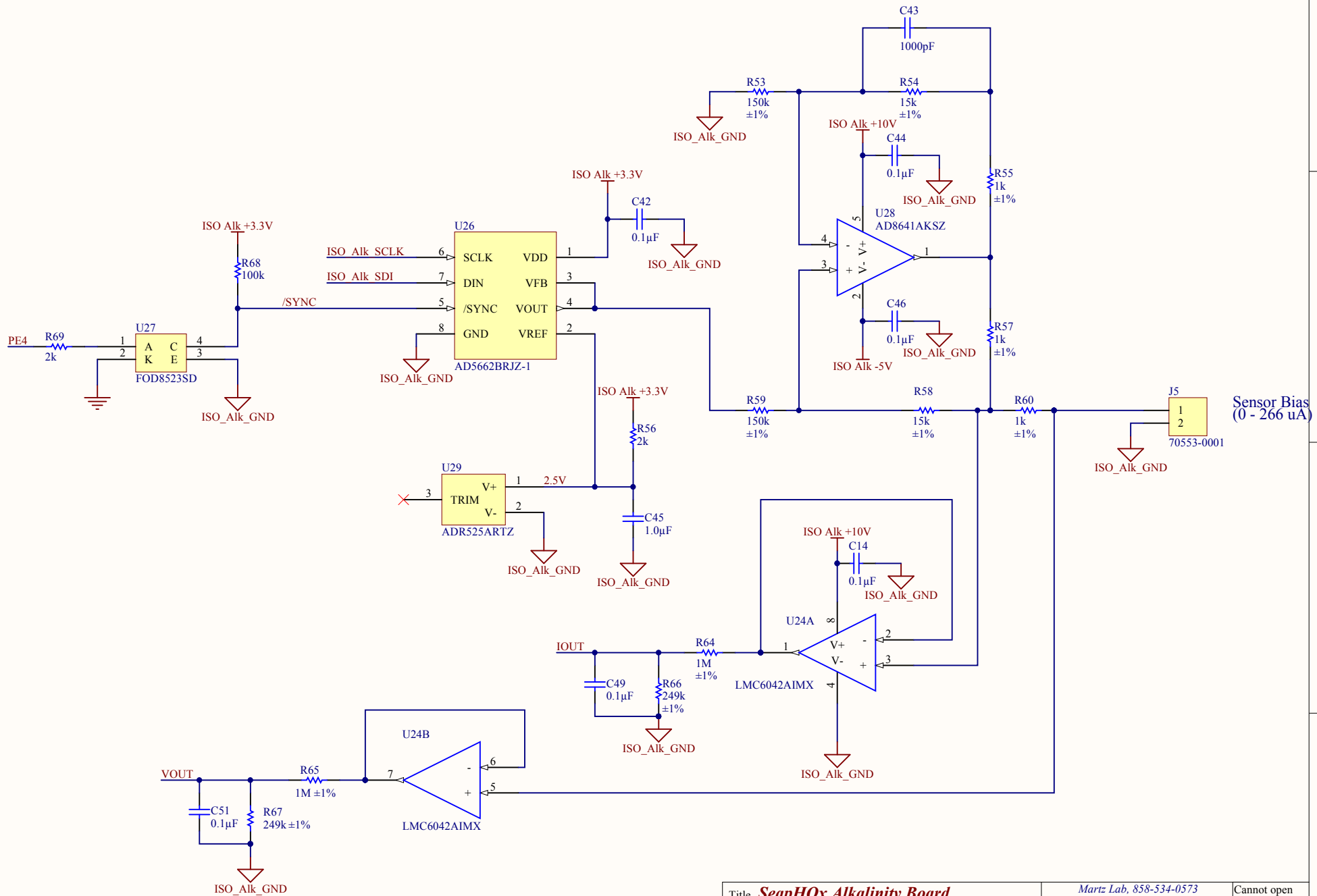
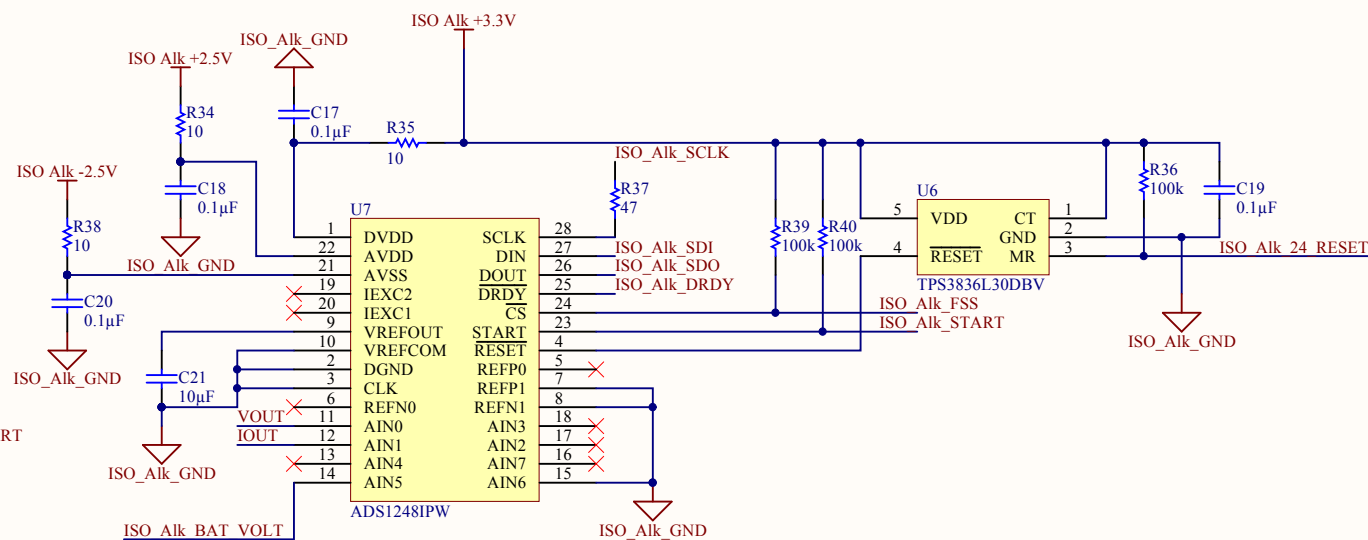


