

# AN6151K

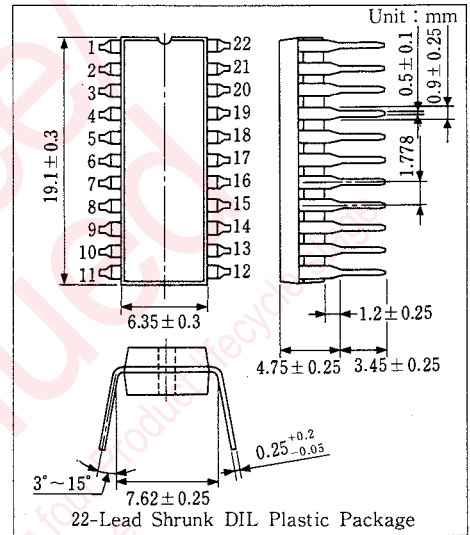
## Telephone Set Communication Circuit

### Outline

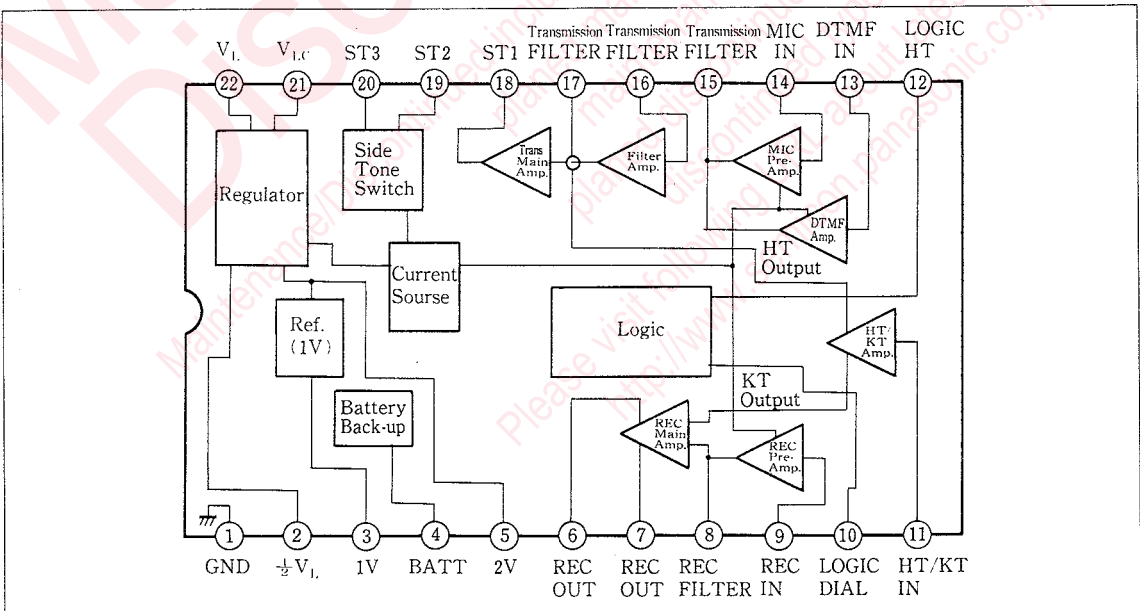
The AN6151K is an integrated circuit designed for telephone set channel. It has all the functions which are necessary to apply a sound signal onto the telephone line and performance similar to that of an ordinary telephone set. It is also applicable for use in both Japan and other countries.

### Features

- Wide operating voltage range : 3 ~ 10V
- Built-in amplifiers for "Hold Tone", "Dial Tone", "DTMF"
- Amplifier output switchable
- Balance network circuit switchable depending on line current
- Each amplifier gain automatically changeable depending on line current
- Compact 22-lead shrunk dual-in-line plastic package



