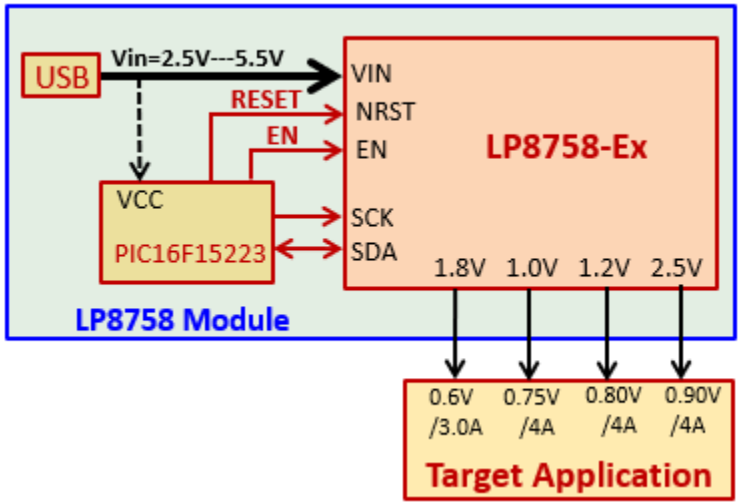
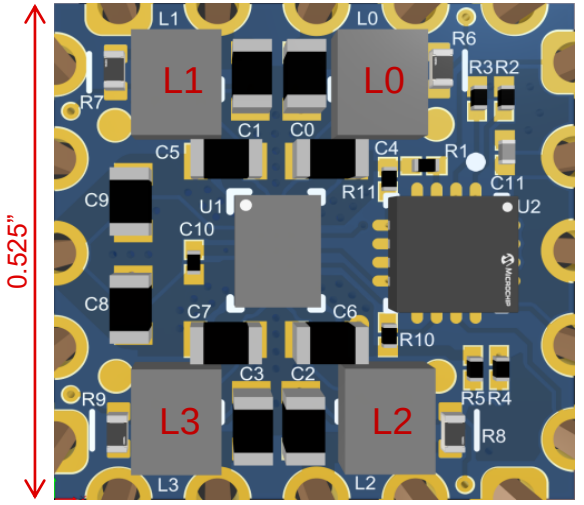
LP8758 Quick Sample Module

