QUICK START GUIDE FOR EVAL-ADPL21610-AZ

ADPL21610
1.2MHz, SOT-23 DC/DC Converter

DESCRIPTION

Evaluation circuit EVAL-ADPL21610-AZ is a 1.2MHz, SOT-23 DC/DC converter featuring the ADPL21610. The Boost Circuit is designed to convert a 5V input to a 12V output at 300mA maximum load. The EVAL-ADPL21610-AZ is designed to demonstrate the soft-start feature, advantages of the 1.2MHz switching frequency, the internal 42V/1.1A switch, wide input voltage range and small circuit size. The EVAL-ADPL21610-AZ is intended for space-conscious applications such as digital cameras, cellular phones, palmtop computers, and liquid crystal display (LCD) displays. The 1.2MHz switching frequency, 1.1A integrated switch, small circuit size, and low component count make the ADPL21610 suitable for use in many other applications, such as PC cards, miniature disk drives, variable digital subscriber line (xDSL) power supplies, flash memory products, and local 5V or 12V supplies.

Read the ADPL21610 data sheet before using or making any hardware changes to the EVAL-ADPL21610-AZ evaluation board.

Design files for this circuit board are available.

PERFORMANCE SUMMARY

Specifications are at T_A = 25°C

PARAMETERS FOR BOOST CONVERTER	CONDITIONS	VALUE
Input Voltage		5V
Output Voltage, V_{OUT}	V_{IN} = 5V, I_{OUT} = 0A to 300A	12V ±2%
Maximum Output Current		300mA
Typical Output Ripple, V_{OUT}	V_{IN} = 5V, I_{OUT} = 300mA	55mV_{P-P}
Typical Efficiency	V_{IN} = 5V, I_{OUT} = 300mA	86%

QUICK START PROCEDURE

The EVAL-ADPL21610-AZ is easy to set up for evaluating the ADPL21610's performance. See Figure 1 for proper measurement equipment setup, and use the following procedure:

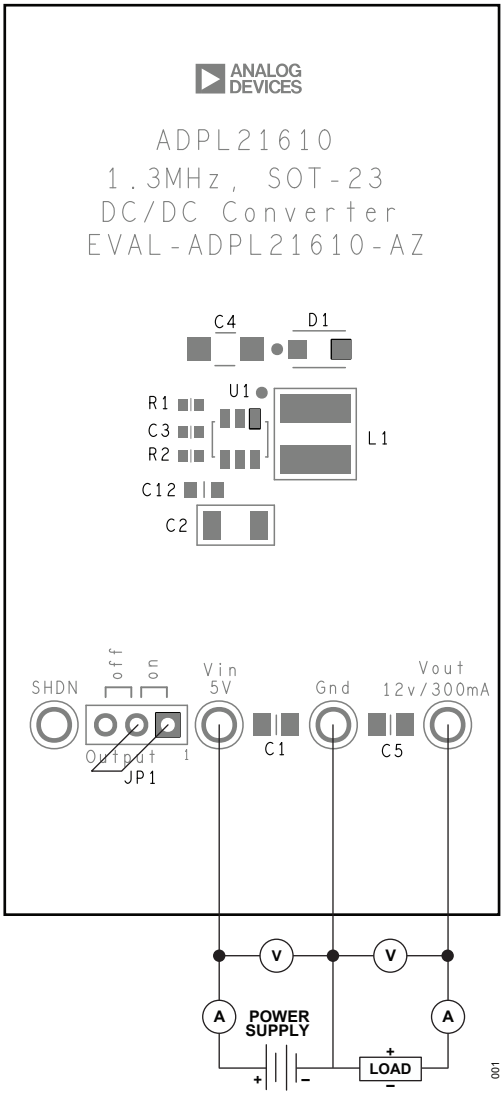

Figure 1. Proper Measurement Equipment Setup

NOTE: When measuring the input or output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. Measure the input or output voltage ripple by touching the probe tip directly across the V_{IN} or V_{OUT} and GND terminals. See Figure 2 for the proper scope probe technique.

