

# FPGA 보드에 CUJS1(FT2232HL) 보드연결하여 JTAG 으로 컨트롤하기

<http://www.mangoboard.com/>

<http://cafe.naver.com/embeddedcrazyboys>

Crazy Embedded Laboratory



# Document History

Revision	Date	Change note
Init	2017-06-05	전종인

1.	필요한 사항 .....	5
1.1.	보드와 연결 방법 .....	5
1.2.	FT2232HL 드라이버 설치 .....	6
2.	iMPACT 수행 및 JTAG 연결 .....	8
2.1.	프로젝트 구성 .....	11
2.2.	MCS 파일 만들기 .....	16
2.3.	SPI Write하기 .....	23
2.4.	References .....	29

# 1. 필요한 사항

ISE 설치 및 환경 설정

## 1.1. 보드와 연결 방법

JTAG\_TMS <-> 보드 JTAG\_TMS

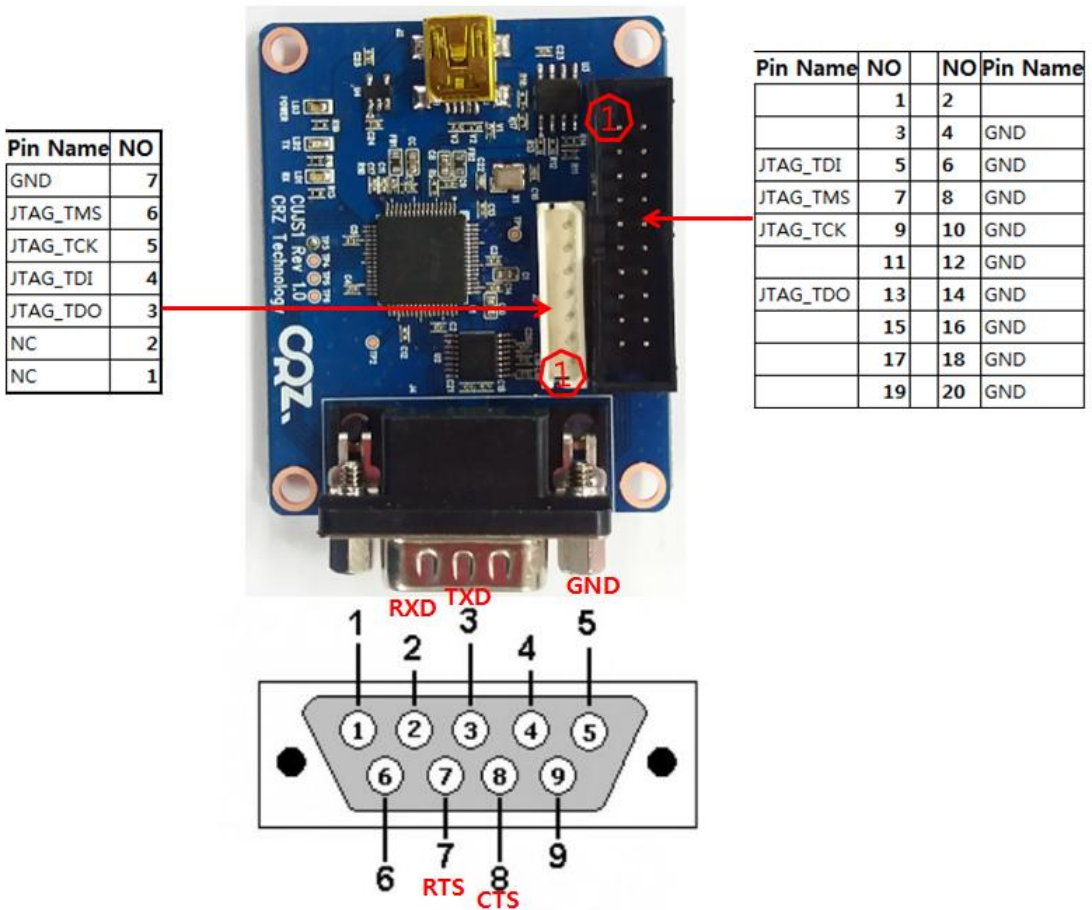
JTAG\_TCK <-> 보드 JTAG\_TCK

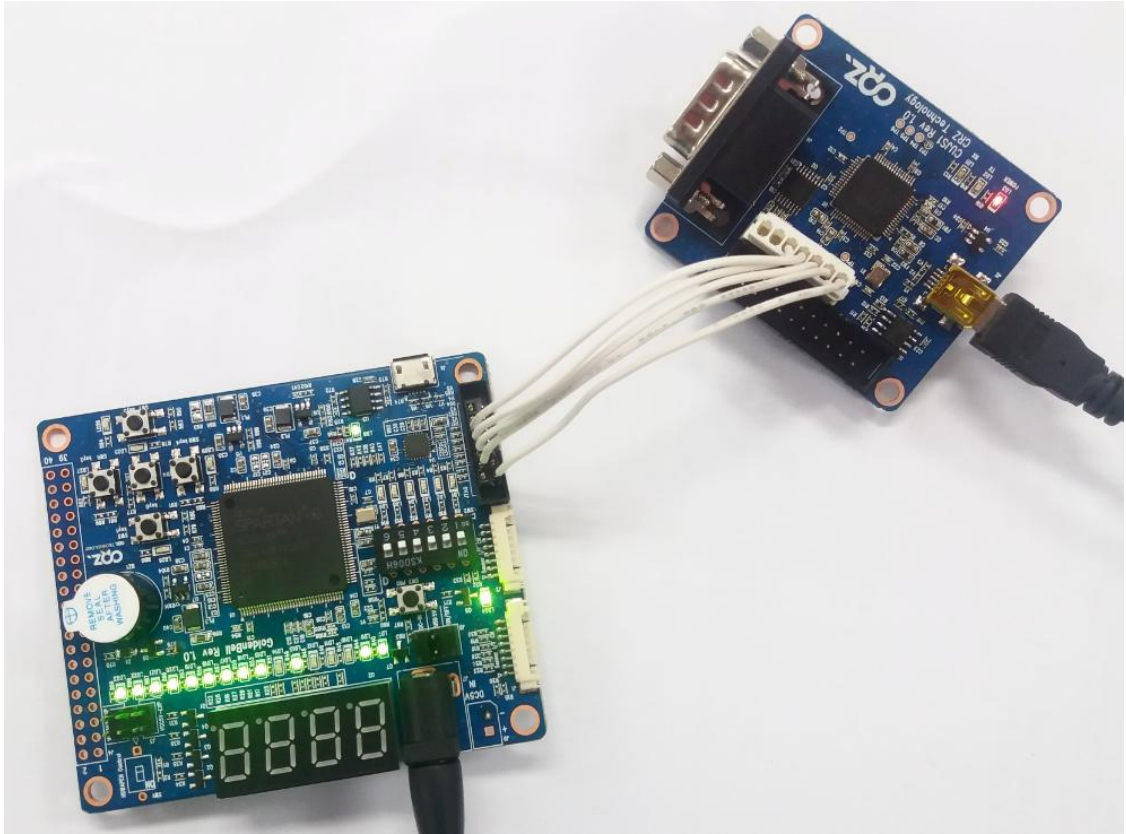
JTAG\_TDI <-> 보드 JTAG\_TDI

JTAG\_TDO <-> 보드 JTAG\_TDO

GND <-> 보드 GND

연결한다.





## 1.2. FT232HL 드라이버 설치

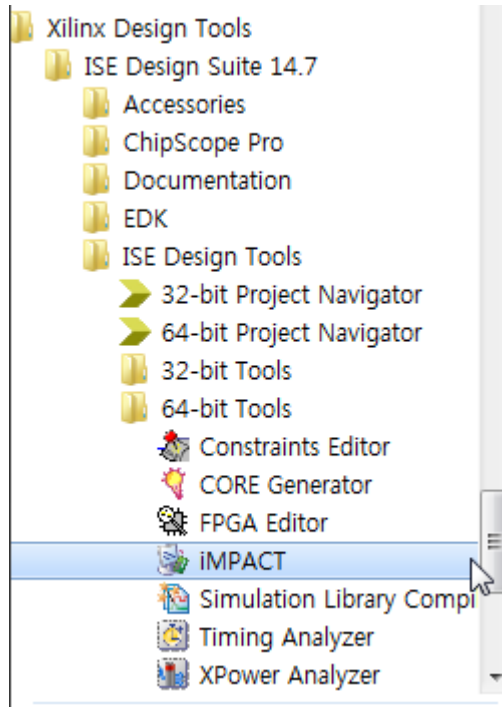
- [드라이버 Download](#)

운영체제따라 설치한다.

장치관리자에서 확인한다.

