

Evaluating the ADL6346B, 40dB Gain, 1500MHz to 2700MHz Transmit Amplifier

FEATURES

- ▶ Full featured evaluation board for the ADL6346-EVALZB
- ▶ Single-supply operation

EQUIPMENT NEEDED

- ▶ 5V DC power supply
- ▶ 1.8V DC power supply
- ▶ Signal generator
- ▶ Spectrum analyzer
- ▶ Network analyzer (option)

DOCUMENTS NEEDED

- ▶ [ADL6346B](#) data sheet

EVALUATION BOARD CONNECTION DIAGRAM

GENERAL DESCRIPTION

The ADL6346-EVALZB is designed to evaluate the features and performance of the ADL6346B, 40.0dB gain transmit amplifier, which has a frequency range of 1500MHz to 2700MHz.

Additional information on the ADL6346B is provided in the ADL6346B data sheet. Consult the data sheet in conjunction with this user guide when using the ADL6346-EVALZB evaluation board.

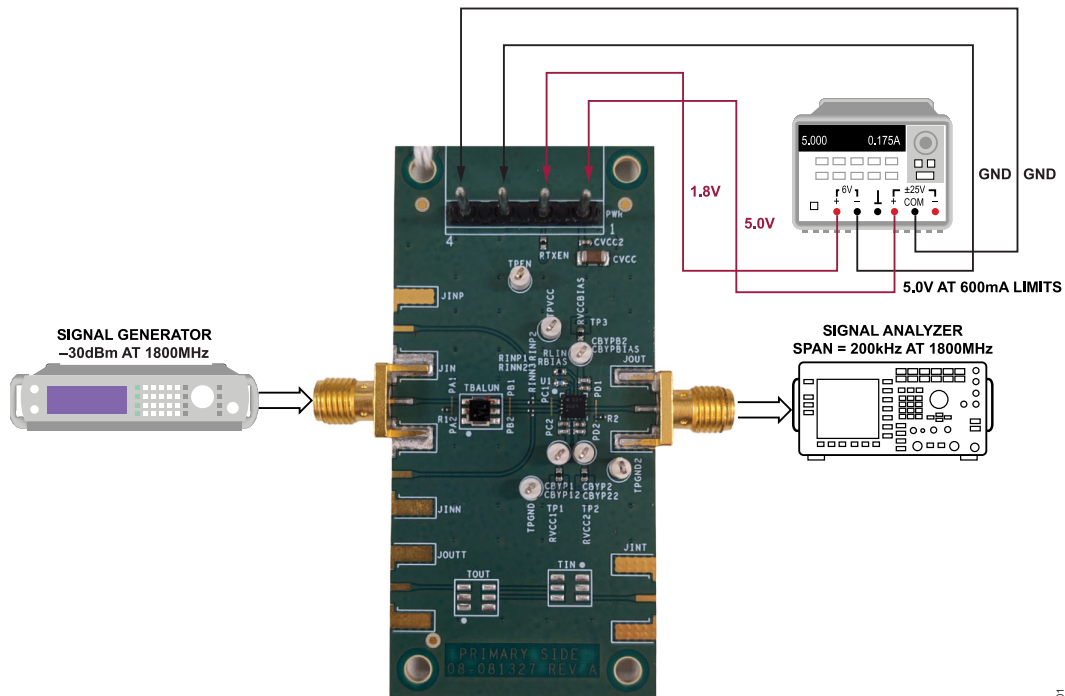


Figure 1. ADL6346-EVALZB Typical Measurement Setup (Option 1)

TABLE OF CONTENTS

Features.....	1	Single-Tone Demonstration.....	5
Equipment Needed.....	1	Losses and Signal-to-Noise Ratio (SNR)	
Documents Needed.....	1	Degradation.....	5
General Description.....	1	Evaluation Board Schematics and Artwork.....	6
Evaluation Board Connection Diagram.....	1	Ordering Information.....	9
Evaluation Board Hardware.....	3	Ordering Guide.....	9
Hardware Setup.....	3	Bill of Materials.....	9
Evaluation Board Quick Start Procedures.....	5		

