# TPS7H2201EVM-CVAL Evaluation Module (EVM) User's Guide

The TPS7H2201EVM-CVAL is the Evaluation Module (EVM) for the TPS7H2201-SP and provides a platform to electrically evaluate its features. This user's guide provides details about the EVM, its configuration, schematics and BOM.

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## Trademarks

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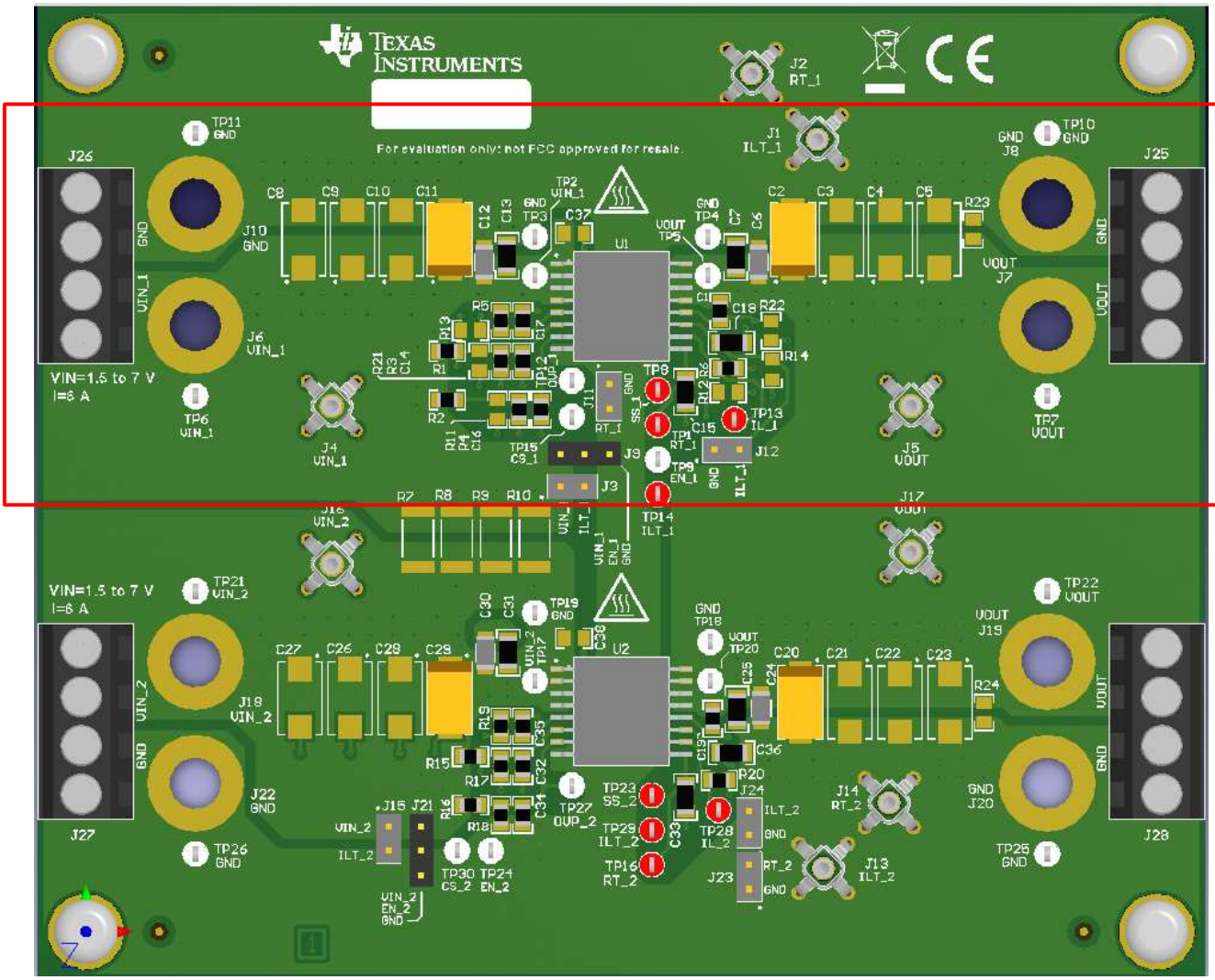
# 1 Introduction

The TPS7H2201-SP device is a single channel, 6-A load switch with a programmable slew rate for applications that require specific rise-time as well as programmable current limit for protection purposes. In addition, the TPS7H2201-SP features a reverse current protection capability for redundancy applications as well as programmable fault timers. The device contains a P-channel MOSFET that can operate over an input voltage range of 1.5 V to 7 V and can support a maximum continuous current of 6 A. The switch is controlled by an on and off input (EN), which is capable of interfacing directly with low-voltage control signals.




NOTE: The red line indicates the section of the EVM populated for the single version. For dual version, both sections are populated.

**Figure 1. TPS7H2201EVM-CVAL EVM Board**

## 2 EVM Configuration

The EVM is designed to be used across the entire input voltage and output current range of the TPS7H2201-SP while providing flexibility in configuring the device under different conditions. By default, the device in the EVM is configured as shown in Table 1. To configure the device in a different configuration, please refer to the TPS7H2201-SP data sheet to calculate the values of the passives around the device that would need to be changed.

**Table 1. Input Voltage and Output Current Summary for the TPS7H2201EVM-CVAL**

| Specification | Value |
|---|---|
| EN threshold | 4.85 V |
| UVLO threshold | 3.7 V |
| OVP threshold | 6 V |
| Current limit, IL | 7.5 A |
| Current limit timer, ILTIMER | 1 ms |
| Retry timer, RTIMER | 1 ms |
| Soft start | 9 ms |
| Maximum CS pin voltage | 4.6 V |

The EVM provides connectors and test points to access every pin of the device. Table 2 shows the description of these connectors and test points.

**Table 2. EVM Connectors and Test Points**

| Reference Designator | Function |
|---|---|
| J6, TP6 | VIN for U1 (single board). |
| J10, TP11 | GND for U1 (single board). |
| J4 | Cold probe connector for VIN1. |
| J7, TP7 | VOUT for U1 (single board). |
| J8, TP10 | GND for VOUT1 (single board). |
| J5 | Cold probe connector for VOUT1. |
| J1 | Cold probe connector for ILTIMER for U1 (single board). |
| J2 | Cold probe connector for RTIMER for U1 (single board). |
| TP9 | Test point for EN1. |
| TP12 | Test point for OVP1. |
| TP15 | Test point for CS1. |
| TP8 | Test point for SS1. |
| TP1 | Test point for RTIMER1. |
| TP14 | Test point for ILTIMER1. |
| TP13 | Test point for IL1. |
| J9 | EN1 jumper selection (pins 1-2: VIN, pins 2-3: GND). |
| J3 | ILTIMER1 jumper selection (closed: VIN1, internal current limit timer selected). |
| J12 | ILTIMER1 jumper selection (closed: GND, internal current limit timer and retry timer both disabled). |
| J11 | RTIMER1 jumper selection (closed: GND, retry timer disabled until EN1 pin is cycled). |
| TP2, TP5 | Test points VIN1 and VOUT1 respectively for U1 RDSon measurements. |
| J18, TP21 | VIN for U2 (dual board). |
| J22, TP26 | GND for VIN2 (dual board). |
| J16 | Cold probe connector for VIN2. |
| J19, TP22 | VOUT for U2 (dual board). |
| J20, TP25 | GND for VOUT2 (dual board). |
| J17 | Cold probe connector for VOUT2. |
| J13 | Cold probe connector for ILTIMER for U2 (dual board). |

**Table 2. EVM Connectors and Test Points (continued)**

| Reference Designator | Function |
|---|---|
| J14 | Cold probe connector for RTIMER for U2 (dual board). |
| TP24 | Test point for EN2. |
| TP27 | Test point for OVP2. |
| TP30 | Test point for CS2. |
| TP23 | Test point for SS2. |
| TP16 | Test point for RTIMER2. |
| TP29 | Test point for ILTIMER2. |
| TP28 | Test point for IL2. |
| J21 | EN2 jumper selection (pins 1-2: VIN, pins 2-3: GND). |
| J15 | ILTIMER2 jumper selection (closed: VIN2, internal current limit timer selected). |
| J24 | ILTIMER2 jumper selection (closed: GND, internal current limit timer and retry timer both disabled). |
| J23 | RTIMER2 jumper selection (closed: GND, retry timer disabled until EN1 pin is cycled). |
| TP17, TP20 | Test points VIN2 and VOUT2 respectively for U2 RDSon measurements. |
| TP3, TP4, TP18, TP19 | GND. |

## 2.1 EVM Variants

There are 2 variants of the EVM, both using the same PCB. Table 3 shows these variants

**Table 3. TPS7H2201-SP EVM Variants**

| EVM Orderable Name | Assembly Name | Description |
|---|---|---|
| TPS7H2201EVM-CVAL | SLHR008-001 | Single version. |
| TPS7H2201EVMCVAL-D | SLHR008-002 | Dual version for redundancy or parallel configuration. |

In the single variant of the EVM, the components associated with the dual variant are not populated. The dual variant has the VOUT of both load switches connected. This allows testing for 2 different main applications:

1. **Redundancy** - This is the default configuration of the dual variant EVM. In this case, each load switch will have a different VIN source but a common VOUT. The common VOUT is already implemented by default in both variants of the EVM. In this configuration, each load switch will have its own passives.
2. **Parallel operation** - In this configuration, both switches will have the same VIN source as well as a common VOUT. To connect the VIN for both switches, there are footprints for 4, size 2512, 1-W, 0-Ω resistors (R7, R8, R9 and R10) in parallel that will need to be populated. In addition, when in parallel application, the master load switch (U1) must drive the EN, OVP, CS, SS, RTIMER and ILTIMER pins of the slave device (U2). As a result, there are footprints for 0-Ω resistors (R21, R11, R13, R22, R12 and R14 respectively) that need to be populated to connect these pins from one device to another. The passives for U2, except for the IL pin, that are populated by default for redundancy application would also need to be removed for parallel operation. Figure 2 and Figure 3 show the redundancy and the parallel operation applications highlighting the all the resistors previously mentioned.

