

- Structure : Silicon Monolithic Integrated Circuit
- Product : Stereo pre-amplifier with mute detection circuits for car audio systems
- Type : **BA3430FS**
- Function :
  1. Compact configuration of between music cassette tape forwarding function and preamplifier
  2. Built in control logic, each mode selectable with microcomputer control
  3. Compatible with auto reversing of normal and metal tapes

Absolute Maximum Ratings (Ta=25°C)

|                       | Symbol | Rating   | Unit |
|-----------------------|--------|----------|------|
| Power Supply voltage  | Vcc    | 18       | V    |
| Power dissipation     | Pd     | 800*     | mW   |
| Operating temperature | Topr   | -30~+85  | °C   |
| Storage temperature   | Tastg  | -55~+125 | °C   |

※This value decreases 8.0 mW/°C for Ta=25°C or more.  
 A standard board, 70 × 70 × 1.6 mm, shall be mounted.

Operating Voltage Range

| Symbol | Range    | Unit |
|--------|----------|------|
| Vcc    | 7.0~18.0 | V    |

(Basic operation shall be available upon Ta=25°C.)

Application example

Note that ROHM cannot provide adequate confirmation of patents.

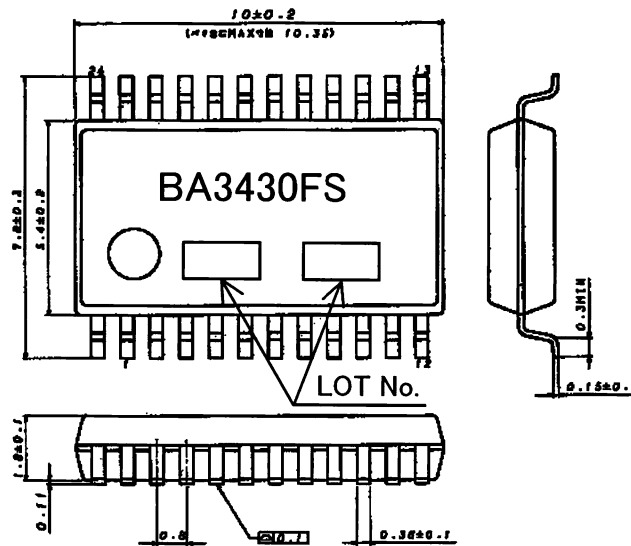
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Electrical Characteristics

(Unless specified particularly, Ta=25°C, Vcc=9V, f=1KHz, Rg=600Ω, Vo=-10dBV)

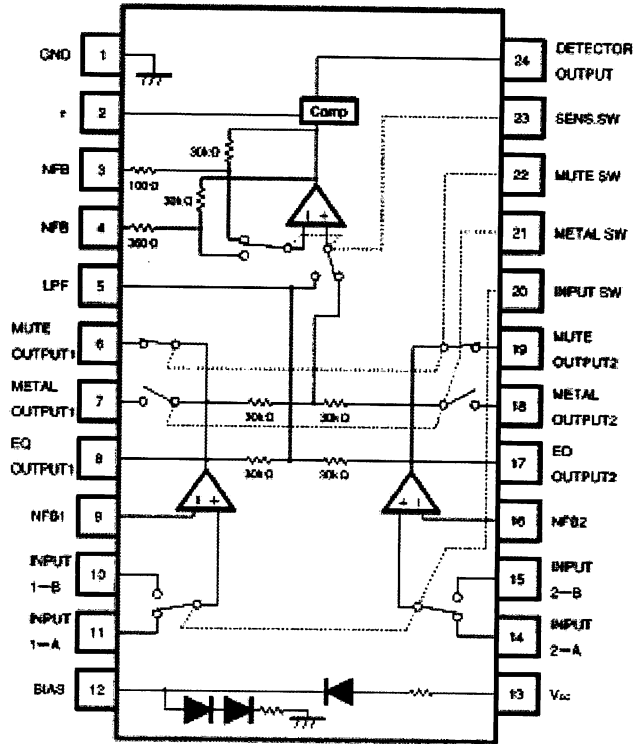
| Parameter                         | Symbol           | Limit |       |       | Unit              | Conditions                                      |
|-----------------------------------|------------------|-------|-------|-------|-------------------|---|
|                                   |                  | Min.  | Typ.  | Max.  |                   |   |
| Circuit current                   | I <sub>CC</sub>  | —     | 10.3  | 16    | mA                | No signal                                       |
| Open loop voltage gain            | G <sub>VO</sub>  | 72    | 85    | —     | dB                |   |
| Closed loop voltage gain 1        | G <sub>VC1</sub> | 37    | 40    | 43    | dB                |   |
| Closed loop voltage gain 2        | G <sub>VC2</sub> | 29    | 32    | 35    | dB                | f=10kHz,during metal playback                   |
| Maximum output voltage            | V <sub>OM</sub>  | 0.5   | 0.9   | —     | V <sub>rms</sub>  | THD=1%  |
| Total harmonic distortion ratio   | THD              | —     | 0.05  | 0.2   | %                 |   |
| Input conversion noise voltage    | V <sub>NIN</sub> | —     | 0.7   | 1.5   | μV <sub>rms</sub> | 20~20kHz BPF                                    |
| Ripple rejection ratio            | RR               | 40    | 50    | —     | dB                | V <sub>RR</sub> =-20dBV, f <sub>RR</sub> =100Hz |
| A-B Cross-talk level              | CT               | 55    | 65    | —     | dB                |   |
| Channel separation                | CS               | 55    | 65    | —     | dB                |   |
| Mute level                        | ML               | 55    | 70    | —     | dB                |   |
| Song detection input level1       | V <sub>ON1</sub> | -96.5 | -93.5 | -90.5 | dBV               | f=5kHz,during playback                          |
| Song detection input level 2      | V <sub>ON2</sub> | -84   | -81   | -78   | dBV               | f=10kHz, during fast-forward                    |
| Song detection time               | τ <sub>1</sub>   | —     | 6     | —     | ms                |   |
| Mute detection input level        | τ <sub>2</sub>   | —     | 45    | —     | ms                |   |
| Logic low output sink current     | I <sub>OL</sub>  | 2     | 4     | —     | mA                |   |
| Logic high output leakage current | I <sub>OH</sub>  | —     | 1     | 3     | μA                |   |
| Logic input low level voltage     | V <sub>IL</sub>  | —     | —     | 0.2   | V                 |   |
| Logic input high level voltage    | V <sub>IH</sub>  | 4.7   | —     | —     | V                 |   |
| Control pin outflow current       | I <sub>IL</sub>  | —     | —     | 200   | μA                | V <sub>IL</sub> =0V                             |
| Control pin inflow current        | I <sub>IH</sub>  | —     | —     | 300   | μA                | V <sub>IL</sub> =5V                             |

