Click here for production status of specific part numbers.

MAX17682EVKIT# Evaluation Kit

Evaluates: MAX17682 for Isolated +12V Output Configuration

General Description

The MAX17682 EV kit is a fully assembled and tested circuit board that demonstrates the performance of the MAX17682 high-efficiency, iso-buck DC-DC Converter. The EV kit operates over a wide input-voltage range of 16V to 42V and uses primary-side feedback to regulate the output voltage. The EV kit has isolated output, programmed to +12V at 750mA, with 10% output voltage regulation.

The EV kit comes installed with the MAX17682 in a 20-pin (4mm x 4mm) TDFN package.

Features

- 16V to 42V Input Voltage Range
- +12V, 750mA Continuous Current
- EN/UVLO Input
- 200kHz Switching Frequency
- 91% Peak Efficiency
- Overcurrent Protection
- No Optocoupler
- Delivers up to 10W Output Power
- Overtemperature Protection
- Proven PCB layout

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

Quick Start

Recommended Equipment

- One 15V - 60V DC, 1A Power Supply
- One resistive load 750mA sink capacity
- Two Digital Multimeters (DMM)

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

Procedure

The EV kit comes with the default secondary output programmed to +12V.

1) Verify that J1 is open
2) Set the power supply output to 24V. Disable the power supply
3) Connect the positive terminal of the power supply to the VIN PCB pad and the negative terminal to the nearest PGND PCB pad. Connect a 750mA resistive load across the +12V PCB pad and the GND0 PCB pad.
4) Connect a DMM configured in voltmeter mode across the +12V PCB pad and the nearest GND0 PCB pad.
5) Enable the input power supply.
6) Verify that output voltage is at +12V (with allowable tolerance of 10%) with respect to GND0.
7) If required, vary the input voltage from 16V to 42V, and the load current from 0mA to 750mA and verify that output voltage is at +12V (with allowable tolerance of 10%).

319-100002; Rev 1; 4/18

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Detailed Description

The MAX17682EVKITA evaluation kit (EV kit) is a fully assembled and tested circuit board that demonstrates the performance of the MAX17682 high-efficiency, iso-buck, DC-DC converter designed to provide an isolated power up to 10W. The EV kit generates +12V, 750mA voltages from a 16V to 42V input supply. The EV kit features a forced-PWM control scheme that provides constant switching-frequency of 200 kHz operation at all load and line conditions.

The EV Kit includes an EN/UVLO PCB pad to monitor and program the EN/UVLO pin of the MAX17682. The VPRI PCB pad helps measure the regulated primary output voltage (V_{PRI}). An additional RESETB PCB pad is available for monitoring the health of primary output voltage (V_{PRI}). RESETB pulls low if FB voltage drops below 92%(typ) of its set value and RESETB goes high impedance 1024 clock cycles after FB voltage rises above 95% of its set value. The programmable soft-start feature allows users to reduce the input inrush current.

The iso-buck is a synchronous-buck-converter-based topology, useful for generating isolated outputs at low power level without using an opto-coupler. The detailed procedure for setting the soft-start time, ENABLE/UVLO divider, primary output voltage (V_{PRI}) selection, adjusting the primary output voltage, primary inductance selection, turns-ratio selection, output capacitor selection, output diode selection and external loop compensation are given in MAX17682 IC data sheet.

Enable Control (J1)

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. Jumper J1 configures the EV kit's output for turn-on/turn-off control. Install a shunt across jumper J1 pins 2-3 to disable VOUT. See Table 1 for proper J1 jumper configurations.

Table 1. Enable Control (EN/UVLO) (J1) Jumper Settings

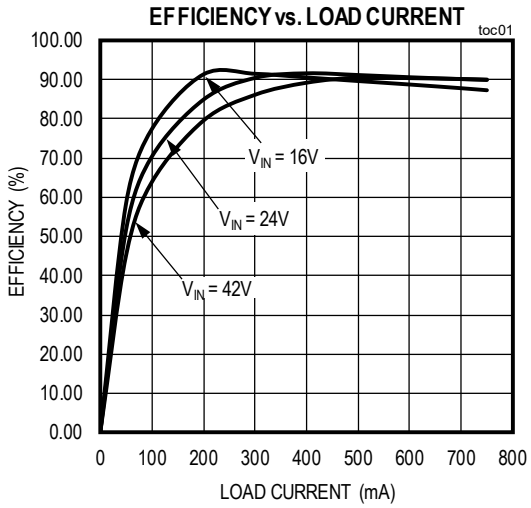
SHUNT POSITION	EN/UVLO PIN	V_{OUT} OUTPUT
J1		
1-2	Connected to V_{IN}	Always Enabled
2-3	Connected to GND	Always Disabled
Open*	Connected to midpoint of R1, R2 resistor-divider	Enabled at $V_{IN} \geq 15V$

