

aP58Q6

18 minutes voice erasable chip

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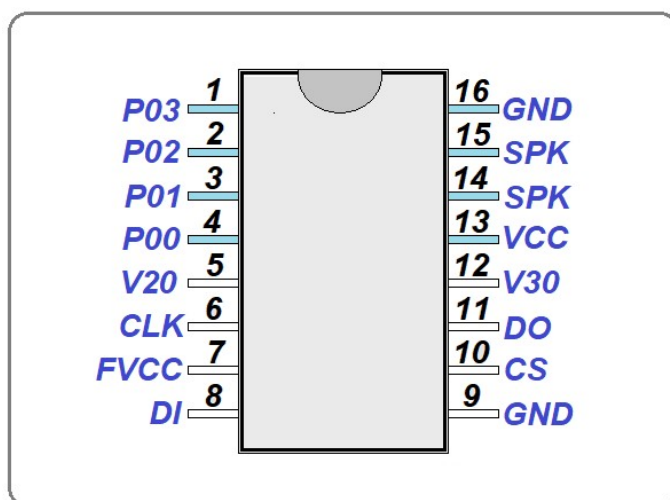
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■ Features :

- 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



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

PIN NAMES :

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

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.

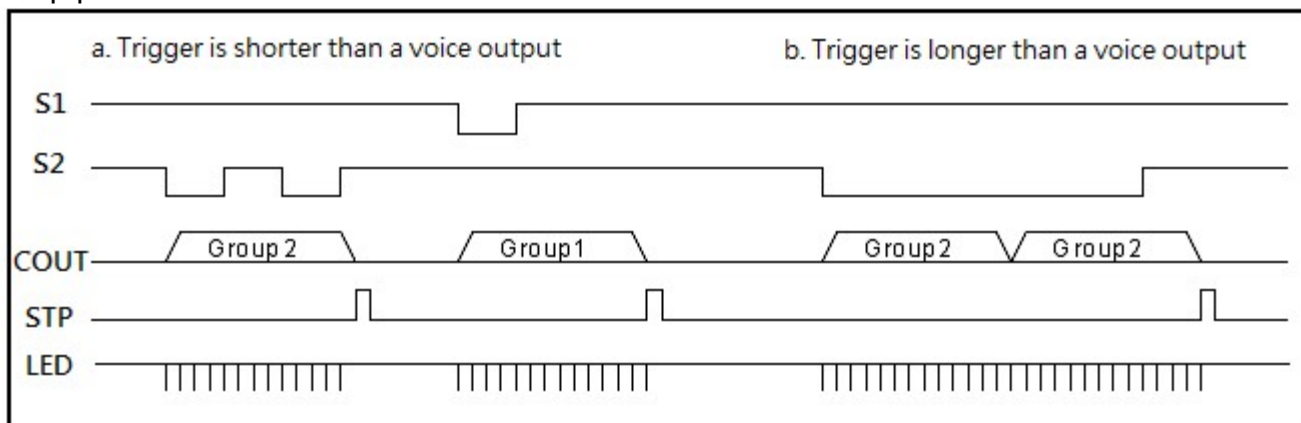


Fig. 1 Level, Unholdable, Non-retrigger

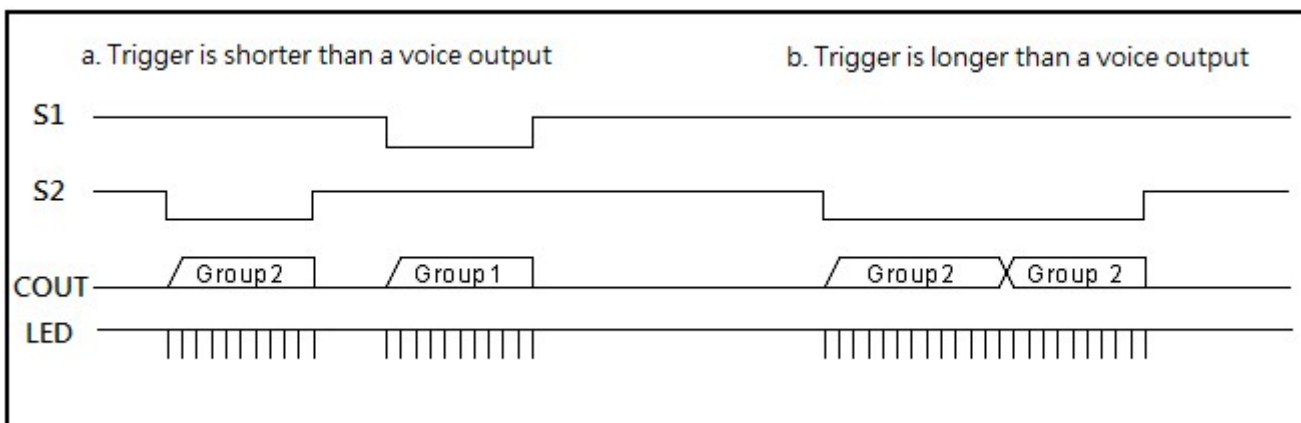


Fig. 2 Level Holdable

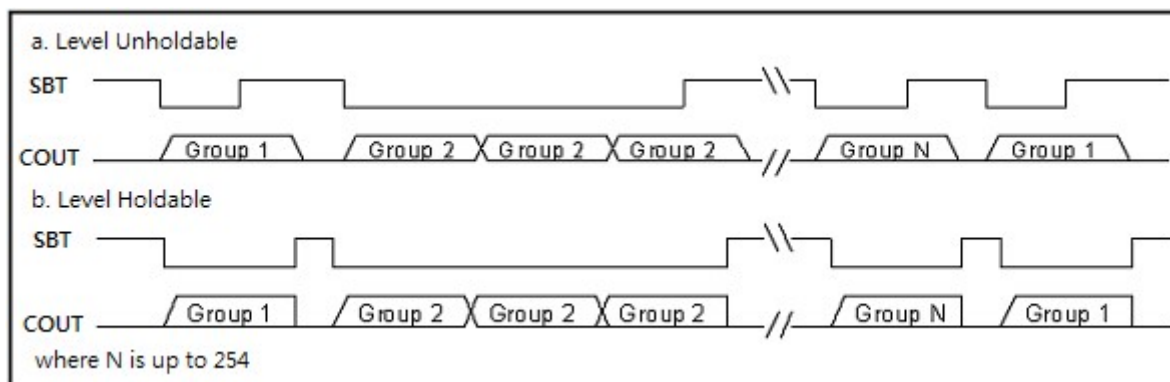


Fig. 3 SBT sequential trigger with Level Holdable and Unholdable

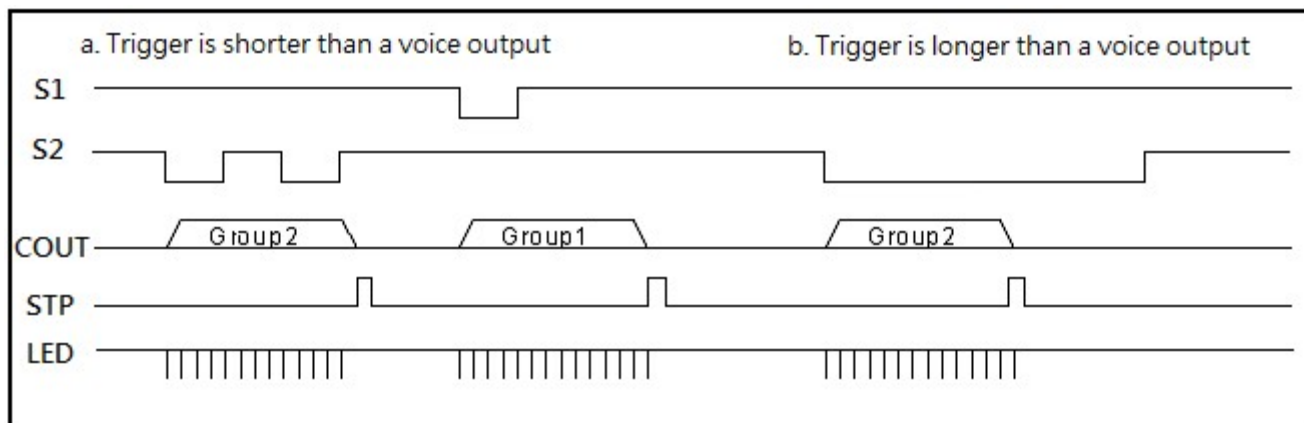


Fig. 4 Edge, Unholdable, Non-retrigger

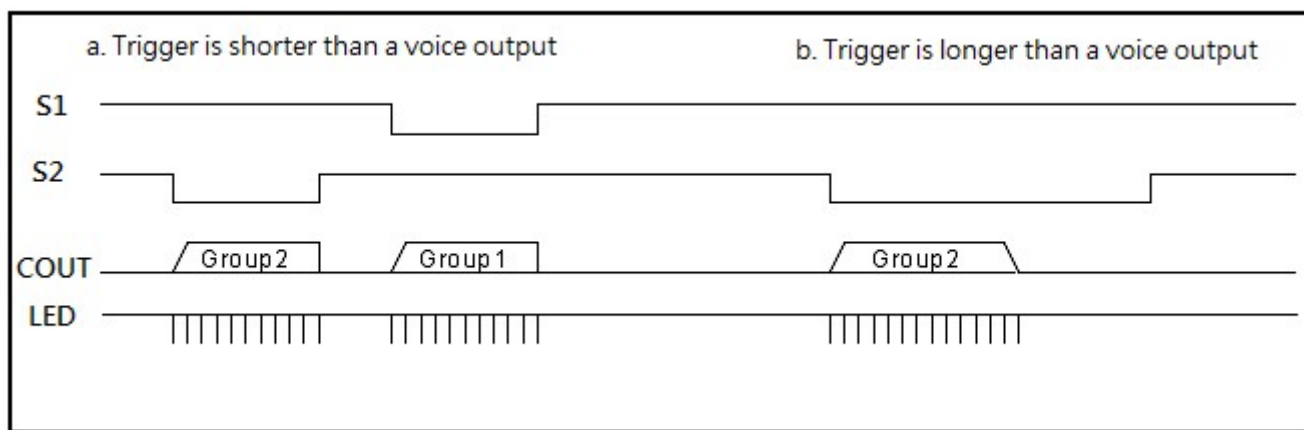


Fig. 5 Edge, Holdable

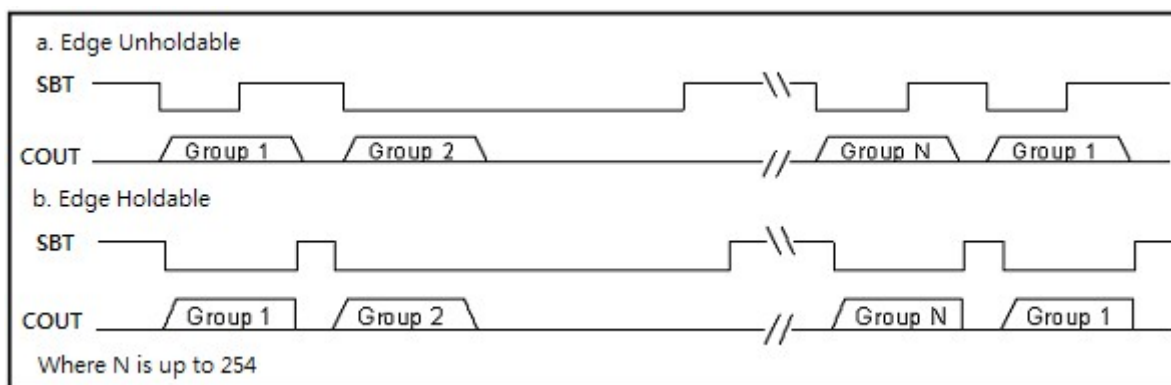


Fig. 6 SBT sequential trigger with Edge Holdable and Unholdable