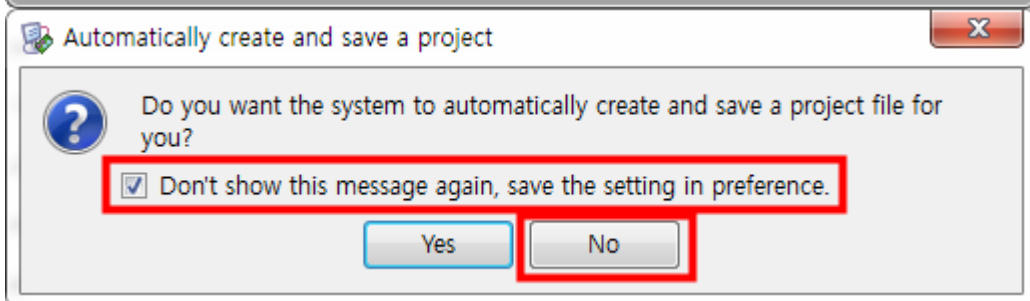
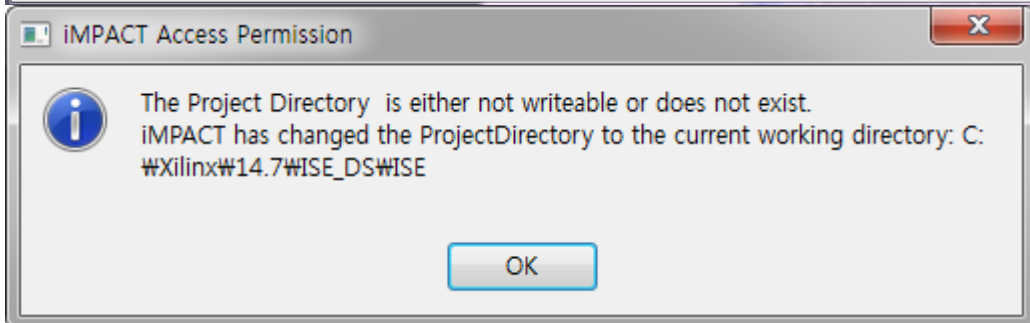
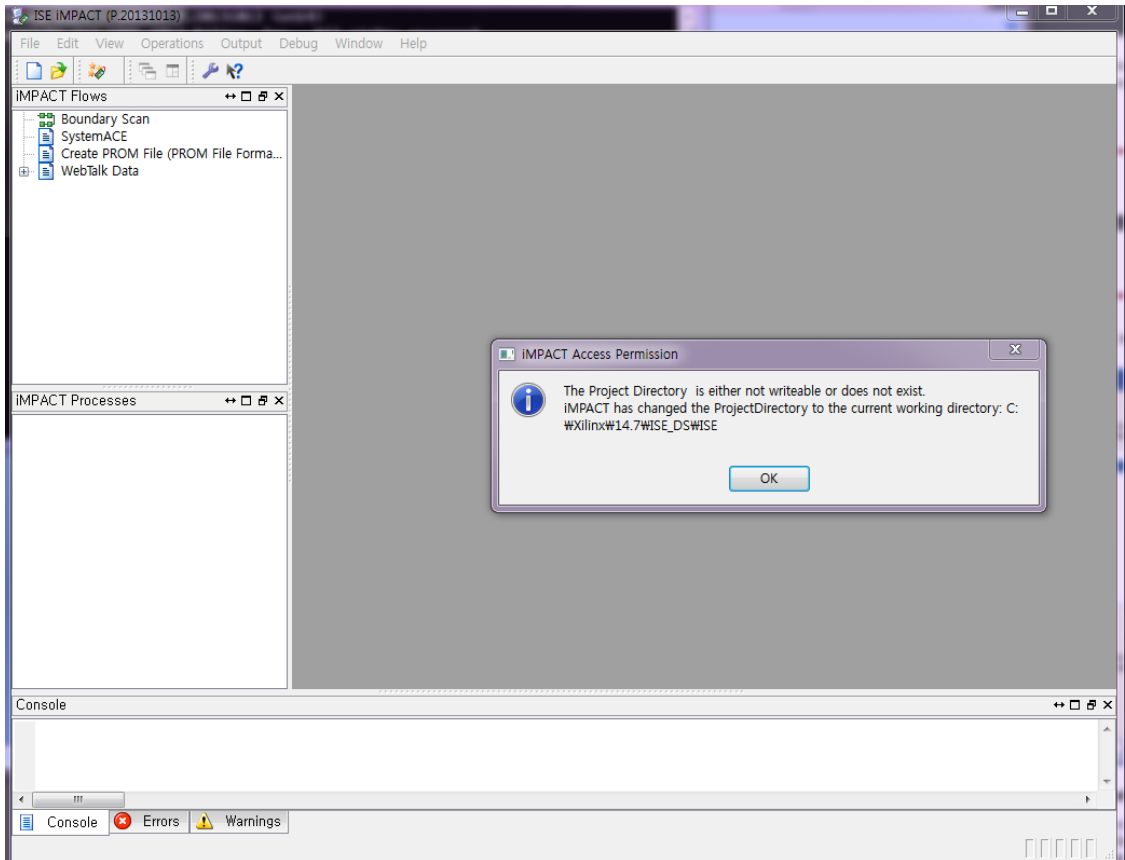


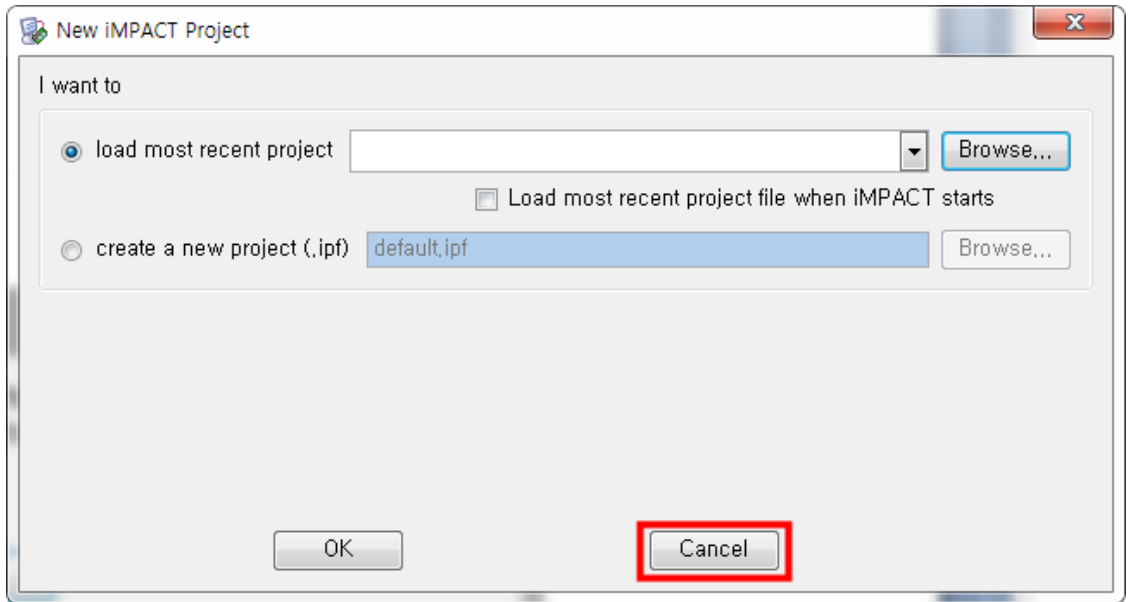
## 2. iMPACT 수행 및 JTAG 연결



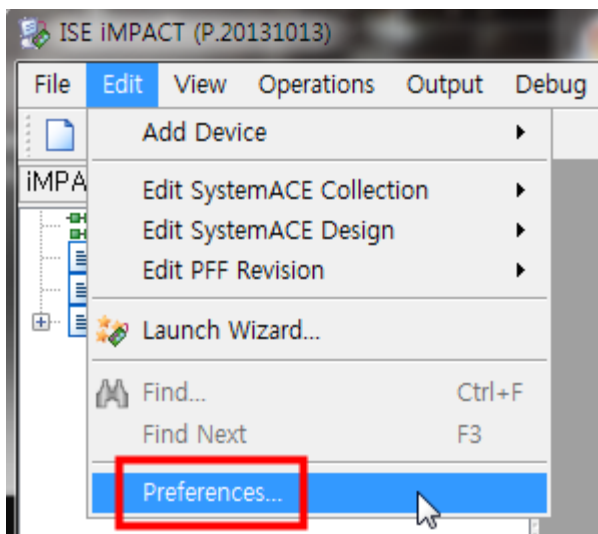
실행하면 아래와 같이 팝업창이 나옵니다.



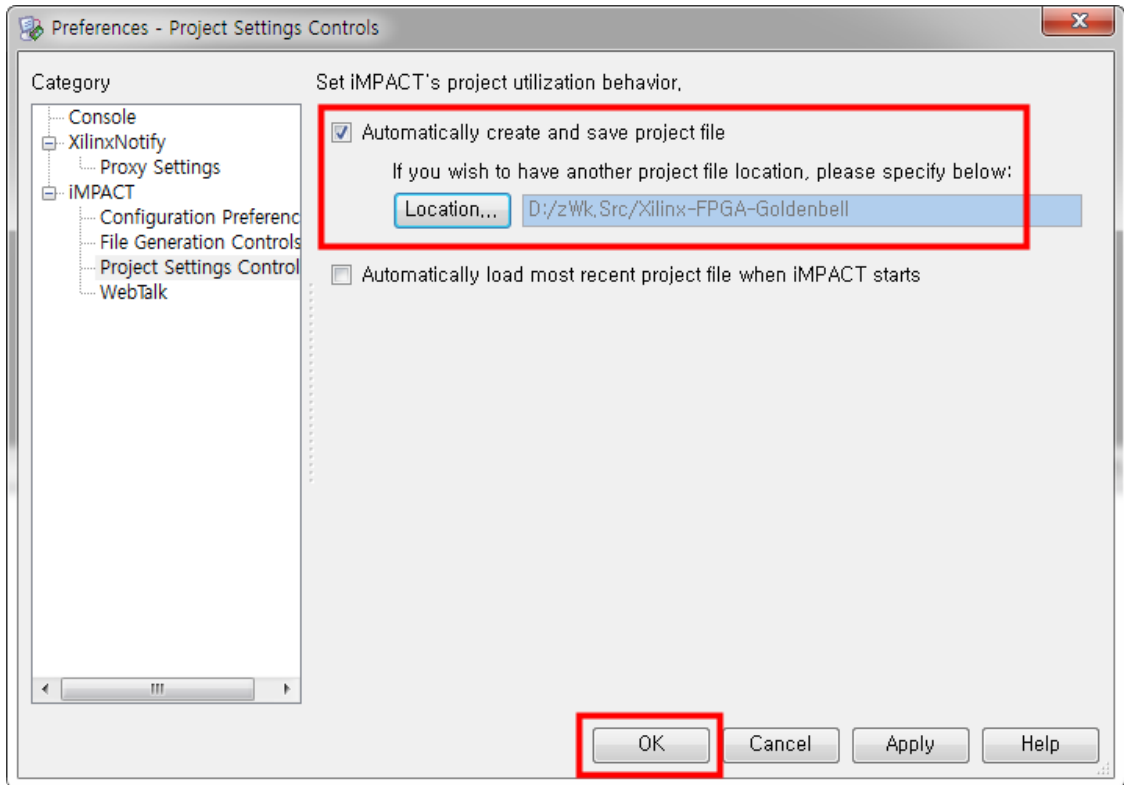




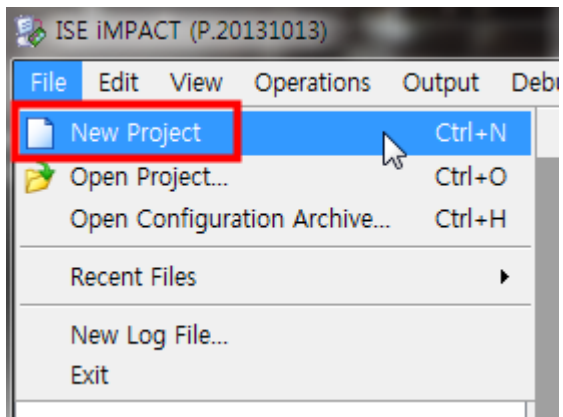
d:\CRZ\_보드\Mango-Board\Mango-GoldenBell\source\W