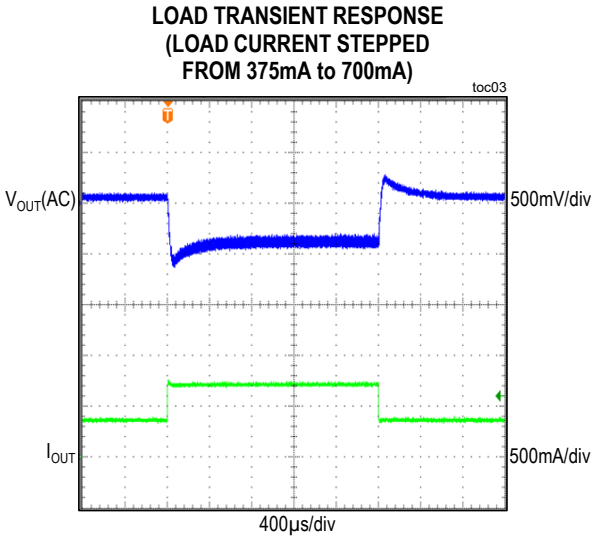
**Default position.*

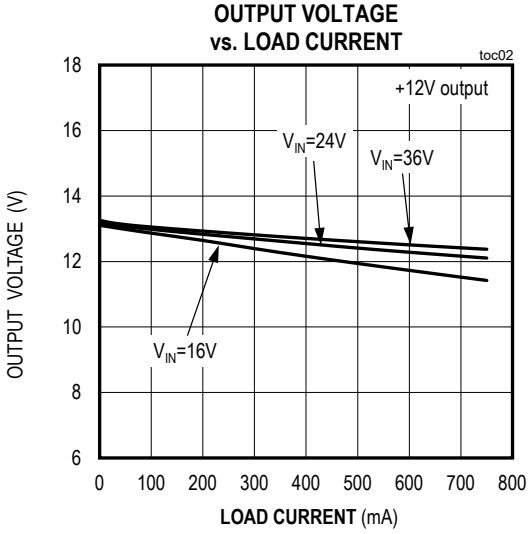
Note 1: *The secondary output diodes D1 is rated to carry short-circuit current only for few hundredths of a millisecond and is not rated to carry the continuous short-circuit current.*

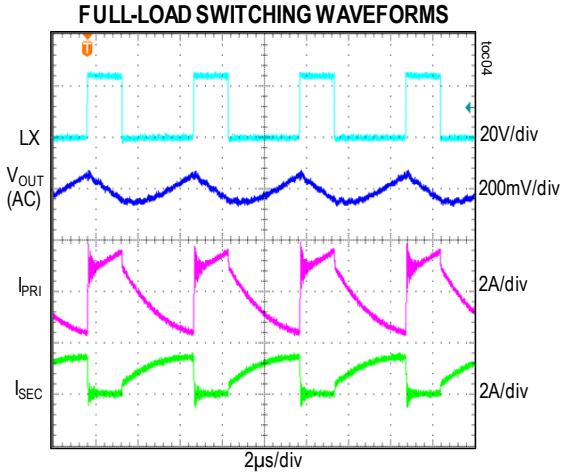
Note 2: *The iso-buck converter typically needs 10% minimum load to regulate the output voltage. In this design when the +12V rail is healthy, U2 sinks the minimum load current required to regulate the output voltages within ±10% regulation.*

EV Kit Performance Report









Component Suppliers

SUPPLIER	WEBSITE
Wurth Electronik	www.we-online.com
Murata Americas	www.murataamericas.com
Panasonic Corp.	www.panasonic.com

Note: *Indicate that you are using the MAX17682 when contacting these component suppliers.*

