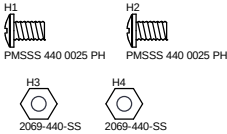


DAC39RF10 Hardware



PCB Number: AMPS214
PCB Rev: A



PCB
LOGO
FCC disclaimer

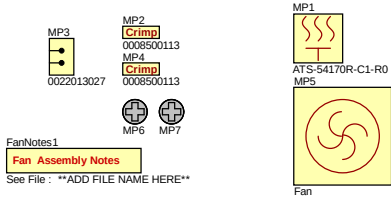
Cannot
open file
C:\Users\sa
a0864280



CAUTION HOT SURFACE

Cannot
open file
C:\Users\sa
a0864280

Fan Assembly



LBL1

PCB Label

TH1-14-423-10

Size: 0.65"x0.20"

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

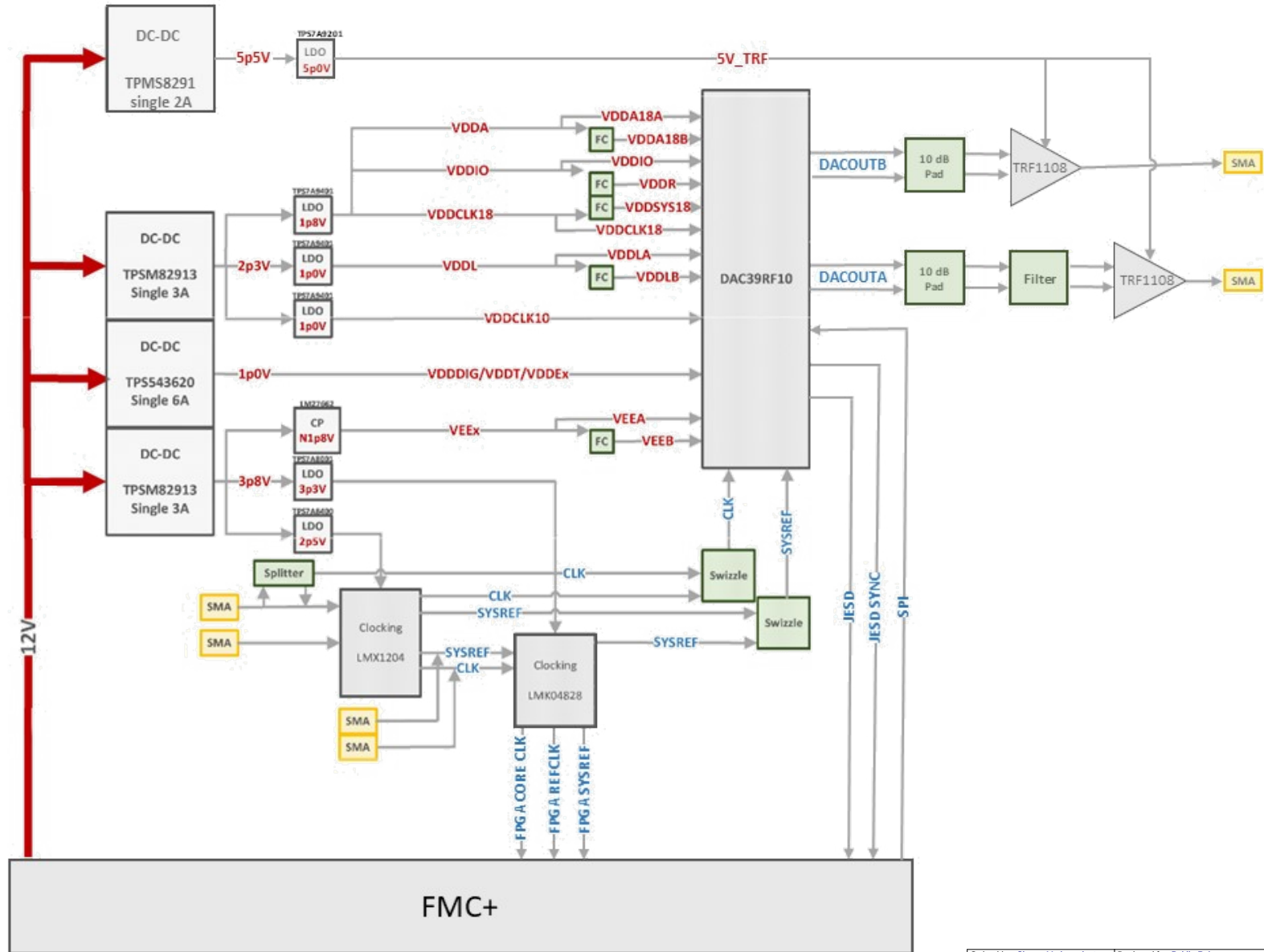
Assembly Note

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

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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 11/15/2023
TID #: N/A	Project Title: DAC39RFxx TRF11xx EVM	
Number: AMPS214	Rev: A	Sheet Title: DAC39RF10 Hardware
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 1 of 22
Drawn By:	File: Hardware RevA.SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	

DAC39RF10EVM Block Diagram



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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 8/9/2024
TID #: N/A	Project Title: DAC39RFxx, TRF11xx, EVM	
Number: AMPS214	Rev: A	Sheet Title: DAC39RF10EVM Block Diagram
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 2 of 22
Drawn By:	File: Block Diagram RevA.SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	

D

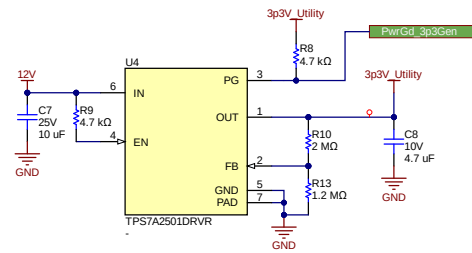
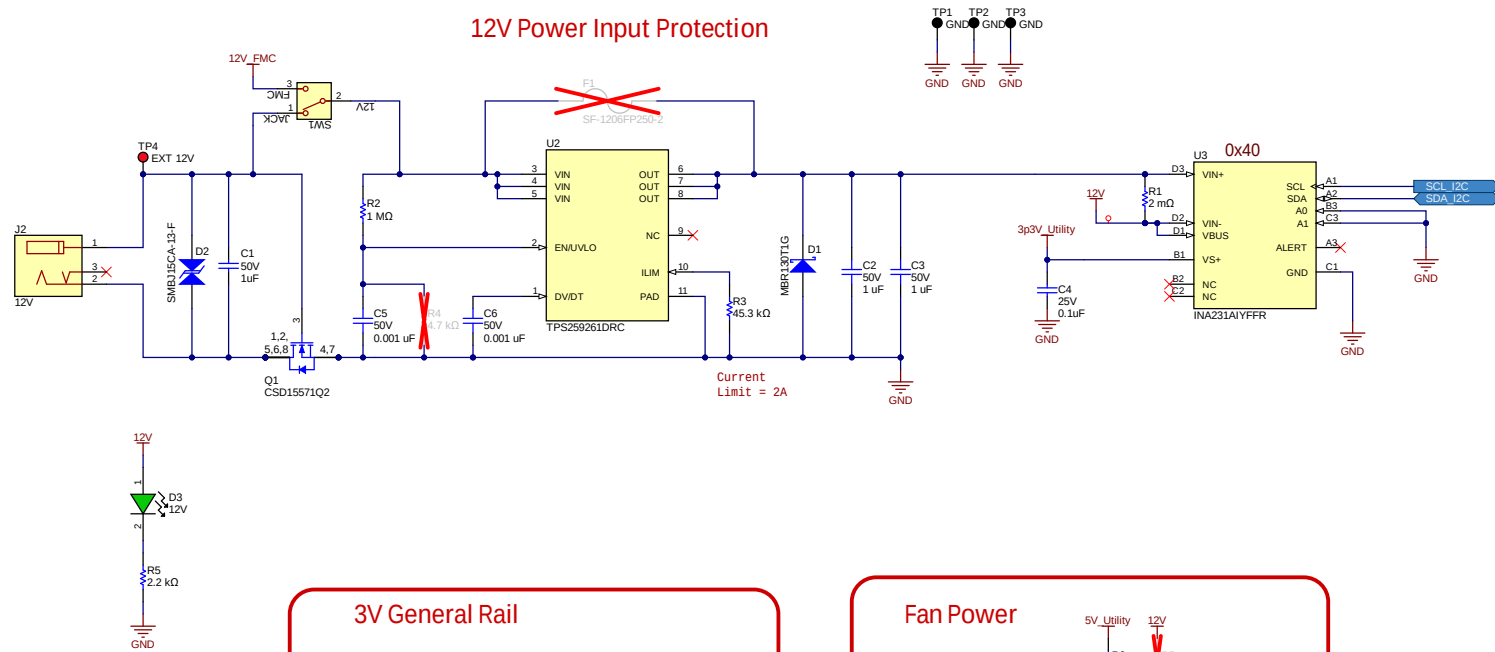
Rev	Release Date	Notes
A	April 2023	Initial Release
B	June 2023	1) FMC COPI signal missing connection fixed 2) Silk corrected on LMK CLK and SYSREF 3) Silk reference designators corrected on J8/J11 4) EEPROM attached to i2C and not to just FMC i2C 5) 2p5V LMX Ivi shifter connected to 2p5_Clock

