ISL95210EVAL1Z
ISL95210 10A Integrated FET Regulator Evaluation Board Setup Procedure

This document describes the setup procedure for the ISL95210EVAL1Z Rev B board.

Description

Increasing demand for circuit board real estate necessitates the use of a higher integration to reduce component count. To that end, Intersil introduces the ISL95210 regulator. It features integrated power MOSFET switches that are capable of delivering 10A continuous load current at elevated temperatures and maintaining high efficiency. Leveraging a highly digital feature set and the new R4™ modulator allows the ISL95210 to provide a fully regulated point of load solution with only four external components. For more information on the features of the ISL95210, see the data sheet FN6938

What's Inside

The Evaluation Board Kit contains the following materials:

- ISL95210EVAL1Z REV B Board
- ISL95210 Data Sheet
- ISL95210 Evaluation Board Setup Procedure (this document)

What's Needed

The following materials will be needed to perform testing:

- +5V, 10A Power Supply
- Precision Digital Multi-Meter
- Electronic Load
- 4-Channel Oscilloscope

NOTE: Amperage rating of power supplies are determined by maximum expected loading plus a percentage margin of error.
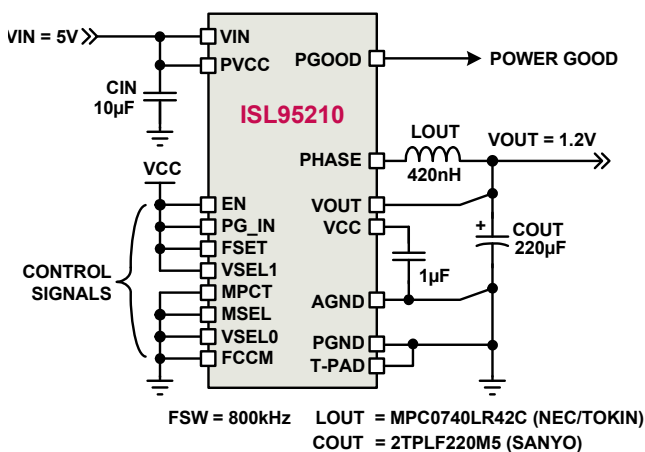
Quick Setup Guide

Step 1: Set the +5.0V power supply to +5V and place in the "STANDBY" or "OFF" position. Connect the positive terminal (+) of the supply to the +5V terminal TP4 and the negative terminal (-) of the supply to GND TP3.

Step 2: Connect the positive terminal (+) of the electronic load to the V_{OUT} terminal TP1. Connect the negative terminal (-) of the electronic load to the GND terminal TP2. Make sure the electronic load is set to the 0A condition.

Step 3: Check to ensure all jumpers and switches are in their default positions prior to application of power (refer to "Detailed Description of Switch Settings" and "Detailed Description of Jumper Settings" on page 2).

Step 4: Set the power supply to the "ON" position. LED D1 should show Red. Check all power supply outputs with a DMM to ensure correct voltage levels. Adjust if necessary.

Step 5: Move the ENABLE jumper to the "ON" position. LED D1 should show Green.

Step 6: Measure V_{OUT} with a DMM from TP5(+) to TP8(-). It should read 1.2V (±1%).

At this point, the board has been properly powered up. Normal testing can begin.

NOTE: If you need technical assistance, or other assistance, with the ISL95210 Evaluation Board, call 1-888-INTERSIL (468-3774).
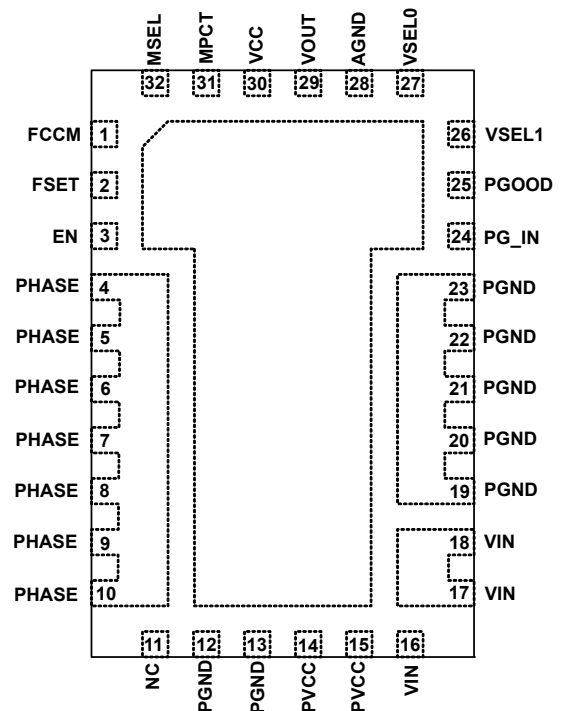