Alkalinity Electrode Bias Supply



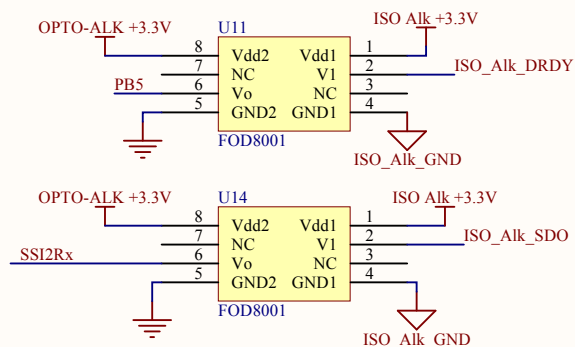
Title <i>SeapHOx Alkalinity Board</i>			Martz Lab, 858-534-0573 trmartz@ucsd.edu		Cannot open file C:\Users\Martz lab\Desktop\we b_color.png
Size: Letter	Number:*	Revision:A	Geosciences Research Division Scripps Institution of Oceanography University of California, San Diego		
Date: 1/19/2016	Time: 2:32:13 PM	Sheet1 of 6			
File: C:\Users\Ellen\Dropbox\SeaFET_SeapHOx\SeaFET_SeapHOx			design_files\Electronics Hardware and Software\ARM\Sch		

ISO A1k A/D



The diagram illustrates the ISO-Alk interface circuit. It features three FOD8523SD chips, labeled U12, U13, and U15. Each chip is connected to a specific PE pin (PE7, PE6, and PE5 respectively) through a 2k resistor (R41, R42, and R43). The input (A) of each chip is connected to the PE pin, and its output (C) is connected to a common ISO-Alk bus. The bus is connected to the ISO-Alk_START, ISO-Alk_24_RESET, and ISO-Alk_PWR_ON signals. The common bus is also connected to the ISO-Alk_GND signal.