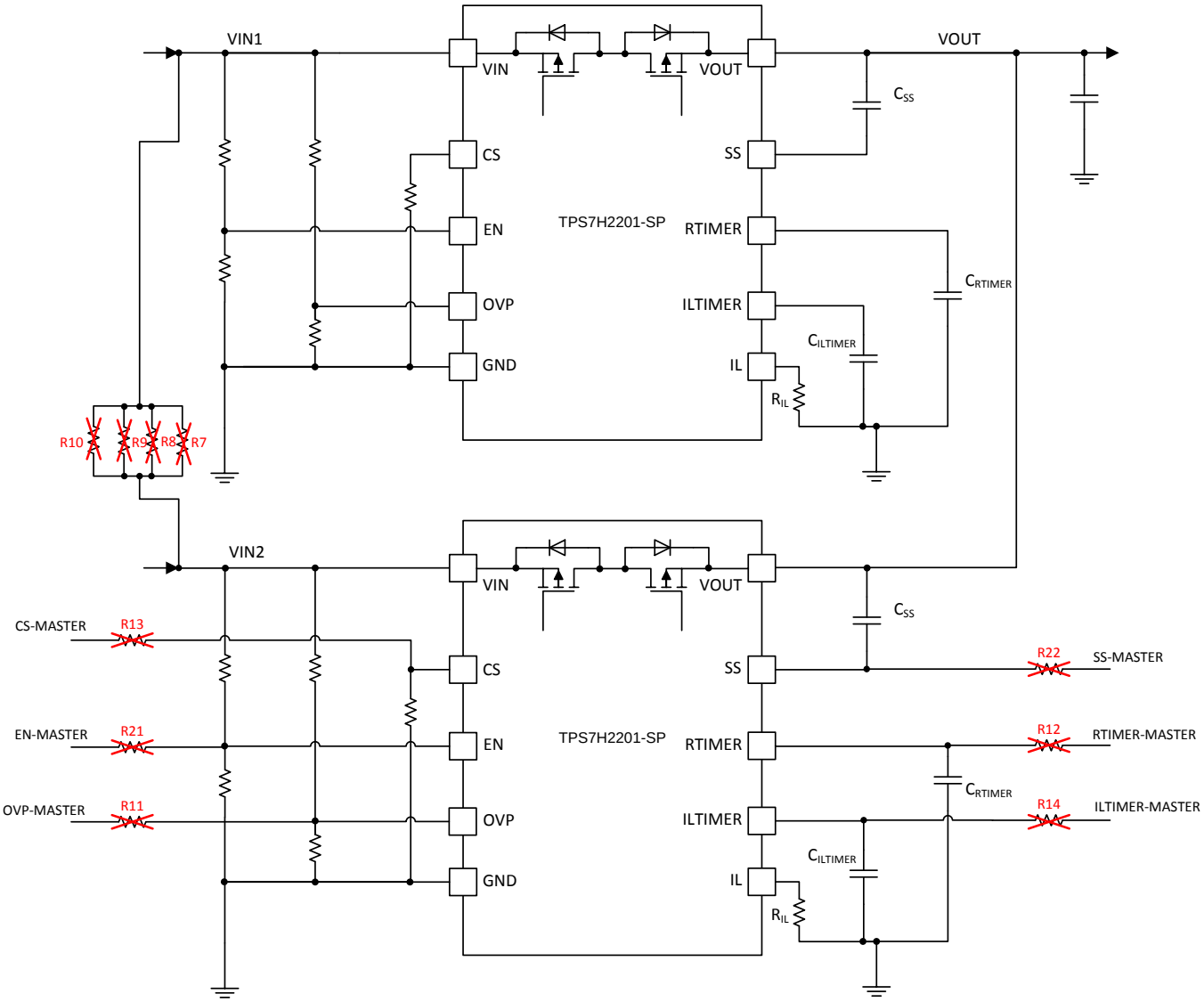



**Figure 2. Redundancy Configuration for TPS7H2201EVMCVAL-D**

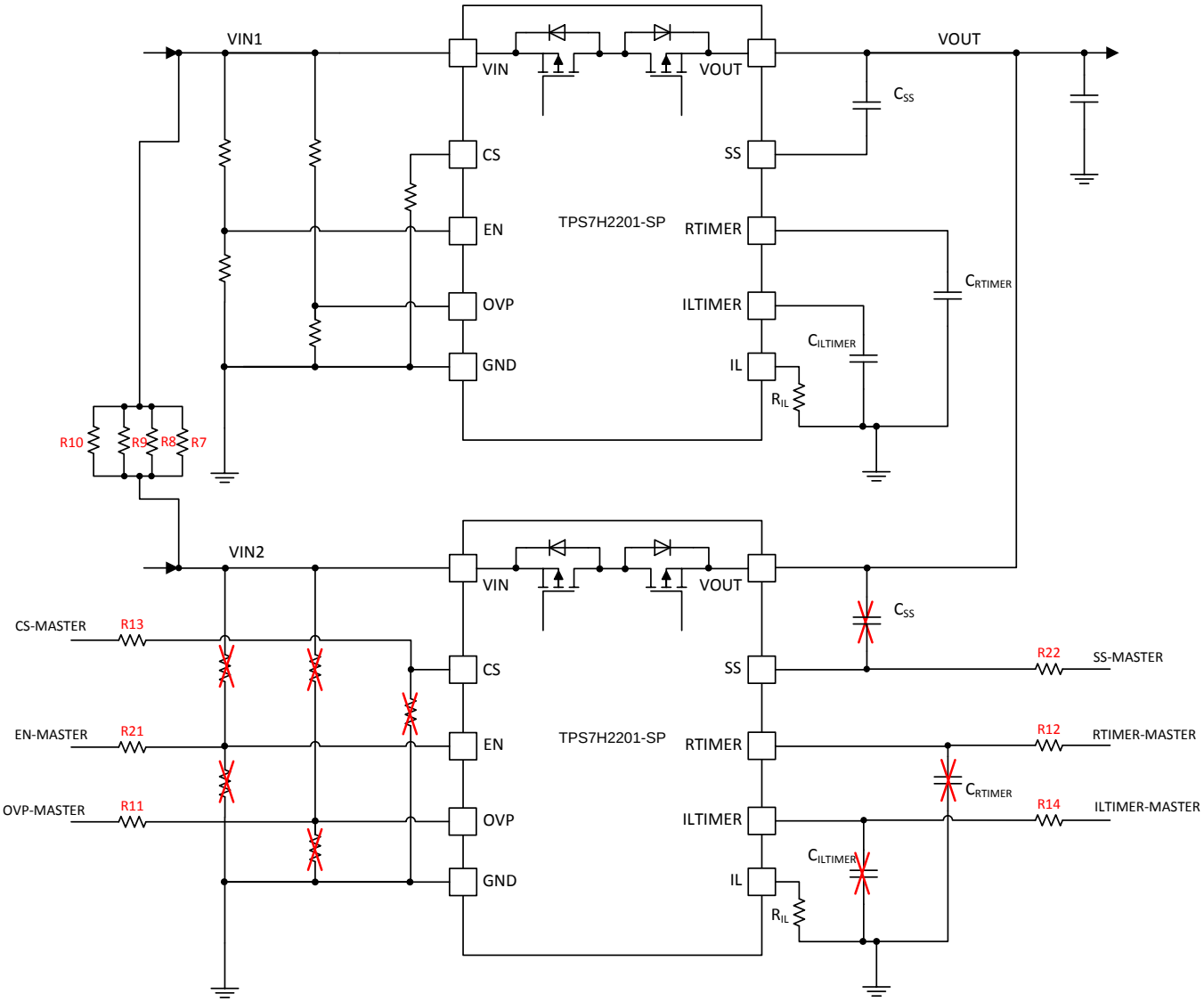



**Figure 3. Parallel Configuration for TPS7H2201EVMCVAL-D**

# 3 Test Setup and Results

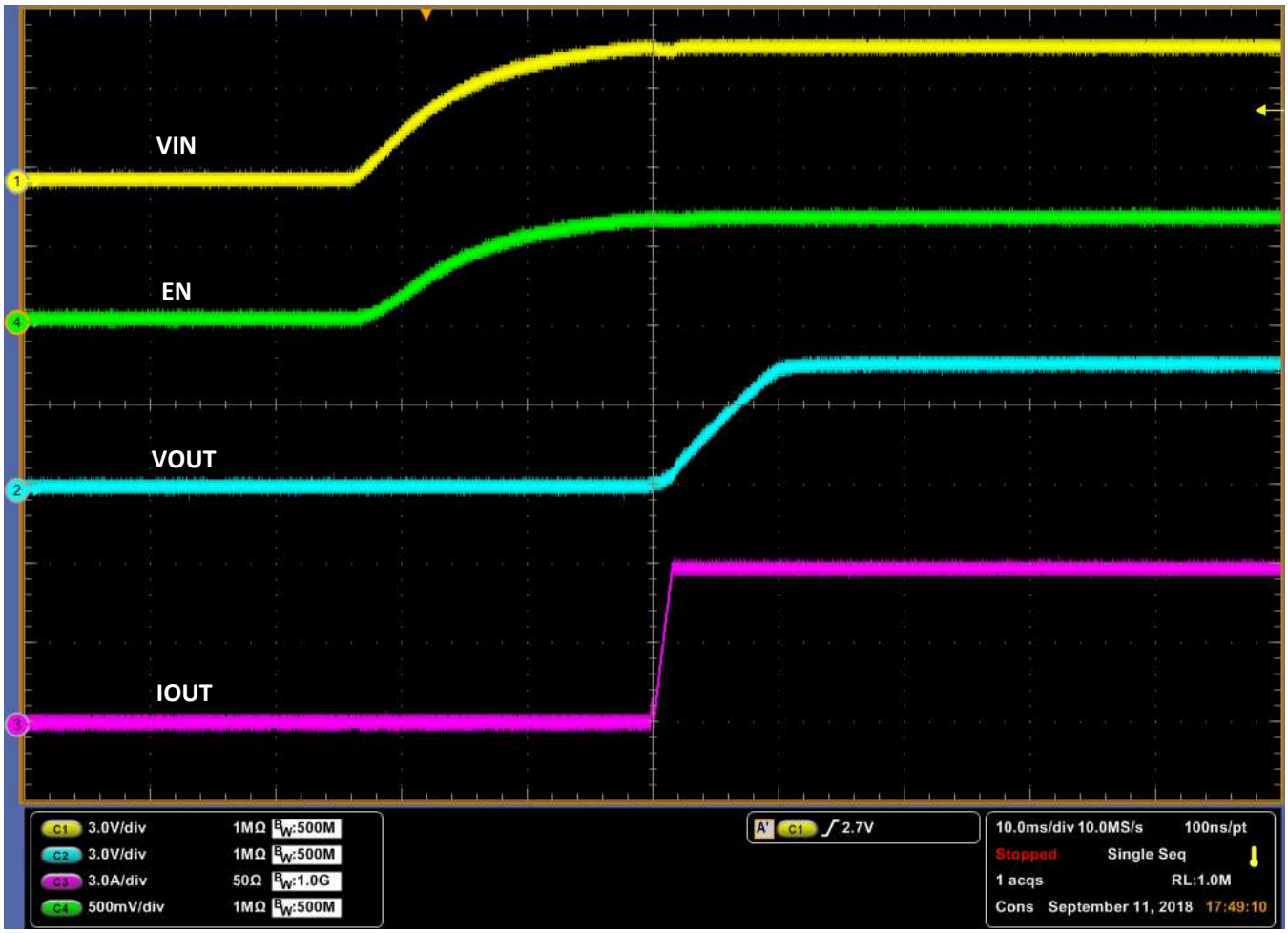
The following sections highlight some of the features of the load switch.

**CAUTION**

Please notice that under extreme fault conditions (a constant GND short on the output for example) and if the device is configured for current limit and retry mode, the amount of power dissipated by the device will be very large and as a result the board might get hot quickly.

