Xilinx
Zynq FPGA
TI DSP MCU 기반의
프로그래밍 및 회로 설계 전문가

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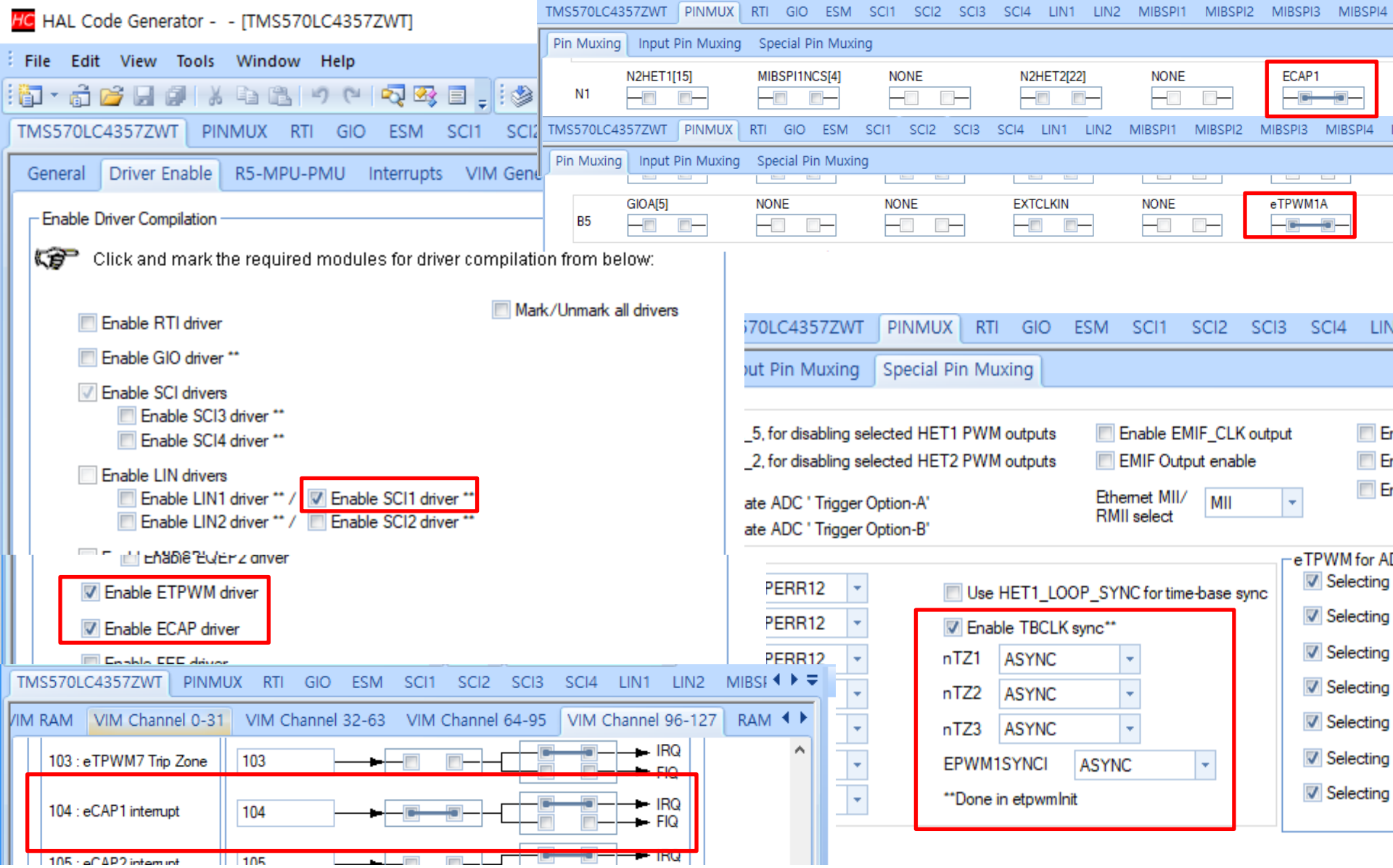
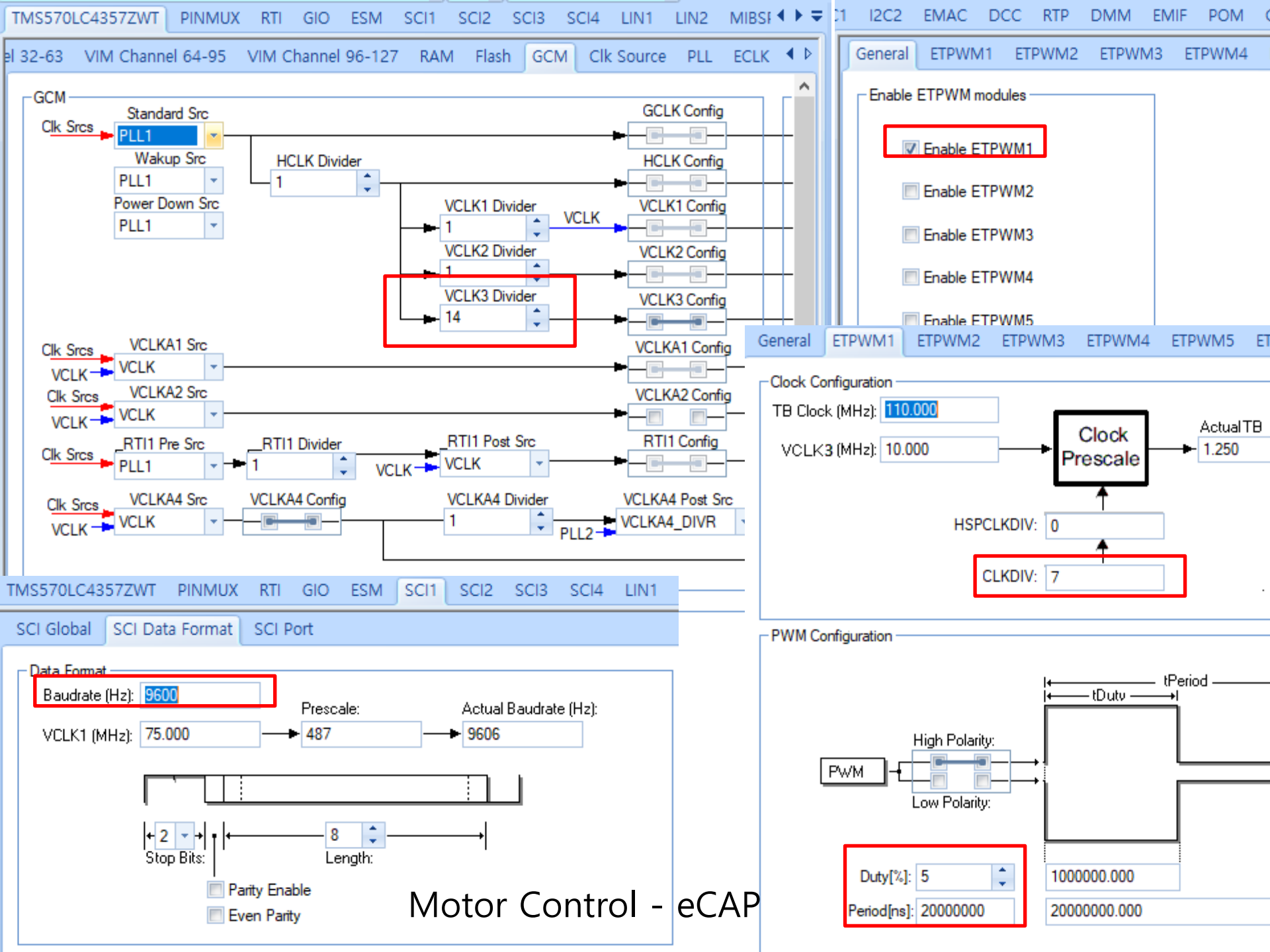
