

LTC4070EDDB: Simple Low-Iq Battery Charger/Protector With NTC Thermistor Input

DESCRIPTION

Demonstration Circuit DC1584A is a Simple Low-Iq Battery Charger/Protector With NTC Thermistor featuring the LTC[®]4070EDDB.

PERFORMANCE SUMMARY

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
VBUS	Input voltage	$R_{LIMIT} = 169\Omega$	10	12	16	V
V(BAT)	Battery Float Voltage	'VFLOAT' jumper on 4.1V, Constant Voltage Mode. $T_{NTC} = 25^{\circ}\text{C}$	4.059		4.141	V
I(BAT)	Battery Charge Current	Constant Current Mode, $V_{in} = 12\text{V}$, $V_{CC} = 3.8\text{V}$		49.7		mA

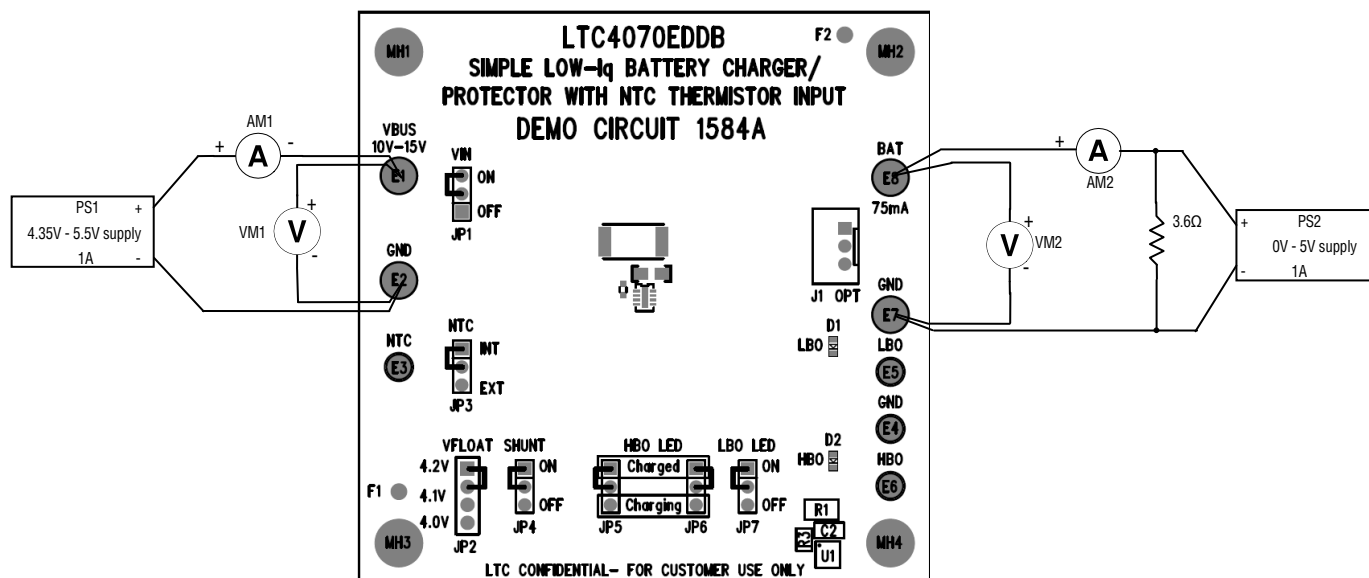
QUICK START PROCEDURE

Refer to Figure 1 for the proper measurement equipment setup and jumper settings and follow the procedure below.

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 VBUS or Vcc and GND terminals. See Figure 2 for proper scope probe technique.

1. Set PS1 = 12V, PS2 = 3.6V, "VFLOAT" (JP2) to 4.1V. Observe I(VBUS) (AM1). The voltage on the battery is below the LTC4070EDDB's float voltage. So all the current is flowing into the battery, and that current is $(12\text{V} - 3.6\text{V}) / 169(R1) = 49.7\text{mA}$.
2. If "LBO" LED lit, decrease PS2 until off. Observe BAT (VM2). The LBO output goes high when the battery voltage is below 3.2V, but it has 200-300mV of hysteresis. So it may not go low until 3.5V, with Vcc $\uparrow$.

3. Increase PS2 until LBO is lit. Observe BAT (VM2).
4. Increase PS2 until HBO lit. Observe BAT (VM2). The HBO LED will light when the battery voltage is within ~50mV of the float voltage.
5. Disconnect PS2, AM2, and 3.6 Ω resistor. Observe BAT (VM2). The only limit to the Vcc voltage now is the LTC4070, so the voltage will rise to the float voltage.
6. Reset the Jumpers to their default position.



