

Evaluating the **ADMV7420** 81 GHz to 86 GHz, E-Band, Low Noise Downconverter SiP

FEATURES

- Simple power-up with on-board LDO regulators
- Option to bypass LDO regulators with connector jumpers

EVALUATION KIT CONTENTS

- ADMV7420-EVALZ
- Connector jumpers

EQUIPMENT NEEDED

- +5 V dc and -5 V dc power supplies
- Baseband signal generator
- RF signal generator
- E-band spectrum analyzer
- WR-12 waveguide

ADMV7420-EVALZ PHOTOGRAPH

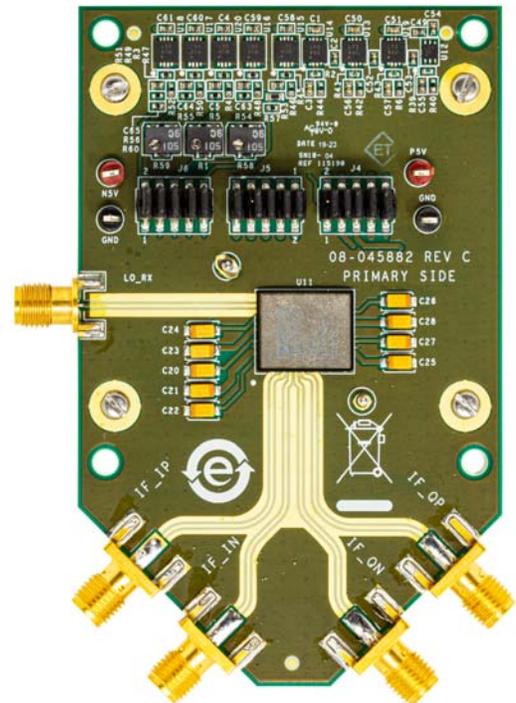


Figure 1.

20885-001

GENERAL DESCRIPTION

The ADMV7420-EVALZ incorporates the [ADMV7420](#) with low dropout (LDO) regulators, potentiometers, and a waveguide back plate to allow quick and easy evaluation of the [ADMV7420](#). The LDO regulators allow the [ADMV7420](#) to be powered on by ± 5 V dc supplies.

The [ADMV7420](#) is a fully integrated system in package (SiP) inphase/quadrature (I/Q) downconverter that operates at an RF input frequency range of 81 GHz to 86 GHz and an intermediate frequency (IF) output frequency range of dc to 2 GHz.

For full details, see the [ADMV7420](#) data sheet, which must be used in conjunction with this user guide when using the ADMV7420-EVALZ.

TABLE OF CONTENTS

Features	1	Evaluation Board Setup	3
Evaluation Kit Contents.....	1	Quick Start Procedure	3
Equipment Needed.....	1	Evaluation Board Schematics.....	4
ADMV7420-EVALZ Photograph.....	1	Ordering Information.....	6
General Description	1	Bill of Materials.....	6
Revision History	2		

REVISION HISTORY

11/2019—Revision A: Initial Version

EVALUATION BOARD SETUP

QUICK START PROCEDURE

The ADMV7420-EVALZ is equipped with LDO regulators to provide drain and gate biases. Only +5 V dc and –5 V dc power supplies are required to power up the chip. Note that the evaluation board is tuned to achieve a typical current level.

To ensure that damage does not occur to the device, use the following sequence to power up the ADMV7420-EVALZ:

1. Place jumpers on all pins of the J5 and J6 connectors.
2. Place jumpers on all pins of the J4 connector, except Pin 1 and Pin 2.

3. Connect a –5 V dc power supply to the N5V test point and ground the power supply to nearest GND test point.
4. Connect the +5 V dc power supply to the P5V test point.
5. Turn on the –5 V dc supply, then turn on the +5 V dc supply.
6. Place jumpers on Pin 1 and Pin 2 of the J4 connector.

