WTV OTP VOICE CHIPS

WTV040 WTV080 WTV170 WTV340

1.FEATURES

- OTP(one time programmable) VOICE-CHIP
- 10s ,20s ,40,80,170, 340s durations at 6KHz. Sampling rate supported form 6KHz to 32KHz.
- WAV and MID sound files are supported.
- Equipped 16 bits DAC audio output. Built-in PSG(Programmable Sound Generator)
- Optional PWM and DAC audio output
- Mute will not take up any memory space.
- The voice data re-use saves memory space.
- Multiple control modes: key mode(keyboard), key combination mode(key array), parallel port mode(COM+SBT), serial port mode.
- BUSY pin can be setted to high or low level.
- Built-in direct drive speaker circuit.
- Operating voltage: DC 2.5V to 3.5V
- In standby, the consumption is low as 2uA , one second after stop working or without any action after electrify chip, it will be sleep automatically.
- DIP16、SOP16、SSOP20、QFP44 package are available
- Powerful programmability, can be customized according to meet all kinds of complicated functions.

2.SUMMARY AND MODELS

2.1.SUMMARY

About the control modes, WTV010 and WTV020 have key mode(keyboard), key combination mode(key array), parallel port mode(COM+SBT), serial port mode(one-line, two-line ,three-line)、WTV040、WTV080、WTV170、WTV340 have key

mode(keyboard), key combination mode(key array), parallel port mode(COM+SBT), serial port mode(one-line three-line), they are almost the same ,but this datasheet is mainly for WTV040、WTV080、WTV170、WTV340.

We equipped with a full-function, easy-using programming software(WTV OTP VOICECHIP 3.53) for these WTV series voice-chip programming.

WTV series chips are high cost effective , with wide range applications, such as electronic organ, toys, children study apparatus, guard apparatus, household appliances, automotive electronics ,medical apparatus, measure, automatic control systems. Its high quality sound and flexible powerful function make it replace ISD voice chips in many products.

2.2.VOICE CHIP MODELS

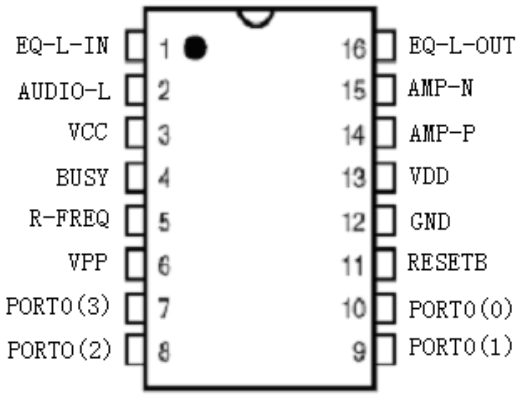
WTV	MODEL	PACKAGE	DURATION	VOICE GROUPS IN EACH MODE			
				KEY	KEY COMBINATION	PARALLEL PORT	SERIAL PORT
WTV010	WTV010-16P	DIP16	10S	4	7	8	208
	WTV010-16S	SOP16		4	7	8	208
WTV020	WTV020-16P	DIP16	20S	4	7	8	208
	WTV020-16S	SOP16		4	7	8	208
	WTV020-16TS	TSOP16		4	7	8	208
	WTV020-20S	SOP20		8	127	128	208
WTV040	WTV040-16P	DIP16	40S	4	7	8	208
	WTV040-16S	SOP16		4	7	8	208
	WTV040-20SS	SSOP20		8	127	128	208
	WTV040-44F2	QFP44		8	127	128	208
WTV080	WTV080-16P	DIP16	80S	4	7	8	208
	WTV080-16S	SOP16		4	7	8	208
	WTV080-20SS	SSOP20		8	127	128	208
	WTV080-44F2	QFP44		8	127	128	208
WTV170	WTV170-16P	DIP16	170S	4	7	8	208
	WTV170-16S	SOP16		4	7	8	208
	WTV170-20SS	SSOP20		8	127	128	208
	WTV170-44F2	QFP44		8	127	128	208
WTV340	WTV340-44F2	QFP44	340S	8	127	128	208

Note: The details of WTV010 and WTV020 refer to WT020 datasheet.

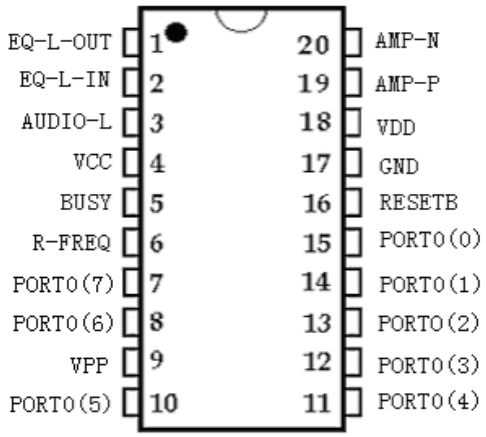
3.APPLICATIONS

Automotive electronics(car anti-theft alarm, parking assistant, GPS navigation system, E-dog, lock) , intelligent home system, household anti-theft system, medical devices, voice tips household appliances(induction cooker, rice cooker, micro-wave oven, entertainment equipment, study apparatus(talking book), toys,intelligent transportation equipment(toll gate, parking lot), communication equipment(telephone switchboard, telephone),industrial control(lift , industrial facilities).

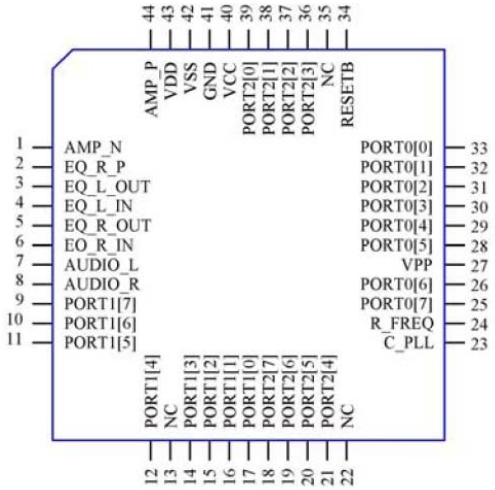
4.PINS CONFIGURATIONS



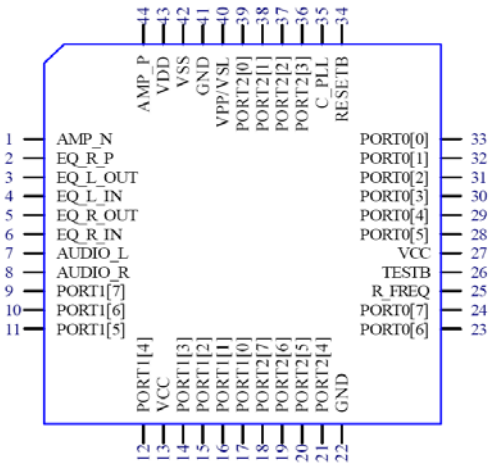
WTV040/080/170-16P、16S



WTV040/080/170-20SS



WTV040/080/170-44F2



WTV340-44F2

5.PIN FUNCTION DEFINITION

DESIGNATION	I/O	DESCRIPTION				
		KEY MODE	KEY COMBINATION MODE	PARALLEL PORT MODE	SERIAL PORT MODE	
					THREE-LINE	ONE-LINE
AMP_N	O	Speaker amplifier negative output signal.				
EQ_R_P	---	OP positive input/output in of EQ_R				
EQ_L_OUT	O	OP out pin of EQ_L.				
EQ_L_IN	I	OP negative input pin of EQ_L				
EQ_R_OUT	---	OP out pin of EQ_R.				
EQ_R_IN	O	OP negative input pin of EQ_R				

AUDIO_L	I	16-bit D/A output of left audio.				
AUDIO_R	I	16-bit D/A output of right audio.				
PORT1 [0]~PORT1[7]	I/O	NC				
PORT2 [0]~PORT2[7]	I/O	NC				
PORT2 [4]	O	BUSY signal				
C_PLL	---	Strengthen anti-jamming(suggest don't use)				
R-FREQ	---	Oscillating pin				
PORT0 [7]	I	K8	K8	Address pin S6	----------	
PORT0 [6]	I	K7	K7	Address pin S5	----------	
VPP	---	Programming voltage				
PORT0 [5]	I	K6	K6	Address pin S4	----------	
PORT0 [4]	I	K5	K5	Address pin S3	----------	
PORT0 [3]	I	K4	K4	Address pin S2	DATA IN	DATA
PORT0 [2]	I	K3	K3	Address pin S1	CLK IN	--------
PORT0 [1]	I	K2	K2	Address pin S0	CS	-------
PORT0 [0]	I	K1	TEST pin	SBT pin	TEST pin	
RESETB	I	Chip reset, low active.				
VCC	---	Analog power supply , positive				
GND		Digital ground				
VSS		Analog ground				
VDD		Digital power supply , positive				
AMP_P		PWM output 1				

Note: When electrify system, P00 and P01 can not be low level at the same time , or else it will enter into test.

6.ELECTRICAL CHARACTERISTICS

DC Electrical Characteristics (DVCC=3.0V ,AVCC=3.0V, GND=0V , TA=25℃)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
D0-D7 IRQ	Driving Current		4		mA	VOH=2.7
AUDIO_L AUDIO_R EQ_L_OUT EQ_R_OUT	Driving Current		4		mA	
AMP_P AMP_N	Driving Current			200	mA	RL=8
D0-D7 IRQ SDA SDL	Sink Current		4		mA	
AUDIO_L AUDIO_R EQ_L_OUT EQ_R_OUT	Sink Current		4		mA	VOL=0.3
AMP_P AMP_N	Sink Current			200	mA	RL=8
I_STD	Standby Current	1.2	1.5	2	uA	

AC Electrical Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
TAS	Address Set-Up Time	0			nS	
TAH	Address Hold time	0			nS	
TDS	Data Set-Up Time	20			nS	
TDH	Data Hold time	2			nS	
TAC	Access Time	0			nS	
TPW	Pulse Width time	20			nS	

6.1.ABSOLUTE MAXIMUM RATINGS

SYMBOL		VALUE	UNIT
VCC-GND		-0.5～3.6	V
Vin		GND-0.3<Vin<VCC+0.3	V
Vout		GND<Vout<VCC	V
T(Operation)	DIP	-10~+70	°C
	SSOP	-20~+80	°C
	QFP	-15~75	°C
T(Junction)		-30~+120	°C
T(Storage)		-45~+125	°C

7.CONTROL MODES

In the following control modes, key mode(keyboard) and one of other modes can be existed at the same time. One-line and three-line serial mode and parallel mode should be customized. For example, customer subscribe three-line serial port mode, then the chip with key mode and three-line serial port mode .other modes can not exist at the same time.

7.1. KEY MODE(KEYBOARD)

7.1.1. KEY MODE DESCRIPTION

One key can trigger one group of voice, each key's trigger mode can be setted individually.

Debounce time is 10ms in key mode.

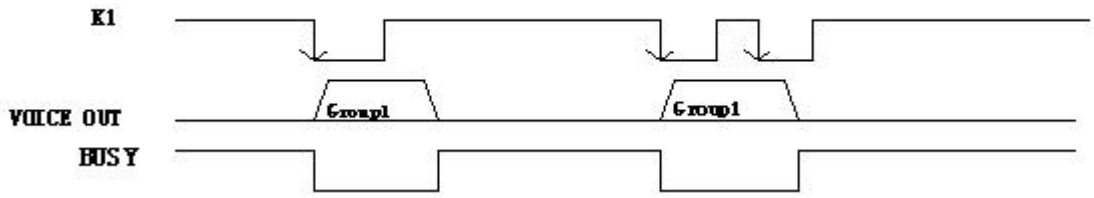
7.1.2. ASSIGNMENT OF PINS

PACKAGE	PIN							
	PORT07	PORT06	PORT05	PORT04	PORT03	PORT02	PORT01	PORT00
DIP16	----	----	----	----	K4	K3	K2	K1
SOP16	----	----	----	----	K4	K3	K2	K1
SSOP20	K8	K7	K6	K5	K4	K3	K2	K1

Each port's control mode can be setted individually.