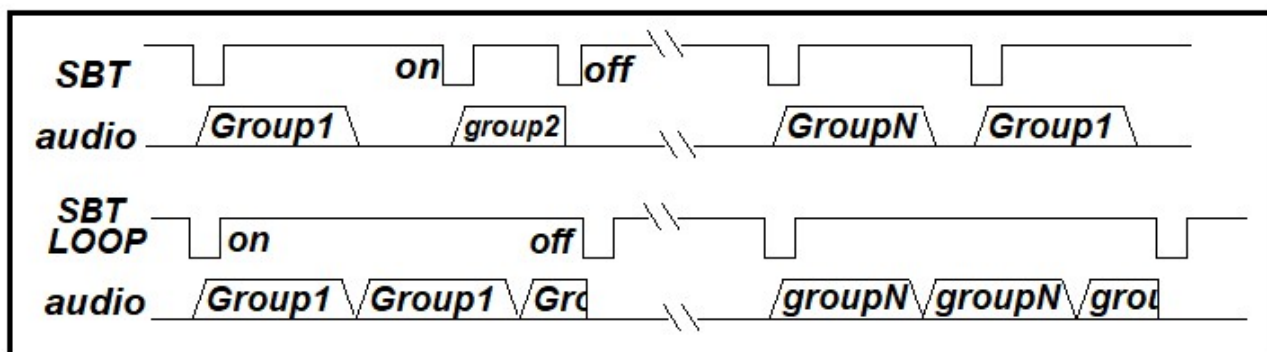


Fig. 7 SBT sequential trigger with On/Off

● **Trigger mode :**

1. **SBT mode :**

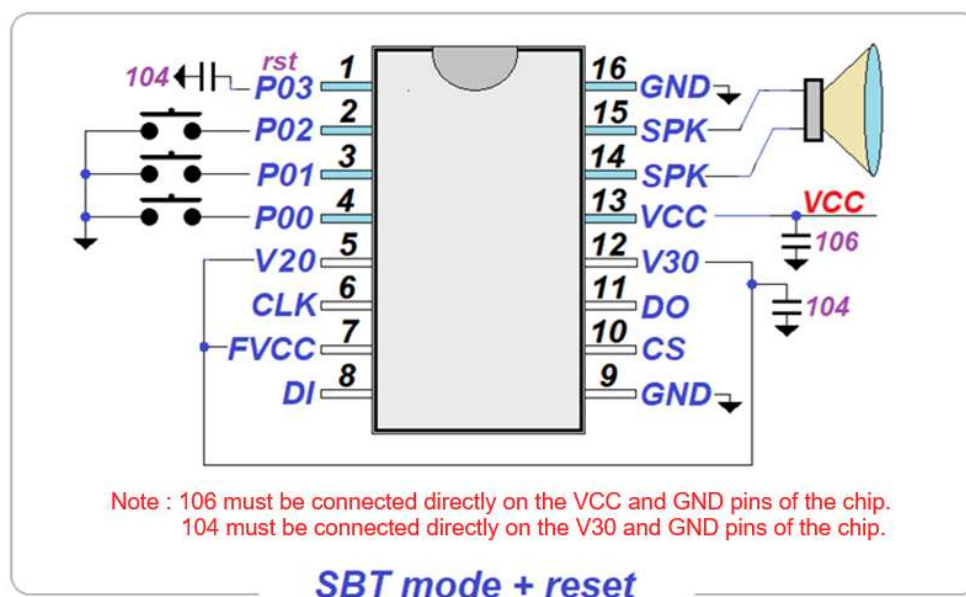
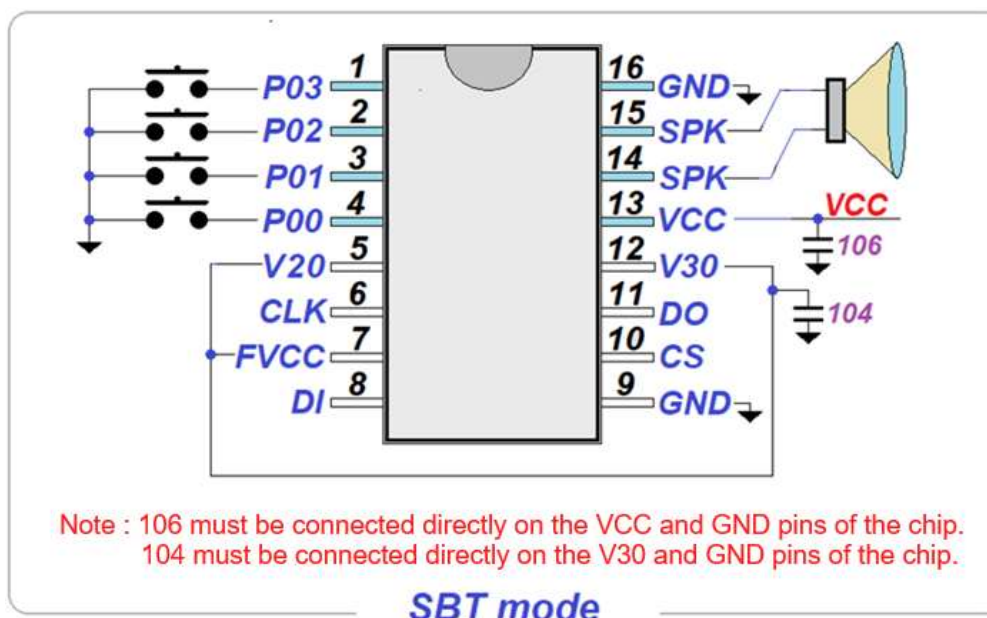
Maximum Voice Groups : 254 for each I/O. All I/O can be chosen input or output.
Each Voice Group can have its independent trigger options (See Fig. 1,2,4 and 5).
SBT mode has an additional on/off function. (See Fig. 7).

