

# AN7171NK-LC, AN7173K-LC

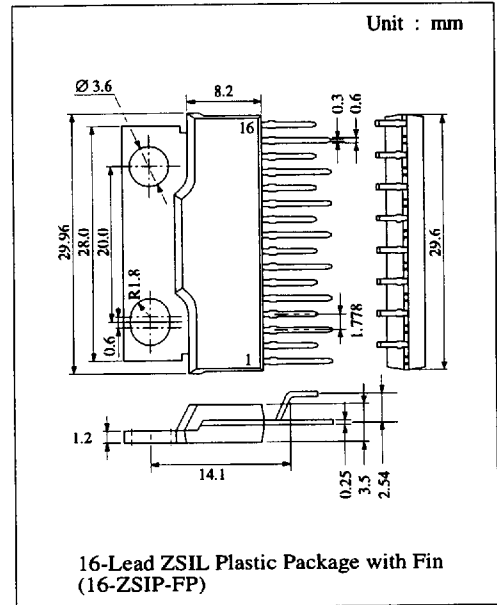
## Dual BTL 14W Audio Power Amplifier

### ■ Description

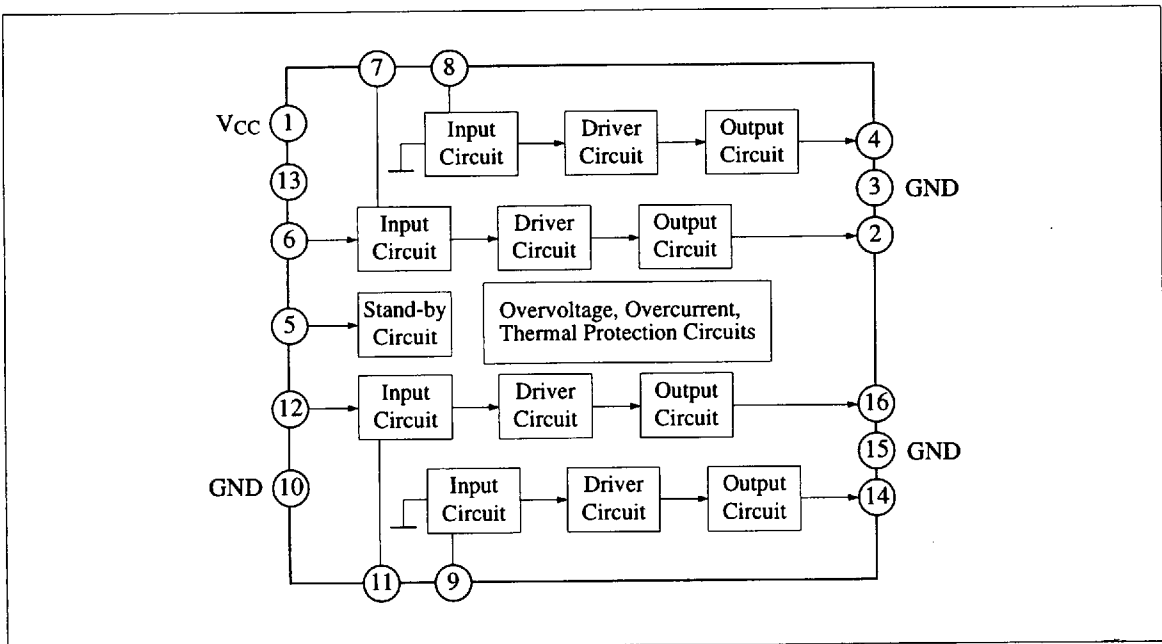
The AN7171NK-LC and AN7173K-LC are the monolithic integrated circuits designed for 14W (13.2V, 4Ω) output power amplifier. Stereo operation is enabled due to incorporating two BTL amplifiers in one chip. High reliability is obtained due to incorporating various protectors. ON/OFF is enabled even if power is supplied to power supply pin by incorporating stand-by circuit.

### ■ Features

- High output power (BTL 14W x 2)
- Incorporating stand-by circuits
- Incorporating protection circuits. (Temperature, overvoltage, V<sub>OUT</sub>-GND short, Load short, V<sub>OUT</sub>-V<sub>CC</sub> short)
- Low shock noise from power ON/OFF operation
- Fewer external components
- Highly stable operation



### ■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

| Item                          | Symbol                    | Rating     | Unit |
|-------------------------------|---------------------------|------------|------|
| Supply Voltage                | V <sub>CC</sub> *1        | 24         | V    |
| Supply Current                | I <sub>CC</sub>           | 6          | A    |
| Supply Voltage Surge          | V <sub>CC(surge)</sub> *2 | 50         | V    |
| Power Dissipation             | P <sub>D</sub> *3         | 62.5       | W    |
| Operating Ambient Temperature | Topr                      | -30 ~ +75  | °C   |
| Storage Temperature           | Tstg                      | -55 ~ +150 | °C   |

