

## MAX77958 Evaluation Kit with 2S Li+ 3A<sub>OUT</sub> Buck-Boost Charger

Evaluates: MAX77958, MAX77962

### General Description

The MAX77958 evaluation kit (EV kit) is a fully assembled and tested printed circuit board (PCB) that demonstrates the MAX77958 Standalone USB Type-C and Power Delivery Controller.

The EV kit enables easy evaluation of the following features:

- USB Type-C Detection/PD Communication (See [Table 1](#) for Acronyms)
  - Power Role (Sink and Source), Data Role (UFP and DFP) detection
  - PD Adapter Detection and PD Communication
  - Integrated V<sub>CONN</sub> Switch with OCP
  - Power/Data Role Swap
  - PPS (with PD Adapter Supporting PPS)
  - Audio and Debug Accessory Sink/Source Mode
  - Vendor Defined Message
- BC1.2 Legacy Charger Detection: SDP, CDP, DCP and DCD Timeout
- I<sup>2</sup>C Master to Control Companion IC.
- 9 Configurable GPIOs

The EV kit contains a MAX77962 charger to demonstrate the I<sup>2</sup>C master feature of the MAX77958. The MAX77962 is a buck-boost charger for 2S Li+ battery application and is capable of 3.5V to 23V input voltage, with a maximum programmable fast charging current of 3.2A.

The MAX16904 a buck converter is installed on the EV kit to provide 5V to V<sub>CONN</sub> pin. The MAX77958 uses GPIO2 to enable the buck converter when the MAX77958 is in SOURCE Power Role.

A Micro-B USB cable is included in the package to serve as the interface from a USB port on a Windows® PC to the slave I<sup>2</sup>C port on the MAX77958. A Windows based software provides a user-friendly interface to exercise the features of the MAX77958.

### Features

- High Voltage V<sub>BUS</sub> Range
- Short to V<sub>BUS</sub> Protection on CC Pins
- Type-C Support and USB-PD Support
  - Mode configuration: DFP/UFP/DRP
  - Type-C rev1.3 and PD3.0 Compatible
  - Cable Orientation and Power Role Detection
  - Integrated V<sub>CONN</sub> Switch with OCP
  - Support Try.Snk State
  - Support Audio
  - Support Debug Accessory Sink/Source Mode
  - FRS (Fast Role Swap) Initial Sink Support
  - PPS (Programmable Power Supply) Sink Support
- Support BC1.2 Legacy/Proprietary Charger Detection
  - Integrated D+/D- Switches
- MTP Memory for Storing Custom Configuration
- Moisture Detection and Corrosion Prevention
- Customization Script
- I<sup>2</sup>C Programmable Configuration
- I<sup>2</sup>C Master to Control External Charger or DC-DC Converter IC
- 9 Configurable GPIOs (GPIO6 for SID)
  - External SuperSpeed Mux/Detection/IRQ
  - EN/DISABLE External Power or FETs
- On-Board I<sup>2</sup>C Interface
- Windows 10 Compatible
- Proven PCB Layout
- Fully Assembled and Tested

[Ordering Information](#) appears at end of data sheet.

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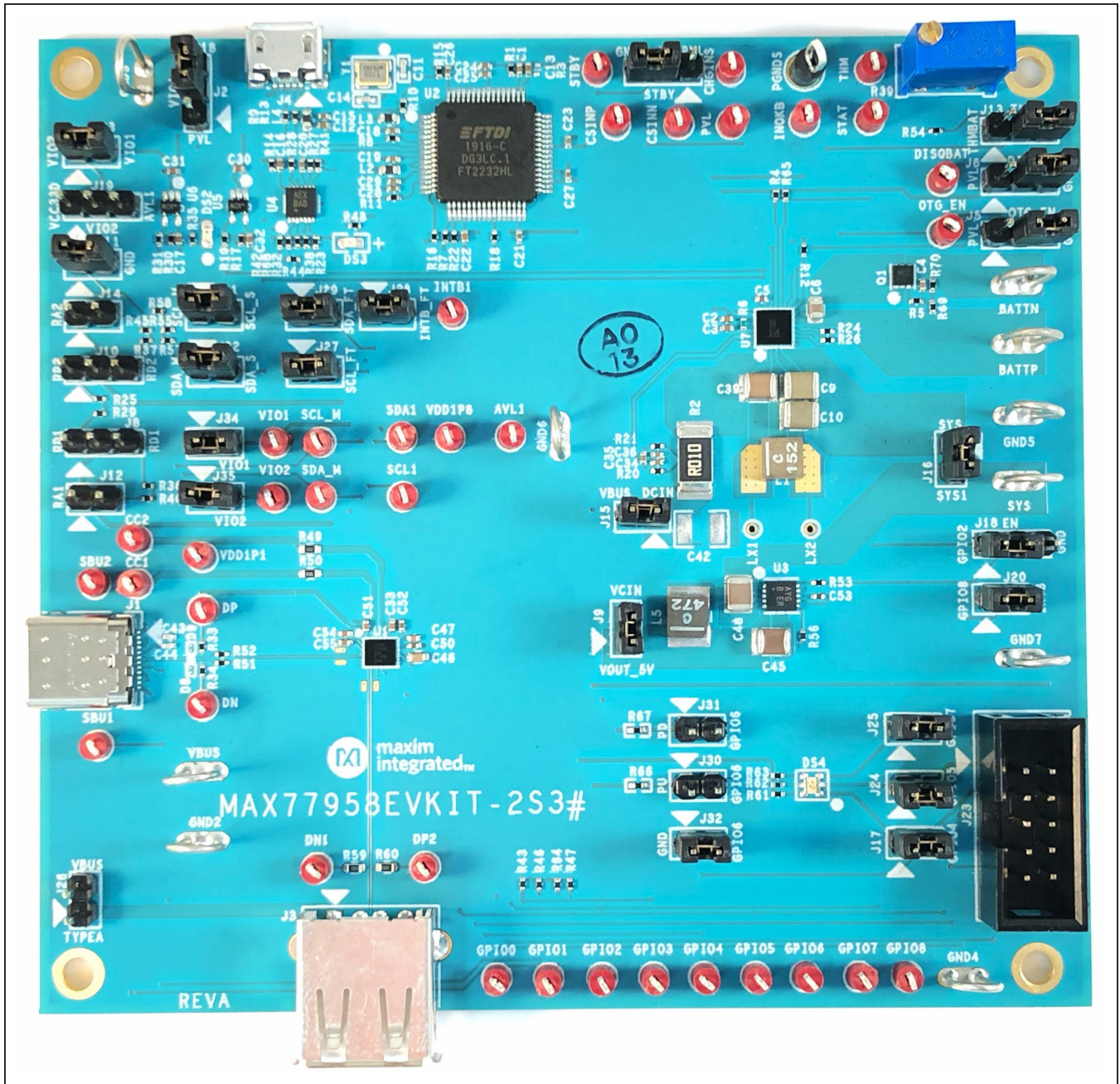


Figure 1. MAX77958 EV Kit-2S3#

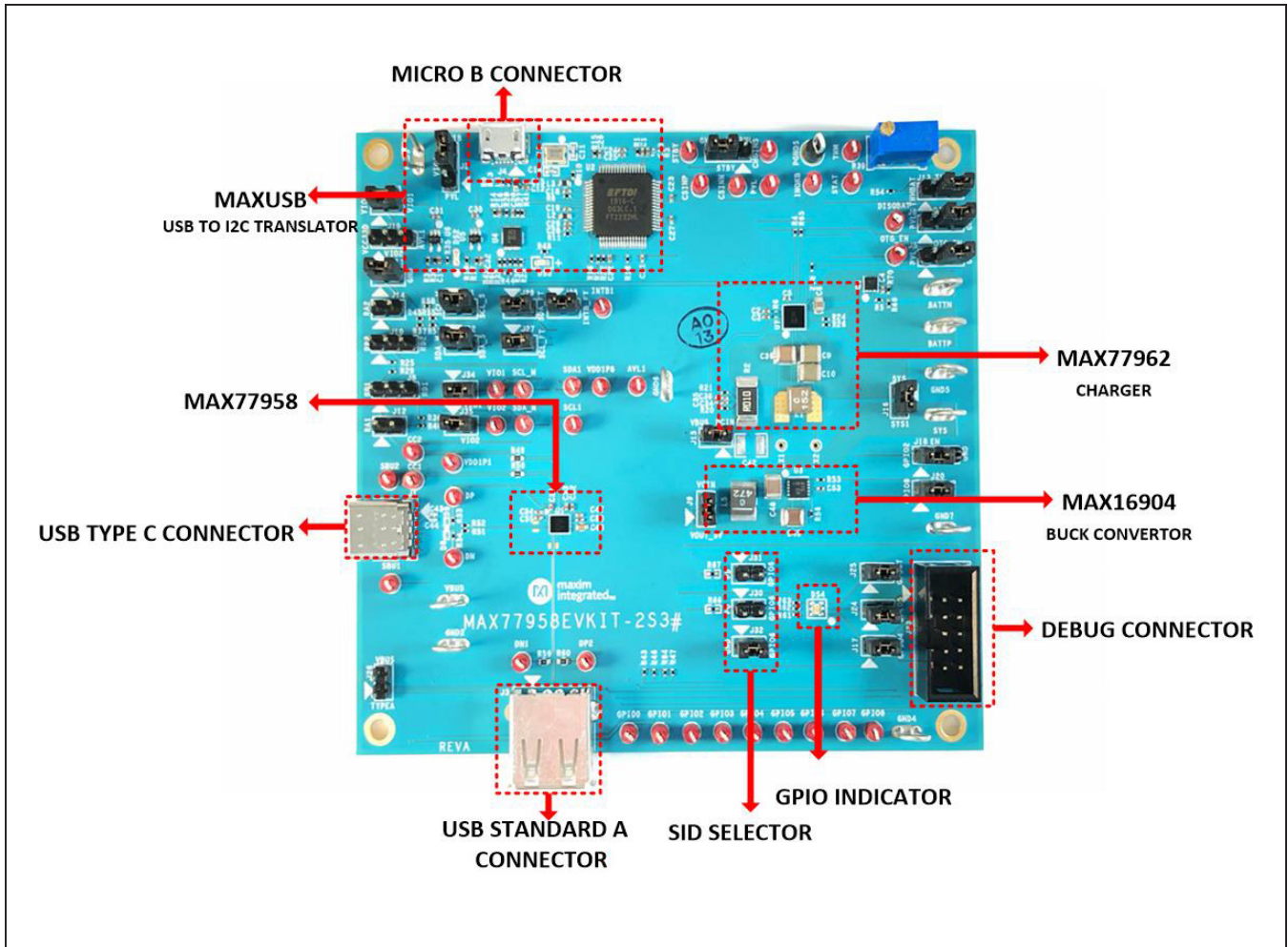


Figure 2. MAX77958 EV Kit-2S3# Top View

## Quick Start

### Required Equipment

- MAX77958 evaluation package
  - MAX77958EVKIT-2S3# Board
  - Micro-B USB cable
  - MAX77958 EV kit software (GUI)
- Type-C or PD travel adapter (TA)
- Power supply
- Battery simulator

- Multimeters
- Windows-based PC
- Oscilloscope to monitor CC pin or other signals

### Detailed Description of Hardware

The default settings of the jumpers configure the MAX77958 in Autonomous mode to control the MAX77962 to charge a 2S Li+ battery. Review jumper settings in [Table 2](#) for other application scenarios.

