EV96C70A

55W Dual Output Converter from 36V–54V Input EVB

Introduction

This document provides the description and operating procedures for Microchip's dual output 55V/30W and 5V/25W board from 36V–54V input EV96C70A. This board type is used for evaluating the performance of Microchip PoE systems and the Microchip PWM controller LX7309, which is an integral part of Microchip PoE PD controllers PD70201 and PD70211.

Microchip's PD70201 and PD70211 devices are a part of a family of devices that support the IEEE® 802.3af, IEEE 802.3at, and HDBaseT standards PD interface.

The PD interface includes the following family of devices.

Table 1. Microchip Powered Device Products Offerings

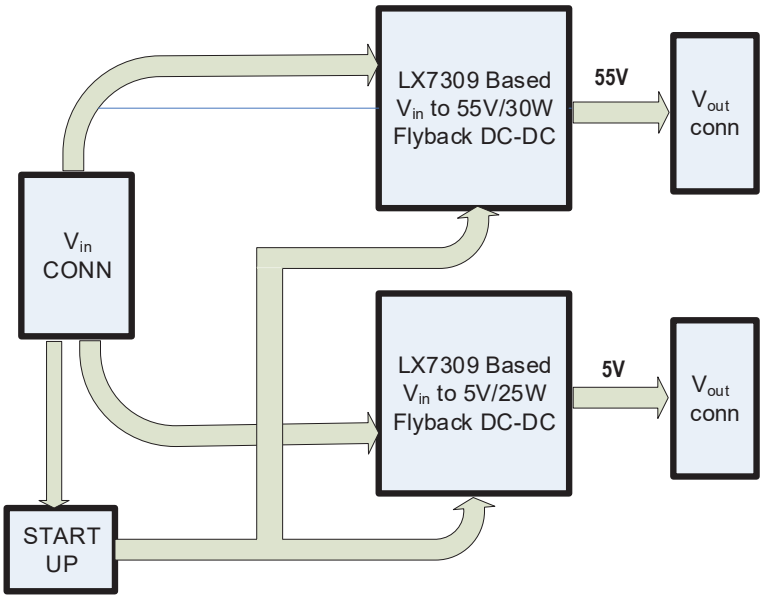
Part	Type	Package	IEEE® 802.3af	IEEE 802.3at	HDBaseT (PoH)	UPoE
PD70100	Front end	3 mm × 4 mm 12L DFN	x	—	—	—
PD70101	Front end + PWM	5 mm × 5 mm 32L QFN	x	—	—	—
PD70200	Front end	3 mm × 4 mm 12L DFN	x	x	—	—
PD70201	Front end + PWM	5 mm × 5 mm 32L QFN	x	x	—	—
PD70210	Front end	4 mm × 5 mm 16L DFN	x	x	x	x
PD70210A	Front end	4 mm × 5 mm 16L DFN	x	x	x	x
PD70210AL	Front end	5 mm × 7 mm 38L QFN	x	x	x	x
PD70211	Front end + PWM	6 mm × 6 mm 36L QFN	x	x	x	x
PD70224	Ideal diode bridge	6 mm × 8 mm 40L QFN	x	x	x	x

Microchip's EV96C70A evaluation board provides designers with the environment needed for evaluating the performance and implementation of PoE PD applications.

The board uses two PWM LX7309, which are an integral part of Microchip PD controllers PD70201 and PD70211.

This document provides all necessary procedures and instructions to install and operate this board.

Figure 1. EV96C70A Block Diagram

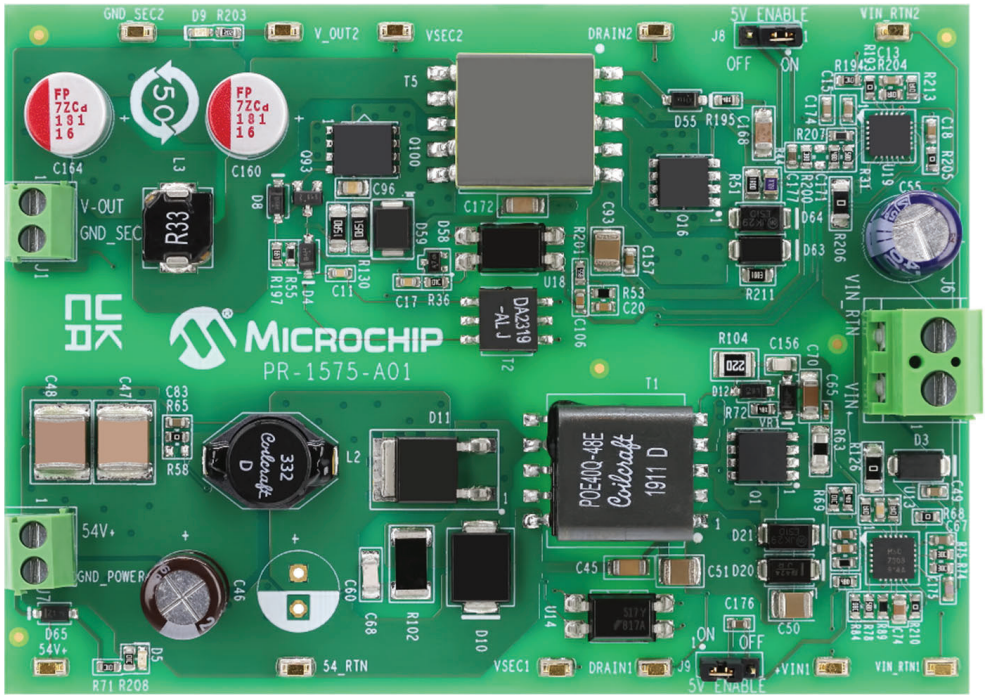


The board can be powered through an input connector J6 by a lab supply or by an output of PoE PD front end. See section 1.3. Electrical Characteristics for the input voltage range. The external load is connected to the evaluation board using the J1 (5V/25W) and J7 (55V/30W) output connectors. The following figure shows the location of input and output connectors.

D5 is the 55V indication LED and D9 is the 5V indication LED. These LEDs indicate the presence of the corresponding outputs.

The following figure shows a top view of the evaluation board.

Figure 2. EV96C70A Evaluation Board



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1. Product Overview

This section provides the product overview of the evaluation board.

1.1 Evaluation Board Features

- Input DC voltage connector and two output voltage connectors.
- Onboard “output present” LED indicators.
- 36 V_{DC} to 54 V_{DC} input voltage range.
- Evaluation board working temperature: 0 ℃ to 70 ℃.
- RoHS compliant.

1.2 Evaluation Board Connectors

The following table lists the evaluation board connectors.

Table 1-1. Connector Details

#	Connector	Name	Description
1	J6	Input connector	Terminal block for connecting DC Input 36V to 54V.
2	J1	Output connector	Terminal block for connecting a load to 5V output.
3	J7	Output connector	Terminal block for connecting a load to 55V output.

1.2.1 Input Connector

The following table lists pinout of input connector.

Table 1-2. J1 Connector

Pin No.	Signal Name	Description
Pin 1	VIN	Positive input voltage 36 V_{DC} to 54 V_{DC}.
Pin 2	VIN_RTN	Return of input voltage.

