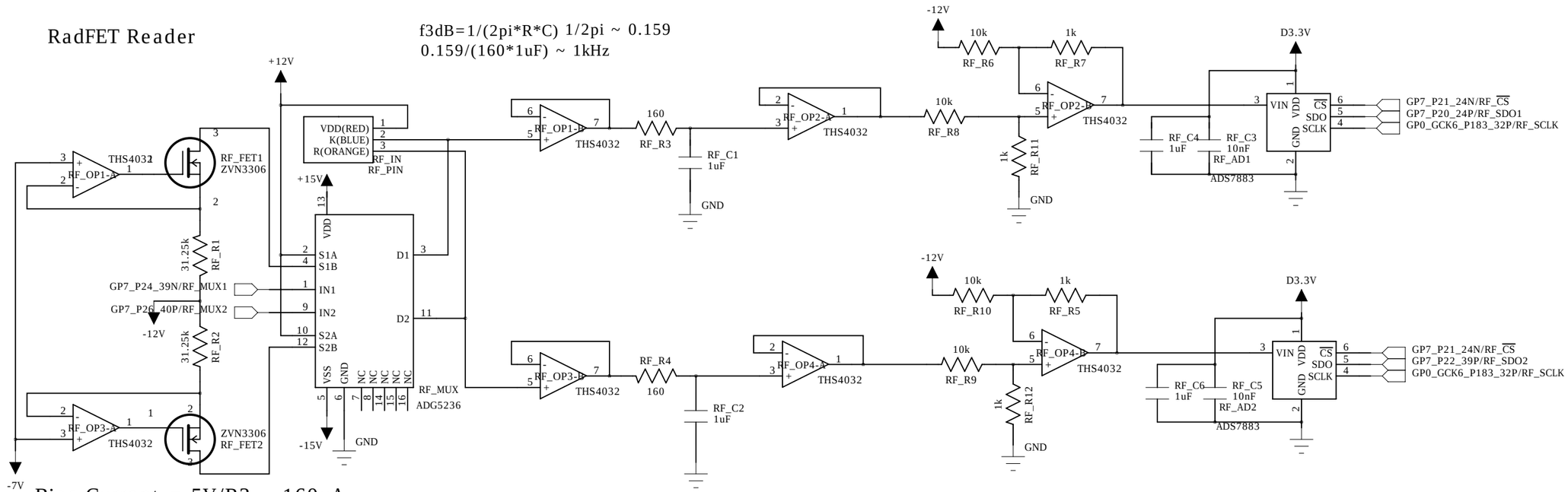
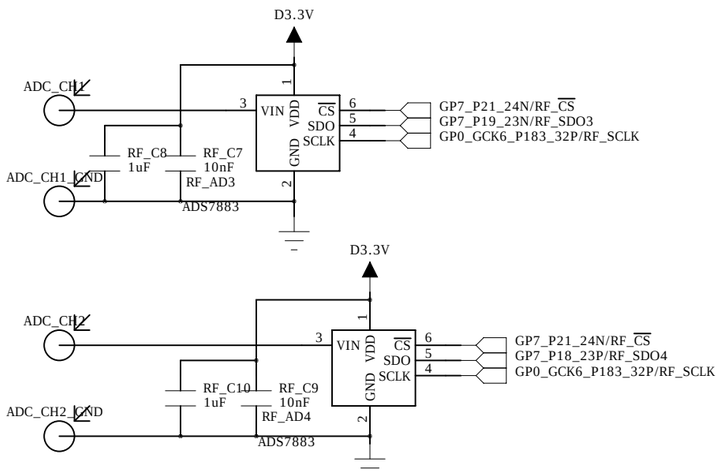
RadFET Reader

f3dB=1/(2pi*R*C) 1/2pi ~ 0.159
0.159/(160*1uF) ~ 1kHz

Differential Amplifier
Vout = (R3/R1)x(V+-V-) = (1/10)x(Vin+12V)<3V



Bias Current = 5V/R3 ~ 160uA



Univ. of Hawai'i -- PHYS476

TITLE: FEt, Diode, and Diamond X-ray sensor (FEDDX)

	Design:	Page Description:	REV:
	KF	RadFET Reader	A

DATED: 18-MAY-12 [RADFET] SHEET: 1 OF 5

Photo Diode Reader

f3dB=1/(2pi*R*C) 1/2pi ~ 0.159
0.159/(160*40pF) ~ 25MHz

ENCODE - differential input >0.4V, 2V<Vhigh<5V

2.8V < Vout ~3.3V-0.2V < ...

