Si3241MB3/5/6-EVB

EVALUATION BOARD FOR THE Si324X QUAD PROSLIC®

Description

This document describes the operation of the Silicon Laboratories Si3241 Quad ProSLIC® device evaluation platform. It covers the Silicon Labs Quad ProSLIC device coupled with the Si3203 (100 V) in a 48-pin TQFP or 40-pin QFN package, the Si3206 (130 V) in a 48-pin TQFP or 40-pin QFN package, and the Si3205 (150 V) in a 16-pin SOIC package. The Quad ProSLIC evaluation platform is designed to provide observation of the ProSLIC's functionality. The Quad ProSLIC platform consists of a Voice Motherboard, an Si3241 daughtercard (Si3241DC-EVB), and the Quad GUI software. The Quad GUI software is a graphical user interface program that will run in the Microsoft Windows® environment.

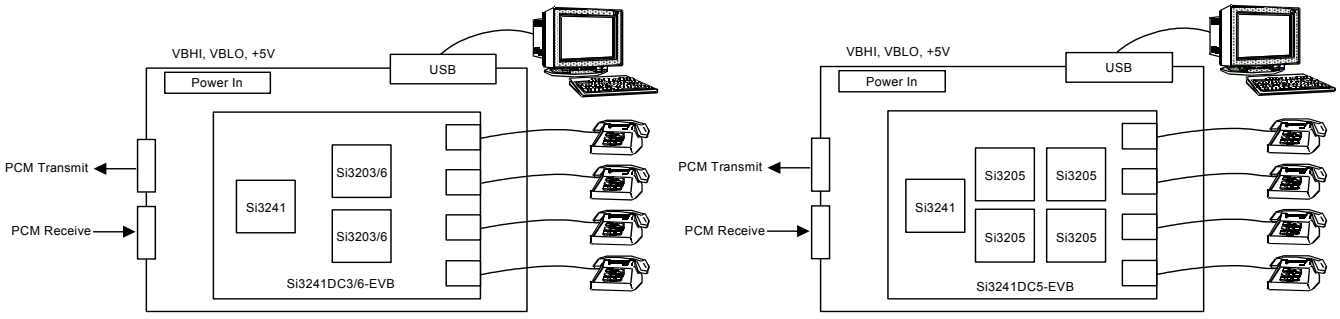
Equipment requirements:

- PC running Windows 95, 98, ME, NT, XP, or 2000
- 5 V, 1 A power supply
- 0.5 A low battery power supply (typically ~ –24 V)
- 0.5 A high battery power supply (typically ~–75 V)
- Ringing battery supply (optional)
- Balanced audio generator and analyzer (optional) (e.g., Audio Precision System 2 and/or HP TIMS set and/or Wandel and Goltermann PCM-4).
- 8 kHz PCM signal generator and analyzer (optional) (e.g., Audio Precision System 2 and Audio Precision SIA-2322 and/or Wandel and Goltermann PCM-4).

Features

- Silicon Laboratories Quad ProSLIC device with high-voltage integrated linefeed IC.
- Stackable cards for up to 32 channels
- All components necessary for linecard implementation
- Control I/O through standard USB port
- PCM I/O set up for Audio Precision System 2 or Wandel and Goltermann PCM-4
- Full access to PCM highway

Function Block Diagram



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1. Quad ProSLIC® GUI Evaluation Software

The Quad ProSLIC software is an executable program that allows control and monitoring of the ProSLIC. It utilizes the USB port of a standard PC to communicate to the Quad ProSLIC SPI port.

To install the software, insert the Silicon Laboratories ProSLIC CD into the computer. The setup routine can be invoked by running the setup.exe program in the root directory of the CD.

Invoking the Quad ProSLIC GUI is achieved by double-clicking the Quad ProSLIC GUI icon. Refer to "AN265: Quad ProSLIC GUI User's Guide" for more information.

1.1. Si3241MB3/5/6-EVB Quad ProSLIC Evaluation Board Description

The schematics for the Quad ProSLIC evaluation daughtercard with the Si3205 line feed circuits are shown in Figures 1 through 10. The schematic in Figure 1 shows the Quad ProSLIC. Figure 2 shows the serial control interface, PCM interface, and daisy chain ports to the motherboard and connections. Figures 3 through 6 show the ac and dc sense paths and the line feed ICs for the four channels. Figures 7 through 10 show basic protection circuitry. Depending on regulatory requirements, this circuitry may need to be enhanced for a given system architecture.

The layout of the Quad ProSLIC evaluation daughtercard is shown in Figure 11, which shows the primary side component placement, while Figures 12 through 16 show the remainder of the layout.

The schematics for the Quad ProSLIC evaluation card with the Si3203 or Si3206 linefeed circuits are shown in Figures 17 through 24. This design uses the same Quad ProSLIC device as well as the same interface to the motherboard, but it uses a dual channel linefeed circuit shown in Figures 19 and 20. The layout for this daughtercard is shown in Figures 25 through 30.

Signal requirements for Quad ProSLIC operation are PCLK (PCM clock), FS (frame sync), and Serial IO. The Voice Motherboard uses a DSP to provide the Quad ProSLIC the necessary PCLK and FS signals. Figures 31 through 42 show the design files of the Voice Motherboard.

The Voice Motherboard has been designed to directly connect to an Audio Precision SIA-2322 Serial Interface Adapter through the optional 15-pin d-connectors, P1 and P2.

See Table 1, "Audio Precision SIA-2322 DIP Switch Setting," on page 5. The Voice Motherboard has also been designed to interface with a Wandel and Goltermann PCM-4 through J4, J5, J6, and J7. See Table 2 for PCM-4 settings. Tip and ring of the two-wire analog interface are present at the RJ-11 connectors, J1–J4, of the Quad ProSLIC daughtercard.

Power is connected to the Voice Motherboard at J11. 5 V is always required for the interface to the USB port. This 5 V supply is then regulated down to 3.3 V for the Si3241. VBHI, VBLO, and VBRNG are provided to the Si3241 through the J11 connection. The Protection Return connections on J12 should be connected to an appropriate ground when performing any tip/ring fault testing. This return is tied to signal ground on-board, although it has a dedicated trace for high-current conditions.

Multiple Quad ProSLIC daughtercards can be daisy-chained by stacking the cards. Stack up to four cards by aligning JS1–JS6 and pressing them together. The Quad ProSLIC software allows channel selection for RAM and register manipulation.

1.2. Si3241MB3/5/6-EVB Quad ProSLIC Evaluation Platform Setup

To prepare the Quad ProSLIC evaluation platform for use, perform the following steps:

1. Set power supplies to 5 V, VBLO (–24 V), and VBHI (–75 V).
2. With these supplies off, connect them to J11, including GND, corresponding to the silkscreen designators.
3. If no VBRNG is used, also connect VBHI to VBRNG.
4. Connect the PC USB to J2.
5. Connect tip/ring from the RJ-11s to phone or telephony test equipment.
6. Invoke the Quad ProSLIC GUI software.
7. Turn the power supplies on, and click "Reset" in the Quad ProSLIC GUI.
8. Follow the instructions on the splash screen, and click "OK".
9. Select the script for the linefeed IC in use, and click "Initialize".

The Quad ProSLIC is now ready to perform its linecard function.

Table 1. Audio Precision SIA-2322 DIP Switch Setting

Receiver Mode				Transmitter Mode			
10111001	00000110	01111101	01111001	1000001	00000110	01111101	01111001
Note: 256 kHz PCLK and 8 kHz FS.							

Table 2. Wandel and Goltermann PCM-4 Settings

General Configuration	2.14
General Configuration	3.13
General Configuration	4.13
For µ-law add the following:	
General Configuration	7.12
General Configuration	7.22

2. Si3241DC5 Rev 1.3 Daughtercard Schematics

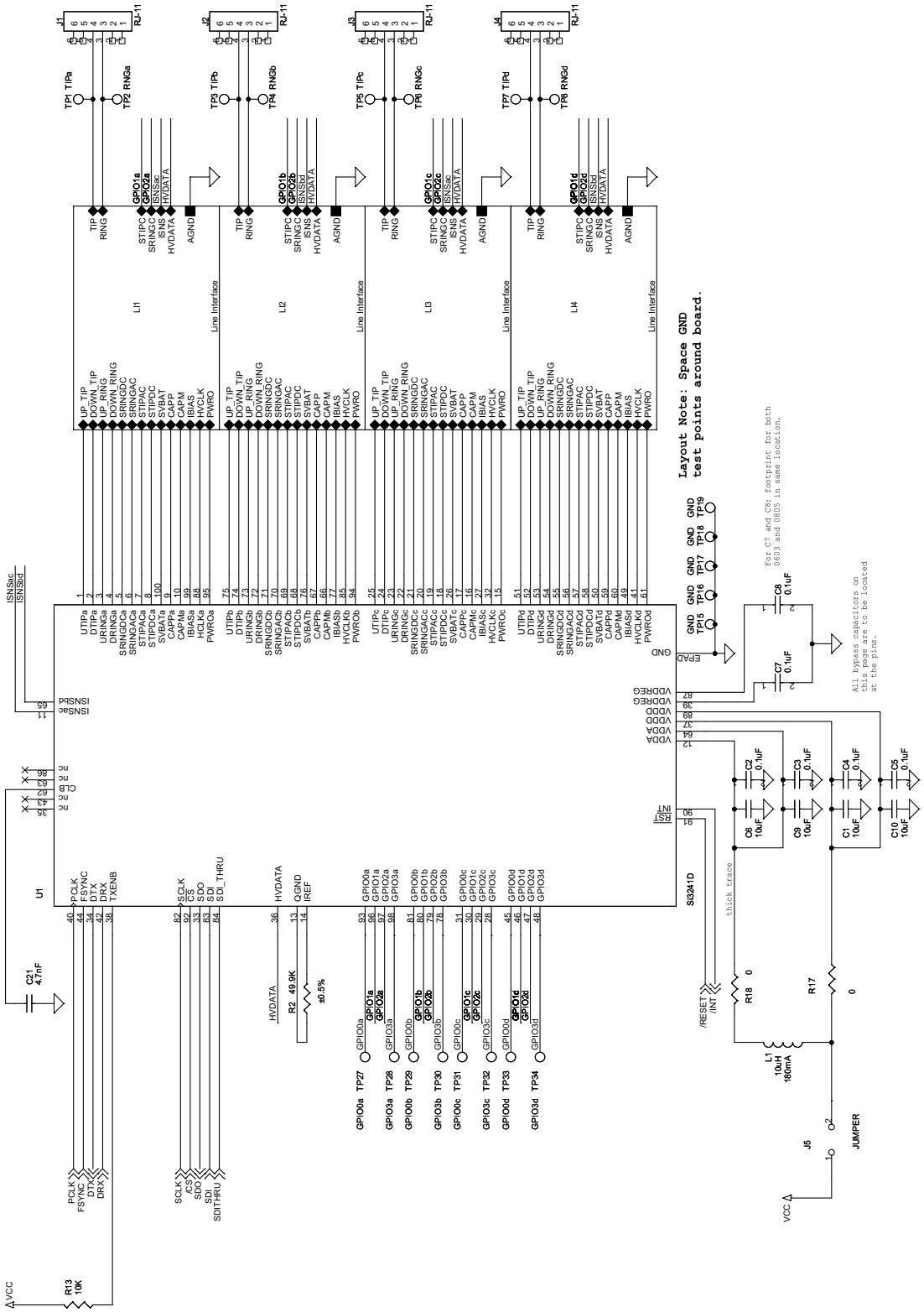
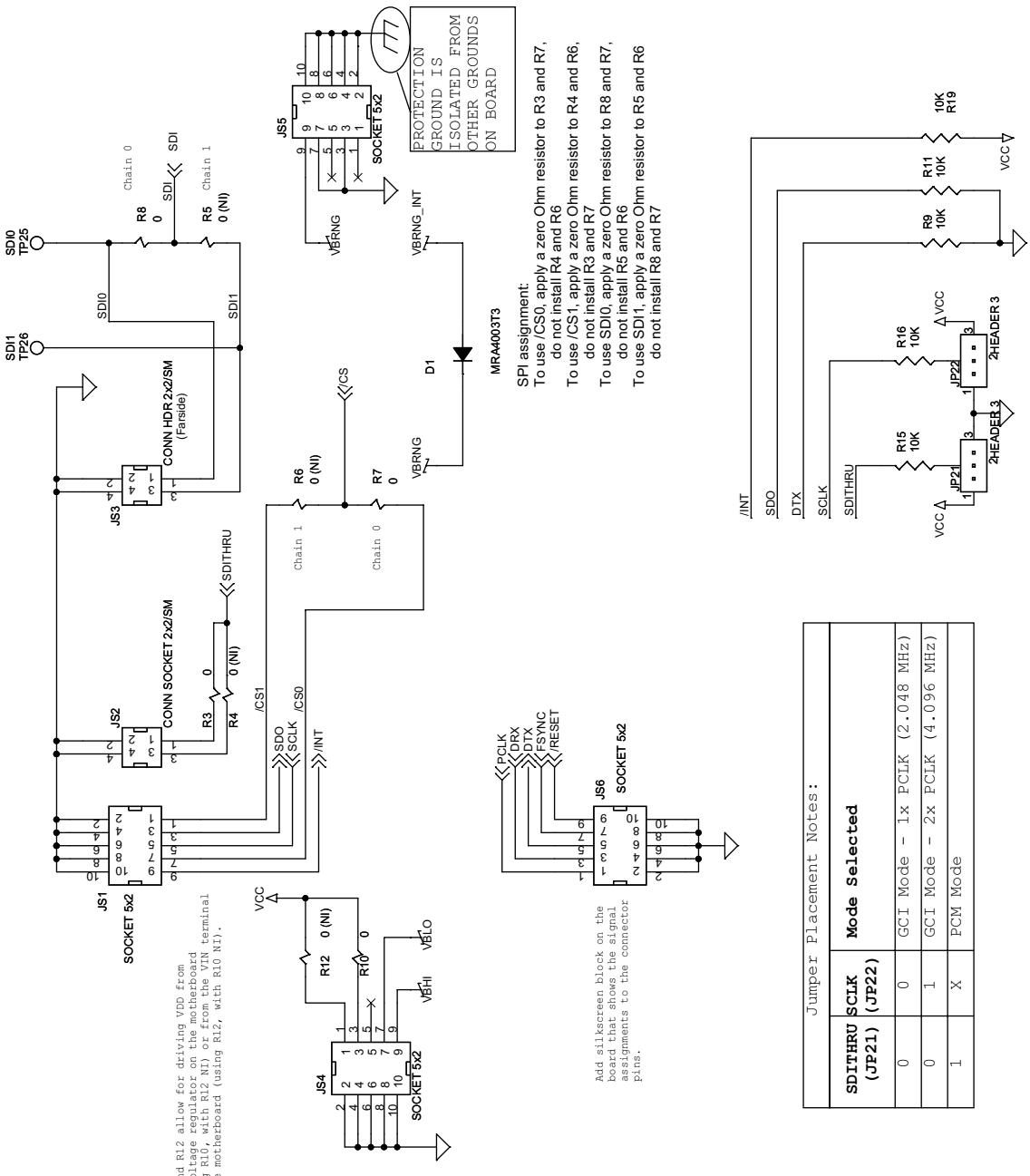


Figure 1. Si3241DC5 Daughtercard



Jumper Placement Notes:

SDITHRU (JP21)	SCLK (JP22)	Mode Selected
0	0	GCI Mode - 1x PCLK (2.048 MHz)
0	1	GCI Mode - 2x PCLK (4.096 MHz)
1	X	PCM Mode

Figure 2. Daughtercard Interconnect

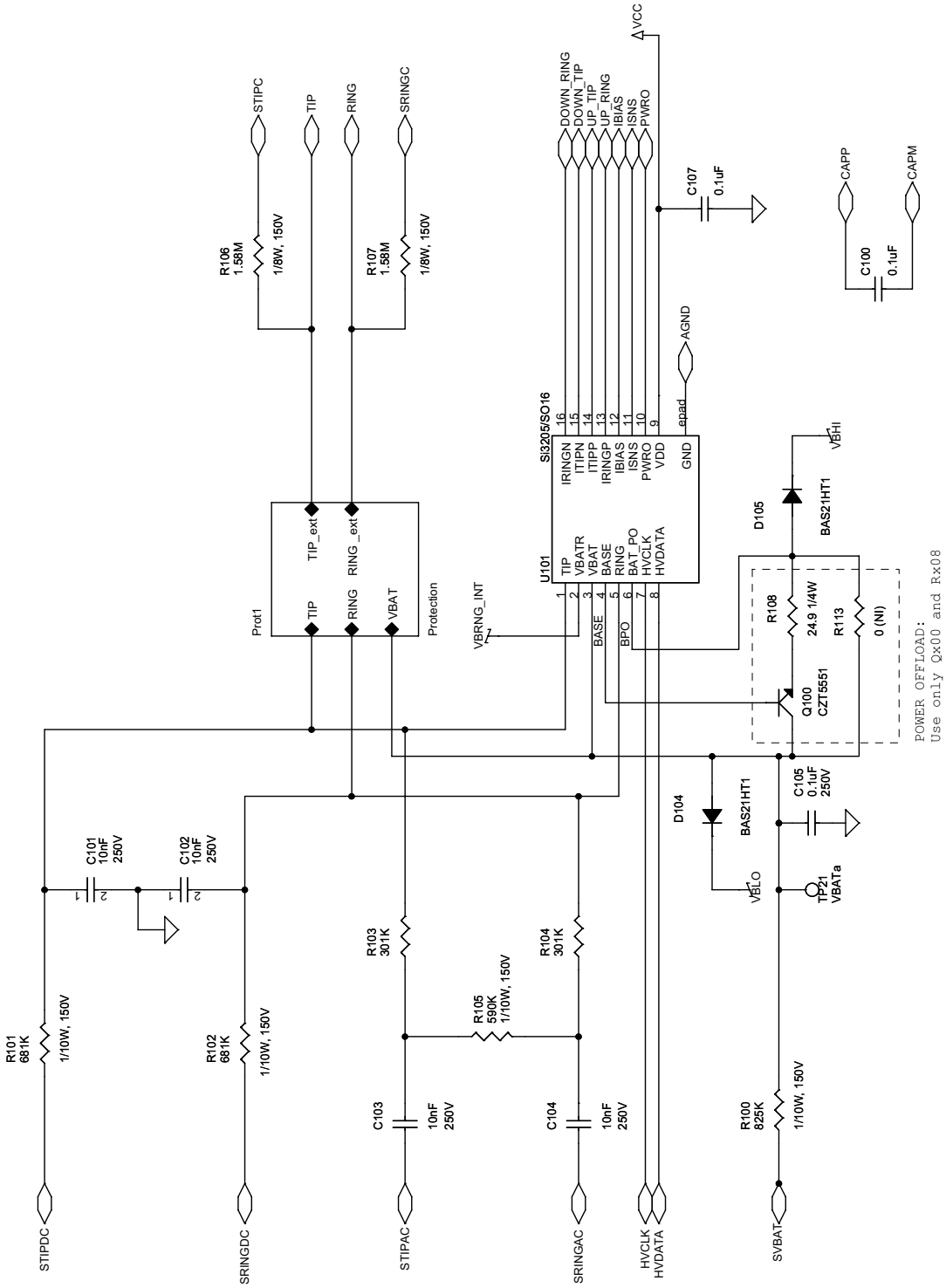


Figure 3. Si3205 Line Interface (1 of 4)

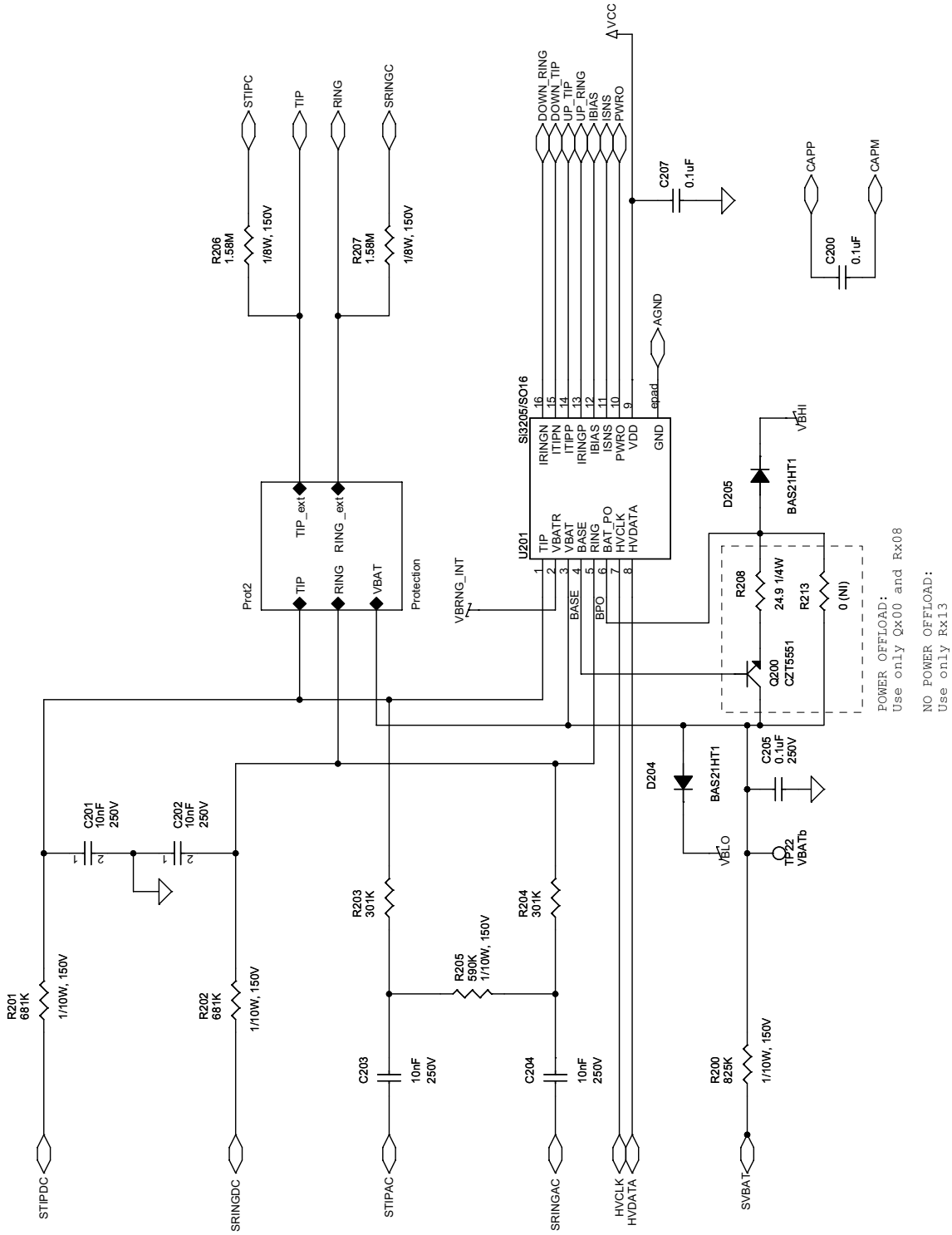


Figure 4. Si3205 Line Interface (2 of 4)

