DEMO CIRCUIT 1468A
QUICK START GUIDE

LTC3554EPD
Micropower USB Power Manager with Two Step-Down Regulators

DESCRIPTION

Demonstration Circuit DC1468A is a Micropower USB Power Manager with Two Step-Down Regulators featuring the LTC®3554.

PERFORMANCE SUMMARY

Specifications are at T_A = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
VBUS	Bus Input Voltage Range		4.35		6	V
V(BAT)	Battery Float Voltage	Constant Voltage Mode	4.15		4.23	V
I(BAT)	Battery Charge Current	Constant Current Mode, R_{PROG} = 1.87k	420		500	mA
VOUT1	Output Voltage 1	I(VOUT1) ≤ 200mA	3.25		3.35	V
VOUT2	Output Voltage 2	I(VOUT2) ≤ 200mA	1.15		1.25	V

QUICK START PROCEDURE

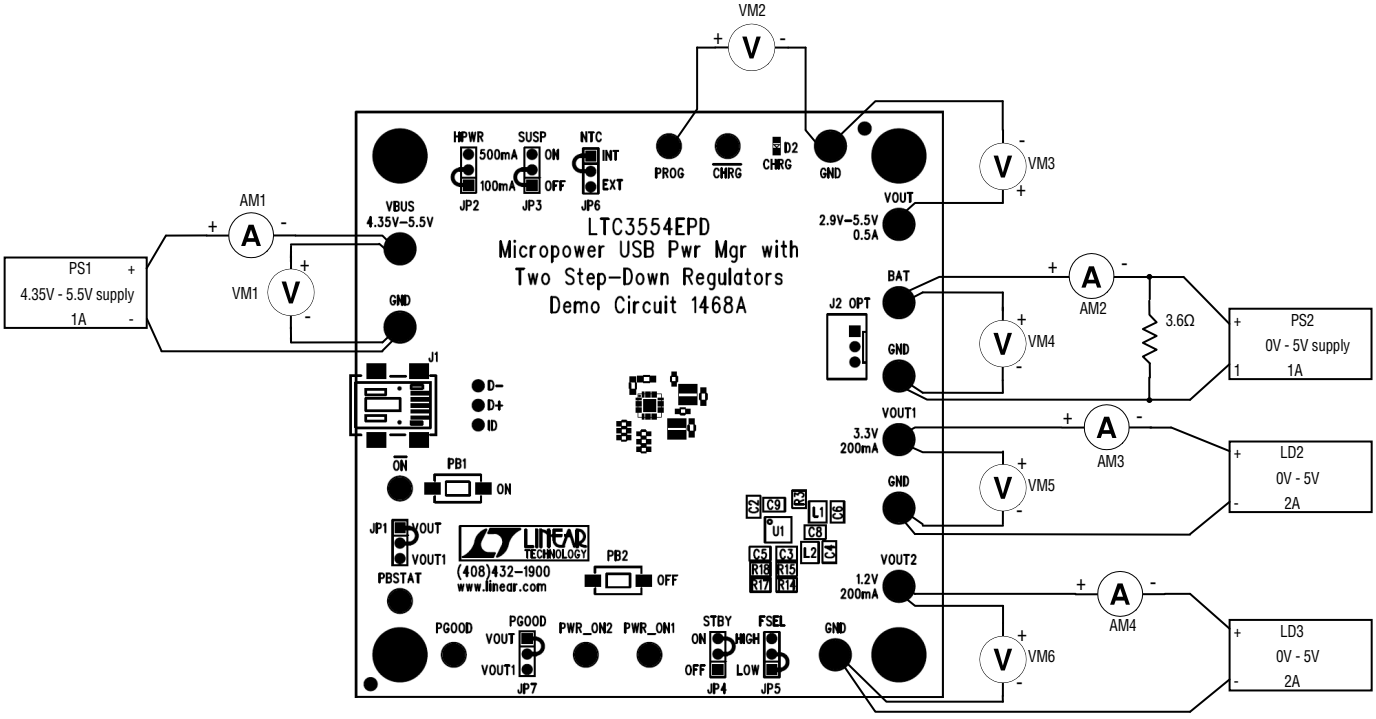
Refer to Figure 1 for the proper measurement equipment setup and jumper settings and follow the procedure below.

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 VOUT(x) and GND terminals. See Figure 2 for proper scope probe technique.

1. Set PS1 = 0V, PS2 = 3.6V. Press “ON” button for > 0.5s. Observe I(BAT) (AM2), VOUT1 (VM5) and VOUT2 (VM6). The regulator ENable lines are low. Pressing the “ON” button turns on the regulators for 5s, via the pushbutton controller. The regulator ENables are bootstrapped to the outputs of the regulators, so regulators stay on indefinitely. The STBY jumper is on, so the LTC3554 draws only ~10µA from the battery.
2. Set STBY (JP4) to “OFF”, PS1 to 5V. Observe I(VBUS) (AM1), I(BAT) (AM2) and VPROG (VM2). The STBY jumper is off, and the battery charger is trying to charge the battery at 500mA, but the input current limit is keeping the charge current at 100mA.
3. Set HPWR (JP2) to “500mA”. Observe I(VBUS) (AM1), I(BAT) (AM2) and VPROG (VM2). The input current limit is now 500mA, so the battery charger is charging at 450mA, and the buck regulators are unloaded.
4. Set LD2 to 200mA, LD3 to 200mA. Observe VOUT1(VM5), VOUT2 (VM6) and I(BAT) (AM2). The buck regulators are each loaded at 200mA. These loads are reflected back to the VBUS input by the ratio of their output voltage to the VOUT Voltage. The buck regulators are higher priority

than the battery charger, so the charger is only charging at the input current limit of 500mA minus the reflected buck regulator loads, ~200mA.