### Block Diagram



**■ Absolute Maximum Ratings (Ta=25°C)**

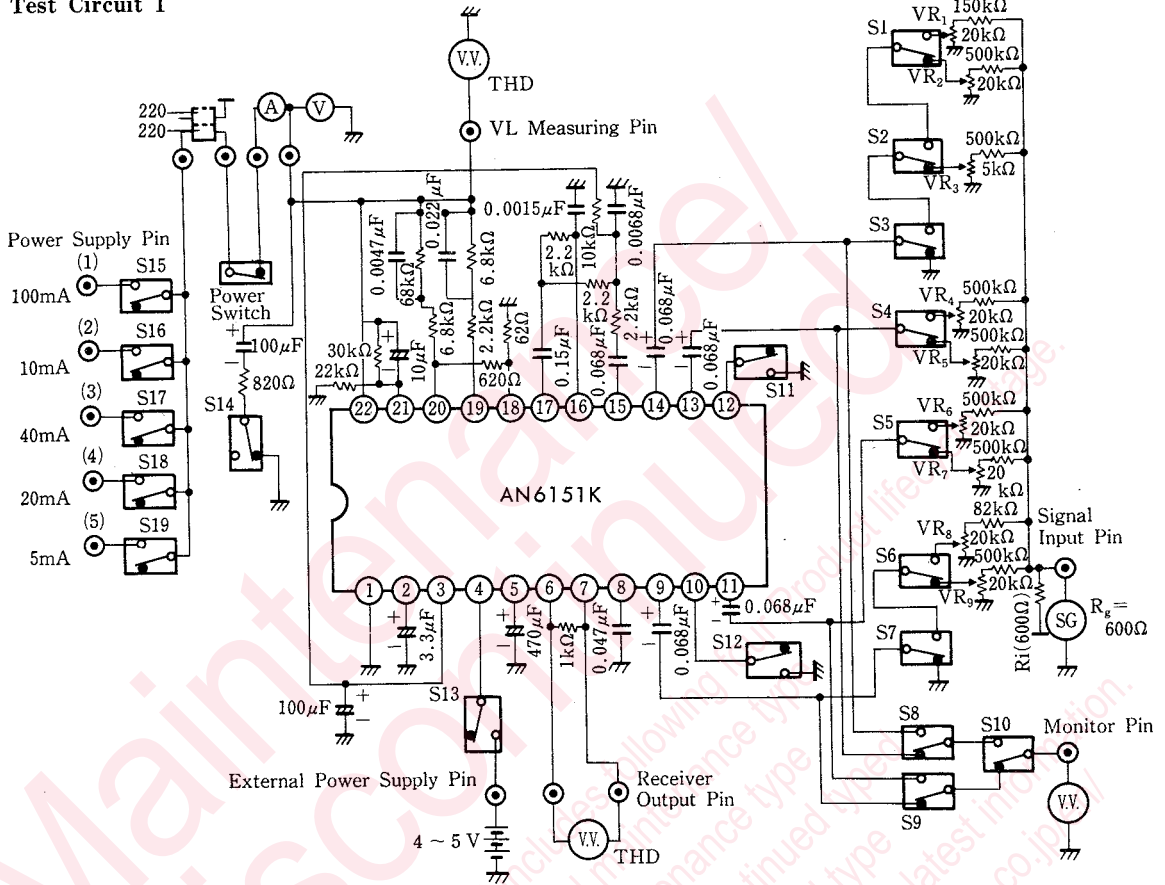
Item	Symbol	Rating	Unit
Line Voltage	V <sub>L</sub>	12	V
Line Current	I <sub>L</sub>	120	mA
Power Dissipation	P <sub>D</sub>	1440	mW
Operating Ambient Temperature (Ta=60°C)	T <sub>opr</sub>	-30 ~ +75	°C
Storage Temperature	T <sub>stg</sub>	-55 ~ +150	°C

