

aP58Q6

18 minutes voice erasable chip

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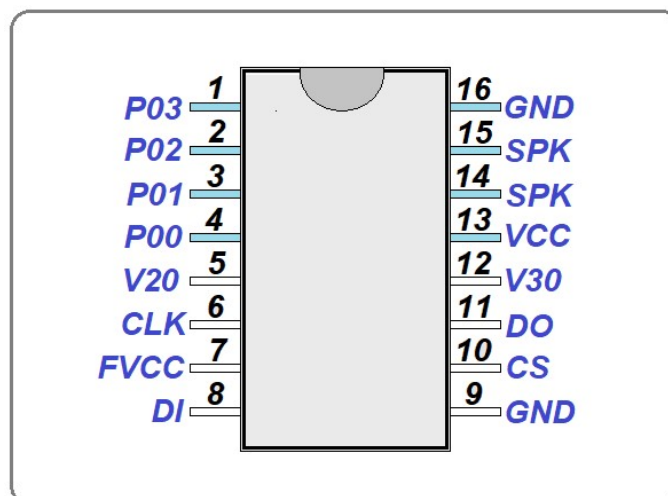
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■ Features :

- Built in 8-bit DSP
- System CPU clock :24MHz
- Program memory : 512k bits(64 K Bytes) OTP.
- Voice memory : 32M bits(4M Bytes) FLASH memory
- 1080 sec voice length at 5.8KHz sampling or 276 sec voice length at 23KHz sampling.
- Built-in 2k bits(256 Bytes) SRAM.
- Built-in R/C Trim (1%)
- Built-in 1 set PWM and 1 set DAC..
- GPIO x 4 available
- Built in low voltage detection and reset system circuit (LVR)
- Built-in Watch Dog Timer.
- Optional PWM driving ability : High Middle Low Buffer Drive .
- Operating Voltage Range: 2.3V ~ 5.0V.
- Five standard triggering modes are available
 - SBT mode
 - Matrix key
 - Cpu serial 1-wire mode
 - Cpu serial 2-wire mode
 - Cpu serial 3-wire mode



Duration Table					
Coding	AD5	AD6	AD8	PCM10	PCM12
SR = 4.6K	23 min.	19.4 min.	14.5 min.	11.6 min.	9.7 min.
SR = 5.8K	18.6 min.	15.5 min.	11.6 min.	9.3 min.	7.7 min.
SR = 6.6K	16.3 min.	13.5 min.	10.1 min.	8.1 min.	6.7 min.
SR = 7.8K	13.9 min.	11.6 min.	8.7 min.	6.9 min.	5.8 min.
SR = 9.3K	11.6 min.	9.7 min.	7.2 min.	5.8 min.	4.8 min.
SR = 11.7K	9.3 min.	7.7 min.	5.8 min.	4.6 min.	3.8 min.
SR = 15.6K	6.9 min.	5.8 min.	4.3 min.	3.4 min.	2.9 min.
SR = 23.4K	4.6 min.	3.8 min.	2.9 min.	2.3 min.	1.9 min.

■ PIN NAMES :

Pin No.	Designation	I/O	Description
1	P0[3] / Reset	I/O	Port-0 I/O.
2	P0[2]	I/O	Port-0 I/O.
3	P0[1]	I/O	Port-0 I/O
4	P0[0]	I/O	Port-0 I/O
5	V20	P	Digital Power. (LDO 2V output).
6	CLK	I/O	CLK of SPI FLASH
7	FVCC	P	Power of SPI FLASH
8	DI	I/O	DI of SPI FLASH
9	GND	P	System Ground.
10	CS	I/O	CS of SPI FLASH
11	DO	I/O	DO of SPI FLASH
12	V30	P	IO Power. (LDO 3V output).
13	VCC	P	Chip Power.
14	SPK_P	O	DAC / PWM1
15	SPK_N	O	PWM2
16	GND	P	System Ground.

Group Options :

Selectable options that affect each individual group are called Group Options. They are:
 Edge or Level trigger.
 Unholdable or Holdable
 Re-trigger or Non-retrigger
 Stop pulse disable or enable.

