FAN53555 Evaluation Board User's Manual

5 A, 2.4 MHz, Digitally Programmable TinyBuck Regulator

EVBUM2953/D

This user guide supports the evaluation kit for the FAN53555. It should be used in conjunction with the FAN53555 datasheet.

DESCRIPTION

The FAN53555 evaluation board is a compact circuit which includes **onsem**i's FAN53555 digitally programmable buck regulator capable of delivering up to 5 A peak load at a 2.4 MHz fixed frequency. The regulator is offered in a 20-bump, 1.6 x 2 mm, WLCSP.

The evaluation board provides probe access points to all key circuit nodes so that electrical characteristics can be measured.

Table 1. FEATURES

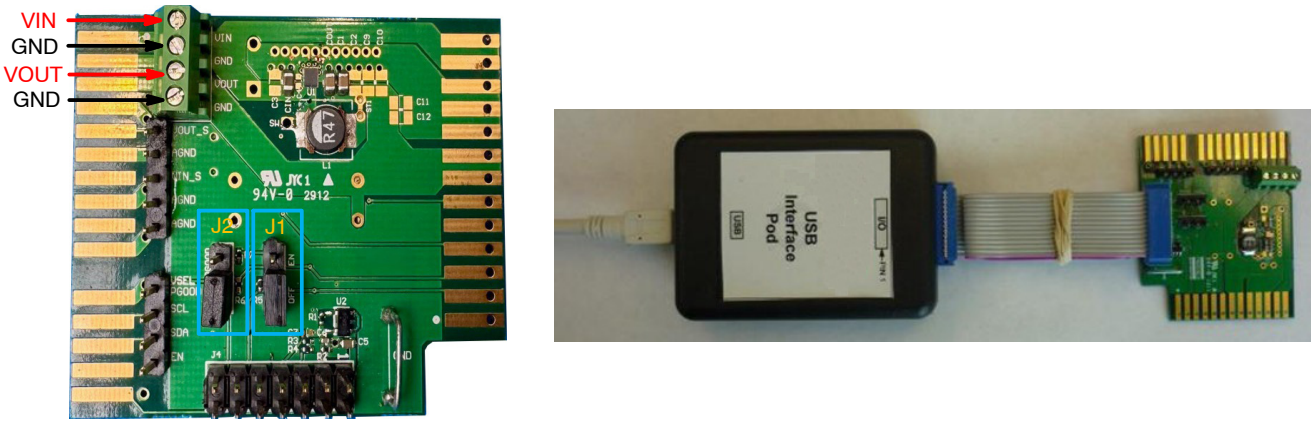
Part Number	Output Voltage	VSEL	I²C Address	Temperature Range
FAN53555UC04X	I²C Controlled	VSEL0, VSEL1	7h'60	–40 °C to 85 °C

Features

- Input Voltage Range: 2.5 V to 5.5 V
- Output Voltage: Programmable from 0.603 V to 1.411 V in 12.826 mV Steps
- Programmable Slew Rate for Voltage Transitions
- I²C Compatible Interface up to 3.4 Mbps
- PFM Mode for High Efficiency in light load
- Quiescent Current in PFM Mode: 60 μA (Typical)
- Internal Soft-Start
- Input Under-Voltage Lockout (UVLO)
- Thermal Shutdown and Overload Protection
- 20-Bump Wafer-Level Chip Scale Package (WLCSP)

Quick Start Connection Guide

1. Connect input power supply between VIN and GND. See Figure 1a.
2. Connect external load between VOUT and GND. See Figure 1a.
3. Connect the Interface Pod to the Evaluation Board using the 14-pin connector (J4) as shown in Figure 1b.
4. VSEL/PG Jumper (J2) factory installed for VSEL0 operation.
5. EN Jumper (J1) factory installed to OFF position. Move to EN position to enable device.
6. Kelvin connected input and output voltage sense points (VIN_S, VOUT_S) are provided. Measure relative to AGND



a) b)

Figure 1. Evaluation Board Connection Diagram

GUI INSTALLATION

Installation

a. Run the installer_FAN53555.exe.
b. Follow the steps as shown in the dialog box for setup.

