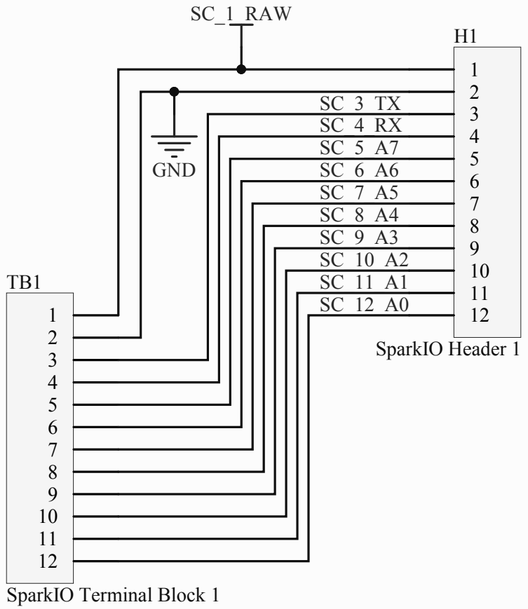
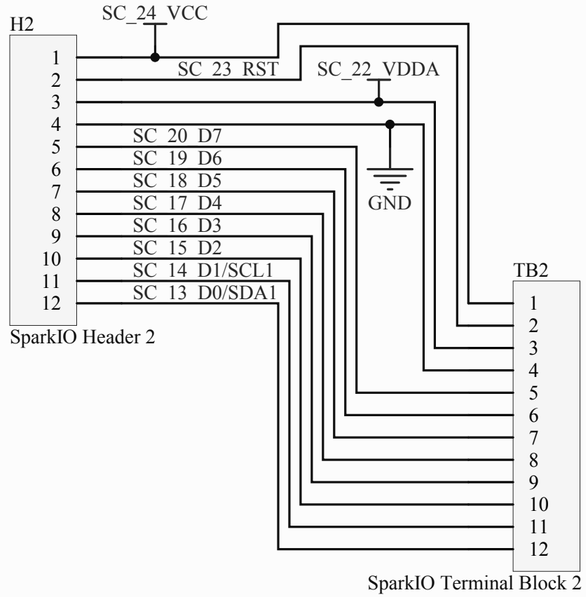




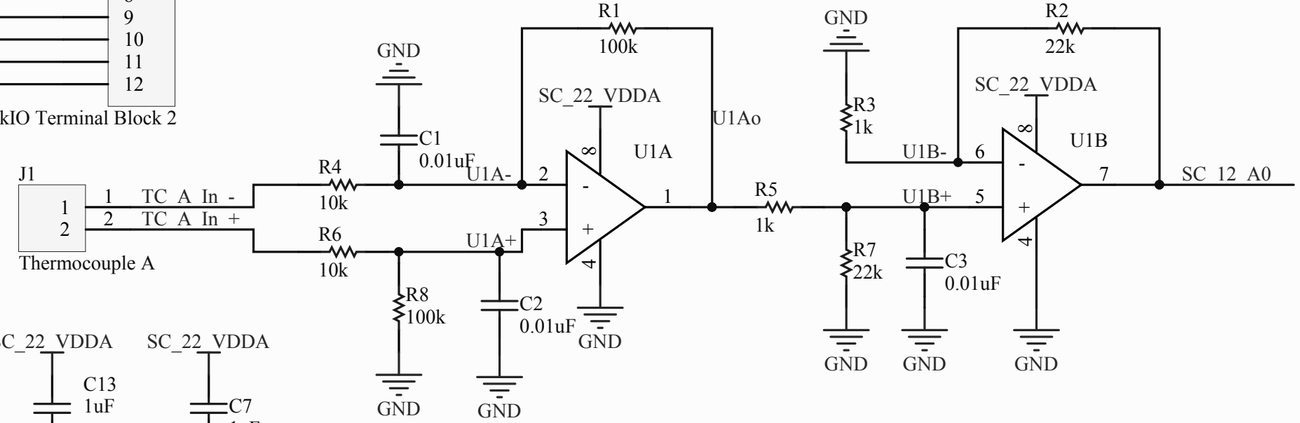
*SparkIO Module
RAW = Diode drop down from +5VUSB
VCC = 3.3V, 500mA Max
VDDA = 3.3V through 500mA ferrite, analog VDD
RST = Reset switch on Spark.io Module
Spark Core has male headers - need female headers here