Operating Supply Voltage Range: V<sub>CC</sub> = 8.0V ~ 18.0V

\*1 No-signal      \*2 Time = 0.2s      \*3 R<sub>θjc</sub> = 2°C/W

■ Electrical Characteristics (V<sub>CC</sub>=13.2V, R<sub>L</sub>=4Ω, f=1kHz, Ta=25°C)

| Item                                         | Symbol                   | Condition                                                                                  | min. | typ. | max. | Unit |
|----------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------|------|------|------|------|
| Quiescent Current                            | I <sub>CQ</sub>          | V <sub>in</sub> = 0mV                                                                      |      | 120  | 200  | mA   |
| Output Noise Voltage                         | V <sub>no</sub> *        | V <sub>in</sub> = 0mV, R <sub>g</sub> = 10kΩ                                               |      | 0.6  | 1.5  | mV   |
| Voltage Gain                                 | G <sub>v</sub>           | V <sub>in</sub> = 5mV                                                                      | 49.5 | 51.5 | 53.5 | dB   |
| Total Harmonic Distortion                    | THD                      | V <sub>in</sub> = 5mV                                                                      |      | 0.2  | 0.75 | %    |
| Maximum Output Power                         | P <sub>O</sub>           | THD = 10%                                                                                  | 9.0  | 12.5 |      | W    |
| Ripple Rejection                             | RR*                      | R <sub>g</sub> = 0Ω, V <sub>in</sub> = 0mV, V <sub>r</sub> = 300mV, f <sub>r</sub> = 120Hz | 35   | 40   |      | dB   |
| Output Offset Voltage                        | V <sub>O(offset)</sub>   | V <sub>in</sub> = 0mV                                                                      | -250 | 0    | +250 | mV   |
| Channel Balance                              | CB                       | V <sub>in</sub> = 5mV                                                                      | -1   | 0    | +1   | dB   |
| Total Harmonic Distortion                    | THD                      | V <sub>in</sub> = 5mV, f = 100Hz                                                           |      | 0.26 |      | %    |
| Total Harmonic Distortion                    | THD                      | V <sub>in</sub> = 5mV, f = 10kHz                                                           |      | 0.45 |      | %    |
| Frequency Characteristics                    | f <sub>CH</sub>          | V <sub>in</sub> = 5mV, -3dB down                                                           |      | 22   |      | kHz  |
| Frequency Characteristics                    | f <sub>CL</sub>          | V <sub>in</sub> = 5mV, -3dB down                                                           |      | 21   |      | Hz   |
| Quiescent Circuit Current at Stand-by Pin ON | I <sub>CQ(STBY-ON)</sub> | Stand-by Pin ON                                                                            |      | 21   |      | μA   |
| Crosstalk                                    | CT                       | V <sub>in</sub> = 5mV, R <sub>g</sub> = 10kΩ                                               |      | 61   |      | dB   |

