WARP Radio Board

MAX2829 Version - Rev 1.4

Schematic Pages:

CMC - Rice University	
Title: WARP Radio Board	
Description: Table of Contents	Rev: x4
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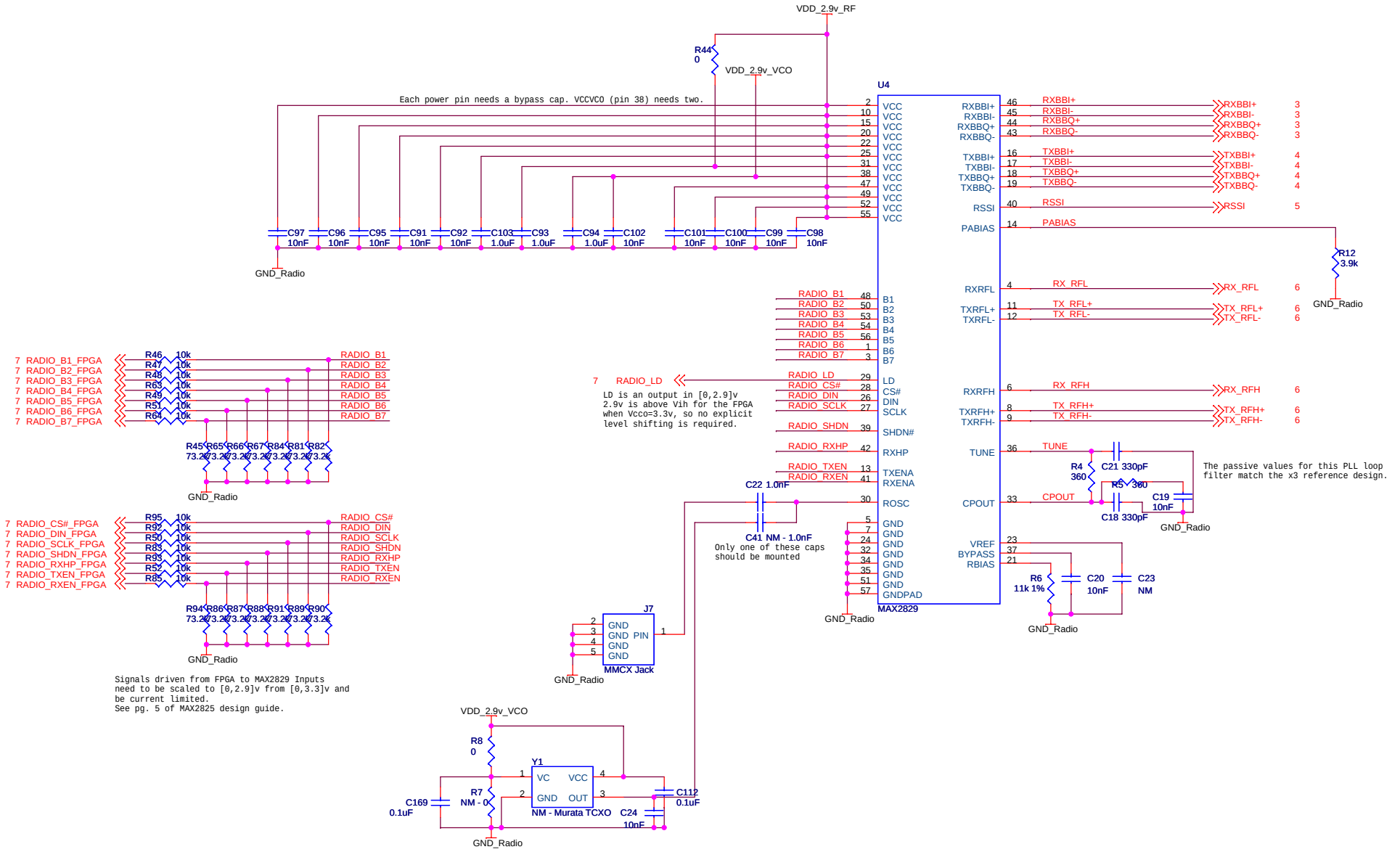
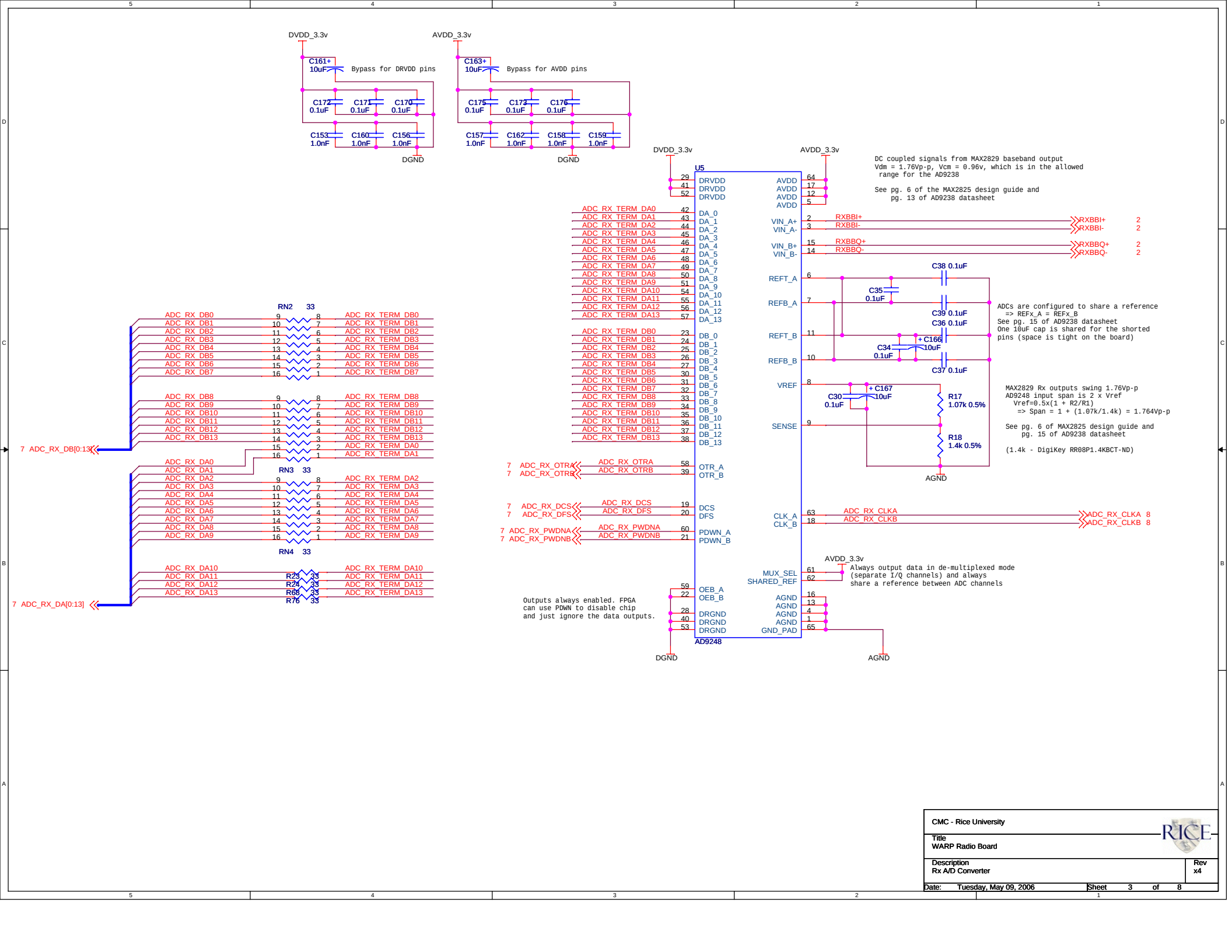


