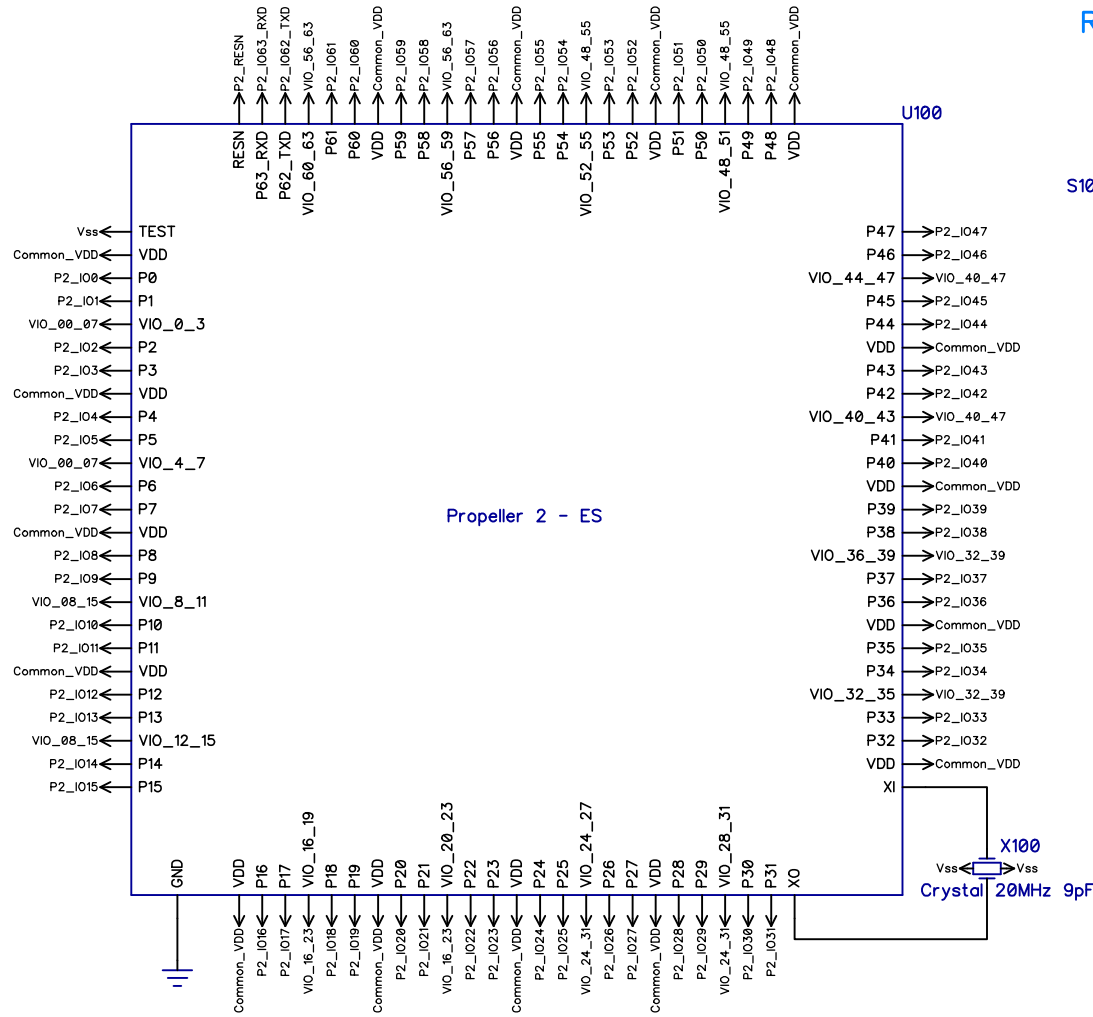
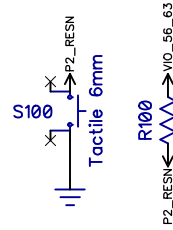


