

**ABSTRACT**

This document is the user's guide for TPS25762Q1EVM-146, TPS25772Q1EVM-149, and TPS25772Q1EVM-150 Evaluation Modules. The EVMs allow for evaluation of the TPS25762-Q1 and TPS25772-Q1 IC as part of a stand-alone testing kit and for development and testing of USB Type-C and Power Delivery (PD) end products. This EVM board is designed for dual PD charging ports. According to different components installation, it can support dual ports charging only (TPS25772Q1EVM-149), dual ports charging + USB2.0 data (TPS25772Q1EVM-150), single port charging only (TPS25762Q1EVM-146). This EVM integrates the TIVA microcontroller and HUB IC, these enable us to support online debugging, online updating EEPROM and support dual ports USB2.0 data. This EVM also integrates some peripherals to implement multiple function of TPS25762/72-Q1, such as temperature sensor, IO expander, and digital potentiometer.

**Table 1-1. TPS25772/62-Q1 EVM Variants**

Number	EVM Variants	Description
1	TPS25762Q1EVM-146	Single port charging only
2	TPS25772Q1EVM-149	Dual ports charging only
3	TPS25772Q1EVM-150	Dual ports charging + USB2.0 Data

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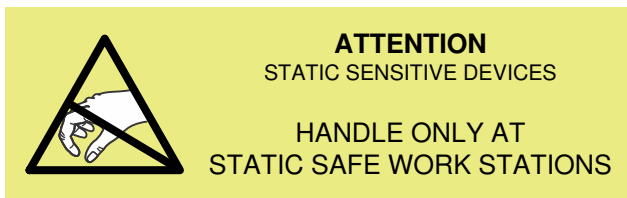
### Trademarks

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 All trademarks are the property of their respective owners.

## 1 About this Manual

This user's guide describes the TPS25762/72-Q1 EVM. The guide consists of an introduction, setup instructions, the EVM schematic, board layouts, component views, internal power (PWR) and ground (GND) plane layouts, and a bill of materials (BOM).

## 2 Information About Cautions and Warnings



### CAUTION

This EVM contains components that can potentially be damaged by electrostatic discharge. Always transport and store the EVM in the supplied ESD bag when not in use. Handle using an antistatic wristband. Operate on an antistatic work surface. For more information on proper handling, see [Electrostatic Discharge \(ESD\)](#).

## 3 Items Required for Operation

The following items are required to use the TPS25762/72-Q1 EVM:

- TPS25762/72-Q1 datasheet
- TPS25762/72-Q1 EVM
- *TPS25762/72-Q1 Configuration Tool*
- 5.5V~18V DC power supply
- Passive USB Type-C® E-Marker cables
- USB Type-A to USB Micro-B cable
- Notebook with USB 2.0 capabilities

## 4 Introduction

The TPS25762/72-Q1 is a fully integrated USB Type-C® Power Delivery (PD) solution with integrated buck-boost converter for using in automotive single and dual USB port applications including: charging only and charging with USB 2.0 or 3.0 data. It is comprised of an ARM® Cortex®-M0; one integrated Buck-Boost converter with 4 power switches; USB port controller with Type-C cable plug and orientation detection; USB Battery Charging Specification Version 1.2 (BC1.2) detection; USB PD PHYs; integrated Short to VBUS and VBAT Protection. Firmware updates are supported using the internal USB Endpoint on Port A.

This user's guide describes how the TPS25762/72-Q1 EVM can be used to test PD functions as well as USB Data. The EVM is customizable through the [TPS2577x/6x-Q1 Configuration Tool](#). Additionally, the EVM is equipped with Aardvark connector to I<sup>2</sup>C interfaces, USB micro-B interface and USB2ANY interface for debugging and development.

## 5 Setup

This section describes the various EVM features and how to test these features. Schematic images, pictures, and block diagrams are provided as necessary.

### 5.1 Switch, Push Button, Connector, and Test Points Descriptions

Switch, push button, connector, and test points as shown in [Table 5-1](#).

**Table 5-1. Components and Functions**

Number	Function
S1	Reset push button. Push to reset TPS25762/72-Q1.
J1	NTC input. Can connect to NTC divider or TPL0102 output.
J2	JTAG connector.
J3	NTC pin and SYNC pin to JTAG connector.
J4	Test points of expander GPIOs.
J5	Connect the NTC pin to digital temperature sensor.
J6	I <sup>2</sup> C mux. Connect I <sup>2</sup> C1 of IC to different devices.
J7	Jumper to connect TVSP pin to different resistor.
J8	USB2ANY connector.
J9	I <sup>2</sup> C mux. Connect Aardvark and USB2ANY to I <sup>2</sup> C1/2/3.
J10	Aardvark connector.
J11	Test point of I <sup>2</sup> C1/2/3.
J12	VIN connector.
J13	GND connector.
J14	From left to right: 5-V buck enable connector; external 5-V VCONN connector; 3.3-V, 1.1-V buck connector.
J15	Choose SYNC mode for TPS55288-Q1.
J16	Micro-B USB connector.
J17	Test point for TIVA JTAG_SWD_SWO signals.
J18/J19	Header to configure GPIO9.
J20	Choose enable signal for TPS55288-Q1.
Other test points	See marking on PCB board.

## 5.2 Jumper Configuration

This section describes the configuration of main jumpers. You can configure the jumpers according to your application.

### J1 NTC Header

The J1 header is used to verify the thermal foldback function. The NTC pin actually detects the voltage of external NTC circuit, it can be connected to thermistor(NTC or PTC) divider or NTC\_VAR. NTC\_VAR is the output of TPL0102, which is a I<sup>2</sup>C digital potentiometer. If you are sure what type of thermistor to be used on your system, you can put the thermistor and resistor divider on our EVM board to test the thermal foldback function. If you can use I<sup>2</sup>C to control the output of TPL0102, you can connect to NTC\_VAR. Or you can directly apply an external voltage to NTC contact pin without any jumper. The thermistor assembled on the EVM is positive temperature coefficient(PTC).

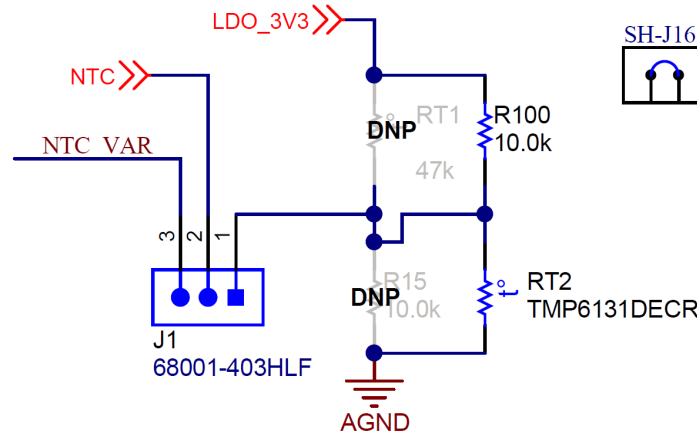


Figure 5-1. J1 NTC Header

### J6 I<sup>2</sup>C MUX

This header expands the I<sup>2</sup>C1 connections of TPS25762/72-Q1: it can connect to GPIO expander, I<sup>2</sup>C temperature sensor and EEPROM. Since I<sup>2</sup>C bus can support multiple slaves, it is recommended to connect all pins.

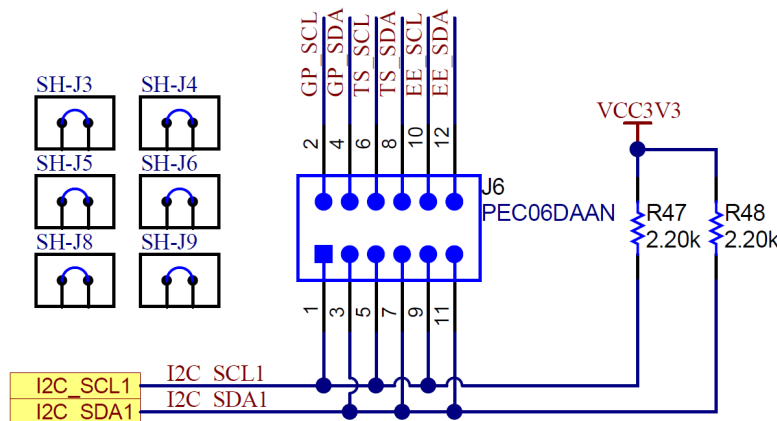


Figure 5-2. J6 I<sup>2</sup>C MUX

### J7 TVSP Connector

Figure 5-3 shows the J7 connector schematic. J7 is the jumper for connecting the TVSP pin to a different resistor. The resistance between the TVSP pin and PGND determines the boot mode, USB PD port I<sup>2</sup>C addresses and I<sup>2</sup>C logic thresholds, you can get more details through the TPS25762/72-Q1 data sheet. Default open corresponds to EEPROM boot mode and 0x22/0x26 I2C address for port A/B. For firmware update mode, connect a shunt on the pins 15 and 16 of J7.

In order to support USB connector pin short to VBUS or VBAT protection, it is recommended to connect an RC circuit on TVSP pin as shown in Figure 5-4 .

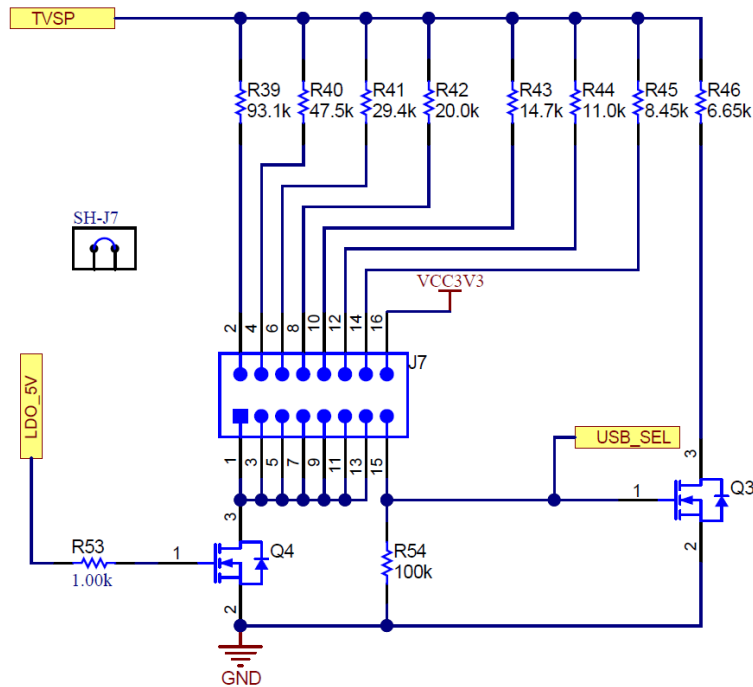


Figure 5-3. J7 TVSP Connector

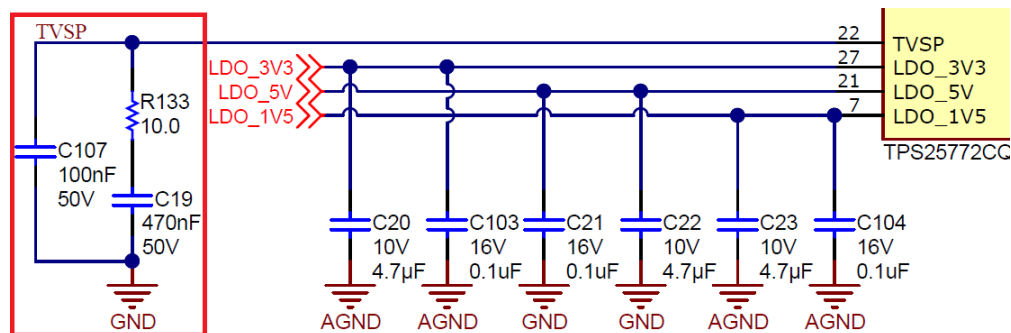


Figure 5-4. TVSP Damper Network

### J8 USB2ANY Connector, J9 I<sup>2</sup>C MUX, and J10 Aardvark Connector

J8 and J10 are the I<sup>2</sup>C connectors for USB2ANY and Aardvark tools. J9 is I<sup>2</sup>C mux for USB2ANY and Aardvark. The I<sup>2</sup>C from USB2ANY or Aardvark can be configured to be connected to I<sup>2</sup>C1, I<sup>2</sup>C2, and I<sup>2</sup>C3. Since I<sup>2</sup>C bus can support multiple slaves, it is recommended to connect all pins.

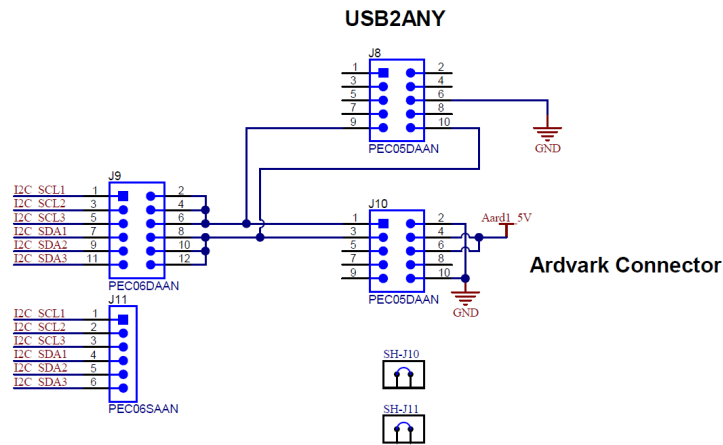


Figure 5-5. Connectors and MUX for USB2ANY and Aardvark

### J14 External VCONN and Auxiliary Power Enable Connector

J14 is used to choose VCONN source and enable external 5 V, 3.3 V and 1.1 V auxiliary power. 3.3 V and 1.1 V voltage are power source of HUB and TIVA. To make sure the EVM board have full function, we recommend connecting all pins of J14. Schematic is shown in [Figure 6-5](#)

### J15 DITH/SYNC Connector

J15 is dithering or synchronous selector for TPS55288-Q1. DITH/SYNC pin can be configured to connect to C75 to set a dithering frequency or connect to TPS25762/72-Q1 SYNC output to synchronize the switching frequency.

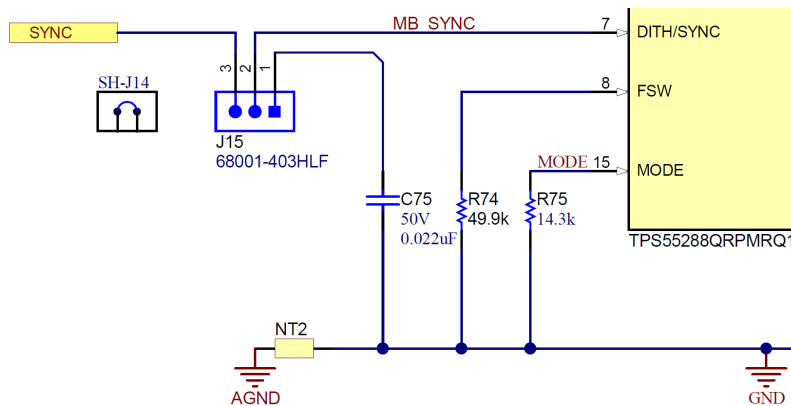


Figure 5-6. J15 DITH/SYNC Connector

### J18/J19 GPIO9 configuration

J18 and J19 is used to configure the GPIO9 according to the function of GPIO9 pin. J18 is the header used to configure GPIO9 as an interrupt I/O for I2C. J19 is the header used to configure GPIO9 as an enable signal or discharge signal for Port B.

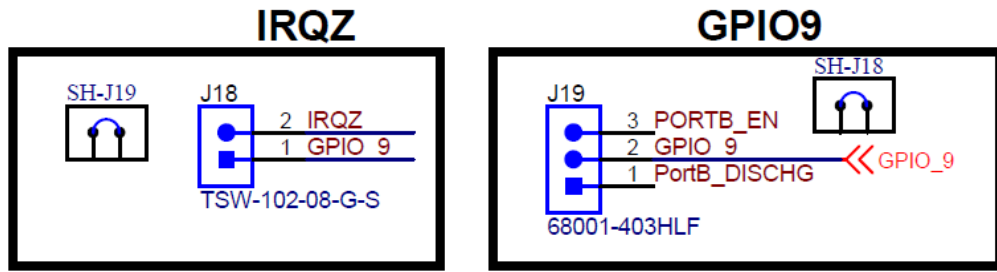


Figure 5-7. J18/J19 GPIO9 Configuration

**J20 Enable Signal for TPS55288-Q1**

J20 is the header to configure the enable signal of TPS55288-Q1. The default enable signal is the 3.3V LDO from TPS25772-Q1. It can be configured to GPIO9 or external enable signal as needed.

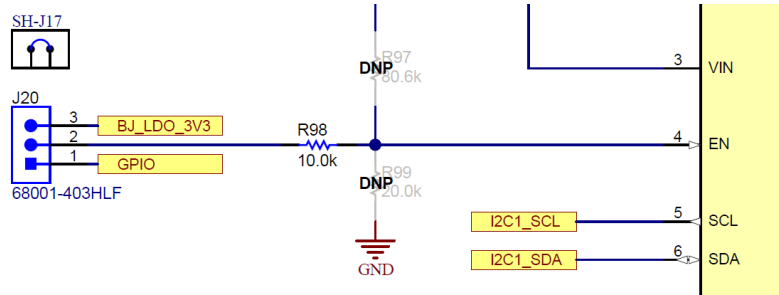


Figure 5-8. J20 Enable Signal for TPS55288-Q1



## 6 Schematics

This section shows the various EVM schematics of TPS25762Q1EVM-146, TPS25772Q1EVM-149, and TPS25772EVM-150. The whole schematic consists of one main schematic and seven sub schematics.

### 6.1 Main Schematic

Figure 6-1 shows the main schematic of TPS25762EVM-146, Figure 6-2 shows the main schematic of TPS25772Q1EVM-149, and Figure 6-3 shows the main schematic of TPS25772Q1EVM-150.

