MAX77659 Evaluation Kit

Evaluates: MAX77659

General Description

The MAX77659 evaluation kit (EV kit) allows for easy experimentation with various MAX77659 features, including a switching charger, a SIMO buck-boost regulator with three buck-boost outputs, a linear regulator, on/off controller, and I^{2}C interface. Windows®-based software provides a user-friendly graphical interface as well as a detailed register-based interface to exercise the features of the MAX77659.

Ordering Information **appears at end of data sheet.**

Features

- Easy to Use
- GUI Drives I^{2}C Interface
- GPIO LEDs
- Assembled and Fully Tested
- On-Board Electronic Loads
  - Steady-State, Transient, and Random Modes
- Evaluates Push-Button, Slide-Switch, and Logic Mode On-Key Options


Figure 1. MAX77659 EV Kit Photo

Windows is a registered trademark and registered service mark of Microsoft Corporation.

maxim integrated™
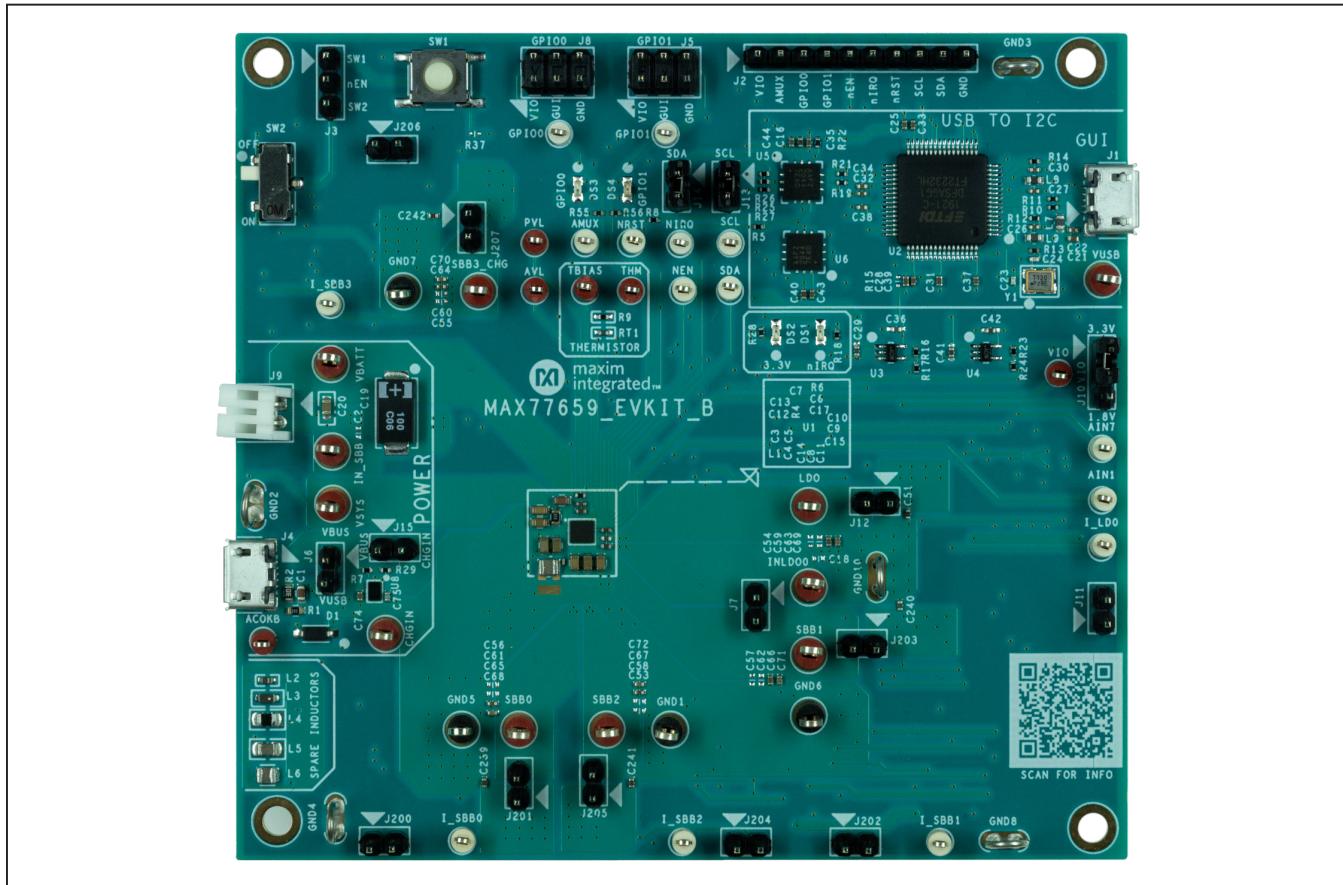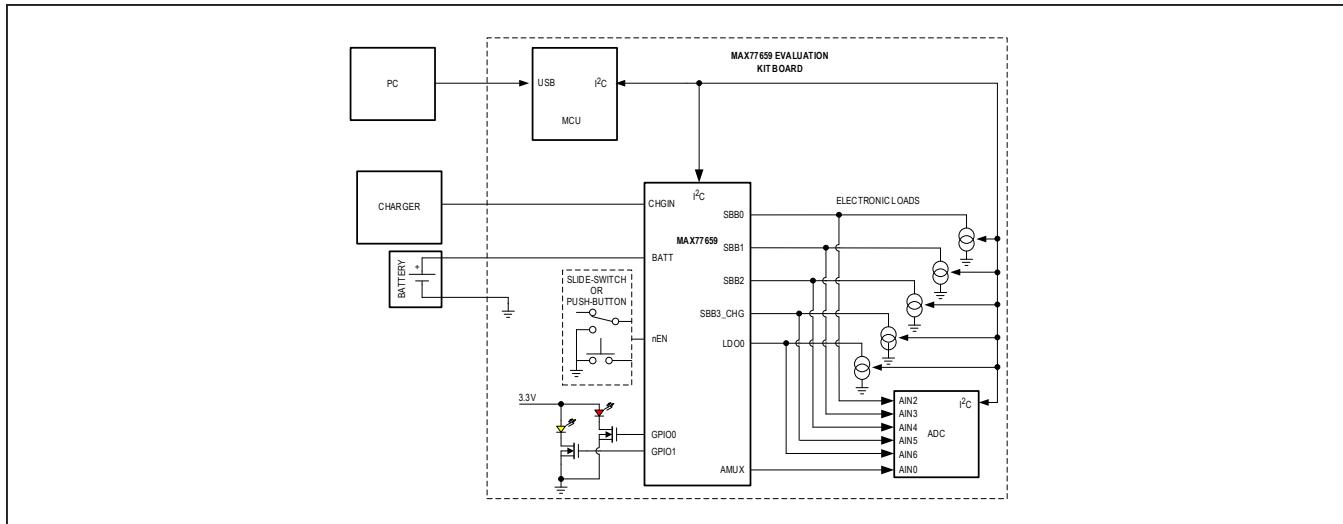
Figure 2. MAX77659 EV Kit Simplified Diagram
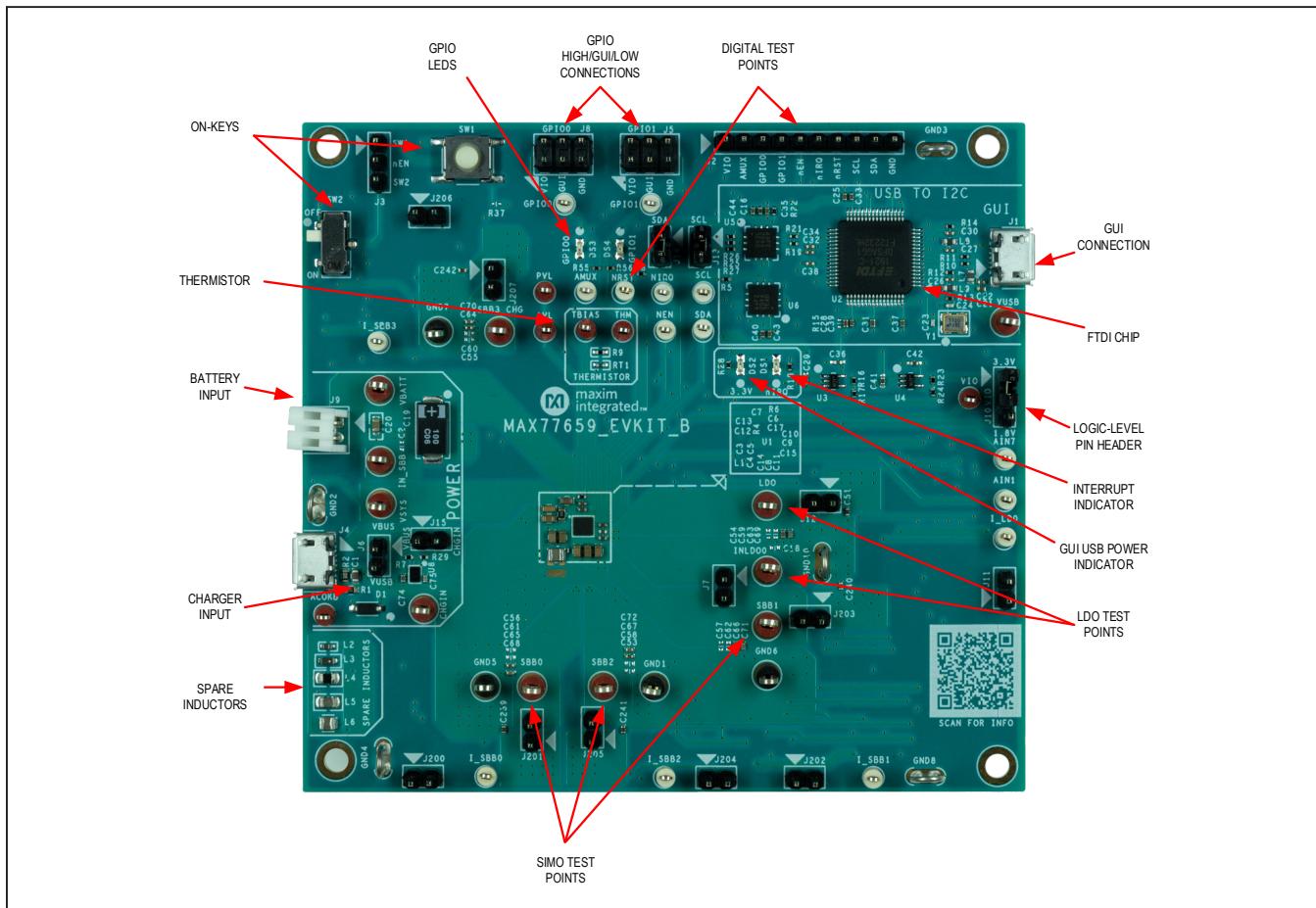

