



@AC

ATCHIP
环芯半导体

深圳市环芯半导体有限公司

电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

C. Retrigger/Irretrigger

- Serial Trigger Mode :

Combinations of TG1 and TG2 to trigger maximum 64 Voice Group.

- CPU Command Mode :

User command through TG1, TG2, TG3 & TG4 with serial CPU Interface to control the Multi-Playback function.

- **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.

H. PWM For LED Dimming control

- **Play rate level :**

TG040 can provide different play rate in one code as follow

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



深圳市环芯半导体有限公司

电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

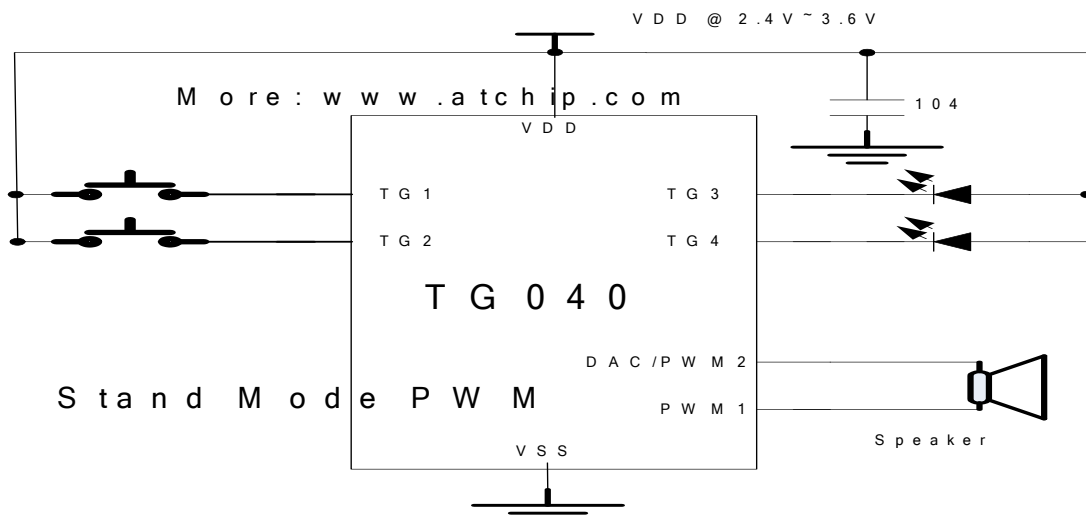
地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

◆ TG040 Pad Location

CHIP SIZE: (0, 0) (1734,715) UM





深圳市环芯半导体有限公司

电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

◆ 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 63 Voice Group.
		CPU Command Mode : TG1 is used as Data Input Pin (CS).
TG2	INPUT	Key Stand-alone Trigger Mode : TG2 is used to trigger the maximum 21 Voice Group one by one sequentially.
		Serial Trigger Mode : TG2 is used to trigger the maximum 64 Voice Group
		CPU Command Mode : TG2 is used as Clock Pin (CLK).
TG3	INPUT	Key Stand-alone Trigger Mode : TG3 is used trigger Only One Group.
		CPU Command Mode : TG3 is used as Data Input Pin (DIO1).
	OUTPUT	As Output PIN , Output the BUSY or Flash Signal .
TG4	INPUT	Key Stand-alone Trigger Mode : TG4 is used trigger Only One Group.
		CPU Command Mode . TG4 is used as Selected Pin (DIO2).
	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 , @ 2.4~3.6 V Working Voltage.
VSS	INPUT	Connected to Ground.



