National Semiconductor



# AF102 Dial Tone Reject Filter

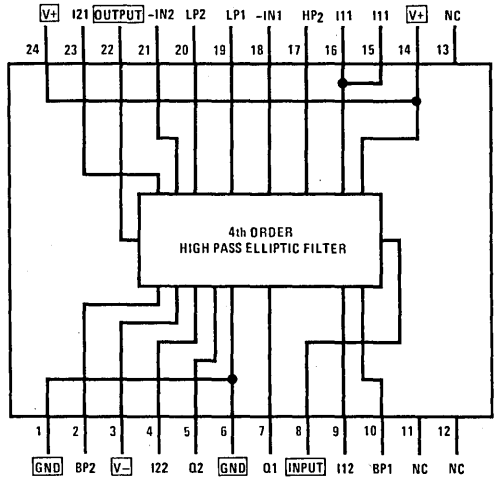
## General Description

The AF102 is a fourth order elliptic highpass filter designed to reject frequencies below 650Hz. This filter rejects the 350Hz and 440Hz dial tone frequencies present on a telephone line. The unit is fully tuned and requires no external components – only input, output and power supply connections.

## Features

- Fully tuned
- High input impedance
- Low output impedance
- Wide power supply range ±5V to ±18V

## Connection Diagram




Ceramic Dual-In-Line Package HY24A
AF102CJ

**Note:** Only those pin functions marked with a □ need be connected for normal operation. All other pins are internal connections or test points; DO NOT USE.

## Absolute Maximum Ratings

| | |
|---|---|
| Supply Voltage | ±18V |
| Power Dissipation | 1W |
| Input Voltage | ±36V |
| Output Short Circuit Duration | Infinite |
| Lead Temperature (soldering, 10 sec.) | 300°C |
| Operating Temperature Range | 0°C to +70°C |
| Storage Temperature Range | -25°C to +100°C |

## Electrical Characteristics

$V_S$ ± 12V to ±15V, $T_A$ = 0°C to 70°C, unless otherwise specified.

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| Cutoff Frequency | $f_c$ | | | 685 | 697 | Hz |
| Passband Ripple | $A_{MAX}$ | f = 685Hz to 1660Hz | -0.5 | 0 | 0.5 | dB |
| Stopband Frequency | $f_s$ | | 440 | 450 | | Hz |
| Stopband Attenuation | $A_{MIN}$ | f < 440Hz | 34 | 35 | | dB |
| Gain | $A_O$ | at 941Hz | -0.5 | 0 | 0.5 | dB |
| Group Delay | gd | | | | 2 | ms |
| Input Impedance | $Z_{IN}$ | | 29k | 30k | | Ω |
| Output Impedance | $Z_O$ | | | < 1 | 5 | Ω |
| Power Supply Voltage | $V_S$ | | ±5 | | ±18 | V |
| Power Supply Current | $I_S$ | $V_S$ = ±15V | | 5 | 9 | mA |

## Typical Performance Characteristics

Typical Amplitude Response