

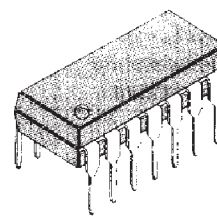
## TV SOUND IF AMPLIFIER

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.

## 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  $200\mu\text{V}$  limiting at 4.5 MHz.
- Audio driver capability  $6.0\text{ mA}_{\text{R.P.}}$ .
- Undistorted audio output voltage  $7\text{ V}_{\text{R.P.}}$ .
- Minimum undesirable output signal at maximum attenuation.

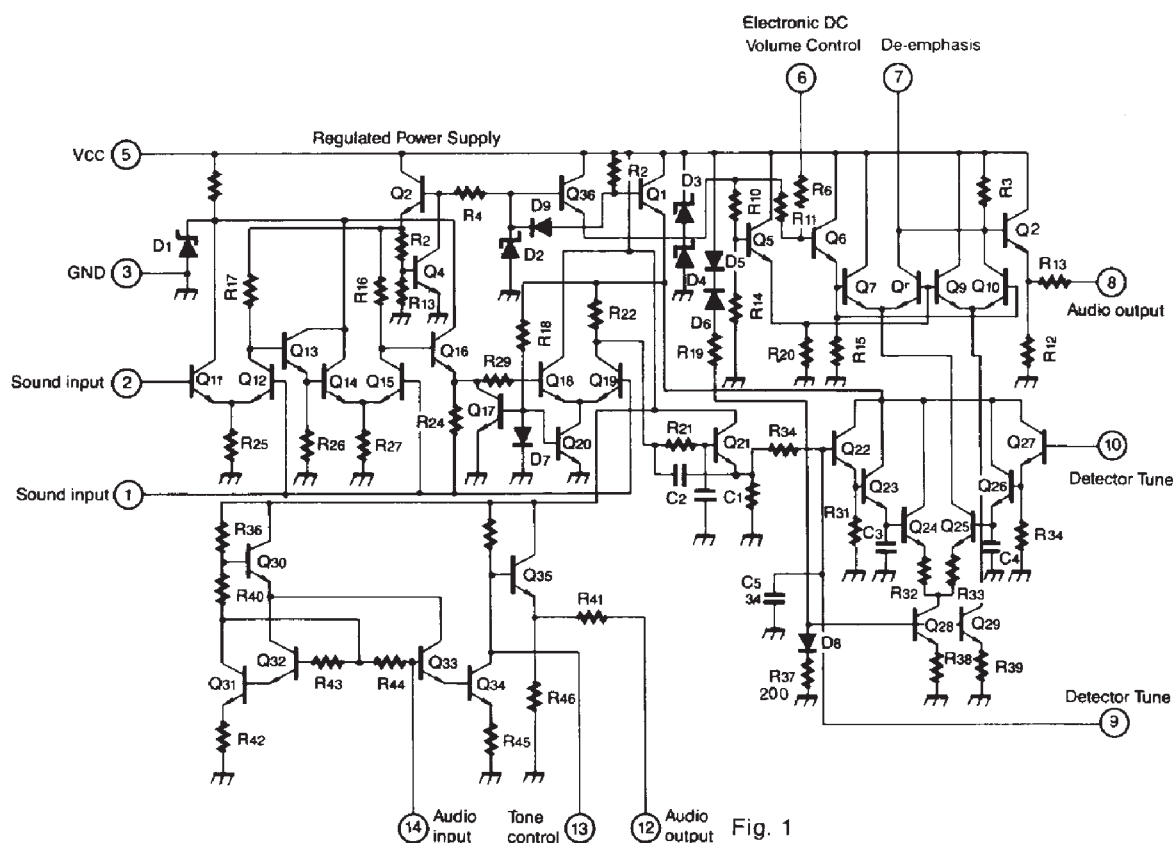
14 DIP



## ORDERING INFORMATION

| Device | Package | Operating Temperature          |
|--------|---------|--------------------------------|
| KA2101 | 14 DIP  | $-20 \sim +75^{\circ}\text{C}$ |