Ordering Information

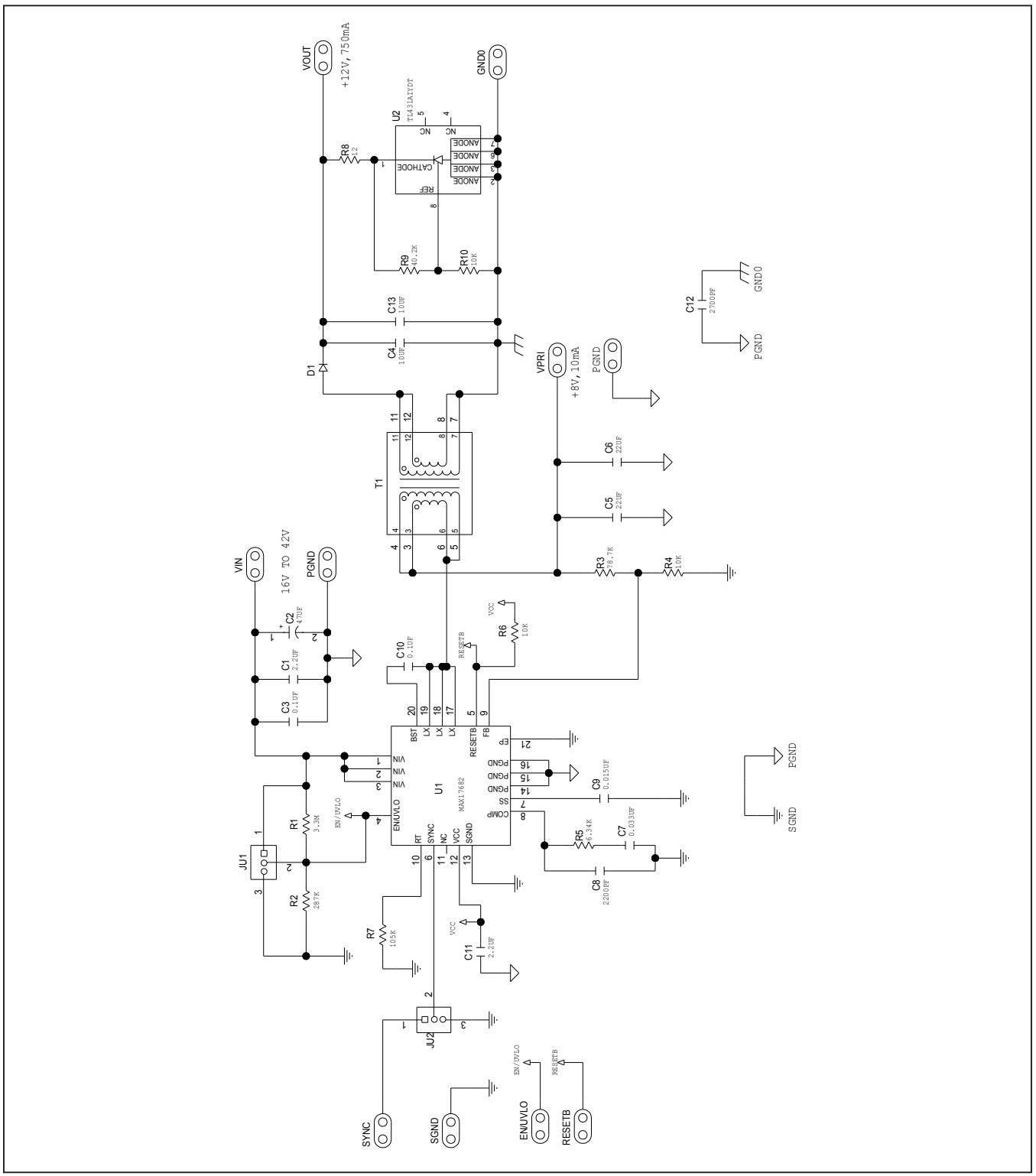
PART	TYPE
MAX17682EVKIT#	EVKIT

#Denotes RoHS compliant.

