

OTP 语音芯片 IC-应用原理资料接线图 (AC8040)OTP40 秒



语音芯片开发-深圳市环芯半导体有限公司

电话 Tel: 0755-28149272

086-18922809111

掩膜 OTP: 主营 语音芯片, 玩具 IC, 录音 IC, 门铃 IC, 音乐芯片

邮箱 QQ: 68681298@qq.com

Http://www.ATChip.Com

u Description

AC8040 is a 40 Sec. PWM or DAC voice output with high quality speech ,2 input pin and 6 I/O pin simple speech.40 Sec. Voice Length at 6 KHz sampling and 4 bit hardware compression. Built-in oscillator for system clock without an external resistor. Maximum 64 voice groups. One Group contain several steps(voice section); Maximum 700 steps for all the Groups. User selectable 8bit / 5bit / 4 bit data compression. Support three mode trigger function (Stand Alone, Serial Trigger Mode, CPU Command Mode). Easy use development system is for function selection and voice combination . PC download the ROM code by the USB Port .

u Functions

- I MAX voice file : 700
- I MAX Groups : 64
- I MAX Step : 700
- I Signal step mute length : 0.64 s (6k sample rate)
- I Operating Voltage range: 2.4V ~ 5V
- I Total Voice Duration : 40" (240K Samples)
- I Input pin : 2
- I I/O pin : 6
- I Voice output : PWM and DAC
- I Sequential Key : TG1 -> 32 Groups.
TG2 -> 21 Groups.
TG5~TG12-> 1 Group
- I Debounce time : 50 us or 10 ms
- I On/Off function : only for TG1 & TG2
- I Trigger mode (for all Input pins) :
 - Key Stand-alone Trigger Mode :
 - A. Edge/Level
 - B. Hold/Unhold
 - C. Retrigger/Irretrigger
 - Serial Trigger Mode :
Combinations of TG1 and TG5 to trigger maximum 64 Voice Group.

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- CPU Command Mode :

User command through TG1,TG2,TG5 & TG6 with serial CPU Interface to control the Multi-Playback function.

I Output status (for each Output pin):

- A. Stand by Status. (High/Low Status)
- B. Busy Low Active.
- C. Busy High Active.
- D. LED Flash at 6 Hz.
- E. LED Flash at 3 Hz.
- F. LED Flash at 1.5 Hz.
- G. LED Flash at 0.75 Hz.

I Play rate level :

AC8040 can provide different play rate in one code as follow

Play rate(K)	Play rate(K)
3	6
3.2	6.4
3.31	6.85
3.42	7.38
3.55	8
3.69	8.72
3.84	9.6
4	10.66
4.17	12
4.36	13.71
4.57	16
4.8	19.2
5.05	24
5.33	
5.64	

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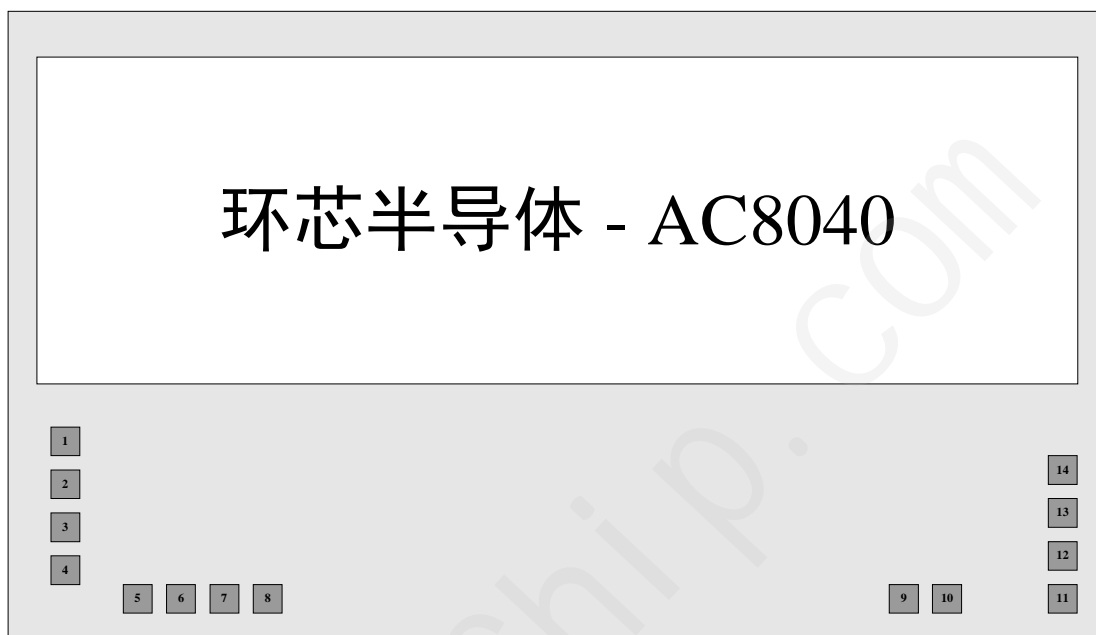
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u AC8040 Pad Location

CHIP SIZE: (0, 0) (1730,1196) UM



NO	PAD NAME	X	Y	NO	PAD NAME	X	Y
1	TG2	-755	-224	8	TG12	-320	-507
2	TG1	-755	-314	9	VSS	192	-507
3	TG5	-755	-404	10	VSS	281	-507
4	TG6	-755	-494	11	PWM2	759	-529
5	TG7	-590	-507	12	PWM1	759	-412
6	TG8	-500	-507	13	VDD	794	-325
7	TG11	-410	-507	14	VDD5	794	-240

