

**■ INTRODUCTION**

SN65031 is a 31 seconds two-channel single chip voice synthesizer IC which contains a PWM Direct Drive Circuit and fixed current D/A output. There are two 4-bit I/O ports 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
- ◆ 31 seconds voice capacity is provided
- ◆ Built in a tiny controller
- ◆ 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
- ◆ Two independent voice channels (Channel 1 + Channel 2→Buo1,Buo2)
- ◆ Built in a PWM Direct Drive circuit and a fixed current D/A output
- ◆ Low Voltage Reset
- ◆ System clock : 2MHZ

**■ 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
GND	I	Negative power supply
BUO1/I/O	O	PWM output 1 / DA current output
BUO2	O	PWM output 2

**■ ABSOLUTE MAXIMUM RATINGS**

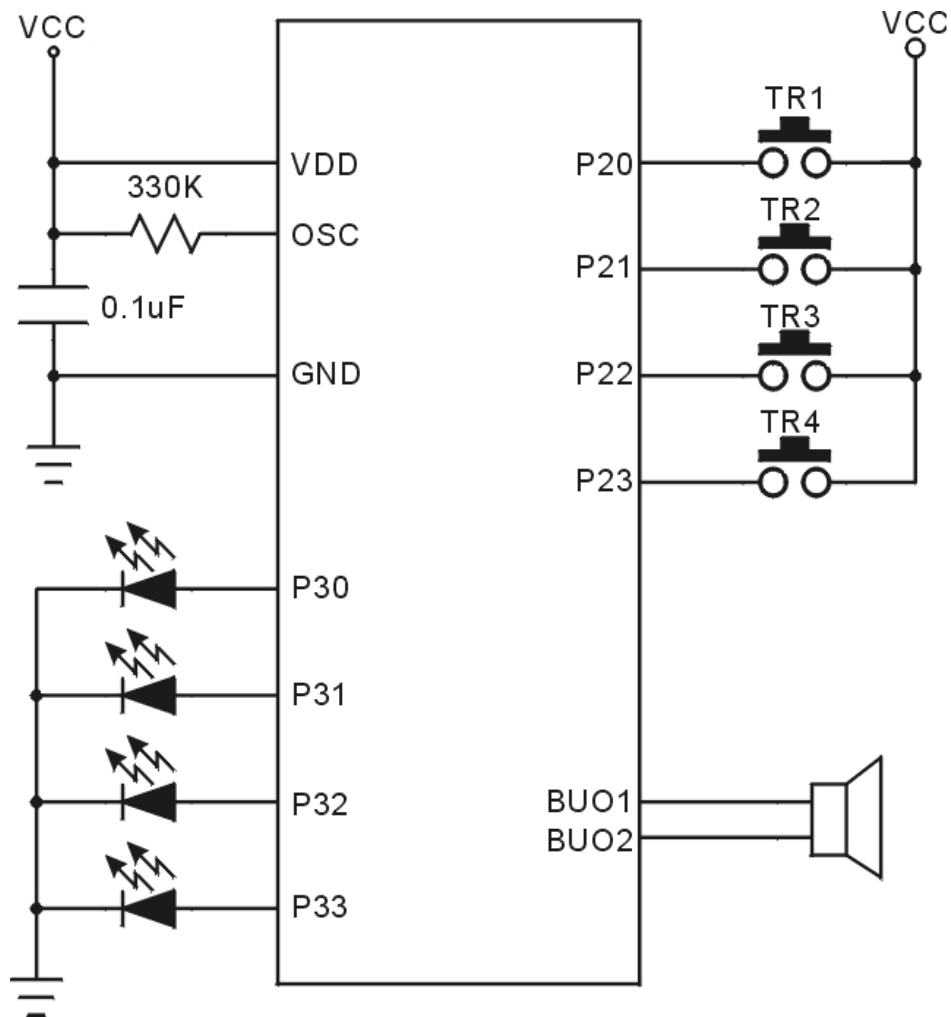
Items	Symbol	Min	Max	Unit.
Supply Voltage	$V_{DD-V}$	-0.3	6.0	V
Input Voltage	$V_{IN}$	GND-0.3	$V_{DD}+0.3$	V
Operating Temperature	$T_{OP}$	-20.0	70.0	°C
Storage Temperature	$T_{STG}$	-55.0	125.0	°C

