Speech network
BA6566/BA6566F/BA6566FP

The BA6566, BA6566F, and BA6566FP are speech network ICs which possess the basic functions required for handset communications. In addition to amplifying signals from a transmitter and sending them to a telephone line, they also amplify only reception signals from a telephone line and drive the receiver. They also compensate for fluctuation in the volume at which signals are transmitted and received, caused by the length of the telephone line (AGC).

●Applications
Telephones and telephone equipment

●Features
1) Can accommodate both dynamic and piezoelectric receivers, simply by changing the circuit constant for a wide dynamic reception range.
2) Automatic gain control (AGC) is used, based on the transmission and reception telephone line current, for easier compliance with communications standards.

3) Erroneous operation caused by high-frequency electrical wave interference is minimized.
4) An HSOP package is used, eliminating the need for an attached transistor to dissipate heat. This means that a common circuit can be shared when a DIP package is used (BA6566FP).

●Block diagram

ROHM
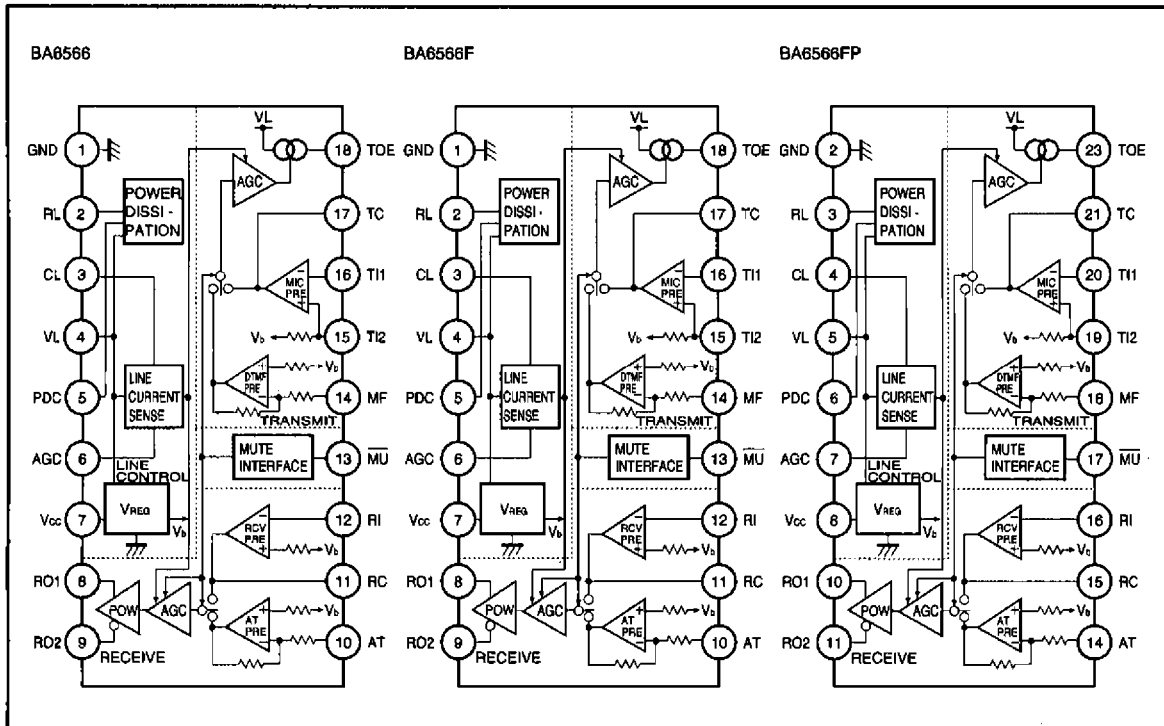
●Absolute maximum ratings (Ta=25℃)

Parameter		Symbol	Limits	Unit
Applied voltage		V_L	16.5	V
Power dissipation	BA6566	Pd	1100 *1	mW
	BA6566F		600 *2	
	BA6566FP		1200 *3	
Operating temperature		Topr	−35~60	℃
Storage temperature		Tstg	−55~125	℃
Current consumption		I_L	125 *4	mA

*1 Reduced by 11 mW for each increase in Ta of 1°C over 25°C.

*2 Reduced by 6 mW for each increase in Ta of 1°C over 25°C.

*3 Reduced by 12 mW for each increase in Ta of 1°C over 25°C.
  When mounted on 90 mm × 50 mm × 1.6 mm glass epoxy board, fins should be soldered to foil pattern.

