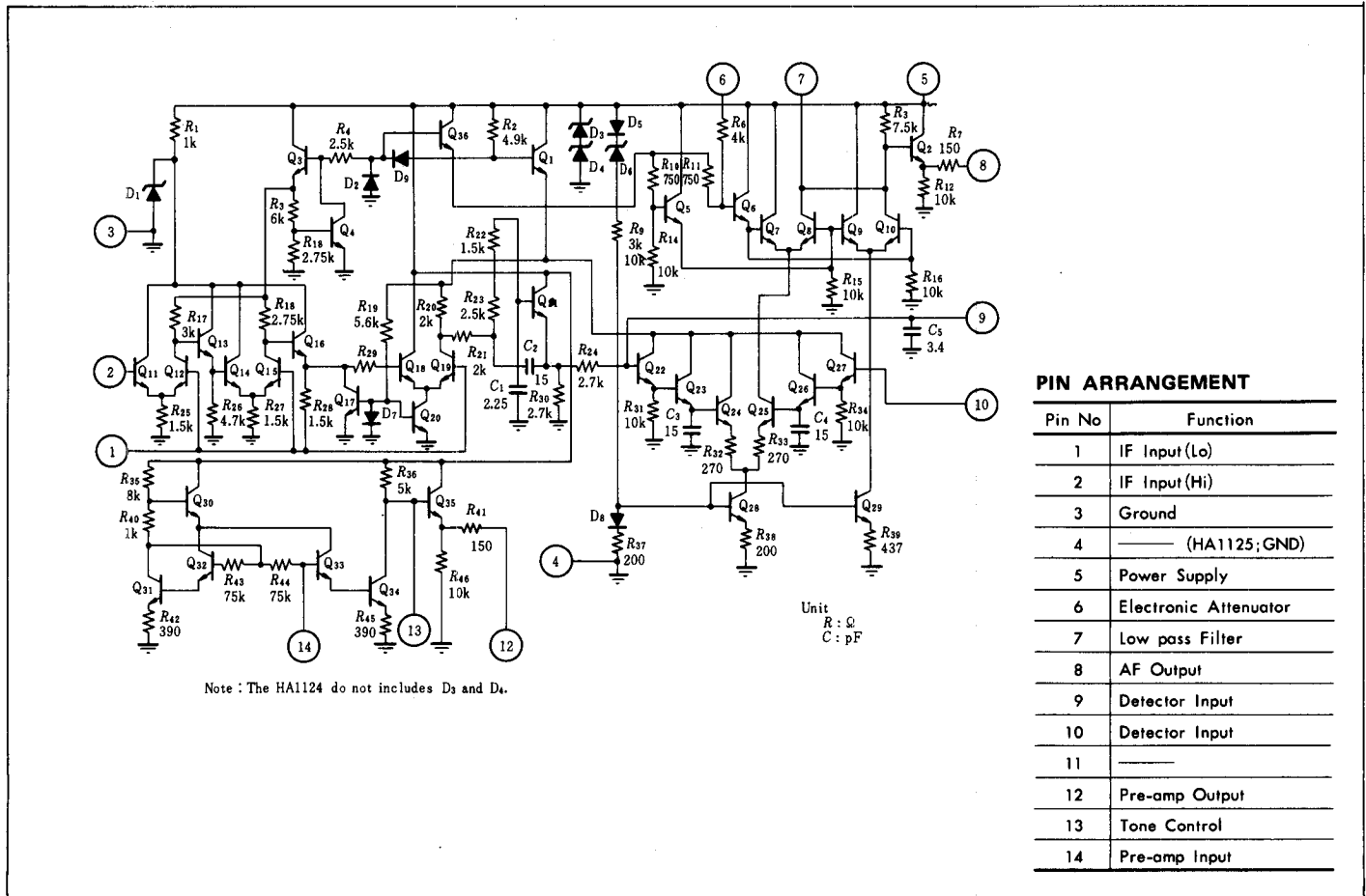
HA1124 HA1125

TV SOUND SYSTEM

- FUNCTIONS
- IF Amplifier-Limiter
- FM Detector
- Electronic Attenuator
- Audio Driver



■ CIRCUIT SCHEMATIC



PIN ARRANGEMENT

Pin No	Function
1	IF Input (Lo)
2	IF Input (Hi)
3	Ground
4	(HA1125; GND)
5	Power Supply
6	Electronic Attenuator
7	Low pass Filter
8	AF Output
9	Detector Input
10	Detector Input
11	—
12	Pre-amp Output
13	Tone Control
14	Pre-amp Input

■ ABSOLUTE MAXIMUM RATINGS(1) ($T_a=25^\circ\text{C}$)

Item	Symbol	HA1124	HA1125	Unit
Input Voltage	V_{in}	± 3	± 3	V
Supply Current	I_{cc}	50	50	mA
Power Dissipation	P_T^*	350	400	mW
Operating Temperature	T_{opr}	-20 to +85	-20 to +85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +125	-55 to +125	$^\circ\text{C}$

* Value at $T_a=85^\circ\text{C}$

■ ABSOLUTE MAXIMUM RATINGS(2)

The following chart gives the range of voltages which can be applied to the terminals listed vertically with respect to the terminals listed horizontally. For example, the voltage range of the vertical terminal 9 with respect to terminal 3 is 0 to +4 volts.

