

# KA8501A

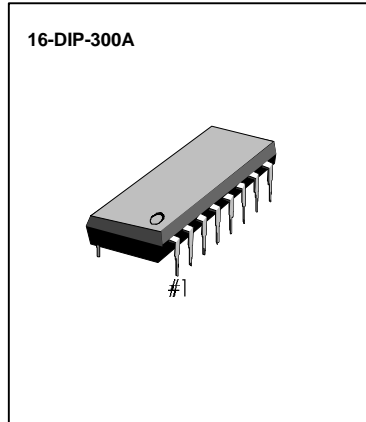
# SPEECH NETWORK WITH DIALER INTERFACE

## INTRODUCTION

The KA8501A 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 the line current. The KA8501A 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	Package	Operating Temperature
KA8501A	16-DIP-300A	- 45°C ~ + 70°C

## PIN CONFIGURATION

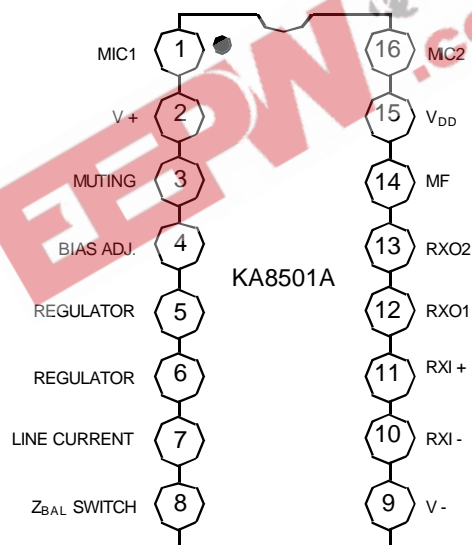


Fig. 1

## ABSOLUTE MAXIMUM RATINGS

Characteristic	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 ( $T_a = 25^\circ\text{C}$ )

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	
Line Voltage	$V_L$	$T_a = 25^\circ\text{C}$	$I_L = 12\text{mA}$	3.9	-	4.7	V
			$I_L = 20\text{mA}$	-	-	5.5	
			$I_L = 80\text{mA}$	-	-	12.2	
Common Mode Rejection Ratio	CMRR	$f = 1\text{KHz}, I_L = 12 \sim 80\text{mA}$	50	-	-	dB	
Line Matching Impedance	$Z_L$	$V_{RI} = 0.3\text{V}, I_L = 12 \sim 80\text{mA}$ $f = 1\text{KHz}$	500	600	700	$\Omega$	
Tx Gain	$G_{V(TX)}$	$T_a = 25^\circ\text{C}$ $f = 1\text{KHz}$ $V_{MI} = 2\text{mV}$	$I_L = 25\text{mA}$	48	49	50	dB
			$I_L = 52\text{mA}$	44	45	46	
			$I_L = 25 \sim 52\text{mA}$	48	49	50	
Tx Gain Flatness	$\Delta G_{V(TX)}$	$V_{MI} = 2\text{mV}, f_{ref} = 1\text{KHz}$ $I_L = 12 \sim 80\text{mA}$	-	-	$\pm 1$	dB	
Tx Distortion	THD <sub>TX</sub>	$f = 1\text{KHz}$ $I_L = 16 \sim 80\text{mA}$	$V_{SO} = 1\text{V}$	-	-	2	%
			$V_{SO} = 1.3\text{V}$	-	-	10	
Tx Noise	$V_{NO(TX)}$	$V_{MI} = 0\text{V}, I_L = 40\text{mA}$	-	-	-70	dBmp	
Side Tone	$G_{V(ST)}$	$T_a = 25^\circ\text{C}, f = 1\text{KHz}$ $I_L = 25 \sim 52\text{mA}$	-	-	36	dB	
MIC Input Impedance	$Z_I(MIC)$	$V_{MI} = 2\text{mV}, I_L = 12 \sim 80\text{mA}$	40	-	-	K $\Omega$	
Tx Loss in MF Operation	$G_{V(LOSS)}$	$V_{MI} = 2\text{mV}$	$I_L = 25\text{mA}$	- 30	-	-	dB
			$I_L = 52\text{mA}$	- 30	-	-	
Rx Gain	$G_{V(RX)}$	$T_a = 25^\circ\text{C}$ $V_{RI} = 0.3\text{V}$ $f = 1\text{KHz}$	$I_L = 25\text{mA}$	7	8	9	dB
			$I_L = 52\text{mA}$	2.5	3.5	4.5	
			$I_L = 25 \sim 52\text{mA}$	7	8	9	

