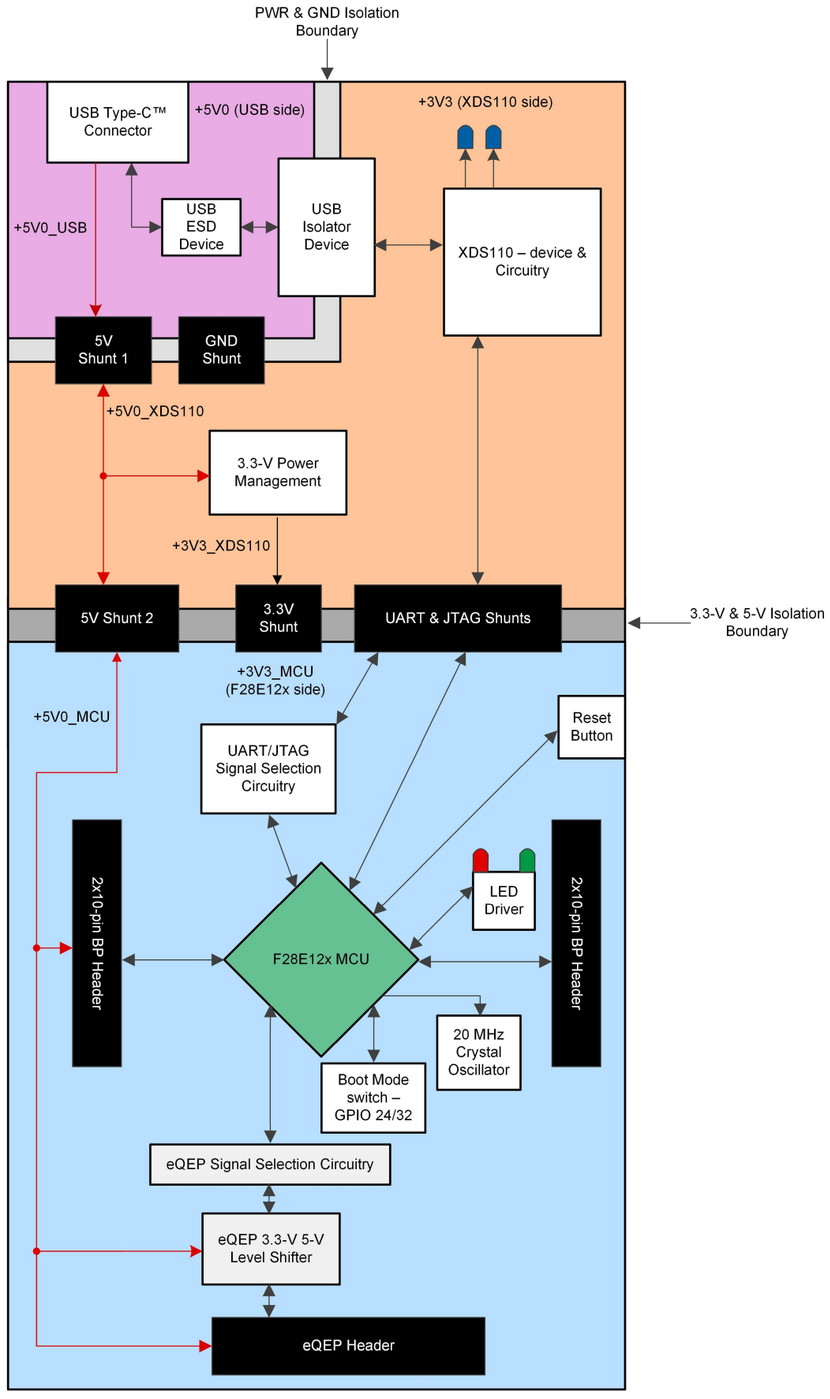
Revision History

Rev	ECN #	Approved Date	Approved by	Notes
E1	N/A	Feb 6, 2025	PL	Original engineering release
E2	N/A	Mar 4, 2025	PL	Minor changes to silkscreen Changed U14 to TPS7A8033
A	N/A	Jul 21, 2025	PL	Updated version of F28E120SC device



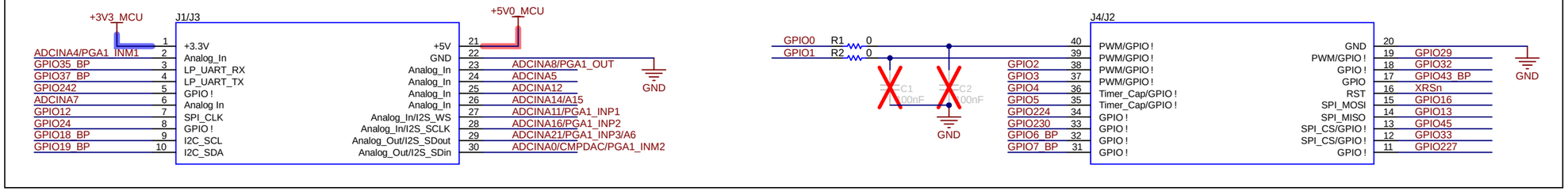
Texas Instruments and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Texas Instruments and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Texas Instruments and/or i t s licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.