FIGURE 1. ISL95210 800kHz TYPICAL APPLICATION CIRCUIT

FIGURE 2. ISL95210 PINOUT 4x6mm 32 LD QFN (TOP VIEW)

Detailed Description of Test Points

TEST POINT	FUNCTION
J1	V_OUT Scope Probe Jack
J2	PHASE Scope Probe Jack
TP5	V_OUT
TP6	GND (V_IN)
TP7	V_IN
TP8	GND (V_OUT)
TP16	PG_IN (external source if J4 is OPEN)
TP17	PGOOD
TP18	+12V_AUX (if charge pump is disabled with J3)

Detailed Description of Switch Settings

SWITCH	POSITION	FUNCTION
S1	OFF	ENABLE On-Board Load Transient

NOTE: The *POSITION* column reflects the default state of each switch or jumper.

Detailed Description of Jumper Settings

JUMPER	POSITION		FUNCTION
S1	OFF	OFF	= Regulator is disabled
		ON	= Regulator is enabled
S2	ON	OFF	= 400kHz operation
		FLOAT	= 533kHz operation
		ON	= 800kHz operation
S3	ON	OFF	= Full DCM
		FLOAT	= Ultra-sonic DCM
		ON	= Full CCM
S4	OFF	OFF	= ±15% margin setpoint
		FLOAT	= ±10% margin setpoint
		ON	= ±20% margin setpoint
S5	OFF	OFF	= No margining
		FLOAT	= Margin down
		ON	= Margin up
S6	OFF	OFF	= VSEL0 logic low
		FLOAT	= VSEL0 floating
		ON	= VSEL0 logic high
S7	ON	OFF	= VSEL1 logic low
		FLOAT	= VSEL1 floating
		ON	= VSEL1 logic high
J3	CLOSED	CLOSED	= LED and charge pump ON
		OPEN	= LED and charge pump OFF
J4	CLOSED	CLOSED	= LED and charge pump ON
		OPEN	= LED and charge pump OFF

