EPSON

# 7920 Series

## Melody IC

Low Voltage Operation Products

- **Clear Electronic Sound**
- **Usable for Wide-ranged Application**
- **Low Power Dissipation & Supply Voltage**

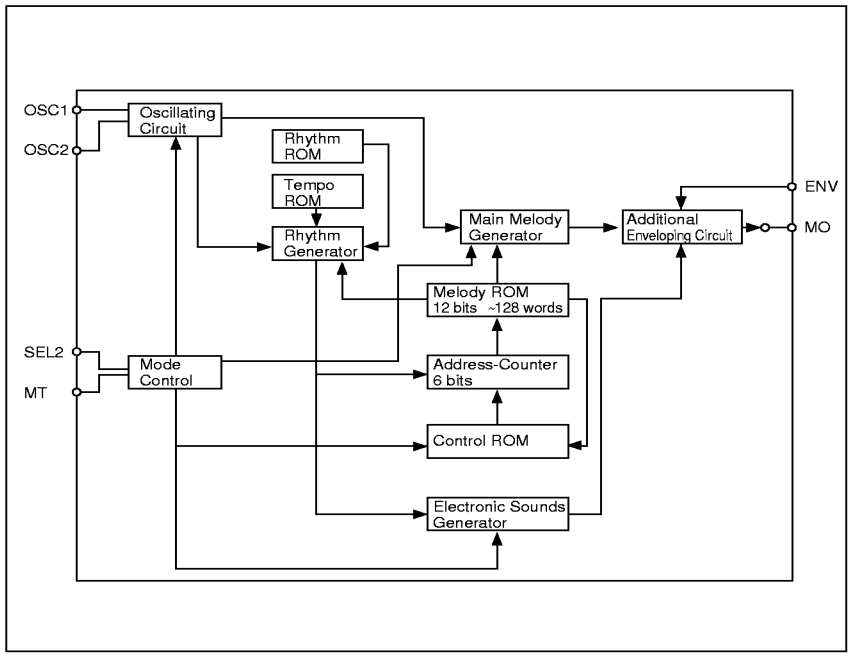
## ■ DESCRIPTION

The series 7920 is a CMOS IC which plays prearranged melodies and alarm sounds electronically. Built-in oscillation circuit generates acoustic pulses, then melodies and alarm sounds are formed with only a few external diserete parts including resistor, capacitor, speaker etc. Thus the 7920 can enjoy various applications such as replacement for conventional music box and alarm sound generator.

## ■ FEATURES

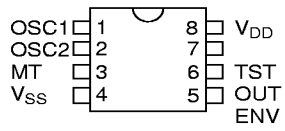
- ●Melody ..... 1
- ●Musical interval ..... Temperament or pure temperament
- ●Sound ..... 1 series, 2.5 octave
  Compound interval or accompaniment are possible.(One octave interval)
- ●Tempo ..... 16 kinds(Prest to Largo). Two tempos in one piece.
- ●Note ..... Basic note ♩ ♩ ♪ ♪ ♪ ♪ , and also possible for 𝅝 𝅗𝅥 ♩ ♩ ♪
- ●Rest ..... According to note
- ●Repeat ..... Continuous performance of pieces, and repeats(8 times at most)of a piece.
- ●Beginning ..... Always starts at the beginning of piece.
- ●Input signal ..... 1 start signal
- ●Envelope ..... External CR(2 series)
- ●Volume control ..... From external circuit(volume etc.)
- ●Oscillation ..... C, R oscillator (C, R external connection)
- ●Voltage ..... 1.5V/3.0V
- ●Package ..... DIP-8pin(plastic)/SOP4-8pin(plastic)

## ■ BLOCK DIAGRAM




## ■ PIN CONFIGURATION

DIP-8pin/SOP4-8pin



## ■ PIN DESCRIPTION

| Pin Name | Pin No. | Function | Pin Name | Pin No. | Function |
|---|---|---|---|---|---|
| OSC1, OSC2 | 1<br>2 | Connected with resistor Rv regulates the oscillation frequency. | ENV | 5 | Connected with C, $R_1$, regulates the time-constant of envelope. |
| | | | OUT | 6 | Connect to pre-amp. |
| MT | 3 | Performance starts on setting this terminal Hi. | TST | 7 | IC test input (Pull-down resistor provided) |
| $V_{SS}$ | 4 | $V_{SS}$ (0V) | $V_{DD}$ | 8 | $V_{DD}$ (+) |

## ■ ABSOLUTE MAXIMUM RATINGS

($V_{SS}$=0V)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Supply voltage | $V_{DD}$ | -0.3 to 5.0 | V |
| Input Output voltage | $V_{I/O}$ | -2.0 to $V_{DD}$+0.2 | V |
| Operating temperature | Topr | -20 to 65 ($V_{DD}$=1.5V) | ˚C |
| Storage temperature | Tstg | -65 to 150 | ˚C |
| Soldering temperature and time | Tsol | 260˚C, 10s (at lead) | – |

