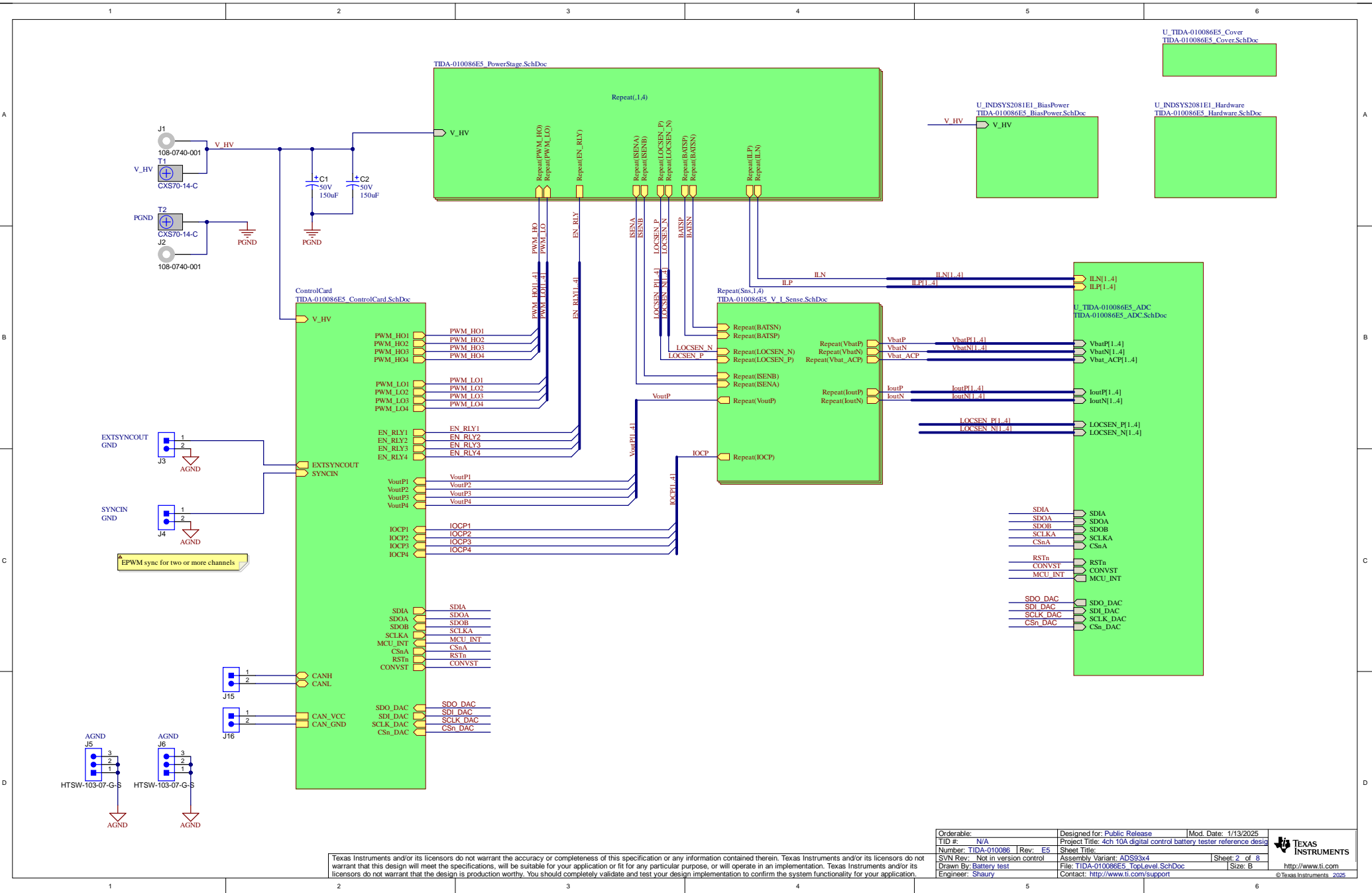


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Orderable:	Designed for: Public Release	Mod. Date: 12/23/2024
TID #:	N/A	Project Title: 4ch 10A digital control battery tester reference design
Number: TIDA-010086	Rev: E5	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: ADS93v4	Sheet: 1 of 8
Drawn By:	File: TIDA-010086E5_Cover.SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	http://www.ti.com





U_TIDA-010086E5_Cover
TIDA-010086E5_Cover.SchDoc

U_INDSYS2081E1_Hardware
TIDA-010086E5_Hardware.SchDoc

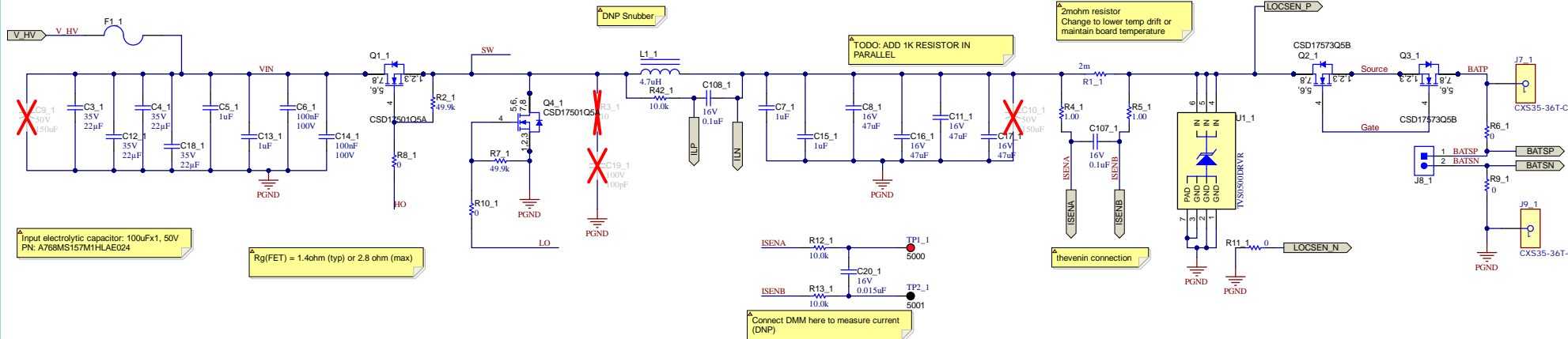
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TID #:	Project Title: 4ch 10A digital control battery tester reference design	
Number: TIDA-010086 Rev: E5	Sheet Title:	
SVN Rev: Not in version control	Assembly Variant: ADS93v4	Sheet: 2 of 8
Drawn By: Battery test	File: TIDA-010086E5_TopLevel_SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	

