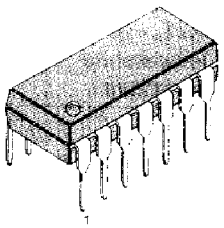
TV SOUND IF AMPLIFIER

The KA2101 is a monolithic integrated circuit for TV sound IF amplifiers. It contains an IF amplifier, IF limiting, detection, electronic attenuation, audio amplifier and audio driver capabilities.

14 DIP



FEATURES

- **Electronic attenuator replaces conventional DC volume.**
- **Differential peak detector requires one single tuned coil.**
- **Internal zener diode regulated supply.**
- **High stability.**
- **Excellent AM rejection at 4.5 MHz, 5.5 MHz, 6.0 MHz, 6.5 MHz.**
- **Low harmonic distortion.**
- **High sensitivity 200μV limiting at 4.5 MHz.**
- **Audio driver capability 6.0 mA_{P-P}.**
- **Undistorted audio output voltage 7 V_{P-P}.**
- **Minimum undesirable output signal at maximum attenuation.**

ORDERING INFORMATION

Device	Package	Operating Temperature
KA2101	14 DIP	−20 ~ +75°C

SCHEMATIC DIAGRAM

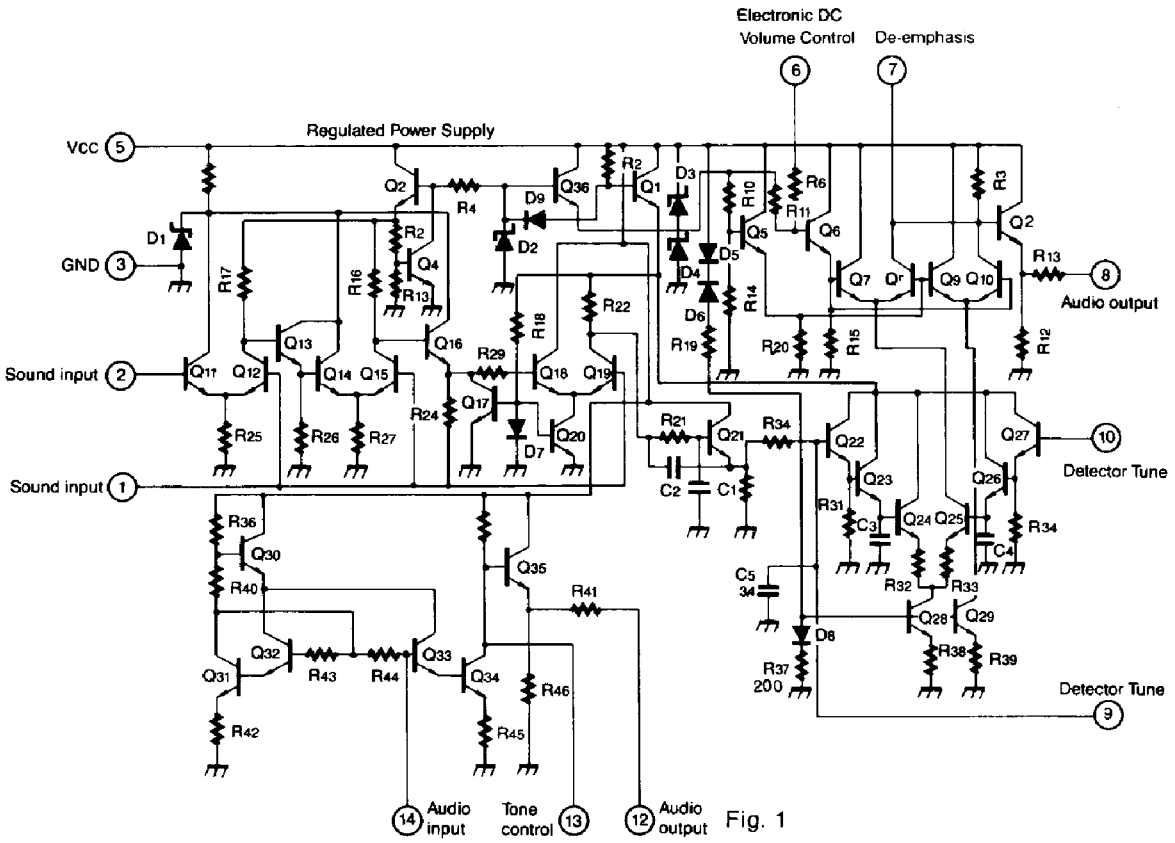


Fig. 1

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Value	Unit
Input Signal Voltage (Pin 1, Pin 2)	V_{in}	±3	V
Power Supply Current (Pin 5)	I_5 (max)	50	mA
Total Power Dissipation	P_d	625	mW
Derate Above T_a=25°C		5.0	mW/°C
Operating Temperature	Topr	−20 ~ +75	°C
Storage Temperature	Tstg	−65 ~ +150	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C, V_{CC}=24V)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	Test Fig