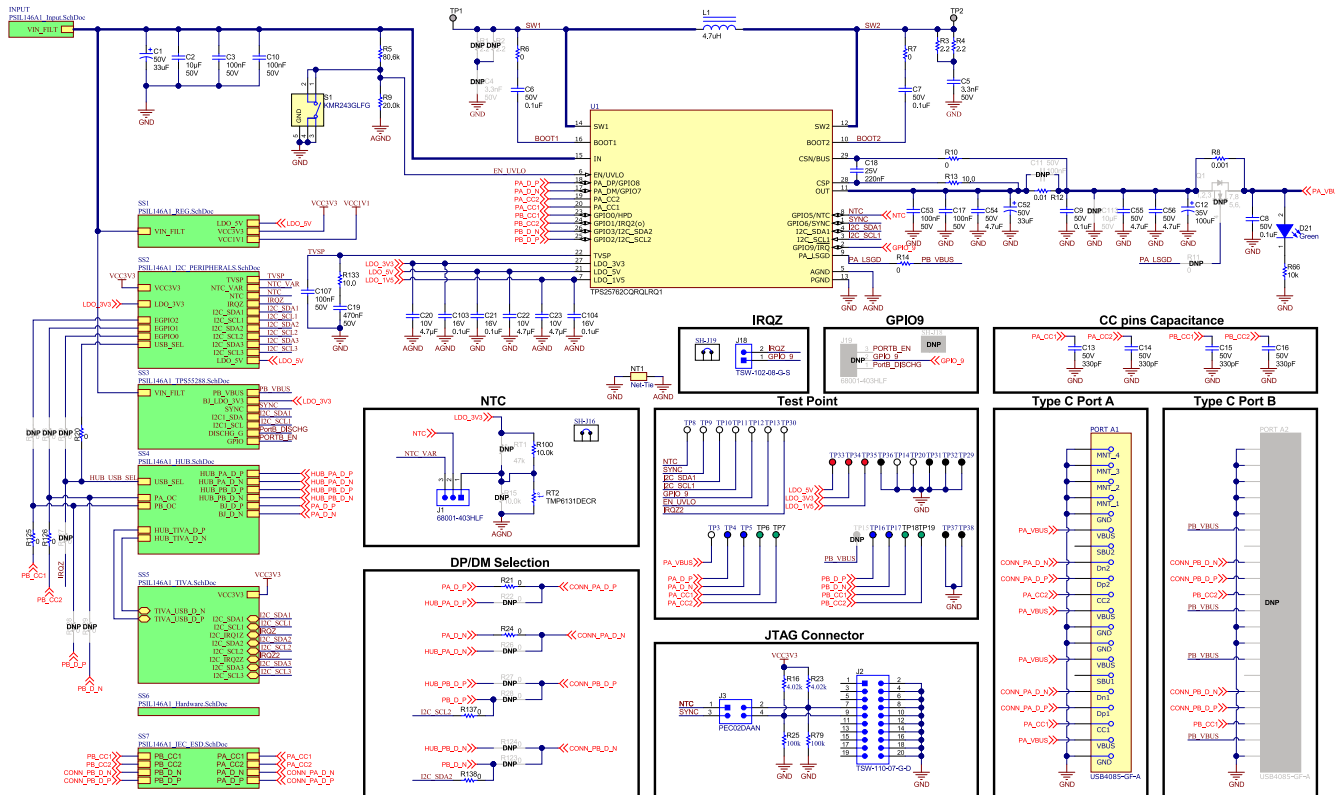


Figure 6-1. TPS25762Q1EVM-146 Main Schematic

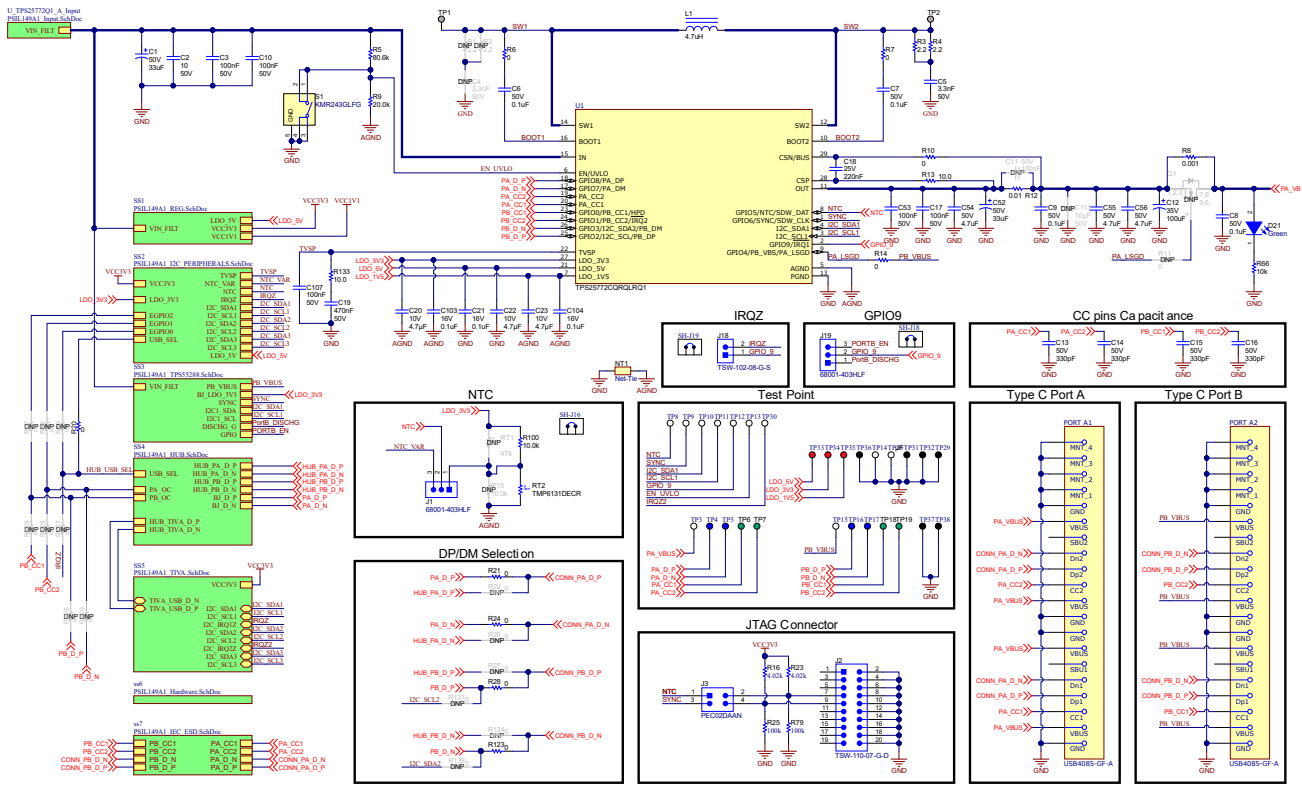


Figure 6-2. TPS25772Q1EVM-149 Main Schematic

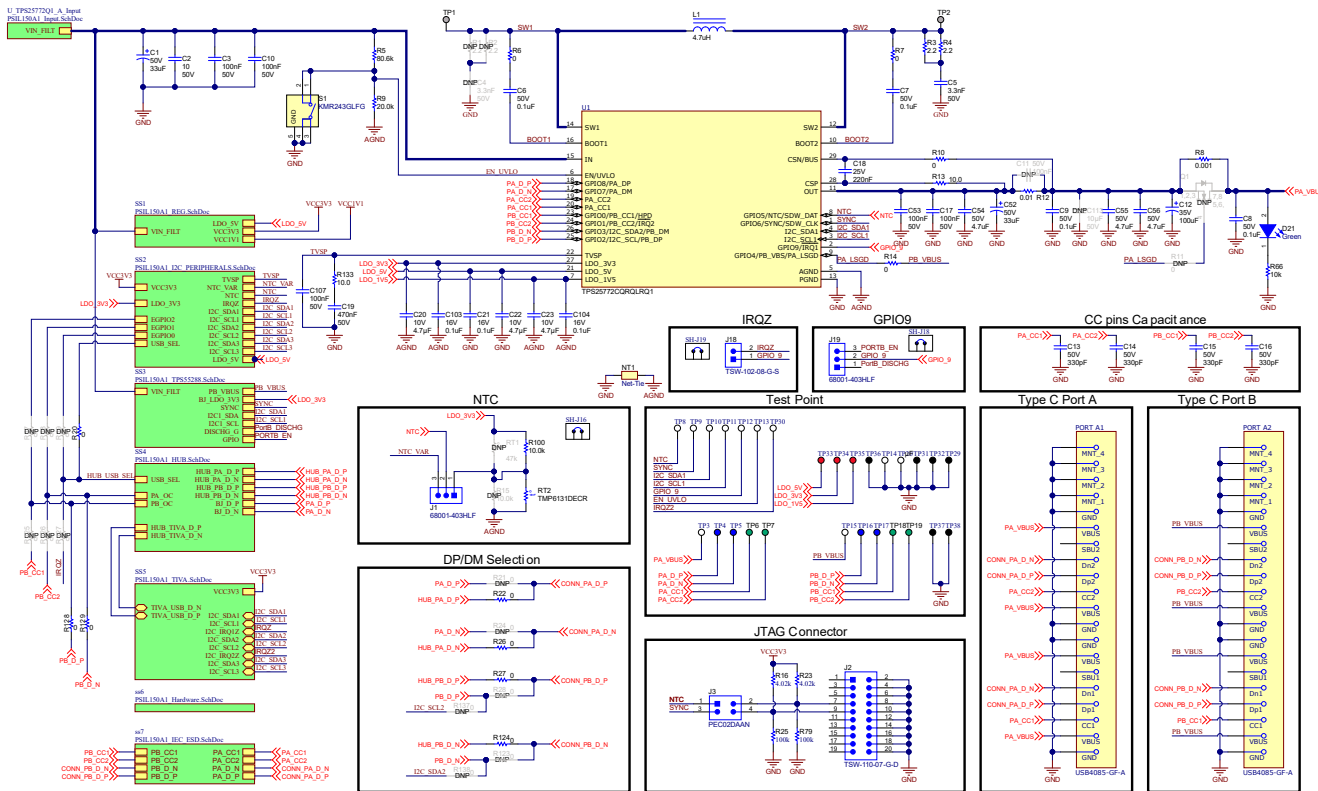


Figure 6-3. TPS25772Q1EVM-150 Main Schematic

## 6.2 Sub Schematic – Input Circuit

This schematic is *U\_TPS25772Q1\_A\_Input* sub-schematic of the main schematic. Figure 6-4 shows the input circuit. TPS25762Q1EVM-146, TPS25772Q1EVM-149, and TPS25772Q1EVM-150 have same input circuit.

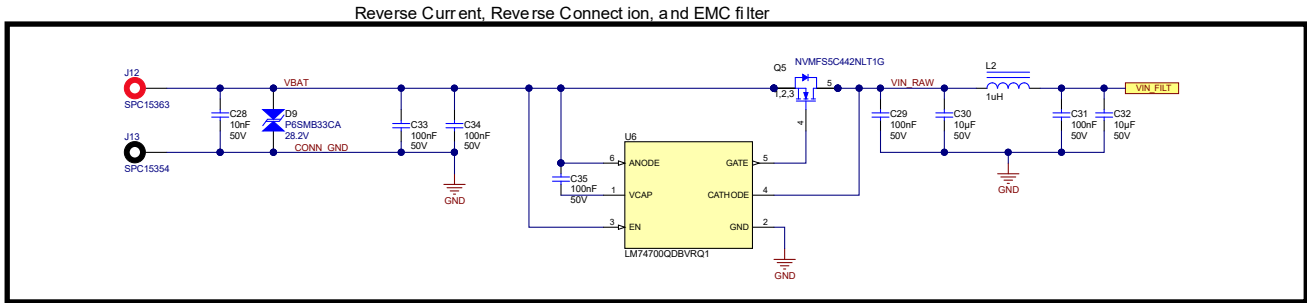


Figure 6-4. Input Circuit

## 6.3 Sub Schematic – Auxiliary Power

This schematic is *SS1* sub-schematic of the main schematic. Figure 6-5 shows the auxiliary power supply circuit. U7 provides the 5-V power for VCONN and LDO input of U8 and U9. U8 and U9 provide 3.3-V power and 1.1-V power for peripherals like TIVA, HUB, IO expander, I<sup>2</sup>C temperature sensor, USB mux, and digital potentiometer.

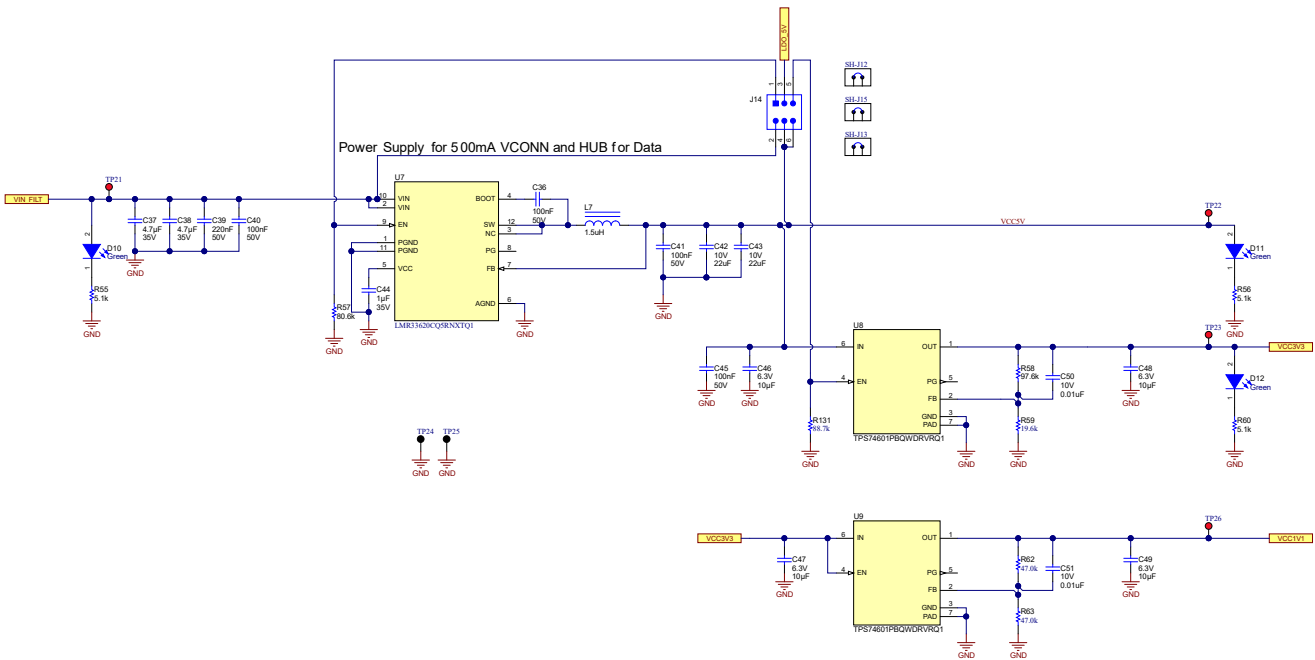
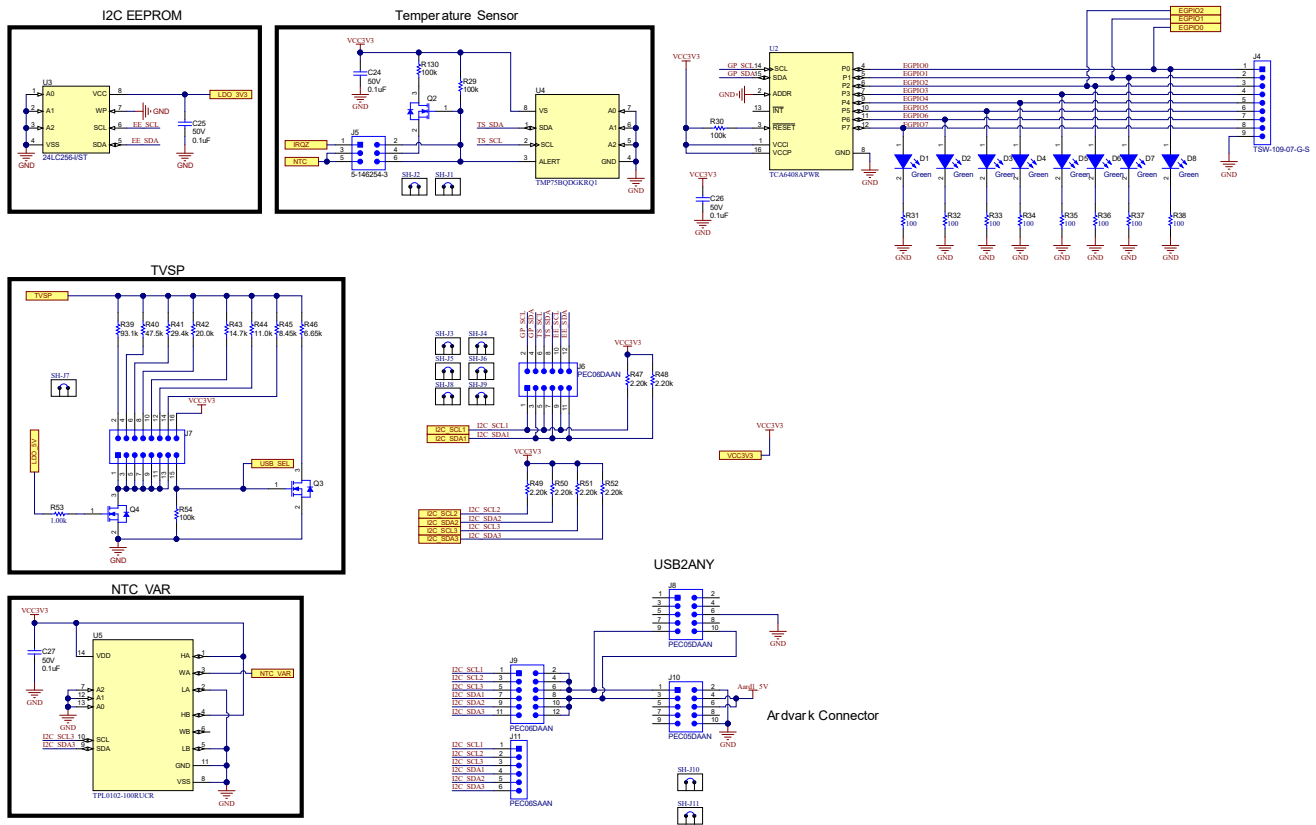


Figure 6-5. Auxiliary Power

## 6.4 Sub Schematic – I2C Peripherals

This schematic is SS2 sub-schematic of the main schematic. **Figure 6-6** shows the I<sup>2</sup>C peripherals and connectors circuit. TPS25762Q1EVM-146, TPS25772Q1EVM-149 and TPS25772Q1EVM-150 have the same I<sup>2</sup>C peripherals circuit.