**Table 1. Acronyms**

BC1.2	Battery Charging 1.2
CC	Configuration Channel
CDP	Charging Downstream Port
DCP	Dedicated Charging Port
DFP	Downstream Facing Port
EV kit	Evaluation kit
GPIO	General Purpose Input/Output
GUI	Graphical User Interface
I <sup>2</sup> C	Inter Integrated Circuit
IC	Integrated Circuit
MAXUSB	USB to I <sup>2</sup> C translator
MTP	Multiple Time Programmable
OVP	Over Voltage Protection
PCB	Printed Circuit Board
PD	Power Delivery
PDO	Power Data Object
PPS	Programmable Power Supply
SDP	Standard Downstream Port
UFP	Upstream Facing Port
USB	Universal Serial Bus
VDM	Vendor Defined Message

**Table 2. Jumper Descriptions and Default Positions**

DESCRIPTION	JUMPER NUMBER	DEFAULT POSITION	FUNCTION
VIO1 and VIO2 Connection	J2	Short 2-3	1-2 VIO1 is powered by the charger's PVL
			2-3 VIO1 is powered by the VCC1P8 LDO from the MAXUSB
	J19	Open	1-2 VIO2 is powered by the VCC3P3 LDO from the MAXUSB
			2-3 VIO2 is powered by the AVL of the MAX77958
	J33	Short 1-2	Open: VIO2 depends on the J19
			Short: connect VIO1 with VIO2
J34	Short 1-2	Open to disconnect VIO1 from the MAX77958	
J35	Short 1-2	Open to disconnect VIO2 from the MAX77958	

**Table 2. Jumper Descriptions and Default Positions (continued)**

DESCRIPTION	JUMPER NUMBER	DEFAULT POSITION	FUNCTION
USB Type-C Detection Test when no USB Type-C cable is connected	J11	Short 1-2	USB Type-C test, Rd and Ra connection to GND
	J8	Open	USB Type-C CC1 RP/RD connection
			1-2 connects RP to CC1
			2-3 connects RD to CC1
	J10	Open	USB Type-C CC2 RP/RD connection
			1-2 connects RP to CC2
			2-3 connects RD to CC2
J12	Open	Connects RA to CC1	
J14	Open	Connects RA to CC2	
V <sub>CONN</sub> Boost Enable	J9	Short 1-2	Connects 5V buck converter to V <sub>CONN</sub>
	J18	Short 1-2	Connects GPIO2 to the EN pin of the 5V buck converter to VCIN
V <sub>BUS</sub> from USB Type A Connector	J26	Open	USB Type-A connection to V <sub>BUS</sub>
LED Indicator	J17	Short 1-2	GPIO4 indicator LED connection
	J24	Short 1-2	GPIO5 indicator LED connection
	J25	Short 1-2	GPIO7 indicator LED connection
I <sup>2</sup> C _Master to MAX66961 from MAX77958	J20	Short 1-2	I <sup>2</sup> C _Master Interrupt input from the MAX77962
	J21	Short 1-2	I <sup>2</sup> C _Master SCL to MAX77962 from the MAX77958
	J22	Short 1-2	I <sup>2</sup> C _Master SDA to MAX77962 from the MAX77958
I <sup>2</sup> C _Slave to MAX-USB	J29	Short 1-2	I <sup>2</sup> C _Slave SDA to the MAXUSB
	J27	Short 1-2	I <sup>2</sup> C _Slave SCL to the MAXUSB
	J28	Short 1-2	I <sup>2</sup> C _Slave INTB to the MAXUSB
MAX77958 Slave ID Selector, one of the Jumper from J30 to J32 must be populated	J31	Open	Connect GPIO6 with an external 330kΩ pulldown resistor to GN; slave address = 0x4E
	J30	Open	Connect GPIO6 with an external 330kΩ pullup resistor to VIO1; slave address = 0x4C
	J32	Short 1-2	Connect GPIO6 to GND; slave address = 0x4A
MAX77962 Charger related jumpers	J5	Short 2-3	Charger OTG_EN
	J6	Short 2-3	Charger DISQBAT
	J7	Short 2-3	Charger STBY
	J13	Short 2-3	Charger THMBAT
	J15	Short 1-2	Charger input power DCIN to V <sub>BUS</sub>
	J16	Short 1-2	Connects charger System Voltage with USBC controller System Voltage

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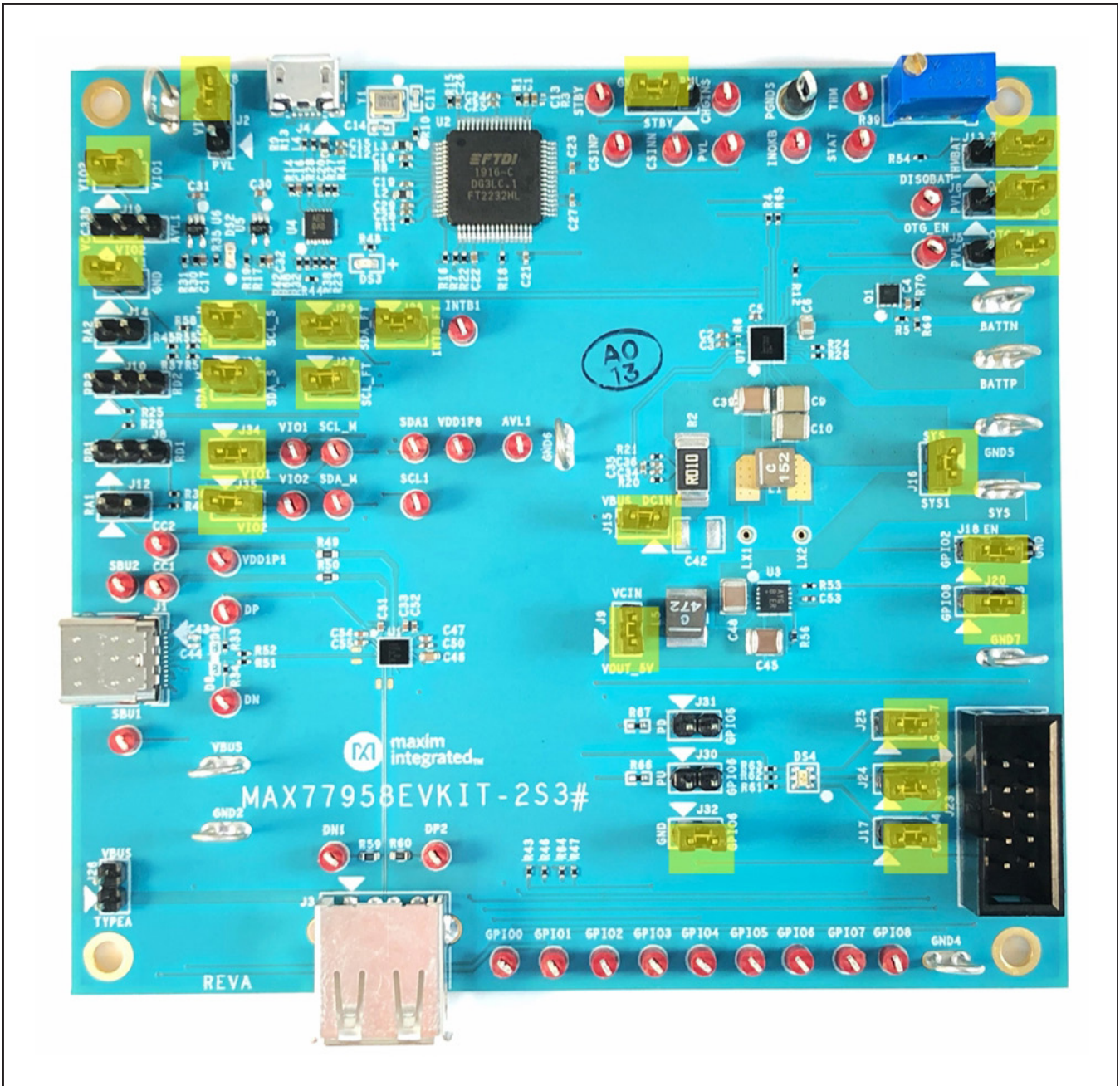


Figure 3. MAX77958 EV Kit-2S3# Top View with Default Jumpers Setup

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## Detailed Description of Software

The GUI allows for quick, easy, and thorough evaluation of the MAX77958. Every control in the GUI corresponds to a register in the MAX77958. Refer to the Register Map Section in the MAX77958 data sheet for a complete description.

## Installation

The MAX77958EVKIT-2S3 GUI can be downloaded from Maxim's website at <http://www.maximintegrated.com/products/MAX77958> (under the Design Resources tab).

Save the EV kit software to a temporary folder and decompress the ZIP file. Run the .EXE file and follow the on-screen instructions to complete the installation.

## Windows Driver

After connecting the Micro-USB cable between a PC and the EV kit for the first time, wait for Windows to automatically install the drivers for the USB to I<sup>2</sup>C Interface.

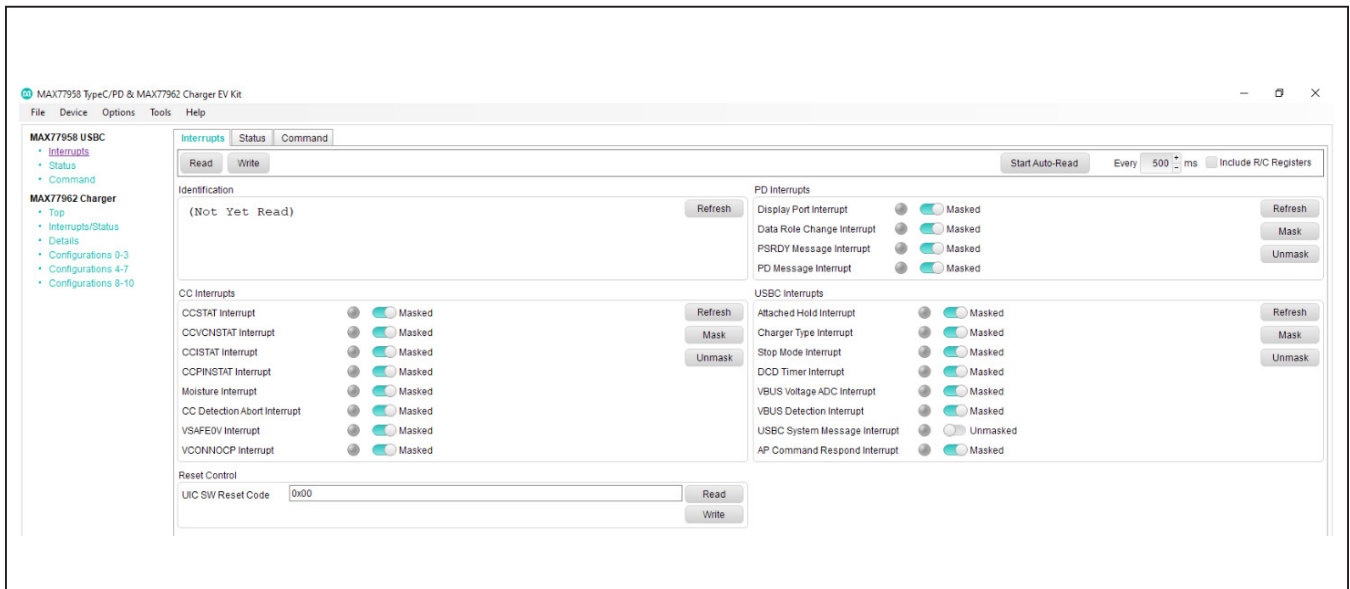


Figure 4. MAX77958 Evaluation Kit Software

## Test Procedure

The EV kit is fully assembled and tested. Use the following steps to verify board operation.