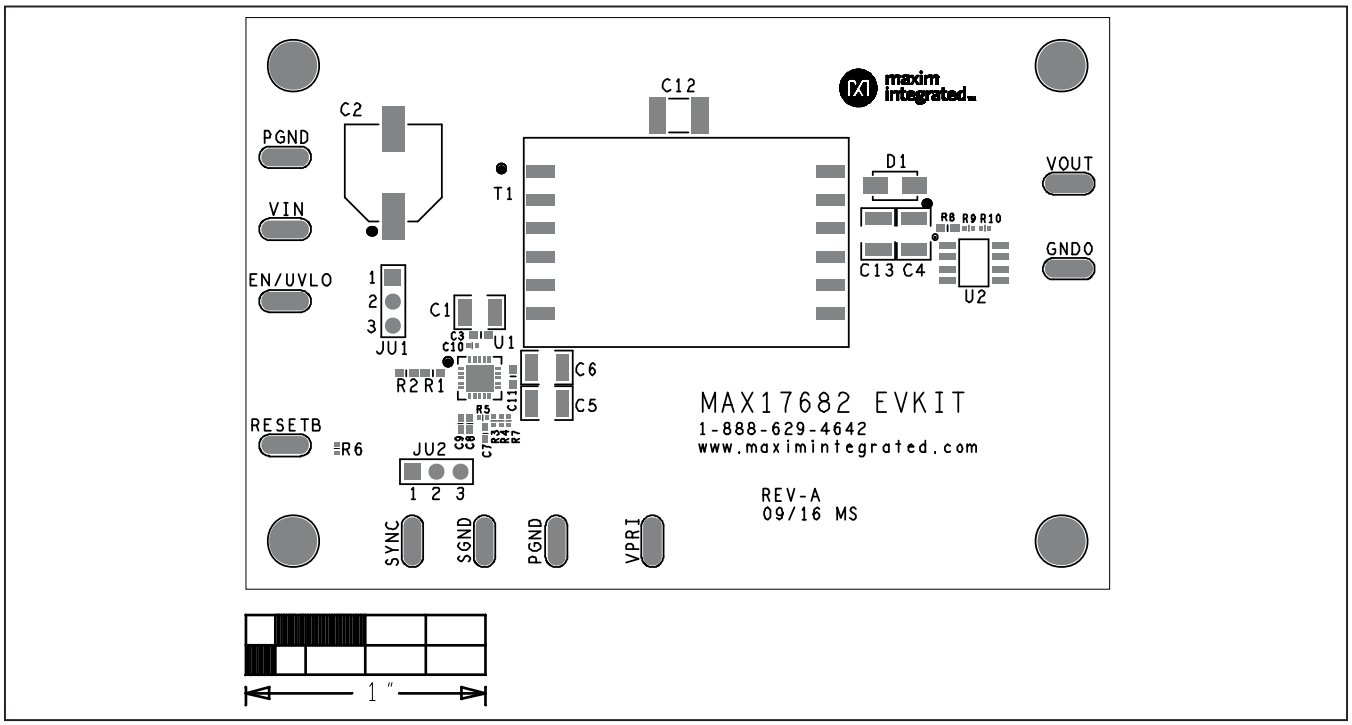
MAX17682 EV Kit Bill of Materials

S NO	Designation	Qty	Description	Manufacturer Partnumber-1	Manufacturer Partnumber-2	Manufacturer Partnumber-3
1	C1	1	2.2µF±10%, 100V,X7R Ceramic capacitor (1210)	Murata GRM32ER72A225KA35	TDK CGA6N3X7R2A225K230	
2	C2	1	47µF, 20%, 80V, ALUMINUM ELECTROLYTIC CAPACITOR 6.60*6.60mm,	Panasonic EEE-FK1K470P		
3	C3	1	0.1µF±10%,100V, X7R ceramic capacitor (0603)	Murata GRM188R72A104KA35	TDK CC0603KRX7R0BB104	
4	C4,C13	2	10µF±10%,16V, X7R ceramic capacitor (1210)	Murata GRM32DR71C106KA01	TDK C3225X7R1C106K	KEMET C1210C106K4RAC
5	C5, C6	2	22µF±20%,10V, X7R ceramic capacitor (1210)	Murata GRM32ER71A226ME20		
6	C7	1	0.033µF±5%,25V,X7R ceramic capacitor (0402)	Murata GRM155R71E333KA88		
7	C8	1	2200pF±10%,50V, X7R ceramic capacitor (0402)	Murata GRM155R71H222JA01		
8	C9	1	0.015uF±10%, 16V, X7R ceramic capacitor (0402)	Murata GRM155R71C153KA01	KEMET C0402C153K4RAC	
9	C10	1	0.1uF±10%, 16V, X7R ceramic capacitor (0402)	Murata GRM155R61C104KA88		
10	C11	1	2.2uF±10%,10V, X7R ceramic capacitor (0603)	Murata GRM188R71A225KE15	SAMSUNG CL10B225KP8NNN	
