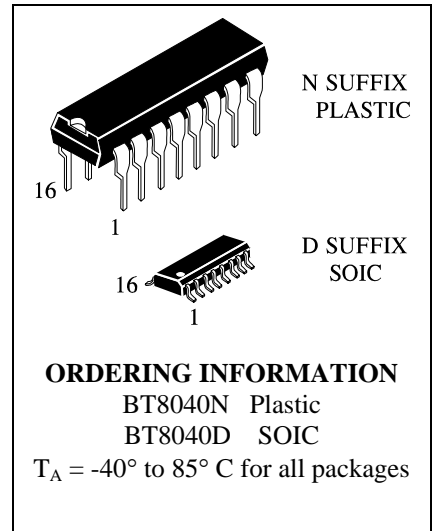


# Melody Generator with Accompaniment

**BT8040**

## FEATURES

- Two Sound Sources with Envelope (CR Envelope)
- Melody is inserted up to four.
- According to customer's request, the inserted melody is flexible.
- 3.0V to 5.0V Operating Voltage
- DC or AC Triggered Performance Start Mode (Mask Selected)
- Can Drive an 8 Ohm Dynamic Loudspeaker if Provided Externally with a Transistor
- Bare chip or 16-pin DIP (Plastic) Package available



## DESCRIPTION

The BT8040 is a CMOS LSI chip, which plays a prearranged melodies.

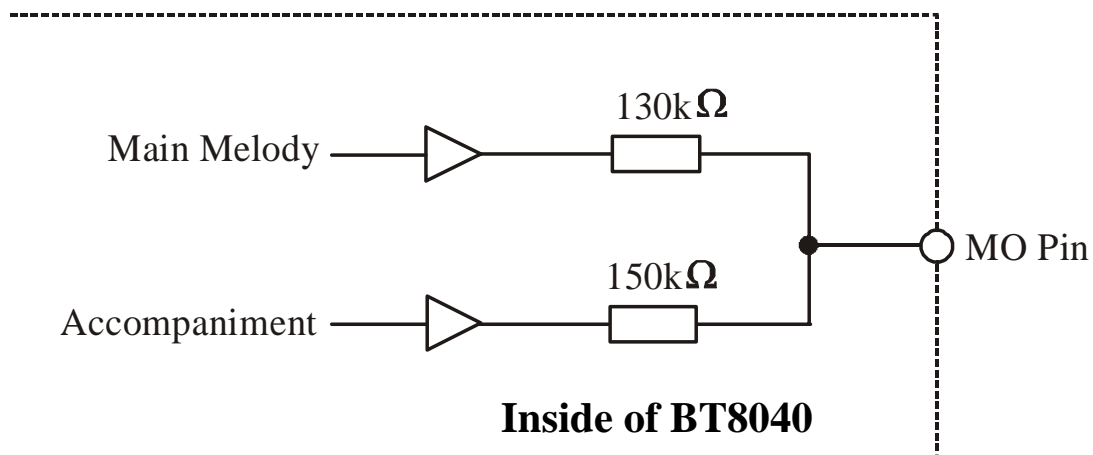
## ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

Characteristic	Symbol	Value	Unit
Power Supply Voltage	$V_{DD}$	- 0.3 to + 7.0	V
Input Terminal Voltage	$V_{I0}$	- 0.2 to $V_{DD} + 0.2$	V
Operating Temperature	$T_a$	-40 to + 85 ( $V_{SS} = 1.5\text{V}$ )	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	- 65 to + 150	$^\circ\text{C}$
Soldering Temperature and Time	$T_{sol}$	260 $^\circ\text{C}$ , 10s (at lead)	