### Autonomous Mode 2S Application

#### SINK Mode

When the MAX77958 is configured as the SINK, the MAX77958 enables the charger mode of the MAX77962 and set the input current limit of the MAX77962 according to the USB Type-C and BC1.2 detection result.

- 1) Connect the battery simulator between BATT<sub>P</sub> and BATT<sub>N</sub>, adjust the voltage to 7V and turn it on.
- 2) Connect USB Type-C AC adapter into the EV kit.
- 3) Observe the current reading from the battery simulator, the default fast charging current should be 450mA.

#### SOURCE Mode

When the MAX77958 is configured as the SOURCE, the MAX77962 automatically switches to reverse-buck mode, and supplies 5.1V to V<sub>BUS</sub>.

- 1) Connect the battery simulator between BATT<sub>P</sub> and BATT<sub>N</sub>, adjust the voltage to 7V and turn it on.
- 2) Make sure no USB Type-C cable is connected.
- 3) Short Pin1-2 of J11 and short Pin2-3 of J8 to connect a 5.1kΩ R<sub>d</sub> to CC1.
- 4) Monitor the voltage of V<sub>BUS</sub> and check whether it equals 5.1V.

### Initial test setup

- 1) Do not turn on the DC power supplies until all connections are made.
- 2) Confirm all jumpers are at their default positions as indicated in [Table 2](#).
- 3) Connect a Micro-B USB cable from the computer's USB port to the MAX77958 EV kit.
- 4) Connect the DC power supply to the loop labeled SYS and GND.
- 5) Adjust the DC power supply to 7V and turn it on.
- 6) Follow the description of software covered in page 7 to install the MAX77958EVKIT-2S3.EXE software program.
- 7) Open the MAX77958 GUI and go to the **Device** drop-down menu, and press the **Connect** button in the drop-down list.
- 8) Wait for the device to respond and click on the **Read** and **Close** button to continue.
- 9) The EV kit and GUI are now ready for use.

### CC Detection Test

- 1) Connect USB Type-C adapter into the EV kit and see whether the MAX77958 detects **SINK** and configures input current limit correctly.
- 2) Connect USB Type-C cable from a Type-C dual role port (Source Preferred) device to see whether the MAX77958 detects **CC Pin State Machine Detection** and configures input current limit correctly.

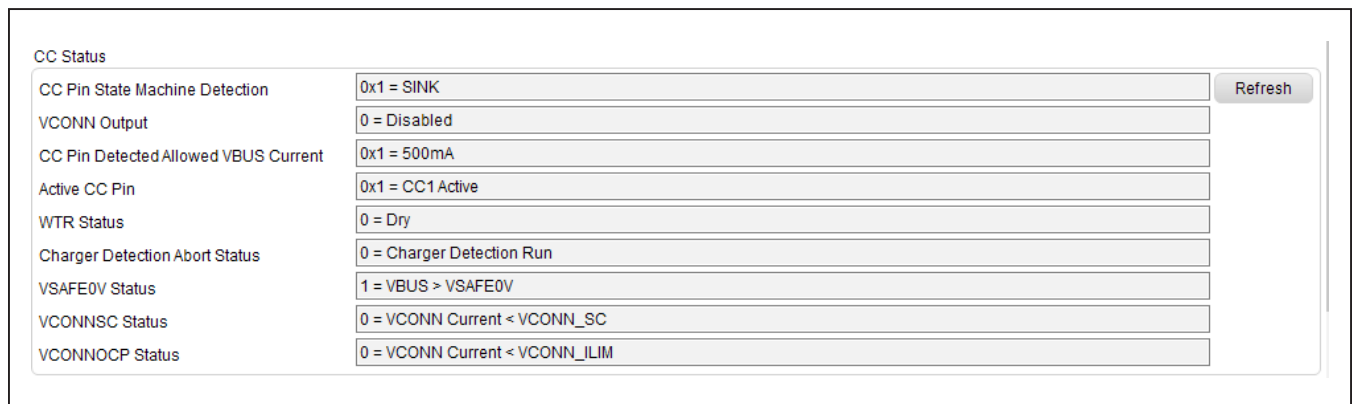


Figure 5. CC Status After Connecting the USB Type-C Connector of EV Kit to a Travel Adapter (TA)



### USB Power Delivery Test

Source capability request function test.

- 1) Connect USB Power delivery AC Adapter into the EV kit.
- 2) Use a voltmeter to monitor the voltage on V<sub>BUS</sub>.
- 3) Go to Command > **Get SrcCap (0x31)**, click on **Write** button execute the command, the MAX77958 sends this command over the CC pin to the TA, the TA provides a list of available source capabilities.
- 4) Review the source capabilities and make a note of the desired PDO.

- 5) Go to **SrcCap Request (0x32)**, set the value of the PDO and press the **Write** button to change the BUS voltage.

### BC1.2 Charger Type Detection

- 1) Plug in the USB Type A to Type-C cable from a BC1.2 adapter or other legacy port, check the **Charger Detection Status** under the status tab of the MAX77958 GUI, to see if the USBC detects the correct charger type.

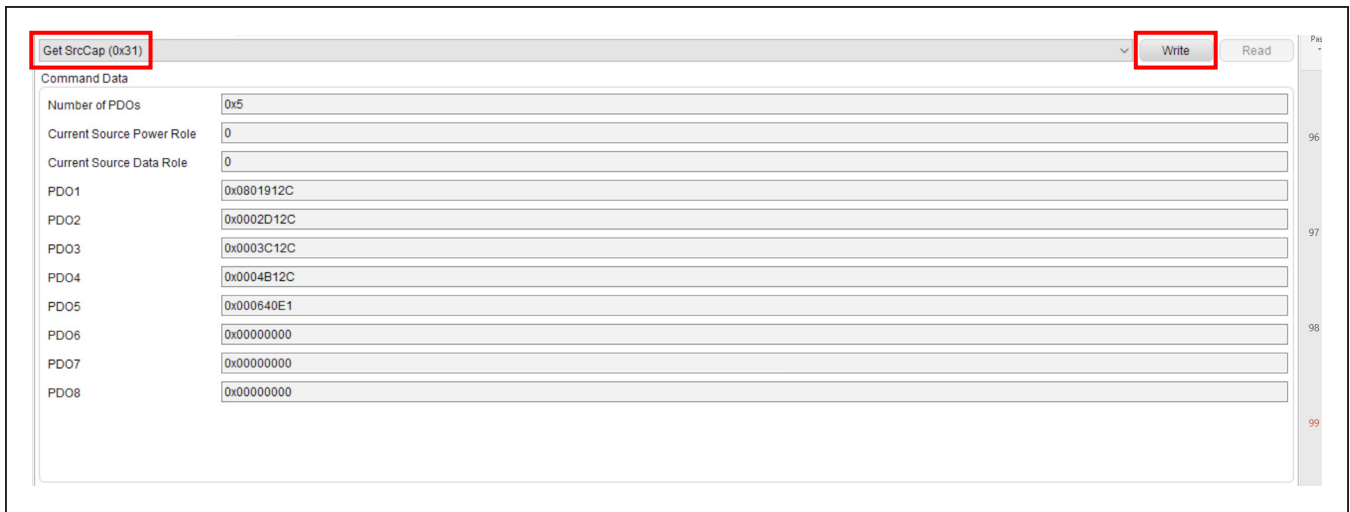


Figure 6. Get Source Capability (Get SrcCap) under Command Section

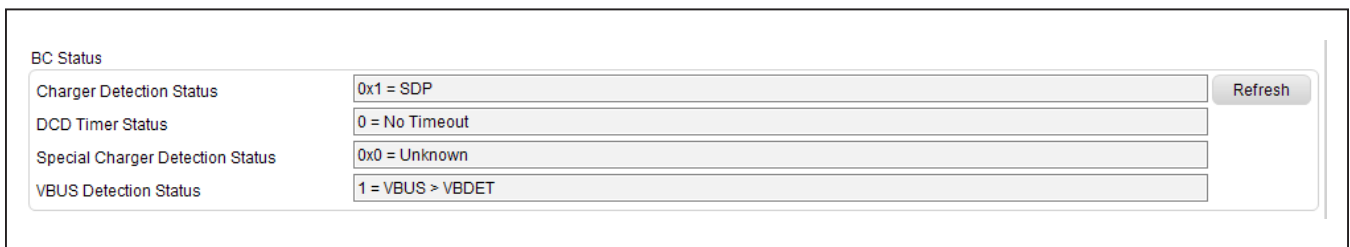


Figure 7. BC Status After Connecting the USB Type-C Connector of EV Kit to SDP

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## I<sup>2</sup>C Master Test

The MAX77962 buck-boost charger IC is installed on the EV kit and communicates with the MAX77958 through the master I<sup>2</sup>C interface. When the MAX77958 is configured as the source, the MAX77962 automatically switches to reverse-buck mode, and supplies 5.1V to V<sub>BUS</sub>.

- 1) Disconnect Type-C cable.
- 2) Connect 7V power supply to BATT+.
- 3) Connect the pin 2-3 of Jumper 10, to attach the Rd to the CC2.
- 4) Check the **CC Status** in GUI, the MAX77958 should be in **SOURCE** mode.
- 5) MAX77962 is under the OTG mode, the measured V<sub>BUS</sub> voltage should equal to 5.1V.

## Detailed Description of Firmware

The firmware of the MAX77958 consists of two main parts: the core firmware and customization script.

The core firmware is compliant with the USB Type-C 1.3 and PD 3.0 specifications. The customization script is based on application system, giving more flexibility for system design. It is based on the customization script update, which can achieve functions such as GPIO matrix control, charger configuration initialization, etc.

Future USB Type-C and PD specifications changes can be accommodated by updating the MAX77958 core firmware. See the [Core Firmware Update](#) section of this data sheet.

See the MAX77958 customization script and OPCode command guide for details about the customization script.

