

## ■ INTRODUCTION

SN66020 is a 20 seconds single chip 4-channel 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, high performance melody, multiple voices, and other logic functions can be implemented.

## ■ FEATURES

- ◆ Single power supply 2.4V – 5.1V
- ◆ Built in a tiny controller
- ◆ 20 seconds voice capacity are provided
- ◆ One 4-bit input port, two 4-bit I/O ports and one 4-bit output port are provided
- ◆ 256\*4 bits RAM are provided
- ◆ Maximum 64k program ROM is provided
- ◆ Readable ROM code data
- ◆ Built in a high quality speech synthesizer
- ◆ Four independent voice channels
- ◆ Adaptive playing speed from 4k-40kHz is provided for all 4 channels individually
- ◆ Automatic repetition for every channel
- ◆ A 6-bit\*8-bit Multiplier is embed to modulate the volume of synthesized voices
- ◆ Two digital mixers (with saturation control) are provided
- ◆ Two 8-bit current output DA converters (Channel 1 + Channel 2 → DA1, Channel 3 + Channel 4 → DA2 )
- ◆ System clock: 2M Hz ( R-type or Crystal Option)
- ◆ Low Voltage Reset

**■ PIN ASSIGNMENT**

Symbol	I/O	Function Description
P10	I	Bit0 of input port 1
P11	I	Bit1 of input port 1
P12	I	Bit2 of input port 1
P13	I	Bit3 of input port 1
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
P40	O	Bit0 of output port 4
P41	O	Bit1 of output port 4
P42	O	Bit2 of output port 4
P43	O	Bit3 of output port 4
V <sub>DD</sub>	I	Positive power supply
GND	I	Negative power supply
OSC/XIN	I	Oscillator / Crystal In
XOUT	O	Crystal Out
CKSEL	I	Clock type select 'L' → RC oscillator 'H' →Crystal (Internal pull low)
VO1	O	D/A current output, for channel 1 and 2
VO2	O	D/A current output, for channel 3 and 4

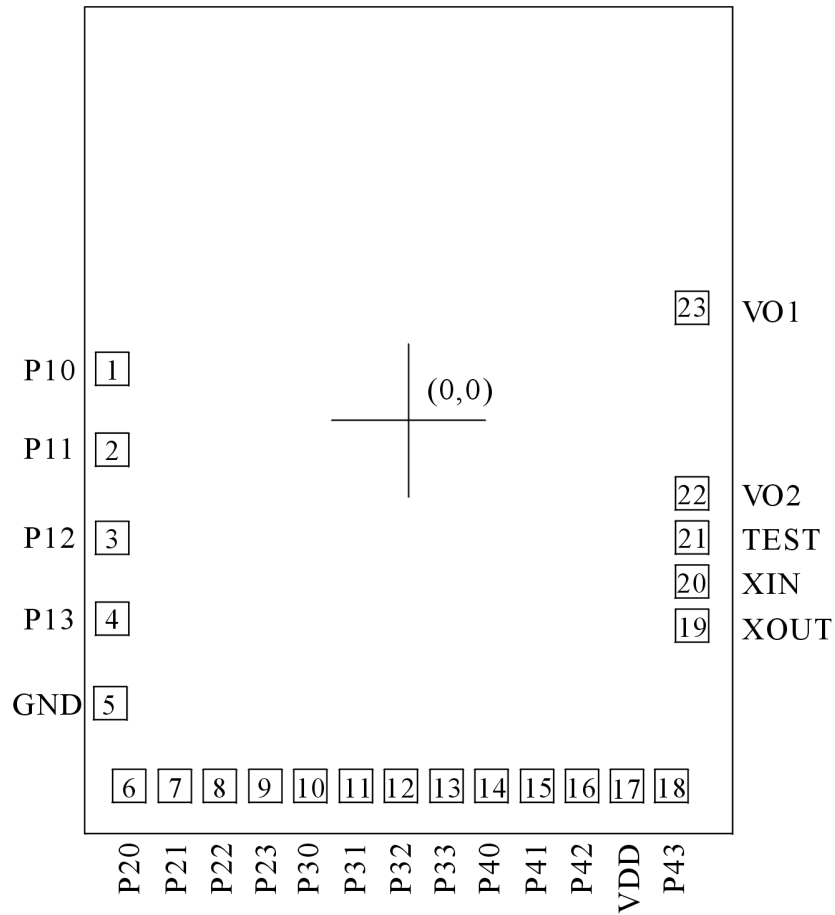
■ **ABSOLUTE MAXIMUM RATING**

Items	Symbol	Min	Max	Unit.
Supply Voltage	$V_{DD-V}$	-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	$I_{SBY}$	-	-	2.0	$\mu A$	$V_{DD}=3V$
Operating Current	$I_{OPR}$	-	-	350	$\mu A$	$V_{DD}=3V$ , no load
Input Current of P1	$I_{IH}$	-	3.0	10.0	$\mu A$	$V_{DD}=3V, V_{IN}=3V$
Drive Current of P2, P3, P4	$I_{OD}$	1.5	2	-	$mA$	$V_{DD}=3V, V_O=2.4V$
Sink Current of P2,P3,P4	$I_{OS}$	2.0	3	-	$mA$	$V_{DD}=3V, V_O=0.4V$
VO1/VO2 Output Current	$I_{VO}$	2.0	3.0	4.0	$mA$	$V_{DD}=3V, V_O=0.7V$
Oscillation Freq.	$F_{OSC}$	-	2.0	-	MHz	$V_{DD}=3V$

■ **BONDING PAD**



**SN66021**

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

## **DISCLAIMER**

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