佑華微電子股份有限公司

AM9CC SERIES
Data sheet

佑華微電子股份有限公司
新竹市光復路二段295號9樓之1號
電話: 03-573 6660
傳真: 03-573 6661
www.ealpha.com.tw

Alpha Microelectronics Corp.
9F-1, 295, Sec. 2, Kuang Fu Rd., Hsinchu, Taiwan
Tel : +886-3-573 6660
Fax: +886-3-573 6661

Rev 2.1 2002/10/29

一般規格:

AM9CC0036, AM9CC0038乃一單晶CMOS VLSI語音合成器，它以LOGPCM編碼方式，合成長達3.5秒之語音。藉由製造過程中更換光罩，將客戶需要之語音資料編寫入ROM中。

特性：

1. 單一工作電壓範圍爲2.4 - 5 伏特。

2. 單一語音長度可達3.5秒。

3. 其中每一段的長度 (語音+靜音時間) 最多可達5.3秒。(在6kHz採樣頻率下)。

4. 具有60個語音格(voice_step)，可規劃成4 語音組(sub_table)。

5. 四個單獨觸發輸入：(TG1 - TG4)每一個輸入對應一組語音格，內含電阻式史密特輸入(270k-1M)外接光敏電阻(CDS)使用。

   ◎優先順序：TG1>TG2>TG3>TG4。
   【註：優先順序乃訊號同時出現時，會按上述符號順序，優先播放】

   ◎防止誤動作(DEBOUNCE)時間：10ms-提供一般手動操作；
   50us-提供跳動開關使用。

6. 播放模式的光罩選擇：

   □邊緣觸發 / □位準觸發 (EDGE/LEVEL)
   □保持 / □非保持 (HOLD/UNHOLD)
   □後段蓋前段 / □非後段蓋前段 (RETRIGGER/IRRETRIGGER).

7. 電流輸出可配合電晶體驅動八歐姆喇叭，有下列三種選擇：
   SMALL 小音量 ：(1.5mA，3V, Full Scale) 低功率應用 (鈕扣型電池搭配)
   MIDDLE 中音量：(3.0mA，3V, Full Scale) 一般典型應用.
   LARGE 大音量 ：(4.5mA，3V, Full Scale) 大音量的應用.

8. STS輸出接腳有下列幾種應用選擇：

STOP訊號：停止播放語音時，將送出一40ms高位準脈衝，用來觸發其它裝置。

LED訊號：SINK 型態。

◎固定 (FIX)：語音播放時發出6Hz,3Hz, 1.5Hz或0.75Hz之訊號閃爍(由光罩選擇決定)。

◎動態 (DYNAMIC)：將使LED隨語音訊號強弱 (1/4、2/4、3/4三種程度，由光罩選擇決定)而閃爍。

※ 對每一支輸入接腳(TG1 ~-TG4)可由光罩選擇STS動作或不動作。

9. 觸發輸入(TG1 --- TG4)具有如下拉低電阻選擇(條件 : VDD = 3V 時)：
1> 1M_CDS, 2> 2M_CDS, 3> 2M_nonCDS, 4> 3.75M_CDS, 5> 3.75M_nonCDS,
6> 6M_CDS, 7> 6M_nonCDS, 8> 8M_CDS, 9> 8M_nonCDS, **A>10M_CDS**
B> 10M_nonCDS.

例如 : 10M_nonCDS：內含 10M 拉低電阻.
10M_CDS：內含電阻式史密特輸入(270k -- 10M), 當 input = low 時輸入阻抗爲 270k , 當 input = high時輸入 阻抗爲 10M。

10. STS 輸出沉入電流具有如下選擇.：
1> 10mA, 2> 60mA

GENERAL DESCRIPTION:

The AM9CC0036, AM9CC0038 is a single-chip synthesizing CMOS VLSI that can synthesize voice up to 3.5 seconds using ALPHA qualified coding algorithm (LOGPCM).
Customer speech data will be edited and programmed into ROM by changing one mask during the device fabrication.