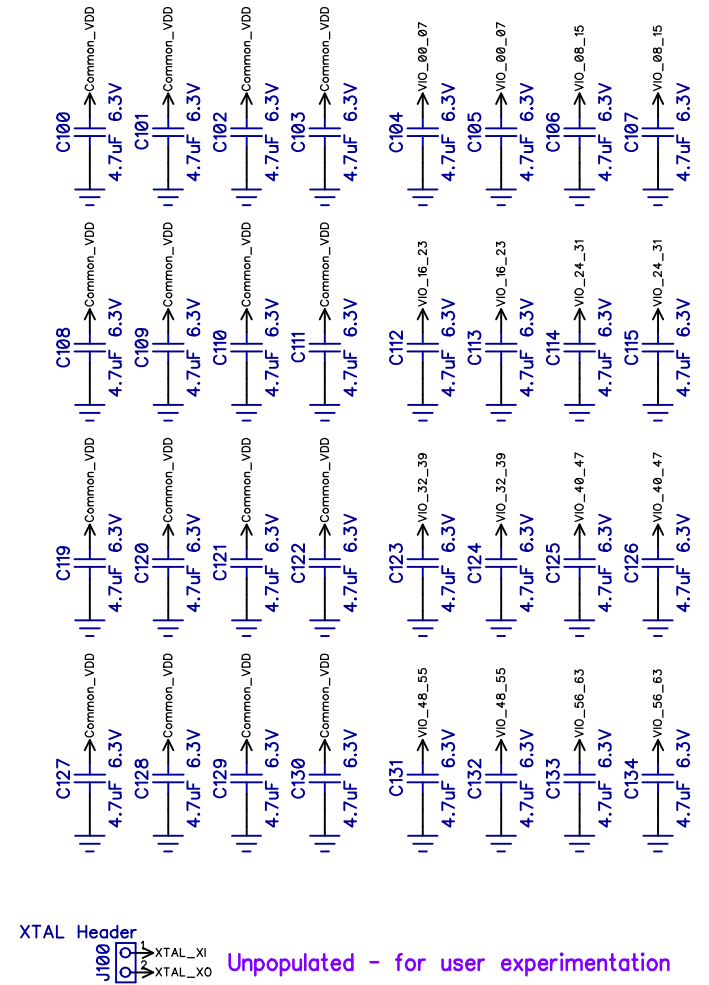
Microcontroller



Reset Switch



VDD and VIO local decoupling



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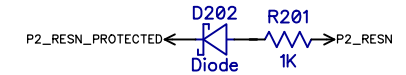
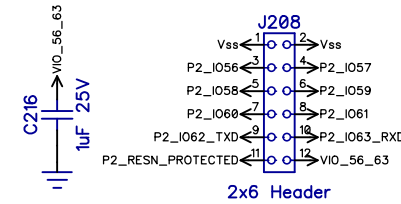
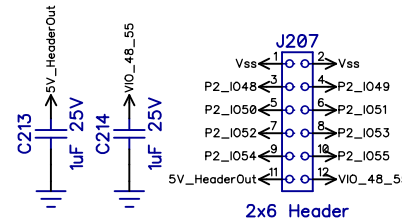
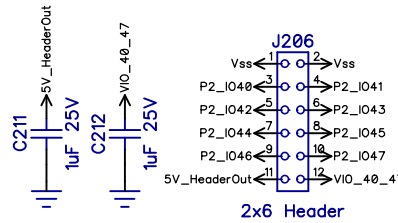
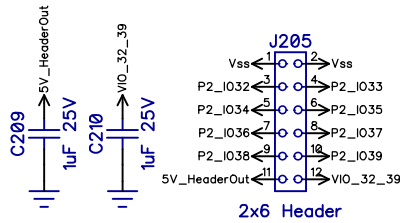
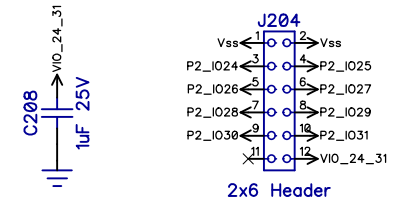
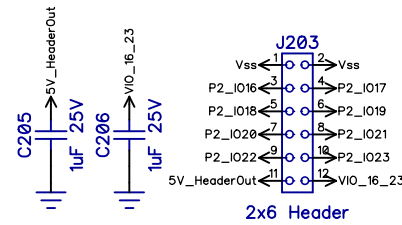
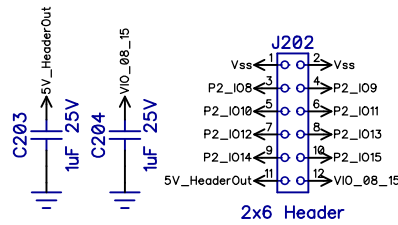
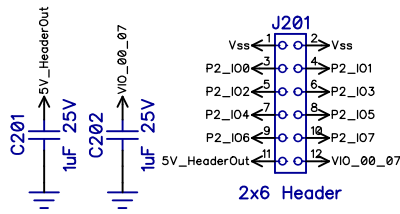
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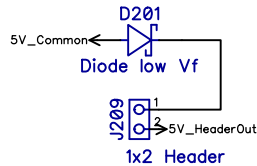
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I/O Headers

Edge expansion headers



Voltage Selection/Disable for Header 5V pins



WX Ready

Header J208 has the Propeller RESn reset pin in place of the 5V output. This allows connection of PropPlug or the Parallax SIP wireless module as an alternative way to program and debug the Propeller 2.

Connections:

P2 VSS to WX GND (must have common ground!)
 P2 P63 to WX DO, P2 P62 to WX DI, VIO56_63 to WX VIN

Prerequisite:

