

## General Description

The MAX77829 is a high-performance companion PMIC for the latest 3G/4G smartphones and tablets. The PMIC includes a single input 2.0A switched-mode charger with reverse boost capability and adapter input protection up to 22V (DC) for one-cell lithium ion (Li+) battery, a safeout LDO, and WLED backlight driver supporting up to 25mA/string, 35V output voltage. It also features a dual-channel 1.5A (combined, 750mA/ch) flash LED driver (with torch mode included).

The MAX77829 evaluation kit (EV kit) is a fully assembled and tested printed circuit board that demonstrates the functionality and performance of MAX77829. The EV kit allows for easy evaluation of each block and feature. In the package, one set of MINIQUSB from Maxim (serves as an I<sup>2</sup>C to USB interface) is provided with the MAX77829 EV kit for easy testing.

Windows®-based software provides a user-friendly interface to exercise the features of the MAX77829. This software offers a graphical user interface (GUI) as well as a register-based interface.

## Benefits and Features

- EV Kit Includes All the Necessary Components for Device Operation in Addition to Many Components for Added Flexibility and Ease of Use
- Easy-to-Use Pushbutton Interface for On/Off Control
- Assembled and Tested
- Test Points Allowing Convenient Access to Nodes of Interest
- Lead-Free and RoHS Compliant
- Jumper Headers Acting as Both Test Points and Shunts

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

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

## Quick Start

### Hardware and Jumper Configuration

Following the jumper configuration as listed in [Table 1](#) and [Figure 1](#):

**Table 1. MAX77829 Evaluation Kit Jumper Configuration**

JUMPER	TYPE	FUNCTION	DEFAULT CONDITION
JU1	2-pin	Connecting WLED1, LED String 1	Install
JU2	2-pin	Connecting WLED2, LED String 2	Install
JU3	2-pin	Connecting THM potentiometer	Install
JU4, JU13	3-pin	Short 1 or 2 LEDs in LED String 1 and 2, respectively	Open
JU12, JU14	2-pin	Connecting THM Potentiometer	Open
JU5, JU15	2-pin	Connecting IN_FLED1 and IN_FLED2 pins and the flash LEDs, respectively	Install
JU6	2-pin	Connecting THM Potentiometer	Install
JU7–JU11	2-pin	Connecting THM Potentiometer	Open
JU16	2-pin	Connecting THM Potentiometer	Install
JU17	2-pin	Connecting THM Potentiometer	Install
JU18	2-pin	Connecting THM Potentiometer	Open

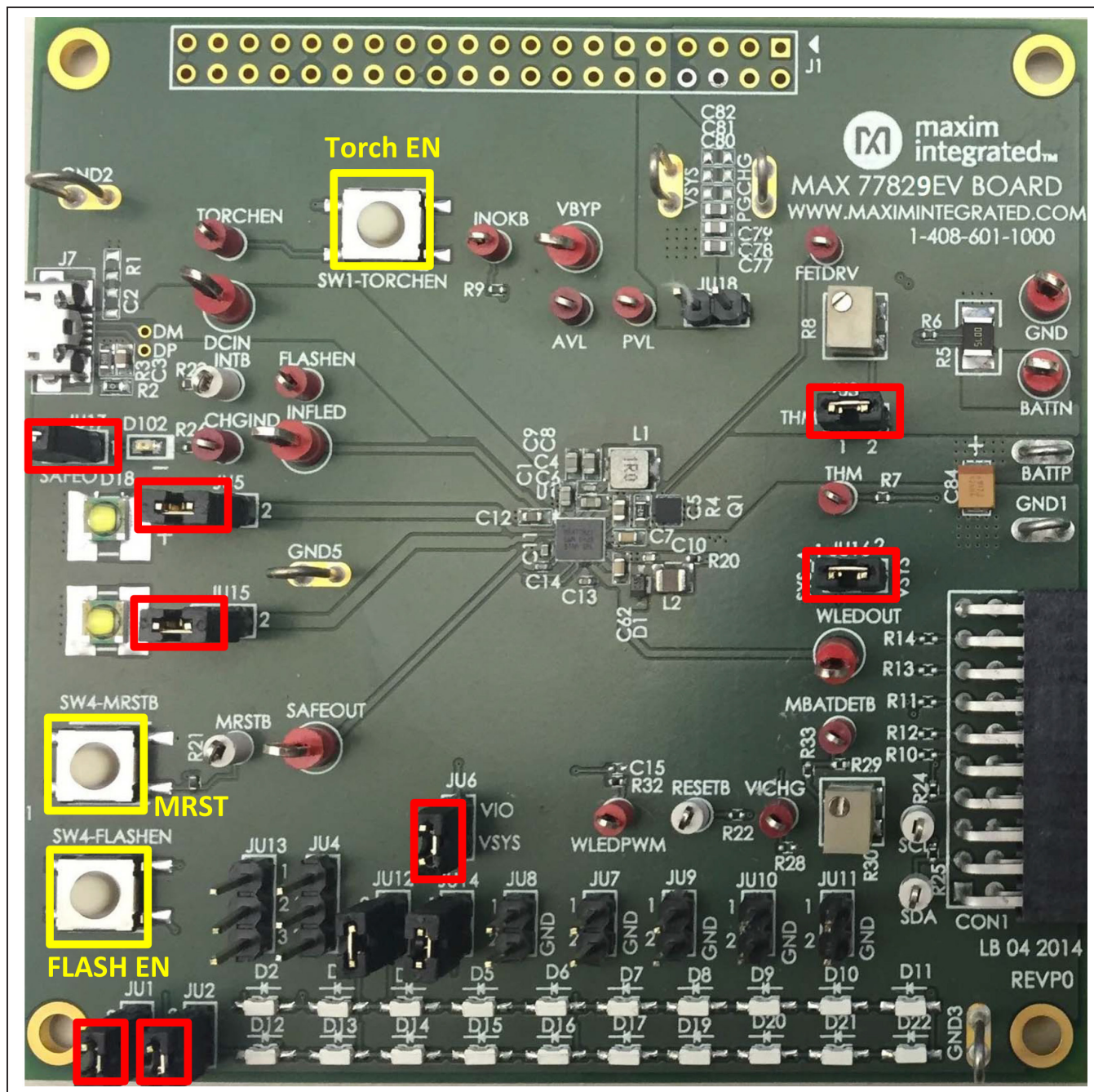


Figure 1. MAX77829 Evaluation Kit Jumper Header Configuration

### GUI Software Installation Procedure

Use the following procedure to connect to the EV kit with the GUI:

- 1) Ensure the USB-I2C interface module (MINIUSB) firmware has been correctly installed on your computer. For more information with regarding to MINIUSB, visit: <http://www.maximintegrated.com/datasheet/index.mvp/id/5311>
- 2) Unzip it and run the provided MAX77829 EV kit GUI execution file. Follow the prompts on screen.
- 3) For the connection among PC, MINIUSB, and the MAX77829 EV kit, see [Figure 2](#). MINIUSB is connected to the MAX77829 EV Kit through the 20-pin connector.
- 4) Connect a suitable DC power supply between DCIN and ground on the EV kit, or plug in the J7 Micro-USB port with a connected USB cable.
- 5) Launch the MAX77829 GUI. The GUI automatically detects the MINIUSB interface and the MAX77829.
- 6) If connection is successful, the full set of registers in the MAX77829 can now be accessed through the GUI.

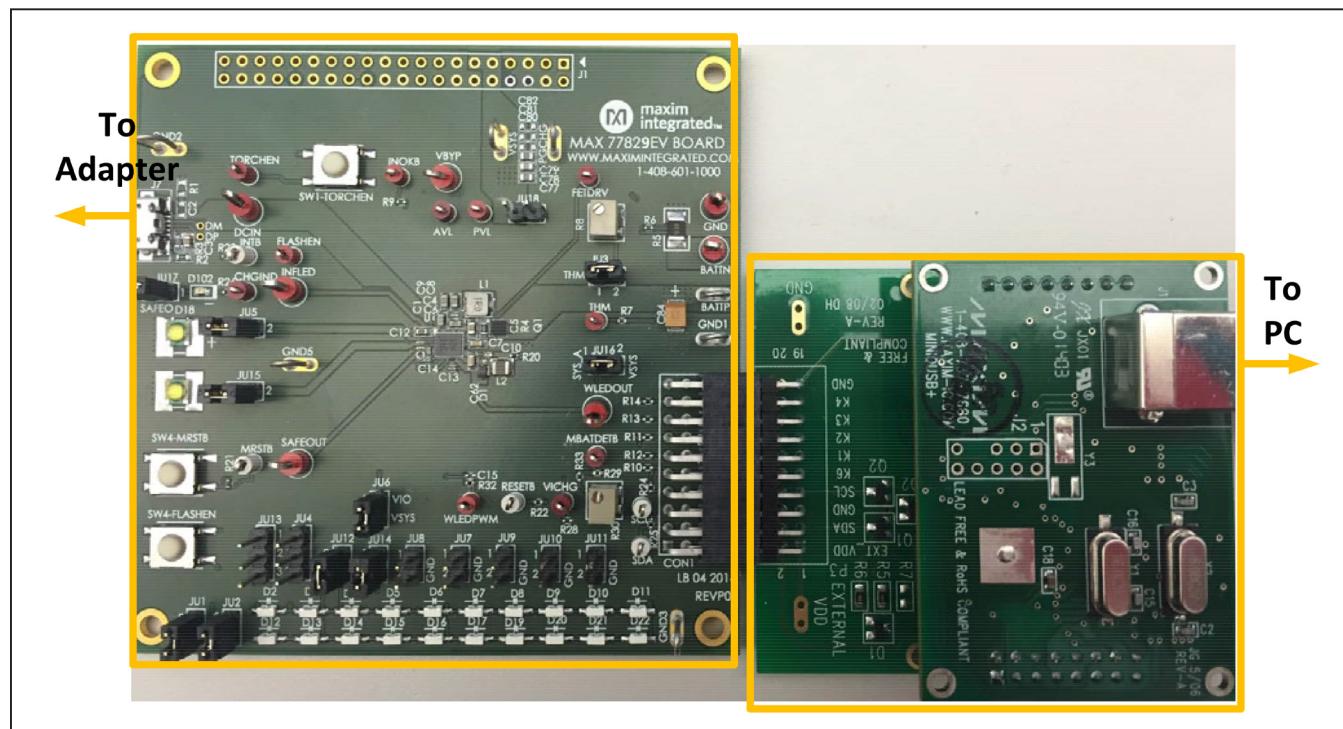


Figure 2. MAX77829 Evaluation Kit and MINIUSB Connection



Start Guide

Before proceeding to the start guide, it is highly recommended to read the MAX77829 data sheet and other related document to get familiar with its functions, registers, and settings.

