

## ■ INTRODUCTION

SN6A511 is a series of single chip voice/dual tone melody synthesizer IC with 16\*64/8\*64 LCD direct drive capability which contains two 4-bit I/O ports, two optional 4-bit output ports and a tiny controller. By programming through the tiny controller, user's application including LCD display, section combination, trigger modes, output status, voice/melody playing and other logic functions and then be easily implemented.

## ■ FEATURES

- ◆ Single power supply 2.4V – 5.1V
- ◆ Built in a tiny controller
- ◆ Two 4-bit I/O ports, two optional 4-bit output ports are provided
- ◆ 256\*4 bits RAM for programming usage are provided
- ◆ 256\*4 bits RAM for LCD display usage are provided
- ◆ Maximum 384k\*10 program ROM is provided
- ◆ Readable ROM code data
- ◆ Built in direct 16\*64/8\*64 LCD driver
- ◆ LCD 1/4 bias, 1/5 bias; 1/8 duty, 1/16 duty
- ◆ Built in a high quality speech synthesizer
- ◆ Adaptive playing speed from 2.5k-40kHz is provided
- ◆ Built in a dual tone melody generator
- ◆ Speech/Dual tone melody mixer is provided which SN6A511 series can play speech and dual tone melody simultaneously
- ◆ Fixed current D/A output is provided to drive external connected transistor for sound output
- ◆ PWM output is provided to drive external connected piezo buzzer

■ **PIN ASSIGNMENT**

Symbol	I/O	Function Description
SEG1 ~ SEG56	O	Segment1~ 56 for LCD driver
SEG57/P53 ~ SEG60/P50	O	Optional to be Segment57 ~ 60 or P53-P50 Seg57-60: segment57 ~ 60 for LCD driver. P53-P50: bit3-bit0 for output port 5.
SEG61/P43 ~ SEG64/P40	O	Optional to be segment61 ~ 64 or P43-P40 SEG61-64: segment61 ~ 64 for LCD driver. P43-P40: Bit3-bit0 for output port 4.
COM1-COM16	O	Com1-Com16 for LCD driver.
GND	I	Negative power supply.
P33-P30	I/O	Bit 3 to bit 0 of IO port 3.
P23-P20	I/O	Bit 3 to bit 0 of IO port 2.
BU1,BU2	O	Buzzer driver outputs.
VO	O	D/A current output.
RST	I	Reset pin with internal pull low.
OSC	I	Oscillation component connection pin.
TEST	I	For testing only.
XIN,XOUT		32768 Hz Crystal connection pins.
V <sub>DD</sub>	I	Positive power supply.
VLCDR		LCD voltage adjusting pin.
VLC1-VLC4		LCD voltage bias connection pins.
WSUB	I	Well substrate of chip. Connected to the highest voltage of chip (VDD or VLCDR).