Disconnect the PC USB cable, power the P2 EVAL via the P2 AUX USB socket

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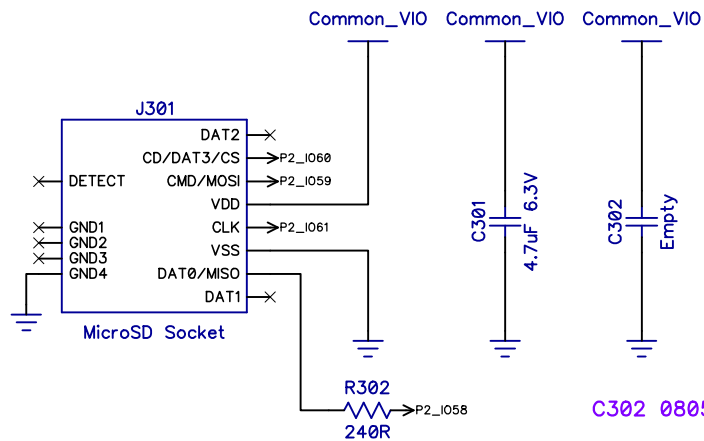
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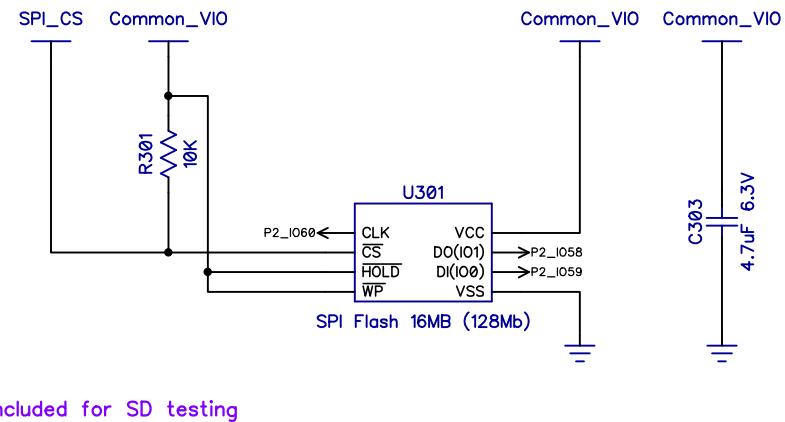
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Memory

MicroSD



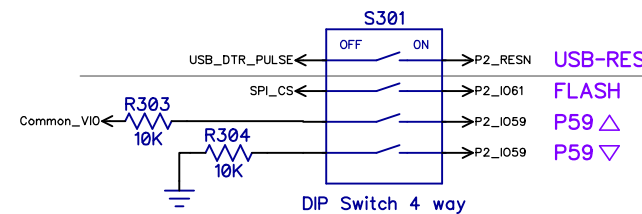
SPI Flash



C302 0805 footprint included for SD testing

Boot Mode Selection	FLASH	P59 \triangle	P59 ∇
Serial window of 60 seconds, default. (When SD card is NOT inserted)	OFF	OFF	OFF
Serial window of 60 seconds, overrides SPI Flash and SD card.	ON or OFF	ON	OFF
Serial window of 100 ms, then SPI flash. If SPI flash fails then serial window of 60 seconds.	ON	OFF	OFF
SPI flash only (fast boot), no serial window. If SPI flash fails then shutdown.	ON	OFF	ON
SD card with serial window on failure. If SD card fails then serial window of 60 seconds.	OFF	OFF	OFF
SD card only, no serial window. If SD card fails then shutdown.	OFF	OFF	ON

Boot options and USB-DTR Reset enable switch



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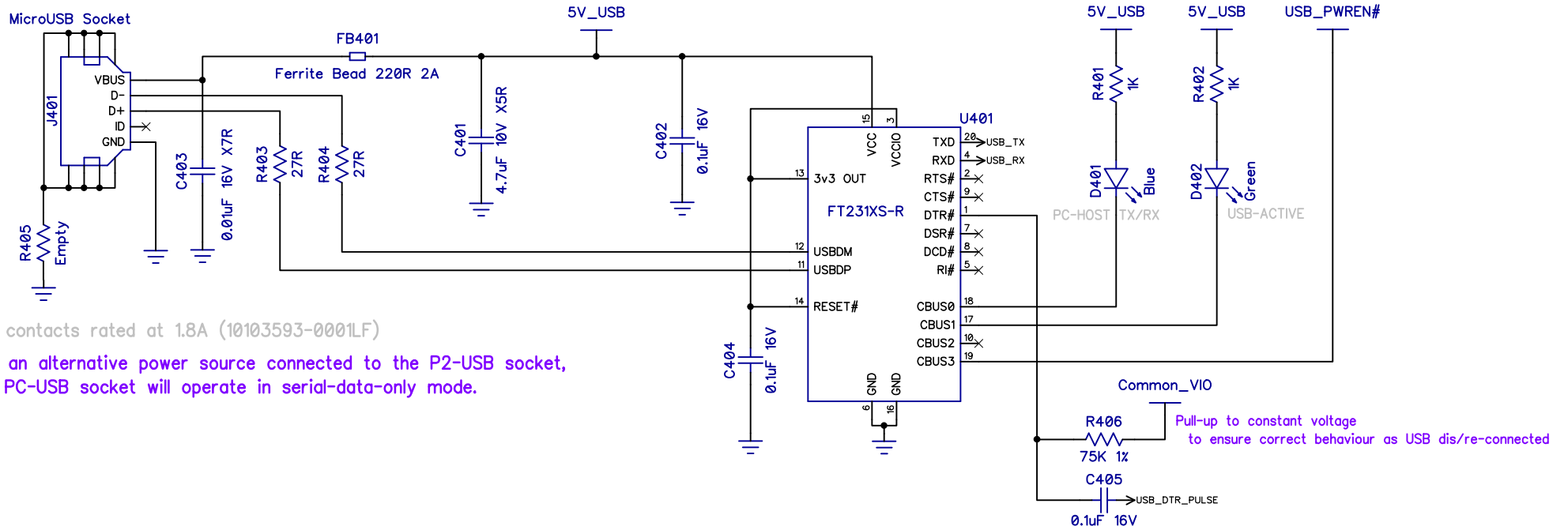
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USB PC Socket

PC-USB power socket and P2-to-PC serial data



USB contacts rated at 1.8A (10103593-0001LF)

With an alternative power source connected to the P2-USB socket, this PC-USB socket will operate in serial-data-only mode.

