

FEATURES

1. Standard 8051 Instruction set, fast machine cycle

Executes instructions six times faster than the standard 8051

2. MTP Program Memory

8K Bytes

Code Protection Capability

100 erase times at least

10 years data retention at least

3. 256 Bytes EEPROM

30K erase times at least (2.5V<VCC<5.5V, -20°C~85°C)

10 years data retention at least

4. Total 512 Bytes SRAM (IRAM + XRAM)

256 Bytes IRAM in the 8051 internal data memory area

256 Bytes XRAM in the 8051 external data memory area (accessed by MOVX Instruction)

5. Two System Clock type selections

Fast clock from Internal RC (FRC, 16.5888 MHz) (trim 7-bit) (5-bit fine-tuning)

low clock from Internal RC (SRC, 131 KHz) (trim 5-bit)

Slow clock timing uses SRC, 131 KHz/, 0~70 °C@5V error (±5%)

System Clock can be divided by 1/2/4/16 option

6. 8051 Standard Timer – Timer0/1

16-bit Timer0, also supports T0O clock output for Buzzer application

16-bit Timer1, supports T1O clock output for Buzzer application

7. 15-bit Timer3

The clock source can be slow clock. (131K/4 = 32K)

Interrupt period can be clock divided by 65536/32768/16384/8192/4096/2048/1024/512 option

8. UART

With UART pin selection option, baud rate clock can be set

9. Two independent 16 bits PWMs with period-adjustment:

16-bit PWM0

16-bit period/duty cycle setting

PWM0(N/P) dead zone complementary, period center aligned (PPD) mode

Highest frequency FRC*2 or FRC or FRC/256 or SRC

16-bit PWM1/2/3

16-bit shared period, 16-bit independent duty cycle can be set

Highest frequency FRC*2 or FRC or FRC/256 or SRC

2 set output

10. LCD Driver

All GPIOs can set the pull-up resistor and pull-down resistor $33K\Omega@5V$

The pull-up resistor and pull-down resistor are turned on at the same time to 1/2 LCD bias voltage

Software controlled SCOM0~13

11. 12-bit ADC with 12 channels external Pin input and 2 channels Internal Reference Voltage

Built-in reference source output VCC or LDOV: 1.18V

Internal Reference Voltage VBG $1.18V\pm 1%@VCC=5V\sim 3V, 25^{\circ}C$

Internal Reference Voltage: $1/4V_{CC}, V_{CC}/201$

12. 11 Sources, 4-level priority Interrupt

Timer0/Timer1/Timer3 Interrupt

Port1/Port 3 Pin change Interrupt

LVD Interrupt

ADC Interrupt

PWM0/1 Interrupt

EEP write finish Interrupt

UART Interrupt

13. Pin Interrupt can Wake up CPU from Halt/Stop mode

Each pin can be defined as Wake up interrupt pin (by pin change)

14. Max. 14 Programmable I/O Pins

CMOS output

Pseudo-Open-Drain, or Open-Drain Output

Schmitt Trigger Input

Pin Pull-up / Pull-down can be Enabled or Disabled

All pin with sink $40mA@VDD=5V, VOL=0.1VDD$

All pin with drive $12mA@VDD=5V, VOH=0.9VDD$

Schmitt Trigger Input $V_{ITH}(0) : V_{IH} 0.7VDD, V_{IL} : 0.3VDD$

Schmitt Trigger Input $V_{ITH}(1) : V_{IH} 0.4VDD, V_{IL} : 0.2VDD$

15. Independent RC Oscillating Watch Dog Timer

480ms/240ms/120ms/60ms selectable WDT timeout options

16. Five types Reset

Power on Reset

Selectable External Pin Reset

Selectable Watch Dog Reset

Software Command Reset
 Selectable Low Voltage Reset

17. 16-level Low Voltage Reset (LVR)

1.6V ~3.5V

18. 15-level Low level Detect(LVD)

1.6V ~ 3.5V

19. Five Power Operation Modes

Fast/ Slow/ Idle/ Halt/ Stop mode

20. On-chip Debug/ICE interface

Use P3.7(VPP)/P3.0/P3.1 pin
 Share with ICP programming pin

21. Operating Voltage and Current

VCC =2.4V ~ 5.5V (@Fsys = FRC/1=16.5888MHz)

VCC =1.8V ~ 5.5V (@Fsys <= FRC/2= 8.2944MHz)

Stop mode I_{CC} =0.7μA@5V

I_{CC} = 4.3μA @Halt mode, PWRSAV=1, V_{CC}=3V

I_{CC} = 6μA @Idle mode, PWRSAV=1, V_{CC}=3V

Operating Temperature Range -40°C ~ +105°C

22. Capacity of resisting disturbance

ESD: better than ± 4000V

EFT: better than ± 4000V

23. Package Types

16-pin SOP (150 mil)

PIN ASSIGNMENT