Variant	Notes
001	Original DNI components Used for production build
002	DAC Output changed from 3dB pad to LC network

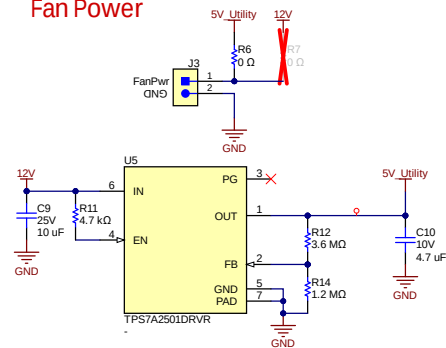
Order Date: ChangeMe in variant		Designed for: Public Release		Mod. Date: 11/8/2023	
TID #: N/A		Project Title: DAC39RFx TRF11xx EVM			
Number: AMPS214 Rev: A		Sheet Title: DAC39RF10 Rev History & Variants			
SVN Rev: Not in version control		Assembly Variant: 001			
Drawn By:		File: Revision History RevA_SchDoc		Sheet: 3 of 22	
Engineer: SRINIVAS BS		Contact: http://www.ti.com/support		Size: B	
				http://www.ti.com © Texas Instruments 2018	



12V Input & General Power Rails



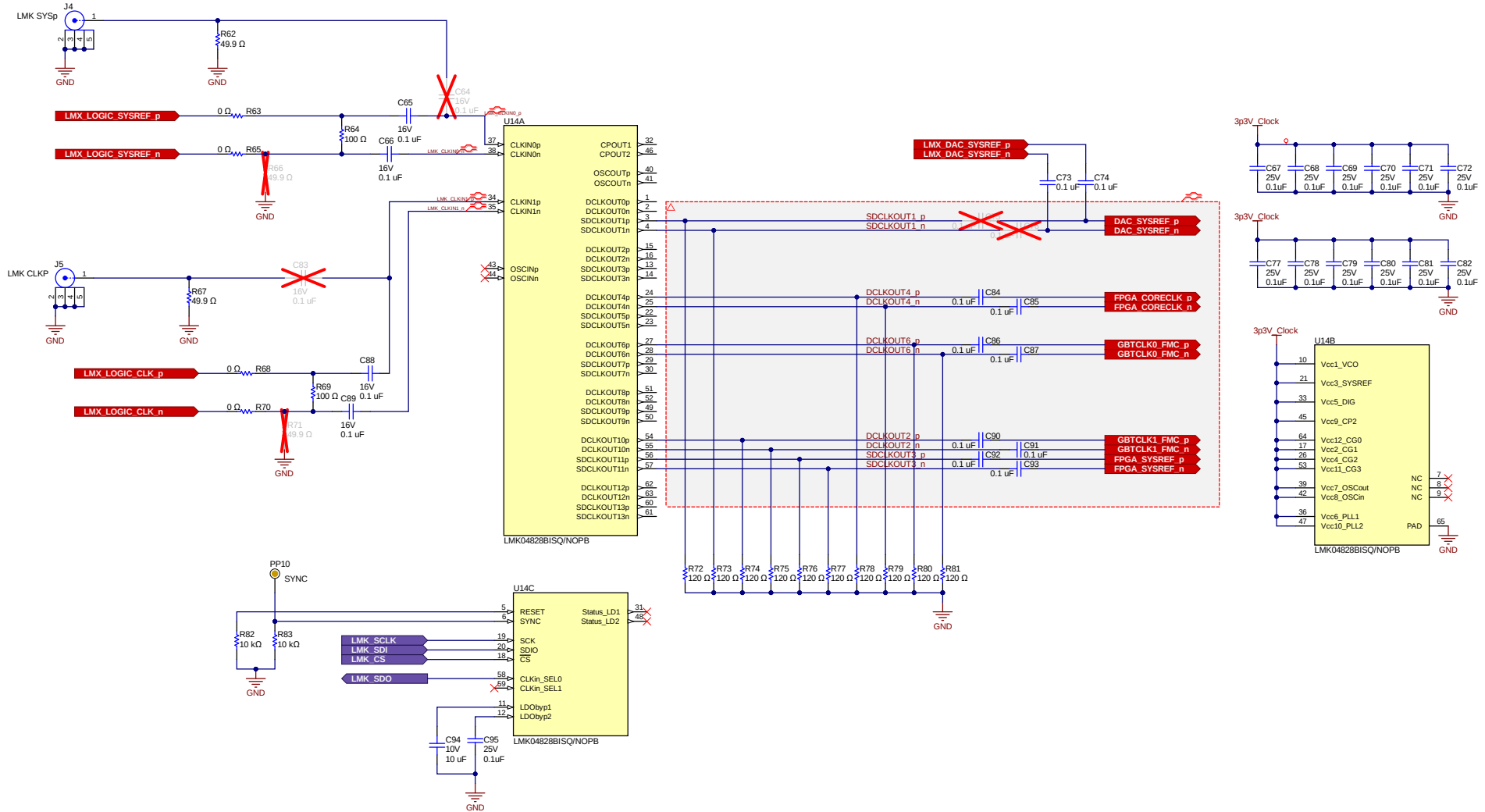
Fan Power



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Order Number: ChangeMe in variant		Designed for: Public Release		Mod. Date: 8/9/2024	
TID #: N/A		Project Title: DAC39RFXx TRF11xx EVM			
Model: AMPS214		Rev: A		Sheet Title: 12V Input & General Power Rails	
SVN Rev: N21 Not in version control		Assembly Variant: 001		Sheet: 4 of 22	
Drawn By: 		File: 12V Input RevA.SchDoc		Size: B	
Engineer: SRINIVAS BS		Contact: http://www.ti.com/support		http://www.ti.com 	
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Clocking LMK04828