- Manufacturer: On Shore Technology.
- Manufacturer part number: ED700/2.

1.2.2 Output Connectors

An external load is connected to the evaluation board using the J1 and J7 output connectors. The following tables list pinouts of the output connector.

The manufacturer and manufacturer part number details of the J1 and J7 output connectors are as follows:

- Manufacturer: Kaifeng Electronic.
- Manufacturer part number: KF350V-02P-14.

Table 1-3. J1 Connector

Pin No.	Signal Name	Description
Pin 1	VOUT	Positive DC/DC output voltage 5V.
Pin 2	VOUT_RTN	Return of 5V output.

Table 1-4. J7 Connector

Pin No.	Signal Name	Description
Pin 1	VOUT	Positive DC/DC output voltage 55V.
Pin 2	VOUT_RTN	Return of 55V output.

1.3 Electrical Characteristics

The following table lists the electrical characteristics of the EV96C70A evaluation board.

Table 1-5. Electrical Characteristics

	Min.	Max.	Unit
Input at J6	36	57	V
Output voltage at J1	4.8	5.25	V
Maximum output current at J1	—	5	A
Port J1 isolation to input	1500	—	V_{RMS}
Output voltage at J7	54	56	V
Maximum output current at J7	—	0.55	A
Port J7 isolation to input	1500	—	V_{RMS}
Port J1 isolation to port J7	1500	—	V_{RMS}
Ambient temperature	0	70	°C

2. Installation

This section provides information about the installation procedure of the EV96C70A evaluation board.

Note: Ensure that power source of the board is turned OFF before all peripheral devices are connected.