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



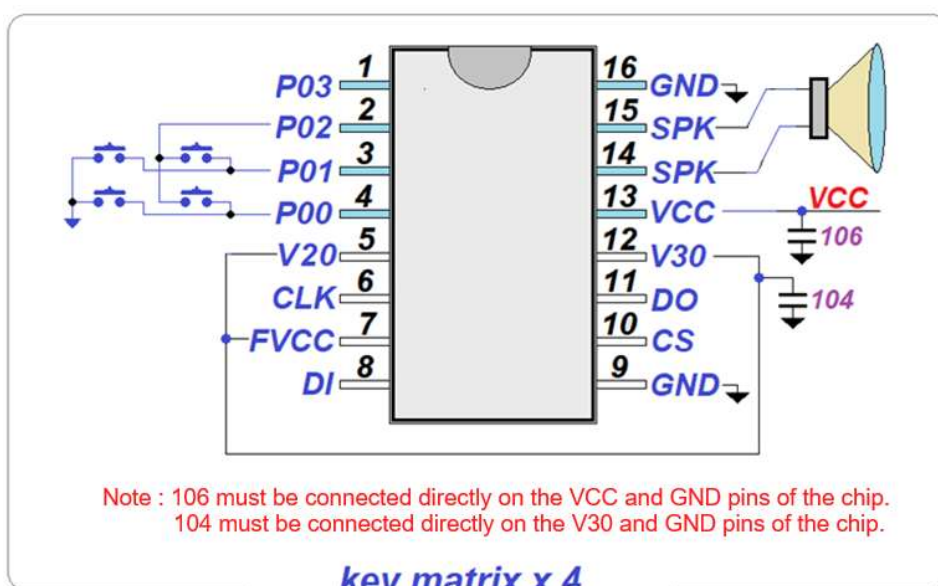
2. Key matrix mode :