Bank 0

DIO_IN-AFTER
LEMO
DIO_OP1-A
AD8001
+15V
160
DIO_R3
DIO_OP2-B
THS3202
DIO_C1
40pF
DIO_TRA
T4-1T
270
DIO_R2
GP4_GCLK1_P80/DIO_ENCODEA
Vref 2.4V
Bias to ground
DIO_C3 0.01uF
DIO_C4 0.1uF
DIO_C5 0.01uF
DIO_C6 0.1uF
DIO_C16 0.01uF
DIO_ADCA
AD6640
GP0_P205/DIO_DA0
GP0_P204_01N/DIO_DA1
GP0_P203_01P/DIO_DA2
GP0_P200/DIO_DA3
GP0_P199_25N/DIO_DA4
GP0_P198_25P/DIO_DA5
GP0_P197/DIO_DA6
GP0_P196_27N/DIO_DA7
GP0_P194_27P/DIO_DA8
GP0_P191_30N/DIO_DA9
GP0_P190_30P/DIO_DA10
GP0_P189/DIO_DA11
DIO_R1-1 10
DIO_R1-2 100
DIO_R1-3 1k
DIO_R1-4 10k
DIO_R1-5 100k
DIO_R1-6 1M
DIO_R1-7 10M
DIO_R1-8
DIO_MUXA
ADG_1208
GP5_P71/DIO_MUXA-2
GP5_P78/DIO_MUXA-1
GP5_P63/DIO_MUXA-0
D3.3V
-15V
+15V
GND

DIO_IN-BEFORE
LEMO
DIO_OP1-B
AD8001
160
DIO_R4
DIO_OP2-A
THS3202
DIO_C2
40pF
DIO_TRB
T4-1T
270
DIO_R5
GP0_GCK7_P184_32N/DIO_ENCODEB
VREF
C1
DIO_C7 0.01uF
DIO_C8 0.1uF
DIO_C9 0.01uF
DIO_C10 0.1uF
DIO_C17 0.01uF
DIO_ADCB
AD6640
GP7_P2_01P/DIO_DB0
GP7_P3_01N/DIO_DB1
GP7_P4_16P/DIO_DB2
GP7_P5_16N/DIO_DB3
GP7_P7_19P/DIO_DB4
GP7_P9_19N/DIO_DB5
GP7_P10_20P/DIO_DB6
GP7_P11_20N/DIO_DB7
GP7_P12_21P/DIO_DB8
GP7_P13_21N/DIO_DB9
GP7_P15_22P/DIO_DB10
GP7_P16_22N/DIO_DB11
DIO_R2-1 10
DIO_R2-2 100
DIO_R2-3 1k
DIO_R2-4 10k
DIO_R2-5 100k
DIO_R2-6 1M
DIO_R2-7 10M
DIO_R2-8
DIO_MUXB
ADG_1208
GP0_P187_31N/DIO_MUXB-2
GP0_P185_31P/DIO_MUXB-1
GP0_P182/DIO_MUXB-0
D3.3V
-15V
GND

Univ. of Hawai'i -- PHYS476			
TITLE: FEt, Diode, and Diamond X-ray sensor (FEDDX)			
	Design: KF	Page Description: Photo Diode Reader	REV: A
DATED: 18-MAY-12	[DIODE]	SHEET: 2 OF 5	