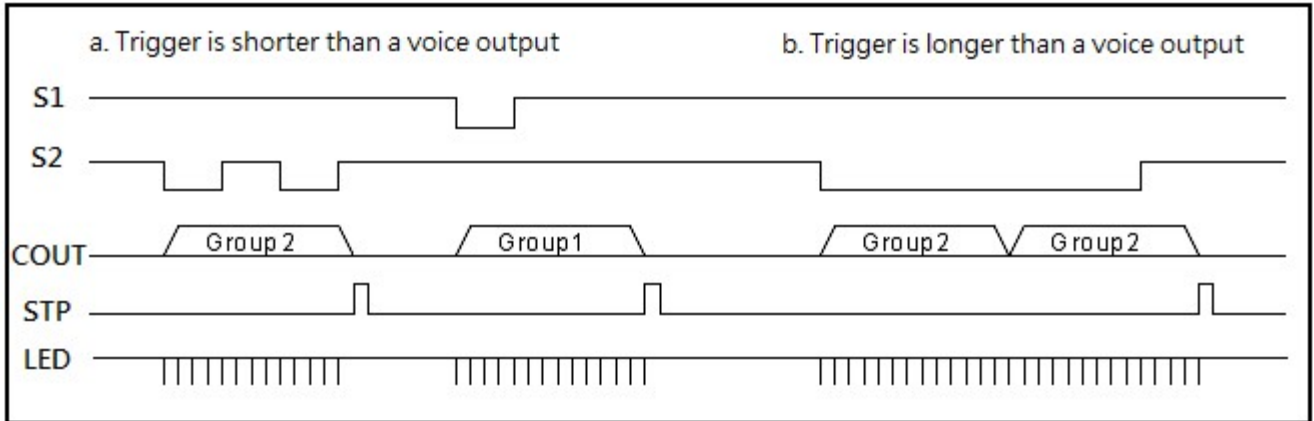


Fig. 1 Level, Unholdable, Non-retrigger

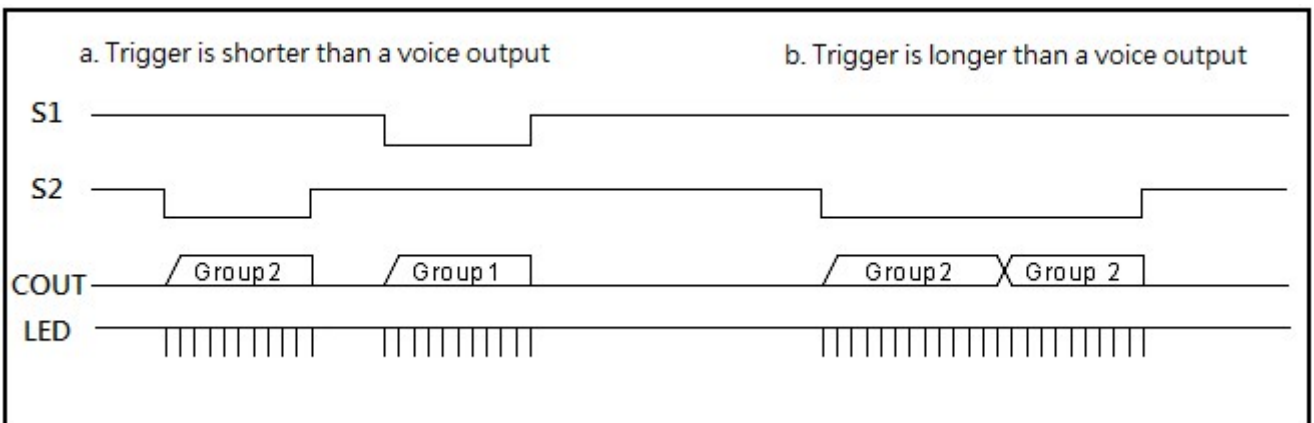


Fig. 2 Level Holdable

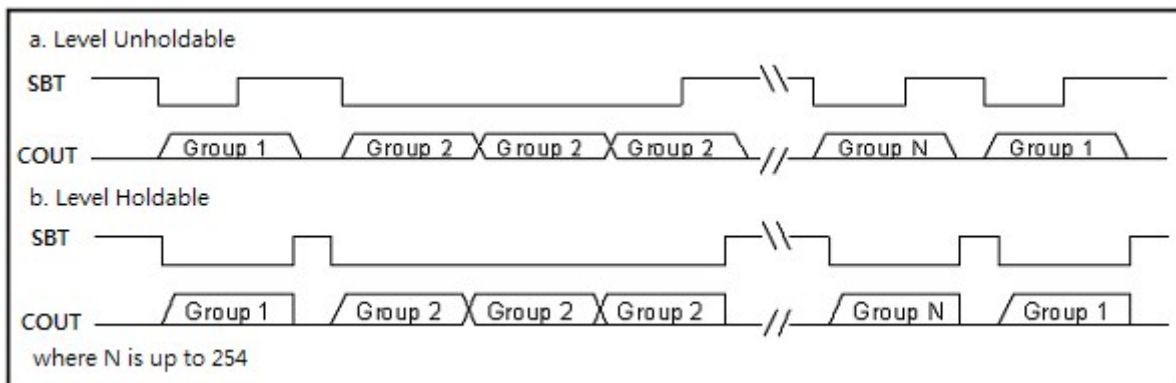


Fig. 3 SBT sequential trigger with Level Holdable and Unholdable

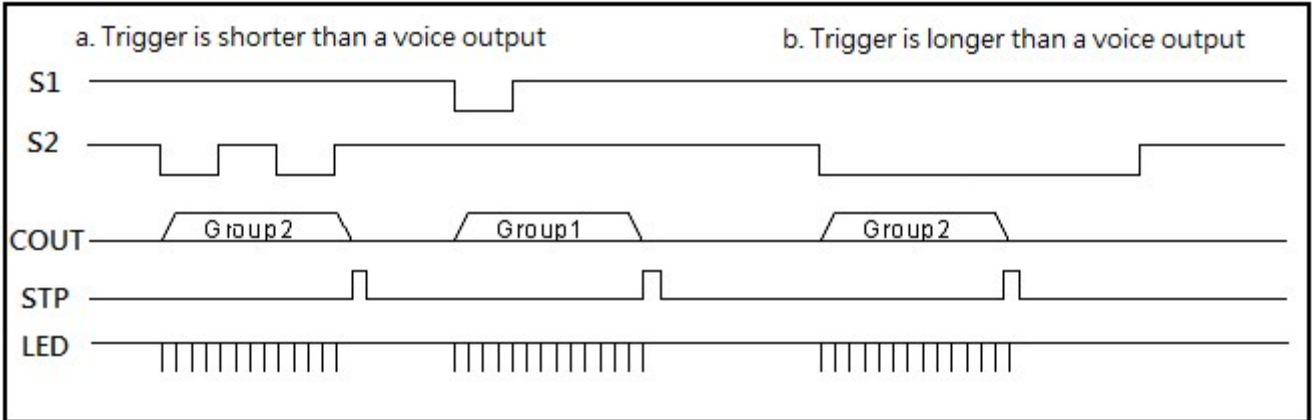


Fig. 4 Edge, Unholdable, Non-retrigger

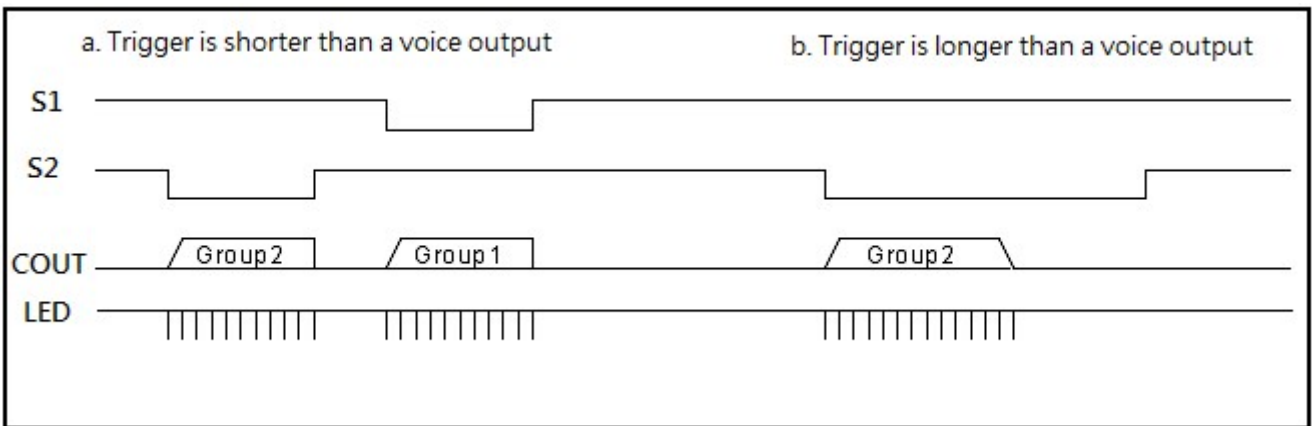


Fig. 5 Edge, Holdable

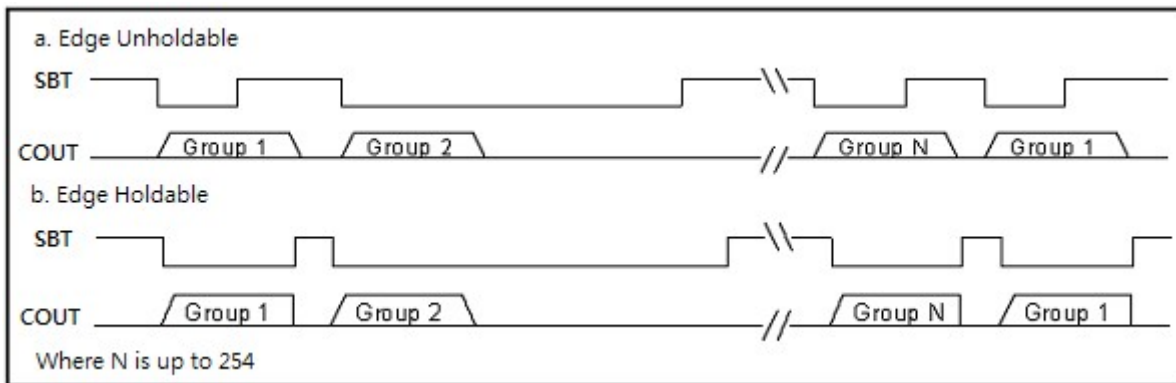


Fig. 6 SBT sequential trigger with Edge Holdable and Unholdable

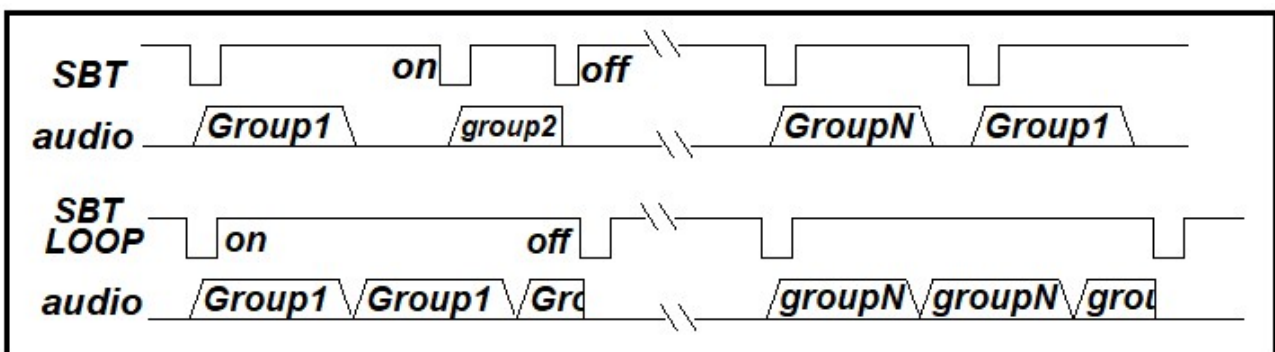