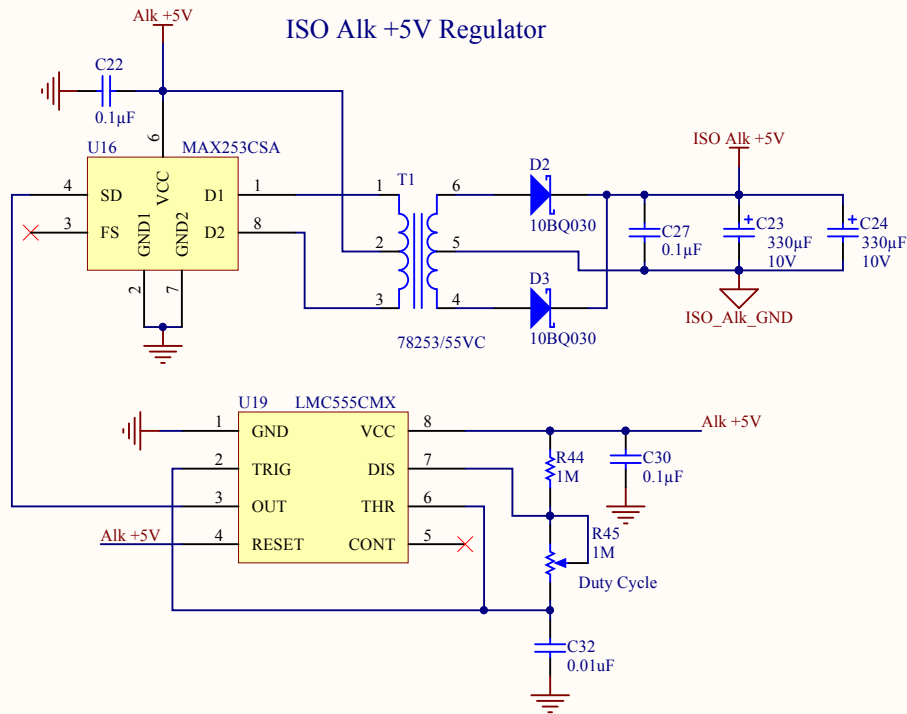
Signal from ADS1248 ISO Alk



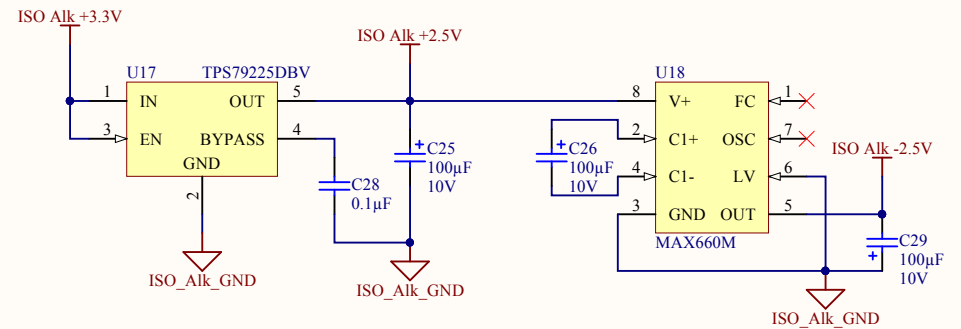
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File: C:\Users\Ellen\Dropbox\SeafET SeapHOx\SeafET SeapHOx			design files\Electronics Hardware and Software\ARM\Sch	

Isolated Power Circuits Constant Current

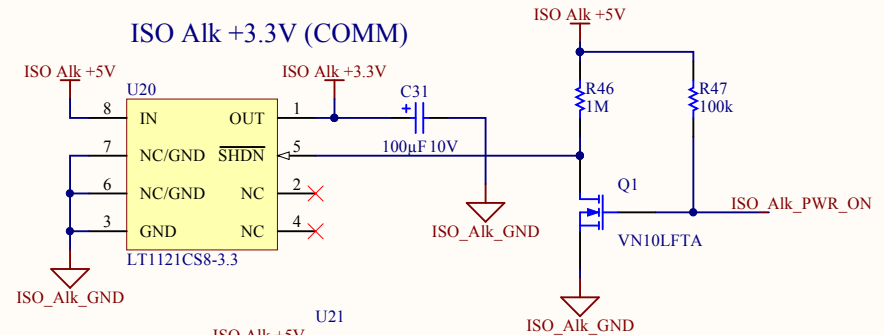
ISO Alk +5V Regulator



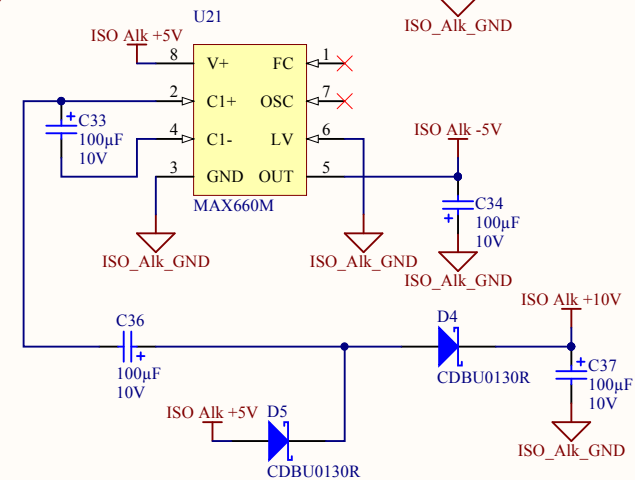
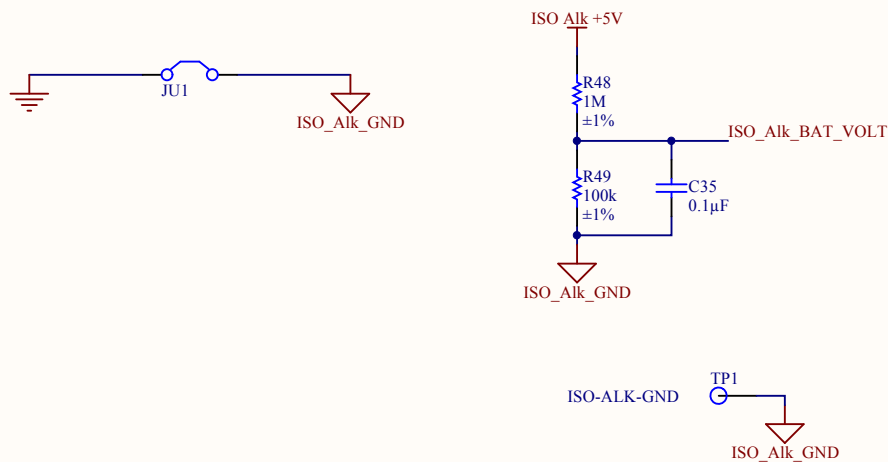
ISO Alk ±2.5V (For ADS1248)