ISL95210EVAL1Z Evaluation Board Schematics

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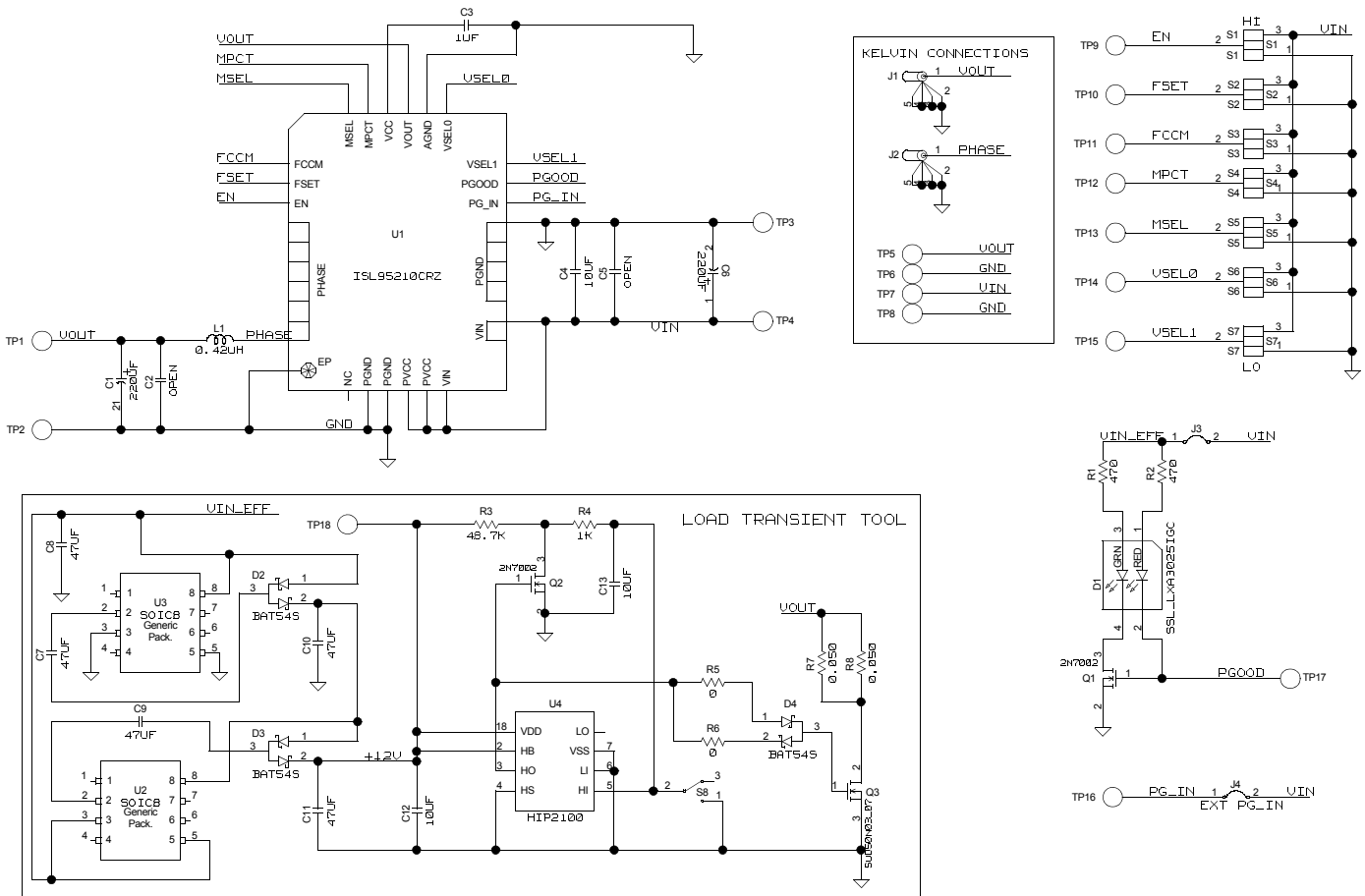
TABLE 1. BILL OF MATERIALS

ITEM	QTY	REFERENCE	VALUE	TYPE	FOOTPRINT	VOLTAGE (V)
TOP LAYER						
1	**1**	**C1**	**220µF**	**Sanyo-POSCAP 2TPLF220M5**		**2**
2	**1**	**C3**	**1µF**	**Generic MLCC X5R (or better)**	**0603**	**6.3**
3	**1**	**C4**	**10µF**	**Generic MLCC X5R (or better)**	**1206**	**6.3**
4	**1**	**L1**	**420nH**	**Tokin MPC0740LR42C**	**2525**	
5	**1**	**U1**		**ISL95210 10A Regulator**	**4x6mm QFN**	
6	1	D1		Lumex SSL_LXA3025IGC LED	3x2 5mm	
7	1	S8		C&K GT11MSCBE SPDT Switch		
BOTTOM LAYER						
8	1	C2	DNP			
9	1	C5	DNP			
10	1	C6	330µF	Sanyo-POSCAP 6TPB330M		6.3
11	7	C7, C8, C9, C10, C11, C12, C13	10µF	Generic MLCC (X5R or better)	0805	16
12	2	R1, R2	470Ω	1% generic thick film chip resistor	0603	
13	1	R3	48.7kΩ			
14	1	R4	1kΩ			
15	2	R5, R6	249Ω			
16	1	R7	0.12Ω		2512	
17	1	R8	DNP			
18	3	D2, D3, D4		Generic BAT54S	SOT-23	
19	2	Q1, Q2		Generic 2N7002	SOT-23	
20	1	Q3		Vishay SUD50N03-07-E3	TO-252	
21	2	U2, U3		Intersil ICL7660 charge pump	SOIC8	
22	1	U4		Intersil HIP2100 half-bridge driver	SOIC8	

NOTES:

1. Jumpers and test points not included in BOM as they represent non-critical components.

2. Components in **BOLD** represent the required components for a real application. The remainder are for board flexibility and evaluation.

