

General Description

The MAX15159 evaluation kit (EV kit) provides a proven design to evaluate the MAX15159, a high-voltage multiphase boost/flyback controller with enhanced low-side MOSFET gate driver capability, designed to support single-phase, dual-phase, triple-phase, or quad-phase boost/flyback configuration.

The EV kit operates from a 40V to 60V input voltage range and provides a default 54V output voltage while the output voltage is configurable by changing the resistor-divider at FB pin or by using an external REFIN input voltage in the range of 1.5V to 2.2V. The EV kit uses the MAX15159 on a proven six-layer PCB design. The EV kit also features an onboard RCD circuit to provide a 10V supply voltage to the MAX15159. Two MAX15159 EV kits are required for triple-phase or quad-phase operation.

Features

- 40V to 60V Input Voltage Range for Flyback Configuration
- 54V Output Voltage
- -40°C to +85°C Temperature Range
- Banana Jacks for Input and Output Voltage
- Configurable Output Voltage and Compensation Parameters
- Adjustable Current Limit
- Flexibility of Adjusting Output Voltage Enabled by REFIN Feature
- Fully Assembled and Tested

[Ordering Information](#) appears at end of data sheet.

Quick Start

Required Equipment

- MAX15159 EV Kit
- One 80V DC Power Supply (PS1)
- One Optional 6V DC Power Supply (PS2)
- 0 to 1.6A Load
- Digital Voltmeters
- Oscilloscope and Probes

Procedure

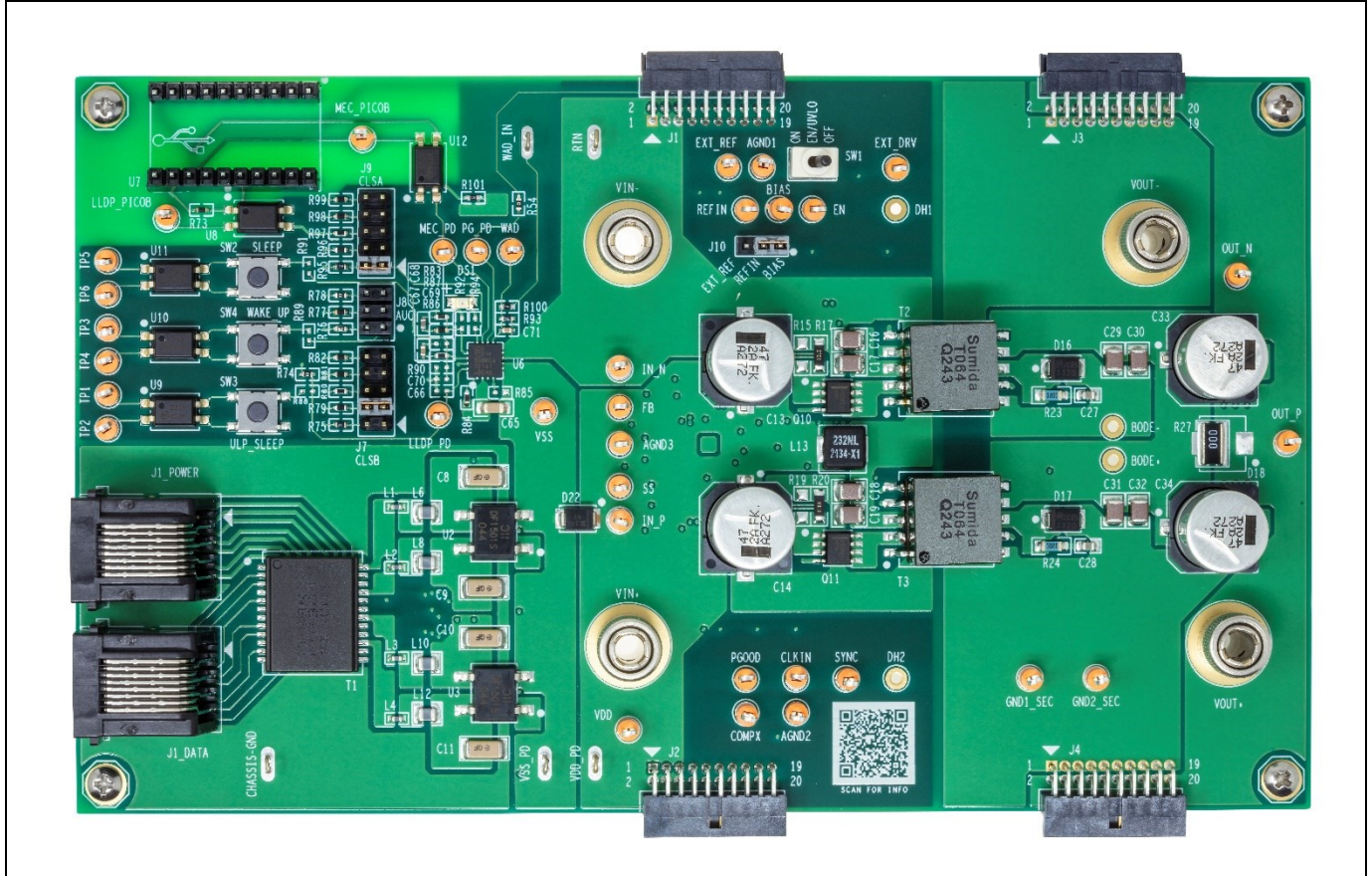
The EV kit is fully assembled and tested. Use the following steps to verify board operation:

Caution: Do not turn on the power supply until all connections are completed.

1. Verify that a shunt is installed across jumpers J7, J9, and J10.
2. Set the power supply (PS1) to 48V, connect the positive terminal of the power supply (PS1) to the VIN+ banana jack on the EV kit and connect the negative terminal of the power supply (PS1) to the VIN- banana jack.
3. If an internal reference voltage is not used (shunt connecting Pin1:Pin2 on J10 is not installed), set another power supply (PS2) to 2.0V, connect the positive terminal of the power supply (PS2) to the test point EXT_REF, and connect the negative terminal of the power supply (PS2) to the test point AGND. Use a shunt to connect Pin2 and Pin3 of J10.
4. Connect the positive terminal of the load to the VOUT+ banana jack, and connect the negative terminal of the load to the VOUT- banana jack.
5. Turn on power supply PS2, if it is used.
6. Turn on power supply PS1.
7. Position the SW1 toggle switch to ON to enable the IC.
8. Verify that the voltage between the OUT_P and OUT_N test points is 54V.

The EV kit is now ready for additional evaluation.

MAX15159 EV Kit Photo



Detailed Description of Hardware

This evaluation kit should be used with the following documents:

- MAX15159 Data Sheet
- MAX15159 EV Kit Data Sheet (this document)
- MAX596C Data Sheet (optional)
- MAX596C EV Kit Data Sheet (optional)

The MAX15159 EV kit provides a proven design to evaluate the MAX15159 fully integrated, highly efficient, two-phase switching regulator. The EV kit can easily be connected between the power input and the load using the banana jacks and connectors provided for the input and output. Test points and connectors are provided to monitor and control the device signals.

The EV kit operates in the 40V to 60V input voltage range. The output voltage is set to 54V by default on the EV kit. The output voltage can be adjusted by changing the resistor-divider across the tertiary winding, whose center is connected to FB pin or by using an external REFIN input voltage in the range of 1.5V to 2.2V. Make sure that the correct transformer, MOSFETs/rectifier diodes, and compensation loop are selected for stable operation.

EN/UVLO Input for MAX15159

The device's enable input (EN/UVLO) is controlled by a resistor-divider ratio between R52 and R53. The divider ratio is chosen so that the VIN UVLO threshold is set at 35.8V by default. If the EN/UVLO pin voltage is above 1V, the MAX15159 will power up. The EN/UVLO pin can be connected to GND to disable the regulation. Additionally, a test point (EN) is also provided to drive the EN/UVLO pin.