CMC - Rice University	
Title: WARP Radio Board	
Description: MAX2829 RF Transceiver	Rev: x4
Date: Tuesday, May 09, 2006	Sheet 2 of 8


DVDD_3.3v
AVDD_3.3v
C161+ 10uF
Bypass for DRVDD pins
C163+ 10uF
Bypass for AVDD pins
C172 0.1uF
C171 0.1uF
C170 0.1uF
C175 0.1uF
C173 0.1uF
C176 0.1uF
C153 1.0nF
C160 1.0nF
C156 1.0nF
C157 1.0nF
C162 1.0nF
C158 1.0nF
C159 1.0nF
DGND
DGND
U5
DRVDD
DA_0
DA_1
DA_2
DA_3
DA_4
DA_5
DA_6
DA_7
DA_8
DA_9
DA_10
DA_11
DA_12
DA_13
DB_0
DB_1
DB_2
DB_3
DB_4
DB_5
DB_6
DB_7
DB_8
DB_9
DB_10
DB_11
DB_12
DB_13
OTR_A
OTR_B
DCS
DFS
PDWN_A
PDWN_B
OEB_A
OEB_B
DRGND
AD9248
AVDD
VIN_A+
VIN_A-
VIN_B+
VIN_B-
REFT_A
REFB_A
REFT_B
REFB_B
VREF
SENSE
CLK_A
CLK_B
MUX_SEL
SHARED_REF
AGND
GND_PAD
DC coupled signals from MAX2829 baseband output
Vdm = 1.76Vp-p, Vcm = 0.96v, which is in the allowed range for the AD9238
See pg. 6 of the MAX2825 design guide and pg. 13 of AD9238 datasheet
RXBBI+
RXBBI-
RXBBQ+
RXBBQ-
C38 0.1uF
C35 0.1uF
C39 0.1uF
C36 0.1uF
C166 10uF
C34 0.1uF
C37 0.1uF
ADCs are configured to share a reference
=> REFx_A = REFx_B
See pg. 15 of AD9238 datasheet
One 10uF cap is shared for the shorted pins (space is tight on the board)
C167 10uF
C30 0.1uF
R17 1.07k 0.5%
R18 1.4k 0.5%
MAX2829 Rx outputs swing 1.76Vp-p
AD9248 input span is 2 x Vref
Vref=0.5x(1 + R2/R1)
=> Span = 1 + (1.07k/1.4k) = 1.764Vp-p
See pg. 6 of MAX2825 design guide and pg. 15 of AD9238 datasheet