11	C12	1	2700pF±10%, 3000V, X7R ceramic capacitor (1812)	AVX 1812HC272KAZ1A		
12	D1	1	Diode, 200V/3A, SMA	Taiwan Semiconductor Corporation SK320A R3G		
13	JU1,JU2	2	3-pin headers	SULLINS ELECTRONICS CORP PEC03SAAN		
14	R1	1	3.3M Ohm±1% resistor (0603)	VISHAY DALE CRCW06033M30FK		
15	R2	1	287K Ohm±1% resistor (0603)	VISHAY DALE CRCW0603287KFK		
16	R3	1	78.7K Ohm±1% resistor (0402)	VISHAY DALE CRCW040278K7FK		
17	R4,R6,R10	3	10kΩ ±1% resistor (0402)	VISHAY DALE CRCW040210K0FK	YAGEO PHICOMP RC0402FR-0710K	
18	R5	1	6.34kΩ ±1% resistor (0402)	VISHAY DALE CRCW04026K34FK		
19	R8	1	12Ω ±1% resistor (0603)	VISHAY DALE RCS060312R0FK		
20	R9	1	40.2kΩ ±1% resistor (0402)	VISHAY DALE CRCW040240K2FK		
21	R7	1	105kΩ ±1% resistor (0402)	VISHAY DALE CRCW0402105KFK		
22	T1	1	EVKIT PART-TRANSFORMER; SMT; 1.67:1	WURTH ELECTRONICS INC. 750343160		
23	U1	1	MAX17682 TQFN10 4*4mm Iso buck DC-DC converter	MAX17682		
24	U2	1	Shunt regulator SOT25	ST MICROELECTRONICS TL431AIYDT		
25	SU1,SU2	2	See Jumper Table	SULLINS ELECTRONICS CORP - STC02SYAN		
26	VIN, GND0, PGND, SGND, SYNC, VOUT, VPRI, PGND1, RESETB, EN/UVLO	10	Test Loops	WEICO WIRE - 9020 BUSS		

