

BL22P02 SPEC

8-bit OTP MCU

V1.0 (2010-4-23)



Shanghai Belling Co., Ltd.



1. General Description

BL22P02 is an 8-bit low power microcontroller with mass applications in small household appliances.

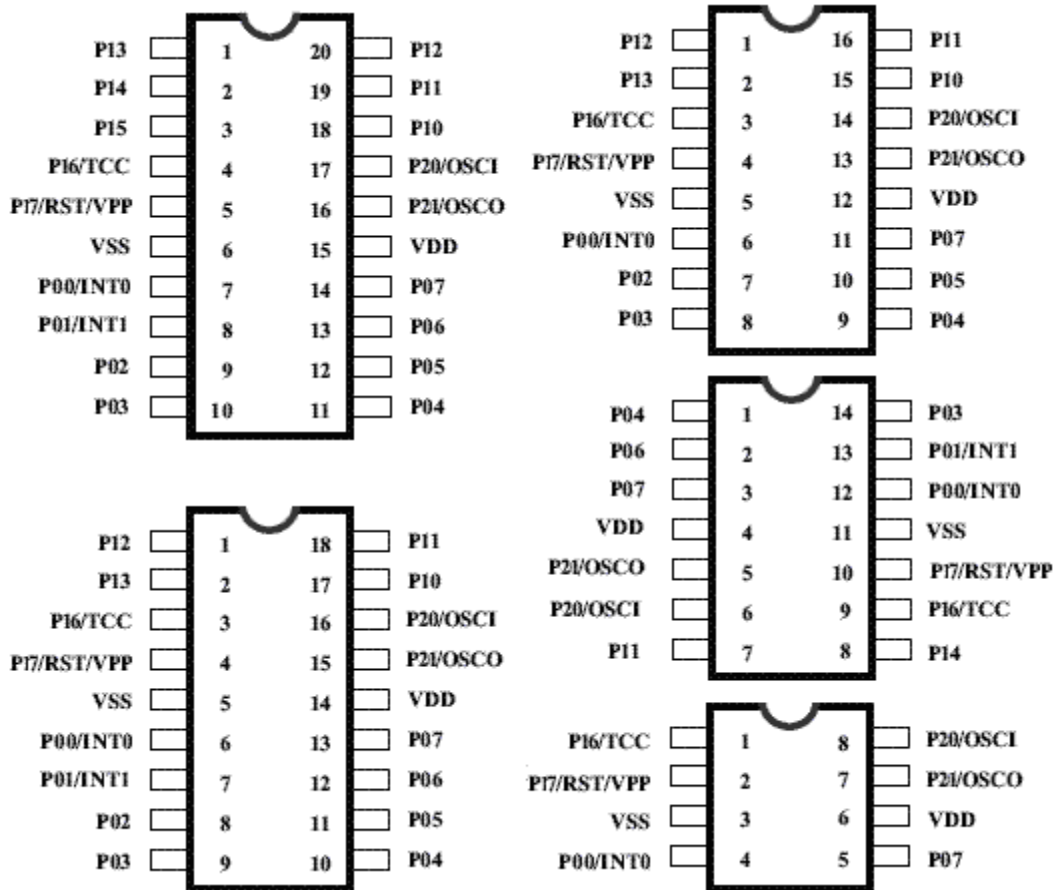
2. Features

- 8-bit CISC core (compatible with Motorola HC05)
- 17 CMOS Bi-directional I/O pins and 1 CMOS input pin
- 8-bit real time clock/counter with 8-bit programmable prescaler
- 7 keyboard interrupts
- 2 external interrupts
- Selectable oscillator options:
 - Crystal/resonator: 432K-8MHz
 - Crystal/resonator: 32K
 - Internal RC oscillator: 2MHz@5V, 4MHz@5V, 6MHz@5V
 - External RC oscillator
- Low power (Standby current less than 1uA@5V)
- Watchdog Timer (WDT) with its own on-chip RC oscillator
- 64*8 bits RAM (including stack)
- 2K*8 bits OTP ROM
- Serial program circuit
- OTP data encrypted
- Operation Voltage:
 - 2.0-5.5V@ (432K-4M)
 - 2.7-5.5V@ (432K-8M)
- Package: DIP20, SOP20, DIP18, SOP18, DIP16, SOP16, DIP14, SOP14, DIP8, SOP8

