

## MA17692AEVKIT# Evaluation Kit

## Evaluates: MAX17692A 5V Output-Voltage Application

### General Description

The MAX17692AEVKIT# evaluation kit (EV kit) provides a proven design to evaluate the performance of the MAX17692A IC. This fully assembled and tested circuit is implemented using the MAX17692A, the No-Opto flyback converter with an integrated 76V nMOSFET available in a 12-pin TDFN package with an exposed pad. The IC data sheet provides a complete description of the part and should be read in conjunction with this EV kit data sheet prior to operating the EV kit.

The MAX17692AEVKIT# EV kit output is configured for an isolated +5V and provides up to 0.65A of output current over an 18V to 36V input range. The device switches at a 145kHz switching frequency. The EV kit regulates the output voltage within  $\pm 5\%$  over line, load, and temperature by sensing the output voltage on the primary-side. The converter does not need an optocoupler for the isolated output voltage sensing.

### Features

- 18V to 36V Input Range
- Isolated Output: 5V/0.65A DC
- Compact Design with High Switching Frequency (145kHz)
- 87% Peak Efficiency
- Resistor Programmable Input Enable/UVLO Protection
- Resistor Programmable Input Overvoltage Protection
- Internal Loop Compensation Reduces Need for External Components
- 15ms Soft-Start Time
- Temperature Compensated Output Voltage Over -40°C to +125°C Operating Temperature
- Provision to External Clock Synchronization and Frequency Dithering
- $V_{CC}$  Overdrive to Improve Efficiency
- Minimum Number of External Components
- Proven PCB Layout
- Fully Assembled and Tested

**Ordering Information** appears at end of data sheet.

### Quick Start

#### Recommended Equipment

- MAX17692AEVKIT#
- One 18V to 36V DC, 0.65A power supply
- 3.25W resistive load with 0.65A sink capacity
- Four digital multimeters (DMM)

#### Warning:

- Do not turn on the power supply until all connections are completed.
- Do not touch any part of the circuit with bare hands or conductive materials when powered up.
- Make sure all high-voltage capacitors are fully discharged before handling. Allow 5 minutes after disconnecting the input power source before touching circuit parts.

#### Equipment Setup and Procedure

- 1) Set the power supply to +24V DC. Disable the power supply output.
- 2) Connect the positive terminal of the power supply to the VIN PCB pad and the negative terminal to the nearest PGND PCB pad. Connect the positive terminal of the electronic load to the VOUT PCB pad and the negative terminal to the nearest GND0 PCB pad.
- 3) Connect a DMM configured in voltmeter mode across the VOUT PCB pad and the nearest GND0 PCB pad.
- 4) Verify that shunt is installed across pins 1–2 on jumper JU1 for proper operation. See [Table 1](#) for details.
- 5) Verify that shunts are not installed for pins 1–2 on both jumpers JU2 and JU3. See [Table 2](#) and [Table 3](#) for details.
- 6) Enable the power supply.
- 7) Verify that the output voltmeter displays 5V and, if required, measure the output current using a DMM in Ammeter mode.
- 8) If required, vary the input voltage from 18V to 36V and the load current from 1mA to 0.65A, and verify that output voltage is 5V.

## MA17692AEVKIT# Evaluation Kit

## Evaluates: MAX17692A 5V Output-Voltage Application

### Detailed Description

The MAX17692AEVKIT# EV kit provides a proven design to evaluate the MAX17692A high-efficiency DC-DC fly-back converter. The device uses a novel sampling technique to eliminate the optocoupler in sensing and regu-

lating the isolated output voltage. The device integrates a 76V nMOSFET and reduces the external component count. The transformer design, as well as the selection of different components, are detailed in the *MAX17692A IC data sheet*. All passive components selected for this EV kit are available from multiple component vendors.

**Table 1. Converter SYNC Jumper (JU1) Settings**

| SHUNT POSITION | SYNC/DITHER PIN                                                                                                  | MAX17692A OPERATION                                   |
|----------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| 1–2*           | Connected to GND                                                                                                 | SYNC/DITHER function disabled                         |
| Not installed  | Need to connect JU1 to external clock for external synchronization or implement dithering on the SYNC/DITHER pin | External clock synchronization or frequency dithering |

\*Default position.