Regulated Voltage (Pin 5)	V_5		10.3	11.5	12.2	V	
DC Supply Current (Pin 5)	I_5	V_{CC}=9V R_S=0	10	13	24	mA	
Quiescent Output Vtg (Pin 12)	V_{12}		4.5	5.1	5.8	V	—
AM Rejection*	AMR	V_{in}=2, 10, 100mV f_o=4.5MHz, Δf= ±25KHz	40	55	—	dB	4
Input Limiting Threshold Voltage	V_i (lim)	f_o=4.5MHz, Δf= ±25KHz	—	200	400	μVrms	4
Recovered Audio Output Voltage	V_o (AF)	V_{in}=10mV f_o=4.5MHz, Δf= ±25KHz	0.5	0.90	—	Vrms	4
Output Distortion	THD	V_{in}= 10mVrms	—	0.9	2	%	4
Input Resistance (Pins 1 & 2)	R_i (IF)	f=4.5MHz	—	17	—	KΩ	
Input Capacitance (Pins 1 & 2)	C_i (IF)	f=4.5MHz	—	4	—	pF	
Output Resistance (Pin 9 & GND)	R_o (IF)	f=4.5MHz	—	3.25	—	KΩ	
Output Capacitance (Pin 9 & GND)	C_o (IF)	f=4.5MHz	—	7.5	—	pF	
Output Resistance, Pin 7	R_o		—	7.5	—	KΩ	
Output Resistance, Pin 8	R_o		—	250	—	Ω	
Volume Reduction Range		DC Volume Control=∞	60	—	—	dB	4
Maximum Undesirable Signal (Note 1)			—	0.02	1	mVrms	4
Audio Amplifier Voltage Gain	A (AF)	V_{in}=0.2Vrms, f=400Hz	17.5	20.5	—	dB	5
Total Harmonic Distortion (Pin 12)	THD	V_o2Vrms, f=400Hz	—	1.5	—	%	5
Output Voltage (Pin 12)		THD=5%, f=400Hz	2	3.4	—	Vrms	5
Input Resistance (Pin 14 & GND)	R_i (AF)	f=400Hz	—	70	—	KΩ	
Output Resistance (Pin 12 & GND)	R_o (AF)	f=400Hz	—	270	—	Ω	

* 100% FM, 30% AM

Note 1. Undesirable signal is measured at Pin 8 when the volume control is set for minimum output.