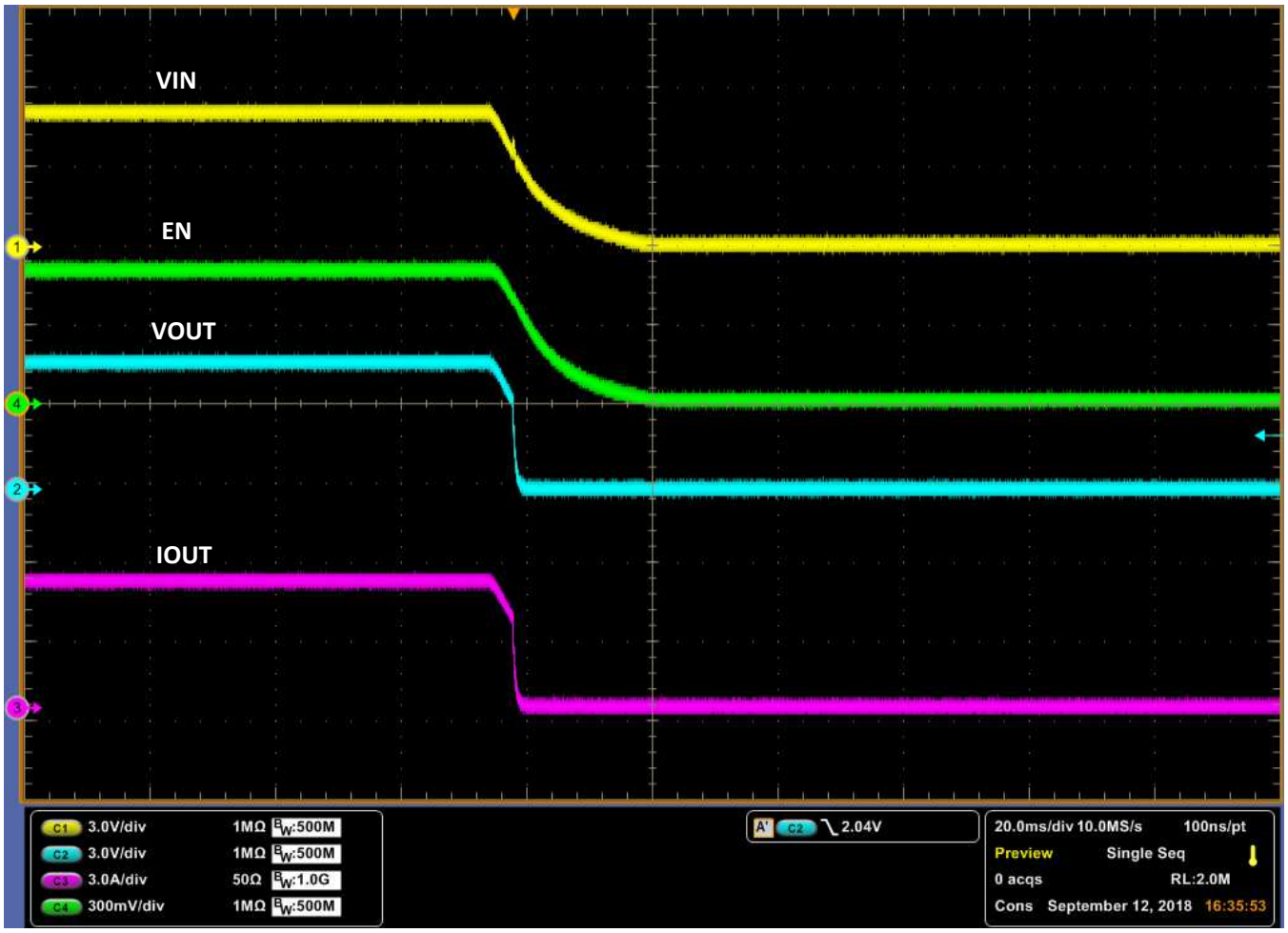
All tests were performed using the TPS7H2201EVM-CVAL in its default configuration at VIN = 5 V with the configuration shown in Table 1.

## *3.1 Power Up and Power Down*




NOTE: The VIN trace shows the enable threshold for the device set by the resistor divider to be about 4.85 V. The EN trace shows the EN pin voltage rising to 0.6 V as indicated in the data sheet. The SS time of about 9 ms can be observed having a 6-A output load.

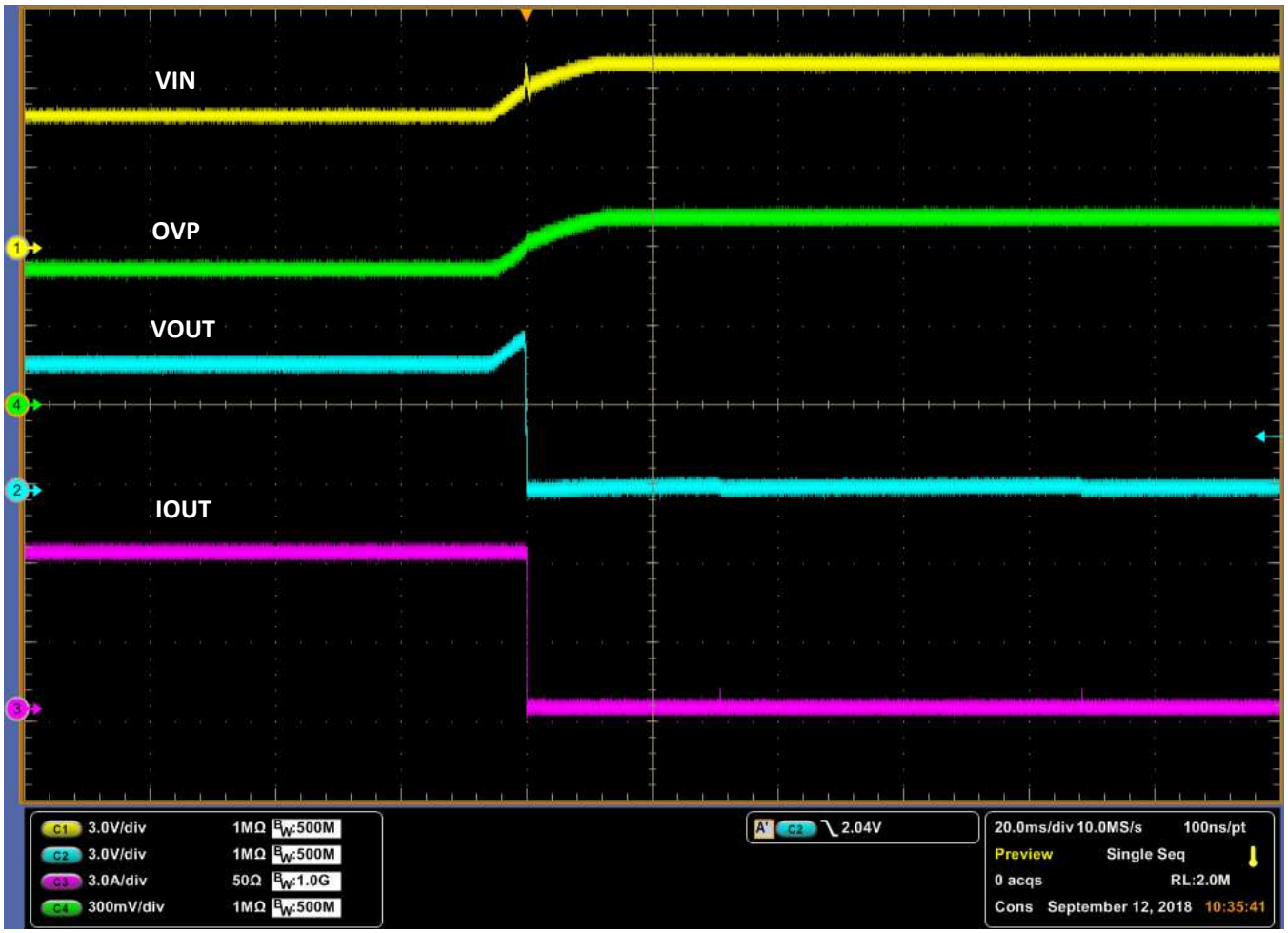
**Figure 4. Power-up Behavior of the TPS7H2201-SP**




NOTE: The VIN trace shows the UVLO threshold for the device set by the resistor divider to be about 3.7 V. Up until this point, VOUT followed VIN before the switch opens. The EN trace shows the EN pin voltage falling to about 0.5 V as indicated in the data sheet.

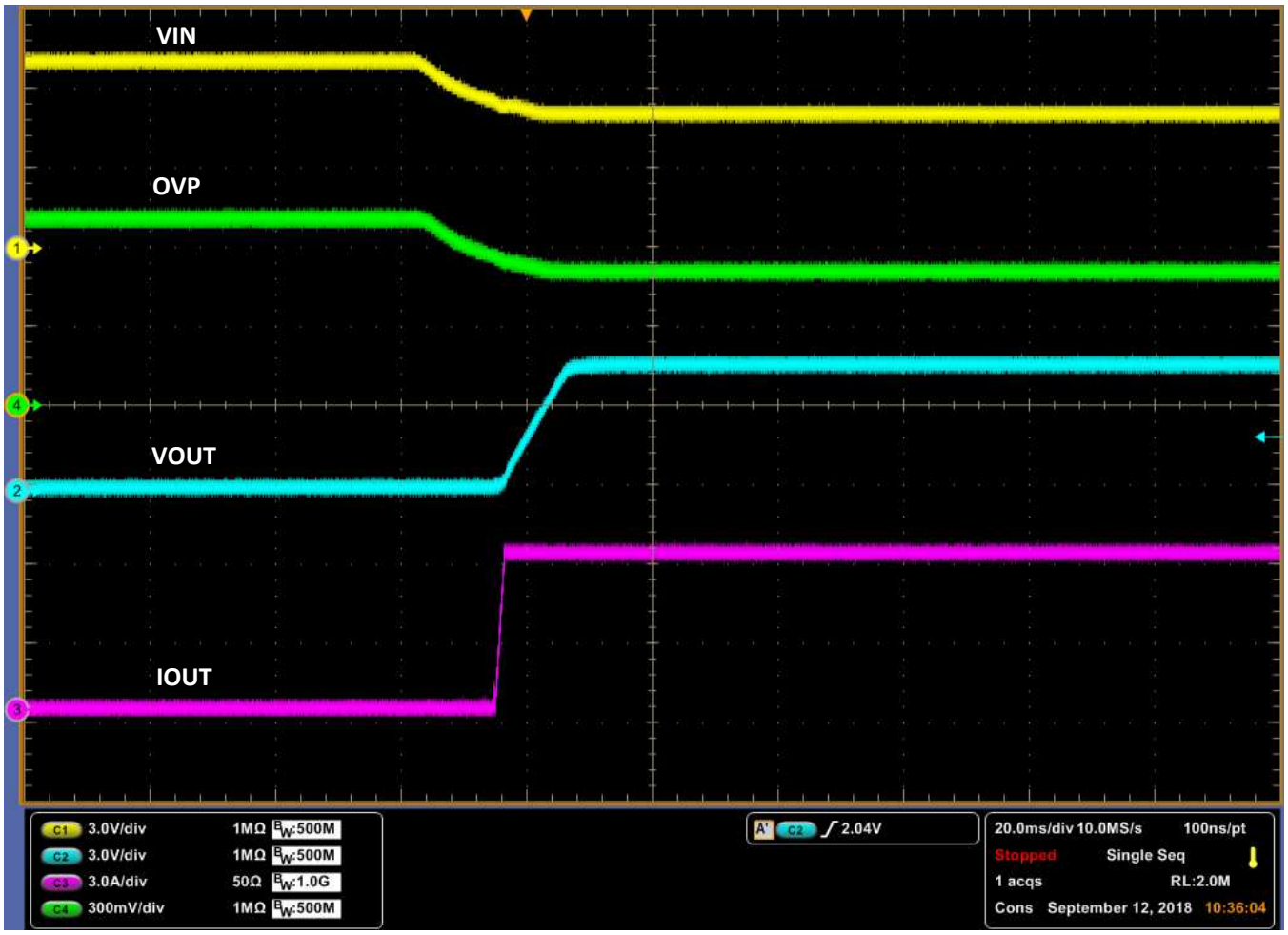
**Figure 5. Power-down Behavior of the TPS7H2201-SP**

## 3.2 Overvoltage Protection




NOTE: The switch opens at VIN = 6 V and the OVP pin trace shows to be about 0.6 V as indicated in the data sheet. Up until this point, VOUT followed VIN.