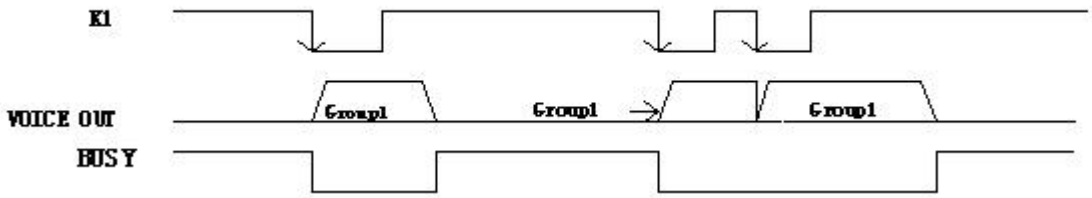
7.1.3.TIMING WAVEFORMS

(1)EDGE IRRETRIGGER (Pulse trigger)

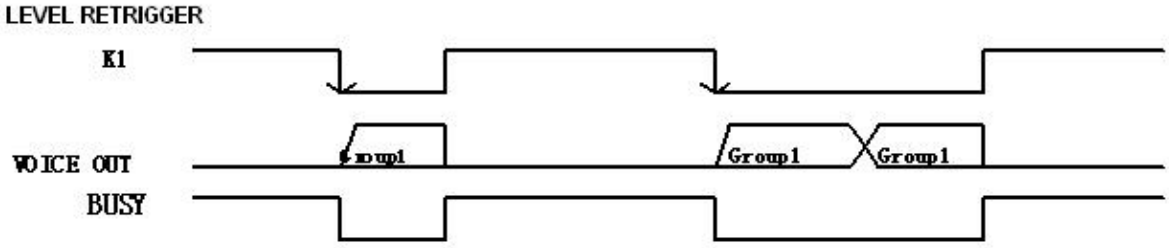


Remark: Negative pulse trigger, when I/O port detect falling edge (such as short-circuit the I/O port to the GND), trigger and play voice. During playing , falling edge was detected again, the chip will take action.After voice played over, detected falling edge to be effective.

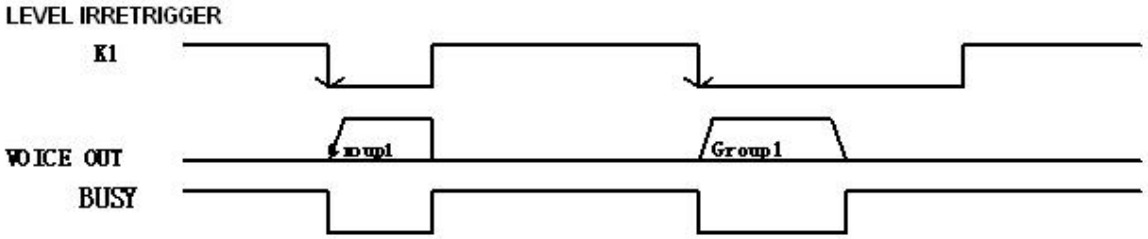
(2)EDGE RETRIGGER(Pulse retrigger)



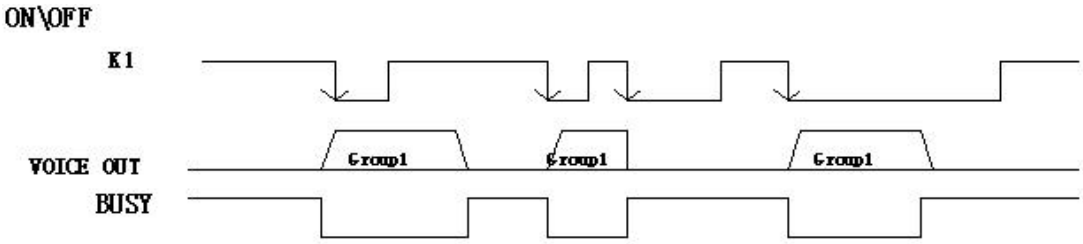
Remark: Negative pulse trigger, when I/O port detect falling edge (such as short-circuit the I/O port to the GND), trigger and play voice. During the playing , falling edge was detected again, the voice will be interrupted and re-play.



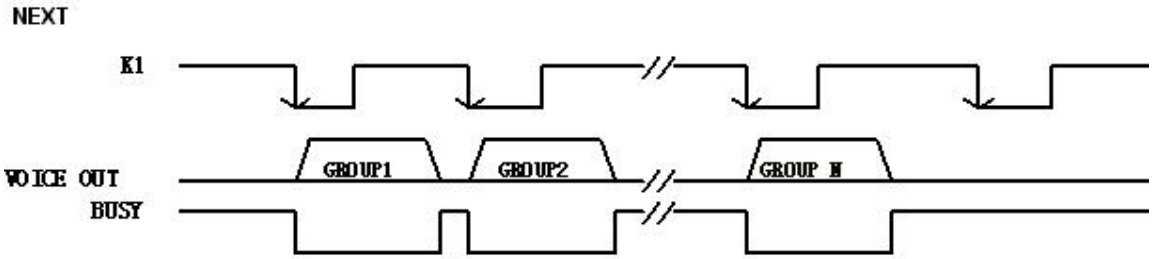
Remark：Level retrigger. When I/O port is low level, keep playing , high level will stop. it will re-play until high level.



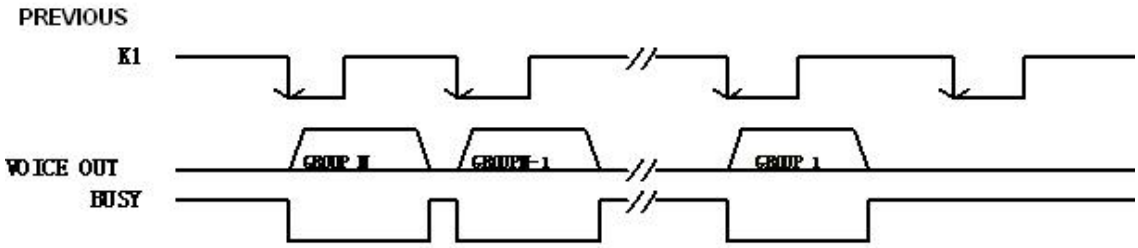
Remark：Level irretrigger(level trigger). When I/O port is low level, keep playing , high level will stop. After first play is over it won't replay even keep low level. Unless pull high then pull low and keep low level, it will be the second play .



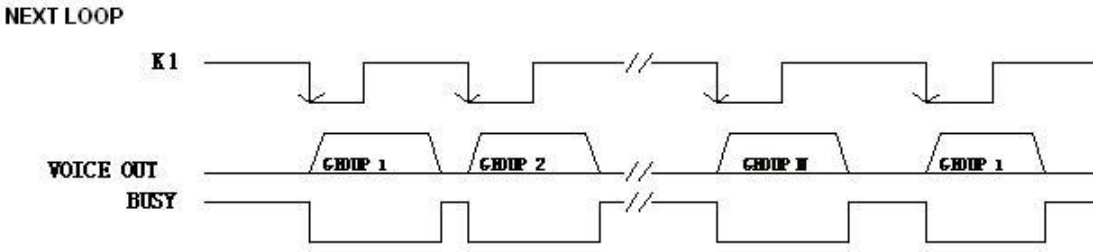
Remark：A negative pulse start to play, next negative pulse to stop.



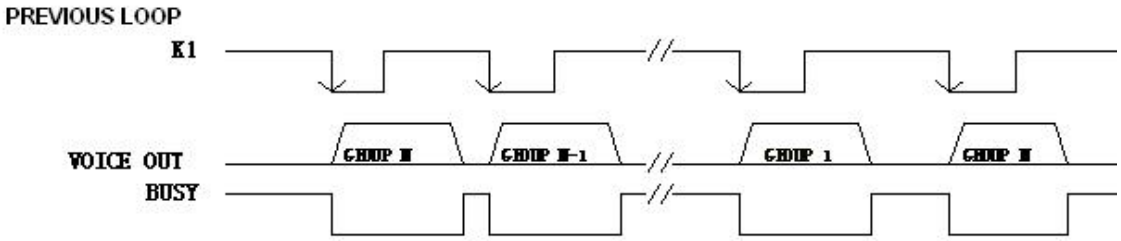
Remark：Next(down) . One key trigger and play all voice, A negative trigger play a section, next negative trigger play next section till last section, then no more voice.



Remark：Previous (Up). A negative pulse trigger to play a group, next negative pulse trigger to play previous group . it can be loop.



Remark：Next loop(down loop). A negative pulse trigger to play a group, next negative pulse trigger to play next group . It can be loop.



Remark：Previous loop(up loop). A negative pulse trigger to play a group, next negative pulse trigger to play previous group . It can be loop.

7.2. KEY COMBINATION MODE (KEY ARRAY)

7.2.1. KEY COMBINATION MODE(KEY ARRAY)

Trigger to play voice by defined combined pins.

7.2.2. ASSIGNMENT OF PINS

PACKAGE	PIN							
	PORT07	PORT06	PORT05	PORT04	PORT03	PORT02	PORT01	PORT00
DIP16	----	----	----	----	K4	K3	K2	K1
SOP16	----	----	----	----	K4	K3	K2	K1
SSOP20	K8	K7	K6	K5	K4	K3	K2	K1
QFP44	K8	K7	K6	K5	K4	K3	K2	K1

NOTE: K1 is the test pin, it can set multifold trigger mode, for example : edge retrigger , next loop. K2、K3、K4 can

combine to use.

7.2.3.THE RELATIONSHIP OF VOICE AND PINS' STATUS.

DIP16、SOP16 PACKAGE

Group N	PIN		
	K4	K3	K2
Group1	0	0	0
Group2	0	0	1
Group3	0	1	0
Group4	0	1	1
Group5	1	0	0
Group6	1	0	1
Group7	1	1	0
MUTE	1	1	1

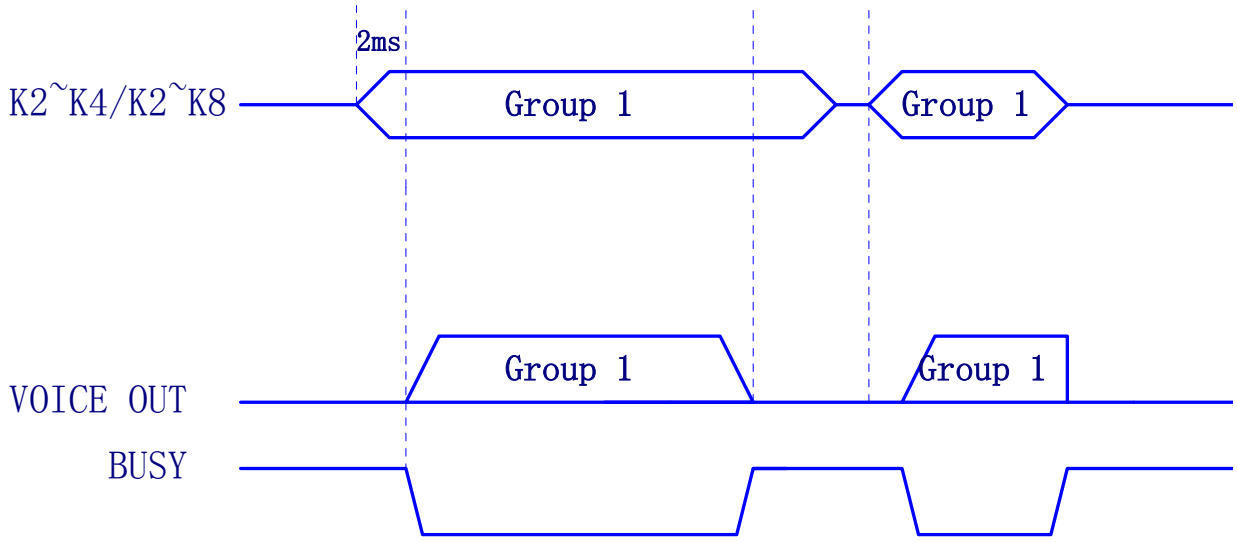
Note: Trigger pin K2, K3, K4 default as 1

SSOP20 PACKAGE

Group N	PIN						
	K8	K7	K6	K5	K4	K3	K2
Group1	0	0	0	0	0	0	0
Group2	0	0	0	0	0	0	1
Group3	0	0	0	0	0	1	0
Group4	0	0	0	0	0	1	1
. . . Increase by binary way . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Group127	1	1	1	1	1	1	0

K2 to K8 is low to high, Increase by binary way

7.2.4.TIMING WAVEFORMS



Remark：Keep pressing related key, chips will play the voice in the related address .After finish playing, it won't be any voice even keep the key pressed unless change key's signal. If release the key during the playing and it will stop to play.

7.3.PARALLEL PORT MODE (COM+SBT)

7.3.1. PARALLEL PORT MODE (COM+SBT)

PORT0(0) is SBT trigger pin . PORT0(1)~ PORT0(7) are address pins. Voice in each address can be controlled by PORT0(0) .