## ■ ELECTRICAL CHARACTERISTICS

($V_{SS}$=0V, Ta=25˚C)

| Characteristic | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Supply voltage | $V_{DD}$ | - | 1.2 | 1.5 | 2 | V |
| High level input voltage | $V_{IH}$ | - | $V_{DD}$-0.1 | - | $V_{DD}$ | V |
| Low level input voltage | $V_{IL}$ | - | $V_{SS}$ | - | $V_{SS}$+0.1 | V |
| High level input current | $I_{IH2}$ | $V_{DD}$=1.5V<br>$V_{IH}$=$V_{DD}$ | 1.5 | - | 15 | µA |
| High level output voltage | $V_{OH}$ | $V_{DD}$=1.2V<br>$R_L$=150kΩ<br>ENV=$V_{SS}$ | $V_{DD}$-0.1 | - | $V_{DD}$ | V |
| Low level output voltage | $V_{OL}$ | $V_{DD}$=1.2V<br>$R_L$=150kΩ<br>ENV=$V_{SS}$ | $V_{SS}$ | - | $V_{SS}$+0.1 | V |
| Fall time of enveloping circuit (10% to 90%) | $t_f$ | $V_{DD}$=1.5V<br>$C_1$=4.7µF<br>$f_{OSC}$=47.52kHz | 2.8 | - | 10 | ms |
| Standby current (Oscillation halting) | $I_{DDS}$ | $V_{DD}$=1.5V<br>OUT1, OUT2 open<br>(OUT open) | - | 0.1 | 0.3 | µA |
| Average operating current | $I_{DDO}$ | $V_{DD}$=1.5V, MT=$V_{DD}$<br>OUT1, OUT2 open<br>(OUT open) | - | 30 | 60 | µA |

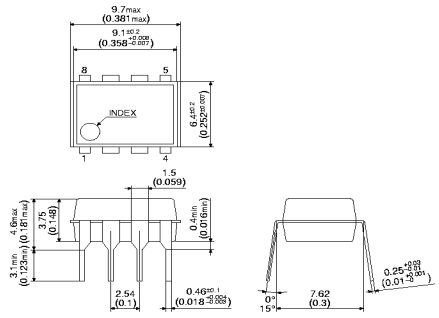
## ■ OSCILLATION CHARACTERISTICS

($V_{SS}$=0V, Ta=25˚C)

| Characteristic | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Oscillation frequency | $f_{osc}$ | $V_{DD}$=1.5V | - | 47.52 | - | kHz |
| Oscillation self-start voltage | $V_{STA}$ | $R_1$=120kΩ | 1.2 | - | - | V |
| Oscillation stop voltage | $V_{STP}$ | $R_1$=120kΩ | - | - | 1.2 | V |

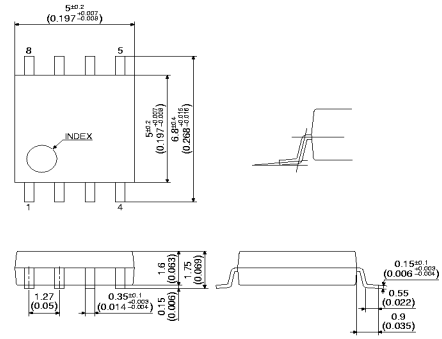
## ■ PACKAGE DIMENSIONS

Plastic DIP-8pin



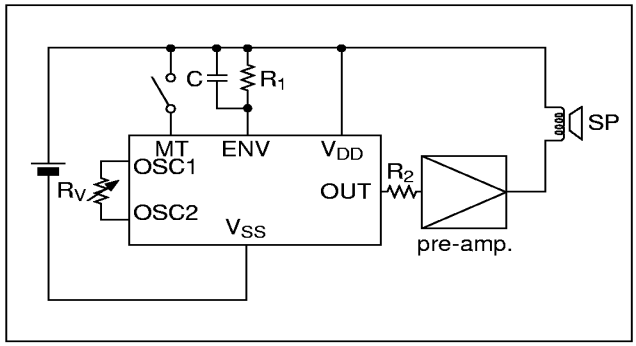

Unit: mm
(inch)

Plastic SOP4-8pin




Unit: mm
(inch)

## ■ BASIC EXTERNAL CONNECTION




<Recommendable conditions of discrete parts>

| Symbol | Recommendable value | Unit |
|---|---|---|
| $R_V$ | 1,160 Typ. | kΩ |
| $R_1$ | 120 | kΩ |
| $R_2$ | 100 to 300 | kΩ |
| C | 4.7 | µF |

Attention

1. Oscillation frequency($f_{OSC}$)changes according to variation of $R_V$ but stability of frequency will be worse.
2. We feel melody differently variation of C, $R_1$.
3. It is possible that fluctuation of oscillation frequency become larger with increase of battery impedance. In that case, connecting condenser between $V_{DD}$ and $V_{SS}$ is desirable.

## ■ CHARACTERISTICS CURVE

### ● Oscillation characteristics