

KS5313**CMOS DIGITAL INTEGRATED CIRCUIT****SIMPLE MELODY IC**

The KS5313 series is a CMOS LSI chip which electronically plays a prearranged melody.

FUNCTIONS

- Tempo: 16 kinds
- Sound range: 2.5 octave
- Selection of melody start switch (Active high switch or active floating switch)
- Selection of melody start signal (Level hold or one shot trigger)
- Selection of automatic stop or repeat of the melody
- Melody stop input
- Level Hold mode/one shot mode user option: 16 Dip
- Level Hold mode only: 8 Dip.

FEATURES

- One chip CMOS construction
- Plays a melody consisting of 64 notes
- Starts from the head of melody
- Very low stand-by current
- 33KHz operating frequency
- 1.5V operation

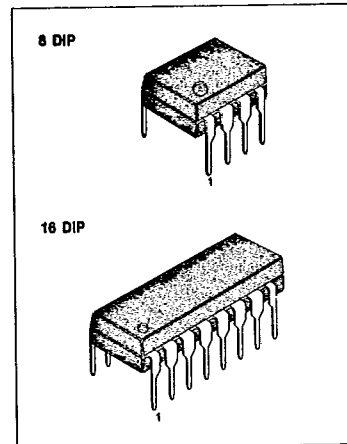
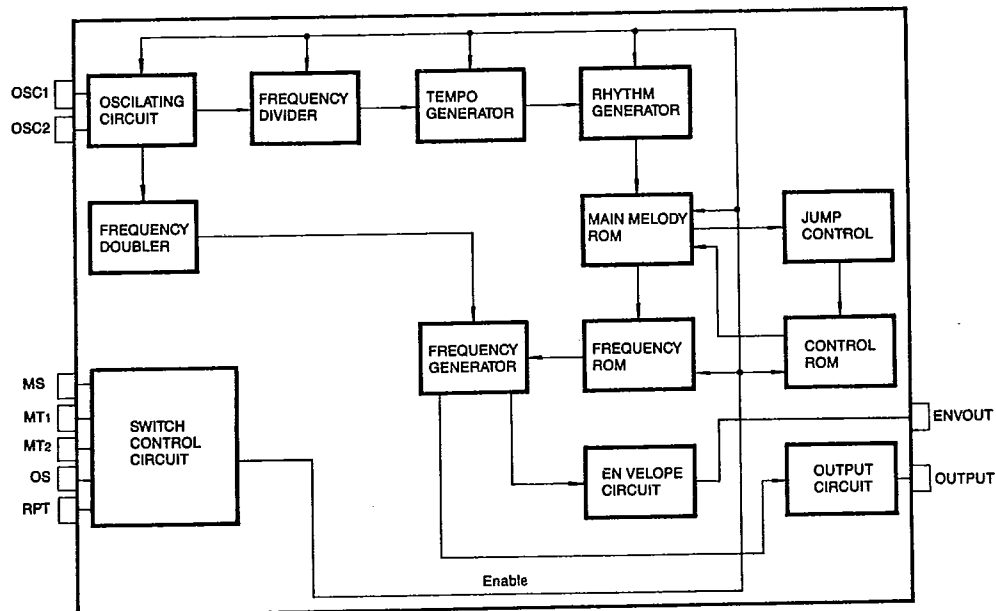
**BLOCK DIAGRAM**

Fig. 1



KS5313

CMOS DIGITAL INTEGRATED CIRCUIT

T-77-13

ABSOLUTE MAXIMUM RATINGS (T_a = 25°C)

| Characteristic | Symbol | Value | Unit |
|-----------------------|------------------|---|------|
| Supply Voltage | V _{DD} | 0.3 ~ -2.0 | V |
| Input Voltage | V _{IN} | V _{SS} + 0.3 ~ V _{DD} - 0.7 | V |
| Operating Temperature | T _{opr} | -20 ~ +70 | °C |
| Storage Temperature | T _{stg} | -55 ~ +125 | °C |