深圳市环芯半导体有限公司

电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

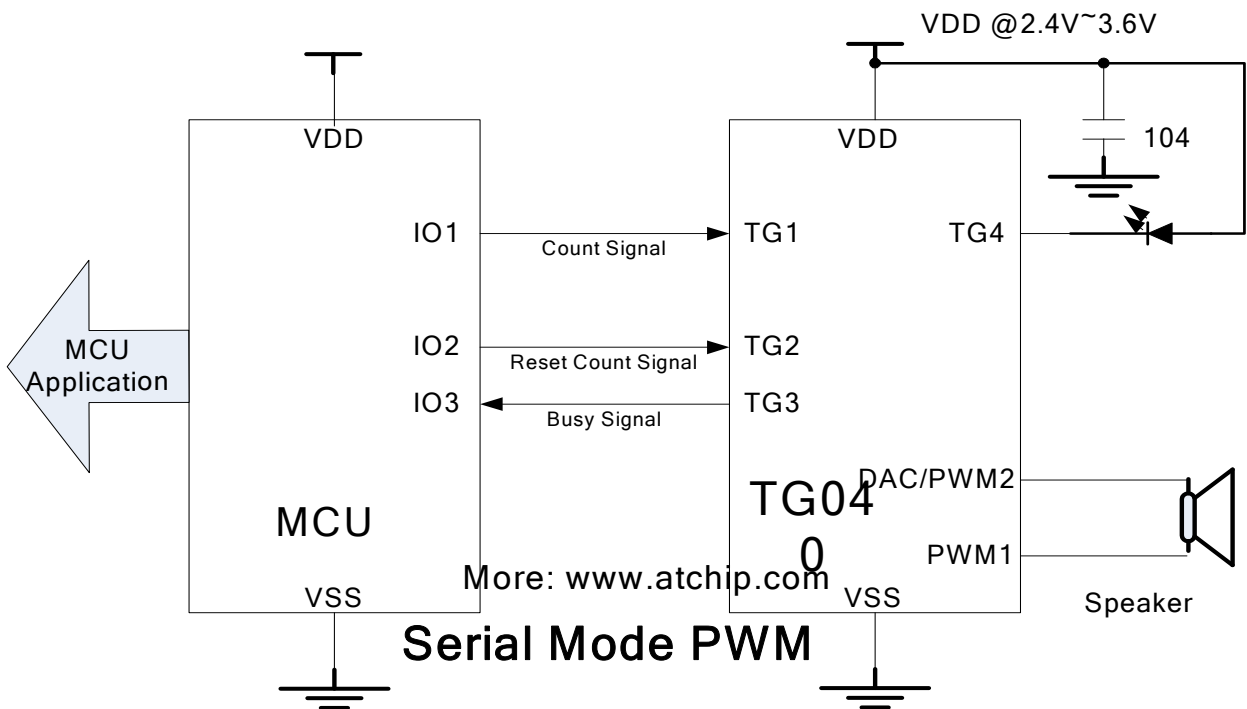
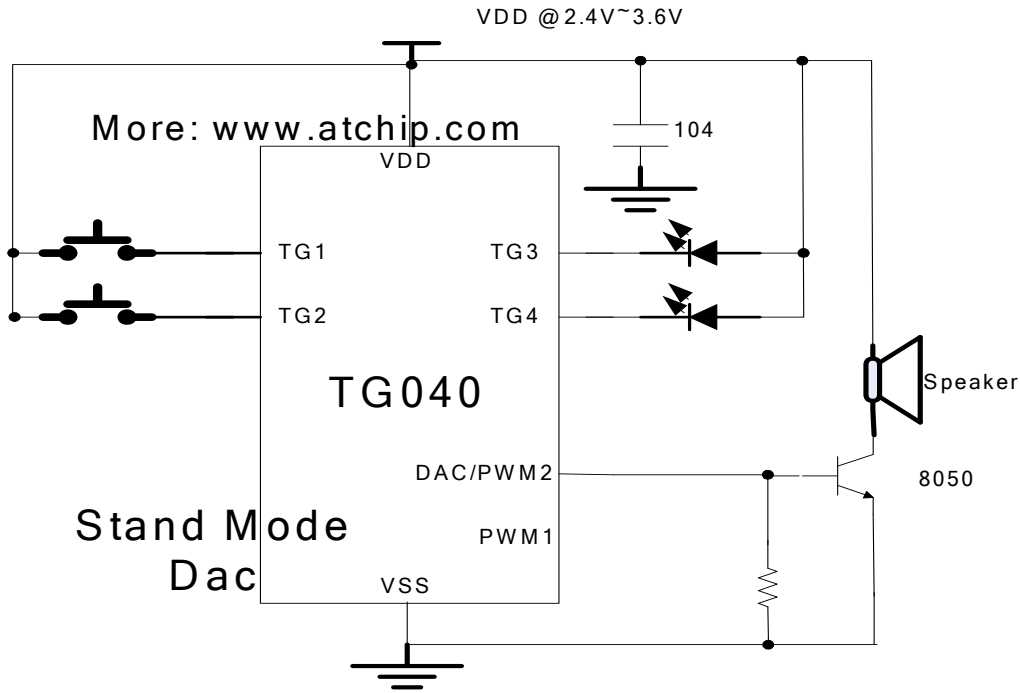
地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

