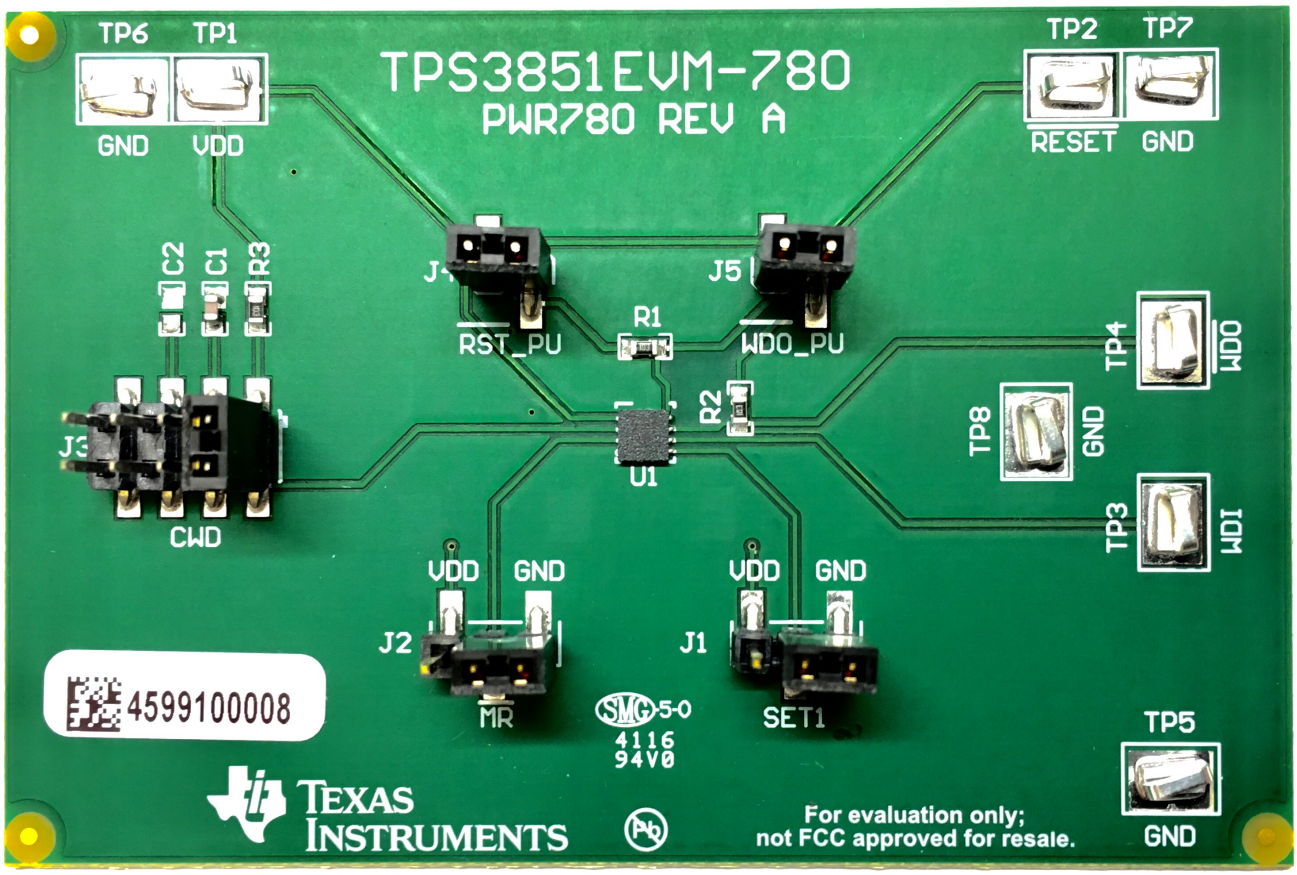
TPS3851EVM-780 Evaluation Module



This user's guide describes the operational use of the TPS3851EVM-780 evaluation module (EVM) as a reference design for engineering demonstration and evaluation of the TPS3851, low quiescent current, 0.8% accurate supervisor with programmable-delay. Included in this user's guide are setup instructions, a schematic diagram, printed circuit board (PCB) layout drawings, and a bill of materials for the evaluation module.

Throughout this document, the terms *EVM*, *demonstration kit*, *evaluation board*, and *evaluation module* are synonyms with the *TPS3851EVM-780* evaluation module.