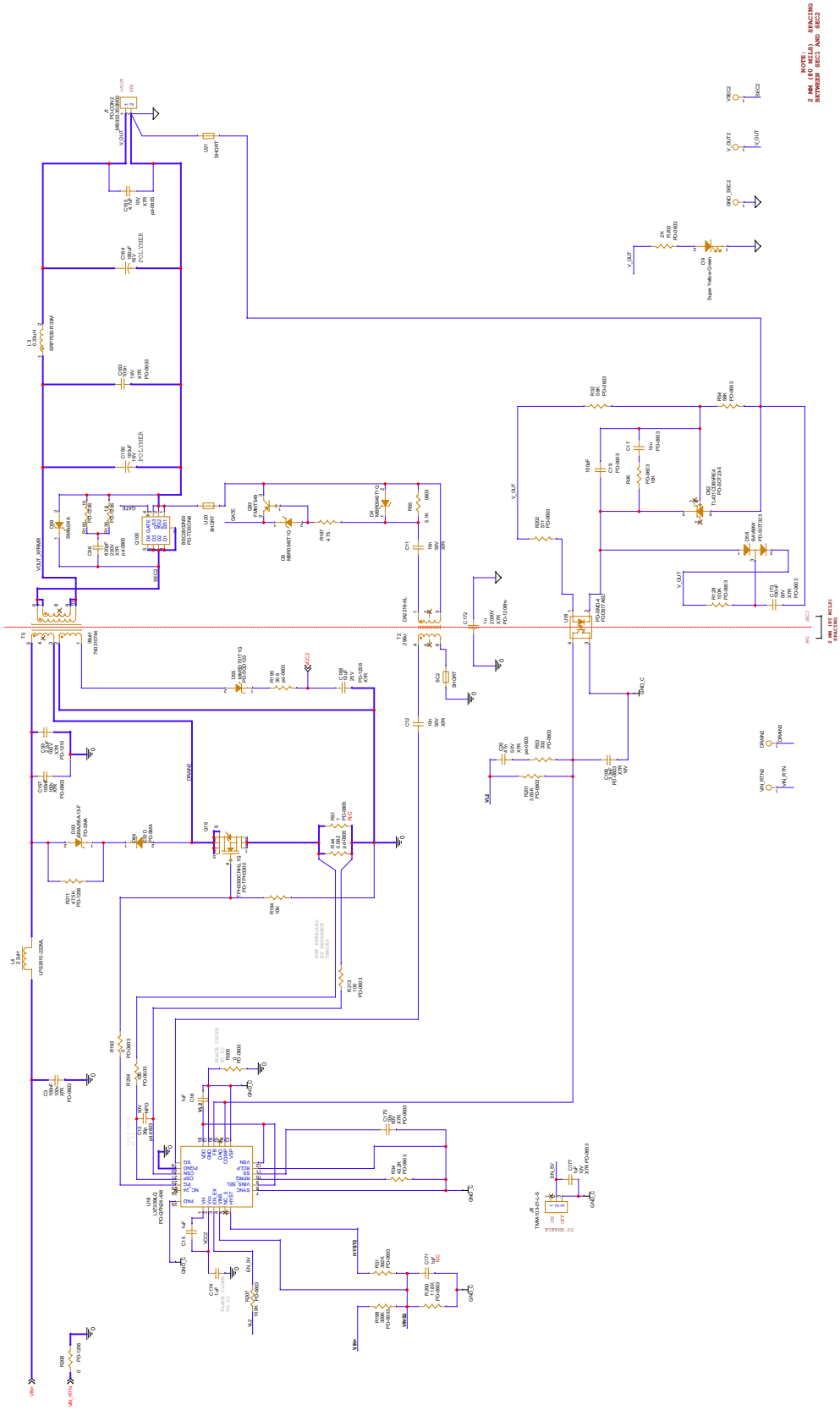
2.1 Initial Configuration

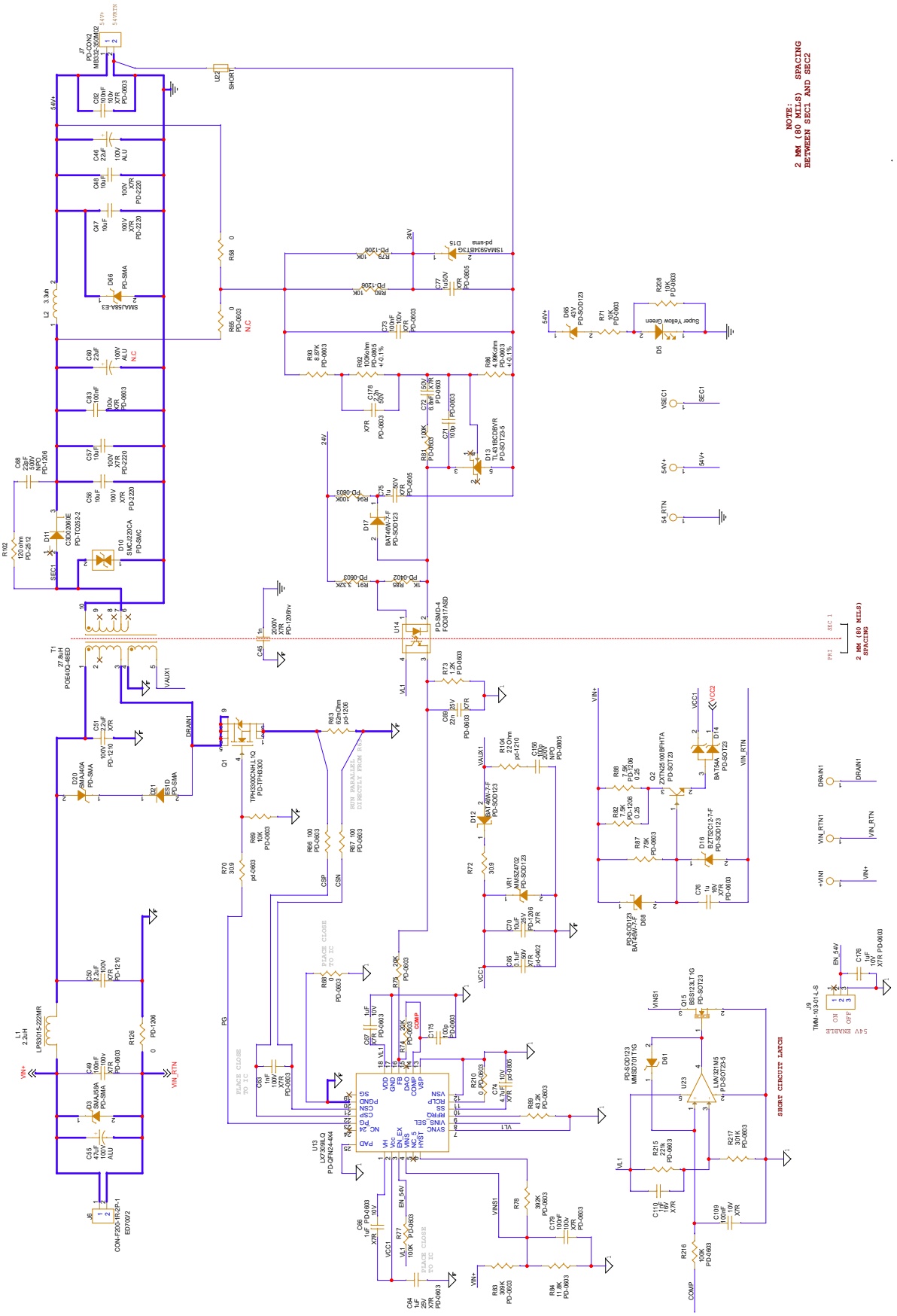
Perform the following steps for initial configuration:

1. Connect load to the board (using J1 and J7).
2. Connect a DC supply to input connector J6.
3. Turn ON the DC supply.

3. Schematic

Figure 3-1. Schematic





4. Bill of Materials

The following table lists the bill of materials.

Table 4-1. Bill of Materials

Item	QTY	Reference	Value	Description	Part Number	Manufacturer
1	10	VSEC1	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
		VIN_RTN1	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
		DRAIN1	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
		V_OUT2	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
		VSEC2	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
		VIN_RTN2	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
		GND_SEC2	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
		DRAIN2	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
		54_RTN	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
		54V+	HK-2-G-S05	TEST POINT	HK-2-G-S05	MAC-8
2	7	C3	100 nF	Capacitor, X7R, 100 nF, 100V, 10% 0603	06031C104KAT2A	AVX
		C49	100 nF	Capacitor, X7R, 100 nF,100V, 10% 0603	06031C104KAT2A	AVX
		C73	100 nF	Capacitor, X7R, 100 nF,100V, 10% 0603	06031C104KAT2A	AVX
		C82	100 nF	Capacitor, X7R, 100 nF, 100V, 10% 0603	06031C104KAT2A	AVX
		C83	100 nF	Capacitor, X7R, 100 nF,100V, 10% 0603	06031C104KAT2A	AVX
		C157	100nF	Capacitor, X7R, 100nF,100v, 10% 0603	06031C104KAT2A	AVX
		C179	100 nF	Capacitor, X7R, 100 nF,100V, 10% 0603	06031C104KAT2A	AVX
3	3	C11	10n	CAP CRM 10 nF, 50V, 10%X7R 0603 SMT	MCH185CN103KK	Rohm
		C12	10n	CAP CRM 10 nF, 50V, 10%X7R 0603 SMT	MCH185CN103KK	Rohm
		C17	10n	CAP CRM 10 nF 50V 10%X7R 0603 SMT	MCH185CN103KK	Rohm
4	1	C13	36p	CAP CRM 36 pF, 50V, 5% C0G 0603 SMT	06035A360JAT2A	AVX
5	4	C15	1 µF	Capacitor, X7R, 1 µF, 25V, 10% 0603	GRM188R71E105KA12D	Murata
		C18	1 µF	Capacitor, X7R, 1µF, 25V, 10% 0603	GRM188R71E105KA12D	Murata
		C171	1 µF	Capacitor, X7R, 1uF, 25V, 10% 0603	GRM188R71E105KA12D	Murata
		C174	1 µF	Capacitor, X7R, 1 µF, 25V, 10% 0603	GRM188R71E105KA12D	Murata
6	1	C19	100 pF	CAP COG 100 pF, 50V, 5% 0603	C1608C0G1H101J	TDK
7	1	C20	47n	CAP CRM 47n, 50V, 0603	CL10B473KB8NNNC	Samsung
8	1	C45	1n	CAP CRM 1 nF/2000V, 10% X7R 1206	C1206C102KGRAC	Kemet
9	2	C46	22 µF	CAP ALU 22 µF, 100V, 20%8X11.5 105C	EEUFC2A220	Panasonic
		C60	22 µF	CAP ALU 22 µF, 100V, 20%8X11.5 105C	EEUFC2A220	Panasonic