(1.4k - DigiKey RR08P1.4KBCT-ND)
AGND
ADC_RX_CLKA
ADC_RX_CLKB
Always output data in de-multiplexed mode (separate I/Q channels) and always share a reference between ADC channels
Outputs always enabled. FPGA can use PDWN to disable chip and just ignore the data outputs.
RN2 33
RN3 33
RN4 33
R23 33
R24 33
R68 33
R76 33
7 ADC_RX_DB[0:13]
7 ADC_RX_DA[0:13]
ADC_RX_DB0
ADC_RX_DB1
ADC_RX_DB2
ADC_RX_DB3
ADC_RX_DB4
ADC_RX_DB5
ADC_RX_DB6
ADC_RX_DB7
ADC_RX_DB8
ADC_RX_DB9
ADC_RX_DB10
ADC_RX_DB11
ADC_RX_DB12
ADC_RX_DB13
ADC_RX_DA0
ADC_RX_DA1
ADC_RX_DA2
ADC_RX_DA3
ADC_RX_DA4
ADC_RX_DA5
ADC_RX_DA6
ADC_RX_DA7
ADC_RX_DA8
ADC_RX_DA9
ADC_RX_DA10
ADC_RX_DA11
ADC_RX_DA12
ADC_RX_DA13
ADC_RX_TERM_DA0
ADC_RX_TERM_DA1
ADC_RX_TERM_DA2
ADC_RX_TERM_DA3
ADC_RX_TERM_DA4
ADC_RX_TERM_DA5
ADC_RX_TERM_DA6
ADC_RX_TERM_DA7
ADC_RX_TERM_DA8
ADC_RX_TERM_DA9
ADC_RX_TERM_DA10
ADC_RX_TERM_DA11
ADC_RX_TERM_DA12
ADC_RX_TERM_DA13
ADC_RX_TERM_DB0
ADC_RX_TERM_DB1
ADC_RX_TERM_DB2
ADC_RX_TERM_DB3
ADC_RX_TERM_DB4
ADC_RX_TERM_DB5
ADC_RX_TERM_DB6
ADC_RX_TERM_DB7
ADC_RX_TERM_DB8
ADC_RX_TERM_DB9
ADC_RX_TERM_DB10
ADC_RX_TERM_DB11
ADC_RX_TERM_DB12
ADC_RX_TERM_DB13
ADC_RX_OTRA
ADC_RX_OTRB
ADC_RX_DCS
ADC_RX_DFS
ADC_RX_PWDNA
ADC_RX_PWDNB
CMC - Rice University
Title
WARP Radio Board
Description
Rx A/D Converter
Rev
x4
Date: Tuesday, May 09, 2006
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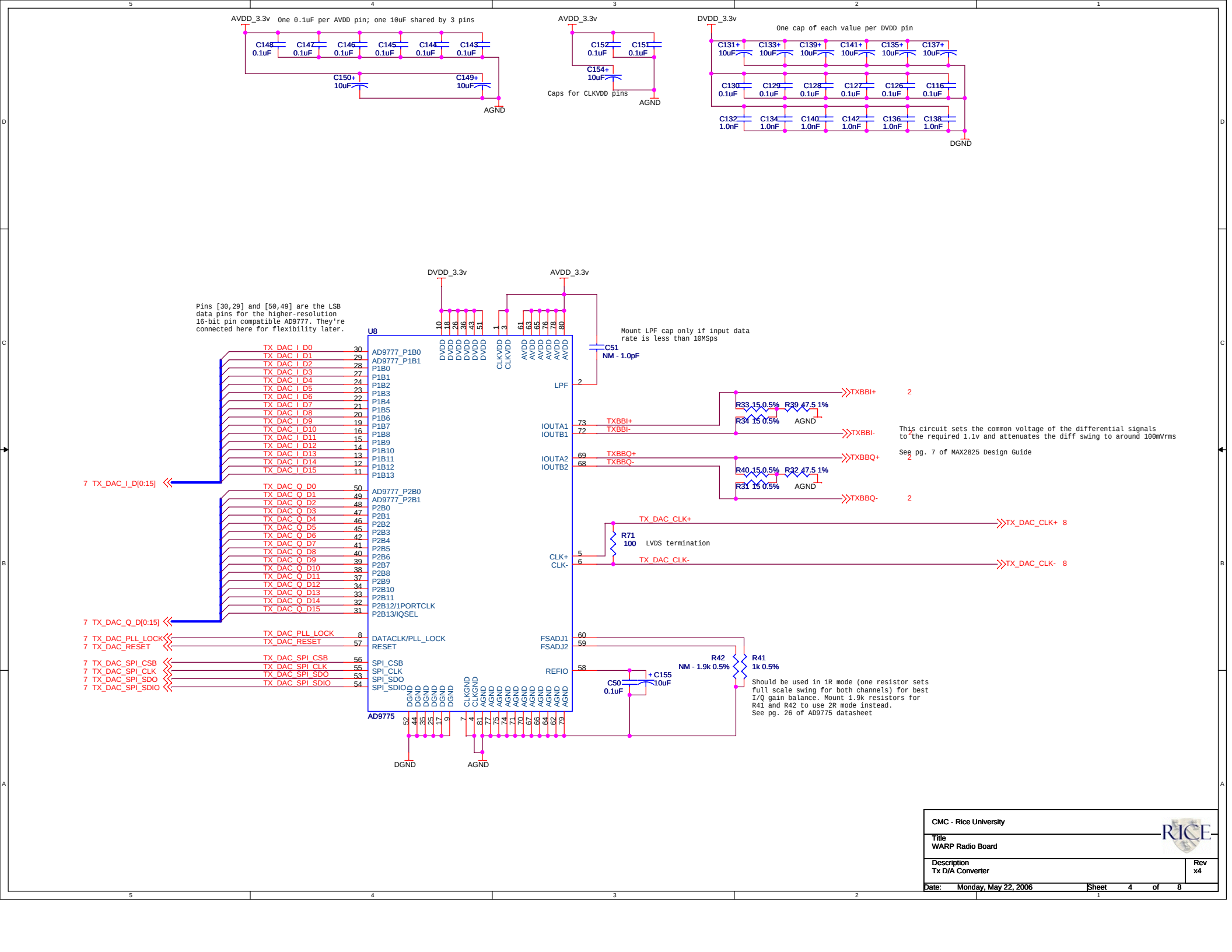