Upon finishing the connection as mentioned in previous section, launch the GUI, and the following screen appears:

The GUI groups the related functions to several tabs. For example, charger configuration related functions are grouped in tabs such as CHG\_CNFG(1), CHG\_CNFG(2), and CHG\_CNFG(3), etc. Top-level interrupt related functions are grouped into tab INTSRC & PMIC ID, and INT (TOPSYS/FLASH), etc.

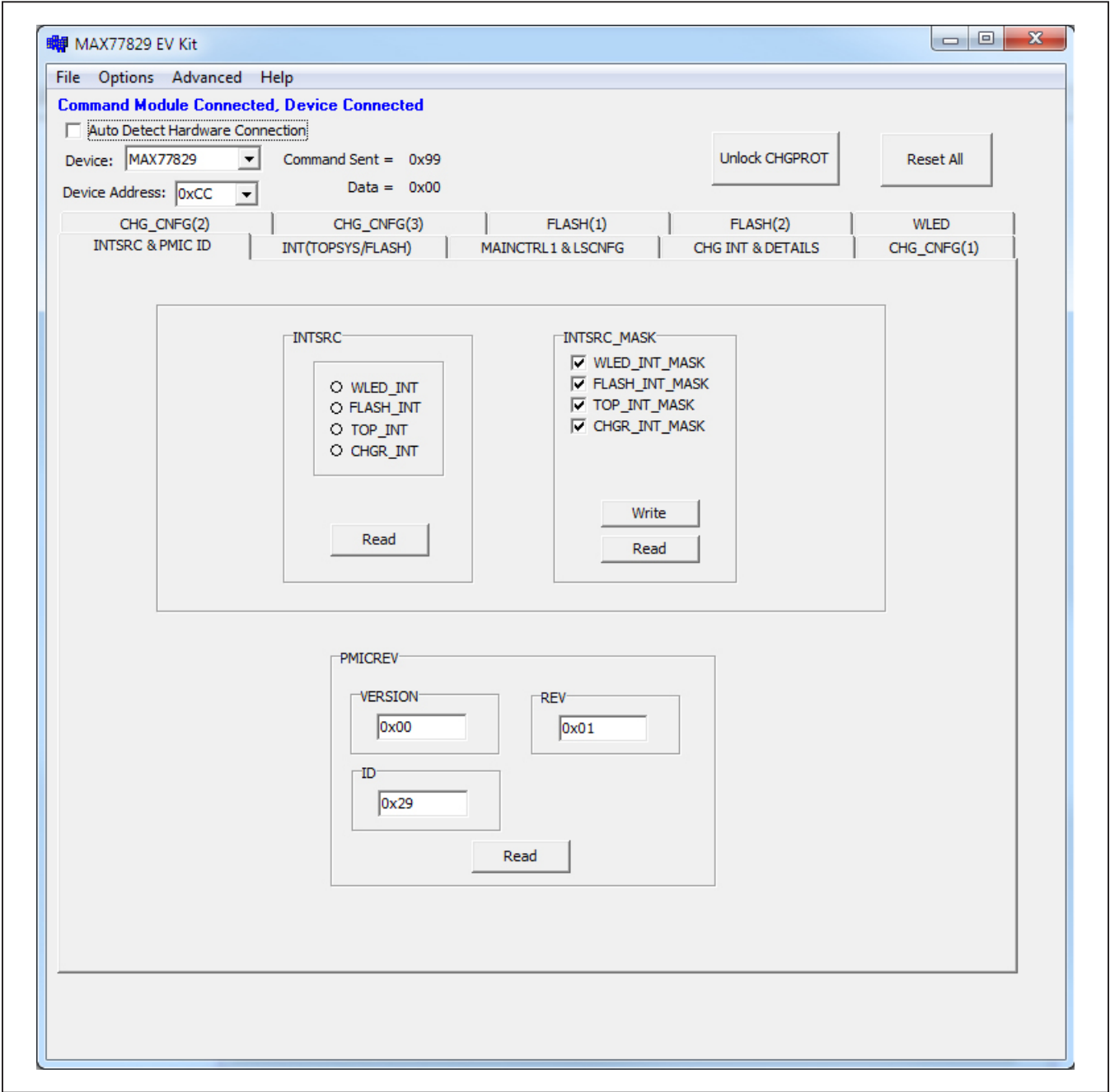


Figure 3. MAX77829 GUI



### Charger-Related Registers

Charger-related registers are mainly grouped to the follow tabs: CHG\_CNFG(1), CHG\_CNFG(2), CHG\_CNFG(3), and CHG INT & DETAILS.

Several critical charger-related settings are protected in the registers, these registers can be programmed after being unlocked. It can be done by clicking **Unlock CHGPROT** or selecting the correct setting of CHGPROT bits, as shown in [Figure 4](#).

To quickly check the charger function, use the following procedure:

- 1) Ensure the EV kit is properly connected and powered. Go to tab CHG\_CNFG(1), as shown in [Figure 5](#), and set up the related the settings for the charger settings. A quick setting guide for related registers is provided below; other different settings are available.
- 2) Go to tab CHG\_CNFG(2).
- 3) Set the registers as follows:
  - DCCRNT → DCILMT → No Limit
  - CHGCTL2 → Enable DCILIM\_EN
  - CHGCTL2 → Enable CEN
- 4) With a battery connected between BATTP and GND, the indicating LED (D102) starts blinking, meaning the charging has started.
- 5) Charging status can be monitored through registers in tab **CHG INT AND DETAILS**. Clicking **Read All**, CHG\_DTLS → CHG\_DTLS gives the charging status that the battery is currently involved in, as indicated in [Figure 8](#).

When MINIQUSB and MAX77829 EV kit GUI are correctly installed and launched, with power supply connected on MAX77829, the GUI displays the text as shown below.

By clicking either the **Unlock CHGPROT** button below or by selecting the related register bit values in the drop-down menu of **CHGPROT** to unlock the protection for changing critical charger related settings.

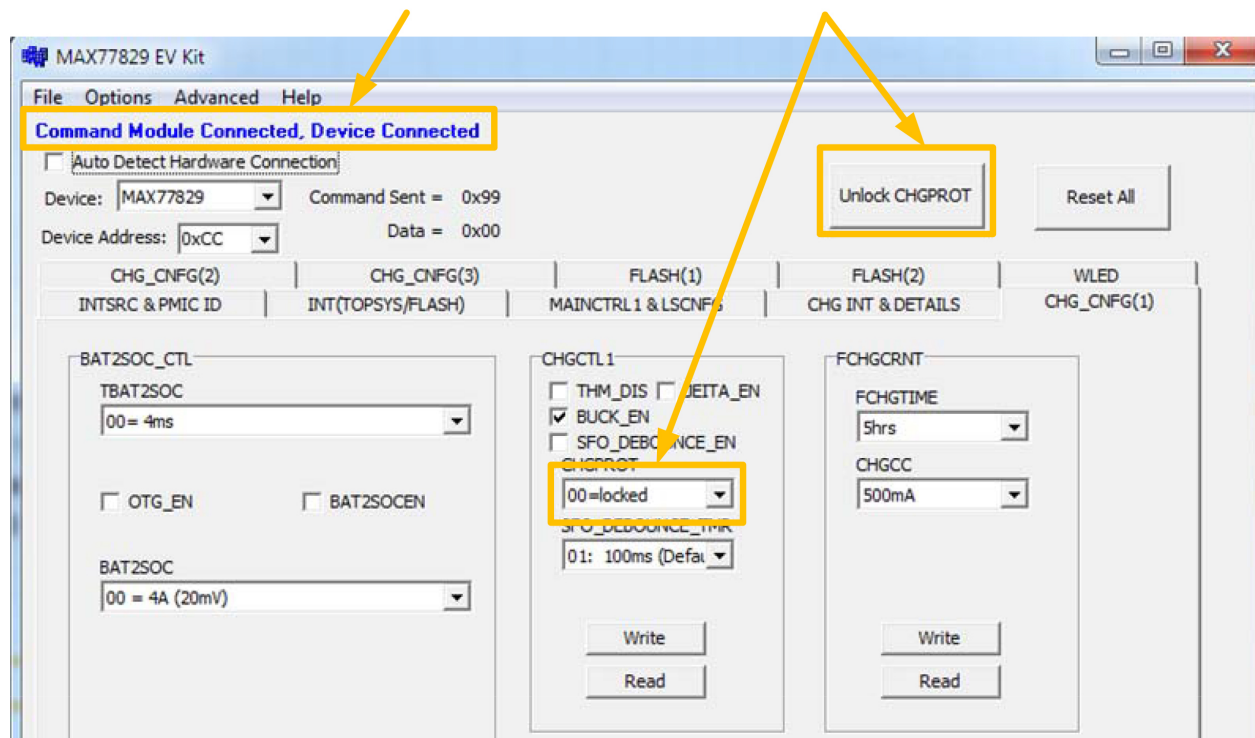
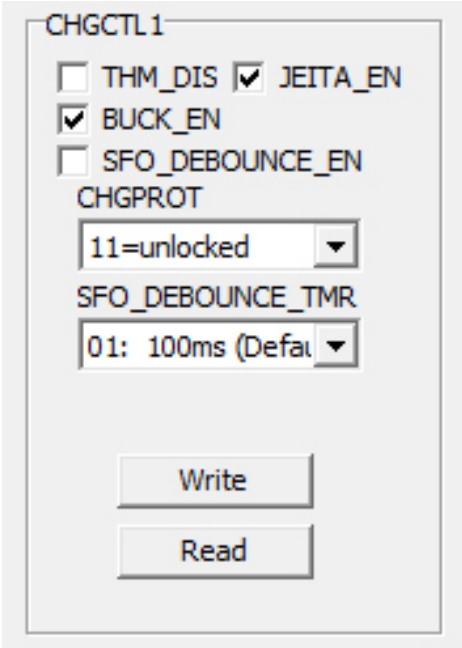