ISL95210EVAL1Z Layout

Board consists of 4 layers of 2 ounce copper
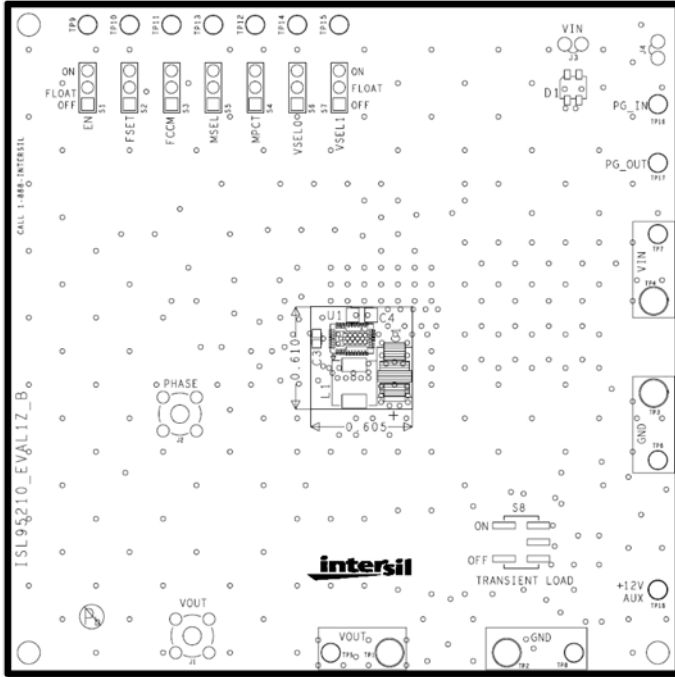
FIGURE 3. SILK SCREEN TOP
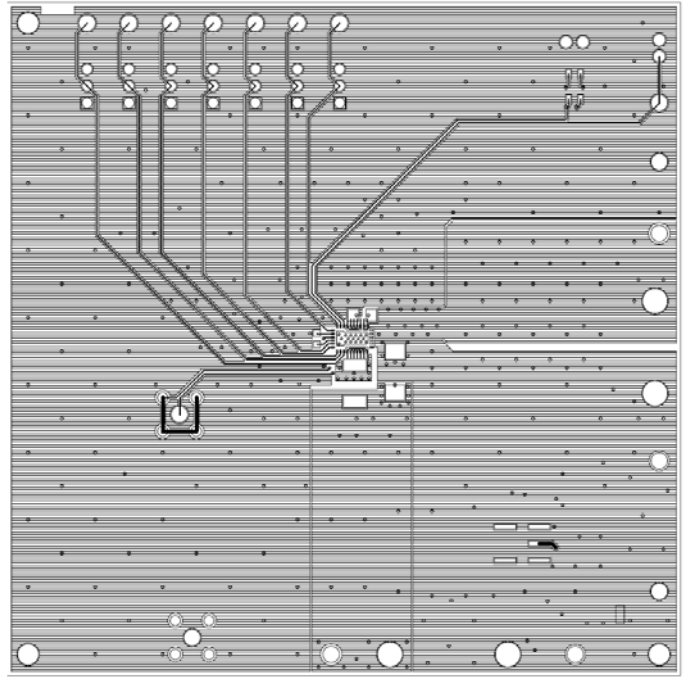