7.3.2.ASSIGNMENT OF PINS

PACKAGE	PIN							
	PORT07	PORT06	PORT05	PORT04	PORT03	PORT02	PORT01	PORT00
DIP16	----	----	----	----	Address S2	Address S1	Address S0	SBT
SOP16	----	----	----	----	Address S2	Address S1	Address S0	SBT
SSOP20	Address S6	Address S5	Address S4	Address S3	Address S2	Address S1	Address S0	SBT

7.3.3. THE RELATIONSHIP OF VOICE AND ADDRESSES

DIP16、SOP16 PACKAGE

Group N	PIN		
	S3	S2	S1
Group1	0	0	0
Group2	0	0	1
Group3	0	1	0
Group4	0	1	1
Group5	1	0	0
Group6	1	0	1
Group7	1	1	0

Group8	1	1	1

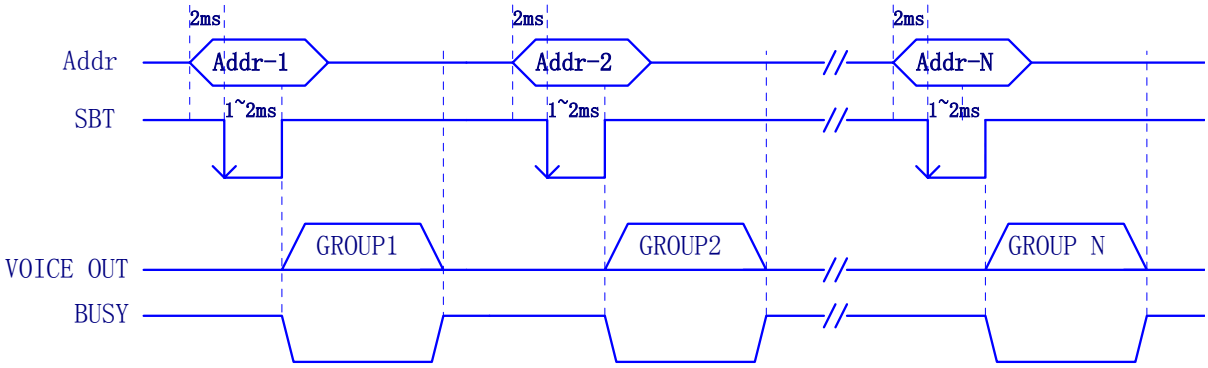
SSOP20 PACKAGE

Group N	PIN						
	K8	K7	K6	K5	K4	K3	K2
Group1	0	0	0	0	0	0	0
Group2	0	0	0	0	0	0	1
Group3	0	0	0	0	0	1	0
Group4	0	0	0	0	0	1	1
. . . Increase by binary way . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Group127	1	1	1	1	1	1	0
Group128	1	1	1	1	1	1	1

7.3.4.PARALLEL CONTROL TIMING WAVEFORMS

Put the address to the code which correspond voice, and trigger SBT pin to play the voice.

SBT trigger mode: Edge retrigger(pulse retrigger) , Edge irretrigger (pulse trigger) ,Level retrigger, Level irretrigger(level trigger)



Note: In order to avoid trigger wrong voice, send out trigger signal after Addr signal stable.

7.4. ONE-LINE SERIAL PORT MODE

7.4.1. ONE-LINE SERIAL PORT MODE

Control chip working by DATA pin. Sending data by serial port can control voice play ,stop, loop.

7.4.2. ASSIGNMENT OF PINS

PACKAGE	PIN							
	PORT07	PORT06	PORT05	PORT04	PORT03	PORT02	PORT01	PORT00
DIP16	----	----	----	----	DATA	----	----	K1
SOP16	----	----	----	----	DATA	----	----	K1
SSOP20	----	----	----	----	DATA	----	----	K1

NOTE: K1 is the test play voice pin, it can set multifold trigger mode, for example : edge retrigger, next loop.

7.4.3. THE RELATIONSHIP OF VOICE AND ADDRESSES.

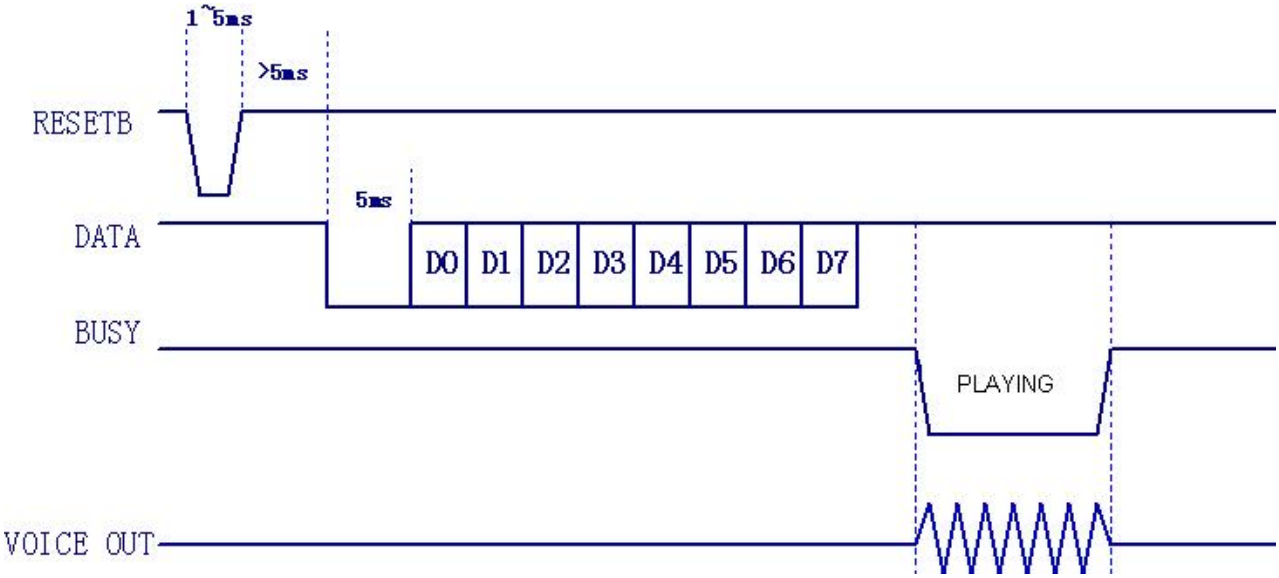
DATA（HEX）	FUNCTIONS
00H	PLAY GROUP 1 VOICE
01H	PLAY GROUP 2VOICE
02H	PLAY GROUP 3 VOICE
03H	PLAY GROUP 4 VOICE
. . XXH . .	. . PLAY GROUP “N”VOICE . . .
DEH	PLAY GROUP 223 VOICE
DFH	PLAY GROUP 224 VOICE
E0H	VOLUME ADJUSTMENT（LEVEL 1）
E1H	VOLUME ADJUSTMENT（LEVEL 2）
. . . . . .	. . . . . .
EFH	VOLUME ADJUSTMENT（LEVEL 16）
F0H	SHUT DOWN AMPLIFIER
F1H	OPEN AMPLIFIER
F2H	PLAY CURRENT VOICE CYCLELY
FEH	STOP TO PLAY CURRENT VOICE

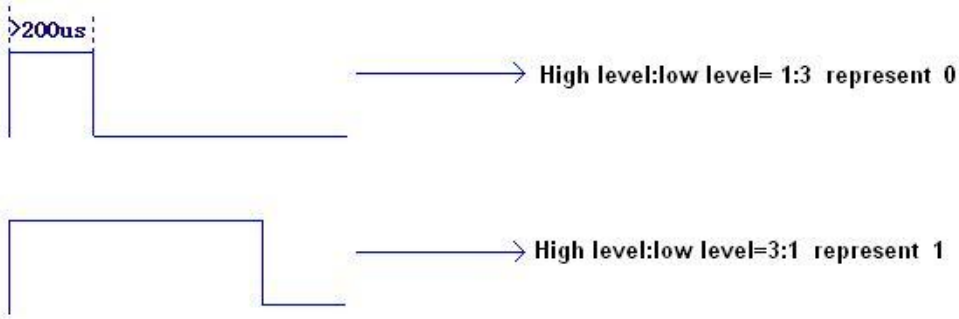
Volume default is maximum as EFH.

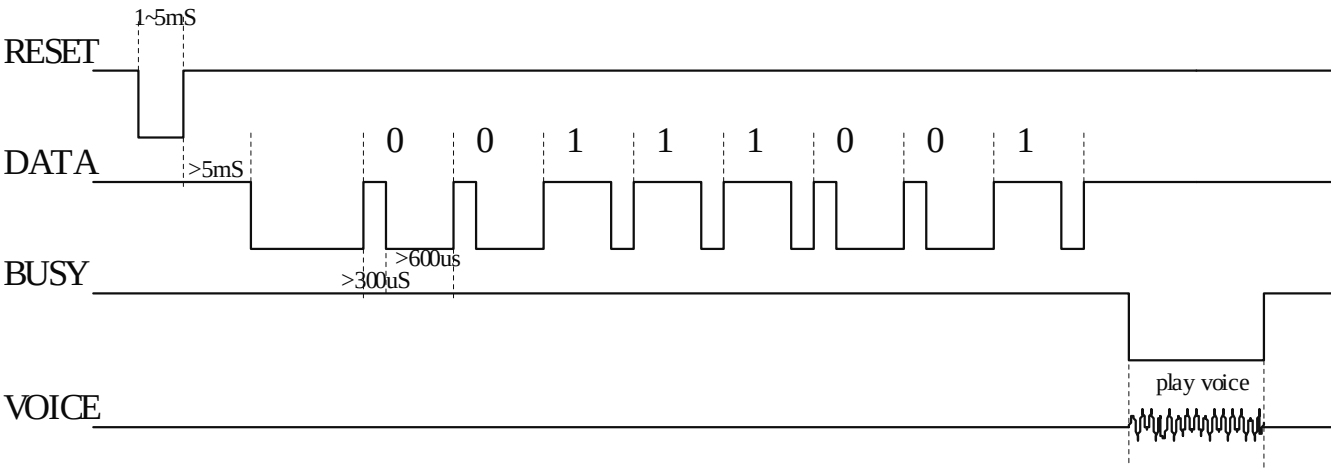
In DAC output (select in software) . Amplifier status can be changed by sending command to chip.

Cycle play code(F2H) must be sent during play, if voice play finished, sending “F2H” code is invalid

7.4.4. TIMING WAVEFORMS







Note: MUC pull low reset signal for 1～5ms , then keep high level , wait for 5ms then pull low DATA and keep low level for 5ms, then transmit data.

DATA should be sent high first, and then low. High : low = 1:2 is “0” , high : low=2:1 is “1” .As you see ,the data is 00111001 , convert to decimalist is “57” , it means trigger the group 57 voice. After the data transmitted, the WTV chip will pull low “BUSY” automatically. And play the voice at the same time.

7.4.5 PROGRAM EXAMPLE(MCU：PIC16F57 CRYSTAL OSCILLATOR ：4MHz)

```
rst=0;
for(i=0;i<10;i++)asm("nop");
rst=1;
wait(200);                                  /* above 5ms */
sda=0;
wait(300);                                  /* 5ms */
for(i=0;i<8;i++)
{
    sda=1;
    if(addr & 1)
    {
        wait(15);                           /* 300us */
        sda=0;
        wait(5);                            /* 100us */
    }
    else
    {
        wait(5);
        sda=0;
        wait(15);
    }
    addr>>=1;
}
sda=1;
```

ASSEMBLER EXAMPLE，MCU ：AT892051， OSCILLATOR：4MHz

```
;-------------------------------------------------send high level
HIGD:   lcall DELAY2    ；delay600us
        clr     SDA
        lcall DELAY3    ；delay200us
        CLR     A
        MOV     a,R2
        RR      A
        mov     r2, a
        djnz    r4,SEND
        SETB    SDA
        CJNE    R2,#09H,NEXT
        SJMP    MAIN
;------------------------------------------------- send low level
LOWD:   lcall DELAY3
```

```
        CLR     SDA
            lcall DELAY2
            CLR     A
            MOV     a,R2
            RR      A
            mov     r2, a
            djnz    r4,    SEND
            SETB    SDA
            CJNE    R2,#09H,NEXT
            SJMP    MAIN

    SEND:   setb    SDA
            clr     a
            mov     a, r2          ;get lowest bit from byte
            anl     a, #01h
    HIGD1: jb       acc.0, HIGD     ;bit is 1，call send high level subprogram
    LOWD1: JNB      ACC.0, LOWD     ; call send low level subprogram
            RET
```

7.5.THREE-LINE SERIAL PORT MODE

7.5.1. THREE-LINE SERIAL PORT MODE

Control chip working by CS,DATA,CLK pins. Sending data by serial port can control voice play , stop, loop.

7.5.2. ASSIGNMENT OF PINS

PACKAGE	PIN							
	PORT07	PORT06	PORT05	PORT04	PORT03	PORT02	PORT01	PORT00
DIP16	----	----	----	----	DATA	CLK	CS	K1
SOP16	----	----	----	----	DATA	CLK	CS	K1
SSOP20	----	----	----	----	DATA	CLK	CS	K1
QFP44	----	----	----	----	DATA	CLK	CS	K1

NOTE: K1 is the test play voice pin, it can set multifold trigger mode, for example : edge retrigger, next loop.

