User's Guide

TPS61299EVM-103 User Guide

ABSTRACT

This user's guide describes the schematic, layout, bill of materials (BOM), and setup of the evaluation module (EVM) for the TPS61299, which outputs a fixed 5 V in a WCSP package. The input voltage of the EVM is from 0.7 V to 5.5 V. The output current mainly depends on the input voltage, because the inductor peak current is limited at typical 1.2 A. The EVM supports typical 0.8A from a 3.6-V input voltage.

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Trademarks

1 Schematic

Figure 1-1 shows the schematic of the TPS61299EVM-103. Use a jumper cap on J5 to connect different resistors for different output voltages (refer to Top Layer of TPS61299EVM-103 for more details). The tantalum capacitor, C3, is used to stabilize the input voltage for the TPS61299, in case the cable between the power supply and the EVM is too long. In most applications, the tantalum capacitor is unnecessary. The definition of the connectors is explained as follows:

- PIN 1 and PIN 2 of J1 are used for the ground of the input power supply.
- PIN 5 and PIN 6 of J1 are used for the positive input of the power supply.
- PIN 3 and PIN 4 of J1 are used to sense the input voltage closed to the IC (see the PCB).
- PIN 1 and PIN 2 of J4 are used for the negative input of the load.
- PIN 5 and PIN 6 of J4 are used for the positive input of the load.
- PIN 3 and PIN 4 of J4 are used to measure the output voltage closed to the IC (see the PCB).
- JP2 is used to enable or disable the IC through the EN pin.
- JP3 is used to connect AVIN to the input rail or external aux input.
- JP5 is used to select different output voltage with a jumper cap.