FTDI Configuration

CBUS0 = TX&RXLED

CBUS1 = PWREN#

CBUS2 = TriState

CBUS3 = PWREN#

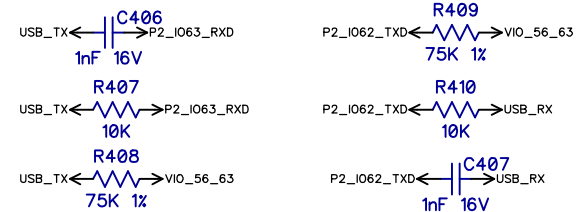
USB Config / MaxPower = 500mA

USB Config / Suspend Pulldown = Disabled

Manufacturer = Parallax Inc

Product Description = Propeller P2-EVAL

Set CBUS3 to Tristate to disable PC-USB power (ie. Serial comms only via USB socket)



Pull-up serial bus to prevent floating-state terminal chars
 Include series to prevent parasitic power in either direction
 Keep as single components to allow high-speed testing. (PASS > 3MBaud)

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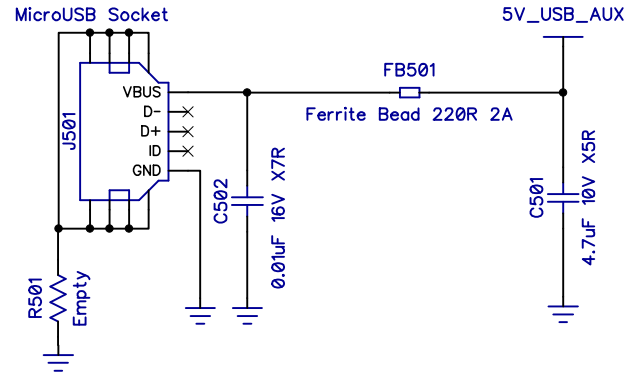
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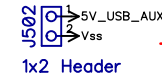
USB Aux Power Socket

P2-USB high current power socket and P2 USB data



USB contacts rated at 1.8A (10103593-0001LF)

Auxiliary power header pads (unpopulated)



These pads are unprotected! Proceed at your own risk!
Unpopulated pads - Use with care !

The pads at J502 connect directly to the P2-AUX 5V input power rail.
Source power here, for example to power a fan, or power your P2-EVAL instead of from USB.

IF you use these pads to supply power to the P2-EVAL board,
you must ensure no other power source is connected to the AUX P2-USB socket!
Do NOT exceed the maximum input voltage of 5.5V. Minimum input voltage is 4.5V

Use of J502 Auxiliary power header pads at USER OWN RISK!

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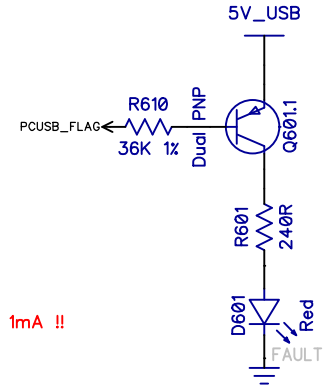
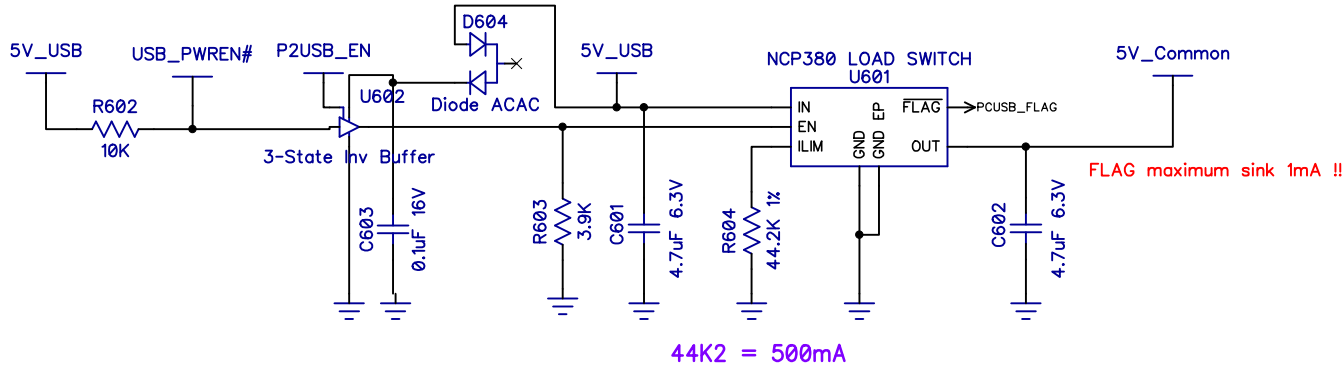
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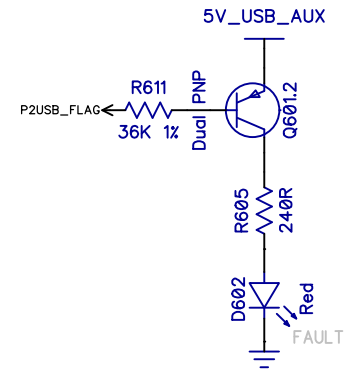
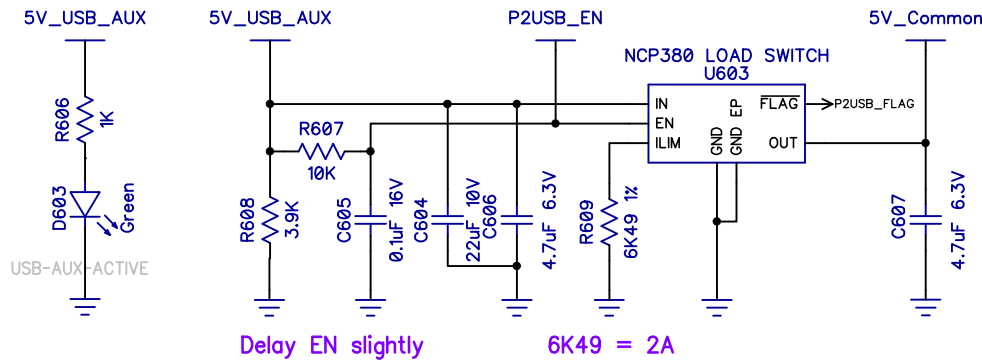
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USB Current Limit and Logic