1. Place the jumper in the following positions:
   JP1 On
2. With power off, connect the input power supply to V_{IN} and GND.
3. Turn on the power at the input.

   NOTE: Ensure that the input voltage does not exceed 5V.
4. Check for the proper output voltages.

   NOTE: If there is no output, temporarily disconnect the load to ensure that the load is not set too high.

NOTE: Once the proper output voltages are established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage, efficiency, and other parameters directly across the V_{IN} or V_{OUT} and GND terminals. See Figure 2 for the proper scope probe technique.

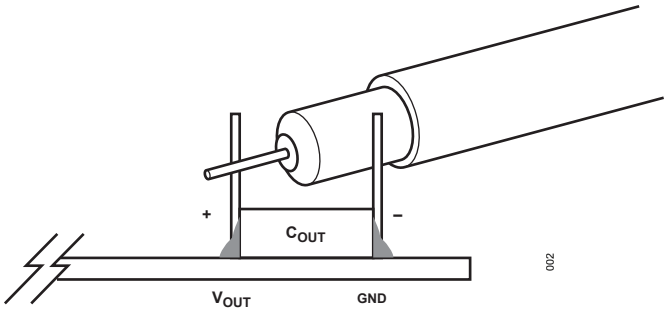

Figure 2. Measuring Output Voltage Ripple

ORDERING INFORMATION

PART	TYPE
EVAL-ADPL21610-AZ	Evaluation Board

EVAL-ADPL21610-AZ BILL OF MATERIALS

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	N/A	PCB	PCB Manufacturing
2	2	C1, C5	CAP., CER., 1µF, 16V, 10%, X7R, 0805	AVX Corporation, 0805YC105KAT2A
3	1	C12	CAP., CER., 0.1µF, 16V, 10%, X7R, 0603	Würth Elektronik, 885012206046
4	1	C2	CAP., CER., 2.2µF, 16V, 10%, X7R, 1206	Yageo, CC1206KKX7R7BB225
5	1	C3	CAP., CER., 10pF, 16V, 10%, C0G, 0402	AVX Corporation, 0402YA100KAT2A
6	1	C4	CAP., SMT (1206), 4.7µF; 10%, 16V, X7R, Ceramic	Kemet, C1206C475K4RAC
7	1	D1	Diode, Schottky, 20V, 1A, SOD123F, AEC-Q101	Nexperia, PMEG2010EH,115
8	1	JP1	Connector, through Hole, Female Header, Straight, 2mm Pitch, 3pins	Adam Tech, 2PH1-03-UA
9	1	L1	IND, SMD, Drum Core, Wirewound, 10µH, 1.15A, 180MΩ	Bourns, SDR0403-100ML
10	1	R1	RES, SMT (0402), 115K, 1%, ±100PPM/°C, 0.0630W	Yageo, RC0402FR-07115KL
11	1	R2	RES, SMT (0402), 13.3K, 1%, ±100PPM/°C, 0.0630W	Vishay, CR0402-16W-1332FT
12	4	TP1, TP2, TP3, TP4	CONN-PCB, Solder Terminal Turrets for Clip Leads, Swage Mount	Mill-Max, 2308-2-00-44-00-00-07-0
13	1	U1	Custom, IC, Boost Regulator TSOT-23; ADPL21610	Analog Devices, ADPL21610EUJZ
Mechanical Component List				
1	0	N/A	Shunt, Mini, Open Top, 4.50mm	Adam Tech, MS2A-G
2	0	D2	Standoff; BRD Support Snap Lock/Screw Mount Nylon, 15mm Long, 6.6 OD, 3.2 ID	Keystone, 9032

