

■ INTRODUCTION

SN65020 is a 20 seconds one-channel single chip voice synthesizer IC which contains a PWM Direct Drive Circuit. There is one 4-bit I/O port and built in a tiny controller. By programming through the tiny controller, user's applications including section combination, trigger modes, output status, and other logic functions can be easily implemented.

■ FEATURES

- ◆ Single power supply 2.4V – 5.1V
- ◆ 20 seconds voice capacity is provided
- ◆ Built in a tiny controller
- ◆ One 4-bit I/O port is provided
- ◆ 64*4 bit 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 PWM Direct Drive circuit output BUO1 and BUO2 directly connected to Speaker for sound output
- ◆ System clock :1MHZ

■ PIN ASSIGNMENT

Symbol	I/O	Function Description
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
V _{DD}	I	Positive power supply
OSC	I	Oscillation component connection pin
TEST	I	For testing only
GND	I	Negative power supply
BUO1	O	PWM output 1
BUO2	O	PWM output 2



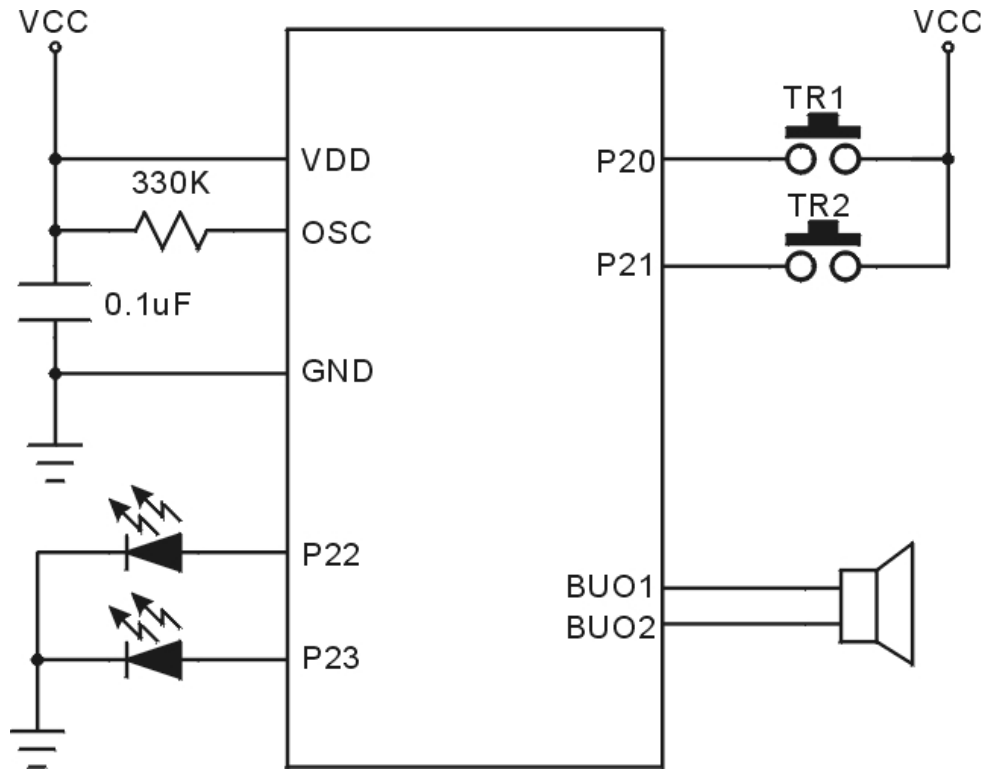
■ **ABSOLUTE MAXIMUM RATINGS**

Items	Symbol	Min	Max	Unit.
Supply Voltage	V_{DD-V}	-0.3	6.0	V
Input Voltage	V_{IN}	GND-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	μA	$V_{DD}=3V$, no load
Operating Current	I_{OPR}	-	-	250	μA	$V_{DD}=3V$, no load
Input current of P2	I_{IH}	-	3.0	10.0	μA	$V_{DD}=3V, V_{IN}=3V$
Drive current of P2	I_{OD}	1.5	2	-	mA	$V_{DD}=3V, V_O=2.4V$
Sink Current of P2	I_{OS}	2.0	3	-	mA	$V_{DD}=3V, V_O=0.4V$
Drive current of Buo1	I_{OD}	100	120	-	mA	$V_{DD}=3V, Buo1=1.5V$
Sink Current of Buo1	I_{OS}	100	120	-	mA	$V_{DD}=3V, Buo1=1.5V$
Drive Current of Buo2	I_{OD}	100	120	-	mA	$V_{DD}=3V, Buo2=1.5V$
Sink Current of Buo2	I_{OS}	100	120	-	mA	$V_{DD}=3V, Buo2=1.5V$
Oscillation Freq.	F_{OSC}	-	1.0	-	MHz	$V_{DD}=3V$

