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MxL7204

Evaluation Board Manual

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Introduction

The MxL7204 evaluation board provides a platform to evaluate the features and performance of the MxL7204. The MxL7204 is a dual 4A Power Module optimized for powering Telecom, Networking and Industrial equipment.

The factory default configuration for the MxL7204 Evaluation Board is

- V_{OUT1} = 3.3V
- V_{OUT2} = 1.8V
- 780kHz switching frequency

Please refer to the MxL7204 datasheet for additional information about the MxL7204, including efficiency curves for this configuration with V_{IN} = 12V.

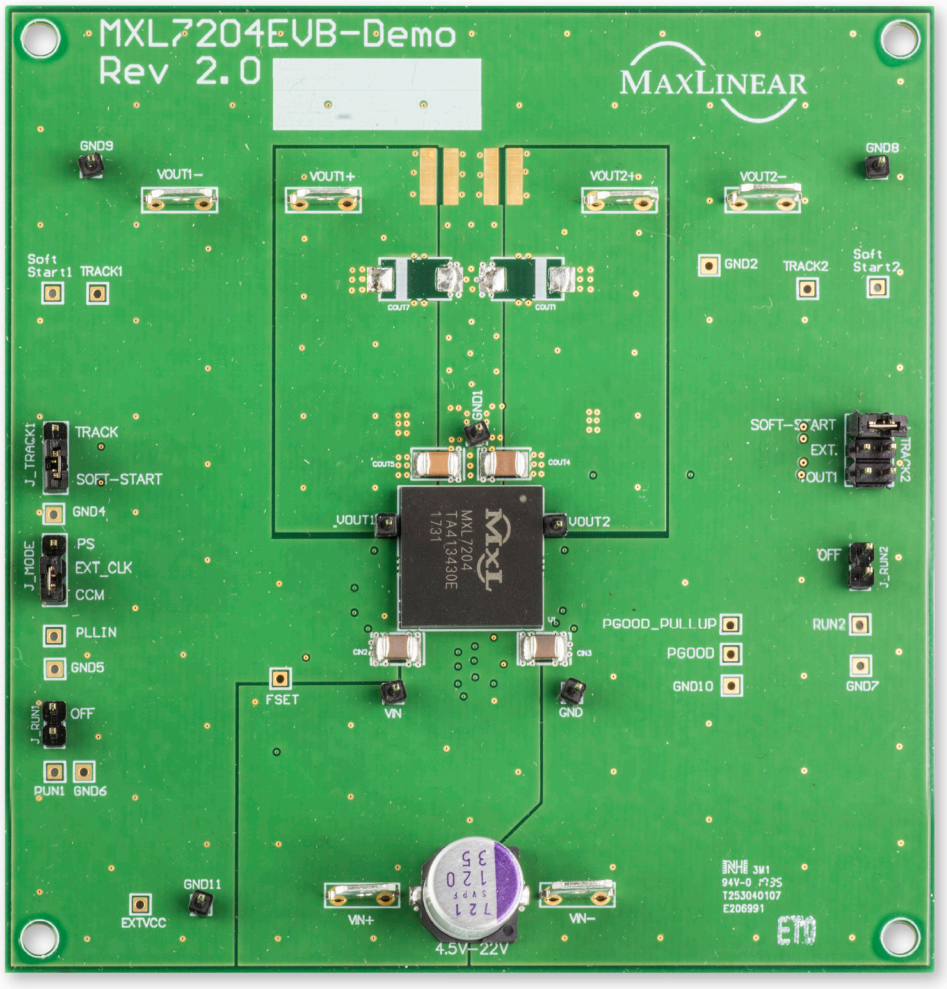


Figure 1: Top View of MxL7204EVB

Ordering Information

***Table 1:* Evaluation Board Ordering Part Number**

Power Module	Evaluation Board
MxL7204-AYA-T	MxL7204EVB

NOTE:

1. Refer to www.exar.com/MxL7204 for most up-to-date Ordering Information.

Evaluation Board Overview

The block diagram shown in Figure 2 illustrates the connection points for VIN, VOUT1, VOUT2, TRACK, MODE and RUN pins.

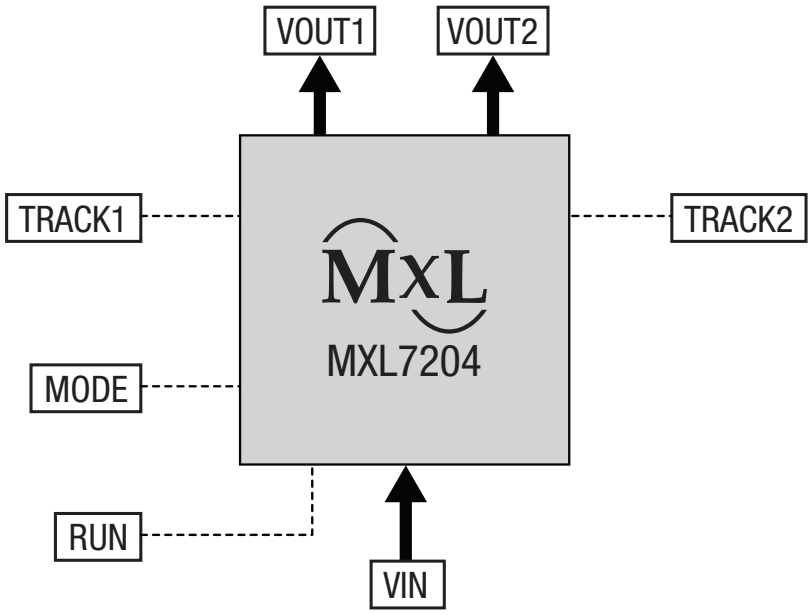


Figure 2: Block Diagram MxL7204EVB

System Set-Up

Jumpers are factory installed per Table 2 to configure the EVB for operation. Jumper and testing options are described in the next sections. Refer to the product data sheet for additional information.