EVAL-ADPL21610-AZ SCHEMATIC DIAGRAM

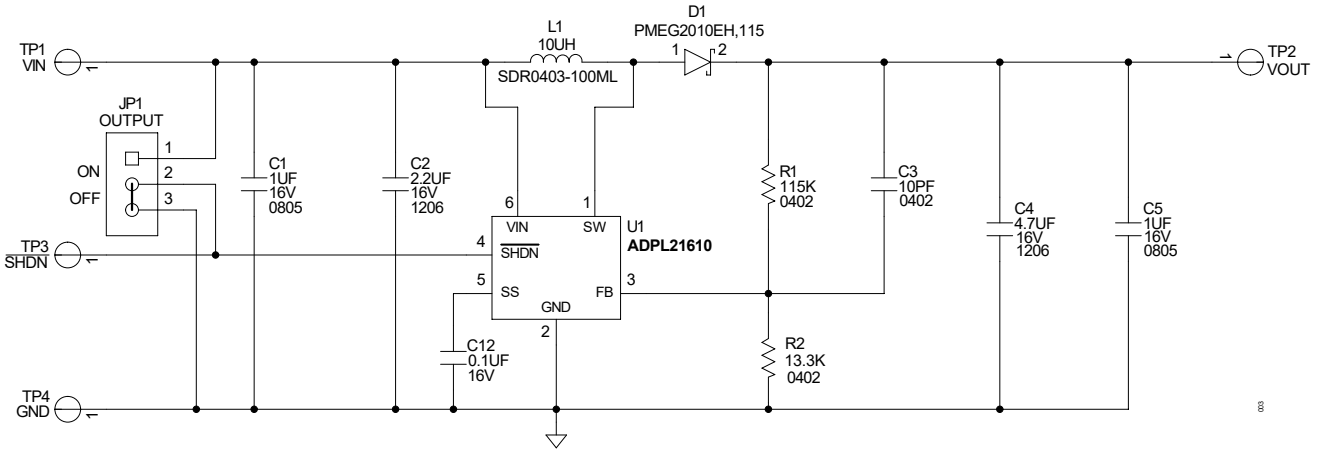

Figure 3. EVAL-ADPL21610-AZ Schematic Diagram

EVAL-ADPL21610-AZ PCB LAYOUT DIAGRAMS

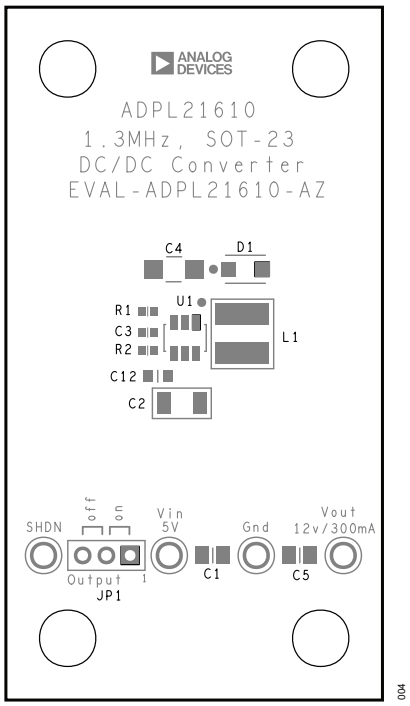

Figure 4. EVAL-ADPL21610-AZ Component Placement Guide—Top Silkscreen

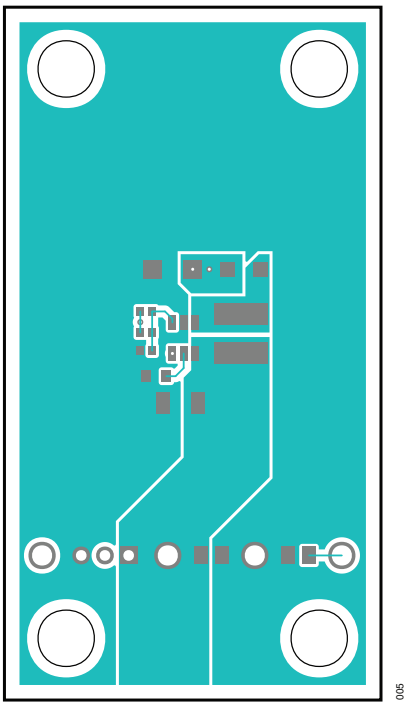

Figure 5. EVAL-ADPL21610-AZ PCB Layout—Top View

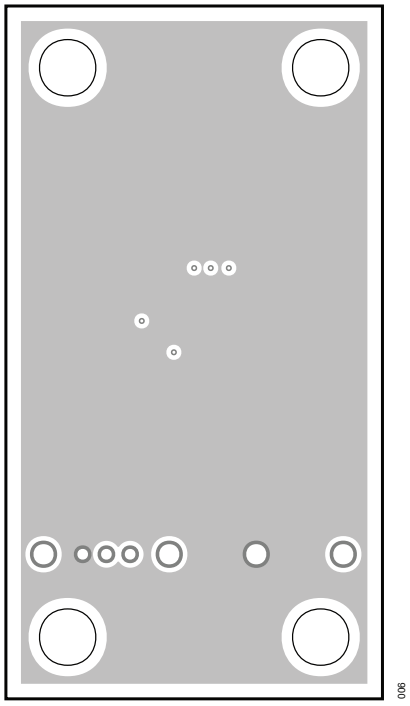

Figure 6. EVAL-ADPL21610-AZ PCB Layout—Internal 2