**■ Electrical Characteristics (I<sub>L</sub>=40mA, f<sub>reg</sub>=1kHz, Ta=25°C)**

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
<b>Receiver System</b>							
Receiver Gain	G <sub>V-R</sub> *1	1	v <sub>i(REC)</sub> = -47dBV	38.5	41	43.5	dB
Receiver Output Distortion	THD <sub>R</sub> *1	1	v <sub>i(REC)</sub> = -47dBV		1.5	5	%
Max. Receiver Level	V <sub>O-R</sub> *1	1	THD=5%	-5.2	-1.2		dBV
Auto Pad	ΔAP <sub>R</sub> *1	1	ΔI <sub>L</sub> =100mA-40mA, v <sub>i(REC)</sub> = -47dBV	-6	-3	-1.5	dB
KEY IN TONE gain	G <sub>V-KT</sub> *1	1	v <sub>i(KEY)</sub> = -42dBV (D·M : ON)	15	18	21	dB
KEY IN TONE Output Distortion	THD <sub>KT</sub> *1	1	v <sub>i(KEY)</sub> = -42dBV (D·M : ON)		1		%
<b>Transmission System (when LIN Open)</b>							
Transmission Gain	G <sub>VKT</sub> *2	1	v <sub>i(MIC)</sub> = -37dBV	27.5	29.5	31.5	dB
Transmission Output Distortion	THD <sub>KT</sub> *2	1	v <sub>i(MIC)</sub> = -37dBV		1	5	%
Max. Transmission Level	U <sub>OT</sub> *2	1	THD=5%	-2.2	2.8		dBV
Transmission Auto Pad	ΔAP <sub>T</sub> *2	1	ΔI <sub>L</sub> =100mA-40mA, v <sub>i(MIC)</sub> = -37dBV	-6.5	-3.5		dB
HOLD TONE Gain	G <sub>V-HT</sub> *2	1	v <sub>i(HOLD)</sub> = -32dBV (H : ON)	21	24	27	dB
HOLD TONE Distortion	THD <sub>HT</sub> *2	1	v <sub>i(HOLD)</sub> = -32dBV (H : ON)		1	10	%
DTMF Gain	G <sub>V-DT</sub> *2	1	v <sub>i(TUCH)</sub> = -37dBV (D·MON)	30.5	32.5	34.5	dB
DTMF TUCH TONE Output Distortion	THD <sub>DT</sub> *2	1	v <sub>i(TUCH)</sub> = -37dBV (D·MON)		1	7	%
DTMF Auto Pad	ΔAP <sub>DT</sub> *2	1	ΔI <sub>L</sub> =100mA-40mA, v <sub>i(REC)</sub> = -36dBV	-6.5	-4.5	-2.5	dB
BATTERY ON	U <sub>BT</sub> *2	1	I <sub>L</sub> =5mA, v <sub>i(REC)</sub> = -47dBV	38			dB
<b>Power Supply</b>							
DC Impedance (1)	Z <sub>DC-1</sub> *2		I <sub>L</sub> =20mA		150		Ω
DC Impedance (2)	Z <sub>DC-2</sub> *2		I <sub>L</sub> =100mA		80		Ω
AC Impedance (1)	Z <sub>AC-1</sub> *2		I <sub>L</sub> =40mA		2		kΩ
AC Impedance (2)	Z <sub>AC-2</sub> *2		I <sub>L</sub> =100mA		1.5		kΩ

\*1 : Measure between Pin ⑥ and ⑦. \*2 : Measure between Pin ② and ①.