Figure 3. MAX77659 EV Kit—Top View
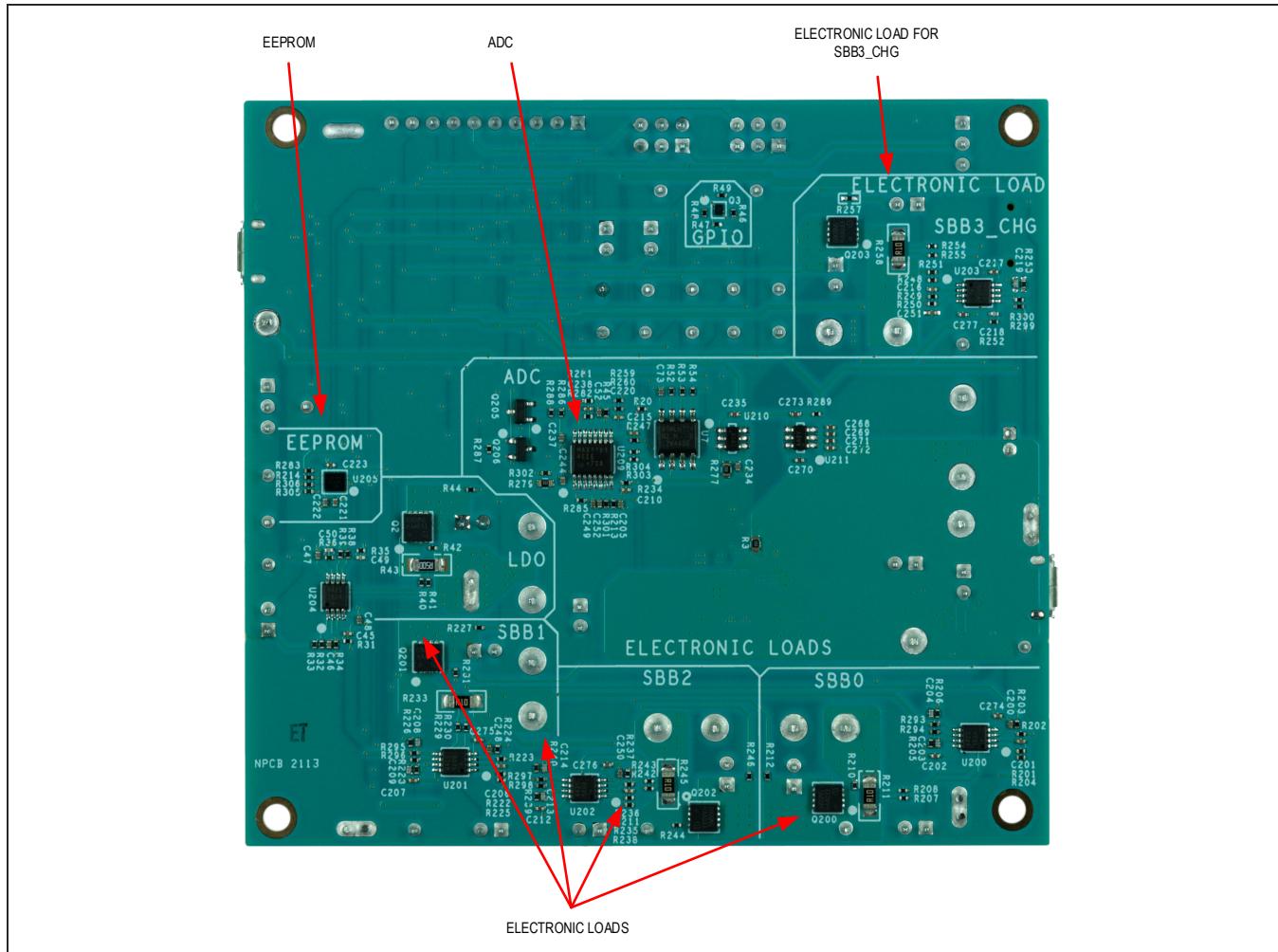
Figure 4. MAX77659 EV Kit—Bottom View
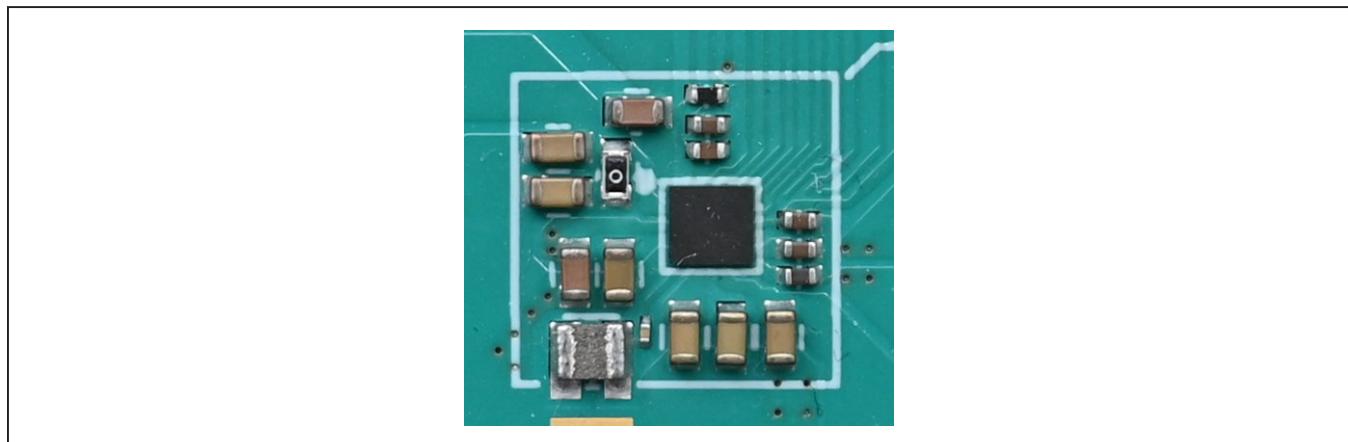
Figure 5. MAX77659 EV Kit—Solution Area

Quick Start

Required Equipment

- MAX77659 EV Kit
- GUI
- Windows-based PC
- Power Supply
- Battery
- Ammeter
- DVM
- Micro-USB Cable

Follow this procedure to familiarize yourself with the EV kit.

Note: In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the EV kit software. Text in **bold and underlined** refers to items from the Windows operating system.

Procedure

1) Install the GUI software. Visit the product webpage at: **http://www.maximintegrated.com/MAX77659evkit** and navigate to *Design Resources* to download the latest version of the EV kit software. Save the EV kit software to a temporary folder and extract the files from the ZIP file.

2) Install EV kit shunts according to Table 1.

3) Connect a Micro-B USB cable between the EV kit USB port labeled "GUI" and your Windows-based PC.

4) Apply a 3.7V supply (set for 100mA current limit) through an ammeter (set for 10mA range) across the VBATT and GND2 terminals of the EV kit. Turn the supply on.

5) Open the GUI and select **Device → Connect** in the upper-left corner. Wait for a **Connected Device List** window to pop up, and then press the **Connect** button.

6) Press the on-key (SW1).

7) On the **ADC/AMUX** tab of the GUI, click the **Read** buttons next to VSBB0, VSBB1, VSBB2, and VSBB3_CHG.

8) Confirm on the ammeter that the quiescent current is approximately 40µA. Then in the **Global Resources** tab on the GUI, set the Main Bias Power Mode to "1" and click the **Write** button. Now confirm that the quiescent current is approximately 4µA.

This concludes the Quick Start procedure. Users are encouraged to explore the device and its register settings with the GUI. For guidance on configuring the charger and the GPIOs, see the *Charger Quick Start* and *GPIO Quick Start* sections. During general device evaluation, set the ammeter range to greater than or equal to 1A to minimize the impact of its series resistance.