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Item	QTY	Reference	Value	Description	Part Number	Manufacturer
10	4	C47	10 µF	CAP CER 10 µF, 100V, 20% X7R 2220	22201C106MAT2A	AVX
		C48	10 µF	CAP CER 10 µF, 100V, 20% X7R 2220	22201C106MAT2A	AVX
		C56	10 µF	CAP CER 10 µF, 100V, 20% X7R 2220	22201C106MAT2A	AVX
		C57	10 µF	CAP CER 10 µF, 100V, 20% X7R 2220	22201C106MAT2A	AVX
11	2	C50	2.2 µF	CAP CRM 2.2 µF, 100V, X7R 1210	C1210C225K1RACTU	Kemet
		C51	2.2 µF	CAP CRM 2.2 µF, 100V, X7R 1210	C1210C225K1RACTU	Kemet
12	1	C55	47 µF	CAP ALU 47 µF, 100V, 20% 105C	100PX47MEFCT78X11.5	Rubycon
13	1	C63	1 nF	Cap 1 nF 100V 10% X7R 0603 SMT	CL10B102KC8NNNC	Samsung
14	1	C64	1 µF	Cap 1nF 100V 10% X7R 0603 SMT	CL10B105KA8NNNC	Samsung
15	1	C65	0.1 µF	CAP CRM 0.1 µF, 50V, X7R 0603	UMK105B7104KV-FR	Taiyo Yuden
16	4	C66	1 µF	Capacitor, X7R 1 µF 10V, 10% 0603	GRM188R71A105KA61D	Murata
		C67	1 µF	Capacitor, X7R, 1 µF, 10V, 10% 0603	GRM188R71A105KA61D	Murata
		C176	1 µF	Capacitor, X7R, 1µF, 10V, 10% 0603	GRM188R71A105KA61D	Murata
		C177	1 µF	Capacitor, X7R, 1 µF, 10V, 10% 0603	GRM188R71A105KA61D	Murata
17	1	C68	22 pF	CAP CRM 22 pF, 500V, 10% NPO 1206 SMT	VJ1206A220JXEAT	Vishay
18	1	C69	22n	CAP CRM 22 nF, 25V, 10%X7R 0603 SMT	VJ0603Y223KXXCW1BC	Vishay
19	2	C70	10 µF	Capacitor, X7R, 10 µF, 25V, 10% 1206	C1206C106K3RACTU	Kemet
		C168	10 µF	Capacitor, X7R, 10 µF, 25V, 10% 1206	C1206C106K3RACTU	Kemet
20	2	C71	100p	CAP CRM 100 pF 100V 5% NPO 0603 SMT	VJ0603A101JXBT	Vishay
		C175	100p	CAP CRM 100pF 100V 5%NPO 0603 SMT	VJ0603A101JXBT	Vishay
21	1	C72	6.8 nF	CAP CER 6.8 nF, 50V, 10% X7R 0603 SMT	06035C682KAT2A	AVX
22	2	C74	4.7 µF	CAP CRM 4.7 µF, 10V, 10%X7R 0805 SMT	0805ZC475KAT2A	AVX
		C165	4.7 µF	CAP CRM 4.7 µF, 10V, 10%X7R 0805 SMT	0805ZC475KAT2A	AVX
23	1	C75	1µ	CAP CRM 1 µF 50V 10% X7R 0805 SMT	UMK212B7105KG-T	Taiyo Yuden
24	1	C76	1µ	CAP CRM 1 µF, 16V, 10% 0805 X7R SMT	CL10B105KO8NNNC	Samsung
25	1	C77	1µ	CAP CRM 1 µF, 50V, 10% X7R 0805 SMT	GRM21BR71H105KA12L	Murata
26	1	C93	2.2 µF	CAP CRM 2.2 µF 100V X7R 1210	C3225X7R2A225K	TDK
27	1	C96	820 pF	CAP CRM 820p, 200V, X7R 0805	08052C821KAT2A	AVX
28	1	C106	3.3 nF	CAP CRM 3.3 nF, 16V, X7R 0603	C1608X7R1C332K	TDK
29	2	C109	100 nF	CAP CRM 100 nF, 10V, X7R 0603	GRM188R71H104KA01	Murata
		C173	100 nF	CAP CRM 100 nF, 10V, X7R 0603	GRM188R71H104KA01	Murata
30	1	C110	1 nF	CAP CRM 1 nF, 16V, X7R 0603	CL10B102KA8NNNC	Samsung
31	1	C156	100p	CAP CRM 100 pF, 200V, NPO 0805	08052A101KAT2A	AVX
32	2	C160	180 µF	CAP Polymer Alum. 180 µF, 16V, 20%	RL81C181MDN1KX	Nichicon
		C164	180 µF	CAP Polymer Alum. 180 µF,16V, 20%	RL81C181MDN1KX	Nichicon

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Item	QTY	Reference	Value	Description	Part Number	Manufacturer
33	1	C163	100n	CAP CRM 100 nF 16V 10%X7R 0603 SMT	VJ0603Y104KXJCW1BC	Vishay
34	1	C170	10n	CAP CRM 10 nF, 50V, 10%X7R 0603 SMT	C1608X7R1H103K080AA	TDK
35	1	C172	1n	CAP CRM 1 nF/2000V, 10%++X7R 1206 SMT	1206B102K202CT	Walsin
36	1	C178	2.2n	CAP CRM 2.2 nF, 50V, 10%X7R 0603 SMT	C0603C222K5RAC	Kemet
37	1	D3	SMAJ58A	DIO TVS 58V, 40A, SRG400WPK SMA SMT	SMAJ58A	Vishay
38	2	D4	MBR0540T1G	DIO SCHOTTKY 40V, 500 mA, SOD123 REC. SMT	MBR0540T1G	ON Semi
		D8	MBR0540T1G	DIO SCHOTTKY 40V, 500 mA, SOD123 REC. SMT	MBR0540T1G	ON Semi
39	2	D5	LED	LED SuperYelGrn 100-130o 0603 SMD	19-21-SYGCS530E3TR8	Everlight
		D9	LED	LED SuperYelGrn 100-130o 0603 SMD	19-21-SYGCS530E3TR8	Everlight
40	1	D10	SMCJ220CA	TVS DIODE Bidirectional 220V WM 356VC SMC	SMCJ220CA	Littelfuse
41	1	D11	C3D02060E	Diode Schottky Zero Recovery 600V DPAK	C3D02060E	Cree Inc
42	3	D12	BAT46W-7-F	Diode Schottky 100V, 150 mA, SOD123F	BAT46W-7-F	Diodes Inc.
		D17	BAT46W-7-F	Diode Schottky 100V, 150 mA, SOD123F	BAT46W-7-F	Diodes Inc.
		D68	BAT46W-7-F	Diode Schottky 100V, 150 mA , SOD123F	BAT46W-7-F	Diodes Inc.
43	1	D13	TL431BCDBVR	IC Adj Prec Shunt Reg 2.5V, 0.5%, SOT23-5	TL431BCDBVR	TI
44	1	D14	BAT54A	DIO Schottky 30V 200 mASOT23	BAT54A	Philips
45	1	D15	1SMA5934BT3G	DIODE ZENER 24V, 1.5W, SMA SMT	1SMA5934BT3G	ON Semi
46	1	D16	BZT52C12-7-F	DIO ZENER 12V, 500 mW, SOD123 SMT	BZT52C12-7-F	Diodes Inc.
47	1	D20	SMAJ40A	DIODE TVS 40V, 400W, 5 µA, 6.2A	SMAJ40A	Bourns
48	2	D21	ES1D	DIODE ULTRA FAST 200V, 1A, DO-214AC	ES1D	Fairchild
		D64	ES1D	DIODE ULTRA FAST 200V, 1A, DO-214AC SMT	ES1D	Fairchild
49	2	D55	MMSD701T1G	DIODE SCHOTTKY 70V 0.2A, 225W, SOD123	MMSD701T1G	ON Semi
		D61	MMSD701T1G	DIODE SCHOTTKY 70V 0.2A, 225W, SOD123	MMSD701T1G	ON Semi
50	1	D58	BAV99W	Diode, Dual Switching BAV99W SOT323	BAV99W	NXP
51	1	D59	SMBJ24A	TVS DIODE 24V 38.9V SMBJ	SMBJ24A	BRIGHTKING
52	1	D62	TL431CDBVRE4	IC Prog Shunt Ref 2.5V, 2% SOT23-5 SMT	TL431CDBVRE4	TI
53	1	D63	SMAJ58A-13-F	DIO TVS 58V 40A SRG400WPK SMA SMT	SMAJ58A-13-F	Diodes Inc.
54	1	D65	DDZ9717-7	Diode, Zener, 500 mW, 43V, 5% SOD123	DDZ9717-7	Diodes Inc.
55	1	D66	SMAJ58A-E3	DIO TVS 58V, 40A, SRG400WPK SMA SMT	SMAJ58A-E3	Vishay
56	2	J1	PD-CON2	Terminal block 2 Pole interlocking 3.5 mm pitch	MB332-350M02	DECA