*4 With the BA6566, Reduced by 1 mA for each increase in Ta of 1°C over 50°C.
  With the BA6566F, Reduced by 1.4 mA for each increase in Ta of 1°C over 50°C.
  With the BA6566FP, Reduced by 1 mA for each increase in Ta of 1°C over 50°C.

Speech network

Telephones

●Electrical characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions				Measurement Circuit
						I_L (mA)	AGC	Mute	f=1kHz	
Line voltage (5)	V_L(5)	—	2.0	—	V	5	—	—	—	Fig.2
Line voltage (20)	V_L (20)	2.5	3.5	5.0	V	20	—	—	—	Fig.2
Line voltage (30)	V_L (30)	3.0	4.0	5.4	V	30	—	—	—	Fig.2
Line voltage (90)	V_L (90)	5.2	7.0	9.5	V	90	—	—	—	Fig.2
Mute low level input voltage	V_{IL}	0.1	0.18	0.25	V	20~90	—	—	—	Fig.2
Mute low level input current	I_{IL}	25	35	45	μA	20~90	—	—	—	Fig.2
Transmit gain 1 (20–90)	G_{T1} (20 - 90)	37	41	44	dB	20~90	OFF	OFF	Vin=−50dBV	Fig.3
Transmit gain 1 (30–90)	G_{T1} (30 - 90)	38	41	44	dB	30~90	OFF	OFF	Vin=−50dBV	Fig.3
Transmit gain 2 (20)	G_{T2} (20)	38	41	45	dB	20	ON	OFF	Vin=−50dBV	Fig.3
Transmit gain 2 (30)	G_{T2} (30)	38	41	44	dB	30	ON	OFF	Vin=−50dBV	Fig.3
Transmit gain 2 (90)	G_{T2} (90)	34.5	37.5	40.5	dB	90	ON	OFF	Vin=−50dBV	Fig.3
Transmit distortion attenuation	D_T	—	−46	−20	dB	20~90	—	OFF	Vin=−50dBV	Fig.3
Transmit noise level	N_T	—	−68	−55	dBV	20~90	—	OFF	BPF=400Hz ~30kHz	Fig.3
Maximum transmit output level (20–90)	O_T (20 - 90)	−2	3	—	dBV	20~90	—	OFF	Dist=−20dB	Fig.3
Maximum transmit output level (30–90)	O_T (30 - 90)	0	3	—	dBV	30~90	—	OFF	Dist=−20dB	Fig.3
Receive gain 1 (20–90)	G_{R1} (20 - 90)	−13	−10	−7	dB	20~90	OFF	OFF	S_1=1 Vin=−20dBV	Fig.4
Receive gain 1 (20)	G_{R1} (20)	−13	−10	−7	dB	20	ON	OFF	S_1=1 Vin=−20dBV	Fig.4
Receive gain 1 (30)	G_{R1} (30)	−13	−10	−7	dB	30	ON	OFF	S_1=1 Vin=−20dBV	Fig.4
Receive gain 1 (90)	G_{R1} (90)	−16.5	−13.5	−10.5	dB	90	ON	OFF	S_1=1 Vin=−20dBV	Fig.4
Receive distortion attenuation 1	D_{R1}	—	−46	−20	dB	20~90	—	OFF	S_1=1 Vin=−20dBV	Fig.4
Receive noise level 1	N_{R1}	—	−70	−60	dBV	20~90	—	OFF	BPF=400Hz ~30kHz	Fig.4
Maximum receive output level 1 (20 - 90)	O_{R1} (20 - 90)	−15	−7	—	dBV	20~90	—	OFF	Dist=−20dB	Fig.4
Maximum receive output level 1 (30 - 90)	O_{R1} (30 - 90)	−11	−7	—	dBV	30~90	—	OFF	Dist=−20dB	Fig.4
Receive gain 2 (20 - 90)	G_{R2} (20 - 90)	5	8	11	dB	20~90	OFF	OFF	S_1=2 Vin=−20dBV	Fig.4
Receive gain 2 (20)	G_{R2} (20)	5	8	11	dB	20	ON	OFF	S_1=2 Vin=−20dBV	Fig.4

