Preliminary W522AXXX DATA SHEET

Winbond Electronics Corp.

PWM SYNTHESIZER

GENERAL DESCRIPTION

W522AXXX is a synthesis IC that utilizes the 8-bit PCM coding method to generate high quality voice effects. In order to save power, the W522AXXX provides PWM output to drive speaker directly without extra transistor and resistor.

The W522AXXX's part number and corresponding duration time at various sampling rate listed as below:

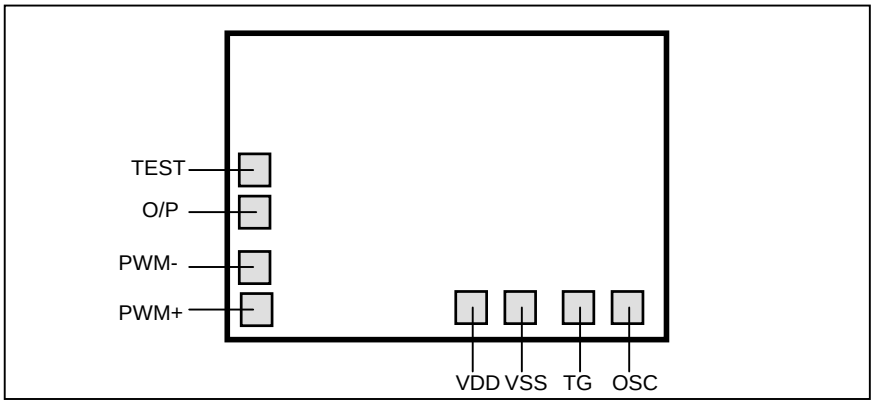
Part number	Duration @ 4KHz	Duration @ 4.8KHz	Duration @ 6KHz	Duration @ 8KHz
W522A008	12.00 seconds	10.00 seconds	8.00 seconds	6.00 seconds
W522A010	16.00 seconds	13.00 seconds	10.50 seconds	8.00 seconds

FEATURES

- Wide operating voltage range: 2.4 to 5.5 volts
- 8-bit PCM algorithm for high sound quality
- PWM output to directly drive speaker
- Provides 1 direct trigger input (including CDS control circuit) with following mask option of play modes:
  - One shot (enable or disable interruption)
  - Toggle ON/OFF
  - Level hold
  - Complete cycle level hold (enable or disable interruption)
  - Single cycle level hold
- Provides 1 output with following mask options:
  - Active high or low in BUSY signal output while voice playing (not including silence)
  - LED flash type: 1.5Hz, 3Hz or 6Hz.
  - LED volume control: ¼, ½, ¾.
- Maximum duration (voice duration + silence) in repeat cycle is around 21 seconds at 6 KHz
- Repeat number 1 to 8 can be mask optioned for both one shot and single-cycle level hold
- Two kinds of trigger input de-bounce time (10 mS or 50 μS) by mask option
- Four kinds of frequencies, 4/4.8/6/8 KHz, can be chosen by mask option

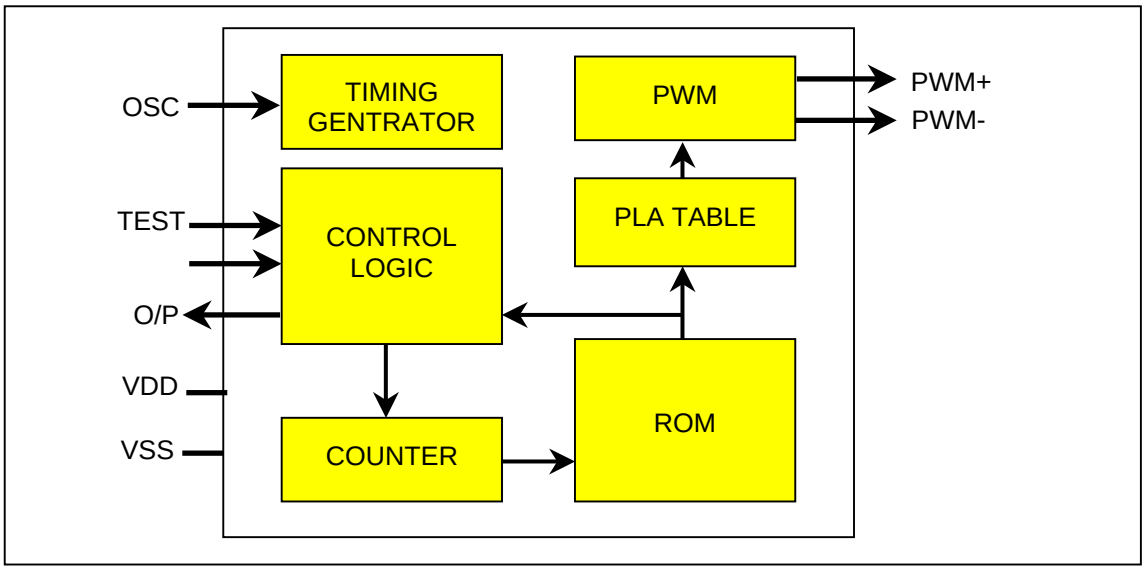
Publication Release Date: May. 2002

PIN DESCRIPTION



PIN NAME	I/O	DESCRIPTION
TEST	I	Test pin with internally pull-high
O/P	O	Output: BUSY, LED flash by mask option
PWM+/PWM-	O	PWM driver positive/negative output
VDD	Power	Positive power supply for oscillator, logical cells and PWM driver
VSS	Ground	
TG	I	Trigger input
OSC	I	Resistor of ring oscillator is connected between OSC and VDD