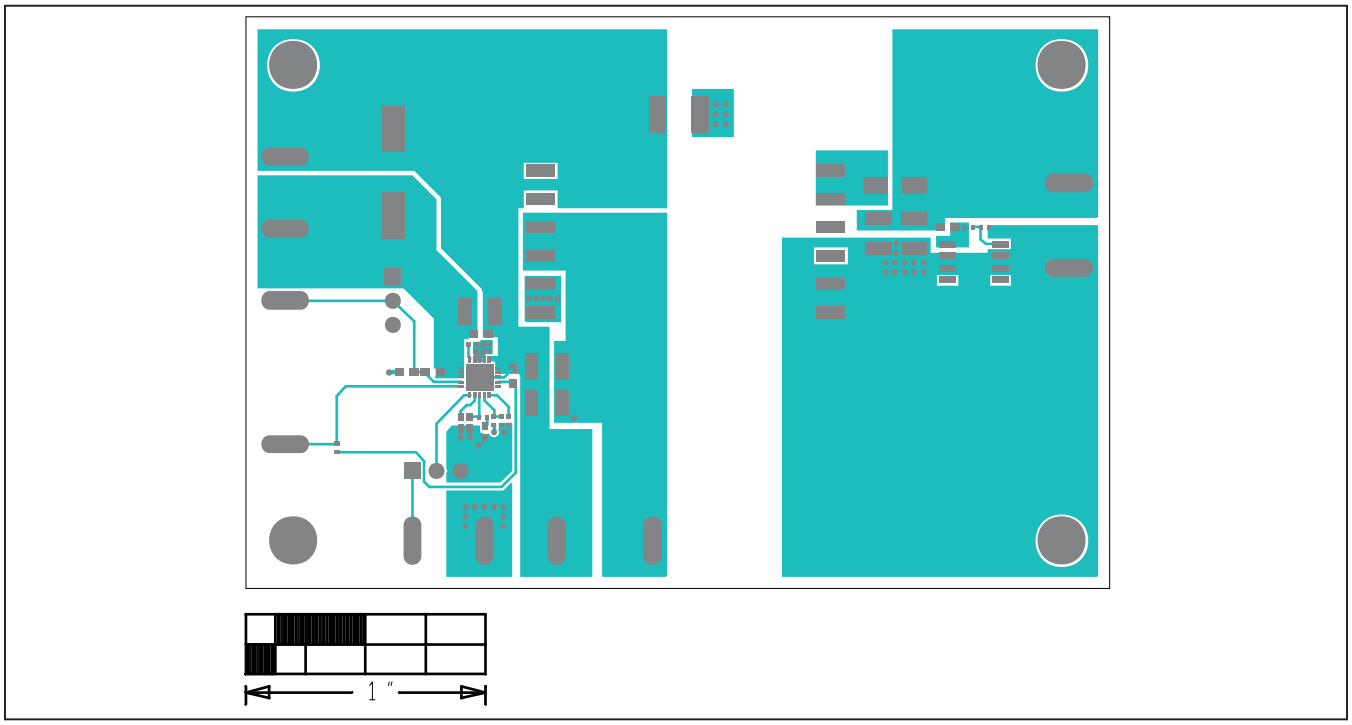
MAX17682 EV Kit Schematics



MAX17682 EV Kit PCB Layout Diagrams

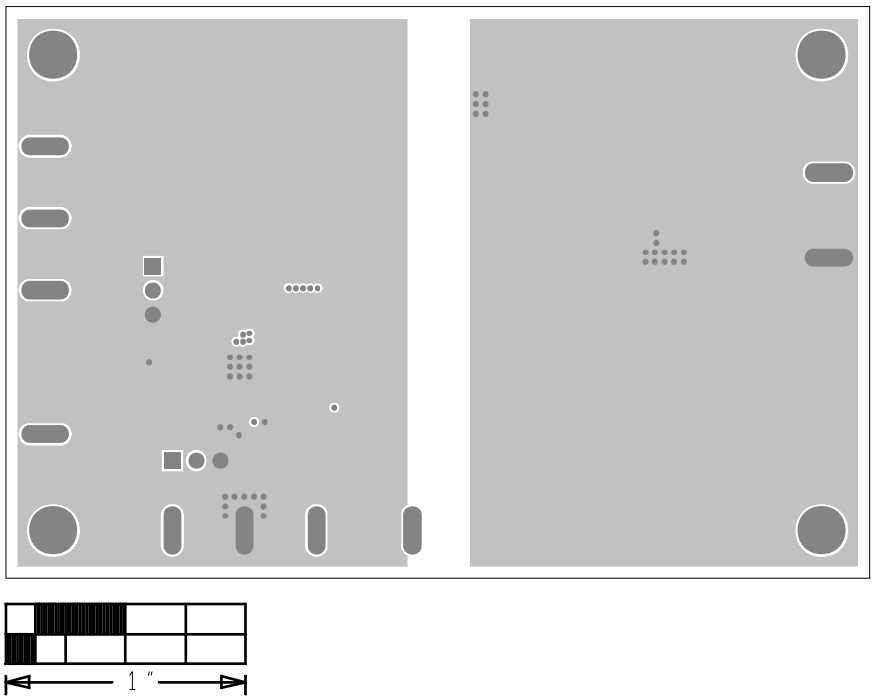


MAX17682 EV Kit—Top Silkscreen

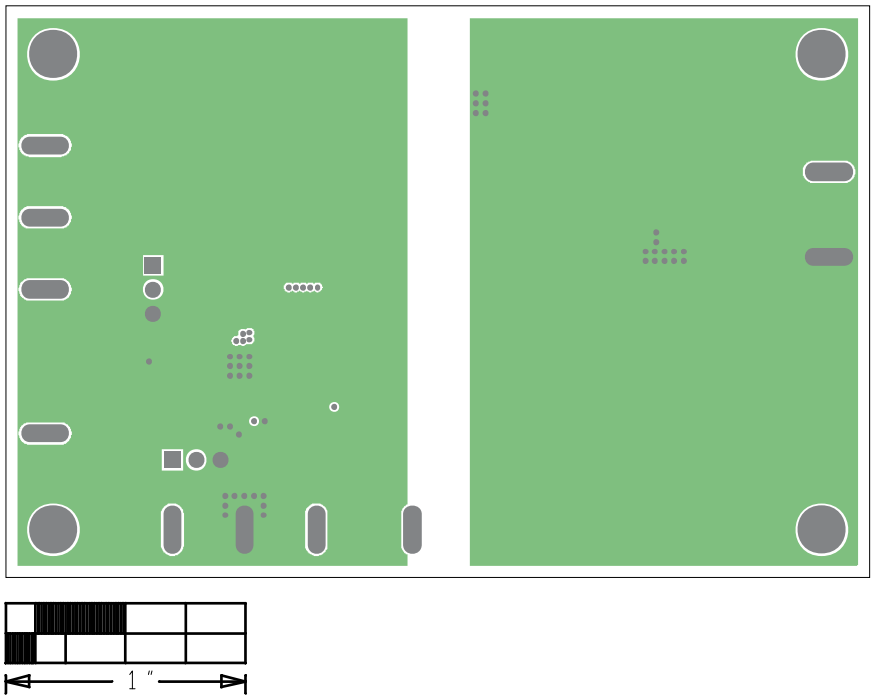


MAX17682 EV Kit—Top

MAX17682 EV PCB Layout Diagrams (continued)

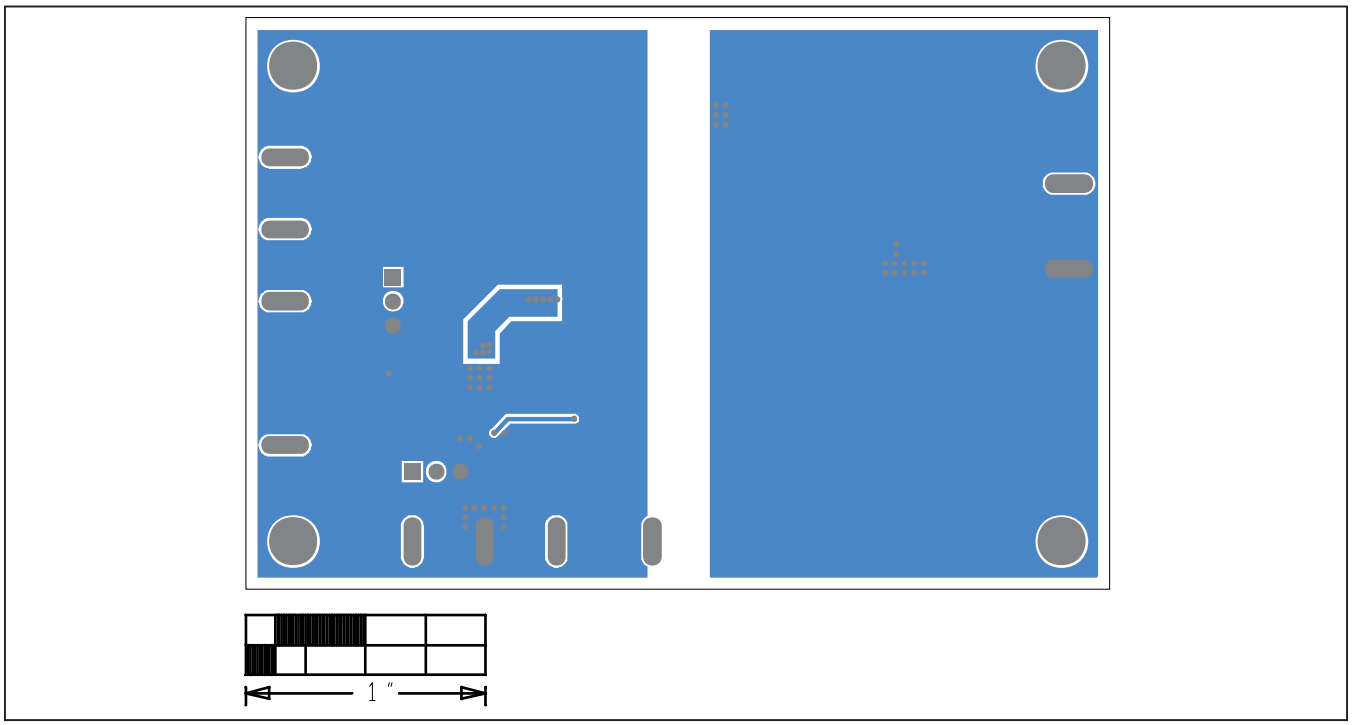


MAX17682 EV Kit—Level 2 SGND



MAX17682 EV Kit—Level 3 SGND

MAX17682 EV Kit PCB Layout Diagrams (continued)



MAX17682EV—Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	3/17	Initial release	—
1	4/18	Updated title and *Bill of Materials*.	1–9

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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
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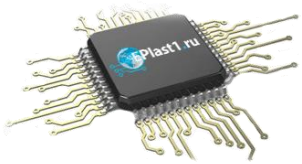
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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