FEATURES:

1. Single power supply can operate from 2.4v through 5v.

2. The total voice duration is about 3.5 seconds and could be partitioned up to four voice sections.

3. Voice + mute length could up to 5.3 seconds (6k sampling rate).

4. One 60 voice-steps table could be partitioned up to 4 groups of voice step.

5. 4 trigger input (TG1; TG2; TG3; TG4): each input correspond to one group of voice-step in the table.
with resistive schmitt input (270K---1M) for CDS interface.
This four trigger have following priority during trigger or level repeat : TG1>TG2>TG3>TG4.
Has two debounce time option: 10 ms - for human interface; 50 us - for bouncing switch.

6. Playing mode mask option: EDGEL/LEVEL, HOLD/UNHOLD, RETRIGGER/IRRETRIGGER.

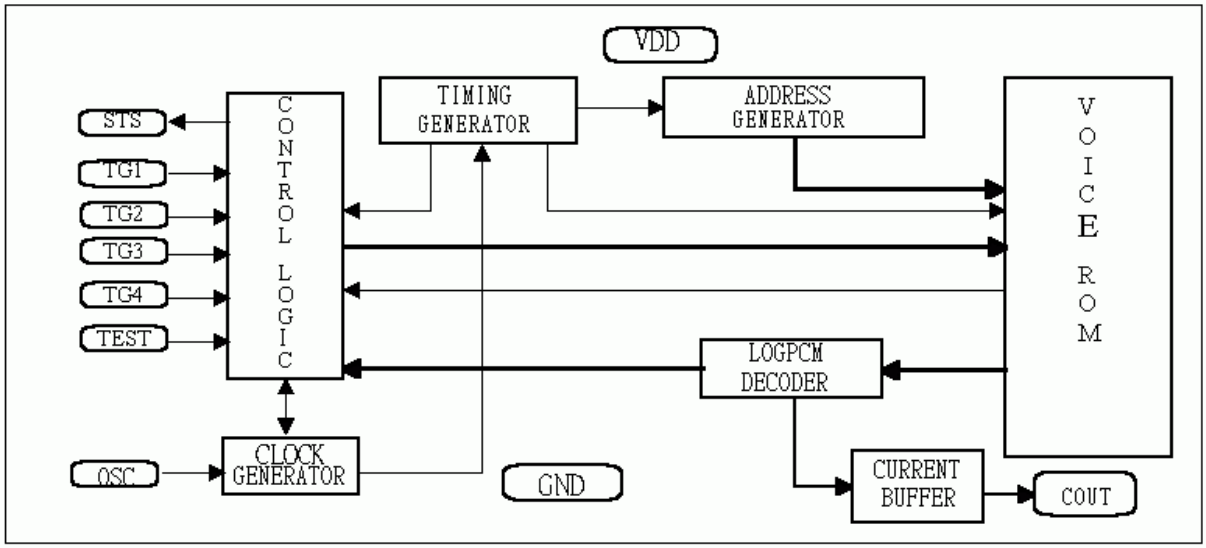
7. Current output could drive 8 ohm speaker with a transistor, has following options:
SMALL: (1.5mA, 3V, full scale) low power application (button cell battery application).
MIDDLE: (3.0mA, 3V, full scale) typical application.
LARGE: (4.5mA, 3V, full scale) large volume application.

8. STS status pad of the device has following option:
STOP: When device stop playing a 40 ms high pulse will output for triggering other device.
LED: sink type > FIX --- 6Hz, 3Hz, 1.5Hz, 0.75Hz.DC (mask option) signal during playing.
> Dynamic --- three levels (1/4, 2/4, 3/4; mask option) depend on voice amplitude.
For each trigger input(TG1 - TG4), STS could be mask-option selected as active or inactive.

9. For each trigger input (TG1 - TG4), having following pull down resistance option: (condition: at Vdd =3v).
1> 1M_CDS, 2> 2M_CDS, 3> 2M_nonCDS, 4> 3.75M_CDS, 5> 3.75M_nonCDS, 6> 6M_CDS,
7> 6M_nonCDS, 8> 8M_CDS, 9> 8M_nonCDS, A> 10M_CDS, B> 10M_nonCDS.
Example: 10M_nonCDS --> Having 10M pull down resistance.
10M_CDS --> Including resistance type Schmitt input (270k -- 10M). When input=low, input resistance value is 270k. When input=high, input resistance value is 10M.