**Figure 6-6. I<sup>2</sup>C Peripherals**

## 6.5 Sub Schematic – TPS55288-Q1

This schematic is SS3 sub-schematic of the main schematic. [Figure 6-7](#) shows the TPS55288-Q1 circuit of TPS25772Q1EVM-149, and TPS25772Q1EVM-150. TPS55288-Q1 provides the power for port B. The components of this circuit is not installed on the single port TPS25762Q1EVM-146 as [Figure 6-8](#) shows.

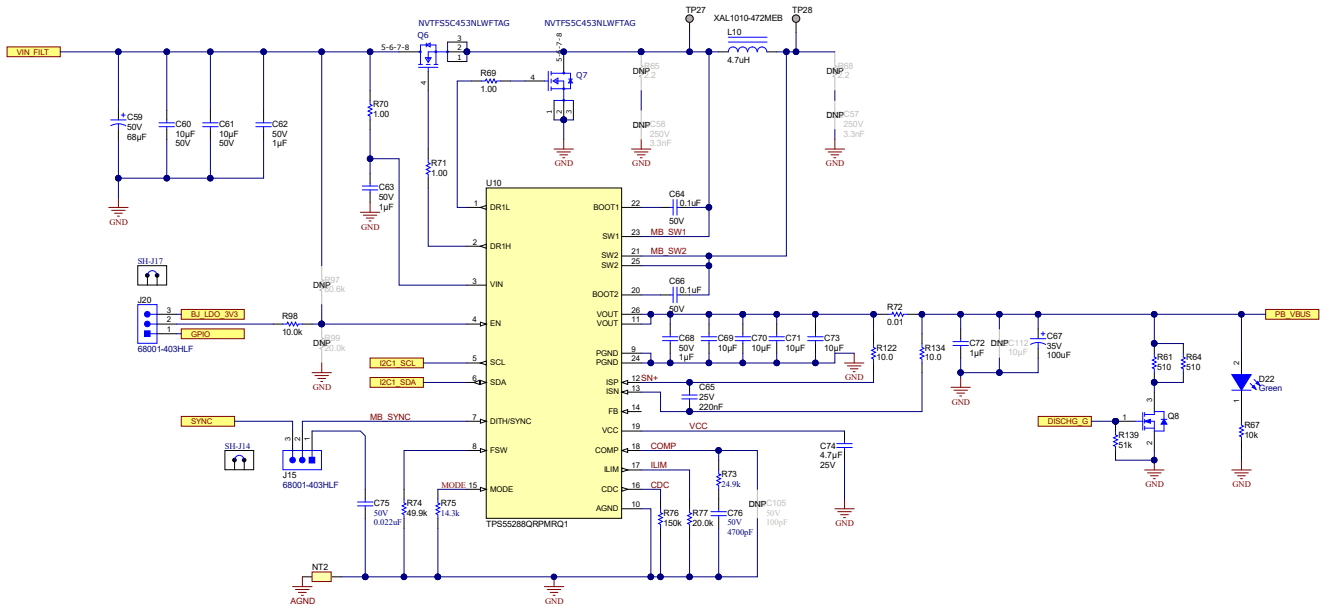


Figure 6-7. TPS55288-Q1 Circuit

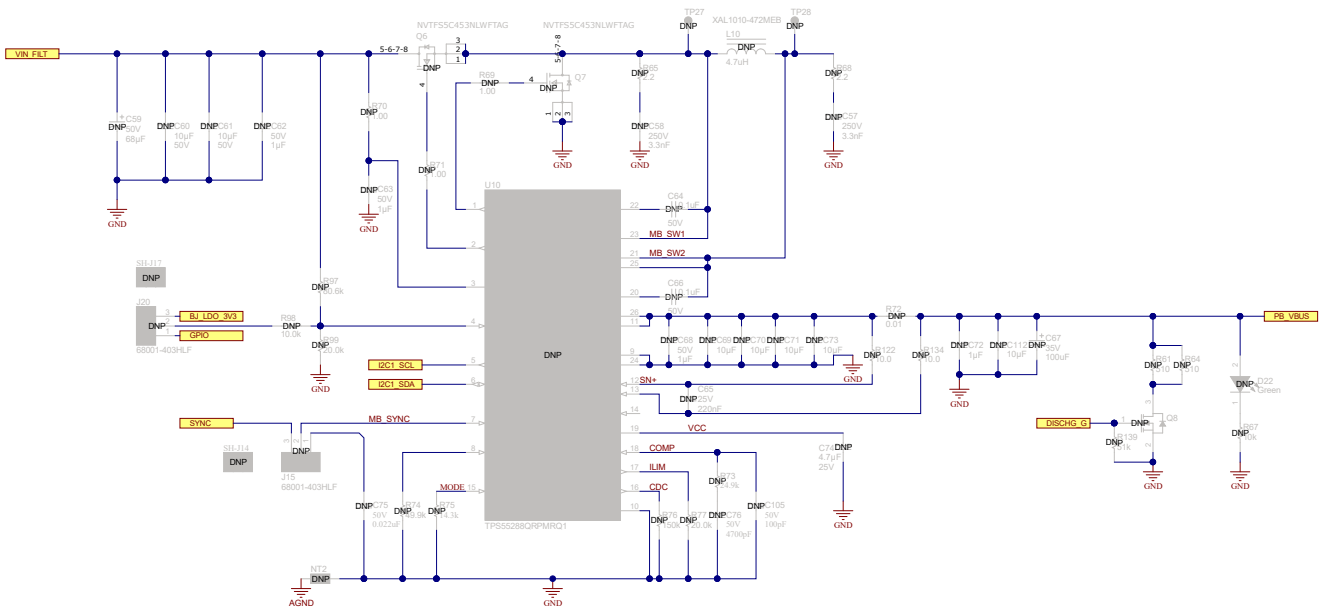


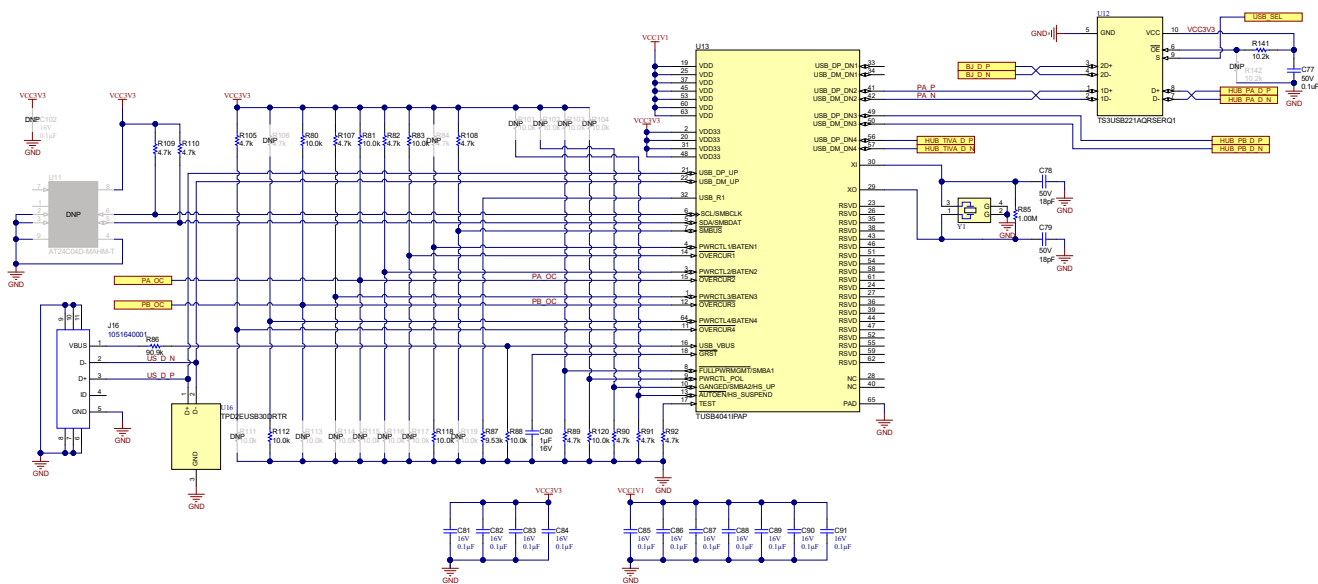
Figure 6-8. Single Port TPS55288-Q1 Circuit

## 6.6 Sub Schematic – HUB

This schematic is SS4 sub-schematic of the main schematic. [Figure 6-9](#) shows the HUB circuit of TPS25762Q1EVM-146 and TPS25772Q1EVM-149. R141 is installed and R142 is not installed to disable the USB mux(U12). As [Figure 6-9](#) shows, the DP/DM of Type-C connector are not connected to HUB, so there is no data connection from the USB micro-B connector(J16) to port A and port B on the TPS25762Q1EVM-146 and TPS25772Q1EVM-149.

[Figure 6-10](#) shows the HUB circuit of TPS25772Q1EVM-150. R142 is installed and R141 is not installed to enable the USB mux(U12). Using pins 15 and 16 of J7 on [Figure 6-6](#) to set USB\_SEL can select DP/DM of Type-C connector to HUB or to TPS25762/72-Q1. The USB\_SEL is pulled low by default, so the data lines are connected from USB micro-B connector to the Type-C connectors of port A and port B. When pins 15 and 16 of J7 are shorted, the TPS25762/72-Q1 is configured as firmware update mode, the USB mux will connect DP/DM from the Type-C connector to TPS25762/72-Q1.

The HUB IC(U13) also provides a data path from USB micro-B connector to TIVA. This allows configuration, monitoring, and firmware update through USB micro-B connector.



**Figure 6-9. TPS25762Q1EVM-146 and TPS25772Q1EVM-149 HUB Circuit**

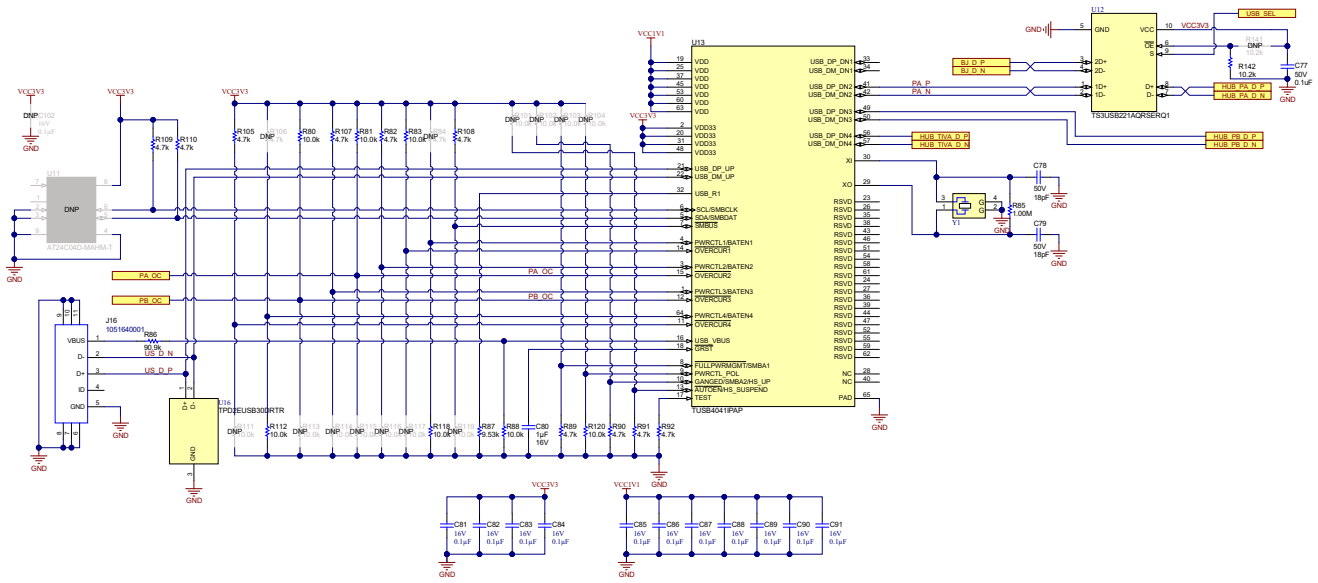


Figure 6-10. TPS25772Q1EVM-150 HUB Circuit

## 6.7 Sub Schematic – TIVA

This schematic is SS5 sub-schematic of the main schematic. [Figure 6-11](#) shows the TIVA circuit. TPS25762Q1EVM-146, TPS25772Q1EVM-149, and TPS25772Q1EVM-150 have the same TIVA circuit.

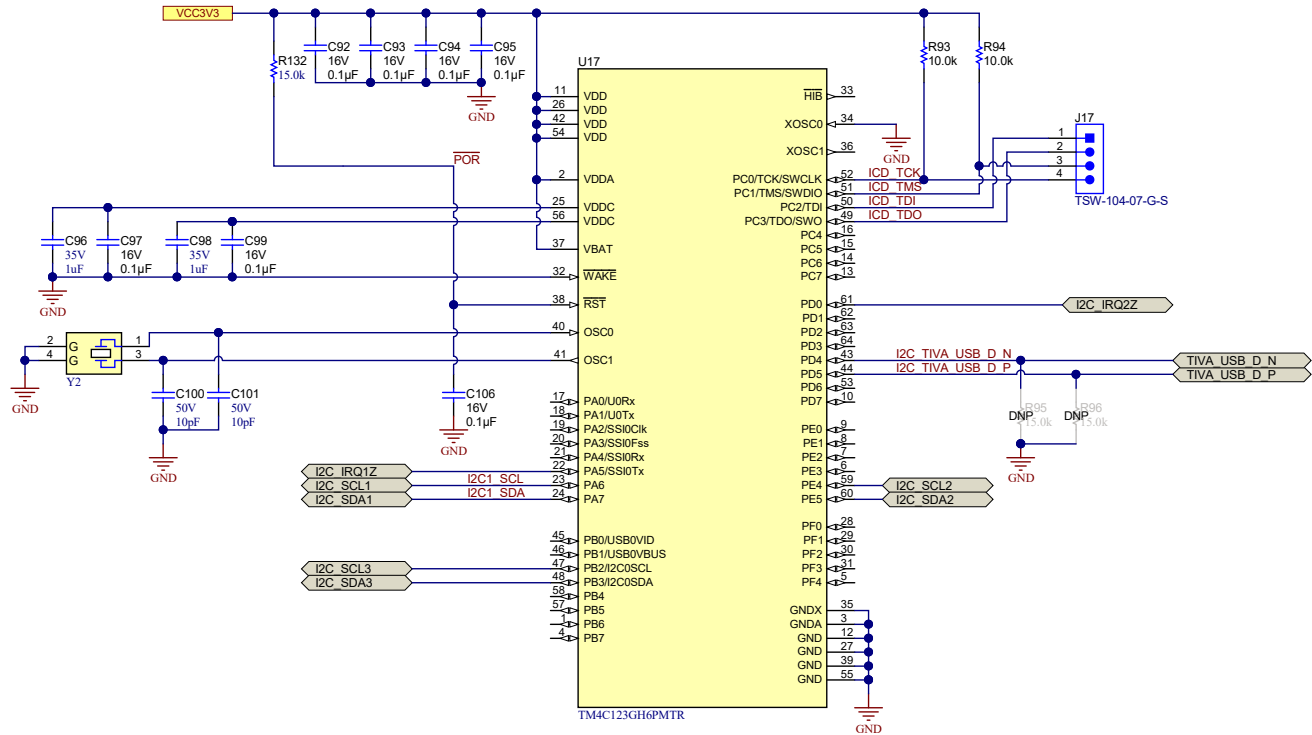


Figure 6-11. TIVA Circuit



## 6.8 Sub Schematic – ESD

This schematic is SS7 sub-schematic of the main schematic. [Figure 6-12](#) shows the ESD circuit, TPS25762Q1EVM-146, TPS25772Q1EVM-149, and TPS25772Q1EVM-150 have the same ESD circuit.