Figure 4. MAX77829 GUI—Unlock CHGPROT



CHGCTL1

☐ THM\_DIS ☒ JEITA\_EN

☒ BUCK\_EN

☐ SFO\_DEBOUNCE\_EN

CHGPROT

11=unlocked ▼

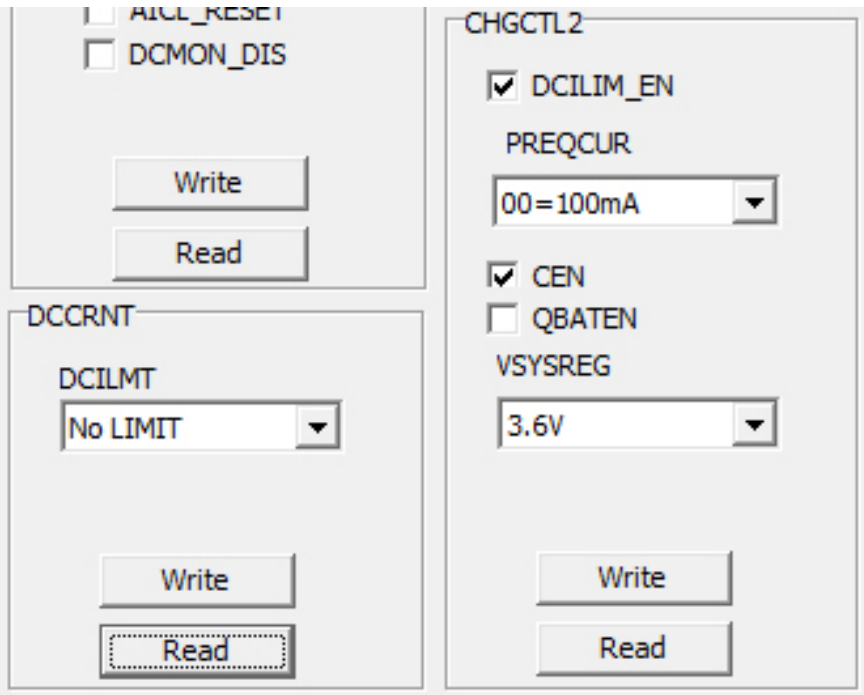
SFO\_DEBOUNCE\_TMR

01: 100ms (Default) ▼

Write

Read

Figure 5. MAX77829 GUI—Charger Configuration 1



☐ AICL\_RESET

☐ DCMON\_DIS

Write

Read

DCCRNT

DCILMT

No LIMIT ▼

Write

Read

CHGCTL2

☒ DCILIM\_EN

PREQCUR

00=100mA ▼

☒ CEN

☐ QBATEN

VSYSREG

3.6V ▼

Write

Read

Figure 6. MAX77829 GUI—Charger Configuration 2

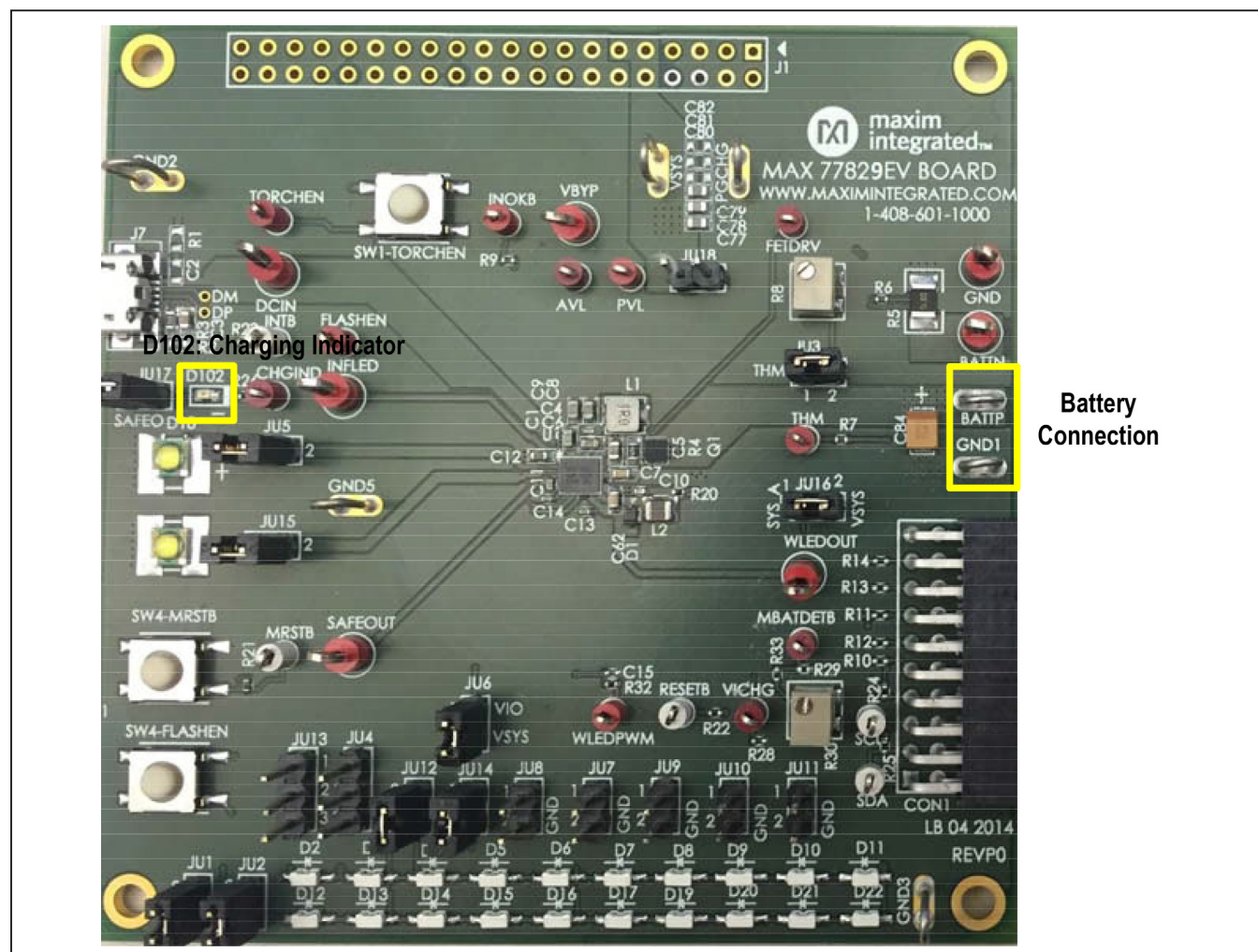


Figure 7. Battery Connection and Charging Indication LED

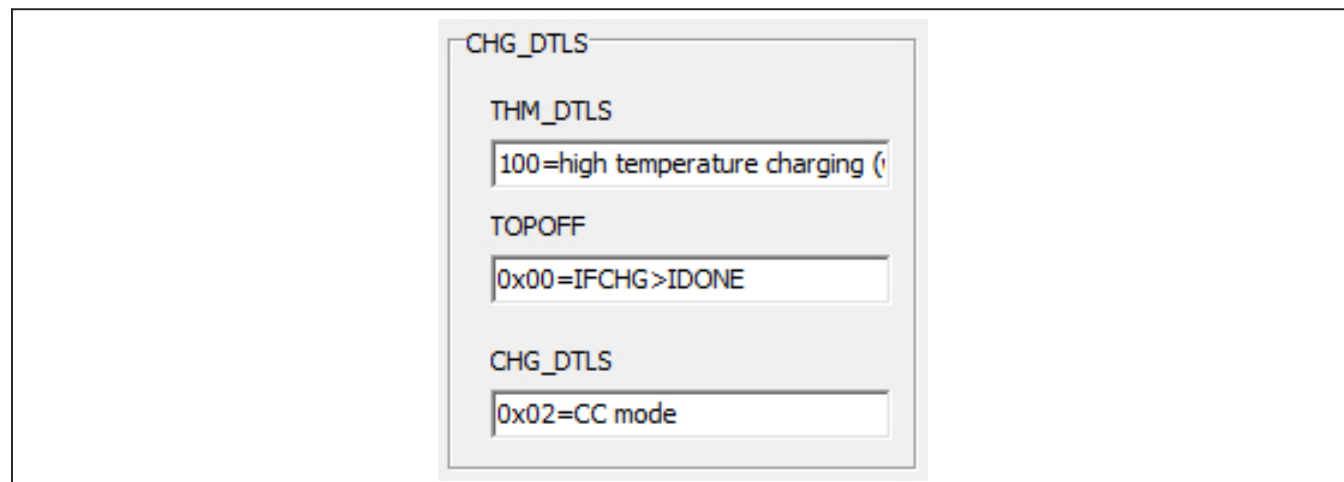


Figure 8. Charger Details



- 6) To verify the reverse boost function of MAX77829's charger, disconnect the power from DCIN, and remove the battery. Connect power to VSYS, go to tab CHG\_CNFG(2), and set the registers as follows:
- RBOOST\_CTL1 → Enable RBOOSTEN
  - RBOOST\_CTL2 → Set VBYPSET to a voltage level higher than your VSYS input

Measure the voltage between BYP to GND, the value is set by VBYPSET mentioned in step 6. In addition, for the USB OTG mode, check the OTG\_EN bit as shown in [Figure 10](#). In such condition, the switch between BYP and DCIN is turned on so that the same voltage level on BYP is now applied on DCIN node.