Bode Plot

A 10 Ω resistor is installed between the OUT_P sense point and optocoupler to measure the Bode plot. BODE+ and BODE- test points are provided on the board on either side of the 10 Ω resistor for small-signal injection and the ability to measure the Bode plot. The Bode plot can only be properly measured when the EV kit is configured with optocoupler feedback.

Output Regulation

The OUT_P and OUT_N test points are provided to measure the V_{OUT} regulation.

Efficiency Measurement

IN_P and IN_N are provided to measure V_{IN} during efficiency measurement. Also, OUT_P and OUT_N are provided to measure V_{OUT} during efficiency measurement.

FREQ/CLK Pin

Switching frequency is selected by connecting the R30 resistor between the FREQ/CLK pin and AGND. The switching frequency can also be selected by providing a 480kHz to 4MHz external clock (360kHz to 3MHz for triple phase) at this pin. A test point (CLKIN) is also provided to drive this pin.

REFIN Pin

By default, the REFIN pin is connected to the BIAS supply by shunt installed through Pin1:Pin2 on J10. This shunt can be removed, and REFIN can be connected to an external supply (between 1.5V and 2.2V) to change the V_{OUT} reference with a shunt installed between Pin2:Pin3 on J10 and, therefore, change the output regulation voltage. The external supply should be applied between test point EXT_REF and AGND.

Optocoupler Feedback

The EV kit can be configured to feedback output voltage with optocoupler by removing R7 and installing R55, R56, R57, R62, and R70. Feedback with an optocoupler can be used for tight line/load regulation.

Connecting Multiple EV Kits Together

The EV kit provides jumpers J1, J2, J3, and J4 to connect two EV kits together for three-phase or four-phase operation. As detailed in the MAX15159 data sheet, the EV kits can be configured for primary controller and secondary controller operation.

Interfacing with MAX5996C

The EV kit has a complete MAX5996C circuit on board, which provides a complete interface for a powered device (PD) to comply with the IEEE® 802.3af/at/bt standard in a Power-over-Ethernet (PoE) system with a detection signature, classification signature, and integrated power switch with startup inrush current control. Refer to the [MAX5996C](#) IC data sheet for more details. The MAX5996C circuit can be enabled by installing R54.

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Ordering Information

PART	TYPE
MAX15159EVKIT#	EV Kit

#Denotes RoHS-compliant.

MAX15159 EV Kit Bill of Materials

ITEM	REF_DES	DNI/DNP	QTY	MFR PART#	MANUFACTURER	VALUE	DESCRIPTION
1	AGND1-AGND3, BIAS, CLKIN, COMPX, EN, EXT_DRV, EXT_REF, FB, GND1_SEC, GND2_SEC, IN_N, IN_P, LLD_P, PD, LLDP_PICOB, MEC_PD, MEC_PICOB, OUT_N, OUT_P, PGOOD, PG_PD, REFIN, SS, SYNC, TP1-TP6, VDD, VSS, WAD	—	34	5013	KEystone	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; ORANGE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; RECOMMENDED FOR BOARD THICKNESS=0.062IN; NOT FOR COLD TEST
2	C1-C4	—	4	C0805C103K1RAC; GRM21BR72A103KA01; 08055C103KAT2A	KEMET;MURATA;AVX	0.01UF	CAP; SMT (0805); 0.01UF; 10%; 100V; X7R; CERAMIC
3	C7-C11	—	5	GA352QR7GF102KW01	MURATA	1000PF	CAP; SMT (2211); 1000PF; 10%; 250V; X7R; CERAMIC
4	C12	—	1	C0805C473J1RAC; GRM21BR72A473JA01	KEMET;MURATA	0.047UF	CAP; SMT (0805); 0.047UF; 5%; 100V; X7R; CERAMIC
5	C13, C14, C33, C34	—	4	EEE-FK2A470AQ	PANASONIC	47UF	CAP; SMT (CASE_H13); 47UF; 20%; 100V; ALUMINUM-ELECTROLYTIC
6	C15, C26, C47	—	3	GCM188R71E105KA64; CGA3E1X7R1E105K080AC	MURATA;TDK	1UF	CAP; SMT (0603); 1UF; 10%; 25V; X7R; CERAMIC
7	C16-C19, C29-C32, C36, C37	—	10	GRM32ER72A225KA35; CGA6N3X7R2A225K230AB; CC1210KKX7R0BB225; HMK325B7225KM	MURATA;TDK;YAGEO;TAIYO YUDEN	2.2UF	CAP; SMT (1210); 2.2UF; 10%; 100V; X7R; CERAMIC
8	C21	—	1	GRM188R71E474KA12	MURATA	0.47UF	CAP; SMT (0603); 0.47UF; 10%; 25V; X7R; CERAMIC
9	C24, C25	—	2	C1206X222KGRAC; C1206X222KGRAC7800	KEMET;KEMET	2200PF	CAP; SMT (1206); 2200PF; 10%; 2000V; X7R; CERAMIC
10	C27, C28	—	2	GCM21A7U2E101JX01	MURATA	100PF	CAP; SMT (0805); 100PF; 5%; 250V; U2J; CERAMIC
11	C35	—	1	CC0603KRX7R0BB104; GRM188R72A104KA35; HMK107B7104KA; 06031C104KAT2A; GRM188R72A104K	YAGEO;MURATA; TAIYO YUDEN;AVX;MURATA	0.1UF	CAP; SMT (0603); 0.1UF; 10%; 100V; X7R; CERAMIC
12	C43, C52	—	2	GRM188R71C103KA01; ECJ-1VB1C10; CL10B103K08NNIN; GCJ188R71C103KA01	MURATA;PANASONIC; SAMSUNG;MURATA	0.01UF	CAP; SMT (0603); 0.01UF; 10%; 16V; X7R; CERAMIC
13	C45, C46, C49, C50, C58	—	5	GRM1885C1H102JA01; C1608C0G1H102J080AA; GCM1885C1H102JA16	MURATA;TDK;MURATA	1000PF	CAP; SMT (0603); 1000PF; 5%; 50V; C0G; CERAMIC
14	C48, C62	—	2	C0603C101J5GAC; ECJ-1VC1H101J; C1608C0G1H101J080AA; GRM1885C1H101JA01; CL10C101JB81PN	KEMET;PANASONIC;TDK; MURATA;SAMSUNG	100PF	CAP; SMT (0603); 100PF; 5%; 50V; C0G; CERAMIC
15	C51	—	1	GRM188R71C683KA01	MURATA	0.068UF	CAP; SMT (0603); 0.068UF; 10%; 16V; X7R; CERAMIC
16	C54	—	1	GRM188Z71C225KE43; EMK107BB7225KA	MURATA;TAIYO YUDEN	2.2UF	CAP; SMT (0603); 2.2UF; 10%; 16V; X7R; CERAMIC
17	C55	—	1	GRM188C71E225KE11	MURATA	2.2UF	CAP; SMT (0603); 2.2UF; 10%; 25V; X7S; CERAMIC
18	C56, C57, C59	—	3	885012206071; C1608X7R1E104K080AA; C0603C104K3RAC; GRM188R71E104KA01; C1608X7R1E104K; 06033C104KAT2A	WURTH ELECTRONICS INC;TDK;KEMET;MURATA;TDK;AVX	0.1UF	CAP; SMT (0603); 0.1UF; 10%; 25V; X7R; CERAMIC
19	C60, C72	—	2	C0603C0G500-561JNE; GRM1885C1H561JA01; ECJ-1VC1H561J	VENKEL LTD;MURATA;PANASONIC	560PF	CAP; SMT (0603); 560PF; 5%; 50V; C0G; CERAMIC
20	C64	—	1	C0603C153K5RAC; GRM188R71H153K	KEMET;MURATA	0.015UF	CAP; SMT (0603); 0.015UF; 10%; 50V; X7R; CERAMIC
21	C65	—	1	C1206C104K1RAC; C3216X7R2A104K160AA; GRM319R72A104KA01	KEMET;TDK;MURATA	0.1UF	CAP; SMT (1206); 0.1UF; 10%; 100V; X7R; CERAMIC
22	C67	—	1	C0603C473K1RAC	KEMET	0.047UF	CAP; SMT (0603); 0.047UF; 10%; 100V; X7R; CERAMIC
23	C68	—	1	C0603C822K5RAC	KEMET	8200PF	CAP; SMT (0603); 8200PF; 10%; 50V; X7R; CERAMIC
24	C71	—	1	CGA3E2X7R2A103K; C0603C103K1RA; GRM188R72A103KA01; C1608X7R2A103K080AA	TDK;KEMET;MURATA;TDK	0.01UF	CAP; SMT (0603); 0.01UF; 10%; 100V; X7R; CERAMIC; NOTE: NOT RECOMMENDED FOR NEW DESIGN. USE 20-00u01-M8
25	C82	—	1	GRM39C0G220J50V; GRM1885C1H220J; C1608C0G1H220J080AA	MURATA;MURATA;TDK	22PF	CAP; SMT (0603); 22PF; 5%; 50V; C0G; CERAMIC
26	CHASSIS-GND, RTN, VDD_PD, VSS_PD, WAD_IN	—	5	9020 BUSS	WEICO WIRE	MAXIMPAD	EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG
27	D1	—	1	CMDZ5252B	CENTRAL SEMICONDUCTOR	24V	DIODE; ZNR; SMT (SOD-323); VZ=24V; IZ=0.0052A
28	D2	—	1	MBR230S1F-7	DIODES INCORPORATED	MBR230S1F-7	DIODE; RECT; SMT (SOD-123F); PIV=30V; IF=2A

