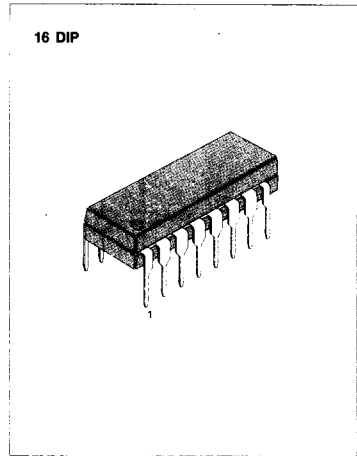


**SPEECH NETWORK WITH DIALER INTERFACE**

The KA8502A/B is a telephone speech network integrated circuit which includes transmit amp, receive amp, DTMF amp, voltage regulator, line equalizer, voltage comparator. It handles the voice signal, performing the 2/4 wires interface and changing the gain on both sending and receiving amplifiers to compensate for line attenuation by sensing the line length through the line current. The KA8502A/B can work in fixed gain mode.

**FEATURES**

- Adjusts sending and receiving attenuation length
- Regulated voltage for dialer
- Linear interface for DTMF
- Suitable for ceramic transducers
- Mute function

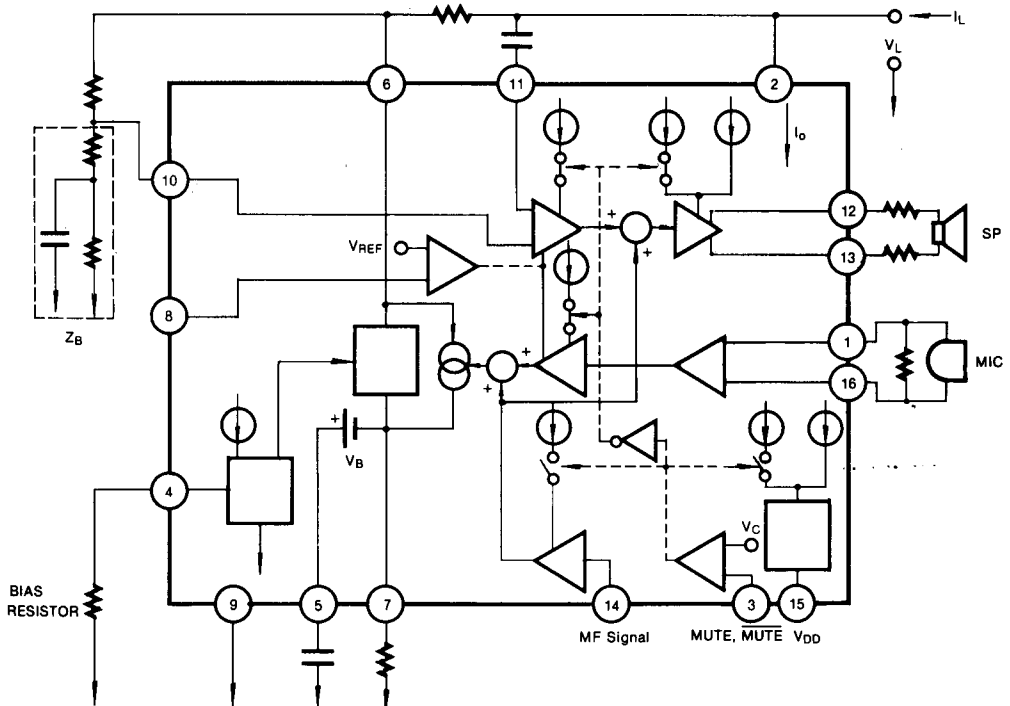


**ORDERING INFORMATION**

Device	Function	Package	Operating Temperature
*KA8502AN	MUTE	16 DIP	-45 ~ +70°C
*KA8502BN	$\overline{\text{MUTE}}$		

\* Under Development

**BLOCK DIAGRAM**



## ABSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Value	Unit
Line Voltage (3msec max)	$V_L$	22	V
Forward Line Current	$I_{LF}$	150	mA
Reverse Line Current	$I_{LR}$	-150	mA
Power Dissipation ( $T_a = 70^\circ\text{C}$ )	$P_D$	1	W
Operating Temperature	$T_{opr}$	-45 ~ +70	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 ~ +150	$^\circ\text{C}$