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

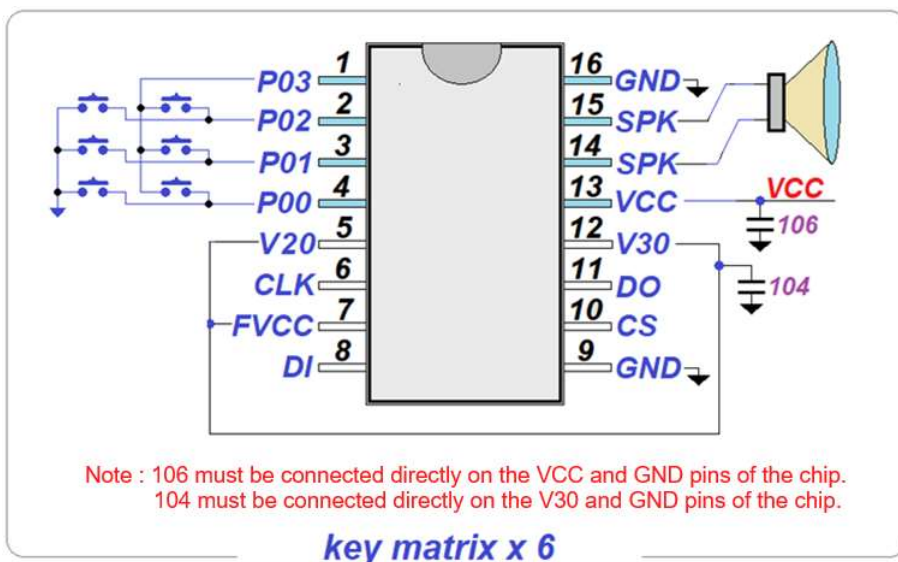
VOL : Volume Control



key matrix x 4

Ps : p03=input = reset

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



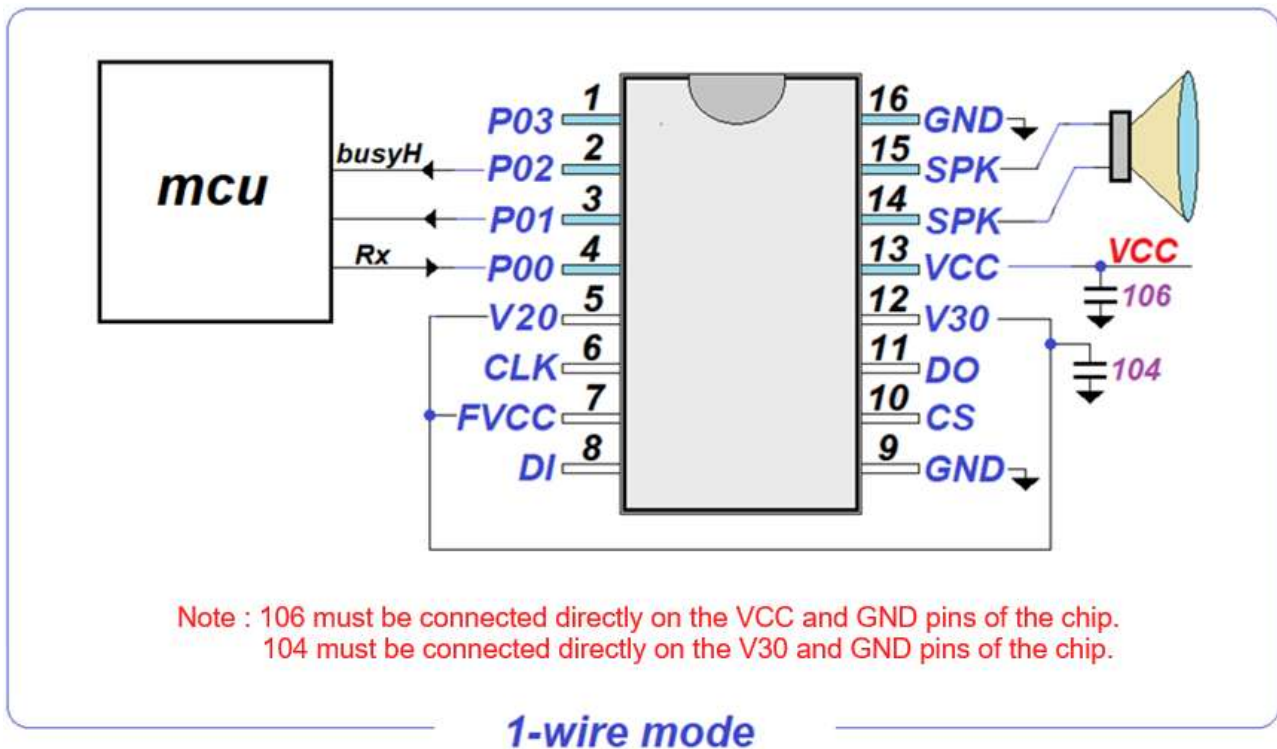
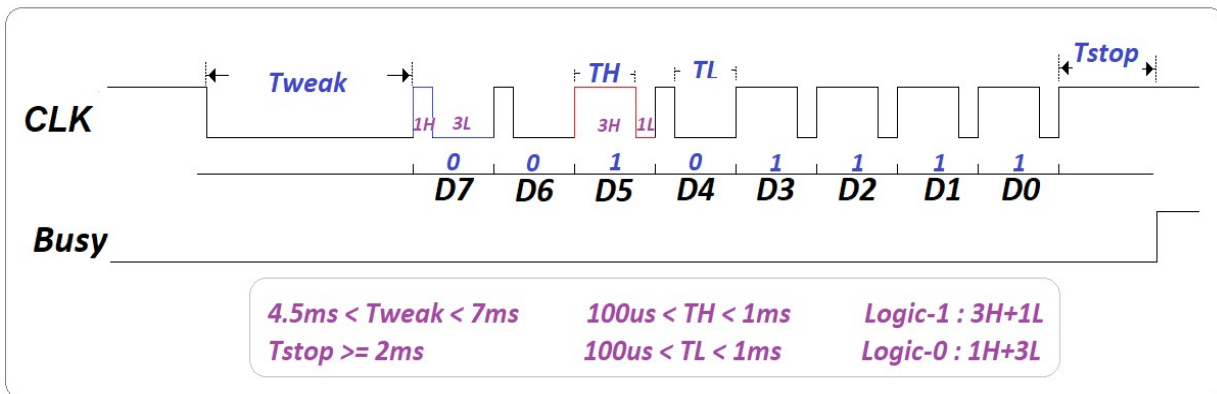
key matrix x 6

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



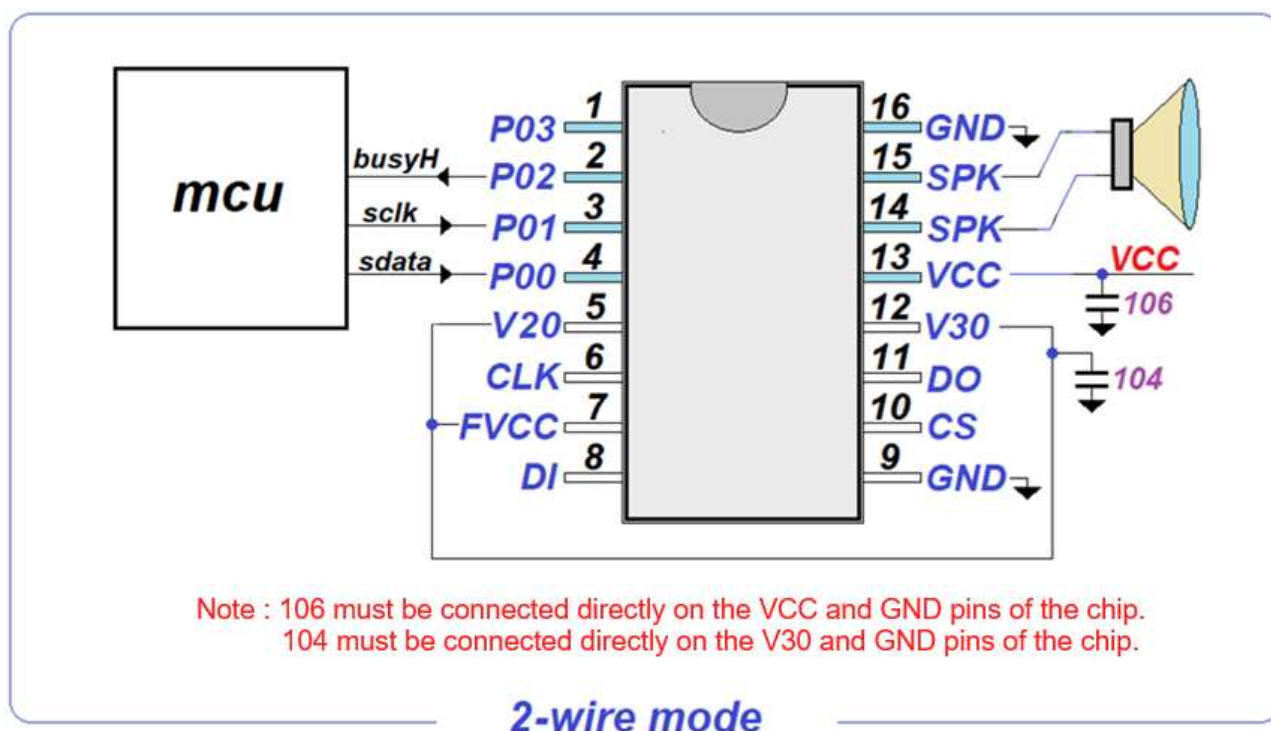
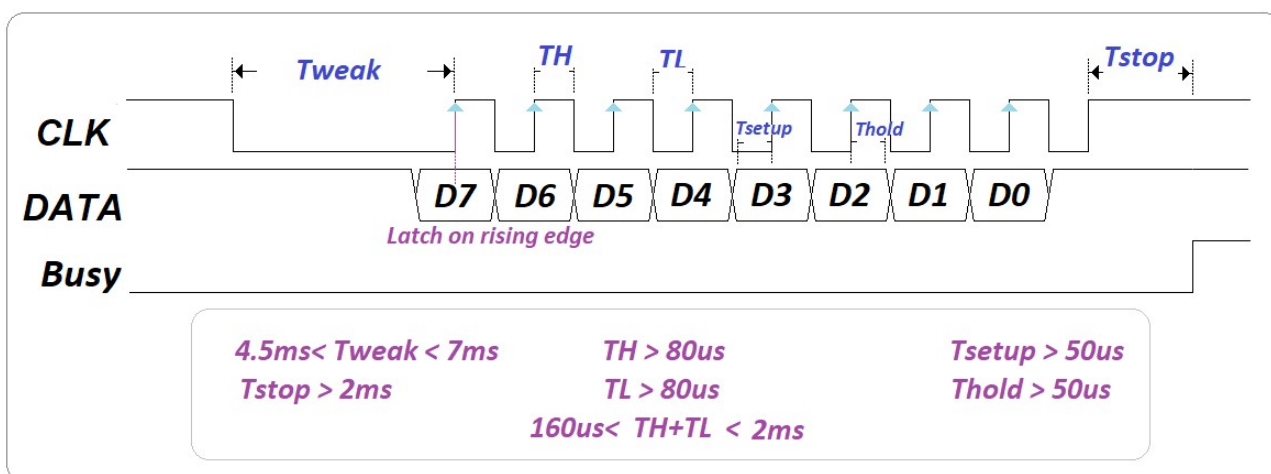
1-wire mode

