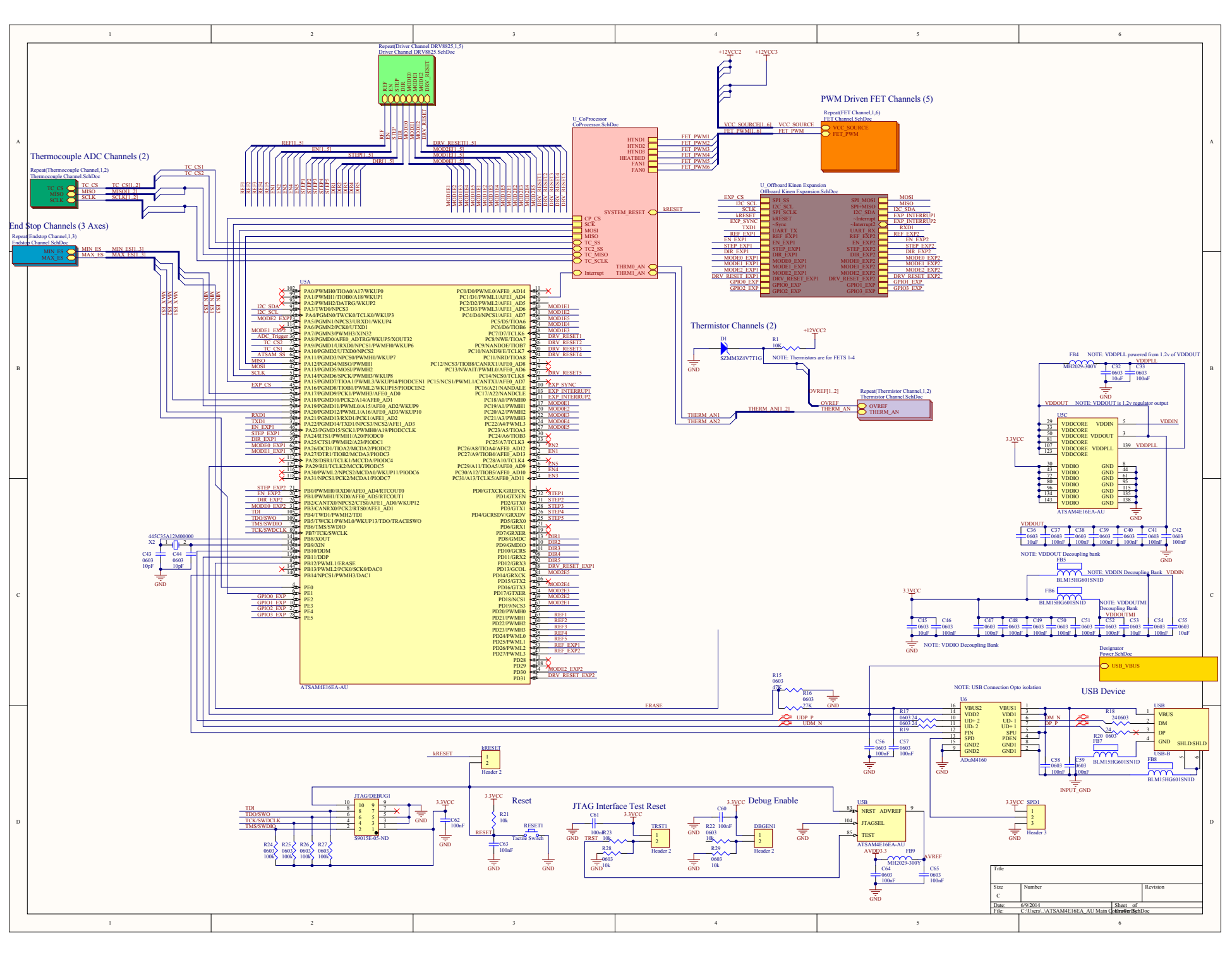
Repeat(Driver Channel DRV8825,1,5)
Driver Channel DRV8825.SchDoc
PWM Driven FET Channels (5)
Repeat(FET Channel,1,6)
FET Channel.SchDoc
Thermocouple ADC Channels (2)
Repeat(Thermocouple Channel,1,2)
Thermocouple Channel.SchDoc
End Stop Channels (3 Axes)
Repeat(Endstop Channel,1,3)
Endstop Channel.SchDoc
U_CoProcessor
CoProcessor.SchDoc
U_Offboard Kinen Expansion
Offboard Kinen Expansion.SchDoc
Thermistor Channels (2)
Repeat(Thermistor Channel,1,2)
Thermistor Channel.SchDoc
U5A
ATSAM4E16EA-AU
USB Device
Reset
JTAG Interface Test Reset
Debug Enable
Designator
Power.SchDoc
Header 2
Header 3
Tactile Switch
ADuM4160
NOTE: USB Connection Opto isolation
NOTE: Thermistors are for FETS 1-4
NOTE: VDDPLL powered from 1.2v of VDDOUT
NOTE: VDDOUT is 1.2v regulator output
NOTE: VDDOUT Decoupling bank
NOTE: VDDIN Decoupling Bank
NOTE: VDDIO Decoupling Bank
Title
Size
Number
Revision
Date: 6/9/2014
Sheet of
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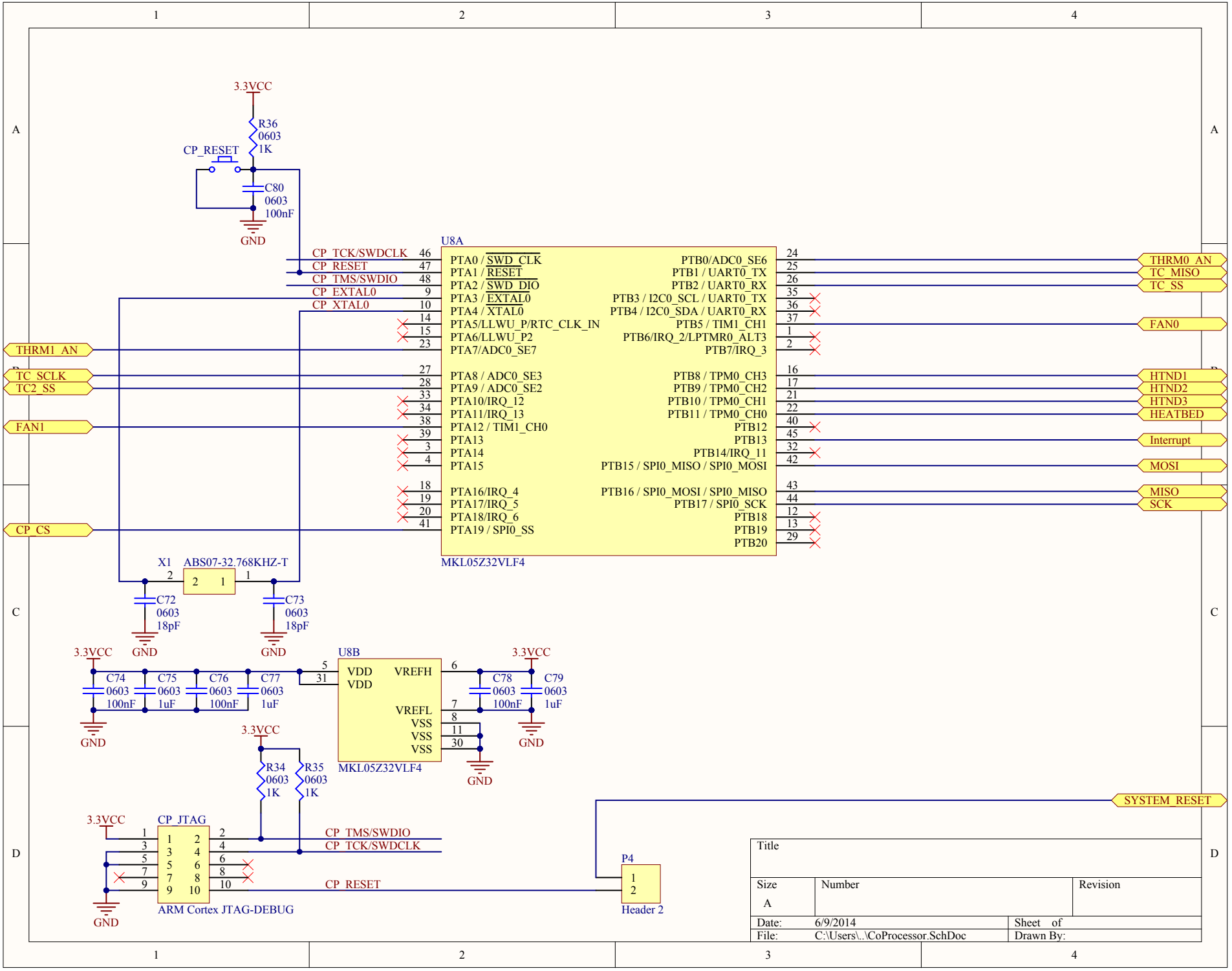
3.3VCC
R36
0603
1K
CP_RESET
C80
0603
100nF
GND
U8A
CP_TCK/SWDCLK 46
CP_RESET 47
CP_TMS/SWDIO 48
CP_EXTAL0 9
CP_XTAL0 10
PTA0 / SWD_CLK
