1. Clock Frequency after Reset on S32K144 Cortex M4F

Clock divider values after reset [1]
The default configuration out of reset has the CPU clocked by the Fast IRC (FIRC_CLK). The clocks (for example, CORE_CLK, FLASH_CLK, and BUS_CLK) are configured in the SCG module (see Memory Map/Register Definition).

Fast IRC Configuration Register (SCG_FIRCCFG)

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
R	0														RANGE	
W																
Reset	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SCG_FIRCCFG field descriptions

Field	Description
31–2 Reserved	This field is reserved. This read-only field is reserved and always has the value 0.
RANGE	Frequency Range **See chip-specific information for supported frequency ranges.** 00 Fast IRC is trimmed to 48 MHz 01 Fast IRC is trimmed to 52 MHz 10 Fast IRC is trimmed to 56 MHz 11 Fast IRC is trimmed to 60 MHz

2. Code

```
int main(void)
{
    WDOG_disable();

    PORT_init ();

    SysTick_Init(16000000);        // SysTick timer Init

    EnableInterrupts();


      while(1){                   // interrupts every 1ms, 500 Hz flash
        WaitForInterrupt();
      }
```

At the moment to initialize Systick interrupt:
Period is 20.8333ns (assuming FIRC @ 48 MHz clock)
Maximum is 2^24-1 = 16777215 = 16,777215 e+6
Minimum is determined by length of ISR

```
SysTick_Init(16000000); period value sets busy wait count to 16 000 000
```

```
// SysTick Init with busy wait running at FIRC CLOCK.
void SysTick_Init(unsigned long period){
  S32_SysTick->CSR = 0;                  // disable SysTick during setup
  S32_SysTick->RVR = period-1;  // maximum reload value
  S32_SysTick->CVR = 0;                  // any write to current clears it

  S32_SCB->SHPR3= (S32_SCB->SHPR3 &0x00FFFFFF)|0x40000000;
  S32_SysTick->CSR = 0x07; // CLKSOURCE =1 processor clock source, TICKINT=1 counting down to zero asserts Systick exception,
                           // ENABLE= 1 counter enabled.
  EnableInterrupts();
}
```

Tick(T) = 20.8333ns
Maximum Reload value (MRV)= RVR-1 = 16 000 000 -1 = 15 999 999

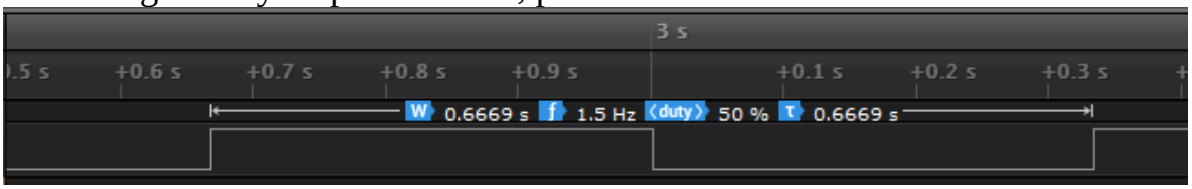
The periodic Systick_Handler is asserted as calculated below :

Systick(ISR) = Tick(T) * (RVR-1)
= (20.8333ns)(15 999 999) = 0,3333327791667s

3. Measurements

- Utilized board: S32K144 EVB.

Saleae logic analyzer put on J6-01, port PD0.



T= 0.6669s
T/2 = 0.3334

4. Reference:

[1] NXP STAFF Document Number: S32K1XXRM Rev. 6, 12/2017