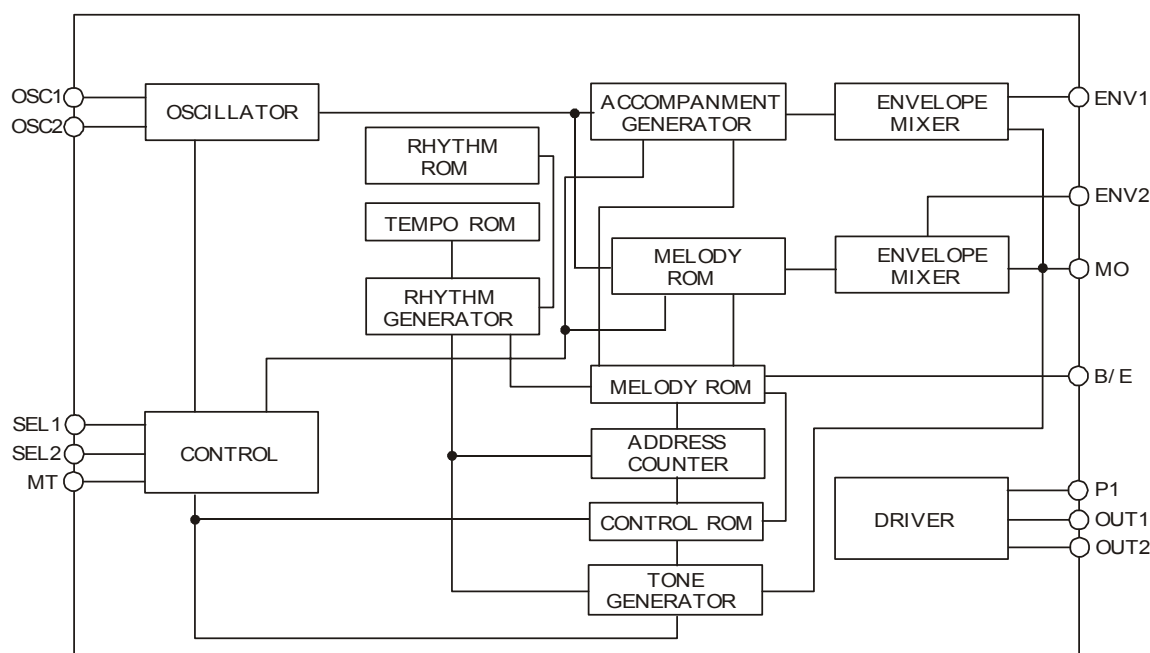
## ELECTRICAL CHARACTERISTICS ( $V_{DD} = 5\text{V}$ , $T_a = 25^\circ\text{C}$ ; unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Operating Voltage	$V_{DD}$		3.0	5.0	5.5	V
Input Voltage	"1"	$V_{IH}$	$V_{DD} - 0.3$	-	$V_{DD}$	V
	"0"	$V_{IL}$	$V_{SS}$	-	$V_{SS} + 0.3$	
MT Power Supply Time			150			ms
Response Time					600	ms