Diamond Reader

G=GB/f_max=2000MHz/50MHz=40

G=1+RF/R1, RF=39R1

AD9430 Input RL = 3k

Gain = 25 dB

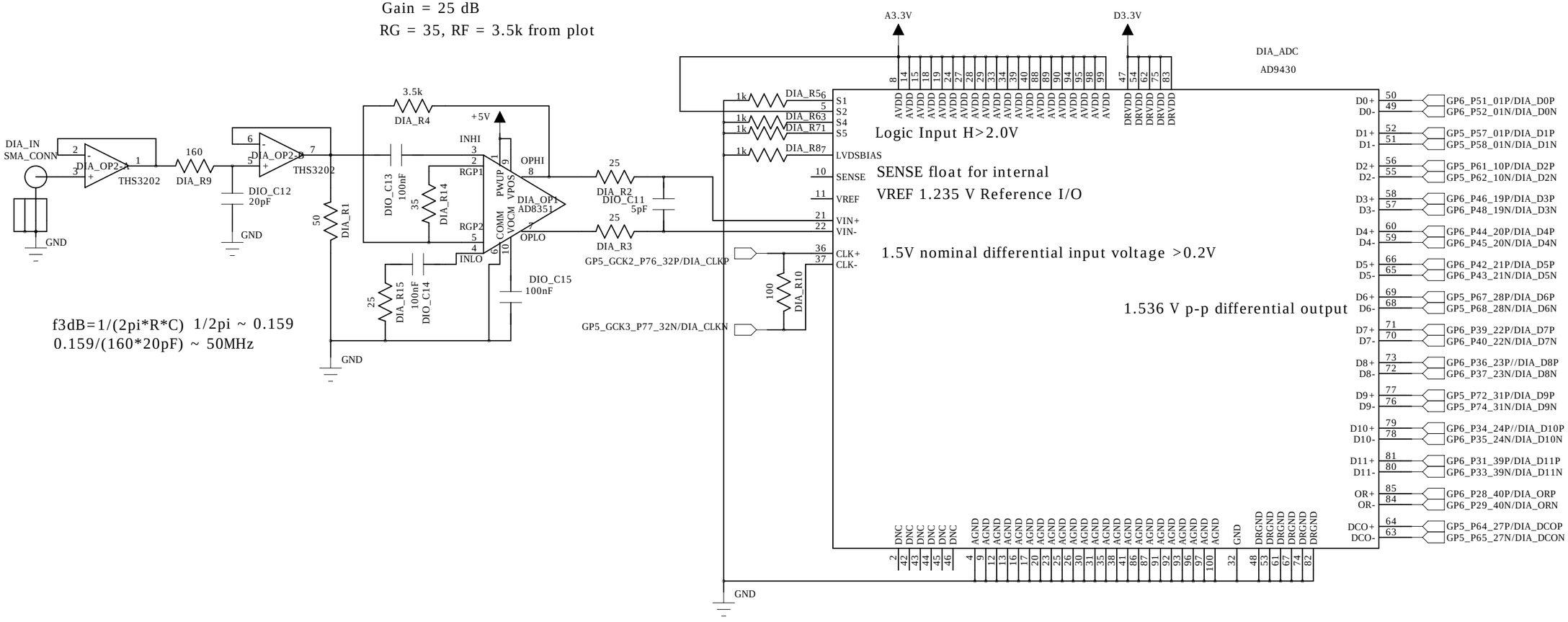
RG = 35, RF = 3.5k from plot

S1 - Data Format Select. GND = binary, AVDD = twos complement.

S2 - Output Mode Select. AVDD = LVDS.

S4 - Tie low when operating in LVDS

S5 - AVDD sets fS = 0.768 V p-p differential, GND sets fS = 1.536 V p-p differential.