Fig. 7 SBT sequential trigger with On/Off

● **Trigger mode :**

1. **SBT mode :**

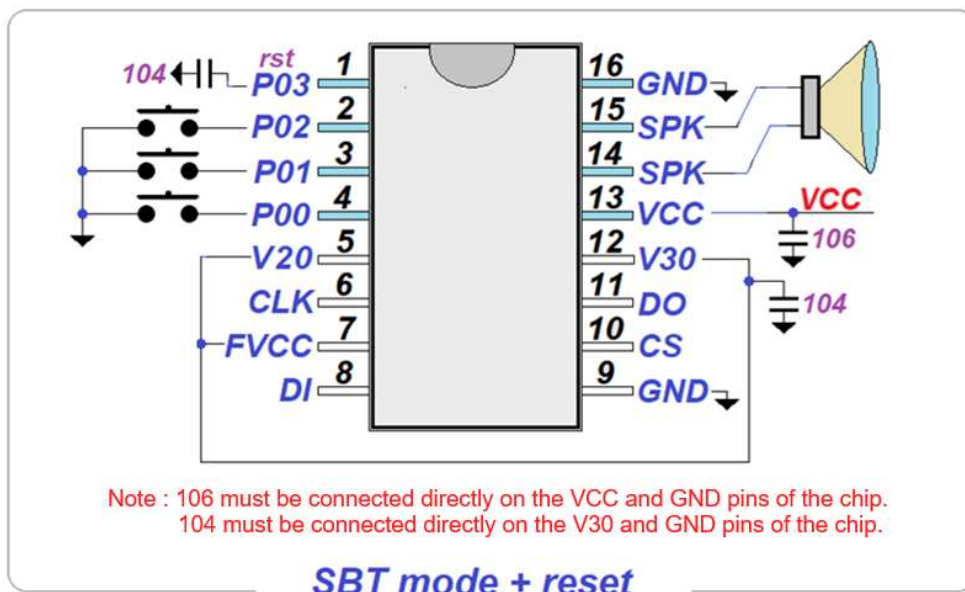
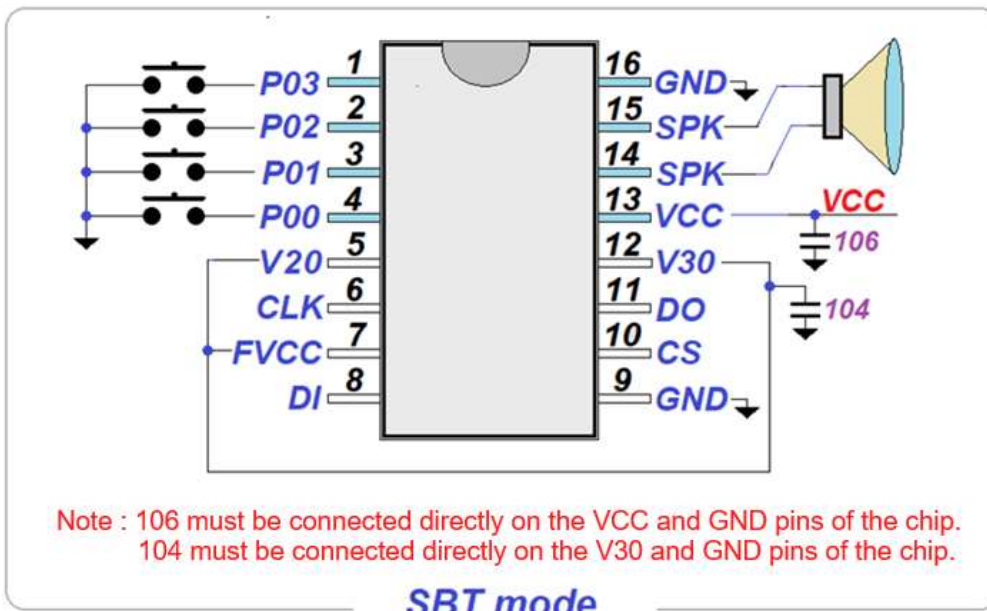
Maximum Voice Groups : 254 for each I/O. All I/O can be chosen input or output. Each Voice Group can have its independent trigger options (See Fig. 1,2,4 and 5). SBT mode has an additional on/off function. (See Fig. 7).

P00	P01	P02	P03
SEQ/VOL/OUT	SEQ/VOL/OUT	SEQ/VOL/OUT	SEQ/VOL/Reset/OUT

SEQ : Sequential Play (See Fig. 3 and 6).

VOL : Volume Control