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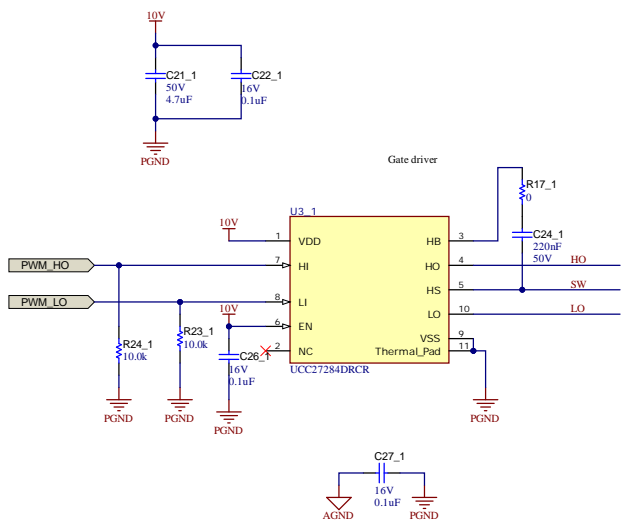
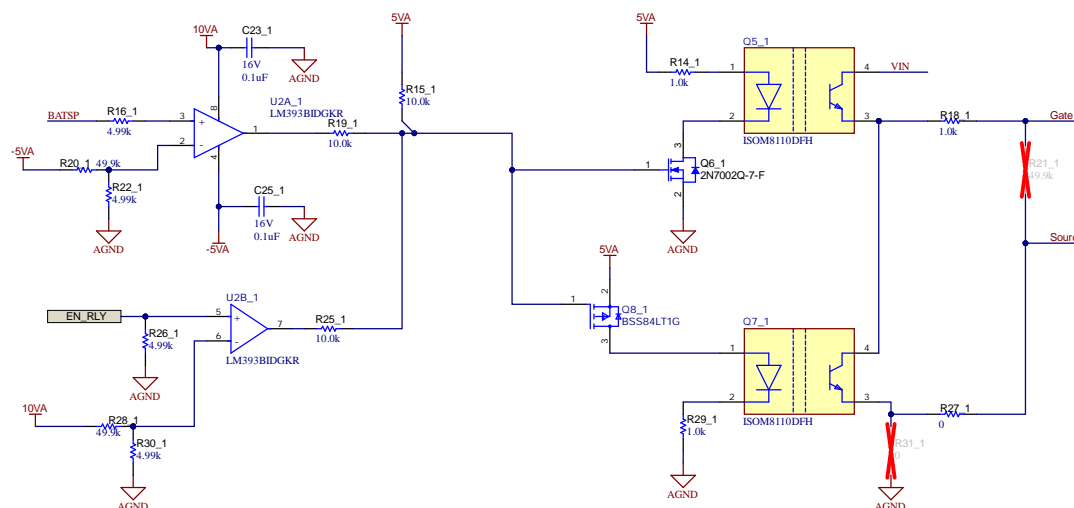


http://www.ti.com
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Power Stage



