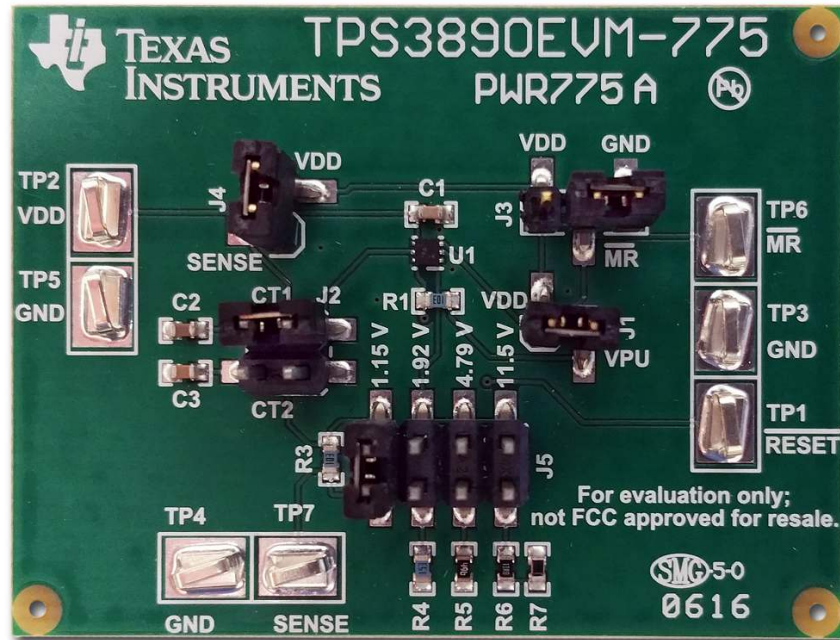


## ***TPS3890EVM-775 Evaluation Module***



This user's guide describes the operational use of the TPS3890EVM-775 evaluation module (EVM) as a reference design for engineering demonstration and evaluation of the [TPS3890](#), low quiescent current, 1% 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 *TPS3890EVM-775* evaluation module.

### Contents

1	Introduction .....	3
2	Hardware.....	3
	2.1 Input and Output Connector and Jumper Descriptions .....	3
3	Board Layout .....	5
4	Schematic.....	6
5	Bill of Materials .....	7

### List of Figures

1	Top Overlay.....	5
2	Top Layer .....	5
3	Bottom Layer .....	5
4	TPS3890EVM-775 Schematic .....	6

### List of Tables

1	Connector JP1 Selections .....	3
2	Connector JP2 Selections .....	3
3	Connector JP3 Selections .....	4
4	Connector JP4 Selections .....	4
5	Connector JP5 Selections .....	4
6	TPS3890EVM-775 Bill of Materials.....	7

## 1 Introduction

The Texas Instruments' TPS3890EVM-775 helps design engineers evaluate the operation and performance of the TPS3890 family of supervisors for possible use in their own circuit application. This particular EVM configuration contains the TPS389001 in a SOT (1.6 mm × 1.2 mm) package. This document describes the configuration and set up of the TPS3890EVM-775 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 TPS3890EVM-775.

### 2.1 Input and Output Connector and Jumper Descriptions

#### 2.1.1 TP1: $\overline{\text{RESET}}$

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.

#### 2.1.2 TP2: VDD

This connector is for the input power supply. The operating range of this supervisor is 1.5 V to 5.5 V.

#### 2.1.3 TP3 to TP5: GND

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

#### 2.1.4 TP6: $\overline{\text{MR}}$

This connector is for the manual reset input. Pulling this pin low causes the device to signal a reset.

#### 2.1.5 TP7: SENSE

This connector is the voltage being monitored.

#### 2.1.6 J1: VPU

The TPS3890EVM-775 is designed for  $\overline{\text{RESET}}$  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: CT

The TPS3890EVM-775 is prepopulated with three timings to evaluate the capacitor-adjustable delay. [Table 2](#) shows the connections for choosing between the three timings.

**Table 2. Connector JP2 Selections**

Short Pins	Capacitor	Delay
1 and 2 (CT1)	330 pF (C2)	479 $\mu\text{s}$
3 and 4 (CT2)	0.047 $\mu\text{F}$ (C3)	63 ms
OPEN	Open	40 $\mu\text{s}$

### 2.1.8 J3: $\overline{MR}$

For convenience, the TPS3890EVM-775 is designed to allow  $\overline{MR}$  to be tied to VDD or GND. [Table 3](#) shows the connection options. If the shorting jumper is removed, drive  $\overline{MR}$  externally via TP6.

**Table 3. Connector JP3 Selections**

Short Pins	$\overline{MR}$ Voltage
1 and 2	VDD
2 and 3	GND
OPEN	Driven through TP6 connection

### 2.1.9 J4: SENSE

The TPS3890EVM-775 is designed to monitor VDD or an external sense voltage on TP7. [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	TP7

### 2.1.10 J5: Resistor Divider

For convenience, the TPS3890EVM-775 is designed with four prepopulated sense resistor dividers. [Table 5](#) shows the connections for choosing between the dividers.