## Customization Script Block Update

The customization script defines the application specific behavior of the MAX77958. An example is setting the input current limit of the charger when the USB device detection is completed.

- 1) Follow the initial test setup to connect the GUI with the MAX77958 EV kit.
- 2) Connect 7.0V to SYS, do not disconnect the EV kit from the PC during the **Customization Script Block Update**.
- 3) Click on **Tools** in the menu bar and then go to **CUS Command Block Update**.
- 4) Click on the **Open** button in the pop up window to load the latest customization script and then click on **Start** to activate the **Customization Script Update**.
- 5) [Figure 10](#) shows the completion of the customization script update process.

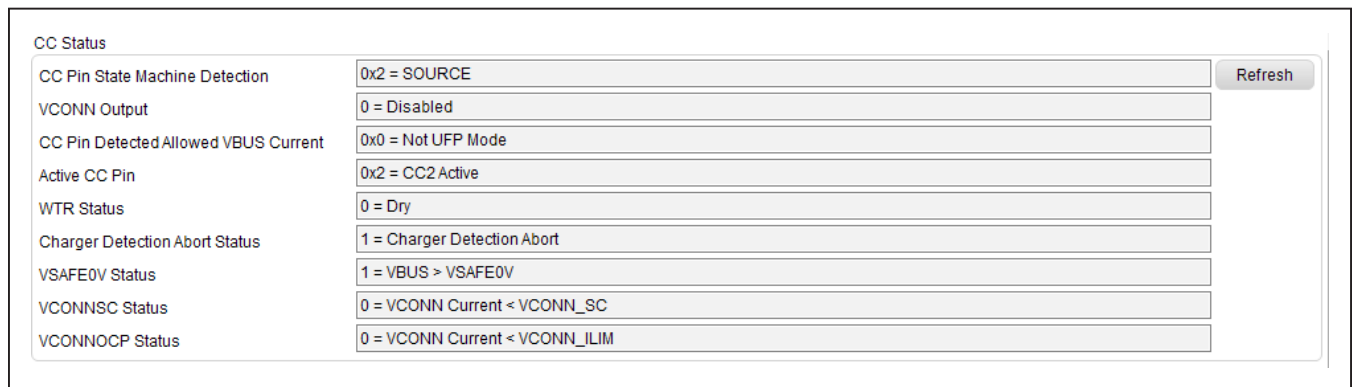


Figure 8. CC Status After Attaching Rd to CC2

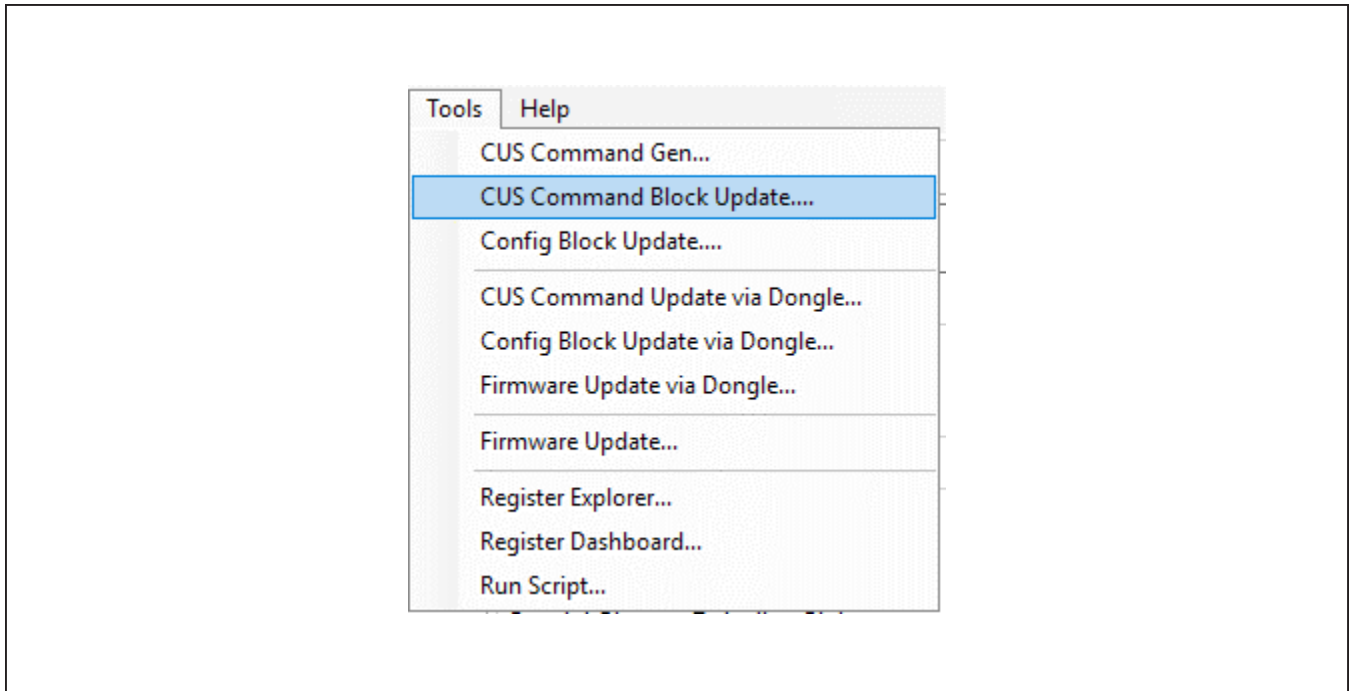


Figure 9. MAX77958 EV kit GUI Customization Script Block Update

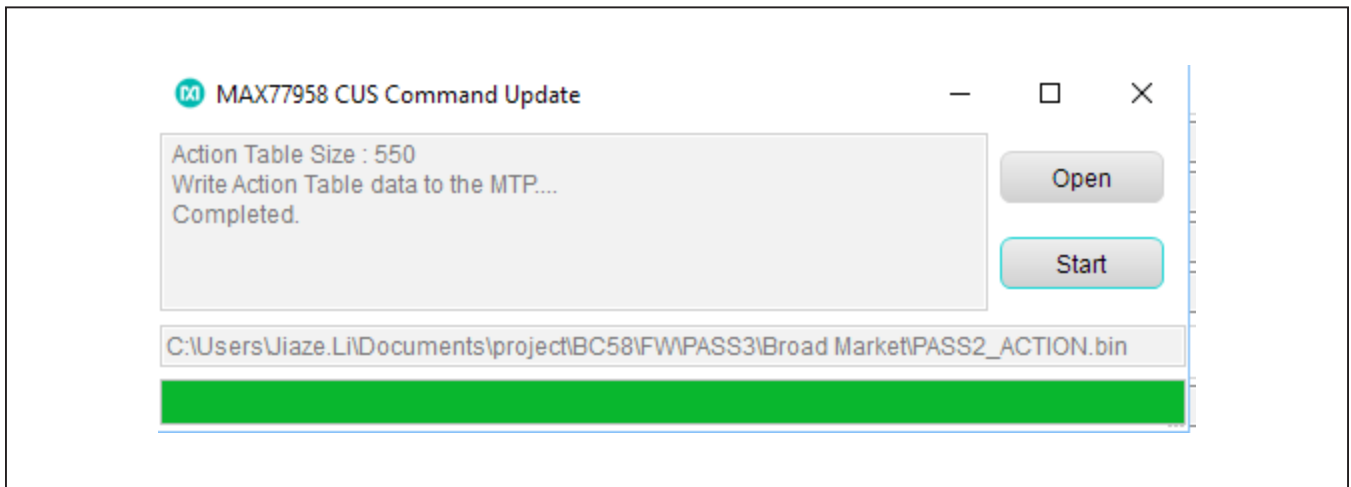


Figure 10. Customization Script Update Process Complete

### Core Firmware Update

- 1) Follow the initial test setup to connect the GUI with the MAX77958 EV kit.
- 2) Connect 7.0V to SYS, do not disconnect the EV kit from the PC during the **Firmware Update**.
- 3) Click on **Tools** in the menu bar and then go to **Firmware Update**.
- 4) Click on the **Open** button in the pop up window to load the latest firmware, in the file select window click on the .bin file, and then select **Start** to activate the **Firmware Update**.
- 5) [Figure 12](#) shows the firmware update process is completed.