5. Set LD2 to 0A, LD3 to 0A. Press “OFF” button. Observe VOUT1 (VM5) and VOUT2 (VM6). The “OFF” button momentarily brings the ENable lines low, shutting regulators off. The battery charge current should now return to 450mA.
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 DC1468A

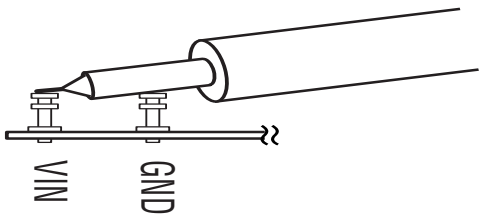


Figure 2. Measuring Input or Output Ripple

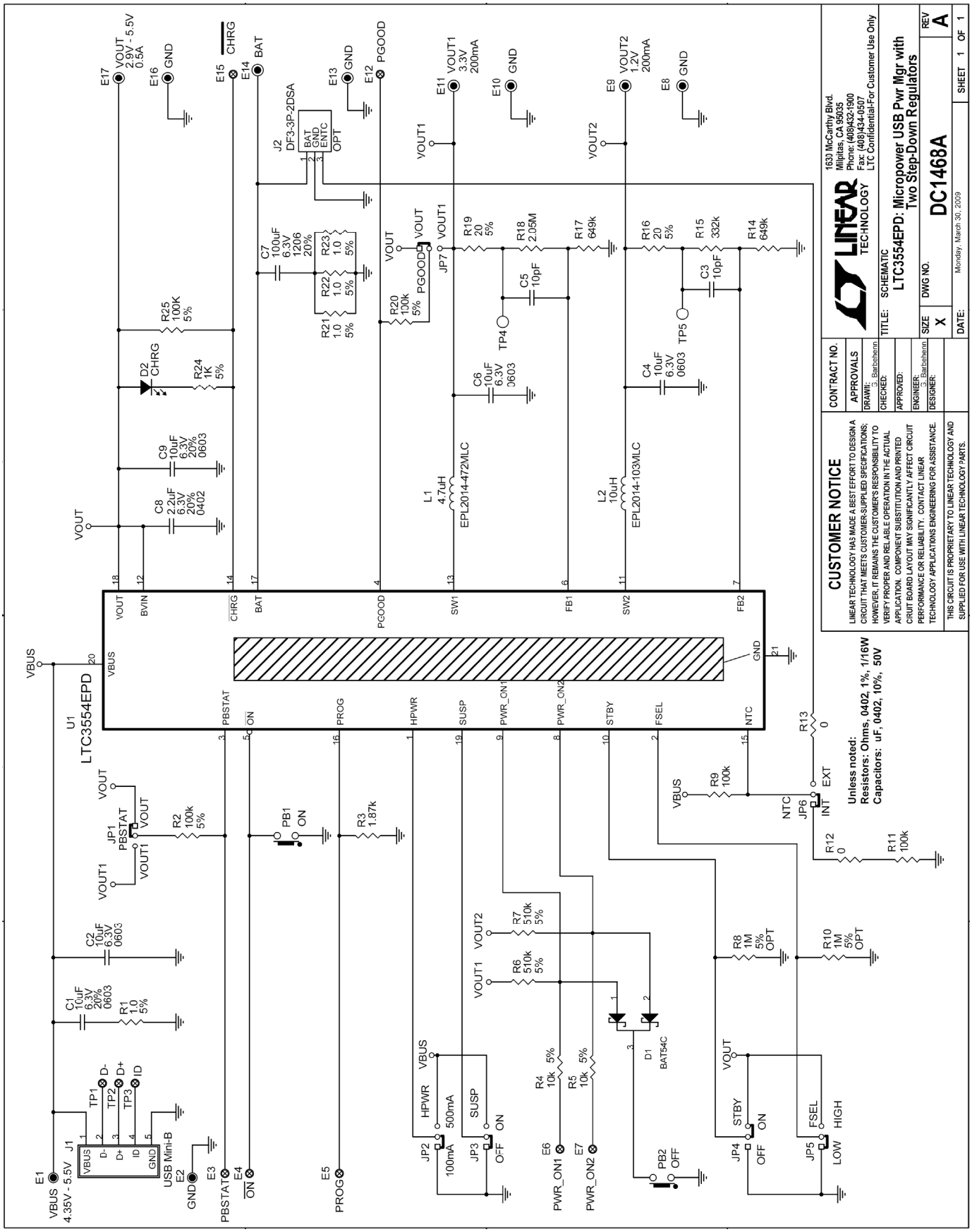


Figure 3. Circuit Schematic

	Qty	Reference	Part Description	Manufacture / Part #
REQUIRED CIRCUIT COMPONENTS:				
1	4	C2, C4, C6, C9	CAP, CHIP, X5R, 10µF, ±10%, 6.3V, 0603	TDK, C1608X5R0J106M
2	2	C3,C5	CAP, CHIP, C0G, 10pF, ±5%, 25V, 0402	VISHAY, VJ0402A100JXAA
3	1	C8	CAP, CHIP, X5R, 2.2µF, ±20%, 6.3V, 0402	MURATA, GRM155R60J225ME15D
4	1	L1	IND, SMT,4.7µH, 254mΩ, ±20%, 1.02A, 1.8mmX2mm	COILCRAFT, EPL2014-472MLB
5	1	L2	IND, SMT,10µH, 459mΩ, ±20%, 0.631A, 1.8mmX2mm	COILCRAFT, EPL2014-103MLB
6	1	R3	RES, CHIP,1.87kΩ, ±1%, 1/16W, 0402	VISHAY, CRCW04021K87FKED
7	2	R9, R11	RES, CHIP, 100kΩ, ±1%, 1/16W, 0402	VISHAY, CRCW0402100KFKED
8	2	R12, R13	RES, CHIP, 0Ω jumper, 1/16W, 0402	VISHAY, CRCW04020000Z0ED
9	2	R14,R17	RES, CHIP, 649KΩ, ±1%, 1/16W, 0402	VISHAY, CRCW0402649KFKED
10	1	R15	RES, CHIP, 332kΩ, ±1%, 1/16W, 0402	VISHAY, CRCW0402332KFKED
11	1	R18	RES, CHIP, 2.05MEGΩ, ±1%, 1/16W, 0402	VISHAY, CRCW04022M05FKED
12	1	U1	Micropower USB Power Manager with Two Step-Down Regulators	LINEAR TECH., LTC3554EPD
ADDITIONAL DEMO BOARD CIRCUIT COMPONENTS				
