

PMIC High Voltage Adaptor Board
 With 5V Adaptor Inputs

DESCRIPTION

Demonstration Circuit 1394A is a 38V, 2A, 2.4MHz Step-Down Switching Regulator with 70 μ A Quiescent Current. The LT3480EDD is available in a 10-pin (3mm \times 3mm) DFN surface mount package.

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PERFORMANCE SUMMARY

 Specifications are at T_A = 25°C

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------|----------------------------------|----------------------------------|-----|-----|-----|-------|
| HVIN | High Voltage Input Voltage Range | Input disabled from 38-60V | 8 | | 60 | V |
| 5V ADAPTOR | 5V Adaptor Input Voltage Range | | 4.5 | | 5.5 | V |
| HVBUCK | Output Voltage Range | Range is mode and load dependant | 3.5 | | 5.5 | V |
| I _{HVBUCK} | Output Current | | | | 2 | A |

QUICK START PROCEDURE

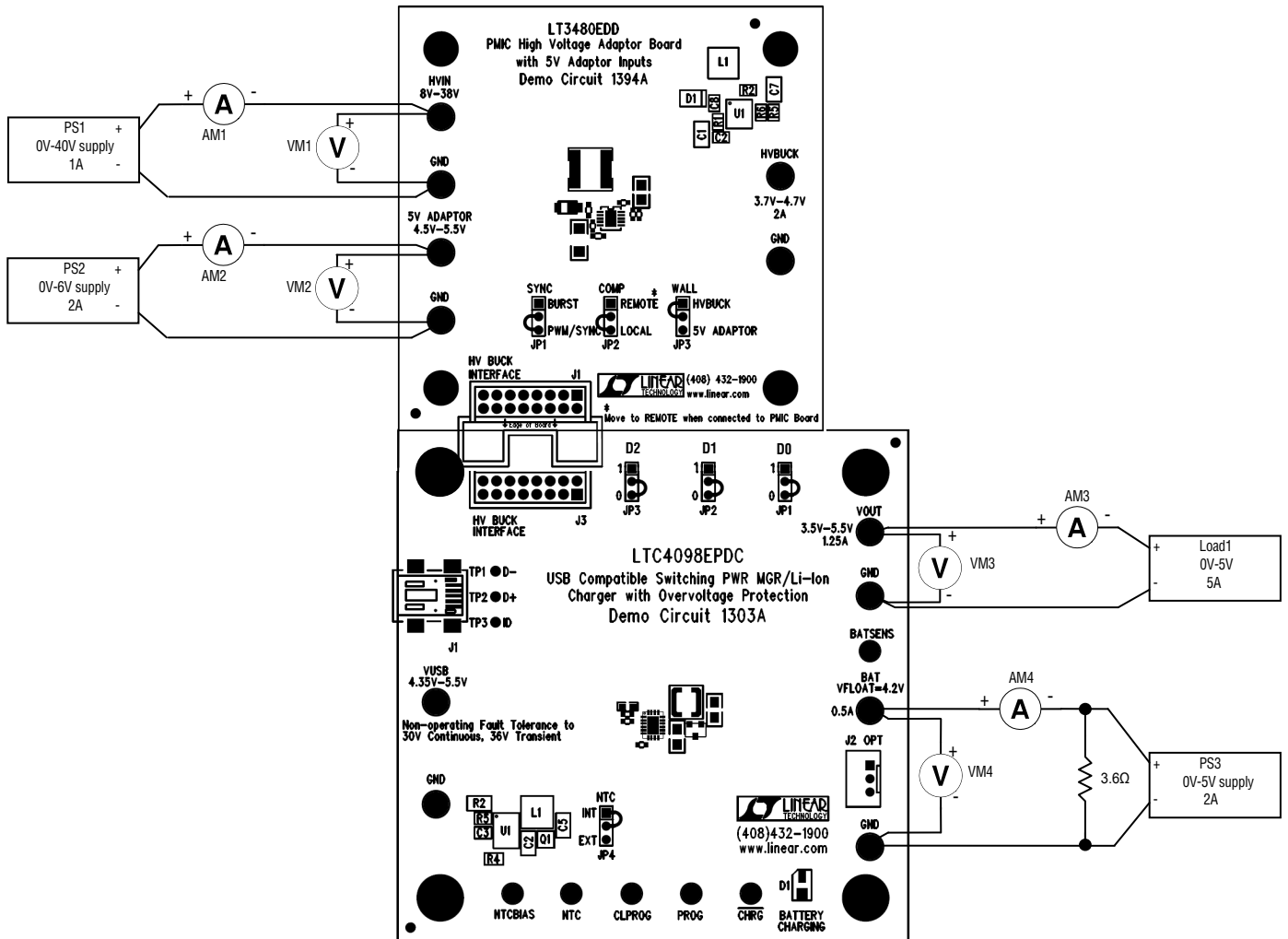
Using short twisted pair leads for any power connections, with all loads and power supplies off, refer to Figures 1 & 2 for the proper measurement and equipment setup.