Orderable: LAUNCHXL-F28E12X		Designed for: Public Release	Mod. Date: 7/21/2025
TID #:		Project Title: LAUNCHXL-F28E12X	
Number: MCU152	Rev: A	Sheet Title:	
SVN Rev: Version control disabled		Assembly Variant: 001	Sheet: 1 of 8
Drawn By: Peter Luong		File: MCU152A_Block_Diagram.SchDoc	Size: B
Engineer: Peter Luong		Contact: http://www.ti.com/support	

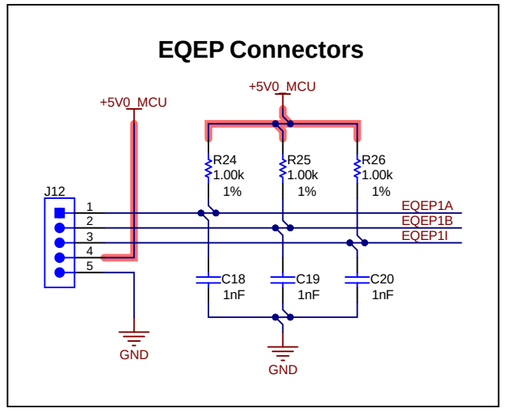
Texas Instruments
http://www.ti.com

© Texas Instruments 2025

BoosterPack Headers Site 1 (Top)



EQEP Connectors



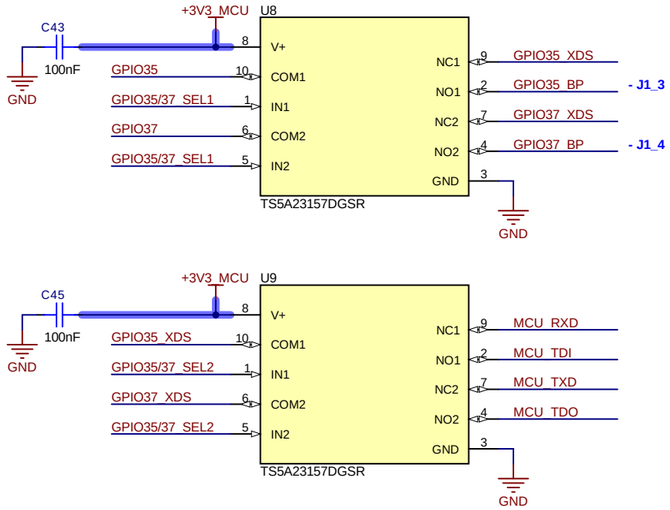
Texas Instruments and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Texas Instruments and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Texas Instruments and/or i t s licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.

Orderable: LAUNCHXL-F28E12X		Designed for: Public Release	Mod. Date: 1/6/2025
TID #:		Project Title: LAUNCHXL-F28E12X	
Number: MCU152	Rev: A	Sheet Title:	
SVN Rev: Version control disabled		Assembly Variant: 001	Sheet: 2 of 8
Drawn By: Peter Luong		File: MCU152A_Connectors.SchDoc	Size: B
Engineer: Peter Luong		Contact: http://www.ti.com/support	

TEXAS INSTRUMENTS
http://www.ti.com

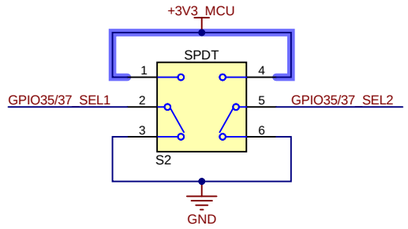
© Texas Instruments 2025

GPIO35/37 Routing (BoosterPack, JTAG, SCI/UART)