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Item	QTY	Reference	Value	Description	Part Number	Manufacturer
		J7	PD-CON2	Terminal block 2 Pole interlocking 3.5mm pitch	MB332-350M02	DECA
57	1	J6	ED700/2	TERMINAL BLOCK 5MM 2POS PCB	ED700/2	On Shore Tech
58	2	J8	TMM-103-01-L-S	Con Male PIN Header 3P 2 mm Vertical SR TH	TMM-103-01-L-S	Samtec
		J9	TMM-103-01-L-S	Con Male PIN Header 3P 2 mm Vertical SR TH	TMM-103-01-L-S	Samtec
59	1	L1	2.2 µH	Power Inductors 2.2 µHy, 1.5A, 110m SMT	LPS3015-222MR	Coilcraft
60	1	L2	3.3 µH	Inductor 3.3 µH, 0.015R, 6.4A, SMT	L0-3316-3R3-RM	ICE Comp
61	1	L3	0.33 µH	Power Inductor 0.33 µH, 20A , Shilded SMT	SRP7030-R33M	Bourns
62	1	L4	2.2 µH	Power Inductors 2.2 µHy, 1.5A , 110mΩ	LPS3015-222ML	Coilcraft
63	2	Q1	TPH3300CNH,L1Q	MOSFET N-CH 150V, 18A 8-SOP	TPH3300CNH,L1Q	Toshiba
		Q16	TPH3300CNH,L1Q	MOSFET N-CH 150V, 18A 8-SOP	TPH3300CNH,L1Q	Toshiba
64	1	Q2	ZXTN25100BFHTA	TRANSISTOR NPN 100V, 3A, SOT23-3 SMT	ZXTN25100BFHTA	Diodes Inc.
65	1	Q15	BSS123LT1G	FET NCH 100V 0.15A 6RLogic Level SOT23	BSS123LT1G	ON Semi
66	1	Q93	FMMT549	TRN PNP -30V -1A SOT23	FMMT549	Fairchild
67	1	Q100	BSC0902NSI	MOSFET N-Ch 30V, 100A, TDSON-8	BSC0902NSI	Infineon
68	2	R31	392K	RES 392K, 0.1W, 1%, 0603 SMT MTL FLM	RC0603FR-07392KL	Yageo
		R78	392K	RES 392K, 0.1W 1%, 0603 SMT MTL FLM	RC0603FR-07392KL	Yageo
69	1	R34	43.2K	RES 43.2K, 100 mW, 0603SMT 1%	ERJ3EKF4322V	Panasonic
70	1	R36	10K	RES 10K 62.5 mW 1% 0603 SMT MTL FLM	RC0603FRF-0710KL	Yageo
71	1	R44	0.082	RES 0.082Ω 1/4W 1% 0805 SMT	UR732ATTD82L0F	KOA
72	1	R51	1	RES 1R 125mW 1% 0805 SMT MTL FLM	RC0805FR-071R	Yageo
73	2	R52	56K	Resistor, SMT 56K, 1%, 1/10W 0603	CRCW060356K0FKEA	Vishay
		R54	56K	Resistor, SMT 56K, 1%, 1/10W 0603	CRCW060356K0FKEA	Vishay
74	1	R53	332	RES 332R 62.5 mW 1% 0603 SMT MTL FLM	RC0603FRF07332R	Yageo
75	1	R55	5.1K	RES TCK FLM 5.1K, 62.5 mW, 1% 0603 SMT	CRCW06035K1FKEA	Vishay
76	4	R58	0	RES TCK FLM 0R 62.5 mW, 5% 0603 SMT	ERJ3GEY0R00V	Panasonic
		R65	0	RES TCK FLM 0R 62.5 mW, 5% 0603 SMT	ERJ3GEY0R00V	Panasonic
		R68	0	RES TCK FLM 0R 62.5mW, 5% 0603 SMT	ERJ3GEY0R00V	Panasonic
		R210	0	RES TCK FLM 0R 62.5 mW, 5% 0603 SMT	ERJ3GEY0R00V	Panasonic
77	1	R63	62 mΩ	RES .062Ω, 1/2W, 1%, 1206 SMT	ERJ8BWFR062V	Panasonic

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Item	QTY	Reference	Value	Description	Part Number	Manufacturer
78	4	R66	100	RES TCK FLM 100R 62.5mW 1% 0603 SMT	RC0603FR-07100RL	Yageo
		R67	100	RES TCK FLM 100R, 62.5 mW, 1% 0603 SMT	RC0603FR-07100RL	Yageo
		R204	100	RES TCK FLM 100R, 62.5 mW, 1% 0603 SMT	RC0603FR-07100RL	Yageo
		R213	100	RES TCK FLM 100R 62.5 mW 1% 0603 SMT	RC0603FR-07100RL	Yageo
79	1	R69	10K	RES 10K 62.5 mW 1% 0603 SMT MTL FLM	RC1608F1002CS	Samsung
80	2	R70	30.9	Resistor, 30.9R, 1%, 1/10W, 0603	CRCW060330R9FKEA	Vishay
		R72	30.9	Resistor, 30.9R, 1%, 1/10W, 0603	CRCW060330R9FKEA	Vishay
81	2	R71	10K	RES 10K, 62.5mW, 1% 0603 SMT MTL FLM	CR16-1002FL	ASJ
		R208	10K	RES 10K, 62.5 mW, 1% 0603 SMT MTL FLM	CR16-1002FL	ASJ
82	1	R73	1.2K	Resistor, SMT 1.2K, 5% 1/10W 0603	CRCW06031K20JNEA	Vishay
83	2	R74	20K	RES 20K, 62.5 mW, 1% 0603 SMT MTL FLM	ERJ3EKF2002V	Panasonic
		R75	20K	RES 20K 62.5mW 1% 0603 SMT MTL FLM	ERJ3EKF2002V	Panasonic
84	4	R77	100K	RES 100K 62.5 mW 1% 0603 SMT MTL FLM	MCR03EZPFX1003	Rohm
		R81	100K	RES 100K, 62. 5 mW, 1% 0603 SMT MTL FLM	MCR03EZPFX1003	Rohm
		R94	100K	RES 100K 62.5 mW, 1% 0603 SMT MTL FLM	MCR03EZPFX1003	Rohm
		R207	100K	RES 100K 62.5 mW, 1% 0603 SMT MTL FLM	MCR03EZPFX1003	Rohm
85	2	R79	10K	RES 10K, 250 mW, 1% 1206 SMT MTL FLM	RC1206FR-0710KL	Yageo
		R80	10K	RES 10K 250 mW, 1% 1206 SMT MTL FLM	RC1206FR-0710KL	Yageo
86	2	R82	7.5K	RES 7.5K 250 mW, 1% 1206 SMT MTL FLM	CR1206-FX-7501ELF	Bourns
		R88	7.5K	RES 7.5K 250 mW, 1% 1206 SMT MTL FLM	CR1206-FX-7501ELF	Bourns
87	2	R83	309K	RES 309K 62.5 mW, 1% 0603 SMT MTL FLM	RC0603FR-07309KL	Yageo
		R199	309K	RES 309K 62.5 mW, 1% 0603 SMT MTL FLM	RC0603FR-07309KL	Yageo
88	2	R84	11.8K	RES 11.8K 0.1W 1% 0603 SMT MTL FLM	RC1608F1182CS	Samsung
		R200	11.8K	RES 11.8K, 0.1W, 1% 0603 SMT MTL FLM	RC1608F1182CS	Samsung
89	1	R85	1K	RES TCK FLM 1K, 1%, 62.5 mW, 0402 SMT, 100 PPM	CR0402-FX-1001GLF	Bourns

