AN6150

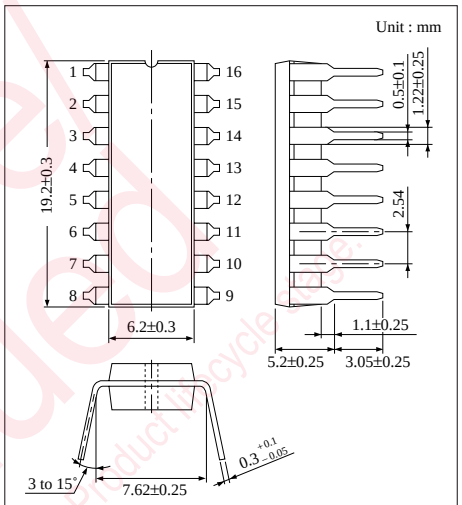
Speech Network Circuit

■ Overview

The AN6150 is an integrated circuit designed for telephone speech network. It has the basic function necessary to apply a sound signal onto the line and is applicable for various types of handsets.

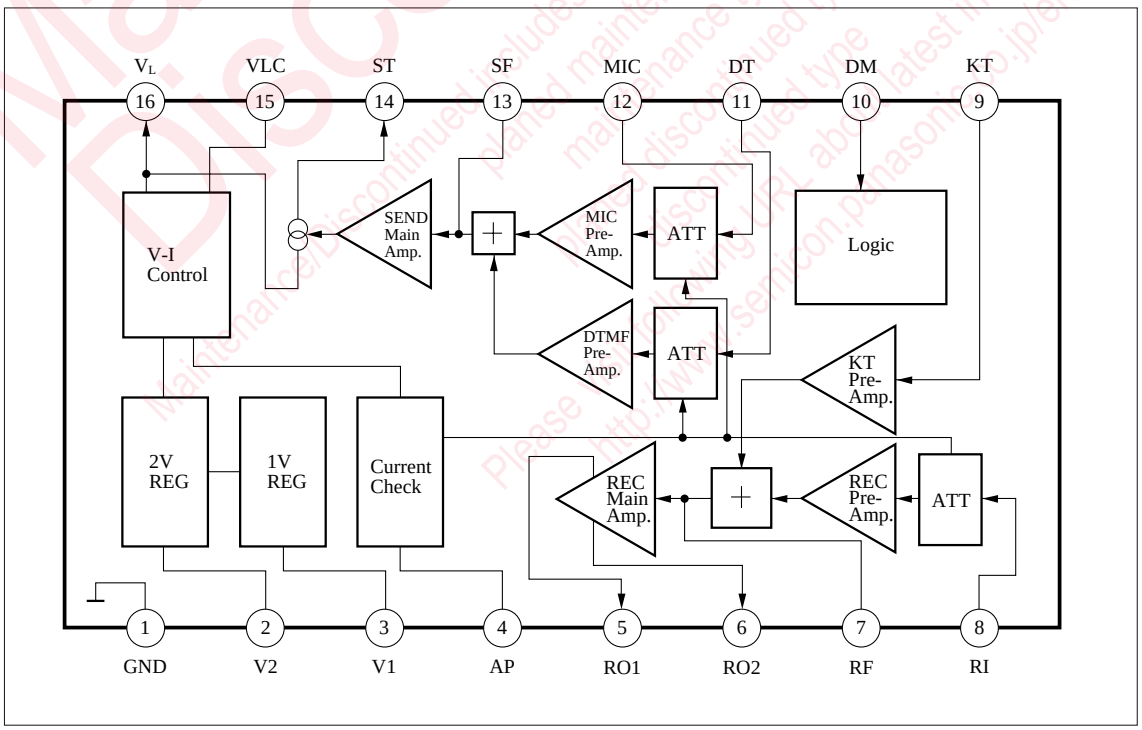
■ Features

- Wide operating voltage range : 3 to 11.5V
- Built-in amplifiers for “Dial Tone” and “DTMF”
- Amplifier output switchable.
- Each amplifier gain automatically changeable depending on line current.
- Various types of microphones and receivers are available.