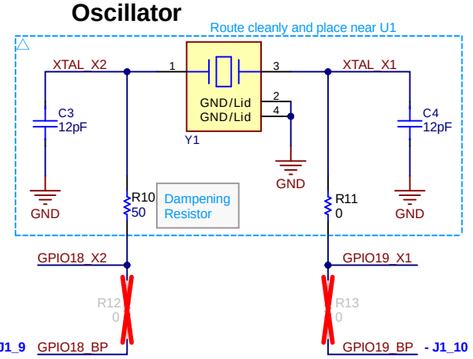


- J1_3
- J1_4

GPIO35/37_SEL1	GPIO35/37_SEL2	GPIO35/37 Route
0	0	XDS110: UART RXD/TXD - DEFAULT
0	1	XDS110: JTAG TDI/TDO
1	x	BoosterPack



Oscillator

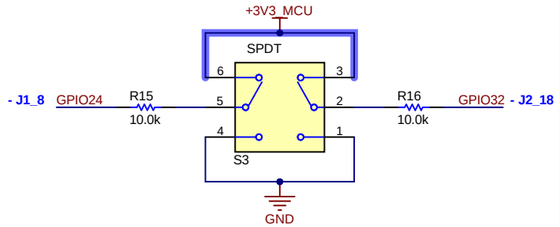


- J1_9
- J1_10

By default:
- Crystal Y2 is connected between GPIO18_X2 and GPIO19_X1.
- GPIO18_BP AND GPIO19_BP are connected to the BoosterPack headers.

If GPIO18 and GPIO19 are needed at the Boosterpack Headers:
- Remove R10 and R11, populate R12 and R13 with 0 ohm resistors
- The F28E12x device's internal oscillator will need to be used

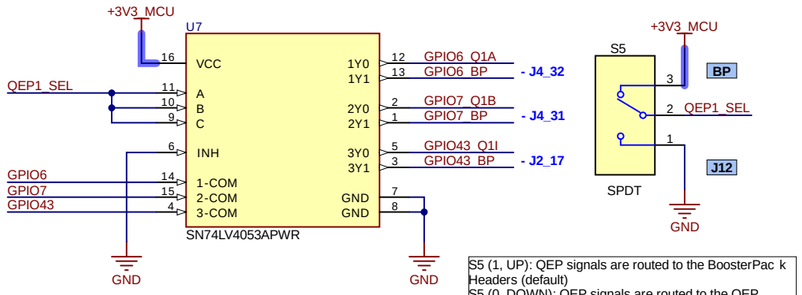
Boot Mode Select



Selected Boot Mode Chart

Mode #	GPIO24	GPIO32	Boot Mode
00	0	0	Boot from Parallel GPIO
01	0	1	Boot from SCI / Wait Mode
02	1	0	Boot from CAN
03	1	1	Boot from Flash

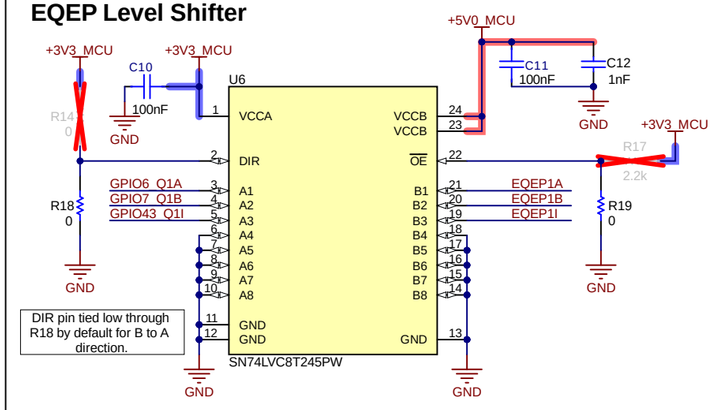
EQEP Routing



- J4_32
- J4_31
- J2_17

S5 (1, UP): QEP signals are routed to the BoosterPac k Headers (default)
S5 (0, DOWN): QEP signals are routed to the QEP Headers

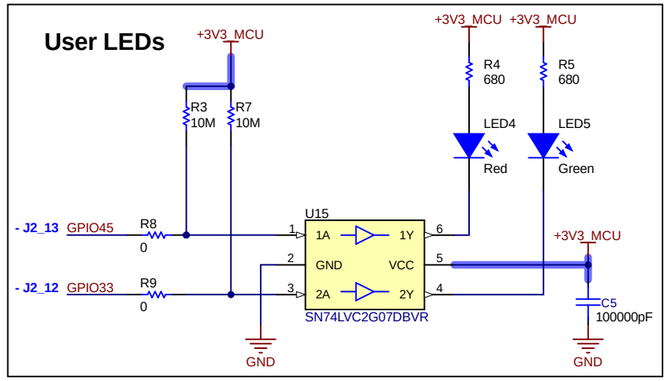
EQEP Level Shifter



DIR pin tied low through R18 by default for B to A direction.