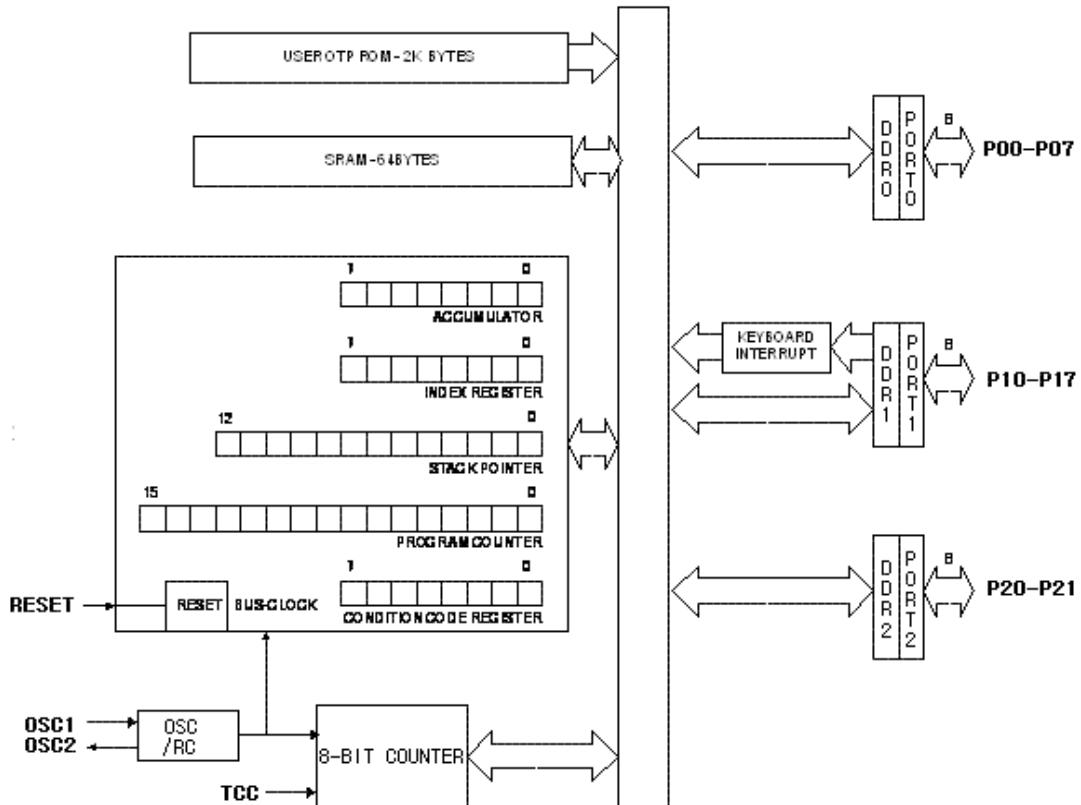


3. Pin Configuration

Pin Name	SOP20/ DIP20	SOP18/ DIP18	SOP16/ DIP16	SOP14/ DIP14	SOP8/ DIP8	Pin Type	Description
P13	1	2	2	-	-	I/O	Bi-directional I/O port;
P14	2	-	-	8	-	I/O	Programmable pull-up resistors;
P15	3	-	-	-	-	I/O	
P16/ TCC	4	3	3	9	1	I/O	Bi-directional I/O port; Programmable pull-up resistors; Clock input to clock/counter;
P17/ RST/ VPP	5	4	4	10	2	I	Input port; External reset input; High voltage power supply as OTP programming ;
VSS	6	5	5	11	3	P	Ground
P00/ INT0	7	6	6	12	4	I/O	Bi-directional I/O port; Programmable pull-up resistors;
P01/ INT1	8	7	-	13	-	I/O	Programmable pull-down resistors; External interrupt input;
P02	9	8	7	-	-	I/O	Bi-directional I/O port; Programmable pull-up resistors; Programmable pull-down resistors;
P03	10	9	8	14	-	I/O	
P04	11	10	9	1	-	I/O	
P05	12	11	10	-	-	I/O	
P06	13	12	-	2	-	I/O	
P07	14	13	11	3	5	I/O	
VDD	15	14	12	4	6	P	Power supply
P21/ OSCO	16	15	13	5	7	I/O	Bi-directional I/O port; Oscillator crystal output; System clock output;
P20/ OSCI	17	16	14	6	8	I/O	Bi-directional I/O port; Oscillator crystal input; External clock source input;
P10	18	17	15	-	-	I/O	Bi-directional I/O port; Programmable pull-up resistors;
P11	19	18	1	7	-	I/O	
P12	20	1	-	-	-	I/O	



4. Block Diagram





5. Electrical Characteristics

5.1 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Operating Voltage	VDD	-0.3~6.0	V
Input Voltage	VIN	VSS-0.3~VDD+0.3	V
Operating Ambient Temperature	TA	-40~85	°C
Storage Temperature	Tstg	-65~150	°C

5.2 DC Electrical Characteristics (VDD=5.0V, GND=0V, T=25°C, unless otherwise specified)

Parameter	Symbol	PIN	Condition	Min.	Typ.	Max.	Unit
Operating Voltage	VDD		432K-4M	2.0		5.5	V
			432K-8M	2.7		5.5	
Input Leakage Current	V _{leak}	P0 P1 P2	V _{IN} =VDD V _{IN} =VSS			±1	uA
Output High Voltage	V _{oh}	P0 P1 P2	I _{load} =-6mA	VDD-0.7			V
Output Low Voltage	V _{ol}	P0 P1 P2	I _{load} =10mA			0.6	V
Input High Voltage	V _{ih}	P0 P1 P2		0.7VDD		VDD	V
Input Low Voltage	V _{il}	P0 P1 P2		0		0.3VDD	V
LVR Voltage	V _{LVR}		VDD=5V		3.6		V
			VDD=3V		2.1		
Dynamic Current	I _{DD}	VDD	VDD=3V, F _{osc} =32K			100	uA
			VDD=5V, F _{osc} =4M			3	MA
Standby Current	I _{STB}	VDD	STOP Mode WDT off, LVR off			1	uA
			STOP Mode WDT on, LVR off			10	uA
			STOP Mode WDT off, LVR on			10	uA
Pull-up resistor	R _p	P0 P1			25		Kohm
Pull-down resistor	R _d	P0			25		Kohm