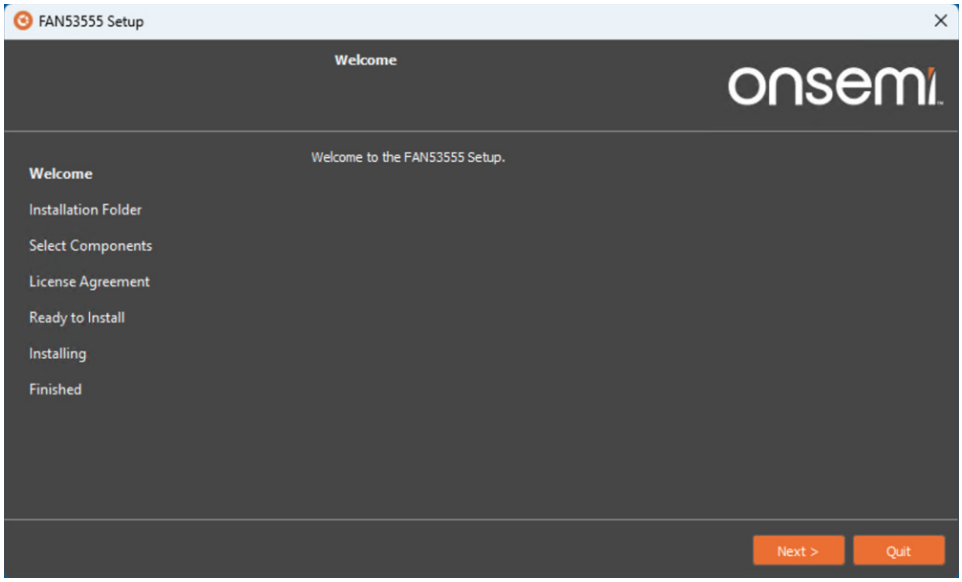


Figure 2. FAN53555 GUI Installation

c. When prompted for Selecting Components,please check the box for PIC POD Driver to install appropriate drivers needed for USB Interface POD.

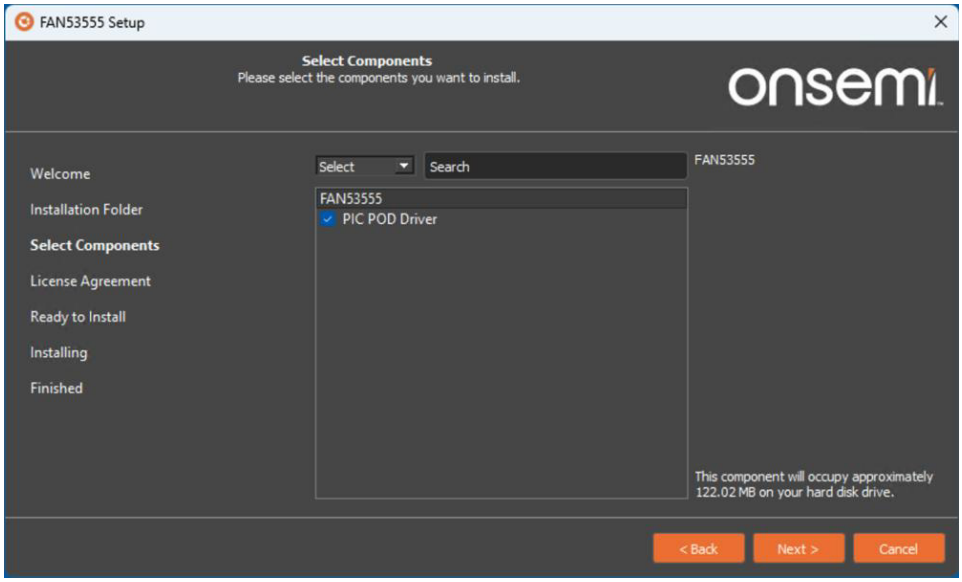


Figure 3. FAN53555 GUI Component Selection

d. Once all steps have been completed, it will start installing the GUI.