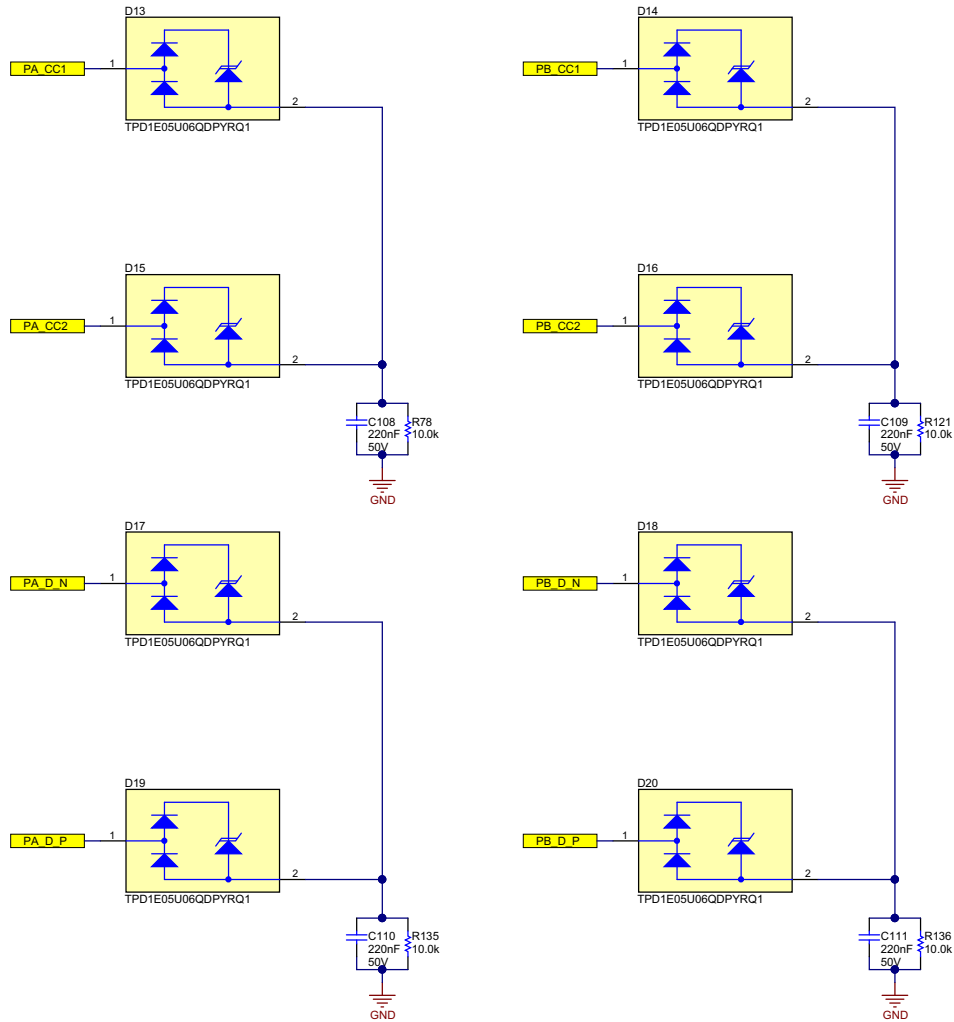
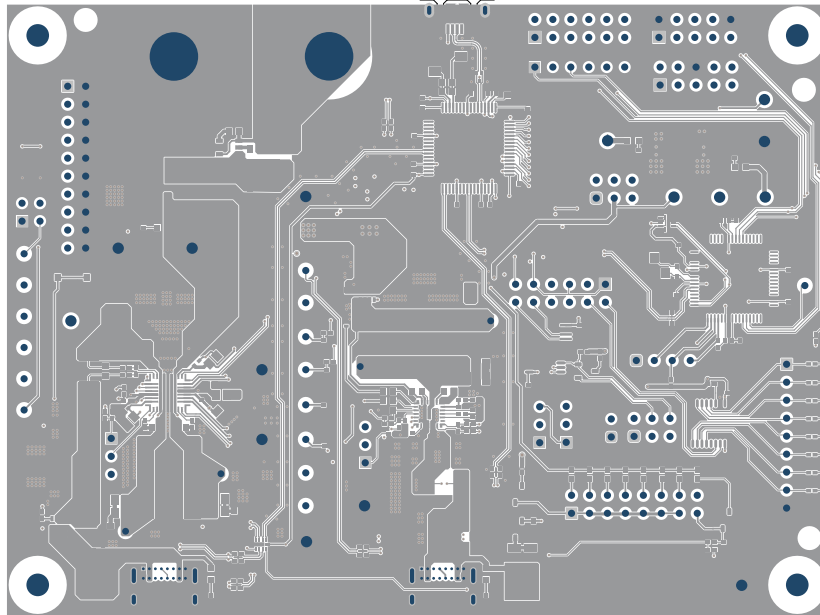


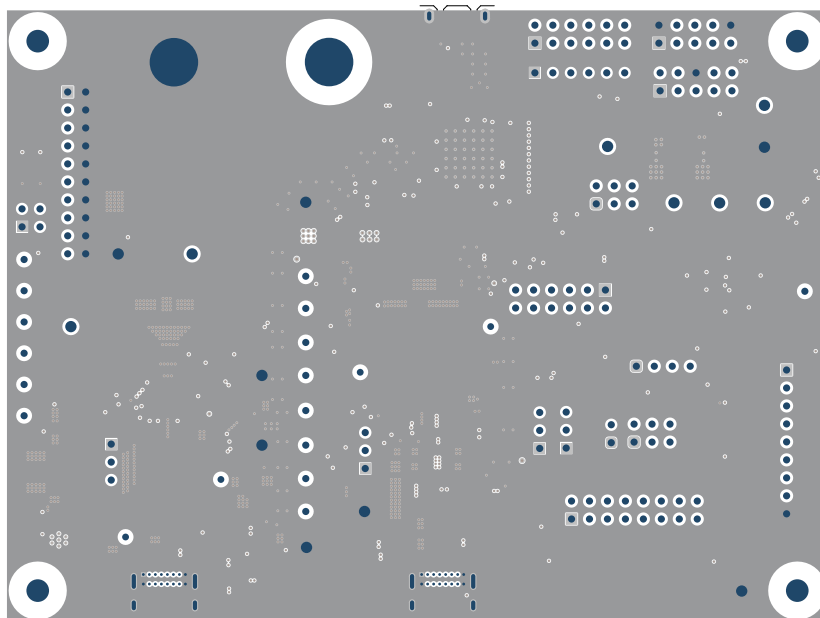
Figure 6-12. ESD Circuit

## 7 Board Views and Layout Prints

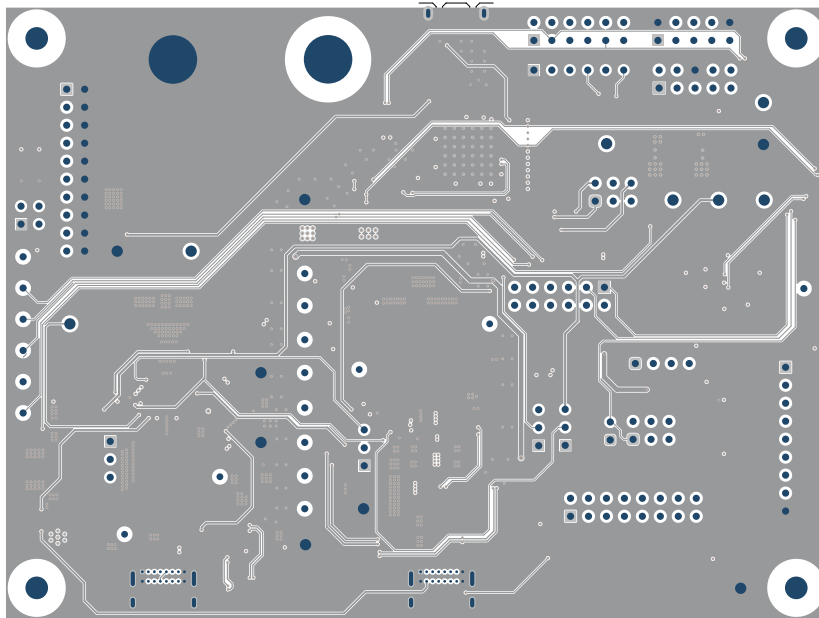
TPS25762EVM-146, TPS25772Q1EVM-149, and TPS25772Q1EVM-150 have the same PCB layout. [Figure 7-1](#), [Figure 7-2](#), [Figure 7-3](#), [Figure 7-4](#) show the PCB layouts of the EVM. [Figure 7-5](#) and [Figure 7-6](#) show the 3D top and bottom view for TPS25762Q1EVM-146, [Figure 7-7](#) and [Figure 7-8](#) show the 3D top and bottom view for TPS25772Q1EVM-149, [Figure 7-9](#) and [Figure 7-10](#) show the 3D top and bottom view for TPS25772Q1EVM-150.