ISO Alk +3.3V (COMM)



ISO Alk-Batt Voltage Divider



Title **SeapHOx Alkalinity Board**

Size: Letter Number:* Revision:A

Date: 1/19/2016 Time: 2:32:14 PM Sheet3 of 6

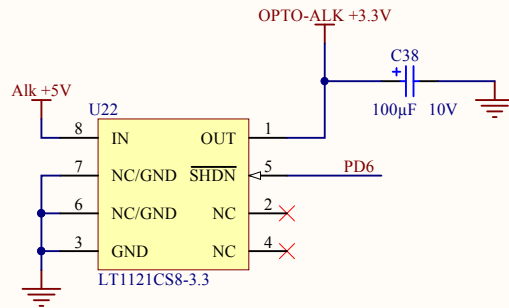
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Martz Lab, 858-534-0573
rmartz@ucsd.edu
Geosciences Research Division
Scripps Institution of Oceanography
University of California, San Diego

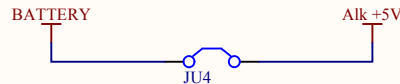
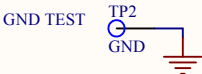
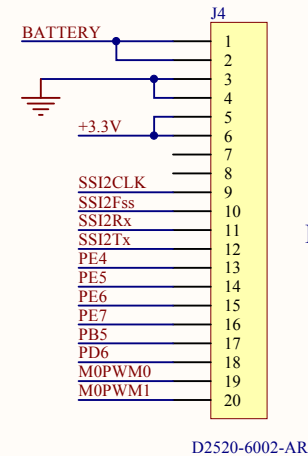
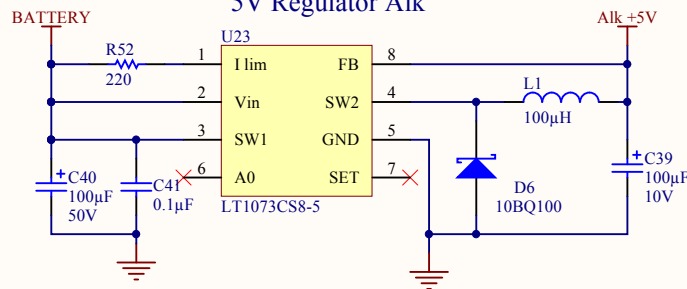
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lab\Desktop\we
b_color.png