.....continued

Item	QTY	Reference	Value	Description	Part Number	Manufacturer
90	1	R86	4.99 KΩ	RES 4.99KΩ, Thin Film, 1/16W,0.1%, 0603	PCF0603R-4K99BT1	TT Electronics
91	1	R87	75K	RES 75K, 62.5 mW, 1% 0603 SMT MTL FLM	MCR03EZPFX7502	Rohm
92	1	R89	43.2K	RES 43.2K, 100 mW, 0603SMT 1%	CR16-4322FL	ASJ
93	1	R91	3.32K	RES TCK FLM 3.32K, 62.5 mW, 1% 0603 SMT	RC0603FR-073K32L	Yageo
94	1	R92	100 KΩ	RES 100KΩ, Thin Film, 1/8W ,0.1% 0805	RT0805BRD07100KL	Yageo
95	1	R93	8.87K	RES 8.87K 62.5 mW 1% 0603SMT	RC0603FR-078K87L	Yageo
96	1	R102	120Ω	RES 120Ω, 1%, 1W, 2512 100 ppm SMD	ERJ-1TNF1200U	Panasonic
97	1	R104	22Ω	RES 22Ω, 1/2W, 5%, 1210	CRCW121022R0JNEA	Vishay
98	2	R126	0	RES 0R 250 mW, 5%, 1206 SMT JUMPER<0.05R	RC3216J000CS	Samsung
		R206	0	RES 0R 250 mW, 5%, 1206 SMT JUMPER<0.05R	RC3216J000CS	Samsung
99	1	R129	100K	RES 100K 62.5 mW, 1%, 0603 SMT MTL FLM	CRCW0603100KFKEA	Vishay
100	2	R130	15	Resistor, 15Ω, 250 mW, 1%, 1206	RC3216F150CS	Samsung
		R192	15	Resistor, 15Ω, 250 mW, 1%, 1206	RC3216F150CS	Samsung
101	2	R193	0	RES TCK FLM 0R 62.5 mW, 5%, 0603 SMT	MCR03EZPJ000	Rohm
		R205	0	RES TCK FLM 0R 62.5 mW, 5% , 0603 SMT	MCR03EZPJ000	Rohm
102	1	R194	10K	RES 10K 62.5 mW, 1%, 0603 SMT MTL FLM	MCR03EZPFX1002	Rohm
103	1	R195	30.9	Resistor, 30.9R, 1%, 1/10W 0603	ERJ3EKF30R9V	Panasonic
104	1	R197	4.75	RES 4.75R, 0.1W 1%, 0603 SMT MTL FLM	CRCW06034R75FKEA	Vishay
105	1	R201	3.65K	RES 3.65K, 0.1W 1%, 0603 SMT MTL FLM	ERJ3EKF3651V	Panasonic
106	1	R202	511	RES 511R, 100 mW, 1% ,0603SMT MTL FLM	ERJ3EKF5110V	Panasonic
107	1	R203	2K	RES TCK FLM 2K, 62.5 mW, 5%, 0603 SMT	ERJ3GEYJ202V	Panasonic
108	1	R211	47.5K	RES TCK FLM 47.5K, 250 mW,1%, 1206 SMT	CRCW1206-4752F-RT7	Vishay
109	1	R215	221K	Resistor, 221K, 1%, 1/10W 0603 SMT	CR16-2213FL	ASJ
110	1	R216	100K	RES 100K 62.5 mW, 1%, 0603 SMT MTL FLM	ERJ3EKF1003V	Panasonic
111	1	R217	301K	RES 301K, 0.1W 1%, 0603 SMT MTL FLM	ERJ3EKF3013V	Panasonic
112	1	T1	27.8 µH	Transformer flyback 54V, 40W, POE40Q-48ED	POE40Q-48ED	Coilcraft
113	1	T2	296u	Transformer, Gate driver SMT 269 µH	DA2319-AL	Coilcraft
114	1	T5	38 µH	TRANS FLYBACK POE+ 38 µH SMD	750310744	WURTH

.....continued

Item	QTY	Reference	Value	Description	Part Number	Manufacturer
115	1	U13	LX7309ILQ	Synchronous Flyback DC/DC Controller	LX7309ILQ	Microchip
116	1	U19	LX7309ILQ	Synchronous Flyback DC/DC Controller	LX7309ILQ	Microchip
117	1	U14	FOD817ASD	OPTOISOLATOR 5 KV TRANSISTOR 4 SMD	FOD817ASD	Fairchild
118	1	U18	FOD817ASD	OPTOISOLATOR 5 KV TRANSISTOR 4 SMD	FOD817ASD	Fairchild
119	1	U23	LMV321M5	IC OPAMP SINGLE RAIL-RAIL SOT23-5	LMV321M5	National
120	1	VR1	MMSZ4702	DIODE ZENER 15V 500MW SOD123	MMSZ4702	Fairchild

Note: Third-party components can be replaced by approved equivalents. N.C = not installed (optional).

5. Board Layout

This section describes the layout of the evaluation board. This is a four-layer board with 2 Oz copper. The following figures show the silk of the board for tracking devices placements.

