MAX17690 No-Opto Flyback Evaluation Kit

Evaluates: MAX17690 In Dual-Output Configuration

General Description

The MAX17690EVKITC is a fully assembled and tested circuit board that demonstrates the working of an isolated 6W no-opto flyback DC-DC converter. This circuit uses a MAX17690 in a 16-pin TQFN package with an exposed pad. The data sheet must be read in conjunction with this quick start guide for demo circuit.

The EV kit output is configured for an isolated ±15V and provides up to 200mA of output current on each output. The MAX17690 switches at a 100kHz switching frequency. The transformer provides the galvanic isolation between input and output, up to $1500V_{RMS}$.

Features

- 18V to 36V Input Range
- Isolated Output: ±15V/200mA On Each Output
- Compact Design with High Frequency (100kHz) Switching
- Minimum Number of External Components
- 90.5% Peak Efficiency
- Low-Cost Flyback Design
- Galvanic Isolation up to $1500V_{RMS}$
- Proven PCB Layout
- Fully Assembled and Tested

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

Quick Start

Recommended Equipment

- One 18V–36V DC, 1A Power Supply
- 2 no's of 3W resistive load with 200mA sink capacity
- Four digital multimeters (DMM)
- MAX17690EVKITC#

Warning:

- Do not turn on the power supply until all connections are completed.
- Wear protective eye gear at all times.
- 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 input power source before touching circuit parts.

Equipment Setup and Test Procedure

1) Set the power supply to +24VDC. 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 one terminal of the first 200mA resistive load to the +15V PCB pad and the other terminal to the nearest GND0 PCB pad. Connect the one terminal of the second 200mA resistive load to the GND0 PCB pad and the other terminal to the nearest -15V PCB pad.
3) Connect a DMM configured in voltmeter mode across the +15V PCB pad and the nearest GND0 PCB pad. Connect another DMM configured in voltmeter mode across the -15V PCB pad and the nearest GND0 PCB pad.
4) Enable the power supply.
5) Verify that the output voltmeter displays ±15V with ±8% accuracy. If required, measure the output current using a DMM configured in Ammeter mode.
6) If required, vary the input voltage from 18V to 36V, and the load current from 0mA to 200mA and verify that output voltage is ±15V with ±8% accuracy.

319-100038; Rev 1; 9/17

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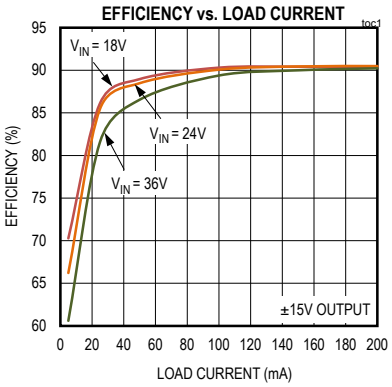
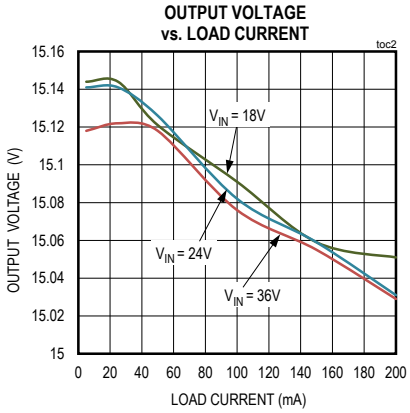
Detailed Description

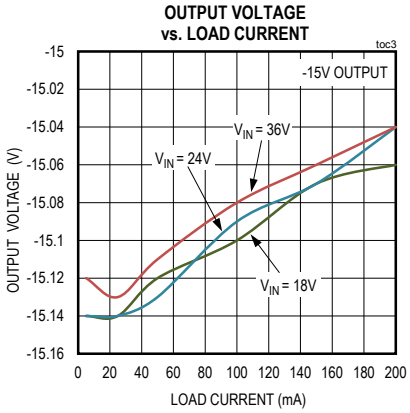
The MAX17690EVKITC provides a proven design to evaluate the MAX17690 high-efficiency DC-DC flyback converter. The MAX17690 uses a novel sampling technique to eliminate the optocoupler in the output voltage sensing across the isolation boundary. The transformer design and the selection of different components are detailed in the MAX17690 data sheet.