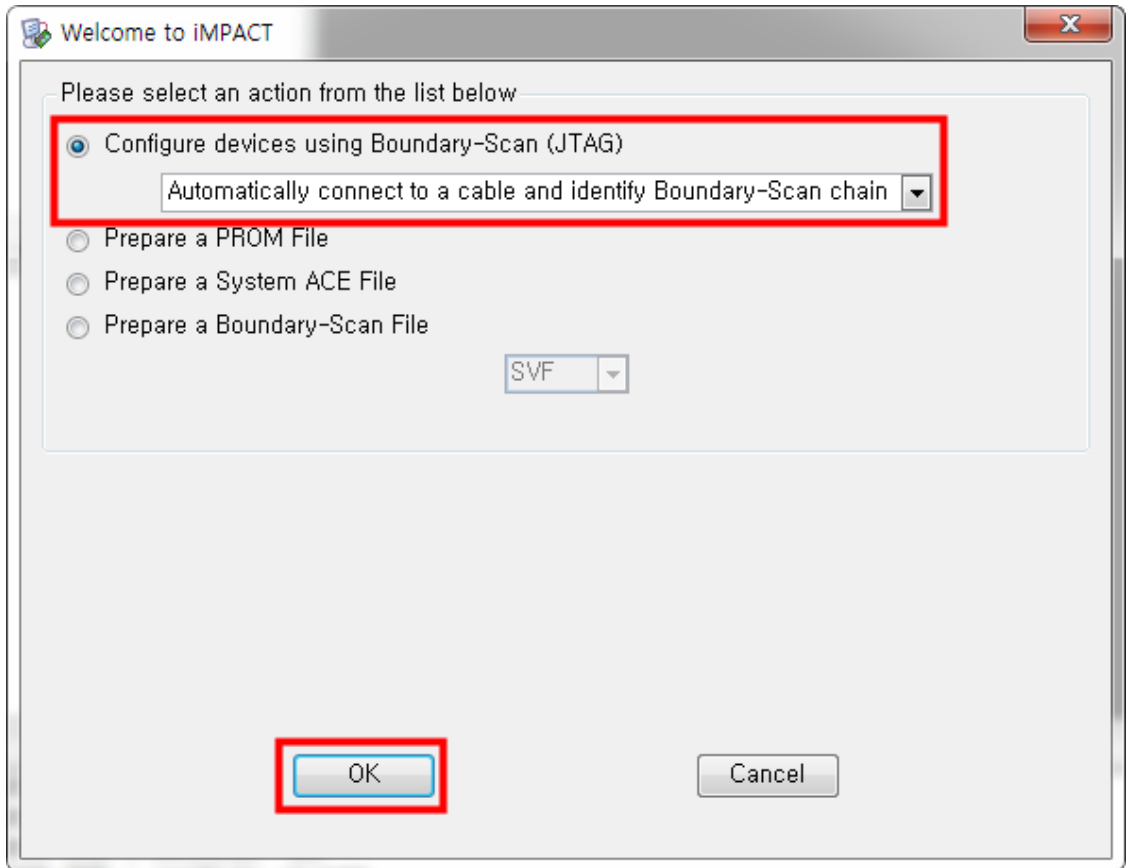


작업할 디렉토리를 설정합니다.

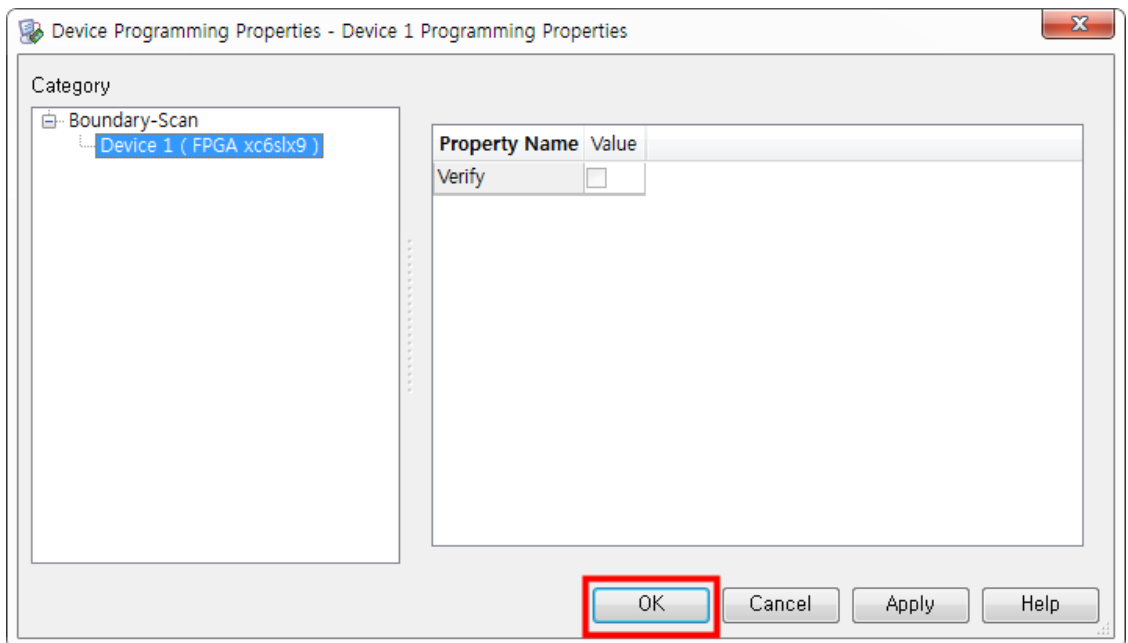


## 2.1. 프로젝트 구성





인식이 되면 아래와 같이 나옵니다.

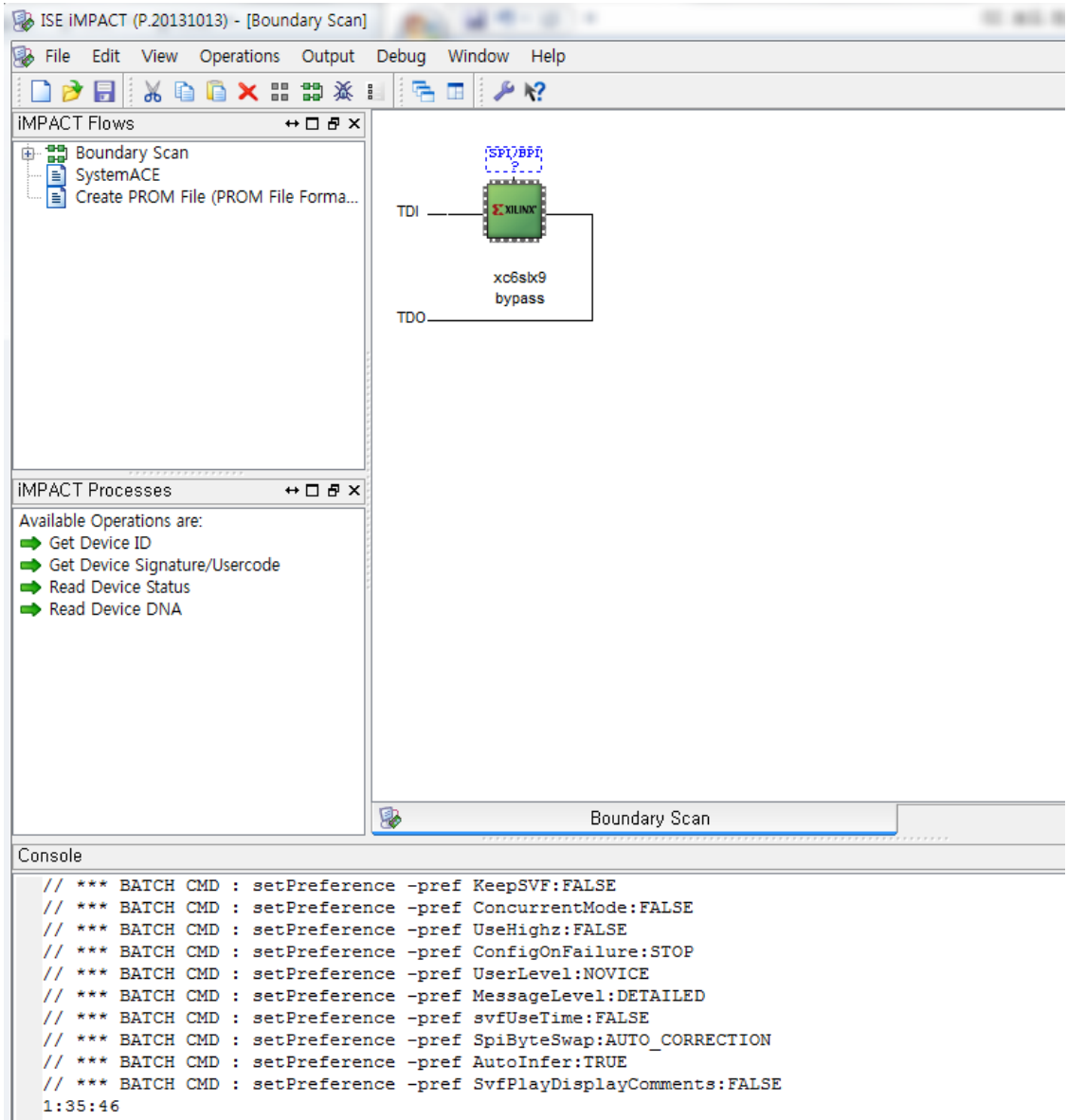


GoldenBell 1.0 보드는 XC6SLX9 입니다.