FIGURE 4. TOP LAYER
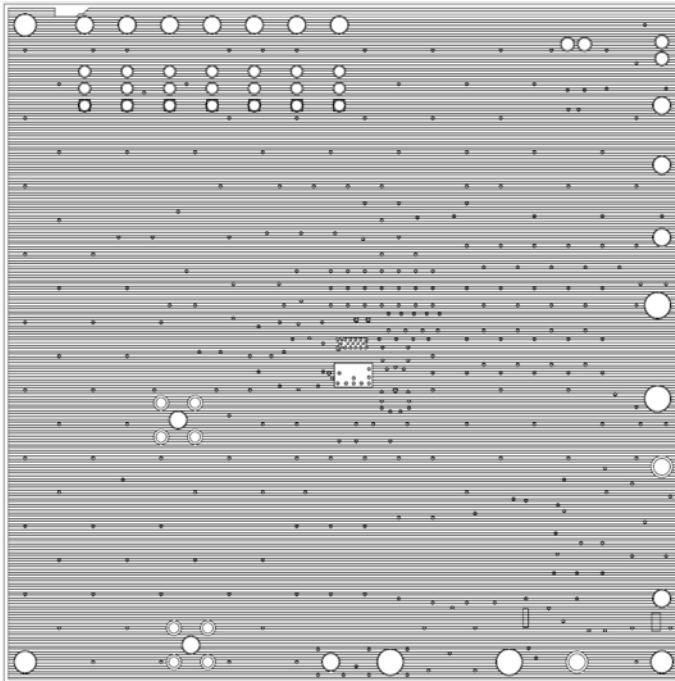
FIGURE 5. INTERNAL LAYER 1
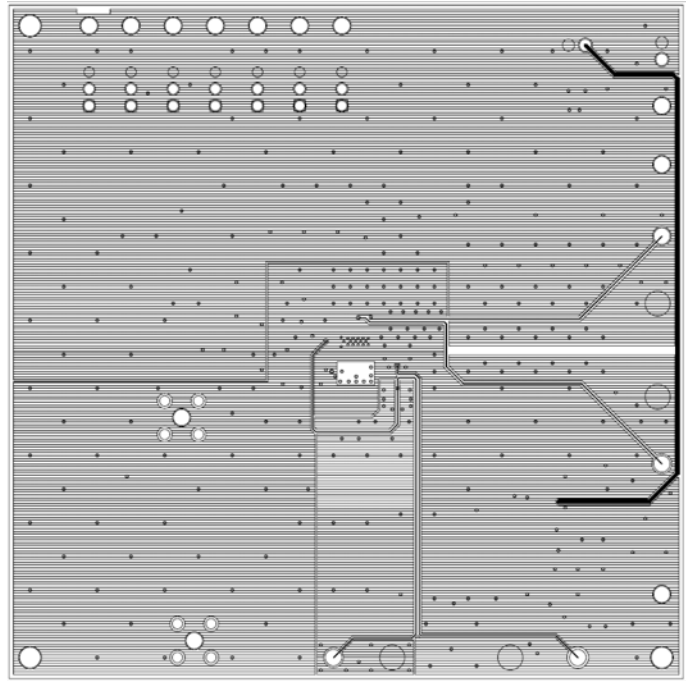
FIGURE 6. INTERNAL LAYER 2

