



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



500mA, Linear Regulator with Precision Current Limit and Diagnostics

DESCRIPTION

Demonstration circuit 1865A is an adjustable 500mA linear regulator featuring LT[®]3055. LT3055 is a micropower, low noise and low dropout voltage linear regulator. The device supplies 500mA of output current with a dropout voltage of 350mV. A 10nF bypass capacitor reduces output noise to 25 μ V_{RMS} in a 10Hz to 100kHz bandwidth and soft-starts the reference. The LT3055's \pm 45V input voltage rating combined with its precision current limit and diagnostic functions make the IC an ideal choice for robust, high reliability applications.

LT3055 current limit can be programmed by a single resistor, accurate to \pm 10% over a wide input voltage and temperature range. Another resistor programs the LT3055's minimum output current monitor, useful for detecting open-circuit conditions. The internal current limit should be considered when the input-to-output differential is high. The current monitor function sources a current equal to 1/500th of output current. See the Operation sec-

tion in the data sheet for a detailed calculation. Logic fault pins assert low if the LT3055 is in current limit (FAULT2), operating below its minimum output current (FAULT1) or is in thermal limit (both FAULT1 and FAULT2). The die temperature is indicated by the TEMP pin.

LT3055 optimizes stability and transient response with a low ESR ceramic capacitor, requiring a minimum of 3.3 μ F.

The LT3055 is available in the thermally-enhanced 16-lead 4mm \times 3mm DFN and MSOP packages.

The LT3055 data sheet gives a complete description of the device, operation and application information. The data sheet must be read in conjunction with this quick start guide for DC1865.

Design files for this circuit board are available at <http://www.linear.com/demo/DC1865A>

LT, LT, LTC, LTM, Linear Technology and the Linear logo are registered trademarks of Linear Technology Corporation. All other trademarks are the property of their respective owners.

PERFORMANCE SUMMARY Specifications are at T_A = 25°C

PARAMETER	CONDITIONS	VALUE
Minimum Input Voltage (Max)	V _{OUT} = 5V, I _{OUT} = 500mA	5.6V
Maximum Input Voltage	V _{OUT} = 5V	45V
Output Voltage V _{OUT}	Header in JP1 Header in JP2 Header in JP3 Header in JP4 Header in JP5 Header in JP6	1.20V \pm 3% 1.50V \pm 3% 1.80V \pm 3% 2.50V \pm 3% 3.32V \pm 3% 4.99V \pm 3%
Maximum Output Current (Typ)	V _{IN} = 12V, V _{OUT} = 5V, R10 = 604 Ω	500mA
Minimum Output Current (Typ)	V _{IN} = 12V, V _{OUT} = 5V, R9 = 121k Ω	10mA
I _{MON} Voltage (to μ P ADC) (Typ)	V _{IN} = 12V, V _{OUT} = 5V, R8 = 1k, I _{OUT} = 500mA	1V
Temp voltage (Typ)	V _{IN} = 12V, V _{OUT} = 5V	0.25V

QUICK START PROCEDURE

DC1865A is easy to set up to evaluate the performance of the LT3055. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

NOTE: Make sure that the input voltage does not exceed 45V.

NOTE: The shutdown jumper JP8 shunt is required to be placed in the OFF or ON position for proper operation.

NOTE: Place the output voltage selection jumper JP1-JP7 at the desired position.

NOTE: Do not hot-plug the input voltage terminal V_{IN} . The absolute maximum voltage on V_{IN} is 50V and hot-plugging a power supply through wire leads to the demonstration circuit can cause the voltage on the extremely low-ESR ceramic input capacitor to ring to twice its DC value. In order to protect the IC, a higher ESR Aluminum Electrolytic capacitor is placed at the input terminals. This may protect against some, but not all, input transients due to hot-plugging with a power supply. See Application Note 88 for more details.

NOTE: Connect the power supply (with power off), load, and meters as shown in Figure 1.

1. After all connections are made, turn on input power and verify that the output voltage according to the output voltage selection jumper (JP1-JP7). If the output voltage is different from the above values, use the USER option and install R7. Select R7 according to the following equation:

$$R7 = (V_{OUT}/0.6 - 1) \cdot 60.4k$$

NOTE: If the output voltage is too low, temporarily disconnect the load to make sure that the load is not set too high.

2. Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, $\overline{FAULT1}$, $\overline{FAULT2}$, PWRGD and other parameters.

QUICK START PROCEDURE

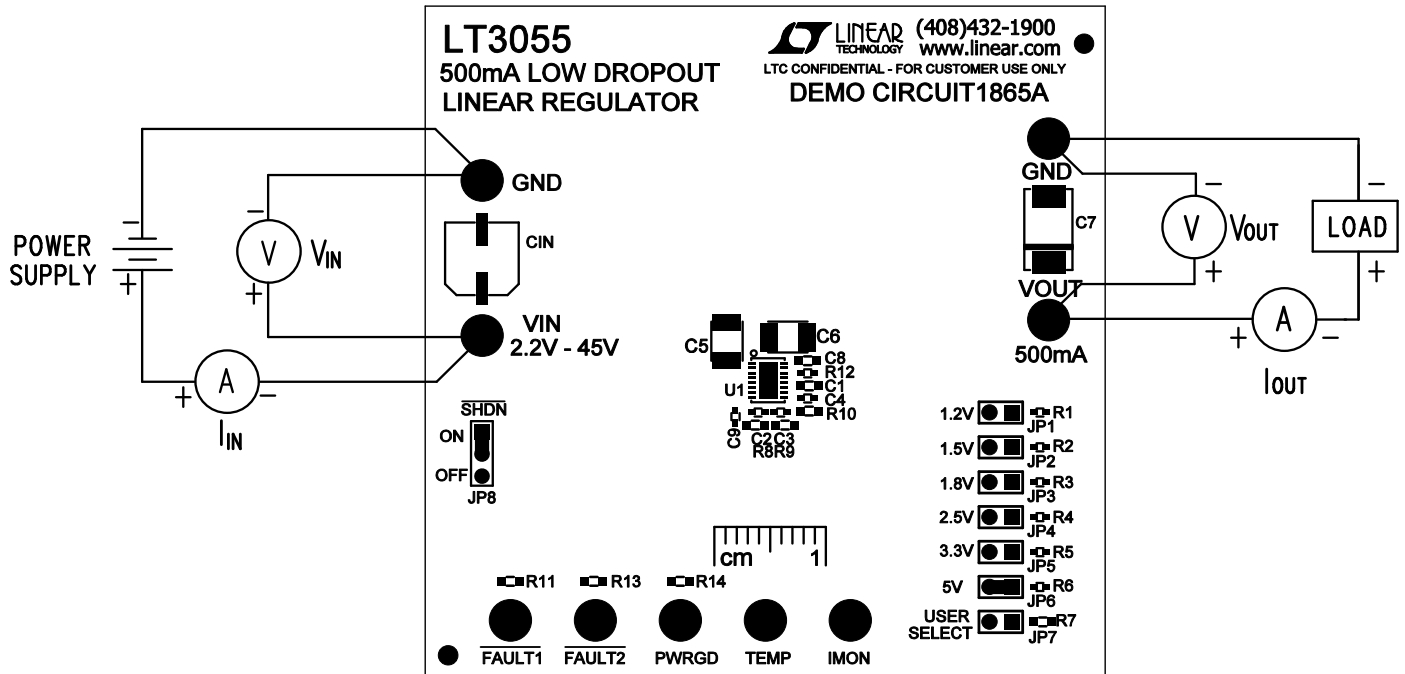


Figure 1. Proper Measurement Equipment Setup

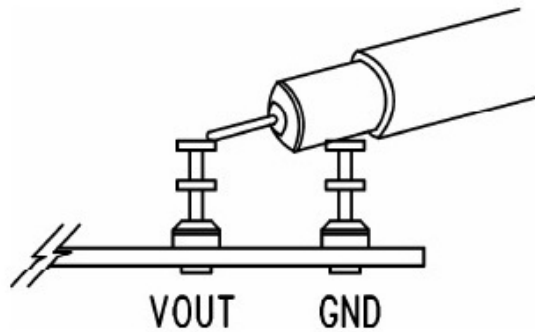


Figure 2. Measuring Input or Output Ripple

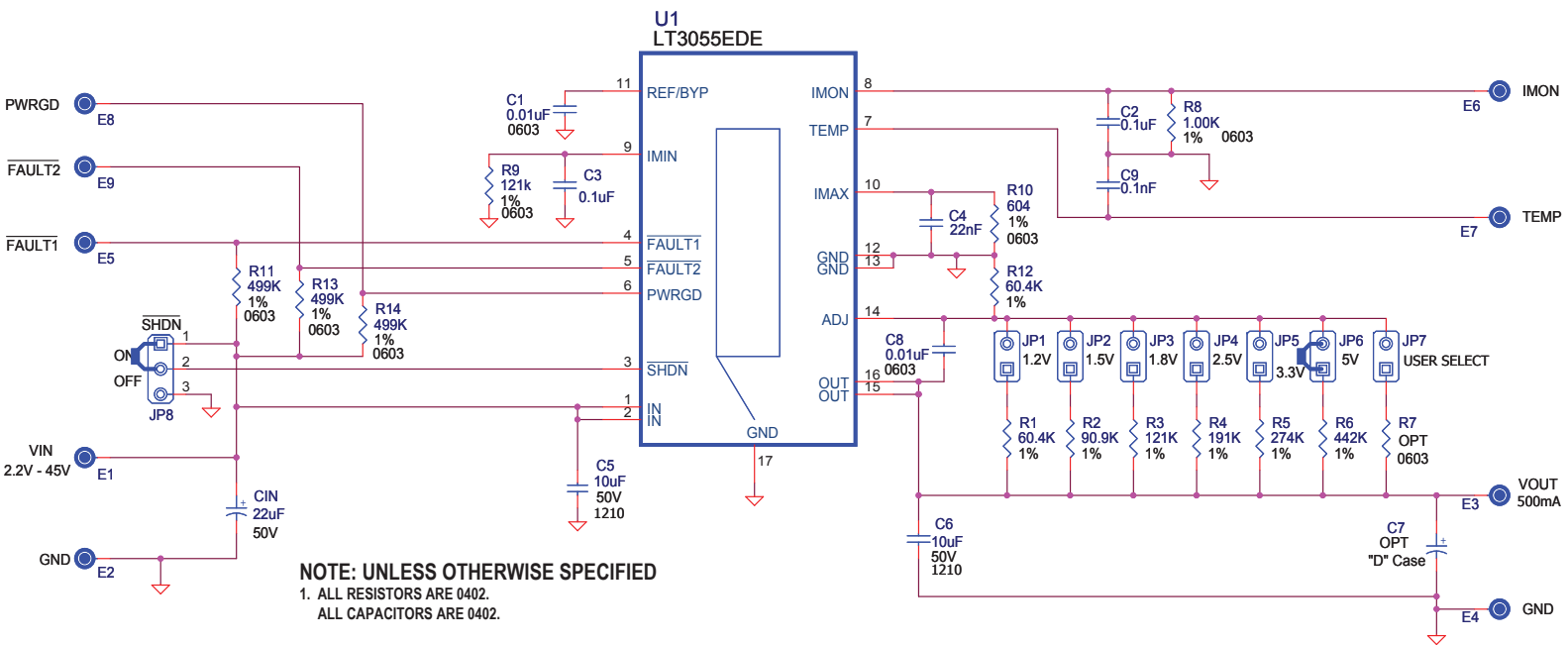
DEMO MANUAL DC1865A

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	2	C1, C8	Cap., X7R, 0.01 μ F, 16V, 10% 0603	AVX, 0603YC103KAT2A
2	2	C2, C3	Cap., X5R, 0.1 μ F, 16V, 20% 0402	AVX, 0402YD104MAT2A
3	1	C4	Cap., X7R, 22nF, 16V, 10% 0402	AVX, 0402YC223KAT2A
4	2	C5, C6	Cap., X7R, 10 μ F, 50V, 10% 1210	TAIYO YUDEN, UMK325AB7106KM-T
5	1	C9	Cap., X7R, 100pF, 16V, 10% 0402	AVX, 0402YC101KAT2A
6	2	R1, R12	Res., Chip, 60.4k, 0.06W, 1% 0402	VISHAY, CRCW040260K4FKED
7	1	R2	Res., Chip, 90.9k, 0.06W, 1% 0402	VISHAY, CRCW040290K9FKED
8	1	R3	Res., Chip, 121k, 0.06W, 1% 0402	VISHAY, CRCW0402121KFKED
9	1	R4	Res., Chip, 191k, 0.06W, 1% 0402	VISHAY, CRCW0402191KFKED
10	1	R5	Res., Chip, 274k, 0.06W, 1% 0402	VISHAY, CRCW0402274KFKED
11	1	R6	Res., Chip, 442k, 0.06W, 1% 0402	VISHAY, CRCW0402442KFKED
12	1	R8	Res., Chip, 1.00k, 0.1W, 1% 0603	VISHAY, CRCW06031K00FKEA
13	1	R9	Res., Chip, 121k, 0.1W, 1% 0603	VISHAY, CRCW0603121KFKEA
14	1	R10	Res., Chip, 604 Ω , 0.1W, 1% 0603	VISHAY, CRCW0603604RFKEA
15	3	R11, R13, R14	Res., Chip, 499k, 0.1W, 1% 0603	VISHAY, CRCW0603499KFKEA