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u PIN Descriptions

PIN NAME	I/O	Function
TG1	INPUT	Key Stand-alone Trigger Mode : TG1 is used to trigger the maximum 32 Voice Group one by one sequentially.
		Serial Trigger Mode : TG1 is used to trigger the maximum 64 Voice Group.
		CPU Command Mode : TG1 is used as Data Input Pin (DIO1).
TG2	INPUT	Key Stand-alone Trigger Mode : TG2 is used to trigger the maximum 21 Voice Group one by one sequentially.
		CPU Command Mode : TG2 is used as Clock Pin (CLK).
TG5	INPUT	Key Stand-alone Trigger Mode : TG5 is used trigger Only One Group.
		Serial Trigger Mode : TG5 is used to trigger the maximum 64 Voice Group
		CPU Command Mode : TG5 is used as Data Input Pin (DIO2).
		As a RESET PIN
	OUTPUT	As Output PIN , Output the BUSY or Flash Signal .
TG6	INPUT	Key Stand-alone Trigger Mode : TG6 is used trigger Only One Group.
		CPU Command Mode . TG6 is used as Selected Pin (CS).
	OUTPUT	As Output PIN , Output the BUSY or Flash Signal.
TG7	INPUT	Key Stand-alone Trigger Mode : TG7 is used trigger Only One Group.
	OUTPUT	As Output PIN , Output the BUSY or Flash Signal.
TG8	INPUT	Key Stand-alone Trigger Mode : TG8 is used trigger Only One Group.
	OUTPUT	As Output PIN , Output the BUSY or Flash Signal.
TG11	INPUT	Key Stand-alone Trigger Mode : TG11 is used trigger Only One Group.
	OUTPUT	As Output PIN , Output the BUSY or Flash Signal.
TG12	INPUT	Key Stand-alone Trigger Mode : TG12 is used trigger Only One Group.

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	OUTPUT	As Output PIN , Output the BUSY or Flash Signal.
PWM1	OUTPUT	As a PWM PIN , can Directly drive the Speaker .
PWM2	OUTPUT	As a PWM PIN , can Directly drive the Speaker .
		As a DAC PIN , 8 bit D/A Current Output.
VDD	INPUT	Power Supply PIN
VDD5	INPUT	Power Supply PIN , Connected with VDD @ 2.4~3.6 V Working Voltage.
		Power Supply PIN , Connected with a 0.1 uF to VSS. @3.6~5V Working Voltage.
VSS	INPUT	Connected to Ground.