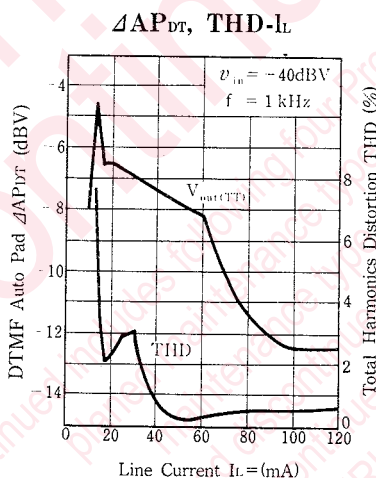
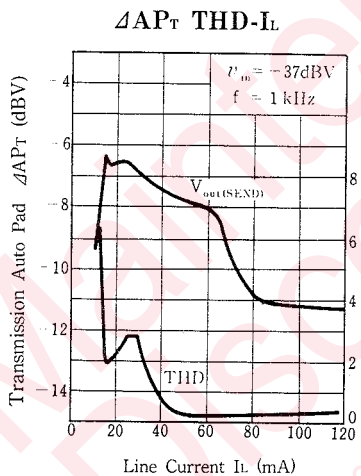
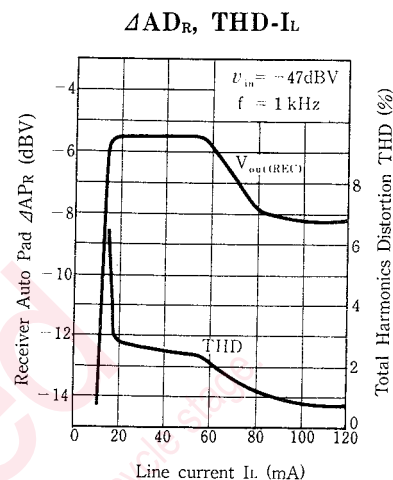
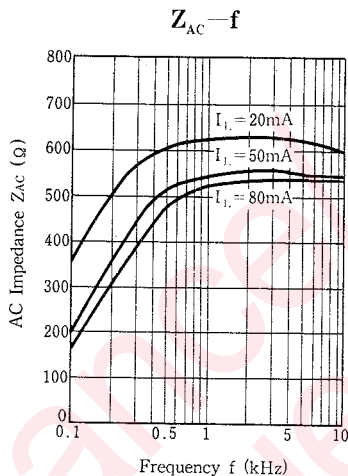
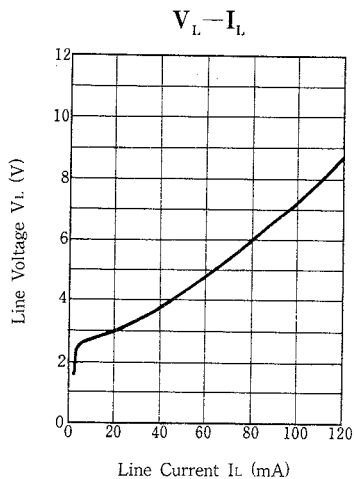
Test Circuit 1



● Measuring Method

Item	Symbol	Pin No.	Relay Switch No.																		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Receiver Gain	$G_{V-R}$	6 ~ 7	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—	—	—
Receiver Output Distortion	$THD_R$	6 ~ 7	—	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—	—
Receive Level	$V_{O-R}$	6 ~ 7	—	—	—	—	—	—	○	○	—	—	—	—	—	—	—	—	—	—	—
Receiver Auto Pad	$\Delta A_{PR}$	6 ~ 7	—	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—	—
KEY IN TONE Gain	$G_{V-KT}$	6 ~ 7	—	—	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—
Transmission Gain	$G_{V-T}$	22 ~ 1	—	○	○	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Transmission Output Distortion	$THD_T$	22 ~ 1	—	○	○	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Max. Transmission Level	$V_{O-T}$	22 ~ 1	○	○	○	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Transmission Auto Pad	$\Delta A_{PT}$	22 ~ 1	—	○	○	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
HOLD TONE Output Gain	$G_{V-HT}$	22 ~ 1	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—	—	—	—
HOLD TONE Output Distortion	$THD_{HT}$	22 ~ 1	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—	—	—
DTMF Output Gain	$G_{VDT}$	22 ~ 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
DTMF Output Distortion	$THD_{DT}$	22 ~ 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
DTMF Auto Pad	$\Delta A_{DT}$	28 ~ 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
BATTERY ON	$V_{OBT}$	6 ~ 7	—	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—	○

