9.1 CPU Clocking System

The dsPIC33EPXXX(GP/MC/MU)806/810/814 and PIC24EPXXX(GP/GU)810/814 family of devices provides seven system clock options:

- Fast RC (FRC) Oscillator
- FRC Oscillator with Phase-Locked Loop (PLL)
- Primary (XT, HS or EC) Oscillator
- Primary Oscillator with PLL
- Secondary (LP) Oscillator
- Low-Power RC (LPRC) Oscillator
- FRC Oscillator with postscaler

Instruction execution speed or device operating frequency, FCY, is given by Equation 9-1.

EQUATION 9-1: DEVICE OPERATING FREQUENCY

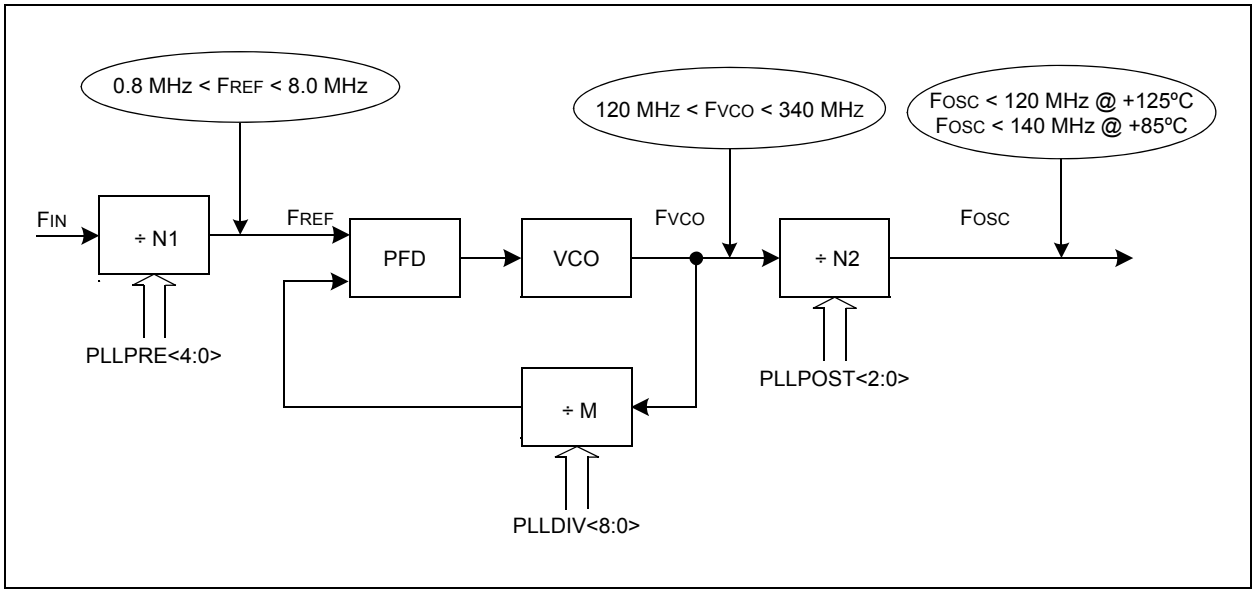
$$FCY = FOSC/2$$

Figure 9-2 is a block diagram of the PLL module.

Equation 9-2 provides the relation between input frequency (FIN) and output frequency (FOSC).

Equation 9-3 provides the relation between input frequency (FIN) and VCO frequency (FVCO).

FIGURE 9-2: PLL BLOCK DIAGRAM



EQUATION 9-2: FOSC CALCULATION

$$FOSC = FIN \times \left(\frac{M}{N1 \times N2}\right) = FIN \times \left(\frac{(PLLDIV + 2)}{(PLLPRE + 2) \times 2(PLLPOST + 1)}\right)$$

Where,

$N1 = PLLPRE + 2$

$N2 = 2 \times (PLLPOST + 1)$

$M = PLLDIV + 2$

EQUATION 9-3: FVCO CALCULATION

$$FVCO = FIN \times \left(\frac{M}{N1}\right) = FIN \times \left(\frac{(PLLDIV + 2)}{(PLLPRE + 2)}\right)$$