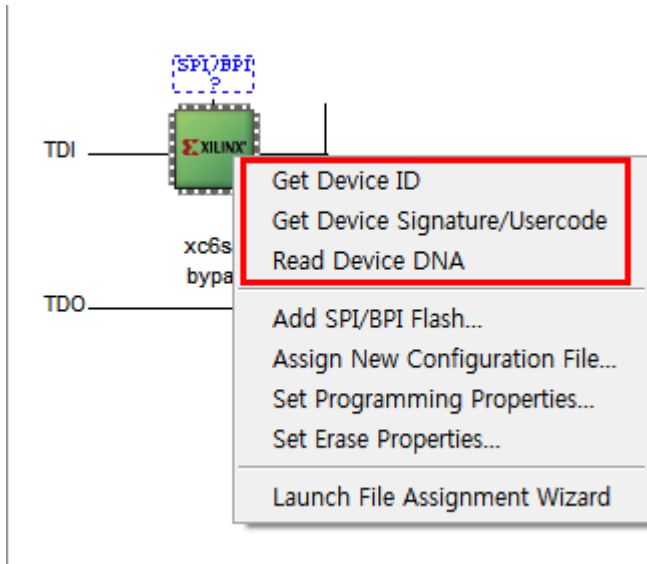
## Spartan-6 FPGA Feature Summary

Table 1: Spartan-6 FPGA Feature Summary by Device

Device	Logic Cells <sup>(1)</sup>	Configurable Logic Blocks (CLBs)			DSP48A1 Slices <sup>(3)</sup>	Block RAM Blocks		CMTs <sup>(5)</sup>	Memory Controller Blocks (Max) <sup>(6)</sup>	Endpoint Blocks for PCI Express	Maximum GTP Transceivers	Total I/O Banks	Max User I/O
		Slices <sup>(2)</sup>	Flip-Flops	Max Distributed RAM (Kb)		18 Kb <sup>(4)</sup>	Max (Kb)						
XC6SLX4	3,840	600	4,800	75	8	12	216	2	0	0	0	4	132
XC6SLX9	9,152	1,430	11,440	90	16	32	576	2	2	0	0	4	200
XC6SLX16	14,579	2,278	18,224	136	32	32	576	2	2	0	0	4	232
XC6SLX25	24,051	3,758	30,064	229	38	52	936	2	2	0	0	4	266



칩을 선택하고, 마우스 우측키를 누르면 아래와 같이 나옵니다.



Get Device ID, Get Device Signature/Usercode, Read Device DNA를 차례로 실행해 보았다.

#### Get Device ID

```
INFO:IMPACT - Current time: 2016-05-26 00:00:00 // *** BATCH CMD : ReadIdcode -p 1
Maximum TCK operating frequency for this device chain: 25000000.
Validating chain...
Boundary-scan chain validated successfully.
'1': IDCODE is '00100100000000000001000010010011'
'1': IDCODE is '24001093' (in hex).
'1': : Manufacturer's ID = Xilinx xc6slx9, Version : 2
```

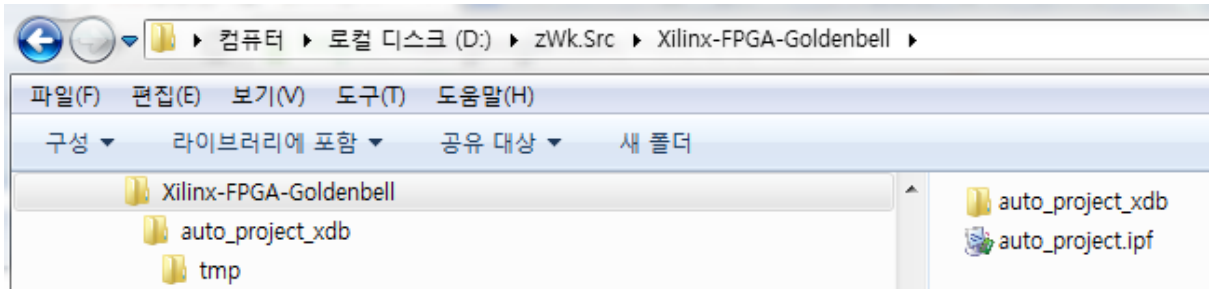
#### Get Device Signature/Usercode

```
INFO:IMPACT - Current time: 2016-05-26 00:00:00 // *** BATCH CMD : ReadUserCode -p 1
Maximum TCK operating frequency for this device chain: 25000000.
Validating chain...
Boundary-scan chain validated successfully.
'1': Usercode is 'ffffff'
```

#### Read Device DNA

```
INFO:IMPACT - Current time: 2016-05-26 00:00:00 // *** BATCH CMD : readdna -p 1
Maximum TCK operating frequency for this device chain: 25000000.
Validating chain...
Boundary-scan chain validated successfully.
```

'1': DNA = '100110111111001000001010101100100111100110100110101010101'

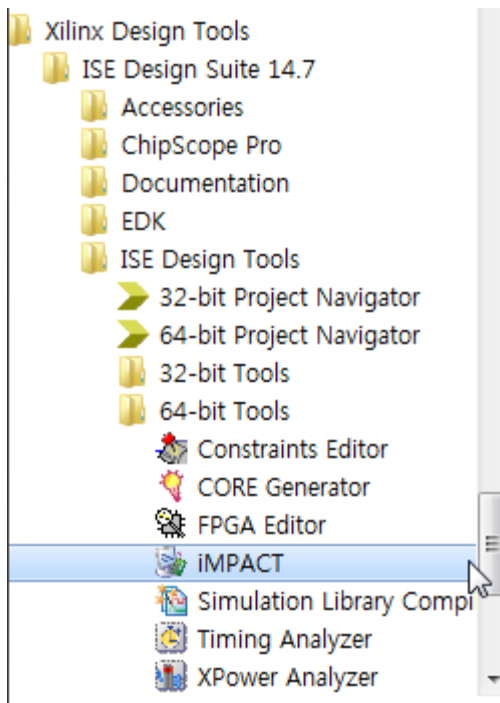


iMPACT을 종료해 보면 위 그림과 같이 D:\zWk.Src\Xilinx-FPGA-Goldenbell 폴더에 아래 폴더와 파일이 생성되어 있다.