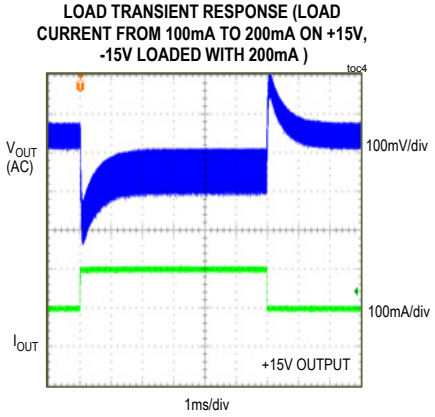
This EV kit provides the programmable soft-start time to limit the inrush current. The IC has over current protection and thermal protection as well.

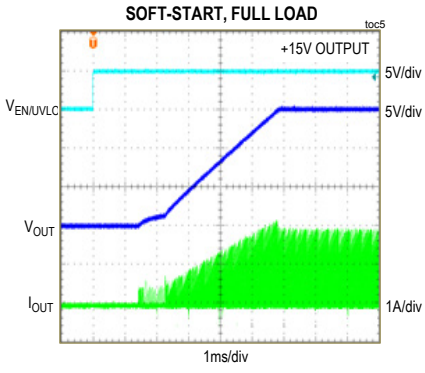
EV Kit Performance Report











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 MAX17690 when contacting these component suppliers.*