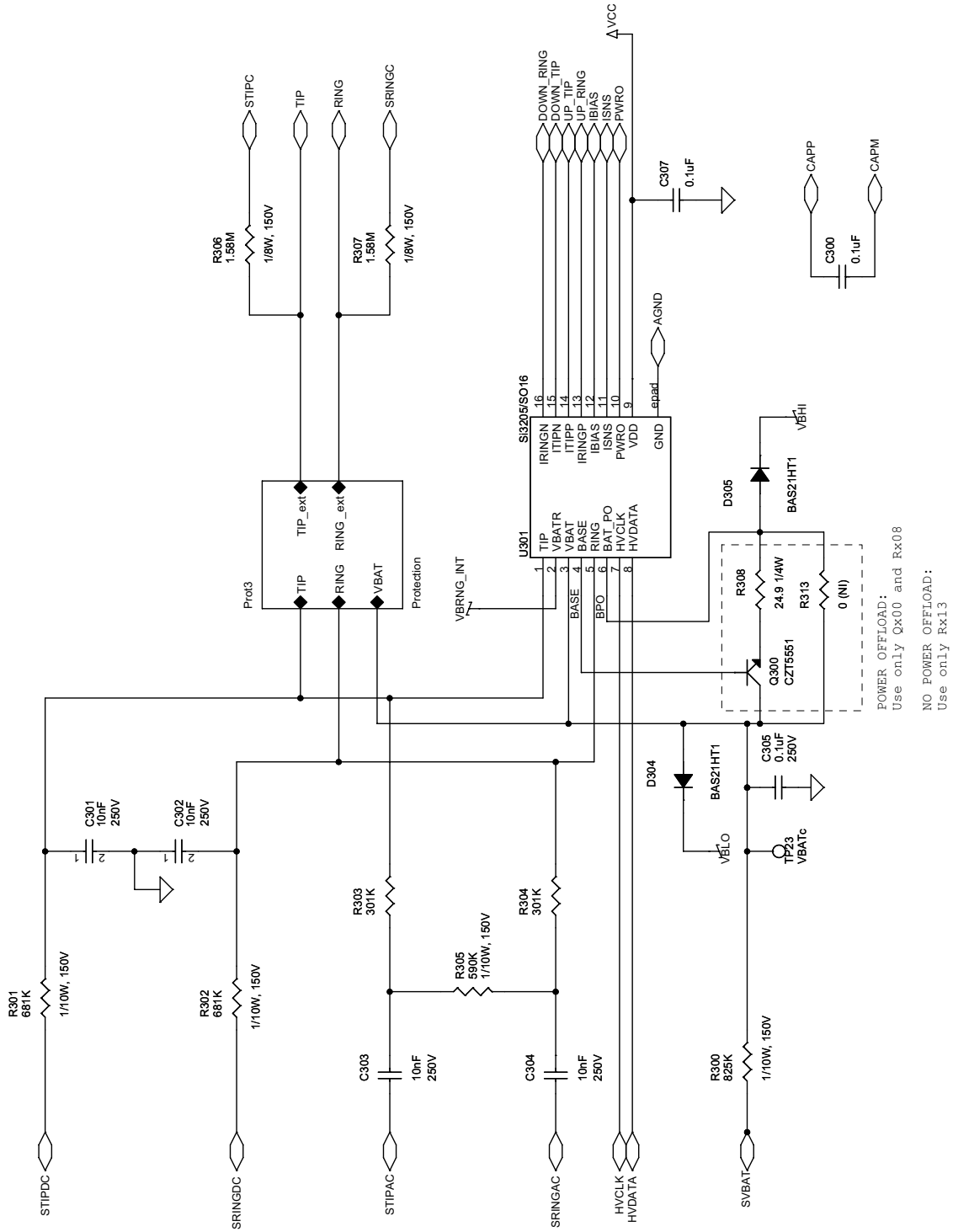


Figure 5. Si3205 Line Interface (3 of 4)

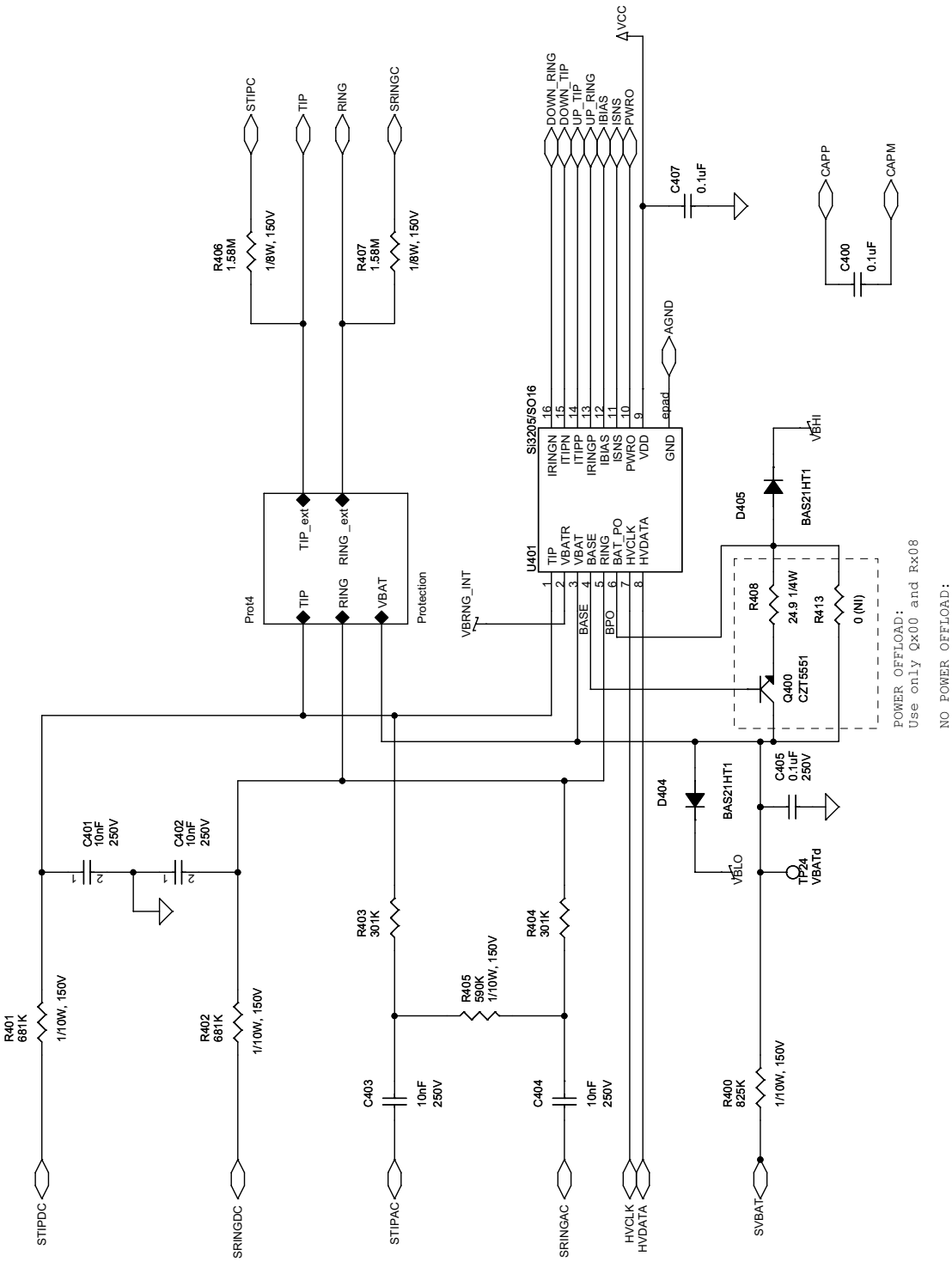


Figure 6. Si3205 Line Interface (4 of 4)

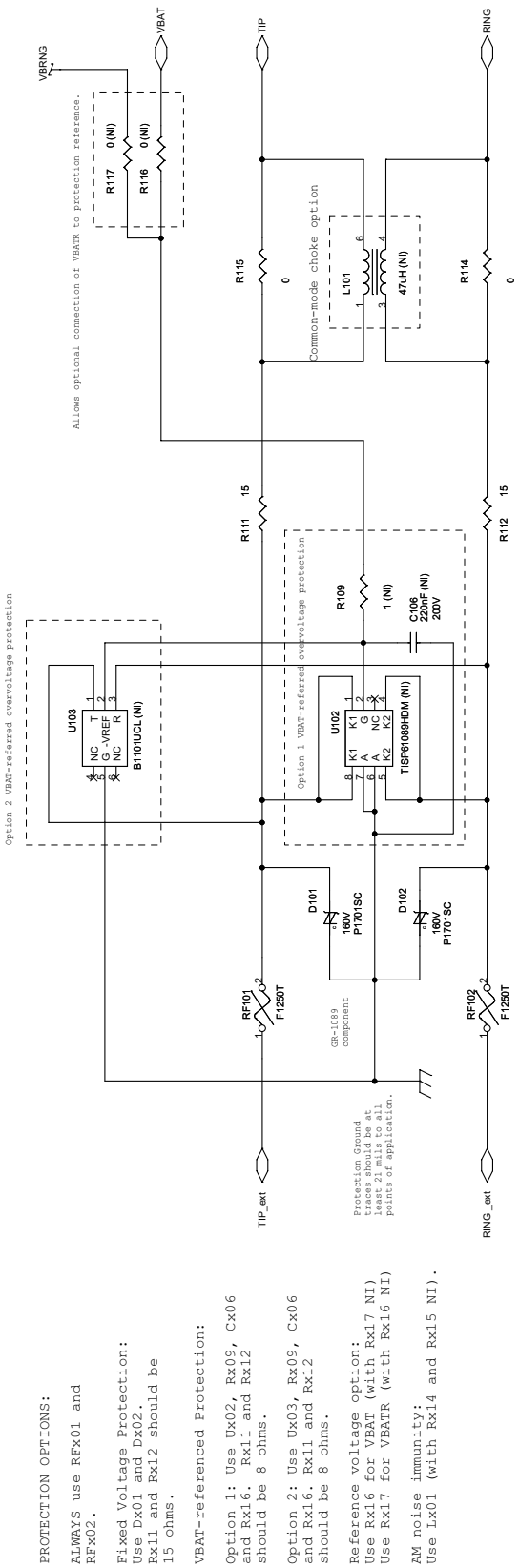
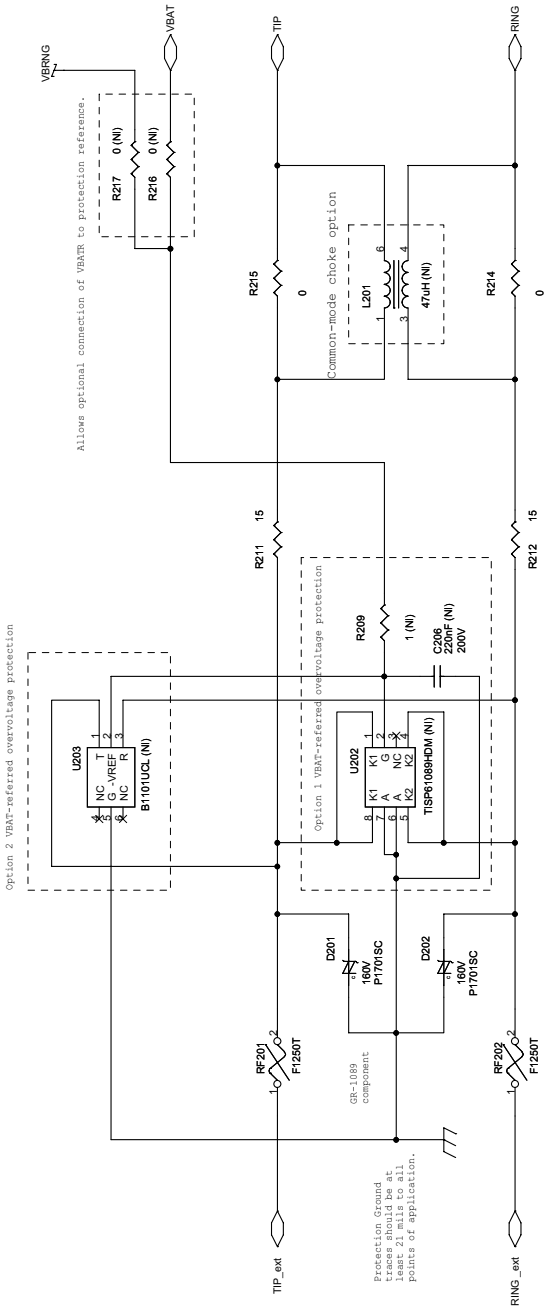


Figure 7. Daughtercard Line Protection (1 of 4)



PROTECTION OPTIONS:

ALWAYS use RFx01 and RFx02.

Fixed Voltage Protection:
Use Dx01 and Dx02.
Rx11 and Rx12 should be 15 ohms.

VBAT-referenced Protection:

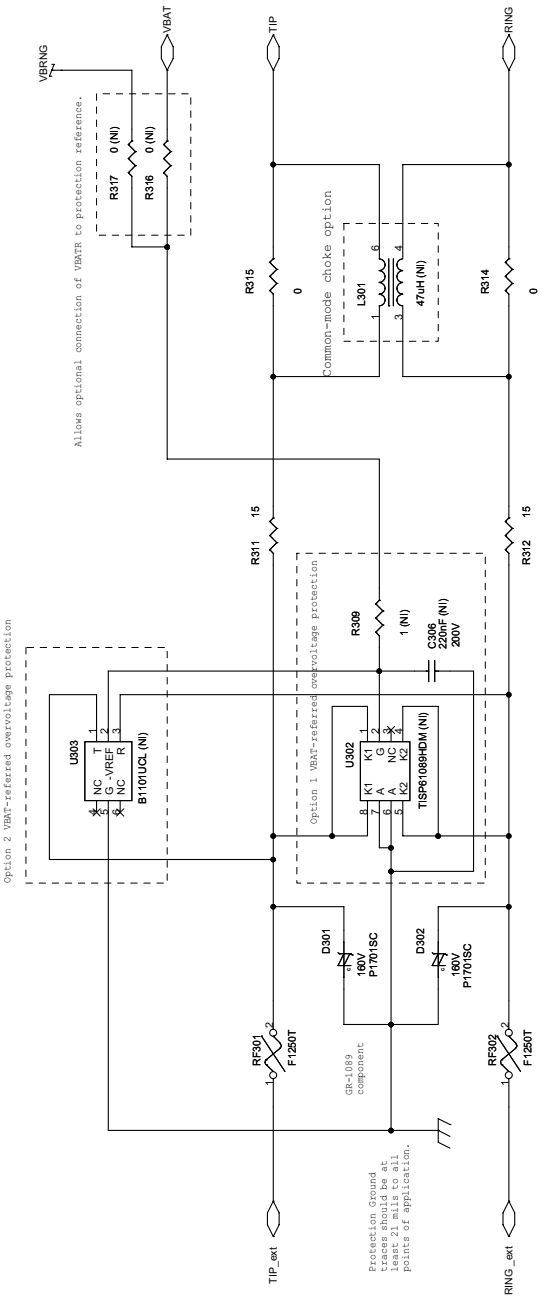
Option 1: Use Ux02, Rx09, Cx06 and Rx16. Rx11 and Rx12 should be 8 ohms.

Option 2: Use Ux03, Rx09, Cx06 and Rx16. Rx11 and Rx12 should be 8 ohms.

Reference voltage option:
Use Rx16 for VBAT (with Rx17 NI)
Use Rx17 for VBATR (with Rx16 NI)

AM noise immunity:
Use Lx01 (with Rx14 and Rx15 NI).

Figure 8. Daughtercard Line Protection (2 of 4)



PROTECTION OPTIONS:

ALWAYS use RFx01 and RFx02.

Fixed Voltage Protection:
Use Dx01 and Dx02.
Rx11 and Rx12 should be 15 ohms.

VBAT-referenced Protection:

Option 1: Use Ux02, Rx09, Cx06 and Rx16. Rx11 and Rx12 should be 8 ohms.

Option 2: Use Ux03, Rx09, Cx06 and Rx16. Rx11 and Rx12 should be 8 ohms.

Reference voltage option:
Use Rx16 for VBAT (with Rx17 NI)
Use Rx17 for VBATR (with Rx16 NI)

AM noise immunity:
Use Lx01 (with Rx14 and Rx15 NI).

Figure 9. Daughtercard Line Protection (3 of 4)

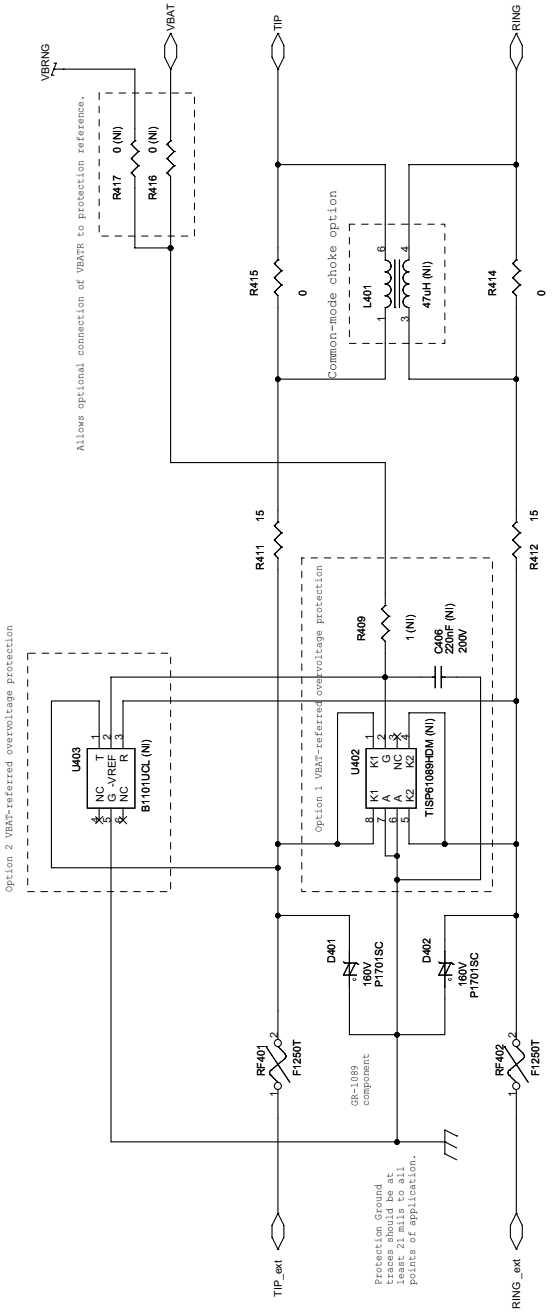


Figure 10. Daughtercard Line Protection (4 of 4)

3. Si3241DC5 Rev 1.3 Bill of Materials (Daughtercard)

Table 3. Si3241DC5 Bill of Materials (Daughtercard)

Item	NI	Qty	Reference	Value	Rating	Tol	Dielectric	PCB Footprint	Part Number	Mfr
1		4	C1,C6,C9,C10	10 µF	10 V	±10%	X7R	CC1210	C1210X7R100-106KNE	Venkel
2		14	C2,C3,C4,C5, C7,C8,C100, C107,C200, C207,C300, C307,C400, C407	0.1 µF	10 V	±10%	X7R	CC0603	C0603X7R100-104KNE	Venkel
3		1	C21	4.7 nF	25 V	±10%	X7R	CC0402	CC0402X7R250-472KN	Venkel
4		16	C101,C102, C103,C104, C201,C202, C203,C204, C301,C302, C303,C304, C401,C402, C403,C404	10 nF	250 V	±10%	X7R	CC0805	C0805X7R251-103KNE	Venkel
5		4	C105,C205, C305,C405	0.1 µF	250 V	±10%	X7R	CC1210	C1210X7R250-104KNE	Venkel
7		1	D1	MRA4003T3	300 V			SMA	MRA4003T3	On Semi
8		8	D101,D102, D201,D202, D301,D302, D401,D402	160 V	160 V			DO-214AA	P1701SC	Littelfuse
9		8	D104,D105, D204,D205, D304,D305, D404,D405	BAS21HT1	250 V			SOD-323	BAS21HT1	On Semi
10		2	JP21,JP22	HEADER3				3x1 100 mil	68000-402	Berg
11		4	JS1,JS4,JS5,J S6	SOCKET 5x2				CONN2X5-SSQ	SSQ-1-05-24-F-D	Samtec
12		1	JS2	CONN SOCKET 2x2/SM				CONN2X2-100-SSM	SSM-102-L-DV-TR	Samtec
13		1	JS3	CONN HDR 2x2/SM				CONN2X2-100-TSM	TSM-102-02-T-DV	Samtec

Table 3. Si3241DC5 Bill of Materials (Daughtercard) (Continued)