16-pin DIL Plastic Package (DIP016-P-0300D)

■ Block Diagram



■ Pin Descriptions

Pin No.	Pin name	Pin No.	Pin name
1	GND	9	KEY In TONE input
2	2V REG.	10	Dial mute SW
3	1V REG.	11	DTMF input
4	ATT control	12	MIC input
5	REC output	13	Transmission filter
6	REC output	14	SIDE tone
7	REC filter	15	LIN filter
8	REC input	16	LIN

■ Absolute Maximum Ratings (Ta=25˚C)

Parameter	Symbol	Rating	Unit
Line voltage	V_L	14.4	V
Line current	I_L	135	mA
Power dissipation (Ta=60˚C)	P_D	1380	mW
Operating ambient temperature	T_{opr}	–30 to + 75	˚C
Storage temperature	T_{stg}	–55 to + 150	˚C

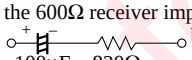
■ Electrical Characteristics (I_L=40mA, f_{in}=1kHz, Ta=25˚C)

Parameter	Symbol	Condition	min	typ	max	Unit
Receive System						
Receiver gain *1	G_{V-R}	V_i=–45dBm	–7	–4.5	–2	dBm
Receiver output distortion *1	THD_{-R}	V_i=–45dBm	—	1	5	%
Max. receiver level *1	V_{O-R}	THD=5%	0	4	—	dBm
Receiver auto pad *1	ΔAP_{-R}	V_i=–45dBm, DI_L=100 to 20mA	–5.5	–3	– 0.5	dB
KEY IN TONE gain *1	G_{V-KT}	V_i=–40dBm, Dial Mute SW– ON	–25	–22.5	–20	dBm
Transmission System						
Transmission gain *2	G_{V-T}	V_i=–45dBm	–6	–4	–2	dBm
Transmission output distortion *2	THD_{-T}	V_i=–45dBm	—	1	5	%
Max. transmission level *2	V_{O-T}	THD=5%	–2.2	2.8	—	dBm
Transmission auto pad *2	ΔAP_{-T}	V_i=–45dBm, DI_L=100 to 20mA	–6.5	–3.5	–1	dB
DTMF gain *2	G_{V-DT}	V_i=–35dBm, Dial Mute SW– ON	–8	–6	–4	dBm
DTMF output distortion *2	THD_{-DT}	V_i=–35dBm, Dial Mute SW– ON	—	1	5	%
DTMF auto pad *2	ΔAP_{-DT}	V_i=–35dBm, DI_L=100 to 20mA	–6	–4	–2	dB
Power Supply						
DC line voltage (1)	V_{L-1}	I_L=12mA	2.4	3	3.6	V
DC line voltage (2)	V_{L-2}	I_L=127mA	5.4	7.8	10.2	V
Internal supply voltage	V_{CC}	I_L=12mA	1.7	2.0	2.3	V

*1 Connect the 1kΩ load between Pins5 and 6 for measurement.
*2 Connect the 600Ω receiver impedance between Pins16 and 1 and measure it at the receiver side.

■ Electrical Characteristics (cont.) (I_L=40mA, f_{in}=1kHz, Ta=25˚C)

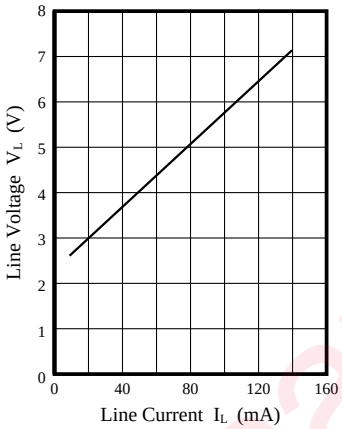
Parameter	Symbol	Condition	min	typ	max	Unit
Dial Mute input						
Dial mute OFF	V_{DM-H}		0.8	—	V_{CC}	V
Dial mute ON	V_{DM-L}		—	—	0.3	V
Input current (1)	I_{DM-H}	$V_{DM}=V_{CC}$	–2.0	0.1	2.0	µA
Input current (2)	I_{DM-L}	V_{DM}=0V	–2.0	– 0.2	– 0.02	µA
Receiver System						
K. T. output distortion *1, 4	THD_{-KT}	V_i=–42dBV, I_L=40mA	—	1	—	%
Mute						
K.T. mute *1, 4	M_{-KT}	V_i=–15dBV, Dial mute SW– OFF	40	—	—	dB
MIC mute *2, 4	M_{-T}	V_i=–40dBV, Dial mute SW– ON	60	—	—	dB
DTMF mute *2, 4	M_{-DT}	V_i=–28dBV, Dial mute SW– OFF	40	—	—	dB
Power Supply						
AC impedance (1)*3, 4	Z_{AC-1}	I_L=30mA, f_{in}=1kHz	400	670	800	Ω
AC impedance (2)*3, 4	Z_{AC-2}	I_L=90mA, f_{in}=1kHz	400	620	800	Ω