## ELECTRICAL CHARACTERISTICS

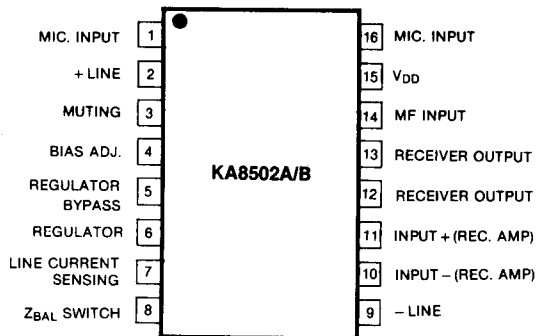
(Refer to the test circuits, S1 and S2 in(a)  $V_G = 1 \sim 2\text{V}$ ,  $I_L = 12 \sim 80\text{mA}$ ,  $f = 200 \sim 3400\text{Hz}$ ,  $T_a = -20 \sim +70^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Test Condition	Test Fig.	KA8502A/B			Unit	
				Min	Typ	Max		
Line Voltage	$V_L$	$T_a = 25^\circ\text{C}$		$I_L = 12\text{mA}$	3.65		4.5	V
				$I_L = 20\text{mA}$			5.0	
				$I_L = 80\text{mA}$			10.0	
Common Mode Rejection Ratio	CMRR	$f = 1\text{KHz}$ , $I_L = 12 \sim 80\text{mA}$	1	50			dB	
Line Matching Impedance	$Z_L$	$V_{RI} = 0.3\text{V}$ , $I_L = 12 \sim 80\text{mA}$ $f = 1\text{KHz}$	3	500	600	700	$\Omega$	
Sending Gain	$G_S$	$T_a = 25^\circ\text{C}$ $f = 1\text{KHz}$ $V_{MI} = 2\text{mV}$		$V_G = 2\text{V}$	44.5	45.5	46.5	dB
				$V_G = 1\text{V}$	48.5	49.5	50.5	
Sending Gain Flatness	$G_{SF}$	$V_{MI} = 2\text{mV}$ , $f_{ref} = 1\text{KHz}$ $I_L = 12 \sim 80\text{mA}$	2			$\pm 1$	dB	
Sending Distortion	THD <sub>S</sub>	$f = 1\text{KHz}$ $I_L = 16$		$V_{SO} = 775\text{mV}$			2	%
				$V_{SO} = 900\text{mV}$			10	
Sending Noise	$N_S$	$V_{MI} = 0\text{V}$ , $V_G = 1\text{V}$	2		-71	-69	dBmp	
Side Tone	ST	$T_a = 25^\circ\text{C}$ , $f = 1\text{KHz}$ $S_1 = b$	2			36	dB	
Micphone Input Impedence	$Z_{IM}$	$V_{MI} = 2\text{mV}$ ,		40			K $\Omega$	
Receiving Gain	$G_R$	$T_a = 25^\circ\text{C}$ $V_{RI} = 0.3\text{V}$ $f = 1\text{KHz}$		$V_G = 2\text{V}$	-5		-3	dB
				$V_G = 1\text{V}$	-0.5		1.5	

ELECTRICAL CHARACTERISTICS (Continued)

Characteristic	Symbol	Test Condition	Test Fig.	KA8502A/B			Unit
				Min	Typ	Max	
Receiving Gain Flatness	$G_{RF}$	$V_{RI} = 0.3V, f_{ref} = 1KHz$ $I_L = 12 \sim 80mA$	3			$\pm 1$	dB
Receiving Distortion	$THD_R$	$f = 1KHz$	3			2	%
						5	
Receiving Noise	$N_R$	$V_{RI} = 0V, I_L = 12 \sim 80mA$	3		100	200	$\mu V$
Receiver Output Impedance		$V_{RO} = 50mV,$			30		$\Omega$
MF Supply Voltage	$V_{DD}$	$I_L = 12 \sim 80mA$		2.4	2.5	2.7	V
MF Supply Current	Stand by	$I_L = 12 \sim 80mA$ KA8502A; S2 = b KA8502B; S2 = a		0.5			mA
	Operation			2			
MF Amplifier Gain	$G_{MF}$	$I_L = 12 \sim 80mA$ $f_{MF} = 1KHz$ $V_{MF} = 80mV$	4	15		17	dB
DC Input Voltage Level (pin 14)	$V_{MF}$	$V_{MF} = 80mV$			0.3V <sub>DD</sub>		V
Input Impedance (pin 14)	$Z_{MF}$	$V_{MF} = 80mV$		60			K $\Omega$
Distortion	$THD_{MF}$	$V_{MF} = 110mV$ $I_L = 12 \sim 80mA$	4			2	%
Starting Delay Time	$t_d$	$I_L = 12 \sim 80mA$				5	mS
Muting Threshold Voltage (pin 3)	$V_{TH}$					1	V
				1.6			
Muting Current	Stand by	$I_L = 12 \sim 80mA$ $I_L = 12 \sim 80mA$ KA8502A; S2 = b KA8502B; S2 = a				- 10	$\mu A$
	Operation					+ 10	
Input Current (pin 8)	$I_8$					- 10	$\mu A$