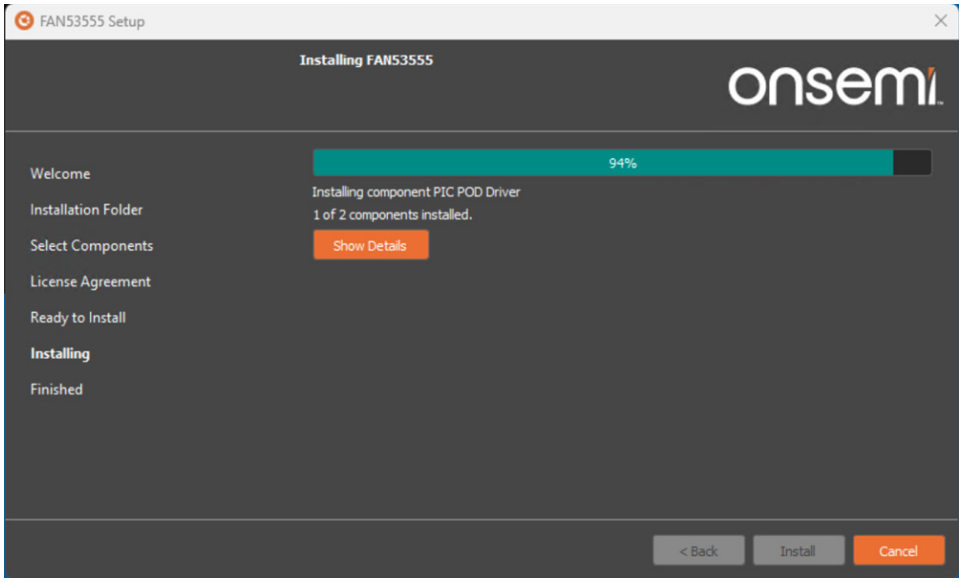


Figure 4. FAN53555 GUI Installation Update

e. Once the installation is complete, FAN53555 GUI will open automatically. This may take a few seconds.

f. You can find the installed GUI at this path: C:\Users*********onsemi**\FAN53555.

g. Below is a screen shot of the FAN53555 GUI that is used to communicate via I^2C.