○ : SW ON, — : SW OFF

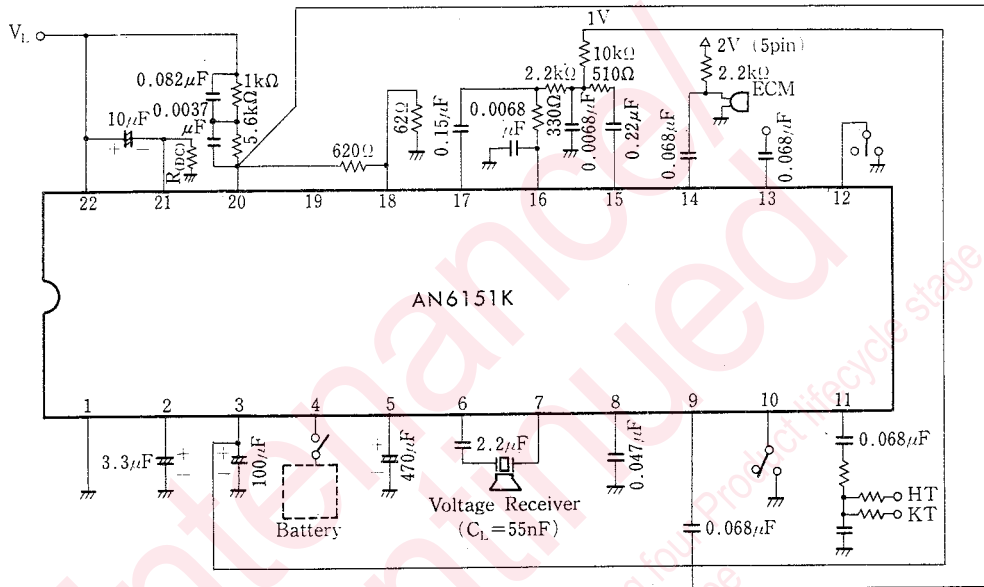


■ Pin

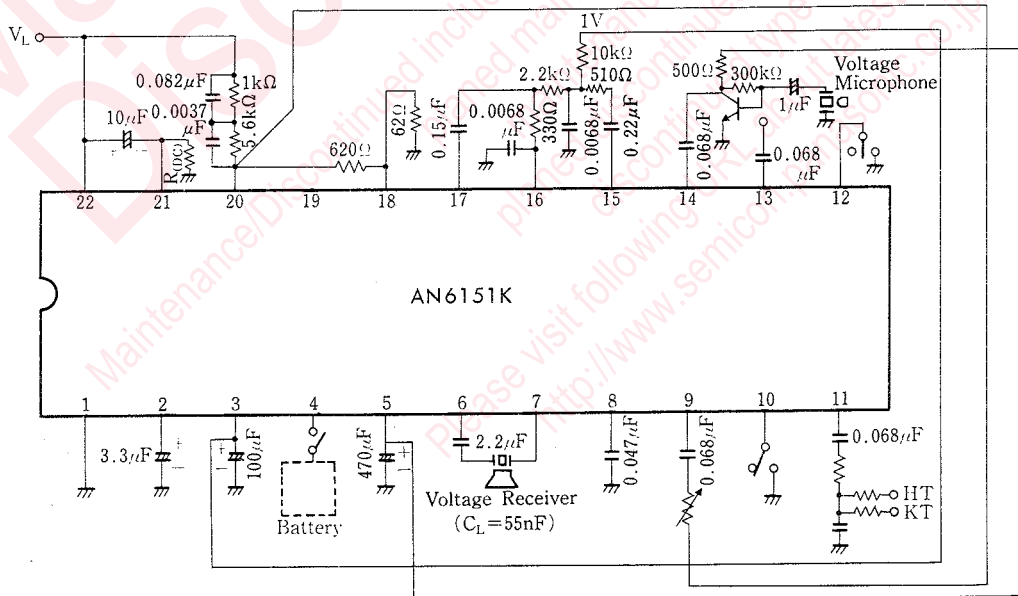
Pin No.	Pin Name	Pin No.	Pin Name
1	GND	12	Logic (Hold Tone)
2	1/2 Line Voltage	13	DTMF Input
3	1V Reference Voltage	14	Transmission MIC Input
4	Battery-Back up	15	Transmission MIC Filter (1)
5	2V Reference Voltage	16	Transmission MIC Filter (2)
6	Receiver Output (1)	17	Transmission MIC Filter (3)
7	Receiver Output (2)	18	Side Tone-SW (1)
8	Receive Filter	19	Side Tone-SW (2)
9	Receiver Input	20	Side Tone-SW (3)
10	Logic (Dial Tone)	21	Line Filter
11	Hold Tone/KEY in Tone Input	22	Line

■ Application Circuits

● When ECM is used in the Transmission MIC



● When ceramic is used in the Transmission MIC



## Request for your special attention and precautions in using the technical information and semiconductors described in this book

- (1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.
- (2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products. No license is granted in and to any intellectual property right or other right owned by Panasonic Corporation or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.
- (3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).  
Consult our sales staff in advance for information on the following applications:
  - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
  - Any applications other than the standard applications intended.
- (4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.
- (5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
  - Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.
- (6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.
- (7) This book may be not reprinted or reproduced whether wholly or partially, without the prior written permission of our company.



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

[LittleDiode.com](http://LittleDiode.com)

Looking forward to providing you with the best possible service.