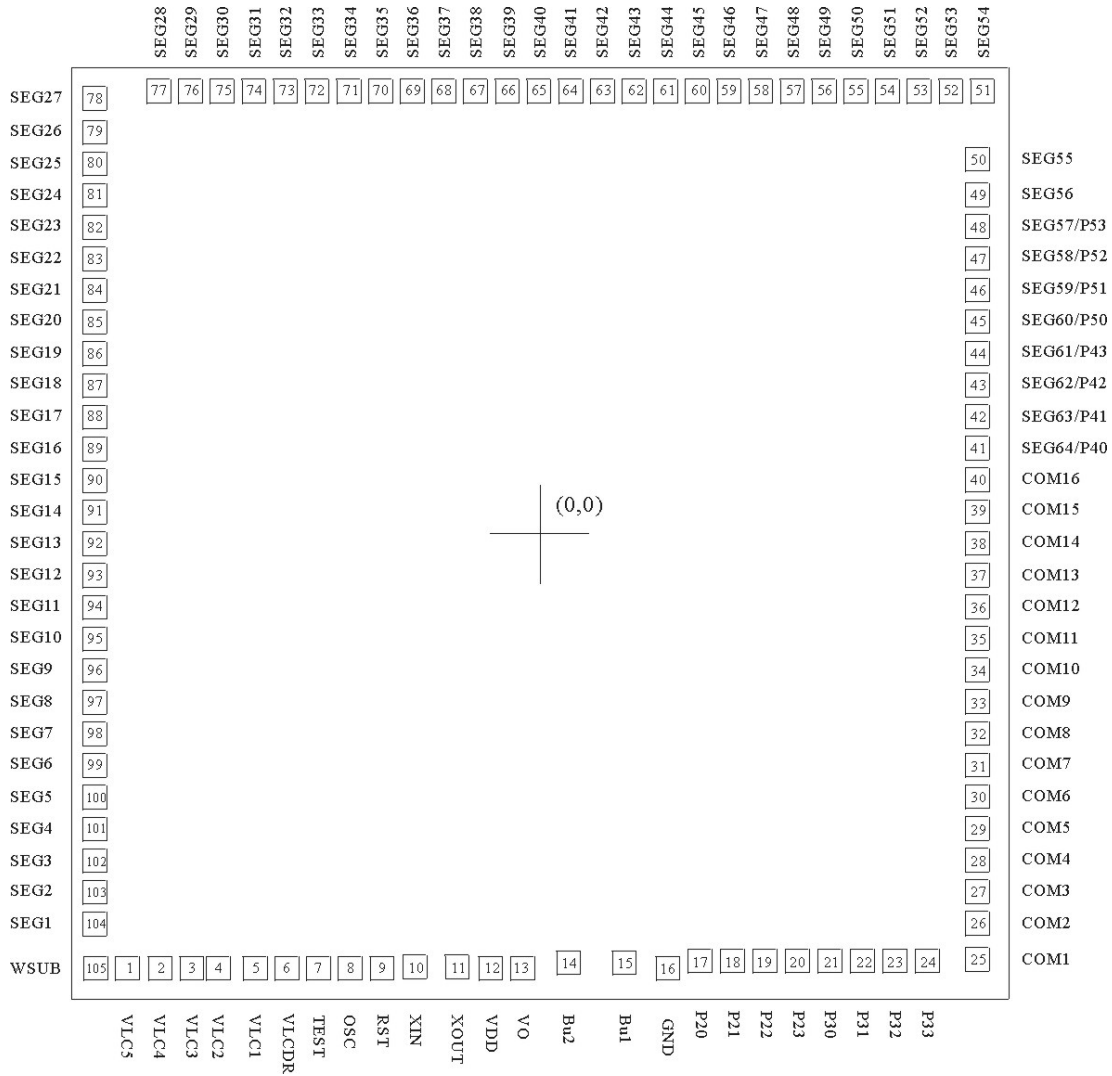
**■ ABSOLUTELY MAXIMUM RATING**

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 CHARACTERISTIC**

Item	Sym.	Min.	Typ.	Max.	Unit	Condition
Operating Voltage	$V_{DD}$	2.4	3.0	5.1	V	
Standby current 1	$I_{SBY1}$	-	-	1.0	$\mu A$	$V_{DD}=3V$ , both system clk and 32768 Hz clk are off
Standby current 2	$I_{SBY2}$	-	20	50	$\mu A$	$V_{DD}=3V$ , system clk is off, 32768 Hz clk is on for LCD display and timer.
Operating current	$I_{OPR}$	-	350	500	$\mu A$	$V_{DD}=3V$ , 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,P4,P5	$I_{OD}$	-1.5	-2	-	mA	$V_{DD}=3V, V_O=2.6V$
Large Sink current of P2,P3,P4,P5	$I_{OS1}$	2.0	3	-	mA	$V_{DD}=3V, V_O=0.4V$
Small Sink current of P2,P3,P4,P5	$I_{OS2}$	-	0.4	-	$\mu A$	$V_{DD}=3V, V_O=0.4V$
D/A output current	$I_{VO}$	2.0	3.0	4.0	mA	$V_{DD}=3V, V_O=0.7V$
Buzzer drive current	$I_{BZD}$		-15		mA	$V_{DD}=3V, V_O=1.5V$
Buzzer sink current	$I_{BZS}$		15		mA	$V_{DD}=3V, V_O=1.5V$
Oscillation resistor	R	-	1.0	-	MHZ	$V_{DD}=3V$
Oscillation Freq.	$F_{OSC}$	-	1.0	-	MHz	$V_{DD}=3V$

■ **BONDING PAD**



**SN6A511**

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.