A companion PMIC demo board is required for this check out procedure. The DC1303A (LTC4098EPDC) board is recommended, and will be used for the following procedure. Please refer to the DC1303A Quick Start Guide for further information.

Follow the procedure below:

1. Set PS1 to 8V, PS2 to 0V, and PS3 to 3.6V. Set Load1 to 0A. Ensure that jumpers are configured as per Figure 1, except the "D2" jumper (JP3) on the DC1303A should be set to "1".
2. Observe that 4.60V < V_{OUT} (VM3) < 4.80V. The LT3480 HV Buck regulator is running with its control loop closed locally. The nominal HVBUCK voltage is 4.75V, and the LTC4098EPDC on the DC1303A board has connected HVBUCK to V_{OUT}.
3. Set Load1 to 2A. Observe that 4.60V < V_{OUT} (VM3) 4.80V. Set Load1 to 0A. The 2A load on V_{OUT} loads HVBUCK, so the LT3480EDD is supplying 2A.
4. Set PS1 to 38V. Observe that 4.60V < V_{OUT} (VM3) < 4.80V. The LT3480 is designed to operate from HVIN = 8V to 38V.
5. Set Load1 to 2A. Observe that 4.60V < V_{OUT} (VM3) < 4.80V. Set Load1 to 0A. The LT3480 is now supplying 2A, while operating from 38V.
6. Set "COMP" jumper (JP2) to "REMOTE". Observe that 3.80V < V_{OUT} (VM3) < 4.10V. The LTC4098EPDC is now controlling the LT3480 output voltage to approximately V(BAT) + 0.3V.
7. Set Load1 to 2A. Observe that 3.80V < V_{OUT} (VM3) < 4.10V. Set Load1 to 0A. LT3480 is supplying 2A, while under LTC4098 control.
8. Set PS1 to 8V. Observe that 3.80V < V_{OUT} (VM3) < 4.10V.

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9. Set Load1 to 2A. Observe that $3.80V < (VM3) < 4.10V$. Set Load1 to 0A.
 10. Set PS2 to 4.5V, and “WALL” jumper (JP3) to “5V ADAPTOR”. Observe that $4.40 < VOUT (VM3) < 4.50V$. The LT3480 is not supplying power to VOUT. This verifies that the LTC4098 recognizes the 5V Adaptor input, and connects it to VOUT.
 11. Set Load1 to 1A. Observe that $4.40V < VOUT (VM3) < 4.50V$. Set Load1 to 0A.
 12. Set PS2 to 5.5V. Observe that $5.40V < VOUT (VM3) < 5.50V$.
 13. Set Load1 to 1A. Observe that $5.40V < VOUT (VM3) < 5.50V$.