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AC8040 Application Circuit

AC8040 3V Stand-alone Mode

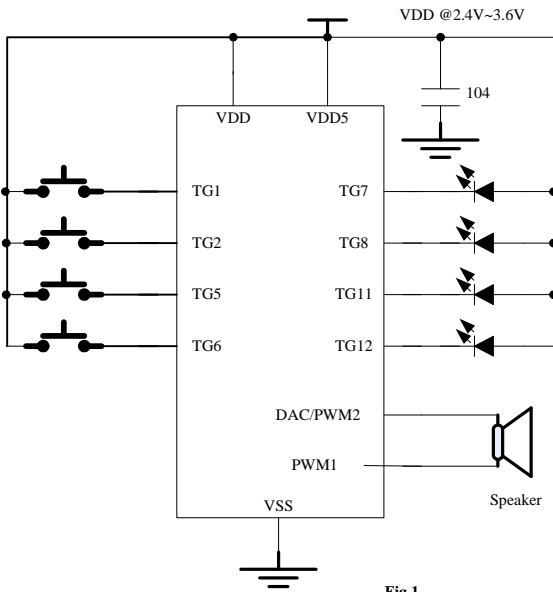


Fig.1

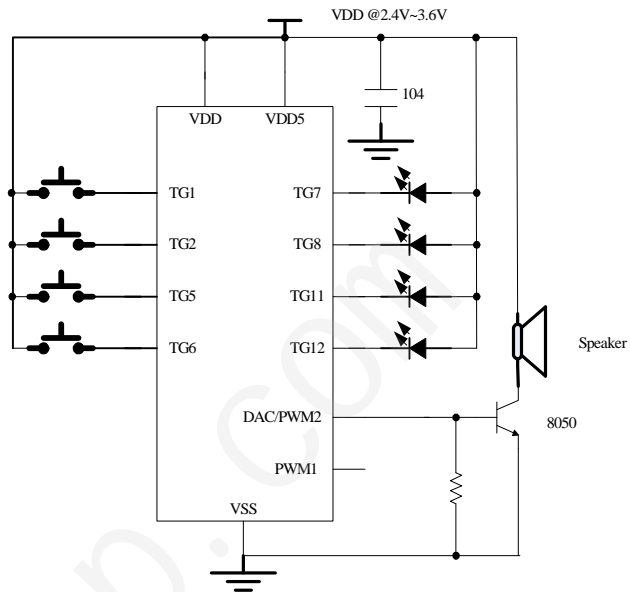


Fig.2

AC8040 5V Stand-alone Mode

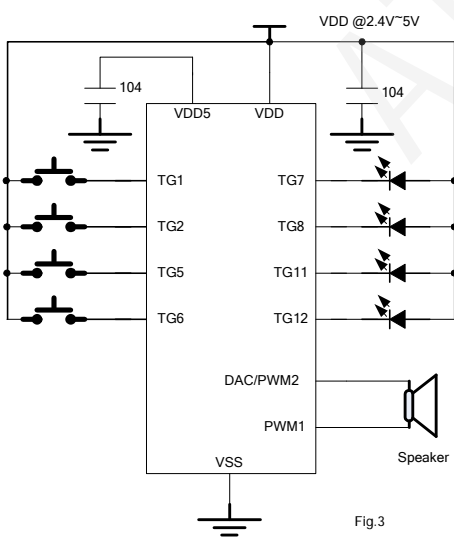


Fig.3

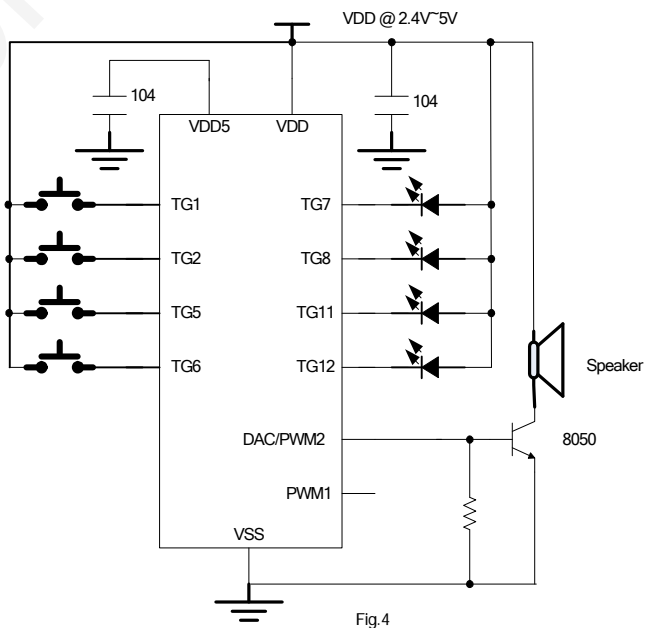


Fig.4

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AC8040 3V Serial Mode