Output : BusyH , BusyL , 3Hz , 6Hz , LED-dyna , StopH , StopL



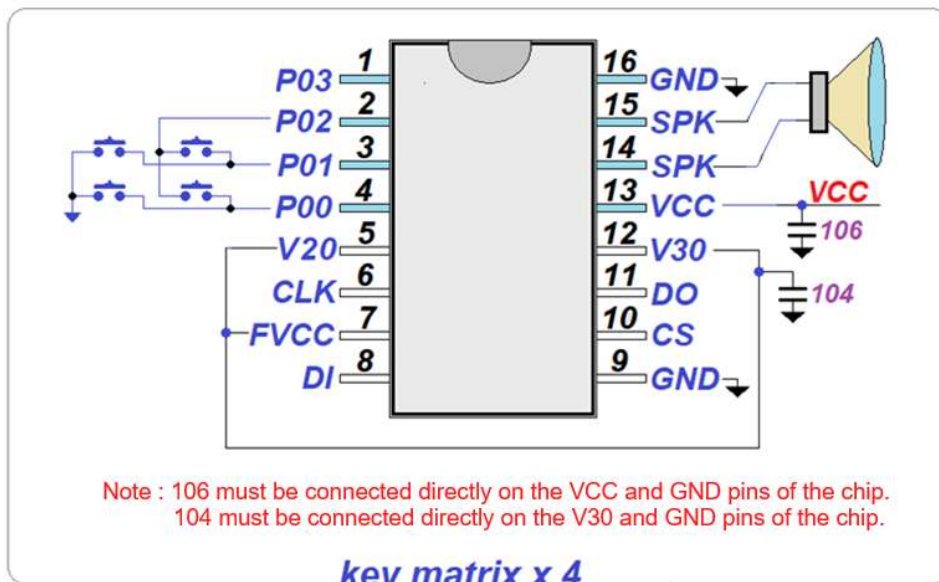
2. Key matrix mode :

The sound group is triggered by combining P00 to P03 and GND in a matrix. All I/O scan is chosen input or output. Each Voice Group can have its independent trigger option (see Figures 1, 2, 4 and 5).

	P00	P01	P02	P03	keyN
4 mkey	scan in	scan in	scan out	Vol/Reset/Out	mkey1~mkey4
6 mkey	scan in	scan in	scan in	scan out	mkey1~mkey6

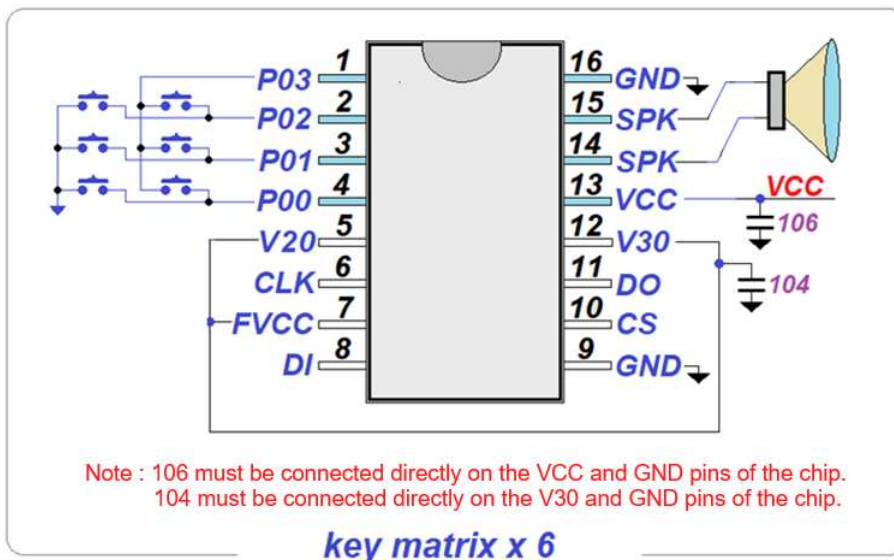
Output : BusyH , BusyL , 3Hz , 6Hz , LED-dyna , StopH , StopL