***Table 2:* Factory Settings**

Jumper	Factory Setting	Description
J_MODE	Jumper 1-3	Mode_PLLIN = GND, forced Continuous Conduction Mode (CCM)
J_TRACK1	Jumper 2-3	TRACK/SS1 = GND, Soft-Start mode
J_TRACK2	Jumper 5-6	TRACK/SS2 = GND, Soft-Start mode

Powering Up the Evaluation Board

- Connect the VIN+/VIN- with short, thick leads to a 5.5V to 20V (12V typical) power supply. Use test pins VIN and GND to monitor V_{IN} and GND respectively. See Note A.
- Turn on the power supply. The MxL7204 EVB will power up and regulate the channel 1 output at 3.3V and channel 2 output at 1.8V.

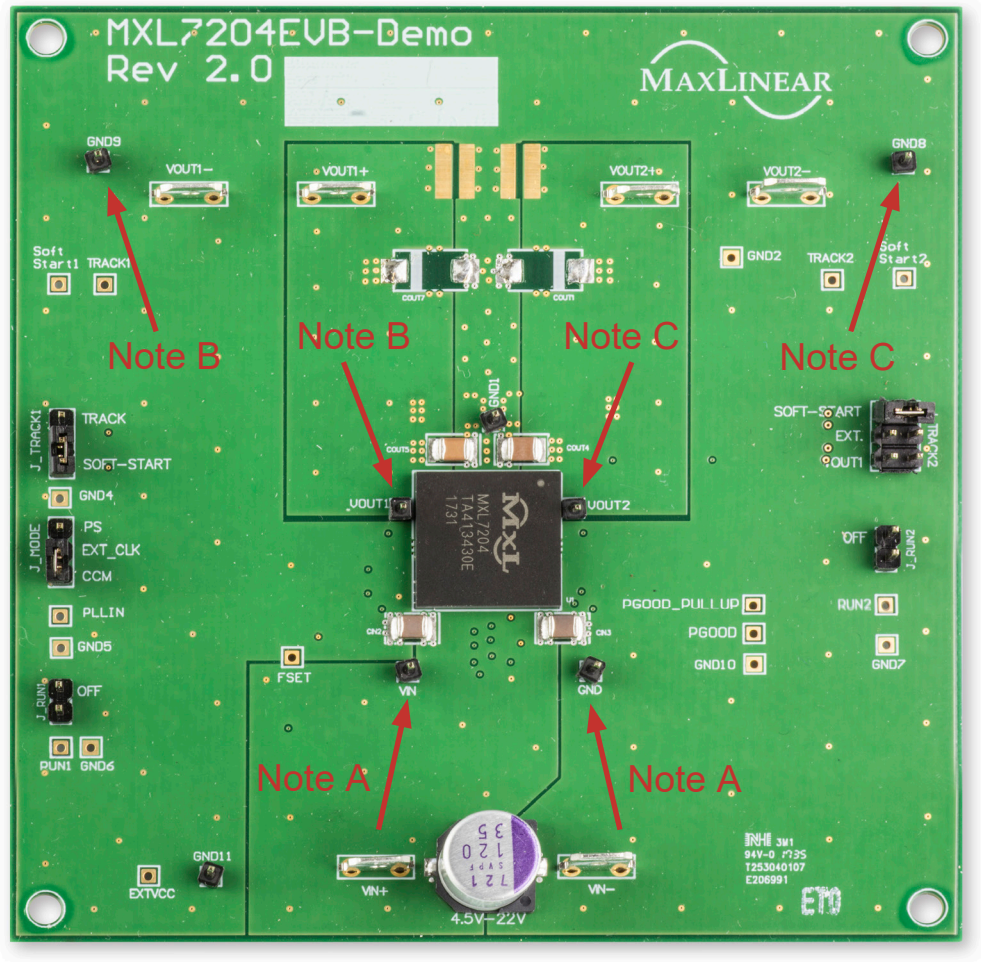


Figure 3: V_{IN} and V_{OUT} Connections

Monitoring or Testing V_{OUT}

- For the channel 1 output, connect VOUT1+/VOUT1- with short, thick leads to an electronic load or DUT. Use test pins VOUT1 and GND9 to monitor VOUT1+ and VOUT1- respectively. See Note B.
- For the channel 2 output, connect VOUT2+/VOUT2- with short, thick leads to an electronic load or DUT. Use test pins VOUT2 and GND8 to monitor VOUT2+ and VOUT2- respectively. See Note C.

Header EXTVCC

An external power input may be applied to EXTVCC. It is enabled into the MxL7204 through an internal switch in the IC to drive INTVCC whenever EXTVCC is greater than 4.7V. Do not exceed 6V on the EXTVCC input. Connect the EXTVCC pin to VIN when VIN is less than 5.5V. Note from the datasheet that VIN must be applied before EXTVCC and EXTVCC must be removed before VIN.