**Table 5. Connector JP5 Selections**

Short Pins	Resistors ( $\Omega$ )		Nominal Threshold Voltage
	$R_{Top}$	$R_{Bottom}$	
1 and 2	Short	OPEN	1.15 V
3 and 4	10.0k (R3)	15.0k (R4)	1.92 V
5 and 6	10.0k (R3)	3.16k (R5)	4.79 V
7 and 8	10.0k (R3)	1.10k (R7) + 11.0 (R6)	11.5 V

### 3 Board Layout

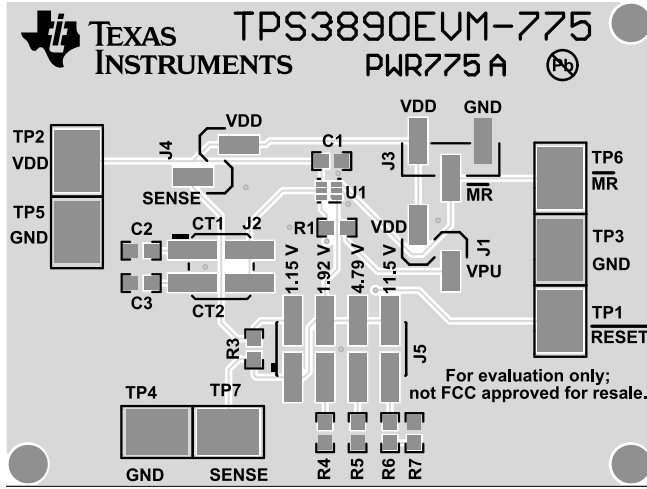


Figure 1. Top Overlay

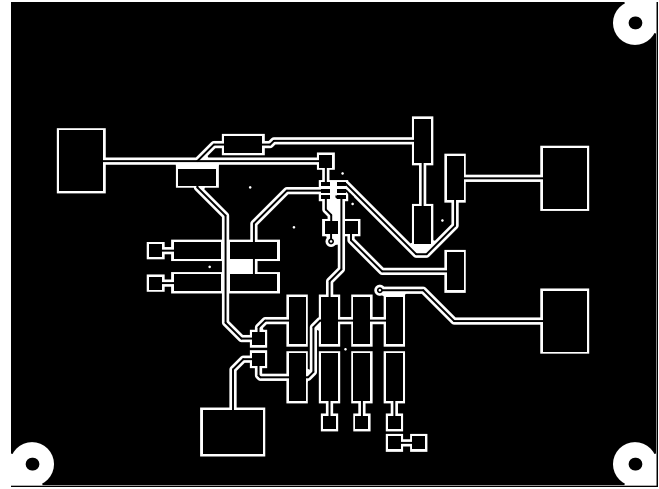


Figure 2. Top Layer

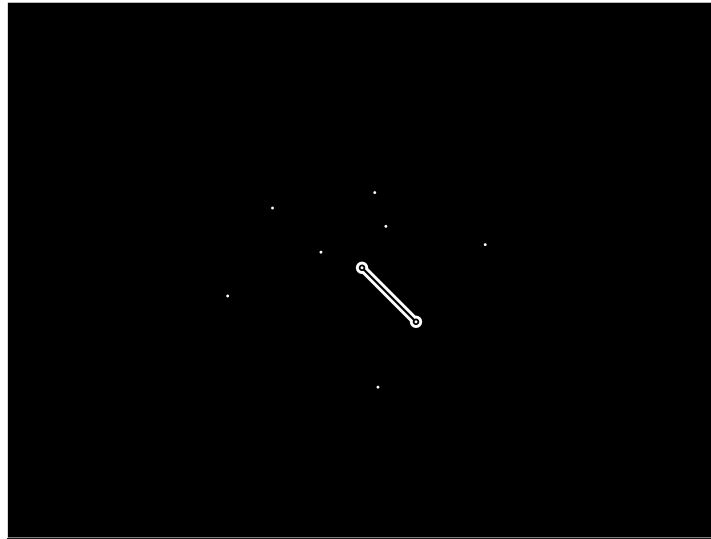
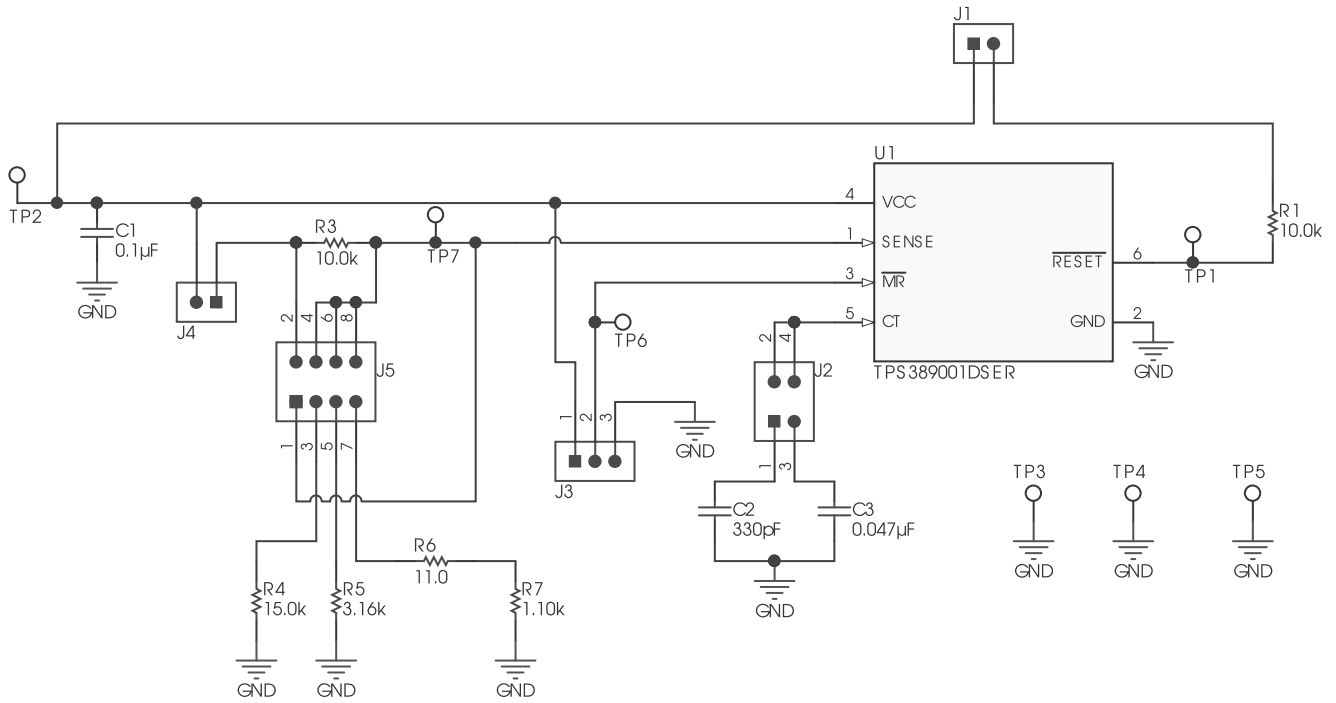


