SGS TBA 231 A

# LINEAR INTEGRATED CIRCUIT

## DUAL AUDIO PREAMPLIFIER

- SINGLE OR DUAL SUPPLY OPERATION
- LOW NOISE FIGURE
- HIGH GAIN
- LARGE INPUT VOLTAGE RANGE
- EXCELLENT GAIN STABILITY VERSUS SUPPLY VOLTAGE
- NO LATCH UP
- OUTPUT SHORT CIRCUIT PROTECTED

The TBA 231A is a monolithic integrated dual operational amplifier in a 14-lead dual in-line plastic package.
These low-noise, high-gain amplifiers show extremely stable operating characteristics over a wide range of supply voltage and temperatures.
The device is intended for a variety of applications requiring two high performance operational amplifiers, such as phono and tape stereo preamplifier, TV remote control receiver, etc.

## ABSOLUTE MAXIMUM RATINGS

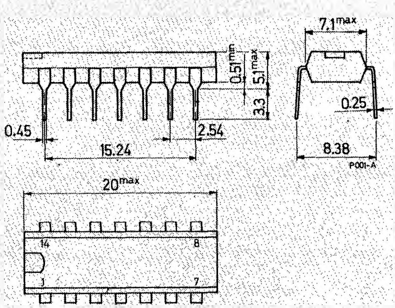
| | | | |
|---|---|---|---|
| $V_s$ | Supply voltage | ± 18 | V |
| $V_i$ | Differential input voltage | ± 5 | V |
| $V_{CM}$ | * Common mode input voltage | ± 15 | V |
| $P_{tot}$ | Power dissipation at $T_{amb} \leq 60\ °C$ | 500 | mW |
| $T_{stg}$ | Storage temperature | -40 to 150 | °C |
| $T_{op}$ | Operating temperature | 0 to 70 | °C |

* For $V_s \leq \pm 15V$, $V_{CM\ max} = V_s$.

**ORDERING NUMBER:** TBA 231A

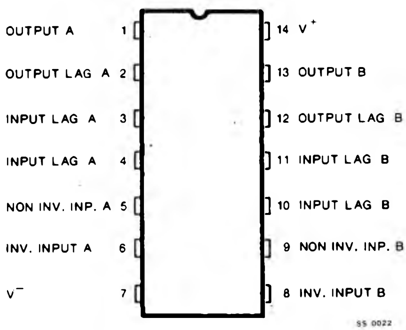
## MECHANICAL DATA

Dimensions in mm

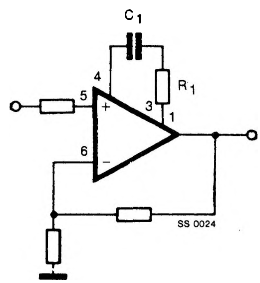


SGS **TBA231A**

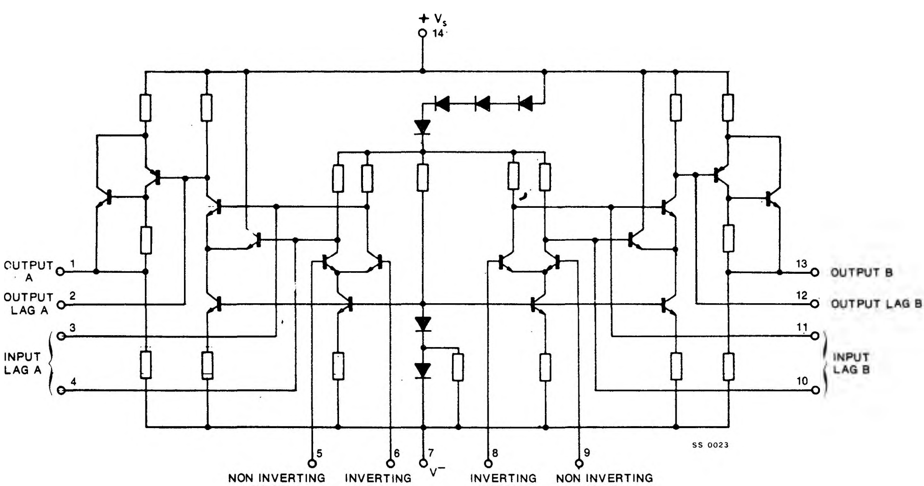
## CONNECTION DIAGRAM
(top view)




