

SVM7100M Series
Multi-Melody IC



■ DESCRIPTION

The SVM7100M series CMOS LSI can generate various melody, chime, and alarm tones according to the music information which has been programmed in the built-in mask ROM. The ROM has the 495-word capacity to store music information, and it can store up to 16 melodies.
As the SCM7100M series can hold the tempo for the reference signal source of different frequencies, it is expected to use for the products that need to hold the play time even when the frequency of the reference signal source varies on each model.

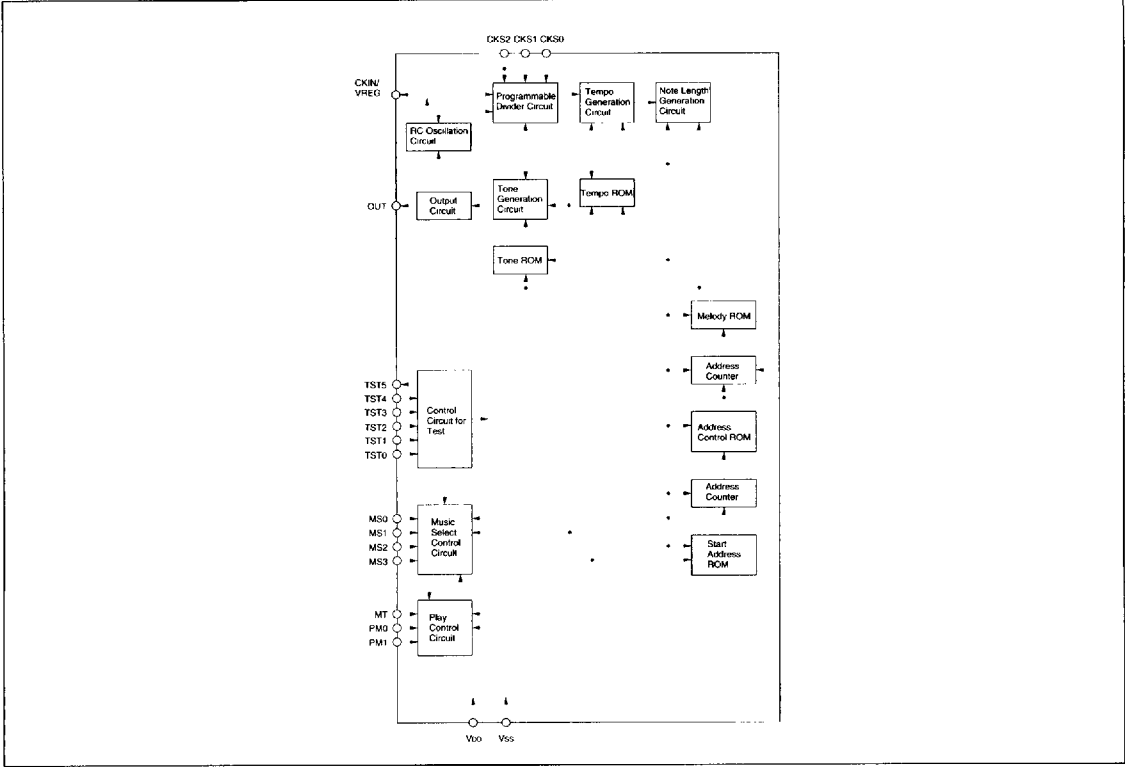
■ FEATURES

- No. of music pieces Up to 16 (selectable by four terminals)
- Melody ROM capacity 495 words (Any number of words can be assigned to each music.)
- Address control ROM 80 words (Any number of words can be assigned to each music.)
- Play output Single-sound square waves
- Selectable four play modes (Level Hold, One Shot A, One Shot B, and Start/Stop by one terminal) by two terminals
- Selectable five reference (32.768 kHz, 38.4 kHz, 76.8 kHz, 153.6 kHz (or 96.0 kHz), 38.4 kHz typical signal sources by three of built-in RC oscillator) terminals
- Options (1) Music change during play : Possible or impossible
(2) Output current of play tone : High or low
(3) External clock frequency : 153.6 kHz or 96.0 kHz
- Low-voltage operation +0.9 to 3.5 V
- Package Die form or SSOP1-20 pin (plastic)