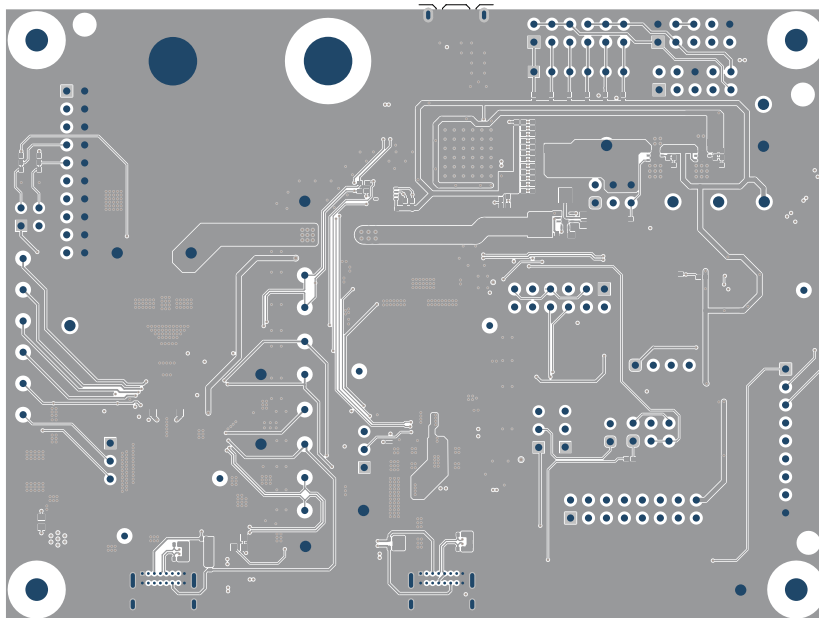
**Figure 7-1. Top Layer**



**Figure 7-2. Middle Layer1**



**Figure 7-3. Middle Layer2**



**Figure 7-4. Bottom Layer**

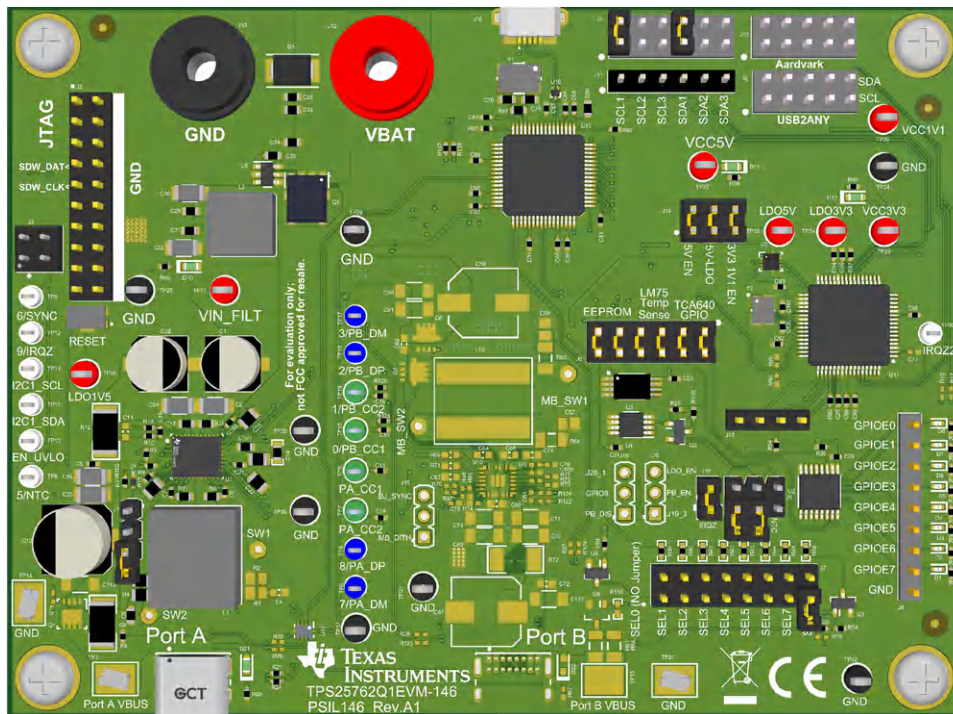


Figure 7-5. TPS25762Q1EVM-146 3D Top View

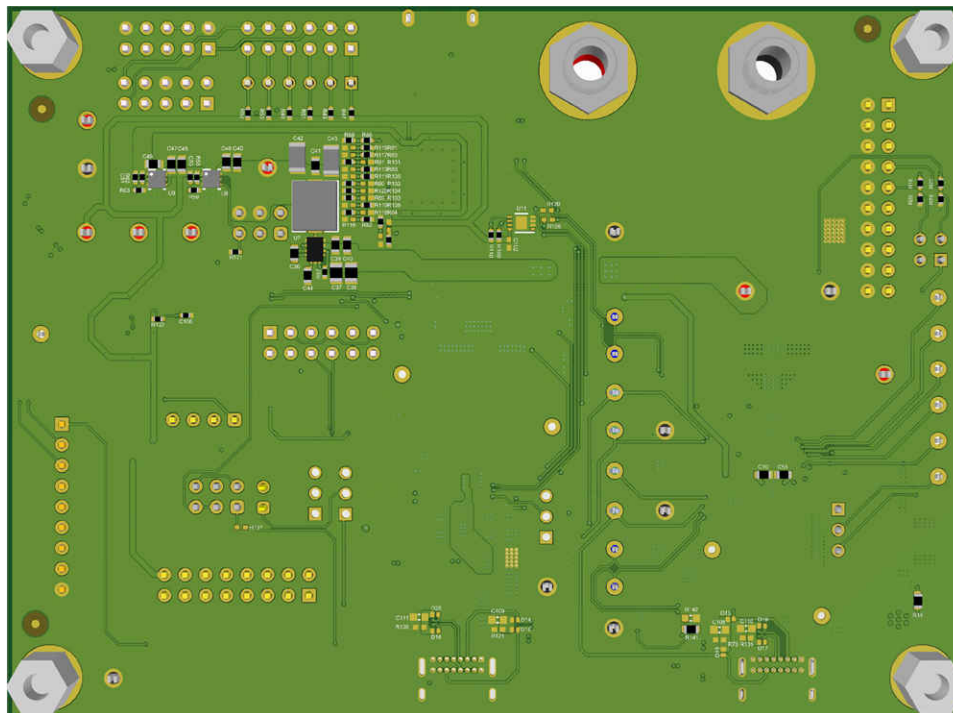


Figure 7-6. TPS25762Q1EVM-146 3D Bottom View

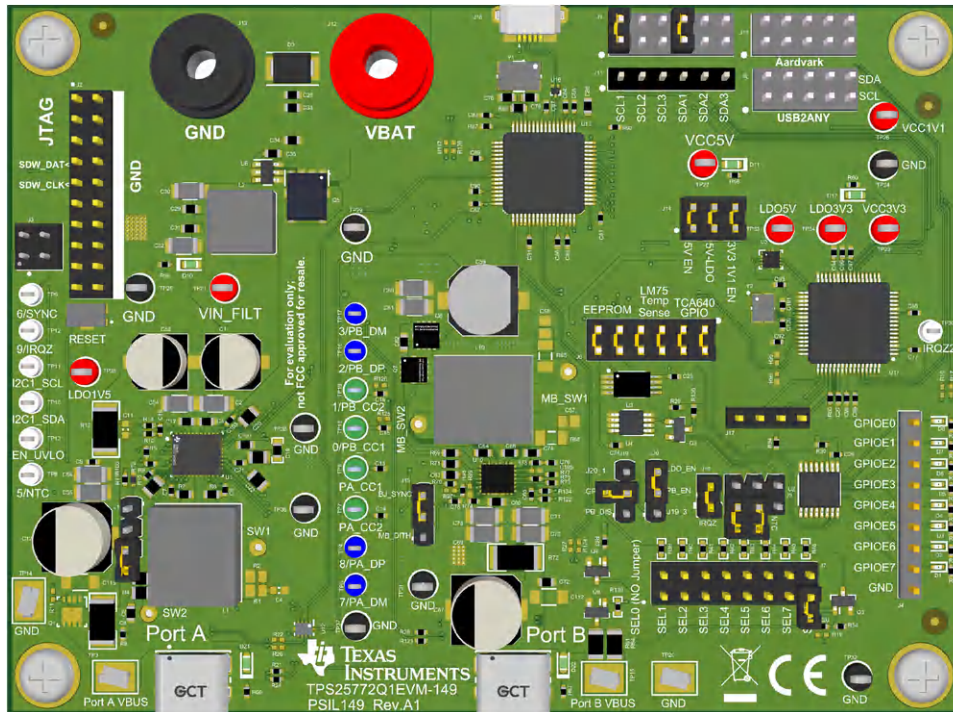


Figure 7-7. TPS25772Q1EVM-149 3D Top View

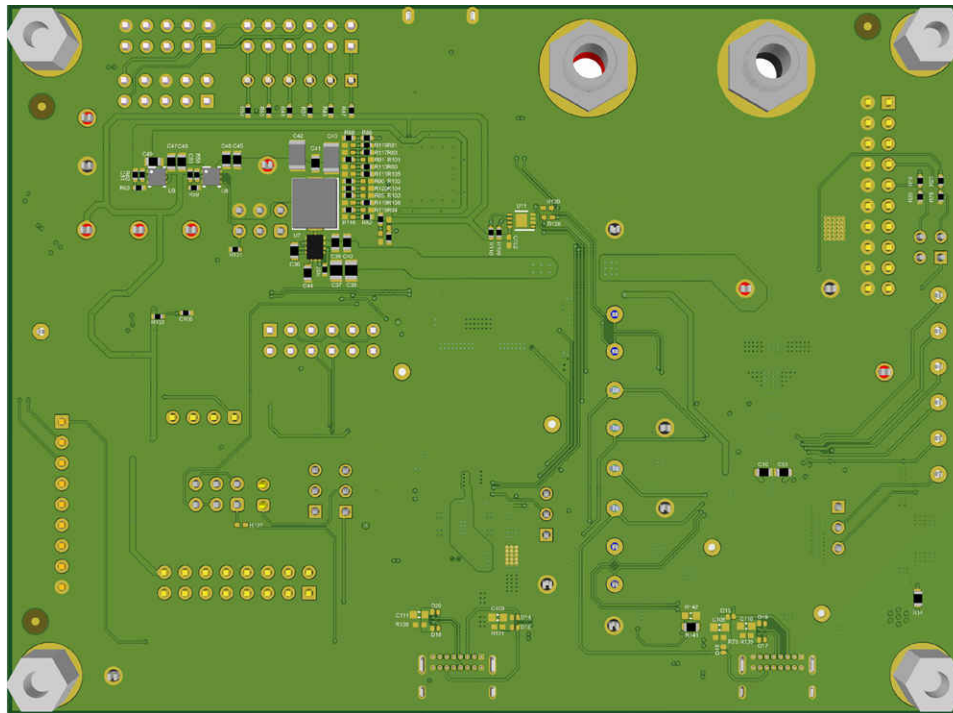


Figure 7-8. TPS25772Q1EVM-149 3D Bottom View



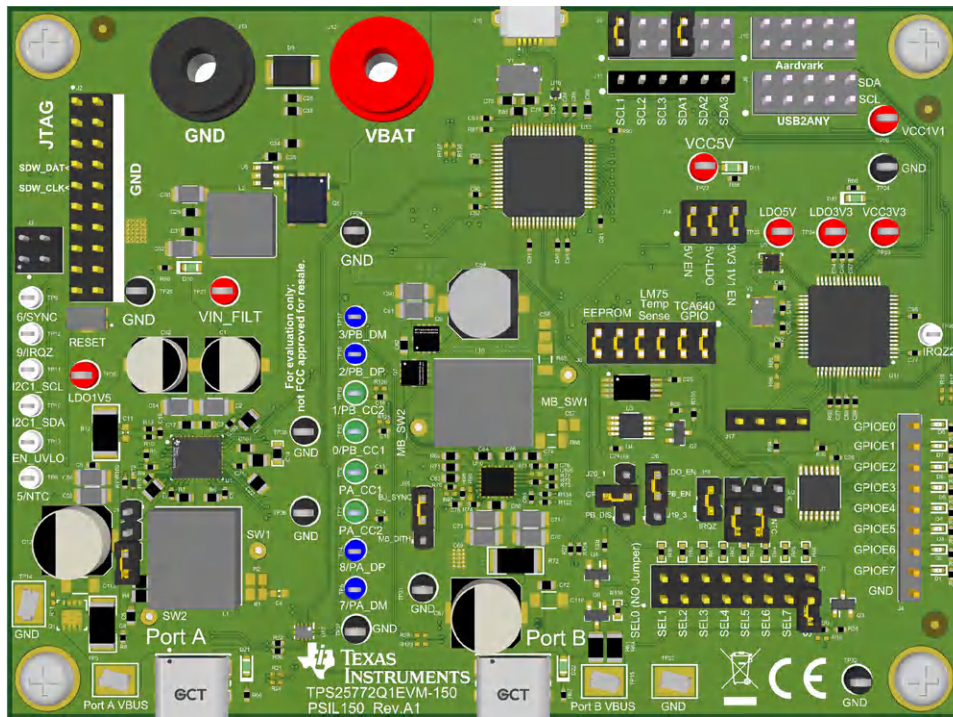


Figure 7-9. TPS25772Q1EVM-150 3D Top View

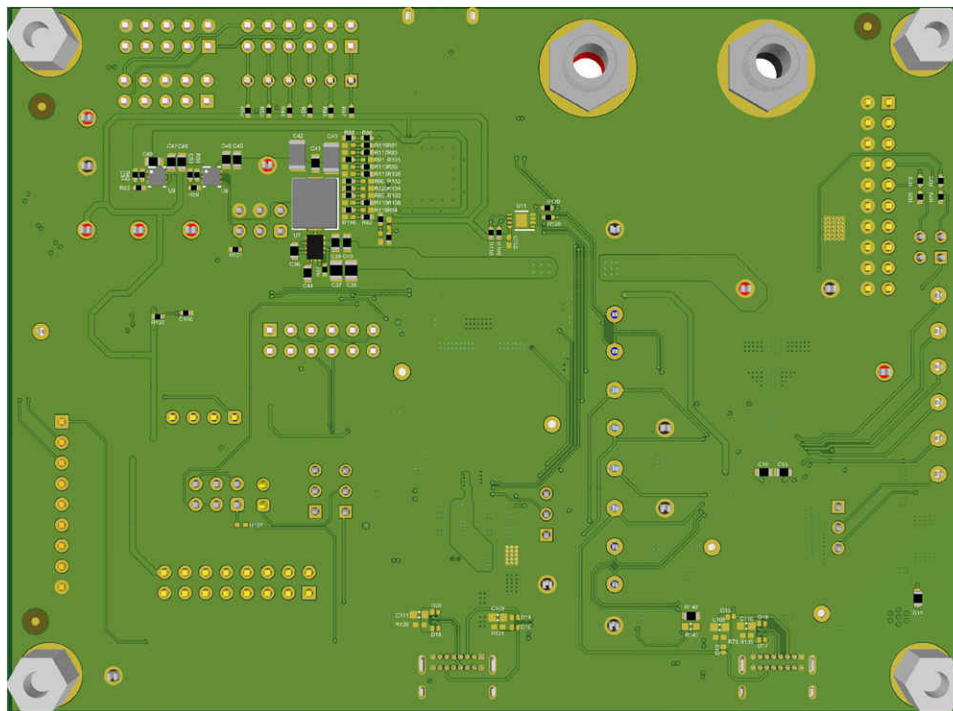


Figure 7-10. TPS25772Q1EVM-150 3D Bottom View

## 8 Bill of Materials

Table 8-1 shows the TPS25762Q1EVM-146 BOM, Table 8-2 shows the TPS25772Q1EVM-149 BOM, and Table 8-3 shows the TPS25772Q1EVM-150 BOM.

**Table 8-1. TPS25762Q1EVM-146 BOM**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
!PCB1	1		Printed Circuit Board		PSIL146	Any
C1, C52	2	33uF	CAP, Polymer Hybrid, 33 uF, 50 V, +/- 20%, 40 ohm, 6.3x7.7 SMD	6.3x7.7	EEH-ZC1H330XP	Panasonic
C2, C30, C32	3	10uF	CAP, CERM, 10 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 1206	1206	CGA5L1X7R1H106K160AC	TDK
C3, C10, C17, C36, C40, C41, C45, C53, C107	9	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	CGA3E2X7R1H104K080AA	TDK
C5	1	3300pF	CAP, CERM, 3300 pF, 50 V, +/- 10%, X7R, 0603	0603	885012206086	Wurth Elektronik
C6, C7, C8, C9, C24, C25, C26, C27	8	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1H104K050BB	TDK
C12	1	100uF	CAP, Polymer Hybrid, 100 uF, 35 V, +/- 20%, 27 mohm, 8x10 SMD	8x10	EEH-ZC1V101P	Panasonic
C13, C14, C15, C16	4	330pF	CAP, CERM, 330 pF, 50 V, +/- 10%, X7R, 0402	0402	GRM155R71H331KA01D	MuRata
C18	1	0.22uF	CAP, CERM, 0.22 uF, 25 V, +/- 20%, X5R, 0402	0402	C1005X5R1E224M050BC	TDK
C19	1	0.47uF	CAP, CERM, 0.47 uF, 50 V, +/- 10%, X7R, 0603	0603	C1608X7R1H474K080AC	TDK
C20, C22, C23	3	4.7uF	CAP, CERM, 4.7 uF, 10 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0805	0805	CGA4J3X7R1A475K125AB	TDK
C21, C103, C104	3	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	0402YC104KAT2A	AVX
C28	1	0.01uF	CAP, CERM, 0.01 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	GCM188R71H103KA37D	MuRata
C29, C31, C33, C34, C35	5	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	06035C104KAZ2A	AVX

**Table 8-1. TPS25762Q1EVM-146 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
C37, C38	2	4.7uF	CAP, CERM, 4.7 uF, 35 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0805	0805	CGA4J1X7R1V475K125AC	TDK
C39	1	0.22uF	CAP, CERM, 0.22 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	GCJ188R71H224KA01D	MuRata
C42, C43	2	22uF	CAP, CERM, 22 uF, 10 V, +/- 10%, X7R, AEC-Q200 Grade 1, 1206	1206	GCM31CR71A226KE02L	MuRata
C44	1	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	CGA3E1X7R1V105K080AC	TDK
C46, C47, C48, C49	4	10uF	CAP, CERM, 10 uF, 6.3 V, +/- 20%, X7R, 0603	0603	CL10B106MQ8NRNC	Samsung Electro-Mechanics
C50, C51	2	0.01uF	CAP, CERM, 0.01 uF, 10 V, +/- 10%, X5R, 0402	0402	GRM155R61A103KA01D	MuRata
C54, C55, C56	3	4.7uF	CAP, CERM, 4.7 uF, 50 V, +/- 10%, X7R, 1206	1206	C3216X7R1H475K160AC	TDK
C78, C79	2	18pF	CAP, CERM, 18 pF, 50 V, +/- 5%, C0G/NP0, 0603	0603	GRM1885C1H180JA01D	MuRata
C80	1	1uF	CAP, CERM, 1 uF, 16 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	EMK107B7105KAHT	Taiyo Yuden
C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C97, C99, C106	18	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 5%, X7R, AEC-Q200 Grade 1, 0402	0402	GCM155R71C104JA55D	MuRata
C96, C98	2	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X5R, 0402	0402	C1005X5R1V105K050BC	TDK
C100, C101	2	10pF	CAP, CERM, 10 pF, 50 V, +/- 5%, C0G/NP0, 0402	0402	500R07S100JV4T	Johanson Technology
D1, D2, D3, D4, D5, D6, D7, D8	8	Green	LED, Green, SMD	0402	APHHS1005CGCK	Kingbright
D9	1	28.2V	Diode, TVS, Bi, 22 V, 35.5 Vc, AEC-Q101, SMC	SMB	P6SMB33CA	Littelfuse
D10, D11, D12, D21	4	Green	LED, Green, SMD	LED_0603	150060GS75000	Würth Elektronik
H1, H2, H3, H4	4		Machine Screw, Round, #4-40 x 1/4, Nylon, Phillips panhead	Screw	NY PMS 440 0025 PH	B&F Fastener Supply
H5, H6, H7, H8	4		Standoff, Hex, 0.5"L #4-40 Nylon	Standoff	1902C	Keystone



**Table 8-1. TPS25762Q1EVM-146 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
J1	1		Header, 2.54mm, 3x1, Tin, TH	Header, 2.54mm, 3x1, TH	68001-403HLF	FCI
J2	1		Header, 100mil, 10x2, Gold, TH	10x2 Header	TSW-110-07-G-D	Samtec
J3	1		Header, 100mil, 2x2, Tin, TH	Header, 2x2, 2.54mm, TH	PEC02DAAN	Sullins Connector Solutions
J4	1		Header, 100mil, 9x1, Gold, TH	9x1 Header	TSW-109-07-G-S	Samtec
J5, J14	2		Header, 100mil, 3x2, Tin, TH	Header, 100mil, 3x2, TH	5-146254-3	TE Connectivity
J6, J9	2		Header, 100mil, 6x2, Tin, TH	Header, 6x2, 100mil, Tin	PEC06DAAN	Sullins Connector Solutions
J7	1		Header, 100mil, 8x2, Gold, TH	8x2 Header	TSW-108-07-G-D	Samtec
J8, J10	2		Header, 100mil, 5x2, Tin, TH	Header, 5x2, 100mil, Tin	PEC05DAAN	Sullins Connector Solutions
J11	1		Header, 100mil, 6x1, Tin, TH	TH, 6-Leads, Body 608x100mil, Pitch 100mil	PEC06SAAN	Sullins Connector Solutions
J12	1		BANANA JACK, SOLDER LUG, RED, TH	Red Insulated Banana Jack	SPC15363	Tenma
J13	1		BANANA JACK, SOLDER LUG, BLACK, TH	Black Insulated Banana Jack	SPC15354	Tenma
J16	1		Receptacle, USB 2.0, Micro B, 5 Position, R/A, SMT	Receptacle, USB 2.0, Micro B, 5 Pos, 0.65mm Pitch, R/A, SMT	1051640001	Molex
J17	1		Header, 100mil, 4x1, Gold, TH	4x1 Header	TSW-104-07-G-S	Samtec
J18	1		Header, 2.54mm, 2x1, Gold, TH	Header, 2.54mm, 2x1, TH	TSW-102-08-G-S	Samtec
L1	1	4.7uH	Inductor, Shielded, Composite, 4.7 uH, 24 A, 0.01 ohm, SMD	Inductor, 11.3x10x10mm	XAL1010-472MEB	Coilcraft
L2	1	1uH	Inductor, Shielded, Composite, 1 uH, 25 A, 0.00255 ohm, SMD	7.2x7x7.5mm	XAL7070-102MEB	Coilcraft
L7	1	1.5uH	Inductor, Shielded, Ferrite, 1.5 uH, 6 A, 0.025 ohm, SMD	Inductor, 5.7x2.8x5.2mm	SRP5030T-1R5M	Bourns
PORT A1	1		USB - C (Type - C) USB 2.0 Receptacle Connector 16 Position Through Hole, Right Angle	PTH_USB-C	USB4085-GF-A	Global Connector Technology
Q2	1	60V	MOSFET, N-CH, 60 V, 0.115 A, AEC-Q101, SOT-23	SOT-23	2N7002Q-7-F	Diodes Inc.
Q3, Q4	2	60V	MOSFET, N-CH, 60 V, 0.24 A, SOT-23	SOT-23	2N7002E-T1-E3	Vishay-Siliconix

**Table 8-1. TPS25762Q1EVM-146 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
Q5	1	40V	MOSFET, N-CH, 40 V, 27 A, AEC-Q101, DFN5 5x6mm	DFN5 5x6mm	NVMFS5C442NLT1G	ON Semiconductor
R3, R4	2	2.2	RES, 2.2, 5%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	ERJ-6GEYJ2R2V	Panasonic
R5, R57	2	80.6k	RES, 80.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040280K6FKED	Vishay-Dale
R6, R7, R14	3	0	RES, 0, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	RMCF0603ZTOR00	Stackpole Electronics Inc
R8	1	0.001	RES, 0.001, 1%, 1 W, 2010	2010	PMR50HZPFV1L00	Rohm
R9	1	20.0k	RES, 20.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040220K0FKED	Vishay-Dale
R10, R20, R21, R24, R125, R126, R137, R138	8	0	RES, 0, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04020000Z0ED	Vishay-Dale
R12	1	0.01	RES, 0.01, 1%, 1 W, 2010	2010	WSL2010R0100FEA18	Vishay-Dale
R13	1	10.0	RES, 10.0, 1%, 0.063 W, 0402	0402	CRCW040210R0FKED	Vishay-Dale
R16, R23	2	4.02k	RES, 4.02 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04024K02FKED	Vishay-Dale
R25, R29, R30, R54, R79, R130	6	100k	RES, 100 k, 1%, 0.0625 W, AEC-Q200 Grade 0, 0402	0402	AC0402FR-07100KL	Yageo America
R31, R32, R33, R34, R35, R36, R37, R38	8	100	RES, 100, 1%, 0.063 W, 0402	0402	MCR01MZPF1000	Rohm
R39	1	93.1k	RES, 93.1 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040293K1FKED	Vishay-Dale
R40	1	47.5k	RES, 47.5 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040247K5FKED	Vishay-Dale
R41	1	29.4k	RES, 29.4 k, 1%, 0.063 W, 0402	0402	CRCW040229K4FKED	Vishay-Dale
R42	1	20.0k	RES, 20.0 k, 1%, 0.063 W, 0402	0402	CRCW040220K0FKED	Vishay-Dale
R43	1	14.7k	RES, 14.7 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040214K7FKED	Vishay-Dale
R44	1	11.0k	RES, 11.0 k, 1%, 0.063 W, 0402	0402	CRCW040211K0FKED	Vishay-Dale
R45	1	8.45k	RES, 8.45 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04028K45FKED	Vishay-Dale

**Table 8-1. TPS25762Q1EVM-146 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
R46	1	6.65k	RES, 6.65 k, 1%, 0.063 W, 0402	0402	CRCW04026K65FKED	Vishay-Dale
R47, R48, R49, R50, R51, R52	6	2.20k	RES, 2.20 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	RMCF0402FT2K20	Stackpole Electronics Inc
R53	1	1.00k	RES, 1.00 k, 1%, 0.063 W, 0402	0402	MCR01MZPF1001	Rohm
R55, R56, R60	3	5.1k	RES, 5.1 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04025K10JNED	Vishay-Dale
R58	1	97.6k	RES, 97.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040297K6FKED	Vishay-Dale
R59	1	19.6k	RES, 19.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040219K6FKED	Vishay-Dale
R62, R63	2	47.0k	RES, 47.0 k, 1%, 0.0625 W, 0402	0402	RC0402FR-0747KL	Yageo America
R66	1	10k	RES, 10 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0402	0402	ERJ-2GEJ103X	Panasonic
R80, R81, R83, R88, R93, R94, R100, R112, R118, R120	10	10.0k	RES, 10.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	AC0402FR-0710KL	Yageo America
R82, R89, R90, R91, R92, R105, R107, R108, R109, R110	10	4.7k	RES, 4.7 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04024K70JNED	Vishay-Dale
R85	1	1.00Meg	RES, 1.00 M, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031M00FKEA	Vishay-Dale
R86	1	90.9k	RES, 90.9 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040290K9FKED	Vishay-Dale
R87	1	9.53k	RES, 9.53 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04029K53FKED	Vishay-Dale
R131	1	88.7k	RES, 88.7 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040288K7FKED	Vishay-Dale
R132	1	15.0k	RES, 15.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040215K0FKED	Vishay-Dale
R133	1	10.0	RES, 10.0, 1%, 0.25 W, 0805	0805	RNCP0805FTD10R0	Stackpole Electronics Inc
R141	1	10.2k	RES, 10.2 k, 1%, 0.1 W, 0603	0603	RC0603FR-0710K2L	Yageo
RT2	1		Thermistor, DEC0002A (X1SON-2)	DEC0002A	TMP6131DECR	Texas Instruments
S1	1		Switch, SPST-NO, Off-Mom, 0.01 A, 32 VDC, SMD	4.2x2.8mm	KMR243GLFG	C&K Components