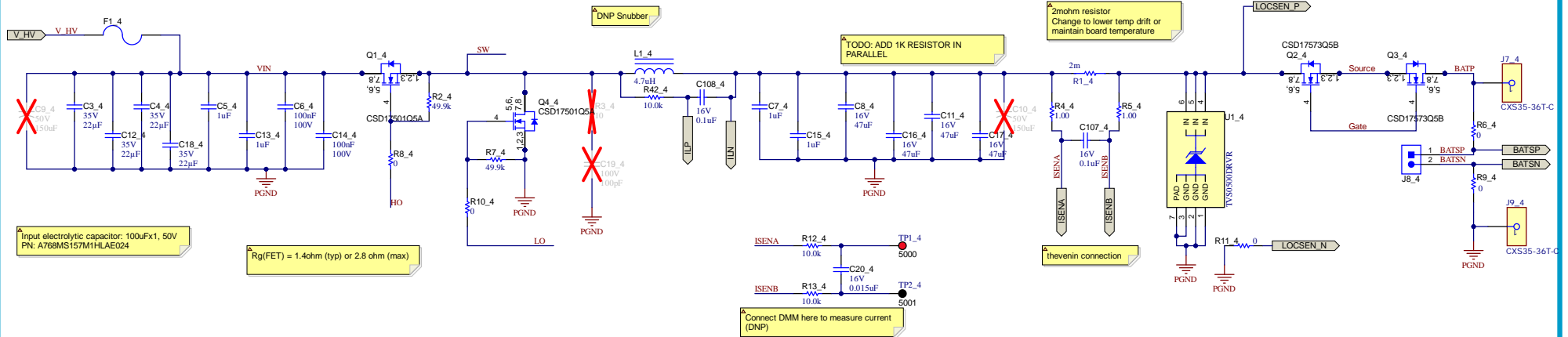
Relay control + Reverse Polarity



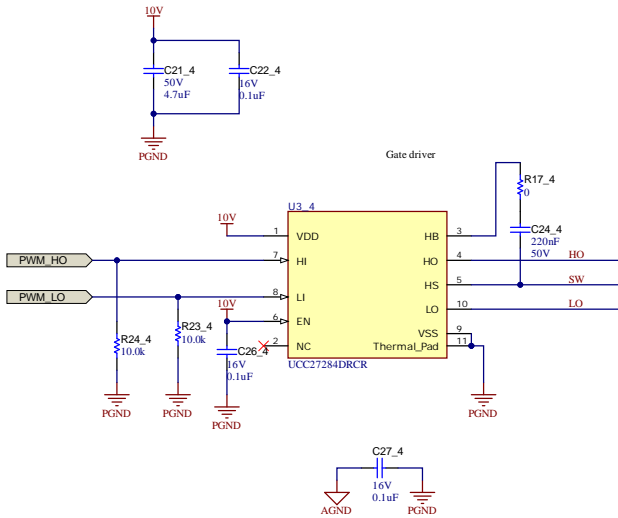
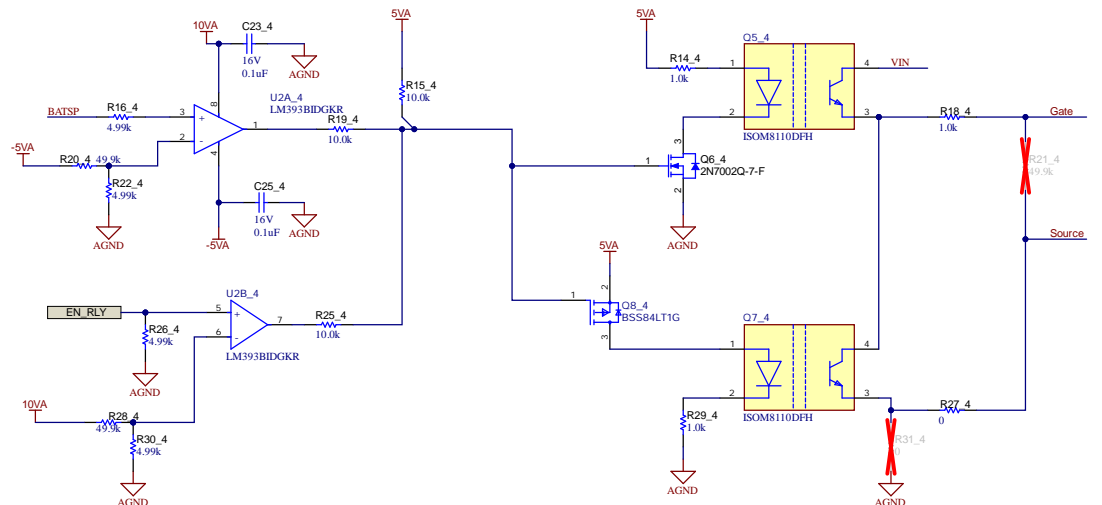
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TID #:	N/A	Project Title: 4ch 10A digital control battery tester reference desig
Number: TIDA-010086	Rev: E5	Sheet Title:
SVM Rev: Not in version control	Assembly Variant: ADS93x4	Sheet: 3 of 8
Drawn By: Battery test	File: TIDA-010086E5_PowerStage_SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	

Power Stage



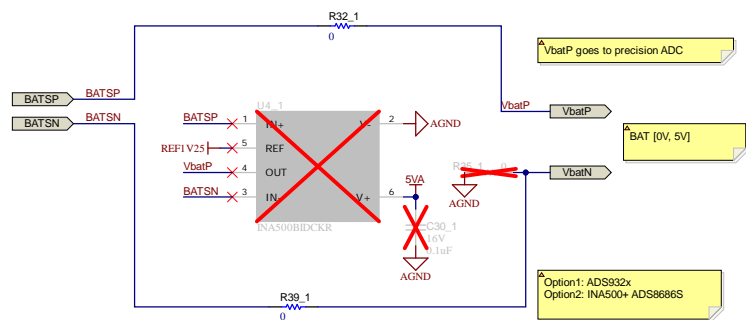
Relay control + Reverse Polarity



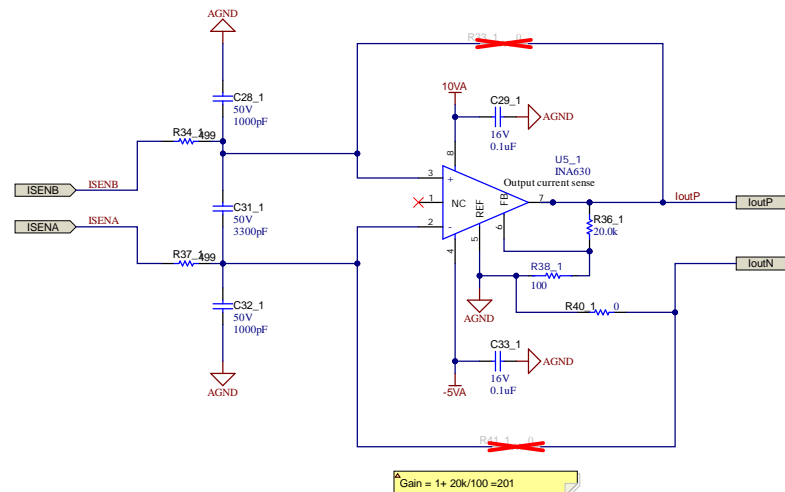
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Number: TIDA-010086	Rev: E5	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: ADS93x4	Sheet: 3 of 8
Drawn By: Battery test	File: TIDA-010086E5_PowerStage_SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	http://www.ti.com