Item	NI	Qty	Reference	Value	Rating	Tol	Dielectric	PCB Footprint	Part Number	Mfr
14		4	J1,J2,J3,J4	RJ-11				RJ11-6-SMT	555077-2	AMP
15		1	J5	JUMPER				CONN-1x2	68000-402	Berg
16		1	L1	10 µH	180 mA	±10%		IND-NLC3225	NLCV32T-100K-PF	TDK
18		4	Q100,Q200,Q300,Q400	CZT5551	2 W			SOT223	CZT5551	Central Semi
19		8	RF101,RF102 RF201,RF202, RF301,RF302, RF401,RF402	F1250T	1.25 A, 600 V			FUSE-F1250T	F1250T	Littelfuse
20		1	R2	49.9 kΩ	1/10 W	±0.5%		RC0603	CR0603-10W-4993DT	Venkel
21		4	R3,R7,R8,R10	0 Ω	1/10 W	±5%		RC0603	CR0603-10W-000JT	Venkel
23		6	R9,R11,R13, R15,R16,R19	10 kΩ	1/10 W	±1%		RC0603	CR0603-10W-1002FT	Venkel
24		2	R17,R18	0 Ω	1/4 W	±5%		RC1206	CR1206-4W-000JT	Venkel
25		4	R100,R200, R300,R400	825 kΩ	1/10 W, 150 V	±1%		RC0805	CR0805-10W-8253FT	Venkel
26		8	R101,R102, R201,R202, R301,R302, R401,R402	681 kΩ	1/10 W, 150 V	±1%		RC0805	CR0805-10W-6813FT	Venkel
27		8	R103,R104, R203,R204, R303,R304, R403,R404	301 kΩ	1/10 W	±1%		RC0603	CR0603-10W-3013FT	Venkel
28		4	R105,R205, R305,R405	590 kΩ	1/10 W, 150 V	±1%		RC0805	CR0805-10W-5903FT	Venkel
29		8	R106,R107, R206,R207, R306,R307, R406,R407	1.58 MΩ	1/8 W, 150 V	±1%		RC0805	CR0805-8W-1584FT	Venkel
30		4	R108,R208, R308,R408	24.9 Ω	1/4 W	±1%		CR1206	CR1206-4W-24R9FT	Venkel
32		4	R111,R211, R311,R411	15 Ω	1/10 W	±1%		RC0805	CR0805-10W-15RFT	Venkel
33		4	R112,R212, R312,R412	15 Ω	1/10 W	±5%		RC0805	CR0805-10W-15RFT	Venkel

Table 3. Si3241DC5 Bill of Materials (Daughtercard) (Continued)

Item	NI	Qty	Reference	Value	Rating	Tol	Dielectric	PCB Footprint	Part Number	Mfr
35		8	R114,R115, R214,R215, R314,R315, R414,R415	0 Ω	1/10 W	±5%		RC0805	CR0805-10W-000JT	Venkel
37		2	TP1,TP2	Test Point	Blue			TESTPOINT	151-205	Mouser
39		1	TP15	Test Point	Black			TESTPOINT	151-203	Mouser
41		1	TP21	Test Point	Red			TESTPOINT	151-207	Mouser
44		1	U1	Si3241D				TQFP100N16X16P0.5	Si3241-D-FQ	Silicon Labs
45		4	U101,U201, U301,U401	Si3205/SO16				SO16E	Si3205-B-FS	Silicon Labs
Uninstalled Components										
6	NI	4	C106,C206, C306,C406	220 nF (NI)	200 V	±10%	X7R	CC1812	18122C224KATA	AVX
17	NI	4	L101,L201, L301,L401	47 µH (NI)				PE-68624	PE-68624	Pulse
22	NI	4	R4,R5,R6,R12	0 (NI)	1/10 W	±5%		RC0603	CR0603-10W-000JT	Venkel
31	NI	4	R109,R209, R309,R409	1 (NI)	1/4 W	±5%		RC1206	CR1206-4W-1R0J	Venkel
34	NI	4	R113,R213, R313,R413	0 (NI)	1/10 W	±5%		RC0603	CR0603-10W-000JT	Venkel
36	NI	8	R116,R117, R216,R217, R316,R317, R416,R417	0 (NI)	1/10 W	±5%		RC0805	CR0805-10W-000JT	Venkel
38	NI	6	TP3,TP4,TP5, TP6,TP7,TP8	Test Point (NI)	Blue			TESTPOINT	151-205	Mouser
40	NI	4	TP16,TP17, TP18,TP19	Test Point (NI)	Black			TESTPOINT	151-203	Mouser
42	NI	3	TP22,TP23, TP24	Test Point (NI)	Red			TESTPOINT	151-207	Mouser

Table 3. Si3241DC5 Bill of Materials (Daughtercard) (Continued)

Item	NI	Qty	Reference	Value	Rating	Tol	Dielectric	PCB Footprint	Part Number	Mfr
43	NI	10	TP25,TP26, TP27,TP28, TP29,TP30, TP31,TP32, TP33,TP34	Test Point (NI)				TESTPOINT	151-205	Mouser
46	NI	4	U102,U202, U302,U402	TISP61089HDM (NI)				SO8	TISP61089HDM	Bourns
47	NI	4	U103,U203, U303,U403	B1101UCL (NI)				MS-013 mod	B1101UCL	Littelfuse

4. Si3241DC5 Rev 1.3 Daughtercard PCB Layout

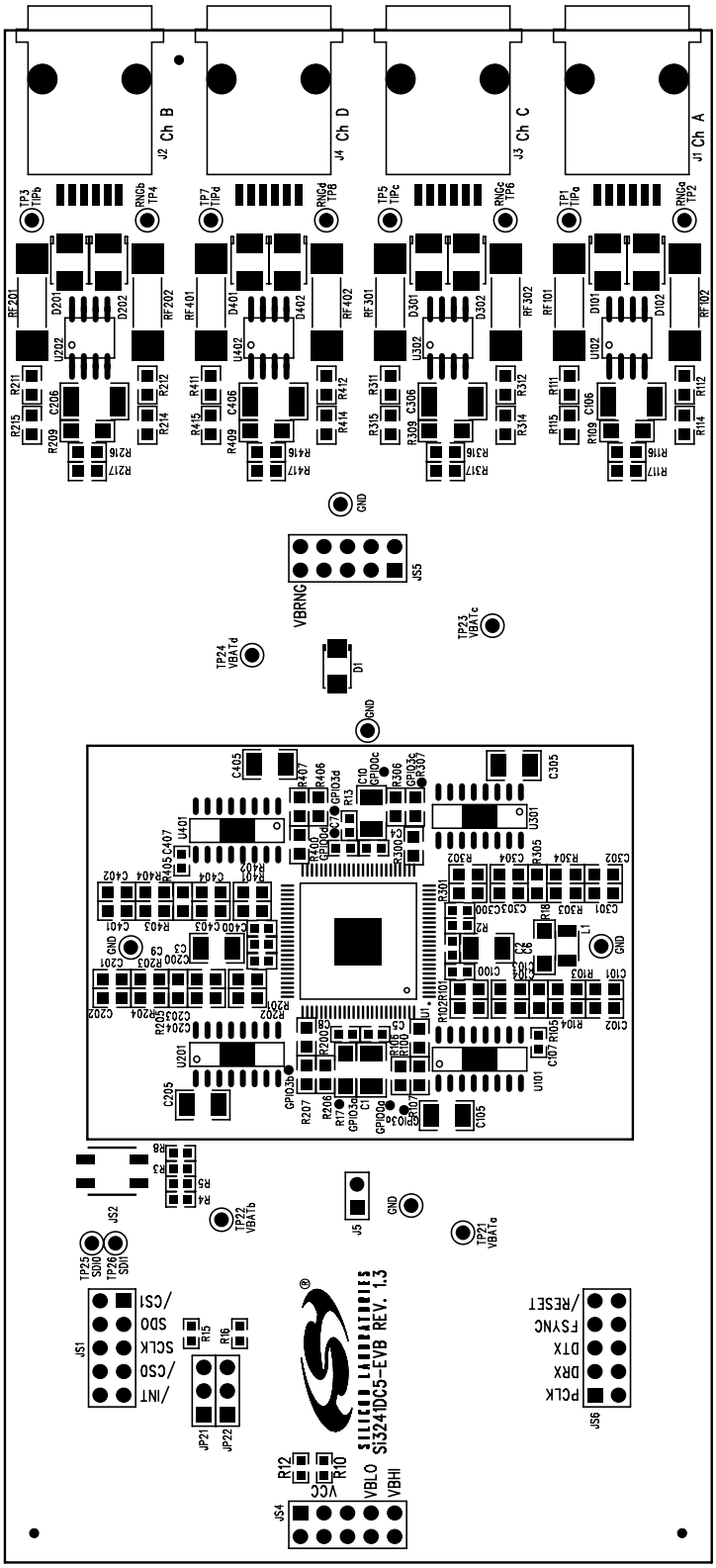


Figure 11. Daughtercard Primary Assembly

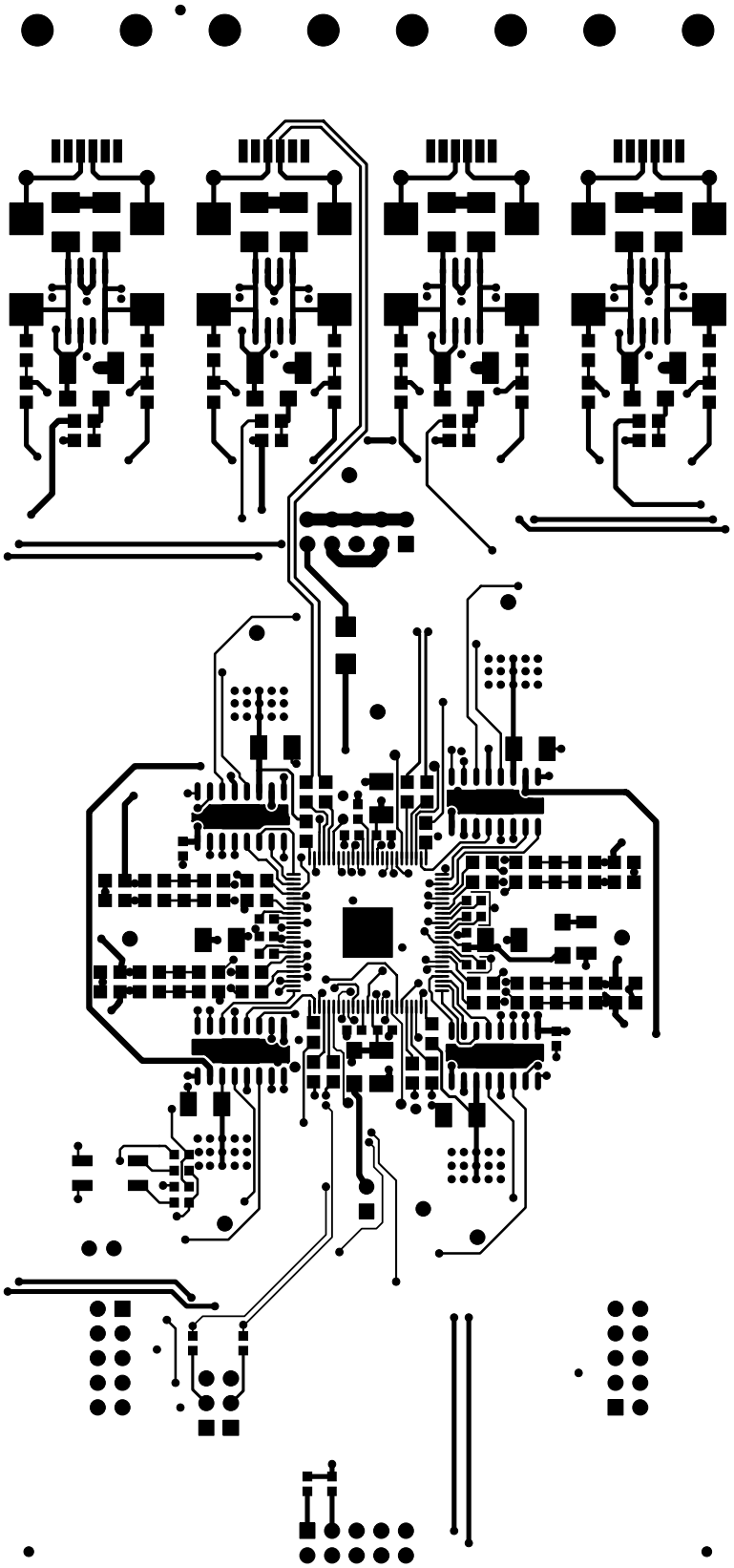


Figure 12. Daughtercard Primary Side

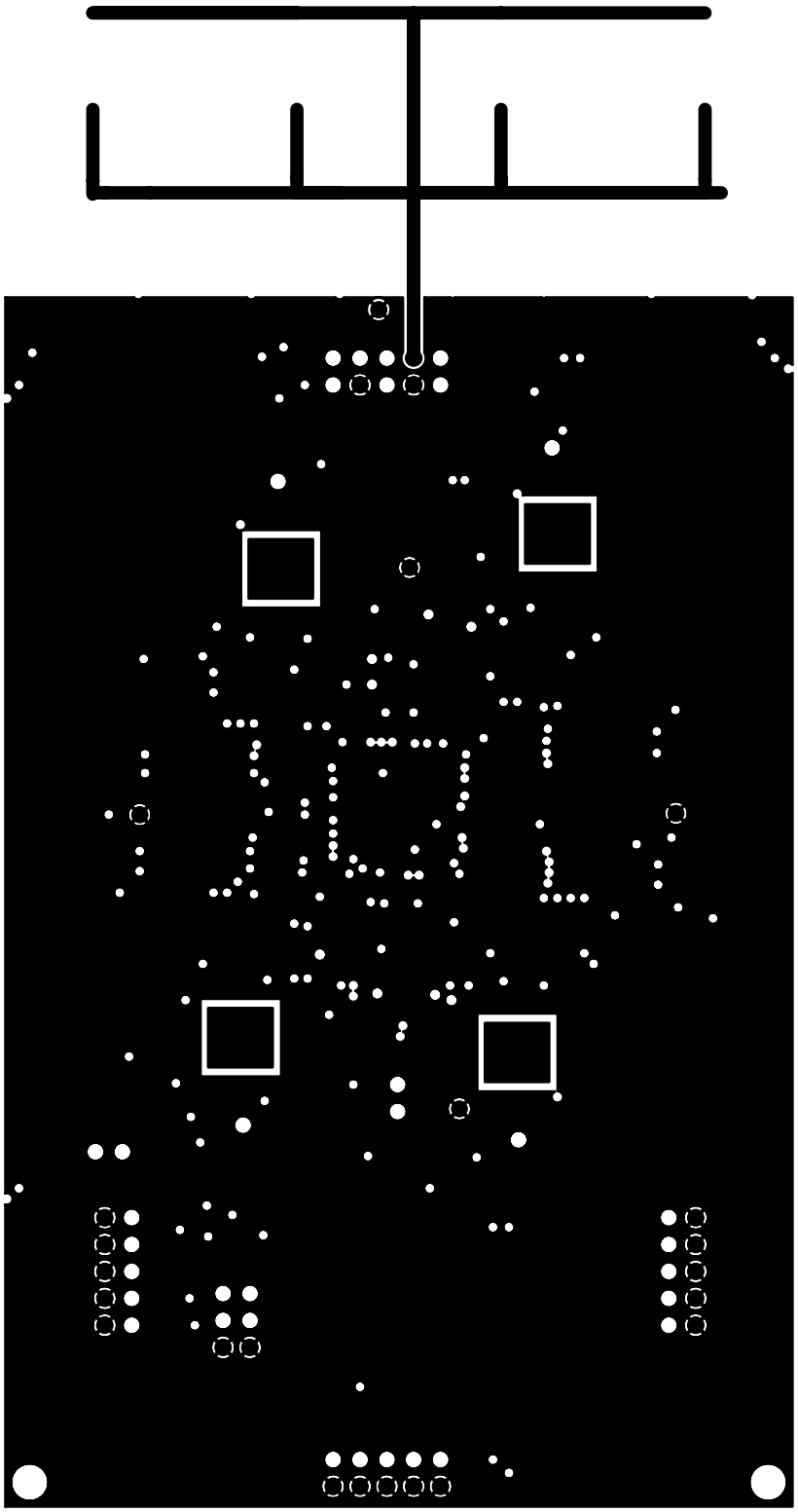


Figure 13. Daughtercard Layer 2 (GND)

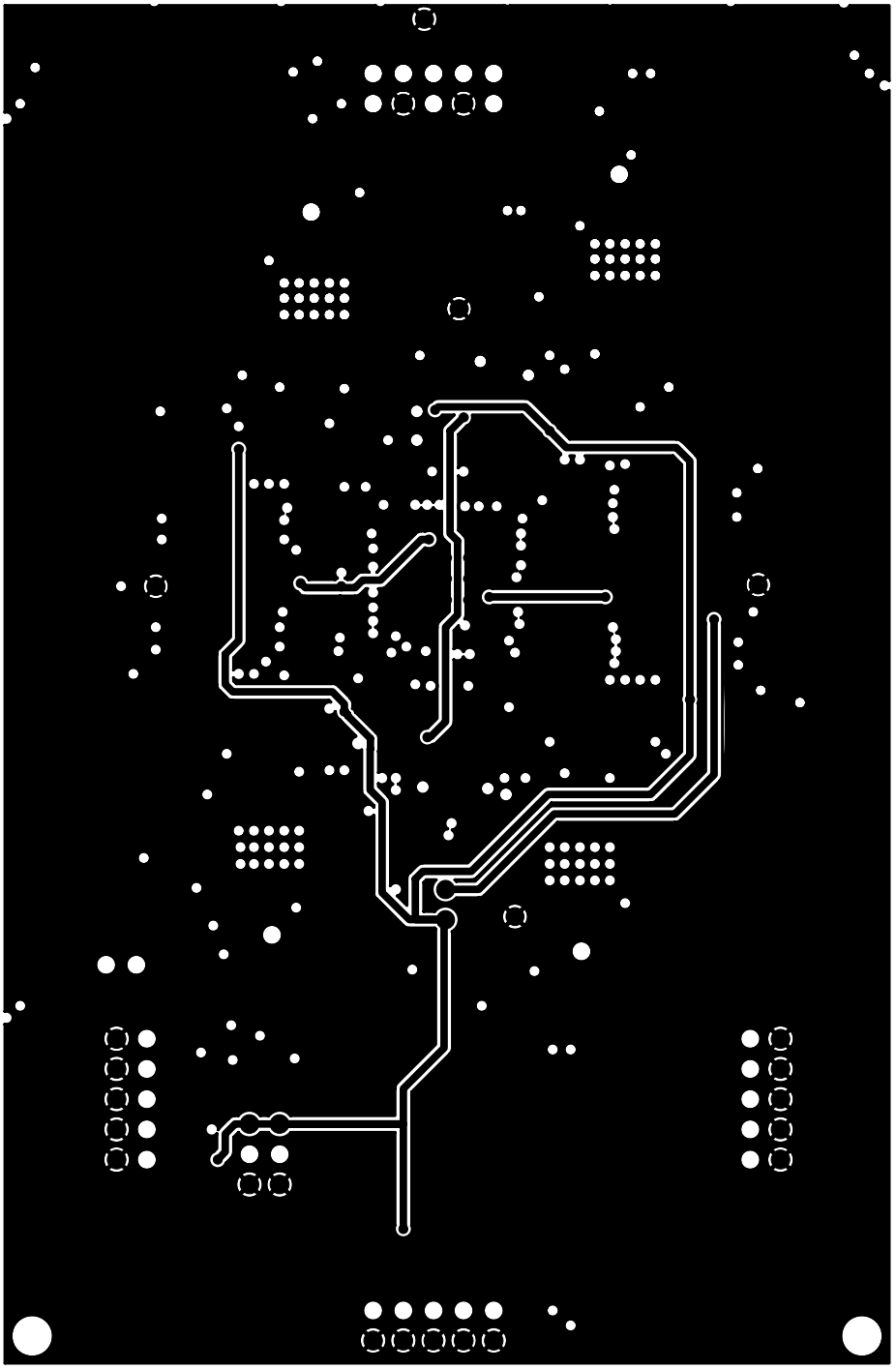


Figure 14. Daughtercard Layer 3 (VCC)