◆ TG040 Application Circuit

TG040 3V Stand-alone Mode



语音 OTP 原理资料 PDF TG040 / OTP40 秒



深圳市环芯半导体有限公司

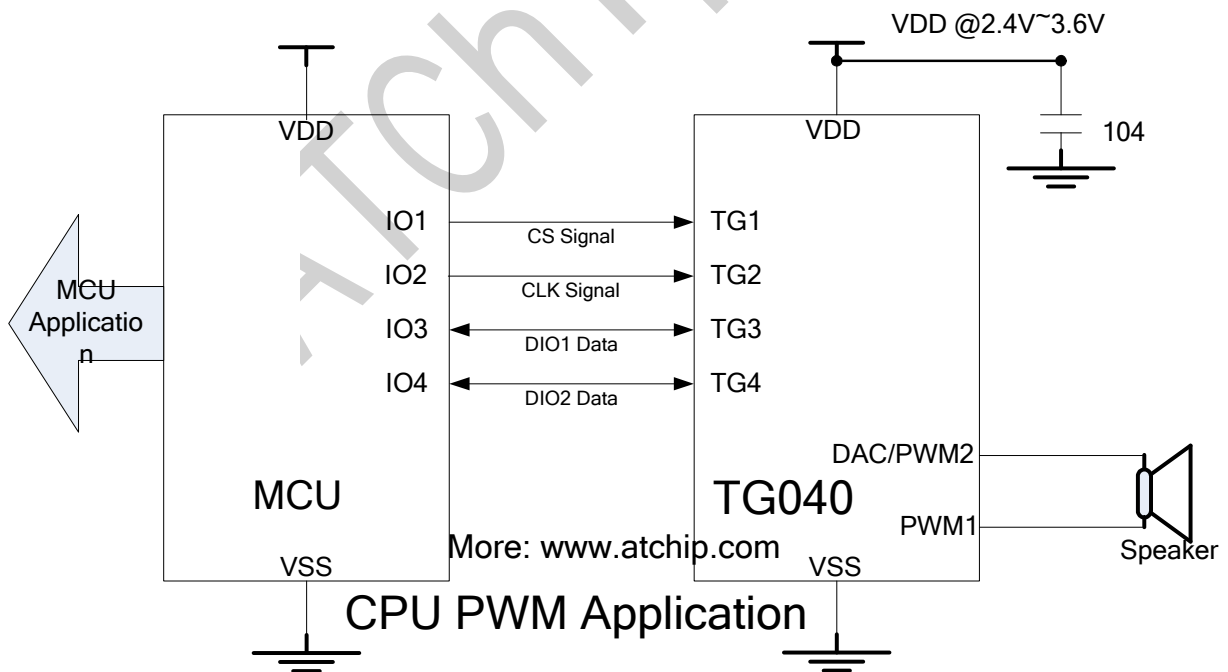
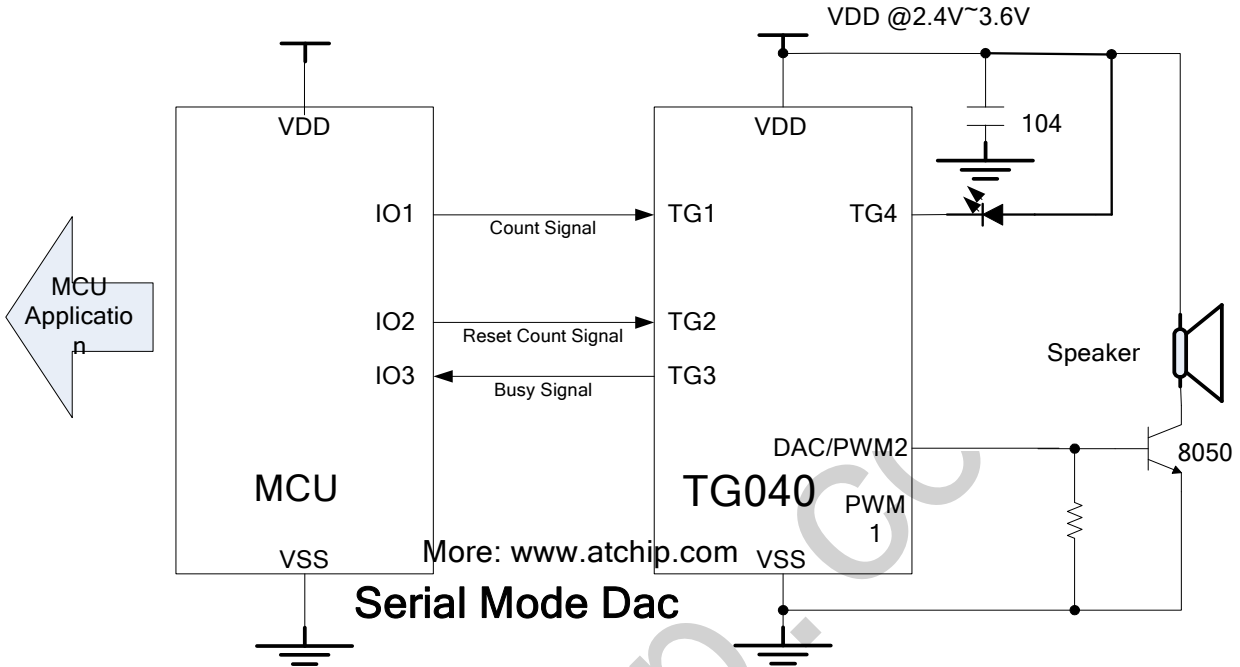
电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