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

Figure 1. Proper Measurement Equipment Setup for DC1394A

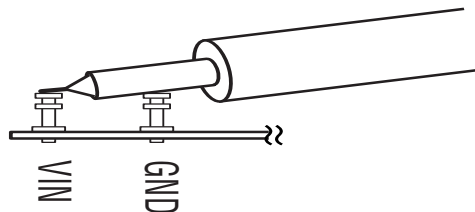


Figure 2. Measuring Input or Output Ripple

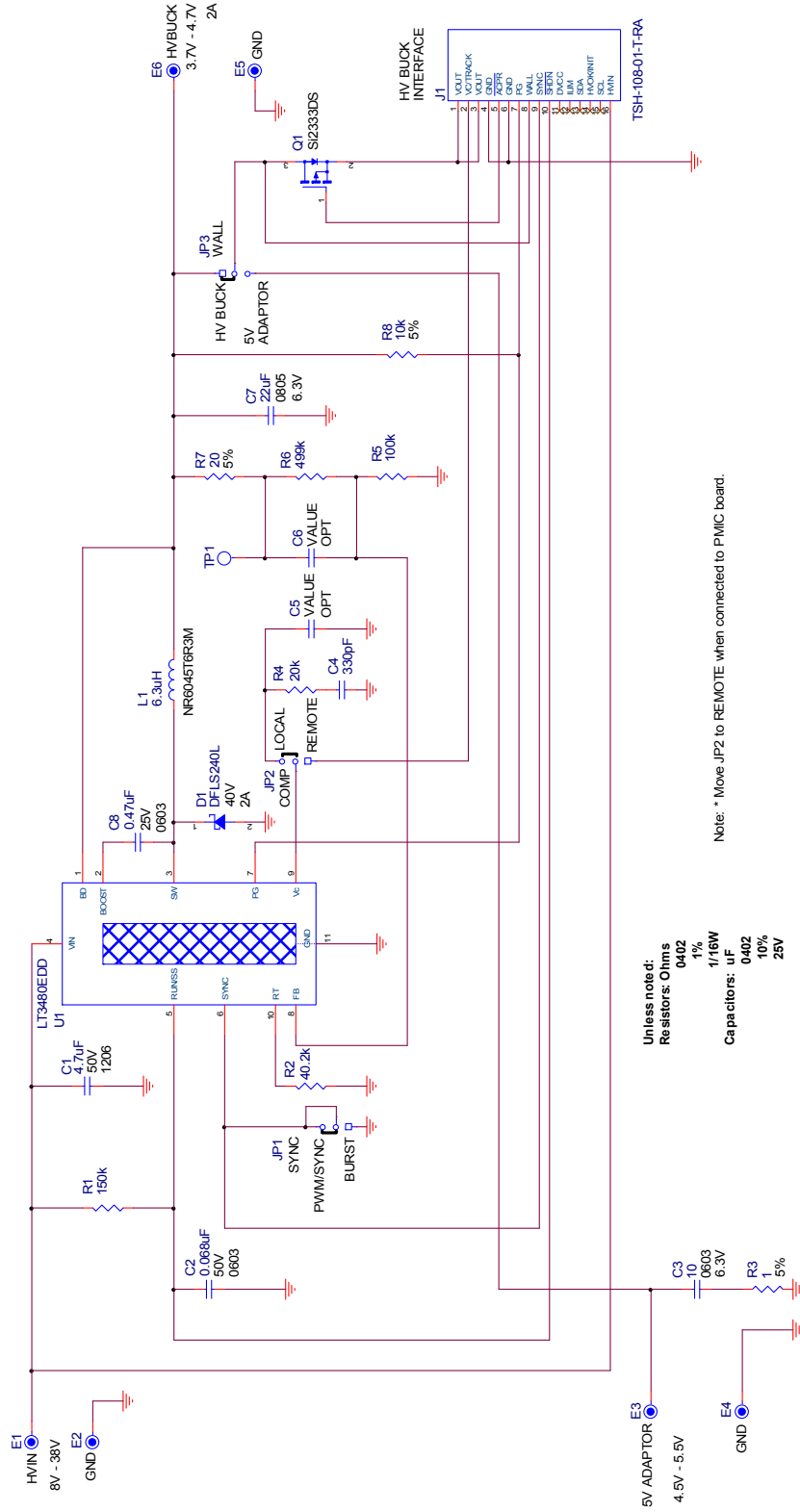


Figure 3. DC1394A Schematic

| | Qty | Reference | Part Description | Manufacture / Part # |
|--|-----|-------------------|---|----------------------------|
| REQUIRED CIRCUIT COMPONENTS: | | | | |
| 1 | 1 | C1 | CAP, CHIP, X5R, 4.7µF, ±10%, 50V, 1206 | MURATA, GRM31CR71H475KA12L |
| 2 | 1 | C2 | CAP, CHIP, X5R, 0.068µF, ±10%, 50V, 0603 | MURATA, GRM188R71H683K |
| 3 | 1 | C4 | CAP, CHIP, BX, 330pF, 50V, 5%, 0402 | VISHAY, VJ0402X331JXAA |
| 4 | 1 | C7 | CAP, CHIP, X5R, 22µF, ±20%, 6.3V, 0805 | TAIYO-YUDEN, JMK212BJ226MG |
| 5 | 1 | C8 | CAP, CHIP, X7R, 0.47µF, ±10%, 25V, 0603 | MURATA, GRM188R71E474K |
| 6 | 1 | D1 | DIODE, SCHOTTKY, 2A, 40V, SMB | DIODES INC., DFLS240L |
| 7 | 1 | L1 | IND, SMT, 6.3µH, 38mΩ, ±30%, 2.8A, 6.0mmX6.0mm | TAIYO-YUDEN, NR6045T6R3 |
| 8 | 1 | Q1 | MOSFET, -12V, 35mΩ, -5.3A, SOT-23 | VISHAY, Si2333DS |
| 9 | 1 | R1 | RES, CHIP, 150kΩ, 1/16W, ±1%, 0402 | VISHAY, CRCW0402150KFKED |
| 10 | 1 | R2 | RES, CHIP, 40.2kΩ, 1/16W, ±1%, 0402 | VISHAY, CRCW040240K2FKED |