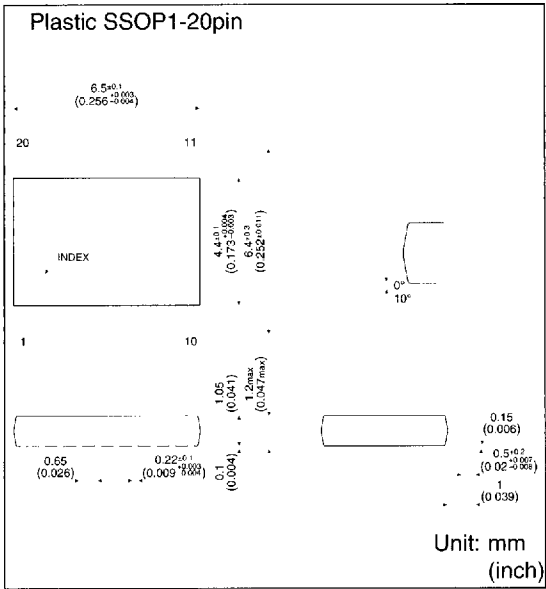


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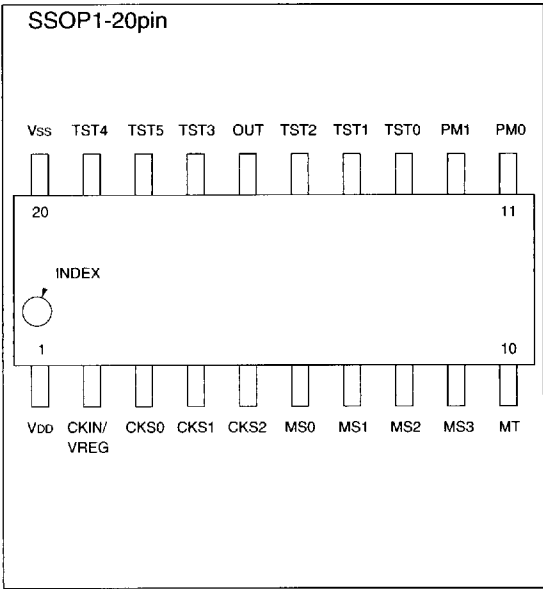
BLOCK DIAGRAM



PACKAGE DIMENSIONS



PIN CONFIGURATION



PIN DESCRIPTION

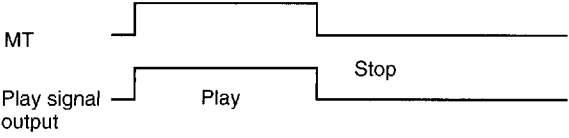
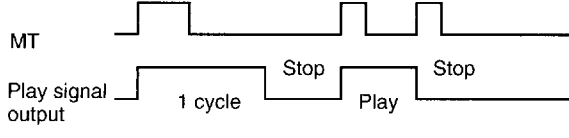
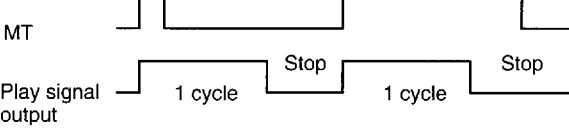
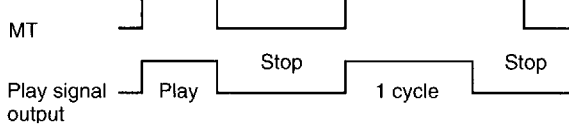
Pin No.	Pin name	I/O	Built-in pull-down	Function																								
1	VDD	—	—	Positive power terminal																								
2	CKIN/ VREG	I/O	None	<p>(1) If the External Clock Input mode is selected by low (0) level input to the CKS2 terminal: One of the following square waves must be entered as the reference signal source to this terminal: 32.768 kHz, 38.4 kHz, 76.8 kHz, or 153.6 kHz This selection range can be changed using the mask option as follows: 32.768 kHz, 38.4 kHz, 76.8 kHz, or 96.0 kHz In the Standby mode (that is, when the MT terminal is low and no music is played), all internal circuits do not operate even when an external clock is entered in this terminal. This terminal may be opened (floating). While in the Operation mode (that is, when a music is played or the high level signal is entered in the MT terminal), this terminal must not be open (or not floating). If this terminal is fixed to low (0) or high (1) level, the internal circuits change to the Operation mode even when the low level signal is entered in the MT terminal. However, these circuits are held and do not operate until the clock is entered. Therefore, if the low (0) level signal is entered in the MT terminal, the system is not returned to the Standby mode. The clock signal must be entered.</p> <p>(2) If the high (1) level signal is entered in the CKS2 terminal and if the built-in RC oscillator is used as the reference signal source: This terminal functions as the IC test output terminal and it outputs the drive voltage of the RC oscillator circuit. The terminal must be open, and no external voltage must be supplied to it.</p>																								
3	CKS0	I	None	<p>One of the following four external clocks and the reference signal source of the following built-in RC oscillator frequencies can be selected by the combination of signals of these three terminals.</p> <table border="1"><thead><tr><th>CKS2</th><th>CKS1</th><th>CKS0</th><th>Reference signal source</th></tr></thead><tbody><tr><td>0</td><td>0</td><td>0</td><td>76.8 kHz external clock</td></tr><tr><td>0</td><td>0</td><td>1</td><td>38.4 kHz external clock</td></tr><tr><td>0</td><td>1</td><td>0</td><td>32.768 kHz external clock</td></tr><tr><td>0</td><td>1</td><td>1</td><td>153.6 kHz (or 96.0 kHz) external clock</td></tr><tr><td>1</td><td>1/0</td><td>1/0</td><td>38.4 kHz (typical) built-in RC oscillation</td></tr></tbody></table> <p>Do not change the input signal level during Operation mode as each terminal does not has the chattering protect circuit. Also, the low (0) or high (1) level signal must be entered as these three terminals do not have the pull-down or pull-up resistor. If the External Clock Input mode is selected, the built-in RC oscillator circuit and the voltage regulator circuit to drive it are in the Standby mode. The music tempo does not change when any of the above five frequencies is used. However, the tone frequency is high for 32.768/38.4 at 32.768 kHz, and it is low for 32.0/38.4 at 96.0 kHz. During RC oscillation, the music tempo and tone frequency change in proportion to the shifted oscillation frequency.</p>	CKS2	CKS1	CKS0	Reference signal source	0	0	0	76.8 kHz external clock	0	0	1	38.4 kHz external clock	0	1	0	32.768 kHz external clock	0	1	1	153.6 kHz (or 96.0 kHz) external clock	1	1/0	1/0	38.4 kHz (typical) built-in RC oscillation
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4	CKS1																											
5	CKS2																											