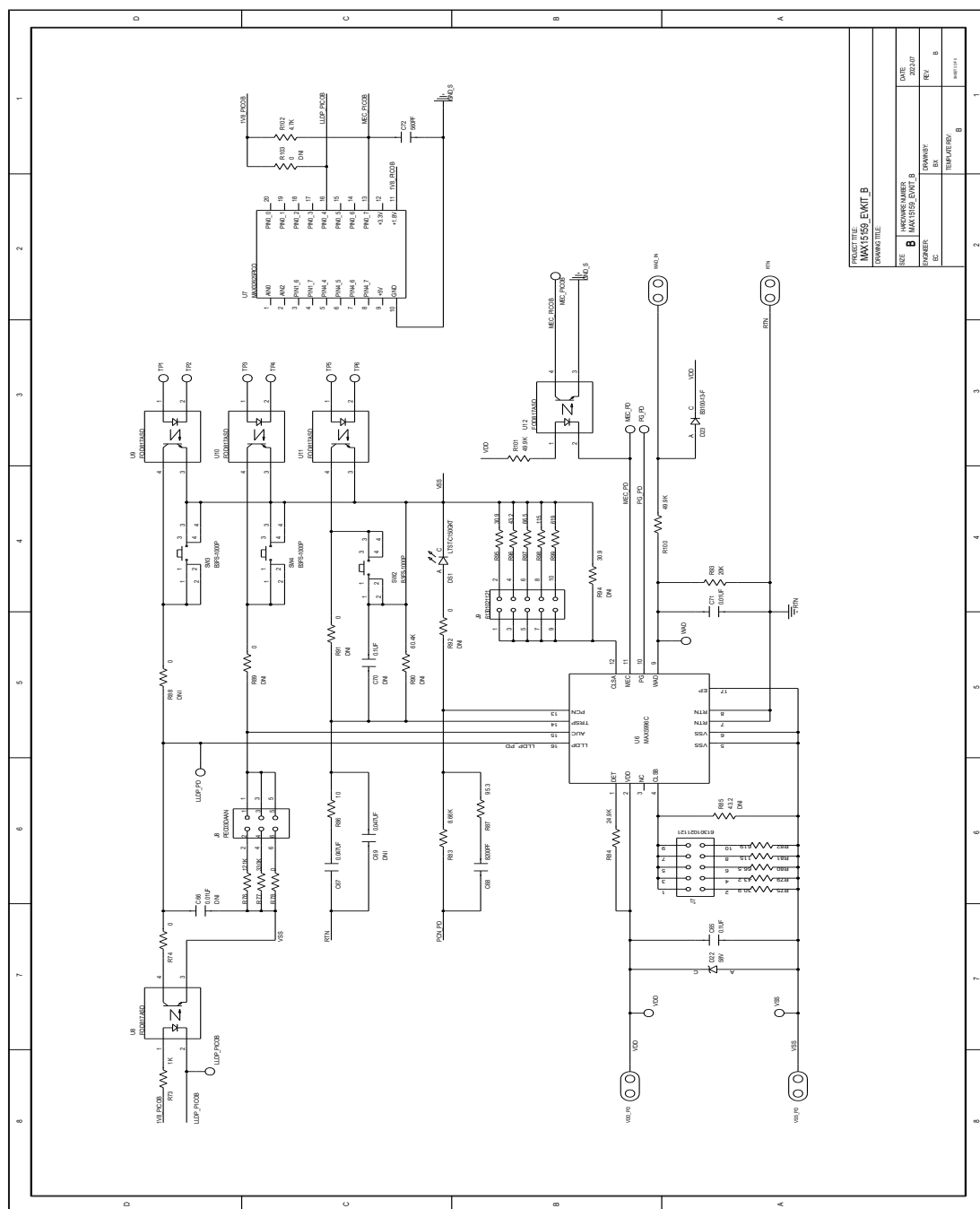
29	D3	—	1	BZT52C10S-7-F	DIODES INCORPORATED	10V	DIODE; ZNR; SMT (SOD-323); VZ=10V; IZ=0.005A
30	D4-D6, D11, D13-D15	—	7	1N4148WS-7-F	DIODES INCORPORATED	1N4148WS-7-F	DIODE; SWT; SMT (SOD-323); PIV=75V; IF=0.3A
31	D7, D9	—	2	SMAJ64A	LITTELFUSE	64V	DIODE; TVS; SMA (DO-214AC); PIV=64V; IF=3.9A
32	D8, D10	—	2	S1B-13-F	DIODES INCORPORATED	S1B	DIODE; RECT; SMA; PIV=100V; IF=1.0A
33	D16, D17	—	2	S320	ON SEMICONDUCTOR	S320	DIODE; SCH; SMB (DO-214AA); PIV=200V; IF=3A
34	D21	—	1	SMBJ45A	TAIWAN SEMICONDUCTOR	45V	DIODE; TVS; DO-214AA (SMB); VRM=45V; IPP=8.6A; NOTE: THESE PARTS HAVE 14 WEEKS LONG LEAD TIME; MANUFACTURING DELAYS HAVE BEEN REPORTED ON THIS PRODUCT
35	D22	—	1	SMBJ58A-13-F	DIODES INCORPORATED	58V	DIODE; TVS; SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR; SMB; PIV=58V; IF=100A
36	D23	—	1	B3100-13-F	DIODES INCORPORATED	B3100-13-F	DIODE; RECT; SMC; PIV=100V; IF=3A
37	DS1	—	1	LTST-C150GKT	LITE-ON ELECTRONICS INC.	LTST-C150GKT	DIODE; LED; ; SMT (1206); VF=2.1V; IF=0.03A; -55 DEGC TO +85 DEGC; GREEN
38	H1-H4	—	4	2203	GENERIC PART	2203	STANDOFF; FEMALE-THREADED; HEX; 4-40; 1/2IN; ALUMINUM
39	H5-H8	—	4	4C25MXPS;9900; 91772A106	MCMaster-CARR	PMSSS4400025PH	MACHINE SCREW; PHILLIPS; PAN; 4-40; 1/4IN; 18-8 STAINLESS STEEL
40	J1, J3	—	2	LS2-110-01-S-D-RA1	SAMTEC	LS2-110-01-S-D-RA1	CONNECTOR; THROUGH HOLE; SELF MATING HERMAPHRODITIC STRIP SHROUD DOWN; RIGHT ANGLE; 20PINS
41	J1_DATA, J1_POWER	—	2	5520252-4	TE CONNECTIVITY	5520252-4	CONNECTOR; FEMALE; THROUGH HOLE; MODULAR JACK ASSEMBLY; KEYED; FLANGELESS; WITH PANEL STOP; RIGHT ANGLE; 8PINS
42	J2, J4	—	2	LS2-110-01-S-D-RA2	SAMTEC	LS2-110-01-S-D-RA2	CONNECTOR; THROUGH HOLE; SELF MATING HERMAPHRODITIC STRIP SHROUD UP; RIGHT ANGLE; 20PINS
43	J7, J9	—	2	61301021121	WURTH ELECTRONICS INC	61301021121	CONNECTOR; MALE; THROUGH HOLE; 2.54 DUAL PIN HEADER; STRAIGHT; 10PINS
44	J8	—	1	PEC03DAAN	SULLINS ELECTRONICS CORP.	PEC03DAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 6PINS; -65 DEGC TO +125 DEGC
45	J10	—	1	PEC03SAAN	SULLINS	PEC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS
46	L1-L4	—	4	BLM18EG221SN1	MURATA	220	INDUCTOR; SMT (0603); FERRITE-BEAD; 220; TOL=+/-25%; 2A
47	L5-L12	—	8	LQM2HPN4R7MG0	MURATA	4.7UH	INDUCTOR; SMT (1008); FERRITE; 4.7UH; 20%; 1.10A