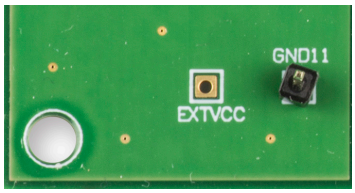


Figure 4: Header EXTVCC

Jumper J_MODE

By default, the jumper is set in CCM position (2-3) with the jumper connected between EXT_CLK and CCM. In this configuration, connect MODE_PLLIN pin to SGND which forces both channels into forced continuous mode of operation. The MxL7204 EVB will operate in “forced CCM”.

Table 3: Jumper J_MODE

Pin Number	Name on Board
1	PS
2	EXT_CLK
3	CCM

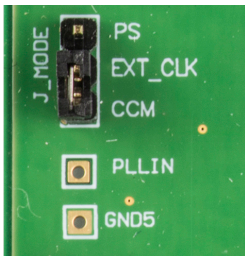


Figure 5: Jumper J_MODE

If there is no jumper or if the jumper is set to the PS position with the jumper connected between EXT_CLK and PS (1-2), and with MODE_PLLIN floating (no jumper) or connected to $INTV_{CC}$ (1-2), both channels are forced into pulse-skipping mode of operation.

An external clock supply may be applied to MODE_PLLIN pin. To do this, first remove the J_MODE jumper and connect the external clock to EXT_CLK. This will force both channels into continuous mode of operation.

Jumper J_TRACK1

By default, the jumper is set in the SOFT-START position with TRACK1 pin connect to GND (2-3). Refer to pin description the product datasheet for other options. Changing the jumper to (1-2) connects the TRACK1 pin for output voltage tracking.

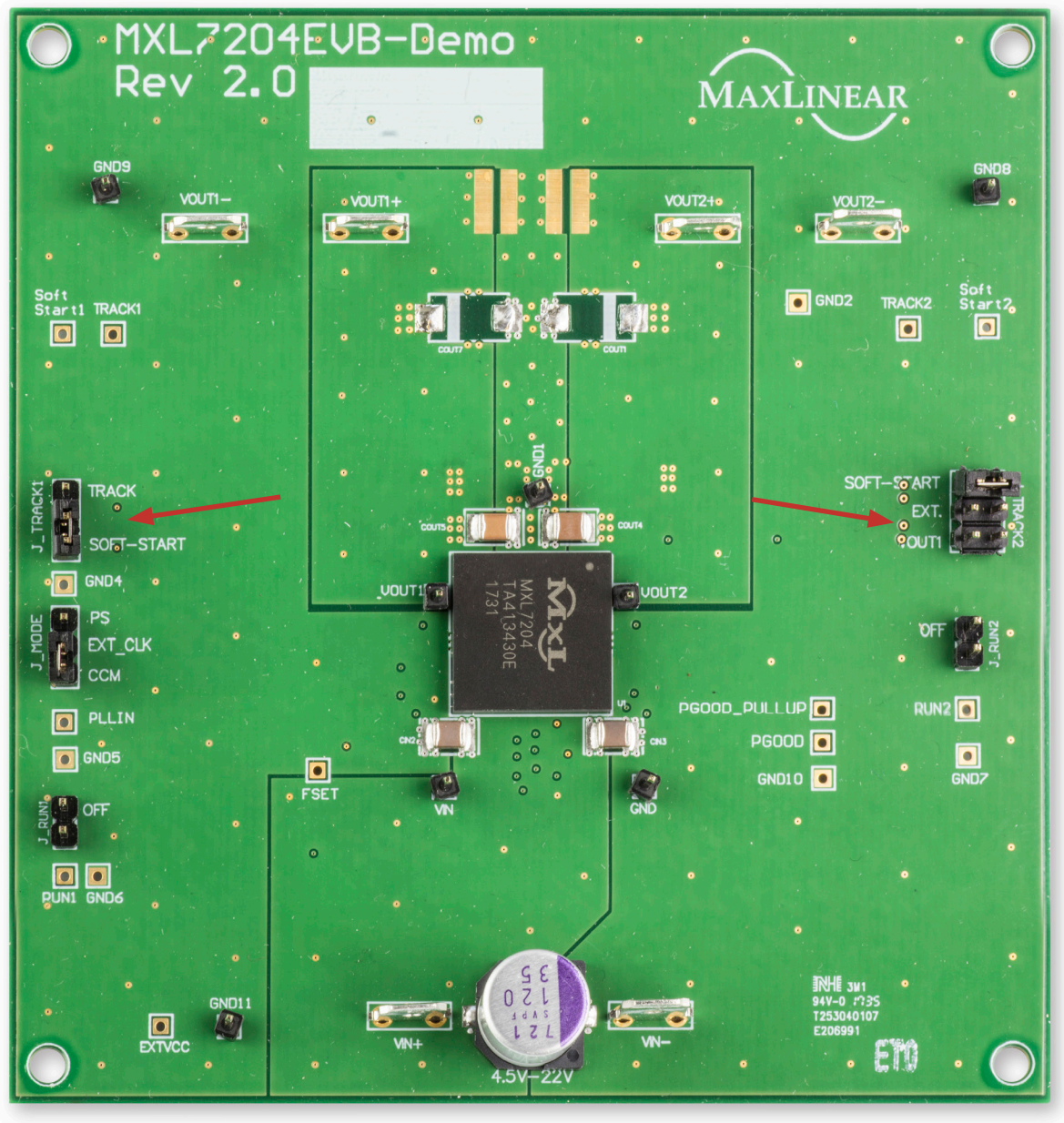


Figure 6: J_TRACK Jumpers

Jumper J_TRACK2

By default, the jumper is set in the SOFT-START position with TRACK2 pin connect to GND (5-6). Refer to the pin description of the product datasheet for other options. Note that the jumper can be changed to 3-4 for TRACK (using R15 and R18 on bottom side) or 1-2 (using R10 and R13 on bottom side) to change the resistor values for TRACK. These resistors can be populated as desired. See the schematic as an example where R15 = R18 = 60.4kΩ.