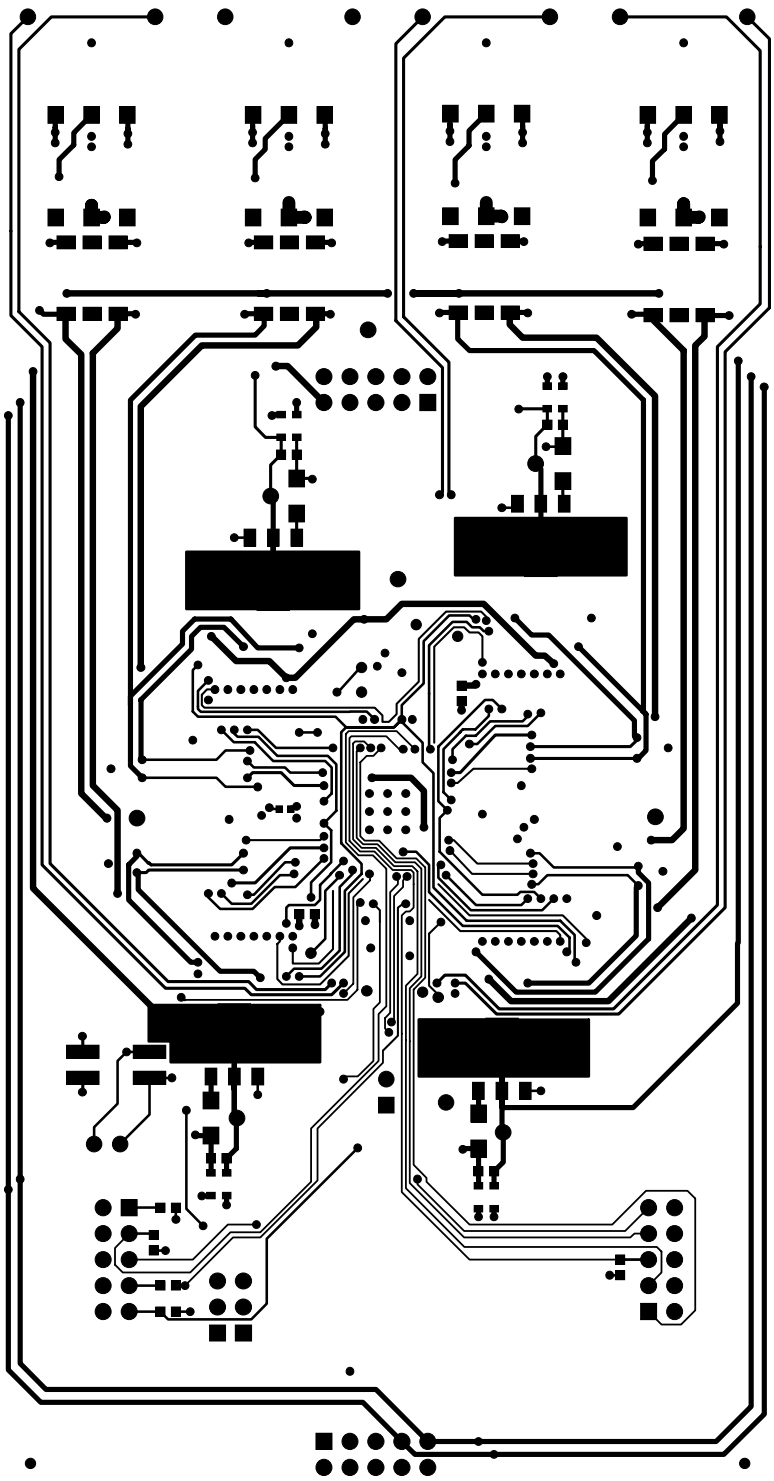


Figure 15. Daughtercard Secondary Side

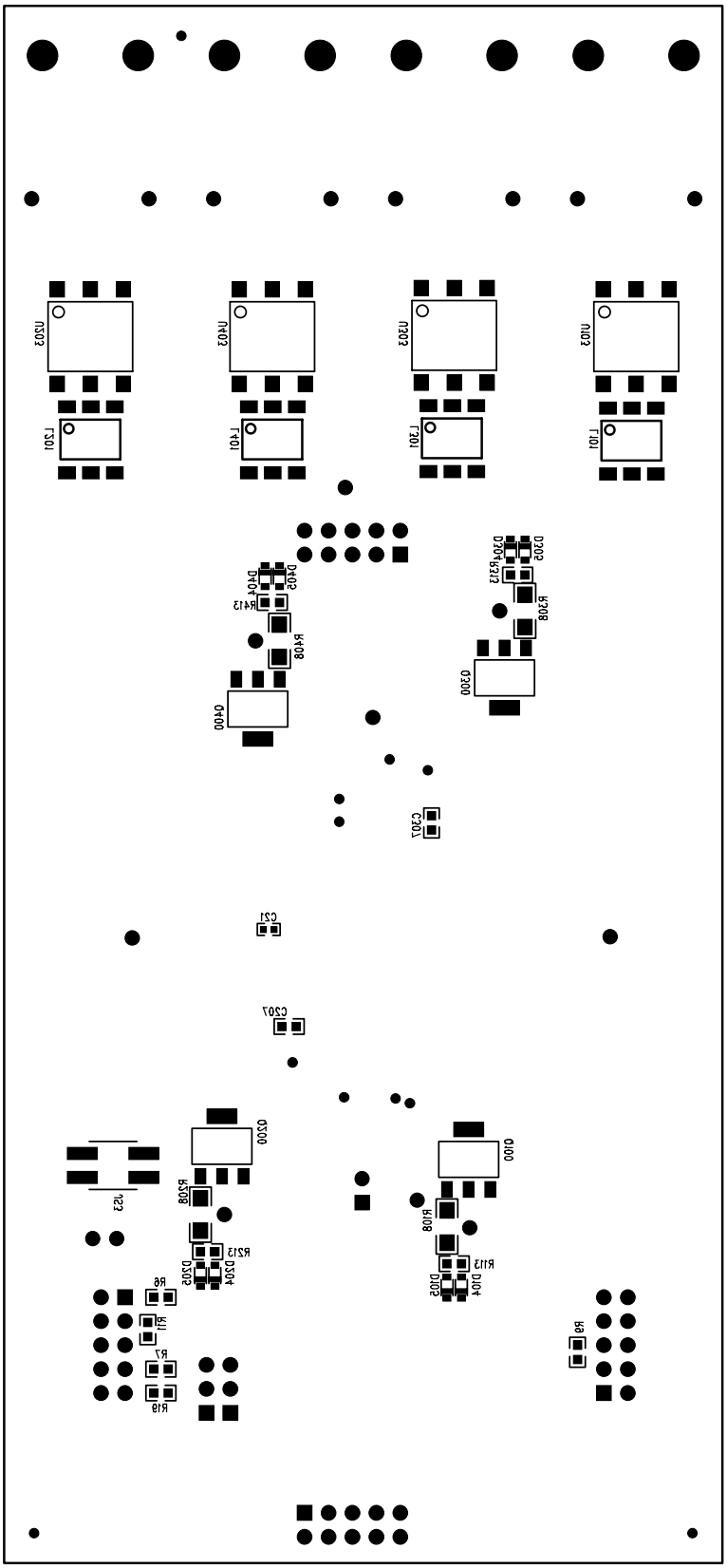


Figure 16. Daughtercard Secondary Assembly

5. Si3241DC6 Rev 1.2 Daughtercard Schematics

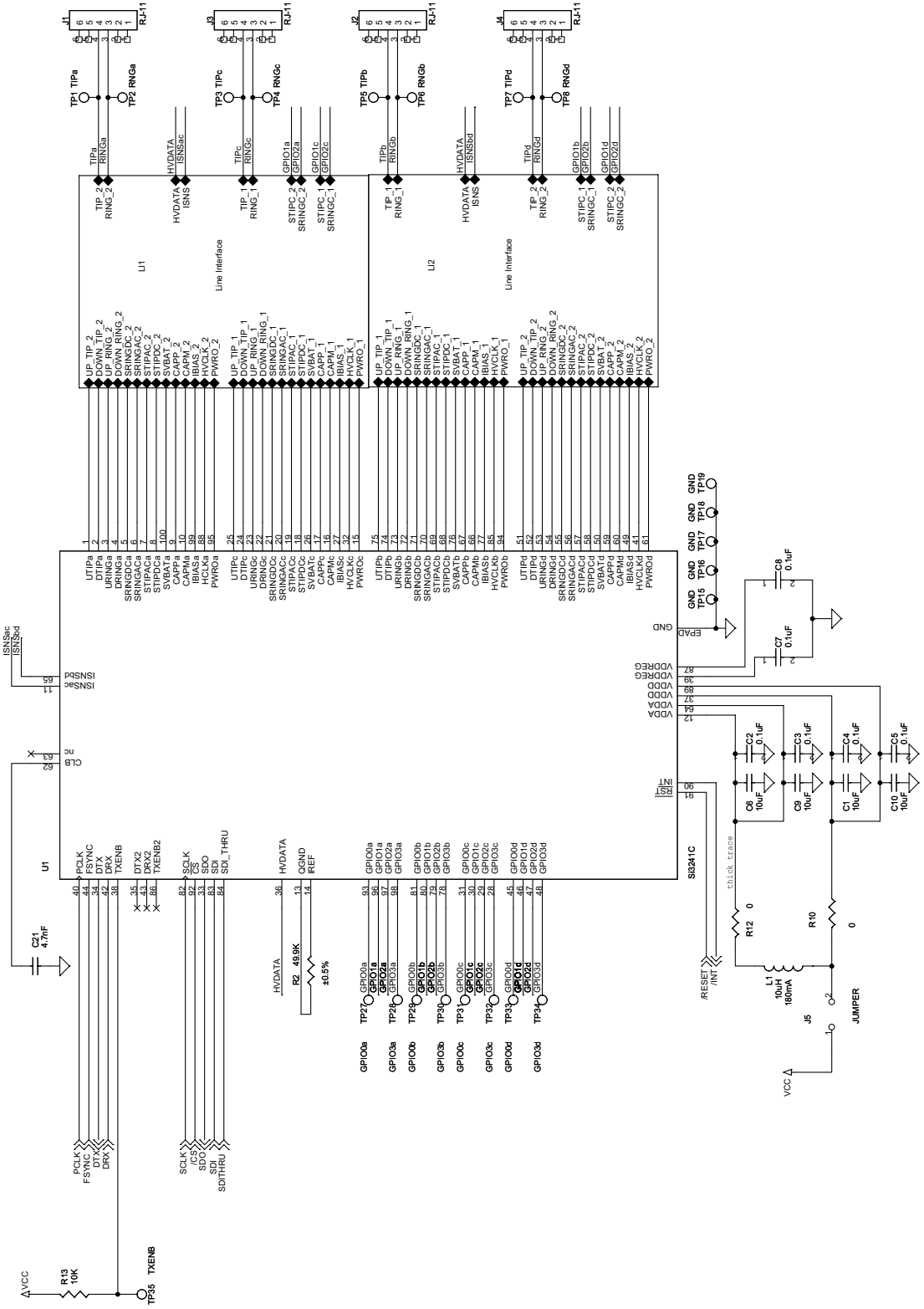
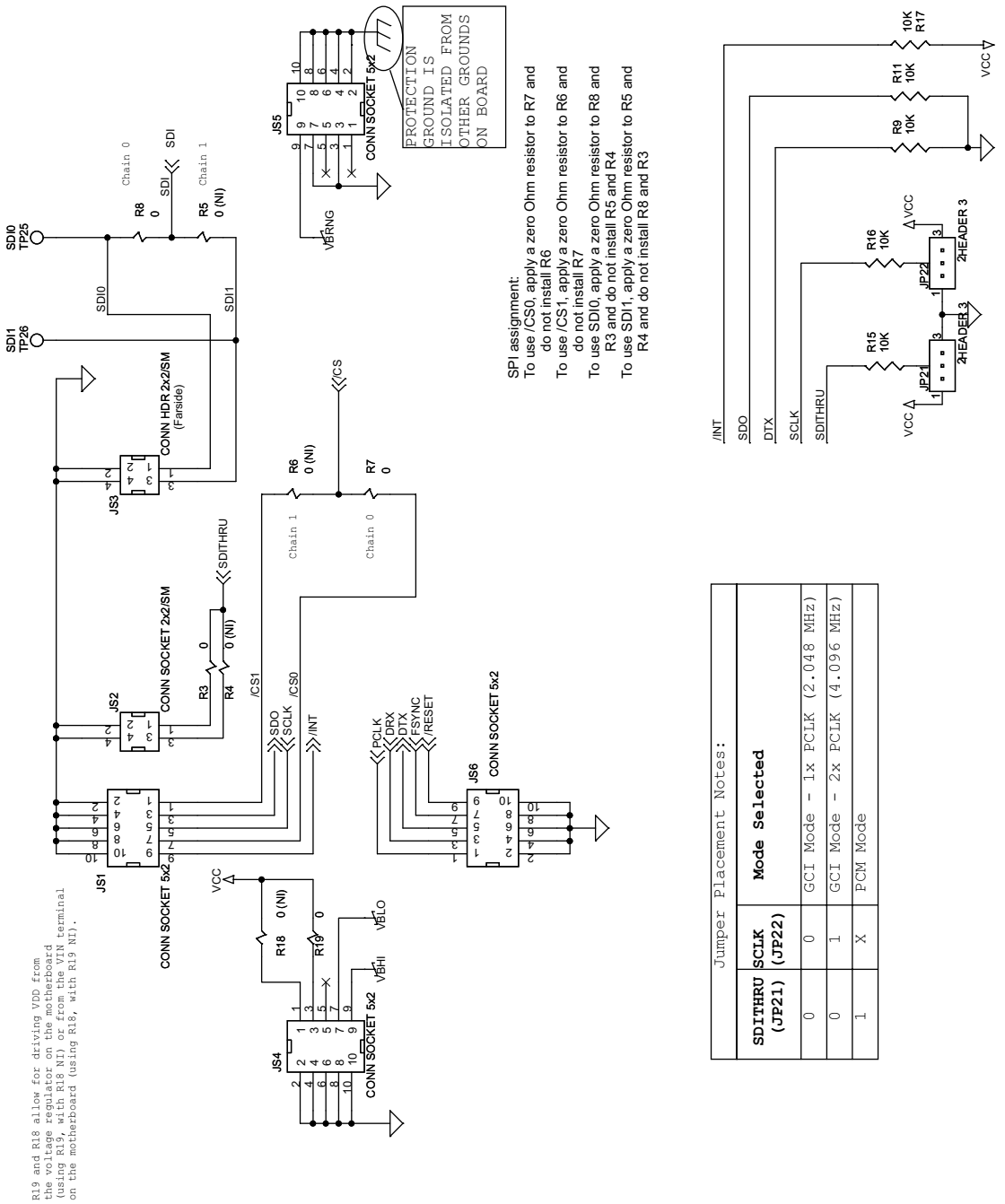


Figure 17. Si3241DC6 Daughtercard Primary



Jumper Placement Notes:

SDITHRU (JP21)	SCLK (JP22)	Mode Selected
0	0	GCI Mode – 1x PCLK (2.048 MHz)
0	1	GCI Mode – 2x PCLK (4.096 MHz)
1	X	PCM Mode

Figure 18. Daughtercard Interconnect

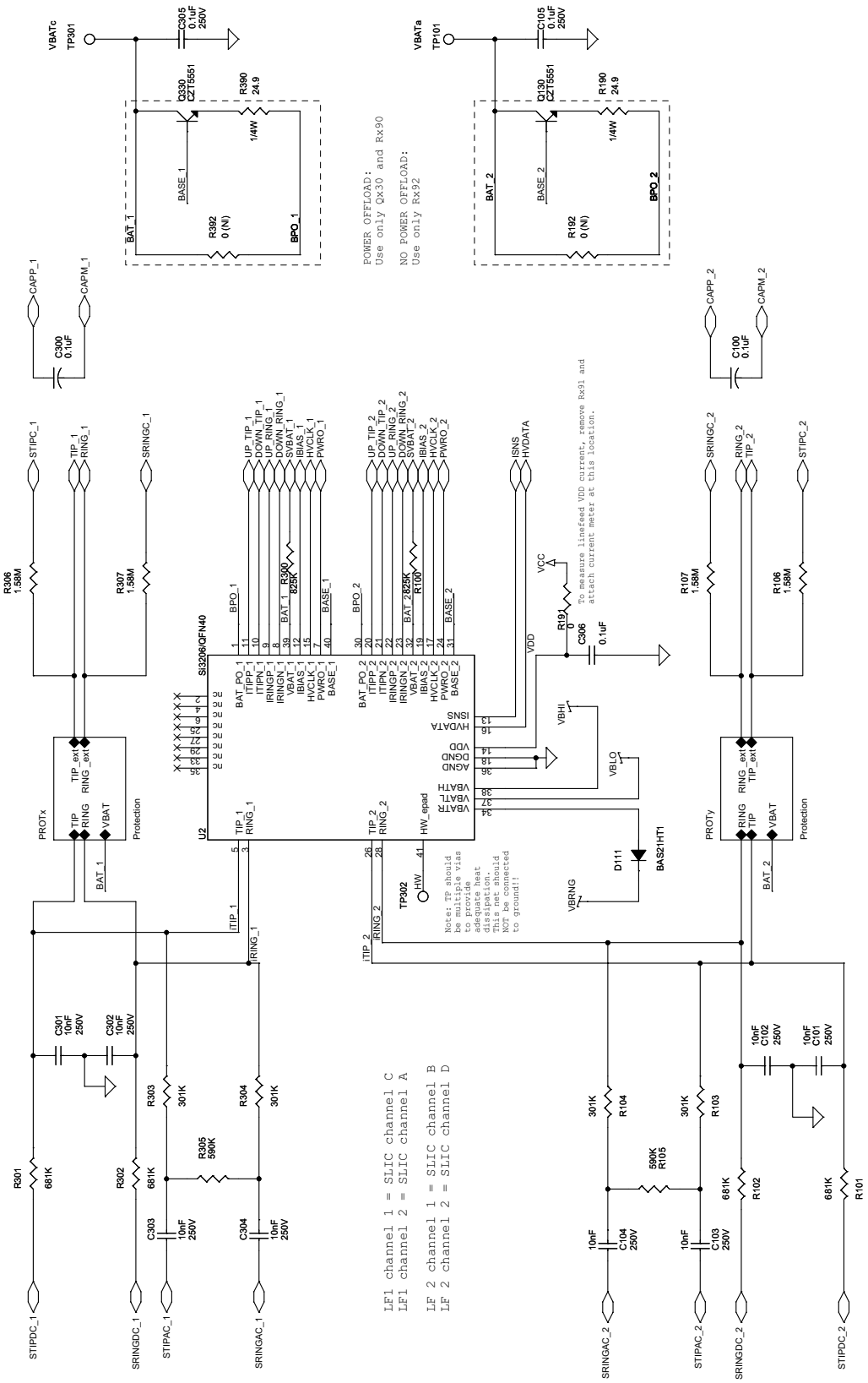


Figure 19. Si3206 Line Interface (1 of 2)

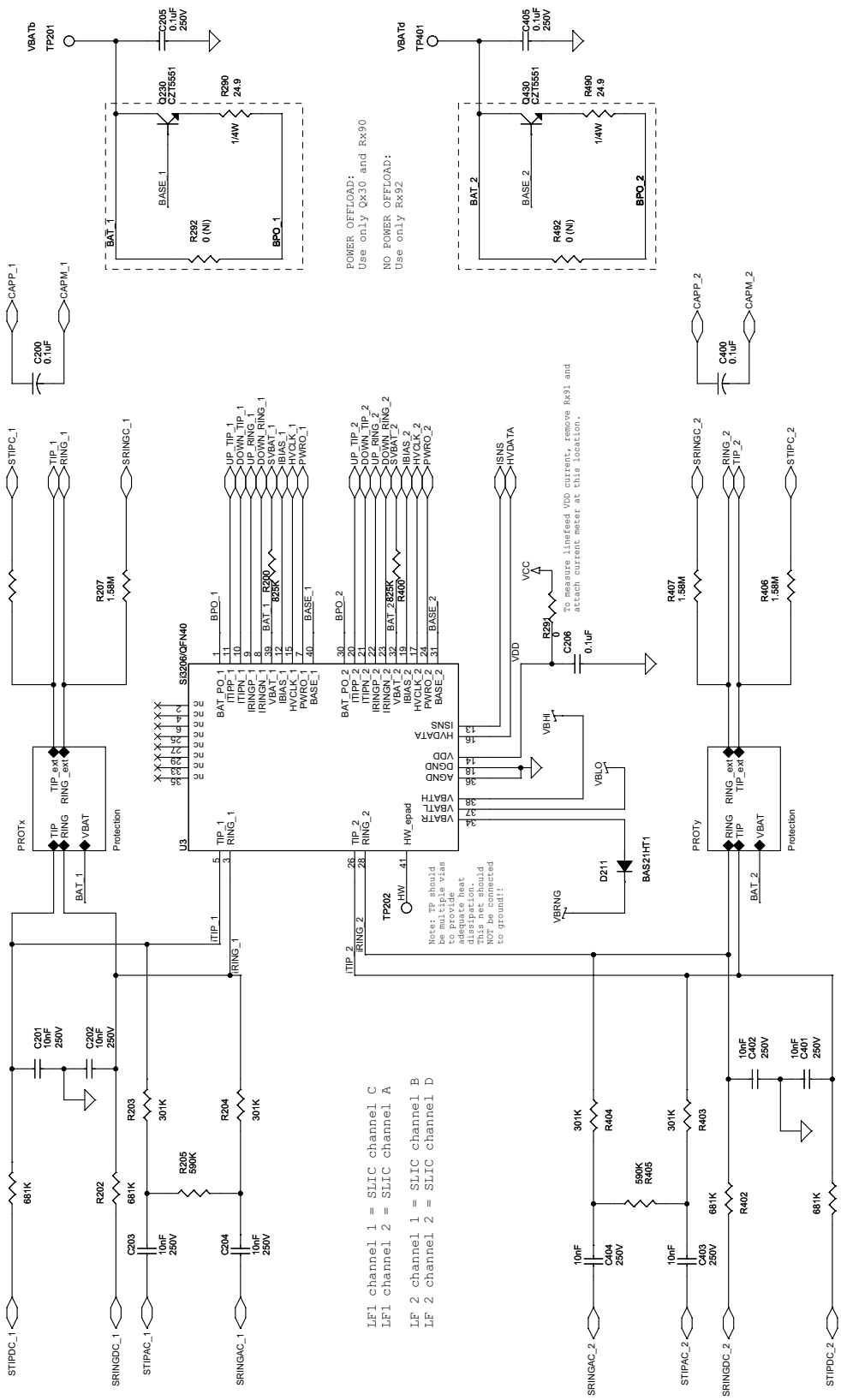


Figure 20. Si3206 Line Interface (2 of 2)

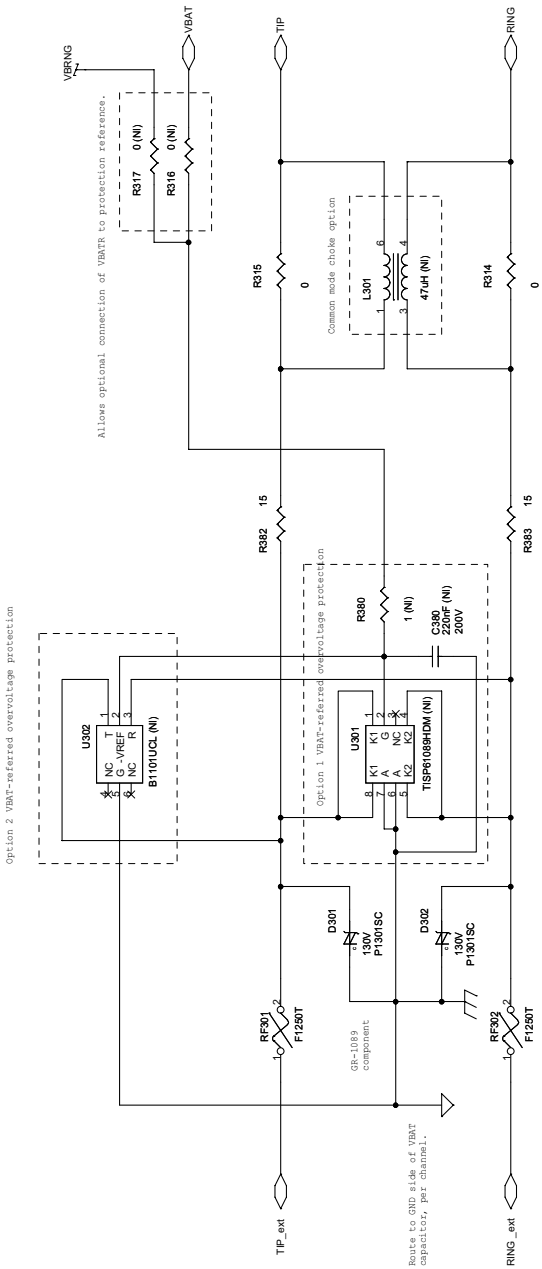


Figure 21. Daughtercard Line Protection (1 of 4)