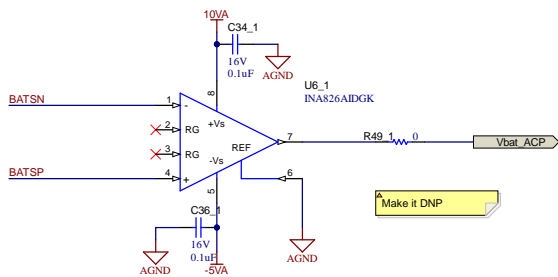
VOLTAGE SENSE



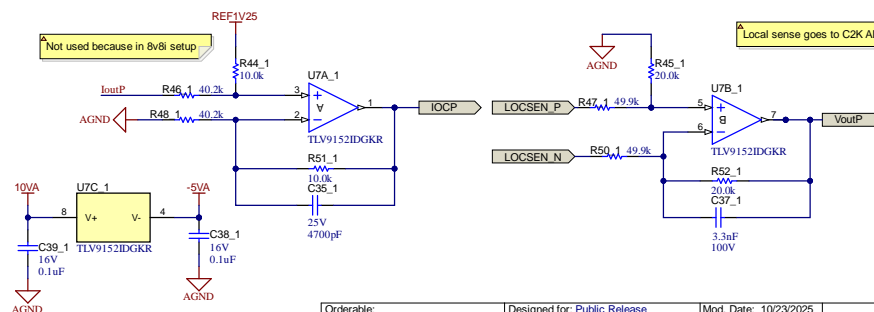
Current Sense



Battery AC Voltage Sense



Local Voltage Sense



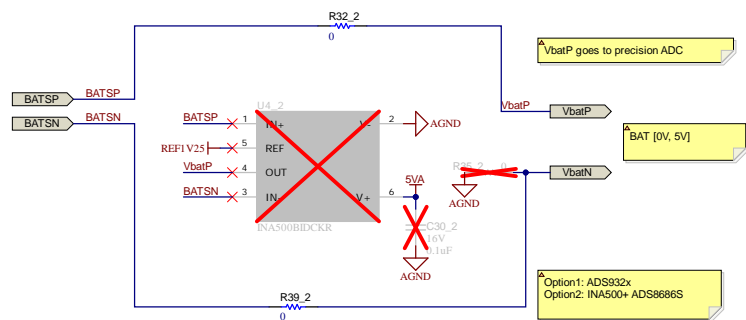
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Number: TIDA-010086	Rev: E5	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: ADS93x4	Sheet: 4 of 8
Drawn By: Battery test	File: TIDA-010086E5_V_I_Sense_SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	

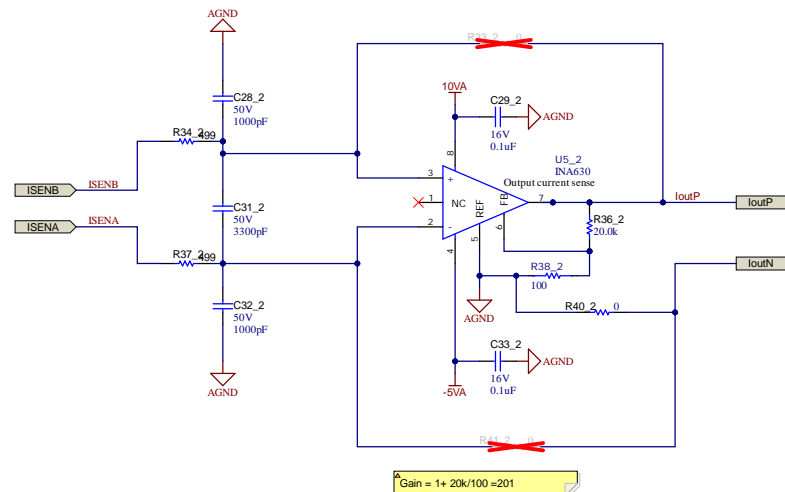


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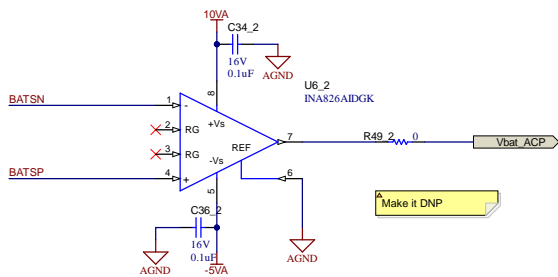
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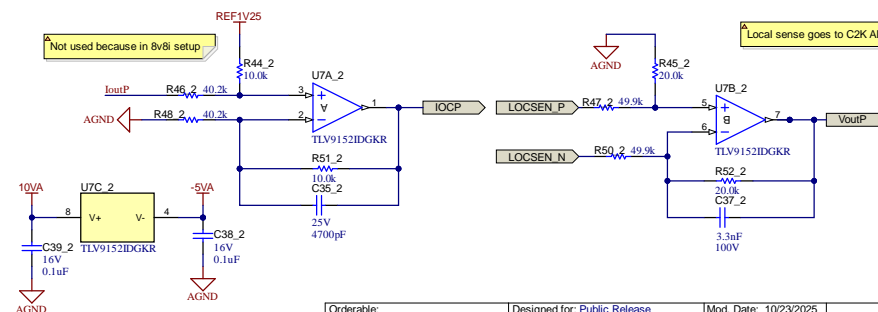
Current Sense