For more information on the GUI, see the *Detailed Description of Hardware (or Software)* section.
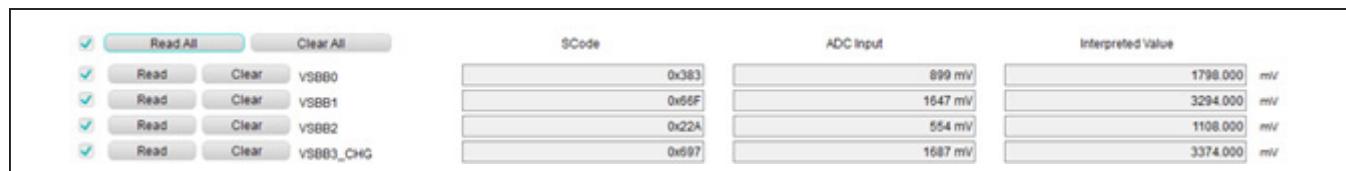
Figure 6. Regulator Check with ADC/AMUX

Table 1. Default Shunt Postions and Jumper Descriptions

REFERENCE DESIGNATOR	DEFAULT POSITION	FUNCTION
J3	1-2	1-2: Connects nEN to SW1 (push-button). 2-3: Connects nEN to SW2 (slide-switch).
J6	Open	1-2: Connects GUI VUSB to MAX77659 CHGIN. Install this jumper to power MAX77659 from the GUI USB.
J16	Open	1-2: Bypasses the MAX14699 overvoltage protection.
J10	2-3	1-2: Connects VIO to 3.3V. 2-3: Connects VIO to 1.8V.
J7	3-4	1-2: Connects IN_LDO to SBB1.
J8	3-4	1-2: Connects GPIO0 to VIO. 3-4: Connects GPIO0 to GUI GPIO0 (see the *GPIO Quick Start* section for more details). 5-6: Connects GPIO0 to ground.
J5	3-4	1-2: Connects GPIO1 to VIO. 3-4: Connects GPIO1 to GUI GPIO1 (see the *GPIO Quick Start* section for more details). 5-6: Connects GPIO1 to ground.
J201	1-2	1-2: Connects SBB0 to the onboard electronic load.
J203	1-2	1-2: Connects SBB1 to the onboard electronic load.
J205	1-2	1-2: Connects SBB2 to the onboard electronic load.
J207	1-2	1-2: Connects SBB3_CHG to the onboard electronic load.
J12	1-2	1-2: Connects LDO to the onboard electronic load.
J200	1-2	1-2: Connects the gate of the Q200 load FET to the U200 amplifier.
J202	1-2	1-2: Connects the gate of the Q201 load FET to the U201 amplifier.
J204	1-2	1-2: Connects the gate of the Q202 load FET to the U202 amplifier.
J206	1-2	1-2: Connects the gate of the Q203 load FET to the U203 amplifier.
J11	1-2	1-2: Connects the gate of the Q2 load FET to the U204 amplifier.

Charger Quick Start

The **Charger** tab on the GUI has many settings to toggle depending on application requirements; however, for a quick start, follow the procedure below:

1) Determine the capacity of the battery to identify a safe charge current. Maxim recommends charging at 0.75C (e.g., charge a 40mAh battery with a 30mA charge current). Consult the battery manufacturer's data sheet carefully to determine safe charging parameters.

2) In **Charger Configuration E/F**, move the Fast-Charge Current (IFAST_CHG) slider to the desired charge current setting, and click the **Write** button.

3) In **Charger Configuration G/H**, move the Fast-Charge Voltage (VFAST_CHG) slider to the desired charge voltage setting, and click the **Write** button.

4) Make sure there is a 5V charge source connected to the EV kit. Then, enable the charger by setting the switch–in charger Configuration B–labeled Battery Charger Enable to "1" (Enabled), and click the **Write** button.

5) The battery should now be charging at the charge current set from step 2).

For more information on the capabilities of the battery charger, refer to the IC data sheet.

GPIO Quick Start

There are two GPIOs (GPIO0, GPIO1) that can serve either as standard GPIOs or in their alternate functionalities. Onboard LEDs light up depending on the GPIO state. To get started with the GPIOs, use the following procedures:

1) In the **GPIO** tab of the GUI, set the desired GPIO's alternate mode enable to 0 (standard GPI or GPO).

2) Set the direction to 0 (output).

3) Set the driver type to 1 (push-pull). If using 0 (open-drain), make sure there is a pullup resistor on the GPIO pin.

4) Click the **Write** button.

5) Set the data output to "1" (logic-high) and click the **Write** button. The onboard LED should light up.

6) Now change the direction to "1" (input) and click the **Write** button.

7) Install the appropriate shunt on J5, J7, or J8 to connect the desired GPIO to the GUI GPIO (connect the jumper between 3 and 4).

8) From the GUI, toggle the EV kit GPIO by clicking **Write** after each time. Click **Read** to observe the GPIO Input Value update.
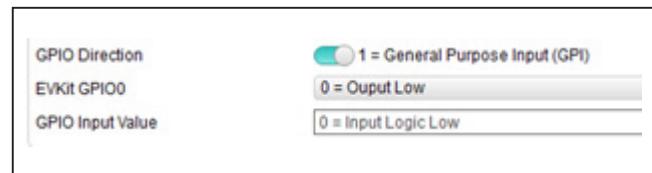

Figure 7. GPIO Input Value Box in the GUI
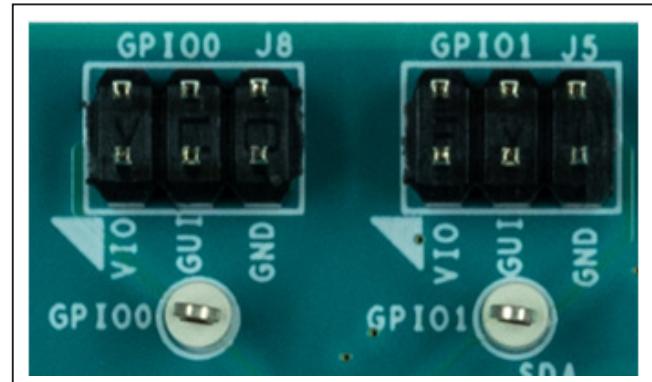
Figure 8. GPIO Headers

EV Kit Features

On-Key Options

For applications that require the IC to enable with a user-interactable switch, the EV kit comes with two common types: the push-button (momentary) and the slide-switch (persistent). The active-low enable pin (nEN) has an internal pullup resistor. Select which type of switch to use with jumper J3. Refer to the MAX77659 data sheet for more information on configuring the IC for momentary or persistent switches.

Changing the Output Voltages

The GUI allows the user to change the output voltages of the SIMO and the LDO. Navigate to the **SIMO Buck-Boost** section or the **LDO** section in the GUI. Drag the **Target Output Voltage slider** until the desired output voltage is reached and click **Write**.

Electronic Load

The EV kit comes with an electronic load allowing the user to evaluate the SIMO and LDO load current capabilities. Onboard circuits set the load current through I^2C. Use J201, J203, J205, J207, and J12 to connect the load to the output of the SBB0, SBB1, SBB2, SBB3_CHG, and LDO respectively. To exercise the load transient response, remove J200 (for SBB0), J202 (for SBB1), J204 (for SBB2), J206 (for LDO0), J11 (for LDO1) and connect a signal generator to the gate of the load MOSFET (pin 2 of the respective header). Drive the gate with a signal between 1V (off) and 3V (fully on) to apply transients to the output of the SIMO or LDO. Note that there are 0.1Ω sense resistors with test points (called I_SBB0, I_SBB1, I_SBB2, I_SBB3, I_LDO) for a 10:1 conversion of load current to voltage.

Figure 9. SIMO Output Voltage Section

Figure 10. LDO Output Voltage Section

REGULATOR OUTPUT	JUMPER A	JUMPER B	SENSE	CONVERT RATIO
SBB0	J200	J201	I_SBB0	10x
SBB1	J202	J203	I_SBB1	10x
SBB2	J204	J205	I_SBB2	10x
SBB3_CHG	J206	J207	I_SBB3	10x
LDO	J11	J12	I_LDO	2x
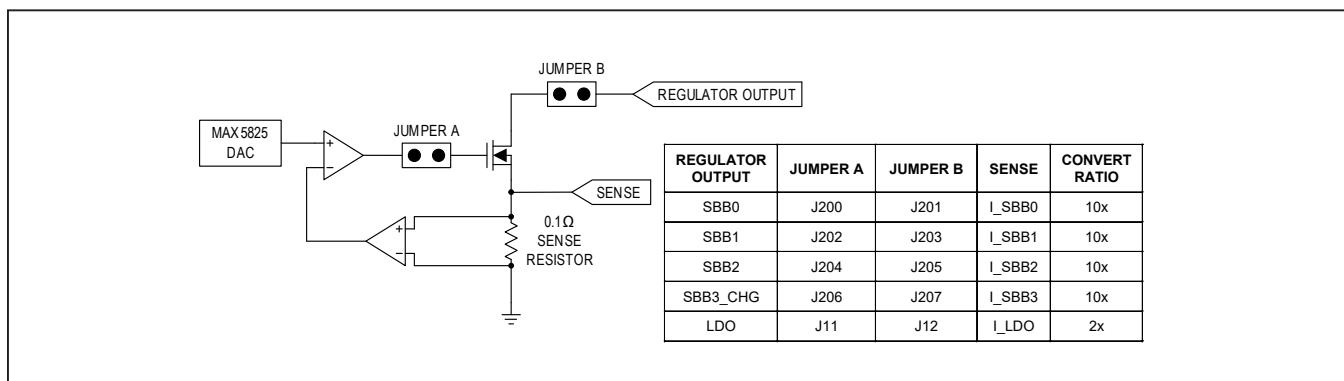
Figure 11. Electronic Load Schematic Diagram

Software

Installation

Visit the product webpage at **http://www.maximinte-grated.com/MAX77659evkit** and navigate to *Design Resources* to download the latest version of the EV kit software. Save the EV kit software to a temporary folder and decompress the ZIP file.

Windows Drivers

Upon connection of a Micro-USB cable between your PC and the EV kit for the first time, wait a few minutes for Windows to automatically install drivers.

Graphical User Interface Details (GUI)

The GUI drives I^{2}C communication with the EV kit. Every control in the GUI (excluding the **Load Control** tab)

corresponds directly to a register within the MAX77659. Hover your cursor over control names for a description of that register. Refer to the IC data sheet for the complete Register map.

Load Control Tab

The **Load Control** tab contains controls for load currents on the regulator outputs. The GUI is capable of setting steady-state, transient, and random load currents. To set a load current, use the slider bar or text field to input a value (mA) and check the **Enable** box. Shuffle through the modes to exercise different load conditions.

The offset and gain values are set by Maxim and do not need to be altered.

Ordering Information

PART	IC	TYPE
MAX77659EVKIT#	MAX77659EVN+	EV Kit

#Denotes RoHS compliant.