To disable the Level Shifter:
1. De-populate R19
2. Place a 2.2k ohm resistor on R17 to pull-up OE

User LEDs

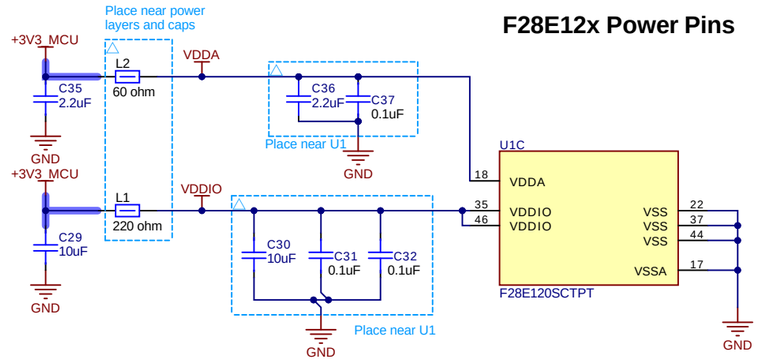


Texas Instruments and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Texas Instruments and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Texas Instruments and/or i t s licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.

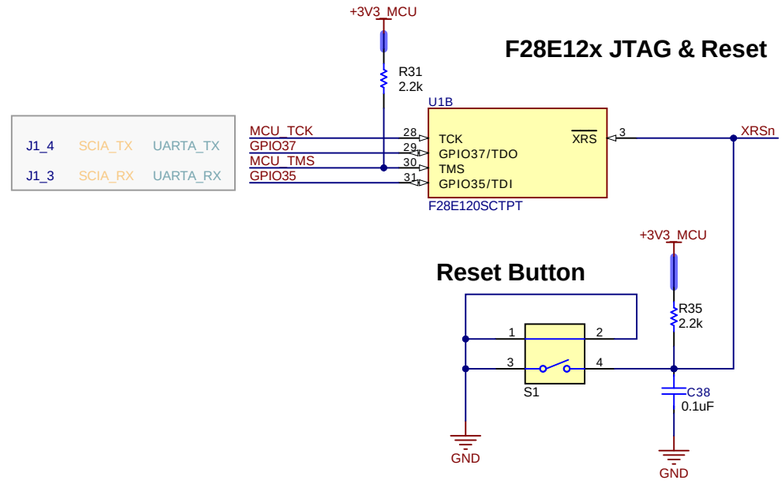
Orderable: LAUNCHXL-F28E12X		Designed for: Public Release	Mod. Date: 3/10/2025
TID #:		Project Title: LAUNCHXL-F28E12X	
Number: MCU152	Rev: A	Sheet Title:	
SVN Rev: Version control disabled		Assembly Variant: 001	Sheet: 3 of 8
Drawn By: Peter Luong		File: MCU152A_AltRouting_Misc.SchDoc	Size: B
Engineer: Peter Luong		Contact: http://www.ti.com/support	http://www.ti.com