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Trademarks

1 Introduction

TI's TPS3851EVM-780 helps design engineers evaluate the operation and performance of the TPS3851 family of supervisors for possible use in their own circuit application. This particular EVM configuration contains the TPS3851G33E in a DRB (3 mm × 3 mm) package. This document describes the configuration and set up of the TPS3851EVM-780 EVM board.

2 Hardware

This section describes the jumpers and connectors on the EVM as well as how to properly connect, setup, and use the TPS3851EVM-780.

2.1 Input and Output Connector and Jumper Descriptions

2.1.1 TP1: VDD

This connector is for the input power supply. The operating range of this supervisor is 1.6 V to 6.5 V.

2.1.2 TP2: $\overline{\text{RESET}}$

This connector is the $\overline{\text{RESET}}$ output. Connect this output to a multimeter, oscilloscope, or external circuit to verify that $\overline{\text{RESET}}$ goes low when the monitored voltage goes below the threshold.

2.1.3 TP3: WDI

This test point allows the user to connect an external WDI signal to the TPS3851EVM-780.

2.1.4 TP4: $\overline{\text{WDO}}$

This connector is the $\overline{\text{WDO}}$ output. Connect this output to a multimeter, oscilloscope, or external circuit to verify that $\overline{\text{WDO}}$ goes low when the WDI signal is not issued before the watchdog timeout.

2.1.5 TP5 to TP8: GND

These connectors are GND and are electrically connected to each other.

2.1.6 J1: SET1

The TPS3851EVM-780 is designed for SET1 to pull up to either VDD or an external voltage source. Table 1 shows the connections for choosing between the two pullup options. If the shorting jumper is removed, an external voltage can be placed on pin 2, labeled VPU in Figure 1.

Table 1. Connector JP1 Selections

Short Pins	Pullup Voltage (VPU)
1 and 2	VDD
OPEN	External voltage on pin 2 (VPU)

2.1.7 J2: $\overline{\text{MR}}$

For convenience, the TPS3851EVM-780 is designed to allow MR to be tied to VDD or GND. Table 2 shows the connection options. If the shorting jumper is removed, drive $\overline{\text{MR}}$ externally via pin 2.

Table 2. Connector JP2 Selections

Short Pins	$\overline{\text{MR}}$ option
1 and 2	$\overline{\text{MR}}$ = VDD
2 and 3	$\overline{\text{MR}}$ = GND
OPEN	$\overline{\text{MR}}$ is driven by pin 2

2.1.8 J3: CWD

For convenience, the TPS3851EVM-780 is designed to allow the CWD to be tied to VDD through a pullup resistor, connected through a capacitor to GND, or left floating. Table 3 shows the connection options, assuming the SET1 pin is tied to GND.

Table 3. Connector JP3 Selections

Short Pins	Capacitor	t_{WD} (ms)
1 and 2	10 kΩ to VDD (R3)	200
3 and 4	100 pF (C1)	62.74
5 and 6	Blank Pads (C2)	1600
7 and 8	OPEN	1600

2.1.9 J4: $\overline{\text{RESET}}$ Pullup

The TPS3851EVM-780 is designed with an open-drain $\overline{\text{RESET}}$ output, which needs to be pulled up to either VDD or an externally supplied voltage. Table 4 shows the connections for choosing between the two monitoring options.

Table 4. Connector JP4 Selections

Short Pins	Voltage Monitored
1 and 2	VDD
OPEN	TP2

2.1.10 J5: $\overline{\text{WDO}}$ Pullup

The TPS3851EVM-780 is designed with an open-drain Watchdog Output ($\overline{\text{WDO}}$), which needs to be pulled up to either VDD or an externally supplied voltage. Table 5 shows the connections for choosing between the two monitoring options.

Table 5. Connector JP5 Selections

Short Pins	Voltage Monitored
1 and 2	VDD
OPEN	TP2

3 Board Layout

Figure 1 through Figure 3 illustrate the PCB layouts.

