

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 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).

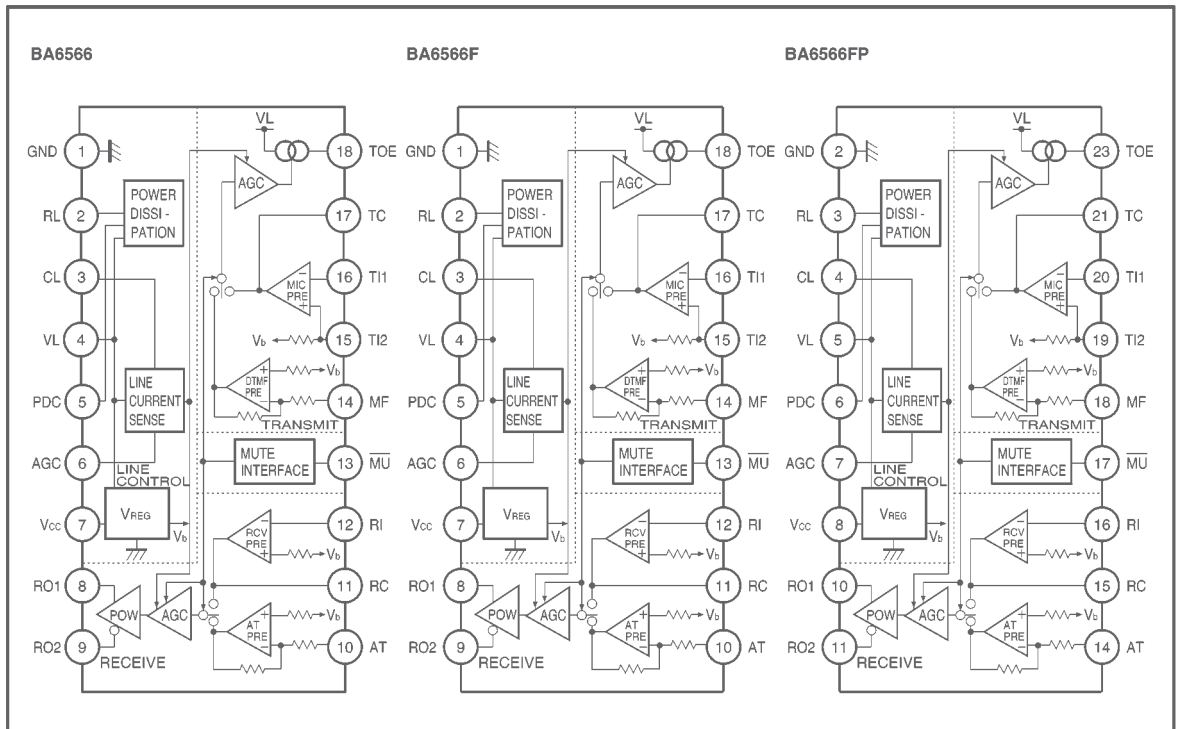
● Applications

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



● Absolute maximum ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|-----------------------|------------------|----------|------|
| Applied voltage | V _L | 16.5 | V |
| Power dissipation | BA6566 | 1100*1 | mW |
| | BA6566F | 600*2 | |
| | BA6566FP | 1350*3 | |
| Operating temperature | T _{opr} | -35~+60 | °C |
| Storage temperature | T _{stg} | -55~+125 | °C |
| Current dissipation | 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 13.5 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.

●Electrical characteristics (Ta=25°C)