**auto\_project\_xdb**

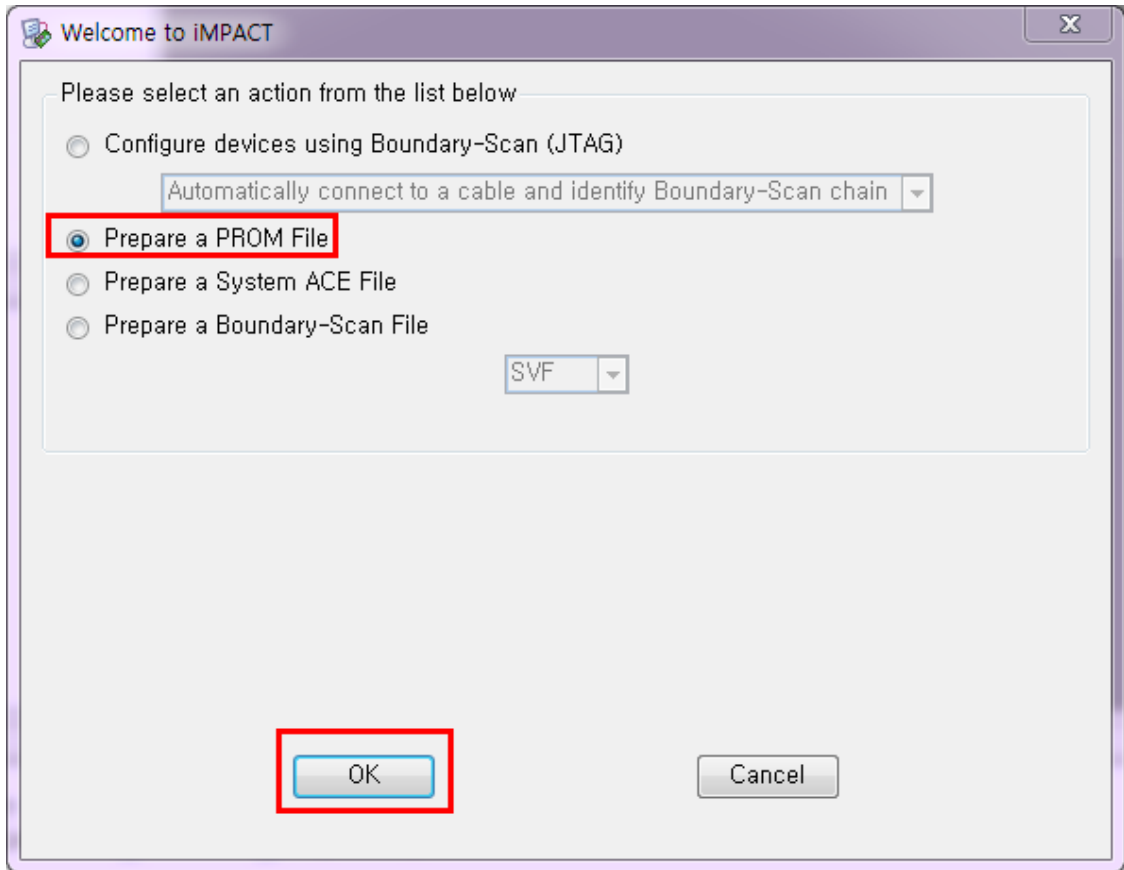
**auto\_project.ipf**

## 2.2. MCS 파일 만들기

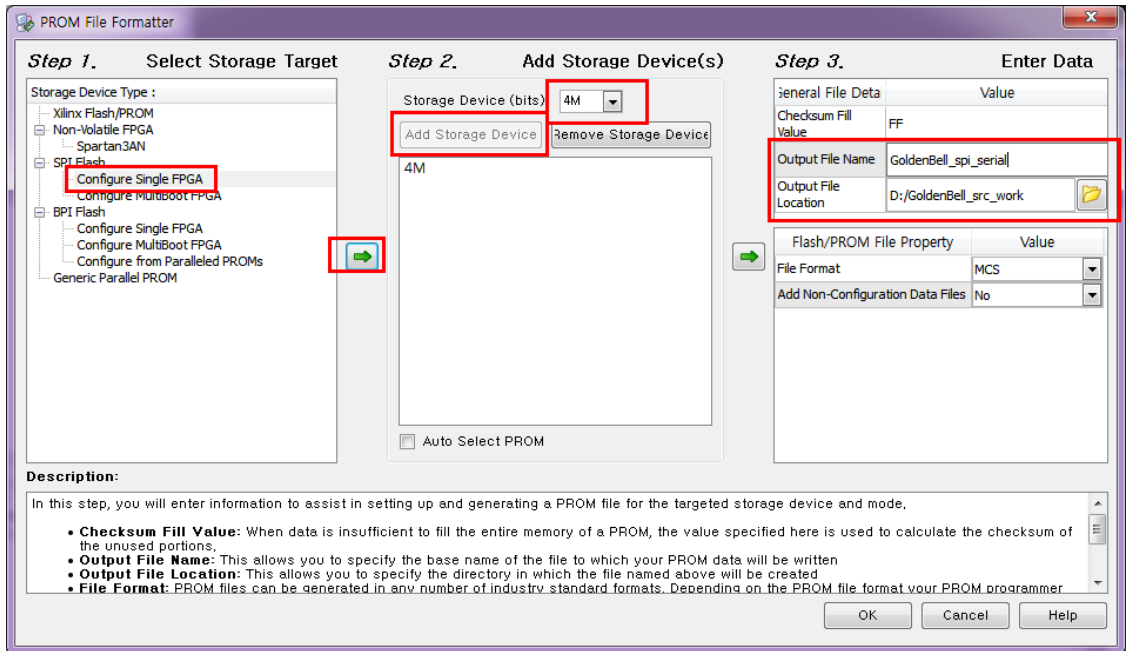


실행을 합니다.





"Prepare a PROM File" 선택

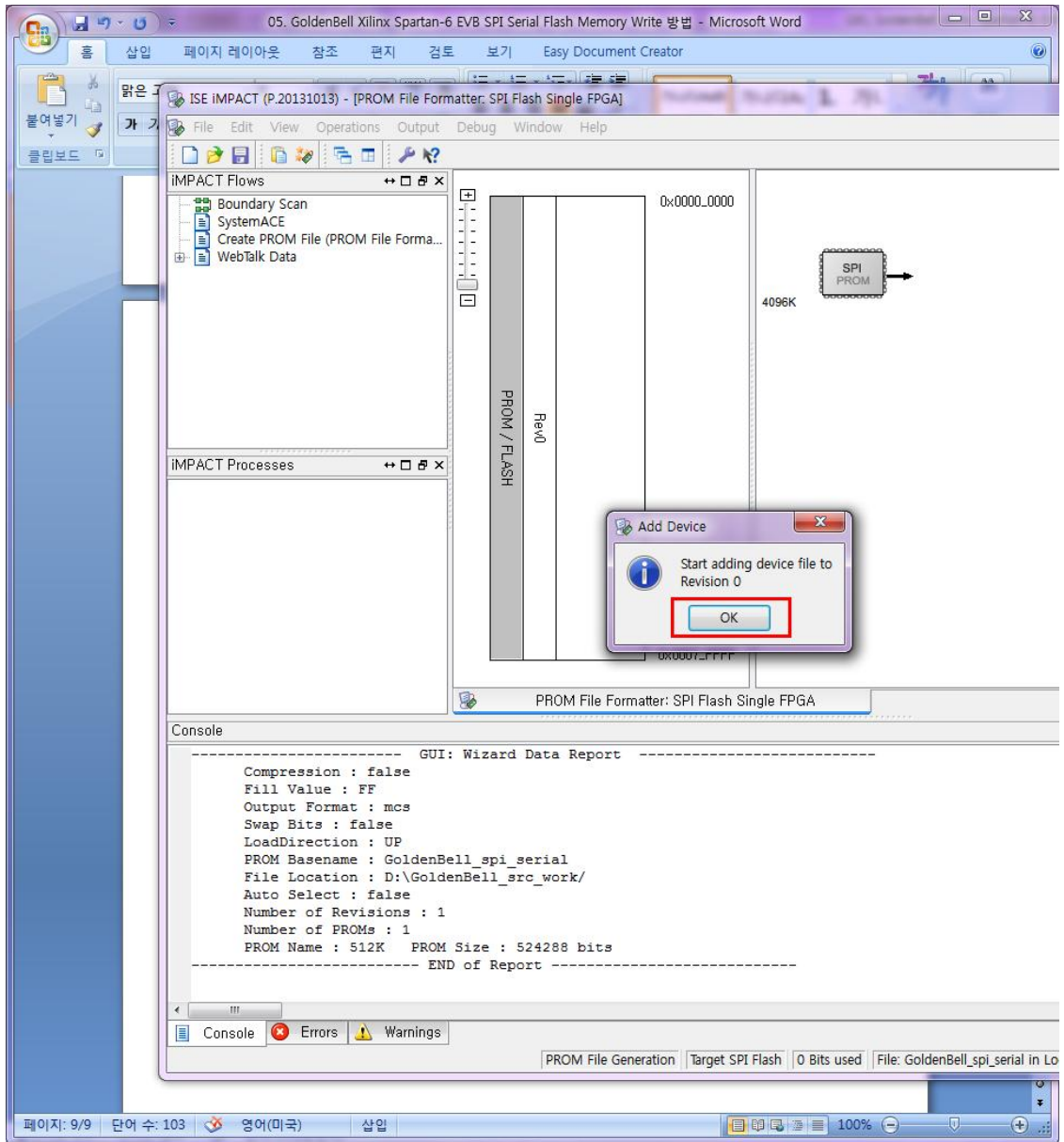


선택을 하고, OK

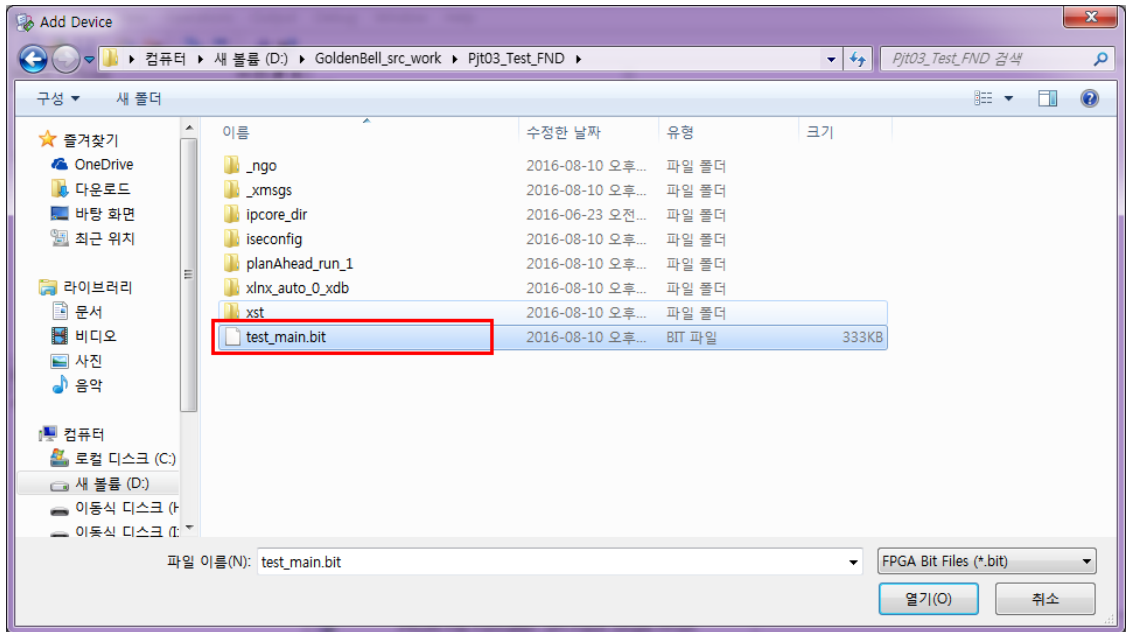
GoldenBell 보드에는 32MBit(4MB) M25P40 Serial Flash Memory가 탑재가 되어 있습니다.