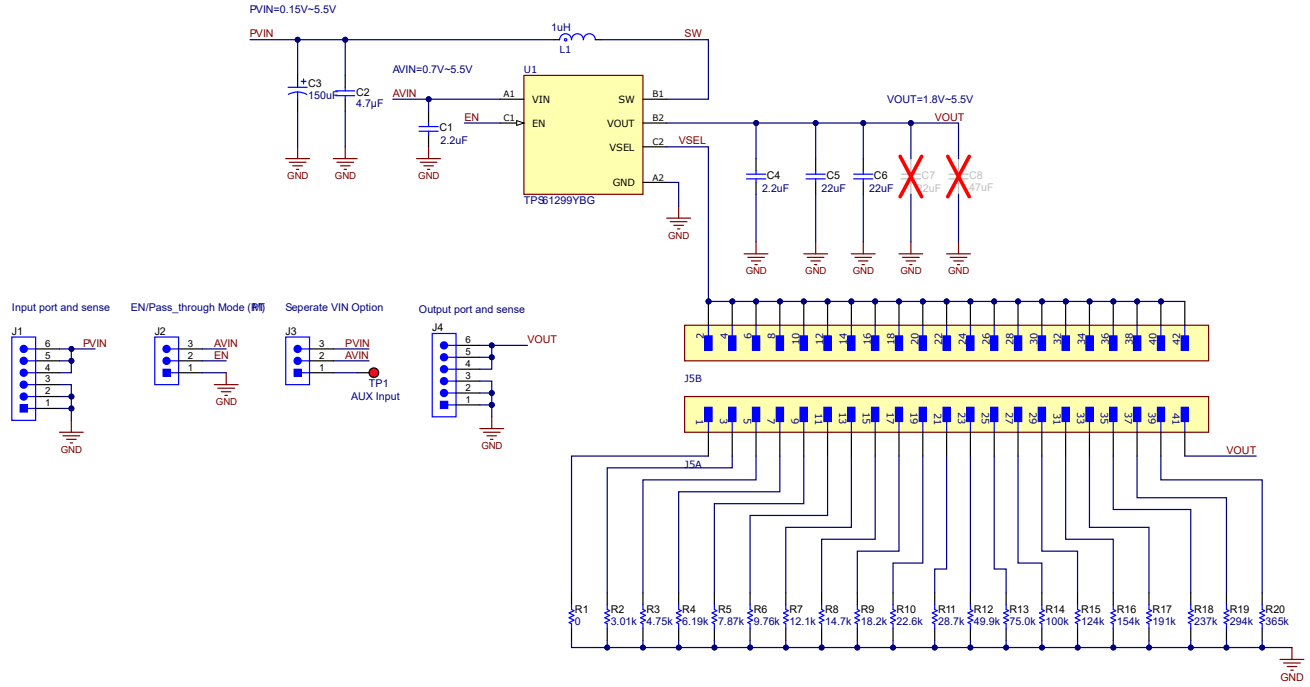

Figure 1-1. TPS61299EVM-103 Schematic

2 Bill of Materials

Table 2-1 lists the TPS61299EVM-103 BOM.

Table 2-1. Bill of Materials

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer
!PCB	1		Printed Circuit Board		BMC103	Any
C1, C4	2	2.2uF	CAP, CERM, 2.2 uF, 10 V, +/- 20%, X5R, 0402	0402	GRM155R61A225ME95	MuRata
C2	1	4.7uF	CAP, CERM, 4.7 uF, 10 V, +/- 20%, X7R, 0603	0603	GRM188Z71A475ME15D	MuRata
C3	1	150uF	CAP, TA, 150 uF, 10 V, +/- 10%, 0.1 ohm, SMD	7343-31	T495D157K010ATE100	Kemet
C5, C6	2	22uF	CAP, CERM, 22 uF, 10 V, +/- 20%, X5R, 0603	0603	GRM187R61A226ME15D	MuRata
J1, J4	2		Header, 2.54 mm, 6x1, Gold, TH	Header, 2.54mm, 6x1, TH	61300611121	Wurth Elektronik
J2, J3	2		Header, 2.54 mm, 3x1, Gold, TH	Header, 2.54mm, 3x1, TH	61300311121	Wurth Elektronik
J5	1		Connector Header Through Hole 42 position 0.100" (2.54mm)	HDR42	TSW-121-23-L-D	Samtec
L1	1	1uH	Power Choke Coil 100% lead pb free DC/DC Converter for CPU 1.6mm x 0.8mm 1uH 20% S Type	0603	HTTH16080H-1R0MSR-99	Cyntec
R1	1	0	RES, 0, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04020000Z0ED	Vishay-Dale
R2	1	3.01k	RES, 3.01 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04023K01FKED	Vishay-Dale
R3	1	4.75k	RES, 4.75 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04024K75FKED	Vishay-Dale
R4	1	6.19k	RES, 6.19 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04026K19FKED	Vishay-Dale
R5	1	7.87k	RES, 7.87 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04027K87FKED	Vishay-Dale
R6	1	9.76k	RES, 9.76 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04029K76FKED	Vishay-Dale
R7	1	12.1k	RES, 12.1 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040212K1FKED	Vishay-Dale
R8	1	14.7k	RES, 14.7 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040214K7FKED	Vishay-Dale
R9	1	18.2k	RES, 18.2 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040218K2FKED	Vishay-Dale
R10	1	22.6k	RES, 22.6 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040222K6FKED	Vishay-Dale
R11	1	28.7k	RES, 28.7 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040228K7FKED	Vishay-Dale
R12	1	49.9k	RES, 49.9 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040249K9FKED	Vishay-Dale
R13	1	75.0k	RES, 75.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040275K0FKED	Vishay-Dale
R14	1	100k	RES, 100 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402100KFKED	Vishay-Dale
R15	1	124k	RES, 124 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402124KFKED	Vishay-Dale
R16	1	154k	RES, 154 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402154KFKED	Vishay-Dale

Table 2-1. Bill of Materials (continued)

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer
R17	1	191k	RES, 191 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402191KFKED	Vishay-Dale
R18	1	237k	RES, 237 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402237KFKED	Vishay-Dale
R19	1	294k	RES, 294 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402294KFKED	Vishay-Dale
R20	1	365k	RES, 365 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402365KFKED	Vishay-Dale
SH-JP1, SH-JP2, SH-JP3	3		Single Operation 2.54mm Pitch Open Top Jumper Socket	Single Operation 2.54mm Pitch Open Top Jumper Socket	M7582-05	Harwin
TP1	1		Test Point, Multipurpose, Red, TH	Red Multipurpose Testpoint	5010	Keystone Electronics
U1	1		Synchronous Boost Converter with Ultra-Low Quiescent Current 0.7-5.5V Output Voltage: 1.8-5.5V Adjustable	DSBGA6	TPS61299YBG	Texas Instruments

3 Board Layout

The TPS61299EVM-103 is built with a two-layer PCB. The thickness of each layout is 1 oz. All the components are placed on the top layer, as shown in Figure 3-1.