PTA1 / RESET
PTA2 / SWD_DIO
PTA3 / EXTAL0
PTA4 / XTAL0
PTA5/LLWU_P/RTC_CLK_IN
PTA6/LLWU_P2
PTA7/ADC0_SE7
PTA8 / ADC0_SE3
PTA9 / ADC0_SE2
PTA10/IRQ_12
PTA11/IRQ_13
PTA12 / TIM1_CH0
PTA13
PTA14
PTA15
PTA16/IRQ_4
PTA17/IRQ_5
PTA18/IRQ_6
PTA19 / SPI0_SS
PTB0/ADC0_SE6
PTB1 / UART0_TX
PTB2 / UART0_RX
PTB3 / I2C0_SCL / UART0_TX
PTB4 / I2C0_SDA / UART0_RX
PTB5 / TIM1_CH1
PTB6/IRQ_2/LPTMR0_ALT3
PTB7/IRQ_3
PTB8 / TPM0_CH3
PTB9 / TPM0_CH2
PTB10 / TPM0_CH1
PTB11 / TPM0_CH0
PTB12
PTB13
PTB14/IRQ_11
PTB15 / SPI0_MISO / SPI0_MOSI
PTB16 / SPI0_MOSI / SPI0_MISO
PTB17 / SPI0_SCK
PTB18
PTB19
PTB20
MKL05Z32VLF4
THRM0_AN
TC_MISO
TC_SS
FAN0
HTND1
HTND2
HTND3
HEATBED
Interrupt
MOSI
MISO
SCK
THRM1_AN
TC_SCLK
TC2_SS
FAN1
CP_CS
X1
ABS07-32.768KHZ-T
C72
0603
18pF
C73
0603
18pF
U8B
VDD
VREFH
VREFL
VSS
MKL05Z32VLF4
C74
0603
100nF
C75
0603
1uF
C76
0603
100nF
C77
0603
1uF
C78
0603
100nF
C79
0603
1uF
R34
0603
1K
R35
0603
1K
CP_JTAG
ARM Cortex JTAG-DEBUG
CP_TMS/SWDIO
CP_TCK/SWDCLK
CP_RESET
SYSTEM_RESET
P4
Header 2
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Size
A
Number
Revision
Date: 6/9/2014
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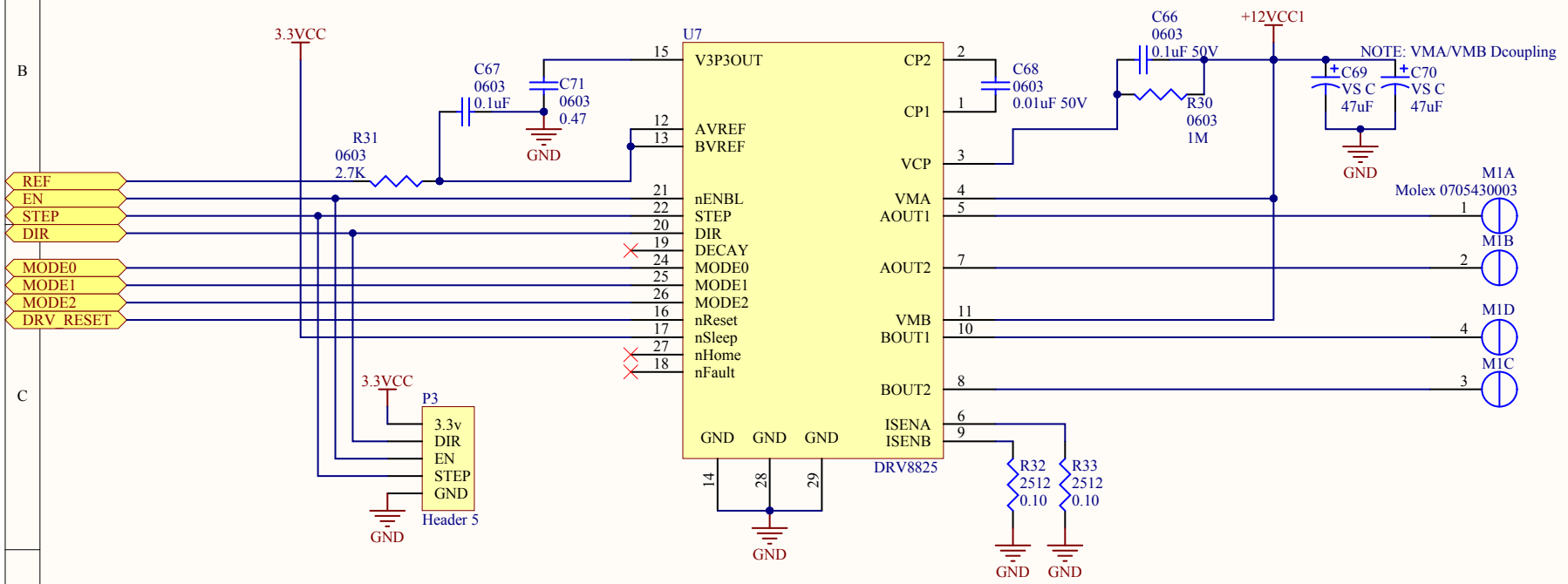