Figure 3. Bottom Layer

4 Schematic



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Figure 4. TPS3890EVM-775 Schematic

## 5 Bill of Materials

**Table 6. TPS3890EVM-775 Bill of Materials**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
!PCB1	1	—	Printed Circuit Board	—	PWR775	Any	—	—
C1	1	0.1uF	CAP, CERM, 0.1 $\mu$ F, 16 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	GCM188R71C104KA37J	MuRata	—	—
C2	1	330pF	CAP, CERM, 330 pF, 50 V, +/- 10%, X7R, 0603	0603	GRM188R71H331KA01D	MuRata	—	—
C3	1	0.047uF	CAP, CERM, 0.047 $\mu$ F, 25 V, +/- 10%, X7R, 0603	0603	GRM188R71E473KA01D	MuRata	—	—
J1, J4	2	—	Header, 2.54 mm, 2x1, Gold, R/A, SMT	Header, 2.54 mm, 2x1, R/A, SMT	87898-0204	Molex	—	—
J2	1	—	Header, 100mil, 2x2, Tin, SMT	2x2 100mil Tin Header	15-91-2040	Molex	—	—
J3	1	—	Header, 100mil, 3x1, Gold, SMT	Samtec_TSM-103-01-X-SV	TSM-103-01-L-SV	Samtec	—	—
J5	1	—	Header, 2.54 mm, 4x2, Tin, SMT	Header, 2.54mm, 4x2, SMT	0015912080	Molex	—	—
R1, R3	2	10.0k	RES, 10.0 k, 1%, 0.1 W, 0603	0603	RCG060310K0FKEA	Vishay Draloric	—	—
R4	1	15.0k	RES, 15.0 k, 1%, 0.1 W, 0603	0603	CRCW060315K0FKEA	Vishay-Dale	—	—
R5	1	3.16k	RES, 3.16 k, 1%, 0.1 W, 0603	0603	CRCW06033K16FKEA	Vishay-Dale	—	—
R6	1	11.0	RES, 11.0, 1%, 0.1 W, 0603	0603	CRCW060311R0FKEA	Vishay-Dale	—	—
R7	1	1.10k	RES, 1.10 k, 1%, 0.1 W, 0603	0603	CRCW06031K10FKEA	Vishay-Dale	—	—
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-TP7	7	SMT	Test Point, Compact, SMT	Testpoint_Keystone_Compact	5016	Keystone	—	—
U1	1	—	Low Quiescent Current, 1% Accurate Supervisor with Programmable-Delay, DSE0006A	DSE0006A	TPS389001DSE	Texas Instruments	TPS389001DSET	Texas Instruments
FID1-FID3	0	—	Fiducial mark. There is nothing to buy or mount.	Fiducial	N/A	N/A	—	—

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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.
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#### Concernant les EVMs avec appareils radio:

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#### Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

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