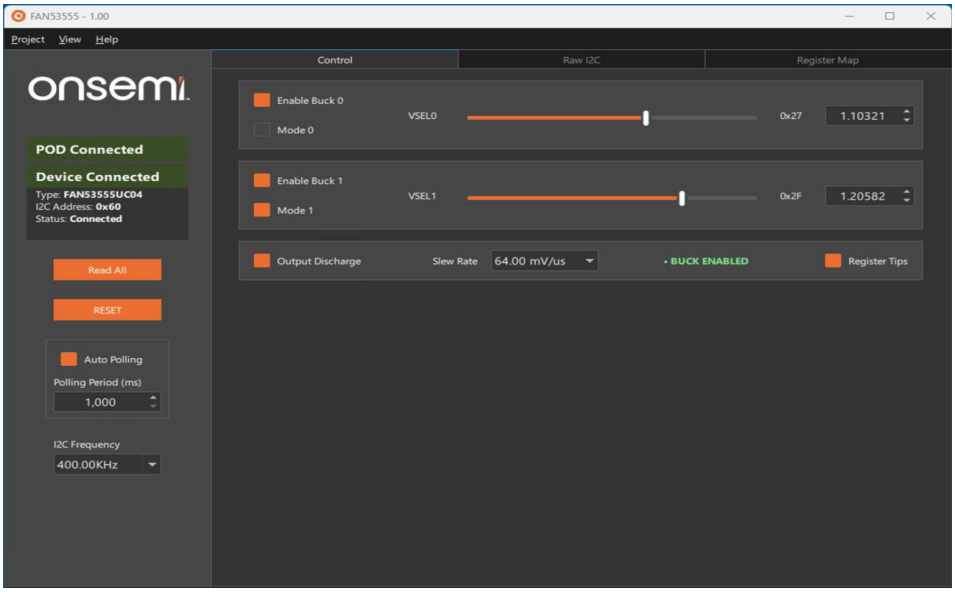


Figure 5. FAN53555 GUI Interface

GUI OVERVIEW

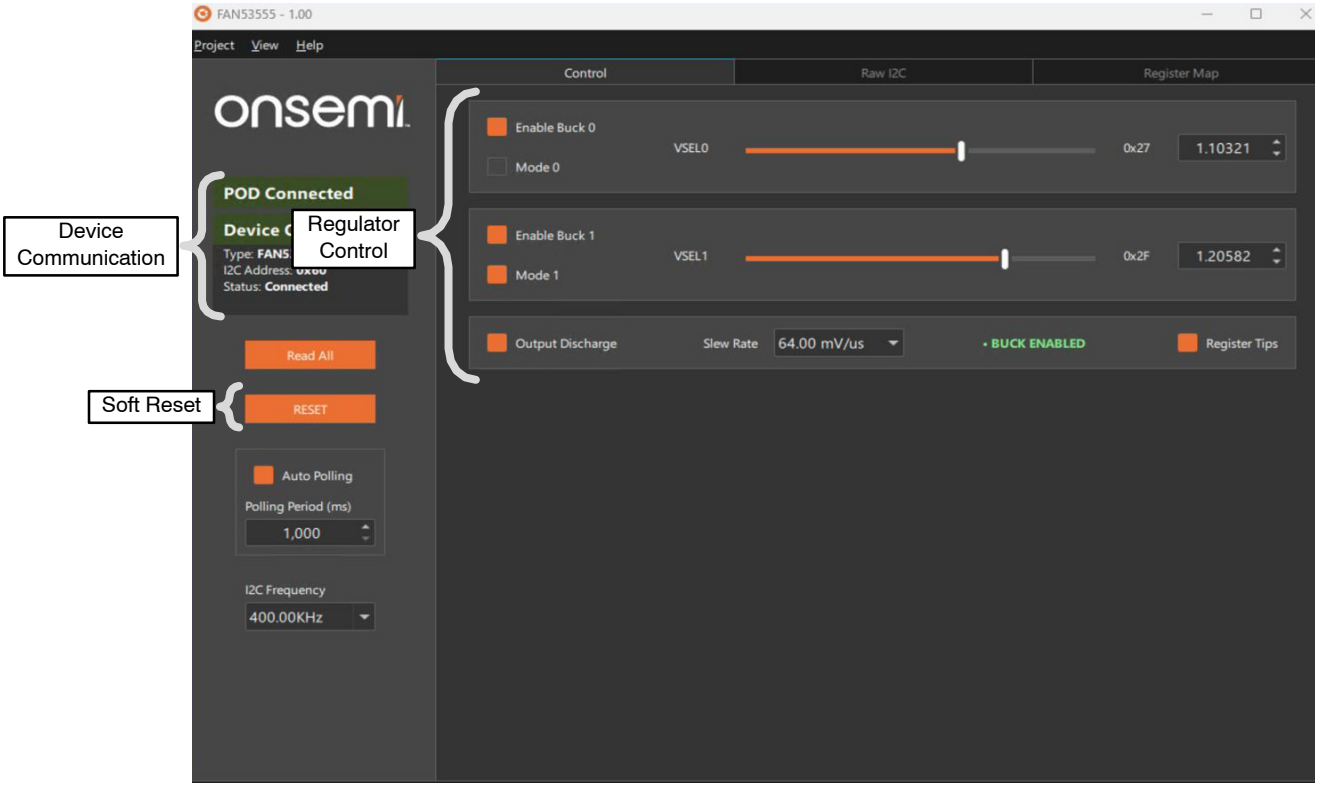


Figure 6. FAN53555 GUI Interface

Regulator Control

a. *Software Enable* or disable device. Depending on jumper position of VSEL (J2).

b. *Mode* forces device to operate in Forced PWM Mode when selected.

c. O*utput Discharge* enables/disables 160 Ω output discharge resistance in shutdown.

d. *Register Tips* provides pop-ups containing register information when hovering over interface controls.

Device Communication

a. the connection status and I^2C address of the device.

