

# MC95FG0128

## CMOS SINGLE-CHIP 8-BIT MICROCONTROLLER WITH 12-BIT A/D CONVERTER

### 1. Overview

#### 1.1 Description

The MC95FG0128 is advanced CMOS 8-bit microcontroller with 128K bytes of FLASH. This is powerful microcontroller which provides a highly flexible and cost effective solution to many embedded control applications. This provides the following features : 128K bytes of FLASH, 256 bytes of SRAM, 4K bytes of Data EEPROM, 8K bytes of XRAM general purpose I/O, 8/16-bit timer/counter, watchdog timer, watch timer, SPI, USART, I<sup>2</sup>C, Calculator, on-chip POR and BOD, 12-bit A/D converter, buzzer driving port, 16-bit PWM output, on-chip oscillator and clock circuitry. The MC95FG0128 also supports power saving modes to reduce power consumption.

Device Name	FLASH	EEPROM	XRAM	SRAM	ADC	Package
MC95FG0128	128K bytes	4K bytes	8K bytes	256 bytes	15 channel	100LQFP 80LQFP 80MQFP 64LQFP 64LQPF14

#### 1.2 Features

- **CPU**
  - 8 Bit CISC Core (8051 Compatible, 2 clock per cycle)
- **128K Bytes On-chip FLASH**
  - Endurance : 10,000 times
  - Retention : 10 years
- **4K Bytes Data EEPROM**
  - Endurance : 100,000 times
  - Retention : 10 years
- **256 Bytes SRAM**
- **8K Bytes XRAM**
- **General Purpose I/O**
  - 86 Ports (P0[7:0], P1[7:0], P2[7:0], P3[7:0], P4[7:0], P5[7:0], P6[7:0], P7[7:0], P8[7:0], P9[7:0], PA[5:0]) : 100 Pin
  - 66 Ports (P0[7:0], P1[7:0], P2[7:0], P3[7:0], P4[7:0], P5[7:0], P6[5:0], P7[7:0], P8[1:0]) : 80 Pin
  - 52 Ports (P0[7:0], P1[7:0], P2[7:0], P3[7:0], P4[7:0], P5[7:0], P6[3:0]) : 64 Pin
  - Support TTL compatible PAD (P3[7:0], SPI0, USART1)
- **Basic Interval Timer**
- **Timer / Counter 6Ch**
  - 8Bit\*2ch(16Bit\*1ch) + 16Bit\*4ch
- **1Ch 10-bit PWM (using Timer1)**
- **4Ch 16-bit PWM (using Timer2,3,4,5)**

- **Watch Dog Timer**
- **Watch Timer**
- **2 SPI**
- **4 USART** (4th usart can use only 100pin)
- **I<sup>2</sup>C**
- **Buzzer Driving Port**
- **Calculator**
  - Multiplier mode : 16bits x 16bits
  - Divider mode : 32bits / 16bits
- **12 Bit A/D Converter**
  - 15 Input channels
- **Interrupt Sources**
  - External (8)
  - Pin Change Interrupt (P0, P7) (2)
  - USART (8)
  - SPI (2)
  - Timer (6)
  - I<sup>2</sup>C (1)
  - ADC (1)
  - WDT (1)
  - WT (1)
  - BIT (1)
  - EEPROM (1)
- **On-Chip RC-Oscillator**
  - 8MHz
- **On-Chip PLL**
  - 1.38MHz ~ 20.18MHz (with 32.768KHz)
- **Power On Reset**
  - 1.4V
- **Programmable Brown-Out Detector**
  - 1.6V / 2.5V / 3.6V / 4.2V
- **Minimum Instruction Execution Time**
  - 200ns (@10MHz, NOP Instruction)
- **Power down mode**
  - IDLE, STOP1, STOP2 mode
- **Sub-Active mode**
  - System used external 32.768KHz crystal
- **Operating Frequency**
  - 1MHz ~ 10MHz (crystal oscillator)
  - 1, 2, 4, 8MHz (internal RC oscillator)
  - 1.38MHz ~ 20.18MHz (PLL)
- **Operating Voltage**
  - 2.7V ~ 5.5V (@ 1~20.18MHz)
- **Operating Temperature : -40 ~ +85°C**
- **Package Type**
  - 100 LQFP
  - 80 LQFP
  - 80 MQFP
  - 64 LQFP
  - 64 LQFP14
  - Pb free package

### 1.3 Ordering Information

Table 1-1 Ordering Information of MC95FG0128

Device name	ROM size	SRAM size	XRAM size	EEPROM size	Package
MC95FG0128L	128 Kbytes FLASH	256 bytes	8 Kbytes	4 Kbytes	100 LQFP
MC95FG8128L					80 LQFP
MC95FG8128Q					80 MQFP
MC95FG6128L					64 LQFP
MC95FG6128L14					64 LQFP14