**Table 8-1. TPS25762Q1EVM-146 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
SH-J1, SH-J2, SH-J3, SH-J4, SH-J5, SH-J6, SH-J7, SH-J8, SH-J9, SH-J10, SH-J11, SH-J12, SH-J13, SH-J15, SH-J16, SH-J19	16	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec
TP3, TP14, TP20	3		Test Point, Compact, SMT	Testpoint_Keystone_Compact	5016	Keystone
TP4, TP5, TP16, TP17	4		Test Point, Miniature, Blue, TH	Blue Miniature Testpoint	5117	Keystone
TP6, TP7, TP18, TP19	4		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone
TP8, TP9, TP10, TP11, TP12, TP13, TP30	7		Test Point, Miniature, White, TH	White Miniature Testpoint	5002	Keystone
TP21, TP22, TP23, TP26, TP33, TP34, TP35	7		Test Point, Compact, Red, TH	Red Compact Testpoint	5005	Keystone
TP24, TP25, TP29, TP31, TP32, TP36, TP37, TP38	8		Test Point, Compact, Black, TH	Black Compact Testpoint	5006	Keystone
U1	1		Automotive Dual USB Type-C Power Delivery Controller with Buck-Boost Regulator	VQFN-HR29	TPS25762CQRQLRQ1	Texas Instruments
U2	1		Low-Voltage 8-Bit I2C and SMBus I/O Expander, 1.65 to 5.5 V, -40 to 85 degC, 16-pin TSSOP (PW), Green (RoHS & no Sb/Br)	PW0016A	TCA6408APWR	Texas Instruments
U3	1		256K I2C CMOS Serial EEPROM, TSSOP-8	TSSOP-8	24LC256-I/ST	Microchip
U4	1		Automotive Grade, 1.4V-Capable Temperature Sensor with I2C/SMBus Interface in LM75 Pinout, DGK0008A (VSSOP-8)	DGK0008A	TMP75BQDGKRQ1	Texas Instruments
U5	1		256-Taps Dual-Channel Digital Potentiometer With I2C Interface and Nonvolatile Memory, RUC0014A (X2QFN-14)	RUC0014A	TPL0102-100RUCR	Texas Instruments
U6	1		Low Iq Always ON Smart Diode Controller, DBV0006A (SOT-23-6)	DBV0006A	LM74700QDBVRQ1	Texas Instruments

**Table 8-1. TPS25762Q1EVM-146 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
U7	1		Automotive 3.8-V to 36-V 2-A Synchronous Step-Down Voltage Regulator, RNX0012B (VQFN-HR-12)	RNX0012B	LMR33620CQ5RNXTQ1	Texas Instruments
U8, U9	2		1-A LDO With Power-Good, DRV0006A (WSON-6)	DRV0006A	TPS74601PBQWDRVRQ1	Texas Instruments
U12	1		Automotive Catalog ESD Protected, High-Speed USB 2.0 (480-Mbps) 1:2 Multiplexer / Demultiplexer Switch, 16 ohm RON, 2.5 to 3.3V, -40 to 125 degC, 10-Pin UQFN (RSE), Green (RoHS & no Sb/Br)	RSE0010A	TS3USB221AQRSERQ1	Texas Instruments
U13	1		Four-Port High-Speed 480Mbps USB 2.0 Hub, PAP0064K (HTQFP-64)	PAP0064K	TUSB4041IPAP	Texas Instruments
U16	1		ESD Solution for Super-Speed (6 Gbps) USB 3.0 Interface, 2 Channels, -40 to +85 degC, 3-pin SOT (DRT), Green (Rohs & No Sb/Br)	DRT0003A	TPD2EUSB30DRTR	Texas Instruments
U17	1		Tiva C Series Microcontroller, 256 KB Flash, 32 KB SRAM, 12 Bit, 12 Channels, -40 to 105 degC, 64-Pin LQFP (PM), Green (RoHS & no Sb/Br), Tape and Reel	PM0064A	TM4C123GH6PMTR	Texas Instruments
Y1	1		Crystal, 24 MHz, 30 ppm, 20 pF, SMD	5x3.2mm	ECS-240-20-30B-AEN-TR	ECS Inc.
Y2	1		Crystal, 16 MHz, 8pF, SMD	3.2x0.75x2.5mm	NX3225GA-16.000M-STD-CRG-1	NDK

**Table 8-2. TPS25772Q1EVM-149 BOM**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
!PCB1	1		Printed Circuit Board		PSIL149	Any
C1, C52	2	33uF	CAP, Polymer Hybrid, 33 uF, 50 V, +/- 20%, 40 ohm, 6.3x7.7 SMD	6.3x7.7	EEH-ZA1H330XP	Panasonic
C2, C30, C32, C60, C61, C69, C70, C71, C73	9	10uF	CAP, CERM, 10 µF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 1206	1206	CGA5L1X7R1H106K160AC	TDK
C3, C10, C17, C36, C40, C41, C45, C53, C107	9	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	CGA3E2X7R1H104K080AA	TDK
C5	1	3300pF	CAP, CERM, 3300 pF, 50 V, +/- 10%, X7R, 0603	0603	885012206086	Würth Elektronik
C6, C7, C8, C9, C24, C25, C26, C27, C77	9	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1H104K050BB	TDK
C12	1	100uF	CAP, Polymer Hybrid, 100 uF, 35 V, +/- 20%, 27 mohm, 8x10 SMD	8x10	EEH-ZC1V101P	Panasonic
C13, C14, C15, C16	4	330pF	CAP, CERM, 330 pF, 50 V, +/- 10%, X7R, 0402	0402	GRM155R71H331KA01D	MuRata
C18, C65	2	0.22uF	CAP, CERM, 0.22 uF, 25 V, +/- 20%, X5R, 0402	0402	C1005X5R1E224M050BC	TDK
C19	1	0.47uF	CAP, CERM, 0.47 uF, 50 V, +/- 10%, X7R, 0603	0603	C1608X7R1H474K080AC	TDK
C20, C22, C23	3	4.7uF	CAP, CERM, 4.7 µF, 10 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0805	0805	CGA4J3X7R1A475K125AB	TDK
C21, C103, C104	3	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	0402YC104KAT2A	AVX
C28	1	0.01uF	CAP, CERM, 0.01 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	GCM188R71H103KA37D	MuRata
C29, C31, C33, C34, C35	5	0.1uF	CAP, CERM, 0.1 µF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	06035C104KAZ2A	AVX
C37, C38	2	4.7uF	CAP, CERM, 4.7 uF, 35 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0805	0805	CGA4J1X7R1V475K125AC	TDK
C39	1	0.22uF	CAP, CERM, 0.22 µF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	GCJ188R71H224KA01D	MuRata

**Table 8-2. TPS25772Q1EVM-149 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
C42, C43	2	22uF	CAP, CERM, 22 uF, 10 V, +/- 10%, X7R, AEC-Q200 Grade 1, 1206	1206	GCM31CR71A226KE02L	MuRata
C44	1	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	CGA3E1X7R1V105K080AC	TDK
C46, C47, C48, C49	4	10uF	CAP, CERM, 10 µF, 6.3 V, +/- 20%, X7R, 0603	0603	CL10B106MQ8NRNC	Samsung Electro-Mechanics
C50, C51	2	0.01uF	CAP, CERM, 0.01 uF, 10 V, +/- 10%, X5R, 0402	0402	GRM155R61A103KA01D	MuRata
C54, C55, C56	3	4.7uF	CAP, CERM, 4.7 uF, 50 V, +/- 10%, X7R, 1206	1206	C3216X7R1H475K160AC	TDK
C59	1	68uF	CAP, Aluminum Polymer, 68 µF, 50 V, +/- 20%, 0.03 ohm, AEC-Q200 Grade 0, D8xL10.2mm SMD	D8xL10.2mm	EEH-ZE1H680V	Panasonic
C62, C63, C68, C72	4	1uF	CAP, CERM, 1 µF, 50 V, +/- 20%, X5R, AEC-Q200 Grade 3, 0603	0603	CGA3E3X5R1H105M080AB	TDK
C64, C66	2	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, 0603	0603	GCM188R71H104KA57D	MuRata
C67	1	100uF	CAP, Polymer Hybrid, 100 uF, 35 V, +/- 20%, 27 ohm, 8x10 SMD	8x10	EEH-ZC1V101P	Panasonic
C74	1	4.7uF	CAP, CERM, 4.7 µF, 25 V, +/- 10%, X6S, AEC-Q200 Grade 2, 0603	0603	GRT188C81E475KE13D	MuRata
C75	1	0.022uF	CAP, CERM, 0.022 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1H223K050BB	TDK
C76	1	4700pF	CAP, CERM, 4700 pF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	GCM155R71H472KA37D	MuRata
C78, C79	2	18pF	CAP, CERM, 18 pF, 50 V, +/- 5%, C0G/NP0, 0603	0603	GRM1885C1H180JA01D	MuRata
C80	1	1uF	CAP, CERM, 1 µF, 16 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	EMK107B7105KAHT	Taiyo Yuden
C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C97, C99, C106	18	0.1uF	CAP, CERM, 0.1 µF, 16 V, +/- 5%, X7R, AEC-Q200 Grade 1, 0402	0402	GCM155R71C104JA55D	MuRata

**Table 8-2. TPS25772Q1EVM-149 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
C96, C98	2	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X5R, 0402	0402	C1005X5R1V105K050BC	TDK
C100, C101	2	10pF	CAP, CERM, 10 pF, 50 V, +/- 5%, C0G/NP0, 0402	0402	500R07S100JV4T	Johanson Technology
D1, D2, D3, D4, D5, D6, D7, D8	8	Green	LED, Green, SMD	0402	APHHS1005CGCK	Kingbright
D9	1	28.2V	Diode, TVS, Bi, 22 V, 35.5 Vc, AEC-Q101, SMC	SMB	P6SMB33CA	Littelfuse
D10, D11, D12, D21, D22	5	Green	LED, Green, SMD	LED_0603	150060GS75000	Würth Elektronik
H1, H2, H3, H4	4		Machine Screw, Round, #4-40 x 1/4, Nylon, Phillips panhead	Screw	NY PMS 440 0025 PH	B&F Fastener Supply
H5, H6, H7, H8	4		Standoff, Hex, 0.5"L #4-40 Nylon	Standoff	1902C	Keystone
J1, J15, J19, J20	4		Header, 2.54mm, 3x1, Tin, TH	Header, 2.54mm, 3x1, TH	68001-403HLF	FCI
J2	1		Header, 100mil, 10x2, Gold, TH	10x2 Header	TSW-110-07-G-D	Samtec
J3	1		Header, 100mil, 2x2, Tin, TH	Header, 2x2, 2.54mm, TH	PEC02DAAN	Sullins Connector Solutions
J4	1		Header, 100mil, 9x1, Gold, TH	9x1 Header	TSW-109-07-G-S	Samtec
J5, J14	2		Header, 100mil, 3x2, Tin, TH	Header, 100mil, 3x2, TH	5-146254-3	TE Connectivity
J6, J9	2		Header, 100mil, 6x2, Tin, TH	Header, 6x2, 100mil, Tin	PEC06DAAN	Sullins Connector Solutions
J7	1		Header, 100mil, 8x2, Gold, TH	8x2 Header	TSW-108-07-G-D	Samtec
J8, J10	2		Header, 100mil, 5x2, Tin, TH	Header, 5x2, 100mil, Tin	PEC05DAAN	Sullins Connector Solutions
J11	1		Header, 100mil, 6x1, Tin, TH	TH, 6-Leads, Body 608x100mil, Pitch 100mil	PEC06SAAN	Sullins Connector Solutions
J12	1		BANANA JACK, SOLDER LUG, RED, TH	Red Insulated Banana Jack	SPC15363	Tenma
J13	1		BANANA JACK, SOLDER LUG, BLACK, TH	Black Insulated Banana Jack	SPC15354	Tenma
J16	1		Receptacle, USB 2.0, Micro B, 5 Position, R/A, SMT	Receptacle, USB 2.0, Micro B, 5 Pos, 0.65mm Pitch, R/A, SMT	1051640001	Molex
J17	1		Header, 100mil, 4x1, Gold, TH	4x1 Header	TSW-104-07-G-S	Samtec
J18	1		Header, 2.54mm, 2x1, Gold, TH	Header, 2.54mm, 2x1, TH	TSW-102-08-G-S	Samtec
L1, L10	2	4.7uH	Inductor, Shielded, Composite, 4.7 uH, 24 A, 0.01 ohm, SMD	Inductor, 11.3x10x10mm	XAL1010-472MEB	Coilcraft



**Table 8-2. TPS25772Q1EVM-149 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
L2	1	1uH	Inductor, Shielded, Composite, 1 uH, 25 A, 0.00255 ohm, SMD	7.2x7x7.5mm	XAL7070-102MEB	Coilcraft
L7	1	1.5uH	Inductor, Shielded, Ferrite, 1.5 uH, 6 A, 0.025 ohm, SMD	Inductor, 5.7x2.8x5.2mm	SRP5030T-1R5M	Bourns
PORT A1, PORT A2	2		USB - C (Type - C) USB 2.0 Receptacle Connector 16 Position Through Hole, Right Angle	PTH_USB-C	USB4085-GF-A	Global Connector Technology
Q2	1	60V	MOSFET, N-CH, 60 V, 0.115 A, AEC-Q101, SOT-23	SOT-23	2N7002Q-7-F	Diodes Inc.
Q3, Q4, Q8	3	60V	MOSFET, N-CH, 60 V, 0.24 A, SOT-23	SOT-23	2N7002E-T1-E3	Vishay-Siliconix
Q5	1	40V	MOSFET, N-CH, 40 V, 27 A, AEC-Q101, DFN5 5x6mm	DFN5 5x6mm	NVMFS5C442NLT1G	ON Semiconductor
Q6, Q7	2		N-Channel 40V 107A (Tc) 68W (Tc) Surface Mount 8-WDFN (3.3x3.3)	WDFN8	NVTFS5C453NLWFTAG	ON Semiconductor
R3, R4	2	2.2	RES, 2.2, 5%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	ERJ-6GEYJ2R2V	Panasonic
R5, R57	2	80.6k	RES, 80.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040280K6FKED	Vishay-Dale
R6, R7, R14	3	0	RES, 0, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	RMCF0603ZT0R00	Stackpole Electronics Inc
R8	1	0.001	RES, 0.001, 1%, 1 W, 2010	2010	PMR50HZPFV1L00	Rohm
R9	1	20.0k	RES, 20.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040220K0FKED	Vishay-Dale
R10, R20, R21, R24, R28, R123	6	0	RES, 0, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04020000Z0ED	Vishay-Dale
R12, R72	2	0.01	RES, 0.01, 1%, 1 W, 2010	2010	WSL2010R0100FEA18	Vishay-Dale
R13, R122, R134	3	10.0	RES, 10.0, 1%, 0.063 W, 0402	0402	CRCW040210R0FKED	Vishay-Dale
R16, R23	2	4.02k	RES, 4.02 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04024K02FKED	Vishay-Dale
R25, R29, R30, R54, R79, R130	6	100k	RES, 100 k, 1%, 0.0625 W, AEC-Q200 Grade 0, 0402	0402	AC0402FR-07100KL	Yageo America

**Table 8-2. TPS25772Q1EVM-149 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
R31, R32, R33, R34, R35, R36, R37, R38	8	100	RES, 100, 1%, 0.063 W, 0402	0402	MCR01MZPF1000	Rohm
R39	1	93.1k	RES, 93.1 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040293K1FKED	Vishay-Dale
R40	1	47.5k	RES, 47.5 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040247K5FKED	Vishay-Dale
R41	1	29.4k	RES, 29.4 k, 1%, 0.063 W, 0402	0402	CRCW040229K4FKED	Vishay-Dale
R42, R77	2	20.0k	RES, 20.0 k, 1%, 0.063 W, 0402	0402	CRCW040220K0FKED	Vishay-Dale
R43	1	14.7k	RES, 14.7 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040214K7FKED	Vishay-Dale
R44	1	11.0k	RES, 11.0 k, 1%, 0.063 W, 0402	0402	CRCW040211K0FKED	Vishay-Dale
R45	1	8.45k	RES, 8.45 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04028K45FKED	Vishay-Dale
R46	1	6.65k	RES, 6.65 k, 1%, 0.063 W, 0402	0402	CRCW04026K65FKED	Vishay-Dale
R47, R48, R49, R50, R51, R52	6	2.20k	RES, 2.20 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	RMCF0402FT2K20	Stackpole Electronics Inc
R53	1	1.00k	RES, 1.00 k, 1%, 0.063 W, 0402	0402	MCR01MZPF1001	Rohm
R55, R56, R60	3	5.1k	RES, 5.1 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04025K10JNED	Vishay-Dale
R58	1	97.6k	RES, 97.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040297K6FKED	Vishay-Dale
R59	1	19.6k	RES, 19.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040219K6FKED	Vishay-Dale
R61, R64	2	510	RES, 510, 5%, 0.25 W, 1206	1206	CRCW1206510RJNEA	Vishay-Dale
R62, R63	2	47.0k	RES, 47.0 k, 1%, 0.0625 W, 0402	0402	RC0402FR-0747KL	Yageo America
R66, R67	2	10k	RES, 10 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0402	0402	ERJ-2GEJ103X	Panasonic
R69, R71	2	1.00	RES, 1.00, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031R00FKEA	Vishay-Dale
R70	1	1.00	RES, 1.00, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04021R00FKED	Vishay-Dale