500mA Limit for PC Host supply
 Power source disabled if AUX connected
 Power source disabled if PC denies supply



2A Limit for USB AUX socket



3K9 discharge path and also holds OE(inv buffer) low

Safe to connect power sources to both USB sockets at the same time. USB Switches will source power from only one socket, AUX socket preferred.

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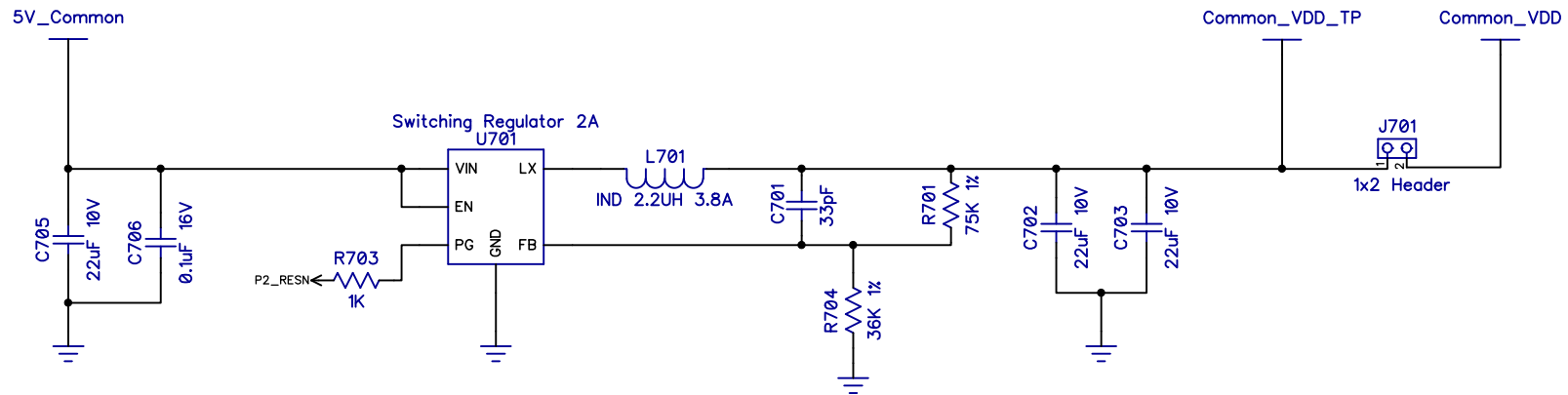
Part Number: 64000
 Revision: C

Last Update: 02 July 2020 (MM)

Common VDD 1V8

VDD Power Supply - Nominal 1.8V

Current Test Point VDD Male Header



PG threshold = 20% of VOUT (1.5V)
Open drain output, active low when undervoltage
Remove R703 to disable BOD behaviour

AT USER RISK! External voltage source for P2-VDD
could be injected at Common_VDD with shunt removed
DO NOT EXCEED 2.2V OR RISK PERMANENT DAMAGE!

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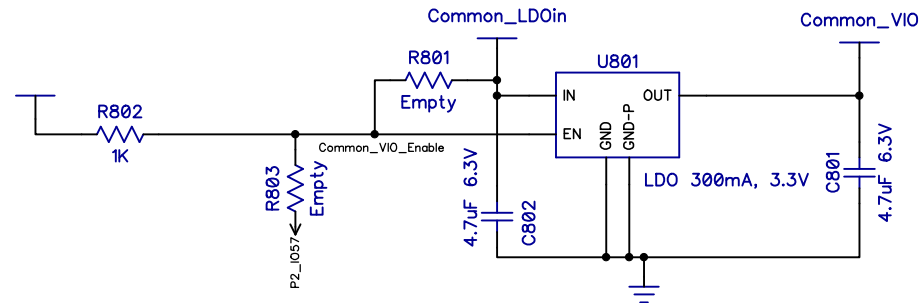
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Common VIO 3V3

VIO Power Supply - LDO 3.3V for Flash and SD card



Allow user to toggle SD card power from P2-I057

P2_RESn (Reset button press) will disable this LDO, to powercycle the Flash and SD card

Fast pulse on DTR will not provide reset (Important!)

