# OKI Semiconductor

# MSM5218

**ADPCM Voice Analysis/Synthesis IC**

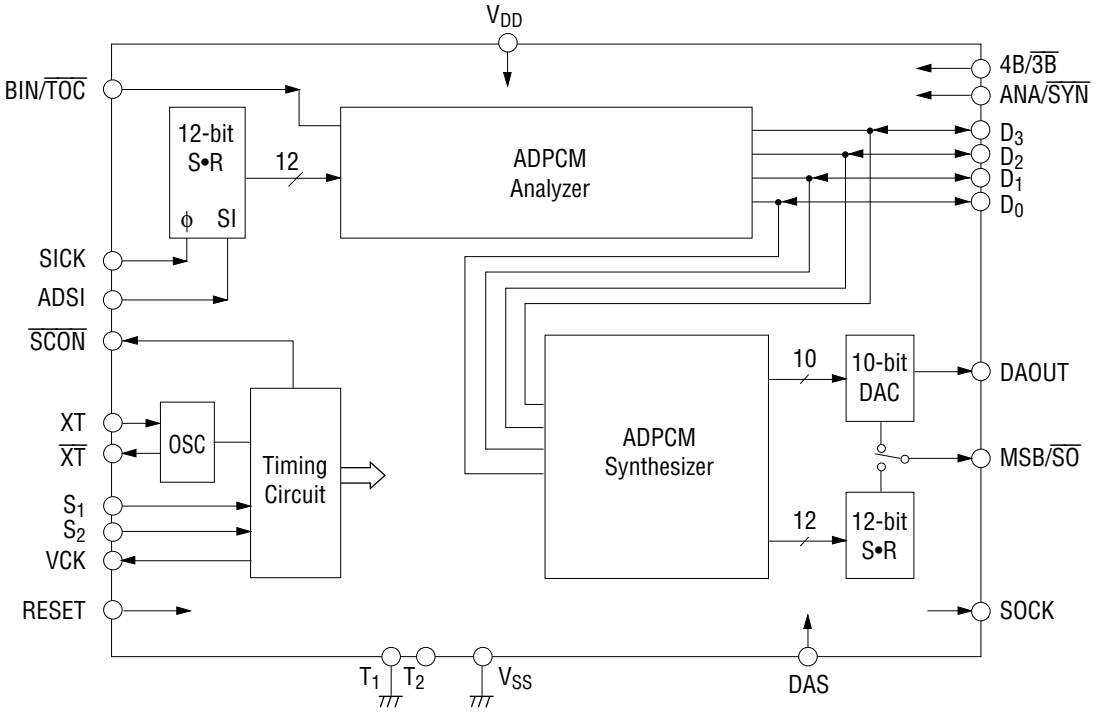
## GENERAL DESCRIPTION

The MSM5218 is a complete voice analysis/synthesis IC featuring the Adaptive Differential Pulse Code Modulation (ADPCM) method of data compression. The MSM5218 contains an analysis stage where serial PCM data is compressed to 3- or 4-bit parallel ADPCM data. In addition, a synthesis stage synthesizes PCM data from ADPCM data.

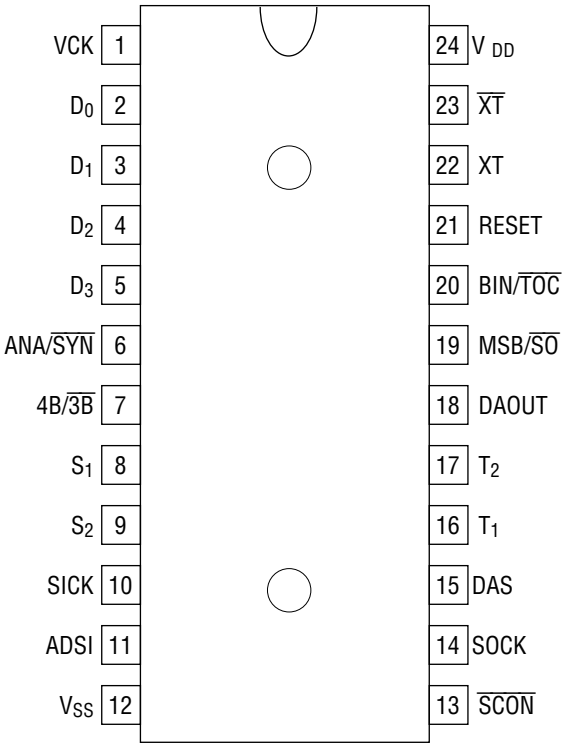
## FEATURES

- ADPCM data compatible with OKI's synthesis IC MSM5205
- Analysis/synthesis switching pin provided
- Lower power consumption achieved by one-chip CMOS IC
- Built-in 10-bit D/A converter for analog output
- Variable sampling frequency (4 kHz, 6 kHz, 8 kHz)
- Master clock frequency: 384 kHz
- Package: 24-pin plastic DIP (DIP24-P-600) (Product name: MSM5218RS)

## BLOCK DIAGRAM



## PIN CONFIGURATION (TOP VIEW)




**24-Pin Plastic DIP**

Note: The product name actually printed on the product is "M5218".

## ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Condition | Rating | Unit |
|---|---|---|---|---|
| Power Supply Voltage | $V_{DD}$ | Ta = 25°C | –3.0 to +7.0 | V |
| Input Voltage | $V_{IN}$ | Ta = 25°C | –3.0 to $V_{DD}$ | V |
| Power Dissipation | $P_D$ | Ta = 25°C | 200 max | mW |
| Storage Temperature | $T_{STG}$ | — | –55 ~ +150 | °C |

## RECOMMENDED OPERATING CONDITIONS

| Parameter | Symbol | Condition | Range | Unit |
|---|---|---|---|---|
| Power Supply Voltage | $V_{DD}$ | — | +3 to +6 | V |
| Operating Temperature | $T_{OP}$ | — | –30 to +70 | °C |
| Oscillator Frequency | $f_{OSC}$ | Specified Oscillator | 386 to 768 | kHz |

## ELECTRICAL CHARACTERISTICS

### DC Characteristics

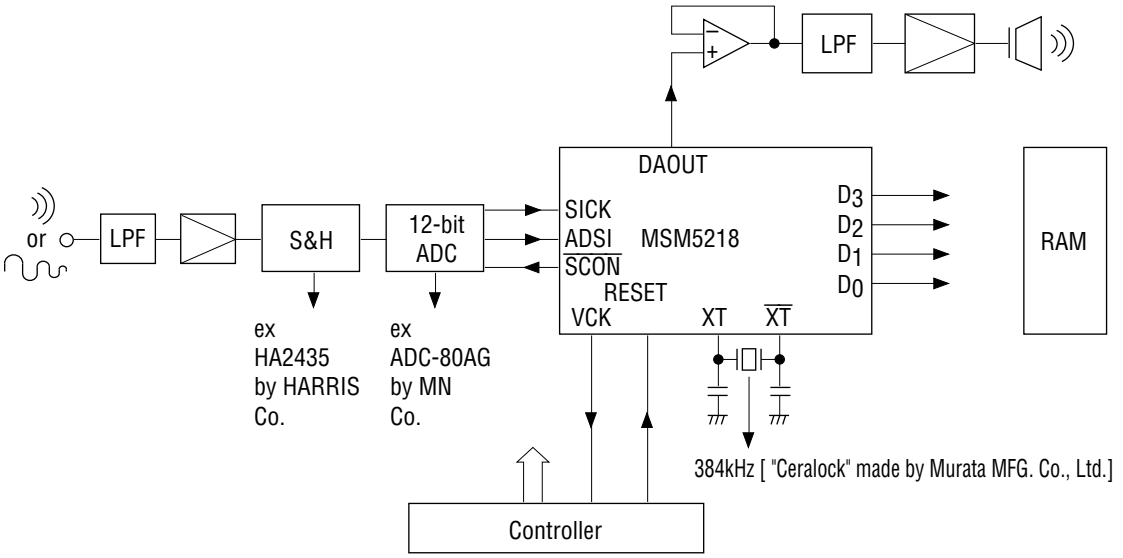
($V_{DD}$ = 5V±5%, Ta = –30°C to +70°C, Ta =25°C typically)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input High Voltage | $V_{IH}$ | All inputs except XT, $T_1$, $T_2$ | 4.2 | — | — | V |
| Input Low Voltage | $V_{IL}$ | All inputs except XT, $T_1$, $T_2$ | — | — | 0.8 | V |
| Input High Current (1) | $I_{IH}$ | $V_{IN} = V_{DD}$ | — | — | 1 | µA |
| Input Low Current | $I_{IL}$ | $V_{IN}$ = 0V | — | — | –1 | µA |
| Output High Current | $I_{OH}$ | $\overline{SCON}$, VCK, SOCK, MSB/$\overline{SO}$, D0 to D3 $V_0$ = 4.2V | –50 | — | — | µA |
| Output Low Current | $I_{OL}$ | $\overline{SCON}$, VCK, SOCK, MSB/$\overline{SO}$, D0 to D3 $V_0$ = 0.4V | 50 | — | — | µA |
| Operating Current | $I_{DD}$ | $f_{VCK}$ = 8kHz | — | 3 | 6 | mA |
| DA. OUT Output Impedance | $V_{OR}$ | — | — | 100 | — | kΩ |
| D/A Accuracy (Internal 10-bit D/A) | $V_E$ | Full Scale $V_{DD}$ = +5V | — | ±4 | — | LSB |
| SICK Clock Frequency | $f_{(SICK)}$ | — | — | — | 500 | kHz |
| Input High Current (2) | $I_{IH2}$ | $V_{IN} = V_{DD}$ (Note 1) | 20 | — | 400 | µA |