Non-Isolated Voltage Regulators

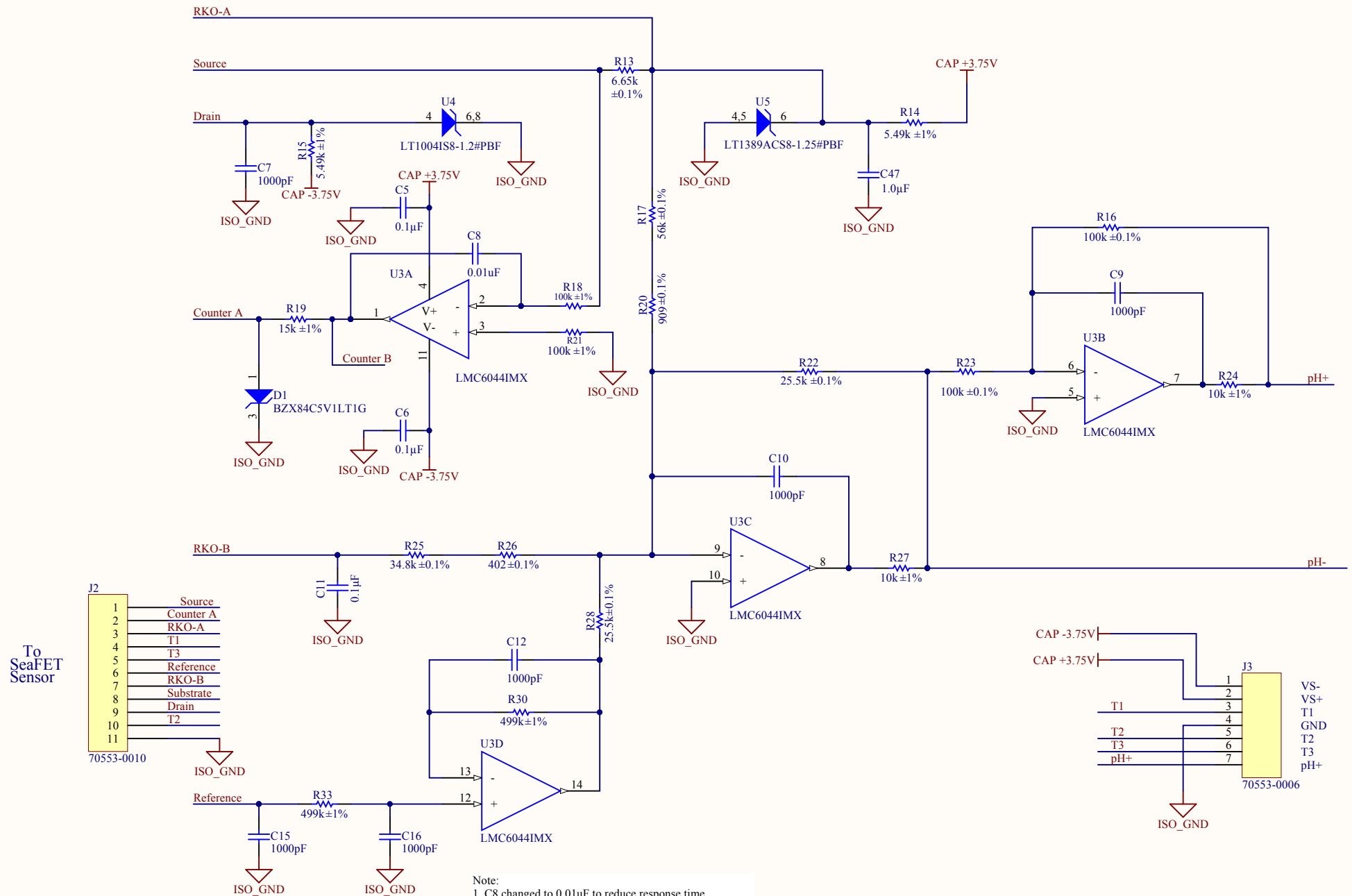
3.3V Regulator for Alk Optoisolators



5V Regulator Alk



Cap Adapter

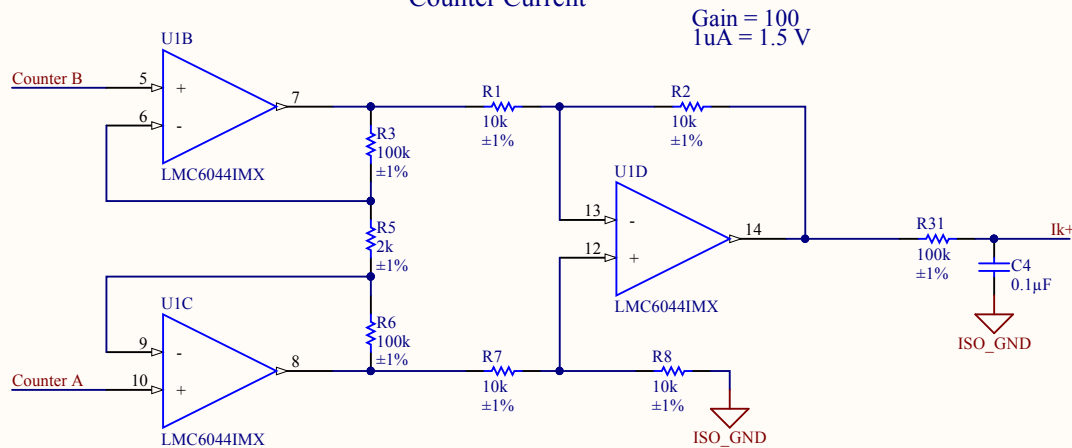


Note:
 1. C8 changed to 0.01μF to reduce response time.
 2. ISO_GND is connected to pH ISO_GND via J3 pin 4.
 3. Added C47 to reduce noise - RCG 8/2014