ROHM

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions				Measurement Circuit
						I_L (mA)	AGC	Mute	f=1kHz	
Receive gain 2 (30)	G_{R2} (30)	5	8	11	dB	30	ON	OFF	S_1=2 Vin=−20dBV	Fig.4
Receive gain 2 (90)	G_{R2} (90)	1.5	4.5	7.5	dB	90	ON	OFF	S_1=2 Vin=−20dBV	Fig.4
Receive distortion attenuation 2	D_{R2}	—	−46	−20	dB	20~90	—	OFF	S_1=2 Vin=−20dBV	Fig.4
Receive noise level (20 - 90)	N_{R2} (20 - 90)	—	−66	−50	dBV	20~90	—	OFF	BPF=400Hz ~30kHz	Fig.4
Receive noise level 2 (30 - 90)	N_{R2} (30 - 90)	—	−66	−55	dBV	30~90	—	OFF	BPF=400Hz ~30kHz	Fig.4
Maximum receive output level 2 (20 - 90)	O_{R2} (20 - 90)	1	7	—	dBV	20~90	—	OFF	Dist=−20dB	Fig.4
Maximum receive output level 2 (30 - 90)	O_{R2} (30 - 90)	3	7	—	dBV	30~90	—	OFF	Dist=−20dB	Fig.4
DTMF gain 1	G_{D1} (20 - 90)	30.5	33.5	36.5	dB	20~90	OFF	ON	Vin=−40dBV	Fig.5
DTMF gain 2 (20)	G_{D1} (20)	30	33	36	dB	20	ON	ON	Vin=−40dBV	Fig.5
DTMF gain 2 (30)	G_{D2} (30)	30	33	36	dB	30	ON	ON	Vin=−40dBV	Fig.5
DTMF gain 2 (90)	G_{D2} (90)	27	30	33	dB	90	ON	ON	Vin=−40dBV	Fig.5
DTMF distortion attenuation	D_D	—	−41	−28	dB	20~90	—	ON	Vin=−40dBV	Fig.5
DTMF noise level	N_D	—	−64	−55	dBV	20~90	—	ON	BPF=400Hz ~30kHz	Fig.5
Maximum DTMF output level (20 - 90)	O_D (20 - 90)	−4.5	−0.5	—	dBV	20~90	—	ON	Dist=−28dB	Fig.5
Maximum DTMF output level (30 - 90)	O_D (30 - 90)	−3.5	−0.5	—	dBV	30~90	—	ON	Dist=−28dB	Fig.5
AT gain 1	G_{A1}	23.5	26.5	29.5	dB	20~90	—	ON	S_1=1 Vin=−40dBV	Fig.6
AT gain 2	G_{A2}	26.5	29.5	32.5	dB	20~90	—	ON	S_1=2 Vin=−40dBV	Fig.6
AC impedance	Z_{TEL}	450	565	750	Ω	20~90	—	—	Vin=−20dBV	Fig.7
Vcc pin voltage	V_{CCR}	1.15	1.27	—	V	20	—	—	S_3=ON	Fig.2