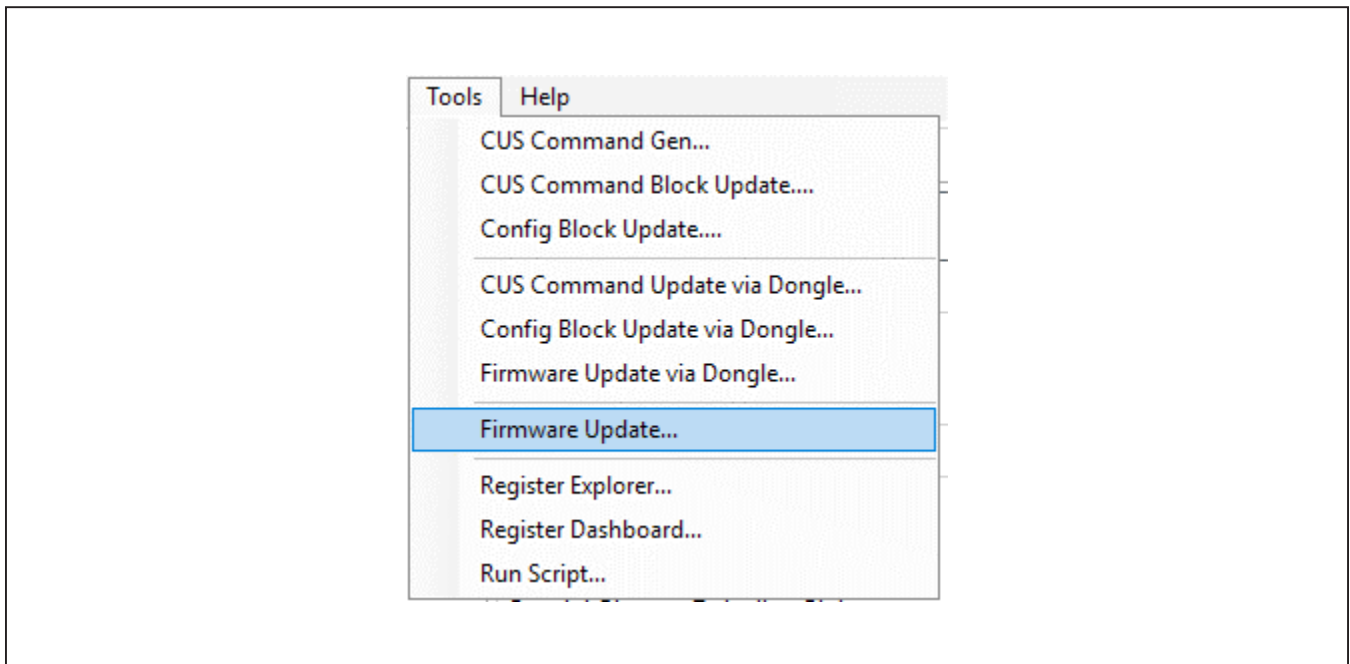


Figure 11. MAX77958 EV Kit GUI Firmware Update

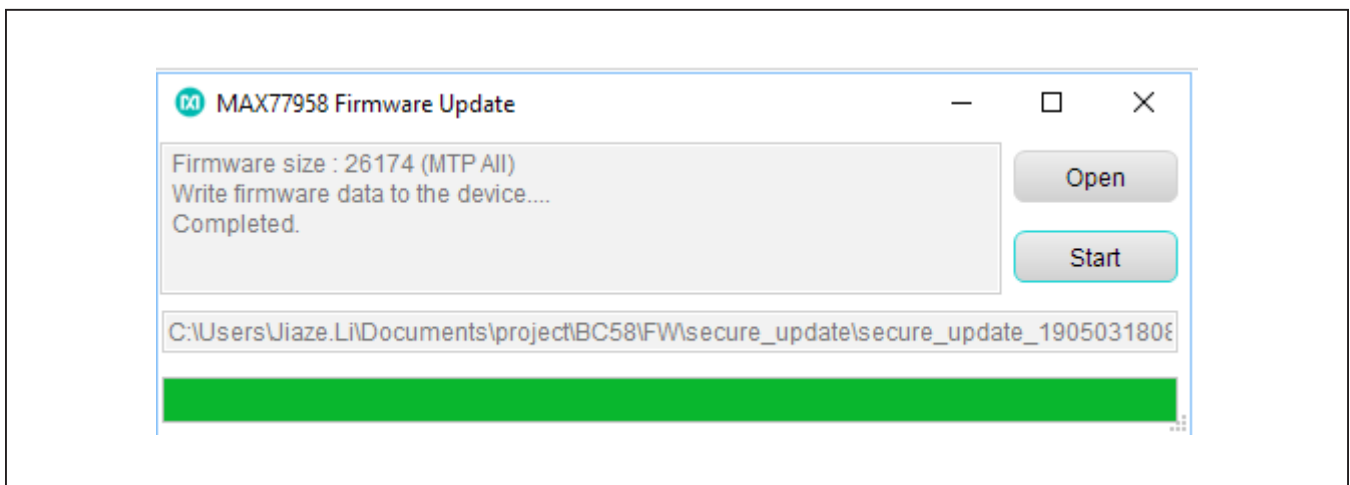


Figure 12. Firmware Update Process Complete

## MAX77958 Evaluation Kit with 2S Li+ 3A<sub>OUT</sub> Buck-Boost Charger

Evaluates: MAX77958, MAX77962

### Component Suppliers

SUPPLIER	PHONE	WEBSITE
MURATA	770-436-1300	<a href="http://www.murata-northamerica.com">www.murata-northamerica.com</a>
SAMTEC	800-726-8329	<a href="http://www.samtec.com">www.samtec.com</a>
SULLINS ELECTRONICS CORP.	760-774-0125	<a href="http://www.sullinselectronics.com">www.sullinselectronics.com</a>
TAIYO-YUDEN	603-669-7587	<a href="http://www.t-yuden.com">www.t-yuden.com</a>
TDK	847-803-6100	<a href="https://www.tdk.com/corp/en/index.htm">https://www.tdk.com/corp/en/index.htm</a>
VISHAY	408-970-5852	<a href="http://www.vishay.com">www.vishay.com</a>
CYNTEC	510-668-5167	<a href="http://www.cyntec.com">www.cyntec.com</a>
PANASONIC	800-344-2112	<a href="https://na.industrial.panasonic.com/">https://na.industrial.panasonic.com/</a>
FUTURE TECHNOLOGY DEVICES INTL LTD.	503-547-0988	<a href="http://www.ftdichip.com">www.ftdichip.com</a>

**Note:** Indicate that you are using the MAX77958 when contacting these component suppliers.

### Ordering Information

PART NUMBER	IC	TYPE
MAX77958EVKIT-2S3#	MAX77958EWW+ MAX77962EWJ12+	EV Kit

#Denotes RoHS compliance.

MAX77958 Evaluation Kit with 2S  
Li+ 3A<sub>OUT</sub> Buck-Boost Charger

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**MAX77958-2S3 EV Kit Bill of Materials**

REF_DES	QTY	MFG PART #	VALUE	DESCRIPTION
AVL1, CC1, CC2, CHGINS, CSINN, CSINP, DISQBAT, DN, DN1, DP, DP2, GPIO0-GPIO8, INOKB, INTB1, OTG_EN, PVL, SBU1, SBU2, SCL1, SCL_M, SDA1, SDA_M, STAT, STBY, THM, VDD1P1, VDD1P8, VIO1, VIO2	37	5000	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
BATTN, BATTP, GND2-GND7, SYS, VBUS	10	9020 BUSS	MAXIMPAD	EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG
C1, C15, C18-C21, C23-C29, C35	14	GRM155R71A104JA01	0.1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 10V; TOL=5%; TG=-55 DEGC TO +125 DEGC; TC=X7R
C2, C3, C12, C13, C22	5	ZRB15XR61A475ME01; CL05A475MP5NRN; GRM155R61A475MEAA; C1005X5R1A475M050BC	4.7UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 4.7UF; 10V; TOL=20%; TG=-55 DEGC TO +85 DEGC; TC=X5R
C4	1	C1005X7R1E473K050BC; GRM155R71E473K; GCM155R71E473KA55	0.047UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.047UF; 25V; TOL=10%; TG=- 55 DEGC TO +125 DEGC
C5	1	GRM155C81E105KE11	1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 1UF; 25V; TOL=10%; TG=-55 DEGC TO +105 DEGC; TC=X6S
C6	1	TMK212BBJ106KG-T; CL21A106KAFN3N	10UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 10UF; 25V; TOL=10%; MODEL=; TG=-55 DEGC TO +85 DEGC; TC=X5R
C7, C8	2	GRM155R71C224KA12	0.22UF	CAPACITOR; SMT (0402); CERAMIC; 0.22UF; 16V; TOL=10%; MODEL=GRM SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R
C9, C10	2	TMK325ABJ476MM	47UF	CAP; SMT (1210); 47UF; 20%; 25V; X5R; CERAMIC CHIP
C11, C14, C43, C44	4	C0402C0G500270JNP; GRM1555C1H270JA01	27PF	CAPACITOR; SMT; 0402; CERAMIC; 27pF; 50V; 5%; C0G; -55degC to + 125degC; 0 +/-30PPM/degC
C16, C17, C30-C32	5	C0402C105K8PAC; CC0402KRX5R6BB105	1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 1UF; 10V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R

**MAX77958-2S3 EV Kit Bill of Materials (continued)**

REF_DES	QTY	MFG PART #	VALUE	DESCRIPTION
C33, C47, C51, C54, C55	5	ANY	1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 1UF; 6.3V; TOL=10%; MODEL=; TG=-55 DEGC TO +85 DEGC; TC=X5R;
C34, C36	2	GRM155R71H153KA12	0.015UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.015UF; 50V; TOL=10%; TG=- 55 DEGC TO +125 DEGC; TC=X7R
C39, C45	2	GRM32ER7YA106KA12; CL32B106KLULNN	10UF	CAPACITOR; SMT (1210); CERAMIC CHIP; 10UF; 35V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
C46	1	GRM188R71A225KE15; CL10B225KP8NNN; C1608X7R1A225K080AC; C0603C225K8RAC	2.2UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 2.2UF; 10V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
C48	1	C1210C475K5RAC; GRM32ER71H475KA88; GCM32ER71H475KA55; CGA6P3X7R1H475K250AB; UMK325B7475KMHP; CNC6P1X7R1H475K250AE	4.7UF	CAPACITOR; SMT (1210); CERAMIC CHIP; 4.7UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
C49	1	TMK105BJ104KV; GRM155R61E104KA87	0.1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 25V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R
C50, C52	2	C1005X5R1V105K050BC	1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 1UF; 35V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R
C53	1	ZRB157R61A225KE11; GRM155R61A225KE95; CL05A225KP5NSN	2.2UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 2.2UF; 10V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R
D8, D9	2	PESD4V0W1BSF	4V	EVKIT PART-DIODE; TVS; SMT (SOD962-2); VRM=+/-4V; IPP=N/A
DS2	1	LTST-C190CKT	LTST-C190CKT	DIODE; LED; STANDARD; RED; SMT (0603); PIV=5.0V; IF=0.04A; -55 DEGC TO +85 DEGC
DS3	1	LTST-C190KFK	LTST-C190KFK	DIODE; LED; ULTRA BRIGHT CHIP LEAD; ORANGE; SMT (0603); VF=2V; IF=0.02A
DS4	1	19-337/R6GHBHC-A01/2T	19-337/R6GHBHC- A01/2T	DIODE; LED; SMD-B; RED/GREEN/ BLUE; SMT; PIV=2V-3.3V; IF=0.02A
J1	1	12401832E402A	12401832E402A	CONNECTOR; FEMALE; SMT; USB TYPE C CONNECTOR; RIGHT ANGLE; DUAL ROW; 24PINS

MAX77958 Evaluation Kit with 2S  
Li+ 3A<sub>OUT</sub> Buck-Boost Charger

Evaluates: MAX77958, MAX77962

MAX77958-2S3 EV Kit Bill of Materials (continued)

REF_DES	QTY	MFG PART #	VALUE	DESCRIPTION
J2, J5-J8, J10, J13, J18, J19	9	PEC03SAAN	PEC03SAAN	EVKIT PART-CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS; -65 DEGC TO +125 DEGC;
J3	1	87520-0010BLF	87520-0010BLF	CONNECTOR; FEMALE; THROUGH HOLE; USB RECEPTACLE; RIGHT ANGLE; 4PINS
J4	1	10118193-0001LF	10118193-0001LF	CONNECTOR; FEMALE; SMT; MICRO USB B TYPE RECEPTACLE; RIGHT ANGLE; 5PINS
J9, J11, J12, J14-J17, J20-J22, J24-J35	22	TSW-102-07-T-S	TSW-102-07-T-S	CONNECTOR; THROUGH HOLE; TSW SERIES; SINGLE ROW; STRAIGHT; 2PINS; -55 DEGC TO +105 DEGC
J23	1	SBH11-PBPC-D05-ST-BK	SBH11-PBPC-D05-ST-BK	CONNECTOR; MALE; THROUGH HOLE; 0.100IN MALE SHROUDED BOX HEADER; STRAIGHT; 10PINS
L1	1	XAL4020-152ME	1.5UH	INDUCTOR; SMT; COMPOSITE CORE; 1.5UH; TOL=+/-20%; 5.2A
L2-L4	3	BLM18AG601SN1	600	INDUCTOR; SMT (0603); FERRITE-BEAD; 600; TOL=+/-; 0.5A
L5	1	XFL4020-472ME	4.7UH	INDUCTOR; SMT; METAL COMPOSITE CORE; 4.7UH; TOL=+/-20%; 5A; -40 DEGC TO +125 DEGC
PGNDS	1	5011	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
Q1	1	DMN3016LFDE	DMN3016LFDE	TRAN; NCH; U-DFN2020-6 (TYPE E); PD-(0.73W); I-(10A); V-(30V)
R1, R7, R14-R16, R18, R22, R24, R26, R32-R34, R44, R68	14	ERJ-2GE0R00	0	RESISTOR; 0402; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM
R2	1	CRA2512-FZ-R010ELF	0.01	RESISTOR; 2512; 0.01 OHM; 1%; 75PPM; 3.0W; THICK FILM
R4, R23, R58, R65	4	CRCW0402200KFK; RF73H1ELTP2003	200K	RESISTOR; 0402; 200K; 1%; 100PPM; 0.0625W; THICK FILM
R5, R11, R40, R45	4	CRCW04021K00FK; RC0402FR-071KL; MCR01MZPF1001	1K	RESISTOR; 0402; 1K; 1%; 100PPM; 0.0625W; THICK FILM
R6	1	ERJ-2GEJ4R7	4.7	RESISTOR; 0402; 4.7 OHM; 5%; 200PPM; 0.10W; THICK FILM