REVISION HISTORY**3/2026—Revision 0: Initial Version**

EVALUATION BOARD QUICK START PROCEDURES

SINGLE-TONE DEMONSTRATION

Use the following settings to configure the ADL6346-EVALZB as an example of amplifying a 1800MHz sine wave:

1. Configure the hardware according to the [Hardware Setup](#) section and what is shown in [Figure 1](#) or [Figure 3](#).
2. Set the frequency of the signal generator to 1800MHz and the output level to -30dBm. Connect the spectrum analyzer to the RFOUT1 connector.
3. Turn on the 5.0V DC power supply connected to the PWR 1 test point.
4. Turn on the 1.8V DC power supply connected to the PWR 2 test point.
5. Measure the signal levels with a signal analyzer. The gain of the [ADL6346B](#) is derived from the following formula:
 $Gain = Signal\ Level\ at\ Signal\ Analyzer - Input\ Signal\ Level + Board\ Loss$ (see [Table 2](#)) + *Cable Loss*.

LOSSES AND SIGNAL-TO-NOISE RATIO (SNR) DEGRADATION

The ADL6346B provides a nominal 40.0dB of power gain between the input and output pins. The on-board balun TCM2-63WX+ (Mini-Circuits) is used to translate from the single-ended board input to the differential inputs of the ADL6346B (see [Figure 4](#)). Consider the board losses to derive the accurate RF performance, conversion gain, noise figure, and output third-order intercept (OIP3) of the device. [Table 2](#) details the board losses including the balun and Sub-miniature Version A (SMA) connectors on the ADL6346-EVALZB.

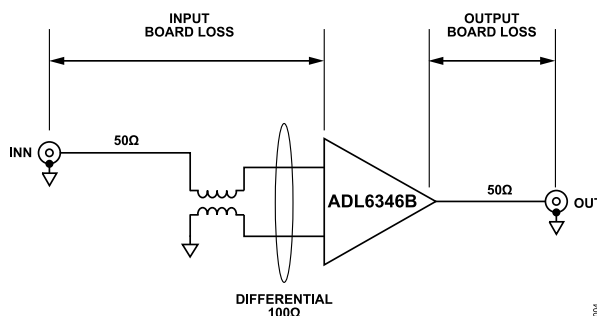


Figure 4. Losses and SNR Degradation for the ADL6346-EVALZB

Table 2. Board Loss Table for the ADL6346-EVALZB

Frequency (MHz)	Loss (dB)		
	Input	Output	Total
1500	1.03	0.31	1.34
1600	1.05	0.32	1.37
1700	1.08	0.32	1.40
1800	1.11	0.33	1.44
1900	1.15	0.35	1.50
2000	1.21	0.35	1.56
2100	1.28	0.36	1.64
2200	1.37	0.37	1.74
2300	1.46	0.37	1.83
2400	1.57	0.38	1.95
2500	1.70	0.39	2.09
2600	1.84	0.39	2.23
2700	1.99	0.40	2.39