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

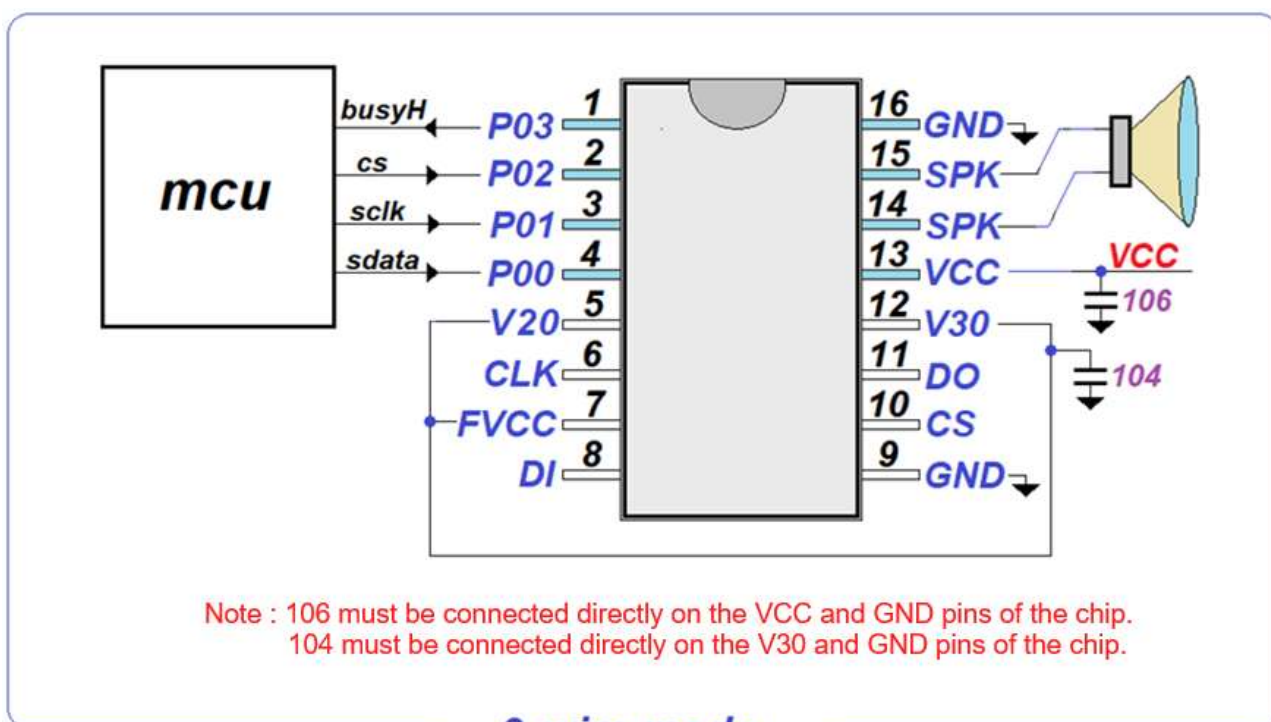
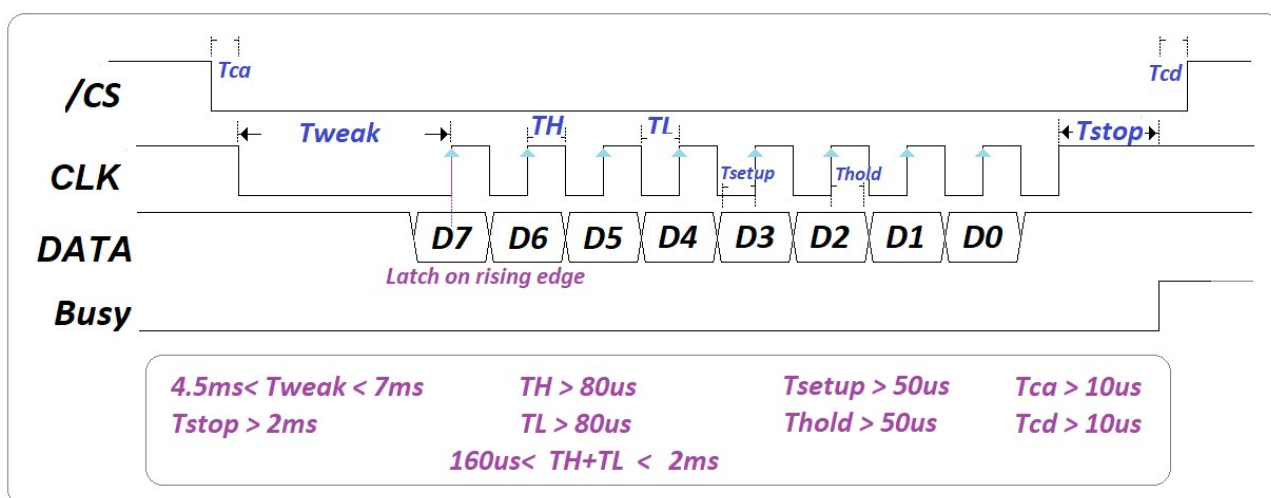