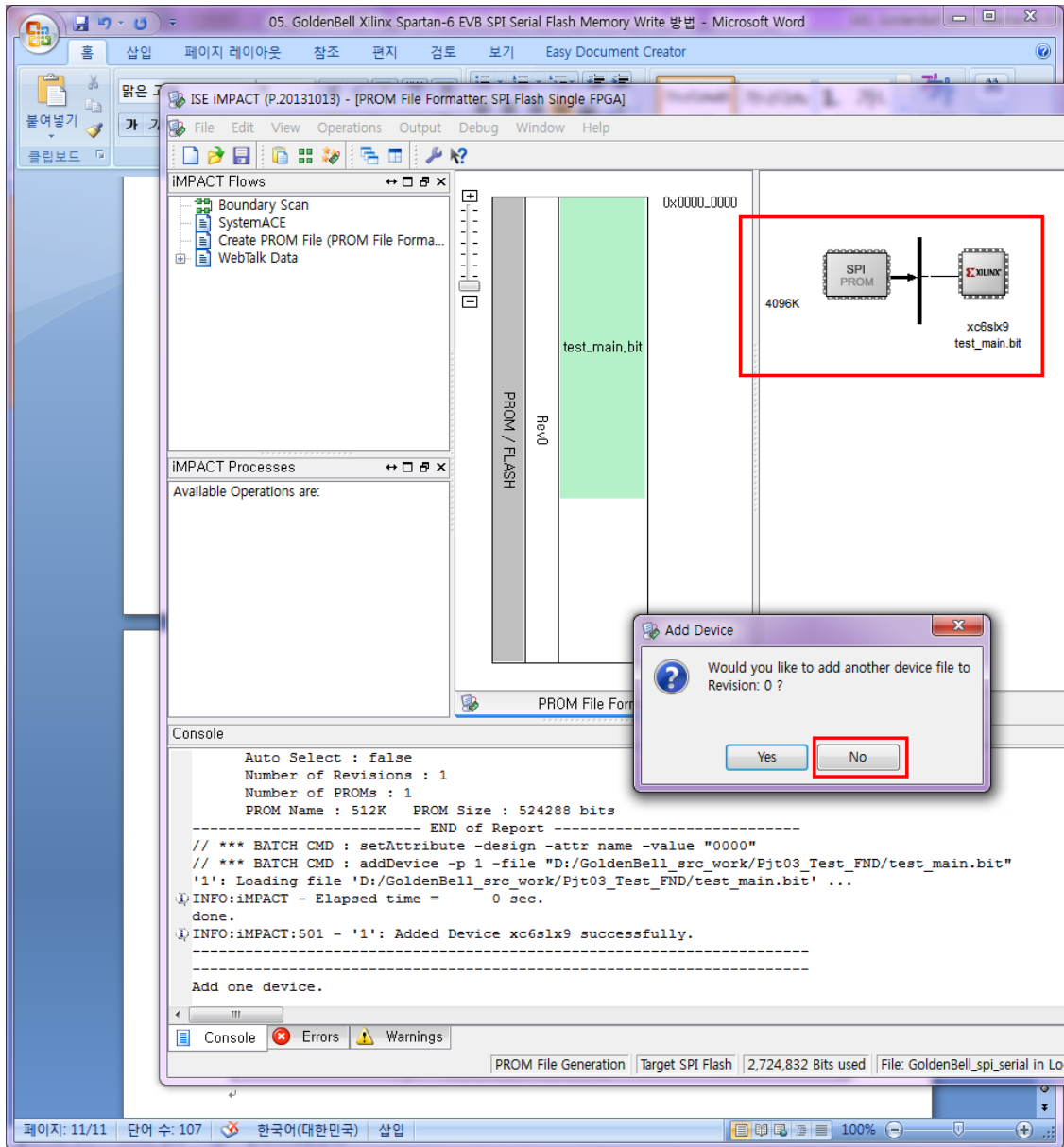
참조사이트

[http://www.xilinx.com/support/documentation/sw\\_manuals/xilinx11/pim\\_p\\_configure\\_spi\\_bpi\\_through\\_fpga.htm](http://www.xilinx.com/support/documentation/sw_manuals/xilinx11/pim_p_configure_spi_bpi_through_fpga.htm)



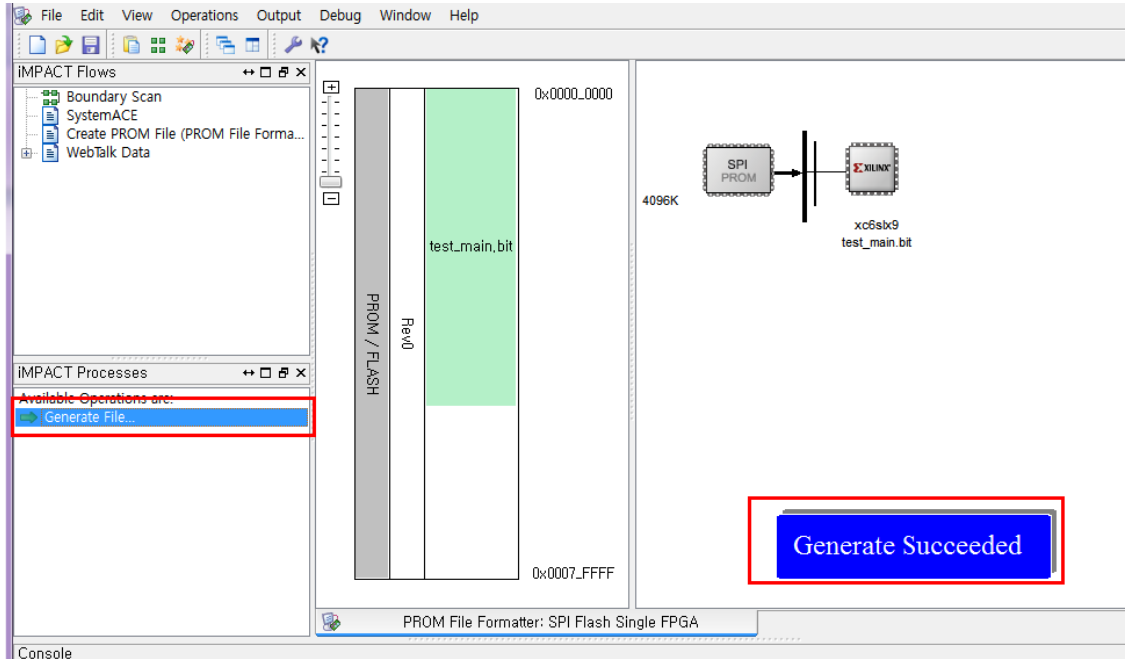
프로젝트로 생성된 이미지를 선택합니다.



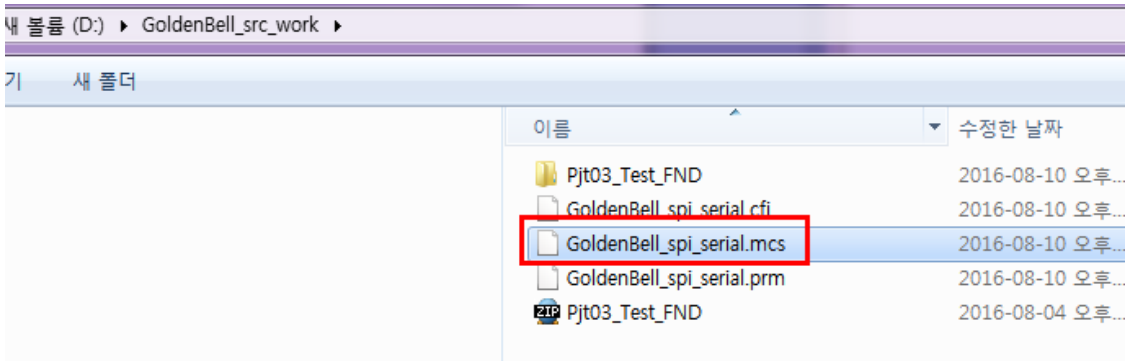


다시 팝업창이 나타나면, NO를 선택합니다.





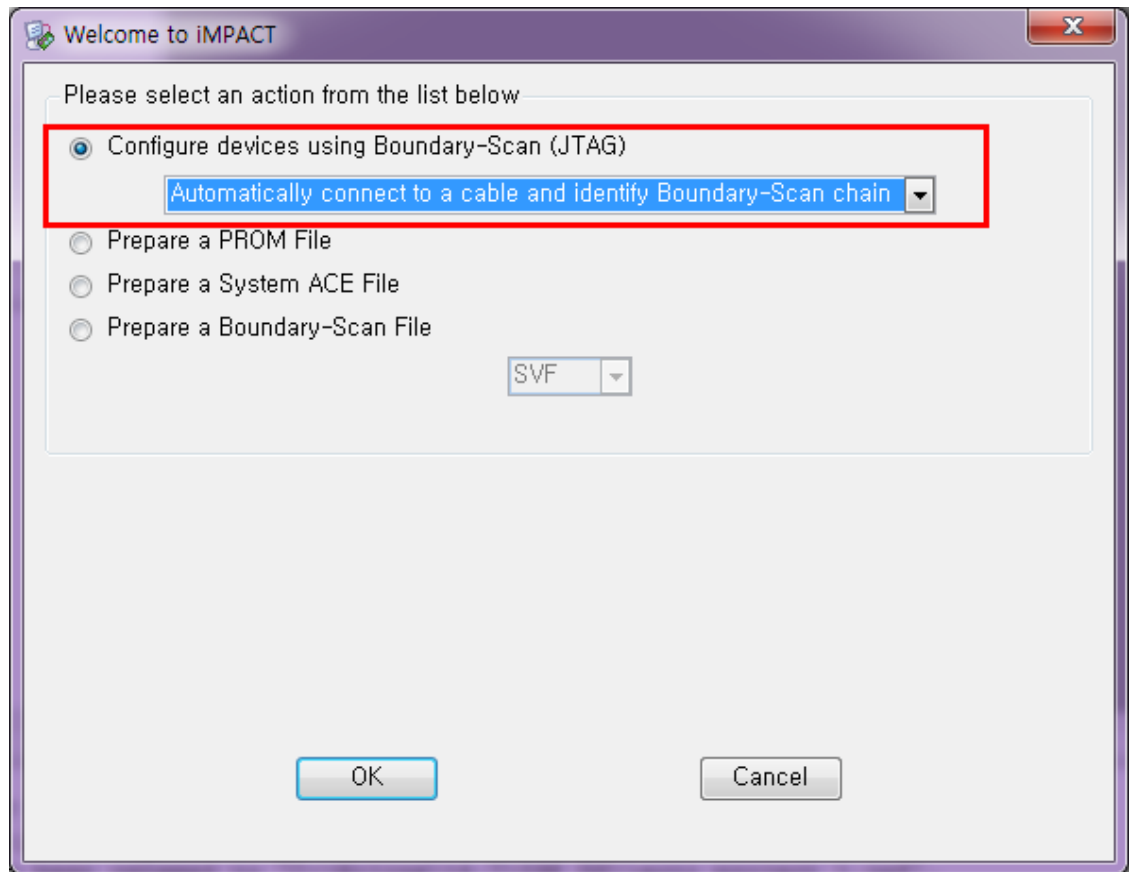
“Generate file” 선택하면 , 해당 디렉토리에 mcs파일이 생성이 됩니다.