TG040 3V Serial Mode





深圳市环芯半导体有限公司

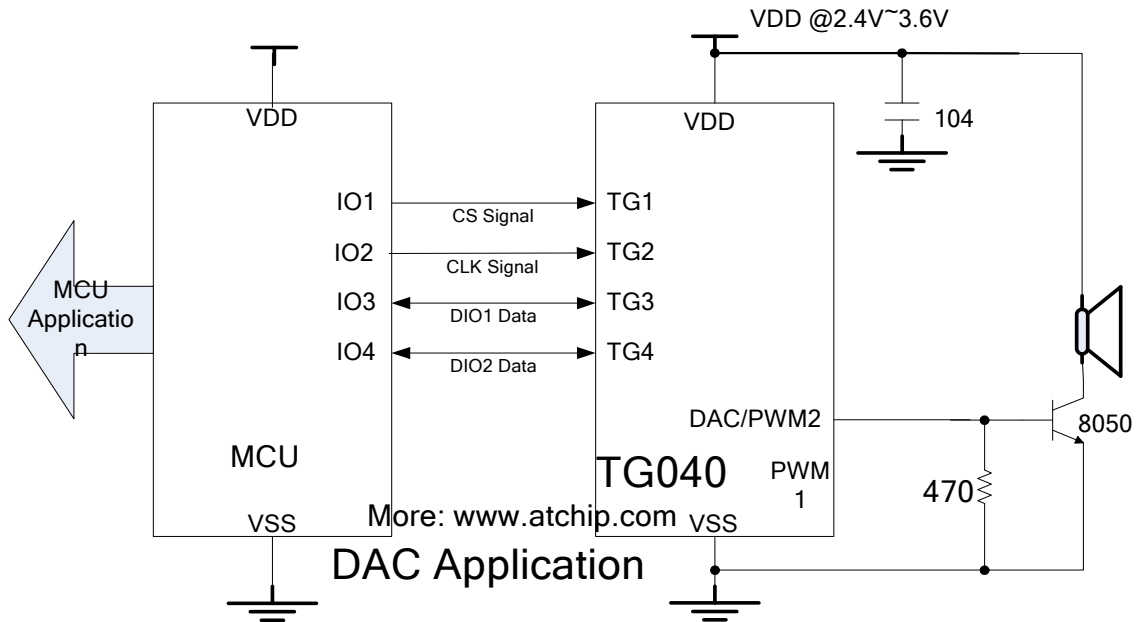
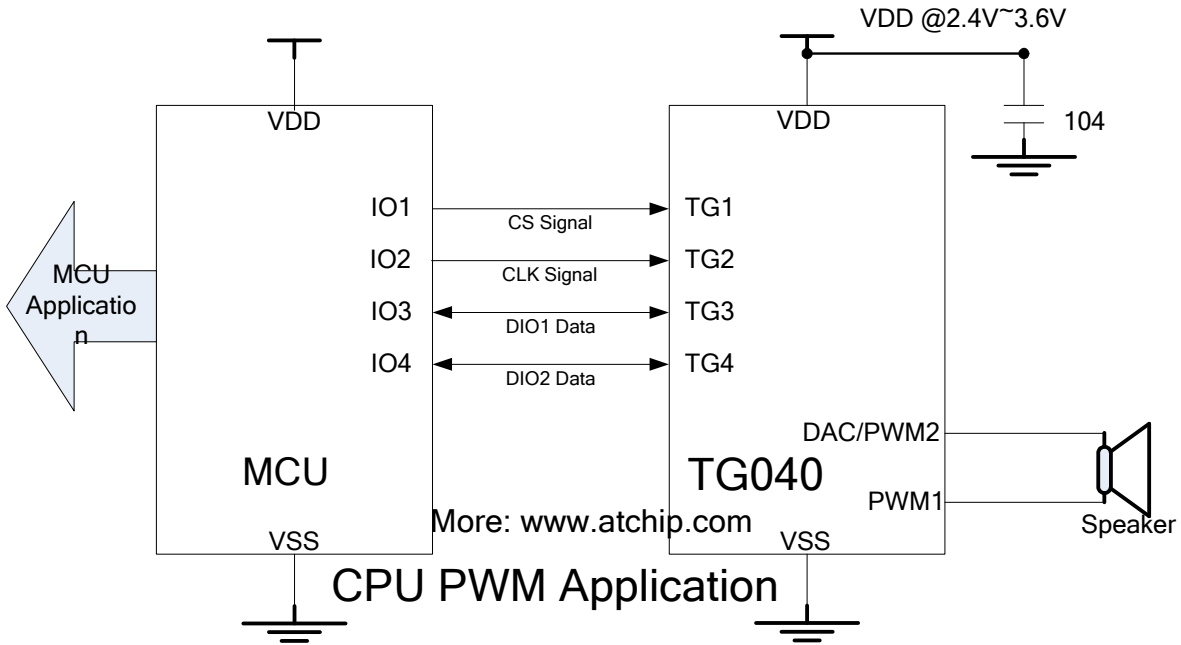
电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

