TPS65185 Evaluation Module

User's Guide

Literature Number: SLVU548
October 2011

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The hardware and software described in this document may slightly vary from the content of the EVM package. However, operating and installation procedures remain the same.

1 EVM Package Contents

The EVM package contains the following components:

- EVM (TPS65185 installed)
- User's guide
- USB interface adapter
- USB interface cable
- Ribbon cable
- Software

2 Hardware

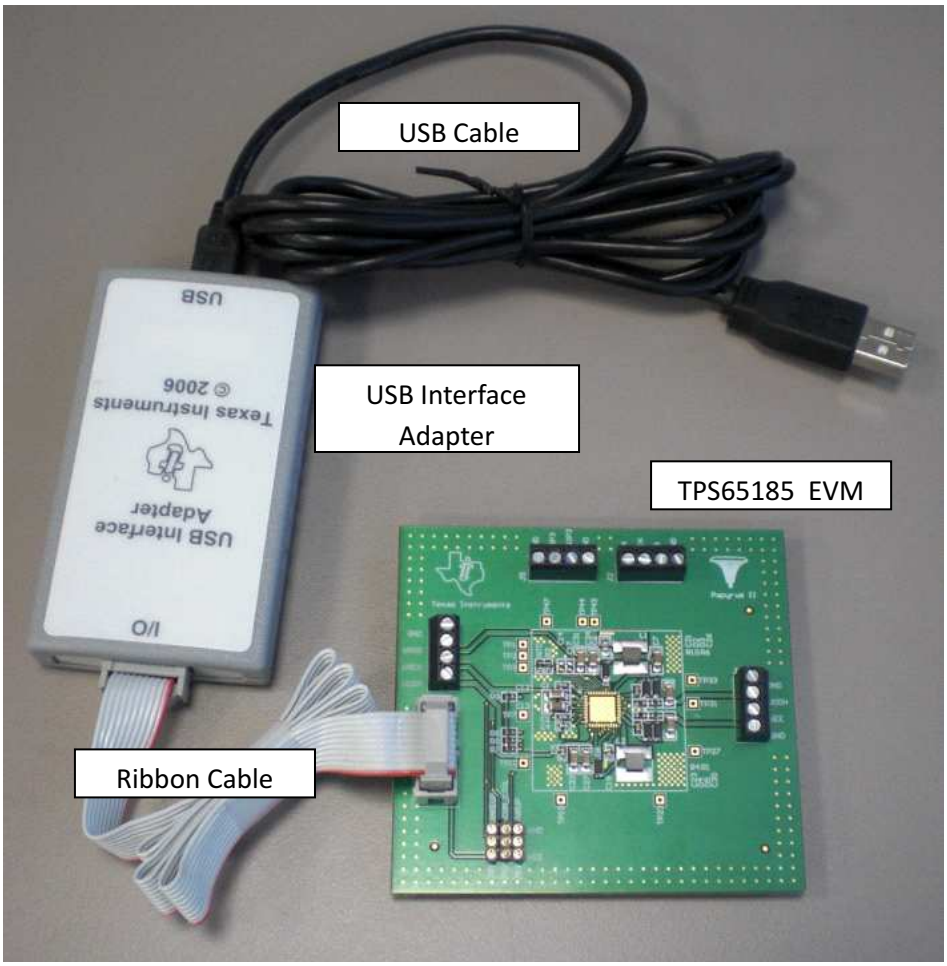


Figure 1. Included Hardware

3 Software

- TPS65185 GUI setup file: setup.exe

4 EVM Overview

Figure 2 identifies the main components of the EVM. The exact configuration of the EVM may vary from the image below.

