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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 ±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.

319-100652; Rev 0; 12/20

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Detailed Description

The MAX17692AEVKIT# EV kit provides a proven design to evaluate the MAX17692A high-efficiency DC-DC flyback converter. The device uses a novel sampling technique to eliminate the optocoupler in sensing and regulating 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
Wurth Electronik	www.we-online.com
Vishay Dale	www.vishay.com

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

Ordering Information

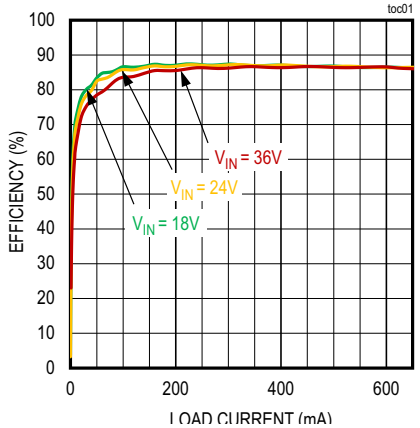
PART	TYPE
MAX17692AEVKIT#	EV Kit

#Denotes RoHS compliance.

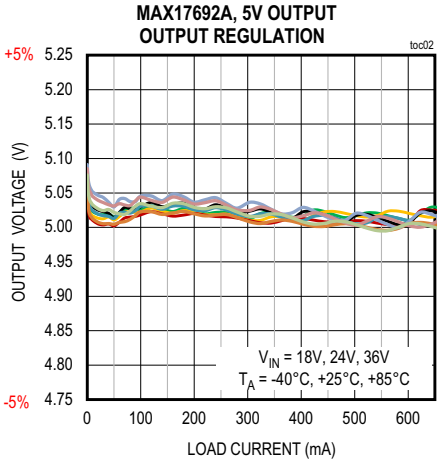
EV Kit Performance Report

(VIN = 24V, unless otherwise noted.)

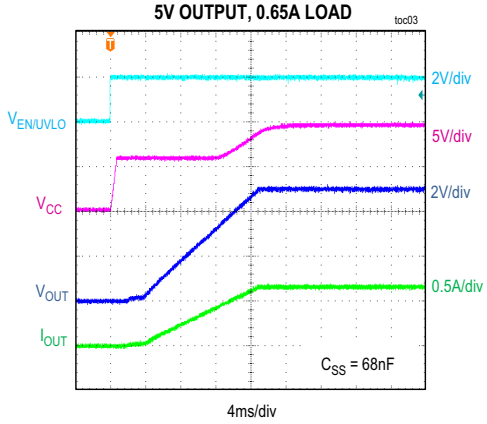
MAX17692A, 5V OUTPUT EFFICIENCY vs. LOAD CURRENT



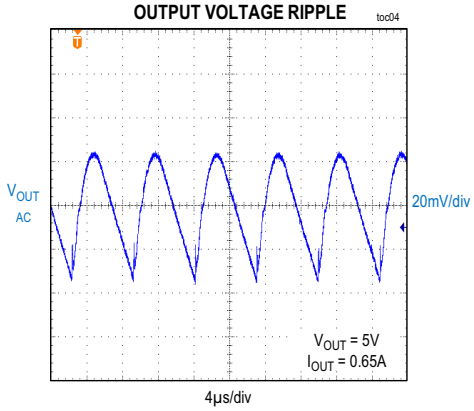
MAX17692A, 5V OUTPUT OUTPUT REGULATION



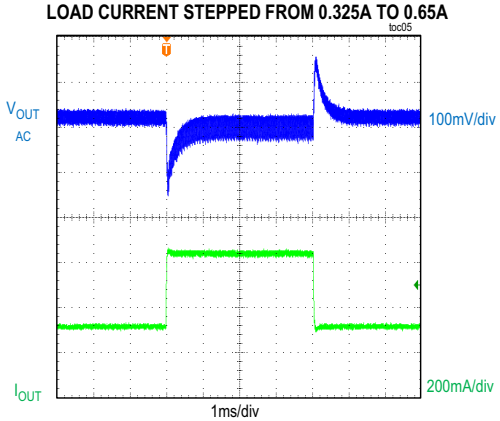
MAX17692A, SOFT-START 5V OUTPUT, 0.65A LOAD