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Title: WARP Radio Board	
Description: Tx D/A Converter	Rev: x4
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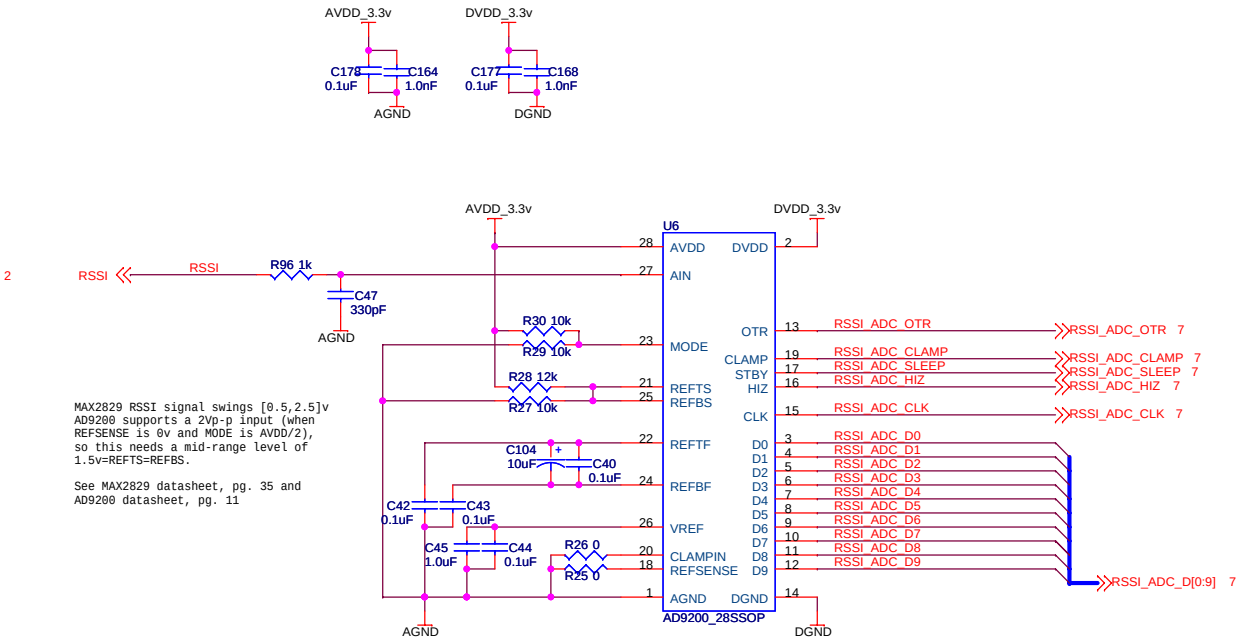