To power down the chip, use the following sequence:

1. Turn off the +5 V dc supply.
2. Turn off the –5 V dc supply.

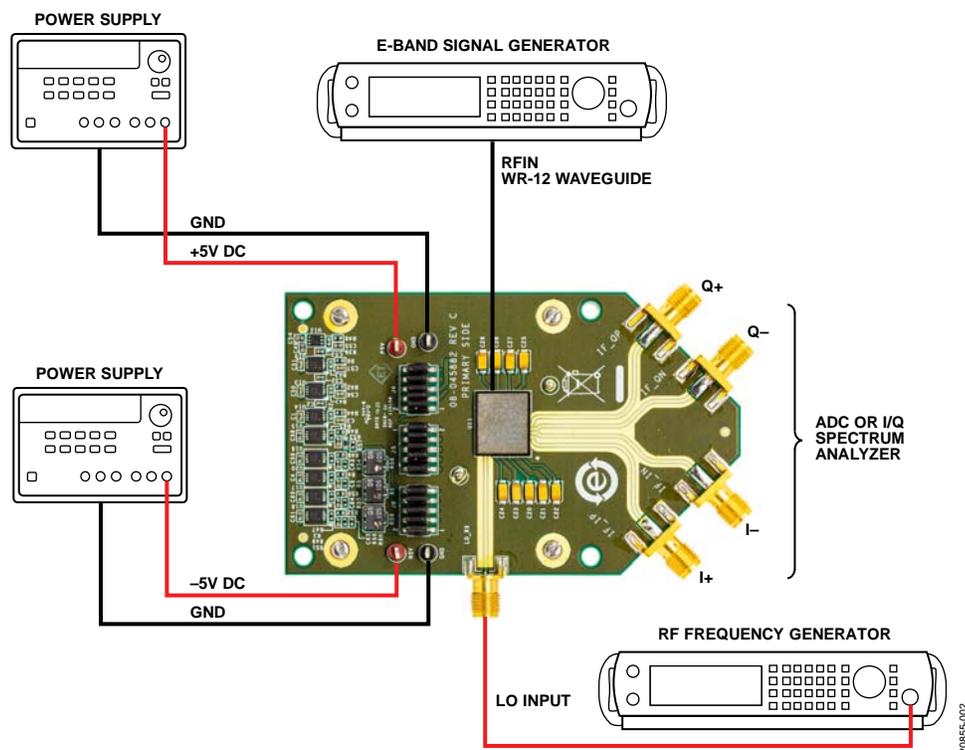


Figure 2. ADMV7420-EVALZ Lab Bench Setup

EVALUATION BOARD SCHEMATICS

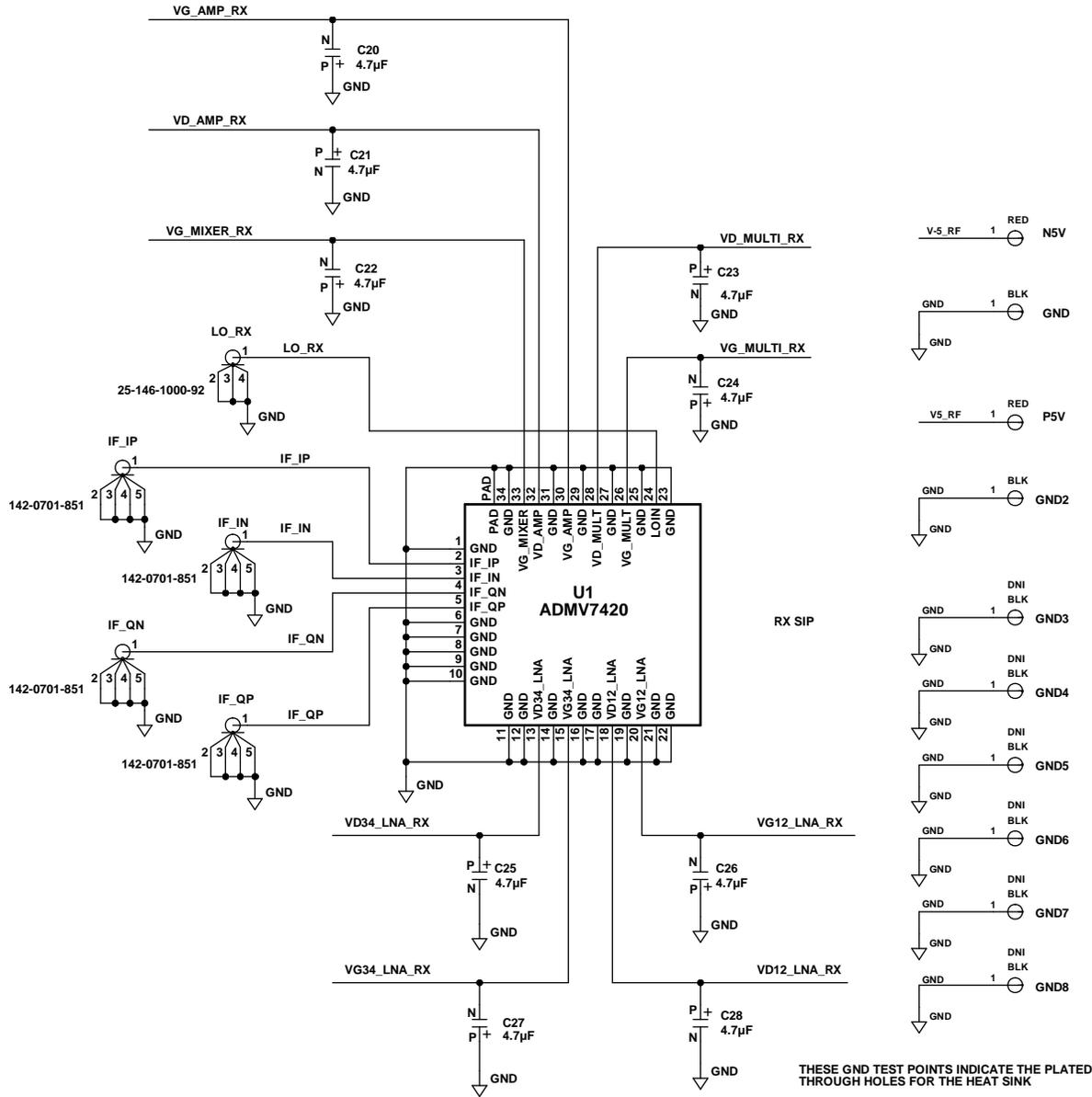


Figure 3. ADMV7420-EVALZ Schematic

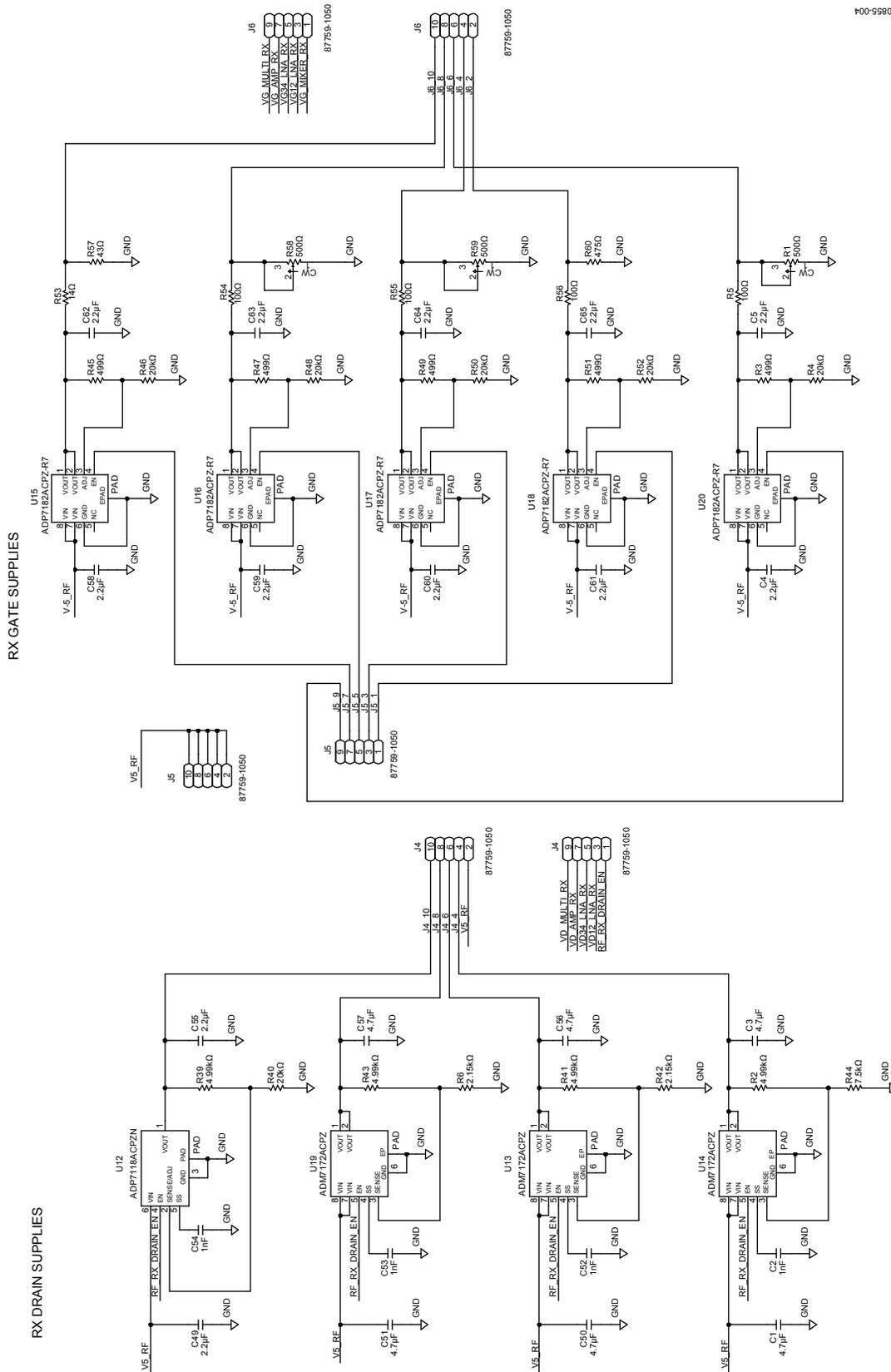


Figure 4. Drain Supply and Gate Supply Schematic

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Qty	Designators	Description	Part Number
6	C1, C3, C50, C51, C56, C57	Capacitors, ceramic, 4.7 μ F	GRM155R60J475ME87D
4	C2, C52 to C54	Capacitors, ceramic, 1 nF	CGA2B2X7R1H102K050BA
9	C20 to C28	Capacitors, tantalum, 4.7 μ F	TAJA475K020RNJ