EVALUATION BOARD SCHEMATICS AND ARTWORK

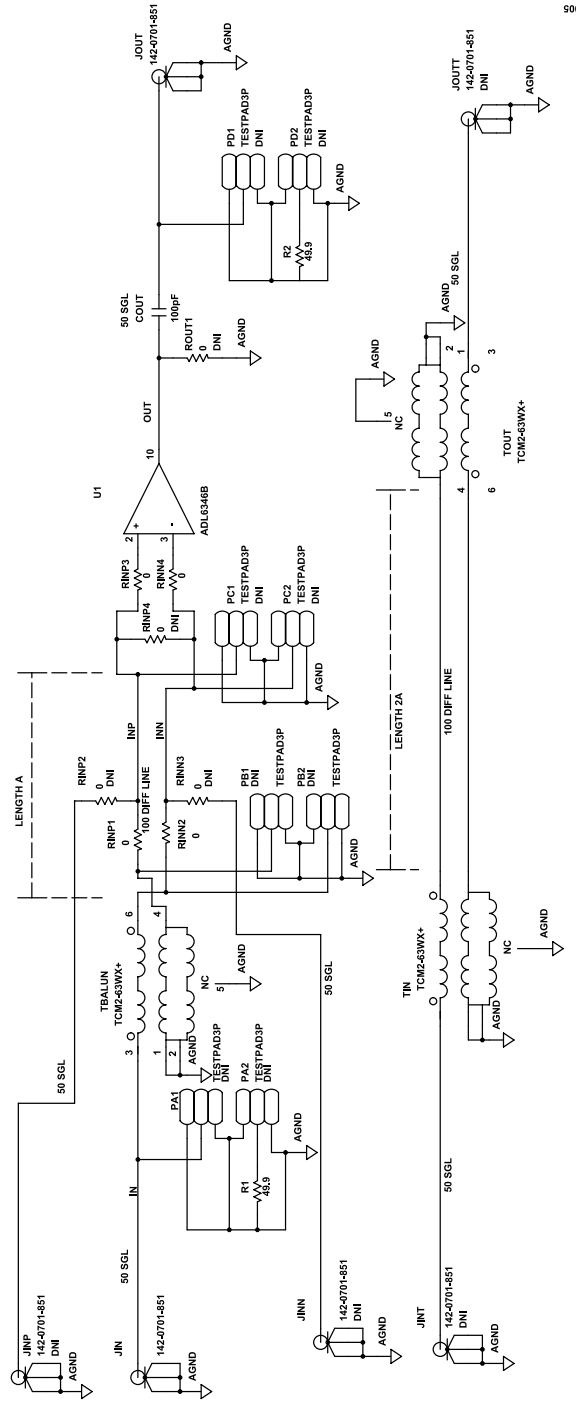


Figure 5. ADL6346-EVALZB Schematic

EVALUATION BOARD SCHEMATICS AND ARTWORK

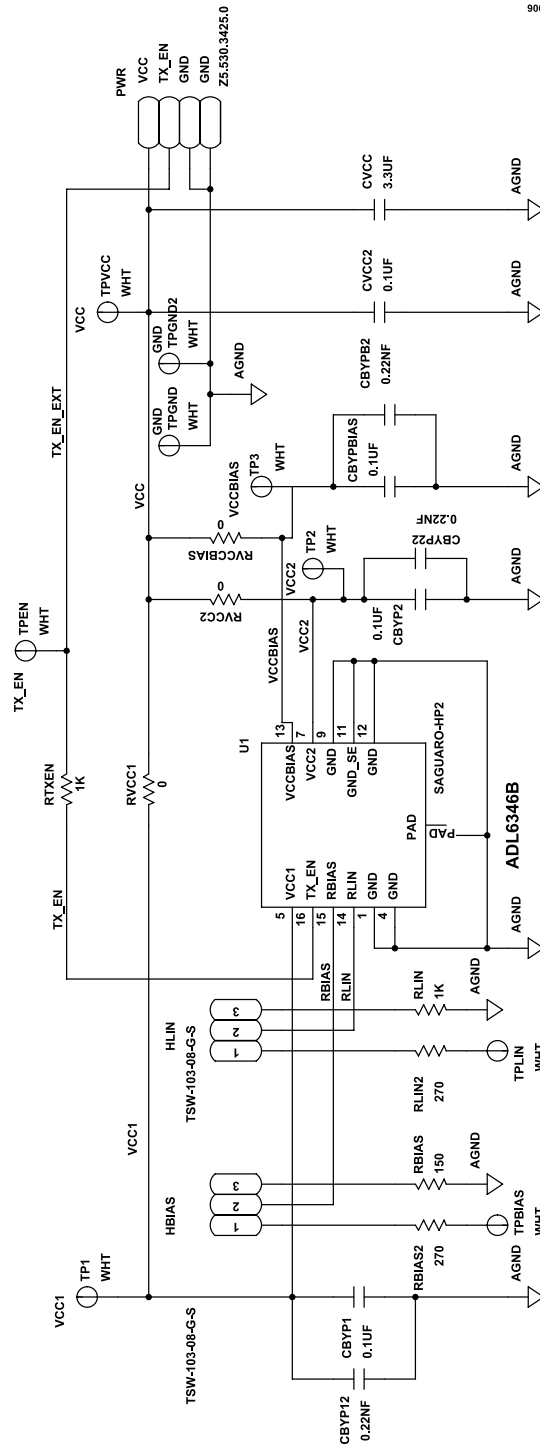


Figure 6. ADL6346-EVALZB Schematic 2

EVALUATION BOARD SCHEMATICS AND ARTWORK

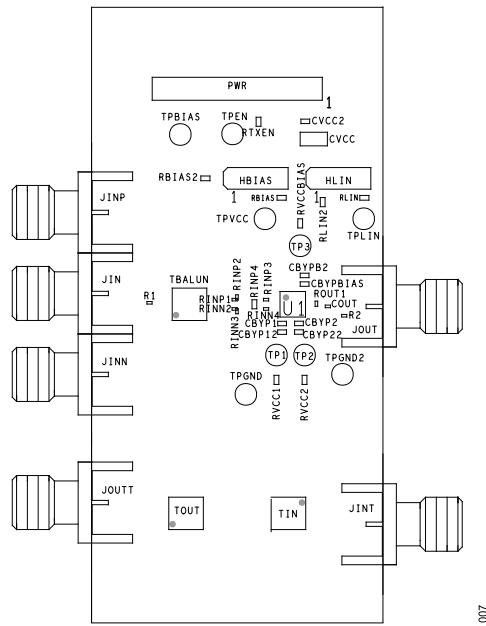


Figure 7. ADL6346-EVALZB Front Side

ORDERING INFORMATION

ORDERING GUIDE

Model ¹	Package Description
ADL6346-EVALZB	Evaluation Board for ADL6346B

¹ Z = RoHS Compliant Part.

BILL OF MATERIALS

Table 3. Bill of Materials for ADL6346-EVALZB

Quantity	Reference Designator	Description	Manufacturer	Part Number
4	CBYP1, CBYP2, CBYPBIAS, CVCC2	Capacitors, 0.1µF, 16V, C0402 package	Kemet	C0402C104J4RACTU
3	CBYP12, CBYP22, CBYPB2	Capacitors, 220pF, 25V, C0402 package	AVX Corporation	04023A221KAT2A
1	COUT	Capacitors, 100pF, 25V, C0201 package	Murata	GRM033R71E101KA01D
1	CVCC	Capacitors, 3.3µF, 16V, C1206 package	Kemet	C1206C335K4PAC