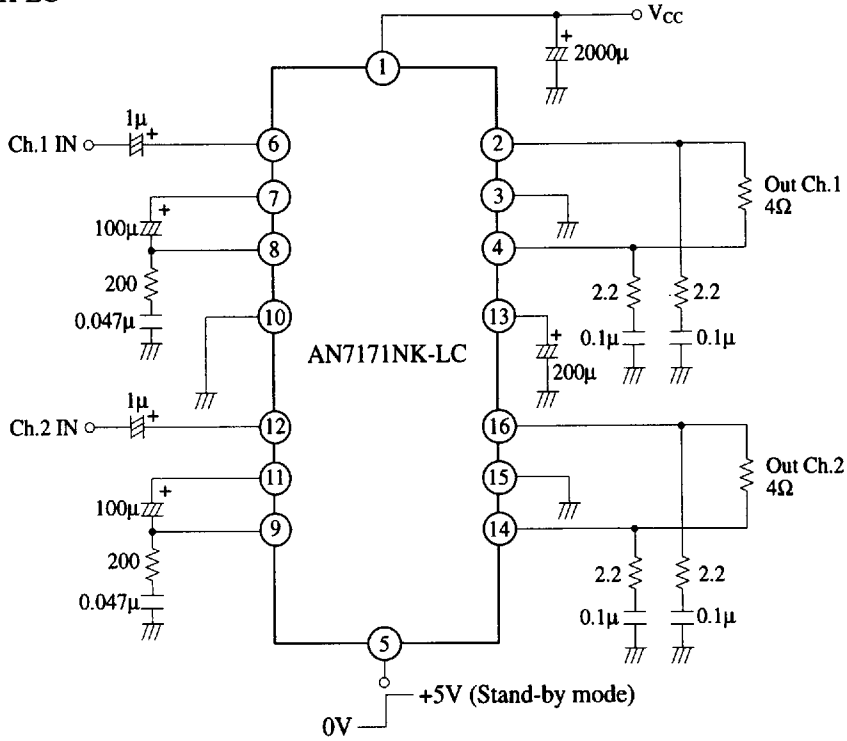
\* With 15Hz ~ 30kHz (12dB/OCT) filter

■ Pin

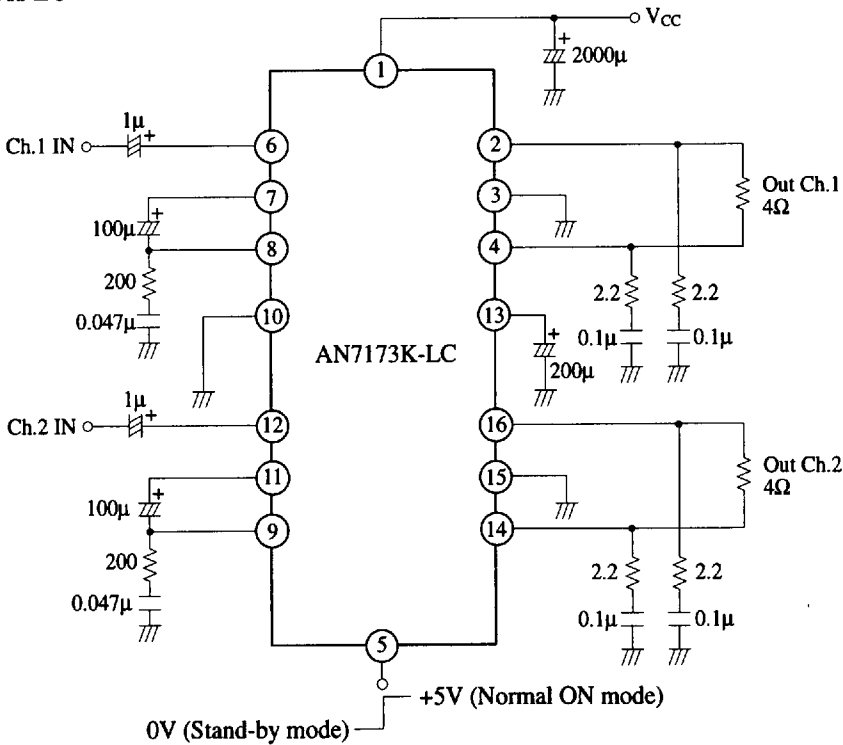
| Pin No | Pin Name          | Pin No | Pin Name          |
|--------|-------------------|--------|-------------------|
| 1      | V <sub>CC</sub>   | 9      | N.F.B. Ch.2       |
| 2      | Output Ch.1       | 10     | GND (Input)       |
| 3      | GND (Output Ch.1) | 11     | N.F.B. Ch.2       |
| 4      | Output Ch.1       | 12     | Input Ch.2        |
| 5      | Stand-by          | 13     | Ripple Filter     |
| 6      | Input Ch.1        | 14     | Output Ch.2       |
| 7      | N.F.B. Ch.1       | 15     | GND (Output Ch.2) |
| 8      | N.F.B. Ch.1       | 16     | Output Ch.2       |