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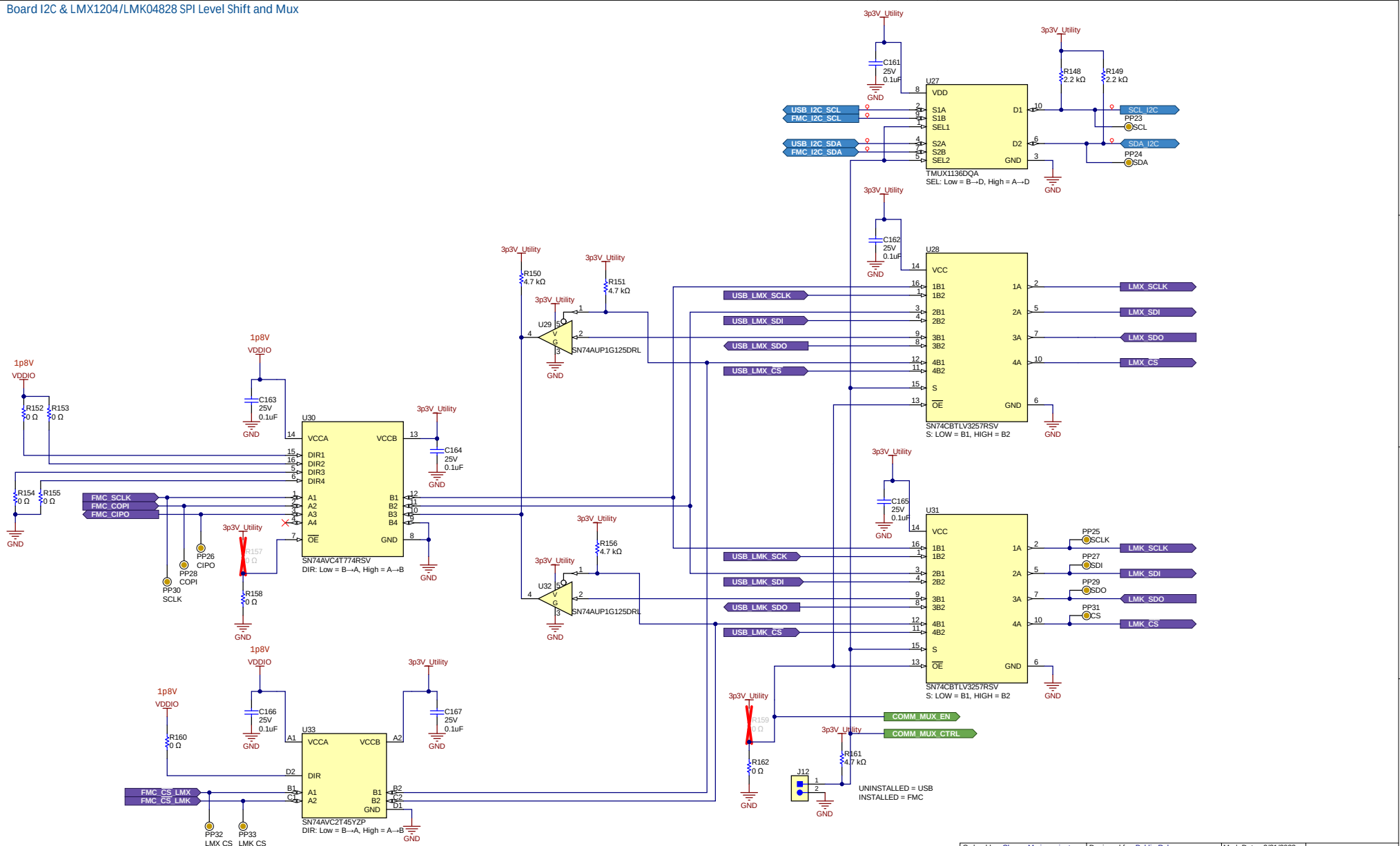
Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 8/9/2024
TID #: N/A	Project Title: DAC39Rxx TRF1xx EVM	
Number: AMPS214	Rev: A	Sheet Title: Clocking LMK04828
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 5 of 22
Drawn By: SRINIVAS BS	File: Clocking LMK04828 RevA.SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	

D



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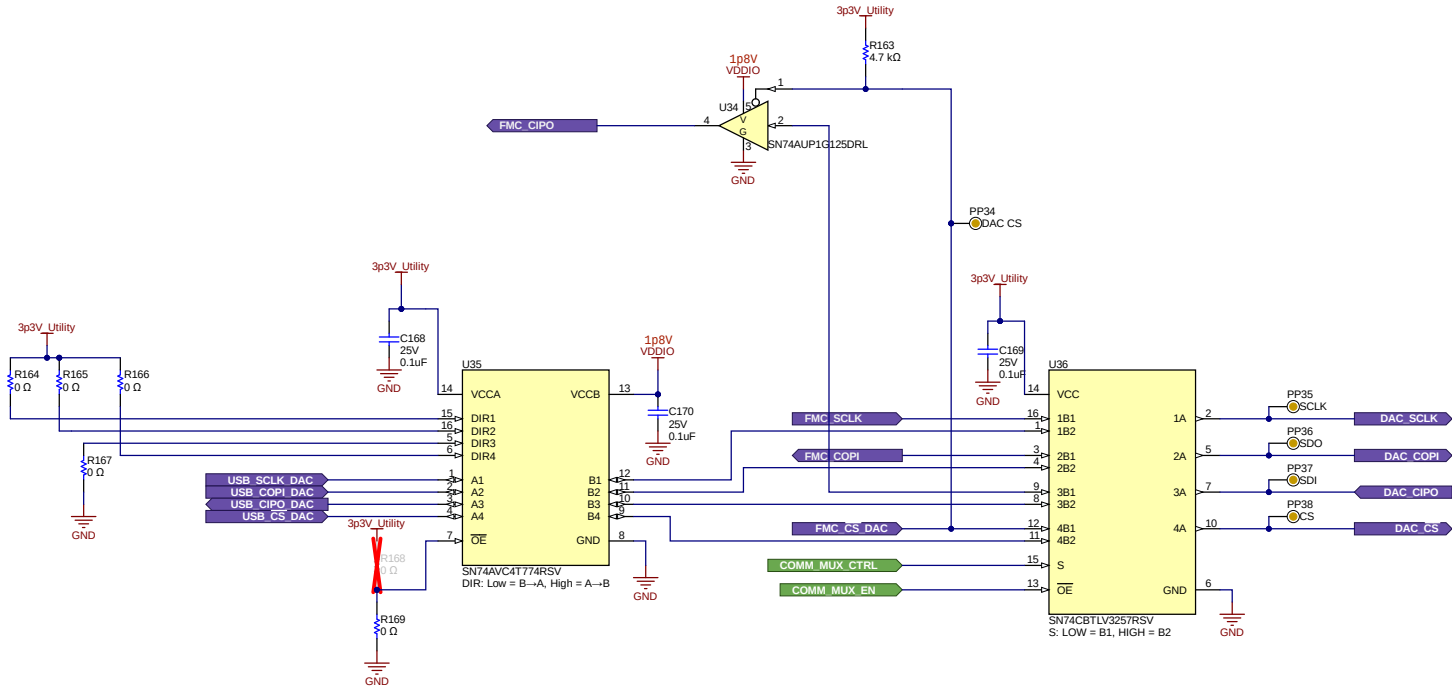
Board I2C & LMX1204/LMK04828 SPI Level Shift and Mux



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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 2/21/2023
TID #:	N/A	Project Title: DAC39RPSxx TRF11xx EVM
Number: AMPS214	Rev: A	Sheet Title: Board I2C & LMX1204/LMK04828 SPI Level Shift and
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 7 of 22
Drawn By:	File: Comms I2C LMX LMX Mux RevA.SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	

DAC39RF10 SPI Level Shift & Mux



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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 4/6/2023
TID #:	N/A	Project Title: DAC39RFxx TRF11xx EVM
Number: AMP5214	Rev: A	Sheet Title: DAC39RF10 SPI Level Shift & Mux
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 8 of 22
Drawn By:	File: Comms Mux DAC RevA.SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	