Users Guide

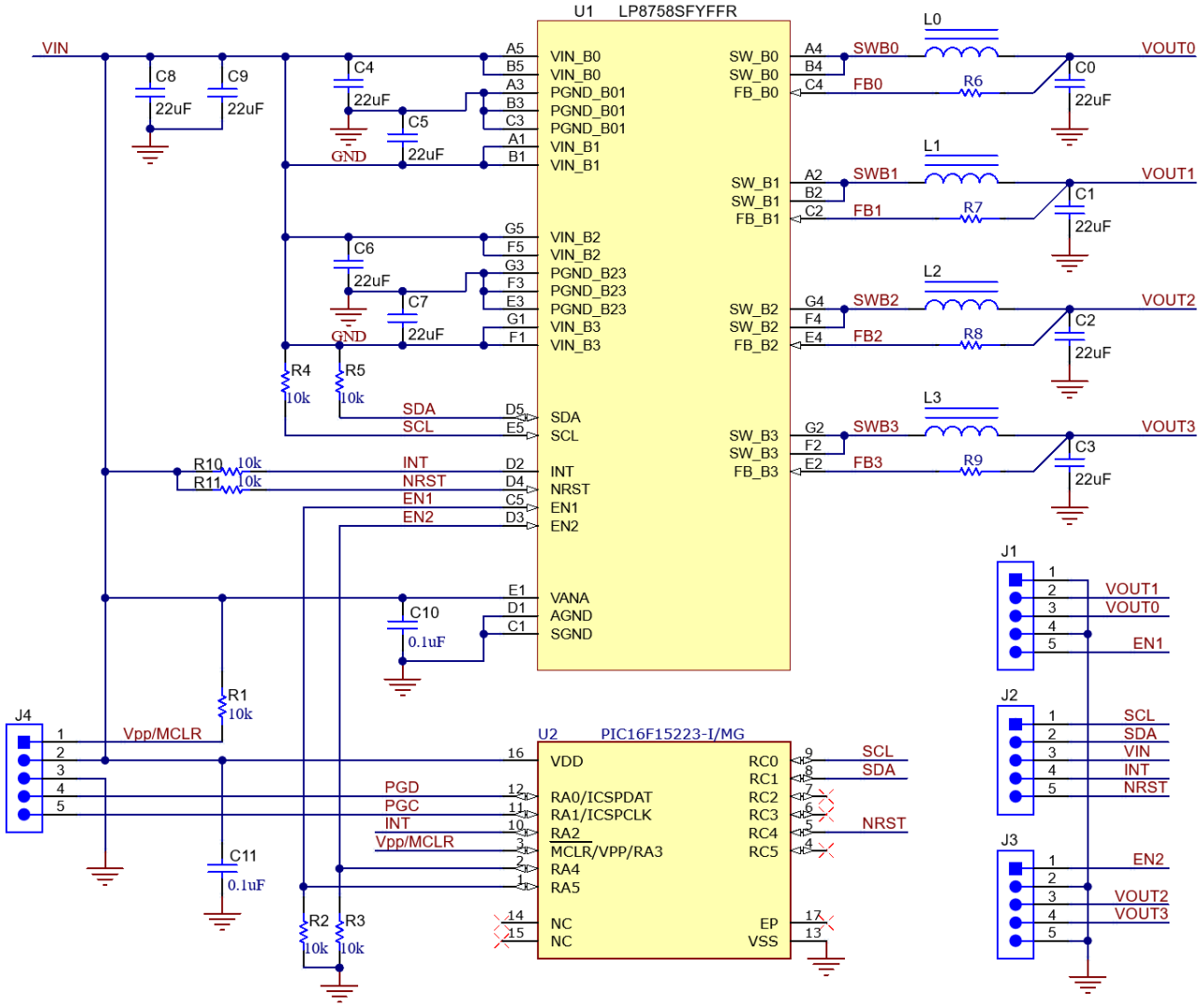
LP8758 Sample Module Purposes

1. The LP8758 device has very effective design in features of size and cost; it attracts more and more customers using it.
2. New OTP samples need about 6 weeks for delivery which is hard to be accepted.
3. The module can provide customer new OTP samples for real application needs of evaluation on prototype in about 1 hour.
4. The MCU in the module can be removed after evaluation done on customer prototype boards for mass productions.
5. Customer can program the module by them selfies or TI does according to their needs.



