HA1124, HA1125

TV Sound System

Functions

- IF amplifier-limiter
- FM detector
- Electronic attenuator
- Audio driver

Pin Description

Pin No.	Function
1	IF input (low)
2	IF input (high)
3	Ground
4	— (HA1125: GND)
5	Power supply
6	Electronic attenuator
7	Lowpass filter
8	AF output
9	Detector input
10	Detector input
11	—
13	Tone control
14	Pre-amp input

Circuit Schematic

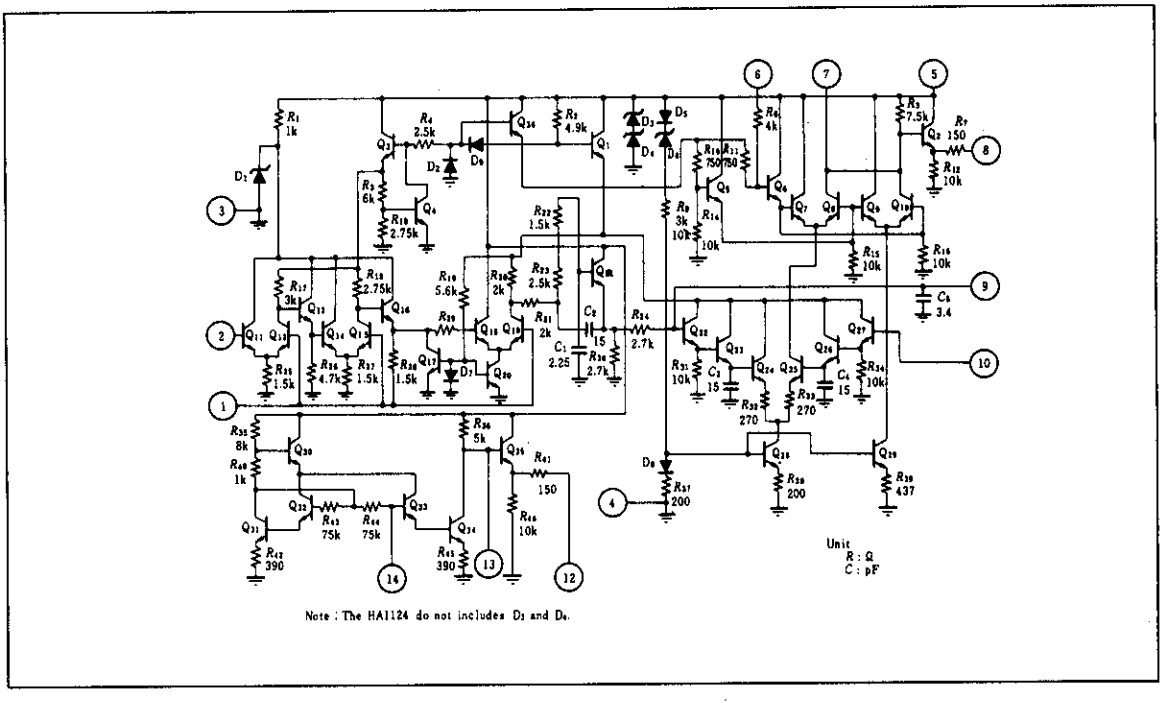

Table 1 shows the range of voltages that can be applied to the vertically listed terminals with respect to horizontally listed terminals. For example, the voltage range of vertical terminal 9 with respect to terminal 3 is 0 to +4 volts. Table 2 shows input and output currents.

Table 1 Maximum Voltage Range

	4	5	6	7	8	9	10	11	12	13	14	1	2	3
4														
5			0 +13	0 +13	0 +13	—	—	Do not use	0 +13	0 +13	—	—	—	any pos.*
6				—	—	—	—		—	—	—	—	—	−5 +13
7					−4 +1	—	—		—	—	—	—	—	0 +13
8						—	—		—	—	—	—	—	—
9							—		—	—	—	—	—	0 +4
10									—	—	—	—	—	−5 +4
11									Internal connection, do not use					
12										−1 +4	—	—	—	—
13											—	—	—	—
14												—	—	−5 +3
1													−5 +5	−5 +5
2														−5 +4
3														

Table 2 Input Output Currents

Terminal No.	I_{in}	I_{out}
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

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	HA1124	HA1125	Unit
Input voltage	V_{in}	±3	±3	V
Supply current	I_{CC}	50	50	mA
Power dissipation	P_T (T_a = 85°C)	350	400	mW
Operating temperature	T_{opr}	-20 to +85	-20 to +85	°C
Storage temperature	T_{stg}	-55 to +125	-55 to +125	°C

Electrical Characteristics (HA1125 only)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zener regulating voltage	V_S	10.3	11.2	12.2	V	
Current into terminal 5	I_5	10	16	24	mA	Connect terminal 5 to +9 V
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	