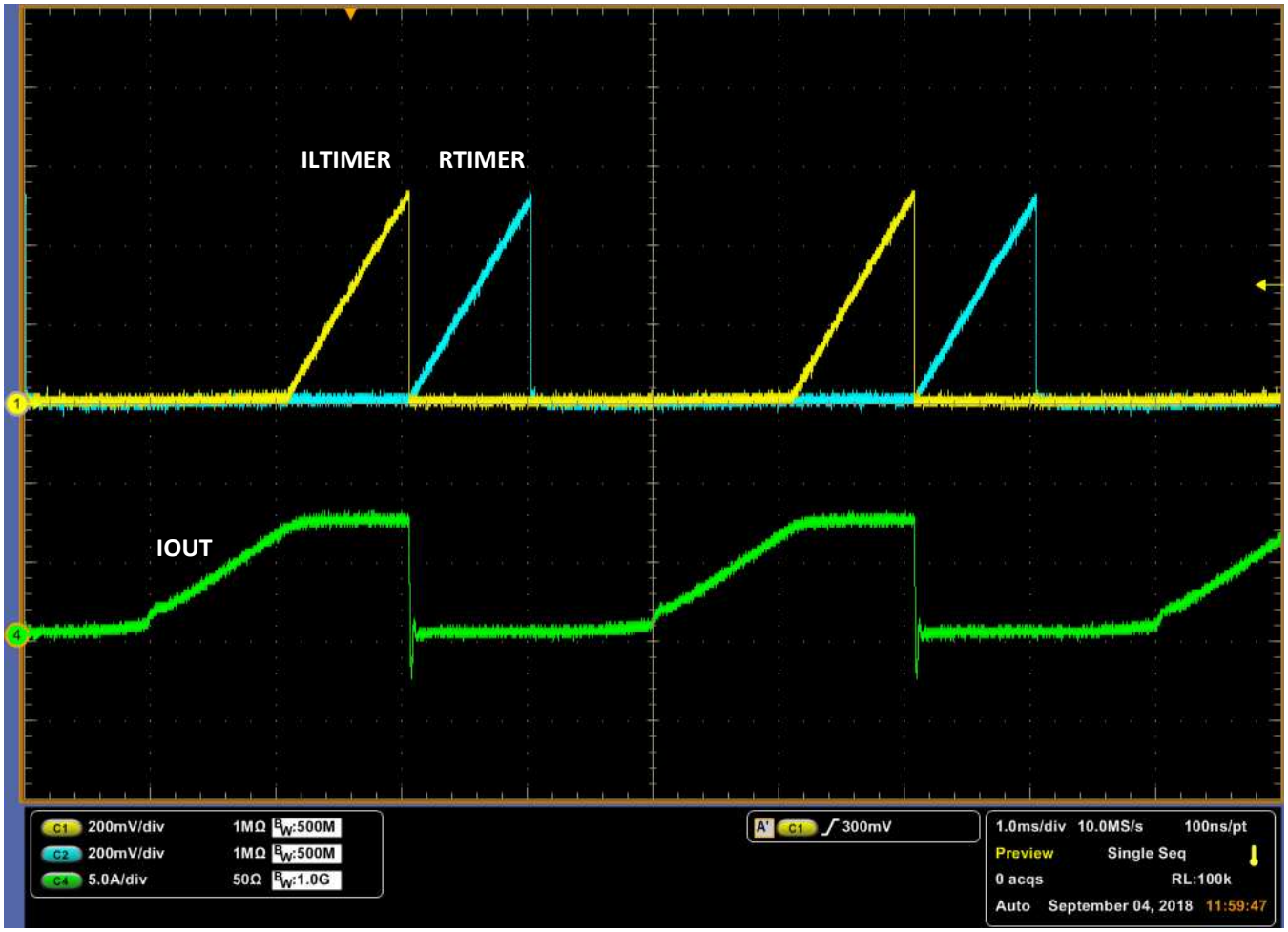
**Figure 6. OVP Assertion at VIN = 6 V Opening the Switch**




NOTE: After VIN returns to about 5.2 V, the OVP pin trace shows to be about 0.52 V as indicated in the data sheet. The switch closes again in SS mode. The SS time of about 9 ms can be observed having a 6-A output load.

**Figure 7. OVP Deassertion by Returning VIN = 5 V**

### 3.3 Programmable Fault Timers




NOTE: The 1-ms programmed time can be observed for each timer. The rising IOUT prior to each ILTIMER waveform shows the switch detecting the current limit and slowly increasing the current until IL is reached. The time after the RTIMER expires and the next cycle restarts (assuming fault condition is still present) is due to the gate of the switch being slowly driven between fault conditions.

**Figure 8. ILTIMER and RTIMER Waveforms When IL is Set to 7.5 A**

# 4 Board Layout

The EVM consists of 4 layers, 2-oz copper, for a total thickness of 62 mil. The layout flows from left (VIN) to right (VOUT) with the input and output capacitors placed as close as possible to the TPS7H2201-SP. Layer 1 contains power planes for VIN1, VIN2, VOUT and GND as well as some signal routing, layer 2 is all GND, layer 3 is GND plus some signal routing and layer 4 contains power planes for VIN1, VIN2, VOUT and GND. Vias under the TPS7H2201-SP allow a thermal path from the top layer all the way to the bottom layer. The EVM does not populate all the input and output capacitors for the TPS7H2201-SP but it allows customers to populate more as needed as the footprints are part of the layout. While this provides flexibility to the customer for electrical evaluation, it does not truly reflect the best optimized area for the TPS7H2201-SP in a real application. The EVM layers are shown next.

The following images show the TPS7H2201EVM-CVAL EVM layers.