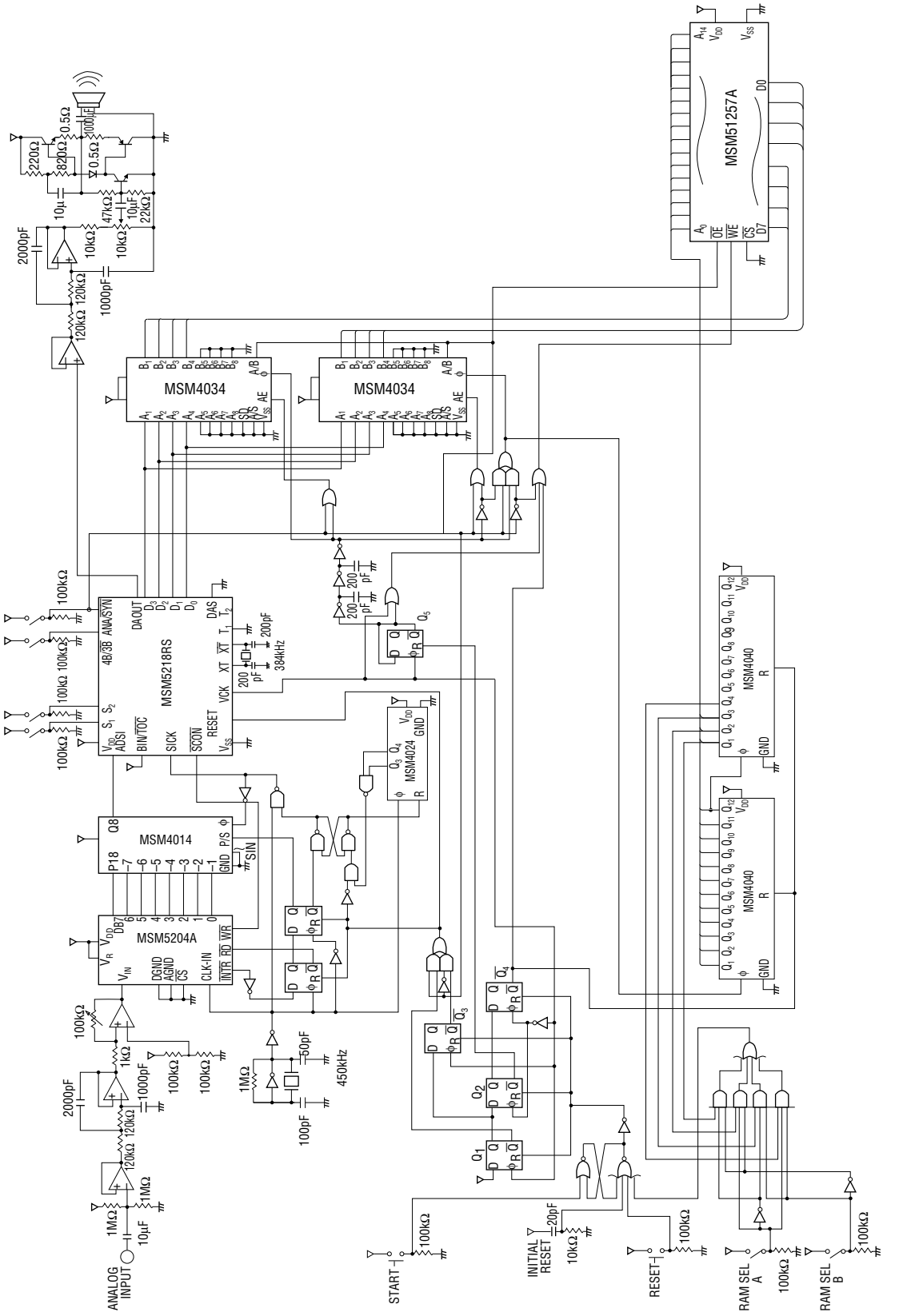
Note 1: Applicable for Reset.

## APPLICATION CIRCUITS

### Example where a 12-bit AD Converter is Connected



## Voice Analysis/Synthesis Circuit Example (When MSM5204 is Used)



## Voice Analysis/Synthesis Circuit Example (When ADC-80AG by MN Co. is Used)