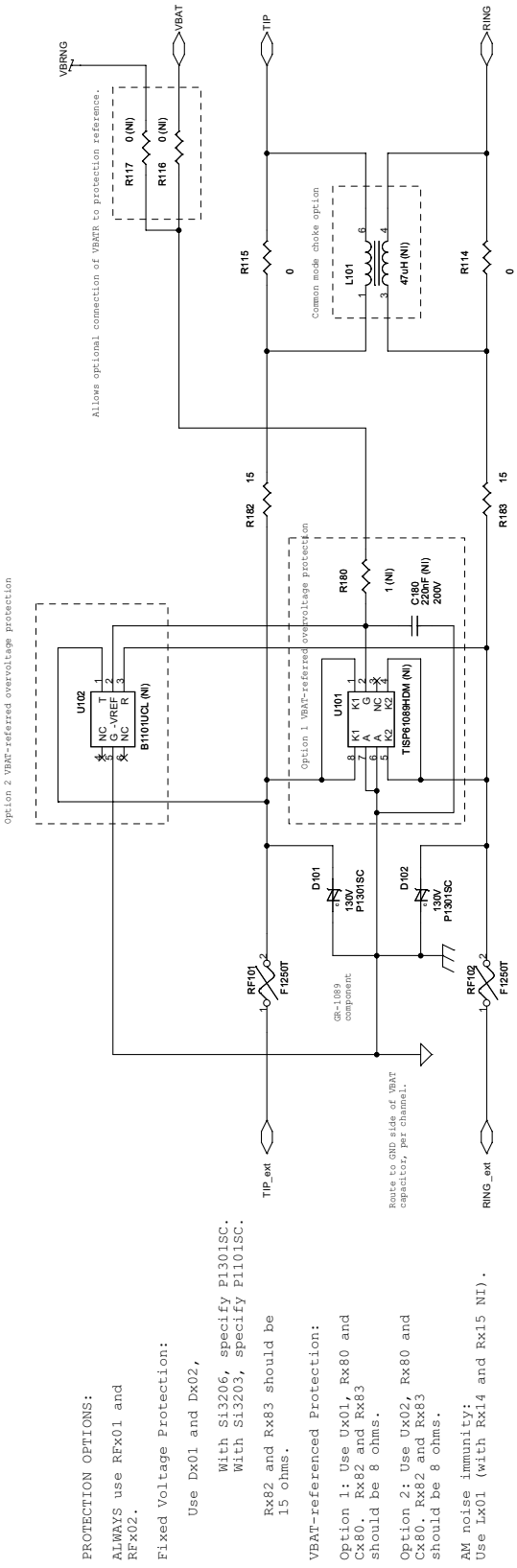


Figure 22. Daughtercard Line Protection (2 of 4)

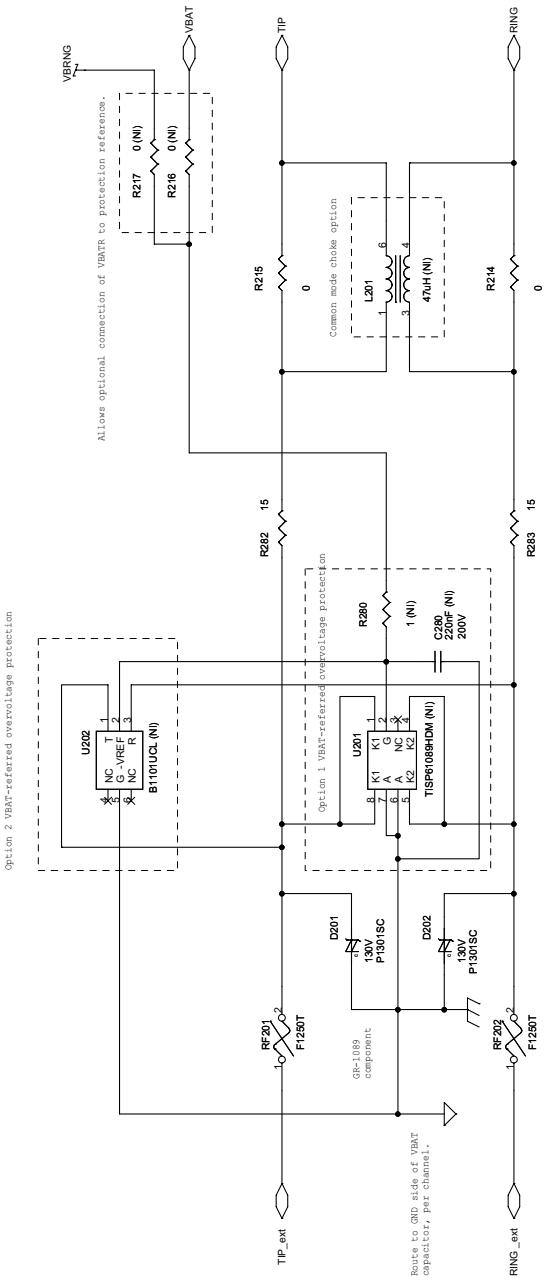


Figure 23. Daughtercard Line Protection (3 of 4)

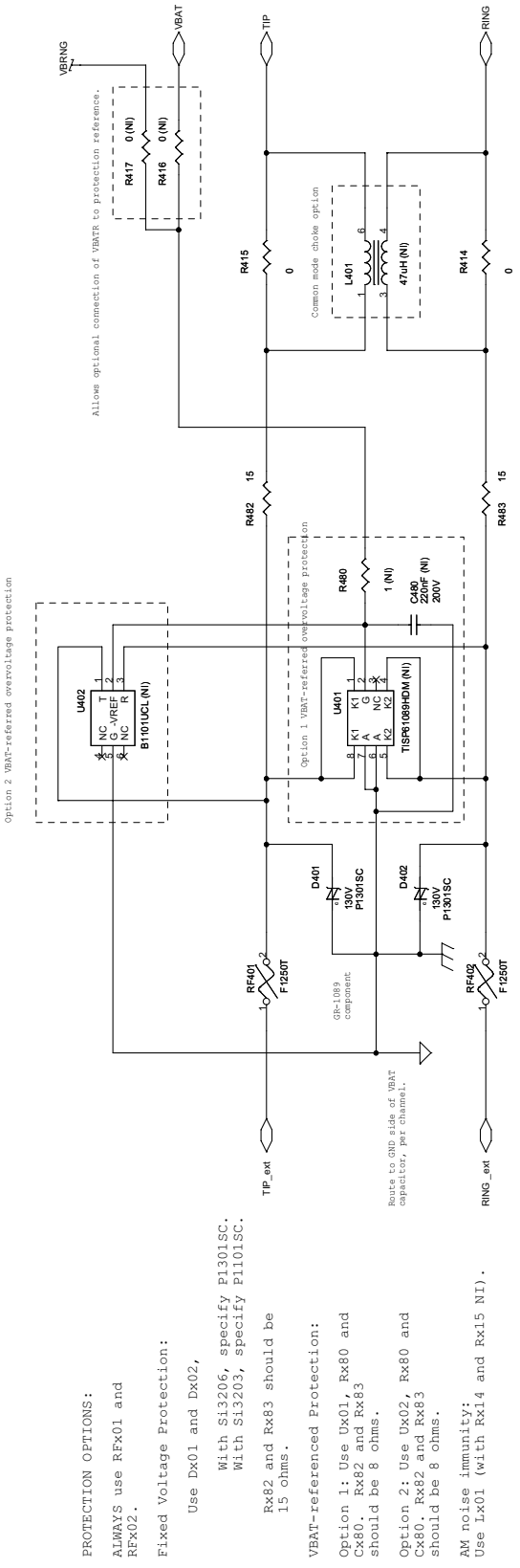


Figure 24. Daughtercard Line Protection (4 of 4)

6. Si3241DC6 Rev 1.2 Bill of Materials (Daughtercard)

Table 4. Si3241DC6 Bill of Materials (Daughtercard)

Item	NI	Qty	Ref	Value	Rating	Tol	Dielectric	PCB Footprint	Part Number	Mfr
1		4	C1,C6,C9,C10	10 µF	10 V	±10%	X7R	CC1210	C1210X7R100-106KNE	Venkel
2		12	C2,C3,C4,C5, C7,C8,C100, C200,C206, C300,C306, C400	0.1 µF	10 V	±10%	X7R	CC0603	C0603X7R100-104KNE	Venkel
3		1	C21	4.7 nF	25 V	±10%	X7R	CC0402	CC0402X7R250-472KN	Venkel
4		16	C101,C102, C103,C104, C201,C202, C203,C204, C301,C302, C303,C304, C401,C402, C403,C404	10 nF	250 V	±10%	X7R	CC0805	C0805X7R251-103KNE	Venkel
5		4	C105,C205, C305,C405	0.1 µF	250 V	±20%	X7R	CC1210	C1210X7R251-104MN	Venkel
7		8	D101,D102, D201,D202, D301,D302, D401,D402	130 V	130 V			DO-214AA	P1301SC	Littel-fuse
8		2	D111,D211	BAS21HT1	250 V			SOD-323	BAS21HT1	On Semi
9		2	JP21,JP22	HEADER 3				3x1 100 mil	68000-402	Berg
10		4	JS1,JS4, JS5,JS6	CONN SOCKET 5x2				CONN2X5-SSQ	SSQ-1-05-24-F-D	Samtec
11		1	JS2	CONN SOCKET 2x2/SM				CONN2X2-100-SSM	SSM-102-L-DV-TR	Samtec
12		1	JS3	CONN HDR 2x2/SM				CONN2X2-100-TSM	TSM-102-02-T-DV	Samtec
13		4	J1,J2,J3,J4	RJ-11				RJ11-6-SMT	555077-2	AMP
14		1	J5	JUMPER				CONN-1X2		
15		1	L1	10 µH	180 mA	±10%		IND-NLC3225	NLCV32T-100K-PF	TDK
17		4	Q130,Q230, Q330,Q430	CZT5551	2 W			SOT-223	CZT5551	Central Semi

Table 4. Si3241DC6 Bill of Materials (Daughtercard) (Continued)

Item	NI	Qty	Ref	Value	Rating	Tol	Dielectric	PCB Footprint	Part Number	Mfr
18		8	RF101,RF102, RF201,RF202, RF301,RF302, RF401,RF402	F1250T	1.25 A, 600 V			FUSE-F1250T	F1250T	Littel-fuse
19		1	R2	49.9 kΩ	1/16 W	±0.5 %		RC0603	CR0603-16W-4992DT	Venkel
20		6	R3,R7,R8,R19, R191,R291	0 Ω	1/10 W	±5%		RC0603	CR0603-10W-000JT	Venkel
22		6	R9,R11,R13, R15,R16,R17	10 kΩ	1/10 W	±1%		RC0603	CR0603-10W-1002FT	Venkel
23		2	R10,R12	0 Ω	1/4 W	±5%		RC1206	CR1206-4W-000JT	Venkel
24		4	R100,R200, R300,R400	825 kΩ	1/10 W	±1%		RC0805	CR0805-10W-8253FT	Venkel
25		8	R101,R102, R201,R202, R301,R302, R401,R402	681 kΩ	1/10 W	±1%		RC0805	CR0805-10W-6813FT	Venkel
26		8	R103,R104, R203,R204, R303,R304, R403,R404	301 kΩ	1/10 W	±1%		RC0603	CR0603-10W-3013FT	Venkel
27		4	R105,R205, R305,R405	590 kΩ	1/10 W	±1%		RC0805	CR0805-10W-5903FT	Venkel
28		8	R106,R107, R206,R207, R306,R307,R406,R407	1.58 MΩ	1/8 W	±1%		RC1206	CR1206-8W-1584FT	Venkel
29		8	R114,R115, R214,R215, R314,R315, R414,R415	0 Ω	1/10 W	±5%		RC0805	CR0805-10W-000JT	Venkel
32		8	R182,R183, R282,R283, R382,R383, R482,R483	15 Ω	1/10 W	±1%		RC0805	CR0805-10W-15R0FT	Venkel
33		4	R190,R290, R390,R490	24.9 Ω	1/4 W	±1%		RC1206	CR1206-4W-24R9FT	Venkel

Table 4. Si3241DC6 Bill of Materials (Daughtercard) (Continued)

Item	NI	Qty	Ref	Value	Rating	Tol	Dielectric	PCB Footprint	Part Number	Mfr
34		3	TP1,TP2,TP15	Test Point				TESTPOINT	151-205	Mouser
37		1	TP101	Test Point (NI)				Test Point	151-205	Mouser
38		1	U1	Si3241C				TQFP100N16X16P0.5	Si3241-D-FQ	SiLABS
39		2	U2,U3	Si3206/QFN40				QFN40N6X6-0.5P	Si3206-A-FM	SiLABS
Uninstalled Components										
6	NI	4	C180,C280, C380,C480	220 nF (NI)	200 V	±10%	X7R	CC1812	18122C224KATA	AVX
16	NI	4	L101,L201, L301,L401	47 µH (NI)				PE-68624	PE-68624	Pulse
21	NI	8	R4,R5,R6,R18, R192,R292, R392,R492	0 (NI)	1/10 W	±5%		RC0603	CR0603-10W-000JT	Venkel
30	NI	8	R116,R117, R216,R217, R316,R317, R416,R417	0 (NI)	1/10 W	±5%		RC0805	CR0805-10W-000JT	Venkel
31	NI	4	R180,R280, R380,R480	1 (NI)	1/4 W	±5%		RC1206	CR1206-4W-1R0J	Venkel
35	NI	13	TP3,TP4,TP5, TP6,TP7,TP8, TP16,TP17, TP18,TP19, TP25,TP26, TP35	Test Point (NI)				TESTPOINT	151-205	Mouser
36	NI	13	TP27,TP28, TP29,TP30, TP31,TP32, TP33,TP34, TP201,TP202, TP301,TP302, TP401	Test Point (NI)				Test Point	151-205	Mouser
40	NI	4	U101,U201, U301,U401	TISP61089HDM (NI)				SO8-210	TISP61089HDM	Bourns
41	NI	4	U102,U202, U302,U402	B1101UCL (NI)				MS-013 mod	B1101UCL	Littel-fuse