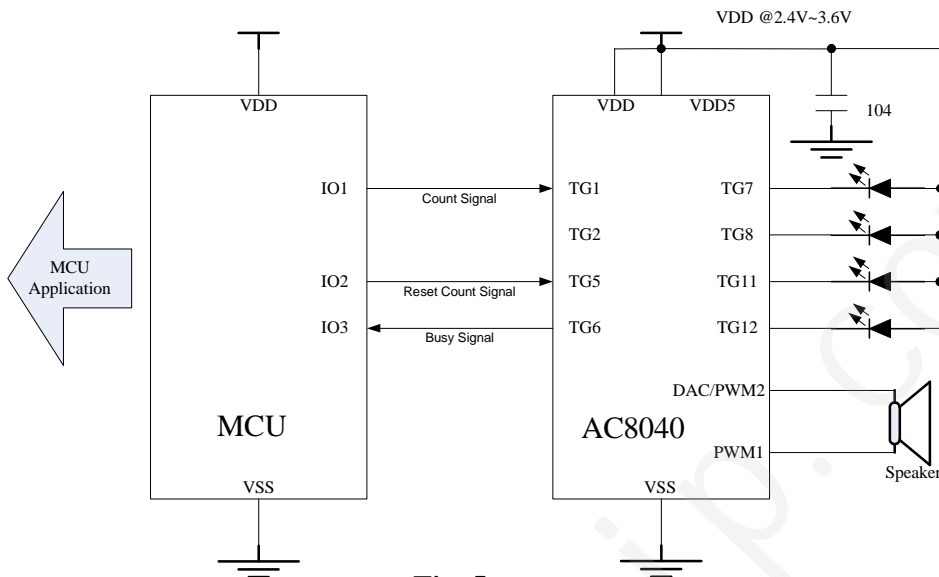


Fig. 5

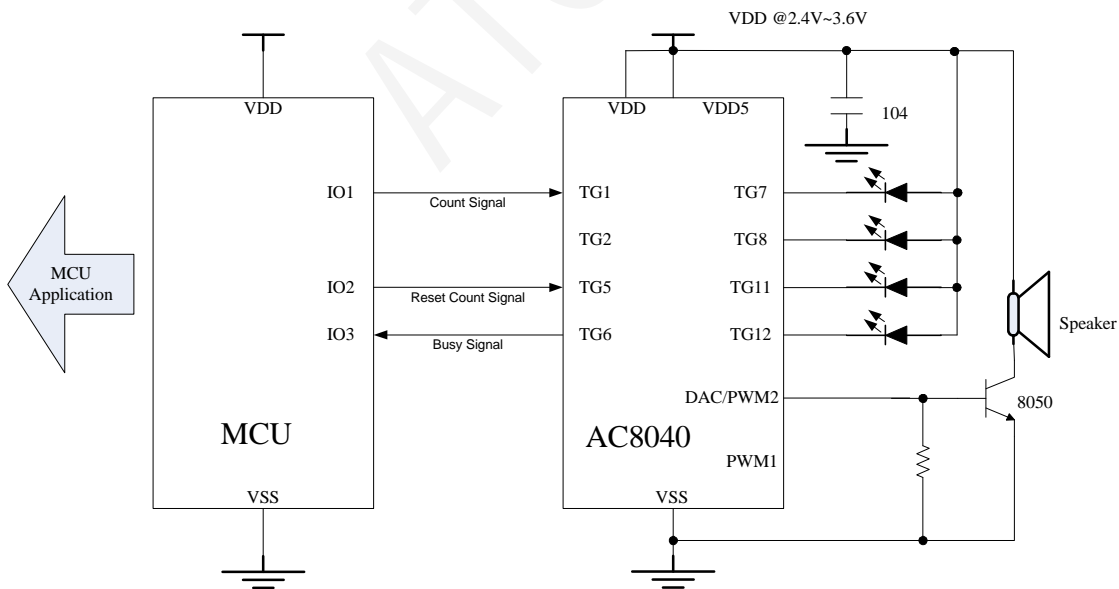


Fig. 6

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AC8040 5V Serial Mode

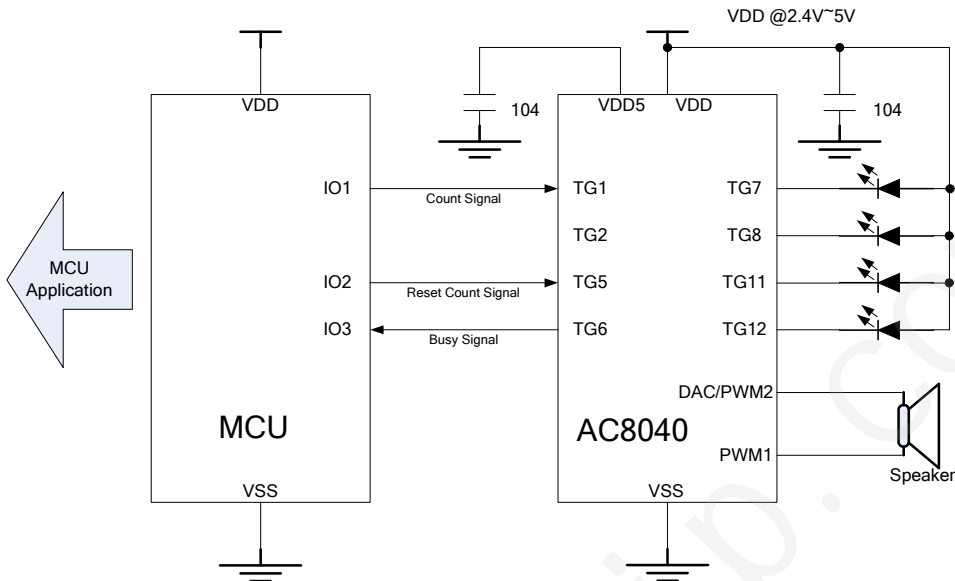


Fig. 7

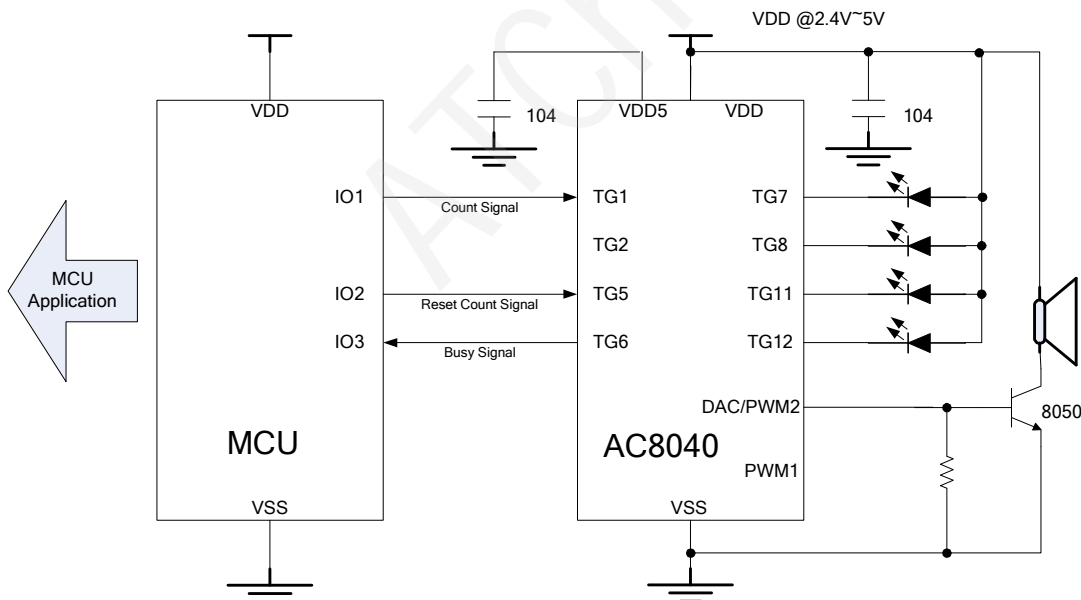


Fig. 8

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AC8040 3V CPU Mode

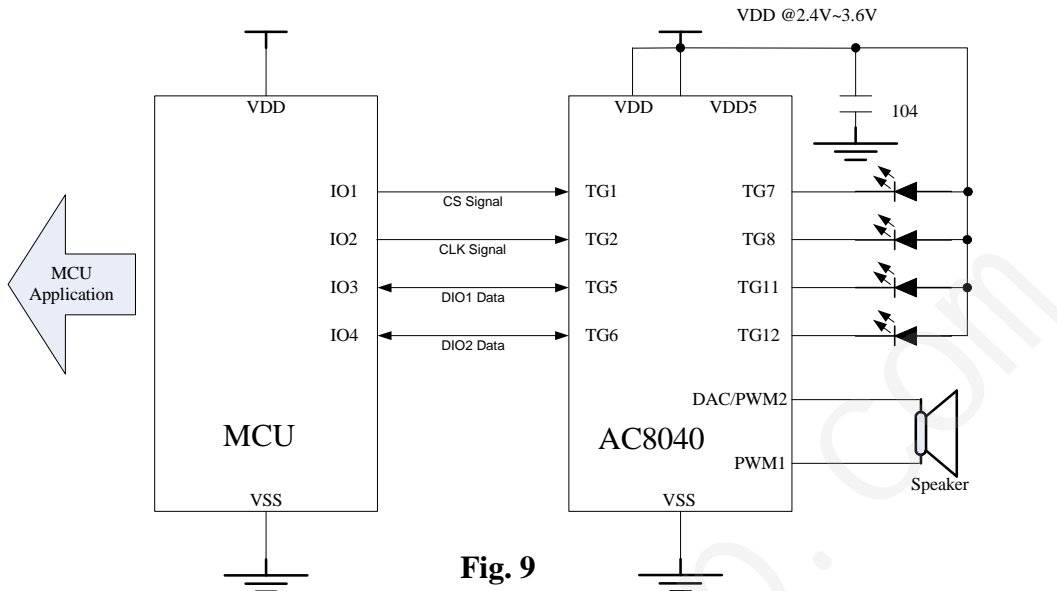


Fig. 9

