

MAX15062C 12V Evaluation Kit

Evaluates: MAX15062C in 12V Output-Voltage Application

General Description

The MAX15062C 12V evaluation kit (EV kit) is a fully assembled and tested circuit board that demonstrates the performance of the MAX15062C 60V, 300mA ultra-small, high-efficiency, synchronous step-down converter. The EV kit operates over a wide input voltage range of 14V to 60V, and provides up to 300mA load current at 12V output voltage. The device features undervoltage lockout, overcurrent protection, and thermal shutdown. The EV kit switches at a frequency of 500kHz, and delivers a peak efficiency of 95% with the supplied components.

The EV kit comes installed with the MAX15062CATA+ in an 8-pin (2mm x 2mm) lead(Pb)-free/RoHS-compliant TDFN package.

Features and Benefits

- 14V to 60V Input Voltage Range
- 12V Output, 300mA Continuous Current
- Internal Compensation
- EN/UVLO for On/Off Control and Programmable Input Undervoltage Lockout
- 95% Peak Efficiency
- 500kHz Switching Frequency
- PFM or Forced-PWM Mode of Operation
- Hiccup Mode Overcurrent Protection
- Open-Drain $\overline{\text{RESET}}$ Output
- Thermal Shutdown
- Lead-Free, 8-Pin, 2mm x 2mm TDFN Package
- Proven PCB Layout
- Fully Assembled and Tested

Ordering Information appears at end of data sheet.

Quick Start

Recommended Equipment

- MAX15062C 12V EV kit
- 60V adjustable, 0.5A DC power supply
- Electronic load up to 300mA
- Voltmeter

Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation. **Caution: Do not turn on the power supply until all connections are completed.**

- 1) Verify that shunts are installed on jumpers JU1, JU2 (EN/UVLO).
- 2) Verify that jumper JU3 (MODE-PFM operation) is open.
- 3) Set the electronic load to constant-current mode, 300mA, and disable the electronic load.
- 4) Connect the electronic load's positive terminal to the VOUT PCB pad. Connect the negative terminal to the GND PCB pad.
- 5) Connect the voltmeter across the VOUT and GND PCB pads.
- 6) Set the power-supply output to 24V. Disable the power supply.
- 7) Connect the 24V power-supply output to the VIN PCB pad. Connect the supply ground to the GND PCB pad.
- 8) Turn on the power supply.
- 9) Enable the electronic load and verify that output voltage is at 12V with respect to GND.
- 10) Vary the input voltage from 14V to 60V.
- 11) Vary the load current from 1mA to 100mA and verify that output voltage is 12V.

Detailed Description

The MAX15062C 12V evaluation kit (EV kit) is a fully assembled and tested circuit board that demonstrates the performance of the MAX15062C 60V, 300mA ultra-small, high-efficiency, synchronous step-down converter. The EV kit operates over a wide input voltage range of 14V to 60V, and provides up to 300mA load current at 12V output voltage. The device features undervoltage lockout, overcurrent protection, and thermal shutdown. The EV kit switches at a frequency of 500kHz, and delivers a peak efficiency of 95% with the supplied components.

The EV kit includes an EN/UVLO PCB pad and jumpers JU1, JU2 to enable control of the converter output. The MODE PCB pad and jumper JU3 are provided for selecting the mode of operation of the converter. The VCC PCB pad helps measure the internal LDO voltage. An additional $\overline{\text{RESET}}$ PCB pad is available for monitoring the open-drain logic output.

The EV kit output voltage can be configured to 15V by installing the resistor R6 and the inductor L1 (alternate) which comes along with the EV kit.

Enable Control (JU1, JU2)

The EN/UVLO pin on the device serves as an on/off control while also allowing the user to program the input

undervoltage-lockout (UVLO) threshold. Jumpers JU1 and JU2 configure the EV kit's output for turn-on/turn-off control. Install a shunt across jumper JU2 pins 1-2 to disable VOUT. See [Table 1](#) for proper JU1, JU2 jumper configurations.

Additionally, resistors R1 and R2 are included to set the UVLO to a desired turn-on voltage. Refer to the *Enable Input (EN/UVLO)*, *Soft-Start* section in the MAX15062 IC data sheet for additional information on setting the UVLO threshold voltage.

Active-Low, Open-Drain Reset Output ($\overline{\text{RESET}}$)

The EV kit provides a PCB pad to monitor the status of the $\overline{\text{RESET}}$ output. $\overline{\text{RESET}}$ goes high 2ms after VOUT rises above 95% (typ) of its nominal regulated output voltage. $\overline{\text{RESET}}$ goes low when VOUT falls below 92% (typ) of its nominal regulated voltage.