7. Si3241DC6 Rev 1.2 Daughtercard PCB Layout

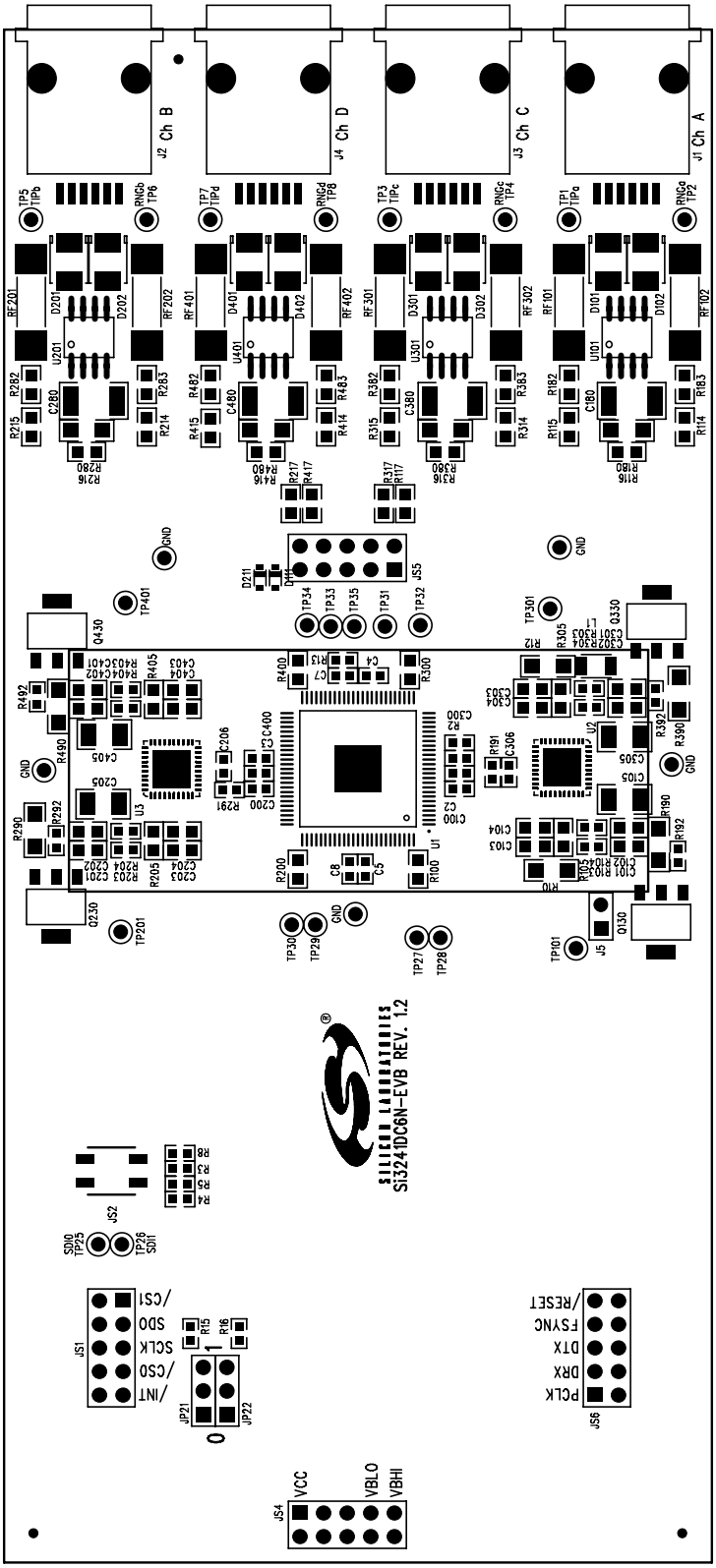


Figure 25. Daughtercard Primary Assembly

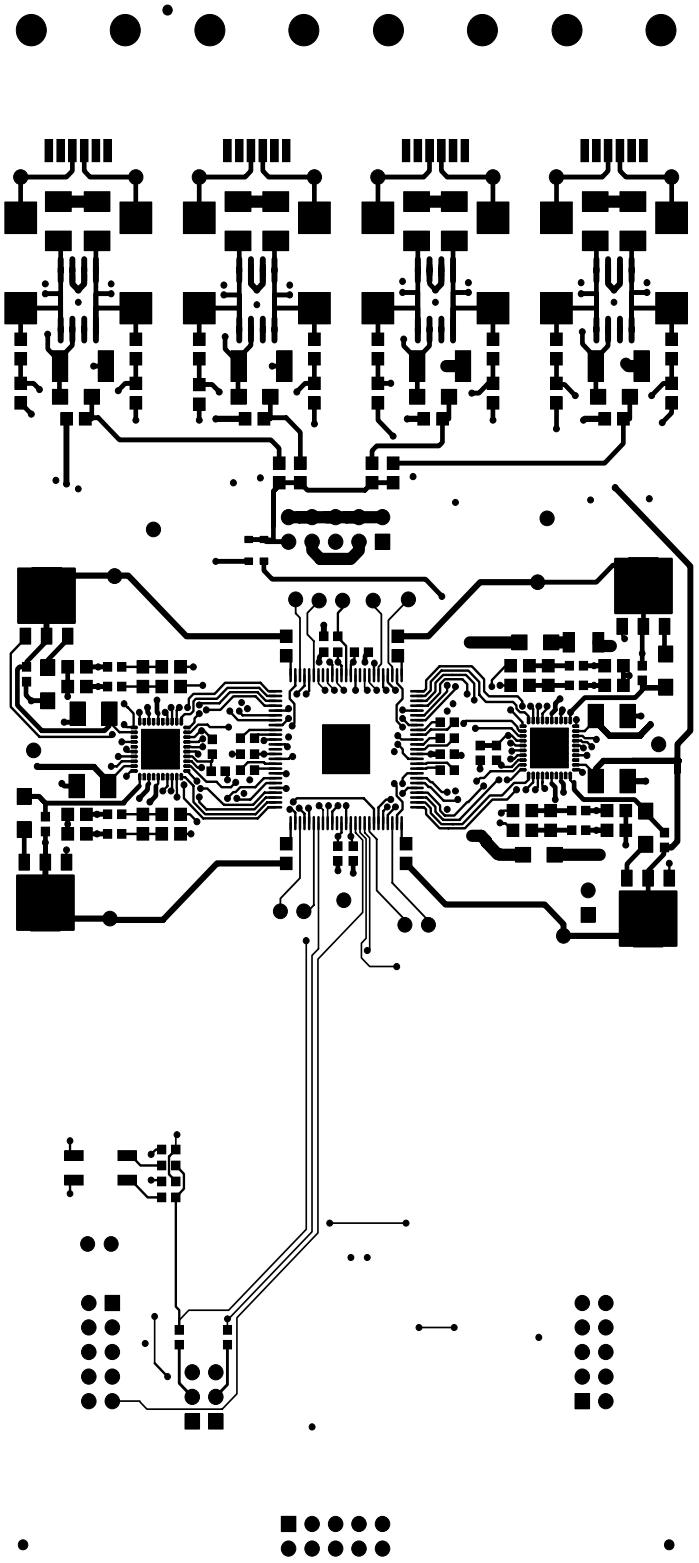


Figure 26. Daughtercard Primary Side

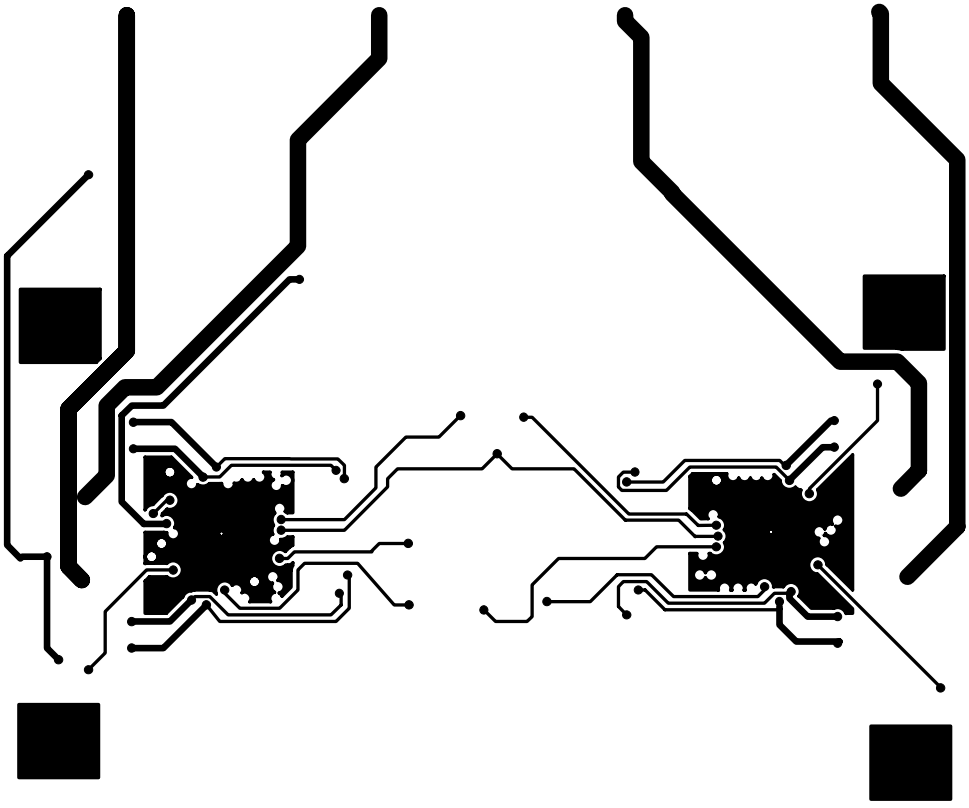


Figure 27. Daughtercard Layer 3

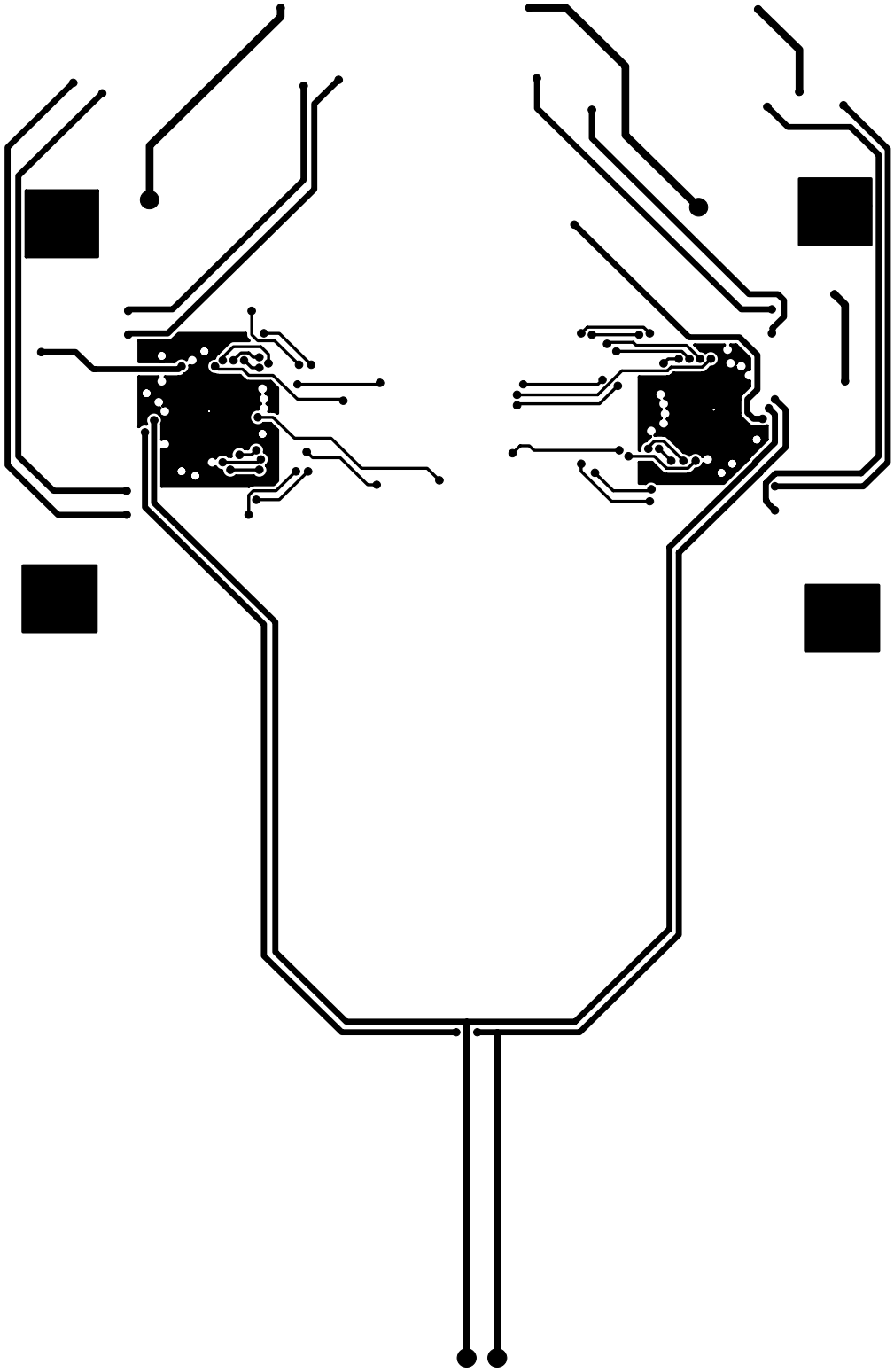


Figure 28. Daughtercard Layer 4

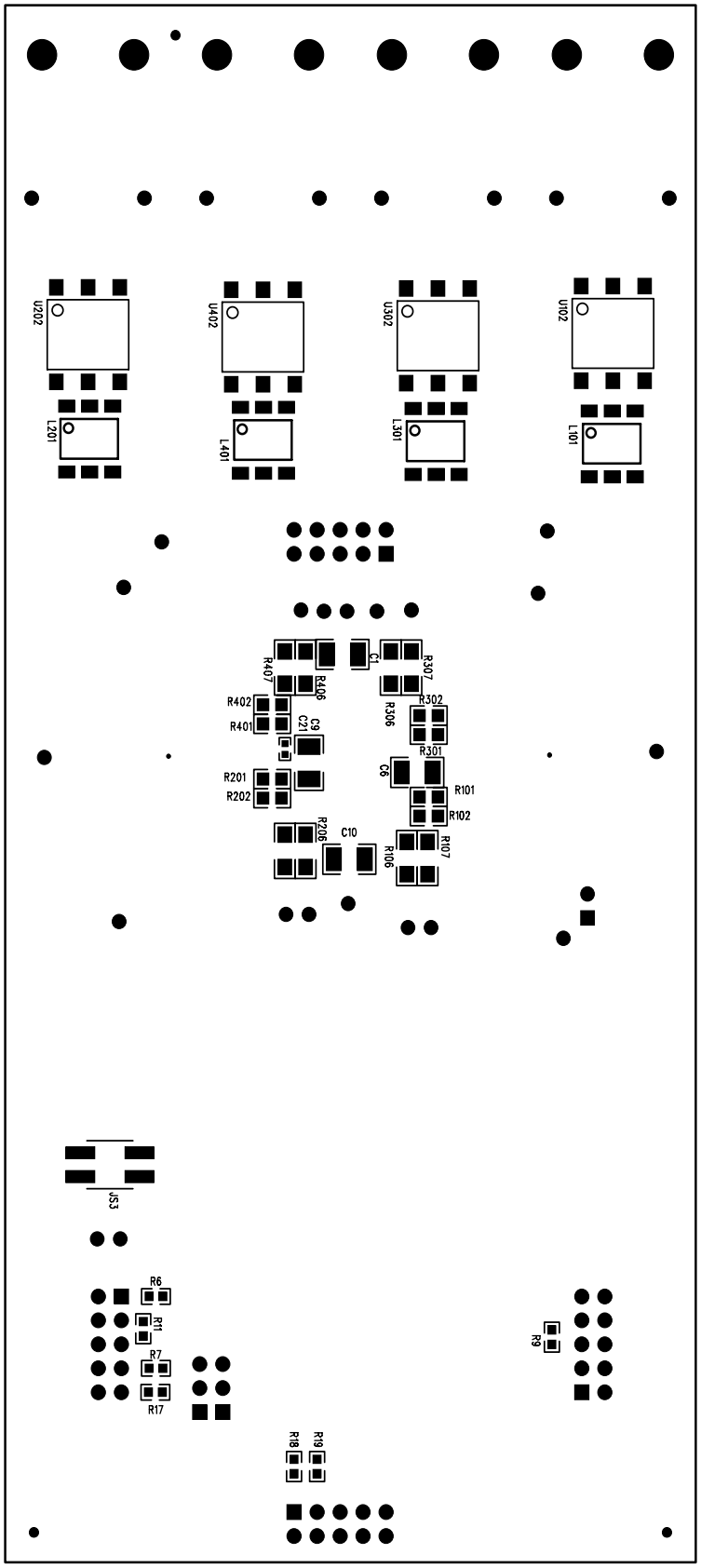


Figure 29. Daughtercard Secondary Assembly

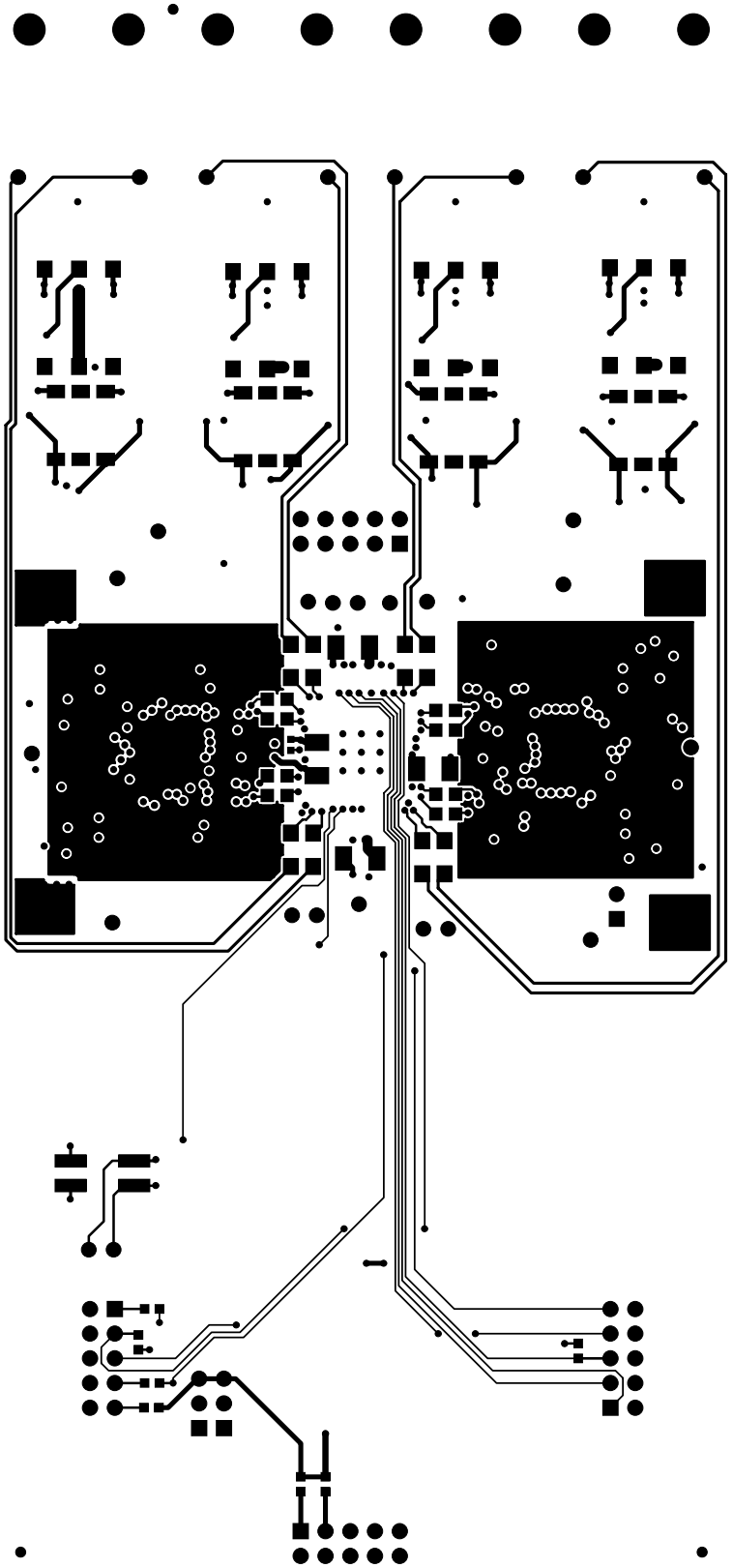


Figure 30. Daughtercard Secondary Side

8. Motherboard Rev 1.2 Schematics

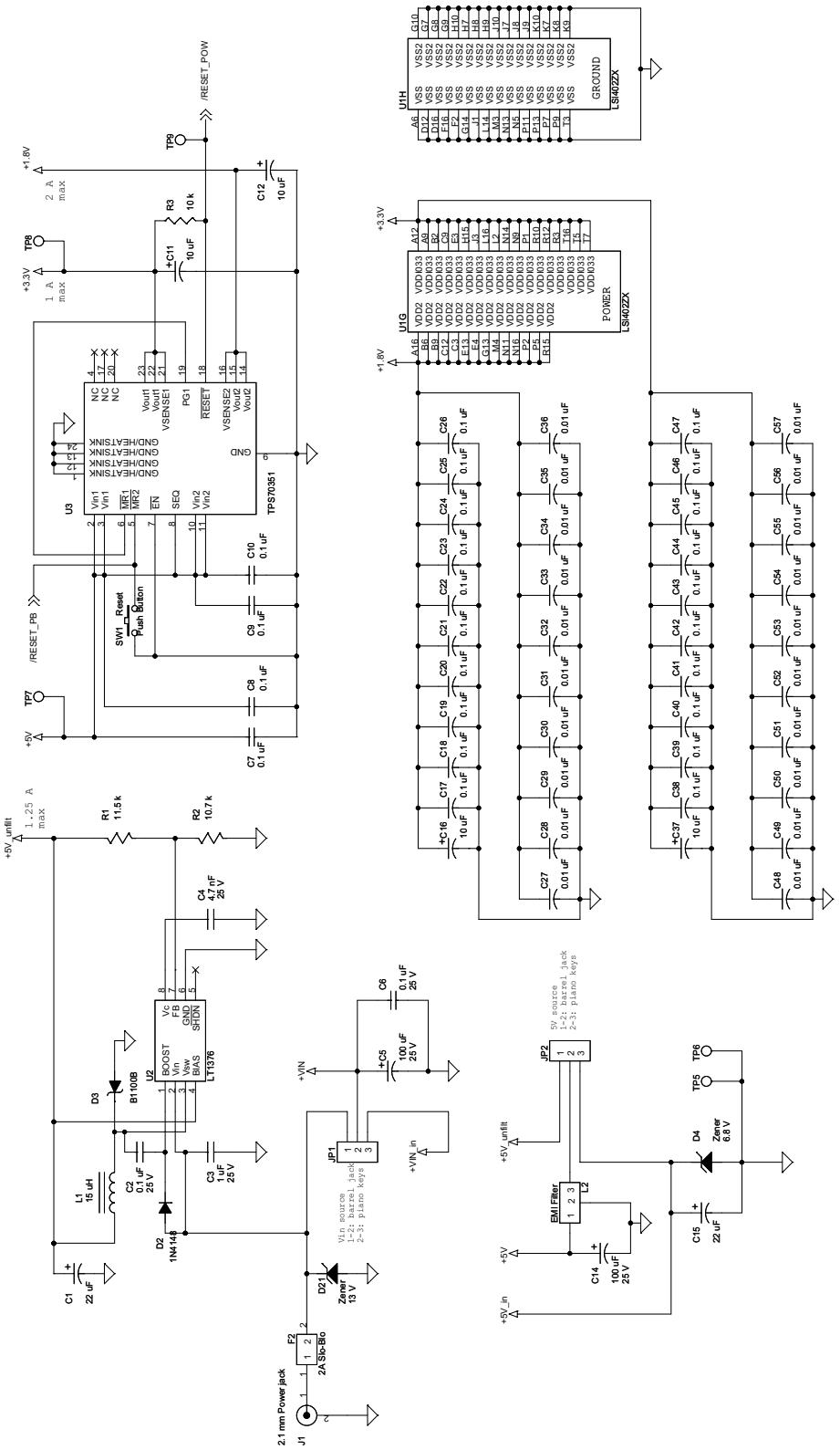


Figure 31. Motherboard Power Circuit

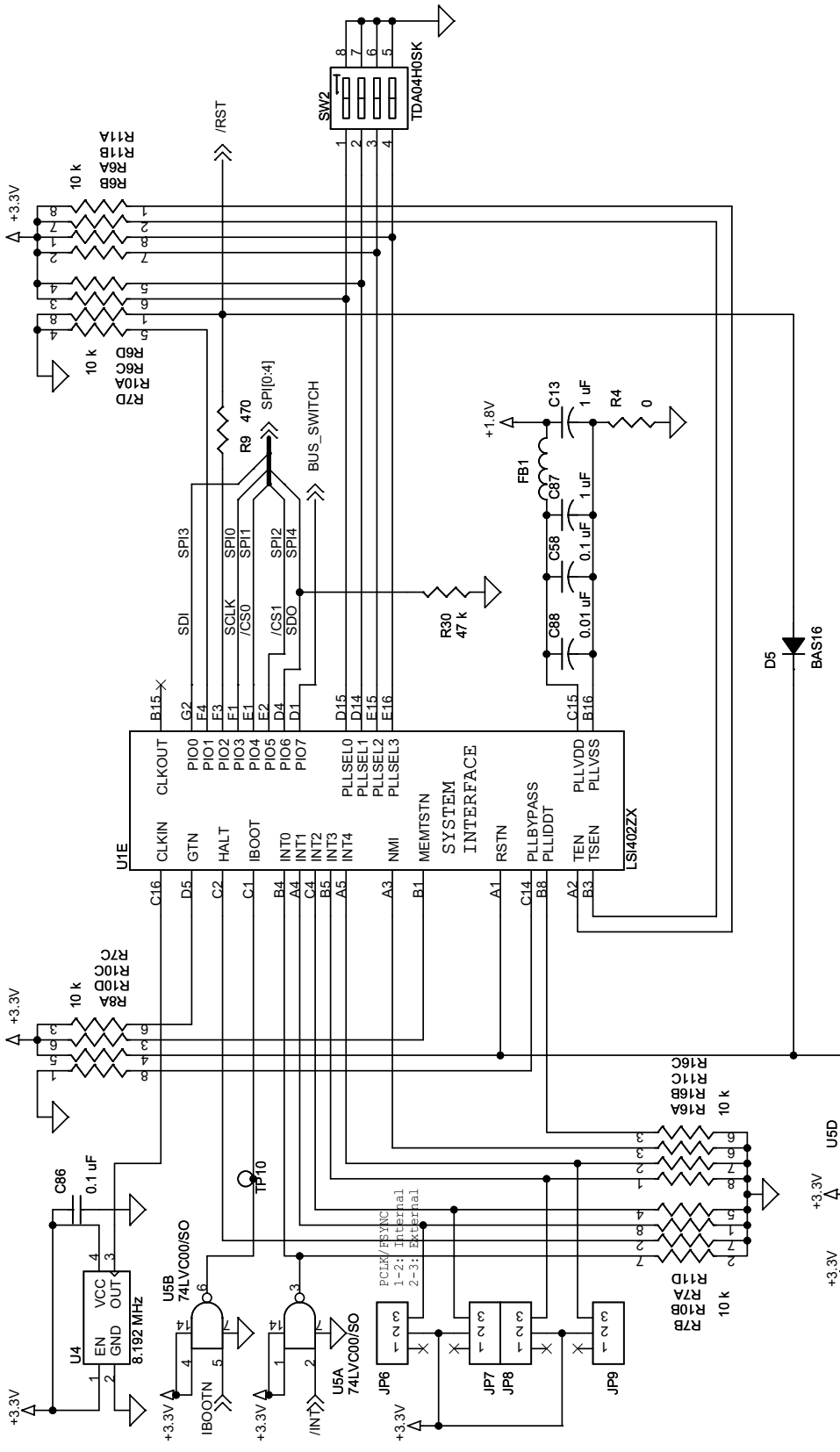


Figure 32. Motherboard DSP System Interface

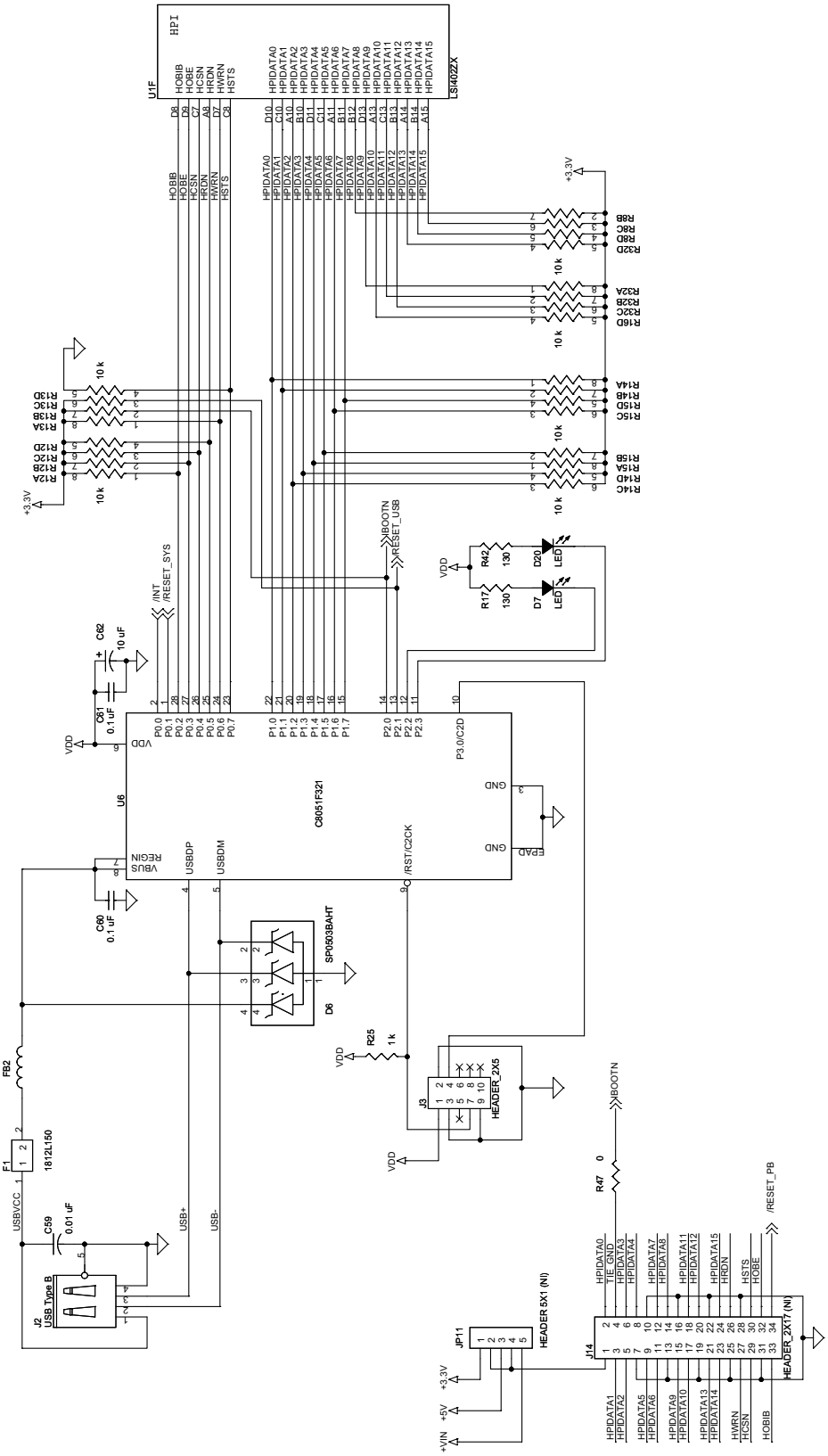


Figure 33. Motherboard USB to DSP Interface

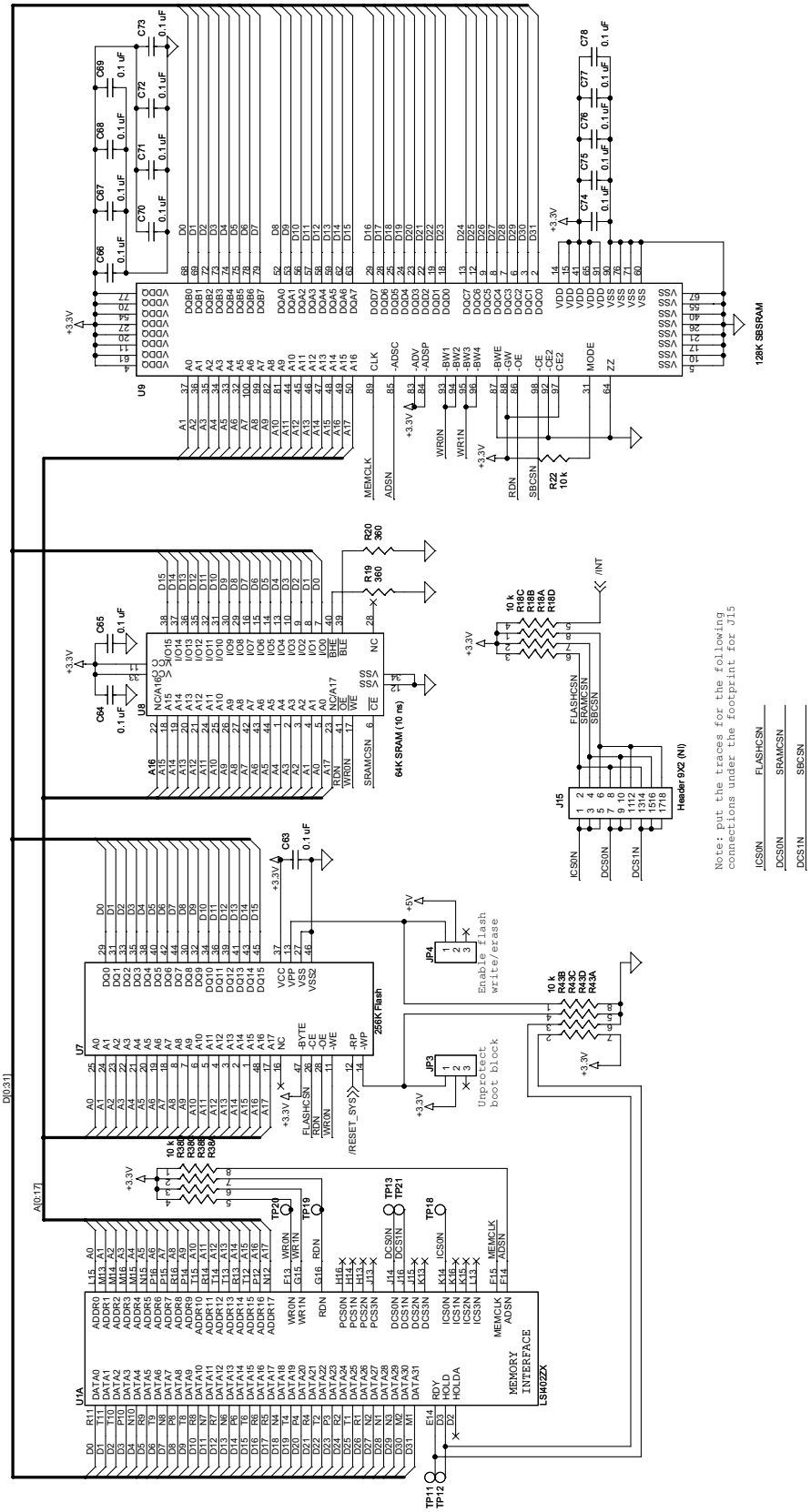


Figure 34. Motherboard Memory to DSP Interface

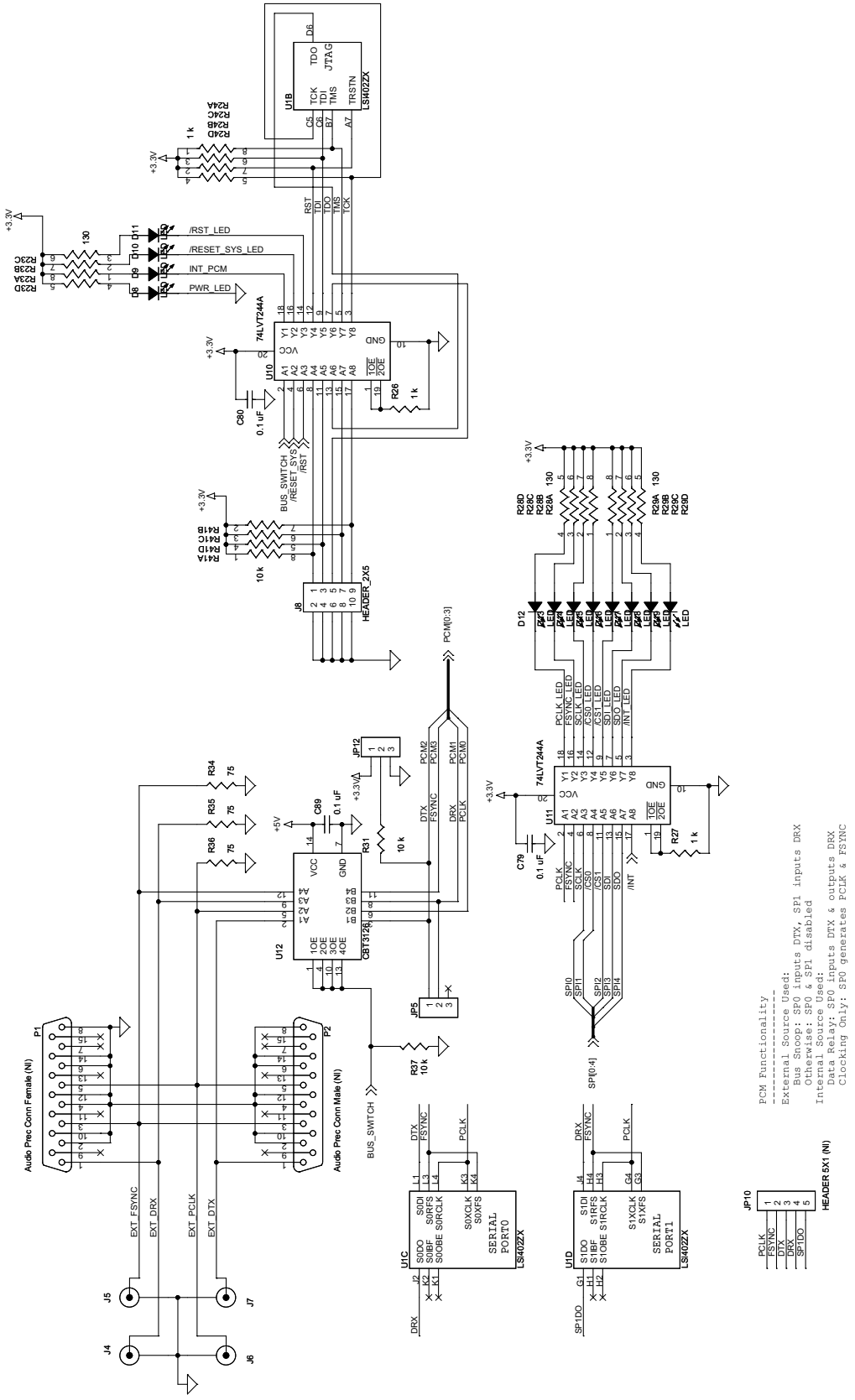


Figure 35. Motherboard DSP Serial Port Interface

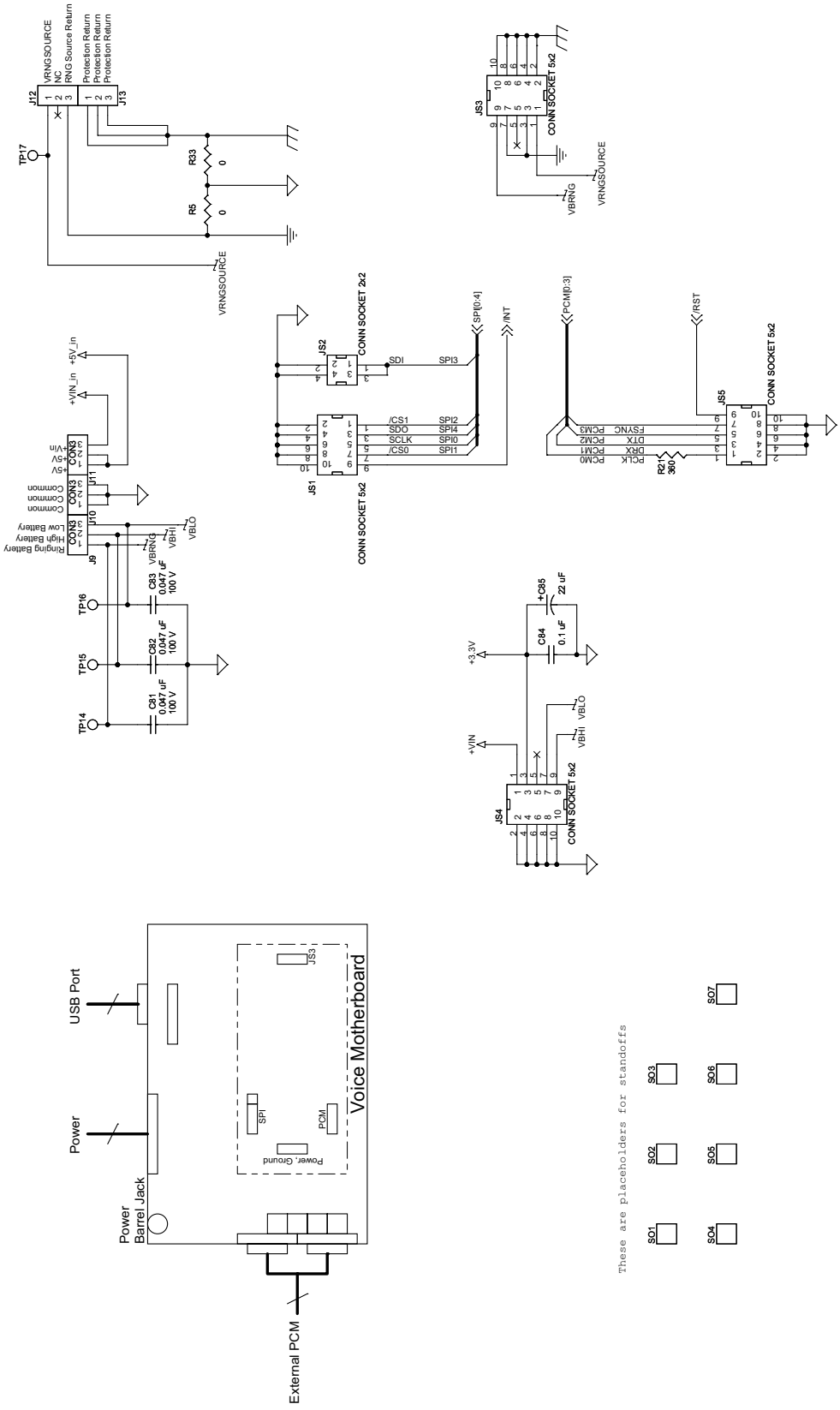


Figure 36. Motherboard Interconnect

9. Bill of Materials Rev 1.2 (Motherboard)

Table 5. Bill of Materials (Motherboard)

Item	Qty.	Ref.	Value	Material	Tol.	Rating	Part Number	Mfr.	PCB Footprint
1	3	C1,C15,C85	22 µF	Tantalum	±20%	10 V	ECST1AX226R	Panasonic	3528_EIAB
2	2	C2,C6	0.1 µF	X7R	±10%	25 V	08053C104KAT2A	AVX	CC0805
3	3	C81,C82, C83	47 nF	X7R	±10%	100 V	08051C473KAT2A	AVX	CC0805
4	1	C3	1 µF	X7R	±10%	25 V	12063C105KAT2A	AVX	CC1206
5	1	C4	4.7 nF	X7R	±10%	25 V	08053C472KAT2A	AVX	CC0805
6	2	C5,C14	100 µF	Electrolytic	±20%	25 V	ECA1EM101	Panasonic	C2.5X6.3MM-RAD
7	48	C7,C8,C9, C10,C17, C18,C19,	0.1 µF	X7R	±20%	16 V	C0603X7R160-104MNE	Venkel	CC0603
		C20,C21, C22,C23, C24,C25,							
		C26,C38, C39,C40, C41,C42,							
		C43,C44, C45,C46, C47,C58,							
		C60,C61, C63,C64, C65,C66,							
		C67,C68, C69,C70, C71,C72,							
		C73,C74, C75,C76, C77,C78,							
		C79,C80, C84,C86, C89							
8	5	C11,C12, C16,C37, C62	10 µF	Tantalum	±20%	10 V	ECST1AX106R	Panasonic	3528_EIAB

Table 5. Bill of Materials (Motherboard) (Continued)

Item	Qty.	Ref.	Value	Material	Tol.	Rating	Part Number	Mfr.	PCB Footprint
9	2	C13,C87	1 µF	X7R	±20%	10 V	C0805X7R100-105MNE	Venkel	CC0805
10	22	C27,C28, C29,C30, C31,C32,	0.01 µF	X7R	±20%	10 V	C0603X7R100-103MNE	Venkel	CC0603
		C33,C34, C35,C36, C48,C49,							
		C50,C51, C52,C53, C54,C55,							
		C56,C57, C59,C88							
11	1	D2	1N4148				MMBD914LT1	ON Semi-conductor	SOT-23
12	1	D3	B1100B			100 V, 1 A	B1100LB-13	Diodes, Inc.	DIO-SMB
13	1	D4	Zener			6.8 V	P6KE6.8A	Vishay	DO-15
14	1	D5	BAS16				BAS16	Fairchild Semicon-ductor	SOT-23
15	1	D6	SP0503BAHT				SP0503BAHT	Littelfuse	SOT-143
16	14	D7,D8,D9, D10,D11, D12,D13,	LED			2 V, 30 mA	SML-LXT0805IW-TR	Lumex	LED-0805
		D14,D15, D16,D17, D18,D19,							
		D20							
17	1	D21	Zener			13 V	P6KE13A	Vishay	DO-15
18	2	FB1,FB2	Ferrite Bead			800 mA	LI0805H121R-00	Steward	RC0805
19	1	F1	1812L150				1812L150	Littelfuse	FUSE-1812L150
20	1	F2	2A Slo-Blo			2 A, 63 V	0430002.WR	Littelfuse	1206
21	10	JP1,JP2,JP3, JP4,JP5,JP6,	HEADER 3X1				2303-6111TN	3M	CONN-1X3

Table 5. Bill of Materials (Motherboard) (Continued)

Item	Qty.	Ref.	Value	Material	Tol.	Rating	Part Number	Mfr.	PCB Footprint