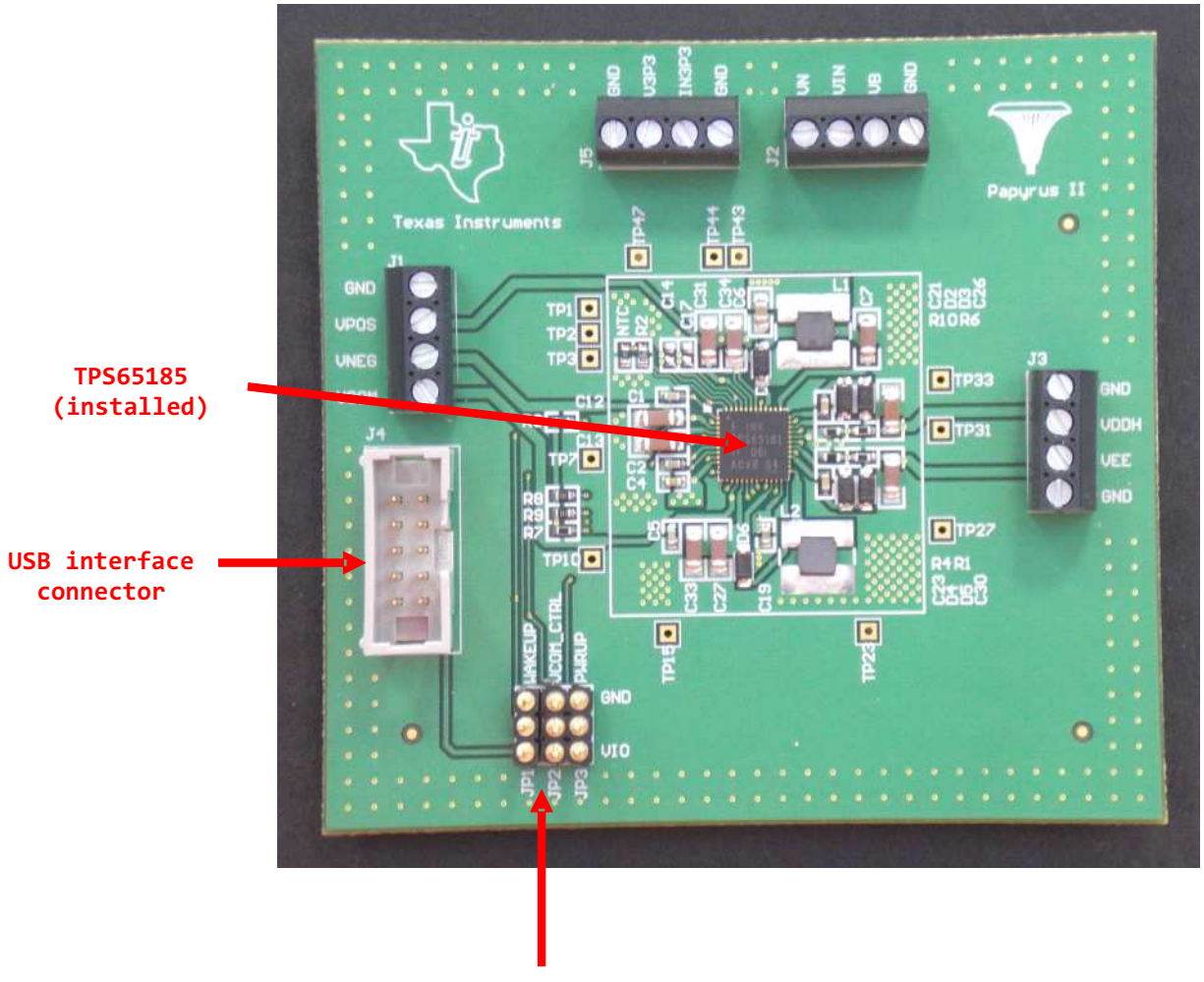


Figure 2. TPS65185 EVM

4.1 Powering Up the EVM - GPIO Control

To power up the EVM follow the steps outlined below:

- Install WAKEUP jumper in the GND position.
- Install VCOM_CTRL jumper in the GND position.
- Install PWRUP jumper in the VIO position.
- Connect the EVM to the USB interface adapter using the 10-lead ribbon cable.
- Connect the USB interface connector to the computer USB port using a standard USB cable.
- Connect a 3-V - 6-V supply from the VIN terminal to GND.
- Move the WAKEUP jumper from the GND position to VIO position.

The TPS65185 should start immediately with the pre-defined power-up sequence and voltage settings.

NOTE: Please note that although in this example no software control and therefore no I^2C communication is required, the USB interface still needs to be connected. This is because the interface board also provides the 3.3-V VIO rail. To operate the EVM without the interface, connect a 3.3-V supply from VIO to GND.

5 Software Installation Instruction

The following section explains the procedure for installing the Graphical User Interface (GUI) onto a Windows based PC. A USB interface adapter is required to connect the EVM to a PC and should have been provided with the EVM.

Additional interfaces can be ordered through http://focus.ti.com/docs/toolsw/folders/print/usb-to-gpio.html.