| 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 input low level voltage | V _{IL} | 0.1 | 0.18 | 0.25 | V | 20~90 | — | — | — | Fig.2 |
| Mute input low level 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 | V _{IN} =-50dBV | Fig.3 |
| Transmit gain 1 (30 - 90) | G _{T1} (30 - 90) | 38 | 41 | 44 | dB | 30~90 | OFF | OFF | V _{IN} =-50dBV | Fig.3 |
| Transmit gain 2 (20) | G _{T2} (20) | 38 | 41 | 45 | dB | 20 | ON | OFF | V _{IN} =-50dBV | Fig.3 |
| Transmit gain 2 (30) | G _{T2} (30) | 38 | 41 | 44 | dB | 30 | ON | OFF | V _{IN} =-50dBV | Fig.3 |
| Transmit gain 2 (90) | G _{T2} (90) | 34.5 | 37.5 | 40.5 | dB | 90 | ON | OFF | V _{IN} =-50dBV | Fig.3 |
| Transmit distortion attenuation | D _T | — | -46 | -20 | dB | 20~90 | — | OFF | V _{IN} =-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 _i =1 V _{IN} =-20dBV | Fig.4 |
| Receive gain 1 (20) | G _{R1} (20) | -13 | -10 | -7 | dB | 20 | ON | OFF | S _i =1 V _{IN} =-20dBV | Fig.4 |
| Receive gain 1 (30) | G _{R1} (30) | -13 | -10 | -7 | dB | 30 | ON | OFF | S _i =1 V _{IN} =-20dBV | Fig.4 |
| Receive gain 1 (90) | G _{R1} (90) | -16.5 | -13.5 | -10.5 | dB | 90 | ON | OFF | S _i =1 V _{IN} =-20dBV | Fig.4 |
| Receive distortion attenuation 1 | D _{R1} | — | -46 | -20 | dB | 20~90 | — | OFF | S _i =1 V _{IN} =-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 _i =2 V _{IN} =-20dBV | Fig.4 |
| Receive gain 2 (20) | G _{R2} (20) | 5 | 8 | 11 | dB | 20 | ON | OFF | S _i =2 V _{IN} =-20dBV | Fig.4 |

| 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 V _{IN} =-20dBV | Fig.4 |
| Receive gain 2 (90) | G _{R2} (90) | 1.5 | 4.5 | 7.5 | dB | 90 | ON | OFF | S ₁ =2 V _{IN} =-20dBV | Fig.4 |
| Receive distortion attenuation 2 | D _{R2} | — | -46 | -20 | dB | 20~90 | — | OFF | S ₁ =2 V _{IN} =-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 (20 - 90) | G _{D1} (20 - 90) | 30.5 | 33.5 | 36.5 | dB | 20~90 | OFF | ON | V _{IN} =-40dBV | Fig.5 |
| DTMF gain 2 (20) | G _{D1} (20) | 30 | 33 | 36 | dB | 20 | ON | ON | V _{IN} =-40dBV | Fig.5 |
| DTMF gain 2 (30) | G _{D2} (30) | 30 | 33 | 36 | dB | 30 | ON | ON | V _{IN} =-40dBV | Fig.5 |
| DTMF gain 2 (90) | G _{D2} (90) | 27 | 30 | 33 | dB | 90 | ON | ON | V _{IN} =-40dBV | Fig.5 |
| DTMF distortion attenuation | D _D | — | -41 | -28 | dB | 20~90 | — | ON | V _{IN} =-40dBV | Fig.5 |
| DTMF noise level (20 - 90) | 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 V _{IN} =-40dBV | Fig.6 |
| AT gain 2 | G _{A2} | 26.5 | 29.5 | 32.5 | dB | 20~90 | — | ON | S ₁ =2 V _{IN} =-40dBV | Fig.6 |
| AC impedance | Z _{TEL} | 450 | 565 | 750 | Ω | 20~90 | — | — | V _{IN} =-20dBV | Fig.7 |
| V _{CC} pin voltage | V _{CCR} | 1.15 | 1.27 | — | V | 20 | — | — | S ₃ =ON | Fig.2 |