PFM or Forced-PWM Mode (MODE)

The EV kit includes a jumper (JU3) to program the mode of operation of the converter. Install a shunt across JU3 before powering up the EV kit to enable the forced-PWM operation. Keep JU3 open to enable the light-load PFM operation. See [Table 2](#) for proper JU3 jumper configurations.

Table 1. Enable Control (EN/UVLO) (JU1, JU2)

SHUNT POSITION		EN/UVLO PIN	VOUT OUTPUT
JU1	JU2		
1-2	Open	Connected to VIN	Enabled
Open	1-2	Connected to GND	Disabled
1-2*	1-2	Connected to midpoint of R1, R2 resistor-divider	Enabled at VIN ≥ 13V

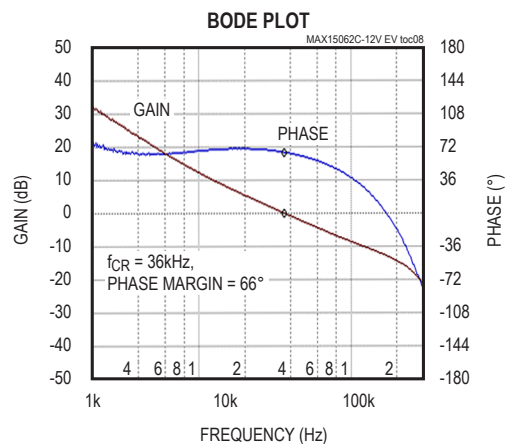
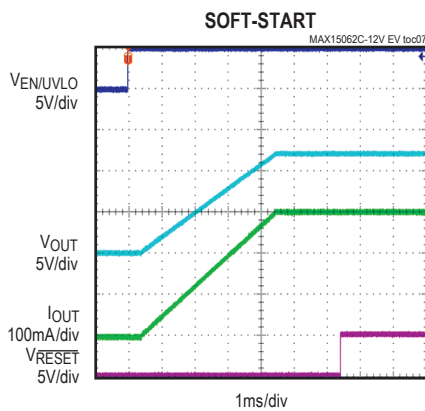
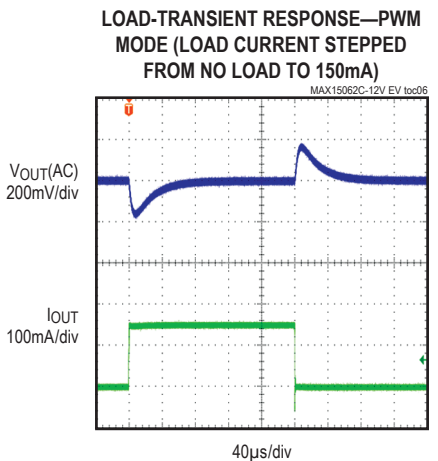
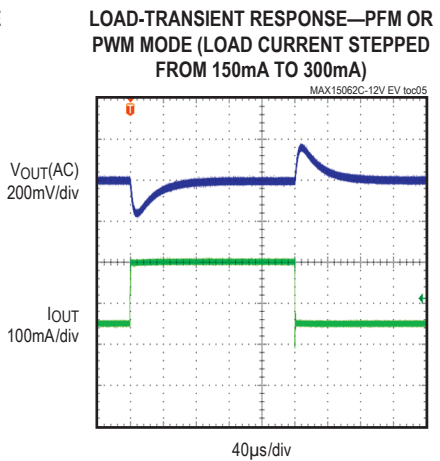
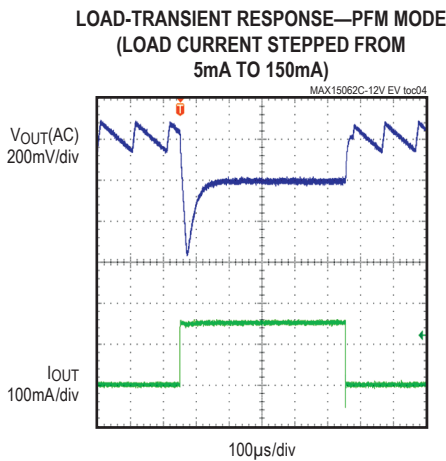
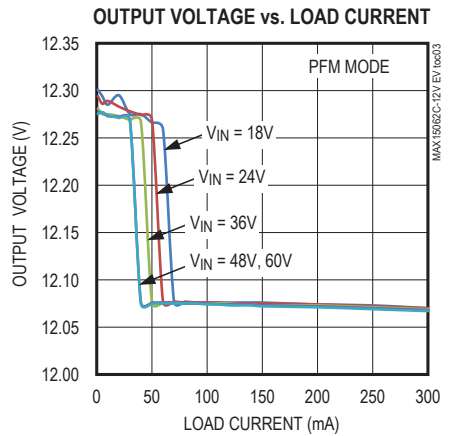
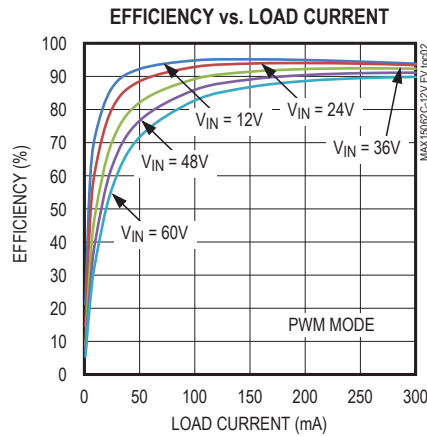
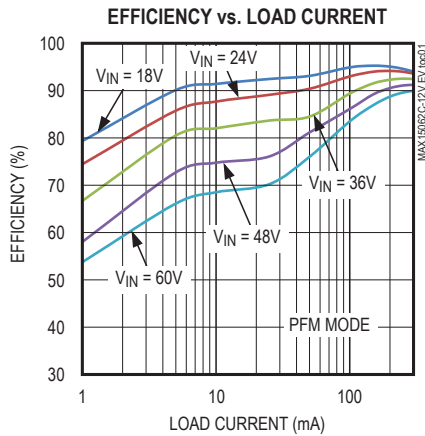
*Default position.