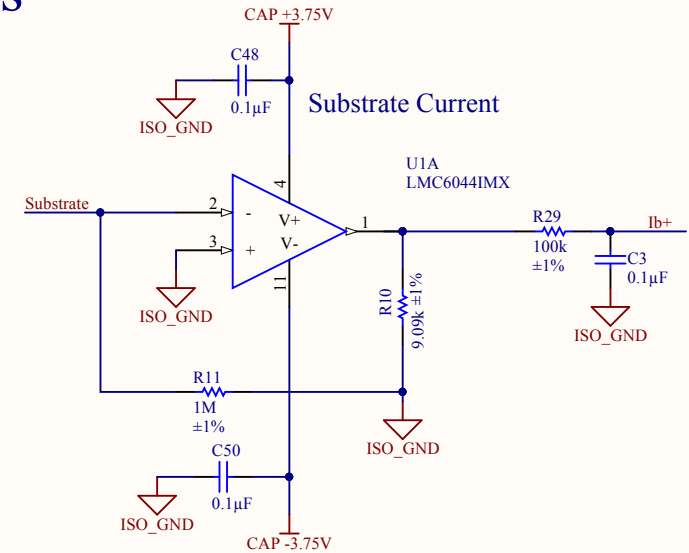
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Date: 1/19/2016	Time: 2:32:14 PM	Sheet5 of 6	Scripps Institution of Oceanography	
File: C:\Users\Ellen\Dropbox\SeaFET_SeapHOx\SeaFET_SeapHOx_design_files\Electronics Hardware and Software\ARM\Sch			University of California, San Diego	

ISFET Current Monitoring Circuits

Counter Current

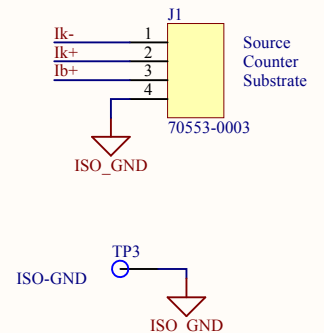
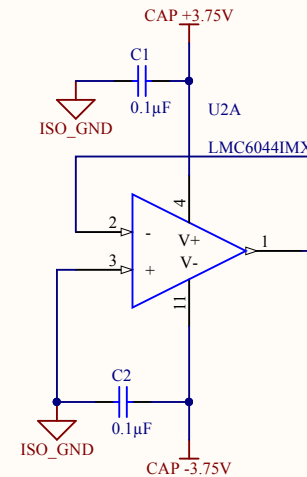
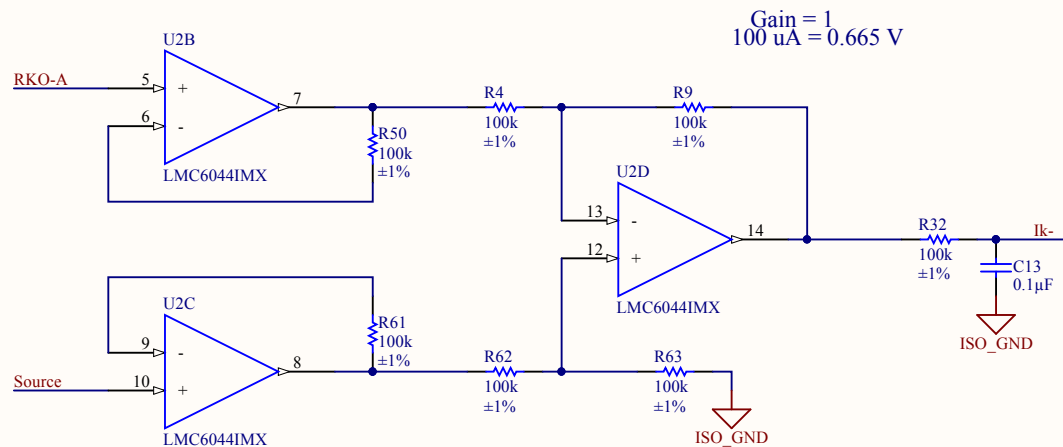