48	L13	—	1	PG0083.232NL	PULSE	2.3UH	INDUCTOR; SMT; POWER; 2.3UH; 25%; 7.5A
49	Q9	—	1	BCX56TA	DIODES INCORPORATED	BCX56TA	TRAN; NPN MEDIUM POWER TRANSISTOR; NPN; SOT-89; PD-(1W); I-(1A); V-(80V)
50	Q10, Q11	—	2	FDS86240	ON SEMICONDUCTOR	FDS86240	TRAN; POWER TRENCH MOSFET; NCH; SO-8; PD-(5W); I-(7.5A); V-(150V)
51	Q14	—	1	SMMBT4403LT1G	ON SEMICONDUCTOR	SMMBT4403LT1G	TRANS; PNP; SOT-23; PD=0.225W; IC=0.6A; VCEO=40V; NOTE: THESE PARTS HAVE 52 WEEKS LONG LEAD TIME; MANUFACTURING DELAYS HAVE BEEN REPORTED ON THIS PRODUCT
52	R1-R4	—	4	CRCW080575R0FK	VISHAY DALE	75	RES; SMT (0805); 75; 1%; +/-100PPM/DEGC; 0.1250W
53	R5, R7, R33, R59, R60, R74, R78, R104	—	8	RC1608J000CS; RC0603-J-000ELF; RC0603JR-070RL	SAMSUNG ELECTRONICS; BOURNS; YAGEO PH	0	RES; SMT (0603); 0; 5%; JUMPER; 0.1000W
54	R6	—	1	CRCW080530K0FK	VISHAY	30K	RES; SMT (0805); 30K; 1%; +/-100PPM/DEGC; 0.1250W
55	R8	—	1	CRCW060345K3FK; ERJ-3EKF4532	VISHAY DALE; PANASONIC	45.3K	RES; SMT (0603); 45.3K; 1%; +/-100PPM/DEGC; 0.1000W
56	R9, R53	—	2	CRCW060310K0FK; ERJ-3EKF1002; AC0603FR-0710KL; RMCF0603FT10K0	VISHAY; PANASONIC; YAGEO; STACKPOLE	10K	RES; SMT (0603); 10K; 1%; +/-100PPM/DEGC; 0.1000W
57	R10, R11, R37, R38, R45, R46, R86	—	7	CRCW060310R0FK; MCR03EZPF10R0; ERJ-3EKF10R0	VISHAY; ROHM SEMICONDUCTOR; PANASONIC	10	RES; SMT (0603); 10; 1%; +/-100PPM/DEGC; 0.1000W
58	R12	—	1	CRCW080510R0FK; ERJ-6ENF10R0	VISHAY DALE; PANASONIC	10	RES; SMT (0805); 10; 1%; +/-100PPM/DEGC; 0.1250W
59	R13	—	1	CR0603-16W-4990FT	VENKEL LTD.	499	RES; SMT (0603); 499; 1%; +/-100PPM/DEGC; 0.0630W
60	R35, R49	—	2	CRCW06033K00FK	VISHAY DALE	3K	RES; SMT (0603); 3K; 1%; +/-100PPM/DEGC; 0.1000W
61	R17, R20	—	2	PMR18EZPFU10L0	ROHM SEMICONDUCTOR	0.01	RES; SMT (1206); 0.01; 1%; +/-100PPM/DEGC; 1W
62	R23, R24	—	2	CRCW12063R00FK; RK73H2BTTD30R0F	VISHAY DALE; KOA SPEER	30	RES; SMT (1206); 30; 1%; +/-100PPM/DEGC; 0.2500W
63	R25, R26	—	2	CRCW06033R00FKEAHP	VISHAY DRALORIC	3	RES; SMT (0603); 3; 1%; +/-100PPM/DEGC; 0.2500W
64	R27	—	1	RCL12250000Z0	VISHAY DRALORIC	0	RES; SMT (1225); 0; JUMPER; JUMPER; 2W
65	R30, R100, R101	—	3	CRCW060349K9FK; ERJ-3EKF4992	VISHAY DALE; PANASONIC	49.9K	RES; SMT (0603); 49.9K; 1%; +/-100PPM/DEGC; 0.1000W
66	R34	—	1	CRCW0603100KFK; RC0603FR-07100KL	VISHAY DALE; YAGEO; YAGEO; PANASONIC; YAGEO	100K	RES; SMT (0603); 100K; 1%; +/-100PPM/DEGC; 0.1000W