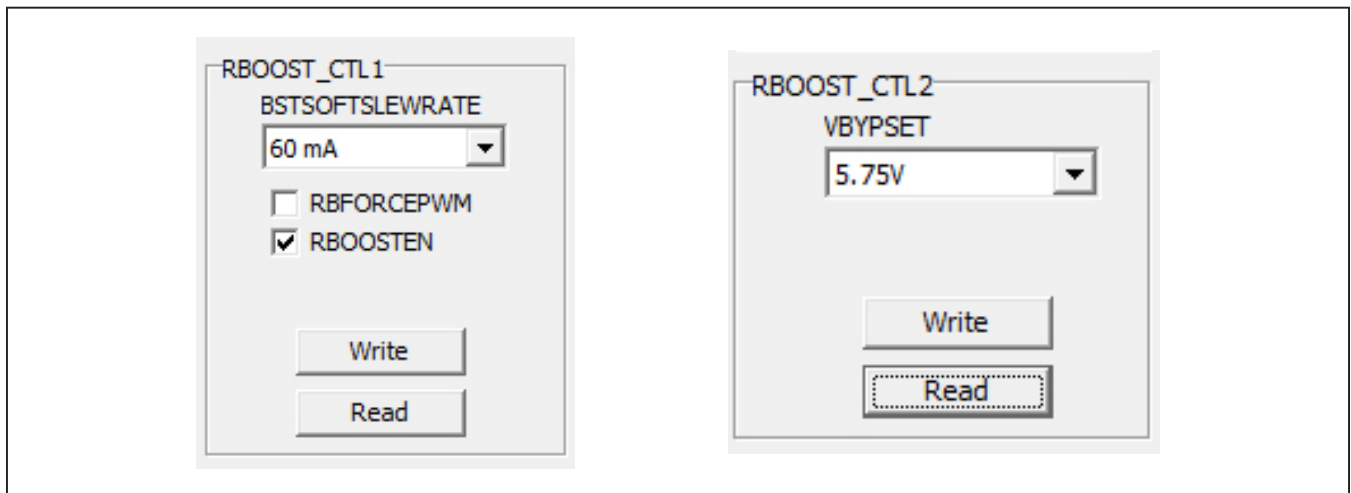


Figure 9. Reverse Boost Mode

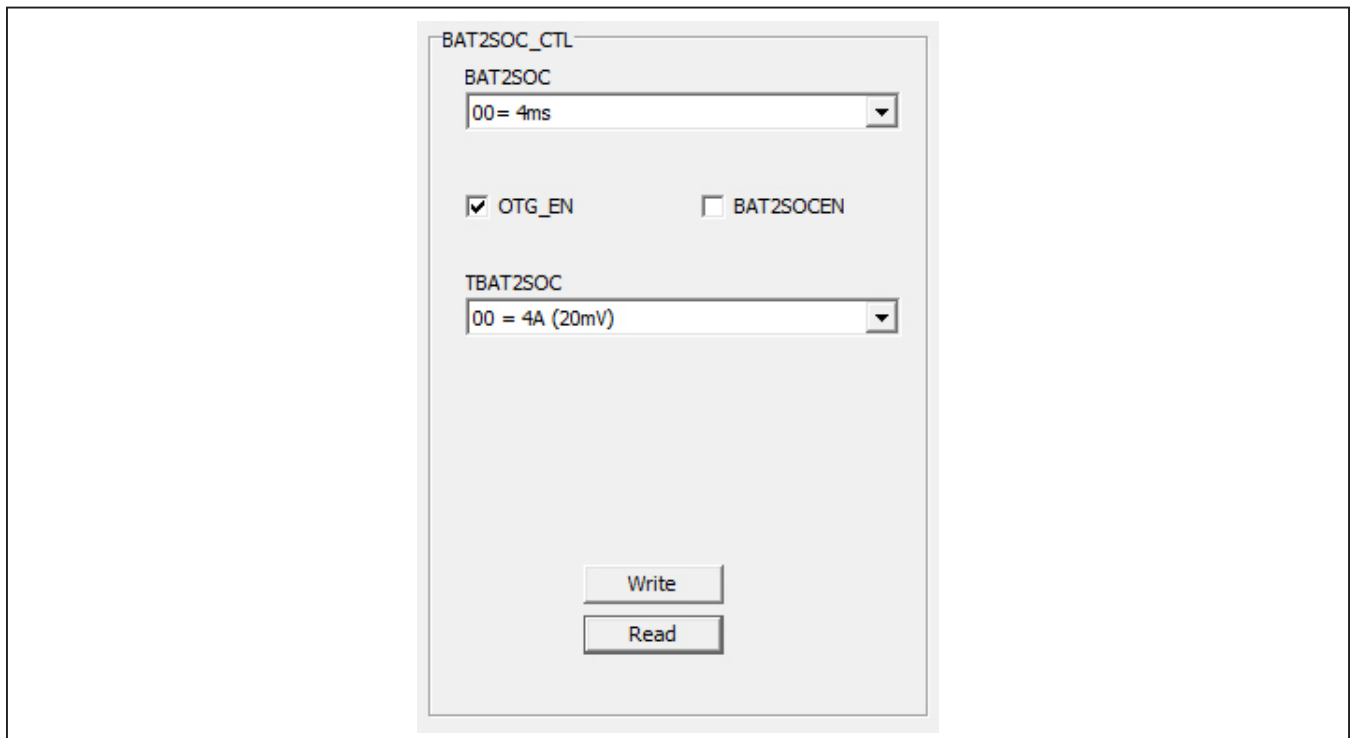


Figure 10. Enable OTG Mode

Flash/Torch-Related Registers

To check the flash/torch function, use the following procedure:

- 1) Go to tab **FLASH(1)**, and set up the related the settings for the flash or torch settings:
  - FLASH\_FLED1\_EN → by FLASHEN
  - TORCH\_FLED2\_EN → by FLASHEN
  - FLASH\_TMR\_DUR and TORCH\_TMR\_DUR → to preferred time duration
  - FLASH\_I and TORCH\_I → to preferred current level

- 2) Go to tab **FLASH(2)**, for VOUT\_CNTL. In the drop-down menu for **BOOST\_FLASH\_MODE**, select **FLED1 in adaptive**.
- 3) Press the **Flash EN** pushbutton on the board, the flash function is enabled. The torch mode can be set in a similar way.

WLED Backlight-Related Registers

For the WLED backlight-related registers, see [Figure 11](#). Set the register WLEDBSTCNTL control for desirable WLED related register settings.

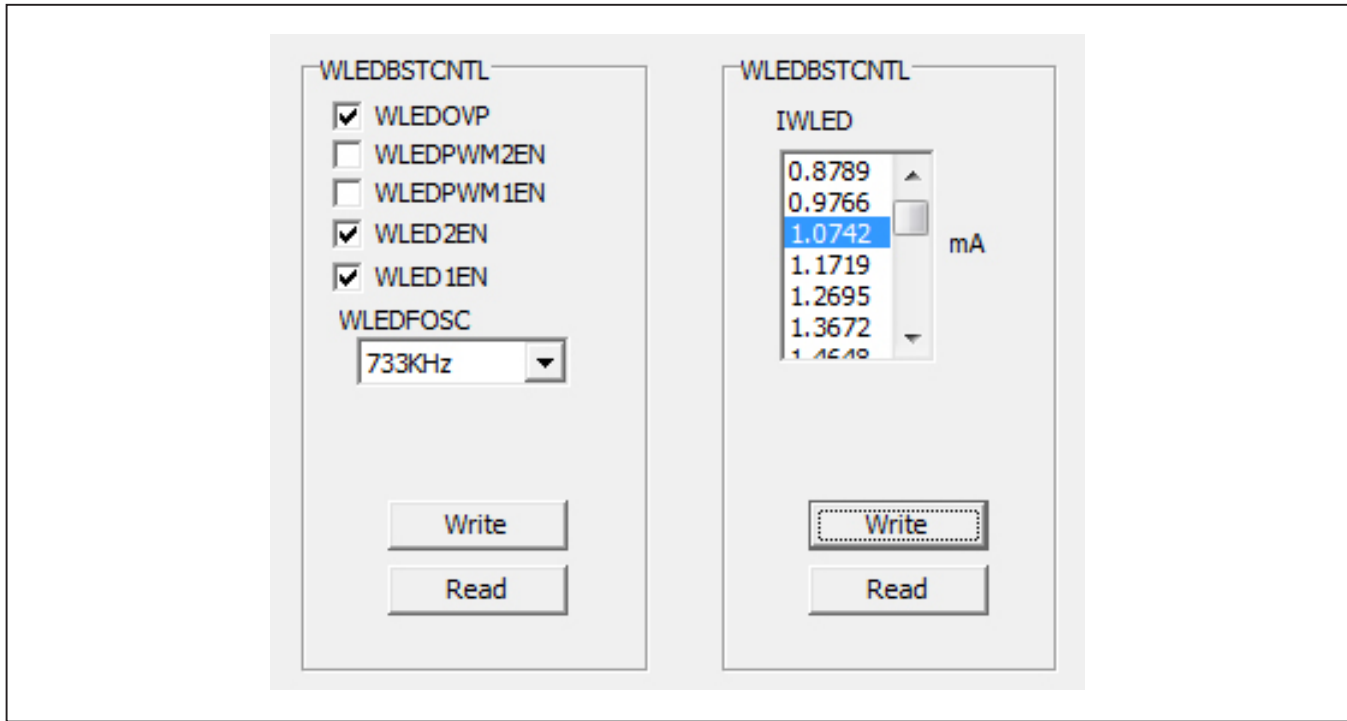


Figure 11. WLED Related Register Setting

Component List, Schematic List, and PCB Layout

See the following links for component list, schematics, and PCB layout:

- [MAX77829 EVKIT BOM](#)
- [MAX77829 EVKIT schematics](#)
- [MAX77829 EVKIT PCB](#)

Ordering Information

PART	TYPE
MAX77829EVKIT#	EV kit

#Denotes RoHS compliant.