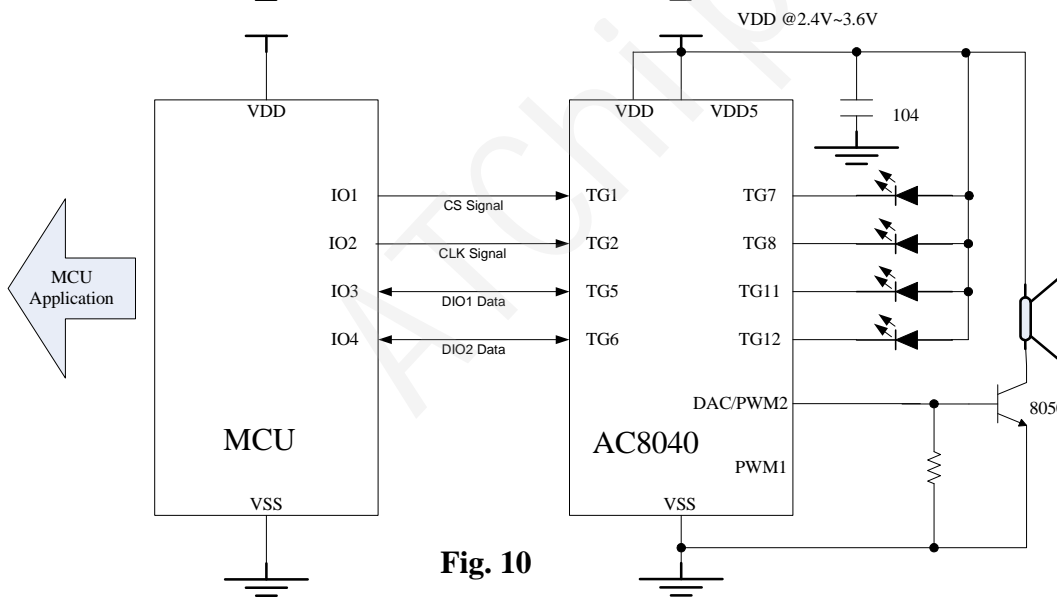


Fig. 10

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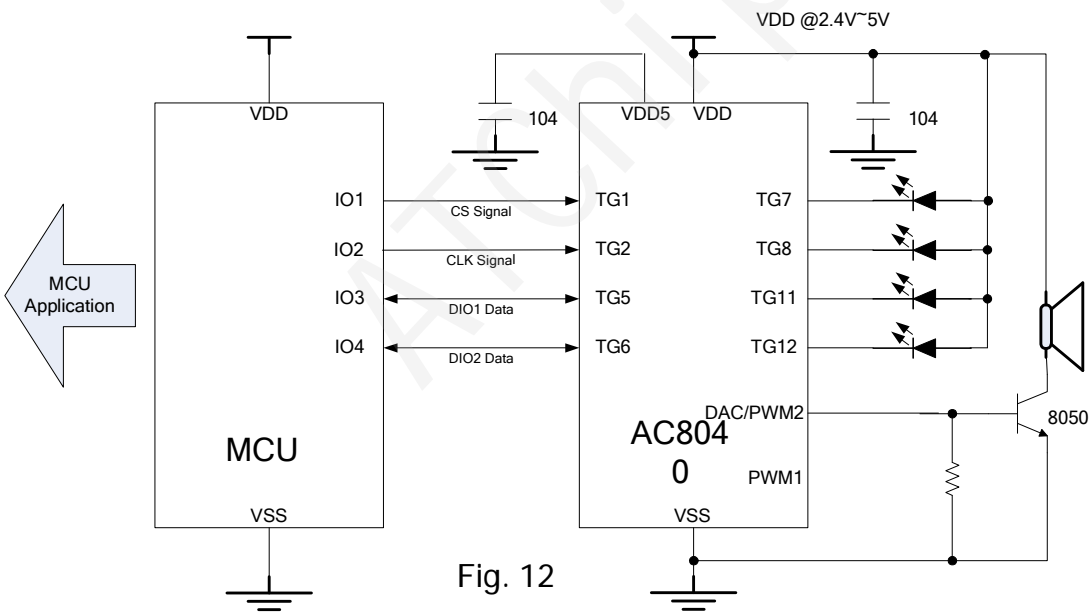
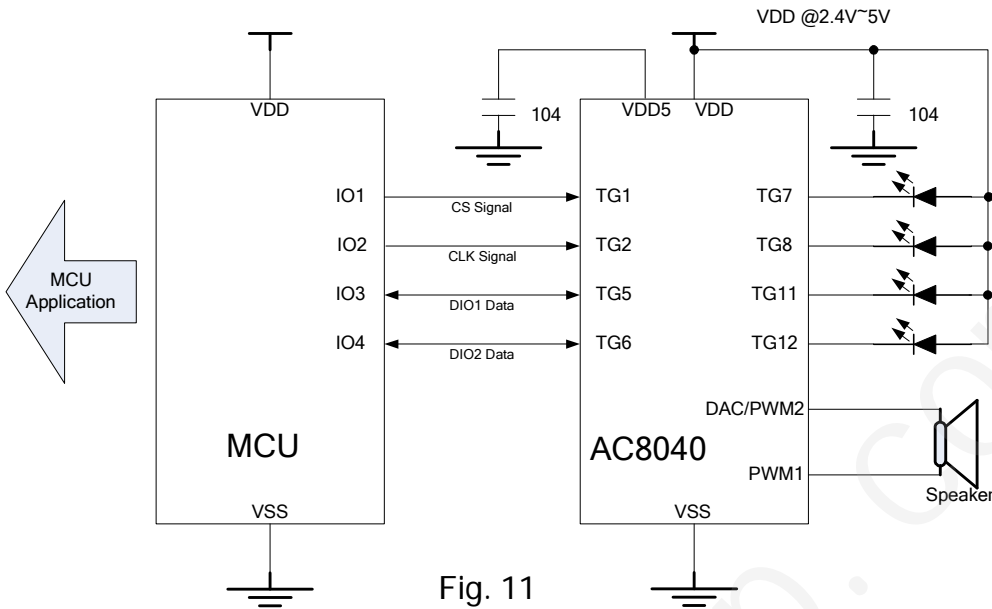
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AC8040 3V CPU Mode



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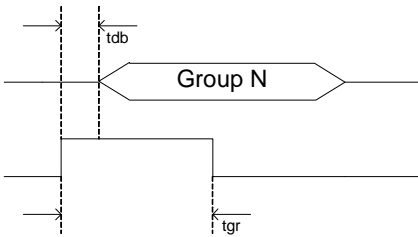
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u AC8040 Trigger Timing