12	C4, C5, C49, C55, C58 to C65	Capacitors, ceramic, 2.2 μ F	C1005X5R0J225K050BC
2	GND, GND2	Test points	TP-104-01-00
4	IF_IN, IF_IP, IF_QN, IF_QP	Connectors, SMA	142-0701-851
3	J4 to J6	Connectors, miniature, 2 mm	87759-1050
1	LO_RX	Connector, RF, 2.92 mm	25-146-1000-92
2	N5V, P5V	Test points	TP-104-01-02
3	R1, R58, R59	Resistors, chip, 500 Ω	SM-42TW501CT-ND
4	R2, R39, R41, R43	Resistors, chip, 4.99 k Ω	TNPW04024K99BEED
5	R3, R45, R47, R49, R51	Resistors, chip, 499 Ω	ERJ-2RKF4990X
6	R4, R40, R46, R48, R50, R52	Resistors, chip, 20 k Ω	ERJ-2RKF2002X
2	R6, R42	Resistors, chip, 2.15 k Ω	ERJ-2RKF2151X
1	R44	Resistor, chip, 7.5 k Ω	ERJ-2RKF7501X
4	R5, R54 to R56	Resistors, chip, 100 Ω	ERJ-2RKF1000X
1	R53	Resistor, chip, 14 Ω	ERJ-3EKF14R0V
1	R57	Resistor, chip, 43 Ω	ERJ-2RKF43R0X
1	R60	Resistor, chip, 475 Ω	ERJ-2RKF4750X
1	U1	E-Band low noise downconverter, SiP, 81 GHz to 86 GHz	ADMV7420
1	U12	20 V, 200 mA, low noise, complementary metal-oxide semiconductor (CMOS) LDO linear regulator	ADP7118ACPZN
3	U13, U14, U19	6.5 V, 2 A, ultralow noise, high power supply rejection ratio (PSRR), fast transient response CMOS LDO regulators	ADM7172ACPZ-R7
5	U15 to U18, U20	-28 V, -200 mA, low noise linear regulators	ADP7182ACPZ-R7

**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 Technology Way, Norwood, MA 02062, USA. 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.