MAX77659 EV Kit Bill of Materials

| ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	ACOKB, AVL, PVL, TBIAS, THM, VIO	-	6	5000	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
2	AIN1, AIN7, AMUX, GPIO0, GPIO1, I_LD0, I_SBB0-I_SBB3, NEN, NIRQ, NRST, SCL, SDA	-	15	5002	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; WHITE; PHOSPHOR BRONZE WIRE SILVER;	
3	C1	-	1	GRM188R71E474KA12	MURATA	0.47UF	CAP; SMT (0603); 0.47UF; 10%; 25V; X7R; CERAMIC	
4	C3	-	1	GRM188R60J476ME15	MURATA	47UF	CAP; SMT (0603); 47UF; 20%; 6.3V; X5R; CERAMIC	
5	C4	-	1	C0603X7R1A103K030BA; GRM033R71A103KA01; GCM033R71A103KA03; CGA1A2X7R1A103K030BA; 0201ZC103KAT2A	TDK;MURATA;MURATA;TDK;AVX	0.01UF	CAP; SMT (0201); 0.01UF; 10%; 10V; X7R; CERAMIC	
6	C5, C8, C11-C14, C20	-	7	C1608X5R1A226M080AC; GRM188R61A226ME15	TDK;MURATA	22UF	CAP; SMT (0603); 22UF; 20%; 10V; X5R; CERAMIC	
7	C6, C9, C10, C16, C17, C29, C36, C40-C42, C51, C239-C242, C269-C271	-	18	C0402C105K8PAC;CC0402KRX5R6BB105	KEMET;YAGEO	1UF	CAP; SMT (0402); 1UF; 10%; 10V; X5R; CERAMIC	
8	C7	-	1	C1608X5R1E475K080AC; GRM188R61E475KE11	TDK;MURATA	4.7UF	CAP; SMT (0603); 4.7UF; 10%; 25V; X5R; CERAMIC	
9	C15	-	1	GRM155R61C225KE44	MURATA	2.2UF	CAP; SMT (0402); 2.2UF; 10%; 16V; X5R; CERAMIC	
10	C19	-	1	16TQC100MYF	PANASONIC	100UF	CAP; SMT (7343); 100UF; 20%; 16V; TANTALUM	
11	C21, C28, C31	-	3	C1005X5R1A475K050	TDK	4.7UF	CAP; SMT (0402); 4.7UF; 10%; 10V; X5R; CERAMIC	
12	C22, C25-C27, C30, C32-C35, C37-C39, C43, C44, C47, C48, C63-C67, C73, C202, C207, C212, C217, C221-C223, C234, C235, C237, C244, C268, C272-C277	-	40	GRM155R71E104KE14;C1005X7R1E104K050BB;TMK105B7104KVH;CGJ2B3X7R1E104K050BB	MURATA;TDK;TAIYO YUDEN;TDK	0.1UF	CAP; SMT (0402); 0.1UF; 10%; 25V; X7R; CERAMIC	
13	C23, C24	-	2	GRM0335C1H270JA01	MURATA	27PF	CAP; SMT (0201); 27PF; 5%; 50V; C0G; CERAMIC	
14	C45, C52, C200, C205, C210, C215, C220, C238, C248-C252	-	13	C0402C472K5RAC; GRM155R71H472KA01; C1005X7R1H472K050BA	KEMET;MURATA;TDK	4700PF	CAP; SMT (0402); 4700PF; 10%; 50V; X7R; CERAMIC;	
15	C46, C201, C206, C211, C216	-	5	C0402H102J5GAC	KEMET	1000PF	CAP; SMT (0402); 1000PF; 5%; 50V; C0G; CERAMIC	
16	C49, C50, C203, C204, C208, C209, C213, C214, C218, C219	-	10	C0402C180J5GAC; GRM1555C1H180JA01; C1005C0G1H180J050BA	KEMET;MURATA;TDK	18PF	CAP; SMT (0402); 18PF; 5%; 50V; C0G; CERAMIC	
17	C68-C72	-	5	CL05B103KP5NNN	SAMSUNG ELECTRONICS	0.01UF	CAP; SMT (0402); 0.01UF; 10%; 10V; X7R; CERAMIC	
18	C74	-	1	C1005X7R1H104K050BB; GRM155R71H104KE14; C1005X7R1H104K050BE; UMK105B7104KV-FR	TDK;MURATA;TDK;TAIYO YUDEN	0.1UF	CAP; SMT (0402); 0.1UF; 10%; 50V; X7R; CERAMIC	
19	C75	-	1	GRM1555C1H120FA01	MURATA	12PF	CAP; SMT (0402); 12PF; 1%; 50V; C0G; CERAMIC ;	
20	CHGIN, INLDO0, IN_SBB, LDO, SBB0-SBB2, SBB3_CHG, VBATT, VSYS, VUSB	-	11	5010	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SIL;	
21	D1	-	1	B0530W-7-F	DIODES INCORPORATED	B0530W	DIODE; SCH; SMT (SOD-123); PIV=30V; IF=0.5A	
22	DS1-DS3	-	3	LTST-C190CKT	LITE-ON ELECTRONICS INC.	LTST-C190CKT	DIODE; LED; STANDARD; RED; SMT (0603); PIV=5.0V; IF=0.04A; -55 DEGC TO +85 DEGC	
23	DS4	-	1	LTST-C190YKT	LITE-ON ELECTRONICS INC.	LTST-C190YKT	DIODE; LED; STANDARD; YELLOW; SMT (0603); PIV=5.0V; IF=0.02A; -55 DEGC TO +85 DEGC	
24	GND1, GND5-GND7	-	4	5011	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
25	GND2-GND4, GND8, GND10	-	5	9020 BUSS	WEICO WIRE	MAXIMPAD	EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG	
26	J1, J4	-	2	10118193-0001LF	FCI CONNECT	10118193-0001LF	CONNECTOR; FEMALE; SMT; MICRO USB B TYPE RECEPTACLE; RIGHT ANGLE; 5PINS	
27	J2	-	1	PBC10SAAN	SULLINS ELECTRONICS CORP.	PBC10SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 10PINS; -65 DEGC TO +125 DEGC	
28	J3, J10	-	2	TSW-103-07-T-S	SAMTEC	TSW-103-07-T-S	CONNECTOR; THROUGH HOLE; TSW SERIES; SINGLE ROW; STRAIGHT; 3PINS	
29	J5, J8	-	2	TSW-103-07-L-D	SAMTEC	TSW-103-07-L-D	CONNECTOR; MALE; THROUGH HOLE; THROUGH HOLE 0.025 POST HEADER; STRAIGHT; 6PINS	
30	J6, J7, J11-J14, J200-J207	-	14	TSW-102-07-T-S	SAMTEC	TSW-102-07-T-S	CONNECTOR; THROUGH HOLE; TSW SERIES; SINGLE ROW; STRAIGHT; 2PINS; -55 DEGC TO +105 DEGC	
31	J9	-	1	S2B-PH-K-S(LF)(SN)	JST MANUFACTURING	S2B-PH-K-S(LF)(SN)	CONNECTOR; MALE; THROUGH HOLE; 2.0MM PITCH; DISCONNECTABLE CRIMP STYLE CONNECTOR; SIDE ENTRY TYPE; RIGHT ANGLE; 2PINS	
32	L1	-	1	DFE201610E-1R5M=P2	MURATA	1.5UH	INDUCTOR; SMT (0806); MAGNETICALLY SHIELDED; 1.5UH; TOL=+/-20%; 2.1A	
33	L2	-	1	MCEE1005T1R0MHN	TAIYO YUDEN	1UH	INDUCTOR; SMT (0402); METAL; 1UH; 20%; 0.80A	
34	L3	-	1	MCHK1608T1R5MKN	TAIYO YUDEN	1.5UH	INDUCTOR; SMT (0603); SHIELDED; 1.5UH; 20%; 1.4A ;	
35	L4	-	1	DFE201210S-2R2M=P2	MURATA	2.2UH	EVKIT PART-INDUCTOR; SMT (0805); MAGNETICALLY SHIELDED; 2.2UH; TOL=+/-20%; 1.8A	
36	L5	-	1	DFE201210U-1R5M=P2	TOKO	1.5UH	INDUCTOR; SMT (0805); METAL ALLOY CHIP; 1.5UH; TOL=+/-20%; 1.9A	
37	L6	-	1	DFE201612E-1R5M	MURATA	1.5UH	INDUCTOR; SMT (0806); METAL; 1.5UH; 20%; 2.30A	
38	L7-L9	-	3	BLM18AG601SN1	MURATA	600	INDUCTOR; SMT (0603); FERRITE-BEAD; 600; TOL=+/-; 0.5A	
39	Q2, Q200-Q203	-	5	BSZ0909NSATMA1	INFINEON	BSZ0909NSATMA1	TRAN; OPTIMOS POWER-MOSFET; NCH; PG-TSDSON8; PD-(25W); I-(36A); V-(34V)	
40	Q3	-	1	DMN2005DLP4K	DIODES INCORPORATED	DMN2005DLP4K	TRAN; DUAL N-CHANNEL ENHANCEMENT MODE MOSFET; NCH; DFN1310-6; PD-(0.4W); I-(0.3A); V-(20V)	

MAX77659 EV Kit Bill of Materials (continued)

ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
41	Q205	-	1	FDN360P	FAIRCHILD SEMICONDUCTOR	FDN360P	TRANSISTOR, MOSFET P-CHANNEL, SUPERSOT-3, PD=0.5W, ID=-2.0A, VDSS=-30V,VGSS=+/-20V	
42	Q206	-	1	2N7002;2N7002;2N7002;2N7002	DIODES INCORPORATED;ST MICROELECTRONICS; ON SEMICONDUCTOR; MICRO COMMERCIAL COMPONENTS	2N7002	TRAN; ; NCH; SOT-23; PD-(0.33W); IC-(0.5A); VCEO-(60V); -55 DEGC TO +150 DEGC	
43	R1, R3, R4, R277, R279	-	5	CRCW06030000Z0	VISHAY DALE	0	RES; SMT (0603); 0; JUMPER; JUMPER; 0.1000W	
44	R2	-	1	ANY	ANY	1M	RESISTOR; 0603; 1M; 1%; 100PPM; 0.10W; THICK FILM; FORMFACTOR	
45	R6	-	1	RC0402JR-070RL; CR0402-16W-000RJT	YAGEO PHYCOMP;VENKEL LTD.	0	RES; SMT (0402); 0; 5%; JUMPER; 0.0630W	
46	R7	-	1	RNCF0402BTE40K0	STACKPOLE ELECTRONICS INC	40K	RES; SMT (0402); 40K; 0.10%; +/-25PPM/DEGC; 0.0630W;	
47	R9, R29, R281, R282, R287, R288	-	6	CRCW040210K0FK; RC0402FR-0710KL	VISHAY DALE;YAGEO PHICOMP	10K	RES; SMT (0402); 10K; 1%; +/-100PPM/DEGC; 0.0630W	
48	R10, R11	-	2	ERJ-2RKF27R0X; RC0402FR-0727RL; CRCW040227R0FK	PANASONIC;YAGEO PHICOMP; VISHAY DALE	27	RES; SMT (0402); 27; 1%; +/-100PPM/DEGC; 0.0630W	
49	R12	-	1	ERJ-2RKF1202	PANASONIC	12K	RES; SMT (0402); 12K; 1%; +/-100PPM/DEGC; 0.1000W	
50	R13, R42, R55, R56, R210, R231, R244, R257, R301	-	9	CRCW04021M00FK	VISHAY DALE	1M	RES; SMT (0402); 1M; 1%; +/-100PPM/DEGC; 0.0630W	
51	R14, R40, R41, R207, R208, R229, R230, R242, R243, R254, R255	-	11	ERJ-2RKF1001	PANASONIC	1K	RES; SMT (0402); 1K; 1%; +/-100PPM/DEGC; 0.1000W	
52	R16	-	1	CRCW04024752FK; 9C04021A4752FLHF3; CRCW040247K5FK	VISHAY DALE;YAGEO; VISHAY DALE	47.5K	RES; SMT (0402); 47.5K; 1%; +/-100PPM/DEGC; 0.0630W	
53	R5, R8, R214, R283, R17, R24	-	6	CRCW0402100KFK; RC0402FR-07100KL	VISHAY;YAGEO	100K	RES; SMT (0402); 100K; 1%; +/-100PPM/DEGC; 0.0630W	
54	R18, R47	-	2	CRCW0402150RFK; 9C04021A1500FL	VISHAY DALE;YAGEO	150	RES; SMT (0402); 150; 1%; +/-100PPM/DEGC; 0.0630W	
55	R19, R20, R33, R52-R54, R204, R225, R238, R251, R285, R286, R302-R306	-	17	ERJ-2GE0R00	PANASONIC	0	RES; SMT (0402); 0; JUMPER; JUMPER; 0.1000W	
56	R21, R22	-	2	ERJ-2GEJ472	PANASONIC	4.7K	RES; SMT (0402); 4.7K; 5%; +/-200PPM/DEGC; 0.1000W	
57	R23	-	1	CRCW0402169KFK	VISHAY DALE	169K	RES; SMT (0402); 169K; 1%; +/-100PPM/DEGK; 0.0630W	
58	R25, R26	-	2	CRCW04022K20FK; RC0402FR-072K2L	VISHAY DALE;YAGEO PHICOMP	2.2K	RES; SMT (0402); 2.2K; 1%; +/-100PPM/DEGC; 0.0630W	
59	R27	-	1	RC0402FR-0722RL	YAGEO PHYCOMP	22	RES; SMT (0402); 22; 1%; +/-100PPM/DEGC; 0.0630W	
60	R28	-	1	CRCW0402470RFK	VISHAY DALE	470	RES; SMT (0402); 470; 1%; +/-100PPM/DEGC; 0.0630W	
61	R31, R203, R224, R237, R250	-	5	ERJ-2RKF2002	PANASONIC	20K	RES; SMT (0402); 20K; 1%; +/-100PPM/DEGC; 0.1000W	
62	R32, R201, R222, R235, R248, R289	-	6	9C04021A1000FL; RC0402FR-07100RL	PANASONIC;YAGEO PHYCOMP	100	RES; SMT (0402); 100; 1%; +/-100PPM/DEGC; 0.0630W	
63	R34, R202, R223, R236, R249	-	5	CRCW0402680RFK; RC0402FR-07680RL	VISHAY DALE;YAGEO PHICOMP	680	RES; SMT (0402); 680; 1%; +/-100PPM/DEGC; 0.0630W	
64	R35, R36, R205, R206, R226, R228, R239, R240, R252, R253	-	10	ERJ-2RKF3302	PANASONIC	33K	RES; SMT (0402); 33K; 1%; +/-100PPM/DEGC; 0.0630W	
65	R38, R293, R295, R297, R299	-	5	ERJ-2RKF4703	PANASONIC	470K	RES; SMT (0402); 470K; 1%; +/-100PPM/DEGC; 0.0630W	
66	R39, R294, R296, R298, R300	-	5	CRCW0402649KFK	VISHAY DALE	649K	RES; SMT (0402); 649K; 1%; +/-100PPM/DEGC; 0.0630W	
67	R43	-	1	CSR1206FTR500	STACKPOLE ELECTRONICS INC.	0.5	RES; SMT (1206); 0.5; 1%; +/-100PPM/DEGC; 0.5000W	
68	R44, R45, R212, R213, R227, R234, R246, R247, R259, R260	-	10	CRCW0402787KFK	VISHAY DALE	787K	RES; SMT (0402); 787K; 1%; +/-100PPM/DEGC; 0.0630W	
69	R46, R48	-	2	CRCW04021R00FK	VISHAY DALE	1	RES; SMT (0402); 1; 1%; +/-100PPM/DEGC; 0.0630W	
70	R49	-	1	CRCW0402120RFK; RC0402FR-07120RL	VISHAY DALE;YAGEO	120	RES; SMT (0402); 120; 1%; +/-100PPM/DEGC; 0.0630W	
71	R211, R233, R245, R258	-	4	CRL1206-JW-R100ELF	BOURNS	0.1	RES; SMT (1206); 0.1; 1%; +/-200PPM/DEGC; 0.2500W	
72	RT1	-	1	NCP15XH103F03	MURATA	10K	THERMISTOR; SMT (0402); THICK FILM (NICKEL PLATED); 10K; TOL=+/-1%	
73	SW1	-	1	EVQ-Q2K03W	PANASONIC	EVQ-Q2K03W	SWITCH; SPST; SMT; 15V; 0.02A; LIGHT TOUCH SWITCH; RCOIL= OHM; RINSULATION= OHM; PANASONIC	
74	SW2	-	1	CL-SB-12B-11	NIDEC COPAL ELECTRONICS CORP	CL-SB-12B-11	SWITCH; SPDT; SMT; 12V; 0.2A; CL-SB SERIES; SLIDE SWITCH; RCOIL=0.05 OHM; RINSULATION=100M OHM	
75	U1	-	1	MAX77659EVN+	MAXIM	MAX77659EVN+	EVKIT PART - IC; MAX77659AENV+; WLP30; PACKAGE OUTLINE DRAWING: 21-100509; PACKAGE CODE: N302D2+1	
76	U2	-	1	FT2232HL	FUTURE TECHNOLOGY DEVICES INTL LTD.	FT2232HL	IC; MMRY; DUAL HIGH SPEED USB TO MULTIPURPOSE UART/FIFO; LQFP64	
77	U3, U4	-	2	MAX8512EXK+	MAXIM	MAX8512EXK	IC, VREG, Ultra-Low-Noise, High PSRR, Adjustable Vout, SC70-5	
78	U5, U6	-	2	MAX3395EETC+	MAXIM	MAX3395EETC	IC; TRANS; 15KV ESD-PROTECTED HIGH-DRIVE CURRENT QUAD-LEVEL TRANSLATOR WITH SPEED-UP CIRCUITRY; TQFN12 4X4	
79	U7	-	1	AT24CS02-SSHM	MICROCHIP	AT24CS02-SSHM	IC; EPROM; I2C-COMPATIBLE TWO-WIRE SERIAL EEPROM; 150MIL; NSOIC8	
80	U8	-	1	MAX14699EWC+	MAXIM	MAX14699EWC+	EVKIT PART-IC; PROT; HIGH ACCURACY; SURGE-PROTECTED OVERVOLTAGE PROTECTOR; WLP12 1.98X1.28	
81	U200-U204	-	5	MAX44251AUA+	MAXIM	MAX44251AUA+	IC; OPAMP; ULTRA-PRECISION; LOW-NOISE OP AMP; UMAX8	
82	U205	-	1	MAX5825AWP+	MAXIM	MAX5825AWP+T	IC; DAC; ULTRA-SMALL; OCTAL CHANNEL; 12-BIT BUFFERED OUTPUT DAC WITH INTERNAL REFERENCE AND I2C INTERFACE; WLP20	
83	U209	-	1	MAX11614EEE+	MAXIM	MAX11614EEE+	IC; ADC; LOW-POWER; 8-CHANNEL; I2C; 12-BIT ADC IN ULTRA-SMALL PACKAGE; QSOP16	
84	U210	-	1	MAX6071AAUT41+	MAXIM	MAX6071AAUT41+	IC; VREF; LOW NOISE; HIGH-PRECISION SERIES VOLTAGE REFERENCE; SOT23-6	
85	U211	-	1	MAX1697UEUT+	MAXIM	MAX1697UEUT+	IC; INV; INVERTING CHARGE PUMP WITH SHUTDOWN; SOT23-6	
86	Y1	-	1	7M-12.000MAAJ	TXC CORPORATION	12MHZ	CRYSTAL; SMT; 12MHZ; 18PF; TOL = +/-30PPM; STABILITY = +/-30PPM	
87	PCB	-	1	MAX77659	MAXIM	PCB	PCB:MAX77659	-
88	J15	DNP	0	TSW-102-07-T-S	SAMTEC	TSW-102-07-T-S	CONNECTOR; THROUGH HOLE; TSW SERIES; SINGLE ROW; STRAIGHT; 2PINS; -55 DEGC TO +105 DEGC	
89	C2, C18, C53-C62	DNP	0	N/A	N/A	OPEN	CAPACITOR; SMT (0402); OPEN; FORMFACTOR	
90	R15, R37	DNP	0	N/A	N/A	OPEN	RESISTOR; 0402; OPEN; FORMFACTOR	
TOTAL			342					