Soft Reset

a. Soft Reset resets the device to its default register values.

REGISTER MAP PANEL

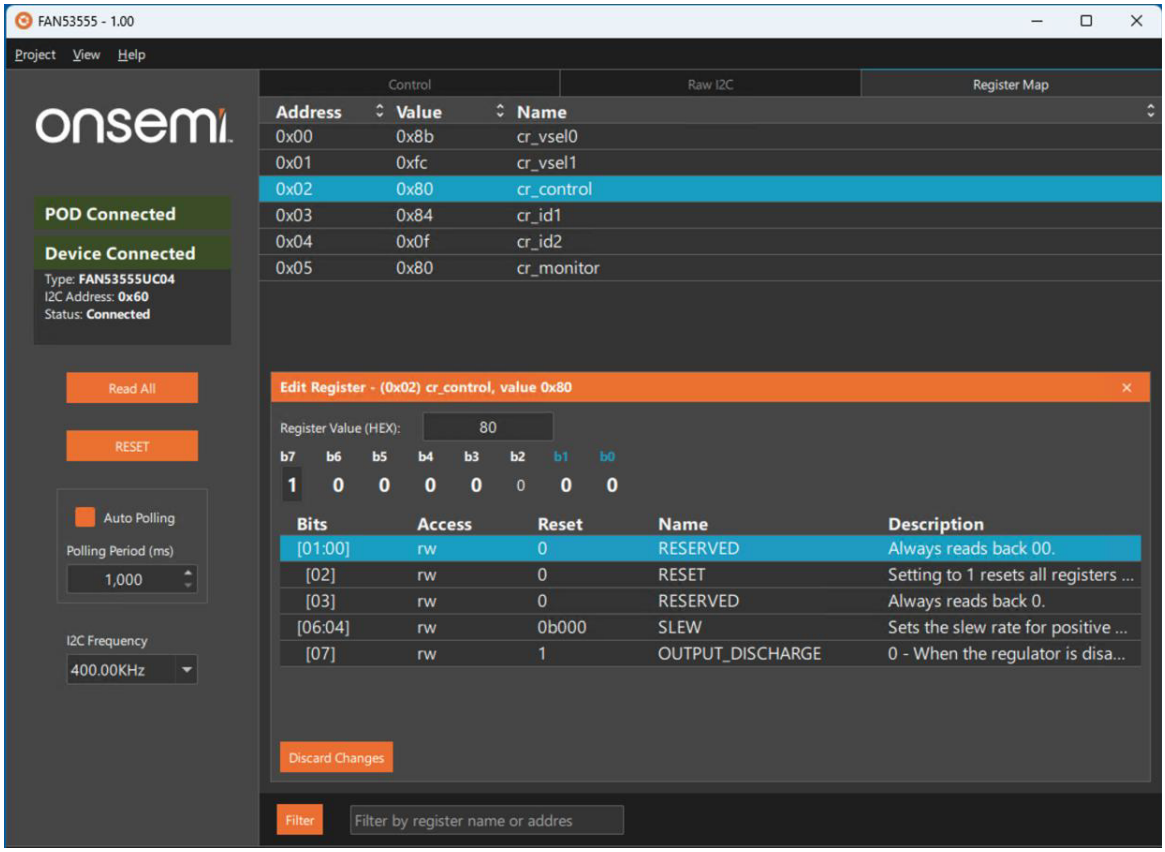


Figure 7. GUI Register Map Panel

Register Map

Register Map allows control of individual bits of each Register.

Edit Register Window

By double clicking on each Register, the “Edit Register” window will pop-up. Register value can be changed from this window.

Discard Changes: This option will revert the changes made by the user to the current register.