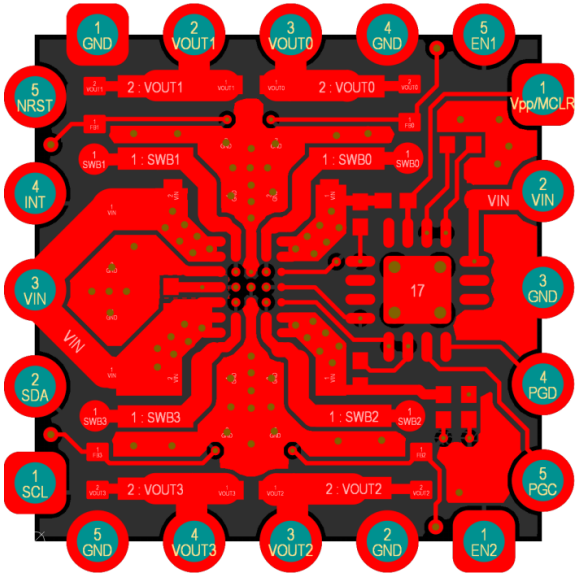


LP8758 Sample Module Schematics

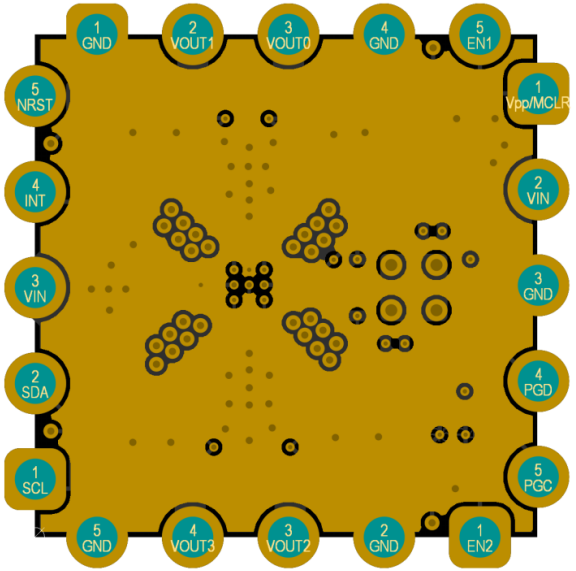


LP8758 Sample Module PCB Layout

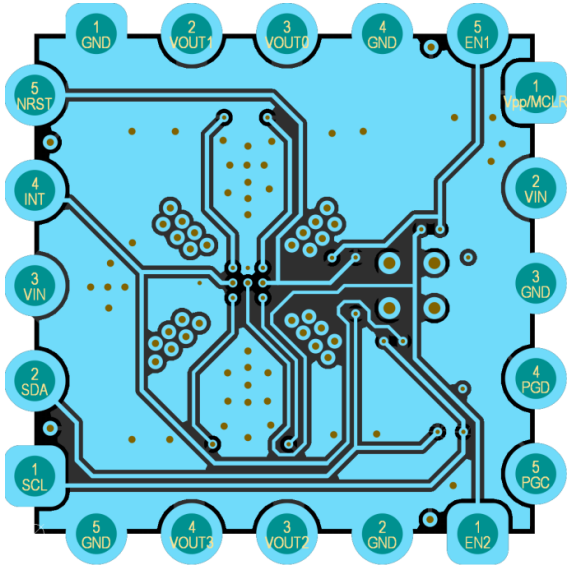
Top Layer



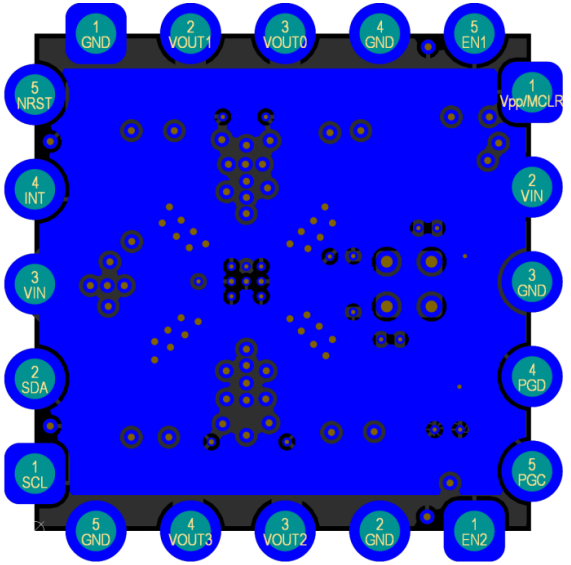
2cd Layer



3rd Layer

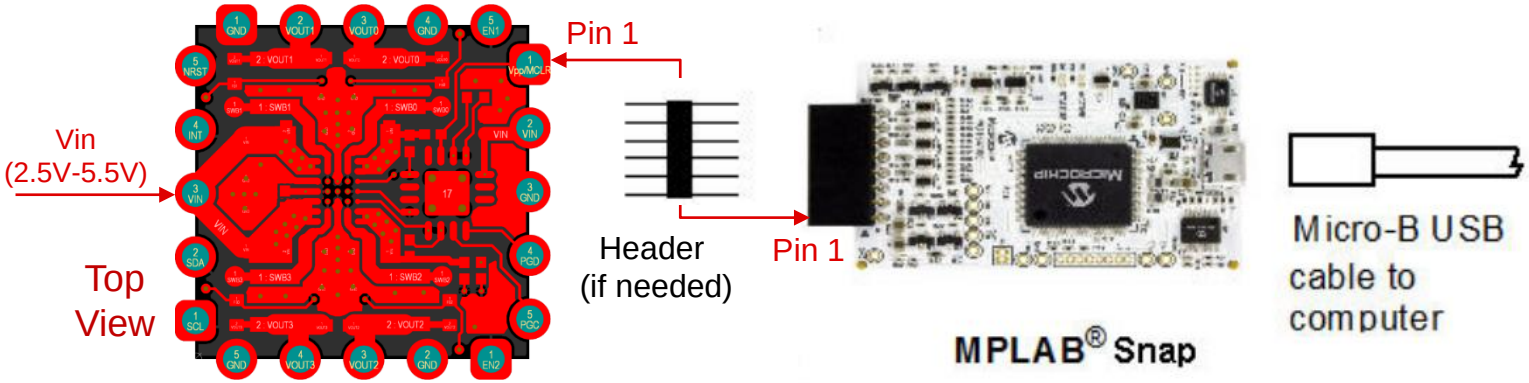


Bottom Layer



Set up to Program the sample module

1. Download the MPLAB X IDE software from http://www.microchip.com/mplabx and install onto local PC. The installer automatically loads the USB drivers and launch MPLAB X IDE.
2. Connect the MPLAB Snap In-Circuit Debugger/Programmer to the computer using a Micro-B USB cable.
3. Connect the MPLAB Snap In-Circuit Debugger/Programmer to the LP8758 module with communication cable (soldering a 5-pin single row header if needed).
4. Special care needs to be taken to align the Pins on the debugger and the module.
5. Connect external power supply (2.5V to 5.5V) to the LP8758 module.

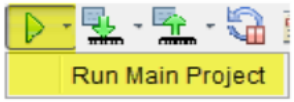


Programming the Module with Sample Code

1. Refer to the MPLAB X IDE User's Guide to install language tools, create or open a project, and configure project properties.