Table 2. MODE Control

SHUNT POSITION	MODE PIN	MODE OF OPERATION
1-2	Connected to GND	Forced PWM
Open*	Unconnected	PFM

*Default position.

EV Kit Performance Report



Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	22 μ F, 100V electrolytic capacitor (8.3mm x 8.3mm) Panasonic EEVFK2A220P
C2	1	1 μ F \pm 10% 100V X7R ceramic capacitor (1206) Murata GRM31CR72A105K
C3	1	1 μ F \pm 10%, 6.3V X7R ceramic capacitor (0603) Murata GRM188R70J105K
C4	1	4.7 μ F \pm 10%, 16V X7R ceramic capacitor (1206) Murata GRM31CR71C475K
JU1, JU2, JU3	3	2-pin headers
L1	1	100 μ H, 680mA inductor Würth 74408943101
L1 (Alternate)	1	150 μ H, 600mA inductor Würth 74404054151

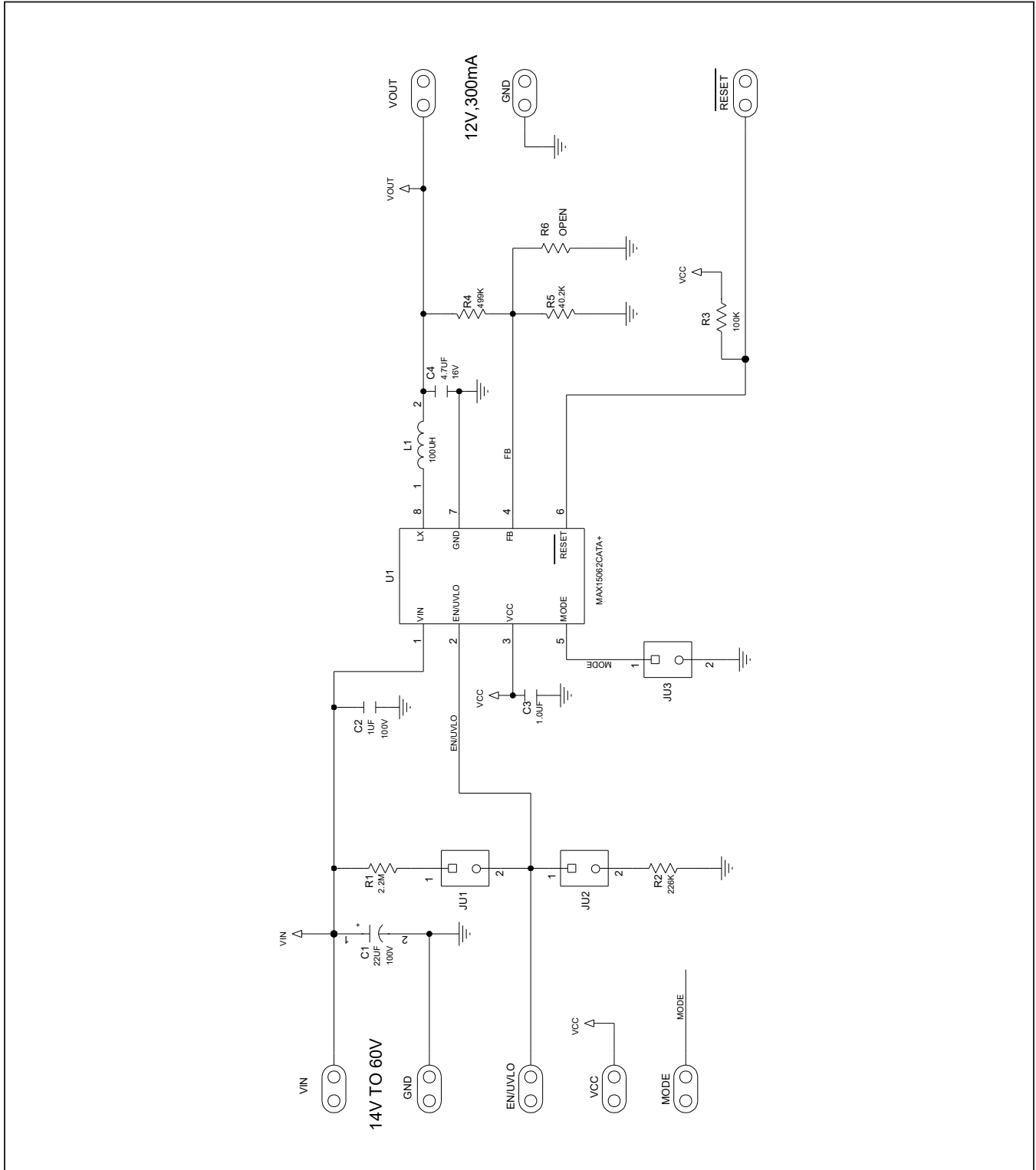
DESIGNATION	QTY	DESCRIPTION
R1	1	2.2M Ω \pm 1% resistor (0402)
R2	1	226k Ω \pm 1% resistor (0402)
R3	1	100k Ω \pm 1% resistor (0402)
R4	1	499k Ω \pm 1% resistor (0402)
R5	1	40.2k Ω \pm 1% resistor (0402)
R6	1	150k Ω \pm 1% resistor (0402)
U1	1	60V, 300mA, ultra-small, high-efficiency, synchronous step-down DC-DC converter (8 TDFN) Maxim MAX15062CATA+
—	3	Shunts
—	1	PCB: MAX15062C-12V EVKIT

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Murata Americas	770-436-1300	www.murataamericas.com
Panasonic Corp.	800-344-2112	www.panasonic.com
Würth Elektronik	—	www.we-online.com

Note: Indicate that you are using the MAX15062C when contacting these component suppliers.

