INTRODUCTION

SN68020 is a 20 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
- 20 seconds voice capacity are provided
- One 4-bit input port and 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
- 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
V_{DD}	I	Positive power supply
OSC	I	Oscillation component connection pin
TEST	I	For testing only
V_{SS}	I	Negative power supply
V_O	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	^{o}C
Storage Temperature	T_{STG}	-55.0	125.0	^{o}C

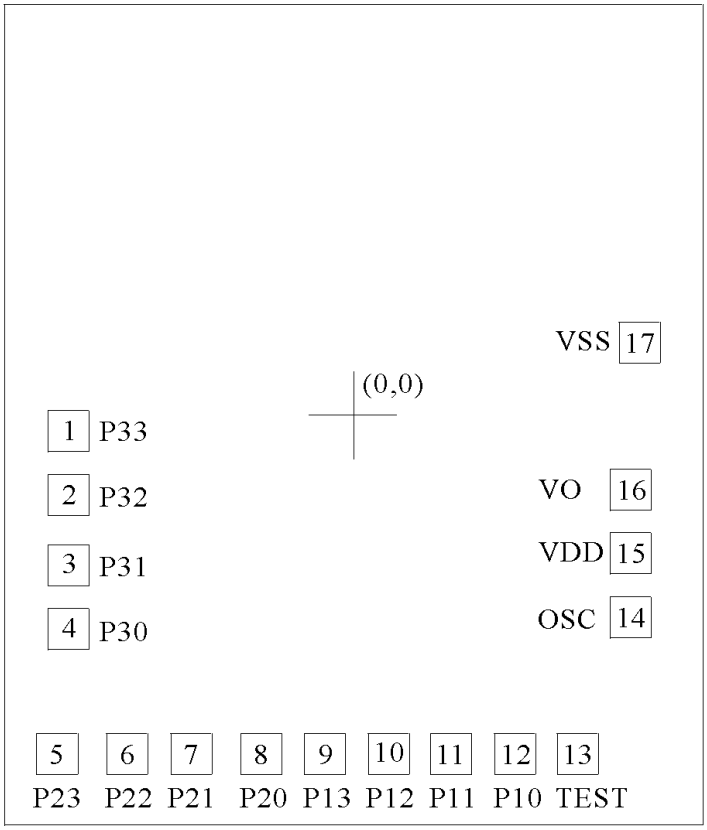
■ ELECTRICAL CHARACTERISTICS

Item	Sym.	Min.	Typ.	Max.	Unit	Condition
Operating Voltage	V_{DD}	2.4	3.0	5.1	V	
Standby Current	I_{SBY}	-	-	2.0	*u*A	V_{DD}=3V, no load
Operating Current	I_{OPR}	-	-	250	*u*A	V_{DD}=3V, no load
Input Current of P1	Ii	-	3	-	*uA*	V_{DD}=3V
Drive Current of P2,P3	I_{OD}	1.5	2	-	*m*A	V_{DD}=3V,V_O=2.4V
Sink Current of P2,P3	I_{OS}	2.0	3	-	*m*A	V_{DD}=3V,V_O=0.4V
D/A Output Current	I_{VO}	2.0	3.0	4.0	*m*A	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	-624	-36
2	P32	-624	-176
3	P31	-624	-330
4	P30	-624	-470
5	P23	-649	-744
6	P22	-496	-744
7	P21	-355	-744
8	P20	-202	-744
9	P13	-63	-744

Pad No.	Pad Name	X(um)	Y(um)
10	P12	77	-744
11	P11	214	-744
12	P10	354	-744
13	TEST	491	-744
14	OSC	607	-445
15	VDD	607	-304
16	VO	607	-165
17	VSS	627	158



(1530,1800)um

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