**Table 2. Converter EN/UVLO Jumper (JU2) Settings**

| SHUNT POSITION | EN/UVLO PIN                                                 | MAX17692A OUTPUT                                              |
|----------------|-------------------------------------------------------------|---------------------------------------------------------------|
| 1–2            | Connected to VIN                                            | Enabled                                                       |
| Not installed* | Connected to the center node of resistor dividers R2 and R3 | UVLO level is set by the resistor divider between VIN and GND |

\*Default position.

**Table 3. Converter OVI Jumper (JU3) Settings**

| SHUNT POSITION | OVI PIN                                                      | MAX17692A OUTPUT                                             |
|----------------|--------------------------------------------------------------|--------------------------------------------------------------|
| 1–2            | Connected to GND                                             | Enabled                                                      |
| Not installed* | Connected to the center node of resistor dividers R3 and R10 | OVI level is set by the resistor divider between VIN and GND |

\*Default position.

### Component Suppliers

| SUPPLIER         | WEBSITE           |
|------------------|-------------------|
| Sumida Corp      | www.sumida.com    |
| Coilcraft Inc    | www.coilcraft.com |
| Murata Americas  | www.murata.com    |
| Würth Elektronik | www.we-online.com |
| Vishay Dale      | www.vishay.com    |

**Note:** Indicate that you are using the MAX17692AEVKIT# when contacting these component suppliers.

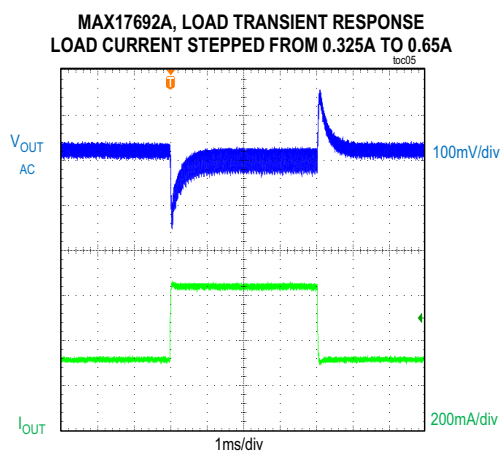
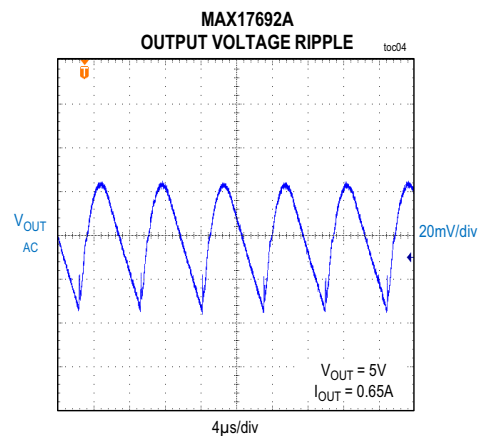
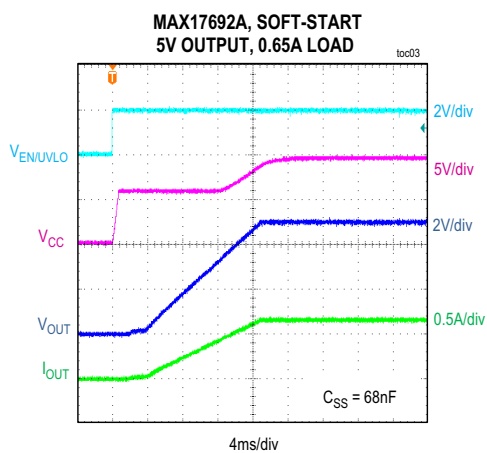
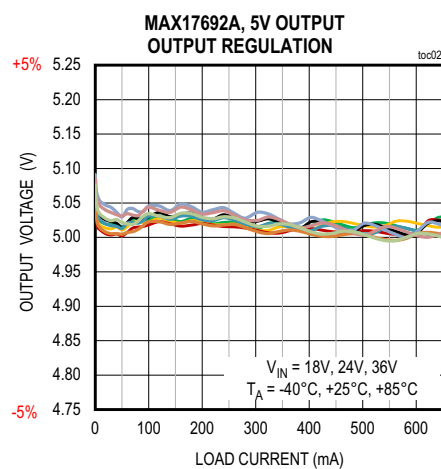
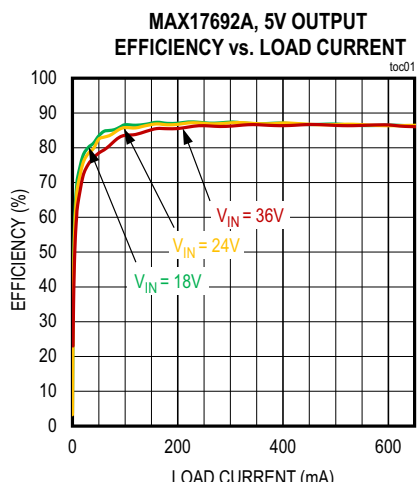
### Ordering Information