Figure 5-1. Top Silk

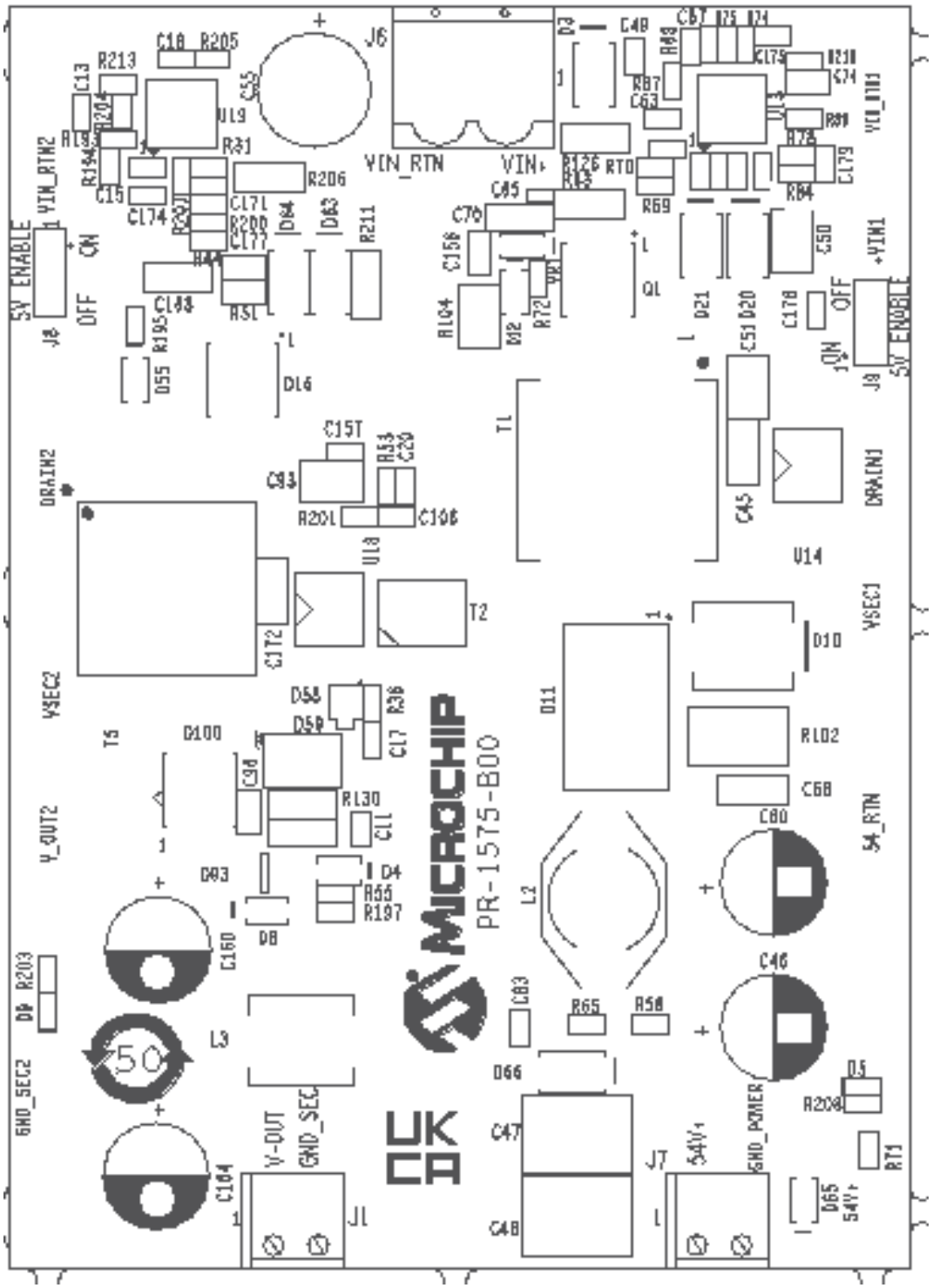


Figure 5-2. Bottom Silk

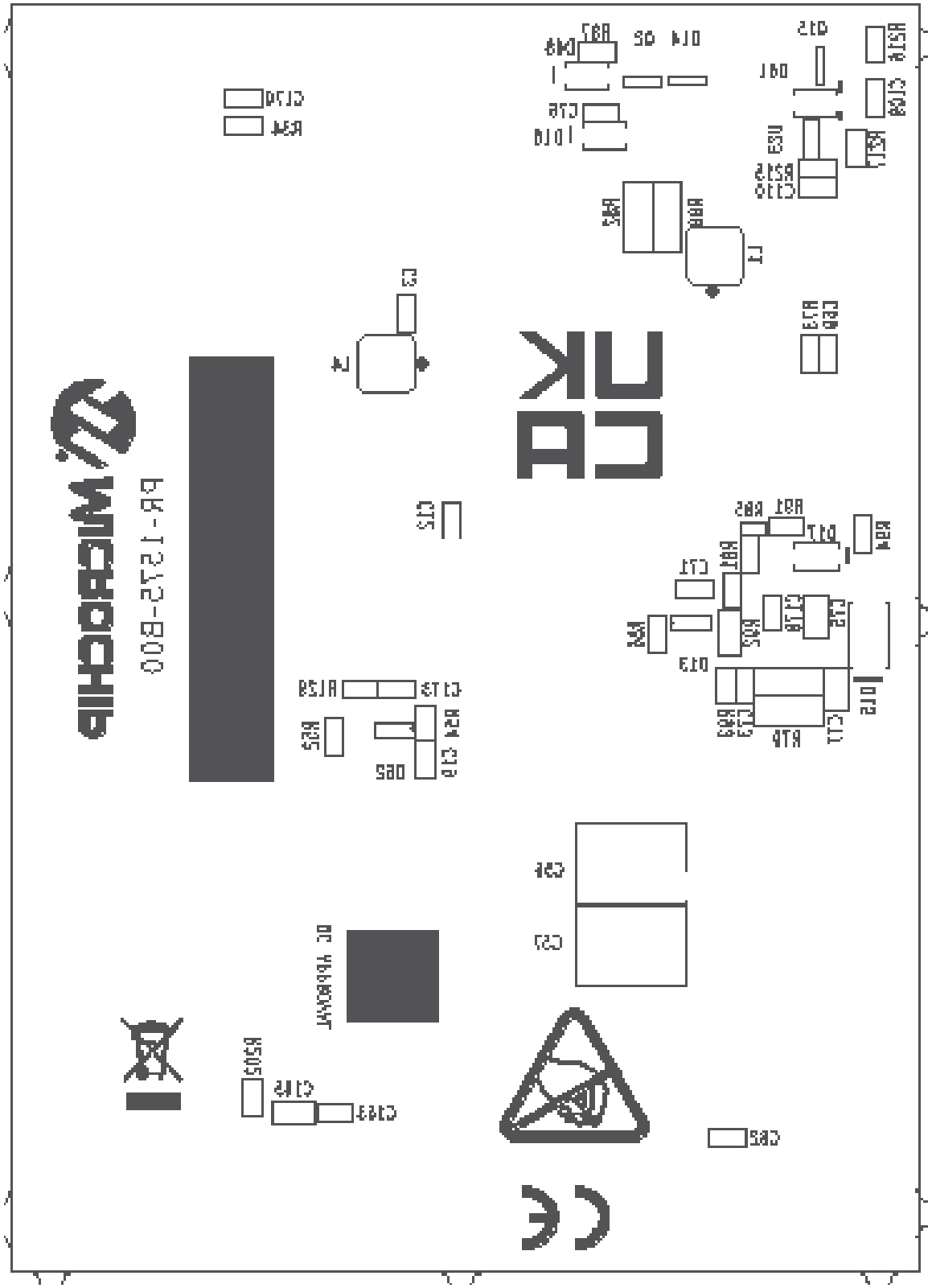


Figure 5-3. Top Copper

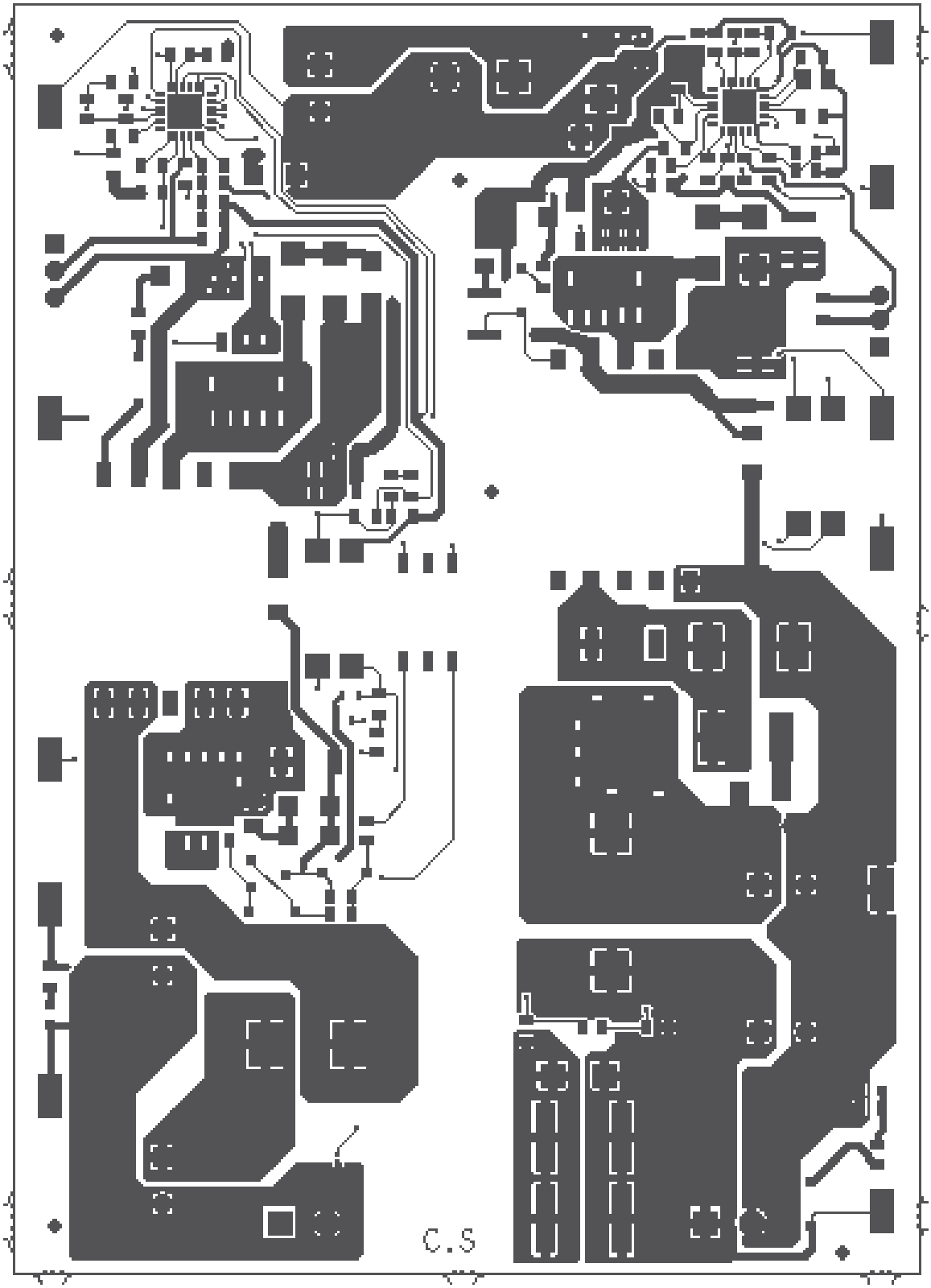
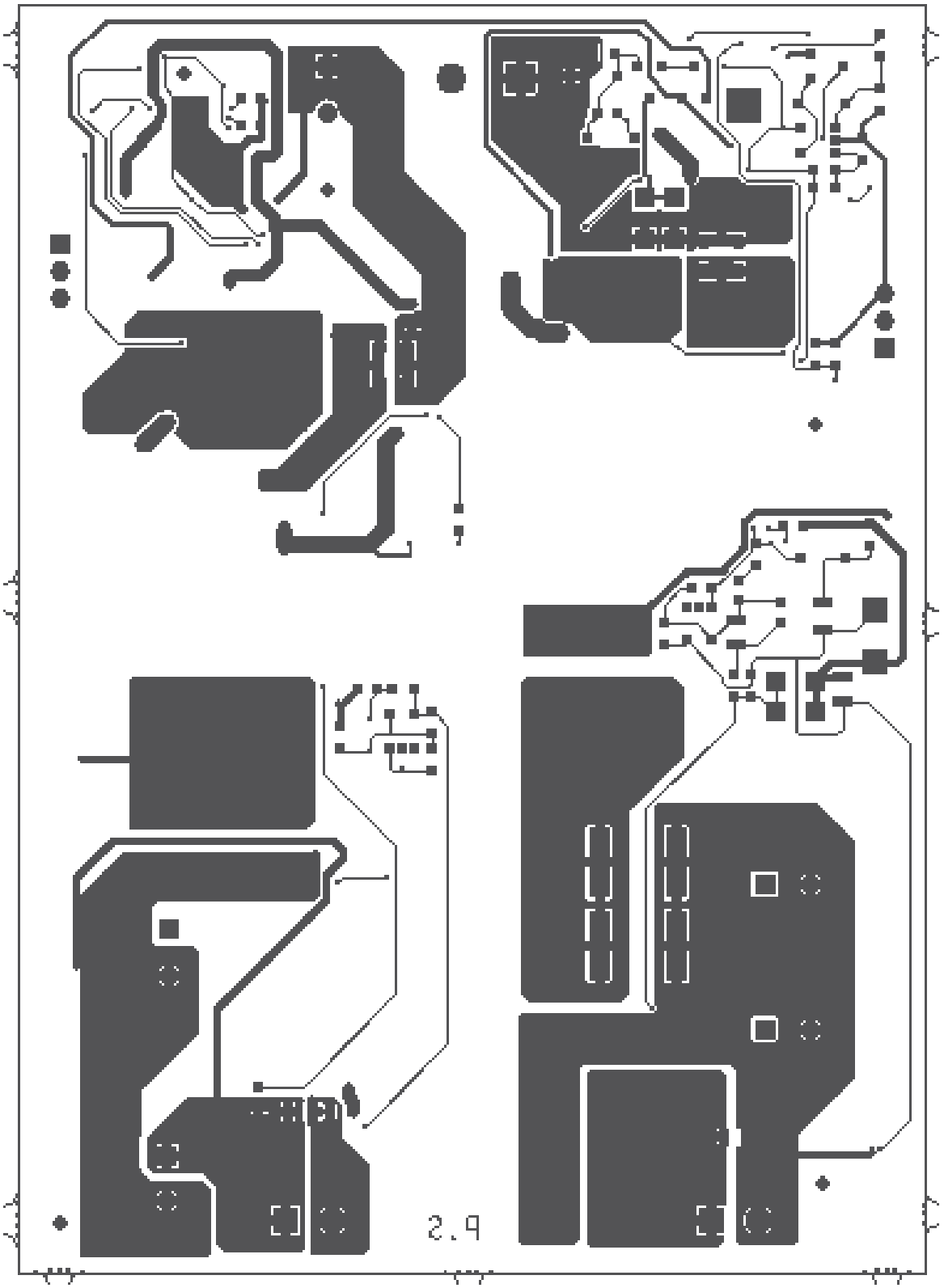


Figure 5-4. Bottom Copper



6. Ordering Information

The following table lists the evaluation board ordering information.

Table 6-1. Evaluation Board Ordering Information

Ordering Number	Description
EV96C70A	55W Dual Output Isolated Flyback Converter from 36V to 54V input.

7. Revision History

Revision	Date	Description
B	03/2022	Following is the summary of changes made in this revision: • Updated Figure 3-1. • Updated item 95 in Table 4-1.
A	01/2022	Initial revision.

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