				RC0603FR-13100KL; ERJ-3EKF1003; AC0603FR-07100KL			
67	R36, R40	—	2	CRCW060340K2FK; RC0603FR-0740K2L; ERJ-3EKF4022	VISHAY DALE;YAGEO;PANASONIC	40.2K	RES; SMT (0603); 40.2K; 1%; +/-100PPM/DEGC; 0.1000W
68	R39, R47, R50, R61, R73	—	5	CRCW06031K00FK; ERJ-3EKF1001; CR0603AFX-1001ELF; RMC0603FT1K00	VISHAY;PANASONIC; BOURNS;STACKPOLE ELECTRONICS INC.	1K	RES; SMT (0603); 1K; 1%; +/-100PPM/DEGC; 0.1000W
69	R41	—	1	CRCW060351K1FK; ERJ-3EKF5112	VISHAY DALE;PANASONIC	51.1K	RES; SMT (0603); 51.1K; 1%; +/-100PPM/DEGC; 0.1000W
70	R43	—	1	RC0603FR-074K53L	YAGEO	4.53K	RES; SMT (0603); 4.53K; 1%; +/-100PPM/DEGC; 0.1000W
71	R51, R93	—	2	MCR03EZPF2002; ERJ-3EKF2002; CR0603-FX-2002ELF; CRCW060320K0FK; RMC0603FT20K0	ROHM;PANASONIC;BOURNS; VISHAY;STACKPOLE ELECTRONICS INC	20K	RES; SMT (0603); 20K; 1%; +/-100PPM/DEGC; 0.1000W
72	R52	—	1	CRCW0603348KFK	VISHAY DALE	348K	RES; SMT (0603); 348K; 1%; +/-100PPM/DEGC; 0.1000W
73	R58	—	1	CRCW0603120KFK	VISHAY DALE	120K	RES; SMT (0603); 120K; 1%; +/-100PPM/DEGC; 0.1000W
74	R14,R63	—	2	CRCW06032K00FK; ERJ-3EKF2001; RC0603FR-072KL; CRCW06032K00FK	VISHAY;PANASONIC; YAGEO;VISHAY	2K	RES; SMT (0603); 2K; 1%; +/-100PPM/DEGC; 0.1000W
75	R66	—	1	CRCW06036K80FK	VISHAY DALE	6.8K	RES; SMT (0603); 6.8K; 1%; +/-100PPM/DEGC; 0.1000W
76	R67	—	1	ERJ-3EKF7501; CRCW06037K50FK	PANASONIC;VISHAY	7.5K	RES; SMT (0603); 7.5K; 1%; +/-100PPM/DEGC; 0.1000W
77	R69	—	1	CRCW06031K65FK	VISHAY DALE	1.65K	RES; SMT (0603); 1.65K; 1%; +/-100PPM/DEGC; 0.1000W
78	R71	—	1	CRCW060316K2FK	VISHAY DALE	16.2K	RES; SMT (0603); 16.2K; 1%; +/-100PPM/DEGC; 0.1000W
79	R75, R95	—	2	CRCW060330R9FK	VISHAY DALE	30.9	RES; SMT (0603); 30.9; 1%; +/-100PPM/DEGC; 0.1000W
80	R76	—	1	CR0603-16W-1213FT	VENKEL LTD.	121K	RES; SMT (0603); 121K; 1%; +/-100PPM/DEGC; 0.0630W
81	R77	—	1	CRCW0603330KFK	VISHAY DALE	330K	RES; SMT (0603); 330K; 1%; +/-100PPM/DEGC; 0.1000W
82	R79, R96	—	2	CRCW060343R2FK	VISHAY DALE	43.2	RES; SMT (0603); 43.2; 1%; +/-100PPM/DEGC; 0.1000W
83	R80, R97	—	2	TNPW060366R5BE; ERA-3AEB66R5	VISHAY;PANASONIC	66.5	RES; SMT (0603); 66.5; 0.10%; +/-25PPM/DEGC; 0.1000W
84	R81, R98	—	2	CRCW0603115RFK	VISHAY DALE	115	RES; SMT (0603); 115; 1%; +/-100PPM/DEGC; 0.1000W
85	R82, R99	—	2	CRCW0603619RFK; ERJ-3EKF6190	VISHAY DALE;PANASONIC	619	RES; SMT (0603); 619; 1%; +/-100PPM/DEGC; 0.1000W
86	R83	—	1	ERJ-3EKF8661	PANASONIC	8.66K	RES; SMT (0603); 8.66K; 1%; +/-100PPM/DEGC; 0.1000W
87	R84	—	1	CRCW060324K9FK; ERJ-3EKF2492	VISHAY DALE;PANASONIC	24.9K	RES; SMT (0603); 24.9K; 1%; +/-100PPM/DEGC; 0.1000W
88	R87	—	1	CRCW060395R3FK; AC0603FR-0795R3L	VISHAY;YAGEO	95.3	RES; SMT (0603); 95.3; 1%; +/-100PPM/DEGC; 0.1000W
89	R102	—	1	CRCW06034K70FK	VISHAY DALE	4.7K	RES; SMT (0603); 4.7K; 1%; +/-100PPM/DEGC; 0.1000W
90	R109	—	1	ERJ-3EKF1782; CRCW060317K8FK	PANASONIC;VISHAY	17.8K	RES; SMT (0603); 17.8K; 1%; +/-100PPM/DEGC; 0.1000W
91	SU1-SU3	—	3	929953-30	3M ELECTRONIC SOLUTIONS DIVISION	929953-30	CONNECTOR; FEMALE; THROUGH HOLE; 929 SERIES; SHUNT CONNECTOR; STRAIGHT; 2PINS
92	SW1	—	1	GT21MCBE	C&K COMPONENTS	GT21MCBE	SWITCH; DPDT; THROUGH HOLE; 20V; 0.4VA; GT SERIES; SEALED ULTRAMINIATURE TOGGLE SWITCH; RCOIL= 0.05 OHM; RINSULATION=10G OHM; C&K COMPONENTS
93	SW2-SW4	—	3	B3FS-1000P	OMRON	B3FS-1000P	SWITCH; SPST; SMT; 24V; 0.05A; TACTILE SURFACE MOUNT SWITCH; RCOIL= OHM; RINSULATION= OHM; OMRON
94	T1	—	1	7490220126	WURTH ELECTRONICS INC	7490220126	EVKIT PART - TRANSFORMER; 7490220126; SMT- 24; SUMIDA
95	T2, T3	—	2	14354-T064	SUMIDA	14354-T064	EVKIT PART - TRANSFORMER; SMT; PRI:(37- 60V;300KHZ); AUX:(12V/0.02A); SEC:(54V/0.1A); SEC:(54V/0.83A); SMT-10
96	U2, U3	—	2	DF1501S	DIODES INCORPORATED	DF1501S	DIODE; RECT; SMT; PIV=100V; IF=1.5A
97	U4	—	1	MAX15159ATJ+	ANALOG DEVICES	MAX15159ATJ+	EVKIT PART - IC; HIGH-VOLTAGE MULTIPHASE BOOST/FLYBACK CONTROLLER WITH NO-OPTO FEEDBACK; PACKAGE OUTLINE DRAWING 21- 0140; LAND PATTERN NUMBER 90-0012; PACKAGE CODE T3255+4C ; TQFN32-EP
98	U5	—	1	FOD817CSD	ON SEMICONDUCTOR	FOD817CSD	IC; OPTO; 4-PIN DIP PHOTOTRANSISTOR OPTOCOUPLER; SMT
99	U6	—	1	MAX5996C	ANALOG DEVICES	MAX5996C	EVKIT PART - IC; MAX5996C; PACKAGE OUTLINE DRAWING: 21-100484; PACKAGE LAND PATTERN: 90-100171; TQFN16-EP
100	U8-U12	—	5	FOD817ASD	FAIRCHILD SEMICONDUCTOR	FOD817ASD	IC; OPTO; 4-PIN HIGH OPERATING TEMPERATURE PHOTOTRANSISTOR OPTOCOUPLER; SMT
101	U13	—	1	TL431AQDBZRQ1	TEXAS INSTRUMENTS	TL431AQDBZRQ1	IC; VREG; ADJUSTABLE PRECISION SHUNT REGULATOR; SOT-23
102	VIN+, VIN-, VOUT+, VOUT-	—	4	111-2223-001	EMERSON NETWORK POWER	111-2223-001	MACHINE SCREW; THUMBSCREW; BANANA; 1/4- 32IN; 11/32IN; NICKEL PLATED BRASS