To disable this feature, remove R802 AND install suitable pullup resistor at R801 (10K, 0402 package suggested)

EN thresholds : 0.4V Low, 0.9V High

Optional configuration

R803 would allow user control of reset from P2 I057

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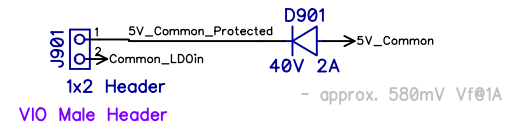
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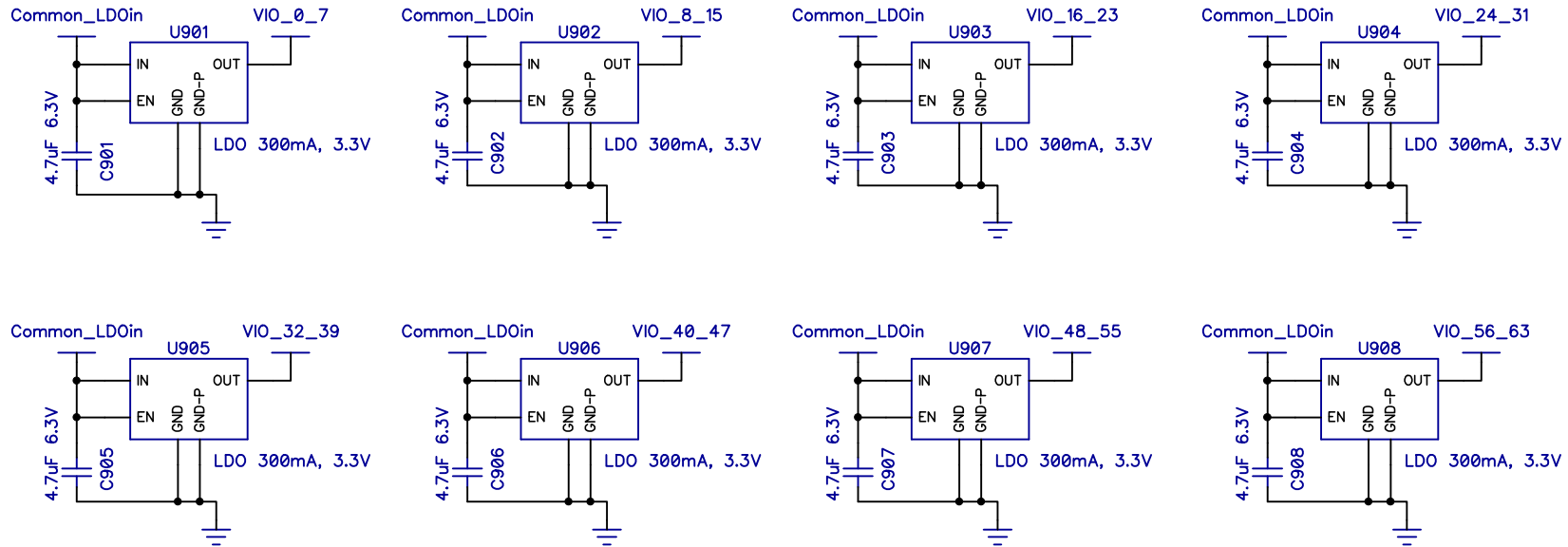
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Low noise VIO 3.3V local regulation



Note: LDO output caps located beside P2 microcontroller

These power sources ensure a fixed 3.3V low noise supply for each group of eight P2 smart pins.

A single high-current regulator could be used, but this design has some advantages, including:

- Less boardspace and lower part cost
- Thermal footprint spread over significantly larger area of copper
- Regulates directly to the power pins, removing power-path losses
- No requirement for local beads/caps for analog experiments, eliminates filtering losses
- Groups of IO's isolated from power supply cross-interference
- Limits power pin issues in each group from impacting others, including undervoltage, overvoltage and short-circuit protection