10. STS output sink current: having following option :
1> 10mA, 2> 60mA

BLOCK DIAGRAM:



ABSOLUTE MAXIMUM RATING:

SYMBOL	RATING	UNIT
VDD~VSS	-0.5~+7.0	V
VIN (FOR ALL INPUT)	VSS-0.3<VIN<VDD+0.3	V
VOUT (FOR ALL OUTPUT)	GND<VOUT<VDD	V
T (OPERATING)	0~+70	℃
T (STORAGE)	-25~+75	℃

DC CHARACTERISTICS:

SYMBOL	PARAMETER		MIN.	TYP.	MAX.	UNIT	CONDITION
VDD	OPERATING VOLTAGE		2.4	3	6	V	
Isb	SUPPLY CURRENT	STANDBY			0.1	uA	VDD=3V ,I/O OPEN (WITH Rosc)
Iop		OPERATING			200		
Iih	TG				15	uA	VDD=3V WITH 1M_CDS
Iil				0			
Ico	CURRENT OUT (FULL SCALE)		-1.2	-1.5	-1.8	mA	VDD=3V, V O/P=0.7V
			-2.4	-3	-3.6		
			-3.6	-4.5	-5.4		
Ioh	OUTPUT CURRENT LED / STP			1.6		mA	VDD=3V, V O/P=0V
Iol			8	10	12		VDD=3V, V O/P=3V option = 10 mA
Iol				60			VDD=3V, V O/P=3V option = 60 mA
dF/F	FREQUENCY STABILITY		-10		10	%	$\frac{Fosc(3v)-Fosc(2.4v)}{Fosc\ (3v)}$
dF/F	Fosc VARIATION		-10		10	%	VDD=3V,Rosc=300K

PIN DESCRIPTION:

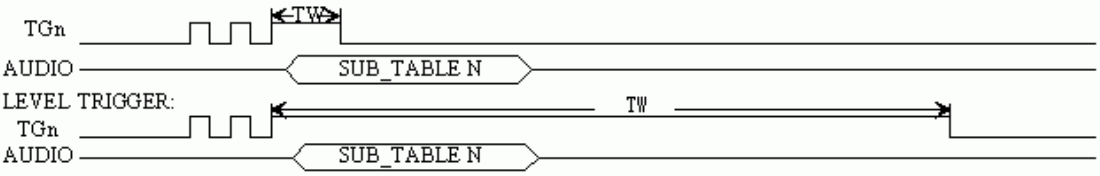
PAD NAME	PIN ATTR.	FUNCTION
VDD;VSS	POWER	POSITIVE POWER SUPPLY; NEGATIVE POWER SUPPLY.
OSC	I	OSCILLATOR INPUT (300K ohm CONNECT TO VDD).
TEST	I	TEST PAD,FOR PRODUCTION TESTING (TEST HIGH FOR TESTING)
TG1_4	I	TRIGGER INPUT, INTERNAL PULL LOW (HIGH ACTIVE).
COUT	O	CURRENT TRISTATE OUTPUT, FOR DRIVING SPEAKER..
STS	O	STATUS OUTPUT, FOR LED OR STOP PULSE.

TIMING DIAGRAM:

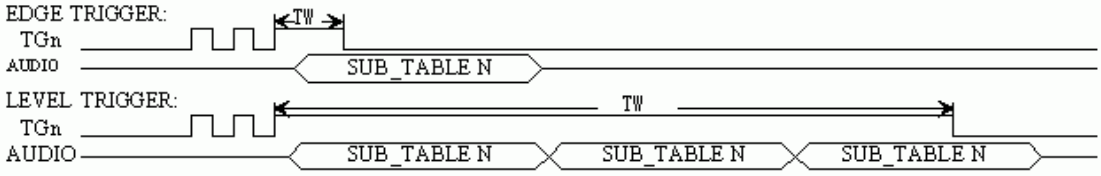
1.>EDGE/LEVEL

EDGE MODE:

EDGE TRIGGER:



