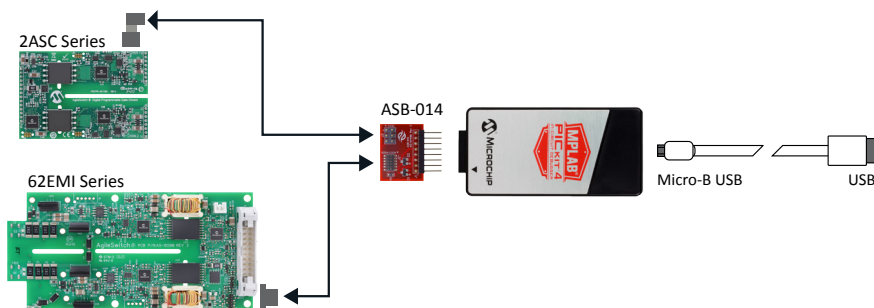# SiC Gate Driver
Quick Start Guide

1 Getting Started

Insert ASB-014 adapter board into PICkit™ 4 and connect programming cable from ASB-014 to driver board.

2ASC Series

62EMI Series

ASB-014

Micro-B USB

USB

2 Connect

Connect micro-USB cable from PICkit™ 4 to computer. Apply power to driver board.

3 Configure

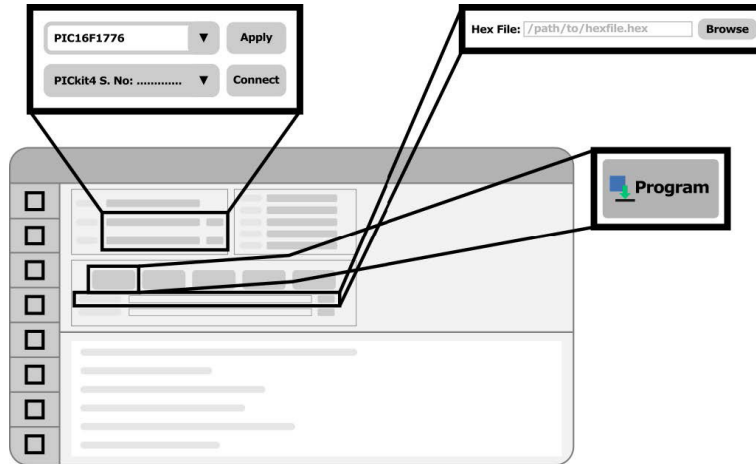Open Intelligent Configuration Tool (ICT), select your board, and enter desired settings.

4 Compile

Click Compile to generate configuration hex file.

Compile

5 Open

Open Integrated Programming Environment (IPE).
Enter Device, Apply; select Tool, Connect.
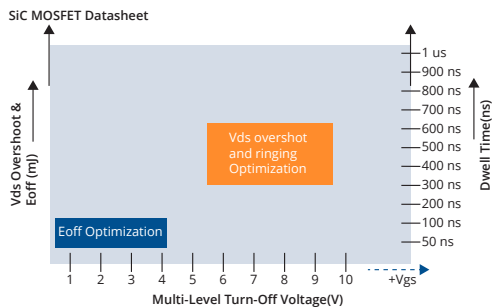
6 Browse

Browse and select configuration hex file from step 4. Click Program.

7 Optimize

Test configuration using double-pulse test. Look at overshoot and switching loss. For gate drivers with lesser number of turn off options, choose the lower limit.
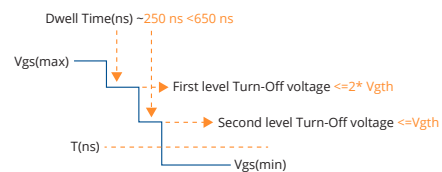

Legend

- Optimization for Eoff with multi-level turn-off voltage less than equal Vgth
- Optimization for Vds Overshoot & Ringing with multi-level turn-off voltage less than equal to 2*Vgth
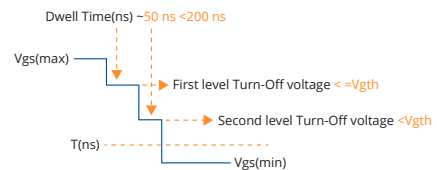
8 Repeat

Repeat steps 3, 4, 6, and 7 until desired operational parameters are met.