		JP7,JP8, JP9,JP12							
22	4	JS1,JS3, JS4,JS5	CONN SOCKET 5x2				SSW-105-01-T-D	Samtec	CONN2X5[6240]SKT
23	1	JS2	CONN SOCKET 2x2				SSW-102-01-T-D	Samtec	CONN2X2[6240]SKT
24	1	J1	2.1 mm Power jack				ADC-002-1	Adam Tech	CONN3[175120]PWR
25	1	J2	USB Type B				897-30-004-90-000000	Mill-Max	CONN-USB-B
26	2	J3,J8	HEADER_2X 5				2510-6002UB	3M	CONN2X5-4W
27	1	J9	CON3				2SV-03	Thomas & Betts	CONN3-2SV-03
28	3	J10,J11,J13	CON3				2SV-03	Thomas & Betts	CONN3-2SV-03
29	1	J12	CON3				2SV-03	Thomas & Betts	CONN3-2SV-03A
30	1	L1	15 µH			1.8 A	DR73-150	Coiltronics	IND-DR73
31	1	L2	EMI Filter				ELK-E103FA	Panasonic	ELKE-3218
32	1	R1	11.5 kΩ		±1%	125 mW	CR0805-8W-1152FT	Venkel	RC0805
33	1	R2	10.7 kΩ		±1%	63 mW	CR0603-16W-1072FT	Venkel	RC0603
34	3	R3,R22,R37	10 kΩ		±5%	63 mW	CR0603-16W-103JT	Venkel	RC0603
35	2	R4,R47	0 Ω			1.0 A	CR0603-16W-000T	Venkel	RC0603
36	2	R5,R33	0 Ω			2.0 A	CR1206-8W-000T	Venkel	RC1206
37	16	R6,R7,R8, R10,R11, R12,R13,	10 kΩ		±5%	63 mW per element	EXB38V103JV	Panasonic	RP8-EXB38V
		R14,R15, R16,R18, R31,R32,							
		R38,R41, R43							
38	1	R9	470 Ω		±1%	100 mW	CR0603-10W-4700FT	Venkel	RC0603
39	2	R17,R42	130 Ω		±5%	63 mW	CR0603-16W-131JT	Venkel	RC0603
40	3	R19,R20, R21	360 Ω		±5%	63 mW	CR0603-16W-361JT	Venkel	RC0603

Table 5. Bill of Materials (Motherboard) (Continued)

Item	Qty.	Ref.	Value	Material	Tol.	Rating	Part Number	Mfr.	PCB Footprint
41	3	R23,R28, R29	130 Ω		±5%	63 mW per element	EXB38V131JV	Panasonic	RP8-EXB38V
42	1	R24	1 kΩ		±5%	63 mW per element	EXB38V102JV	Panasonic	RP8-EXB38V
43	3	R25,R26, R27	1 kΩ		±5%	63 mW	CR0603-16W-102JT	Venkel	RC0603
44	1	R30	47 kΩ		±5%	63 mW	CR0603-16W-473JT	Venkel	RC0603
45	3	R34,R35, R36	75 Ω		±5%	125 mW	CR0805-8W-75R0FT	Venkel	RC0805
46	7	SO1,SO2, SO3,SO4, SO5,SO6, SO7	Standoff and Screw				561-P440.25, 561-K4.50	Eagle Plastic Devices	MH[125]
47	1	SW1	Push Button				101-0161	Mouser	SW4[6240]PB
48	1	SW2	TDA04H0SK				TDA04H0SK	C&K	SW4-DIP-SMT
49	1	U1	LSI402ZX				LSI402ZX	LSI Logic	BGA256N17X17-1.0P
50	1	U2	LT1376				LT1376HVCS8	LTC	SO8
51	1	U3	TPS70351				TPS70351PWP	TI	TSSOP24N6.4-0.65P-TPAD
52	1	U4	8.192 MHz				OSC_SG-636	Epson	OSC_SG-636
53	1	U5	74LVC00/SO				74LVC00APW	Philips	TSSOP14
54	1	U6	C8051F321				C8051F321	Silicon Labs	MLP28N5X5-0.5P
55	1	U7	256K Flash				MT28F400B3WG-8T	Micron	TSOP48
57	2	U10,U11	74LVT244A				74LVT244A-DB	Philips	SSOP20
58	1	U12	CBT3126				CBT3126PW	Philips	TSSOP14
	Not Installed								
59	2	JP10,JP11	HEADER 5X1 (NI)				2303-6111TN	3M	CONN-1X5
60	4	J4,J5,J6,J7	BNC Conn (NI)				73133	Molex	CONN-BNC
61	1	J14	HEADER_2X 17 (NI)				2534-6002UB	3M	CONN2X17-4W

Table 5. Bill of Materials (Motherboard) (Continued)

Item	Qty.	Ref.	Value	Material	Tol.	Rating	Part Number	Mfr.	PCB Footprint
62	1	J15	Header 9X2 (NI)				2303-6111TN	3M	CONN-2X9
63	1	P1	Audio Prec Conn Female (NI)				747845-4	Amp	CONN15[6543]DBF
64	1	P2	Audio Prec Conn Male (NI)				747841-4	Amp	CONN15[6543]DBM
65	17	TP5,TP6, TP7,TP8, TP9,TP10,	Test Point (NI)				151-207	Mouser	TESTPOINT
		TP11,TP12, TP13,TP14, TP15,							
		TP16,TP17, TP18,TP19, TP20,							
		TP21							
56	1	U8	64K SRAM (10 ns)				CY7C1021CV33-10VC	Cypress	SOJ44
66	1	U9	128K SBSRAM				CY7C1339F-133AC	Cypress	QFP100N16X22-65P