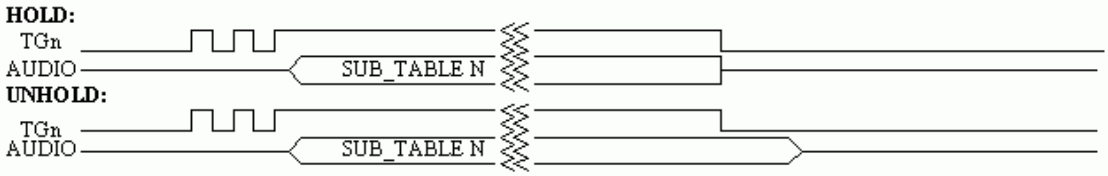
LEVEL MODE:



* NOTE:Tw IS THE MINIMUM INPUT PULSE WIDTH > DEBOUNCE TIME (10 ms or 50 us)

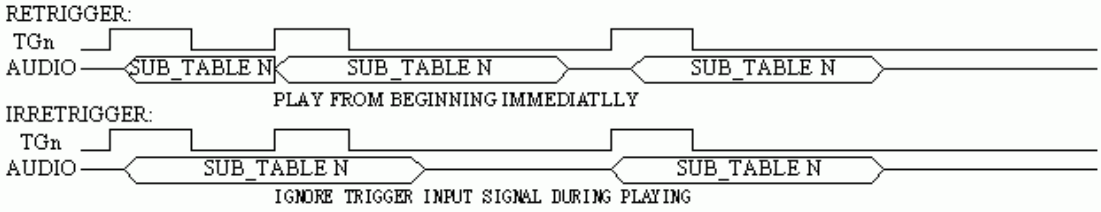
2.>HOLD/UNHOLD

HOLD:

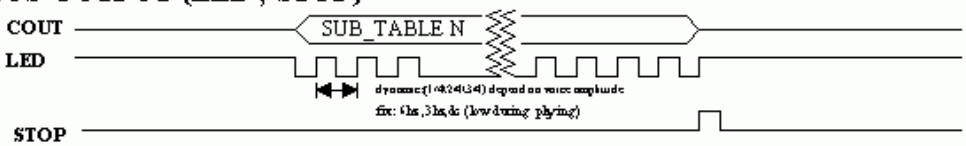


*NOTE:BOTH EDGE AND LEVEL HAVE HOLD AND UNHOLD OPTION.

3.>RETRIGGABLE/IRRETRIGGABLE

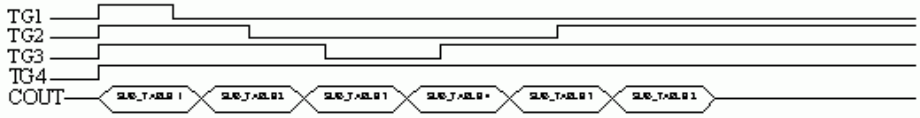


4 > STATUS OUTPUT (LED ; STOP)



NOTE: every new beginning of voice section will reset status signal.

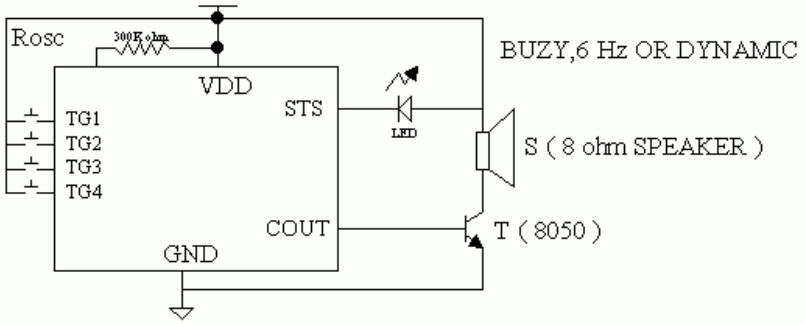
5 > PRIORITY



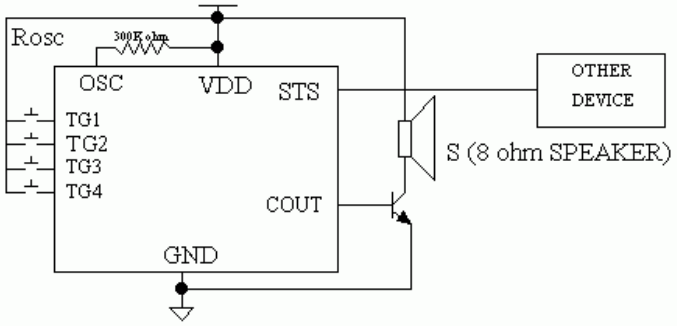
NOTE : PRIORITY TG1>TG2>TG3>TG4

The device will detect the input priority at start playing and level trigger repeat.