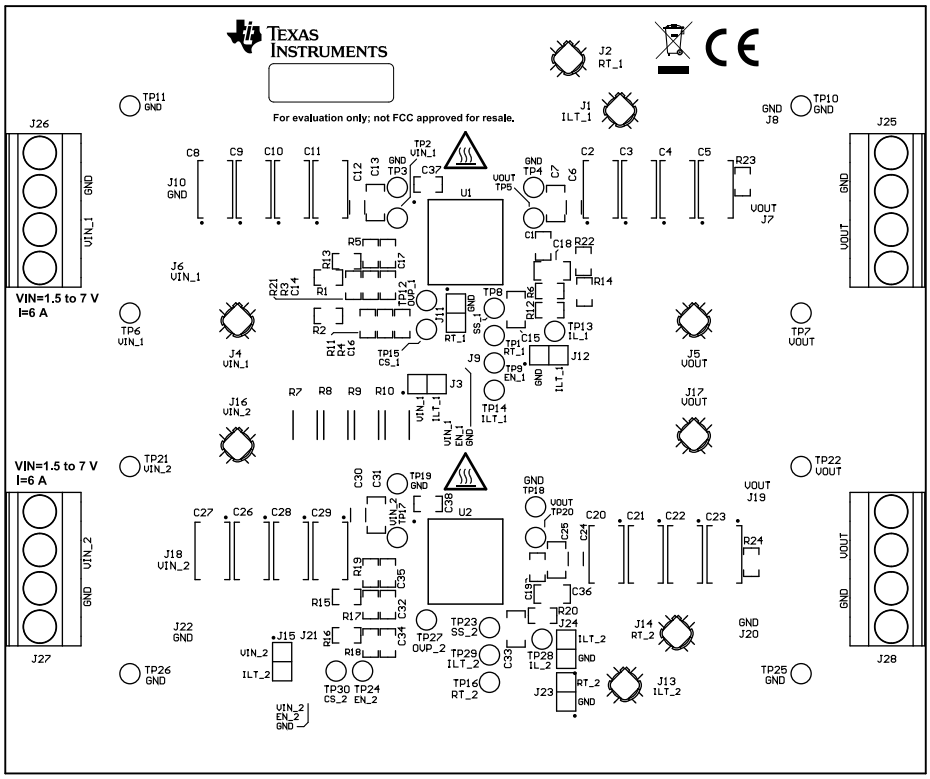



**Figure 9. Top Overlay**

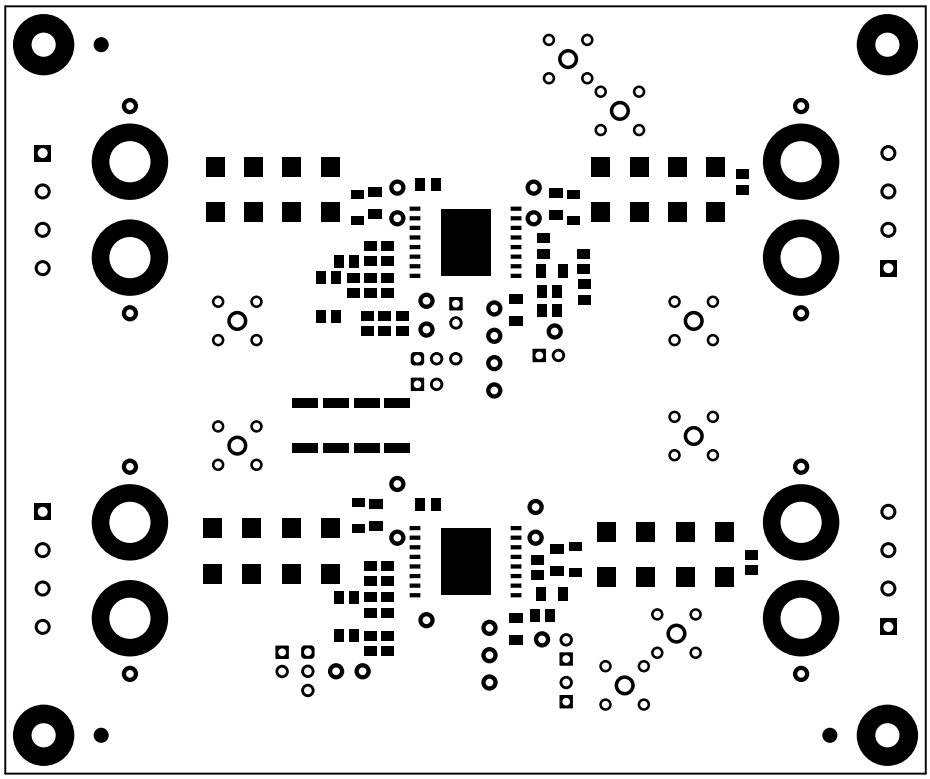


**Figure 10. Top Solder Mask**

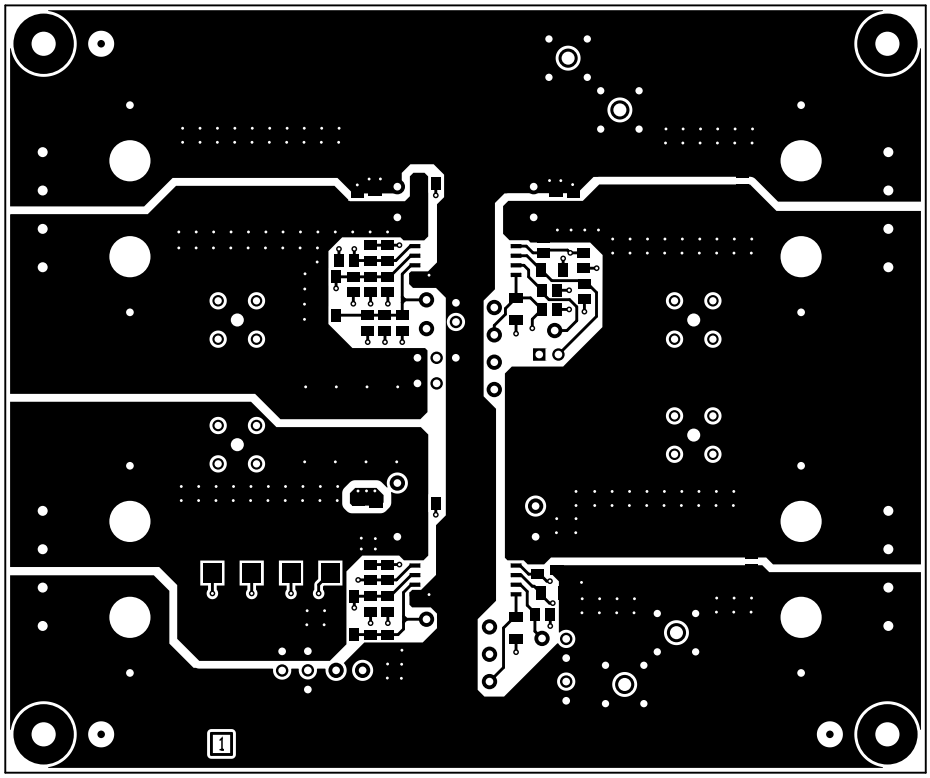


**Figure 11. Top Layer**

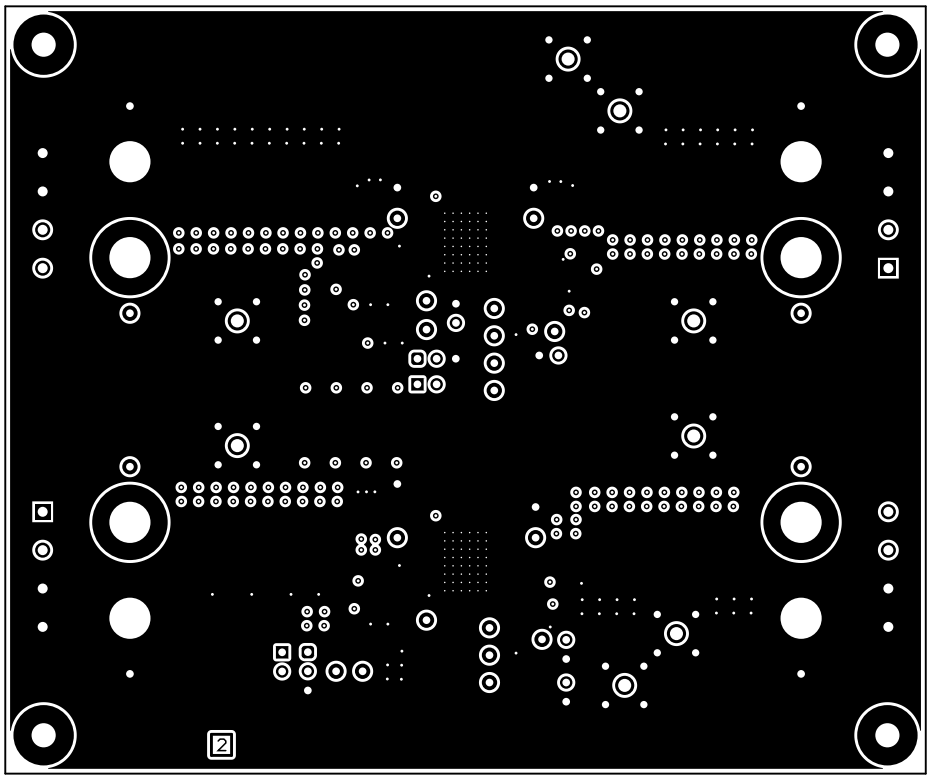



**Figure 12. Signal Layer 1**

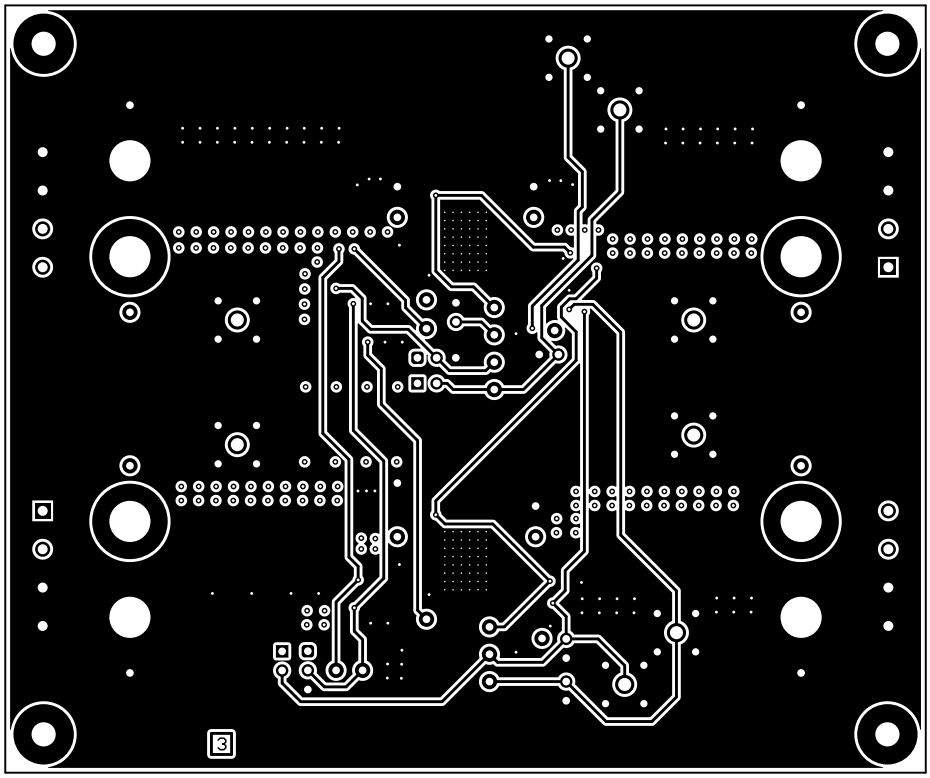



**Figure 13. Signal Layer 2**

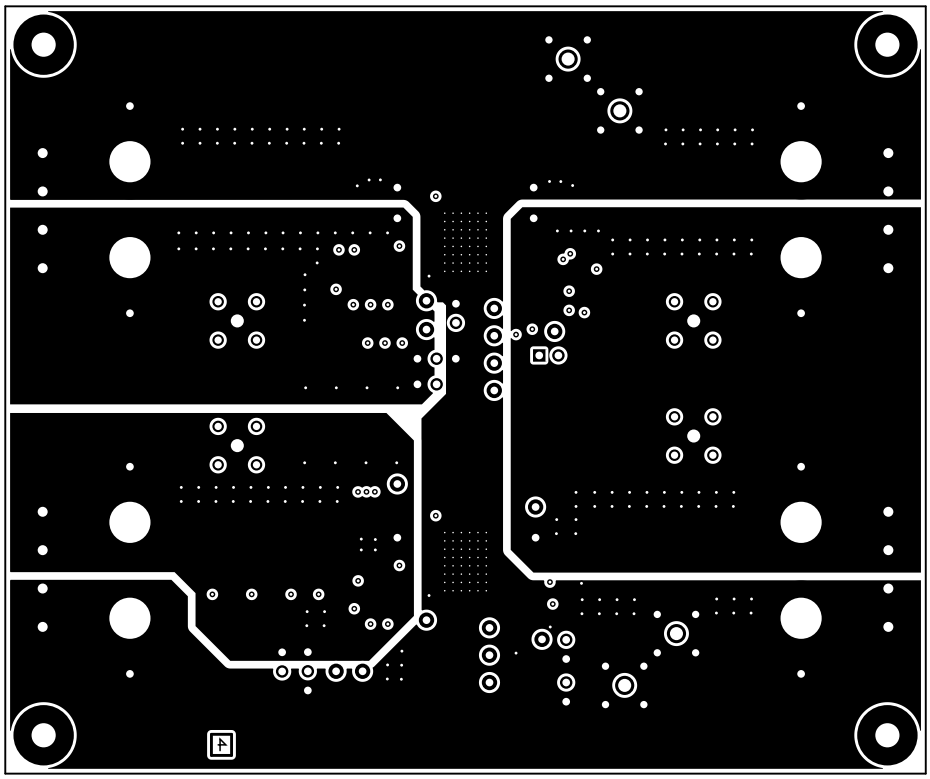


**Figure 14. Bottom Layer**

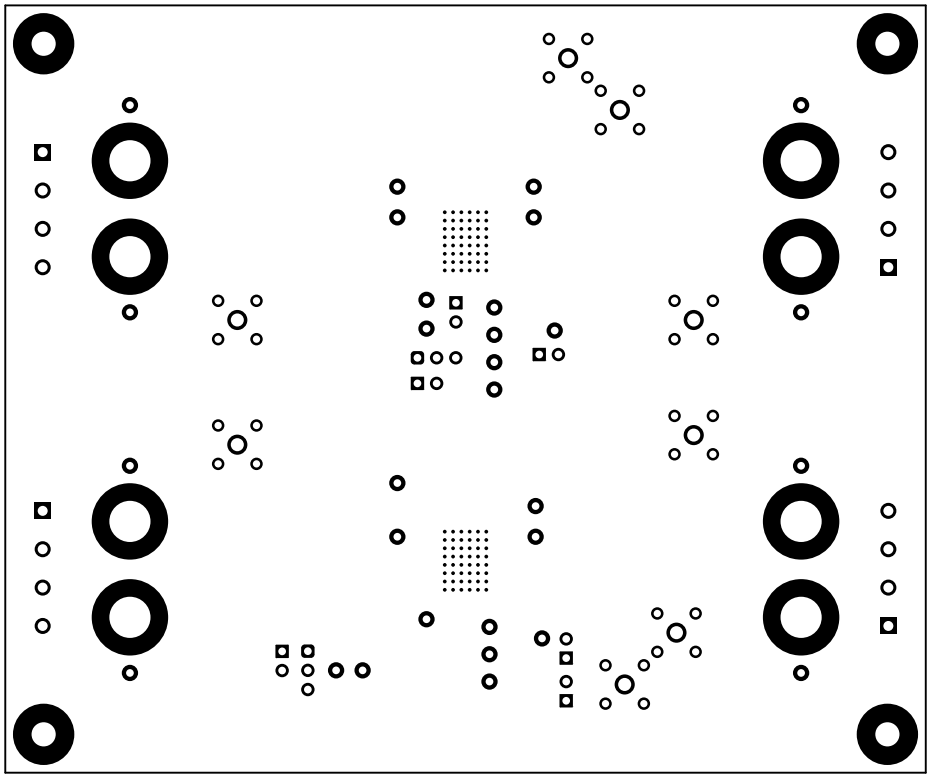
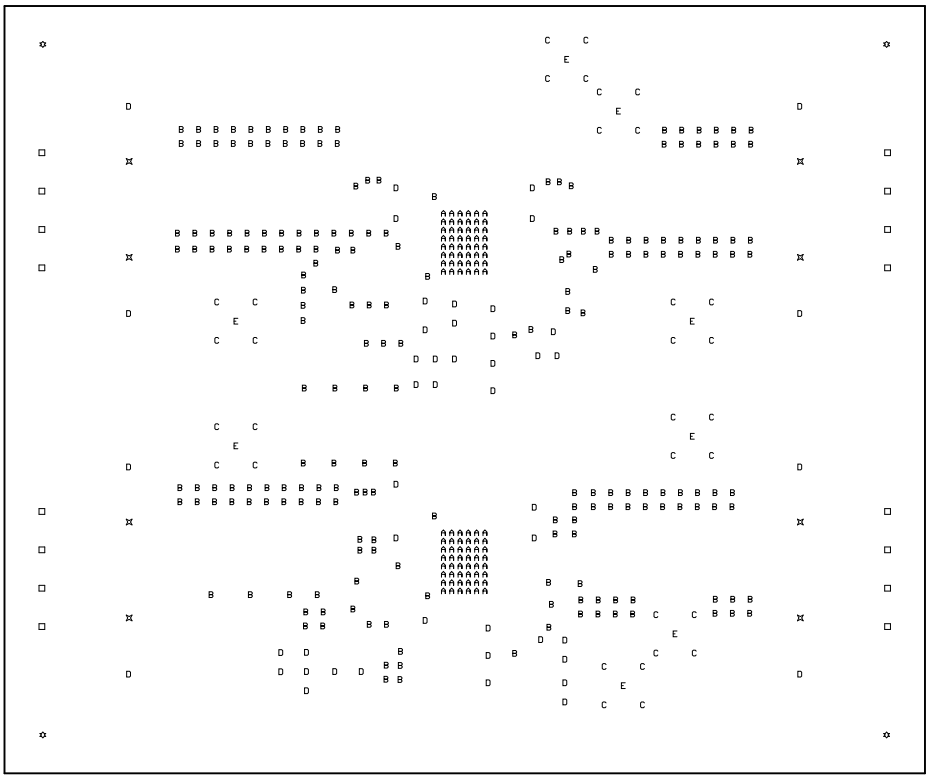


**Figure 15. Bottom Solder**



DRILL TABLE:

| Symbol | Quantity | Finished Hole Size | Plated | Hole Type | Hole Tolerance (mils) |
|---|---|---|---|---|---|