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D

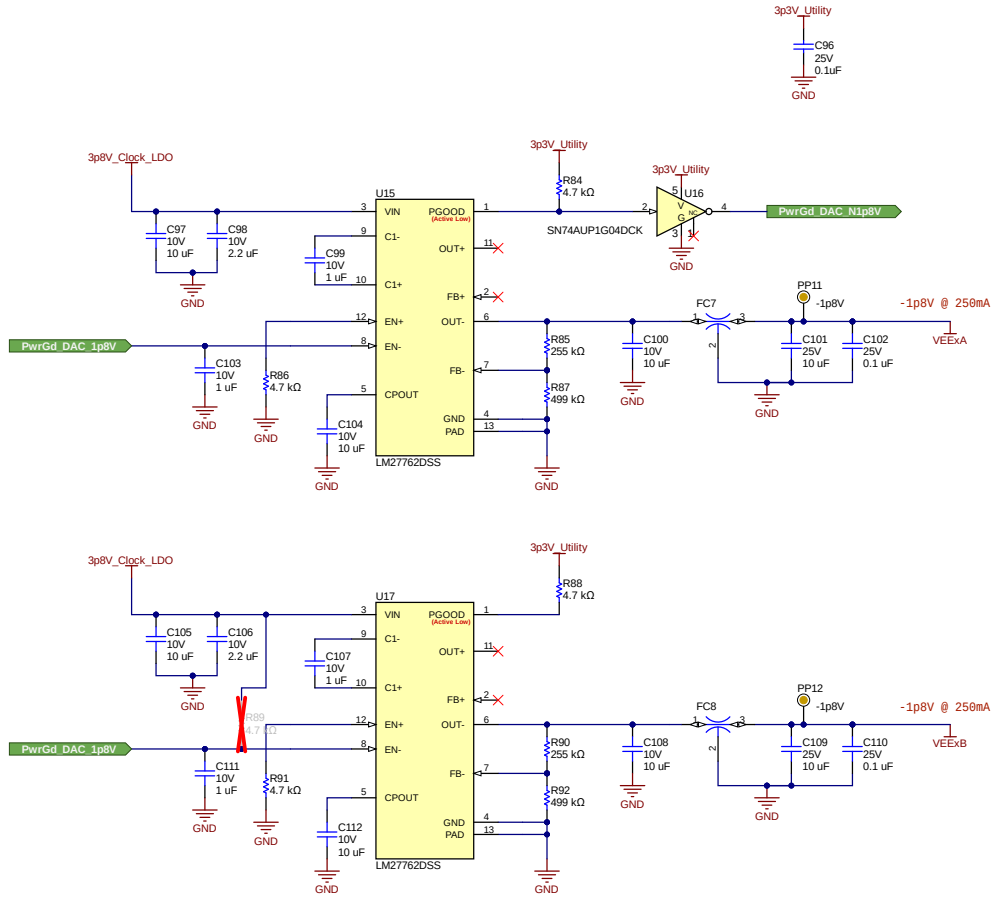


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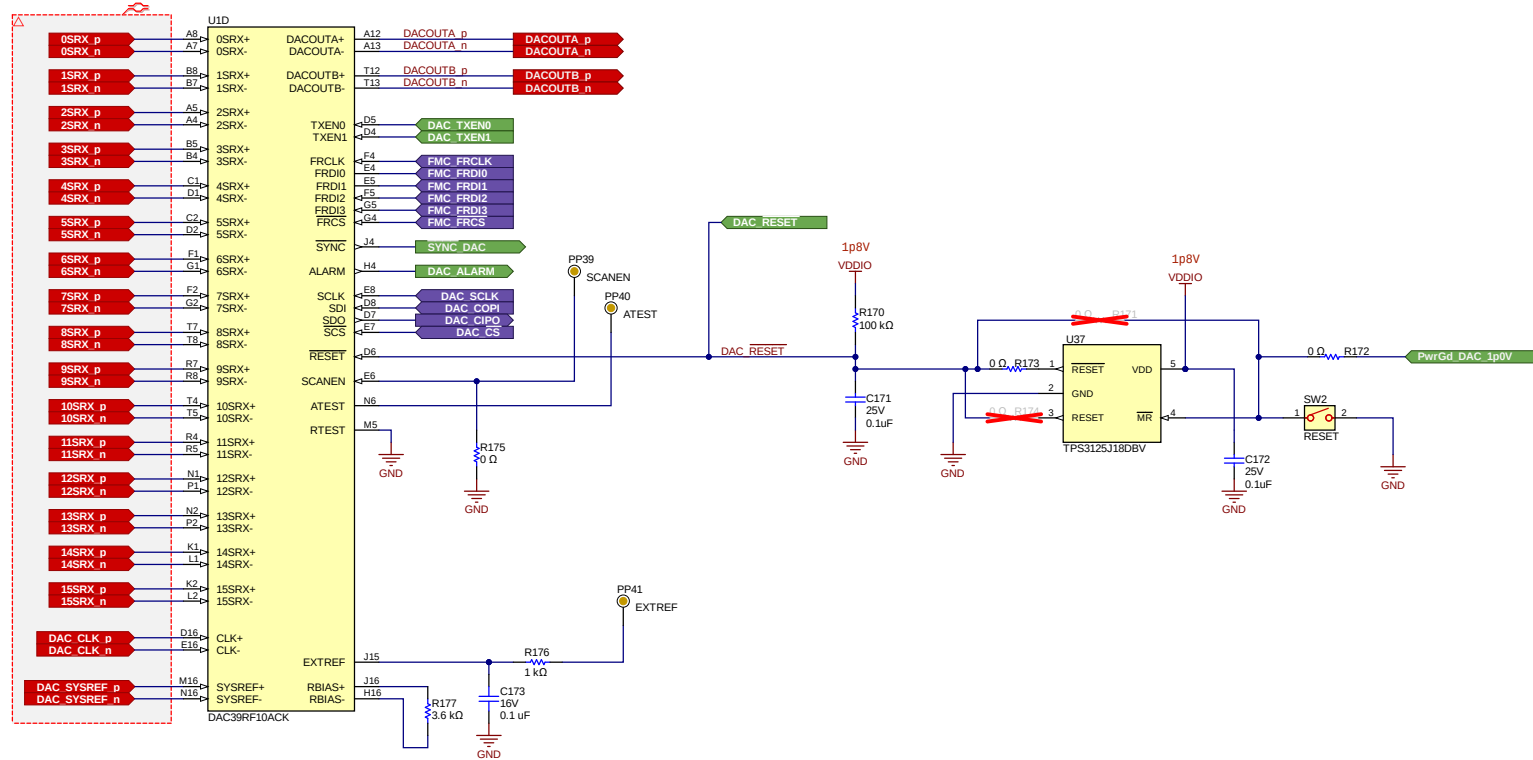
<http://bassett.ti.com>

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DAC39RF10 Charge Pump & LDO N1p8V