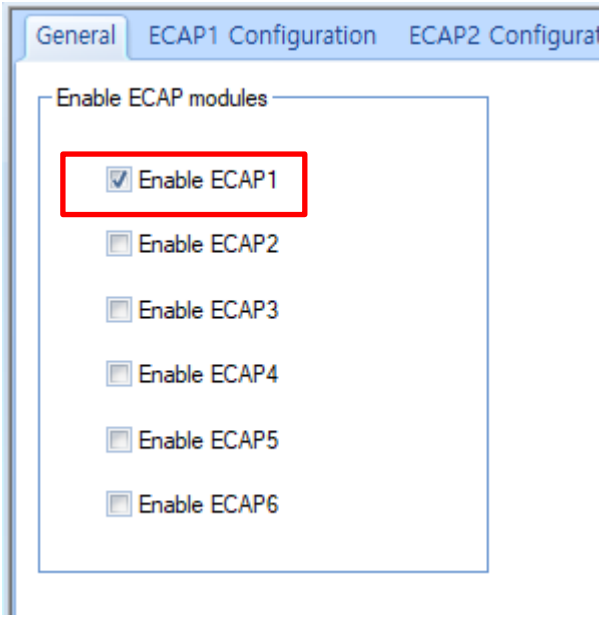
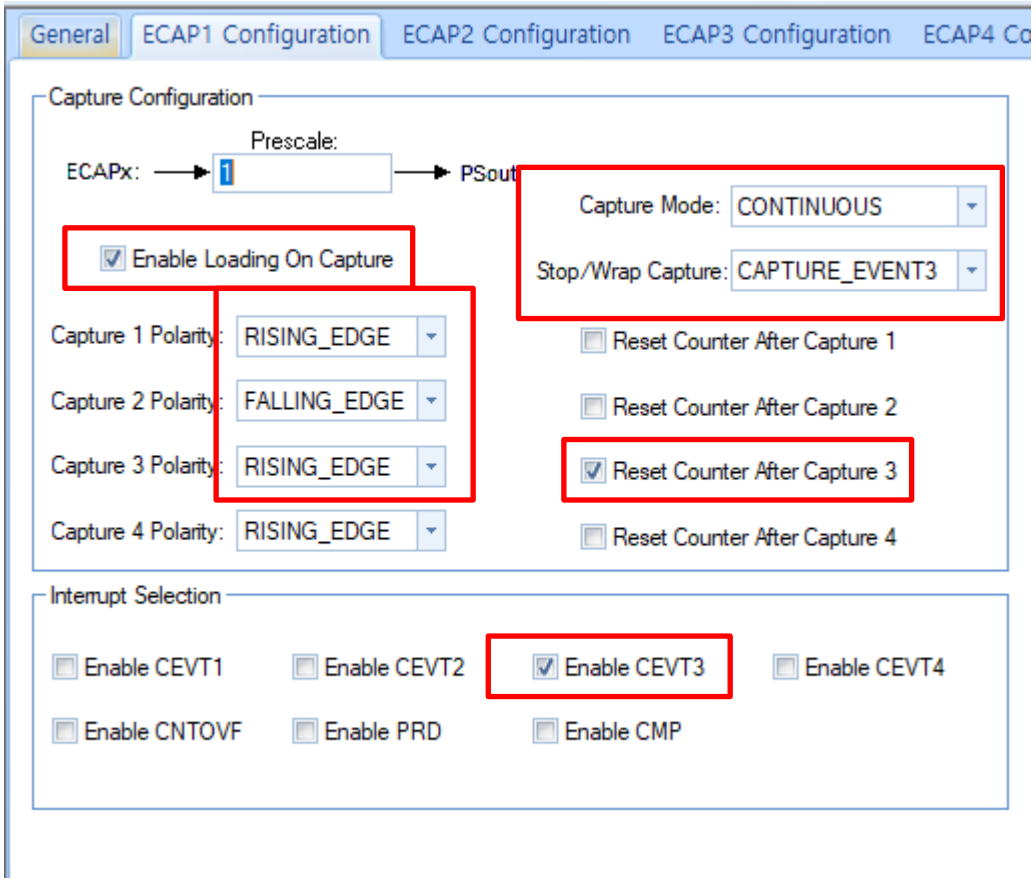