| 11 | 1 | R4 | RES, CHIP, 20kΩ, 1/16W, ±1%, 0402 | VISHAY, CRCW040220K0FKED |
| 12 | 1 | R5 | RES, CHIP, 100kΩ, 1/16W, ±1%, 0402 | VISHAY, CRCW0402100KFKED |
| 13 | 1 | R6 | RES, CHIP, 499kΩ, 1/16W, ±1%, 0402 | VISHAY, CRCW0402499KFKED |
| 14 | 1 | U1 | LT3480EDD, PMIC 38V, 2A, 2.4MHz Step-Down Switching Regulator with 70µA Quiescent Current | LINEAR TECH., LT3480EDD |
| ADDITIONAL DEMO BOARD CIRCUIT COMPONENTS: | | | | |
| 1 | 1 | C3 | CAP, CHIP, X5R, 10µF, ±10%, 6.3V, 0603 | TDK, C1608X5R0J106K |
| 2 | 0 | C5-OPT, C6-OPT | None | User determined |
| 3 | 1 | R3 | RES, CHIP, 1.0Ω, 1/16W, 5%, 0402 | VISHAY, CRCW04021R00JNED |
| 4 | 1 | R7 | RES, CHIP, 20Ω, 1/16W, ±5%, 0402 | VISHAY, CRCW040220R0JNED |
| 5 | 1 | R8 | RES, CHIP, 10kΩ, 1/16W, 5%, 0402 | VISHAY, CRCW040210K0JNED |
| HARDWARE FOR DEMO BOARD ONLY: | | | | |
| 1 | 6 | E1,E2,E3,E4,E5,E6 | Turret, 0.09" | MILL-MAX, 2501-2 |
| 2 | 1 | J1 | CONN, HV interface | SAMTEC, TSH-108-01-T-RA |
| 3 | 3 | JP1,JP2,JP3 | 3 Pin Jumper, 2mm | SAMTEC, TMM-103-02-L-S |
| 4 | 3 | JP1,JP2,JP3 | 2mm SHUNT | SAMTEC, 2SN-BK-G |
| 5 | 4 | | STAND-OFF, NYLON 0.375" tall (SNAP ON) | KEYSTONE, 8832 (SNAP ON) |

Figure 4. DC1394A BOM

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