Substrate Current



Substrate current of 100nA = 1V output

Source-Drain Current



1

2

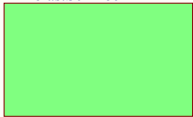
3

4

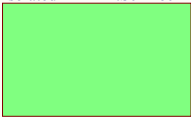
A

A

S1
Alk bias.SchDoc



S2
Isolated Alk AD.SchDoc



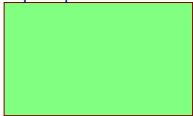
S3
Isolated Power Circuits Alk.SchDoc



S4
Non Isolated Alk Voltage Regulators.SchDoc



S5
Cap Adapter.SchDoc



S6
ISFET Current Measurements.SchDoc



B

B

C

C

D

D

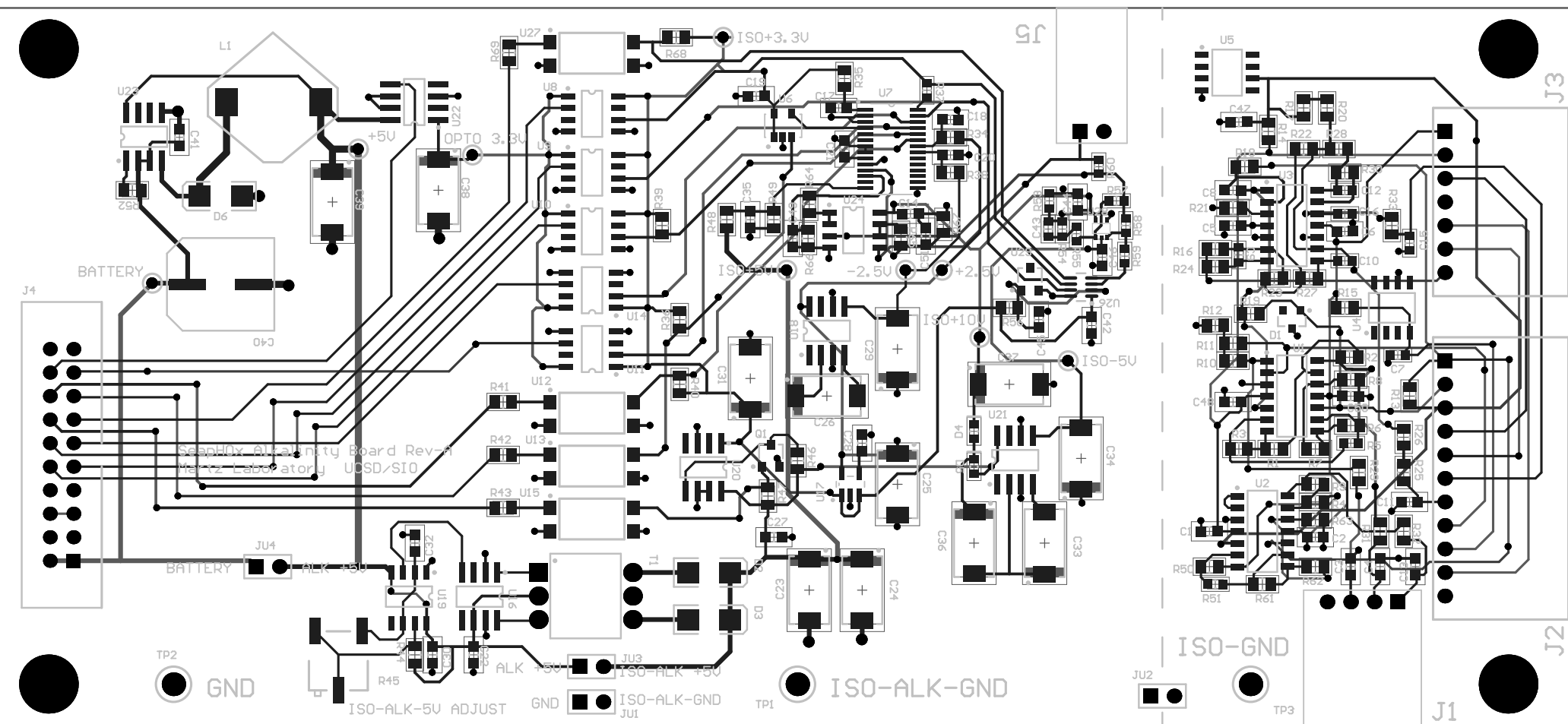
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Size: Letter	Number:*	Revision: A		
Date: 1/19/2016	Time: 2:32:14 PM	Sheet* of *		
File: C:\Users\Ellen\Dropbox\SeaFET SeapHOx\SeaFET SeapHOx design_files\Electronics Hardware and Software\ARM SchVA				

1

2

3

4



Bill of Materials

Bill of Materials For Project [Daughter Board Alk.PrjPcb] (PCB Document : SeapHOx I

Source Data From: Daughter Board Alk.PrjPcb
 Project: Daughter Board Alk.PrjPcb
 Variant: None