MAX17692A OUTPUT VOLTAGE RIPPLE



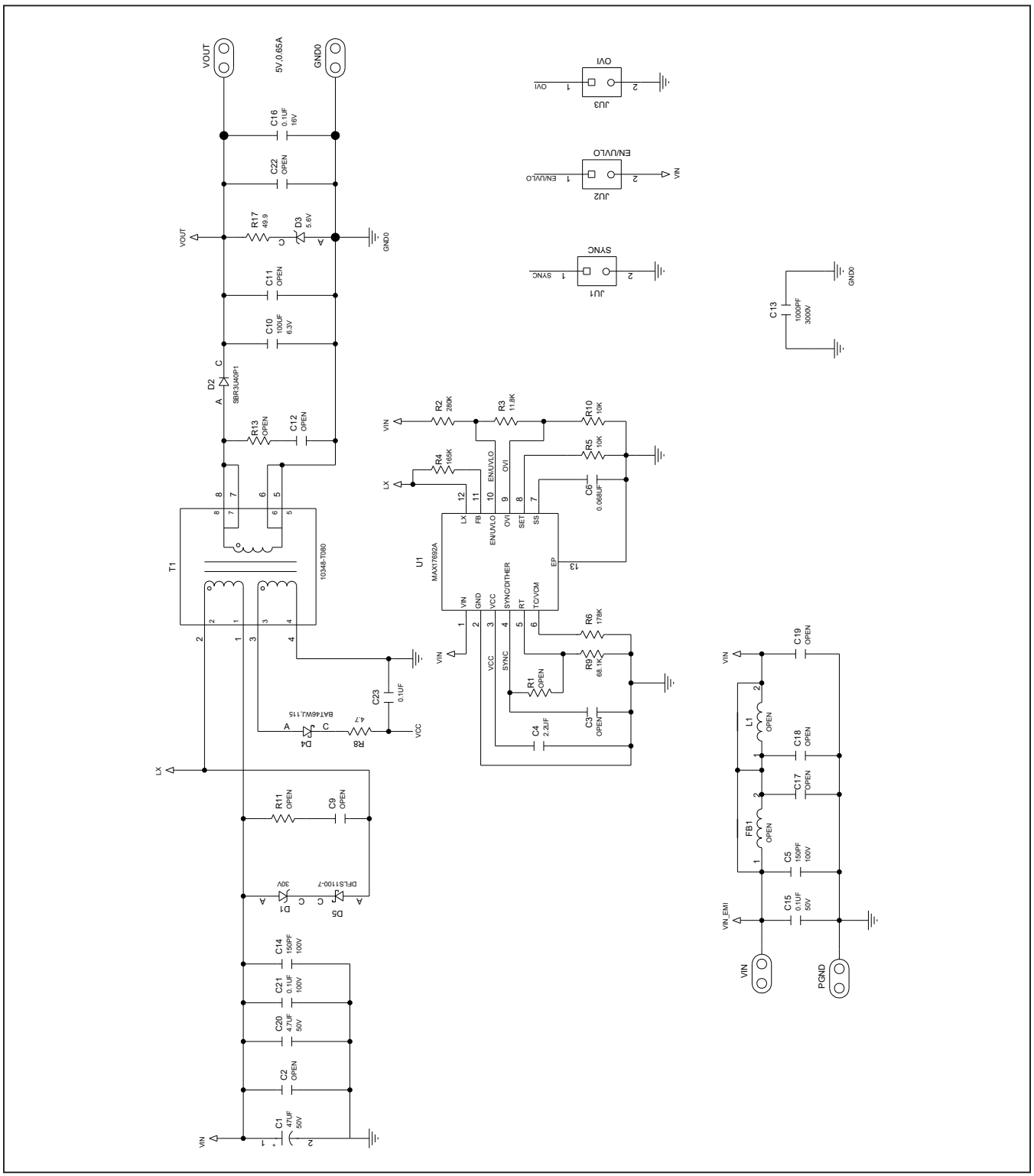
MAX17692A, LOAD TRANSIENT RESPONSE LOAD CURRENT STEPPED FROM 0.325A TO 0.65A



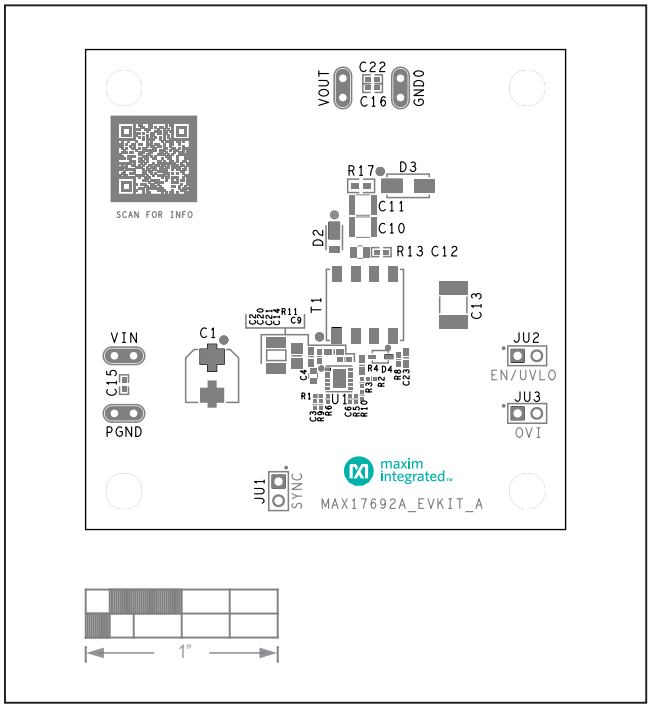
MAX17692AEVKIT# Bill of Materials

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

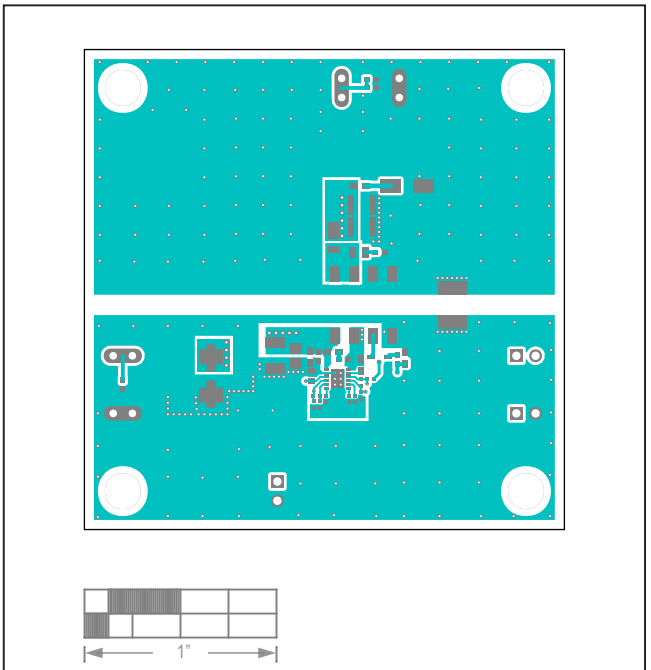