Note: All connections from equipment should be Kelvin connected directly to the board pins which they are connected on this diagram and any input or output leads should be twisted pair.

Figure 1. Proper Measurement Equipment Setup for DC1584A

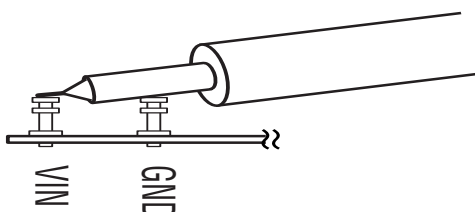


Figure 2. Measuring Input or Output Ripple

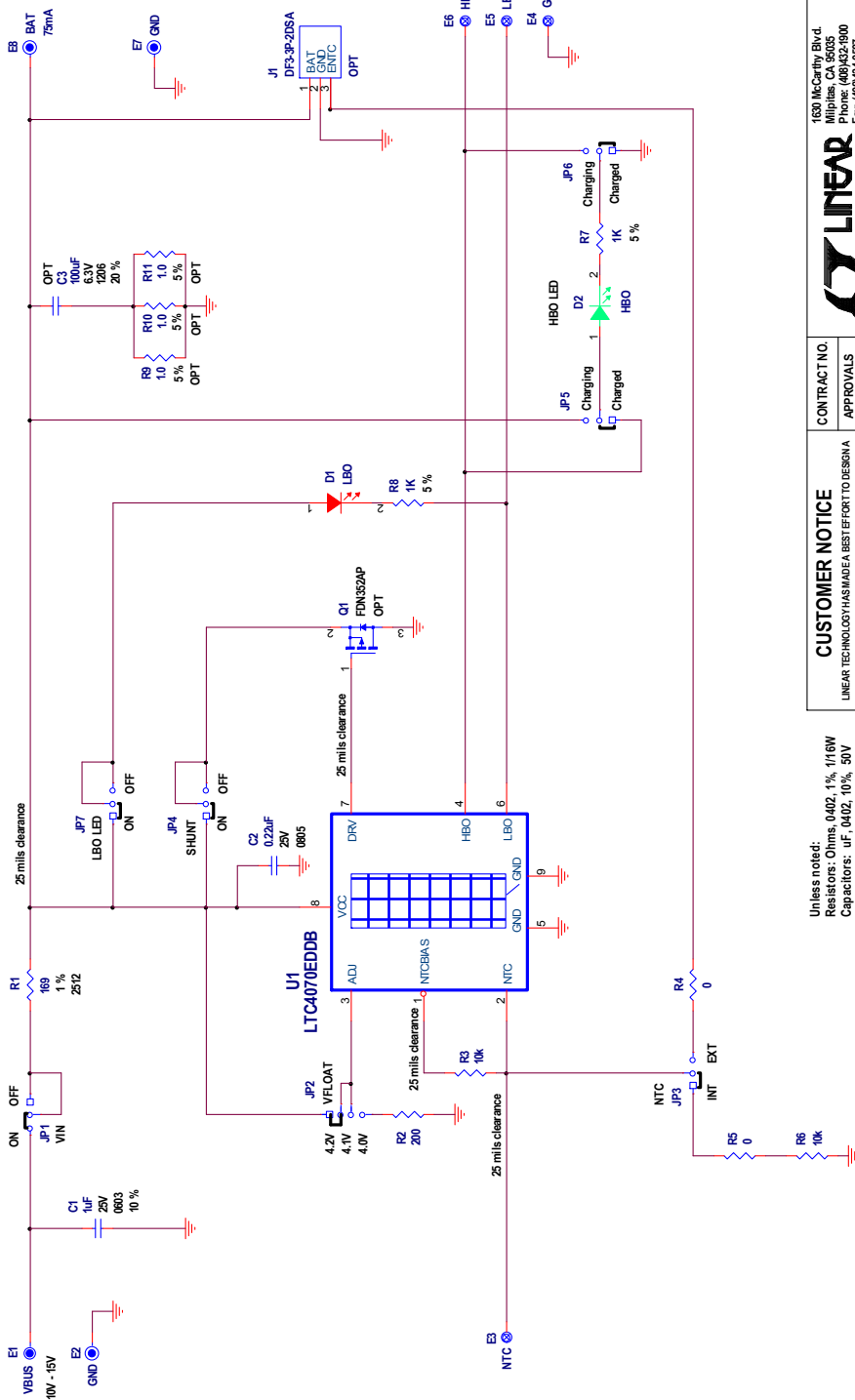


Figure 3. Schematic

Unless noted:
Resistors: Ohms, 0402, 1%, 1/16W
Capacitors: uF, 0402, 10%, 50V

CUSTOMER NOTICE LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS AND MEETS THE CUSTOMER'S APPLICATION. THE CUSTOMER HAS THE RESPONSIBILITY TO PROVIDE THE PROPER AND VALID OPERATION IN THE ACTUAL APPLICATION. COMPONENT SUBSTITUTION AND PRINTED CIRCUIT BOARD LAYOUT MAY SOMEWHAT AFFECT CIRCUIT PERFORMANCE OR RELIABILITY. CONTACT LINEAR TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE. THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SHOULD NOT BE REPRODUCED OR COPIED WITHOUT THE WRITTEN PERMISSION OF LINEAR TECHNOLOGY.		CONTRACT NO. APPROVALS DRAWING: Ba-Ba-Ba-Ba CHECKED: Ba-Ba-Ba-Ba DESIGNED: Ba-Ba-Ba-Ba ENGINEER: Ba-Ba-Ba-Ba APPROVED: Ba-Ba-Ba-Ba	1630 McCarty Blvd. Milpitas, CA 95035 Tel: (408)343-9000 Fax: (408)343-9397 LINEAR TECHNOLOGY	1630 McCarty Blvd. Milpitas, CA 95035 Tel: (408)343-9000 Fax: (408)343-9397 LTC Confidential For Customer Use Only
TITLE: LTC4070EDDB: SIMPLE LOW - Iq BATTERY CHARGER / PROTECTOR WITH NTC THERMISTOR INPUT		SIZE DATE REV	DC1584A A	SHEET 4 OF 4

	Qty	Reference	Part Description	Manufacture / Part #