VOL : Volume Control



Ps : p03=input = reset

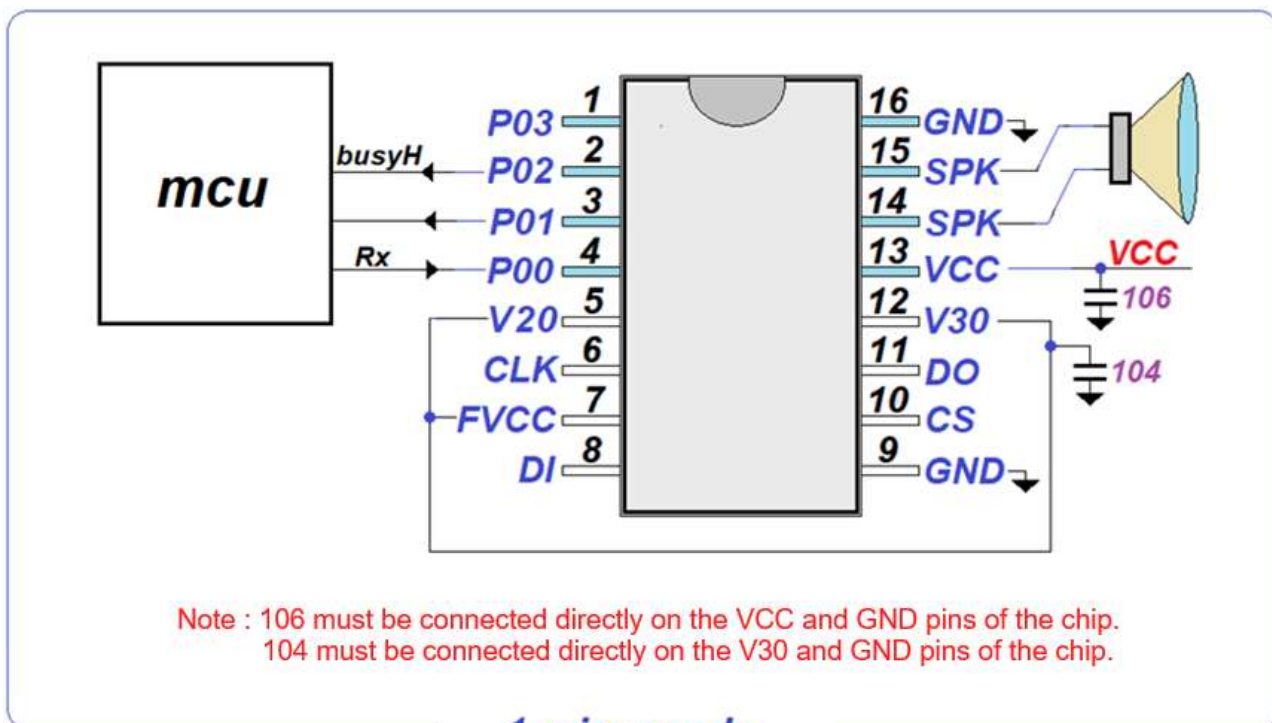
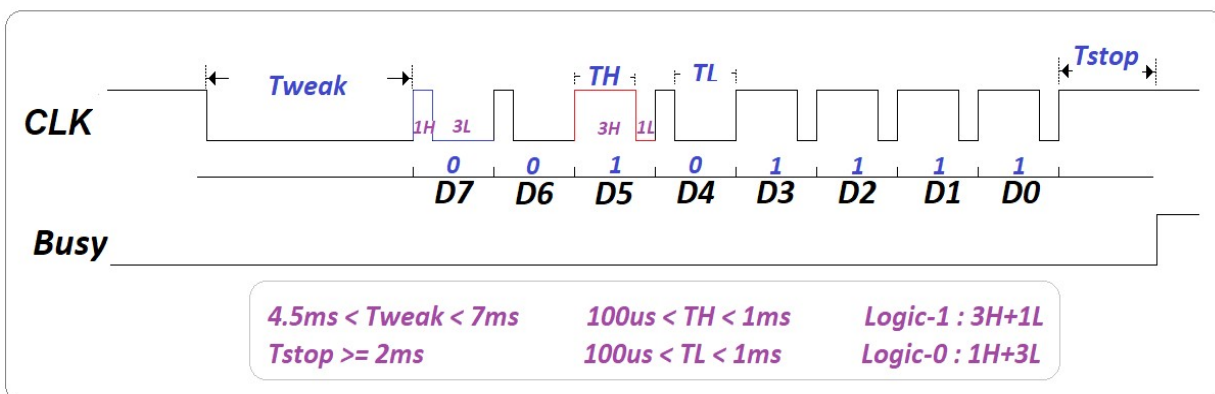
P03 = output option = busyH , busyL , 3Hz , 6Hz , LED-dyna , stopH , stopL



3. 1-wire mode :

P00	P01	P02	P03
Rx	Out	Out	Out/Reset

Out option : busyH , busyL , 3Hz , 6Hz , LED-dyna , stopH , stopL
P03 = input = reset option