| PART            | TYPE   |
|-----------------|--------|
| MAX17692AEVKIT# | EV Kit |

#Denotes RoHS compliance.

## EV Kit Performance Report

(VIN = 24V, unless otherwise noted.)



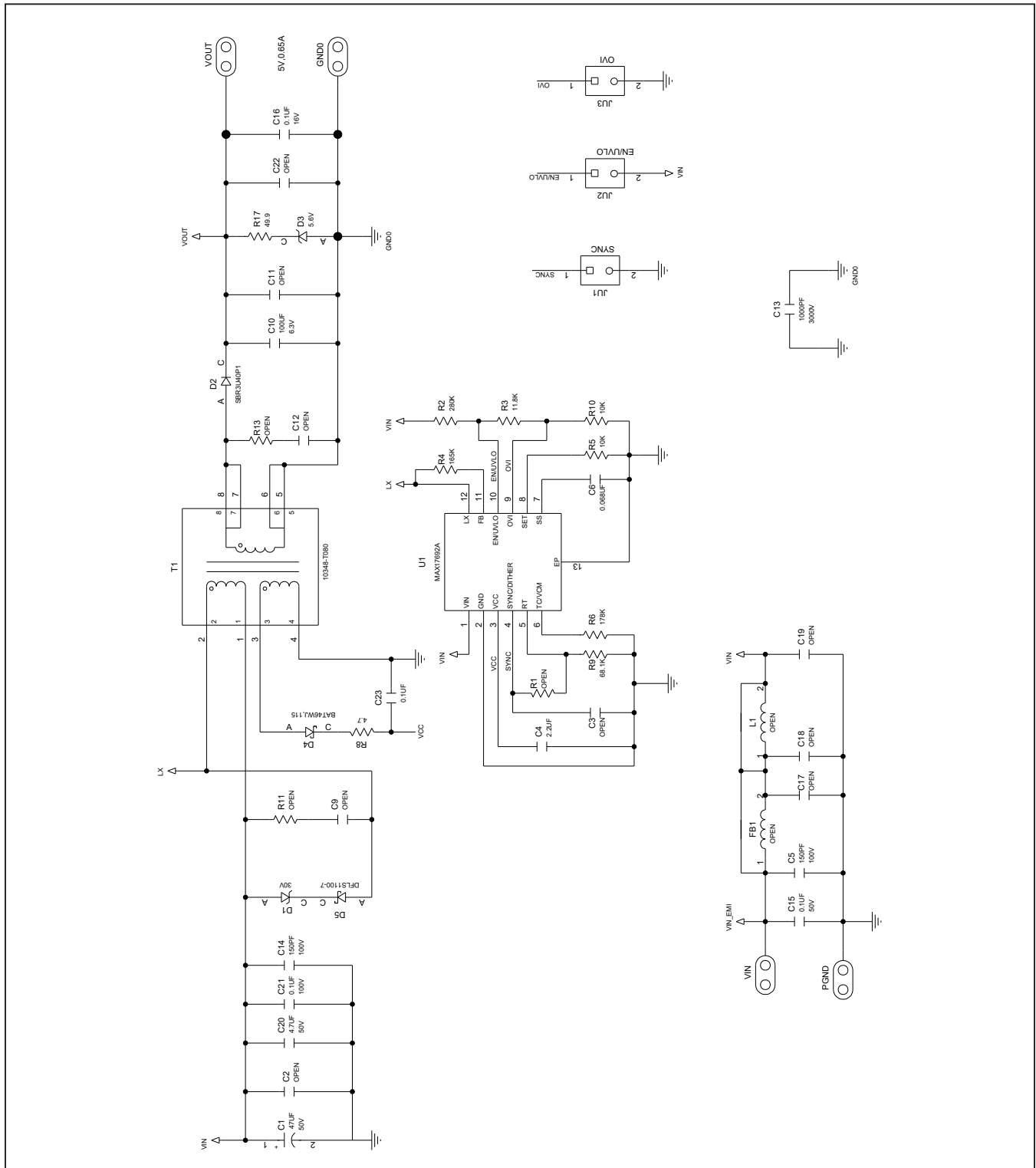
# MA17692AEVKIT# Evaluation Kit

Evaluates: MAX17692A  
5V Output-Voltage Application

## MAX17692AEVKIT# Bill of Materials

| ITEM | Part Reference   | QTY | Specification                                                     | Part Number             |
|------|------------------|-----|-------------------------------------------------------------------|-------------------------|
| 1    | C1               | 1   | 47µF ±20%,50V;Aluminium capacitor                                 | EEE-FT1H470AV           |
| 2    | C4               | 1   | 2.2µF ±10%, 16V, X7R ceramic capacitor (0603)                     | GRM188Z71C225KE43       |
| 3    | C5, C14          | 2   | 150pF ±5%, 100V, COG ceramic capacitor (0402)                     | C1005C0G2A151J050BA     |
| 4    | C6               | 1   | 0.068µF ±10%, 16V, X7R ceramic capacitor (0402)                   | GCM155R71C683KA55       |
| 5    | C10              | 1   | 100µF ±20%, 6.3V, X7S ceramic capacitor (1210)                    | JMK325AC7107MM-P        |
| 6    | C13              | 1   | 1000pF ±10%, 3000V, X7R ceramic capacitor (1812)                  | HV1812Y102KXHATHV       |
| 7    | C15              | 1   | 0.1µF ±10%, 50V, X7R ceramic capacitor (0402)                     | GRM155R71H104KE14       |
| 8    | C16              | 1   | 0.1µF ±10%, 16V, X7R ceramic capacitor (0402)                     | GRM155R71C104KA88       |
| 9    | C20              | 1   | 4.7µF ±10%, 50V, X7R ceramic capacitor (0805)                     | GRM21BZ71H475KE15       |
| 10   | C21              | 1   | 0.1µF ±10%, 100V, X7R ceramic capacitor (0603)                    | GRM188R72A104KA35       |
| 11   | C23              | 1   | 0.1µF ±10%, 25V, X7R ceramic capacitor (0603)                     | GRM188R71E104KA01       |
| 12   | D1               | 1   | Zener, 30V, 0.25W                                                 | CMDZ5252B               |
| 13   | D2               | 1   | Schottky diode, 40V,3A                                            | SBR3U40P1               |
| 14   | D3               | 1   | Zener, 5.6V, 500mW                                                | CMZ5919B                |
| 15   | D4               | 1   | Schottky diode, 100V,0.25A                                        | BAT46WJ                 |