Vgs operation
Vth

SiC MOSFET Datasheet

Ids overshot and ringing Optimization

Eon Optimization

Ids Overshoot & Eon (mJ)

Dwell Time(ns)

- 1 us
- 900 ns
- 800 ns
- 700 ns
- 600 ns
- 500 ns
- 400 ns
- 300 ns
- 200 ns
- 100 ns
- 50 ns

1 2 3 4 5 6 7 8 9 10   +Vgs

2Level Turn-on Voltage(V)

Legend

■ Optimization for Eon 2Level Turn-On voltage up to Vgth
■ Optimization for Ids Overshoot & Ringing with 2Level Turn-On voltage less than equal to 2.5*Vgth

Eon Optimization

Dwell Time(ns) ~50 ns <200 ns

Vgs(max)

First level Turn-On voltage < =Vgth

T(ns)

Vgs(min)

Ids overshot and ringing Optimization

Dwell Time(ns) ~400 ns <750 ns

Vgs(max)

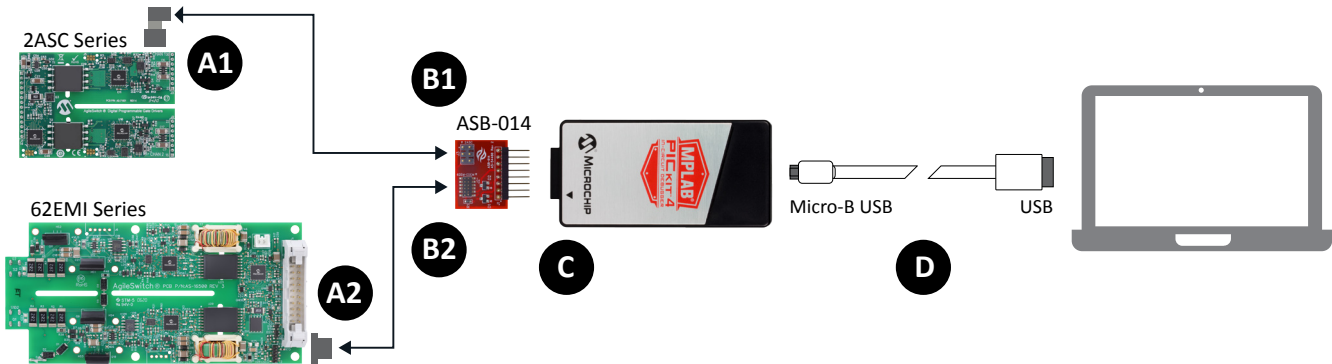First level Turn-On voltage < =2.5*Vgth

T(ns)

Vgs(min)

Set Up

Note: Diagrams and parts are not to scale.

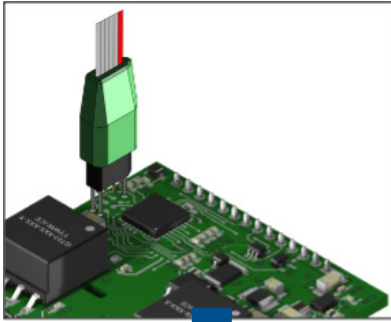If using 2ASC series core board, connect programming cable at A1 and B1.

If using 62EM1 series plug-and-play board, connect programming cable at A2 and B2.

2ASC Series

A1

B1

ASB-014

62EMI Series

B2

A2

C

Micro-B USB   USB

D

A1

(2ASC series only)

Connect 6-pin spring-loaded header to 2ASC (J4, near input connector).