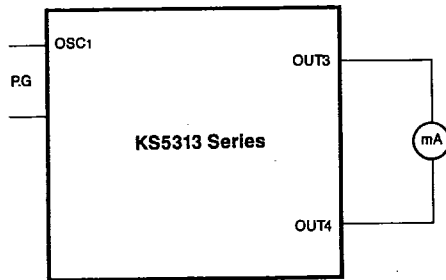
ELECTRICAL CHARACTERISTICS

(T_a = 25°C, V_{SS} = -1.5V, V_{DD} = 0V unless otherwise specified)

| Characteristic | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------|---------------------|---|-----------------------|-----|-----------------------|------|
| Operating Voltage | V _{SS} | | 1.2 | 1.5 | 2 | V |
| Input High Voltage | V _{IH} | | V _{DD} - 0.1 | | V _{DD} | V |
| Input Low Voltage | V _{IL} | | V _{SS} | | V _{SS} + 0.1 | V |
| Stand-by Current | I _{ST} | Without Load | | 0.1 | 0.3 | μA |
| Operating Current | I _{OP} | Without Load | | 20 | 30 | μA |
| Input High Current | I _{IH} | V _{IH} = V _{DD} | 1.5 | | 15 | μA |
| Input Low Current | I _{IL} | V _{IL} = V _{SS} | | | 0.05 | μA |
| Output 0 Current | I ₀₀ | V _{SS} = -1.2V, V _{OH} = -0.7V, E _{NV} = V _{SS} | 15 | | | μA |
| Output 3, 4 Current | I _{O(3,4)} | V _{DD} = 0V, V _{SS} = -1.5V | ± 1.8 | | | mA |
| Output Low Voltage | V _{OL} | Without Load | V _{SS} | | V _{SS} + 0.1 | V |
| Output High Voltage | V _{OH} | Without Load | V _{DD} - 0.1 | | V _{DD} | V |
| Operating Frequency | F _{OSC} | | 30 | 33 | 36 | KHz |

TEST CIRCUIT

1) OUT 3 AND OUT 4 DRIVE CURRENT TEST CIRCUIT



PG: Pulse Generator (1020Hz)

Fig. 2

2) OUT 0 CURRENT TEST CIRCUIT

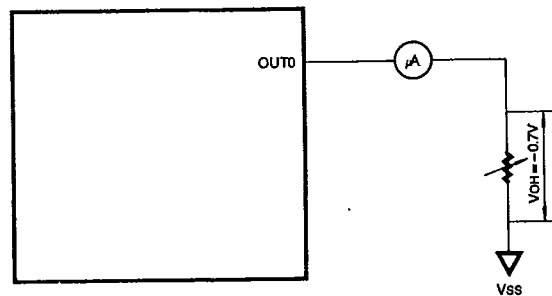


Fig. 3

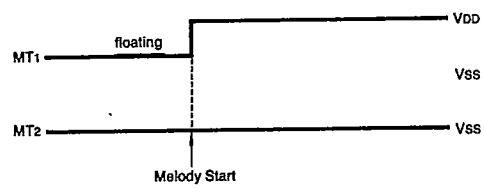
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CMOS DIGITAL INTEGRATED CIRCUIT

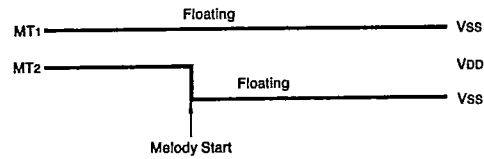
TIMING

1) MELODY START INPUT

a) MT1 (Active High Input)

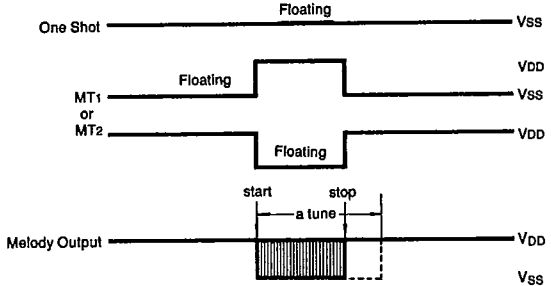


b) MT2 (Active Floating Input)