Table 4: ***Jumper J_TRACK1***

Pin Number	Name on Board
1	TRACK
2	
3	SOFT-START

Table 5: ***Jumper J_TRACK2***

Pin Number	Name on Board
5-6	SOFT-START
3-4	EXT
1-2	VOUT1

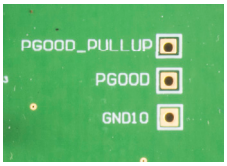
Jumpers J_RUN1 and J_RUN2

If desired, putting a jumper on headers J_RUN1 or J_RUN2 will inhibit their respective outputs, VOUT1 or VOUT2. Without a jumper on the respective J_RUN header, the output will not be inhibited.

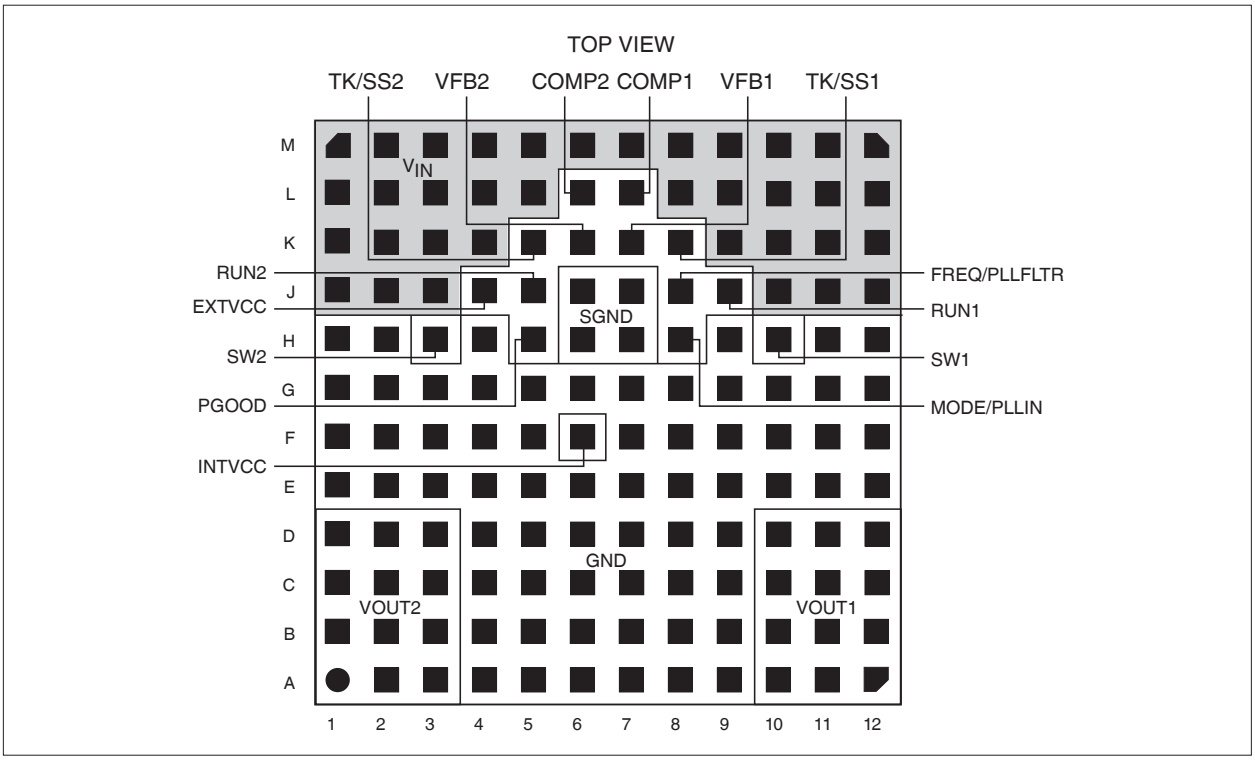
Figure 7: RUN Connectors

PGOOD

The Power Good output can be monitored. Also there is another point, PGOOD_PULLUP, where a different pullup voltage can be applied to alter the PGOOD high level voltage.