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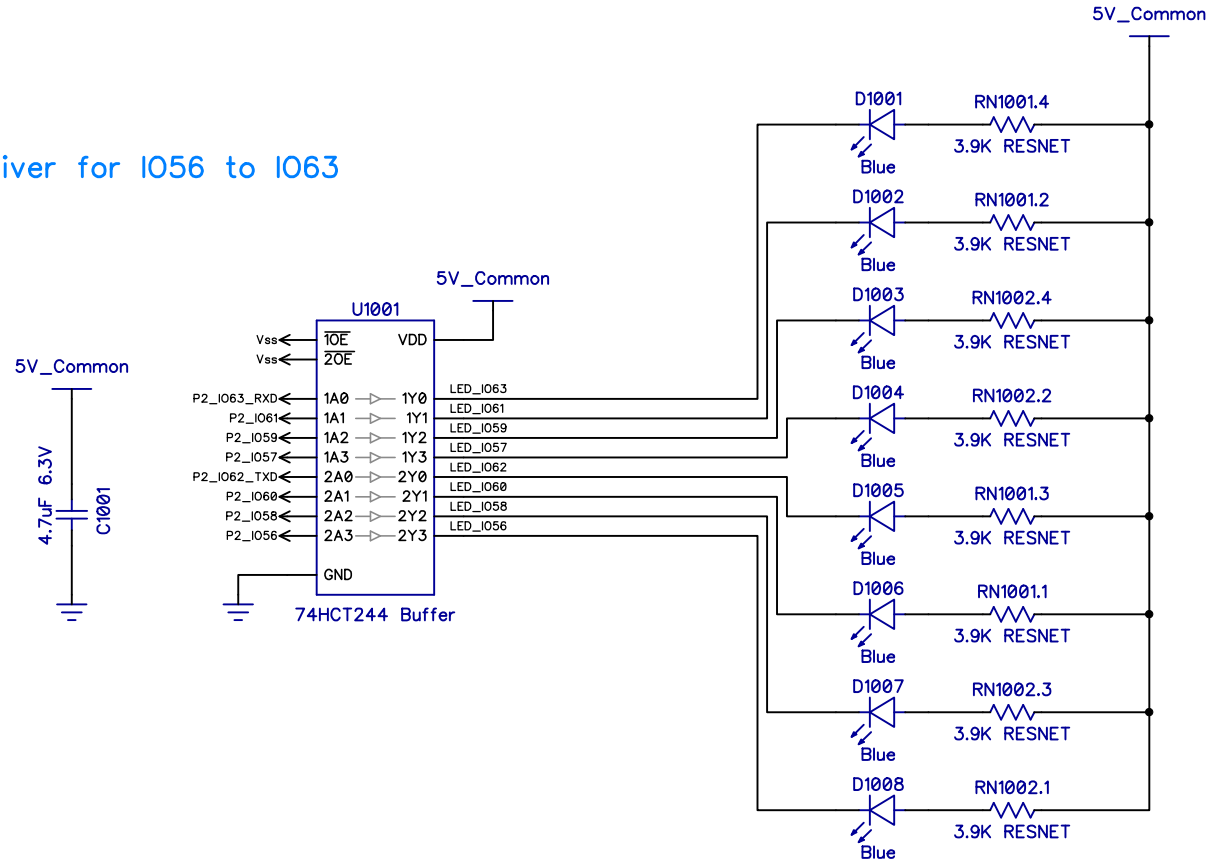
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LEDs

LED driver for IO56 to IO63



P2_IO56 to P2_IO63 are typically idle high and active low.

The LED's are wired such that they turn ON when the corresponding P2_IO pin asserts low.

Buffer input capacitance typically 3.5pF.

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Mounting holes



Mounting hole diameter 3.2mm
40mm hole spacing (56.56mm diagonal), suitable for 50mm fan

Gnd test points



BOM only - mfg

PCB
PCB for P2 Eval Board RevC

BOM only - kitted parts

HW1101 CONN SHUNT
HW1102 CONN SHUNT
HW1103 CONN SHUNT
HW1104 Self adhesive foot
HW1105 Self adhesive foot
HW1106 Self adhesive foot
HW1107 Self adhesive foot