**MAX77958-2S3 EV Kit Bill of Materials (continued)**

REF_DES	QTY	MFG PART #	VALUE	DESCRIPTION
R8	1	CRCW040212K0FK; MCR01MZPF1202	12K	RESISTOR, 0402, 12K OHM, 1%, 100PPM, 0.0625W, THICK FILM
R9, R13	2	ERJ-2RKF27R0X; RC0402FR-0727RL; CRCW040227R0FK	27	RESISTOR, 0402, 27 OHM, 1%, 100PPM, 0.0625W, THICK FILM
R10	1	CRCW04021M00FK	1M	RESISTOR; 0402; 1M; 1%; 100PPM; 0.0625W; THICK FILM
R12, R54	2	CRCW040210K0FK; RC0402FR-0710KL	10K	RESISTOR; 0402; 10K; 1%; 100PPM; 0.0625W; THICK FILM
R17	1	CRCW04024752FK; 9C04021A4752FLHF3; CRCW040247K5FK	47.5K	RESISTOR; 0402; 47.5K; 1%; 100PPM; 0.0625W; THICK FILM
R19, R31, R41	3	CRCW0402100KFK; RC0402FR-07100KL	100K	RESISTOR; 0402; 100K; 1%; 100PPM; 0.0625W; THICK FILM
R20, R21	2	CRCW040210R0FK; 9C04021A10R0FL	10	RESISTOR; 0402; 10 OHM; 1%; 100PPM; 0.0625W; THICK FILM
R25, R29	2	ERJ-2RKF5602	56K	RESISTOR, 0402, 56K OHM, 1%, 100PPM, 0.0625W, THICK FILM
R27, R28	2	CRCW04024K70FK; MCR01MZPF4701	4.7K	RESISTOR, 0402, 4.7K OHM, 1%, 100PPM, 0.0625W, THICK FILM
R30	1	CRCW0402169KFK	169K	RESISTOR; 0402; 169K OHM; 1%; 100PPM; 0.063W; THICK FILM
R35	1	CRCW0402470RFK	470	RESISTOR, 0402, 470 OHM, 1%, 100PPM, 0.0625W, THICK FILM
R36, R37	2	CRCW04025K10FK	5.1K	RESISTOR; 0402; 5.1K; 1%; 100PPM; 0.0625W; THICK FILM
R38, R42, R55, R57	4	CRCW04022K20FK; RC0402FR-072K2L	2.2K	RESISTOR, 0402, 2.2K OHM, 1%, 100PPM, 0.0625W, THICK FILM
R39	1	3296Y-1-503LF	50K	RESISTOR; THROUGH HOLE-RADIAL LEAD; 3296 SERIES; 50K OHM; 10%; 100PPM; 0.5W
R43, R47	2	ERJ-2RKF6493	649K	RESISTOR; 0402; 649K OHM; 1%; 100PPM; 0.1W; THICK FILM
R46, R64	2	ERJ-2RKF1203	120K	RESISTOR; 0402; 120K OHM; 1%; 100PPM; 0.1W; THICK FILM
R48	1	ERJ-2GEJ132	1.3K	RESISTOR; 0402; 1.3K OHM; 5%; 200PPM; 0.1W; THICK FILM
R49, R50, R59, R60	4	CRCW06030000Z0EAHP	0	RESISTOR; 0603; 0 OHM; 0%; JUMPER; 0.25W; THICK FILM
R51, R52	2	CRCW04021R00FK	1	RESISTOR, 0402, 1 OHM, 1%, 100PPM, 0.0625W, THICK FILM
R53	1	ERJ-2RKF3302X	33K	RESISTOR, 0402, 33K OHM, 1%, 100PPM, 0.0625W, THICK FILM

MAX77958 Evaluation Kit with 2S  
Li+ 3A<sub>OUT</sub> Buck-Boost Charger

Evaluates: MAX77958, MAX77962

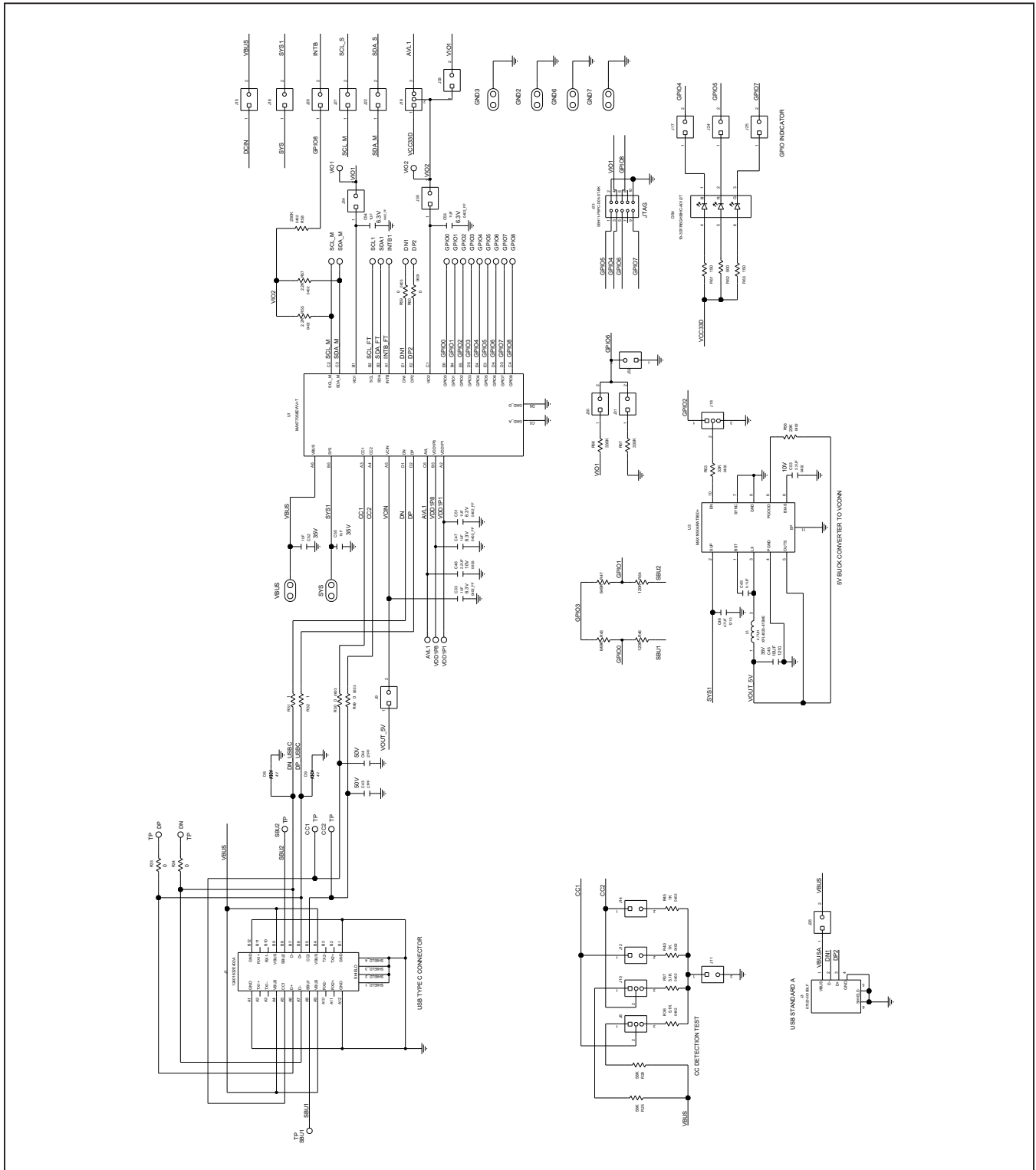
MAX77958-2S3 EV Kit Bill of Materials (continued)

REF_DES	QTY	MFG PART #	VALUE	DESCRIPTION
R56	1	CRCW040220K0FK	20K	RESISTOR; 0402; 20K OHM; 1%; 100PPM; 0.063W; THICK FILM
R61, R63	2	CRCW0402150RFK; 9C04021A1500FL	150	RESISTOR; 0402; 150 OHM; 1%; 100PPM; 0.0625W; THICK FILM
R62	1	PNM0402E5000BS	500	RESISTOR; 0402; 500 OHM; 0.1%; 25PPM; 0.05W; THIN FILM
R66, R67	2	CRCW0402330KFK	330K	RESISTOR, 0402, 330K OHM, 1%, 100PPM, 0.0625W, THICK FILM
R69	1	ERJ-2RKF2203	220K	RESISTOR; 0402; 220K OHM; 1%; 100PPM; 0.1W; THICK FILM
R70	1	ERJ-2GEJ474	470K	RES; SMT (0402); 470K; 5%; +/-200PPM/DEGC; 0.1W
U1	1	MAX77958EWW+T	MAX77958EWW+T	EVKIT PART - IC; USB TYPE-C AND USB PD CONTROLLER; WLP30; 0.5MM PITCH; PACKAGE OUTLINE: 21-0069; PACKAGE CODE: W302A3+2
U2	1	FT2232HL	FT2232HL	IC; MMR; DUAL HIGH SPEED USB TO MULTIPURPOSE UART/FIFO; LQFP64
U3	1	MAX16904RATB50+	MAX16904RATB50+	IC; CONV; 2.1MHZ HIGH-VOLTAGE; 600 MILLIAMPERE MINI-BUCK CONVERTER; TDFN10-EP
U4	1	MAX14611ETD+	MAX14611ETD+	IC; TRANS; QUAD BIDIRECTIONAL LOW-VOLTAGE LOGIC LEVEL TRANSLATOR; TDFN14-EP
U5, U6	2	MAX8512EXK+	MAX8512EXK	IC, VREG, Ultra-Low-Noise, High PSRR, Adjustable Vout, SC70-5
U7	1	MAX77962EWJ12+	MAX77962EWJ12+	EVKIT PART -IC; MAX77962; PACKAGE OUTLINE DRAWING: 21-100355
Y1	1	7M-12.000MAAJ	12MHZ	CRYSTAL; SMT; 18PF; 12MHZ; +/-30PPM; +/-30PPM
PCB	1	MAX77958	PCB	PCB:MAX77958
R3	0	N/A	OPEN	RESISTOR; 0402; OPEN; FORMFACTOR
C37, C38, C40-C42	0	N/A	OPEN	CAPACITOR; SMT (1210); OPEN; IPC MAXIMUM LAND PATTERN