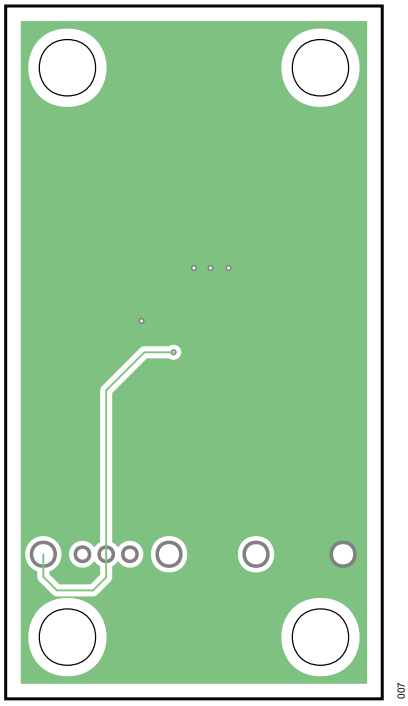

Figure 7. EVAL-ADPL21610-AZ PCB Layout—Internal 3

EVAL-ADPL74101-AZ PCB LAYOUT DIAGRAMS

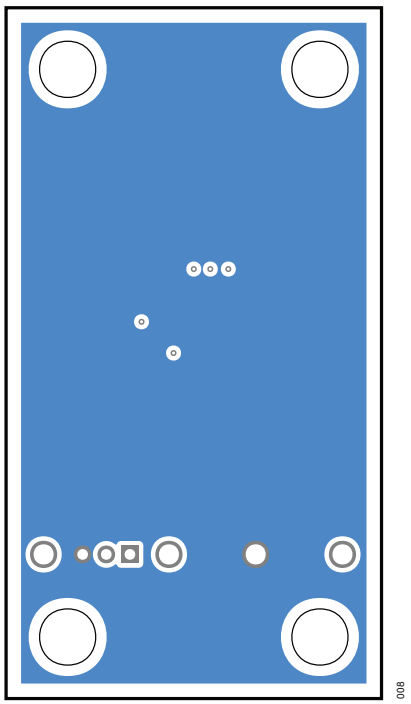

Figure 8. EVAL-ADPL21610-AZ PCB Layout—Bottom View

Figure 9. EVAL-ADPL21610-AZ Component Placement Guide—Bottom Silkscreen

REVISION HISTORY

REV	DATE	DESCRIPTION	PAGE NUMBER
0	1/26	Initial release	—

ESD Caution
ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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