MAX77659 EV Kit Schematic
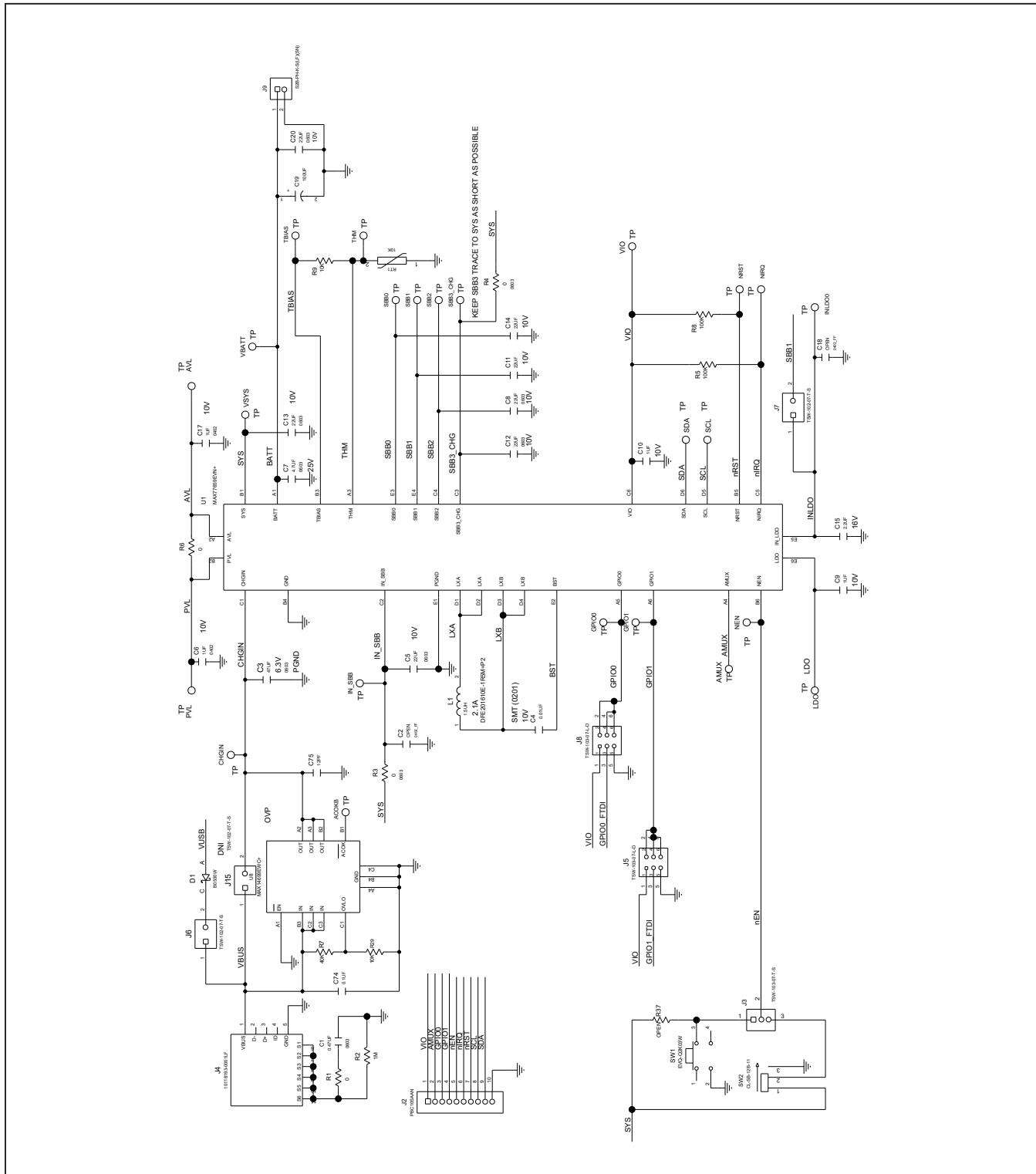
MAX77659 EV Kit Schematic (continued)
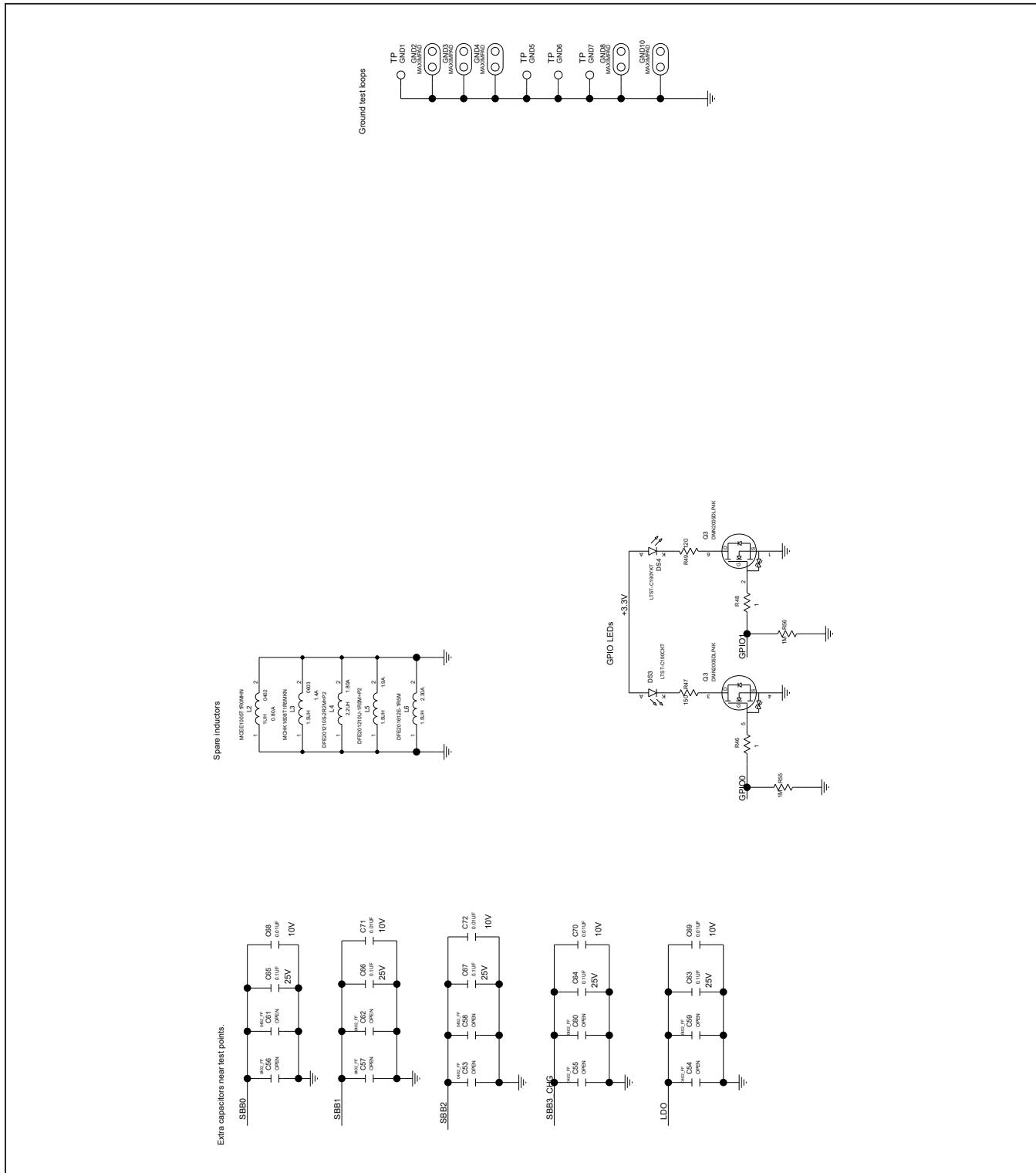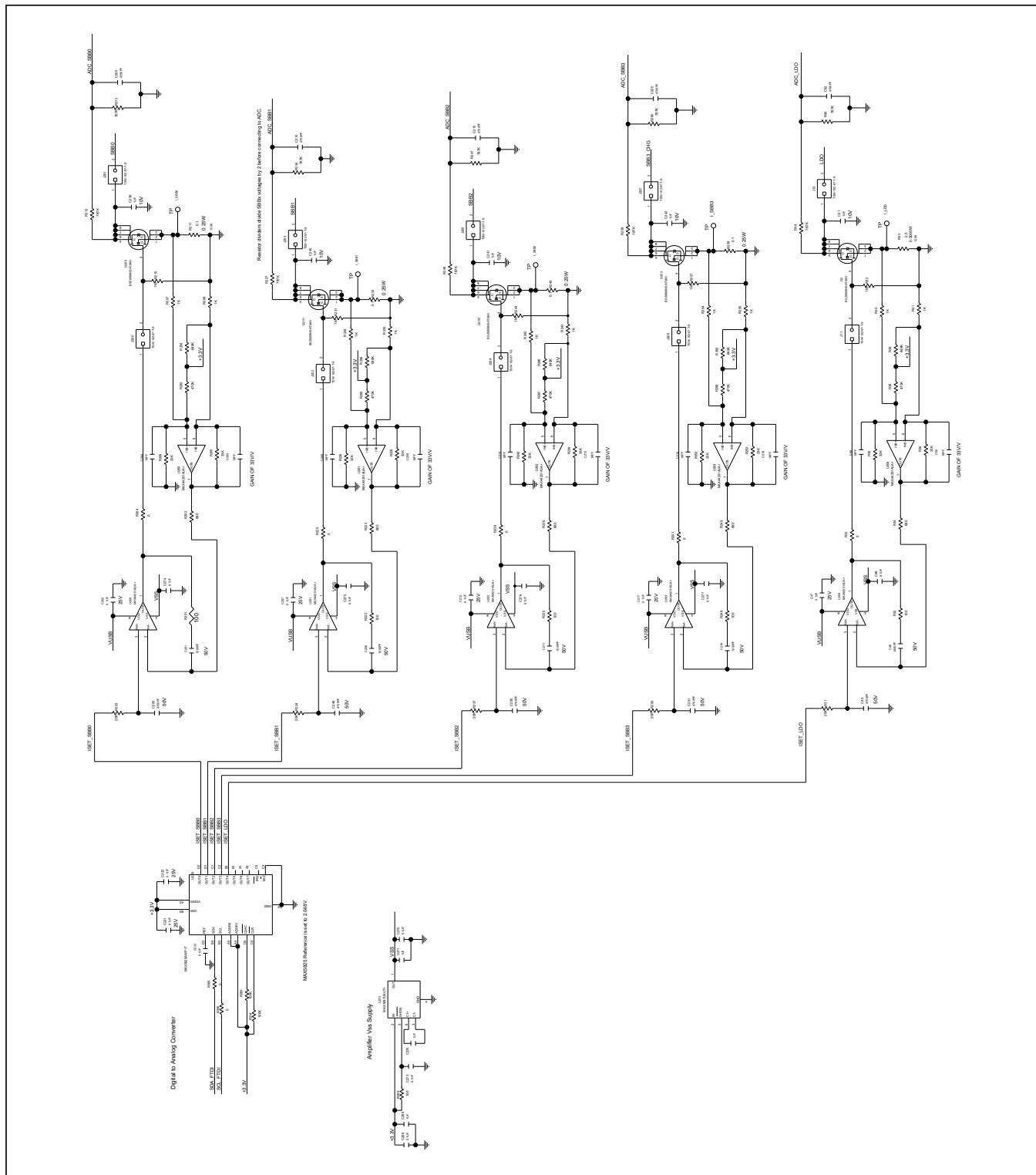
MAX77659 EV Kit Schematic (continued)
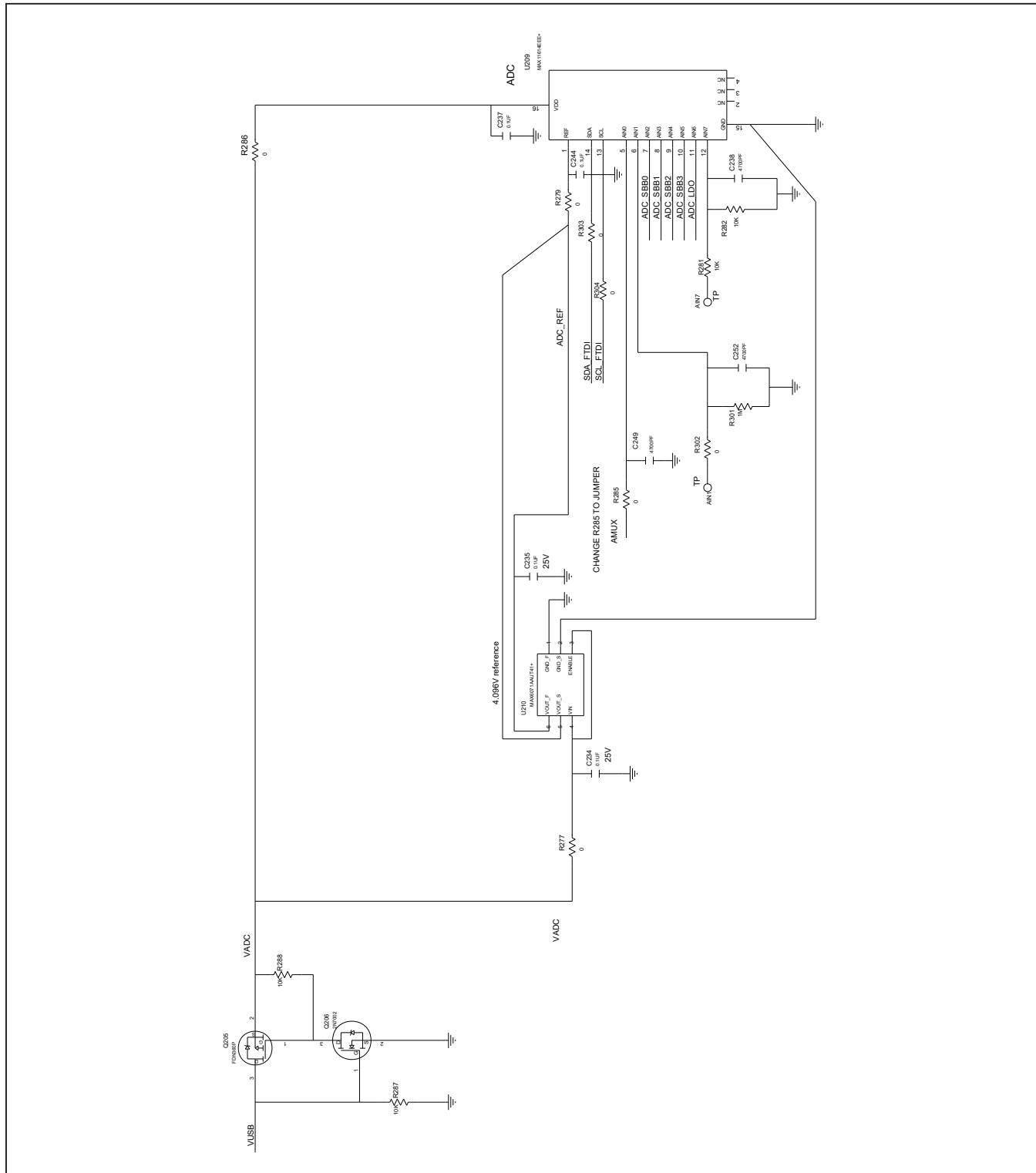
## MAX77659 EV Kit Schematic (continued)