## Revision History

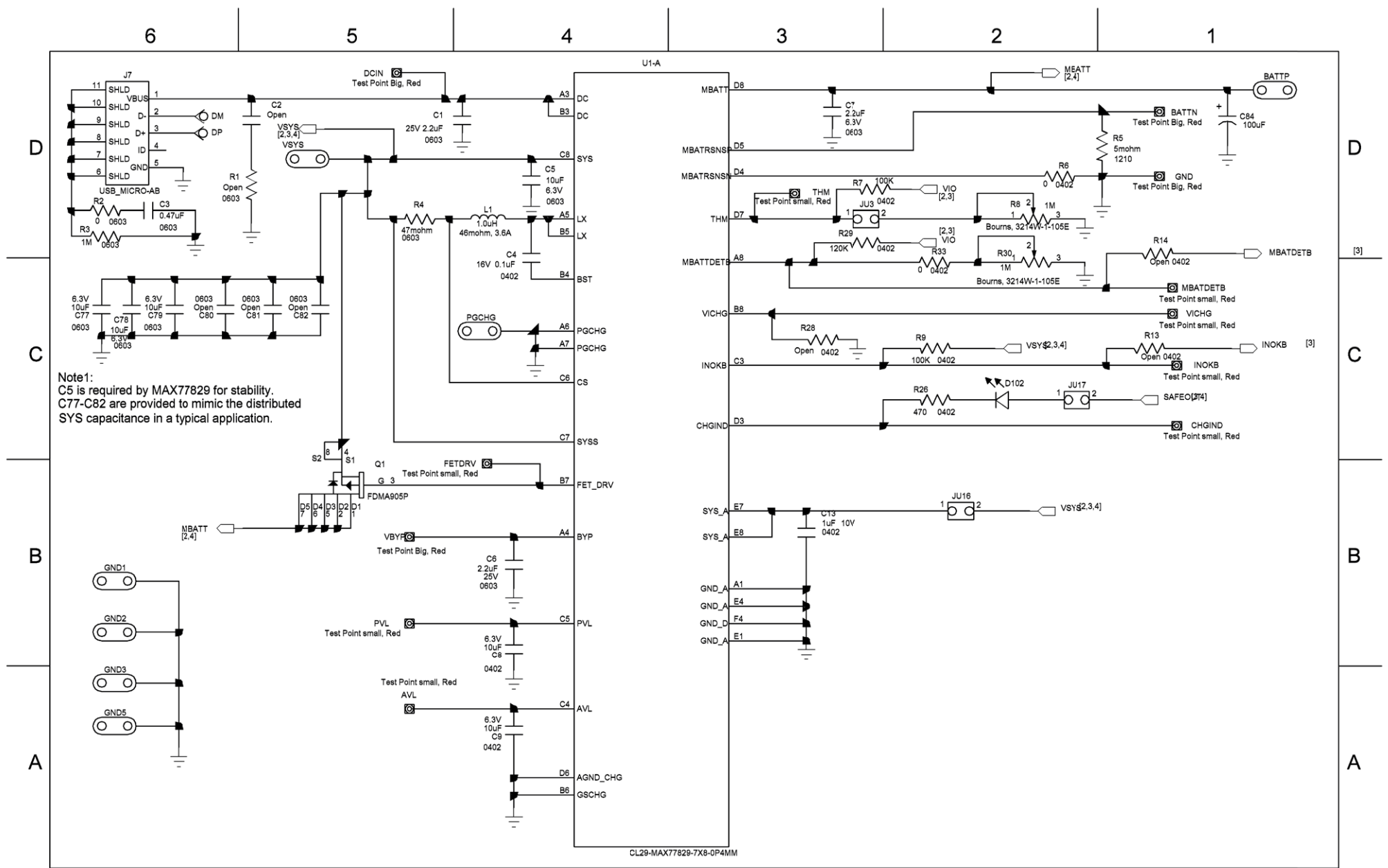
REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	12/15	Initial release	—

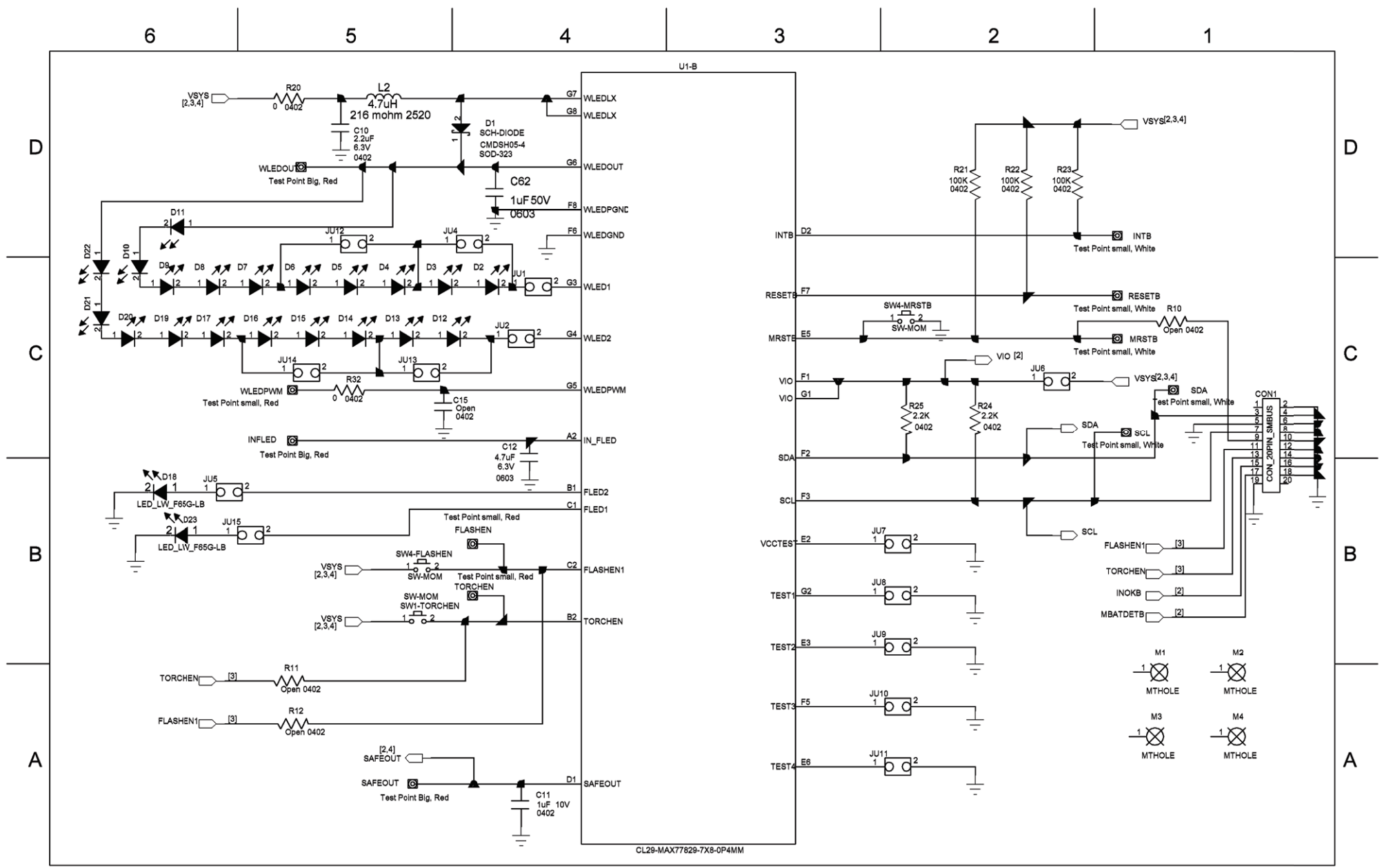
For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at [www.maximintegrated.com](http://www.maximintegrated.com).

