

**Prevention of the potential glitch caused by IOSCDIV switching**

**1 IOSCDIV**

In some applications saving MCU normal mode power is desired, which can be achieved by reducing the operating frequency, e.g. changing the system clock from 16MHz to 1MHz. With the IOSCDIV setting, the system clock generated by the 16MHz IOSC becomes adjustable, as in the following table:

**CKSEL (0x8F) R/W (0x9C) System Clock Selection Register TB Protected**

	7	6	5	4	3	2	1	0
RD	IOSCDIV[3-0]						CLKSEL[1]	CLKSEL[0]
WR	IOSCDIV[3-0]				REGRDY[1]	REGRDY[0]	CLKSEL[1]	CLKSEL[0]

IOSCDIV[3-0] IOSC Pre-Divider

IOSCDIV[3-0]	SYSCLK
0	IOSC
1	IOSC/2
2	IOSC/4
3	IOSC/6
4	IOSC/8
5	IOSC/10
6	IOSC/12
7	IOSC/14
8	IOSC/16
9	IOSC/32
10	IOSC/64
11	IOSC/128
12	IOSC/256
13	IOSC/512
14	IOSC/1024
15	IOSC/2048

Figure 1: IOSC Pre-Divider Setting Table

**2 Sample Code for switching IOSCDIV**

In RTL simulation, due to asynchronous design, switching IOSCDIV from value 0 to another or from another to 0 may result in a clock glitch. **To prevent this potential glitch, the software needs to switch the system clock source to SOSC before changing the IOSCDIV value, and switch back to IOSC after IOSCDIV is modified.** The following sections demonstrate two cases of this.

CLKSEL[1-0] Clock Source Selection

These two bits define the clock source of the system clock SYSCLK. The selections are shown in the following table. The default setting after reset is IOSC.

CLKSEL[1]	CLKSEL[0]	SYSCLK
0	0	IOSC (through divider)
0	1	SOSC
1	0	RTC
1	1	PLL

Figure 2: Clock Source Selection

**2.1 Example: switching (16MHz) to 1MHz**

```
// CKSEL: TB Protected
TB = 0xAA;
TB = 0x55;
CKSEL = (CKSEL&0xFC) | 0x01; // SOSC
CKSEL = (CKSEL&0x0F) | 0x80; // IOSCDIV=8: SYSCLK=IOSC/16
CKSEL = CKSEL&0xFC; // IOSC(through divider)
TB = 0x00;
```

**2.2 Example: switching to 16MHz**

```
// CKSEL: TB Protected
TB = 0xAA;
TB = 0x55;
CKSEL = (CKSEL&0xFC) | 0x01; // SOSC
CKSEL = CKSEL&0x0F; // IOSCDIV=0: SYSCLK= IOSC
CKSEL = CKSEL&0xFC; // IOSC(through divider)
TB = 0x00;
```

**3 Revision History**

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