High-output dual power amplifier BA5417

The BA5417 is a 6 to 15V-compatible dual power amplifier developed for use radio cassette players. It is equipped with standby switching functions for excellent total harmonic distortion and other basic characteristics.

Applications

Radio cassette players

Features

1) High output.

Pout = 2.8W (Vcc = 9V, RL
$$3\Omega$$
, THD = 10%)
Pout = 5.0W (Vcc = 12V, RL 3Ω , THD = 10%)

2) Excellent audio quality

$$THD=0.1\%~(f=1kHz,~P_0=0.5W)$$

$$V_{\text{NO}} = 0.3 \text{mVrms (Rg} = 10 \text{k}\Omega)$$

$$RR = 55dB (f_{RR} = 100Hz)$$

- 3) Wide supply voltage operating range (Vcc = 6.0V to 15.0V).
- 4) Switching noise ("pop" noise) generated when the power is switched on and off is small.
- Ripple mixing when motor starts has been prevented.
- 6) Built-in thermal shutdown circuit.
- Built-in standby switch. Output is not influenced by the standby pin voltage.
- 8) Soft clipping.

■Absolute maximum ratings (Ta = 25°C)

| Parameter | Symbol | Limits | Unit |
|--------------------------|--------|------------------|------|
| Power supply voltage | Vcc | 20*1 | V |
| Power dissipation | Pd | 15* ² | w |
| Operating temperature | Topr | −20~+75 | °C |
| Storage temperature Tstg | | −55∼ +150 | ° |

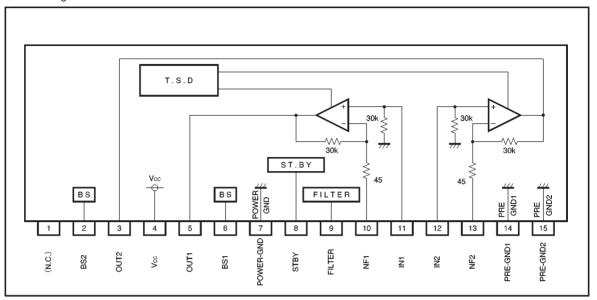
^{*1} Must be within standby values.

• Recommended operating conditions (Ta = 25°C)

| Parameter | Symbol | Limits | Unit |
|----------------------|--------|----------|------|
| Power supply voltage | Vcc | 6.0~15.0 | V |

^{*2} Ta=75℃ (when using infinite heatsink)

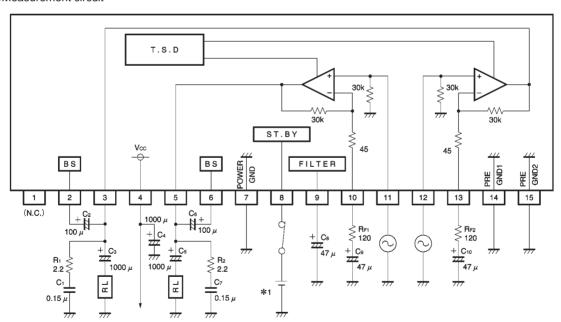
Block diagram



• Electrical characteristics (unless otherwise noted, Ta = 25 °C, Vcc = 9.0V, RL = 3 Ω , RF = 120 Ω , Rg = 600 Ω , f = 1kHz)

| Parame | ter | Symbol | Min. | Тур. | Max. | Unit | Coniditions |
|----------------------------------|---------------|--------|------|------|------|-------|------------------------------------|
| Quiescent curre | nt | lo | _ | 22 | 45 | mA | V _{IN} =0Vrms |
| Rated output vo | Itage 1 | Роит1 | 2.2 | 2.8 | _ | w | TDH=10% |
| Rated output vo | Itage 2 | Роит2 | 4.0 | 5.0 | _ | w | TDH=10%, Vcc=12V |
| Closed-loop vol | tage gain | Gvc | 43 | 45 | 47 | dB | _ |
| Output noise vo | Itage | VNO | _ | 0.3 | 1.0 | mVrms | Rg=10kΩ, DIN AUDIO |
| Total harmonic | distortion | THD | _ | 0.1 | 1.0 | % | Р _О Т=0.5W |
| Ripple rejection | | RR | 42 | 55 | _ | dB | frR=100Hz, VRR=-10dBm |
| Crosstalk | | СТ | 48 | 65 | _ | dB | Vo=0dBm |
| Circuit current (with standby st | witch off) | loff | _ | 0 | 20 | μΑ | _ |
| Standby pin curre | nt when on | Isın | _ | 0.15 | 0.4 | mA | V _{STBY} =V _{CC} |
| Standby pin control voltage | Activated | Vsтн | 3.5 | _ | _ | V | _ |
| | Not activated | VstL | _ | _ | 1.2 | V | _ |

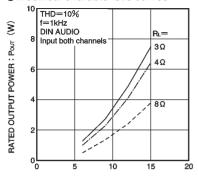
Measurement circuit



*1 Vstey=3.5V~Vcc

Fig.1

Electrical characteristic curves



POWER SUPPLY VOLTAGE: V∞ (V) Fig.2 Rated output power vs.

power supply voltage

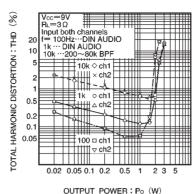
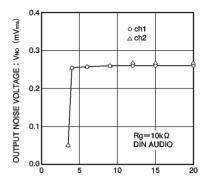
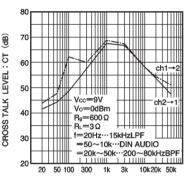


Fig.3 Total harmonic distortion vs. output power



POWER SUPPLY VOLTAGE: V∞ (V)
Fig.4 Output noise voltage vs.
power supply voltage



FREQUENCY: f (Hz)
Fig.5 Crosstalk vs. frequency

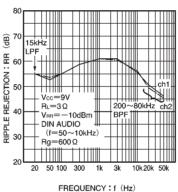


Fig.6 Ripple rejection vs. frequency

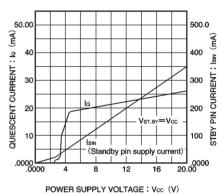
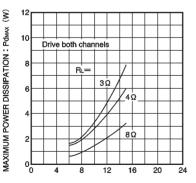
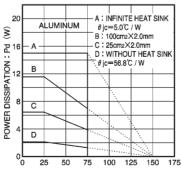


Fig.7 Quiescent standby pin supply current vs. power supply voltage



POWER SUPPLY VOLTAGE: Vcc (V)
Fig.8 Maximum power dissipation vs.
power supply voltage



AMBIENT TEMPERATURE: Ta (°C)
Fig.9 Thermal derating curve

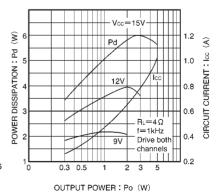


Fig.10 Power dissipation vs. power supply voltage $(RL=4\Omega)$

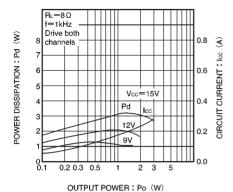


Fig.11 Power dissipation vs. power supply voltage $(RL=8\Omega)$

External dimensions (Units: mm)