*1 Connect the 1kΩ load between Pins5 and 6 for measurement
*2 Connect the 600Ω receiver impedance between Pins16 and 1 measure it at the receiver side.
*3 Connect  between Pins16 and 1 for measurement.

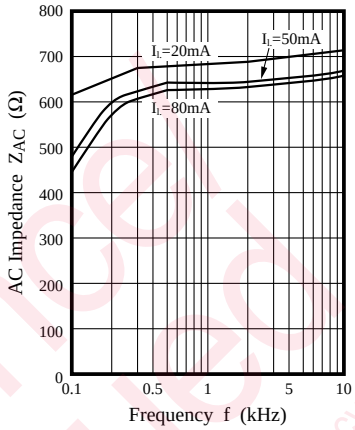
*4 Characteristics above are of reference valuse for design but not guaranteed values.

■ Characteristics Curve

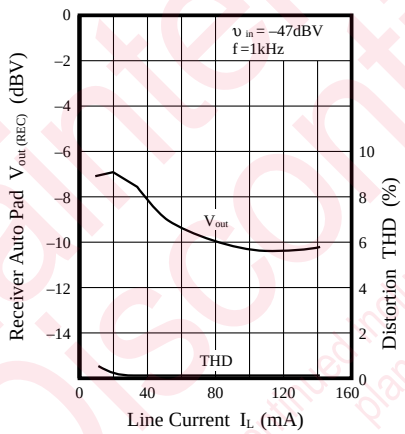
$V_L - I_L$