If the software has been installed already, skip the following section and continue at Operating Instructions.

To install the EVM software follow the steps outlined below:

- Copy the TPS65185 folder to your computer.
- Double-click on the setup.exe file in the TPS65185\Volume directory.
- Follow the prompts to finish the installation.
- At the end of the installation you may be asked to reboot your computer.

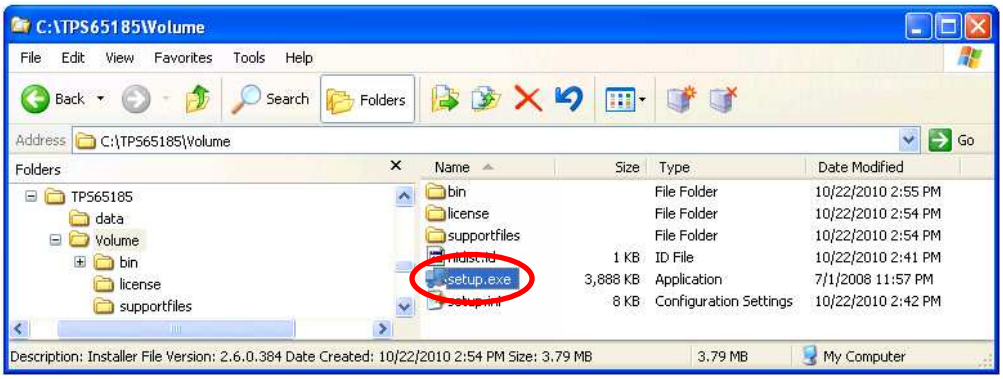


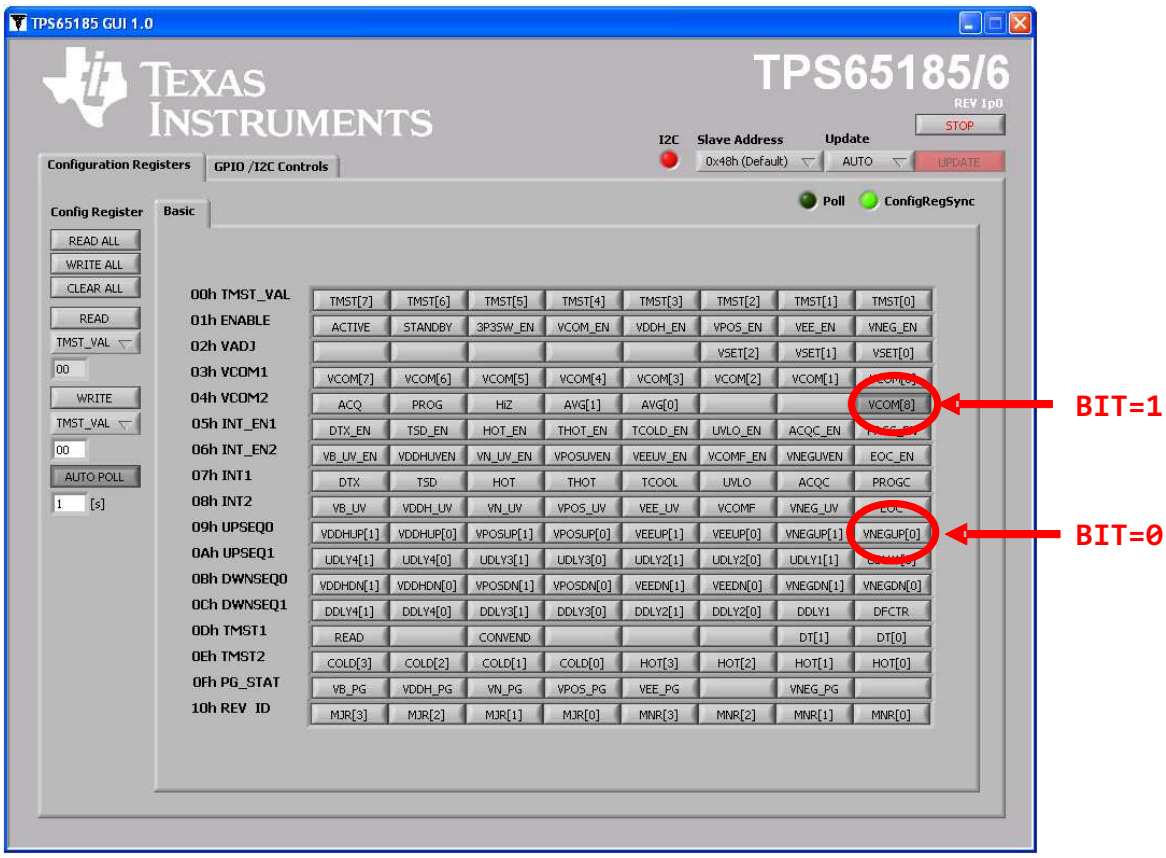
Figure 3. setup.exe File Location

6 Powering Up the EVM - Software Control

To power up the EVM follow the steps outlined below:

- Install WAKEUP jumper in the GND position.
- Install VCOM_CTRL jumper in the GND position.
- Install PWRUP jumper in the GND position.
- Connect the USB interface connector to the computer USB port using a standard USB cable.
- Connect a 3-V - 6-V supply from the VIN terminal to GND.
- Move the WAKEUP jumper from the GND position to VIO position.
- Run the TPS65185.exe software:
  - Click on “start".
  - Click on “All Programs”.
  - Select TPS65185 program group.
  - Click on TPS65185.

The following window should appear:



This image is for illustration only and does not represent the default register settings.

Figure 4. Startup Panel TPS65185 Control Software

Click on the ACTIVE bit in the ENABLE register. All regulators should power up.

6.1 Configuration Registers/BASIC Tab

The BASIC panel represents the register map and contains a button for each bit. A depressed button represents a bit set to ‘1’ and a released button represents a ‘0’.

6.2 GPIO/I²C Controls Tab

Use this page to change the I²C interface data rate and SDA/SCL pull-up resistors which are built into the USB interface adapter.

This tab also provides controls for the VCOM_CTRL, PWRUP, and WAKEUP pins. Please note that the jumpers JP1, JP2, and JP3 must be removed to control the pins through the GUI.