RAW I²C PANEL

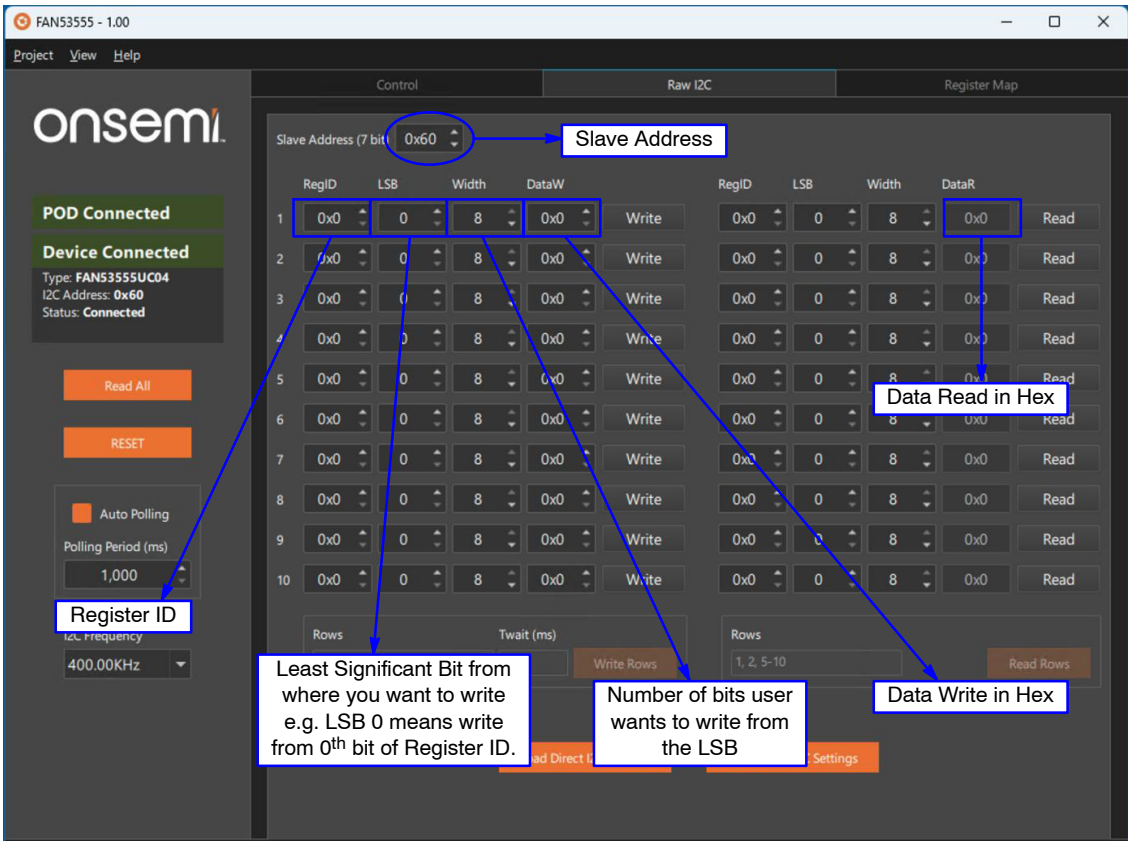


Figure 8a. GUI Raw I²C Panel

Raw I²C Panel allows the user to write to or read from the known Slave Address with Hex values of data & Register info.

