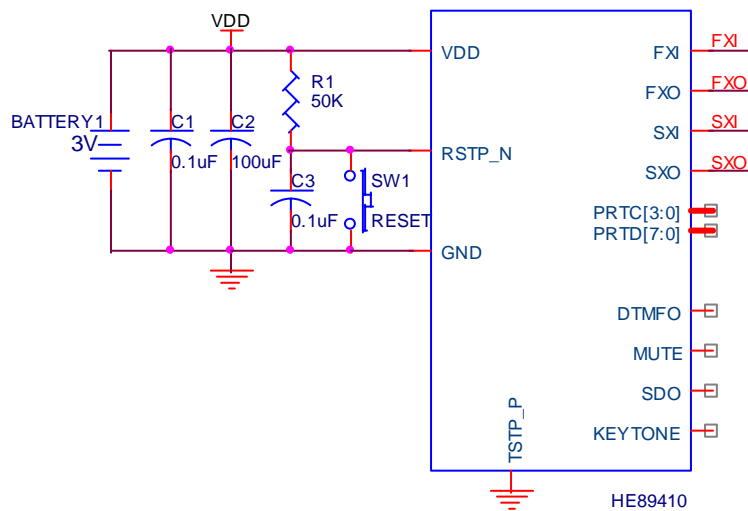# A. HE89410 Introduction

HE89410 is a member of 8-bit Micro-controller series used for telephone communication developed by King Billion Electronics Ltd. The built-in DTMF generator can generate the PSTN dialing tone directly. It can be applicable as Small/ Medium class telephone or communication product etc..

The instruction set of HE89410 are quite easy to learn and simple to use. Only about thirty instructions with four-type addressing mode are provided. Most of instructions take only 3 oscillator clocks (machine cycles). The processing power is enough to most of battery operation system.
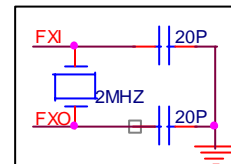
B. HE89410 Features

- Operation Voltage   2.4V – 5.5V
- System Clock   DC ~ 8MHz @ 5.0V
-                            DC ~ 4MHz @ 2.4V
- Internal ROM   4K Bytes(4K Program ROM)
- Internal RAM   256 Bytes.
- Dual Clock System   Normal (Fast) clock   32.768K ~ 8MHz
-                            Slow clock   32.768KHz
- Operation Mode   DUAL   FAST   SLOW   IDLE   SLEEP Mode.
- With WDT (WATCH DOG TIMER) to prevent deadlock condition..
- 12 bit Bi-directional I/O port. Mask Option can select PUSH-PULL or OPEN DRAIN output mode for each I/O pin.
- Built-in DTMF Generator.
- Two external interrupts and three internal timer interrupts.
- Two 16-bit timers and one Time Base timer.
- Instruction set   32 instructions, 4 addressing mode. 8-bit DATA POINTER for RAM and 12-bit TABLE POINTER for ROM.
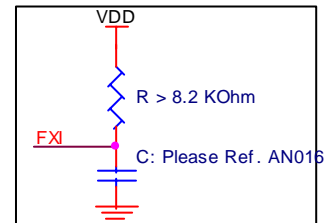
C. Application Circuit

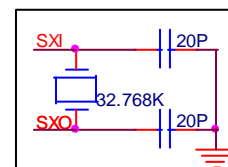No External Parts is necessary if user adopt Internal Fast RC Clock

External Fast Clock: Crystal osc.

External Fast Clock: RC osc.

External Slow Clock: Crystal osc.

External Slow Clock: RC osc.