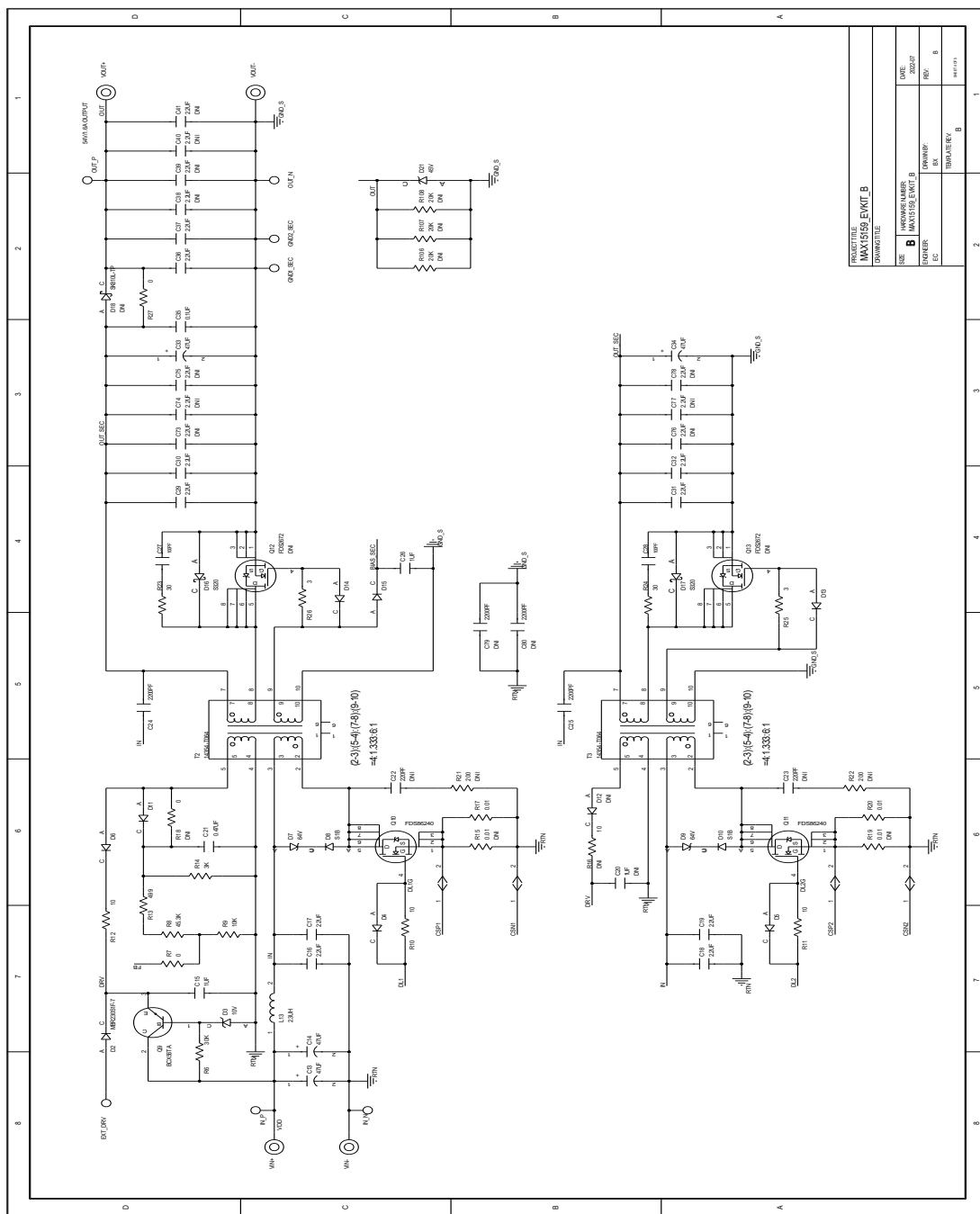
103	PCB	—	1	MAX15159	ANALOG DEVICES	PCB	PCB:MAX15159
104	U7	—	2	BCS-110-L-S-TE	SAMTEC	N/A	CONNECTOR; FEMALE; THROUGH HOLE; TIGER CLAW PASS-THROUGH SOCKET; STRAIGHT; 10PINS
105	U7	—	2	TSW-110-07-F-S	SAMTEC	N/A	CONNECTOR; MALE; THROUGH HOLE; 0.025 IN SQ POST HEADER; STRAIGHT; 10PINS
106	BODE+, BODE-, DH1, DH2	DNP	4	5013	KEystone	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; ORANGE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; RECOMMENDED FOR BOARD THICKNESS=0.062IN; NOT FOR COLD TEST
107	C5, C6	DNP	2	C1210C105K1RAC; C1210C105K1R1C; CL32B105KCJNNN	KEMET;KEMET; SAMSUNG ELECTRO-MECHANICS	1UF	CAP; SMT (1210); 1UF; 10%; 100V; X7R; CERAMIC
108	C20	DNP	1	GCM188R71E105KA64; CGA3E1X7R1E105K080AC	MURATA;TDK	1UF	CAP; SMT (0603); 1UF; 10%; 25V; X7R; CERAMIC
109	C22, C23	DNP	2	C0805C221J2GAC; GRM21A5C2D221JW01	KEMET;MURATA	220PF	CAP; SMT (0805); 220PF; 5%; 200V; C0G; CERAMIC
110	C38-C41, C73-C78	DNP	10	GRM32ER72A225KA35; CGA6N3X7R2A225K230AB; CC1210KKX7R0BB225; HMK325B7225KM	MURATA;TDK;YAGEO; TAIYO YUDEN	2.2UF	CAP; SMT (1210); 2.2UF; 10%; 100V; X7R; CERAMIC
111	C42	DNP	1	GRM1885C1H102JA01; C1608C0G1H102J080AA; GCM1885C1H102JA16	MURATA;TDK;MURATA	1000PF	CAP; SMT (0603); 1000PF; 5%; 50V; C0G; CERAMIC
112	C44, C53	DNP	2	GRM1885C1H470JA01	MURATA	47PF	CAP; SMT (0603); 47PF; 5%; 50V; C0G; CERAMIC
113	C61	DNP	1	C1608X5R1H474K080AB	TDK	0.47UF	CAP; SMT (0603); 0.47UF; 10%; 50V; X5R; CERAMIC
114	C63	DNP	1	C0603X472J1GAC; CGA3E1C0G2A472J080AC	KEMET;TDK	4700PF	CAP; SMT (0603); 4700PF; 5%; 100V; C0G; CERAMIC
115	C66	DNP	1	CGA3E2X7R2A103K; C0603C103K1RA; GRM188R72A103KA01; C1608X7R2A103K080AA	TDK;KEMET;MURATA;TDK	0.01UF	CAP; SMT (0603); 0.01UF; 10%; 100V; X7R; CERAMIC; NOTE: NOT RECOMMENDED FOR NEW DESIGN. USE 20-00u01-M8
116	C69	DNP	1	C0603C473K1RAC	KEMET	0.047UF	CAP; SMT (0603); 0.047UF; 10%; 100V; X7R; CERAMIC
117	C70	DNP	1	GCJ188R71H104KA12; GCM188R71H104K; CGA3E2X7R1H104K080AA; CGA3E2X7R1H104K080AD; CL10B104KB8WPN	MURATA;MURATA; TDK;TDK;SAMSUNG	0.1UF	CAP; SMT (0603); 0.1UF; 10%; 50V; X7R; CERAMIC
118	C79, C80	DNP	2	C1206X222KGRAC; C1206X222KGRAC7800	KEMET;KEMET	2200PF	CAP; SMT (1206); 2200PF; 10%; 2000V; X7R; CERAMIC
119	C81	DNP	1	GRM188C71E225KE11	MURATA	2.2UF	CAP; SMT (0603); 2.2UF; 10%; 25V; X7S; CERAMIC
120	D12, D19, D20	DNP	3	1N4148WS-7-F	DIODES INCORPORATED	1N4148WS-7-F	DIODE; SWT; SMT (SOD-323); PIV=75V; IF=0.3A
121	D18	DNP	1	SK810L-TP	MICRO COMMERCIAL COMPONENTS	SK810L-TP	DIODE; SCH; SMC (DO-214AB); PIV=100V; IF=8A
122	Q1-Q8	DNP	8	FDS86240	ON SEMICONDUCTOR	FDS86240	TRAN; POWER TRENCH MOSFET; NCH; SO-8; PD-(5W); I-(7.5A); V-(150V)
123	Q12, Q13	DNP	2	FDS2672	ON SEMICONDUCTOR	FDS2672	TRAN; ULTRAFET TRENCH MOSFET; NCH; SO-8; PD-(2.5W); I-(3.9A); V-(200V)
124	R15, R19	DNP	2	PMR18EZPFU10L0	ROHM SEMICONDUCTOR	0.01	RES; SMT (1206); 0.01; 1%; +/-100PPM/DEGC; 1W
125	R16	DNP	1	CRCW080510R0FK; ERJ-6ENF10R0	VISHAY DALE;PANASONIC	10	RES; SMT (0805); 10; 1%; +/-100PPM/DEGC; 0.1250W
126	R18, R26, R29, R31, R32, R44, R48, R54, R55, R57, R62, R88, R89, R91, R92, R103	DNP	16	RC1608J000CS; CR0603-J/-000ELF; RC0603JR-070RL	SAMSUNG ELECTRONICS; BOURNS;YAGEO PH	0	RES; SMT (0603); 0; 5%; JUMPER; 0.1000W
127	R21, R22	DNP	2	CRCW1206200R0FK	VISHAY DALE	200	RES; SMT (1206); 200; 1%; +/-100PPM/DEGC; 0.2500W
128	R42	DNP	1	CRCW06031M00FK; MCR03EZPFX1004	VISHAY DALE;ROHM	1M	RES; SMT (0603); 1M; 1%; +/-100PPM/DEGC; 0.1000W
129	R56	DNP	1	CRCW0603200K0FK	VISHAY DALE	200K	RES; SMT (0603); 200K; 1%; +/-100PPM/DEGC; 0.1000W
130	R64	DNP	1	ERJ-3EKF7502; CRCW060375K0FK	PANASONIC;VISHAY	75K	RES; SMT (0603); 75K; 1%; +/-100PPM/DEGC; 0.1000W
131	R65	DNP	1	MCR03EZPFX2002; ERJ-3EKF2002; CR0603-FX-2002ELF; CRCW060320K0FK; RMC0603FT20K0	ROHM;PANASONIC;BOURNS; VISHAY;STACKPOLE ELECTRONICS INC	20K	RES; SMT (0603); 20K; 1%; +/-100PPM/DEGC; 0.1000W
132	R68	DNP	1	CRCW060315K0FK	VISHAY DALE	15K	RES; SMT (0603); 15K; 1%; +/-100PPM/DEGC; 0.1000W
133	R70	DNP	1	CRCW060310R0FK; MCR03EZPFX10R0; ERJ-3EKF10R0	VISHAY; ROHM SEMICONDUCTOR; PANASONIC	10	RES; SMT (0603); 10; 1%; +/-100PPM/DEGC; 0.1000W
134	R72	DNP	1	CRCW060349K9FK; ERJ-3EKF4992	VISHAY DALE;PANASONIC	49.9K	RES; SMT (0603); 49.9K; 1%; +/-100PPM/DEGC; 0.1000W
135	R85	DNP	1	CRCW060343R2FK	VISHAY DALE	43.2	RES; SMT (0603); 43.2; 1%; +/-100PPM/DEGC; 0.1000W
136	R90	DNP	1	CRCW060360K4FK	VISHAY DALE	60.4K	RES; SMT (0603); 60.4K; 1%; +/-100PPM/DEGC; 0.1000W
137	R94	DNP	1	CRCW060330R9FK	VISHAY DALE	30.9	RES; SMT (0603); 30.9; 1%; +/-100PPM/DEGC; 0.1000W