Motor Control - eCAP



Motor Control - eCAP


General
ECAP1 Configuration
ECAP2 Configurat
Enable ECAP modules
Enable ECAP1
Enable ECAP2
Enable ECAP3
Enable ECAP4
Enable ECAP5
Enable ECAP6


General
ECAP1 Configuration
ECAP2 Configuration
ECAP3 Configuration
ECAP4 Co
Capture Configuration
Prescale:
ECAPx:
1
PSout
Capture Mode: CONTINUOUS
Enable Loading On Capture
Stop/Wrap Capture: CAPTURE_EVENT3
Capture 1 Polarity: RISING_EDGE
Capture 2 Polarity: FALLING_EDGE
Capture 3 Polarity: RISING_EDGE
Capture 4 Polarity: RISING_EDGE
Reset Counter After Capture 1
Reset Counter After Capture 2
Reset Counter After Capture 3
Reset Counter After Capture 4
Interrupt Selection
Enable CEVT1
Enable CEVT2
Enable CEVT3
Enable CEVT4
Enable CNTOVF
Enable PRD
Enable CMP

```c
#include <HL_ecap.h>
#include <HL_etpwm.h>
#include <HL_hal_stdtypes.h>
#include <HL_reg_ecap.h>
#include <HL_reg_sci.h>
#include <HL_sci.h>
#include <HL_sys_core.h>
#include <HL_system.h>
#include <string.h>
#include "HL_system.h"
#include "stdio.h"
#include "math.h"

void send_data(sciBASE_t* sci, uint8* msg, int length);
int main(void)
{
    _enable_interrupt_();
    sciInit();
    etpwmInit();
    ecapInit();

    etpwmStartTBCLK();
    while (1)
    {
    }
    return 0;
}

void send_data(sciBASE_t* sci, uint8* msg, int length)
{
    int i;
    for (i = 0; i < length; i++)
        sciSendByte(sci, msg[i]);
}
```

Motor Control – eCAP code

```c
void ecapNotification(ecapBASE_t *ecap, uint16 flags)
{
    uint32 ecap1, ecap2, ecap3;
    float64 duty, period, w;
    float64 pi = 3.14;
    uint8 msg[128] = { 0, };
    uint8 T[64] = { 0, };

    ecap1 = ecapGetCAP1(ecapREG1);
    ecap2 = ecapGetCAP2(ecapREG1);
    ecap3 = ecapGetCAP3(ecapREG1);

    duty = (ecap2 - ecap1) * 1000 / VCLK3_FREQ;
    period = (ecap3 - ecap1) * 1000 / VCLK3_FREQ;
    w = ((2*pi)/(432*period))*pow(10,9);

    sprintf(msg, "duty = %.3lf, period = %.3lf, W = %.3lf₩r₩n", duty, period, w);
    send_data(sciREG1, msg, 128);
}
```

COM4 - PuTTY

```
duty = 135300.000, period = 268300.000, W = 54.182
duty = 136200.000, period = 269800.000, W = 53.881
duty = 132200.000, period = 262100.000, W = 55.464
duty = 138000.000, period = 273200.000, W = 53.210
duty = 134900.000, period = 267100.000, W = 54.425
duty = 135100.000, period = 268500.000, W = 54.142
duty = 134200.000, period = 266300.000, W = 54.589
duty = 137100.000, period = 271100.000, W = 53.622
duty = 134500.000, period = 266000.000, W = 54.651
duty = 132700.000, period = 264100.000, W = 55.044
duty = 133600.000, period = 265500.000, W = 54.753
duty = 135500.000, period = 268200.000, W = 54.202
duty = 135800.000, period = 269000.000, W = 54.041
duty = 134000.000, period = 265500.000, W = 54.753
duty = 137600.000, period = 273200.000, W = 53.210
duty = 135600.000, period = 267700.000, W = 54.303
duty = 135100.000, period = 268400.000, W = 54.162
duty = 132500.000, period = 262200.000, W = 55.443
duty = 137300.000, period = 272500.000, W = 53.347
duty = 134900.000, period = 267300.000, W = 54.385
duty = 135700.000, period = 268700.000, W = 54.101
duty = 134000.000, period = 265600.000, W = 54.733
duty = 137600.000, period = 271400.000, W = 53.563
duty = 134100.0
```