

# AN6154NK, AN6154NS

## Speech Network IC

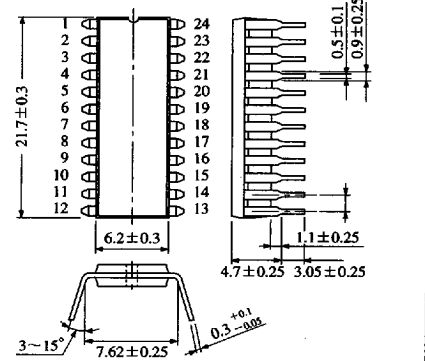
### Overview

The AN6154NK and AN6154NS are speech network circuits capable of switching side-tone preventive networks. They incorporate an ECM power supply (typically 1.3 V), and are operable at as low as 1.8 V.

### Features

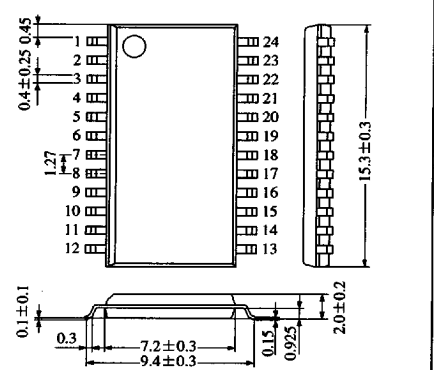
- Operable at as low as a 1.8 V line voltage.
- Incorporates an ECM power supply for easier interface with peripheral devices.
- Automatically adjusts the transmitter/receiver gain according to line current.
- Can select one of two side-tone preventive networks according to line current.
- Selection of side-tone preventive networks and control of the transmitter/receiver gain are possible from outside.
- The receiver gain is switchable between 0 and 6 dB.

AN6154NK



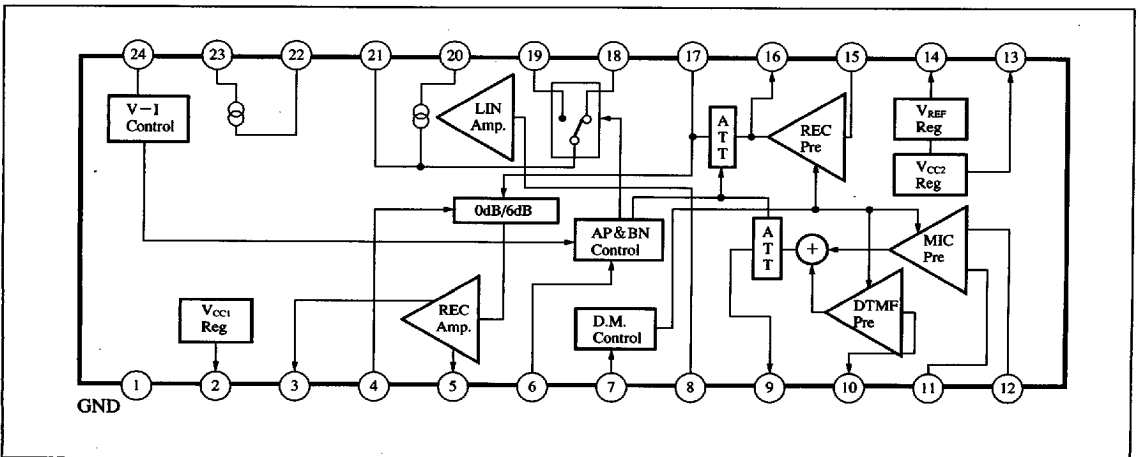
SDIP package with 24 pins (SDIP024-P-0300)

AN6154NS



SOP package with 24 pins (SOP024-P-0375)