TG040 3V CPU Mode





深圳市环芯半导体有限公司

电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

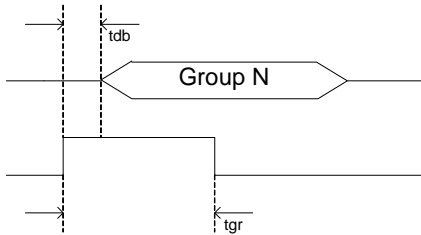
邮编 Ps.: 518109

Http://www.ATChip.Com

◆ TG040 Trigger Timing

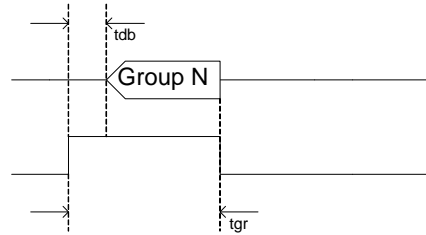
(a) Trigger Pulse Width < Group Length

Option Setting = Edge / Unhold



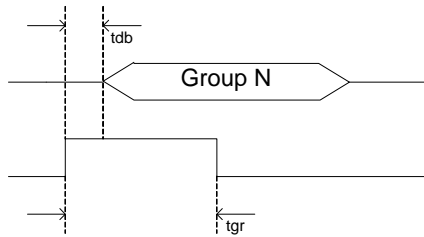
(b) Trigger Pulse Width < Group Length

Option Setting = Edge / Hold



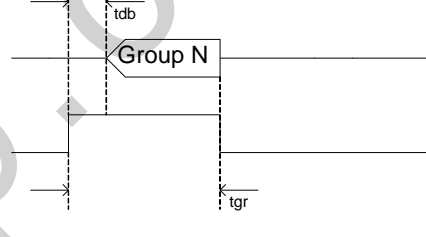
(c) Trigger Pulse Width < Group Length

Option Setting = Level / Unhold



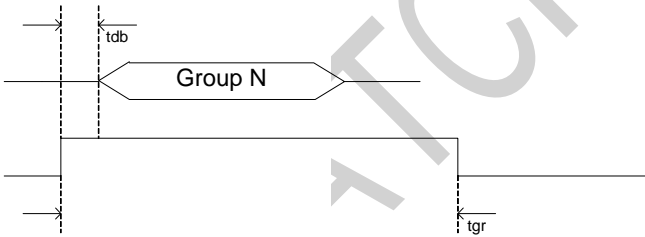
(d) Trigger Pulse Width < Group Length

Option Setting = Level / Hold



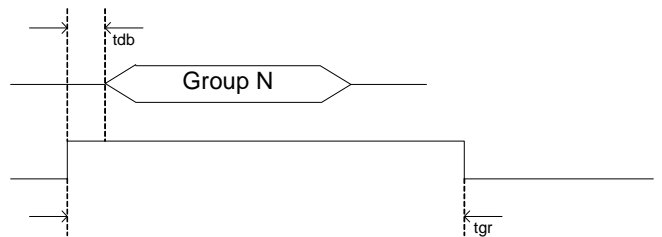
(e) Trigger Pulse Width > Group Length

Option Setting = Edge / Unhold



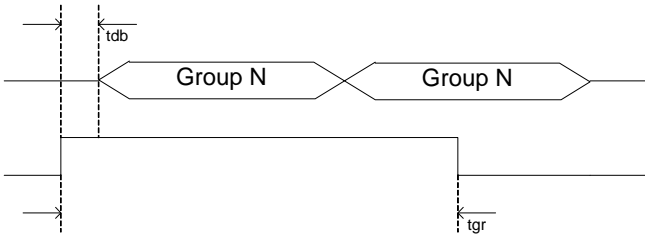
(f) Trigger Pulse Width > Group Length

Option Setting = Edge / Hold



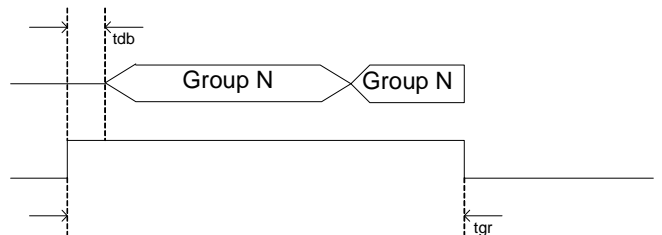
(g) Trigger Pulse Width > Group Length

Option Setting = Level / Unhold



(h) Trigger Pulse Width > Group Length

Option Setting = Level / Hold



语音 OTP 原理资料 PDF TG040 / OTP40 秒



深圳市环芯半导体有限公司

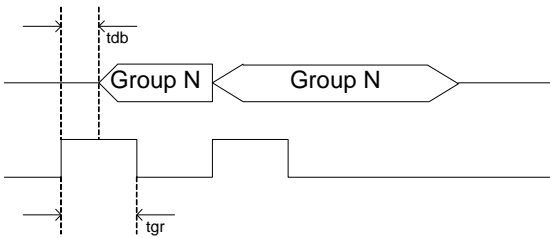