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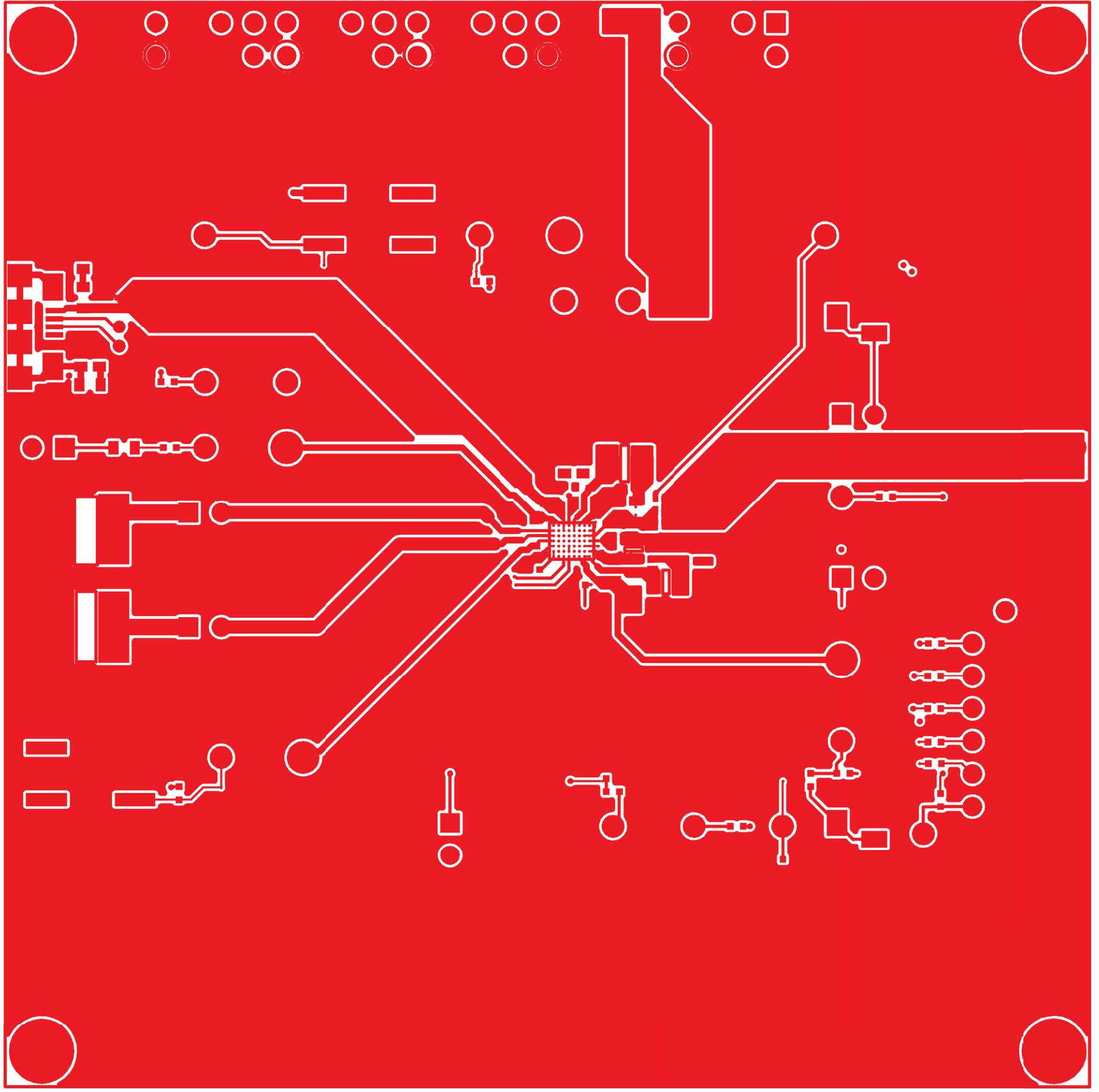


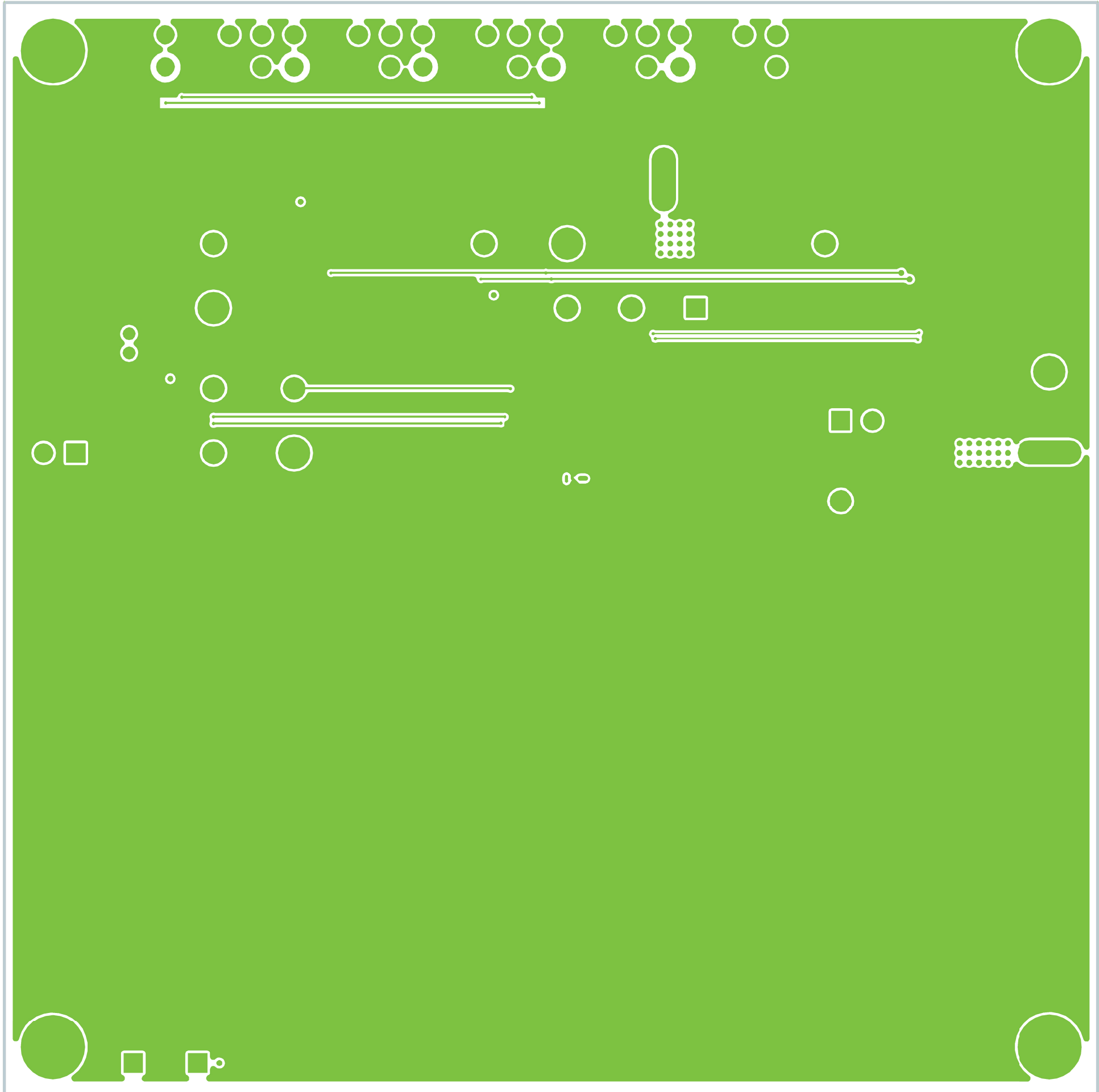
Item	Qty	Reference Designator	Description	Part Name	Assembly
1	1	C4	0.1µF ±10%, 16V X7R ceramic capacitor 0402	Murata, GRM155R71C104K	
2	1	C3	0.47µF ±10%, 6.3V X7R ceramic capacitor 0603	Taiyo Yuden, JMK107BJ474KA-T	
3	6	C5 C8-9 C77-79	10µF, 6.3V, X5R, ±10% Ceramic Capacitor 0603	Taiyo Yuden, JMK107ABJ106MA-L	
4	3	C11, C13-14	1µF, 10V, X5R, ±20%, Ceramic Capacitor, 0402	Taiyo-Yuden, LMK105BJ105MA	
5	1	C62	1.0µF, 50V, X5R, ±10% Ceramic Capacitor 0603	Murata, GRM188R61H105MAALD	
6	2	C1 C6	2.2µF 25V X5R Ceramic Capacitor, 0603	TDK, C1608X5R1E225M	
7	1	C7	2.2µF 6.3V X5R Ceramic Capacitor 0603	Murata, GRM188R60J225ME19D	
8	1	C10	2.2µF 6.3V X5R Ceramic Capacitor 0402	Murata, GRM155R60J225ME19D	
9	1	C12	4.7µF 6.3V X5R Ceramic Capacitor 0603	Taiyo Yuden, JMK107BJ475KA-T	
10	4	C2 C80-82	Open Ceramic Capacitor, 0603		NP
11	1	C15	Open Ceramic Capacitor 0402		NP
12	1	C84	100µF, 6.3V, Tantalum Capacitor, 1210	AVX, TCJB107M006R0070	
13	1	U1	PMIC, 0.4MM PITCH, 7X8 WLP	Maxim, MAX77821	NP
14	1	J1	CONNECTOR, THROUGH HOLE, .100" x .100" LATCH/EJECTOR HEADER, MALE, STRAIGHT ANGLE, 4 WALL, 40 PIN, FOR .094" TO .125" [2.39mm TO 3.18mm] THICK BOARD, Ic=1A, -55°C TO +105°C	3M, 3432-6303	NP
15	1	CON1	2X10 right angle female receptacle SMBUS		
16	1	D102	LED, Green 0603	LITE-ON LTST-C190GKT	
17	1	Q1	Single P-Ch Power Trench MOSFET, uFET 2X2	Fairchild, FDMA905P	
18	2	JU4 JU13	3 Pin Header, 0.1"	Cut to size	
19	1	L1	1µH, +/-30%, 46mohm typ, 3600mA ISAT	Cyntec, PIME031B-1R0MS	
20	1	L2	4.7µH, 216 mohm typ, 1.6A, 2520	Toko, 1239AS-H 4R7N	
21	16	JU1-3 JU5-12 JU14-18	2 Pin Header, 0.1"	Cut to size	
22	20	D2-17 D19-22	WHITE LIGHT EMITTING DIODE	OSRAM, LW-Y15G	
23	2	D18 D23	Flash LED White	OSRAM, LED_LW_F65G or OSRAM, LUW FQ6N	
24	7	BATTP GND1-3 GND5 PGCHG VSYS	Maxim Loop		
25	4	M1-4	Mounting Hole	Do not mount	NP
26	1	R2	0Ω SMT Resistor, 0603		
27	4	R6 R20 R32-33	0Ω SMT Resistor, 0402		
28	1	R3	1MΩ SMT Resistor, 0603		
29	1	R4	47mΩ SMT Resistor, 0603		
30	1	R1	Open SMT Resistor, 0603		NP
31	3	R21-23	100kΩ, SMT Resistor, 0402		
32	2	R7 R9	100kΩ, SMT Resistor, 0402		
33	1	R29	40kΩ SMT Resistor, 0402		
34	2	R24-25	2.2kΩ, SMT Resistor, 0402		
35	1	R26	470 SMT Resistor, 0402		
36	1	R5	5mΩ SMT Resistor, 1210		
37	6	R10-14 R28	Open SMT Resistor, 0402		NP
38	2	R8 R30	1MΩ Trimmer, SMD	Bourns, 3214W-1-105E	
39	1	D1	40V, 1A Schottky diode, SOD323	Central Semi, CMDSH05-4	
40	3	SW1-TORCHEN SW4-FLASHEN SW4-MRSTB	Momentary switch	Panasonic, EVQ-PHV03T	
41	11	AVL CHGIND FETDRV FLASHEN INOKB MBATDETB PVL THM TORCHEN VICHG WLEDPWM	Test Point small, Red	Keystone, 5000	
42	5	MRSTB RESETB SCL SDA INTB	Test Point small, White	Keystone, 5002	
43	7	SAFEOUT INFLED VBYP WLEDOUT GND BATTN DCIN	Test Point Big, Red	Keystone, 5010	
45	2	DM DP	Test Point	PCB Test Point	
46	1	J7	Micro AB receptacle SMD type, Bottom Mount	Hirose, ZX62-AB-5PA	