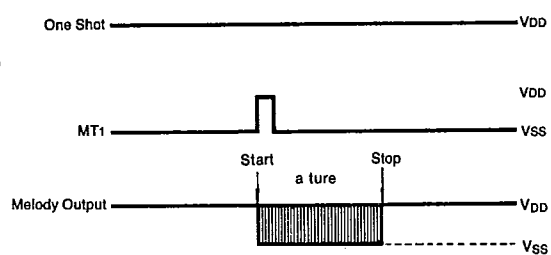


2) MELODY START SIGNAL

a) Level Hold Mode

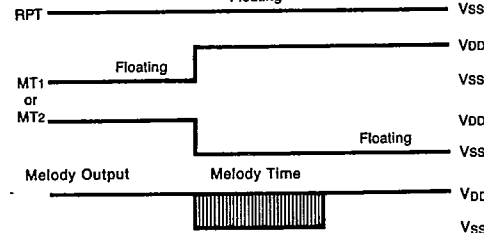


b) One Shot Mode

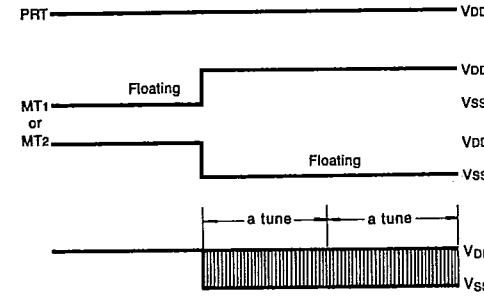


3) REPEAT INPUT

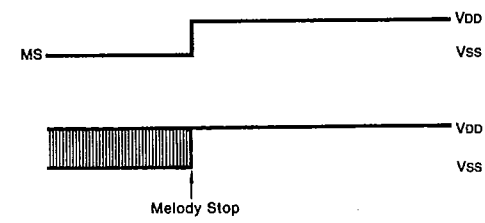
a) Normal Mode



b) Repeat Mode



4) MELODY STOP

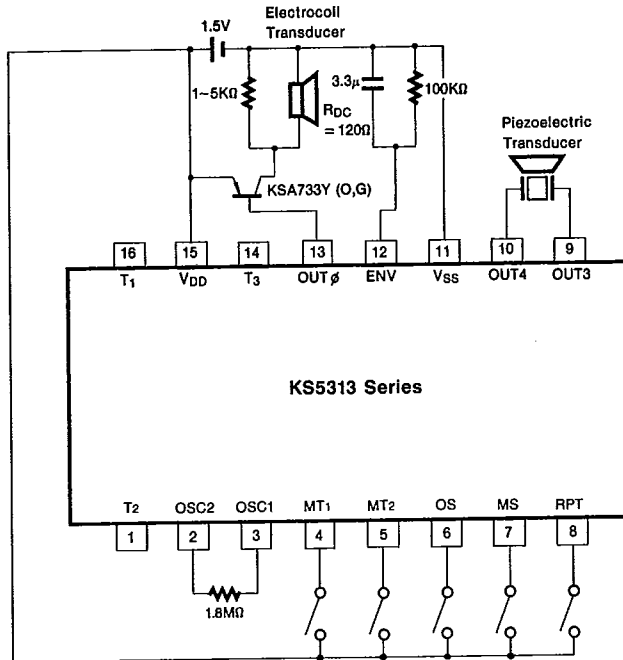


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CMOS DIGITAL INTEGRATED CIRCUIT

APPLICATION CIRCUIT

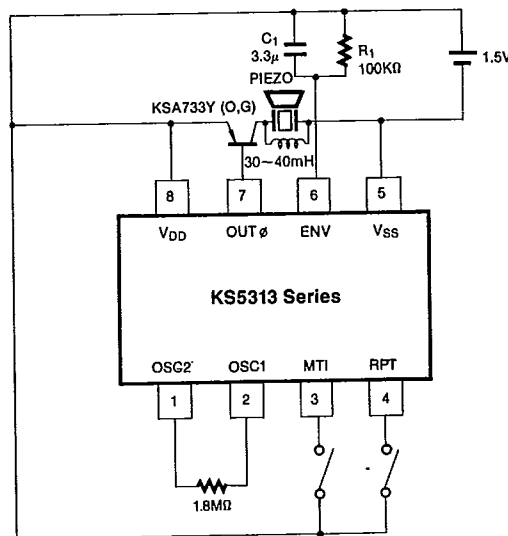
1) ONE SHOT & LEVEL HOLD MODE



* Currently available types
 KS5313N: MINUET (BACH)
 KS5313Q: Home Sweet Home
 KS5313S: Big Ben
 KS5313T: For Elise



2) LEVEL HOLD MODE



*C₁ and R₁ are necessary only when employ ENVELOPE circuit. Otherwise, ENVELOPE terminal must be connected to V_{SS}.