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Title: WARP Radio Board	
Description: RSSI A/D Converter	Rev: x4
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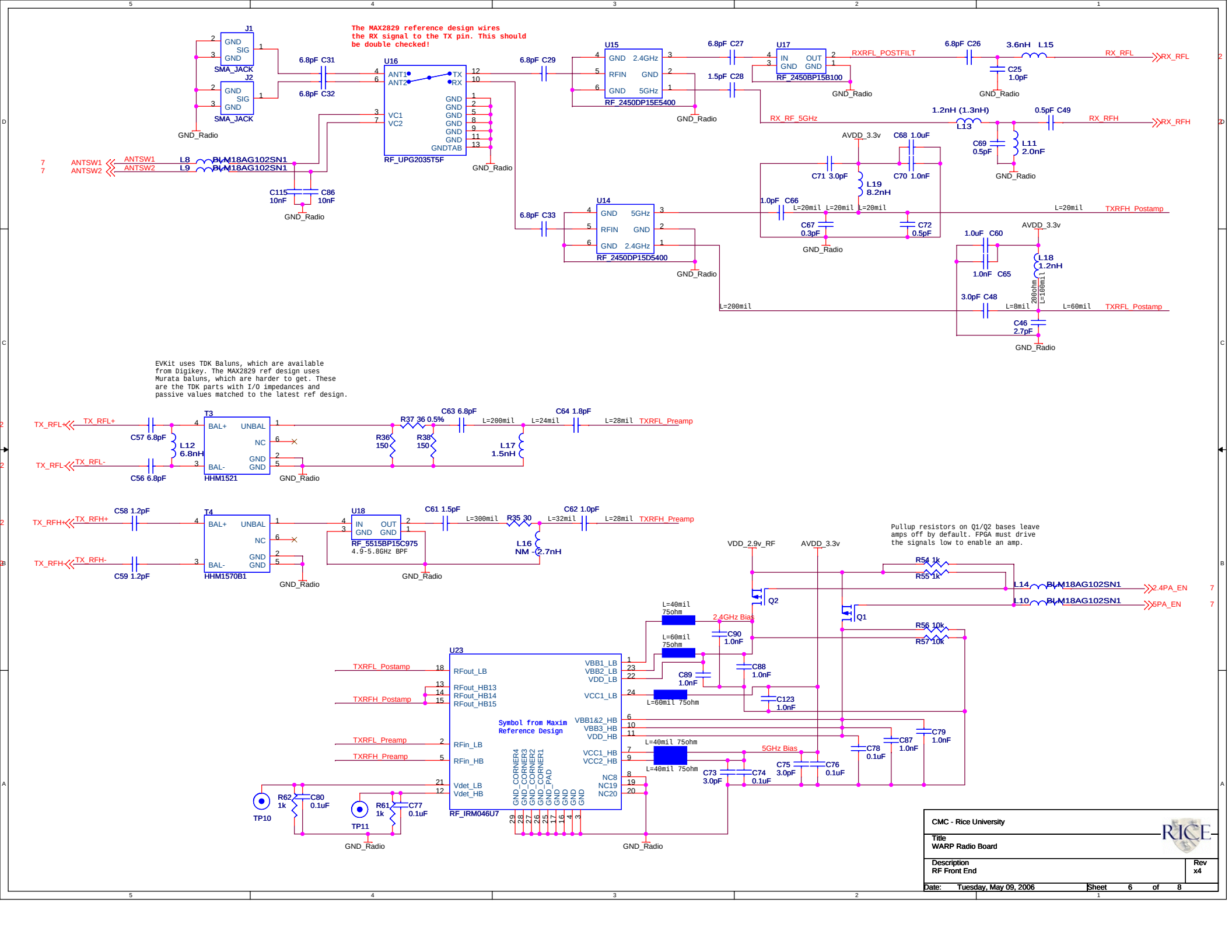
The MAX2829 reference design wires the RX signal to the TX pin. This should be double checked!
EVKit uses TDK Baluns, which are available from Digikey. The MAX2829 ref design uses Murata baluns, which are harder to get. These are the TDK parts with I/O impedances and passive values matched to the latest ref design.
Pullup resistors on Q1/Q2 bases leave amps off by default. FPGA must drive the signals low to enable an amp.
Symbol from Maxim Reference Design
CMC - Rice University
Title
WARP Radio Board
Description
RF Front End
Rev
x4
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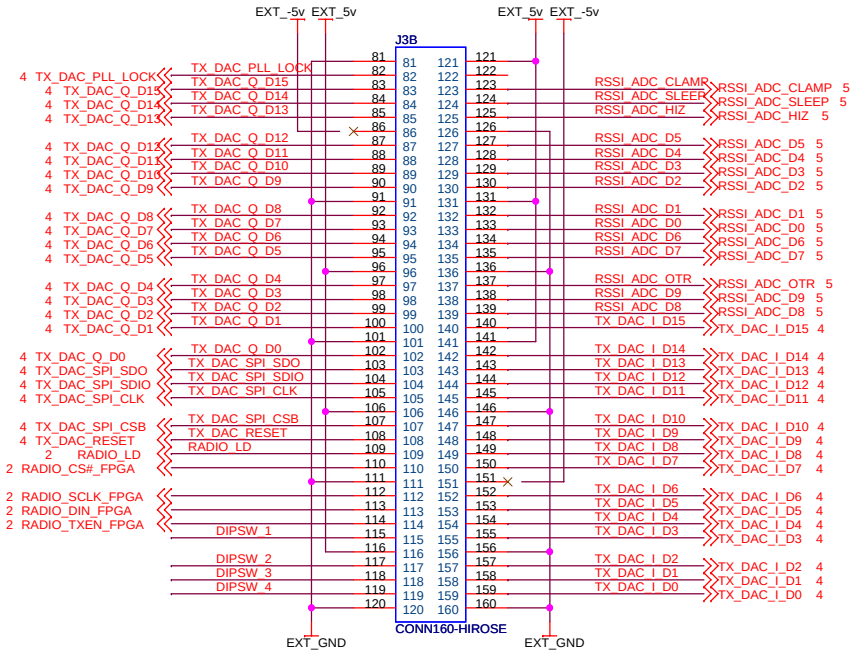