Battery AC Voltage Sense



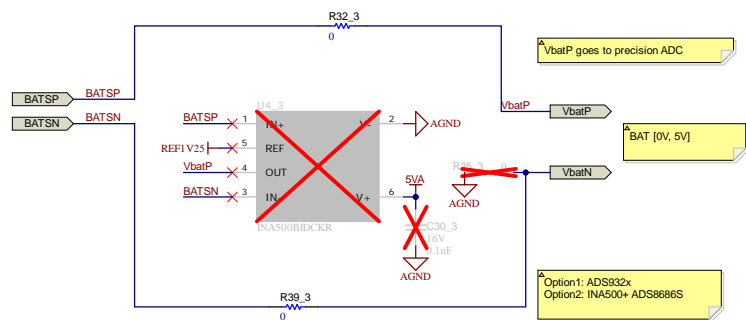
Local Voltage Sense



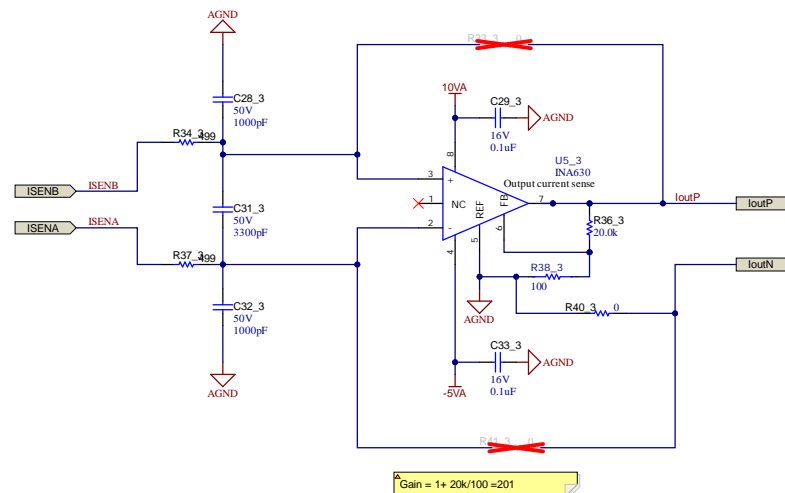
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Number: TIDA-010086	Rev: E5	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: ADS93x4	Sheet: 4 of 8
Drawn By: Battery test	File: TIDA-010086E5_V_I_Sense_SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	

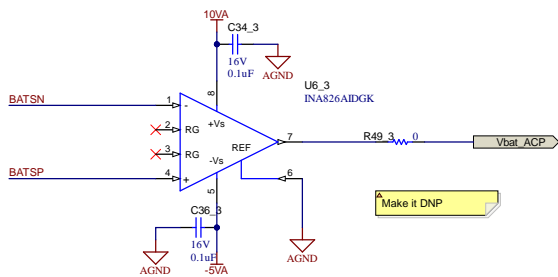
VOLTAGE SENSE



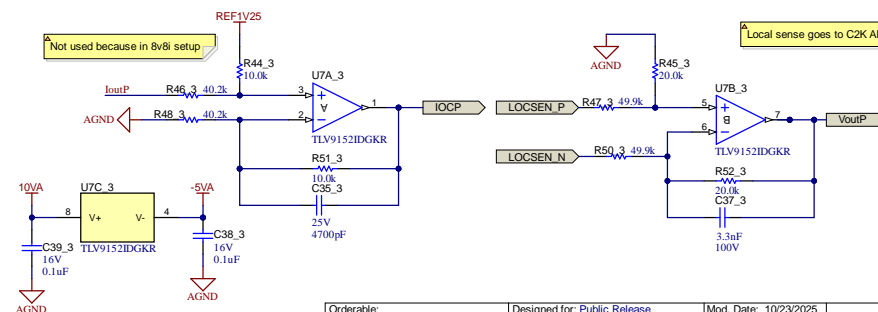
Current Sense



Battery AC Voltage Sense



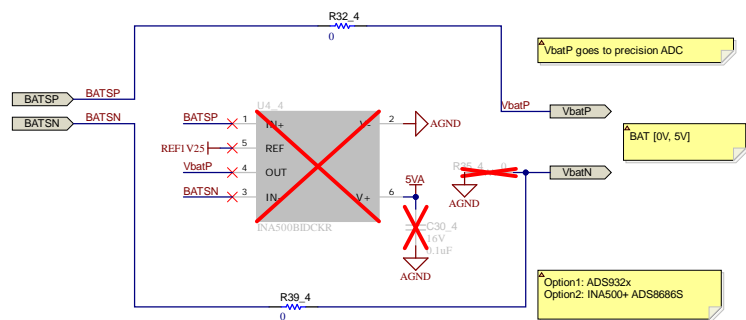
Local Voltage Sense



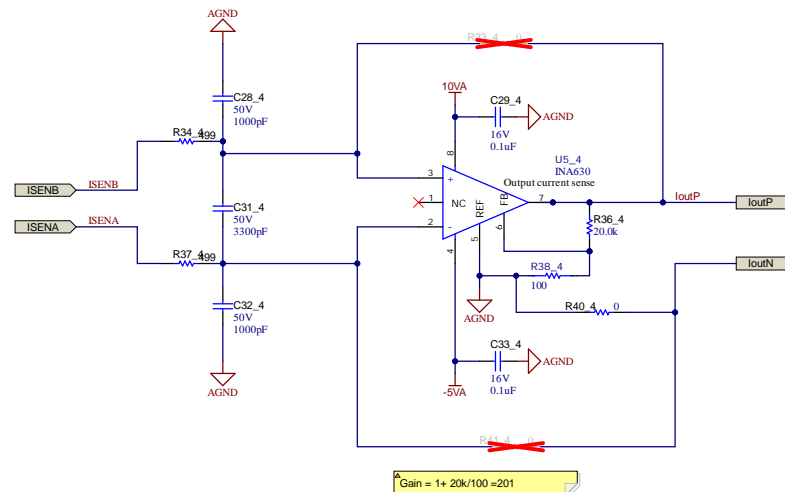
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TID #:	N/A	Project Title: 4ch 10A digital control battery tester reference desig
Number: TIDA-010086	Rev: E5	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: ADS93x4	Sheet: 4 of 8
Drawn By: Battery test	File: TIDA-010086E5_V_I_Sense_SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	