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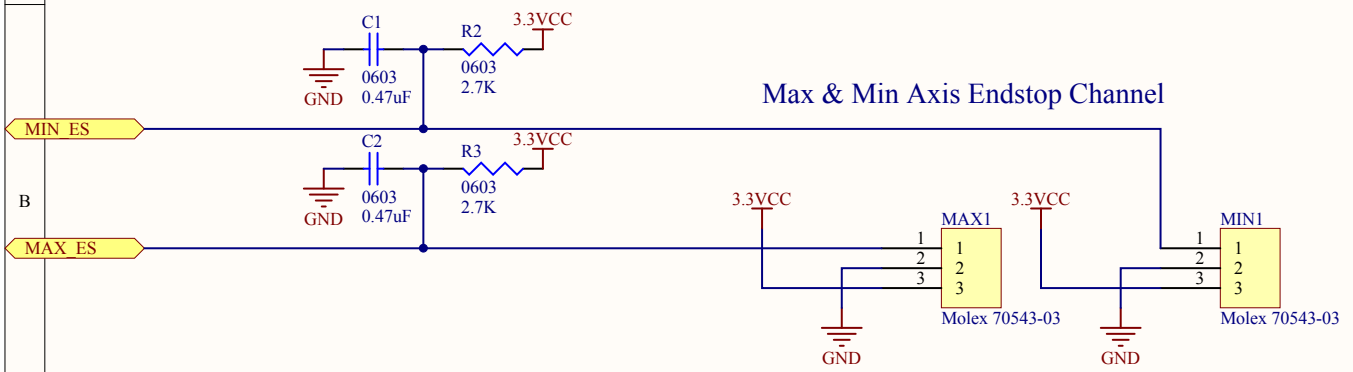
End Stop Channel