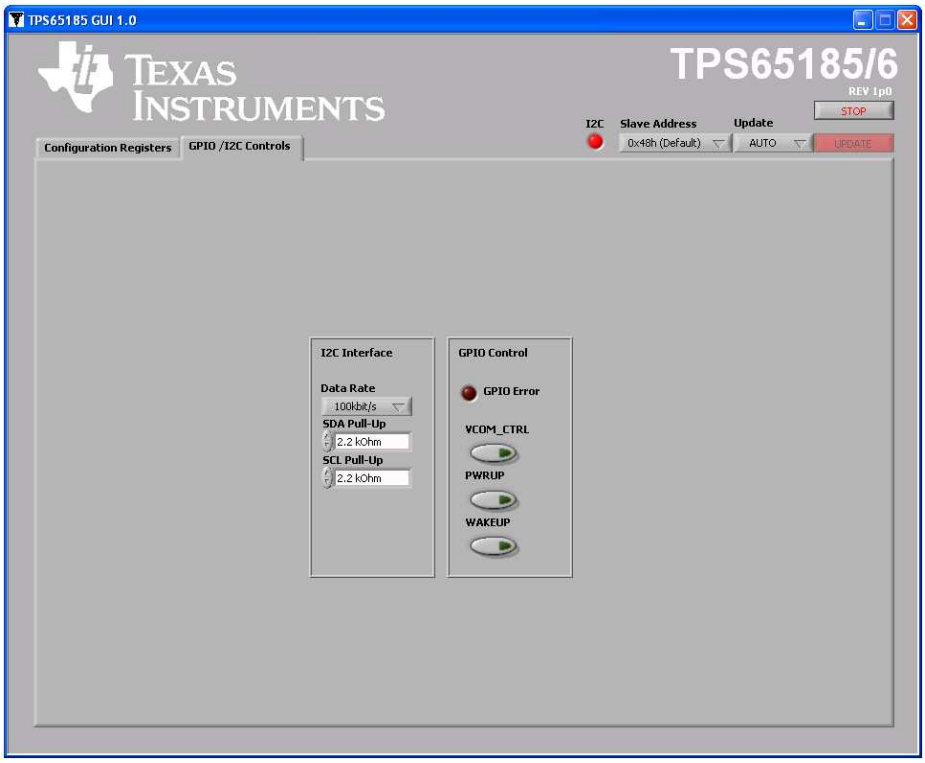


Figure 5. GPIO/I²C Control Tab