| 16   | D5               | 1   | Schottky diode, 100V,1A                                           | DFLS1100-7              |
| 17   | R2               | 1   | 280kΩ, 1%, 0402                                                   | ERJ-2RKF2803            |
| 18   | R3               | 1   | 11.8kΩ, 1%, 0402                                                  | ERJ-2RKF1182            |
| 19   | R4               | 1   | 165kΩ, 1%, 0603                                                   | CRCW0603165KFK          |
| 20   | R5, R10          | 2   | 10kΩ, 1%, 0402                                                    | CRCW040210K0FK          |
| 21   | R6               | 1   | 178kΩ, 1%, 0402                                                   | CR0402-FX-1783GLF       |
| 22   | R8               | 1   | 4.7Ω, 1%, 0402                                                    | CRCW04024R70FK          |
| 23   | R9               | 1   | 68.1kΩ, 1%, 0402                                                  | CRCW040268K1FK          |
| 24   | R17              | 1   | 49.9Ω, 1%, 0603                                                   | CRCW060349R9FK          |
| 25   | T1               | 1   | EP7,8-pin SMT, 55µH ±10% ,1.1A,(1-2):(5,6-7,8):(3-4)= 3:1:1.5,±1% | 10348-T080 or 750319211 |
| 26   | U1               | 1   | 4.2V-60V No-Opto Isolated Flyback Converter with Integrated FET   | MAX17692AATC+           |
| 27   | C2, C17-C19      | 0   | OPEN: Capacitor (1210)                                            | NA                      |
| 28   | L1               | 0   | OPEN: Inductor (4mm x 4mm)                                        | NA                      |
| 29   | C3, C9, C12, C22 | 0   | OPEN: Capacitor (0402)                                            | NA                      |
| 30   | C11              | 0   | OPEN: Capacitor (1210)                                            | NA                      |
| 31   | R1               | 0   | OPEN: Resistor (0402)                                             | NA                      |
| 32   | R11              | 0   | OPEN: Resistor (0603)                                             | NA                      |
| 33   | R13              | 0   | OPEN: Resistor (0805)                                             | NA                      |
| 34   | FB1              | 0   | OPEN: Ferrite Bead (0805)                                         | NA                      |