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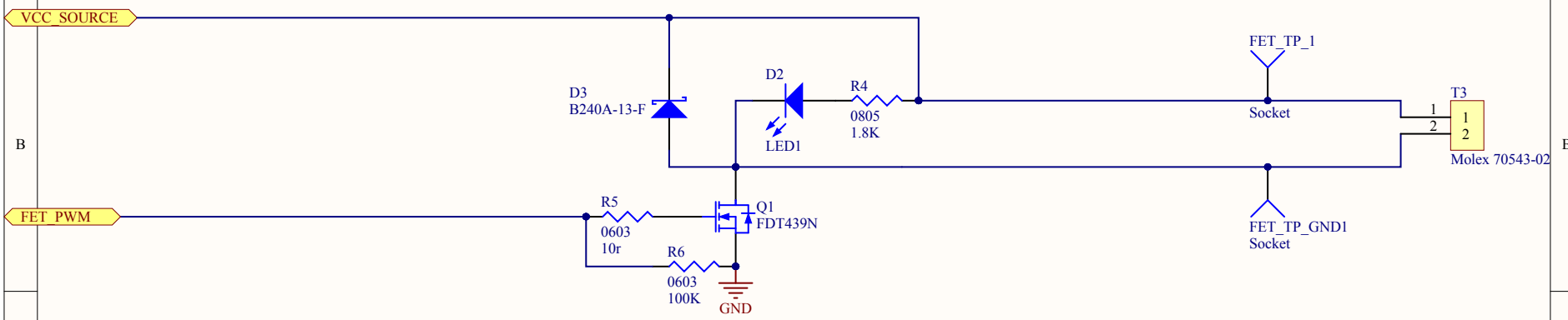
FET Channel 3A