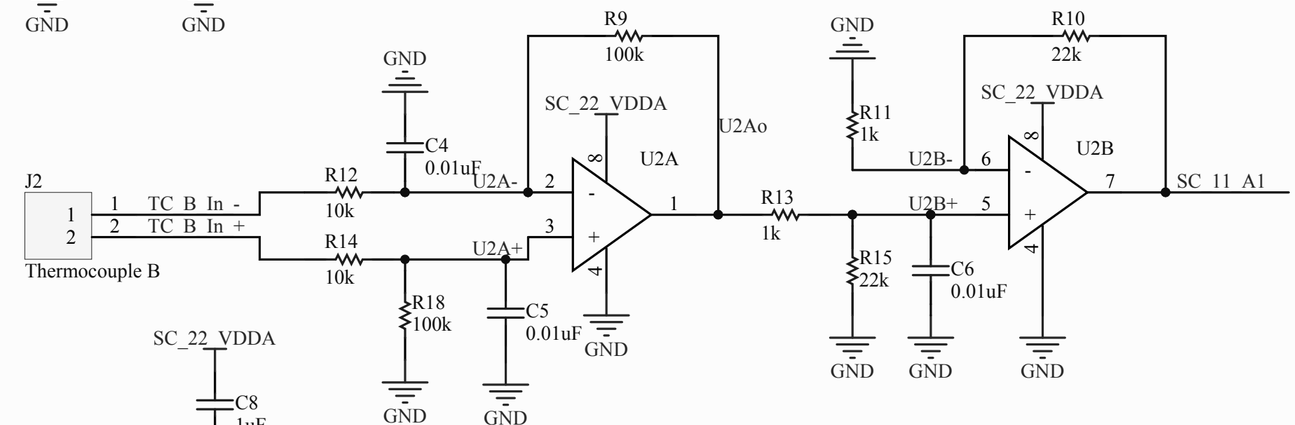
Op Amp Circuits are a cascaded two stage amplifier:
A Gain = 10 stage followed by a Gain = 22 stage to accomplish overall gain of 220

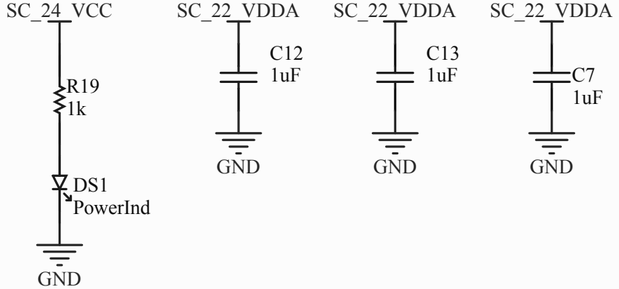
Linear approximation of a K-type thermocouple is about 40.8uV per degree C from -200C to +1350C
At 25C: V=1020uV = 1.02mV
At 100C, V=4008uV = 4.008mV
At 1000C, V=40.8mV
At 1350C, V=55.08mV

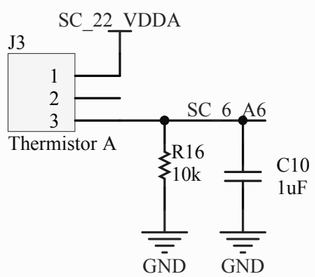
Desired range is roughly up to 600F or 0C to 350C
At 0C: V=0V
At 350C: V=14.28mV

To scale this voltage to 3.2V, gain needed is
A = 3.2V/14.28mV = 224

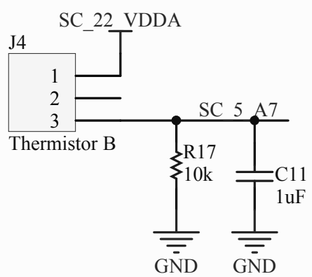






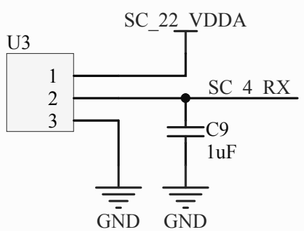


Thermistor A Input



Thermistor B Input

Thermistor Inputs - Assuming 10k



Cold Junction Temperature Compensation Thermistor
*Must be located very close to thermocouple connectors
U3 is analog thermistor IC

Title	***SparkIO Thermal Shield - Analog***		*
Size: A4	Number:*	Revision:A	*
Date: 7/17/2014	Time: 5:03:17 PM	Sheet 1 of 1	*
File: C:\Users\Jim Griazbacher\Documents\GitHub\probe\SparkIO Thermal Shield\SparkIO Thermal Shield - No Aux ADC.SchDoc			*

Altium

Bill of Materials

SparkIO Thermal Shield - Analog

Source Data From: SparkIO Thermal Shield - No Aux ADC.SchDoc
Project: SparkIO Thermal Shield.PrjPCB
Variant: None

Creation Date: 7/17/2014 5:03:19 PM
Print Date: 41837 41837.71068

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			C7, C8, C9, C10, C11, C12, C13		
			DS1		
			H1, H2		
			J1, J2		
			J3, J4		
			R1, R8, R9, R18		
			R2, R7, R10, R15		
			R3, R5, R11, R13, R19		
			R4, R6, R12, R14, R16, R17		
			TB1, TB2		
			U1, U2		
			U3		
					0

Approved	Notes	