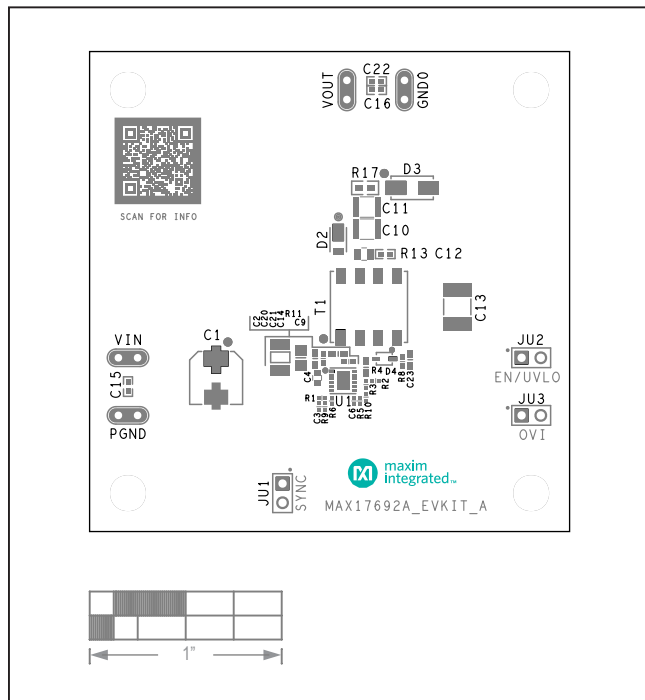
## MAX17692AEVKIT# Schematic



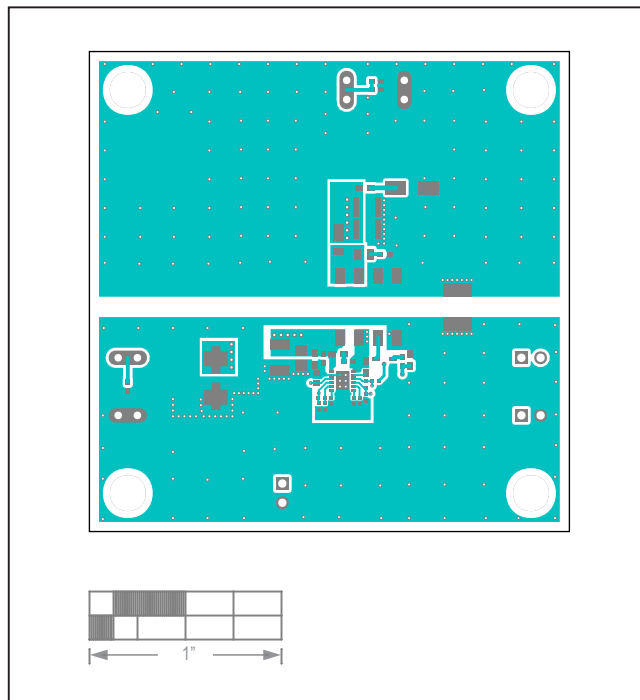
## MA17692AEVKIT# Evaluation Kit

Evaluates: MAX17692A  
5V Output-Voltage Application

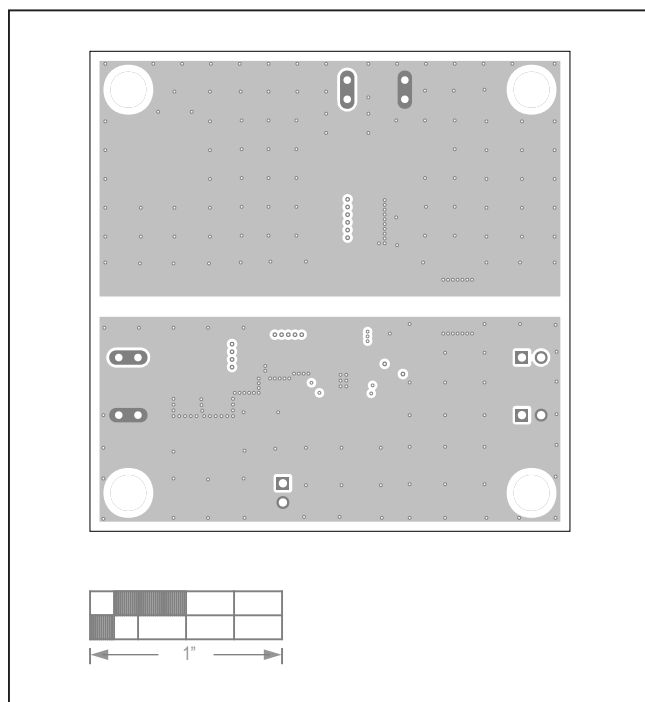
### MAX17692AEVKIT# PCB Layout Diagrams



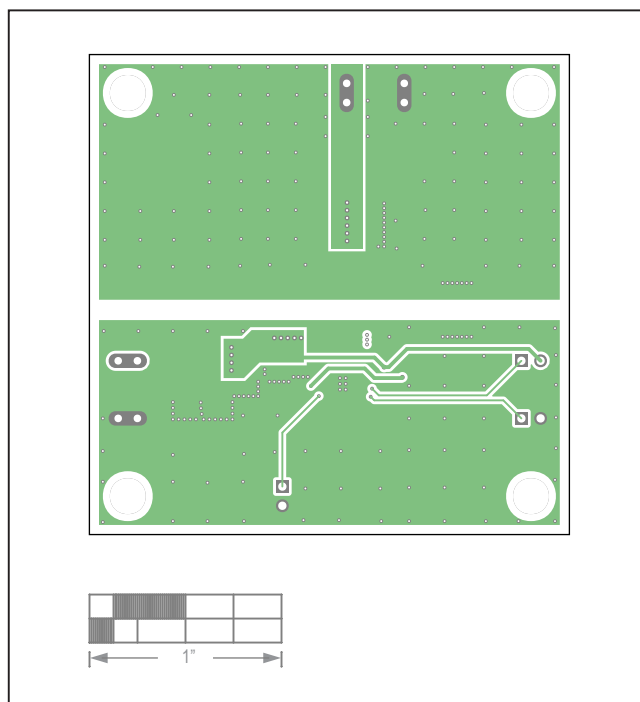
MAX17692AEVKIT# Layout—Top Silkscreen



MAX17692AEVKIT# Layout—Top Layer

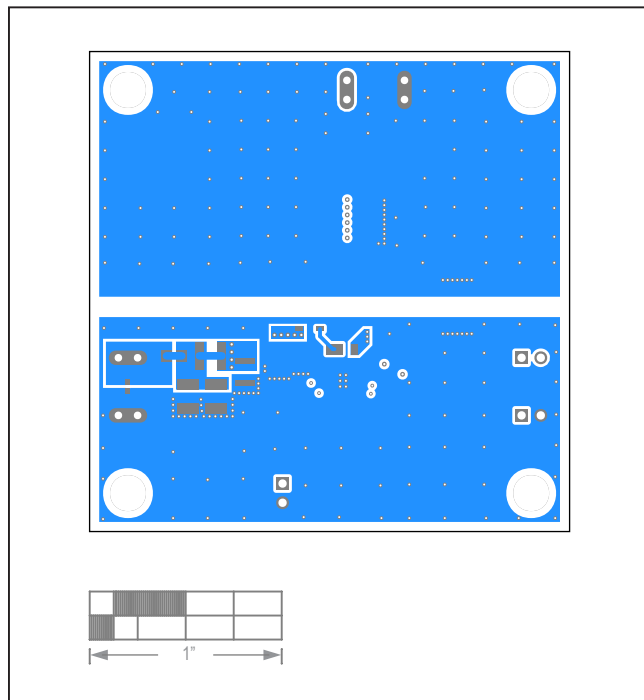


MAX17692AEVKIT# Layout—Layer 2