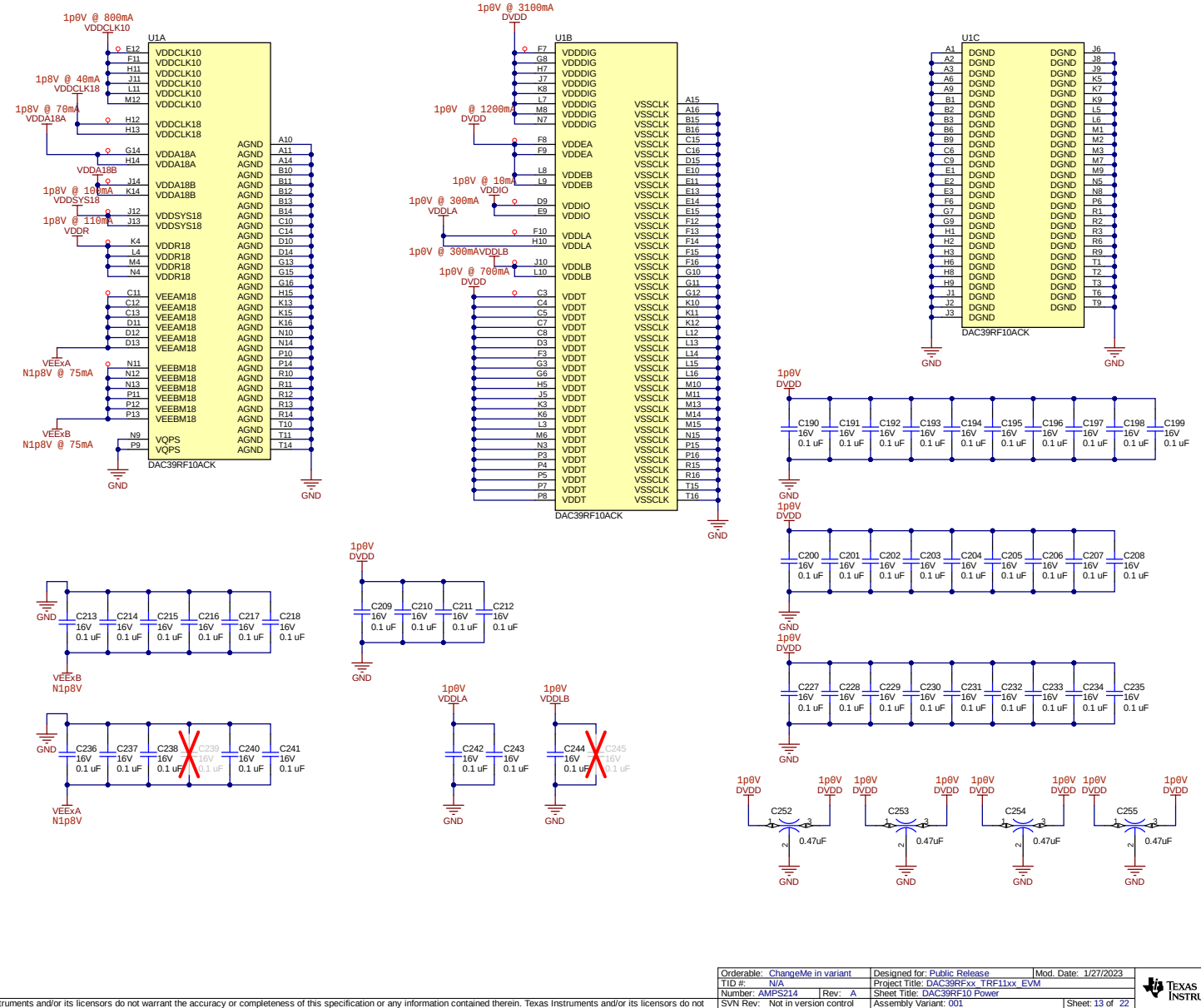
DAC39RF10 IO



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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 1/27/2023
TID #:	N/A	Project Title: DAC39RFxx TRF11xx EVM
Number: AMPS214	Rev: A	Sheet Title: DAC39RF10 IO
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 12 of 22
Drawn By:	File: DAC39RF10 IO RevA SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	

DAC39RF10 Power



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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 1/27/2023	 TEXAS INSTRUMENTS
TID #:	Project Title: DAC39RFxx TRF11xx EVM		
Number: AMPS214 Rev: A	Sheet Title: DAC39RF10 Power		
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 13 of 22	
Drawn By:	File: DAC39RF10 Power RevA_SchDoc	Size: B	
Engineer: SRINIVAS BS	Contact: http://www.ti.com/ti/support		http://www.ti.com © Texas Instruments 2018



D



Orderable:	ChangeMe in variant	Project Title:	Public Release	Mod. Date:	2/21/2023
TID #:	N/A	Project Title:	DAC33RFxx TRF11xx EVM		
Number:	AMPS214	Rev:	A	Sheet Title:	DAC33RF10-DC-DC Analog Power
SVN Rev:	Not in version control	Assembly Variant:	001	Sheet:	14 of 22
Drawn by:		File:	DC-DC Analog RevA SchDoc	Size:	B
Engineer:	SRINIVAS BS	Contact:	http://www.ti.com/support		http://www.ti.com
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D

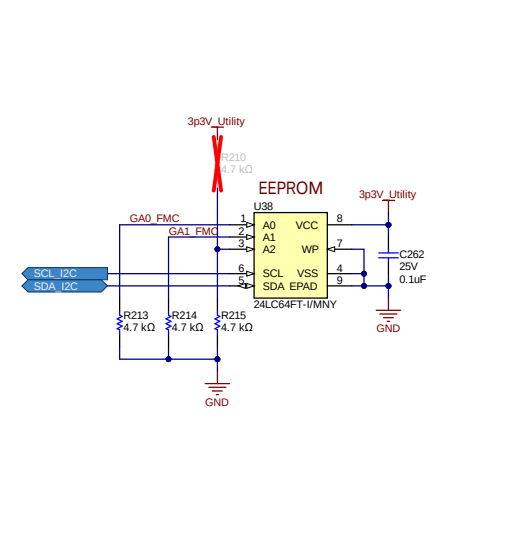
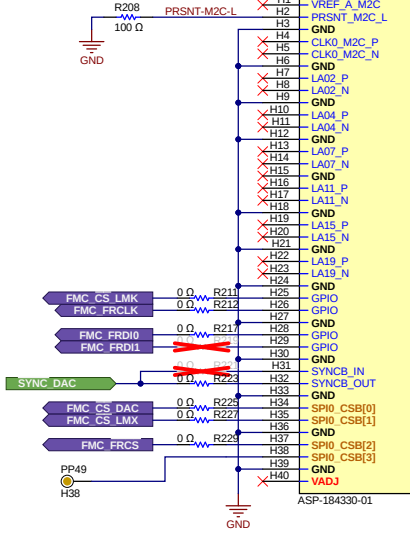
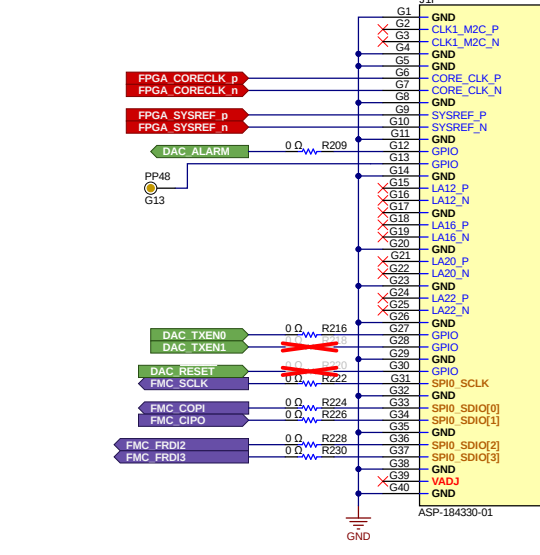
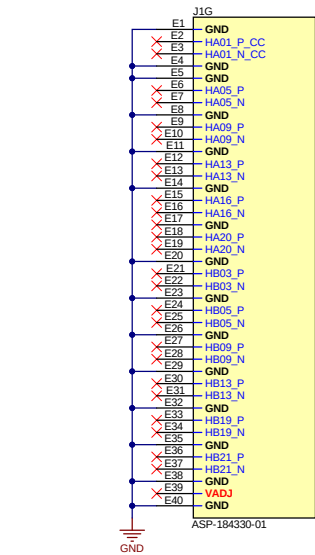
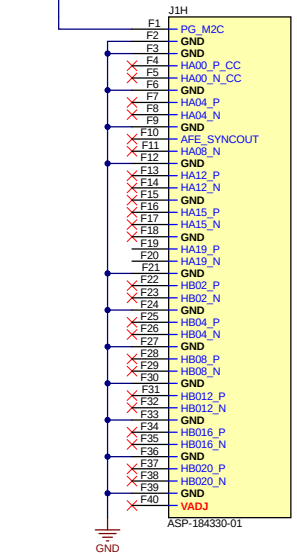
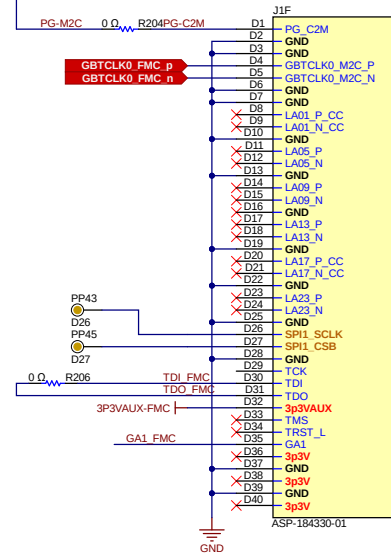
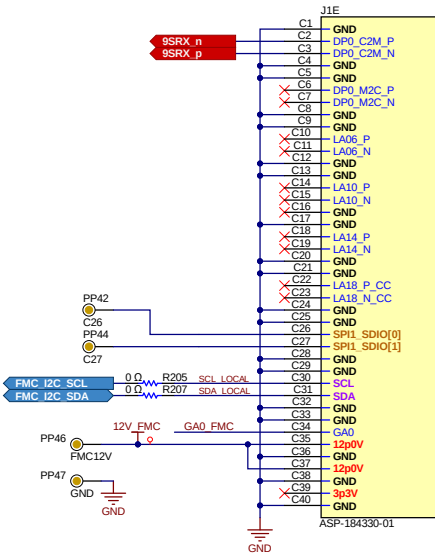
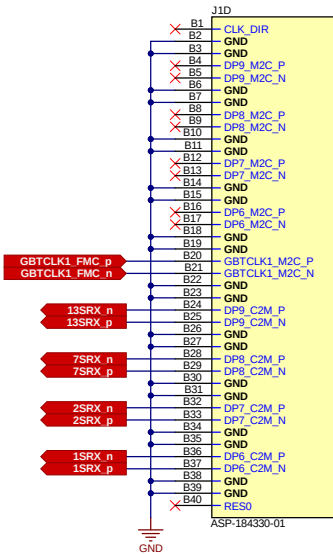
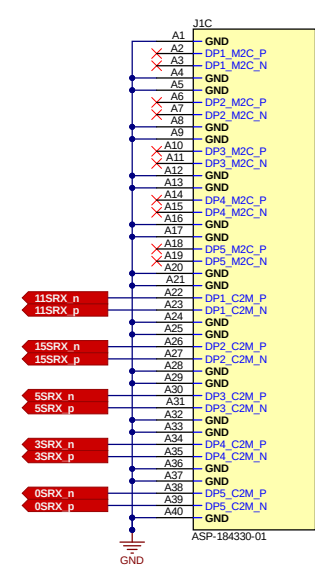


Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 2/21/2023	
TID #: N/A	Project Title: DAC39RFxx, TRF11xx EVM		
Number: AMPS214	Rev.: A	Sheet Title: LMX1224 & LMK04832 Power	
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 16 of 22	
Drawn by:	File: DC-DC LMX LMK Clocking RevA SchDoc	Size: B	
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support		http://www.ti.com © Texas Instruments 2018



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FMC+ Banks A → H

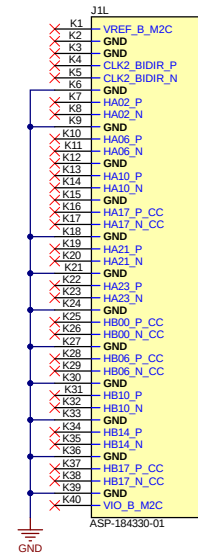
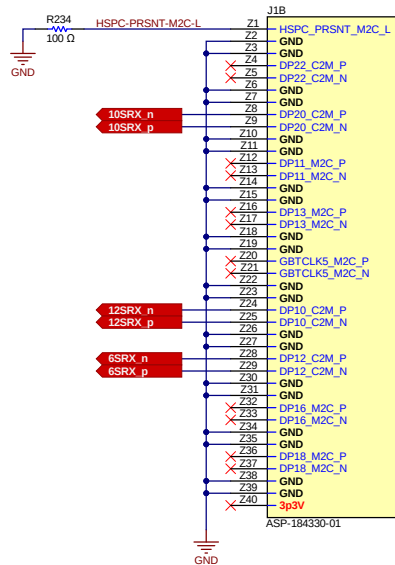
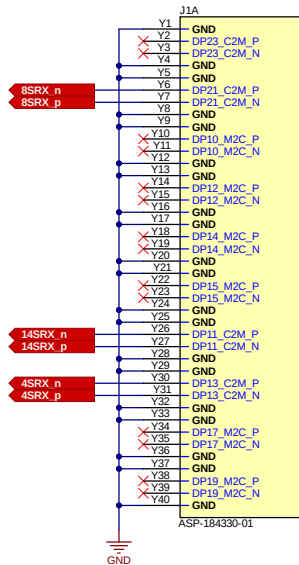
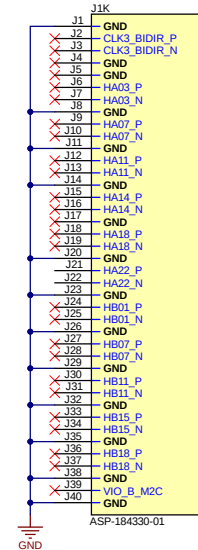
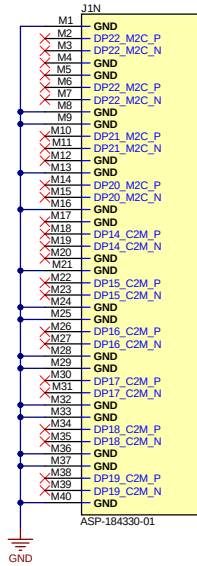
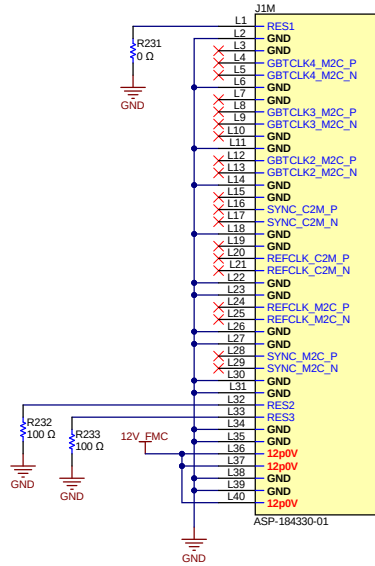


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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 8/8/2024
TID #:	N/A	Project Title: DAC39Rxx TRF11xx EVM
Number: AMPS214	Rev: A	Sheet Title: FMC+ Banks A → H
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 17 of 22
Drawn By: SRINIVAS BS	File: FMC+ Sections A-H RevA.SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	



FMC+ Banks J → Z



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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 1/27/2023
TID #: N/A	Project Title: DAC39Rxx TRF1xx EVM	
Number: AMPS214	Rev: A	Sheet Title: FMC+ Banks J → Z
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 18 of 22
Drawn By: SRINIVAS BS	File: FMC+ Sections J - Z RevA.SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	



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I2C Addresses & SPI Block Diagram

I2C Addresses

Address	Chip	Page	Function
0x40	INA231YFF	3	12V rail power monitor
0x41	INA231YFF	5	DAC 1V digital power monitor
0x42	INA231YFF	7	DAC 1.8V analog power monitor
0x43	INA231YFF	9	DAC 1.0V VDDL power monitor
0x44	INA231YFF	9	DAC 1.0V VDDCLK10 power monitor
0x50	24LC64FT-I/MNY	18	EEPROM for EVM

Cannot open file C:\Users\A0864280\Desktop\Untitled.png. File does not exist.

SPI Block Diagram

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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 12/13/2022
TID #:	N/A	Project Title: DAC39R9xx TRF11xx EVM
Number: AMPS214	Rev: A	Sheet Title: I2C Addresses & SPI Block Diagram
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 19 of 22
Drawn By:	File: I2C Device Addr SPI Block Diagram RevA SchD	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	