Ordering Information

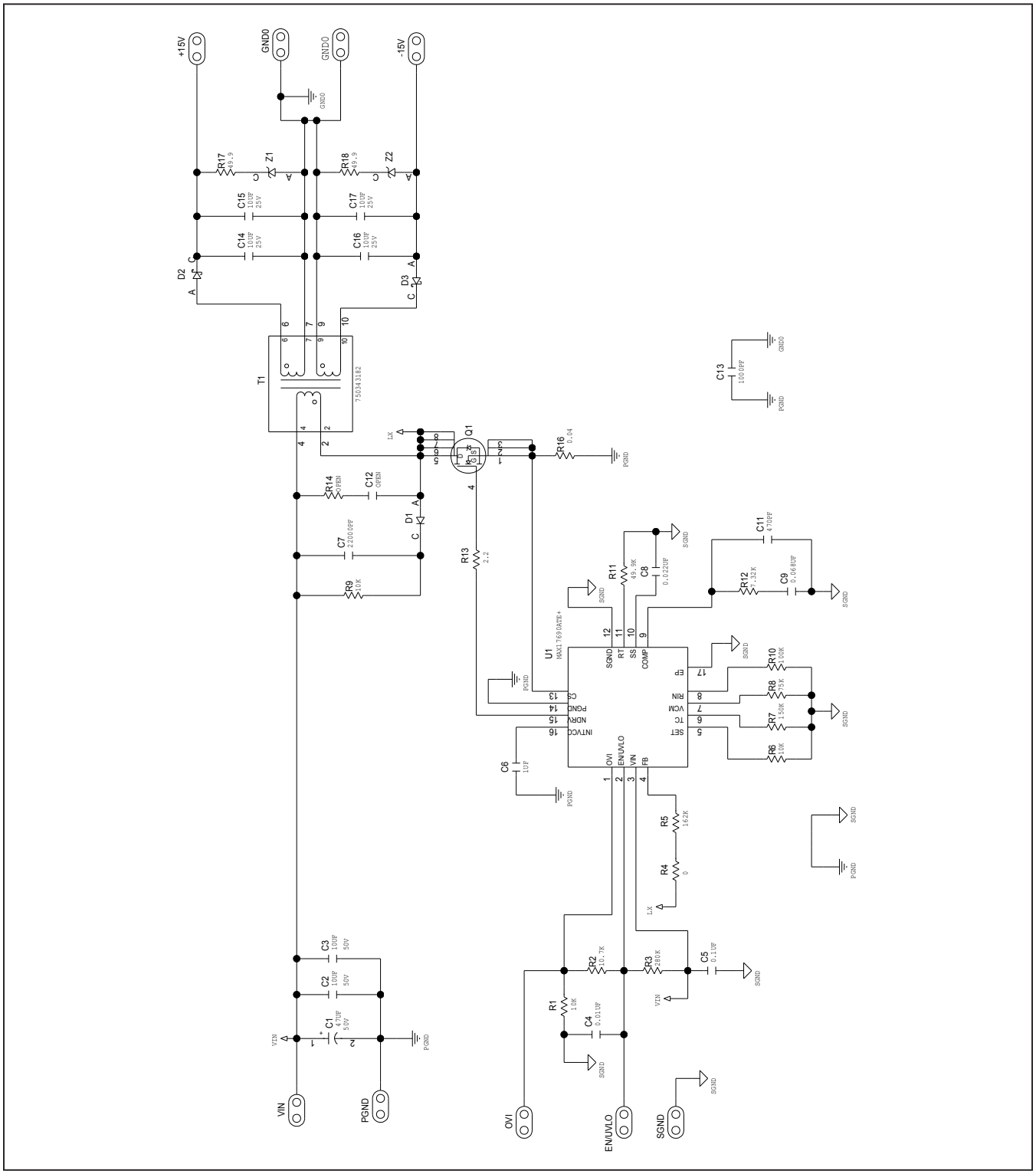
PART	TYPE
MAX17690EVKITC#	EV Kit

#Denotes RoHS compliant.