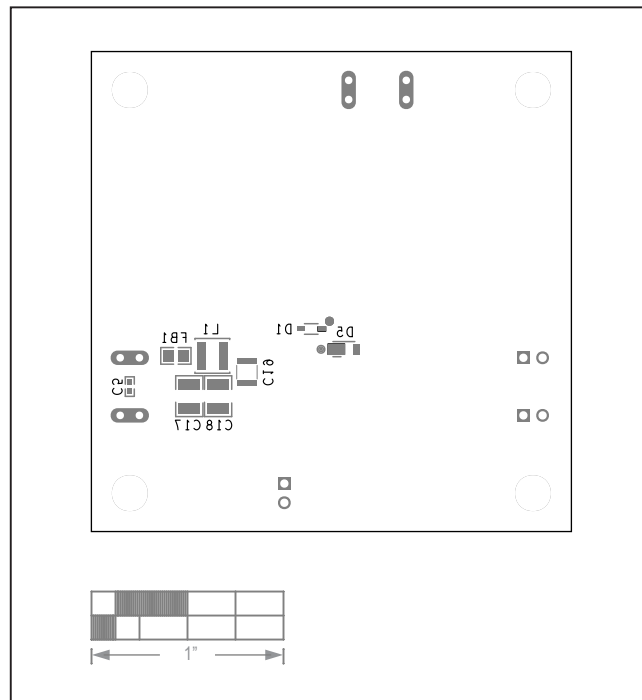


MAX17692AEVKIT# Layout—Layer 3

## MAX17692AEVKIT# PCB Layout Diagrams (continued)



MAX17692AEVKIT# Layout—Bottom Layer



MAX17692AEVKIT# Layout—Bottom Silkscreen

**Revision History**

| REVISION<br>NUMBER | REVISION<br>DATE | DESCRIPTION              | PAGES<br>CHANGED |
|--------------------|------------------|--------------------------|------------------|
| 0                  | 12/20            | Release for Market Intro | —                |

For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at <https://www.maximintegrated.com/en/storefront/storefront.html>.

*Maxim Integrated cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim Integrated product. No circuit patent licenses are implied. Maxim Integrated reserves the right to change the circuitry and specifications without notice at any time.*

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Maxim Integrated:](#)

[MAX17692AEVKIT#](#)