## SCHEMATIC DIAGRAM



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

| Characteristic                        | Symbol      | Value           | Unit                   |
|---------------------------------------|-------------|-----------------|------------------------|
| Input Signal Voltage (Pin 1, Pin 2)   | $V_{in}$    | $\pm 3$         | V                      |
| Power Supply Current (Pin 5)          | $I_s$ (max) | 50              | mA                     |
| Total Power Dissipation               | $P_d$       | 625             | mW                     |
| Derate Above $T_a=25^{\circ}\text{C}$ |             | 5.0             | mW/ $^{\circ}\text{C}$ |
| Operating Temperature                 | $T_{opr}$   | $-20 \sim +75$  | $^{\circ}\text{C}$     |
| Storage Temperature                   | $T_{stg}$   | $-65 \sim +150$ | $^{\circ}\text{C}$     |

ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$ ,  $V_{CC}=24\text{V}$ )

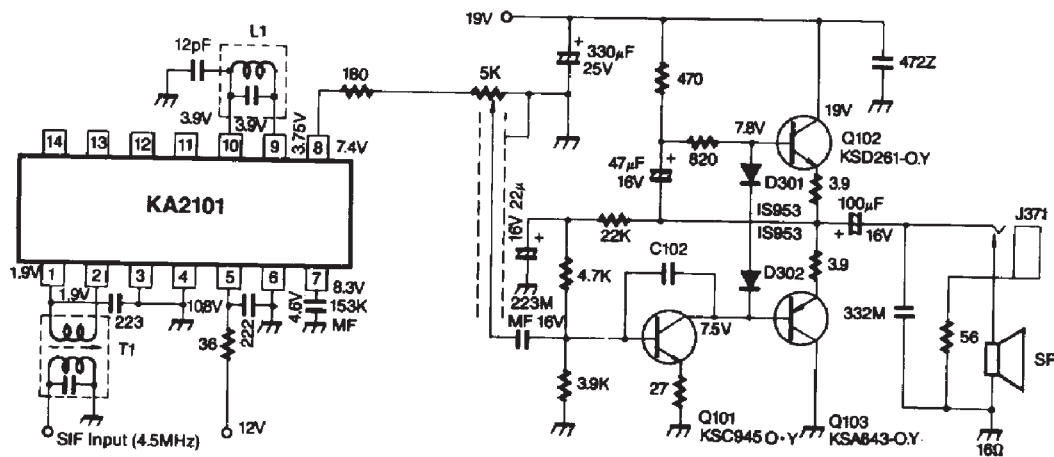
| Characteristic                      | Symbol      | Test Conditions                                                                   | Min  | Typ  | Max  | Unit             | Test Frg |
|-------------------------------------|-------------|-----------------------------------------------------------------------------------|------|------|------|-----------------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