## ELECTRICAL CHARACTERISTICS (Continued)

Characteristic		Symbol	Test Conditions	Min	Typ	Max	Unit		
R <sub>X</sub> Gain Flatness		$\Delta G_{V(RX)}$	V <sub>RI</sub> = 0.3V, f <sub>ref</sub> = 1KHz I <sub>L</sub> = 12 ~ 80mA	-	-	± 1	dB		
R <sub>X</sub> Distortion		THD <sub>RX</sub>	f = 1KHz	I <sub>L</sub> = 12mA	V <sub>RO</sub> = 1.6V	-	-	2	%
					V <sub>RO</sub> = 1.9V	-	-	10	
			I <sub>L</sub> = 50mA	V <sub>RO</sub> = 1.8V	-	-	2		
				V <sub>RO</sub> = 2.1V	-	-	10		
R <sub>X</sub> Noise		V <sub>NO(RX)</sub>	V <sub>RI</sub> = 0V, I <sub>L</sub> = 12 ~ 80mA	-	-	100	μV		
R <sub>X</sub> Output Impedance		R <sub>O(RX)</sub>	V <sub>RO</sub> = 50mV, I <sub>L</sub> = 40mA	-	-	100	Ω		
MF Supply Voltage		V <sub>DD(MF)</sub>	I <sub>L</sub> = 12 ~ 80mA	2.4	2.5	-	V		
MF Supply Current	Stand by	I <sub>SB(MF)</sub>	I <sub>L</sub> = 12 ~ 80mA	0.5	-	-	mA		
	Operation	I <sub>DD(MF)</sub>		2	-	-			
MF Amplifier Gain		G <sub>V(MF)</sub>	I <sub>L</sub> = 12 ~ 80mA f <sub>MF</sub> = 1KHz V <sub>MF</sub> = 80mV	15	-	17	dB		
DC Input Voltage Level (pin 14)		V <sub>I(MF)</sub>	V <sub>MF</sub> = 80mV	-	0.3V <sub>DD</sub>	-	V		
Input Impedance (pin 14)		Z <sub>I(MF)</sub>	V <sub>MF</sub> = 80mV	40	-	-	KΩ		
Distortion		THD <sub>MF</sub>	V <sub>MF</sub> = 110mV I <sub>L</sub> = 12 ~ 80mA	-	-	2	%		
Starting Delay Time		t <sub>D(ST)</sub>	I <sub>L</sub> = 12 ~ 80mA	-	-	5	mS		
Muting Threshold Voltage (pin 3)		V <sub>TH(MUTE)</sub>		-	-	1	V		
				1.6	-	-			
Muting Current	Stand by	I <sub>SB(MUTE)</sub>	I <sub>L</sub> = 12 ~ 80mA	-	-	-10	μA		
	Operation	I <sub>DD(MUTE)</sub>	I <sub>L</sub> = 12 ~ 80mA	-	-	+10			

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APPLICATION CIRCUIT

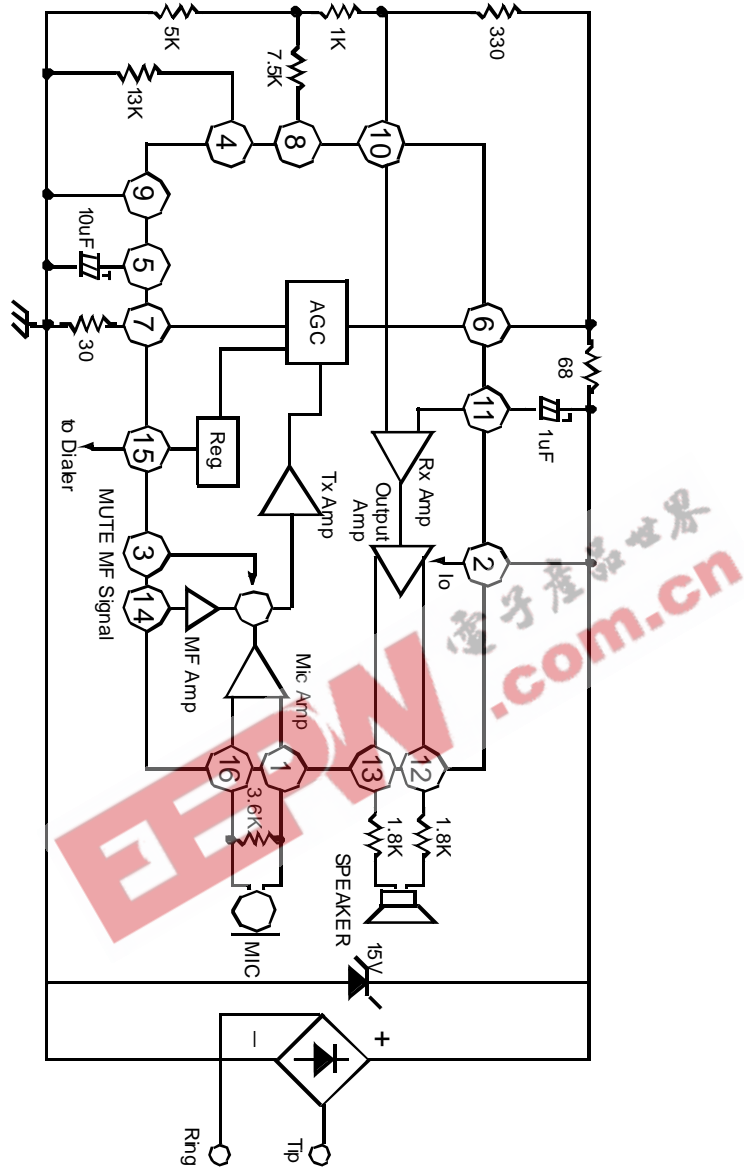


Fig. 2