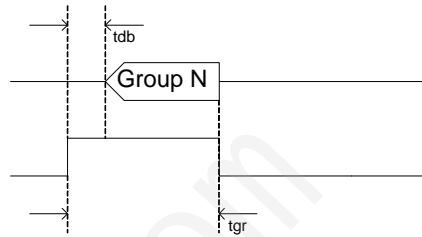
(a) Trigger Pulse Width < Group Length

Option Setting = Edge / Unhold



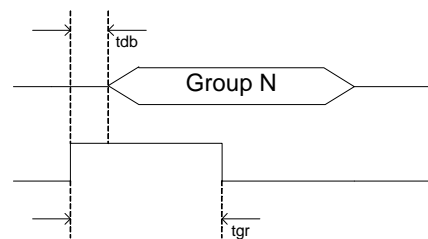
(b) Trigger Pulse Width < Group Length

Option Setting = Edge / Hold



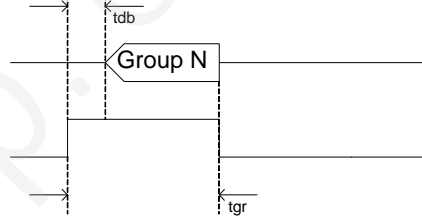
(c) Trigger Pulse Width < Group Length

Option Setting = Level / Unhold



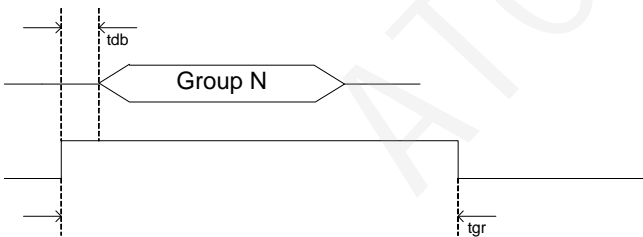
(d) Trigger Pulse Width < Group Length

Option Setting = Level / Hold



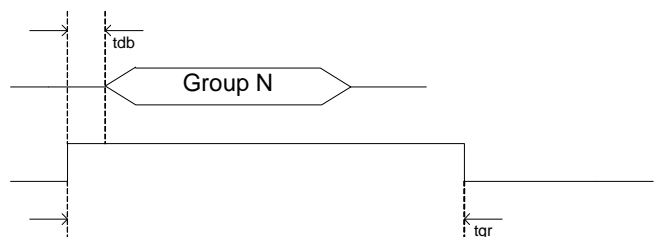
(e) Trigger Pulse Width > Group Length

Option Setting = Edge / Unhold



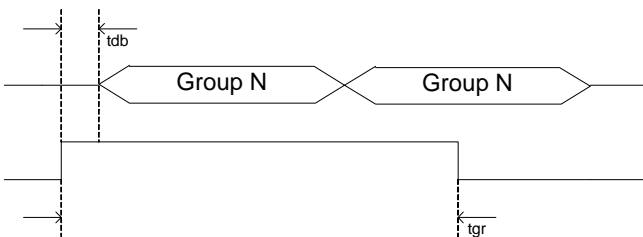
(f) Trigger Pulse Width > Group Length

Option Setting = Edge / Hold



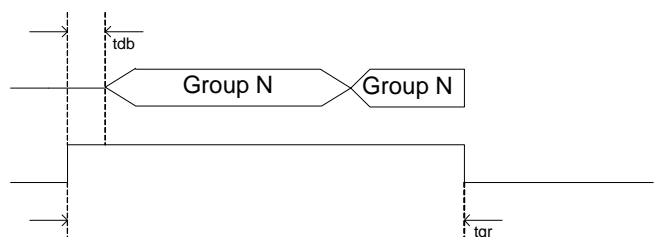
(g) Trigger Pulse Width > Group Length

Option Setting = Level / Unhold



(h) Trigger Pulse Width > Group Length

Option Setting = Level / Hold



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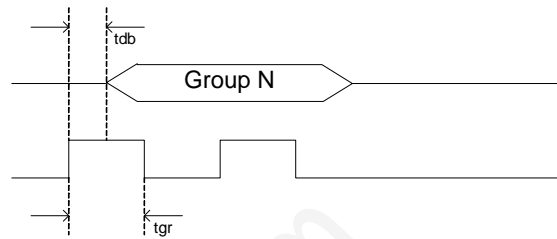
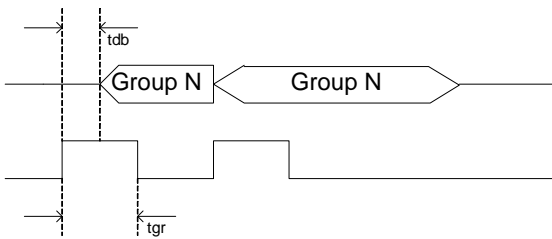
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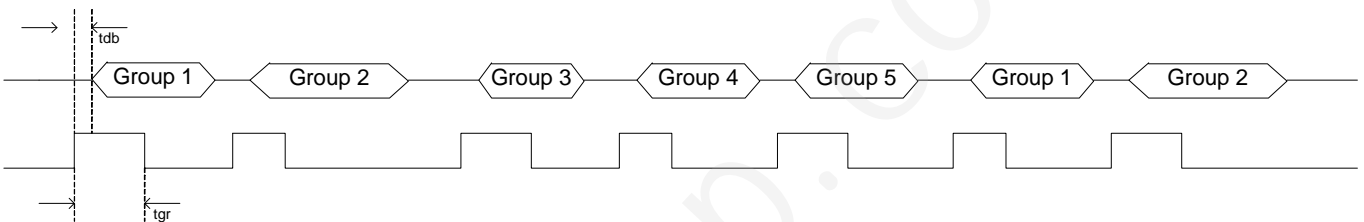
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(i) Option Setting = Retrigger

(j) Option Setting = Irretrigger



(k) TG1 = Sequential Trigger & From Group1~Group5



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u AC8040 Trigger Voice Combination Example

Voice File	Description
Voice File A	Hello (1.5'')
Voice File B	Good Morning (3'')
Voice File C	John (1'')
Voice File D	Tom (1'')
Voice File E	Mary (1.5'')

Group1 = Step1 + Step 2

Group 2 = Step3 + Step 4 + Step 5

Group 3 = Step 6 + Step 7

Group1 = Hello John

Group 2= Hello Tom Good Morning

Group 3 = Good Morning Mary

Step1 = Voice File A

Step 2 = Voice File C

Step 3 = Voice File A

Step 4 = Voice File D

Step 5 = Voice File B

Step 6 = Voice File B

Step 7 = Voice File E

Total use 3 Group , 7 Steps

Voice duration= Hello + Good Morning + John + Tom + Mary

= 1.5'' + 3'' + 1'' + 1'' + 1.5''

= 8''

Total duration = 8'' (40''-8'' = 32'' space are free , can add more Voice File)