\* 100% FM, 30% AM

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

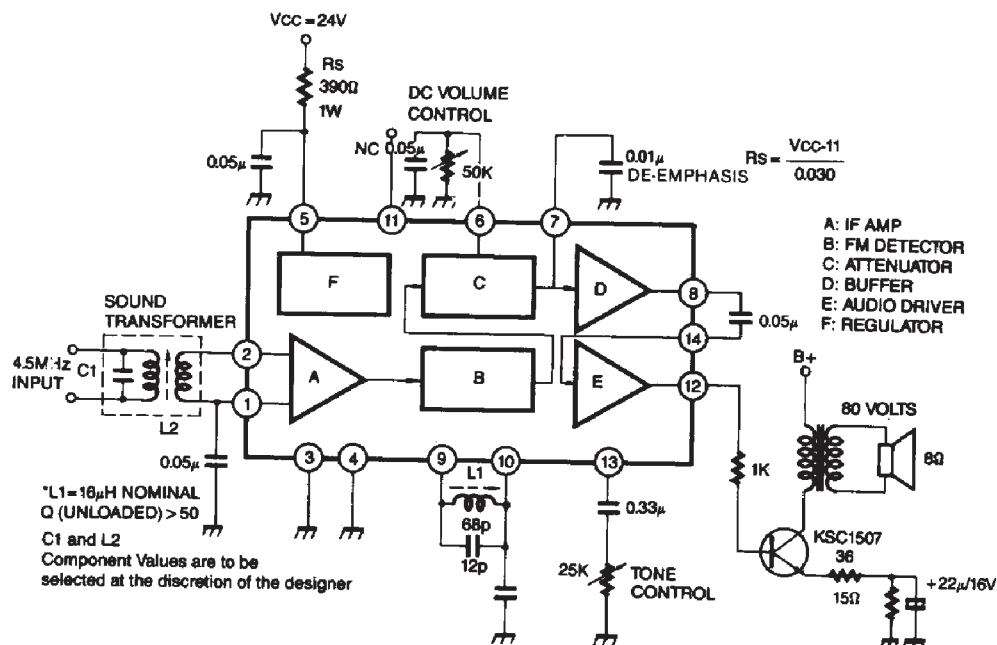
## TYPICAL APPLICATION CIRCUIT

### A. 1.5 Watts Output



**Fig. 2**

### B. 0.8 Watts