© Texas Instruments 2025

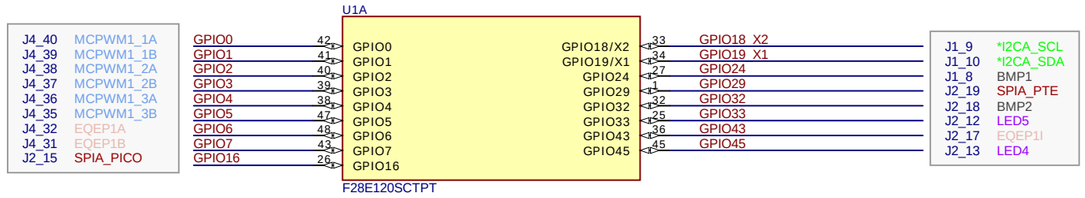
F28E12x Power Pins



F28E12x JTAG & Reset



F28E12x GPIO Pins

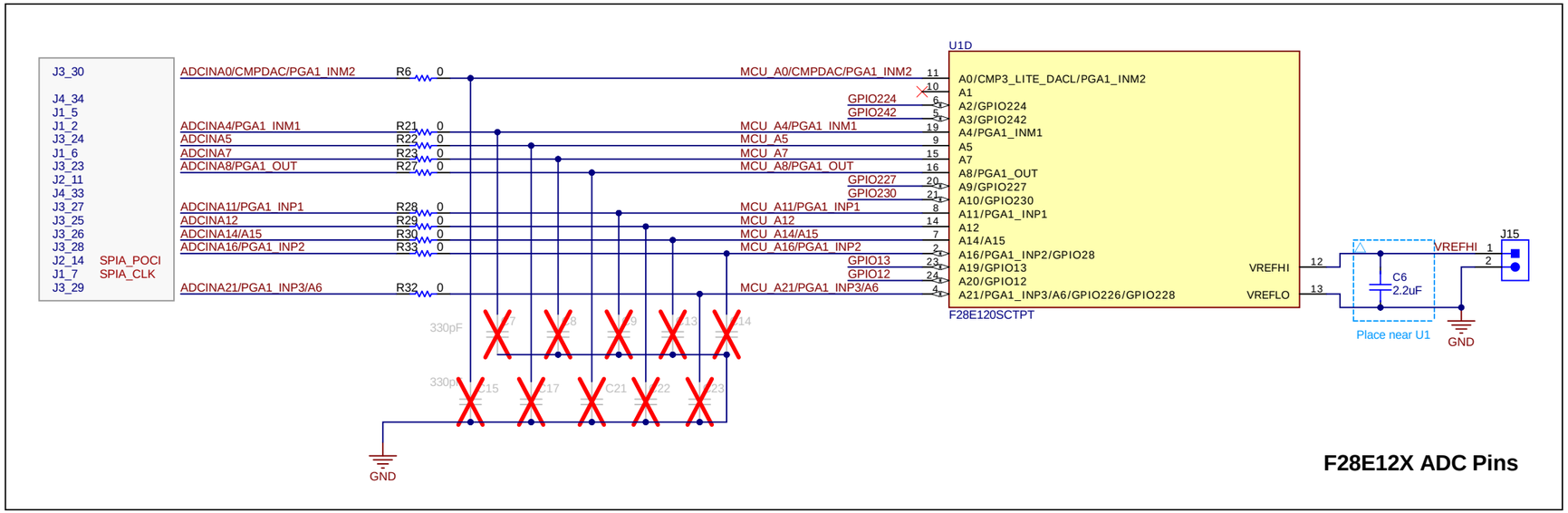


Texas Instruments and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Texas Instruments and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Texas Instruments and/or i t s licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.

Orderable: LAUNCHXL-F28E12X		Designed for: Public Release	Mod. Date: 7/21/2025
TID #:		Project Title: LAUNCHXL-F28E12X	
Number: MCU152	Rev: A	Sheet Title:	
SVN Rev: Version control disabled		Assembly Variant: 001	Sheet: 4 of 8
Drawn By: Peter Luong		File: MCU152A_F28E12X_Device.SchDoc	Size: B
Engineer: Peter Luong		Contact: http://www.ti.com/support	

TEXAS INSTRUMENTS
http://www.ti.com

© Texas Instruments 2025



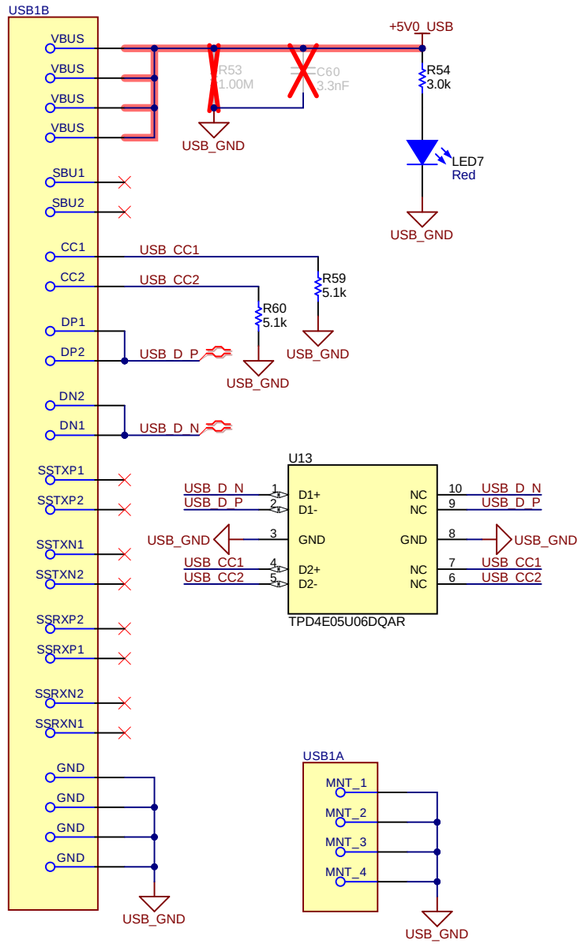
Texas Instruments and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Texas Instruments and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Texas Instruments and/or i t s licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.