电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

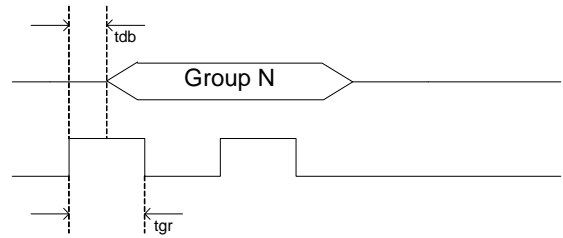
邮编 Ps.: 518109

Http://www.ATChip.Com

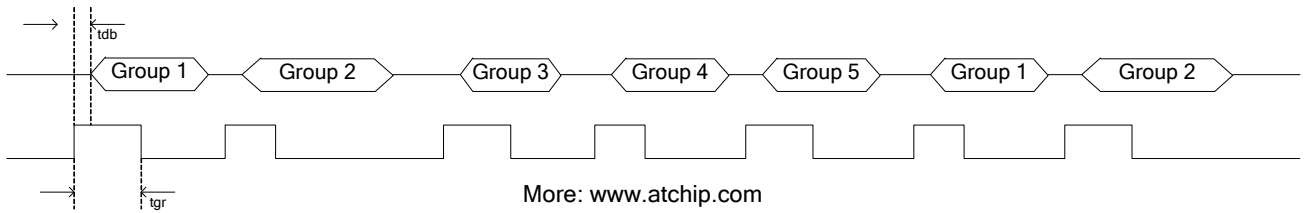
(i) Option Setting = Retrigger



(j) Option Setting = Irretrigger



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





深圳市环芯半导体有限公司

电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

◆ TG040 Trigger Voice Combination Example

Voice File	Description
Voice File A	Hello (1.5”)
Voice File B	Welcom to ShenZhen HuanXin .LTD (3”)
Voice File C	0755-28149272 (1”)
Voice File D	ATChip.com (1”)
Voice File E	QQ:68681298 (1.5”)

Group1 = Step1 + Step 2

Group 2 = Step3 + Step 4 + Step 5

Group 3 = Step 6 + Step 7

Group1 = Hello 28149272

Group 2= Hello Www.ATChip.com Welcom to ShenZhen HuanXin .LTD

Group 3 = Welcom to ShenZhen HuanXin .LTD QQ:68681298

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 + Welcom to ShenZhen HuanXin .LTD + 0755-28149272 + ATChip.com + QQ:68681298

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

$$= 8''$$

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



深圳市环芯半导体有限公司

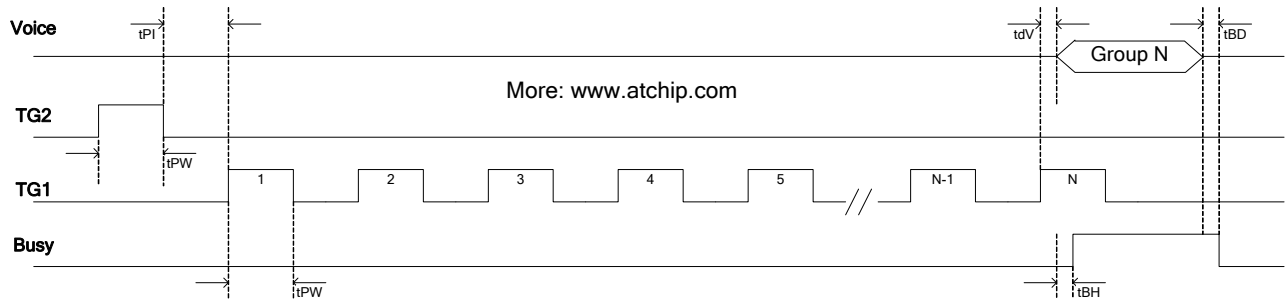
电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