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1

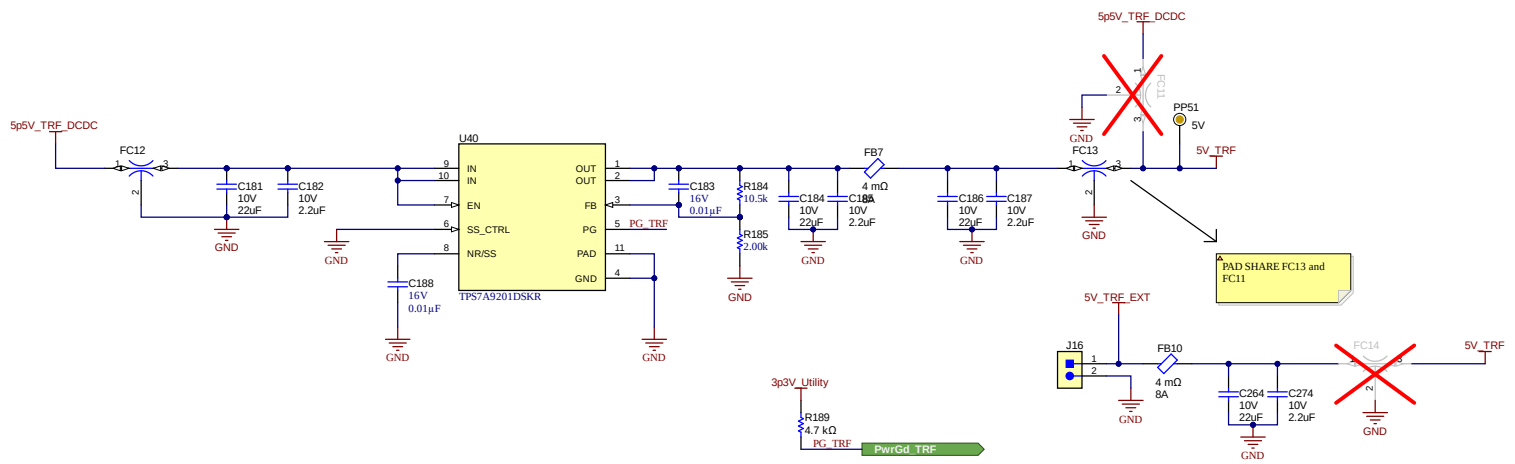
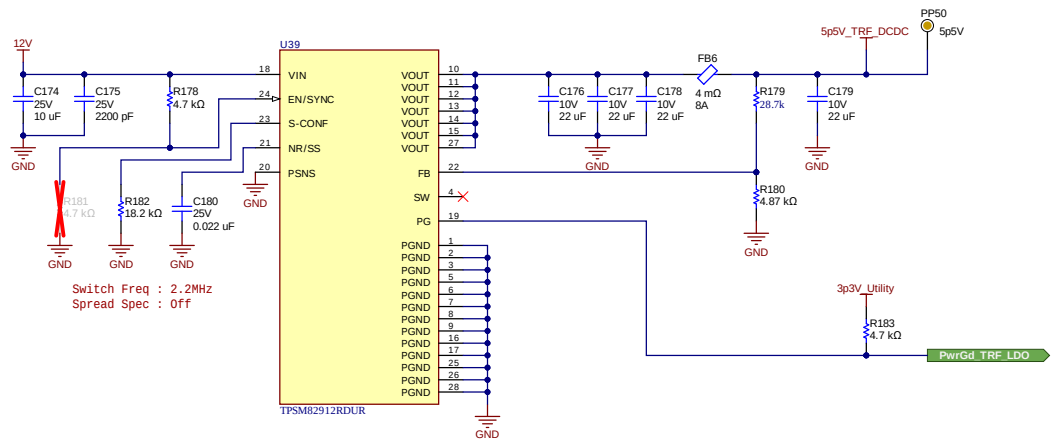
2

3

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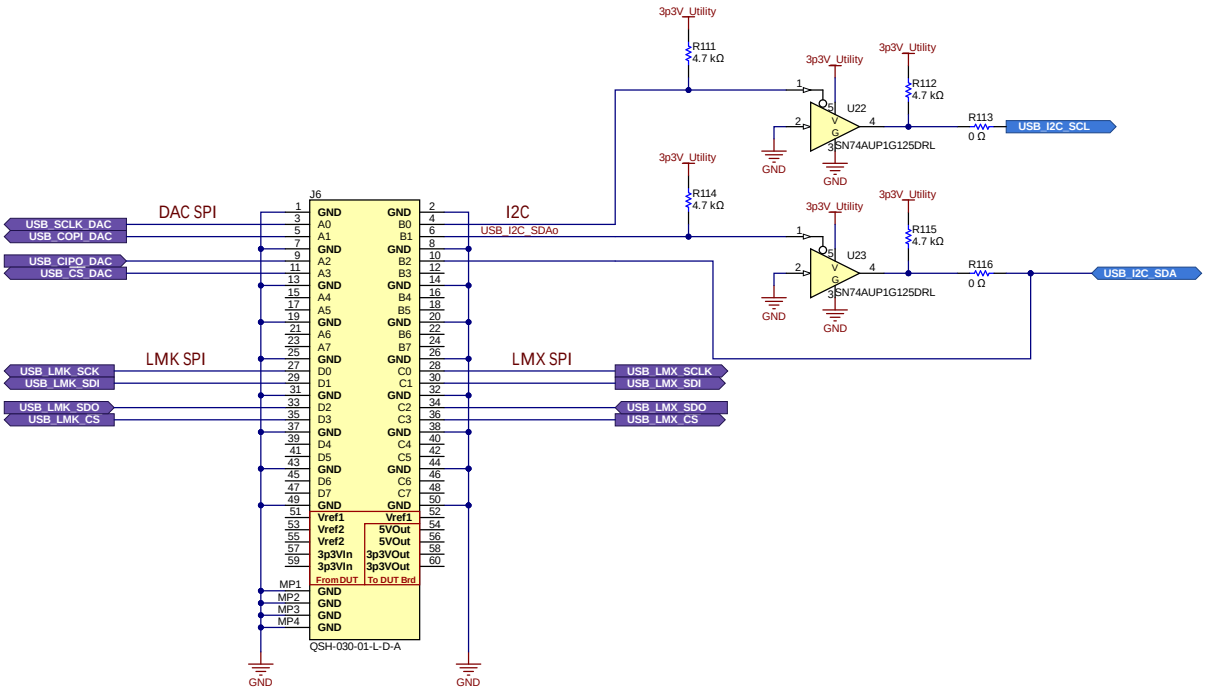
6



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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 11/2/2023
TID #:	N/A	Project Title: DAC39RFxx TRF11xx EVM
Number: AMPS214	Rev: A	Sheet Title: DAC39RF10 DC-DC Analog Power
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 20 of 22
Drawn By:	File: Power TRF1108 RevA_SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	

FTDI Debug Dongle Connection



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Orderable: ChangeMe in variant	Designed for: Public Release	Mod. Date: 2/21/2023
TID #:	N/A	Project Title: DAC39R1xx, TRF11xx, EVM
Number: AMPS214	Rev: A	Sheet Title: FTDI Debug Dongle Connection
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 22 of 22
Drawn By: SRINIVAS BS	File: USB FTDI Comms RevA.SchDoc	Size: B
Engineer: SRINIVAS BS	Contact: http://www.ti.com/support	http://www.ti.com



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NOTES: (UNLESS OTHERWISE SPECIFIED)

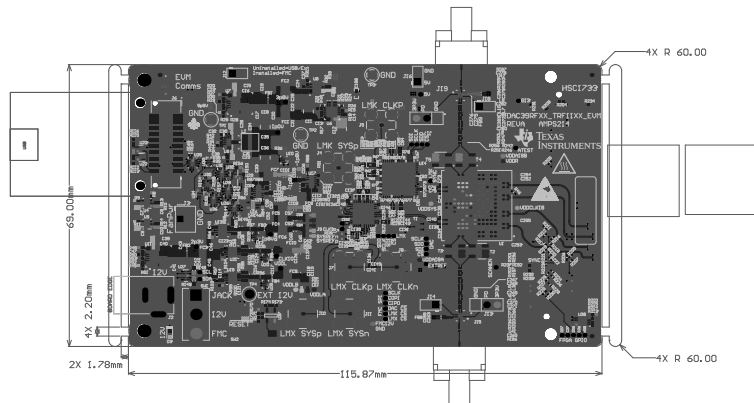
- 1.FABRICATE PER IPC-6012A CLASS 2
- 2.LAMINATE MATERIAL: MEGTRON6 & FR4-370HR
- 3.COPPER WEIGHT: SEE STACKUP
- 4.BOARD THICKNESS: 2MM +/- 10%
- 5.NO OF LAYERS: 16 AS PER SUPPLIED ARTWORK
- 6.SURFACE FINISH: ENIG
- 7.SOLDERMASK BOTH SIDES WITH LIQUID PHOTO IMAGEABLE (LPI) PER IPC-SM-840C COLOR: RED
- 8.SILKSCREEN: BOTH SIDE WITH PERMANENT NON CONDUCTIVE WHITE EPOXY INK.
SILKSCREEN MAY BE TRIMMED OFF ANY SOLDERED ENTITY.
- 9.BOW AND TWIST NOT TO EXCEED 0.180MM (0.007) PER INCH AS MEASURED PER IPC-TM-650.
- 10.SOLDER MASK CLEARANCE IS GIVEN SAME AS PAD SIZE EXCEPT FOR NPTH AND FIDUCIALS.
VENDOR SHALL OVERSIZE THE MASK CLEARANCES AS PER THE REQUIRED MANUFACTURING CAPABILITIES,
- 11.100% CONTINUITY TESTING USING DATABASE NETLIST SHALL BE PERFORMED.
- 12.ALL INNER LAYER UNCONNECTED PADS SHALL BE REMOVED.
- 13.LOCAL FIDUCIALS MUST BE FREE OF ANY MARKINGS.
- 14.ALL VIAS ARE REQUIRED NON-CONDUCTIVE FILL AND PLATED OVER ON BOTH SIDES EXCEPT 10.1 MIL DRILL VIAS. UNLESS OTHERWISE MASK IS OPENED IN GERBERS
- 15.BOARD DIMENSION: 115.87 MM X 69 MM.