**■ ELECTRICAL CHARACTERISTICS**

Item	Sym.	Min.	Typ.	Max.	Unit	Condition
Operating Voltage	$V_{DD}$	2.4	3.0	5.1	V	
Standby current	$I_{SBY}$	-	-	2.0	$\mu A$	$V_{DD}=3V$ , no load
Operating Current	$I_{OPR}$	-	-	250	$\mu A$	$V_{DD}=3V$ , no load
Input current of P2, P3	$I_{IH}$	-	3.0	10.0	$\mu A$	$V_{DD}=3V, V_{IN}=3V$
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	-	$mA$	$V_{DD}=3V, V_O=0.4V$
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	-	$mA$	$V_{DD}=3V, Buo2=1.5V$
Output current of VO	$I_{VO}$	2.0	3.0	4.0	$mA$	$V_{DD}=3V, V_O=0.7V$
Oscillation Freq.	$F_{OSC}$	-	1.0	-	MHz	$V_{DD}=3V$

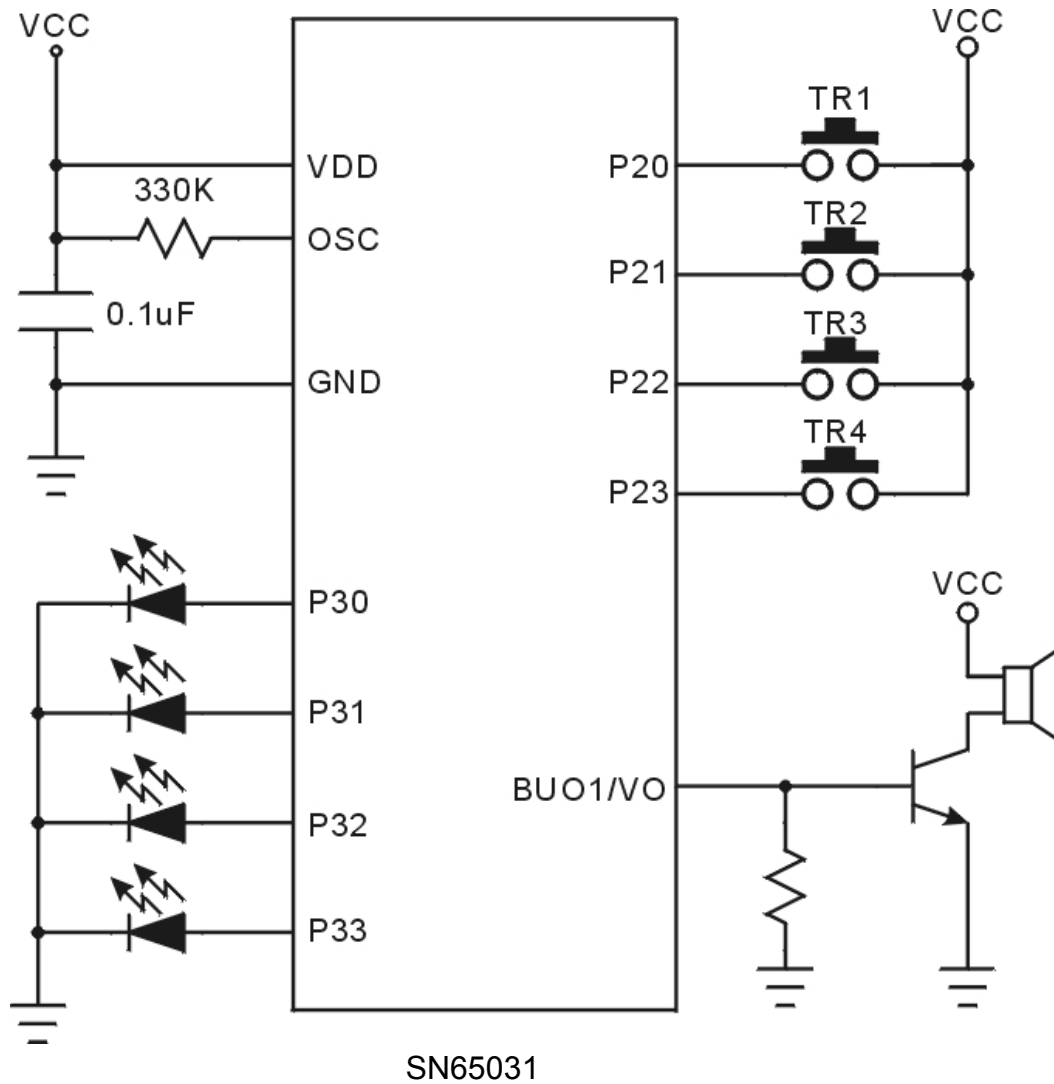
**■ APPLICATION CIRCUIT**

- ◆ PWM Direct Drive Output


**SN65031**

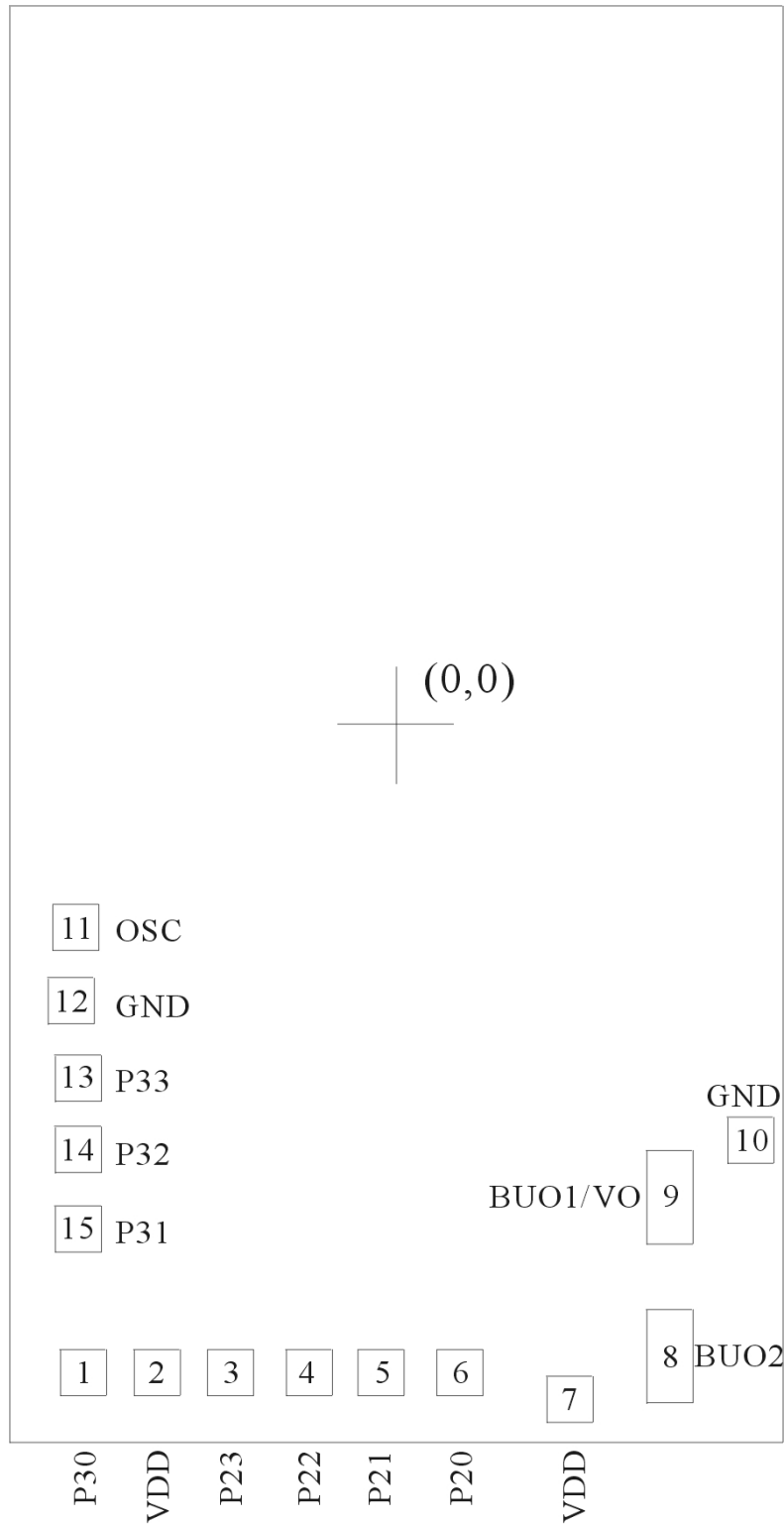
Note: Please bonds all of  $V_{DD}$  and  $V_{SS}$  pins.

- ◆ Fixed current D/A output



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

■ **BONDING PAD**



**SN65031**

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

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