Univ. of Hawai'i -- PHYS476

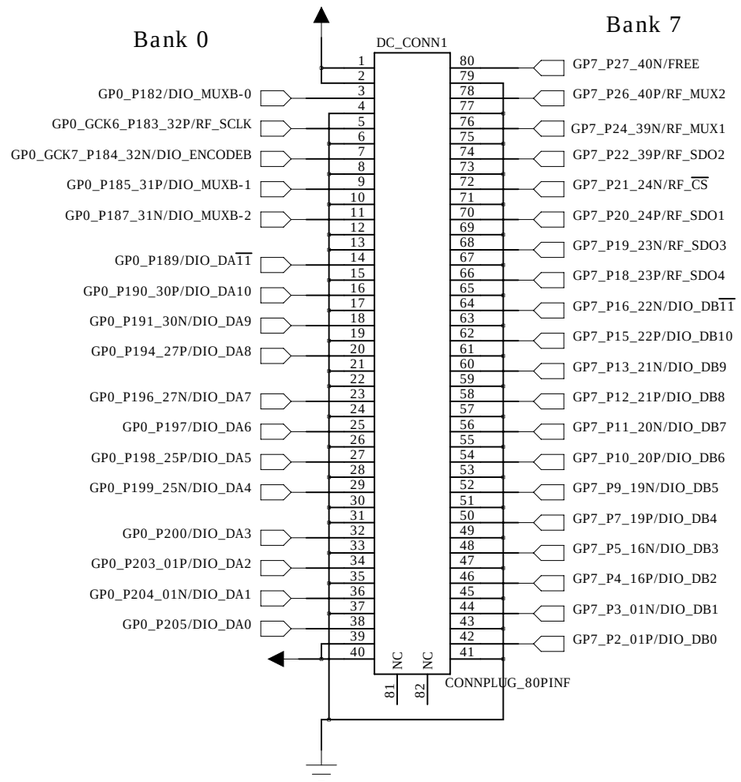
TITLE: FEt, Diode, and Diamond X-ray sensor (FEDDX)

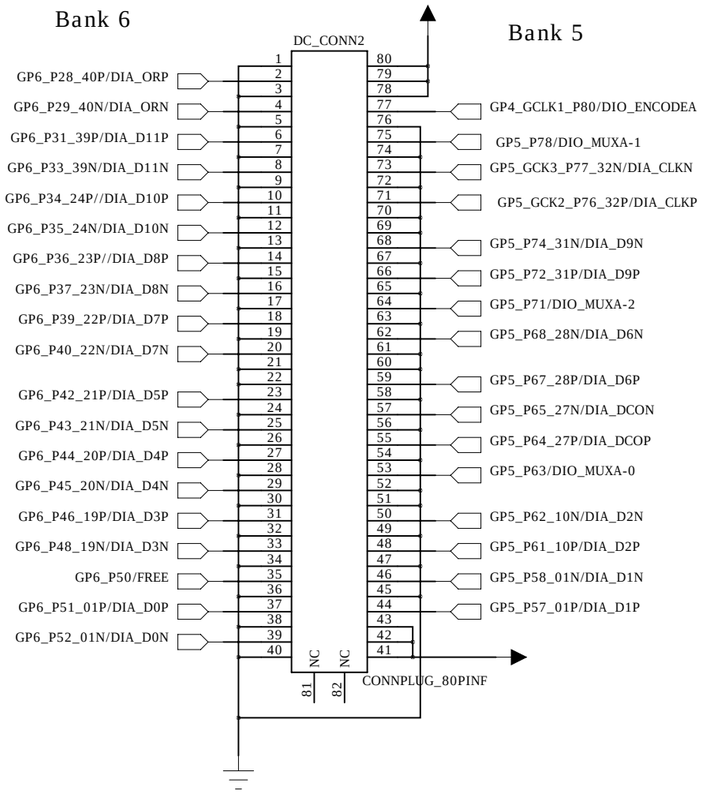
	Design:	Page Description:	REV:
	KF	Diamond Detector Reader	A

DATED: 18-MAY-12 [DIAMOND] SHEET: 3 OF 5

RF - RadFET reader pin
DIO - silicon diode reader pin
DIA - diamond detector pin
IO/GP - FPGA pin names

NOTE: Arrow on connector indicates pin 1 and corresponds to silkscreen arrow on board (arrow is small and located inside of housing)