7.5.3.THE RELATIONSHIP OF DATA AND VOICE

DATA（HEX）	FUNCTIONS
00H	PLAY GROUP 1 VOICE
01H	PLAY GROUP 2VOICE
02H	PLAY GROUP 3 VOICE
03H	PLAY GROUP 4 VOICE
. . XXH .	. . PLAY GROUP “N” VOICE. .

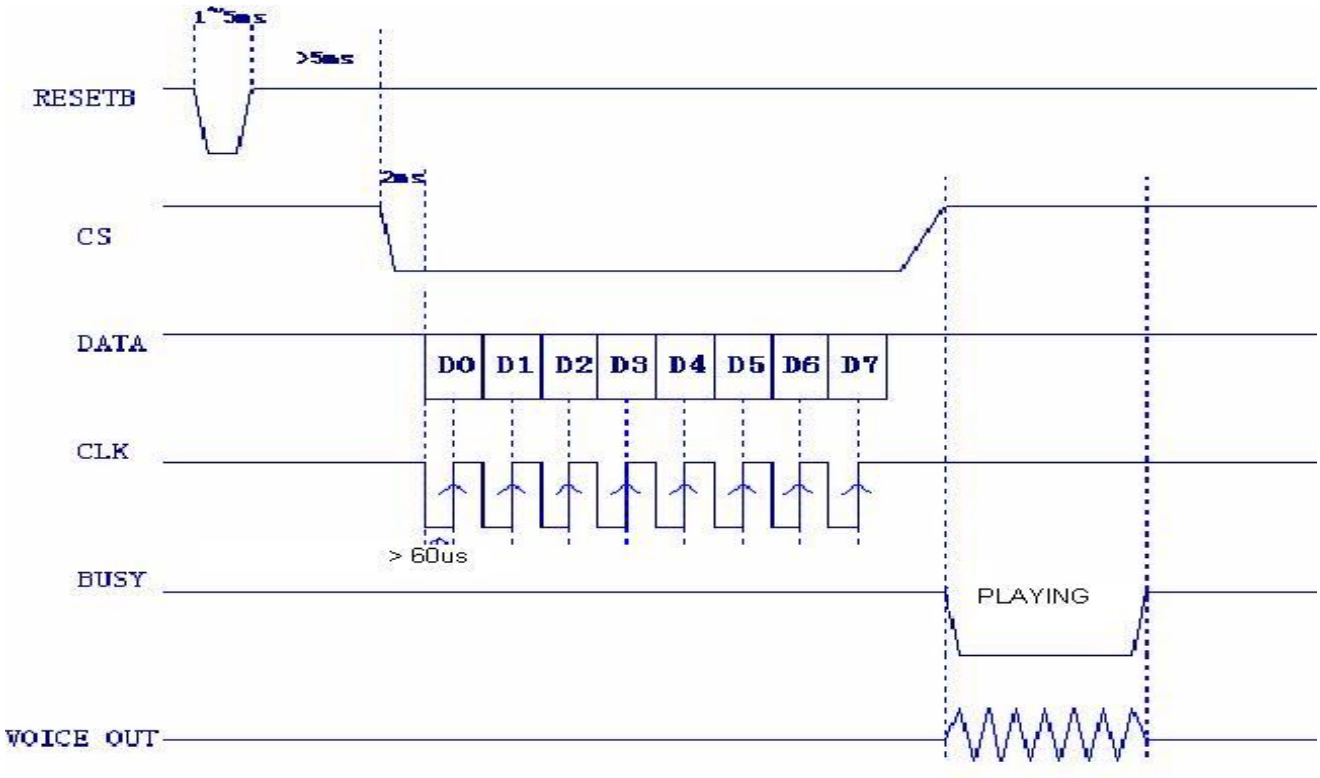
.	.
DEH	PLAY GROUP 223 VOICE
DFH	PLAY GROUP 224 VOICE
E0H	VOLUME ADJUSTMENT（LEVEL 1）
E1H	VOLUME ADJUSTMENT（LEVEL 2）
. . . . . .	. . . . . .
EFH	VOLUME ADJUSTMENT（LEVEL 16）
F0H	SHUT DOWN AMPLIFIER
F1H	OPEN AMPLIFIER
F2H	PLAY CURRENT VOICE CYCLELY
FEH	STOP TO PLAY CURRENT VOICE

Volume default is maximum as EFH.

In DAC output (select in software) . Amplifier status can be changed by sending command to chip.

Cycle play code(F2H) must be sent during play, if voice play finished, sending “F2H” code is invalid.

7.5.5.TIMING WAVEFORMS



Note: MUC pull low reset signal for 1～5ms , then keep high level , wait for 5ms then pull low CS and keep low level for 2ms, then transmit DATA and CLK.

DATA should be sent high first, and then low. High : low = 1:2 is “0” , high : low=2:1 is “1” . Voice address represent by 8 bit binary system ,such as 00111001 , convert to decimalist is “57” , it means trigger the group 57 voice. CLK transmit low before high , CLK cycle is 120us, After the voice address data transmitted, DATA,CLK ,CS set to high level, after 5ms ,the WTV chip will pull low “BUSY” automatically. And play the voice at the same time.

7.5.6. PROGRAM EXAMPLE(MCU：PIC16F57 CRYSTAL OSCILLATOR ：4MHz)

```
rst=0;
for(i=0;i<10;i++)asm("nop");
rst=1;
wait(200);                                  /*above 5ms */
cs=0;
for(i=0;i<200;i++)asm("nop");               /* above1ms */
for(i=0;i<8;i++)
{
    scl=0;
    if(addr & 1)sda=1;
    else sda=0;
    addr>>=1;
    for(t=0;t<20;t++)asm("nop");            /* above 60us */
    scl=1;
    for(t=0;t<20;t++)asm("nop");
}
    cs=1;
```

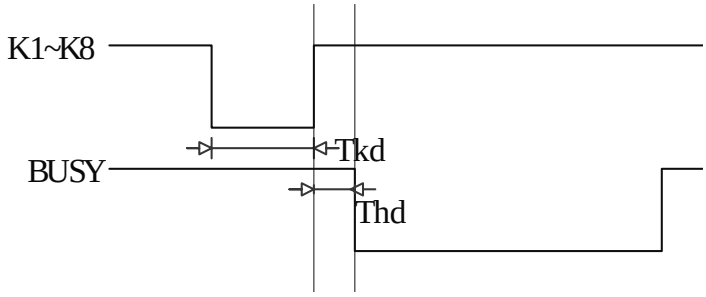
ASSEMBLER EXAMPLE, MCU ： AT892051 , OSCILLATOR：4MHz

```
    SETB   SCL
    SETB   SDA
    CLR    CS
    MOVE   r2,2
    LCALL  DELAY1MS   ;delay2MS
    MOVE   R3,8
LOOP_8:
    CLR        A
    MOVE   A,R4
    ANL    A,01H    ； send low bit first
    JNB    ACC.0,LOW
    SETB   SDA          ； the bit is high
LOW:CLR        SCL
    MOVE   R2,20
    LCALL  DELAY1US  ； delay 20us
```

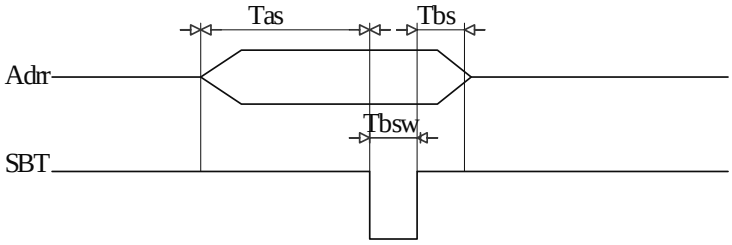
```
SETB    SCL
MOVE    R2,20
LCALL   DELAY1US  ；send code at rising edge
MOVE    A,R4
RR      A
DZNJ    R3,LOOP_8  ；judge the code if amount 8
MOVE    R2,2
CALL    DELAY1MS  ；delay 2ms after send code
SETB   SCL
SETB   SDA
SETB    CS
```

7.6.TIMING ANALYSIS

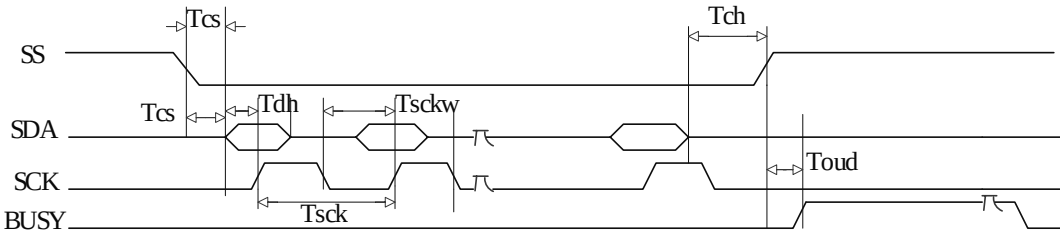
Key mode(keyboard)



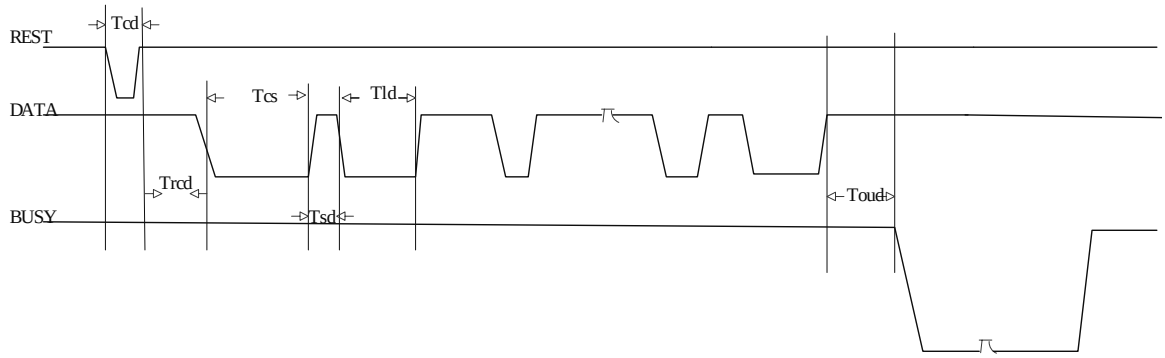
Parallel port mode(COM+SBT)



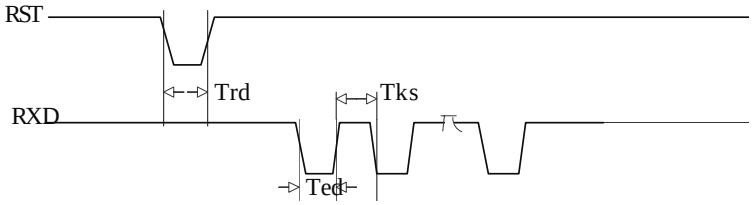
Three-line serial port mode



One-line serial port mode



232 serial port mode



7.7. THE CORRESPONDING VOLUME OF TIMING

MARK	DESCRIPTION	MIN.	TYPICAL	MAX.	UNIT
Tkd	Key trigger debounce time	16	20		ms
Thd	Busy signal output delay time	400			us
Tas	Address set-up time	1			ms
Tbs	Address hold time	1			ms
Tbsw	SBT stroke pulse width	16			ms
Tcs	Chip select set-up time	1	2	10	ms
Tdh	Data-in hold time	40	200	8000	us
Tsck	Serial clock cycle time	60	200	8000	us
Tsckw	Serial clock pulse width	30	100	4000	us
Tch	Chip select hold time	20			us
Toutd	B Busy signal output delay time	400			us
Tcd	Reset chip hold time	3	5		ms
Tcs	Data power up hold time	3	5	10	ms
Trd	Chip select hold time	20			us
Ted	Serial stop bit hold time	99	101	110	us
Tks	Serial one bit hold time	99	101	110	us
Trcd	Chip reset delay time	5			ms
Tsd	Data short level hold time	100	200	1000	us
Tld	Data long level hold time	200	400	2000	ms

8. TYPICAL APPLICATIONS

8.1.TIPS FOR APPLICATION CIRCUIT

8.1.1. The parameter of components in circuit only for reference. For the best purpose, parameter should be adjust according the actual application. R1、R2、R3、R4、C1、C2、C3、C4 should be as close to chip as possible.