ISL95210EVAL1Z Layout (Continued)

Board consists of 4 layers of 2 ounce copper
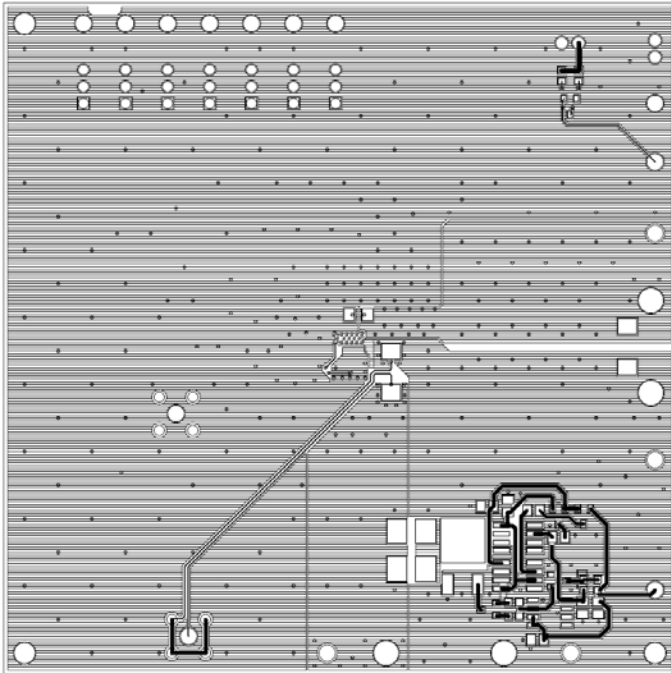
FIGURE 7. BOTTOM LAYER
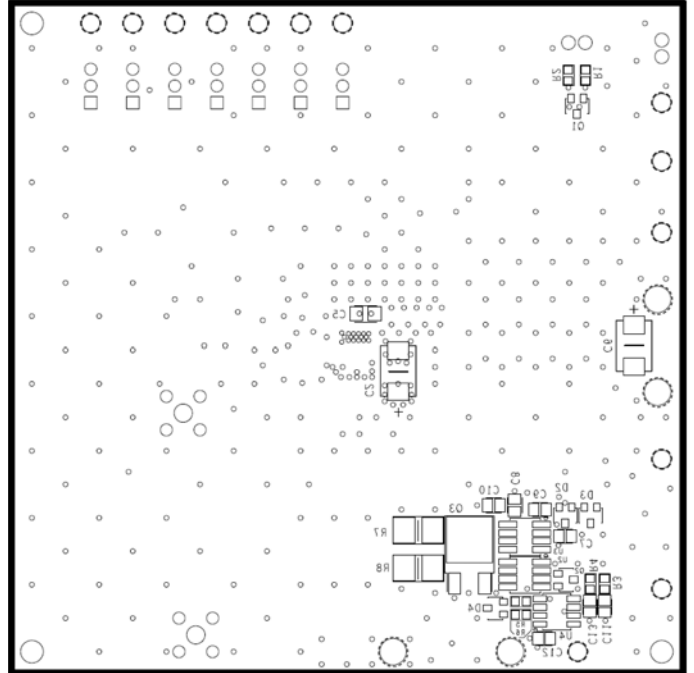
FIGURE 8. SILK SCREEN BOTTOM
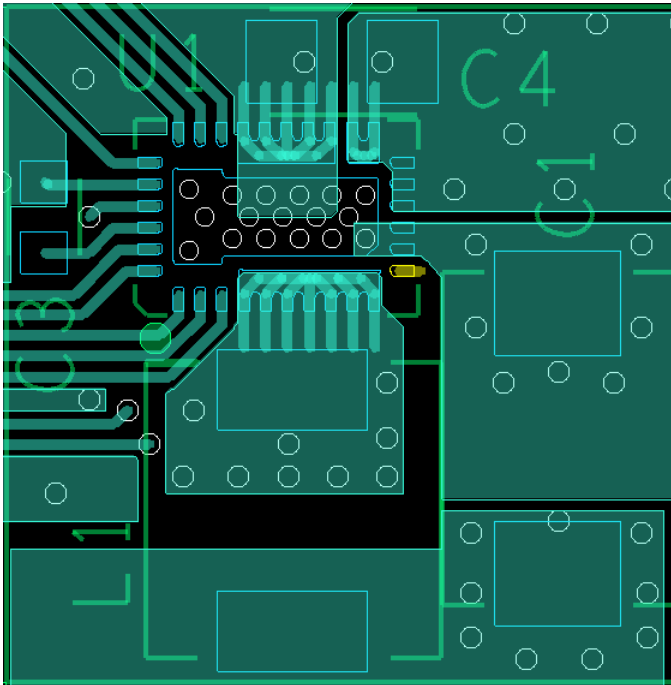
FIGURE 9. ZOOM OF APPLICATION ONLY (TOP LAYER)
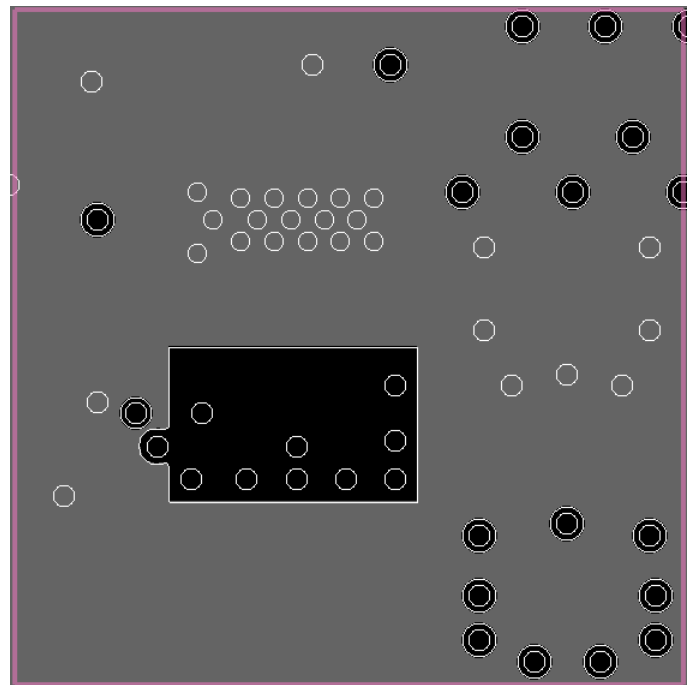
FIGURE 10. ZOOM OF APPLICATION ONLY (INTERNAL LAYER 1)