1	1	C1	CAP, CHIP, X5R, 10µF, ±10%, 6.3V, 0603	TDK, C1608X5R0J106M
2	1	C7	CAP, CHIP, X5R, 100µF, ±20%, 6.3V, 1206	MURATA, GRM31CR60J107ME39L
3	1	D1	DIODE, Dual Schottky, 30V, 200mA, SOT23	DIODES INC., BAT54C
4	1	D2	LED, GREEN, 0603	LITE-ON, LTST-C190KGKT
5	4	R1, R21, R22, R23	RES, CHIP, 1Ω, ±5%, 1/16W, 0402	VISHAY, CRCW04021R00JNED
6	3	R2, R20, R25	RES, CHIP, 100kΩ, ±5%, 1/16W, 0402	VISHAY, CRCW0402100KJNED
7	2	R4, R5	RES, CHIP, 10kΩ, ±5%, 1/16W, 0402	VISHAY, CRCW040210K0JNED
8	2	R6, R7	RES, CHIP, 510kΩ, ±5%, 1/16W, 0402	VISHAY, CRCW0402510KJNED
9	0	R8-OPT, R10-OPT	RES, CHIP, 1MEGΩ, ±5%, 1/16W, 0402	VISHAY, CRCW04021M00JNED
10	2	R16, R19	RES, CHIP, 20Ω, ±5%, 1/16W, 0402	VISHAY, CRCW040220R0JNED
11	1	R24	RES, CHIP, 1kΩ, ±5%, 1/16W, 0402	VISHAY, CRCW04021K00JNED
HARDWARE FOR DEMO BOARD ONLY:				
1	10	E1, E2, E8, E9, E10, E11, E13, E14, E16, E17	TURRET, 0.09"	MILLMAX, 2501-2
2	7	E3, E4, E5, E6, E7, E12, E15	TURRET, 0.061"	MILLMAX, 2308-2
3	1	J1	CONN, USB Mini-B	TYCO, 1734035-2
4	0	J2-OPT	CONN, 3 Pin Polarized	HIROSE, DF3-3P-2DSA
5	7	JP1, JP2, JP3, JP4, JP5, JP6, JP7	HEADER, 3 Pin, 2mm	SAMTEC, TMM-103-02-L-S
6	7	JP1, JP2, JP3, JP4, JP5, JP6, JP7	SHUNT, 2mm	SAMTEC, 2SN-BK-G
7	2	PB1, PB2	SWITCH, N.O. Momentary, 3.5mmx6mm SMT	PANASONIC, EVQPPFA25
8	4		STAND-OFF, NYLON, 0.375"	KEYSTONE, 8832
9	1		FAB, PRINTED CIRCUIT BOARD	DEMO CIRCUIT 1468-1
10	1		STENCIL-TOP	STENCIL #1468-1-TOP
11	1		STENCIL-BOTTOM	STENCIL #1468-1-BOTTOM

Figure 4. Bill of Materials