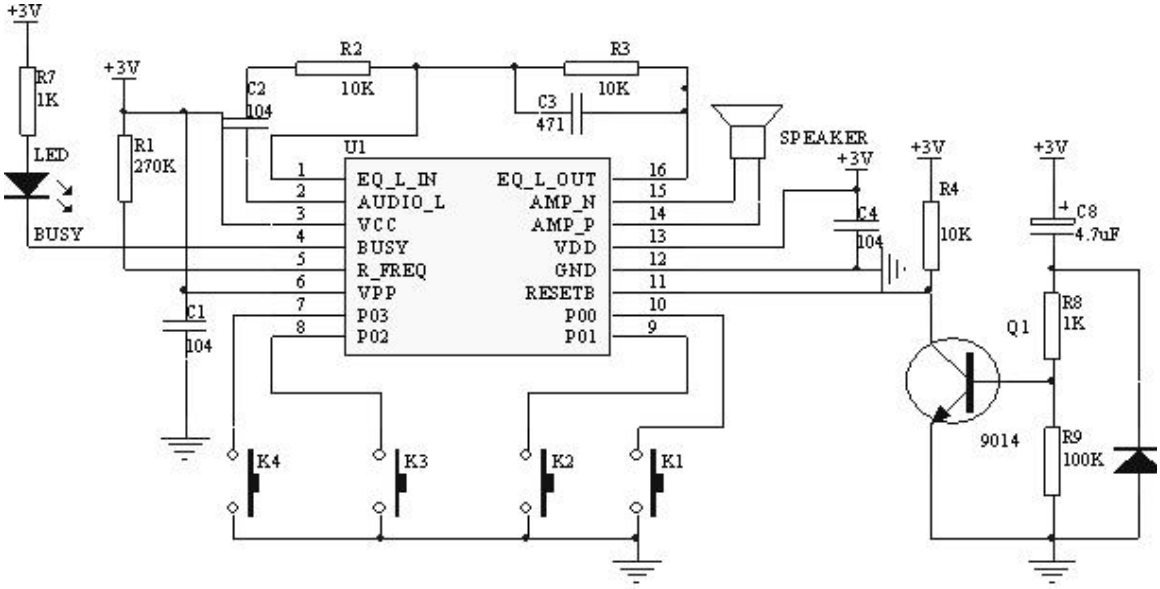
8.1.2. R1 is a oscillating resistor of 270K, voice playback speed can be changed by adjust the R1 value between 250K to 270K, too low or high will lead to work abnormally

8.1.3.Change R3(feedback resistor) value can change the volume, higher resistance and higher sound volume .

8.1.4. If MCU power supply voltage is not compatible with voice chip voltage , Resistance of 地址线或者数据线，复位线 can be calculated by （Vin-Vout）×700/Vin =Rn , if use 5V MUC as controller ,200Ω- 510Ω Rn value is suggested.

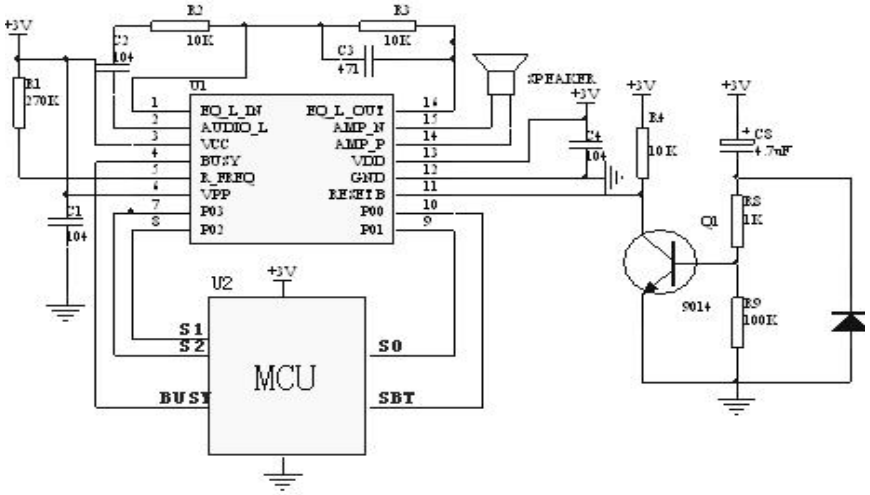
8.2. WTV040/080/170－DIP16、SOP16 WIRING DIAGRAM

8.2.1. IN THE KEY MODE(KEYBOARD)



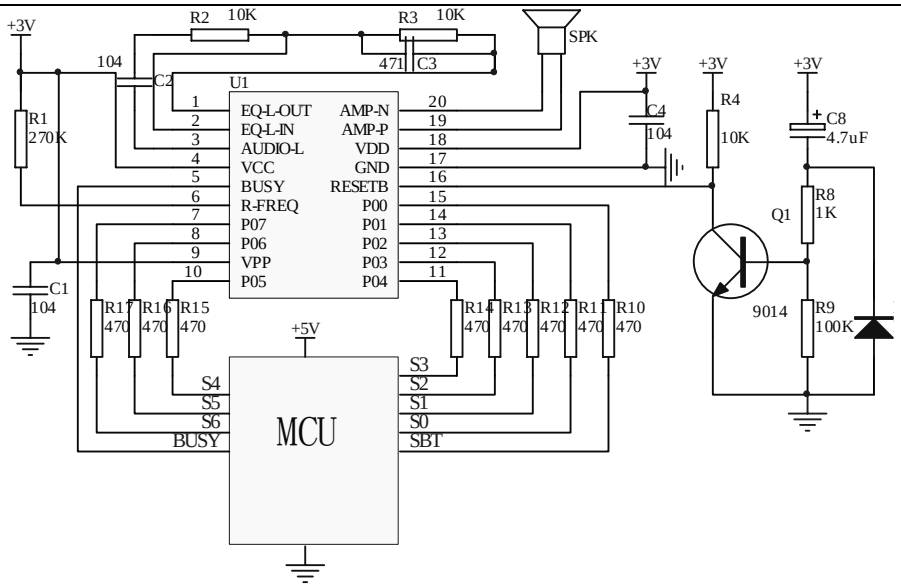
DIRECT-DRIVE SPEAKER TYPICAL CIRCUIT IN KEY MODE

8.2.2. IN PARALLEL PORT MODE(RESET IS SUGGESTED TO ADD)



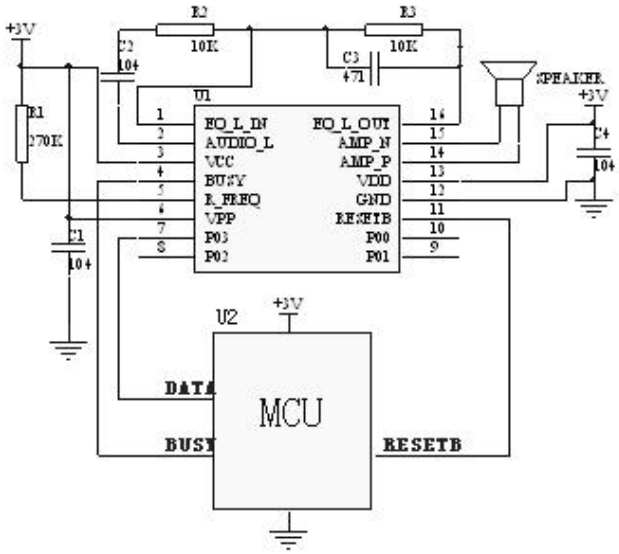
TYPICAL CIRCUIT FOR PARALLEL PORT MODE ,MCU CONTROL

MCU : 3V VOICE CHIP: 3V

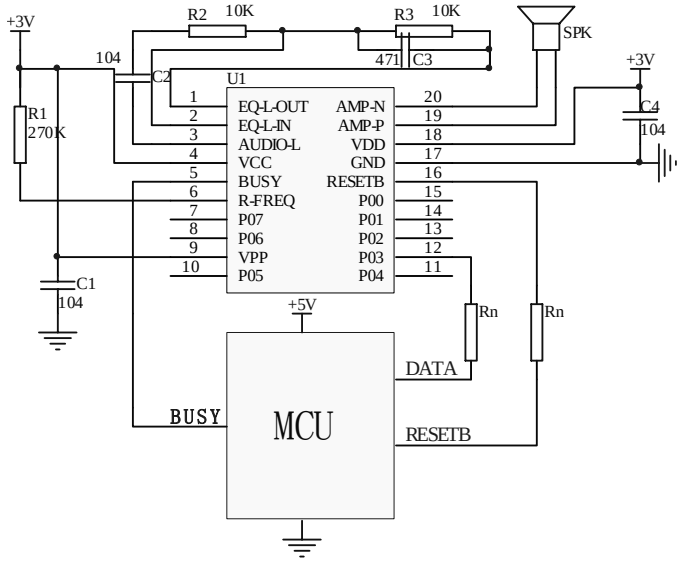


Note： The resistance of parallel address wire and SBT wire can be calculated by：（Vin-Vout）×700/Vout =Rn

8.2.3.IN ONE-LINE SERIAL PORT MODE(RESET IS SUGGESTED TO ADD)

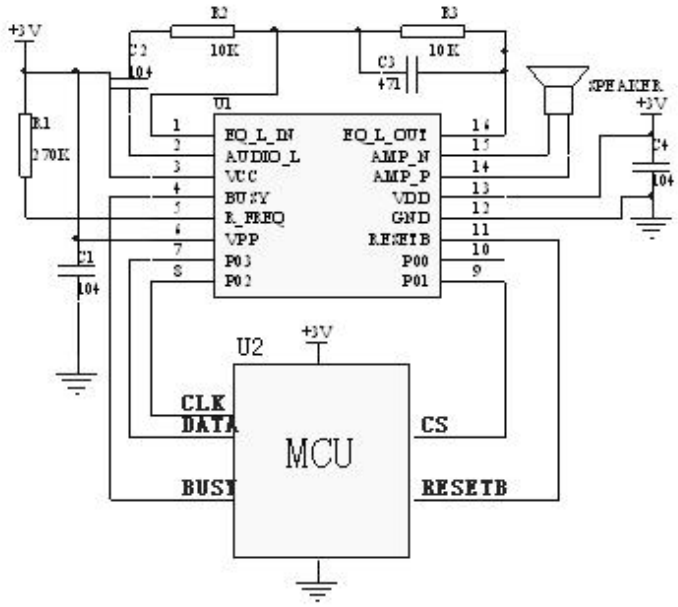


TYPICAL CIRCUIT FOR ONE-LINE SERIAL PORT MODE, MCU CONTROL
MCU: 3V VOICE CHIP: 3V

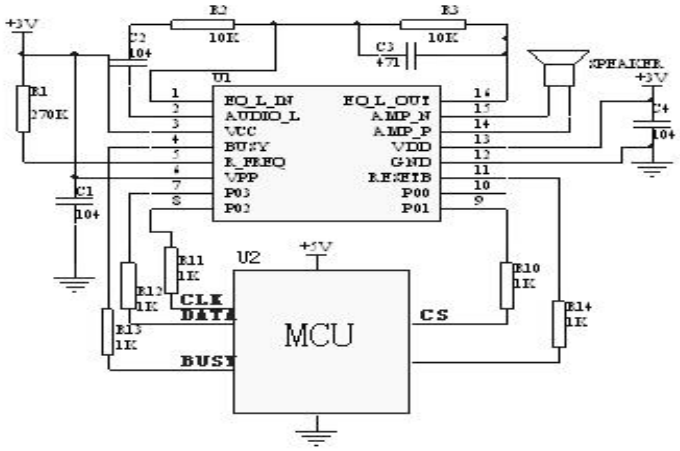


Note：The resistance of DATA and RESETB can be calculated by：（Vin-Vout）×700/ Vout =Rn

8.2.4.IN THREE-LINE SERIAL PORT MODE(RESET IS SUGGESTED TO ADD)



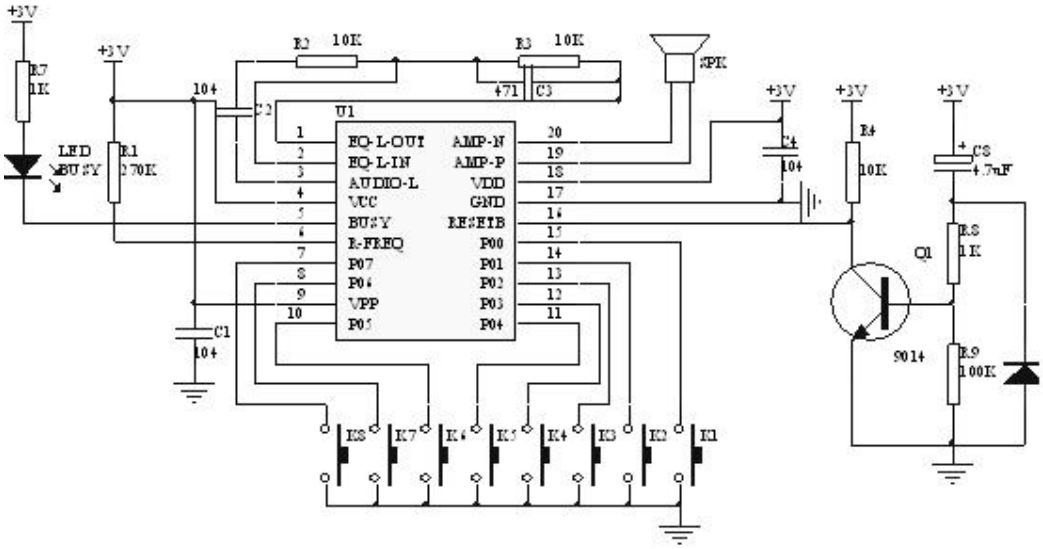
TYPICAL CIRCUIT FOR THREE-LINE SERIAL PORT CONTROL, MCU CONTROL
MCU:3V VOICE CHIP:3V