X1 4-40 MOUNTING-HOLE-4-40
X2 4-40 MOUNTING-HOLE-4-40
X4 4-40 MOUNTING-HOLE-4-40
X3 4-40 MOUNTING-HOLE-4-40

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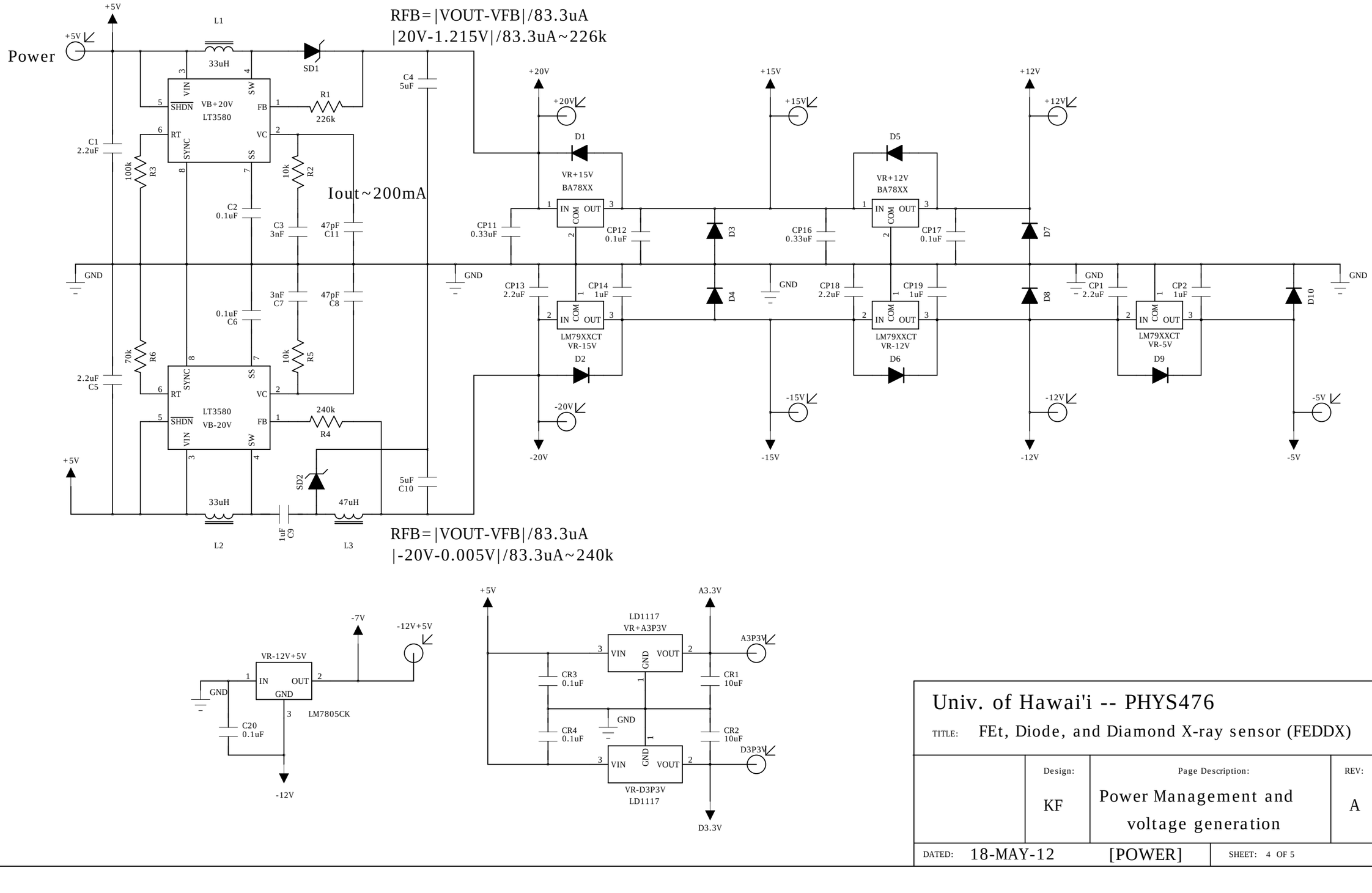
TITLE: FEt, Diode, and Diamond X-ray sensor (FEDDX)

	Design:	Page Description:	REV:
	KF	Connector to Universal Eval. Board	A

DATED: 18-MAY-12 [IN/OUT] SHEET: 4 OF 5



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TITLE: FEt, Diode, and Diamond X-ray sensor (FEDDX)

	Design:	Page Description:	REV:
	KF	Power Management and voltage generation	A

DATED: 18-MAY-12 [POWER] SHEET: 4 OF 5