

■ INTRODUCTION

SN6A509 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 96k*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 SN6A509 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	0	Segment1~ 56 for LCD driver				
SEG57/P53 ~	0	Optional to be Segment57 ~ 60 or P53-P50				
SEG60/P50		Seg57-60: segment57 ~ 60 for LCD driver.				
		P53-P50: bit3-bit0 for output port 5.				
SEG61/P43 ~	0	Optional to be segment61 ~ 64 or P43-P40				
SEG64/P40		SEG61-64: segment61 ~ 64 for LCD driver.				
		P43-P40: Bit3-bit0 for output port 4.				
COM1-COM16	0	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	0	Buzzer driver outputs.				
VO	0	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_{DD}	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).				



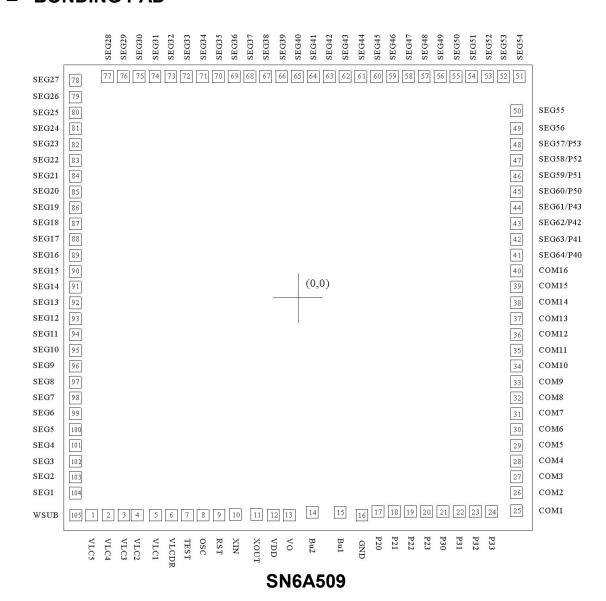
■ ABSOLUTELY MAXIMUM RATING

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	T_OP	-20.0	70.0	°C
Temperature				
Storage Temperature	T _{STG}	-55.0	125.0	°C

■ ELECTRICAL CHARACTERISTIC

Item	Sym.	Min.	Тур.	Max.	Unit	Condition
Operating Voltage	V_{DD}	2.4	3.0	5.1	V	
Standby current 1	I _{SBY1}	1	-	1.0	иA	V_{DD} =3V,both system clk and 32768 Hz clk are off
Standby current 2	I _{SBY2}	-	20	50	иA	V_{DD} =3V, system clk is off, 32768 Hz clk is on for LCD display and timer.
Operating current	I _{OPR}	1	350	500	иA	V _{DD} =3V, no load
Input current of ,P2,P3	I _{IH}	ı	3.0	10.0	иA	V_{DD} =3 V , V_{IN} =3 V
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	ı	mA	V_{DD} =3V, V_{O} =0.4V
Small Sink current of P2,P3,P4,P5	I _{OS2}	-	0.4	-	иA	$V_{DD} = 3V, V_{O} = 0.4V$
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	ı	MHZ	V _{DD} =3V
Oscillation Freq.	Fosc	-	1.0	-	MHZ	V _{DD} =3V

BONDING PAD



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



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