Outline Dimension



SSOP-A24 (Unit:mm)

Block Diagram



Terminal Number/ Terminal Name

| Terminal Number | Terminal Name | Terminal Number | Terminal Name   |
|-----------------|---------------|-----------------|-----------------|
| 1               | GND           | 13              | V <sub>cc</sub> |
| 2               | $\tau$        | 14              | INPUT 2-A       |
| 3               | NFB           | 15              | INPUT 2-B       |
| 4               | NFB           | 16              | NFB2            |
| 5               | LPF           | 17              | EQ OUTPUT2      |
| 6               | MUTE OUTPUT1  | 18              | METAL OUTPUT2   |
| 7               | METAL OUTPUT1 | 19              | MUTE OUTPUT2    |
| 8               | EQ OUTPUT1    | 20              | INPUT SW        |
| 9               | NFB1          | 21              | METAL SW        |
| 10              | INPUT 1-B     | 22              | MUTE SW         |
| 11              | INPUT 1-A     | 23              | SENS SW         |
| 12              | BIAS          | 24              | DETECTOR OUTPUT |

## Application example

- (1) Numbers and data in entries are representative design values and are not guaranteed values of the items.
- (2) Although we are confident in recommending the sample application circuits, carefully check their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient characteristics.
- (3) Absolute maximum ratings  
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.
- (4) GND potential  
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.
- (5) Thermal design  
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.
- (6) Shorts between pins and misinstallation  
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.
- (7) Operation in strong magnetic fields  
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.
- (8) Resister of each switching terminal  
To prevent the malfunction of switching terminal, set the resister value of 3k-10kΩ for 20 and 23 pins, and 2k-22kΩ for 21 and 22 pin.
- (9) Condensers for each switching terminal  
The condensers of 20 pin and 23 pin are designed for malfunction prevention of the detection circuit between the music. Without these condensers, the between music detection output terminal (24pin) becomes low due to no signal caused by the pop sound generated when internal switch is activated. This malfunction continues during the between music detection time. By making the time for the between music detection shorter, this malfunction can be permitted to omit condensers. The condensers of 21pin and 22 pin are for pop sound prevention for voice signal. When the mute function is used at the latter part of setting to shut off the pup sound, the condensers can be omitted. This omission will not cause the malfunction of between music detection circuits.
- (10) Music presence detection input level can be set by the resister of 3 pin and 4 pin. As the smaller this resister value the larger, the amplifier gain is, the music detection input level is smaller. Music presence detection input level of applicable circuit is set at - 93.5dBV (5kHz) for reproduction, and at - 81dBV (10kHz) for fast forwarding
- (11) Frequency characteristics for amplifier frequency characteristic reproduction when sensitivity is switched can be set by the C of 3pin, low range cut-off frequency by time constant of R can be set. The frequency characteristics for fast forwarding can be set by the C of 4pin, low range cut-off frequency by time constant of R can be set
- (12) Music Detection Time  
The music detection time setting is done with the 2 pin condenser. If this time is too short, short noise signal will activate the between music detection circuit, and it should be set longer as much as possible.
- (13) Between Music Detection Time  
Between music detection time is proportional to the product of power voltage and 2 pin condenser and 2 pin resister. Set the resister value at more than 22kΩ in consideration of allowable current of IC.

|                              | 20pinC |    | 21pinC |    | 22pinC |    | 23pinC |    |
|------------------------------|--------|----|--------|----|--------|----|--------|----|
|                              | Yes    | No | Yes    | No | Yes    | No | Yes    | No |
| Pop sound in audio signal    | △      | ×  | ○      | △  | ○      | ×  | ○      | ○  |
| Mute detection circuit error | ○      | ×  | ○      | ○  | ○      | ○  | ○      | *  |

× ... Occurs

○ ... Not occurs

△ ... May occur due to gain in following stage

\* ... Possibly of incorrect operation

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