## TEST CIRCUIT




## SCHEMATIC DIAGRAM




## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{th\ j\text{-}amb}$ | Thermal resistance junction-ambient | max | 180 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_{amb}$ = 25°C, $R_L$ = 50 kΩ to pin 7, unless otherwise specified, $V_s$ = ± 15V)

| | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_d$ | Quiescent drain current | $V_o = 0$ | | 9 | 14 | mA |
| $V_{os}$ | Input offset voltage | $R_g$ = 200Ω | | 1 | 6 | mV |
| $I_{os}$ | Input offset current | | | 50 | 1000 | nA |
| $I_b$ | Input bias current | | | 250 | 2000 | nA |
| $V_{CM}$ | Common mode input voltage range | | ± 10 | ± 11 | | V |
| $R_i$ | Input resistance | f = 1 kHz | 37 | 150 | | kΩ |
| $G_v$ | Voltage gain | $V_o$ = ± 5V | 6500 | 20 000 | | – |
| $V_o$ | Positive output voltage swing | | +12 | +13 | | V |
| $V_o$ | Negative output voltage swing | | -14 | -15 | | V |
| $R_o$ | Output resistance | f = 1 kHz | | 5 | | kΩ |
| CMR | Common mode rejection | $R_g$ = 200Ω | 70 | 90 | | dB |
| SVR | Supply voltage rejection | $R_g$ = 200Ω | | 50 | | µV/V |
| SR | Slew rate | Unity gain<br>$C_1$ = 0.1 µF $R_1$ = 4.7Ω | | 1 | | V/µs |
| CS | Channel separation | $R_g$ = 10 kΩ f = 10 kHz | | 140 | | dB |
| NF | Noise figure | $R_g$ = 10 kΩ<br>B = 10 Hz to 10 kHz | | 1.5 | | dB |

Fig. 1 - Output voltage swing vs. supply voltage

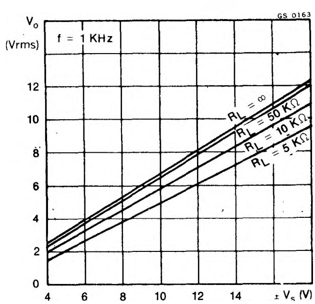



Fig. 2 - Quiescent drain current vs. supply voltage

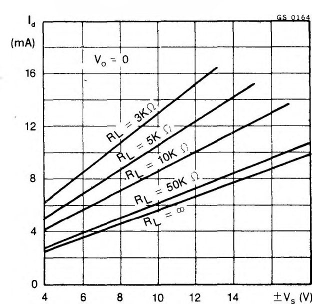



Fig. 3 - Open loop voltage gain vs. supply voltage

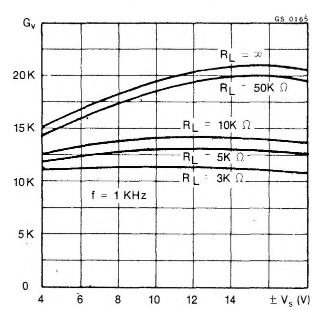


Fig. 4 - Open loop frequency response using recommeded compensation networks

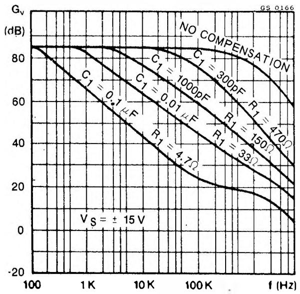



Fig. 5 - Output voltage swing vs. frequency for various compensation networks

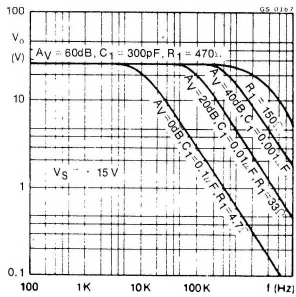



Fig. 6 - Input noise voltage vs. frequency

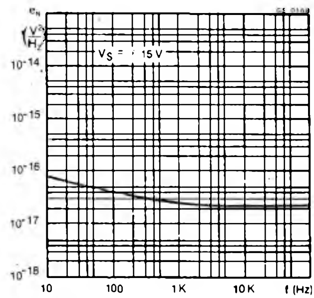



Fig. 7 - Input noise current vs. frequency

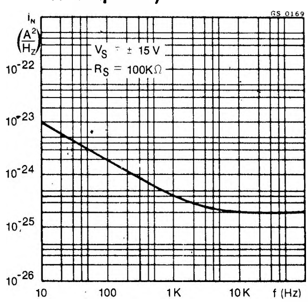



Fig. 8 - Closed loop gain vs. frequency

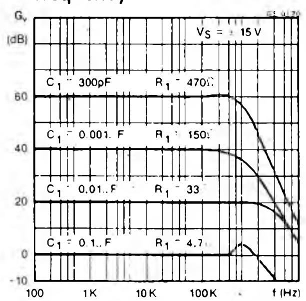
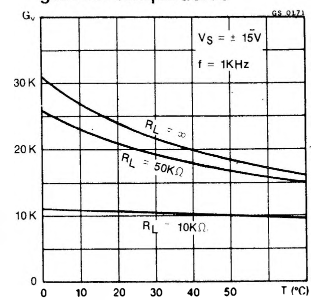



Fig. 9 - Open loop voltage gain vs. temperature




## APPLICATION INFORMATION

Fig. 10 - TV remote control receiver