2. The LP8758 sample module uses a Mid-Range 8-bit PIC16F15223 MCU.

3. The sample code using Pic-as Compiler Toolchain and I2C to communicate between the LP8758 sample module and the MCU.

4. Refer to TI provided "LP8758 Module Sample Code" and execute the code by performing "RUN Main Project" 

to program the module.

5. After successful programming, the output window in MPLAB X IDE will show "Program/verify complete".

Programming the Module with Sample Code (Continue)

- Change registers data (circled in red as an example) as much as needed in "#define" directives for LP8758 necessary settings for real applications.

```
;Write Data values for LP8758 module control registers
#define BUCK0_CTRL1_DATA 0xC8; /*Register data for BUCK0_CTRL1*/
#define BUCK0_CTRL2_DATA 0x3A; /*Register data for BUCK0_CTRL2*/
#define BUCK1_CTRL1_DATA 0xC8; /*Register data for BUCK1_CTRL1*/
#define BUCK1_CTRL2_DATA 0x3A; /*Register data for BUCK1_CTRL2*/
#define BUCK2_CTRL1_DATA 0xC8; /*Register data for BUCK2_CTRL1*/
#define BUCK2_CTRL2_DATA 0x3A; /*Register data for BUCK2_CTRL2*/
#define BUCK3_CTRL1_DATA 0xC8; /*Register data for BUCK3_CTRL1*/
#define BUCK3_CTRL2_DATA 0x3A; /*Register data for BUCK3_CTRL2*/
#define BUCK0_VOUT_DATA 0x25; /*Register data for BUCK0_VOUT*/ Vout = 0.8V/
#define BUCK0_FLOOR_VOUT_DATA 0x0; /*Register data for BUCK0_FLOOR_VOUT*/
#define BUCK1_VOUT_DATA 0x25; /*Register data for BUCK1_VOUT*/ Vout = 0.8V/
#define BUCK1_FLOOR_VOUT_DATA 0x0; /*Register data for BUCK1_FLOOR_VOUT*/
#define BUCK2_VOUT_DATA 0x25; /*Register data for BUCK2_VOUT*/ Vout = 0.8V/
#define BUCK2_FLOOR_VOUT_DATA 0x0; /*Register data for BUCK2_FLOOR_VOUT*/
#define BUCK3_VOUT_DATA 0x25; /*Register data for BUCK3_VOUT*/ Vout = 0.8V/
#define BUCK3_FLOOR_VOUT_DATA 0x0; /*Register data for BUCK3_FLOOR_VOUT*/
```

```
#define BUCK0_DELAY_DATA 0x22; /*Register data for BUCK0_DELAY*/
#define BUCK1_DELAY_DATA 0x22; /*Register data for BUCK1_DELAY*/
#define BUCK2_DELAY_DATA 0x22; /*Register data for BUCK2_DELAY*/
#define BUCK3_DELAY_DATA 0x22; /*Register data for BUCK3_DELAY*/
#define RESET_DATA 0x0; /*Register data for RESET*/
#define CONFIG_DATA 0x6; /*Register data for CONFIG*/
#define INT_TOP_DATA 0x0; /*Register data for INT_TOP*/
#define INT_BUCK_0_1_DATA 0x0; /*Register data for INT_BUCK_0_1*/
#define INT_BUCK_2_3_DATA 0x0; /*Register data for INT_BUCK_2_3*/
#define TOP_MASK_DATA 0x0; /*Register data for TOP_MASK*/
#define BUCK_0_1_MASK_DATA 0x0; /*Register data for BUCK_0_1_MASK*/
#define BUCK_2_3_MASK_DATA 0x0; /*Register data for BUCK_2_3_MASK*/
#define SEL_I_LOAD_DATA 0x0; /*Register data for SEL_I_LOAD*/
#define I_LOAD_2_DATA 0x0; /*Register data for I_LOAD_2*/
#define I_LOAD_1_DATA 0x0; /*Register data for I_LOAD_1*/

#define BAUD 100000; /*Intended I2C baud rate in bps*/
```

- The reference register address/data and output voltage codes can refer to either device datasheet or TI provided "LP8758_sample_module_programming_table".

Reference Documentations

- MICROCHIP MPLAB X IDE User's Guide: http://ww1.microchip.com/downloads/en/devicedoc/50002027d.pdf
- MICROCHIP MPLAB Snap In-Circuit Debugger User's Guide: https://ww1.microchip.com/downloads/en/DeviceDoc/50002787C.pdf
- LP8758-E0 Four-Output Synchronous Step-Down DC-DC Converter Datasheet: https://www.ti.com/lit/ds/symlink/lp8758-e0.pdf?ts=1652736029788&ref_url=https%253A%252F%252Fwww.ti.com%252Fproduct%252FLP8758-E0