2	JIN, JOUT	Edge mount, SMA connectors	Cinch	142-0701-851
1	PWR	Connector PCB terminal strip header	Wieland Electric GMBH	Z5.530.3425.0
2	HBIAS, HLIN	Connector headers through hole, 3 position	Samtec	TSW-103-08-G-S
2	R1, R2	Resistors, 49.9Ω, 0.05W, 0201 package	Vishay	CRCW020149R9FKED
1	RBIAS	Resistors, 150Ω, 0.1W, 0402 package	Panasonic	ERJ-2GEJ151X
2	RBIAS2, RLIN2	Resistors, 270Ω, 0.1W, 0402 package	Panasonic	ERJ-2RKF2700X
4	RINN2, RINN4, RINP1, RINP3	Resistors, 0Ω, 0.05W, 0201 package	Panasonic	ERJ-1GN0R00C
2	RLIN, RTXEN	Resistor, 1kΩ, 0.063W, 0402 package	Yageo	RC0402JR-071KL
3	RVCC1, RVCC2, RVCCBIAS	Resistors, 0Ω, 0.1W, 0402 package	Panasonic	ERJ-2GE0R00X
3	TBALUN, TIN, TOUT	Transformer baluns, 1:2 ratio, 30MHz to 6000MHz	Mini-Circuits Labs	TCM2-63WX+
9	TP1 to TP3, TPBIAS, TPEN, TPGND, TPGND2, TPLIN, TPVCC	PCB test point connectors	Keystone Electronics	5xxx
1	U1	0dB gain, 1500MHz to 2700MHz transmit amplifier	Analog Devices, Inc.	ADL6346ACRZB
1	PCB	Evaluation board	Analog Devices	ADL6346-EVALZB