138	R106-R108	DNP	3	CRCW120620K0FK; RM12F2002CT	VISHAY DALE;CAL-CHIP ELECTRONIC INC.	20K	RES; SMT (1206); 20K; 1%; +/-100PPM/DEGC; 0.2500W
139	U1	DNP	1	LT4321HUF#TRPBF	ANALOG DEVICES	LT4321HUF#TRPBF	IC; CTRL; POE IDEAL DIODE BRIDGE CONTROLLER; QFN16

MAX15159 EV Kit Schematic (continued)

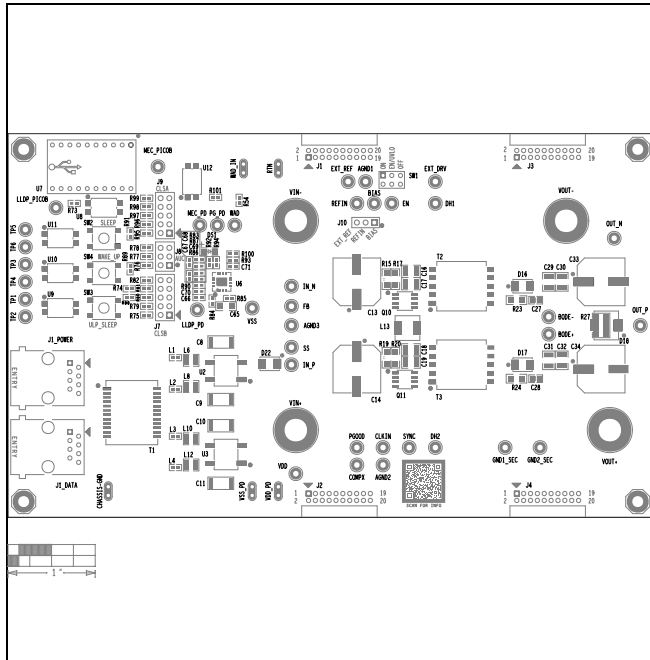


MAX15159 EV Kit Schematic (continued)

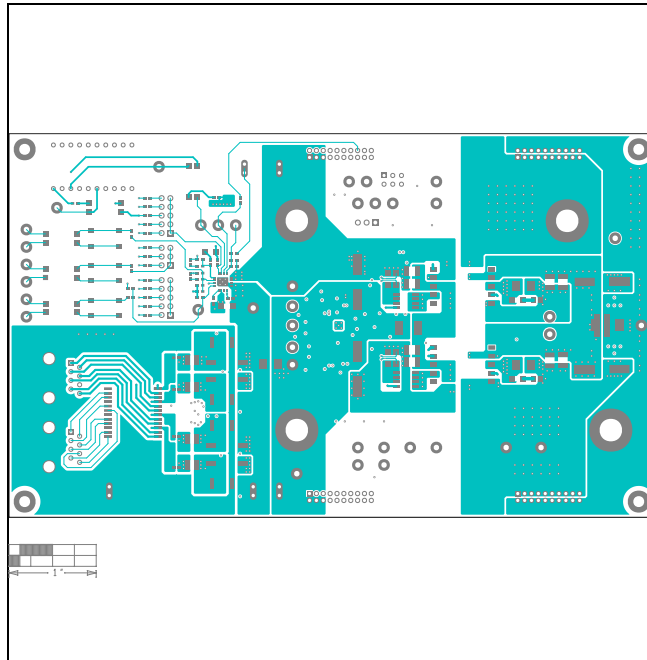


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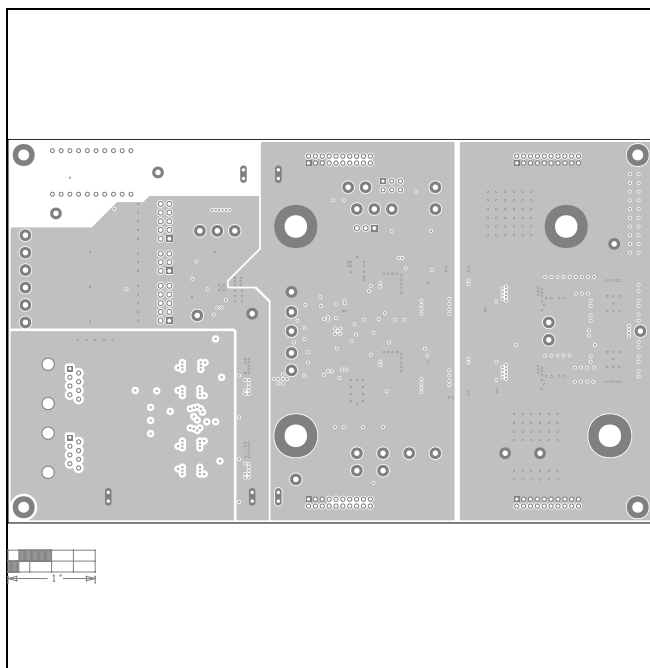
MAX15159 EV Kit PCB Layout