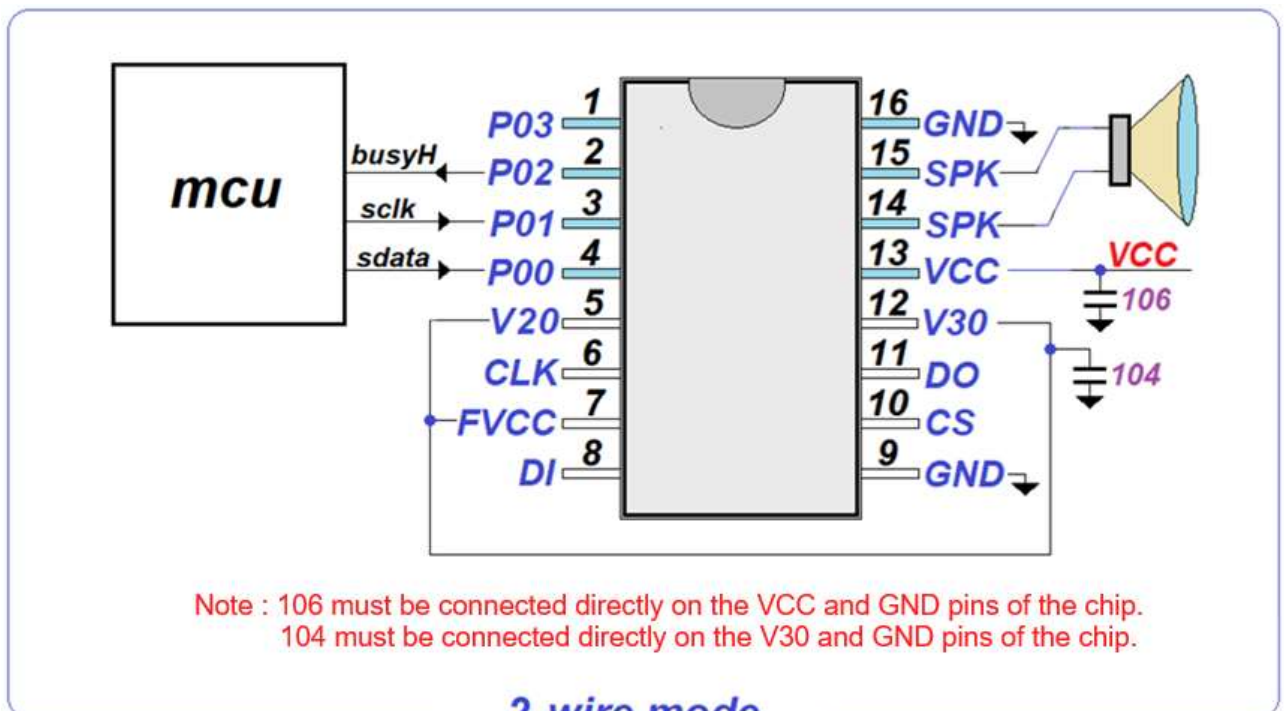
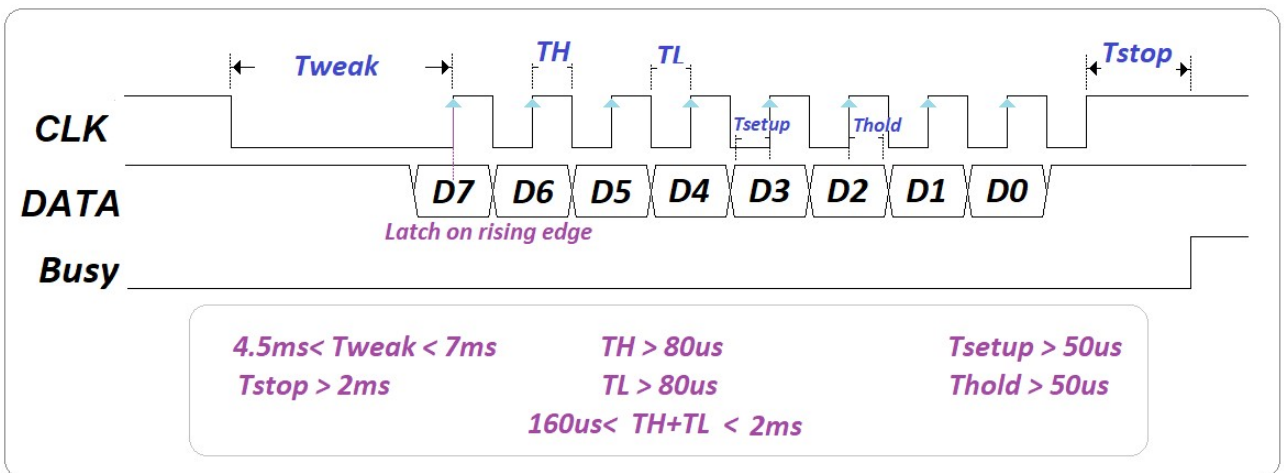
1-wire mode

4. 2-wire mode :