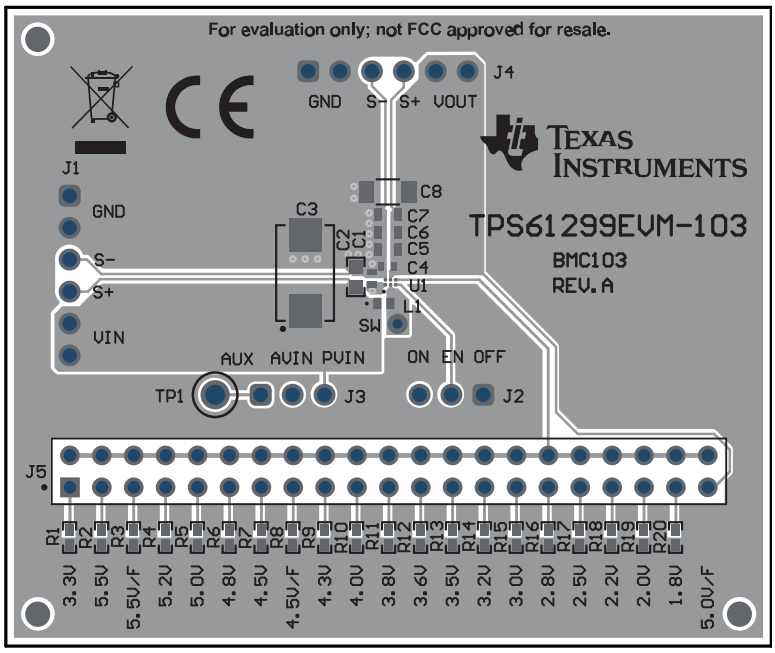

Figure 3-1. Top Layer of TPS61299EVM-103

The bottom layer is the ground panel, as shown in Figure 3-2.

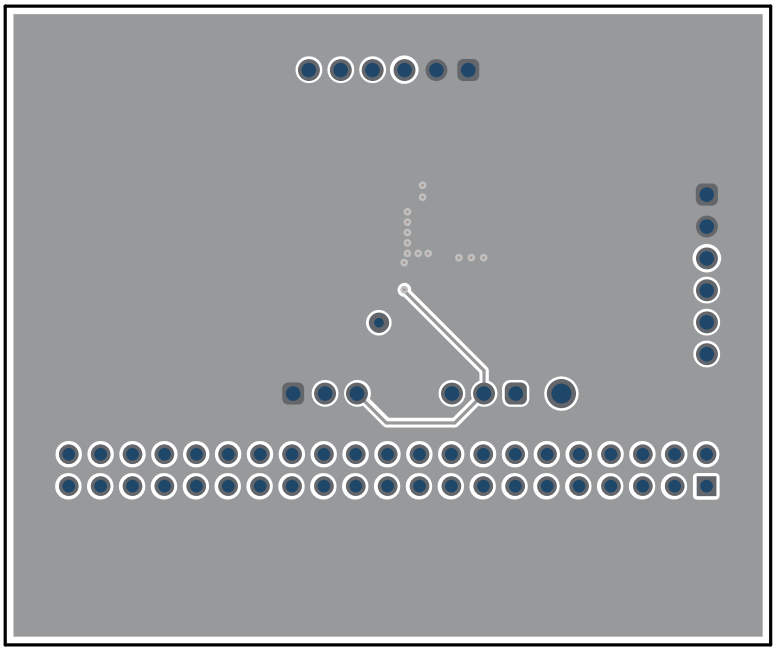

Figure 3-2. Bottom Layer of TPS61299EVM-103

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