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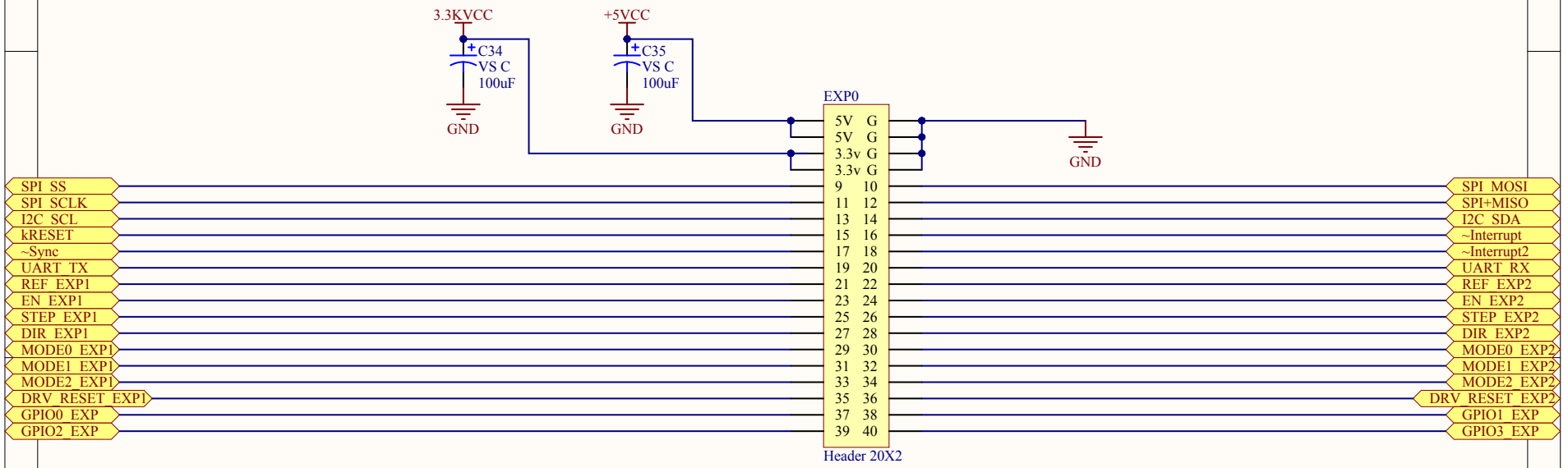