P00	P01	P02	P03
sdata	sclk	Out	Out/Reset

Out option : busyH , busyL , 3Hz , 6Hz , LED-dyna , stopH , stopL

P03 = input = reset option

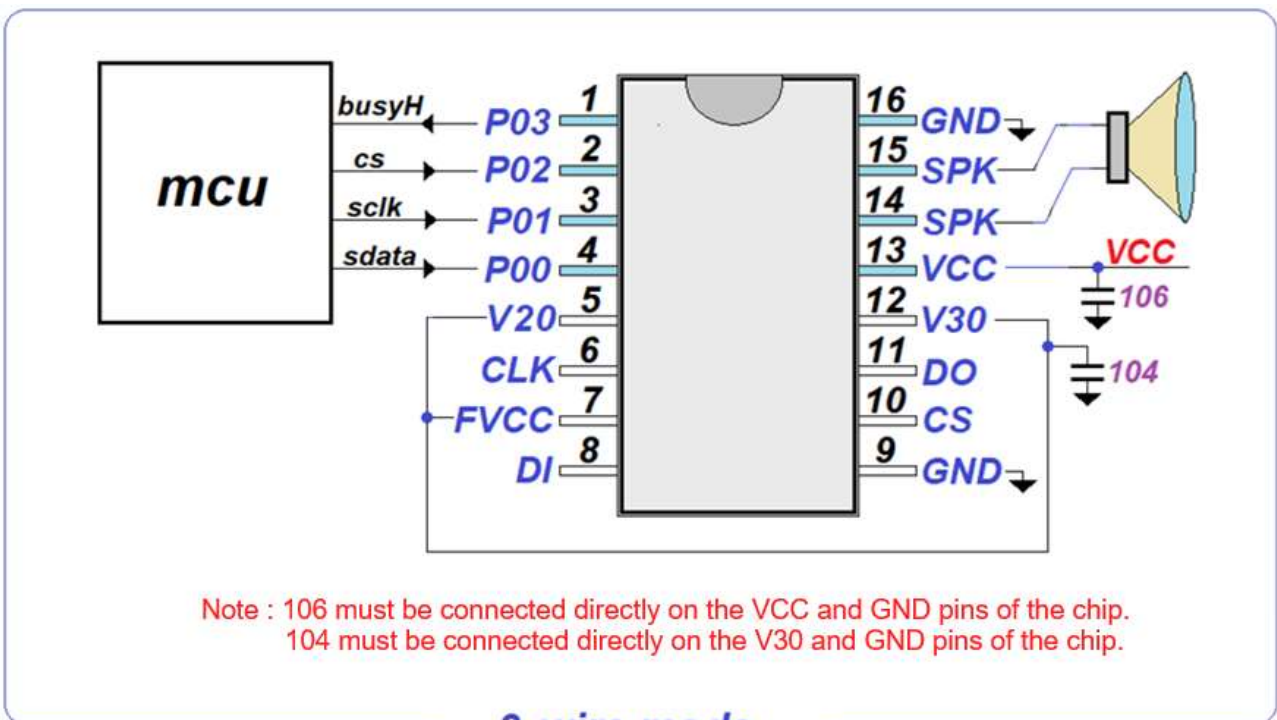
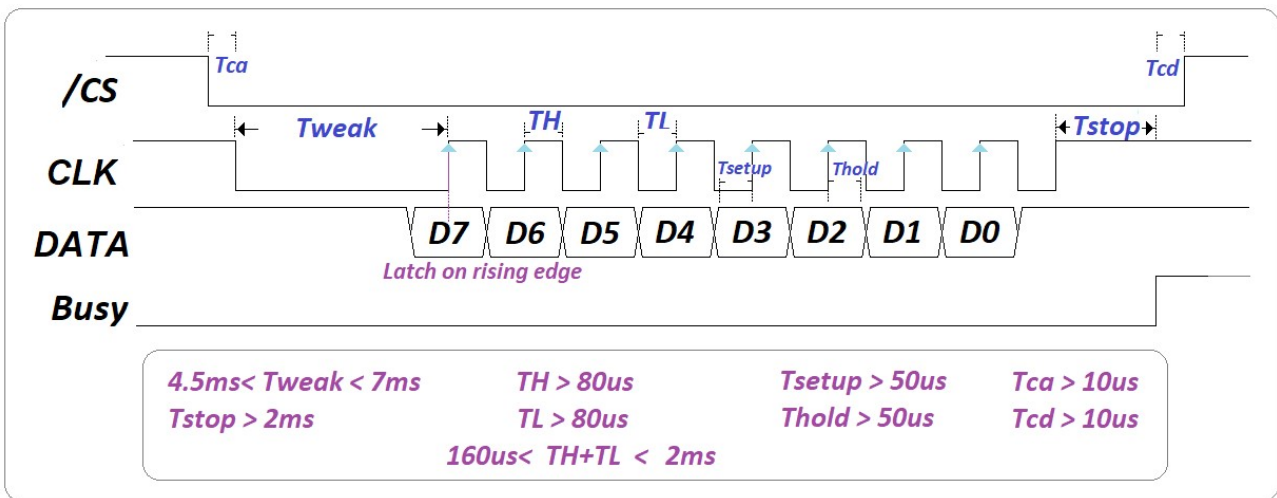


5. 3-wire mode :

P00	P01	P02	P03
sdata	sclk	Cs	Out/Reset

Out option : busyH , busyL , 3Hz , 6Hz , LED-dyna , stopH , stopL

P03 = input = reset option

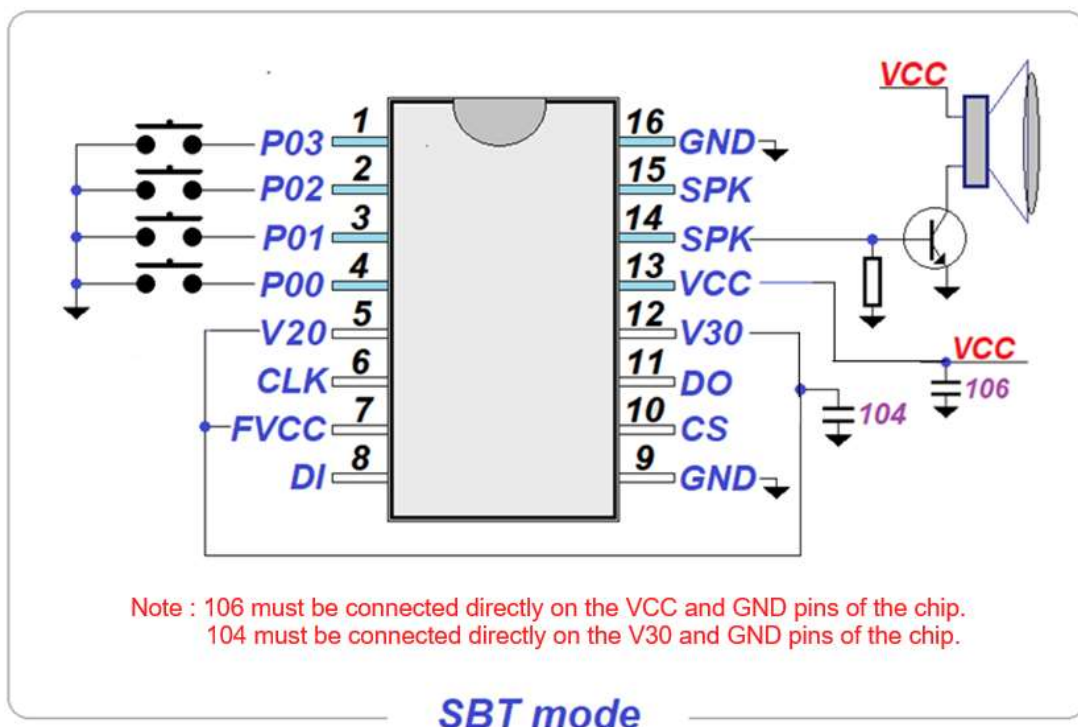


3-wire mode

Command :