**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.

Legal Terms and Conditions

By using the evaluation board discussed herein (together with any tools, components documentation or support materials, the "Evaluation Board"), you are agreeing to be bound by the terms and conditions set forth below ("Agreement") unless you have purchased the Evaluation Board, in which case the Analog Devices Standard Terms and Conditions of Sale shall govern. Do not use the Evaluation Board until you have read and agreed to the Agreement. Your use of the Evaluation Board shall signify your acceptance of the Agreement. This Agreement is made by and between you ("Customer") and Analog Devices, Inc. ("ADI"), with its principal place of business at One Analog Way, Wilmington, MA 01887-2356, U.S.A. Subject to the terms and conditions of the Agreement, ADI hereby grants to Customer a free, limited, personal, temporary, non-exclusive, non-sublicensable, non-transferable license to use the Evaluation Board FOR EVALUATION PURPOSES ONLY. Customer understands and agrees that the Evaluation Board is provided for the sole and exclusive purpose referenced above, and agrees not to use the Evaluation Board for any other purpose. Furthermore, the license granted is expressly made subject to the following additional limitations: Customer shall not (i) rent, lease, display, sell, transfer, assign, sublicense, or distribute the Evaluation Board; and (ii) permit any Third Party to access the Evaluation Board. As used herein, the term "Third Party" includes any entity other than ADI, Customer, their employees, affiliates and in-house consultants. The Evaluation Board is NOT sold to Customer; all rights not expressly granted herein, including ownership of the Evaluation Board, are reserved by ADI. CONFIDENTIALITY. This Agreement and the Evaluation Board shall all be considered the confidential and proprietary information of ADI. Customer may not disclose or transfer any portion of the Evaluation Board to any other party for any reason. Upon discontinuation of use of the Evaluation Board or termination of this Agreement, Customer agrees to promptly return the Evaluation Board to ADI. ADDITIONAL RESTRICTIONS. Customer may not disassemble, decompile or reverse engineer chips on the Evaluation Board. Customer shall inform ADI of any occurred damages or any modifications or alterations it makes to the Evaluation Board, including but not limited to soldering or any other activity that affects the material content of the Evaluation Board. Modifications to the Evaluation Board must comply with applicable law, including but not limited to the RoHS Directive. TERMINATION. ADI may terminate this Agreement at any time upon giving written notice to Customer. Customer agrees to return to ADI the Evaluation Board at that time. LIMITATION OF LIABILITY. THE EVALUATION BOARD PROVIDED HEREUNDER IS PROVIDED "AS IS" AND ADI MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND WITH RESPECT TO IT. ADI SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, ENDORSEMENTS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, RELATED TO THE EVALUATION BOARD INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT WILL ADI AND ITS LICENSORS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES RESULTING FROM CUSTOMER'S POSSESSION OR USE OF THE EVALUATION BOARD, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DELAY COSTS, LABOR COSTS OR LOSS OF GOODWILL. ADI'S TOTAL LIABILITY FROM ANY AND ALL CAUSES SHALL BE LIMITED TO THE AMOUNT OF ONE HUNDRED US DOLLARS (\$100.00). EXPORT. Customer agrees that it will not directly or indirectly export the Evaluation Board to another country, and that it will comply with all applicable United States federal laws and regulations relating to exports. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Massachusetts (excluding conflict of law rules). Any legal action regarding this Agreement will be heard in the state or federal courts having jurisdiction in Suffolk County, Massachusetts, and Customer hereby submits to the personal jurisdiction and venue of such courts. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement and is expressly disclaimed. All Analog Devices products contained herein are subject to release and availability.

