Electronic Organ Circuits

MM5871 rhythm pattern generator

general description

The MM5871 rhythm pattern generator is an MOS/LSI circuit, fabricated with P-channel enhancement-mode and ion-implanted, depletion-mode devices. The PLA implementation is programmed to produce 6 rhythm patterns which may be combined in any manner and provide 5 instrument-trigger outputs. Trigger output pulse width is determined by an external RC network, *(Figure 1)*. A similar network, including a potentiometer, determines tempo of the on-chip oscillator. This circuit is packaged in a 16-pin Epoxy-B DIP, *(Figure 2)*. *Figure 3* illustrates the standard pattern coding. *Figure 4* is a programming worksheet for ordering custom patterns.

features

- On-chip tempo oscillator
- Variable output pulse width
- 6 rhythm patterns
- 5 trigger outputs
- Flexible supply voltages
- Low power dissipation

standard patterns

- Waltz (3/4)
- Swing (3/4)
- Country/Western (3/4)
- March (4/4)
- Latin (4/4)
- Rock (4/4)

applications

- Electronic organs
- Portable rhythm boxes

block and connection diagrams

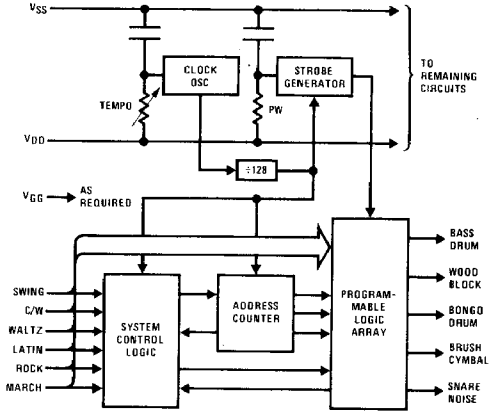
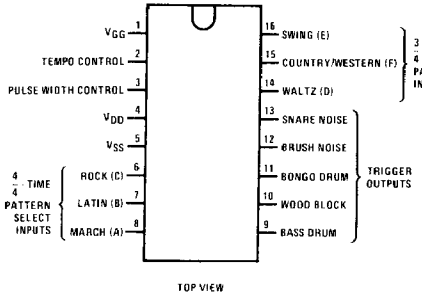


FIGURE 1.

Dual-In-Line Package



Order Number MM5871N
See Package 19

FIGURE 2.

absolute maximum ratings

		MIN	MAX	UNITS
Supply Voltages	V_{GG}	−33	0.3	V
	V_{DD}	−22	0.3	V
Input Voltage		−18	0.3	V
Storage Temperature	T_S	−55	100	°C
Operating Temperature	T_A	0	70	°C
Lead Temperature (Soldering, 10 seconds)			300	°C

electrical characteristics

T_A within operating range, V_{SS} = 0V, V_{DD} = −14V ±2V, V_{GG} = −27V ±2V, unless otherwise noted.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Tempo Control Input	C to V_{SS} = 0.0056 μF				
Minimum Tempo	R to V_{DD} = 1.1 MΩ	≤2.7			bps
Maximum Tempo	R to V_{DD} = 120 kΩ (Note 1)			≥27	bps
Pulse Width Control Input	C to V_{SS} = 0.0056 μF				
	R to V_{DD} = 100 kΩ, (Note 1)	2	3	4	ms
Select Inputs					
Logic High Level	(Active Level)	V_{SS}−0.75	V_{SS}	V_{SS}+0.3	V
Input Current	V_{IH} = V_{SS}			0.2	mA
Logic Low Level		V_{DD}	V_{DD}	V_{DD}+0.75	V
Trigger Outputs					
Logic High Level	(Active Level) (w/20k to V_{DD})	V_{SS}−0.37		V_{SS}+0.3	V
Leakage Current	V_{OL} = V_{DD}, (Note 2)			−10	μA
Supply Currents	(No Output Loads)				
	I_{DD}			20	mA
	I_{GG}			5	mA

Note 1: Both the Tempo Control and Pulse Width Control inputs utilize external RC networks to determine tempo and strobe pulse width. Additionally, these parameters are affected by the V_{SS} − V_{DD} voltage. Therefore, for these tests the RC values apply to V_{SS} − V_{DD} = −14 ±0.5 volts.

Note 2: All trigger outputs are open-drain transistors. The active output level is therefore high, and the off condition is high impedance as indicated by the specified leakage current.

Device: MM5871

Customer:

Pattern: AA (Standard)

	DEVICE PIN	16									15									14									7								6								8								
	Rhythm Name	Swing									Country/Western									Waltz									Latin								Rock								March								
	Rhythm Space	E									F									D									B								C								A								
	Time	3/4									3/4									3/4									4/4								4/4								4/4								
	Instrument Trigger Outputs:																																																					
Device Pin	Instrument Name / Card Address	Counts									Counts									Counts									Counts								Counts								Counts								"1" Totals
		0	1	2	3	4	5	5	5	5	0	1	2	3	4	5	5	5	5	0	1	2	3	4	5	5	5	5	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	
9	Bass Drum A0	X									X					X				X									X			X				X			X	X				X							12
10	Block A1																												X			X			X																3
11	Bongo A2				X									X							X		X											X	X				X				X	X			X	X	12
12	Brush A3	X				X					X	X	X		X	X				X									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X			26
13	Snare A4				X									X								X		X																X						X				X	X	10
	A5																																																			0
	A6																																																				0
	"1" Totals	2	0	0	2	0	1	0	0	0	2	1	1	2	1	2	0	0	0	2	0	2	0	2	0	0	0	0	3	1	1	2	2	1	3	3	2	1	3	2	2	1	3	3	2	0	2	0	2	0	2	2	63

Note 1: In this chart, "X" represents the presence of a gate in the spot.

Note 2: "X" = 1; negative logic.

FIGURE 3. Standard Pattern Coding

Device: MM5871

Customer:

Pattern:

	DEVICE PIN	16									15									14									7								6								8								
	Rhythm Name																																																				
	Rhythm Space	E									F									D									B								C								A								
	Time	3/4									3/4									3/4									4/4								4/4								4/4								
	Instrument Trigger Outputs:																																																					
Device Pin	Instrument Name / Card Address	Counts									Counts									Counts									Counts								Counts								Counts								"1" Totals
		0	1	2	3	4	5	5	5	5	0	1	2	3	4	5	5	5	5	0	1	2	3	4	5	5	5	5	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	
9	Bass Drum A0																																																			
10	Block A1																																																			
11	Bongo A2																																																		
12	Brush A3																																																		
13	Snare A4																																																		
	A5																																																			0
	A6																																																			0
	"1" Totals							0	0	0							0	0	0								0	0	0																										

Note 1: Combination counts of 5 on 3/4 time are not programmable, i.e., no gates in "555" section.

Note 2: In this chart, "X" represents the presence of a gate in the spot.

Note 3: "X" = 1; negative logic.

FIGURE 4. Programming Worksheet For Ordering Custom Patterns