A.HE83115 Introduction

HE83115 is a member of 8-bit Micro-controller series developed by King Billion Electronics Ltd. Users can chose any one of combination among 80 dots LCD Driver + 12 Bit I/O Port … 48 dots LCD Driver + 20 Bit I/O Port etc. The built-in OP comparator can be used with (light voice temperature humility) sensor and used as battery low detection. And the 7-bit current-type D/A converter and PWM device provide the complete speech output mechanism. The 64K ROM Size can be used in the storage of speech (20 seconds at 3Kbytes per second), graphic, text etc. This IC is applicable to the small systems such as sport match, sport recorder, digital watch etc..

The instruction set of HE83115 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.HE83115 Features

- Operation Voltage   2.4V – 5.5V
- System Clock   DC ~ 8MHz @ 5.0V
                           DC ~ 4MHz @ 2.4V
- 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..
- 12~20 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.
- 80~48 dots LCD driver (A B TYPE selectable).
- One 7-bit current-type DAC output.
- PWM device.
- Two external interrupts and two internal timer interrupts.
- Two 16-bit timer.
- Instruction set   32 instructions, 4 addressing mode. 8-bit DATA POINTER for RAM and 16-bit TABLE POINTER for ROM.
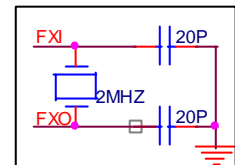
C. Application Circuit

Tripple Charge Pump is selected
LCD Max. Voltage=LV3=3*VDD

Tripple Charge Pump is selected
LCD Max. Voltage=LV3=3/2*VDD

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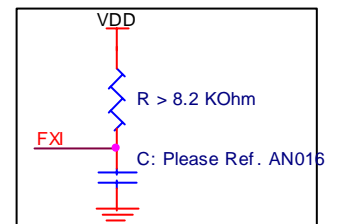LCD Max. Voltage=LV3=VDD

VDD
LV1
LC1
C4
0.1uF
LC2

VDD
LV2
LC1
C4
0.1uF
LC2

VDD
LV3
LC1
C4
0.1uF
LC2
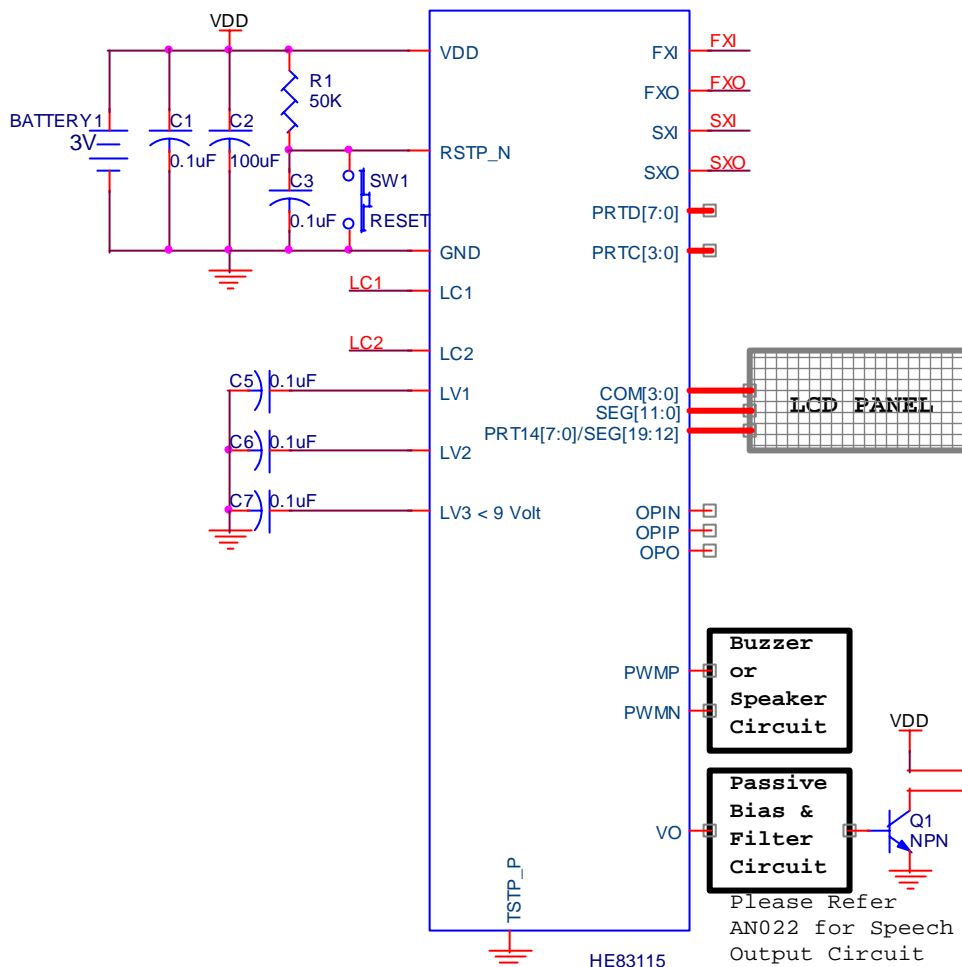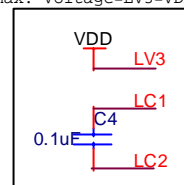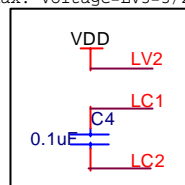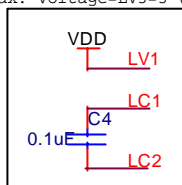
No External Parts is necessary if user adopt Internal Fast RC Clock

External Fast Clock: Crystal osc.

FXI
20P
2MHZ
FXO
20P

VDD
VDD

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

VDD
FXI
FXO
SXI
SXO
RSTP_N
PRTD[7:0]
PRTC[3:0]
GND
LC1
LC2
LV1
LV2
LV3 < 9 Volt
OPIN
OPIP
OPO
PWMP
PWMN
VO
TSTP_P
HE83115

C5 0.1uF
C6 0.1uF
C7 0.1uF

COM[3:0]
SEG[11:0]
PRT14[7:0]/SEG[19:12]
LCD PANEL

External Fast Clock: RC osc.

VDD
R > 8.2 KOhm
FXI
C: Please Ref. AN016

Buzzer or Speaker Circuit

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

VDD
SP1
Q1 NPN
SPEAKER

External Slow Clock: Crystal osc.

SXI
20P
32.768K
SXO
20P

External Slow Clock: RC osc.

SXI
R: Please ref. AN016
SXO