MAX17692AEVKIT# Schematic



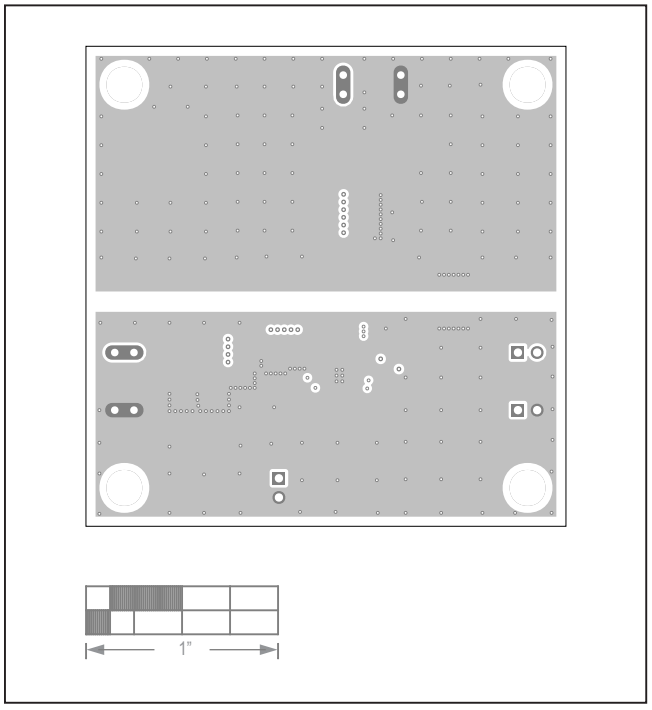
MAX17692AEVKIT# PCB Layout Diagrams



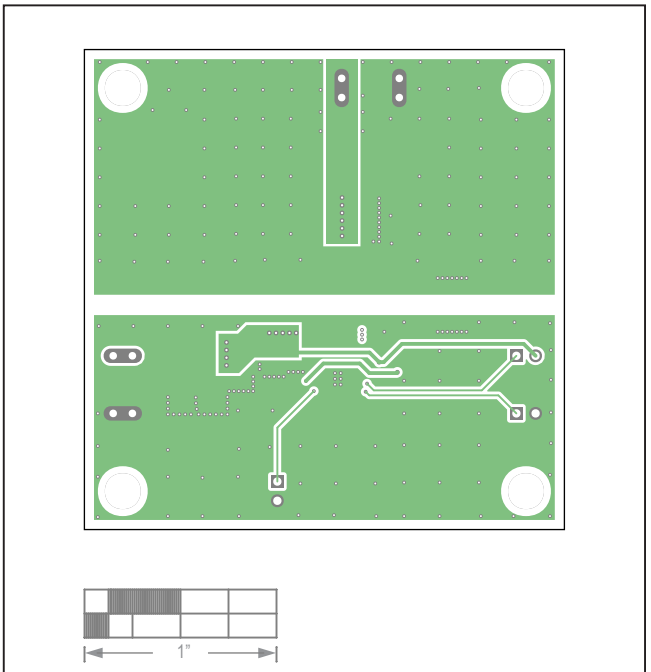
MAX17692AEVKIT# Layout—Top Silkscreen



MAX17692AEVKIT# Layout—Top Layer

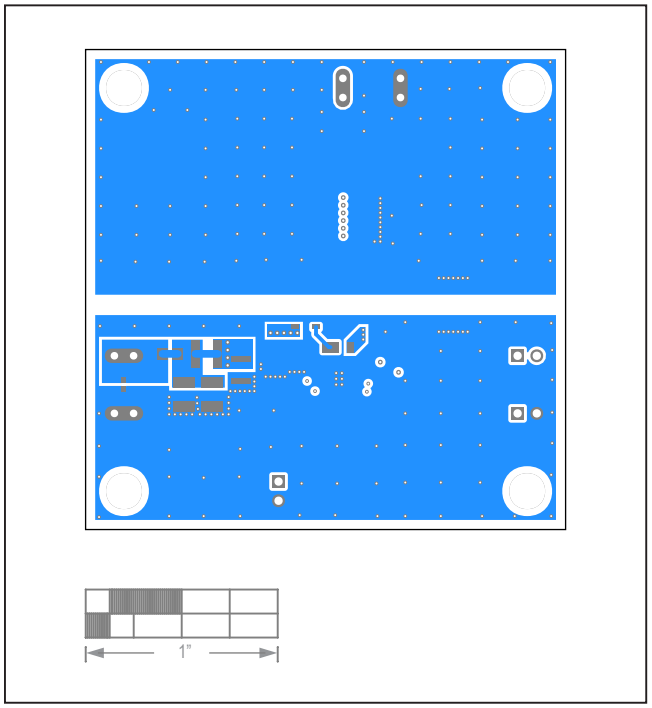


MAX17692AEVKIT# Layout—Layer 2

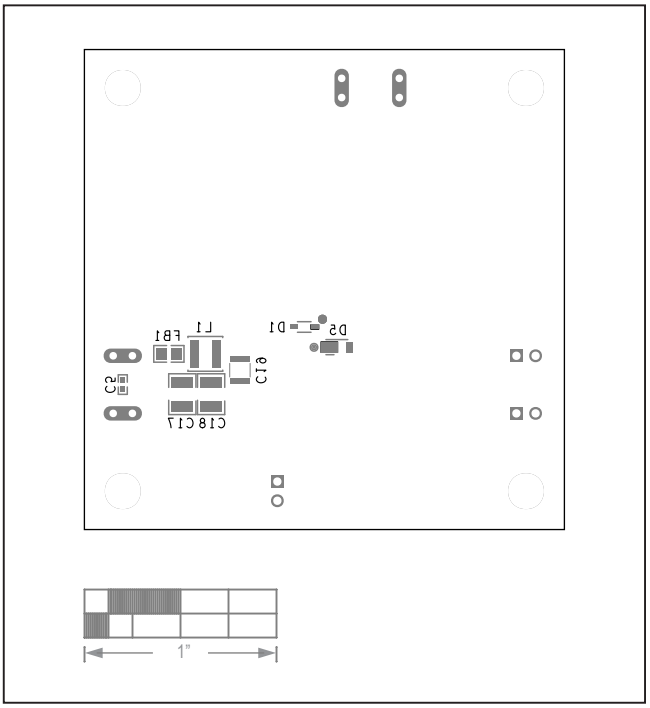


MAX17692AEVKIT# Layout—Layer 3

MAX17692AEVKIT# PCB Layout Diagrams (continued)



MAX17692AEVKIT# Layout—Bottom Layer



MAX17692AEVKIT# Layout—Bottom Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES 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.

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