TYPICAL APPLICATION CIRCUIT

A. 1.5 Watts Output

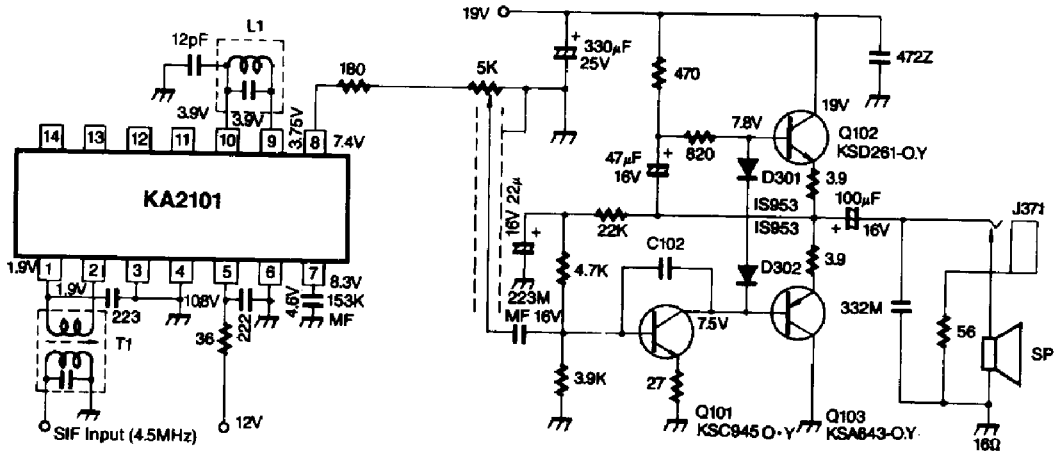


Fig. 2

B. 0.8 Watts Output

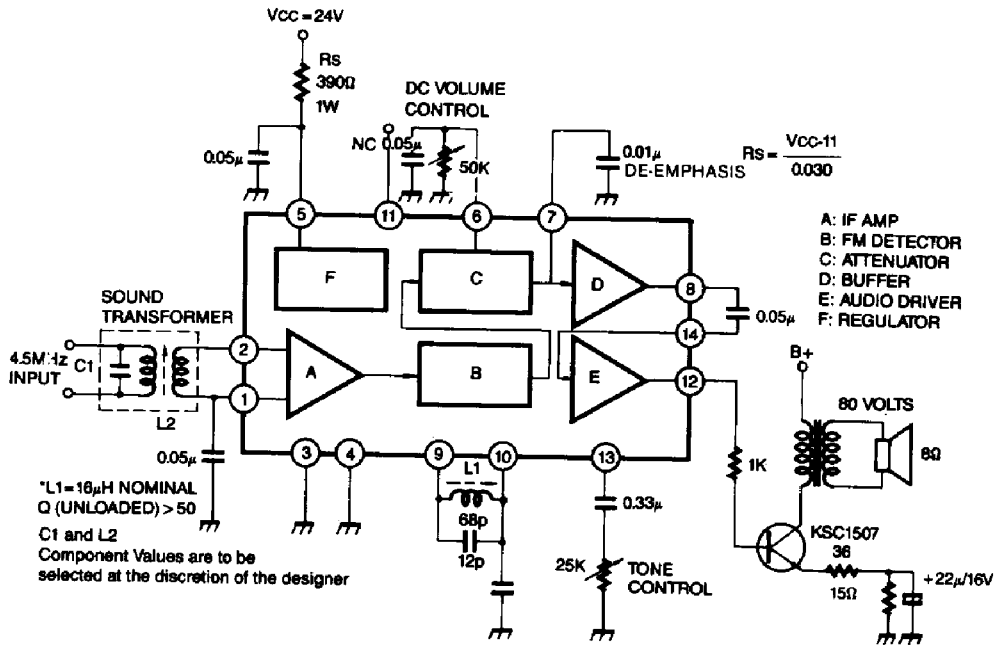


Fig. 3

TEST CIRCUIT 1

