

INTRODUCTION

The S1T8501 is a speech network integrated circuit which includes the following components: transmit amp, receive amp, DTMF amp, voltage regulator, line equalizer, and 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 S1T8501 can work in fixed gain mode.

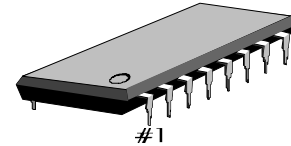
FEATURES

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

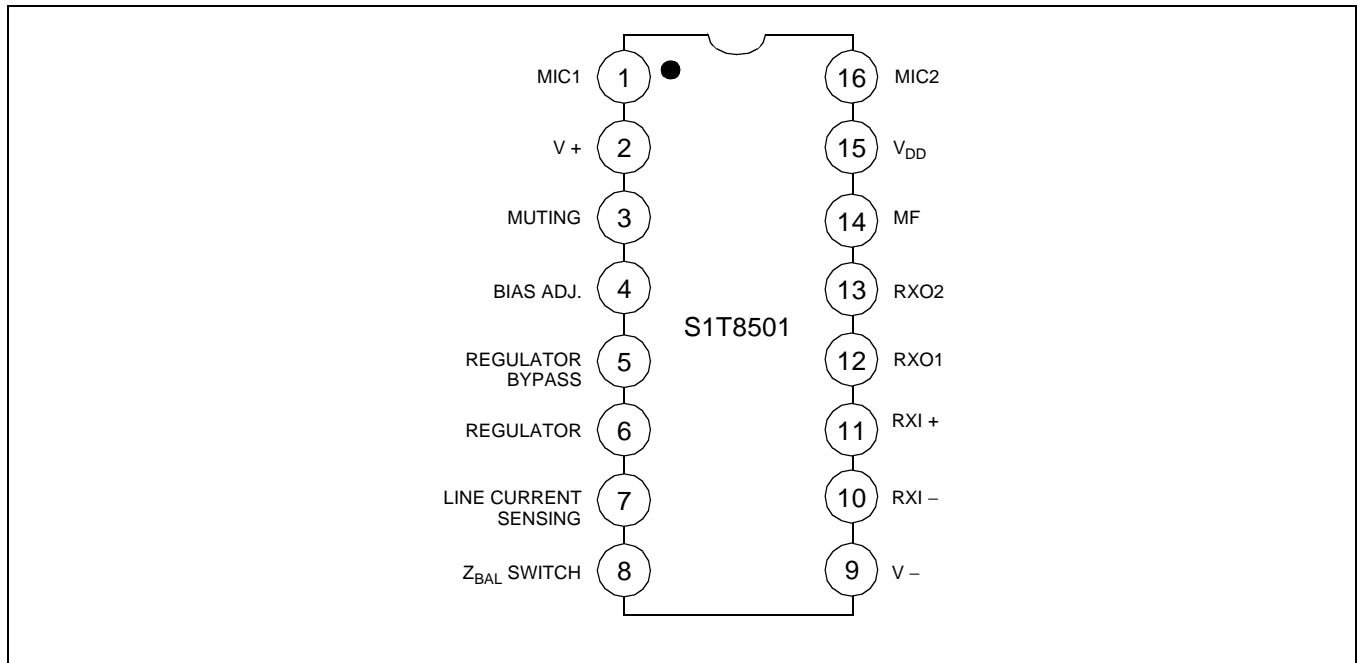
ORDERING INFORMATION

Device	Package	Operating Temperature
S1T8501X01-D0B0	16-DIP-300A	-45°C — +70°C

16-DIP-300A



PIN CONFIGURATION



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	$^\circ\text{C}$

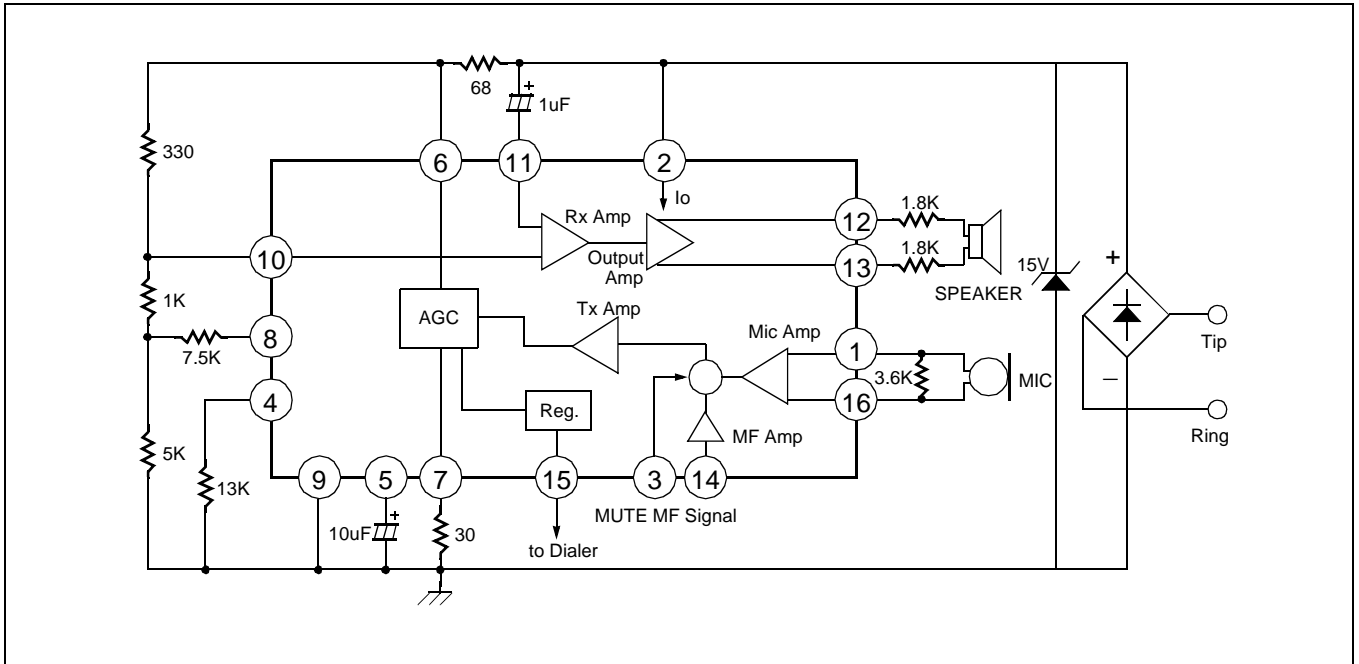
ELECTRICAL CHARACTERISTICS (TA = 25°C)