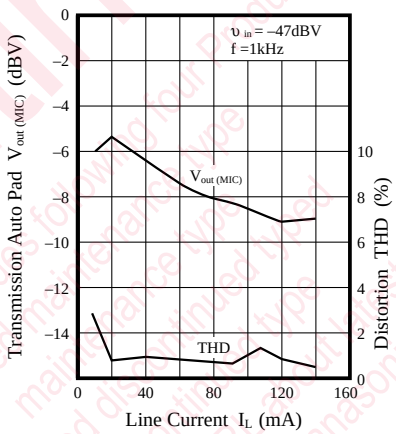
$Z_{AC} - f$



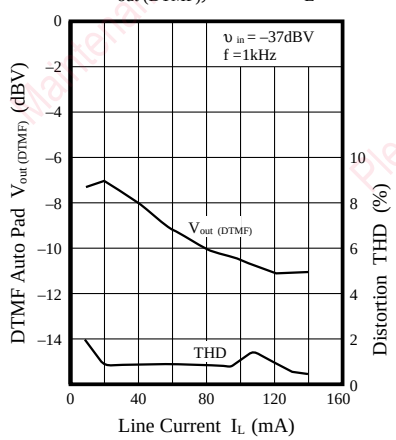
$V_{out\ (REC)}$, THD – I_L



$V_{out\ (MIC)}$, THD – I_L

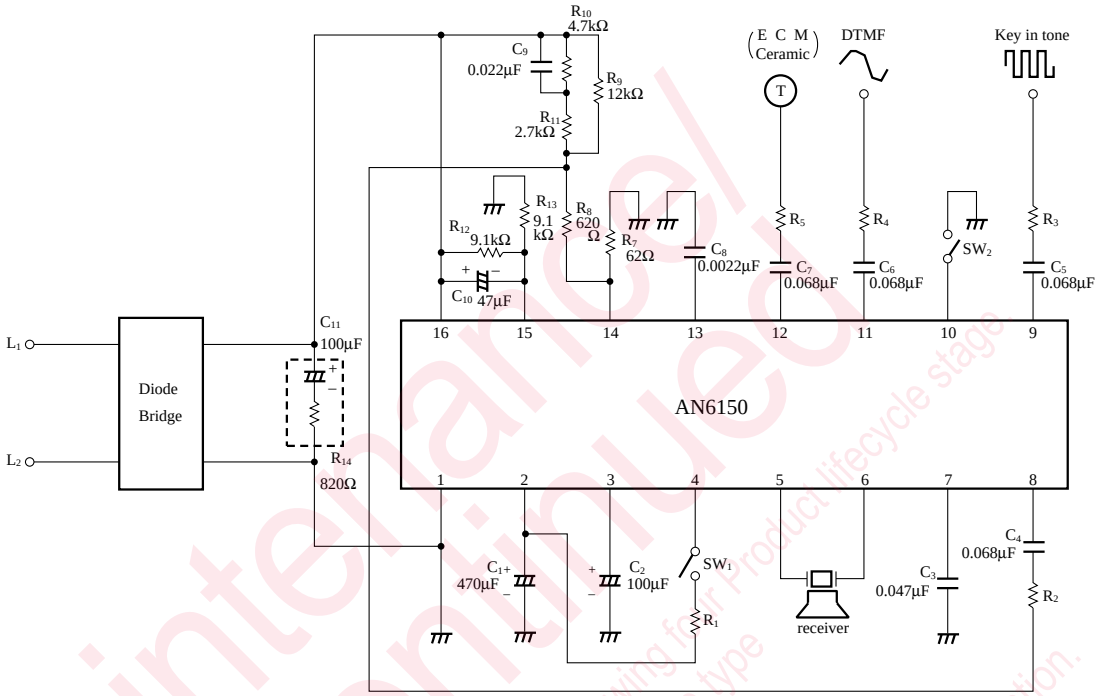


$V_{out\ (DTMF)}$, THD – I_L

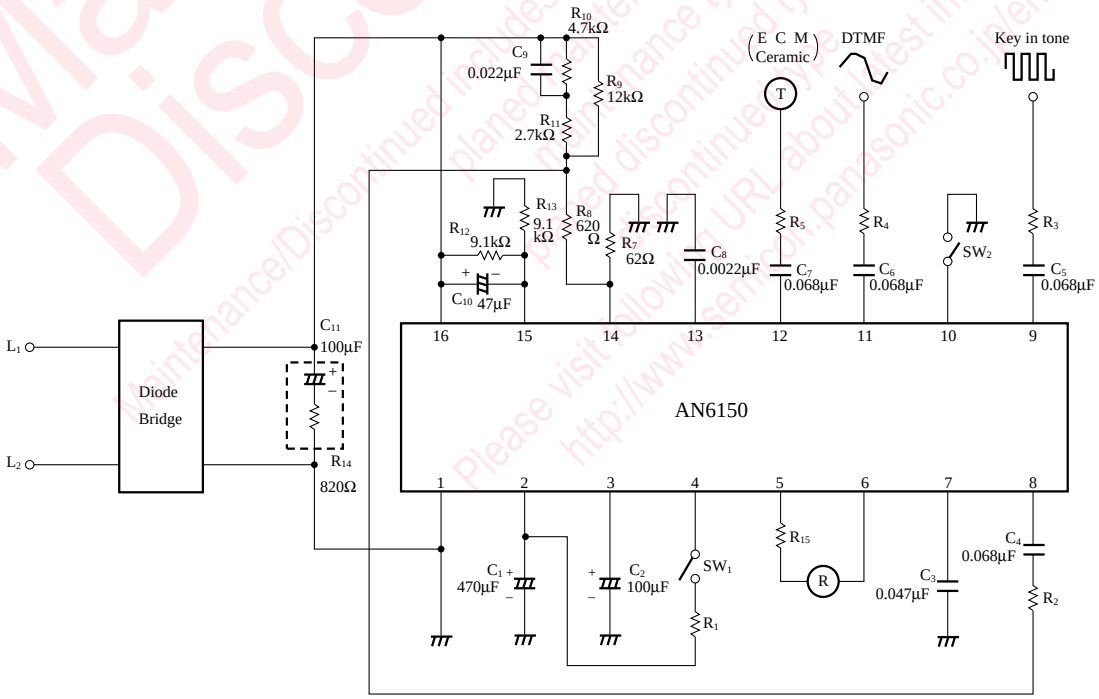


■ Application Circuits

• In case of using ceramic receiver



• In case of using low impedance receiver



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