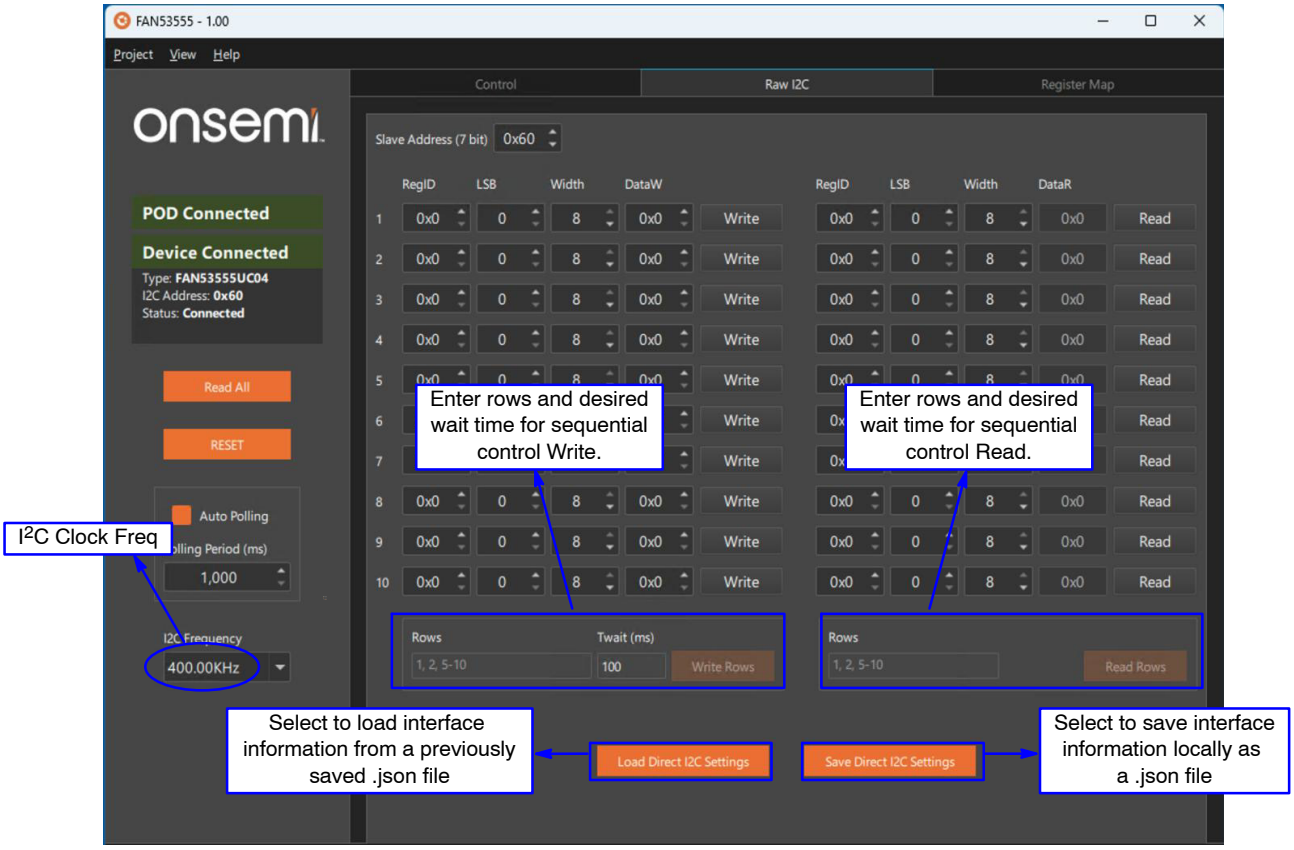


Figure 8b. GUI Raw I²C Panel

GUI has features to select I²C Clock Frequency, write/read registers sequentially, and save/load complete settings to/from .json file.

Communication Error: If Slave-Address is not correct or communication with respective Slave Address fails it will give error on Write or Read.