5. 3-wire mode :

P00	P01	P02	P03
sdata	sclk	Cs	Out/Reset

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

P03 = input = reset option

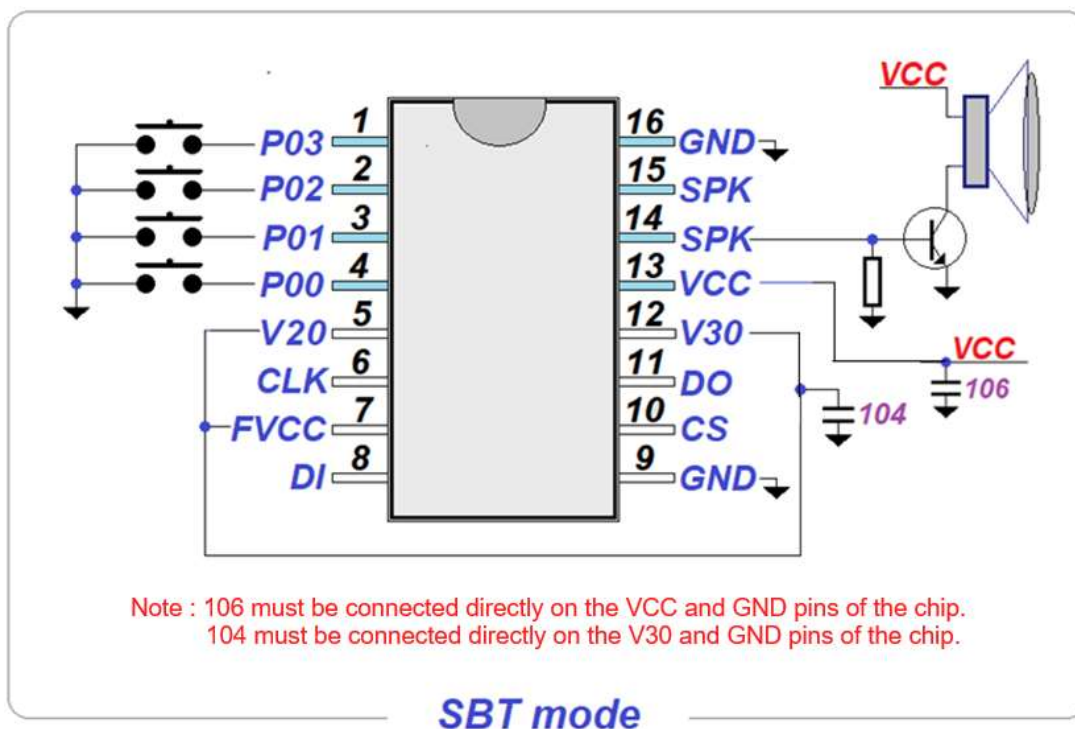


3-wire mode

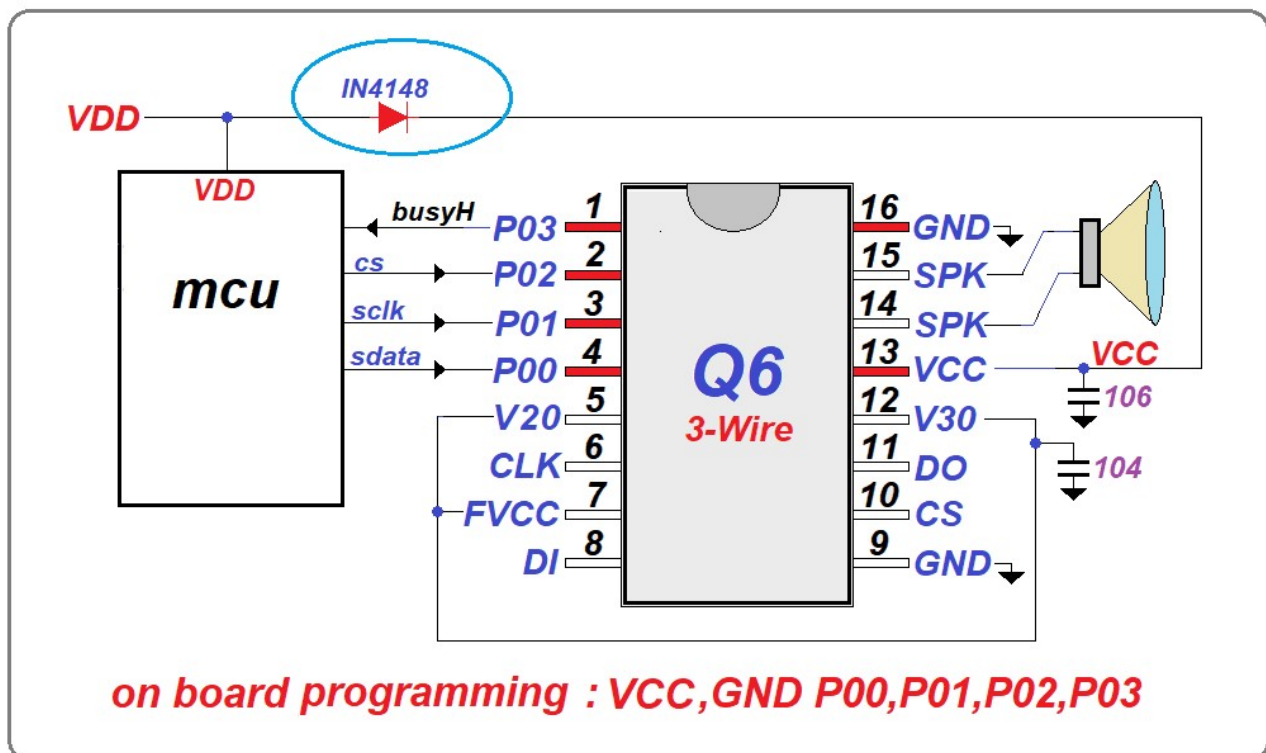
Command :

