

LT3020 100mA, Low Voltage, Very Low Dropout Linear Regulator

DESCRIPTION

Demonstration circuit 687A is a low input voltage and ultra-low dropout voltage supply using the [LT®3020](#) linear regulator, which comes in a small 8-lead DFN package. The DC687A has an input voltage range from 1V to 10V, an output voltage range between 0.2V and 10V minus the dropout voltage, and is capable of delivering 100mA max. Due to the 0.2V reference of the LT3020, the DC687A is capable of supplying power to very low voltage applications, such as (relatively) high current voltage references. DC687A uses ceramic capacitors because of the LT3020's ability to maintain stability even with the low ESR of ceramic output capacitors.

The LT3020 data sheet gives a complete description of the part, operation and applications information. The data sheet must be read in conjunction with this demo manual for demonstration circuit DC687A. The LT3020 is assembled in an 8-lead MSOP and 3mm x 3mm DFN packages with an exposed pad on the bottom-side of the IC. Proper board layout is essential for maximum thermal performance.

[Design files for this circuit board are available.](#)

All registered trademarks and trademarks are the property of their respective owners.

PERFORMANCE SUMMARY Specifications are at $T_A = 25^\circ\text{C}$

PARAMETERS	CONDITIONS	MIN	TYP	MAX
Input Voltage Range (V_{IN})	$I_{OUT} = 100\text{mA}$, $V_{OUT} = 3.3\text{V}$	1.05V		10V
Output Voltage (V_{OUT}) (JP2 in 1V Position)	$V_{IN} = 1.3\text{V}$, $I_{OUT} = 100\text{mA}$	0.96V	1V	1.04V

QUICK START PROCEDURE

The DC687A is easy to set up to evaluate the performance of the LT3020. For proper measurement equipment configuration, set up the circuit according to the diagram in Figure 1.

Please follow the procedure outlined below for proper operation.

1. Before proceeding to test, insert jumper JP1 into the OFF position, and insert jumper JP2 into the 1V option.
2. Apply 1.3V across V_{IN} (to GND). Insert jumper JP1 into the ON position. Draw 10mA of load current. Measure V_{OUT} ; it should be $1\text{V} \pm 2\%$ (0.98V to 1.02V).
3. Vary the input voltage from 1.3V to 10V and the load current from no load to 100mA. V_{OUT} should measure $1\text{V} \pm 4\%$ (0.96V to 1.04V).
4. Insert jumper JP1 into the OFF position and move jumper JP2 into any of the remaining output voltage options: 1.2V,

1.5V, or 1.8V. Re-insert jumper JP1 into the ON position. Just as in the 1V out test, the output voltage should read $V_{OUT} \pm 2\%$ tolerance under static line and load conditions, and $\pm 4\%$ tolerance under dynamic line and load conditions.

5. When finished evaluating, insert jumper JP1 into the OFF position.
6. **WARNING:** If long leads are used to power the demo circuit, the input voltage at the part could “ring”. This ringing could affect the operation of the circuit or even exceed the maximum voltage rating of the IC. To eliminate this, insert a small tantalum capacitor (for instance, an AVX part # TAJW226M010R) on the pads between the input power and return terminals on the bottom of the demo board. The (greater) ESR of the tantalum will dampen the (possible) ringing voltage due to the use of long input leads. On a normal, typical PCB, with short traces, the capacitor is not needed.