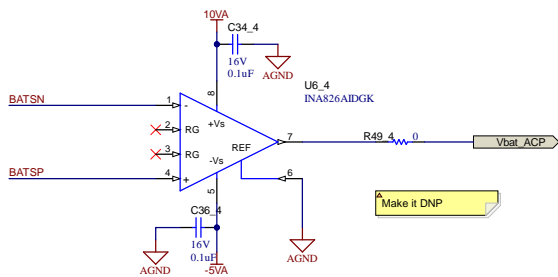
VOLTAGE SENSE



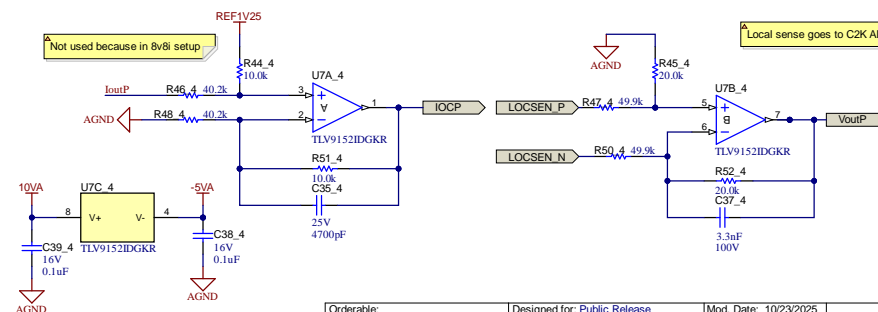
Current Sense



Battery AC Voltage Sense



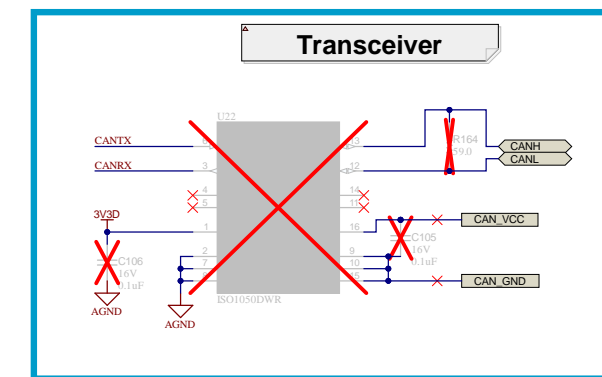
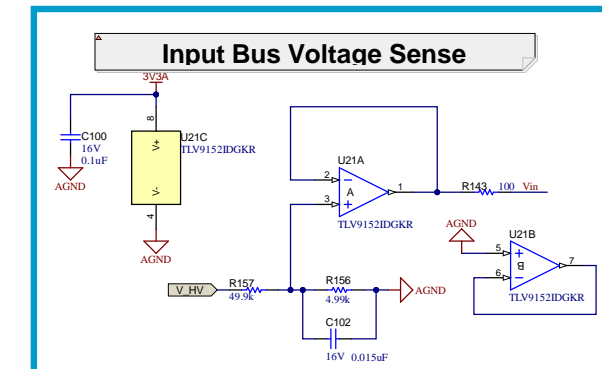
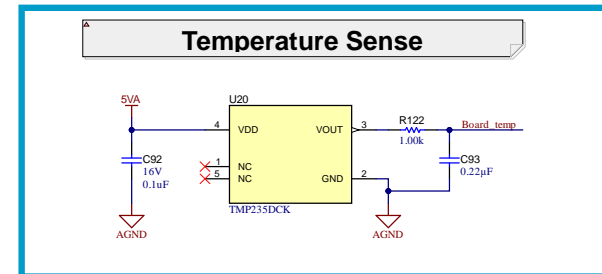
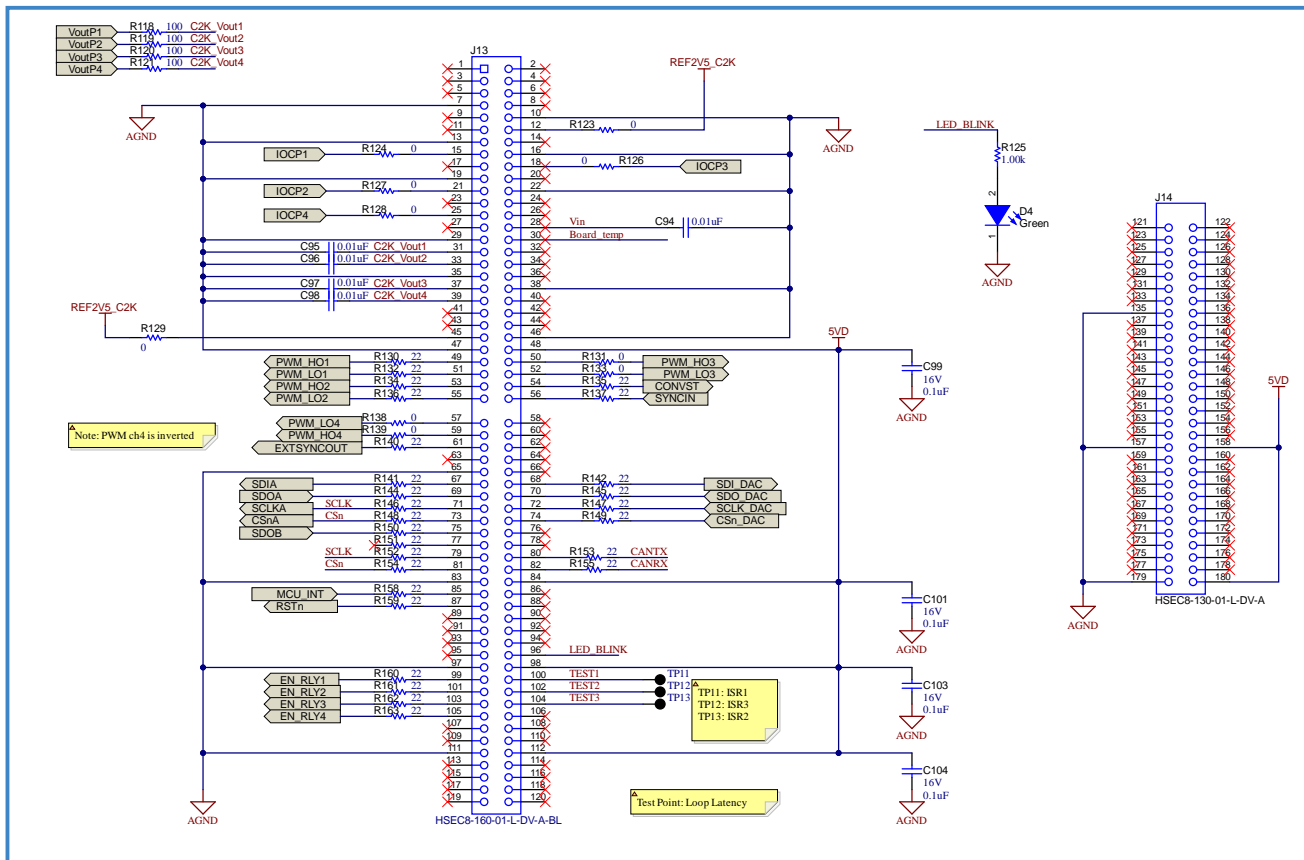
Local Voltage Sense