## Test Circuit

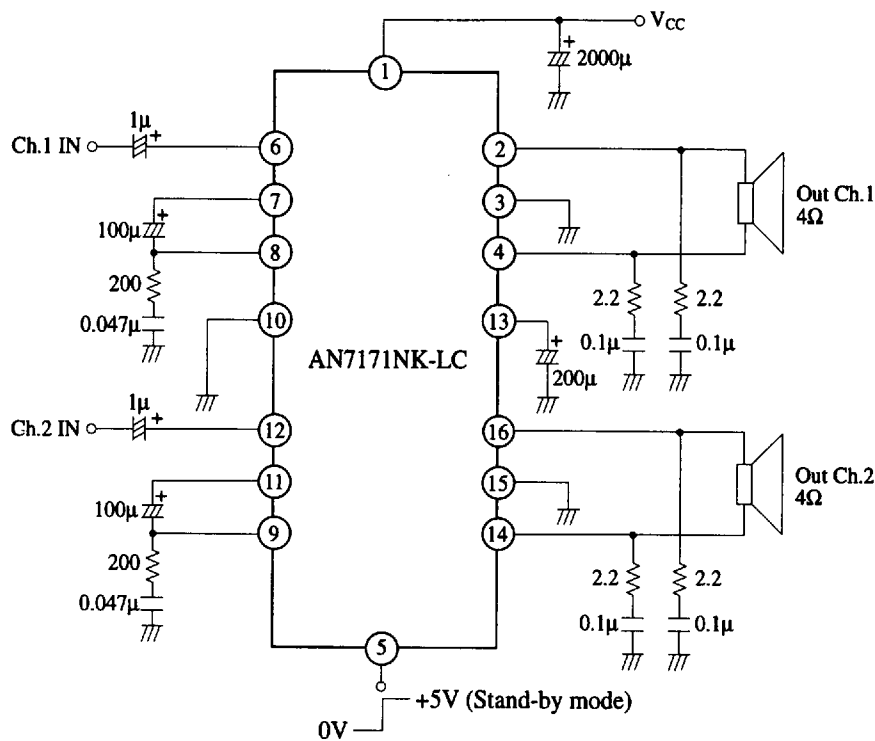
## AN7171NK-LC



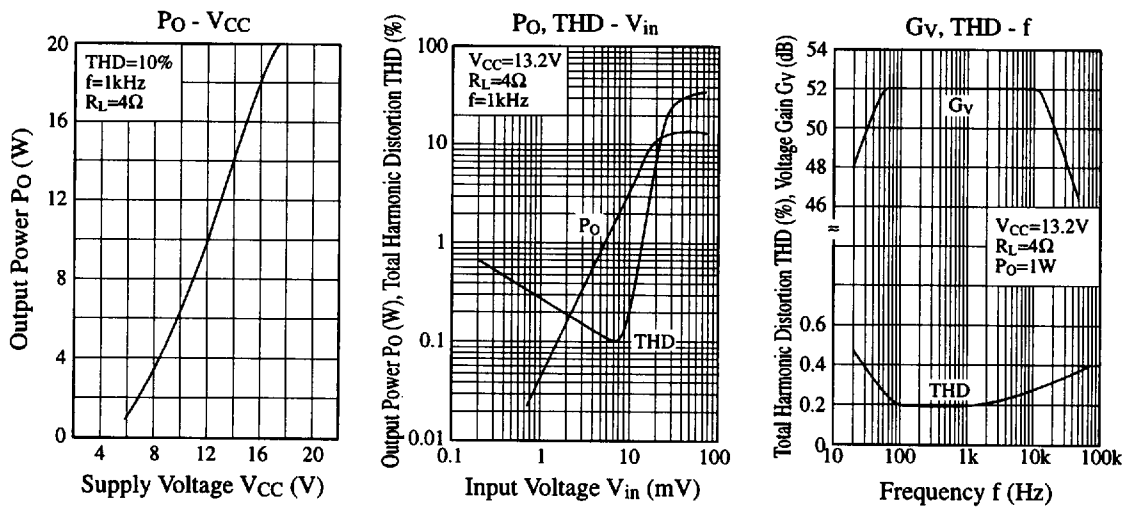
## AN7173K-LC



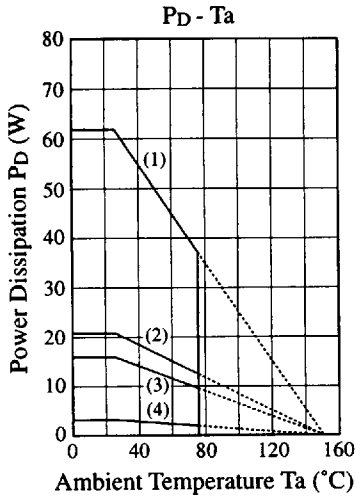
■ Application Circuit



■ Characteristics Curve



## ■ Characteristics Curve (Continue)



- (1)  $T_c = T_a, 62.5\text{W}$  ( $\theta_{j-c} = 2^{\circ}\text{C/W}$ )
- (2)  $20.8\text{W}$  ( $\theta_f = 4^{\circ}\text{C/W}$ ) With a  $100\text{cm}^2 \times 3\text{mm}$  Al heat sink (black colour coated) or a  $200\text{cm}^2 \times 2\text{mm}$  Al heat sink (not lacquered)
- (3)  $15.6\text{W}$  ( $\theta_f = 6^{\circ}\text{C/W}$ ) With a  $100\text{cm}^2 \times 2\text{mm}$  Al heat sink (not lacquered)
- (4)  $3.0\text{W}$  at  $T_a = 30^{\circ}\text{C}$  Without heat sink

## ■ Printed Circuit Board Layout (Scale: 1:1)