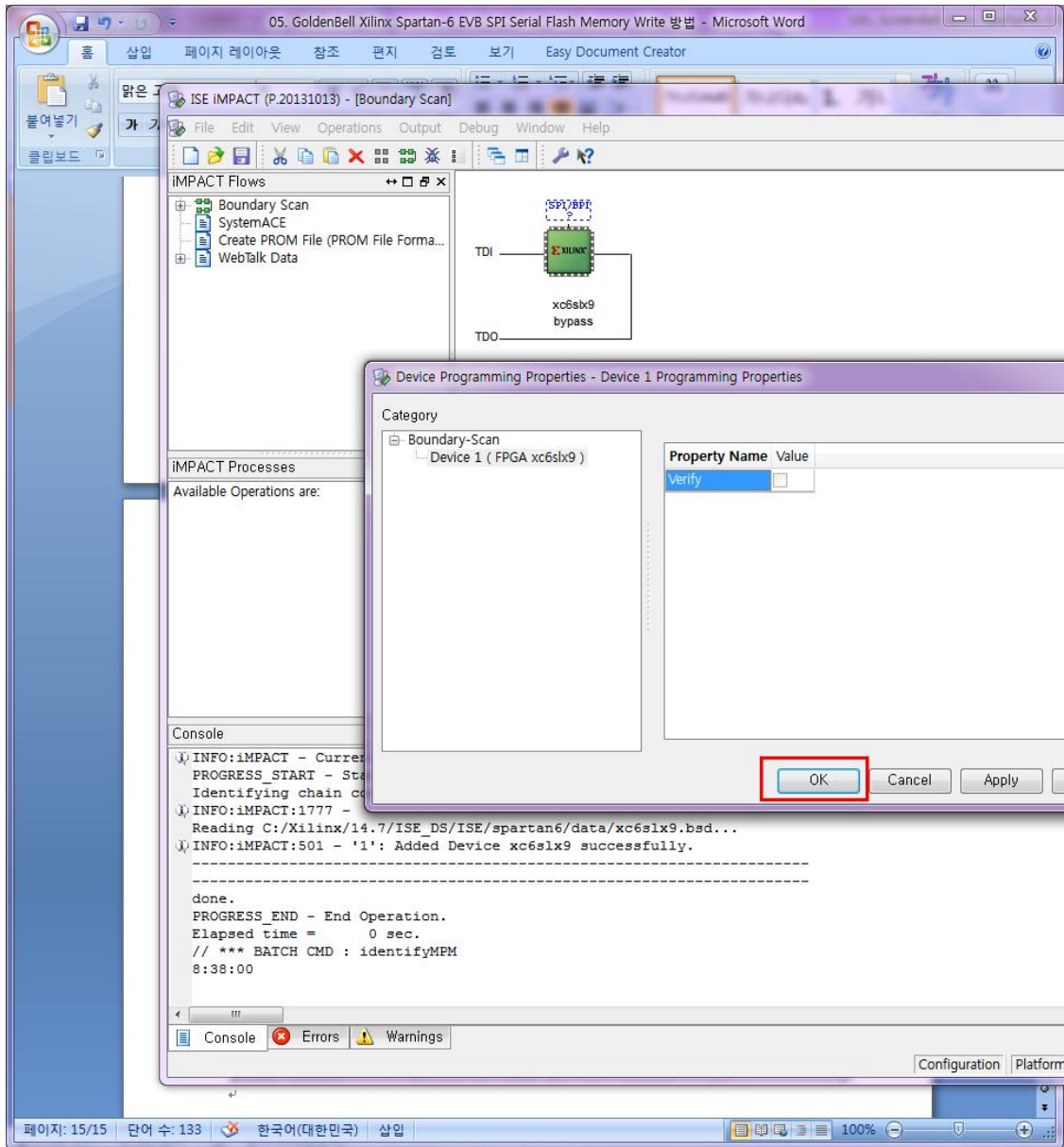
그리고, IMPACT 프로그램을 종료 합니다.

### 2.3. SPI Write하기

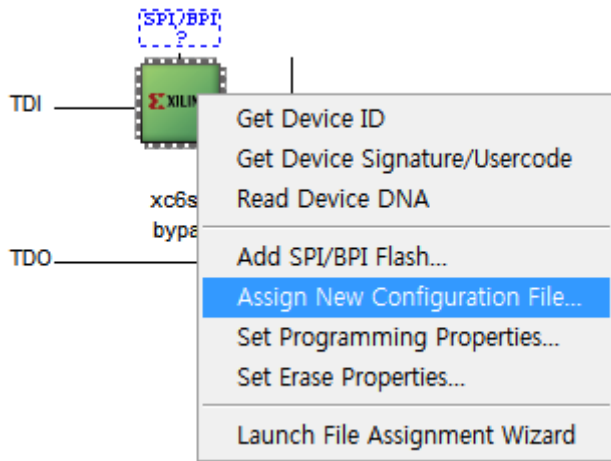
IMPACT 프로그램을 다시 실행합니다.