■ **APPLICATION CIRCUIT**

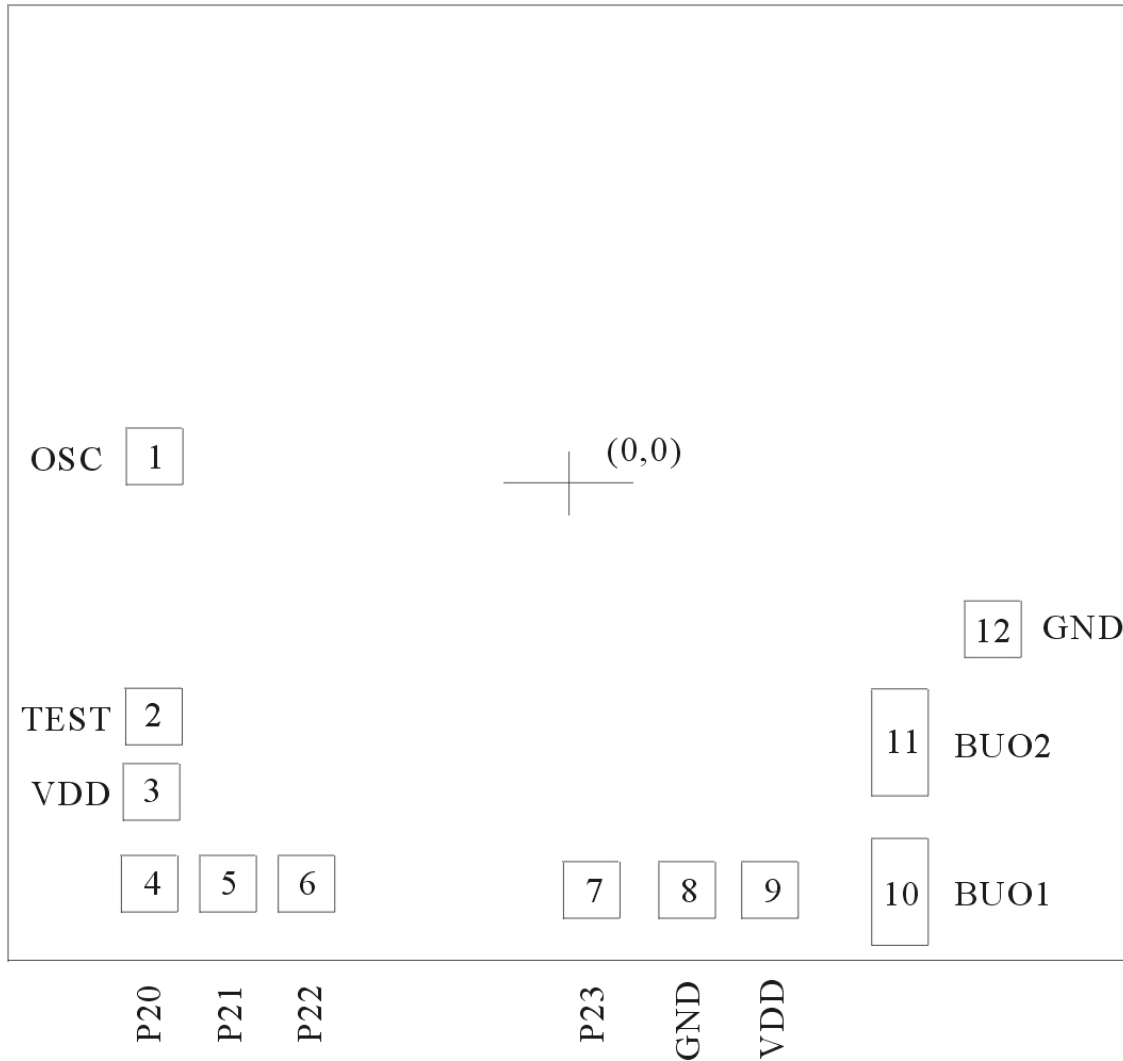


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Note: Please bonds all of V_{DD} and V_{SS} pins.



■ **BONDING PAD**



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

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