

■ INTRODUCTION

SN66090 is a 90 seconds single chip 4-channel voice synthesizer IC which contains I/O ports 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
- ◆ 90 seconds voice capacity are provided
- ◆ One 4-bit input port, two 4-bit I/O ports and one 4-bit output port are provided
- ◆ 128*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)

■ 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 _{DD} | 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' → R type (1M) 'H' → 2M 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 |

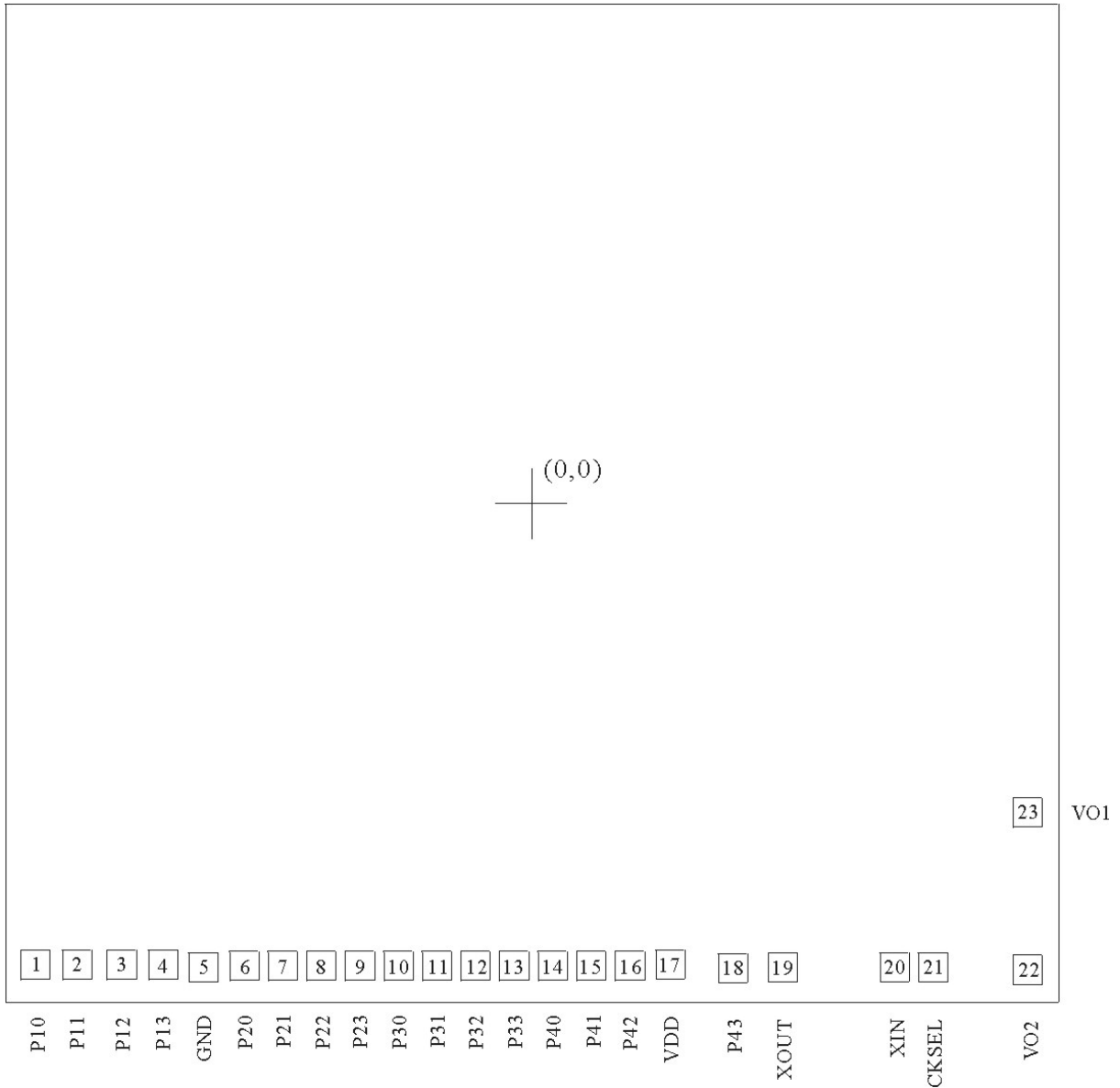
■ **ABSOLUTE MAXIMUM RATING**

| 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} | - | - | 1.0 | μA | $V_{DD}=3V$ |
| Operating Current | I_{OPR} | - | - | 350 | μA | $V_{DD}=3V$, no load |
| Input Current of P1 | I_{IH} | - | 3.0 | 10.0 | μA | $V_{DD}=3V, V_{IN}=3V$ |
| 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**



SN66090

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

DISCLAIMER

The information appearing in SONiX web pages (“this publication”) is believed to be accurate.

However, this publication could contain technical inaccuracies or typographical errors.

The reader should not assume that this publication is error-free or that it will be suitable for any particular purpose. SONiX makes no warranty, express, statutory implied or by description in this publication or other documents which are referenced by or linked to this publication. In no event shall SONiX be liable for any special, incidental, indirect or consequential damages of any kind, or any damages whatsoever, including, without limitation, those resulting from loss of use, data or profits, whether or not advised of the possibility of damage, and on any theory of liability, arising out of or in connection with the use or performance of this publication or other documents which are referenced by or linked to this publication. This publication was developed for products offered in Taiwan. SONiX may not offer the products discussed in this document in other countries. Information is subject to change without notice. Please contact SONiX or its local representative for information on offerings available. Integrated circuits sold by SONiX are covered by the warranty and patent indemnification provisions stipulated in the terms of sale only.

The application circuits illustrated in this document are for reference purposes only. SONiX DISCLAIMS ALL WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE. SONiX reserves the right to halt production or alter the specifications and prices, and discontinue marketing the Products listed at any time without notice. Accordingly, the reader is cautioned to verify that the data sheets and other information in this publication are current before placing orders.

Products described herein are intended for use in normal commercial applications. Applications involving unusual environmental or reliability requirements, e.g. military equipment or medical life support equipment, are specifically not recommended without additional processing by SONiX for such application.