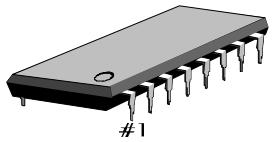
INTRODUCTION

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.

16–DIP–300A



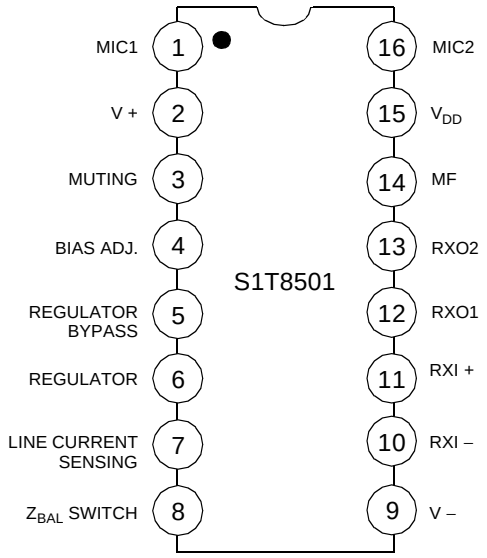
FEATURES

- 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 — + 70C

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 (Ta = 70°C)	P_D	1	W
Operating Temperature	T_{OPR}	– 45 — + 70	°C
Storage Temperature	T_{STG}	– 65 — + 150	°C

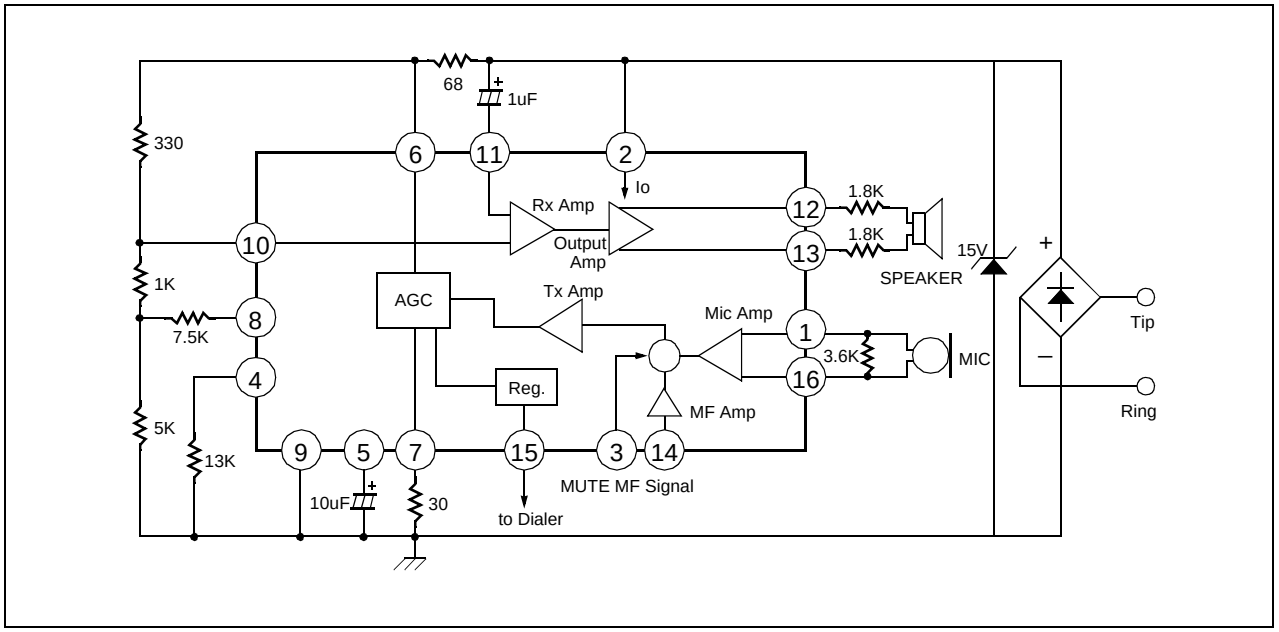
ELECTRICAL CHARACTERISTICS (TA = 25°C)

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 VMI = 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		$\Delta G_{V\ (TX)}$	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		$\Delta G_{V\ (RX)}$	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



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