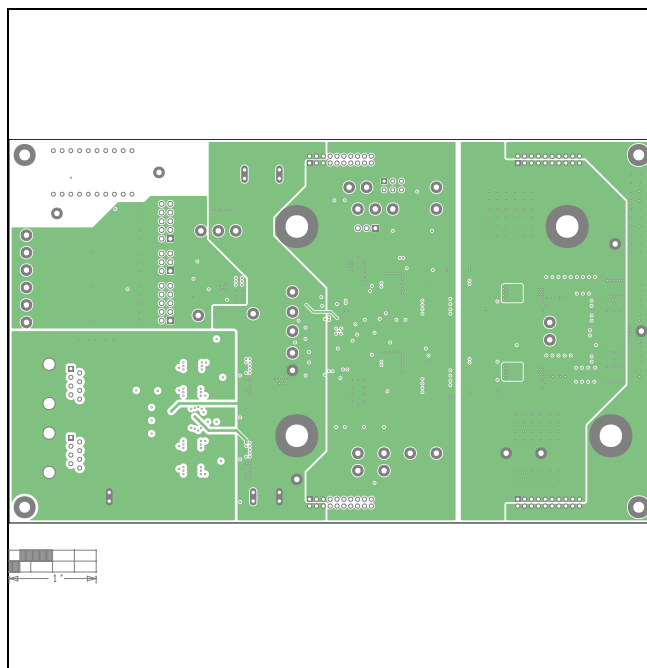
MAX15159 EV Kit Component Placement Guide—Top Silkscreen



MAX15159 EV Kit PCB Layout—Top

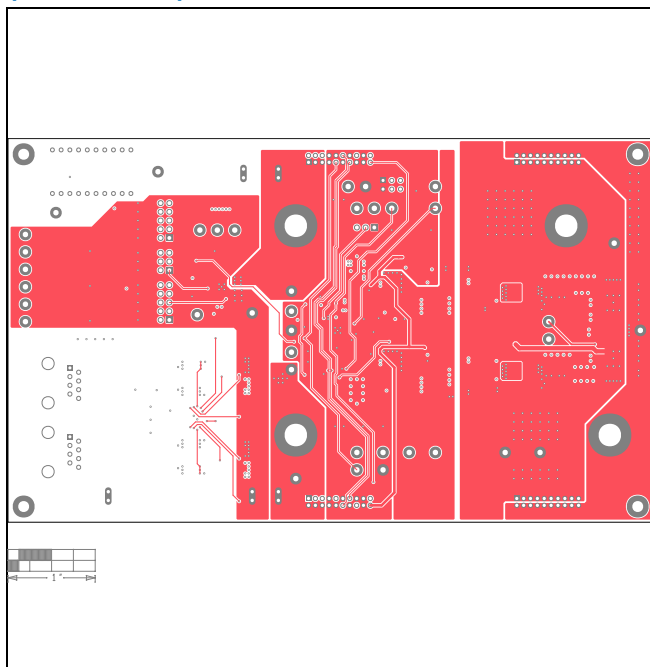


MAX15159 EV Kit PCB Layout—Layer 2

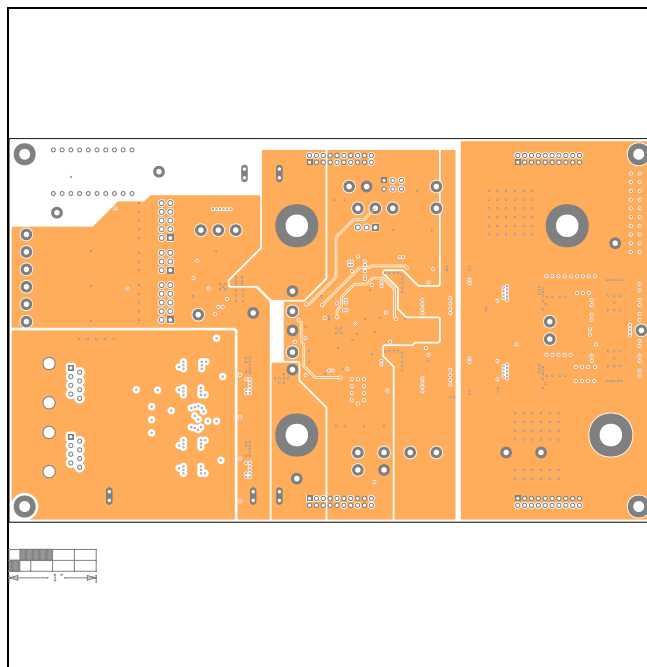


MAX15159 EV Kit PCB Layout—Layer 3

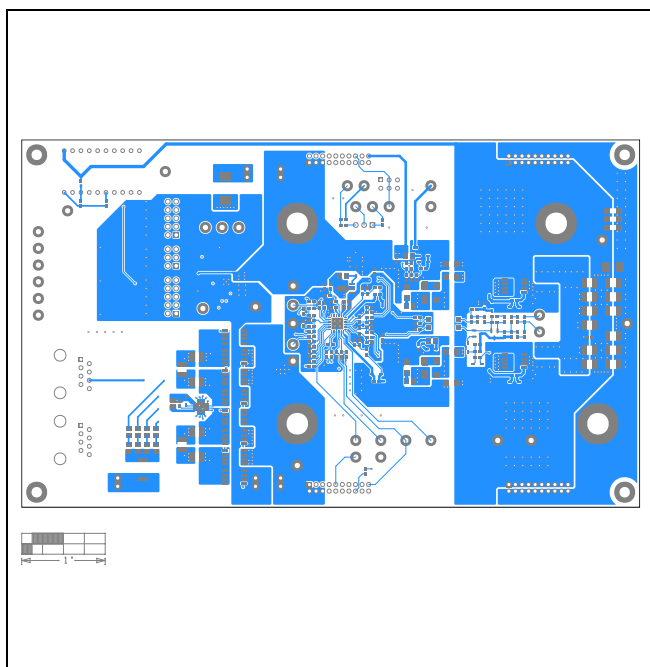
MAX15159 EV Kit PCB Layout (continued)



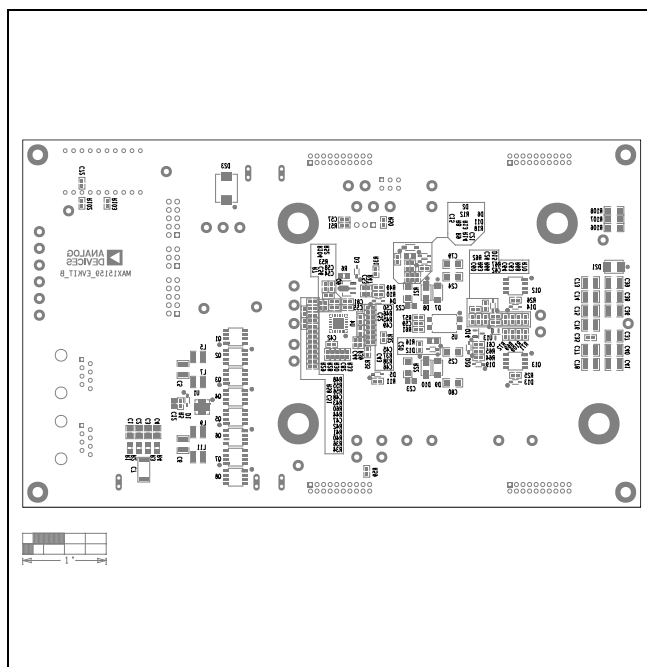
MAX15159 EV Kit PCB Layout—Layer 4



MAX15159 EV Kit PCB Layout—Layer 5



MAX15159 EV Kit PCB Layout—Bottom



MAX15159 EV Kit Component Placement Guide—Bottom
Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	7/23	Initial release	—