Orderable: LAUNCHXL-F28E12X		Designed for: Public Release	Mod. Date: 7/21/2025
TID #:		Project Title: LAUNCHXL-F28E12X	
Number: MCU152	Rev: A	Sheet Title:	
SVN Rev: Version control disabled		Assembly Variant: 001	Sheet: 5 of 8
Drawn By: Peter Luong		File: MCU152A_ADC.SchDoc	Size: B
Engineer: Peter Luong		Contact: http://www.ti.com/support	

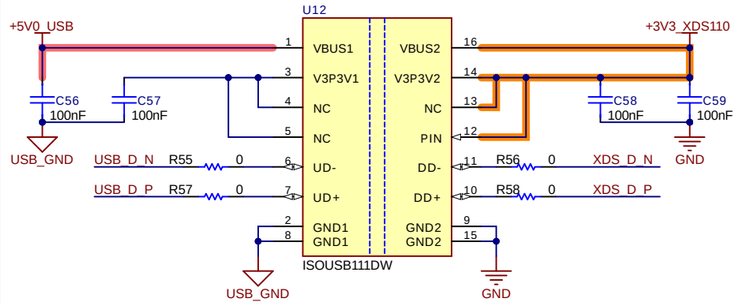
TEXAS INSTRUMENTS
http://www.ti.com

© Texas Instruments 2025

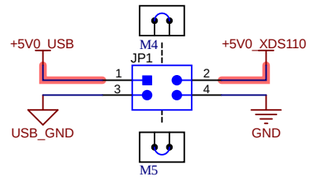
USB-C Connector



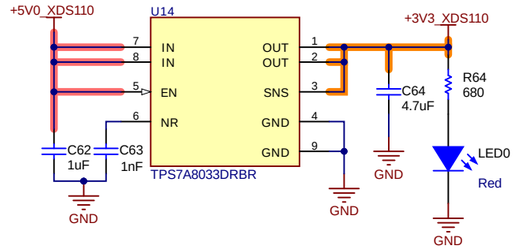
USB Isolation



