

## ■ INTRODUCTION

SN68004 is a 4 seconds single chip voice synthesizer IC which contains I/O pins and a tiny controller. By programming through the tiny controller, user's applications including section combination, trigger modes, output status, and other logic functions can then be easily implemented.

## ■ FEATURES

- ◆ Single power supply 2.4V - 5.1V
- ◆ Built in a tiny controller
- ◆ 4 seconds voice capacity are provided
- ◆ Two 4-bit I/O ports are provided
- ◆ 64\*4 bits RAM are provided
- ◆ Maximum 16k program ROM is provided
- ◆ Readable ROM code data
- ◆ Built in a high quality speech synthesizer
- ◆ Adaptive playing speed from 2.5k-20kHz is provided
- ◆ Built in a dual tone melody generator
- ◆ Speech/Dual tone melody mixer is provided
- ◆ Fixed current D/A output is provided to drive external connected transistor for sound output

**■ PIN ASSIGNMENT**

<b>Symbol</b>	<b>I/O</b>	<b>Function Description</b>
P20	I/O	Bit0 of I/O port 2
P21	I/O	Bit1 of I/O port 2
P22	I/O	Bit2 of I/O port 2
P23	I/O	Bit3 of I/O port 2
P30	I/O	Bit0 of I/O port 3
P31	I/O	Bit1 of I/O port 3
P32	I/O	Bit2 of I/O port 3
P33	I/O	Bit3 of I/O port 3
V <sub>DD</sub>	I	Positive power supply
OSC	I	Oscillation component connection pin
TEST	I	For testing only
V <sub>SS</sub>	I	Negative power supply
V <sub>O</sub>	O	D/A current output

**■ ABSOLUTE MAXIMUM RATING**

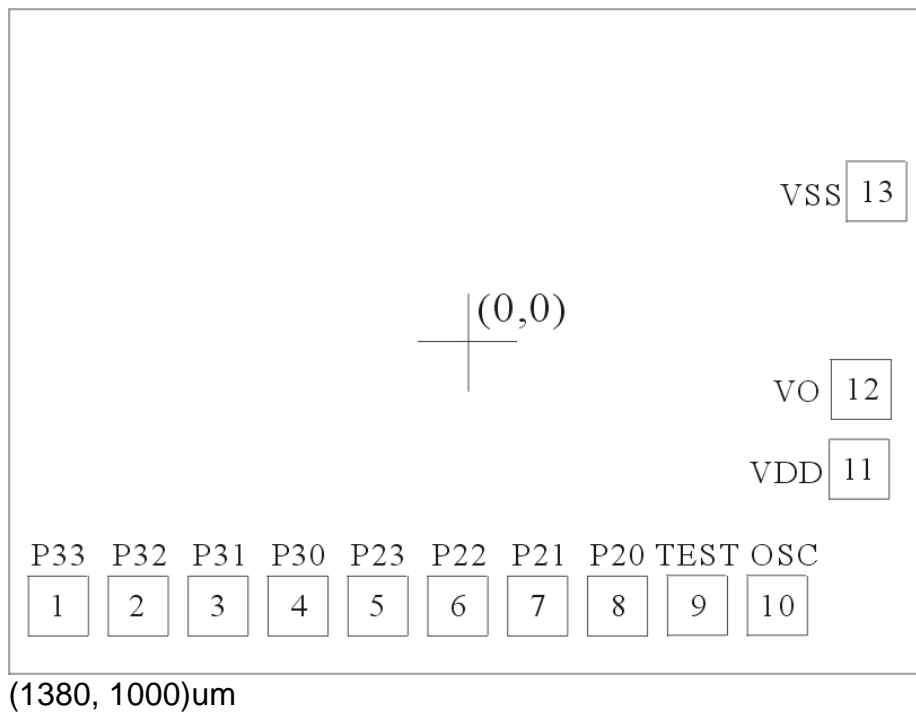
Items	Symbol	Min	Max	Unit.
Supply Voltage	$V_{DD}$	-0.3	6.0	V
Input Voltage	$V_{IN}$	$V_{SS}-0.3$	$V_{DD}+0.3$	V
Operating Temperature	$T_{OP}$	-20.0	70.0	°C
Storage Temperature	$T_{STG}$	-55.0	125.0	°C

**■ ELECTRICAL CHARACTERISTICS**

Item	Sym.	Min.	Typ.	Max.	Unit	Condition
Operating Voltage	$V_{DD}$	2.4	3.0	5.1	V	
Standby Current	$I_{SBY}$	-	-	1.0	$\mu A$	$V_{DD}=3V$ , no load
Operating Current	$I_{OPR}$	-	-	250	$\mu A$	$V_{DD}=3V$ , no load
Input Current of P1	$I_i$	-	3	-	$\mu A$	$V_{DD}=3V$
Drive Current of P2,P3	$I_{OD}$	1.5	2	-	$mA$	$V_{DD}=3V, V_O=2.4V$
Sink Current of P2,P3	$I_{OS}$	2.0	3	-	$mA$	$V_{DD}=3V, V_O=0.4V$
D/A Output Current	$I_{VO}$	2.0	3.0	4.0	$mA$	$V_{DD}=3V, V_O=0.7V$
Oscillation Freq.	$F_{OSC}$	-	1.0	-	MHz	$V_{DD}=3V$

■ **BONDING PAD LOCATION**

Pad No	Pad Name	X (um)	Y (um)
1	P33	-616	-398
2	P32	-496	-398
3	P31	-376	-398
4	P30	-256	-398
5	P23	-136	-398
6	P22	-16	-398
7	P21	104	-398
8	P20	224	-398
9	TEST	344	-397
10	OSC	464	-397
11	VDD	587	-192
12	VO	590	-72
13	VSS	613	226



**SN68004**

Note : The substrate MUST be connected to Vss in PCB layout.