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Number: TIDA-010086	Rev: E5	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: ADS93x4	Sheet: 4 of 8
Drawn By: Battery test	File: TIDA-010086E5_V_I_Sense_SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	

F28P65 Control Card



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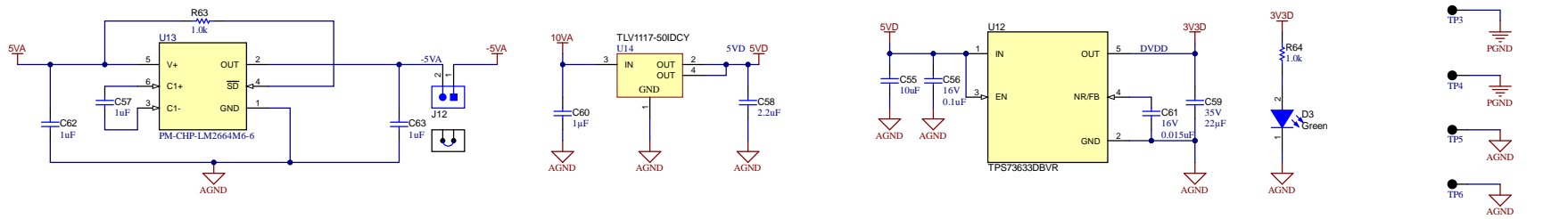
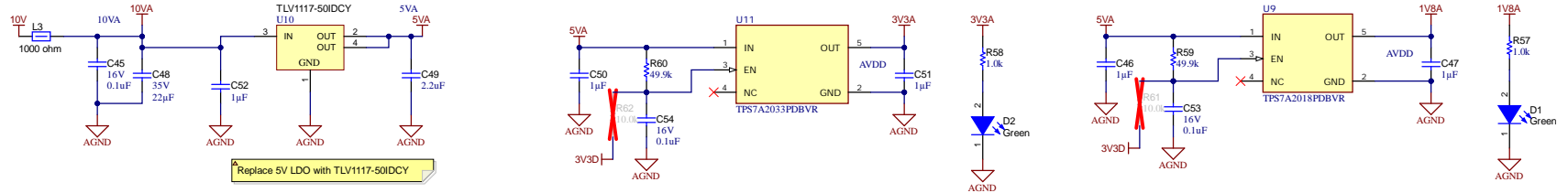
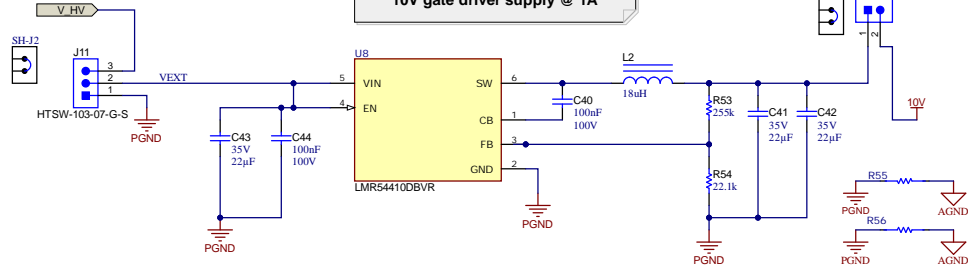
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TID #: N/A	Project Title: 4ch 10A digital control battery tester reference design	
Number: TIDA-010086 Rev: E5	Sheet Title:	
SVN Rev: Not in version control	Assembly Variant: ADS93x4	Sheet: 6 of 8
Drawn By: Battery test	File: TIDA-010086E5_ControlCard_SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	



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BIAS POWER

10V gate driver supply @ 1A



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TID #:	N/A	Project Title: 4ch 10A digital control battery tester reference desig
Number: TIDA-010086	Rev: E5	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: ADS93v4	Sheet: 7 of 8
Drawn By: Battery test	File: TIDA-010086E5_BiasPower_SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	

H1 NY PMS 440 0025 PH
 H2 NY PMS 440 0025 PH
 H3 NY PMS 440 0025 PH
 H4 NY PMS 440 0025 PH

H5 1902C
 H6 1902C
 H7 1902C
 H8 1902C

FID1
 FID2
 FID3

PCB Number: TIDA-010086
 PCB Rev: E5

PCB LOGO
 Texas Instruments



PCB LOGO
 FCC disclaimer

PCB LOGO
 WEEE logo



ZZ1
 Label Assembly Note
 This Assembly Note is for PCB labels only

ZZ2
 Assembly Note
 These assemblies are ESD sensitive, ESD precautions shall be observed.

ZZ3
 Assembly Note
 These assemblies must be clean and free from flux and all contaminants. Use of no clean flux is not acceptable.

ZZ4
 Assembly Note
 These assemblies must comply with workmanship standards IPC-A-610 Class 2, unless otherwise specified.

You should delete the nylon screws/standoffs and/or the bumpons as needed for your design (or substitute other parts from Hardware.IntLib). Bumpons are cheaper, but provide less clearance.

