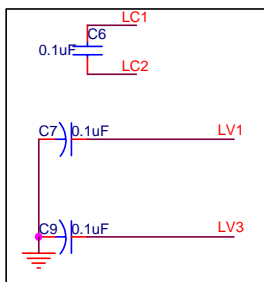# A.HE83130 Introduction

HE83130 is a member of 8-bit Micro-controller series that is developed by King Billion. This IC built-in 640-dot LCD driver and has one OP comparator. The built-in OP comparator can be used with (light voice temperature humility) sensor etc. The 7-bit current-type D/A converter and PWM device provide the complete speech output mechanism. The 64K ROM Size can storage around 20 second's speech. This IC is applicable to the medium systems such as LCD Games and Educational Toy etc. Use external SRAM or Flash RAM to have recording function. This IC is very easy to learn and use. Most of instructions take only 3 oscillator clocks (machine cycles). As a result this IC is suitable for the applications that require higher performance system.
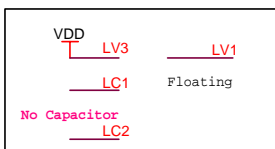
B.HE83130 Features

- Operation Voltage   2.2V – 5.5V
- System Clock   DC ~ 8MHz @ 5.0V
                          DC ~ 4MHz @ 2.2V
- Internal ROM   64K Bytes(64K 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.
- One built-in OP comparator.
- 640 dots LCD driver (A   B TYPE selectable).
- One 7-bit current-type DAC output.
- PWM device.
- Two external interrupts and two internal timers interrupts.
- Two 16-bit timers.
- Instruction set   32 instructions, 4 addressing mode. 8-bit DATA POINTER for RAM and 16-bit TABLE POINTER for ROM.

C.Application Circuit
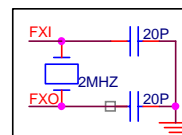
Twice Charge Pump is selected
LCD Max. Voltage=LV3=3/2*VDD

LC1
C6
0.1uF
LC2

C7 0.1uF   LV1

C9 0.1uF   LV3

Twice Charge Pump is selected
LCD Max. Voltage=LV3=VDD

VDD
LV3   LV1
LC1   Floating
No Capacitor
LC2

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

External Fast Clock: Crystal osc.

FXI   20P
2MHZ
FXO   20P

External Fast Clock: RC osc.

VDD
R > 8.2 KOhm
FXI
C: Please Ref. AN016
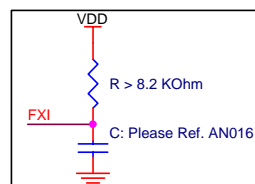
External Slow Clock: Crystal osc.

SXI   20P
32.768K
SXO   20P

External Slow Clock: RC osc.

SXI
R: Please ref. AN016
SXO

VDD

BATTERY1
3V
C1 0.1uF
C2 100uF
R1 50K
C3 0.1uF
SW1
RESET

1/5 BAIS CONFIGURATION

LV3
C1 0.1uF
C2 0.1uF
C3 0.1uF
C4 0.1uF
C5 0.1uF

?K Ohm
VR1

HE83130 chip pins:
VDD
RSTP_N
GND
LC1
LC2
LV1
LV3 < 9 Volt
LR4
LR3
LR2
LR1
LR0
LVG
TSTP_P

FXI   FXI
FXO   FXO
SXI   SXI
SXO   SXO
PRTD[7:0]
PRTC[3:0]

COM[15:0]
SEG[39:0]

LCD PANEL

OPIN
OPIP
OPO
DAO

PWMP
PWMN

VO

Buzzer or Speaker Circuit

Passive Bias & Filter Circuit
Please Refer
AN022 for Speech
Output Circuit

VDD
Q1 NPN
SP1
SPEAKER