TYPICAL CIRCUIT FOR THREE-LINE SERIAL MODE, MCU CONTROL
MUC : 5V VOICE CHIP: 3V

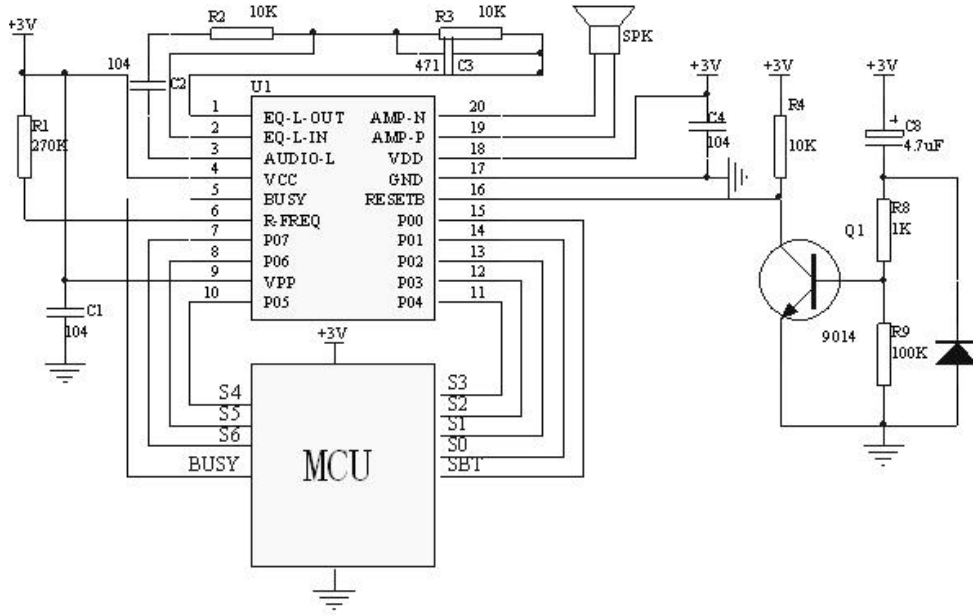
8.3. WTV040/080/170－SSOP20 WIRING DIAGRAM

8.3.1. IN KEY MODE(KEYBOARD) (RESET IS SUGGESTED TO ADD)

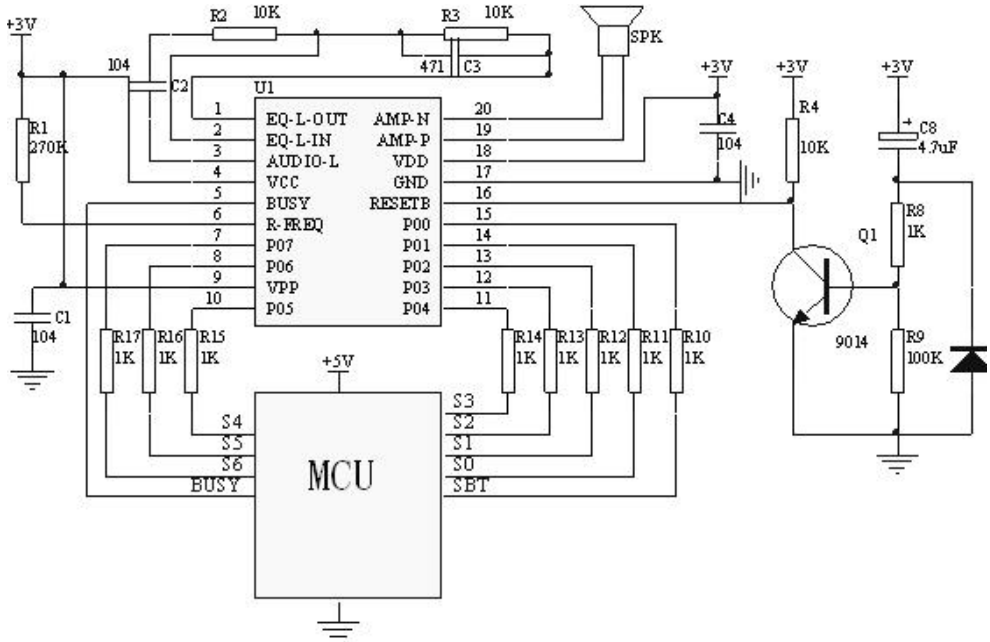


DIRECT-DRIVE SPEAKER TYPICAL CIRCUIT FOR KEY MODE

8.3.2. IN PARALLEL PORT MODE(RESET IS SUGGESTED TO ADD)

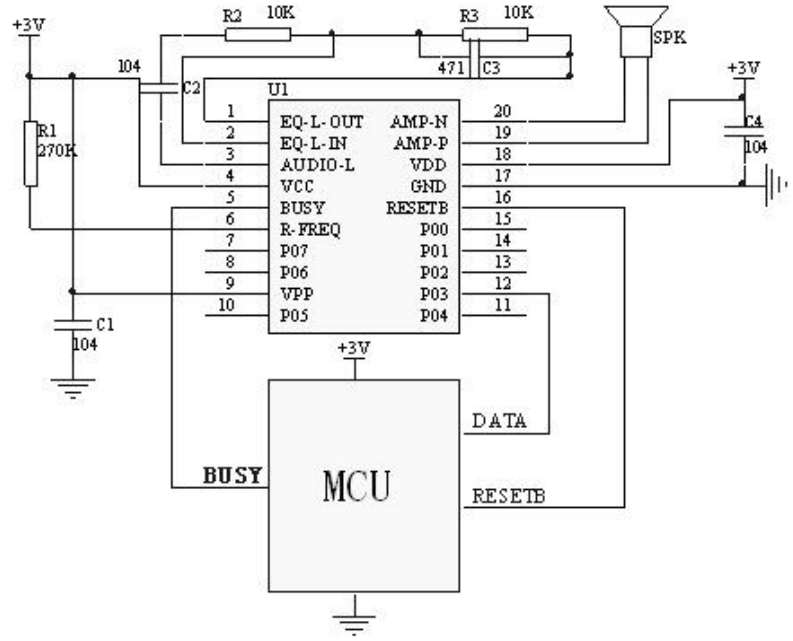


TYPICAL CIRCUIT FOR PARALLEL PORT MODE, MCU CONTROL
MCU : 3V VOICE CHIP: 3V

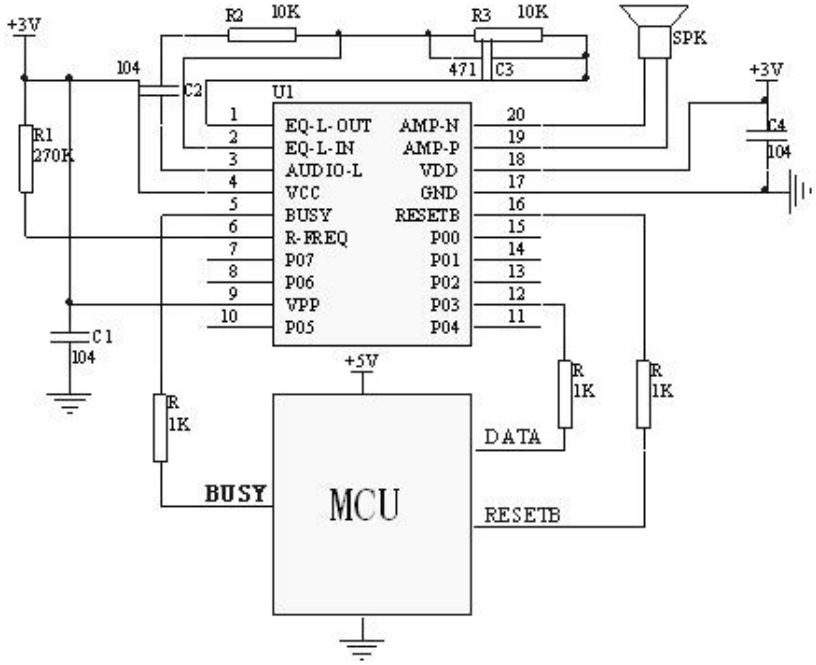


TYPICAL CIRCUIT FOR PARALLEL PORT MODE ,MCU CONTROL
MCU :5V VOICE CHIP:3V

8.3.3.ONE-LINE SERIAL PORT MODE(RESET IS SUGGESTED TO ADD)

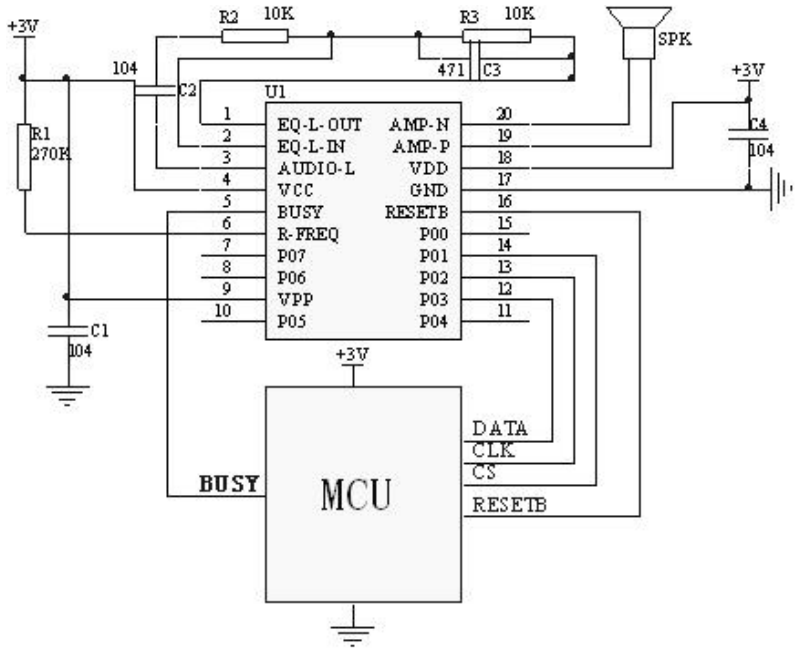


TYPICAL CIRCUIT FOR ONE-LINE SERIAL PORT MODE, MCU CONTROL
MCU :3V VOICE CHIP:3V

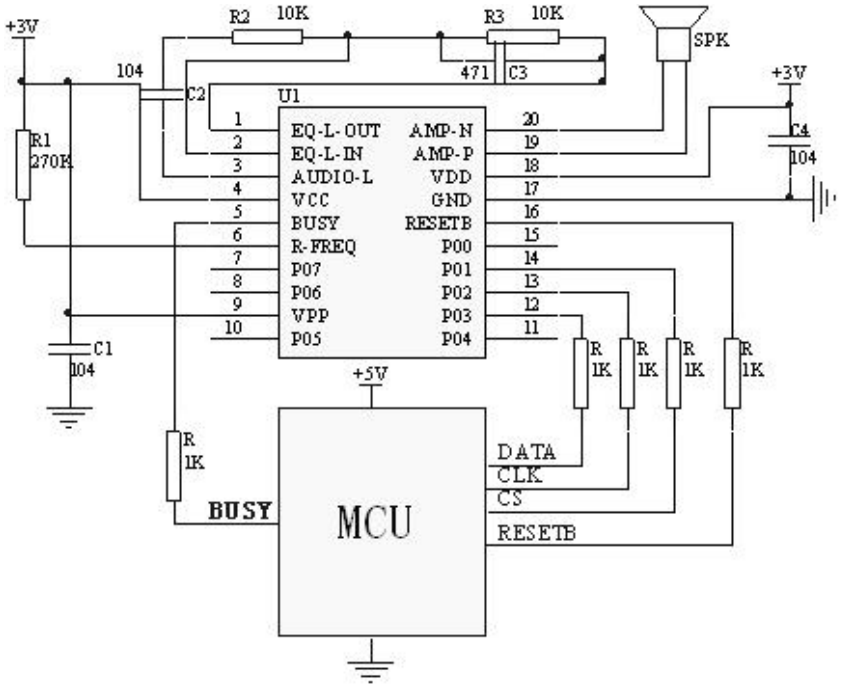


TYPICAL CIRCUIT FOR ONE-LINE SERIAL PORT MODE, MCU CONTROL
MCU :5V VOICE CHIP :3V

8.3.4.THREE-LINE SERIAL PORT MODE(RESET IS SUGGESTED TO ADD)