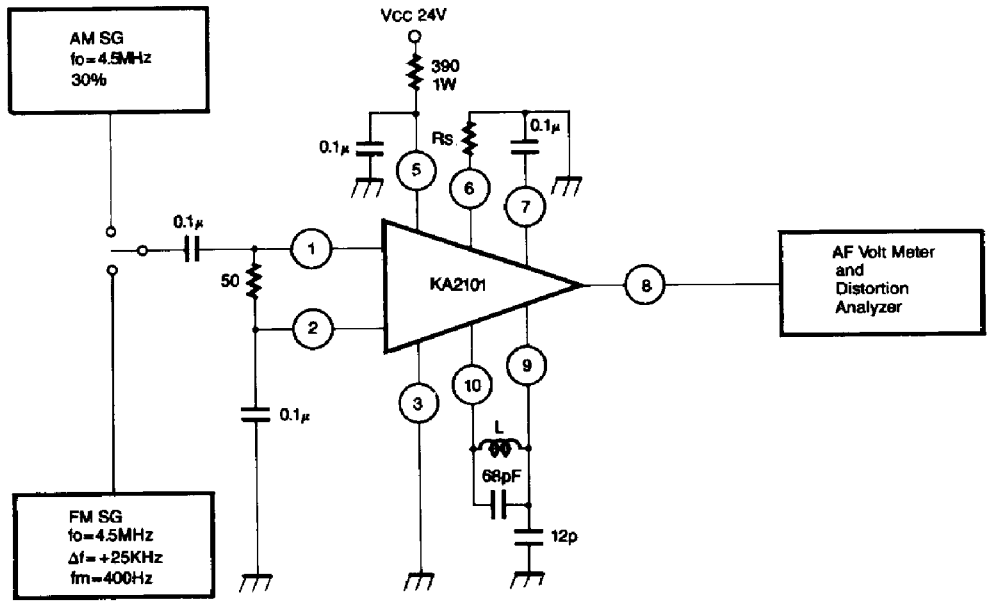


Fig. 4

TEST CIRCUIT 2

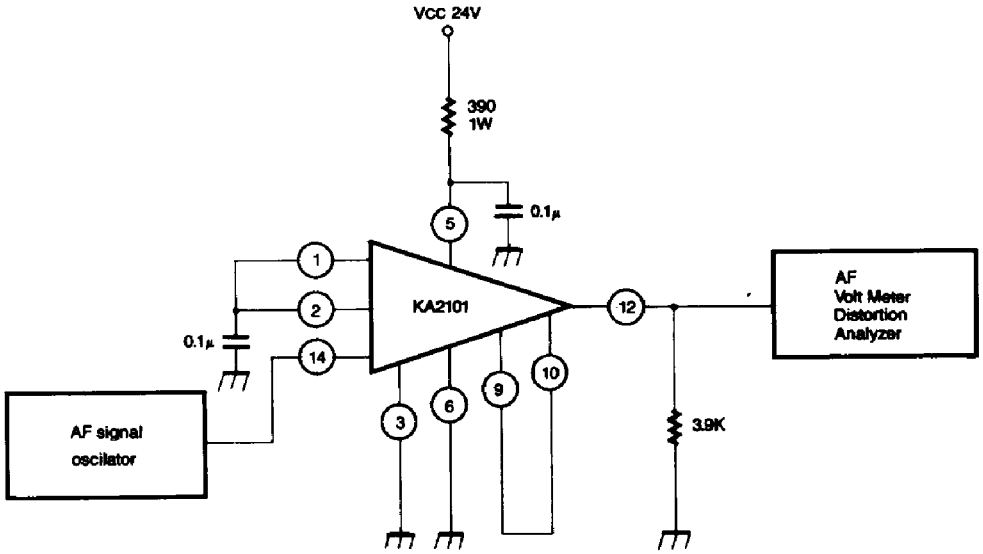
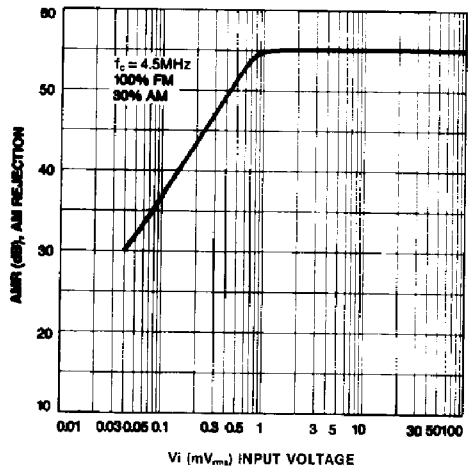
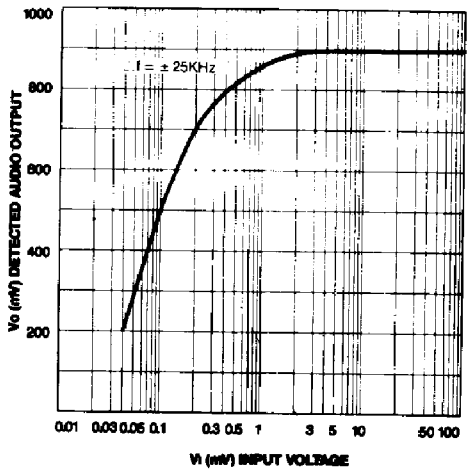