| A | 96 | 7.87mil (0.200mm) | PTH | Round | +0/-7.87 |
| B | 205 | 15.00mil (0.381mm) | PTH | Round | +0/-15 |
| C | 32 | 38.00mil (0.965mm) | PTH | Round | +/-3 |
| D | 48 | 40.00mil (1.016mm) | PTH | Round | +/-3 |
| □ | 16 | 52.00mil (1.321mm) | PTH | Round | |
| E | 8 | 68.00mil (1.727mm) | PTH | Round | +/-3 |
| ✡ | 4 | 125.98mil (3.200mm) | PTH | Round | |
| ⌘ | 8 | 214.57mil (5.450mm) | PTH | Round | |
| | 417 Total | | | | |

**Figure 16. Drill Drawing**

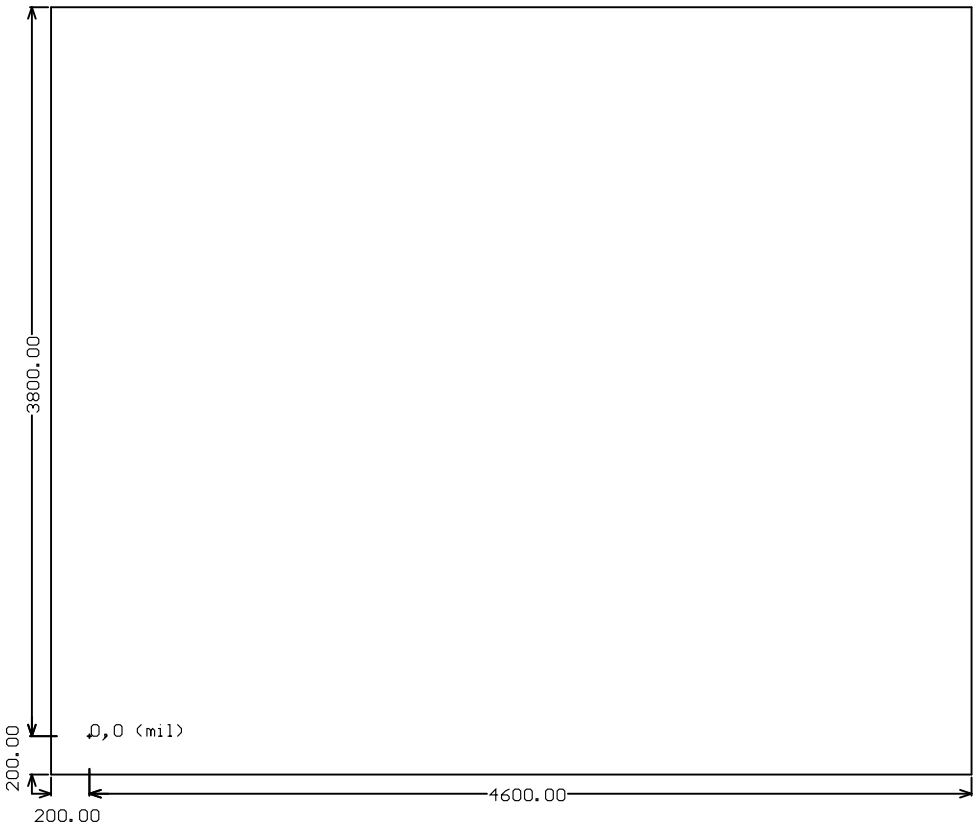



**Figure 17. Board Dimensions**

# 5 Schematic and Bill of Materials

The EVM schematics and BOM for both variants of the EVM are shown in this section.