10. Motherboard Rev 1.2 PCB Layout

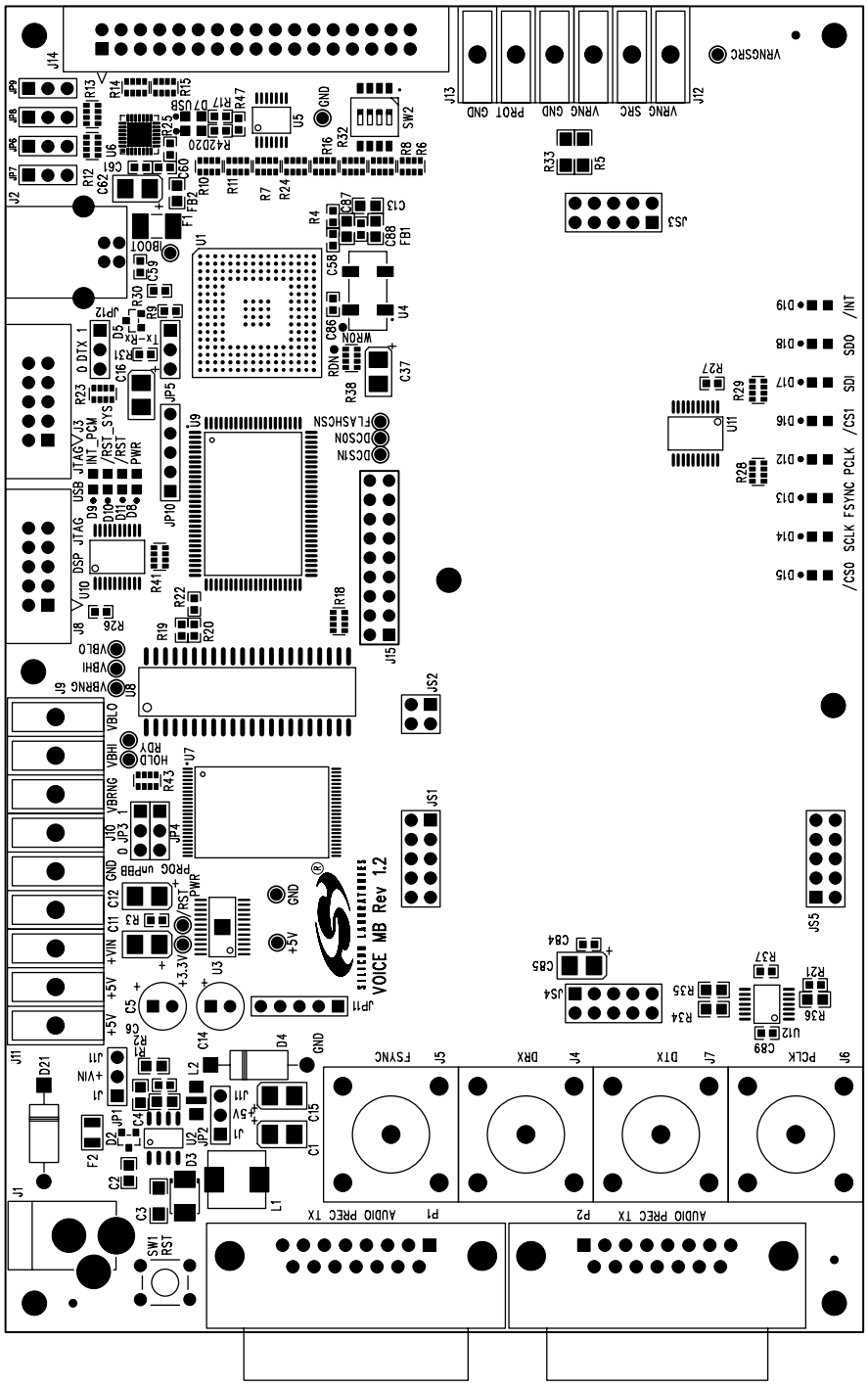


Figure 37. Motherboard Primary Assembly

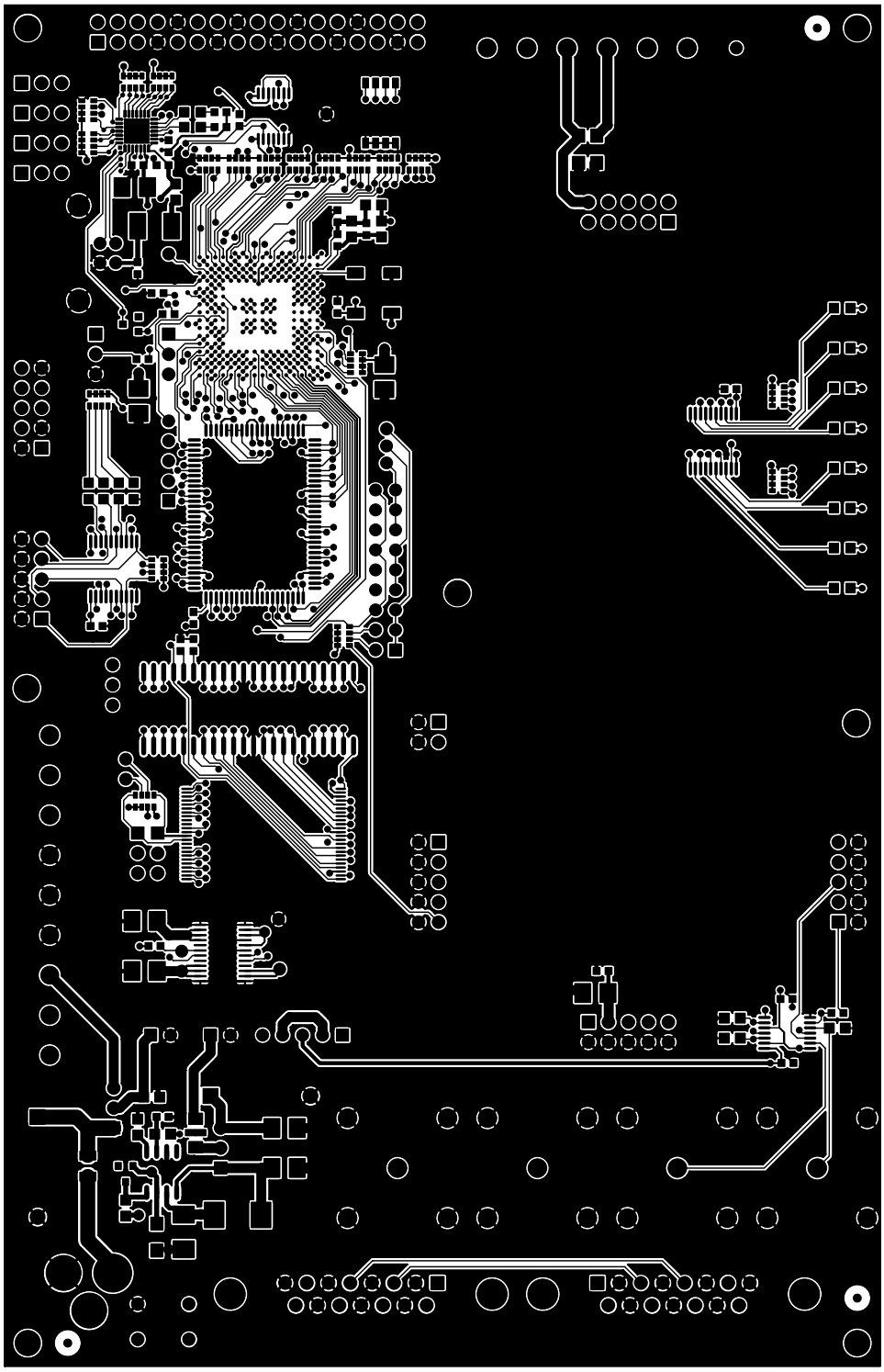


Figure 38. Motherboard Primary Side

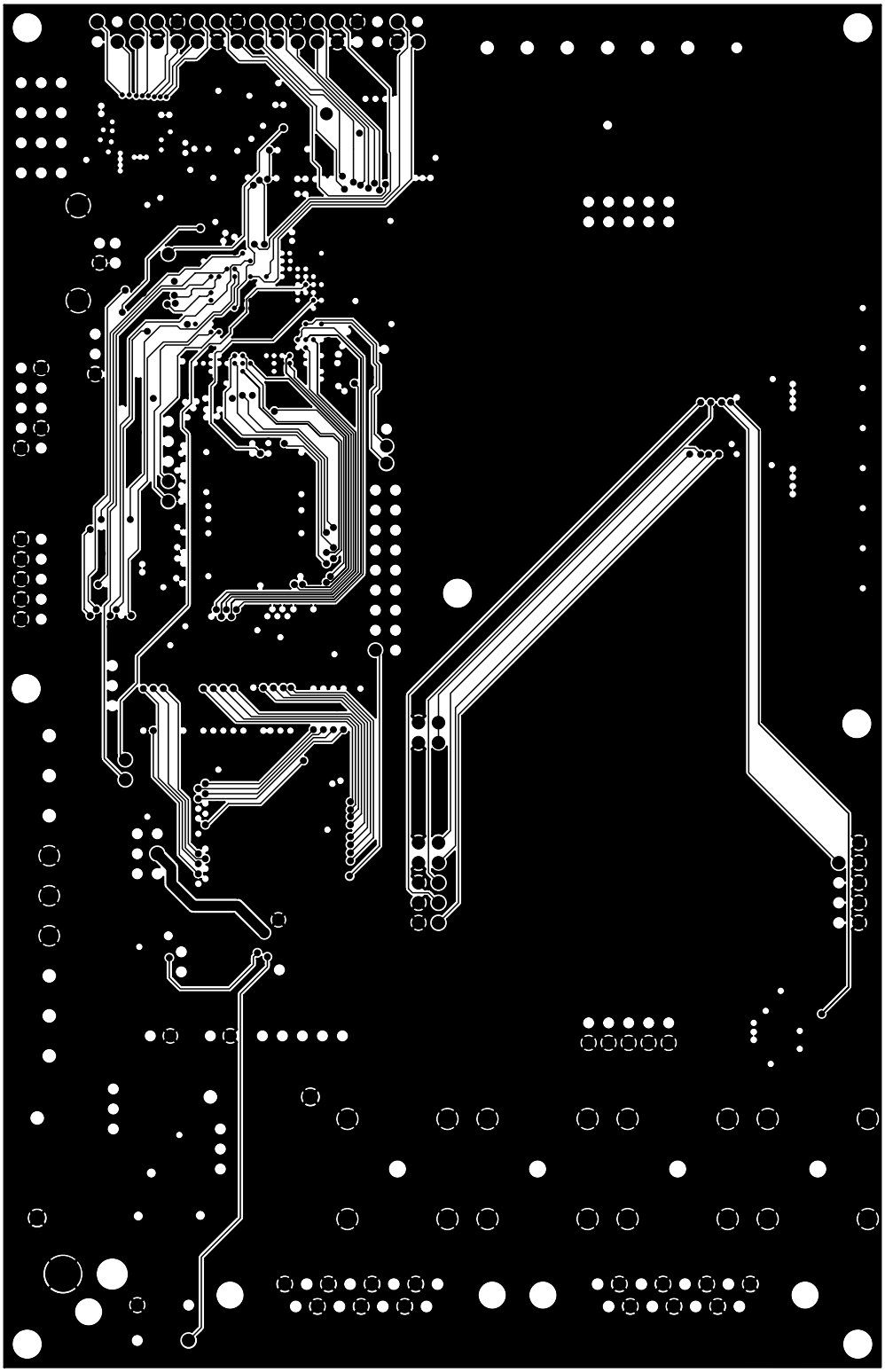


Figure 39. Motherboard Signal 1

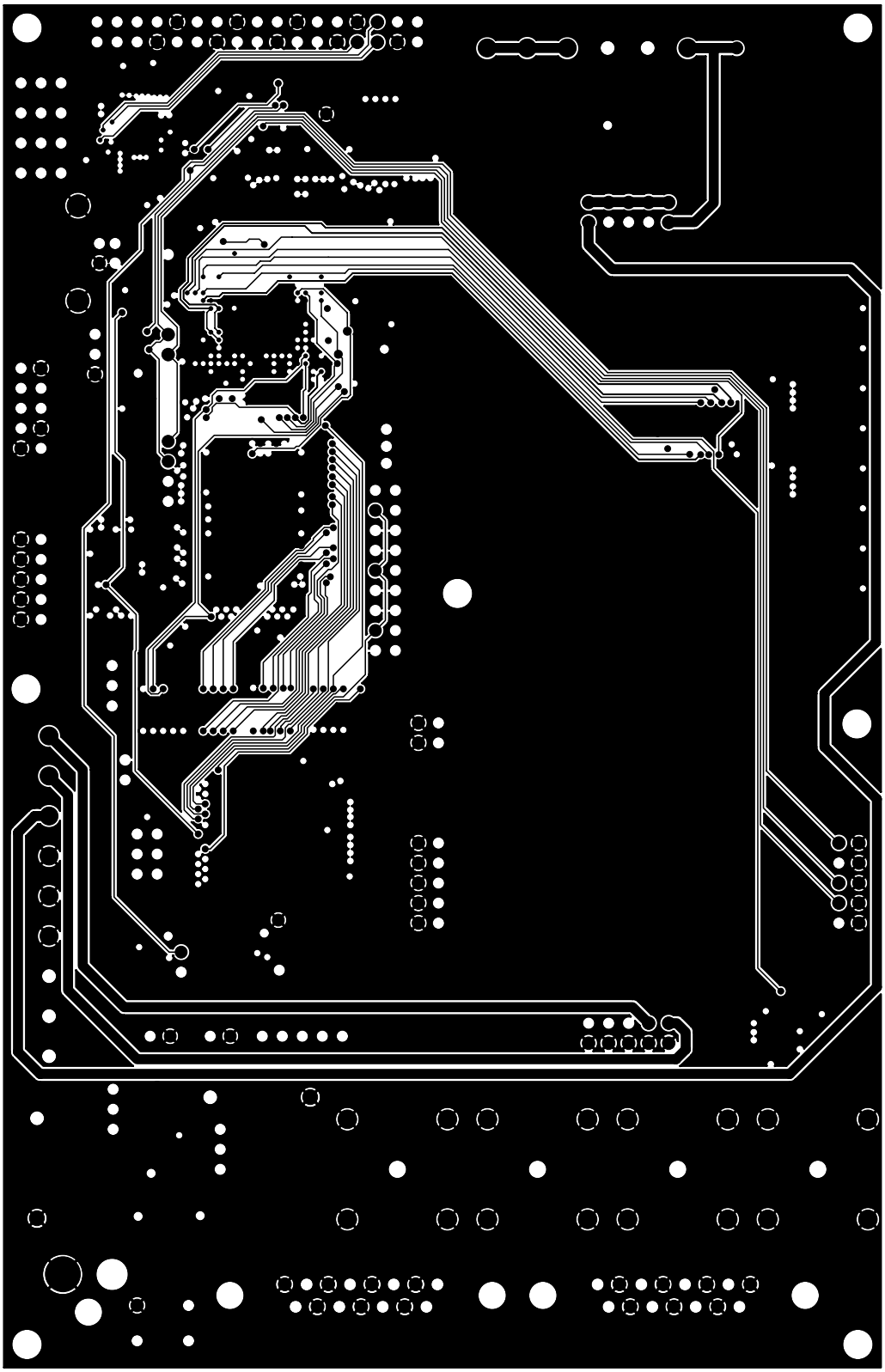


Figure 40. Motherboard Signal 2

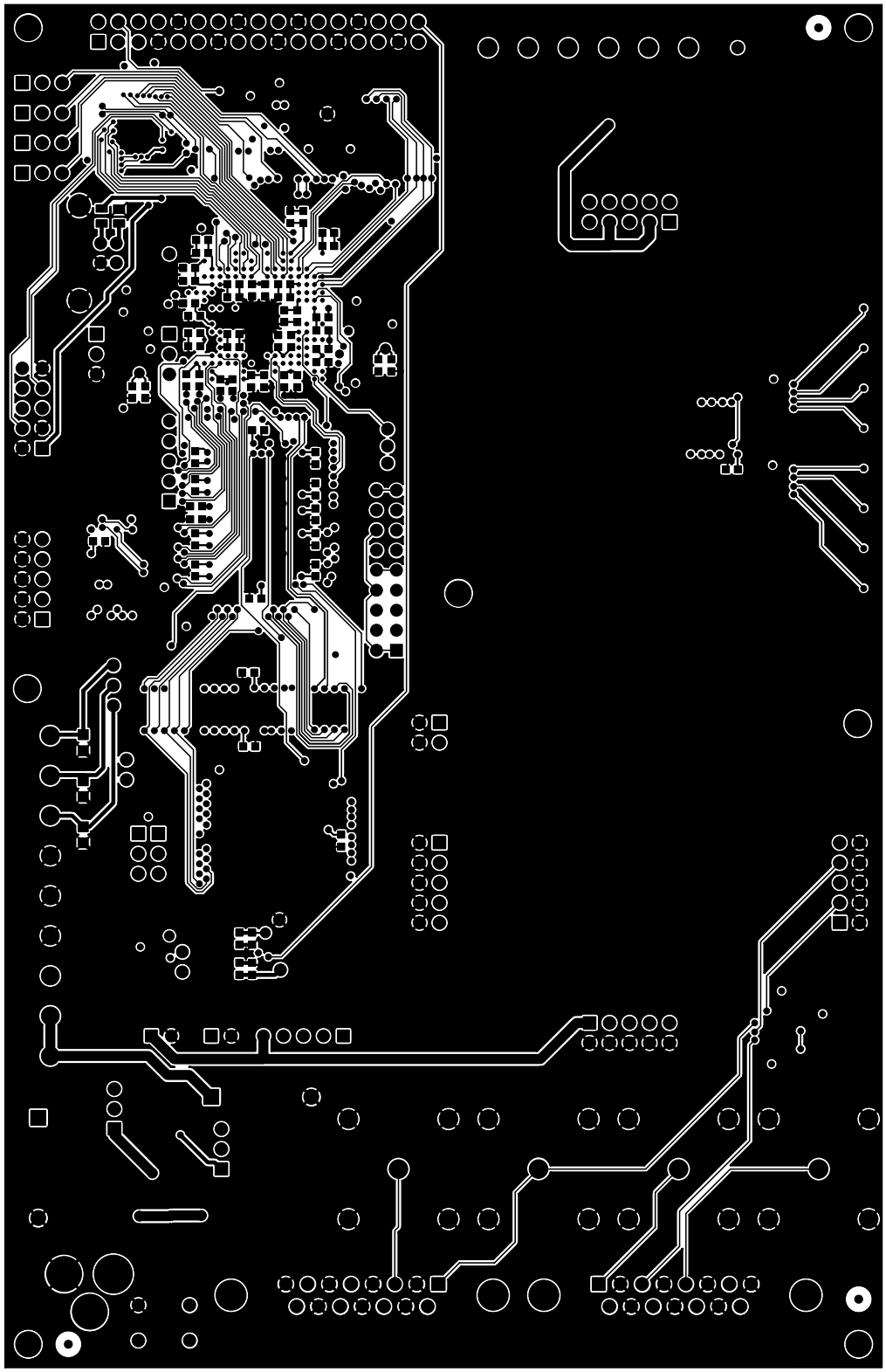


Figure 41. Motherboard Secondary Side

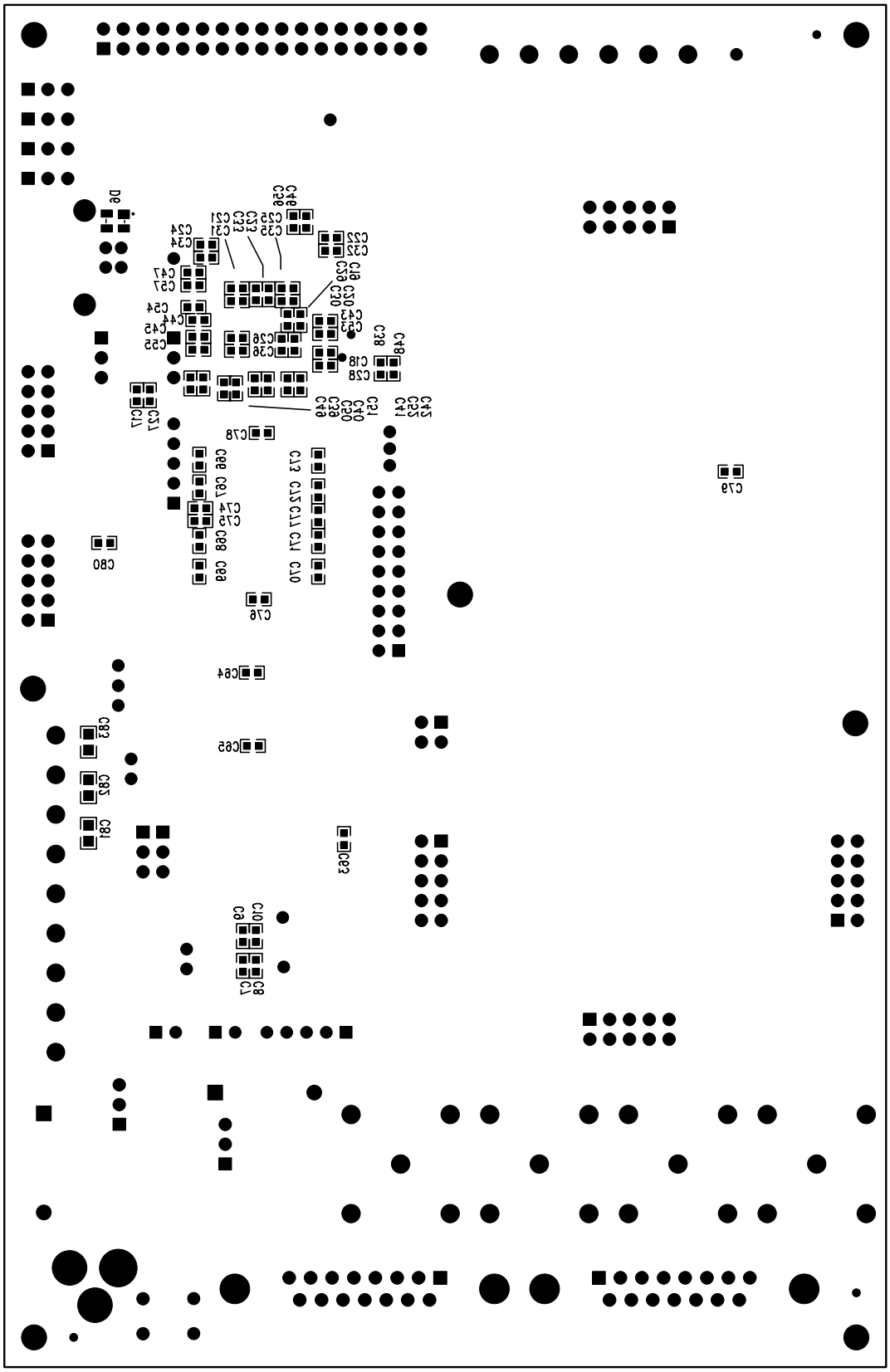


Figure 42. Motherboard Secondary Assembly

Document Change List

Revision 1.0 to Revision 1.1

- Revised sections 1.1 and 1.2
- Added revision numbers to schematics, BOM's and PCB layouts
- Updated Si3241DC5 Daughtercard Schematics from Rev. 1.1 to Rev. 1.3
- Updated Si3241DC5 Bill of Materials (Daughtercard) from Rev. 1.1 to Rev. 1.3
- Updated Si3241DC5 Daughtercard PCB Layout from Rev. 1.1 to Rev. 1.3
- Updated Si3241DC6 Daughtercard Schematics from Rev. 1.1 to Rev. 1.2
- Updated Si3241DC6 Bill of Materials (Daughtercard) from Rev. 1.1 to Rev. 1.2
- Updated Si3241DC6 Daughtercard PCB Layout from Rev. 1.1 to Rev. 1.2
- Revised table of contents

NOTES:

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