CONNECTION DIAGRAM



TEST CIRCUIT

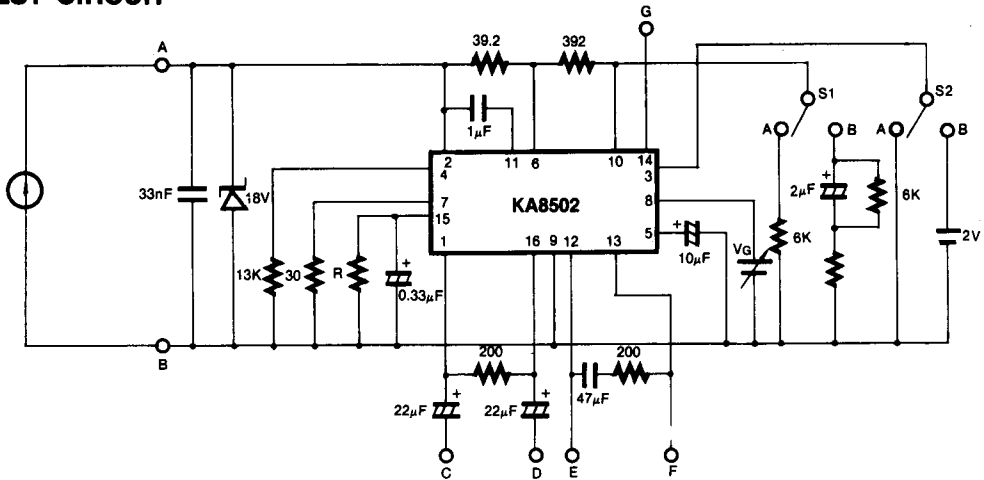


Fig. 1

Fig. 2

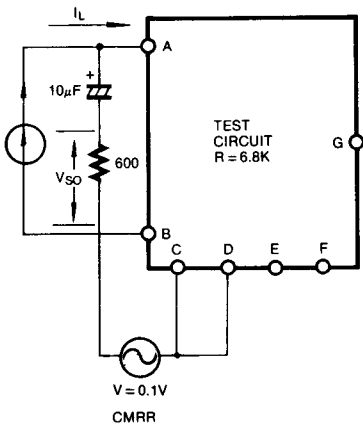


Fig. 3

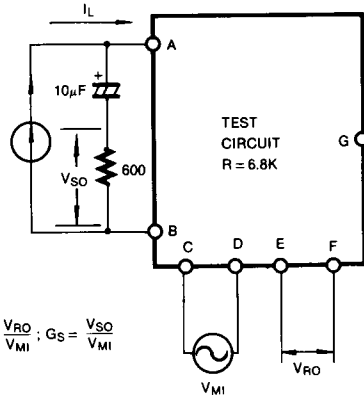
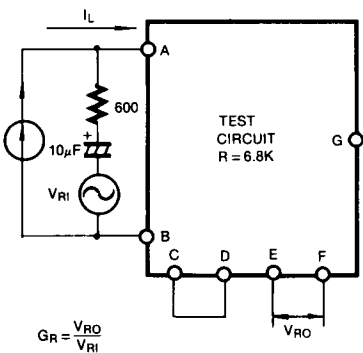
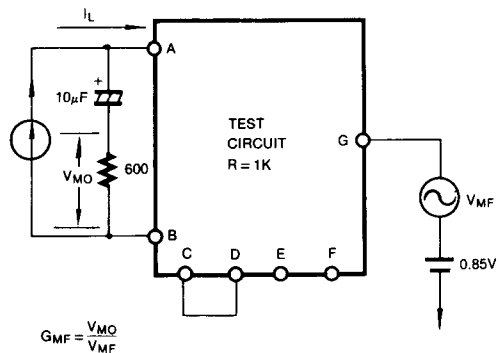


fig. 4

$$\text{Side Tone} = \frac{V_{RO}}{V_{MI}}; G_S = \frac{V_{SO}}{V_{MI}}$$



$$G_R = \frac{V_{RO}}{V_{RI}}$$



$$G_{MF} = \frac{V_{MO}}{V_{MF}}$$