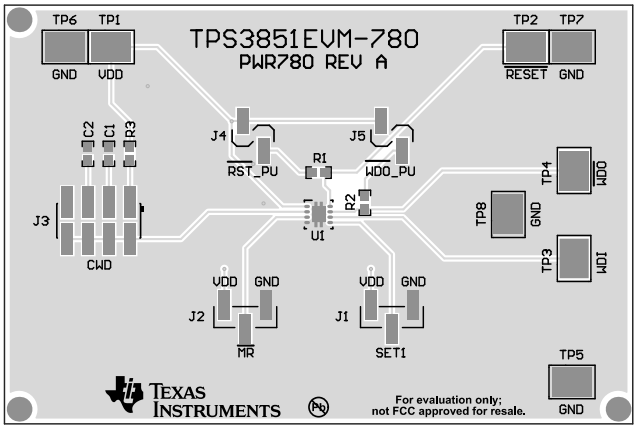

Figure 1. Top Overlay

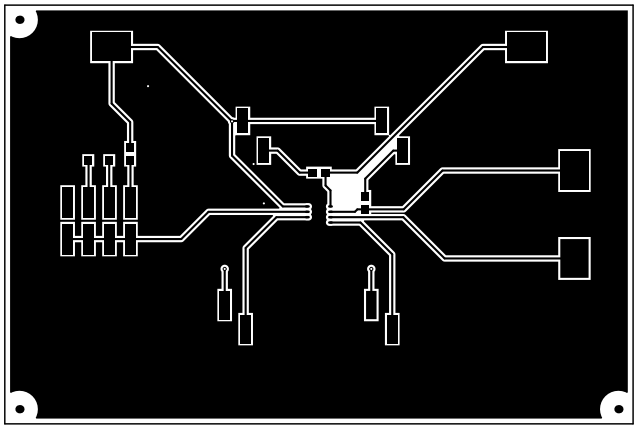

Figure 2. Top Layer

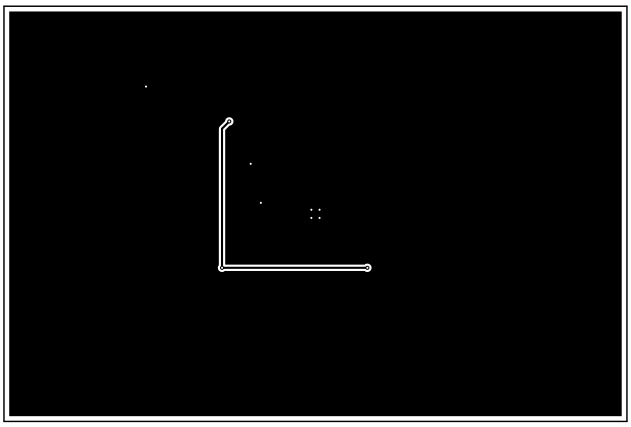

Figure 3. Bottom Layer

4 Schematic

Figure 4 shows the EVM schematic.