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Pin No.	Pin name	I/O	Built-in pull-down	Function																																			
6	MS0	I	Yes	<div>16 music pieces can be selected in the sequence of binary codes (from music 1 to music 16) as shown by the combination of input signal levels in these four terminals.</div> <table><tr><th>MS3</th><th>MS2</th><th>MS1</th><th>MS0</th><th>Music selected</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>Music 1</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>Music 2</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>Music 3</td></tr><tr><td>⋮</td><td>⋮</td><td>⋮</td><td>⋮</td><td>⋮</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td><td>Music 15</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>Music 16</td></tr></table> <div>Although each terminal has the pull-down resistor, this resistor is turned off in the Standby mode and the high-impedance input is set. When the Operation mode is selected, this resistor is turned on and it functions as the pull-down resistor.</div> <div>Although each terminal has the high-impedance input in the Standby mode, the external low (0) or high (1) level input needs not be held. Each terminal has the input chattering protect circuit.</div> <div>(1) If the "Disabled music change during play" option (explained later) is used: When the high (1) level signal is entered in the MT terminal and the Operation mode is selected, the input signal level is checked at the MS0 to MS3 terminals. This check level is internally held and the music is not changed even when the input signal level is later changed.</div> <div>(2) If the "Enabled music change during play" option is used: The music is changed each time the input signal level is changed at the MS0 to MS3 terminals in the Operation mode.</div>	MS3	MS2	MS1	MS0	Music selected	0	0	0	0	Music 1	0	0	0	1	Music 2	0	0	1	0	Music 3	⋮	⋮	⋮	⋮	⋮	1	1	1	0	Music 15	1	1	1	1	Music 16
MS3	MS2				MS1	MS0	Music selected																																
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0	0				0	1	Music 2																																
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⋮	⋮	⋮	⋮	⋮																																			
1	1	1	0	Music 15																																			
1	1	1	1	Music 16																																			
7	MS1																																						
8	MS2																																						
9	MS3																																						
10	MT	I	Yes	<div>When the high (1) level signal is entered, the Operation mode is selected and the music starts or stops to play according to the play mode specified by the PM0 and PM1 terminals.</div> <div>The internal pull-down resistor is always connected.</div> <div>This terminal has the chattering protect circuit. When the high (1) level signal is entered, the Operation mode is selected and the input pulse width is checked. If the input is insufficient to assign the noise or chattering pulse width and if the low (0) level signal input is detected before the music starts, the system returns to the Standby mode.</div>																																			