SCHEMATIC

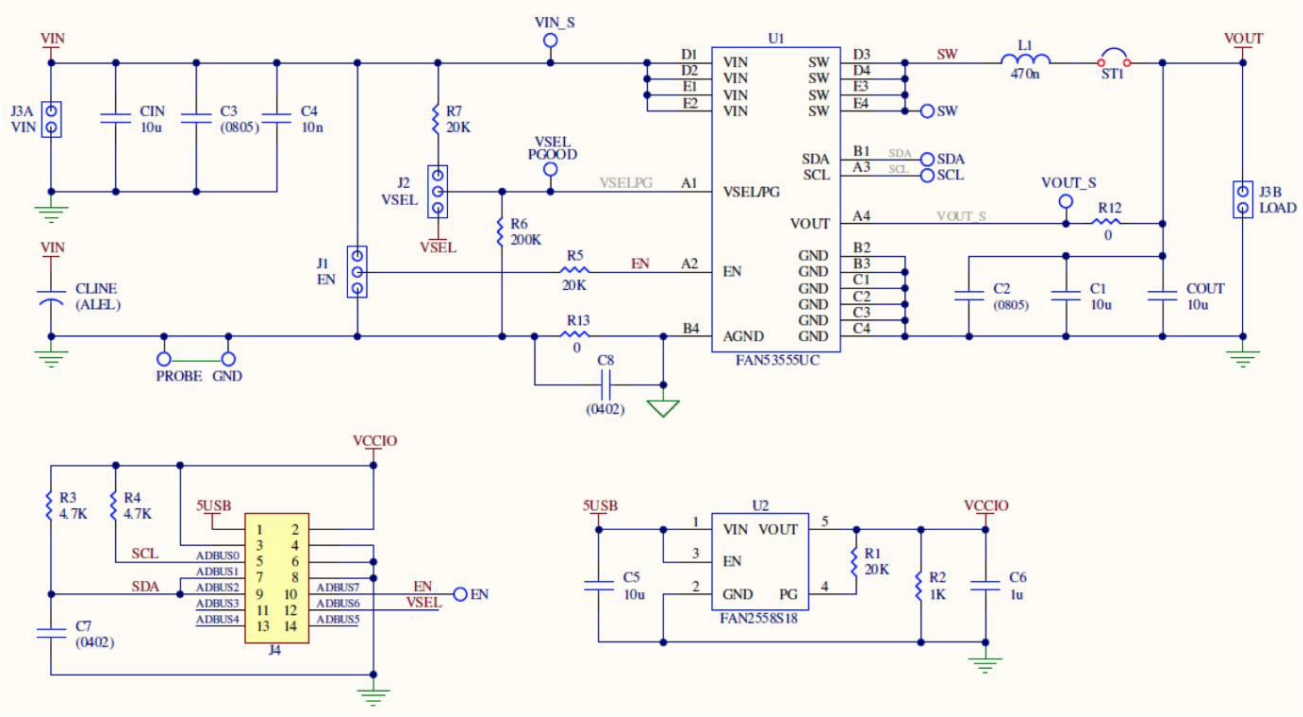


Figure 8. Evaluation Board Schematic

BILL OF MATERIALS

Table 2. BILL OF MATERIALS

FAN53555UC_3_BOM_1			
REF	**QTY**	**DESCRIPTION**	**MANUFACTURER / NUMBER**
U1	1	IC, FAN53555_xx (WLCSP 20)	Fairchild FAN53555UCxx
U2	1	IC, FAN2558, 1.8V LDO, SOT2	Fairchild FAN2558S18
L1 when xx=08, 09, 24	1	330nH, 2x1.6x1.2, 20mΩ	TOKO DFR201612 C33N
		330nH, 2x1.6x1.2, 20mΩ	CYNTEC PIFE20161B-R33MS-39
L1	1	**330nH, 20%, 13mΩ, 7.5A**	**MAG LAYERS MMD-04ABNR33M**
CIN	1	10uf, 10V, 10%, X7R, 0805 or 22uF,10V, 10%, X5R, 0805	Murata GRM21BR71A106K
			DigiKey 490-3905-1
COUT, C1(when xx=08, 09, 24)	2	22uF, 6.3V, X5R, 0603	C1608X5RJ226M
COUT, C1	2	**22uF,10V,10%, X5R, 0805**	**Murata GRM21BR61A226M**
C4	1	10nf, 25V, 10%, X7R, 0402	DigiKey PCC2270
C5	1	10uf, 6.3V, 10%, X5R, 0603	Murata GRM188R60J106M
			DigiKey 490-3896
C6	1	1.0uf, 10V, 10%, X5R, 0402	Murata GRM155R61A105K
			DigiKey 490-3890-1
R1, R5, R7	3	20K, 5%, 0402	DigiKey P20K J
R2	1	1.0K, 5%, 0402	DigiKey P1.0K J
R3, R4	2	4.53K, 1%, 0402	DigiKey P4.53K L
R6(not installed when xx=03)	1	200K, 5%, 0402	DigiKey P200K J
R12, R13	2	0Ω, 0402	DigiKey P0R0 J

REVISION HISTORY

Revision	Description of Changes	Date
0	Evaluation Board User's Manual creation.	4/7/2026

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

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