16	1	U1	I.C., Volt. Reg., DFN-16 (4x3)	LINEAR TECH., LT3055EDE#PBF
Additional Demo Board Circuit Components				
1	1	C _{IN}	Cap., Alum., 22 μ F, 50V, 6.3mm x 5.4mm	SUN SELECT, 50CE22BSS
2	0	C7 (OPT)	Cap., D Case	
3	0	R7 (OPT)	Res., 0603	
Hardware-For Demo Board Only				
1	9	E1-E9	Turret, Testpoint 0.094"	MILL-MAX 2501-2-00-80-00-00-07-0
2	7	JP1-JP7	Headers, 2 Pins 2mm Ctrs.	SAMTEC, TMM-102-02-L-S
3	1	JP8	Headers, Single Row 3 Pins 2mm Ctrs.	SAMTEC, TMM-103-02-L-S
4	2	XJP6, XJP8	Shunt, 2mm Ctrs.	SAMTEC, 2SN-BK-G

SCHEMATIC DIAGRAM

DEMO MANUAL DC1865A



DEMO MANUAL DC1865A

DEMONSTRATION BOARD IMPORTANT NOTICE

Linear Technology Corporation (LTC) provides the enclosed product(s) under the following **AS IS** conditions:

This demonstration board (DEMO BOARD) kit being sold or provided by Linear Technology is intended for use for **ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY** and is not provided by LTC for commercial use. As such, the DEMO BOARD herein may not be complete in terms of required design-, marketing-, and/or manufacturing-related protective considerations, including but not limited to product safety measures typically found in finished commercial goods. As a prototype, this product does not fall within the scope of the European Union directive on electromagnetic compatibility and therefore may or may not meet the technical requirements of the directive, or other regulations.

If this evaluation kit does not meet the specifications recited in the DEMO BOARD manual the kit may be returned within 30 days from the date of delivery for a full refund. **THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY THE SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. EXCEPT TO THE EXTENT OF THIS INDEMNITY, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.**

The user assumes all responsibility and liability for proper and safe handling of the goods. Further, the user releases LTC from all claims arising from the handling or use of the goods. Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge. Also be aware that the products herein may not be regulatory compliant or agency certified (FCC, UL, CE, etc.).

No License is granted under any patent right or other intellectual property whatsoever. **LTC assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or any other intellectual property rights of any kind.**

LTC currently services a variety of customers for products around the world, and therefore this transaction **is not exclusive**.

Please read the DEMO BOARD manual prior to handling the product. Persons handling this product must have electronics training and observe good laboratory practice standards. **Common sense is encouraged.**

This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

Mailing Address:

Linear Technology
1630 McCarthy Blvd.
Milpitas, CA 95035

Copyright © 2004, Linear Technology Corporation