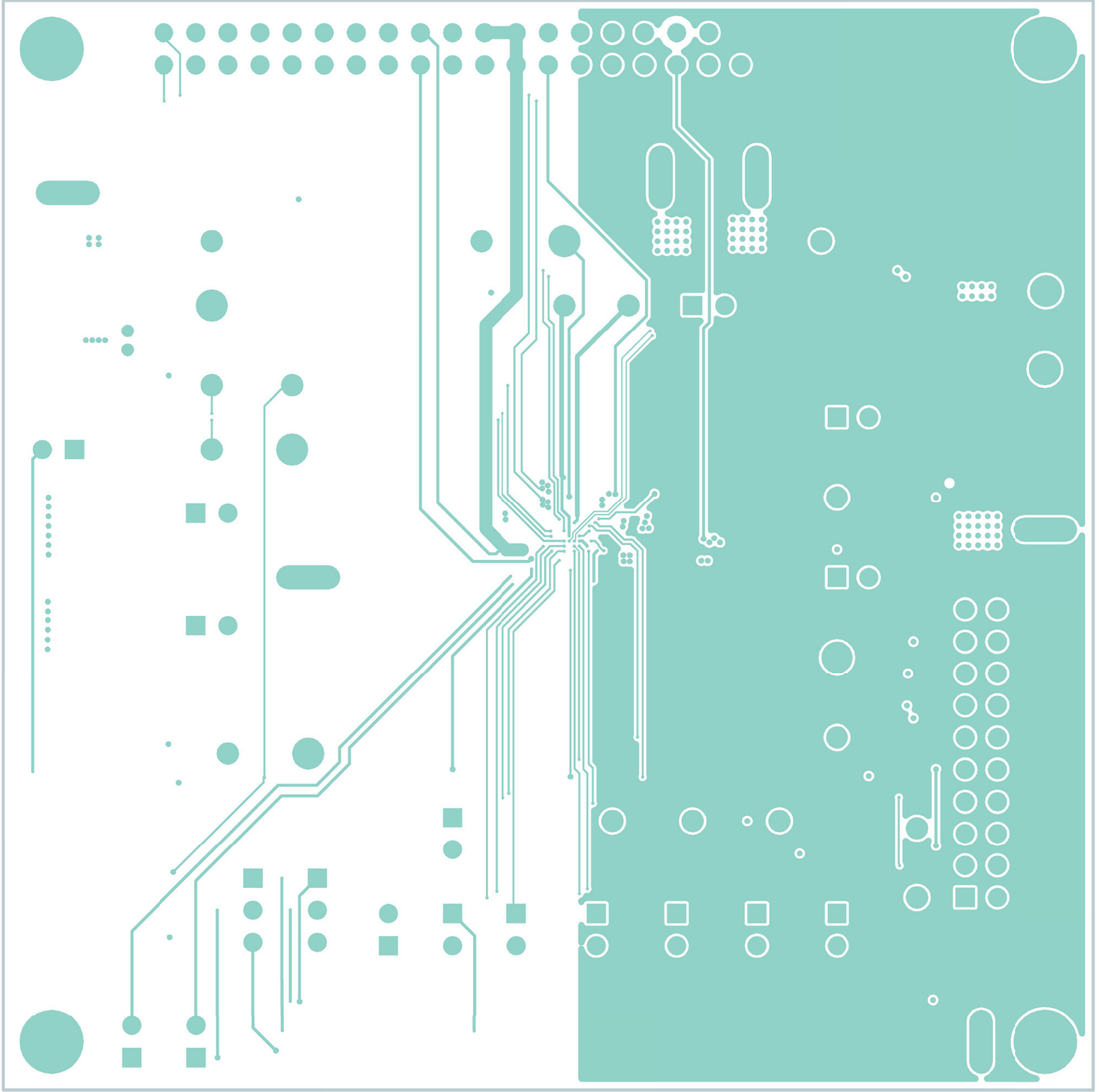




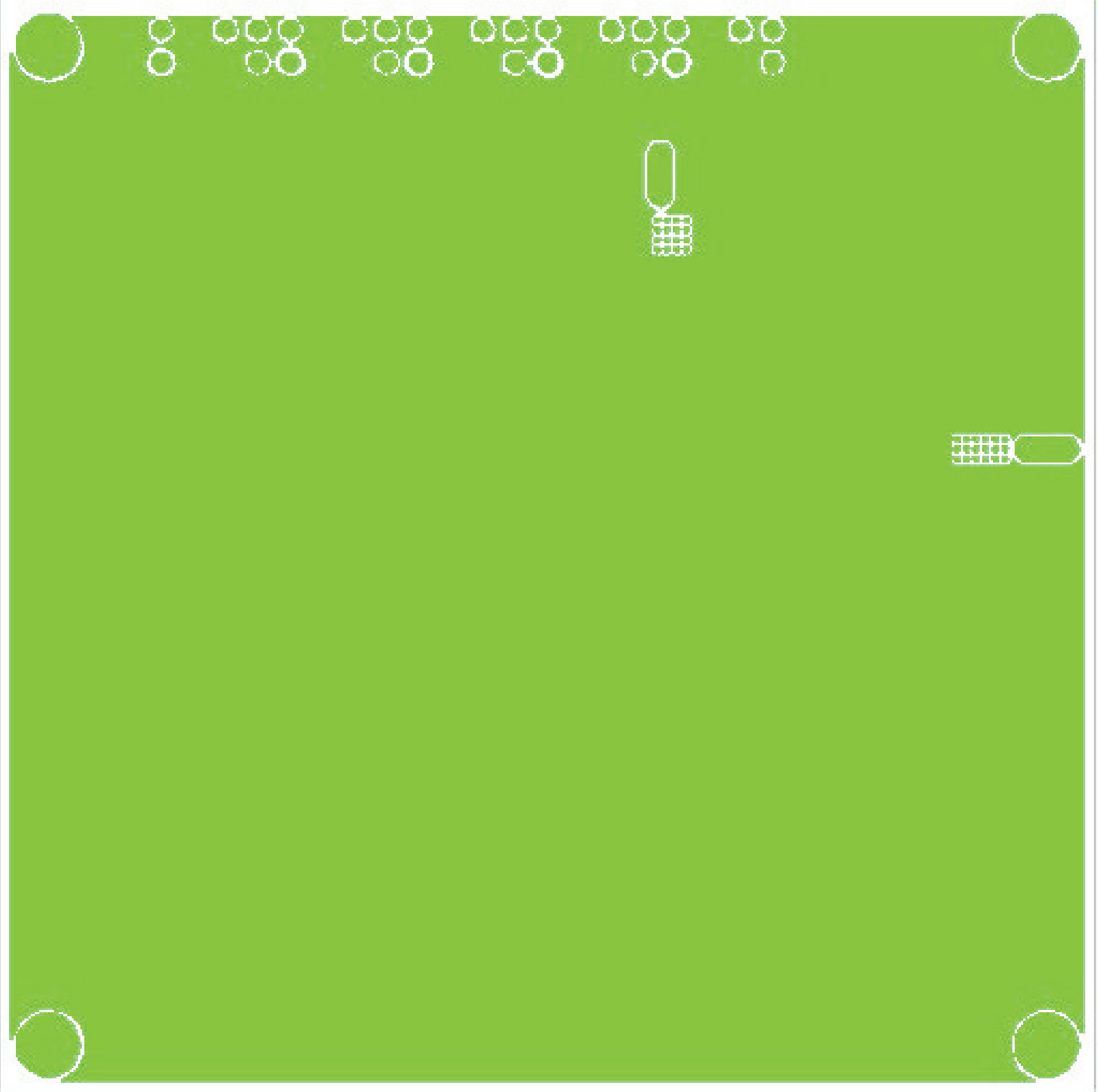


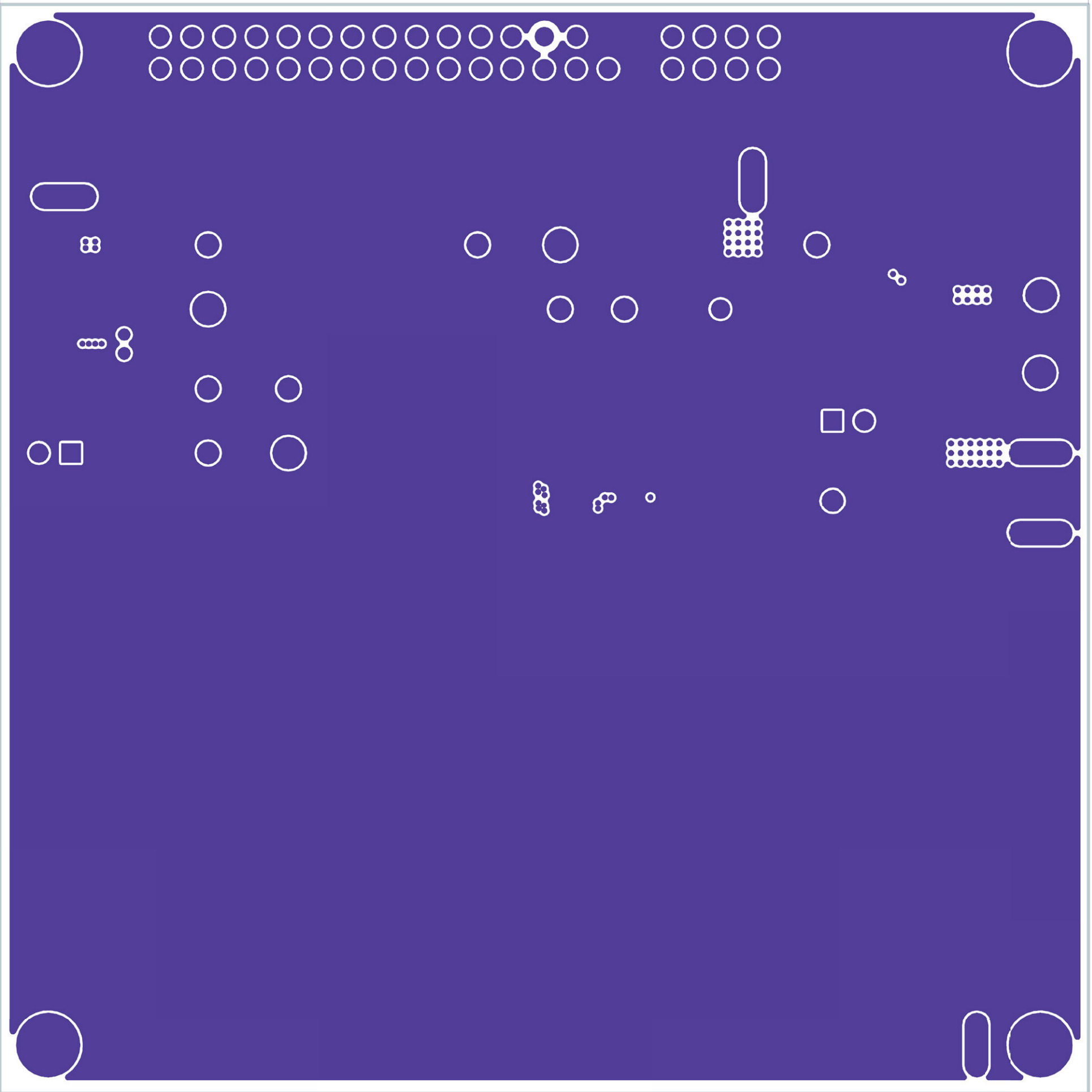


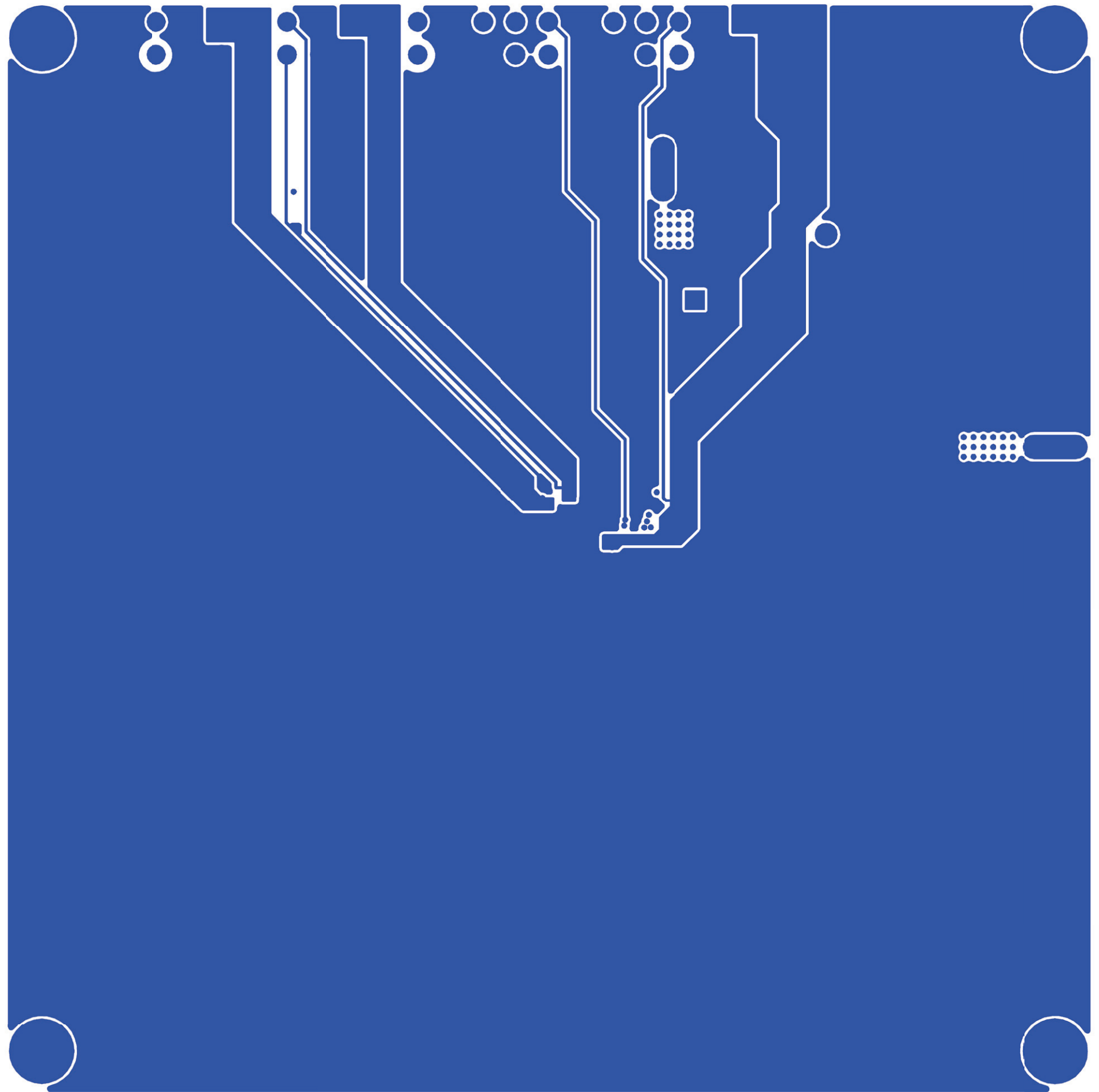


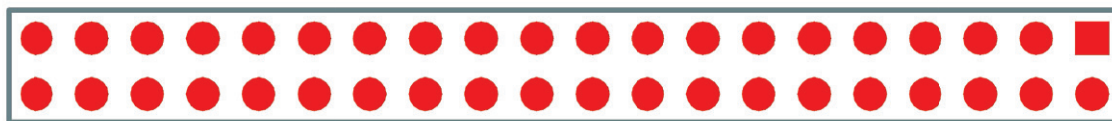












J1



maxim  
integrated™

MAX 77829EV BOARD  
WWW.MAXIMINTEGRATED.COM  
1-408-601-1000

GND2

TORCHEN

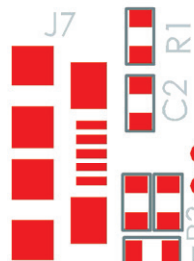


INOKB

VBYP



FETDRV



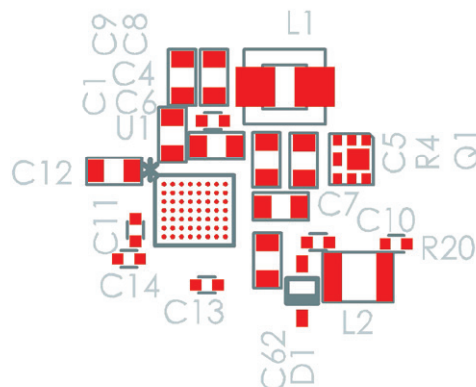
DCIN  
INTB

FLASHEN

INFLED



GND5



GND

BATTN

BATTP

GND1

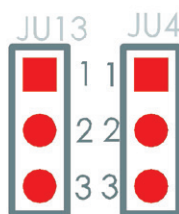
SW4-MRSTB

MRSTB

SAFEOUT

1

SW4-FLASHEN



VIO

VSYS

WLEDPWM



RESETB

VICHG

MBATDETB

R14

R13

R11

R12

R10

R24

R29

R28

R33

R30

R25

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R21

R20

R19

R18

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