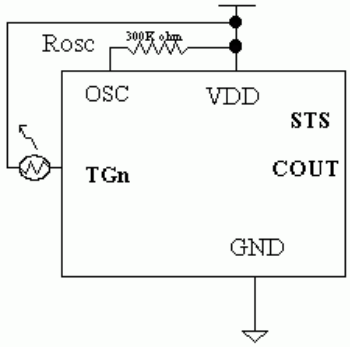
A> USE LED OUTPUT PULSE TO DRIVE LED.



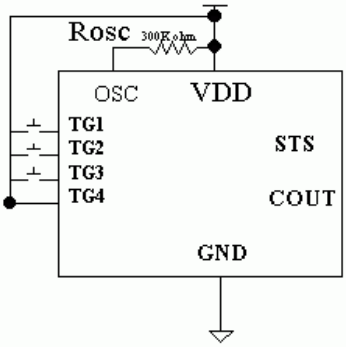
B> USE STOP PULSE TO TRIGGER OTHER DEVICE



C> CDS INTERFACE .



D> POWER ON TRIGGER .

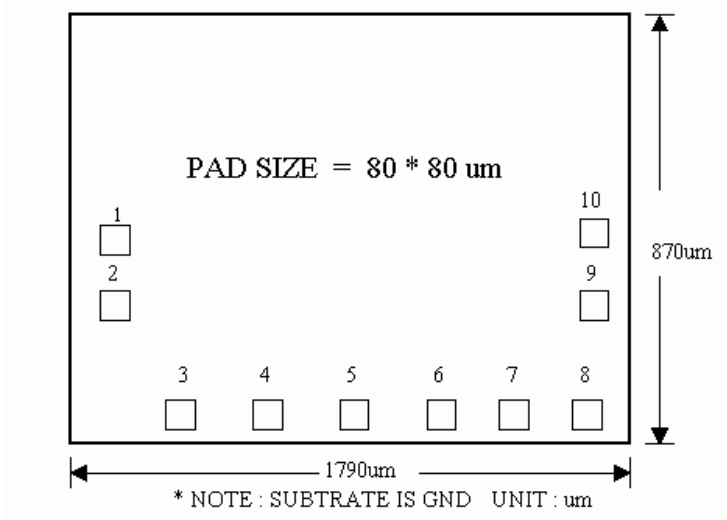


NOTE: Rosc=300K ohm (TYPICAL) , T bata=100(TYPICAL).

OPTION TABLE :

FUNCTION	OPTION
10 ms / 50 us	MASK OPTION
EDGE / LEVEL	MASK OPTION
HOLD / UNHOLD	MASK OPTION
RETRIGGERABLE / IRTRIGGERABLE	MASK OPTION
STOP / 6Hz / 3Hz /1.5HZ/0.75HZ DC/ 1/4 / 2/4 / 3/4	MASK OPTION
SMALL / MIDDLE / LARGE	MASK OPTION
60mA / 10mA (STS OUTPUT SINK CURRENT)	MASK OPTION
TRIGGER INPUT PULL DOWN RESISTANCE	MASK OPTION

BONDING DIAGRAM :



TYPE		AM9CC0036 AM9CC0038	
PIN NO.	**NAME**	**X**	**Y**
1	VDD	-627.25	22.36
2	OSC	-618.83	-251.16
3	TEST	-487.4	-251.16
4	TG1	-355.97	-251.16
5	TG2	-224.54	-251.16
6	TG3	-93.11	-251.16
7	TG4	38.97	-251.16
8	STS	169.1	-251.16
9	COUT	628.75	237.9
10	GND	626.8	-73

*** NOTE : all data and specifications are subject to change without notice.**