Deleting anything else from this page may result in your EVM submission being rejected (until you add them back).

Update the Label Text in the Label Table as needed for each Assembly Variant.

You should delete this note too.

Variant/Label Table	
Variant	Label Text
001	ChangeMe!
002	ChangeMe!

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Orderable:	Designed for: Public Release	Mod. Date: 12/22/2024
TID #:	N/A	Project Title: 4ch 10A digital control battery tester reference design
Number: TIDA-010086	Rev: E5	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: ADS93v4	Sheet: 8 of 8
Drawn By: Battery test	File: TIDA-010086E5_Hardware.SchDoc	Size: B
Engineer: Shaury	Contact: http://www.ti.com/support	http://www.ti.com



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Install label in silkscreened box after final wash. Text shall be 8 pt font. Text shall be per the Label Table in the PDF schematic.

ASSEMBLY VARIANT: [No Variations]
PLOT NAME =

ZZ1 # These assemblies are ESD sensitive, ESD precautions shall be observed.
ZZ2 # These assemblies must be clean and free from flux and all contaminants. Use of no clean flux is not acceptable.
ZZ3 # These assemblies must comply with workmanship standards IPC-A-610 Class 2, unless otherwise specified.

6400.00mm
6200.00mm

COMPONENTS MARKED 'DNP' SHOULD NOT BE ORDERED. SEE THE BOARD RELEASE INFORMATION FOR DETAILS.

Layer Name	Material	Thickness	Constant	Board Layer Stack
Top Overlay				
Top Solder	SM-001	1.00mil	4	
Top Surface Finish	PbSn	0.79mil		
1 Top Layer	CF-005	2.76mil		
Dielectric 6	PP-006	2.80mil	4.1	
Dielectric 1	PP-017	5.10mil	4.3	
2 Power	CF-005	2.76mil		
Dielectric 4	PP-017	5.10mil	4.3	
3 GND	CF-005	2.76mil		
Dielectric 2	Core-039	28.00mil	4.8	
4 Signal	CF-005	2.76mil		
Dielectric 5	PP-017	5.10mil	4.3	
5 PGN2	CF-005	2.76mil		
Dielectric 3	PP-017	5.10mil	4.3	
Dielectric 7	PP-006	2.80mil	4.1	
6 Bottom Layer	CF-005	2.76mil		
Bottom Surface Finish	PbSn	0.79mil		
Bottom Solder	SM-001	1.00mil	4	
Bottom Overlay				

DESIGN INFORMATION

MIL TRACK WIDTH: 6 MIL
MIL CLEARANCE: 7.874 MIL
MIL VIA PAD SIZE: .20 MIL
MINIMUM ANNUJAR RING 0.15mm (6.0MIL) EXTERNAL
PER IPC-D-278 CLASS 2 LEVEL C
REGISTRATION TOLERANCES: METAL +/- .5 MIL HOLES +/- .3 MIL
HOLE SIZE TOLERANCE (UNLESS OTHERWISE SPECIFIED): +/- .3 MIL

MATERIAL:
 FR-408 FR-4 High Tg OTHER

THICKNESS: 62 MIL (1.6mm) +/-10% OTHER

TOLERANCE: ANSI IPC-6012 TYPE 3 CLASS 2
 OTHER +/-

BOW & TWIST: ANSI IPC-6012 TYPE 3 CLASS 2
 OTHER +/-

DRILLING:
REFERENCE: AS SHOWN NC_DRILL FILES
PTH COPPER THICKNESS: 20-30 um OTHER

BOARD FINISH:
SILKSCREEN COLOR: TOP BOTTOM
SILKSCREEN COLOR: WHITE OTHER
SOLDER RESIST COLOR: GREEN OTHER
 MATTE SEMI-GLOSS

SURFACE FINISH: IMMERSION GOLD (ENIG) ENEG
 IMM. TN/SILVER OR EQUIV OTHER

ARRAY/PANEL:
 CUT AND TRM PER M1 BOARD OUTLINE
 N.C. ROUTE V. SCORE

CERTIFICATION: MATERIALS AND WORKMANSHIP FOR ALL PCBs TO MEET OR EXCEED THE REQUIREMENTS OF:
 ANSI IPC-A-600F CLASS -> 1 2 3
 REL5 OTHER PER ORDER

ALL BOARDS MUST MEET OR EXCEED UL94V-0 REQUIREMENTS.
PCB MUST BEAR THE UL94V-0 UL REGISTERED MATERIAL ID NUMBER

ADDITIONAL REQUIREMENTS:
MICROSECTION: YES
BARE BOARD ELEC. TEST: NONE REQUIRED PER ORDER

XX MIL VAS REQUIRE NON-CONDUCTIVE FILL AND PLANARIZE
 12.5mil MIL WAS REQUIRE CONDUCTIVE FILL AND PLANARIZE
 OUTER XX MIL TRACES REQUIRE 50 OHM SINGLE-ENDED IMPEDANCE
 LAYER 2 & 3 (INNER LAYERS) XX MIL WIDE, XX MIL SPACE
TRACES REQUIRE 100 OHM DIFFERENTIAL IMPEDANCE

TEXAS INSTRUMENTS

PROJECT TITLE:
4ch 10A digital control battery tester reference design

DESIGNED FOR:
Public Release

FILE NAME:
TIDA-010086E5_PcbDoc

ENGINEER:
Shaury

LAYOUT BY:
Ethan

SCALE: 1.00

ALUM DESIGNER VERSION:
23.1.1.15

ALL ARTWORK VIEWED FROM TOP SIDE	BOARD # TIDA-010086E5	DATE: 10/23/2025	DESIGNED BY: SHOURY	LAYOUT BY: ETHAN
LAYER NAME: TOP	TID # N/A	10/23/2025	SHOURY	ETHAN
PLS: 10/23/2025	GENERATED: 10/23/2025	12:43:30 PM	TEXAS INSTRUMENTS	

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Last updated 10/2025