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	CONDITIONS	RATED VALUE	UNIT
Power Supply	V_{DD}–V_{SS}	-	-0.3 to +7.0	V
Input Voltage	V_{IN}	All Inputs	V_{SS} -0.3 to V_{DD} +0.3	V
Storage Temp.	T_{STG}	-	-55 to +150	°C
Operating Temp.	T_{OPR}	-	0 to +70	°C

Note: Exposure to conditions beyond those listed under Absolute Maximum Ratings may adversely affect the life and reliability of the device.

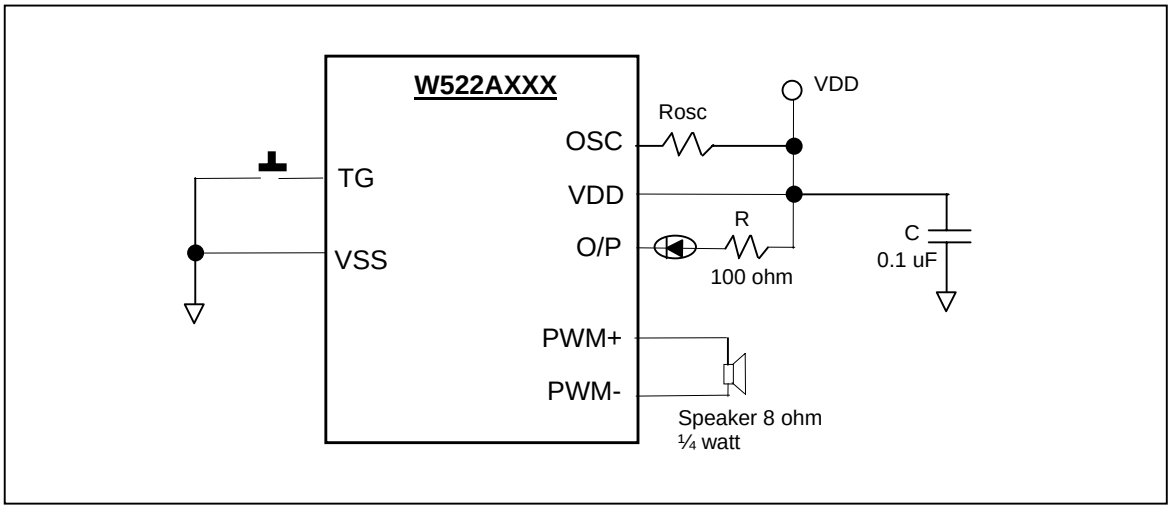
ELECTRICAL CHARACTERISTICS

(T_A = 25° C, V_{SS} = 0 V)

PARAMETER	SYM.	CONDITIONS	LIMITS			UNIT
			MIN.	TYP.	MAX.	
Operating Voltage	V_{DD}	-	2.4	3	5.5	V
Input Voltage	V_{IL}	All Input Pins	V_{SS}-0.3	-	0.3*V_{DD}	V
	V_{IH}		0.7 V_{DD}	-	V_{DD}	
Standby Current	I_{DD1}	V_{DD} = 3V, No Playing	-	-	1.0	μA
	I_{DD2}	V_{DD} = 4.5V, No Playing	-	-	1.0	
Operating Current	I_{OP1}	V_{DD} = 3V, No Load	-	-	4	mA
	I_{OP2}	V_{DD} = 5V, No Load	-	-	8	
Input Current for TG	I_{IN}	V_{DD} = 3V, V_{IN} = 0V	4	8	12	μA
Input Current TEST	I_{TEST}	V_{DD} = 3V, V_{TEST} = 3V	6	10	20	μA
PWM drive current	I_{PD}	V_{DD} = 3V, R_L = 8 Ω	-130	-	-	mA
PWM sink current	I_{PS}	V_{DD} = 3V, R_L = 8 Ω	130	-	-	mA
Output Current	I_{OL}	V_{DD} = 3V, V_{OUT} = 1V	10	-	-	mA
	I_{OH}	V_{DD} = 3V, V_{OUT} = 2V	-5	-	-	
Oscillation Freq.	F_{OSC}	V_{DD} = 3V, R_{OSC} = Typ.	2.7	3	3.3	MHz
		V_{DD} = 4.5V, R_{OSC} = Typ.	2.7	3	3.3	
Oscillation Freq. Deviation by Voltage Drop	$\frac{\Delta F_{OSC}}{F_{OSC}}$	[F(5.5V)-F(2.4V)]/F(2.4V)	-	-	10	%

Note: Rosc = typical value = 510K ohm

APPLICATION CIRCUIT



Notes:

1. In principle, the playing speed determined by Rosc should correspond to the sampling rate during the coding phase. The playing speed may be adjusted by varying Rosc. The typical value of Rosc is 510K ohm.
2. The capacitor, C (0.1uF), shunted between VDD and VSS is necessary for PWM output.
3. R is used to limit the current on the LED.
4. No warranty for production.

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Publication Release Date: May. 2002