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

● **DAC Application :**



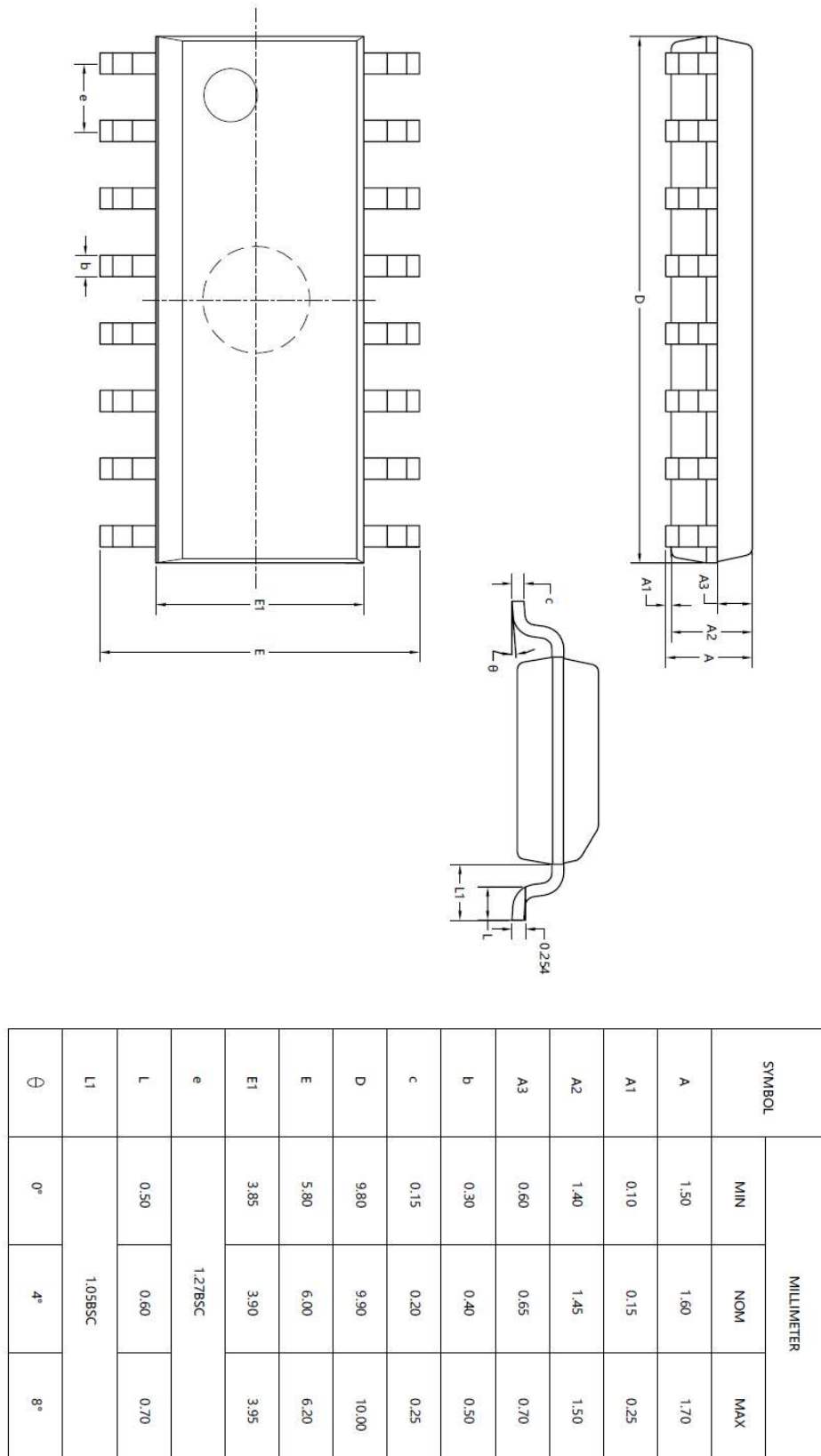
In-Circuit Program



DC CHARACTERISTICS (VCC = 3.0V , VDD = 2.0V , GND = 0V , TA = 25 °C)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
PORT0[7:4] PORT0[2:0]	Driving Current(VCC = LDO3V)	1.7		4.8	mA	VOH=2.7
PORT0[3]	Driving Current		1.7		mA	VOH=2.7
SPK_P/SPK_N	Driving Current			200	mA	RL = 8Ω @3.0V
SPK_P/SPK_N	Driving Current			320	mA	RL = 8Ω @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	VOL=0.3
PORT0[3]	Sink Current		2.5		mA	VOL=0.3
SPK_P/SPK_N	Sink Current			200	mA	RL = 8Ω @3.0V
SPK_P/SPK_N	Sink Current			320	mA	RL = 8Ω @4.5V
I_STD	Standby Current		1	6	uA	<2uA @<4.5V <3uA @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**



History

23 July 2024

Internal Initial APLUS Release.

01 April 2025

Modify Page.11 Command Table set volume (n) 0E→E

25 May 2026

Modify Page.11 command table.

17 June 2026

Add In-Circuit Program in page. 12