◆ TG040 Serial Mode Timing



TG1=Edge/Unhold/Retrigger

TG2=Reset PIN



深圳市环芯半导体有限公司

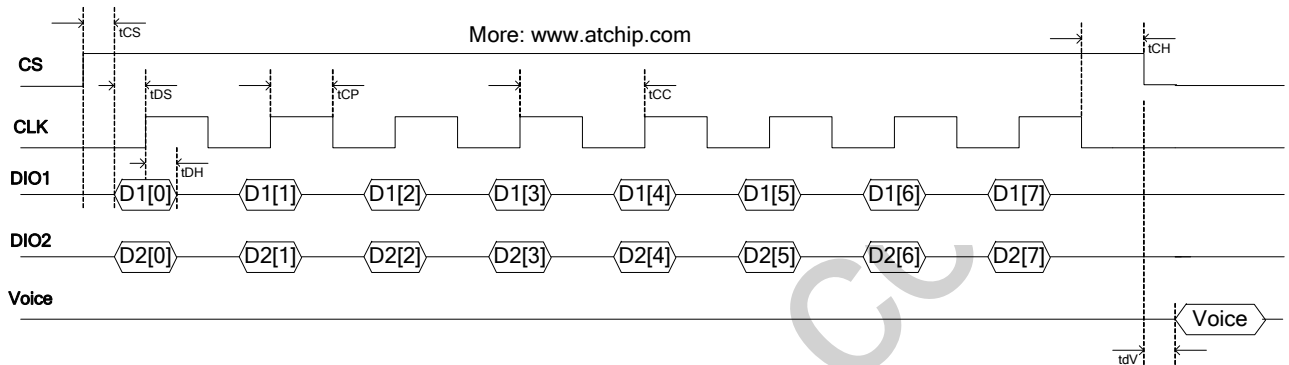
电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

◆ TG040 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.

语音 OTP 原理资料 PDF TG040 / OTP40 秒



深圳市环芯半导体有限公司

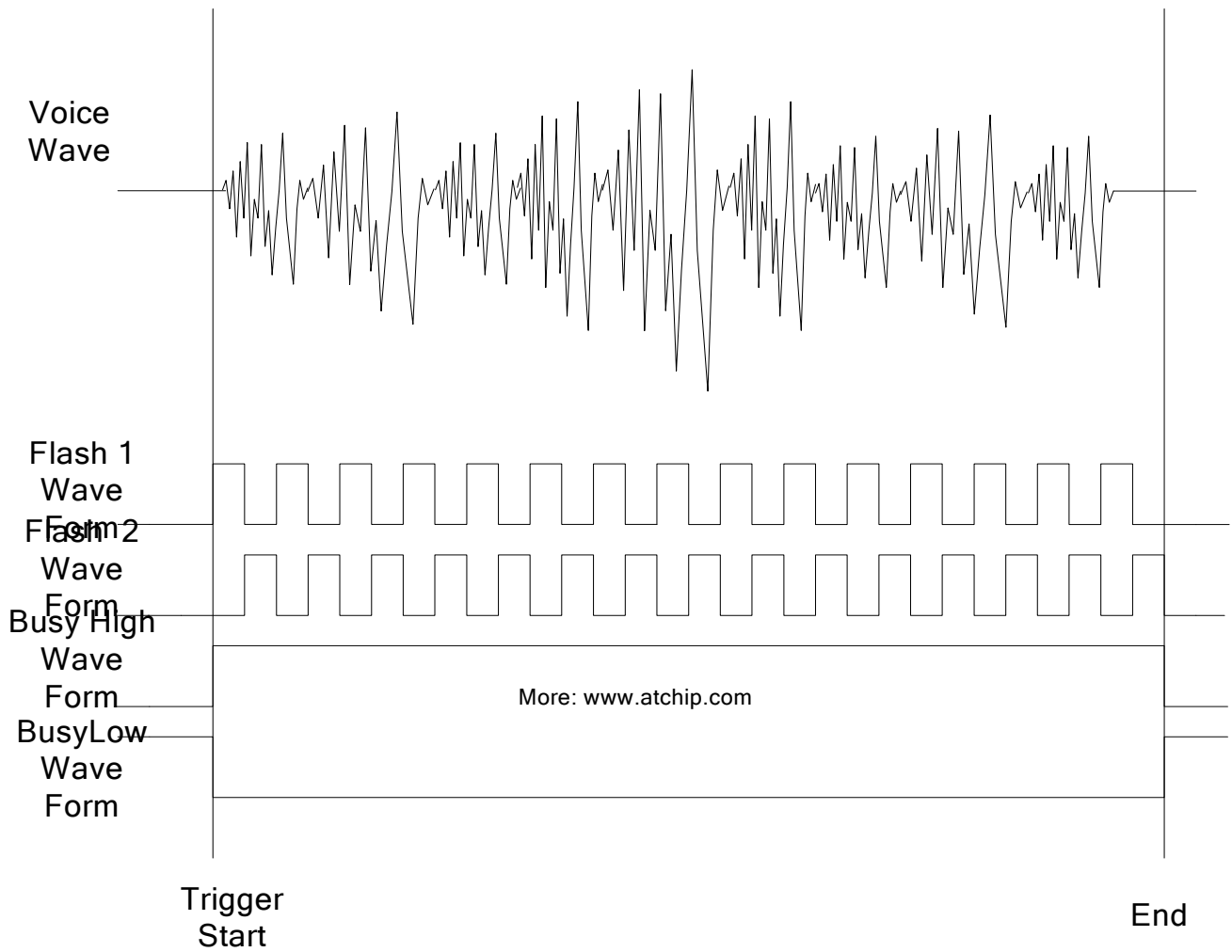
电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