Fig. 5

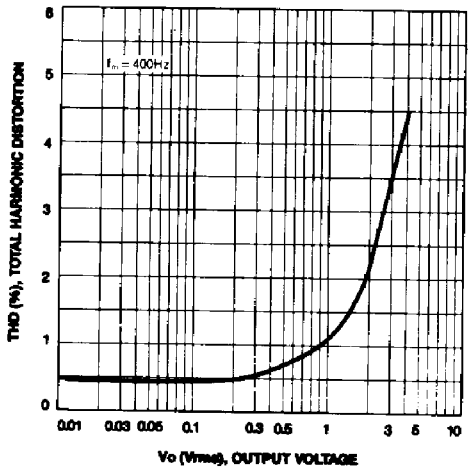
AM REJECTION



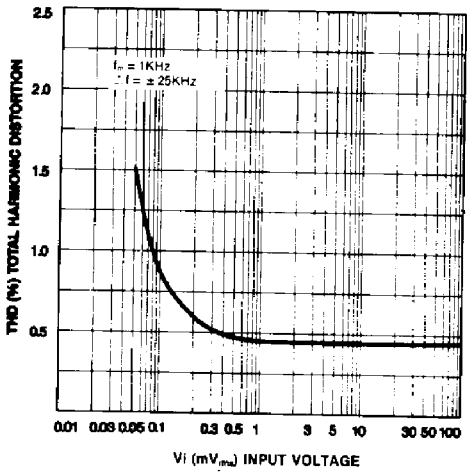
DETECTED AUDIO OUTPUT



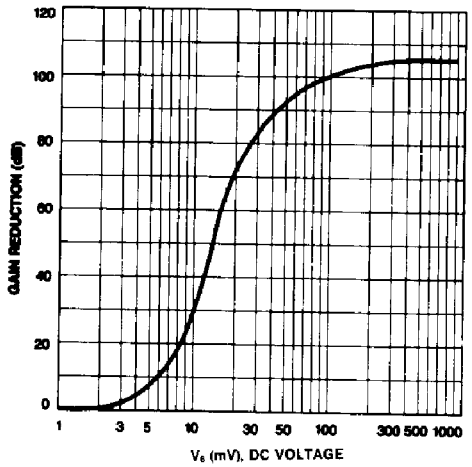
AUDIO AMPLIFIER THD



IF AMPLIFIER AND DETECTOR THD



GAIN REDUCTION OF ATTENUATOR



IF FREQUENCY RESPONSE

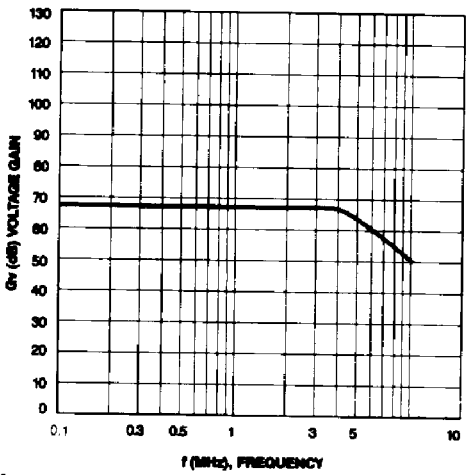


Fig. 6