### Block Diagram



6932852 0013049 30T

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■ Absolute Maximum Ratings (Ta=25℃)

| Parameter                        |          | Symbol | Rating      | Unit |
|----------------------------------|----------|--------|-------------|------|
| Supply voltage *1                |          | VL     | 14.4        | V    |
| Supply current *1                |          | IL     | 120         | mA   |
| Internal supply current *3       |          | ICCI   | 20          | mA   |
| APC voltage *4                   |          | V6     | VCCI+0.3V   | V    |
| DMC voltage *4                   |          | V7     | VCCI+0.3V   | V    |
| Power dissipation *2<br>(Ta=60℃) | AN6154NK | PD     | 700         | mW   |
|                                  | AN6154NS |        | 338         |      |
| Operating ambient temperature    |          | Topt   | -20 to +75  | ℃    |
| Storage temperature              |          | Tstg   | -55 to +125 | ℃    |

- \*1 VL and IL are input voltage and current measured at pin 21 respectively.  
\*2 The PD rating must be observed.  
\*3 ICCI is the line current measured at pin 2. No voltage other than the line voltage must be applied to this pin.  
\*4 VCCI is the line voltage measured at pin 2.

■ Recommended Operating Range (Ta=25℃)

| Parameter                      | Symbol | Range    |
|--------------------------------|--------|----------|
| Operating supply voltage range | VL     | 3V~11.5V |

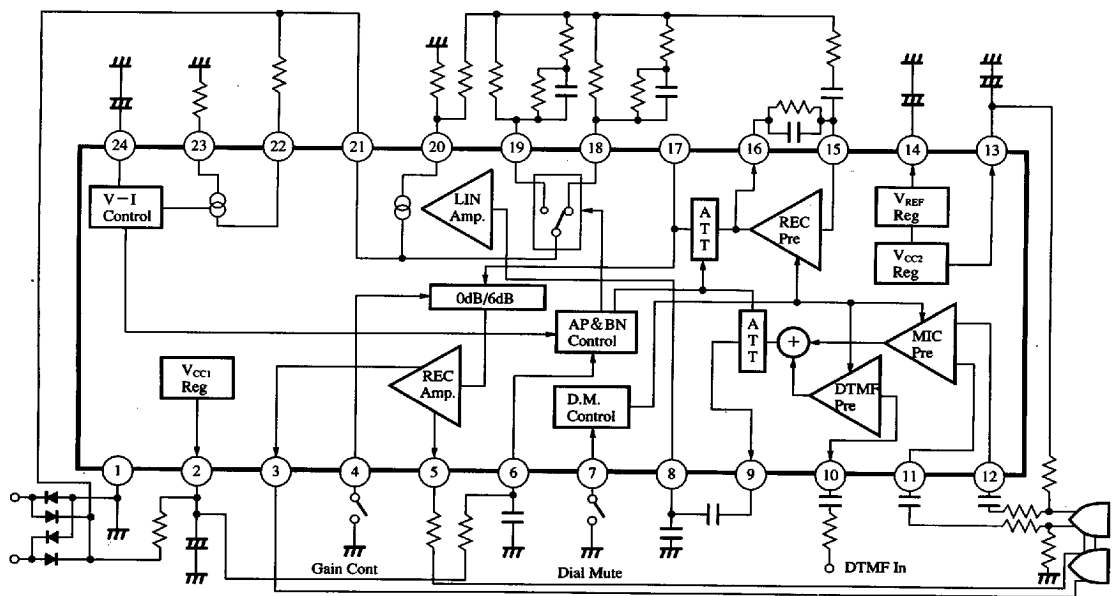
■ Electrical Characteristics (Ta=25℃)