Electrical Characteristics (cont)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Terminal 12 voltage	V_{12}	4.0	5.1	5.8	V	
Input limiting voltage	$V_{i(lim)}$	—	200	400	μV	f_O = 4.5 MHz, f_m = 400 Hz, Δf = 25 kHz
AM rejection	AMR	40	50	—	dB	V_{in} = 2, 10, 100mVrms f = 4.5 MHz, AM: 30% mod. (FM: 100% mod.)
Forward transadmittance	$\lvert y_m \rvert$	—	500	—	mS	f = 4.5 MHz,
Phase angle	θ	—	46	—	deg	Input terminal 2 to 1, output terminal 9 to 3
Feedback capacitance	C_{fb}	—	—	0.02	pF	f = 1 Mhz, terminal 2 to 9
Input resistance	R_{in}	—	17	—	kΩ	f = 4.5 MHz,
Input capacitance	C_{in}	—	4	—	pF	terminal 2 to 1
Output resistance	R_{out}	—	3.25	—	kΩ	f = 4.5 MHz,
Output capacitance	C_{out}	—	75	—	pF	terminal 9 to 3
Recovered AF voltage	$V_{O(AF)}$	0.5	0.75	—	V_{rms}	V_{in} = 100 mV,
Total harmonic distortion	THD	—	0.9	2	%	f = 4.5 MHz, f_m = 400 Hz, Δf = 25 kHz
Output resistance terminal 7	R_{out} 7	—	7.5	—	kΩ	
Output resistance terminal 8	R_{out} 8	—	300	—	Ω	
Maximum attenuation		60	80	—	dB	Terminal 6 open
Play-through voltage		—	0.075	1	mV	Terminal 6 open
Voltage gain	$G_{V(AF)}$	17.5	20	—	dB	V_{in} = 0,1 V_{rms}, f = 400 Hz
Total harmonic distortion (AF)	$THD_{(AF)}$	—	1.5	—	V	V_{out} = 2 V_{rms}, f = 400 Hz
Undistorted output voltage	V_{out}	2.0	2.5	—	V	THD = 5%, f = 400 Hz
Input resistance	$R_{in(AF)}$	—	70	—	kΩ	f = 400 Hz, terminal 14 to 3
Output resistance	$R_{out(AF)}$	—	270	—	Ω	f = 400 Hz, terminal 12 to 3

Note: Test conditions are Ta = 25°C, V_{CC} = 30 V applied to terminal 5 through R_C = 600 Ω and DC volume control = zero unless otherwise specified.

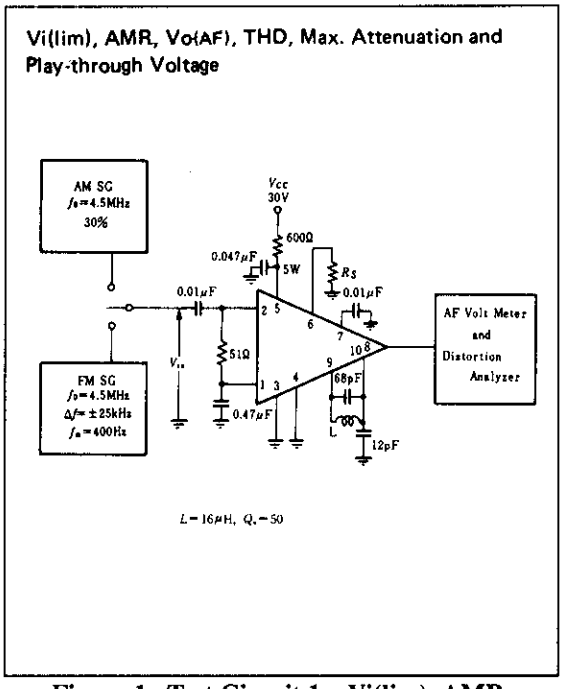

Figure 1 Test Circuit 1—Vi(lim), AMR, V0(AF), THD, Max. Attenuation, and Play-Through Voltage (HA 1125 only)

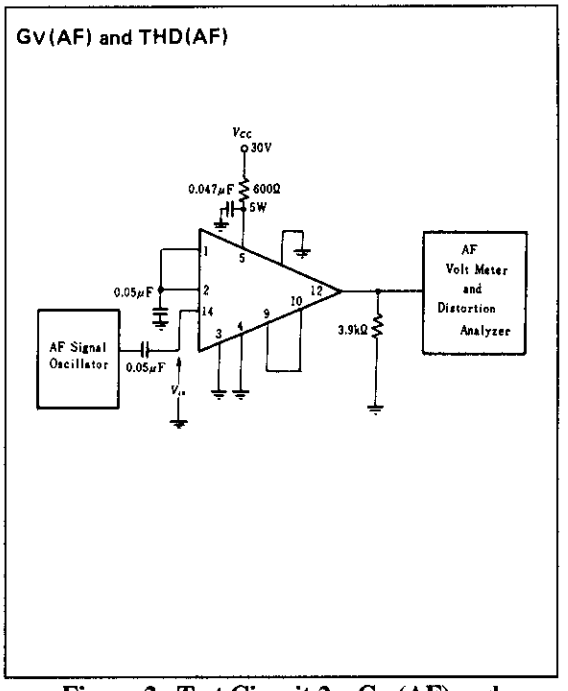

Figure 2 Test Circuit 2—G_V(AF) and THD(AF) (HA1125 only)