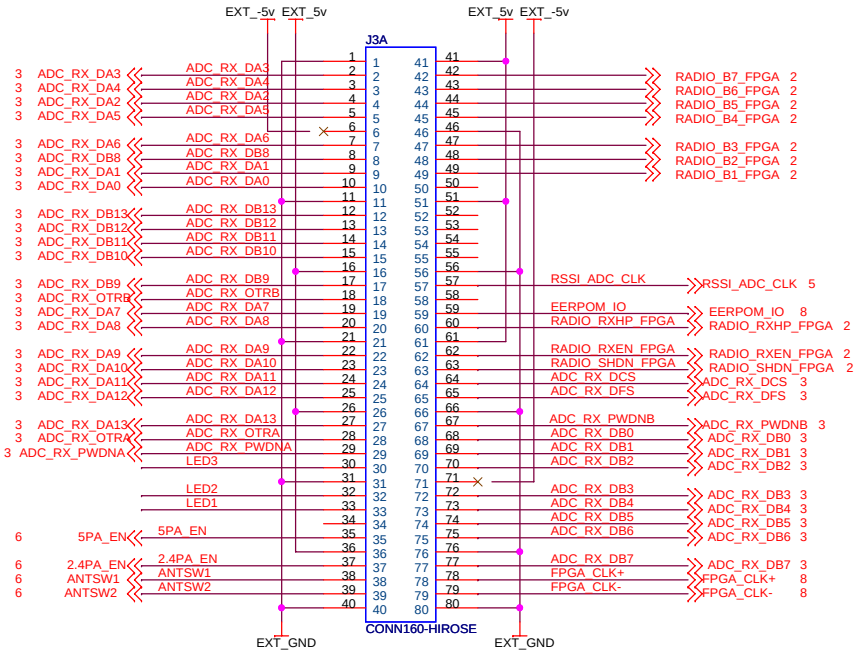

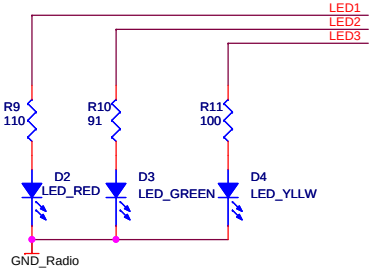

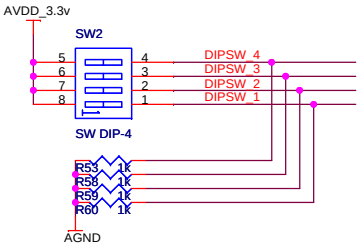

CMC - Rice University	
Title: WARP Radio Board	
Description: FPGA Board Headers	Rev: x4