| Parameter                     | Symbol | Condition                   | min. | typ. | max. | Unit |
|-------------------------------|--------|-----------------------------|------|------|------|------|
| Receiver system               |        |                             |      |      |      |      |
| Receiver gain                 | GV-R   | IL=30mA, Vi=-40dBV          | 31.5 | 34   | 36.5 | dB   |
| Receiver automatic pad        | AP-R   | IL=80mA to 30mA, Vi=-40dBV  | -6.8 | -5.3 | -3.8 | dB   |
| Receiver gain control         | GV-A   | IL=30mA, Vi=-40dBV          | 5    | 6    | 7    | dB   |
| Maximum receiver signal level | VO-R   | IL=30mA, THD=5%             | -1   | 2    | —    | dBV  |
| KEY-IN TONE gain              | GV-KT  | IL=30mA, Vi=-30dBV          | 14.5 | 17   | 19.5 | dB   |
| Transmitter system            |        |                             |      |      |      |      |
| Transmitter gain              | GV-T   | IL=30mA, Vi=-50dBV          | 37.5 | 40   | 42.5 | dB   |
| Transmitter automatic pad     | AP-T   | ΔIL=80mA to 30mA, Vi=-50dBV | -4.8 | -3.5 | -2.1 | dB   |
| Maximum output                | VO-T   | IL=30mA, THD=5%             | -2   | 1.3  | —    | dBV  |
| DTMF gain                     | GV-DT  | IL=30mA, Vi=-50dBV          | 30   | 32   | 34   | dB   |
| DTMF automatic pad            | AP-DT  | ΔIL=80mA to 30mA, Vi=-50dBV | -4.8 | -3.4 | -2.1 | dB   |
| Maximum DTMF output           | VO-DT  | IL=30mA, THD=5%             | -2   | 1.3  | —    | dBV  |
| Power supply                  |        |                             |      |      |      |      |
| DC line voltage (1)           | VL-1   | IL=20mA                     | 3    | 3.5  | 4    | V    |
| DC line voltage (2)           | VL-2   | IL=120mA                    | 6.3  | 6.8  | 7.3  | V    |
| Internal supply voltage (1)   | VCCI-1 | IL=20mA                     | 2.2  | 2.45 | 2.7  | V    |
| Internal supply voltage (2)   | VCCI-2 | IL=120mA                    | 2.2  | 2.45 | 2.7  | V    |
| Internal supply voltage (1)   | VCC2-1 | IL=20mA                     | 1.1  | 1.3  | 1.5  | V    |
| Internal supply voltage (2)   | VCC2-2 | IL=20mA                     | 1.1  | 1.3  | 1.5  | V    |
| Dial mute input               |        |                             |      |      |      |      |
| Dial mute OFF                 | VDM-H  |                             | 0.9  | —    | VCCI | V    |
| Dial mute ON                  | VDM-L  |                             | —    | —    | 0.3  | V    |
| AP control                    |        |                             |      |      |      |      |
| BN-1 ON                       | IL-BN1 |                             | —    | 54   | 61   | mA   |
| BN-2 ON                       | IL-BN2 |                             | 40   | 46   | —    | mA   |

Note) Unless otherwise specified, input signal frequency (fin) is 1 kHz.

■ 6932852 0013050 021 ■

■ Application Circuit



■ Pin Descriptions

| Pin No. | Description                       | Pin No. | Description                                            |
|---------|-----------------------------------|---------|--------------------------------------------------------|
| 1       | Ground                            | 13      | Regulated power supply (2) Output                      |
| 2       | Regulated power supply (1) Output | 14      | Reference voltage output                               |
| 3       | Receiver output (1)               | 15      | Receiver preamplifier input                            |
| 4       | Receiver gain switching control   | 16      | Receiver preamplifier output                           |
| 5       | Receiver output (2)               | 17      | To a receiver output amplifier                         |
| 6       | AP/BN switching control           | 18      | To a long-distance side-tone preventive network (BN1)  |
| 7       | Dial muting control               | 19      | To a short-distance side-tone preventive network (BN2) |
| 8       | Line amplifier input              | 20      | Side-tone adjustment                                   |
| 9       | Transmitter preamplifier output   | 21      | To the positive line                                   |
| 10      | DTMF input                        | 22      | Line current bypass (2)                                |
| 11      | Transmitter input (1)             | 23      | Line current bypass (1)                                |
| 12      | Transmitter input (2)             | 24      | Line voltage control                                   |

■ Supplementary Explanation

● Designed Electrical Characteristics (Ta=25℃)

| Parameter        | Symbol     | Condition                   | min. | typ. | max. | Unit     |
|------------------|------------|-----------------------------|------|------|------|----------|
| AC impedance (1) | $Z_{AC-1}$ | $I_L = 30mA, F_{in} = 1kHz$ | 400  | 650  | 800  | $\Omega$ |
| AC impedance (2) | $Z_{AC-2}$ | $I_L = 80mA, F_{in} = 1kHz$ | 400  | 610  | 800  | $\Omega$ |

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