## MO OUTPUT PIN EQUIVALENT CIRCUIT



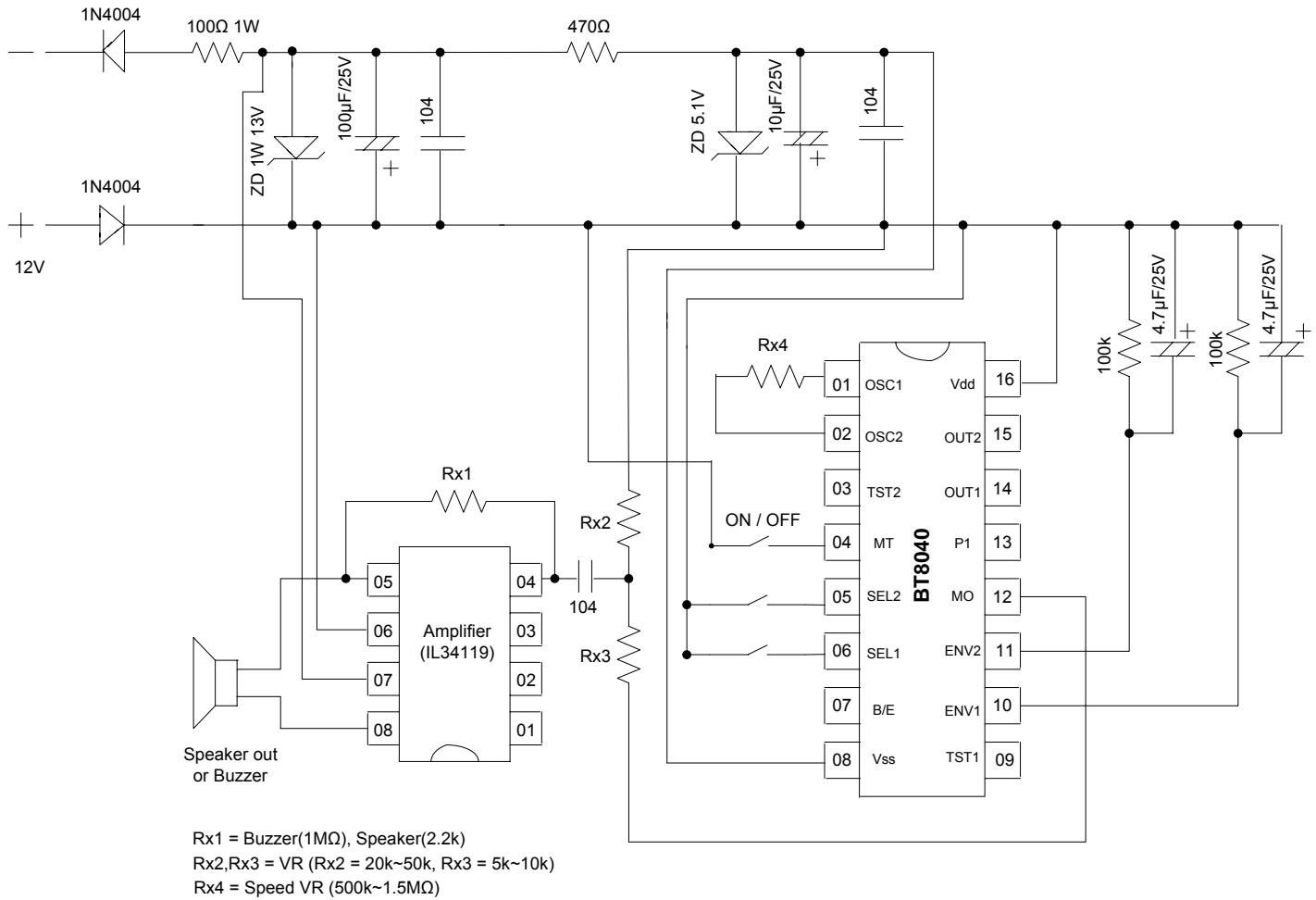
**BLOCK DIAGRAM**



**PIN DESCRIPTION**

Pin. No.	Pin Name	Pull-Down Resistor	Functions
1	OSC1	-	A resistor is connected between both terminals to form a ring oscillator, or external reference signals are applied to OSC1.
2	OSC2	-	
3	TST2	Provided	LSI Test Input/Output.
4	MT	Provided	For binary selection: Controls Start and Stop of Performance. For direct selection: Selects Melody 1 and Controls Start and Stop of its Performance.
5	SEL2	Provided	For binary selection: this Terminal in Conjunction with SEL1, selects a Melody. For direct selection: Selects Melody 3 and Controls Start and Stop of its Performance.
6	SEL1	Provided	For binary selection: this Terminal in Conjunction with SEL1, selects a Melody. For direct selection: Selects Melody 2 and Controls Start and Stop of its Performance.
7	B/E	-	BUSY or END Signal Output Terminal.
8	V <sub>SS</sub>	-	Power Supply Terminal (0V).
9	TST1	Provided	LSI Test Input.
10	ENV1	-	Connects Resistor and Capacitor to add Envelope to Main Melody.
11	ENV2	-	Connects Resistor and Capacitor to add Envelope to Accompaniment.
12	MO	-	Output Terminal or Acoustic Signals that have not been Amplified.
13	P1	Provided	Connects PNP/NPN Transistors, resistors and Capacitors to form a Low-Frequency Linear Amplifier Circuit.
14	OUT1		
15	OUT2		
16	V <sub>DD</sub>	-	3.0V to 5.0V Operating Voltage