## 5.1 Schematic

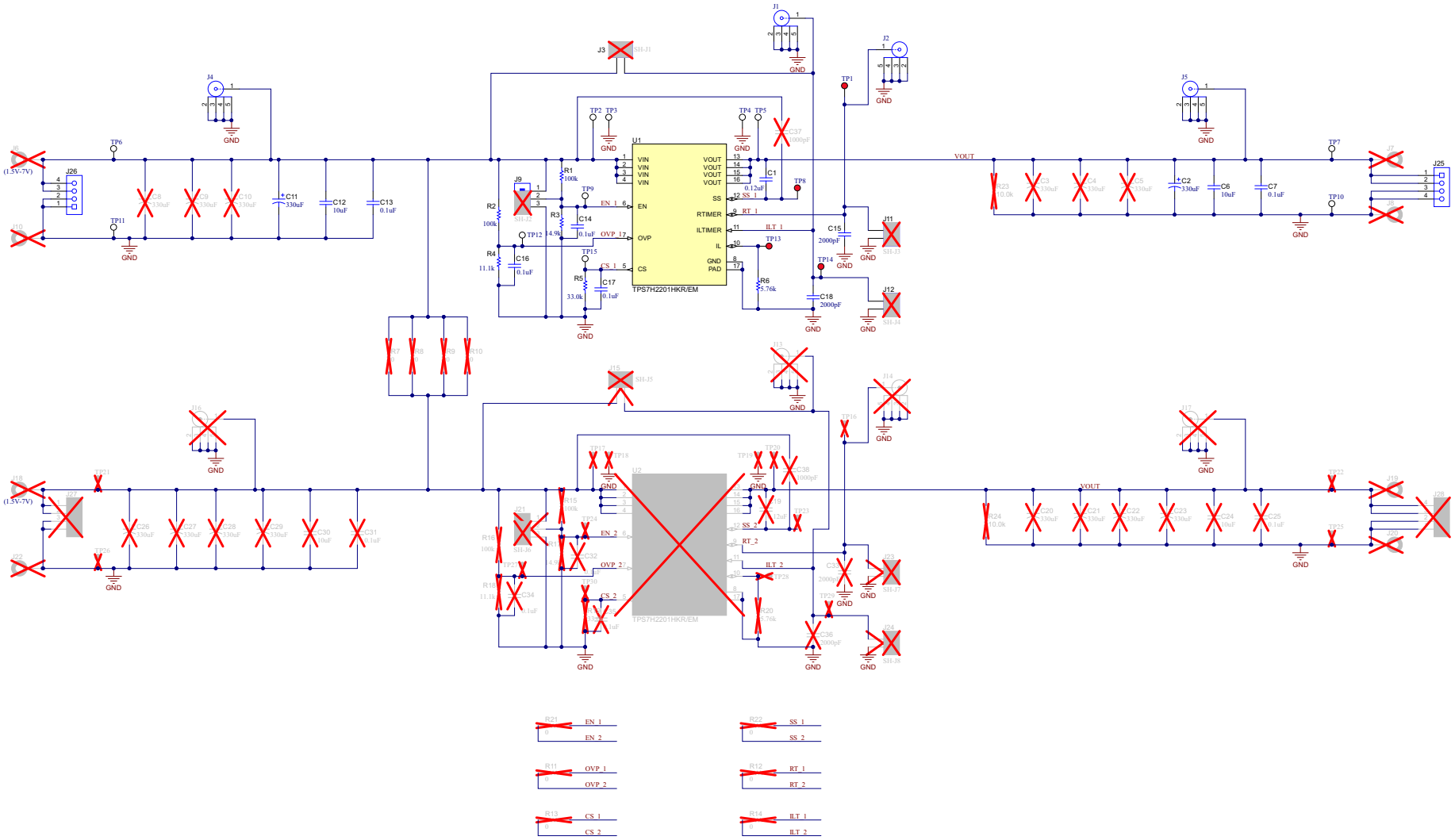



**Figure 18. Schematic for TPS7H2201EVM-CVAL**

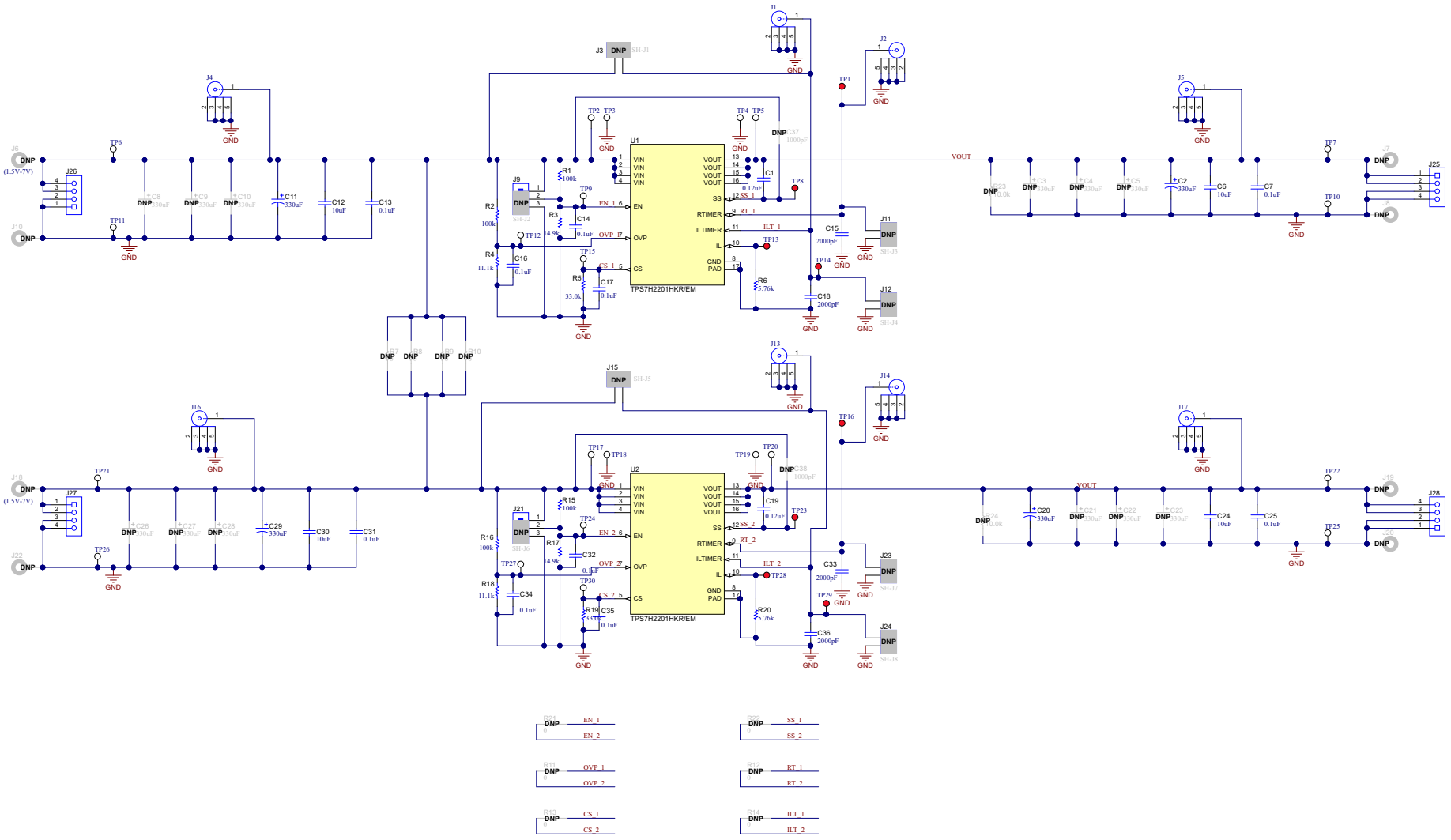



**Figure 19. Schematic for TPS7H2201EVMCVAL-D in Redundancy Configuration**

## 5.2 Bill of Materials

**Table 4. Bill of Materials for TPS7H2201EVM-CVAL**

| Description | Designator | PartNumber | QTY | Manufacturer | PackageReference | Value | Alternate Manufacturer | Alternate PartNumber | Fitted |
|---|---|---|---|---|---|---|---|---|---|
| Printed Circuit Board | !PCB1 | SLHR008 | 1 | Any | | | | | Fitted |
| CAP, CERM, 0.12 uF, 50 V, +/- 10%, X7R, 0805 | C1 | 08055C124KAT2A | 1 | AVX | 0805 | 0.12uF | | | Fitted |
| CAP, Tantalum Polymer, 330 uF, 10 V, +/- 20%, 0.006 ohm, 7343-43 SMD | C2, C11 | T530X337M010ATE006 | 2 | Kemet | 7343-43 | 330uF | | | Fitted |
| CAP, CERM, 10 uF, 50 V, +/- 10%, X5R, 1206 | C6, C12 | GRM31CR61H106KA12L | 2 | MuRata | 1206 | 10uF | | | Fitted |
| CAP, CERM, 0.1 uF, 50 V, +/- 5%, X7R, 1206 | C7, C13 | 12065C104JAT2A | 2 | AVX | 1206 | 0.1uF | | | Fitted |
| CAP, CERM, 0.1 uF, 25 V, +/- 5%, X7R, 0805 | C14, C16, C17 | 08053C104JAZ2A | 3 | AVX | 0805 | 0.1uF | | | Fitted |
| CAP, CERM, 2000 pF, 50 V,+/- 5%, C0G/NP0, 1206 | C15, C18 | 12065A202JAT2A | 2 | AVX | 1206 | 2000pF | | | Fitted |
| Machine Screw, Round, #4-40 x 1/4, Nylon, Philips panhead | H1, H2, H3, H4 | NY PMS 440 0025 PH | 4 | B&F Fastener Supply | Screw | | | | Fitted |
| Standoff, Hex, 0.5"L #4-40 Nylon | H5, H6, H7, H8 | 1902C | 4 | Keystone | Standoff | | | | Fitted |
| Compact Probe Tip Circuit Board Test Points, TH, 25 per | J1, J2, J4, J5 | 131-5031-00 | 4 | Tektronix | TH Scope Probe | | | | Fitted |
| Header, 100mil, 2x1, Gold, TH | J3, J11, J12 | HTSW-102-07-G-S | 3 | Samtec | Header, 100mil, 2x1, TH | | | | Fitted |
| Header, 100mil, 3x1, Gold, TH | J9 | TSW-103-07-G-S | 1 | Samtec | 3x1 Header | | | | Fitted |
| Terminal Block, 4x1, 5.08mm, TH | J25, J26 | 39544-3004 | 2 | Molex | 4x1 Terminal Block | | | | Fitted |
| Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll | LBL1 | THT-14-423-10 | 1 | Brady | PCB Label 0.650 x 0.200 inch | | | | Fitted |
| RES, 100 k, 0.1%, 0.125 W, 0805 | R1, R2 | RT0805BRD07100KL | 2 | Yageo America | 0805 | 100k | | | Fitted |
| RES, 14.9 k, 0.1%, 0.125 W, 0805 | R3 | RT0805BRD0714K9L | 1 | Yageo America | 0805 | 14.9k | | | Fitted |
| RES, 11.1 k, 0.1%, 0.2 W, 0805 | R4 | PTN0805E1112BST1 | 1 | Vishay Thin Film | 0805 | 11.1k | | | Fitted |
| RES, 33.0 k, 0.1%, 0.125 W, 0805 | R5 | RG2012P-333-B-T5 | 1 | Susumu Co Ltd | 0805 | 33.0k | | | Fitted |
| RES, 5.76 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805 | R6 | CRCW08055K76FKEA | 1 | Vishay-Dale | 0805 | 5.76k | | | Fitted |
| Test Point, Miniature, Red, TH | TP1, TP8, TP13, TP14 | 5000 | 4 | Keystone | Red Miniature Testpoint | | | | Fitted |
| Test Point, Miniature, White, TH | TP2, TP3, TP4, TP5, TP6, TP7, TP9, TP10, TP11, TP12, TP15 | 5002 | 11 | Keystone | White Miniature Testpoint | | | | Fitted |
| Radiation Hardened 7-V, 6-A Load Switch, HKR0016A (CFP-16) | U1 | TPS7H2201HKR/EM | 1 | Texas Instruments | HKR0016A | | Texas Instruments | | Fitted |