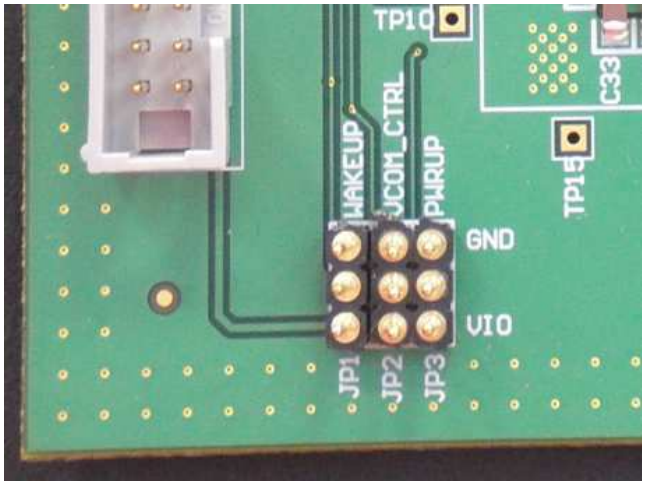
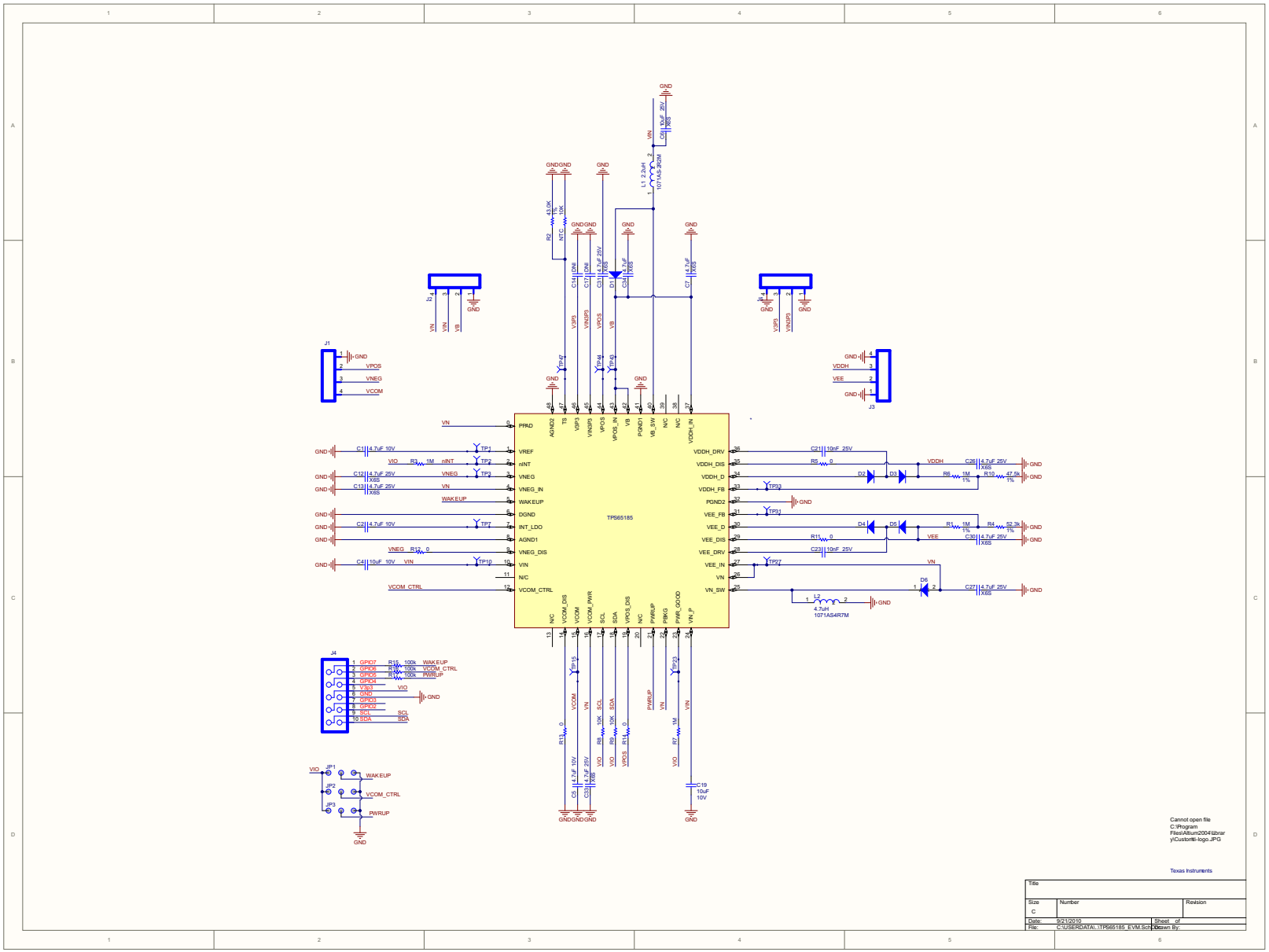