224 #These assemblies must comply with workmanship standards IPC-A-610 Class 2, unless otherwise specified.

225 #These assemblies must be clean and free from flux and all contaminants. Use of no clean flux is not acceptable.

226 #These assemblies are ESD sensitive, ESD precautions shall be observed.

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



COMPONENTS MARKED 'DNP' SHOULD NOT BE ORDERED. 38 70N 03U0H2 7440 03X9AM 8713K0P003
ASSEMBLY VARIANT: [No Variations] [no variations on] 17M19W YJH1328H

PCB+REFERENCE NO: 115.87 X 69.00	A	BOARD #:	MPR5234	DATE:	A	SUN 30/08/2023	115.87 X 69.00
LAYER NAME = 115.87 X 69.00							
PLT: 115.87 X 69.00	Composite	PCB: 115.87 X 69.00	GENERATED: 01/10/2023	30/08/2023	115.87 X 69.00	115.87 X 69.00	115.87 X 69.00

IMPEDANCE TABLE

LAYERS	SINGLE ENDED (50 OHM)		DIFF PAIR (100 OHM)	
	WIDTH	TOLERANCE	WIDTH/GAP	TOLERANCE
TOP LAYER	10 MIL	+/-10%	6.25 MIL /3.5 MIL	+/-10%
L10 CTRL SIGNAL 2	-----	-----	4 MIL /5 MIL	+/-10%
BOTTOM LAYER	10 MIL	+/-10%	6.25 MIL /3.5 MIL	+/-10%

Layer	Name	Material	Thickness	Constant	Board Layer Stack
Top Overlay	Top Solder	Solder Resist	0.40mil	3.5	
1	Top Layer		1.40mil		
2	Dielectric 1	Megtron6	4.90mil	3.34	
2	L2 GND1	CF-D04	1.40mil		
3	Dielectric 2	FR4-370HR	3.00mil	3.72	
3	L3 PWR1	CF-D04	1.40mil		
4	Dielectric 3	FR4-370HR	3.00mil	3.72	
4	L4 GND2	CF-D04	1.40mil		
4	Dielectric 4	FR4-370HR	3.00mil	3.86	
5	L5 PWR2	CF-D04	1.40mil		
5	Dielectric 5	FR4-370HR	3.00mil	3.72	
6	L6 GND3	CF-D04	1.40mil		
6	Dielectric 6	FR4-370HR	3.00mil	3.86	
7	L7 Ctrl Signal 1	CF-D04	1.40mil		
7	Dielectric 8	FR4-370HR	3.00mil	3.72	
7	Dielectric 7	FR4-370HR	3.00mil	3.72	
8	L8 GND4	CF-D04	1.40mil		
8	Dielectric 9	FR4-370HR	6.00mil	3.86	
9	L9 GND5	CF-D04	1.40mil		
9	Dielectric 11	FR4-370HR	3.00mil	3.72	
9	Dielectric 10	FR4-370HR	3.00mil	3.72	
10	L10 Ctrl Signal 2	CF-D04	1.40mil		
10	Dielectric 12	FR4-370HR	3.00mil	3.86	
11	L11 GND6	CF-D04	1.40mil		
11	Dielectric 13	FR4-370HR	3.00mil	3.72	
12	L12 PWR3	CF-D04	1.40mil		
12	Dielectric 14	FR4-370HR	3.00mil	3.86	
13	L13 GND7	CF-D04	1.40mil		
13	Dielectric 15	FR4-370HR	3.00mil	3.72	
14	L14 PWR4	CF-D04	1.40mil		
14	Dielectric 16	FR4-370HR	3.00mil	3.72	
15	L15 GND8	CF-D04	1.40mil		
15	Dielectric 17	Megtron6	4.90mil	3.34	
16	Bottom Layer		1.40mil		
16	Bottom Solder	Solder Resist	0.40mil	3.5	
16	Bottom Overlay				
Total board thickness:			81.00mil		

M10 Fab Notes

DESIGN INFORMATION

MIN. TRACK WIDTH: 4 MIL
MIN. CLEARANCE: 3.5 MIL
MIN. VIA PAD SIZE: 18 MIL
MINIMUM ANNUAL RING 0.05mm (2MIL) EXTERNAL
PER PC-D-275 CLASS 2 LEVEL C
REGISTRATION TOLERANCES: METAL +/- 5 MIL HOLES +/- 3 MIL
HOLE SIZE TOLERANCE (UNLESS OTHERWISE SPECIFIED): +/- 3 MIL

MATERIAL:

☐ FR-408 ☒ ISOLA FR4-370HR (or Equivalent)
☐ Meg4 ☐ Isola I-Speed
☒ Meg6 (or Equivalent)
☐ OTHER

THICKNESS: ☐ 62 MIL (1.6mm) +/-10% ☒ OTHER 81 MIL +/-10%

TOLERANCE: ☒ ANSI PC-6012 TYPE 3 CLASS 2
☐ OTHER +/-

BOW & TWIST: ☒ ANSI PC-6012 TYPE 3 CLASS 2
☐ OTHER +/-

DRILLING:

REFERENCE: ☒ AS SHOWN ☐ NC DRILL FILES
PTH COPPER THICKNESS: ☒ 20-30 um ☐ OTHER

BOARD FINISH:

SILKSCREEN: ☒ TOP ☐ BOTTOM
SILKSCREEN COLOR: ☐ WHITE ☐ OTHER WHITE
SOLDER RESIST COLOR: ☐ GREEN ☒ OTHER RED
☒ MATTE ☐ SEMI-GLOSS

SURFACE FINISH: ☒ IMMERSION GOLD (ENIG) ☐ ENERP
☐ IMM. TN/SILVER OR EQUIV ☐ HARD GOLD (J30)
☐ 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 PC-A-600F CLASS -> ☐ 1 ☒ 2 ☐ 3
☒ RoHS ☐ OTHER PER ORDER

ALL BOARDS MUST MEET OR EXCEED UL94-V0 REQUIREMENTS.
PCB MUST BEAR THE UL94-V0 UL REGISTERED MATERIAL ID NUMBER

ADDITIONAL REQUIREMENTS:

MICROSECTION: ☐ YES

BARE BOARD ELEC. TEST: ☐ NONE ☒ REQUIRED ☐ PER ORDER

☒ 16 MIL & SMALLER VAS REQUIRE NON-CONDUCTIVE FILL AND PLANARIZE
☒ OUTER LAYER TRACKS 10 MIL WIDE REQUIRE 50 OHM SINGLE-ENDED IMPEDANCE
☒ OUTER LAYER TRACKS 6.25 MIL WIDE WITH 3.5 MIL AIR GAP REQUIRE 100 OHM DIFFERENTIAL IMPEDANCE
☐ INNER LAYER XX & XX TRACKS XX MIL WIDE REQUIRE 50 OHM SINGLE-ENDED IMPEDANCE
☒ INNER LAYER 10 TRACKS 4 MIL WIDE WITH 5 MIL AIR GAP REQUIRE 100 OHM DIFFERENTIAL IMPEDANCE



PROJECT TITLE:
DAC39RF xx_TRF11xx_EVM

DESIGNED FOR:
Public Release

FILE NAME:
DAC39RF xx_TRF11xx_EVM_PCB_111523_PcbDoc

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ENGINEER:
SRINIVAS BS

LAYOUT BY:
KRAVICKANNAN

SCALE: 1.00

ALTA DESIGN VERSION:
24.6.1.21