## MAX77659 EV Kit Schematic (continued)
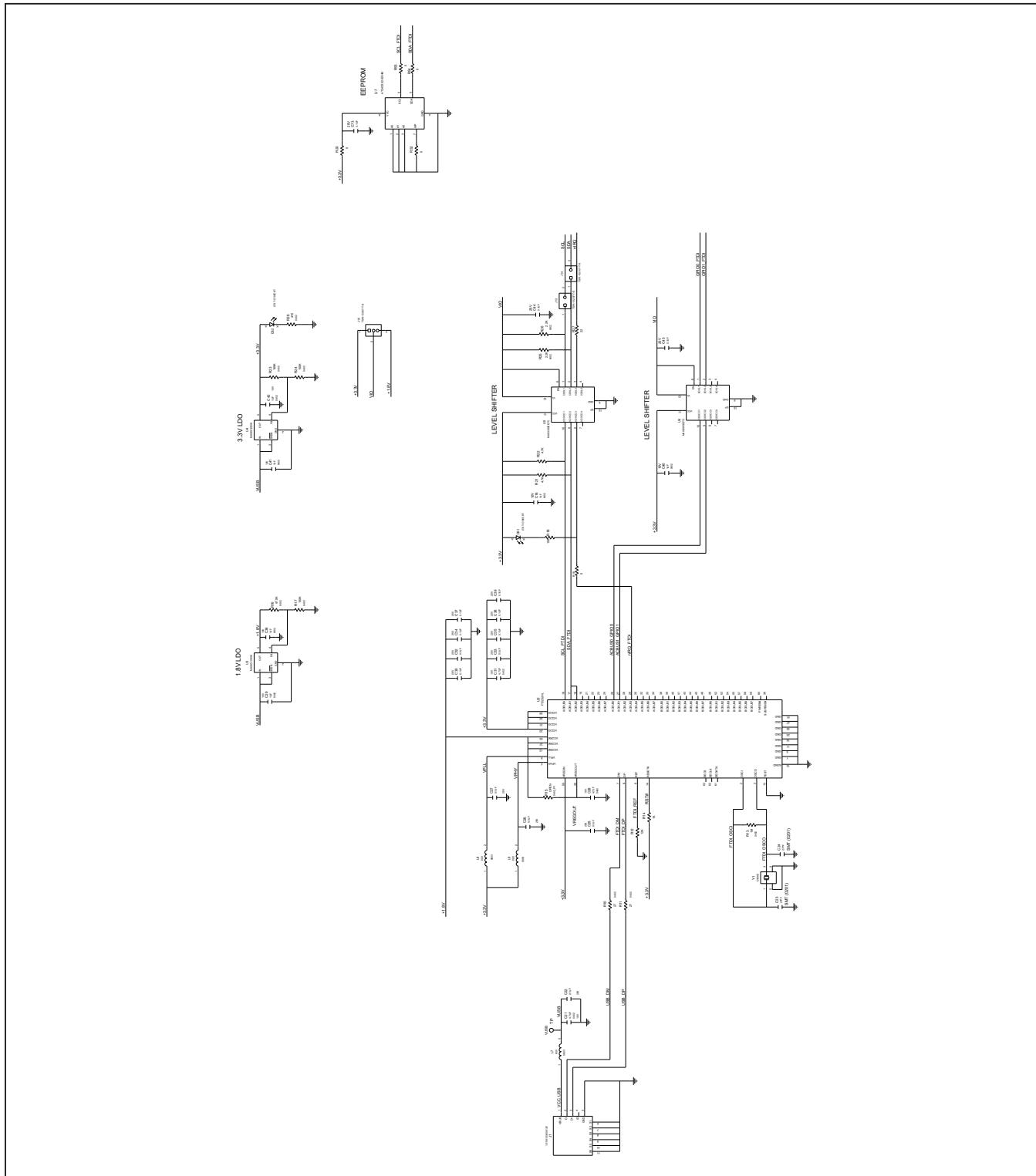
## MAX77659 EV Kit PCB Layouts
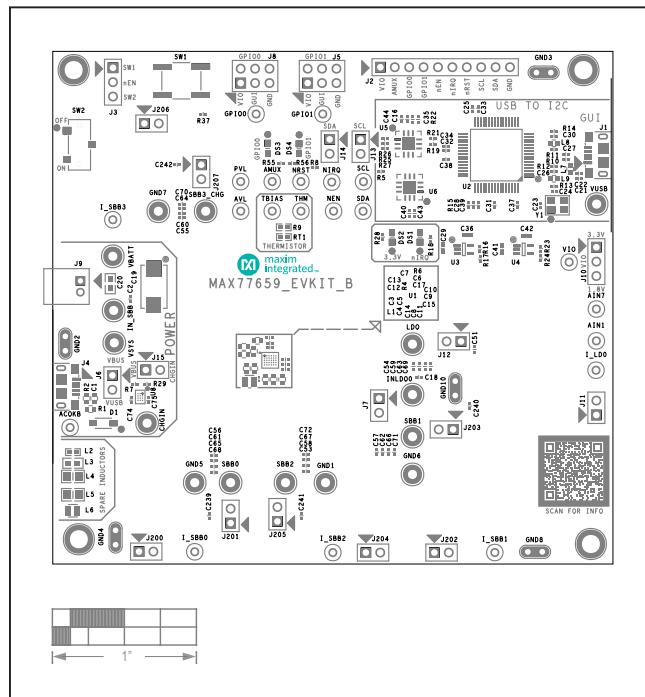
MAX77659 EV Kit Component Placement Guide—Top Silkscreen
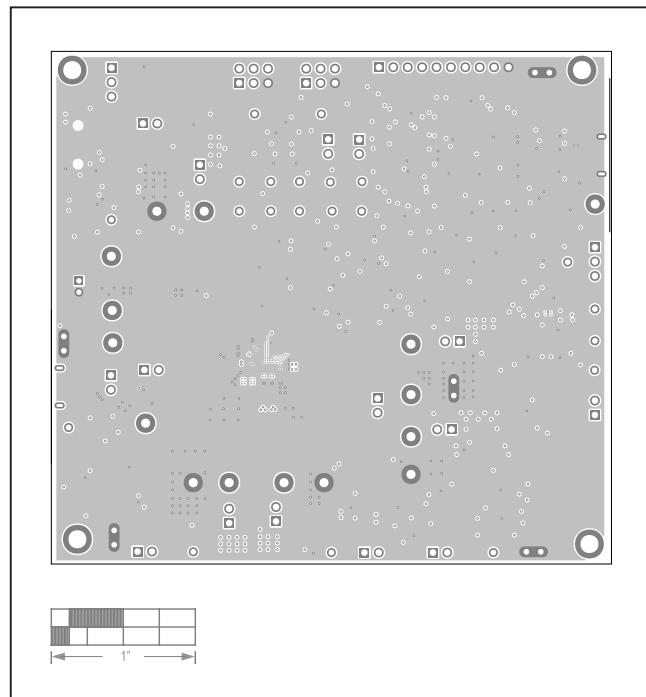
*MAX77659 EV Kit PCB Layout—Internal Layer 2*
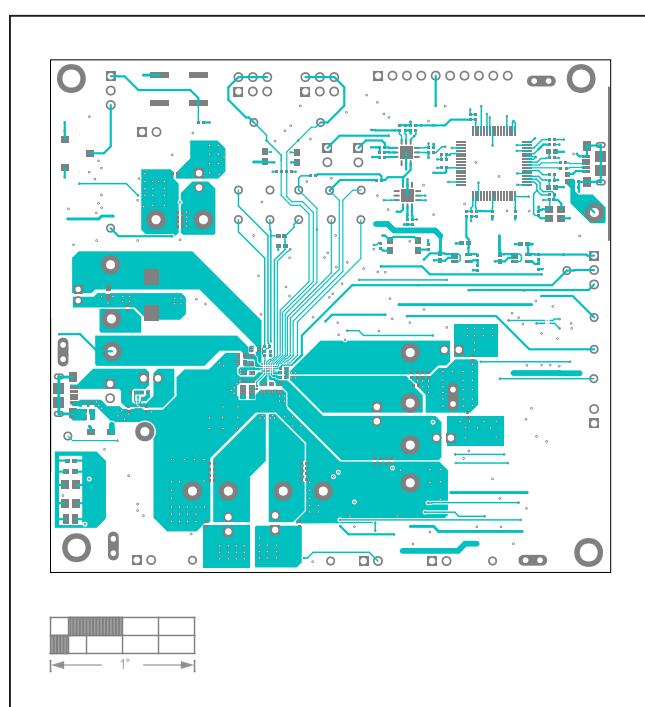

