QUICK START GUIDE FOR DC1395A

LT3505EDD: PMIC High Voltage Adaptor Board with 5 Volt Adaptor Inputs

DESCRIPTION

Demonstration Circuit 1395A is a 1.2A, Step-Down Switching Regulator in a 3mm × 3mm DFN. The LT3505EDD is available in an 8-pin (3mm × 3mm) DFN surface mount package.

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 36-40V	8		40	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

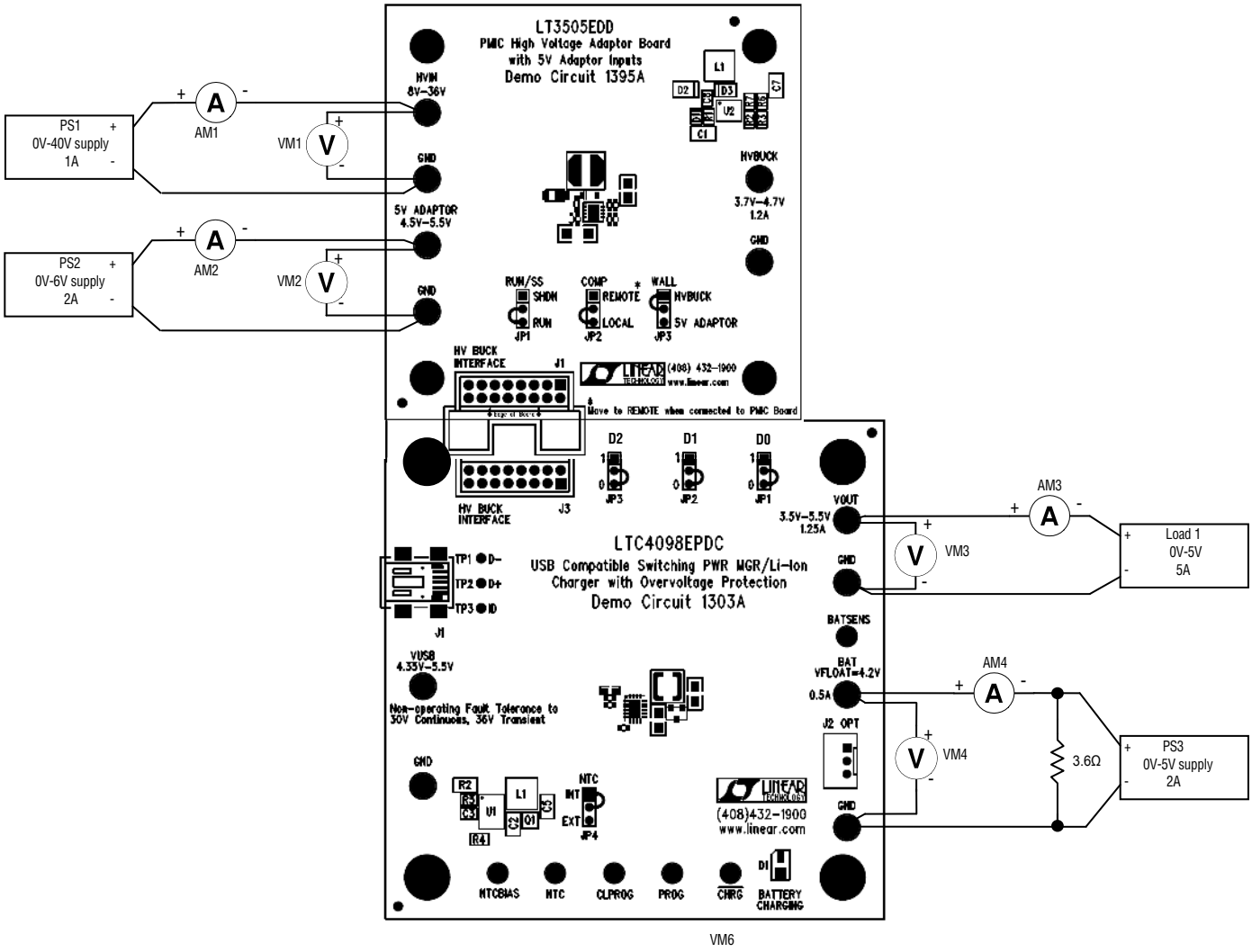
Using short twisted pair leads for any power connections, with all loads and power supplies off, refer to Figures 1 & 2 for the proper measurement and equipment setup.