Output



**Fig. 3**

## TEST CIRCUIT 1

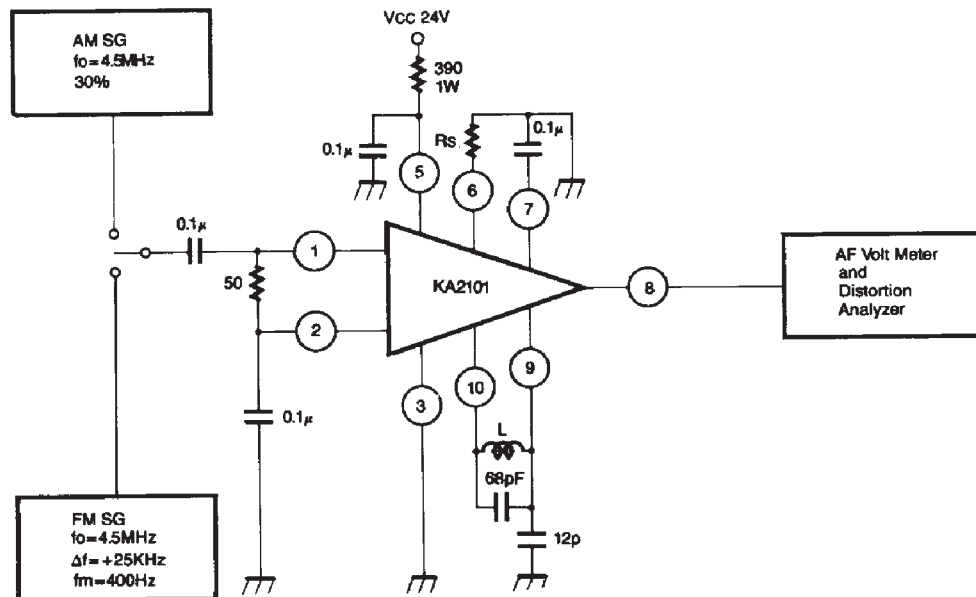


Fig. 4

## TEST CIRCUIT 2

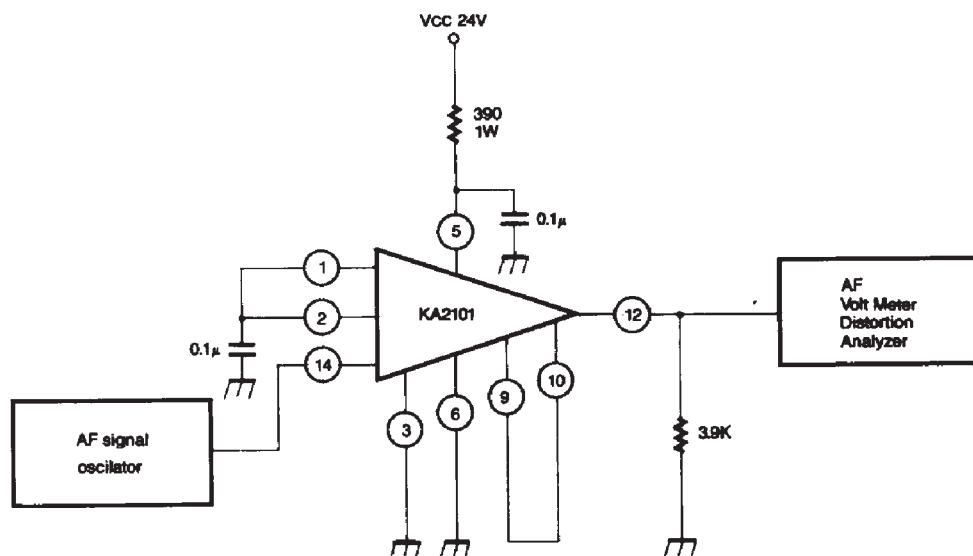


Fig. 5

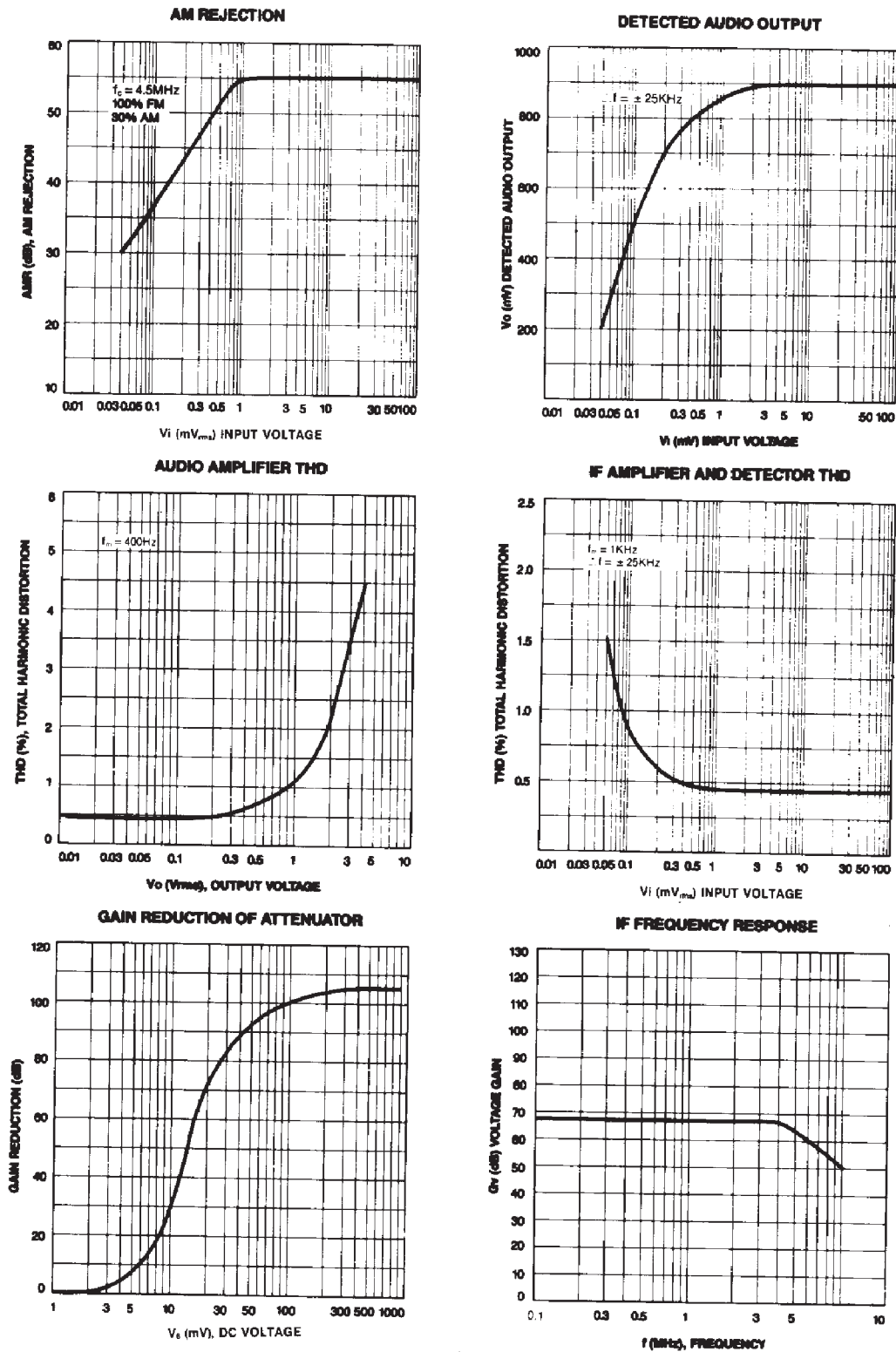


Fig. 6