Figure 6. JP1, JP2, and JP3 Must Be Removed Before Using the GUI GPIO Control

7 Other Functions

- To clear the GUI panel, press the “CLEAR ALL” button. Note that this function has no effect on the TPS65185. This function is useful to verify that “READ ALL” function is working properly.
- Individual registers can be read and written to using the READ and WRITE buttons. The data is displayed in HEX format.
- The default setting for the GUI is to update the register settings immediately after the user changes values. Select “MANUAL” update control if you wish to change multiple values before writing to the TPS65185.
- The GUI periodically polls the TMST_VAL, ENABLE, INT1, INT2, and PG_STAT registers to reflect the current status of the device. The polling interval can be adjusted by the user by entering a number below the "AUTO POLL" button. Release the "AUTO POLL" button to disable automatic polling.

8 EVM Schematic



9 Bill of Materials

Designator	Description	Footprint	Value	Tolerance	Voltage rating	Dielectric	Vendor	Vendor PN	QTY
U1	TPS65185	RGZ (S-PQFP-N48)							1
C6	Capacitor	0805	10uF	10%	25V	X6S	Murata	GRM21BR70J106KE76L	1
J4	Connector, Male Straight 2x5 pin 100mil spacing, 4 Wall	CONN_2510-6002UB	2510-6002UB				3M	2510-6002UB	1
L1	Inductor	CDRH6D28	2.2uH				Toko Taiyo Yuden	1071AS-2R2M NR 4012T 2R2M	1
L2	Inductor	CDRH6D28	4.7uH				Toko Taiyo Yuden	1071AS-4R7M NR4018T 4R7M	1
R10	Resistor	0603	47.5k	1%					1
R2	Resistor	0603	43.0K	1%			ROHM	MCR03EZPFX4302	1
R4	Resistor	0603	52.3k	1%			ROHM	MCR03EZPFX5232	1
C14, C17	Capacitor, DNI	0603	DNI	10%					2
C21, C23	Capacitor	0603	10nF	10%	25V		Murata	GRM216R71H103KA01D	2
C4, C19	Capacitor	0603	10uF	10%	10V		Murata	GRM188R60G106ME47D	2
C1, C2, C5	Capacitor	0603	4.7uF	10%	10V		Murata	GRM188R60J475KE19D	3
JP1, JP2, JP3	Three Pin Jumper	JMP0.3					Mill-Max	800-10-003-10-001000	3
NTC, R8, R9	NTC, Resistor	0603	10K	1%			Murata, ROHM	MCR03EZPFX1002, NCP18XH103F03RB	3
R15, R16, R17	Resistor	0603	100k	1%			ROHM	RHM100KAGTR-ND	3
J1, J2, J3, J5	3.5mm	TB_4X3.5MM					OST	ED555/4DS	4
R1, R3, R6, R7	Resistor	0603	1M	1%			ROHM	MCR03EZPFX1004	4
R14	Resistor	0603	0	1%			ROHM	MCR006YZPJ000	5
D1, D2, D3, D4, D5, D6	Diode	SOD-123					ON Semi	MBR130T1G	6
C27, C30, C31, C33, C34	Capacitor	1206	4.7uF	10%	25V	X6S	Murata Taiyo Yuden	GJ831CR71H475KA12L UMK316BJ475KL-T	9
TP1, TP2, TP3, TP7, TP10, TP15, TP23, TP27, TP31, TP33, TP43, TP44, TP47	Test Point, O.032 Hole	TP-032	STD						13

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EVM Warnings and Restrictions

It is important to operate this EVM within the input voltage range of 3 V to 6 V and the output voltage range of -20 V to 22 V.

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than 85°C. The EVM is designed to operate properly with certain components above 40°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

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