Speech network

Telephones
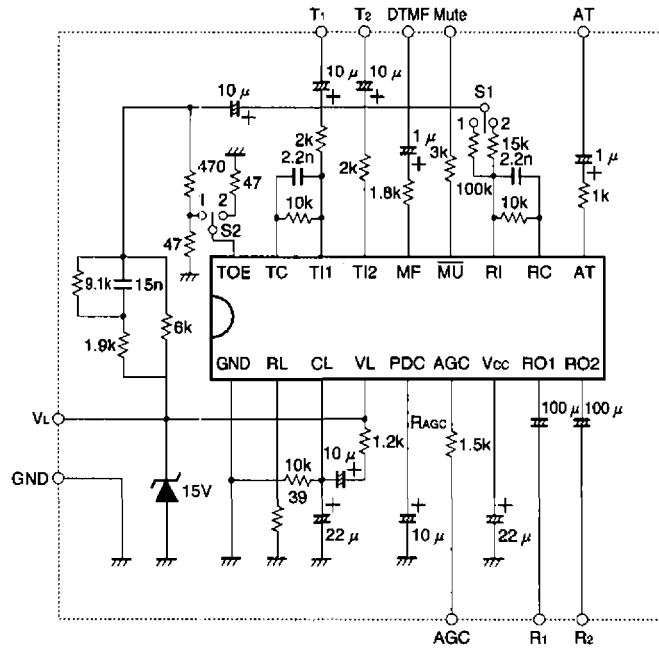
●Measurement circuits

Fig. 1
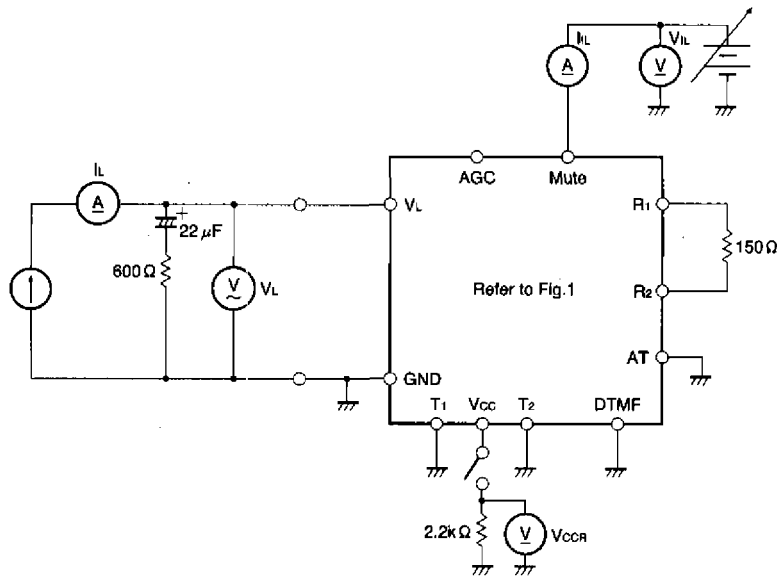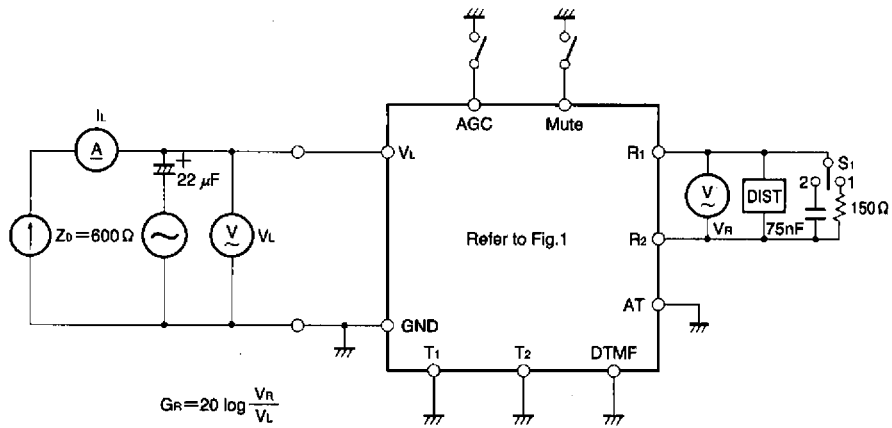
Fig. 2
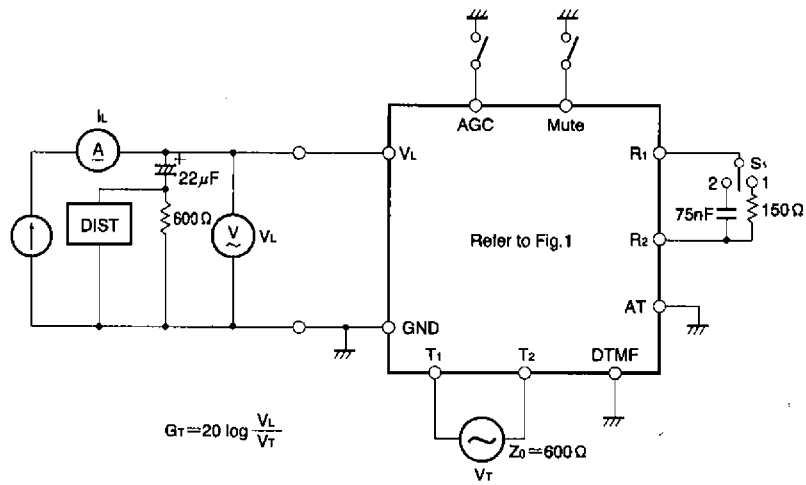
ROHM