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Date: 6/9/2014	Sheet of	
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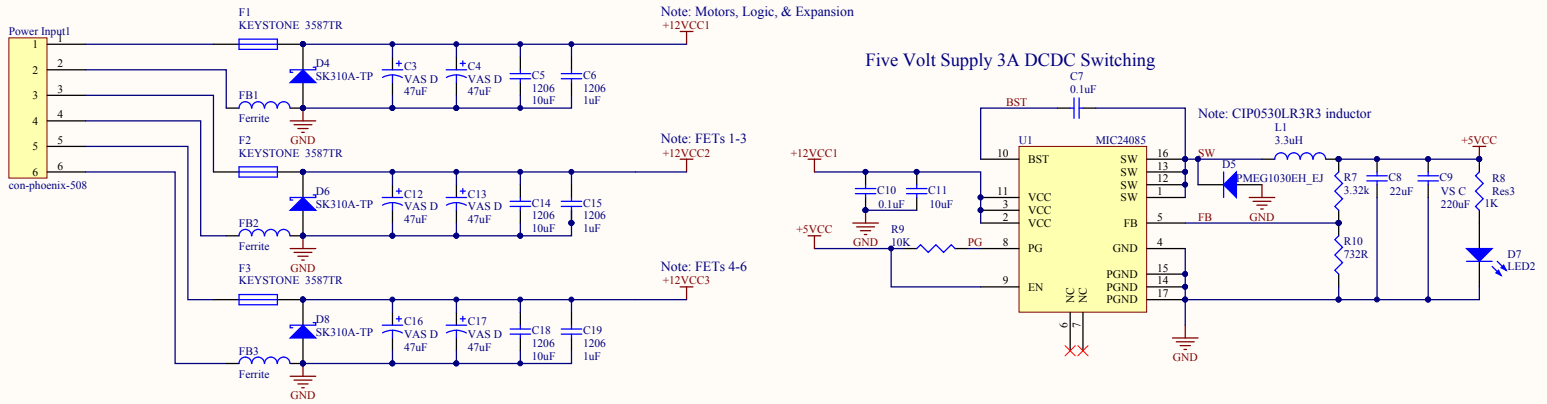
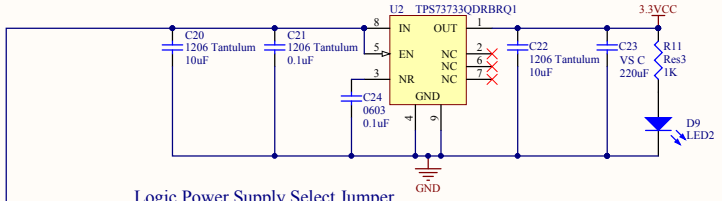


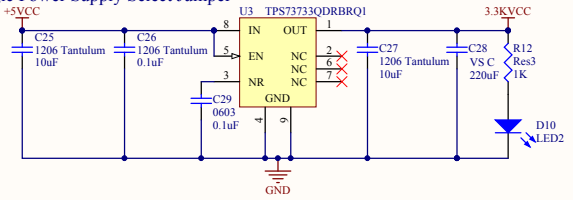
NOTE: Compatible with 24VDC

Five Volt Supply 3A DCDC Switching

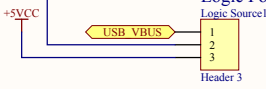
Logic Power Supply (3.3VDC)