OR

A2

(62EM1 series only)

Connect 12-pin (6x2) header to 62EM1 (J2) using either row on the ribbon cable connector. Note the location of pin 1 (red stripe) and header protrusion.
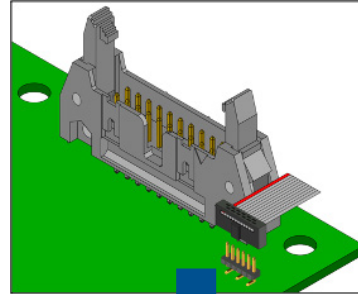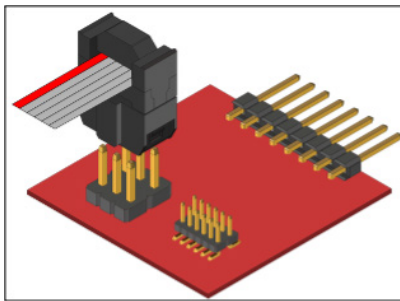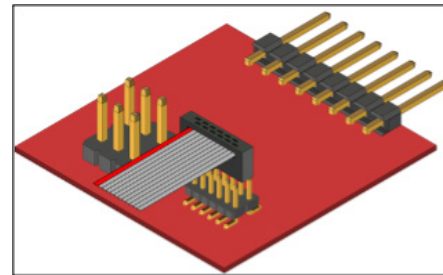

B1

(2ASC series only)

Connect other end of programming cable to ASB-014 adapter board (J3, 3x2 pins).

OR

B2

(62EM1 series only)

Connect other end of programming cable to ASB-014 adapter board (J2, 6x2 pins).

C

(All boards)

Insert 8-pin header from ASB-014 adapter board into PICkit 4, aligning the top side of the board with the top/logo side of the PICkit.
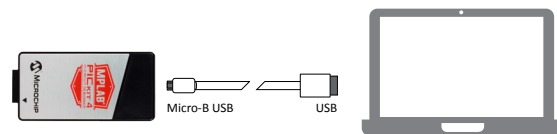

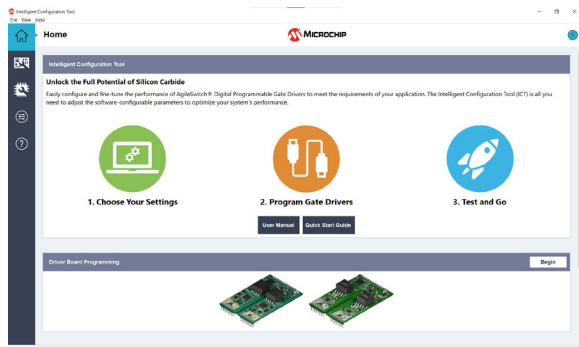## D

(All boards)

Insert micro-USB into PICkit 4.

Insert other end of USB cable into computer.


Micro-B USB   USB

Configure

1 Open ICT

Open the ICT by double-clicking the executable file (Intelligent Configuration Tool v2.X.X.exe). The ICT will open to the Home page

2 Select Board

Click the Board Settings icon on the left navigation menu (by default the second item). Click the "Select Board" button in the center of the window, or click the "+" at the top next to the "Start Page" tab. Click the board you wish to configure.
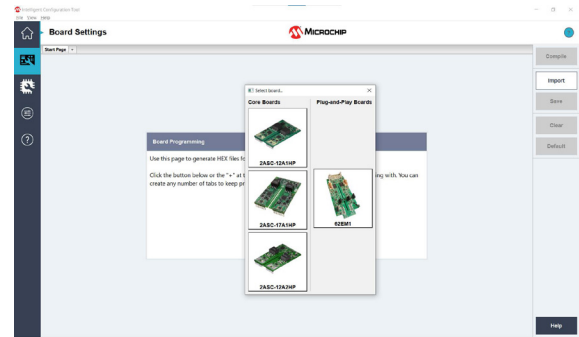

3 Enter Settings

Enter all desired settings, or use one of the recommended configurations for your module by clicking "Import è Board".

If the module you are using is listed under

"Predefined Settings", select it, then press "Import". Otherwise, it is often a good starting point to select the module with characteristics closest to the one you are using.