● Measurement circuits

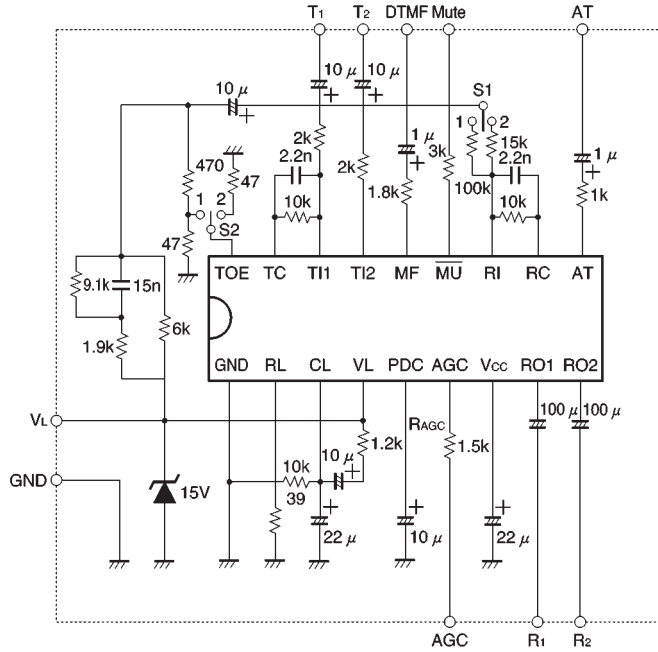


Fig. 1

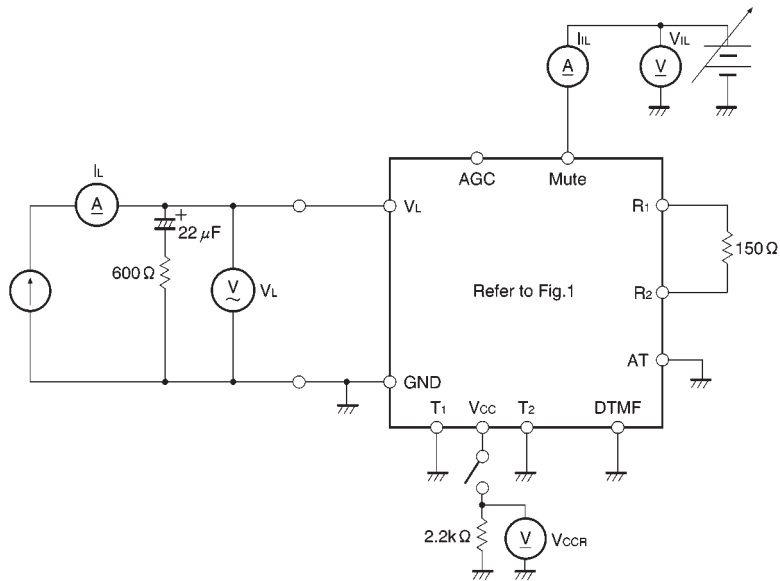


Fig. 2

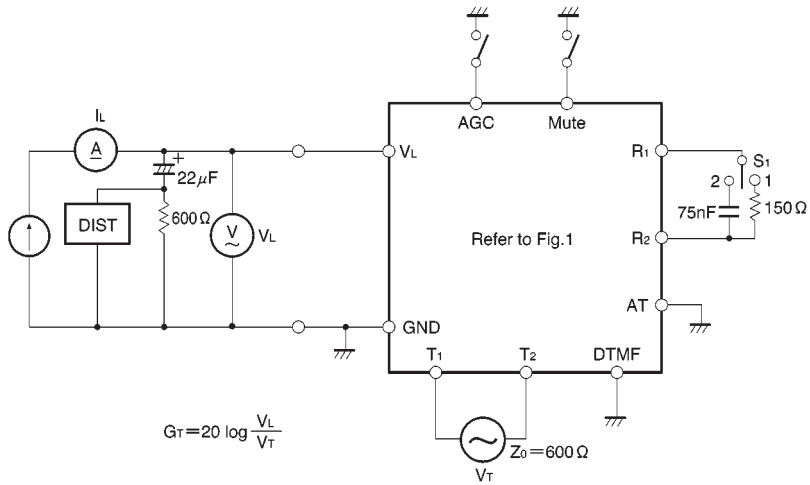


Fig. 3