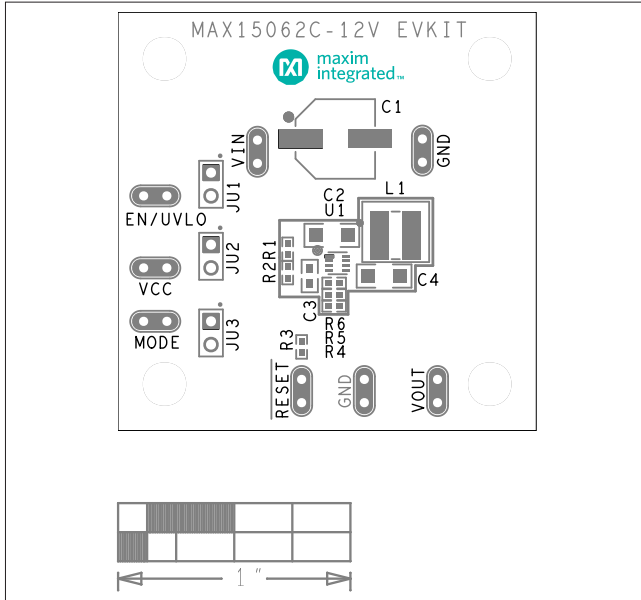
MAX15062C 12V EV Kit Schematic



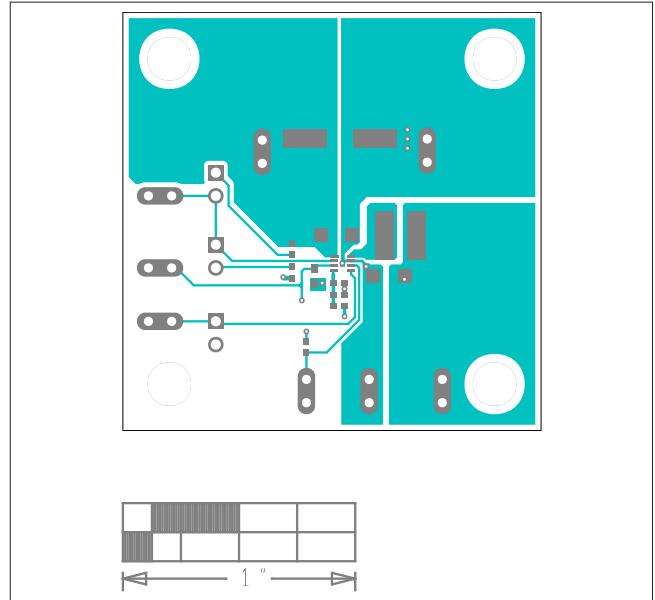
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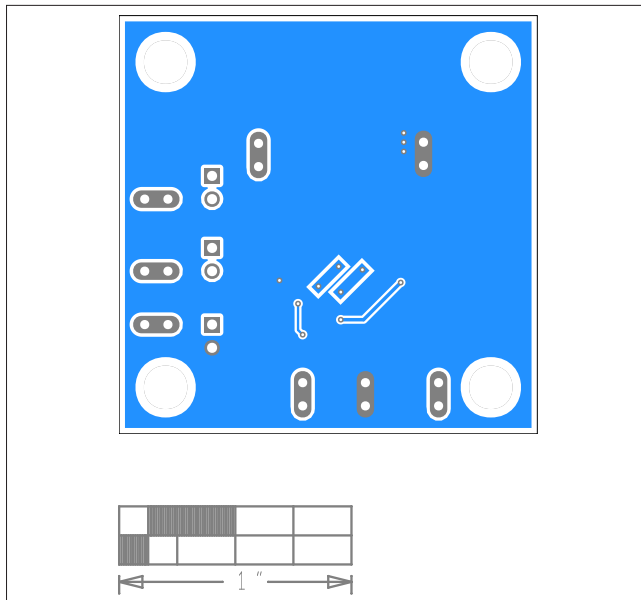
MAX15062C 12V EV Kit PCB Layout Diagrams



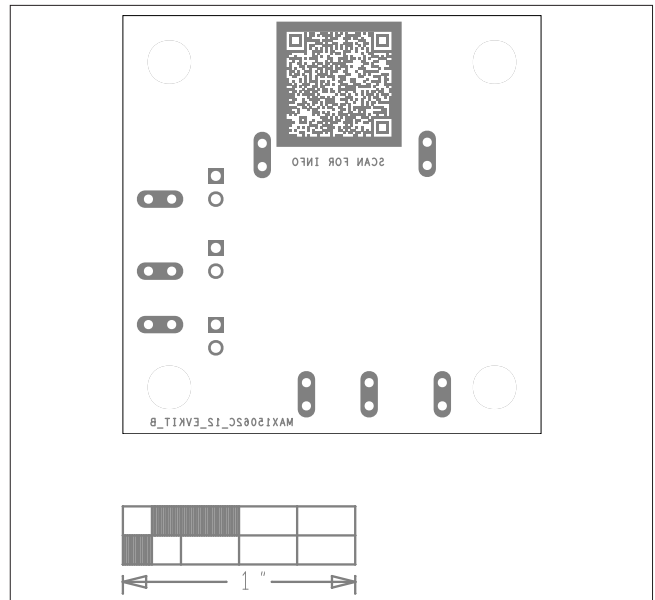
MAX15062C 12V EV Kit—Top Silkscreen



MAX15062C 12V EV Kit PCB Layout—Top Layer



MAX15062C 12V EV Kit PCB Layout—Bottom Layer



MAX15062C 12V EV Kit PCB Layout—Bottom Silkscreen

Ordering Information

PART	TYPE
MAX15062C12EVKIT#	EV Kit

Denotes RoHS compliant.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	11/13	Initial release	—
1	7/20	Updated the <i>Active-Low, Open-Drain Reset Output (RESET)</i> , <i>Component List</i> , <i>Schematic</i> , and <i>PCB Layout</i> sections	2, 4–6

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