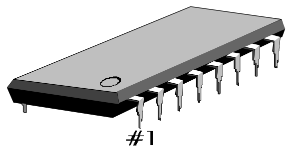
INTRODUCTION

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



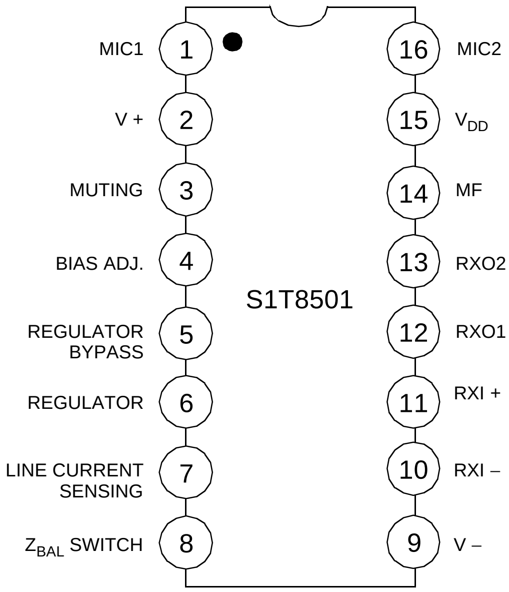
FEATURES

- 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 — + 70°C

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

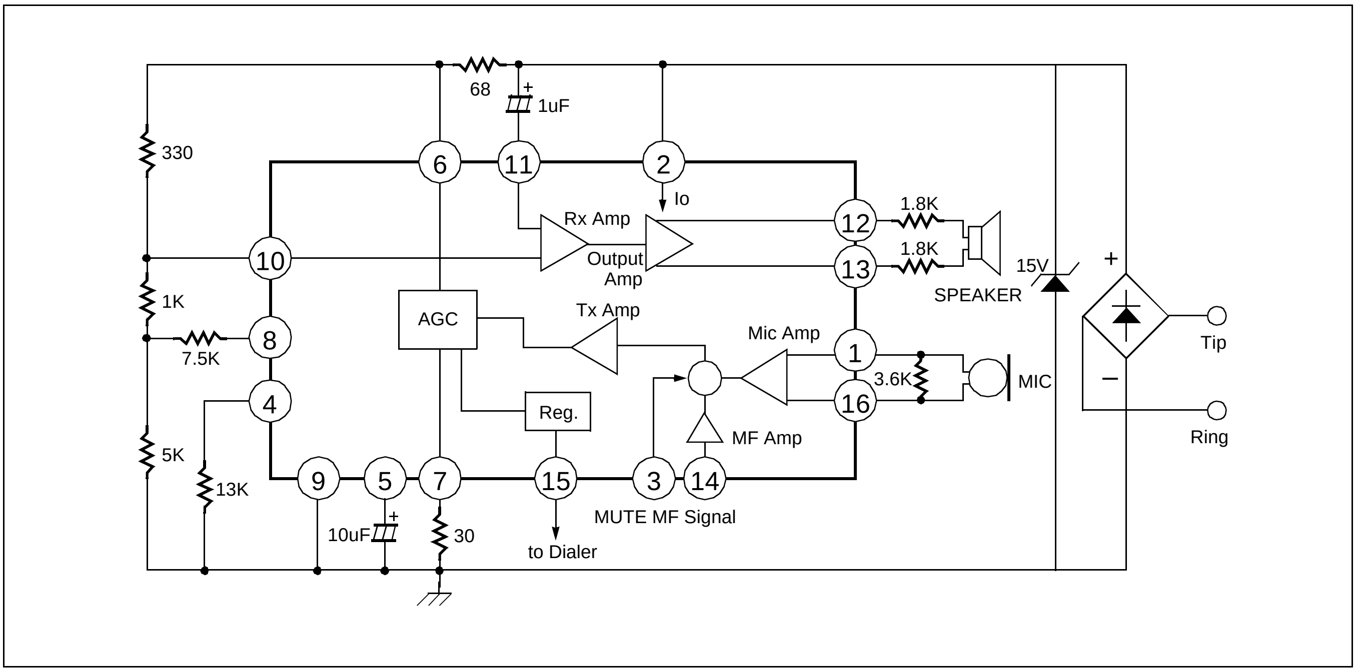
ELECTRICAL CHARACTERISTICS (TA = 25°C)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Line Voltage	V_L	Ta = 25°C, I_L = 12mA	3.9	–	4.7	V
		Ta = 25°C, I_L = 20mA	–	–	5.5	V
		Ta = 25°C, I_L = 80mA	–	–	12.2	V
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
		Ta = 25°C, f = 1kHz, VMI = 2mV, I_L = 52mA	44	45	46	dB
		I_L = 25 to 52mA	48	49	50	dB
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	%
		f = 1kHz, I_L = 16 to 80mA, 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
		V_{MI} =2mV, I_L = 52mA	–30	–	–	dB
RX Gain	$G_{V\ (RX)}$	Ta = 25°C, V_{RI} = 0.3V, f = 1kHz, I_L = 25mA	7	8	9	dB
		Ta = 25°C, V_{RI} = 0.3V, f = 1kHz, I_L = 52mA	2.5	3.5	4.5	dB
		I_L = 25 to 52mA	7	8	9	dB
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	%
		f =1kHz, I_L = 12mA, V_{RO} = 1.9V	–	–	10	%
		f =1kHz, I_L = 50mA, V_{RO} = 1.8V	–	–	2	%
		f =1kHz, I_L = 50mA, 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
MF Supply Current: Operation	$I_{DD\ (MF)}$	I_L = 12 to 80mA	2	–	–	mA
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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