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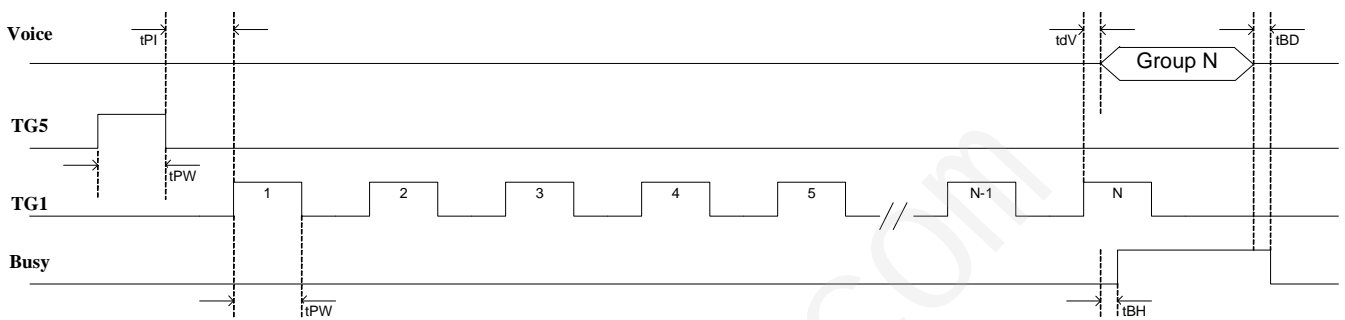
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u AC8040 Serial Mode Timing



TG1=Edge/Unhold/Retriger

TG5=Reset PIN

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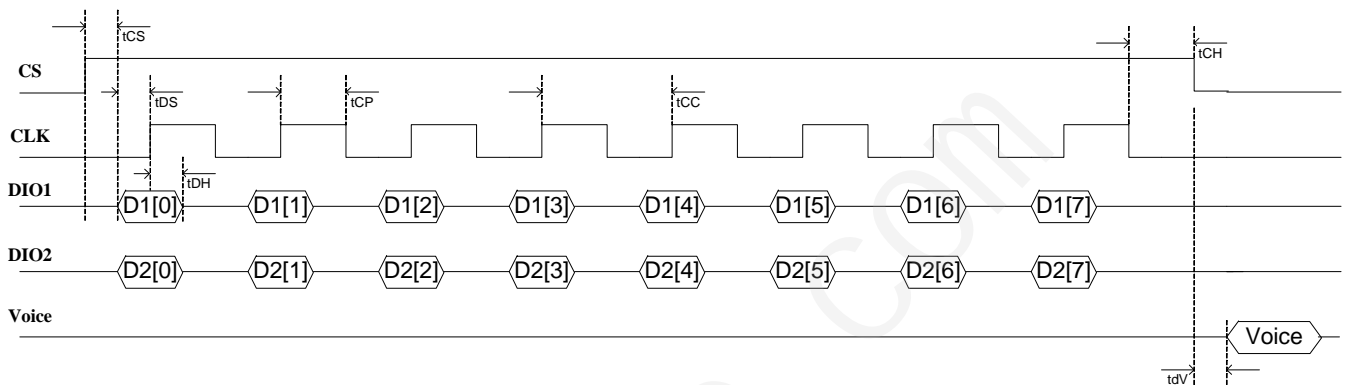
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u AC8040 CPU Mode Timing



Command	PIN	HEX	[7]	[6]	[5]	[4]	[3]	[2]	[1]	[0]	Description
START	DIO1	A5h	1	0	1	0	0	1	0	1	Wake up the chip
	DIO2	05h	0	0	0	0	0	1	0	1	
END	DIO1	81h	1	0	0	0	0	0	0	1	Power down the chip into standby status
	DIO2	05h	0	0	0	0	0	1	0	1	
RESET	DIO1	83h	1	0	0	0	0	0	1	1	Stop the Playback and wait a new command
	DIO2	02h	0	0	0	0	0	0	1	1	
PAUSE	DIO1	83h	1	0	0	0	0	1	0	1	Pause the Playback and hold at the Voice data
	DIO2	07h	0	0	0	0	0	1	1	1	
RESUME	DIO1	05h	0	0	0	0	0	1	0	1	Resume Playback from the previous Voice data
	DIO2	07h	0	0	0	0	0	1	1	1	

Play Address Command is generated by the Tool.

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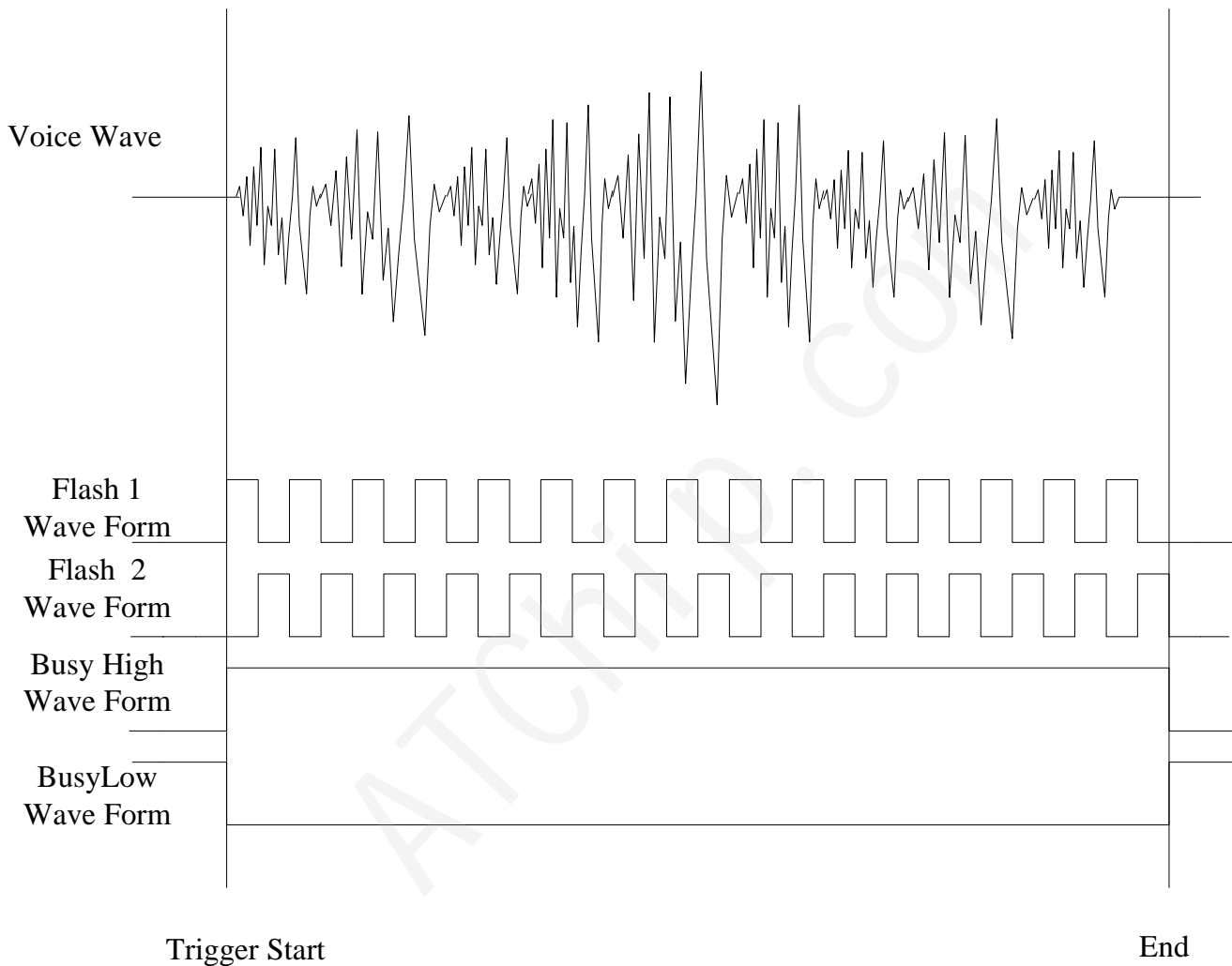
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u AC8040 Voice Wave & Output Status