Logic Power Supply Select Jumper



Logic Power Supply Select Jumper



Title		
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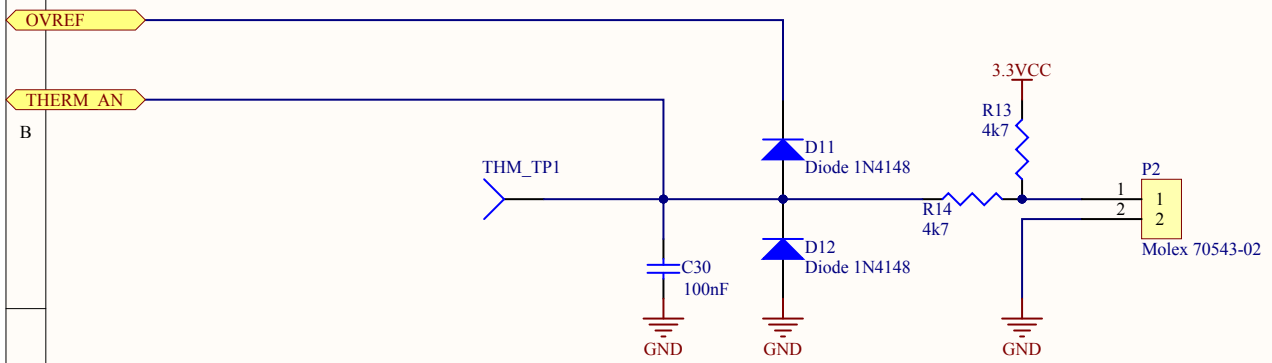
Date: 6/9/2014		Sheet of
File: C:\Users\..\Power.SchDoc		Drawn By:

Thermistor Channel



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Date: 6/9/2014		Sheet of
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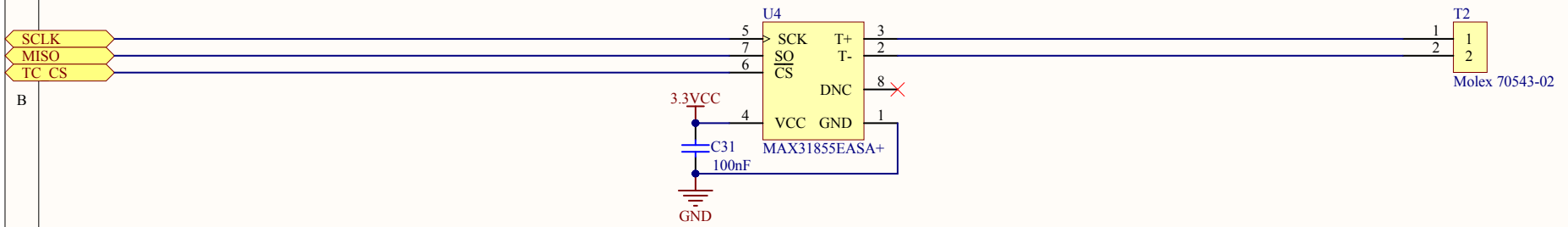
MAX31855 Thermocouple ADC Channel



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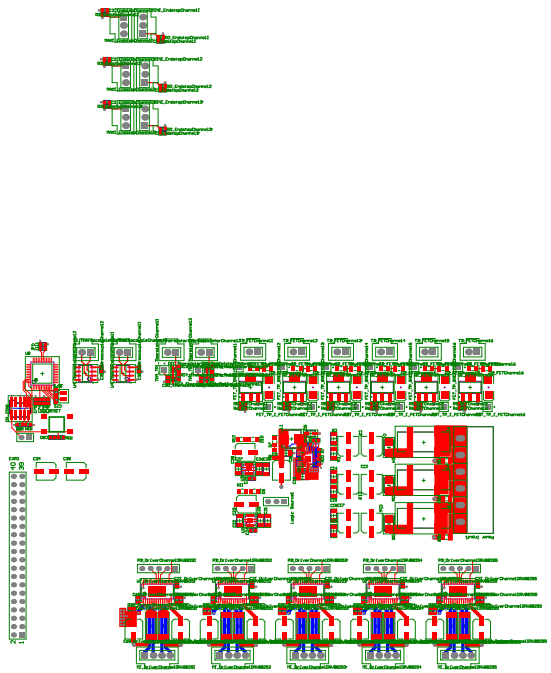

Bill of Materials

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Source Data From: ZMBo.PrjPcb
Project: ZMBo.PrjPcb
Variant: None