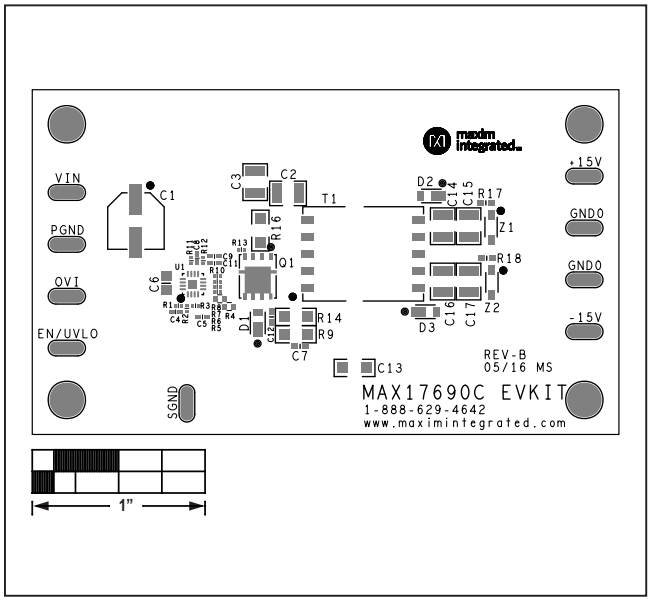
MAX17690 EV Kit Bill of Materials

S.NO	DESIGNATION	VALUE	QTY	DESCRIPTION	MANUFACTURER PARTNUMBER	MANUFACTURER
1	C1	47UF	1	(CASE_E); ALUMINUM-ELECTROLYTIC; 47UF; 50V; TOL=20%	EEE-FK1H470P	PANASONIC
2	C2, C3	10UF	2	(1210); CERAMIC CHIP; 10UF; 50V; TOL=10%;TC=X7R	GRJ32ER71H106KE11	MURATA
3	C4	0.01UF	1	(0402); CERAMIC CHIP; 0.01UF; 50V; TOL=10%;TC=X7R	C0402C103K5RAC;GRM155R71H103KA88	KEMET/MURATA
4	C5	0.1UF	1	(0402); CERAMIC CHIP; 0.1UF; 50V; TOL=10%;TC=X7R	CGA2B3X7R1H104K; C1005X7R1H104K050BB; GRM155R71H104KE14	TDK/MURATA
5	C6	1UF	1	(0805); CERAMIC CHIP; 1UF; 50V; TOL=10%;TC=X7R	GRM21BR71H105KA12; CL21B105KBFNNNE; C2012X7R1H105K085AC	MURATA/SAMSUNG ELECTRONICS/TDK
6	C7	22000PF	1	(0603); CERAMIC CHIP; 22000PF; 100V;TC=X7R	GRM188R72A223KAC4; C0603C223K1RAC; HMK107B7223KA	MURATA/ KEMET/TAIYO YUDEN
7	C8	0.022UF	1	(0402); CERAMIC CHIP; 0.022UF; 50V; TOL=10%;TC=X7R	GRM155R71H223KA12	MURATA
8	C9	0.068UF	1	(0402); CERAMIC CHIP; 0.068UF; 16V;TC=X7R	C0402X7R160-683KNE; C1005X7R1C683K050	VENKEL LTD/TDK
9	C11	470PF	1	(0402); CERAMIC; 470pF; 50V; 10%; TC=X7R	C0402S471K5RAC; GRM155R71H471K	KEMET/MURATA
10	C12	OPEN	1	(0603)	N/A	N/A
11	C13	1000PF	1	(1206); CERAMIC CHIP; 1000PF; 1500V;TC=X7R	1206SC102KAT	AVX
12	C14-C17	10UF	4	(1210); CERAMIC CHIP; 10UF; 25V; TOL=10%;TC=X7R	GCM32ER71E106KA57; CGA6P1X7R1E106K	MURATA/TDK
13	D1	200V/1A	1	(POWERDI-123); PIV=200V; IF=1A	DFLS1200	DIODES INCORPORATED
14	D2, D3	100V/1A	2	(POWERDI-123); PIV=100V; IF=1A	DFLS1100-7	DIODES INCORPORATED
15	Q1	100V/7.5A	1	(SO-8);N-CHANNEL 100V MOSFET; PD-(23W); I-(7.5A); V-(100V)	SIR698DP-T1-GE3	VISHAY SILICONIX
16	R1, R6	10K	2	(0402); 10K OHM; 5%	CRCW040210K0JN	VISHAY DALE
17	R2	10.7K	1	(0402); 10.7K OHM; 1%	CRCW040210K7FK	VISHAY
18	R3	280K	1	(0402); 280K OHM; 1%	CRCW0402280KFKEDHP	VISHAY DRALORIC
19	R4	0Ω	1	(0603); 0Ω; 0%	CRCW06030000ZS; MCR03EZPJ000; ERJ-3GEY0R00	VISHAY DALE/ROHM/PANASONIC
20	R5	162K	1	(0603); 162K OHM; 1%	CRCW0603162KFK	VISHAY DALE
21	R7	150K	1	(0402), 150K OHM, 1%	CRCW0402150KFK	VISHAY DALE
22	R8	75K	1	(0402); 75K OHM; 1%	CRCW040275K0FK	VISHAY DALE
23	R9	10K	1	(1206); 10K; 1%; 100PPM; 1/4W	CRCW120610K0FK	VISHAY DALE
24	R10	100K	1	(0402); 100K OHM; 5%	CRCW0402100KJN	VISHAY DALE
25	R11	49.9K	1	(0402); 49.9K; 1%	CRCW040249K9FK; 9C04021A4992FLHF3	VISHAY DALE
26	R12	7.32K	1	(0402); 7.32K OHM; 1%	RK73H1ETTP7321F	KOA SPEER ELECTRONICS INC.
27	R13	2.2	1	(0402), 2.2 OHM, 1%	CRCW04022R20FK	VISHAY DALE
28	R14	OPEN	1	(1206)	N/A	N/A
29	R16	0.04	1	(1206); 0.04 OHM; 1%	WSL1206R0400F	VISHAY DALE
30	R17, R18	49.9	2	(0603); 49.9 OHM; 1%	CRCW060349R9FK	VISHAY DALE
31	T1	33µH,2.2A	1	EP13,10-pin SMT, 33µH,2.2A,(2-1):(9-10)=1:1	750343182	WURTH ELECTRONICS INC.
32	U1		1	(TQFN16-EP)FLYBACK CONTORLLER;	MAX17690ATE+	MAXIM
33	Z1, Z2	17V/0.01A	2	(SOD-123); PD=0.5W; IZ=0.01A; VZ=17V	DDZ17-7	DIODES INCORPORATED