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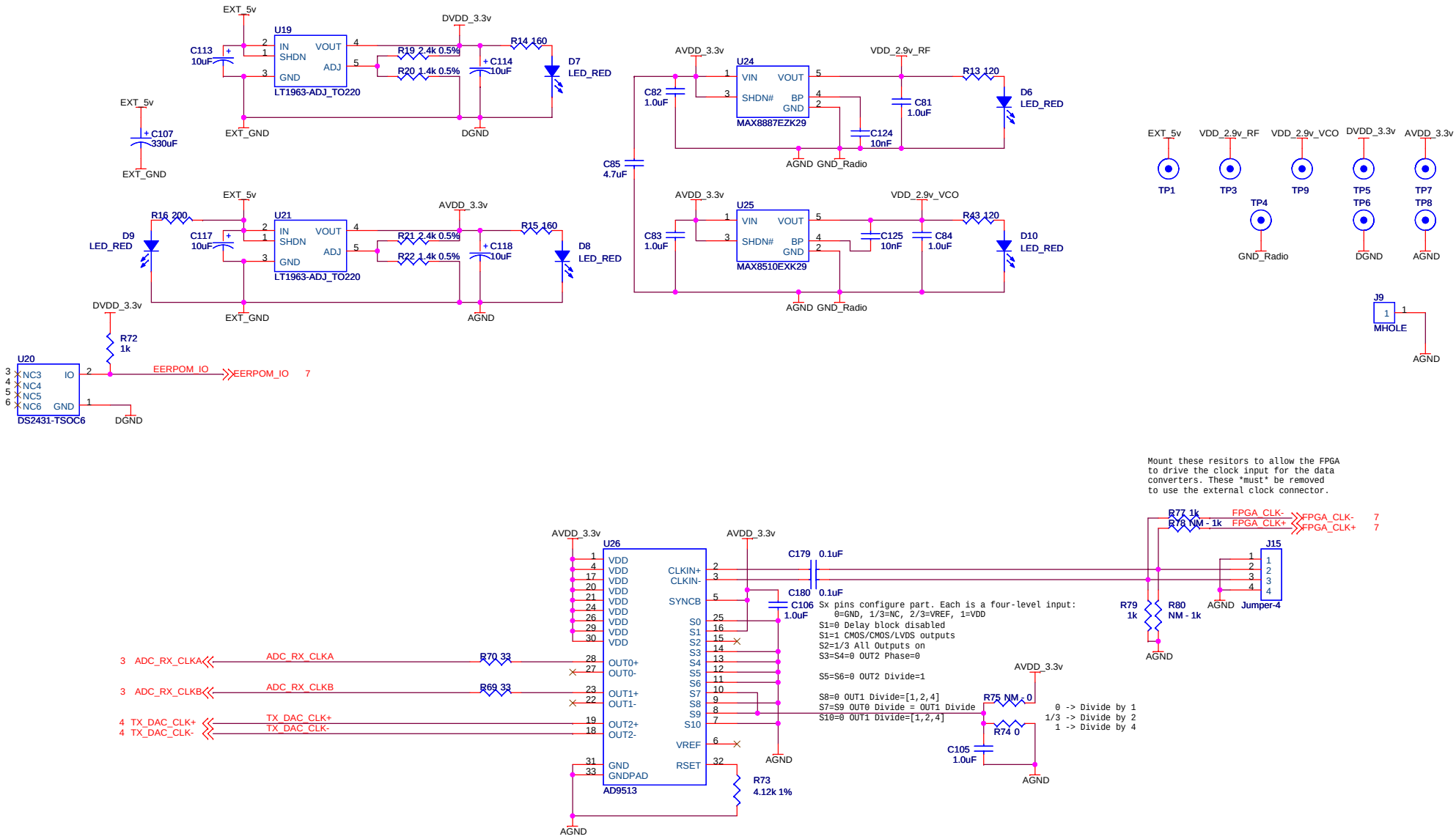

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Title
WARP Radio Board

Description
Clocks & Power

Rev
x4

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