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 4.50V < VOUT (VM3) < 4.70V. 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 VOUT.
3. Set Load1 to 1A. Observe that 4.35V < VOUT (VM3) 4.55V. Set Load1 to 0A. The 1A load on VOUT loads HVBUCK, so the LT3505EDD is supplying 1A.
4. Set PS1 to 36V. Observe that 4.50V < VOUT (VM3) < 4.70V. The LT3505 is designed to operate from HVIN = 8V to 36V.
5. Set Load1 to 1A. Observe that 4.20V < VOUT (VM3) < 4.55V. Set Load1 to 0A. The LT3505 is now supplying 1A, while operating from 38V.
6. Set "COMP" jumper (JP2) to "REMOTE". Observe that 3.80V < VOUT (VM3) < 4.10V. The LTC4098EPDC is now controlling the LT3505 output voltage to approximately V(BAT) + 0.3V.
7. Set Load1 to 1A. Observe that 3.70V < VOUT (VM3) < 3.90V. Set Load1 to 0A. LT3505 is supplying 1A, while under LTC4098 control.
8. Set PS1 to 8V. Observe that 3.80V < VOUT (VM3) < 4.10V.

9. Set Load1 to 1A. Observe that 3.70V < (VM3) < 3.90V. 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 LT3505 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 4.10V < VOUT (VM3) < 4.40V. 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 5.10V < 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 DC1395A