**Table 4. Bill of Materials for TPS7H2201EVM-CVAL (continued)**

| Description | Designator | PartNumber | QTY | Manufacturer | PackageReference | Value | Alternate Manufacturer | Alternate PartNumber | Fitted |
|---|---|---|---|---|---|---|---|---|---|
| CAP, Tantalum Polymer, 330 uF, 10 V, +/- 20%, 0.006 ohm, 7343-43 SMD | C3, C4, C5, C8, C9, C10, C20, C21, C22, C23, C26, C27, C28, C29 | T530X337M010ATE006 | 0 | Kemet | 7343-43 | 330uF | | | Not Fitted |
| CAP, CERM, 0.12 uF, 50 V, +/- 10%, X7R, 0805 | C19 | 08055C124KAT2A | 0 | AVX | 0805 | 0.12uF | | | Not Fitted |
| CAP, CERM, 10 uF, 50 V, +/- 10%, X5R, 1206 | C24, C30 | GRM31CR61H106KA12L | 0 | MuRata | 1206 | 10uF | | | Not Fitted |
| CAP, CERM, 0.1 uF, 50 V, +/- 5%, X7R, 1206 | C25, C31 | 12065C104JAT2A | 0 | AVX | 1206 | 0.1uF | | | Not Fitted |
| CAP, CERM, 0.1 uF, 25 V, +/- 5%, X7R, 0805 | C32, C34, C35 | 08053C104JAZ2A | 0 | AVX | 0805 | 0.1uF | | | Not Fitted |
| CAP, CERM, 2000 pF, 50 V,+/- 5%, C0G/NP0, 1206 | C33, C36 | 12065A202JAT2A | 0 | AVX | 1206 | 2000pF | | | Not Fitted |
| CAP, CERM, 1000 pF, 50 V, +/- 5%, X7R, 0805 | C37, C38 | C0805C102J5RACTU | 0 | Kemet | 0805 | 1000pF | | | Not Fitted |
| Fiducial mark. There is nothing to buy or mount. | FID1, FID2, FID3 | N/A | 0 | N/A | N/A | | | | Not Fitted |
| Standard Banana Jack, Uninsulated, 5.5mm | J6, J7, J8, J10, J18, J19, J20, J22 | 575-4 | 0 | Keystone | Keystone_575-4 | | | | Not Fitted |
| Compact Probe Tip Circuit Board Test Points, TH, 25 per | J13, J14, J16, J17 | 131-5031-00 | 0 | Tektronix | TH Scope Probe | | | | Not Fitted |
| Header, 100mil, 2x1, Gold, TH | J15, J23, J24 | HTSW-102-07-G-S | 0 | Samtec | Header, 100mil, 2x1, TH | | | | Not Fitted |
| Header, 100mil, 3x1, Gold, TH | J21 | TSW-103-07-G-S | 0 | Samtec | 3x1 Header | | | | Not Fitted |
| Terminal Block, 4x1, 5.08mm, TH | J27, J28 | 39544-3004 | 0 | Molex | 4x1 Terminal Block | | | | Not Fitted |
| RES, 0, 5%, 1 W, 2512 | R7, R8, R9, R10 | RC6432J000CS | 0 | Samsung | 2512 | 0 | | | Not Fitted |
| RES, 0, 5%, 0.125 W, AEC-Q200 Grade 0, 0805 | R11, R12, R13, R14, R21, R22 | CRCW08050000Z0EA | 0 | Vishay-Dale | 0805 | 0 | | | Not Fitted |
| RES, 100 k, 0.1%, 0.125 W, 0805 | R15, R16 | RT0805BRD07100KL | 0 | Yageo America | 0805 | 100k | | | Not Fitted |
| RES, 14.9 k, 0.1%, 0.125 W, 0805 | R17 | RT0805BRD0714K9L | 0 | Yageo America | 0805 | 14.9k | | | Not Fitted |
| RES, 11.1 k, 0.1%, 0.2 W, 0805 | R18 | PTN0805E1112BST1 | 0 | Vishay Thin Film | 0805 | 11.1k | | | Not Fitted |
| RES, 33.0 k, 0.1%, 0.125 W, 0805 | R19 | RG2012P-333-B-T5 | 0 | Susumu Co Ltd | 0805 | 33.0k | | | Not Fitted |
| RES, 5.76 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805 | R20 | CRCW08055K76FKEA | 0 | Vishay-Dale | 0805 | 5.76k | | | Not Fitted |
| RES, 10.0 k, 1%, 0.2 W, 0805 | R23, R24 | MCU08050C1002FP500 | 0 | Vishay/Beyschlag | 0805 | 10.0k | | | Not Fitted |
| Shunt, 100mil, Flash Gold, Black | SH-J1, SH-J2, SH-J3, SH-J4, SH-J5, SH-J6, SH-J7, SH-J8 | SPC02SYAN | 0 | Sullins Connector Solutions | Closed Top 100mil Shunt | 1x2 | | | Not Fitted |
| Test Point, Miniature, Red, TH | TP16, TP23, TP28, TP29 | 5000 | 0 | Keystone | Red Miniature Testpoint | | | | Not Fitted |

**Table 4. Bill of Materials for TPS7H2201EVM-CVAL (continued)**

| Description | Designator | PartNumber | QTY | Manufacturer | PackageReference | Value | Alternate Manufacturer | Alternate PartNumber | Fitted |
|---|---|---|---|---|---|---|---|---|---|
| Test Point, Miniature, White, TH | TP17, TP18, TP19, TP20, TP21, TP22, TP24, TP25, TP26, TP27, TP30 | 5002 | 0 | Keystone | White Miniature Testpoint | | | | Not Fitted |
| Radiation Hardened 7-V, 6-A Load Switch, HKR0016A (CFP-16) | U2 | TPS7H2201HKR/EM | 0 | Texas Instruments | HKR0016A | | Texas Instruments | | Not Fitted |

**Table 5. Bill of Materials for TPS7H2201EVMCVAL-D**

| Description | Designator | PartNumber | Quantity | Manufacturer | PackageReference | Value | Alternate Manufacturer | Alternate PartNumber | Fitted |
|---|---|---|---|---|---|---|---|---|---|
| Printed Circuit Board | !PCB1 | SLHR008 | 1 | Any | | | | | Fitted |
| CAP, CERM, 0.12 uF, 50 V, +/- 10%, X7R, 0805 | C1, C19 | 08055C124KAT2A | 2 | AVX | 0805 | 0.12uF | | | Fitted |
| CAP, Tantalum Polymer, 330 uF, 10 V, +/- 20%, 0.006 ohm, 7343-43 SMD | C2, C11, C20, C29 | T530X337M010ATE006 | 4 | Kemet | 7343-43 | 330uF | | | Fitted |
| CAP, CERM, 10 uF, 50 V, +/- 10%, X5R, 1206 | C6, C12, C24, C30 | GRM31CR61H106KA12L | 4 | MuRata | 1206 | 10uF | | | Fitted |
| CAP, CERM, 0.1 uF, 50 V, +/- 5%, X7R, 1206 | C7, C13, C25, C31 | 12065C104JAT2A | 4 | AVX | 1206 | 0.1uF | | | Fitted |
| CAP, CERM, 0.1 uF, 25 V, +/- 5%, X7R, 0805 | C14, C16, C17, C32, C34, C35 | 08053C104JAZ2A | 6 | AVX | 0805 | 0.1uF | | | Fitted |
| CAP, CERM, 2000 pF, 50 V,+/- 5%, C0G/NP0, 1206 | C15, C18, C33, C36 | 12065A202JAT2A | 4 | AVX | 1206 | 2000pF | | | Fitted |
| Machine Screw, Round, #4-40 x 1/4, Nylon, Philips panhead | H1, H2, H3, H4 | NY PMS 440 0025 PH | 4 | B-and-F Fastener Supply | Screw | | | | Fitted |
| Standoff, Hex, 0.5"L #4-40 Nylon | H5, H6, H7, H8 | 1902C | 4 | Keystone | Standoff | | | | Fitted |
| Compact Probe Tip Circuit Board Test Points, TH, 25 per | J1, J2, J4, J5, J13, J14, J16, J17 | 131-5031-00 | 8 | Tektronix | TH Scope Probe | | | | Fitted |
| Header, 100mil, 2x1, Gold, TH | J3, J11, J12, J15, J23, J24 | HTSW-102-07-G-S | 6 | Samtec | Header, 100mil, 2x1, TH | | | | Fitted |
| Header, 100mil, 3x1, Gold, TH | J9, J21 | TSW-103-07-G-S | 2 | Samtec | 3x1 Header | | | | Fitted |

**Table 5. Bill of Materials for TPS7H2201EVMCVAL-D (continued)**

| Description | Designator | PartNumber | Quantity | Manufacturer | PackageReference | Value | Alternate Manufacturer | Alternate PartNumber | Fitted |
|---|---|---|---|---|---|---|---|---|---|
| Terminal Block, 4x1, 5.08mm, TH | J25, J26, J27, J28 | 39544-3004 | 4 | Molex | 4x1 Terminal Block | | | | Fitted |
| Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll | LBL1 | THT-14-423-10 | 1 | Brady | PCB Label 0.650 x 0.200 inch | | | | Fitted |
| RES, 100 k, 0.1%, 0.125 W, 0805 | R1, R2, R15, R16 | RT0805BRD07100KL | 4 | Yageo America | 0805 | 100k | | | Fitted |
| RES, 14.9 k, 0.1%, 0.125 W, 0805 | R3, R17 | RT0805BRD0714K9L | 2 | Yageo America | 0805 | 14.9k | | | Fitted |
| RES, 11.1 k, 0.1%, 0.2 W, 0805 | R4, R18 | PTN0805E1112BST1 | 2 | Vishay Thin Film | 0805 | 11.1k | | | Fitted |
| RES, 33.0 k, 0.1%, 0.125 W, 0805 | R5, R19 | RG2012P-333-B-T5 | 2 | Susumu Co Ltd | 0805 | 33.0k | | | Fitted |
| RES, 5.76 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805 | R6, R20 | CRCW08055K76FKEA | 2 | Vishay-Dale | 0805 | 5.76k | | | Fitted |
| Test Point, Miniature, Red, TH | TP1, TP8, TP13, TP14, TP16, TP23, TP28, TP29 | 5000 | 8 | Keystone | Red Miniature Testpoint | | | | Fitted |
| Test Point, Miniature, White, TH | TP2, TP3, TP4, TP5, TP6, TP7, TP9, TP10, TP11, TP12, TP15, TP17, TP18, TP19, TP20, TP21, TP22, TP24, TP25, TP26, TP27, TP30 | 5002 | 22 | Keystone | White Miniature Testpoint | | | | Fitted |
| Radiation Hardened 7-V, 6-A Load Switch, HKR0016A (CFP-16) | U1, U2 | TPS7H2201HKR/EM | 2 | Texas Instruments | HKR0016A | | Texas Instruments | | Fitted |
| CAP, Tantalum Polymer, 330 uF, 10 V, +/- 20%, 0.006 ohm, 7343-43 SMD | C3, C4, C5, C8, C9, C10, C21, C22, C23, C26, C27, C28 | T530X337M010ATE006 | 0 | Kemet | 7343-43 | 330uF | | | Not Fitted |
| CAP, CERM, 1000 pF, 50 V, +/- 5%, X7R, 0805 | C37, C38 | C0805C102J5RACTU | 0 | Kemet | 0805 | 1000pF | | | Not Fitted |
| Fiducial mark. There is nothing to buy or mount. | FID1, FID2, FID3 | N/A | 0 | N/A | N/A | | | | Not Fitted |
| Standard Banana Jack, Uninsulated, 5.5mm | J6, J7, J8, J10, J18, J19, J20, J22 | 575-4 | 0 | Keystone | Keystone_575-4 | | | | Not Fitted |

**Table 5. Bill of Materials for TPS7H2201EVMCVAL-D (continued)**

| Description | Designator | PartNumber | Quantity | Manufacturer | PackageReference | Value | Alternate Manufacturer | Alternate PartNumber | Fitted |
|---|---|---|---|---|---|---|---|---|---|
| RES, 0, 5%, 1 W, 2512 | R7, R8, R9, R10 | RC6432J000CS | 0 | Samsung | 2512 | 0 | | | Not Fitted |
| RES, 0, 5%, 0.125 W, AEC-Q200 Grade 0, 0805 | R11, R12, R13, R14, R21, R22 | CRCW08050000Z0EA | 0 | Vishay-Dale | 0805 | 0 | | | Not Fitted |
| RES, 10.0 k, 1%, 0.2 W, 0805 | R23, R24 | MCU08050C1002FP500 | 0 | Vishay/Beyschlag | 0805 | 10.0k | | | Not Fitted |
| Shunt, 100mil, Flash Gold, Black | SH-J1, SH-J2, SH-J3, SH-J4, SH-J5, SH-J6, SH-J7, SH-J8 | SPC02SYAN | 0 | Sullins Connector Solutions | Closed Top 100mil Shunt | 1x2 | | | Not Fitted |

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265