Creation Date: 1/19/2016 2:32:52 PM
 Print Date: 19-Jan-16 2:32:58 PM

#Column Name	#Column Name E	#Column Name E	Designator	Description	Quantity
			C1, C2, C3, C4, C5, C6, C11, C13, C14, C17, C18, C19, C20, C22, C27, C28, C30, C35, C41, C42, C44, C46, C48, C49, C50, C51	CAP CER 0.1UF 50V 10% X7R 0603	26
			C7, C9, C10, C12, C15, C16, C43	CAP CER 1000PF 50V 10% X7R 0603	7
			C8, C32	CAP CER 10000PF 50V 10% X7R 0603	2
			C21	CAP CER 10UF 10V 10% X5R 0603	1
			C23, C24	CAP TANT 330UF 10V 20% 2917	2
			C25, C26, C29, C31, C33, C34, C36, C37, C38, C39	CAP TANT 100UF 10V 10% 2917	10
			C40	CAP ALUM 100UF 50V 20% SMD	1
			C45, C47	CAP CER 1UF 50V 10% X5R 0603	2
			D1	DIODE ZENER 5.1V 225MW SOT23-3	1
			D2, D3	DIODE SCHOTTKY 30V 1A DO214AA	2
			D4, D5	DIODE SCHOTTKY 30V 0.1A 0603	2
			D6	DIODE SCHOTTKY 100V 1A DO214AA	1
			J1	CONN HEADER 4POS .100 R/A GOLD	1
			J2	CONN HEADER 11POS .100 R/A GOLD	1
			J3	CONN HEADER 7POS .100 R/A GOLD	1
			J4	CONN HEADER 20POS VERT 10GOLD	1
			J5	CONN HEADER 2POS .100 R/A GOLD	1
			JU1, JU2, JU3, JU4	BERGSTIK II .100" SR STRAIGHT	4
			L1	COIL PWR CHOKE 100UH 1A SMD	1
			Q1	MOSFET N-CH 60V 150MA SOT23-3	1
			R1, R2, R7, R8, R24, R27	RES 10K OHM 1/8W 1% 0805 SMD	6
			R3, R4, R6, R9, R18, R21, R29, R31, R32, R49, R50, R61, R62, R63	RES 100K OHM 1/8W 1% 0805 SMD	14
			R5	RES 2.00K OHM 1/8W 1% SMD 0603	1
			R10	RES 9.09K OHM 1/8W 1% 0805 SMD	1
			R11, R48, R64, R65	RES 1M OHM 1/8W 1% 0805 SMD	4
			R13	RES 6.65K OHM 1/8W .1% 0805 SMD	1
			R14, R15	RES 5.49K OHM 1/8W 1% 0805 SMD	2
			R16, R23	RES 100K OHM 1/8W .1% 0805 SMD	2
			R17	RES 56K OHM 1/8W .1% 0805 SMD	1
			R19	RES 15K OHM 1/8W 1% 0805 SMD	1
			R20	RES 909 OHM 1/8W .1% 0805 SMD	1
			R22, R28	RES 25.5K OHM 1/8W .1% 0805 SMD	2
			R25	RES 34.8K OHM 1/8W .1% 0805 SMD	1
			R26	RES 402 OHM 1/8W .1% 0805 SMD	1
			R30, R33	RES 499K OHM 1/8W 1% 0805 SMD	2
			R34, R35, R38	RES 10 OHM 1/8W 5% 0805 SMD	3
			R36, R39, R40, R47, R68	RES 100K OHM 1/8W 5% 0805 SMD	5
			R37	RES 47 OHM 1/10W 5% 0603 SMD	1
			R41, R42, R43, R56, R69	RES 2K OHM 1/8W 5% 0805 SMD	5
			R44, R46	RES 1M OHM 1/8W 5% 0805 SMD	2
			R45	TRIMMER 1M OHM 0.25W SMD	1
			R52	RES 220 OHM 1/8W 5% 0805 SMD	1
			R53, R59	RES 150K OHM 1/8W 1% SMD 0603	2
			R54, R58	RES 15.0K OHM 1/8W 1% SMD 0603	2
			R55, R57	RES 1.00K OHM 1/8W 1% SMD 0603	2
			R60	RES 1K OHM 1/10W 1% 0603 SMD	1
			R66, R67	RES 249K OHM 1/8W 1% 0805 SMD	2
			T1	XFRMR 5V IN/OUT MAX 253 DIP	1
			TP1, TP2, TP3	TEST POINT PC COMPACT .063"D BLK	3
			U1, U2, U3	IC OPAMP GP 100KHZ RRO 14SOIC	3
			U4	IC VREF SHUNT 1.23V 8SOIC	1
			U5	IC VREF SHUNT 1.25V 8SOIC	1
			U6	IC 2.64V NANOPWR MON SOT-23-5	1
			U7	IC ADC 24BIT DEL/SIG LN 28TSSOP	1
			U8, U9, U10, U11, U14	OPTOCOUPLER 3.3V 8-SOIC	5
			U12, U13, U15, U27	OPTOCOUPLER DARL 5KV/RMS 4SMD	4
			U16	Gate Drivers Transformer Driver for Iso RS-485 Int	1
			U17	IC REG LDO 2.5V 0.1A SOT23-5	1
			U18, U21	IC REG MULTI CONFIG ADJ 8-SOIC	2
			U19	IC OSC MONO TIMING 3MHZ 8-SOIC	1
			U20, U22	IC REG LDO 3.3V 0.15A 8SOIC	2
			U23	IC REG BUCK BST INV 5V .4A 8SOIC	1
			U24	IC OPAMP GP 100KHZ RRO 8SOIC	1
			U26	IC DAC 16BIT BUFF V-OUT SOT23-8	1
			U28	IC OPAMP JFET 3.5MHZ RRO SC70-5	1
			U29	IC VREF SHUNT 2.5V SOT23-3	1

Approved	Notes	