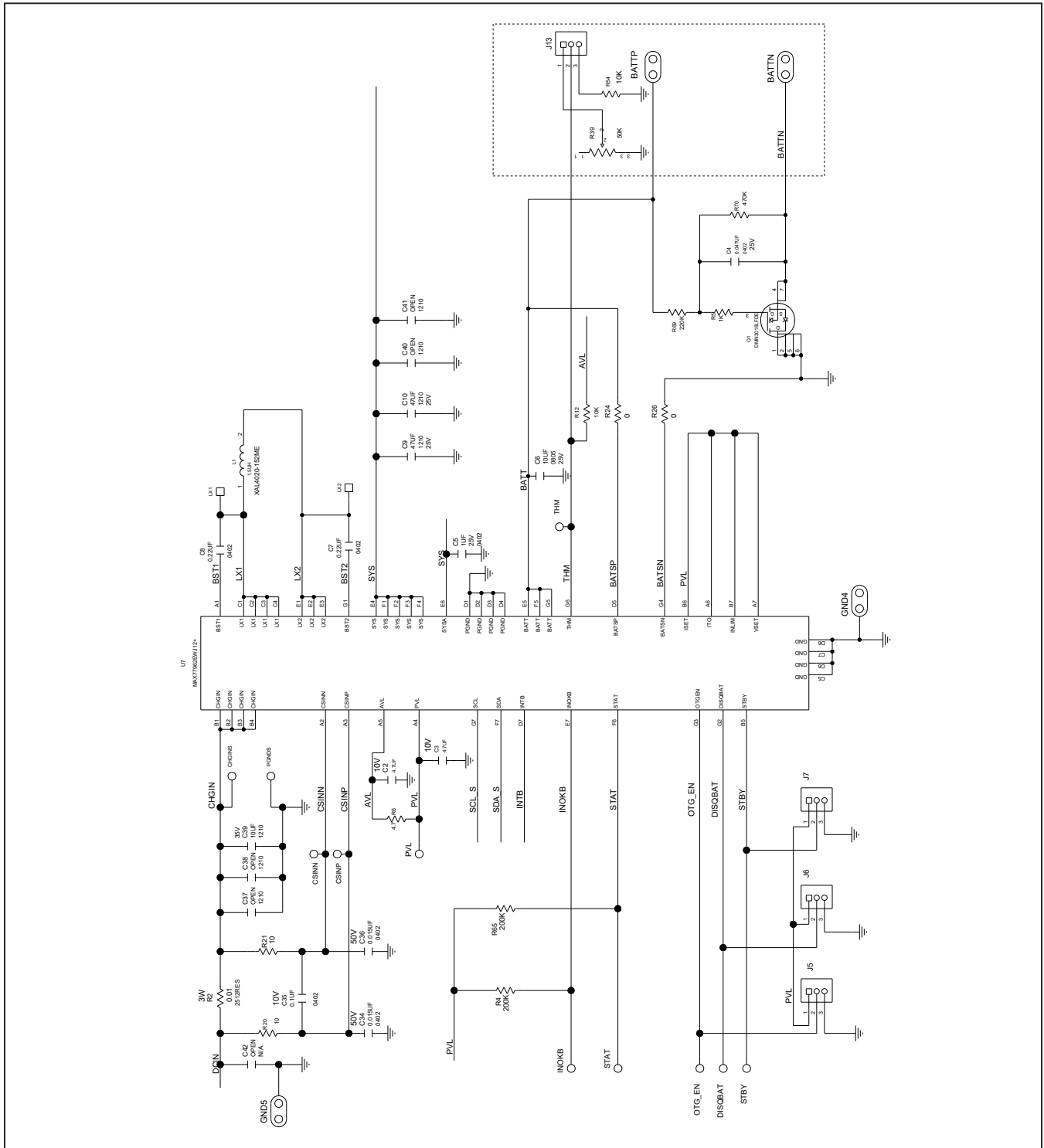
# MAX77958 Evaluation Kit with 2S Li+ 3A<sub>OUT</sub> Buck-Boost Charger

Evaluates: MAX77958, MAX77962

## MAX77958-2S3 EV Kit Schematics

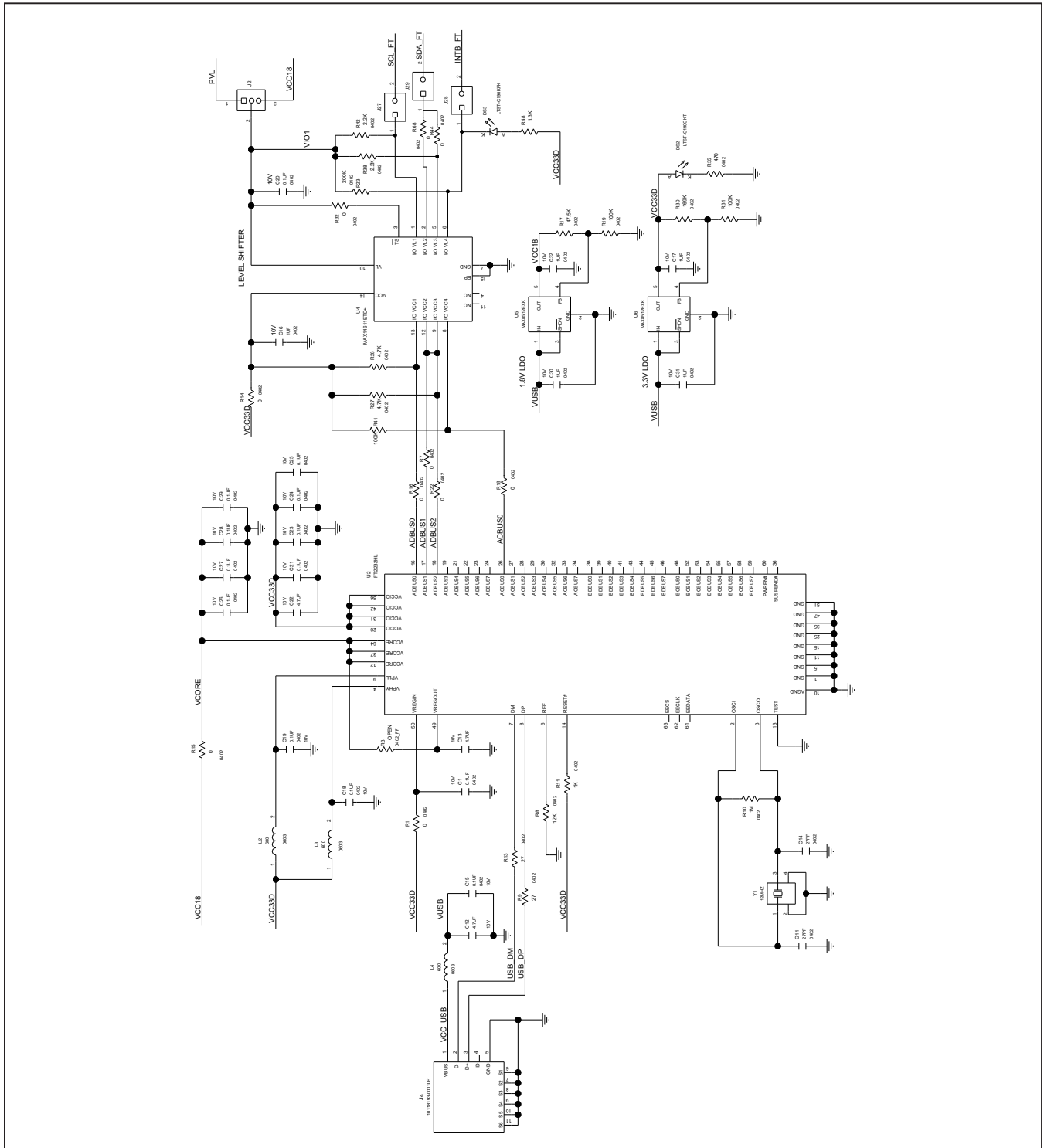


MAX77958-2S3 EV Kit Schematics (continued)



MAX77962 2-Cell Charger to Validate the I<sup>2</sup>C Master Feature

MAX77958-2S3 EV Kit Schematics (continued)

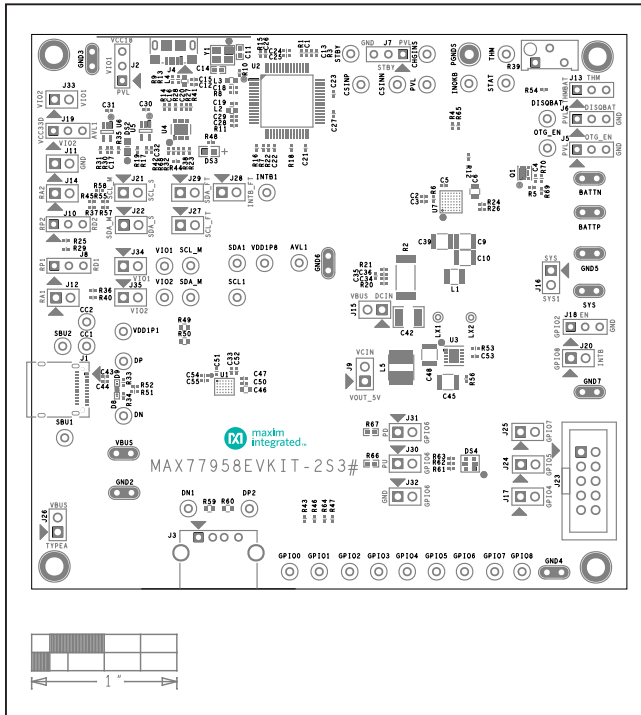


MAXUSB, USB to I2C translator

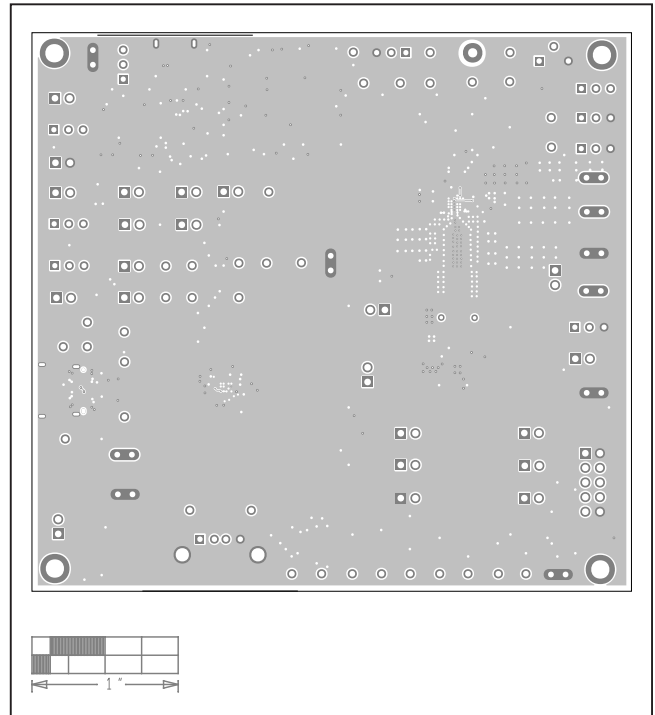
# MAX77958 Evaluation Kit with 2S Li+ 3A<sub>OUT</sub> Buck-Boost Charger