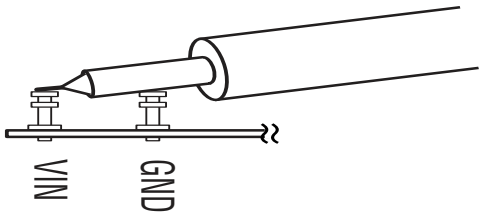


Figure 2. Measuring Input or Output Ripple

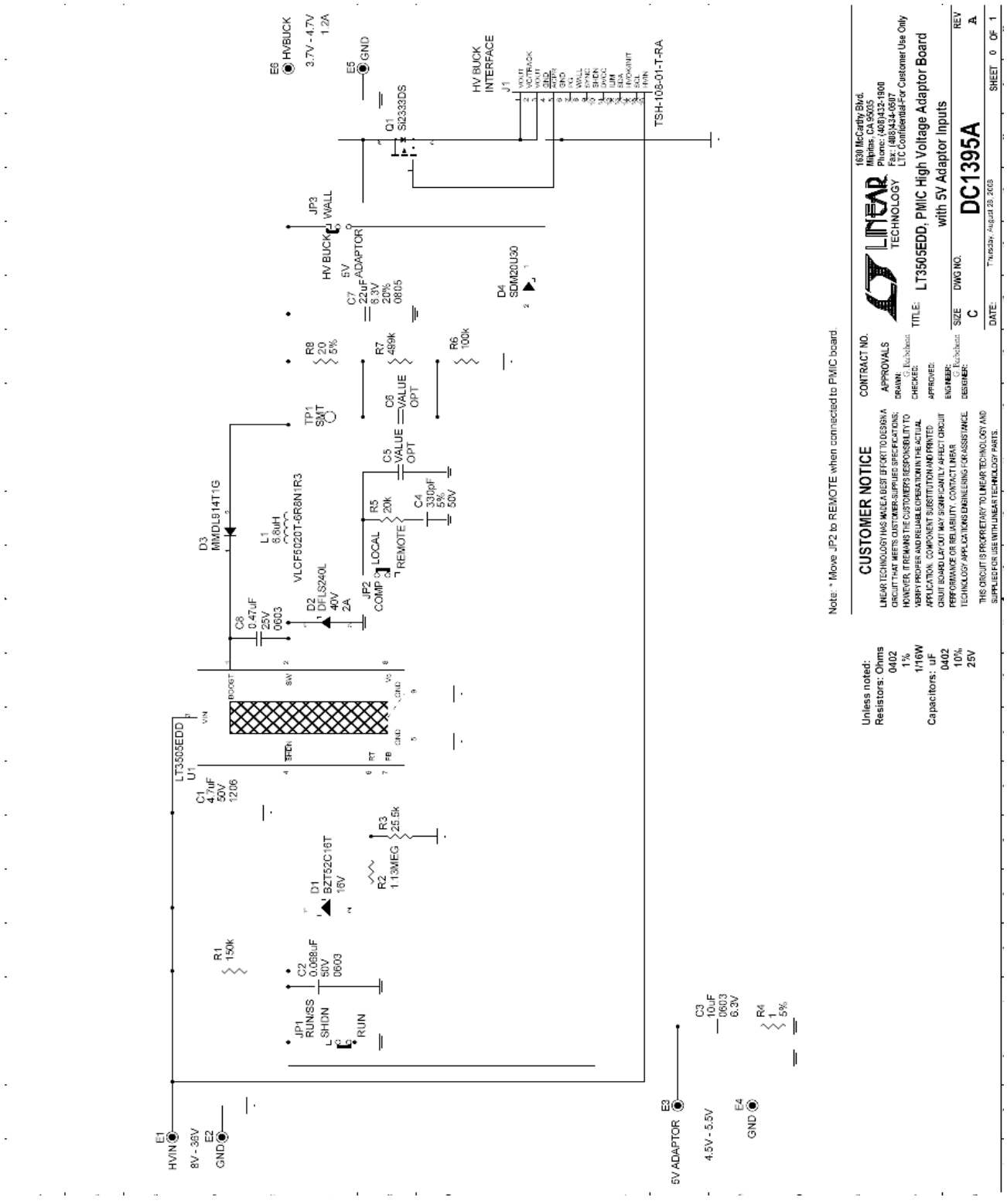


Figure 3. DC1395A Schematic

	Qty	Reference	Part Description	Manufacture / Part #
		REQUIRED CIRCUIT COMPONENTS:		
1	1	C1	CAP, CHIP, X7R, 4.7µF, ±10%, 50V, 1206	MURATA, GRM31CR71H475KA12L
2	1	C2	CAP, CHIP, X7R, 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, ZENER, 16V, ±7%, 150mW, SOD-523	DIODES INC., BZT52C16T
7	1	D2	DIODE, SCHOTTKY, 2A, 40V, SMB	DIODES INC., DFLS240L
8	1	D3	DIODE, SILICON, 200mA, 100V, SOD-323	ON SEMICONDUCTOR, MMDL914T1G
9	1	D4	DIODE, SCHOTTKY, 200mA, 30V, SOD-523	DIODES INC., SDM20U30
10	1	L1	IND, SMT,6.8µH, 0.122Ω, ±30%, 1.11A, 5mmX5mm	TDK, VLCF5020T-6R8N1R3
11	1	Q1	MOSFET, -12V, 35mΩ, -5.3A, SOT-23	VISHAY, Si2333DS
12	1	R1	RES, CHIP, 150kΩ, 1/16W, ±1%, 0402	VISHAY, CRCW0402150KFKED
13	1	R2	RES, CHIP, 1.13MΩ, 1/16W, ±1%, 0402	VISHAY, CRCW04021M13FKED
14	1	R3	RES, CHIP, 25.5kΩ, 1/16W, ±1%, 0402	VISHAY, CRCW040225K5FKED
15	1	R5	RES, CHIP, 20kΩ, 1/16W, ±1%, 0402	VISHAY, CRCW040220K0FKED
16	1	R6	RES, CHIP, 100kΩ, 1/16W, ±1%, 0402	VISHAY, CRCW0402100KFKED
17	1	R7	RES, CHIP, 499kΩ, 1/16W, ±1%, 0402	VISHAY, CRCW0402499KFKED
18	1	U1	LT3505EDD, PMIC High Voltage Adaptor Board with 5V Adaptor Inputs	LINEAR TECH., LT3505EDD
		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	R4	RES, CHIP, 1.0Ω, 1/16W, 5%, 0402	VISHAY, CRCW04021R00JNED
4	1	R8	RES,CHIP, 20Ω, 1/16W, ±5%, 0402	VISHAY, CRCW040220R0JNED
		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. DC1395A BOM