	4	5	6	7	8	9	10	11	12	13	14	1	2	3	
4															
5			+13 0	+13 0	+13 0	*	*	INTERNAL CONNECTION DO NOT USE	+13 0	+13 0	*	*	*	**	
6				*	*	*	*		*	*	*	*	*	*	+13 -5
7					+1 -4	*	*		*	*	*	*	*	*	+13 0
8						*	*		*	*	*	*	*	*	*
9							*		*	*	*	*	*	*	+4 0
10									*	*	*	*	*	*	+4 -5
11									INTERNAL CONNECTION DO NOT USE						
12										+4 -1	*	*	*	*	
13											*	*	*	*	
14												*	*	+3 -5	
1													+5 -5	+5 -5	
2														+4 -5	
3															

Notes: * Voltages are not normally applied between these terminals.
 ** Terminal 5 may be connected to any positive voltage through a suitable resistor provided that the current and dissipation ratings are not exceeded.

Terminal No.	I_{IN} (mA)	I_{OUT} (mA)
4		
5	50	1
6	1	1
7	1	1
8	0.5	6
9	1	1
10	1	0.1
11	DO NOT USE	
12	0.5	6
13	1	2
14	1	0.1
1	1	0.1
2	1	0.1
3	0.1	50

■ ELECTRICAL CHARACTERISTICS (This table is applied to the HA1125 only)

Item	Symbol	Test Conditions	min	typ	max	Unit
Zener Regulating Voltage	V_s		10.3	11.2	12.2	V
Current into Terminal 5	I_s	Connect Terminal 5 to +9V	10	16	24	mA
Total Device Dissipation	P_T		339	351	362	mW
Terminal 1 Voltage	V_1		—	2	—	V
Terminal 7 Voltage	V_7		—	6.1	—	V
Terminal 9 Voltage	V_9		—	3.7	—	V
Terminal 12 Voltage	V_{12}		4.0	5.1	5.8	V
Input Limiting Voltage	$V_{i(lim)}$	$f_o = 4.5\text{MHz}$, $f_m = 400\text{Hz}$, $\Delta f = 25\text{kHz}$	—	200	400	μV
AM Rejection	AMR	$V_{in} = 2, 10, 100\text{mVrms}$, $f = 4.5\text{MHz}$, AM: 30% mod. (FM: 100% mod.)	40	50	—	dB
Forward Transadmittance	$ y_m $	$f = 4.5\text{MHz}$, Input Terminal 2 to 1	—	500	—	mS
Phase Angle	θ	Output Terminal 9 to 3	—	46	—	deg
Feedback Capacitance	C_{fb}	$f = 1\text{MHz}$, Terminal 2 to 9	—	—	0.02	pF
Input Resistance	R_{in}	$f = 4.5\text{MHz}$, Terminal 2 to 1	—	17	—	k Ω
Input Capacitance	C_{in}		—	4	—	pF
Output Resistance	R_{out}	$f = 4.5\text{MHz}$, Terminal 9 to 3	—	3.25	—	k Ω
Output Capacitance	C_{out}		—	75	—	pF
Recovered AF Voltage	$V_{o(AF)}$	$V_{in} = 100\text{mV}$, $f = 4.5\text{MHz}$, $f_m = 400\text{Hz}$, $\Delta f = 25\text{kHz}$	0.5	0.75	—	Vrms
Total Harmonic Distortion	T.H.D		—	0.9	2	%
Output Resistance Terminal 7	R_{out7}		—	7.5	—	k Ω
Output Resistance Terminal 8	R_{out8}		—	300	—	Ω
Max. Attenuation		Terminal 6 Open	60	80	—	dB
Play-through Voltage		Terminal 6 Open	—	0.075	1	mV
Voltage Gain	$G_{V(AF)}$	$V_{in} = 0.1\text{Vrms}$, $f = 400\text{Hz}$	17.5	20	—	dB
Total Harmonic Distortion (AF)	T.H.D(AF)	$V_{out} = 2\text{Vrms}$, $f = 400\text{Hz}$	—	1.5	—	%
Undistorted Output Voltage	V_{out}	T.H.D = 5%, $f = 400\text{Hz}$	2.0	2.5	—	V
Input Resistance	$R_{in(AF)}$	$f = 400\text{Hz}$, Terminal 14 to 3	—	70	—	k Ω
Output Resistance	$R_{out(AF)}$	$f = 400\text{Hz}$, Terminal 12 to 3	—	270	—	Ω

Note) TEST CONDITIONS: $T_a = 25^\circ\text{C}$, $V_{cc} = 30\text{V}$ applied to Terminal 5 through $R_c = 600\Omega$ and DC Volume Control = 0 unless otherwise specified.

■ TEST CIRCUIT (This test circuit is applied to the HA1125 only)