BOM

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RefDes	Quantity	Value	Name	Manufacturer
C100, C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C121, C122, C123, C124, C125, C126, C127, C128, C129, C130, C131, C132, C133, C134, C301, C303, C601, C602, C606, C607, C801, C802, C901, C902, C903, C904, C905, C906, C907, C908, C1001	49	4.7uF 6.3V	200-01049 : CAP-CER,4.7uF,X5R,6.3V,0402	TDK : C1005X5R0J475M050BC
C201, C202, C203, C204, C205, C206, C208, C209, C210, C211, C212, C213, C214, C216	14	1uF 25V	213-01011 : Cap-Cer,1uF,25V,X5R,0402	Taiyo : TMK105BJ105MV-F
C302, R405, R501, R801, R803	5	Empty	Empty	Empty
C401, C501	2	4.7uF 10V X5R	200-11202 : CAP-CER,4.7uF,10V,X5R,0603	Samsung : CL10A475MP5LNNC
C402, C404, C405, C603, C605, C706	6	0.1uF 16V	200-11203 : CAP-CER,0.1uF,X7R,16V,0402	Murata : GRM155R71C104KA88J
C403, C502	2	0.01uF 16V X7R	200-10504 : CAP-CER,0.01uF,10%,16V,0402	AVX : 0402YC103KAT2A
C406, C407	2	1nF 16V	213-01014 : CAP-CER,1000pf,10%,16V,0402	Samsung : CL05B102K05NNNC
C604, C702, C703, C705	4	22uF 10V	200-11529 : CAP-CER,22uF,10V,X7R,1206	Taiyo : LMK316AB722BML-T
C701	1	33pF	200-10510 : CAP-CER,33pF,5%,50V,0402	Yageo : CC0402JRNPO9BN330
D201	1	Diode low Vf	501-10041 : Diode,Schottky,Low Vf,30V,2A,SOD-123W	Nexperia : PMEG3020ER,115
D202	1	Diode	501-10008 : Diode,Schottky,40V,30mA	OnSemi : RB751S40T1G
D401, D1001, D1002, D1003, D1004, D1005, D1006, D1007, D1008	9	Blue	350-10004 : LED 0603, Blue Clear	Lite-On : LTST-C190TBKT
D402, D603	2	Green	350-10003 : LED 0603, Green Clear	Lite-On : LTST-C191KGKT
D601, D602	2	Red	350-10001 : LED 0603, Super Red Clear	Lite-On : LTST-C191KRKT
D604	1	Diode ACAC	501-10132 : DIODE SERIES PAIR 100V 215MA SOT323	OnSemi : BAV99WTTG
D801	1	40V 2A	501-10037 : Diode,Schottky,Low If,40V,2A,SOD-123F	Rohm : RB066NM-40TR
FB401, FB501	2	Ferrite Bead 220R 2A	275-10004 : FerriteBead,2A,220OHM,0603,SMT	TDK : MP21606S221ATA00
HW1101, HW1102, HW1103	3	CONN SRJUNT	452-00009 : Jumper, 2-Pin - LF	TE : 382811-6
HW1104, HW1105, HW1106, HW1107	4	Self adhesive foot	700-00037 : PCB Feet, Rubber	3M : SJ-5003 (BLACK)
J100	1	XTAL Header	Empty	Empty
J201, J202, J203, J204, J205, J206, J207, J208	8	2x6 Header	450-00112 : CON-HDR,2X6,0.1",Straight,TH	Amphenol FCI : 77313-101-12LF
J209, J701, J901	3	1x2 Header	450-00115 : CON-HDR,1x2,0.1",Straight,TH	Amphenol FCI : 68000-102HLF
J301	1	MicroSD Socket	452-10029 : CON-MICRO SD,RA,SMT	Molex : 105162-0001
J401, J501	2	MicroUSB Socket	452-10028 : MicroUSB SMT, RA Connector	Amphenol FCI : 10118194-0001LF
J502	1	1x2 Header	Empty	Empty
J1101, J1102, J1103, J1104	4	Mounting Hole Vss	Empty	Empty
L701	1	IND 2.2uH 3.8A	275-10009 : IND,2.2uH,3.8A,19mOhm,Shielded	Laird : TYS50402R2N-10
PCB	1	PCB for P2 Eval Board RevC	300-64000 : PCB for P2-EvalBoard	
Q601	1	Dual PNP	500-10030 : TRANS 2PNP 40V 0.2A SOT-363	ON Semi : MBT3906DWT1G
R100, R301, R303, R304, R407, R410, R602, R607	8	10K	150-11022 : RES,10K,5%,0402	Parasonic : ERJ-2GEJ103X
R201, R401, R402, R606, R703, R802	6	1K	173-10002 : RES,1K,5%,0402	Stackpole : RMCF0402JT1K00
R302, R601, R605	3	240R	150-12023 : RES,240,5%,0402	Yageo : RC0402JR-07240RL
R403, R404	2	27R	150-11050 : Res,27,0402	Rohm : MCR01MRTJ270
R406, R408, R409, R701	4	75K 1%	172-16014 : RES,75K,1%,0402	Stackpole : RC0402FR-0775K1
R603, R608	2	3.9K	150-11051 : Res,3.9K,0402	Yageo : RC0402JR-073K9L
R604	1	44.2K 1%	150-14704 : RES,44.2K,1%,0402	Stackpole : RMCF0402FT44K2
R609	1	6K49 1%	172-10223 : Res,6.49K,1%,0402	Stackpole : RC0402FR-076K49L
R610, R611, R704	3	36K 1%	150-14705 : RES,36K,1%,0402	Stackpole : RMCF0402FT36K0
RN1001, RN1002	2	3.9K RESNET	179-10009 : RES-NTWK,3.9K,5%,0804	Vishay : CRA04S0833K90J
S100	1	Tactile 6mm	400-10002 : SW-PB,Tactile,Blue,SMD	C&K : PTS645SM435MTR
S301	1	DIP Switch 4 way	400-10017 : SWITCH SLIDE SPST DIP 4WAY SMT	CTS Electro : 219-4MSTR
TP1101, TP1102, TP1103, TP1104	4	Test Point Turret	452-00024 : Test Point - LF	Keystone : 1503-2
U100	1	Propeller 2 - ES	P2X8C4M64P-ES : P2X8C4M64P-ES multicore uC	Parallax : P2X8C4M64P-ES
U301	1	SPI Flash 16MB (128Mb)	604-10047 : IC FLASH 128M SPI 133MHZ 8SOIC	Winbond : W25Q128JVSIM TR
U401	1	FT232XS-R	604-00065 : IC-FTDI, FT232X	FTDI : FT232XS-R
U601, U603	2	NCP360 LOAD SWITCH	400-10018 : IC CURRENT LIMIT SWITCH 6-UDFN	ON Semi : NCP360HMUAJAATBG
U602	1	3-State Inv Buffer	603-10031 : IC Buf,Tristate,74LVC,SC-70-5	Texas : SN74LVC16240DCKR
U701	1	Switching Regulator 2A	601-10352 : DCDC CONV 2A BUCK SOT26	Diodes Inc. : AP3445LW6-7
U801, U901, U902, U903, U904, U905, U906, U907, U908	9	LDO 300mA, 3.3V	601-10339 : IC REG LDO CMOS 3.3V UDFN4	OnSemi : NCP114AMX330TCG
U1001	1	74HCT244 Buffer	603-10036 : Octal Buffer NonInv 20TSSOP	Nexperia : 74HCT244PW,118
X100	1	Crystal 20MHz 9pF	251-15002 : CRYSTAL 20.000MHZ 9PF SMD	Epson : TSX-3225 20.000MF20G-AC3
	190			