A.HE83143 Introduction

HE83143 is a member of 8-bit Micro-controller series developed by King Billion Electronics Ltd.

Users can chose any one of combination among 1024 dots LCD Driver + 16 Bit I/O Port … 896 dots LCD Driver + 24 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. The 7-bit current-type D/A converter and PWM device provide the complete speech output mechanism. The 512K ROM Size can be used in the storage of speech graphic text etc.. The built-in DTMF generator can generate the PSTN dialing tone directly. It can be applicable to the medium systems such as Small-Scale Dictionary, Data Bank, Pocket Dialer, Educational Toy, Digital Voice Recording System etc.
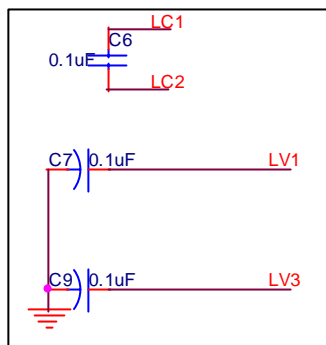
The instruction set of HE83143 are quite easy to learn and simple to use. Only about thirty instructions with four-type addressing mode are provided. Most of instructions take only 3 oscillator clocks (machine cycles). The processing power is enough to most of battery operation system.
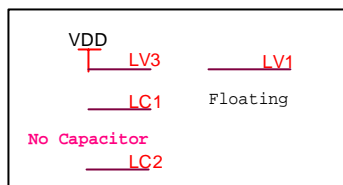
B.HE83143 Features

- Operation Voltage   2.2V – 5.5V
- System Clock   DC ~ 8MHz @ 5.0V
                             DC ~ 4MHz @ 2.2V
- Internal ROM   512K Bytes(64K Program ROM+448K Data 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.
- 16~24 bit Bi-directional I/O port. Mask Option can select PUSH-PULL or OPEN DRAIN output mode for each I/O pin. 8 of them are shared with LCD segment pins.
- One built-in OP comparator.
- 1024~896 dots LCD driver (B TYPE selectable).
- One 7-bit current-type DAC output.
- PWM device.
- 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 19-bit TABLE POINTER for ROM.

C.   Application Circuit

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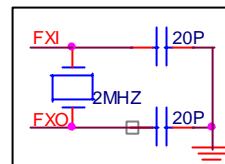LCD Max. Voltage=LV3=3/2*VDD

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

VDD

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

VDD
RSTP_N
GND
LC1
LC2
LV1

LC1
LC2
LV1

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

COM[15:0]
SEG[55:0]
PRT14[7:0]/SEG[63:56]

LCD PANEL

External Fast Clock:
RC osc.

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

LV3
C1 0.1uF
LR4
C2 0.1uF
LR3
C3 0.1uF
LR2
C4 0.1uF
LR1

LV3 < 9 Volt

1/5 BAIS
CONFIGURATION

OPIN
OPIP
OPO

Buzzer
or
Speaker
Circuit

PWMP
PWMN

VDD
SP1
SPEAKER
Q1 NPN
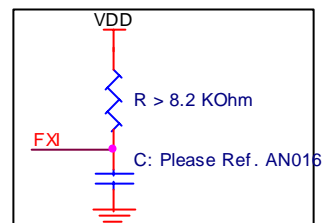
External Slow Clock:
Crystal osc.

SXI   20P
32.768K
SXO   20P

Passive
Bias &
Filter
Circuit

VO

Please Refer
AN022 for Speech
Output Circuit

External Slow Clock:
RC osc.

SXI
R: Please ref. AN016
SXO

LVG
?K Ohm   VR1

TSTP_P

HE83143