**Table 8-2. TPS25772Q1EVM-149 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
R73	1	24.9k	RES, 24.9 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040224K9FKED	Vishay-Dale
R74	1	49.9k	RES, 49.9 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040249K9FKED	Vishay-Dale
R75	1	14.3k	RES, 14.3 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040214K3FKED	Vishay-Dale
R76	1	150k	RES, 150 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402150KFKED	Vishay-Dale
R80, R81, R83, R88, R93, R94, R98, R100, R112, R118, R120	11	10.0k	RES, 10.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	AC0402FR-0710KL	Yageo America
R82, R89, R90, R91, R92, R105, R107, R108, R109, R110	10	4.7k	RES, 4.7 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04024K70JNED	Vishay-Dale
R85	1	1.00Meg	RES, 1.00 M, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031M00FKEA	Vishay-Dale
R86	1	90.9k	RES, 90.9 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040290K9FKED	Vishay-Dale
R87	1	9.53k	RES, 9.53 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04029K53FKED	Vishay-Dale
R131	1	88.7k	RES, 88.7 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040288K7FKED	Vishay-Dale
R132	1	15.0k	RES, 15.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040215K0FKED	Vishay-Dale
R133	1	10.0	RES, 10.0, 1%, 0.25 W, 0805	0805	RNCP0805FTD10R0	Stackpole Electronics Inc
R139	1	51k	RES, 51 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040251K0JNED	Vishay-Dale
R141	1	10.2k	RES, 10.2 k, 1%, 0.1 W, 0603	0603	RC0603FR-0710K2L	Yageo
RT2	1		Thermistor, DEC0002A (X1SON-2)	DEC0002A	TMP6131DECR	Texas Instruments
S1	1		Switch, SPST-NO, Off-Mom, 0.01 A, 32 VDC, SMD	4.2x2.8mm	KMR243GLFG	C&K Components

**Table 8-2. TPS25772Q1EVM-149 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
SH-J1, SH-J2, SH-J3, SH-J4, SH-J5, SH-J6, SH-J7, SH-J8, SH-J9, SH-J10, SH-J11, SH-J12, SH-J13, SH-J14, SH-J15, SH-J16, SH-J17, SH-J18, SH-J19	19	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec
TP3, TP14, TP15, TP20	4		Test Point, Compact, SMT	Testpoint_Keystone_Compact	5016	Keystone
TP4, TP5, TP16, TP17	4		Test Point, Miniature, Blue, TH	Blue Miniature Testpoint	5117	Keystone
TP6, TP7, TP18, TP19	4		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone
TP8, TP9, TP10, TP11, TP12, TP13, TP30	7		Test Point, Miniature, White, TH	White Miniature Testpoint	5002	Keystone
TP21, TP22, TP23, TP26, TP33, TP34, TP35	7		Test Point, Compact, Red, TH	Red Compact Testpoint	5005	Keystone
TP24, TP25, TP29, TP31, TP32, TP36, TP37, TP38	8		Test Point, Compact, Black, TH	Black Compact Testpoint	5006	Keystone
U1	1		Automotive Dual USB Type-C Power Delivery Controller with Buck-Boost Regulator	VQFN-HR29	TPS25772CQRQLRQ1	Texas Instruments
U2	1		Low-Voltage 8-Bit I2C and SMBus I/O Expander, 1.65 to 5.5 V, -40 to 85 degC, 16-pin TSSOP (PW), Green (RoHS & no Sb/Br)	PW0016A	TCA6408APWR	Texas Instruments
U3	1		256K I2C CMOS Serial EEPROM, TSSOP-8	TSSOP-8	24LC256-I/ST	Microchip
U4	1		Automotive Grade, 1.4V-Capable Temperature Sensor with I2C/SMBus Interface in LM75 Pinout, DGK0008A (VSSOP-8)	DGK0008A	TMP75BQDGKRQ1	Texas Instruments
U5	1		256-Taps Dual-Channel Digital Potentiometer With I2C Interface and Nonvolatile Memory, RUC0014A (X2QFN-14)	RUC0014A	TPL0102-100RUCR	Texas Instruments
U6	1		Low Iq Always ON Smart Diode Controller, DBV0006A (SOT-23-6)	DBV0006A	LM74700QDBVRQ1	Texas Instruments

**Table 8-2. TPS25772Q1EVM-149 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
U7	1		Automotive 3.8-V to 36-V 2-A Synchronous Step-Down Voltage Regulator, RNX0012B (VQFN-HR-12)	RNX0012B	LMR33620CQ5RNXTQ1	Texas Instruments
U8, U9	2		1-A LDO With Power-Good, DRV0006A (WSON-6)	DRV0006A	TPS74601PBQWDRVRQ1	Texas Instruments
U10	1		36-V, 16-A Buck-Boost Converter, RPM0026A (VQFN-HR-26)	RPM0026A	TPS55288QRPMRQ1	Texas Instruments
U12	1		Automotive Catalog ESD Protected, High-Speed USB 2.0 (480-Mbps) 1:2 Multiplexer / Demultiplexer Switch, 16 ohm RON, 2.5 to 3.3V, -40 to 125 degC, 10-Pin UQFN (RSE), Green (RoHS & no Sb/Br)	RSE0010A	TS3USB221AQRSERQ1	Texas Instruments
U13	1		Four-Port High-Speed 480Mbps USB 2.0 Hub, PAP0064K (HTQFP-64)	PAP0064K	TUSB4041IPAP	Texas Instruments
U16	1		ESD Solution for Super-Speed (6 Gbps) USB 3.0 Interface, 2 Channels, -40 to +85 degC, 3-pin SOT (DRT), Green (Rohs & No Sb/Br)	DRT0003A	TPD2EUSB30DRTR	Texas Instruments
U17	1		Tiva C Series Microcontroller, 256 KB Flash, 32 KB SRAM, 12 Bit, 12 Channels, -40 to 105 degC, 64-Pin LQFP (PM), Green (RoHS & no Sb/Br), Tape and Reel	PM0064A	TM4C123GH6PMTR	Texas Instruments
Y1	1		Crystal, 24 MHz, 30 ppm, 20 pF, SMD	5x3.2mm	ECS-240-20-30B-AEN-TR	ECS Inc.
Y2	1		Crystal, 16 MHz, 8pF, SMD	3.2x0.75x2.5mm	NX3225GA-16.000M-STD-CRG-1	NDK

**Table 8-3. TPS25772Q1EVM-150 BOM**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
!PCB1	1		Printed Circuit Board		PSIL150	Any
C1, C52	2	33uF	CAP, Polymer Hybrid, 33 uF, 50 V, +/- 20%, 40 ohm, 6.3x7.7 SMD	6.3x7.7	EEH-ZC1H330XP	Panasonic
C2, C30, C32, C60, C61, C69, C70, C71, C73	9	10uF	CAP, CERM, 10 µF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 1206	1206	CGA5L1X7R1H106K160AC	TDK
C3, C10, C17, C36, C40, C41, C45, C53, C107	9	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	CGA3E2X7R1H104K080AA	TDK
C5	1	3300pF	CAP, CERM, 3300 pF, 50 V, +/- 10%, X7R, 0603	0603	885012206086	Würth Elektronik
C6, C7, C8, C9, C24, C25, C26, C27, C77	9	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1H104K050BB	TDK
C12	1	100uF	CAP, Polymer Hybrid, 100 uF, 35 V, +/- 20%, 27 mohm, 8x10 SMD	8x10	EEH-ZC1V101P	Panasonic
C13, C14, C15, C16	4	330pF	CAP, CERM, 330 pF, 50 V, +/- 10%, X7R, 0402	0402	GRM155R71H331KA01D	MuRata
C18, C65	2	0.22uF	CAP, CERM, 0.22 uF, 25 V, +/- 20%, X5R, 0402	0402	C1005X5R1E224M050BC	TDK
C19	1	0.47uF	CAP, CERM, 0.47 uF, 50 V, +/- 10%, X7R, 0603	0603	C1608X7R1H474K080AC	TDK
C20, C22, C23	3	4.7uF	CAP, CERM, 4.7 µF, 10 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0805	0805	CGA4J3X7R1A475K125AB	TDK
C21, C103, C104	3	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	0402YC104KAT2A	AVX
C28	1	0.01uF	CAP, CERM, 0.01 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	GCM188R71H103KA37D	MuRata
C29, C31, C33, C34, C35	5	0.1uF	CAP, CERM, 0.1 µF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	06035C104KAZ2A	AVX
C37, C38	2	4.7uF	CAP, CERM, 4.7 uF, 35 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0805	0805	CGA4J1X7R1V475K125AC	TDK
C39	1	0.22uF	CAP, CERM, 0.22 µF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	GCJ188R71H224KA01D	MuRata

Table 8-3. TPS25772Q1EVM-150 BOM (continued)

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
C42, C43	2	22uF	CAP, CERM, 22 uF, 10 V, +/- 10%, X7R, AEC-Q200 Grade 1, 1206	1206	GCM31CR71A226KE02L	MuRata
C44	1	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	CGA3E1X7R1V105K080AC	TDK
C46, C47, C48, C49	4	10uF	CAP, CERM, 10 uF, 6.3 V, +/- 20%, X7R, 0603	0603	CL10B106MQ8NRNC	Samsung Electro-Mechanics
C50, C51	2	0.01uF	CAP, CERM, 0.01 uF, 10 V, +/- 10%, X5R, 0402	0402	GRM155R61A103KA01D	MuRata
C54, C55, C56	3	4.7uF	CAP, CERM, 4.7 uF, 50 V, +/- 10%, X7R, 1206	1206	C3216X7R1H475K160AC	TDK
C59	1	68uF	CAP, Aluminum Polymer, 68 uF, 50 V, +/- 20%, 0.03 ohm, AEC-Q200 Grade 0, D8xL10.2mm SMD	D8xL10.2mm	EEH-ZE1H680V	Panasonic
C62, C63, C68, C72	4	1uF	CAP, CERM, 1 uF, 50 V, +/- 20%, X5R, AEC-Q200 Grade 3, 0603	0603	CGA3E3X5R1H105M080AB	TDK
C64, C66	2	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, 0603	0603	GCM188R71H104KA57D	MuRata
C67	1	100uF	CAP, Polymer Hybrid, 100 uF, 35 V, +/- 20%, 27 ohm, 8x10 SMD	8x10	EEH-ZC1V101P	Panasonic
C74	1	4.7uF	CAP, CERM, 4.7 uF, 25 V, +/- 10%, X6S, AEC-Q200 Grade 2, 0603	0603	GRT188C81E475KE13D	MuRata
C75	1	0.022uF	CAP, CERM, 0.022 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1H223K050BB	TDK
C76	1	4700pF	CAP, CERM, 4700 pF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	GCM155R71H472KA37D	MuRata
C78, C79	2	18pF	CAP, CERM, 18 pF, 50 V, +/- 5%, C0G/NP0, 0603	0603	GRM1885C1H180JA01D	MuRata
C80	1	1uF	CAP, CERM, 1 uF, 16 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0603	0603	EMK107B7105KAHT	Taiyo Yuden
C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C97, C99, C106	18	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 5%, X7R, AEC-Q200 Grade 1, 0402	0402	GCM155R71C104JA55D	MuRata

**Table 8-3. TPS25772Q1EVM-150 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
C96, C98	2	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X5R, 0402	0402	C1005X5R1V105K050BC	TDK
C100, C101	2	10pF	CAP, CERM, 10 pF, 50 V, +/- 5%, C0G/NP0, 0402	0402	500R07S100JV4T	Johanson Technology
D1, D2, D3, D4, D5, D6, D7, D8	8	Green	LED, Green, SMD	0402	APHHS1005CGCK	Kingbright
D9	1	28.2V	Diode, TVS, Bi, 22 V, 35.5 Vc, AEC-Q101, SMC	SMB	P6SMB33CA	Littelfuse
D10, D11, D12, D21, D22	5	Green	LED, Green, SMD	LED_0603	150060GS75000	Würth Elektronik
H1, H2, H3, H4	4		Machine Screw, Round, #4-40 x 1/4, Nylon, Phillips panhead	Screw	NY PMS 440 0025 PH	B&F Fastener Supply
H5, H6, H7, H8	4		Standoff, Hex, 0.5"L #4-40 Nylon	Standoff	1902C	Keystone
J1, J15, J19, J20	4		Header, 2.54mm, 3x1, Tin, TH	Header, 2.54mm, 3x1, TH	68001-403HLF	FCI
J2	1		Header, 100mil, 10x2, Gold, TH	10x2 Header	TSW-110-07-G-D	Samtec
J3	1		Header, 100mil, 2x2, Tin, TH	Header, 2x2, 2.54mm, TH	PEC02DAAN	Sullins Connector Solutions
J4	1		Header, 100mil, 9x1, Gold, TH	9x1 Header	TSW-109-07-G-S	Samtec
J5, J14	2		Header, 100mil, 3x2, Tin, TH	Header, 100mil, 3x2, TH	5-146254-3	TE Connectivity
J6, J9	2		Header, 100mil, 6x2, Tin, TH	Header, 6x2, 100mil, Tin	PEC06DAAN	Sullins Connector Solutions
J7	1		Header, 100mil, 8x2, Gold, TH	8x2 Header	TSW-108-07-G-D	Samtec
J8, J10	2		Header, 100mil, 5x2, Tin, TH	Header, 5x2, 100mil, Tin	PEC05DAAN	Sullins Connector Solutions
J11	1		Header, 100mil, 6x1, Tin, TH	TH, 6-Leads, Body 608x100mil, Pitch 100mil	PEC06SAAN	Sullins Connector Solutions
J12	1		BANANA JACK, SOLDER LUG, RED, TH	Red Insulated Banana Jack	SPC15363	Tenma
J13	1		BANANA JACK, SOLDER LUG, BLACK, TH	Black Insulated Banana Jack	SPC15354	Tenma
J16	1		Receptacle, USB 2.0, Micro B, 5 Position, R/A, SMT	Receptacle, USB 2.0, Micro B, 5 Pos, 0.65mm Pitch, R/A, SMT	1051640001	Molex
J17	1		Header, 100mil, 4x1, Gold, TH	4x1 Header	TSW-104-07-G-S	Samtec
J18	1		Header, 2.54mm, 2x1, Gold, TH	Header, 2.54mm, 2x1, TH	TSW-102-08-G-S	Samtec
L1, L10	2	4.7uH	Inductor, Shielded, Composite, 4.7 uH, 24 A, 0.01 ohm, SMD	Inductor, 11.3x10x10mm	XAL1010-472MEB	Coilcraft



**Table 8-3. TPS25772Q1EVM-150 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
L2	1	1uH	Inductor, Shielded, Composite, 1 uH, 25 A, 0.00255 ohm, SMD	7.2x7x7.5mm	XAL7070-102MEB	Coilcraft
L7	1	1.5uH	Inductor, Shielded, Ferrite, 1.5 uH, 6 A, 0.025 ohm, SMD	Inductor, 5.7x2.8x5.2mm	SRP5030T-1R5M	Bourns
PORT A1, PORT A2	2		USB - C (Type - C) USB 2.0 Receptacle Connector 16 Position Through Hole, Right Angle	PTH_USB-C	USB4085-GF-A	Global Connector Technology
Q2	1	60V	MOSFET, N-CH, 60 V, 0.115 A, AEC-Q101, SOT-23	SOT-23	2N7002Q-7-F	Diodes Inc.
Q3, Q4, Q8	3	60V	MOSFET, N-CH, 60 V, 0.24 A, SOT-23	SOT-23	2N7002E-T1-E3	Vishay-Siliconix
Q5	1	40V	MOSFET, N-CH, 40 V, 27 A, AEC-Q101, DFN5 5x6mm	DFN5 5x6mm	NVMFS5C442NLT1G	ON Semiconductor
Q6, Q7	2		N-Channel 40V 107A (Tc) 68W (Tc) Surface Mount 8-WDFN (3.3x3.3)	WDFN8	NVTF5C453NLWFTAG	ON Semiconductor
R3, R4	2	2.2	RES, 2.2, 5%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	ERJ-6GEYJ2R2V	Panasonic
R5, R57	2	80.6k	RES, 80.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040280K6FKED	Vishay-Dale
R6, R7, R14	3	0	RES, 0, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	RMCF0603ZT0R00	Stackpole Electronics Inc
R8	1	0.001	RES, 0.001, 1%, 1 W, 2010	2010	PMR50HZPFV1L00	Rohm
R9	1	20.0k	RES, 20.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040220K0FKED	Vishay-Dale
R10, R20, R22, R26, R27, R124, R128, R129	8	0	RES, 0, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04020000Z0ED	Vishay-Dale
R12, R72	2	0.01	RES, 0.01, 1%, 1 W, 2010	2010	WSL2010R0100FEA18	Vishay-Dale
R13, R122, R134	3	10.0	RES, 10.0, 1%, 0.063 W, 0402	0402	CRCW040210R0FKED	Vishay-Dale
R16, R23	2	4.02k	RES, 4.02 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04024K02FKED	Vishay-Dale
R25, R29, R30, R54, R79, R130	6	100k	RES, 100 k, 1%, 0.0625 W, AEC-Q200 Grade 0, 0402	0402	AC0402FR-07100KL	Yageo America