◆ TG040 Voice Wave & Output Status





深圳市环芯半导体有限公司

电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

◆ DC Electrical Characteristics

Item	Symbol	Min	Typ	Max	Unit	Condition
Operating voltage	VDD	2.4	3.0	3.6	V	
Standby current	I _{sb}		1	5	uA	VDD=3V,no load
Operating current	I _{op}		600		uA	VDD=3V,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 PWM	I _{od}		200		mA	VDD=3V,VOUT=1.5V
Sink current of PWM	I _{os}		200		mA	VDD=3V,VOUT=1.5V

◆ 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	200			us
t _{BD}	Busy signal output delay time	200			us
t _{dV}	Voice output delay time	200			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



深圳市环芯半导体有限公司

电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

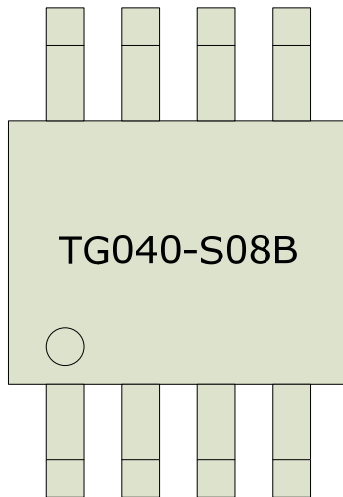
地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

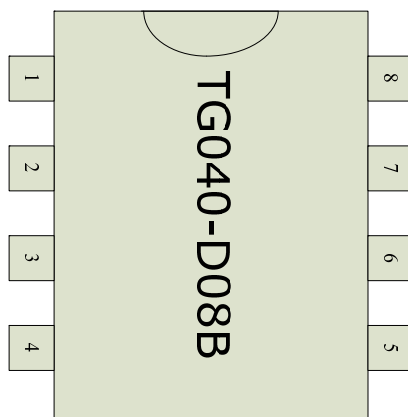
TG040 Package Information

TG040-S08B



PIN	NAME
1	TG2
2	TG1
3	TG3
4	TG4
5	VSS
6	PWM1
7	VDD
8	PWM2/DAC

TG040-D08B



PIN	NAME
1	TG2
2	TG1
3	TG3
4	TG4
5	VSS
6	PWM1
7	VDD
8	PWM2/DAC



深圳市环芯半导体有限公司

电话 Tel: 0755-28149272 29058191 传真 Fax: 29018191

地址 Add: 深圳市宝安区龙华东环一路港之都大厦 703

邮编 Ps.: 518109

Http://www.ATChip.Com

◆ Writer Mapping Description

Writer Pin : **TG2,TG1,TG3,TG4,PWM1,VDD,VSS**

OTP Writer Power Board Pin Mapping Table			
DIP 48	PAD Name	TG040-SOP8	TG040-DIP8
10 - RSTN			
11 - GND	5-VSS	5-VSS	5-VSS
12 - SCK	7-PWM1	7-PWM1	7-PWM1
13 - CS	2-TG1	2-TG1	2-TG1
14 - VCC	8-VDD	8-VDD	8-VDD
36 - TEST			
37 - VPP	1-TG2/RSTB	1-TG2/RSTB	1-TG2/RSTB
38 - DIO1	3-TG3	3-TG3	3-TG3
39 - DIO2	4-TG4	4-TG4	4-TG4
NC	9-PWM2/DAC	9-PWM2/DAC	9-PWM2/DAC

◆ Writer Board Slot Location