Pin Configuration



Top View, 15mm x 15mm x 2.82mm LGA

Figure 8: Pin Configuration

MxL7204EVB Schematic

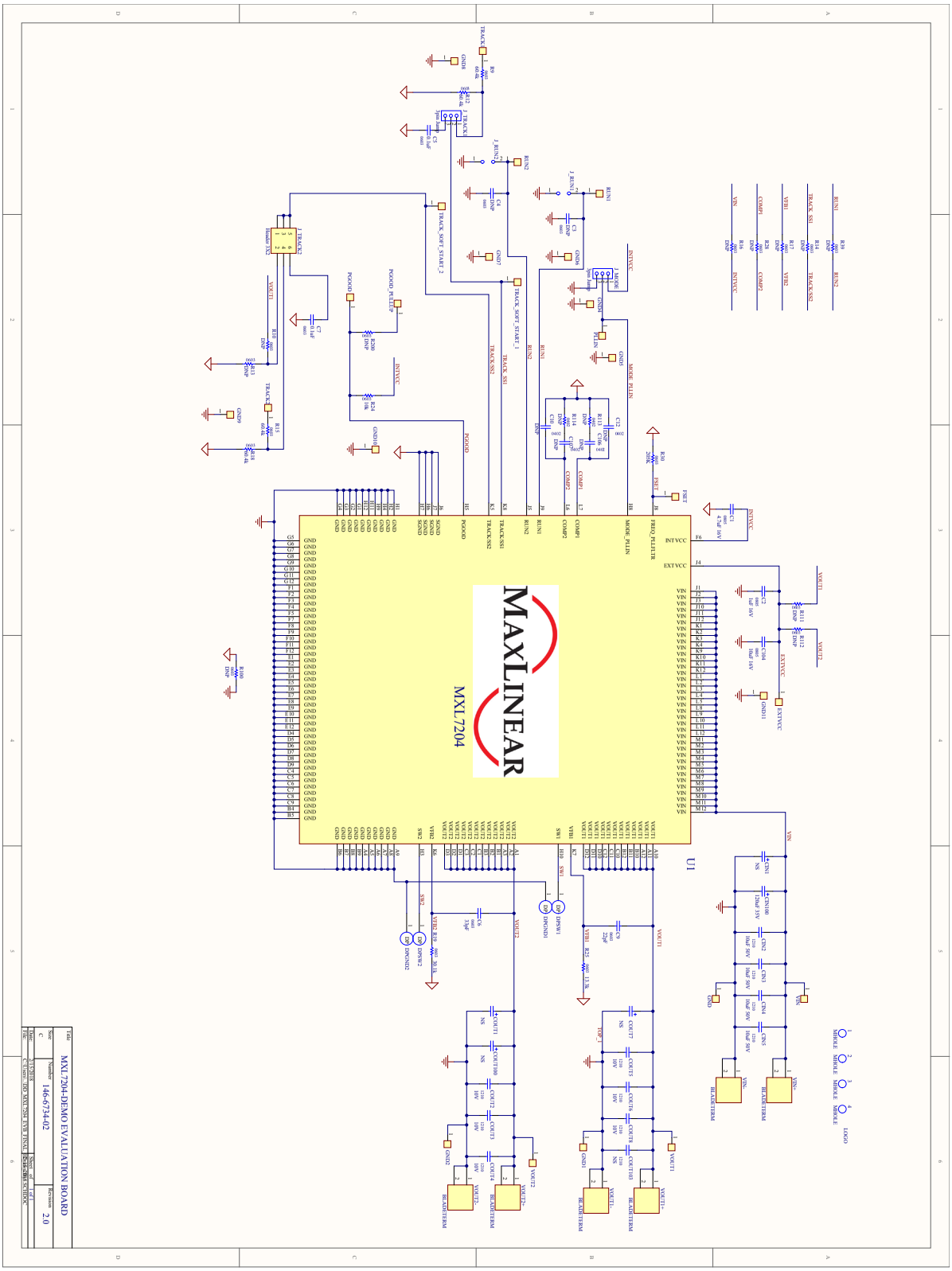


Figure 9: EVB Schematic

MxL7204EVB PCB Layers

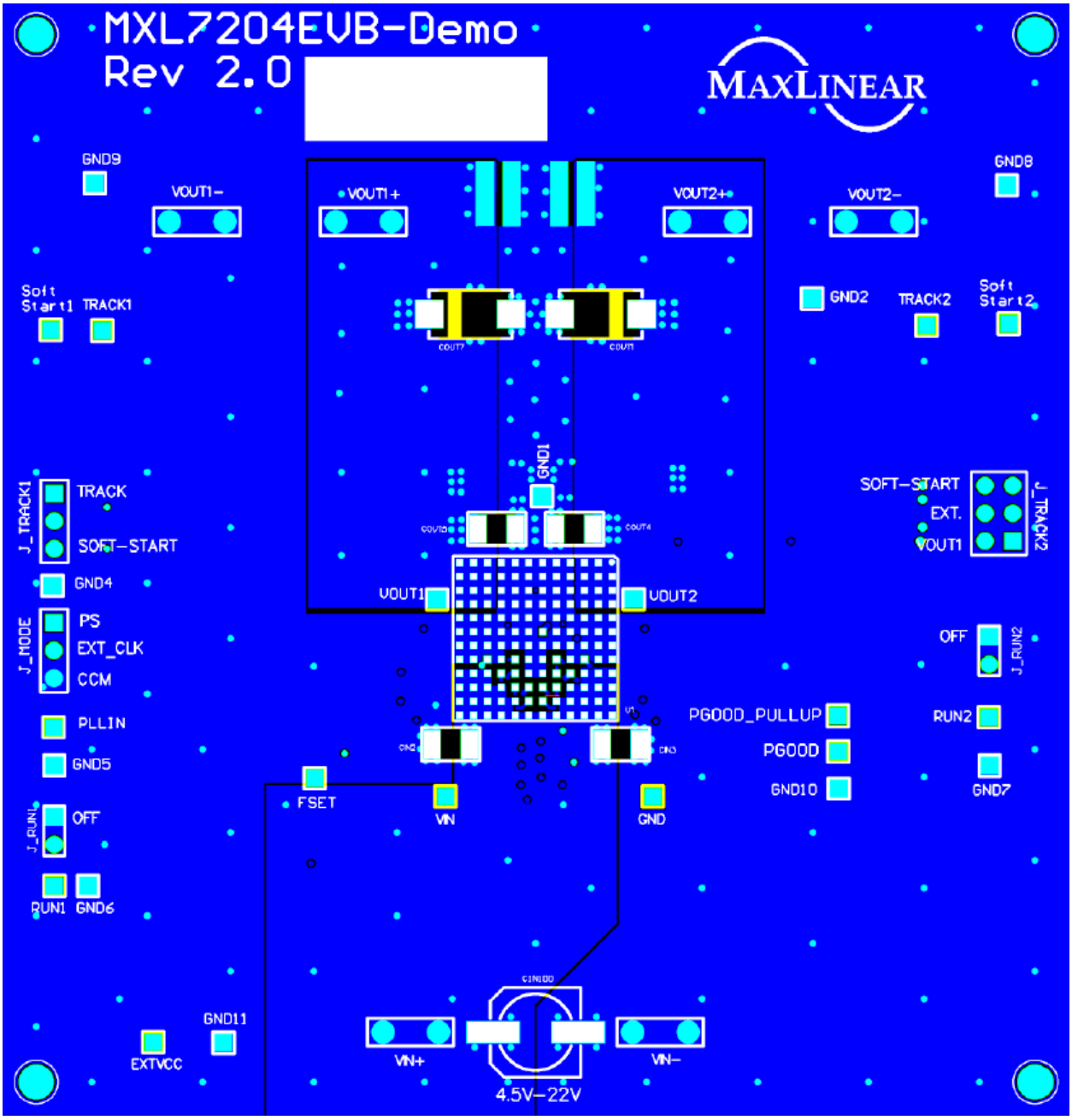


Figure 10: EVB PCB, Top View

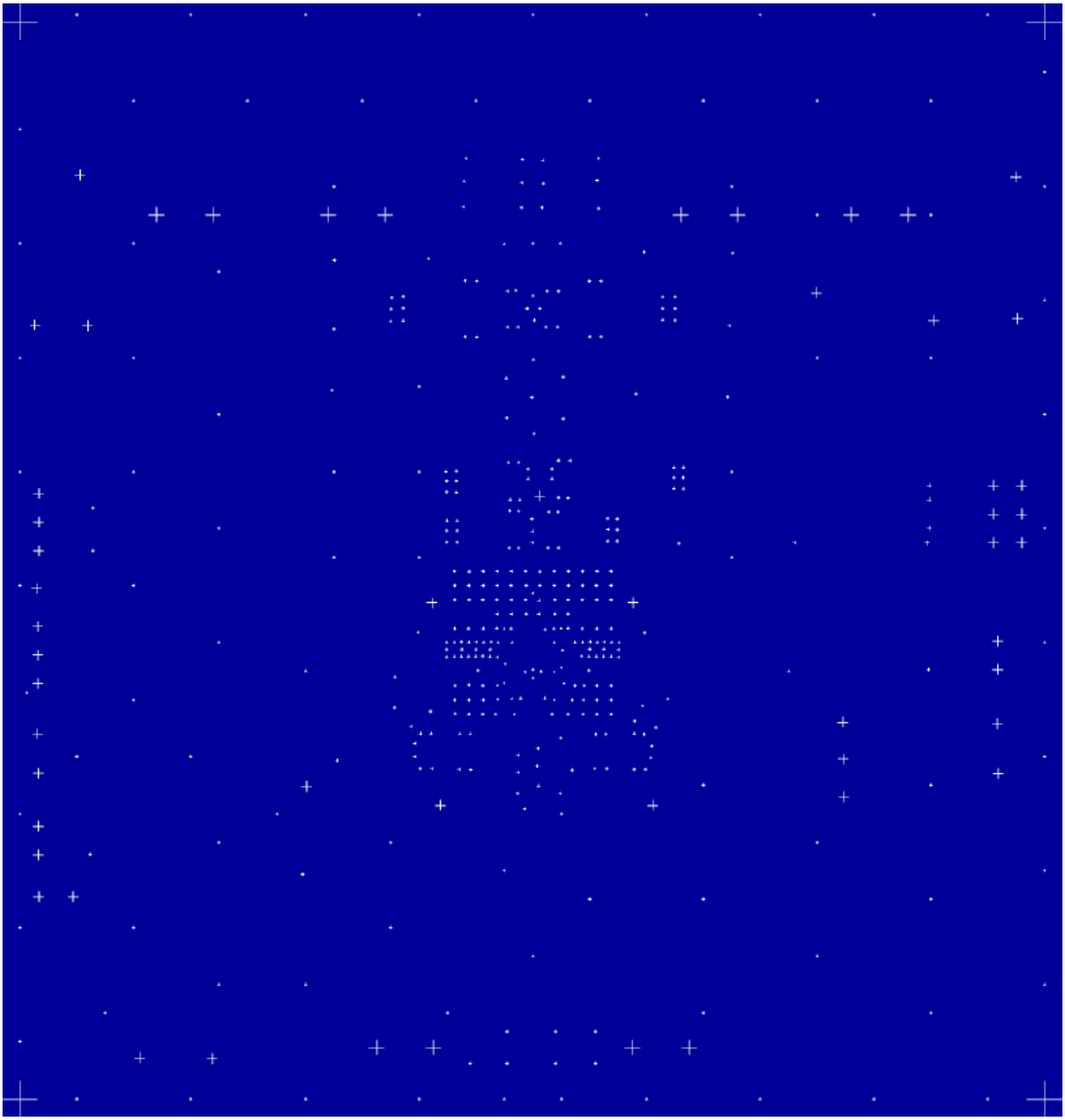


Figure 11: EVB PCB Layer 2, Ground Plane

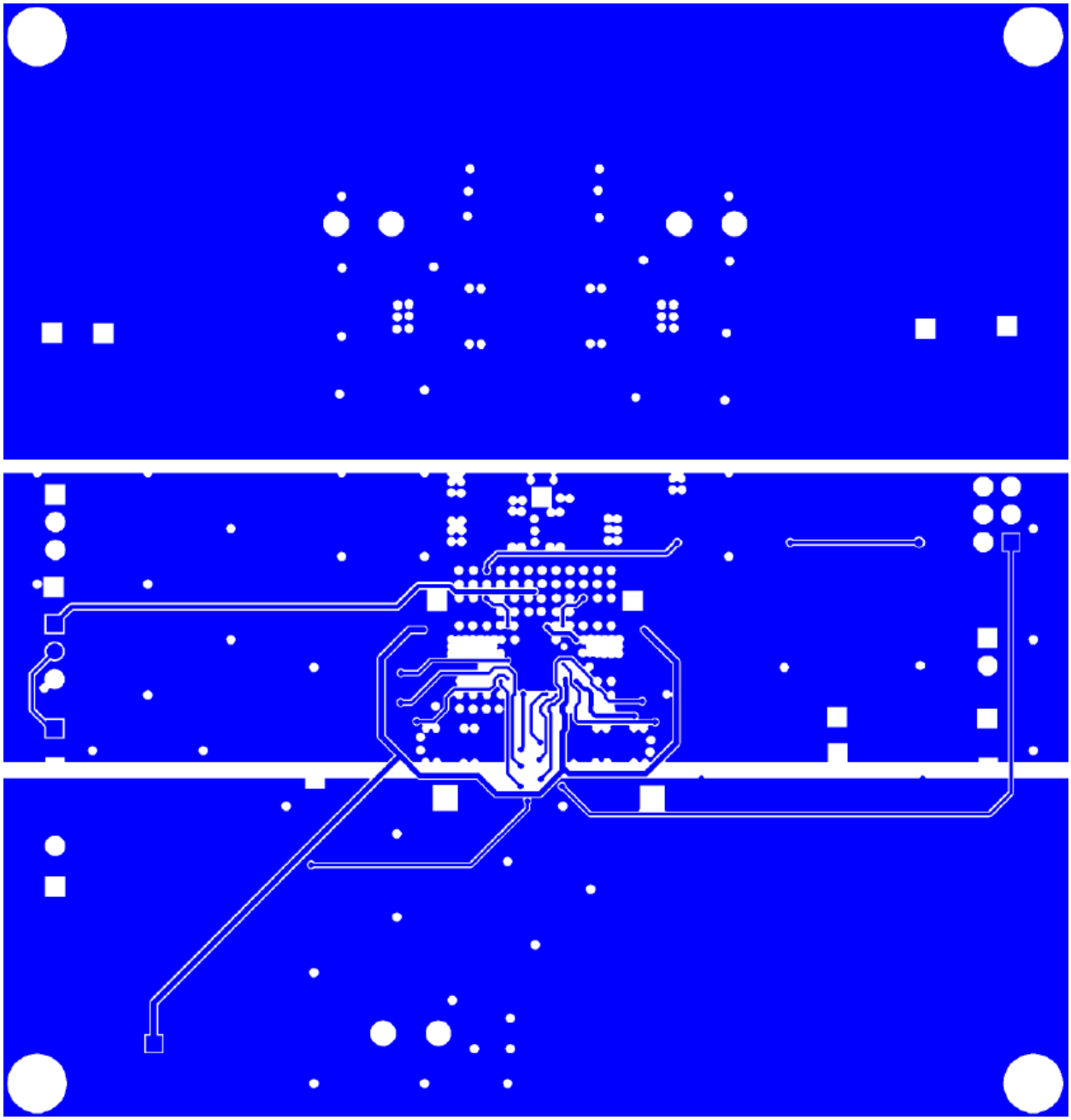


Figure 12: EVB PCB Layer 3, Signal Plane

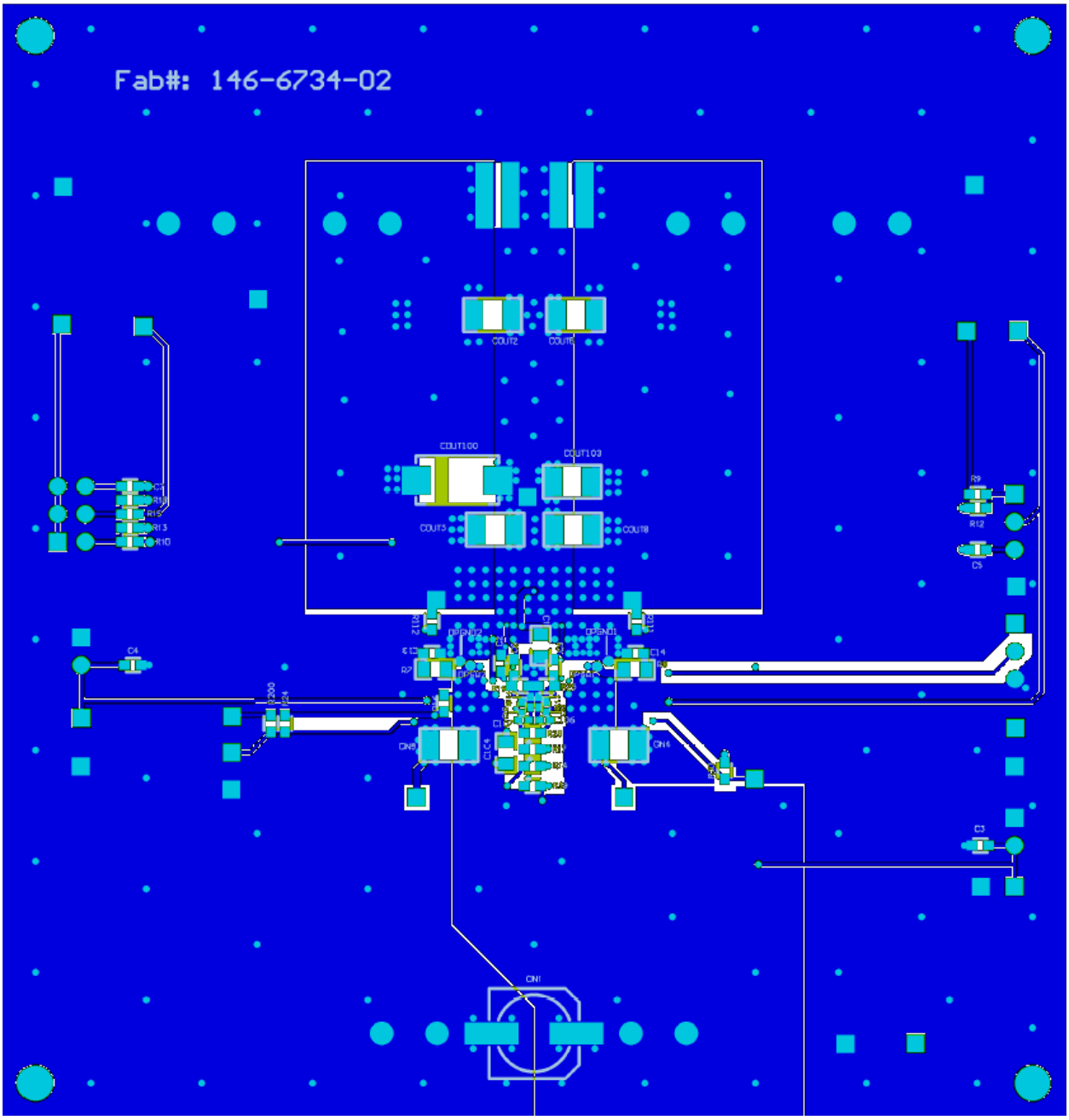


Figure 13: EVB PCB, Bottom View

MxL7204EVB Bill of Materials