**Table 8-3. TPS25772Q1EVM-150 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
R31, R32, R33, R34, R35, R36, R37, R38	8	100	RES, 100, 1%, 0.063 W, 0402	0402	MCR01MZPF1000	Rohm
R39	1	93.1k	RES, 93.1 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040293K1FKED	Vishay-Dale
R40	1	47.5k	RES, 47.5 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040247K5FKED	Vishay-Dale
R41	1	29.4k	RES, 29.4 k, 1%, 0.063 W, 0402	0402	CRCW040229K4FKED	Vishay-Dale
R42, R77	2	20.0k	RES, 20.0 k, 1%, 0.063 W, 0402	0402	CRCW040220K0FKED	Vishay-Dale
R43	1	14.7k	RES, 14.7 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040214K7FKED	Vishay-Dale
R44	1	11.0k	RES, 11.0 k, 1%, 0.063 W, 0402	0402	CRCW040211K0FKED	Vishay-Dale
R45	1	8.45k	RES, 8.45 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04028K45FKED	Vishay-Dale
R46	1	6.65k	RES, 6.65 k, 1%, 0.063 W, 0402	0402	CRCW04026K65FKED	Vishay-Dale
R47, R48, R49, R50, R51, R52	6	2.20k	RES, 2.20 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	RMCF0402FT2K20	Stackpole Electronics Inc
R53	1	1.00k	RES, 1.00 k, 1%, 0.063 W, 0402	0402	MCR01MZPF1001	Rohm
R55, R56, R60	3	5.1k	RES, 5.1 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04025K10JNED	Vishay-Dale
R58	1	97.6k	RES, 97.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040297K6FKED	Vishay-Dale
R59	1	19.6k	RES, 19.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040219K6FKED	Vishay-Dale
R61, R64	2	510	RES, 510, 5%, 0.25 W, 1206	1206	CRCW1206510RJNEA	Vishay-Dale
R62, R63	2	47.0k	RES, 47.0 k, 1%, 0.0625 W, 0402	0402	RC0402FR-0747KL	Yageo America
R66, R67	2	10k	RES, 10 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0402	0402	ERJ-2GEJ103X	Panasonic
R69, R71	2	1.00	RES, 1.00, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031R00FKEA	Vishay-Dale
R70	1	1.00	RES, 1.00, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04021R00FKED	Vishay-Dale

**Table 8-3. TPS25772Q1EVM-150 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
R73	1	24.9k	RES, 24.9 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040224K9FKED	Vishay-Dale
R74	1	49.9k	RES, 49.9 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040249K9FKED	Vishay-Dale
R75	1	14.3k	RES, 14.3 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040214K3FKED	Vishay-Dale
R76	1	150k	RES, 150 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402150KFKED	Vishay-Dale
R80, R81, R83, R88, R93, R94, R98, R100, R112, R118, R120	11	10.0k	RES, 10.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	AC0402FR-0710KL	Yageo America
R82, R89, R90, R91, R92, R105, R107, R108, R109, R110	10	4.7k	RES, 4.7 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04024K70JNED	Vishay-Dale
R85	1	1.00Meg	RES, 1.00 M, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031M00FKEA	Vishay-Dale
R86	1	90.9k	RES, 90.9 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040290K9FKED	Vishay-Dale
R87	1	9.53k	RES, 9.53 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04029K53FKED	Vishay-Dale
R131	1	88.7k	RES, 88.7 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040288K7FKED	Vishay-Dale
R132	1	15.0k	RES, 15.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040215K0FKED	Vishay-Dale
R133	1	10.0	RES, 10.0, 1%, 0.25 W, 0805	0805	RNCP0805FTD10R0	Stackpole Electronics Inc
R139	1	51k	RES, 51 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040251K0JNED	Vishay-Dale
R142	1	10.2k	RES, 10.2 k, 1%, 0.1 W, 0603	0603	RC0603FR-0710K2L	Yageo
RT2	1		Thermistor, DEC0002A (X1SON-2)	DEC0002A	TMP6131DECR	Texas Instruments
S1	1		Switch, SPST-NO, Off-Mom, 0.01 A, 32 VDC, SMD	4.2x2.8mm	KMR243GLFG	C&K Components

**Table 8-3. TPS25772Q1EVM-150 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
SH-J1, SH-J2, SH-J3, SH-J4, SH-J5, SH-J6, SH-J7, SH-J8, SH-J9, SH-J10, SH-J11, SH-J12, SH-J13, SH-J14, SH-J15, SH-J16, SH-J17, SH-J18, SH-J19	19	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec
TP3, TP14, TP15, TP20	4		Test Point, Compact, SMT	Testpoint_Keystone_Compact	5016	Keystone
TP4, TP5, TP16, TP17	4		Test Point, Miniature, Blue, TH	Blue Miniature Testpoint	5117	Keystone
TP6, TP7, TP18, TP19	4		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone
TP8, TP9, TP10, TP11, TP12, TP13, TP30	7		Test Point, Miniature, White, TH	White Miniature Testpoint	5002	Keystone
TP21, TP22, TP23, TP26, TP33, TP34, TP35	7		Test Point, Compact, Red, TH	Red Compact Testpoint	5005	Keystone
TP24, TP25, TP29, TP31, TP32, TP36, TP37, TP38	8		Test Point, Compact, Black, TH	Black Compact Testpoint	5006	Keystone
U1	1		Automotive Dual USB Type-C Power Delivery Controller with Buck-Boost Regulator	VQFN-HR29	TPS25772CQRQLRQ1	Texas Instruments
U2	1		Low-Voltage 8-Bit I2C and SMBus I/O Expander, 1.65 to 5.5 V, -40 to 85 degC, 16-pin TSSOP (PW), Green (RoHS & no Sb/Br)	PW0016A	TCA6408APWR	Texas Instruments
U3	1		256K I2C CMOS Serial EEPROM, TSSOP-8	TSSOP-8	24LC256-I/ST	Microchip
U4	1		Automotive Grade, 1.4V-Capable Temperature Sensor with I2C/SMBus Interface in LM75 Pinout, DGK0008A (VSSOP-8)	DGK0008A	TMP75BQDGKRQ1	Texas Instruments
U5	1		256-Taps Dual-Channel Digital Potentiometer With I2C Interface and Nonvolatile Memory, RUC0014A (X2QFN-14)	RUC0014A	TPL0102-100RUCR	Texas Instruments
U6	1		Low Iq Always ON Smart Diode Controller, DBV0006A (SOT-23-6)	DBV0006A	LM74700QDBVRQ1	Texas Instruments

**Table 8-3. TPS25772Q1EVM-150 BOM (continued)**

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
U7	1		Automotive 3.8-V to 36-V 2-A Synchronous Step-Down Voltage Regulator, RNX0012B (VQFN-HR-12)	RNX0012B	LMR33620CQ5RNXTQ1	Texas Instruments
U8, U9	2		1-A LDO With Power-Good, DRV0006A (WSON-6)	DRV0006A	TPS74601PBQWDRVRQ1	Texas Instruments
U10	1		36-V, 16-A Buck-Boost Converter, RPM0026A (VQFN-HR-26)	RPM0026A	TPS55288QRPMRQ1	Texas Instruments
U12	1		Automotive Catalog ESD Protected, High-Speed USB 2.0 (480-Mbps) 1:2 Multiplexer / Demultiplexer Switch, 16 ohm RON, 2.5 to 3.3V, -40 to 125 degC, 10-Pin UQFN (RSE), Green (RoHS & no Sb/Br)	RSE0010A	TS3USB221AQRSERQ1	Texas Instruments
U13	1		Four-Port High-Speed 480Mbps USB 2.0 Hub, PAP0064K (HTQFP-64)	PAP0064K	TUSB4041IPAP	Texas Instruments
U16	1		ESD Solution for Super-Speed (6 Gbps) USB 3.0 Interface, 2 Channels, -40 to +85 degC, 3-pin SOT (DRT), Green (Rohs & No Sb/Br)	DRT0003A	TPD2EUSB30DRTR	Texas Instruments
U17	1		Tiva C Series Microcontroller, 256 KB Flash, 32 KB SRAM, 12 Bit, 12 Channels, -40 to 105 degC, 64-Pin LQFP (PM), Green (RoHS & no Sb/Br), Tape and Reel	PM0064A	TM4C123GH6PMTR	Texas Instruments
Y1	1		Crystal, 24 MHz, 30 ppm, 20 pF, SMD	5x3.2mm	ECS-240-20-30B-AEN-TR	ECS Inc.
Y2	1		Crystal, 16 MHz, 8pF, SMD	3.2x0.75x2.5mm	NX3225GA-16.000M-STD-CRG-1	NDK

## STANDARD TERMS FOR EVALUATION MODULES

1. *Delivery:* TI delivers TI evaluation boards, kits, or modules, including any accompanying demonstration software, components, and/or documentation which may be provided together or separately (collectively, an "EVM" or "EVMs") to the User ("User") in accordance with the terms set forth herein. User's acceptance of the EVM is expressly subject to the following terms.
  - 1.1 EVMs are intended solely for product or software developers for use in a research and development setting to facilitate feasibility evaluation, experimentation, or scientific analysis of TI semiconductors products. EVMs have no direct function and are not finished products. EVMs shall not be directly or indirectly assembled as a part or subassembly in any finished product. For clarification, any software or software tools provided with the EVM ("Software") shall not be subject to the terms and conditions set forth herein but rather shall be subject to the applicable terms that accompany such Software
  - 1.2 EVMs are not intended for consumer or household use. EVMs may not be sold, sublicensed, leased, rented, loaned, assigned, or otherwise distributed for commercial purposes by Users, in whole or in part, or used in any finished product or production system.
2. *Limited Warranty and Related Remedies/Disclaimers:*
  - 2.1 These terms do not apply to Software. The warranty, if any, for Software is covered in the applicable Software License Agreement.
  - 2.2 TI warrants that the TI EVM will conform to TI's published specifications for ninety (90) days after the date TI delivers such EVM to User. Notwithstanding the foregoing, TI shall not be liable for a nonconforming EVM if (a) the nonconformity was caused by neglect, misuse or mistreatment by an entity other than TI, including improper installation or testing, or for any EVMs that have been altered or modified in any way by an entity other than TI, (b) the nonconformity resulted from User's design, specifications or instructions for such EVMs or improper system design, or (c) User has not paid on time. Testing and other quality control techniques are used to the extent TI deems necessary. TI does not test all parameters of each EVM. User's claims against TI under this Section 2 are void if User fails to notify TI of any apparent defects in the EVMs within ten (10) business days after delivery, or of any hidden defects with ten (10) business days after the defect has been detected.
  - 2.3 TI's sole liability shall be at its option to repair or replace EVMs that fail to conform to the warranty set forth above, or credit User's account for such EVM. TI's liability under this warranty shall be limited to EVMs that are returned during the warranty period to the address designated by TI and that are determined by TI not to conform to such warranty. If TI elects to repair or replace such EVM, TI shall have a reasonable time to repair such EVM or provide replacements. Repaired EVMs shall be warranted for the remainder of the original warranty period. Replaced EVMs shall be warranted for a new full ninety (90) day warranty period.

### **WARNING**

**Evaluation Kits are intended solely for use by technically qualified, professional electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems, and subsystems.**

**User shall operate the Evaluation Kit within TI's recommended guidelines and any applicable legal or environmental requirements as well as reasonable and customary safeguards. Failure to set up and/or operate the Evaluation Kit within TI's recommended guidelines may result in personal injury or death or property damage. Proper set up entails following TI's instructions for electrical ratings of interface circuits such as input, output and electrical loads.**

**NOTE:**

**EXPOSURE TO ELECTROSTATIC DISCHARGE (ESD) MAY CAUSE DEGRADATION OR FAILURE OF THE EVALUATION KIT; TI RECOMMENDS STORAGE OF THE EVALUATION KIT IN A PROTECTIVE ESD BAG.**

### 3 Regulatory Notices:

#### 3.1 United States

##### 3.1.1 Notice applicable to EVMs not FCC-Approved:

**FCC NOTICE:** This kit is designed to allow product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and software developers to write software applications for use with the end product. This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of this chapter, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter.

##### 3.1.2 For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant:

#### **CAUTION**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

#### **FCC Interference Statement for Class A EVM devices**

*NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

#### **FCC Interference Statement for Class B EVM devices**

*NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- 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 or RSS-247

#### **Concerning EVMs Including Radio Transmitters:**

This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:

(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

#### **Concerning EVMs Including Detachable Antennas:**

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.

### 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.

#### 3.3 Japan

3.3.1 *Notice for EVMs delivered in Japan:* Please see [http://www.tij.co.jp/lstds/ti\\_ja/general/eStore/notice\\_01.page](http://www.tij.co.jp/lstds/ti_ja/general/eStore/notice_01.page) 日本国内に輸入される評価用キット、ボードについては、次のところをご覧ください。  
[http://www.tij.co.jp/lstds/ti\\_ja/general/eStore/notice\\_01.page](http://www.tij.co.jp/lstds/ti_ja/general/eStore/notice_01.page)

3.3.2 *Notice for Users of EVMs Considered "Radio Frequency Products" in Japan:* EVMs entering Japan may not be certified by TI as conforming to Technical Regulations of Radio Law of Japan.

If User uses EVMs in Japan, not certified to Technical Regulations of Radio Law of Japan, User is required to follow the instructions set forth by Radio Law of Japan, which includes, but is not limited to, the instructions below with respect to EVMs (which for the avoidance of doubt are stated strictly for convenience and should be verified by User):

1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
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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2. 実験局の免許を取得後ご使用いただく。
3. 技術基準適合証明を取得後ご使用いただく。

なお、本製品は、上記の「ご使用にあたっての注意」を譲渡先、移転先に通知しない限り、譲渡、移転できないものとします。

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3.3.3 *Notice for EVMs for Power Line Communication:* Please see [http://www.tij.co.jp/lstds/ti\\_ja/general/eStore/notice\\_02.page](http://www.tij.co.jp/lstds/ti_ja/general/eStore/notice_02.page)  
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#### 3.4 European Union

3.4.1 *For EVMs subject to EU Directive 2014/30/EU (Electromagnetic Compatibility Directive):*

This is a class A product intended for use in environments other than domestic environments that are connected to a low-voltage power-supply network that supplies buildings used for domestic purposes. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.



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- 4 *EVM Use Restrictions and Warnings:*
    - 4.1 EVMS ARE NOT FOR USE IN FUNCTIONAL SAFETY AND/OR SAFETY CRITICAL EVALUATIONS, INCLUDING BUT NOT LIMITED TO EVALUATIONS OF LIFE SUPPORT APPLICATIONS.
    - 4.2 User must read and apply the user guide and other available documentation provided by TI regarding the EVM prior to handling or using the EVM, including without limitation any warning or restriction notices. The notices contain important safety information related to, for example, temperatures and voltages.
    - 4.3 *Safety-Related Warnings and Restrictions:*
      - 4.3.1 User shall operate the EVM within TI's recommended specifications and environmental considerations stated in the user guide, other available documentation provided by TI, and any other applicable requirements and employ reasonable and customary safeguards. Exceeding the specified performance ratings and specifications (including but not limited to input and output voltage, current, power, and environmental ranges) for the EVM may cause personal injury or death, or property damage. If there are questions concerning performance ratings and specifications, User should contact a TI field representative prior to connecting interface electronics including input power and intended loads. Any loads applied outside of the specified output range may also result in unintended and/or inaccurate operation and/or possible permanent damage to the EVM and/or interface electronics. Please consult the EVM user 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, even with the inputs and outputs kept within the specified allowable ranges, some circuit components may have elevated case temperatures. These components include but are not limited to linear regulators, switching transistors, pass transistors, current sense resistors, and heat sinks, which can be identified using the information in the associated documentation. When working with the EVM, please be aware that the EVM may become very warm.
      - 4.3.2 EVMs are intended solely for use by technically qualified, professional electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems, and subsystems. User assumes all responsibility and liability for proper and safe handling and use of the EVM by User or its employees, affiliates, contractors or designees. User assumes all responsibility and liability to ensure that any interfaces (electronic and/or mechanical) between the EVM and any human body are designed with suitable isolation and means to safely limit accessible leakage currents to minimize the risk of electrical shock hazard. User assumes all responsibility and liability for any improper or unsafe handling or use of the EVM by User or its employees, affiliates, contractors or designees.
    - 4.4 User assumes all responsibility and liability to determine whether the EVM is subject to any applicable international, federal, state, or local laws and regulations related to User's handling and use of the EVM and, if applicable, User assumes all responsibility and liability for compliance in all respects with such laws and regulations. User assumes all responsibility and liability for proper disposal and recycling of the EVM consistent with all applicable international, federal, state, and local requirements.
  5. *Accuracy of Information:* To the extent TI provides information on the availability and function of EVMs, TI attempts to be as accurate as possible. However, TI does not warrant the accuracy of EVM descriptions, EVM availability or other information on its websites as accurate, complete, reliable, current, or error-free.
  6. *Disclaimers:*
    - 6.1 EXCEPT AS SET FORTH ABOVE, EVMS AND ANY MATERIALS PROVIDED WITH THE EVM (INCLUDING, BUT NOT LIMITED TO, REFERENCE DESIGNS AND THE DESIGN OF THE EVM ITSELF) ARE PROVIDED "AS IS" AND "WITH ALL FAULTS." TI DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, REGARDING SUCH ITEMS, INCLUDING BUT NOT LIMITED TO ANY EPIDEMIC FAILURE WARRANTY OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF ANY THIRD PARTY PATENTS, COPYRIGHTS, TRADE SECRETS OR OTHER INTELLECTUAL PROPERTY RIGHTS.
    - 6.2 EXCEPT FOR THE LIMITED RIGHT TO USE THE EVM SET FORTH HEREIN, NOTHING IN THESE TERMS SHALL BE CONSTRUED AS GRANTING OR CONFERRING ANY RIGHTS BY LICENSE, PATENT, OR ANY OTHER INDUSTRIAL OR INTELLECTUAL PROPERTY RIGHT OF TI, ITS SUPPLIERS/LICENSORS OR ANY OTHER THIRD PARTY, TO USE THE EVM IN ANY FINISHED END-USER OR READY-TO-USE FINAL PRODUCT, OR FOR ANY INVENTION, DISCOVERY OR IMPROVEMENT, REGARDLESS OF WHEN MADE, CONCEIVED OR ACQUIRED.
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9. *Return Policy.* Except as otherwise provided, TI does not offer any refunds, returns, or exchanges. Furthermore, no return of EVM(s) will be accepted if the package has been opened and no return of the EVM(s) will be accepted if they are damaged or otherwise not in a resalable condition. If User feels it has been incorrectly charged for the EVM(s) it ordered or that delivery violates the applicable order, User should contact TI. All refunds will be made in full within thirty (30) working days from the return of the components(s), excluding any postage or packaging costs.

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