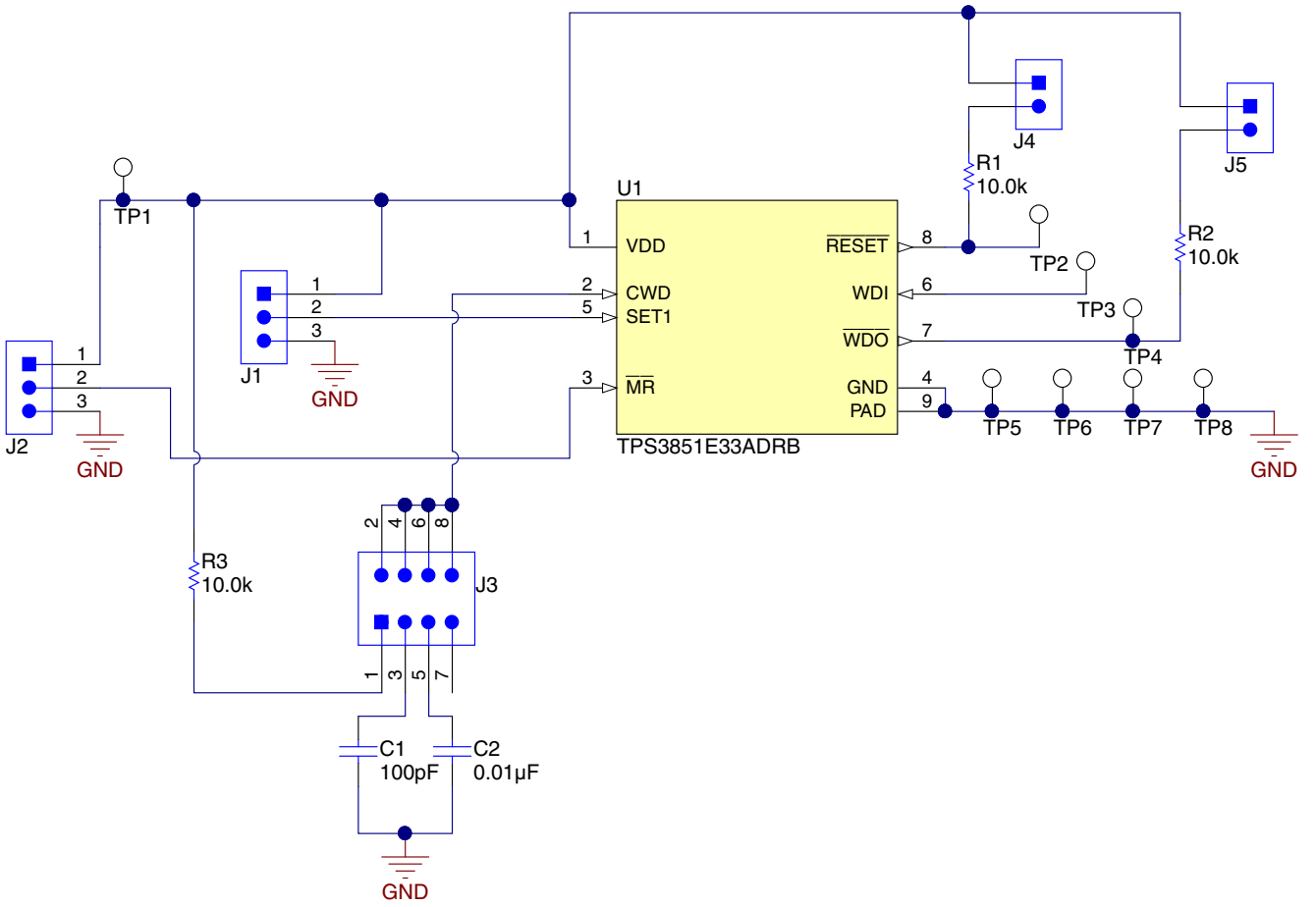

Figure 4. TPS3851EVM-780 Schematic

5 Bill of Materials

Table 6 lists the EVM bill of materials.

Table 6. TPS3851EVM-780 Bill of Materials

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
!PCB1	1		Printed Circuit Board		PWR780	Any	-	-
C1	1	100pF	CAP, CERM, 100 pF, 50 V, +/- 5%, C0G/NP0, 0603	603	06035A101JAT2A	AVX		
J1, J2	2		Header, 100mil, 3x1, Gold, SMT	Samtec_TSM-103-01-X-SV	TSM-103-01-L-SV	Samtec		
J3	1		Header, 2.54 mm, 4x2, Tin, SMT	Header, 2.54mm, 4x2, SMT	15912080	Molex		
J4, J5	2		Header, 2.54 mm, 2x1, Gold, R/A, SMT	Header, 2.54 mm, 2x1, R/A, SMT	87898-0204	Molex		
R1, R2, R3	3	10.0k	RES, 10.0 k, 1%, 0.1 W, 0603	603	RC0603FR-0710KL	Yageo America		
SH-J1, SH-J2, SH-J3, SH-J4, SH-J5	5	1x2	Shunt, 100mil, Gold plated, Black	Shunt	969102-0000-DA	3M	SNT-100-BK-G	Samtec
TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8	8	SMT	Test Point, Compact, SMT	Testpoint_Keystone_Compact	5016	Keystone		
U1	1		High Accuracy Voltage Supervisior with Integrated Watchdog Timer, DRB0008A	DRB0008A	TPS3851G33EDRB	Texas Instruments		Texas Instruments
C2	0	0.01uF	CAP, CERM, 0.01 µF, 25 V, +/- 5%, C0G/NP0, 0603	603	C1608C0G1E103J	TDK		
FID1, FID2, FID3	0		Fiducial mark. There is nothing to buy or mount.	Fiducial	N/A	N/A		

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      CAUTION

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      Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

3.2 *Canada*

3.2.1 *For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210*

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Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

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2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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