command	D7	D6	D5	D4	D3	D2	D1	D0
play sentence(n)	01 ~ DF							
set volume (n)	0E				N (0~15)			
reserved	F0 ~ F7							
repeat off	F8							
repeat on	F9							
Vol-	FA							
Vol+	FB							
Play Next	FC							
Play Next	1	1	1	1	1	1	0	0
Play Previous	FD							
Pause / Resume	FE							
Stop	FF							

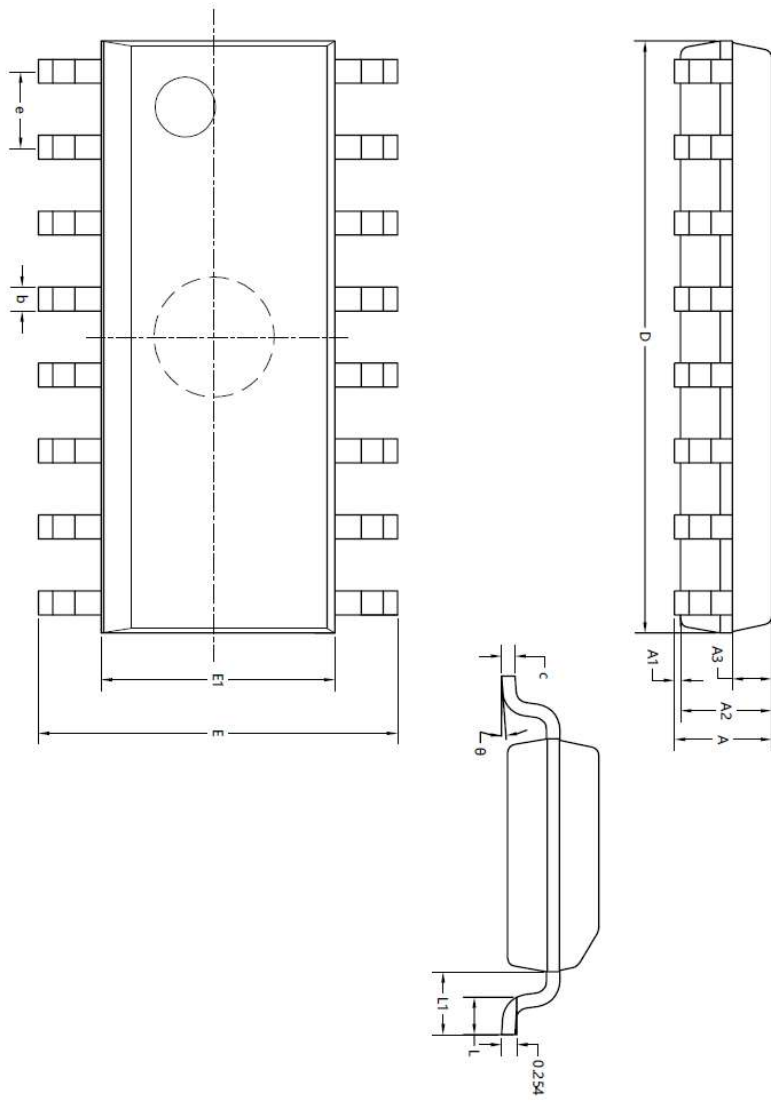
● **DAC Application :**



DC CHARACTERISTICS ($V_{CC} = 3.0V$, $V_{DD} = 2.0V$, $GND = 0V$, $T_A = 25^\circ C$)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
PORT0[7:4] PORT0[2:0]	Driving Current($V_{CC} \setminus LDO3V$)	1.7		4.8	mA	$V_{OH}=2.7$
PORT0[3]	Driving Current		1.7		mA	$V_{OH}=2.7$
SPK_P/SPK_N	Driving Current			200	mA	$R_L = 8\Omega @3.0V$
SPK_P/SPK_N	Driving Current			320	mA	$R_L = 8\Omega @4.5V$
SPK_P	Current DAC output current			3.52	mA	@4.5V
PORT0[7:4] PORT0[2:0]	Sink Current	2.4		13	mA	$V_{OL}=0.3$
PORT0[3]	Sink Current		2.5		mA	$V_{OL}=0.3$
SPK_P/SPK_N	Sink Current			200	mA	$R_L = 8\Omega @3.0V$
SPK_P/SPK_N	Sink Current			320	mA	$R_L = 8\Omega @4.5V$
I_STD	Standby Current		1	6	μA	<2 μA @<4.5V <3 μA @4.5~5.1V
V20	output Voltage		2.0		V	
	output Current			60	mA	
	output Current		1		mA	
V30	output Voltage		3.0		V	
	output Current			30	mA	80mA @4.5V
	output Current		1		mA	

- Package : SOP16



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.50	1.60	1.70
A1	0.10	0.15	0.25
A2	1.40	1.45	1.50
A3	0.60	0.65	0.70
b	0.30	0.40	0.50
c	0.15	0.20	0.25
D	9.80	9.90	10.00
E	5.80	6.00	6.20
E1	3.85	3.90	3.95
e	1.27BSC		
L	0.50	0.60	0.70
L1	1.05BSC		
θ	0°	4°	8°

History

Version no.	Date	Description
0.1	2024/07/23	Internal Initial APLUS Release.