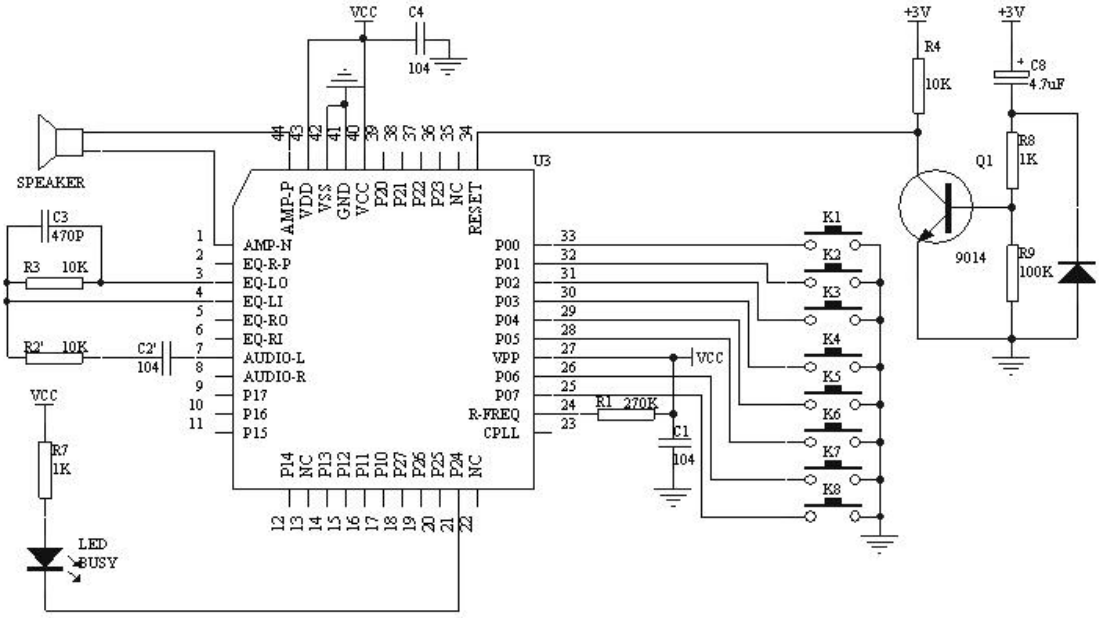


TYPICAL CIRCUIT FOR THREE-LINE SERIAL PORT MODE,MCU CONTROL
MCU: 3V VOICE CHIP: 3V



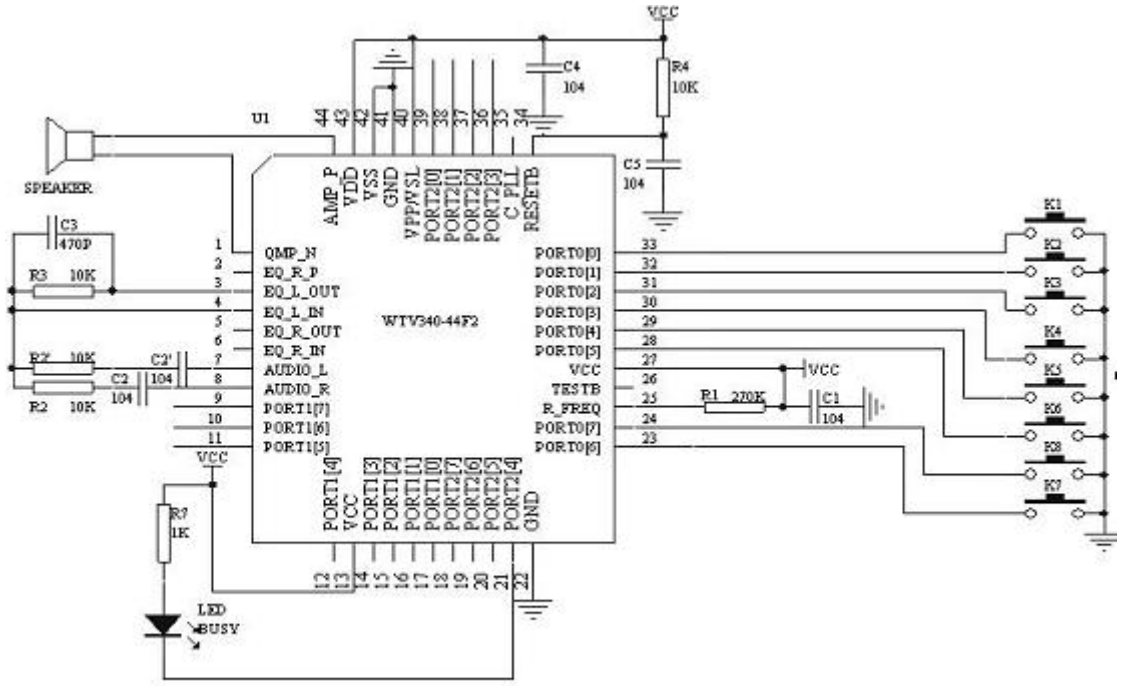
TYPICAL CIRCUIT FOR THREE-LINE PORT MODE,MCU CONTROL
MCU: 5V VOICE CHIP:3V

8.4. WTV040/080/170－44F2 WIRING DIAGRAM(RESET IS SUGGESTED TO ADD)



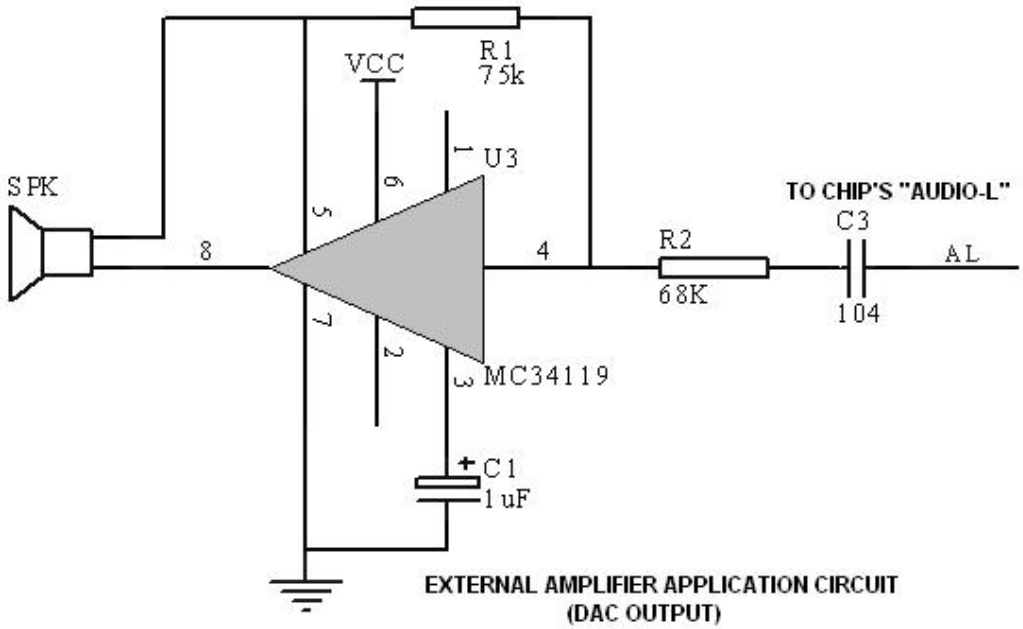
DIRECT-DRIVE SPEAKER TYPICAL CIRCUIT IN KEY MODE

8.5. WTV340－44F2(RESET IS SUGGESTED TO ADD)

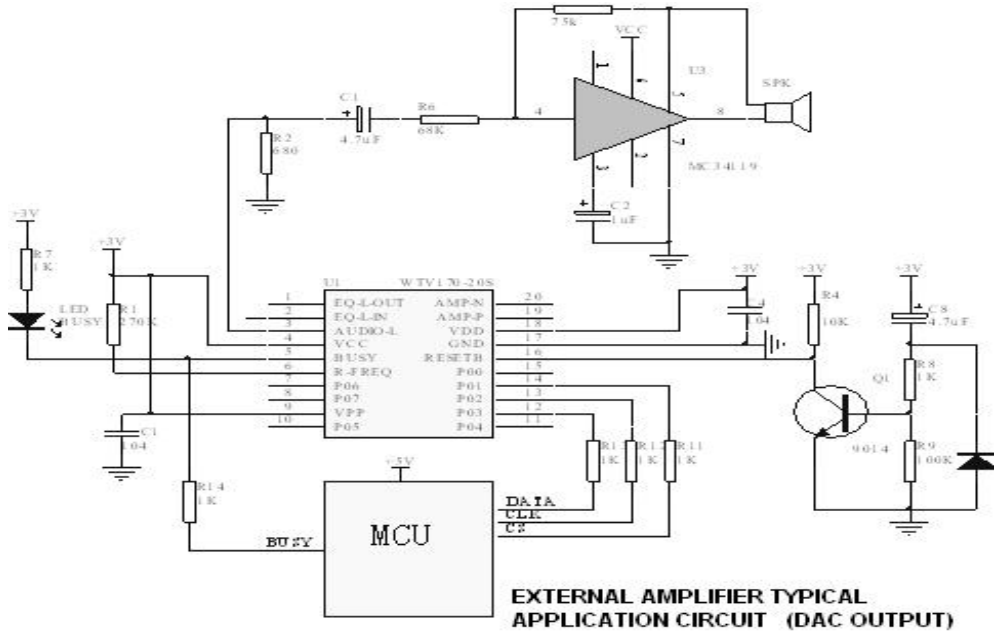


DIRECT-DRIVE SPEAKER TYPICAL CIRCUIT IN KEY MODE

8.6.EXTERNAL AMPLIFIER TYPICAL APPLICATION CIRCUIT.

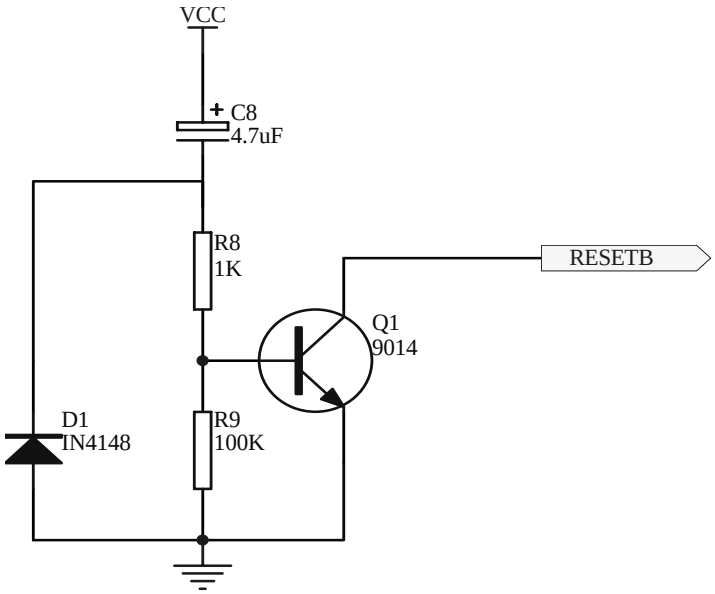


EXTERNAL AMPLIFIER APPLICATION CIRCUIT
(DAC OUTPUT)



The wiring diagram of WTV chips and other amplifier component (LM386、MC34119、TDA2822、TDA2030)are available .