●Measurement circuits

$$G_T = 20 \log \frac{V_L}{V_T}$$

Fig. 3

$$G_R = 20 \log \frac{V_R}{V_L}$$

Fig. 4

Speech network   Telephones

●Measurement circuits

$$G_D = 20 \log \frac{V_L}{V_D}$$

Fig. 5

$$G_D = 20 \log \frac{V_R}{V_A}$$

Fig. 6

ROHM

●Measurement circuits

$$Z_{TEL} = \frac{600}{\frac{V_{L1}}{V_{L2}} - 1}$$
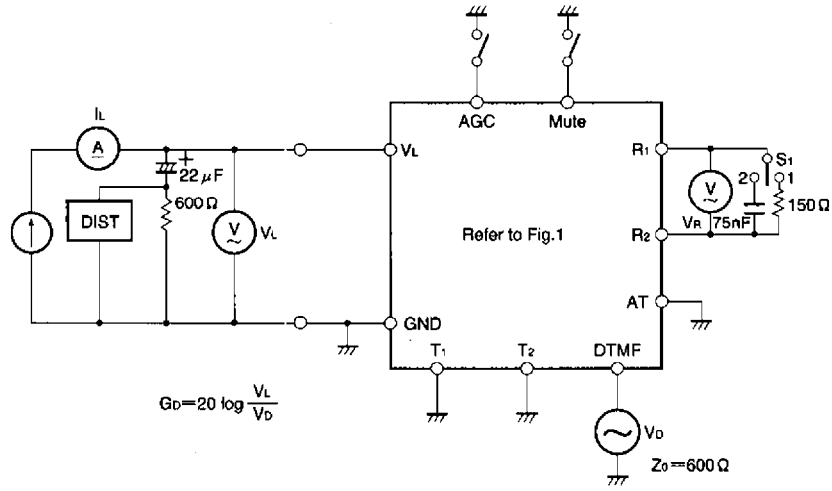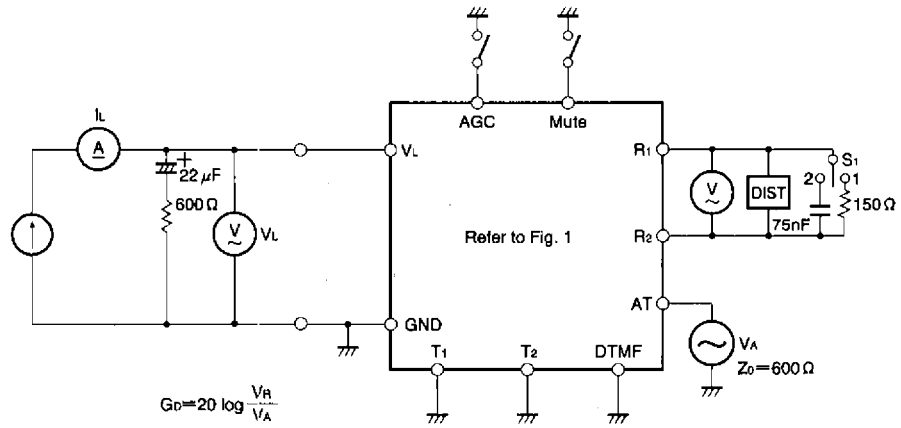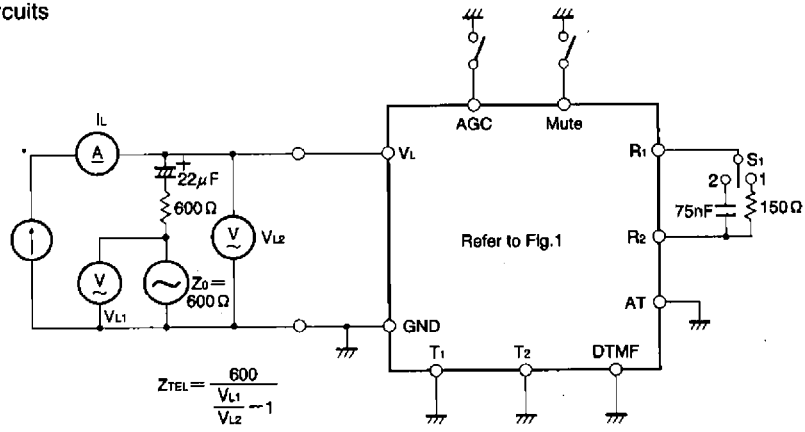
Fig. 7

●External dimensions (Units: mm)

BA6566

22.9±0.3

18　　　　　10

6.5±0.3

1　　　　　9

3.95±0.3
0.51Min.
3.29±0.2

2.54

0.5±0.1

7.62

0.3±0.1

0°~15°

DIP18

BA6566F

11.2±0.2

18　　　　　10

7.8±0.3
5.4±0.2

1　　　　　9

1.8±0.1
0.11

1.27

0.4±0.1

0.3Min.

0.15±0.1

0.15

SOP18

BA6566FP

13.8±0.2

24　　　　　13

7.8±0.3
5.4±0.2

1　　　　　12

2.75±0.1

1.9±0.1
0.11

0.8

0.36±0.1

0.3Min.

0.25±0.1

0.15

HSOP24

ROHM