Evaluates: MAX77958, MAX77962

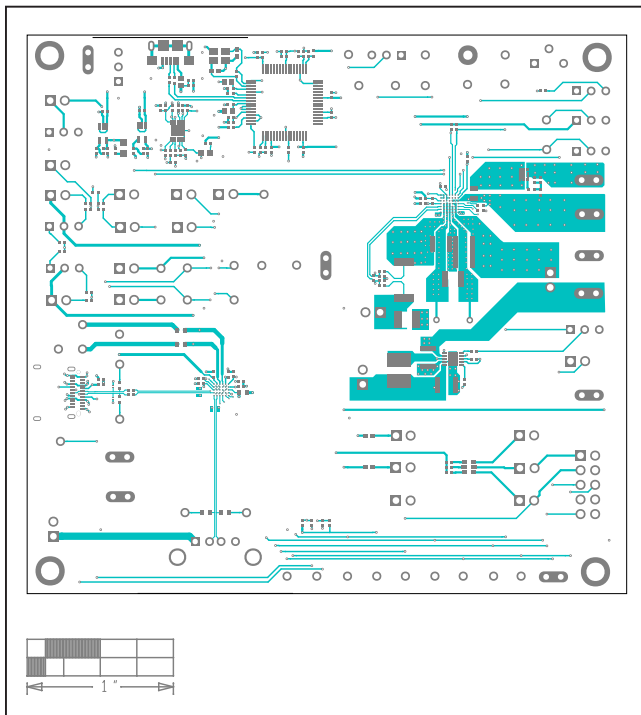
## MAX77958-2S3 EV Kit PCB Layouts



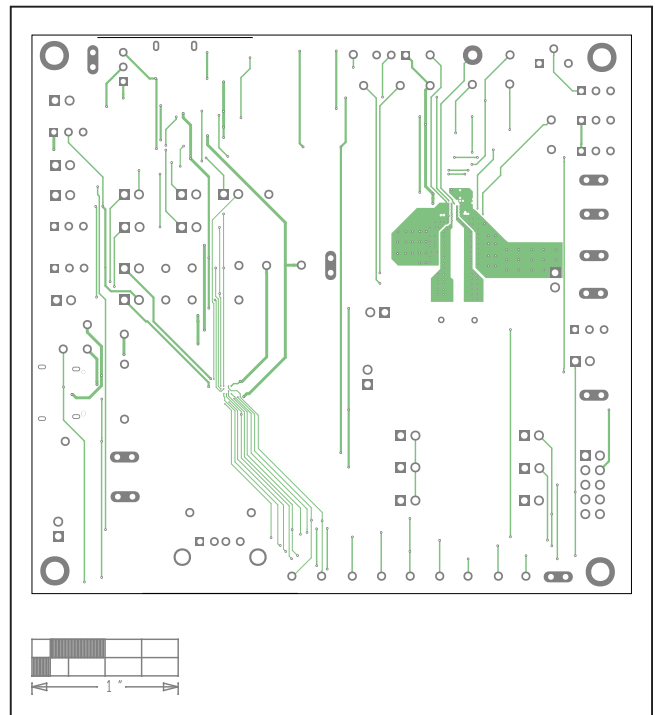
MAX77958-2S3 EV Kit PCB Layout—Silkscreen Top



MAX77958-2S3 EV Kit PCB Layout—Inner Layer 2



MAX77958-2S3 EV Kit PCB Layout—Top Layer

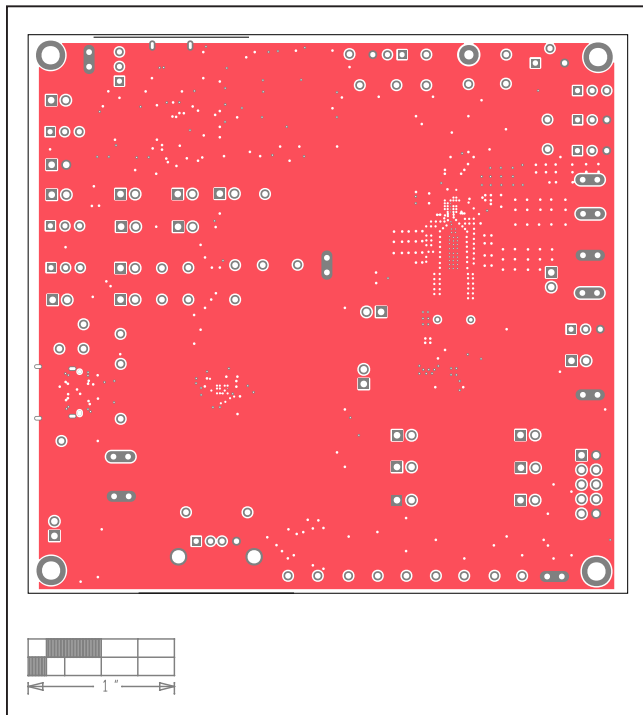


MAX77958-2S3 EV Kit PCB Layout—Inner Layer 3

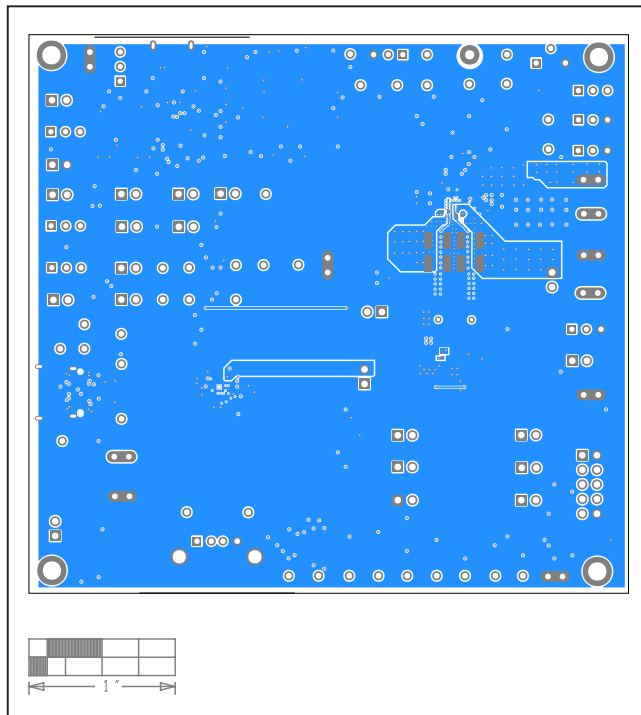
MAX77958 Evaluation Kit with 2S  
Li+ 3A<sub>OUT</sub> Buck-Boost Charger

Evaluates: MAX77958, MAX77962

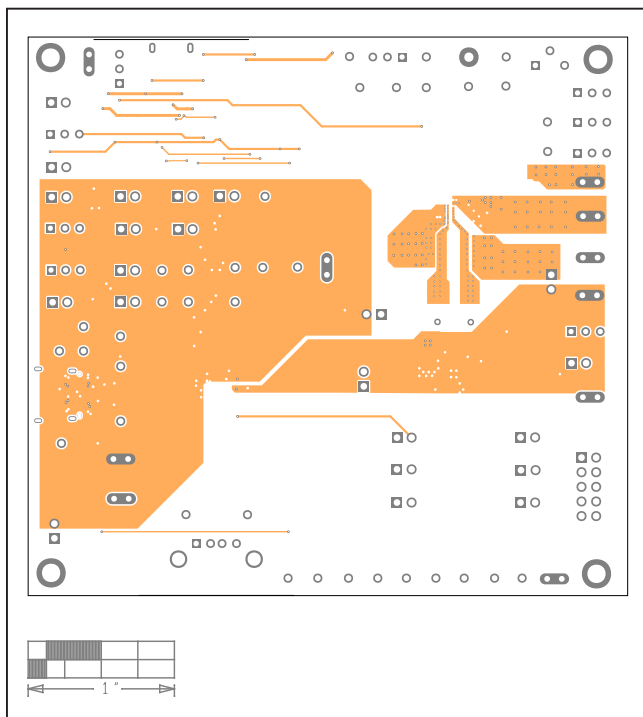
MAX77958-2S3 EV Kit PCB Layouts (continued)



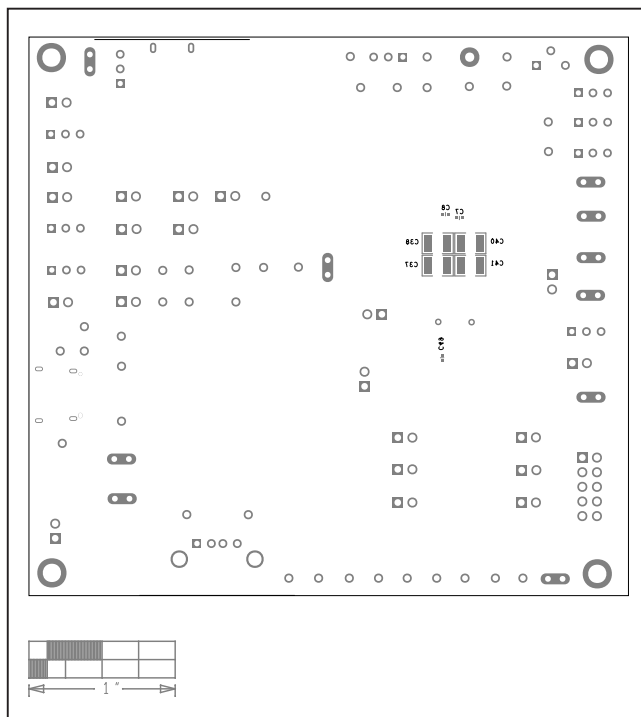
MAX77958-2S3 EV Kit PCB Layout—Inner Layer 4



MAX77958-2S3 EV Kit PCB Layout—Bottom Layer



MAX77958-2S3 EV Kit PCB Layout—Inner Layer 5



MAX77958-2S3 EV Kit PCB Layout—Silkscreen Bottom

MAX77958 Evaluation Kit with 2S  
Li+ 3A<sub>OUT</sub> Buck-Boost Charger

Evaluates: MAX77958, MAX77962

### Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	4/20	Initial release	—
0.1		Corrected rev date	1, 24
1	7/20	Added MAX77962 to the evaluated parts, updated the <i>Ordering Information</i> table	1, 13

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