MAX77659 EV Kit PCB Layout—Top Layer
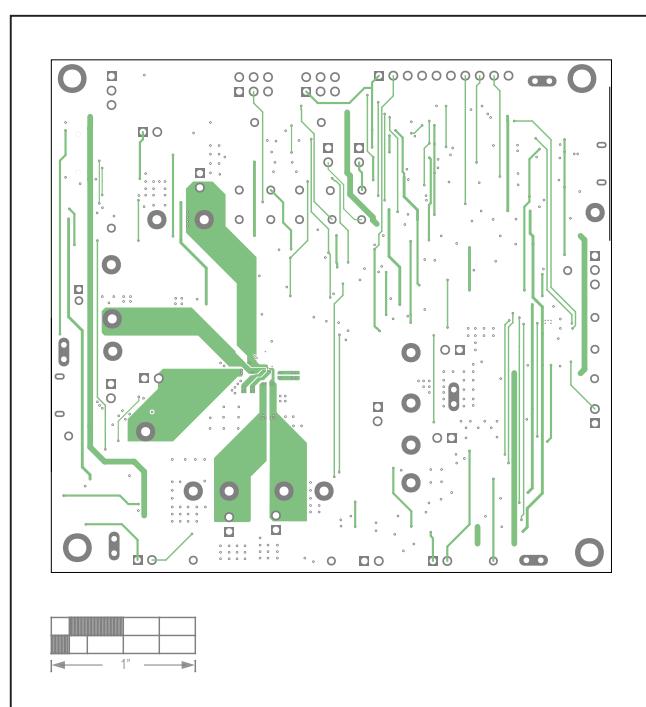
MAX77659 EV Kit PCB Layout—Internal Layer 3

MAX77659 EV Kit PCB Layouts (continued)
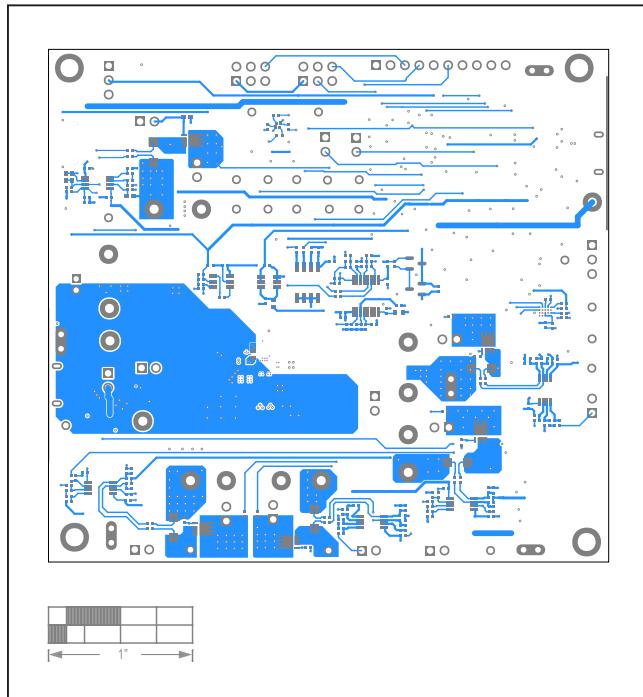
MAX77659 EV Kit PCB Layout—Bottom Layer
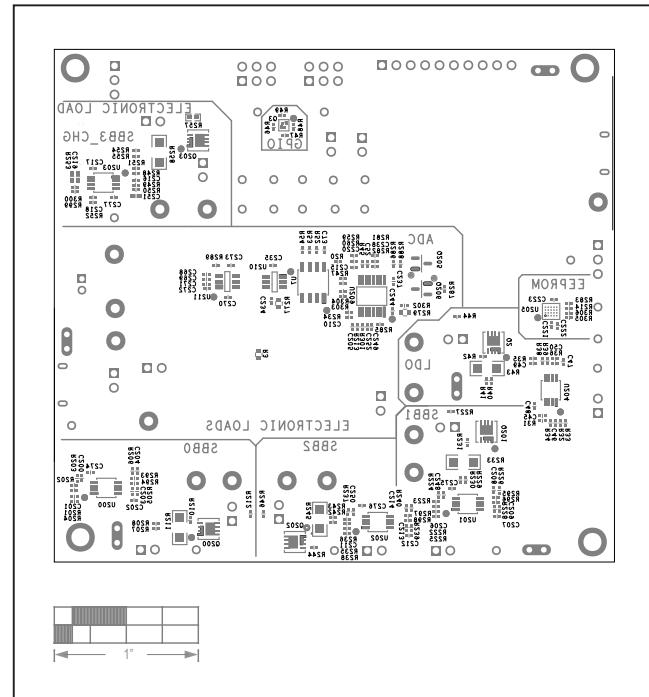
MAX77659 EV Kit Component Placement Guide—Bottom Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	8/21	Initial release	—