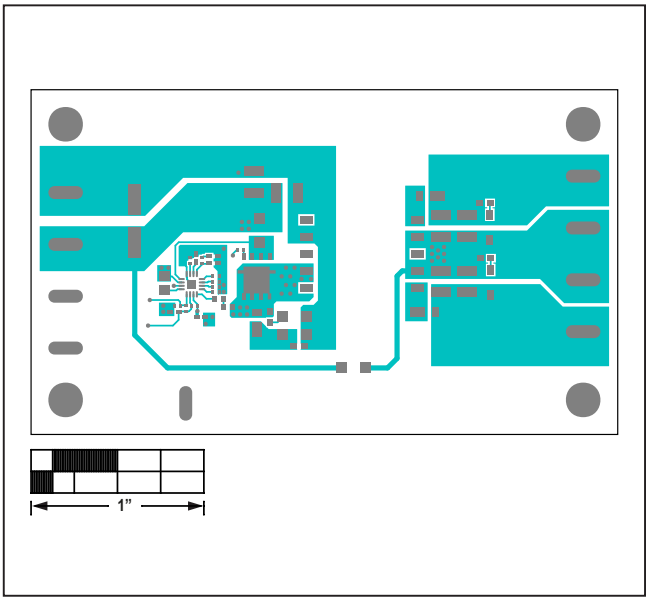
MAX17690 EV Kit Schematic



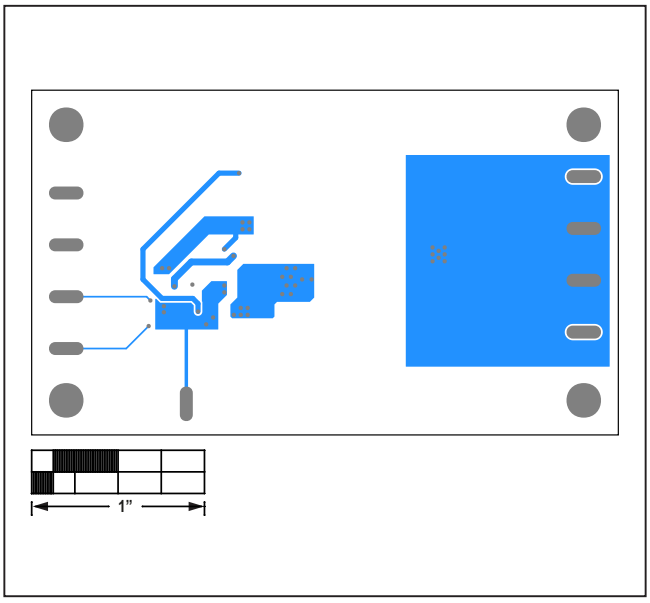
MAX17690 EV Kit PCB Layout Diagrams



MAX17690 EV Kit—Top Silkscreen



MAX17690 EV Kit—Top



MAX17690 EV Kit—Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	6/17	Initial release	—
1	9/17	Corrected part number from MAX17690C to MAX17690, and EV kit number from MAX17690C to MAX17690EVKITC.	1–6

Mouser Electronics

Authorized Distributor

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

MAX17690EVKITC#