***Table 6:* EVB Bill of Materials**

Item	Qty	Reference Designator	Manufacturer	Part Number	Package Size	Component
1	1	PCB	MaxLinear	146-6734-02	PCB	MXL7204EVB Evaluation Board
2	1	U1	MaxLinear	MXL7204AYA-T	15x15mmLGA	MXL7204 Power Module
3	1	CIN100	Panasonic	35SVPF120M	10.3x10.3mm	OSCON 120µF, 35V
4	4	CIN2, CIN3, CIN4, CIN5	Murata	GRM32ER71H106KA12L	1210	Ceramic Cap., 10µF, 50V, X7R, 10%
5	3	COUT2, COUT3, COUT4	Murata	GRM32ER71A476KE15L	1210	Ceramic Cap., 47µF, 10V, X7R, 10%
6	3	COUT5, COUT8, COUT6	Murata	GRM32ER71A476KE15L	1210	Ceramic Cap., 47µF, 10V, X7R, 10%
7	1	C6	Murata	GRM1885C1H330JA01D	0603	Ceramic Cap., 33µF, 50V, NP0, 10%
8	1	C9	Murata	GRM1885C1H220JA01D	0603	Ceramic Cap., 22µF, 50V, NP0, 10%
9	2	C1, C104	Murata	GRM21BR71C475KA73L	0805	Ceramic Cap., 4.7µF, 16V, X7R, 10%
10	1	C2	Murata	GRM188R71C105KA12D	0603	Ceramic Cap., 1.0µF, 16V, X7R, 10%
11	2	C5, C7	Murata	GRM188R71H104KA93D	0603	Ceramic Cap., 0.1µF, 50V, X7R, 10%
12	1	R19	Panasonic	ERJ-3EKF3012V	0603	Resistor 30.1kΩ, 1/10W, 1%, SMD
13	1	R25	Panasonic	ERJ-3EKF1332V	0603	Resistor 13.3kΩ, 1/10W, 1%, SMD
14	1	R30	Panasonic	ERJ-3EKF2053V	0603	Resistor 205kΩ, 1/10W, 1%, SMD
15	1	R24	Panasonic	ERJ-3EKF1002V	0603	Resistor 10.0kΩ, 1/10W, 1%, SMD
16	4	VIN, GND, VOUT1, VOUT2	Wurth Elektronik	61300111121	2.54mm	Header 1 pin
17	4	GND1, GND8, GND9, GND11	Wurth Elektronik	61300111121	2.54mm	Header 1 pin
18	2	J_TRACK1, J_MODE	Wurth Elektronik	61300311121	2.54mm	Header 3 pin
19	2	J_RUN1, J_RUN2	Wurth Elektronik	61300211121	2.54mm	Header 2 pin
20	1	J_TRACK2	Wurth Elektronik	61300621121	2.54mm	Header 6 pin dual row
21	2	VIN+, VIN-	Wurth Elektronik	7471287	0.32x0.10in	Blade connectors
22	2	VOUT1+, VOUT1-	Wurth Elektronik	7471287	0.32x0.10in	Blade connectors
23	2	VOUT2+, VOUT2-	Wurth Elektronik	7471287	0.32x0.10in	Blade connectors

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