Microchip provides recommended settings for switching characteristics, including multi-level turn-on/turn-off and desaturation waveforms. However, note that some features, such as temperature and voltage monitoring, are system-level considerations, and therefore these must be determined by the end user.

You can also import a custom settings file by clicking the "..." button under "Custom Settings". Navigate to the file, then press "Load from file" to preview the settings, and finally "Import" to load these settings into a new tab.
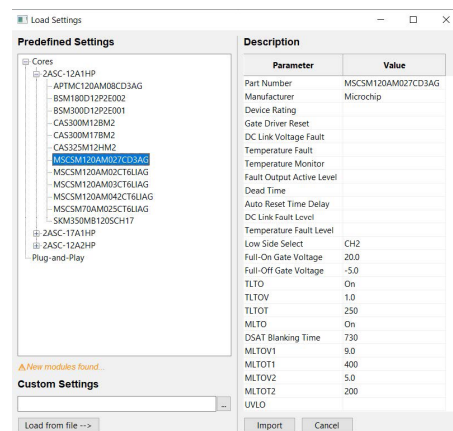
4   Compile

Click the "Compile" button on the right. Enter any of the optional traceability information, then click "Compile!" to confirm.

Select a location to save the output. The compilation process will create a new folder named SOFT-XXXXX-YY (depending on the entered Part Number) containing all output files. Click "Select Folder" to continue.

A window displaying compilation progress will appear. Wait for the process to finish, then click "Close".
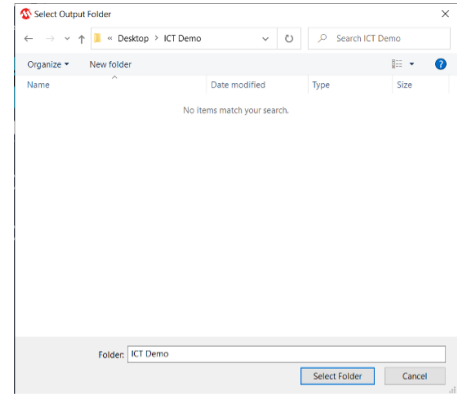
5   Program

Open MPLAB X IPE. In the "Device" box, enter the corresponding device based on the board you are programming, using the table below.

Board	Device
2ASC series	PIC16F1776
62EM1 series	PIC16F1773

Click "Apply". Make sure PICkit 4 is selected as the Tool, then click "Connect".

Next to "Hex File", click "Browse" and select the SOFT-XXXXX-YY.hex file generated during compilation. Ensure the driver board is powered, then click "Program".

Power to the driver board can be made available through the IPE software configuration by selecting Advanced Mode in the Settings Pulldown menu (see right) or from the hardware platform.
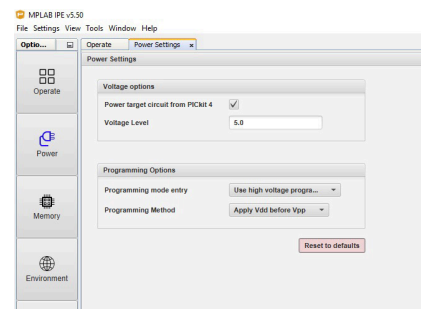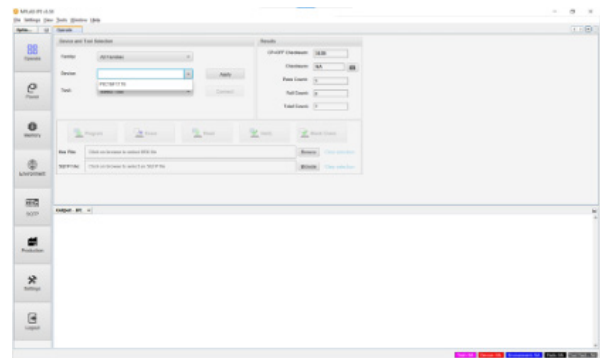
6   Test

Your board is ready to test! If you wish to change any parameters, simply edit those values in the Board Settings page and repeat steps 4 and 5.

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