ISL95210EVAL1Z Layout (Continued)

Board consists of 4 layers of 2 ounce copper
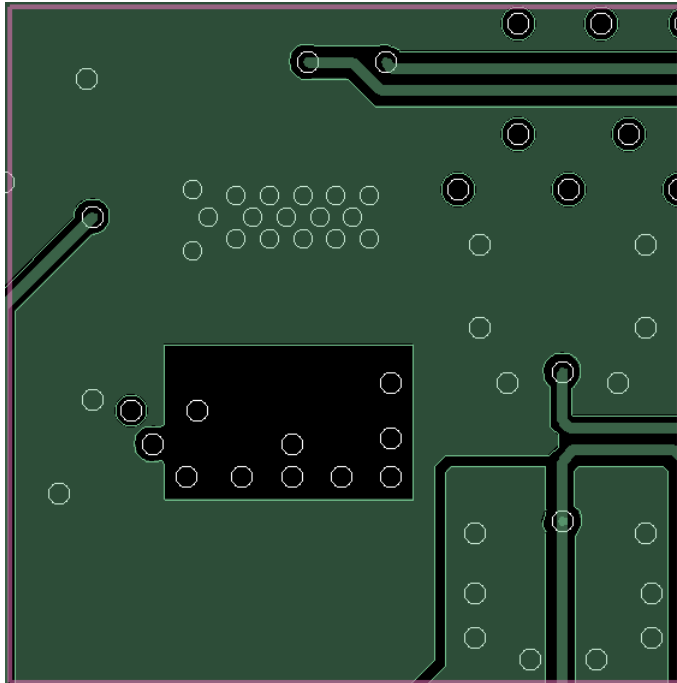
FIGURE 11. ZOOM OF APPLICATION ONLY (INTERNAL LAYER 2)
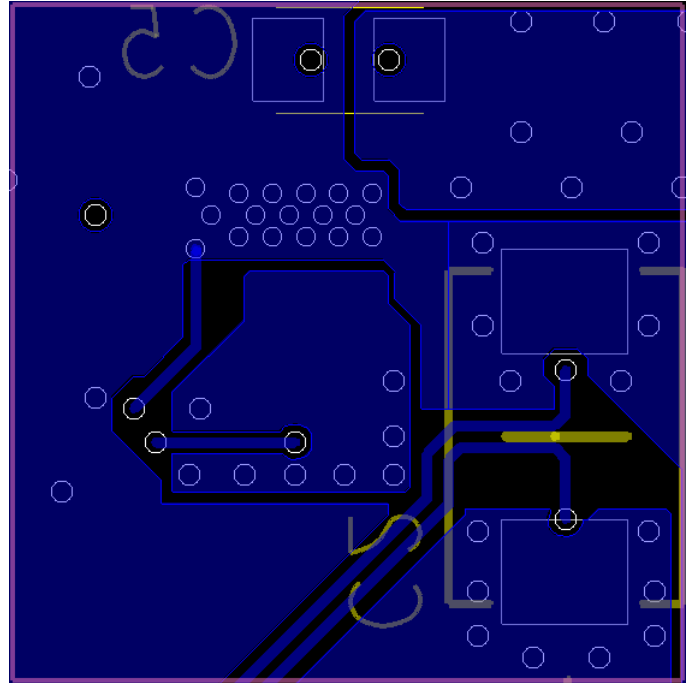
FIGURE 12. ZOOM OF APPLICATION ONLY (BOTTOM LAYER)

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