**APPLICATION CIRCUIT (basic external connection)**



**RECOMMENDED CONDITIONS FOR EXTERNAL DEVICES**

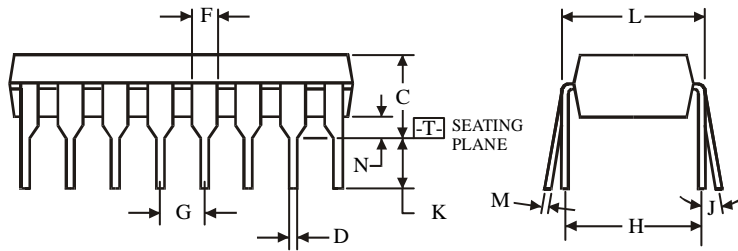
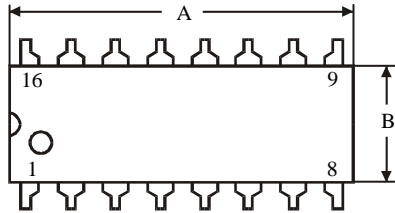
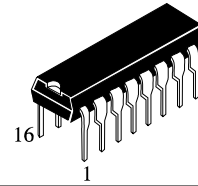
Symbol	Ratings	Unit	Symbol	Ratings	Unit
VR1	1 - 2	MΩ	C1	4.7	μF
VR2	50	kΩ	C2	4.7	μF
R1	100	kΩ	C3	0.1	μF
R2	100	kΩ	-	-	-

**SELECTION CONDITION FOR MELODY**

Condition		Melody
#5	#6	
High	High	*Test melody
High	Low	*Ding - Dong
Low	High	*Do - Mi - Sol - Do
Low	Low	*Do- Sol - Mi - Do

\* Revision & Injection of Melody is possible according to customer's request.

**N SUFFIX PLASTIC DIP  
(MS - 001BB)**



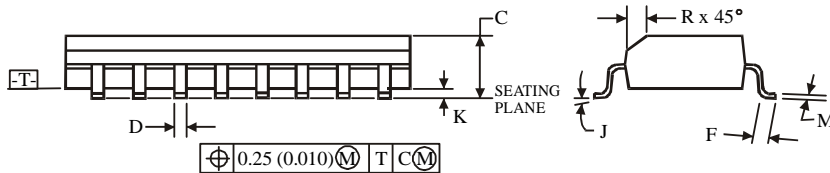
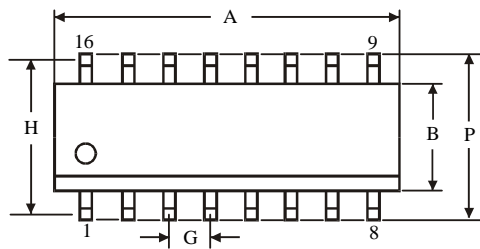
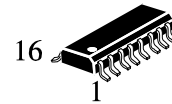
$\oplus 0.25 (0.010) \text{ (M) T}$

**NOTES:**

- Dimensions "A", "B" do not include mold flash or protrusions.  
Maximum mold flash or protrusions 0.25 mm (0.010) per side.

Symbol	Dimension, mm	
	MIN	MAX
A	18.67	19.69
B	6.10	7.11
C		5.33
D	0.36	0.56
F	1.14	1.78
G	2.54	
H	7.62	
J	0°	10°
K	2.92	3.81
L	7.62	8.26
M	0.20	0.36
N	0.38	

**D SUFFIX SOIC  
(MS - 012AC)**



$\oplus 0.25 (0.010) \text{ (M) T (C) (M)}$

**NOTES:**

- Dimensions A and B do not include mold flash or protrusion.
- Maximum mold flash or protrusion 0.15 mm (0.006) per side  
for A; for B - 0.25 mm (0.010) per side.

Symbol	Dimension, mm	
	MIN	MAX
A	9.80	10.00
B	3.80	4.00
C	1.35	1.75
D	0.33	0.51
F	0.40	1.27
G	1.27	
H	5.72	
J	0°	8°
K	0.10	0.25
M	0.19	0.25
P	5.80	6.20
R	0.25	0.50