QUICK START PROCEDURE

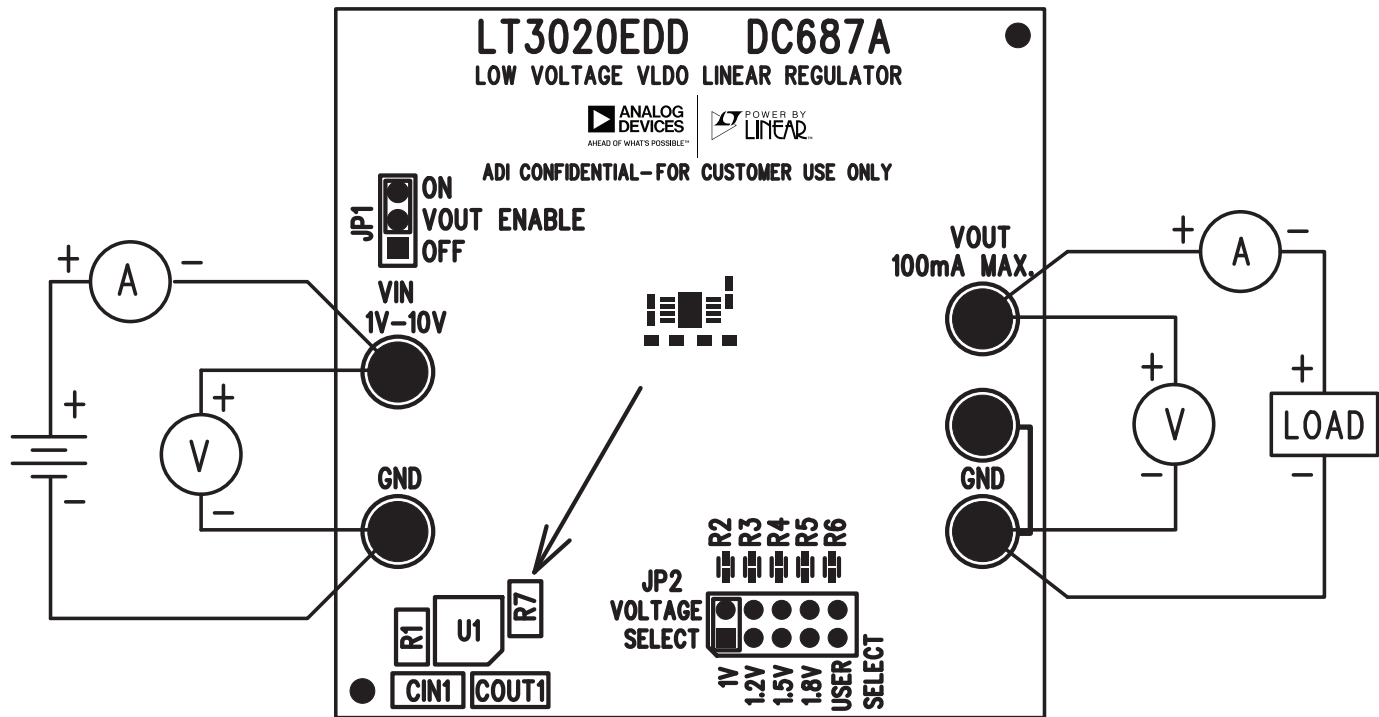


Figure 1. Test Procedure Setup Drawing for DC687A

QUICK START PROCEDURE

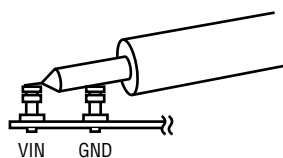


Figure 2. Measuring Input or Output Ripple

DEMO MANUAL DC687A

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	2	CIN1, COUT1	CAP., X5R 2.2µF 10V 10%, 0603	TDK C1608X5R1A225MA
2	1	C1	CAP., TANT, 33µF 16V, 20%, 6032	AVX, TAJW336M016R
3	2	R3, R1	RES., CHIP 100k 1/16W 1%, 0402	AAC, CR05-1003FM
4	1	R2	RES., CHIP 80.6k 1/16W 1%, 0402	AAC, CR05-8062FM
5	1	R4	RES., CHIP 130k 1/16W 1%, 0402	AAC, CR05-1303FM
6	1	R5	RES., CHIP 162k 1/16W 1%, 0402	AAC, CR05-1623FM
7	1	R7	RES., CHIP 20k 1/16W 1%, 0402	AAC, CR05-2002FM
8	1	U1	I.C., LT3020EDD, DD	ANALOG DEVICES, LT3020EDD#PBF
Optional Electronic Components				
1	0	C2	CAP., 100µF 6.3V, 1812	
2	0	R6	RES., CHIP, 0402	
Hardware				
1	5	E1, E2, E3, E4, E5	TESTPOINT, TURRET, .094"	MILL-MAX, 2501-2
2	1	JP1	JMP, 3PIN 1 ROW .079CC	COMM-CON, 2802S-03-G1
3	1	JP2	JMP, 2 × 5, .079CC	COMM-CON, 2202S-10-G2
4	2	SHUNTS FOR JP1 (2 AND 3) AND JP2 (1 AND 2)	SHUNT, .079 CENTER	COMM-CON CCIJ2MM-138W

DEMO MANUAL DC687A



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.

Rev. 0



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.