11	PM0	I	No	<div>One of the following four types of play modes can be selected by the combination of input signal level to these two terminals.</div> <table><tr><th>PM1</th><th>PM0</th><th>Music play mode</th></tr><tr><td>0</td><td>0</td><td>Level hold play</td></tr><tr><td>0</td><td>1</td><td>Start/stop control by MT terminal</td></tr><tr><td>1</td><td>0</td><td>One-shot A play</td></tr><tr><td>1</td><td>1</td><td>One-shot C play</td></tr></table>	PM1	PM0	Music play mode	0	0	Level hold play	0	1	Start/stop control by MT terminal	1	0	One-shot A play	1	1	One-shot C play																				
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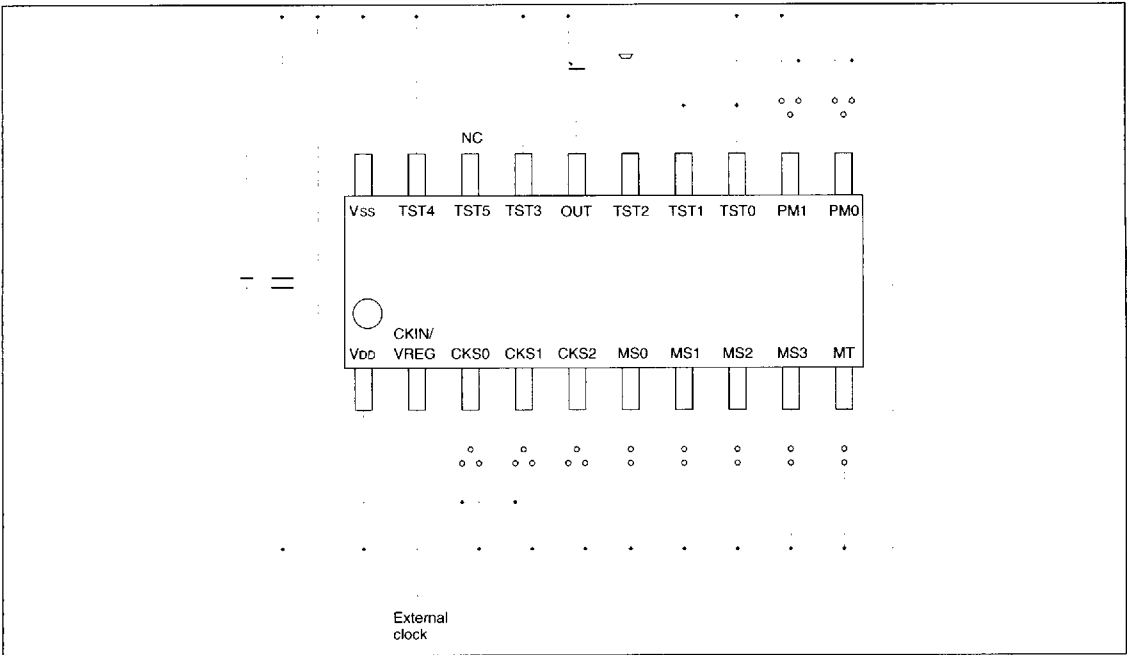
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Pin No.	Pin name	I/O	Built-in pull-down	Function
				<p>(1) Level hold play</p>  <p>(2) Start/stop control by MT terminal</p>  <p>(3) One-shot A play</p>  <p>(4) One-shot C play</p>  <p>The low (0) or high (1) level signal must always be entered as each terminal does not have the pull-down resistor. Also, the input signal level must be fixed and it must not be changed during Operation mode as each terminal does not have the input chattering protect circuit.</p>
13	TST0	I	Yes	IC test input terminals. Each terminal has the pull-down resistor but it does not have the chattering protect circuit. We recommend to always connect these terminals to the Vss level lines. Also, do not enter the high (1) level signal during Operation mode.
14	TST1			
15	TST2			
16	OUT	0	—	<p>The square waves of audio signals are output.</p> <p>If the “No attenuation during play” option is used: The larger current output (to allow direct drive of piezoelectric buzzer) can be selected. To select this mode, a piezoelectric buzzer must be connected between this terminal and Vss terminal and approximately 3Vdc power voltage is required. (The buzzer can directly be driven even when the power voltage is low, but the sound pressure is insufficient.) If the large current output mode is not required, this terminal must be connected to the base of the NPN transistor to drive the tone generator.</p> <p>The Vss level signal is output during Standby mode, during no play, or during rest signal generation.</p>

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Pin No.	Pin name	I/O	Built-in pull-down	Function
17	TST3	I	No	Used as the LSI test input and output terminals when the Test mode is selected by the TST0, TST1, and TST2 terminals. The TST3 and TST4 terminals are used as floating input terminals during normal status. They must be fixed to the VDD or VSS signal level. Also, the TST5 terminal must be open.
19	TST4			
18	TST5	0	—	
20	Vss	—	—	Negative power terminal

■ BASIC EXTERNAL CONNECTION DIAGRAM



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