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u DC Electrical Characteristics

Item	Symbol	Min	Typ	Max	Unit	Condition
Operating voltage	VDD	2.4	3.0	5	V	
Standby current	I _{sb}		1	5	uA	VDD=3V,no load
Operating current	I _{op}		600		uA	VDD=3V,no load
			1		mA	VDD=4.5V,no load
Drive current of Output	I _{od}		10		mA	VDD=3V VOUT=0.6V
Sink current of Output	I _{os}		30		mA	VDD=3V VOUT=2.4V
Drive current of Output	I _{od}		10		mA	VDD=3V(LDO ON) VOUT=0.6V
Sink current of Output	I _{os}		15		mA	VDD=3V(LDO ON) VOUT=2.4V
Drive current of PWM	I _{od}		200		mA	VDD=3V,VOUT=1.5V
Sink current of PWM	I _{os}		200		mA	VDD=3V,VOUT=1.5V

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掩膜 OTP: 主营 语音芯片, 玩具 IC, 录音 IC, 门铃 IC, 音乐芯片

邮箱 QQ: 68681298@qq.com

Http://www.ATChip.Com

AC Electrical Characteristics

Symbol	Characteristic	Rating			Unit
		Min.	Typ.	Max.	
t _{db}	Key Trigger debounce time (long)	14			ms
t _{db}	Key Trigger debounce time (short)	50			us
t _{gr}	Key Trigger Pulse width				
t _{PW}	Serial Mode Input Pulse Width	100			us
t _{PI}	The interval of two pulse	100			us
t _{BH}	Busy signal output hold time	400			us
t _{BD}	Busy signal output delay time	400			us
t _{dV}	Voice output delay time	400			us
t _{CS}	Chip Select setup time	1			us
t _{DS}	Data In setup time	1			us
t _{DH}	Data In hold time	1			us
t _{CP}	Clock Pulse Width	1			us
t _{CC}	Clock Cycle time	2			us
t _{CH}	Chip Select hold time	1			us

OTP 语音芯片 IC-应用原理资料接线图 (AC8040)OTP40 秒



语音芯片开发-深圳市环芯半导体有限公司

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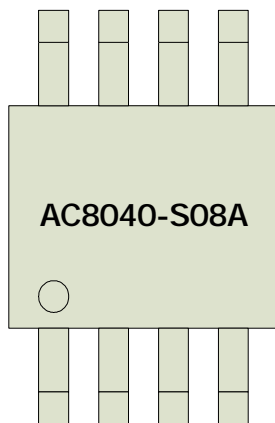
掩膜 OTP: 主营 语音芯片, 玩具 IC, 录音 IC, 门铃 IC, 音乐芯片

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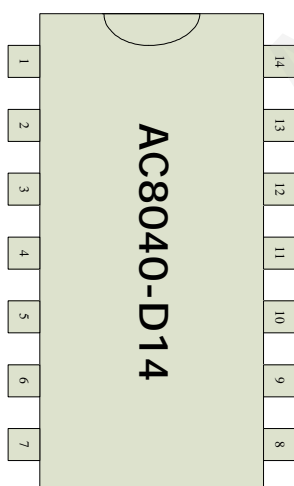
u AC8040 Package Information

AC8040-S08A



PIN	NAME
1	TG2
2	TG1
3	TG5
4	VSS
5	PWM2/DAC
6	PWM1
7	VDD
8	VDD5

AC8040-D14



PIN	NAME
1	PWM2/DAC
2	PWM1
3	VDD5
4	VDD
5	VSS
6	TG12
7	TG11
8	TG8
9	NC
10	TG2
11	TG1
12	TG5
13	TG6
14	TG7

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u Writer Mapping Description

Writer Pin : **TG2,TG1,TG5,VSS,PWM2,PWM1,VDD,VDD5**

OTP Writer Power Board Pin Mapping Table			
DIP 48	PAD Name	AC8040-SO8A	AC8040-D14
10 - RSTN			
11 - GND	9-VSS, 10-VSS	4-VSS	5-VSS
12 - SCK	11-PWM2	5-PWM2	1-PWM2
13 - CS	12-PWM1	6-PWM1	2-PWM1
14 - VCC	13-VDD5, 14-VDD	7-VDD5, 8-VDD	3-VDD5, 4-VDD
36 - TEST			
37 - VPP	1-TG2	1-TG2	10-TG2
38 - DIO1	2-TG1	2-TG1	11-TG1
39 - DIO2	3-TG5	3-TG5	12-TG5

u Writer Board Slot Location