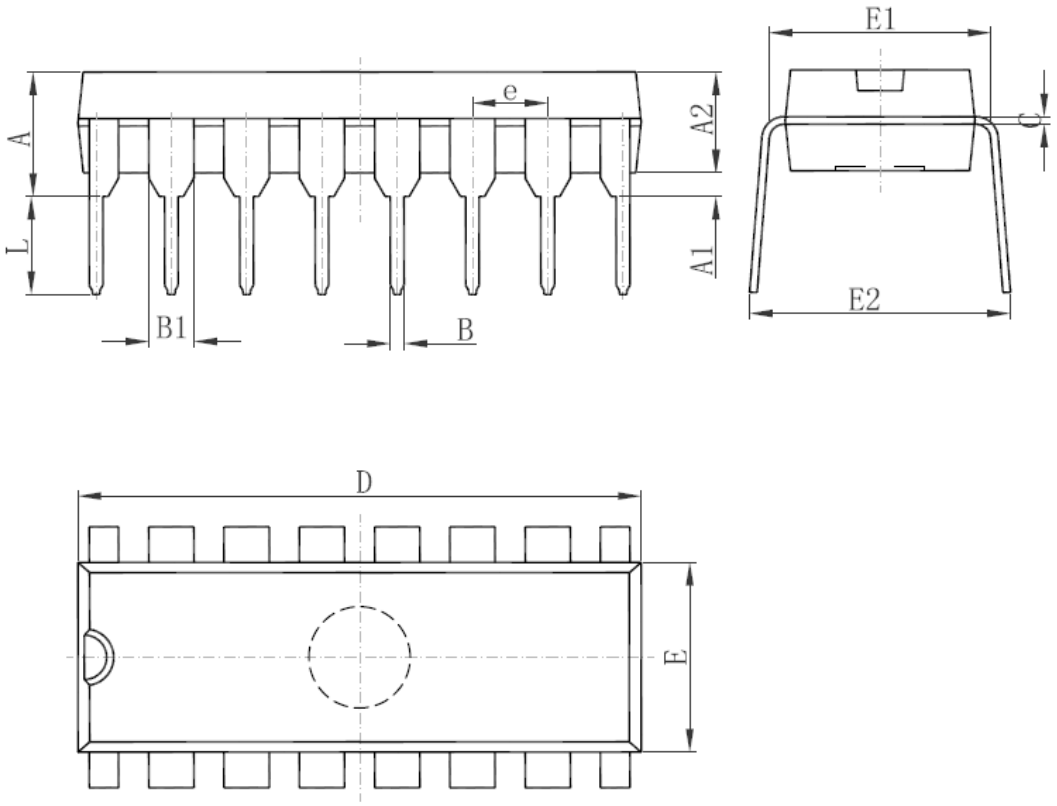
8.7. HARDWARE RESET CIRCUIT



Note: low level for reset not less than 5ms

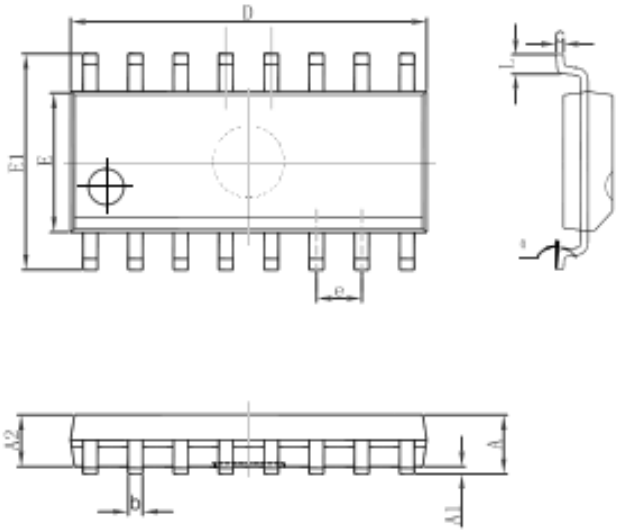
9.PACKAGE AND PINS CONFIGURATION

DIP16 PACKAGE OUTLINE DIMENSIONS



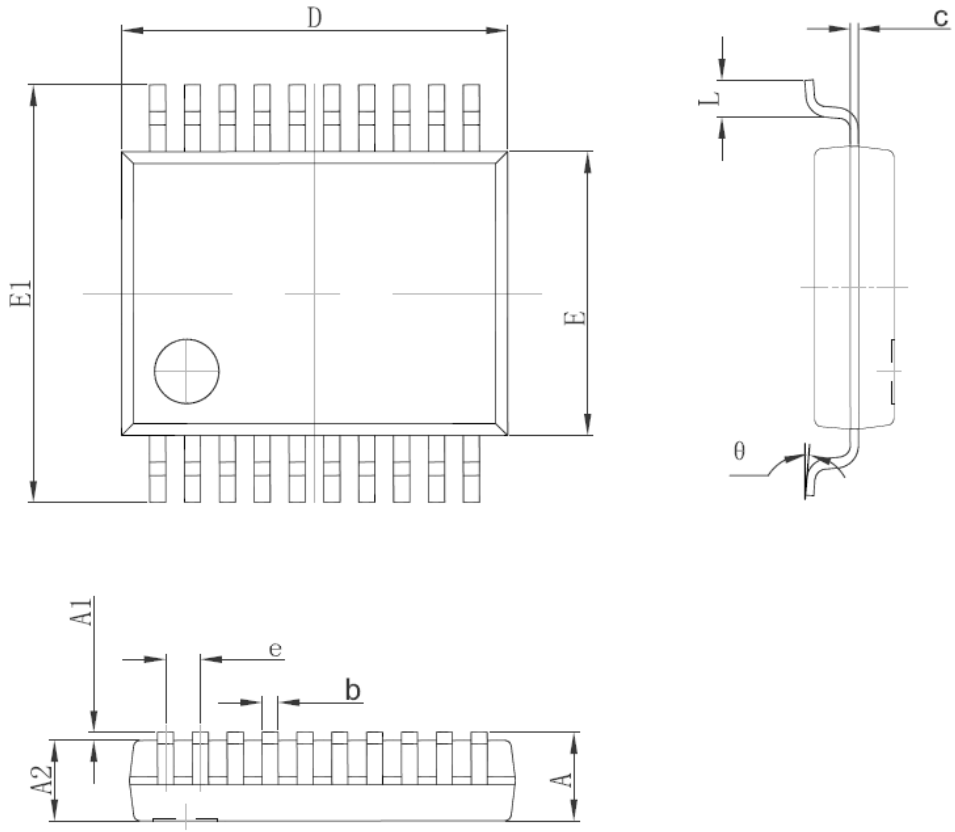
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524 (BSC)		0.060 (BSC)	
C	0.204	0.360	0.008	0.014
D	18.800	19.200	0.740	0.756
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540 (BSC)		0.100 (BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

SOP16 PACKAGE OUTLINE DIMENSIONS



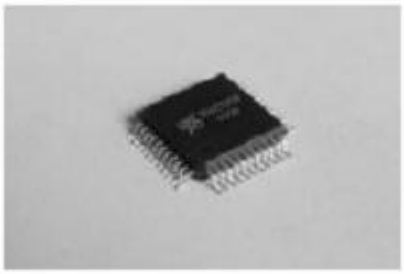
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	9.800	10.200	0.386	0.402
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

SSOP20(209mil) PACKAGE OUTLINE DIMENSIONS

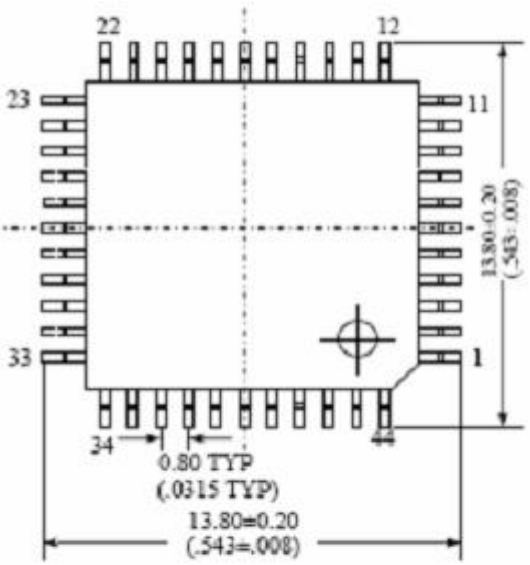


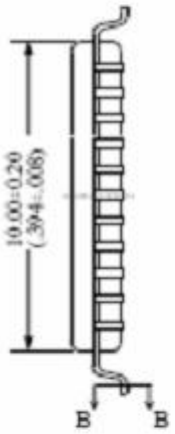
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A		1.730		0.068
A1	0.050	0.230	0.002	0.009
A2	1.400	1.600	0.055	0.063
b	0.220	0.380	0.009	0.015
c	0.090	0.250	0.004	0.010
D	7.000	7.400	0.276	0.291
E	5.100	5.500	0.201	0.217
E1	7.600	8.000	0.299	0.315
e	0.65(BSC)		0.026(BSC)	
L	0.550	0.950	0.022	0.037
θ	0°	8°	0°	8°

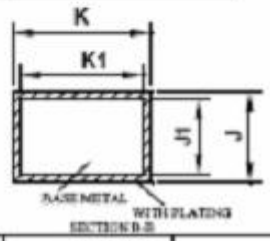
QFP44L



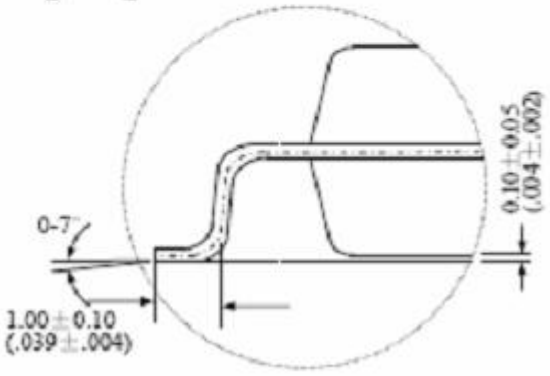
Lead Pitch	0.80mm(31.5mil)
Pad Size	160mil×160mil 210mil×210mil
Depressed Die Pad	0.33±0.051 (0.013±0.002)
Unit	mm(inch)





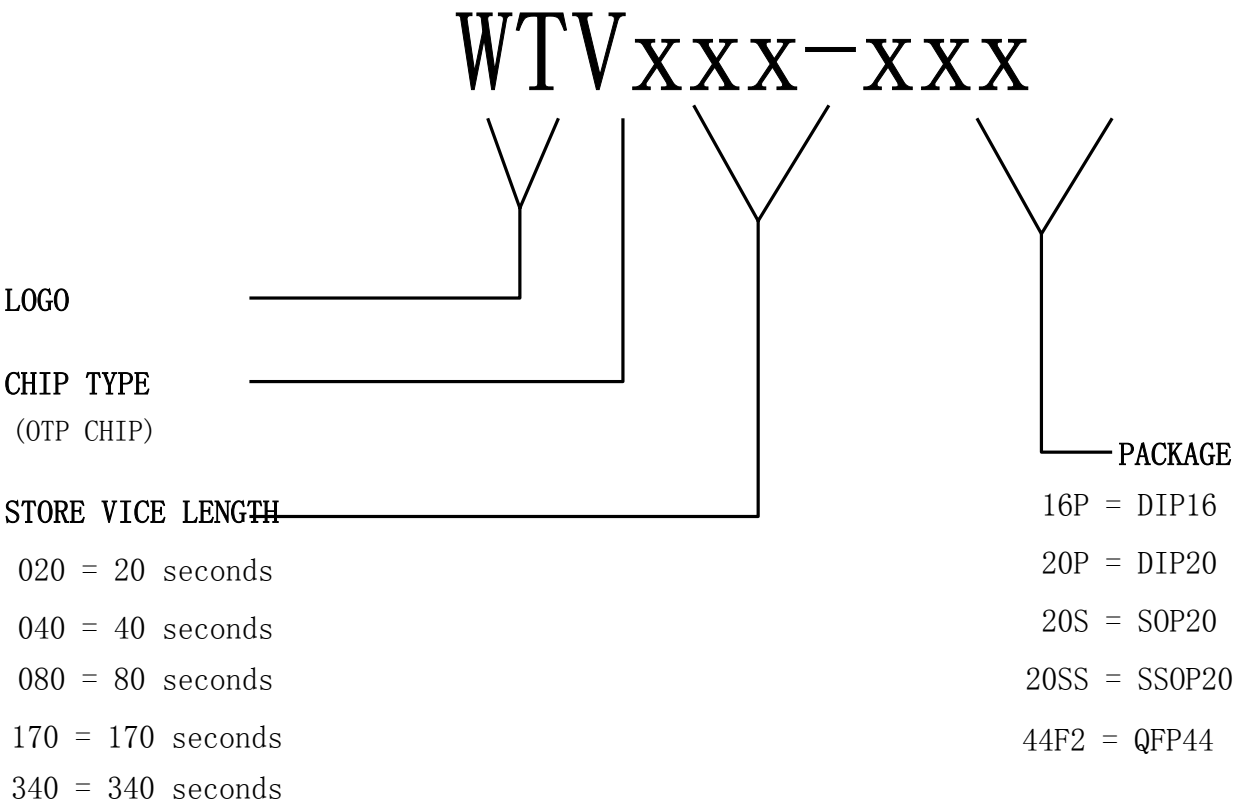


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
J	0.132	0.222	.0052	.0087
J1	0.132	0.172	.0052	.0068
K	0.300	0.400	.0118	.0157
K1	0.300	0.350	.0118	.0138



DETAIL A

10.REGULATION OF NAMING CHIPS



11. VERSIONS

VERSION	DATE	DESCRIPTION
V2.10	2008-8-18	ORIGINAL