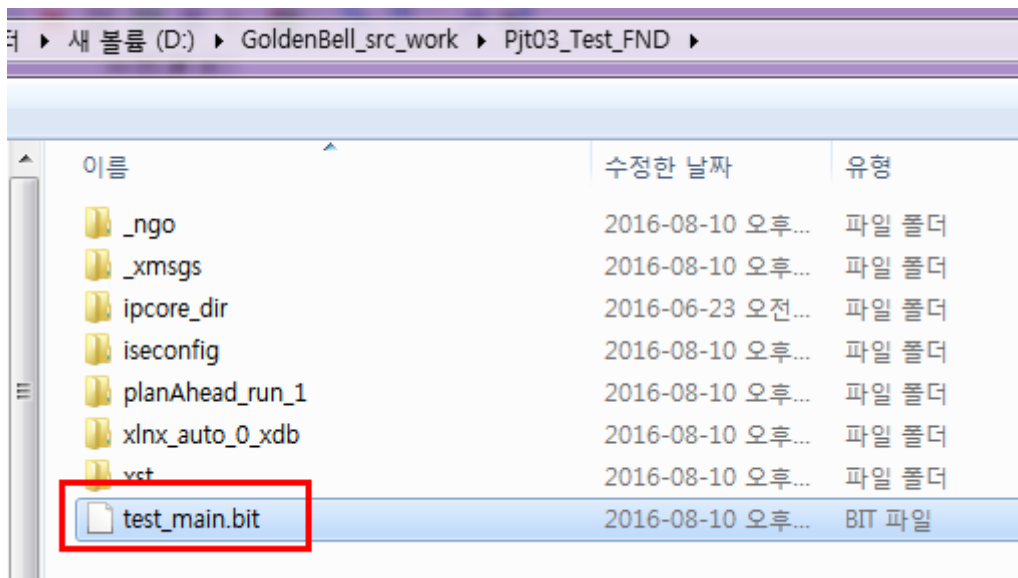




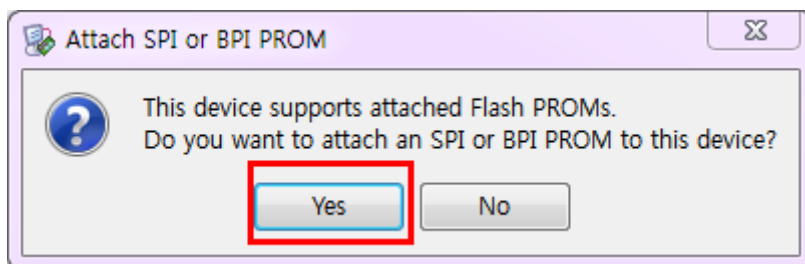
칩을 선택하고 마우스 우측을 Click하고

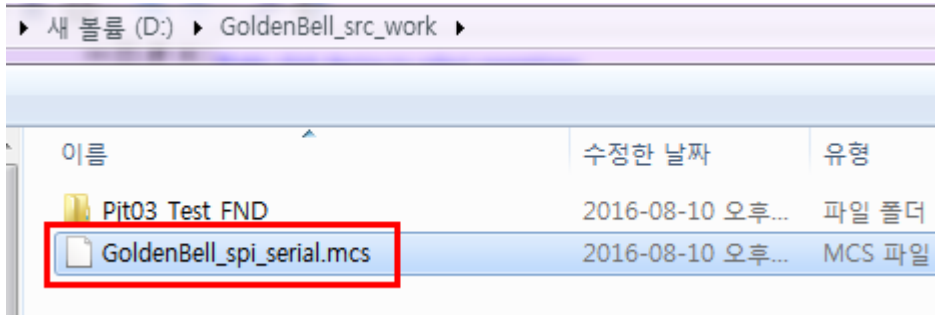


Assign New Configuration File dialog box 선택

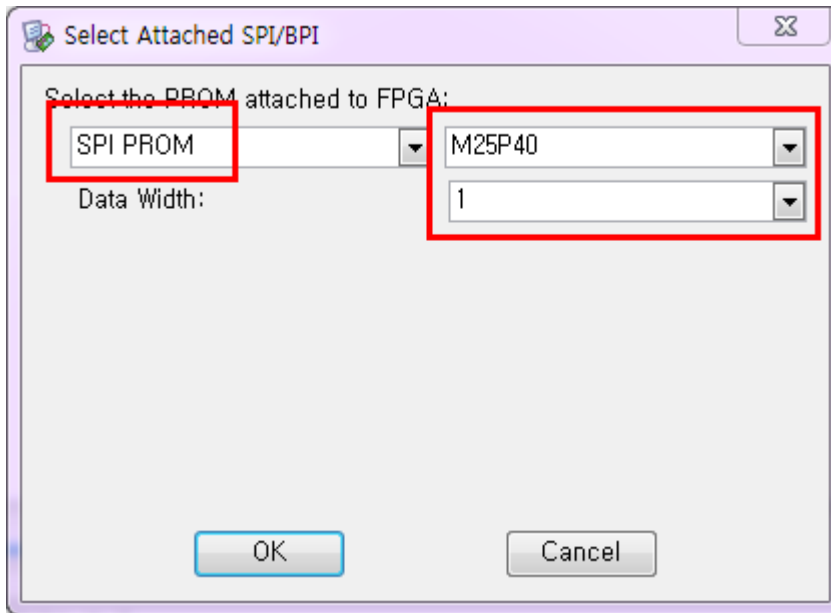


확장자 bit 선택

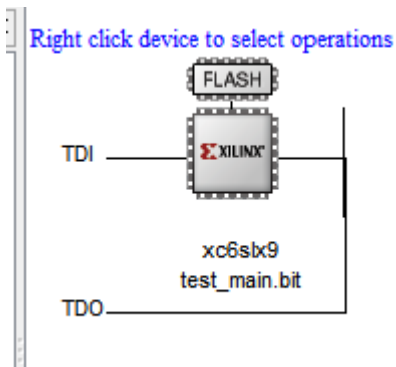




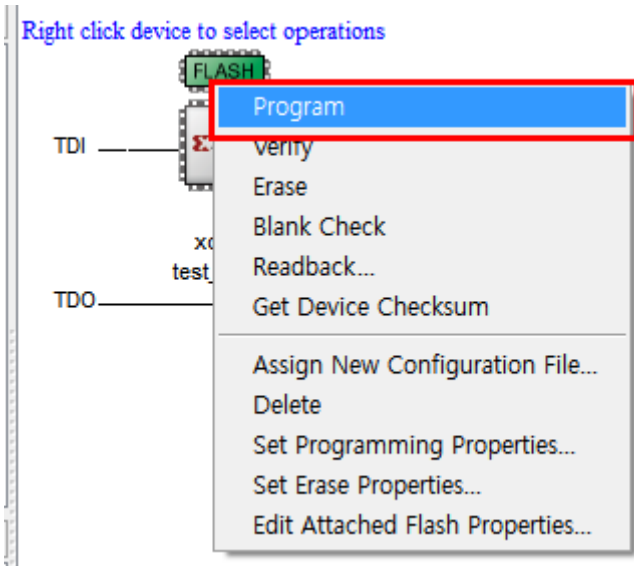
선택



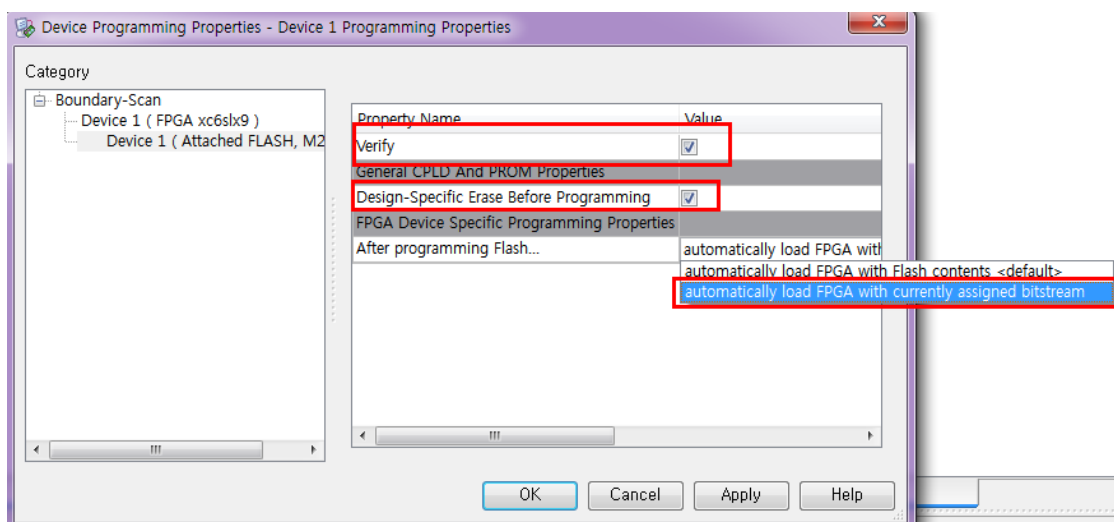
"Select the PROM attached to FPGA" 에서 MP2540선택합니다.



Flash가 보입니다.



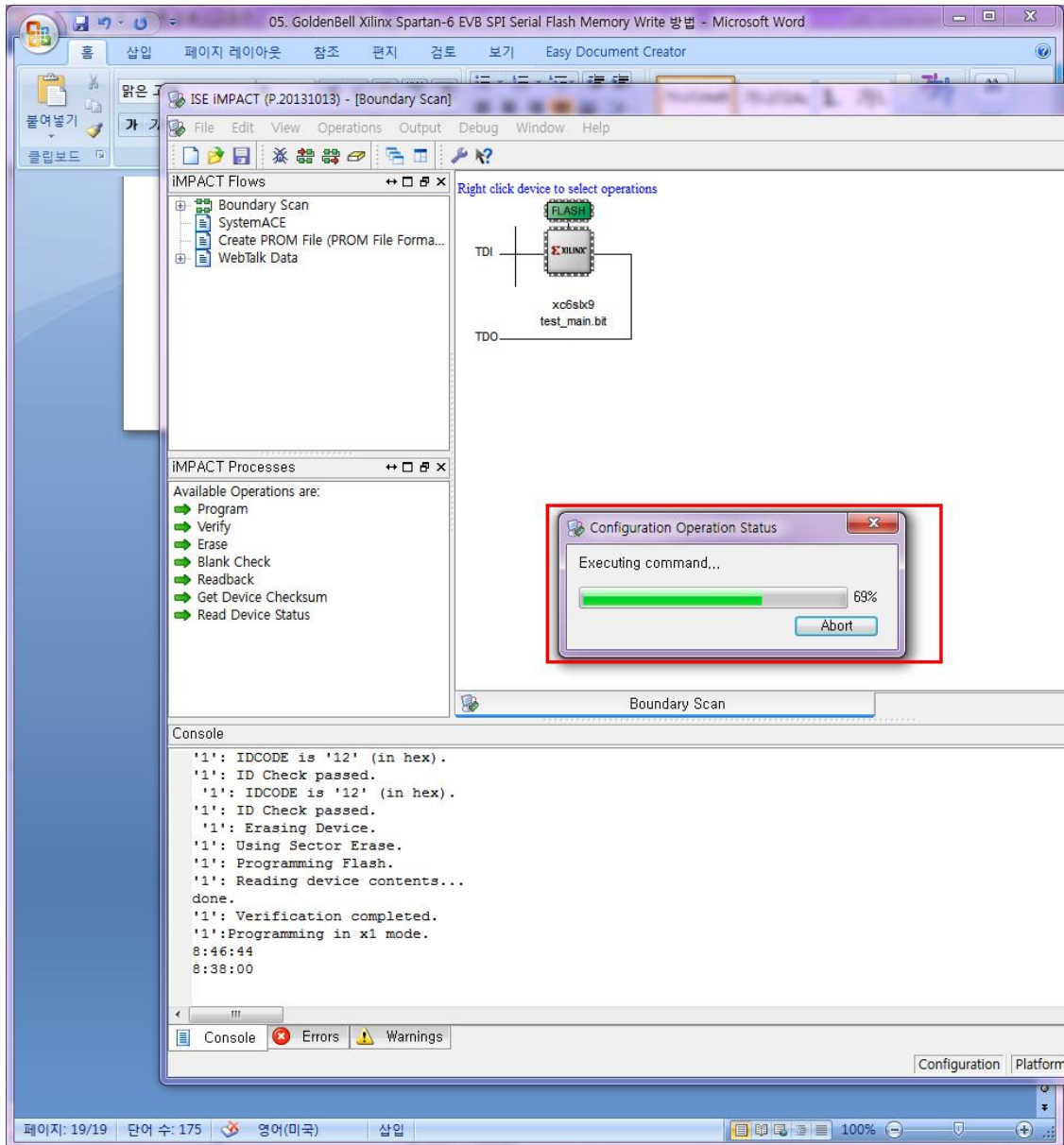
마우스로 Flash 그림을 선택하고, 마우스 우측 클릭하고 Program을 선택하면 됩니다.



"Verify"와 Design-Specific Erase Before Programming"은 권장 사항입니다.

**중요한 것은 "automatically load FPGA With currently assigned bitstream" 을 선택**

위와 같이 선택하고 , OK버튼 클릭



이미지 Write를 진행합니다.

Write시 Fail이 나면, Erase를 했다가 다시 Program하기 바랍니다.

이미지 Write하는 시간은 40초

## 2.4. References

[http://www.xilinx.com/support/documentation/sw\\_manuals/xilinx11/pim\\_p\\_configure\\_spi\\_bpi\\_through\\_fpga.htm](http://www.xilinx.com/support/documentation/sw_manuals/xilinx11/pim_p_configure_spi_bpi_through_fpga.htm)