Characteristic	Symbol	Test Conditions		Min.	Typ.	Max.	Unit	
Line Voltage	V _L	Ta = 25°C	I _L = 12mA	3.9	–	4.7	V	
			I _L = 20mA	–	–	5.5		
			I _L = 80mA	–	–	12.2		
Common Mode Rejection Ratio	CMRR	f = 1kHz, I _L = 12 to 80mA		50	–	–	dB	
Line Matching Impedance	Z _L	V _{RI} = 0.3V, I _L = 12 to 80mA f = 1kHz		500	600	700	Ω	
TX Gain	G _{V(TX)}	Ta = 25°C f = 1kHz V _{MI} = 2mV	I _L = 25mA	48	49	50	dB	
			I _L = 52mA	44	45	46		
			I _L = 25 to 52mA	48	49	50		
TX Gain Flatness	ΔG _{V(TX)}	V _{MI} = 2mV, f _{ref} = 1kHz, I _L = 12 to 80mA		–	–	± 1	dB	
TX Distortion	THD _{TX}	f = 1kHz I _L = 16 to 80mA	V _{SO} = 1V	–	–	2	%	
			V _{SO} = 1.3V	–	–	10		
TX Noise	V _{NO(TX)}	V _{MI} = 0V, I _L = 40mA		–	–	–70	dBm	
Side Tone	G _{V(ST)}	Ta = 25°C, f = 1kHz, I _L = 25 to 52mA		–	–	36	dB	
MIC Input Impedance	Z _{I(MIC)}	V _{MI} = 2mV, I _L = 12 to 80mA		40	–	–	kΩ	
Tx Loss in MF Operation	G _{V(LOSS)}	V _{MI} = 2mV	I _L = 25mA	–30	–	–	dB	
			I _L = 52mA	–30	–	–		
RX Gain	G _{V(RX)}	Ta = 25°C V _{RI} = 0.3V f = 1kHz	I _L = 25mA	7	8	9	dB	
			I _L = 52mA	2.5	3.5	4.5		
			I _L = 25 to 52mA	7	8	9		
RX Gain Flatness	ΔG _{V(RX)}	V _{RI} = 0.3V, f _{ref} = 1kHz, I _L = 12 to 80mA		–	–	± 1	dB	
RX Distortion	THDRX	f = 1kHz	I _L = 12mA	V _{RO} = 1.6V	–	–	2	%
				V _{RO} = 1.9V	–	–	10	
			I _L = 50mA	V _{RO} = 1.8V	–	–	2	
				V _{RO} = 2.1V	–	–	10	
RX Noise	V _{NO(RX)}	V _{RI} = 0V, I _L = 12 to 80mA		–	–	100	μV	
RX Output Impedance	R _{O(RX)}	V _{RO} = 50mV, I _L = 40mA		–	–	100	Ω	
MF Supply Voltage	V _{DD(MF)}	I _L = 12 to 80mA		2.4	2.5	–	V	
MF Supply Current	Standby	I _{SB(MF)}	I _L = 12 to 80mA	0.5	–	–	mA	
	Operation	I _{DD(MF)}		2	–	–		
MF Amplifier Gain	G _{V(MF)}	I _L = 12 to 80mA f _{MF} = 1kHz, V _{MF} = 80mV		15	–	17	dB	
DC Input Voltage Level (pin 14)	V _{I(MF)}	V _{MF} = 80mV		–	0.3V _{DD}	–	V	
Input Impedance (pin 14)	Z _{I(MF)}	V _{MF} = 80mV		40	–	–	kΩ	
Distortion	THD _{MF}	V _{MF} = 110mV, I _L = 12 to 80mA		–	–	2	%	

ELECTRICAL CHARACTERISTICS (TA = 25°C) (Continued)

Characteristic		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Starting Delay Time		$t_{D(ST)}$	$I_L = 12$ to 80mA	–	–	5	mS
Muting Threshold Voltage (pin 3)		$V_{TH(MUTE)}$		–	–	1	V
				1.6	–	–	
Muting Current	Standby	$I_{SB(MUTE)}$	$I_L = 12$ to 80mA	–	–	– 10	μA
	Operation	$I_{DD(MUTE)}$	$I_L = 12$ to 80mA	–	–	+ 10	

APPLICATION CIRCUIT



NOTES