Creation Date: 8/9/2014 8:26:00 PM
Print Date: 41799 41799.85154

Footprint	Comment	LibRef	Designator	Description	Quantity
1608[0603]	0603	Cap Semi	C1_EndstopChannel1, C1_EndstopChannel2, C1_EndstopChannel3, C2_EndstopChannel1, C2_EndstopChannel2, C2_EndstopChannel3, C24, C29, C32, C33, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58,	Capacitor (Semiconductor SIM Model)	65
Panasonic VS D	VAS D	Cap Pol1	C3, C4, C12, C13, C16, C17	Polarized Capacitor (Radial)	6
C1206	1206	Cap Semi	C5, C6, C14, C15, C18, C19	Capacitor (Semiconductor SIM Model)	6
1608[0603]	Cap Semi	Cap Semi	C7, C11, C30_ThermistorChannel1, C30_ThermistorChannel2, C31_ThermocoupleChannel1, C31_ThermocoupleChannel2, C60, C61, C62, C63	Capacitor (Semiconductor SIM Model)	10
C1206	Cap Semi	Cap Semi	C8, C10	Capacitor (Semiconductor SIM Model)	2
Panasonic VS C	VS C	Cap Semi, Cap Semi, Cap Semi, Cap Pol1, Cap Pol1, Cap Pol1, Cap Pol1, Cap Pol1, Cap Pol1, Cap Pol1, Cap Pol1, Cap Pol1, Cap Pol1, Cap Pol1	C9, C23, C26, C54, C55, C69_DriverChannelDRV8251, C69_DriverChannelDRV8252, C69_DriverChannelDRV8253, C69_DriverChannelDRV8254, C69_DriverChannelDRV8255, C70_DriverChannelDRV8251, C70_DriverChannelDRV8252, C70_DriverChannelDRV8253, C70_DriverChann	Capacitor (Semiconductor SIM Model), Capacitor (Semiconductor SIM Model), Capacitor (Semiconductor SIM Model), Polarized Capacitor (Radial), Polarized Capacitor (Radial), Polarized Capacitor (Radial), Polarized Capacitor (Rad	15
C1206	1206 Tantalum	Cap Semi	C20, C21, C22, C25, C26, C27	Capacitor (Semiconductor SIM Model)	6
FTSH-105-XX-KDV	ARM Cortex JTAG-DEBUG	ARM Cortex JTAG DEBUG Header	CP_JTAG		1
Mountain Switch TS632417160	Tactile Switch	Tactile Switch	CP_RESET		1
SJMM324V7TLG	SJMM324V7T1G	D Zener	D1	Zener Diode	1
SM 0805 polarized	LED1	LED1	D2_FETChannel1, D2_FETChannel2, D2_FETChannel3, D2_FETChannel4, D2_FETChannel5, D2_FETChannel6	Typical RED GaAs LED	6
SMB	B240A-13-F	D Schottky	D3_FETChannel1, D3_FETChannel2, D3_FETChannel3, D3_FETChannel4, D3_FETChannel5, D3_FETChannel6	Schottky Diode	6
SK310A-TP	SK310A-TP	D Schottky	D4, D6, D8	Schottky Diode	3
PMEG1030EH_EJ	PMEG1030EH, EJ	PMEG1030EH, EJ	D5	Default Diode	1
SM 0805 polarized	LED2	LED2	D7, D9, D10	Typical RED, GREEN, YELLOW, AMBER GaAs LED	3
1N4148WT	Diode 1N4148	Diode 1N4148	D11_ThermistorChannel1, D11_ThermistorChannel2, D12_ThermistorChannel1, D12_ThermistorChannel2	High Conductance Fast Diode	4
HDR1X2	Header 2	Header 2	DBGEN1, nRESET, P4, TRST1	Header, 2-Pin	4
HDR2X20	Header 20X2	Header 20X2	EXP2	Header, 20-Pin, Dual row	1
KEYSTONE 3568TR	KEYSTONE 3568TR	Fuse 1	F1, F2, F3	Fuse	3
SM 0805 - gap trimmed	Ferrite	Inductor	FB1, FB2, FB3	Inductor	3
SM 0805 - gap trimmed	MH2029-300Y	Inductor	FB4, FB9	Inductor	2
BLM18PG121SN1D	BLM15HG601S N1D	BLM15HG601S N1D	FB5, FB6, FB7, FB8	BLM15HG601SN1D	4
PIN1	Socket	Socket	FET_TP_1_FETChannel1, FET_TP_1_FETChannel2, FET_TP_1_FETChannel3, FET_TP_1_FETChannel4, FET_TP_1_FETChannel5, FET_TP_1_FETChannel6, FET_TP_GND1_FETChannel1, FET_TP_GND1_FETChannel2, FET_TP_GND1_FETChannel3, FET_TP_GND1_FETChannel4, FET_TP_GND1_FETChannel5	Socket	12
59015E-05-ND	59015E-05-ND	59015E-05-ND	JTAG/DEBUG1		1
CIP5530LR3	Inductor	Inductor	L1	Inductor	1
HDR1X3	Header 3	Header 3	Logic Source1, SPD1	Header, 3-Pin	2
Molex 0705430003	Molex 0705430003	Molex 0705430003 AH	M1_DriverChannelDRV8251, M1_DriverChannelDRV8252, M1_DriverChannelDRV8253, M1_DriverChannelDRV8254, M1_DriverChannelDRV8255	Molex 4 Pin Clip Connector	5
MOLEX Endstop	Molex 70543-03	Molex Endstop	MAX1_EndstopChannel1, MAX1_EndstopChannel2, MAX1_EndstopChannel3, MIN1_EndstopChannel1, MIN1_EndstopChannel2, MIN1_EndstopChannel3		6
Molex 70543-02	Molex 70543-02	Molex 70543-02	P2_ThermistorChannel1, P2_ThermistorChannel2, P2_ThermocoupleChannel1, P2_ThermocoupleChannel2, T3_FETChannel1, T3_FETChannel2, T3_FETChannel3, T3_FETChannel4, T3_FETChannel5, T3_FETChannel6	Molex 70543-02	10
HDR1X5	Header 5	Header 5	P3_DriverChannelDRV8251, P3_DriverChannelDRV8252, P3_DriverChannelDRV8253, P3_DriverChannelDRV8254, P3_DriverChannelDRV8255	Header, 5-Pin	5
con-phoenix-508-6	con-phoenix-508	con-phoenix-508	Power Input1		1
Fairchild FDT439N	FDT439N	Fairchild FDT439N	Q1_FETChannel1, Q1_FETChannel2, Q1_FETChannel3, Q1_FETChannel4, Q1_FETChannel5, Q1_FETChannel6	N-Channel MOSFET	6
J1-0603	Res3	Res3	R1, R7, R9, R10, R13_ThermistorChannel1, R13_ThermistorChannel2, R14_ThermistorChannel1, R14_ThermistorChannel2, R21, R23	Resistor	10
J1-0603	0603	Res3	R2_EndstopChannel1, R2_EndstopChannel2, R2_EndstopChannel3, R3_EndstopChannel1, R3_EndstopChannel2, R3_EndstopChannel3, R5_FETChannel1, R5_FETChannel2, R5_FETChannel3, R5_FETChannel4, R5_FETChannel5, R5_FETChannel6, R6_FETChannel1, R6_FETChannel2, R6_FETC	Resistor	44
SM 0805 - gap trimmed	0805	Res3	R4_FETChannel1, R4_FETChannel2, R4_FETChannel3, R4_FETChannel4, R4_FETChannel5, R4_FETChannel6	Resistor	6
SM 0805 - gap trimmed	Res3	Res3	R8, R31, R32	Resistor	3
Resistor2512	2512	Res3	R32_DriverChannelDRV8251, R32_DriverChannelDRV8252, R32_DriverChannelDRV8253, R32_DriverChannelDRV8254, R32_DriverChannelDRV8255, R33_DriverChannelDRV8251, R33_DriverChannelDRV8252, R33_DriverChannelDRV8253, R33_DriverChannelDRV8254, R33_DriverCh	Resistor	10
TL3301 PIN1	Tactile Switch TP4	Tactile Switch Socket	RESET1, THM_TP1_ThermistorChannel1, THM_TP1_ThermistorChannel2	Socket	3
MIC24085-AYML	MIC24085	MIC24085	U1		1
TI-DRB8-TPS5037	TPS73733QDRBRQ1	TPS73733QDRBR	U2, U3	Single Output Automotive LDO, 1 A, Fixed 3.3 V Output, 2.2 to 5.5 V Input, with Reverse Current Protection, 8-pin SON (DRB), -40 to 125 degC, Green (RoHS & no Sb/Br)	2
MAXIM-SB+4_N	MAX31855EASA+	MAX31855EASA+	U4_ThermocoupleChannel1, U4_ThermocoupleChannel2	Cold Junction Compensated Thermocouple to Digital Converter, 14 Bits Temperature Resolution, -40 to 125 degC, 8-Pin SOIC (SB+4), Pb-Free	2
LQFP144_N	ATSAM4E16EA-AU	ATMEL-ATSAM4E8EA-LQFP-144	U5		1
ADuM4160	ADuM4160	ADuM4160	U6	USB Opto Isolator	1
DRV8825	DRV8825	DRV8825	U7_DriverChannelDRV8251, U7_DriverChannelDRV8252, U7_DriverChannelDRV8253, U7_DriverChannelDRV8254, U7_DriverChannelDRV8255	DRV8825 Ti Stepper Driver	5
MKL05Z32VLF4	MKL05Z32VLF4	MKL05Z32VLF4	U9	ARM Cortex M0+	1
PN61729	USB-B	USB-B	USB		1
ABS07-32.768KHZ-T	ABS07-32.768KHZ-T	ABS07-32.768KHZ-T	X1	ABS07-32.768KHZ-T RTC Crystal Oscillator	1
445C25A12M00000	445C25A12M00000	XTAL	X2	Crystal Oscillator	1
					254

Approved		Notes	