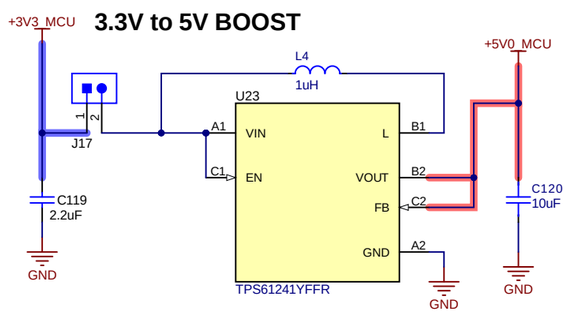
PWR & GND Isolation Boundary



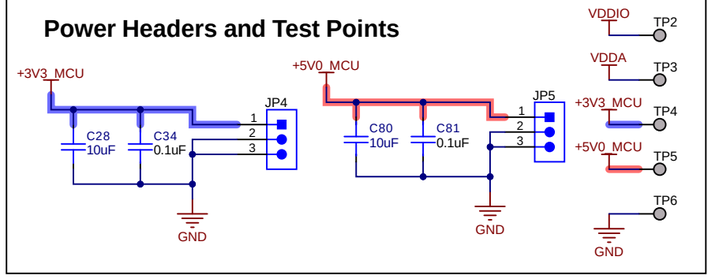
5V to 3.3V



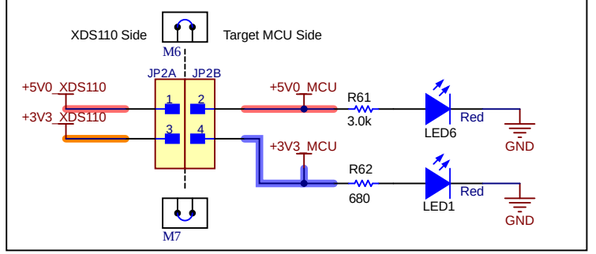
3.3V to 5V BOOST



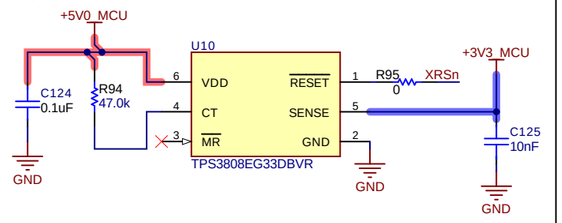
Power Headers and Test Points



5V & 3.3V Isolation Boundary



System Supervisory Circuit



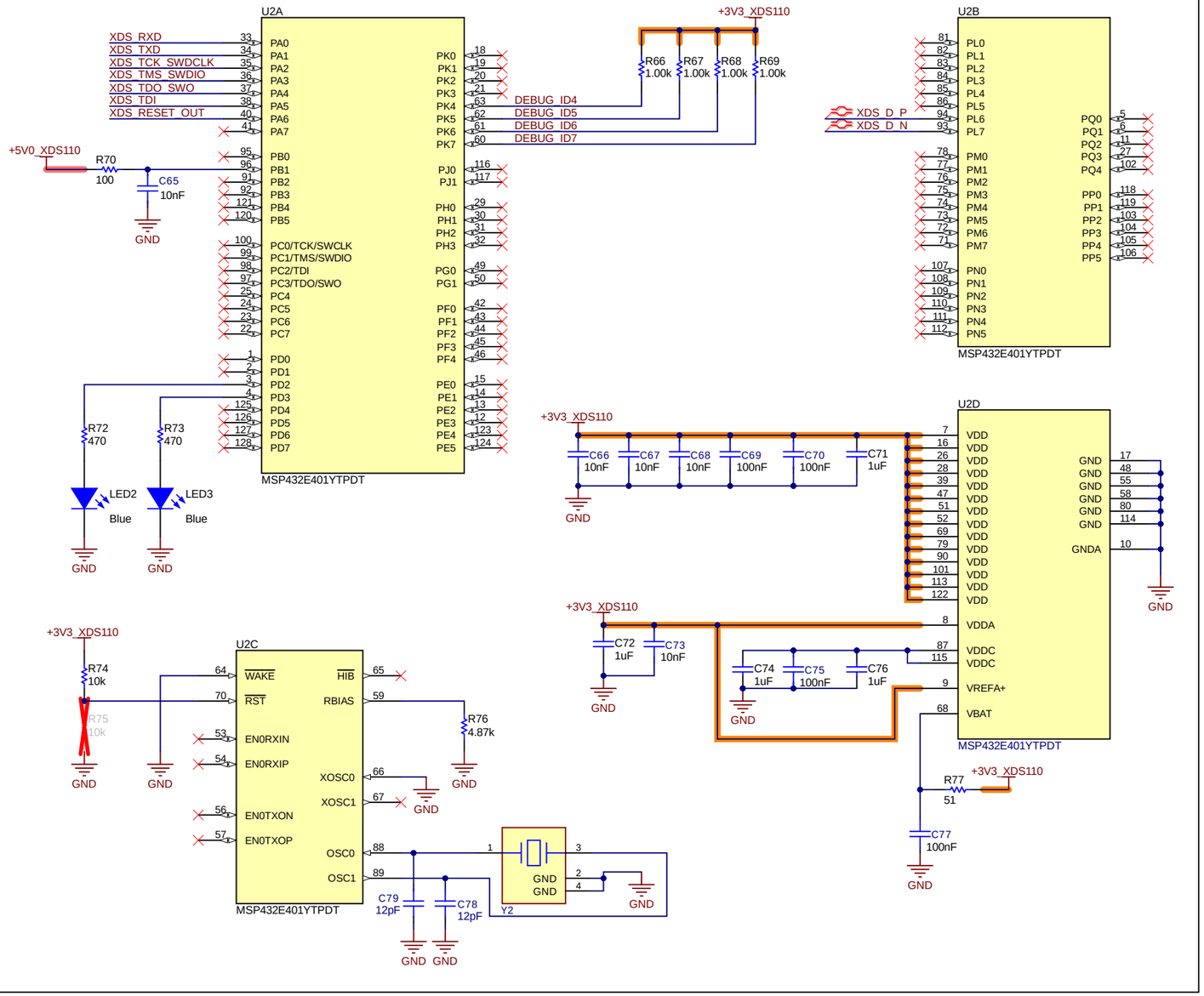
Texas Instruments and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Texas Instruments and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Texas Instruments and/or i t s licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.