REQUIRED CIRCUIT COMPONENTS:				
1	1	C1	CAP, CHIP, X5R, 1 μ F, $\pm$ 20%, 25V, 0603	AVX, 06033D105MAT2A
2	1	C2	CAP, CHIP, X7R, 0.22 μ F, $\pm$ 10%, 25V, 0805	VISHAY, VJ0805Y224KXXA
3	1	R1	RES, CHIP, 169 Ω , $\pm$ 1%, 1W, 2512	VISHAY, CRCW2512169RFKED
4	1	R2	RES, CHIP, 200 Ω , $\pm$ 1%, 1/16W, 0402	VISHAY, CRCW0402200RFKED
5	1	R3, R6	RES, CHIP, 10k Ω , $\pm$ 1%, 1/16W, 0402	VISHAY, CRCW040210K0FKED
6	2	R4, R5	RES, CHIP, 0 Ω jumper, 1/16W, 0402	VISHAY, CRCW04020000Z0ED
7	2	R7, R8	RES, CHIP, 1k Ω , $\pm$ 5%, 1/16W, 0402	VISHAY, CRCW04021K00JNED
8	1	U1	IC, SMT, SIMPLE LOW-Iq BATTERY CHARGER / PROTECTOR WITH NTC THERMISTOR INPUT	LINEAR TECH., LTC4070EDDB
ADDITIONAL DEMO BOARD CIRCUIT COMPONENTS:				
1	0	C3-OPT	CAP, CHIP, X5R, 100 μ F, $\pm$ 20%, 6.3V, 1206	MURATA, GRM31CR60J107ME39L
2	1	D1	DIODE, LED, RED, 0603	Panasonic, LNJ208R8ARA
3	1	D2	DIODE, LED, GREEN, 0603	LITE-ON, LTST-C190KGKT
4	0	Q1-OPT	MOSFET, P-channel, -30V, -1.1A, 0.30 Ω , SSOT-23	FAIRCHILD, FDN352AP
5	0	R9-OPT, R10-OPT, R11-OPT	RES, CHIP, 1 Ω , $\pm$ 5%, 1/16W, 0402	VISHAY, CRCW04021R00JNED
HARDWARE FOR DEMO BOARD ONLY:				
1	4	E1-2, E7-8	TURRET, 0.09 DIA	MILL-MAX, 2501-2-00-80-00-00-07-0
2	4	E3-6	TURRET, 0.061 DIA	MILL-MAX, 2308-2-00-80-00-00-07-0
3	0	J1-OPT	CONN, 3 Pin Polarized	HIROSE, DF3-3P-2DSA
4	6	JP1, JP3-7	3 Pin Jumper, 2mm	SAMTEC, TMM-103-02-L-S
5	1	JP2	4 Pin Jumper, 2mm	SAMTEC, TMM-104-02-L-S
6	7	JP1-7	SHUNT, 2mm	SAMTEC, 2SN-KB-G
7	4		STAND-OFF, NYLON, 0.375"	KEYSTONE, 8832

Figure 4. Bill of Materials



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.