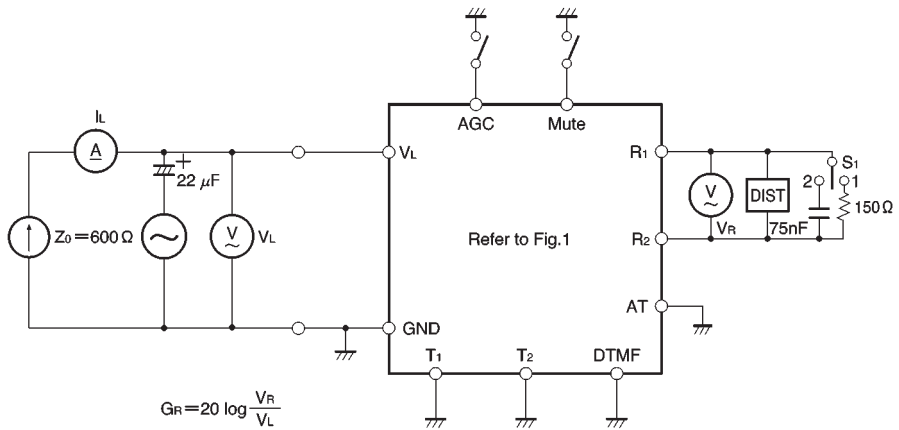


Fig. 4

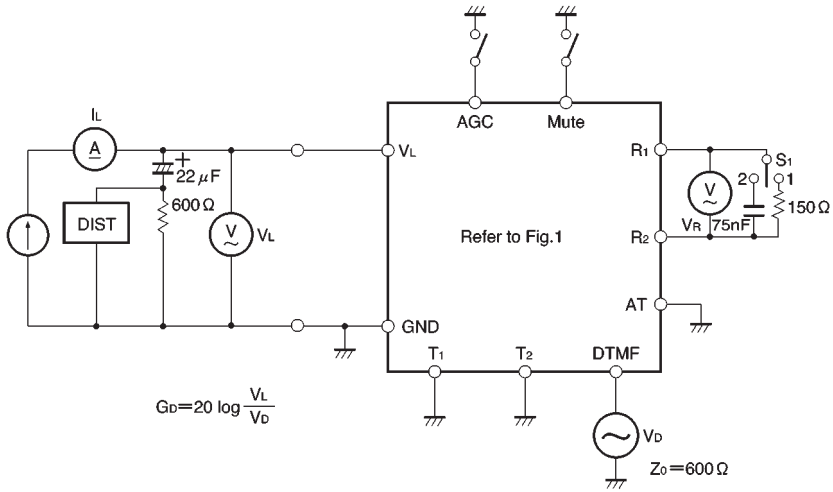


Fig. 5

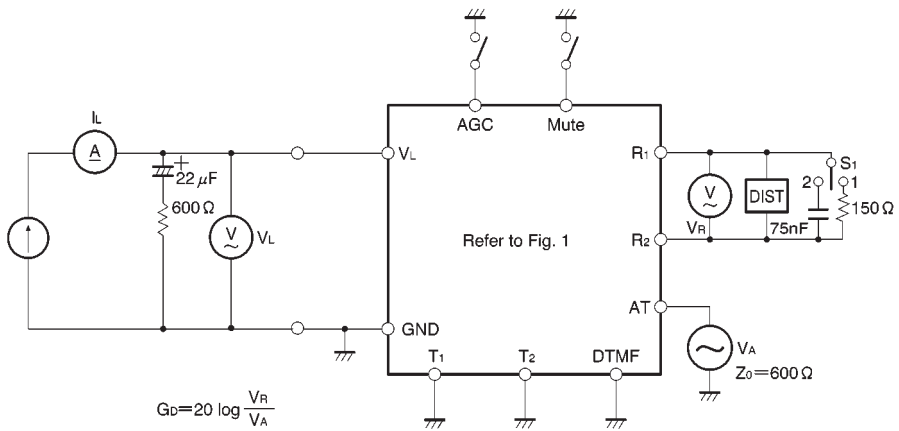


Fig. 6

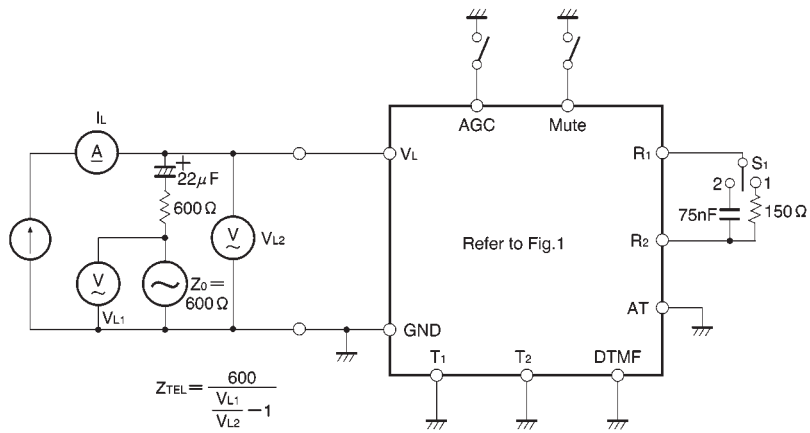


Fig. 7