Orderable: LAUNCHXL-F28E12X		Designed for: Public Release	Mod. Date: 3/10/2025
TID #:		Project Title: LAUNCHXL-F28E12X	
Number: MCU152	Rev: A	Sheet Title:	
SVN Rev: Version control disabled		Assembly Variant: 001	Sheet: 6 of 8
Drawn By: Peter Luong		File: MCU152A_USB_and_Power.SchDoc	Size: B
Engineer: Peter Luong		Contact: http://www.ti.com/support	

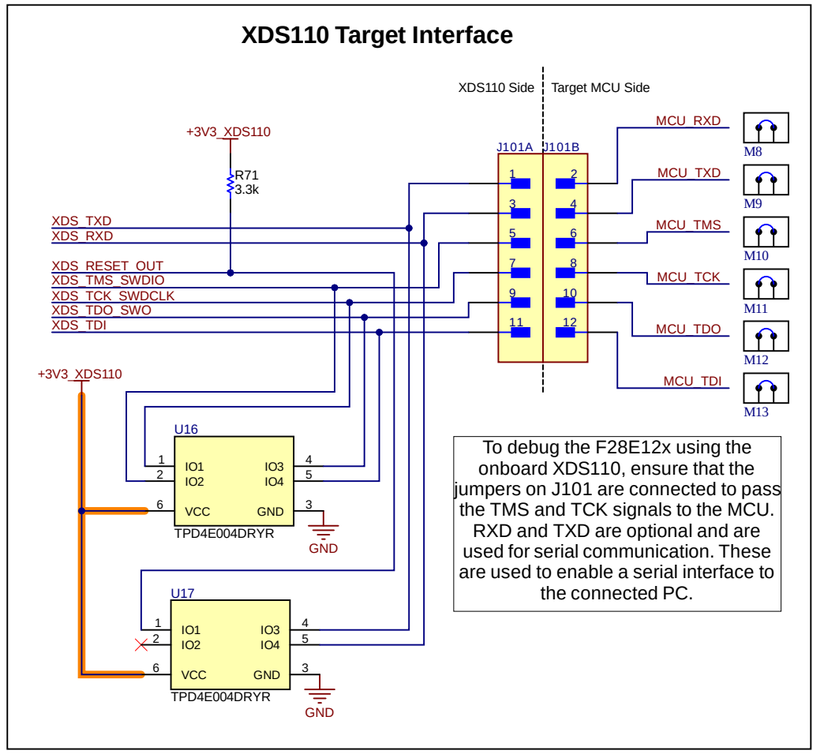
TEXAS INSTRUMENTS
http://www.ti.com

© Texas Instruments 2025

XDS110 Device



XDS110 Target Interface



To debug the F28E12x using the onboard XDS110, ensure that the jumpers on J101 are connected to pass the TMS and TCK signals to the MCU. RXD and TXD are optional and are used for serial communication. These are used to enable a serial interface to the connected PC.

Texas Instruments and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Texas Instruments and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Texas Instruments and/or i t s licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.

Orderable: LAUNCHXL-F28E12X		Designed for: Public Release	Mod. Date: 3/10/2025
TID #:		Project Title: LAUNCHXL-F28E12X	
Number: MCU152	Rev: A	Sheet Title:	
SVN Rev: Version control disabled		Assembly Variant: 001	Sheet: 7 of 8
Drawn By: Peter Luong		File: MCU152A_XDS110_MCU.SchDoc	Size: B
Engineer: Peter Luong		Contact: http://www.ti.com/support	

Texas Instruments
http://www.ti.com

© Texas Instruments 2025

FID1 FID2 FID3

FID4 FID5 FID6

MH1 MH2

MH3 MH4

H1 MAE-10

H2 MAE-10

PCB Number: MCU152
PCB Rev: A

Logo1
PCB
LOGO
Texas Instruments

CE Logo1

Logo2
PCB
LOGO
FCC disclaimer

Logo3
PCB
LOGO
WEEE logo

Logo4
PCB
LOGO
Texas Instruments

ZZ1
Assembly Note
These assemblies are ESD sensitive, ESD precautions shall be observed.

ZZ2
Assembly Note
These assemblies must be clean and free from flux and all contaminants. Use of no clean flux is not acceptable.

ZZ3
Assembly Note
These assemblies must comply with workmanship standards IPC-A-610 Class 2, unless otherwise specified.

Texas Instruments and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Texas Instruments and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Texas Instruments and/or i t s licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.

Orderable: LAUNCHXL-F28E12X		Designed for: Public Release	Mod. Date: 2/5/2025
TID #:		Project Title: LAUNCHXL-F28E12X	
Number: MCU152	Rev: A	Sheet Title:	
SVN Rev: Version control disabled		Assembly Variant: 001	Sheet: 8 of 8
Drawn By: Peter Luong		File: MCU152A_Hardware.SchDoc	Size: B
Engineer: Peter Luong		Contact: http://www.ti.com/support	

TEXAS INSTRUMENTS
http://www.ti.com

© Texas Instruments 2025

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2025, Texas Instruments Incorporated